Analytical Resources, Incorporated
Analytical Chemists and Consultants

01 September 2021

Cindy Fields
Anchor QEA, LLC
1201 3rd Ave, Suite 2600
Seattle, WA 98101

RE: Lower Duwamish AOC4

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
21G0286	N/A

Susan Dunnihoo
Digitally signed by Susan Dunnihoo
Date: 2021.09.01 17:23:06 -07'00'

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclosed Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Susan Dunnihoo, Director, Client Services

Cert# 100006-012

1 of 1 21G0286

CHAIN-OF-CUSTODY/TEST REQUEST FORM

Tier 1

№ 4132

Project/Client Name: Duwamish AOCA
Project Number: 180067-02.02
Contact Name: Amara Vandervort
Sampled By: Windward

Ship to: ARI
Attn: Sue Dunnihoo
Shipper: courier
Form filled out by: S. Replinger

Shipping Date: 7.22.2021
Airbill Number: —
Turnaround requested: std.

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	PCBs	TOC / total solids	Archive	PAHs	Metals	Sulfide + Ammonia	Grain Size	Comments / Instructions [Jar tag number(s)]
					Test(s) Requested (check test(s) required)							
7.22.2021	0645	LDW21-SS687	11	Sediment	A	x	x	x	A	x	x	extra volume for tox testing
	0750	LDW21-SS625	4		x	x	x		x			BBP, metals (As, Zn, Pb, Hg)
	0750	LDW21-IT625	3		x	x	x		x			Arsenic
	0810	LDW21-SS627	4		x	x	x		x			BBP, metals (As, Zn, Pb, Hg)
	1150	LDW21-SS646	4		x	x	x					BBP, dioxins / furans
		Total Number of Containers	26	Purchase Order / Statement of Work # CFL-052021-ARI								

1) Released by:	1) Rec'd by:	2) Released by:	2) Rec'd by:
Print name: Aoreiro	Print name: Sambhatla	Print name:	
Signature:	Company: ARI	Signature:	Company:
Company: ~~Windward~~ AOCA		Company:	
Date/Time: 7.22.2021 1730	Date/Time: 07/22/2021 1730	Date/Time:	Date/Time:

* Distribution: White copies accompany shipment; yellow retained by consignor.

Wind Ward environmental LLC

200 1st Ave W, Suite 500
Seattle, WA 98119

206.378.1364

To be completed by Laboratory upon sample receipt:

Date of receipt::	Laboratory W.O. #:
Condition upon receipt:	Time of receipt:
Cooler temperature:	Received by:

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: windward/Anchor

Project Name: Lower Duwamish AOC4

COC No(s): 4132 NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other:_____

Assigned ARI Job No: 21G0286

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of the cooler?	YES	NO
Were custody papers included with the cooler?	YES	NO
Were custody papers properly filled out (ink, signed, etc.)	YES	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time 1755 1.3 ____ ____ ____ ____ ____

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: DOO 5206

Cooler Accepted by: JSm Date: 07/23/2021 Time: 1730

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	NO
What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: Trash bag			
Was sufficient ice used (if appropriate)?	NA	YES	NO
How were bottles sealed in plastic bags?	Individually	Grouped	Not
Did all bottles arrive in good condition (unbroken)?		YES	NO
Were all bottle labels complete and legible?		YES	NO
Did the number of containers listed on COC match with the number of containers received?		YES	NO
Did all bottle labels and tags agree with custody papers?		YES	NO
Were all bottles used correct for the requested analyses?		YES	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs) ...	NA	YES	NO
Were all VOC vials free of air bubbles?	NA	YES	NO
Was sufficient amount of sample sent in each bottle?		YES	NO
Date VOC Trip Blank was made at ARI	NA	_____	

Were the sample(s) split by ARI? NA YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: JSm Date: 07/23/2021 Time: 1336 Labels checked by: JSm

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Anchor QEA, LLC	Project:	Lower Duwamish AOC4	
1201 3rd Ave, Suite 2600	Project Number:	180067-02.03	**Reported:**
Seattle, WA 98101	Project Manager:	Cindy Fields	09/01/2021 16:49

ANALYTICAL REPORT FOR SAMPLES

Laboratory ID	Sample ID	Matrix	Date Sampled	Date Received
21G0286-01	LDW21-SS687	Solid	07/22/21 06:45	07/22/21 17:30
21G0286-02	LDW21-SS625	Solid	07/22/21 07:50	07/22/21 17:30
21G0286-03	LDW21-IT625	Solid	07/22/21 07:50	07/22/21 17:30
21G0286-04	LDW21-SS627	Solid	07/22/21 08:10	07/22/21 17:30
21G0286-05	LDW21-SS646	Solid	07/22/21 11:50	07/22/21 17:30

Anchor QEA, LLC	Project: Lower Duwamish AOC4	
1201 3rd Ave, Suite 2600	Project Number: 180067-02.03	**Reported:**
Seattle WA, 98101	Project Manager: Cindy Fields	01-Sep-2021 16:49

Case Narrative

Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Work Order: 21G0286

Sample receipt

Samples as listed on the preceding page were received 22-Jul-2021 17:30 under ARI work order 21G0286. For details regarding sample receipt, please refer to the Cooler Receipt Form. Mercury aliquots were frozen to meet QAPP requirements.

Grainsize

The samples were submitted to Materials Testing & Consulting, Inc. (MTC) Burlington for grainsize analysis and will be reported under separate cover.

Semivolatiles - EPA Method SW8270E

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries were within limits. The matrix spike duplicate (MSD) percent recovery of benzo(g,h,i)perylene (45.8%) was flagged as outside advisory limits (45.8%) was flagged as outside advisory limits (46-148%). The relative percent difference (RPD) were within advisory control limits.

The reference material (SRM) percent recoveries were within control limits.

PCB Aroclors - EPA Method SW8082A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

Anchor QEA, LLC	Project: Lower Duwamish AOC4	
1201 3rd Ave, Suite 2600	Project Number: 180067-02.03	**Reported:**
Seattle WA, 98101	Project Manager: Cindy Fields	01-Sep-2021 16:49

Case Narrative

The matrix spike (MS) recovery of aroclor 1260 (122%) was high of advisory limits (58-120%). The matrix spike duplicate (MS/MSD) percent recoveries and relative percent difference (RPD) were within advisory control limits.

The reference material (SRM) percent recoveries were within control limits.

Total Metals - EPA Method 6020B

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike (MS) percent recovery of lead (126%) was high of advisory control liimits (75-125%). The matrix spike duplicate (MSD) percent recoveries of lead and zinc were low of advisory limits, and the RPD for lead was outside limits. The post spikes were with control limits. The duplicate (DUP) relative percent difference (RPD) for lead was high of advisory control limits.

Total Mercury - EPA Method 7471

The sample(s) were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Wet Chemistry

The sample(s) were prepared and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blank(s) were clean at the reporting limits.

The blank spike (BS/LCS) percent recoveries were within control limits.

The reference material (SRM) percent recoveries were within control limits.

The batch BJG0629 ammonia matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

The batch BJG0286 sulfide matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits.

Anchor QEA, LLC	Project: Lower Duwamish AOC4	
1201 3rd Ave, Suite 2600	Project Number: 180067-02.03	**Reported:**
Seattle WA, 98101	Project Manager: Cindy Fields	01-Sep-2021 16:49

Case Narrative

The batch BJG0300 TOC matrix spike (MS) percent recoveries and the duplicate (DUP) relative percent difference (RPD) were within advisory control limits, reported under work order 21G0269.

DIOXINS WILL BE REPORTED UNDER SEPARATE COVER

Anchor QEA, LLC	Project: Lower Duwamish AOC4	
1201 3rd Ave, Suite 2600	Project Number: 180067-02.03	**Reported:**
Seattle WA, 98101	Project Manager: Cindy Fields	01-Sep-2021 16:49

Case Narrative

QUALIFIERS AND NOTES

Qualifier	Definition
Y1	Raised reporting limit due to interference
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
Q	Indicates a detected analyte with an initial or continuing calibration that does not meet established acceptance criteria (<20% RSD, <20% drift or minimum RRF)
P1	The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
NRS	This surrogate not reported due to chromatographic interference
J	Estimated concentration value detected below the reporting limit.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
D	The reported value is from a dilution
*	Flagged value is not within established control limits.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS687

Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8270E
Semivolatiles (20ug/kg - 0.2ug/L SepF)

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-01 D	SDG:	21G0286
Sampled:	07/22/21 06:45	Prepared:	08/02/21 11:20	File ID:	NT1021081408.D
% Solids:	75.88	Preparation:	EPA 3546 (Microwave)	Analyzed:	08/14/21 13:53
Batch:	BJH0004	Sequence:	SJH0174	Initial/Final:	13.22 g Wet / 1 mL
Instrument:	NT10	Column:	ZB-5MSi	Calibration:	EG00057
Cleanups:	GPC				

CAS NO.	COMPOUND	DILUTION	CONC: (ug/kg dry)	Q	DL	RL
91-20-3	Naphthalene	1	22.3		4.2	19.9
91-57-6	2-Methylnaphthalene	1	13.8	J	4.5	19.9
208-96-8	Acenaphthylene	1	10.7	J	6.2	19.9
83-32-9	Acenaphthene	1	21.0		5.2	19.9
86-73-7	Fluorene	1	25.3	Q	14.5	19.9
85-01-8	Phenanthrene	1	177	Q	8.7	19.9
120-12-7	Anthracene	1	35.6	Q	7.2	19.9
206-44-0	Fluoranthene	1	439	Q	6.1	19.9
129-00-0	Pyrene	1	351		5.7	19.9
56-55-3	Benzo(a)anthracene	1	107		5.9	19.9
218-01-9	Chrysene	1	133		6.0	19.9
	Benzofluoranthenes, Total	1	169		10.0	39.9
50-32-8	Benzo(a)pyrene	1	97.0		4.2	19.9
193-39-5	Indeno(1,2,3-cd)pyrene	1	54.5		14.6	19.9
53-70-3	Dibenzo(a,h)anthracene	1	21.5		17.2	19.9
191-24-2	Benzo(g,h,i)perylene	1	67.7		13.5	19.9

SURROGATES	ADDED: (ug/kg dry)	FOUND: (ug/kg dry)	% REC	QC LIMITS	Q
1,2-Dichlorobenzene-d4	498.44	326	65.3	32 - 120	
Nitrobenzene-d5	498.44	349	70.0	30 - 120	
2-Fluorobiphenyl	498.44	382	76.7	35 - 120	
p-Terphenyl-d14	498.44	441	88.5	37 - 120	

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Date : 14-AUG-2021 13:53

Client ID:

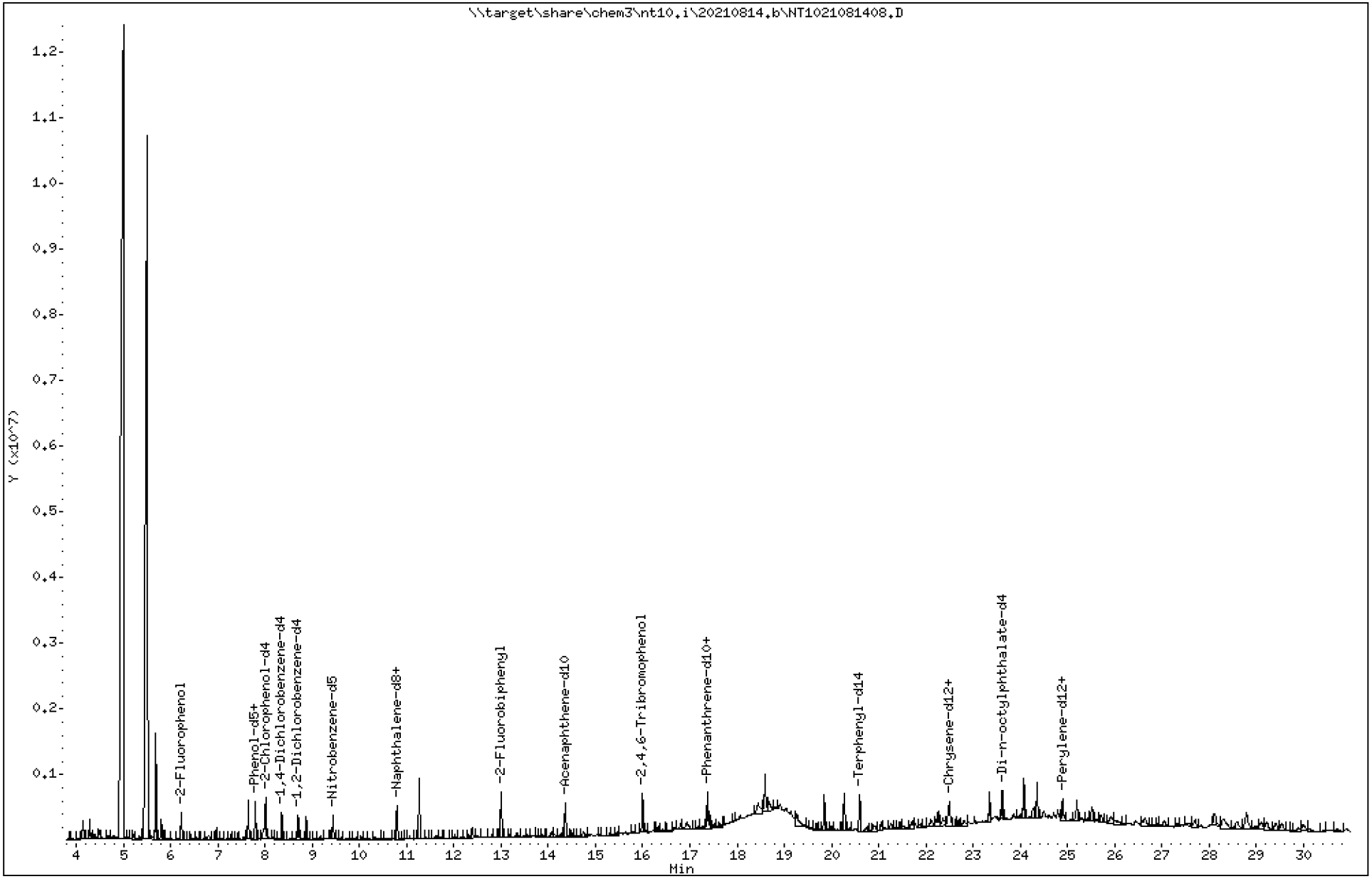
Instrument: nt10.i

Sample Info: 21G0286-01

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

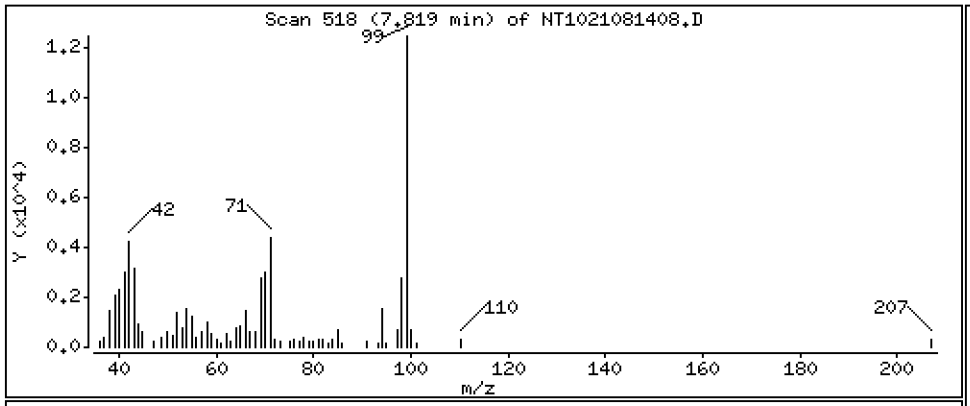
Operator: VTS

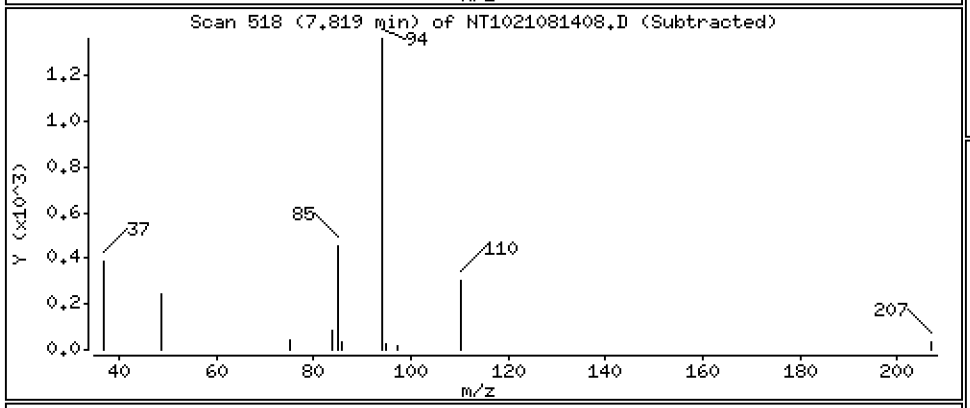
Column phase: ZB-5msi

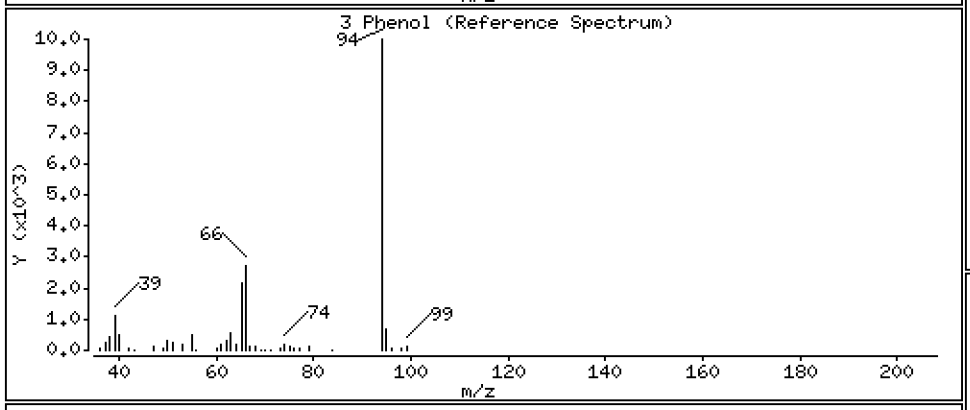
Column diameter: 0.25

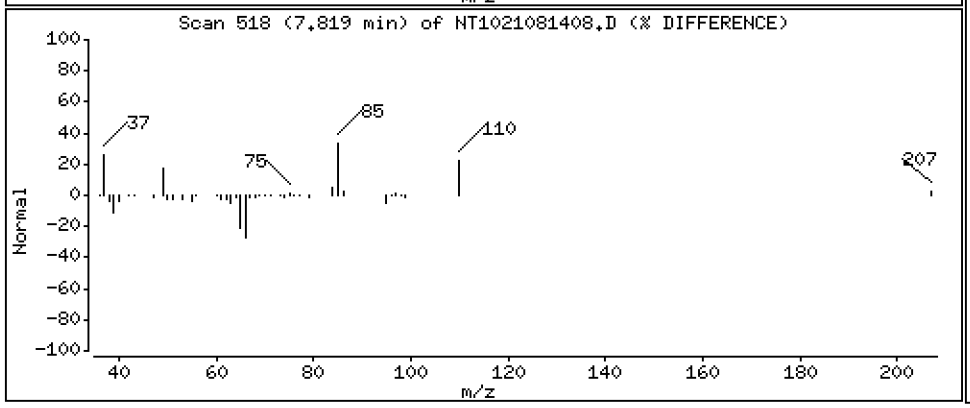
3 Phenol

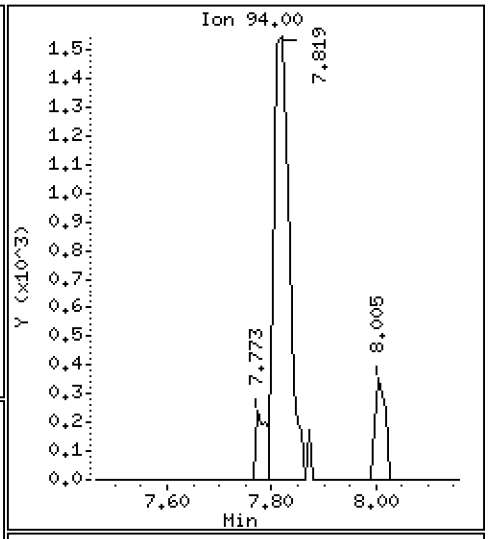
Concentration: 0.06357 ug/mL

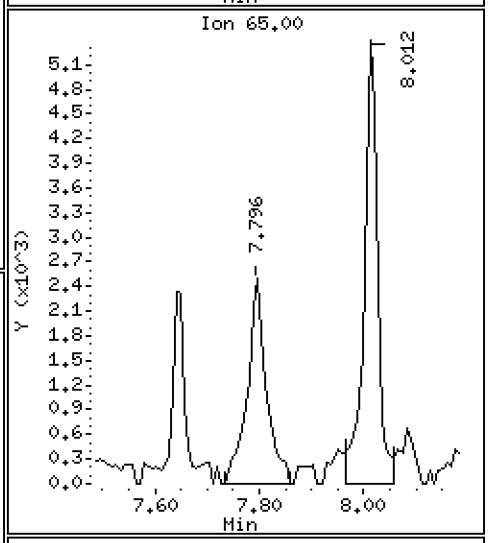


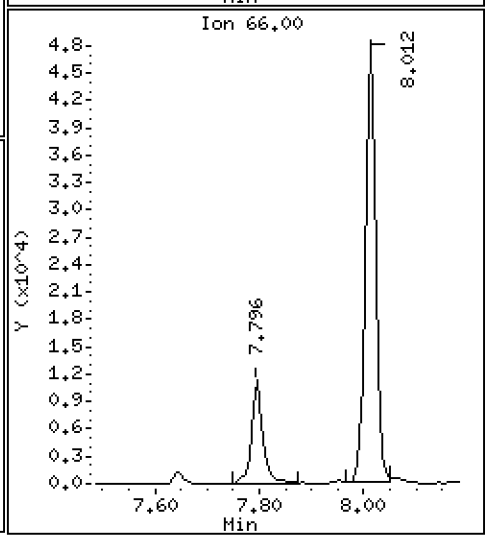












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

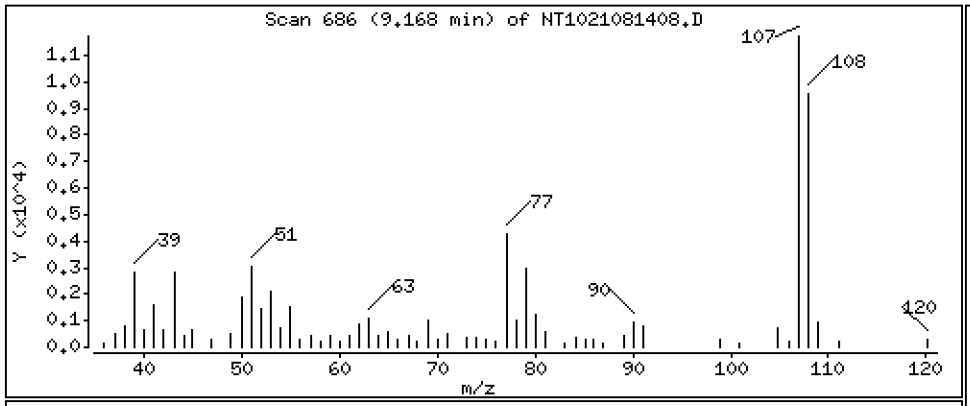
Operator: VTS

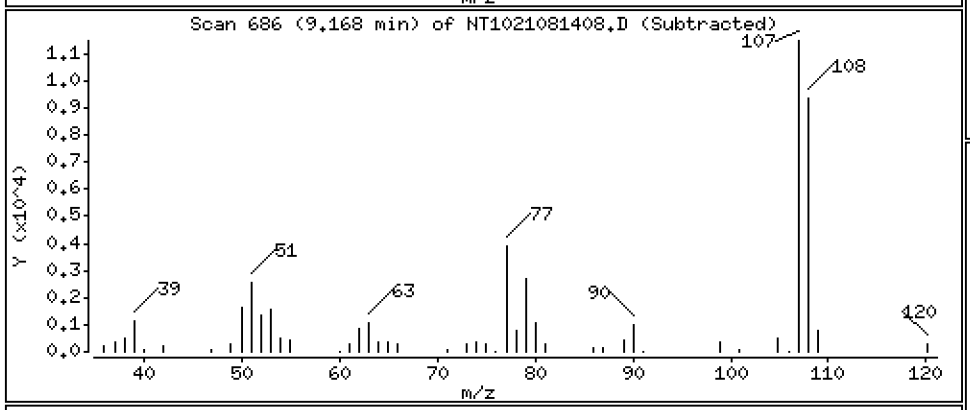
Column phase: ZB-5msi

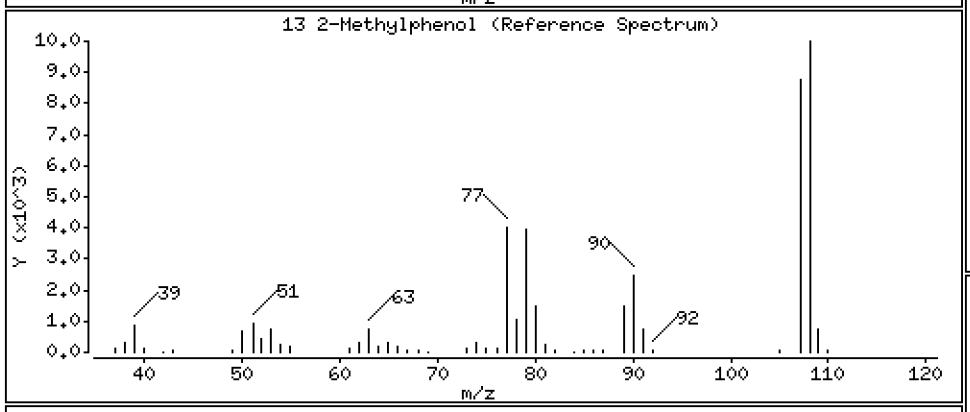
Column diameter: 0.25

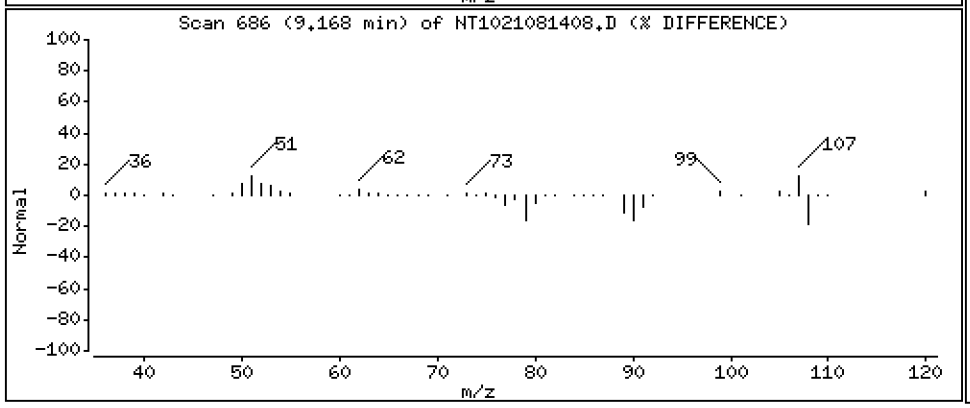
13 2-Methylphenol

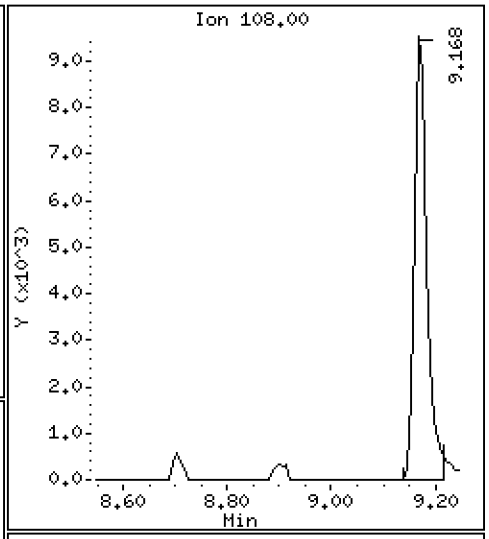
Concentration: 0.5533 ug/mL

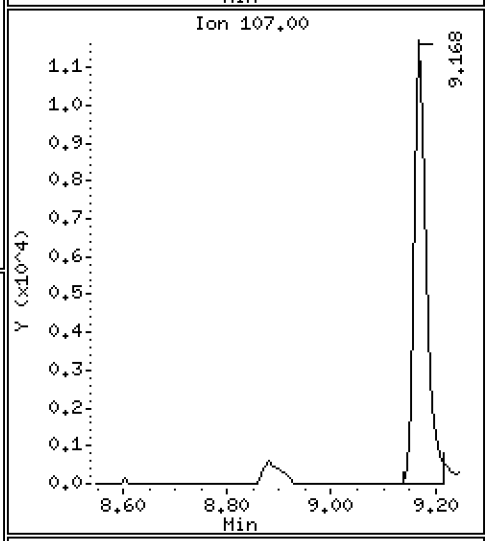


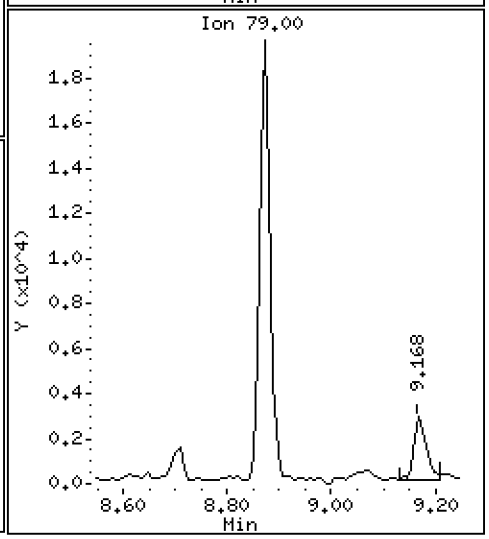












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

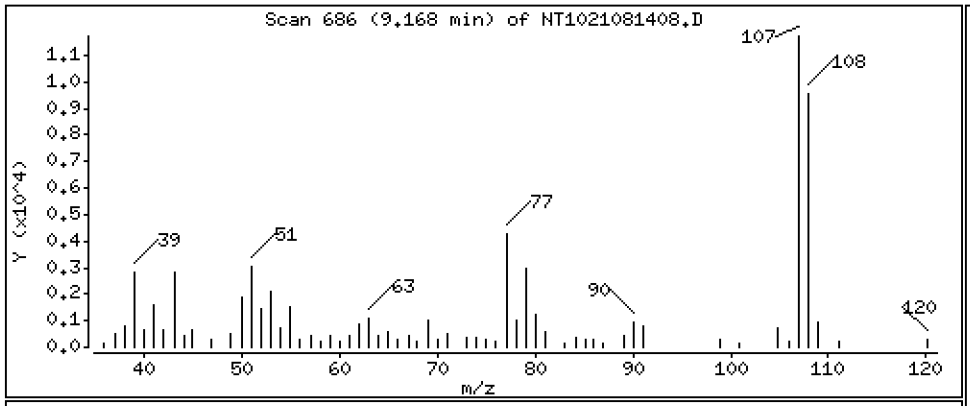
Operator: VTS

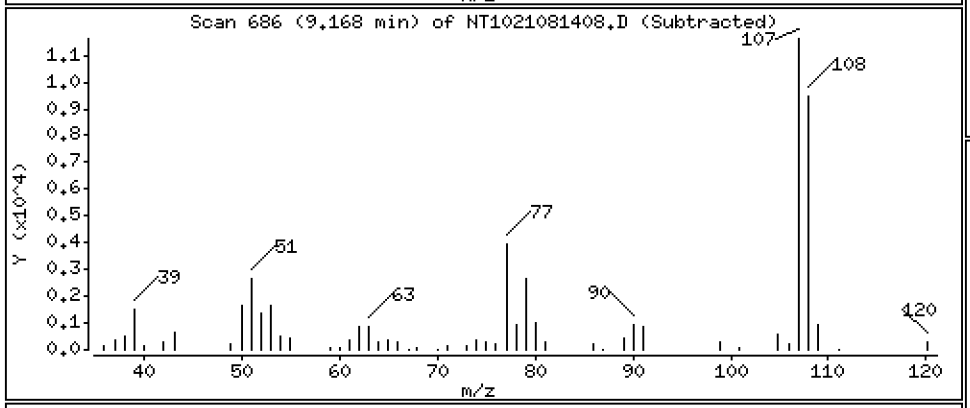
Column phase: ZB-5msi

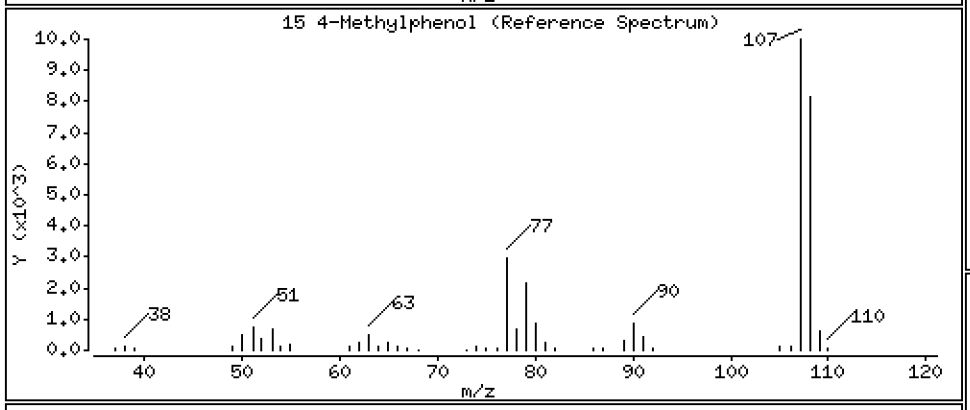
Column diameter: 0.25

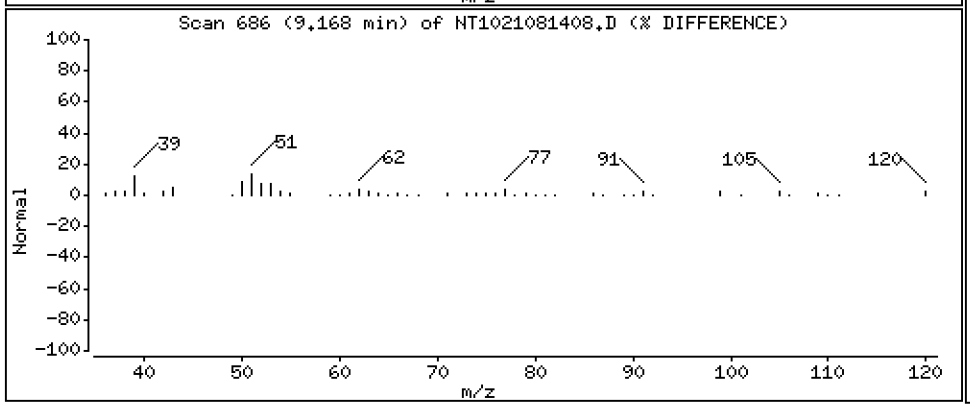
15 4-Methylphenol

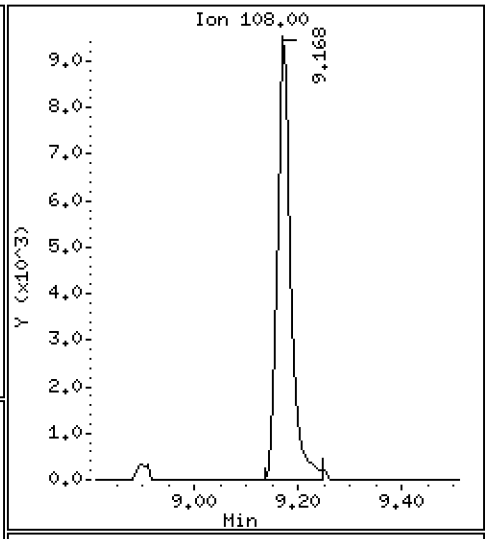
Concentration: 0.5315 ug/mL

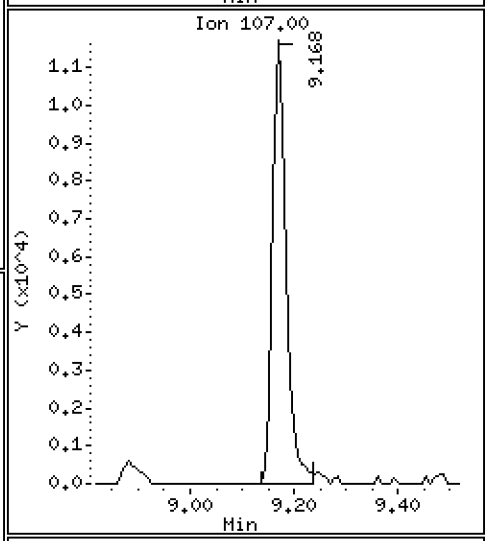


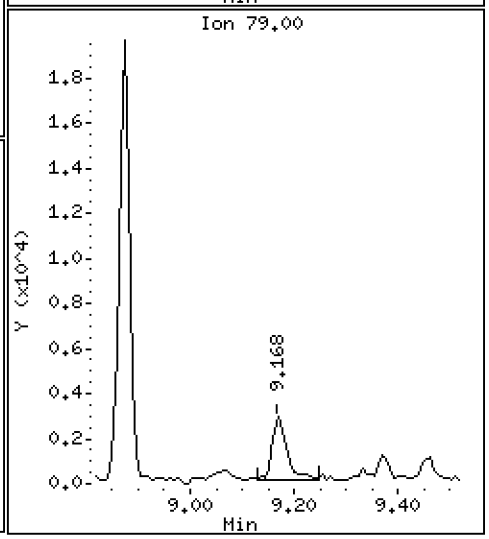












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081408.D

Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

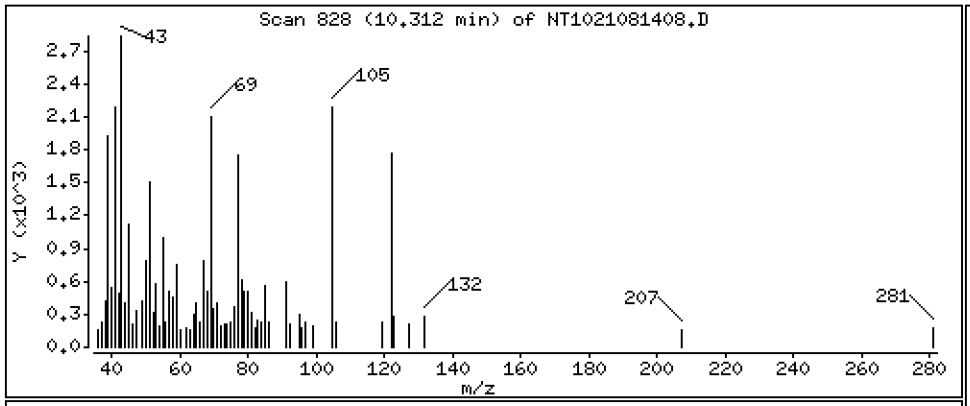
Operator: VTS

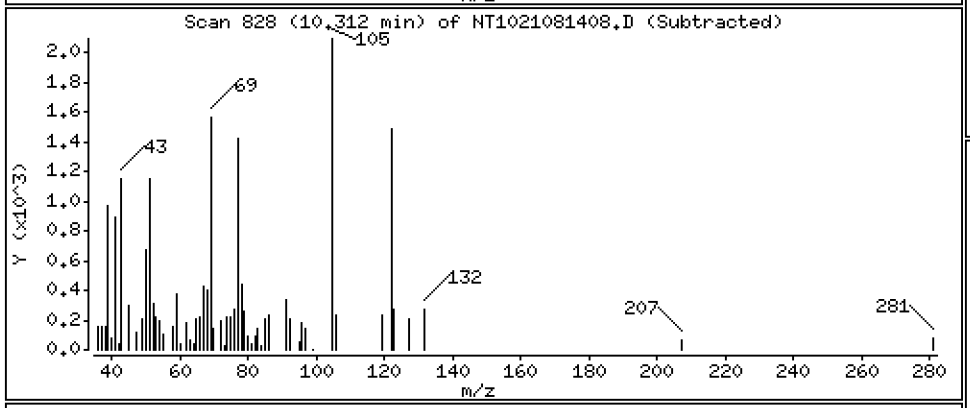
Column phase: ZB-5msi

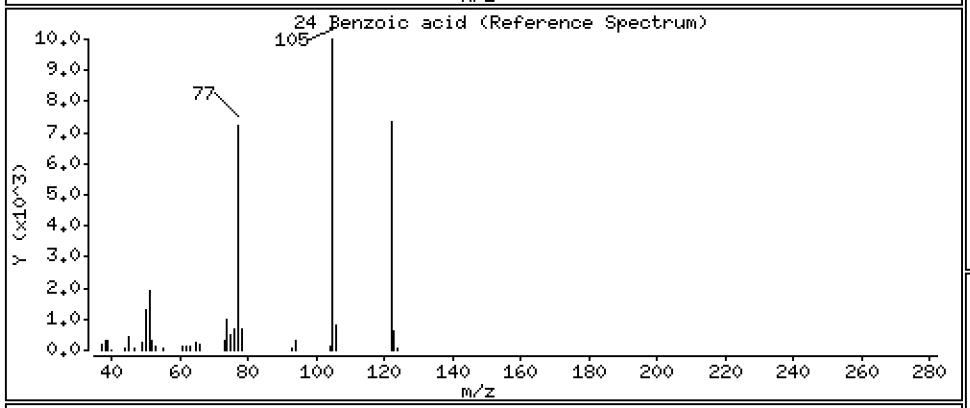
Column diameter: 0.25

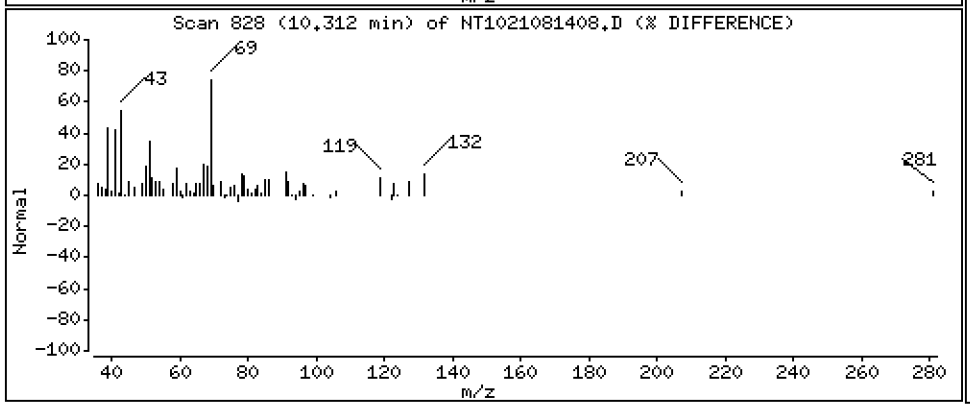
24 Benzoic acid

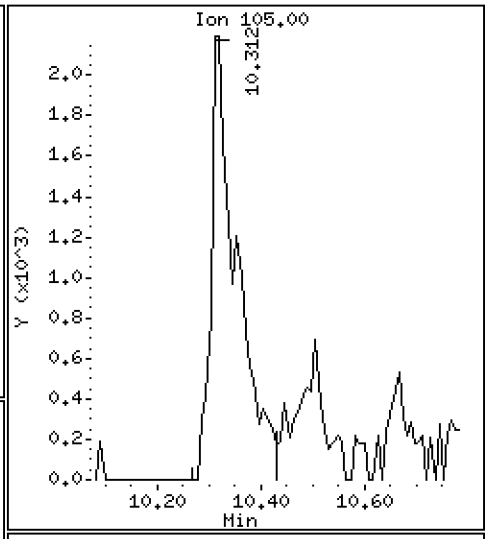
Concentration: 0.4177 ug/mL

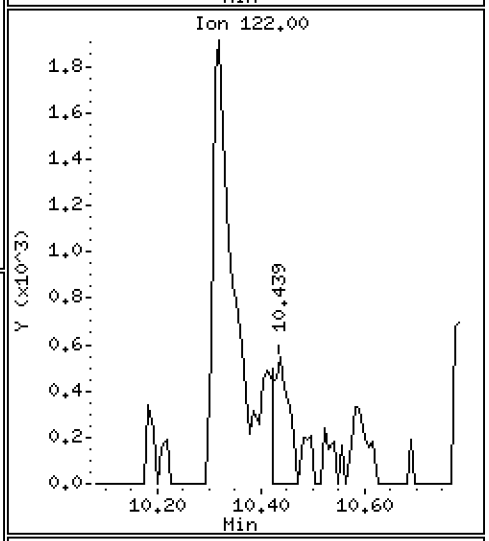


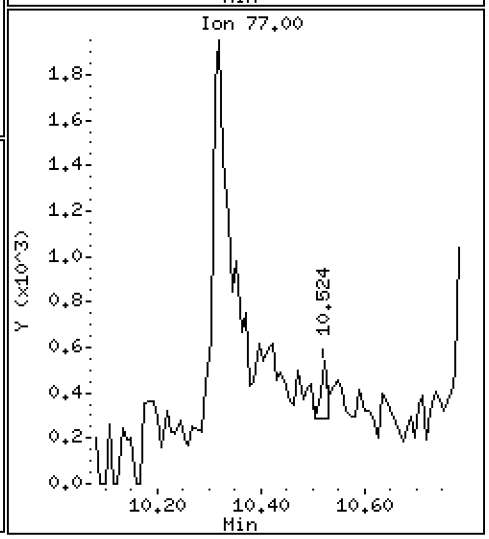












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

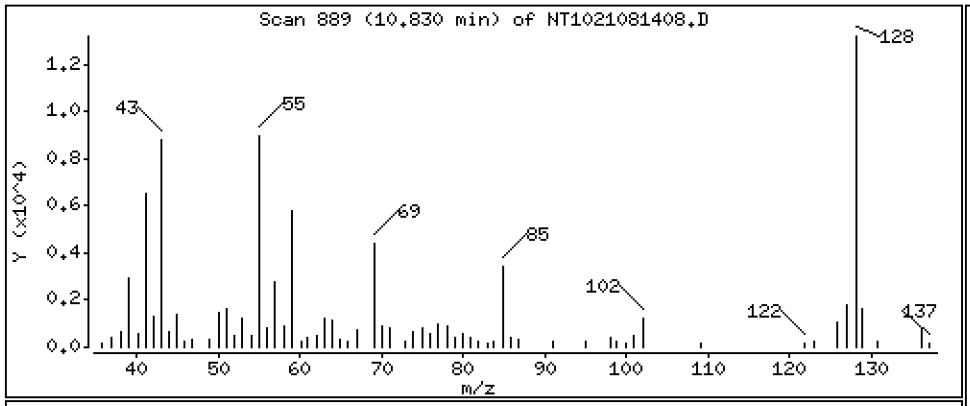
Operator: VTS

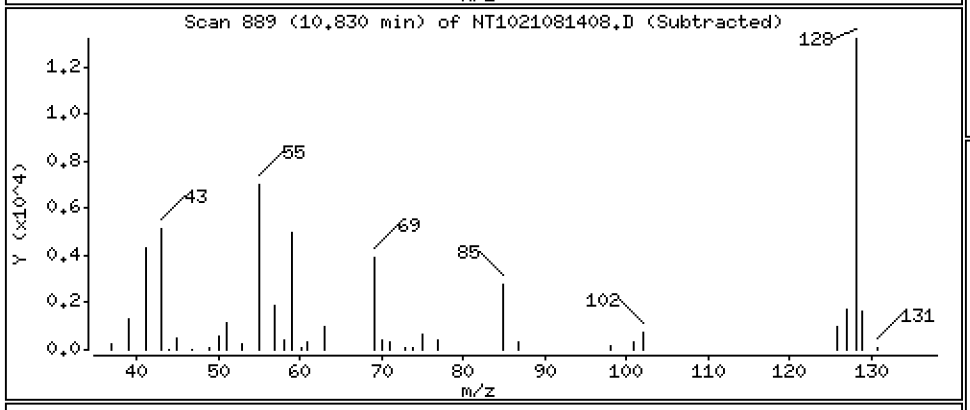
Column phase: ZB-5msi

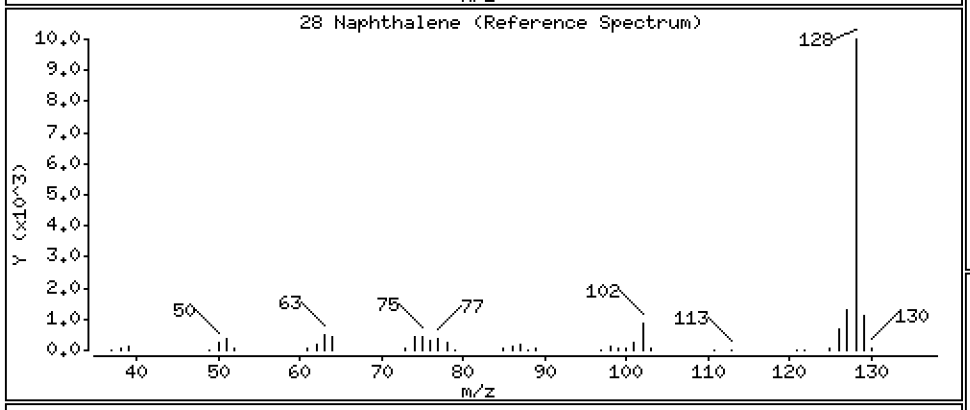
Column diameter: 0.25

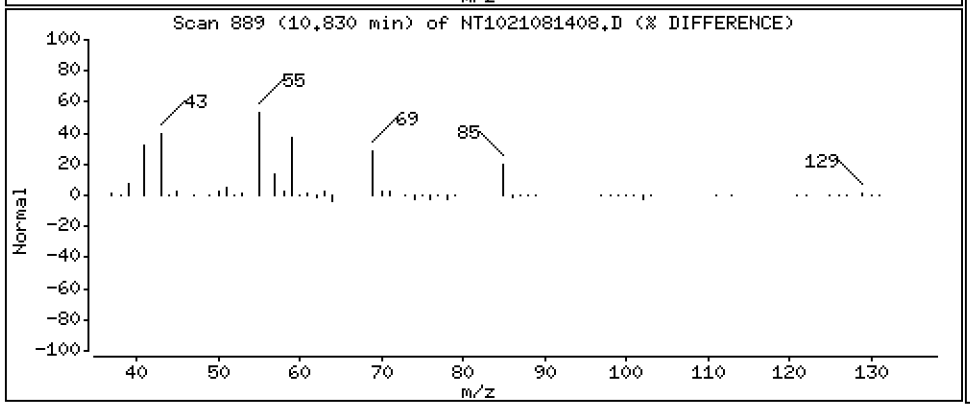
28 Naphthalene

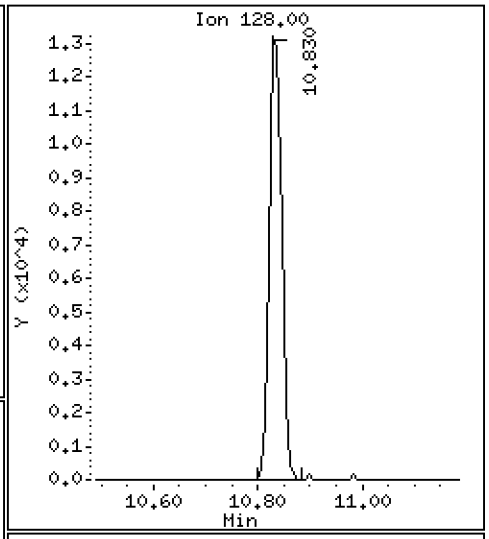
Concentration: 0.2235 ug/mL

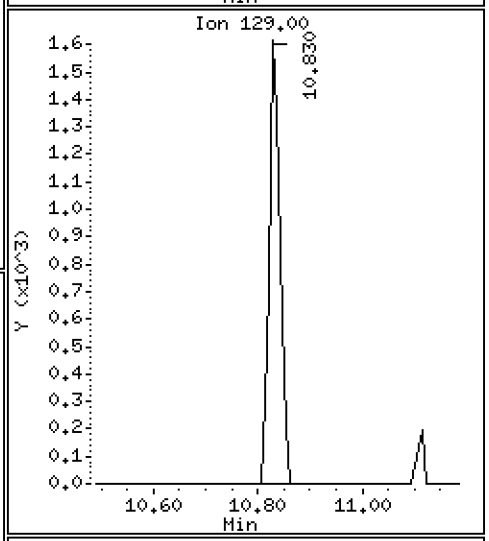


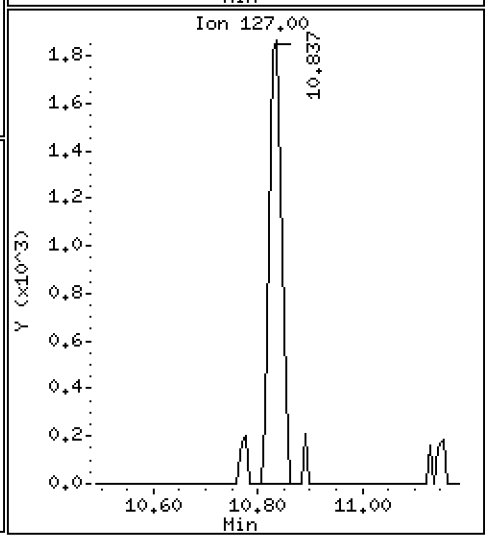












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

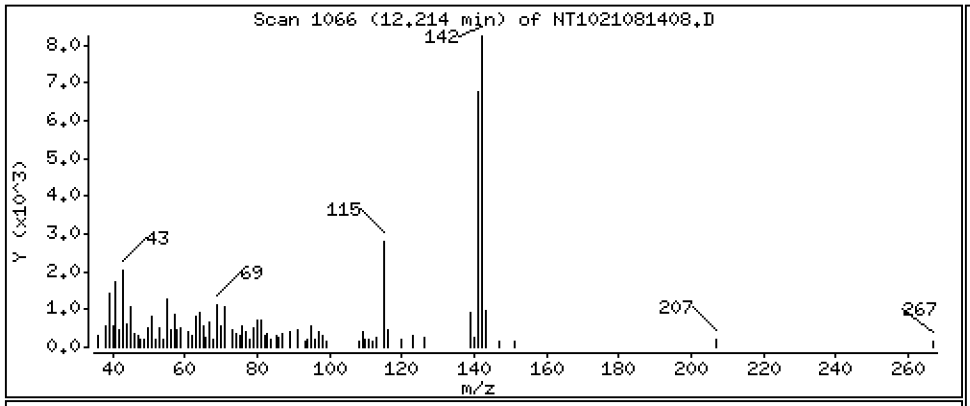
Operator: VTS

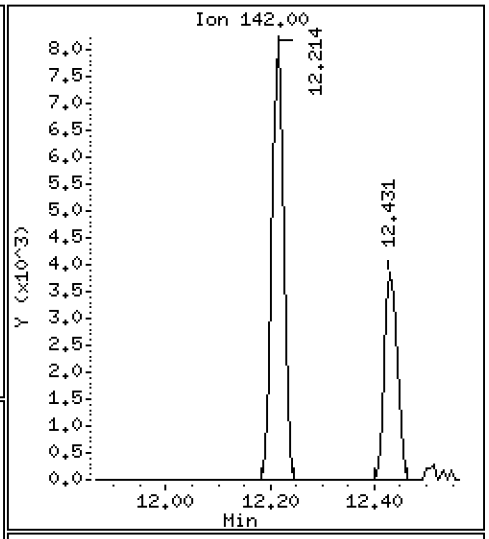
Column phase: ZB-5msi

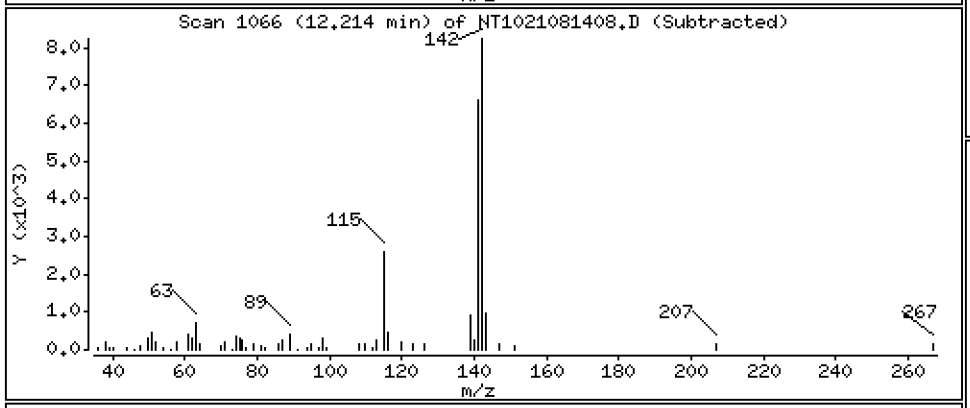
Column diameter: 0.25

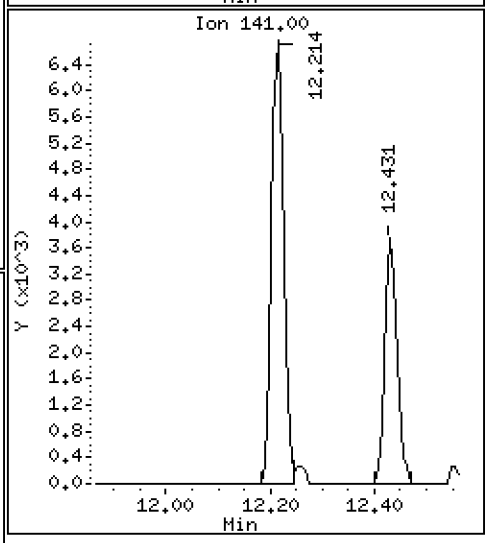
32 2-Methylnaphthalene

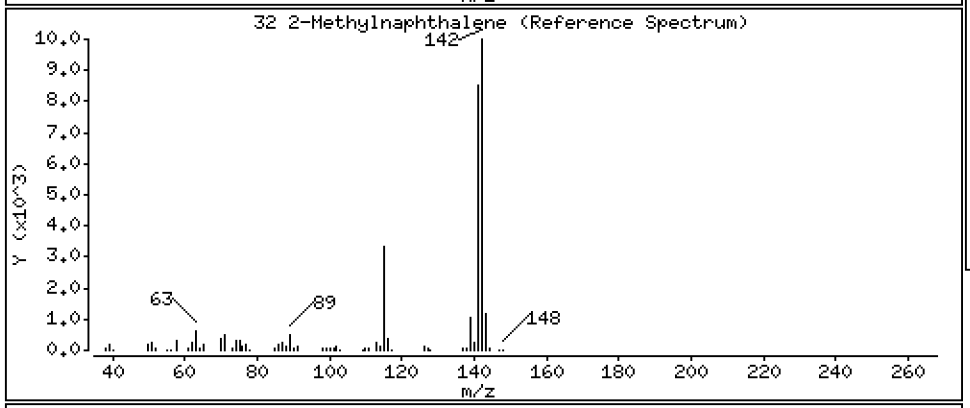
Concentration: 0.1380 ug/mL

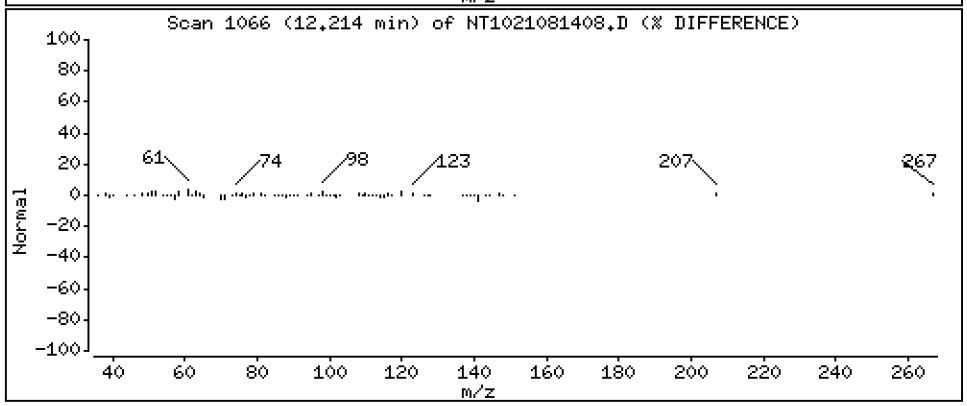












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

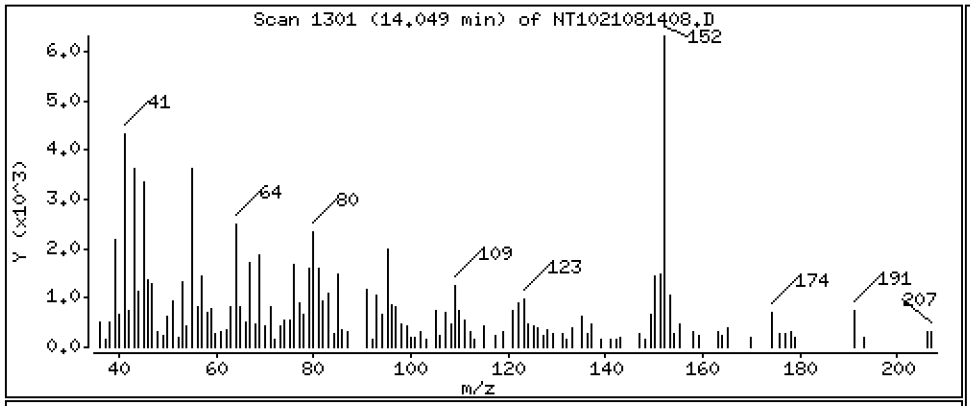
Operator: VTS

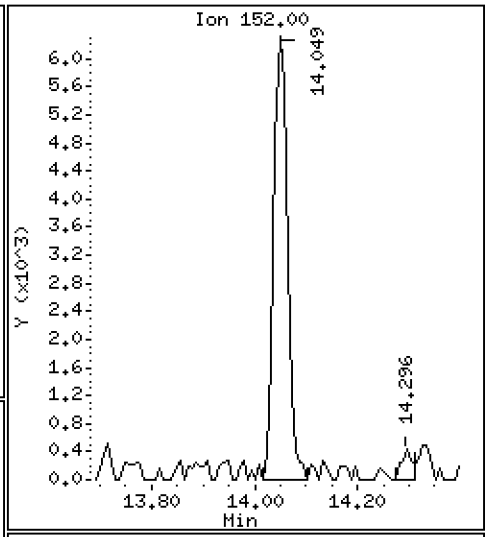
Column phase: ZB-5msi

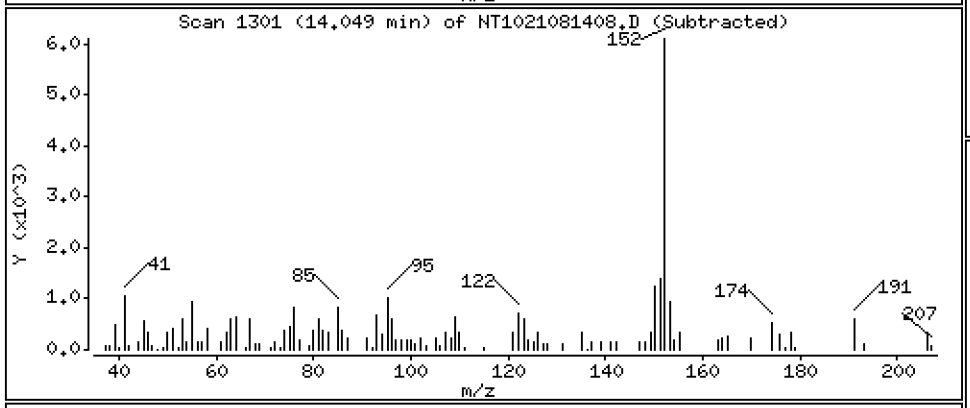
Column diameter: 0.25

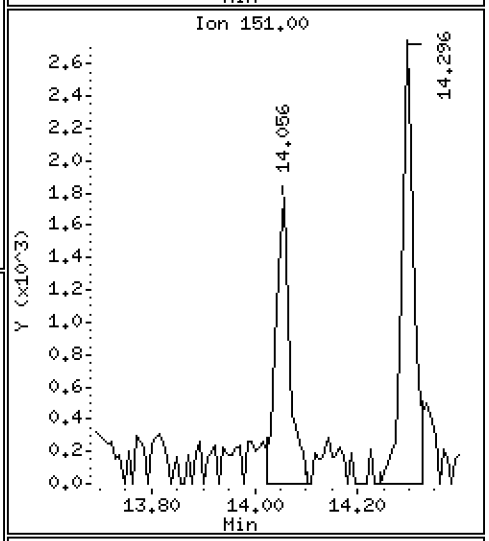
40 Acenaphthylene

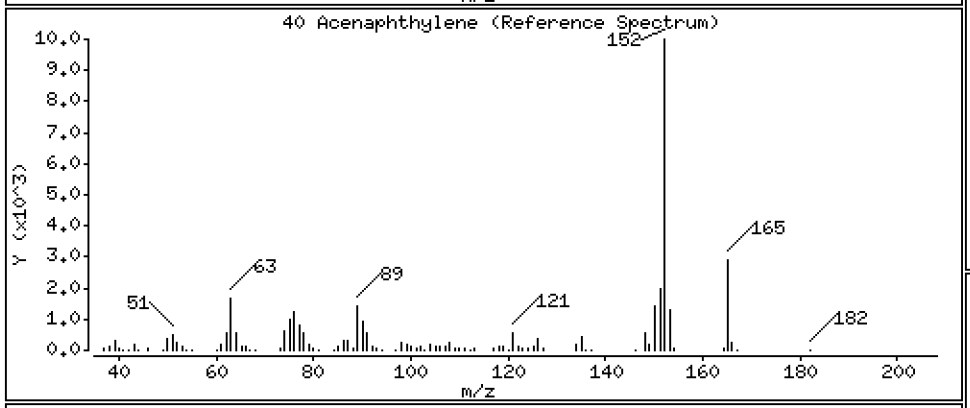
Concentration: 0.1077 ug/mL

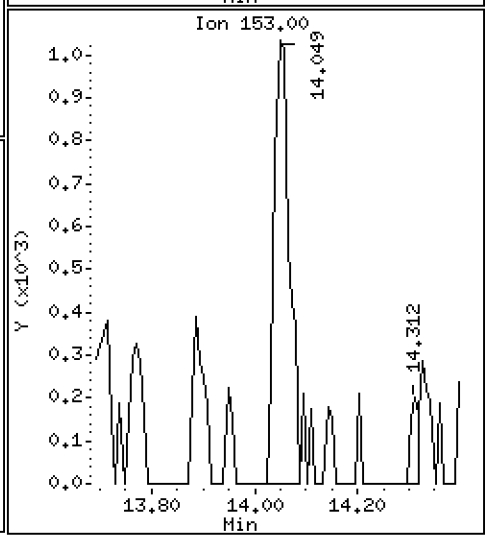


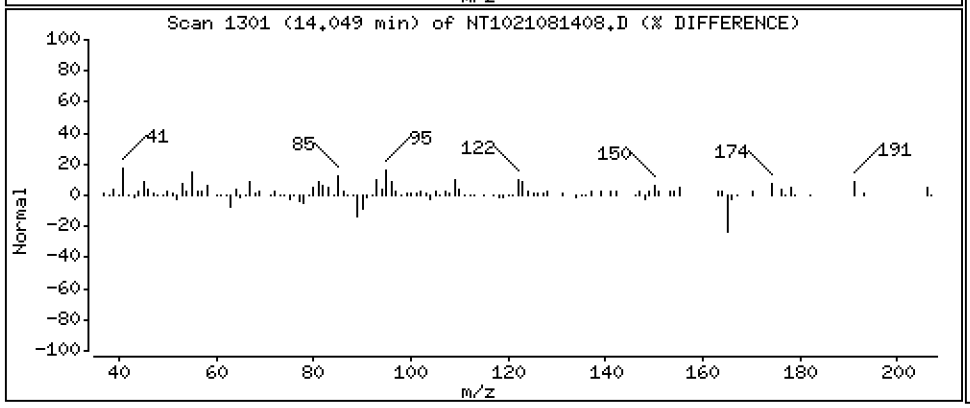












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

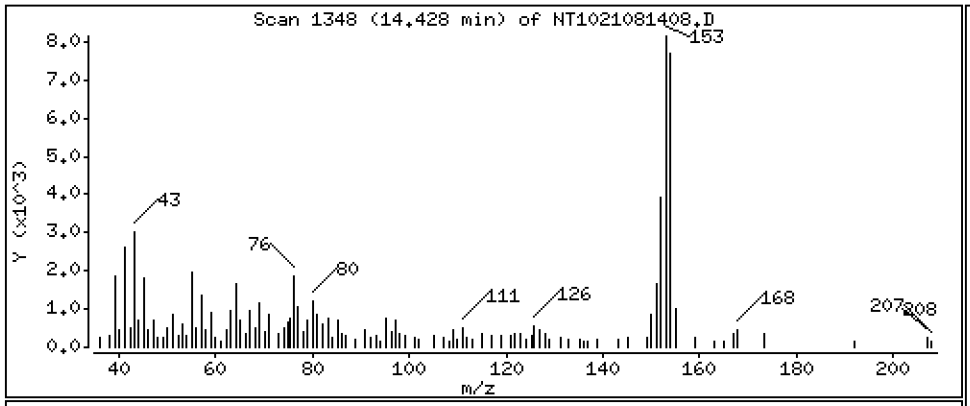
Operator: VTS

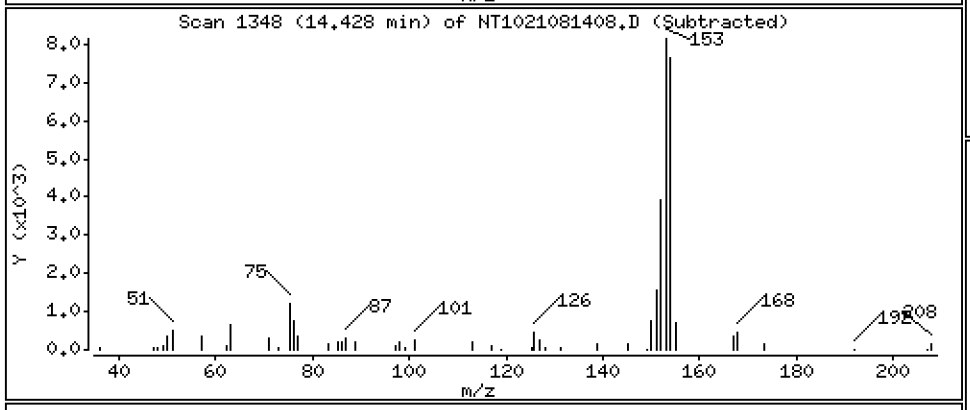
Column phase: ZB-5msi

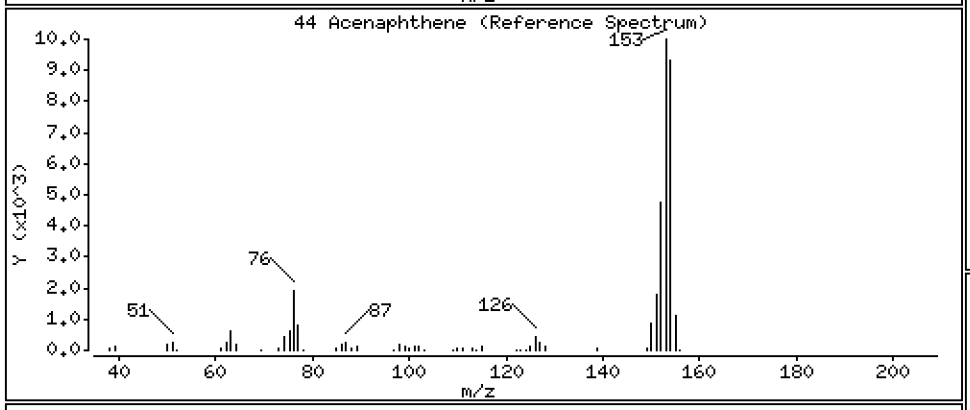
Column diameter: 0.25

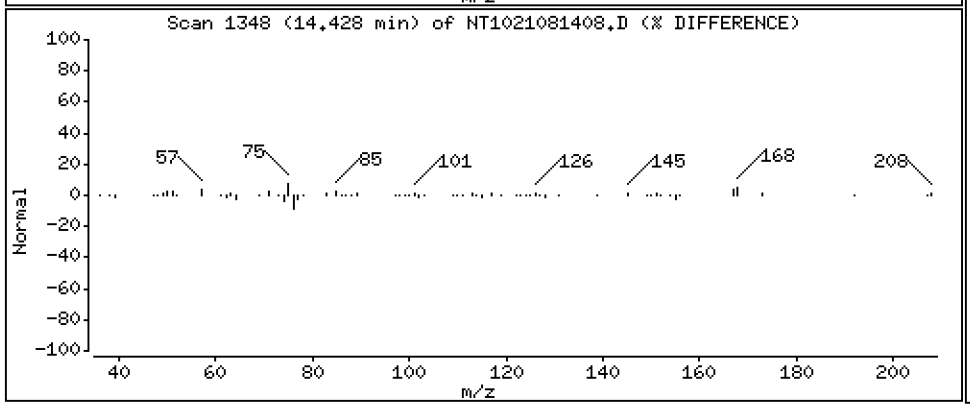
44 Acenaphthene

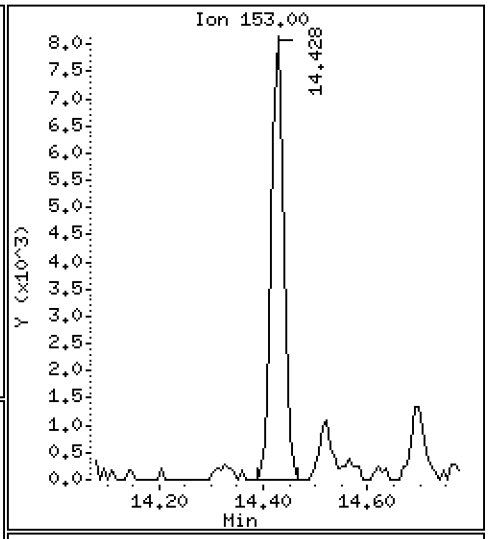
Concentration: 0.2109 ug/mL

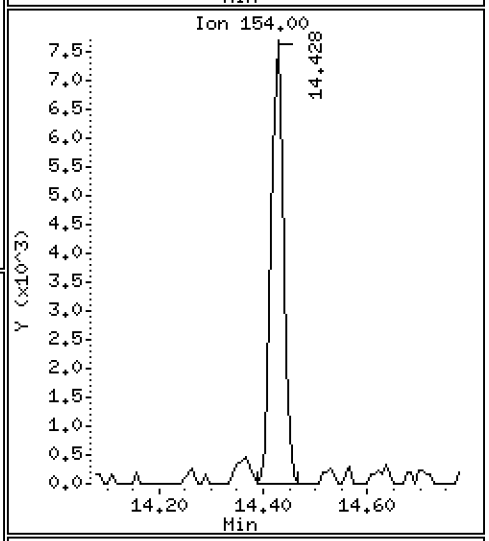


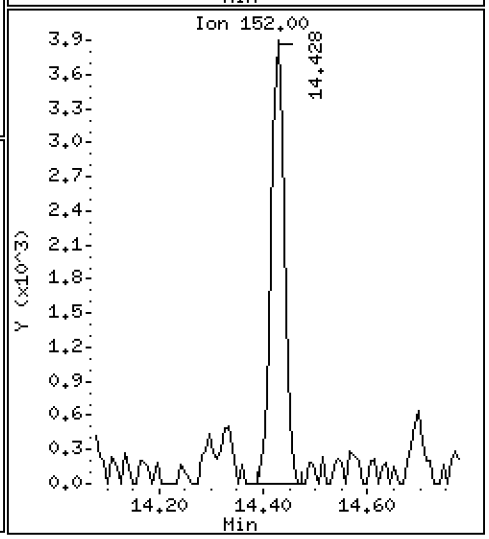












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

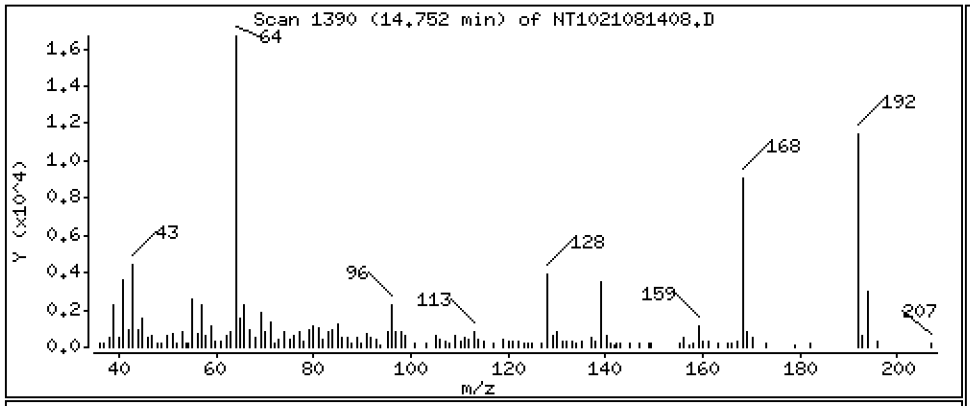
Operator: VTS

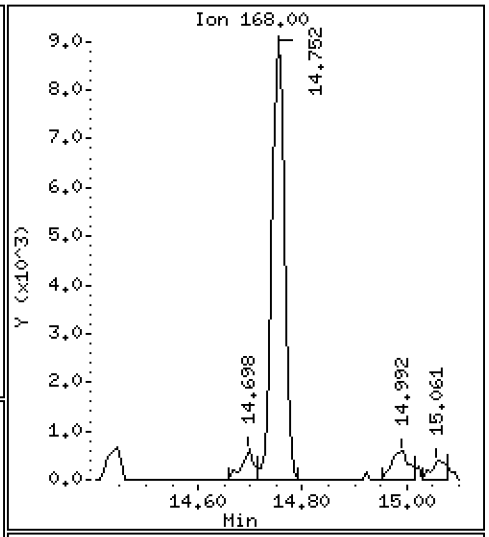
Column phase: ZB-5msi

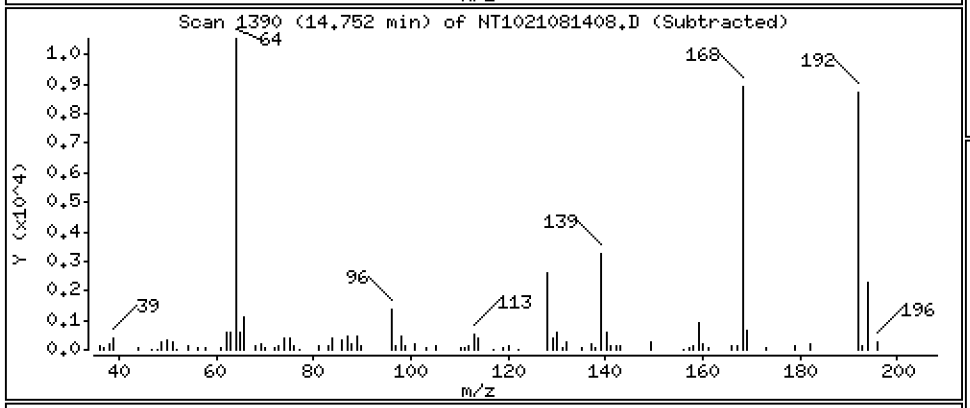
Column diameter: 0.25

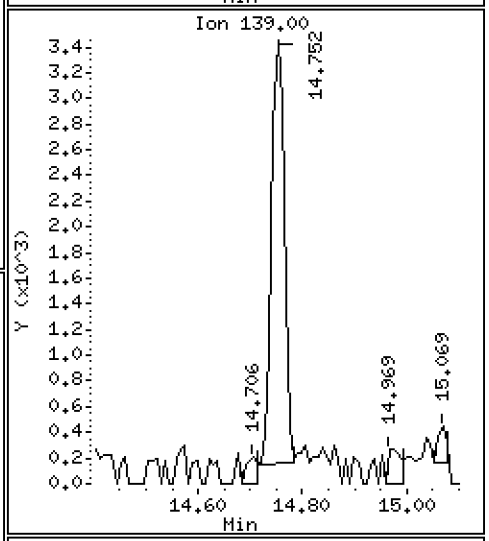
46 Dibenzofuran

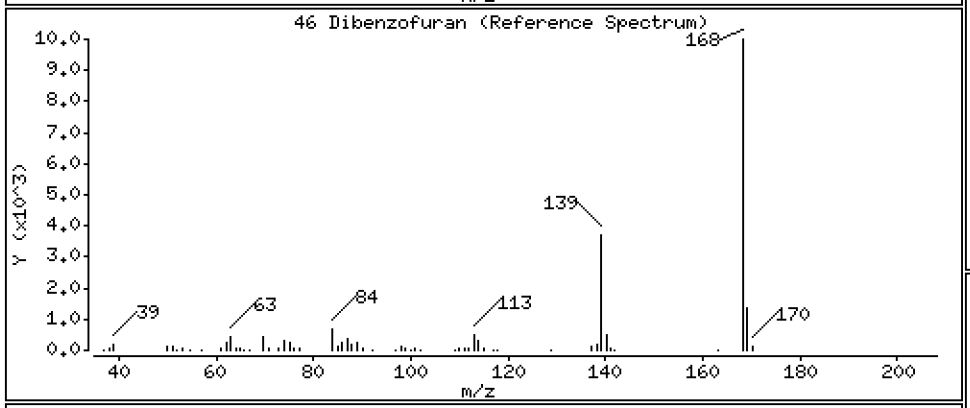
Concentration: 0.1539 ug/mL

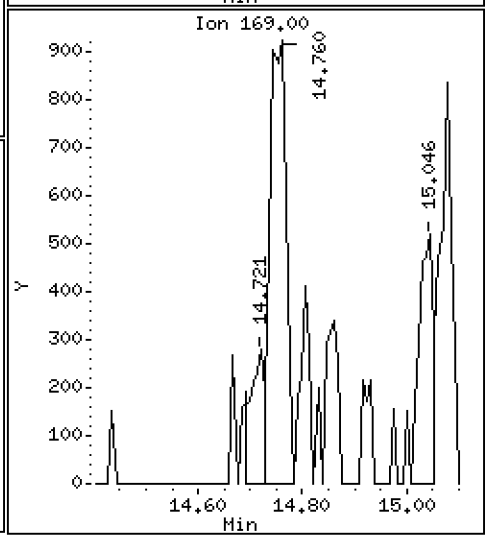


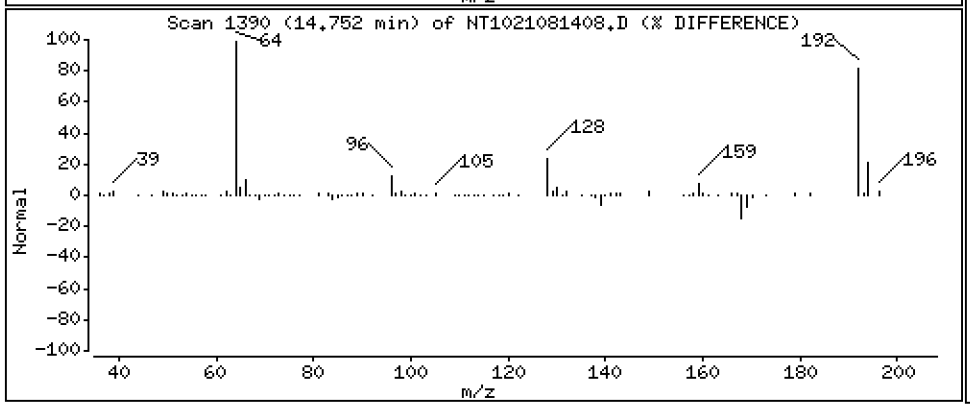












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

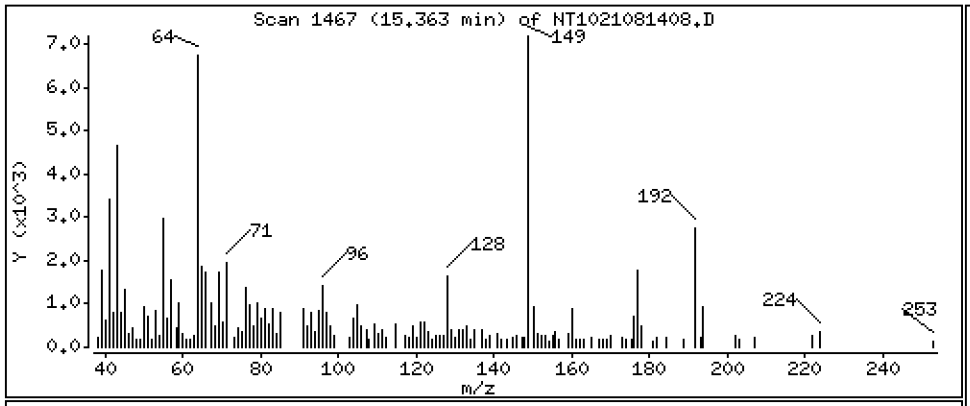
Operator: VTS

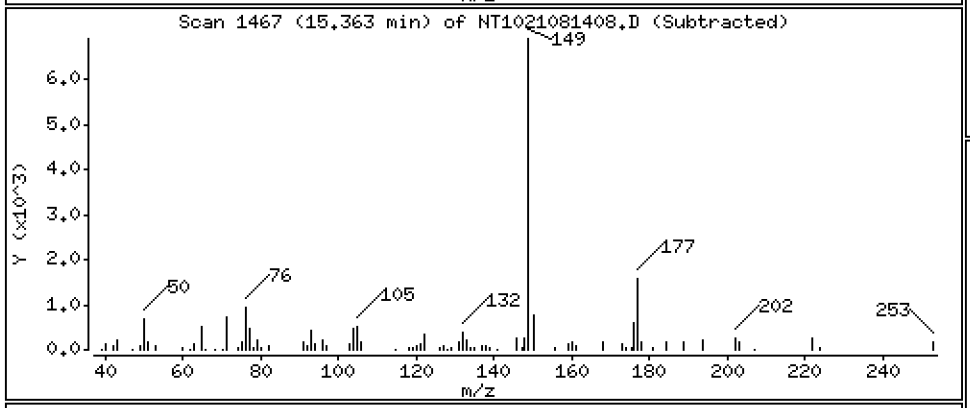
Column phase: ZB-5msi

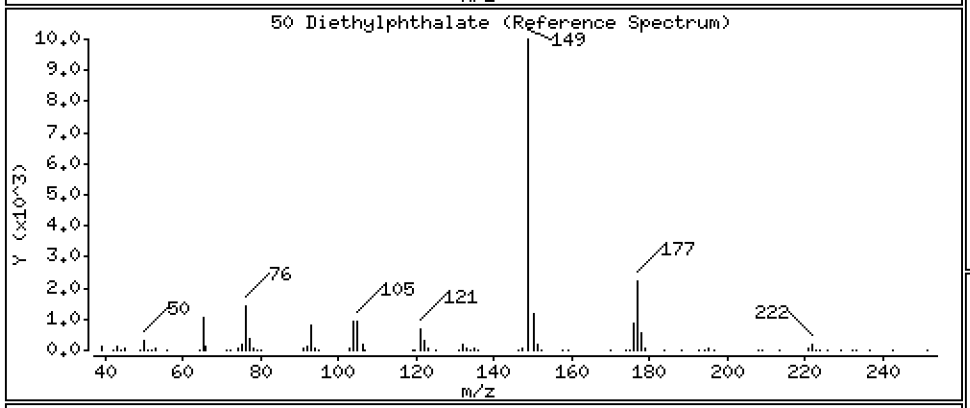
Column diameter: 0.25

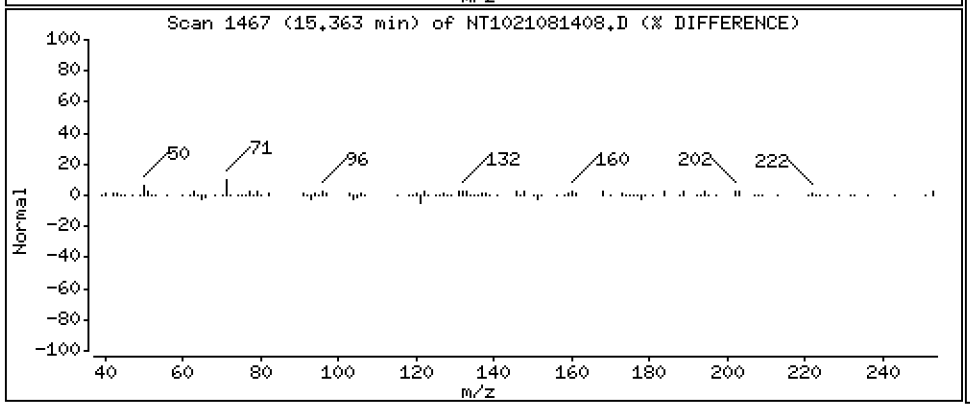
50 Diethylphthalate

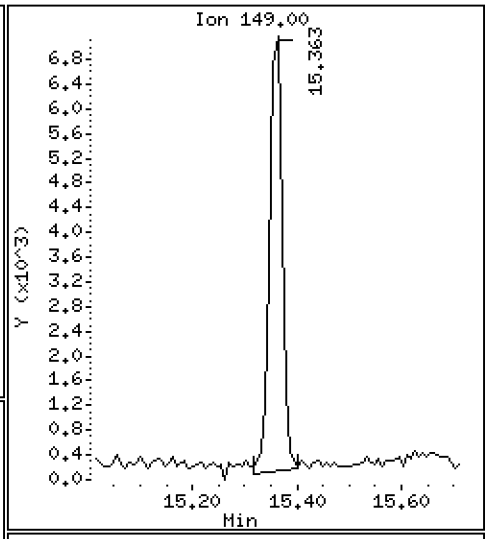
Concentration: 0.1691 ug/mL

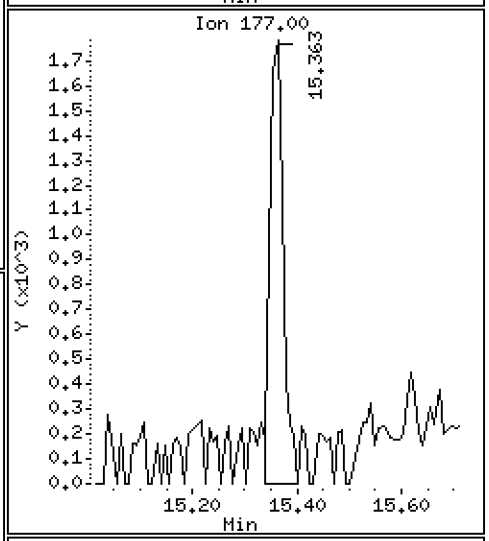


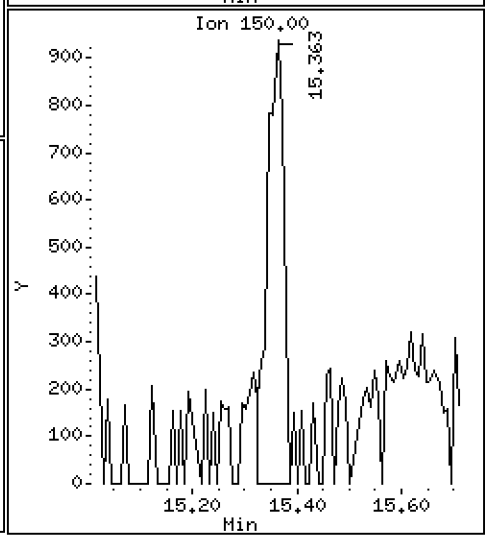












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081408.D

Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

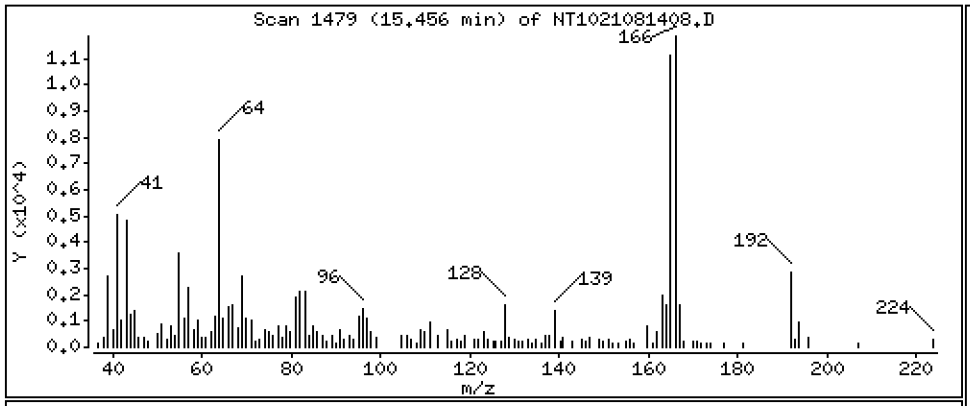
Operator: VTS

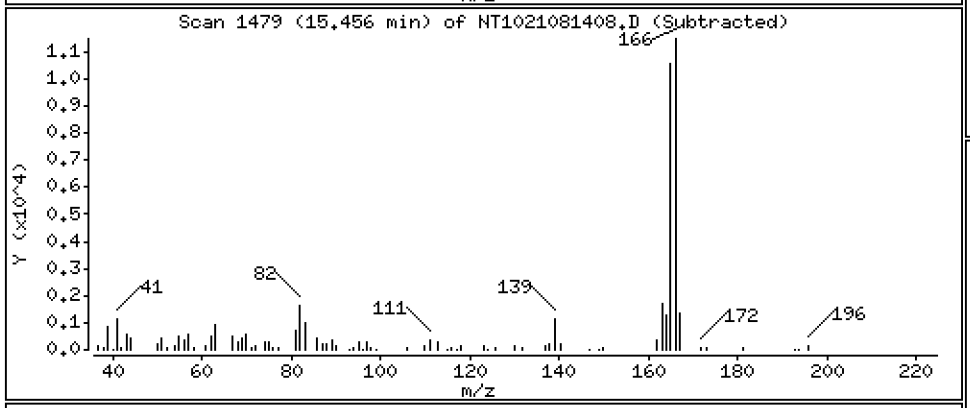
Column phase: ZB-5msi

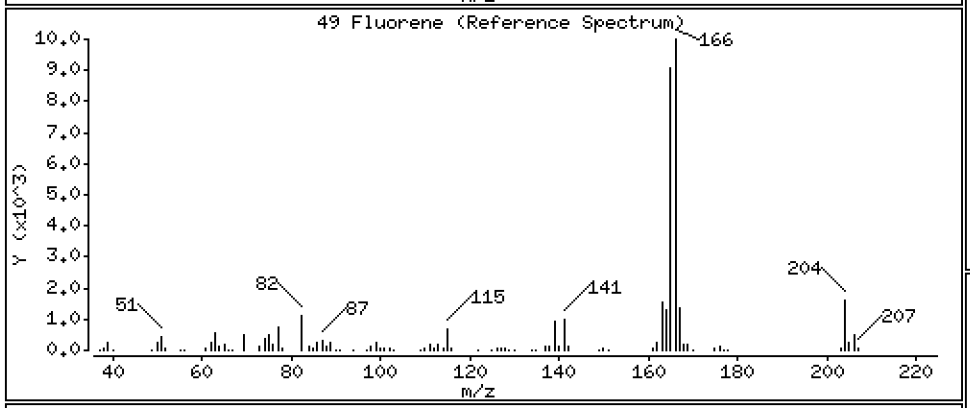
Column diameter: 0.25

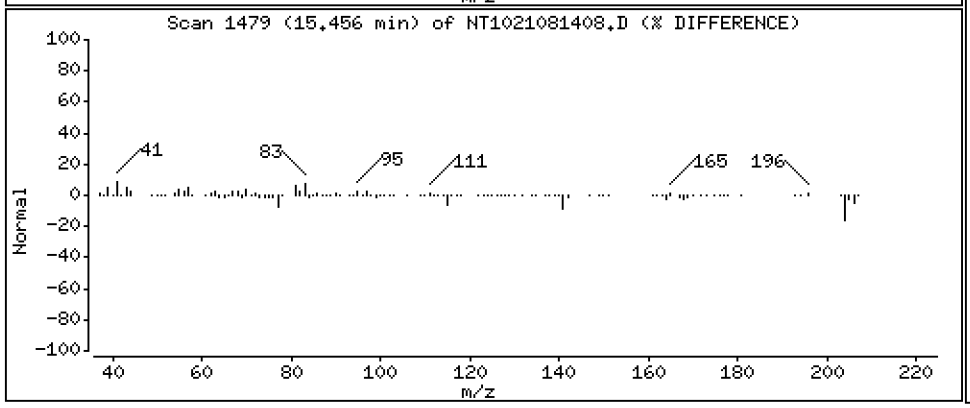
49 Fluorene

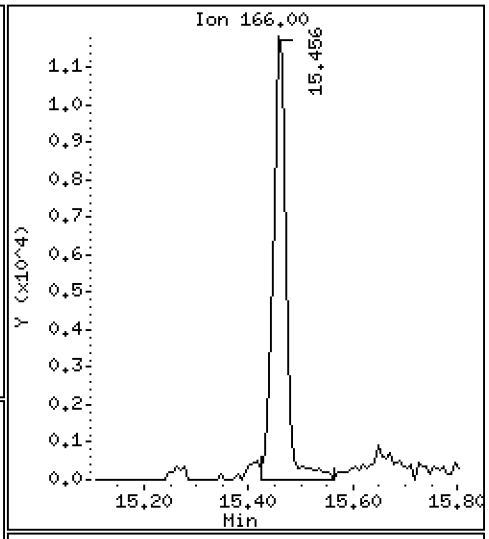
Concentration: 0.2539 ug/mL

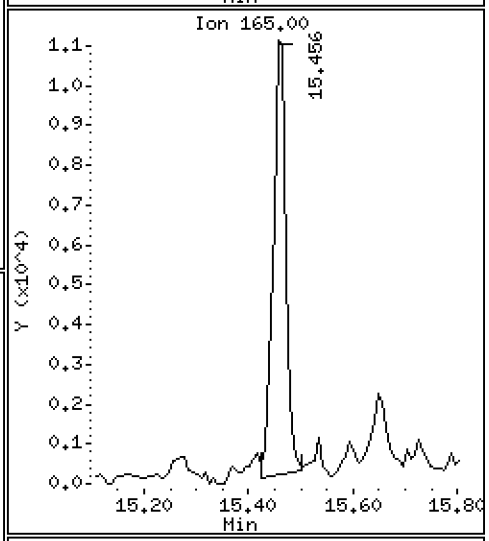


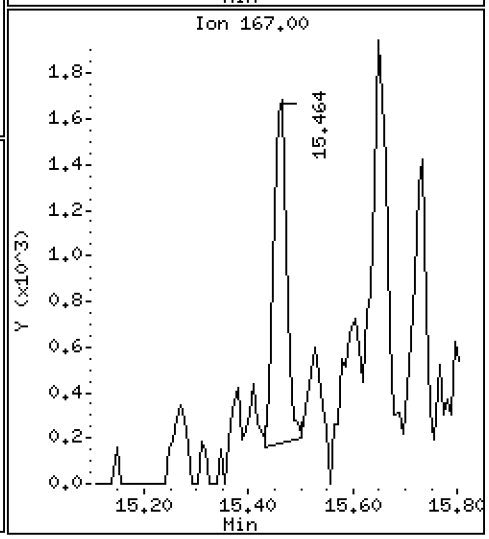












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

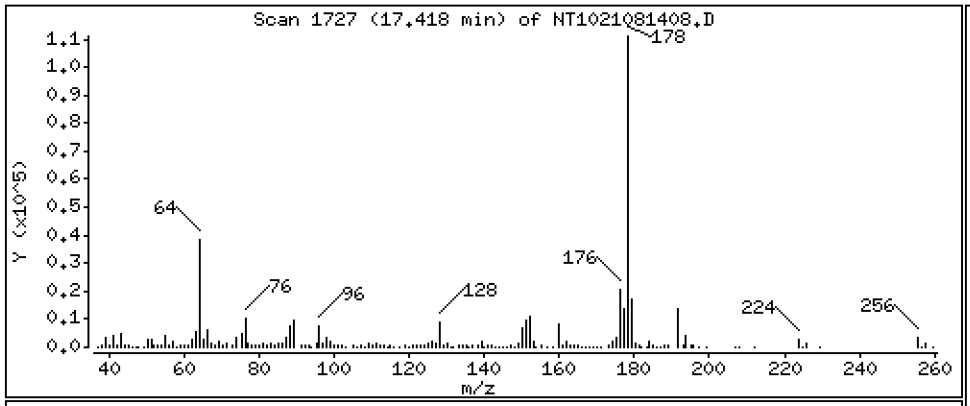
Operator: VTS

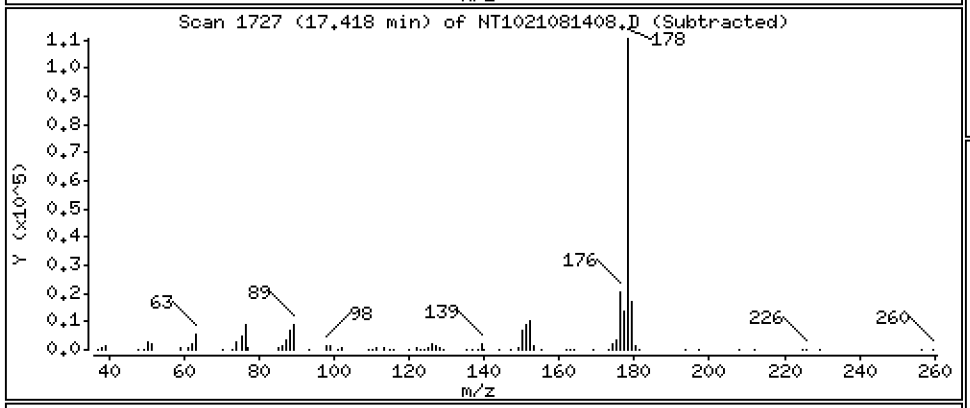
Column phase: ZB-5msi

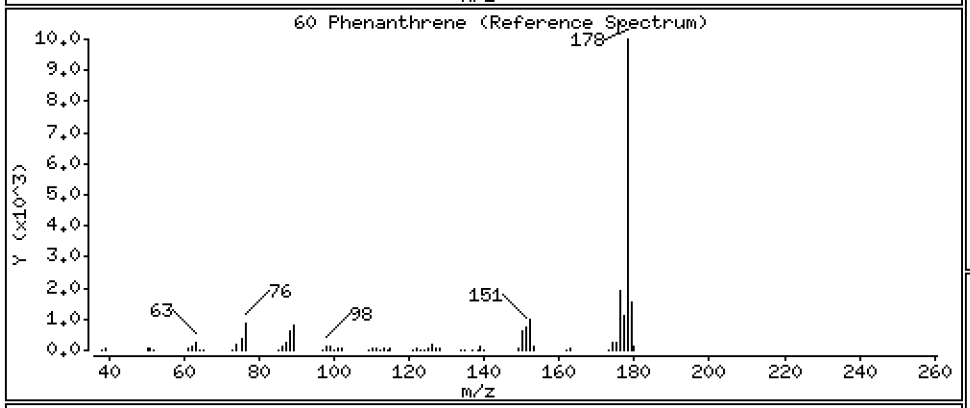
Column diameter: 0.25

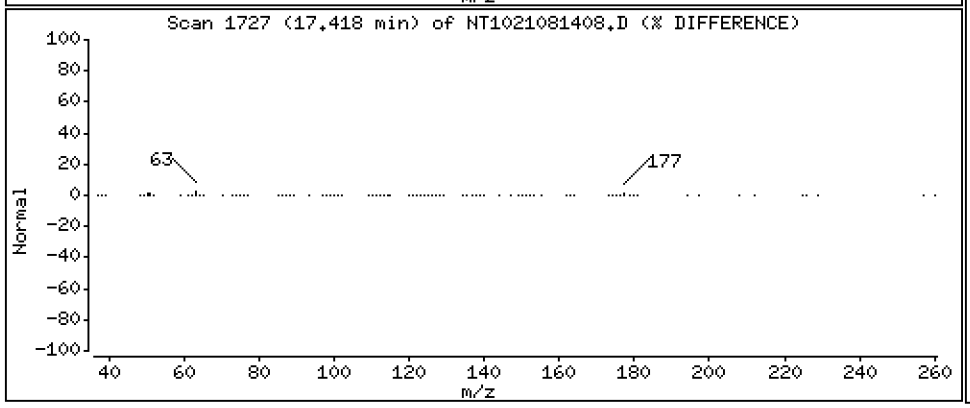
60 Phenanthrene

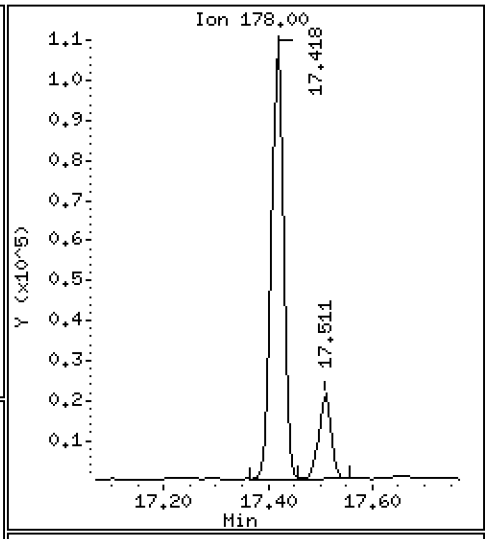
Concentration: 1.775 ug/mL

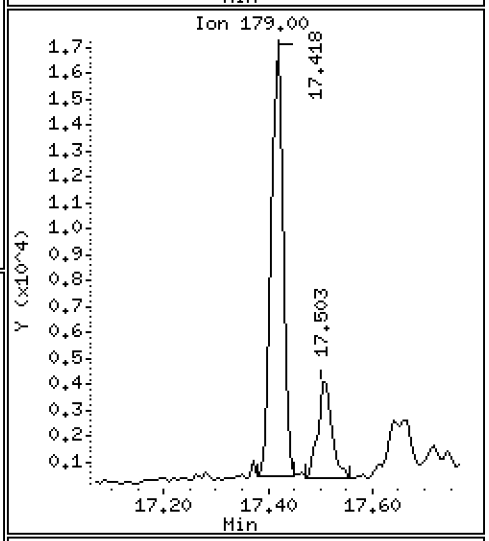


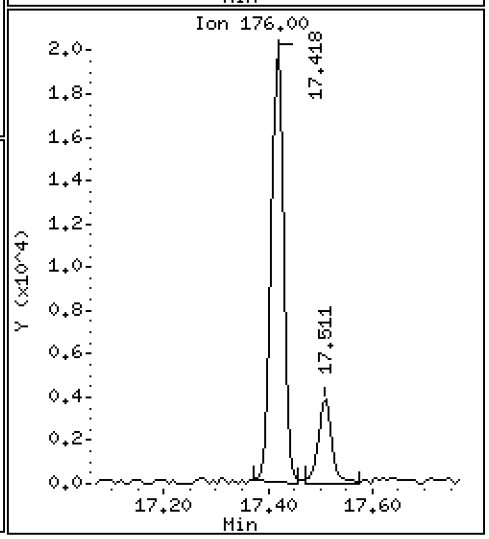












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

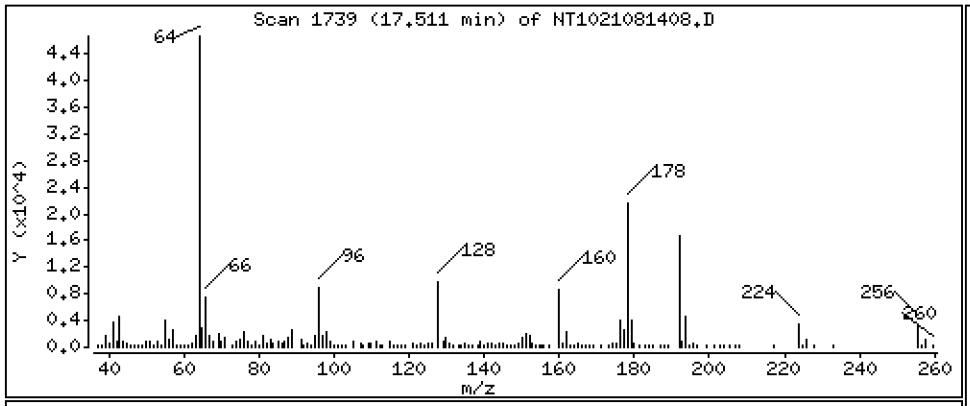
Operator: VTS

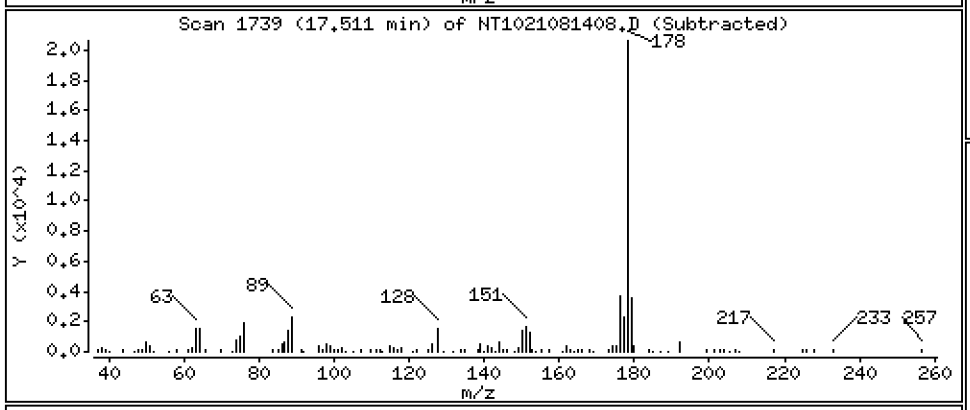
Column phase: ZB-5msi

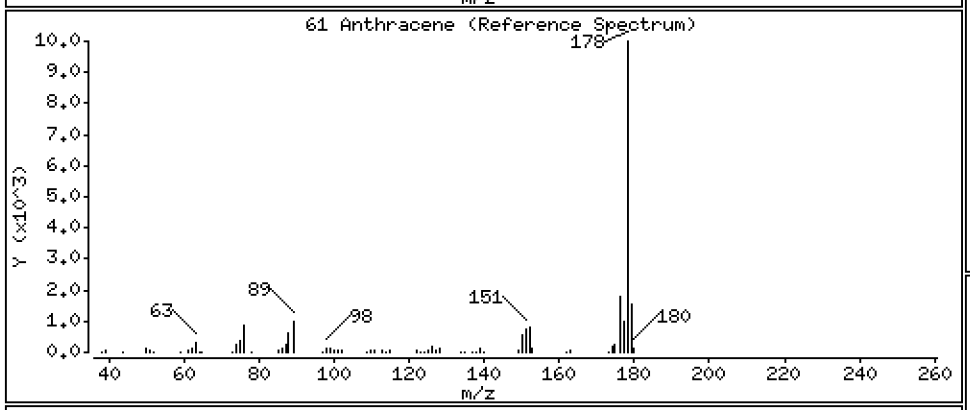
Column diameter: 0.25

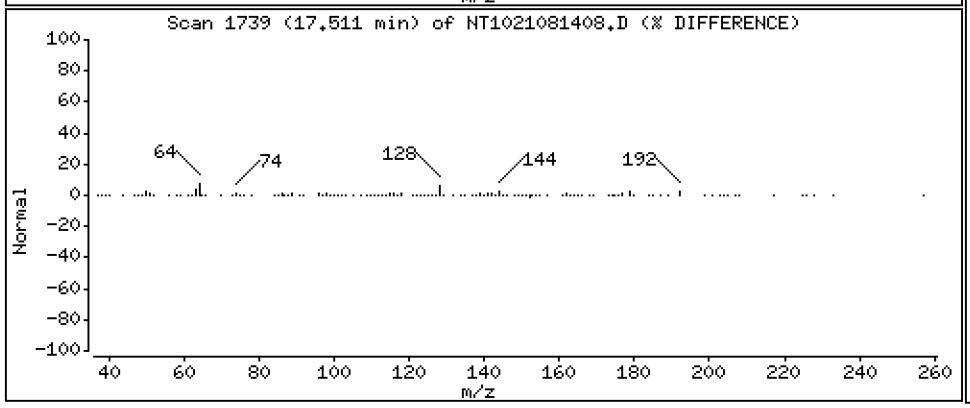
61 Anthracene

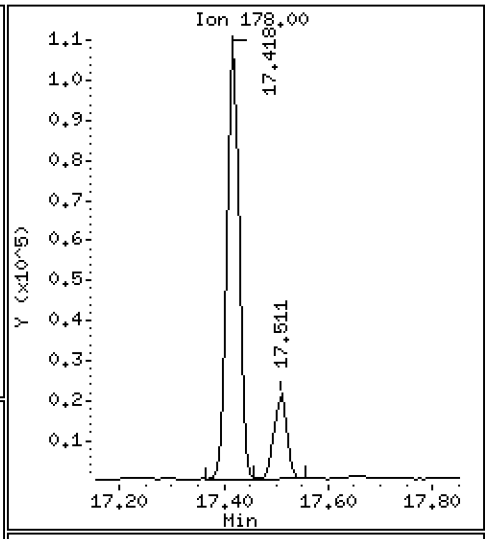
Concentration: 0.3568 ug/mL

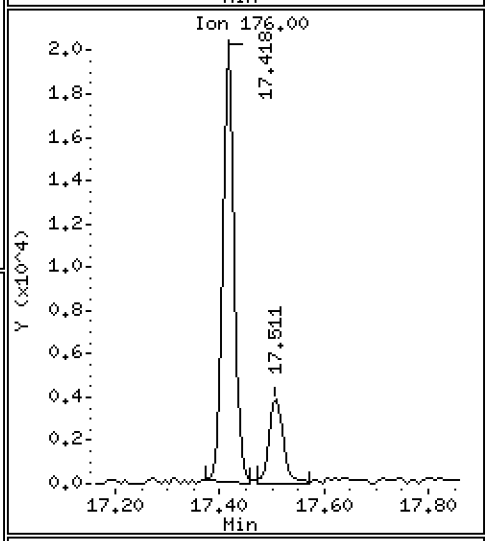


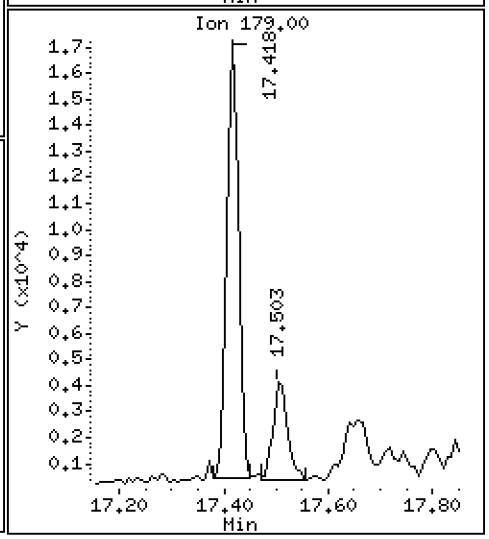












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

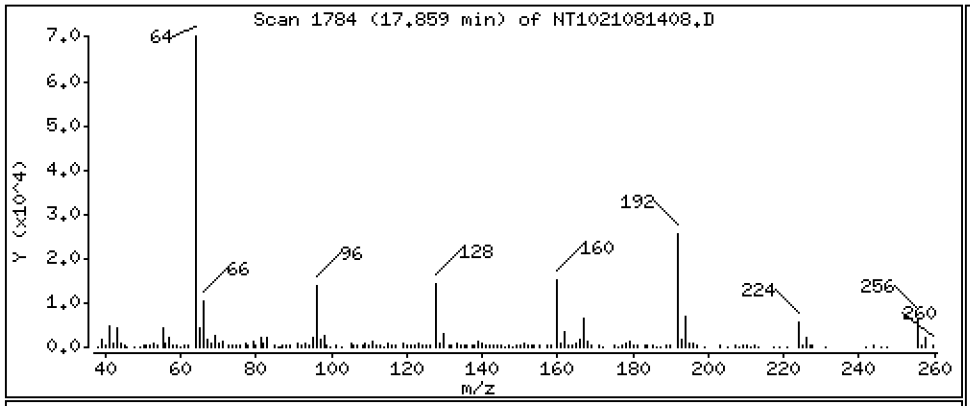
Operator: VTS

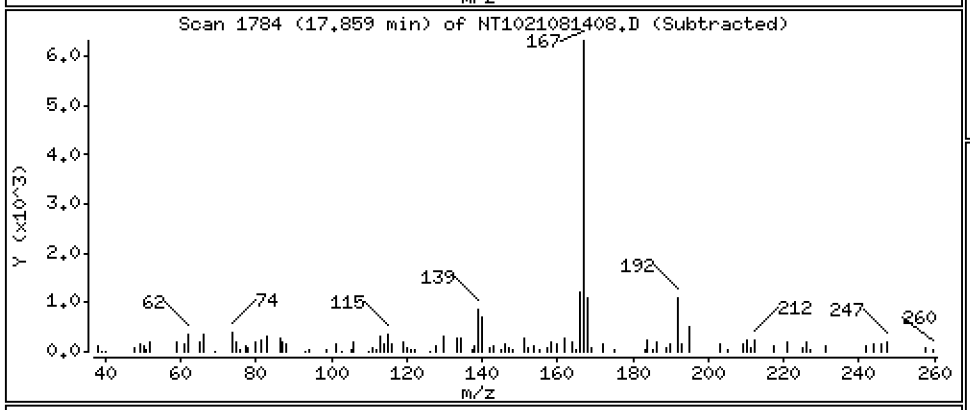
Column phase: ZB-5msi

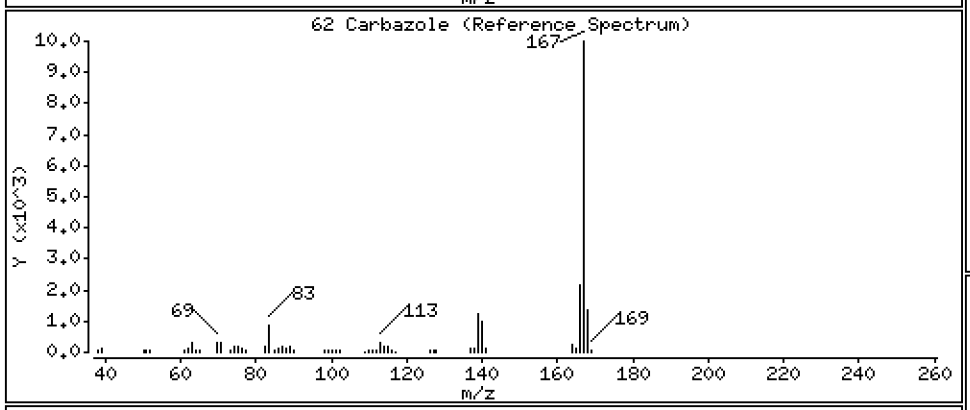
Column diameter: 0.25

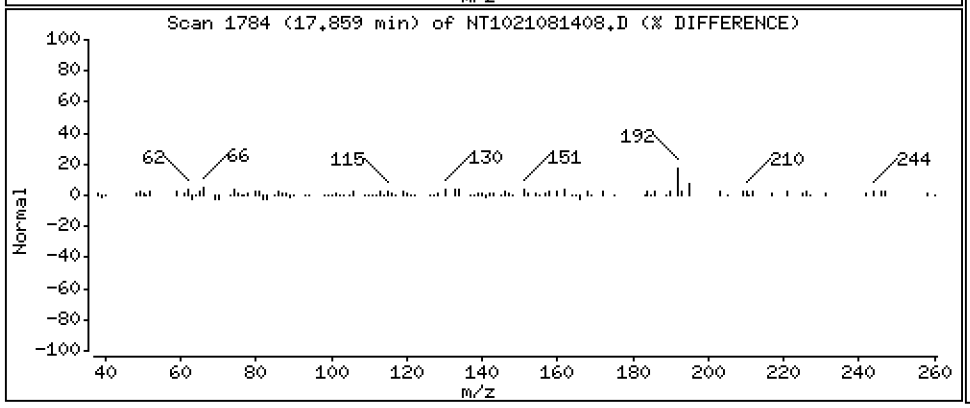
62 Carbazole

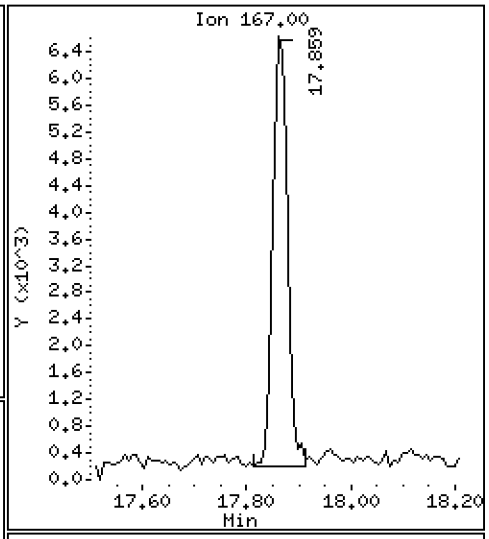
Concentration: 0.1249 ug/mL

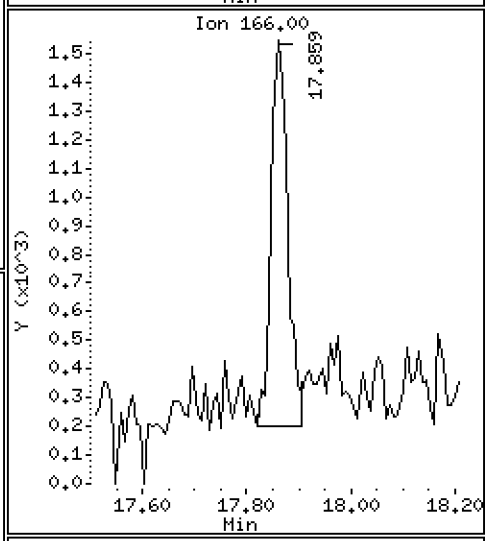


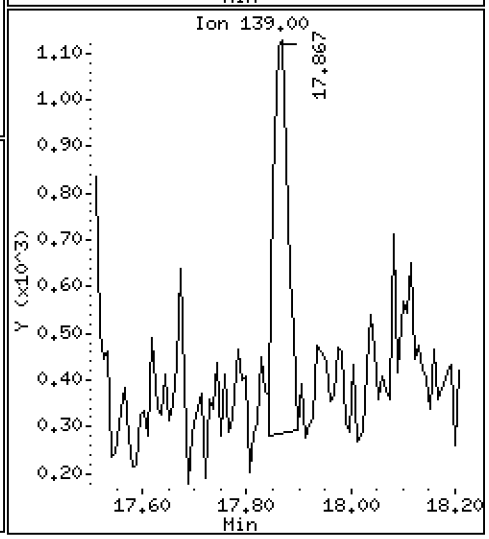












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

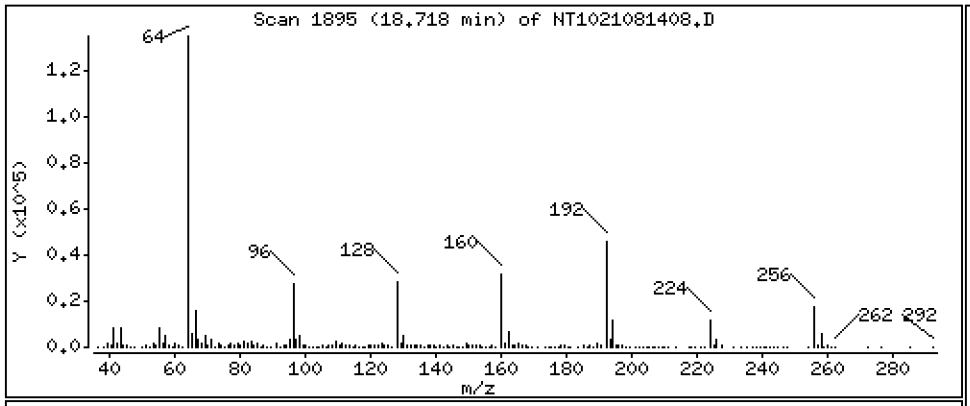
Operator: VTS

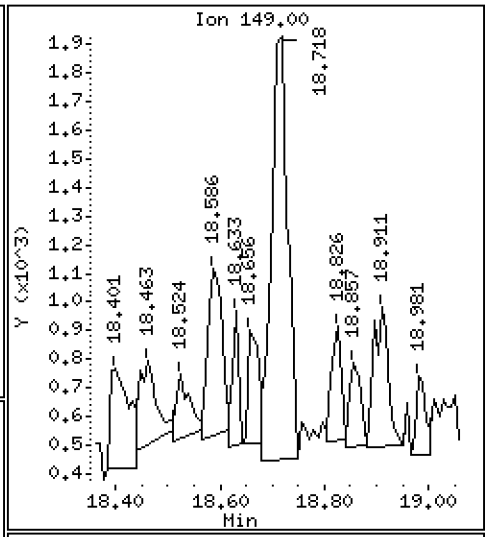
Column phase: ZB-5msi

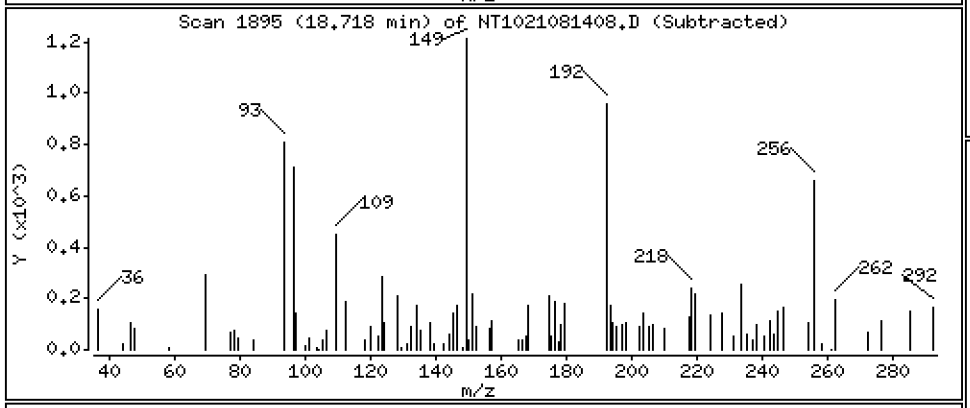
Column diameter: 0.25

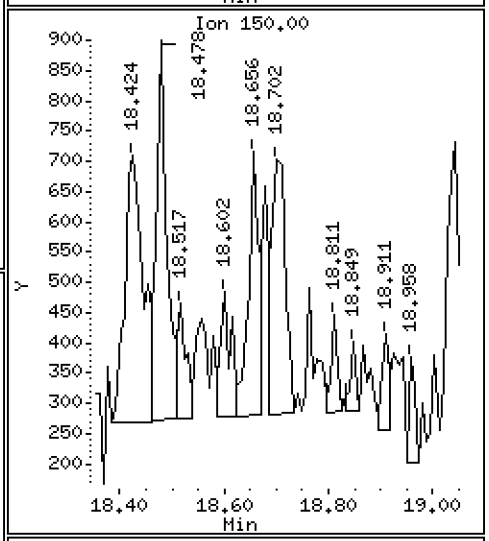
63 Di-n-butylphthalate

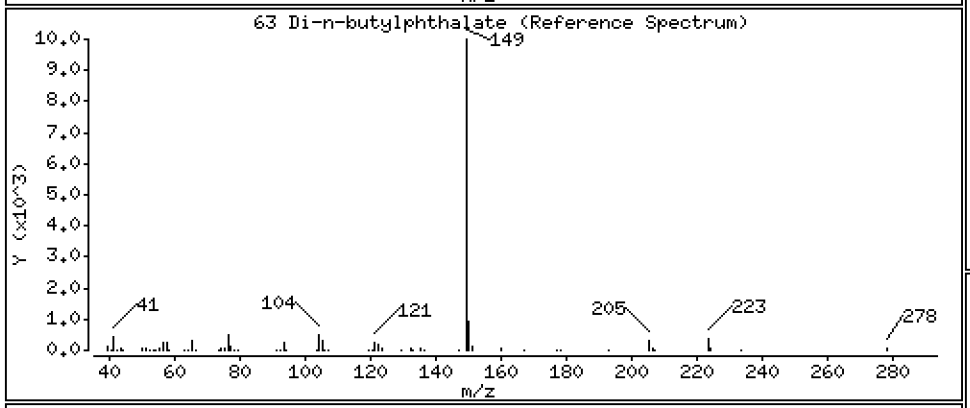
Concentration: 0.02105 ug/mL

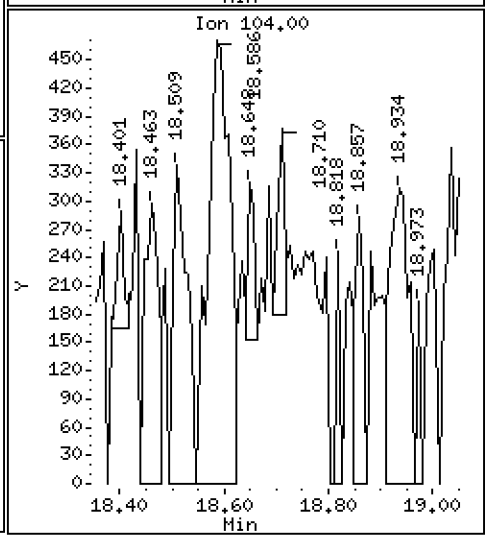


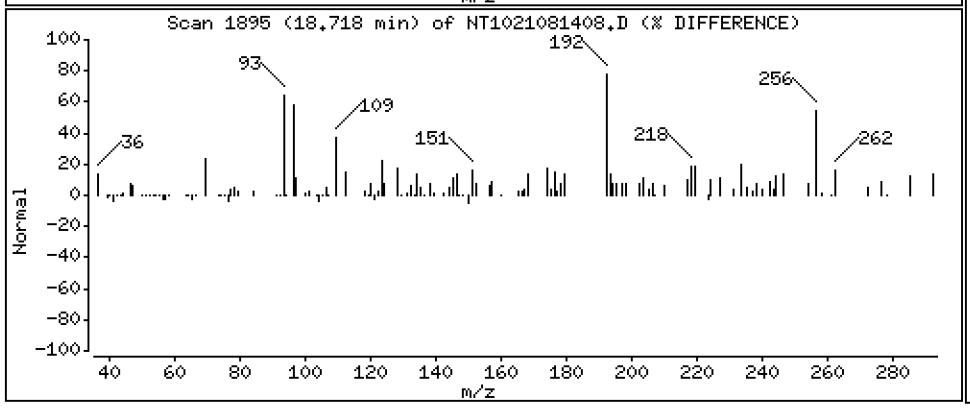












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

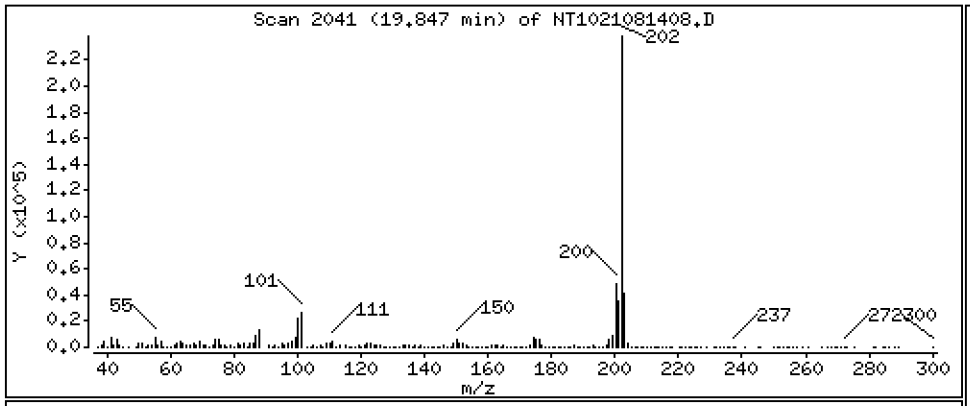
Operator: VTS

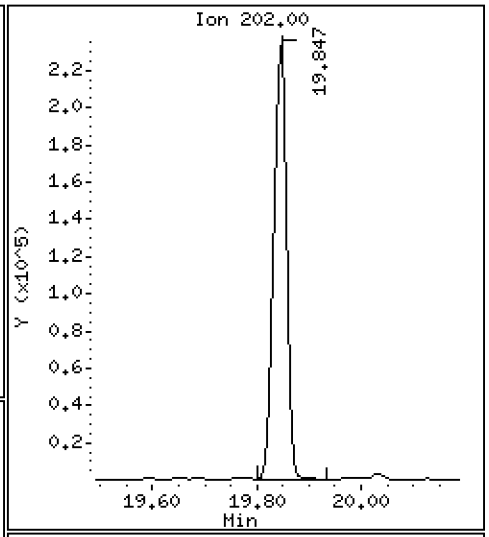
Column phase: ZB-5msi

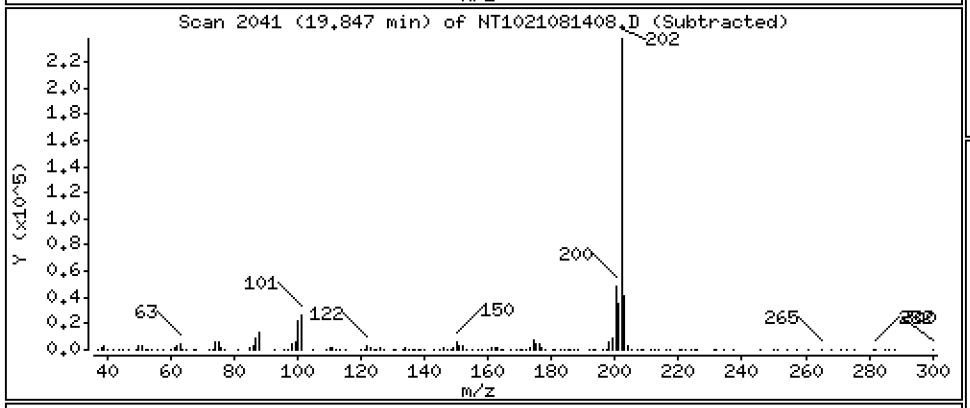
Column diameter: 0.25

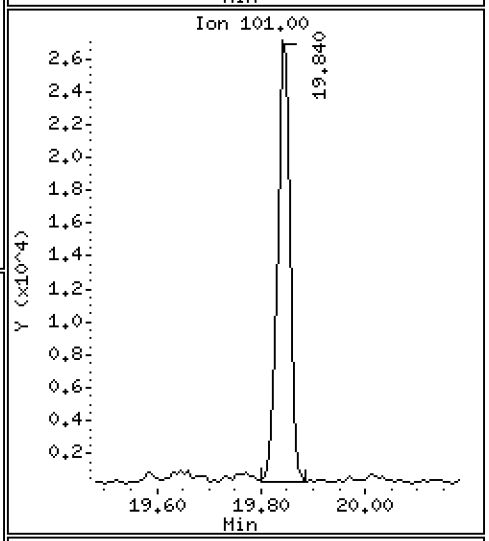
64 Fluoranthene

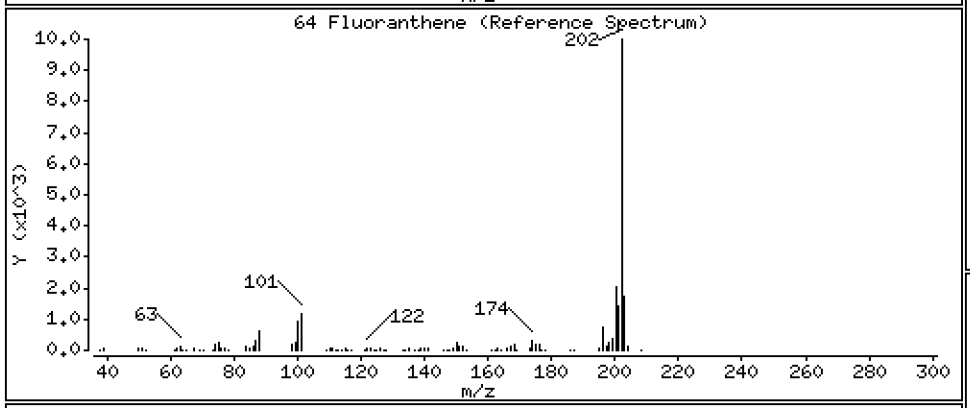
Concentration: 4.407 ug/mL

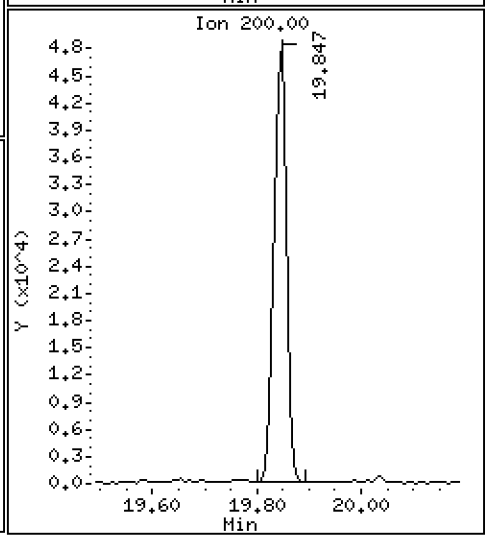


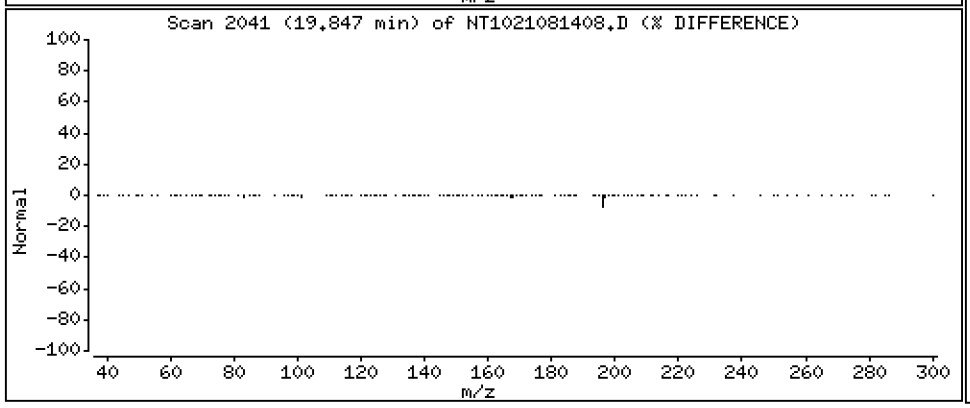












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

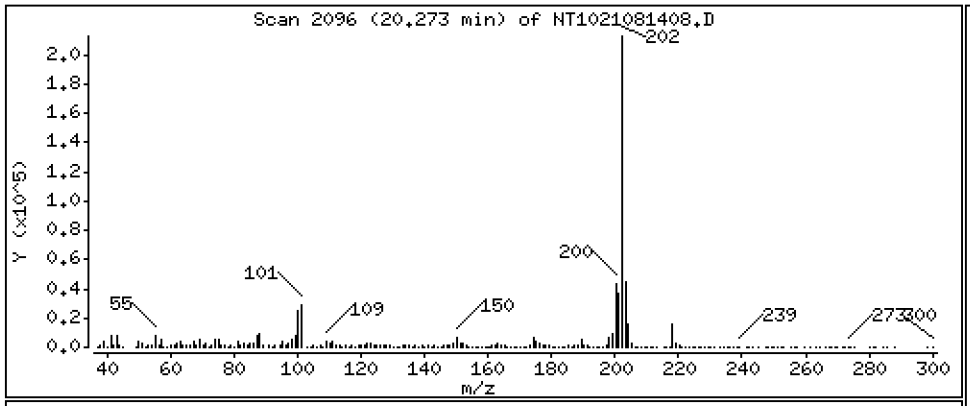
Operator: VTS

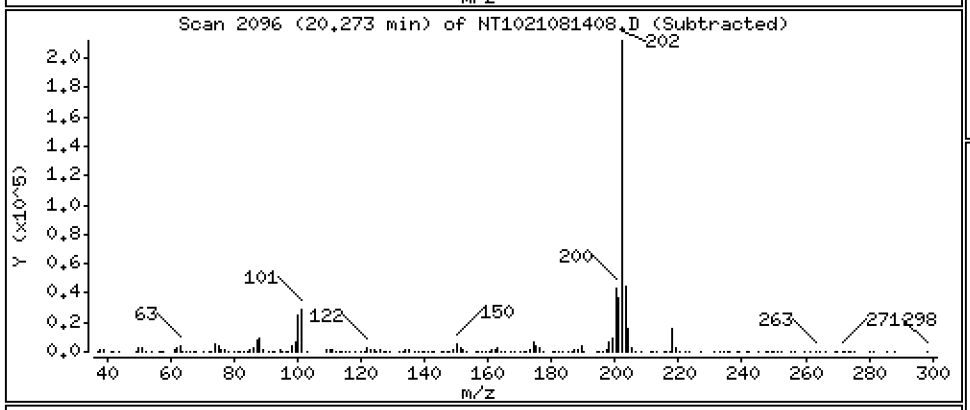
Column phase: ZB-5msi

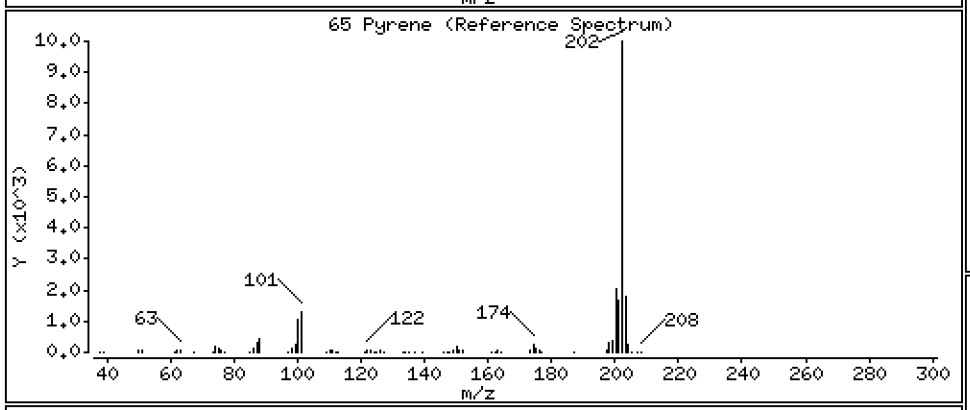
Column diameter: 0.25

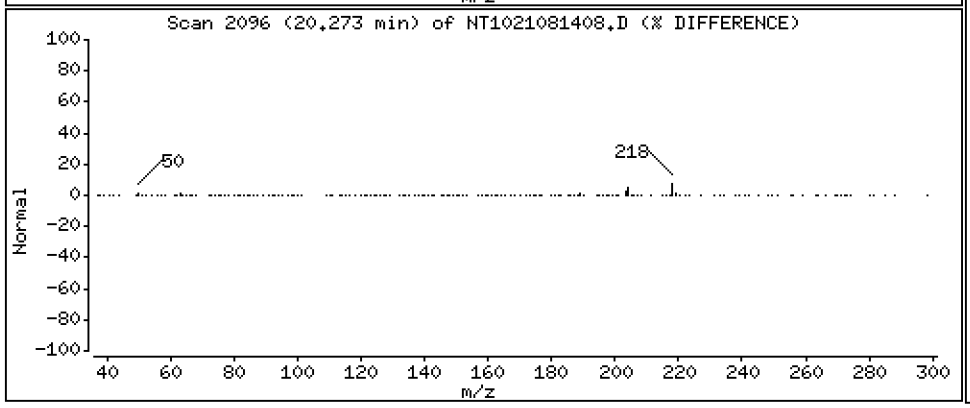
65 Pyrene

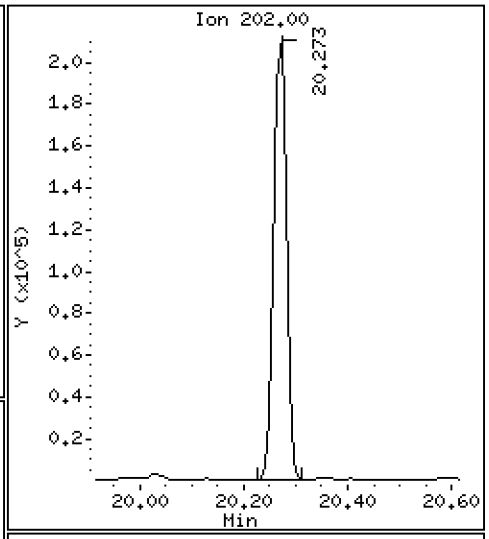
Concentration: 3.518 ug/mL

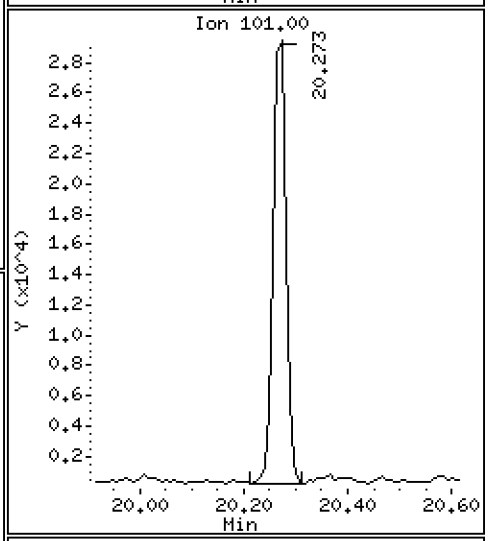


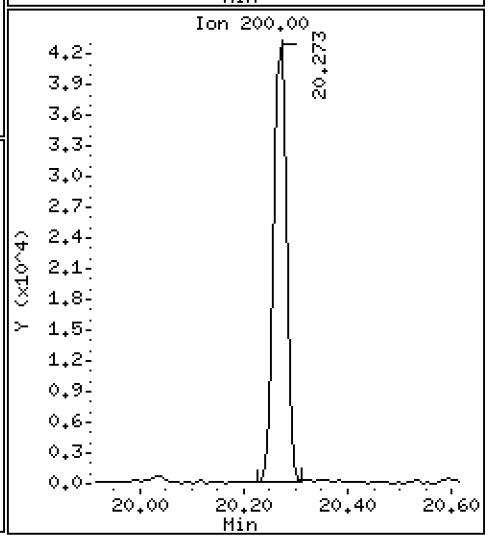












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081408.D

Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

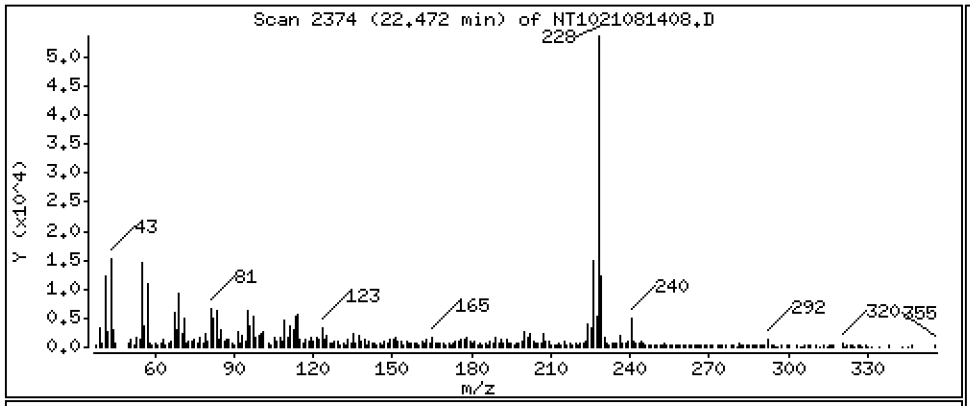
Operator: VTS

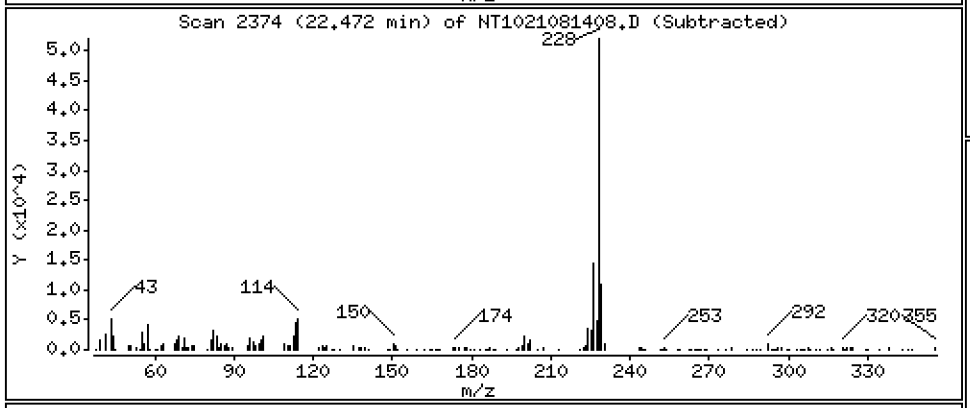
Column phase: ZB-5msi

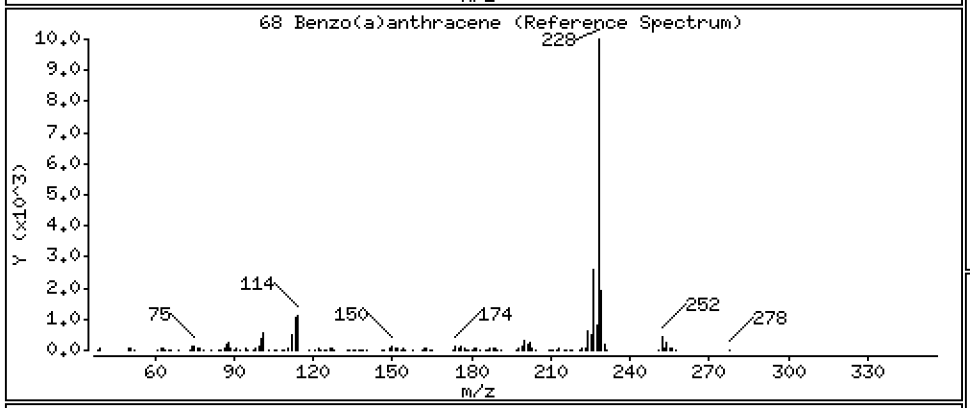
Column diameter: 0.25

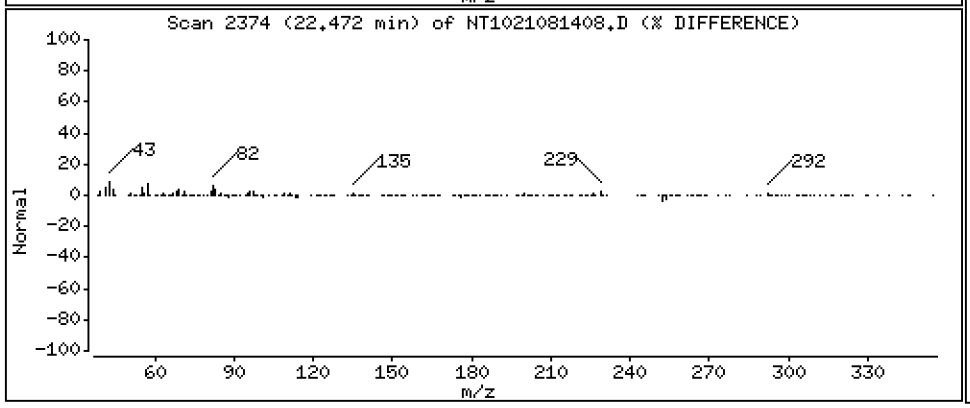
68 Benzo(a)anthracene

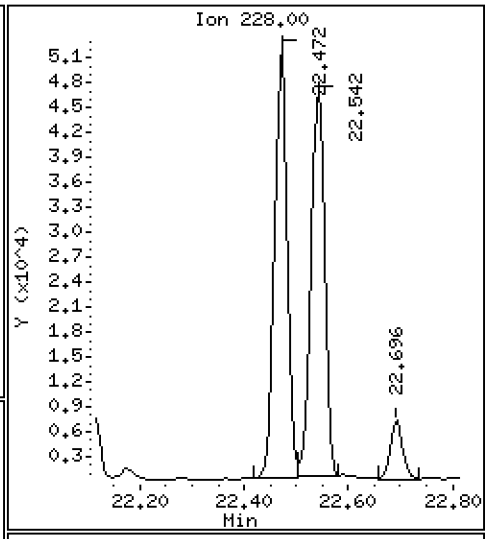
Concentration: 1.077 ug/mL

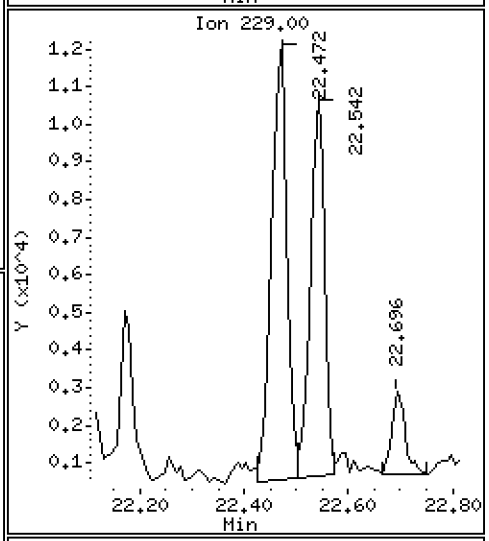


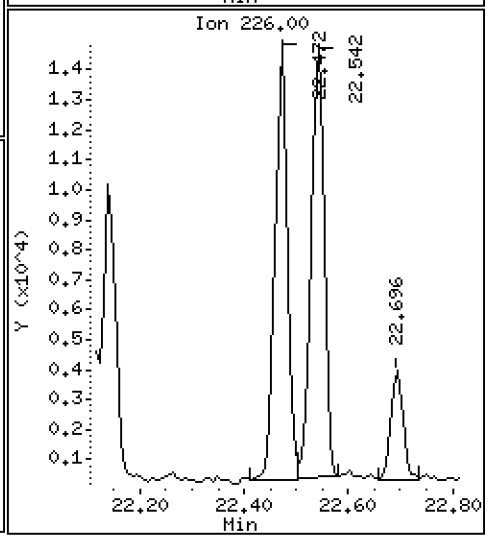












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

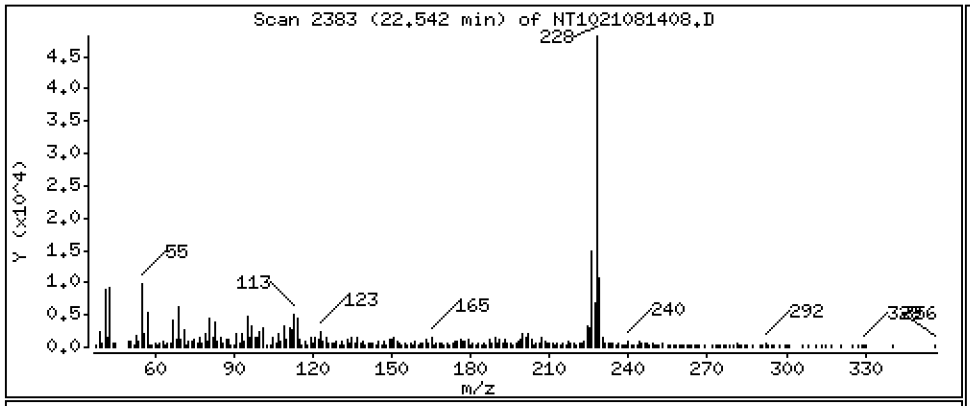
Operator: VTS

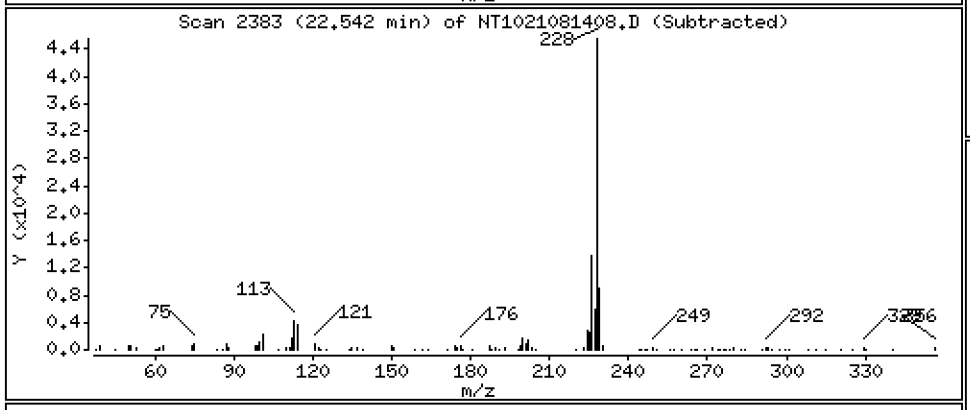
Column phase: ZB-5msi

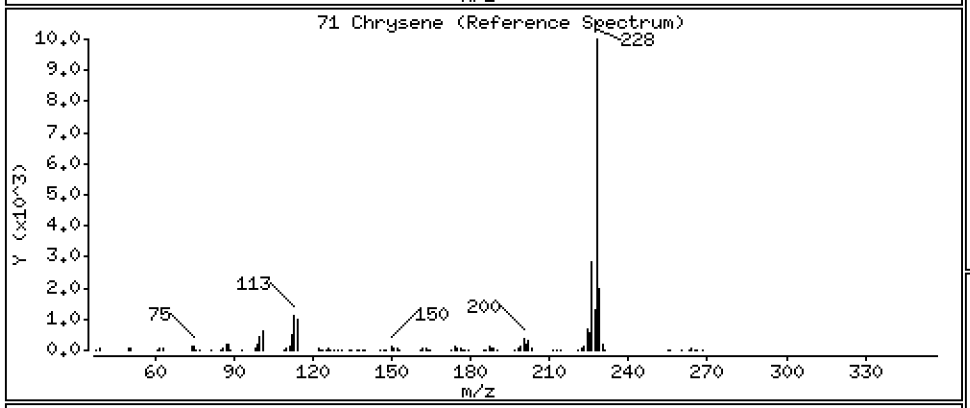
Column diameter: 0.25

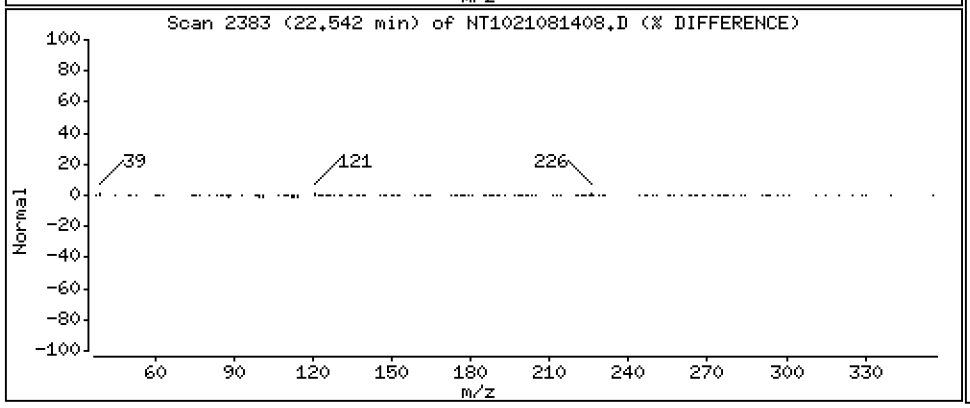
71 Chrysene

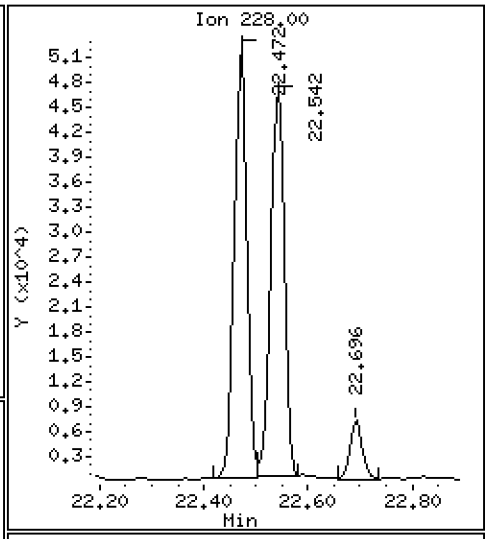
Concentration: 1.335 ug/mL

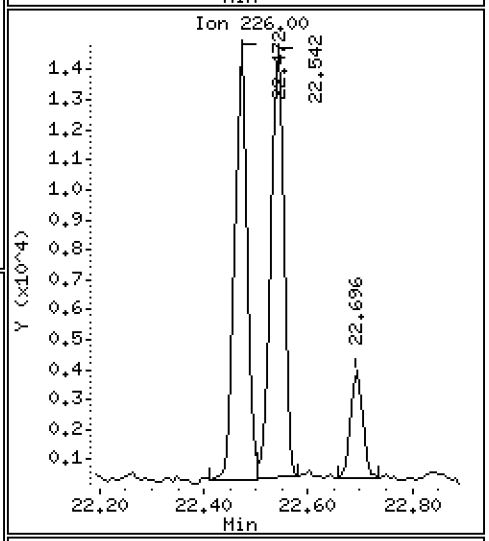


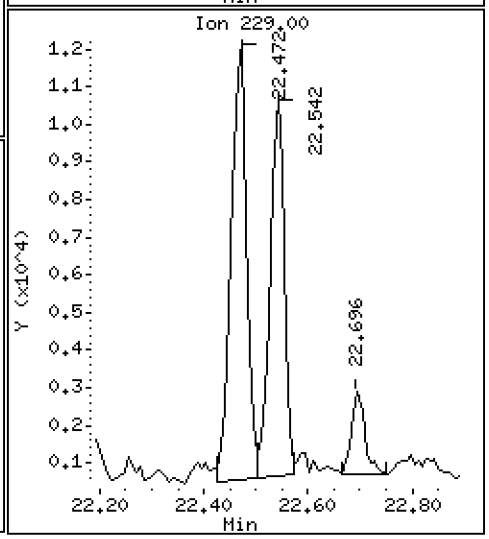












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

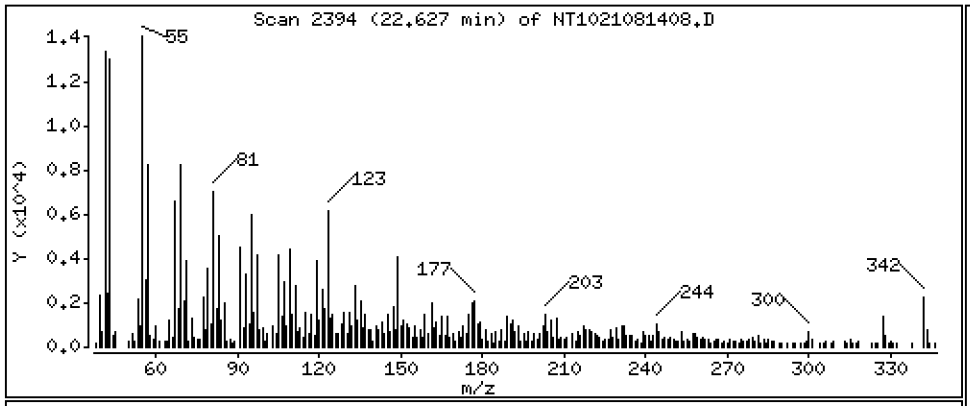
Operator: VTS

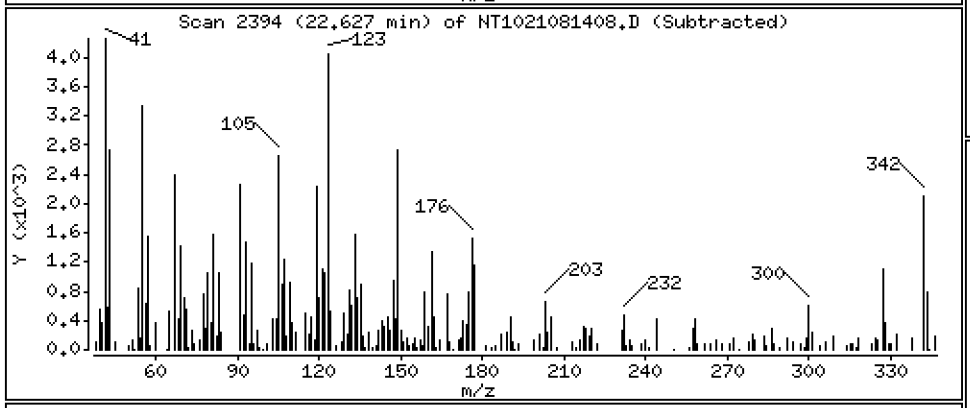
Column phase: ZB-5msi

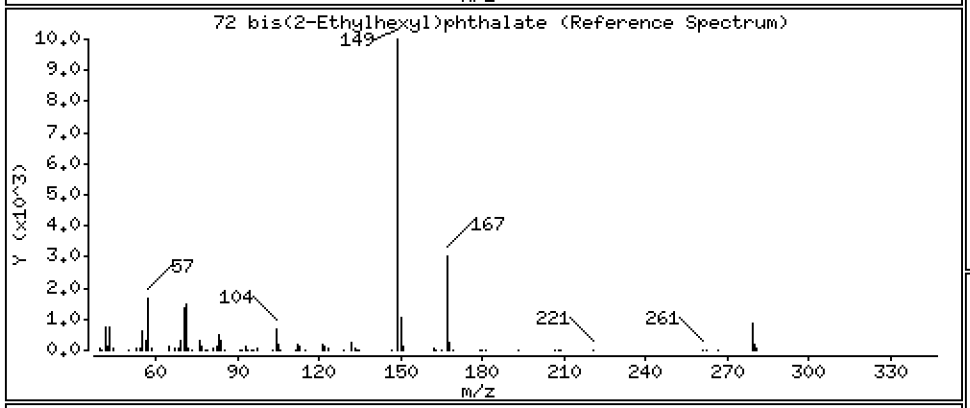
Column diameter: 0.25

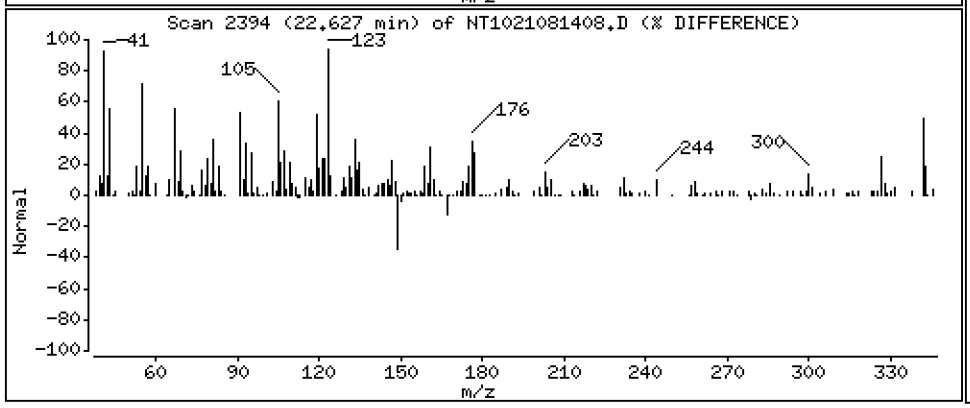
72 bis(2-Ethylhexyl)phthalate

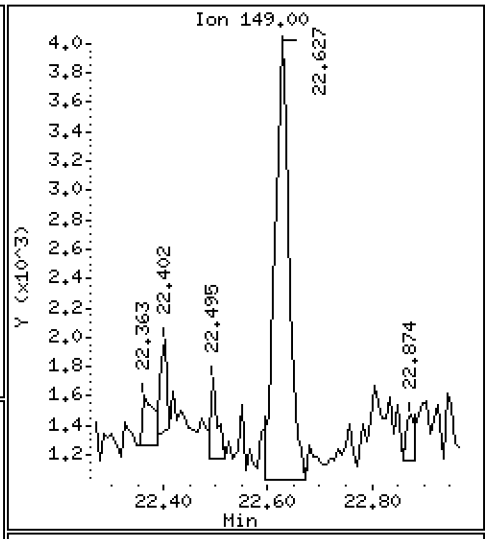
Concentration: 0.1613 ug/mL

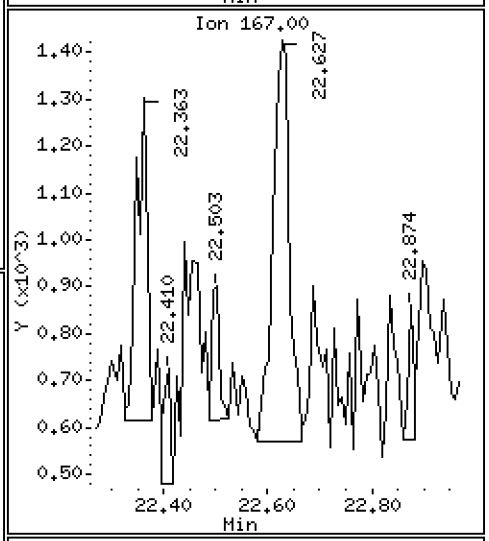


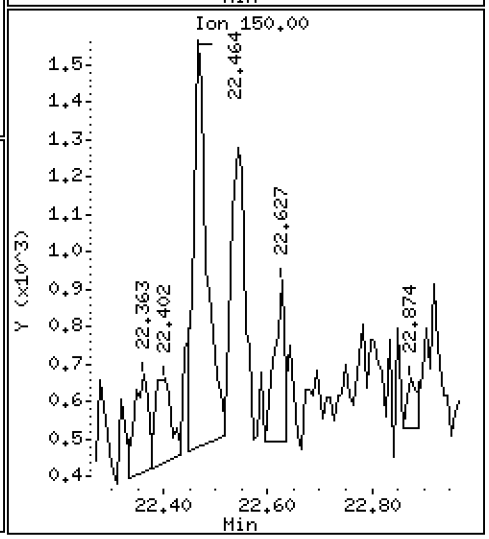












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

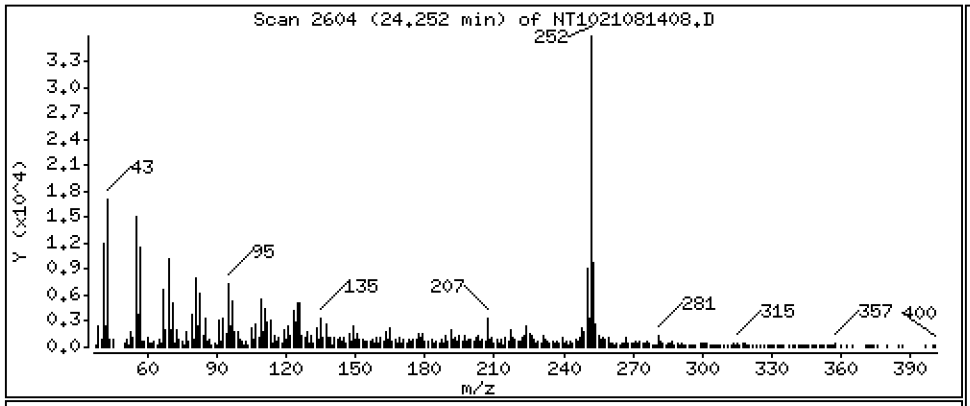
Operator: VTS

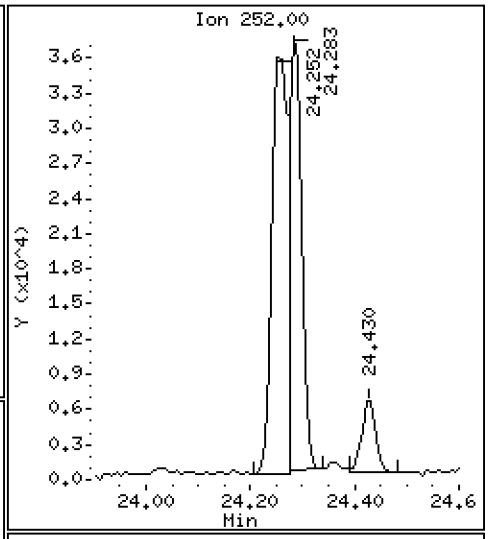
Column phase: ZB-5msi

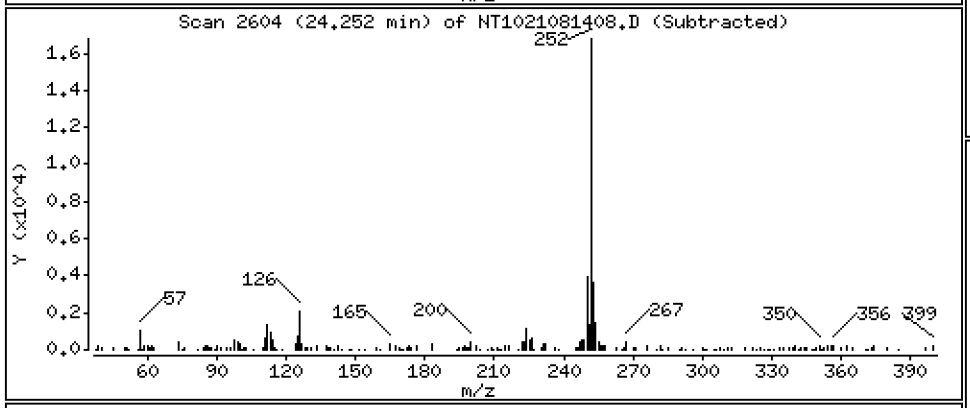
Column diameter: 0.25

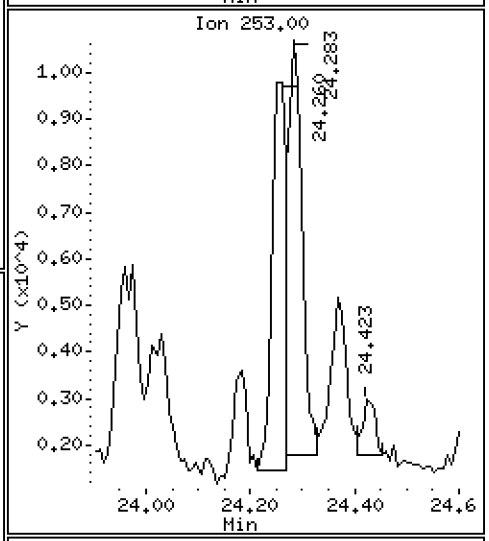
74 Benzo(b)fluoranthene

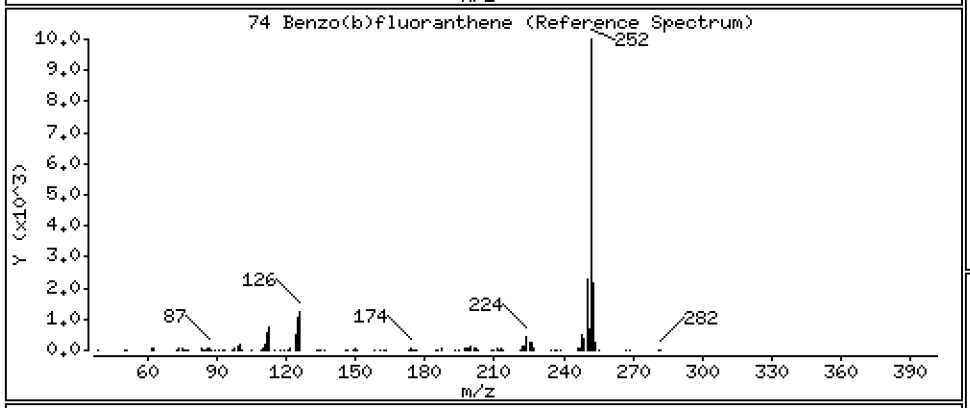
Concentration: 0.9968 ug/mL

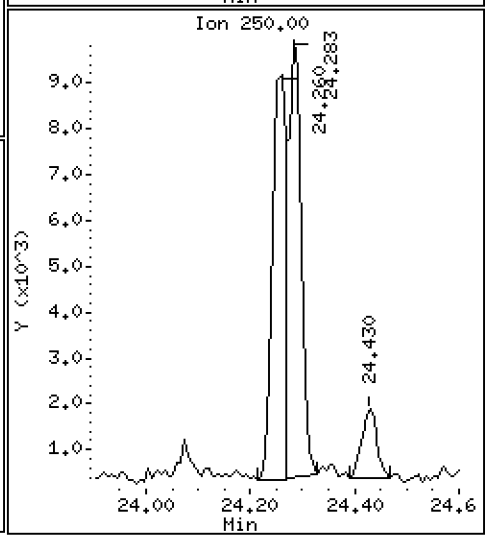


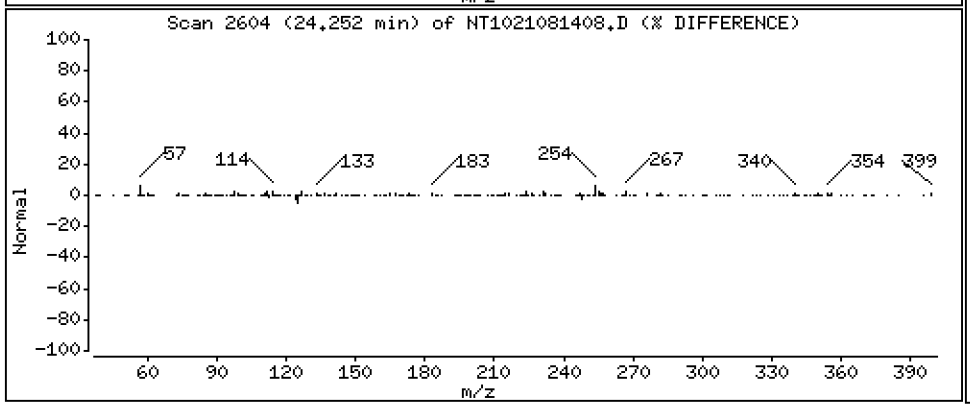












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

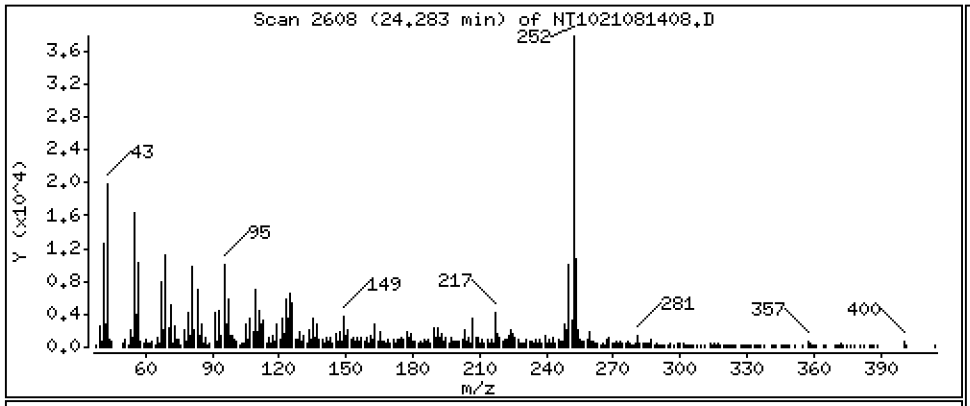
Operator: VTS

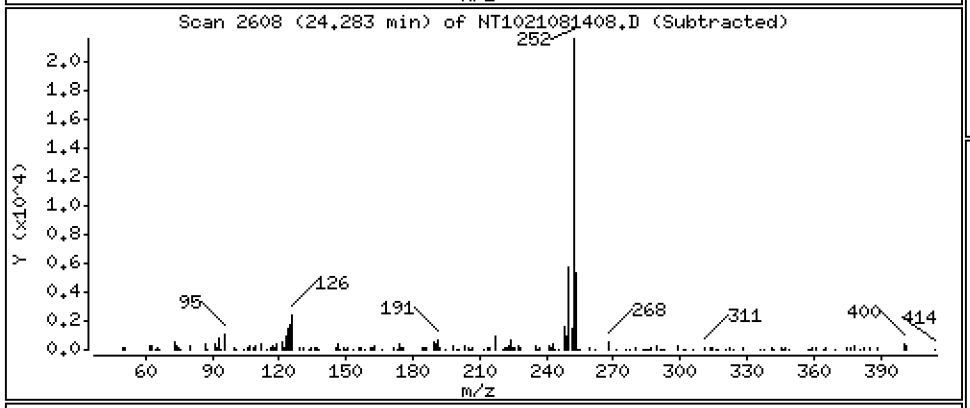
Column phase: ZB-5msi

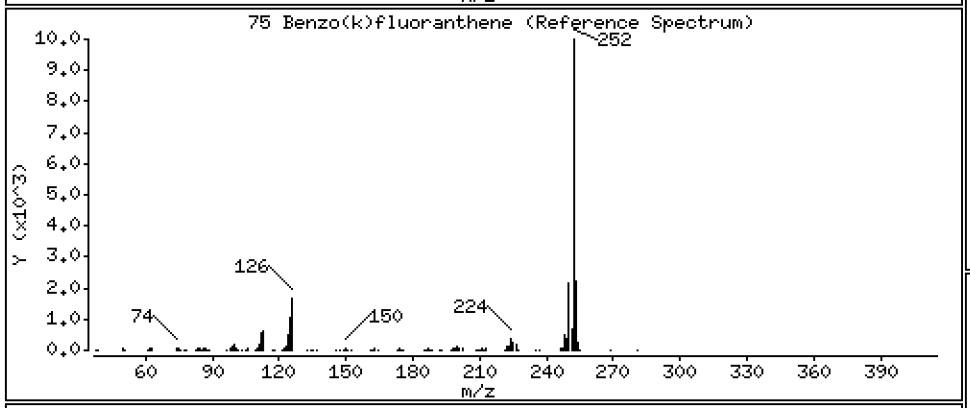
Column diameter: 0.25

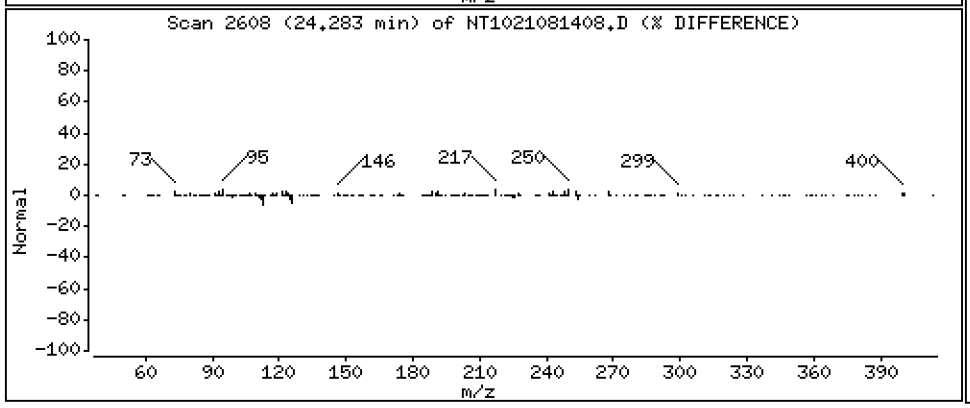
75 Benzo(k)fluoranthene

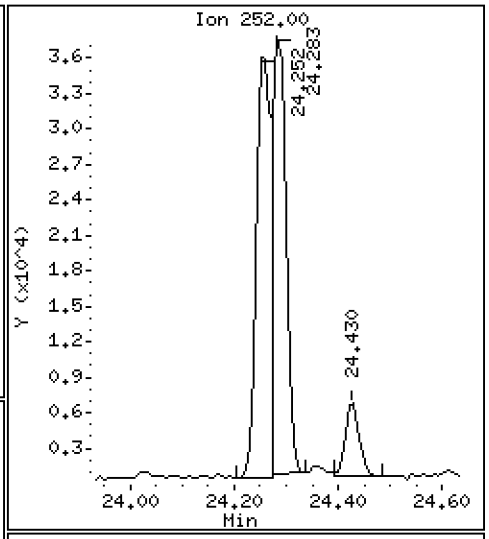
Concentration: 0.8028 ug/mL

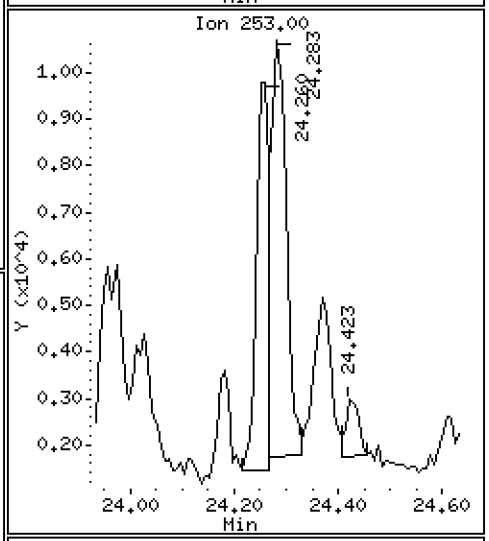


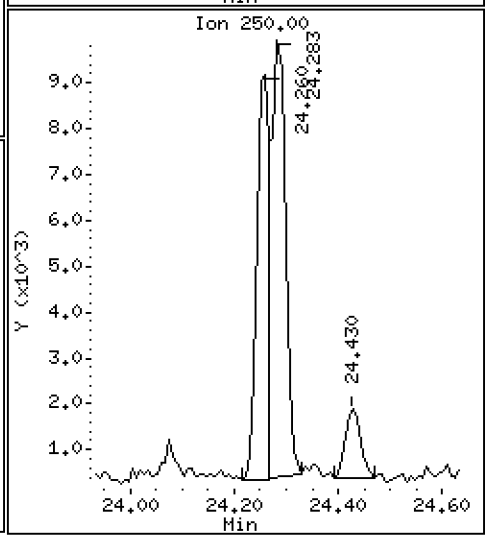












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

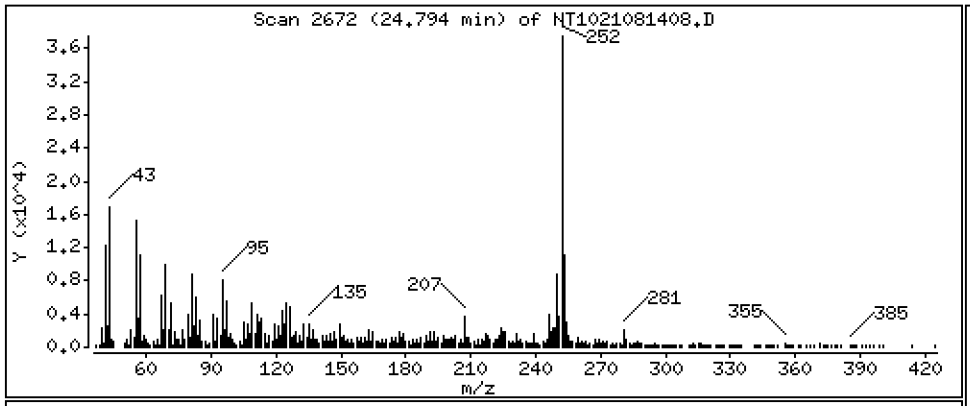
Operator: VTS

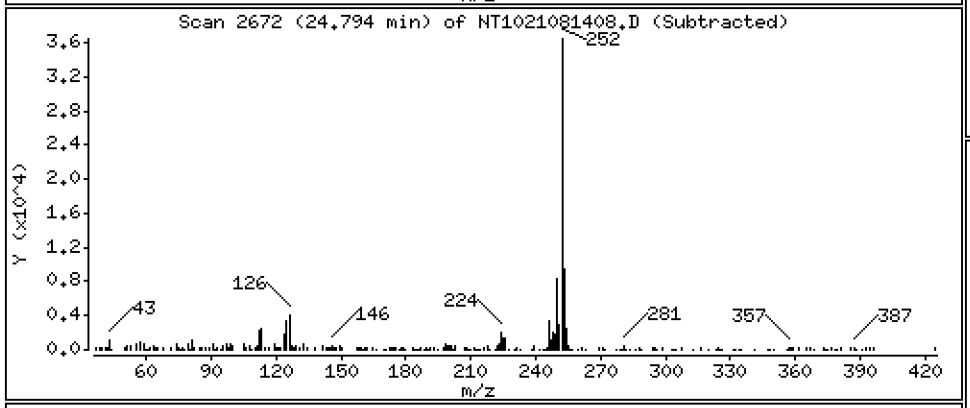
Column phase: ZB-5msi

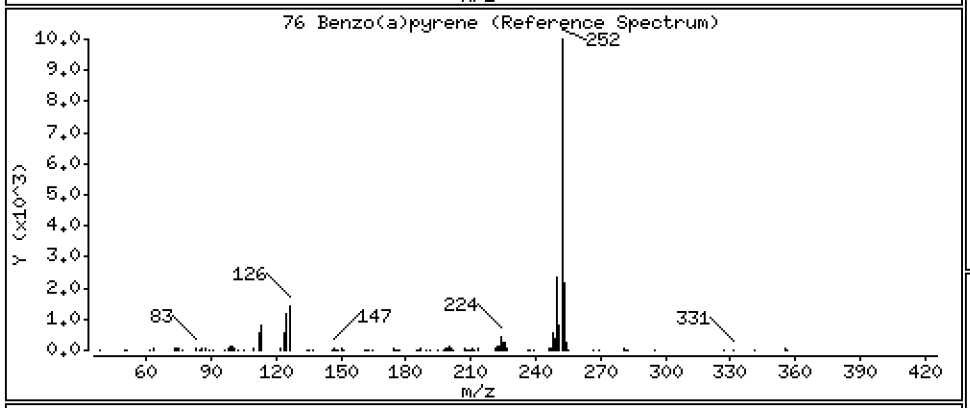
Column diameter: 0.25

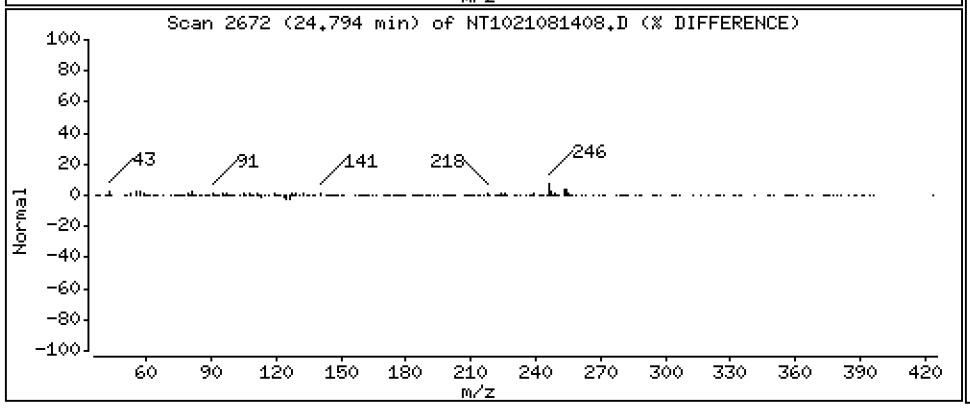
76 Benzo(a)pyrene

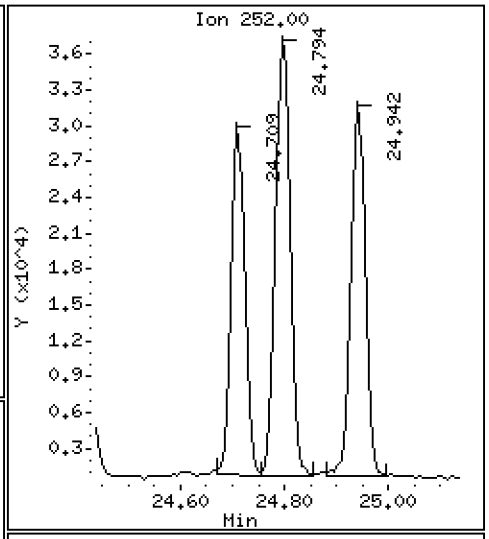
Concentration: 0.9728 ug/mL

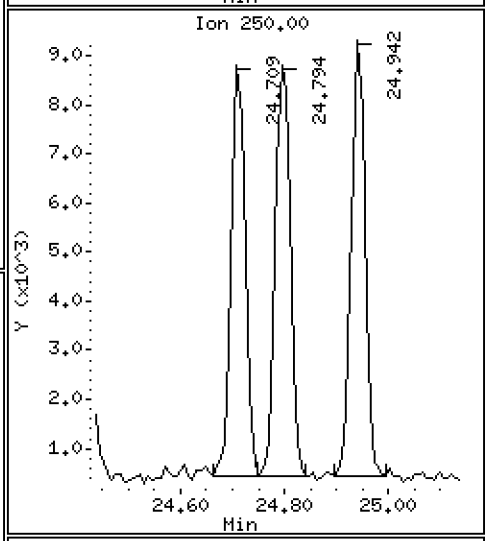


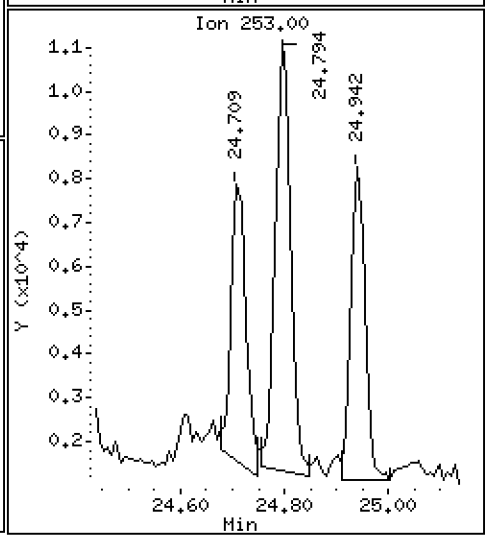












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

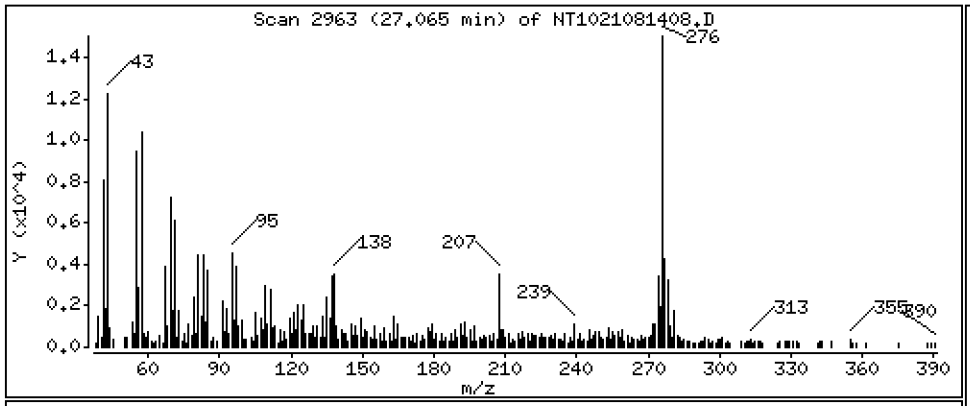
Operator: VTS

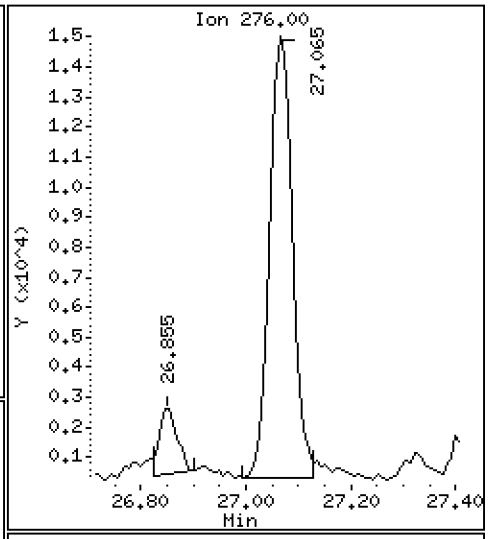
Column phase: ZB-5msi

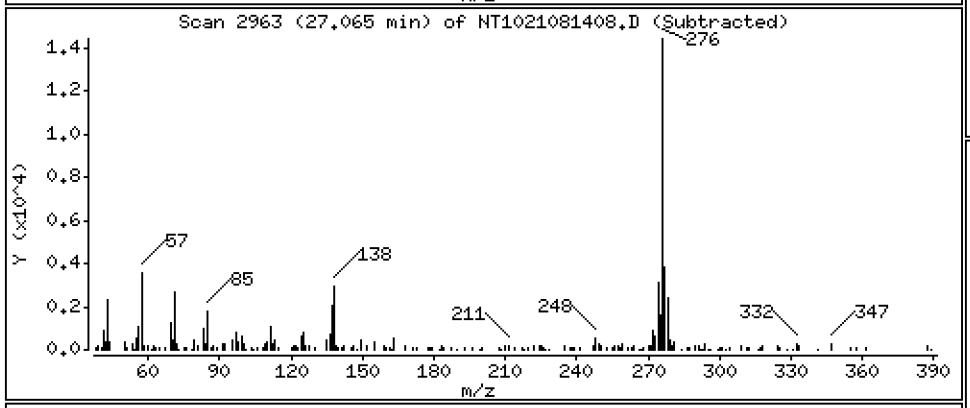
Column diameter: 0.25

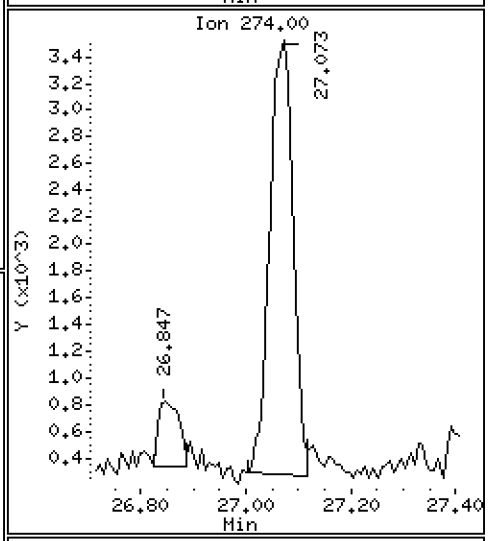
78 Indeno(1,2,3-cd)pyrene

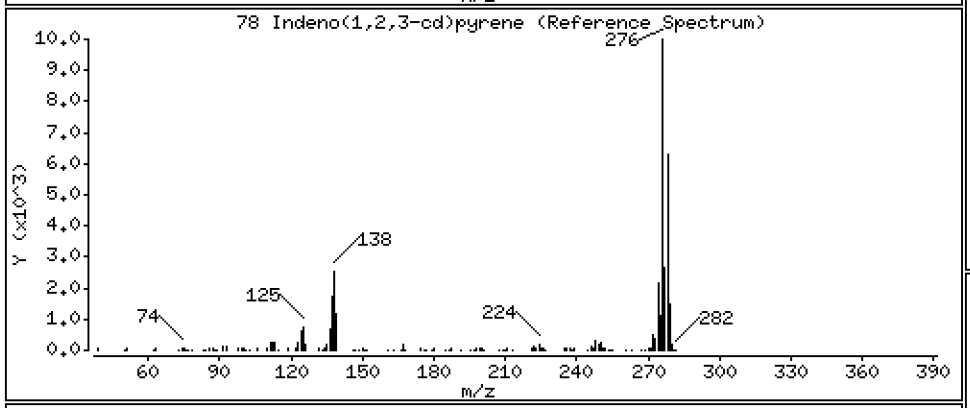
Concentration: 0.5470 ug/mL

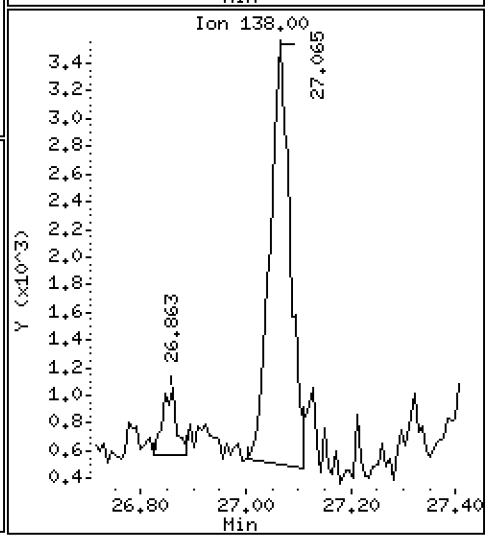


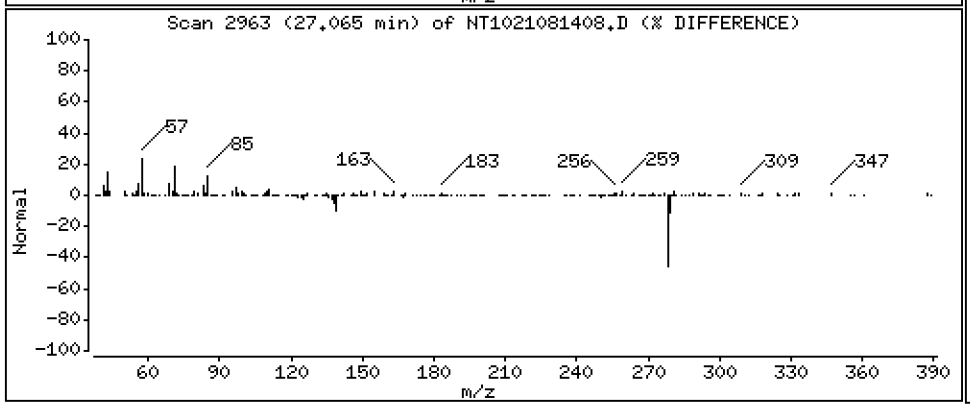












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081408.D

Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

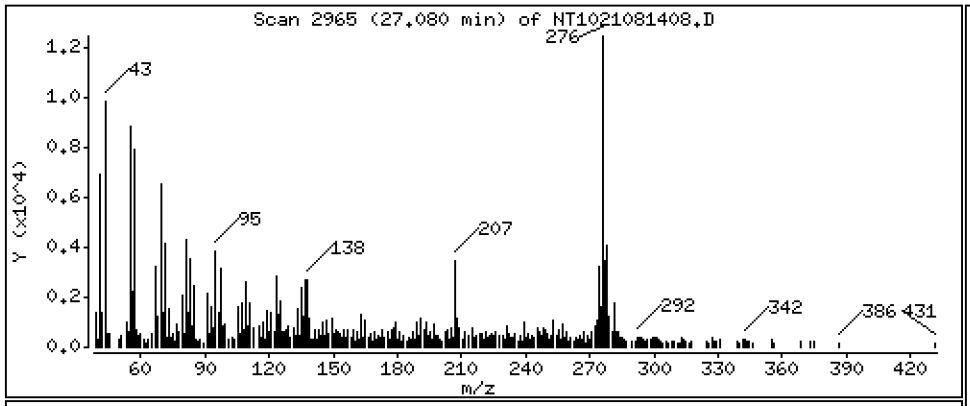
Operator: VTS

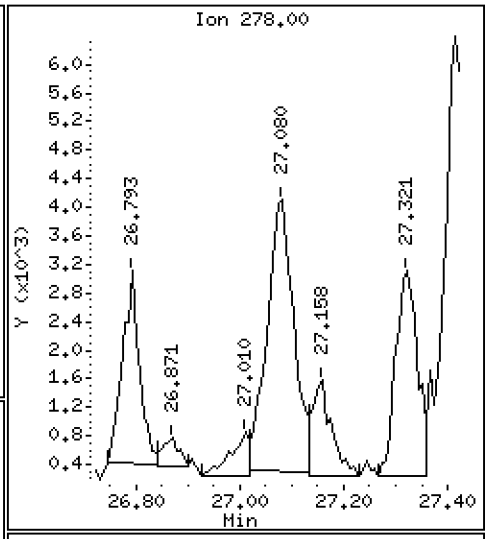
Column phase: ZB-5msi

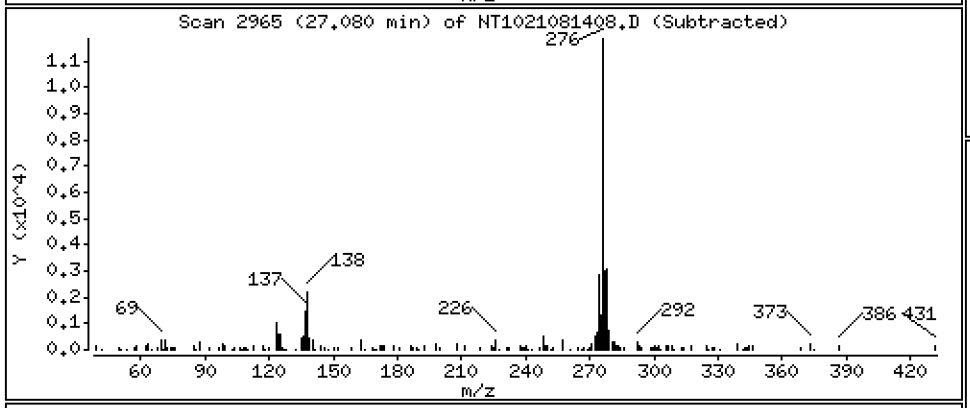
Column diameter: 0.25

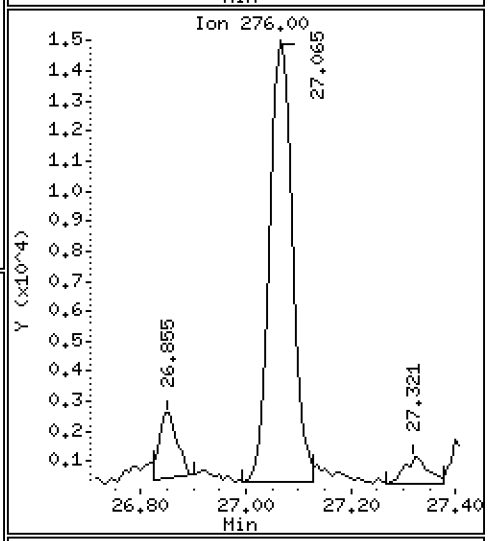
79 Dibenzo(a,h)anthracene

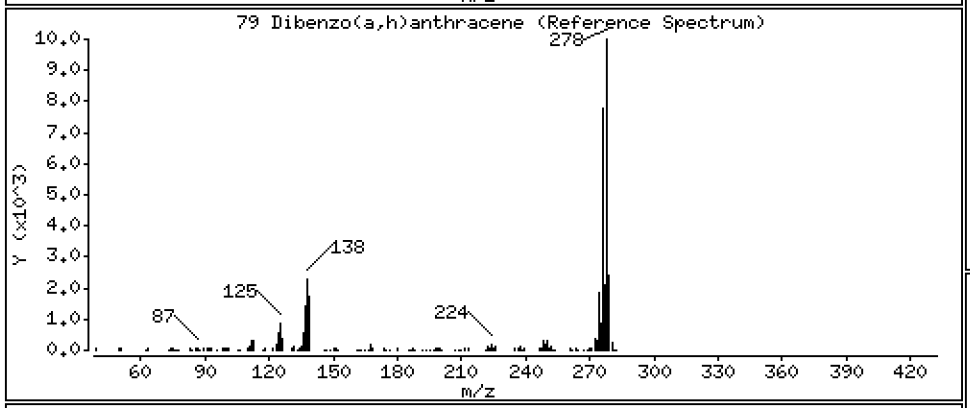
Concentration: 0.2153 ug/mL

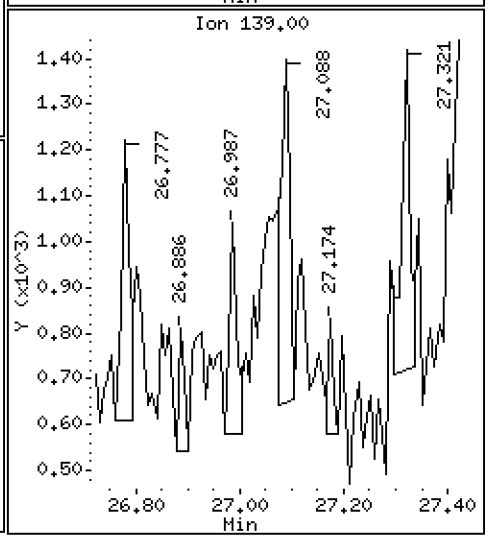


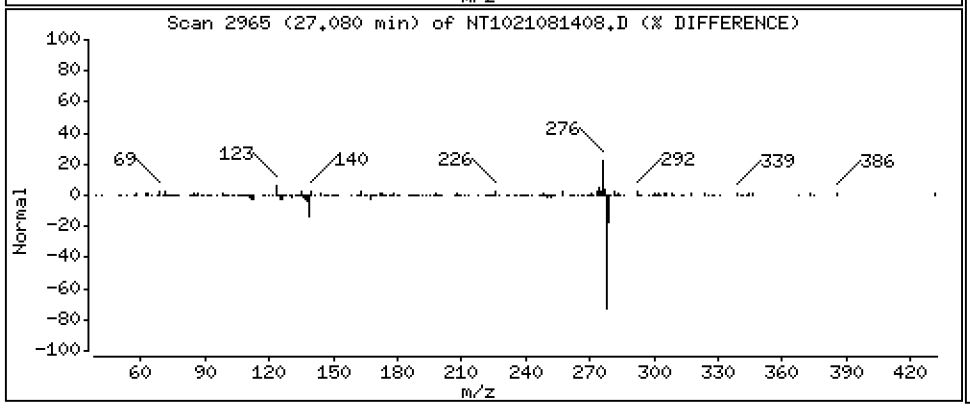












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081408.D

Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

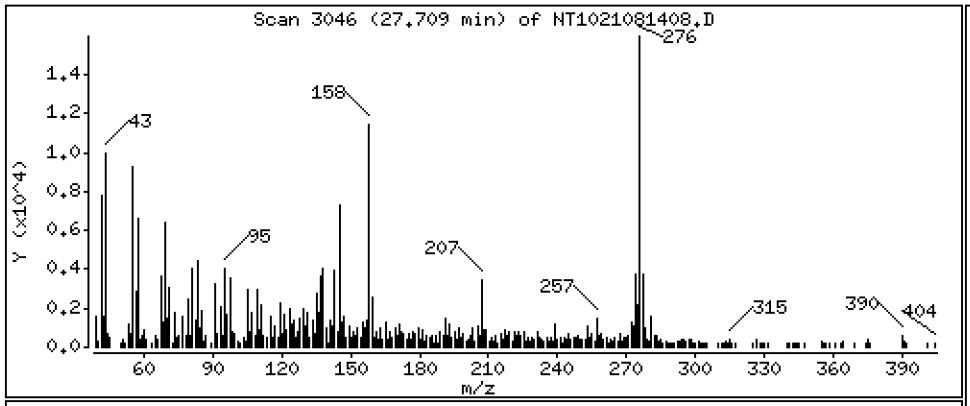
Operator: VTS

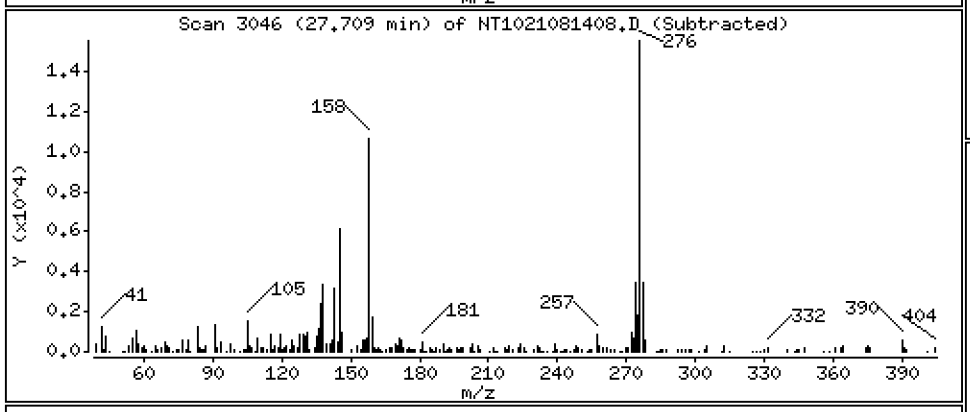
Column phase: ZB-5msi

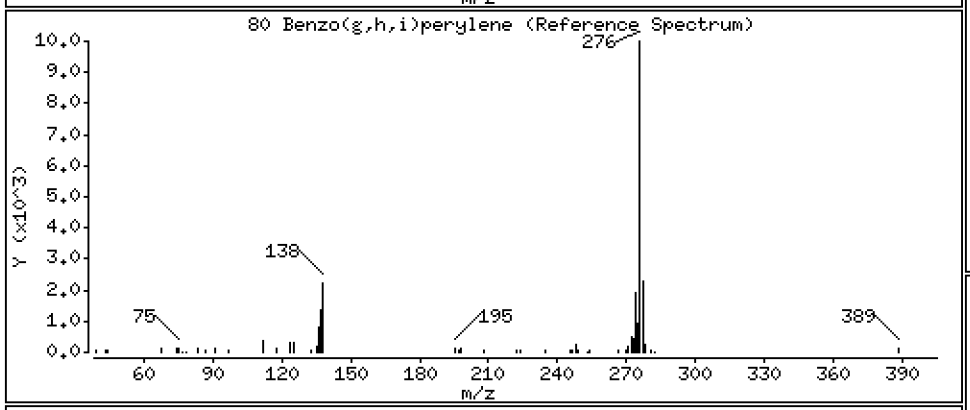
Column diameter: 0.25

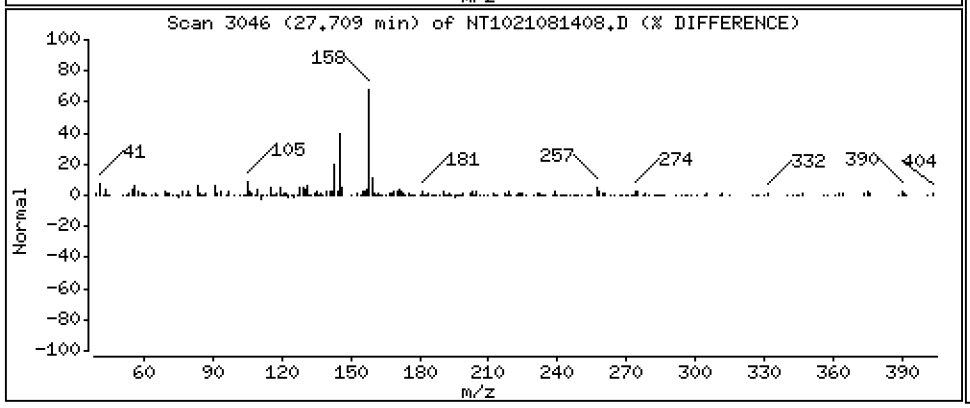
80 Benzo(g,h,i)perylene

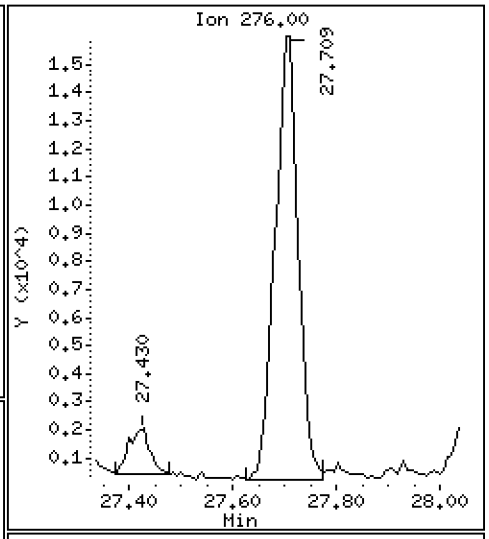
Concentration: 0.6789 ug/mL

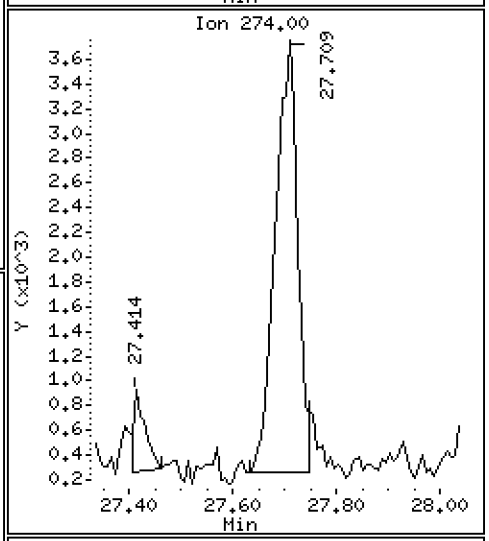


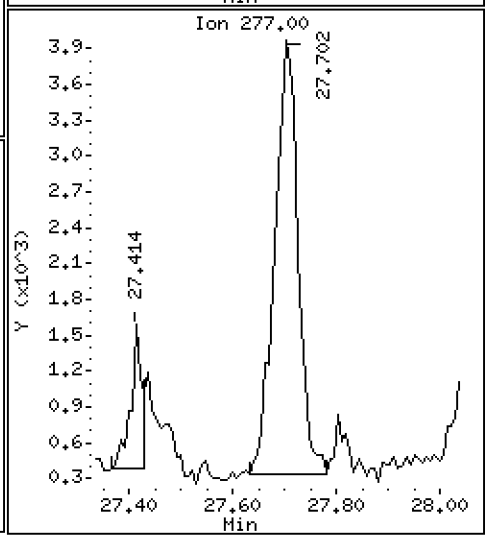












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

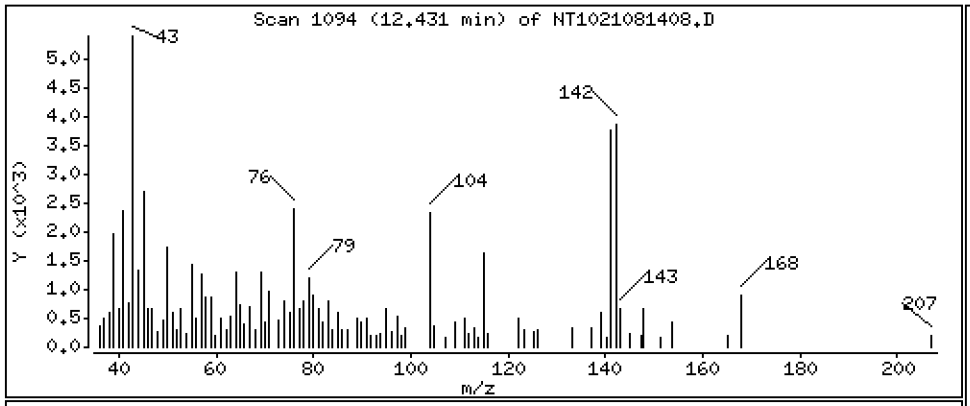
Operator: VTS

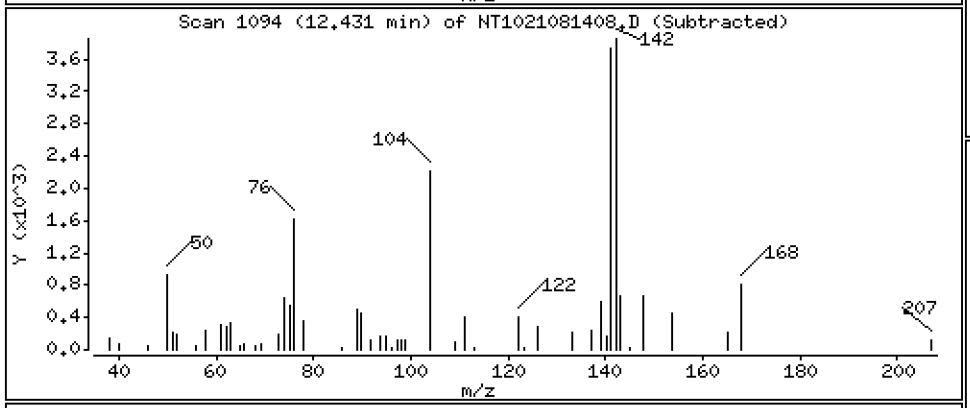
Column phase: ZB-5msi

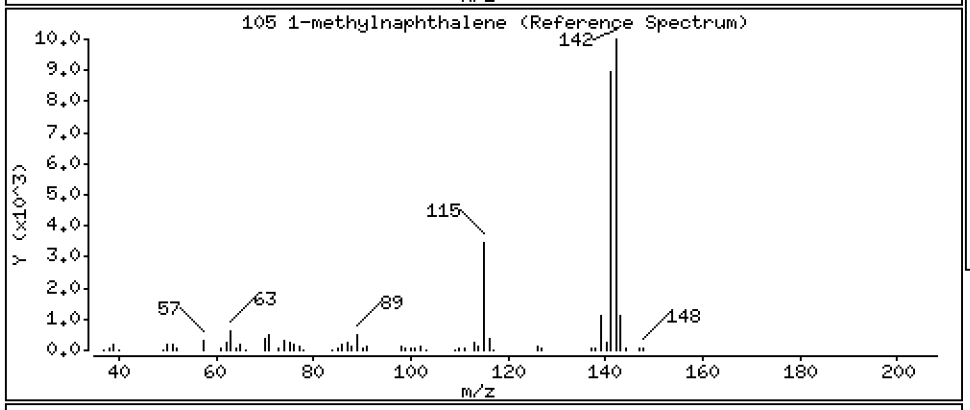
Column diameter: 0.25

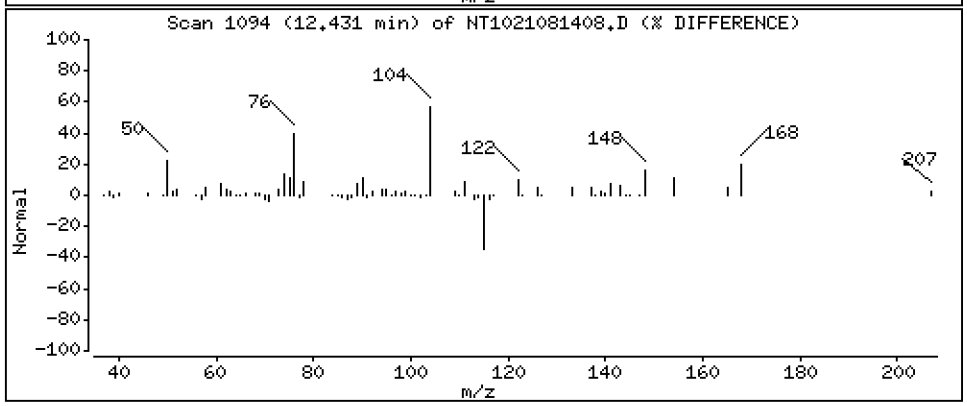
105 1-methylnaphthalene

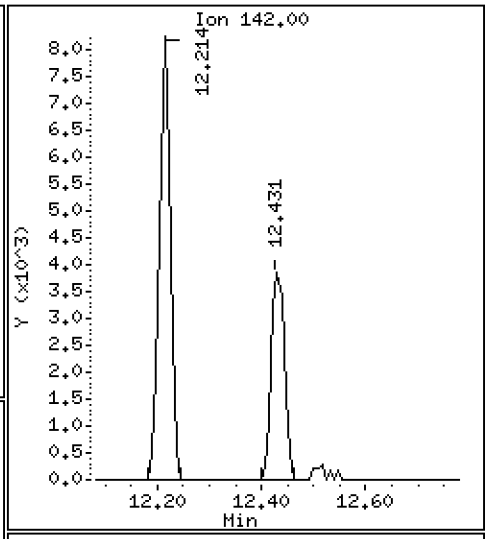
Concentration: 0.07948 ug/mL

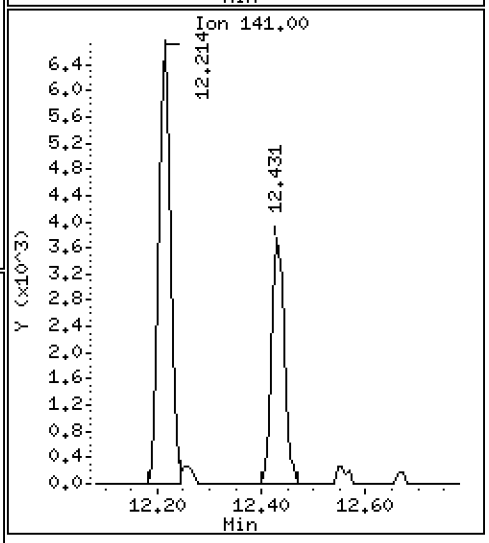












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Date : 14-AUG-2021 13:53

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-01

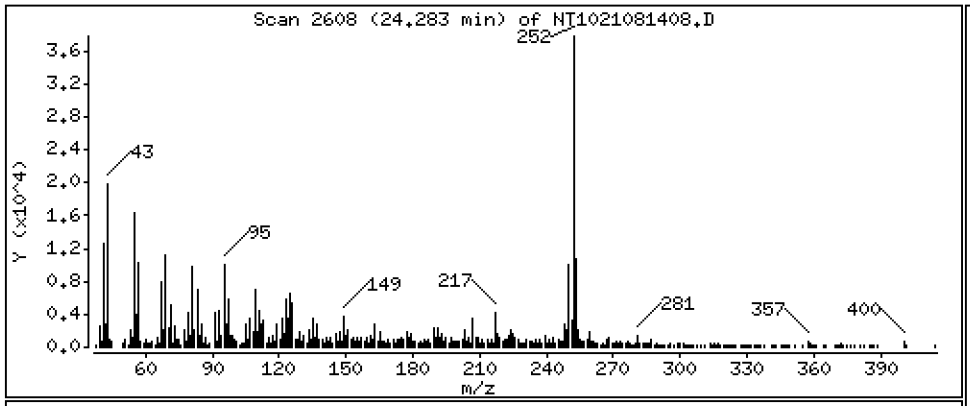
Operator: VTS

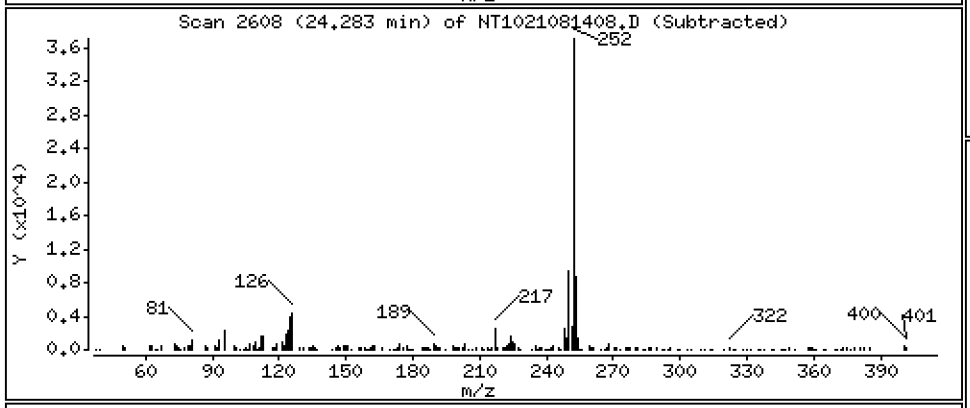
Column phase: ZB-5msi

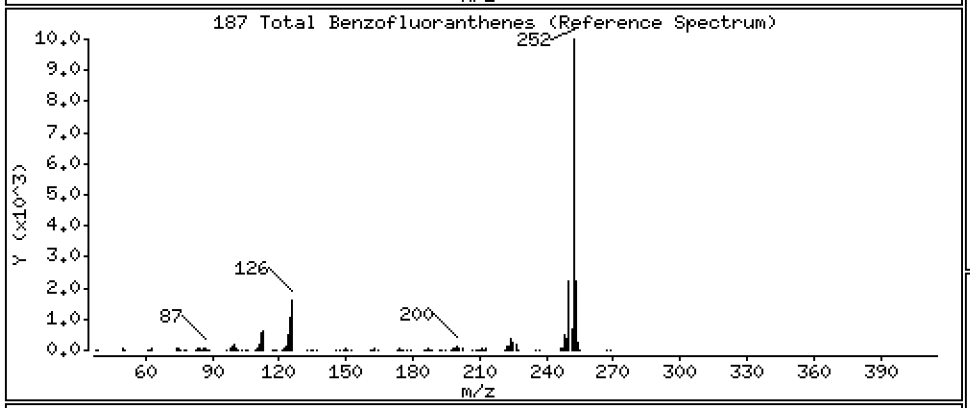
Column diameter: 0.25

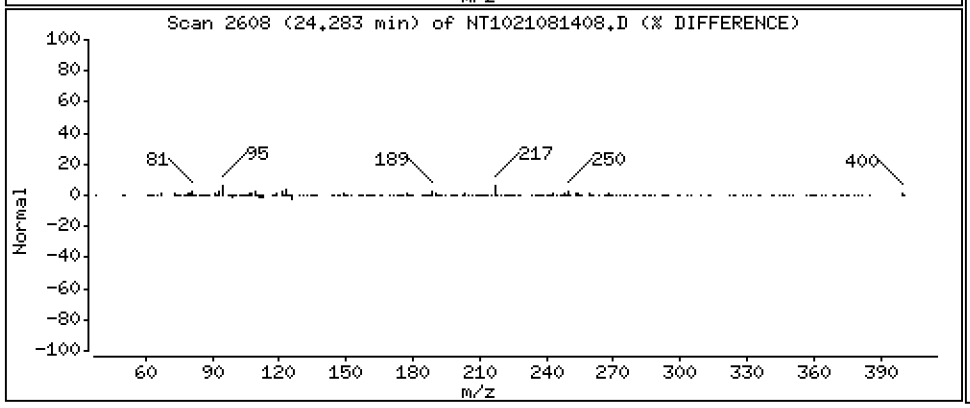
187 Total Benzofluoranthenes

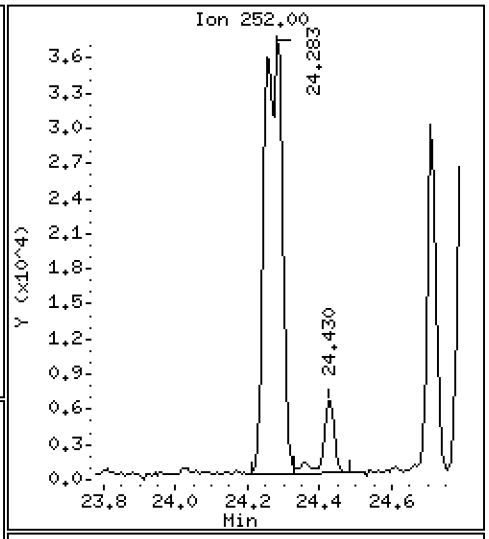
Concentration: 1.697 ug/mL

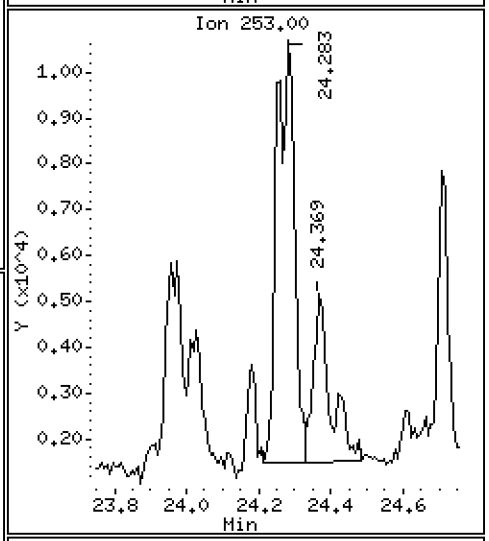


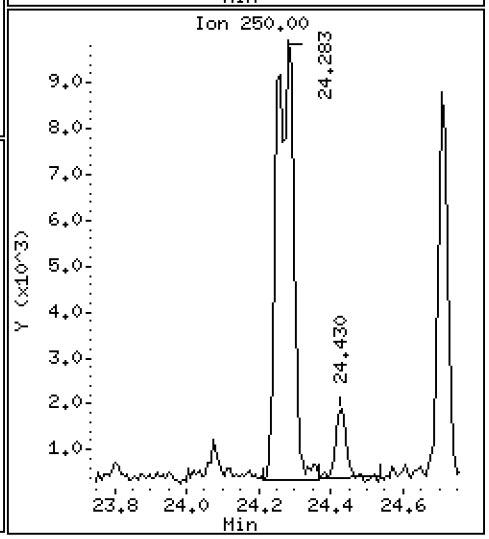












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210814.b\NT1021081408.D
Lab Smp Id: 21G0286-01
Inj Date : 14-AUG-2021 13:53
Operator : VTS Inst ID: nt10.i
Smp Info : 21G0286-01
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 8
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$ 1 2-Fluorophenol	112	6.227	6.204	(0.746)	143132	3.86659	3.867
$ 2 Phenol-d5	99	7.796	7.788	(0.933)	234982	4.27677	4.277
3 Phenol	94	7.819	7.811	(0.936)	3053	0.06357	0.06357
$ 5 2-Chlorophenol-d4	132	8.012	8.004	(0.959)	214984	5.54990	5.550
4 Bis(2-Chloroethyl)ether	93	Compound Not Detected.					
6 2-Chlorophenol	128	Compound Not Detected.					
7 1,3-Dichlorobenzene	146	Compound Not Detected.					
* 8 1,4-Dichlorobenzene-d4	152	8.353	8.353	(1.000)	94063	4.00000	
9 1,4-Dichlorobenzene	146	Compound Not Detected.					
$ 10 1,2-Dichlorobenzene-d4	152	8.702	8.702	(1.042)	81369	3.26595	3.266
12 1,2-Dichlorobenzene	146	Compound Not Detected.					
11 Benzyl alcohol	108	Compound Not Detected.					
14 2,2'-oxybis(1-Chloropropane)	121	Compound Not Detected.					
13 2-Methylphenol	108	9.168	8.896	(1.098)	16542	0.55335	0.5533
17 Hexachloroethane	117	Compound Not Detected.					
16 N-Nitroso-di-n-propylamine	70	Compound Not Detected.					
15 4-Methylphenol	108	9.168	9.160	(1.098)	17051	0.53150	0.5315
$ 18 Nitrobenzene-d5	82	9.439	9.440	(0.875)	151663	3.50031	3.500
19 Nitrobenzene	77	Compound Not Detected.					
20 Isophorone	82	Compound Not Detected.					
21 2-Nitrophenol	139	Compound Not Detected.					
22 2,4-Dimethylphenol	107	Compound Not Detected.					
23 Bis(2-Chloroethoxy)methane	93	Compound Not Detected.					
24 Benzoic acid	105	10.311	10.430	(0.956)	7773	0.41769	0.4177(M)
25 2,4-Dichlorophenol	162	Compound Not Detected.					
26 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
* 27 Naphthalene-d8	136	10.791	10.791	(1.000)	353267	4.00000	
28 Naphthalene	128	10.829	10.837	(1.004)	20897	0.22351	0.2235
29 4-Chloroaniline	127	Compound Not Detected.					
30 Hexachlorobutadiene	225	Compound Not Detected.					
31 4-Chloro-3-methylphenol	107	Compound Not Detected.					
32 2-Methylnaphthalene	142	12.214	12.214	(1.132)	11935	0.13797	0.1380
33 Hexachlorocyclopentadiene	237	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	Compound Not Detected.					
	35 2,4,5-Trichlorophenol	196	Compound Not Detected.					
$	36 2-Fluorobiphenyl	172	13.003	13.003	(0.905)	335513	3.83256	3.833
	37 2-Chloronaphthalene	162	Compound Not Detected.					
	38 2-Nitroaniline	65	Compound Not Detected.					
	39 Dimethylphthalate	163	Compound Not Detected.					
	40 Acenaphthylene	152	14.048	14.048	(0.978)	11208	0.10775	0.1077
	41 2,6-Dinitrotoluene	165	Compound Not Detected.					
*	42 Acenaphthene-d10	164	14.365	14.358	(1.000)	190634	4.00000	
	43 3-Nitroaniline	138	Compound Not Detected.					
	44 Acenaphthene	153	14.427	14.427	(1.004)	12734	0.21086	0.2109
	45 2,4-Dinitrophenol	184	Compound Not Detected.					
	46 Dibenzofuran	168	14.752	14.752	(1.027)	14367	0.15387	0.1539
	47 4-Nitrophenol	109	Compound Not Detected.					
	48 2,4-Dinitrotoluene	165	Compound Not Detected.					
	50 Diethylphthalate	149	15.363	15.363	(1.069)	11344	0.16912	0.1691
	49 Fluorene	166	15.455	15.456	(1.076)	22986	0.25394	0.2539
	51 4-Chlorophenyl-phenylether	204	Compound Not Detected.					
	52 4-Nitroaniline	138	Compound Not Detected.					
	53 4,6-Dinitro-2-methylphenol	198	Compound Not Detected.					
	54 N-Nitrosodiphenylamine	169	Compound Not Detected.					
$	55 2,4,6-Tribromophenol	330	15.995	15.996	(1.113)	120632	7.58151	7.582
	56 4-Bromophenyl-phenylether	248	Compound Not Detected.					
	57 Hexachlorobenzene	284	Compound Not Detected.					
	58 Pentachlorophenol	266	Compound Not Detected.					
*	59 Phenanthrene-d10	188	17.371	17.364	(1.000)	344539	4.00000	
	60 Phenanthrene	178	17.418	17.418	(1.003)	165414	1.77535	1.775
	61 Anthracene	178	17.510	17.503	(1.008)	35551	0.35681	0.3568
	62 Carbazole	167	17.859	17.859	(1.028)	12288	0.12493	0.1249
	63 Di-n-butylphthalate	149	18.717	18.710	(1.077)	3148	0.02105	0.02105
	64 Fluoranthene	202	19.847	19.839	(0.882)	386489	4.40715	4.407
	65 Pyrene	202	20.272	20.265	(0.901)	340096	3.51814	3.518
$	66 Terphenyl-d14	244	20.598	20.590	(0.915)	305012	4.42692	4.427
	67 Butylbenzylphthalate	149	Compound Not Detected.					
	68 Benzo(a)anthracene	228	22.471	22.464	(0.999)	84570	1.07694	1.077
*	69 Chrysene-d12	240	22.502	22.495	(1.000)	210440	4.00000	
	70 3,3'-Dichlorobenzidine	252	Compound Not Detected.					
	71 Chrysene	228	22.541	22.541	(1.002)	80848	1.33538	1.335
	72 bis(2-Ethylhexyl)phthalate	149	22.626	22.619	(0.958)	5621	0.16132	0.1613
*	134 Di-n-octylphthalate-d4	153	23.617	23.610	(1.000)	316721	4.00000	
	73 Di-n-octylphthalate	149	Compound Not Detected.					
	74 Benzo(b)fluoranthene	252	24.252	24.252	(0.974)	79041	0.99685	0.9968
	75 Benzo(k)fluoranthene	252	24.283	24.283	(0.975)	63055	0.80282	0.8028
	76 Benzo(a)pyrene	252	24.794	24.786	(0.996)	69713	0.97282	0.9728
*	77 Perylene-d12	264	24.895	24.887	(1.000)	201217	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.064	27.057	(1.087)	44364	0.54701	0.5470
	79 Dibenzo(a,h)anthracene	278	27.080	27.072	(1.088)	13716	0.21531	0.2153
	80 Benzo(g,h,i)perylene	276	27.709	27.686	(1.113)	49132	0.67886	0.6789
	90 N-Nitrosodimethylamine	74	Compound Not Detected.					
	91 Aniline	93	Compound Not Detected.					
	93 Benzidine	184	Compound Not Detected.					
	103 Pyridine	79	Compound Not Detected.					
	105 1-methylnaphthalene	142	12.430	12.431	(1.152)	6451	0.07948	0.07948
	111 Azobenzene (1,2-DP-Hydrazine)	77	Compound Not Detected.					

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	CONCENTRATIONS FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.283	24.283	(0.975)	129218	1.69706	1.697
120 2,3,4,6-Tetrachlorophenol	232	Compound Not Detected.					

QC Flag Legend

M - Compound response manually integrated.

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081408.D
Lab Smp Id: 21G0286-01
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	94063	10.59
27 Naphthalene-d8	291658	145829	583316	353267	21.12
42 Acenaphthene-d10	163642	81821	327284	190634	16.49
59 Phenanthrene-d10	304099	152050	608198	344539	13.30
69 Chrysene-d12	199453	99727	398906	210440	5.51
134 Di-n-octylphthala	303639	151820	607278	316721	4.31
77 Perylene-d12	200082	100041	400164	201217	0.57

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.35	-0.00
27 Naphthalene-d8	10.79	10.29	11.29	10.79	-0.00
42 Acenaphthene-d10	14.36	13.86	14.86	14.37	0.05
59 Phenanthrene-d10	17.36	16.86	17.86	17.37	0.04
69 Chrysene-d12	22.50	22.00	23.00	22.50	0.03
134 Di-n-octylphthala	23.61	23.11	24.11	23.62	0.03
77 Perylene-d12	24.89	24.39	25.39	24.90	0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081408.D

Lab ID: 21G0286-01
nt10.i, ABN.m, 14-AUG-2021 13:53

RT	CO-ELUTION COMPOUNDS
9.168	4-Methylphenol and 2-Methylphenol

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
1.098	1.065	0.0325	2-Methylphenol
0.956	0.967	-0.0110	Benzoic acid

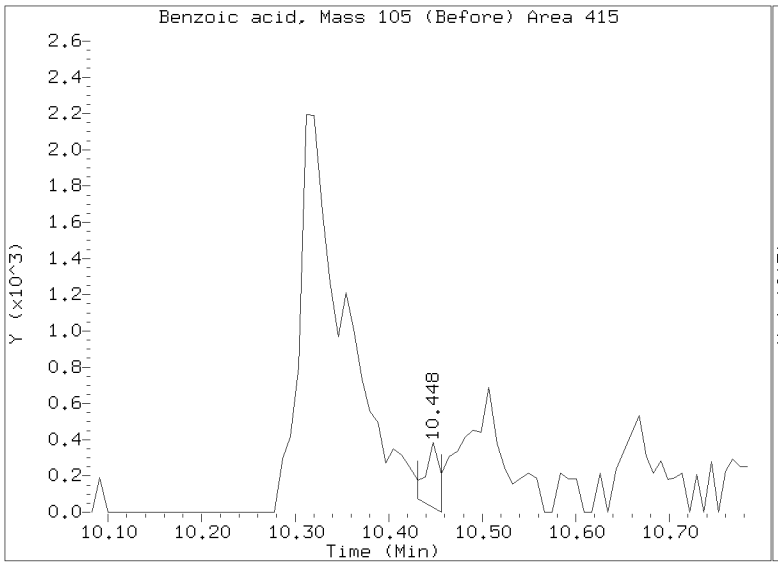
RRT check based on Ccal File: NT1021081402.D

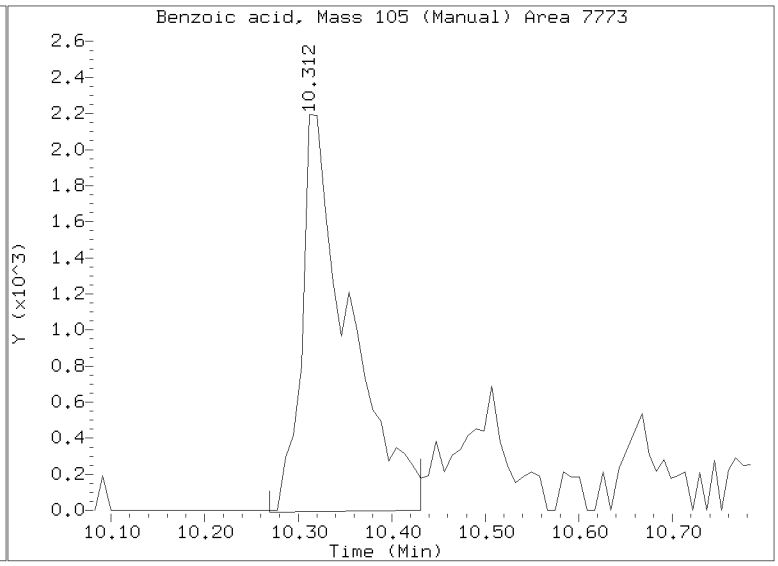
On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Quant Ion Manual Peak Adjustment Report

Datafile: //target/share/chem3/nt10.i/20210814.b/NT1021081408.D
Injection Date: 14-AUG-2021 13:53
Lab ID:21G0286-01 Client ID:
Report Date: 08/16/2021 09:24





Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS625

Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8270E
Semivolatiles (20ug/kg - 0.2ug/L SepF)

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-02 B	SDG:	21G0286
Sampled:	07/22/21 07:50	Prepared:	08/02/21 11:20	File ID:	NT1021081409.D
% Solids:	76.11	Preparation:	EPA 3546 (Microwave)	Analyzed:	08/14/21 14:32
Batch:	BJH0004	Sequence:	SJH0174	Initial/Final:	13.17 g Wet / 1 mL
Instrument:	NT10	Column:	ZB-5MSi	Calibration:	EG00057
Cleanups:	GPC				

CAS NO.	COMPOUND	DILUTION	CONC: (ug/kg dry)	Q	DL	RL
85-68-7	Butylbenzylphthalate	1	43.7		9.4	20.0

SURROGATES	ADDED: (ug/kg dry)	FOUND: (ug/kg dry)	% REC	QC LIMITS	Q
p-Terphenyl-d14	498.82	438	87.8	37 - 120	

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081409.D

Date : 14-AUG-2021 14:32

Client ID:

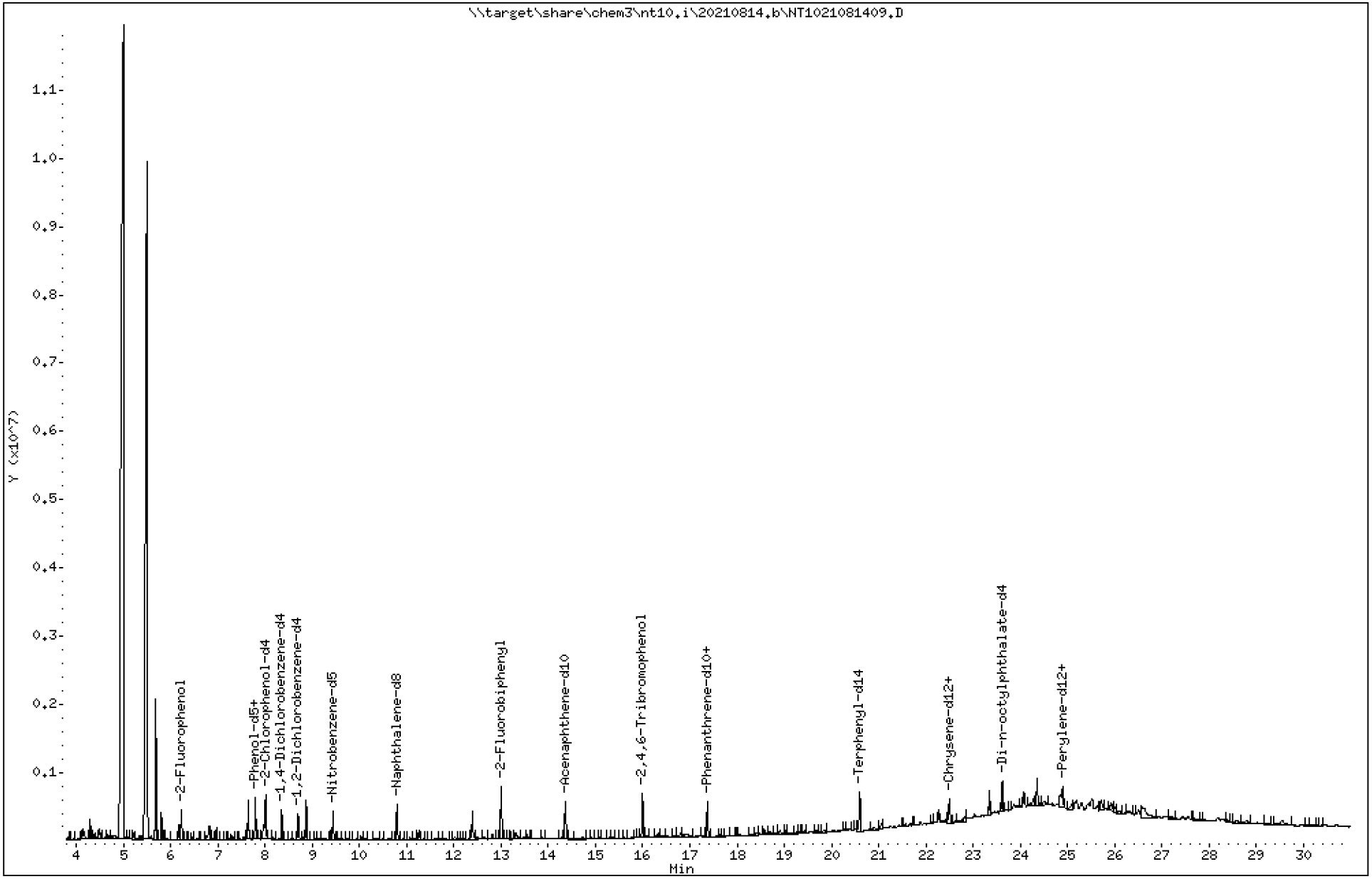
Instrument: nt10.i

Sample Info: 21G0286-02

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

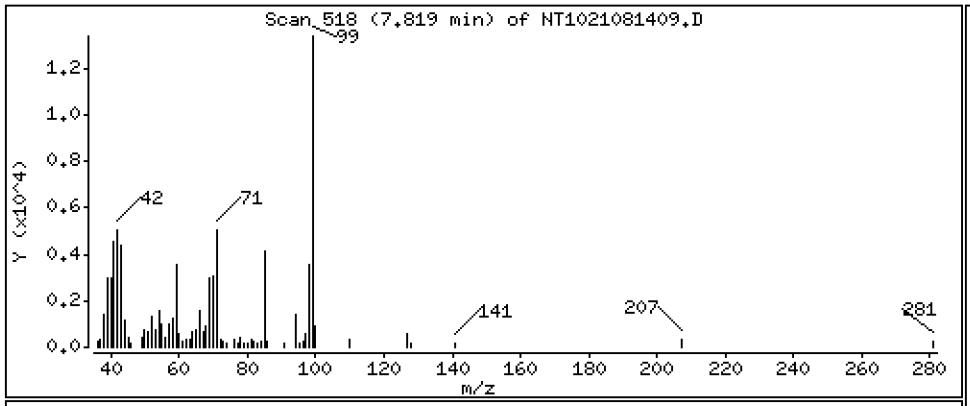
Operator: VTS

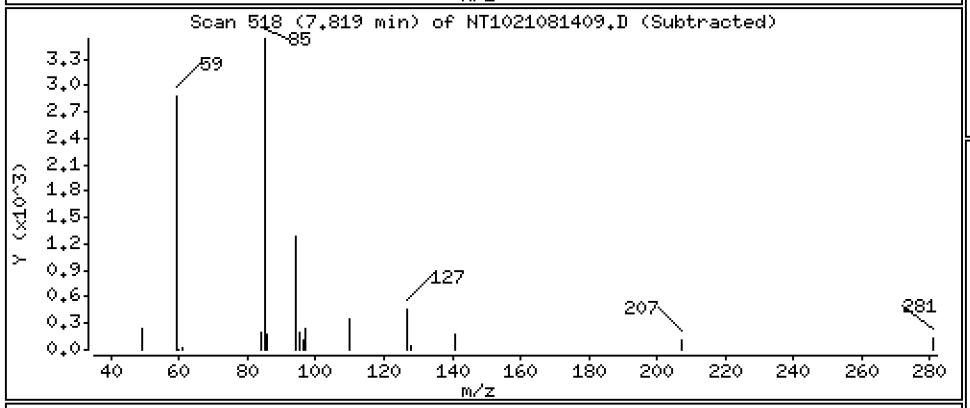
Column phase: ZB-5msi

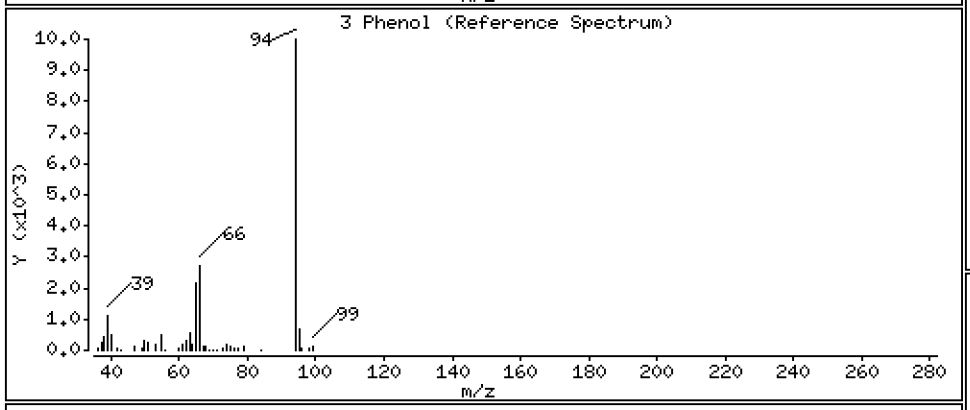
Column diameter: 0.25

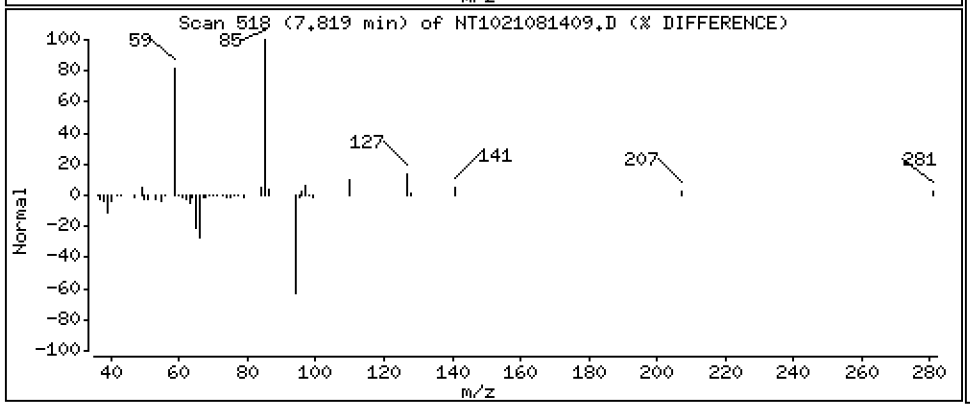
3 Phenol

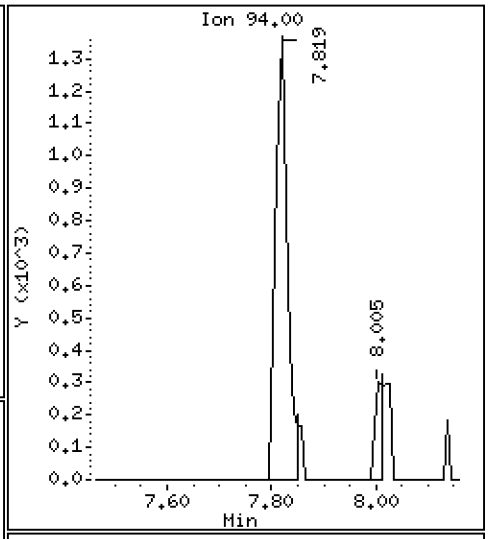
Concentration: 0.04236 ug/mL

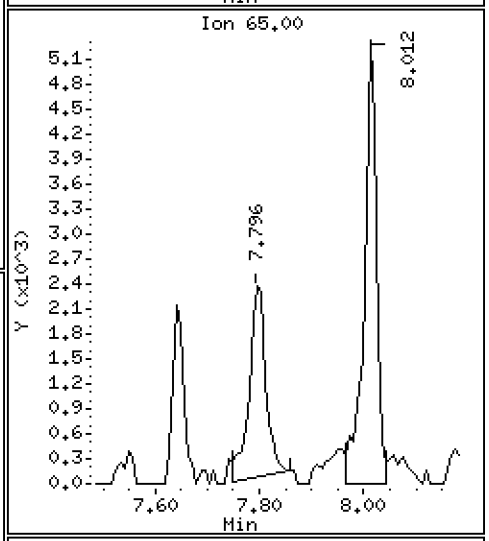


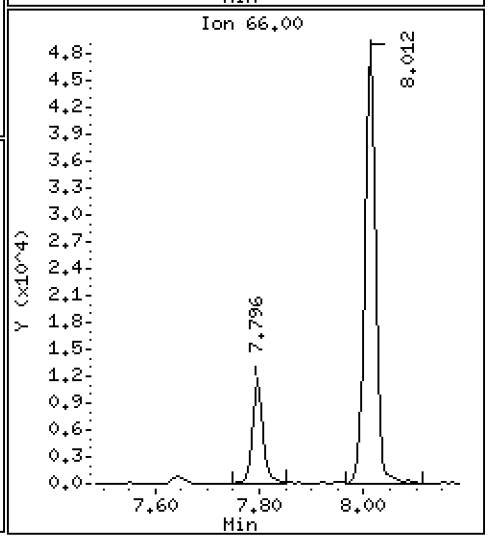












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

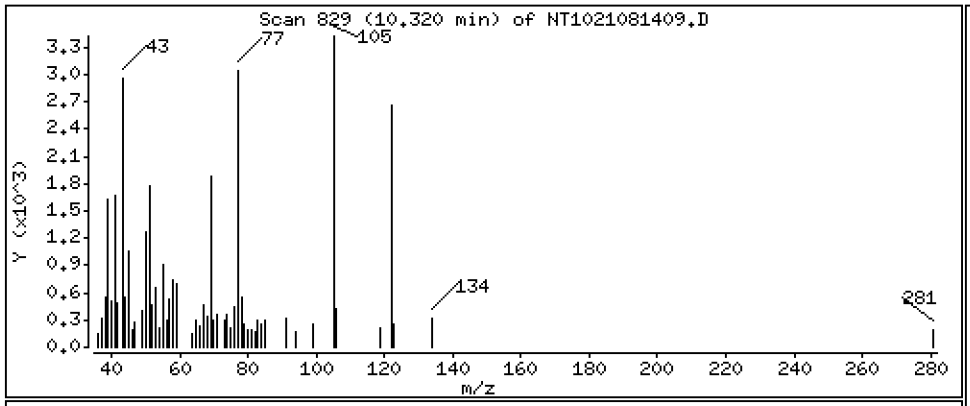
Operator: VTS

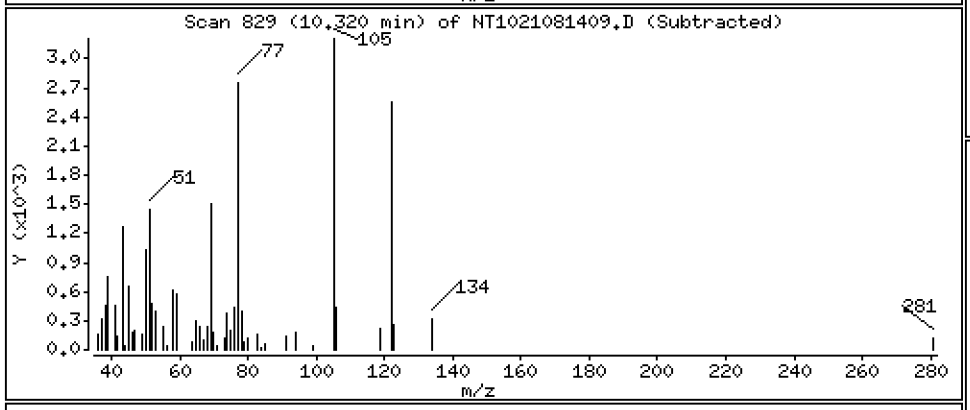
Column phase: ZB-5msi

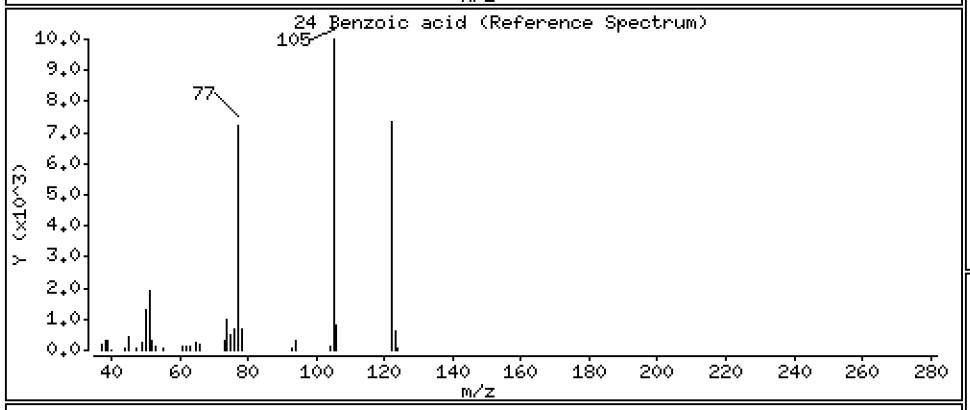
Column diameter: 0.25

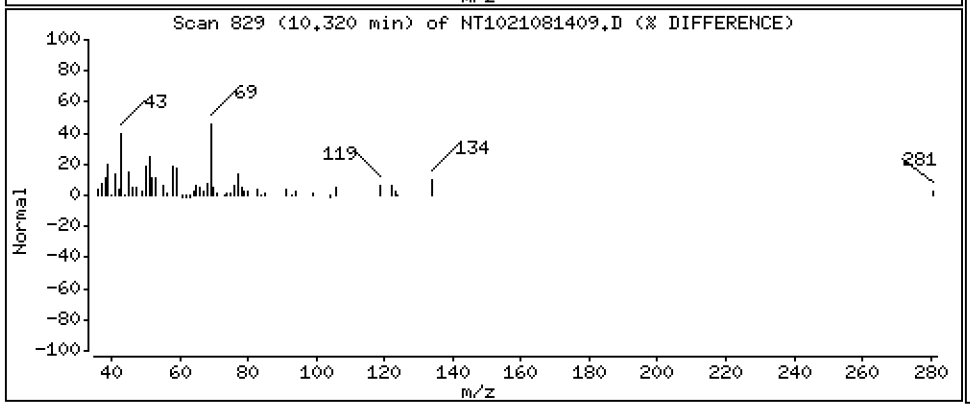
24 Benzoic acid

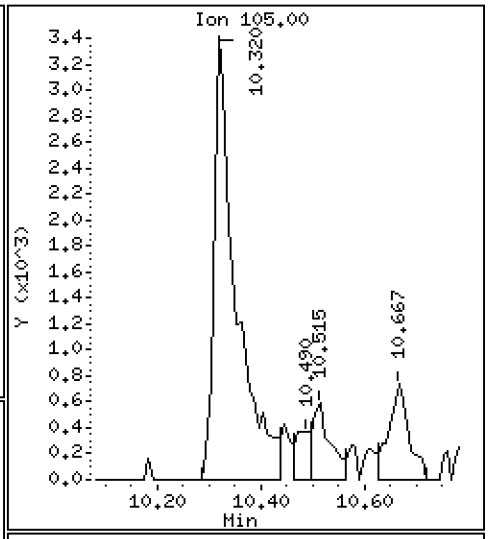
Concentration: 0.5376 ug/mL

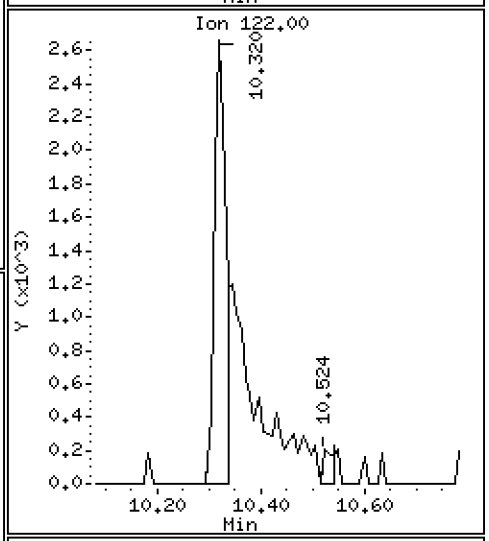


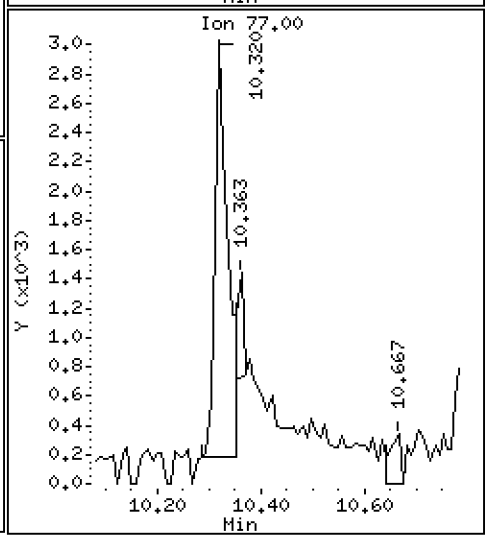












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

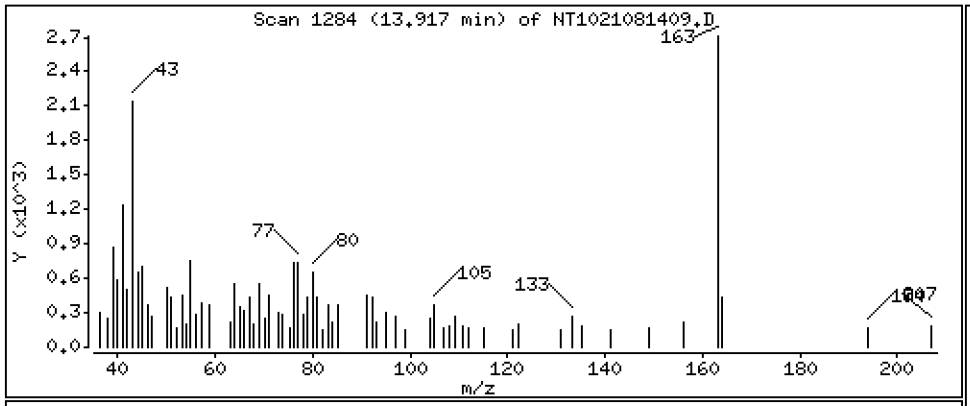
Operator: VTS

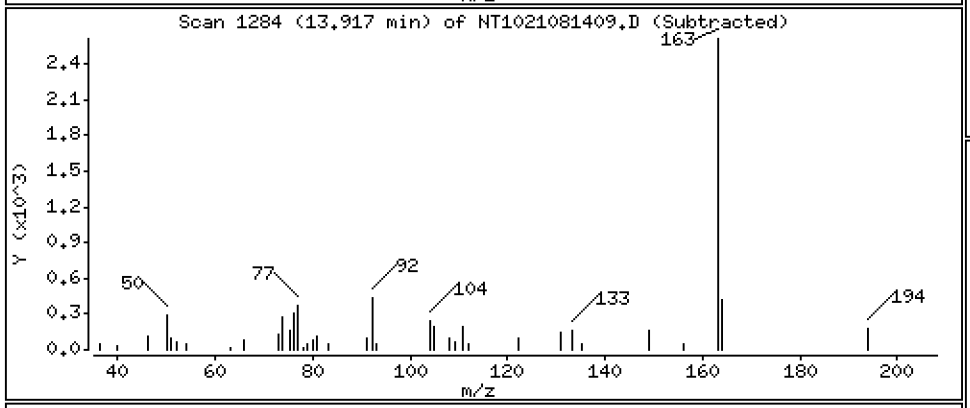
Column phase: ZB-5msi

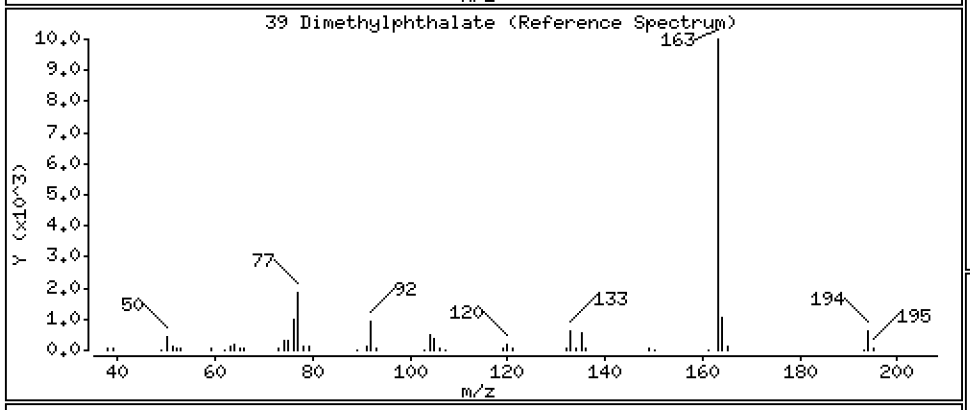
Column diameter: 0.25

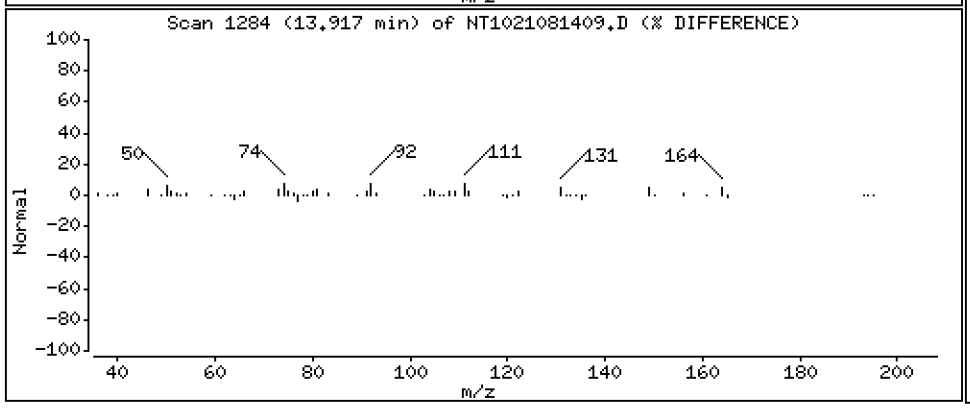
39 Dimethylphthalate

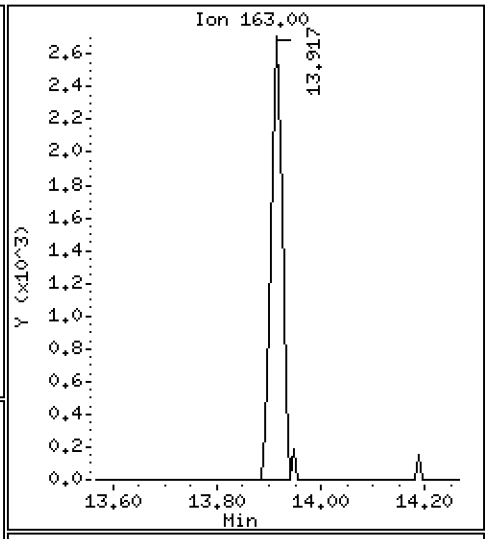
Concentration: 0.05300 ug/mL

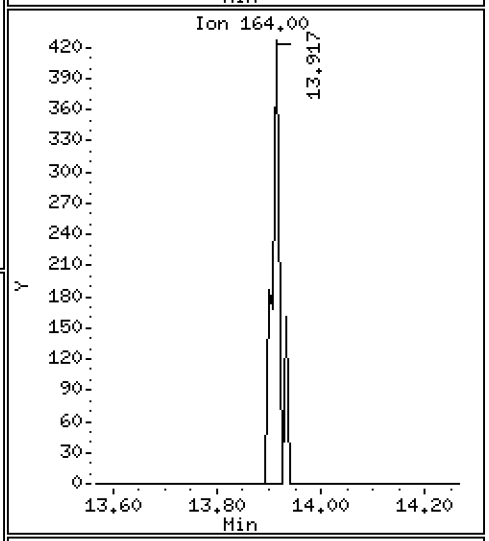


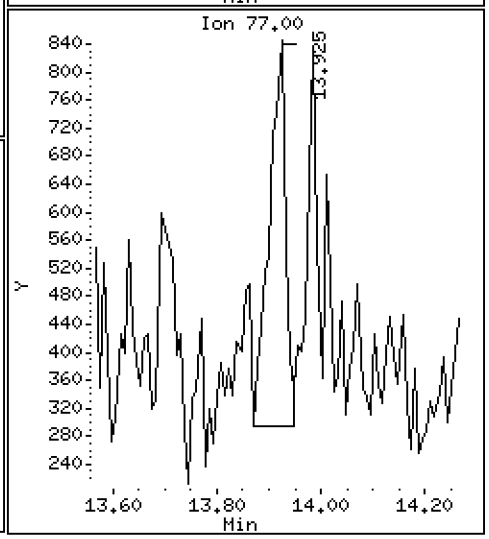












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

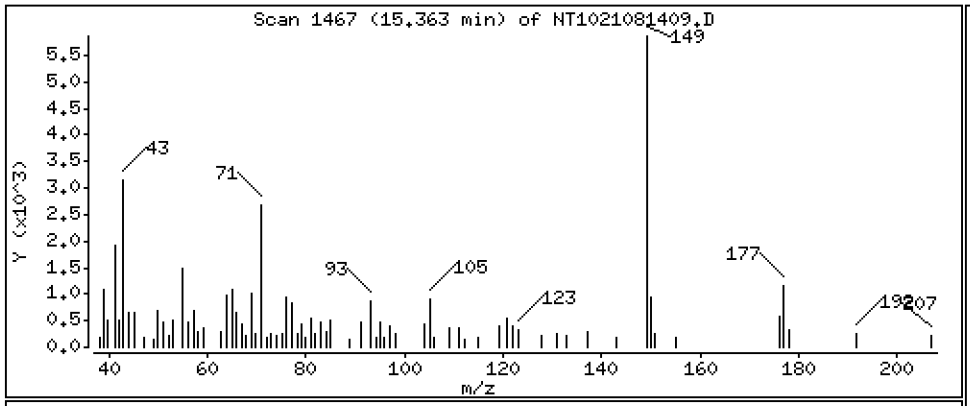
Operator: VTS

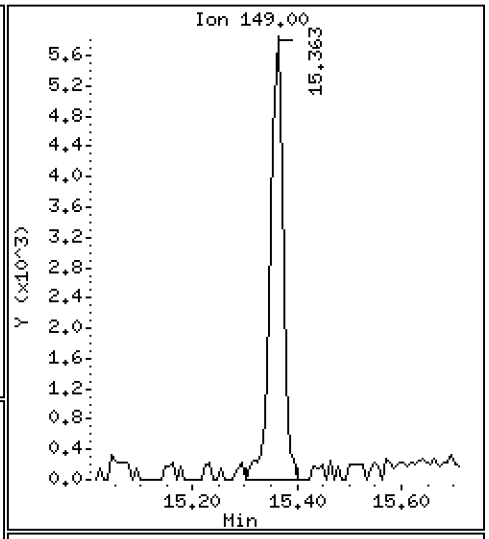
Column phase: ZB-5msi

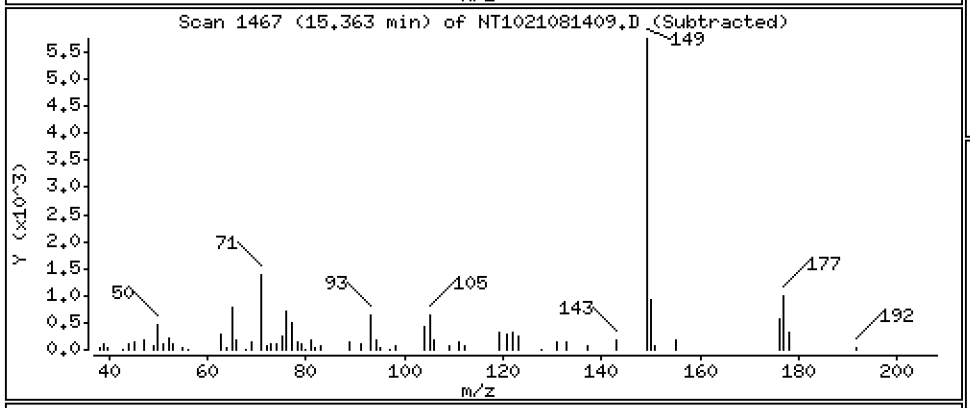
Column diameter: 0.25

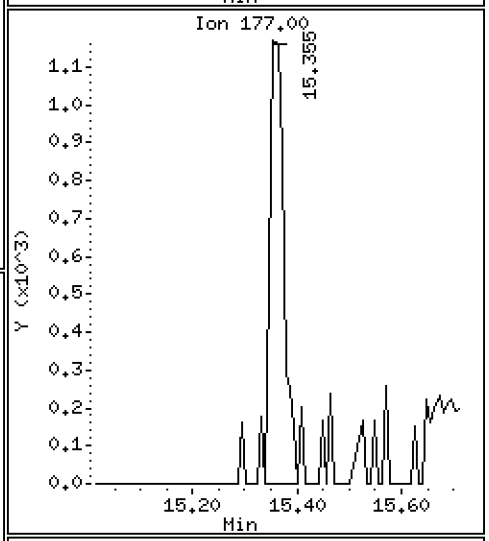
50 Diethylphthalate

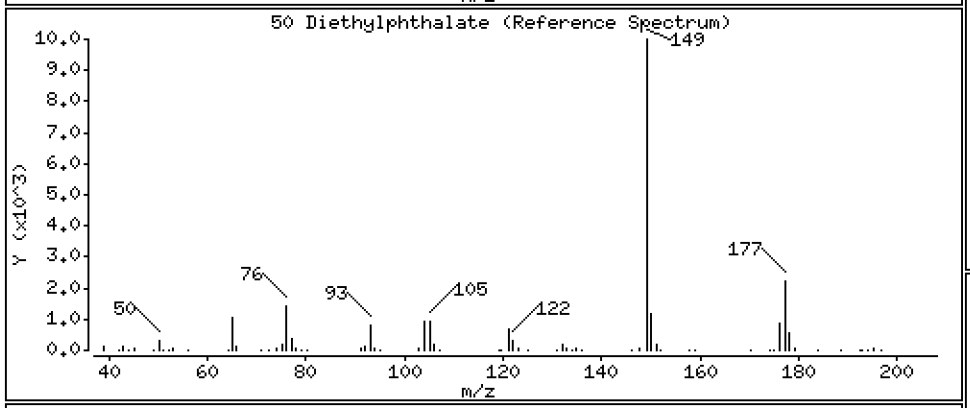
Concentration: 0.1396 ug/mL

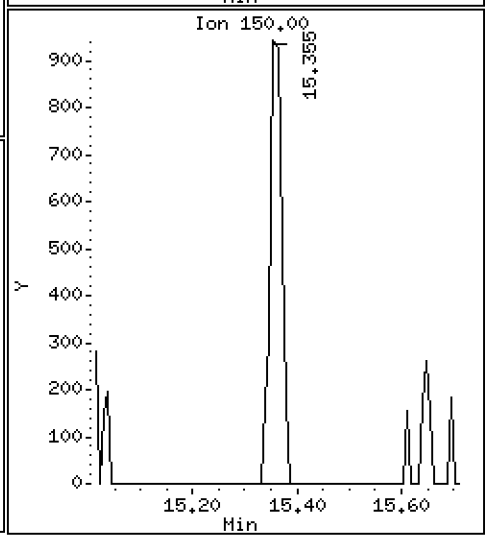


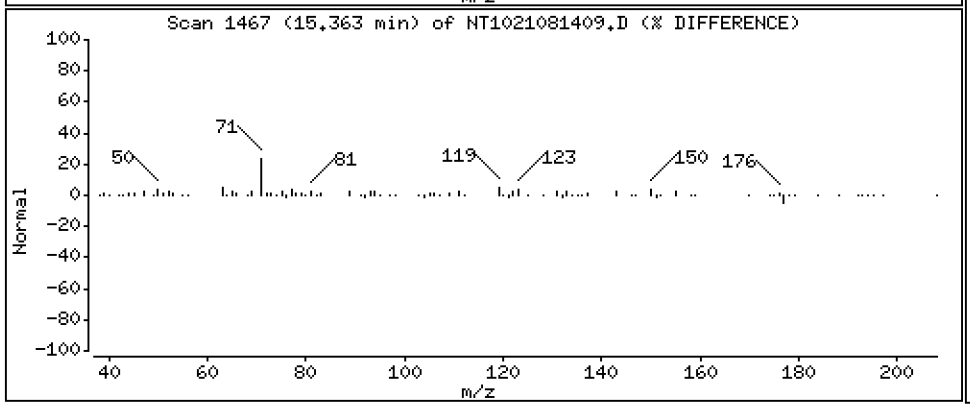












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

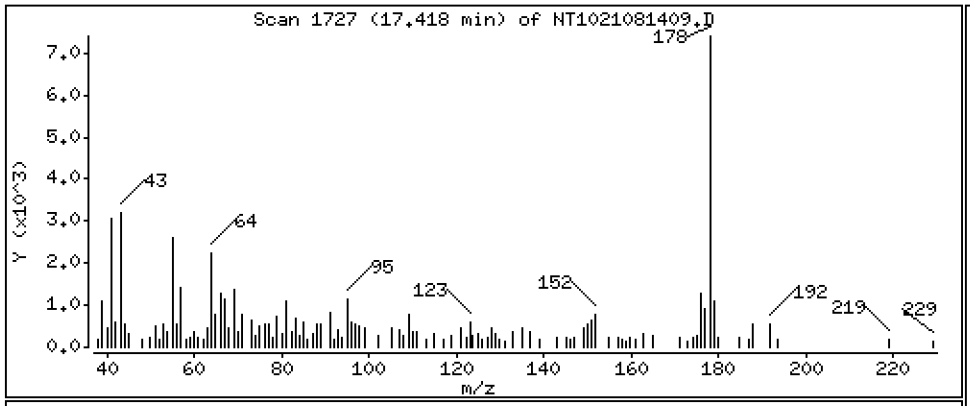
Operator: VTS

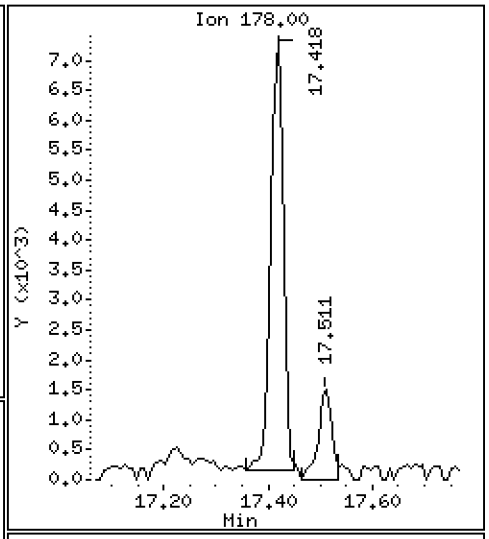
Column phase: ZB-5msi

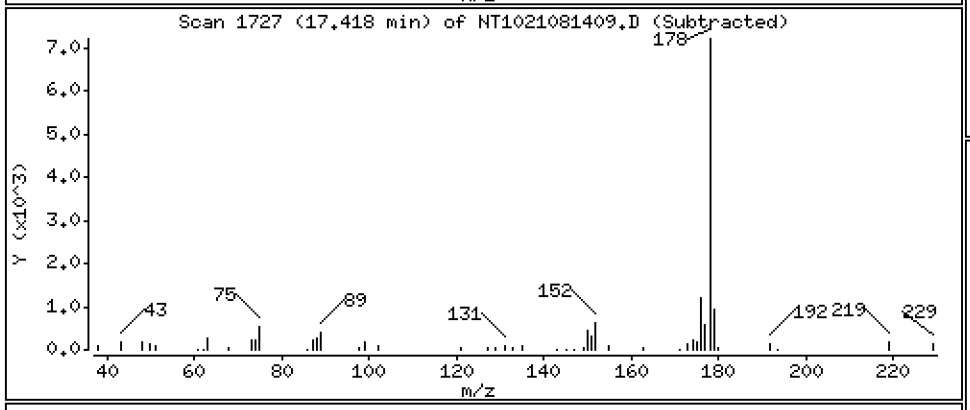
Column diameter: 0.25

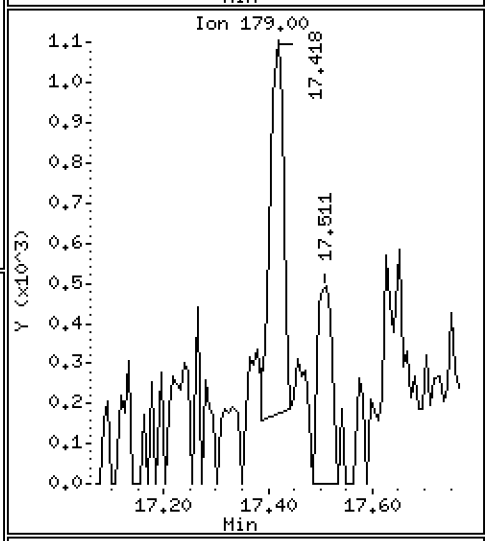
60 Phenanthrene

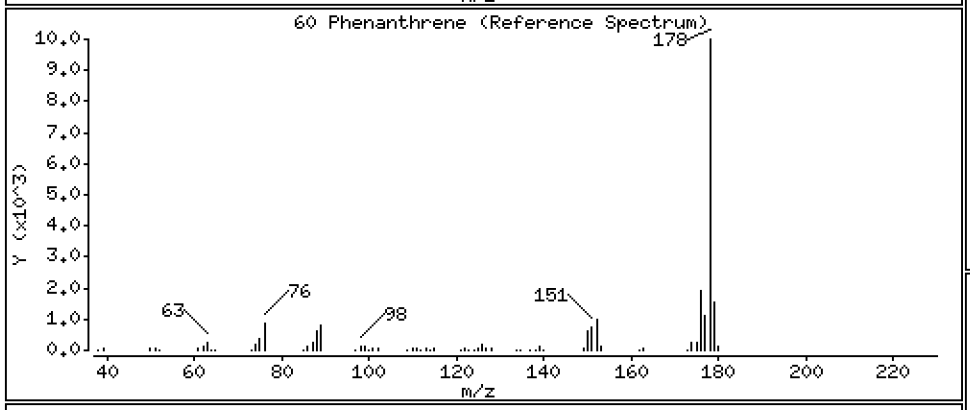
Concentration: 0.1274 ug/mL

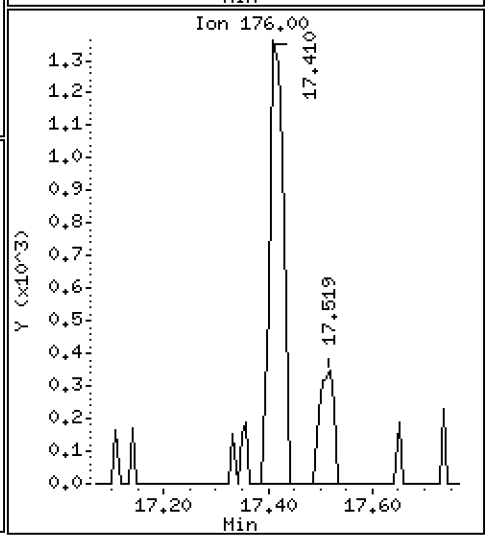


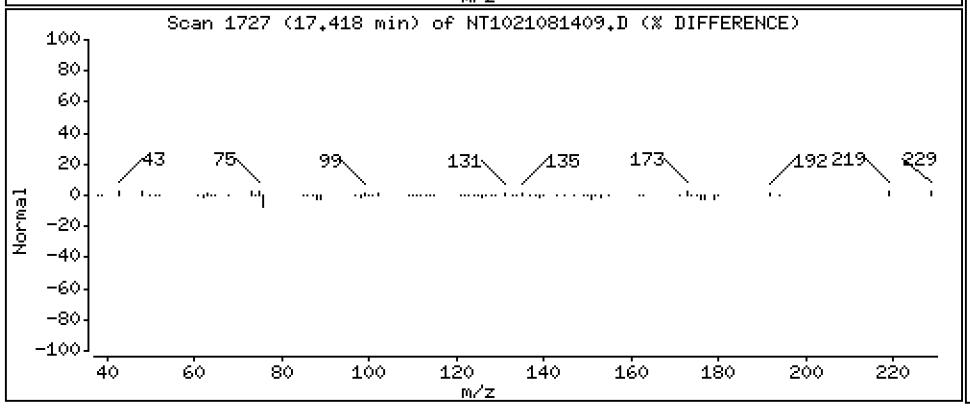












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

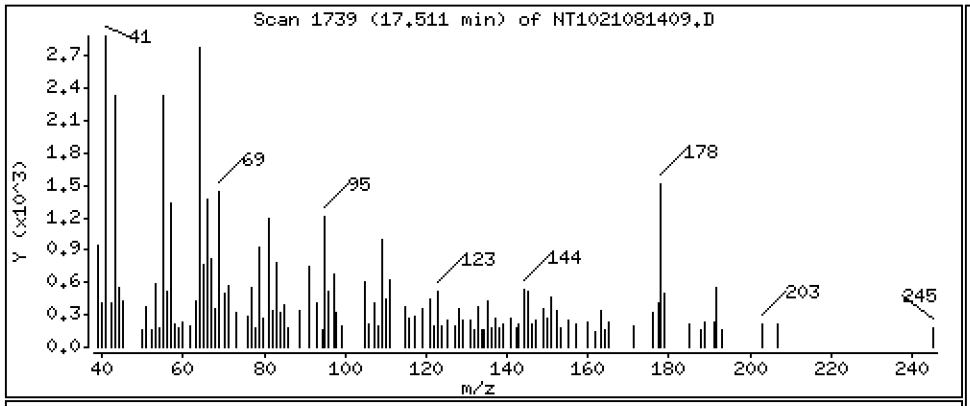
Operator: VTS

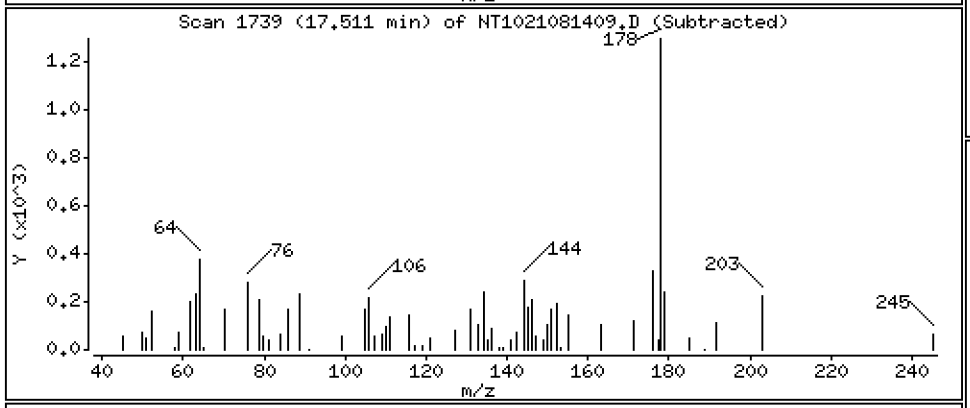
Column phase: ZB-5msi

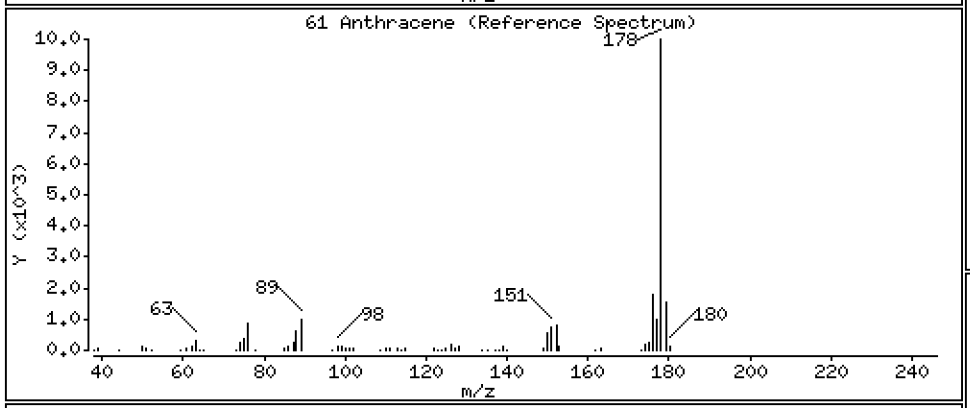
Column diameter: 0.25

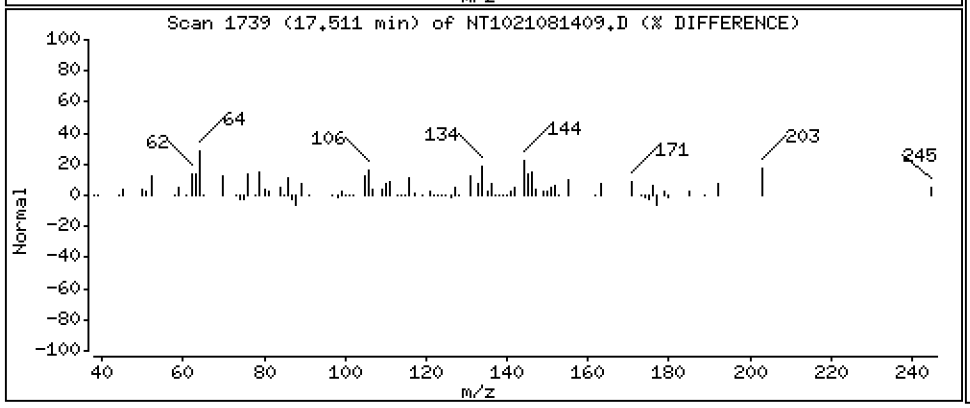
61 Anthracene

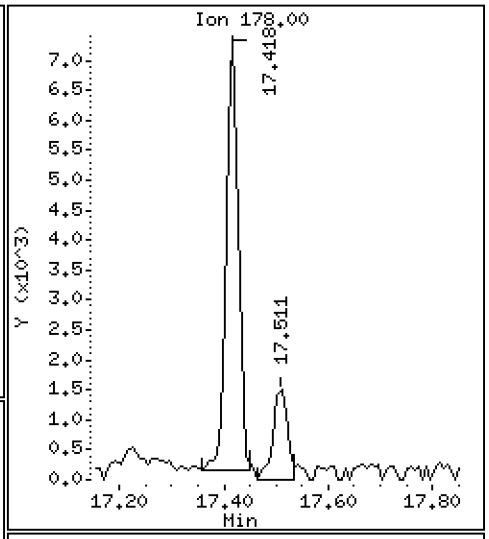
Concentration: 0.02941 ug/mL

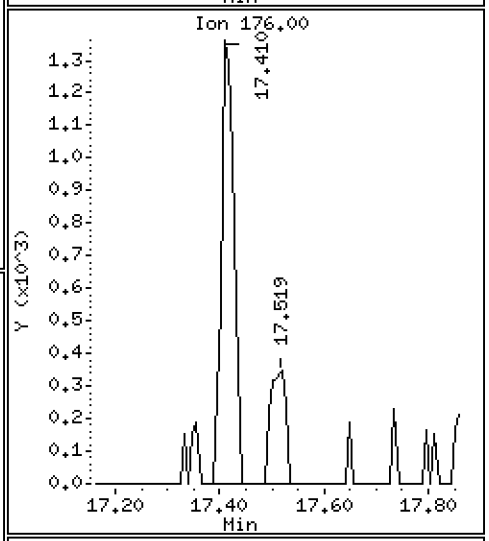


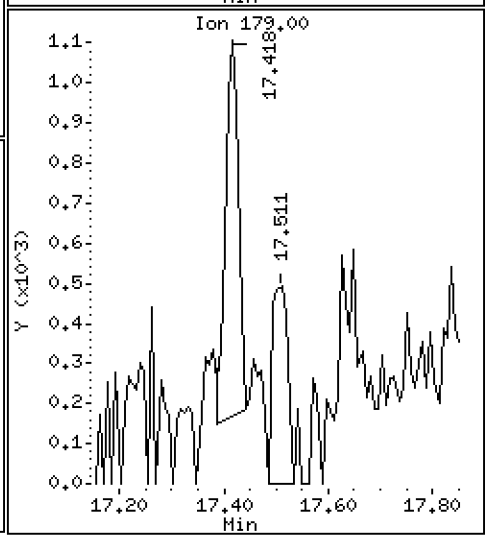












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

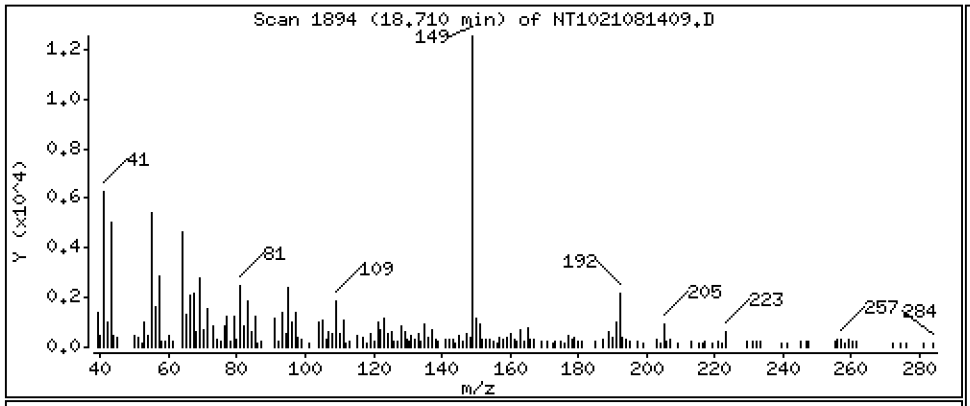
Operator: VTS

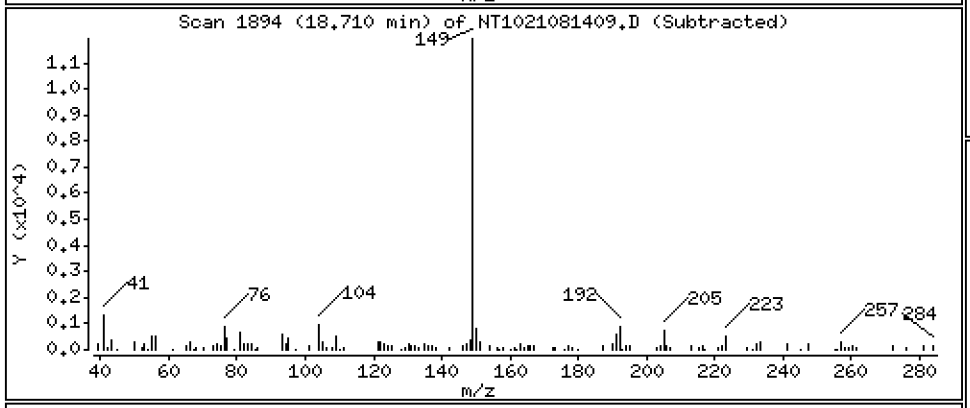
Column phase: ZB-5msi

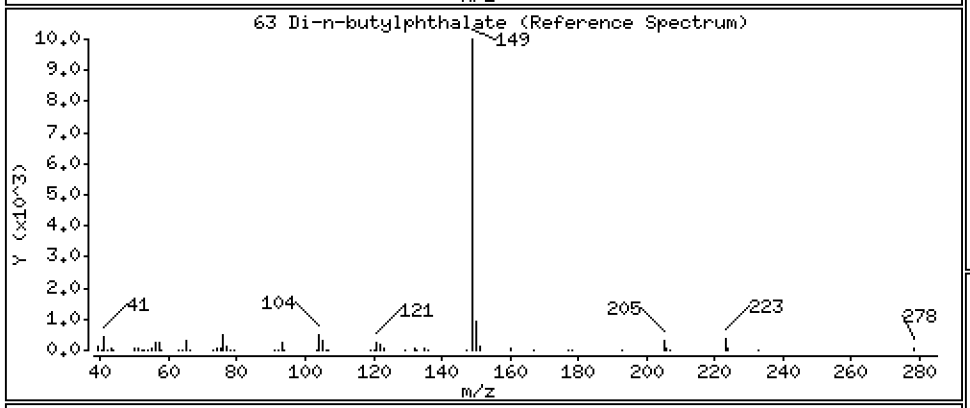
Column diameter: 0.25

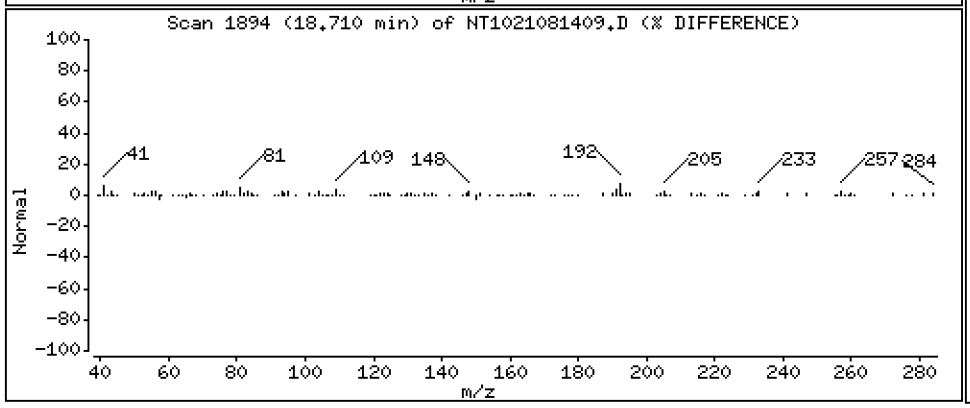
63 Di-n-butylphthalate

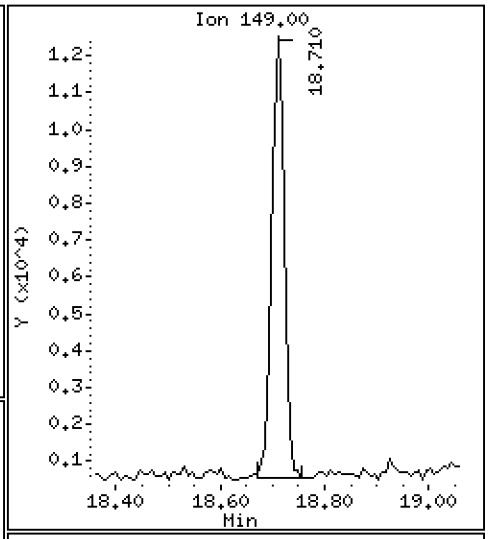
Concentration: 0.1307 ug/mL

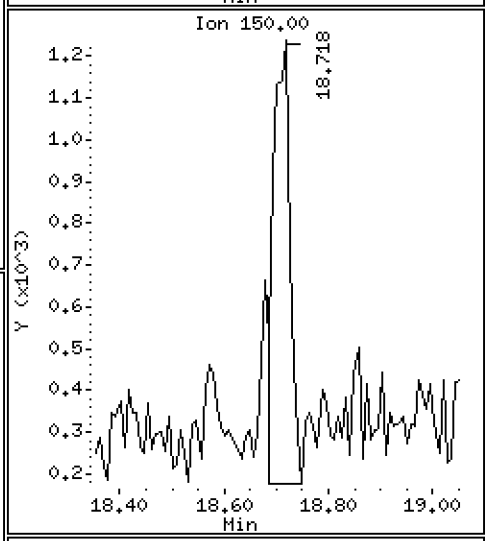


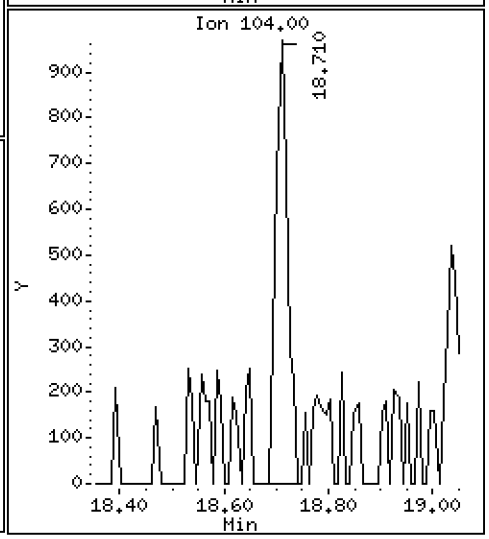












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

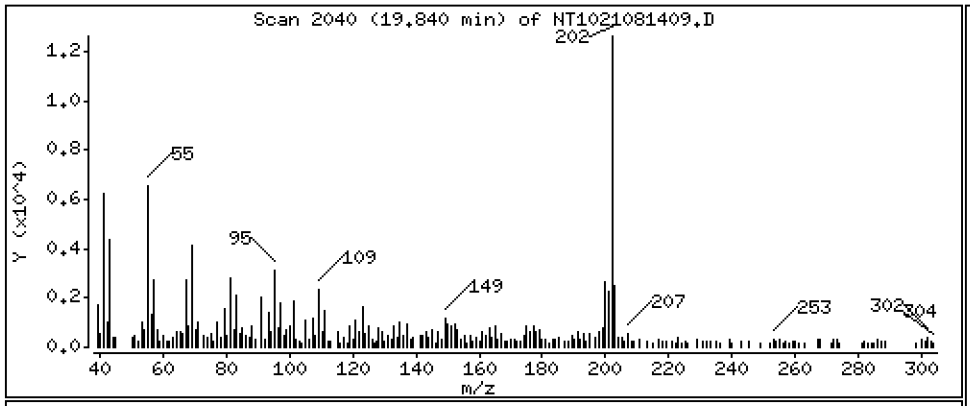
Operator: VTS

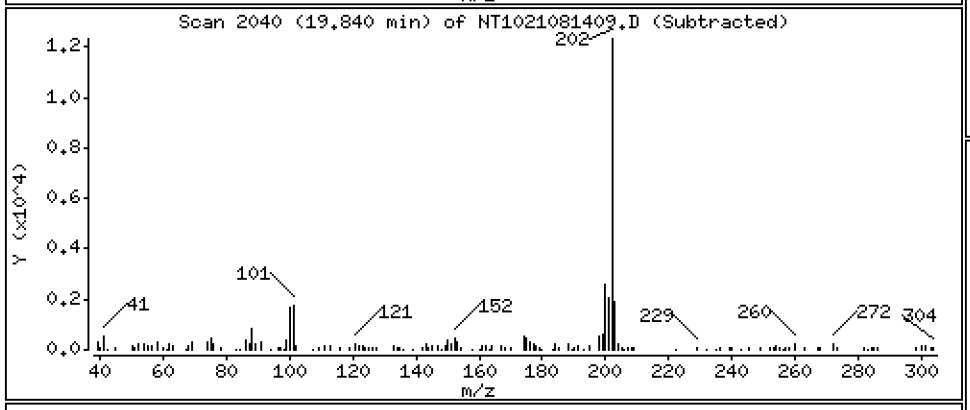
Column phase: ZB-5msi

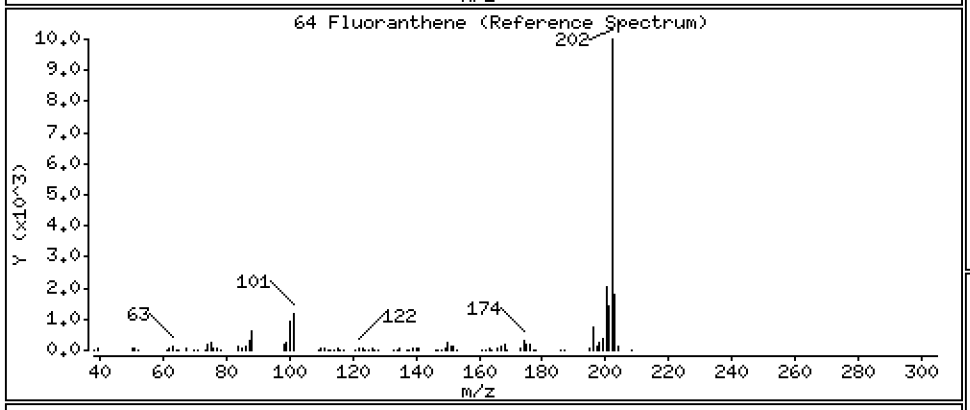
Column diameter: 0.25

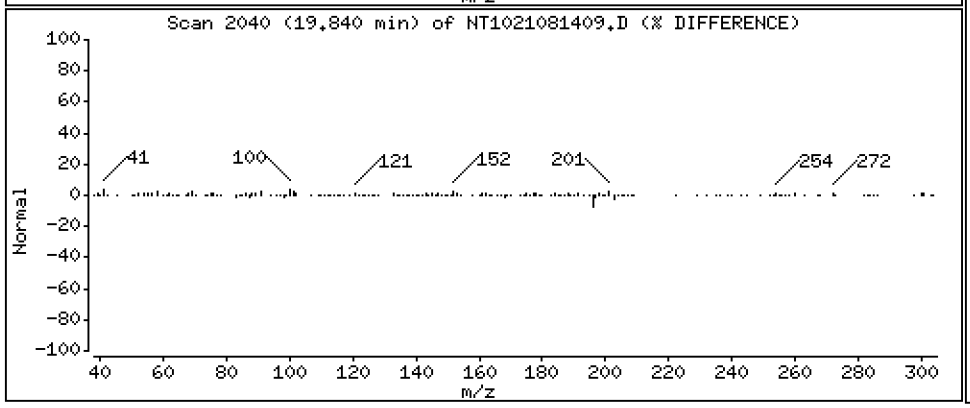
64 Fluoranthene

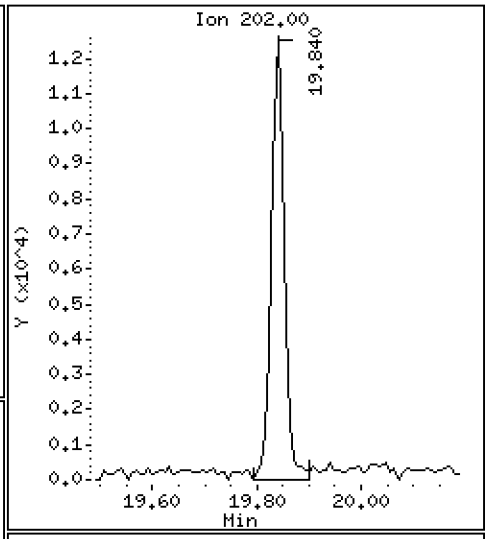
Concentration: 0.2401 ug/mL

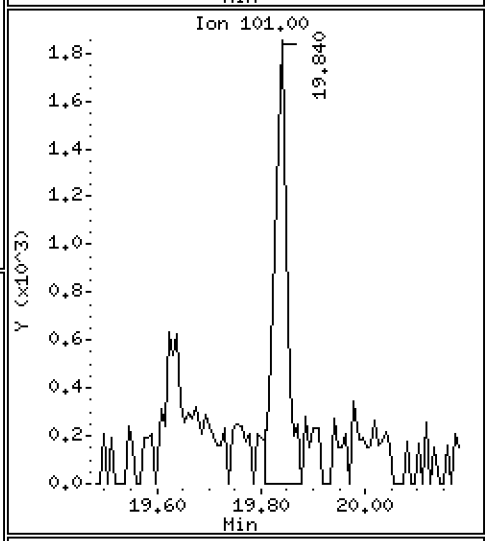


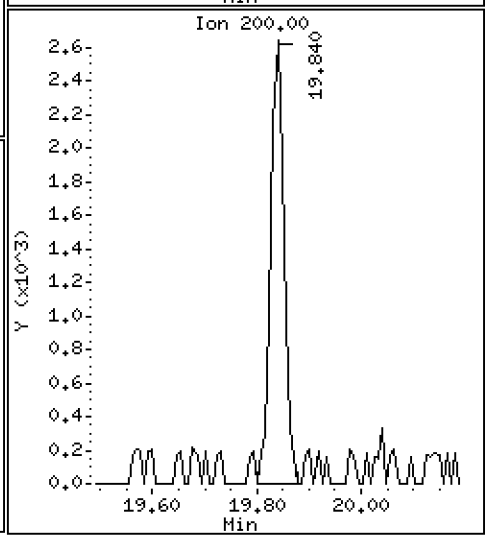












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081409.D

Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

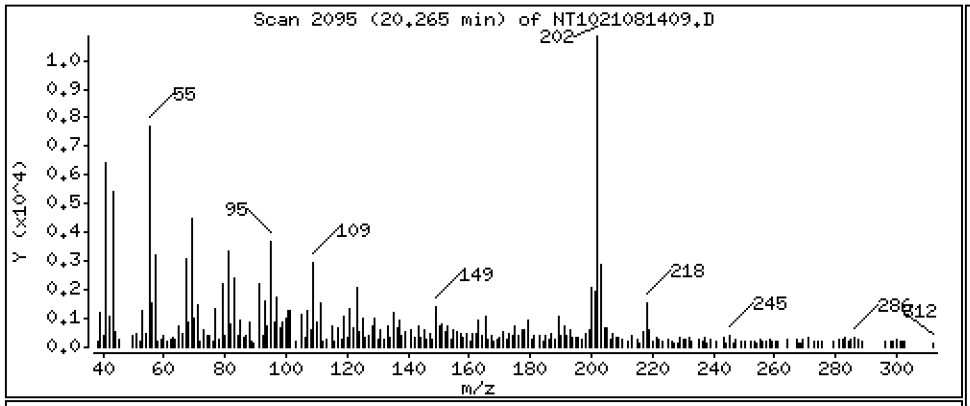
Operator: VTS

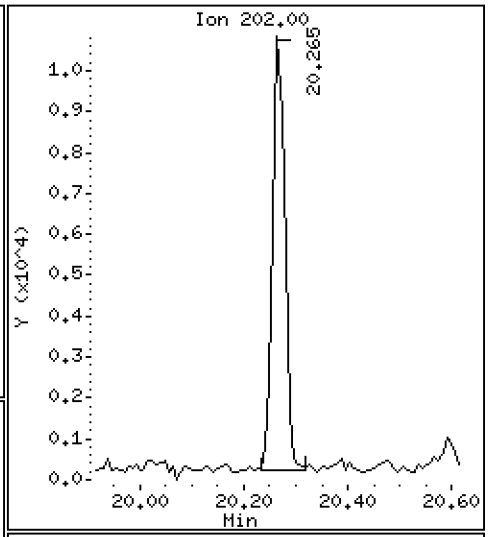
Column phase: ZB-5msi

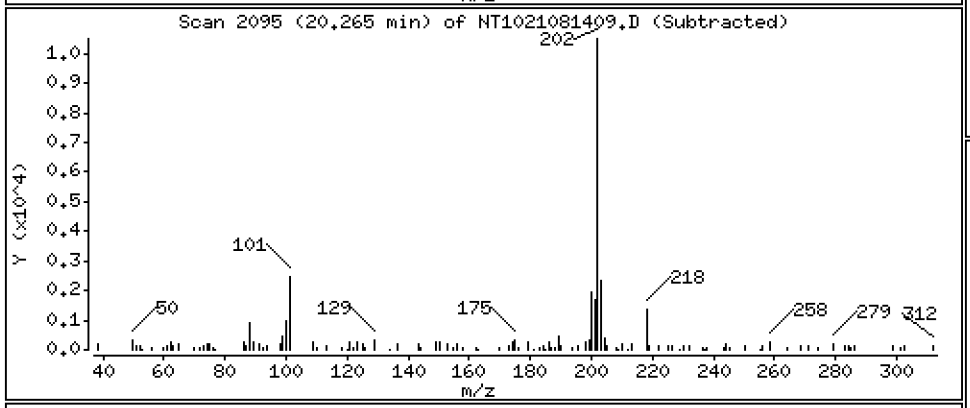
Column diameter: 0.25

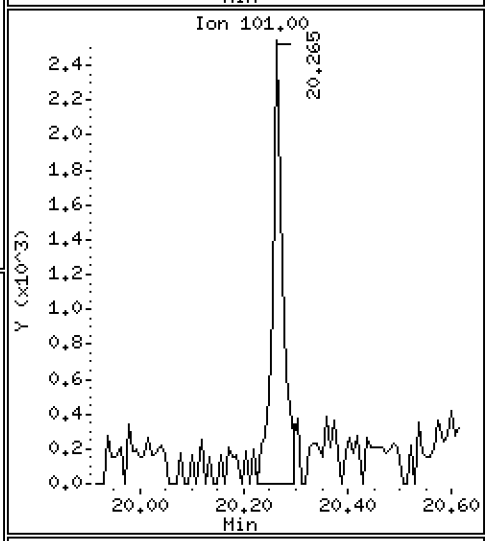
65 Pyrene

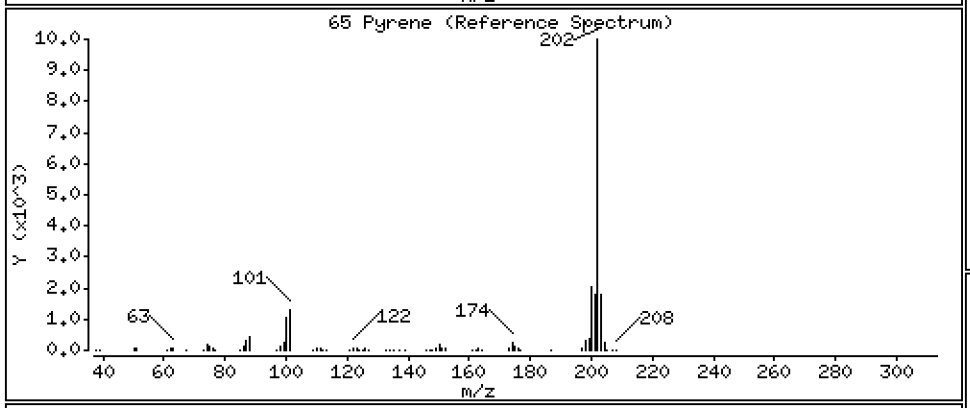
Concentration: 0.1737 ug/mL

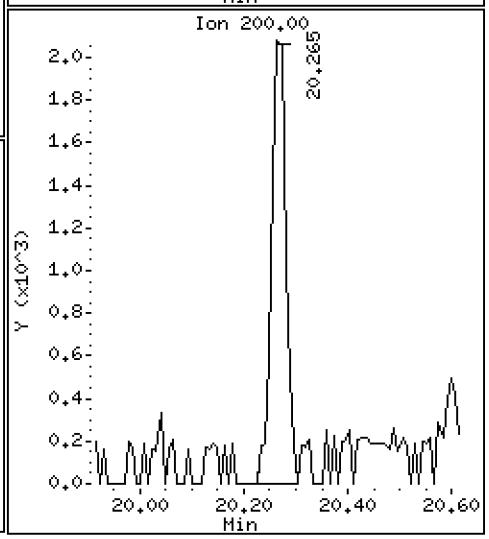


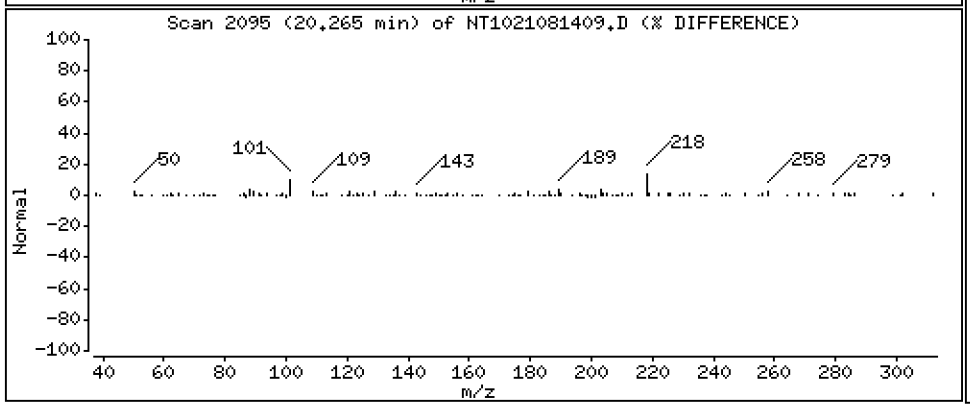












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

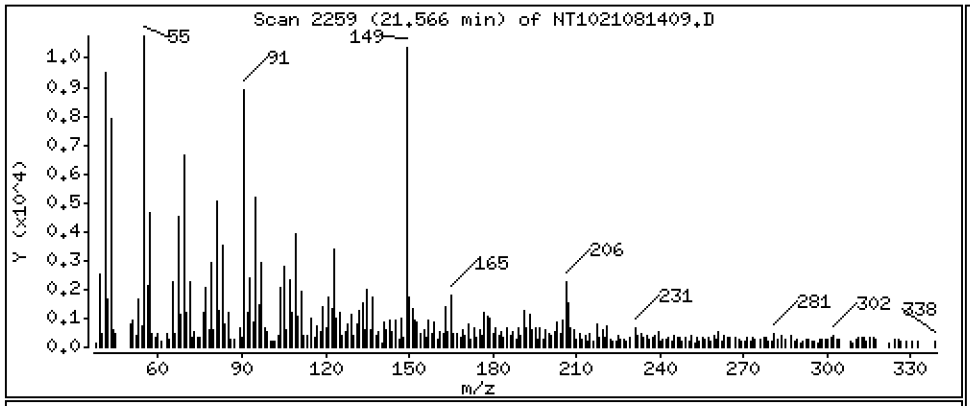
Operator: VTS

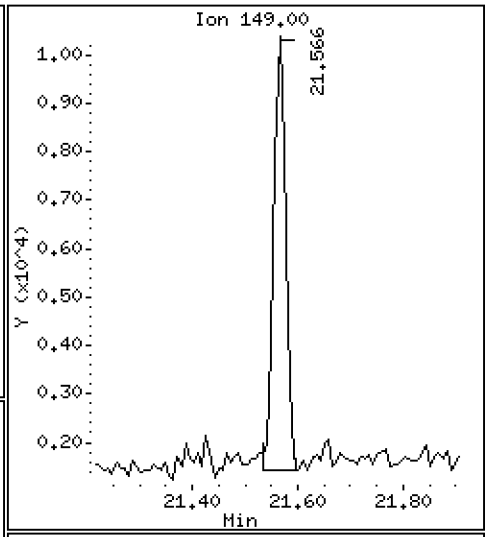
Column phase: ZB-5msi

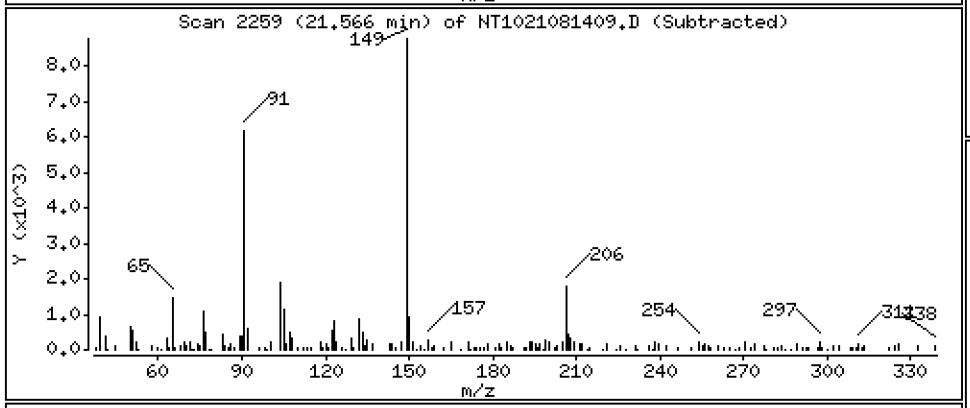
Column diameter: 0.25

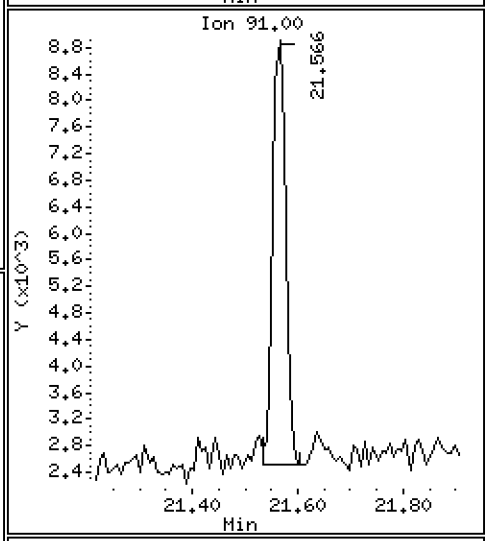
67 Butylbenzylphthalate

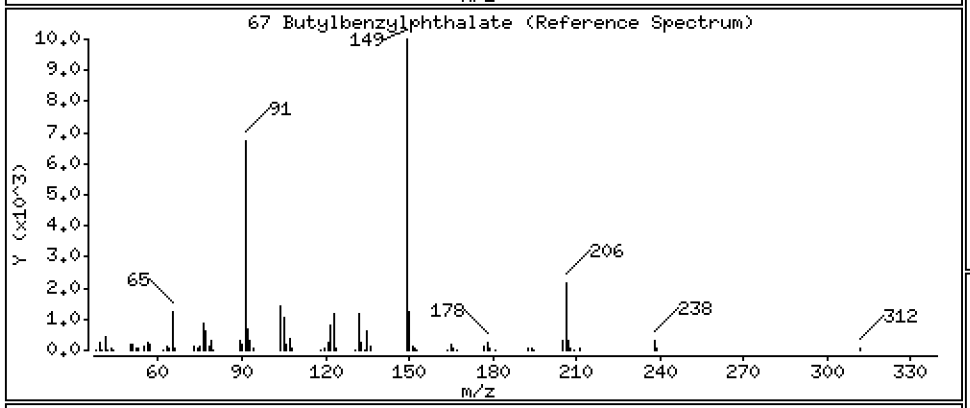
Concentration: 0.4377 ug/mL

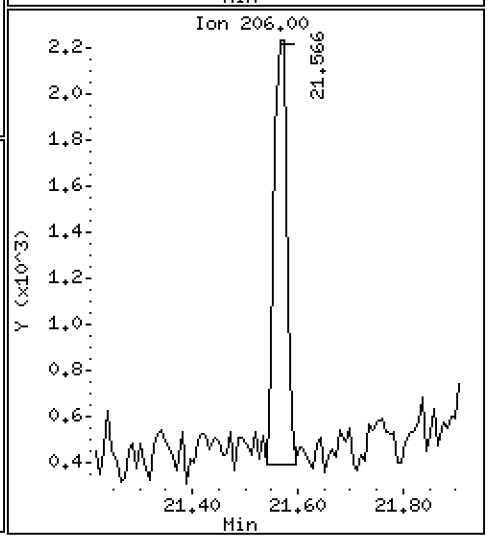


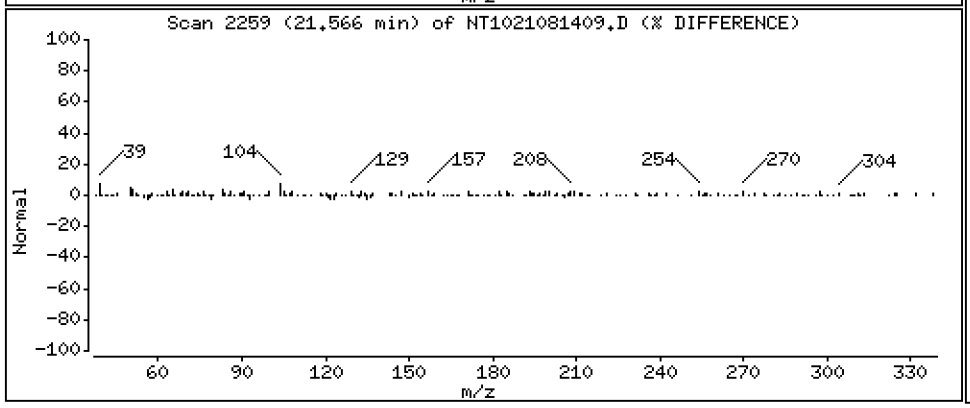












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081409.D

Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

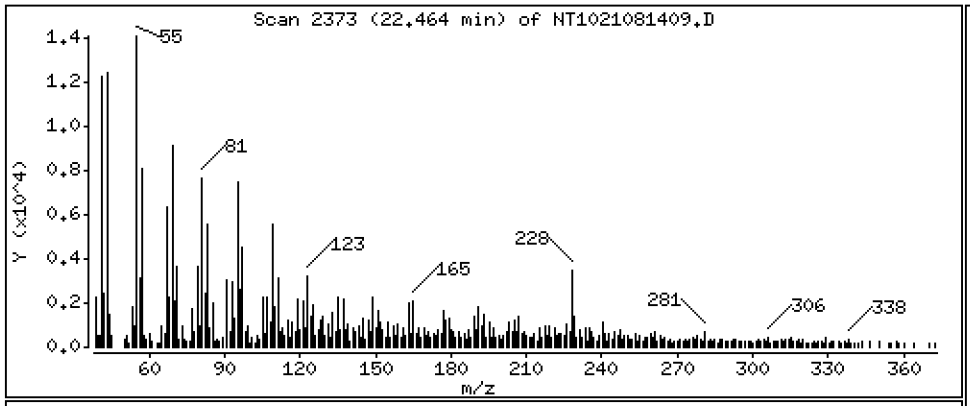
Operator: VTS

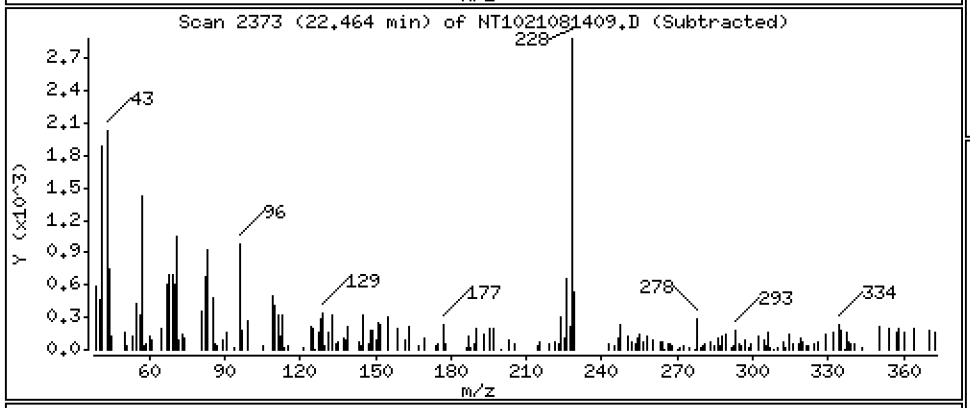
Column phase: ZB-5msi

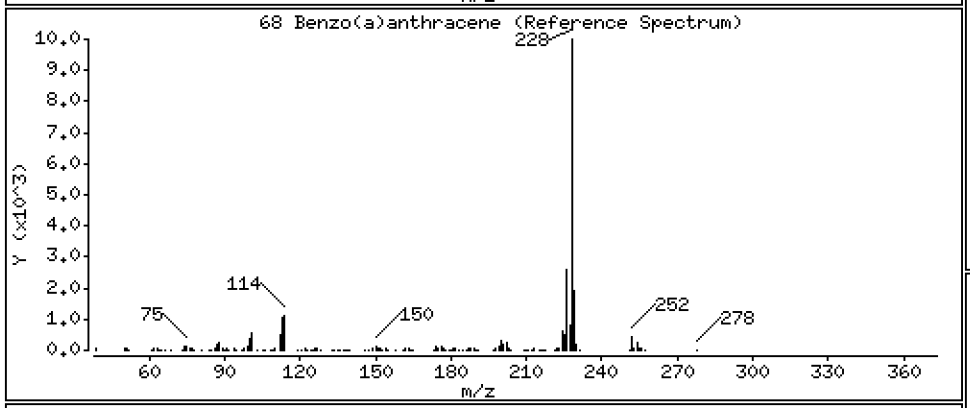
Column diameter: 0.25

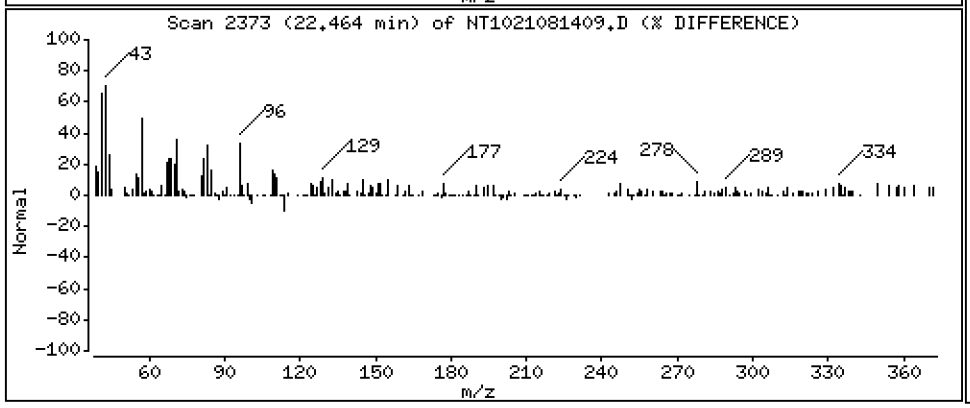
68 Benzo(a)anthracene

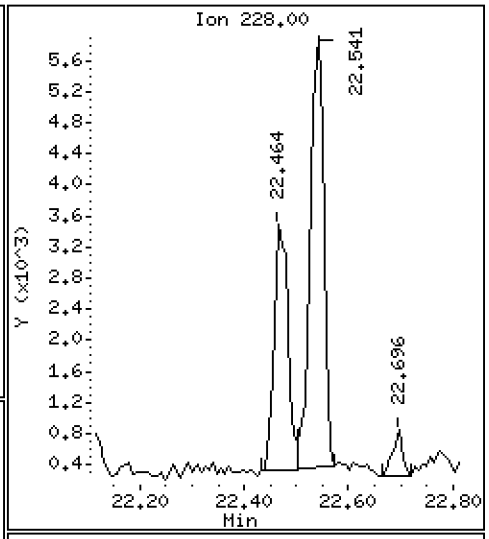
Concentration: 0.07494 ug/mL

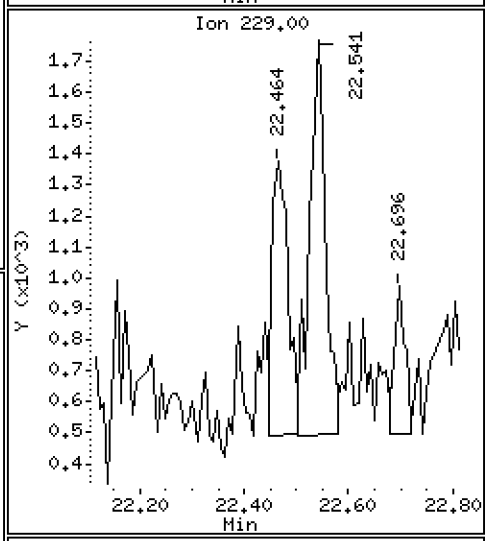


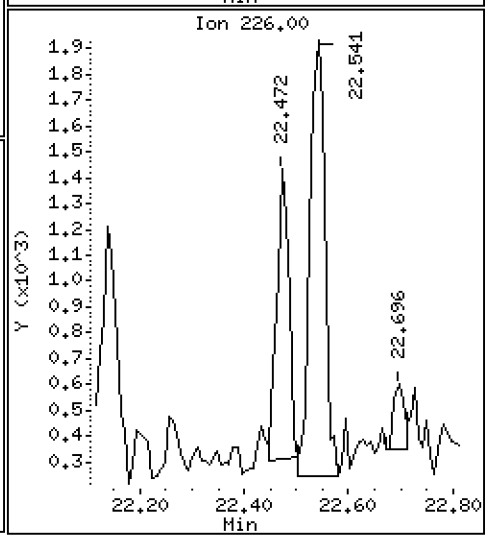












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081409.D

Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

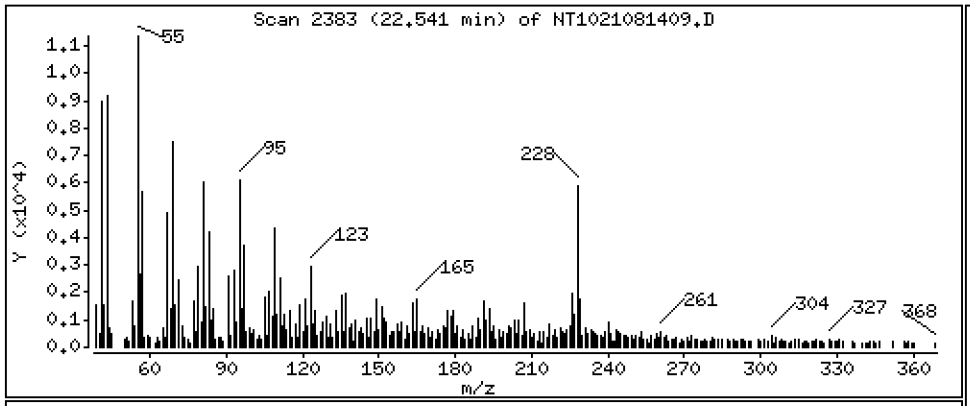
Operator: VTS

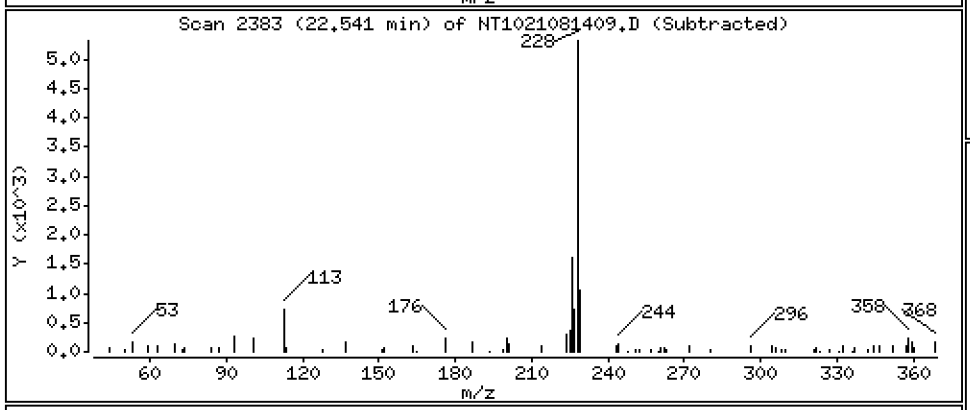
Column phase: ZB-5msi

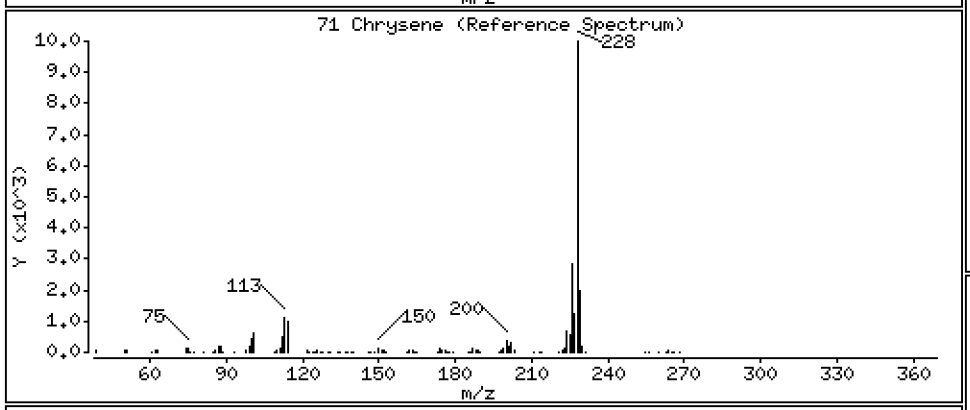
Column diameter: 0.25

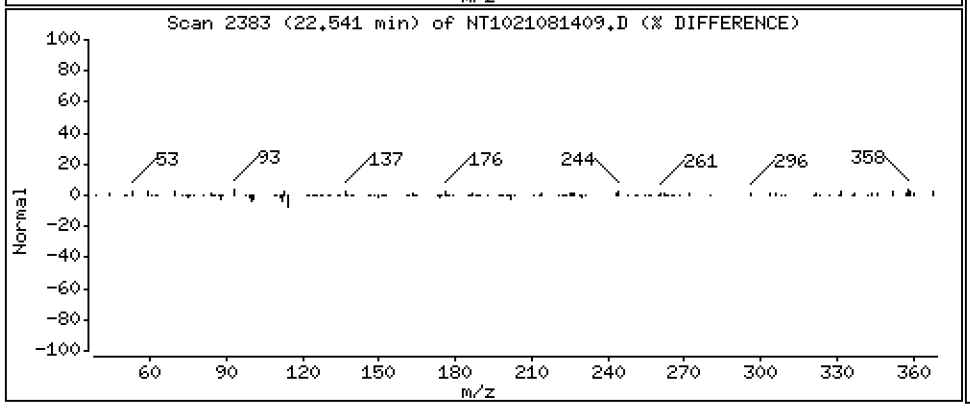
71 Chrysene

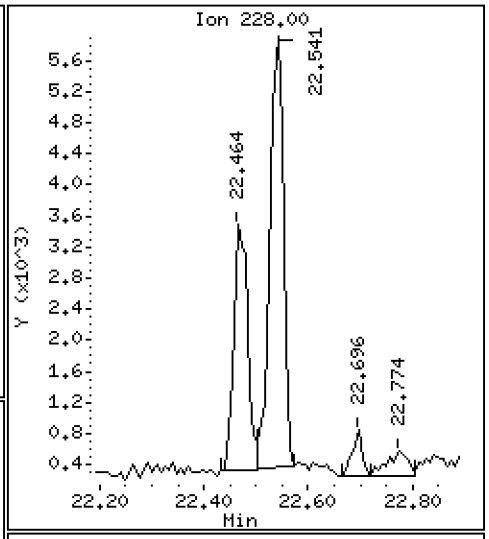
Concentration: 0.1630 ug/mL

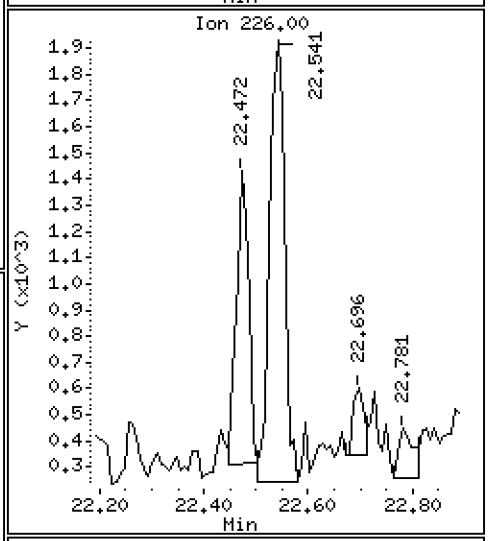


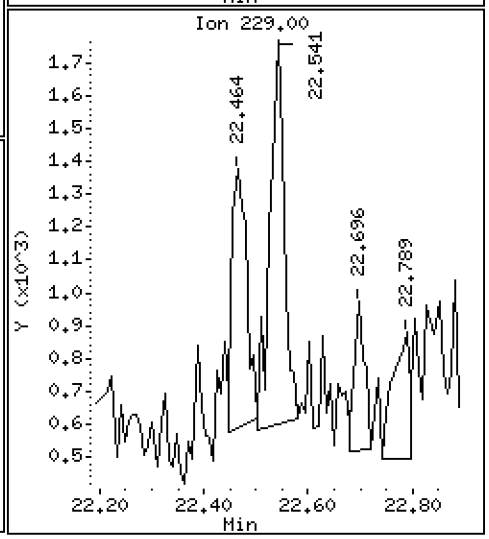












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

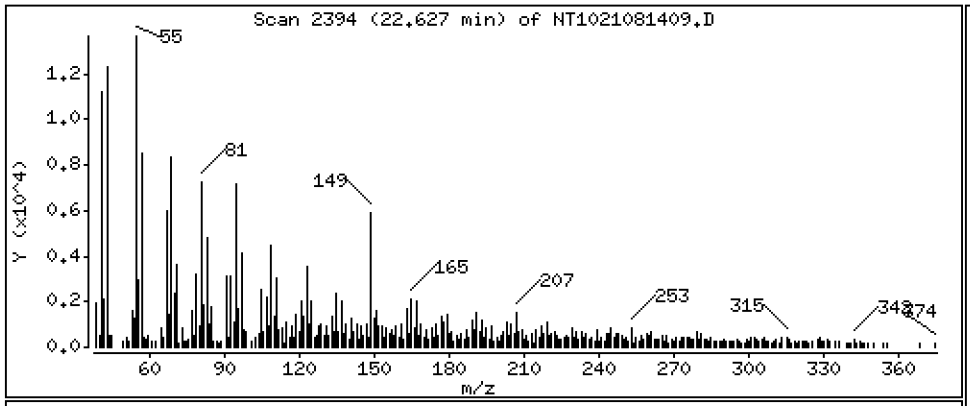
Operator: VTS

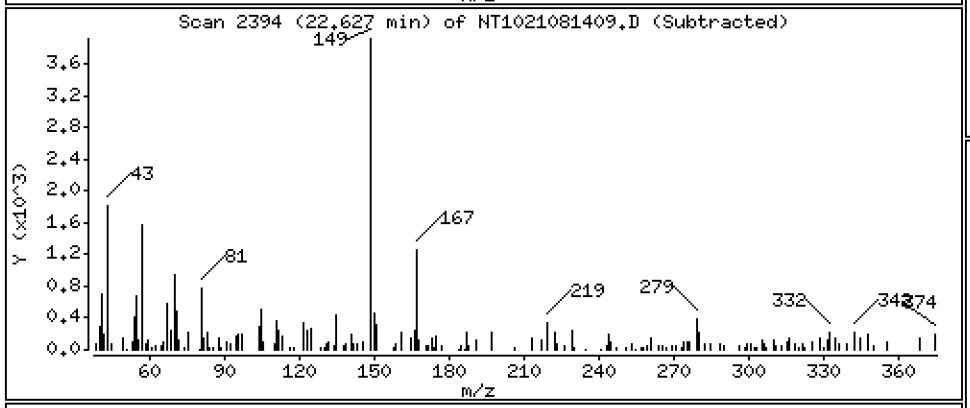
Column phase: ZB-5msi

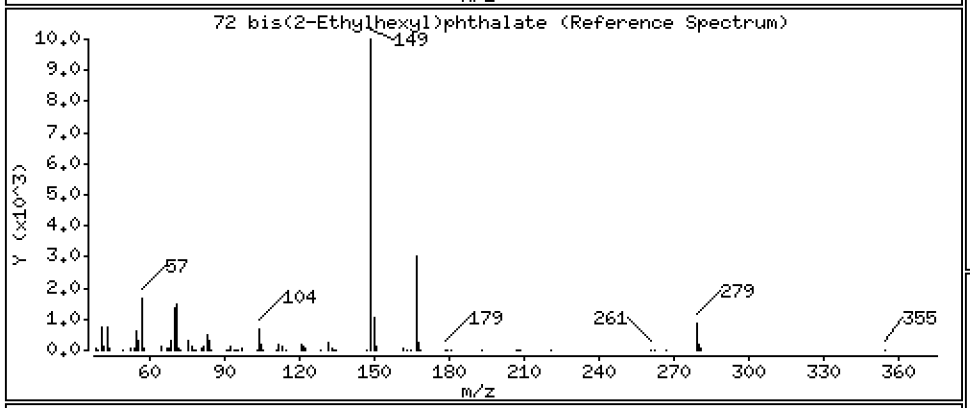
Column diameter: 0.25

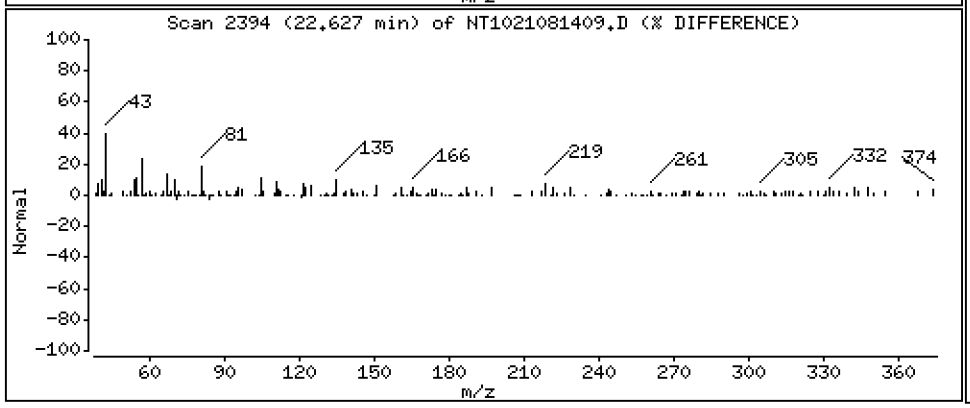
72 bis(2-Ethylhexyl)phthalate

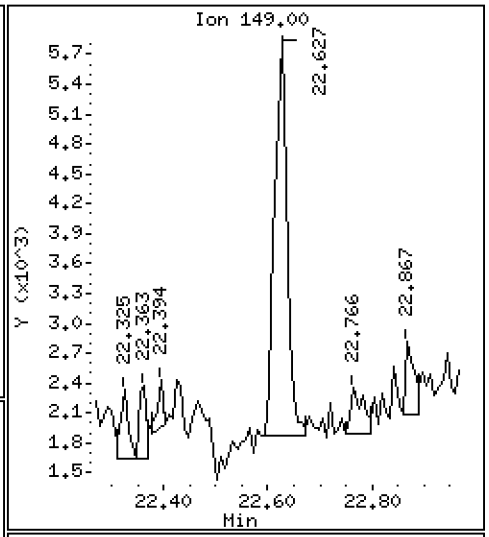
Concentration: 0.1895 ug/mL

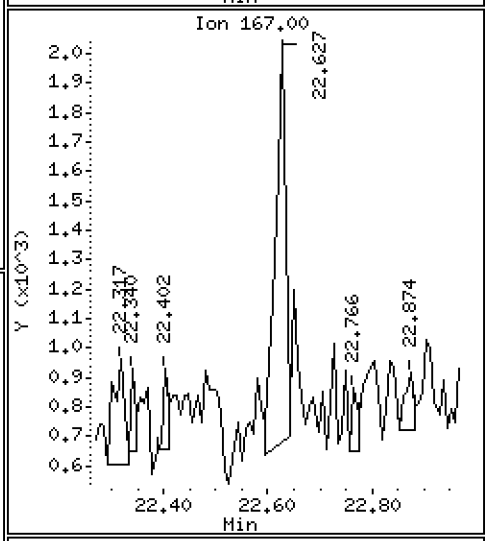


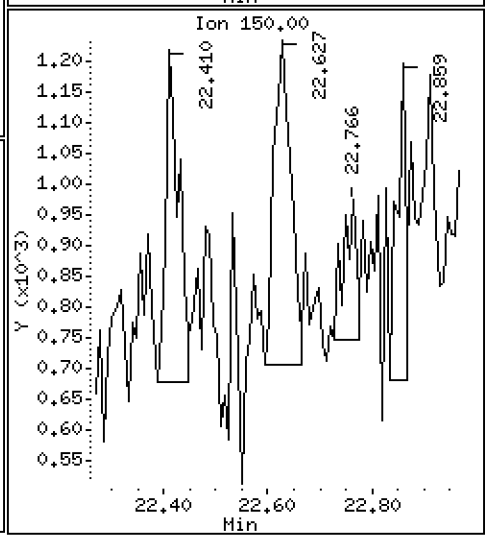












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

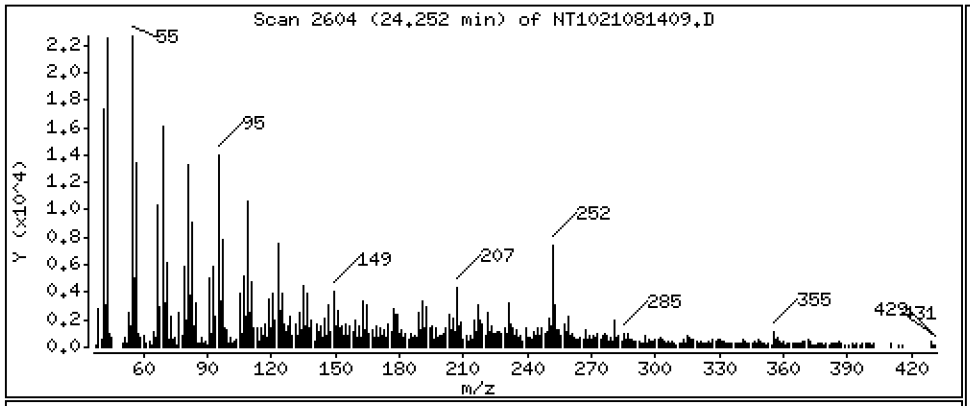
Operator: VTS

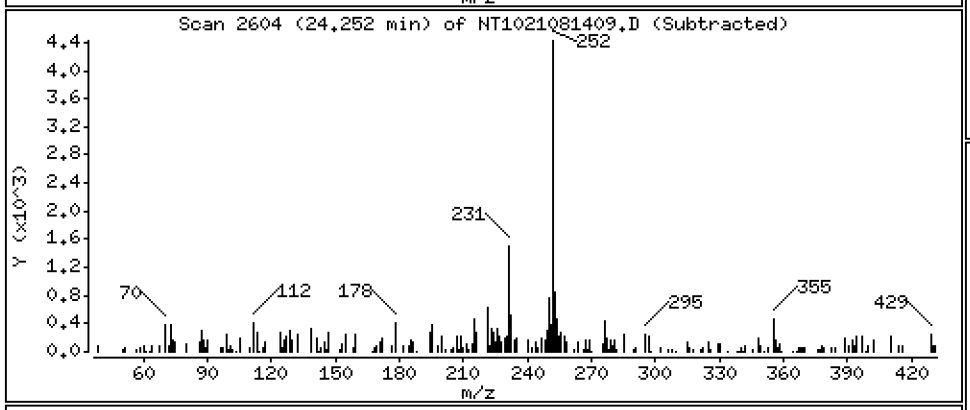
Column phase: ZB-5msi

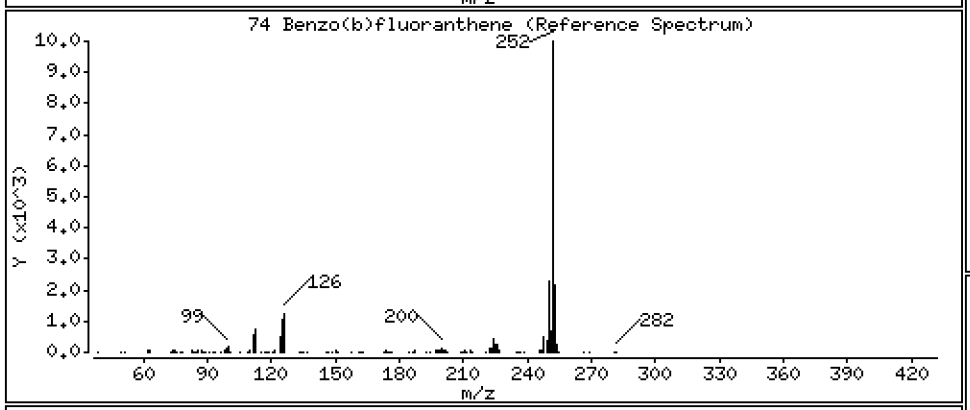
Column diameter: 0.25

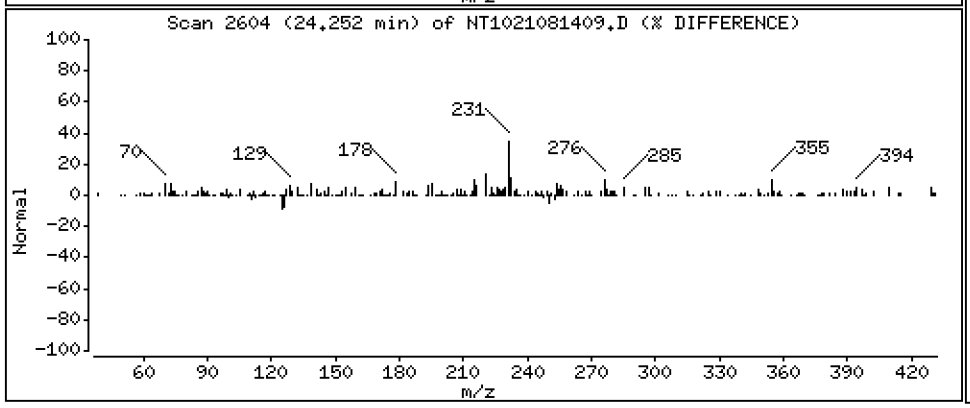
74 Benzo(b)fluoranthene

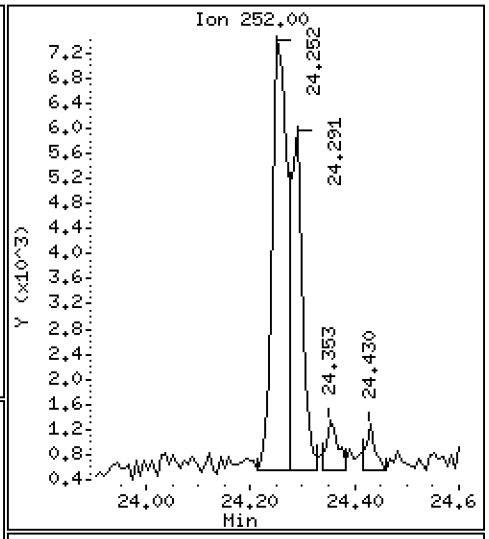
Concentration: 0.1814 ug/mL

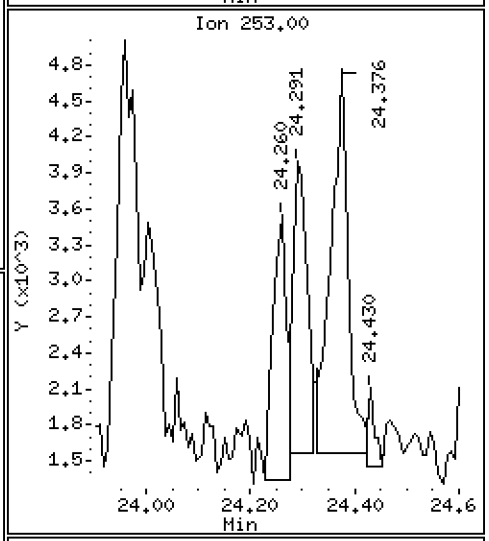


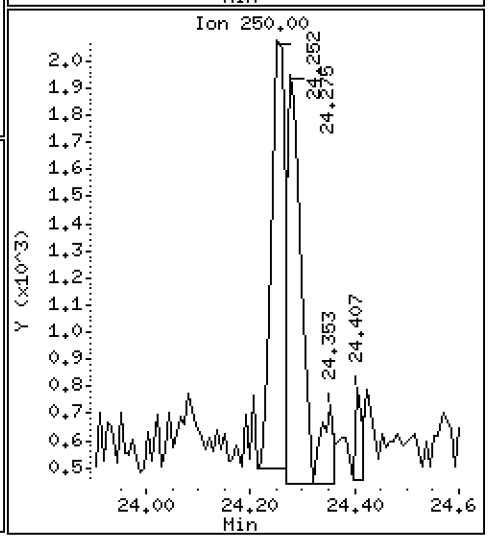












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081409.D

Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

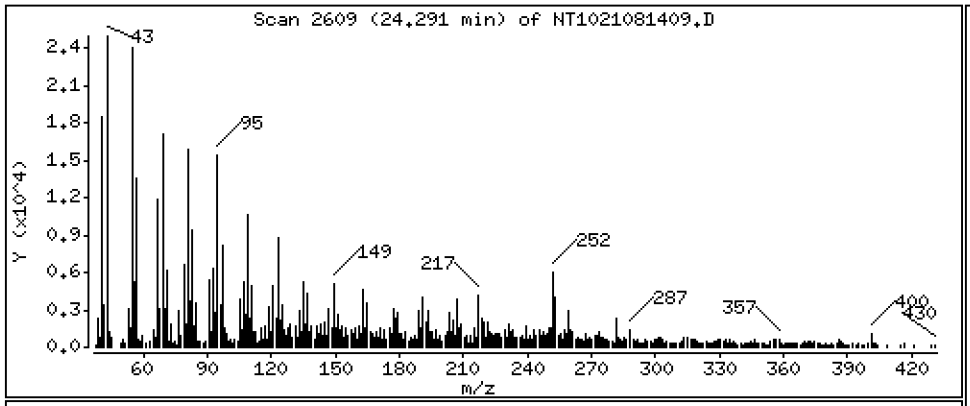
Operator: VTS

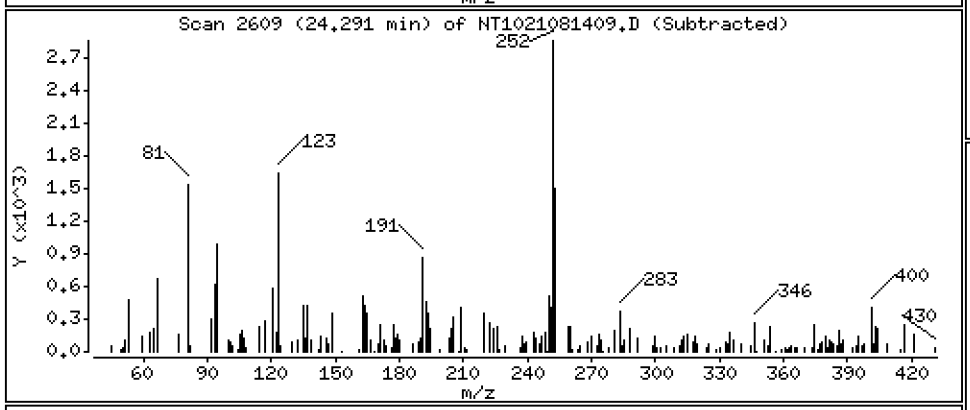
Column phase: ZB-5msi

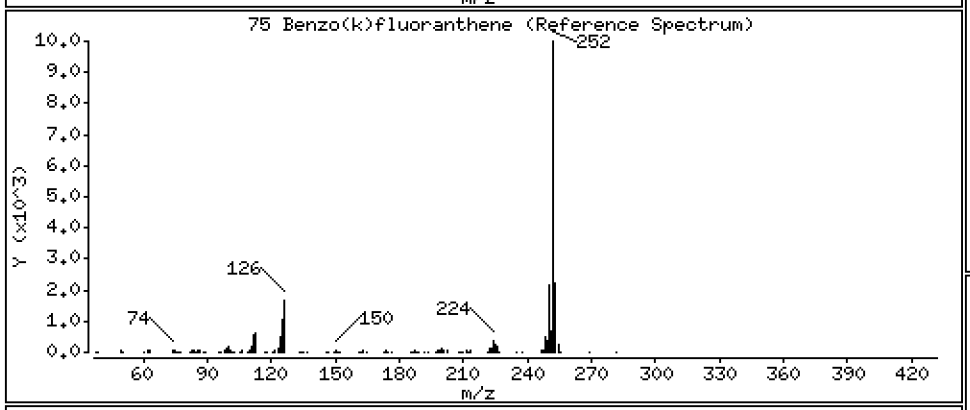
Column diameter: 0.25

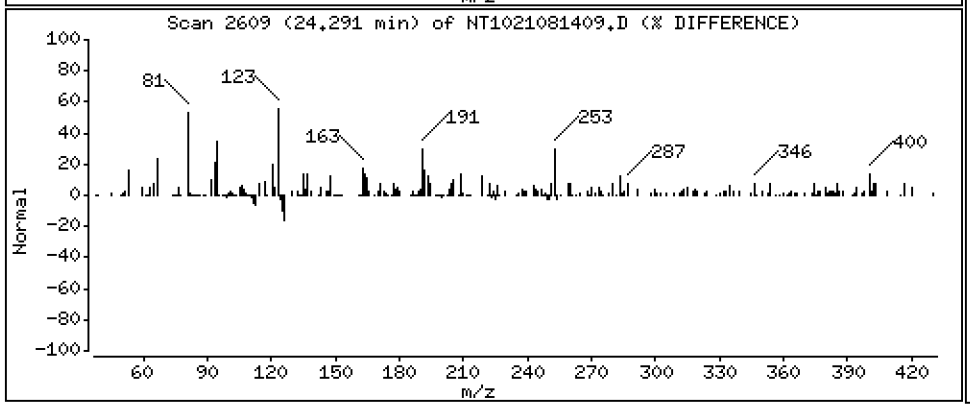
75 Benzo(k)fluoranthene

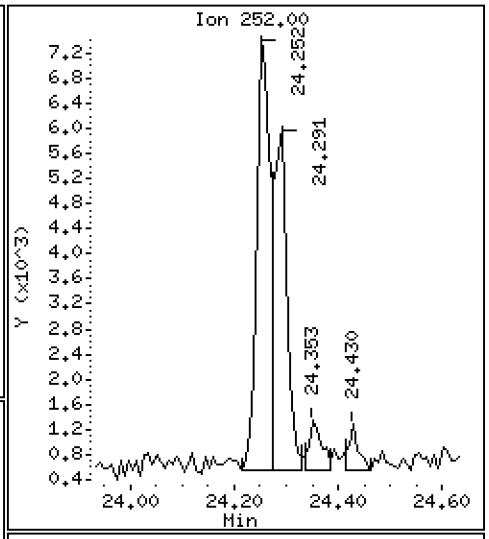
Concentration: 0.1299 ug/mL

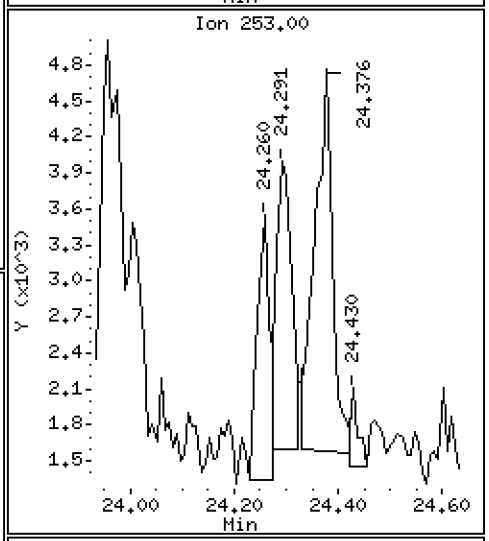


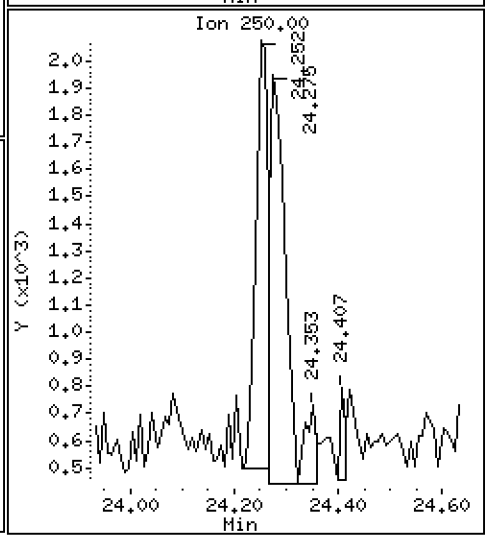












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

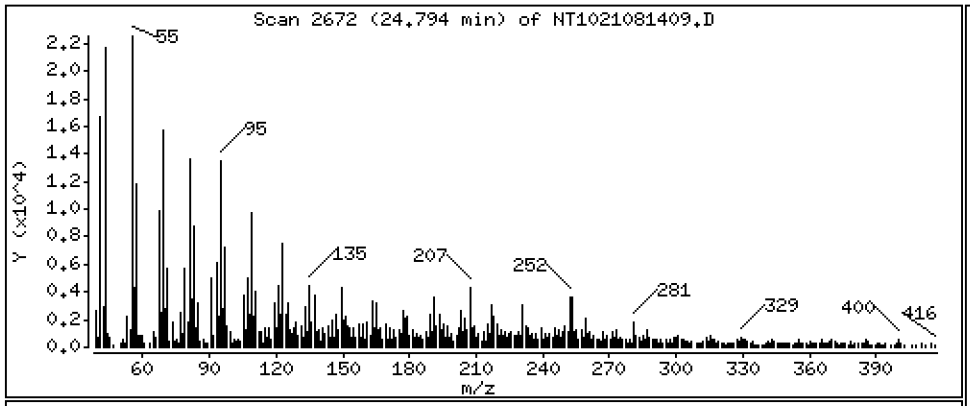
Operator: VTS

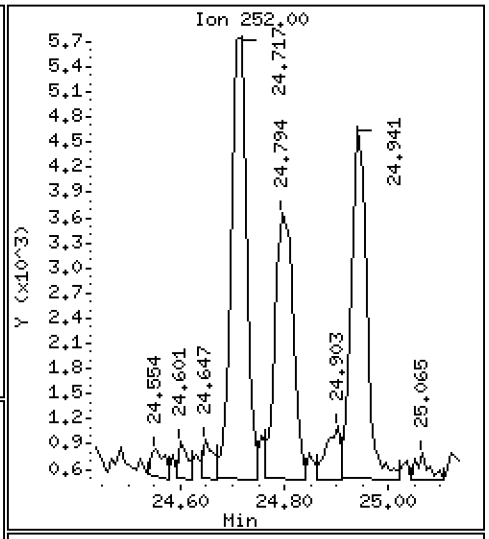
Column phase: ZB-5msi

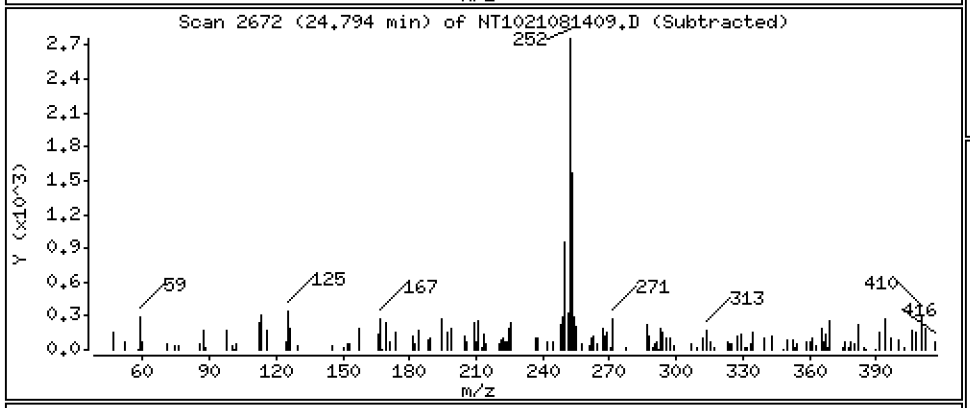
Column diameter: 0.25

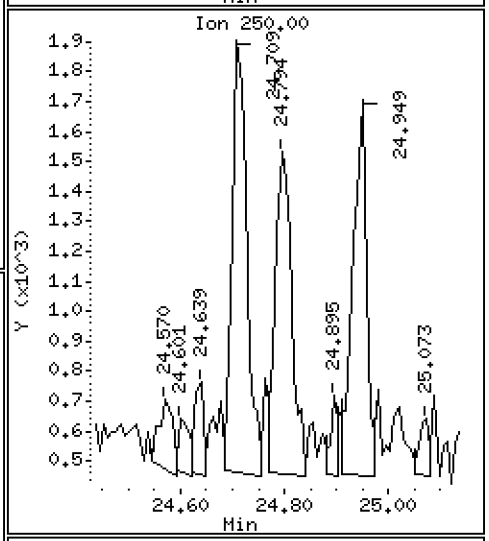
76 Benzo(a)pyrene

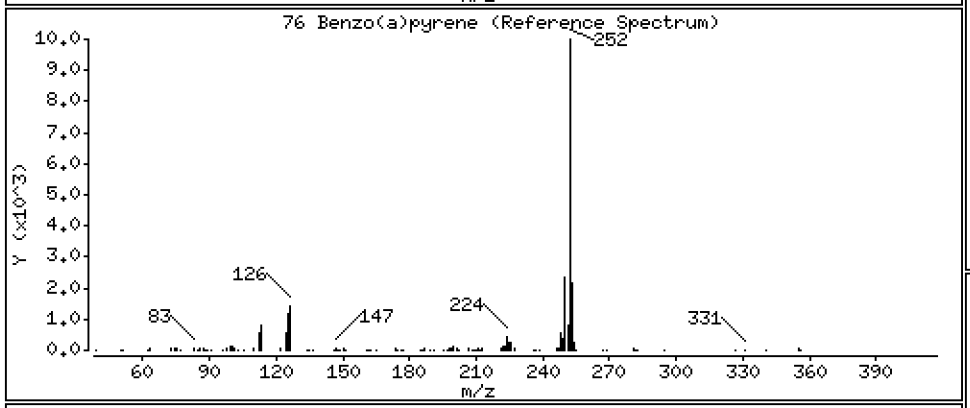
Concentration: 0.1123 ug/mL

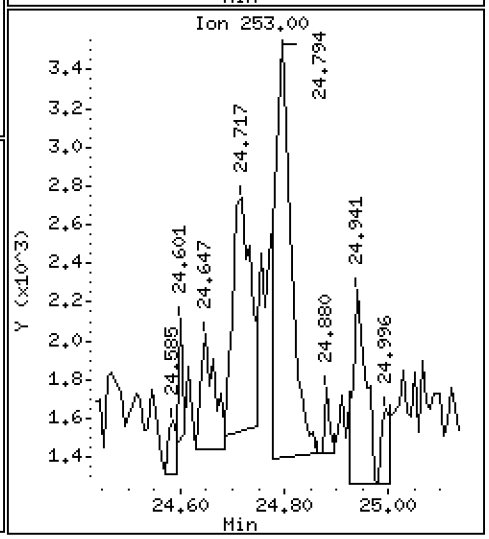


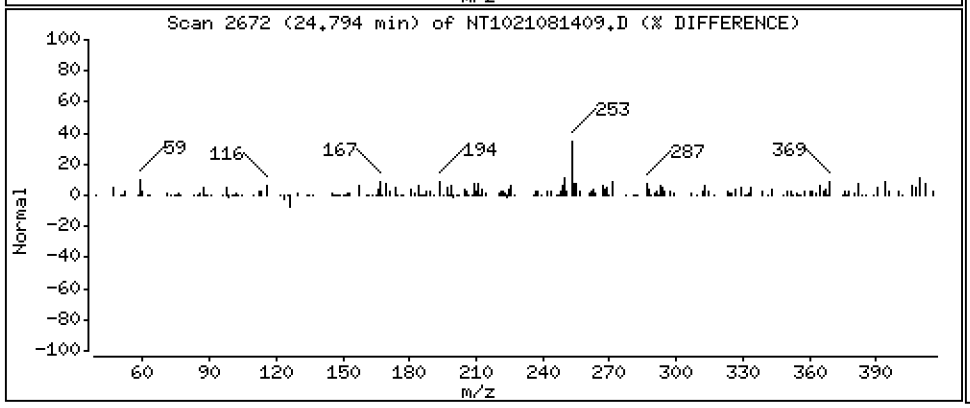












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

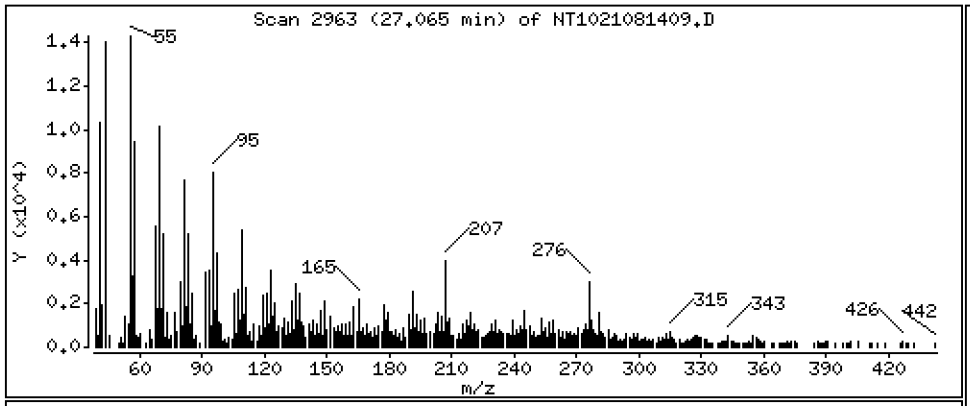
Operator: VTS

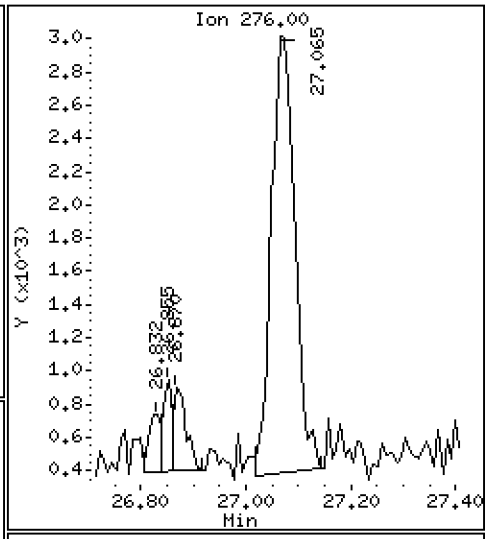
Column phase: ZB-5msi

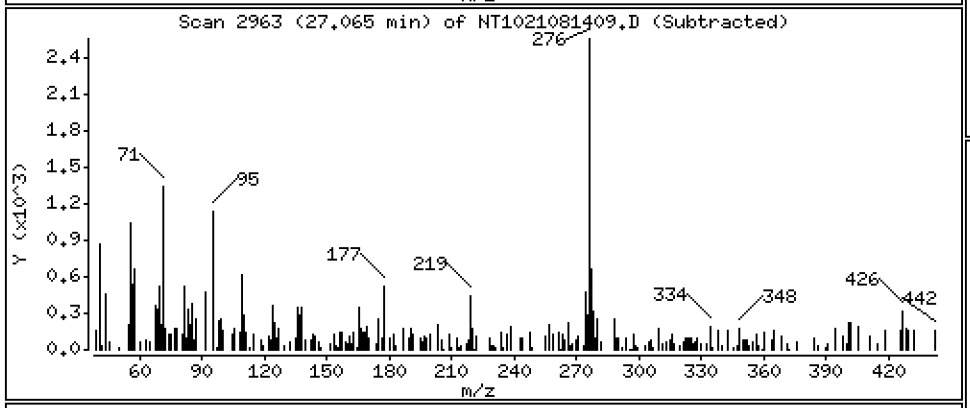
Column diameter: 0.25

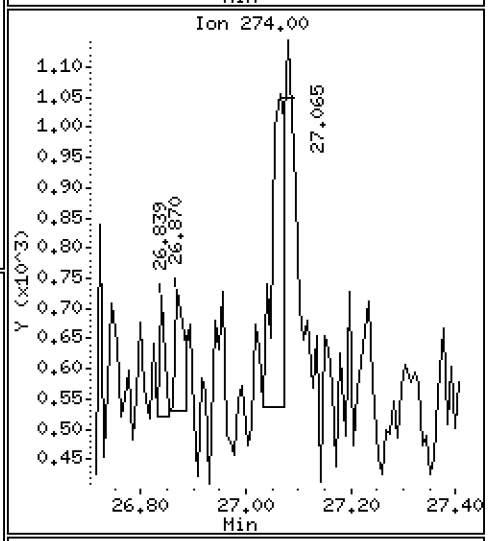
78 Indeno(1,2,3-cd)pyrene

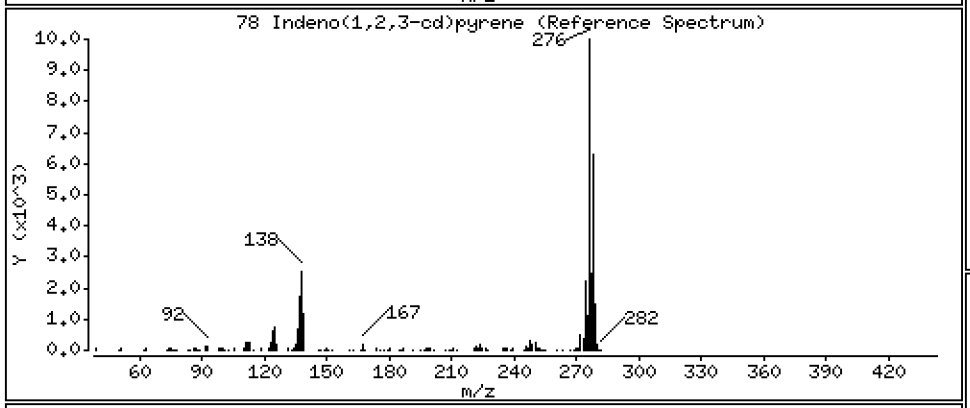
Concentration: 0.1059 ug/mL

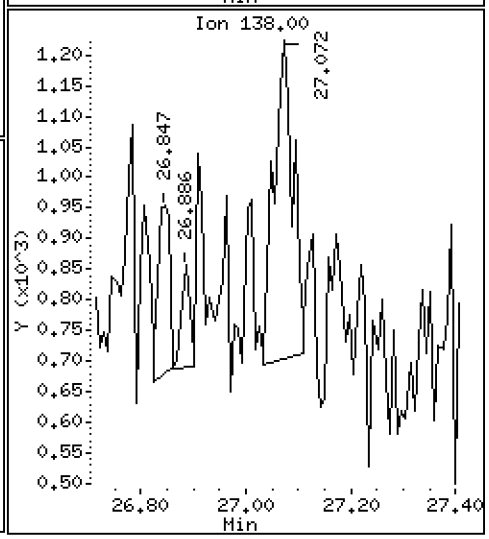


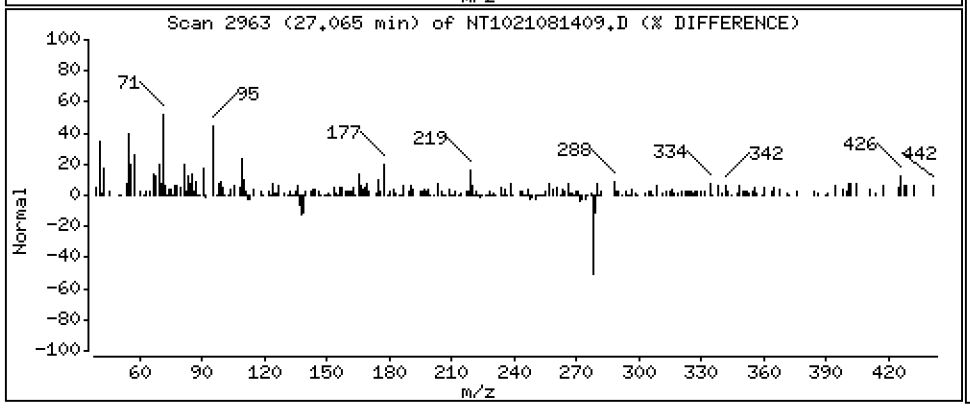












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

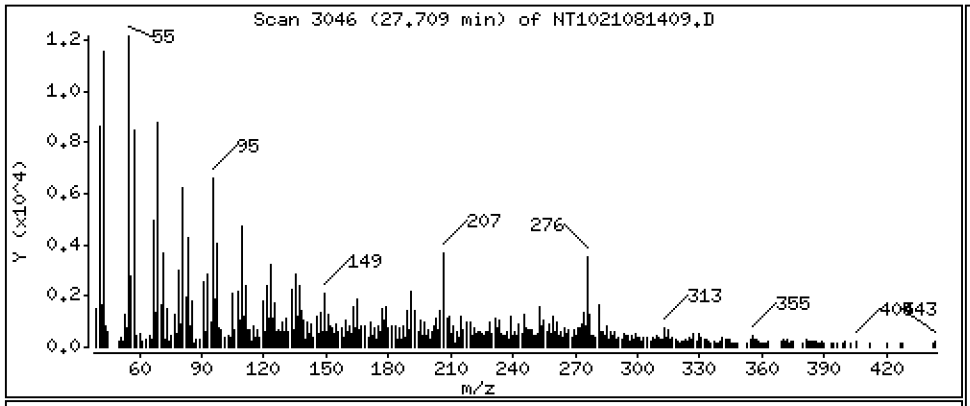
Operator: VTS

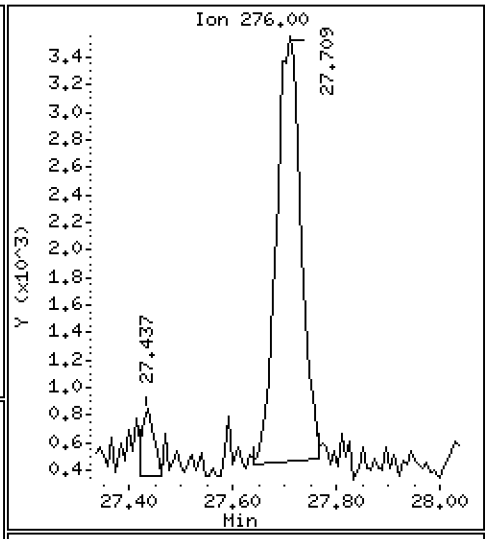
Column phase: ZB-5msi

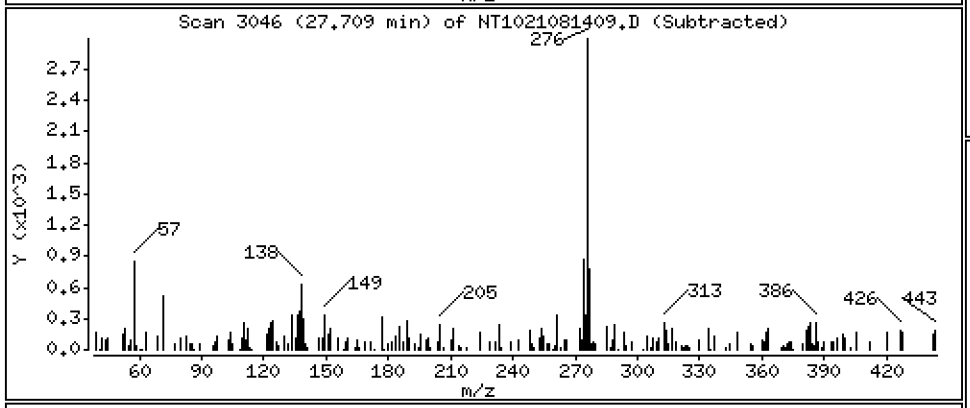
Column diameter: 0.25

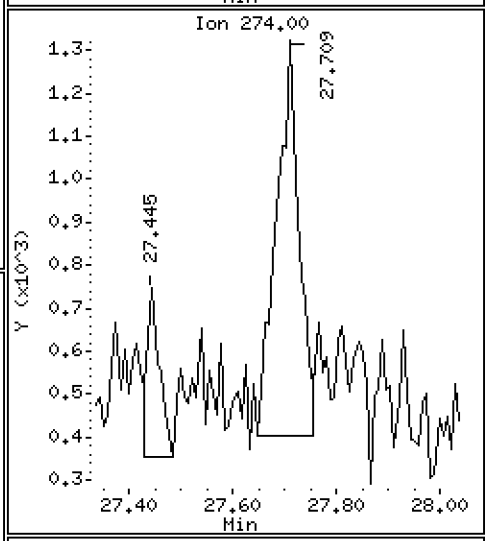
80 Benzo(g,h,i)perylene

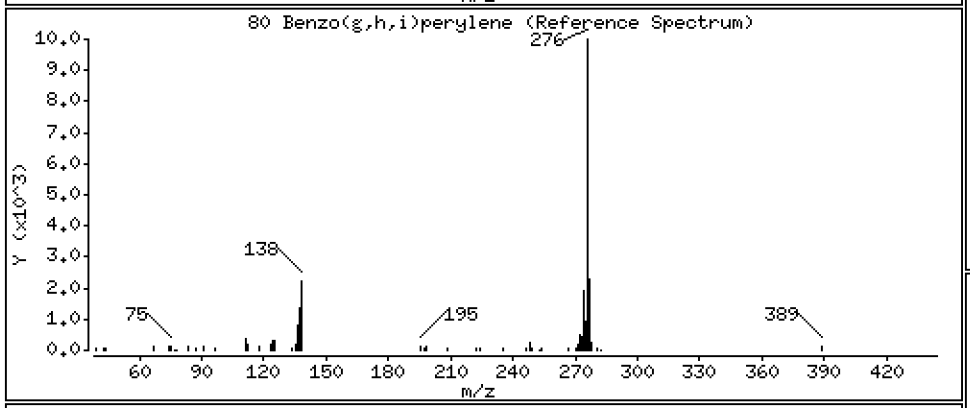
Concentration: 0.1505 ug/mL

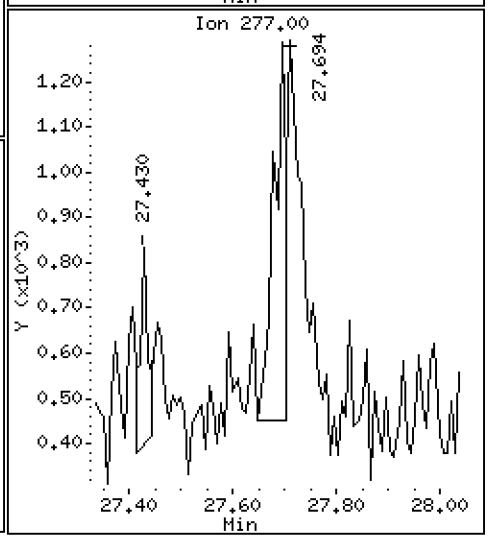


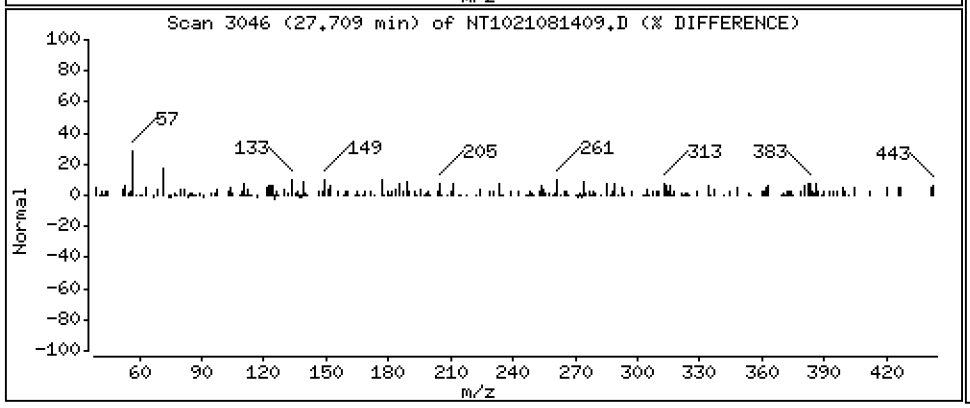












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Date : 14-AUG-2021 14:32

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-02

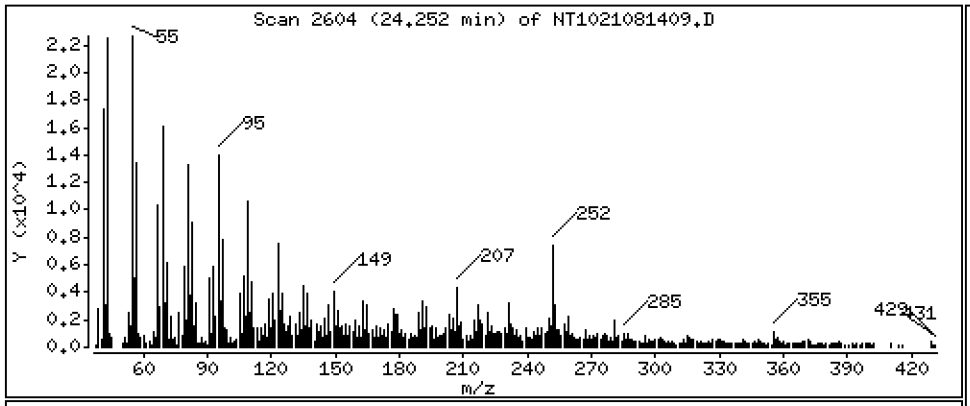
Operator: VTS

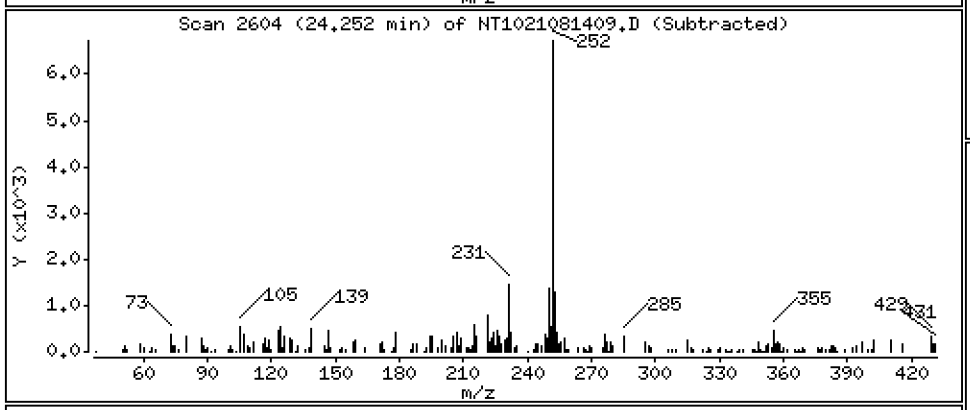
Column phase: ZB-5msi

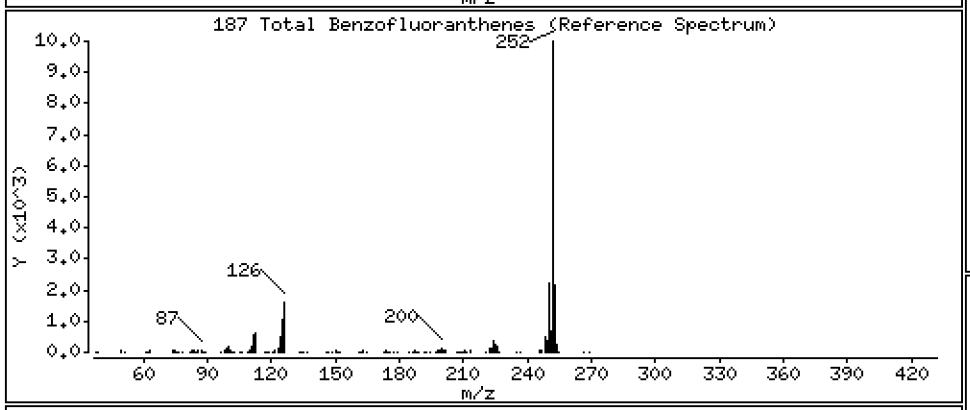
Column diameter: 0.25

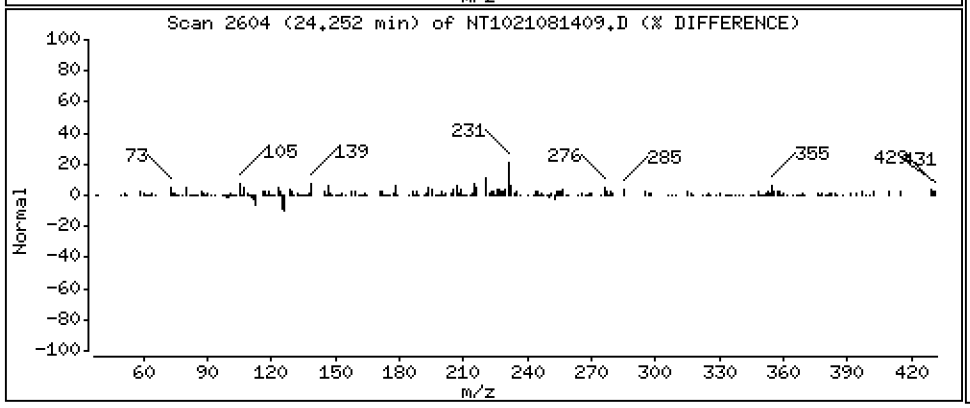
187 Total Benzofluoranthenes

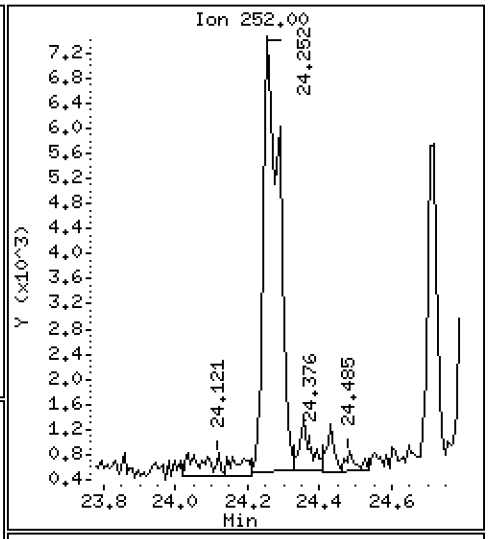
Concentration: 0.2948 ug/mL

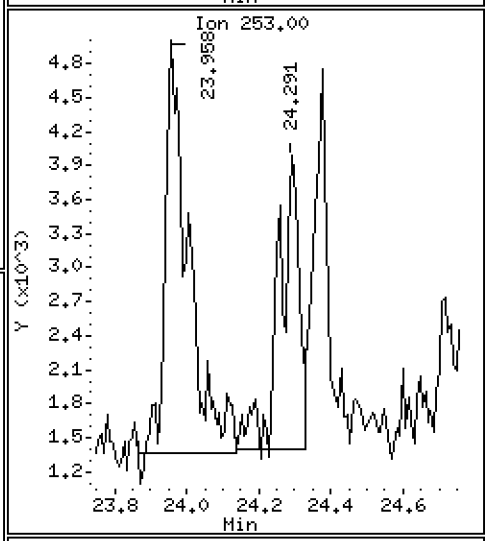


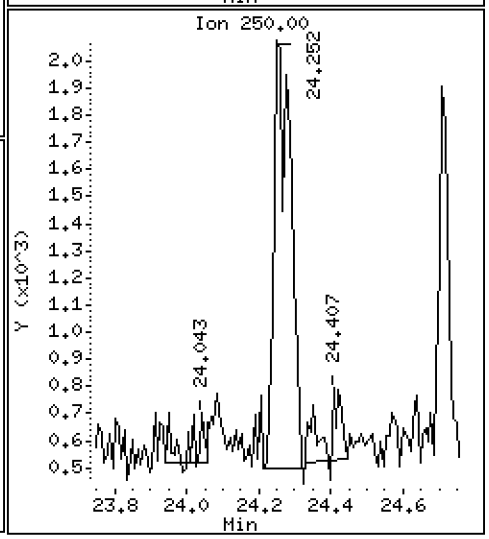












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210814.b\NT1021081409.D
Lab Smp Id: 21G0286-02
Inj Date : 14-AUG-2021 14:32
Operator : VTS Inst ID: nt10.i
Smp Info : 21G0286-02
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 9
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$	1 2-Fluorophenol	112	6.227	6.204	(0.745)	150851	4.05224	4.052
$	2 Phenol-d5	99	7.795	7.788	(0.933)	250279	4.52962	4.530
	3 Phenol	94	7.819	7.811	(0.936)	2046	0.04236	0.04236
$	5 2-Chlorophenol-d4	132	8.012	8.004	(0.959)	249246	6.39827	6.398
	4 Bis(2-Chloroethyl)ether	93	Compound Not Detected.					
	6 2-Chlorophenol	128	Compound Not Detected.					
	7 1,3-Dichlorobenzene	146	Compound Not Detected.					
*	8 1,4-Dichlorobenzene-d4	152	8.353	8.353	(1.000)	94594	4.00000	
	9 1,4-Dichlorobenzene	146	Compound Not Detected.					
$	10 1,2-Dichlorobenzene-d4	152	8.702	8.702	(1.042)	85001	3.39258	3.393
	12 1,2-Dichlorobenzene	146	Compound Not Detected.					
	11 Benzyl alcohol	108	Compound Not Detected.					
	14 2,2'-oxybis(1-Chloropropane)	121	Compound Not Detected.					
	13 2-Methylphenol	108	Compound Not Detected.					
	17 Hexachloroethane	117	Compound Not Detected.					
	16 N-Nitroso-di-n-propylamine	70	Compound Not Detected.					
	15 4-Methylphenol	108	Compound Not Detected.					
$	18 Nitrobenzene-d5	82	9.439	9.440	(0.875)	164286	3.71323	3.713
	19 Nitrobenzene	77	Compound Not Detected.					
	20 Isophorone	82	Compound Not Detected.					
	21 2-Nitrophenol	139	Compound Not Detected.					
	22 2,4-Dimethylphenol	107	Compound Not Detected.					
	23 Bis(2-Chloroethoxy)methane	93	Compound Not Detected.					
	24 Benzoic acid	105	10.320	10.430	(0.956)	10218	0.53760	0.5376(H)
	25 2,4-Dichlorophenol	162	Compound Not Detected.					
	26 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
*	27 Naphthalene-d8	136	10.790	10.791	(1.000)	360727	4.00000	
	28 Naphthalene	128	Compound Not Detected.					
	29 4-Chloroaniline	127	Compound Not Detected.					
	30 Hexachlorobutadiene	225	Compound Not Detected.					
	31 4-Chloro-3-methylphenol	107	Compound Not Detected.					
	32 2-Methylnaphthalene	142	Compound Not Detected.					
	33 Hexachlorocyclopentadiene	237	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	Compound Not Detected.					
	35 2,4,5-Trichlorophenol	196	Compound Not Detected.					
$	36 2-Fluorobiphenyl	172	13.003	13.003	(0.905)	348821	3.94735	3.947
	37 2-Chloronaphthalene	162	Compound Not Detected.					
	38 2-Nitroaniline	65	Compound Not Detected.					
	39 Dimethylphthalate	163	13.916	13.917	(0.969)	3785	0.05300	0.05300
	40 Acenaphthylene	152	Compound Not Detected.					
	41 2,6-Dinitrotoluene	165	Compound Not Detected.					
*	42 Acenaphthene-d10	164	14.365	14.358	(1.000)	192432	4.00000	
	43 3-Nitroaniline	138	Compound Not Detected.					
	44 Acenaphthene	153	Compound Not Detected.					
	45 2,4-Dinitrophenol	184	Compound Not Detected.					
	46 Dibenzofuran	168	Compound Not Detected.					
	47 4-Nitrophenol	109	Compound Not Detected.					
	48 2,4-Dinitrotoluene	165	Compound Not Detected.					
	50 Diethylphthalate	149	15.362	15.363	(1.069)	9454	0.13963	0.1396
	49 Fluorene	166	Compound Not Detected.					
	51 4-Chlorophenyl-phenylether	204	Compound Not Detected.					
	52 4-Nitroaniline	138	Compound Not Detected.					
	53 4,6-Dinitro-2-methylphenol	198	Compound Not Detected.					
	54 N-Nitrosodiphenylamine	169	Compound Not Detected.					
$	55 2,4,6-Tribromophenol	330	15.995	15.996	(1.113)	129181	8.03860	8.039
	56 4-Bromophenyl-phenylether	248	Compound Not Detected.					
	57 Hexachlorobenzene	284	Compound Not Detected.					
	58 Pentachlorophenol	266	Compound Not Detected.					
*	59 Phenanthrene-d10	188	17.371	17.364	(1.000)	334611	4.00000	
	60 Phenanthrene	178	17.417	17.418	(1.003)	11531	0.12743	0.1274
	61 Anthracene	178	17.510	17.503	(1.008)	2846	0.02941	0.02941
	62 Carbazole	167	Compound Not Detected.					
	63 Di-n-butylphthalate	149	18.709	18.710	(1.077)	18999	0.13075	0.1307
	64 Fluoranthene	202	19.839	19.839	(0.882)	20538	0.24015	0.2401
	65 Pyrene	202	20.265	20.265	(0.901)	16379	0.17374	0.1737
$	66 Terphenyl-d14	244	20.597	20.590	(0.915)	294941	4.38951	4.390
	67 Butylbenzylphthalate	149	21.565	21.558	(0.958)	13572	0.43767	0.4377
	68 Benzo(a)anthracene	228	22.463	22.464	(0.998)	5739	0.07494	0.07494
*	69 Chrysene-d12	240	22.502	22.495	(1.000)	205226	4.00000	
	70 3,3'-Dichlorobenzidine	252	Compound Not Detected.					
	71 Chrysene	228	22.541	22.541	(1.002)	9623	0.16298	0.1630
	72 bis(2-Ethylhexyl)phthalate	149	22.626	22.619	(0.958)	6443	0.18955	0.1895
*	134 Di-n-octylphthalate-d4	153	23.617	23.610	(1.000)	308969	4.00000	
	73 Di-n-octylphthalate	149	Compound Not Detected.					
	74 Benzo(b)fluoranthene	252	24.252	24.252	(0.974)	13679	0.18144	0.1814
	75 Benzo(k)fluoranthene	252	24.290	24.283	(0.976)	9703	0.12993	0.1299
	76 Benzo(a)pyrene	252	24.794	24.786	(0.996)	7649	0.11226	0.1123
*	77 Perylene-d12	264	24.894	24.887	(1.000)	191323	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.064	27.057	(1.087)	8170	0.10595	0.1059
	79 Dibenzo(a,h)anthracene	278	Compound Not Detected.					
	80 Benzo(g,h,i)perylene	276	27.709	27.686	(1.113)	10360	0.15055	0.1505
	90 N-Nitrosodimethylamine	74	Compound Not Detected.					
	91 Aniline	93	Compound Not Detected.					
	93 Benzidine	184	Compound Not Detected.					
	103 Pyridine	79	Compound Not Detected.					
	105 1-methylnaphthalene	142	Compound Not Detected.					
	111 Azobenzene (1,2-DP-Hydrazine)	77	Compound Not Detected.					

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	CONCENTRATIONS FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.252	24.283	(0.974)	21343	0.29480	0.2948
120 2,3,4,6-Tetrachlorophenol	232	Compound Not Detected.					

QC Flag Legend

H - Operator selected an alternate compound hit.

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081409.D
Lab Smp Id: 21G0286-02
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	94594	11.21
27 Naphthalene-d8	291658	145829	583316	360727	23.68
42 Acenaphthene-d10	163642	81821	327284	192432	17.59
59 Phenanthrene-d10	304099	152050	608198	334611	10.03
69 Chrysene-d12	199453	99727	398906	205226	2.89
134 Di-n-octylphthala	303639	151820	607278	308969	1.76
77 Perylene-d12	200082	100041	400164	191323	-4.38

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.35	-0.00
27 Naphthalene-d8	10.79	10.29	11.29	10.79	-0.00
42 Acenaphthene-d10	14.36	13.86	14.86	14.37	0.05
59 Phenanthrene-d10	17.36	16.86	17.86	17.37	0.04
69 Chrysene-d12	22.50	22.00	23.00	22.50	0.03
134 Di-n-octylphthala	23.61	23.11	24.11	23.62	0.03
77 Perylene-d12	24.89	24.39	25.39	24.89	0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081409.D

Lab ID: 21G0286-02
nt10.i, ABN.m, 14-AUG-2021 14:32

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
0.956	0.967	-0.0102	Benzoic acid

RRT check based on Ccal File: NT1021081402.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS627

Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8270E
Semivolatiles (20ug/kg - 0.2ug/L SepF)

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-04 B	SDG:	21G0286
Sampled:	07/22/21 08:10	Prepared:	08/02/21 11:20	File ID:	NT1021081410.D
% Solids:	54.40	Preparation:	EPA 3546 (Microwave)	Analyzed:	08/14/21 15:12
Batch:	BJH0004	Sequence:	SJH0174	Initial/Final:	18.38 g Wet / 1 mL
Instrument:	NT10	Column:	ZB-5MSi	Calibration:	EG00057
Cleanups:	GPC				

CAS NO.	COMPOUND	DILUTION	CONC: (ug/kg dry)	Q	DL	RL
85-68-7	Butylbenzylphthalate	1	36.0		9.4	20.0

SURROGATES	ADDED: (ug/kg dry)	FOUND: (ug/kg dry)	% REC	QC LIMITS	Q
p-Terphenyl-d14	500.06	388	77.7	37 - 120	

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

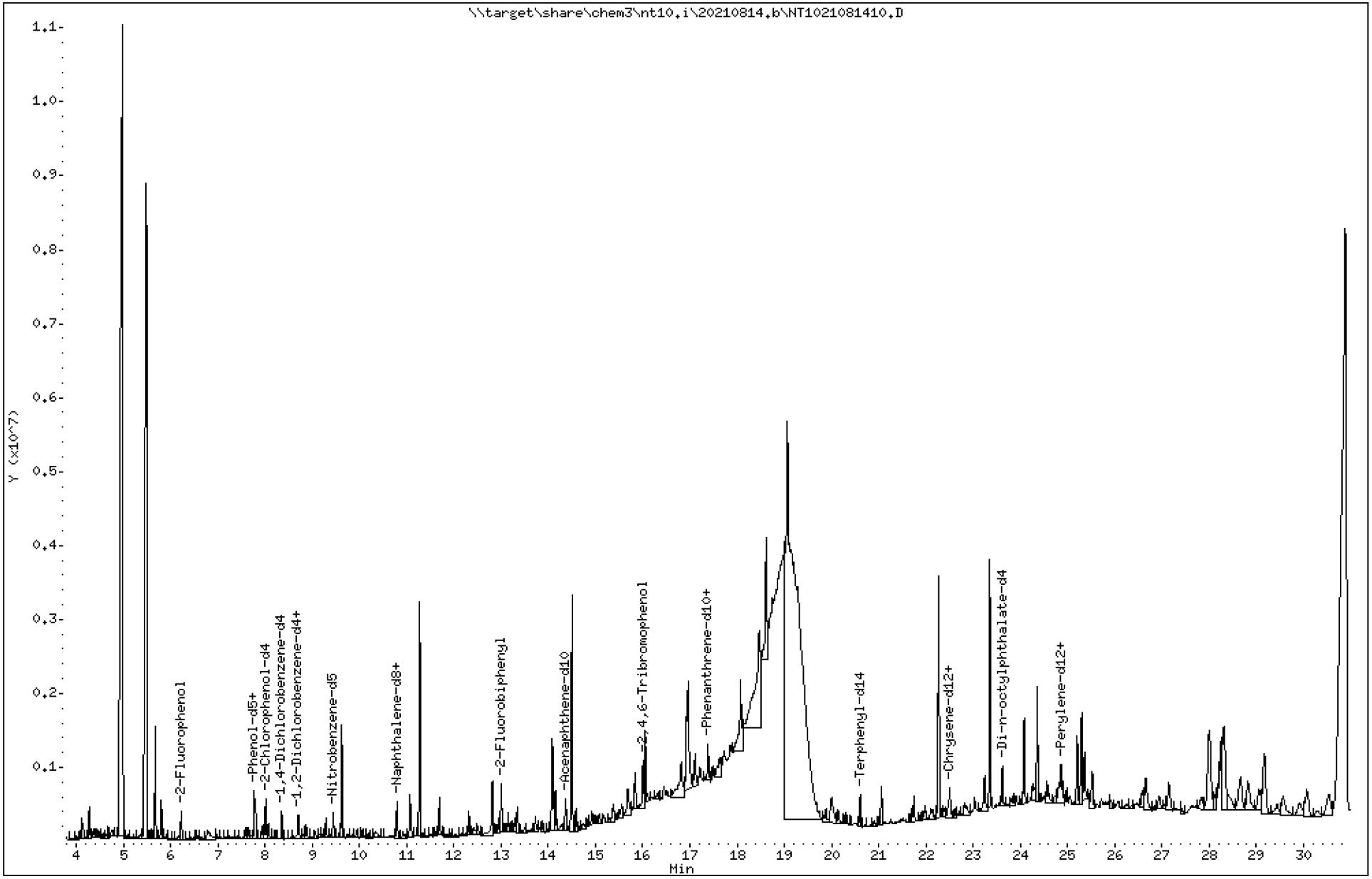
Instrument: nt10.i

Sample Info: 21G0286-04

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

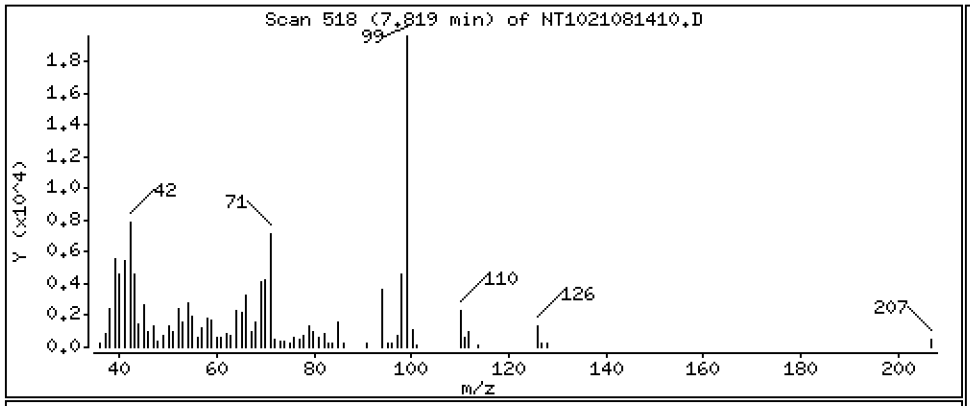
Operator: VTS

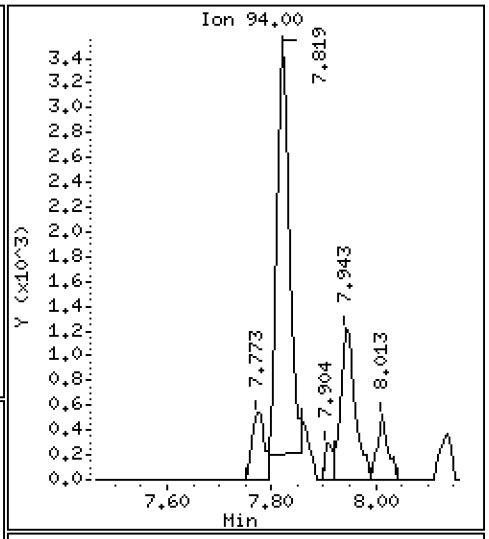
Column phase: ZB-5msi

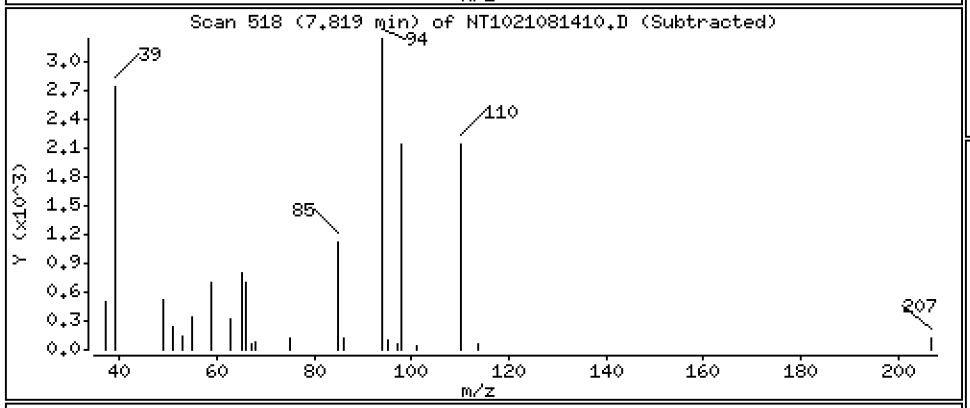
Column diameter: 0.25

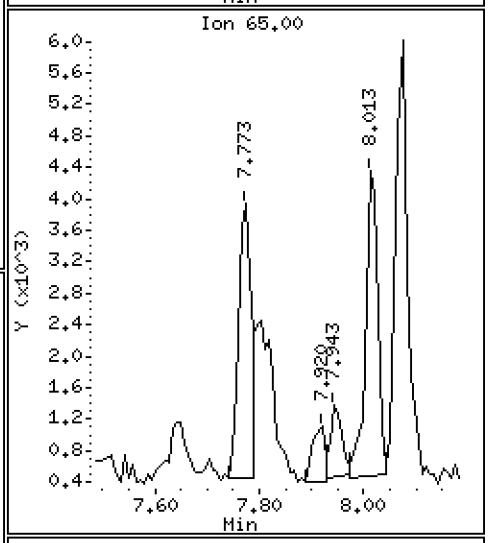
3 Phenol

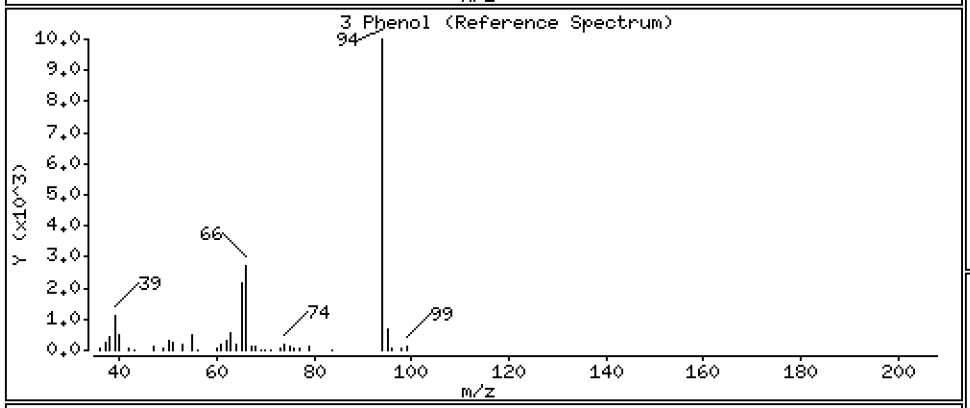
Concentration: 0.1227 ug/mL

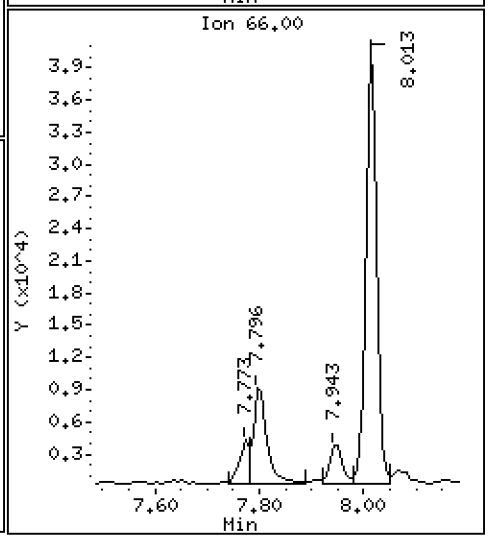


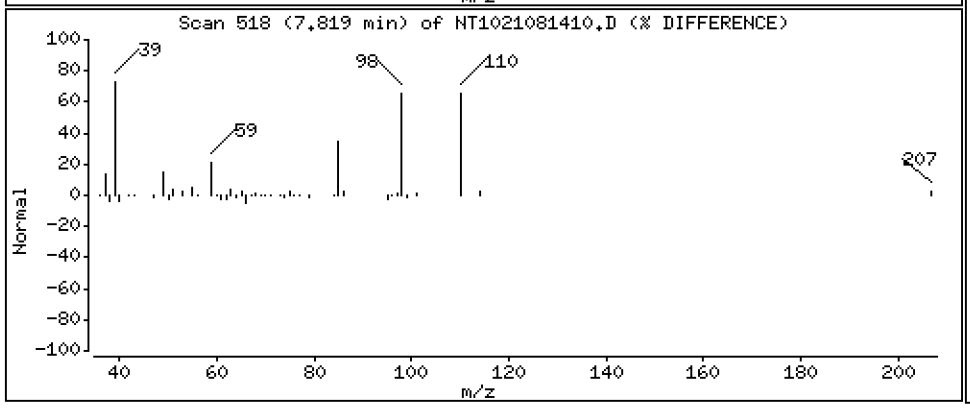












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

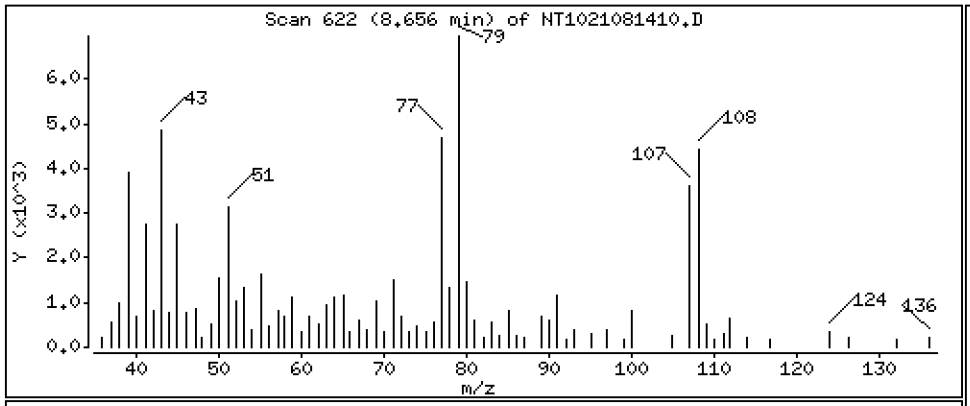
Operator: VTS

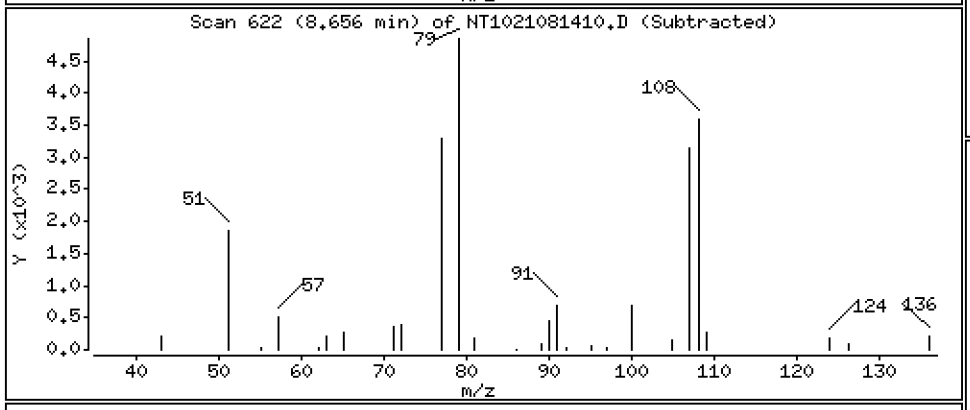
Column phase: ZB-5msi

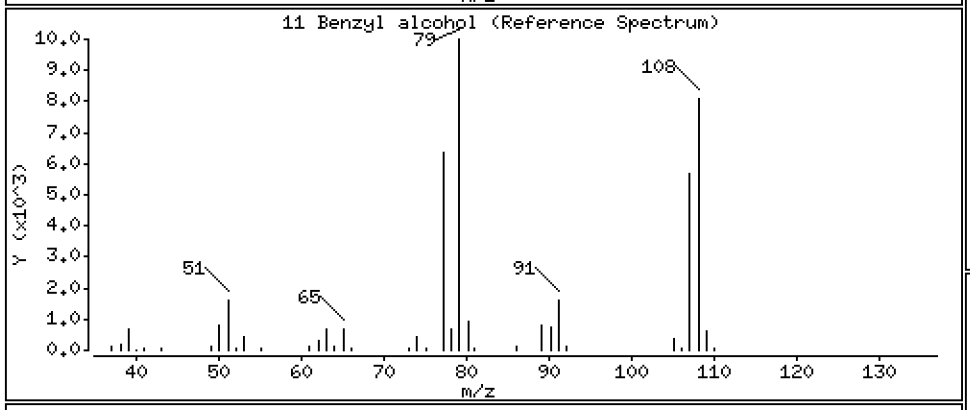
Column diameter: 0.25

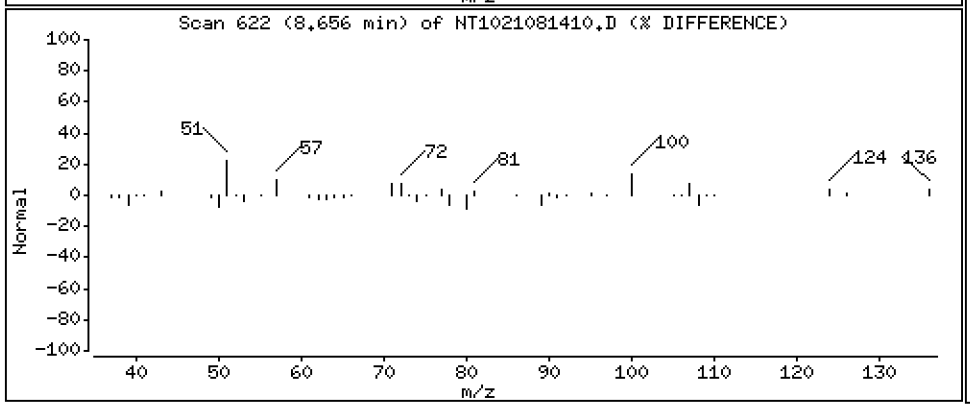
11 Benzyl alcohol

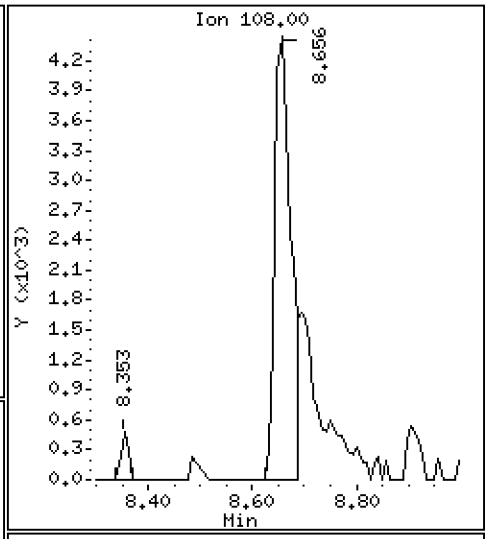
Concentration: 0.4668 ug/mL

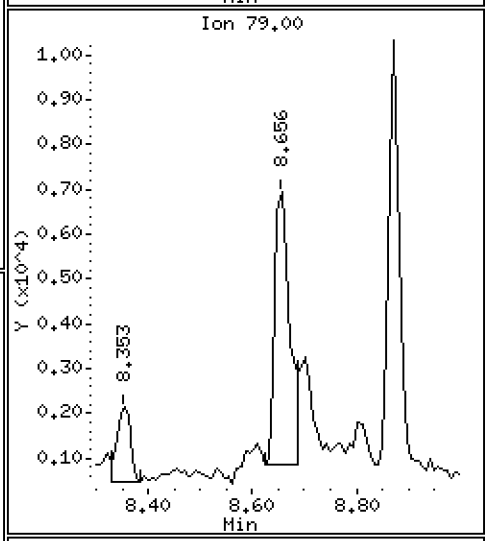


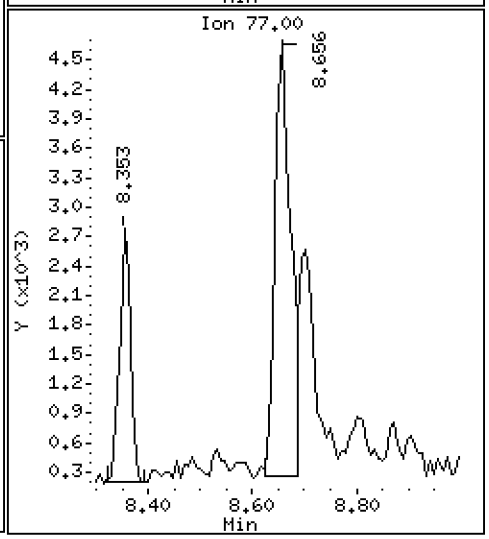












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

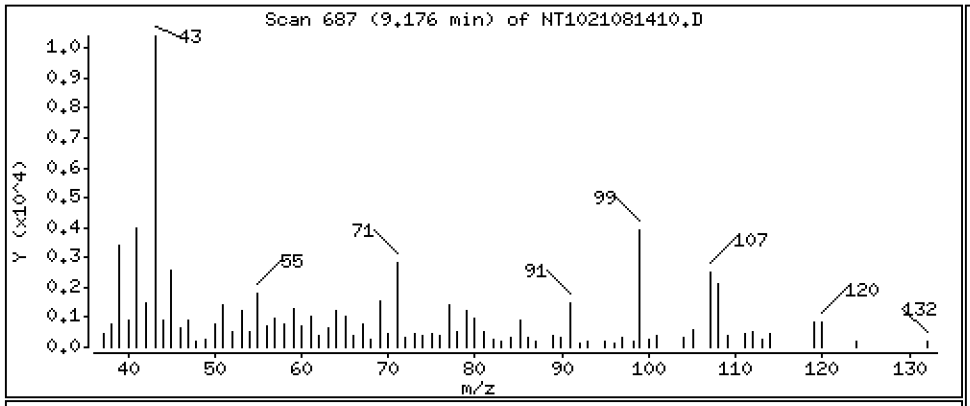
Operator: VTS

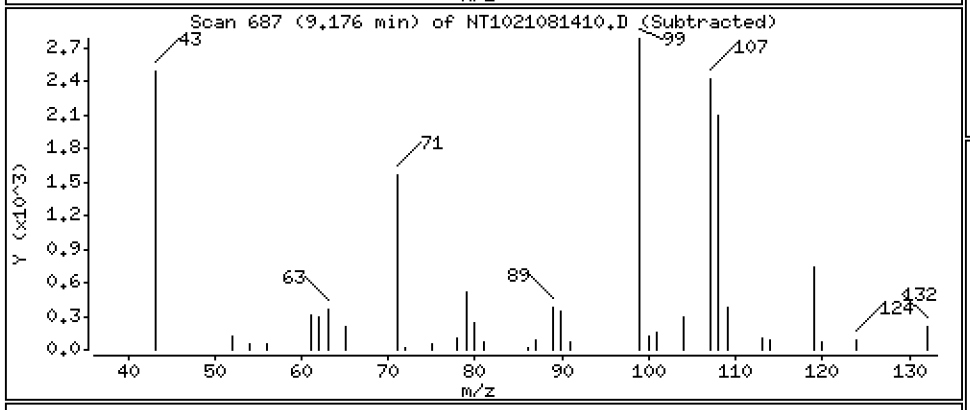
Column phase: ZB-5msi

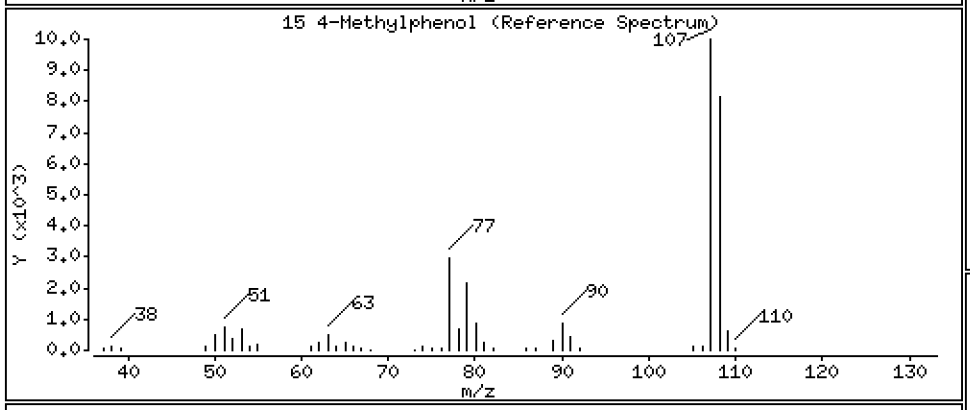
Column diameter: 0.25

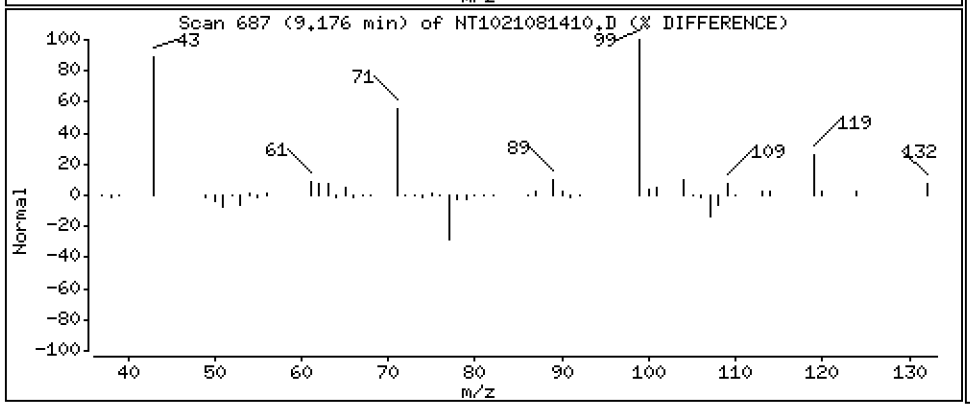
15 4-Methylphenol

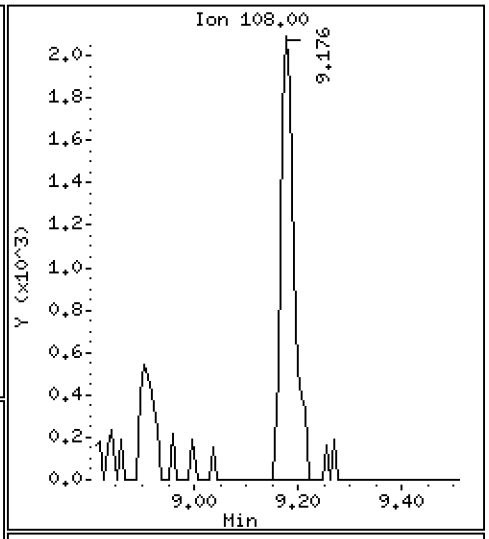
Concentration: 0.1376 ug/mL

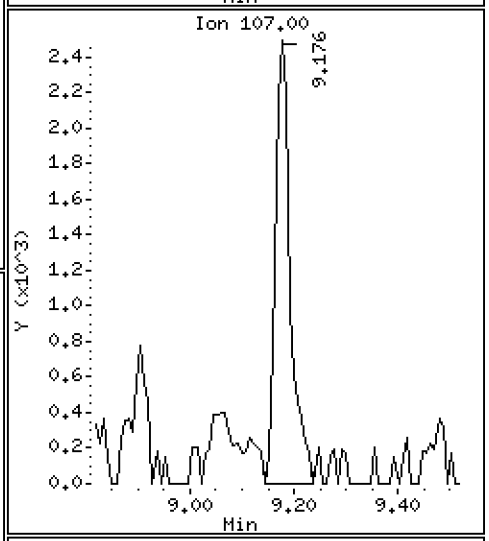


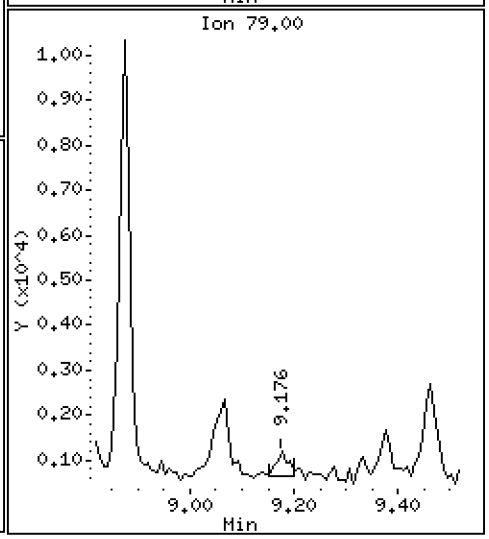












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

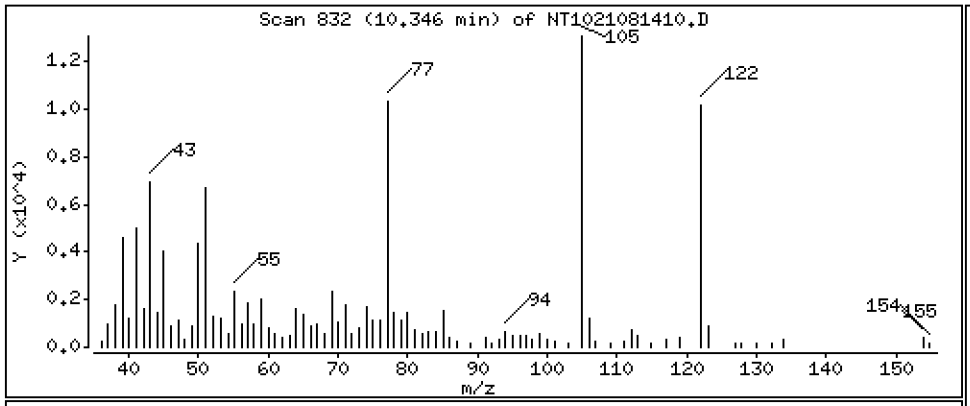
Operator: VTS

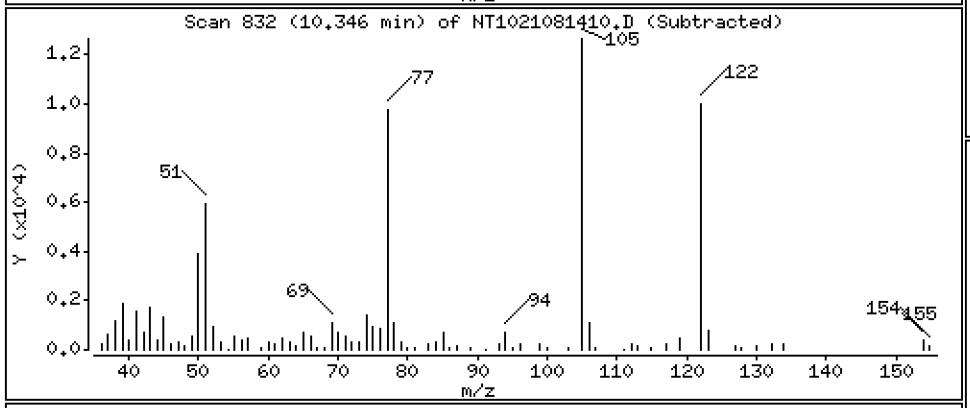
Column phase: ZB-5msi

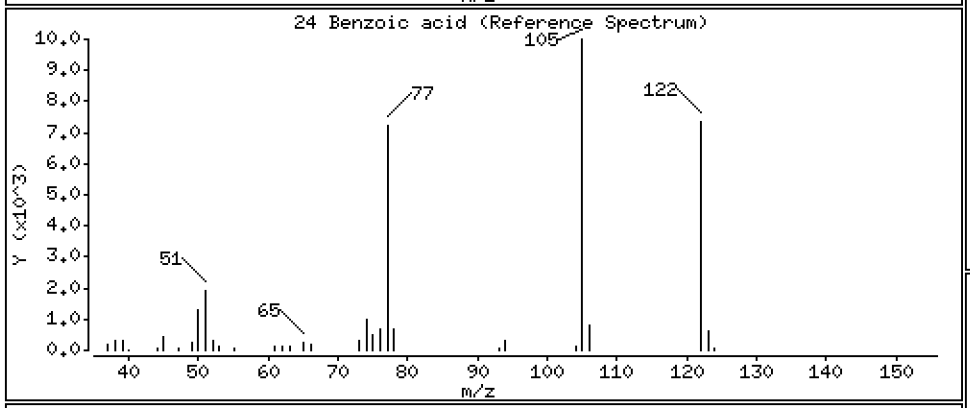
Column diameter: 0.25

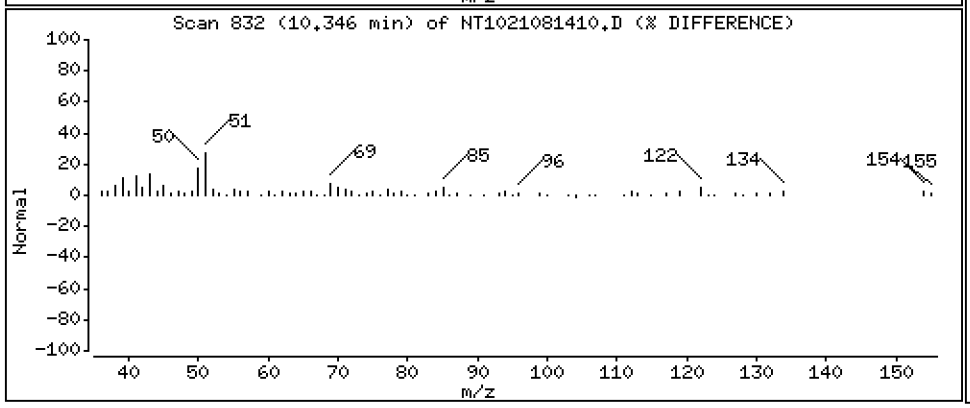
24 Benzoic acid

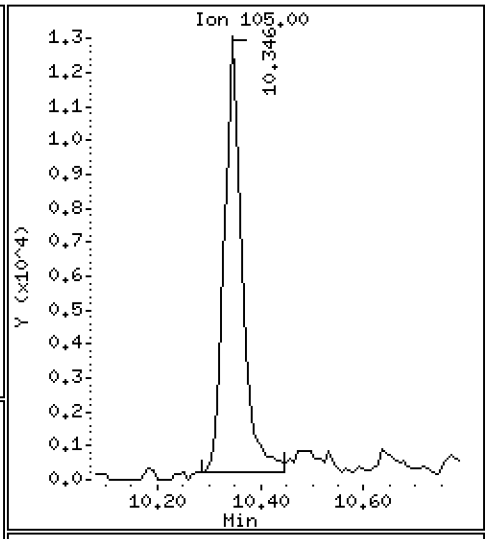
Concentration: 1.811 ug/mL

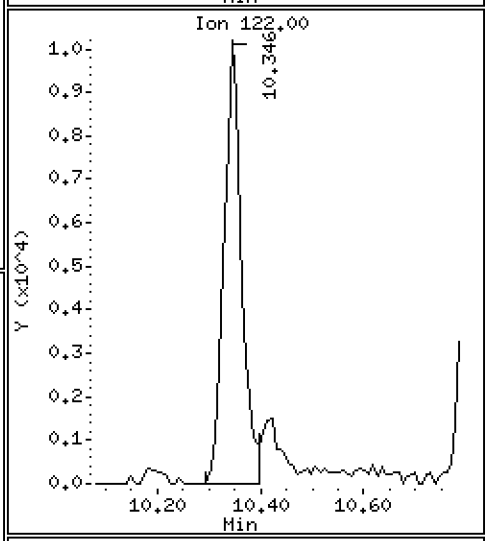


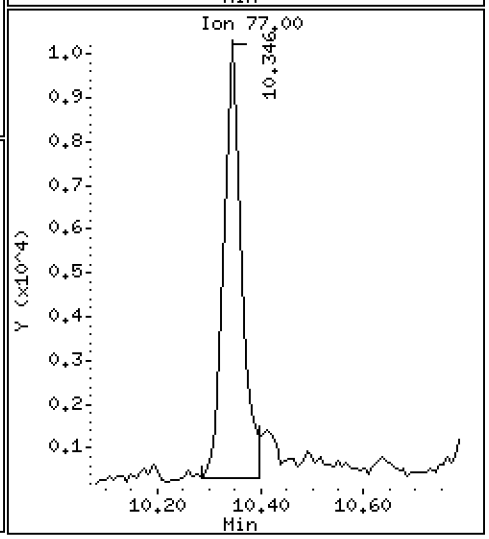












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

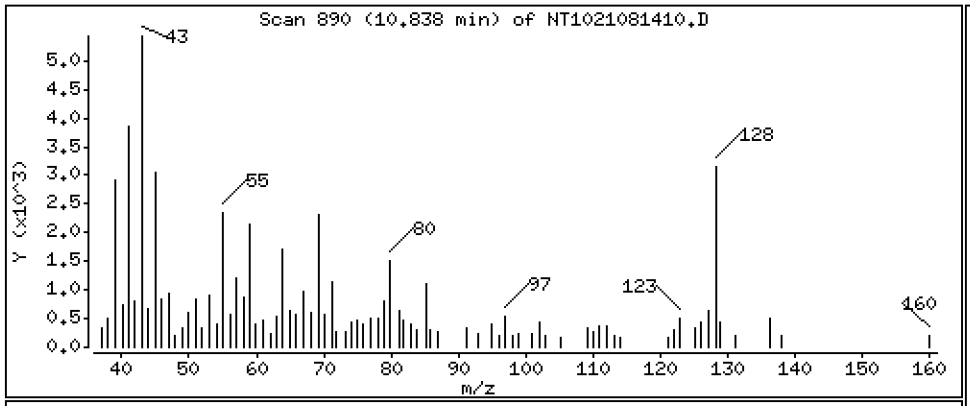
Operator: VTS

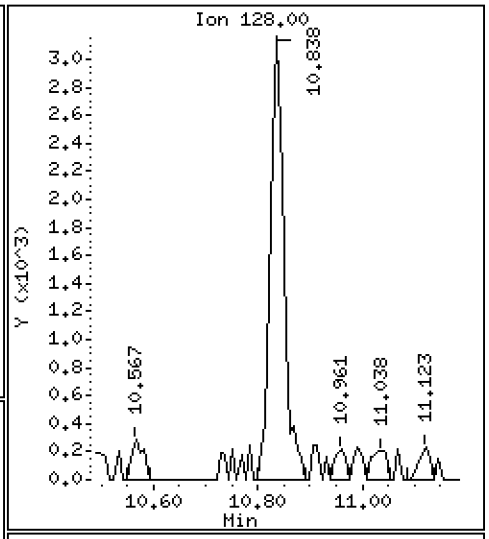
Column phase: ZB-5msi

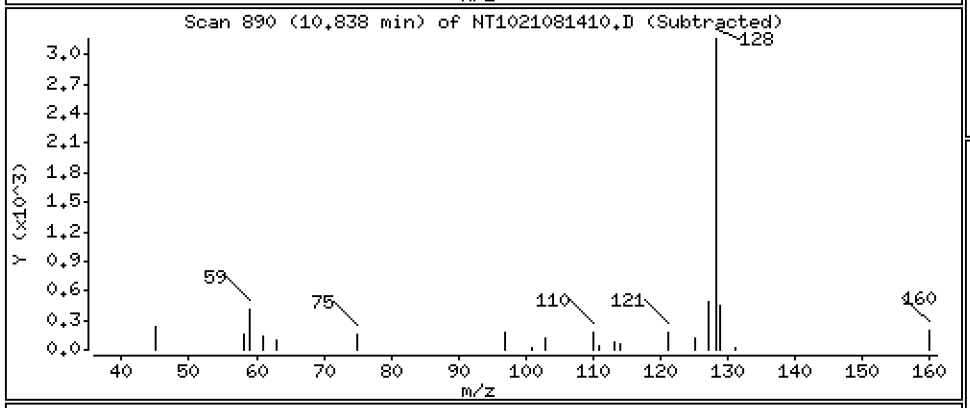
Column diameter: 0.25

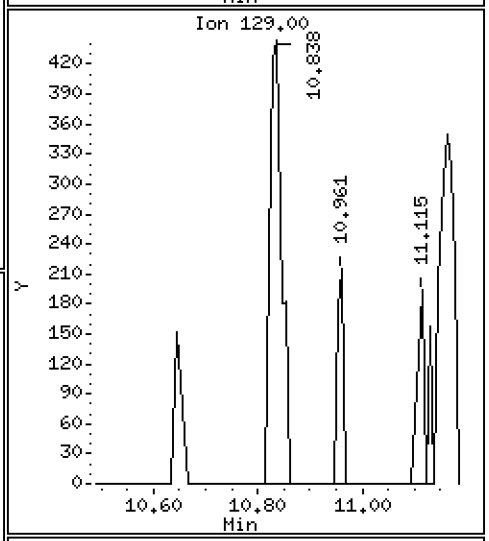
28 Naphthalene

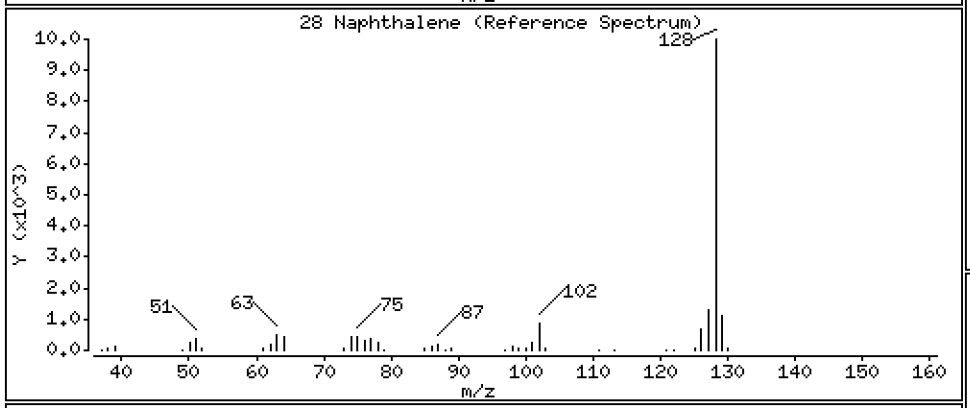
Concentration: 0.06430 ug/mL

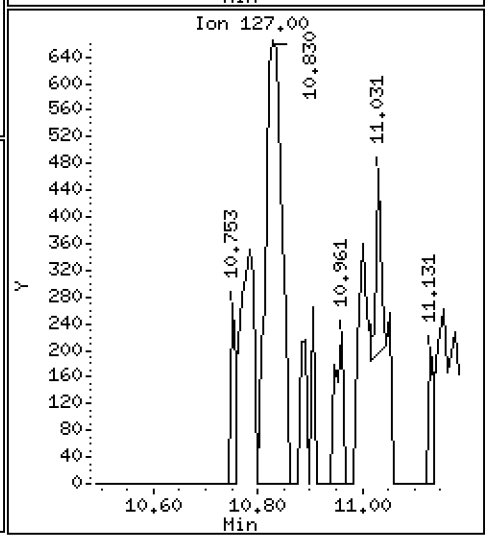


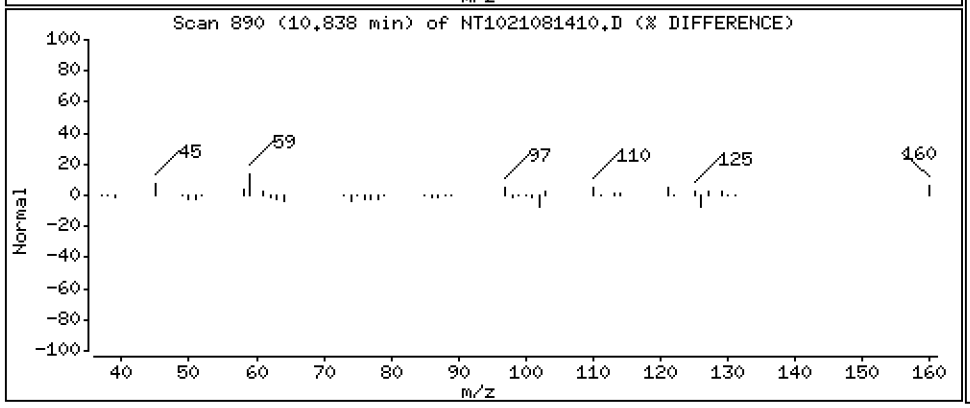












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

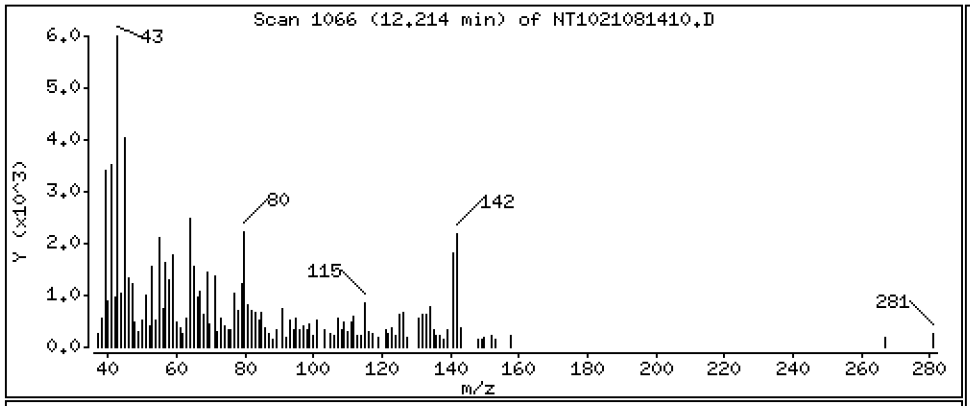
Operator: VTS

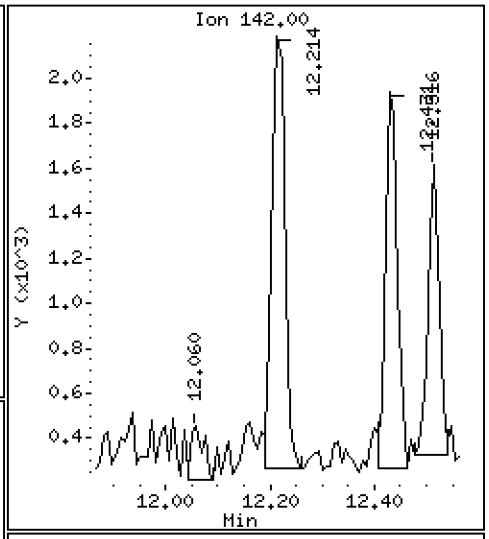
Column phase: ZB-5msi

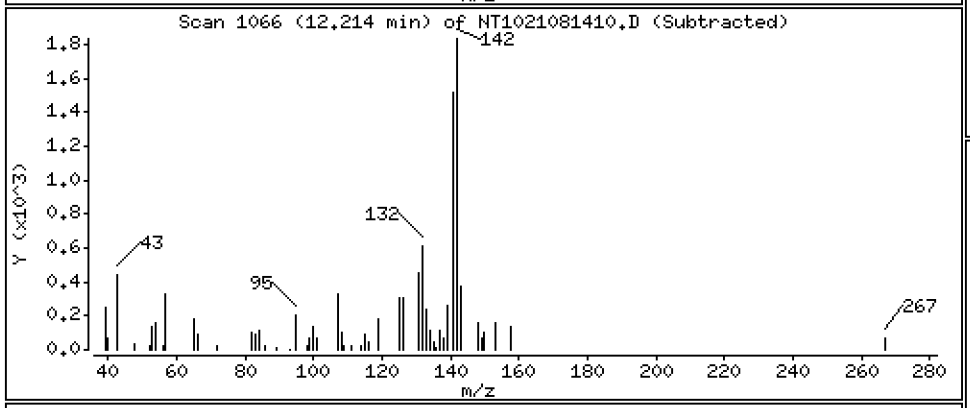
Column diameter: 0.25

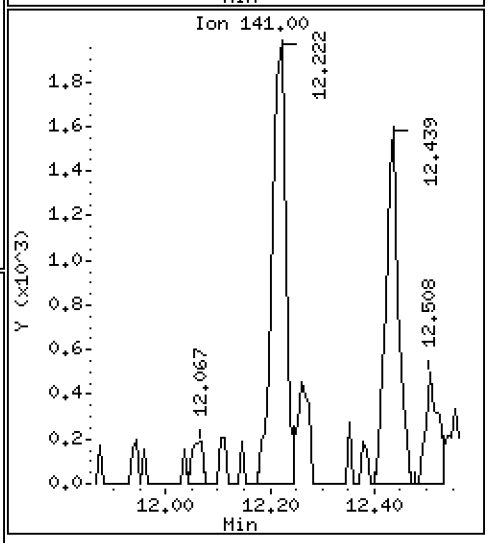
32 2-Methylnaphthalene

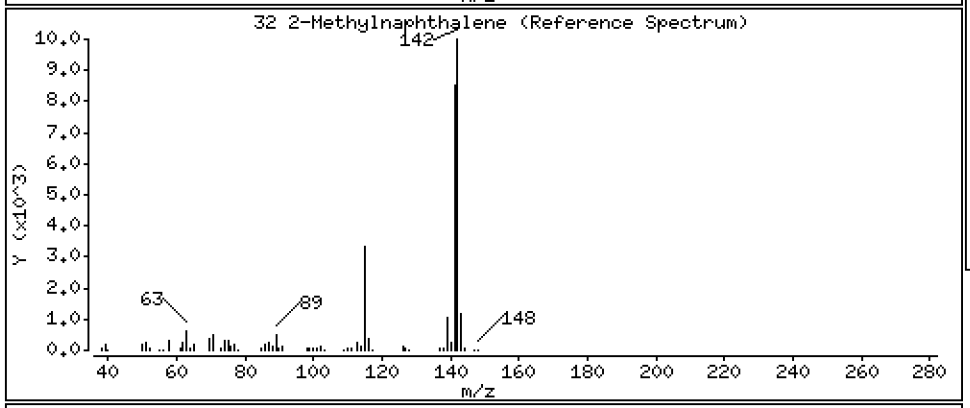
Concentration: 0.04097 ug/mL

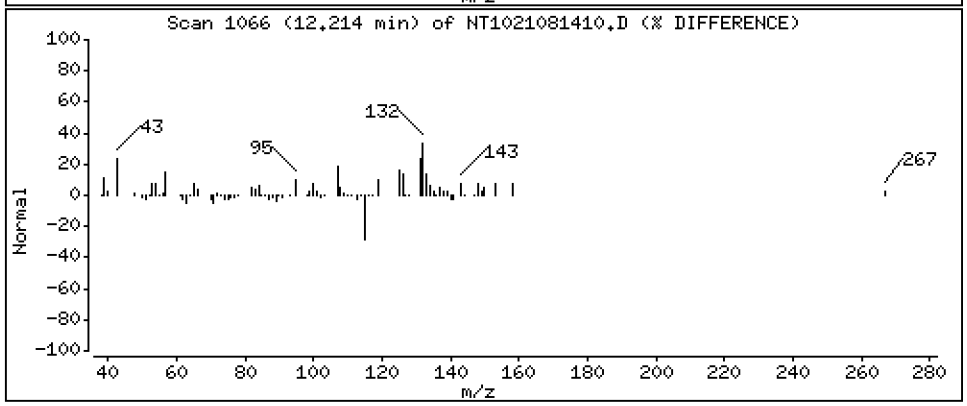












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

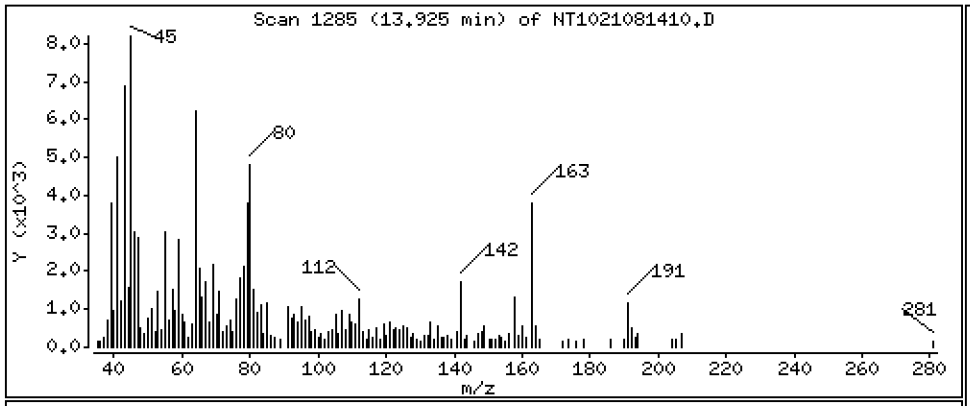
Operator: VTS

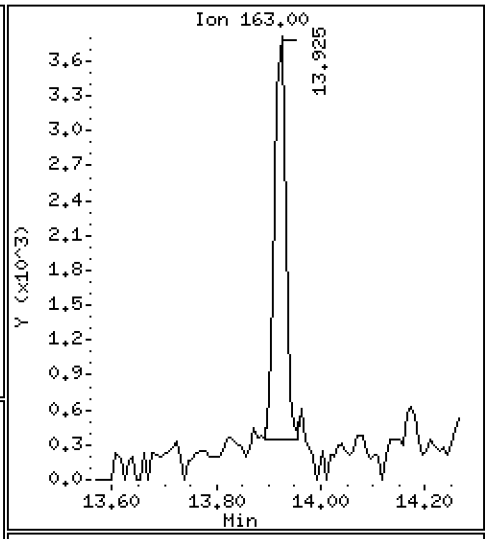
Column phase: ZB-5msi

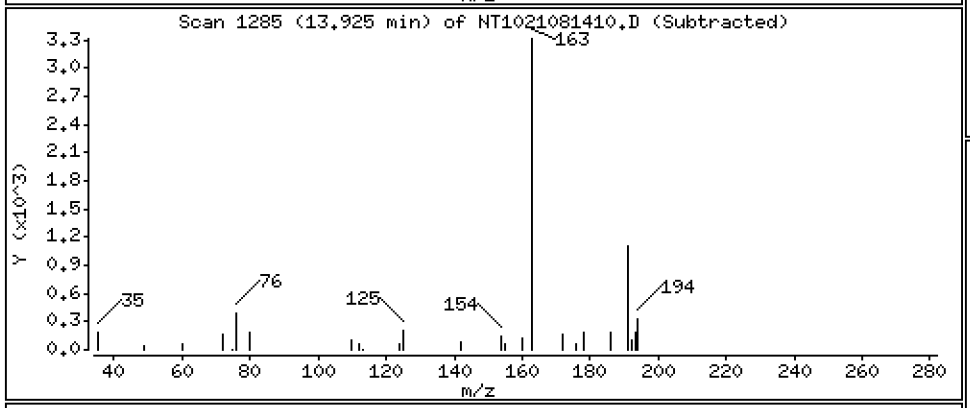
Column diameter: 0.25

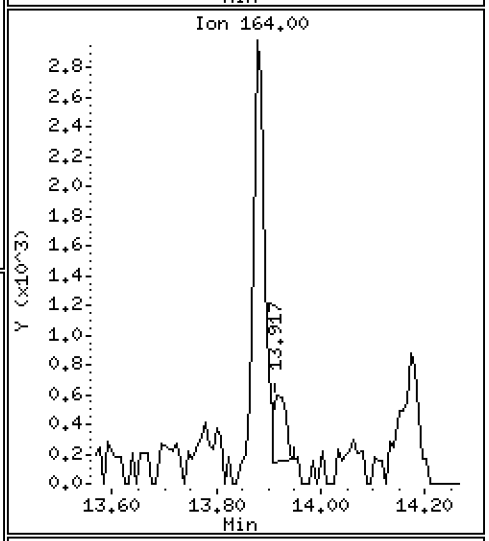
39 Dimethylphthalate

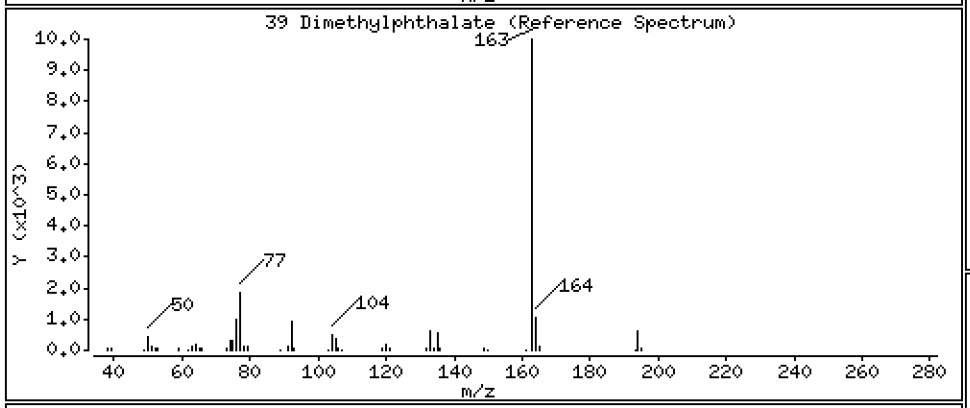
Concentration: 0.08068 ug/mL

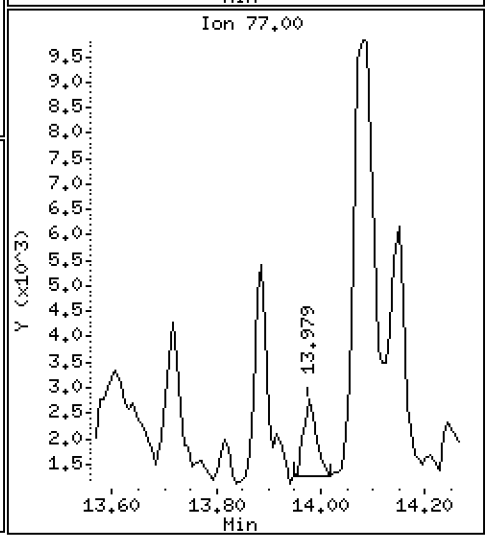


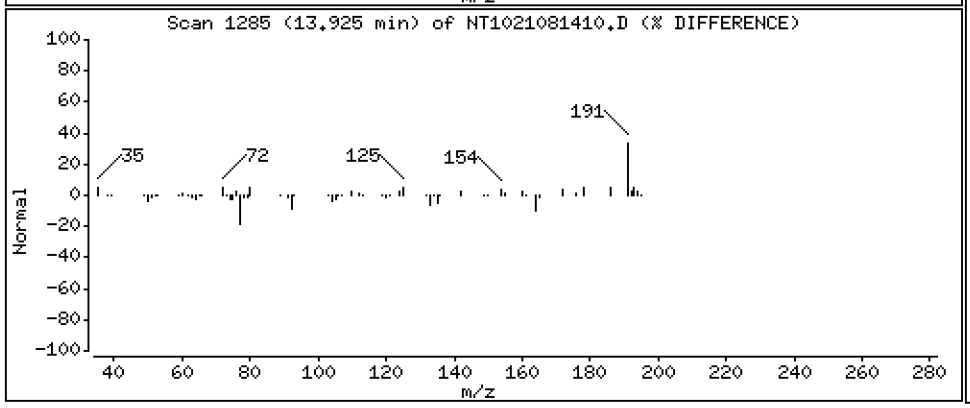












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

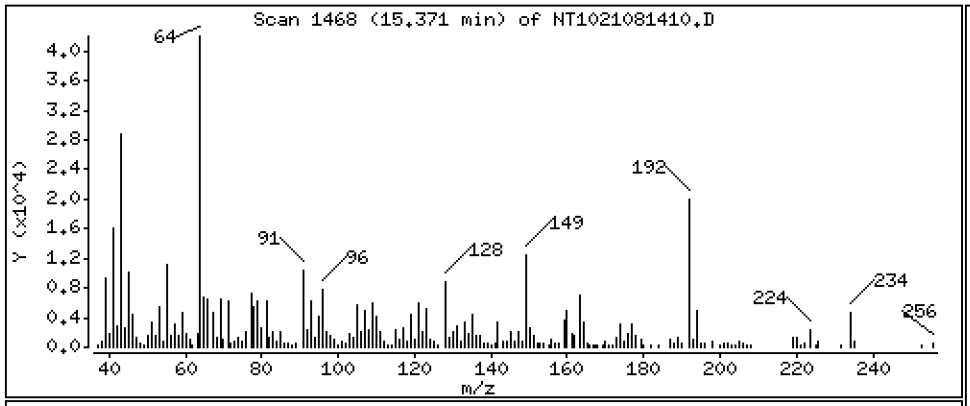
Operator: VTS

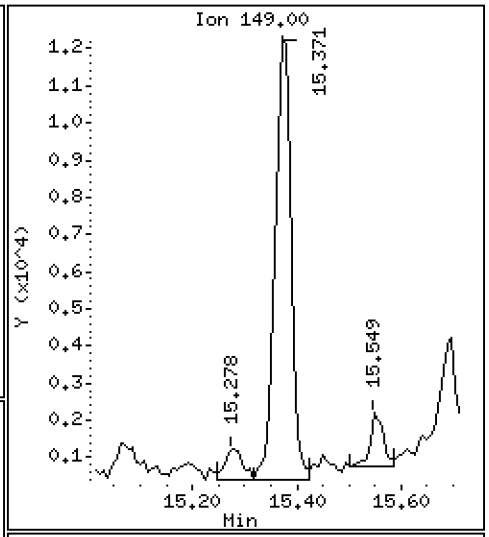
Column phase: ZB-5msi

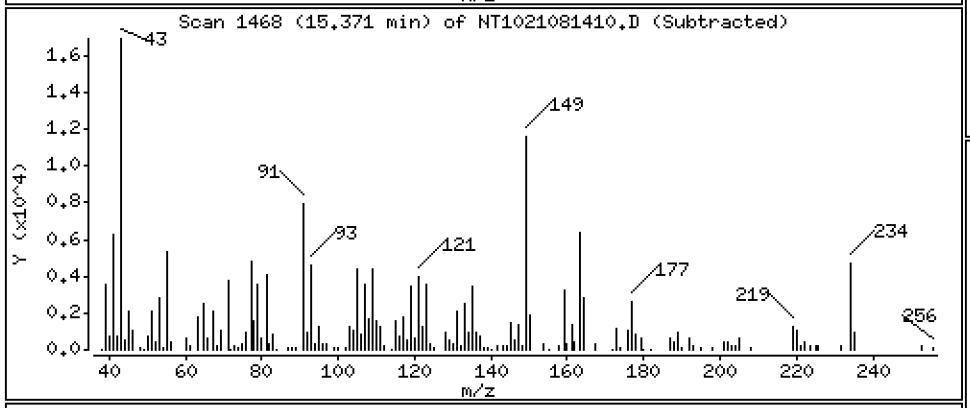
Column diameter: 0.25

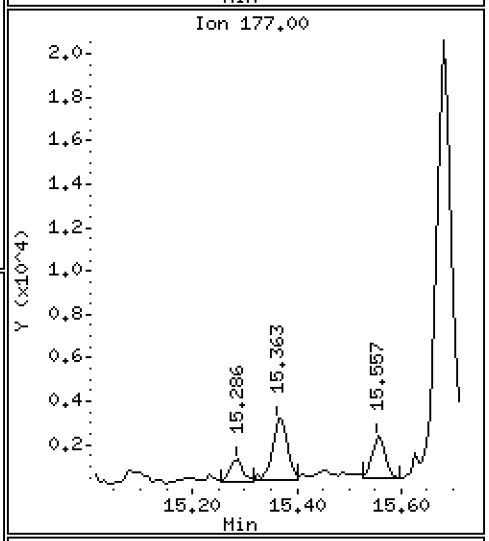
50 Diethylphthalate

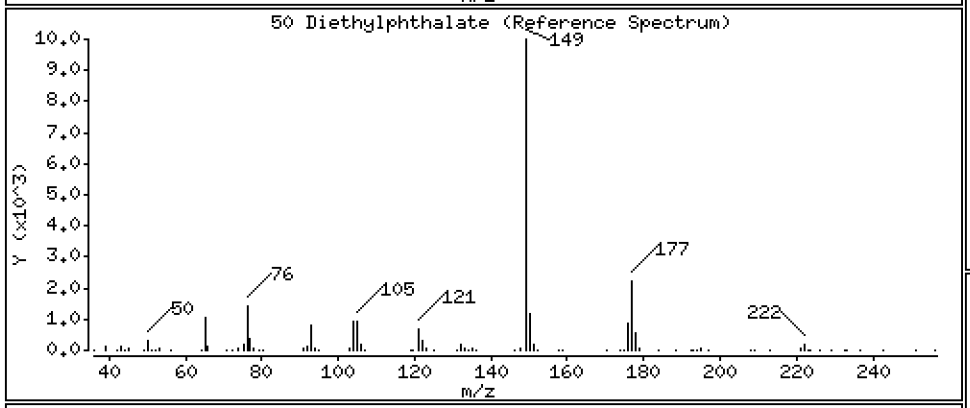
Concentration: 0.4408 ug/mL

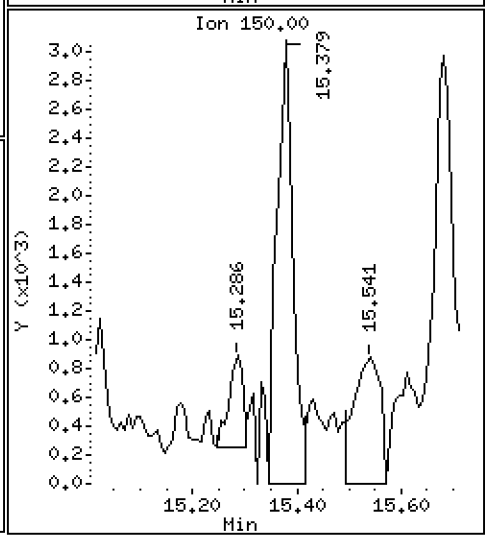


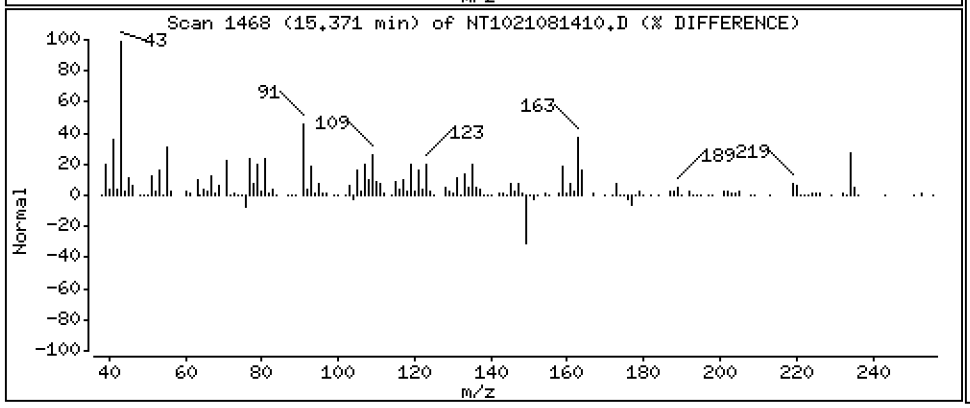












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

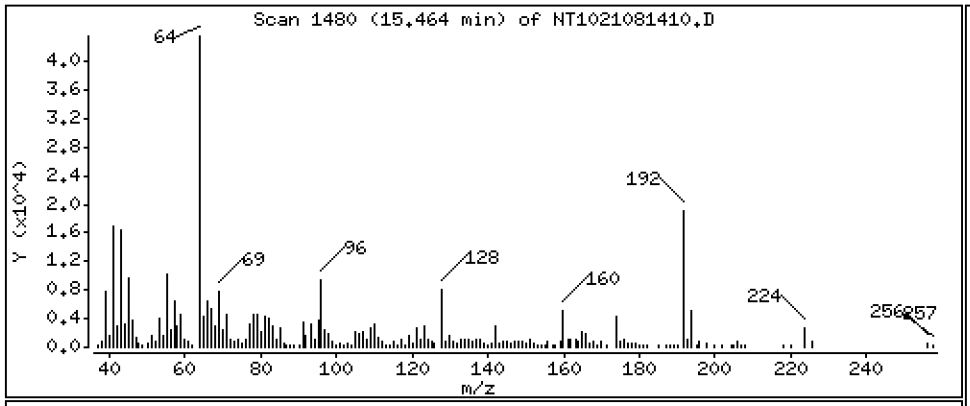
Operator: VTS

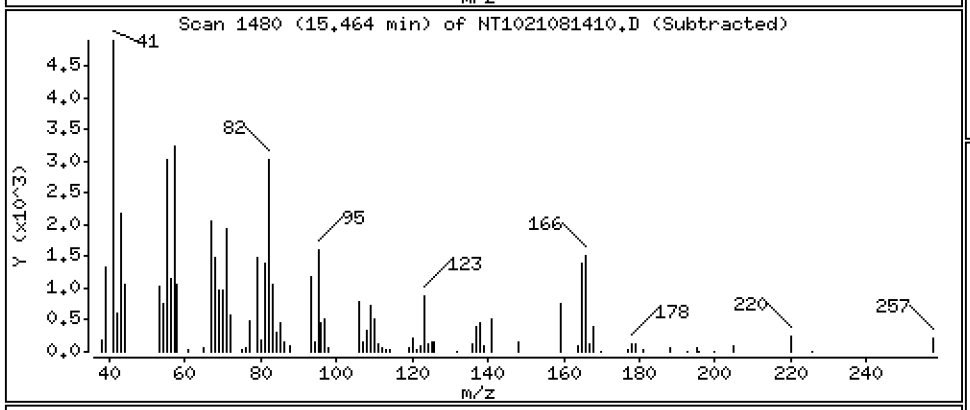
Column phase: ZB-5msi

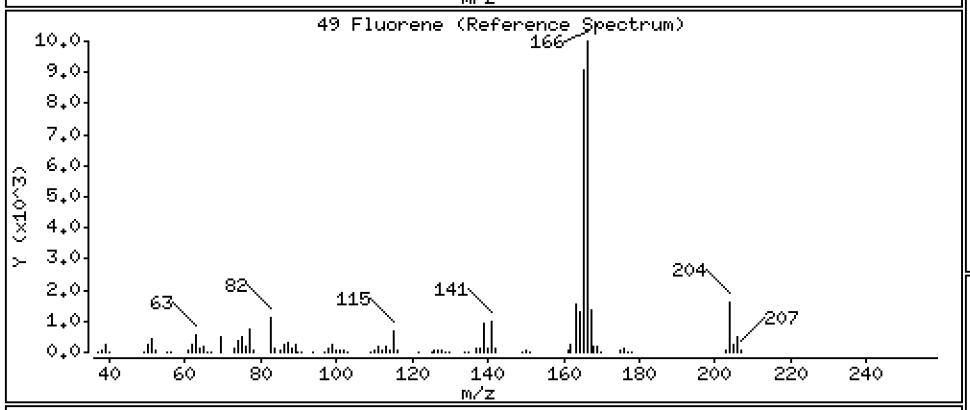
Column diameter: 0.25

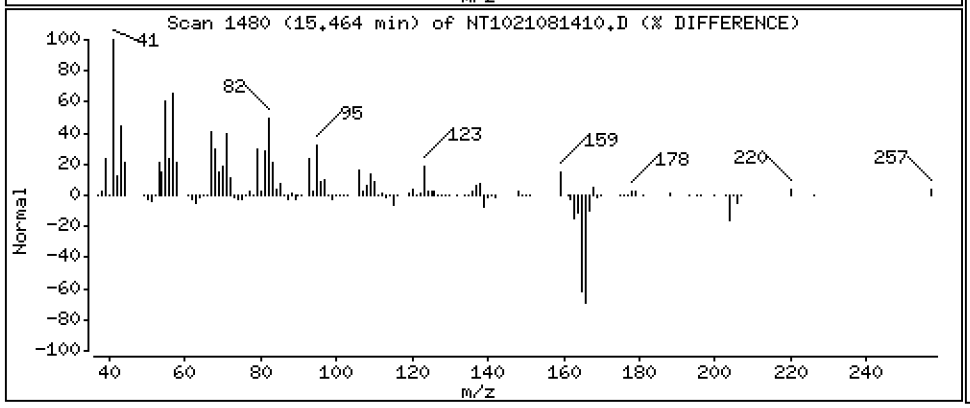
49 Fluorene

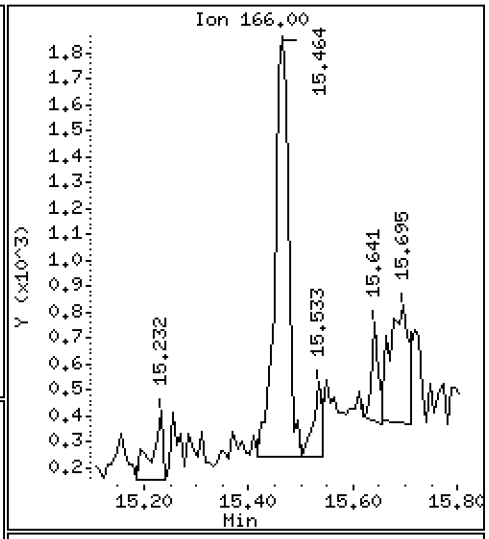
Concentration: 0.03927 ug/mL

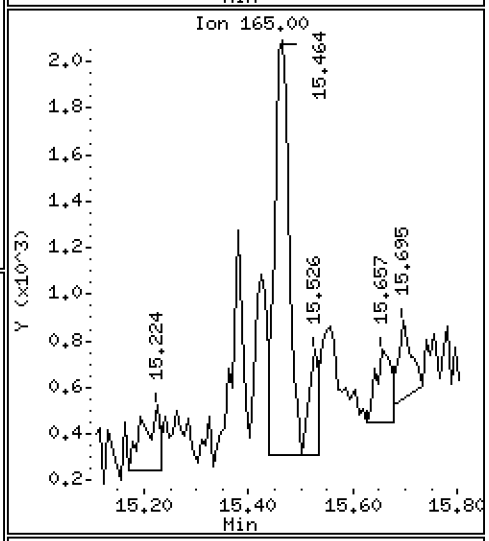


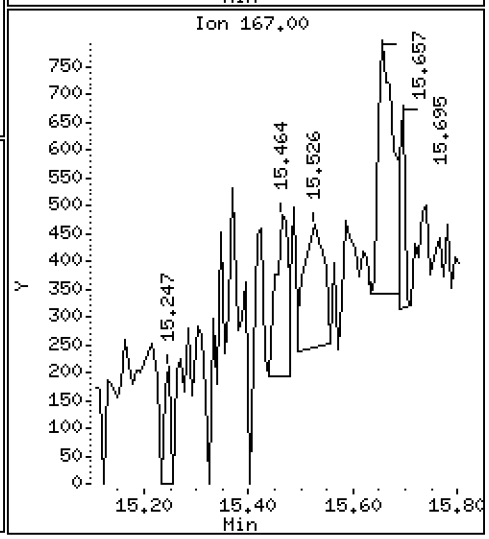












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

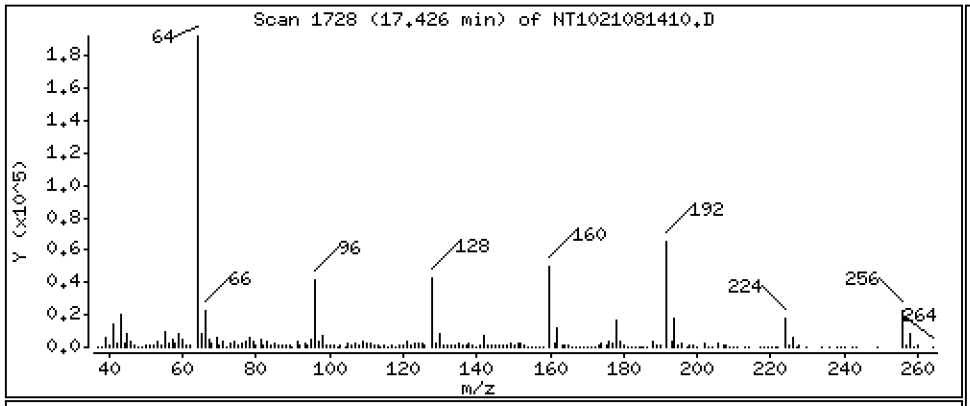
Operator: VTS

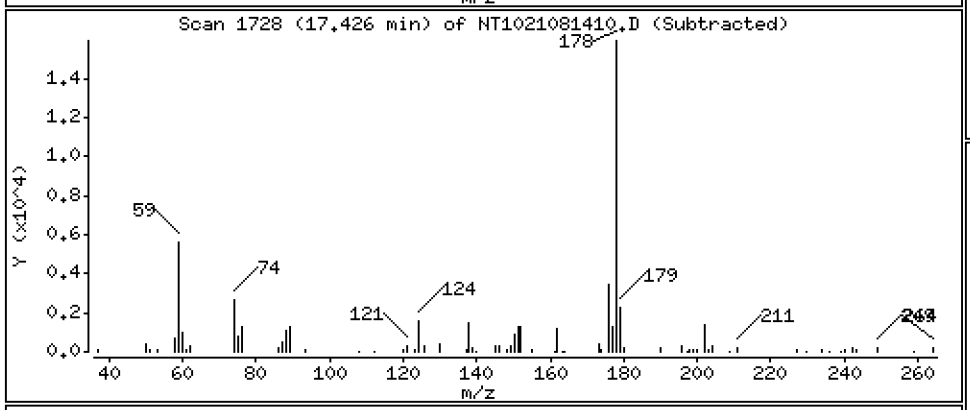
Column phase: ZB-5msi

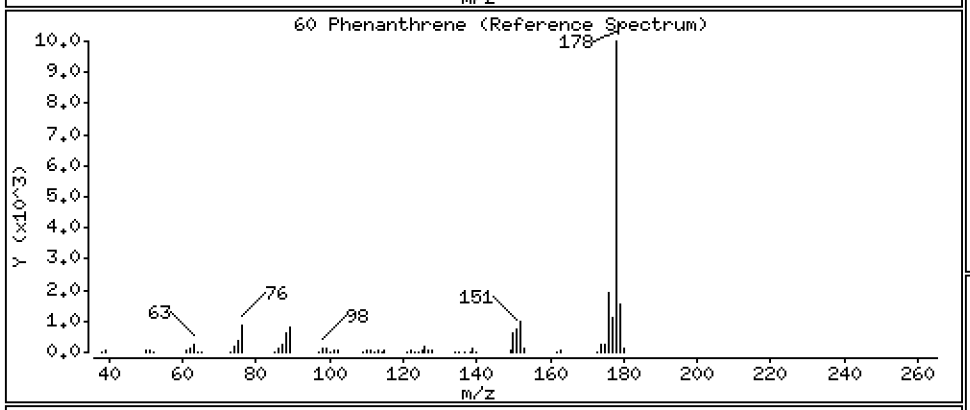
Column diameter: 0.25

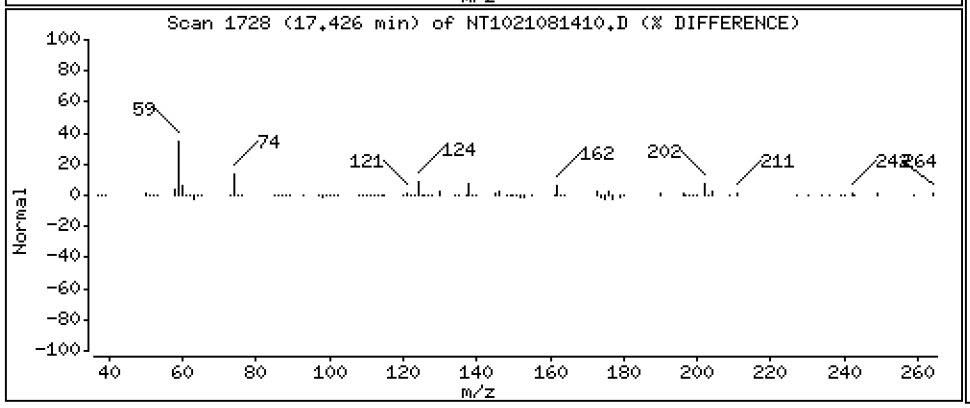
60 Phenanthrene

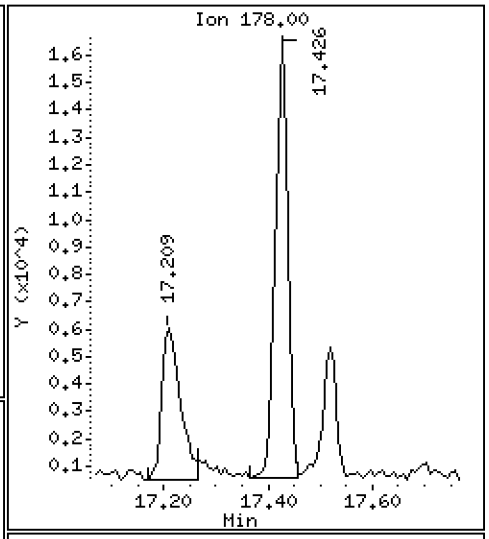
Concentration: 0.3303 ug/mL

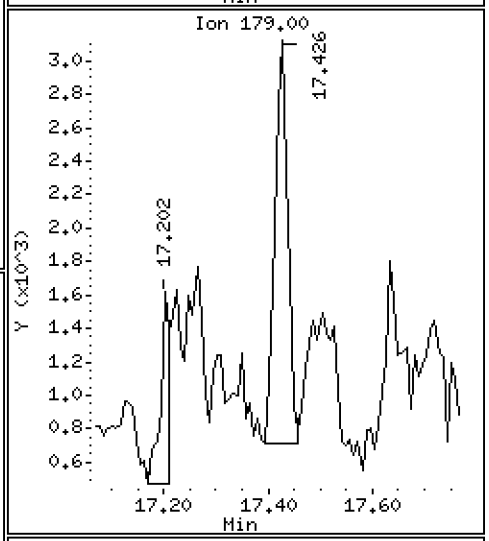


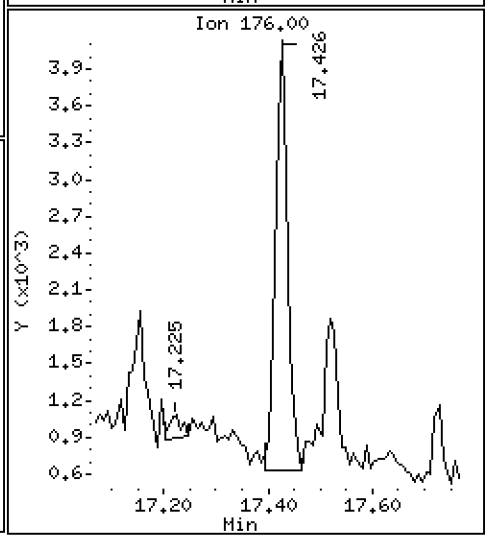












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

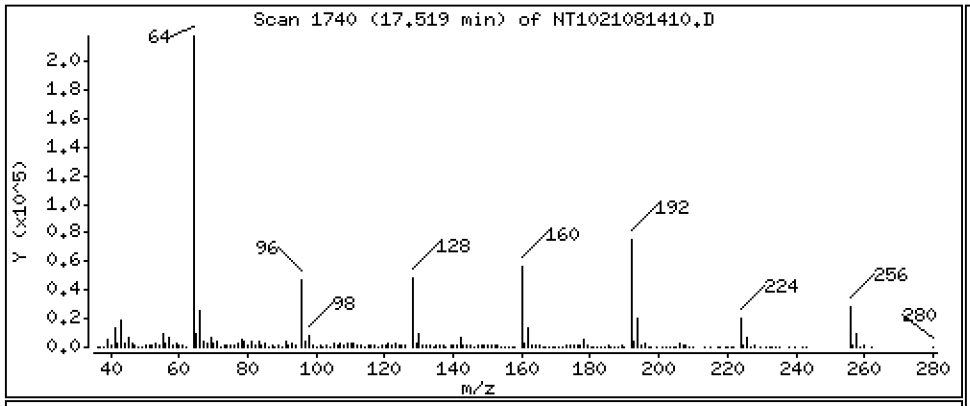
Operator: VTS

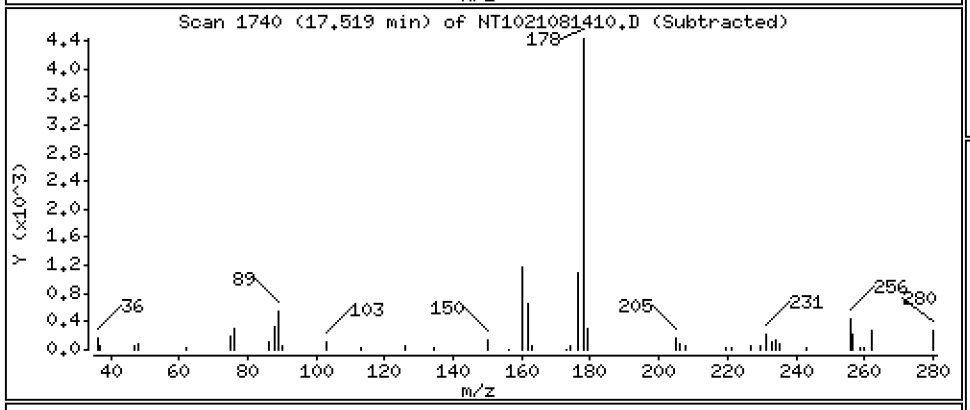
Column phase: ZB-5msi

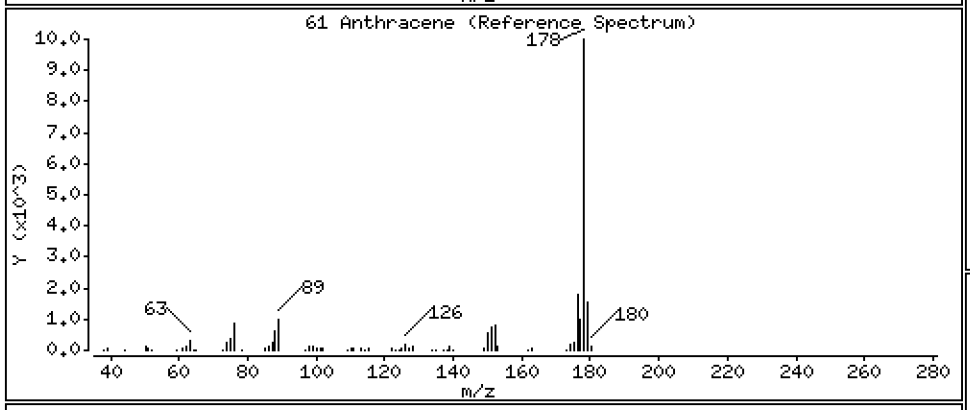
Column diameter: 0.25

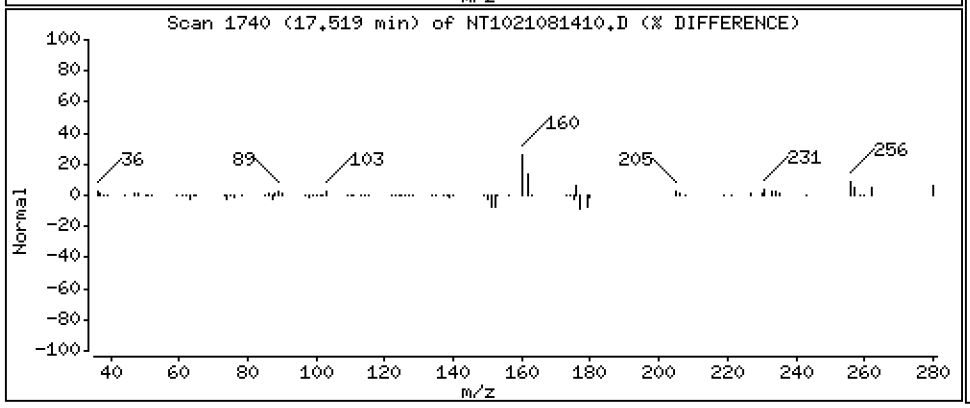
61 Anthracene

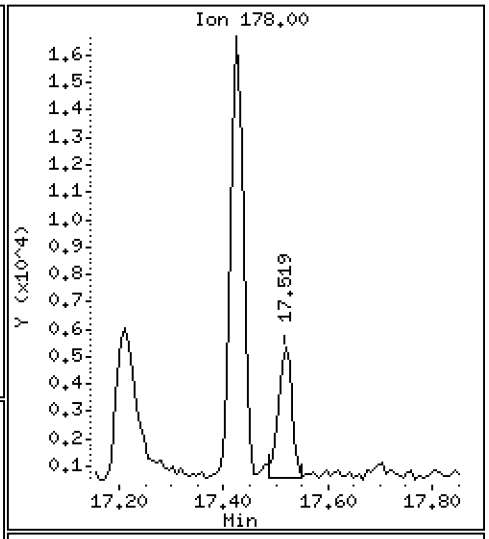
Concentration: 0.09933 ug/mL

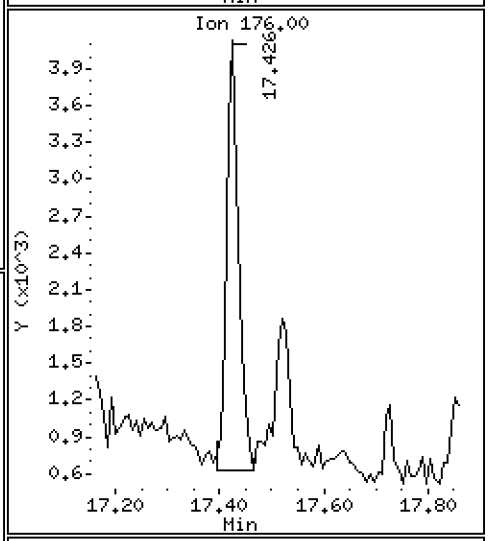


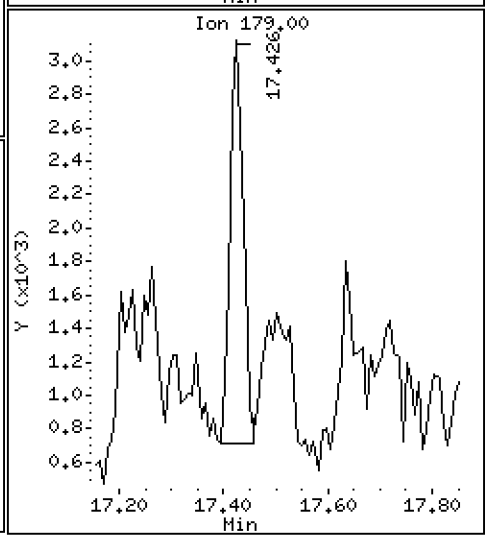












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

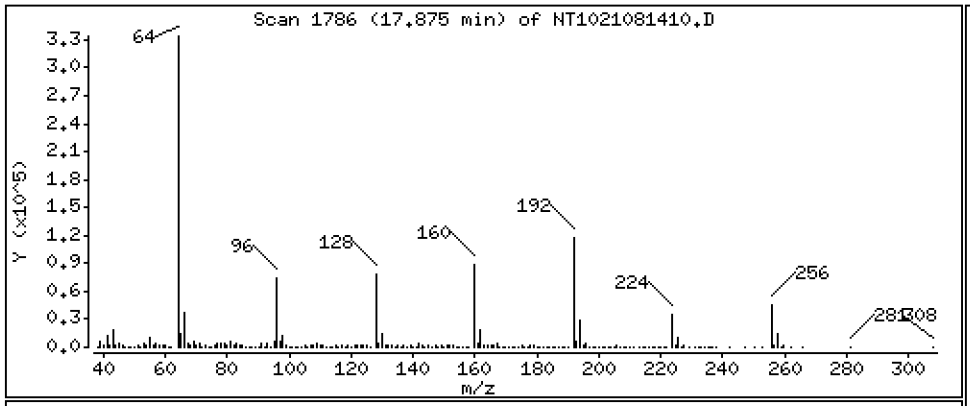
Operator: VTS

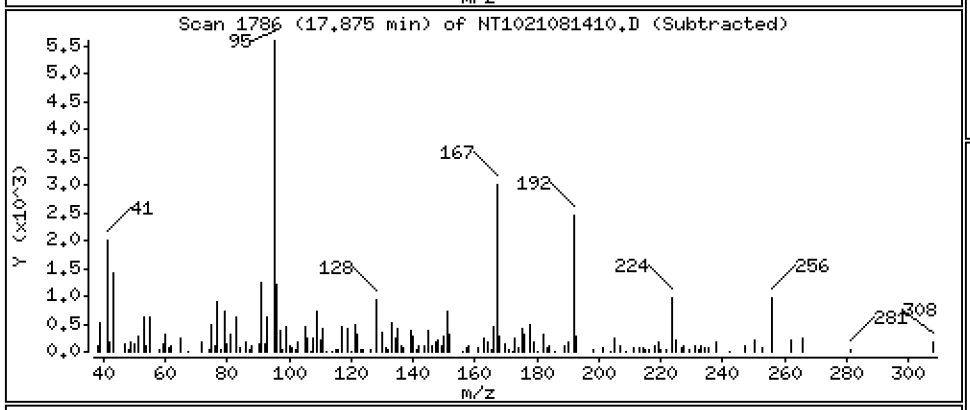
Column phase: ZB-5msi

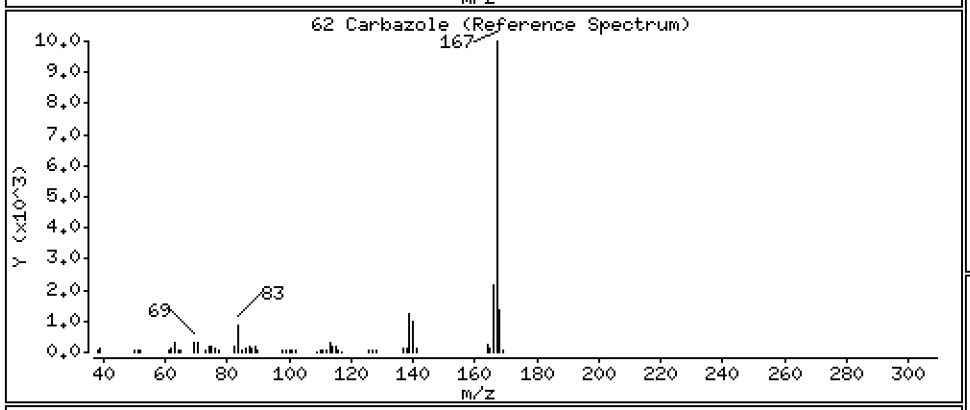
Column diameter: 0.25

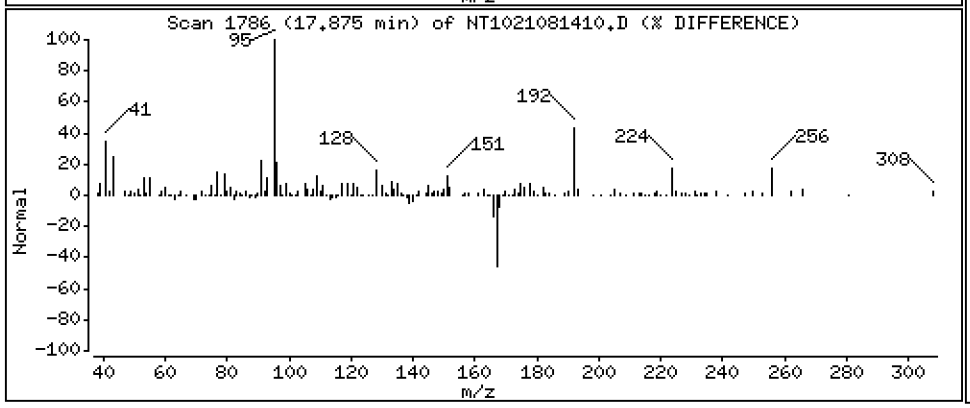
62 Carbazole

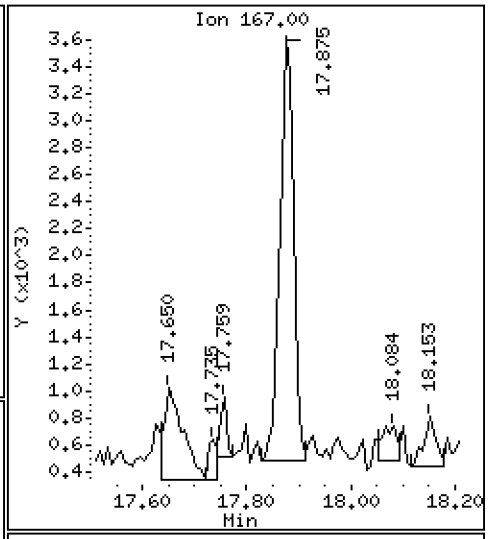
Concentration: 0.06832 ug/mL

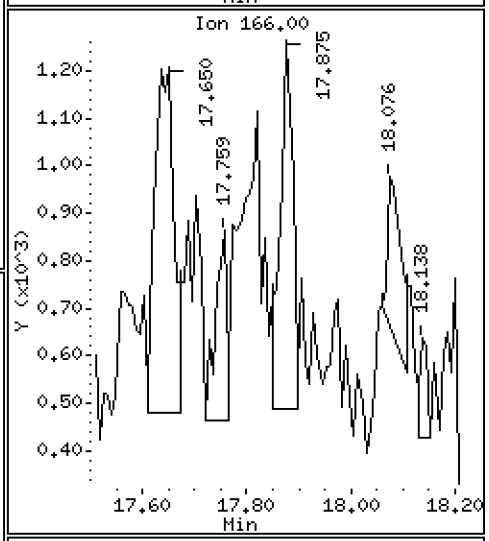


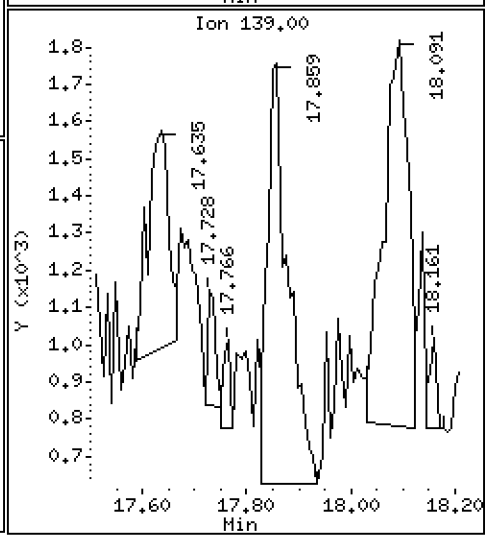












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

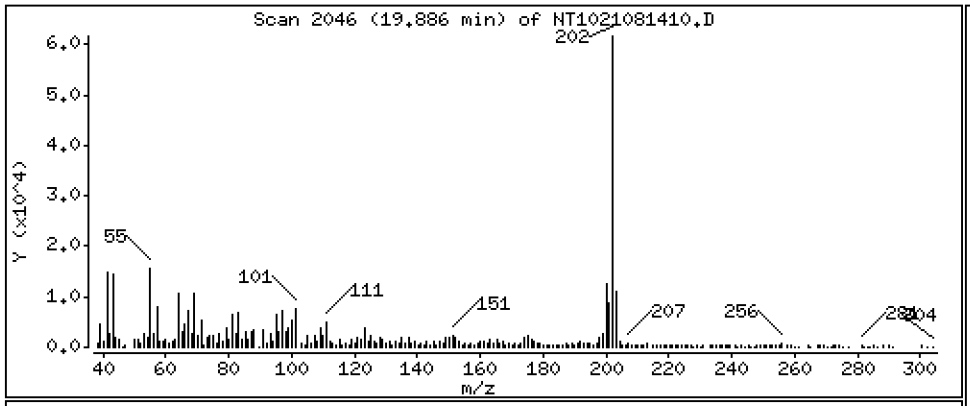
Operator: VTS

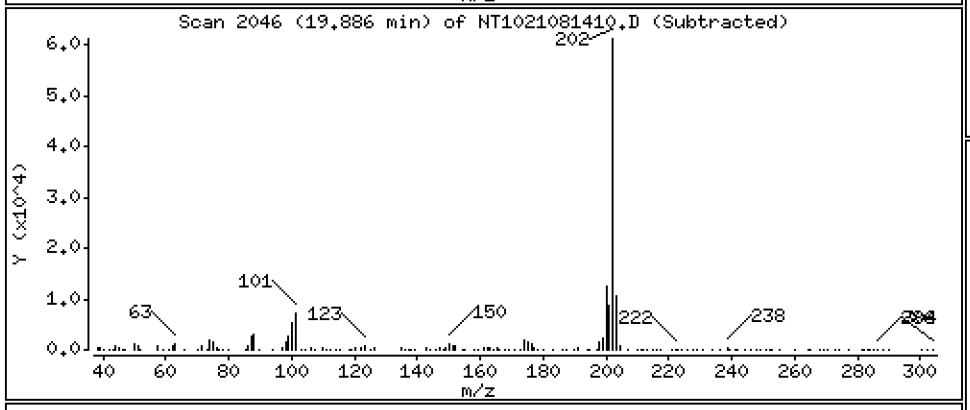
Column phase: ZB-5msi

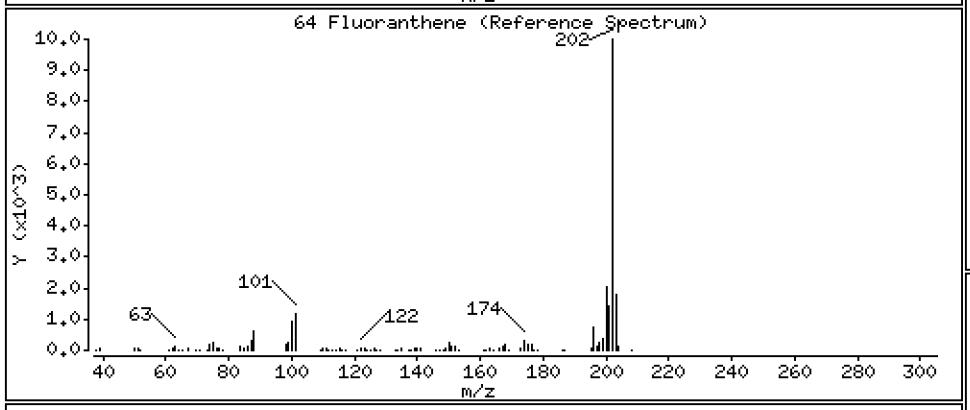
Column diameter: 0.25

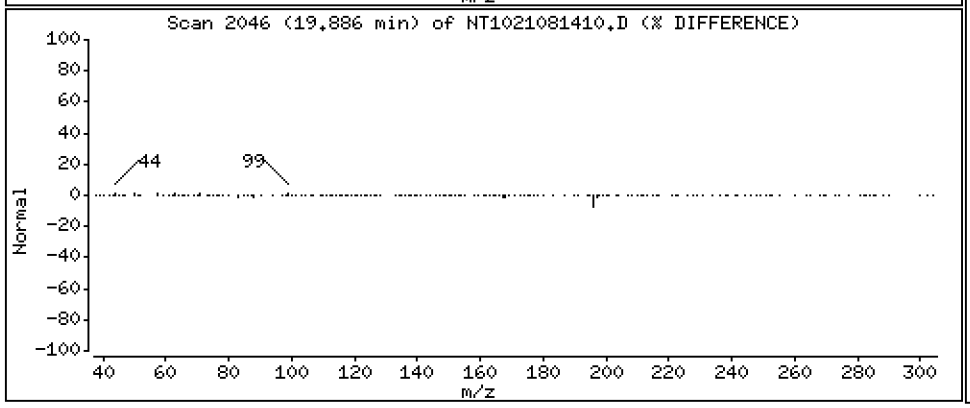
64 Fluoranthene

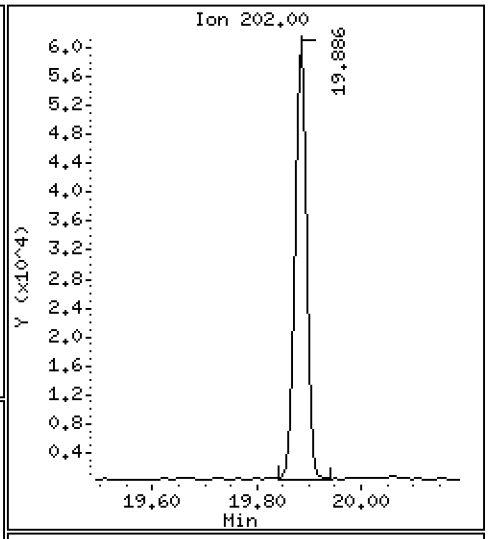
Concentration: 1.332 ug/mL

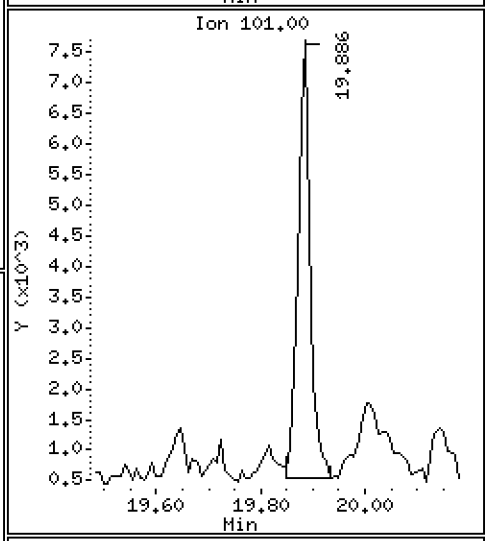


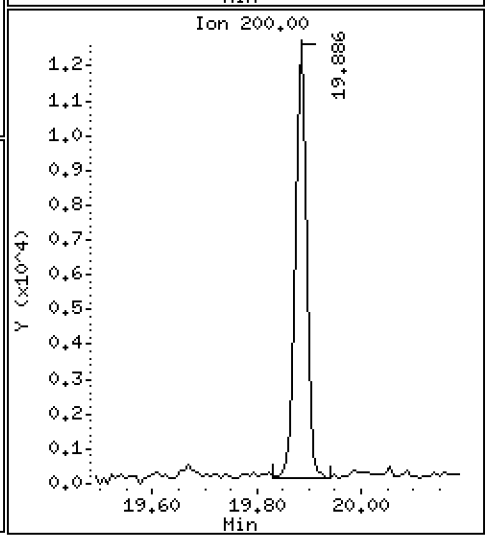












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

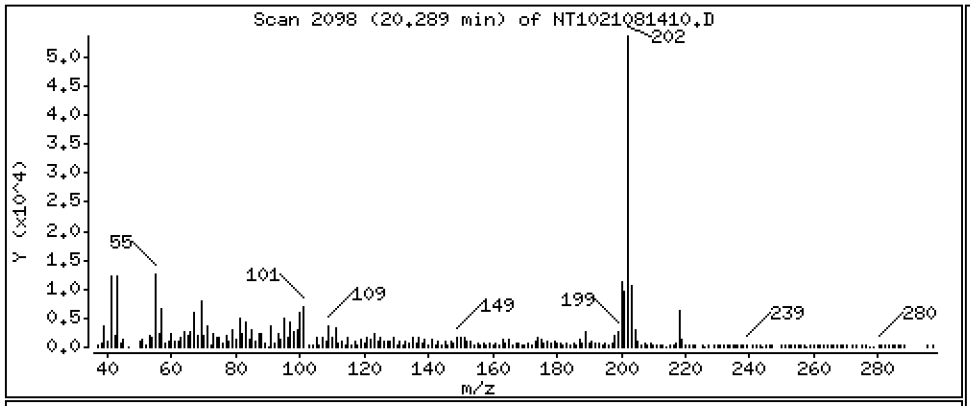
Operator: VTS

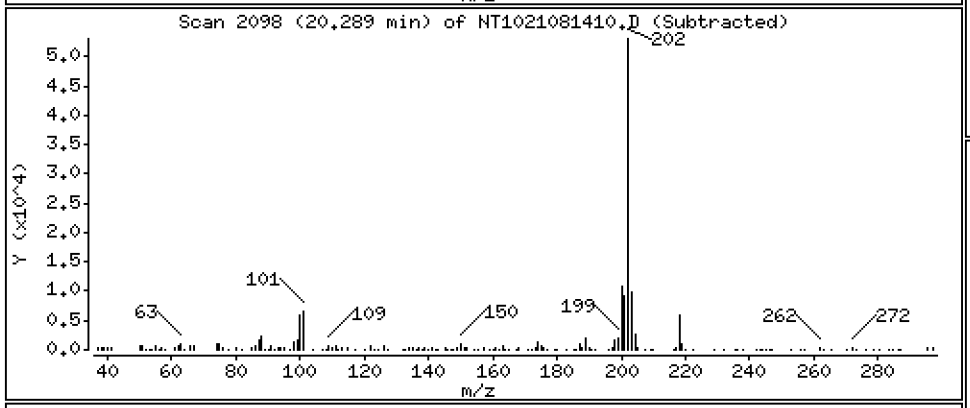
Column phase: ZB-5msi

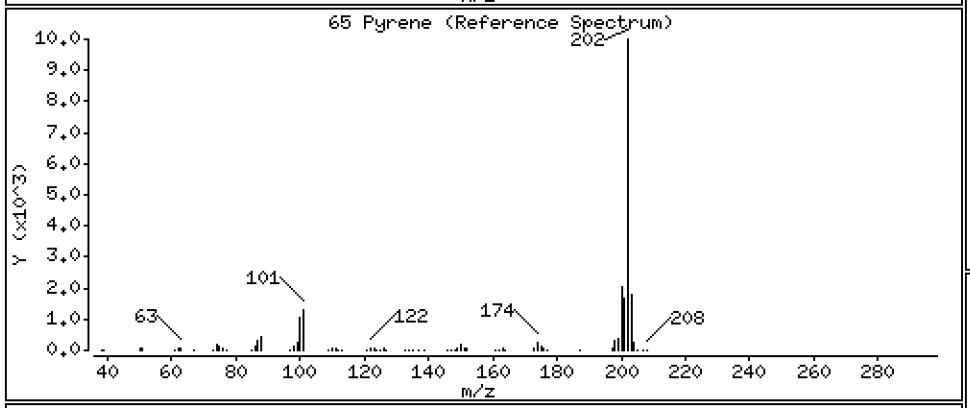
Column diameter: 0.25

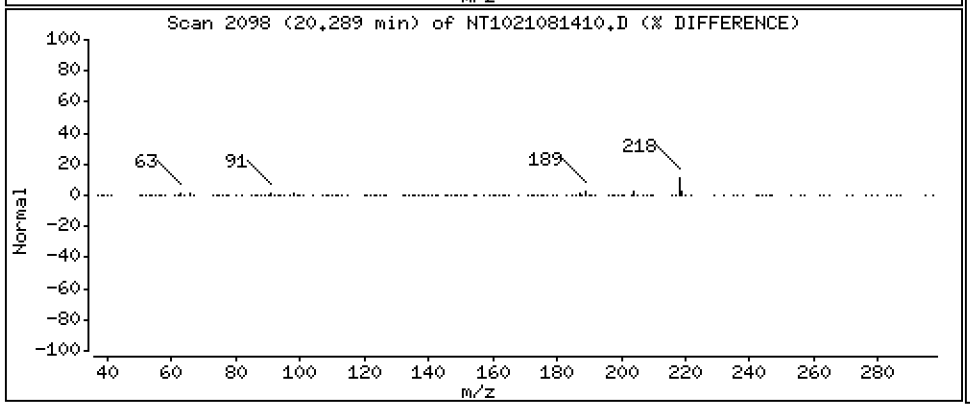
65 Pyrene

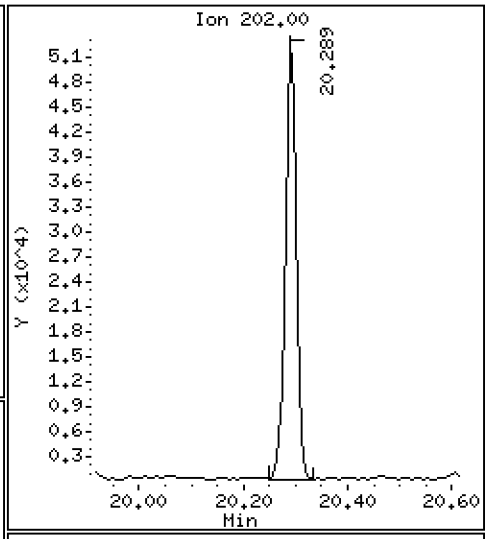
Concentration: 0.9626 ug/mL

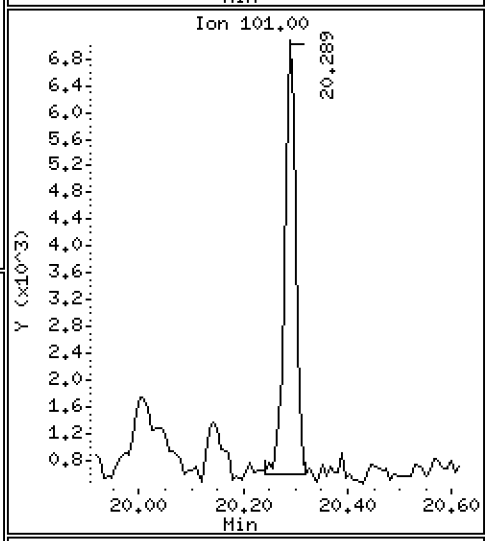


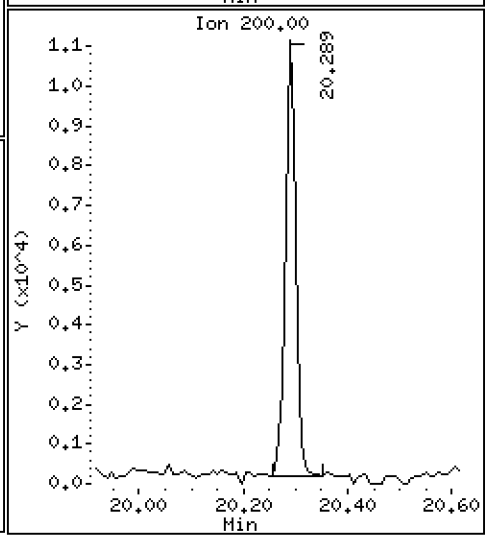












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

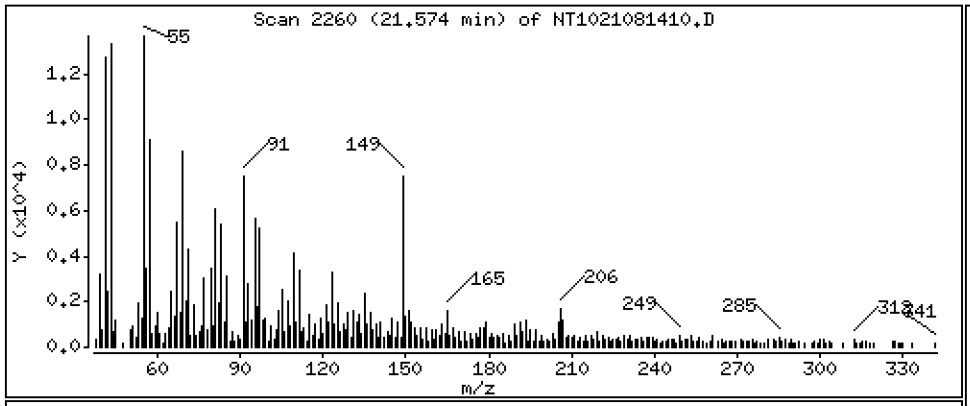
Operator: VTS

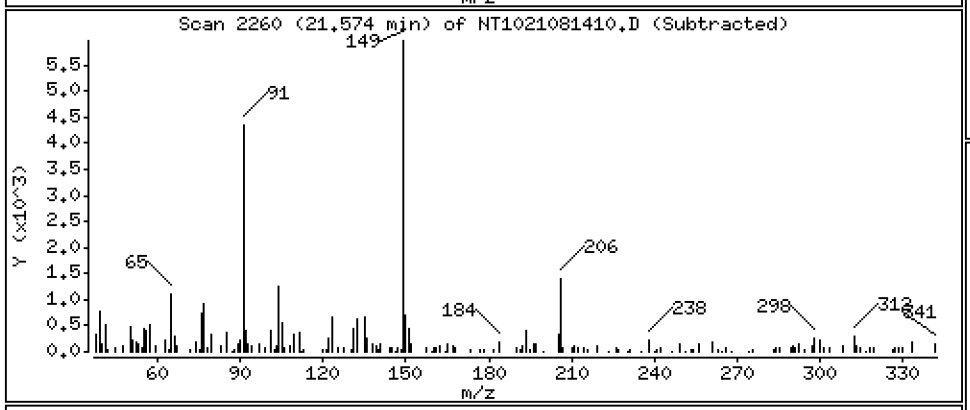
Column phase: ZB-5msi

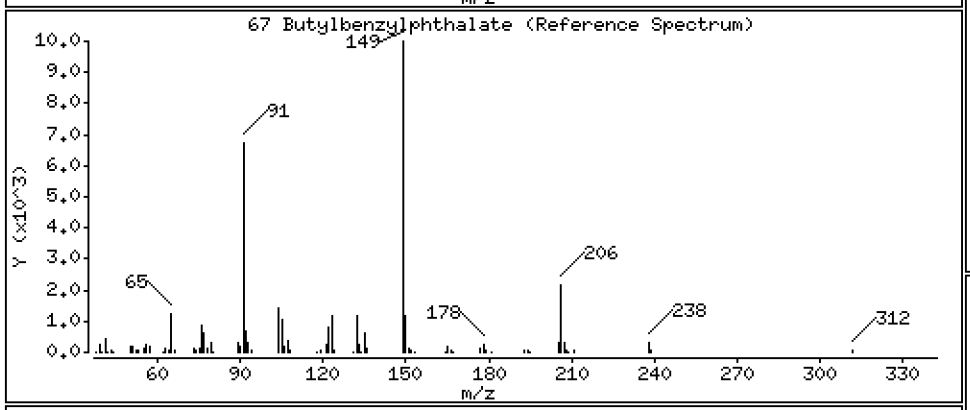
Column diameter: 0.25

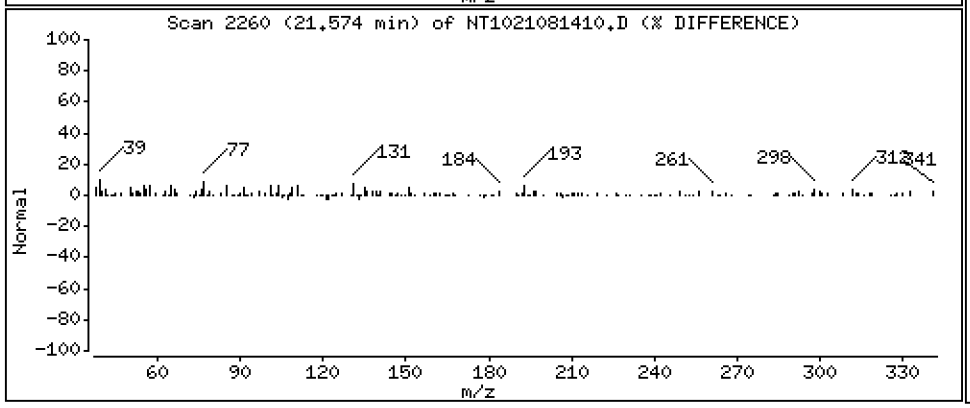
67 Butylbenzylphthalate

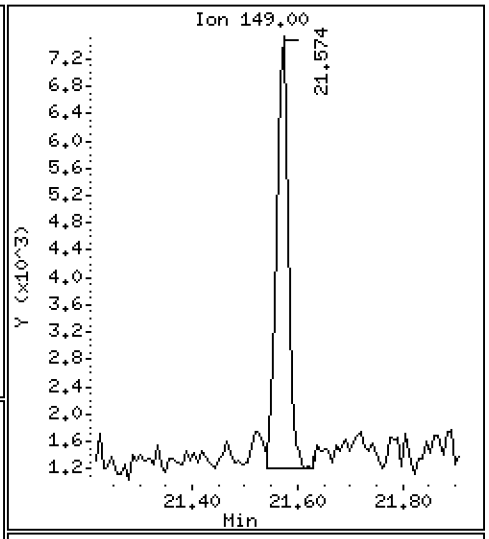
Concentration: 0.3597 ug/mL

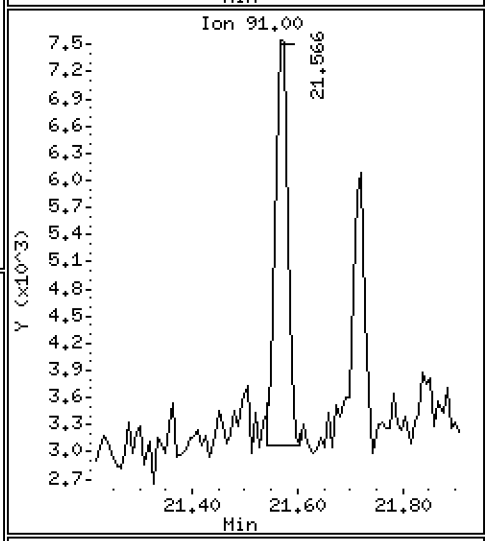


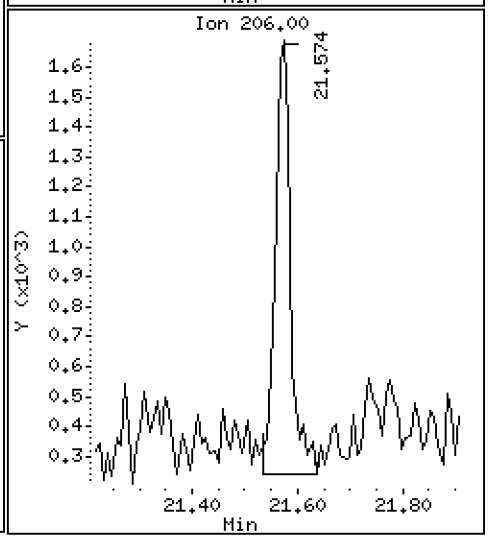












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

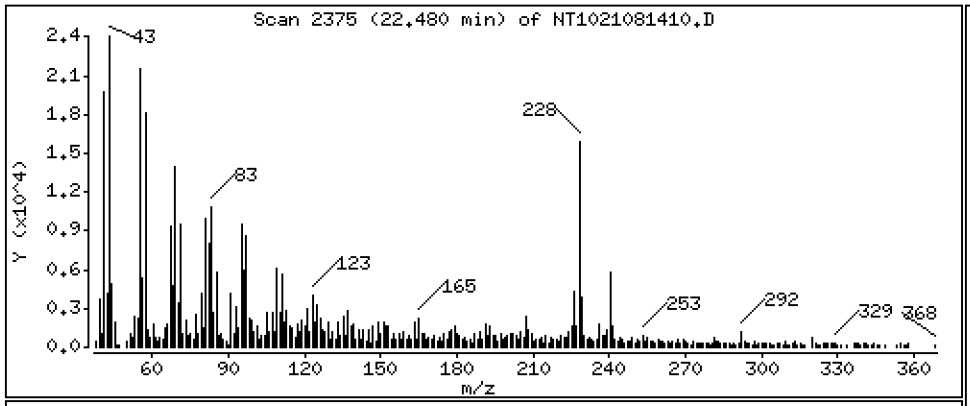
Operator: VTS

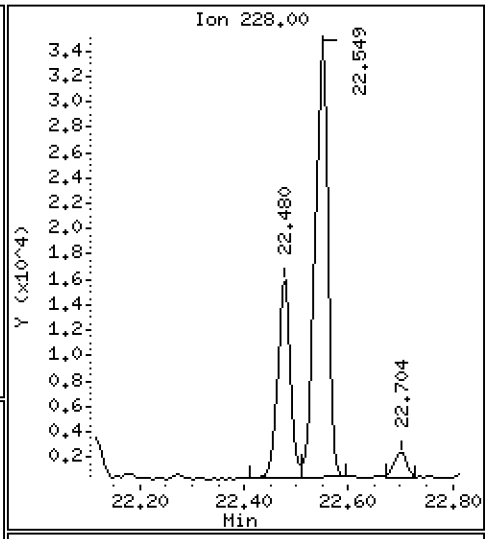
Column phase: ZB-5msi

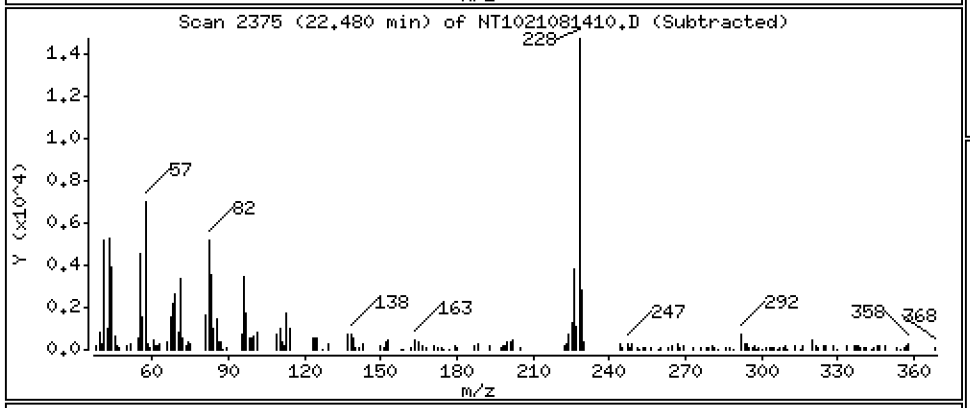
Column diameter: 0.25

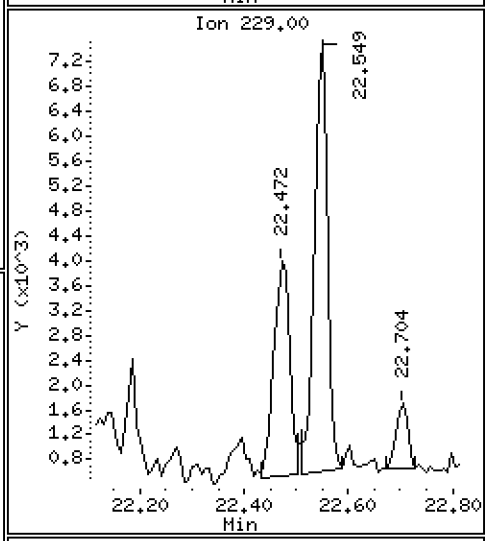
68 Benzo(a)anthracene

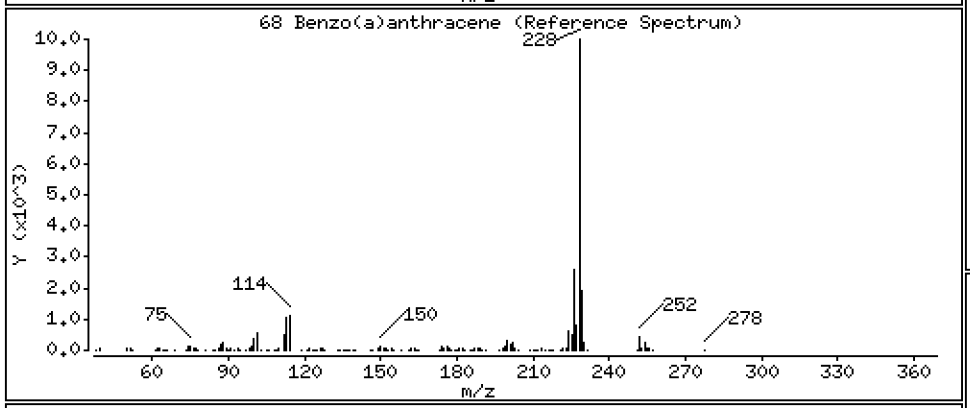
Concentration: 0.4070 ug/mL

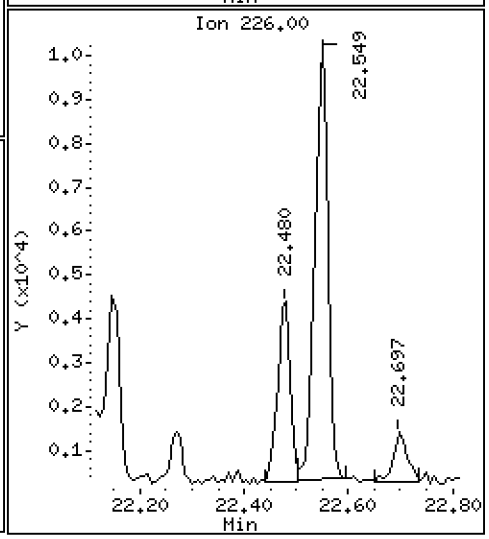


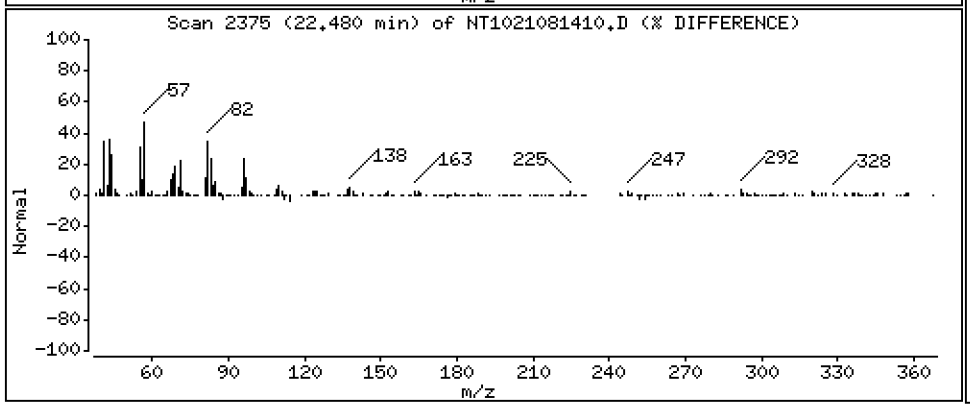












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

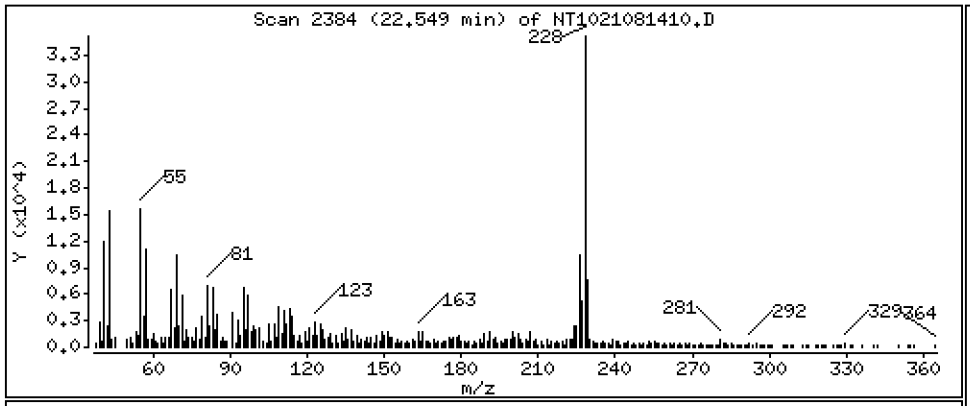
Operator: VTS

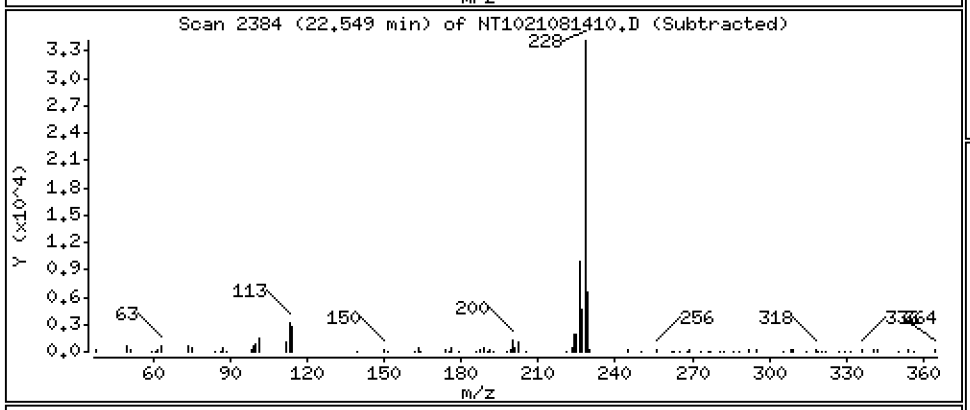
Column phase: ZB-5msi

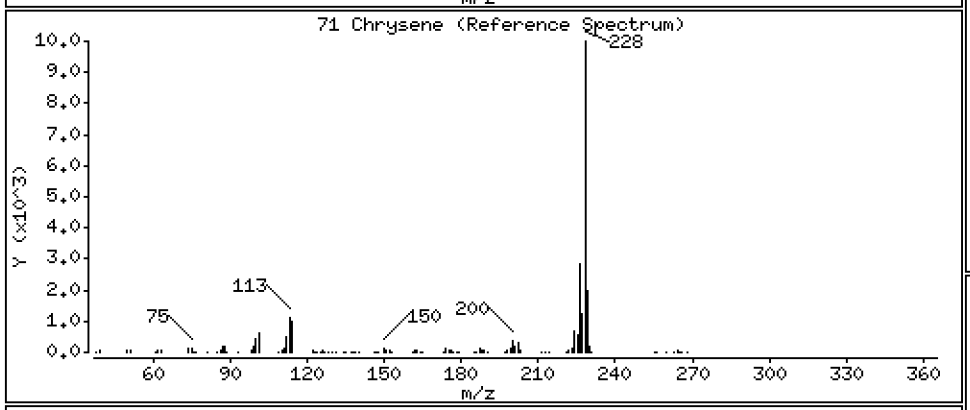
Column diameter: 0.25

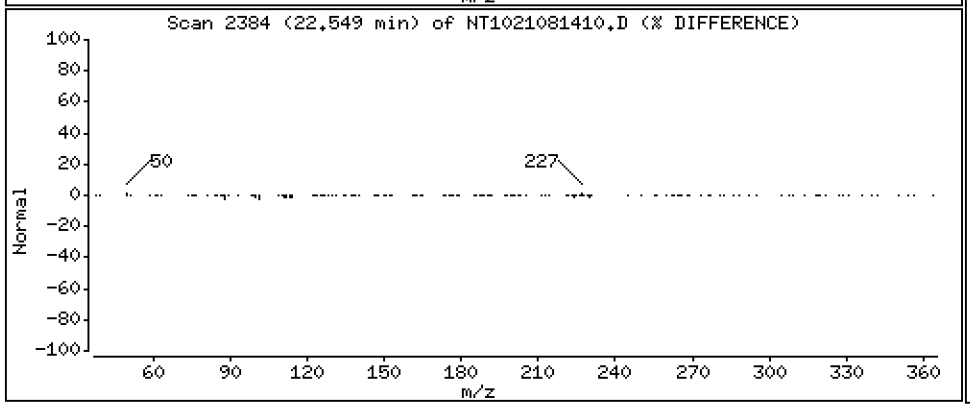
71 Chrysene

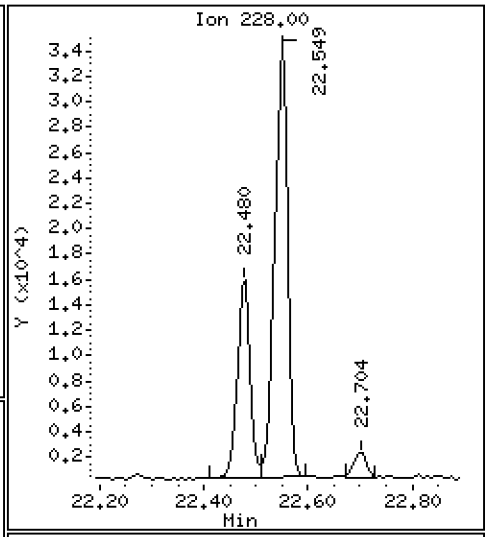
Concentration: 1.124 ug/mL

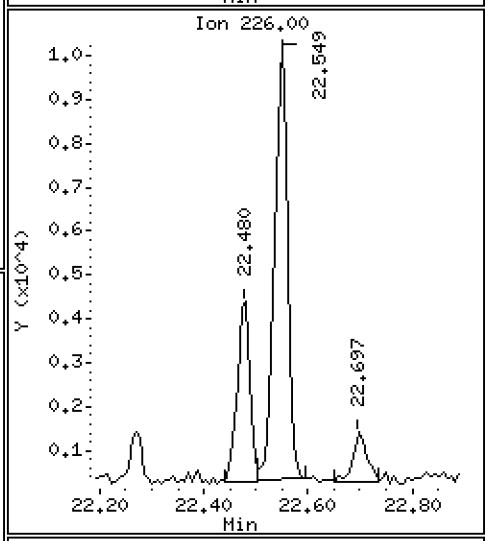


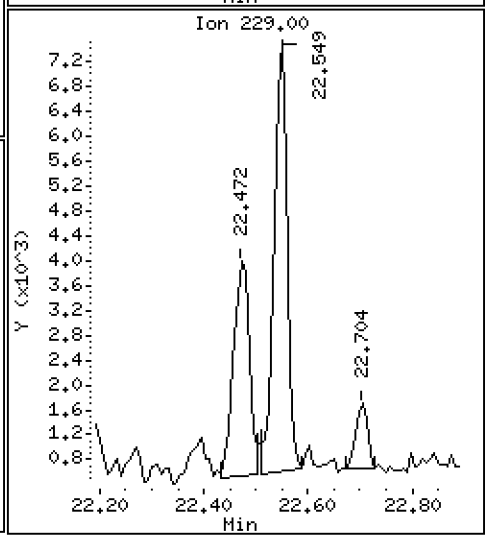












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D

Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

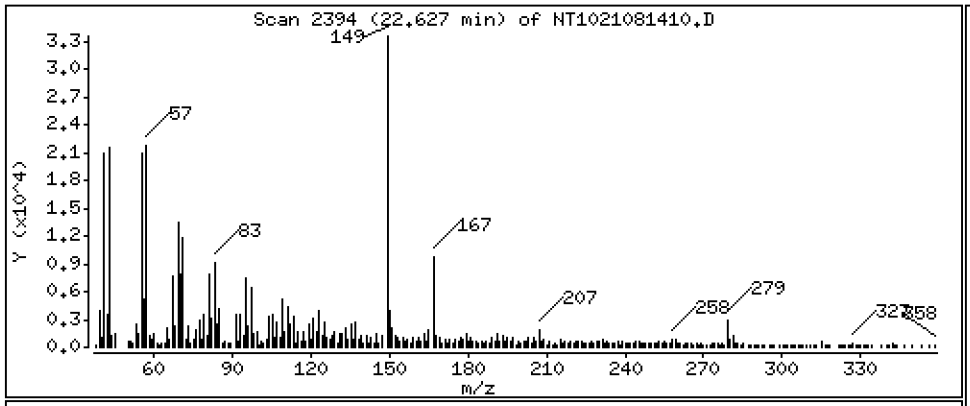
Operator: VTS

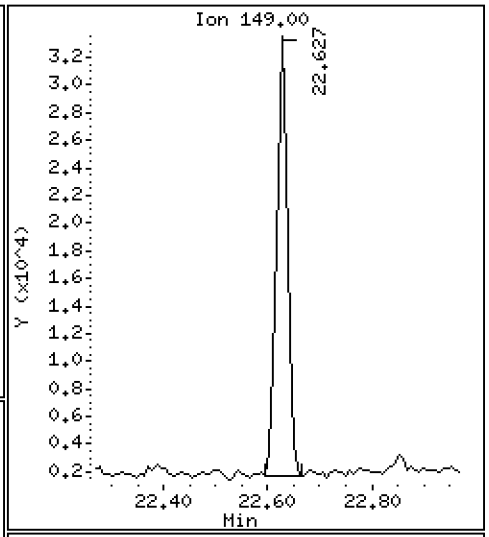
Column phase: ZB-5msi

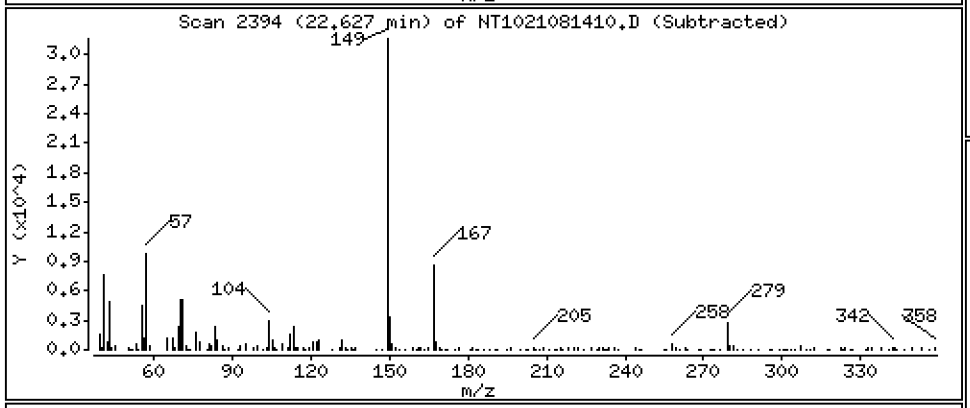
Column diameter: 0.25

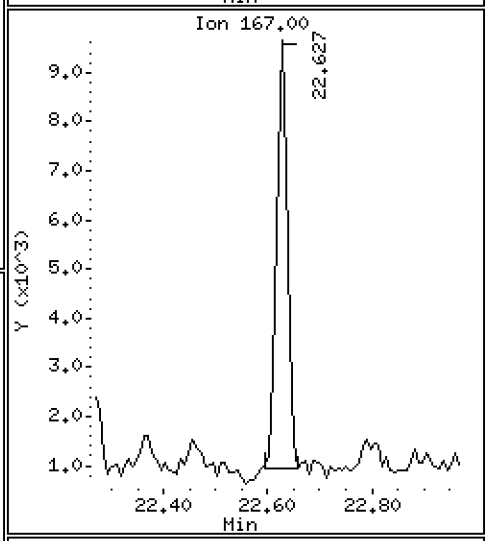
72 bis(2-Ethylhexyl)phthalate

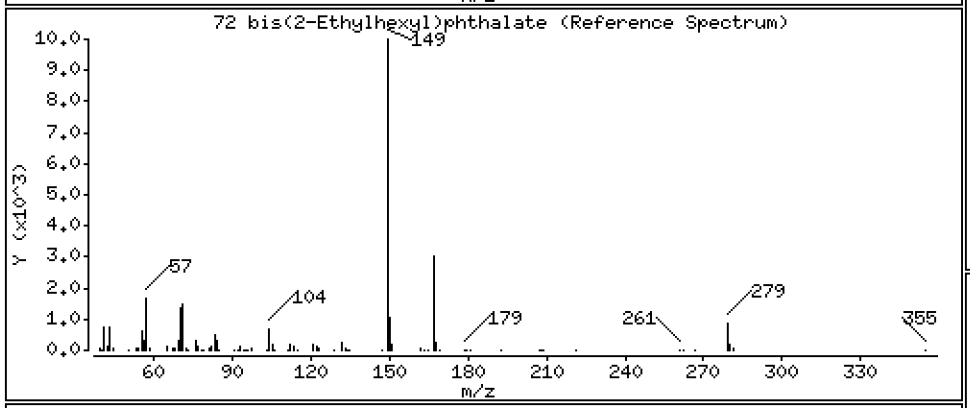
Concentration: 1.532 ug/mL

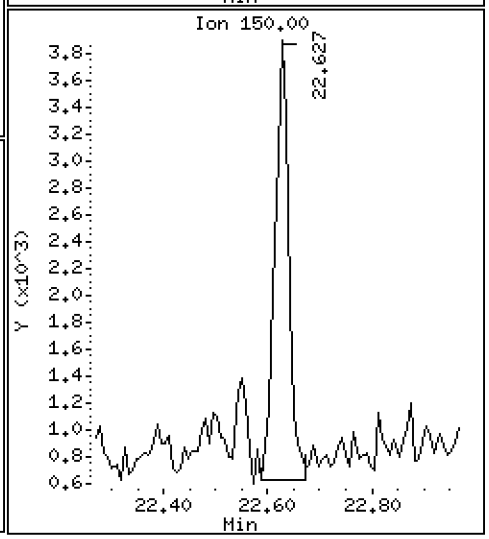


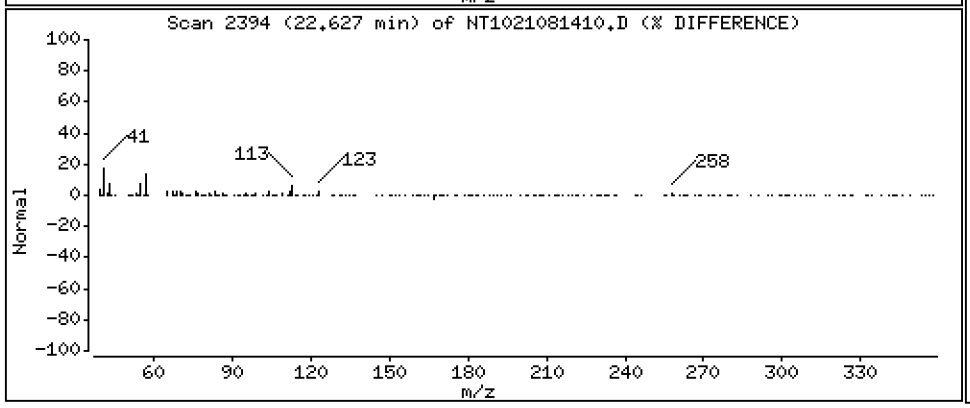












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

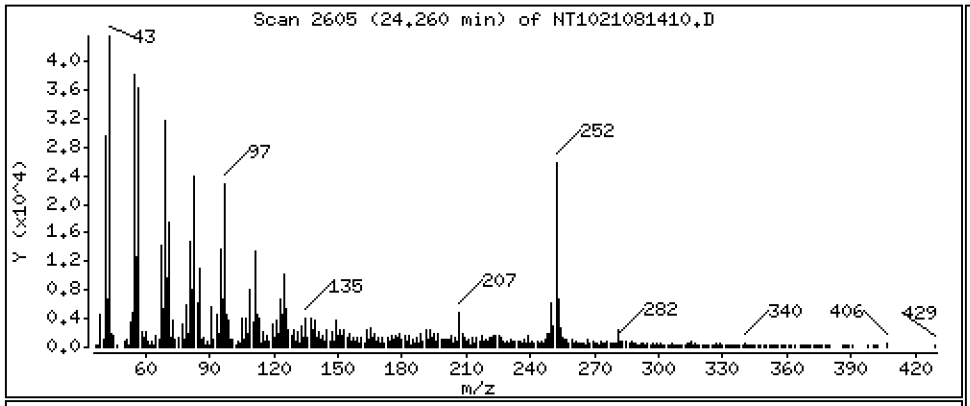
Operator: VTS

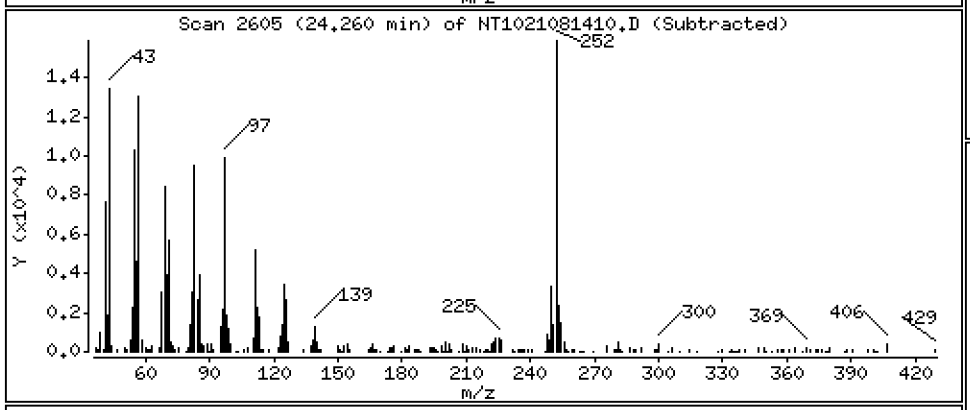
Column phase: ZB-5msi

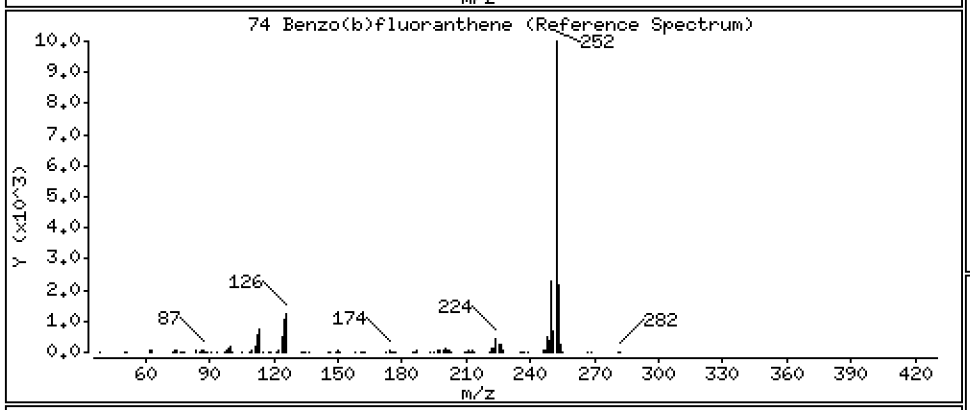
Column diameter: 0.25

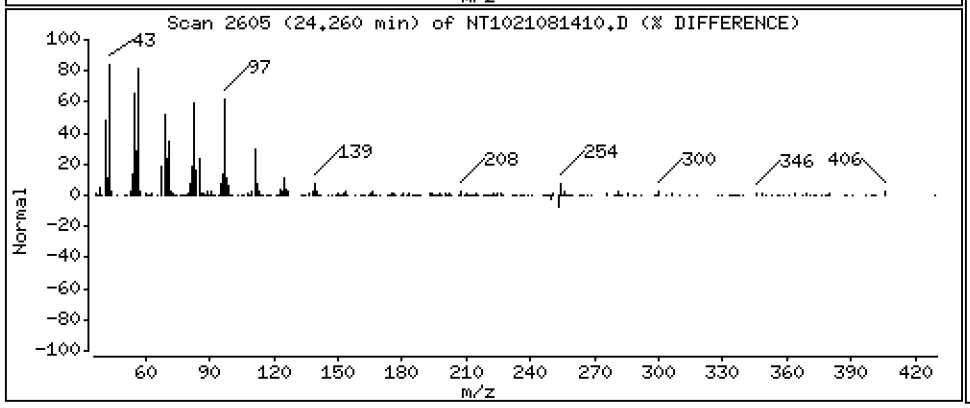
74 Benzo(b)fluoranthene

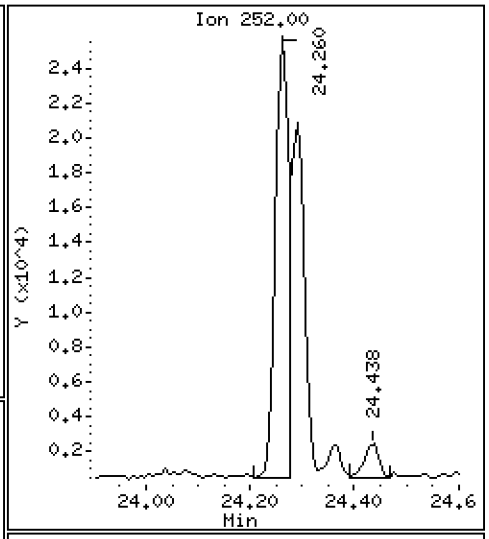
Concentration: 0.6395 ug/mL

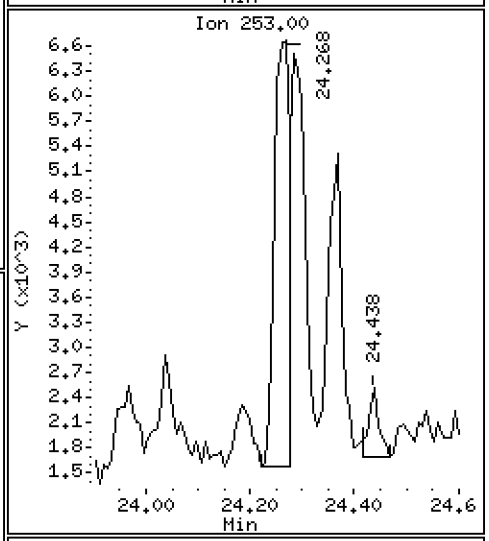


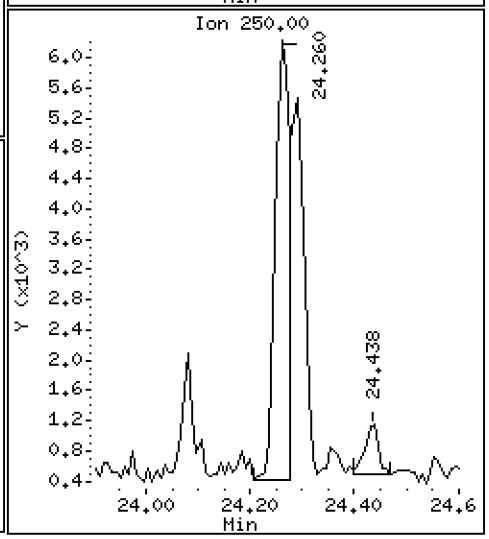












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

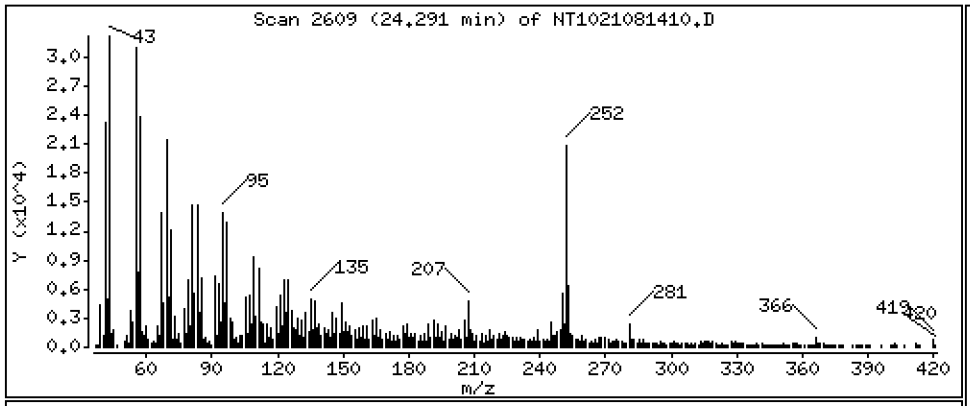
Operator: VTS

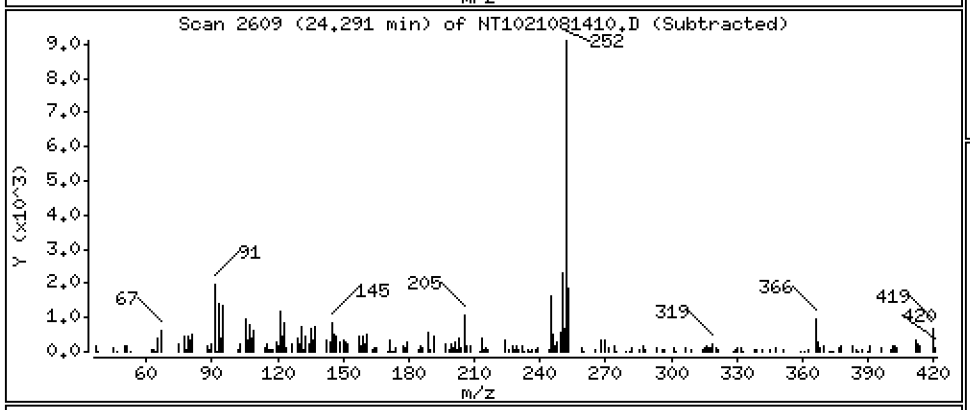
Column phase: ZB-5msi

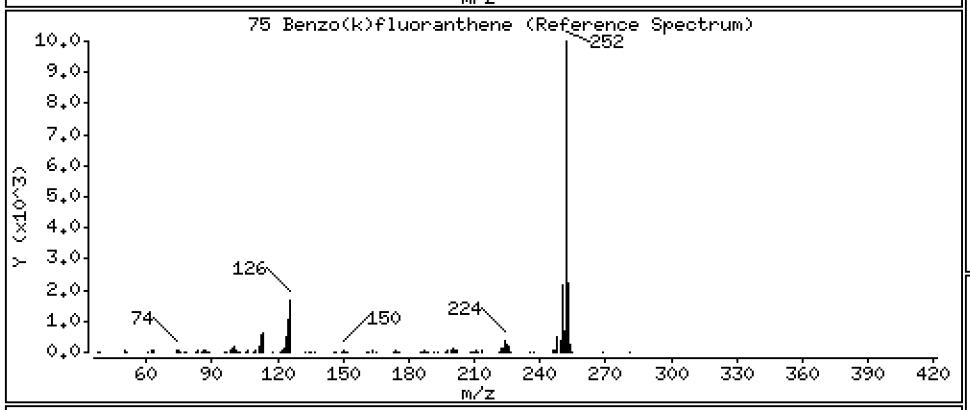
Column diameter: 0.25

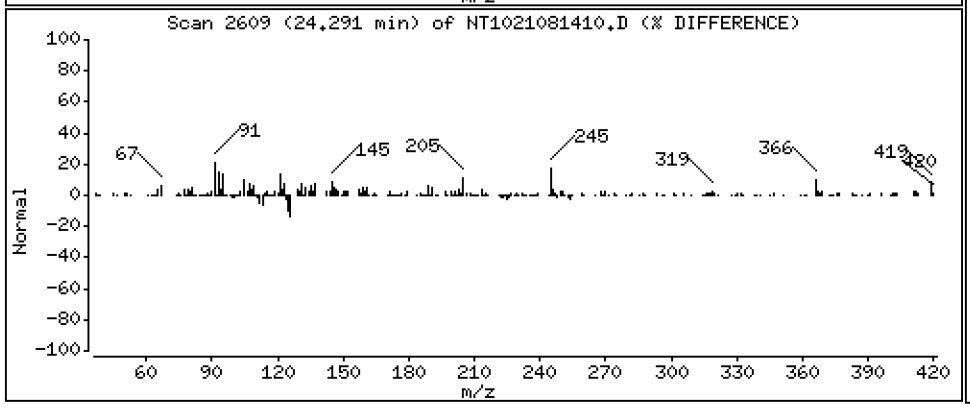
75 Benzo(k)fluoranthene

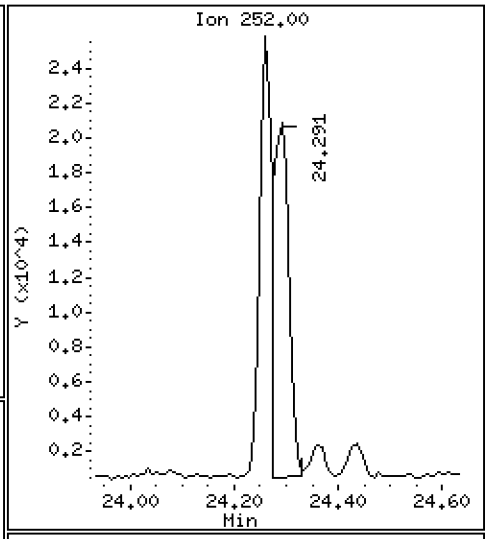
Concentration: 0.6126 ug/mL

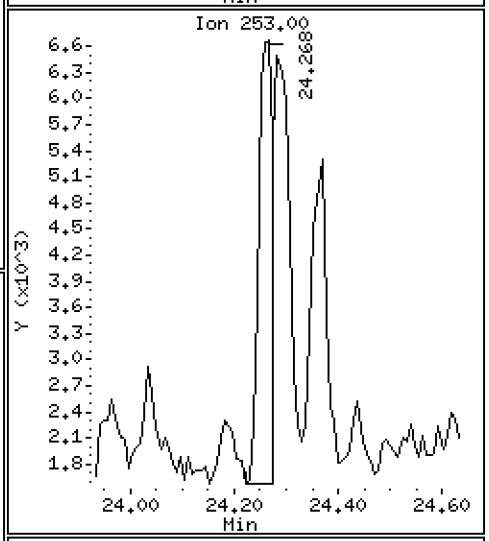


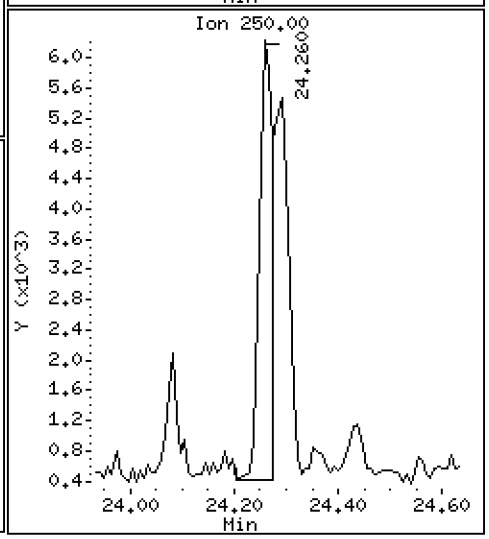












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

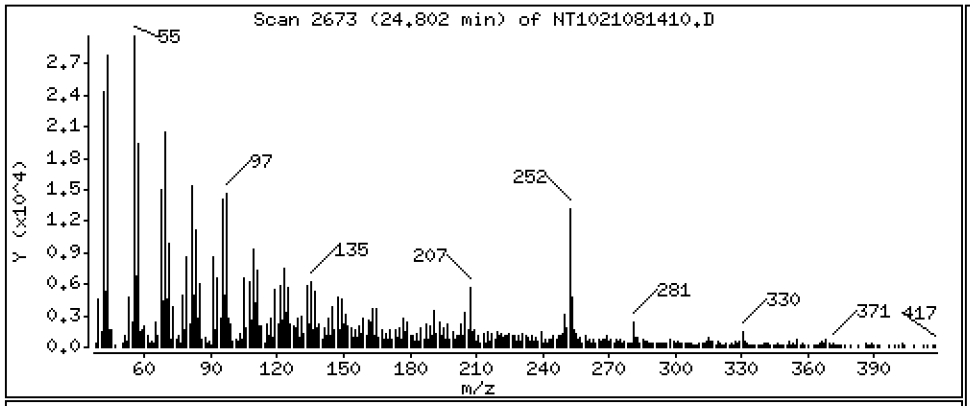
Operator: VTS

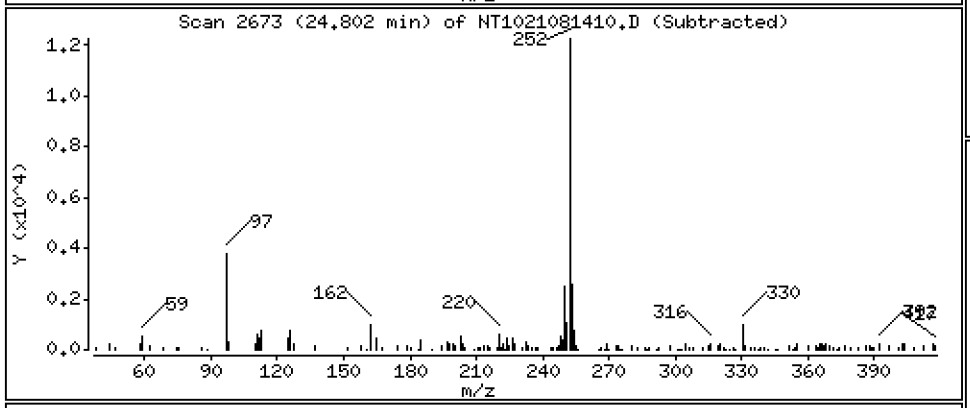
Column phase: ZB-5msi

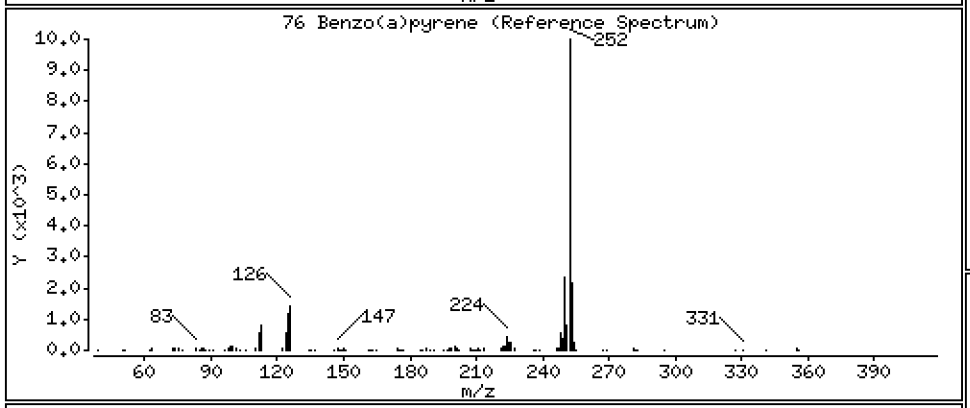
Column diameter: 0.25

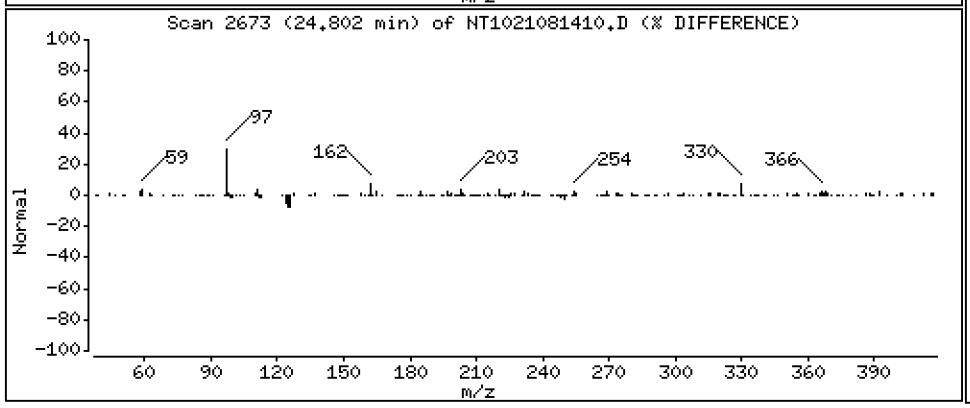
76 Benzo(a)pyrene

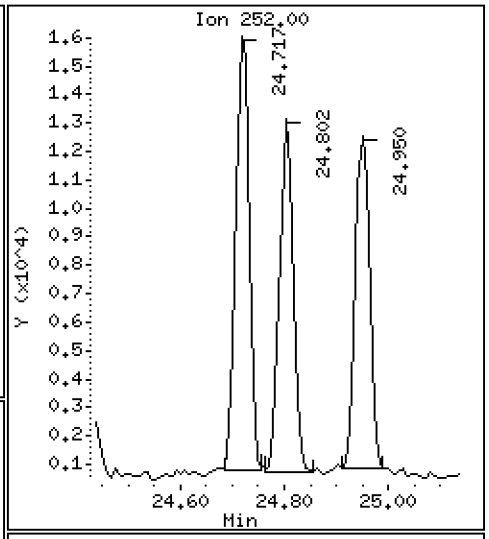
Concentration: 0.3661 ug/mL

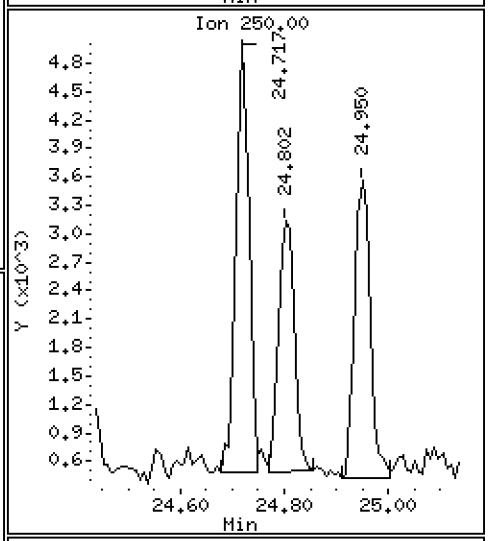


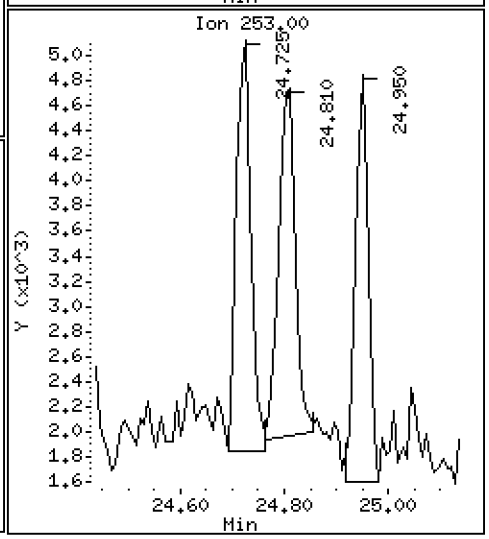












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

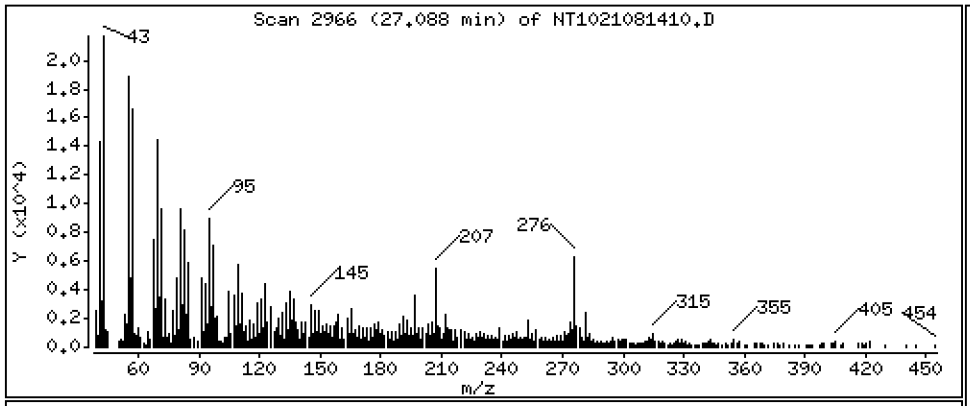
Operator: VTS

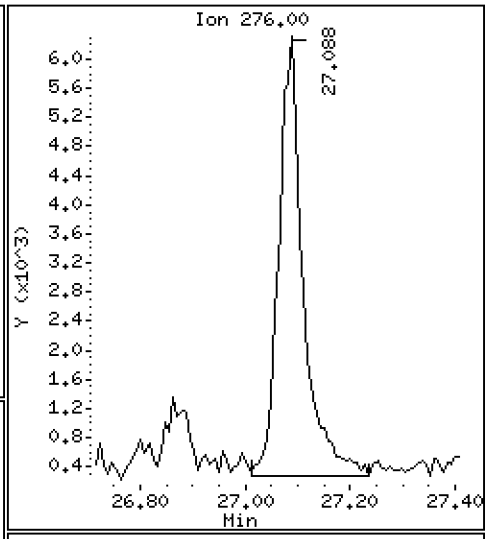
Column phase: ZB-5msi

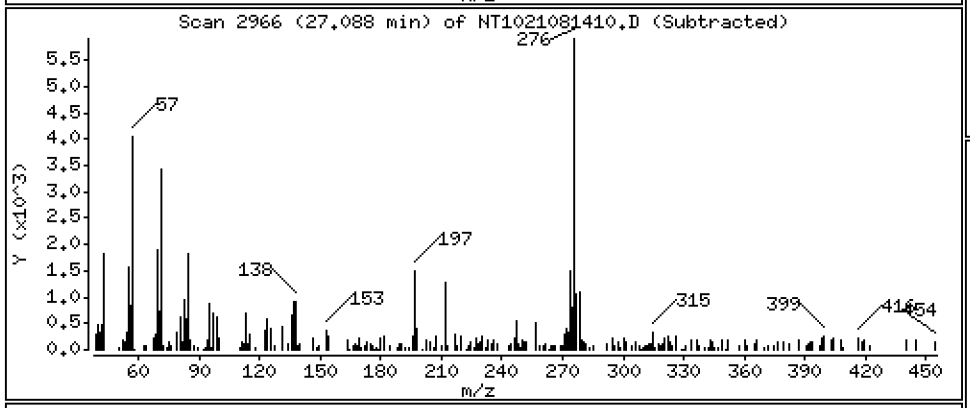
Column diameter: 0.25

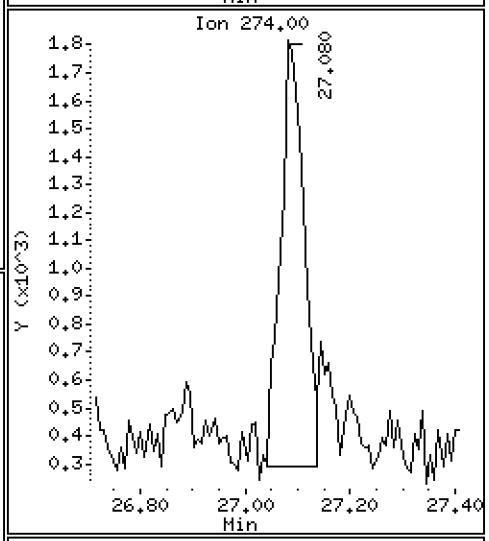
78 Indeno(1,2,3-cd)pyrene

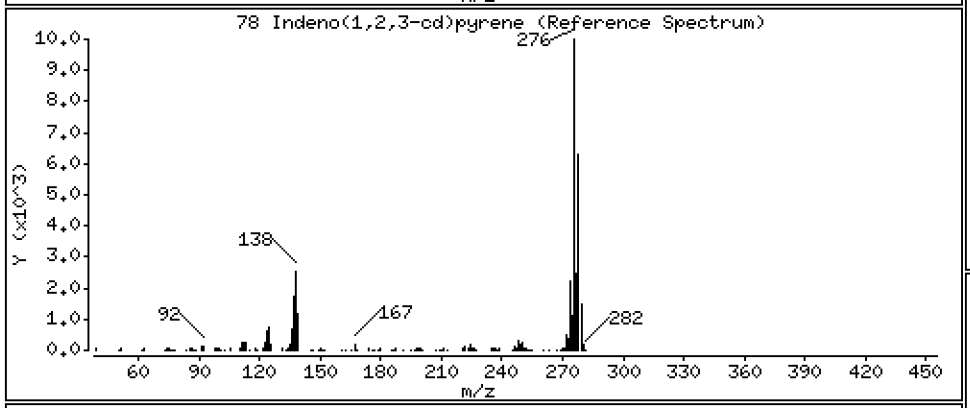
Concentration: 0.2856 ug/mL

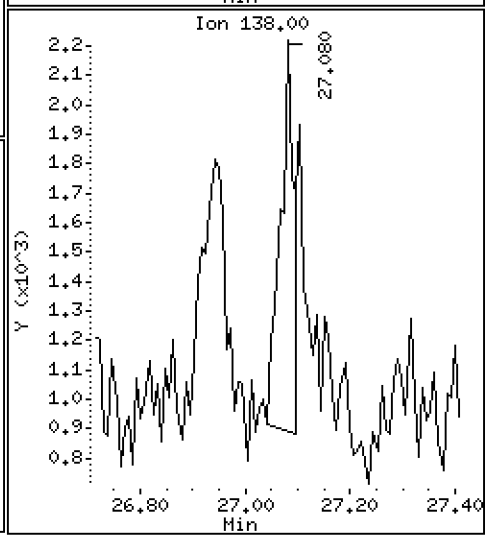


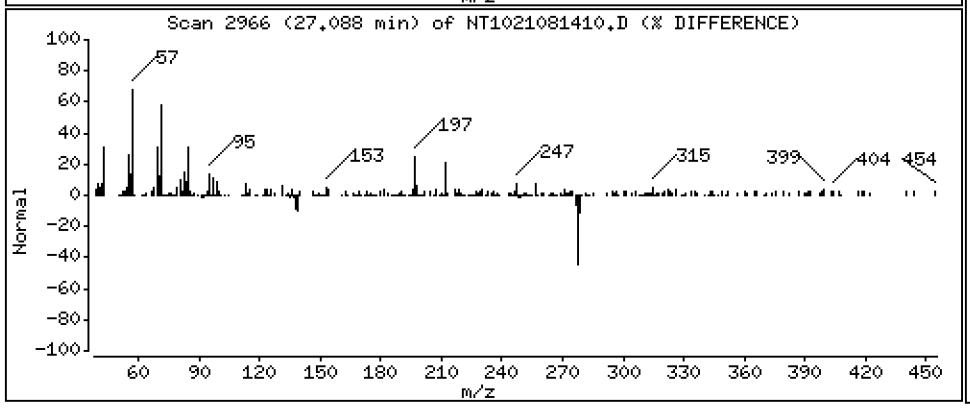












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

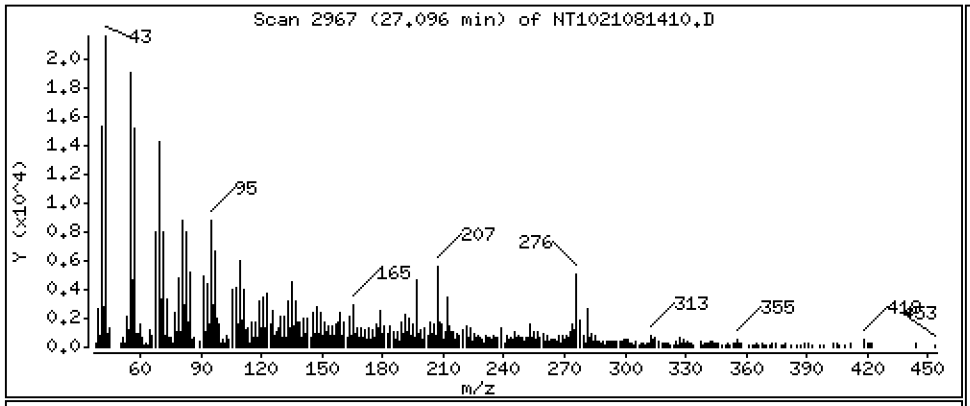
Operator: VTS

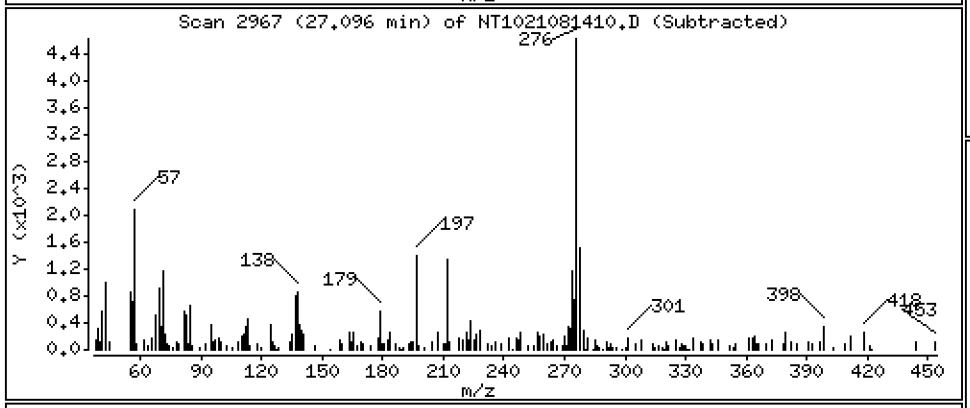
Column phase: ZB-5msi

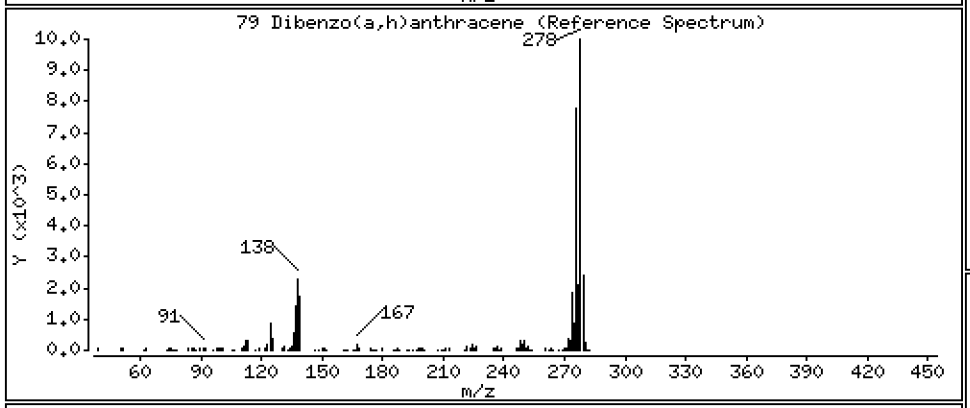
Column diameter: 0.25

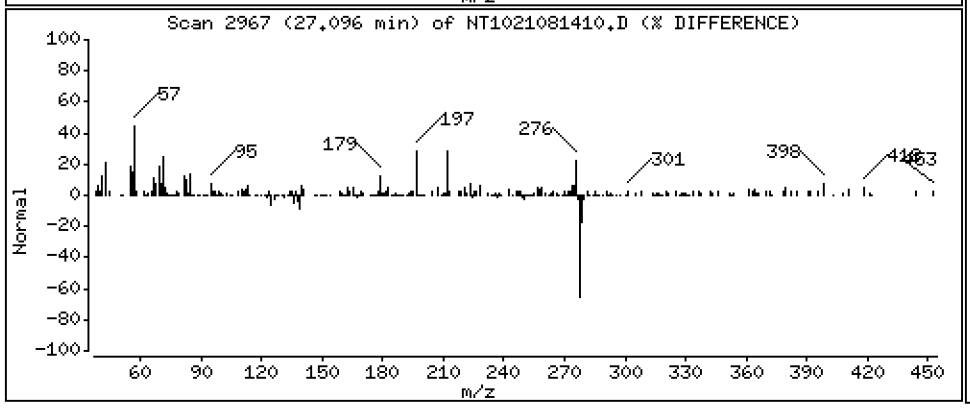
79 Dibenzo(a,h)anthracene

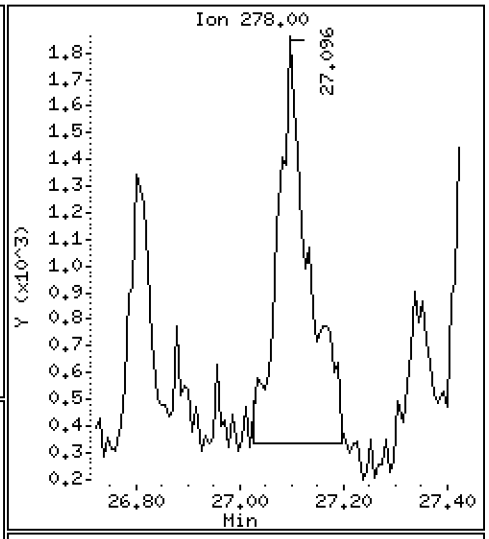
Concentration: 0.1137 ug/mL

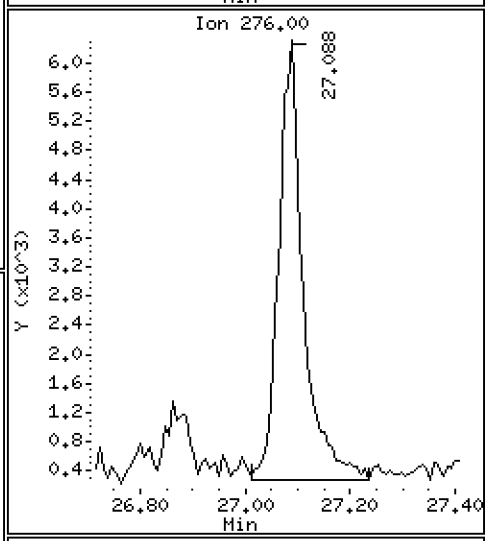


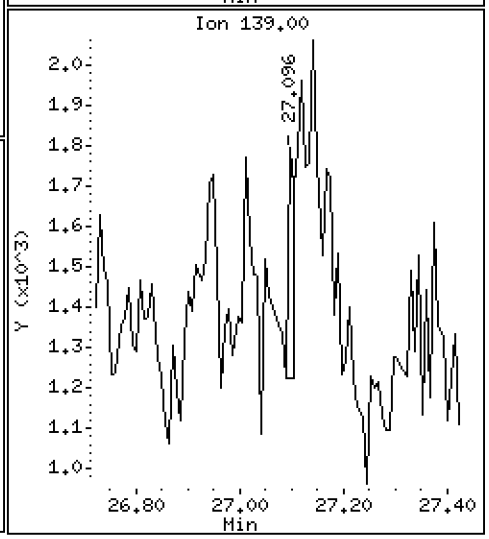












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

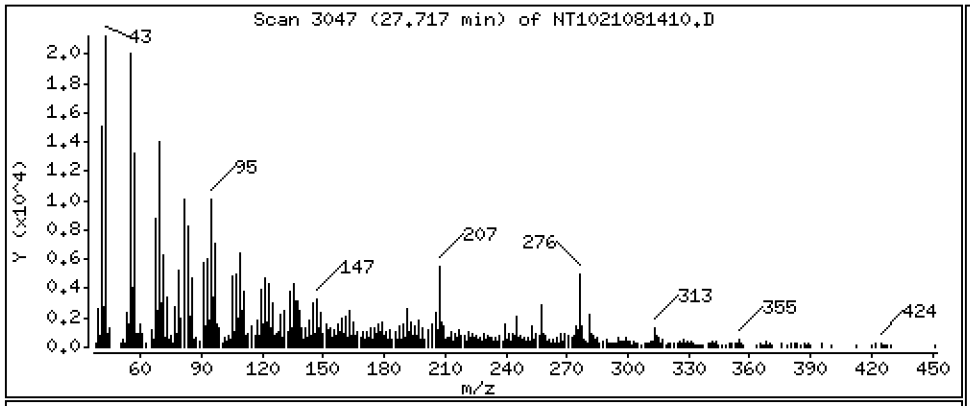
Operator: VTS

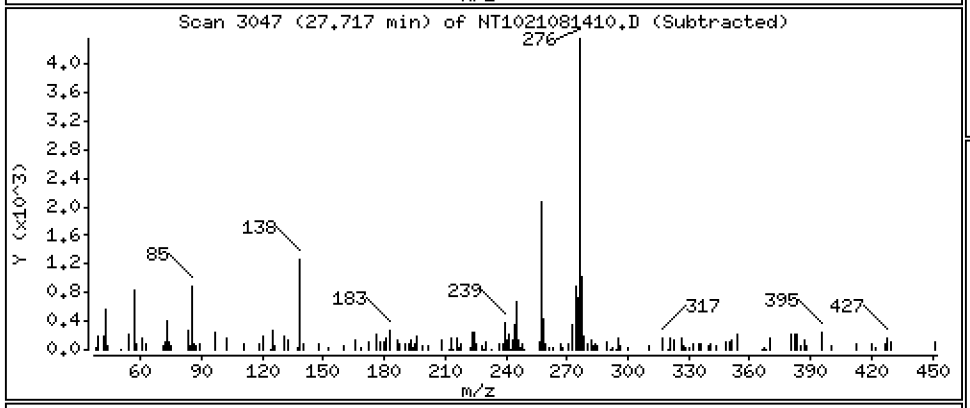
Column phase: ZB-5msi

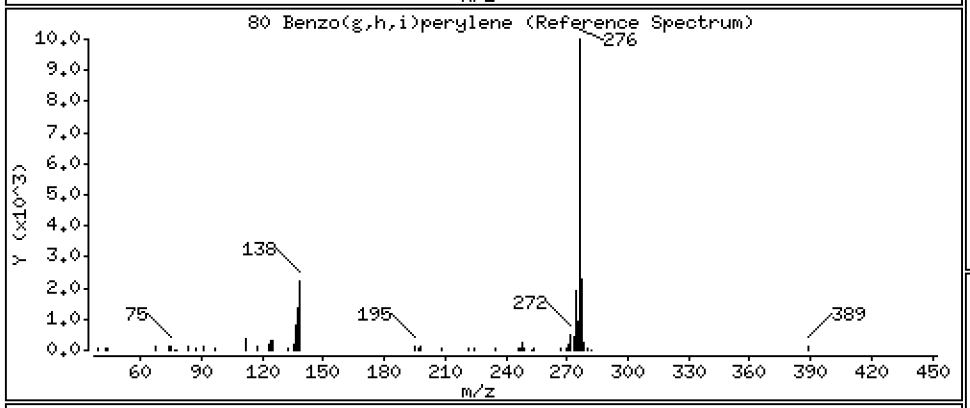
Column diameter: 0.25

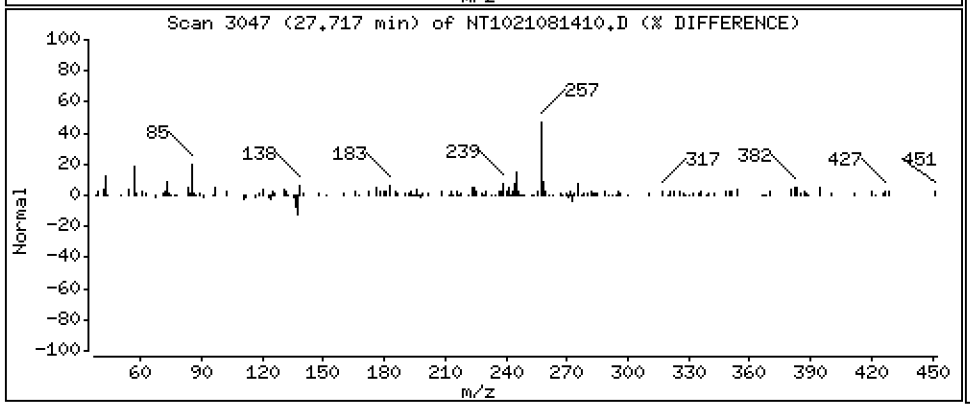
80 Benzo(g,h,i)perylene

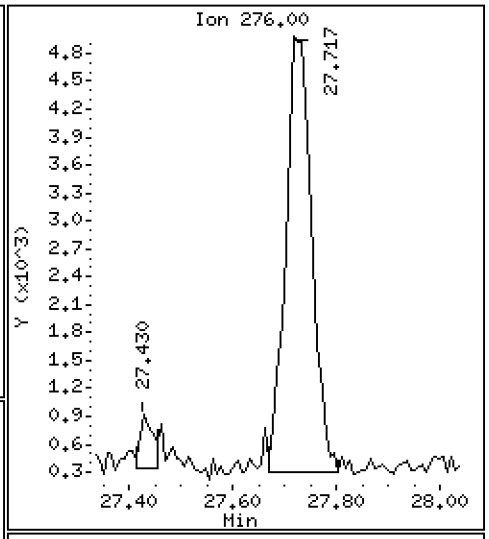
Concentration: 0.2673 ug/mL

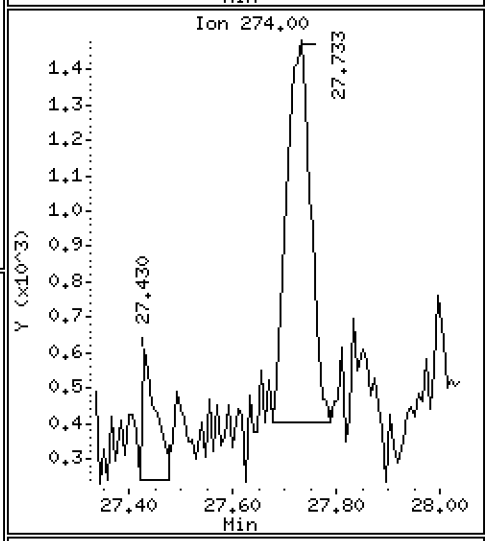


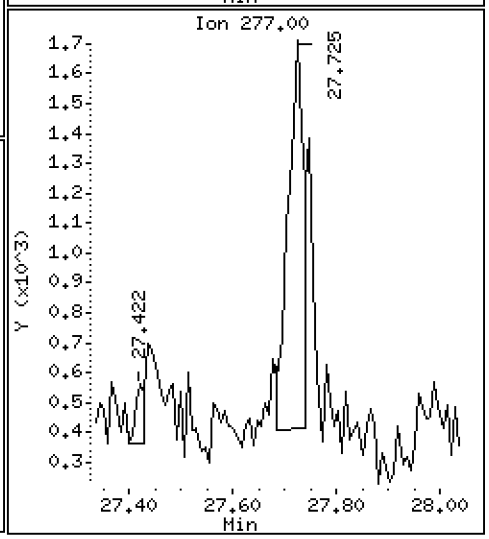












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

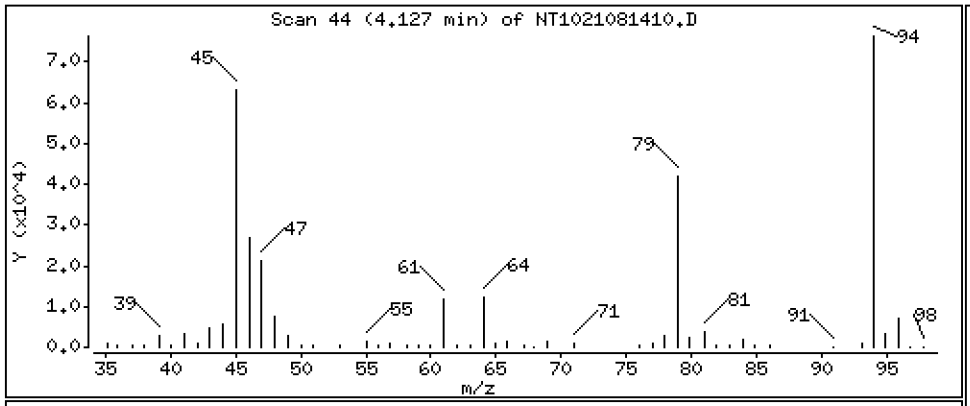
Operator: VTS

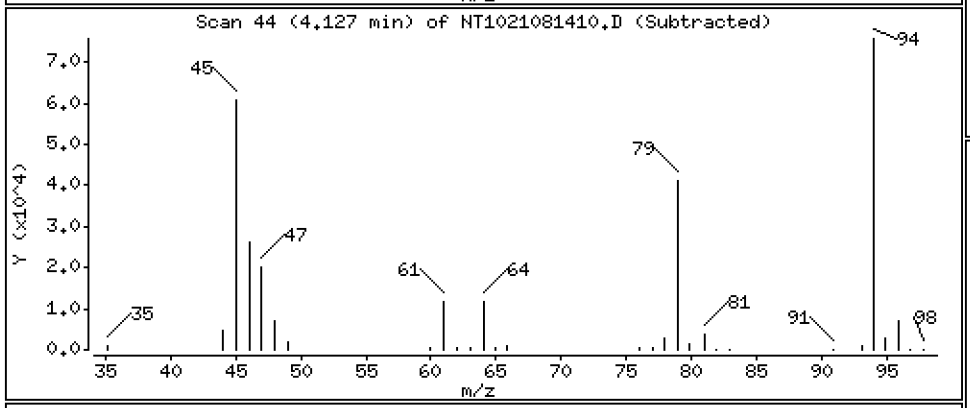
Column phase: ZB-5msi

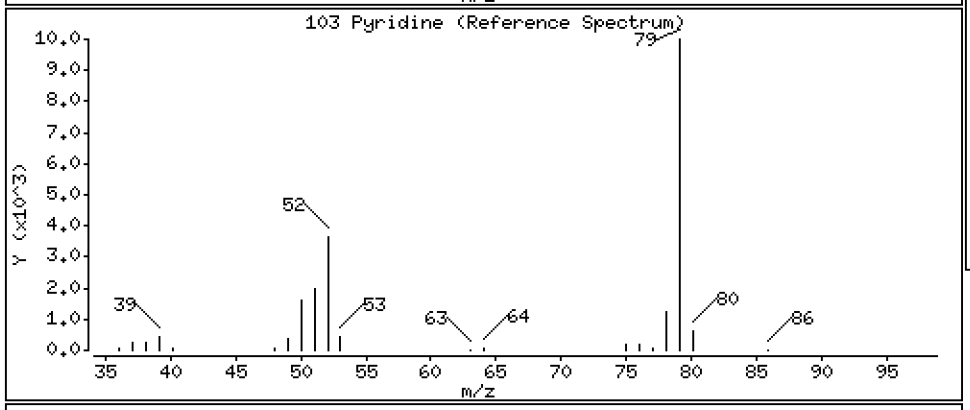
Column diameter: 0.25

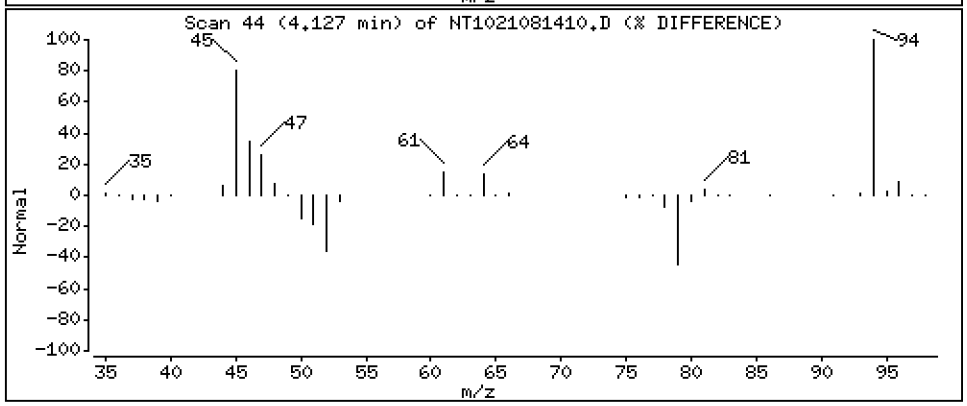
103 Pyridine

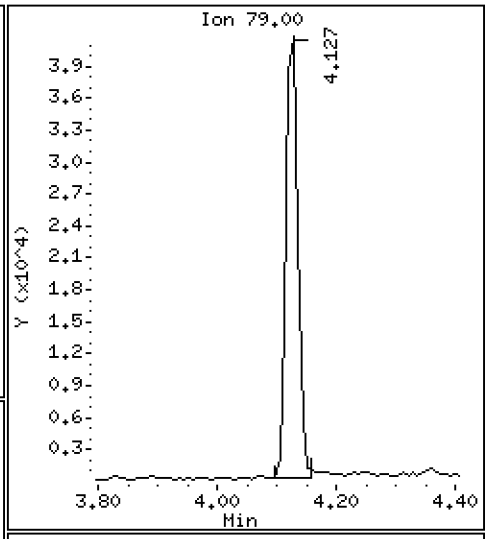
Concentration: 1.639 ug/mL

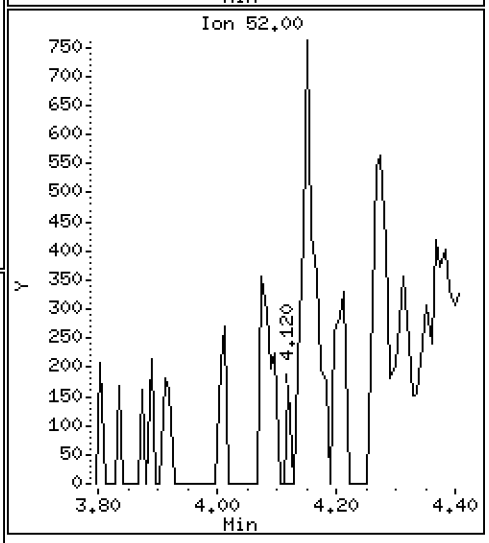












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

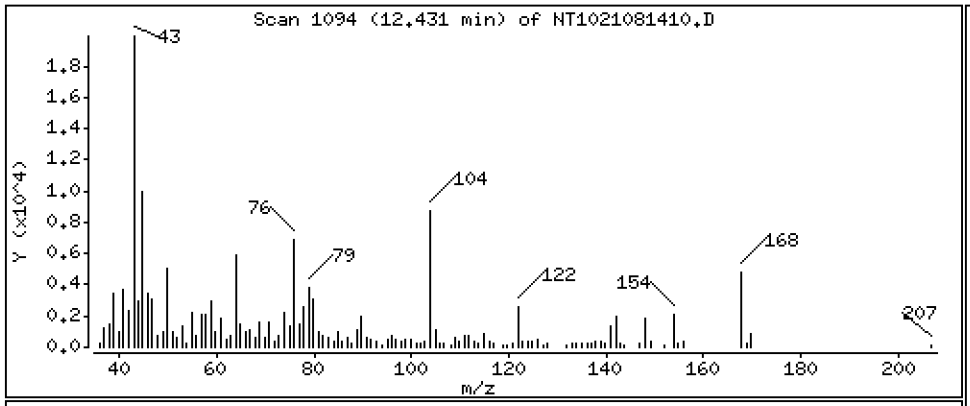
Operator: VTS

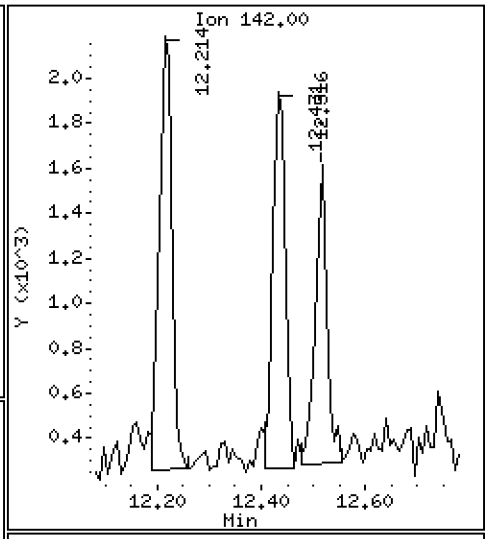
Column phase: ZB-5msi

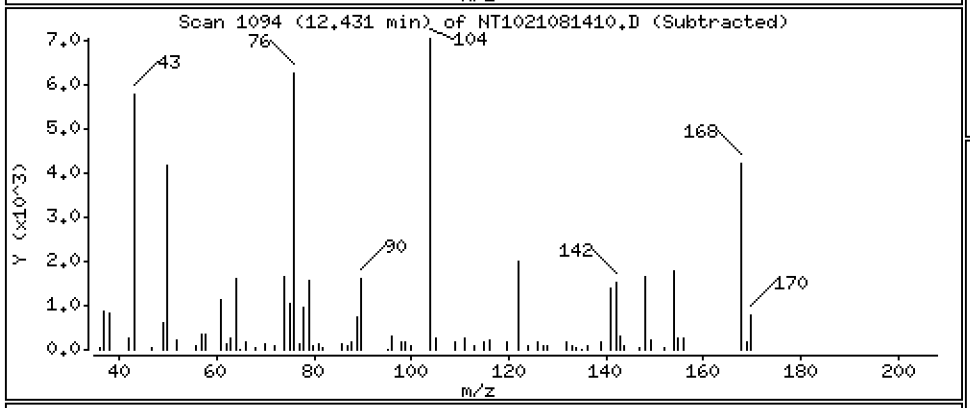
Column diameter: 0.25

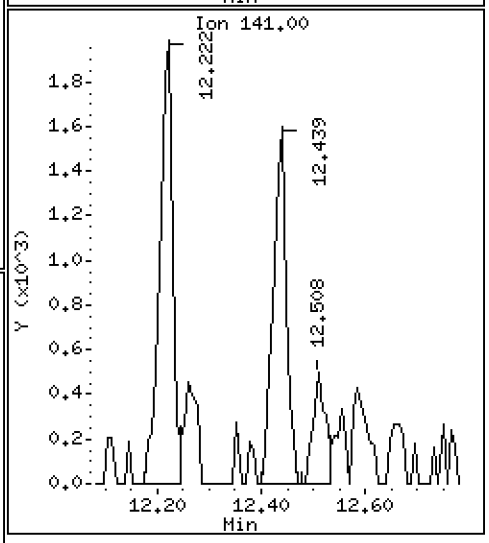
105 1-methylnaphthalene

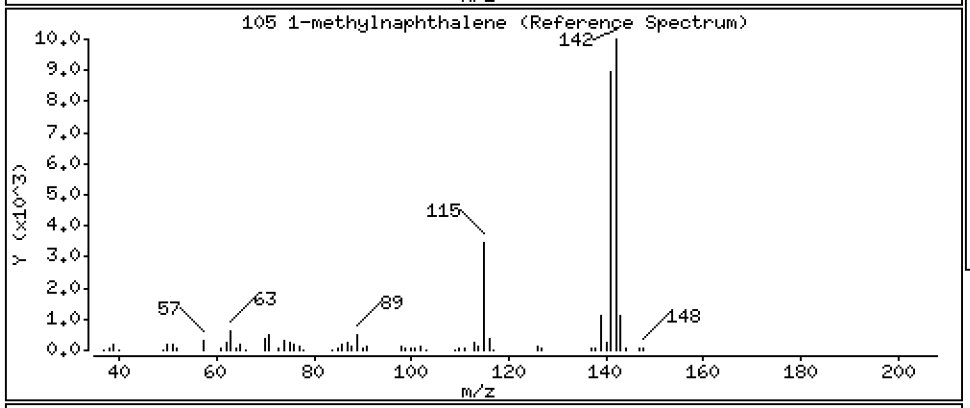
Concentration: 0.03655 ug/mL

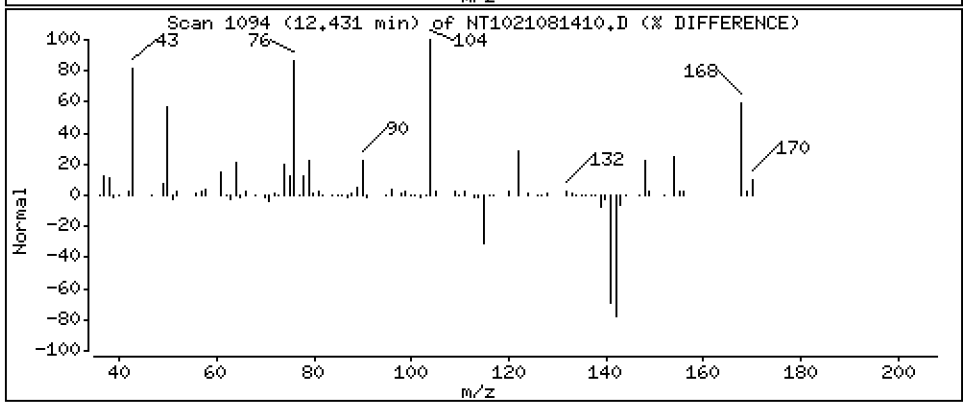












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

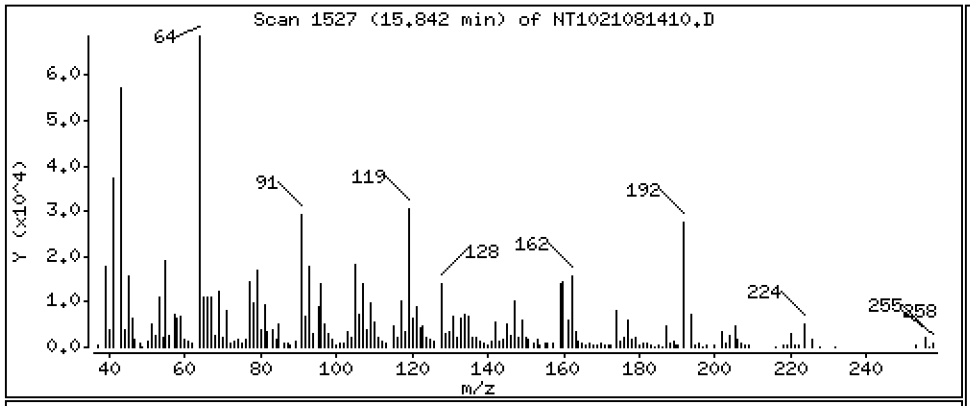
Operator: VTS

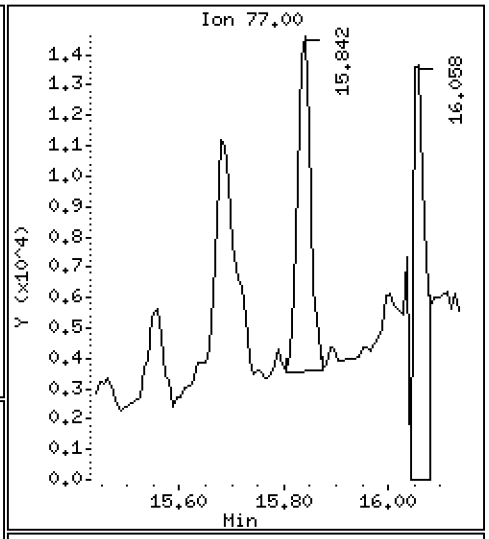
Column phase: ZB-5msi

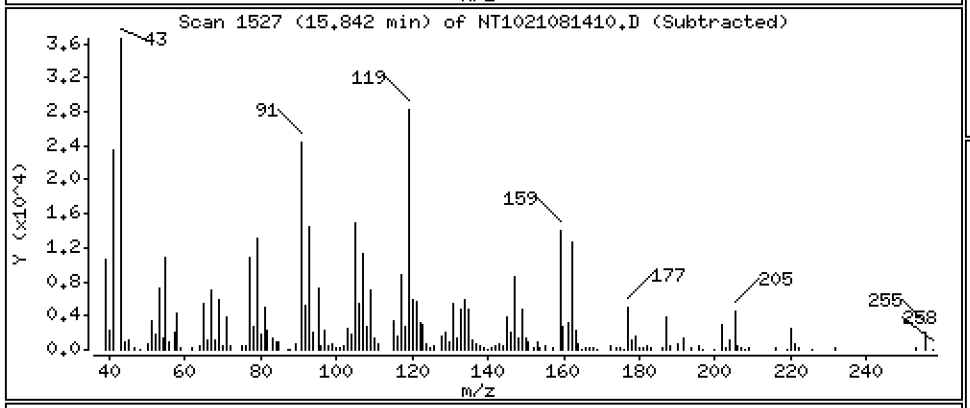
Column diameter: 0.25

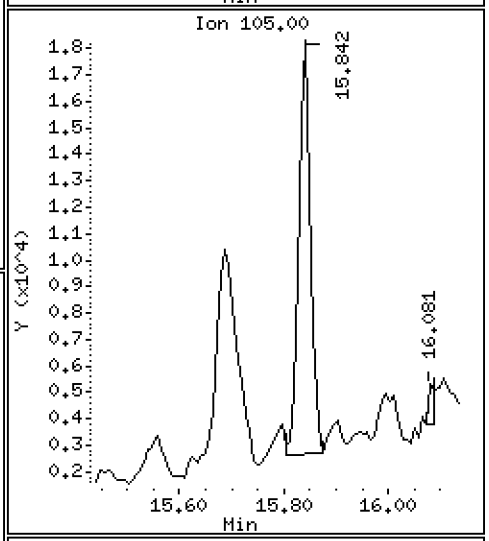
111 Azobenzene (1,2-DP-Hydrazine)

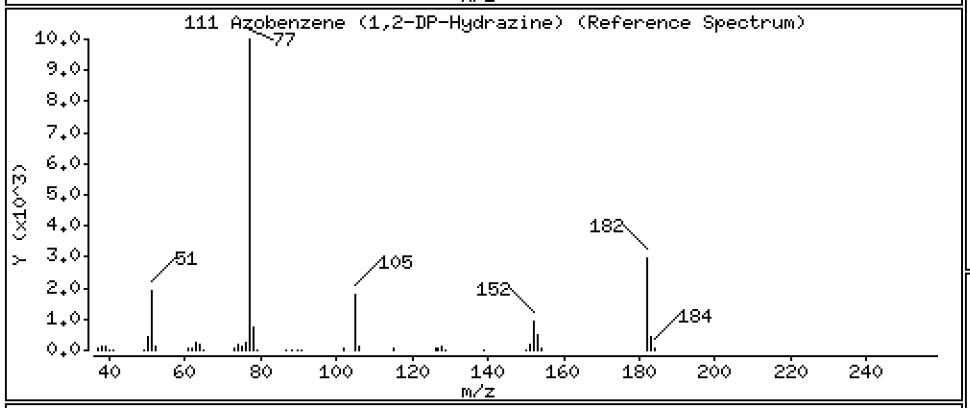
Concentration: 0.2716 ug/mL

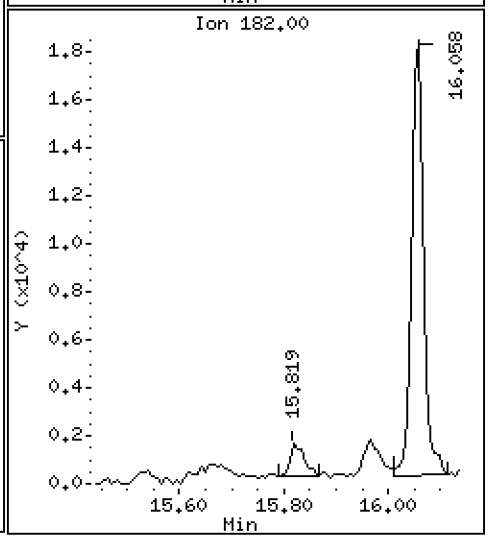


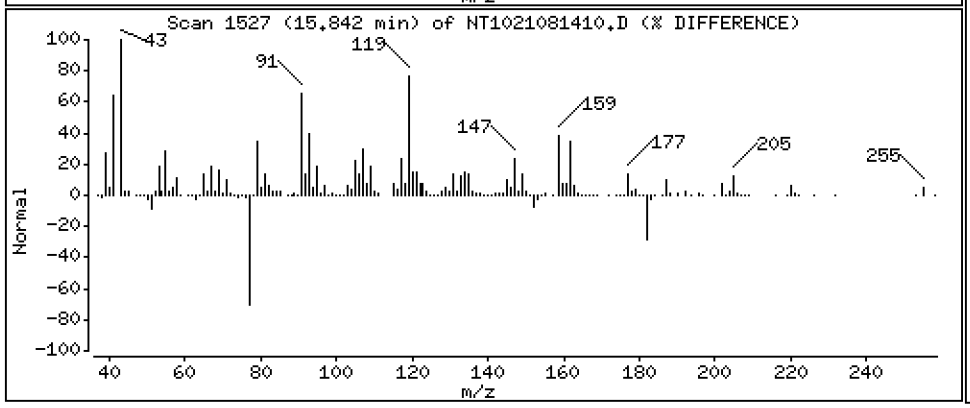












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Date : 14-AUG-2021 15:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-04

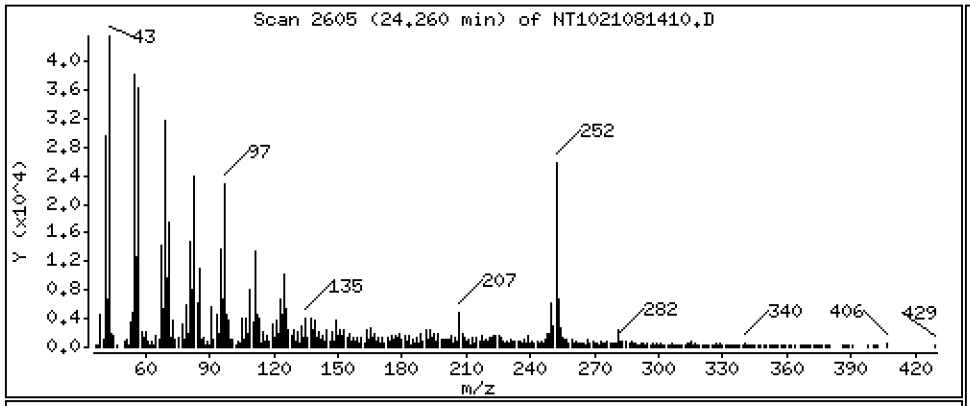
Operator: VTS

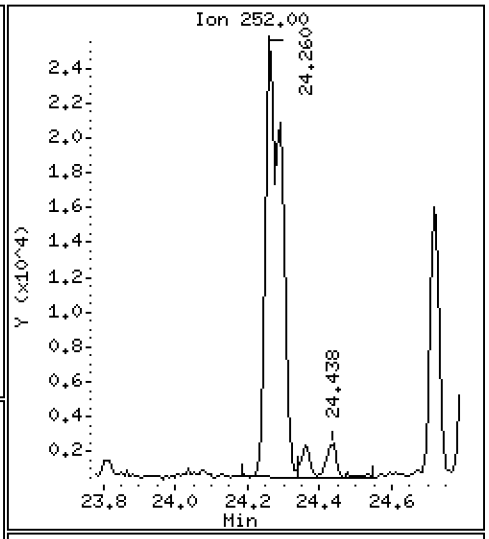
Column phase: ZB-5msi

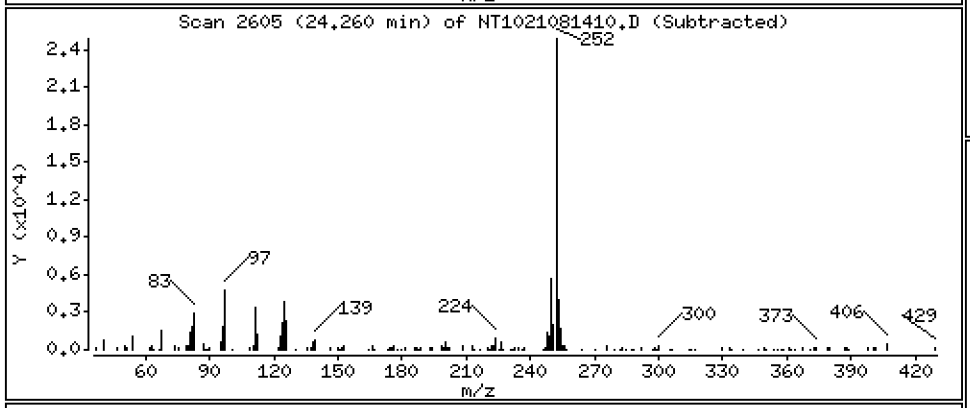
Column diameter: 0.25

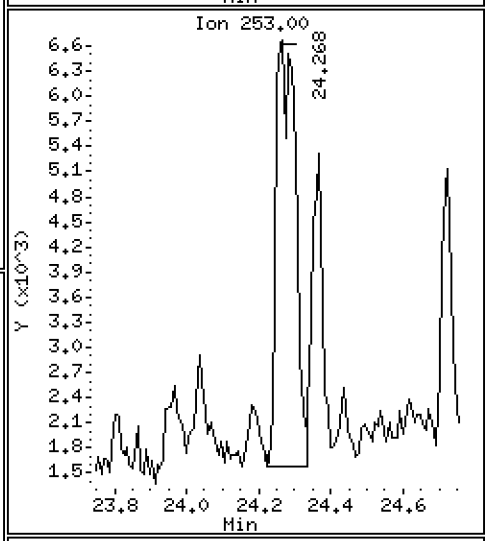
187 Total Benzofluoranthenes

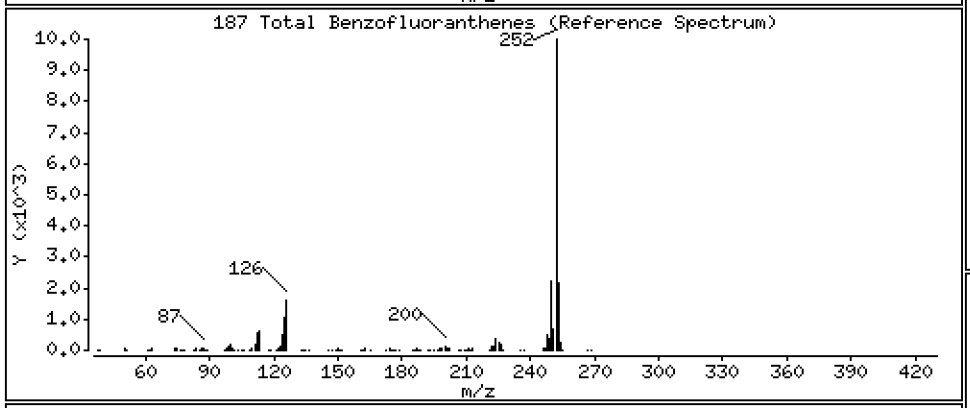
Concentration: 1.183 ug/mL

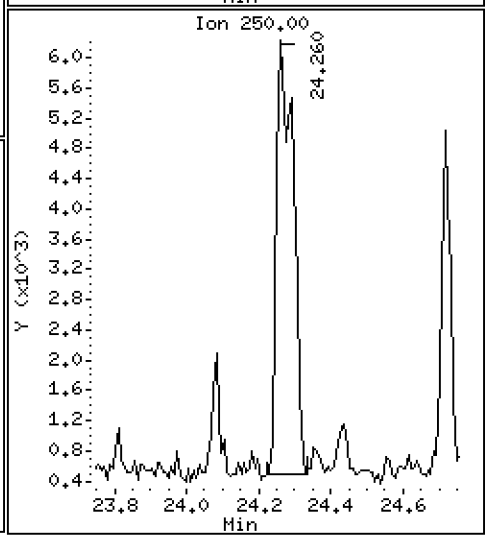


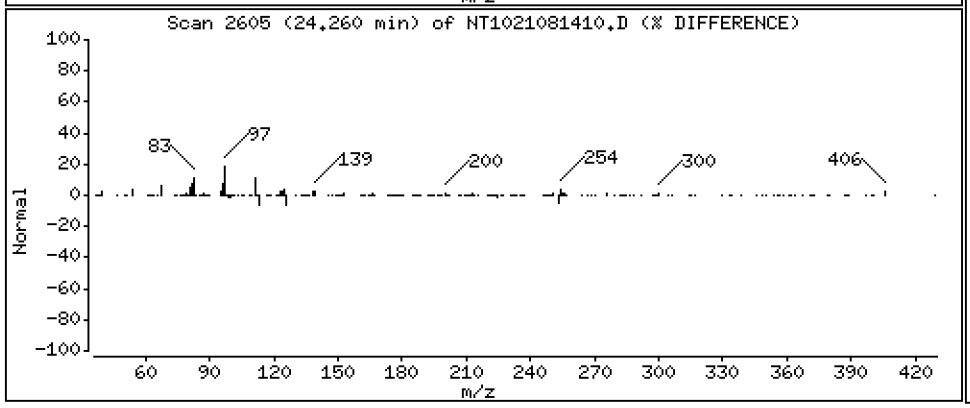












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210814.b\NT1021081410.D
Lab Smp Id: 21G0286-04
Inj Date : 14-AUG-2021 15:12
Operator : VTS Inst ID: nt10.i
Smp Info : 21G0286-04
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 10
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$ 1 2-Fluorophenol	112	6.227	6.204	(0.746)	130318	3.96811	3.968
$ 2 Phenol-d5	99	7.796	7.788	(0.933)	204388	4.19300	4.193
3 Phenol	94	7.819	7.811	(0.936)	5228	0.12270	0.1227
$ 5 2-Chlorophenol-d4	132	8.012	8.004	(0.959)	184230	5.36076	5.361
4 Bis(2-Chloroethyl)ether	93	Compound Not Detected.					
6 2-Chlorophenol	128	Compound Not Detected.					
7 1,3-Dichlorobenzene	146	Compound Not Detected.					
* 8 1,4-Dichlorobenzene-d4	152	8.353	8.353	(1.000)	83451	4.00000	
9 1,4-Dichlorobenzene	146	Compound Not Detected.					
$ 10 1,2-Dichlorobenzene-d4	152	8.702	8.702	(1.042)	71988	3.25685	3.257
12 1,2-Dichlorobenzene	146	Compound Not Detected.					
11 Benzyl alcohol	108	8.656	8.648	(1.036)	9311	0.46675	0.4668
14 2,2'-oxybis(1-Chloropropane)	121	Compound Not Detected.					
13 2-Methylphenol	108	Compound Not Detected.					
17 Hexachloroethane	117	Compound Not Detected.					
16 N-Nitroso-di-n-propylamine	70	Compound Not Detected.					
15 4-Methylphenol	108	9.176	9.160	(1.099)	3916	0.13759	0.1376
$ 18 Nitrobenzene-d5	82	9.440	9.440	(0.874)	137872	3.50682	3.507
19 Nitrobenzene	77	Compound Not Detected.					
20 Isophorone	82	Compound Not Detected.					
21 2-Nitrophenol	139	Compound Not Detected.					
22 2,4-Dimethylphenol	107	Compound Not Detected.					
23 Bis(2-Chloroethoxy)methane	93	Compound Not Detected.					
24 Benzoic acid	105	10.346	10.430	(0.958)	30651	1.81062	1.811
25 2,4-Dichlorophenol	162	Compound Not Detected.					
26 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
* 27 Naphthalene-d8	136	10.798	10.791	(1.000)	320548	4.00000	
28 Naphthalene	128	10.837	10.837	(1.004)	5455	0.06430	0.06430
29 4-Chloroaniline	127	Compound Not Detected.					
30 Hexachlorobutadiene	225	Compound Not Detected.					
31 4-Chloro-3-methylphenol	107	Compound Not Detected.					
32 2-Methylnaphthalene	142	12.214	12.214	(1.131)	3216	0.04097	0.04097
33 Hexachlorocyclopentadiene	237	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	Compound Not Detected.					
	35 2,4,5-Trichlorophenol	196	Compound Not Detected.					
$	36 2-Fluorobiphenyl	172	13.003	13.003	(0.905)	303391	4.05601	4.056
	37 2-Chloronaphthalene	162	Compound Not Detected.					
	38 2-Nitroaniline	65	Compound Not Detected.					
	39 Dimethylphthalate	163	13.924	13.917	(0.969)	4877	0.08068	0.08068(M)
	40 Acenaphthylene	152	Compound Not Detected.					
	41 2,6-Dinitrotoluene	165	Compound Not Detected.					
*	42 Acenaphthene-d10	164	14.365	14.358	(1.000)	162886	4.00000	
	43 3-Nitroaniline	138	Compound Not Detected.					
	44 Acenaphthene	153	Compound Not Detected.					
	45 2,4-Dinitrophenol	184	Compound Not Detected.					
	46 Dibenzofuran	168	Compound Not Detected.					
	47 4-Nitrophenol	109	Compound Not Detected.					
	48 2,4-Dinitrotoluene	165	Compound Not Detected.					
	50 Diethylphthalate	149	15.371	15.363	(1.070)	25263	0.44080	0.4408
	49 Fluorene	166	15.463	15.456	(1.076)	3037	0.03927	0.03927
	51 4-Chlorophenyl-phenylether	204	Compound Not Detected.					
	52 4-Nitroaniline	138	Compound Not Detected.					
	53 4,6-Dinitro-2-methylphenol	198	Compound Not Detected.					
	54 N-Nitrosodiphenylamine	169	Compound Not Detected.					
$	55 2,4,6-Tribromophenol	330	16.003	15.996	(1.114)	106051	7.79854	7.799
	56 4-Bromophenyl-phenylether	248	Compound Not Detected.					
	57 Hexachlorobenzene	284	Compound Not Detected.					
	58 Pentachlorophenol	266	Compound Not Detected.					
*	59 Phenanthrene-d10	188	17.379	17.364	(1.000)	290125	4.00000	
	60 Phenanthrene	178	17.425	17.418	(1.003)	25913	0.33028	0.3303
	61 Anthracene	178	17.518	17.503	(1.008)	8334	0.09933	0.09933(M)
	62 Carbazole	167	17.874	17.859	(1.028)	5659	0.06832	0.06832
	63 Di-n-butylphthalate	149	Compound Not Detected.					
	64 Fluoranthene	202	19.886	19.839	(0.884)	98534	1.33227	1.332
	65 Pyrene	202	20.288	20.265	(0.902)	78482	0.96265	0.9626
$	66 Terphenyl-d14	244	20.605	20.590	(0.916)	225605	3.88258	3.883
	67 Butylbenzylphthalate	149	21.573	21.558	(0.959)	9646	0.35970	0.3597
	68 Benzo(a)anthracene	228	22.479	22.464	(0.999)	26953	0.40698	0.4070
*	69 Chrysene-d12	240	22.502	22.495	(1.000)	177477	4.00000	
	70 3,3'-Dichlorobenzidine	252	Compound Not Detected.					
	71 Chrysene	228	22.549	22.541	(1.002)	57374	1.12366	1.124
	72 bis(2-Ethylhexyl)phthalate	149	22.626	22.619	(0.958)	45770	1.53209	1.532
*	134 Di-n-octylphthalate-d4	153	23.617	23.610	(1.000)	271541	4.00000	
	73 Di-n-octylphthalate	149	Compound Not Detected.					
	74 Benzo(b)fluoranthene	252	24.260	24.252	(0.974)	43548	0.63954	0.6395
	75 Benzo(k)fluoranthene	252	24.291	24.283	(0.975)	41322	0.61263	0.6126(M)
	76 Benzo(a)pyrene	252	24.802	24.786	(0.996)	22529	0.36609	0.3661
*	77 Perylene-d12	264	24.903	24.887	(1.000)	172799	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.088	27.057	(1.088)	19889	0.28556	0.2856
	79 Dibenzo(a,h)anthracene	278	27.096	27.072	(1.088)	6220	0.11370	0.1137(M)
	80 Benzo(g,h,i)perylene	276	27.717	27.686	(1.113)	16612	0.26728	0.2673
	90 N-Nitrosodimethylamine	74	Compound Not Detected.					
	91 Aniline	93	Compound Not Detected.					
	93 Benzidine	184	Compound Not Detected.					
	103 Pyridine	79	4.127	4.057	(0.494)	57945	1.63944	1.639
	105 1-methylnaphthalene	142	12.431	12.431	(1.151)	2692	0.03655	0.03655
	111 Azobenzene (1,2-DP-Hydrazine)	77	15.841	15.788	(1.103)	19846	0.27158	0.2716

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	CONCENTRATIONS FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.260	24.283	(0.974)	77327	1.18257	1.183
120 2,3,4,6-Tetrachlorophenol	232	Compound Not Detected.					

QC Flag Legend

M - Compound response manually integrated.

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081410.D
Lab Smp Id: 21G0286-04
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	83451	-1.89
27 Naphthalene-d8	291658	145829	583316	320548	9.91
42 Acenaphthene-d10	163642	81821	327284	162886	-0.46
59 Phenanthrene-d10	304099	152050	608198	290125	-4.60
69 Chrysene-d12	199453	99727	398906	177477	-11.02
134 Di-n-octylphthala	303639	151820	607278	271541	-10.57
77 Perylene-d12	200082	100041	400164	172799	-13.64

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.35	-0.00
27 Naphthalene-d8	10.79	10.29	11.29	10.80	0.07
42 Acenaphthene-d10	14.36	13.86	14.86	14.37	0.05
59 Phenanthrene-d10	17.36	16.86	17.86	17.38	0.09
69 Chrysene-d12	22.50	22.00	23.00	22.50	0.03
134 Di-n-octylphthala	23.61	23.11	24.11	23.62	0.03
77 Perylene-d12	24.89	24.39	25.39	24.90	0.06

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081410.D

Lab ID: 21G0286-04
nt10.i, ABN.m, 14-AUG-2021 15:12

RT	CO-ELUTION COMPOUNDS

NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
0.958	0.967	-0.0086	Benzoic acid
0.494	0.486	0.0083	Pyridine

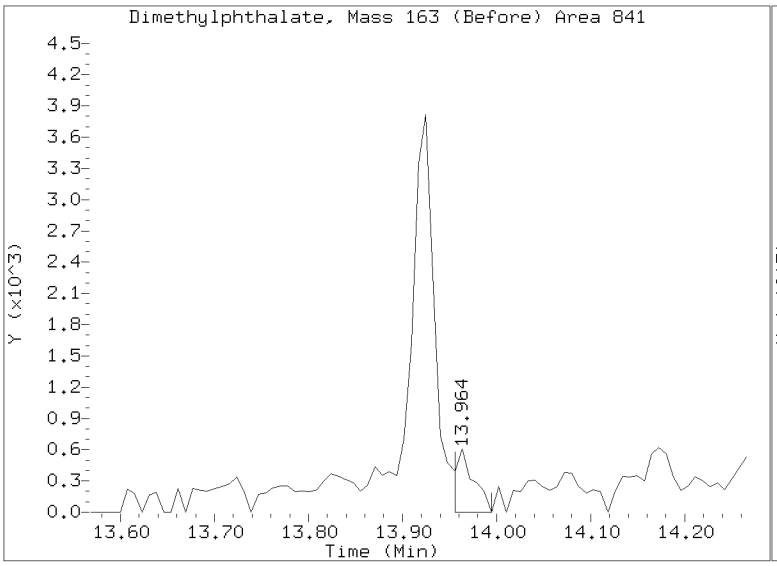
RRT check based on Ccal File: NT1021081402.D

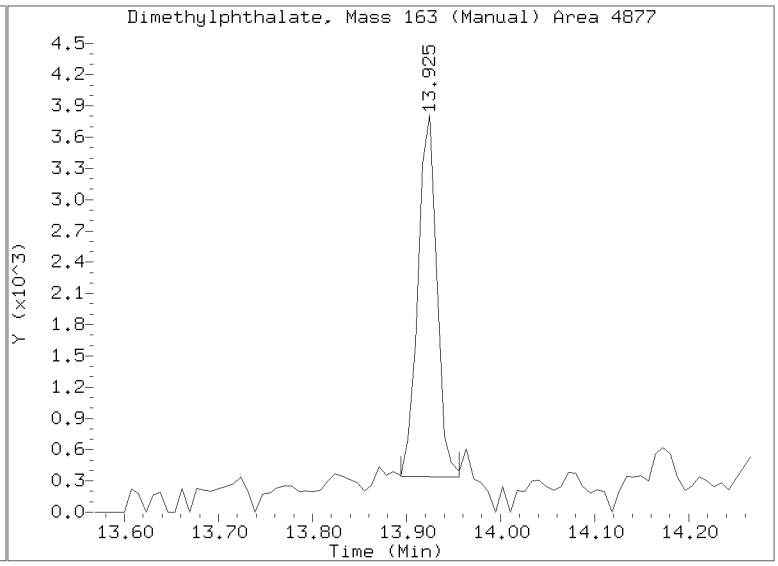
On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

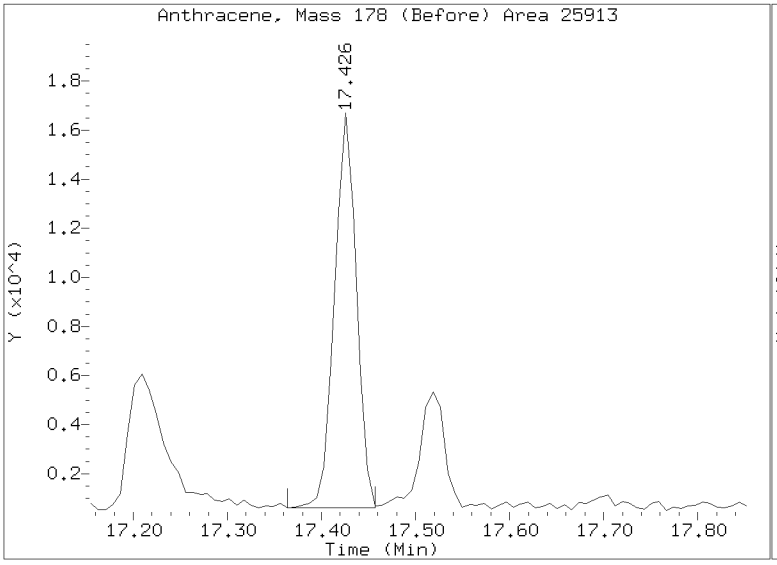
* Only compounds listed in the work order have been verified by the analyst *

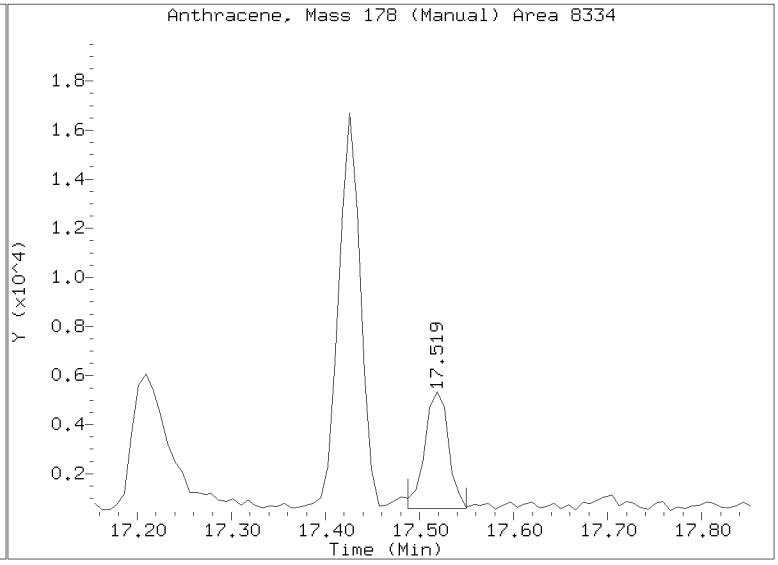
Quant Ion Manual Peak Adjustment Report

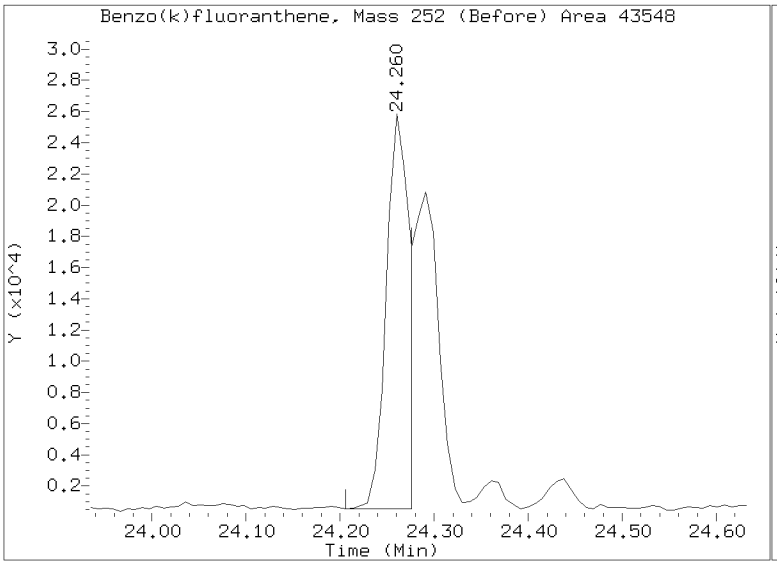
Datafile: //target/share/chem3/nt10.i/20210814.b/NT1021081410.D
Injection Date: 14-AUG-2021 15:12
Lab ID:21G0286-04 Client ID:
Report Date: 08/16/2021 09:24

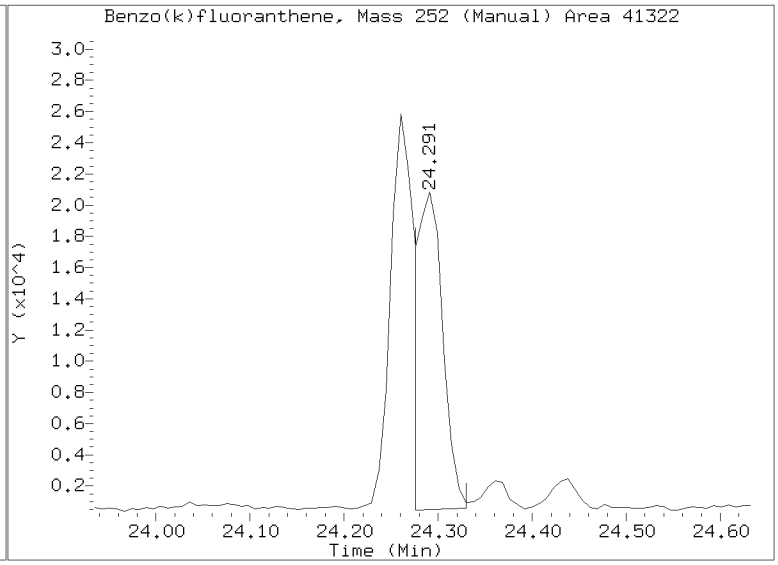






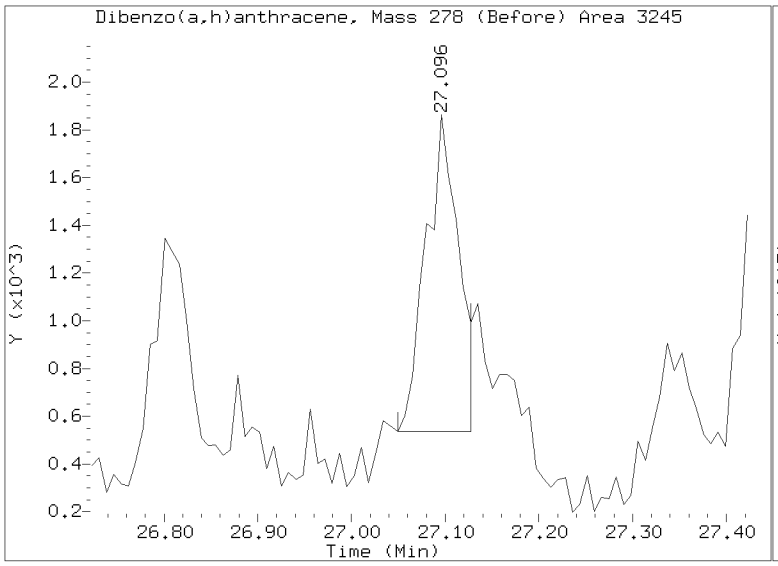


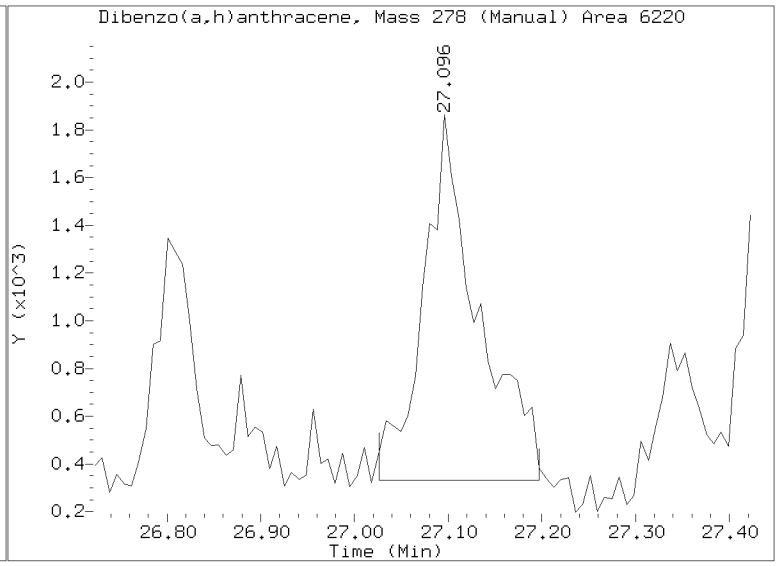




Quant Ion Manual Peak Adjustment Report

Datafile: //target/share/chem3/nt10.i/20210814.b/NT1021081410.D
Injection Date: 14-AUG-2021 15:12
Lab ID:21G0286-04 Client ID:
Report Date: 08/16/2021 09:24





Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS646

Form I
ORGANIC ANALYSIS DATA SHEET
EPA 8270E
Semivolatiles (20ug/kg - 0.2ug/L SepF)

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-05 B	SDG:	21G0286
Sampled:	07/22/21 11:50	Prepared:	08/02/21 11:20	File ID:	NT1021081413.D
% Solids:	64.57	Preparation:	EPA 3546 (Microwave)	Analyzed:	08/14/21 17:12
Batch:	BJH0004	Sequence:	SJH0174	Initial/Final:	15.55 g Wet / 1 mL
Instrument:	NT10	Column:	ZB-5MSi	Calibration:	EG00057
Cleanups:	GPC				

CAS NO.	COMPOUND	DILUTION	CONC: (ug/kg dry)	Q	DL	RL
85-68-7	Butylbenzylphthalate	1	200		9.4	19.9

SURROGATES	ADDED: (ug/kg dry)	FOUND: (ug/kg dry)	% REC	QC LIMITS	Q
p-Terphenyl-d14	497.98	395	79.4	37 - 120	

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081413.D

Date : 14-AUG-2021 17:12

Client ID:

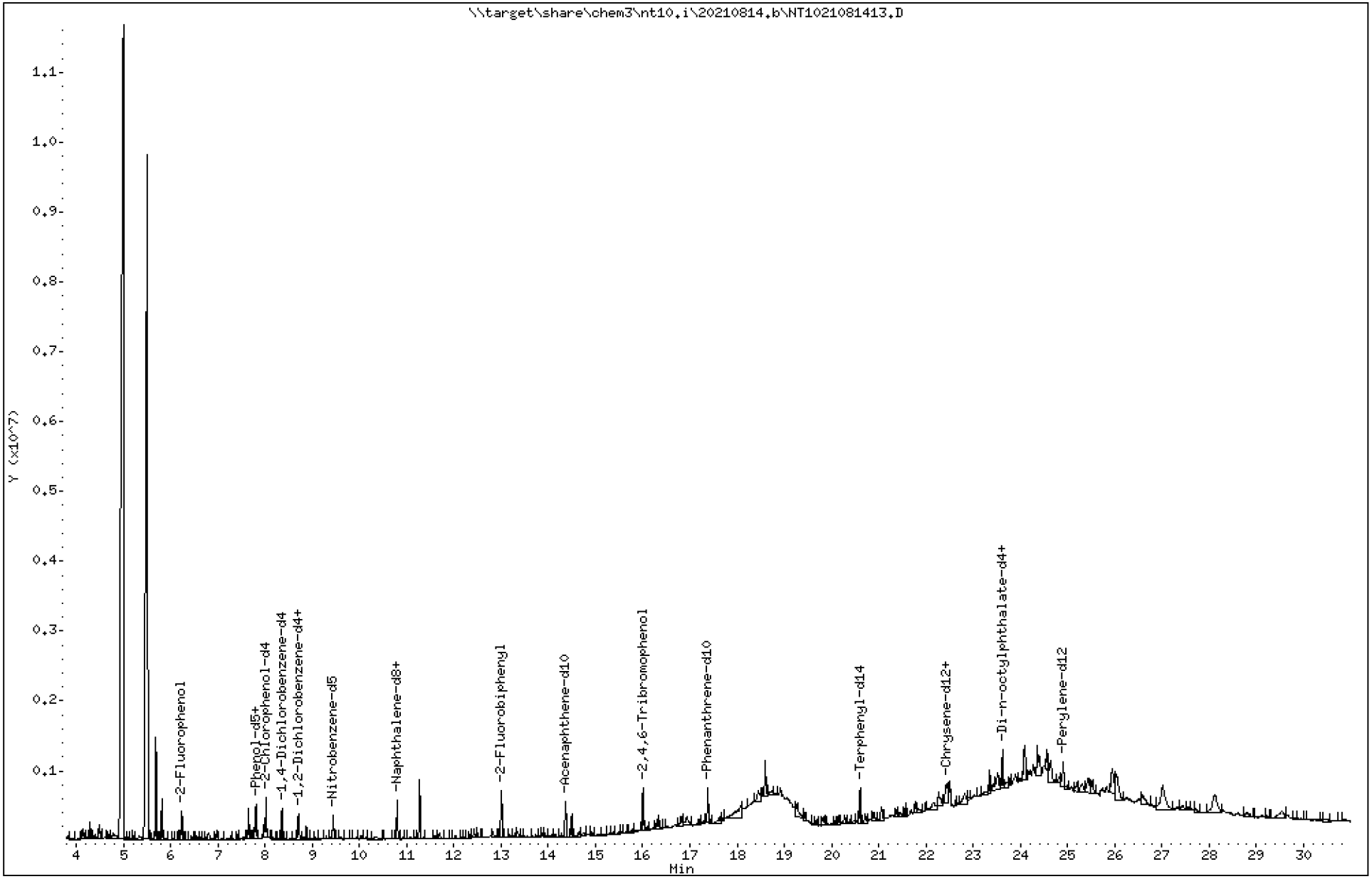
Instrument: nt10.i

Sample Info: 21G0286-05

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

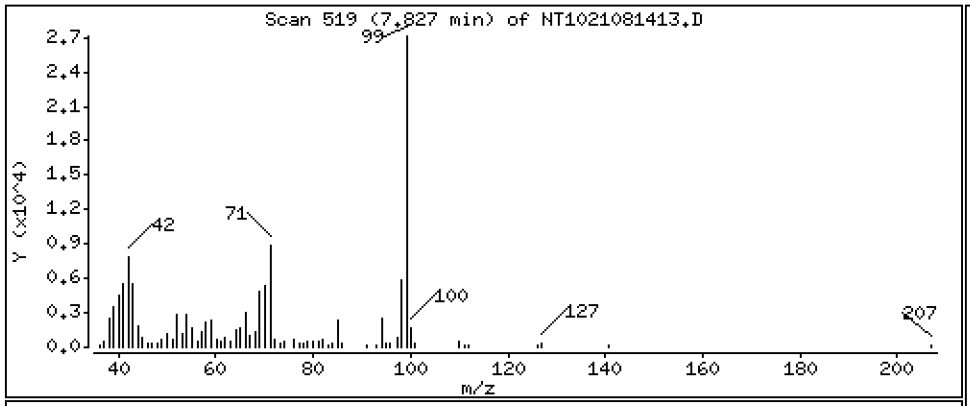
Operator: VTS

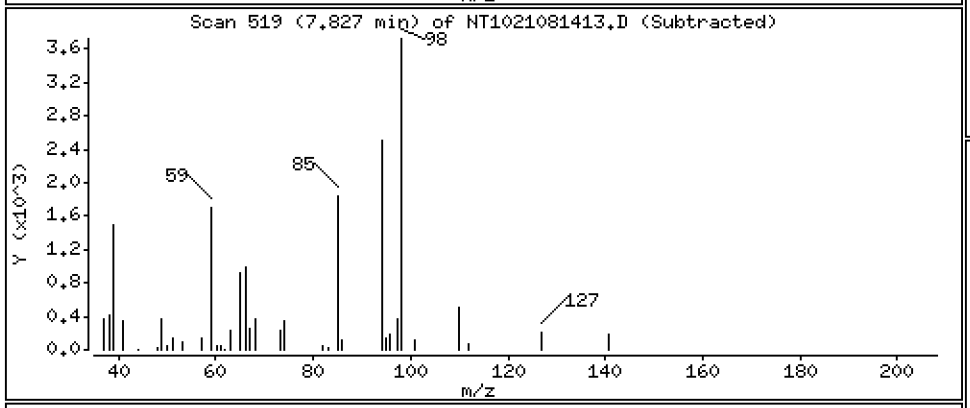
Column phase: ZB-5msi

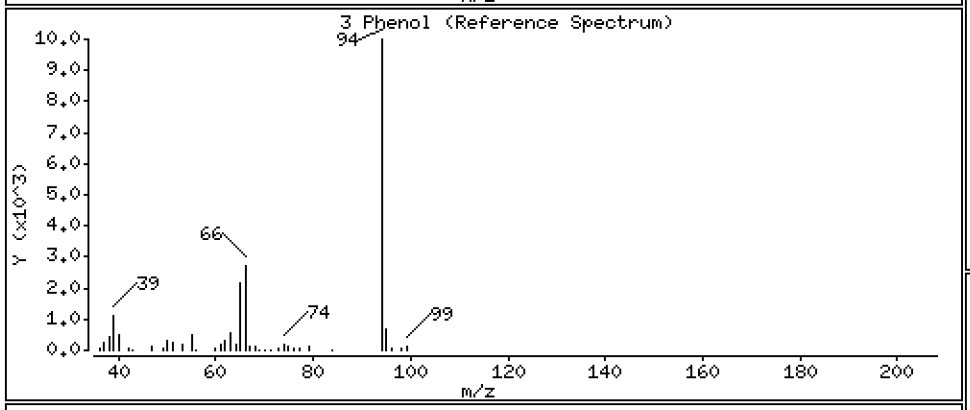
Column diameter: 0.25

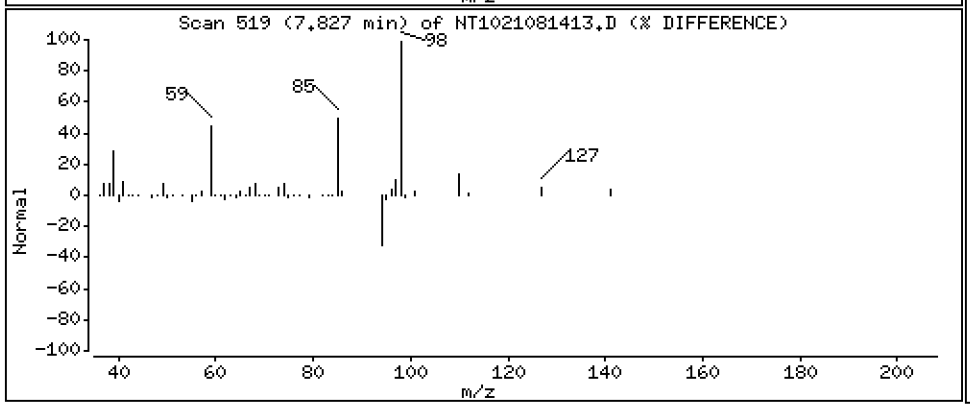
3 Phenol

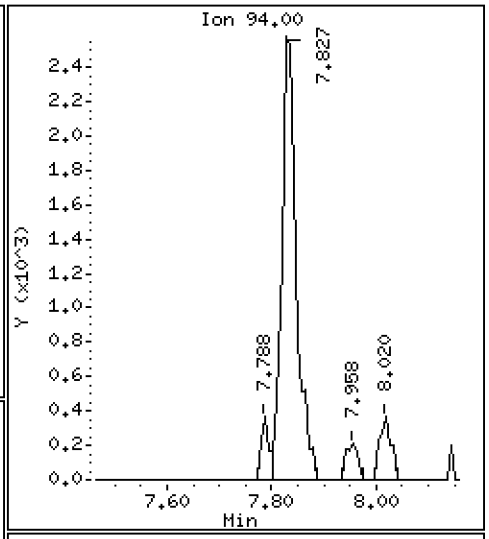
Concentration: 0.1015 ug/mL

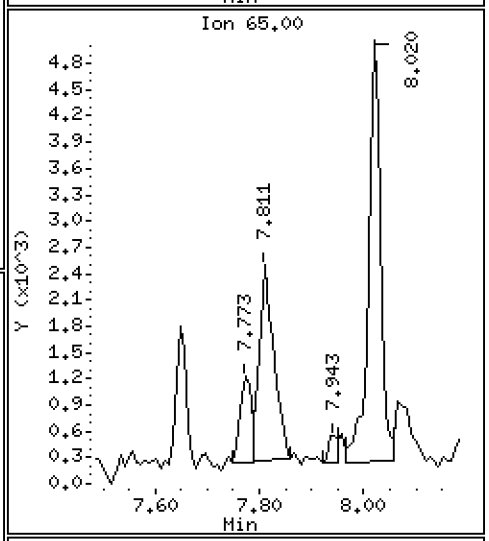


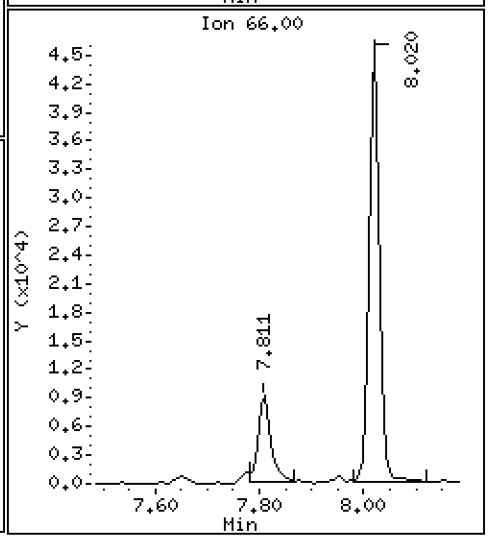












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

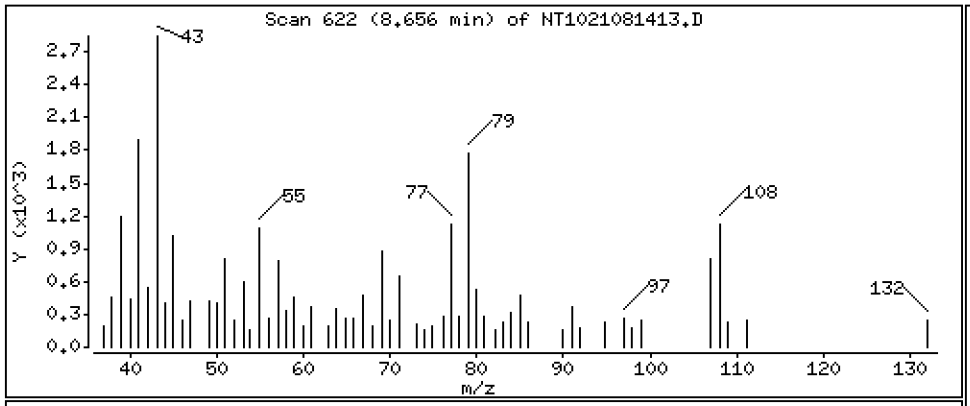
Operator: VTS

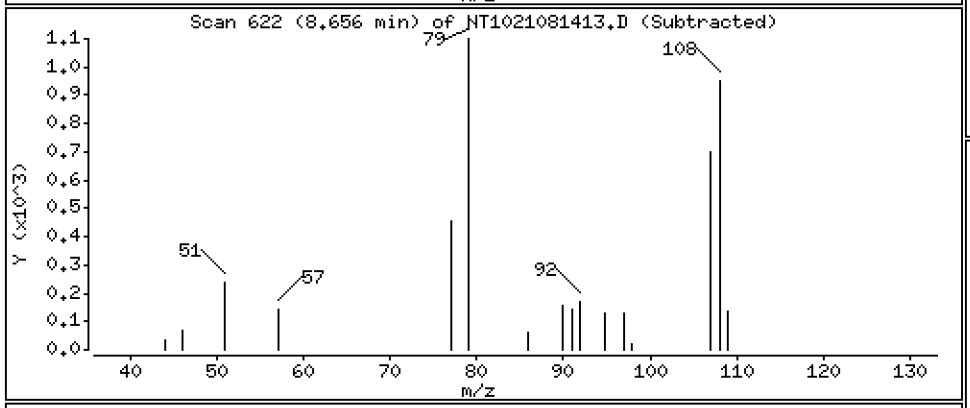
Column phase: ZB-5msi

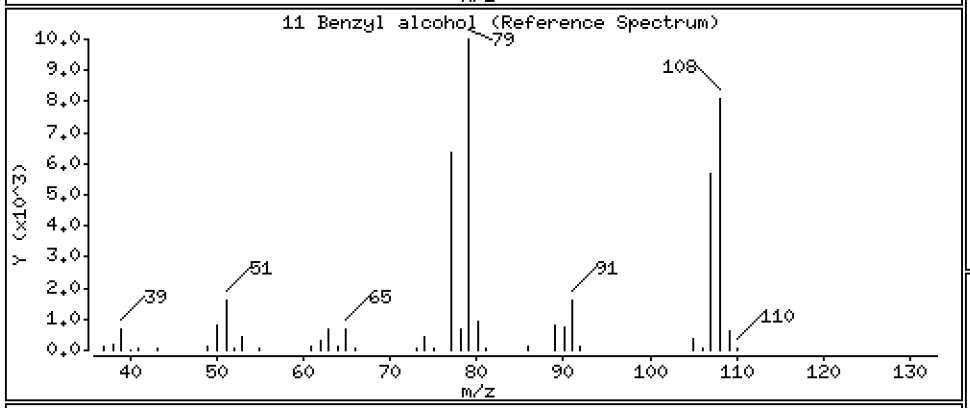
Column diameter: 0.25

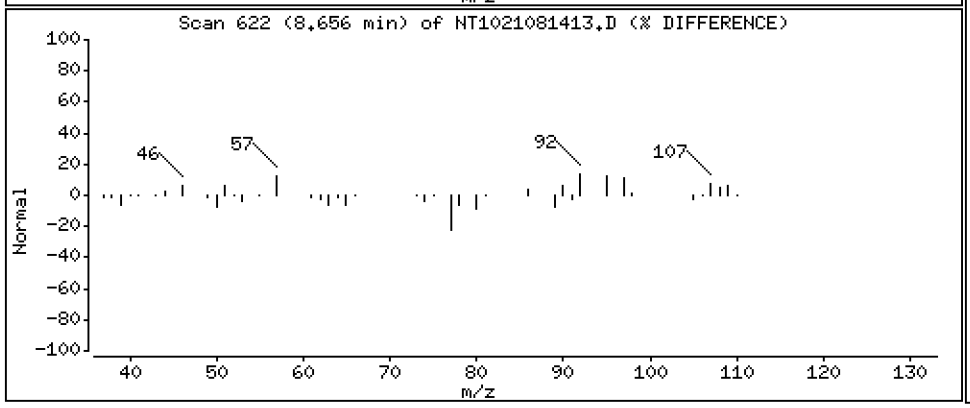
11 Benzyl alcohol

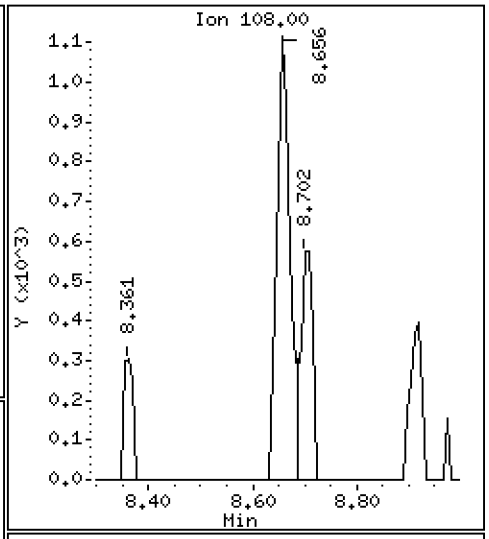
Concentration: 0.08217 ug/mL

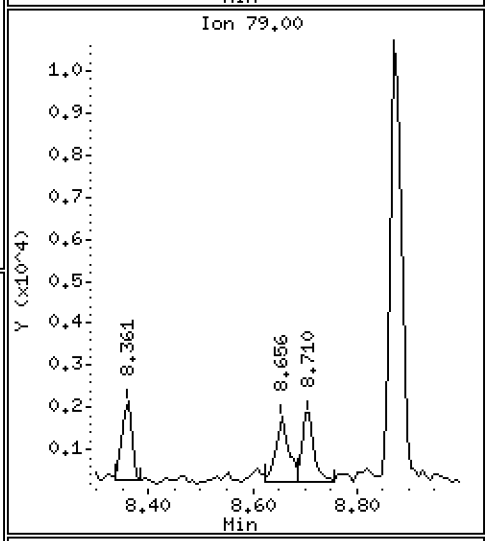


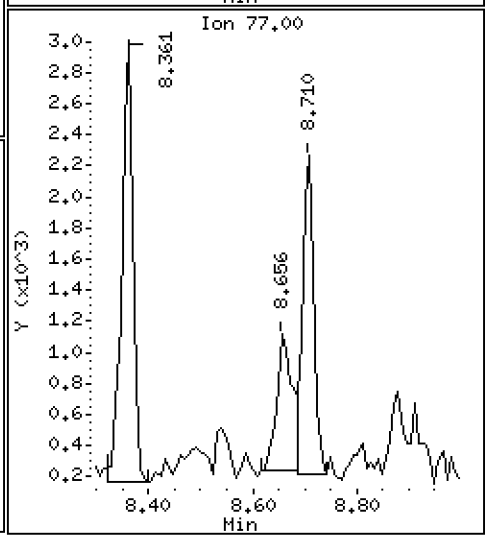












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

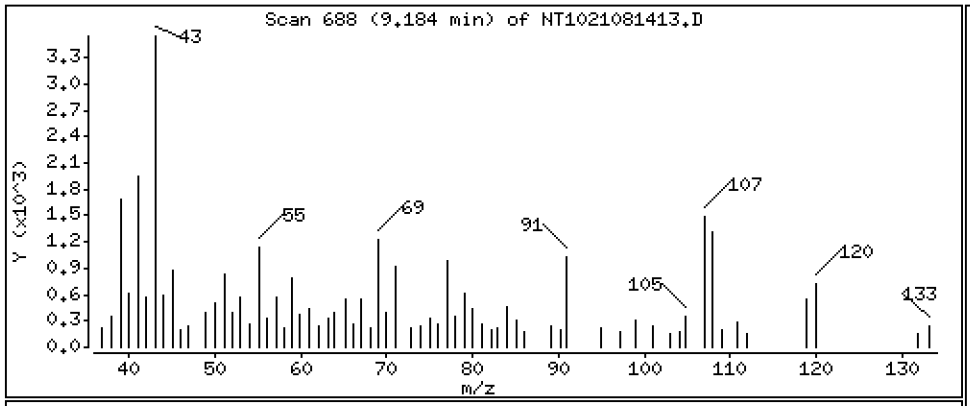
Operator: VTS

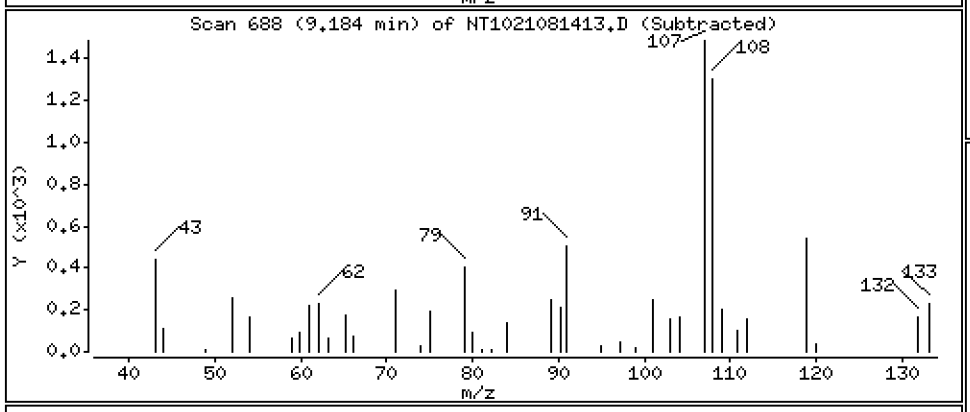
Column phase: ZB-5msi

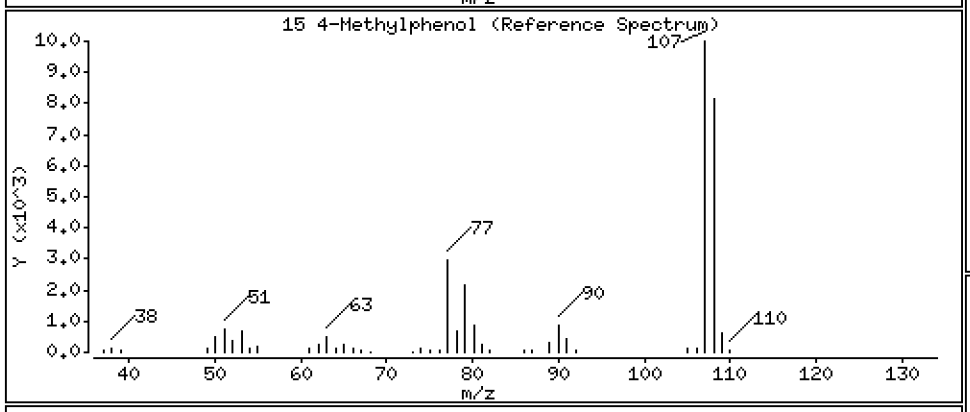
Column diameter: 0.25

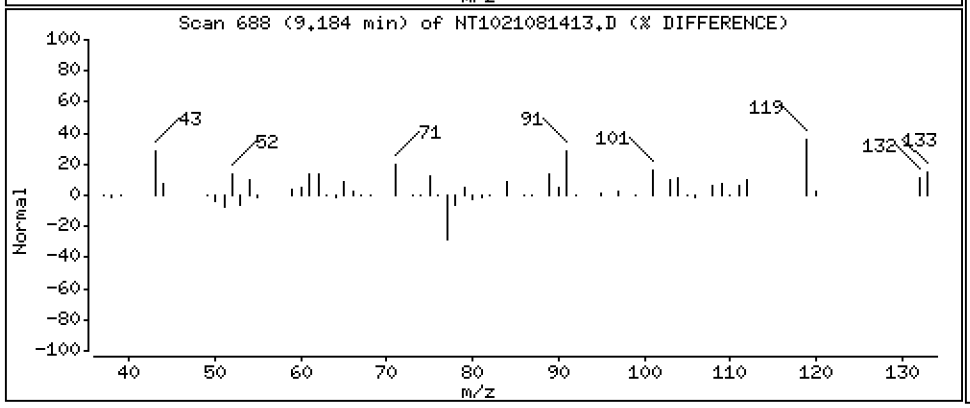
15 4-Methylphenol

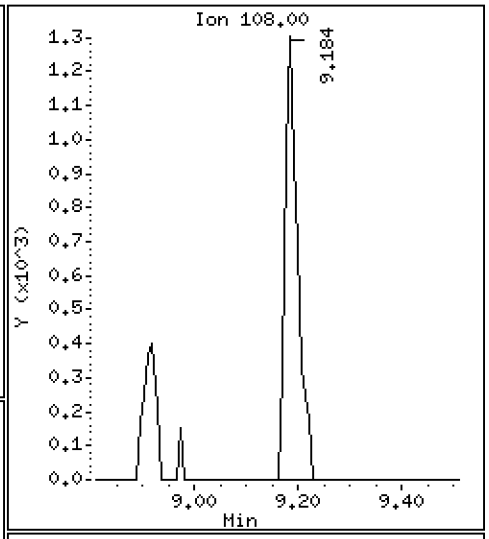
Concentration: 0.06942 ug/mL

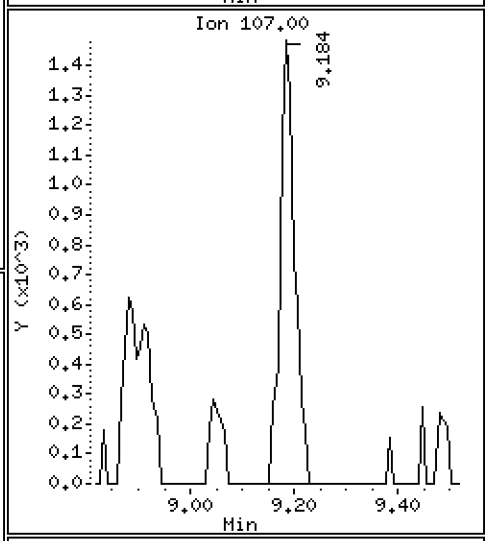


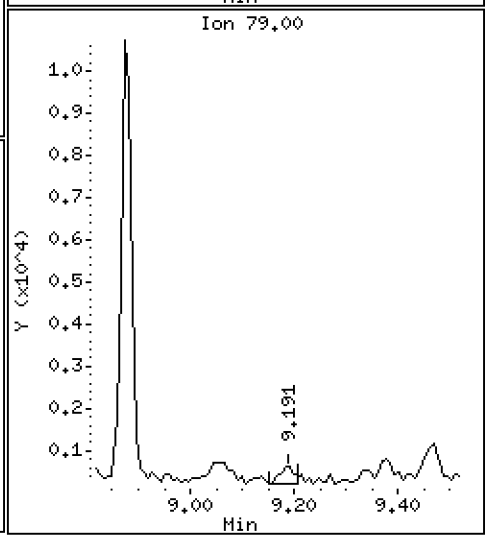












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

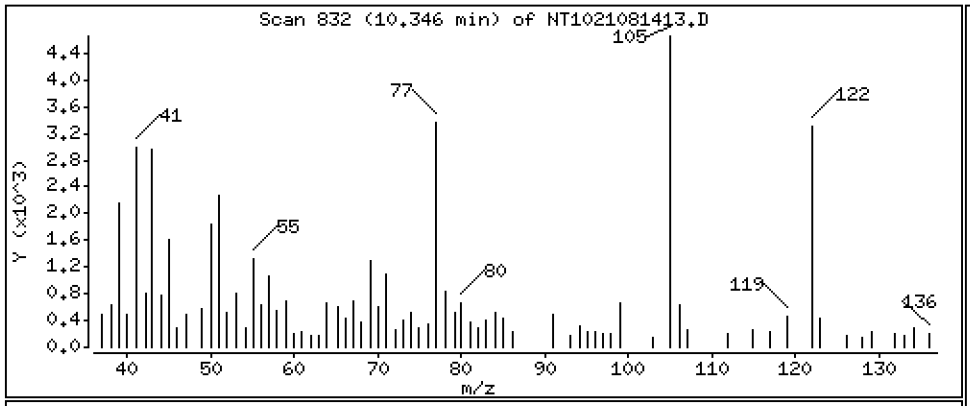
Operator: VTS

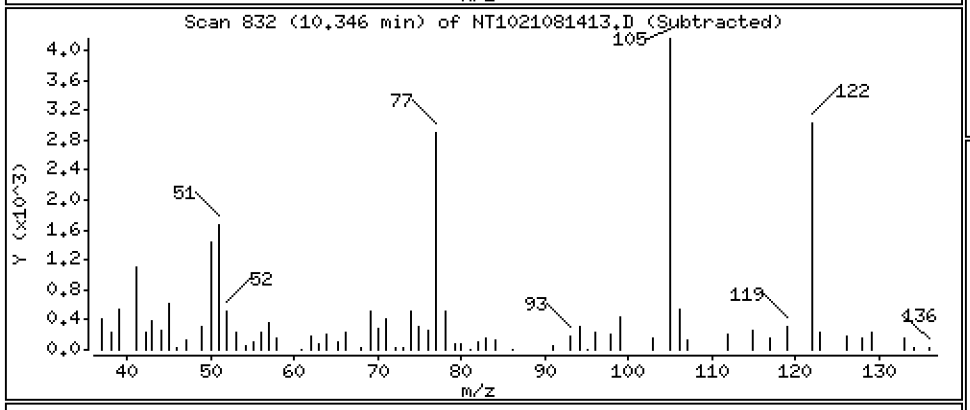
Column phase: ZB-5msi

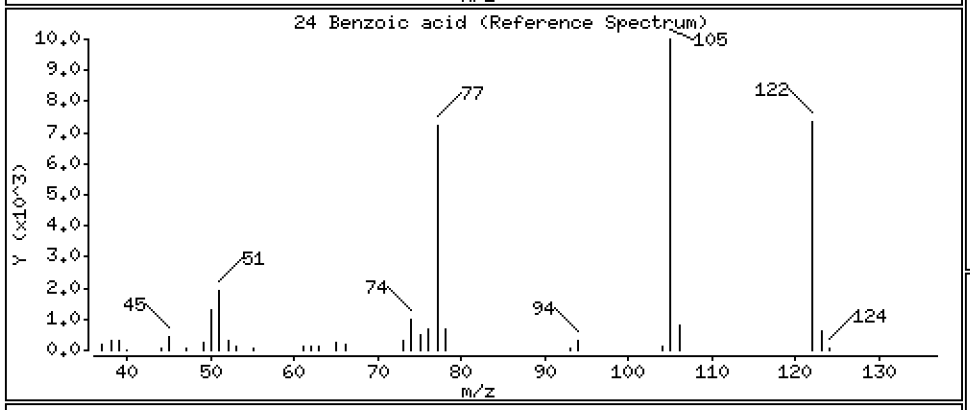
Column diameter: 0.25

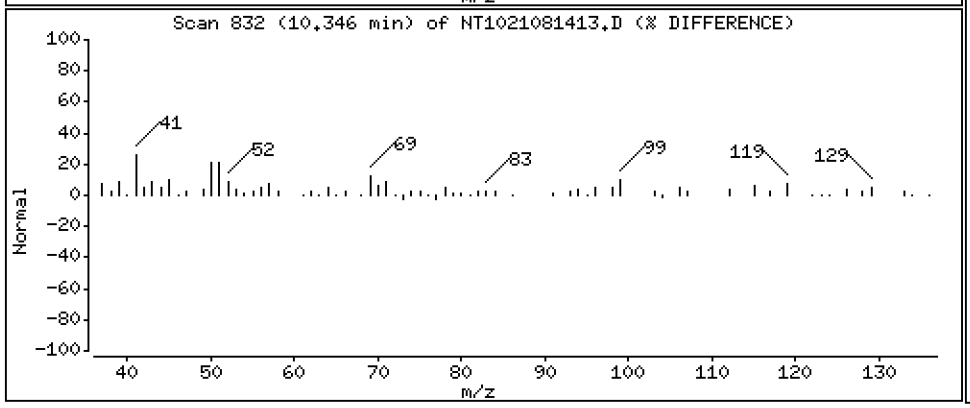
24 Benzoic acid

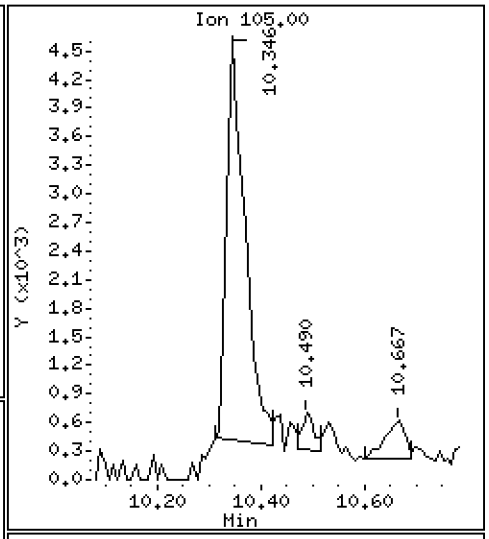
Concentration: 0.5514 ug/mL

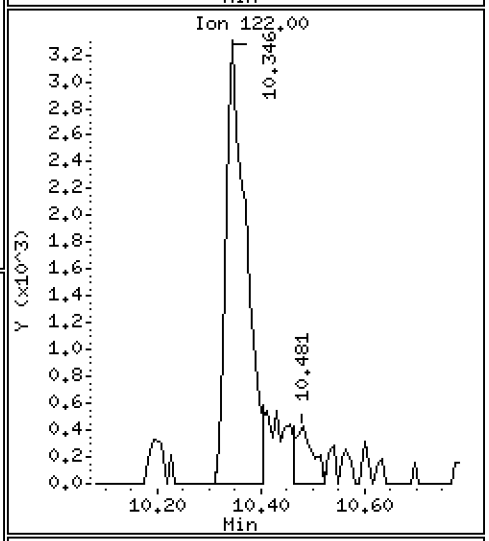


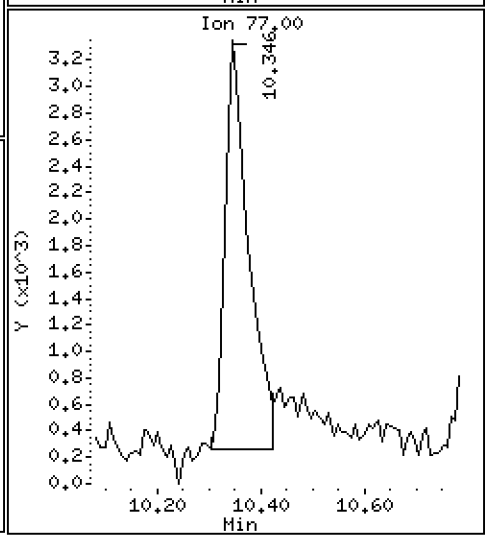












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

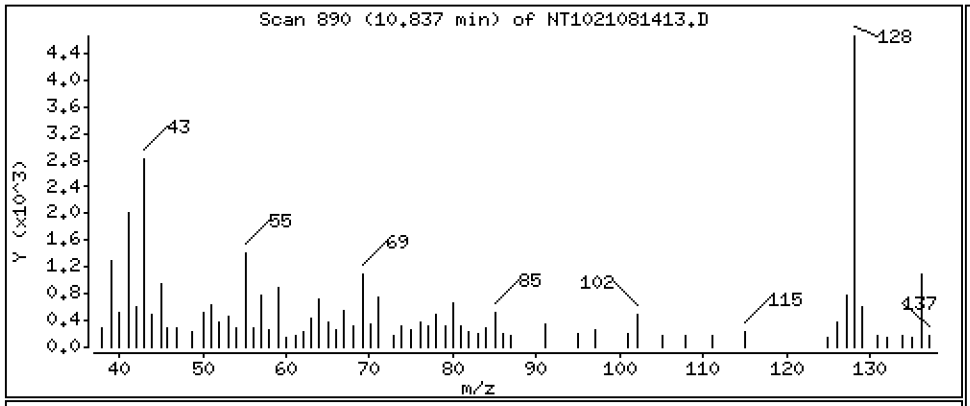
Operator: VTS

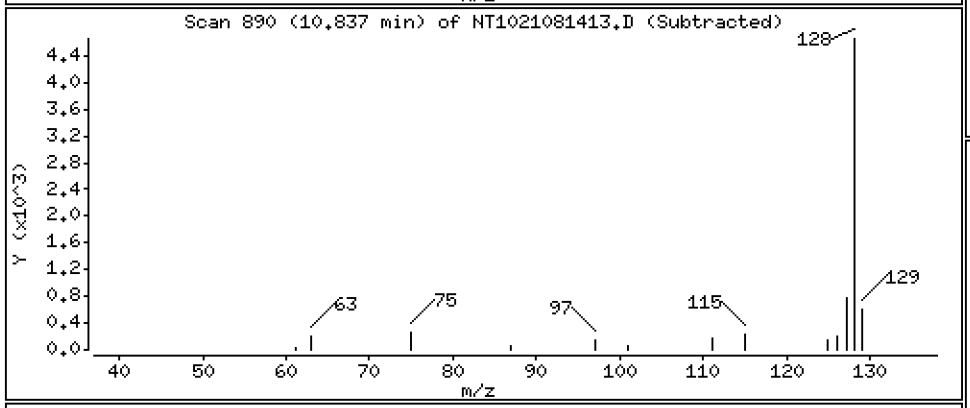
Column phase: ZB-5msi

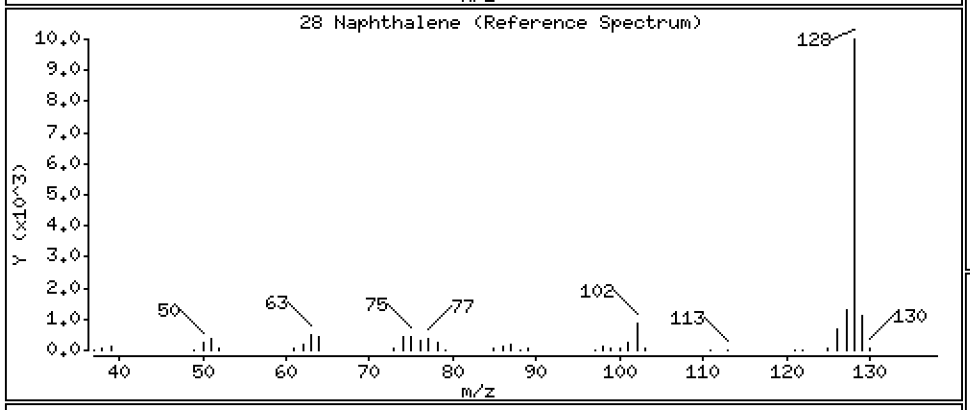
Column diameter: 0.25

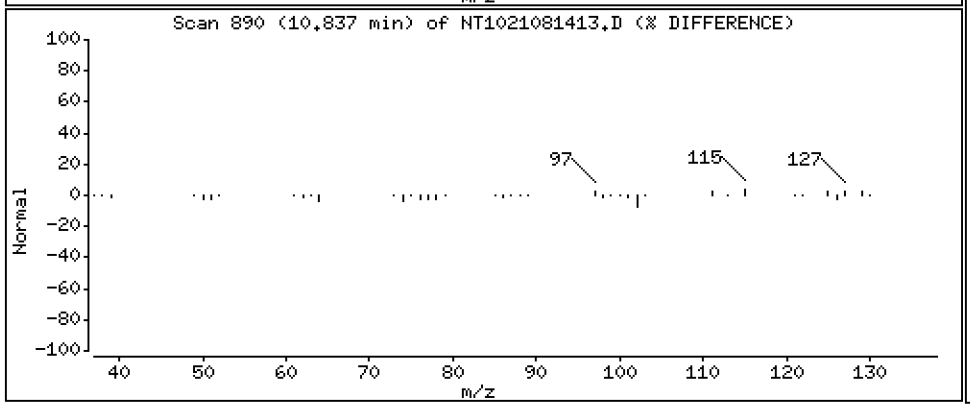
28 Naphthalene

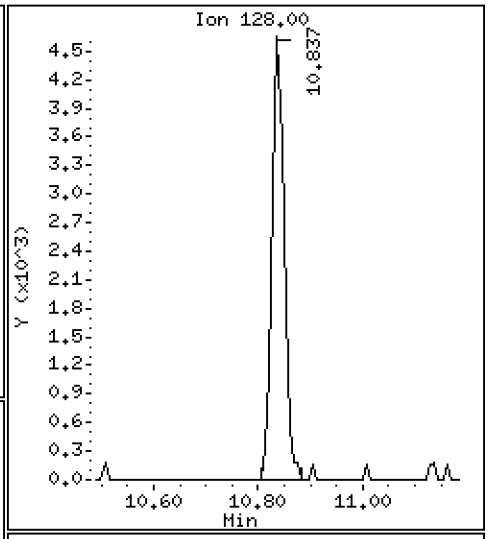
Concentration: 0.07421 ug/mL

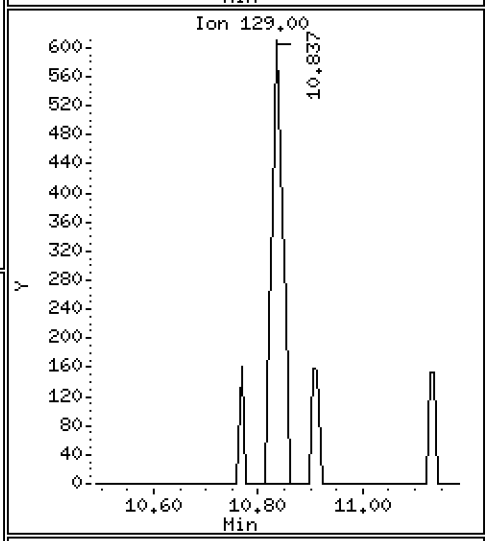


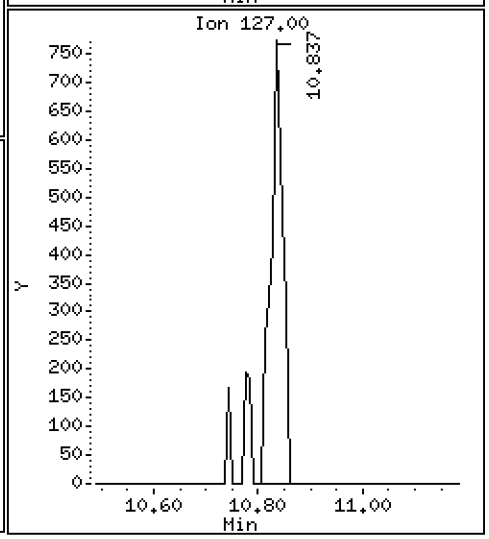












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

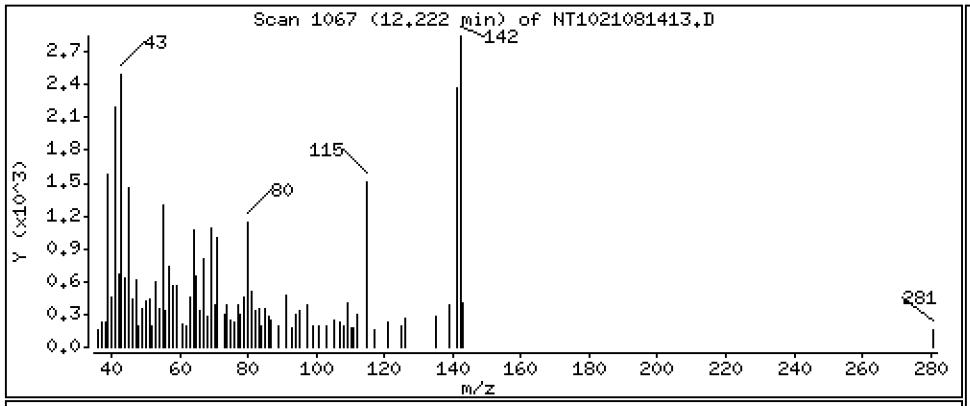
Operator: VTS

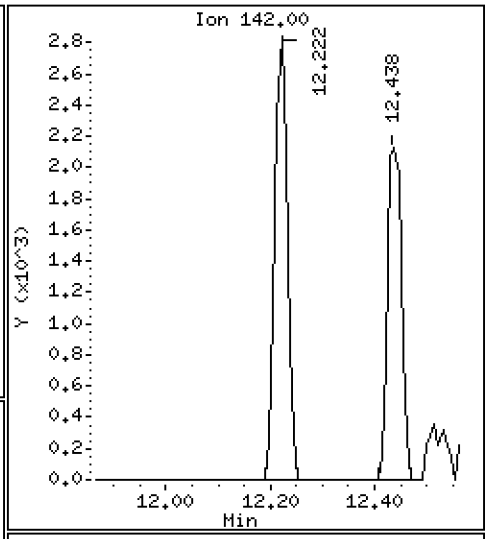
Column phase: ZB-5msi

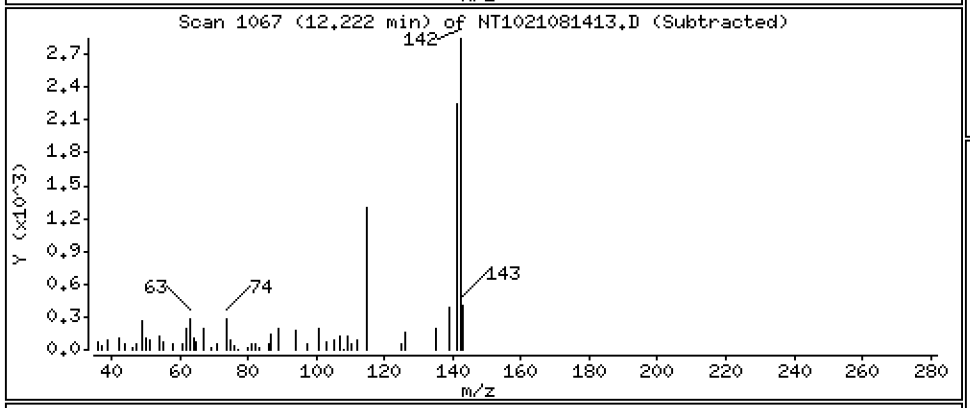
Column diameter: 0.25

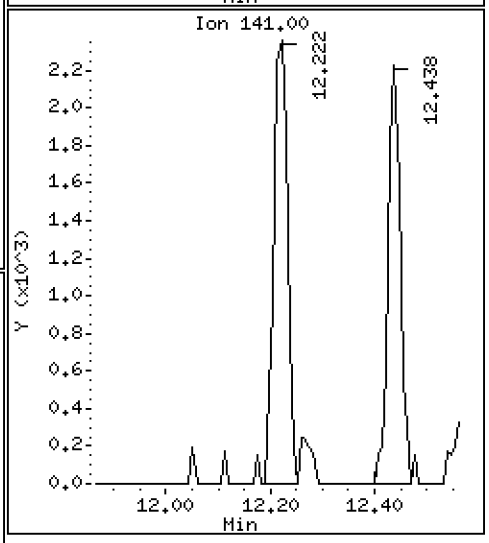
32 2-Methylnaphthalene

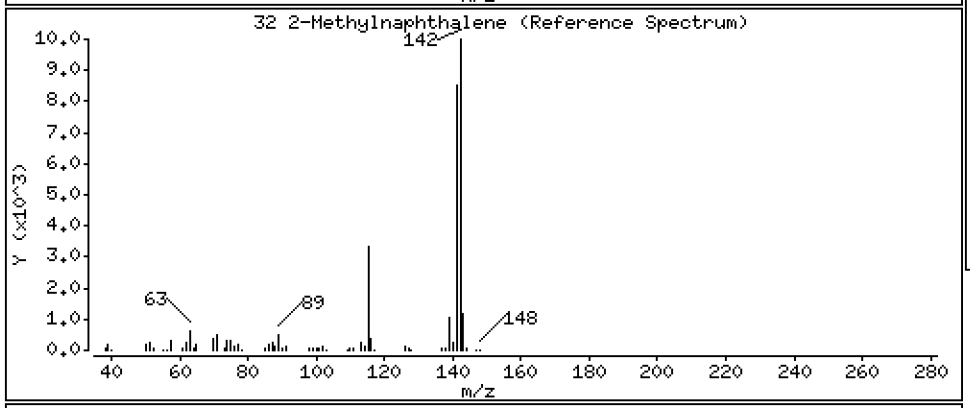
Concentration: 0.05087 ug/mL

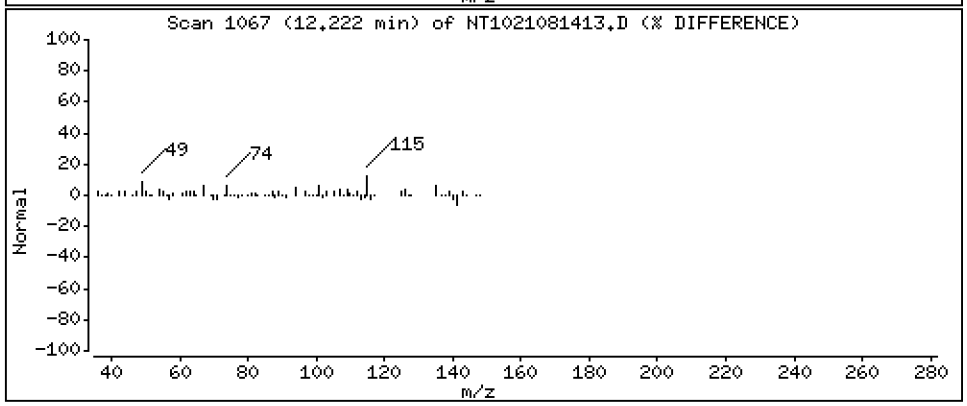












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

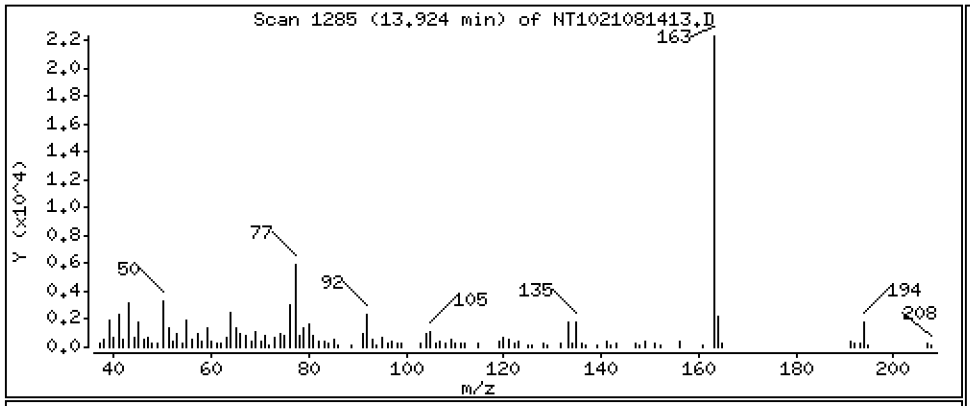
Operator: VTS

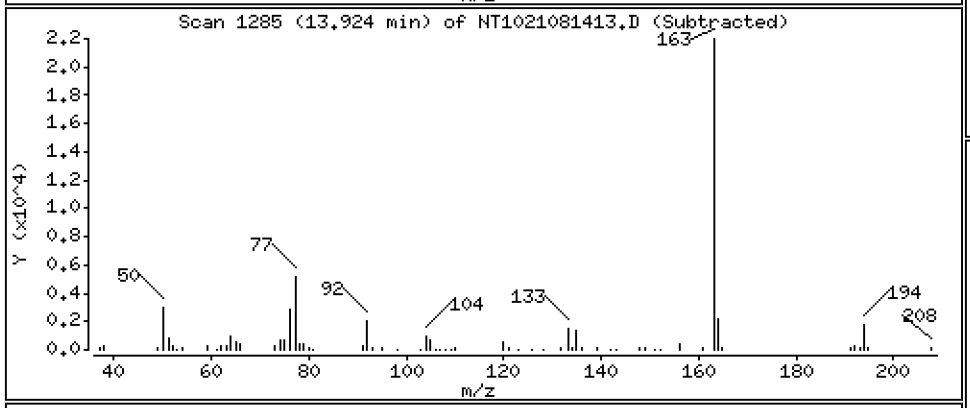
Column phase: ZB-5msi

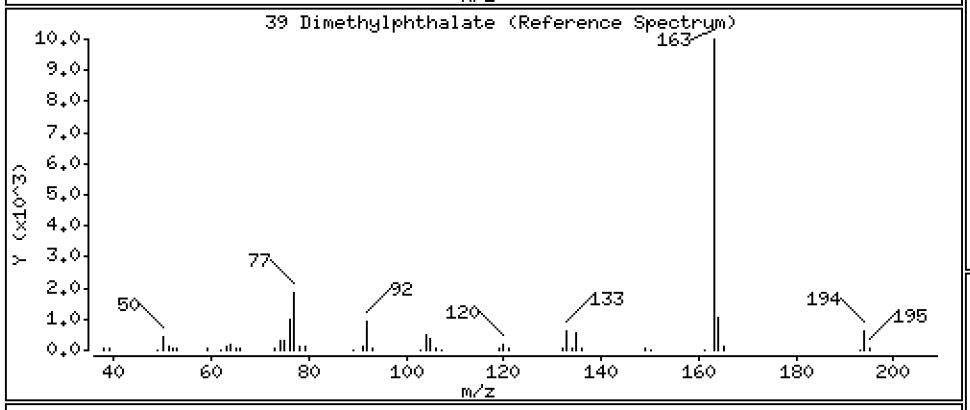
Column diameter: 0.25

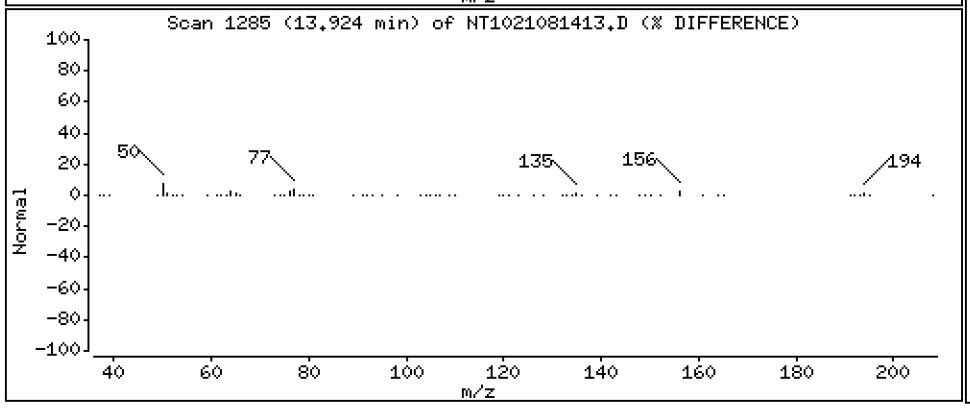
39 Dimethylphthalate

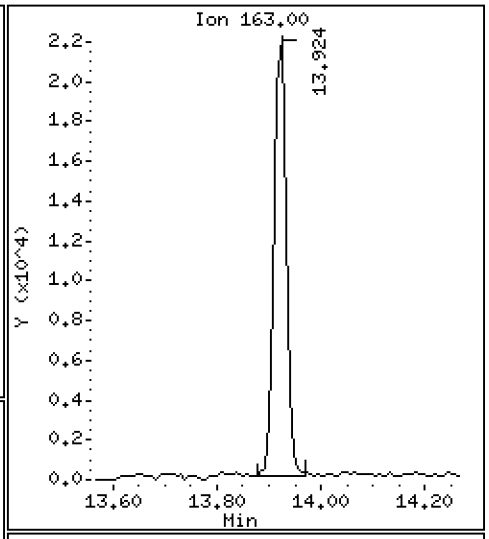
Concentration: 0.4715 ug/mL

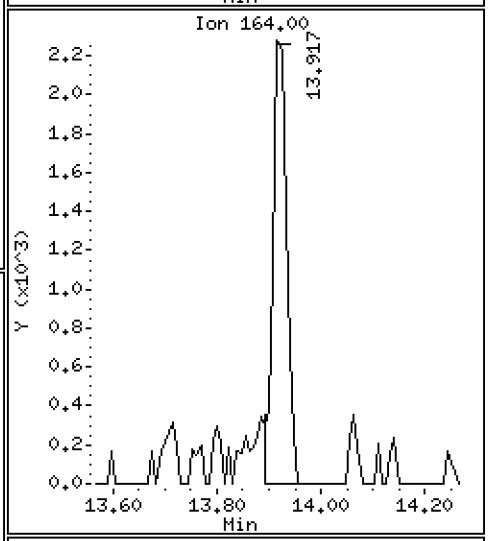


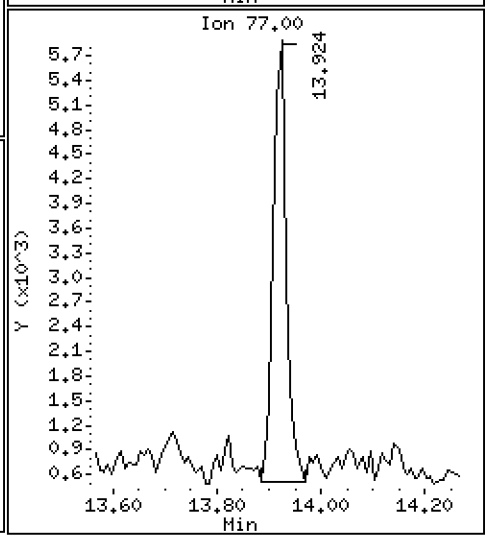












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

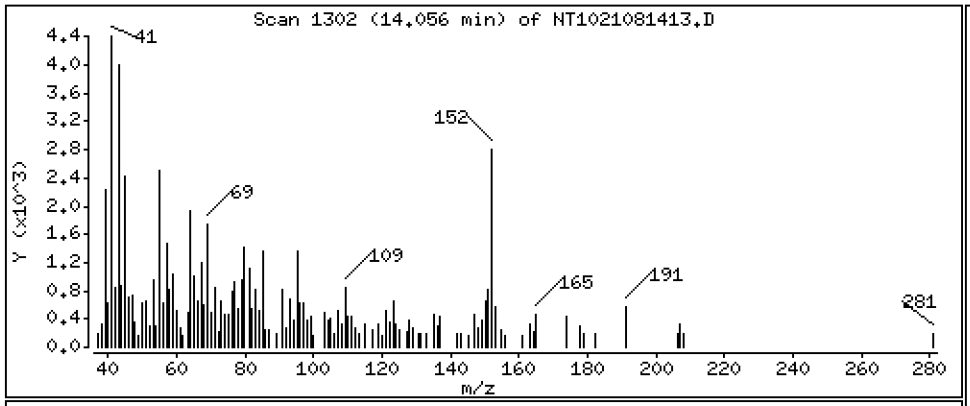
Operator: VTS

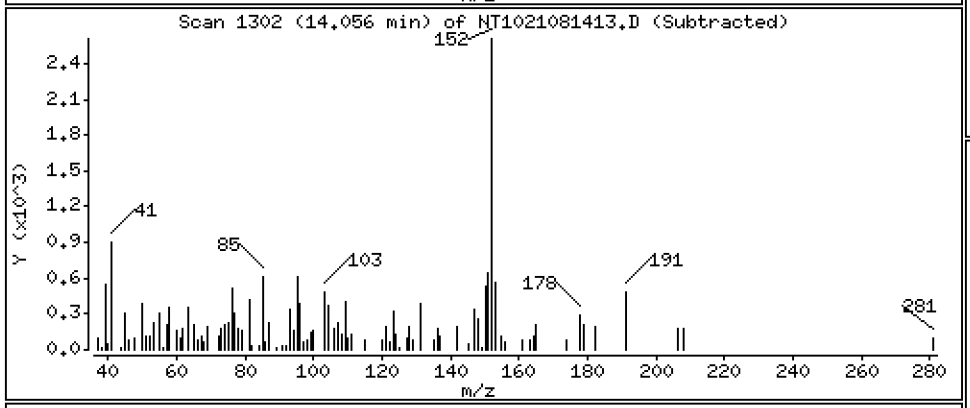
Column phase: ZB-5msi

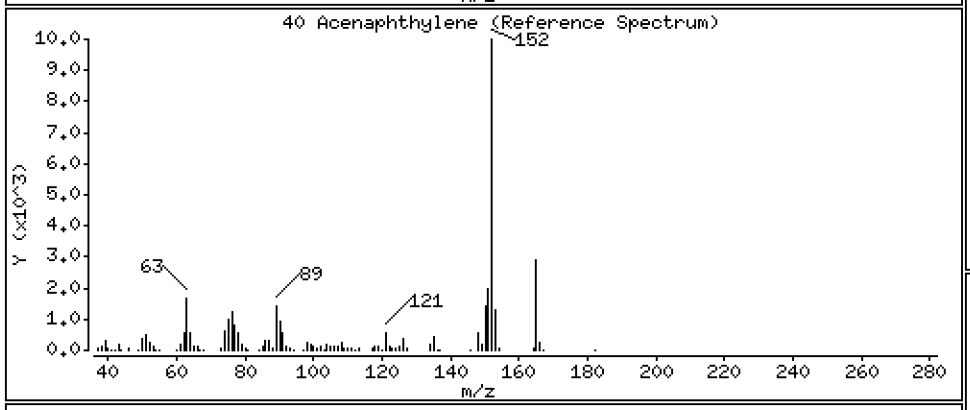
Column diameter: 0.25

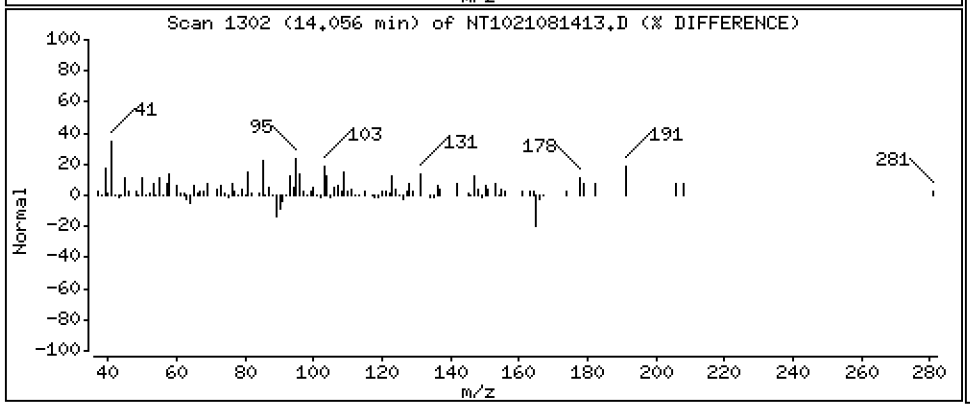
40 Acenaphthylene

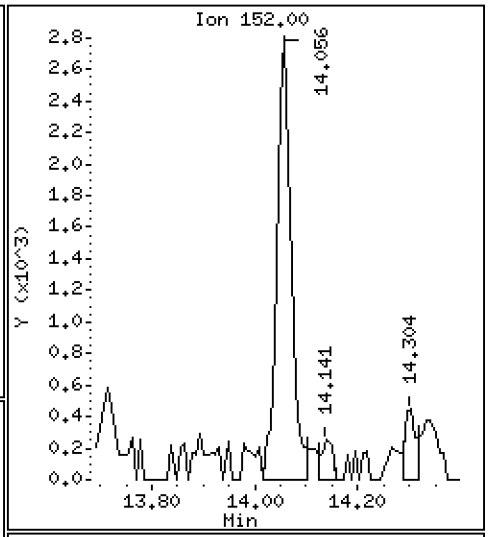
Concentration: 0.04984 ug/mL

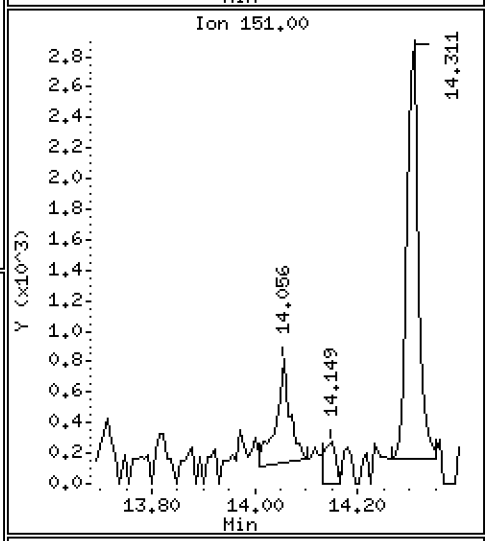


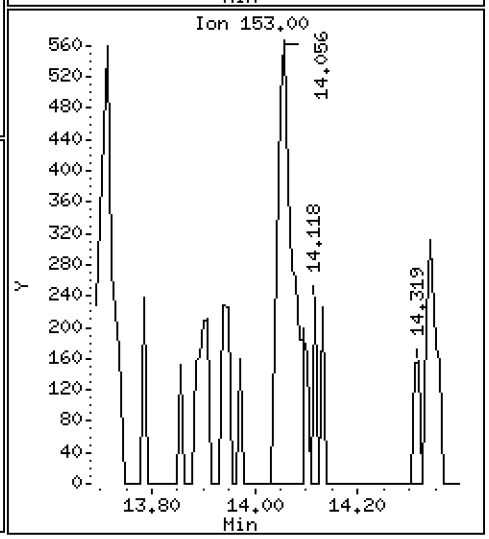












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

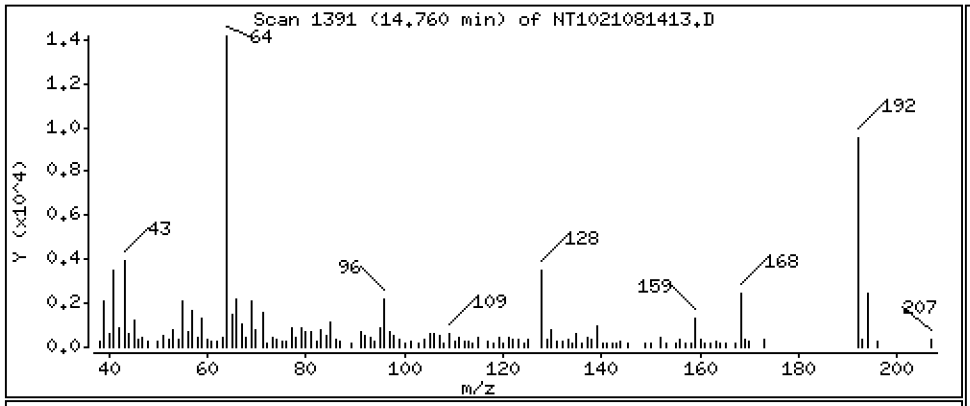
Operator: VTS

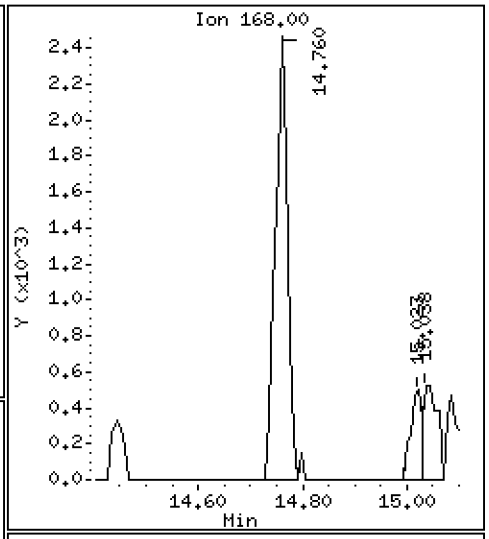
Column phase: ZB-5msi

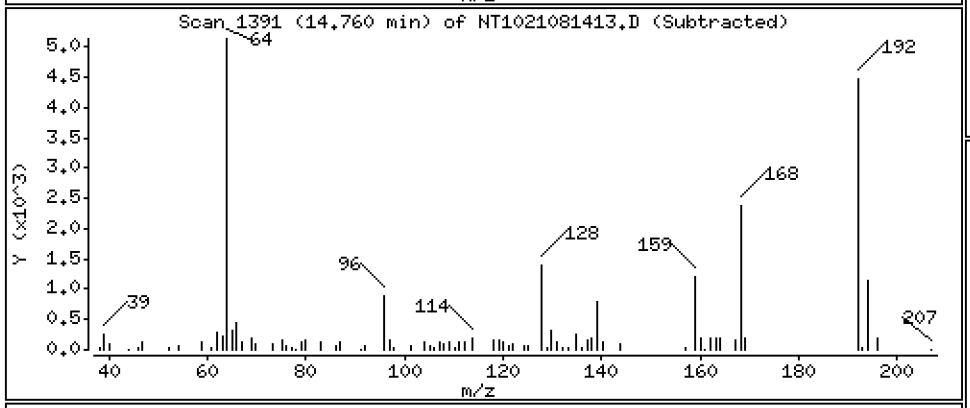
Column diameter: 0.25

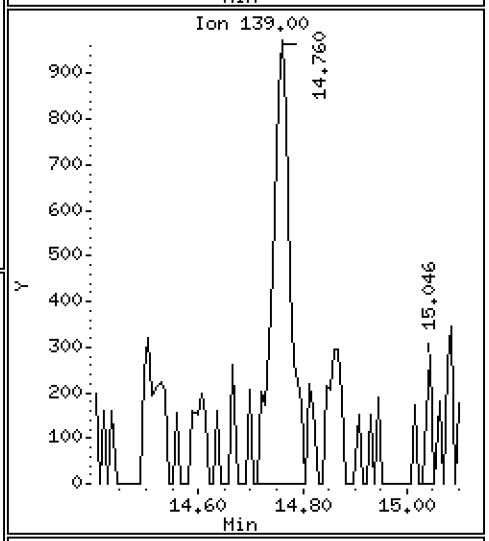
46 Dibenzofuran

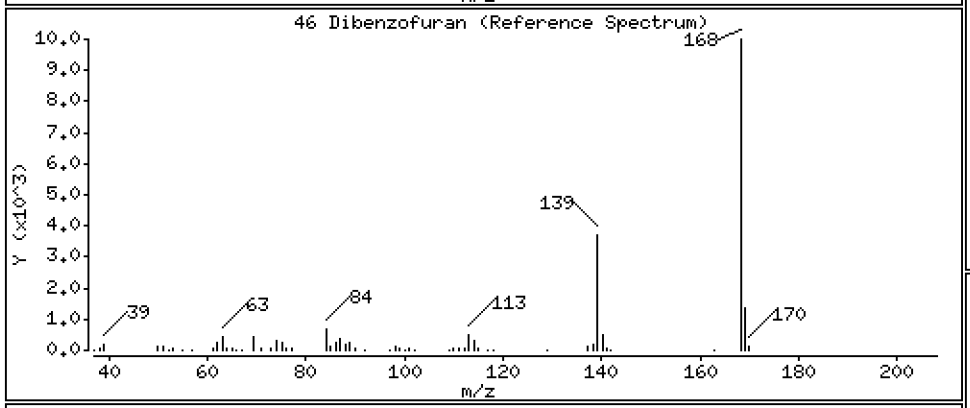
Concentration: 0.04123 ug/mL

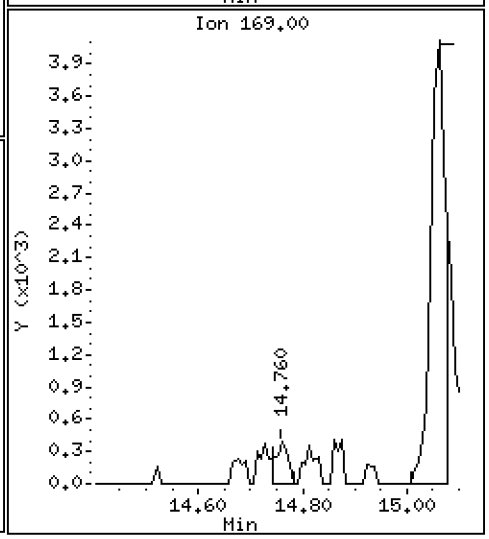


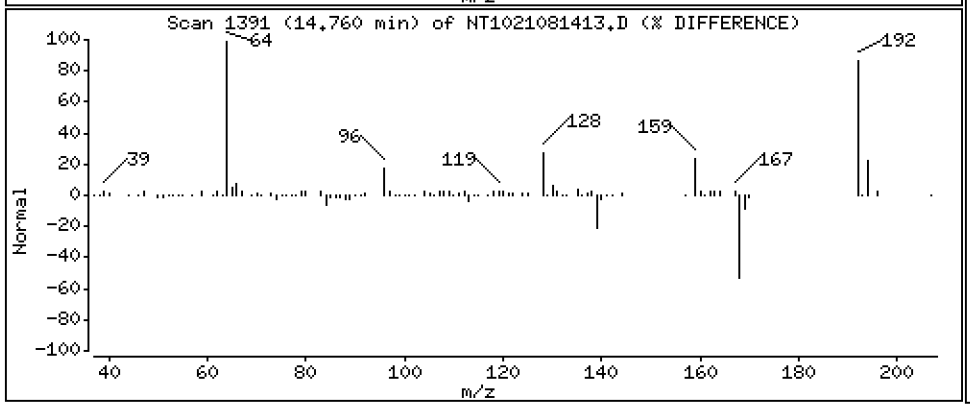












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

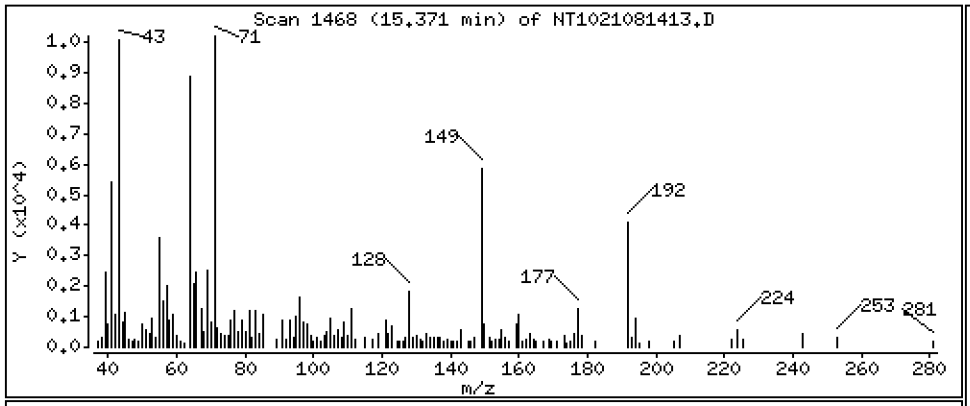
Operator: VTS

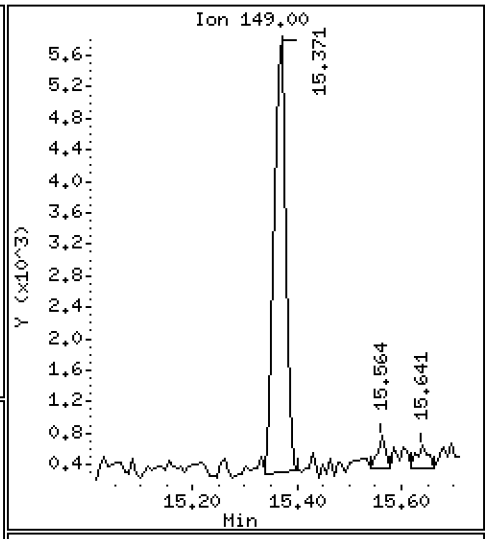
Column phase: ZB-5msi

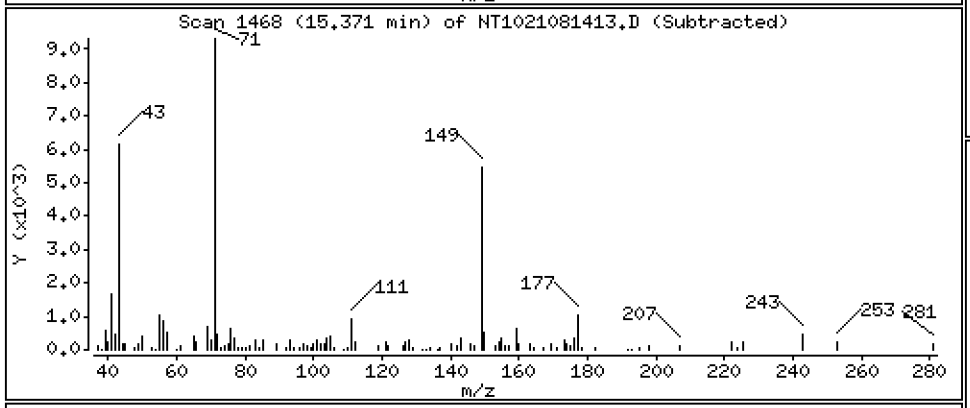
Column diameter: 0.25

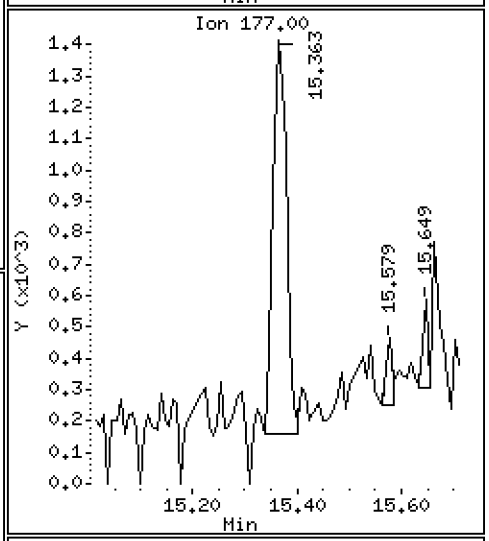
50 Diethylphthalate

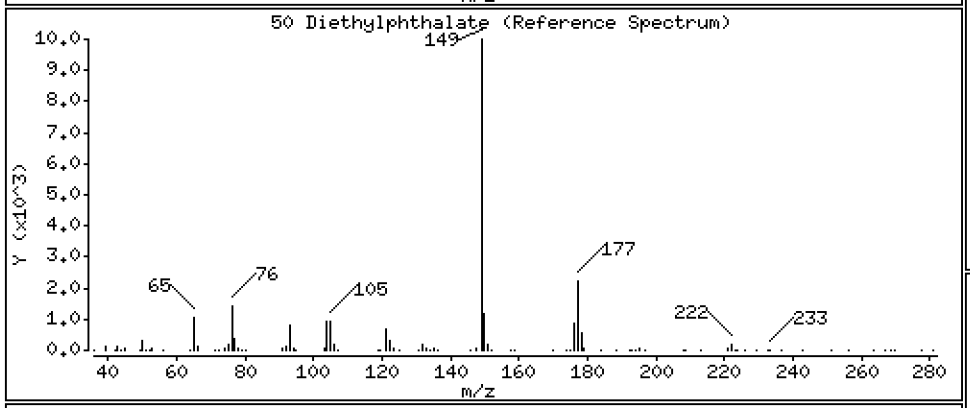
Concentration: 0.1213 ug/mL

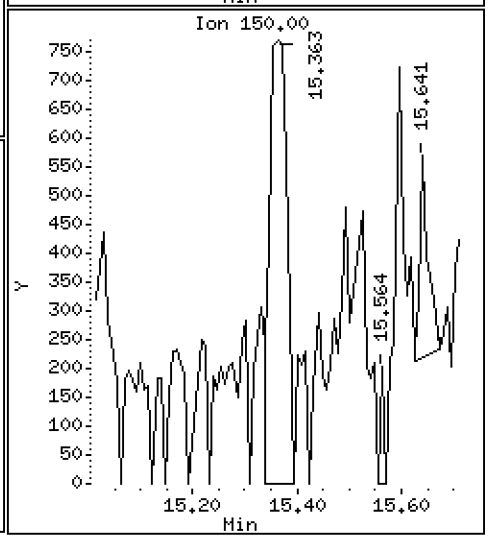


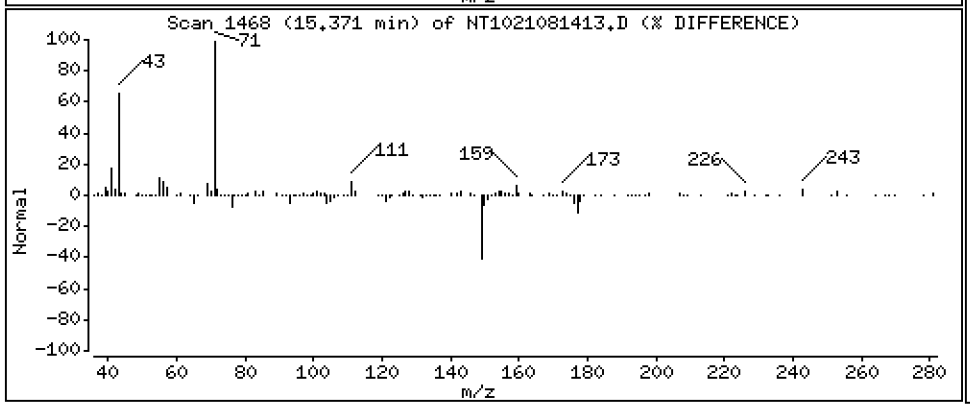












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081413.D

Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

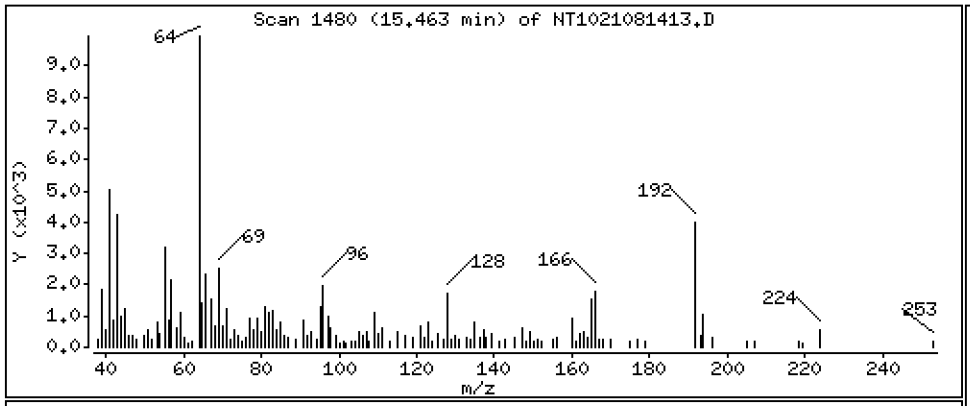
Operator: VTS

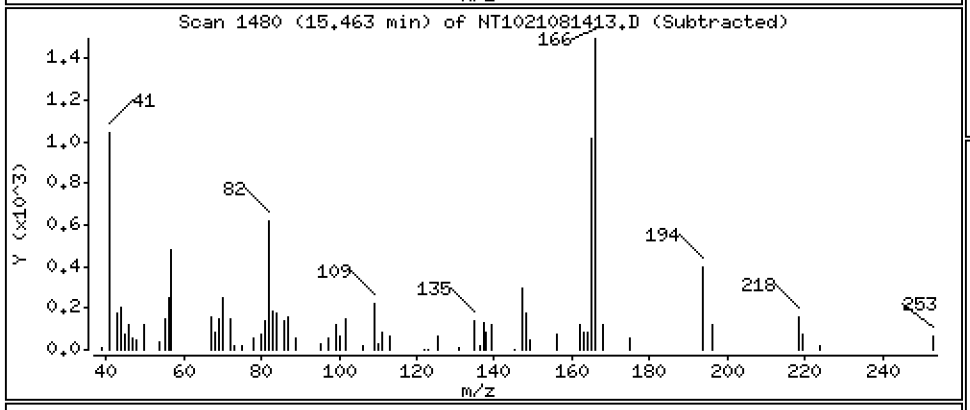
Column phase: ZB-5msi

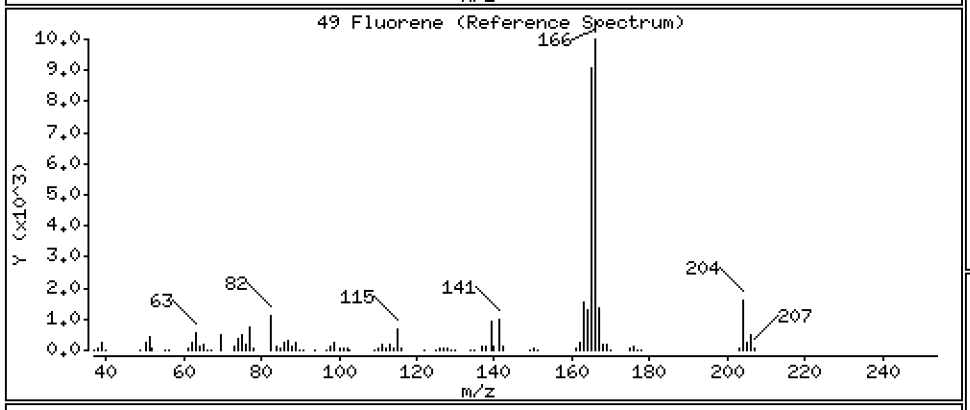
Column diameter: 0.25

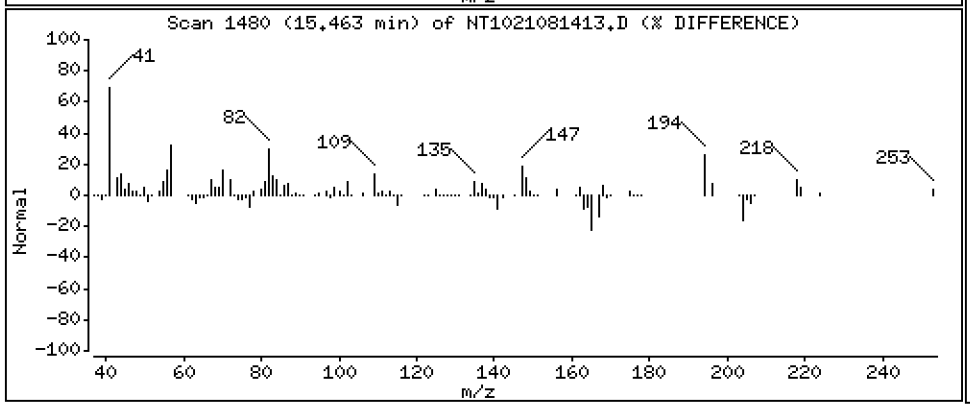
49 Fluorene

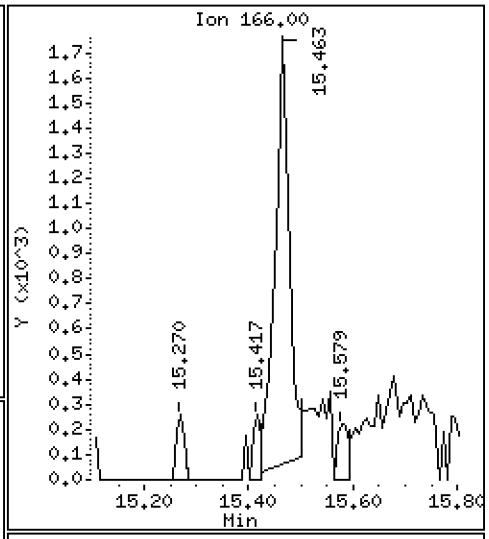
Concentration: 0.03634 ug/mL

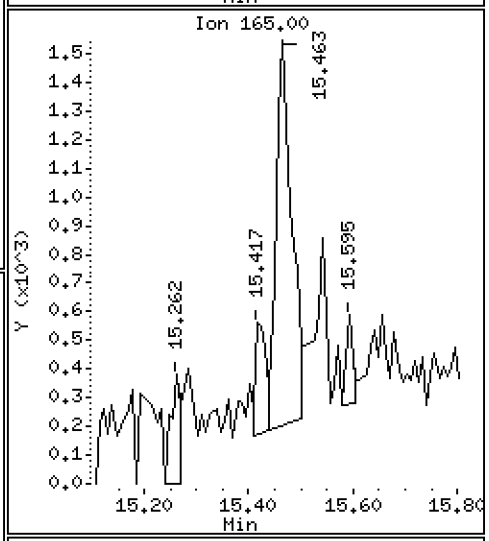


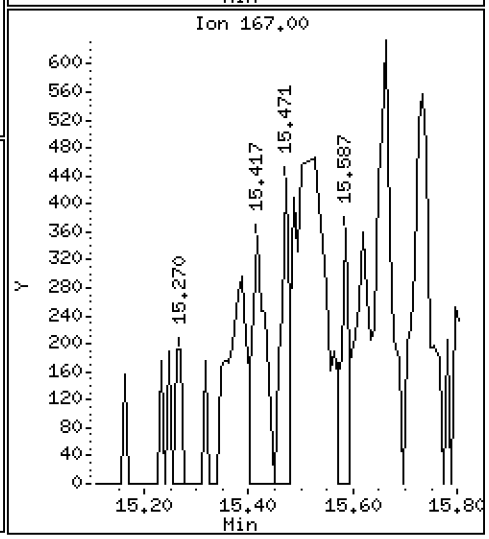












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

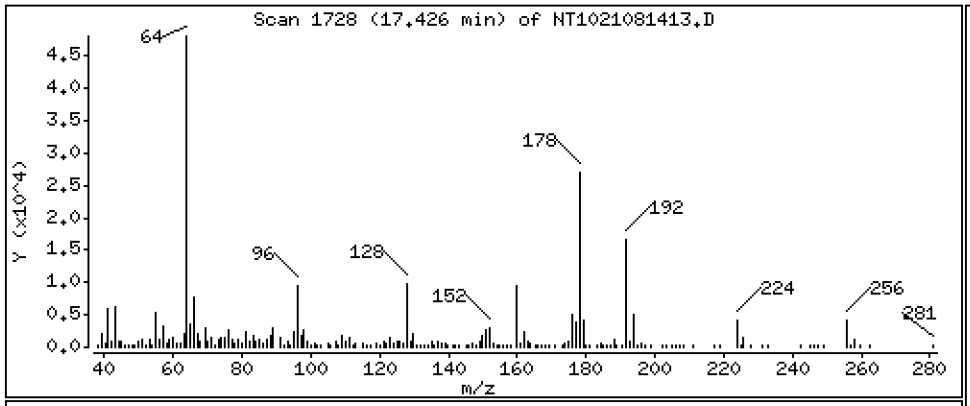
Operator: VTS

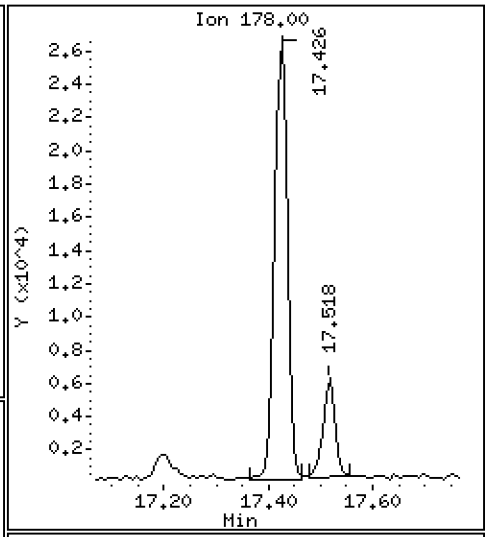
Column phase: ZB-5msi

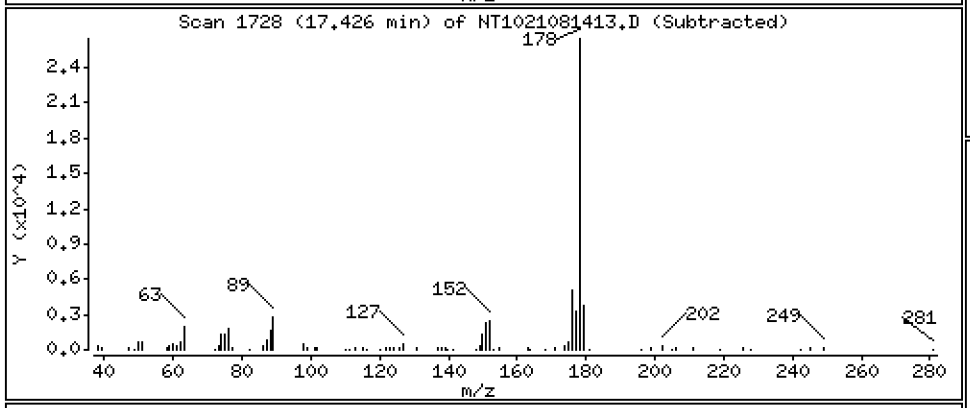
Column diameter: 0.25

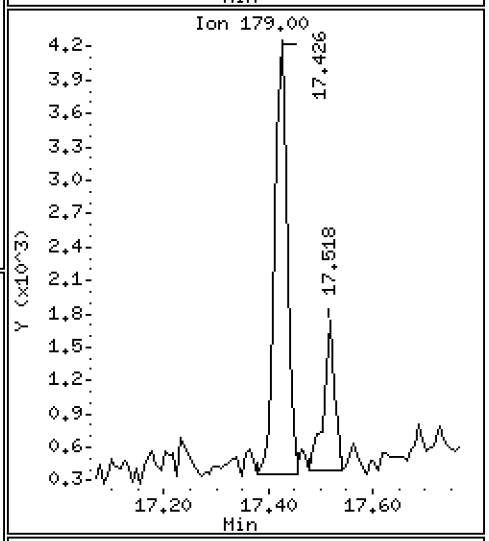
60 Phenanthrene

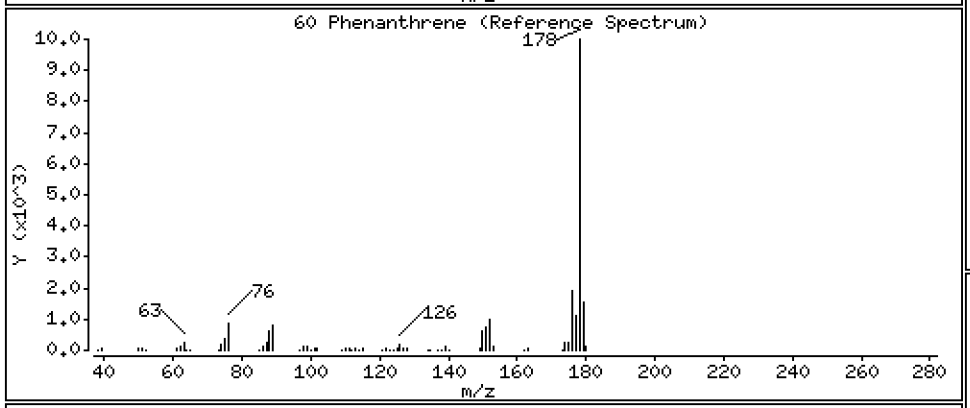
Concentration: 0.4658 ug/mL

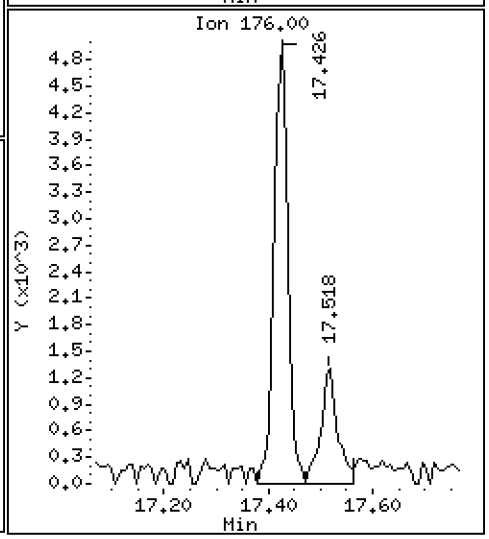


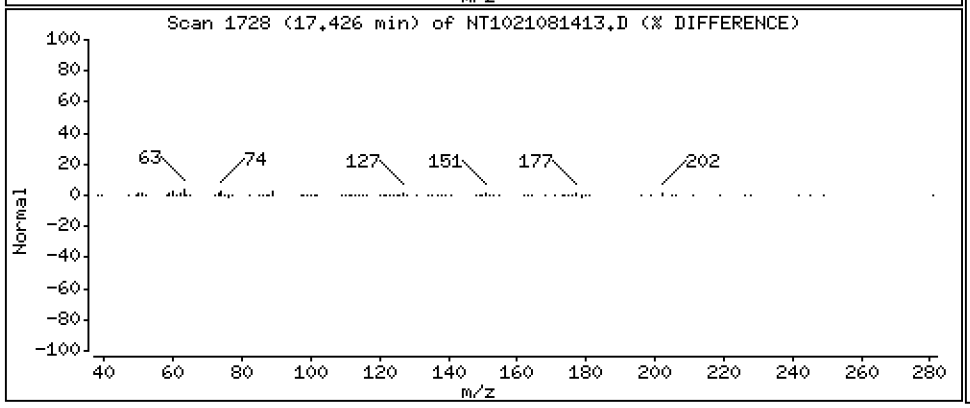












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081413.D

Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

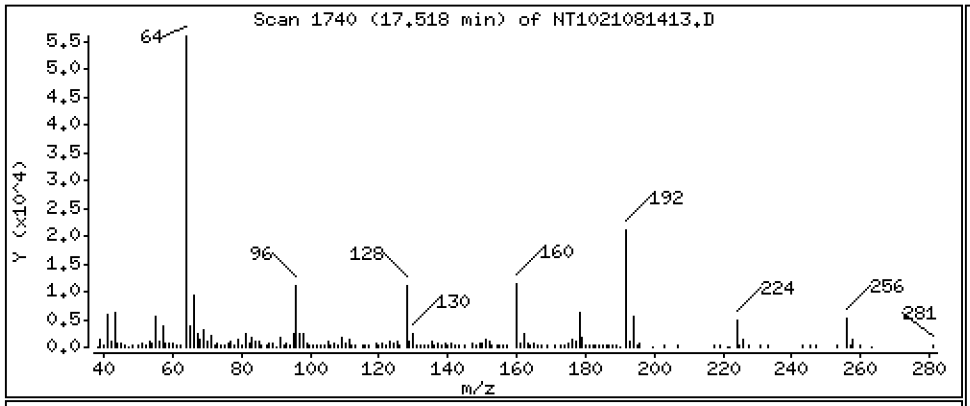
Operator: VTS

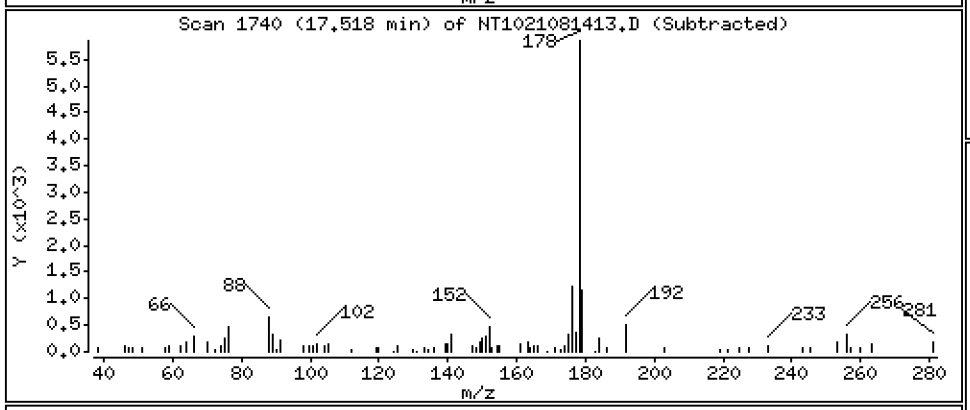
Column phase: ZB-5msi

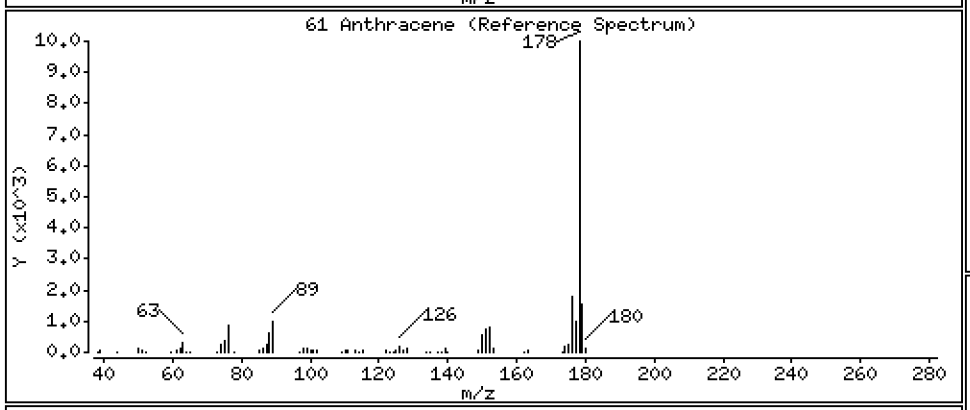
Column diameter: 0.25

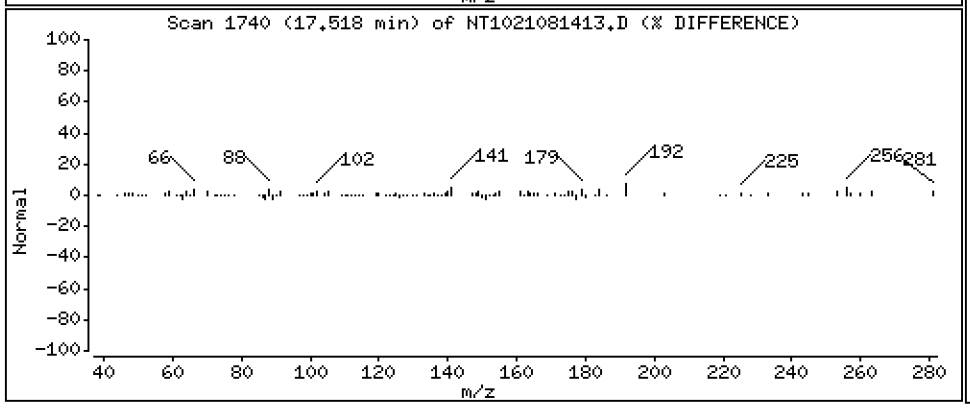
61 Anthracene

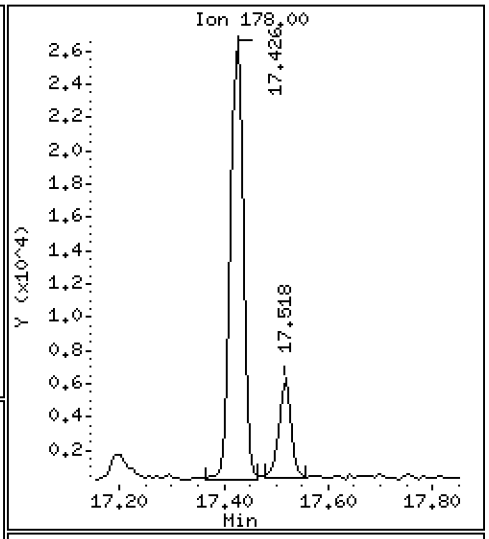
Concentration: 0.09647 ug/mL

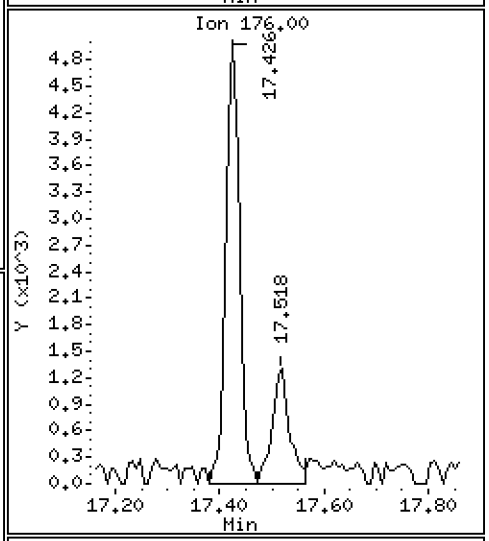


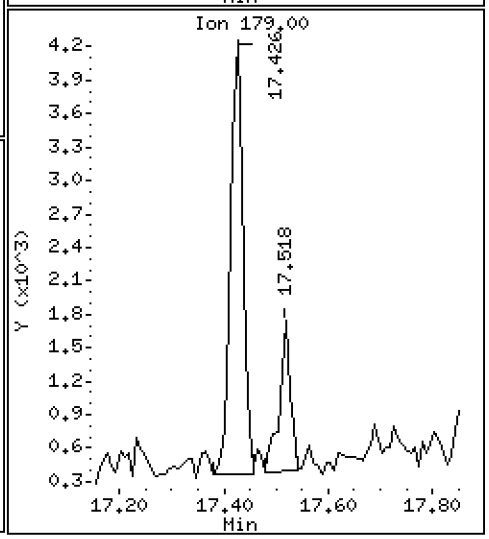












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081413.D

Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

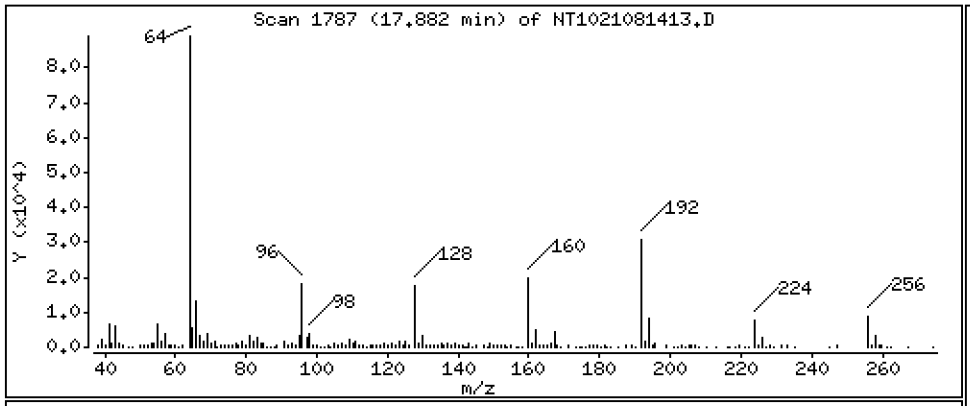
Operator: VTS

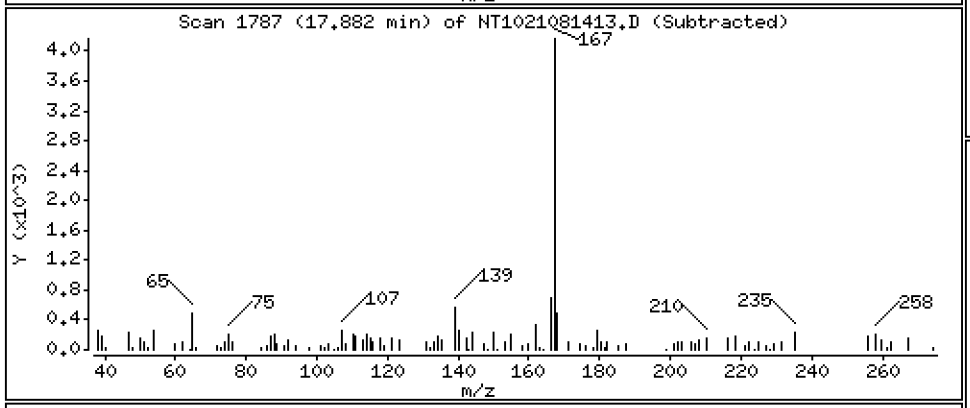
Column phase: ZB-5msi

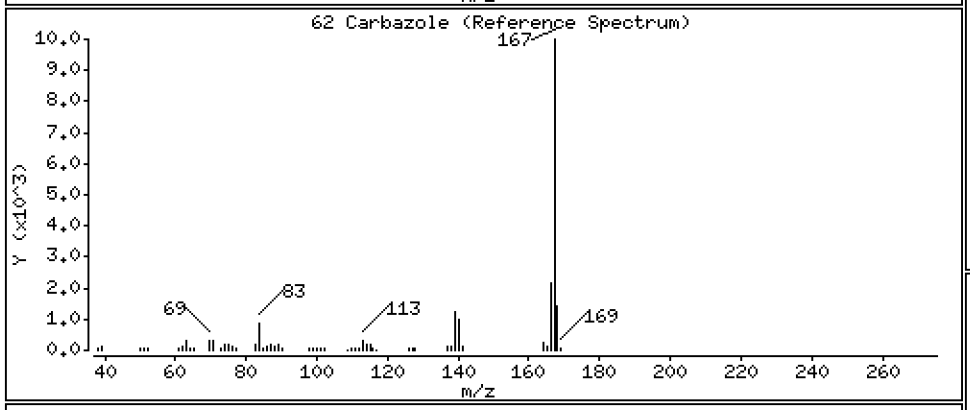
Column diameter: 0.25

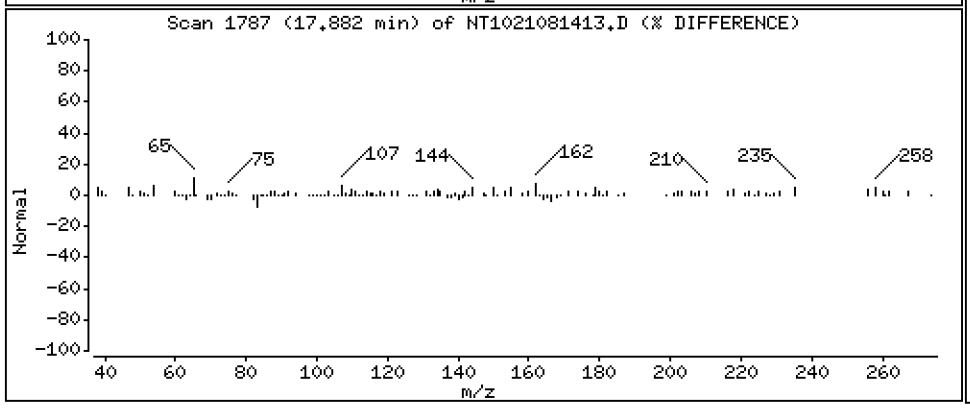
62 Carbazole

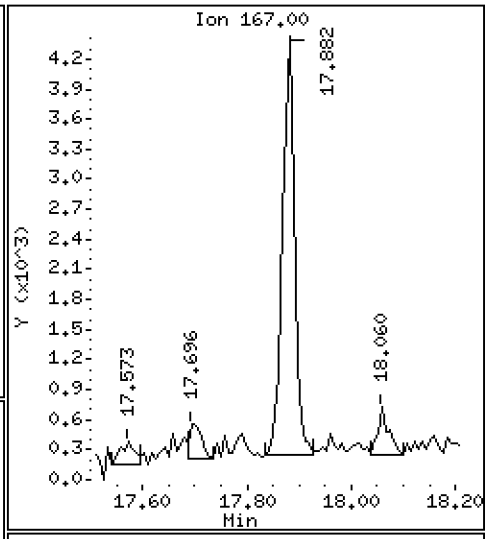
Concentration: 0.07095 ug/mL

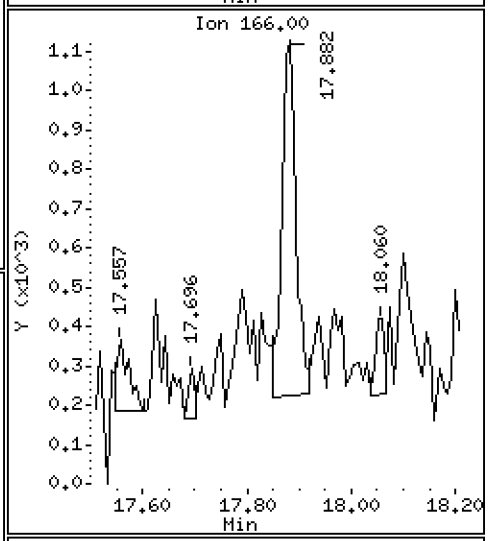


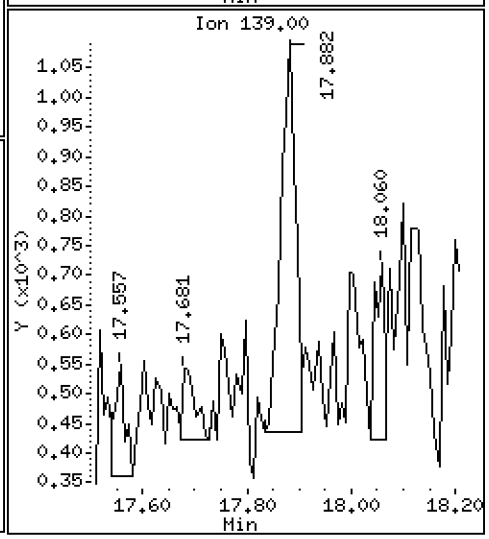












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

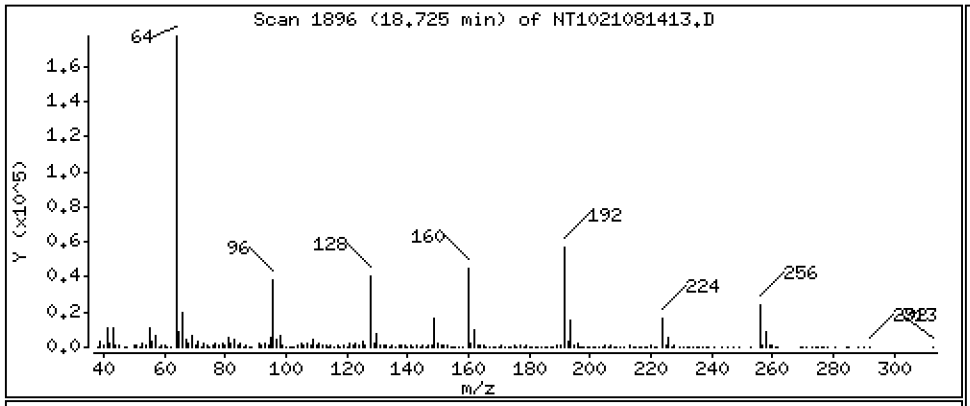
Operator: VTS

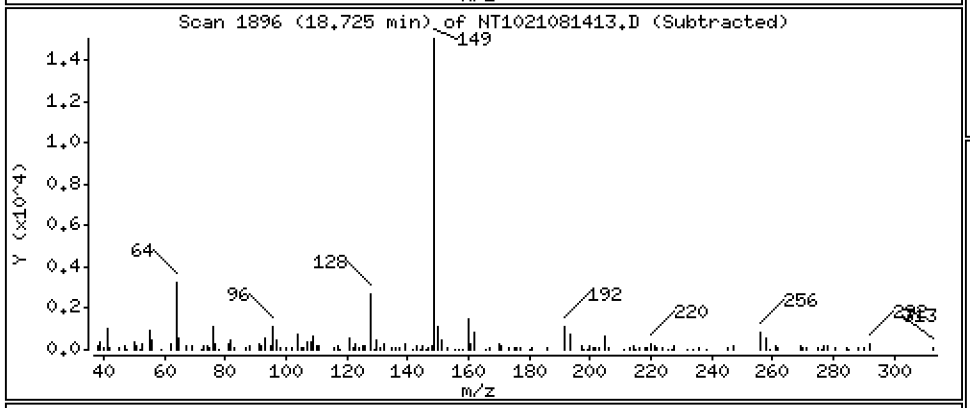
Column phase: ZB-5msi

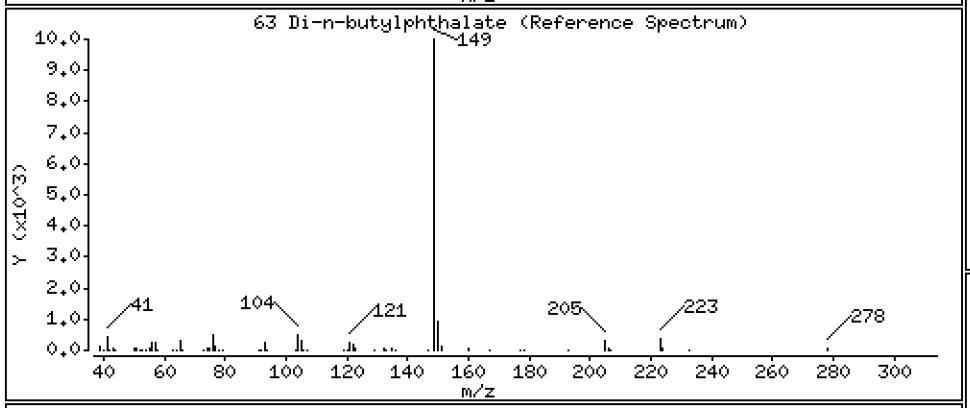
Column diameter: 0.25

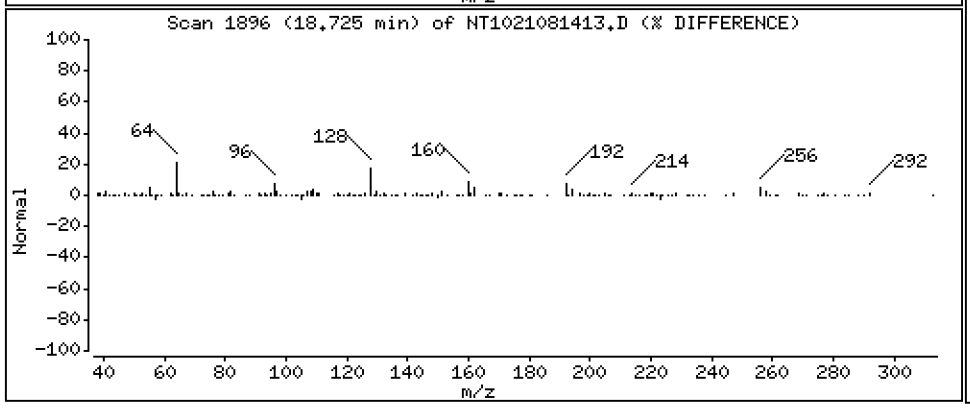
63 Di-n-butylphthalate

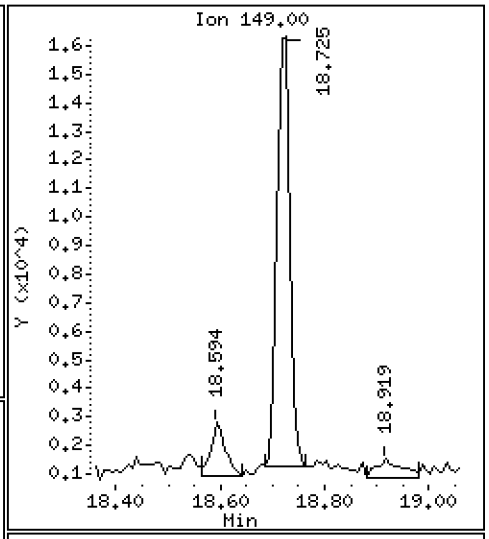
Concentration: 0.1660 ug/mL

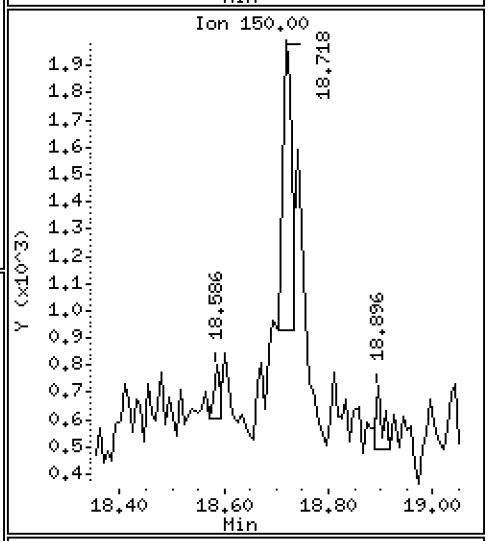


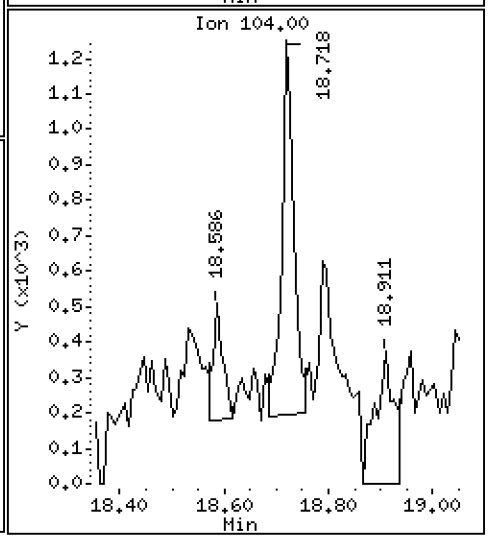












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

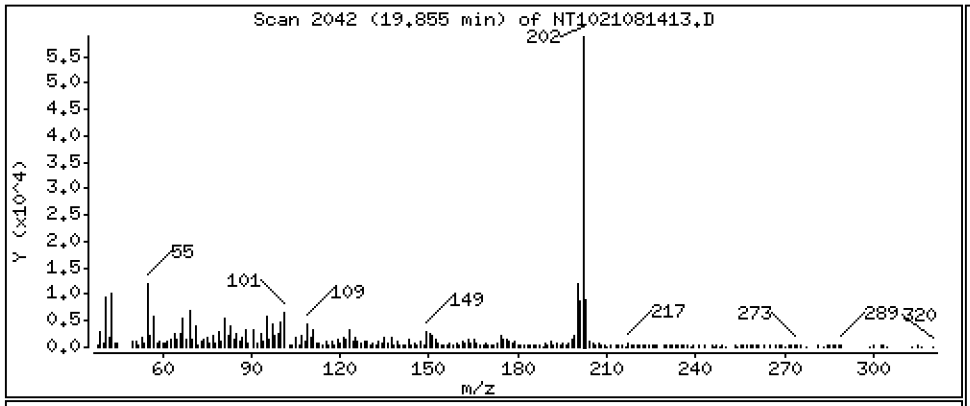
Operator: VTS

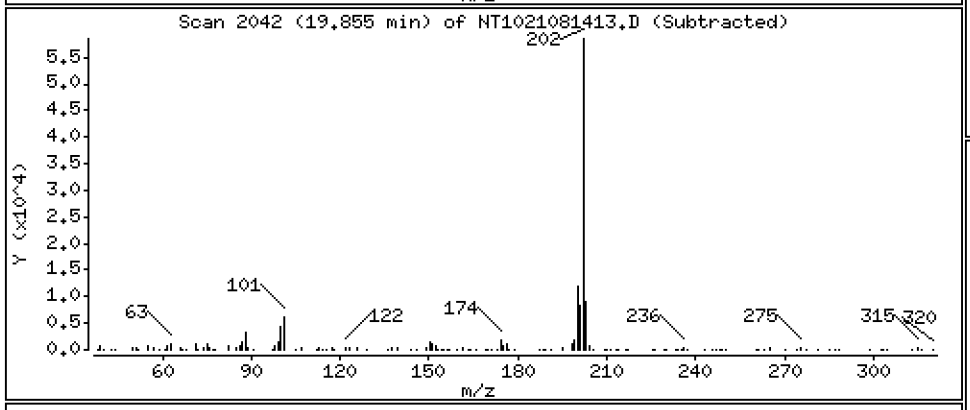
Column phase: ZB-5msi

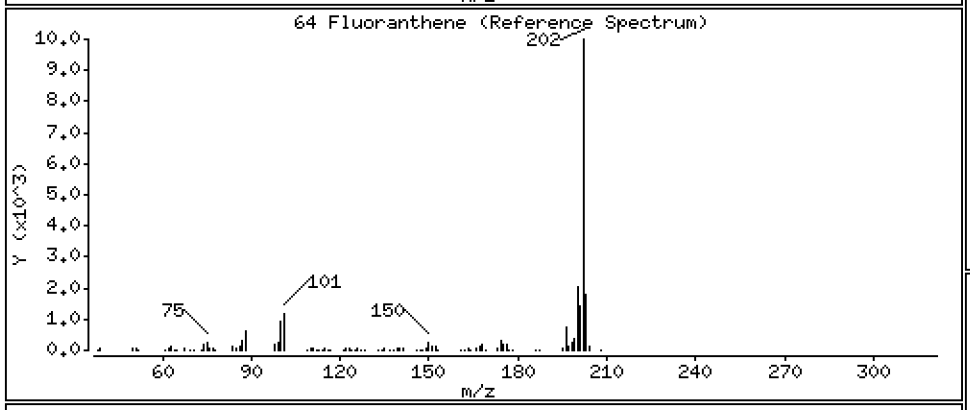
Column diameter: 0.25

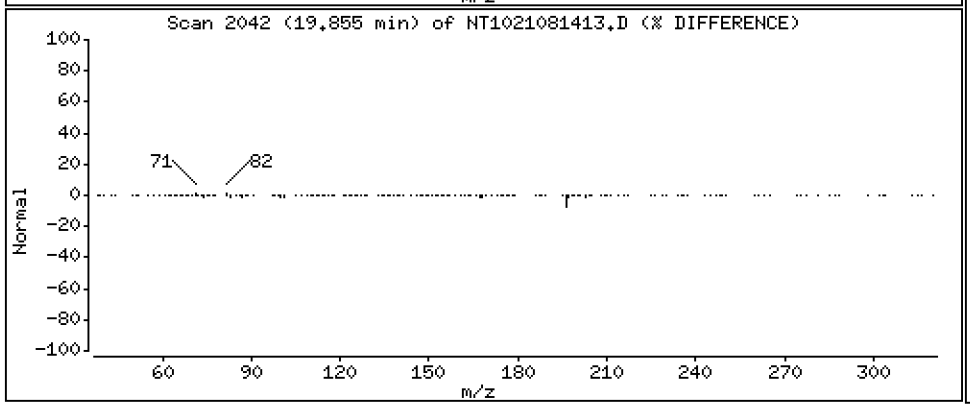
64 Fluoranthene

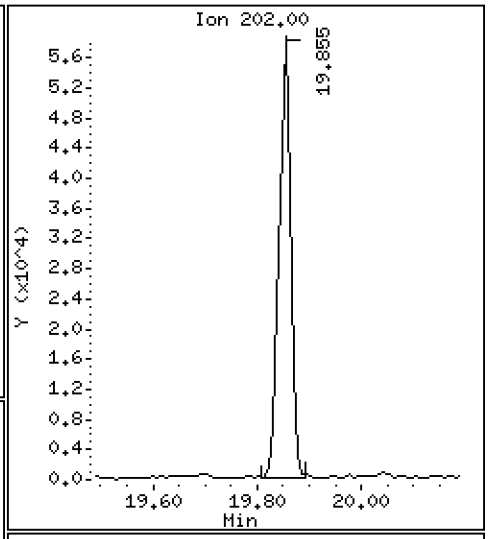
Concentration: 1.025 ug/mL

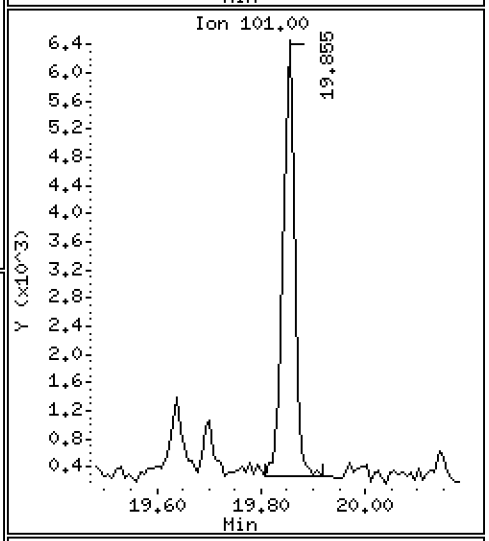


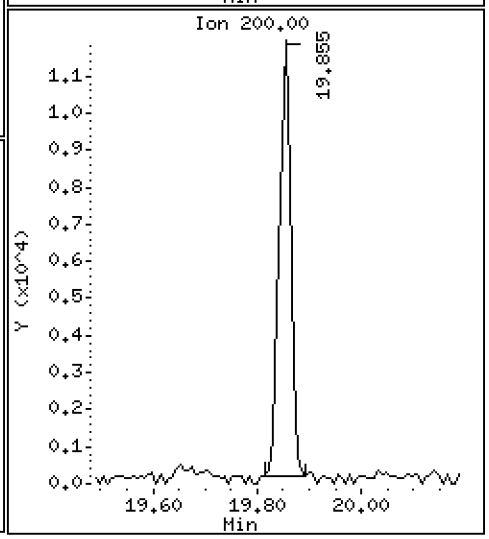












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081413.D

Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

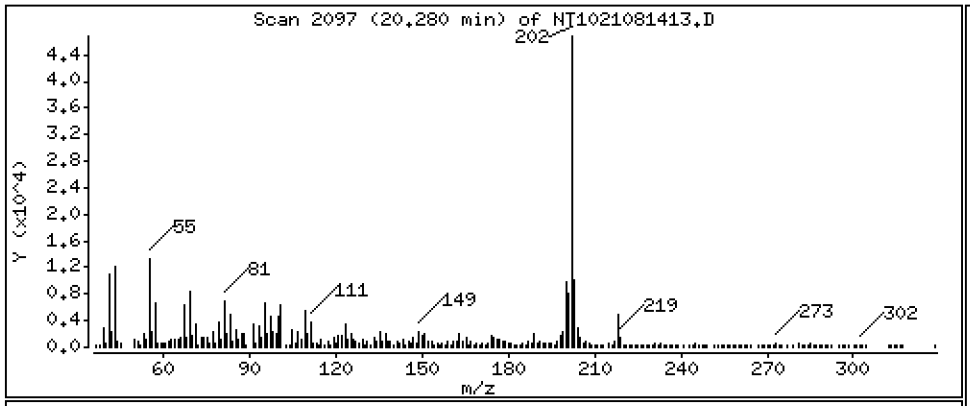
Operator: VTS

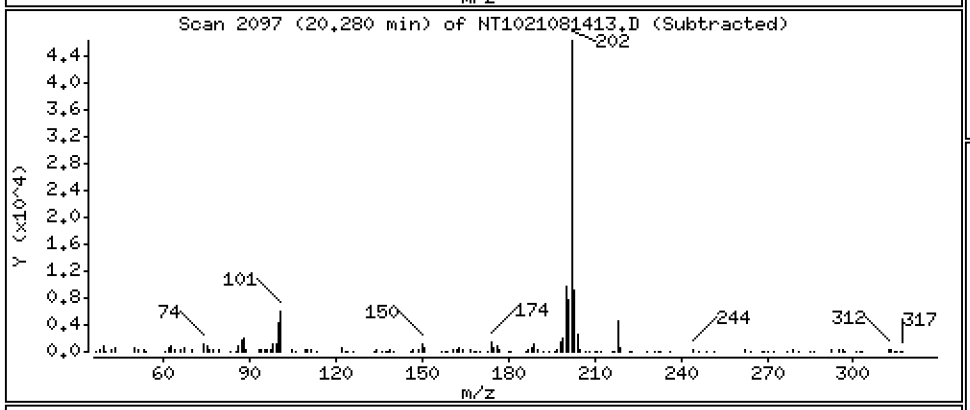
Column phase: ZB-5msi

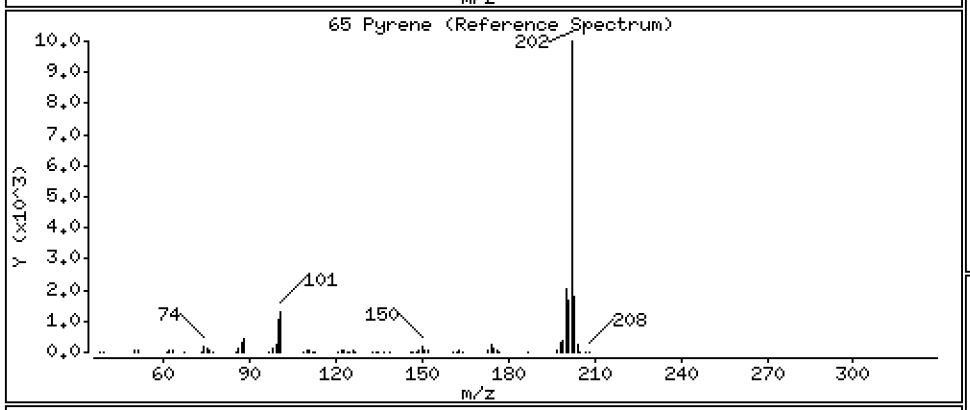
Column diameter: 0.25

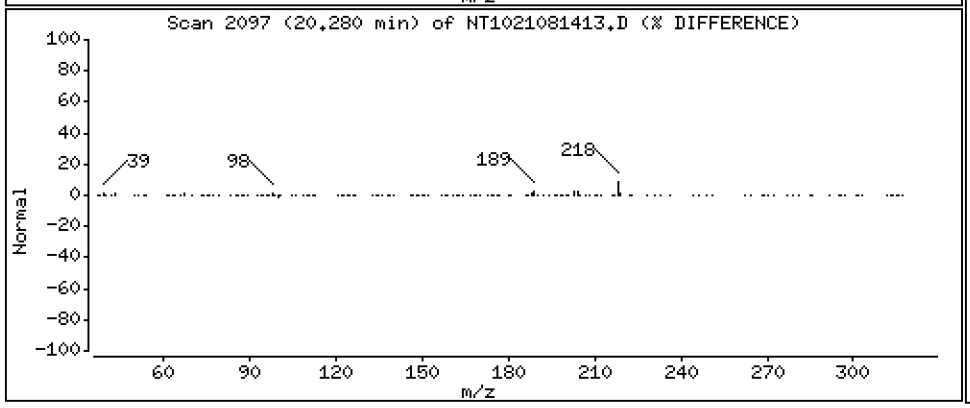
65 Pyrene

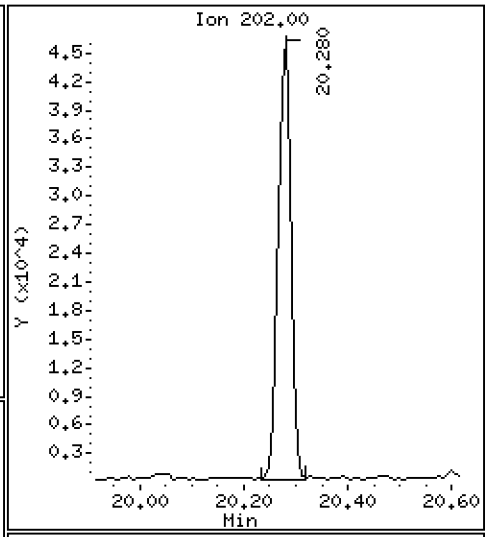
Concentration: 0.8008 ug/mL

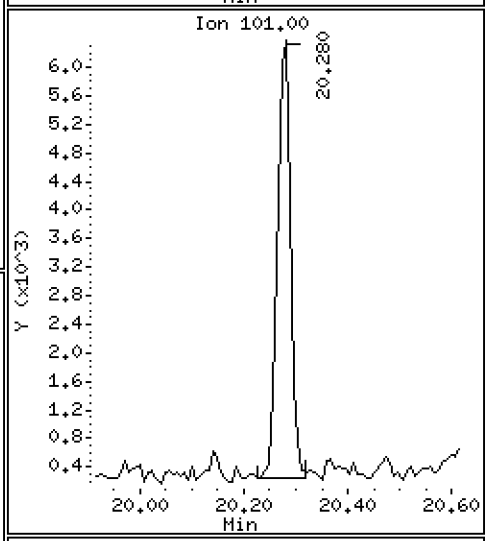


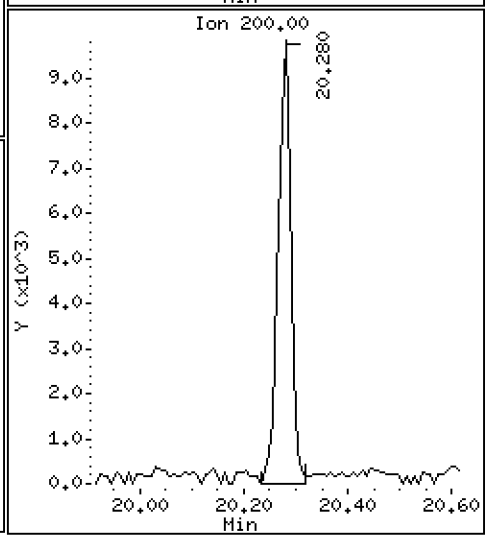












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081413.D

Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

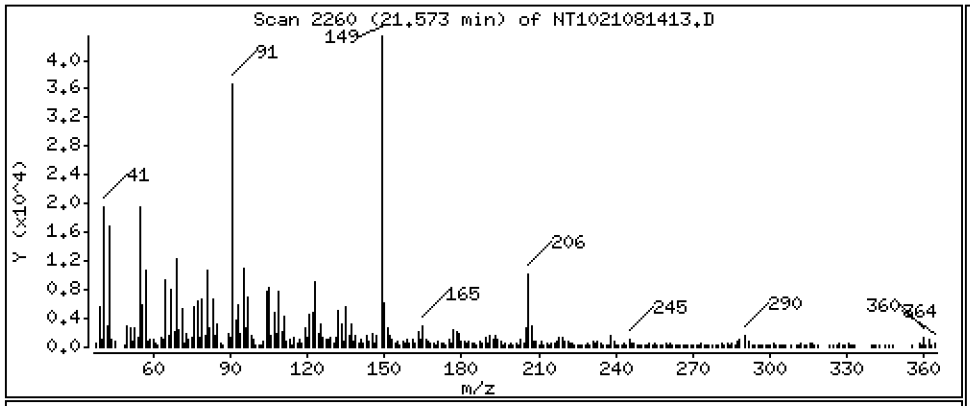
Operator: VTS

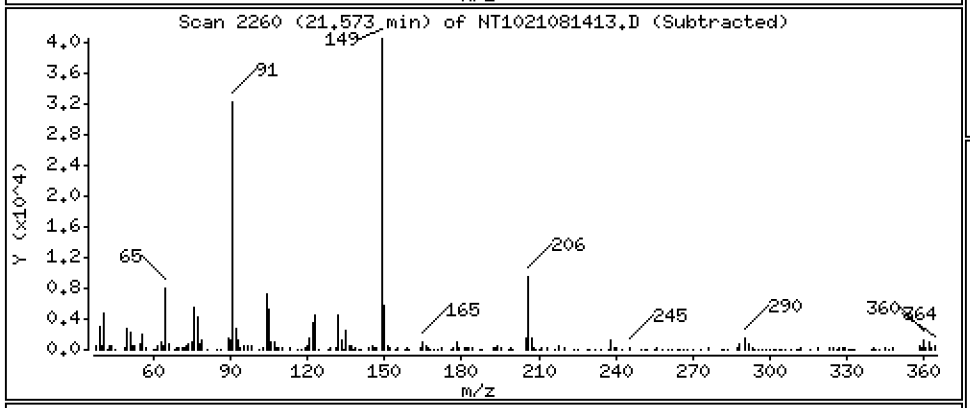
Column phase: ZB-5msi

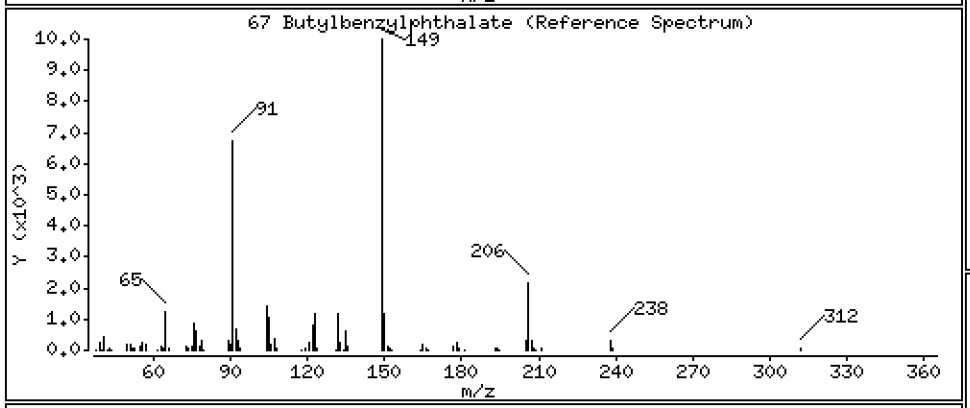
Column diameter: 0.25

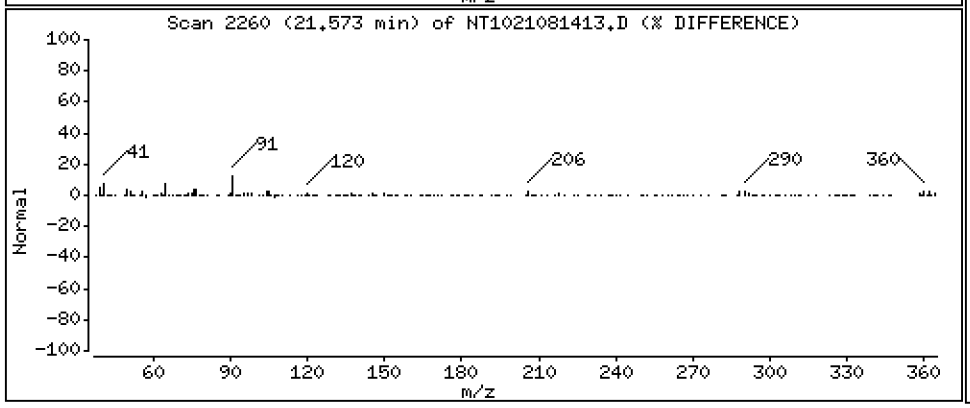
67 Butylbenzylphthalate

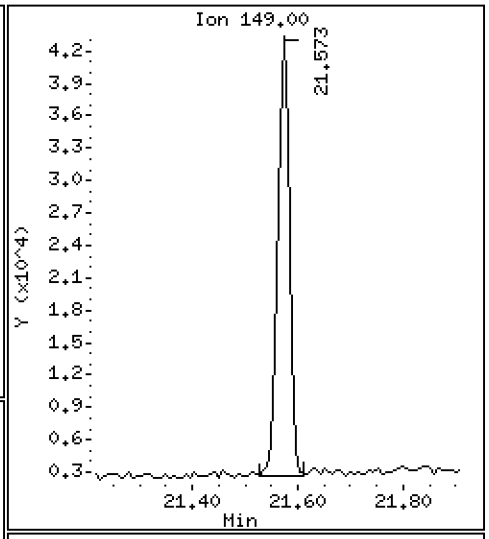
Concentration: 2.011 ug/mL

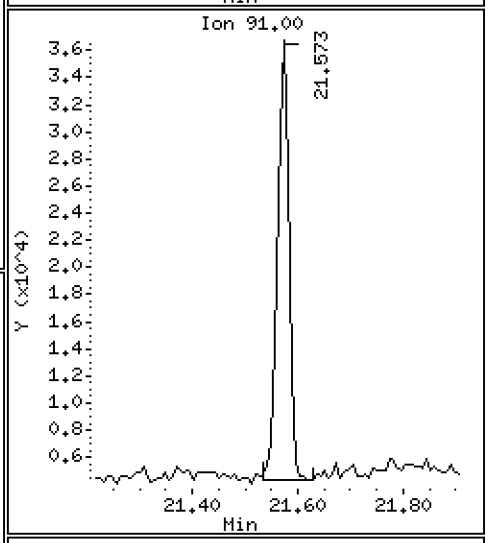


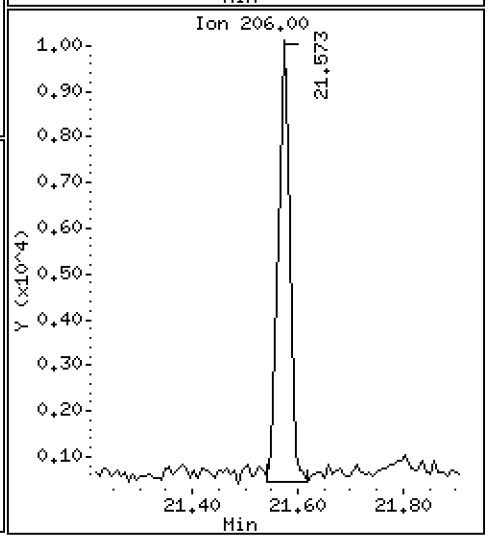












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

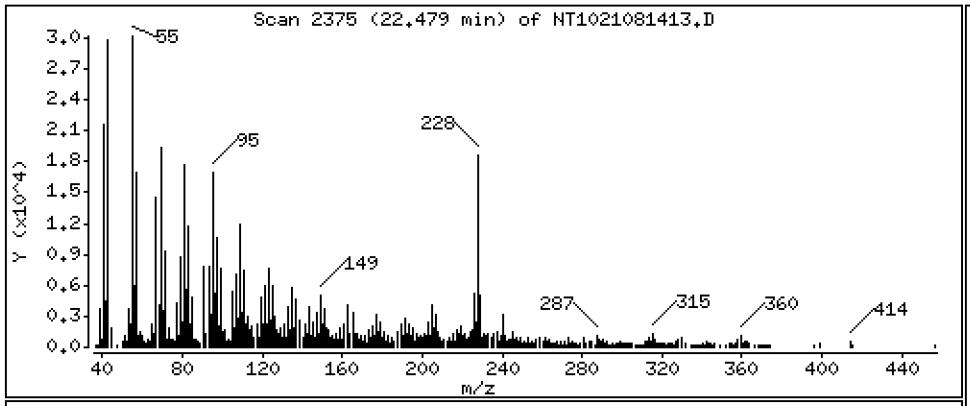
Operator: VTS

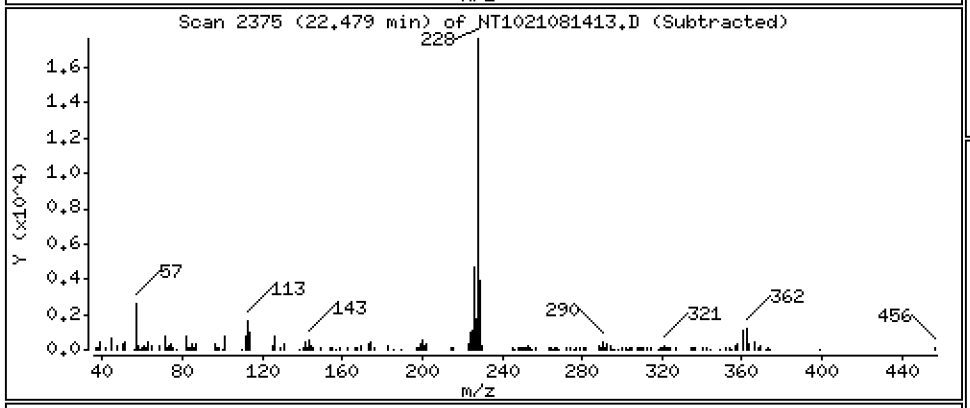
Column phase: ZB-5msi

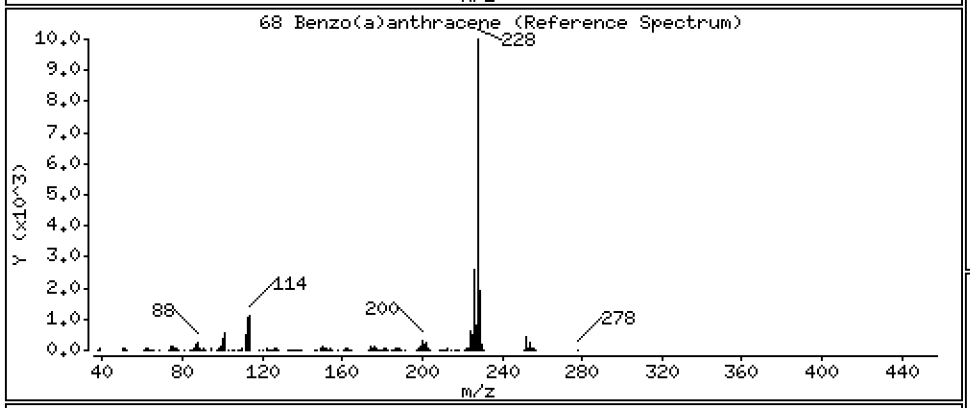
Column diameter: 0.25

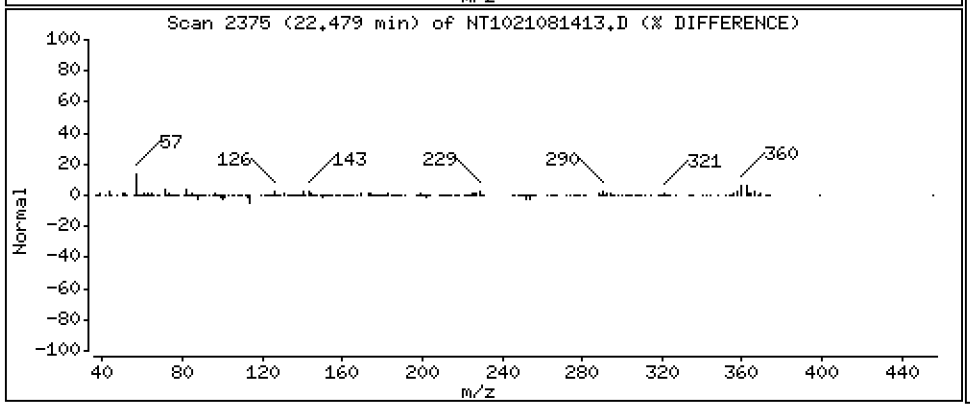
68 Benzo(a)anthracene

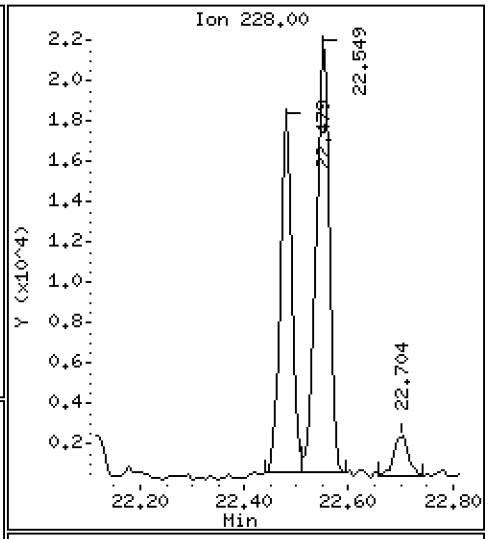
Concentration: 0.3690 ug/mL

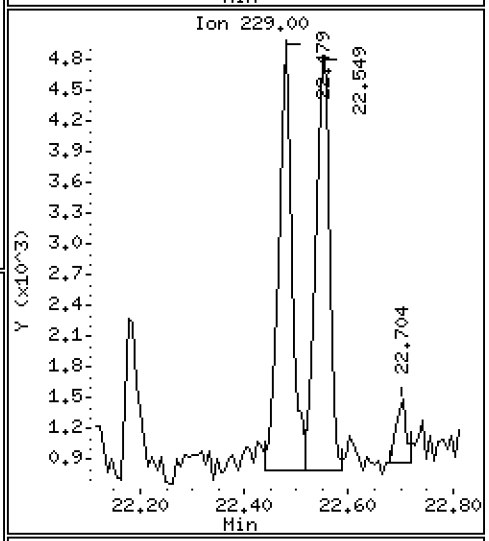


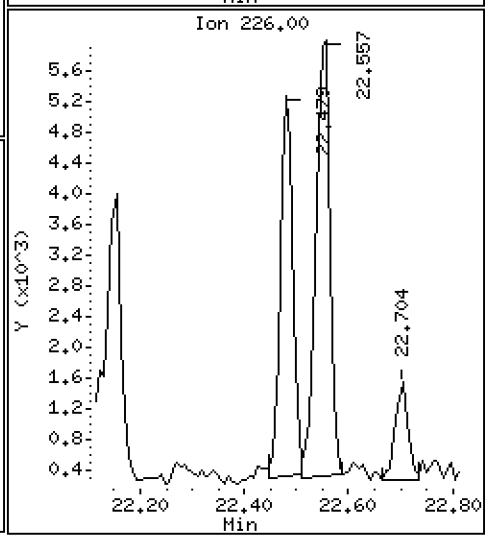












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

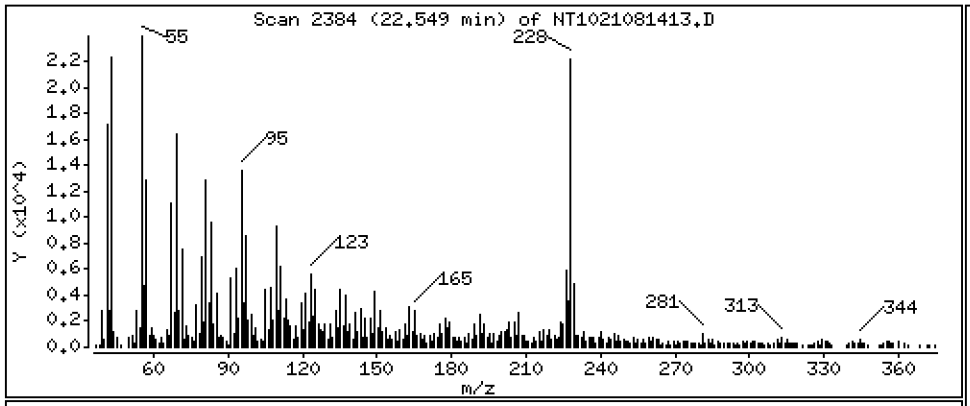
Operator: VTS

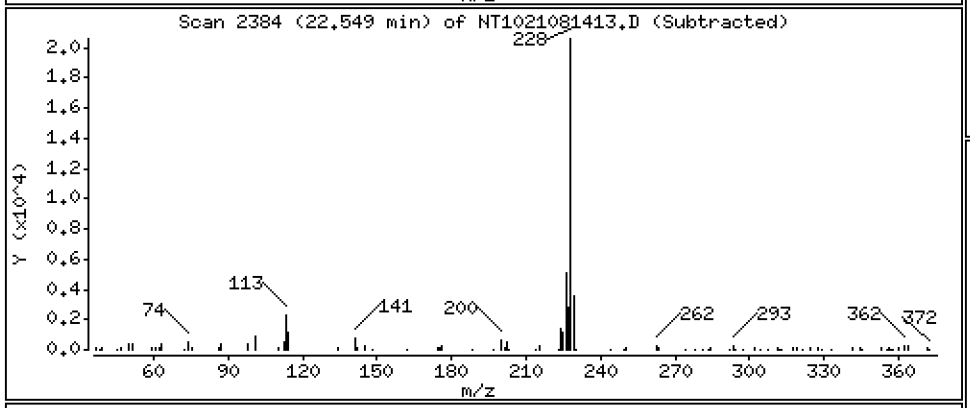
Column phase: ZB-5msi

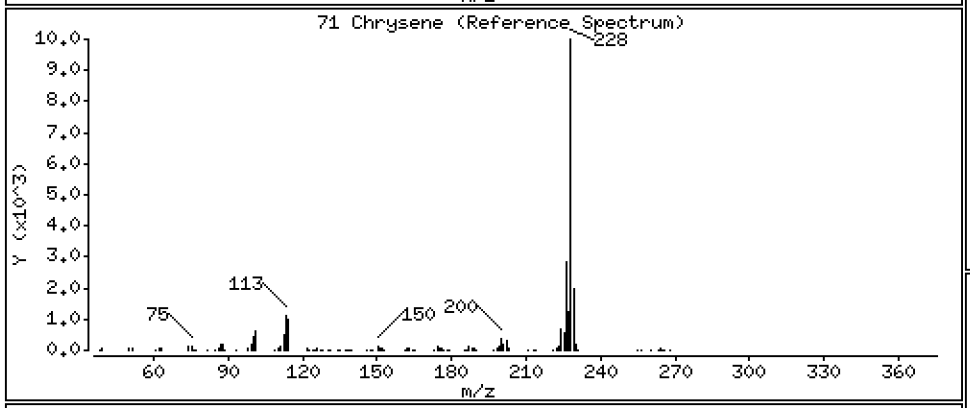
Column diameter: 0.25

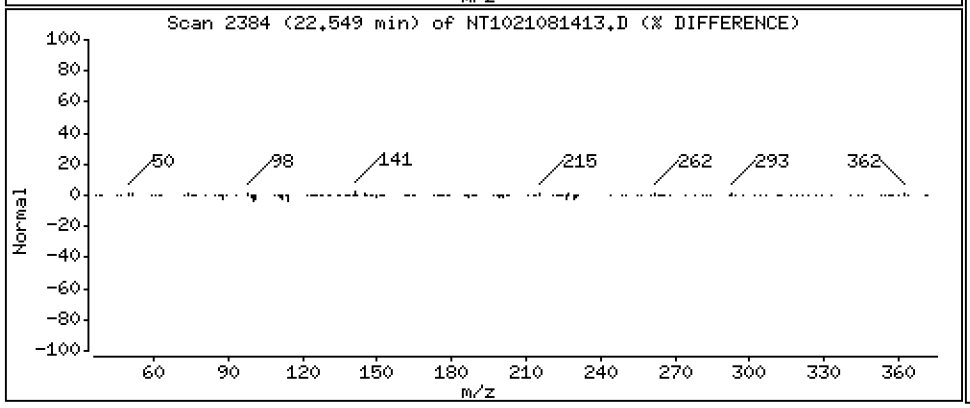
71 Chrysene

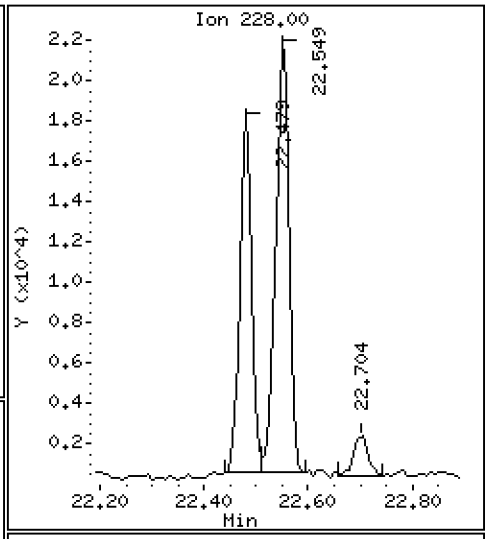
Concentration: 0.6366 ug/mL

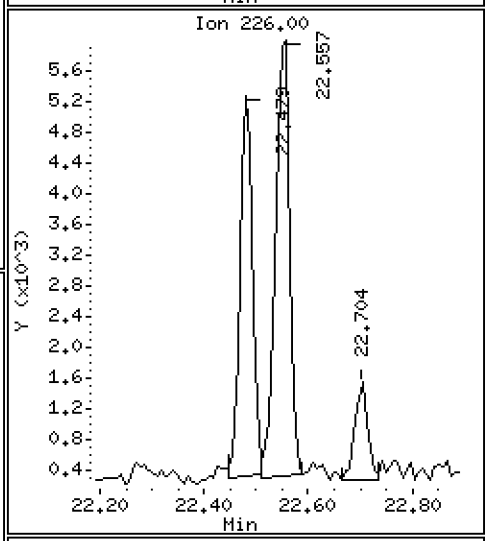


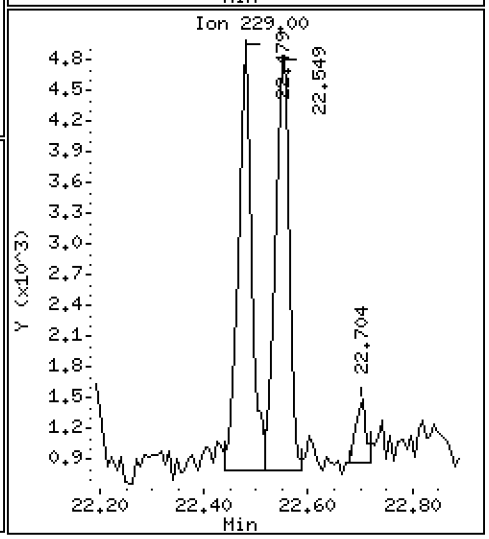












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

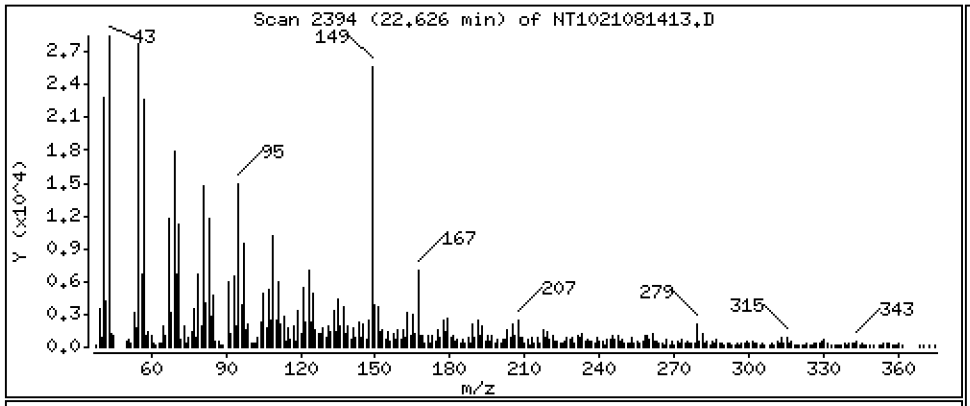
Operator: VTS

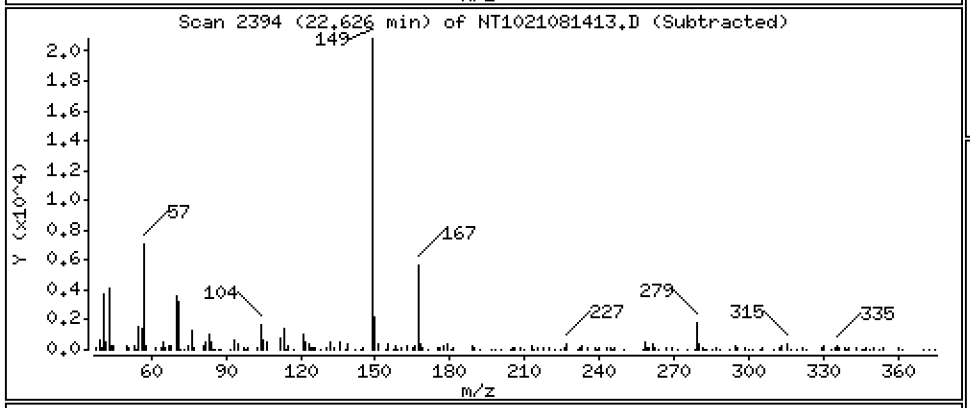
Column phase: ZB-5msi

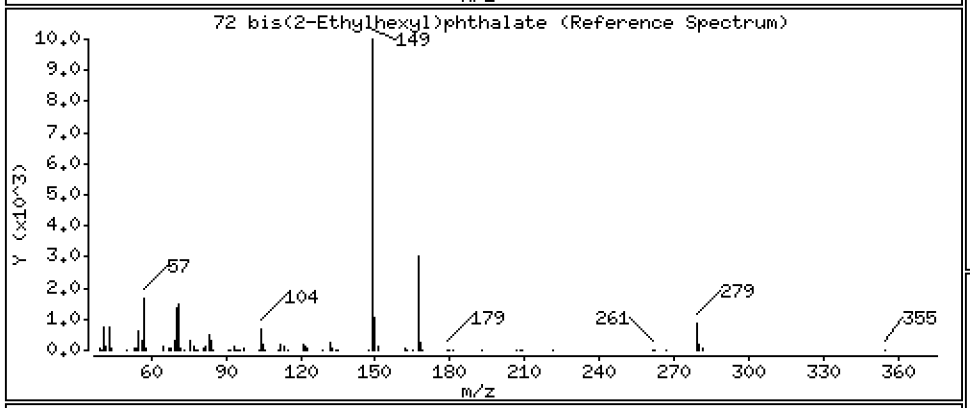
Column diameter: 0.25

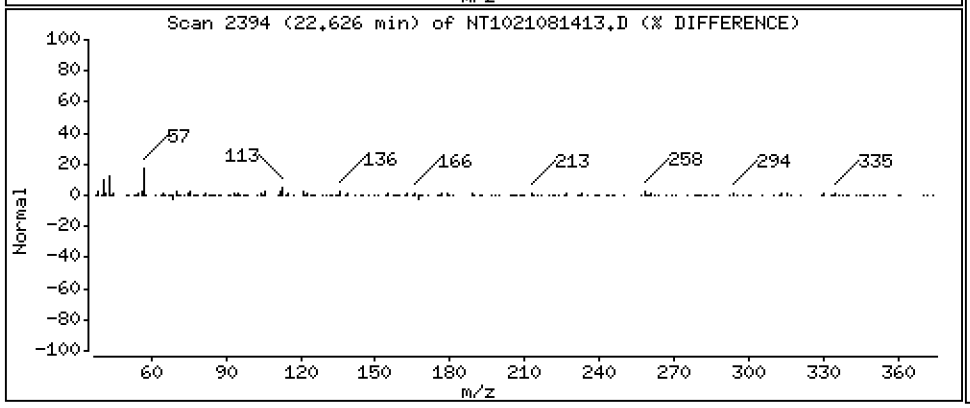
72 bis(2-Ethylhexyl)phthalate

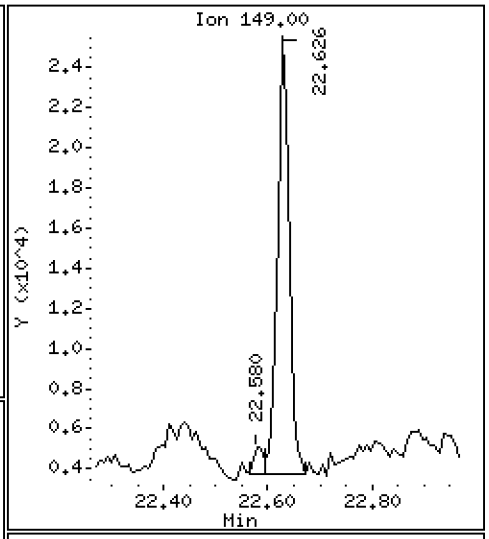
Concentration: 0.9992 ug/mL

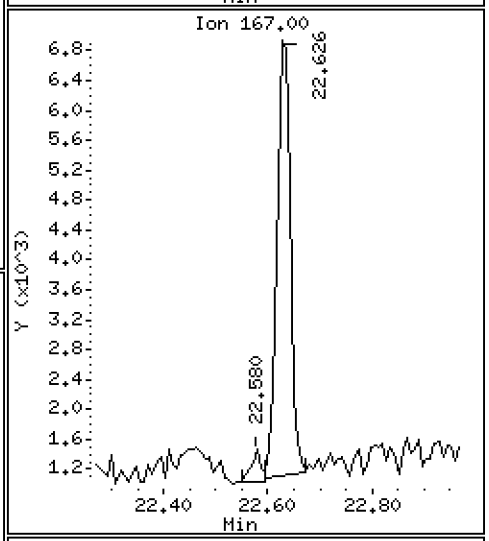


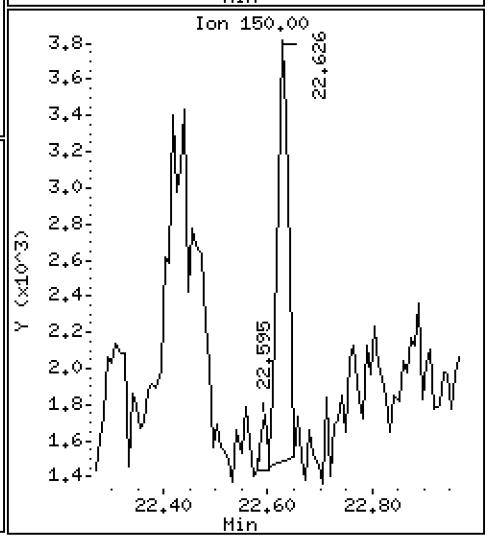












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

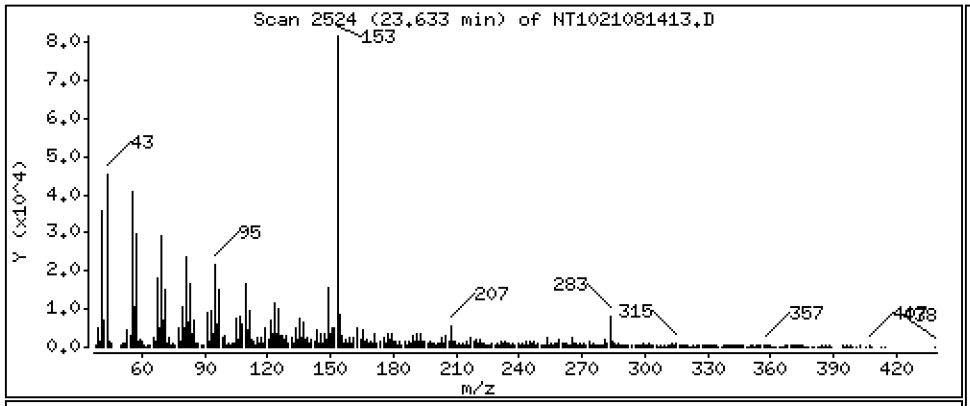
Operator: VTS

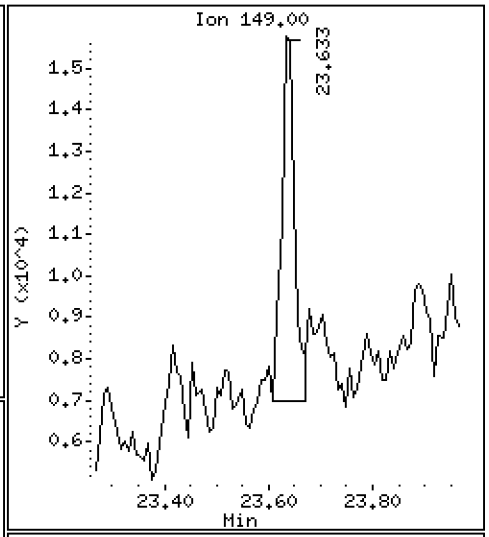
Column phase: ZB-5msi

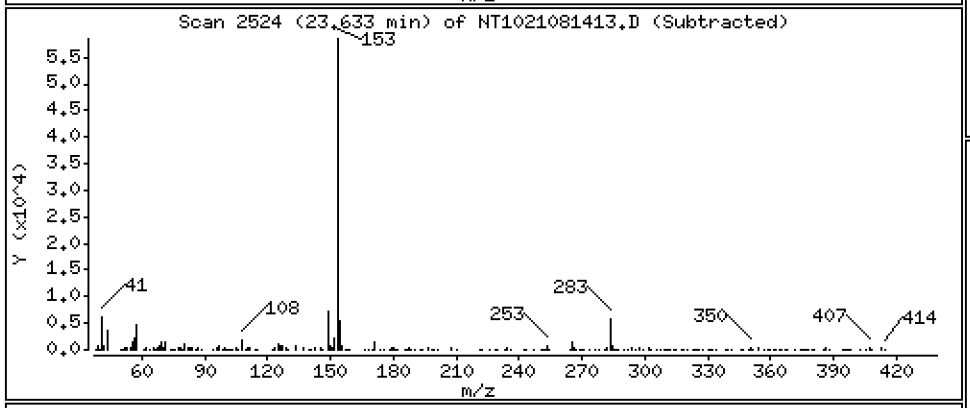
Column diameter: 0.25

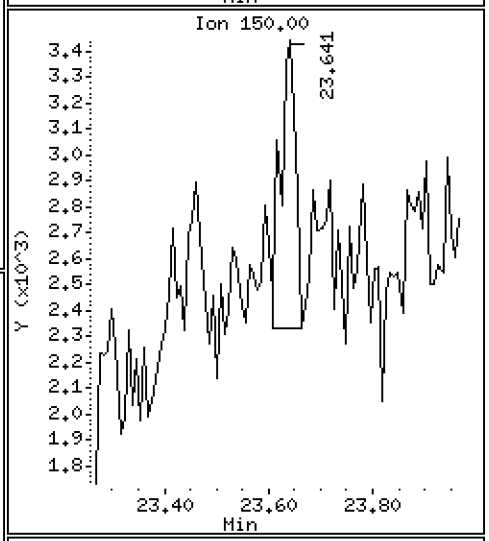
73 Di-n-octylphthalate

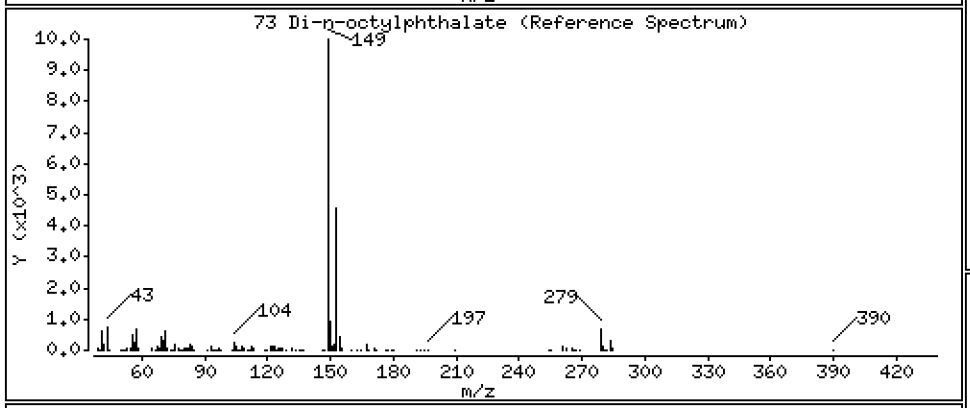
Concentration: 0.1763 ug/mL

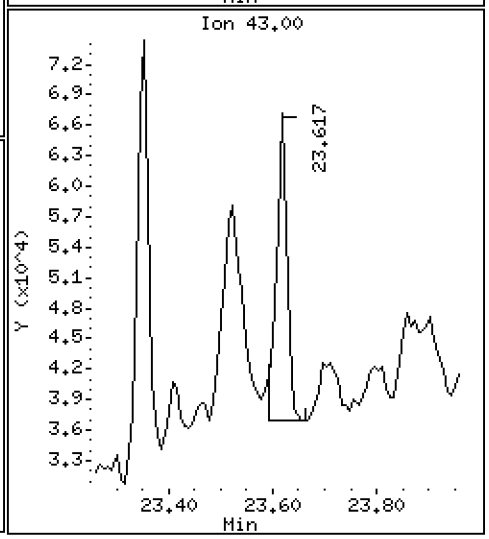


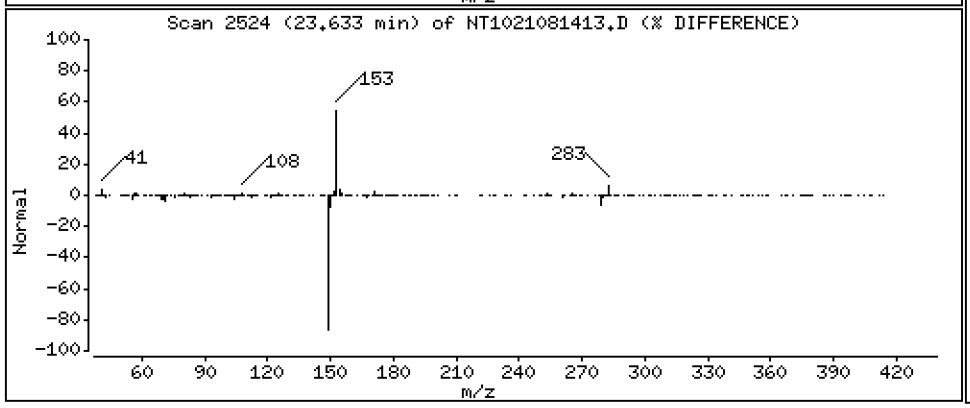












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

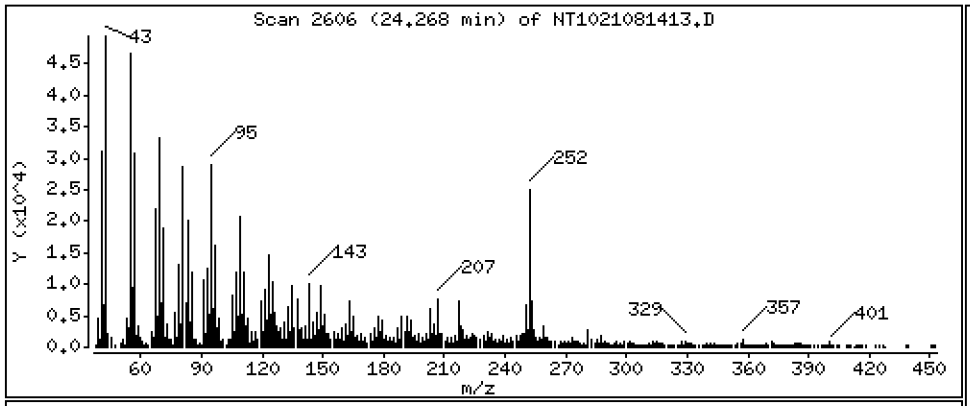
Operator: VTS

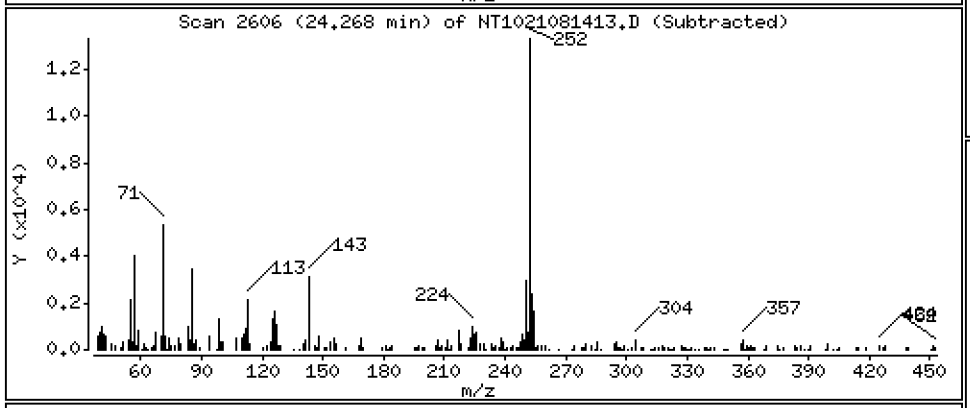
Column phase: ZB-5msi

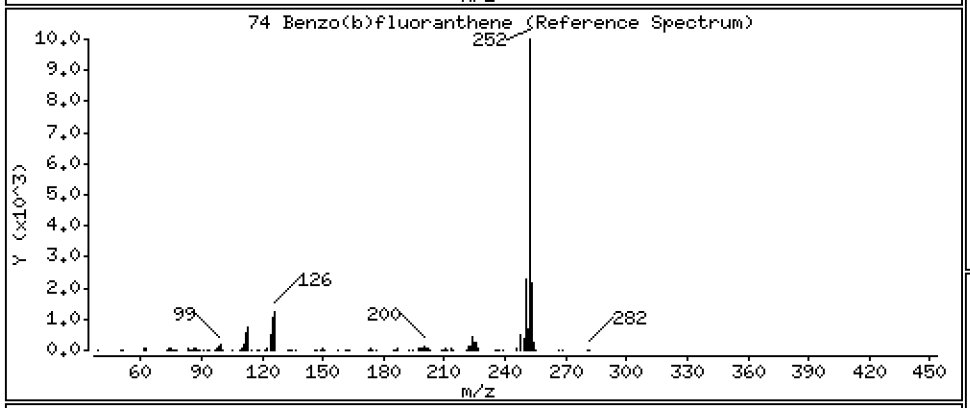
Column diameter: 0.25

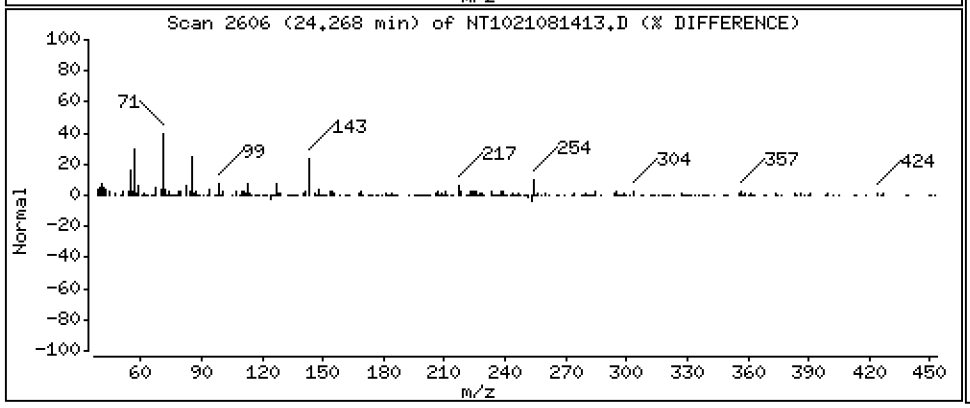
74 Benzo(b)fluoranthene

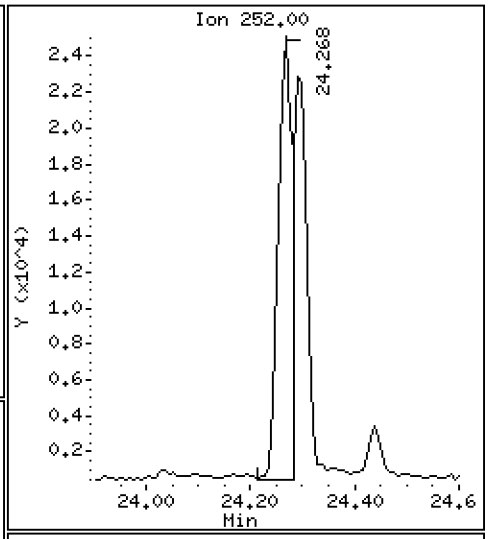
Concentration: 0.5909 ug/mL

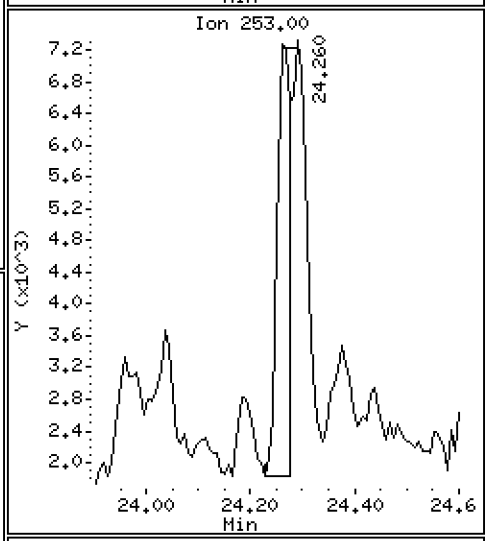


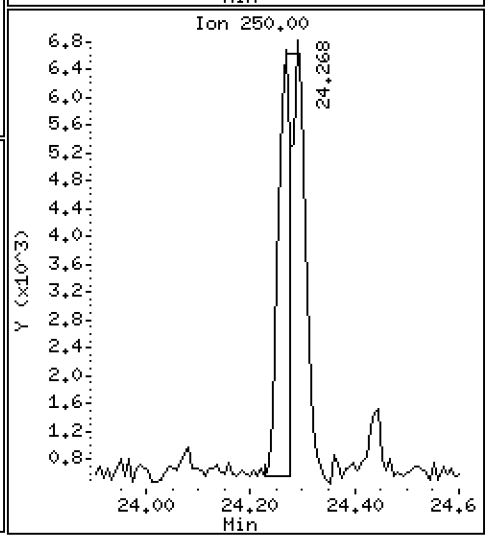












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

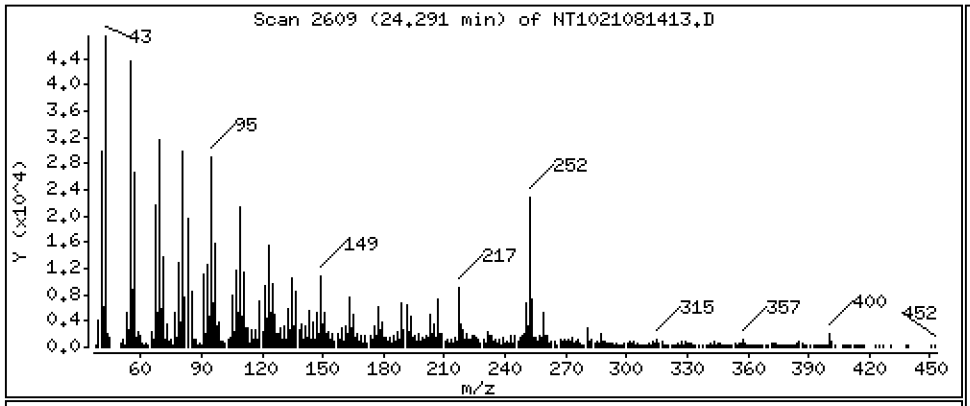
Operator: VTS

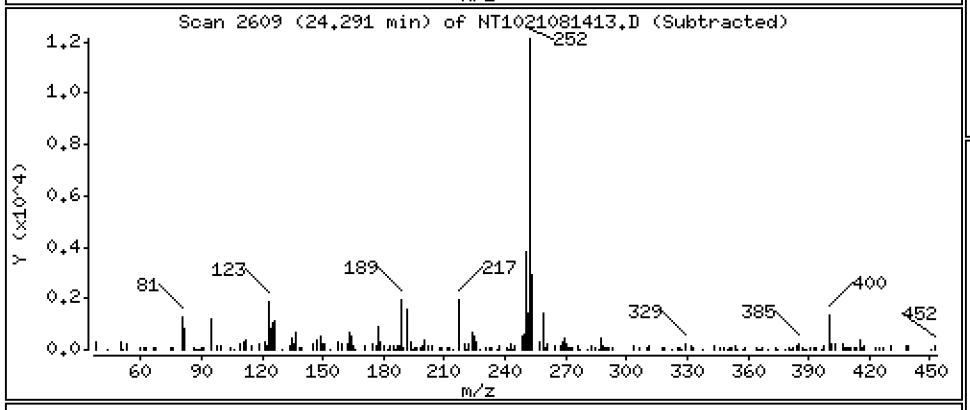
Column phase: ZB-5msi

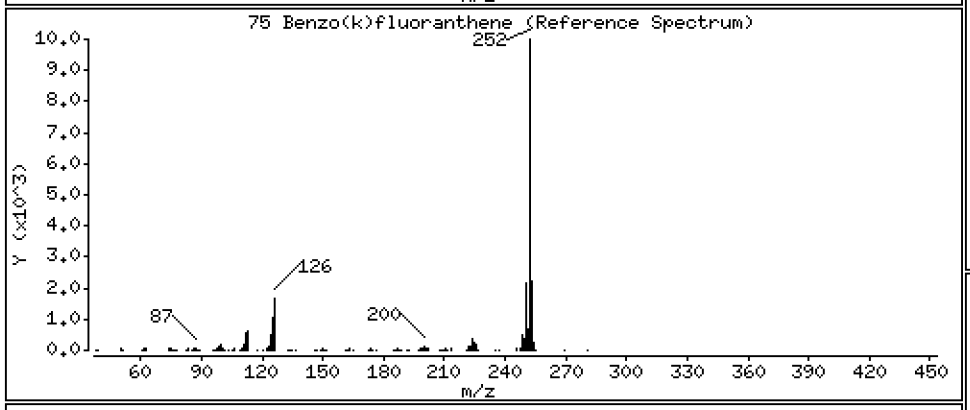
Column diameter: 0.25

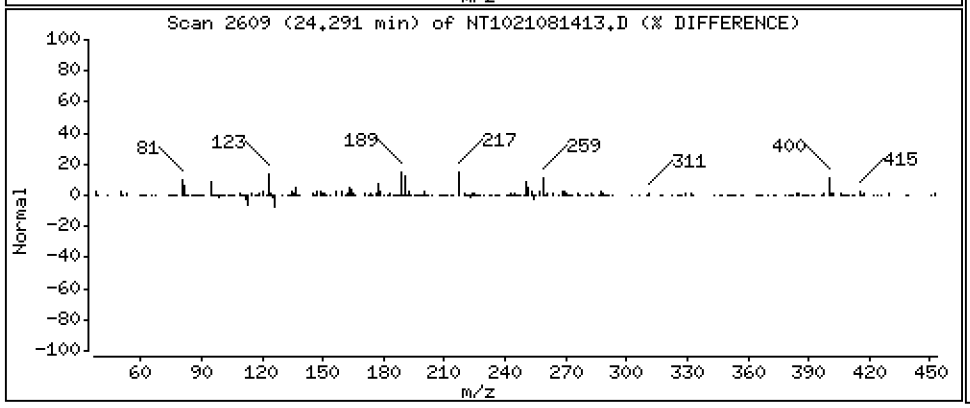
75 Benzo(k)fluoranthene

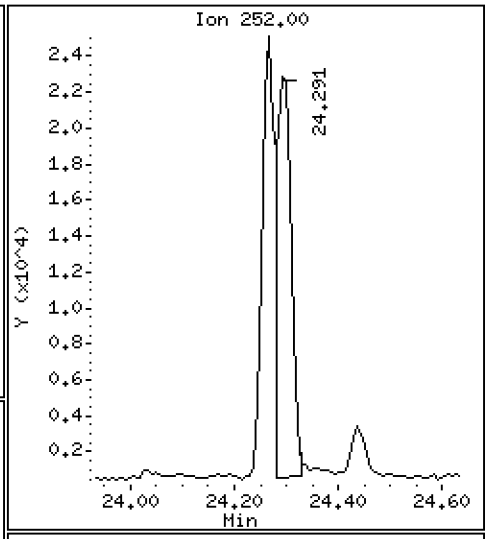
Concentration: 0.5358 ug/mL

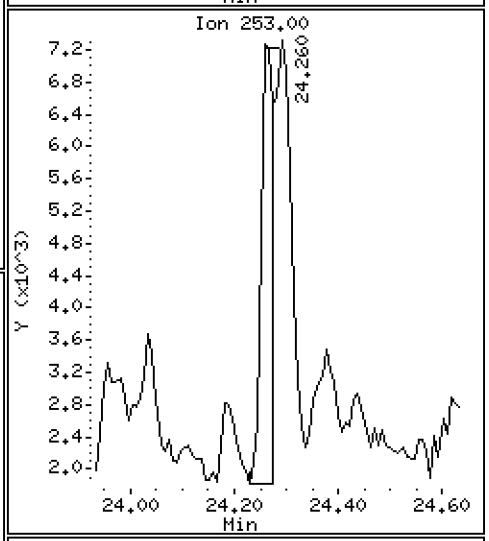


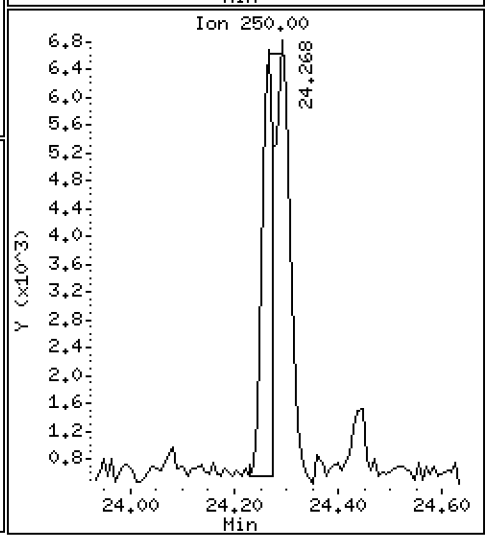












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

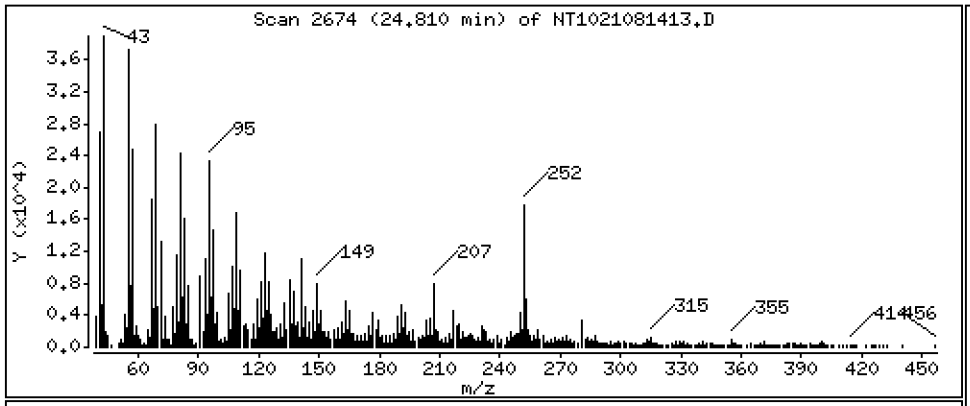
Operator: VTS

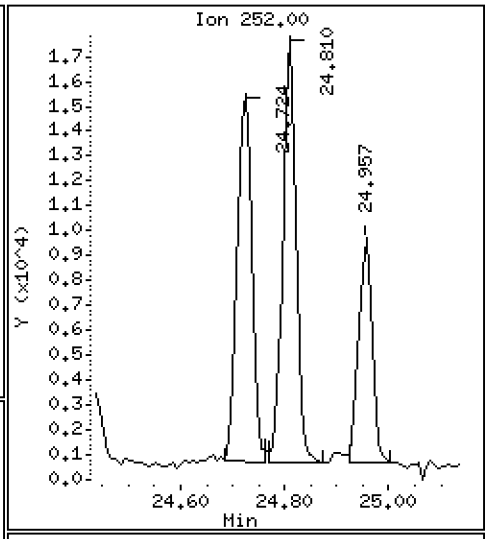
Column phase: ZB-5msi

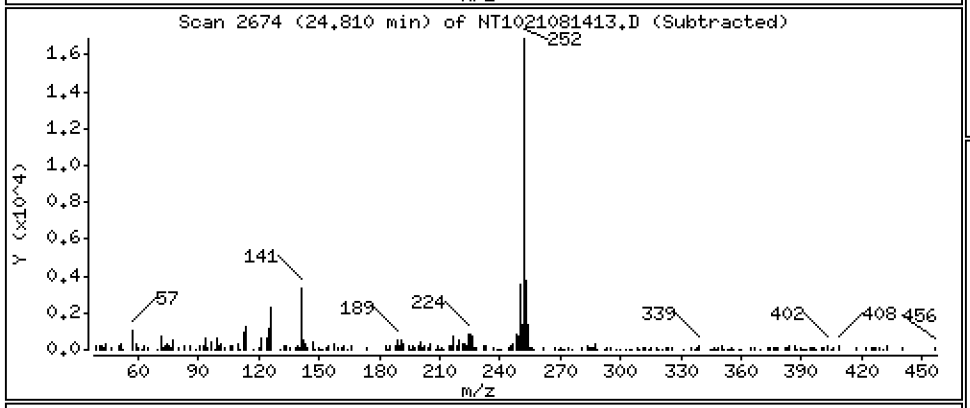
Column diameter: 0.25

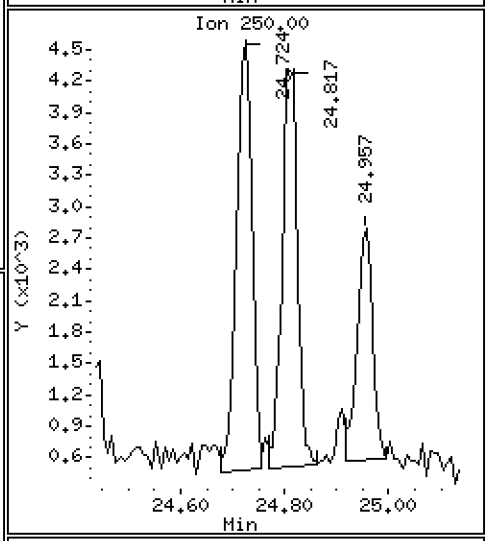
76 Benzo(a)pyrene

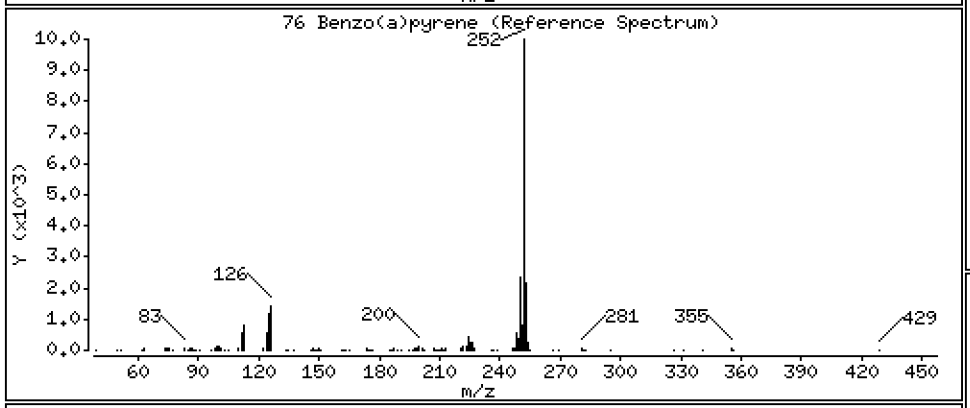
Concentration: 0.4284 ug/mL

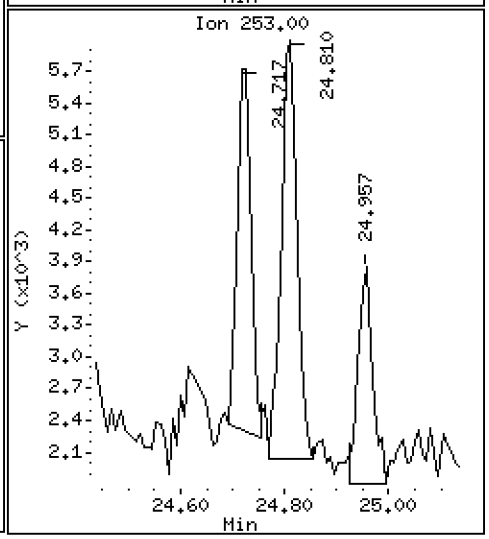


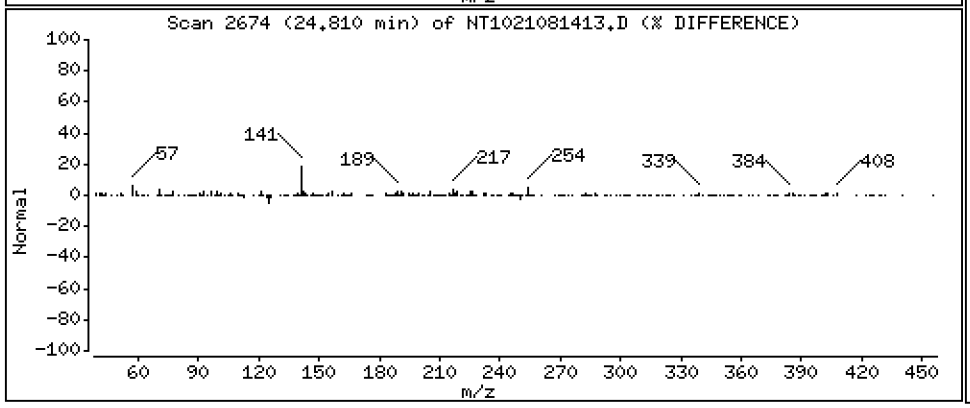












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

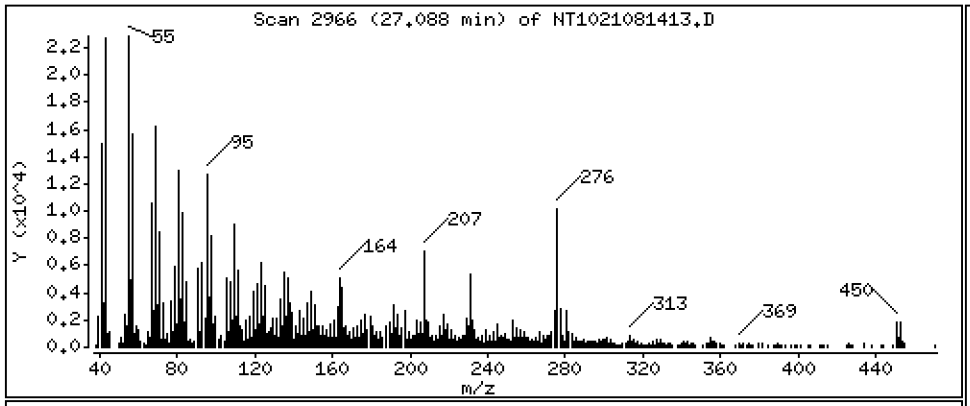
Operator: VTS

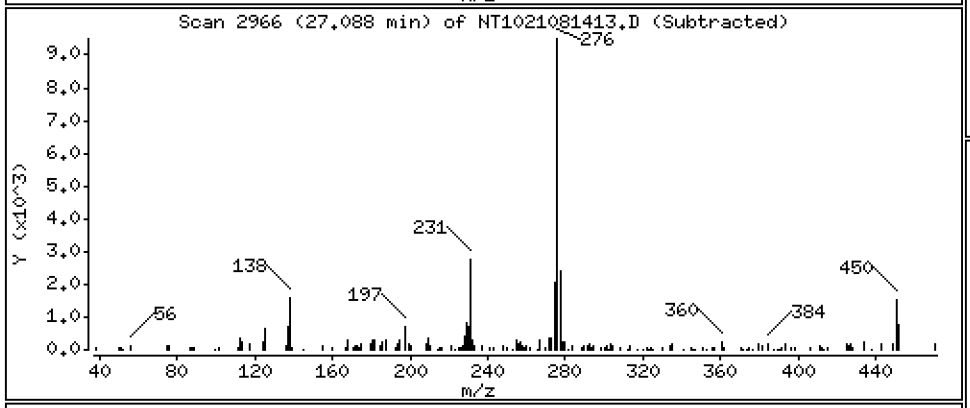
Column phase: ZB-5msi

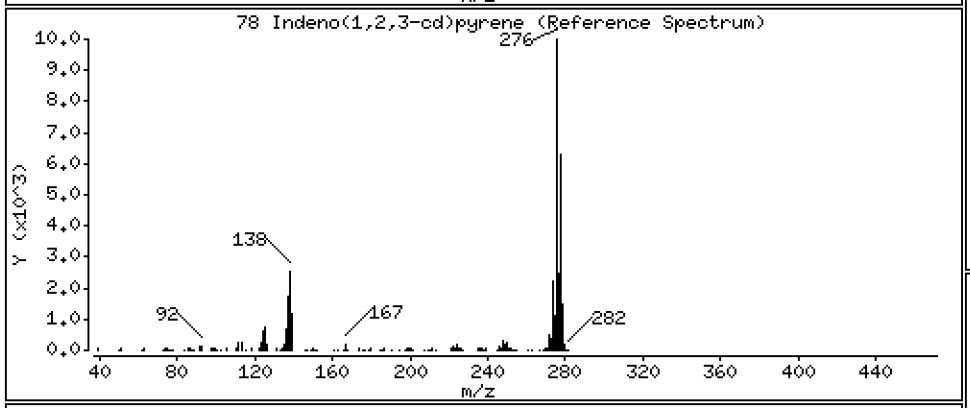
Column diameter: 0.25

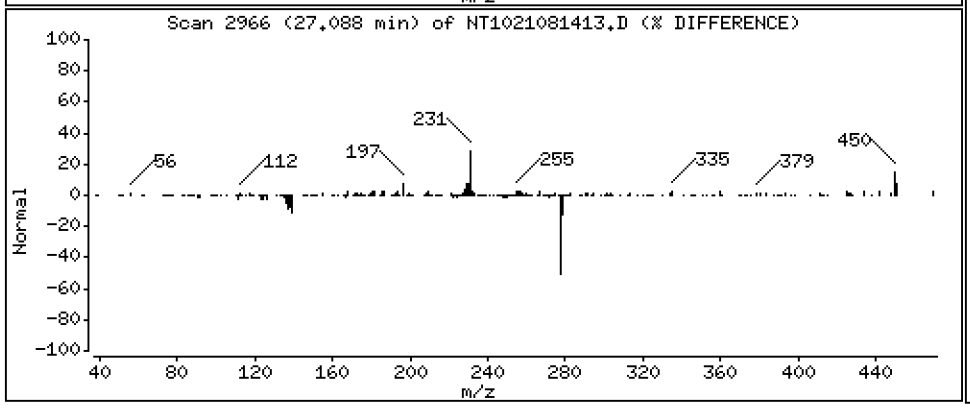
78 Indeno(1,2,3-cd)pyrene

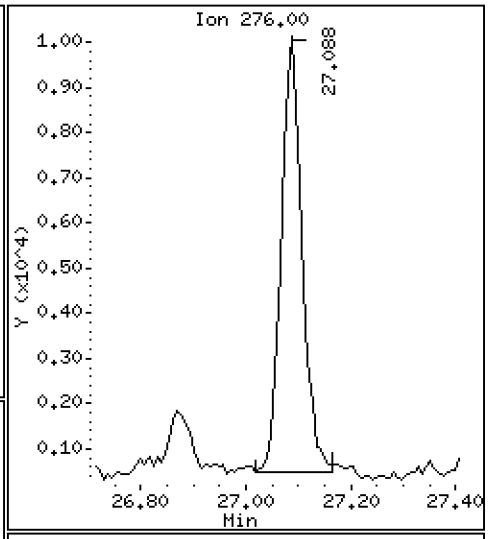
Concentration: 0.3358 ug/mL

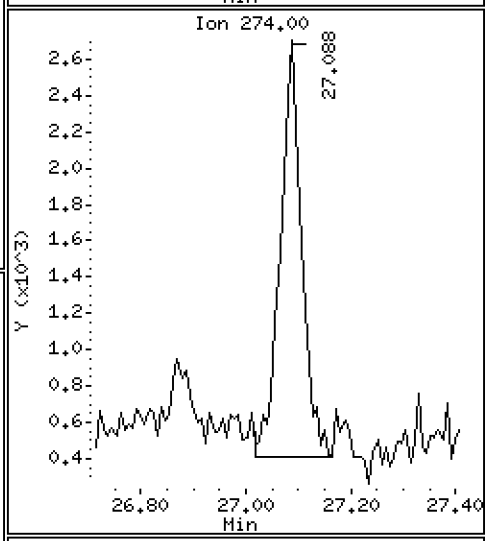


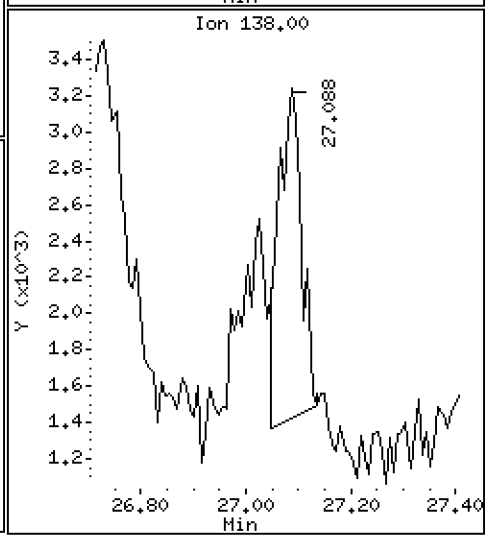












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

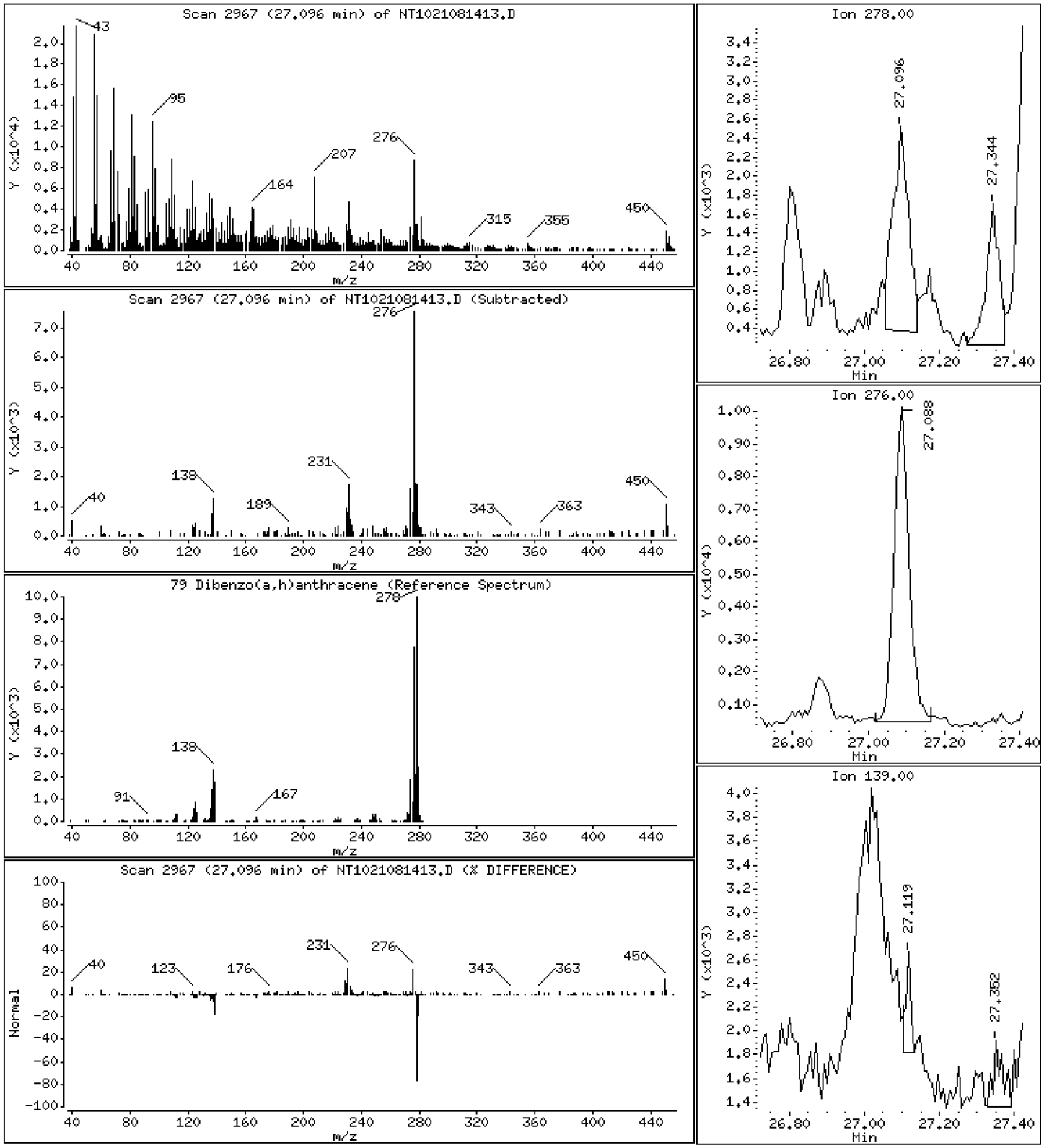
Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25

79 Dibenzo(a,h)anthracene

Concentration: 0.1031 ug/mL



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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

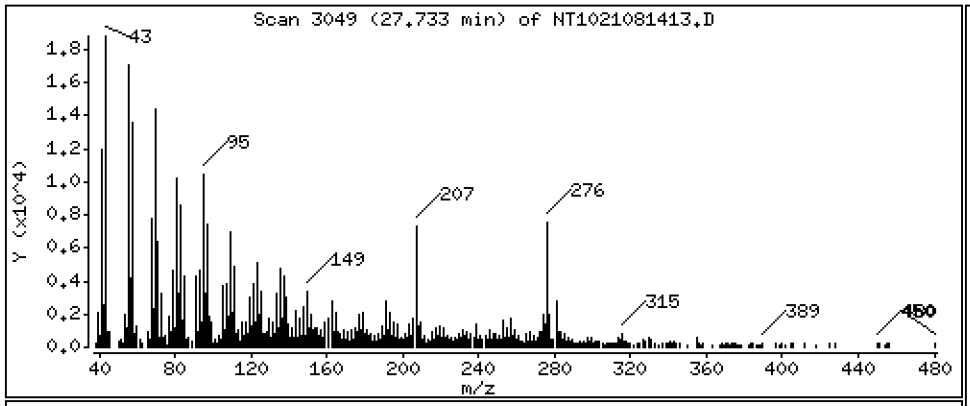
Operator: VTS

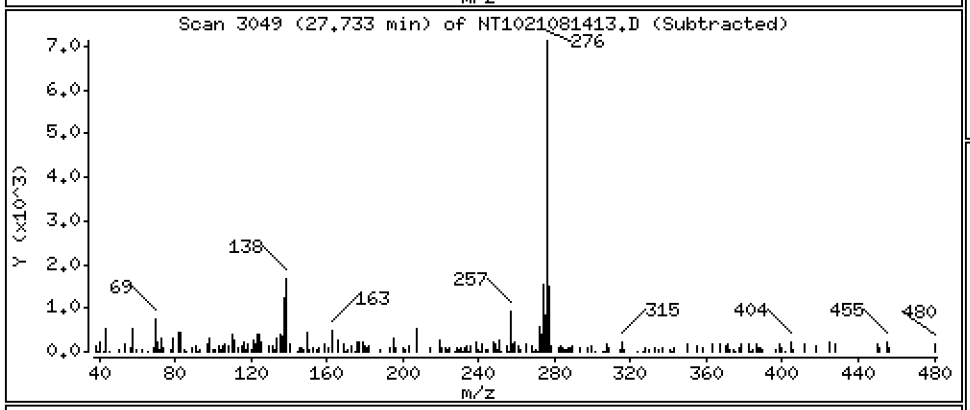
Column phase: ZB-5msi

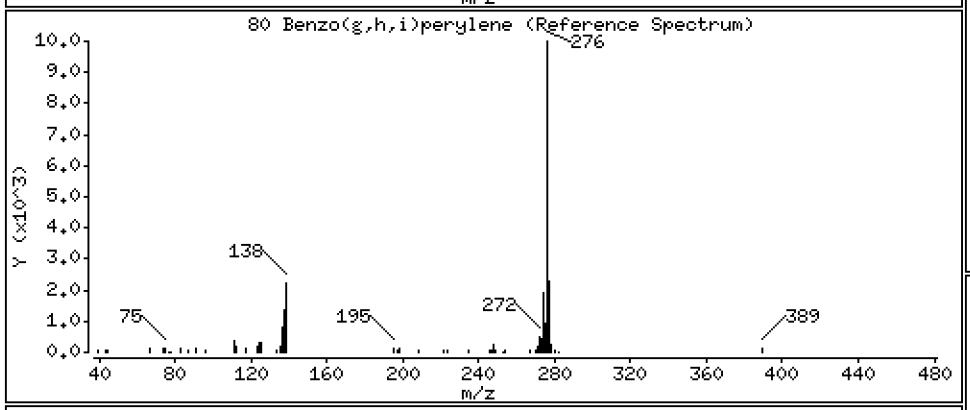
Column diameter: 0.25

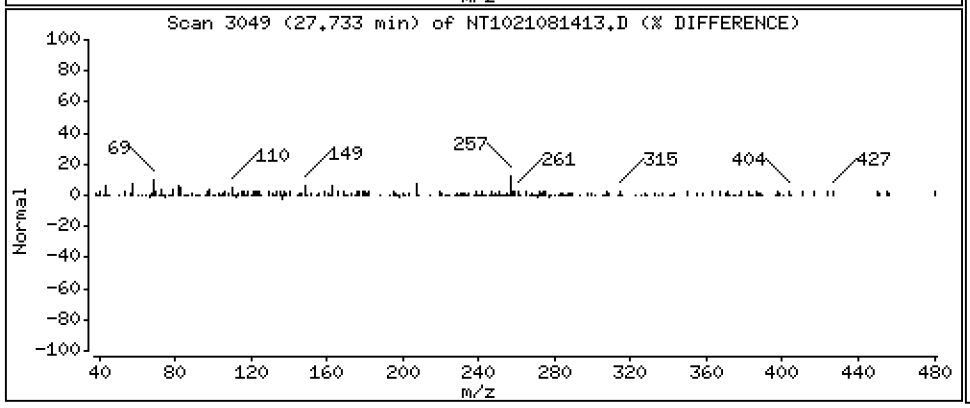
80 Benzo(g,h,i)perylene

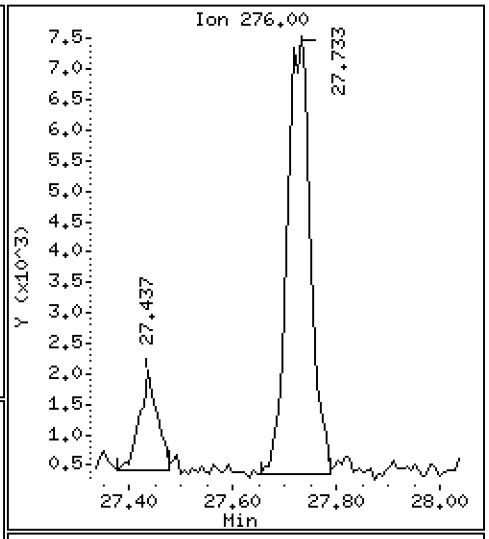
Concentration: 0.3239 ug/mL

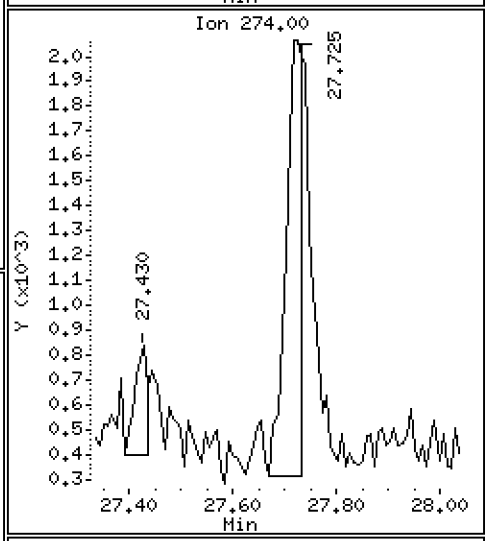


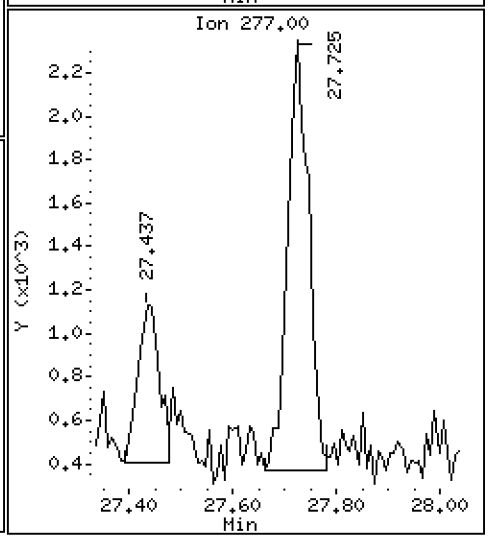












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

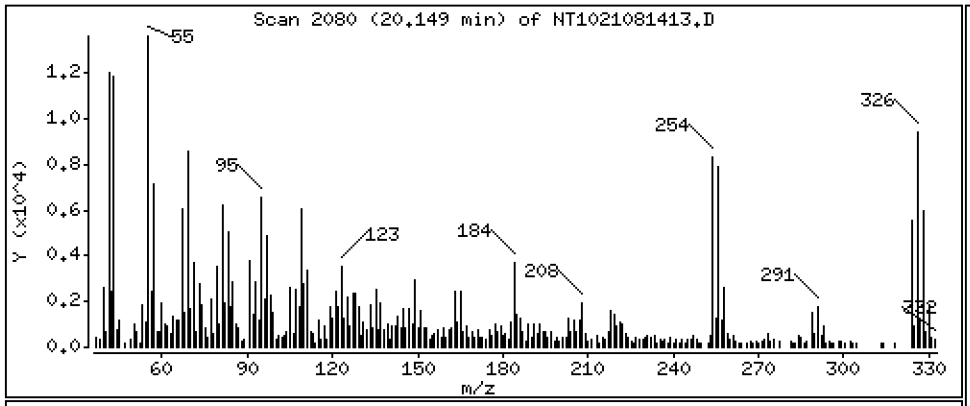
Operator: VTS

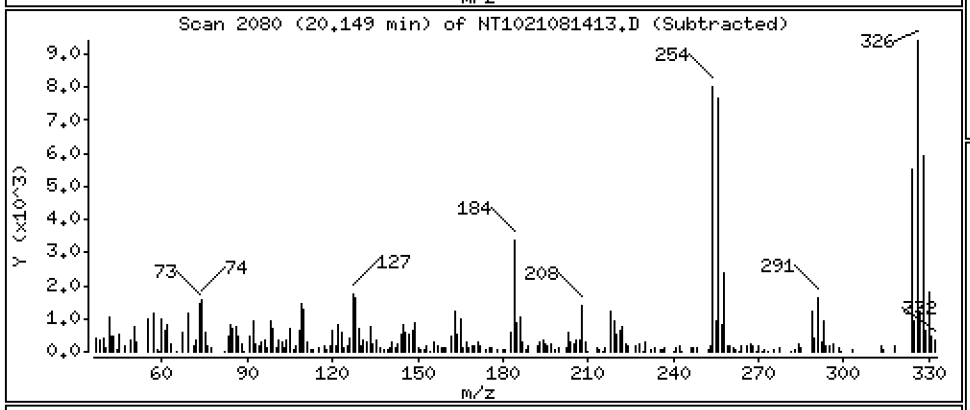
Column phase: ZB-5msi

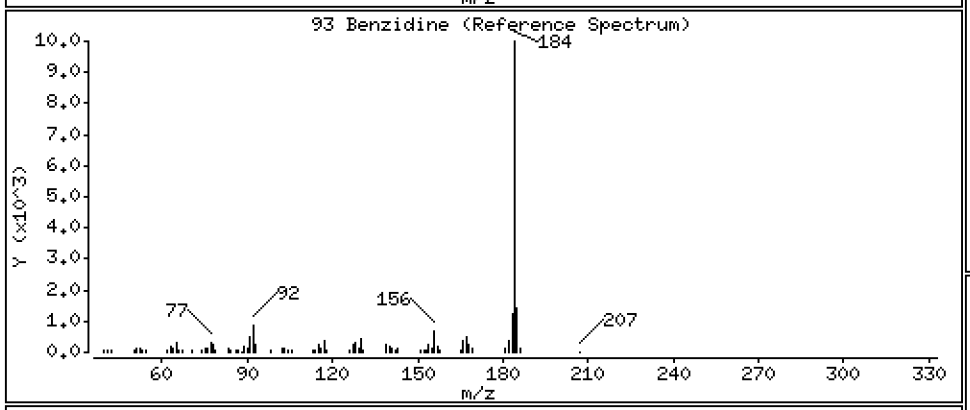
Column diameter: 0.25

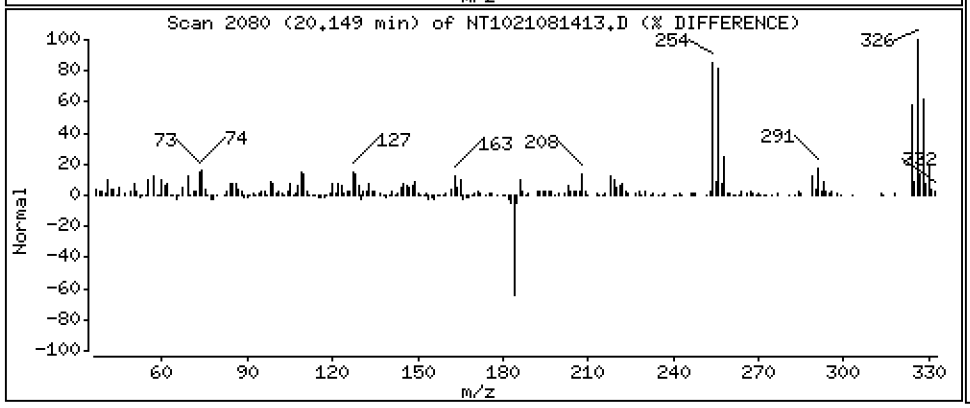
93 Benzidine

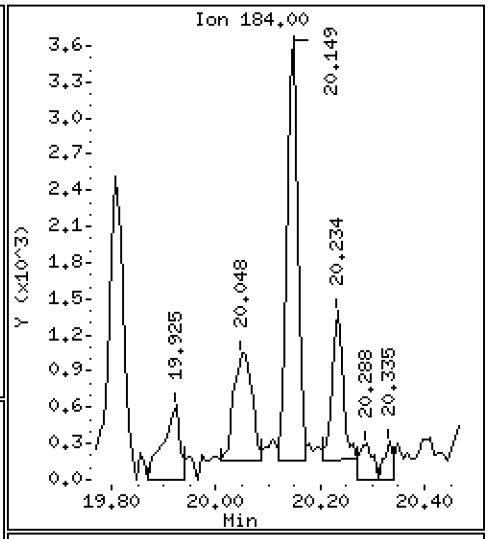
Concentration: 0.1362 ug/mL

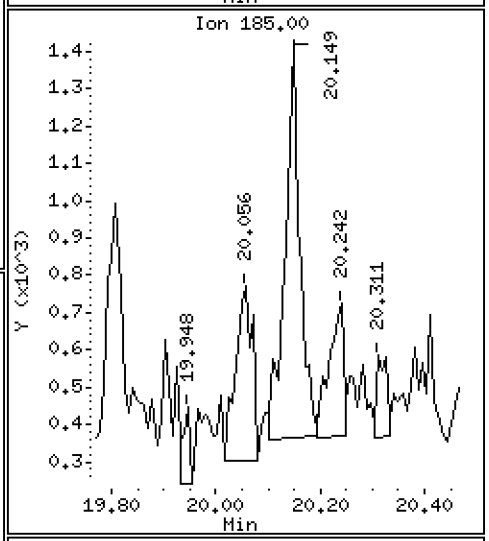


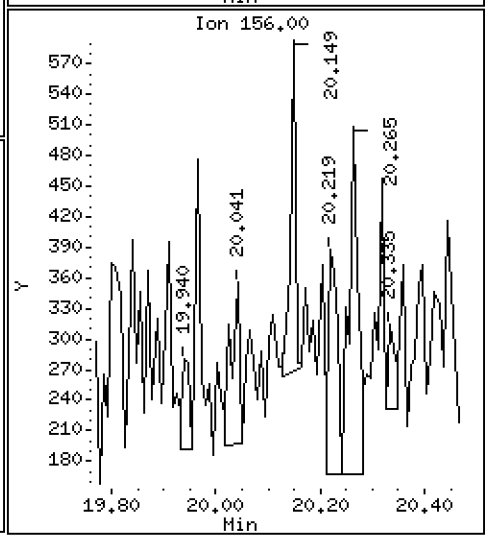












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

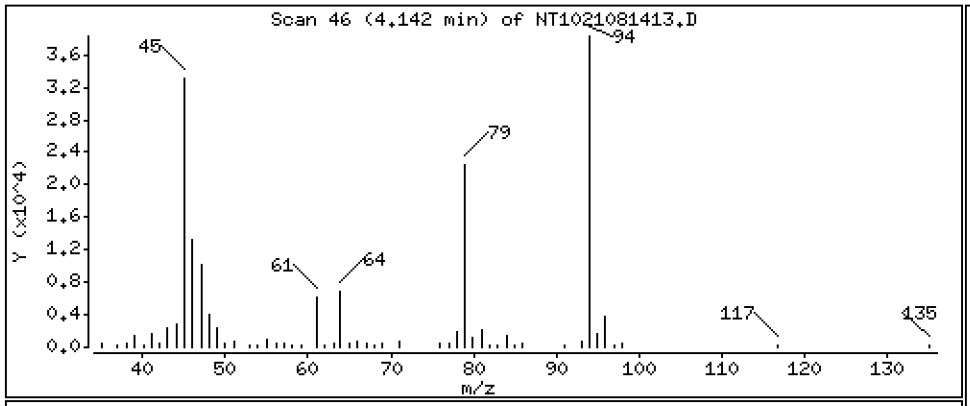
Operator: VTS

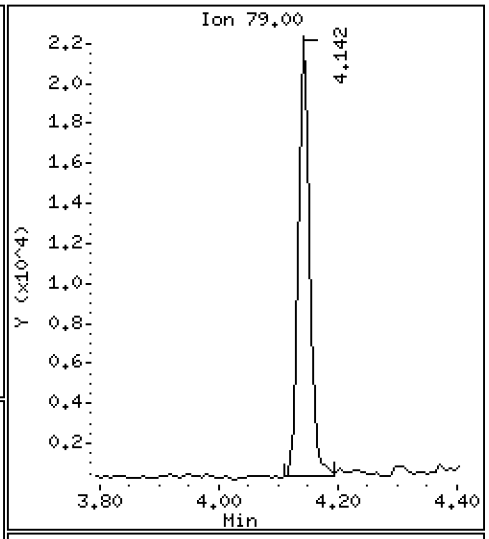
Column phase: ZB-5msi

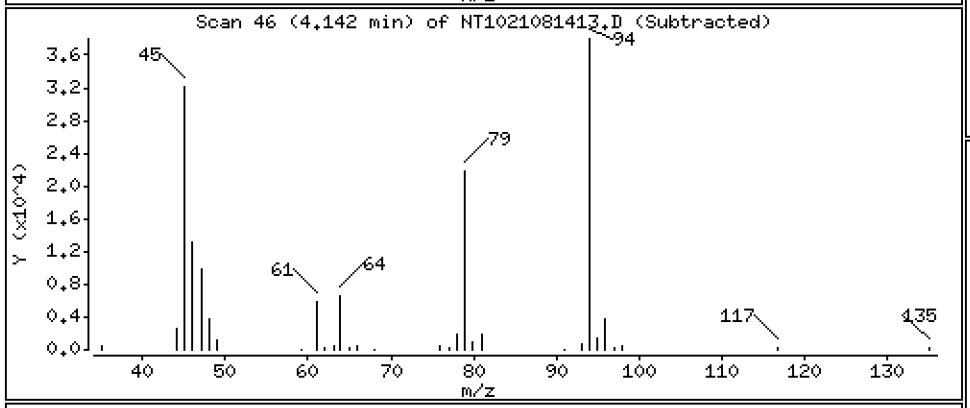
Column diameter: 0.25

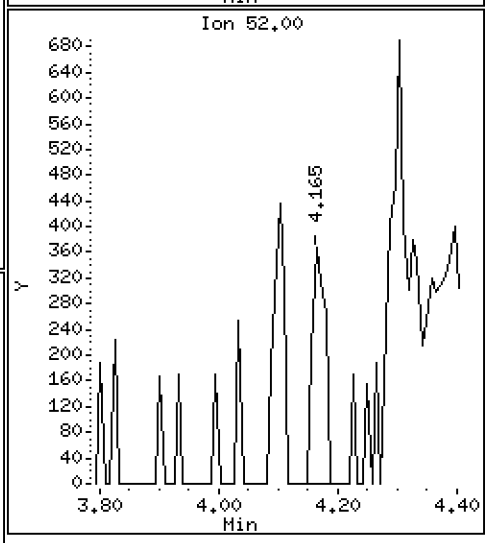
103 Pyridine

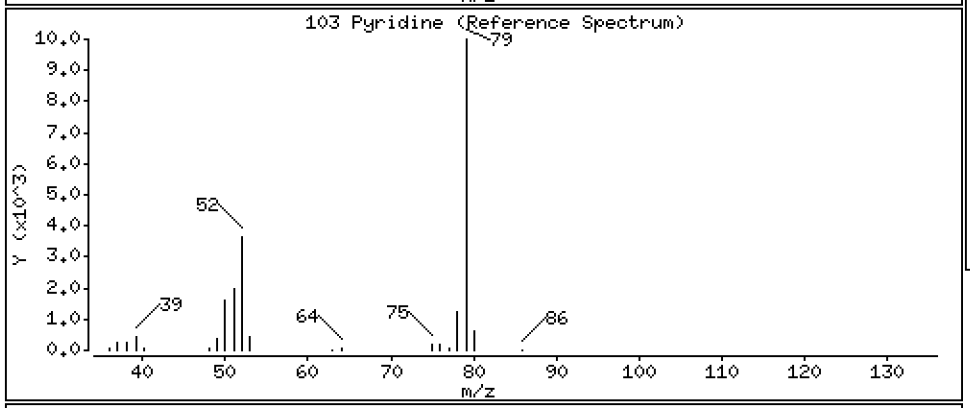
Concentration: 0.7069 ug/mL

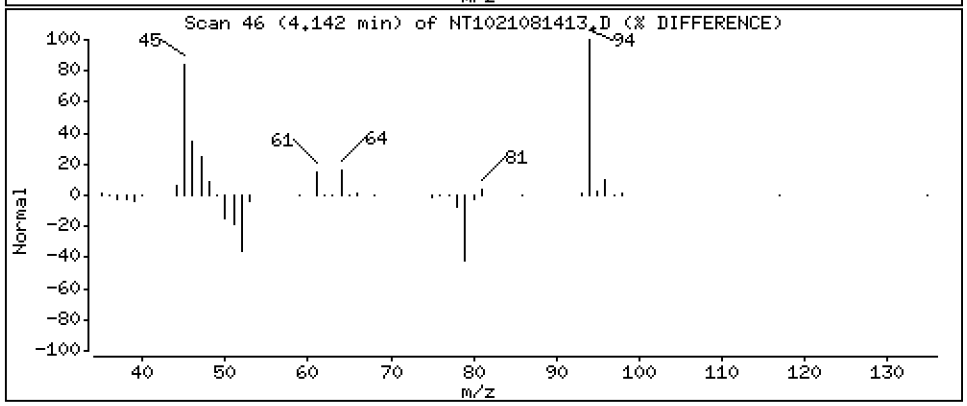












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

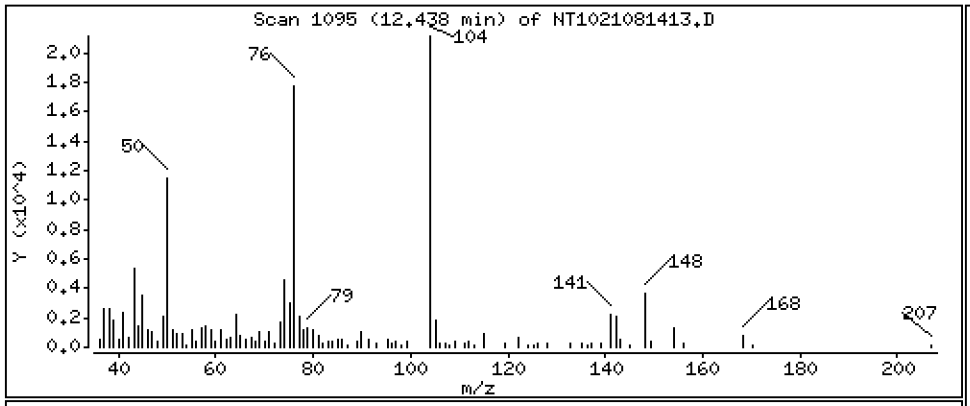
Operator: VTS

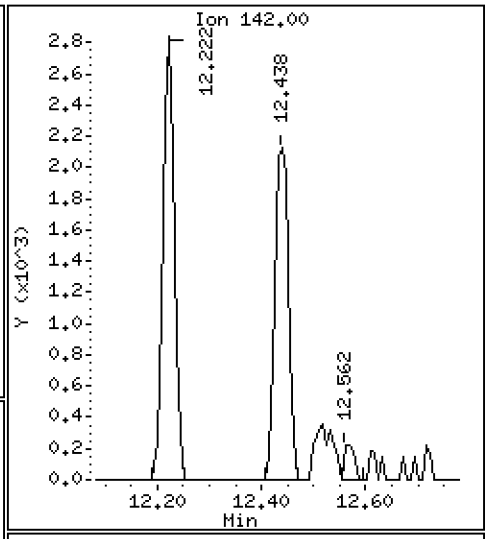
Column phase: ZB-5msi

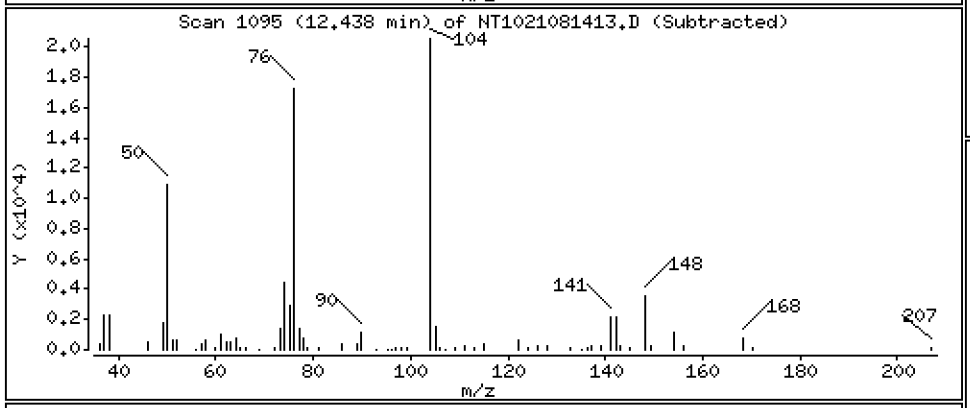
Column diameter: 0.25

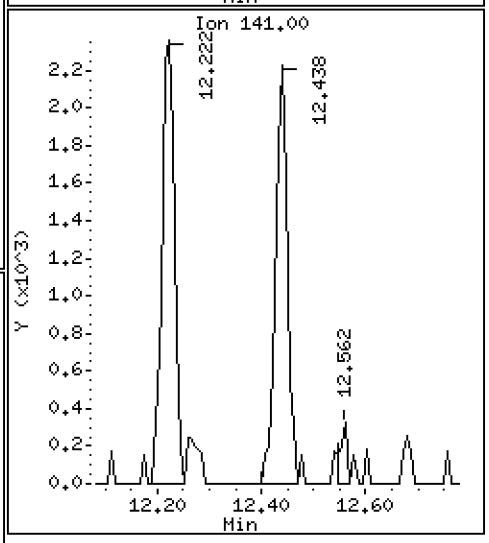
105 1-methylnaphthalene

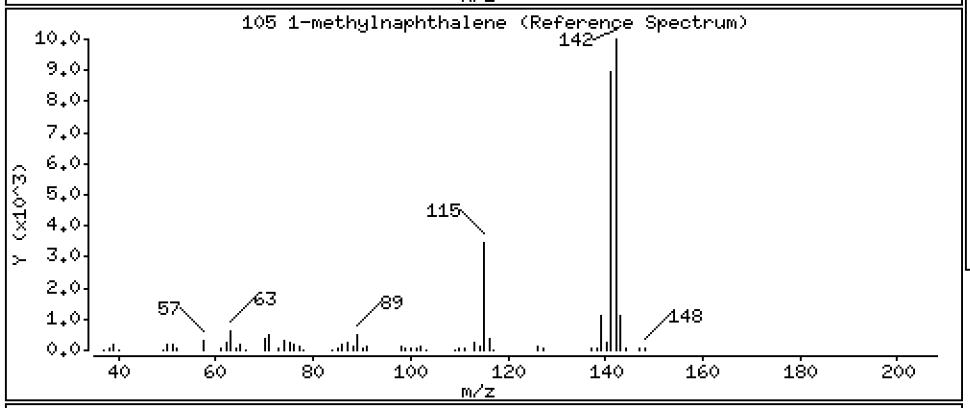
Concentration: 0.04543 ug/mL

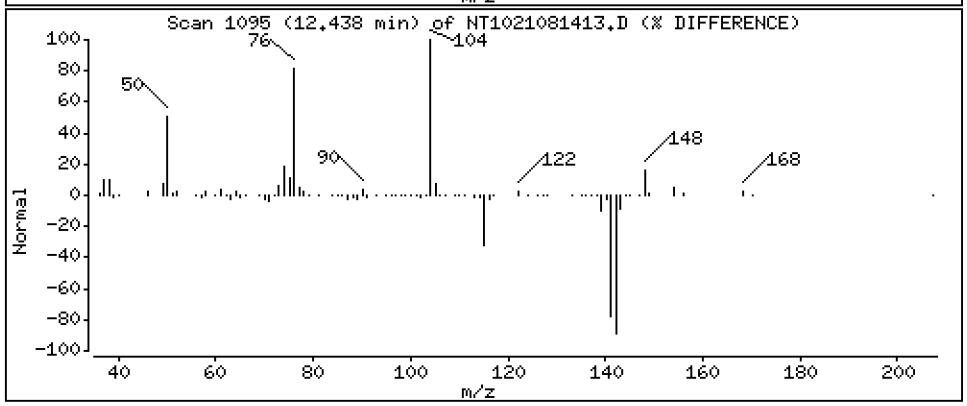












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Date : 14-AUG-2021 17:12

Client ID:

Instrument: nt10.i

Sample Info: 21G0286-05

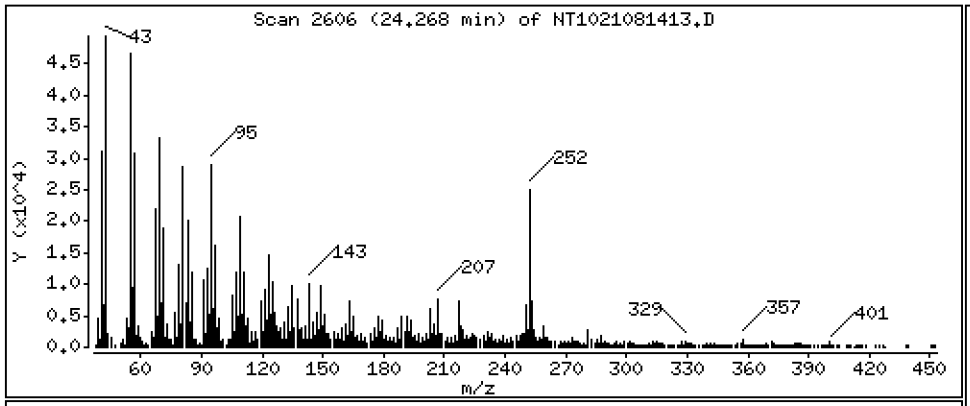
Operator: VTS

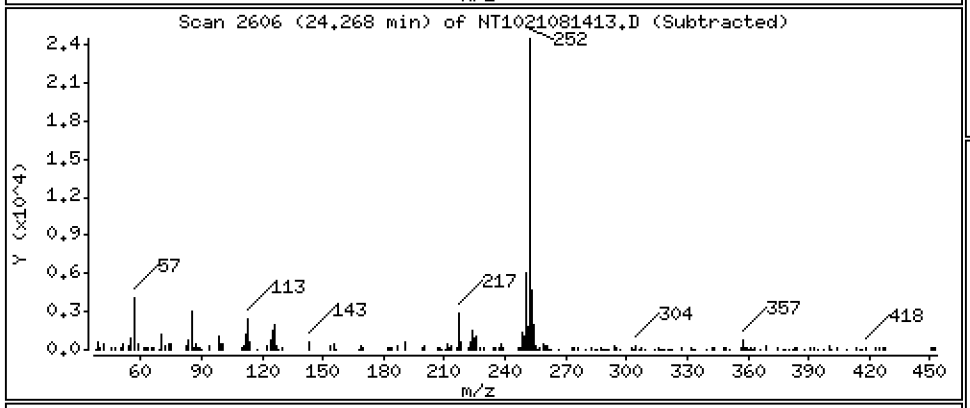
Column phase: ZB-5msi

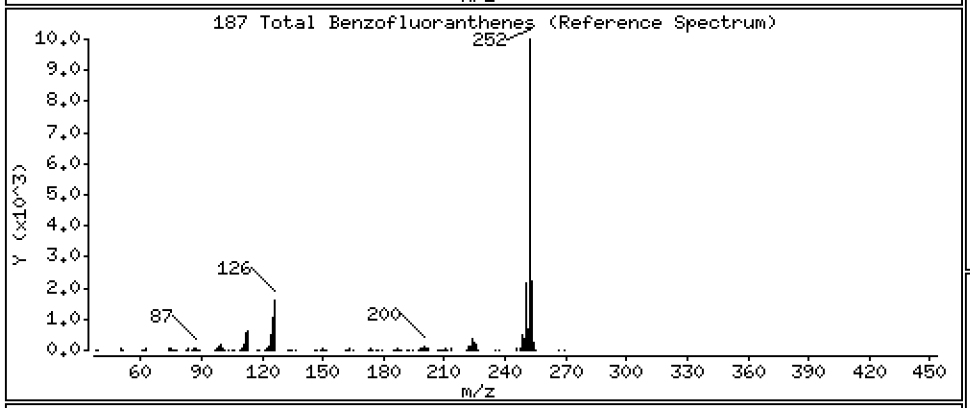
Column diameter: 0.25

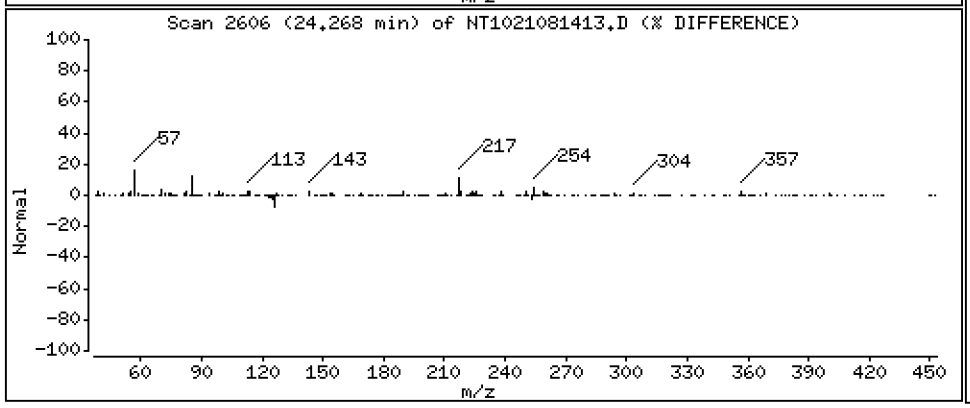
187 Total Benzofluoranthenes

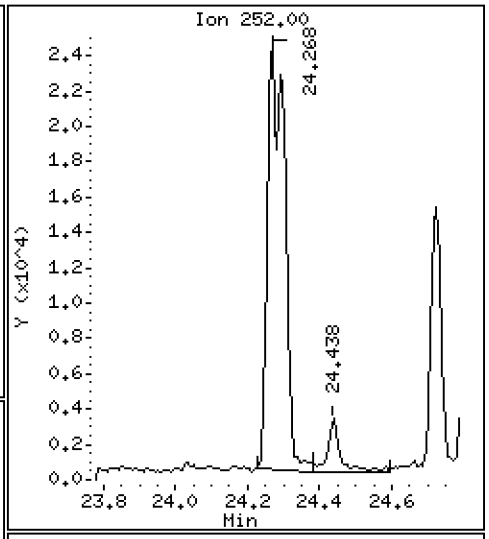
Concentration: 1.075 ug/mL

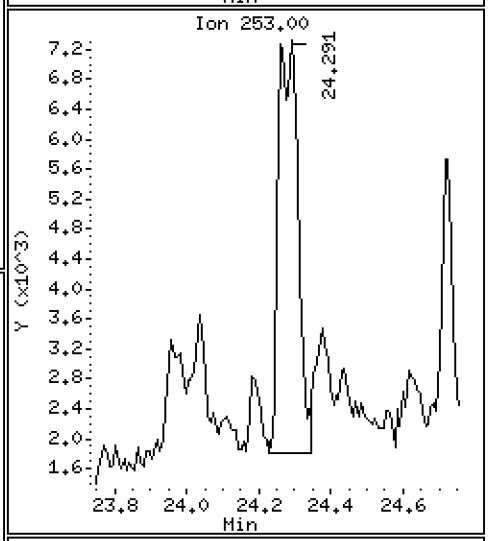


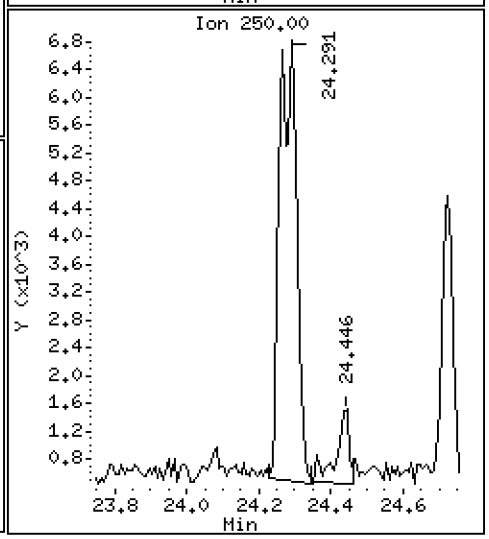












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

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Inj Date : 14-AUG-2021 17:12
Operator : VTS Inst ID: nt10.i
Smp Info : 21G0286-05
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 13
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$	1 2-Fluorophenol	112	6.234	6.204	(0.746)	140498	3.64646	3.646
$	2 Phenol-d5	99	7.811	7.788	(0.934)	223310	3.90481	3.905
	3 Phenol	94	7.826	7.811	(0.936)	5072	0.10146	0.1015
$	5 2-Chlorophenol-d4	132	8.019	8.004	(0.959)	206076	5.11112	5.111
	4 Bis(2-Chloroethyl)ether	93	Compound Not Detected.					
	6 2-Chlorophenol	128	Compound Not Detected.					
	7 1,3-Dichlorobenzene	146	Compound Not Detected.					
*	8 1,4-Dichlorobenzene-d4	152	8.360	8.353	(1.000)	97906	4.00000	
	9 1,4-Dichlorobenzene	146	Compound Not Detected.					
$	10 1,2-Dichlorobenzene-d4	152	8.709	8.702	(1.042)	80138	3.09028	3.090
	12 1,2-Dichlorobenzene	146	Compound Not Detected.					
	11 Benzyl alcohol	108	8.655	8.648	(1.035)	1923	0.08217	0.08217(H)
	14 2,2'-oxybis(1-Chloropropane)	121	Compound Not Detected.					
	13 2-Methylphenol	108	Compound Not Detected.					
	17 Hexachloroethane	117	Compound Not Detected.					
	16 N-Nitroso-di-n-propylamine	70	Compound Not Detected.					
	15 4-Methylphenol	108	9.183	9.160	(1.098)	2318	0.06942	0.06942
$	18 Nitrobenzene-d5	82	9.447	9.440	(0.875)	156652	3.51807	3.518
	19 Nitrobenzene	77	Compound Not Detected.					
	20 Isophorone	82	Compound Not Detected.					
	21 2-Nitrophenol	139	Compound Not Detected.					
	22 2,4-Dimethylphenol	107	Compound Not Detected.					
	23 Bis(2-Chloroethoxy)methane	93	Compound Not Detected.					
	24 Benzoic acid	105	10.345	10.430	(0.958)	10548	0.55141	0.5514(H)
	25 2,4-Dichlorophenol	162	Compound Not Detected.					
	26 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
*	27 Naphthalene-d8	136	10.798	10.791	(1.000)	363046	4.00000	
	28 Naphthalene	128	10.837	10.837	(1.004)	7130	0.07421	0.07421
	29 4-Chloroaniline	127	Compound Not Detected.					
	30 Hexachlorobutadiene	225	Compound Not Detected.					
	31 4-Chloro-3-methylphenol	107	Compound Not Detected.					
	32 2-Methylnaphthalene	142	12.221	12.214	(1.132)	4522	0.05087	0.05087
	33 Hexachlorocyclopentadiene	237	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	Compound Not Detected.					
	35 2,4,5-Trichlorophenol	196	Compound Not Detected.					
$	36 2-Fluorobiphenyl	172	13.011	13.003	(0.906)	337898	3.81397	3.814
	37 2-Chloronaphthalene	162	Compound Not Detected.					
	38 2-Nitroaniline	65	Compound Not Detected.					
	39 Dimethylphthalate	163	13.924	13.917	(0.969)	33759	0.47152	0.4715
	40 Acenaphthylene	152	14.056	14.048	(0.978)	5247	0.04984	0.04984
	41 2,6-Dinitrotoluene	165	Compound Not Detected.					
*	42 Acenaphthene-d10	164	14.365	14.358	(1.000)	192925	4.00000	
	43 3-Nitroaniline	138	Compound Not Detected.					
	44 Acenaphthene	153	Compound Not Detected.					
	45 2,4-Dinitrophenol	184	Compound Not Detected.					
	46 Dibenzofuran	168	14.759	14.752	(1.027)	3896	0.04123	0.04123
	47 4-Nitrophenol	109	Compound Not Detected.					
	48 2,4-Dinitrotoluene	165	Compound Not Detected.					
	50 Diethylphthalate	149	15.370	15.363	(1.070)	8236	0.12133	0.1213
	49 Fluorene	166	15.463	15.456	(1.076)	3329	0.03634	0.03634
	51 4-Chlorophenyl-phenylether	204	Compound Not Detected.					
	52 4-Nitroaniline	138	Compound Not Detected.					
	53 4,6-Dinitro-2-methylphenol	198	Compound Not Detected.					
	54 N-Nitrosodiphenylamine	169	Compound Not Detected.					
$	55 2,4,6-Tribromophenol	330	16.003	15.996	(1.114)	129100	8.01327	8.013
	56 4-Bromophenyl-phenylether	248	Compound Not Detected.					
	57 Hexachlorobenzene	284	Compound Not Detected.					
	58 Pentachlorophenol	266	Compound Not Detected.					
*	59 Phenanthrene-d10	188	17.379	17.364	(1.000)	343410	4.00000	
	60 Phenanthrene	178	17.425	17.418	(1.003)	43260	0.46583	0.4658
	61 Anthracene	178	17.518	17.503	(1.008)	9580	0.09647	0.09647
	62 Carbazole	167	17.882	17.859	(1.029)	6956	0.07095	0.07095
	63 Di-n-butylphthalate	149	18.725	18.710	(1.077)	24754	0.16596	0.1660
	64 Fluoranthene	202	19.854	19.839	(0.882)	88008	1.02548	1.025
	65 Pyrene	202	20.280	20.265	(0.901)	75754	0.80076	0.8008
$	66 Terphenyl-d14	244	20.605	20.590	(0.915)	267746	3.97092	3.971
	67 Butylbenzylphthalate	149	21.573	21.558	(0.958)	62577	2.01098	2.011
	68 Benzo(a)anthracene	228	22.479	22.464	(0.999)	28356	0.36898	0.3690
*	69 Chrysene-d12	240	22.510	22.495	(1.000)	205942	4.00000	
	70 3,3'-Dichlorobenzidine	252	Compound Not Detected.					
	71 Chrysene	228	22.548	22.541	(1.002)	37719	0.63662	0.6366
	72 bis(2-Ethylhexyl)phthalate	149	22.626	22.619	(0.958)	34149	0.99915	0.9992
*	134 Di-n-octylphthalate-d4	153	23.617	23.610	(1.000)	310661	4.00000	
	73 Di-n-octylphthalate	149	23.632	23.617	(1.001)	15353	0.17634	0.1763
	74 Benzo(b)fluoranthene	252	24.267	24.252	(0.974)	46723	0.59094	0.5909
	75 Benzo(k)fluoranthene	252	24.290	24.283	(0.975)	41963	0.53580	0.5358(M)
	76 Benzo(a)pyrene	252	24.809	24.786	(0.996)	30614	0.42843	0.4284
*	77 Perylene-d12	264	24.910	24.887	(1.000)	200643	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.087	27.057	(1.087)	27156	0.33579	0.3358
	79 Dibenzo(a,h)anthracene	278	27.095	27.072	(1.088)	6547	0.10307	0.1031
	80 Benzo(g,h,i)perylene	276	27.732	27.686	(1.113)	23372	0.32386	0.3239
	90 N-Nitrosodimethylamine	74	Compound Not Detected.					
	91 Aniline	93	Compound Not Detected.					
	93 Benzidine	184	20.148	20.118	(0.895)	5347	0.13623	0.1362
	103 Pyridine	79	4.142	4.057	(0.495)	29312	0.70688	0.7069
	105 1-methylnaphthalene	142	12.438	12.431	(1.152)	3789	0.04543	0.04543
	111 Azobenzene (1,2-DP-Hydrazine)	77	Compound Not Detected.					

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	CONCENTRATIONS FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.267	24.283	(0.974)	81615	1.07494	1.075
120 2,3,4,6-Tetrachlorophenol	232	Compound Not Detected.					

QC Flag Legend

M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081413.D
Lab Smp Id: 21G0286-05
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	97906	15.10
27 Naphthalene-d8	291658	145829	583316	363046	24.48
42 Acenaphthene-d10	163642	81821	327284	192925	17.89
59 Phenanthrene-d10	304099	152050	608198	343410	12.93
69 Chrysene-d12	199453	99727	398906	205942	3.25
134 Di-n-octylphthala	303639	151820	607278	310661	2.31
77 Perylene-d12	200082	100041	400164	200643	0.28

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.36	0.09
27 Naphthalene-d8	10.79	10.29	11.29	10.80	0.07
42 Acenaphthene-d10	14.36	13.86	14.86	14.37	0.05
59 Phenanthrene-d10	17.36	16.86	17.86	17.38	0.09
69 Chrysene-d12	22.50	22.00	23.00	22.51	0.07
134 Di-n-octylphthala	23.61	23.11	24.11	23.62	0.03
77 Perylene-d12	24.89	24.39	25.39	24.91	0.09

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081413.D

Lab ID: 21G0286-05
nt10.i, ABN.m, 14-AUG-2021 17:12

RT	CO-ELUTION COMPOUNDS

NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
0.958	0.967	-0.0086	Benzoic acid
0.495	0.486	0.0097	Pyridine

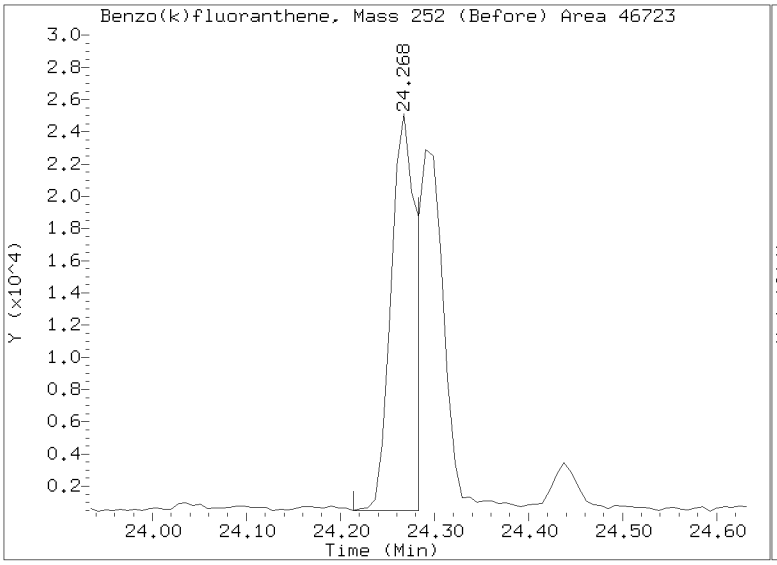
RRT check based on Ccal File: NT1021081402.D

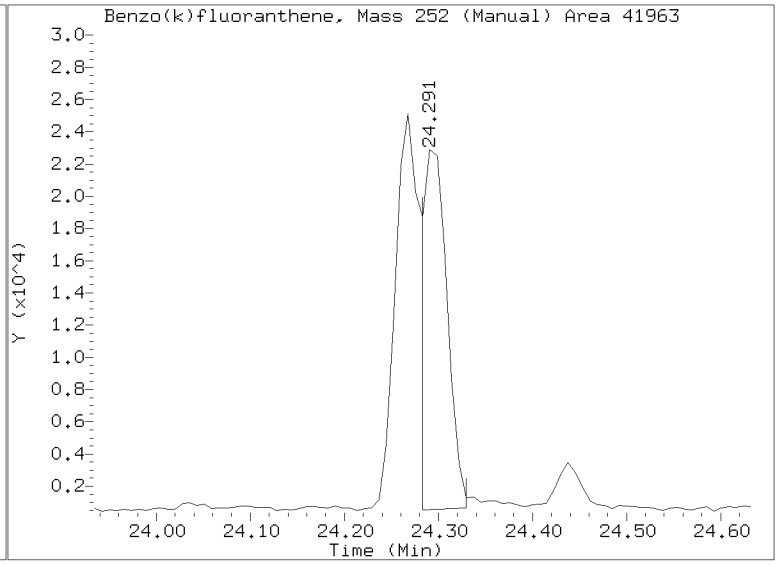
On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Quant Ion Manual Peak Adjustment Report

Datafile: //target/share/chem3/nt10.i/20210814.b/NT1021081413.D
Injection Date: 14-AUG-2021 17:12
Lab ID:21G0286-05 Client ID:
Report Date: 08/16/2021 09:24





Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

EPA 8270E

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Batch:	BJH0004	Batch Matrix:	Solid	Preparation:	EPA 3546 (Microwave)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS687	21G0286-01	NT1021081408.D	08/02/21 11:20	
LDW21-SS625	21G0286-02	NT1021081409.D	08/02/21 11:20	
LDW21-SS627	21G0286-04	NT1021081410.D	08/02/21 11:20	
LDW21-SS646	21G0286-05	NT1021081413.D	08/02/21 11:20	
Blank	BJH0004-BLK1	NT1021081405.D	08/02/21 11:20	
LCS	BJH0004-BS1	NT1021081406.D	08/02/21 11:20	
LDW21-SS627	BJH0004-MS1	NT1021081411.D	08/02/21 11:20	
LDW21-SS627	BJH0004-MSD1	NT1021081412.D	08/02/21 11:20	
Reference	BJH0004-SRM1	NT1021081407.D	08/02/21 11:20	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ORGANICS PREPARATION BENCH SHEET

Batch: BJH0004

Prepared using: EPA 3546 (Microwave)

8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf) in Solid (Version:ButylBenzylPhth Only)
8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf) in Solid (Version:PAH and Phenols Only)
8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf) in Solid (Version:PAH Only)
8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf) in Solid (Version:SMS PAH)

Matrix: Solid **Date Prepared:** 08/02/21 **Balance ID:** 3146462614 **Set Up By:** CTO 8/2/21

WO Comments
21G0286: <G> BPR Project batch as mcuh as possible </G> <C>BPR SRM, MS, DUP </C> <M>BPR PS, MS/MSD </M> <E>BPR 8270E RM H002055, SIM RM H010158, PCB RM J006840-43, MS/MSD </E>
<H>BPR J006840-43, Dup </H>
21G0289: <C>BPR DUP MS</C><M>BPR DUP MS</M><E>BPR MS MSD</E><H>BPR DUP per batch of 20. PSSRM on per project</H><G>Do not freeze Hg</G>

The following standards may be missing from this batch!

Designator	Description
39	Benzidine Spike
QLS 14	QLS Spike (Freezer)

Analysis: 8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf)

Lab Number & Container	% Solids	Initial (g) Target Dry: 10 (Wet) Actual	(REQ) GPC C/U (1:1) 1 (2) 3	Water Wash 1mL	Final Effective Vol (mL)	Vol (mL) to Lab	Extraction Comments
21G0286-01 D	75.9	(13.18) 13.22	(1:1)	1mL	1 ____	0.5 ____	
21G0286-02 B	76.1	(13.14) 13.17	(1:1)	1mL	1 ____	0.5 ____	
21G0286-04 B	54.4	(18.38) 18.38	(1:1)	1mL	1 ____	0.5 ____	
21G0286-05 B	64.6	(15.49) 15.55	(1:1)	1mL	1 ____	0.5 ____	
21G0289-01 C	80.8	(12.37) 12.37	(1:1)	1mL	1 ____	0.5 ____	Version
21G0289-02 C	66.1	(15.13) 15.18	(1:1)	1mL	1 ____	0.5 ____	Version
21G0289-05 C	76.2	(13.13) 13.13	(1:1)	1mL	1 ____	0.5 ____	Version

Batch QC

Lab Number	% Solids	Initial (g) Target Dry: 10 (Wet) Actual	(REQ) GPC C/U (1:1) 1 (2) 3	Water Wash 1mL	Final Effective Vol (mL)	Vol (mL) to Lab	Extraction Comments
BJH0004-BLK1	100.0	(10.00) 10.00	(1:1)	1mL	1 ____	0.5 ____	Use 5g Neutral Sodium Sulfate for Blanks
BJH0004-BS1	100.0	(10.00) 10.00	(1:1)	1mL	1 ____	0.5 ____	Use 5g Neutral Sodium Sulfate for Blanks
BJH0004-MS1	54.4	(18.38) 18.38	(1:1)	1mL	1 ____	0.5 ____	Use 21G0286-04
BJH0004-MS2	76.2	(13.13) 13.13	(1:1)	1mL	1 ____	0.5 ____	Use 21G0289-05
BJH0004-MSD1	54.4	(18.38) 18.38	(1:1)	1mL	1 ____	0.5 ____	Use 21G0286-04
BJH0004-MSD2	76.2	(13.13) 13.13	(1:1)	1mL	1 ____	0.5 ____	Use 21G0289-05
BJH0004-SRM1	100.0	~~(10.00)~~ (1.00) 1.00	(1:1)	1mL	1 ____	0.5 ____	Use ~~I005638~~ I005667

+1g DI H2O

08/02/21 — Client ID verified By — Date

DM — Preparation Reviewed By — 8-13-21 Date

08/02/21 11:20 — Extraction Date and Time

Printed: 8/2/2021 8:29:40AM

3036F
Page 1 of 2

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ORGANICS PREPARATION BENCH SHEET

Batch: BJH0004

Prepared using: EPA 3546 (Microwave)

8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf) in Solid (Version:ButylBenzylPhth Only)
8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf) in Solid (Version:PAH and Phenols Only)
8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf) in Solid (Version:PAH Only)
8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf) in Solid (Version:SMS PAH)

WO Comments

21G0286: <G> BPR Project batch as mcuh as possible </G> <C>BPR SRM, MS, DUP </C> <M>BPR PS, MS/MSD </M> <E>BPR 8270E RM H002055, SIM RM H010158, PCB RM J006840-43, MS/MSD </E>
<H>BPR J006840-43, Dup </H>
21G0289: <C>BPR DUP MS</C><M>BPR DUP MS</M><E>BPR MS MSD</E><H>BPR DUP per batch of 20. PSSRM on per project</H><G>Do not freeze Hg</G>

Prep Steps

Microwave
1 (2) 3
08/02/21
Analyst/Date

KD 100°C
1 2 3 (4) 5 6
AA/RM 081021
Analyst/Date

TurboVap Pre GPC
1 2 3 (4) 5
SH 8/10/21
Analyst/Date

GPC Prep Filter (1:1)
SH 8/10/21
Analyst/Date

Post GPC KD 80-85°C
(1) 2 3 4 5 (6)
RM 08/11/21
Analyst/Date

TurboVap
1 2 3 (4) 5
8-13-21
DM
Analyst/Date

Water Wash
8-13-21
DM
Analyst/Date

Vialing
8-13-21
DM
Analyst/Date

Reagents Used

Station/Reagent	Standard ID
Microwave Analyst: GT Date: 08/02/21	
Anhydrous Sodium Sulfate	J007778
1:1 Methylene Chloride/Acetone	J007534
Methylene Chloride	J006423
Pre-Deactivated Glass Wool	J054009
Pre GPC KD Analyst: AA/RM Date: 081021	
Pre-Deactivated Glass Wool	NA
Anhydrous Sodium Sulfate	J008034
Methylene Chloride	J007004
Hexane	J005194
GPC Filter Prep Analyst: SH Date: 8/10/21	
Methylene Chloride	J007004
GPC Analyst: MS Date: 8/10/21	
Methylene Chloride	J007004
GPC Calibration File	CJE245
Post GPC KD Analyst: RM Date: 08/11/21	
Methylene Chloride	J007004
Vialing Analyst: DM Date: 8-13-21	
Methylene Chloride	J007004

Surrogates & Spike Standards Used

Type	Vial ID / Standard ID	Vol uL	Analyst	Witness
Surrogate 100/150µg/mL	A J004253 Exp: 04/20/2022	50µL	GT	
Full List Spike (Freezer) 100µg/mL	7 J005209 (V) Exp: 08/04/2021 J004679	50µL	GT	
Base Spike 200µg/mL	56 J005209 (V) Exp: 08/04/2021 J004231	50µL	GT	
Acid Spike 100/200µg/mL	38 J005209 (V) Exp: 08/04/2021 J004232	50µL	GT	

(V) indicates a virtual standard combining two or more physical standards. In these cases the Standard ID refers to the virtual standard, not the parent standards.

If a Standard ID is missing, but should be present, check the standard definition in Element LIMS to be sure Standard Info 6 has the correct letter or number designator matching the vial designator inthe Standard ID column. If it is correct, check the batch and bench sheet in Element LIMS to be sure the correct standards are selected for surrogate(s) and spike(s).

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Organic Extractions Laboratory Analyst Notes

Extraction Parameter: SVOA Extraction Batch: BJH0004

Total Solids Batch: BJG0687 Work Order(s): 21G0289

Screens: Soil/Sediment/Solid/Other:	Analyst/Date
☐ No Anomalies (standard soil/wet sediment/sand/gravel)=	
☐ Standing Water Decanted (Not shared)=	
☐ Standing Water Homogenized (Shared samples)=	
☐ Clay/Clumps (Difficult to homogenize)=	
☑ Rocks (%+size)? 05 (45%, 1/4")	07/30/21
☑ Organics (Leaves/sticks/grass)= 02	07/30/21
☐ Oily, obvious fuel/sulfur odors=	
☐ Received in 32oz jar(s)=Homogenized in Pyrex dish=	
☐ Previously Frozen =	
☐ Other (Details)=	
Aqueous:	
☐ No Anomalies	
☐ Turbid/Color=	
☐ Particulates(%)=(Note: >5%=Notify Supervisor/Lead)	
☐ Emulsions (%)=	
☐ Oily, obvious fuel/sulfur odors=	
☐ Other (Details)=	
☐ Received in 1.0L Bottle(s)=No Bottle Rinse=	
☒ Other Notes/Comments= (Note problems, concerns, corrective actions).	
Sample 05 sticker & TT don't match. Might have been labeled with other 05 sample! 289-05 was on 286-05 and vice versa	DM 8-13-21
☑ Share Samples Y / (N)	07/30/21
☑ Multiple Jars Y / (N)	07/30/21
☐ Sample Pre-Screens indicate analyte activity=	
☐ Sample weights/volumes reduced based on Pre-Screen=	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Organic Extractions Laboratory Analyst Notes

Extraction Parameter: SVOA Extraction Batch BJH0004

Total Solids Batch: BJG0086 Work Order(s): 21G0286

Screens: Soil/Sediment/Solid/Other:	Analyst/Date
☑ No Anomalies (standard soil/wet sediment/sand/gravel)= 01-05	07/30/21
☐ Standing Water Decanted (Not shared)=	
☐ Standing Water Homogenized (Shared samples)=	
☐ Clay/Clumps (Difficult to homogenize)=	
☐ Rocks (%+size)?	
☐ Organics (Leaves/sticks/grass)=	
☐ Oily, obvious fuel/sulfur odors=	
☐ Received in 32oz jar(s)=Homogenized in Pyrex dish=	
☐ Previously Frozen =	
☐ Other (Details)=	
Aqueous:	
☐ No Anomalies	
☐ Turbid/Color=	
☐ Particulates(%)=(Note: >5%=Notify Supervisor/Lead)	
☐ Emulsions (%)=	
☐ Oily, obvious fuel/sulfur odors=	
☐ Other (Details)=	
☐ Received in 1.0L Bottle(s)=No Bottle Rinse=	
☒ Other Notes/Comments= (Note problems, concerns, corrective actions).	
Sample 05 Sticker & TT dont match. Might have been labeled with other 05 sample: 289-05 was on 286-05 and vice versa	DM 8-13-21
☑ Share Samples Y / N	07/30/21
☑ Multiple Jars Y / N	07/30/21
☐ Sample Pre-Screens indicate analyte activity=	
☐ Sample weights/volumes reduced based on Pre-Screen=	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ORGANICS PREPARATION BENCH SHEET

Batch: BJH0004

Prepared using: EPA 3546 (Microwave)

8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf) in Solid (Version:ButylBenzylPhth Only)
8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf) in Solid (Version:PAH and Phenols Only)
8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf) in Solid (Version:PAH Only)
8270E SVOC (20ug/kg solid or 0.2ug/L low H2O Sepf) in Solid (Version:SMS PAH)

WO Comments

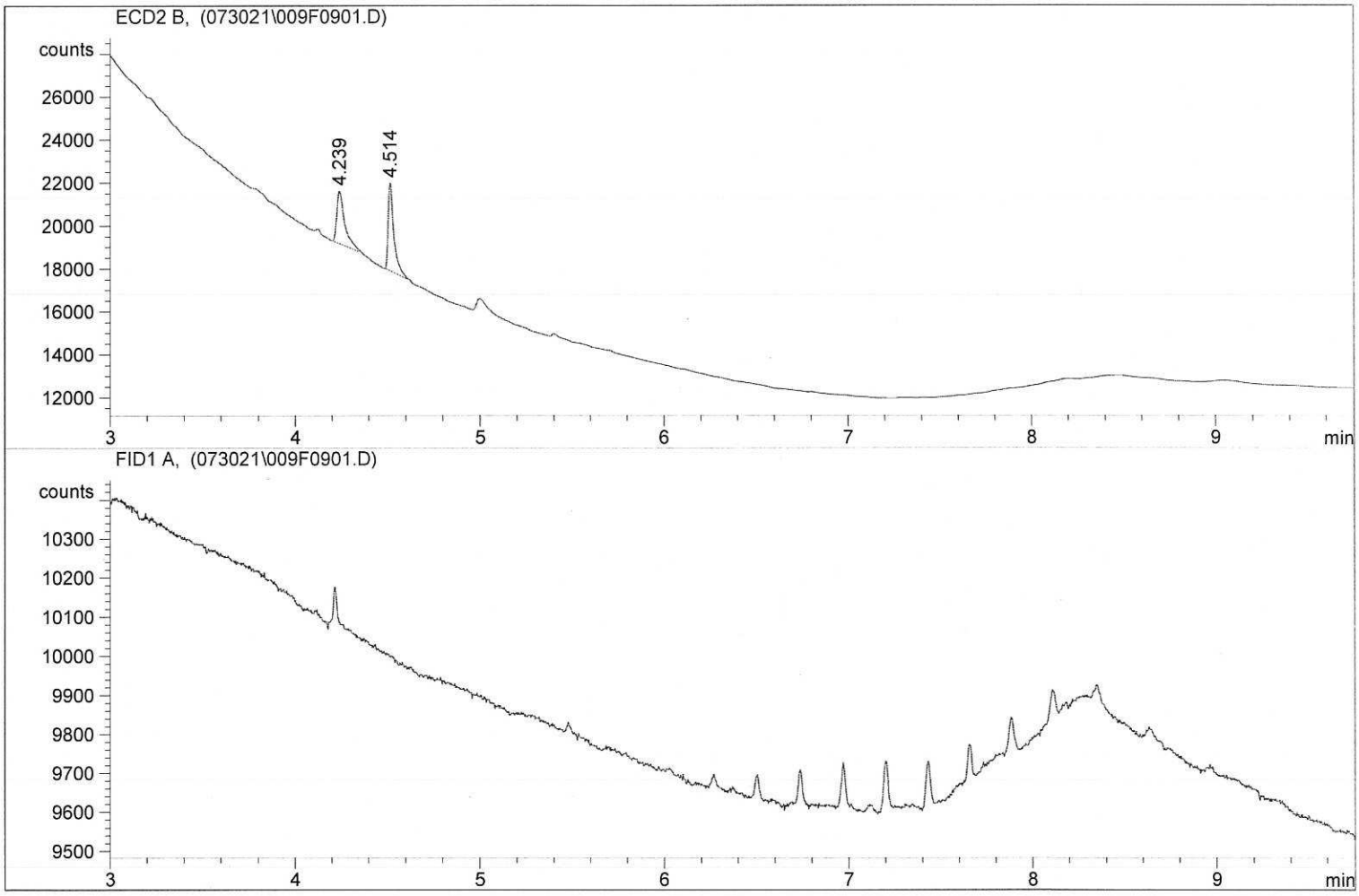
21G0286: <G> BPR Project batch as mcuh as possible </G> <C>BPR SRM, MS, DUP </C> <M>BPR PS, MS/MSD </M> <E>BPR 8270E RM H002055, SIM RM H010158, PCB RM J006840-43, MS/MSD </E>
<H>BPR J006840-43, Dup </H>
21G0289: <C>BPR DUP MS</C><M>BPR DUP MS</M><E>BPR MS MSD</E><H>BPR DUP per batch of 20. PSSRM on per project</H><G>Do not freeze Hg</G>

Prep Instructions	
SPECIAL INSTRUCTIONS: 1. Weigh into beakers-lightly dry with Sodium Sulfate. 2. Transfer to microwave vessel. 3. Add DCM ONLY to the vessels (until solvent is 3 inches above soil layer after homogenization). 4. Add surr/spike. 5. Microwave on appropriate power setting determined by # of samples. 6. After microwave-re-homogenize while hot then let cool 10-15 min in Refridgerator 05. Re-homogenize while cool. 7. Decant DCM into Erlenmeyer flask with a funnel containing pre-deactivated glasswool. 8. Rinse with DCM 9. Microwave a 2nd time using 1:1 DCM/ACE. 10. Let cool and decant the solvent then empty the soil into the funnel and rinse with DCM. 11. KD: Add 10 mL Hexane directly to extract in the KD. 12. GPC REQUIRED 100°C water bath (CLP) KD to 5mL. 13. (After GPC) KD at 80°C. 14.TurboVap 15. Vial in DCM. 16. Water Wash Required 17. 0.5mL (1:2) Split to Lab. A. Need Total Solids Y / N B. Archive/Freeze Y / N	

3036F

Printed: 8/2/2021 8:29:40AM

Injection Date	: 7/30/2021 5:45:49 PM	Seq. Line :	9
Sample Name	: 21G0289 1	Location :	Vial 9
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021B.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



*** End of Report ***

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Sample Name	: 21G0289 2	Location :	Vial 10
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
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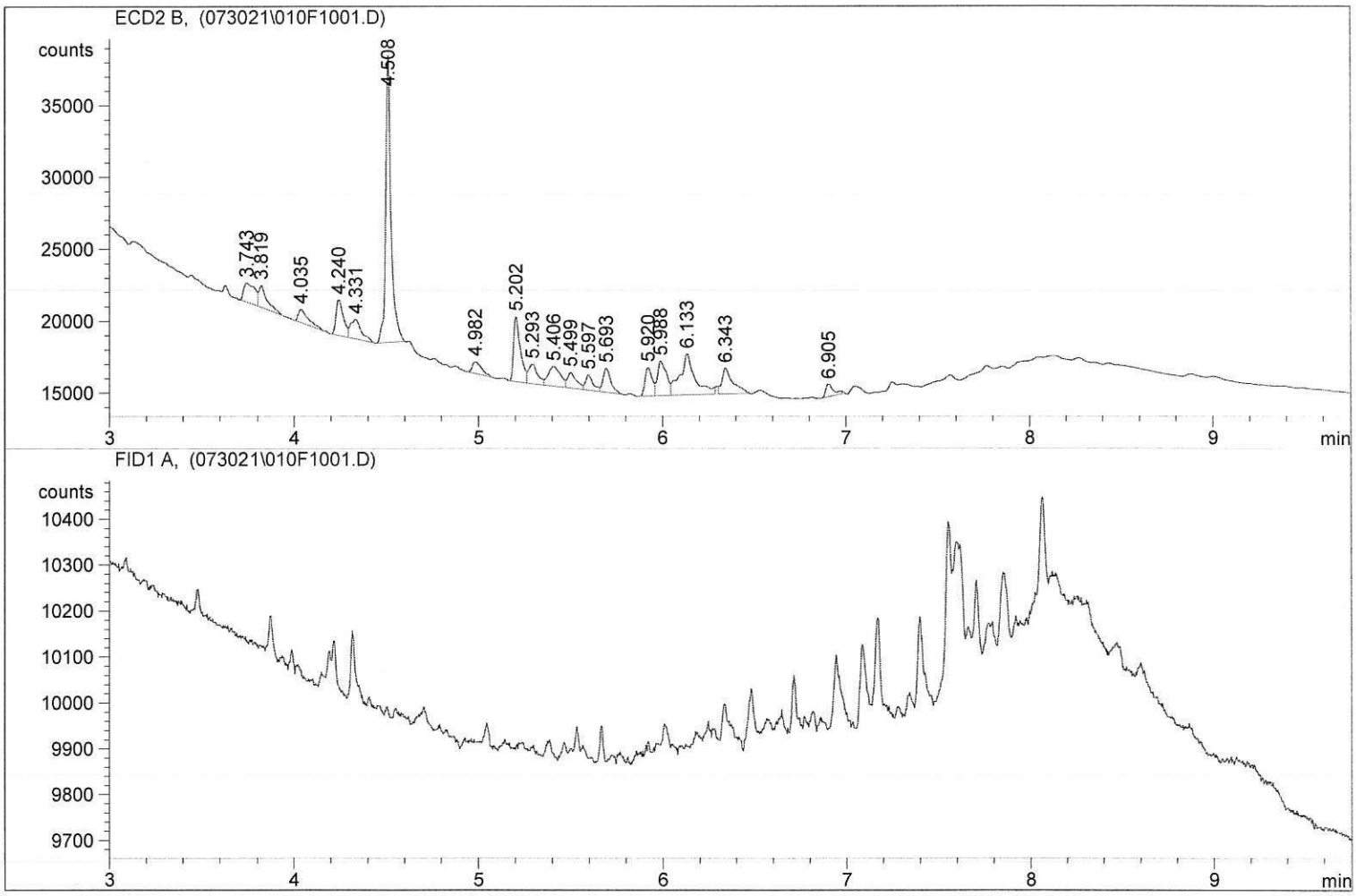
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



*** End of Report ***

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Sample Name	: 21G0289 5	Location :	Vial 11
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
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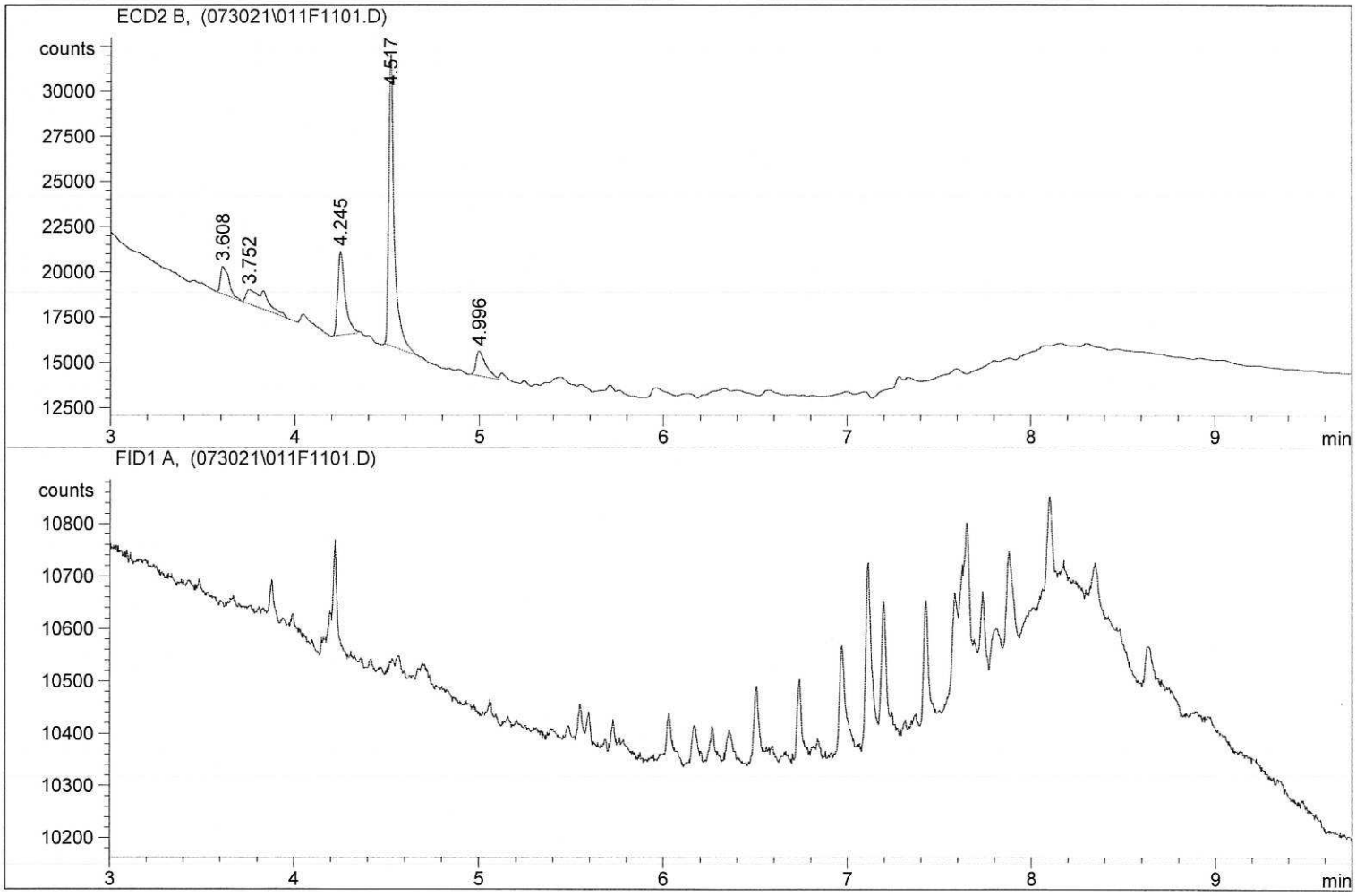
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



*** End of Report ***

BJH0004 21G286/289 BAN

Date:2021-08-10,10:05:03 PM
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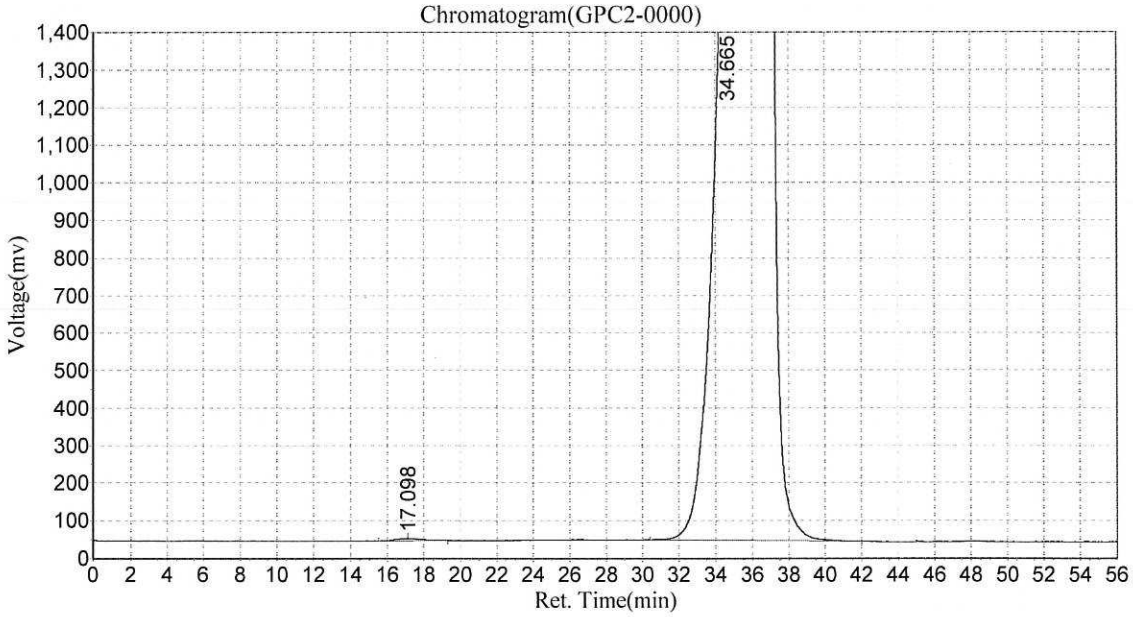
Method File:C:\N2000\GPC2_InHouse.mtd

Analyst£ºCCT
Date/Time2021-08-10,10:05:03 PM



Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		17.098	6533.684	631393.188	0.1950
2		34.665	1378455.500	323128480.000	99.8050
Total			1384989.184	323759873.188	100.000

Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

BJH0004 21G286/289 BAN

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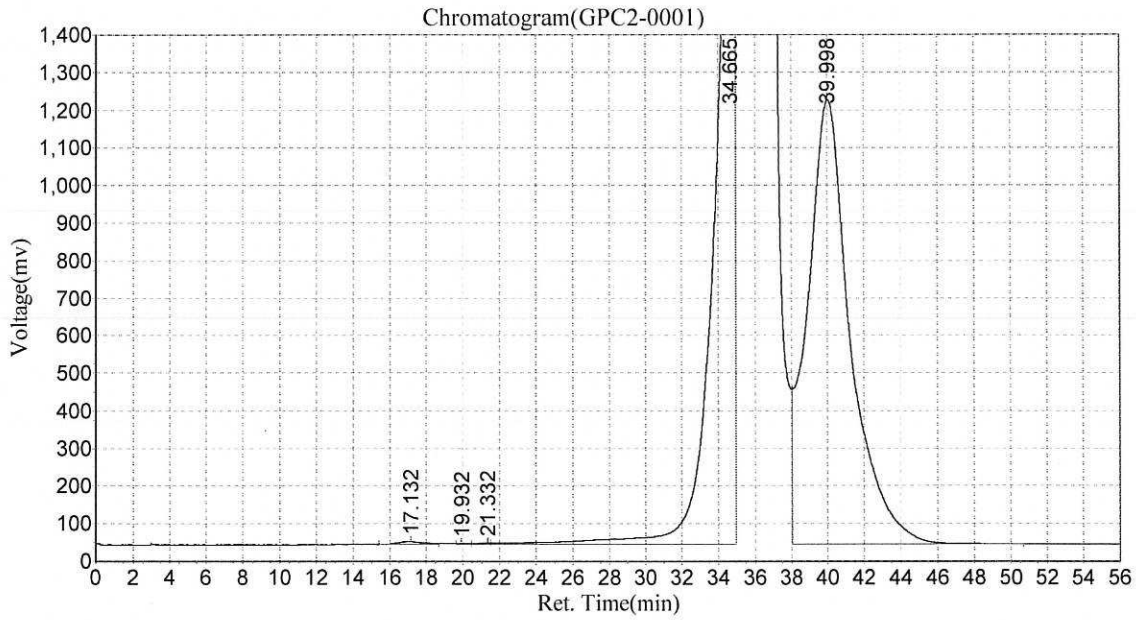
Method File:C:\N2000\GPC2_InHouse.mtd

Analyst£°CCT
Date/Time2021-08-10,11:02:49 PM



Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		17.132	7919.416	775679.500	0.2368
2		19.932	3267.934	151193.859	0.0461
3		21.332	3594.193	209750.844	0.0640
4		34.665	1381178.500	134068512.000	40.9208
5		39.998	1182824.000	192423888.000	58.7322
Total			2578784.043	327629024.203	100.000

Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

BJH0004 21G286/289 BAN

Date:2021-08-11,12:00:30 AM
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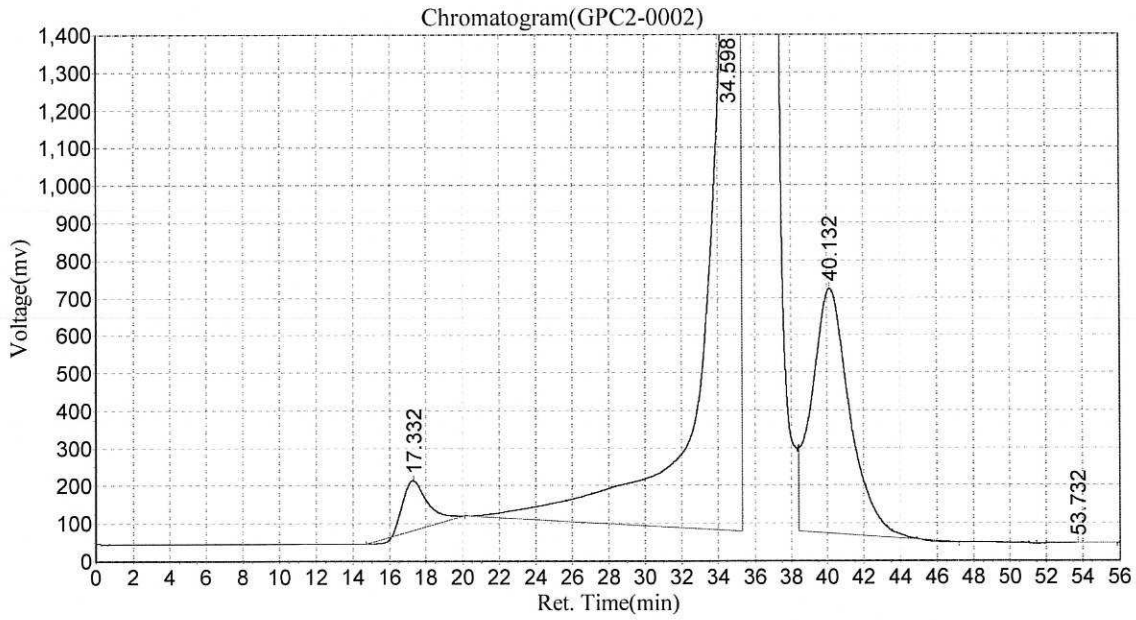
Method File:C:\N2000\GPC2_InHouse.mtd

Analyst£°CCT
Date/Time2021-08-11,12:00:30 AM



Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		17.332	133157.391	12363884.000	3.8469
2		34.598	1343905.875	212436224.000	66.0975
3		40.132	654616.188	96372912.000	29.9855
4		53.732	1201.000	225122.406	0.0700
Total			2132880.453	321398142.406	100.000

Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

BJH0004 21G286/289 BAN

Date:2021-08-11,12:58:13 AM
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Analyst£ºCCT
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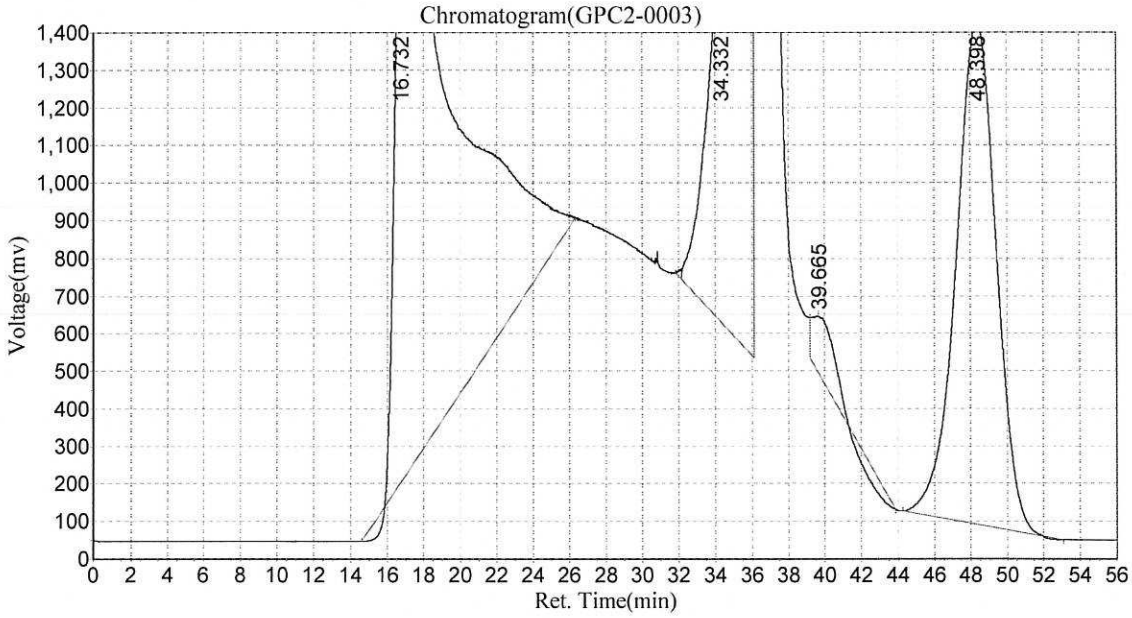

Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		16.732	1224350.250	360555488.000	48.7899
2		34.332	795718.063	142743760.000	19.3159
3		39.665	294357.094	31194646.000	4.2212
4		48.398	1332822.500	204502528.000	27.6730
Total			3647247.906	738996422.000	100.000

Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

BJH0004 21G286/289 BAN

Date:2021-08-11,1:55:54 AM
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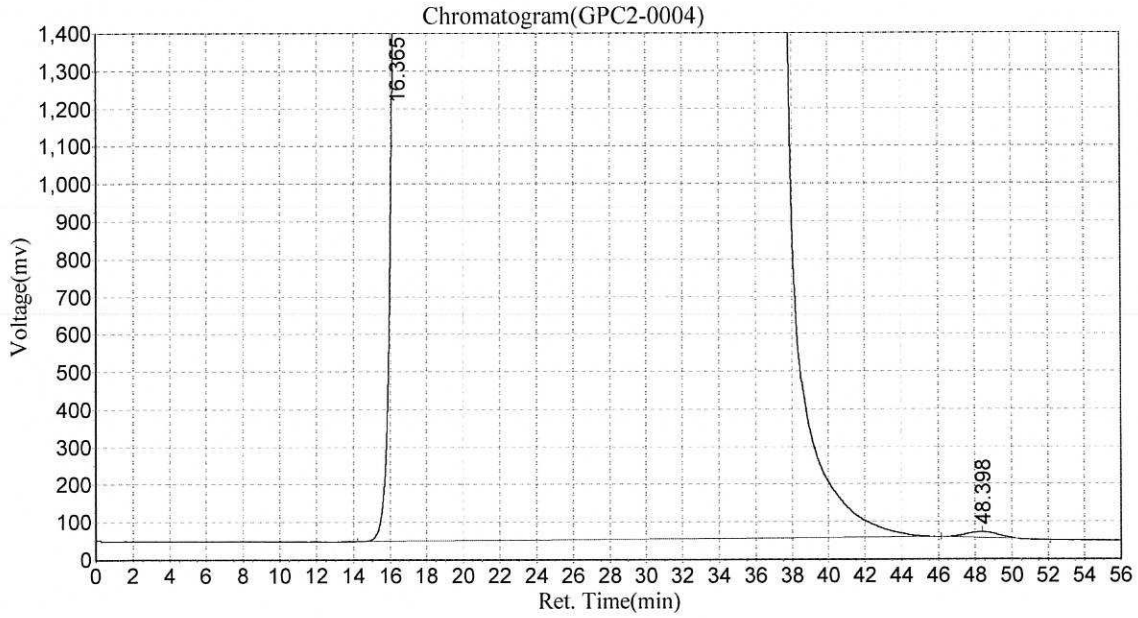
Method File:C:\N2000\GPC2_InHouse.mtd

Analyst£ºCCT
Date/Time2021-08-11,1:55:55 AM



Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		16.365	1377048.375	1870937600.000	99.8905
2		48.398	15954.084	2050645.250	0.1095
Total			1393002.459	1872988245.250	100.000

Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

BJH0004 21G286/289 BAN

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Analyst£ºCCT
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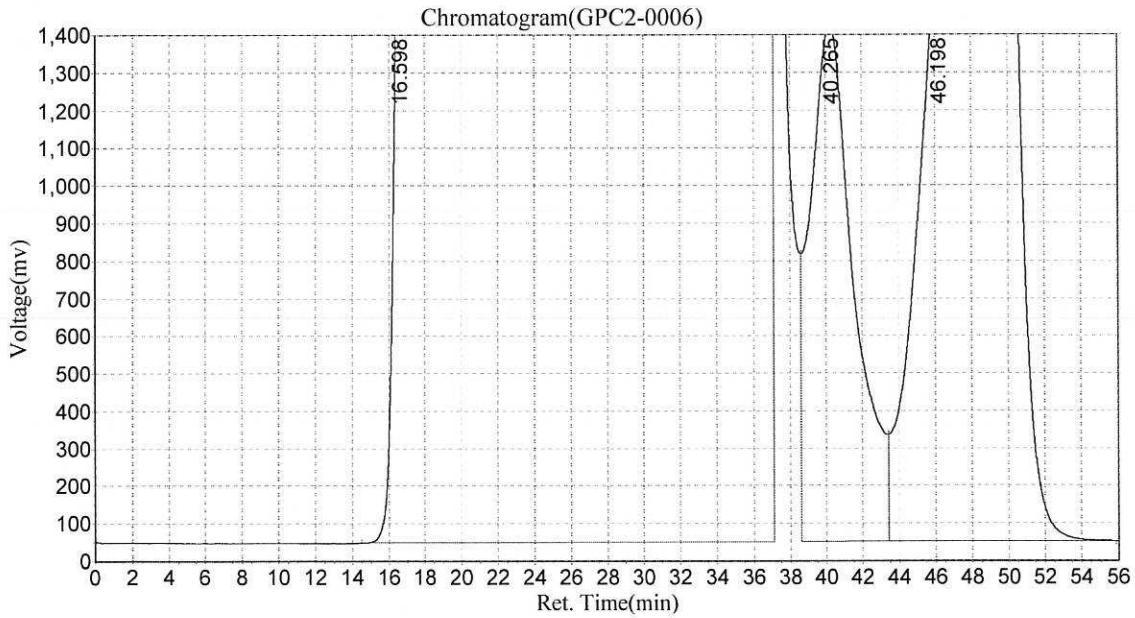

Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		16.598	1378236.375	1731176832.000	69.1924
2		40.265	1375020.625	233206272.000	9.3209
3		46.198	1374214.500	537591552.000	21.4867
Total			4127471.500	2501974656.000	100.000

Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

BJH0004 21G286/289 BAN

Date:2021-08-11,4:49:02 AM
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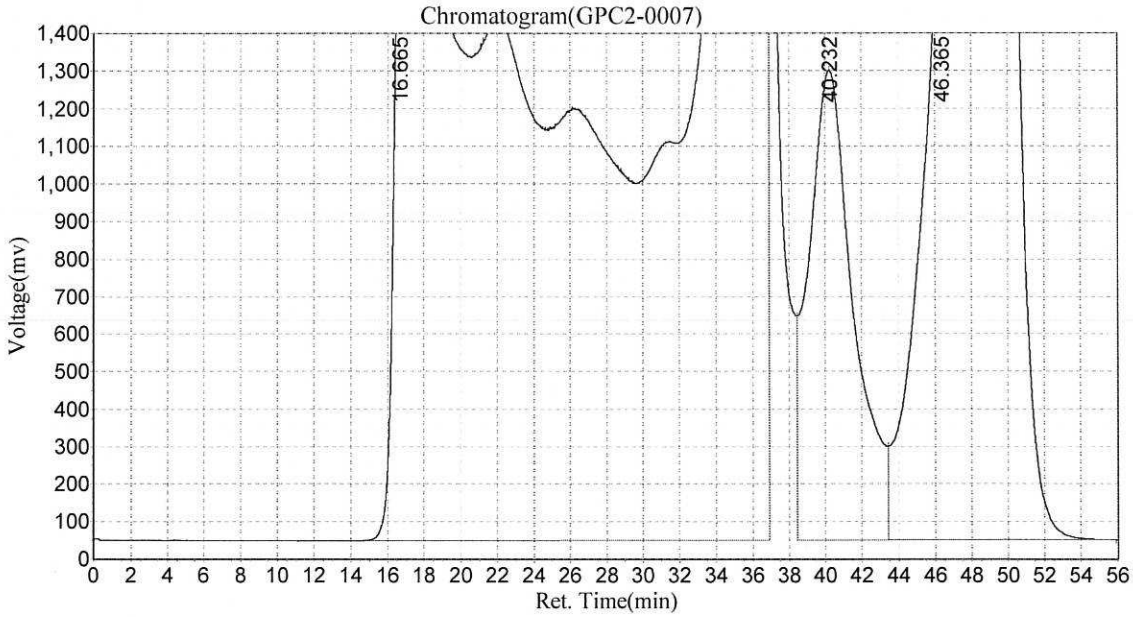
Method File:C:\N2000\GPC2_InHouse.mtd

Analyst£ºCCT
Date/Time2021-08-11,4:49:03 AM



Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		16.665	1376969.000	1522221440.000	67.2044
2		40.232	1250304.125	213585600.000	9.4296
3		46.365	1374853.125	529253792.000	23.3660
Total			4002126.250	2265060832.000	100.000

Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

BJH0004 21G286/289 BAN

Date:2021-08-11,5:46:44 AM
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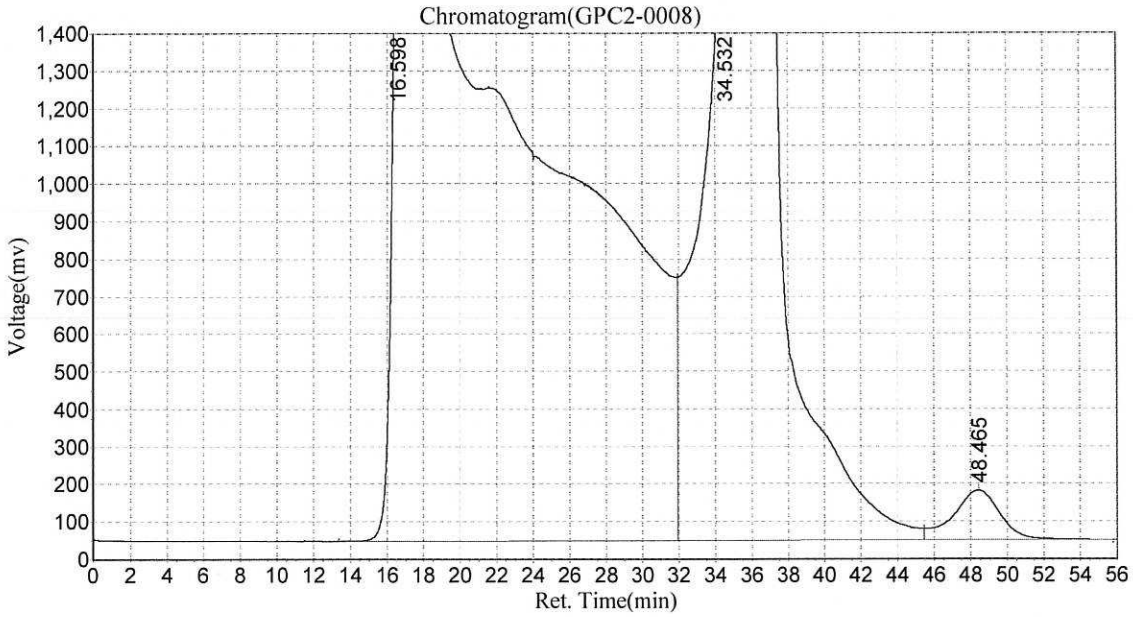
Method File:C:\N2000\GPC2_InHouse.mtd

Analyst£ºCCT
Date/Time2021-08-11,5:46:44 AM



Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		16.598	1377697.125	1016667008.000	66.0071
2		34.532	1376448.125	500009184.000	32.4631
3		48.465	132227.734	23563434.000	1.5299
Total			2886372.984	1540239626.000	100.000

Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

BJH0004 21G286/289 BAN

Date:2021-08-11,6:44:27 AM
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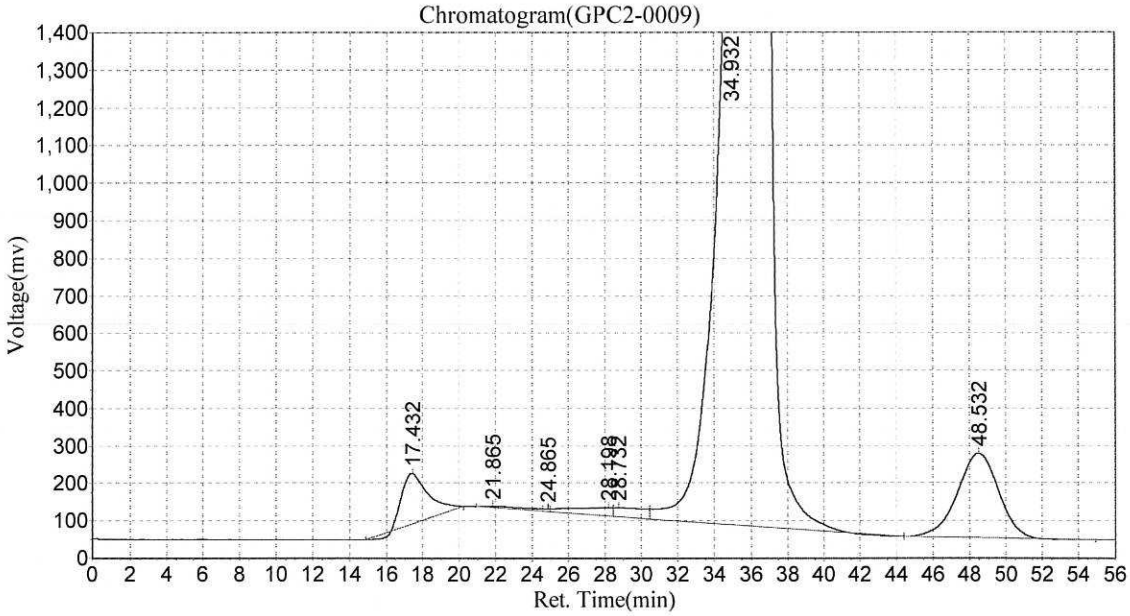

Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		17.432	135303.688	13500996.000	3.7291
2		21.865	4355.489	981570.250	0.2711
3		24.865	7845.131	180383.922	0.0498
4		28.198	21648.732	3257821.250	0.8998
5		28.732	23509.869	2933607.750	0.8103
6		34.932	1336108.375	305497056.000	84.3811
7		48.532	226295.906	35692880.000	9.8587
Total			1755067.190	362044315.172	100.000

Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

BJH0004 21G286/289 BAN

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Method File:C:\N2000\GPC2_InHouse.mtd

Analyst£ºCCT
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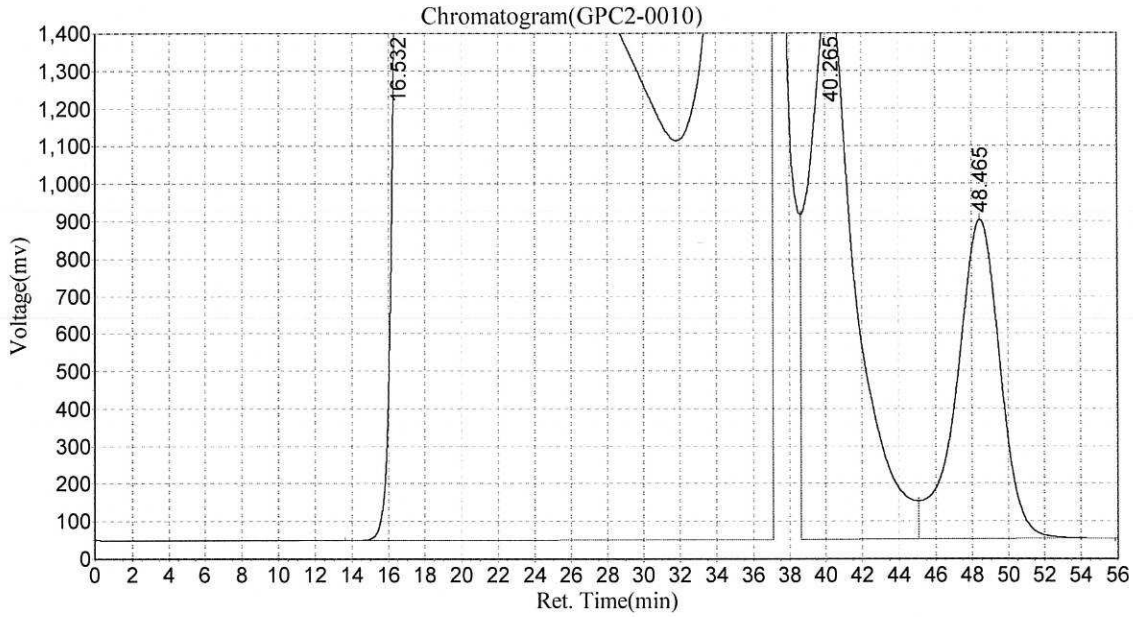

Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		16.532	1377089.750	1680740224.000	80.8639
2		40.265	1374156.250	255810896.000	12.3076
3		48.465	851170.688	141929568.000	6.8285
Total			3602416.688	2078480688.000	100.000

Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

BJH0004 21G286/289 BAN

Date:2021-08-11,8:39:52 AM
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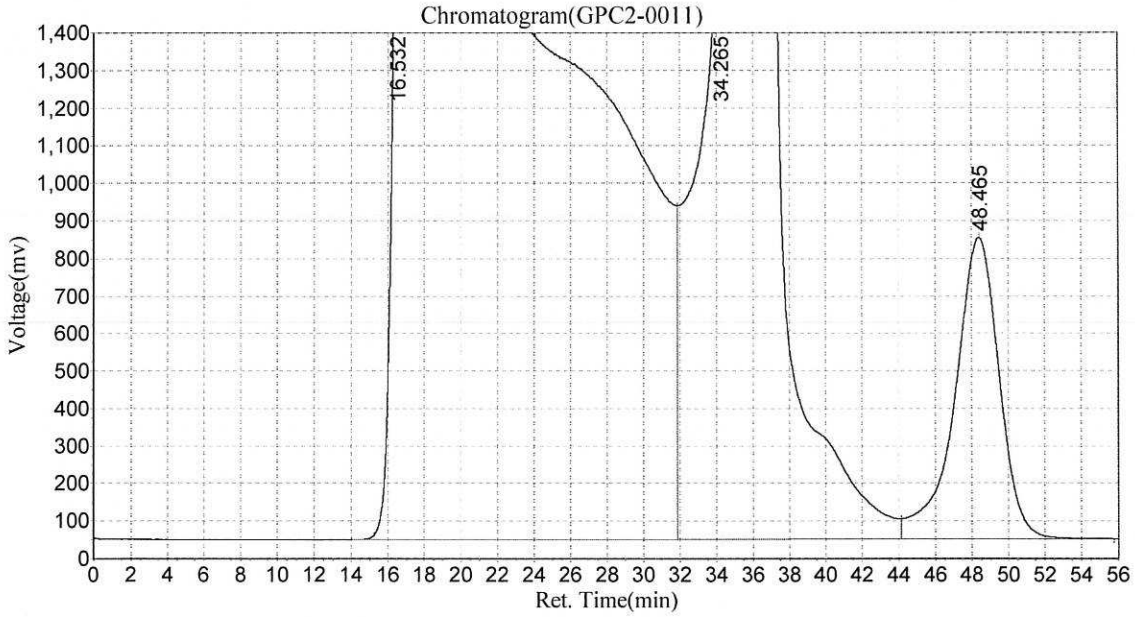
Method File:C:\N2000\GPC2_InHouse.mtd

Analyst£ºCCT
Date/Time2021-08-11,8:39:52 AM



Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		16.532	1375680.250	1197487488.000	64.7275
2		34.265	1374299.125	516706720.000	27.9294
3		48.465	802130.188	135851072.000	7.3431
Total			3552109.563	1850045280.000	100.000

Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

BJH0004 21G286/289 BAN

Date:2021-08-11,9:37:33 AM
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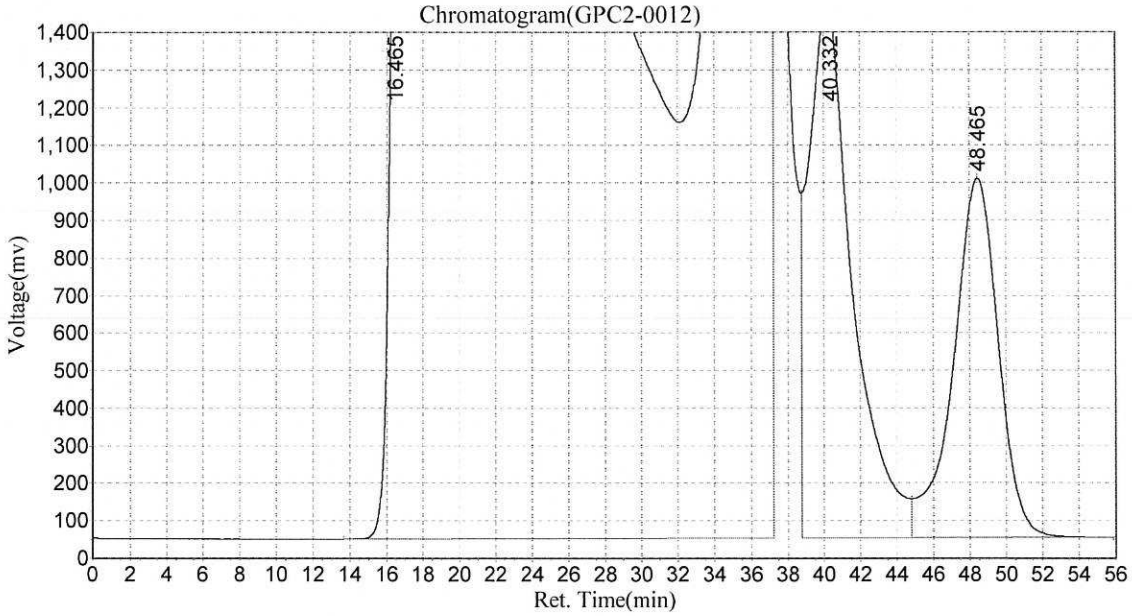
Method File:C:\N2000\GPC2_InHouse.mtd

Analyst£ºCCT
Date/Time2021-08-11,9:37:34 AM



Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		16.465	1374741.250	1712019072.000	80.8858
2		40.332	1372107.875	239562640.000	11.3183
3		48.465	956563.500	165006464.000	7.7959
Total			3703412.625	2116588176.000	100.000

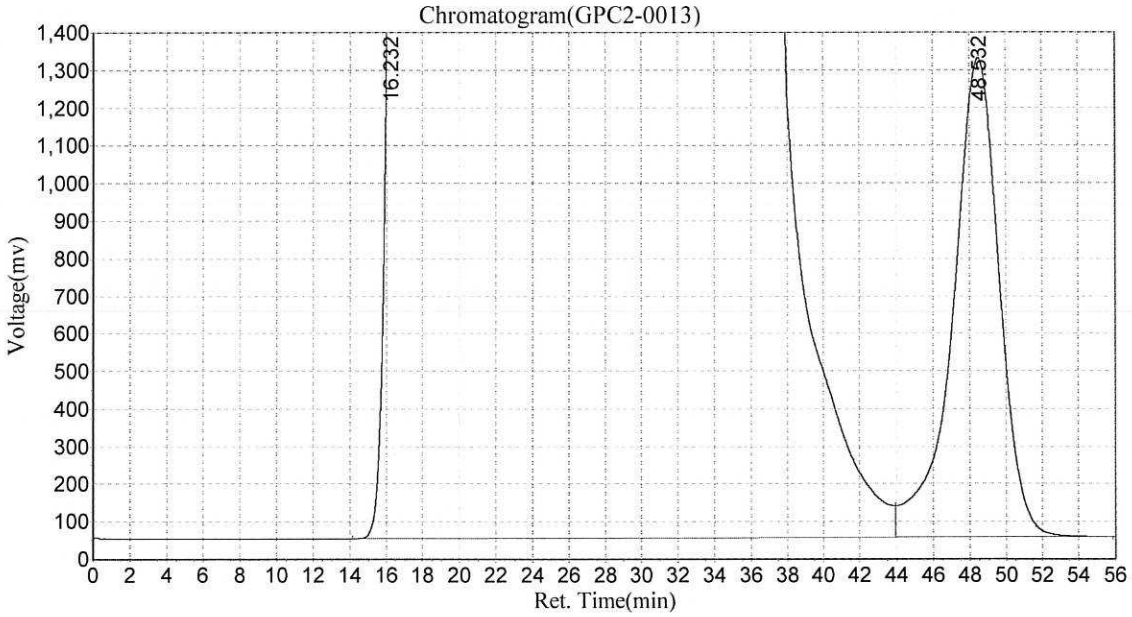
Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

BJH0004 21G286/289 BAN

Date:2021-08-11,10:35:17 AM
Data File:c:\n2000\data\gpc2\081021\GPC2-0013
Method File:C:\N2000\GPC2_InHouse.mtd

Analyst£ºCCT
Date/Time2021-08-11,10:35:22 AM



Results

Peak No.	Peak ID	Ret Time	Height	Area	Conc
1		16.232	1371685.000	1958143616.000	89.5977
2		48.532	1273699.500	227339392.000	10.4022
Total			2645384.500	2185483008.000	100.000

Ingredient Table

No	Peak ID	Ret Time	Peak Width	Factor1	Factor2	ISTD Wt.
1	Collect BAN	24.000	0.010	0.00E+000	0.00E+000	0.0000
2	Collect Pest	29.000	0.010	0.00E+000	0.00E+000	0.0000
3	Dump Pest	49.000	0.010	0.00E+000	0.00E+000	0.0000
4	Dump BAN	49.000	0.010	0.00E+000	0.00E+000	0.0000

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BATCH SUMMARY

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Cleanup Batch:	CJH0114	Cleanup Type:	GPC
Cleanup Method:	EPA 3640A GPC Cleanup 1:1	Analysis:	EPA 8270E

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS625	21G0286-02	NT1021081409.D	08/13/2021	
Reference	BJH0004-SRM1	NT1021081407.D	08/13/2021	
Blank	BJH0004-BLK1	NT1021081405.D	08/13/2021	
LDW21-SS687	21G0286-01	NT1021081408.D	08/13/2021	
LDW21-SS627	21G0286-04	NT1021081410.D	08/13/2021	
LCS	BJH0004-BS1	NT1021081406.D	08/13/2021	
Matrix Spike Dup	BJH0004-MSD1	NT1021081412.D	08/13/2021	
LDW21-SS646	21G0286-05	NT1021081413.D	08/13/2021	
Matrix Spike	BJH0004-MS1	NT1021081411.D	08/13/2021	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BENCH SHEET

CJH0114

Matrix: Solid **Cleanup using: Organics - EPA 3640A GPC Cleanup 1:1** **Printed: 8/13/2021 9:49:01AM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (uL)	Final (uL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
21G0289-05	C	WC-18-SS-210719	C 01	1	1	;VOC (20ug/kg solid or 0.2ug/L low H2	8/13/2021	DDM	
21G0289-02	C	WC-01-OF-210719	C 01	1	1	;VOC (20ug/kg solid or 0.2ug/L low H2	8/13/2021	DDM	
21G0289-01	C	WC-17-SS-210719	C 01	1	1	;VOC (20ug/kg solid or 0.2ug/L low H2	8/13/2021	DDM	
21G0286-04	B	LDW21-SS627	B 01	1	1	;VOC (20ug/kg solid or 0.2ug/L low H2	8/13/2021	DDM	
21G0286-05	B	LDW21-SS646	B 01	1	1	;VOC (20ug/kg solid or 0.2ug/L low H2	8/13/2021	DDM	
21G0286-02	B	LDW21-SS625	B 01	1	1	;VOC (20ug/kg solid or 0.2ug/L low H2	8/13/2021	DDM	
21G0286-01	D	LDW21-SS687	D 01	1	1	;VOC (20ug/kg solid or 0.2ug/L low H2	8/13/2021	DDM	
BJH0004-SRM1	-	Reference	-	1	1	-	8/13/2021	DDM	
BJH0004-MSD2	-	Matrix Spike Dup	-	1	1	-	8/13/2021	DDM	
BJH0004-BS1	-	LCS	-	1	1	-	8/13/2021	DDM	
BJH0004-MS1	-	Matrix Spike	-	1	1	-	8/13/2021	DDM	
BJH0004-MS2	-	Matrix Spike	-	1	1	-	8/13/2021	DDM	
BJH0004-MSD1	-	Matrix Spike Dup	-	1	1	-	8/13/2021	DDM	
BJH0004-BLK1	-	Blank	-	1	1	-	8/13/2021	DDM	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
METHOD BLANK DATA SHEET
EPA 8270E

Blank

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Solid	Laboratory ID:	BJH0004-BLK1	File ID:	NT1021081405.D
Sampled:	N/A	Prepared:	08/02/21 11:20	Analyzed:	08/14/21 11:48
Solids:		Preparation:	EPA 3546 (Microwave)	Initial/Final:	10 g / 1 mL
Batch:	BJH0004	Sequence:	SJH0174	Calibration:	EG00057
Instrument:	NT10	Column:	ZB-5MSi	Cleanups:	GPC

CAS NO.	COMPOUND	DILUTION	CONC: (ug/kg wet)	Q	DL	RL
91-20-3	Naphthalene	1	20.0	U	4.2	20.0
91-57-6	2-Methylnaphthalene	1	20.0	U	4.5	20.0
208-96-8	Acenaphthylene	1	20.0	U	6.2	20.0
83-32-9	Acenaphthene	1	20.0	U	5.2	20.0
86-73-7	Fluorene	1	20.0	U	14.6	20.0
85-01-8	Phenanthrene	1	20.0	U	8.7	20.0
120-12-7	Anthracene	1	20.0	U	7.2	20.0
206-44-0	Fluoranthene	1	20.0	U	6.1	20.0
129-00-0	Pyrene	1	20.0	U	5.7	20.0
85-68-7	Butylbenzylphthalate	1	20.0	U	9.4	20.0
56-55-3	Benzo(a)anthracene	1	20.0	U	6.0	20.0
218-01-9	Chrysene	1	20.0	U	6.1	20.0
	Benzofluoranthenes, Total	1	40.0	U	10.0	40.0
50-32-8	Benzo(a)pyrene	1	20.0	U	4.2	20.0
193-39-5	Indeno(1,2,3-cd)pyrene	1	20.0	U	14.7	20.0
53-70-3	Dibenzo(a,h)anthracene	1	20.0	U	17.2	20.0
191-24-2	Benzo(g,h,i)perylene	1	20.0	U	13.6	20.0

SURROGATES	ADDED: (ug/kg wet)	FOUND: (ug/kg wet)	% REC	QC LIMITS	Q
1,2-Dichlorobenzene-d4	500.00	332	66.4	32 - 120	
Nitrobenzene-d5	500.00	356	71.1	30 - 120	
2-Fluorobiphenyl	500.00	378	75.6	35 - 120	
p-Terphenyl-d14	500.00	420	83.9	37 - 120	

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Date : 14-AUG-2021 11:48

Client ID:

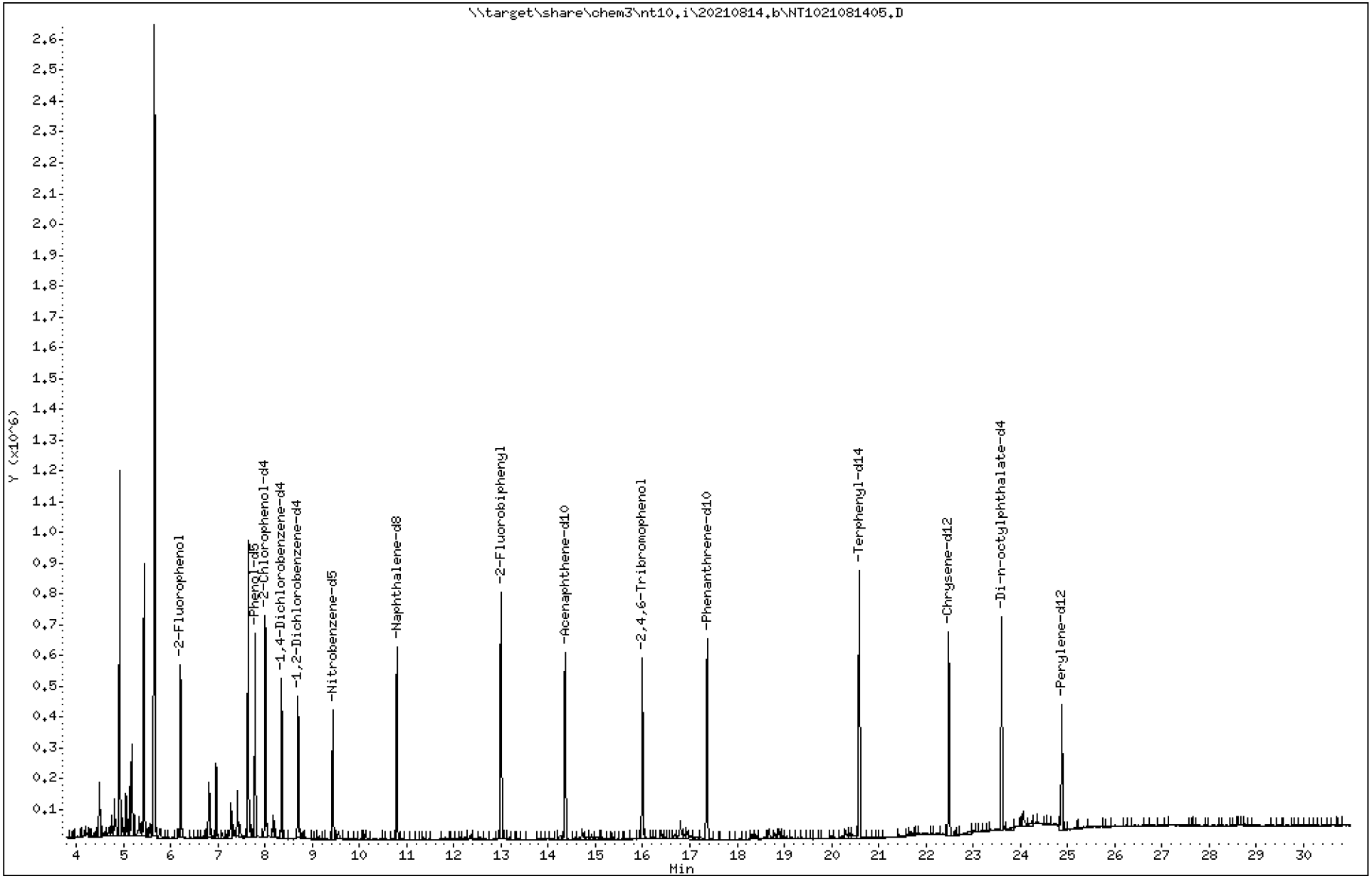
Instrument: nt10.i

Sample Info: BJH0004-BLK1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 11:48

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BLK1

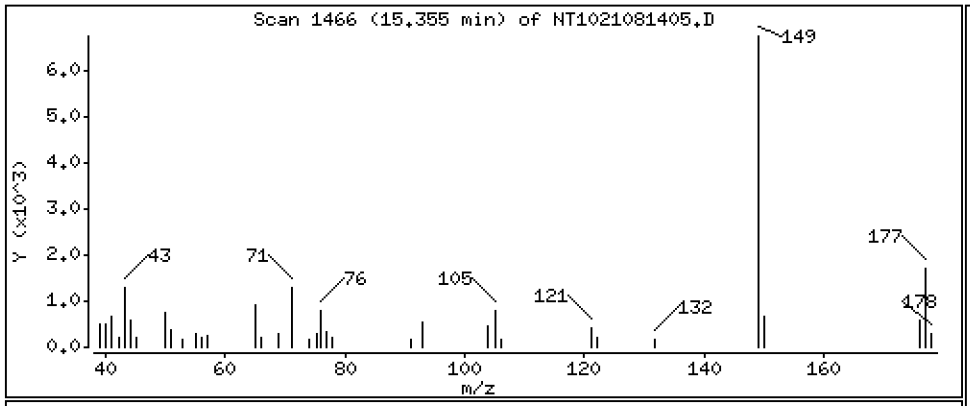
Operator: VTS

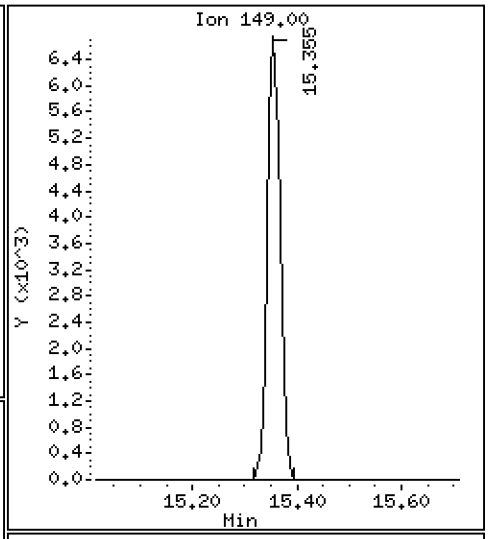
Column phase: ZB-5msi

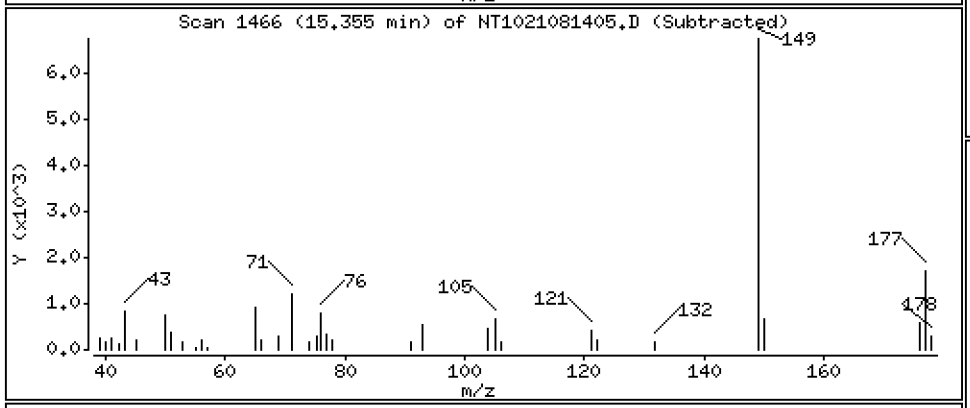
Column diameter: 0.25

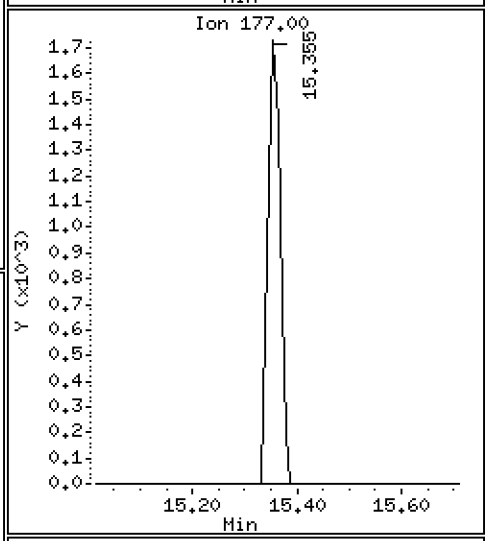
50 Diethylphthalate

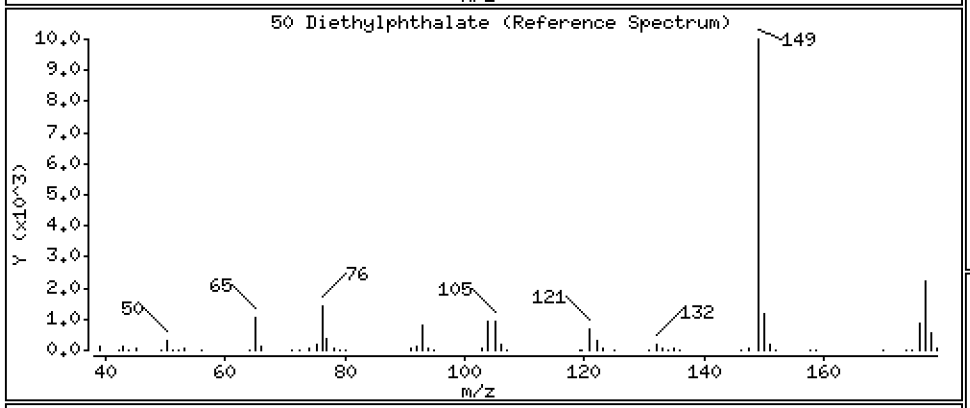
Concentration: 0.1374 ug/mL

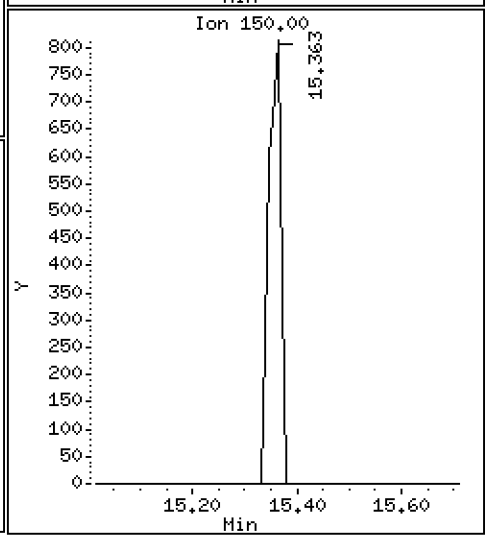


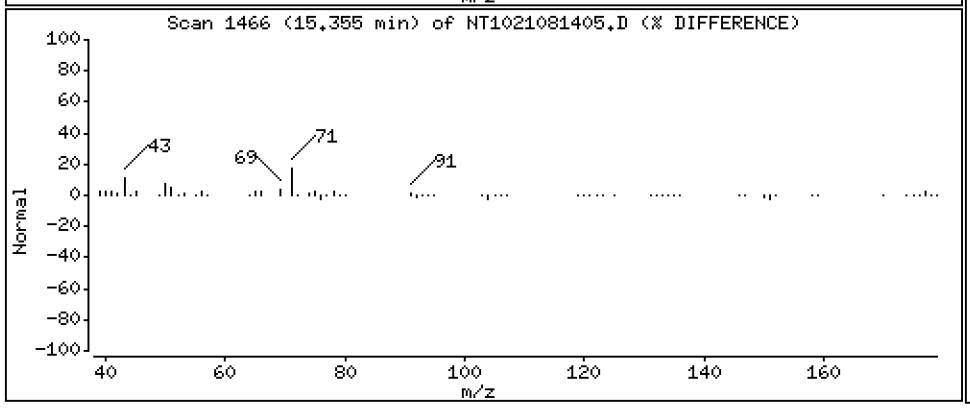












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Date : 14-AUG-2021 11:48

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BLK1

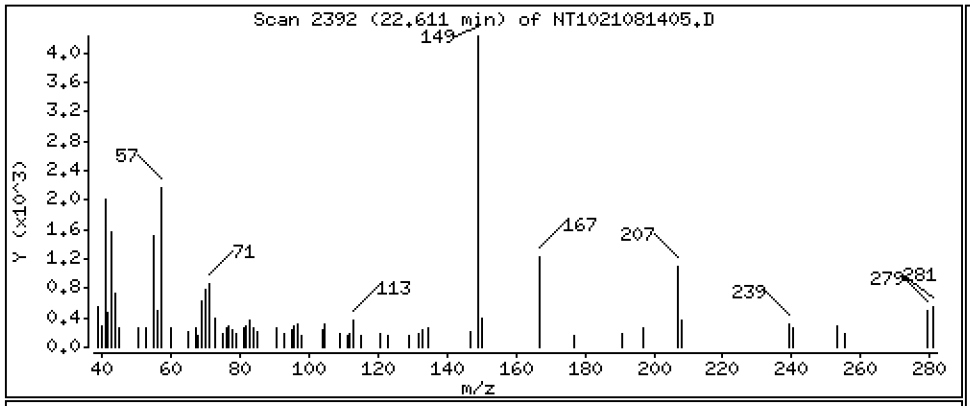
Operator: VTS

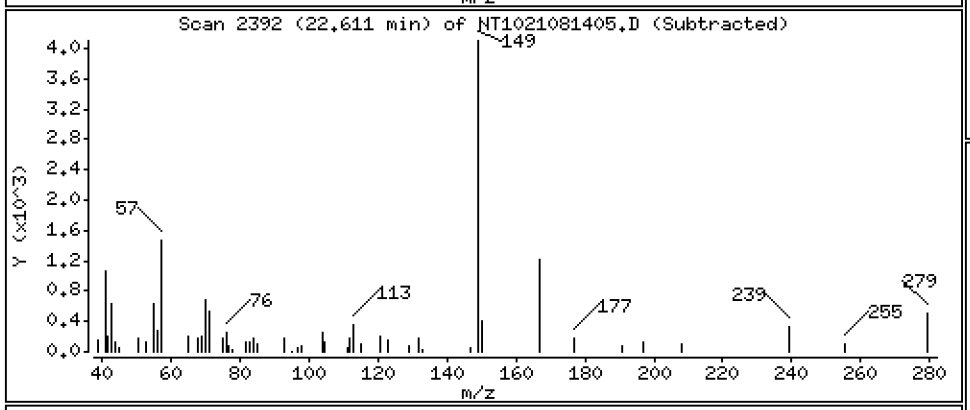
Column phase: ZB-5msi

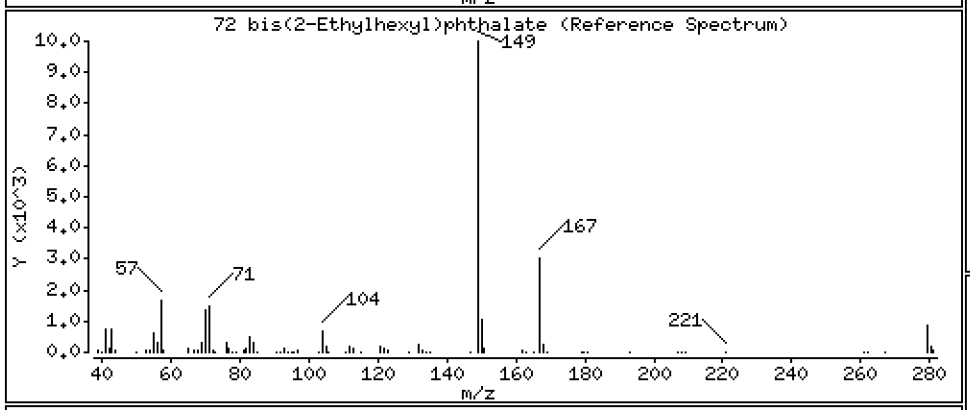
Column diameter: 0.25

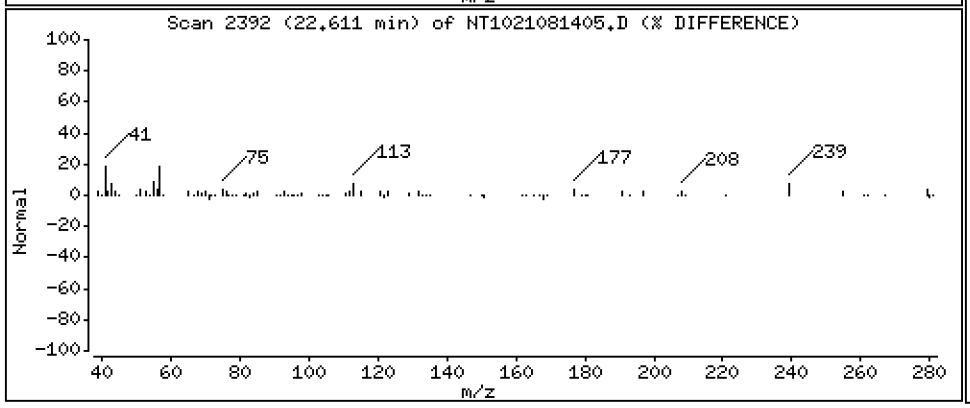
72 bis(2-Ethylhexyl)phthalate

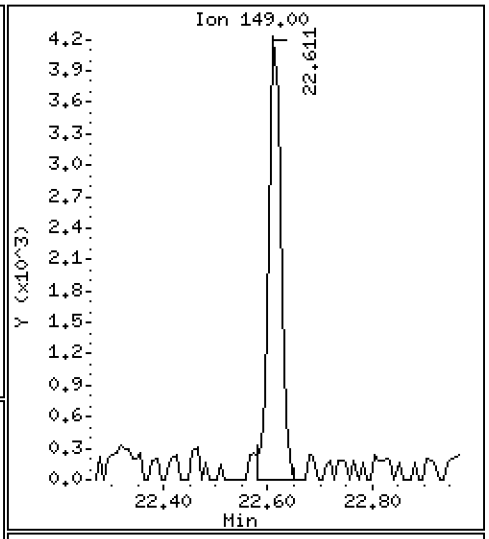
Concentration: 0.1350 ug/mL

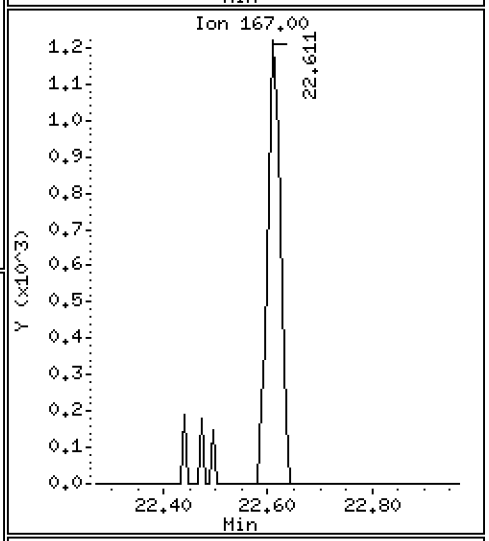


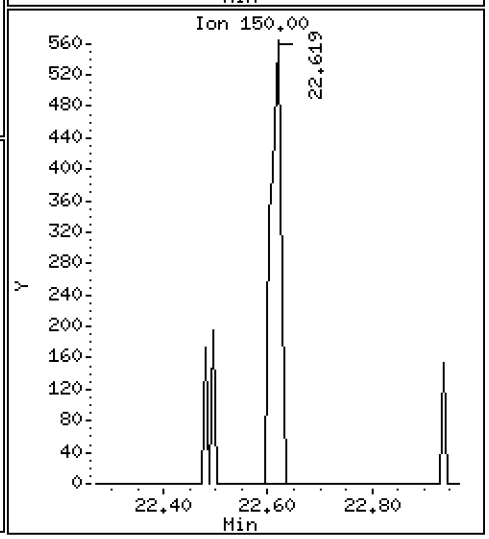












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210814.b\NT1021081405.D
Lab Smp Id: BJH0004-BLK1
Inj Date : 14-AUG-2021 11:48
Operator : VTS Inst ID: nt10.i
Smp Info : BJH0004-BLK1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$	1 2-Fluorophenol	112	6.211	6.204	(0.744)	188453	4.12773	4.128
$	2 Phenol-d5	99	7.788	7.788	(0.932)	281766	4.15802	4.158
	3 Phenol	94	Compound Not Detected.					
$	5 2-Chlorophenol-d4	132	8.004	8.004	(0.958)	287442	6.01652	6.017
	4 Bis(2-Chloroethyl)ether	93	Compound Not Detected.					
	6 2-Chlorophenol	128	Compound Not Detected.					
	7 1,3-Dichlorobenzene	146	Compound Not Detected.					
*	8 1,4-Dichlorobenzene-d4	152	8.353	8.353	(1.000)	116012	4.00000	
	9 1,4-Dichlorobenzene	146	Compound Not Detected.					
$	10 1,2-Dichlorobenzene-d4	152	8.702	8.702	(1.042)	102085	3.32222	3.322
	12 1,2-Dichlorobenzene	146	Compound Not Detected.					
	11 Benzyl alcohol	108	Compound Not Detected.					
	14 2,2'-oxybis(1-Chloropropane)	121	Compound Not Detected.					
	13 2-Methylphenol	108	Compound Not Detected.					
	17 Hexachloroethane	117	Compound Not Detected.					
	16 N-Nitroso-di-n-propylamine	70	Compound Not Detected.					
	15 4-Methylphenol	108	Compound Not Detected.					
$	18 Nitrobenzene-d5	82	9.439	9.440	(0.875)	185507	3.55648	3.556
	19 Nitrobenzene	77	Compound Not Detected.					
	20 Isophorone	82	Compound Not Detected.					
	21 2-Nitrophenol	139	Compound Not Detected.					
	22 2,4-Dimethylphenol	107	Compound Not Detected.					
	23 Bis(2-Chloroethoxy)methane	93	Compound Not Detected.					
	24 Benzoic acid	105	Compound Not Detected.					
	25 2,4-Dichlorophenol	162	Compound Not Detected.					
	26 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
*	27 Naphthalene-d8	136	10.791	10.791	(1.000)	425275	4.00000	
	28 Naphthalene	128	Compound Not Detected.					
	29 4-Chloroaniline	127	Compound Not Detected.					
	30 Hexachlorobutadiene	225	Compound Not Detected.					
	31 4-Chloro-3-methylphenol	107	Compound Not Detected.					
	32 2-Methylnaphthalene	142	Compound Not Detected.					
	33 Hexachlorocyclopentadiene	237	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	CONCENTRATIONS FINAL (ug/mL)
34	2,4,6-Trichlorophenol	196	Compound Not Detected.					
35	2,4,5-Trichlorophenol	196	Compound Not Detected.					
$ 36	2-Fluorobiphenyl	172	12.995	13.003	(0.905)	393300	3.78146	3.781
37	2-Chloronaphthalene	162	Compound Not Detected.					
38	2-Nitroaniline	65	Compound Not Detected.					
39	Dimethylphthalate	163	Compound Not Detected.					
40	Acenaphthylene	152	Compound Not Detected.					
41	2,6-Dinitrotoluene	165	Compound Not Detected.					
* 42	Acenaphthene-d10	164	14.358	14.358	(1.000)	226488	4.00000	
43	3-Nitroaniline	138	Compound Not Detected.					
44	Acenaphthene	153	Compound Not Detected.					
45	2,4-Dinitrophenol	184	Compound Not Detected.					
46	Dibenzofuran	168	Compound Not Detected.					
47	4-Nitrophenol	109	Compound Not Detected.					
48	2,4-Dinitrotoluene	165	Compound Not Detected.					
50	Diethylphthalate	149	15.355	15.363	(1.069)	10948	0.13738	0.1374(H)
49	Fluorene	166	Compound Not Detected.					
51	4-Chlorophenyl-phenylether	204	Compound Not Detected.					
52	4-Nitroaniline	138	Compound Not Detected.					
53	4,6-Dinitro-2-methylphenol	198	Compound Not Detected.					
54	N-Nitrosodiphenylamine	169	Compound Not Detected.					
$ 55	2,4,6-Tribromophenol	330	15.995	15.996	(1.114)	130861	6.92775	6.928
56	4-Bromophenyl-phenylether	248	Compound Not Detected.					
57	Hexachlorobenzene	284	Compound Not Detected.					
58	Pentachlorophenol	266	Compound Not Detected.					
* 59	Phenanthrene-d10	188	17.363	17.364	(1.000)	404061	4.00000	
60	Phenanthrene	178	Compound Not Detected.					
61	Anthracene	178	Compound Not Detected.					
62	Carbazole	167	Compound Not Detected.					
63	Di-n-butylphthalate	149	Compound Not Detected.					
64	Fluoranthene	202	Compound Not Detected.					
65	Pyrene	202	Compound Not Detected.					
$ 66	Terphenyl-d14	244	20.590	20.590	(0.916)	501526	4.19647	4.196
67	Butylbenzylphthalate	149	Compound Not Detected.					
68	Benzo(a)anthracene	228	Compound Not Detected.					
* 69	Chrysene-d12	240	22.487	22.495	(1.000)	365025	4.00000	
70	3,3'-Dichlorobenzidine	252	Compound Not Detected.					
71	Chrysene	228	Compound Not Detected.					
72	bis(2-Ethylhexyl)phthalate	149	22.611	22.619	(0.958)	6545	0.13502	0.1350
* 134	Di-n-octylphthalate-d4	153	23.602	23.610	(1.000)	440617	4.00000	
73	Di-n-octylphthalate	149	Compound Not Detected.					
74	Benzo(b)fluoranthene	252	Compound Not Detected.					
75	Benzo(k)fluoranthene	252	Compound Not Detected.					
76	Benzo(a)pyrene	252	Compound Not Detected.					
* 77	Perylene-d12	264	24.879	24.887	(1.000)	279618	4.00000	
78	Indeno(1,2,3-cd)pyrene	276	Compound Not Detected.					
79	Dibenzo(a,h)anthracene	278	Compound Not Detected.					
80	Benzo(g,h,i)perylene	276	Compound Not Detected.					
90	N-Nitrosodimethylamine	74	Compound Not Detected.					
91	Aniline	93	Compound Not Detected.					
93	Benzidine	184	Compound Not Detected.					
103	Pyridine	79	Compound Not Detected.					
105	1-methylnaphthalene	142	Compound Not Detected.					
111	Azobenzene (1,2-DP-Hydrazine)	77	Compound Not Detected.					

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
187 Total Benzofluoranthenes	252	Compound Not Detected.					
120 2,3,4,6-Tetrachlorophenol	232	Compound Not Detected.					

QC Flag Legend

H - Operator selected an alternate compound hit.

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081405.D
Lab Smp Id: BJH0004-BLK1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	116012	36.39
27 Naphthalene-d8	291658	145829	583316	425275	45.81
42 Acenaphthene-d10	163642	81821	327284	226488	38.40
59 Phenanthrene-d10	304099	152050	608198	404061	32.87
69 Chrysene-d12	199453	99727	398906	365025	83.01
134 Di-n-octylphthala	303639	151820	607278	440617	45.11
77 Perylene-d12	200082	100041	400164	279618	39.75

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.35	-0.00
27 Naphthalene-d8	10.79	10.29	11.29	10.79	-0.00
42 Acenaphthene-d10	14.36	13.86	14.86	14.36	-0.00
59 Phenanthrene-d10	17.36	16.86	17.86	17.36	-0.00
69 Chrysene-d12	22.50	22.00	23.00	22.49	-0.04
134 Di-n-octylphthala	23.61	23.11	24.11	23.60	-0.03
77 Perylene-d12	24.89	24.39	25.39	24.88	-0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081405.D

Lab ID: BJH0004-BLK1
nt10.i, ABN.m, 14-AUG-2021 11:48

RT	CO-ELUTION COMPOUNDS

NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND

NONE

RRT check based on Ccal File: NT1021081402.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LCS / LCS DUPLICATE RECOVERY
EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/14/21 12:28
Batch:	BJH0004	Laboratory ID:	BJH0004-BS1
Preparation:	EPA 3546 (Microwave)	Sequence Name:	LCS
Initial/Final:	10 g / 1 mL		

COMPOUND	SPIKE ADDED (ug/kg wet)	LCS CONCENTRATION (ug/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Naphthalene	500	369		73.7	43 - 120
2-Methylnaphthalene	500	360		72.1	43 - 120
Acenaphthylene	500	369		73.9	42 - 120
Acenaphthene	500	382		76.3	45 - 120
Fluorene	500	312	Q	62.5	45 - 120
Phenanthrene	500	410	Q	82.1	49 - 120
Anthracene	500	376	Q	75.2	45 - 120
Fluoranthene	500	451	Q	90.2	53 - 145
Pyrene	500	432		86.4	52 - 134
Butylbenzylphthalate	500	460		92.1	45 - 132
Benzo(a)anthracene	500	424		84.7	49 - 120
Chrysene	500	399		79.7	47 - 120
Benzofluoranthenes, Total	1000	904		90.4	30 - 160
Benzo(a)pyrene	500	401		80.2	42 - 120
Indeno(1,2,3-cd)pyrene	500	422		84.3	42 - 163
Dibenzo(a,h)anthracene	500	407		81.5	30 - 133
Benzo(g,h,i)perylene	500	397		79.4	46 - 148

* Indicates values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081406.D

Date : 14-AUG-2021 12:28

Client ID:

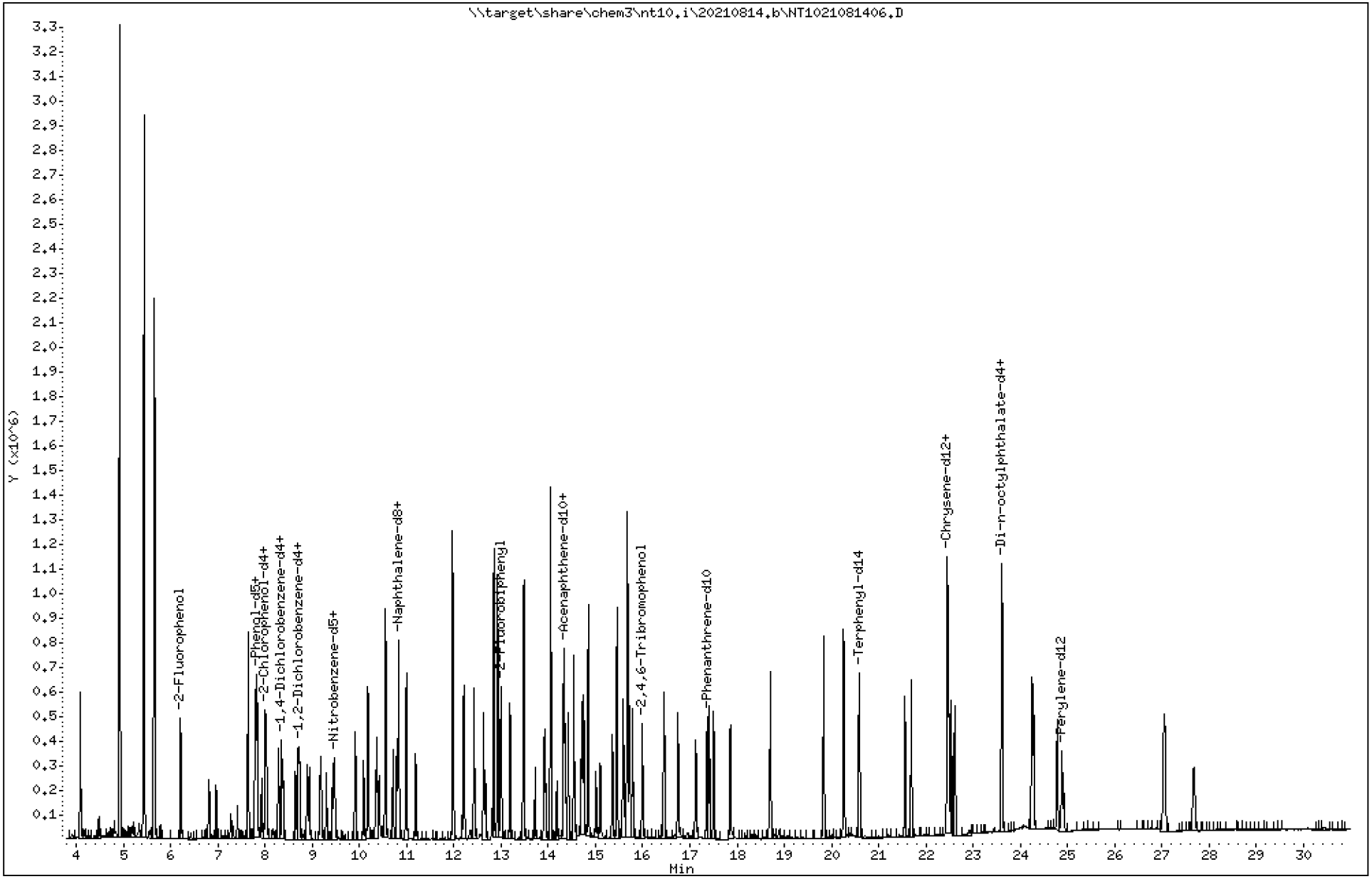
Instrument: nt10.i

Sample Info: BJH0004-BS1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

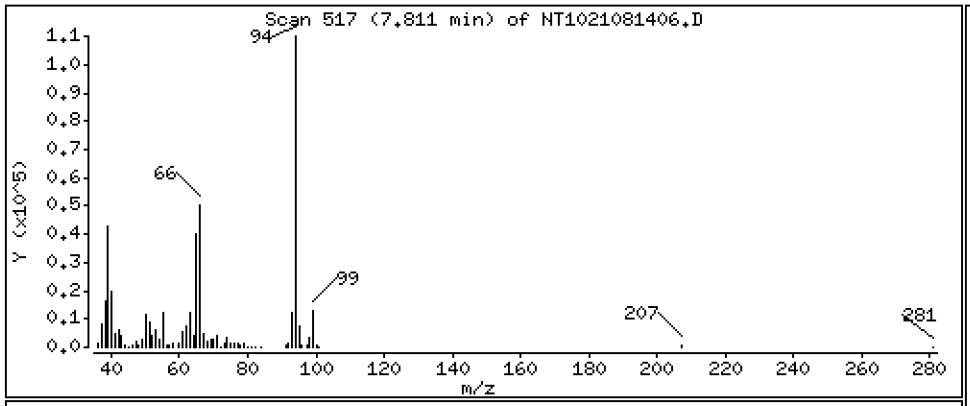
Operator: VTS

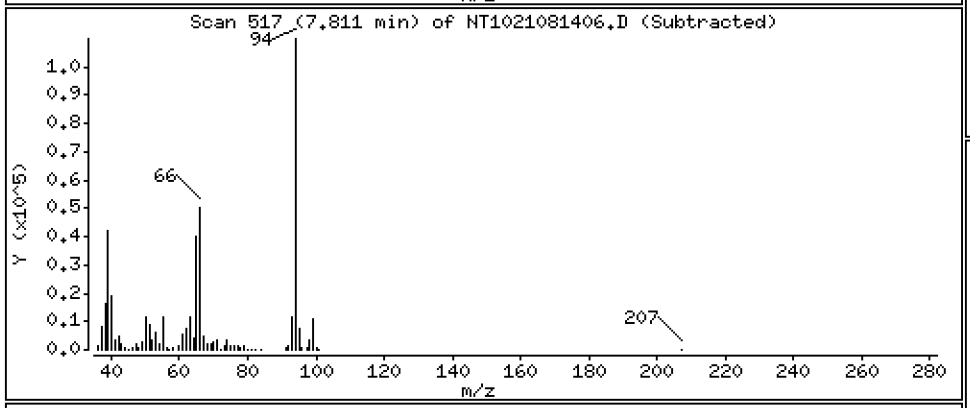
Column phase: ZB-5msi

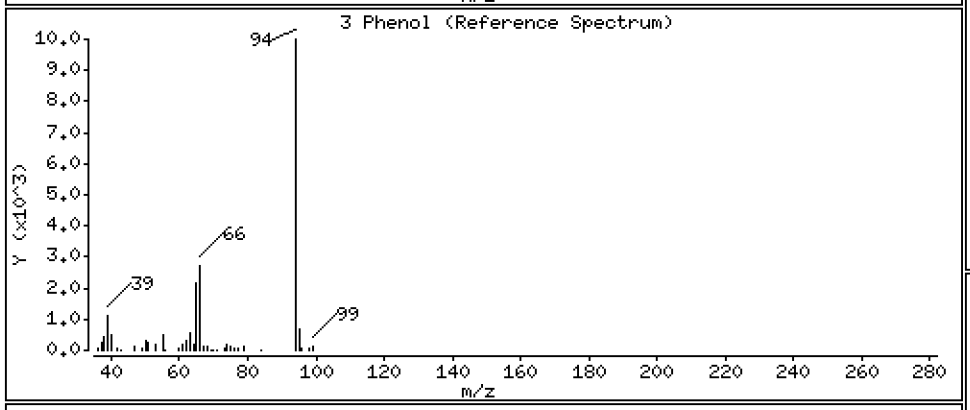
Column diameter: 0.25

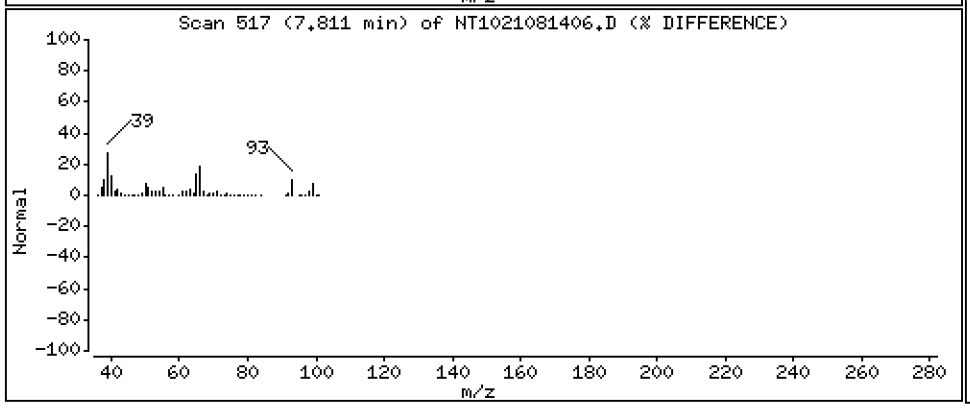
3 Phenol

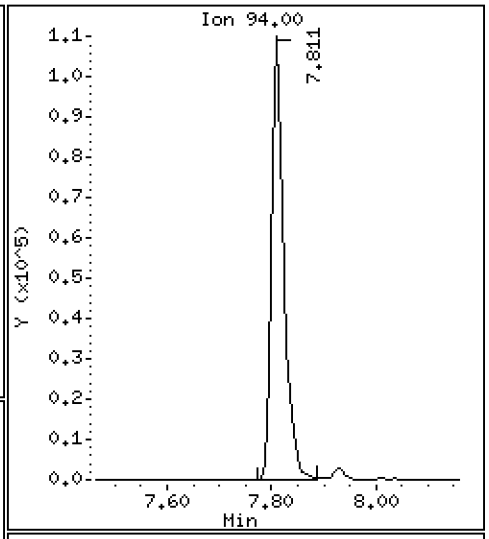
Concentration: 3.842 ug/mL

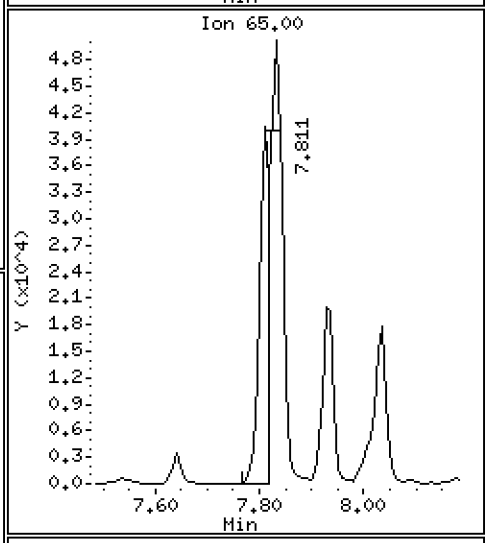


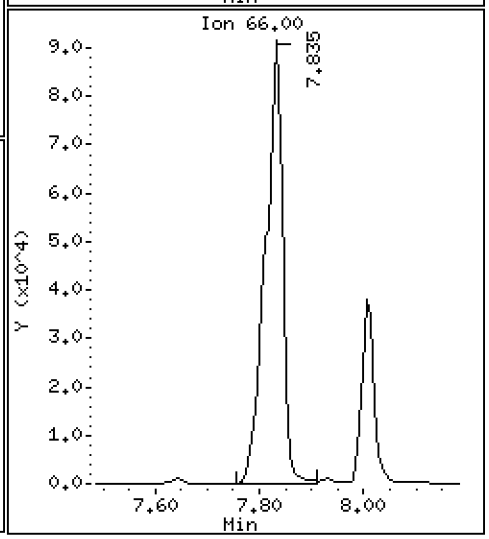












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081406.D

Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

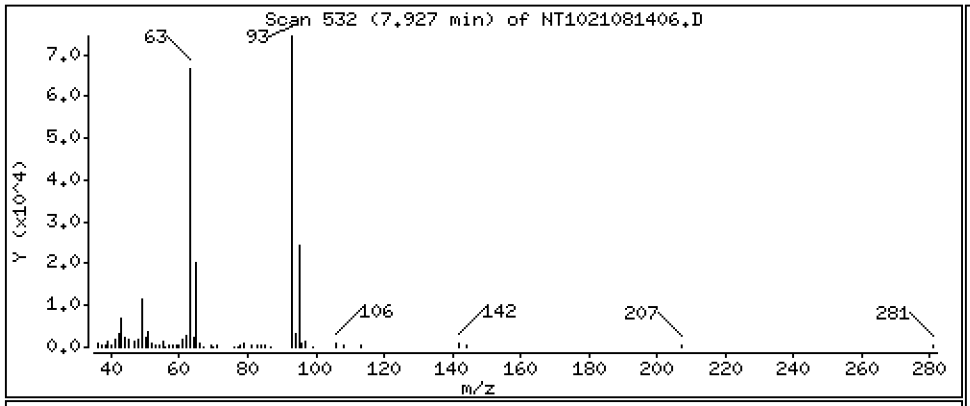
Operator: VTS

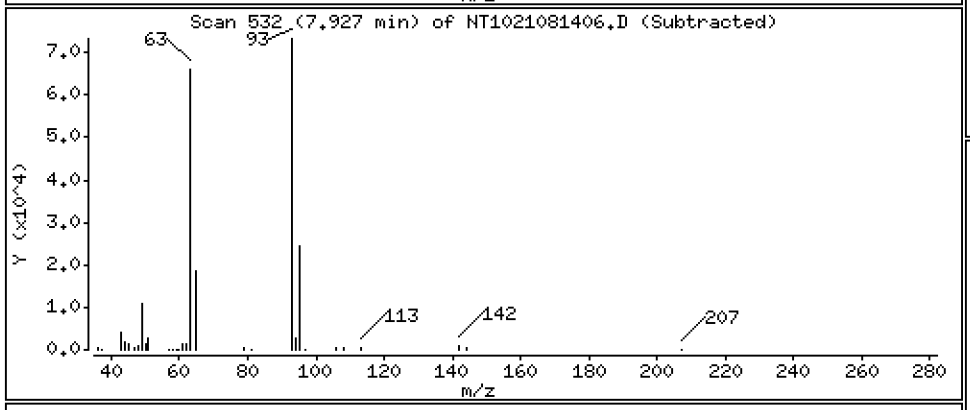
Column phase: ZB-5msi

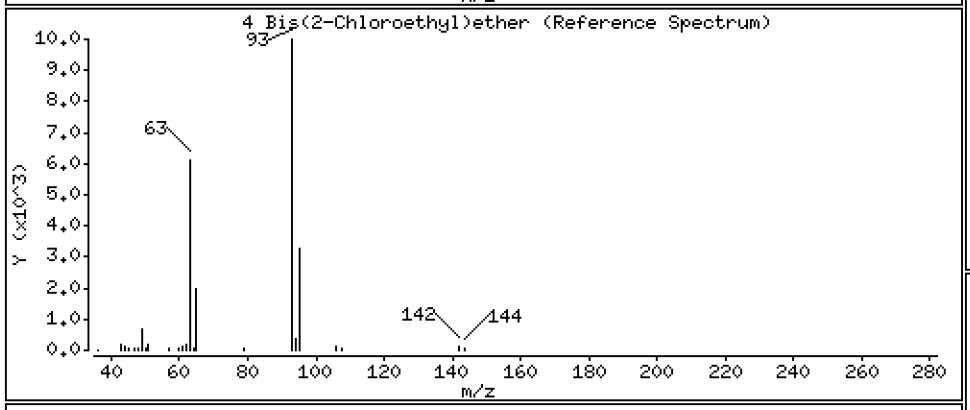
Column diameter: 0.25

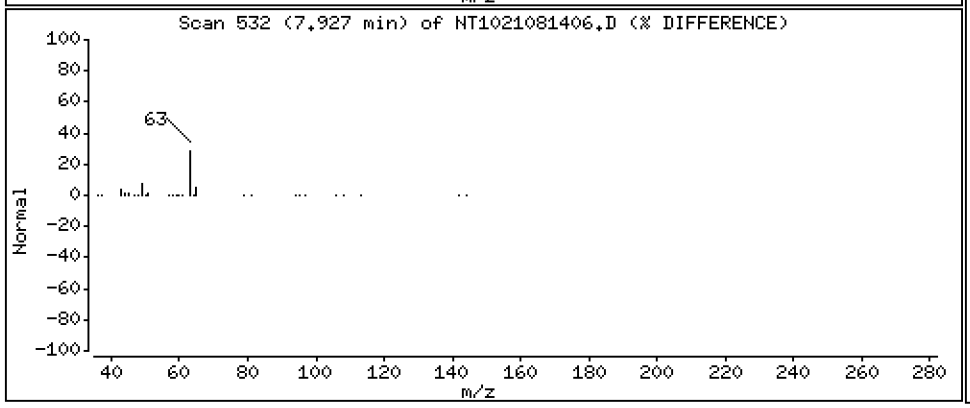
4 Bis(2-Chloroethyl)ether

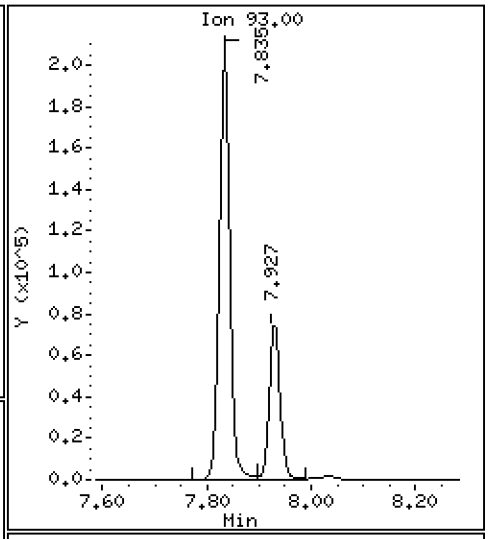
Concentration: 3.127 ug/mL

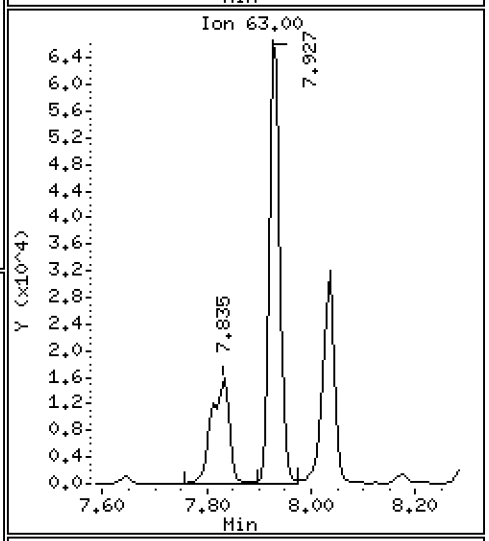


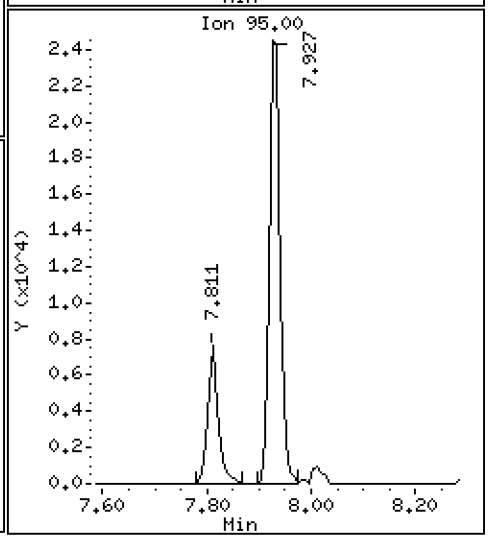












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081406.D

Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

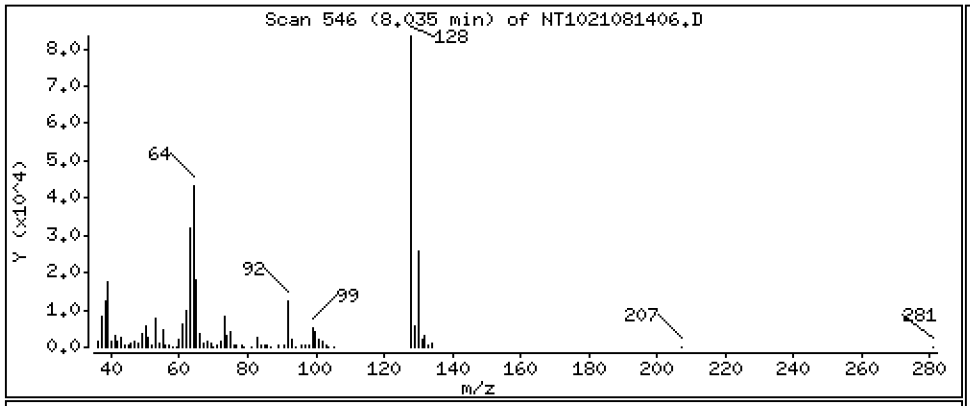
Operator: VTS

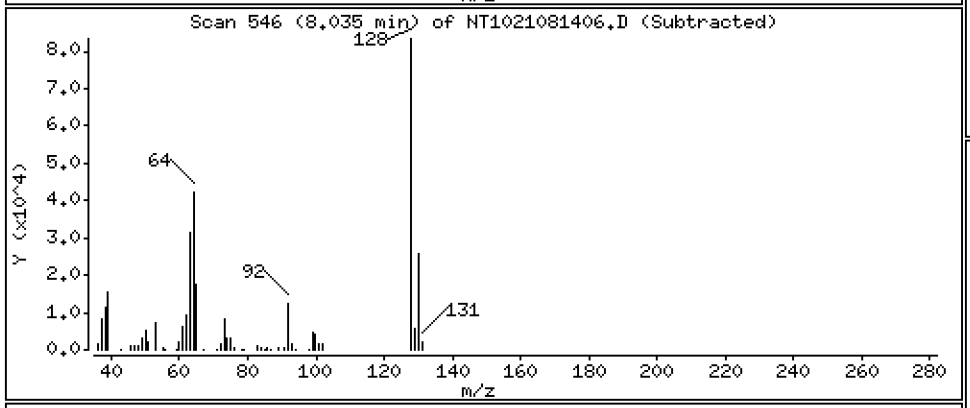
Column phase: ZB-5msi

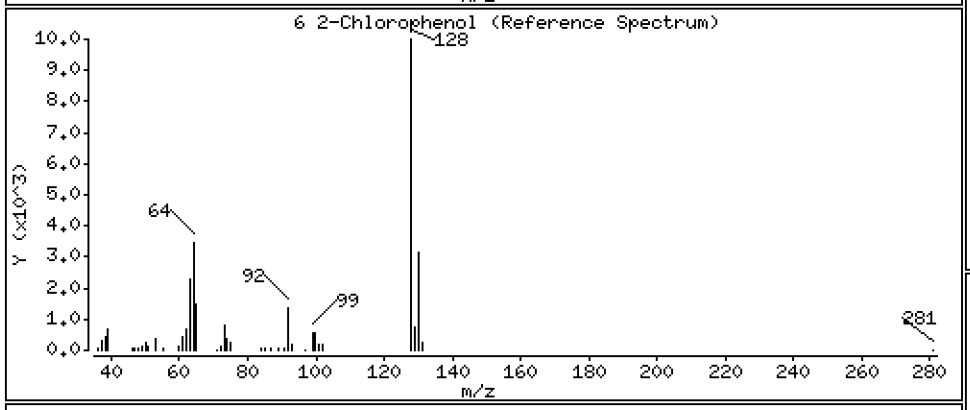
Column diameter: 0.25

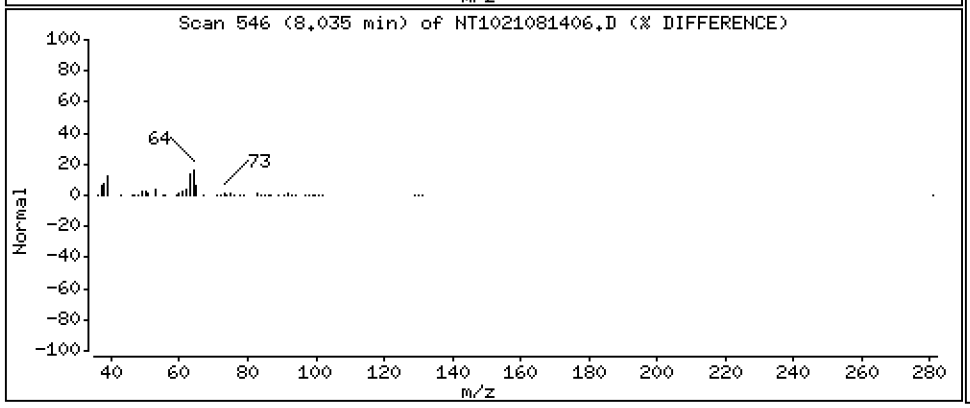
6 2-Chlorophenol

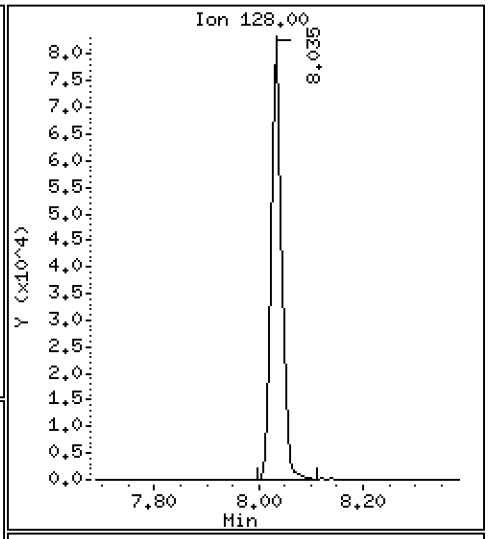
Concentration: 3.961 ug/mL

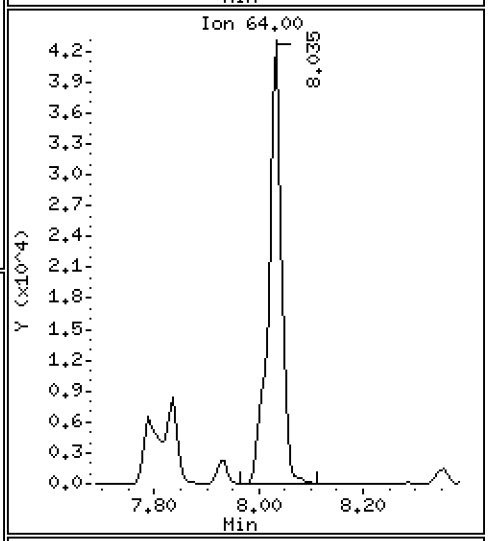


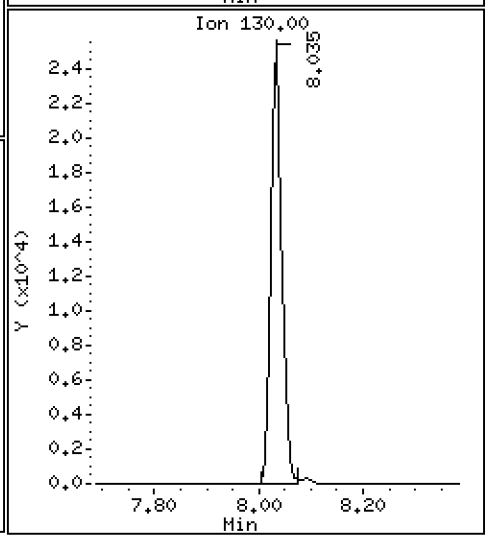












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

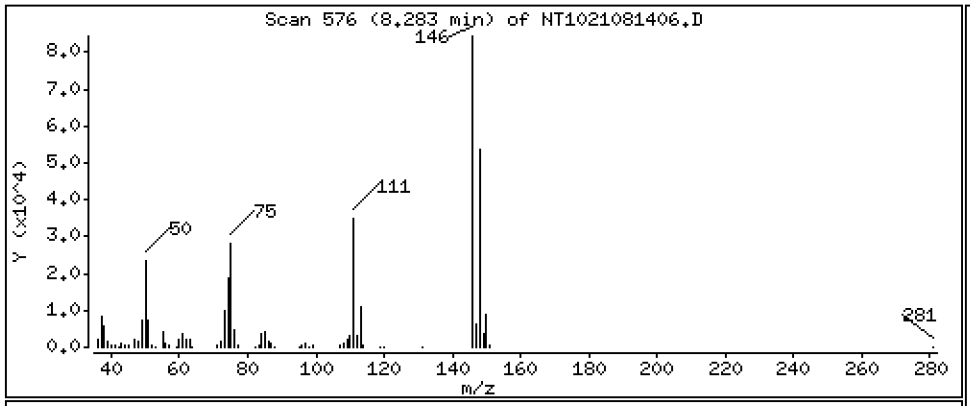
Operator: VTS

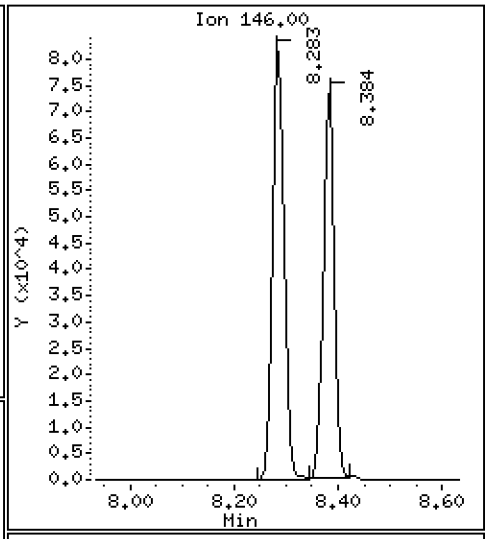
Column phase: ZB-5msi

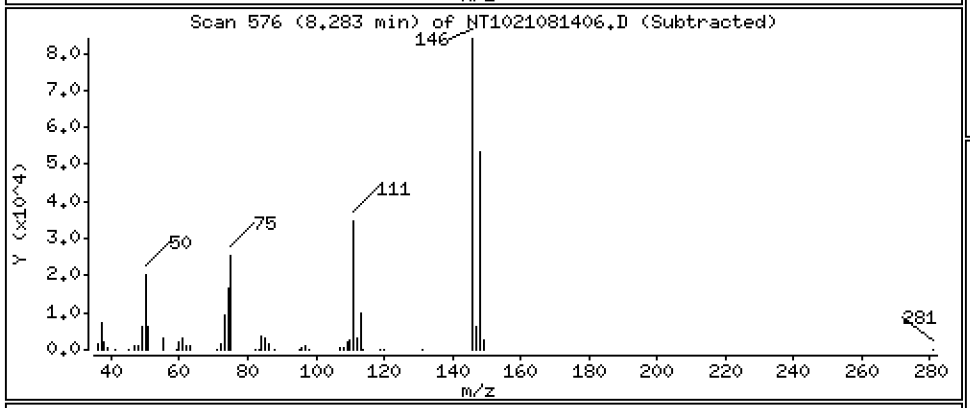
Column diameter: 0.25

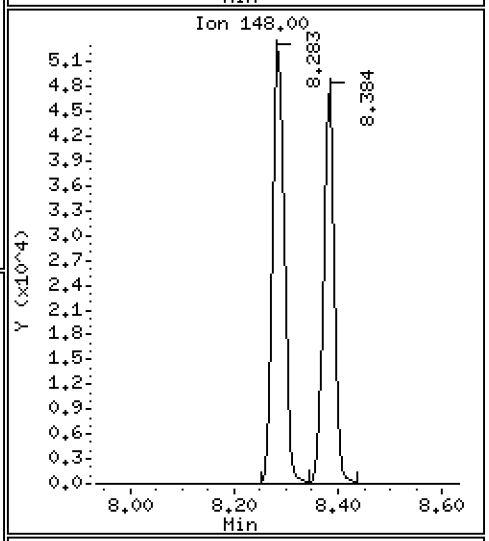
7 1,3-Dichlorobenzene

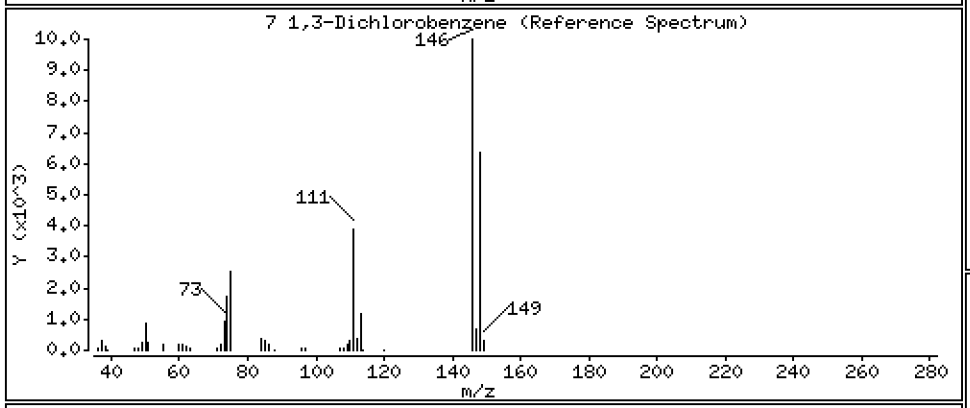
Concentration: 3.377 ug/mL

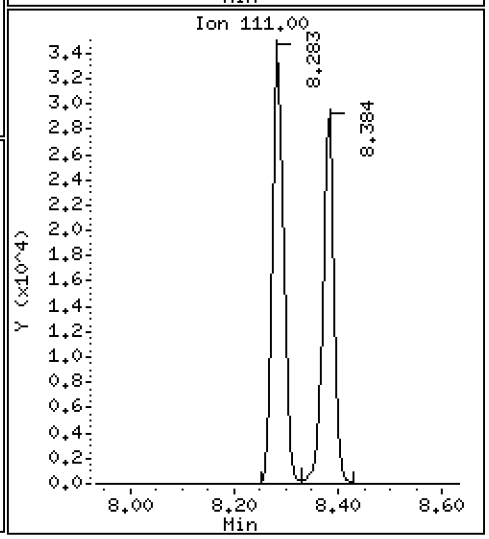


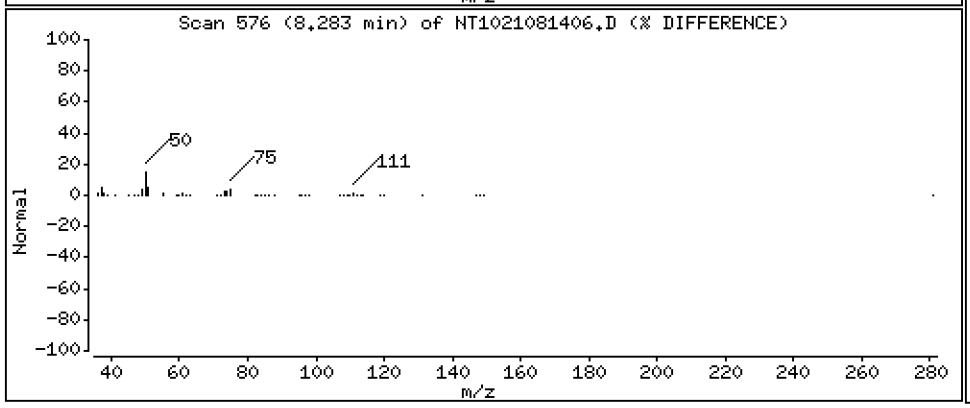












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

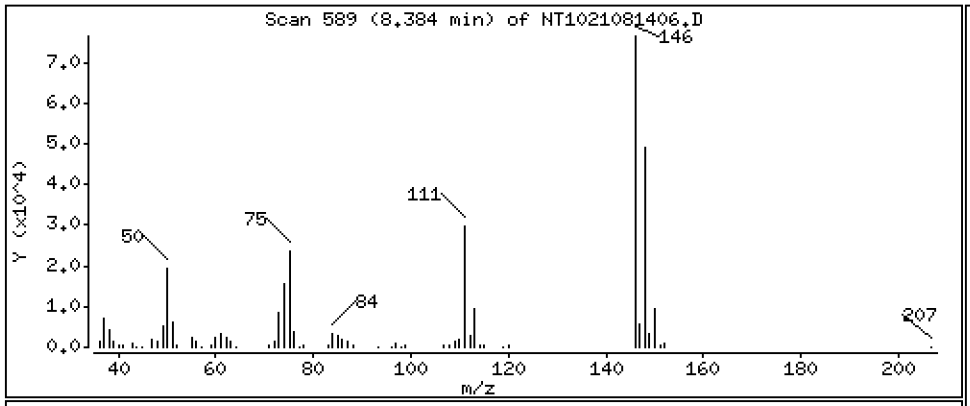
Operator: VTS

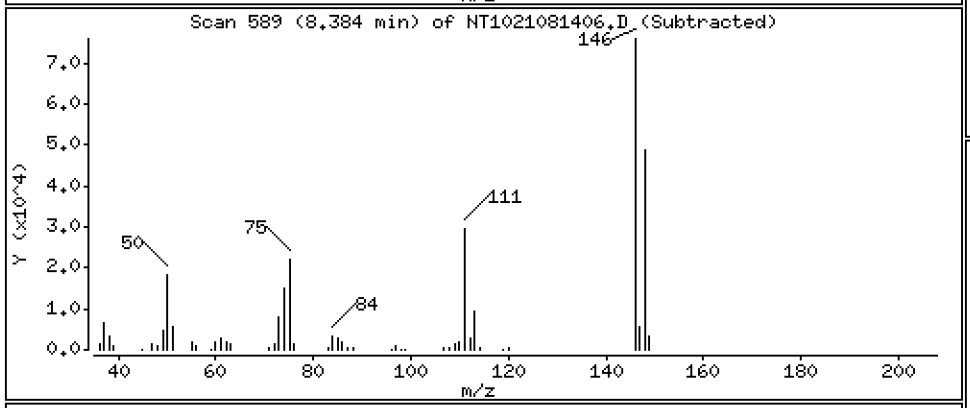
Column phase: ZB-5msi

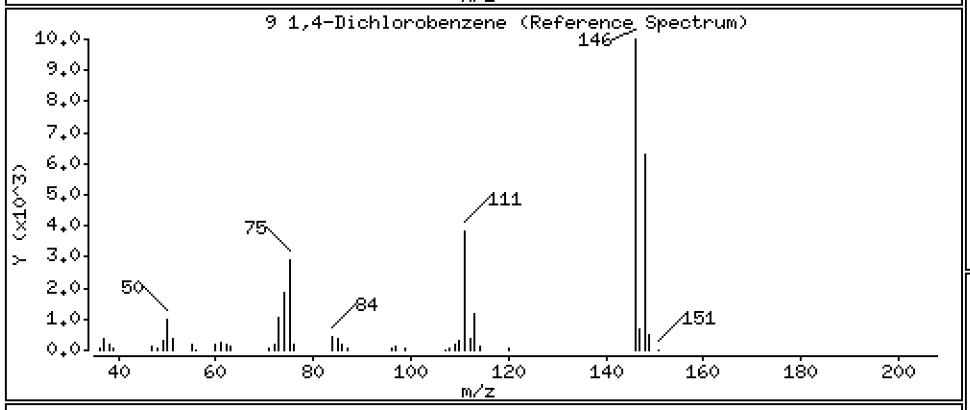
Column diameter: 0.25

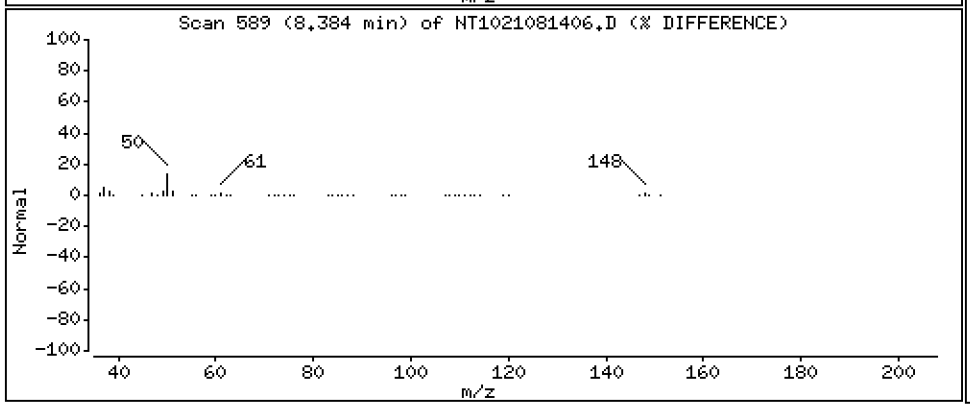
9 1,4-Dichlorobenzene

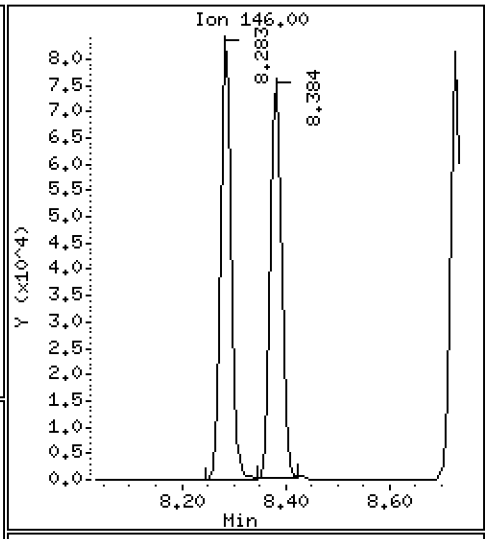
Concentration: 3.481 ug/mL

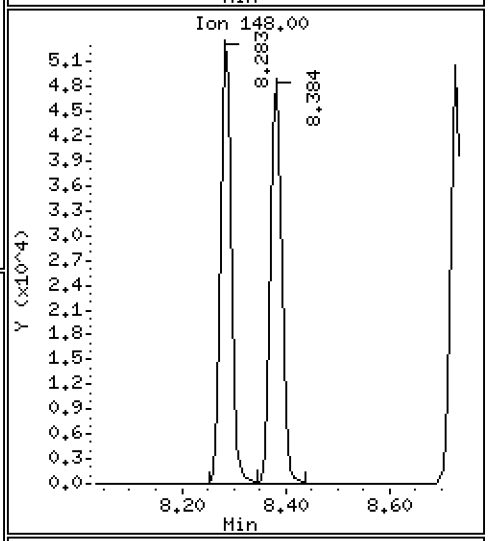


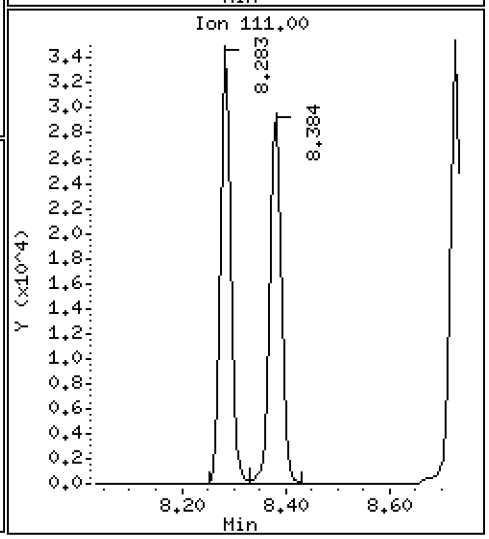












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

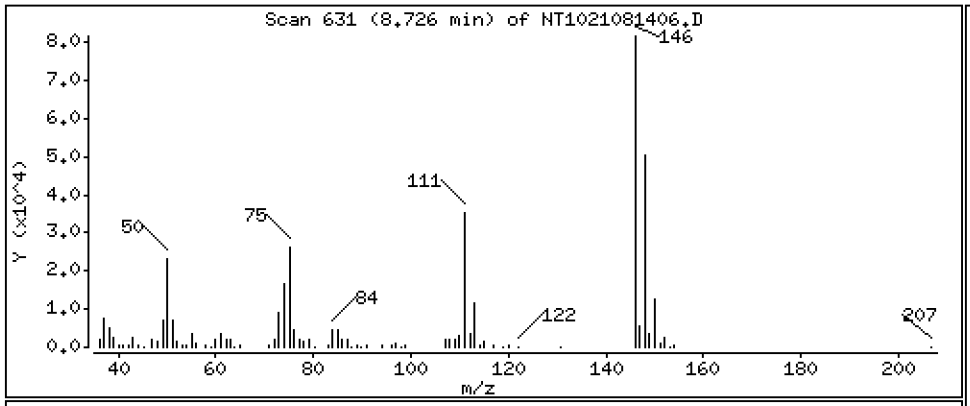
Operator: VTS

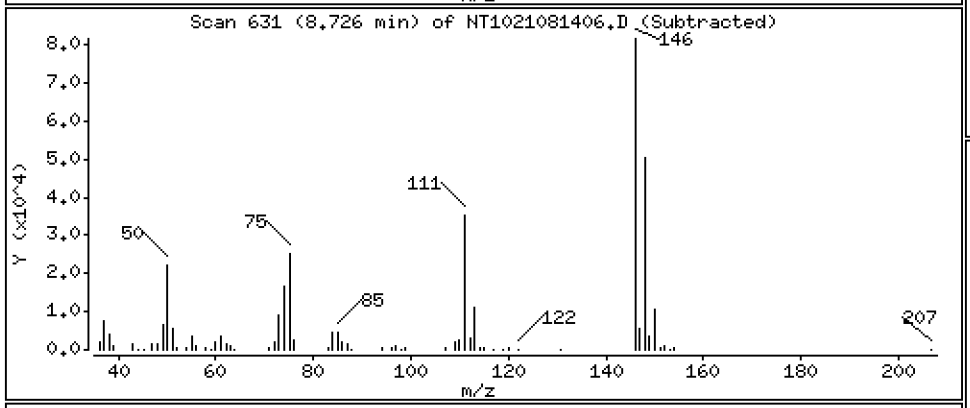
Column phase: ZB-5msi

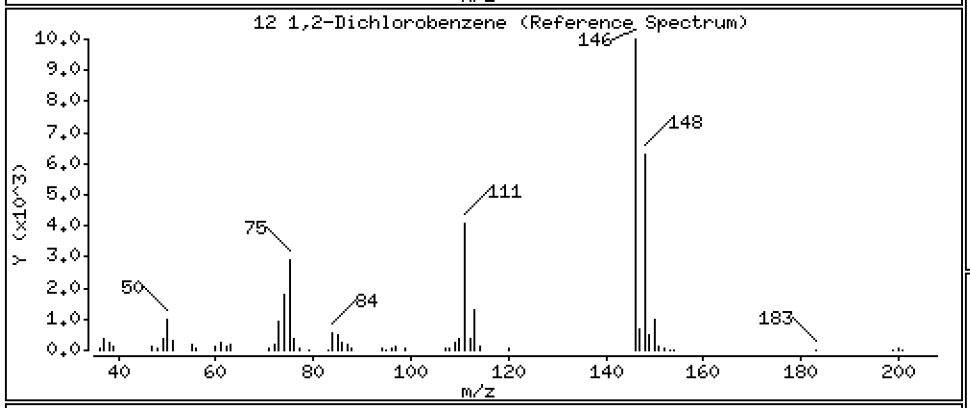
Column diameter: 0.25

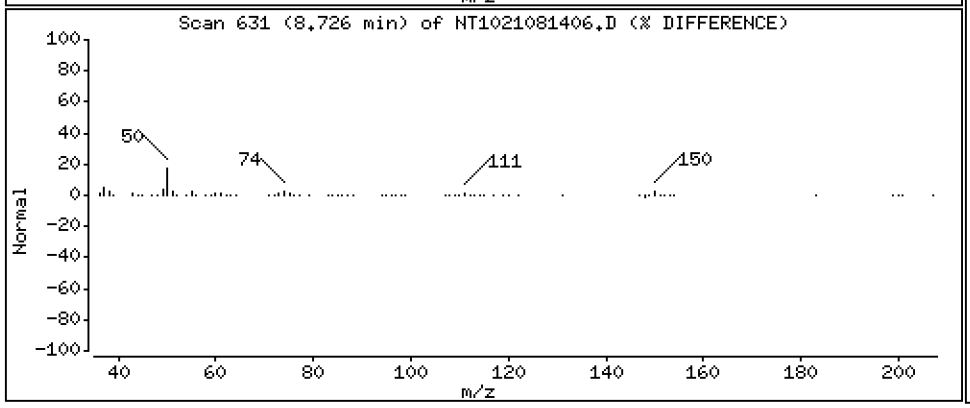
12 1,2-Dichlorobenzene

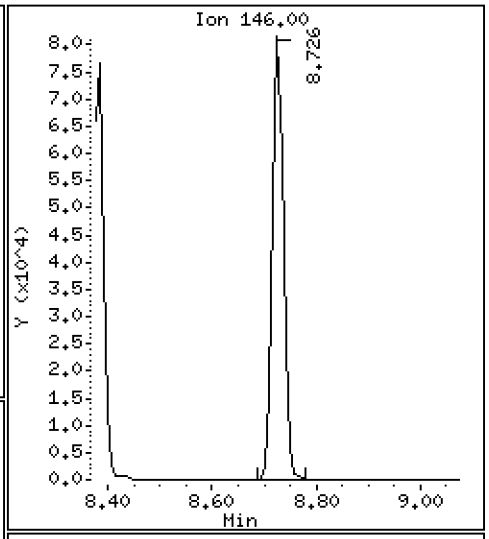
Concentration: 3.453 ug/mL

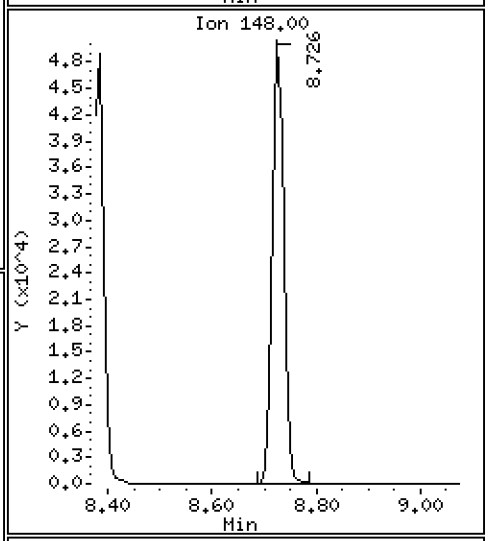


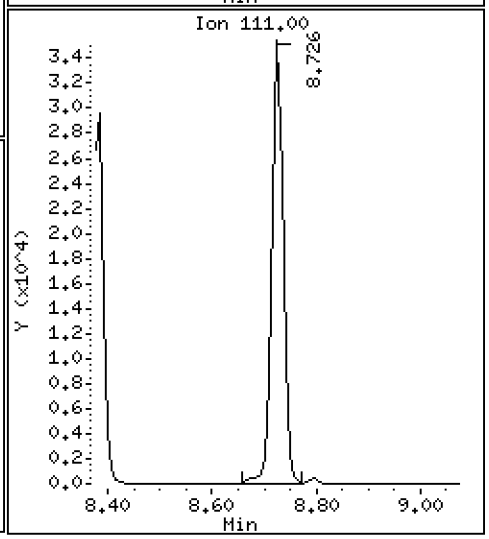












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081406.D

Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

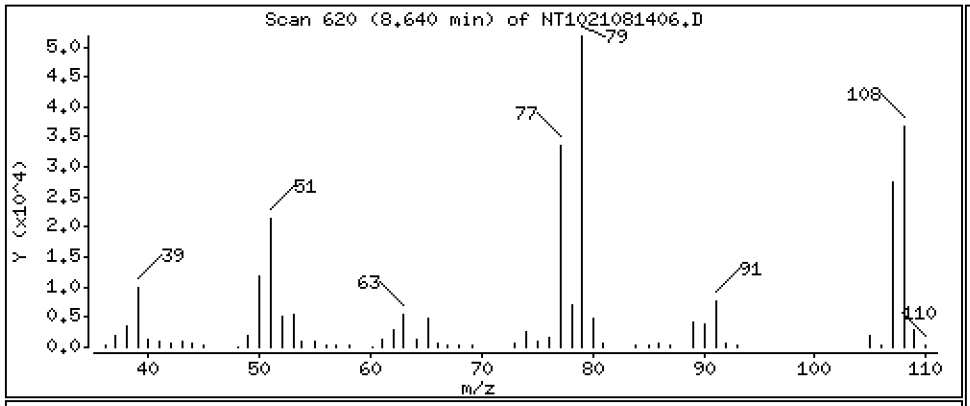
Operator: VTS

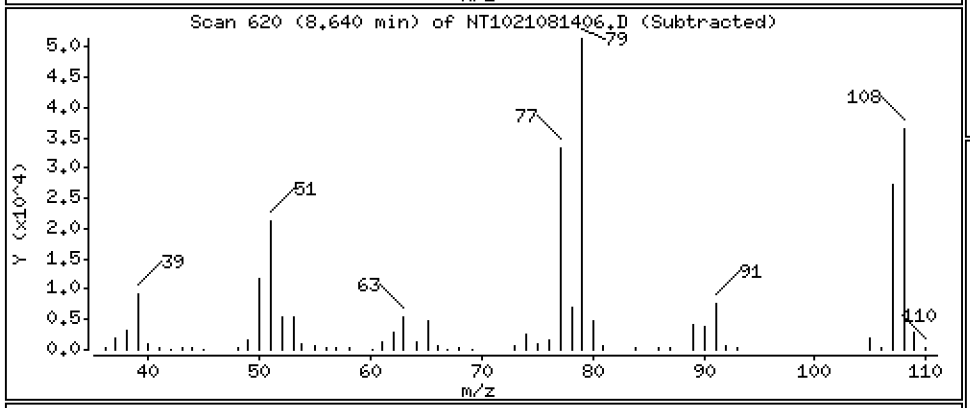
Column phase: ZB-5msi

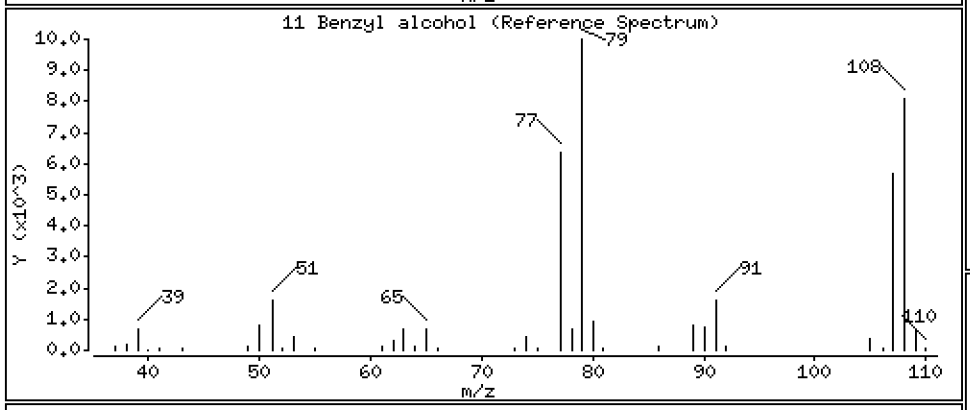
Column diameter: 0.25

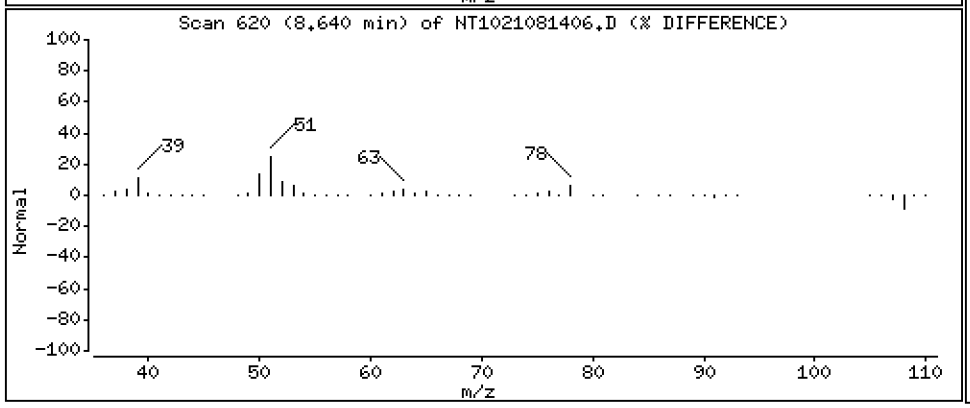
11 Benzyl alcohol

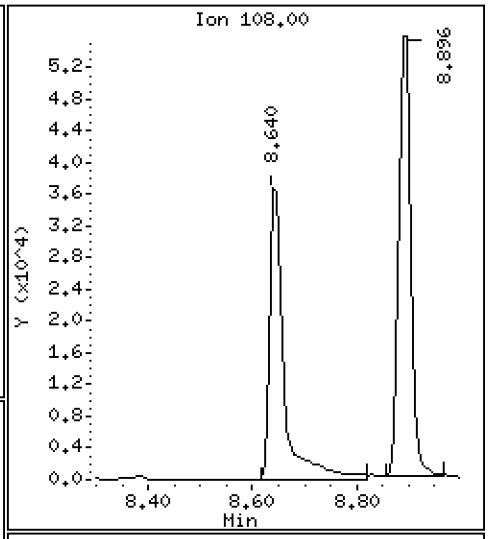
Concentration: 3.357 ug/mL

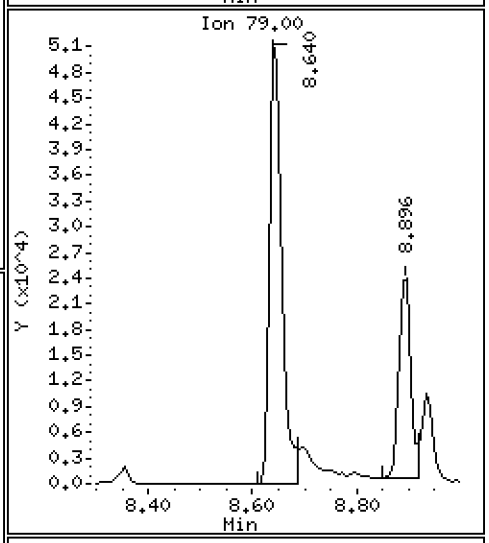


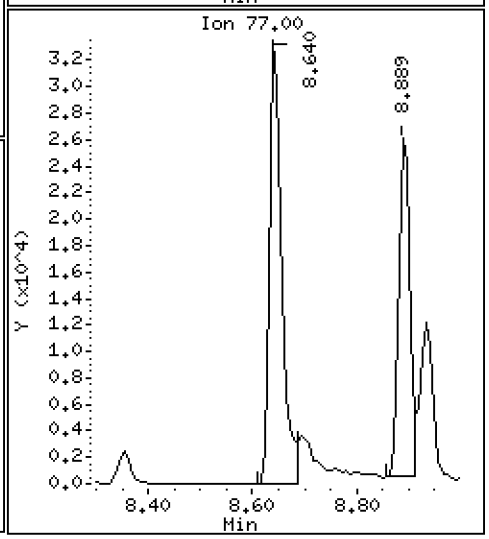












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

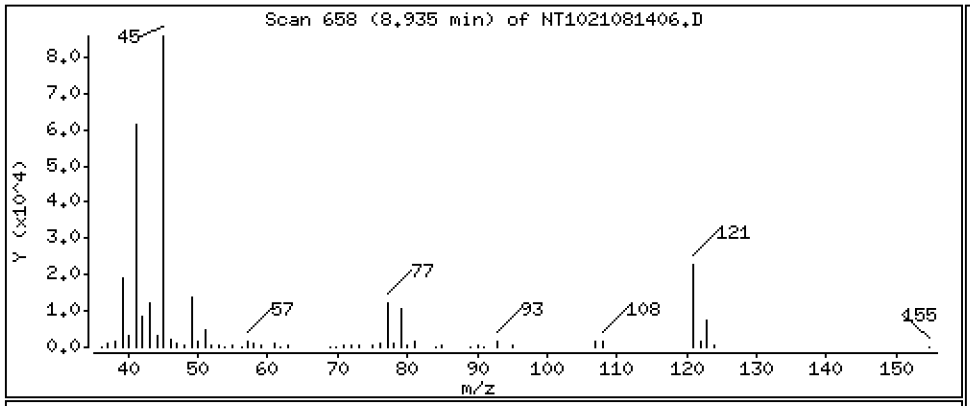
Operator: VTS

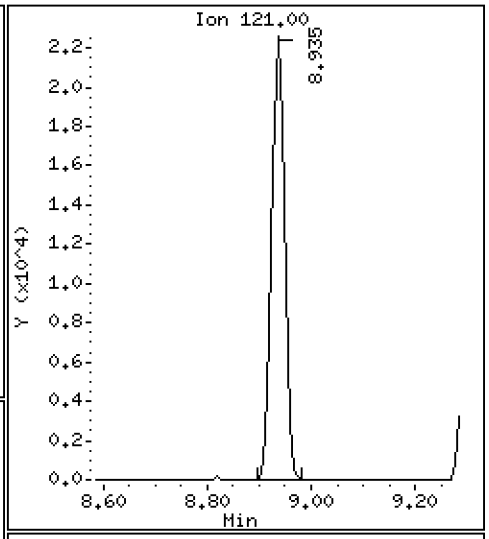
Column phase: ZB-5msi

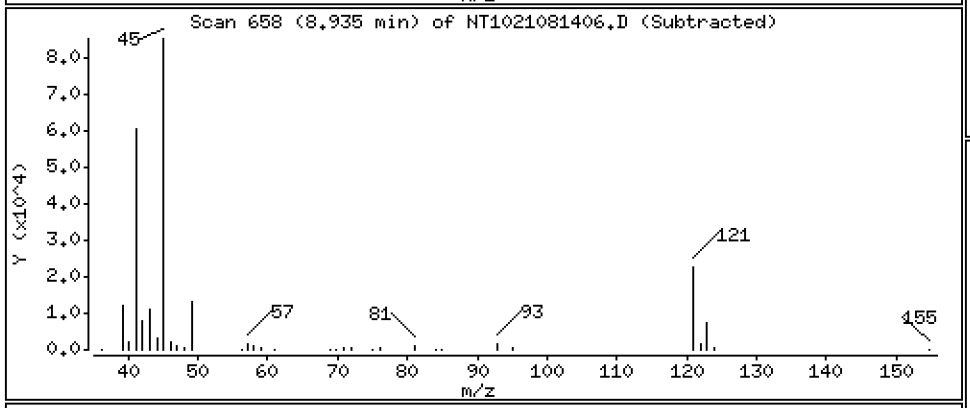
Column diameter: 0.25

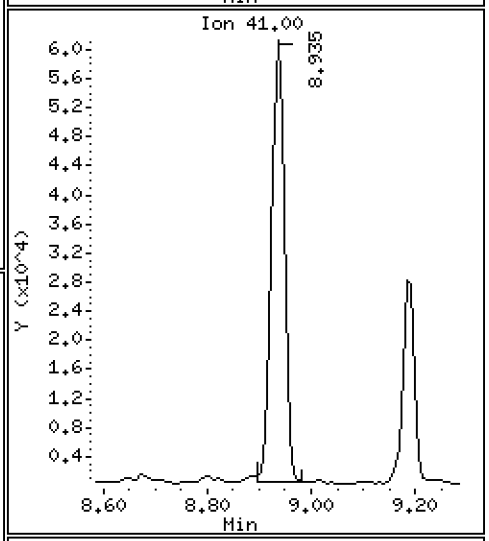
14 2,2'-oxybis(1-Chloropropane)

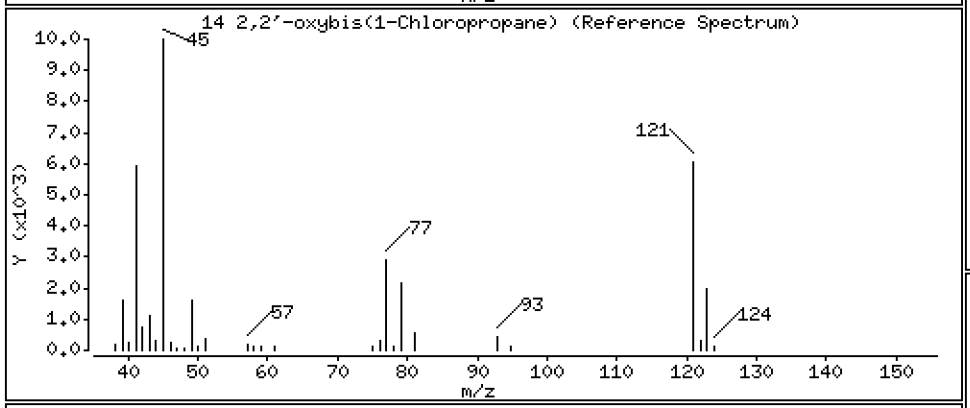
Concentration: 2.966 ug/mL

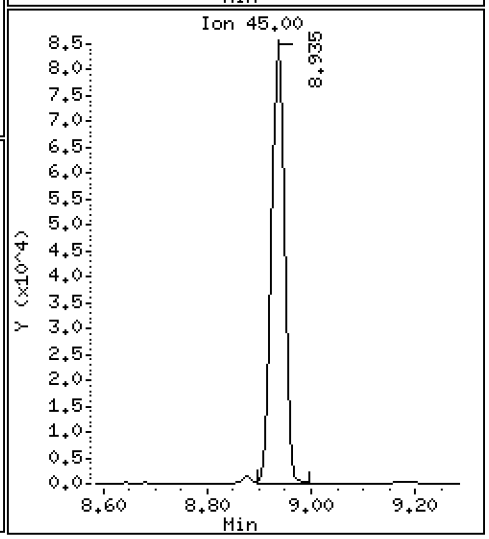


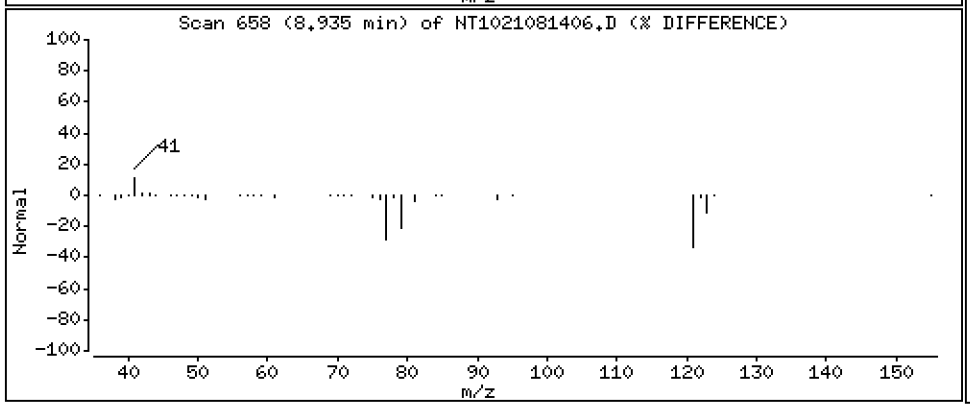












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

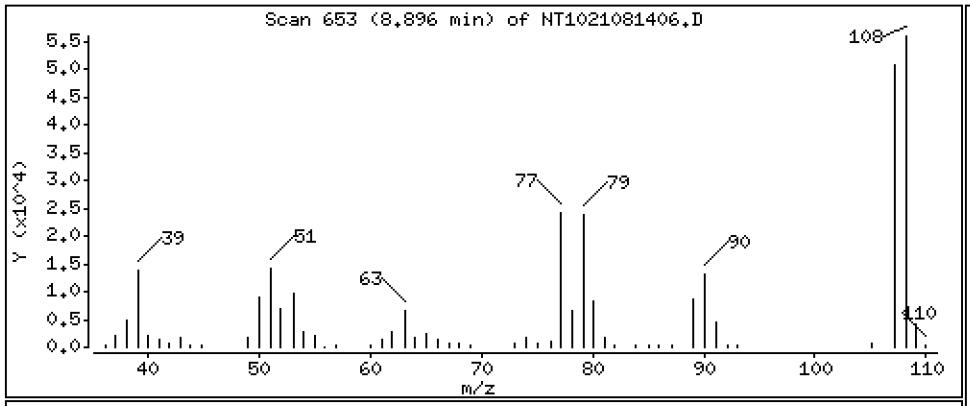
Operator: VTS

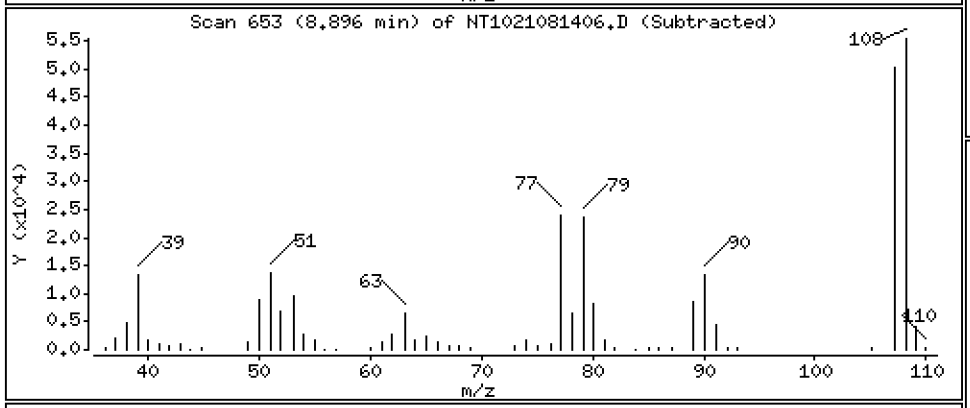
Column phase: ZB-5msi

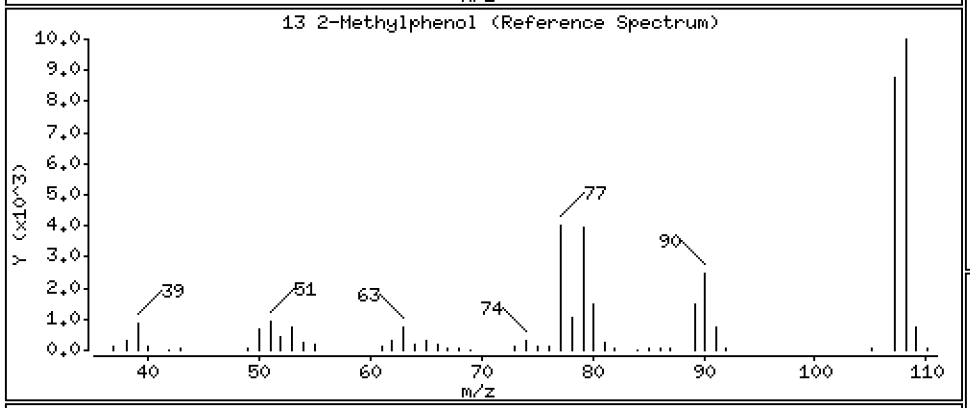
Column diameter: 0.25

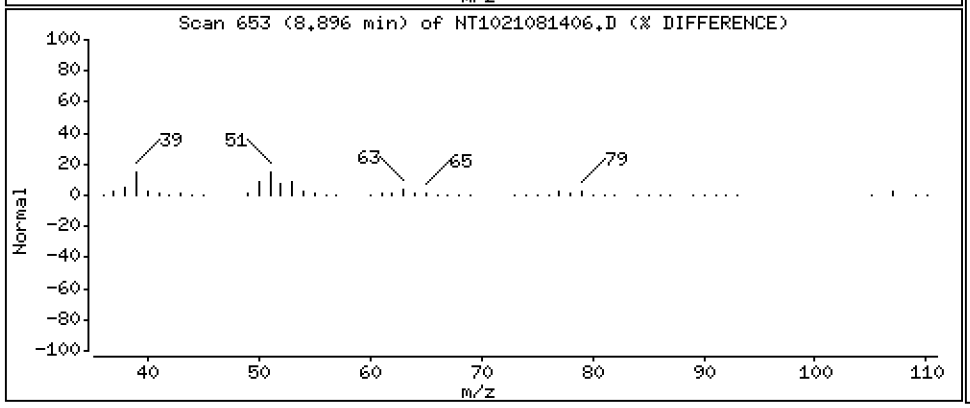
13 2-Methylphenol

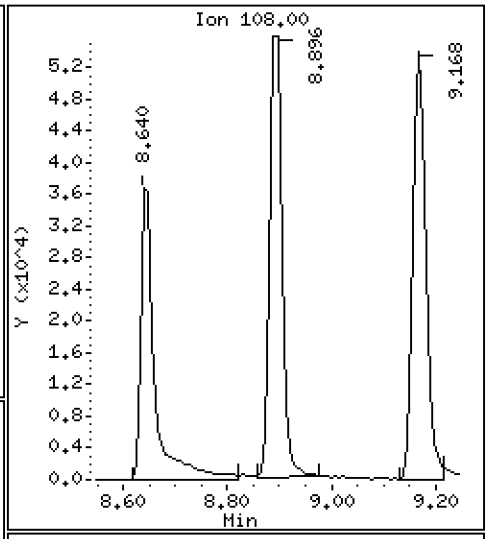
Concentration: 3.184 ug/mL

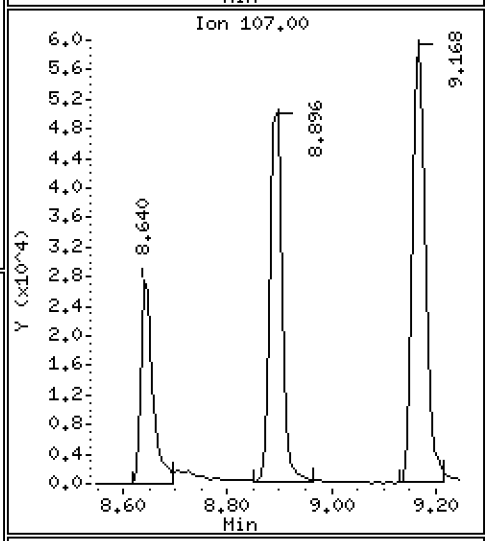


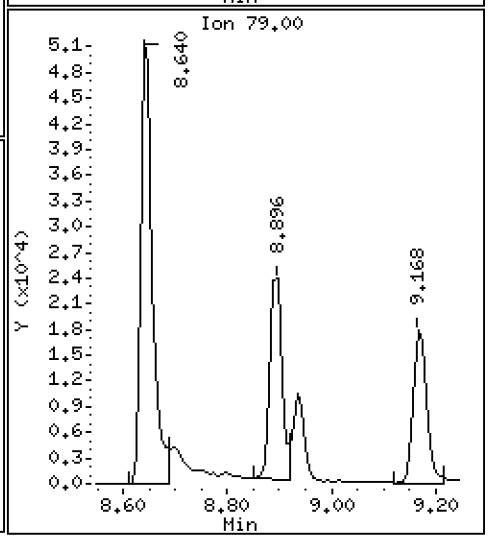












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

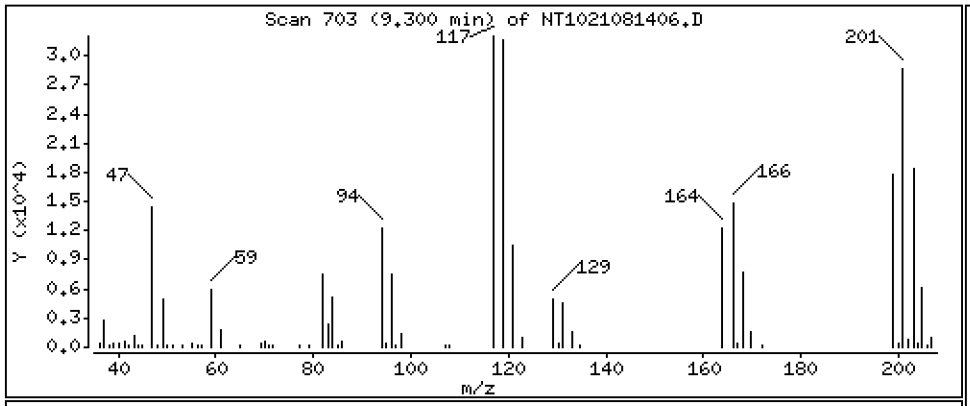
Operator: VTS

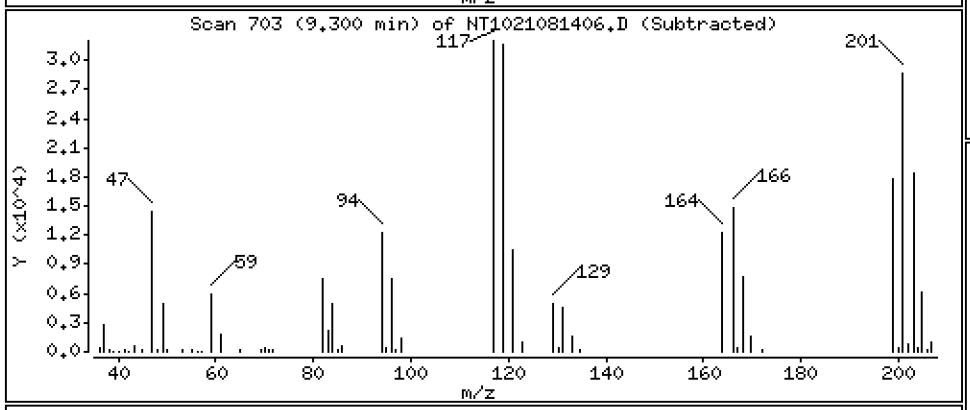
Column phase: ZB-5msi

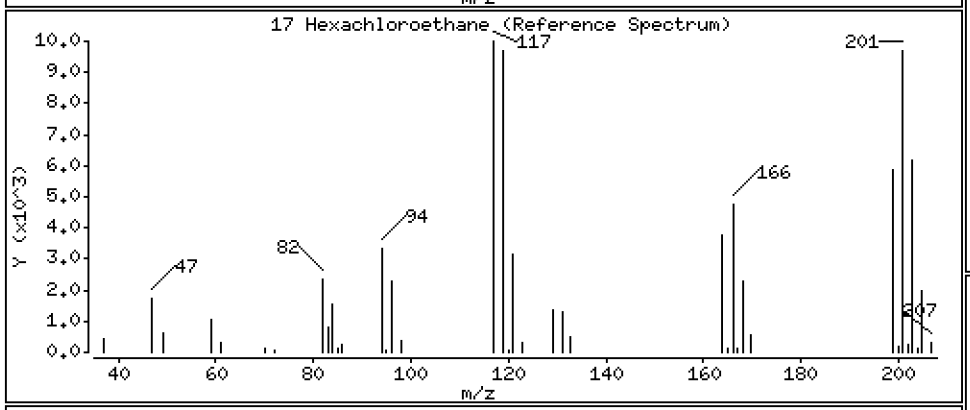
Column diameter: 0.25

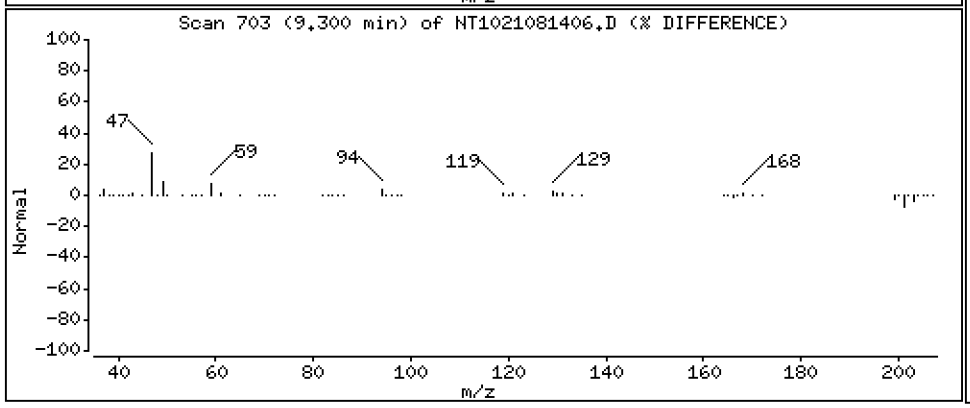
17 Hexachloroethane

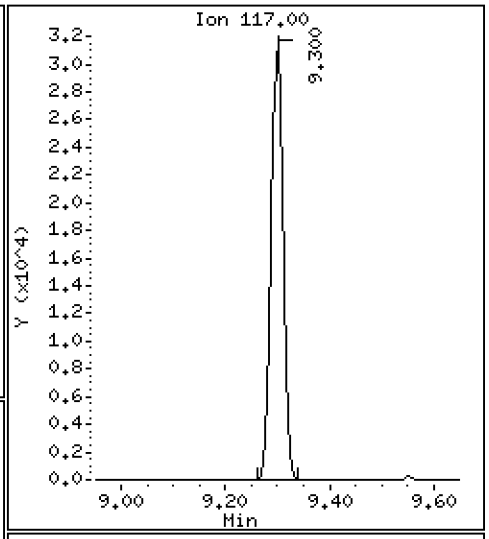
Concentration: 3.553 ug/mL

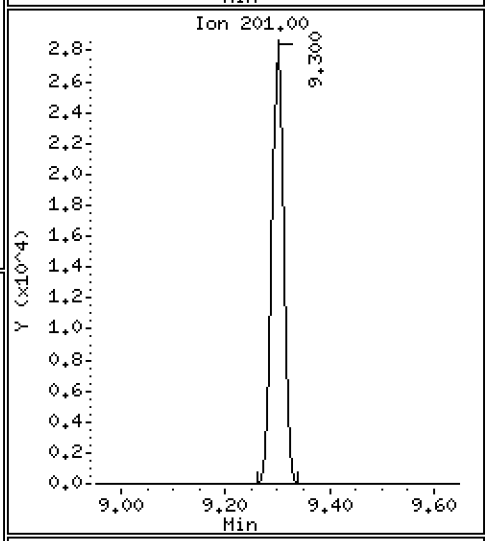


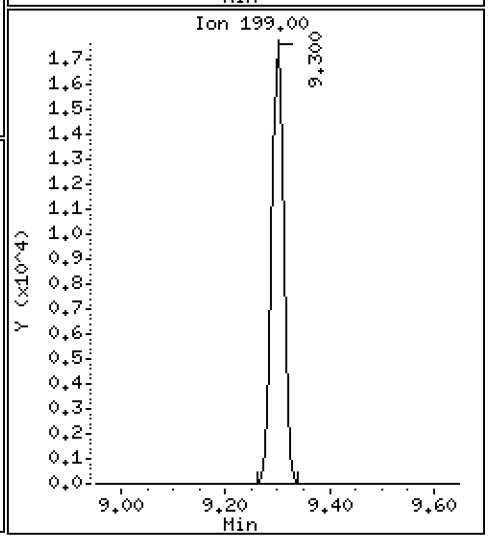












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

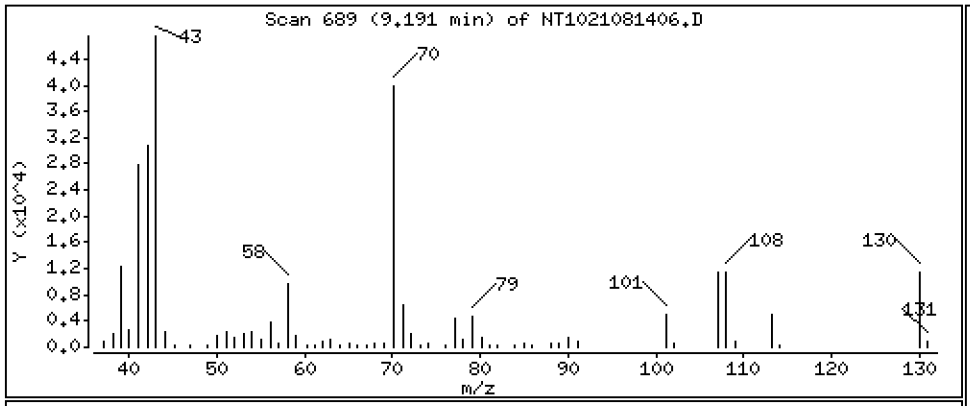
Operator: VTS

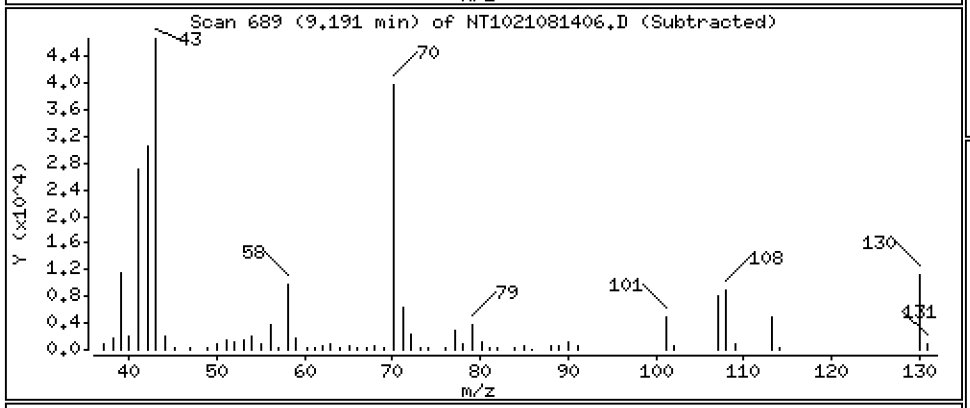
Column phase: ZB-5msi

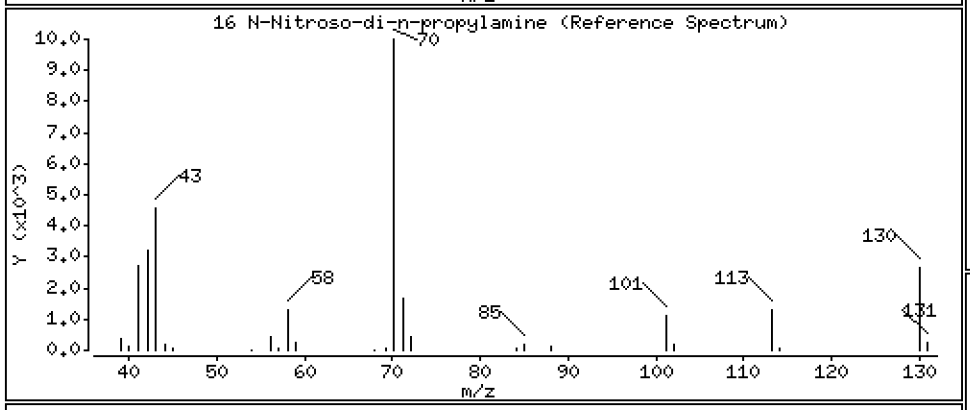
Column diameter: 0.25

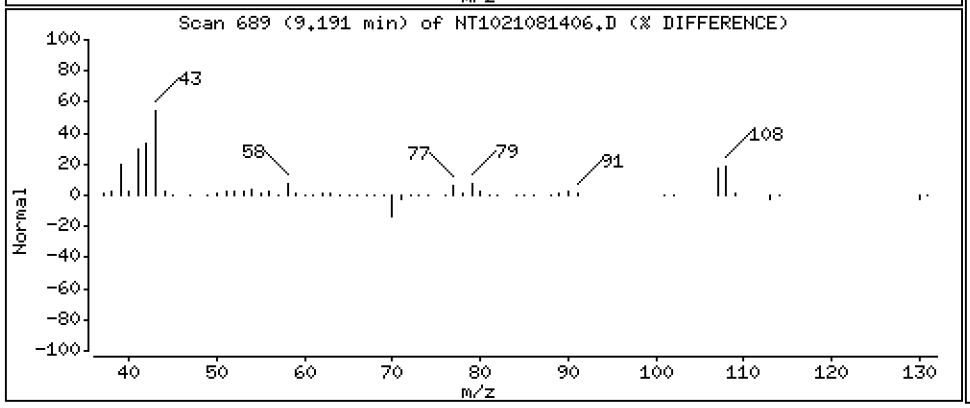
16 N-Nitroso-di-n-propylamine

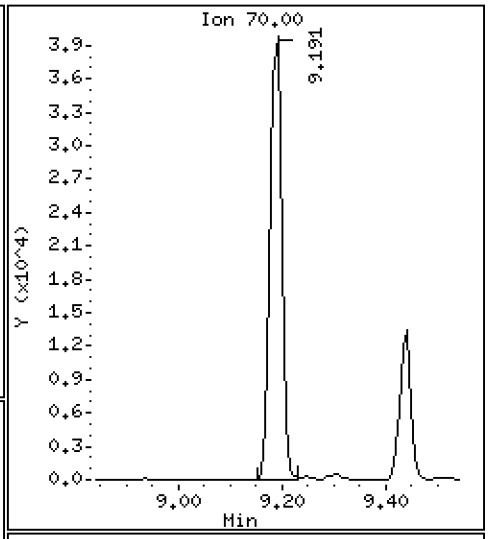
Concentration: 2.506 ug/mL

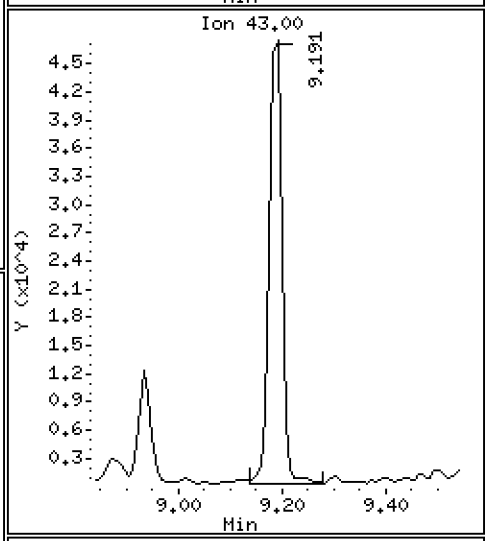


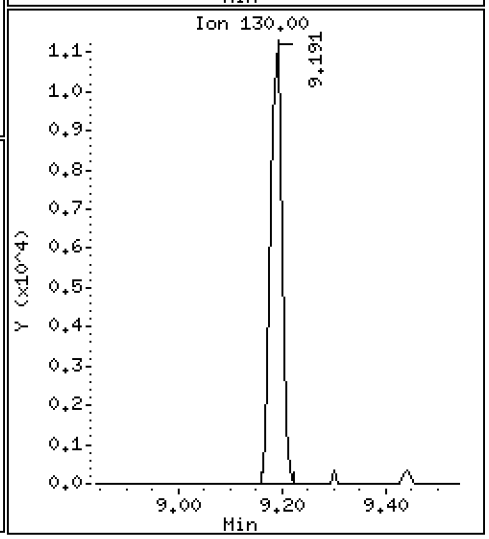












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

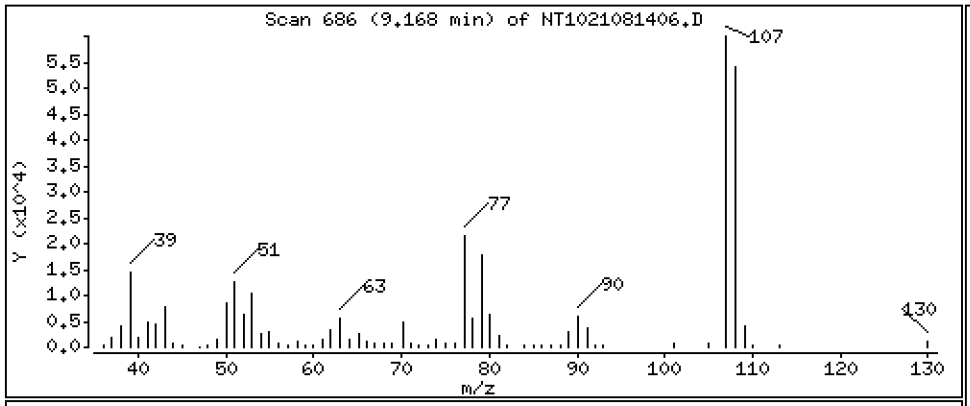
Operator: VTS

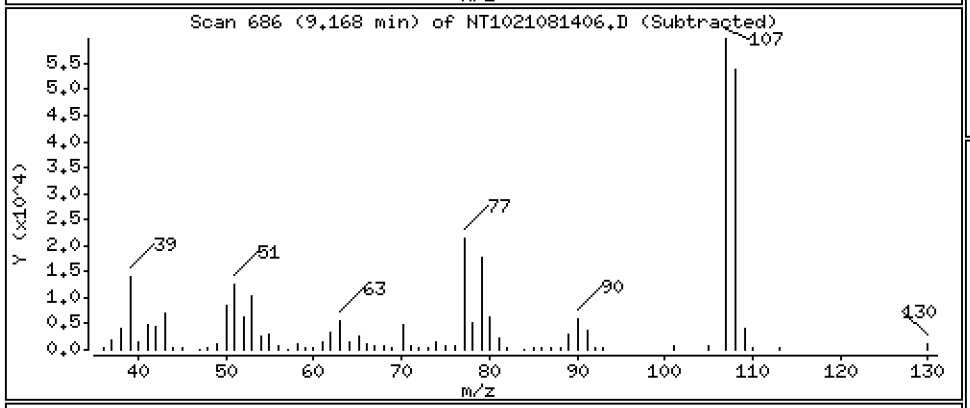
Column phase: ZB-5msi

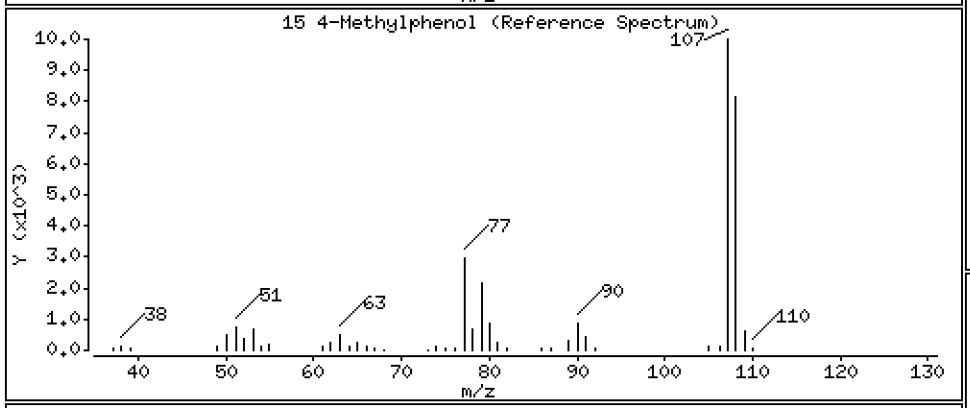
Column diameter: 0.25

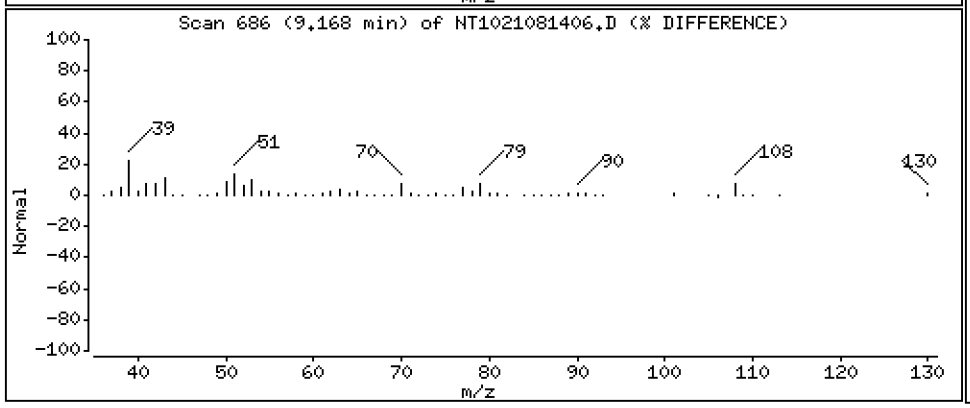
15 4-Methylphenol

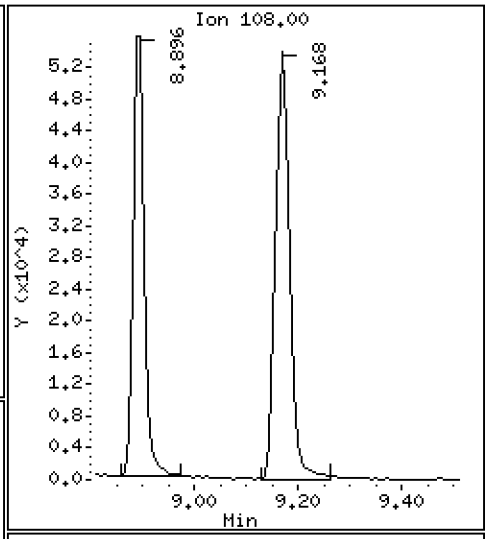
Concentration: 3.476 ug/mL

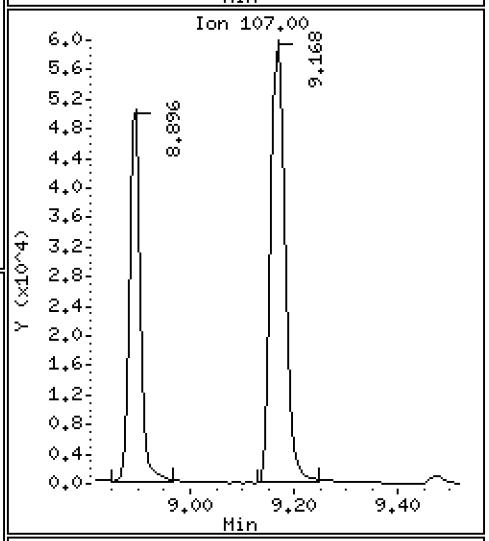


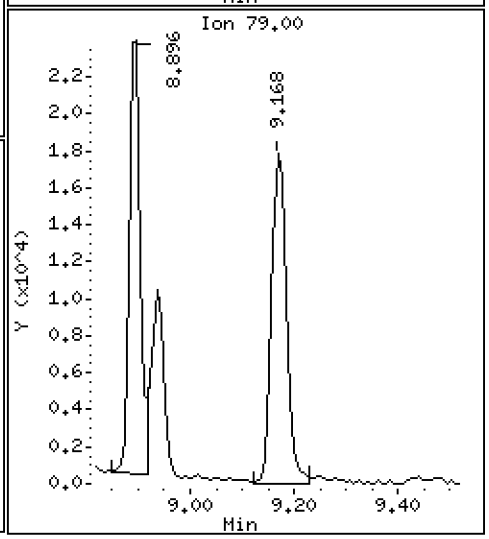












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

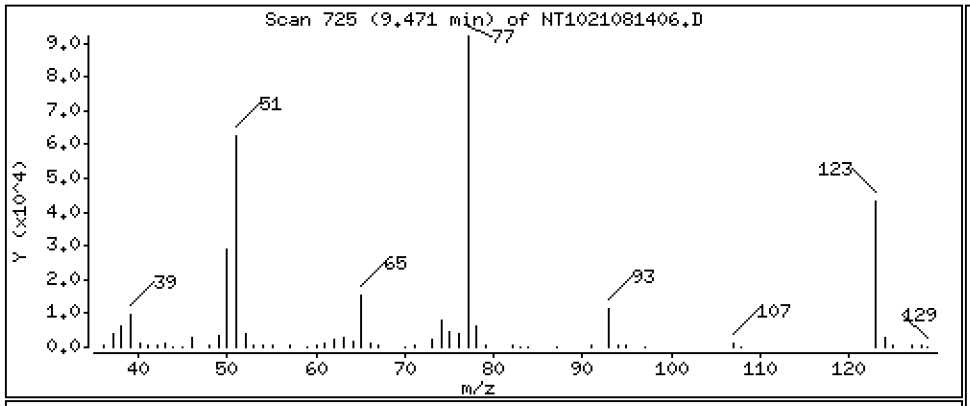
Operator: VTS

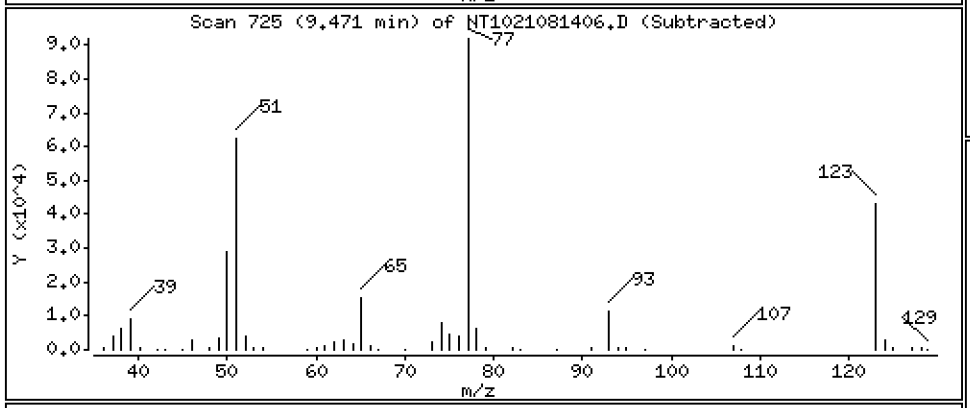
Column phase: ZB-5msi

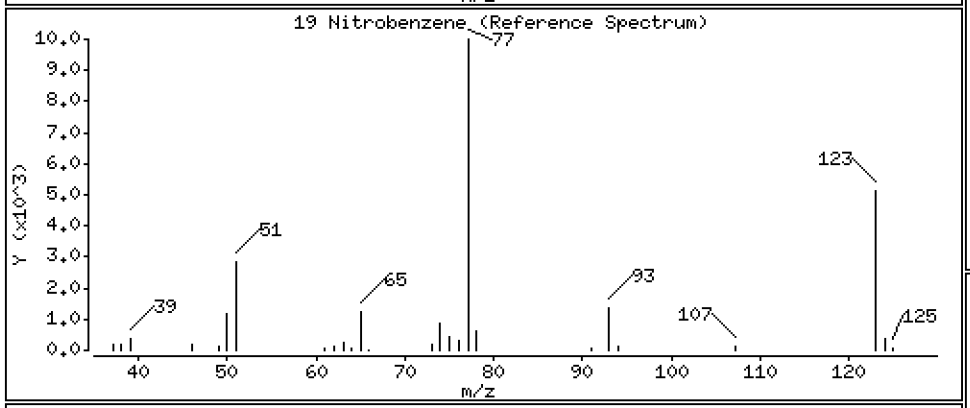
Column diameter: 0.25

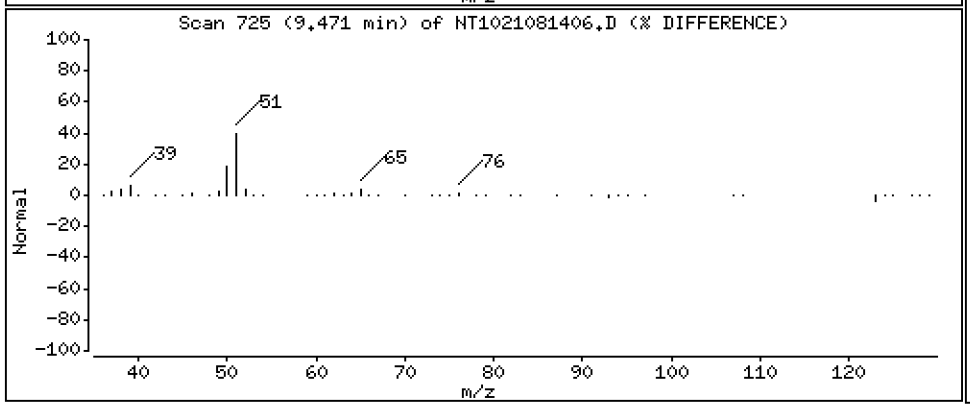
19 Nitrobenzene

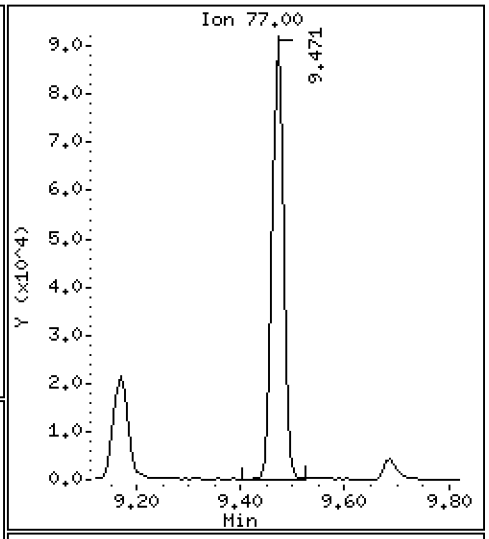
Concentration: 3.666 ug/mL

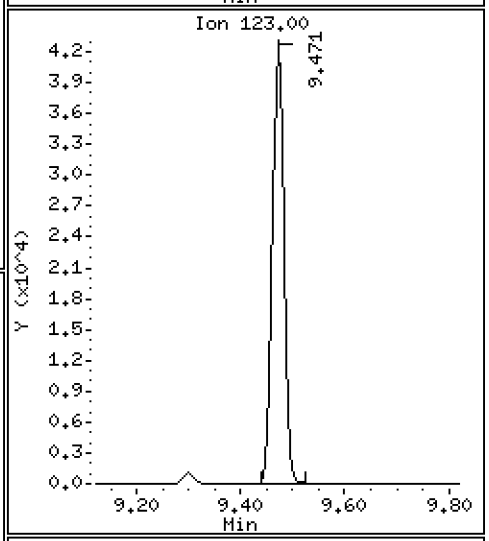


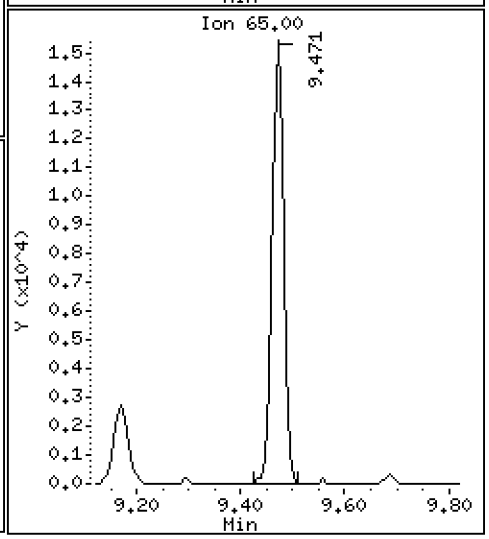












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081406.D

Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

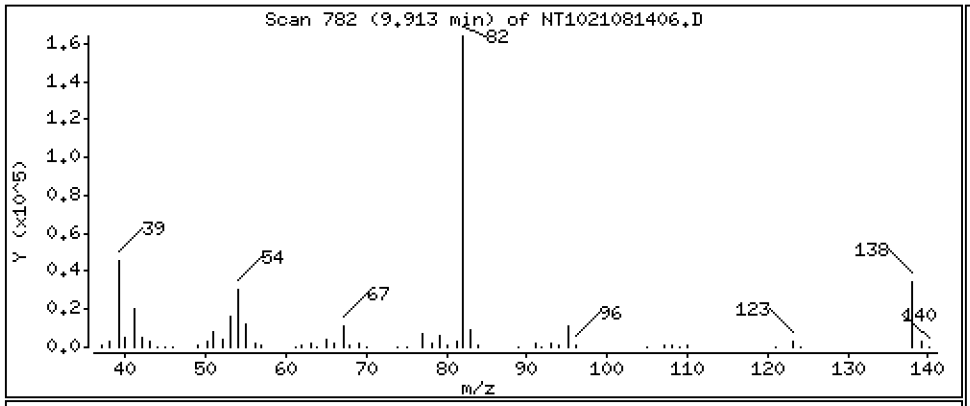
Operator: VTS

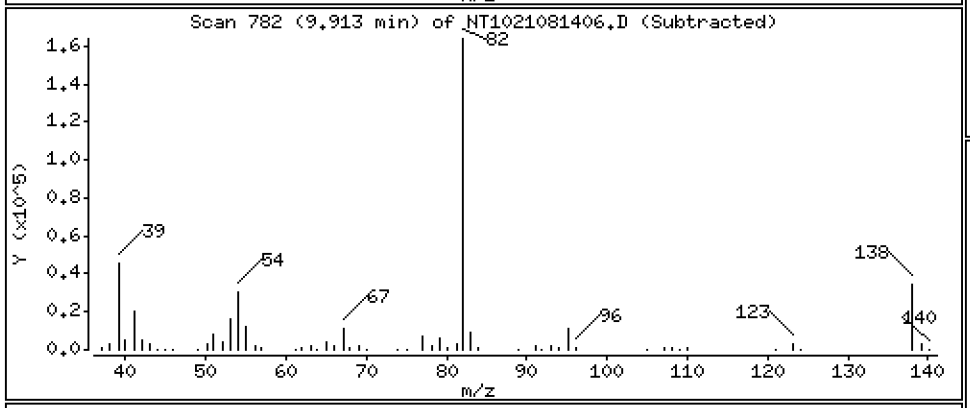
Column phase: ZB-5msi

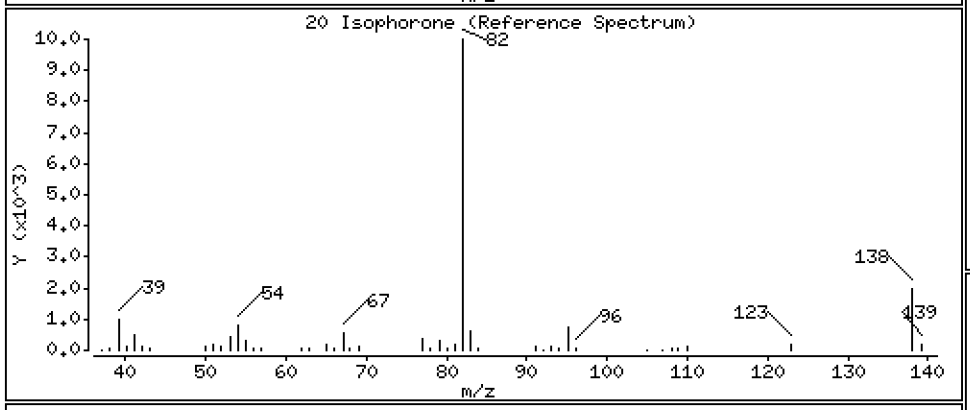
Column diameter: 0.25

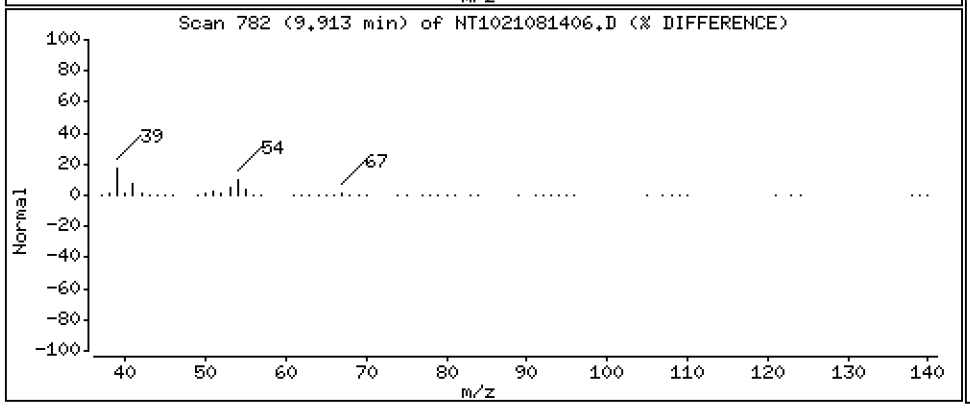
20 Isophorone

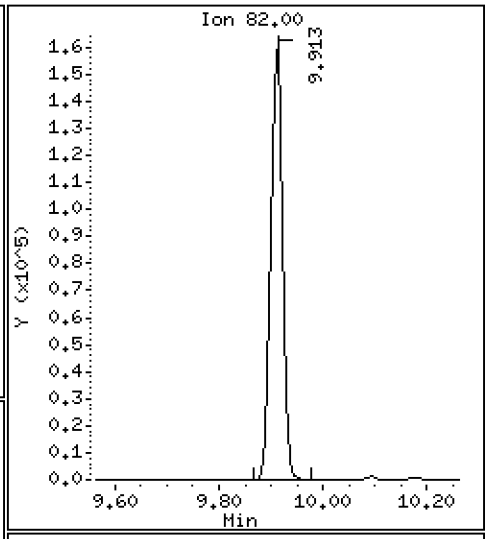
Concentration: 3.581 ug/mL

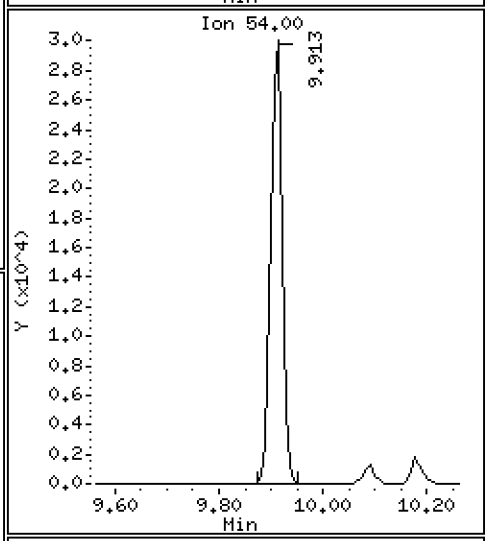


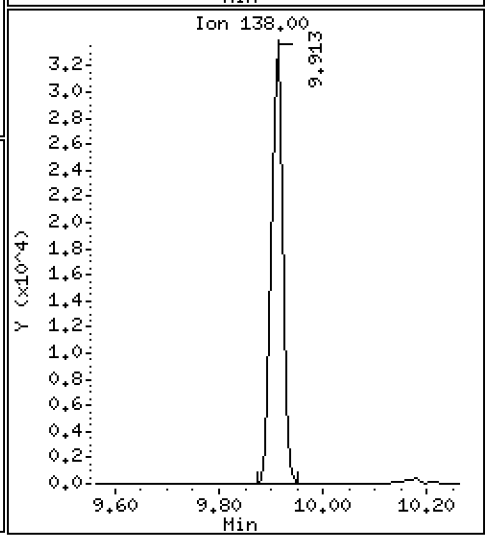












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

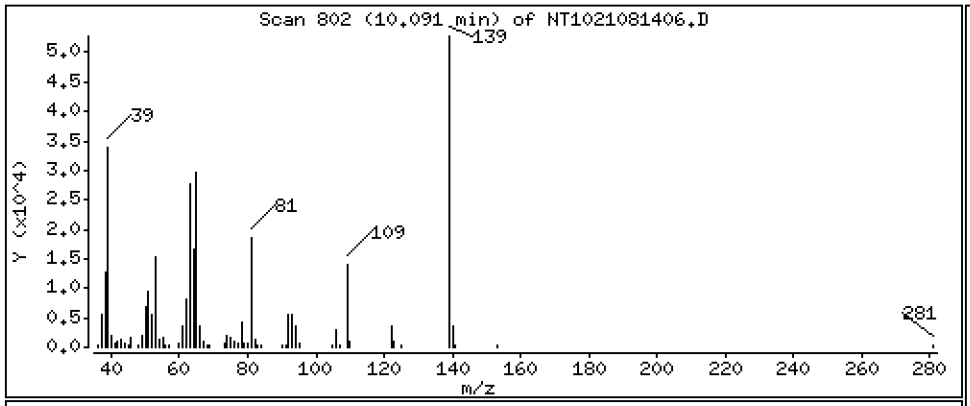
Operator: VTS

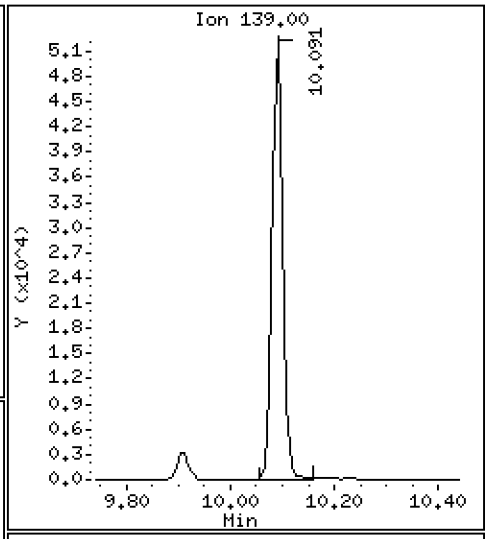
Column phase: ZB-5msi

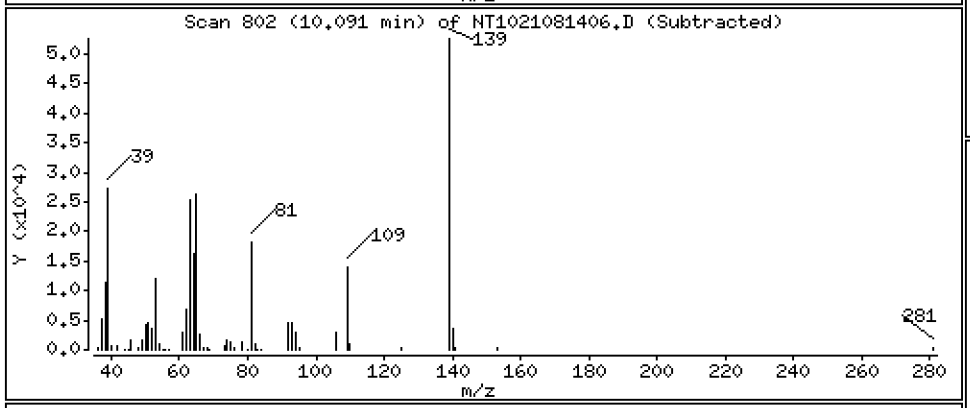
Column diameter: 0.25

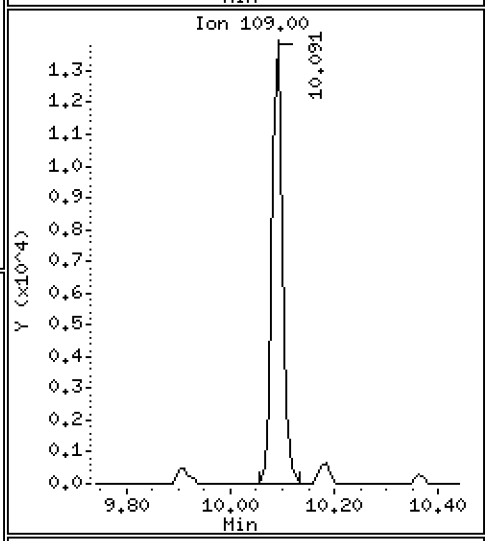
21 2-Nitrophenol

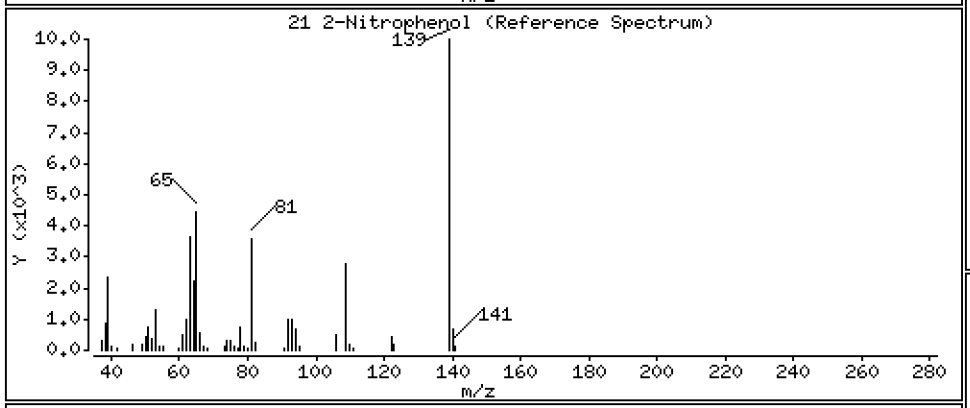
Concentration: 3.858 ug/mL

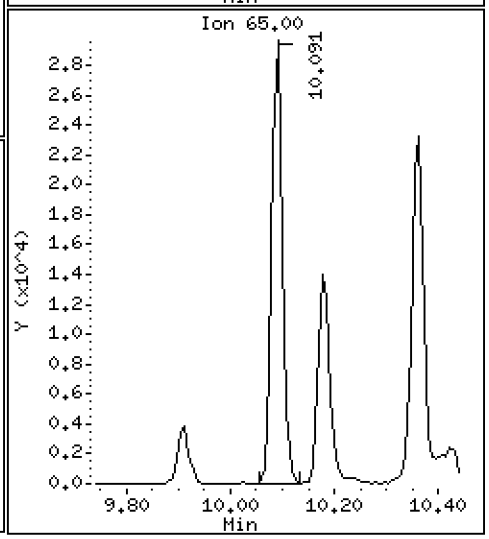


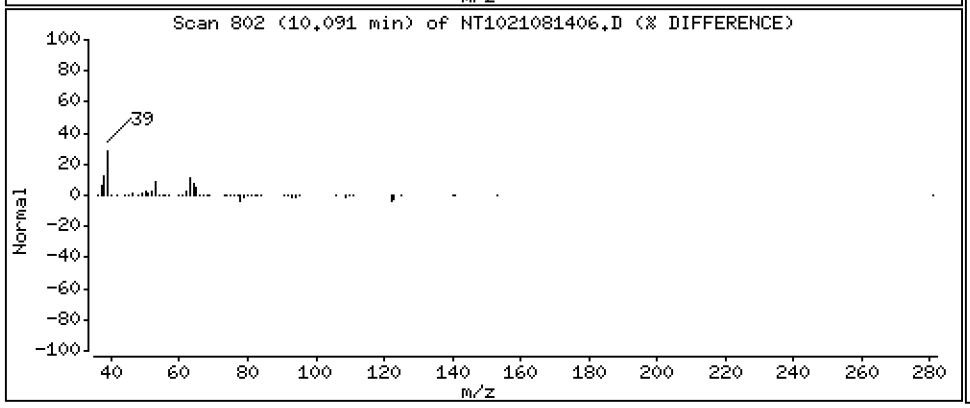












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

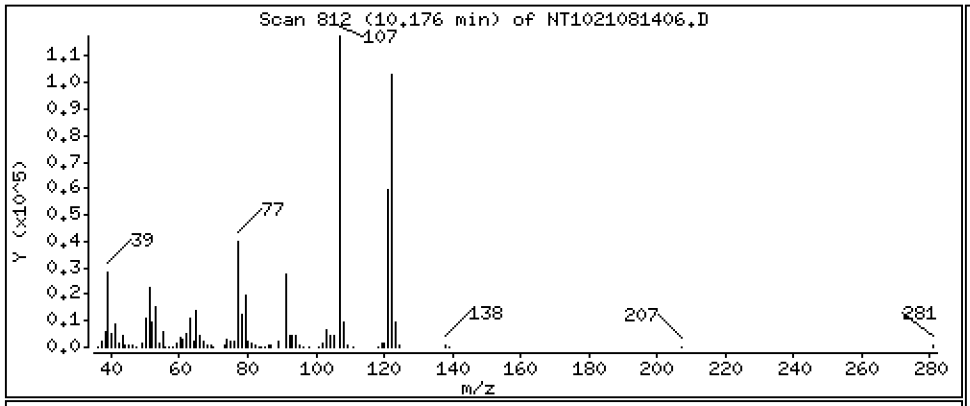
Operator: VTS

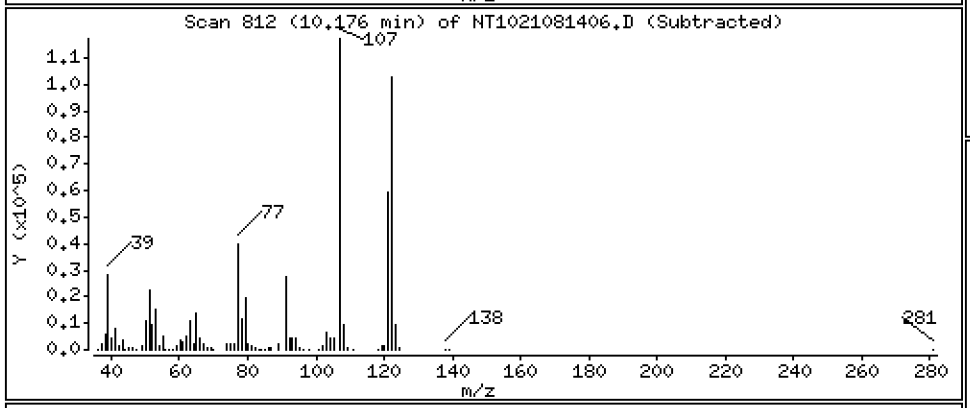
Column phase: ZB-5msi

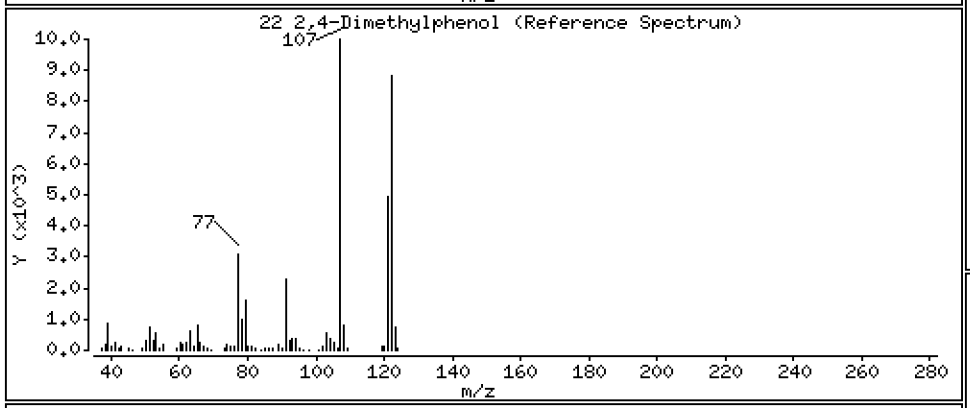
Column diameter: 0.25

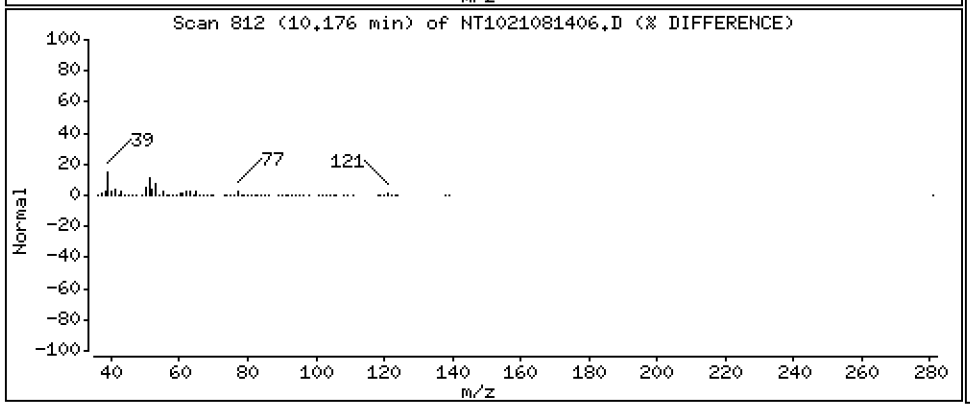
22 2,4-Dimethylphenol

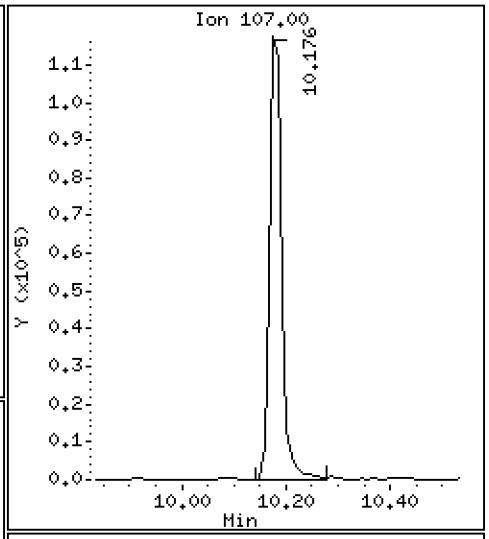
Concentration: 6.656 ug/mL

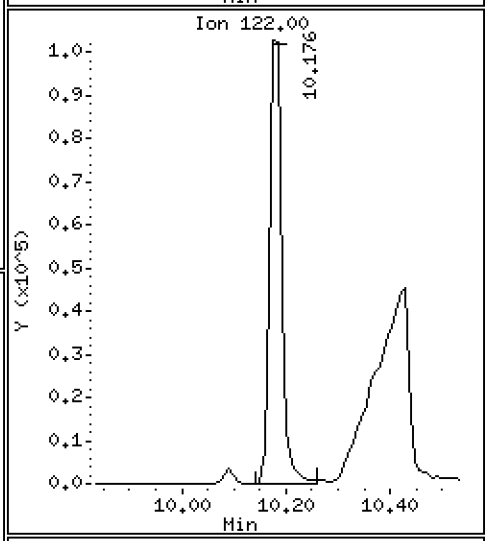


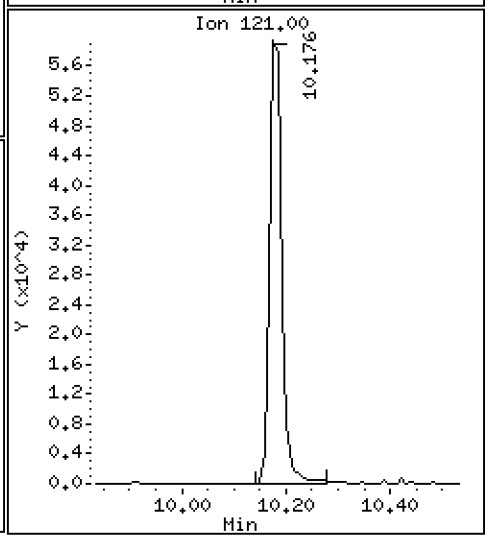












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

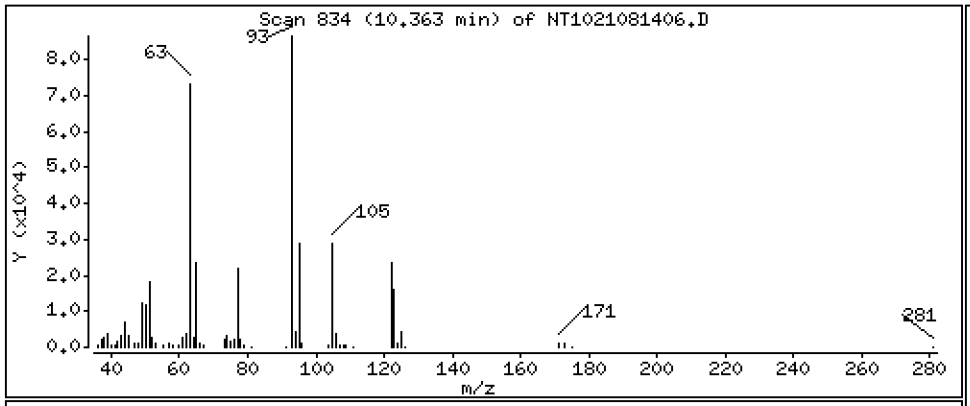
Operator: VTS

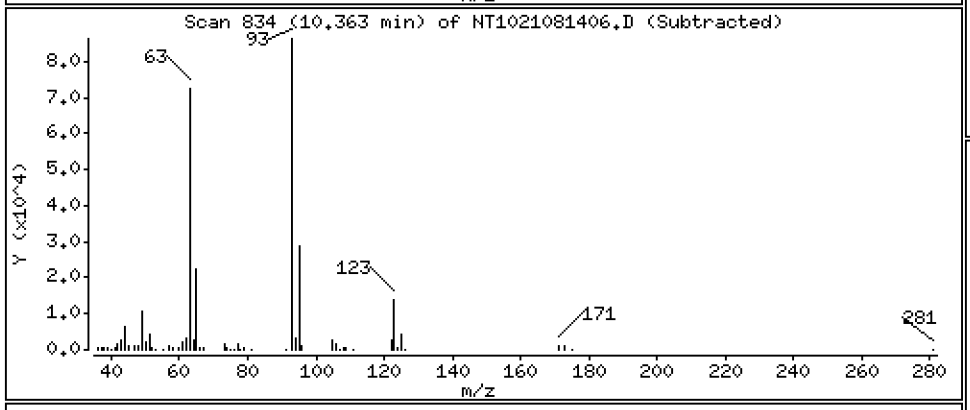
Column phase: ZB-5msi

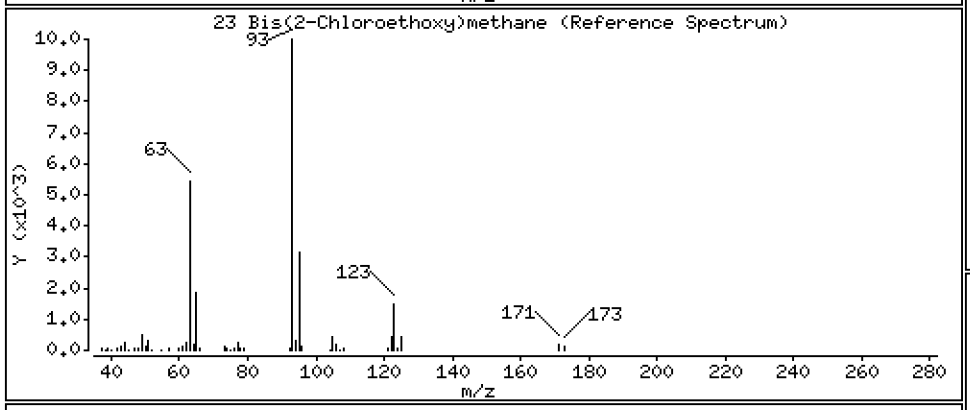
Column diameter: 0.25

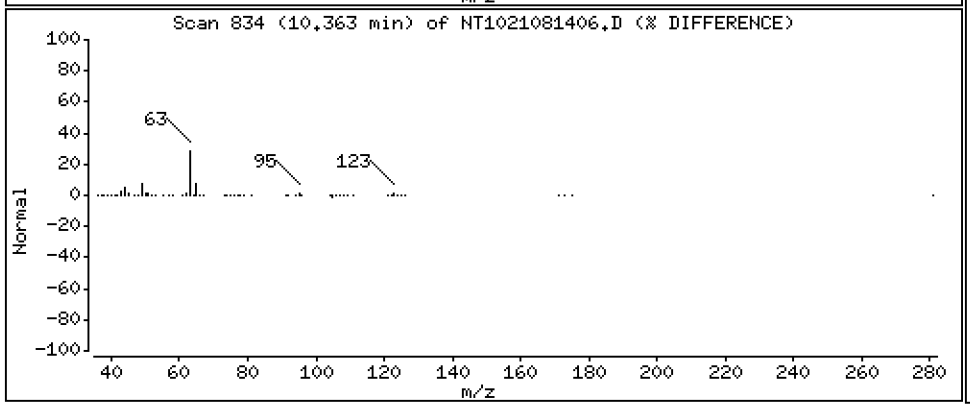
23 Bis(2-Chloroethoxy)methane

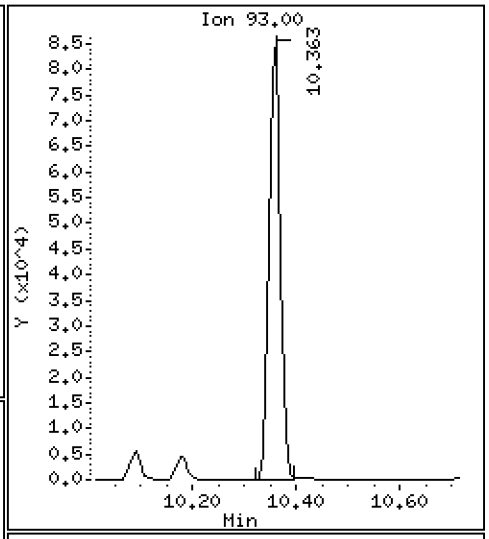
Concentration: 3.655 ug/mL

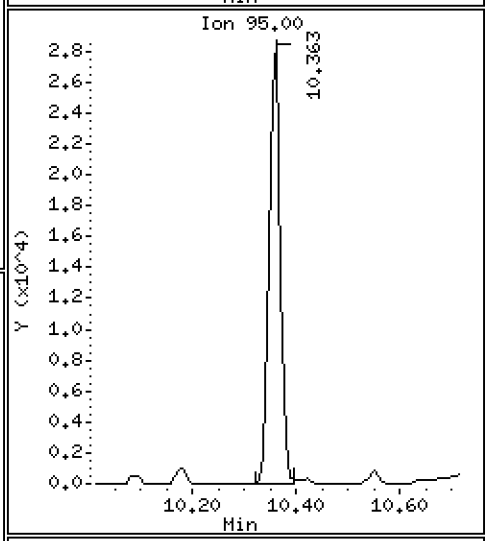


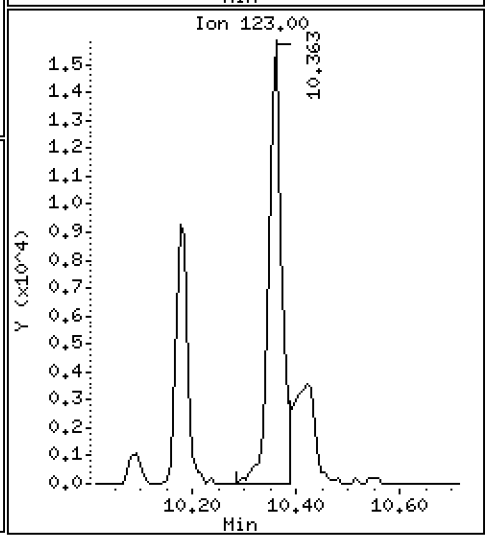












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

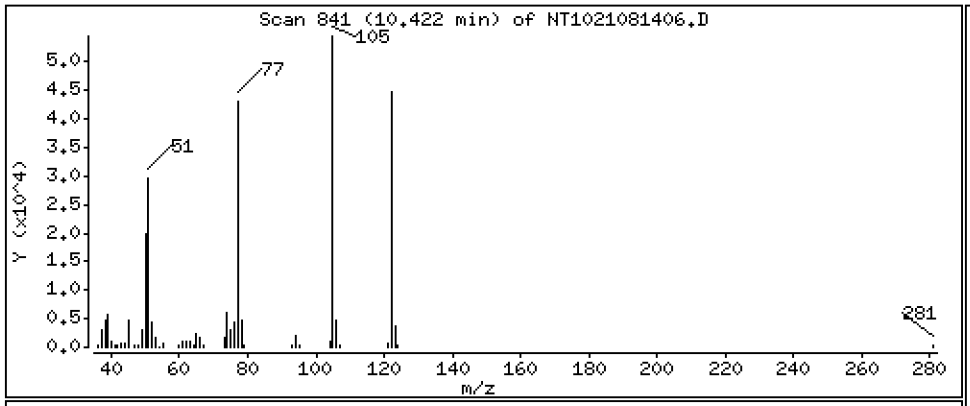
Operator: VTS

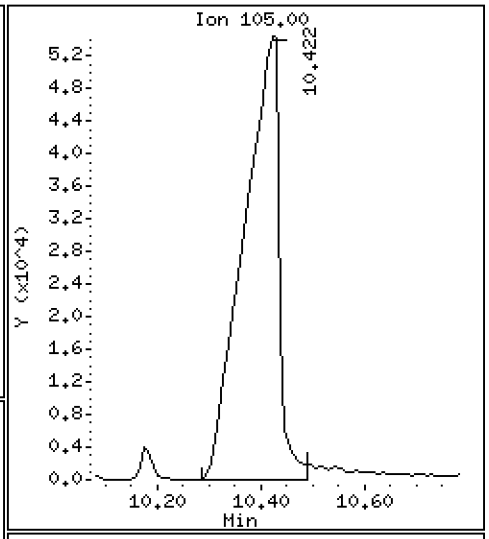
Column phase: ZB-5msi

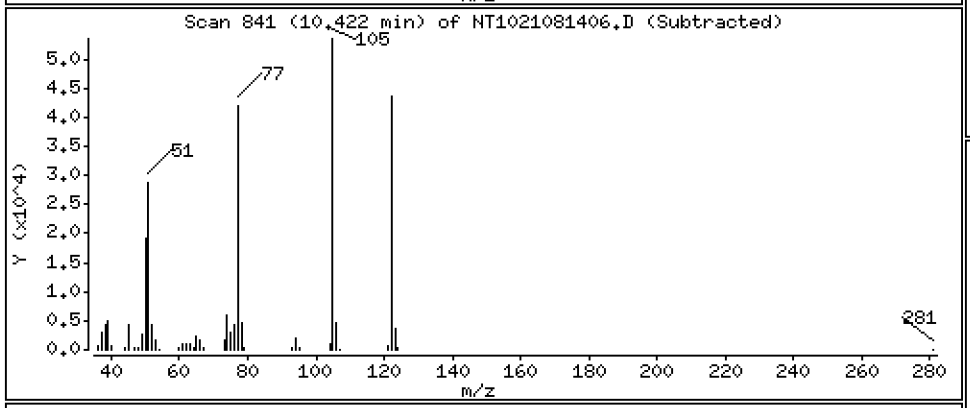
Column diameter: 0.25

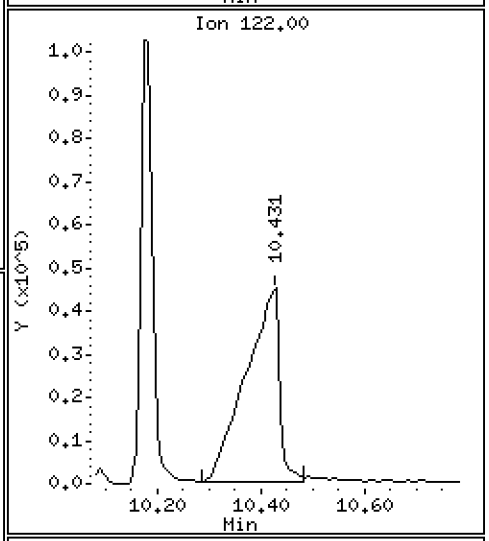
24 Benzoic acid

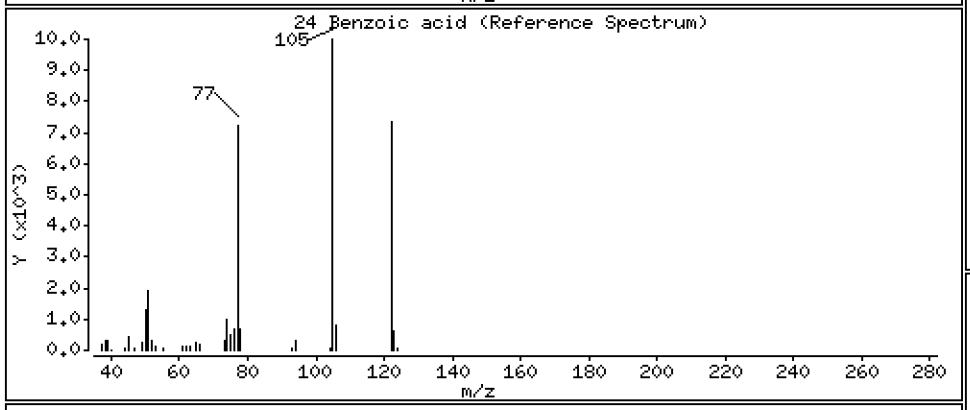
Concentration: 16.20 ug/mL

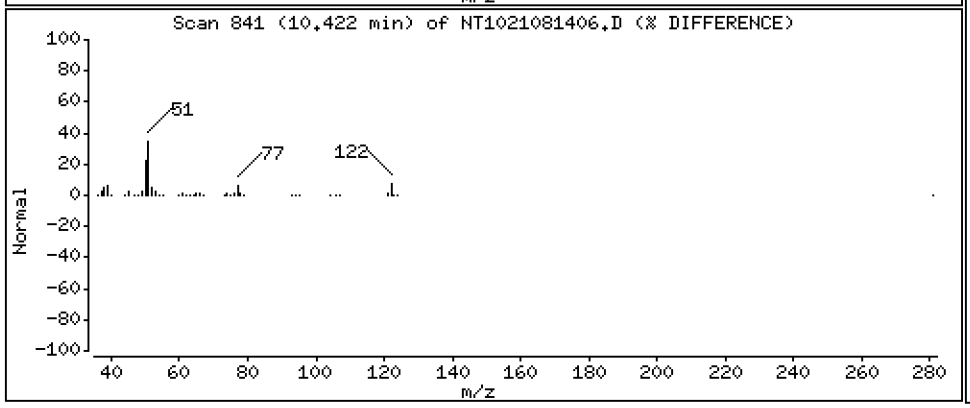


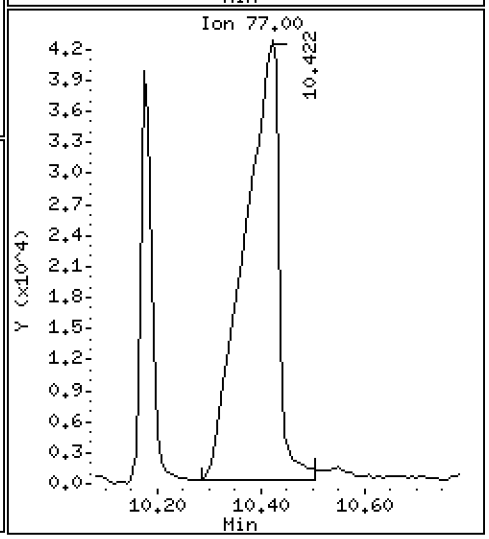












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

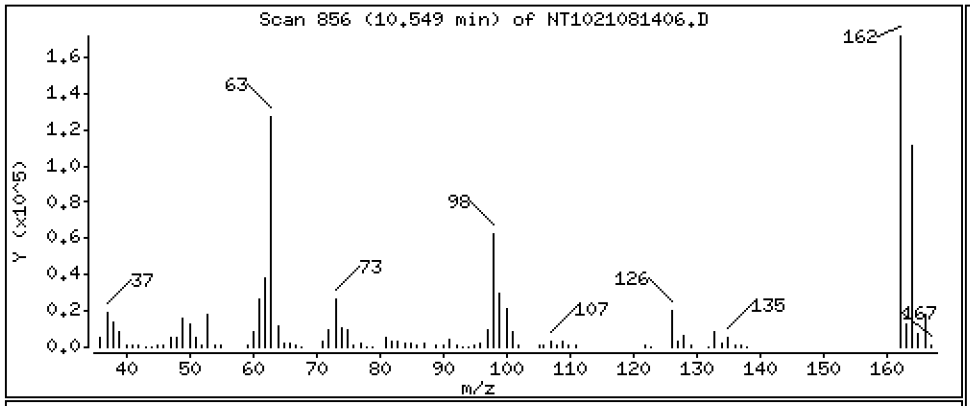
Operator: VTS

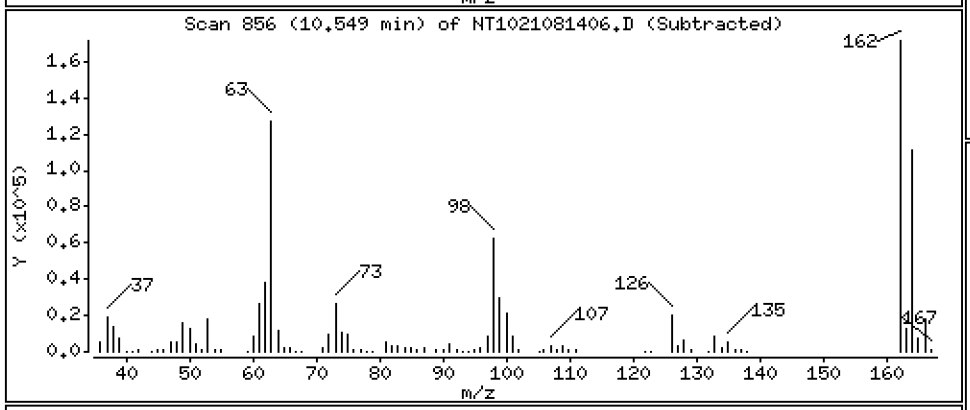
Column phase: ZB-5msi

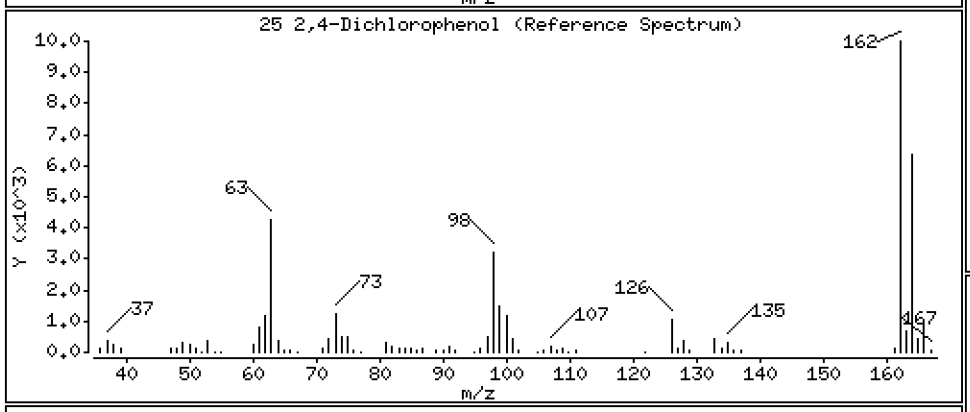
Column diameter: 0.25

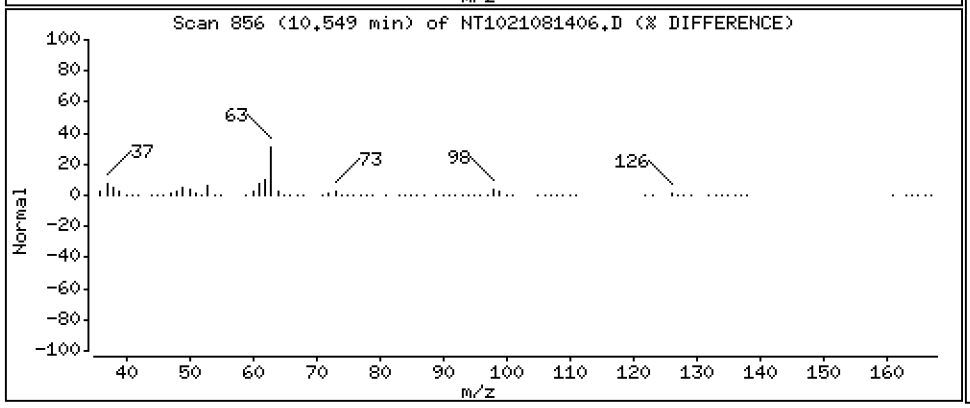
25 2,4-Dichlorophenol

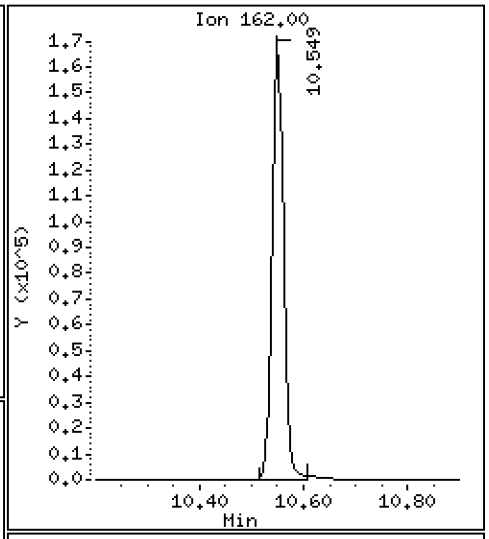
Concentration: 10.97 ug/mL

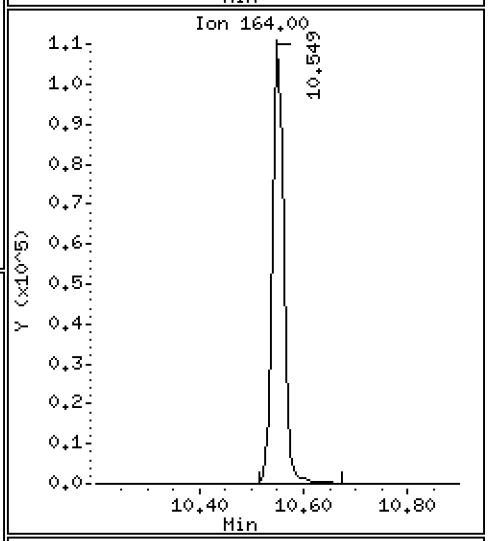


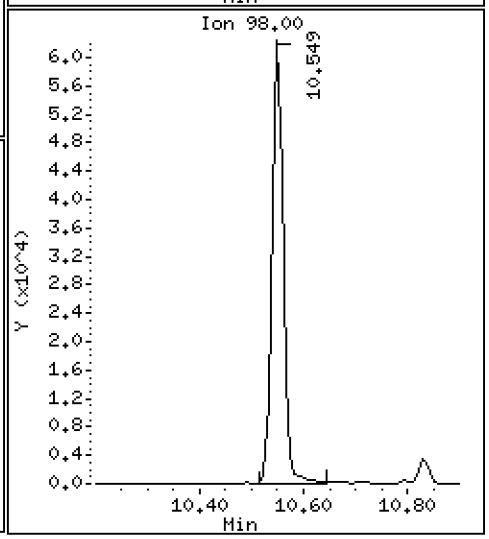












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

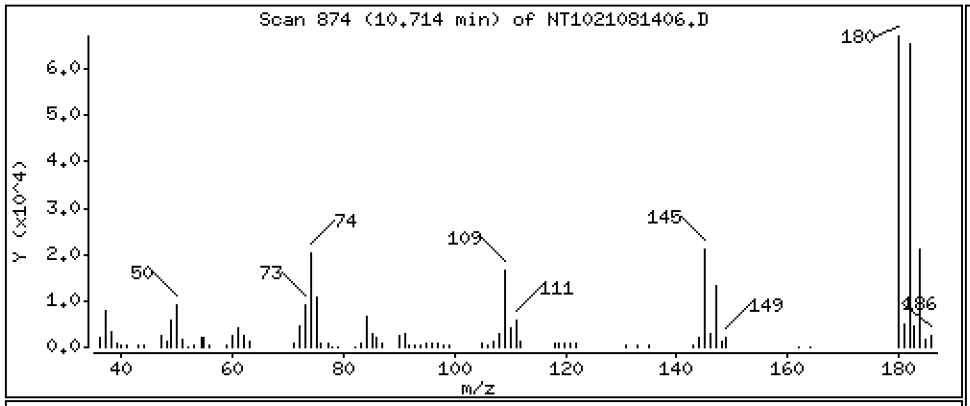
Operator: VTS

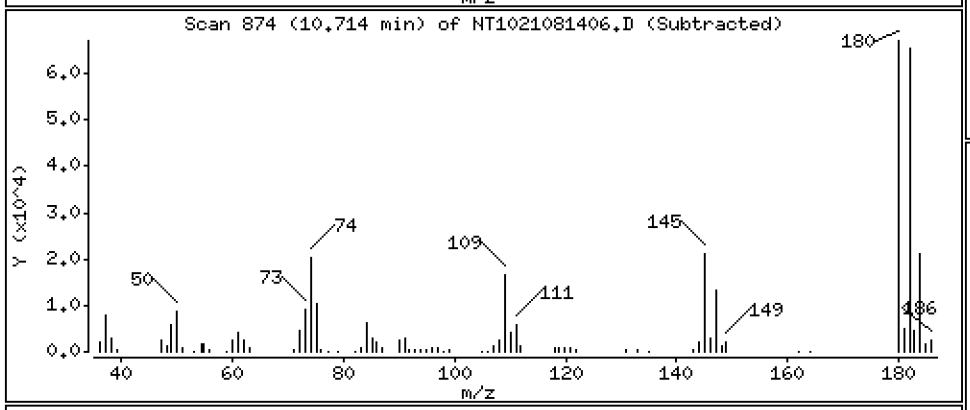
Column phase: ZB-5msi

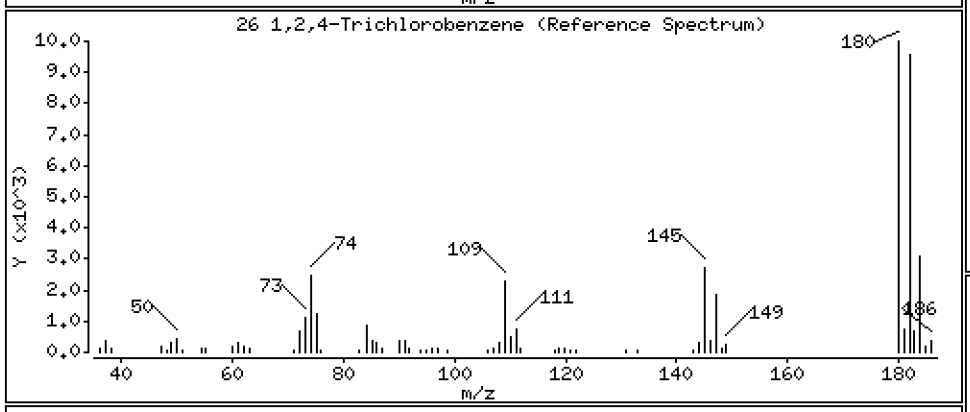
Column diameter: 0.25

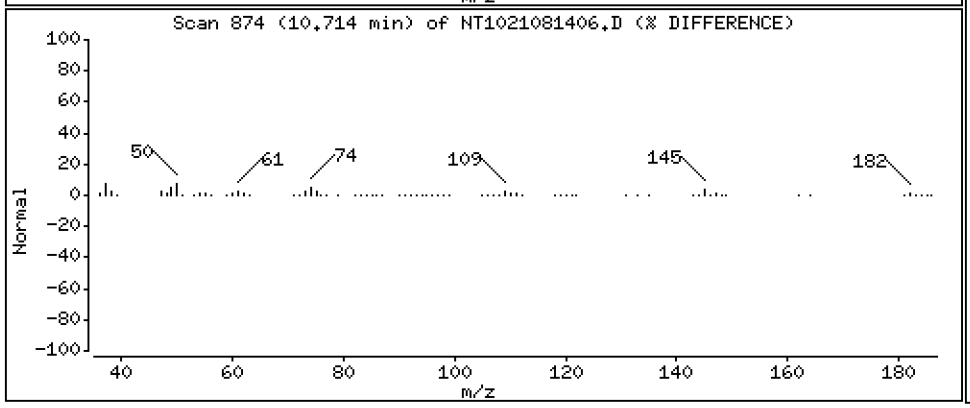
26 1,2,4-Trichlorobenzene

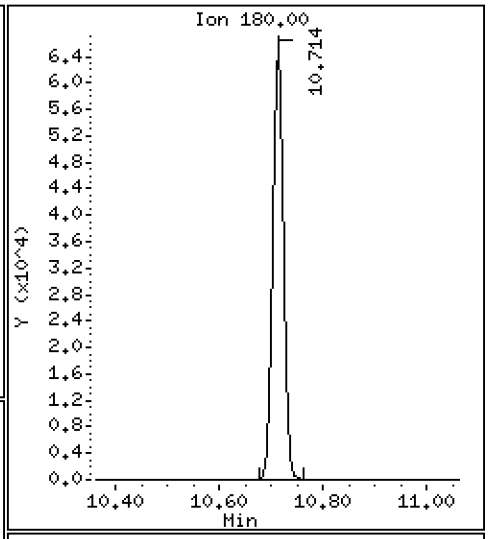
Concentration: 3.721 ug/mL

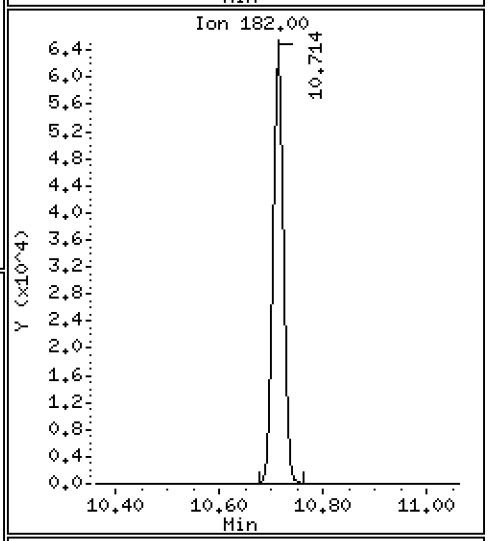


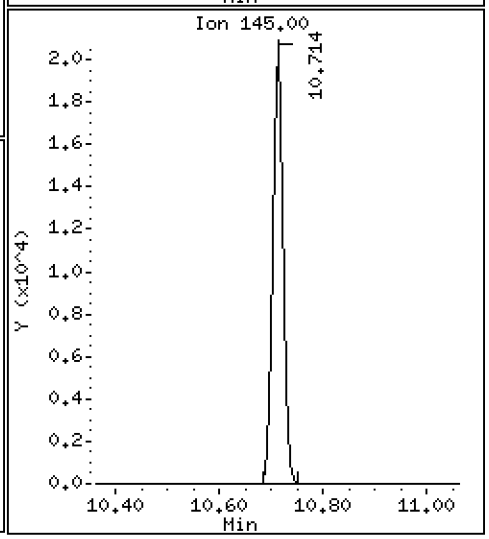












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

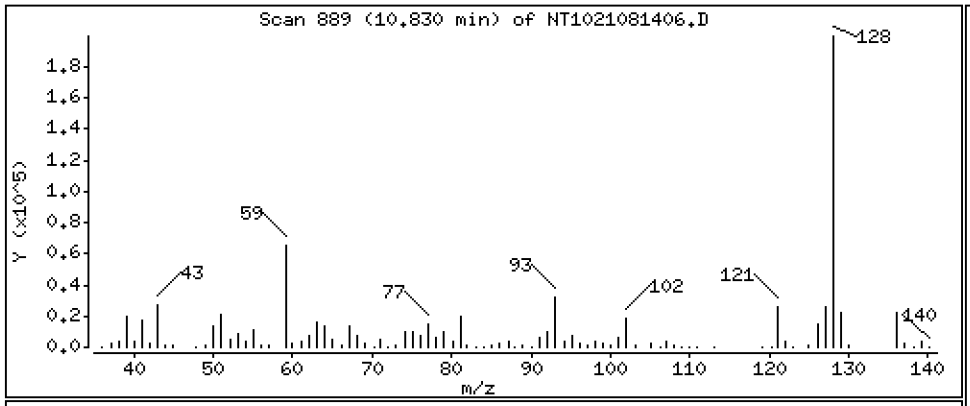
Operator: VTS

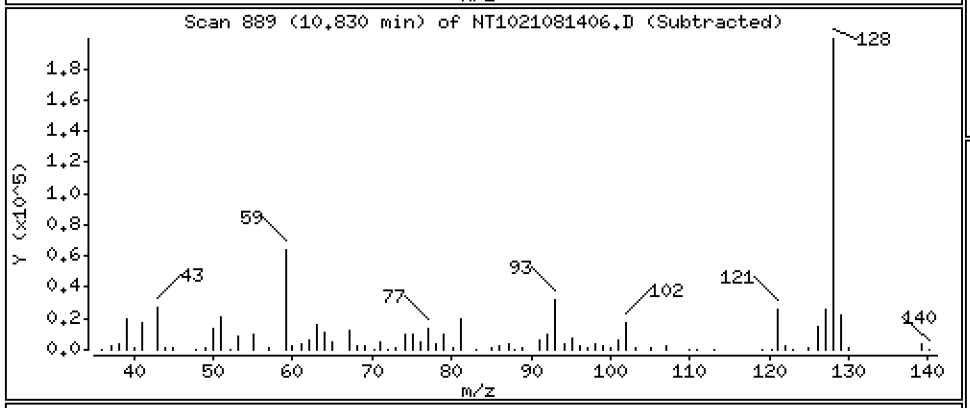
Column phase: ZB-5msi

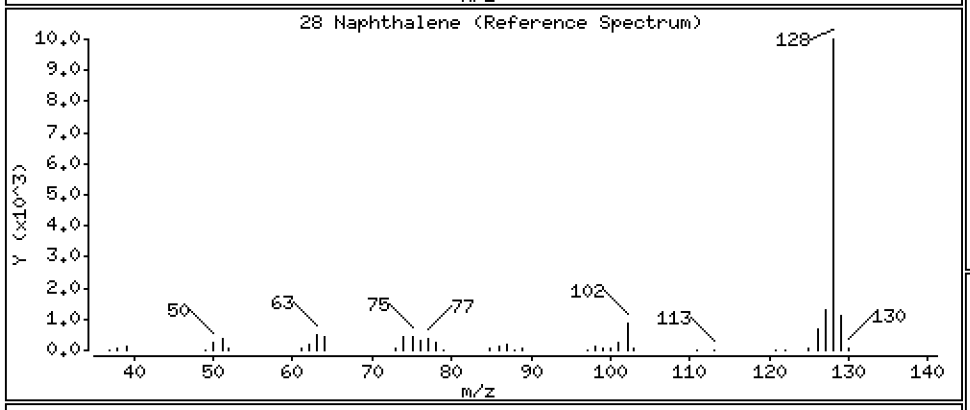
Column diameter: 0.25

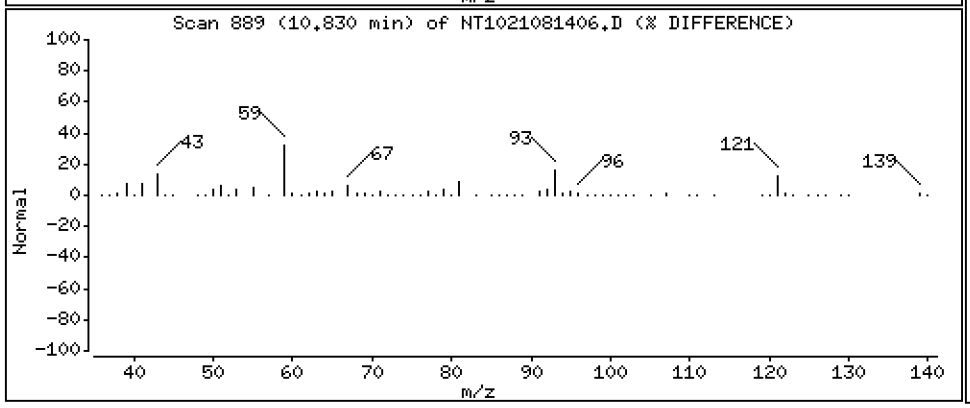
28 Naphthalene

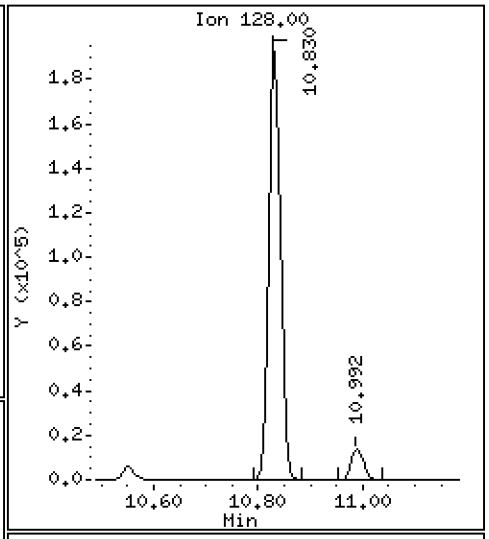
Concentration: 3.686 ug/mL

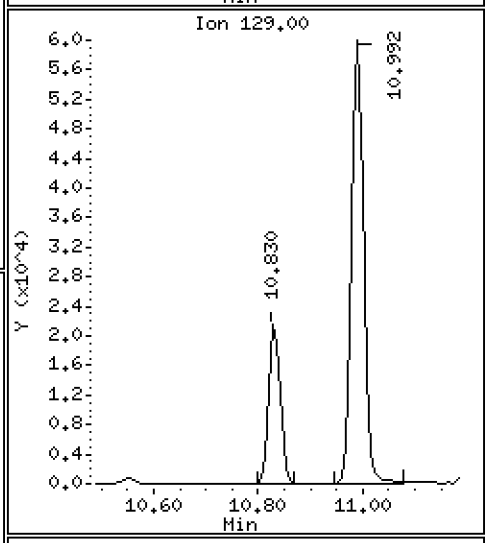


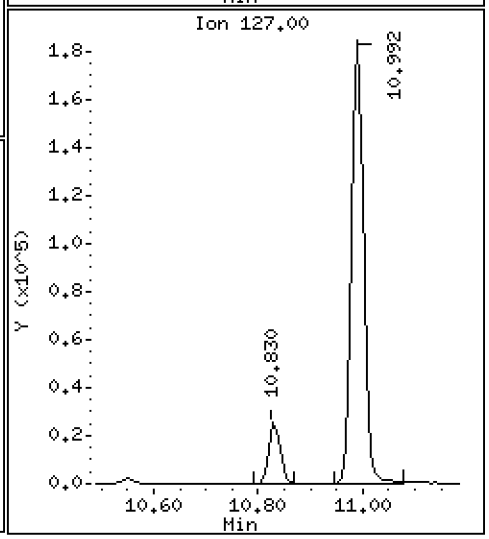












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

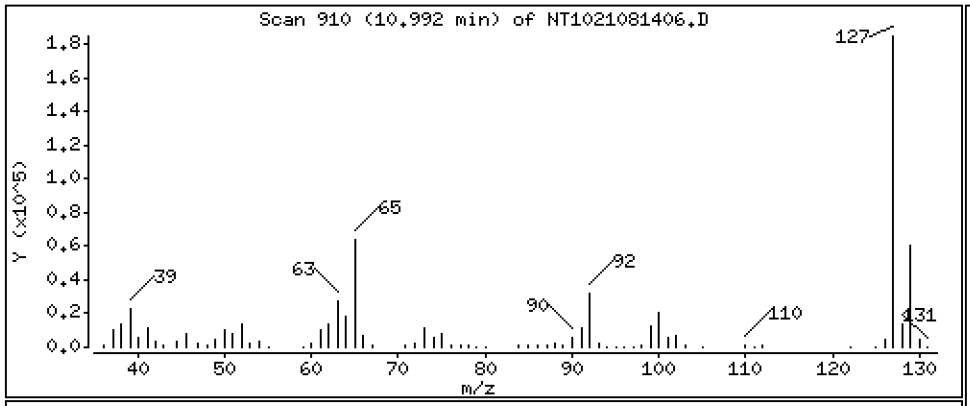
Operator: VTS

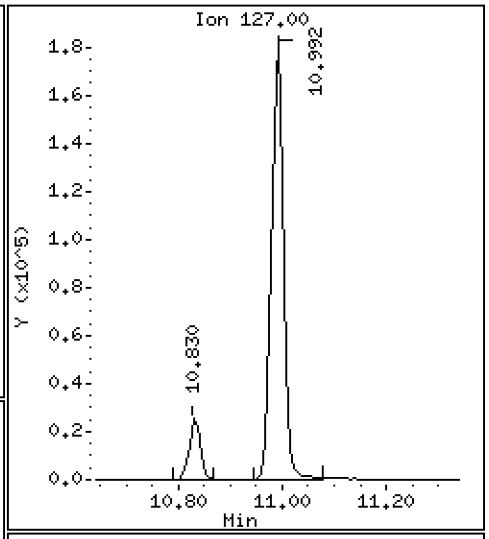
Column phase: ZB-5msi

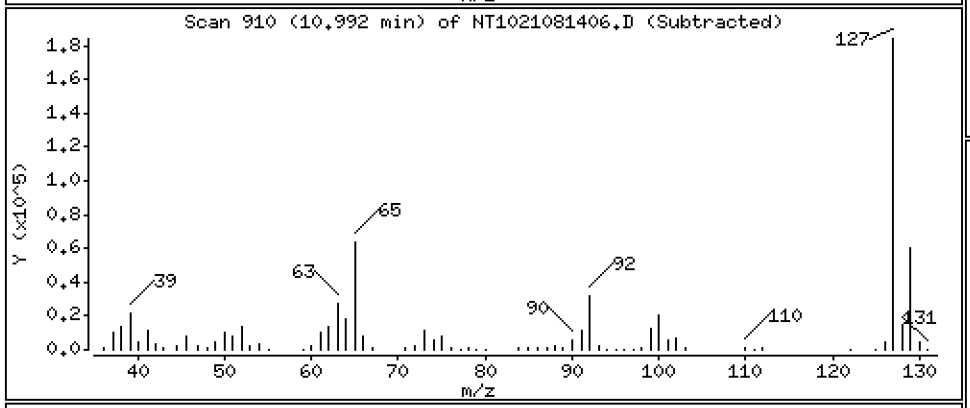
Column diameter: 0.25

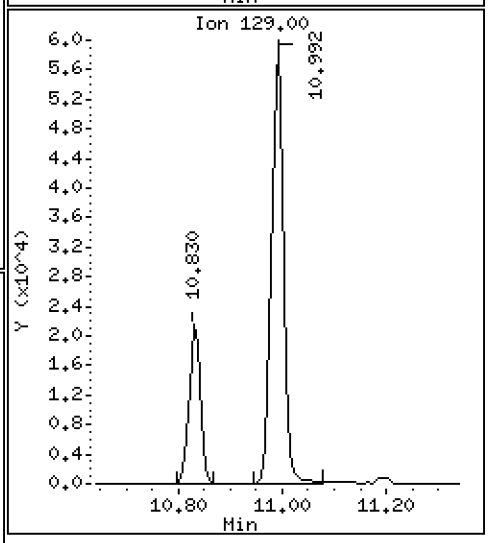
29 4-Chloroaniline

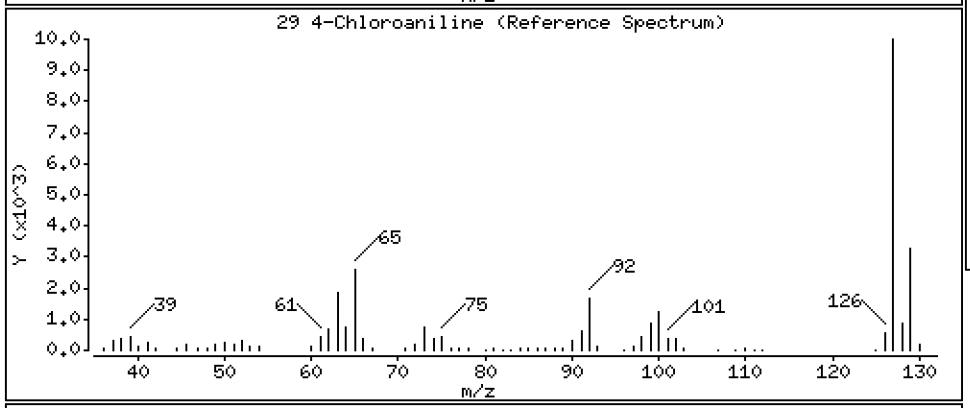
Concentration: 7.222 ug/mL

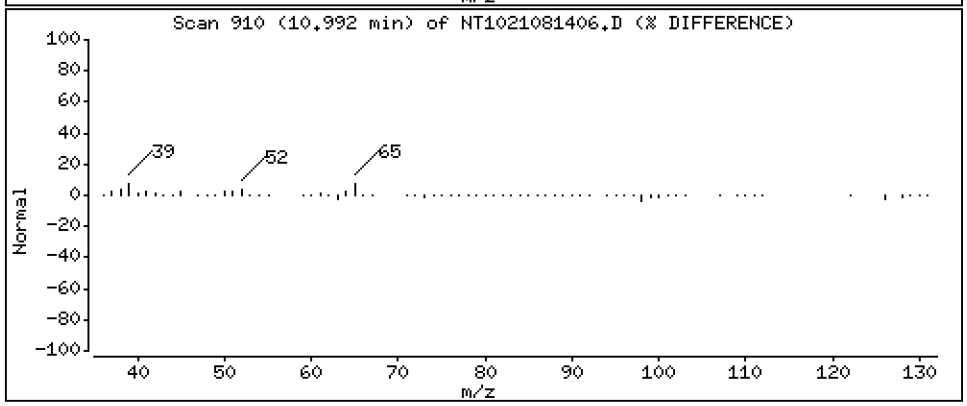












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

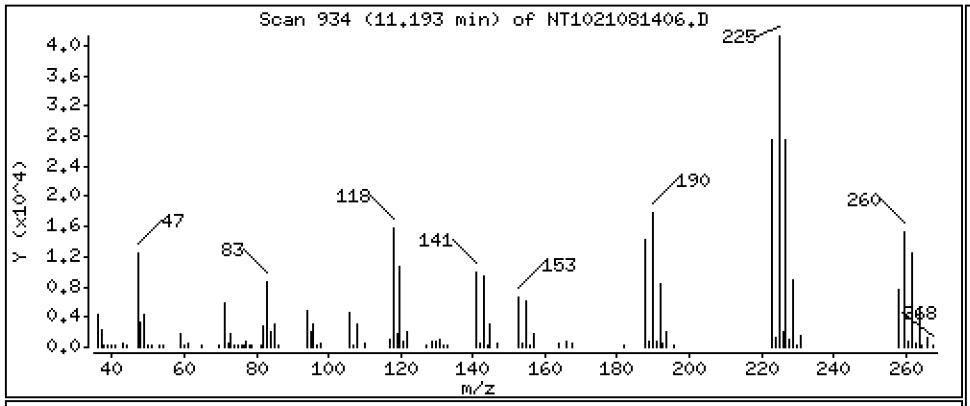
Operator: VTS

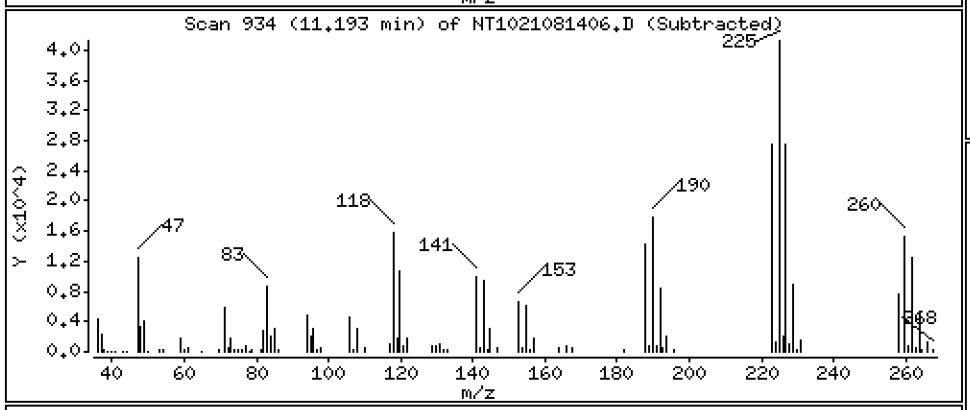
Column phase: ZB-5msi

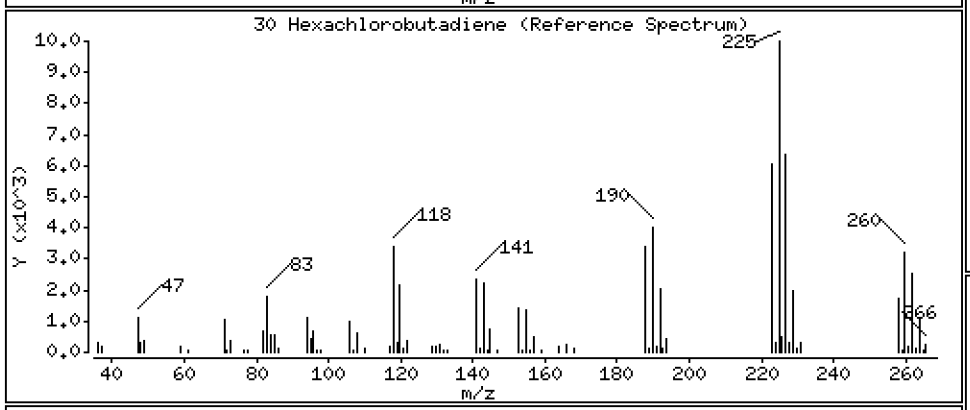
Column diameter: 0.25

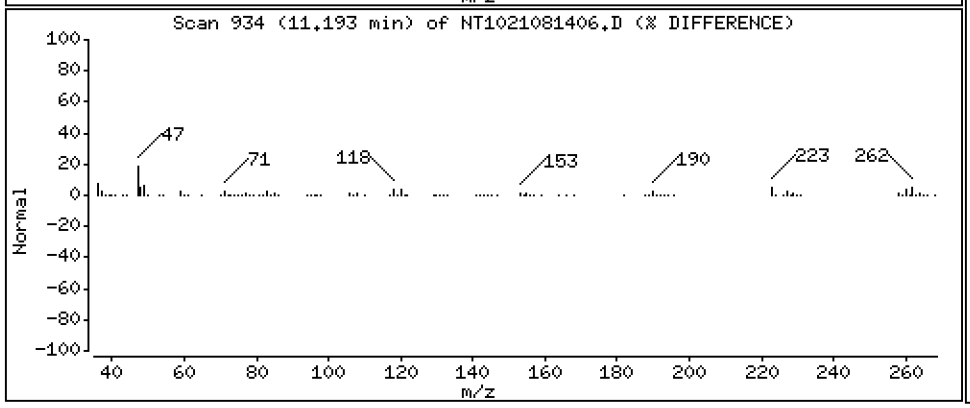
30 Hexachlorobutadiene

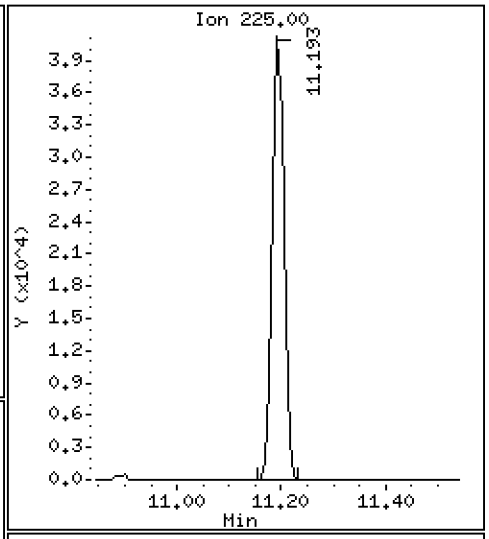
Concentration: 4.210 ug/mL

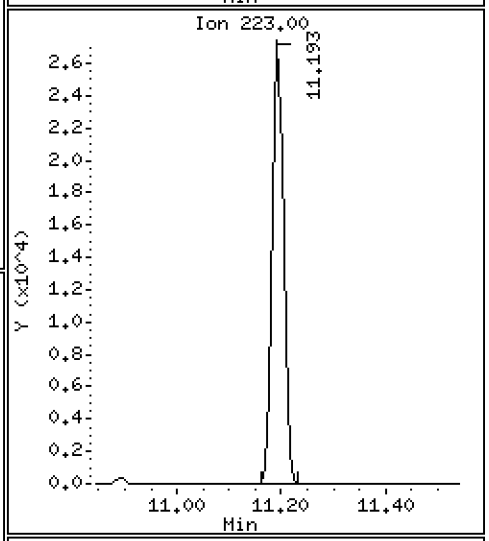


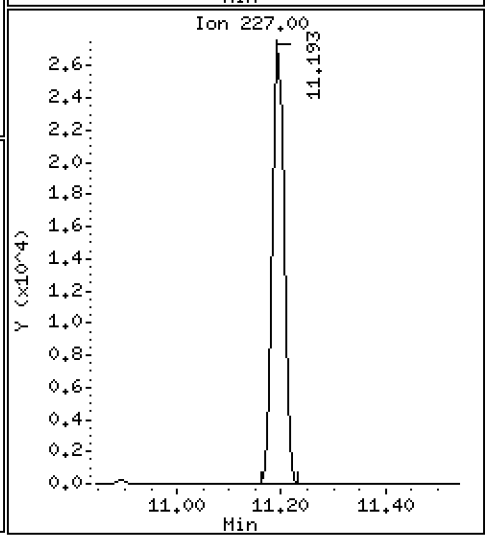












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

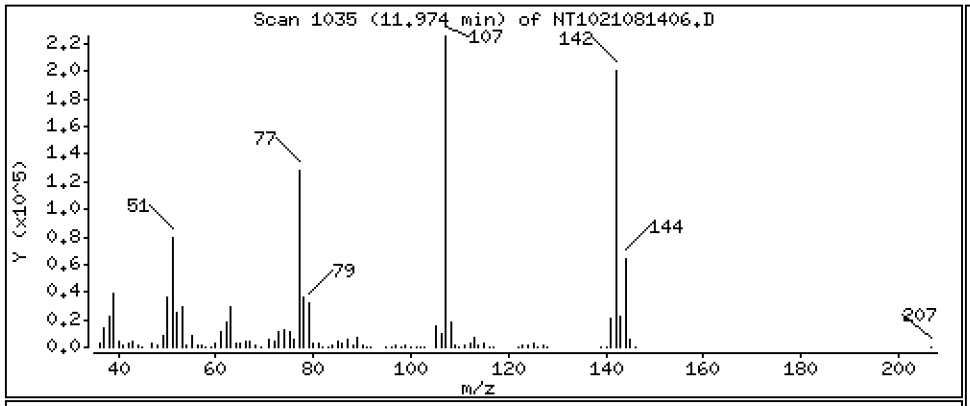
Operator: VTS

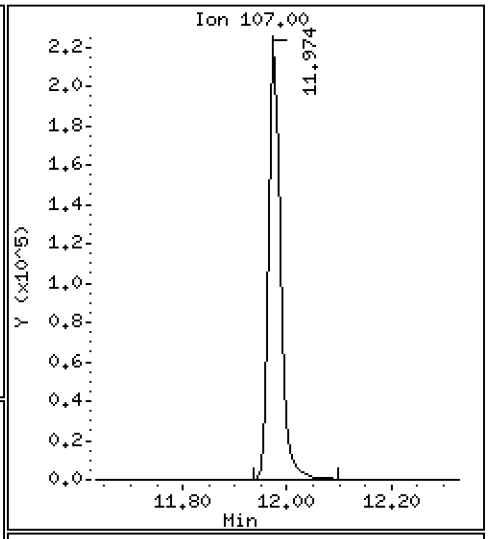
Column phase: ZB-5msi

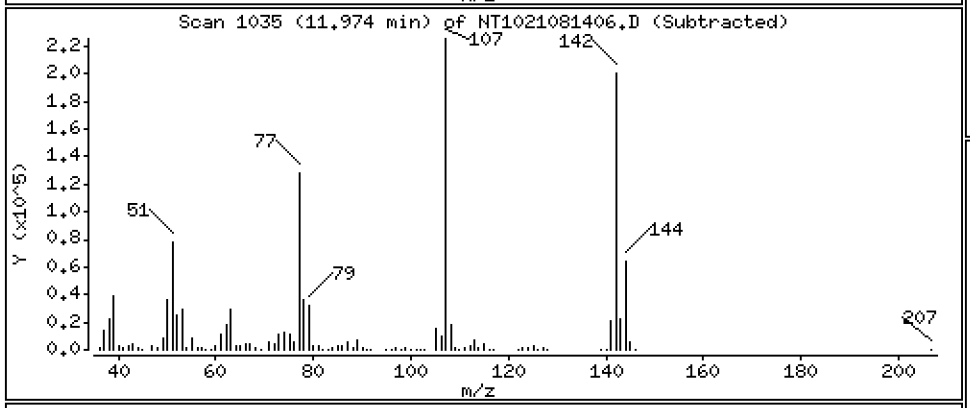
Column diameter: 0.25

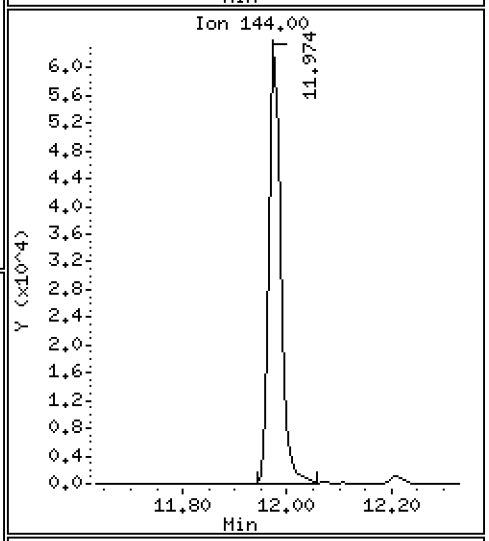
31 4-Chloro-3-methylphenol

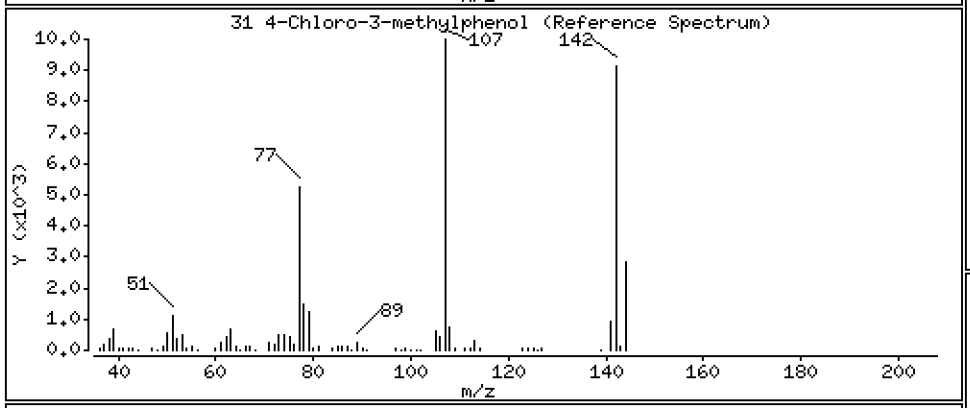
Concentration: 11.80 ug/mL

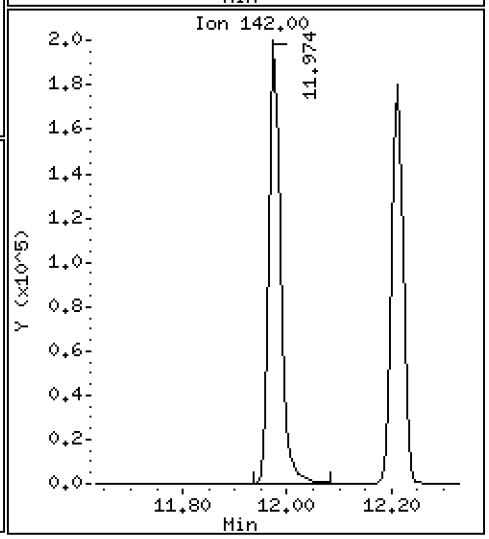


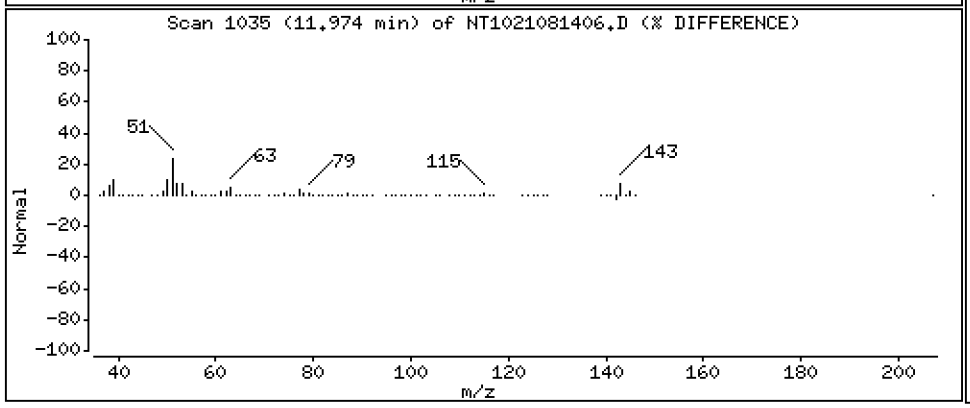












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

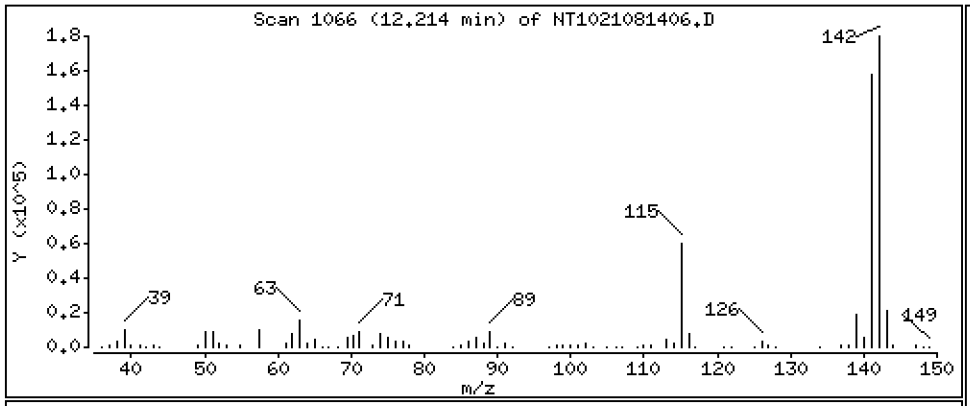
Operator: VTS

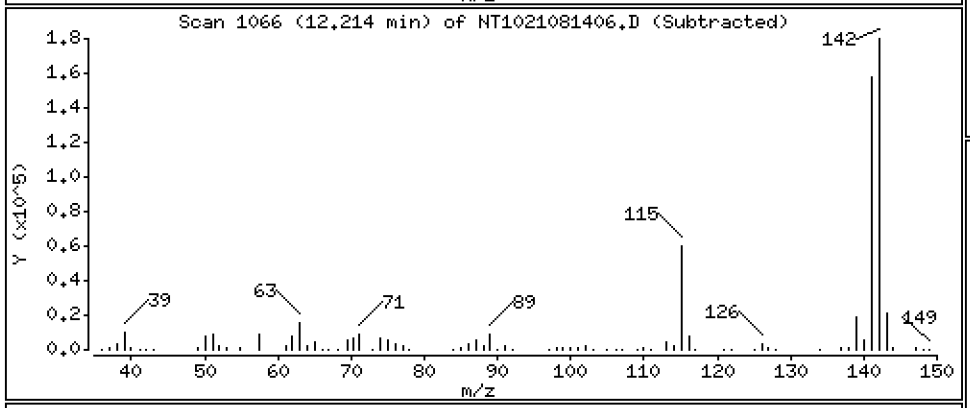
Column phase: ZB-5msi

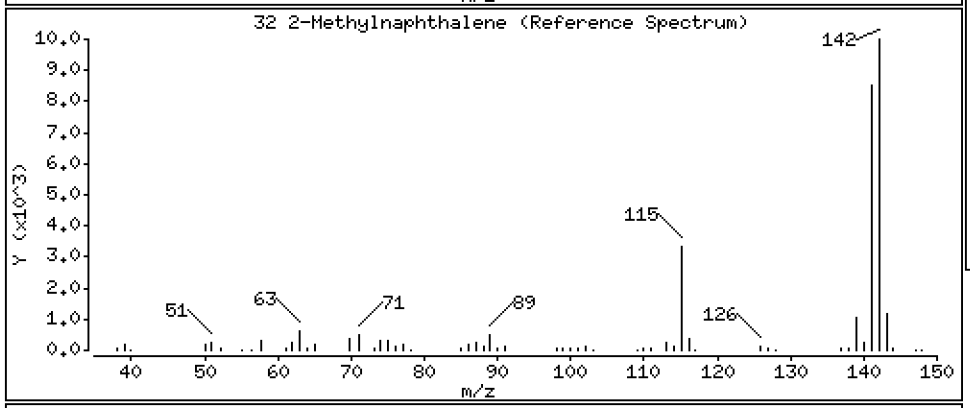
Column diameter: 0.25

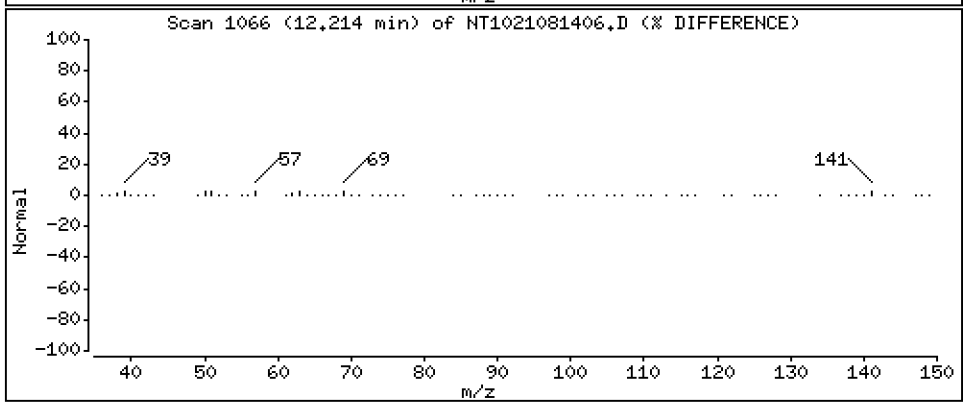
32 2-Methylnaphthalene

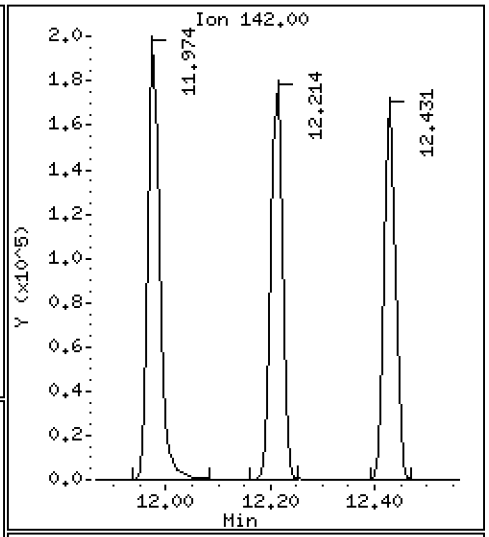
Concentration: 3.604 ug/mL

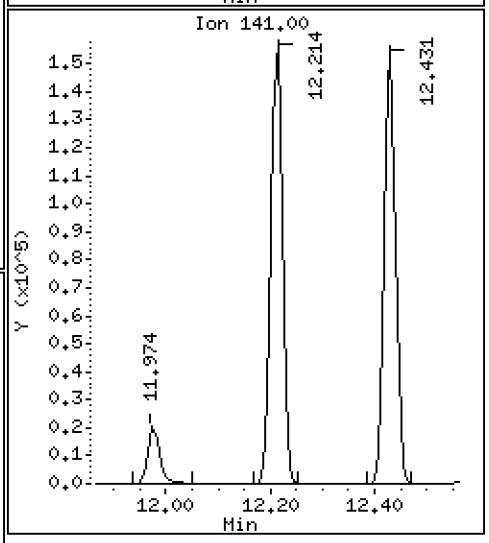












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

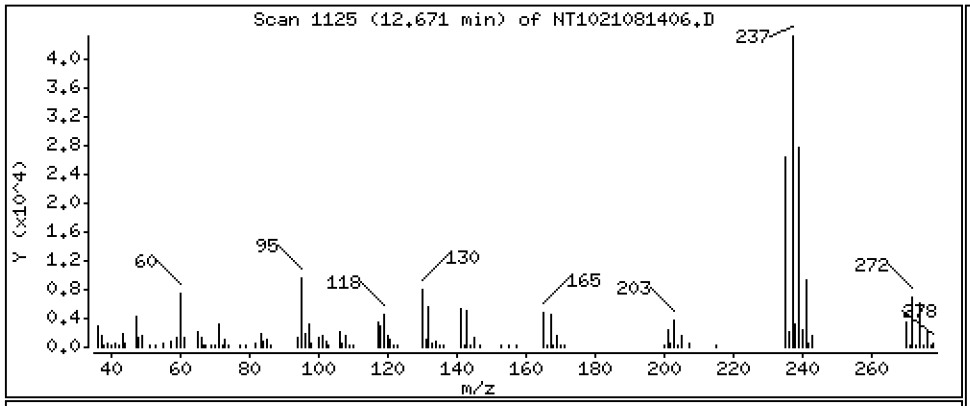
Operator: VTS

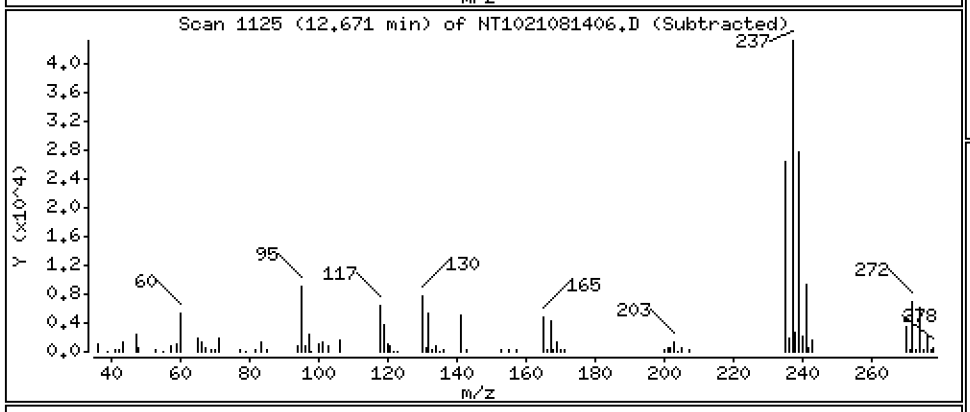
Column phase: ZB-5msi

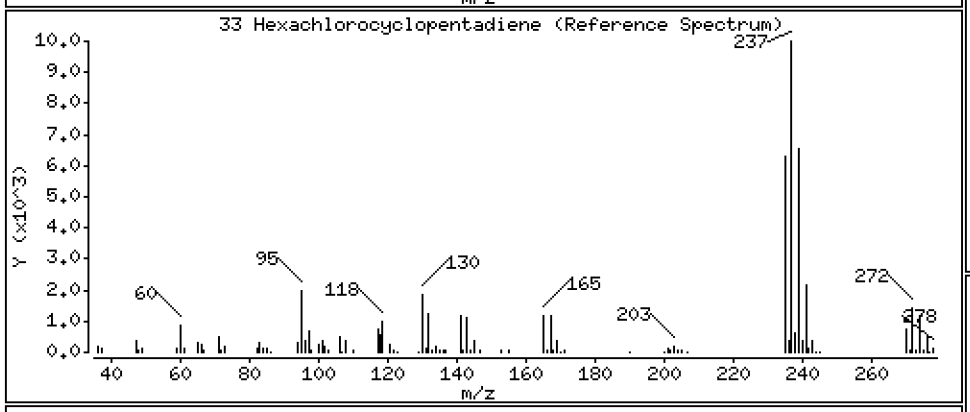
Column diameter: 0.25

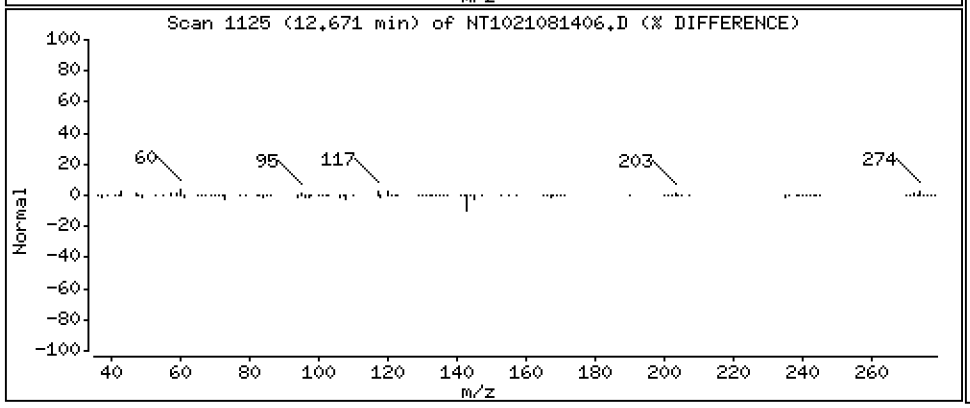
33 Hexachlorocyclopentadiene

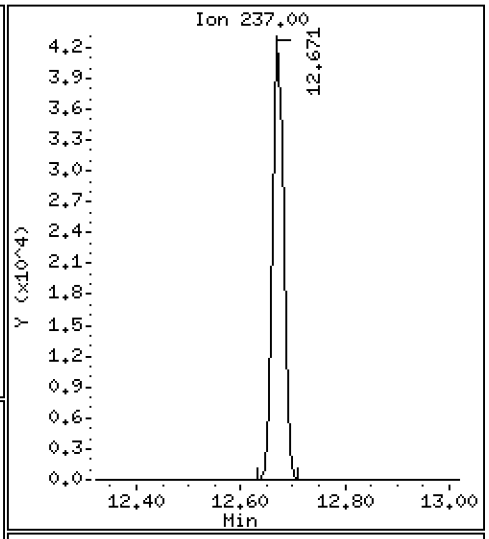
Concentration: 3.255 ug/mL

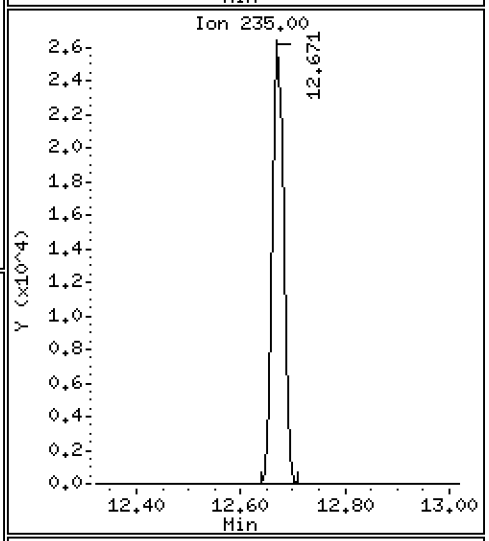


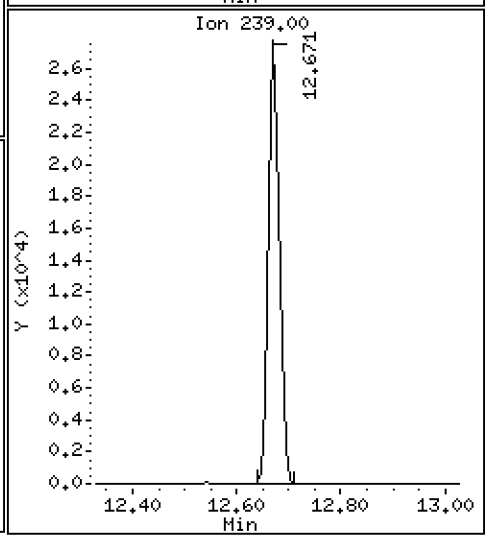












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

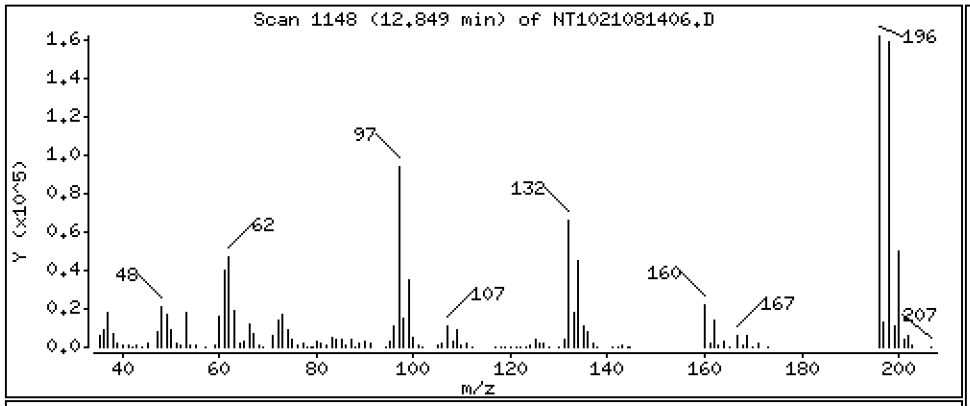
Operator: VTS

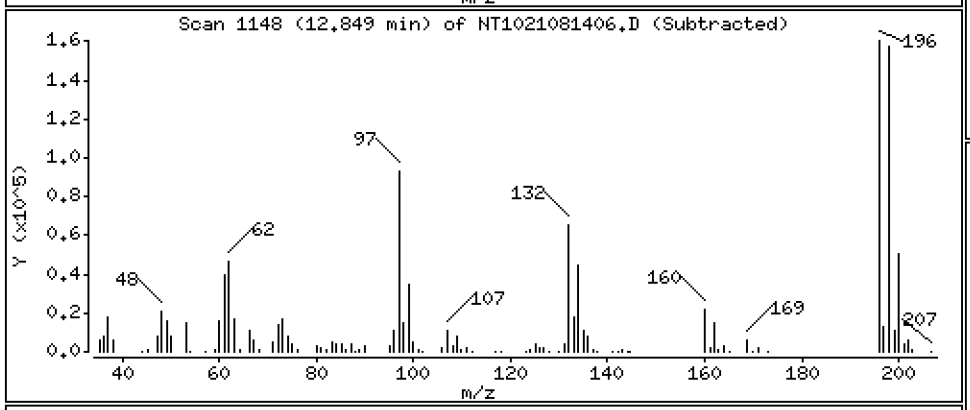
Column phase: ZB-5msi

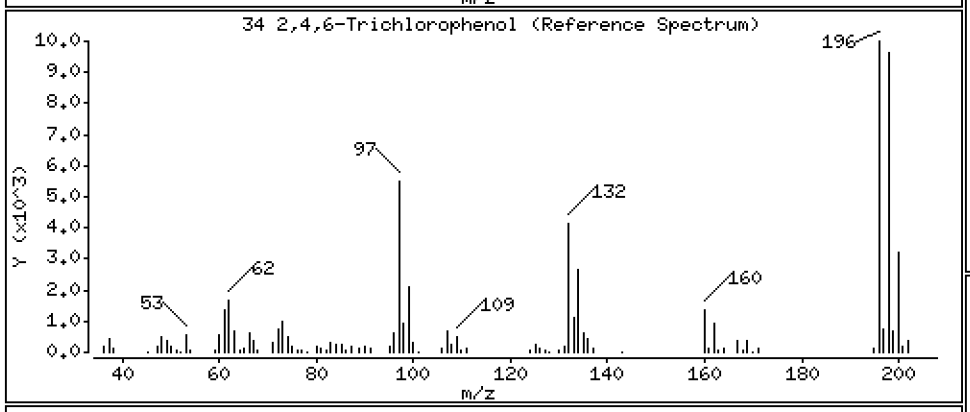
Column diameter: 0.25

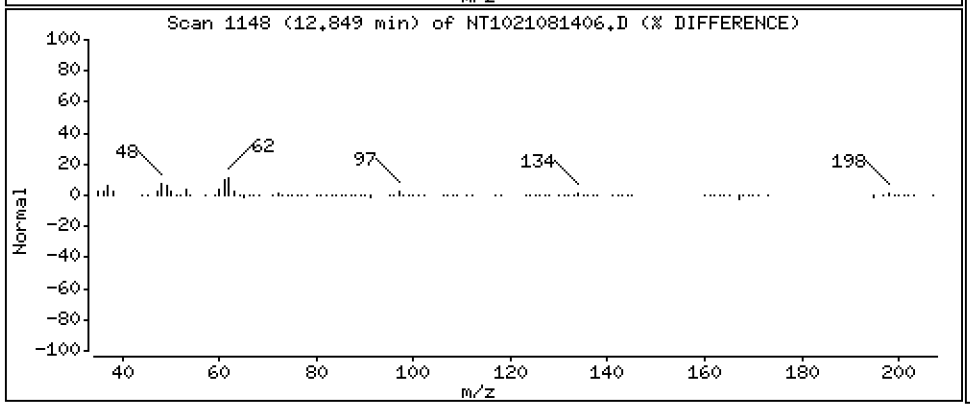
34 2,4,6-Trichlorophenol

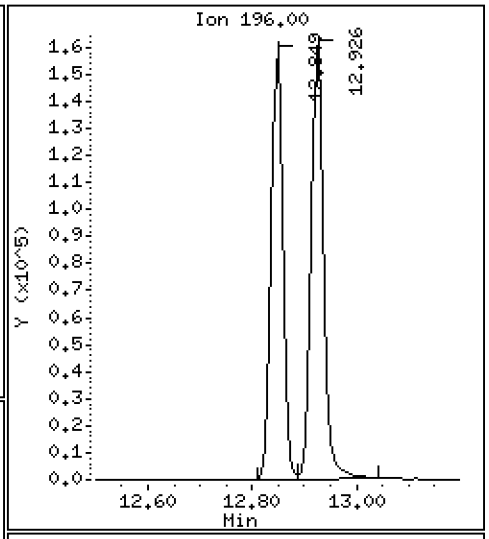
Concentration: 12.41 ug/mL

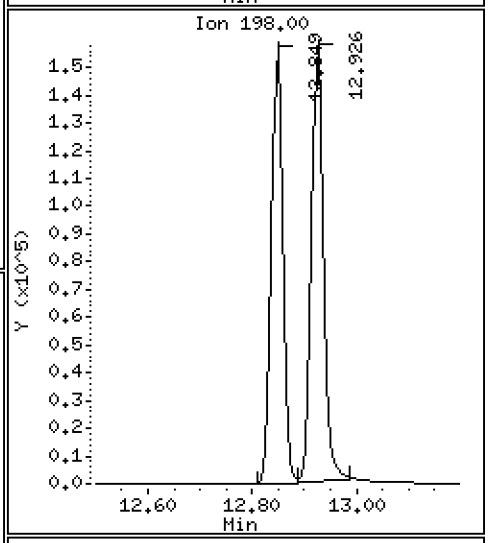


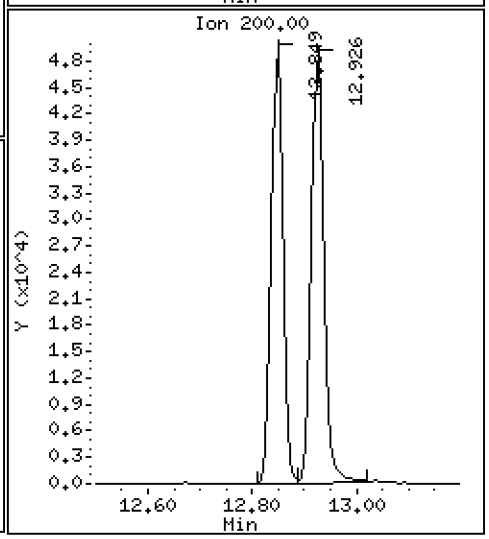












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

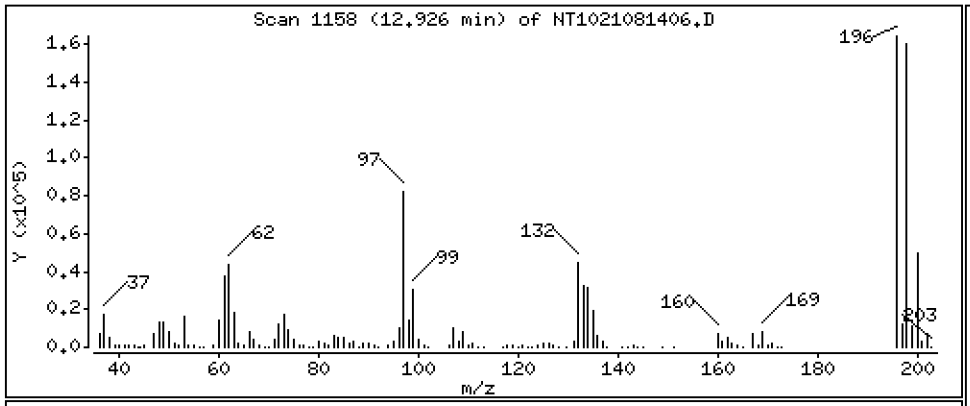
Operator: VTS

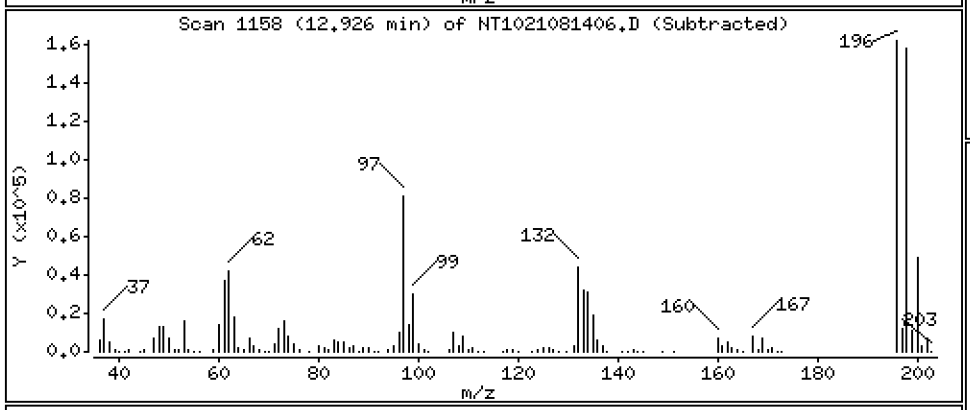
Column phase: ZB-5msi

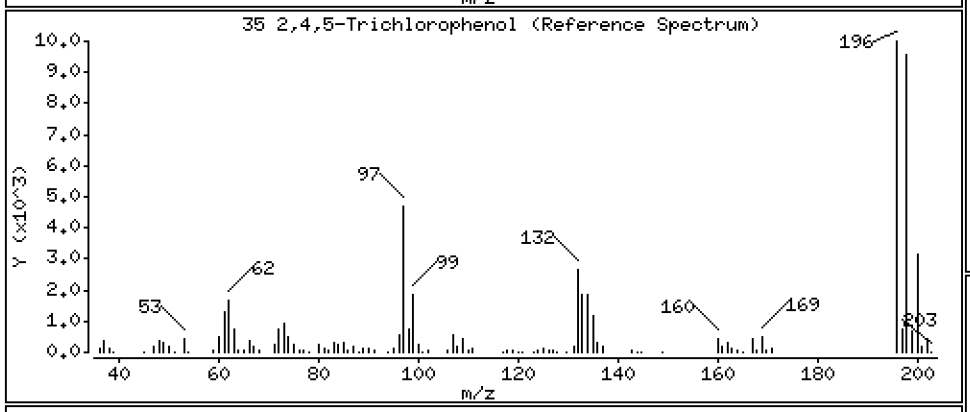
Column diameter: 0.25

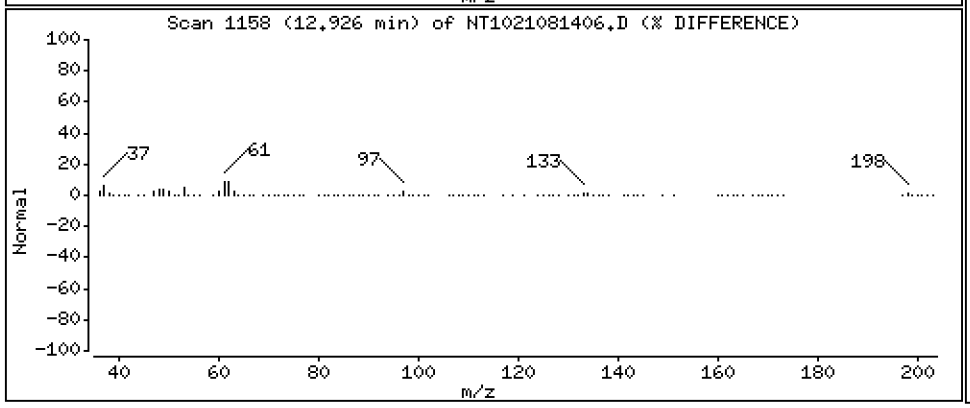
35 2,4,5-Trichlorophenol

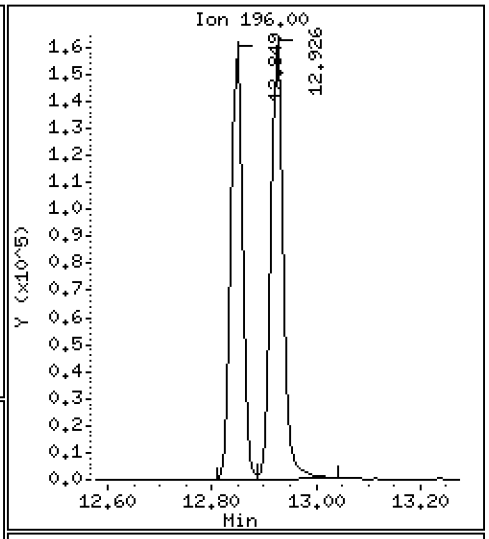
Concentration: 12.43 ug/mL

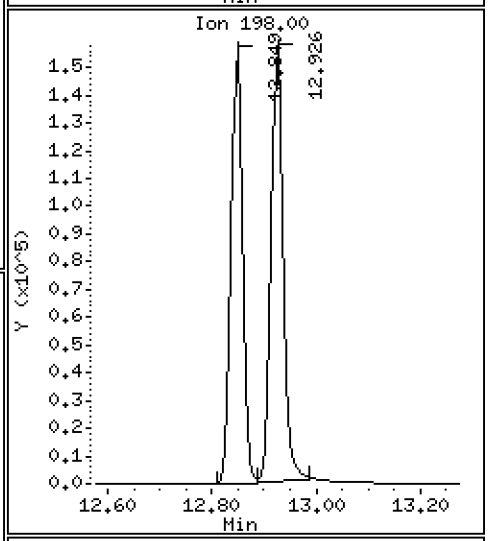


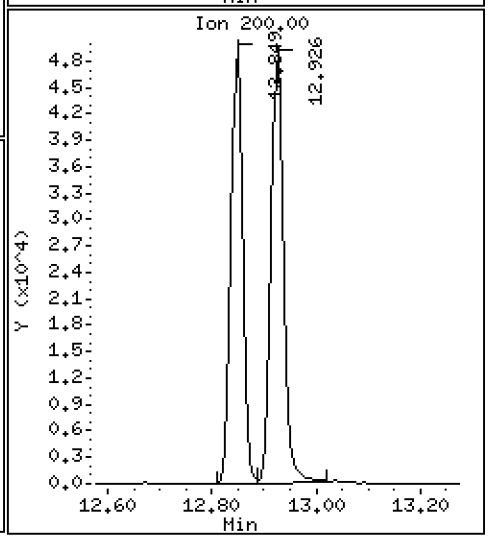












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

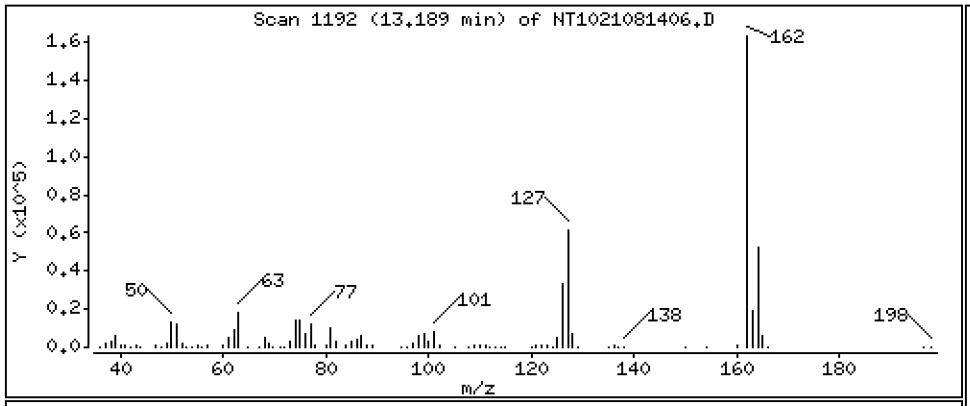
Operator: VTS

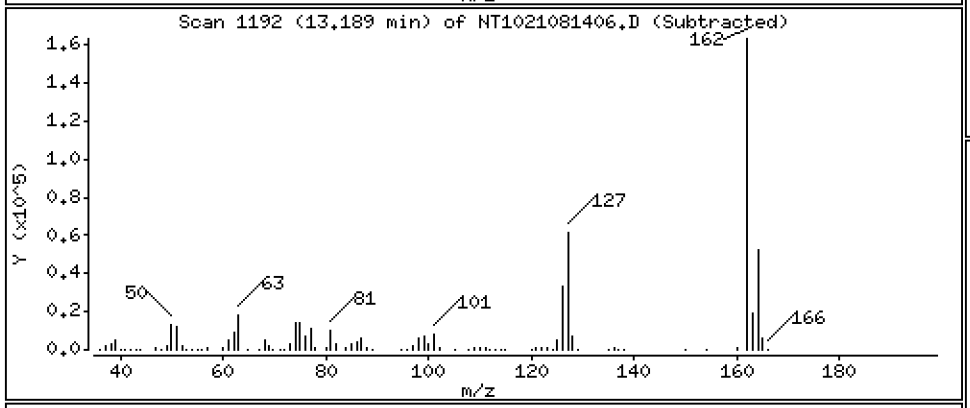
Column phase: ZB-5msi

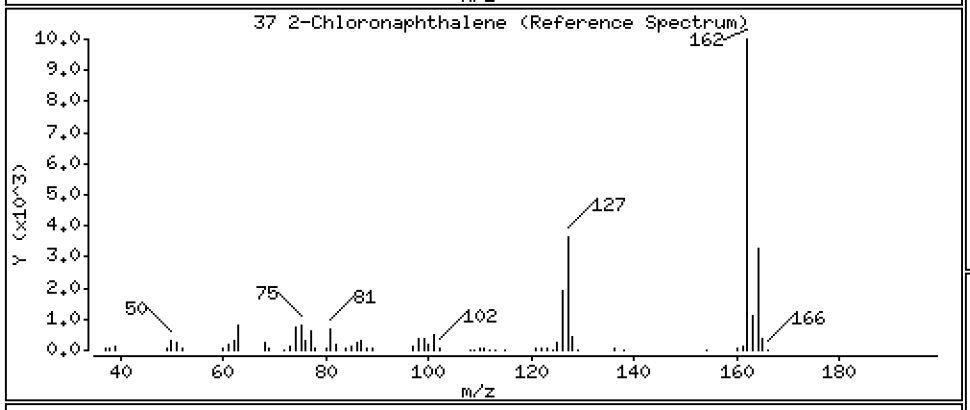
Column diameter: 0.25

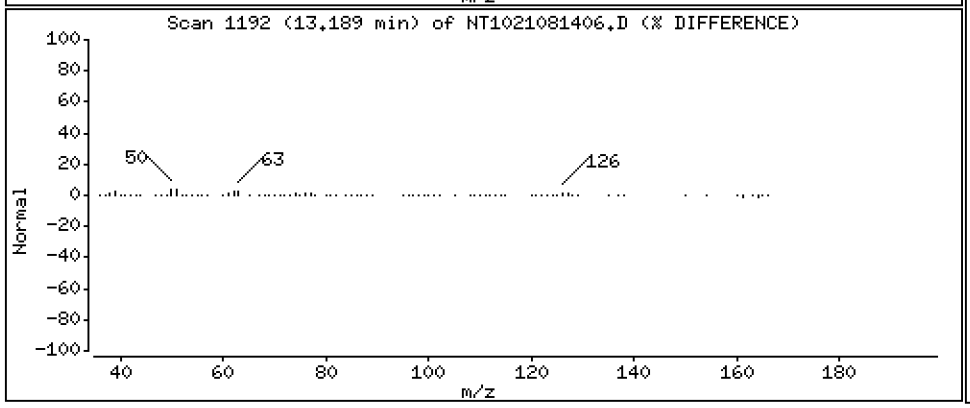
37 2-Chloronaphthalene

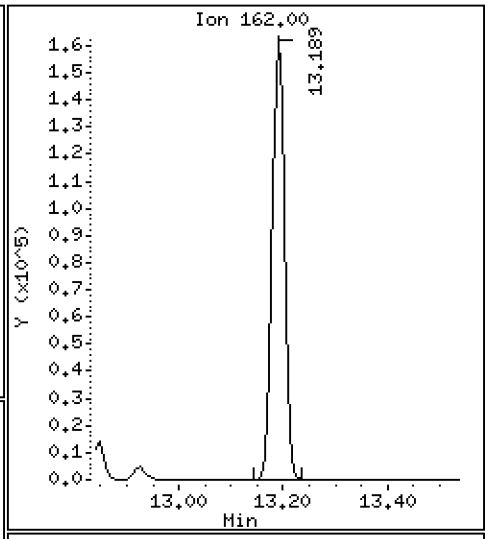
Concentration: 3.826 ug/mL

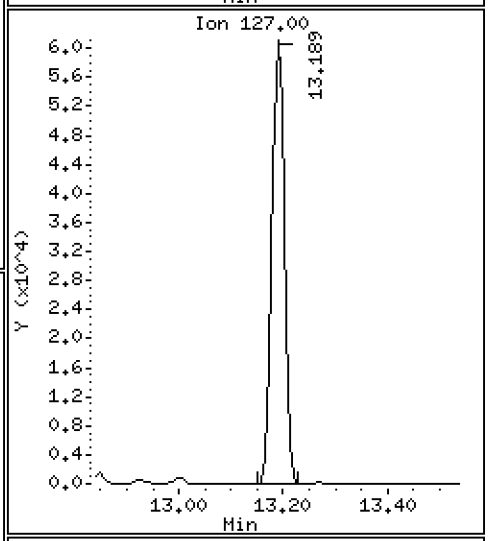


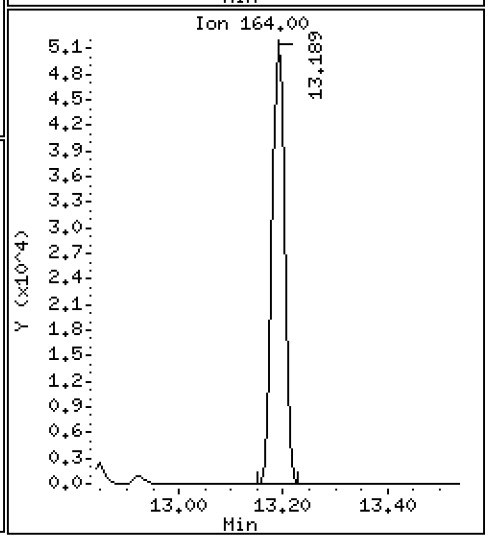












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

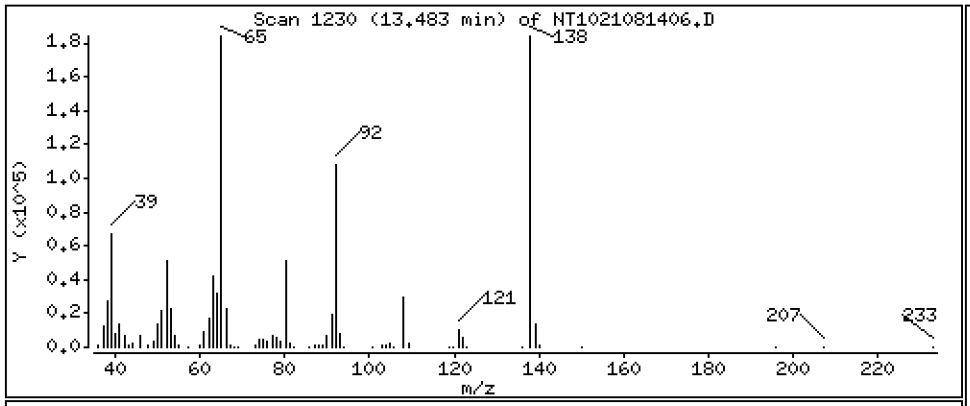
Operator: VTS

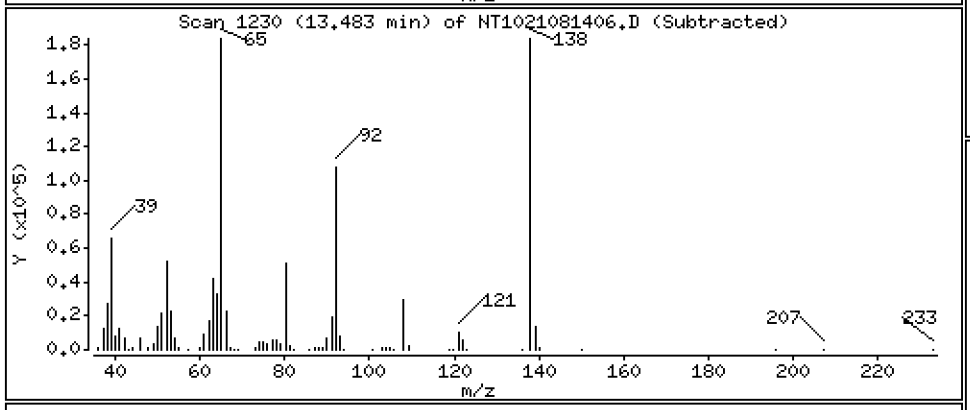
Column phase: ZB-5msi

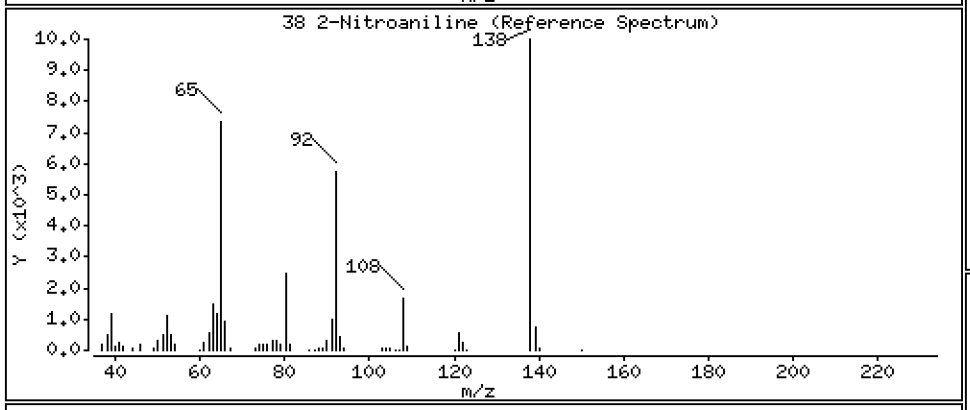
Column diameter: 0.25

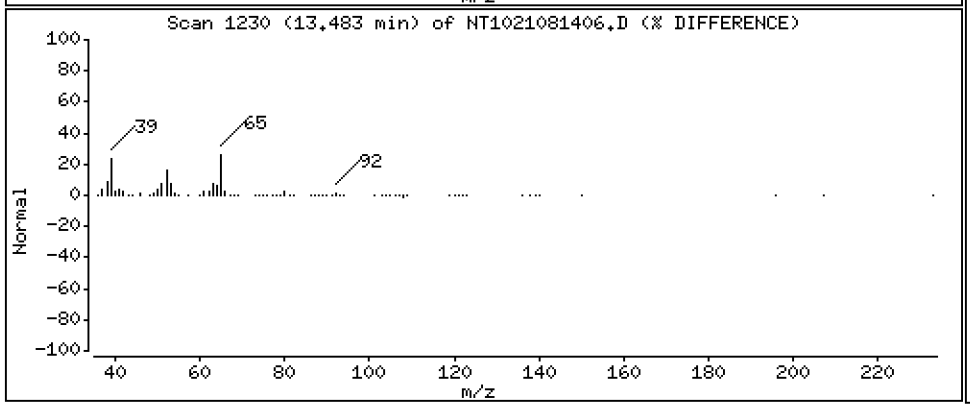
38 2-Nitroaniline

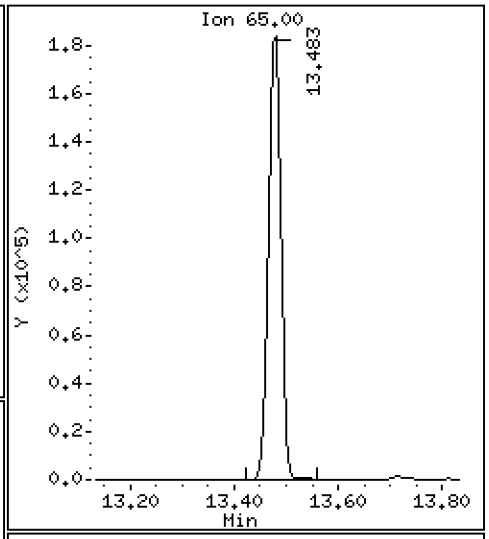
Concentration: 11.94 ug/mL

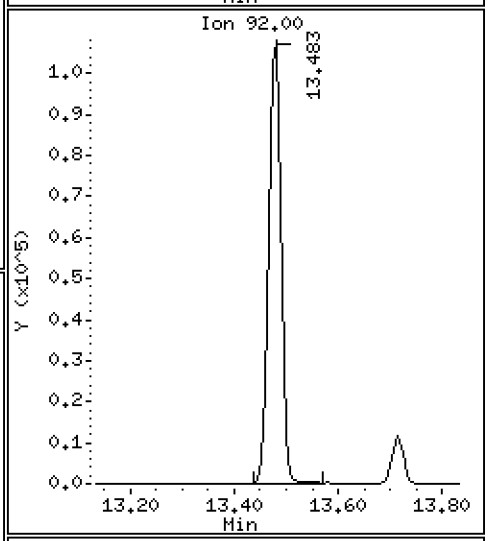


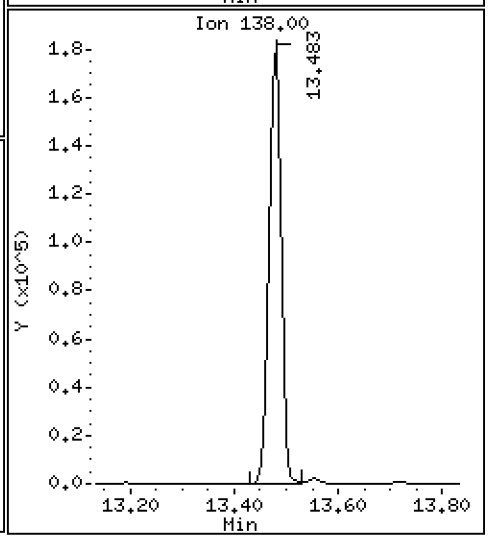












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

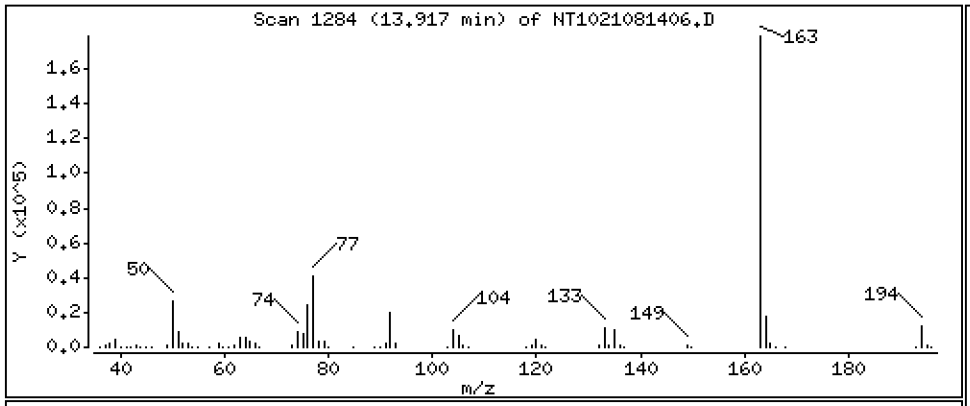
Operator: VTS

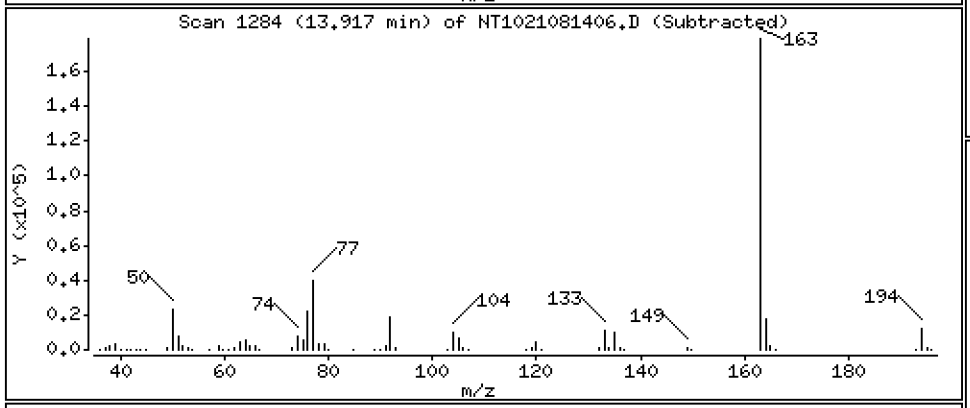
Column phase: ZB-5msi

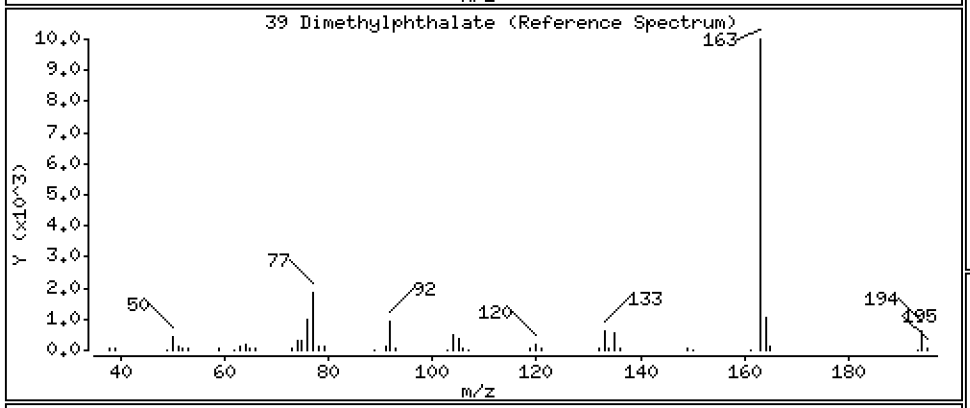
Column diameter: 0.25

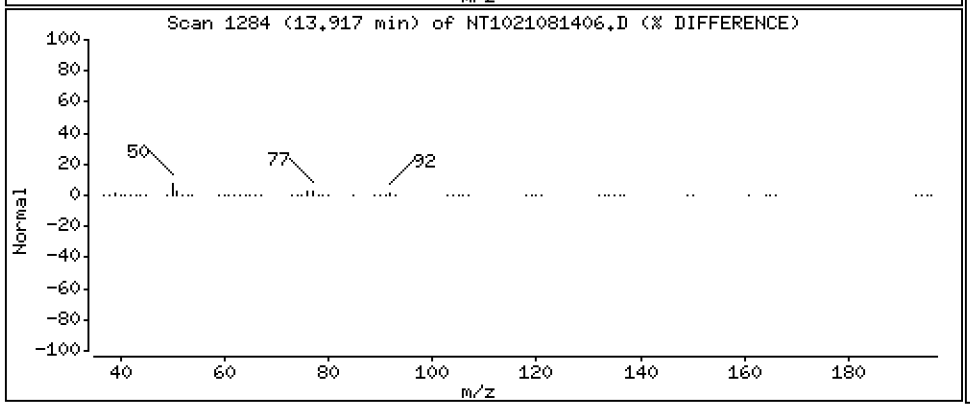
39 Dimethylphthalate

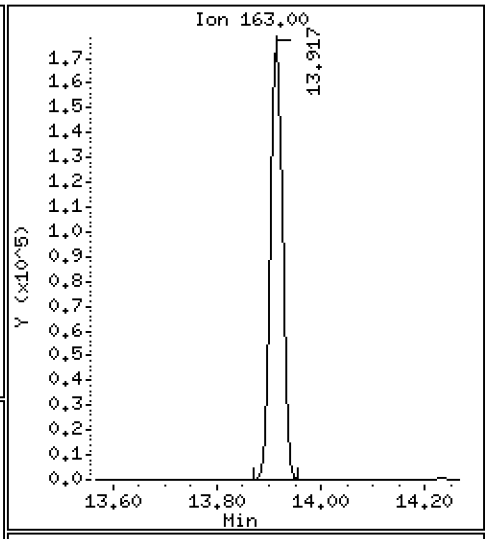
Concentration: 4.220 ug/mL

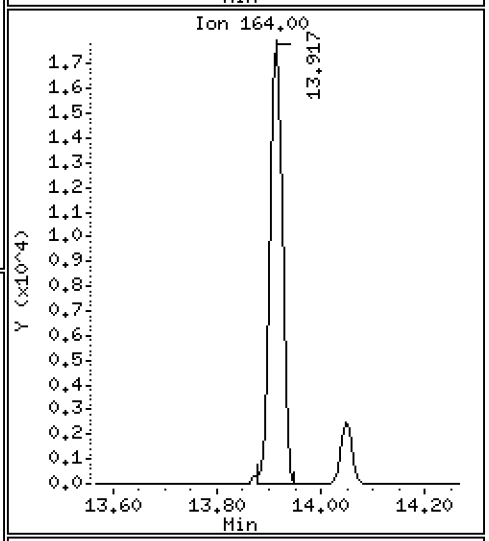


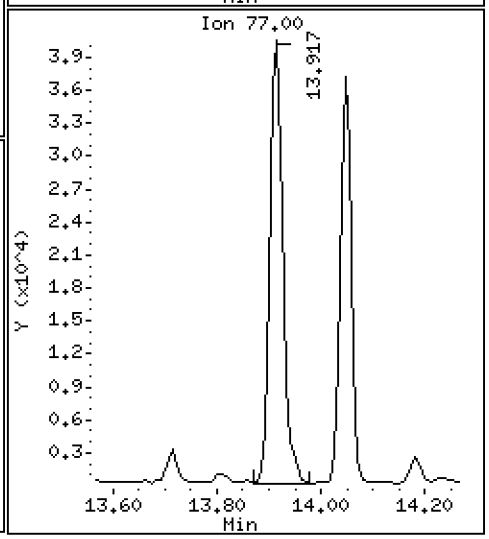












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

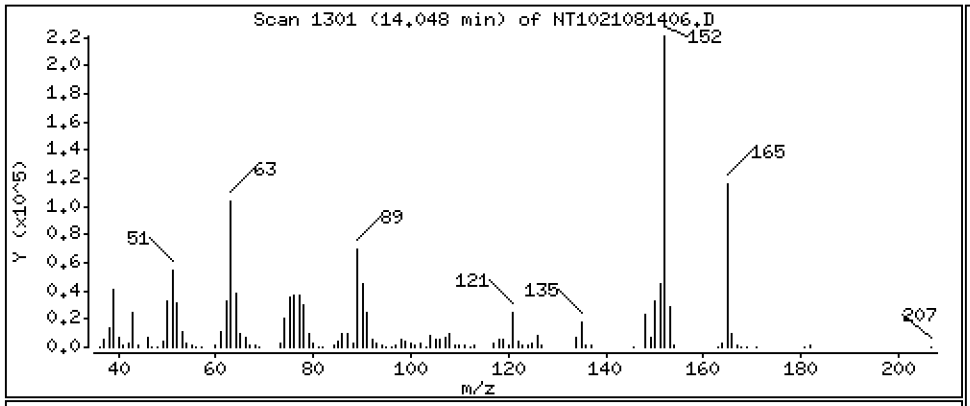
Operator: VTS

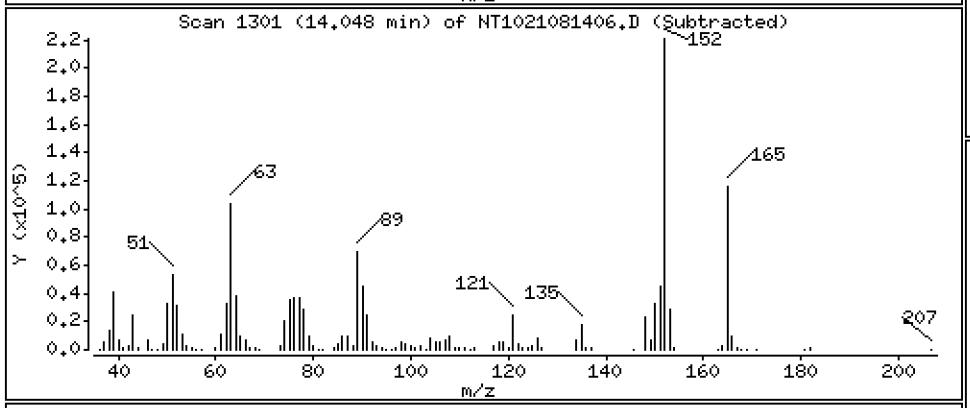
Column phase: ZB-5msi

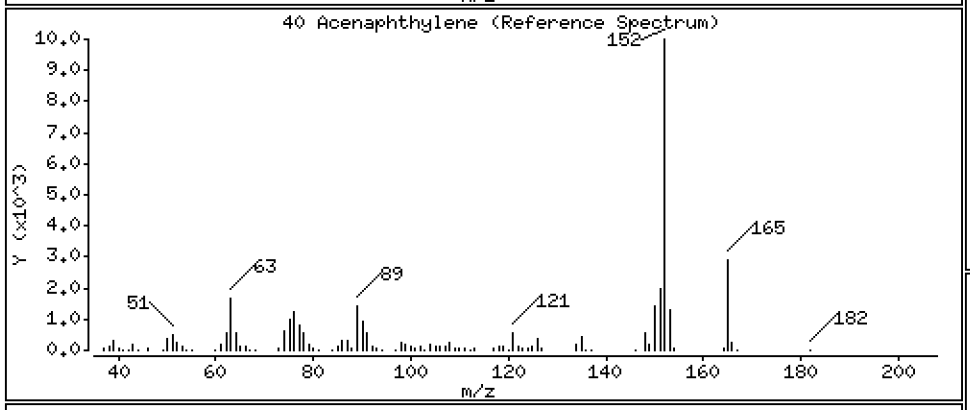
Column diameter: 0.25

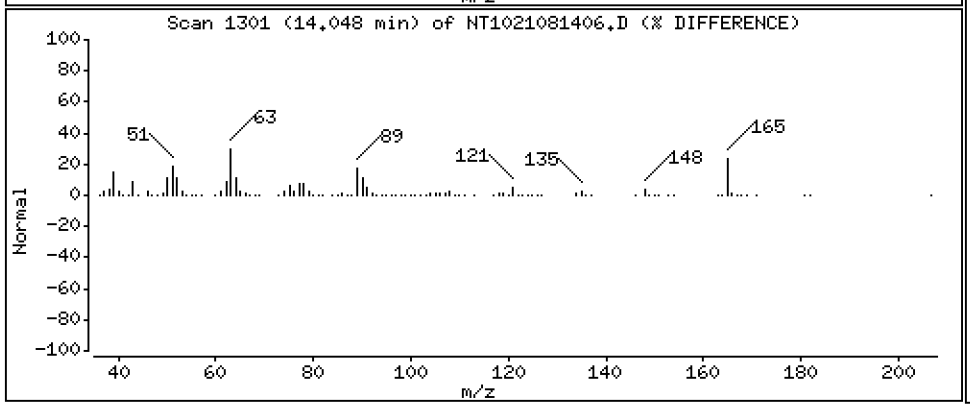
40 Acenaphthylene

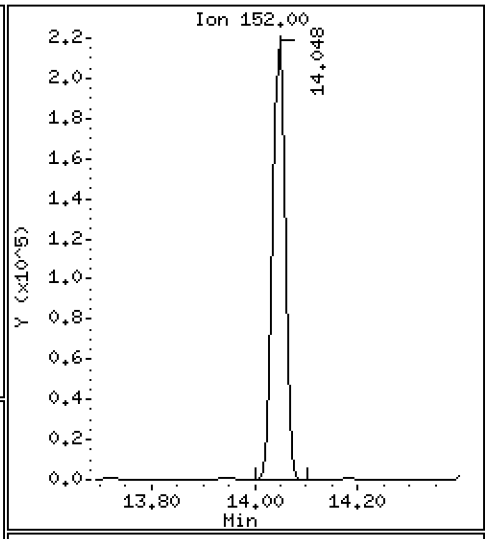
Concentration: 3.694 ug/mL

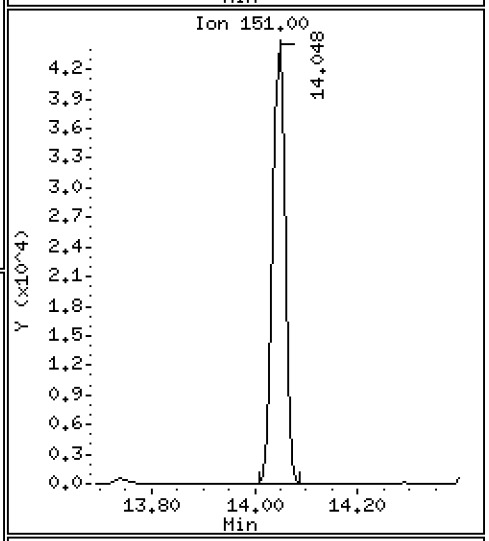


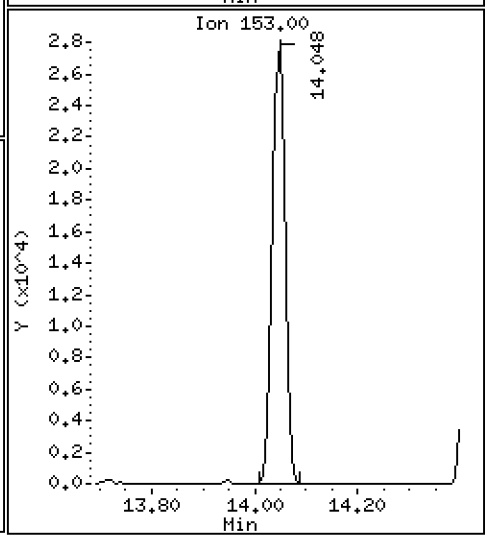












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

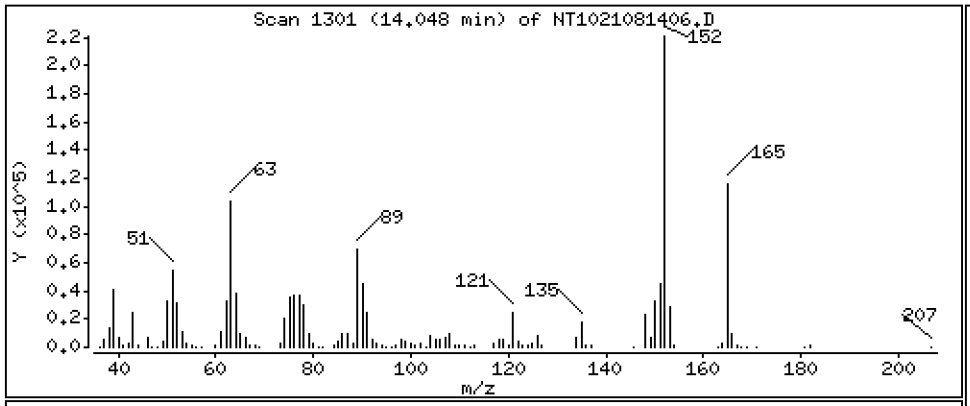
Operator: VTS

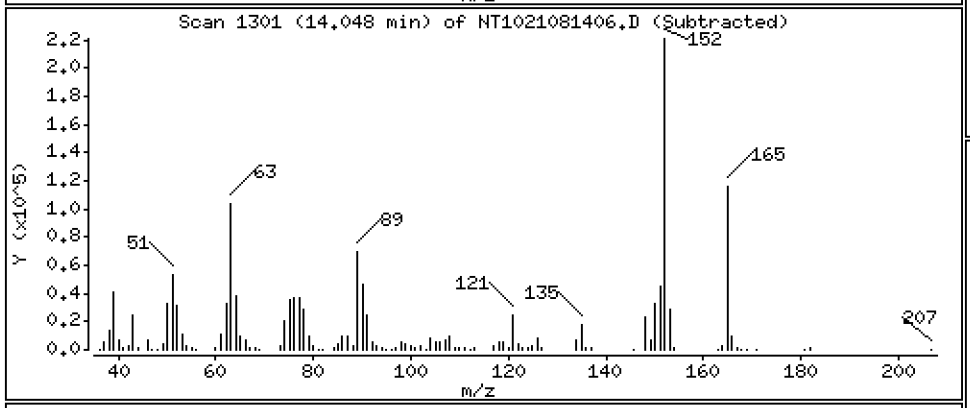
Column phase: ZB-5msi

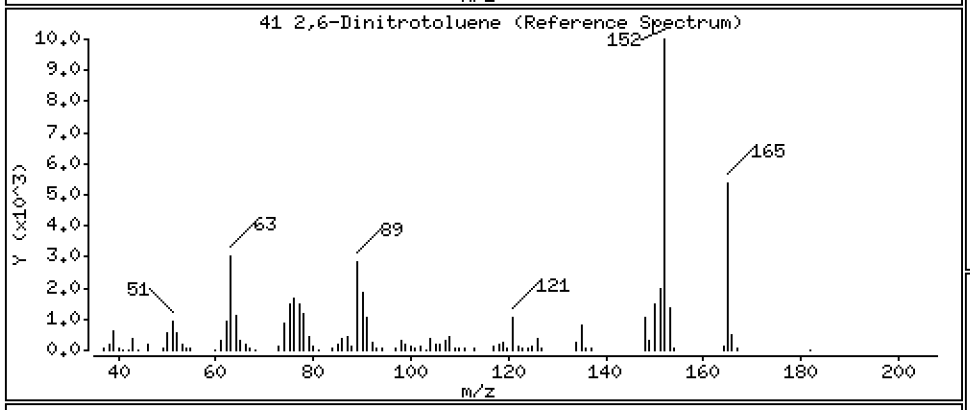
Column diameter: 0.25

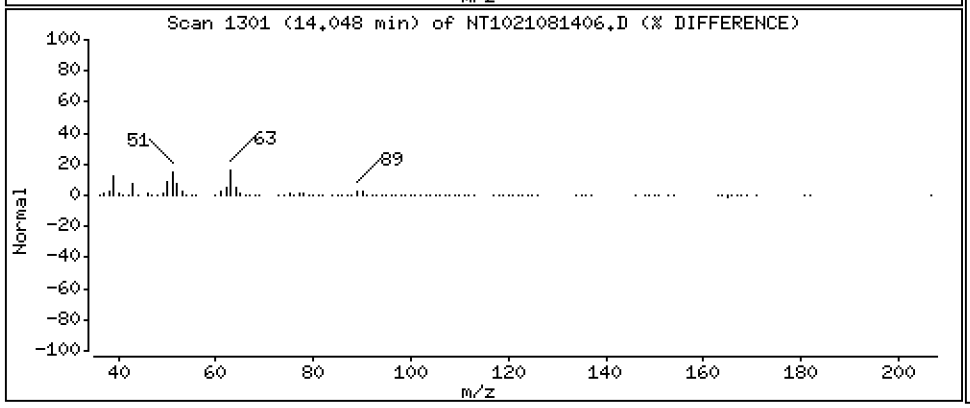
41 2,6-Dinitrotoluene

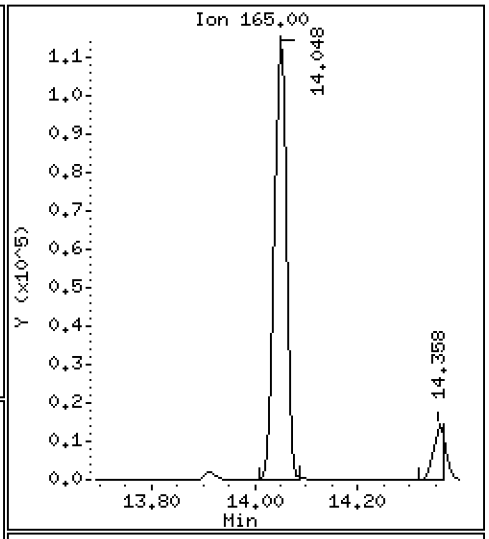
Concentration: 12.05 ug/mL

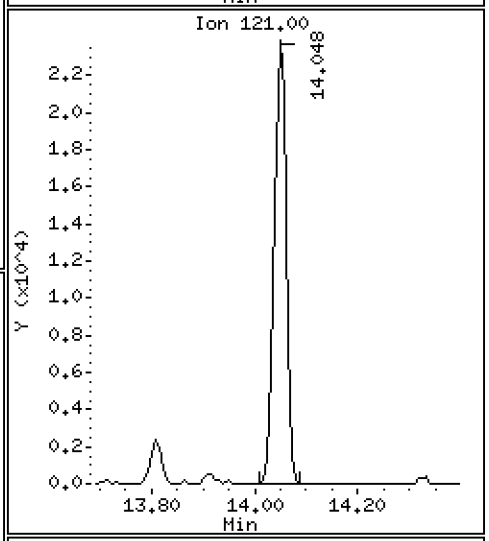


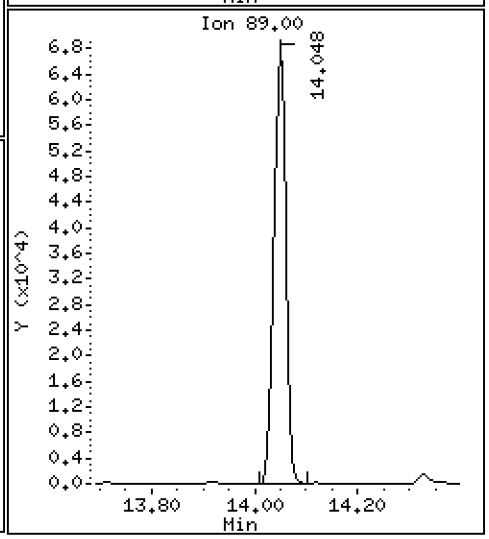












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

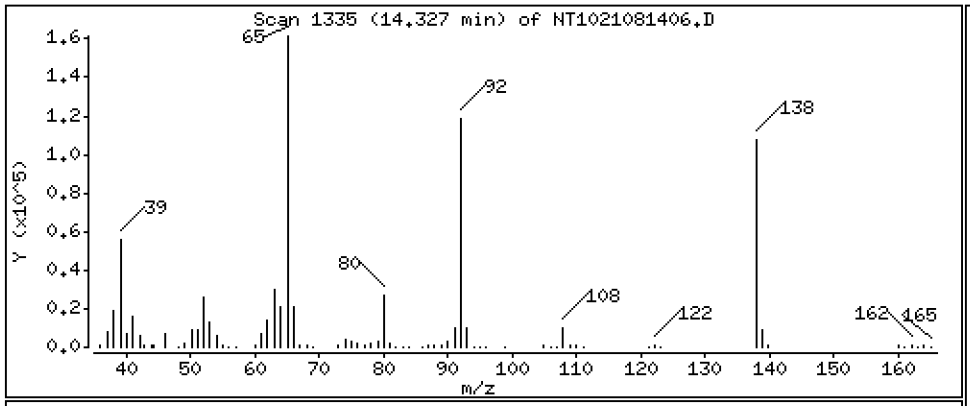
Operator: VTS

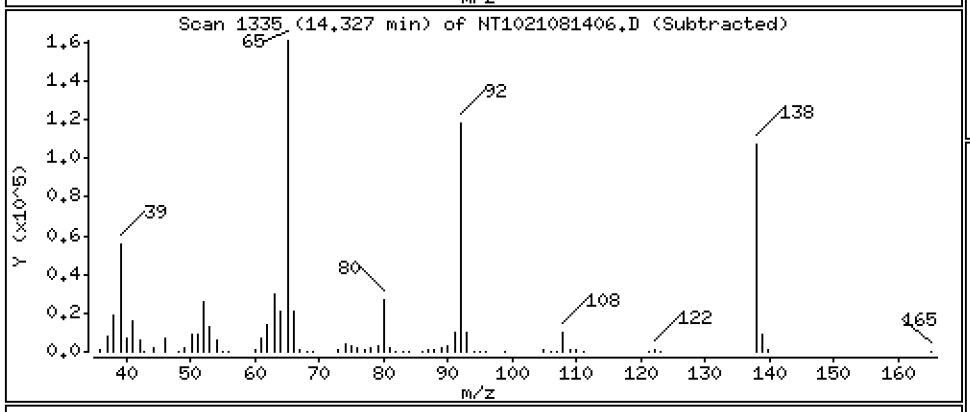
Column phase: ZB-5msi

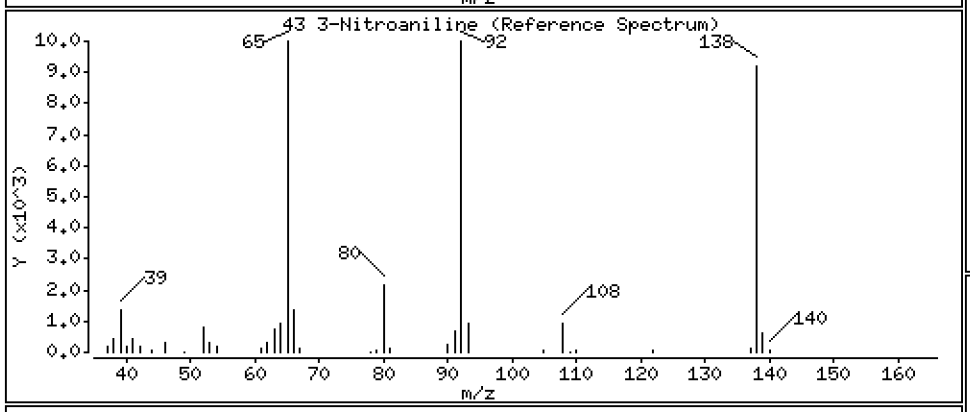
Column diameter: 0.25

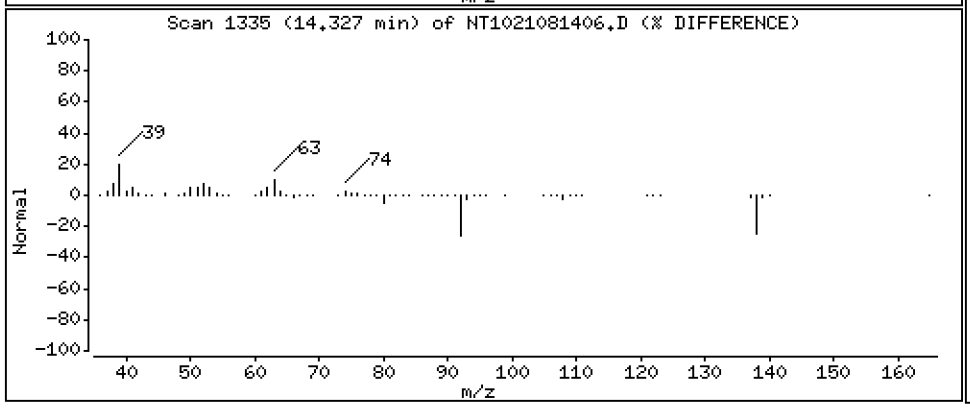
43 3-Nitroaniline

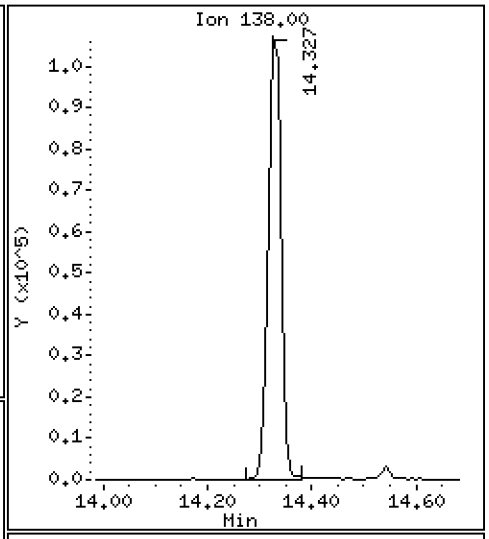
Concentration: 9.578 ug/mL

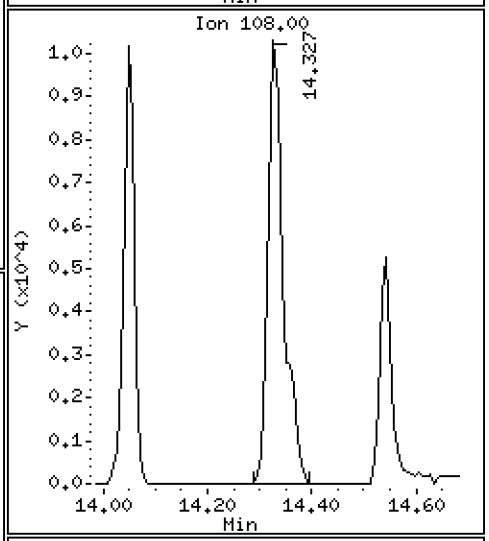


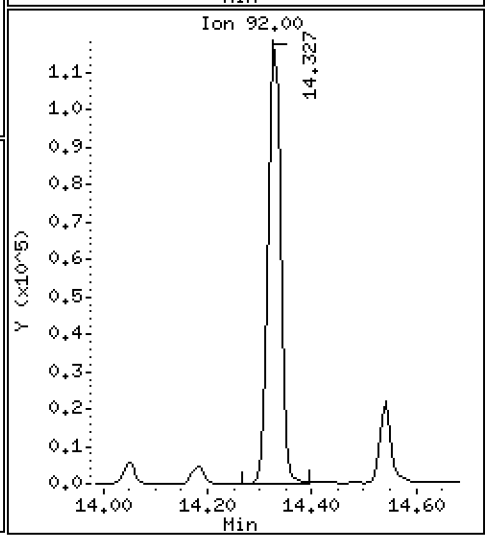












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

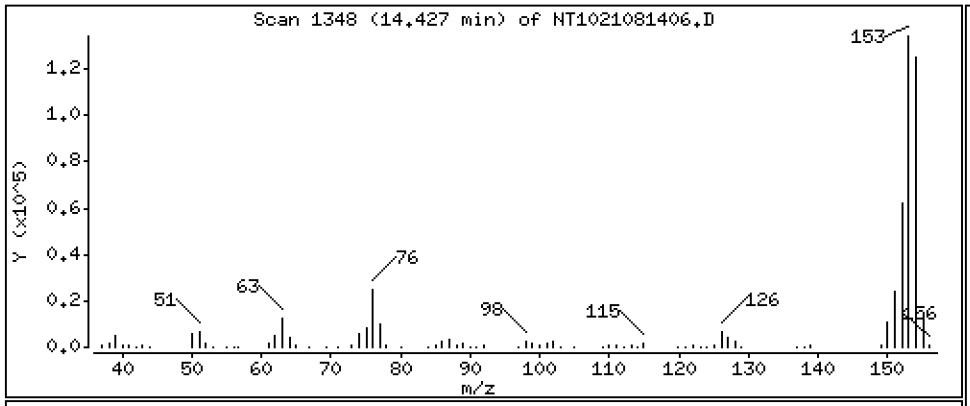
Operator: VTS

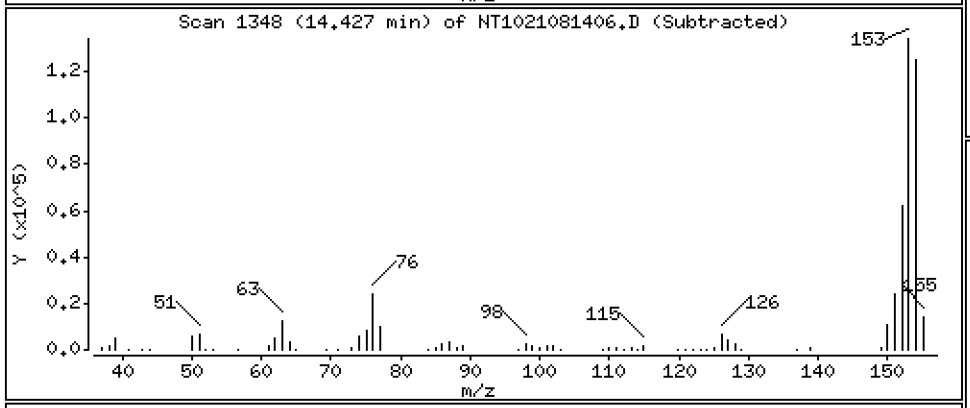
Column phase: ZB-5msi

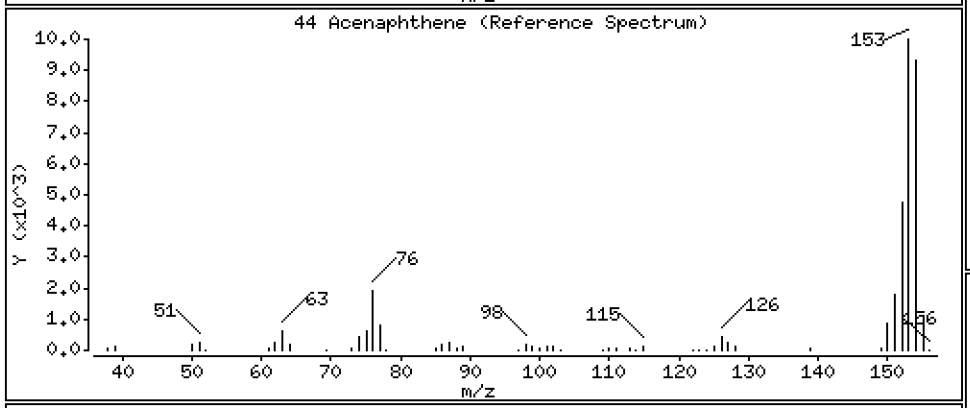
Column diameter: 0.25

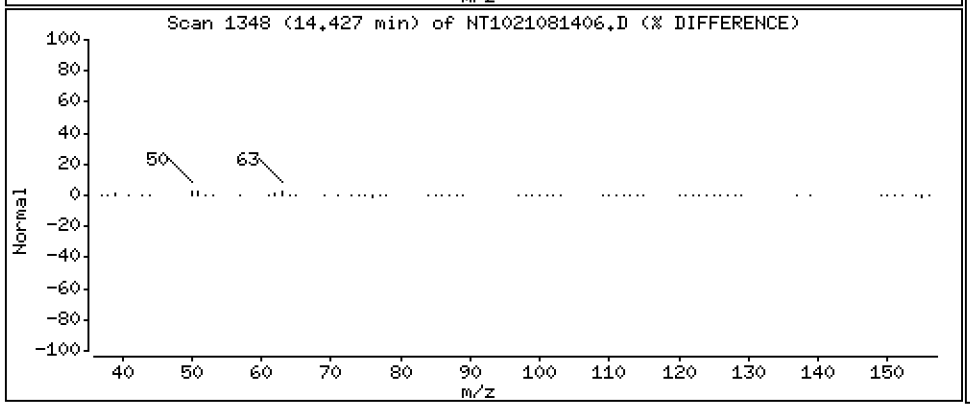
44 Acenaphthene

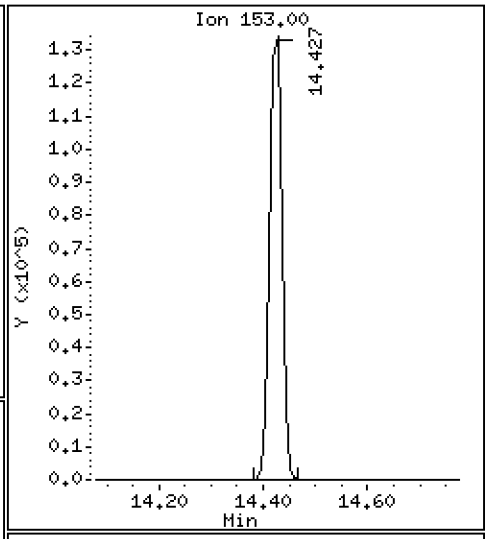
Concentration: 3.815 ug/mL

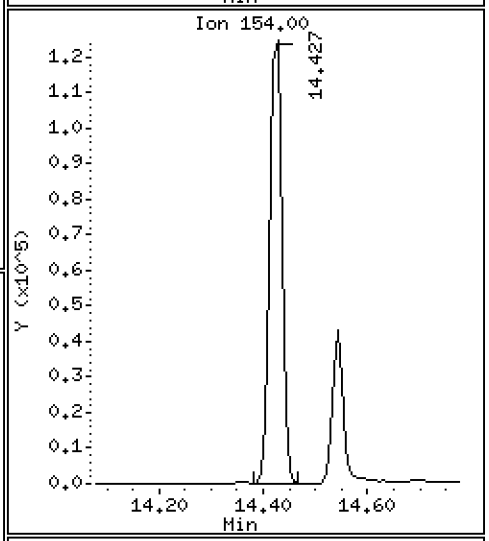


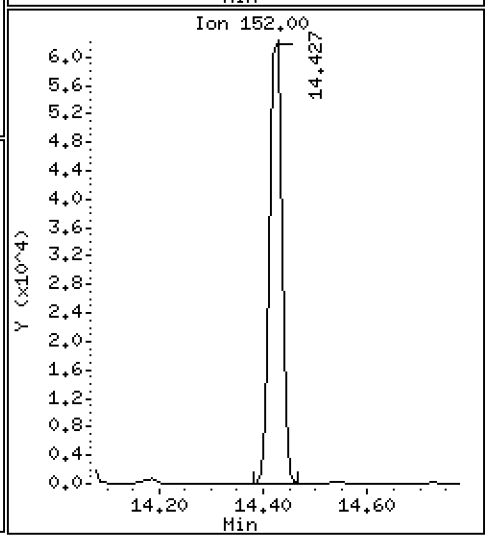












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

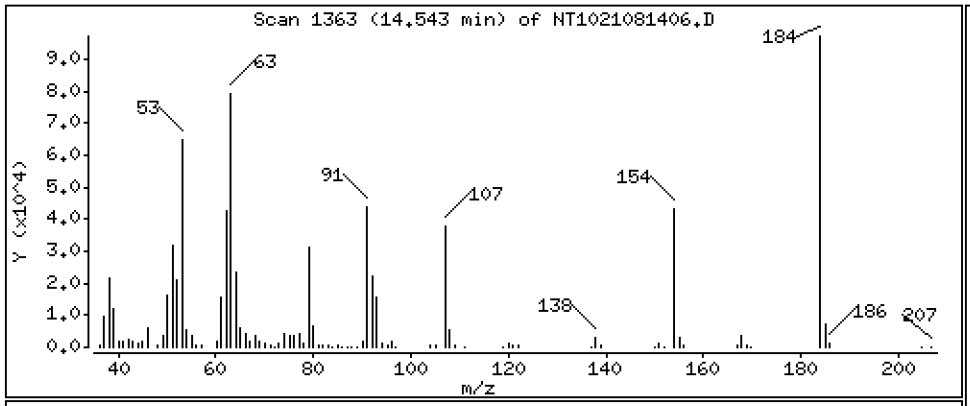
Operator: VTS

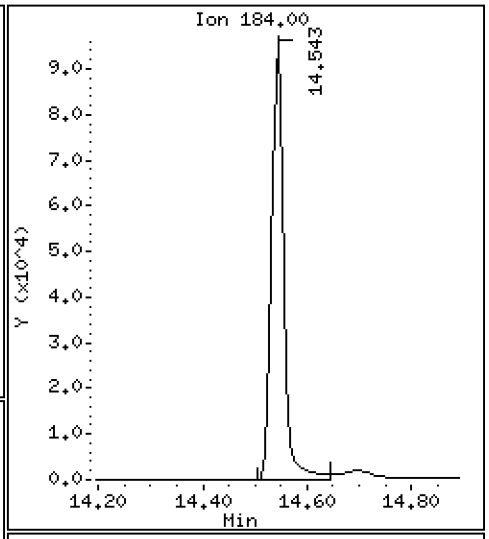
Column phase: ZB-5msi

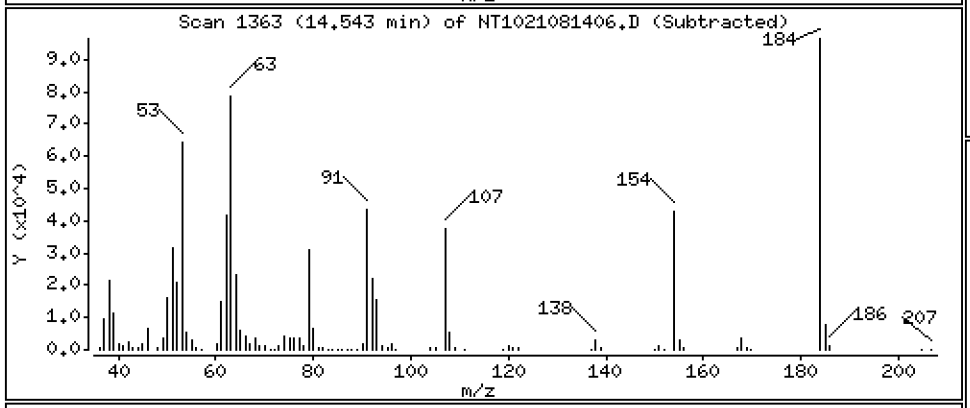
Column diameter: 0.25

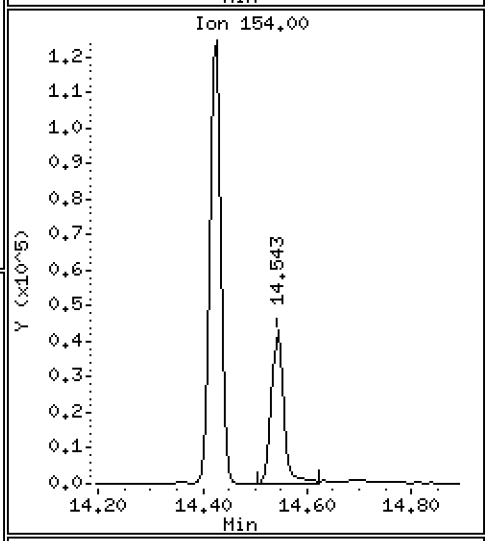
45 2,4-Dinitrophenol

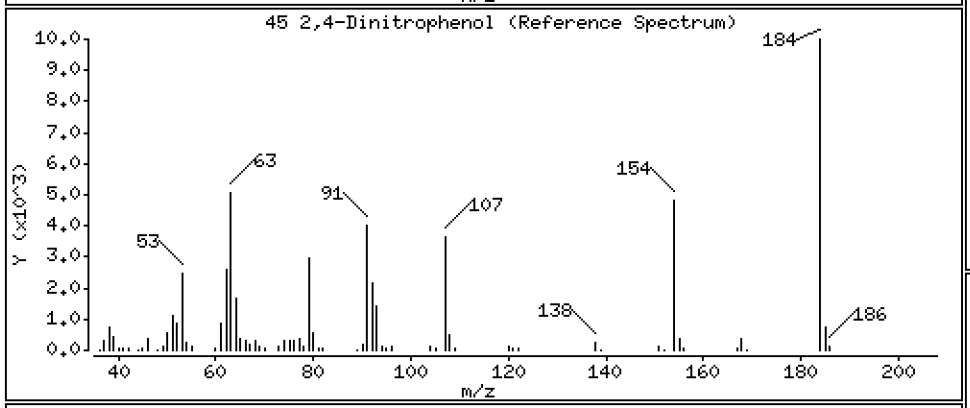
Concentration: 17.13 ug/mL

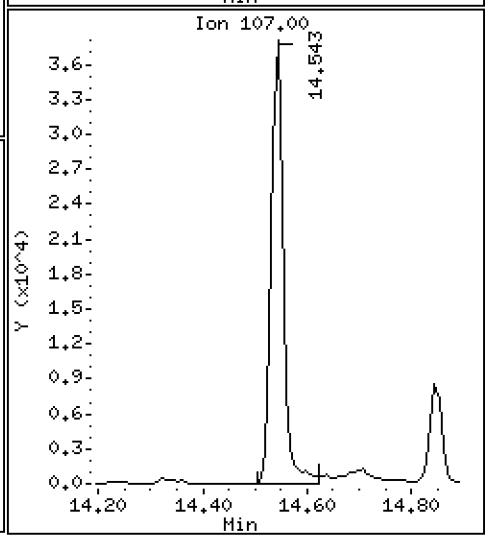


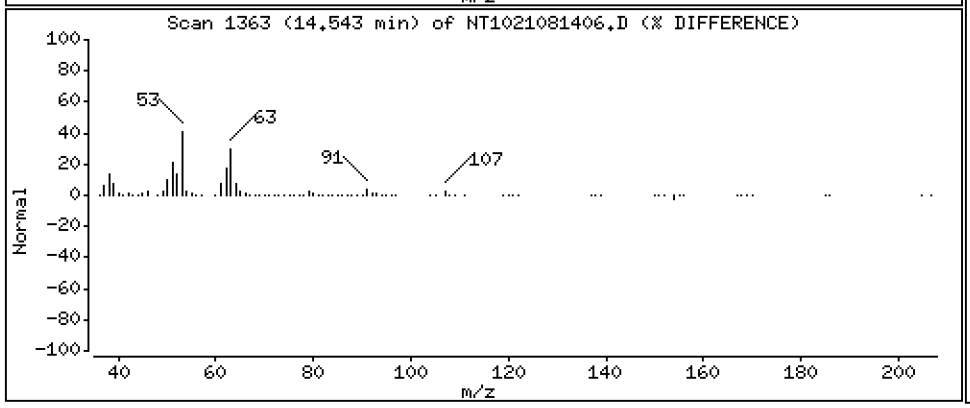












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081406.D

Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

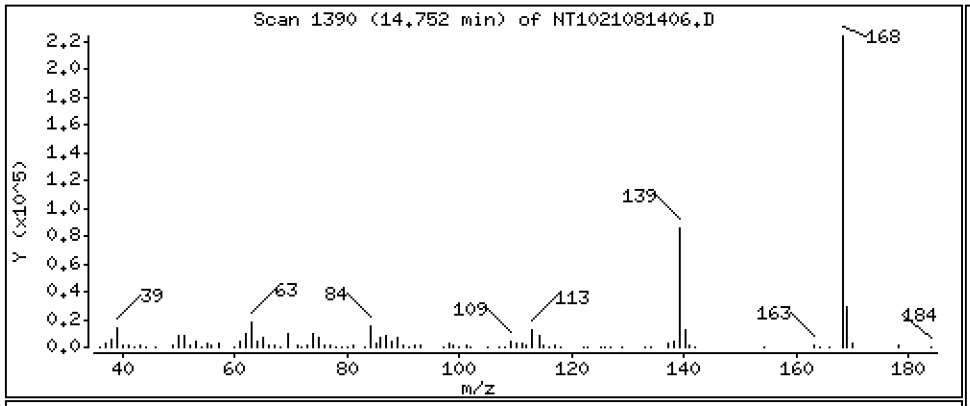
Operator: VTS

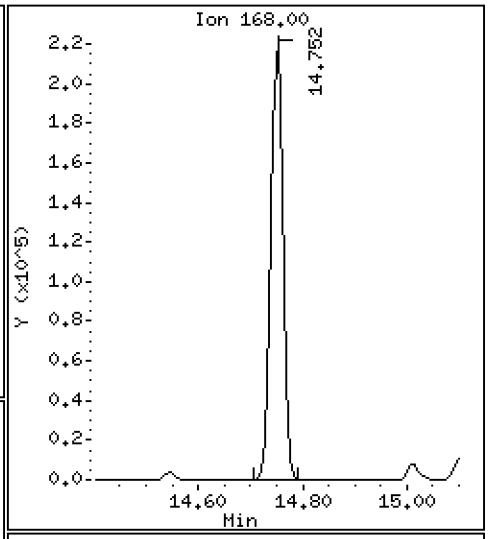
Column phase: ZB-5msi

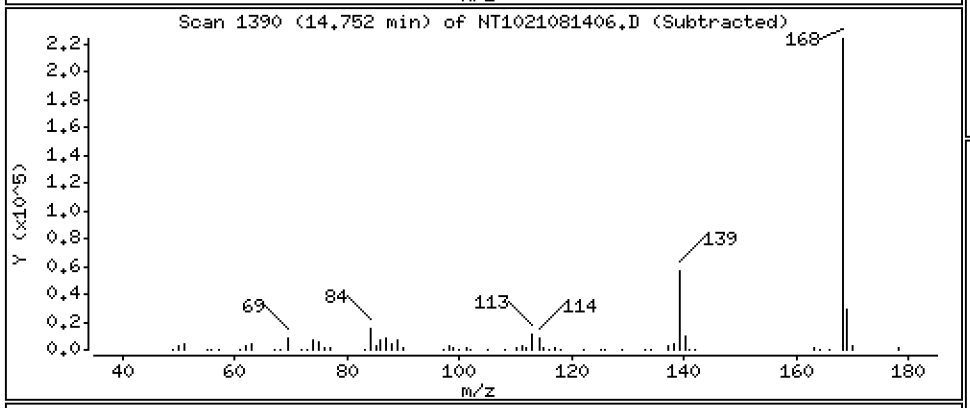
Column diameter: 0.25

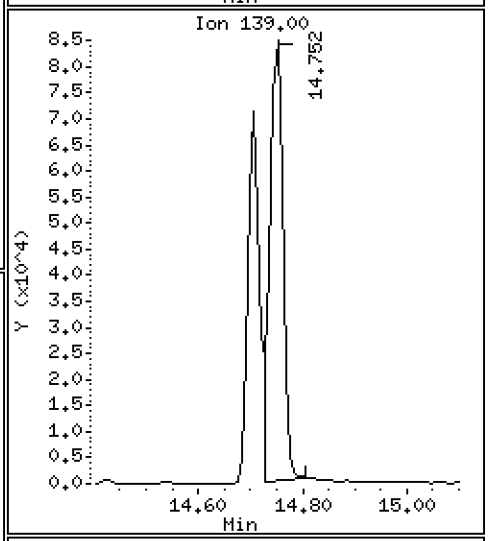
46 Dibenzofuran

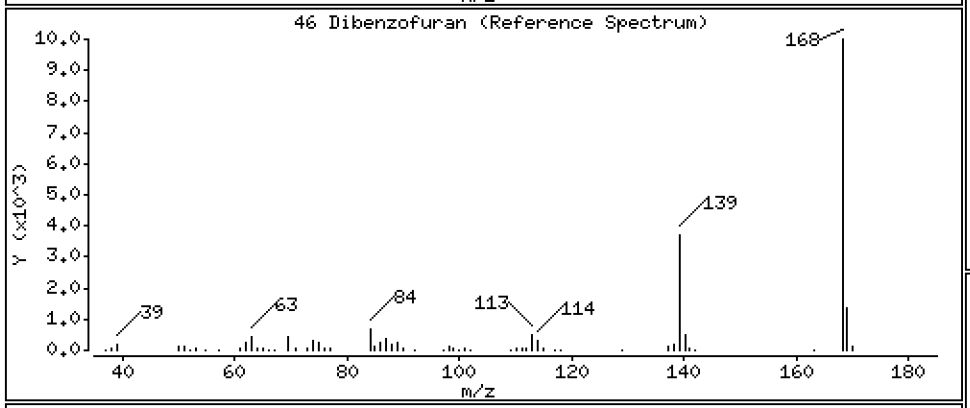
Concentration: 3.945 ug/mL

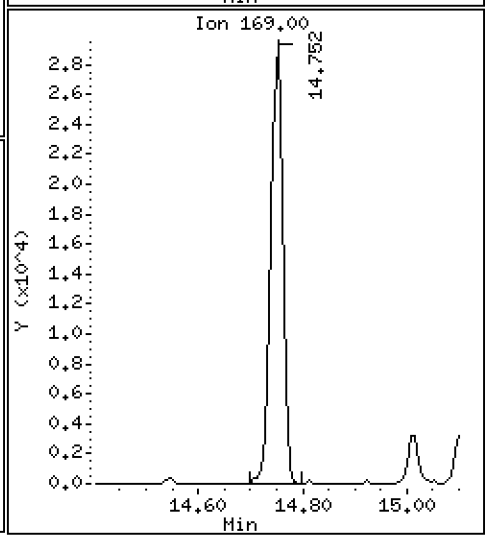


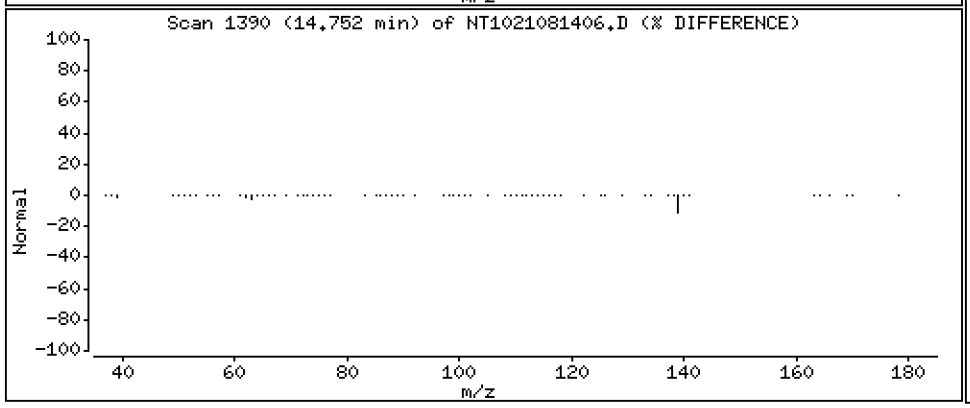












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

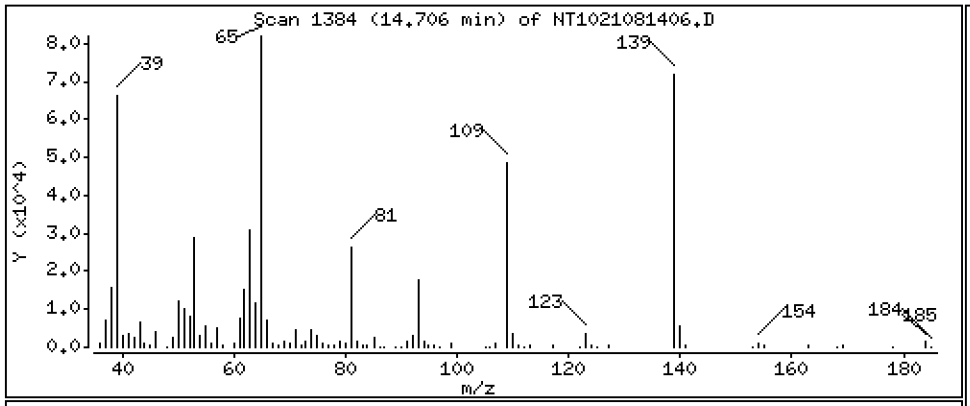
Operator: VTS

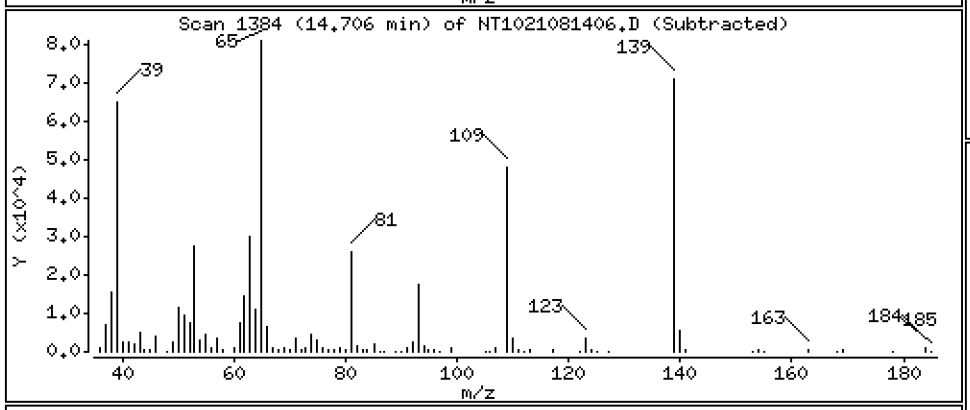
Column phase: ZB-5msi

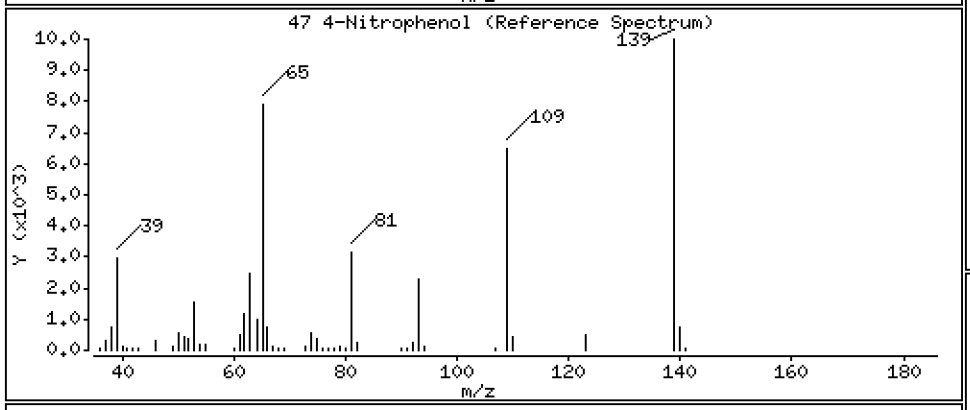
Column diameter: 0.25

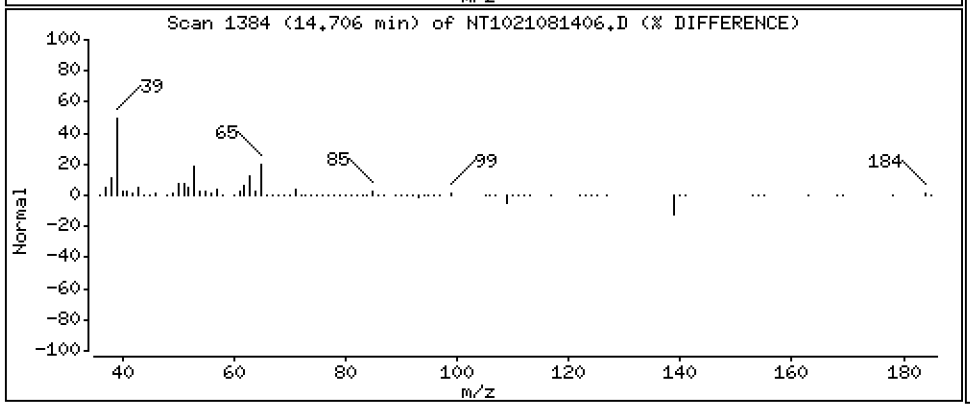
47 4-Nitrophenol

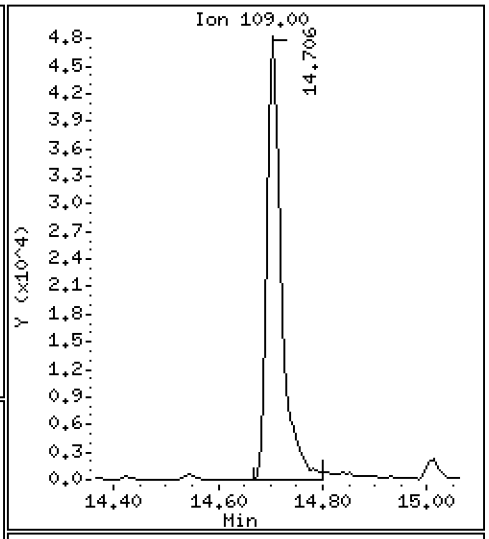
Concentration: 12.83 ug/mL

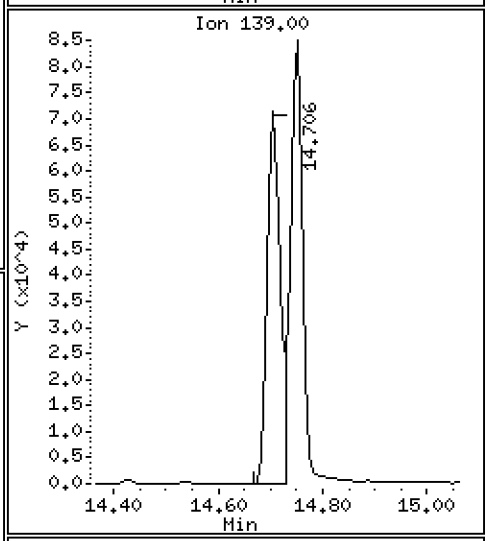


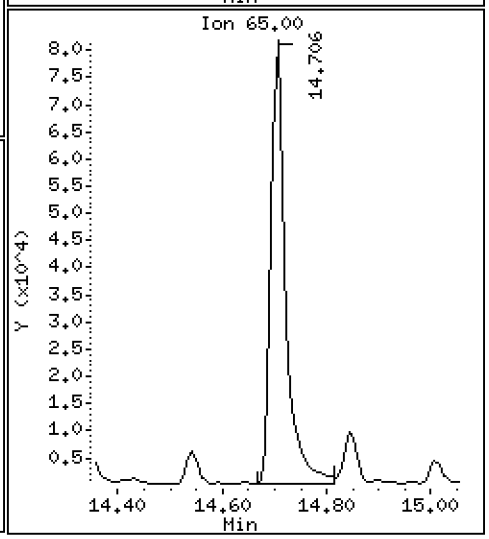












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

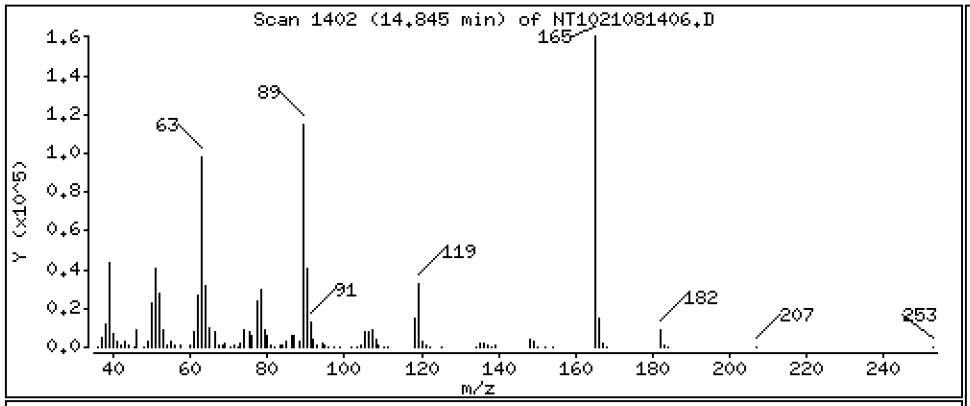
Operator: VTS

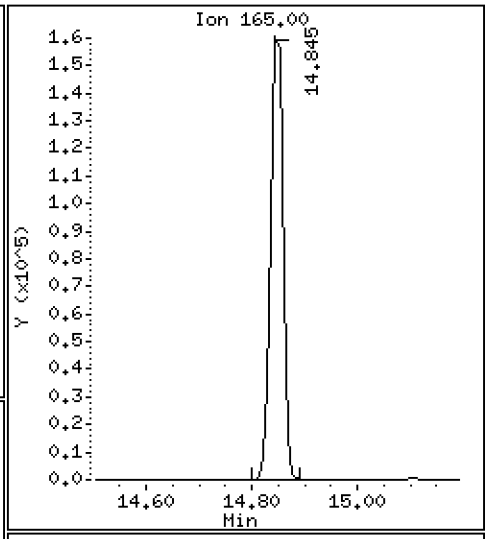
Column phase: ZB-5msi

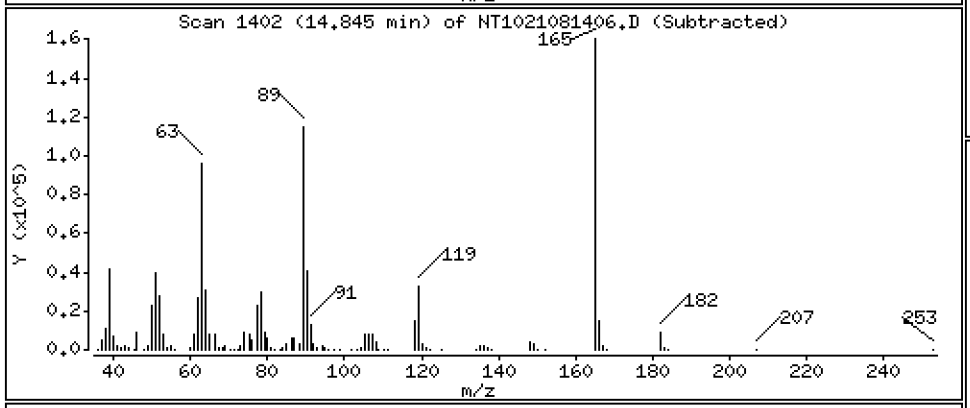
Column diameter: 0.25

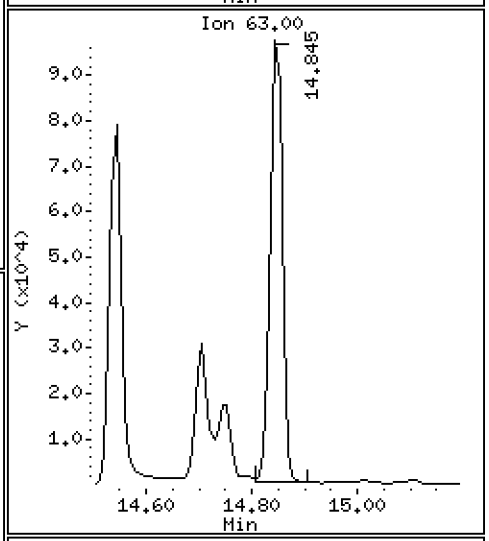
48 2,4-Dinitrotoluene

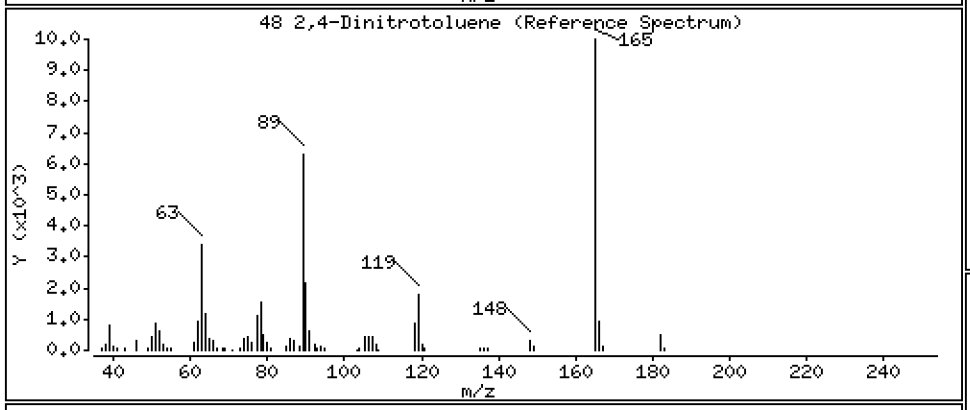
Concentration: 12.94 ug/mL

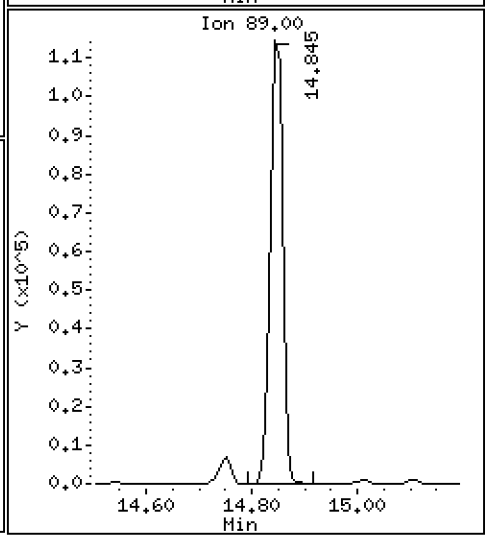


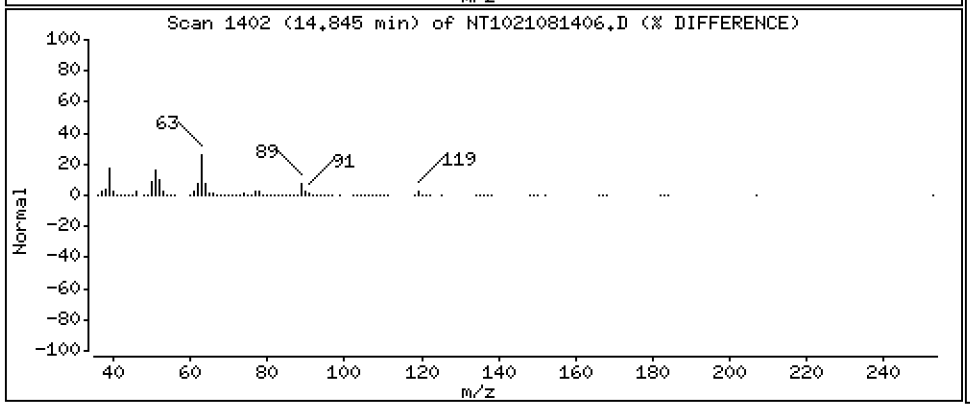












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

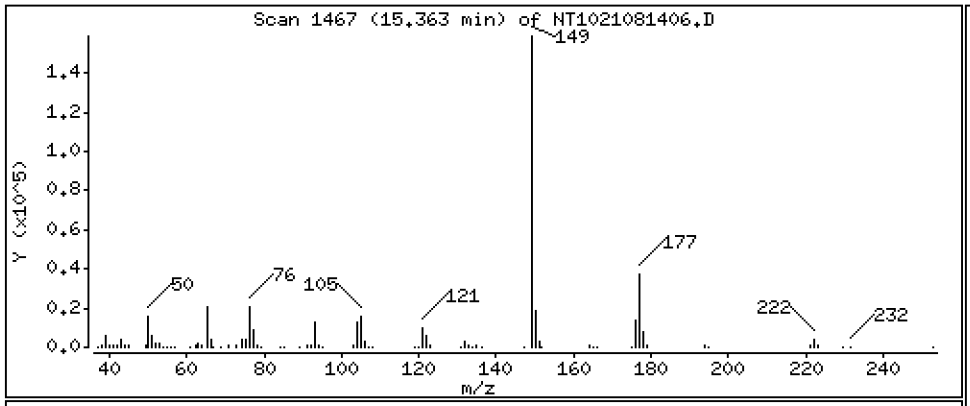
Operator: VTS

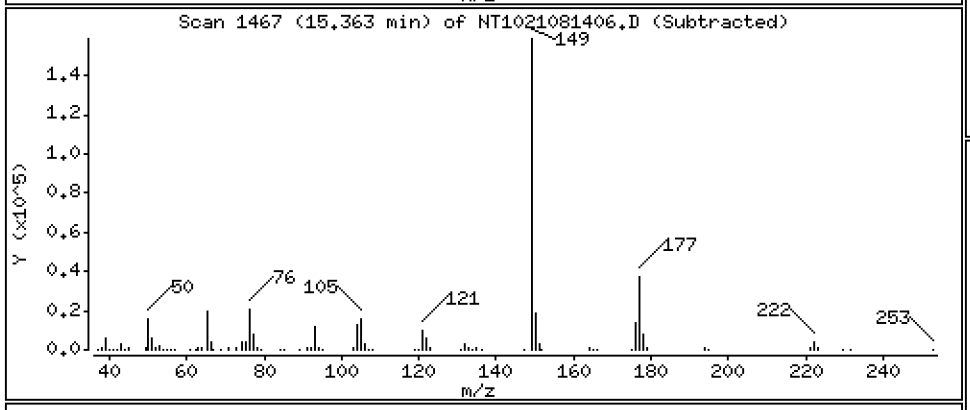
Column phase: ZB-5msi

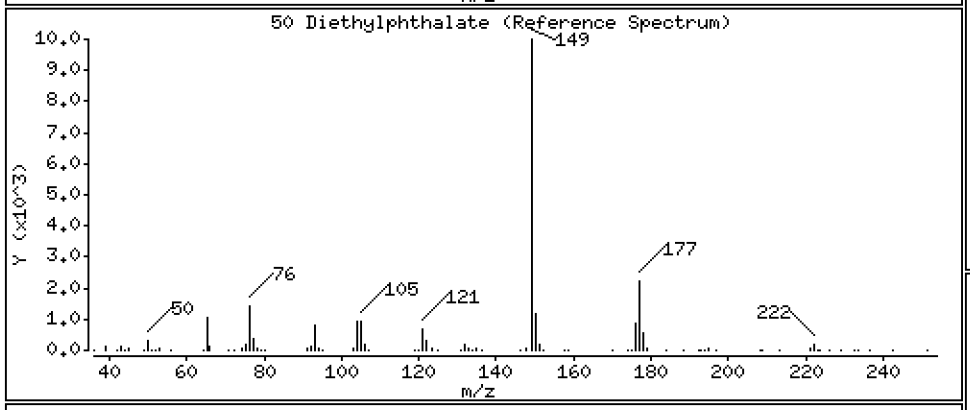
Column diameter: 0.25

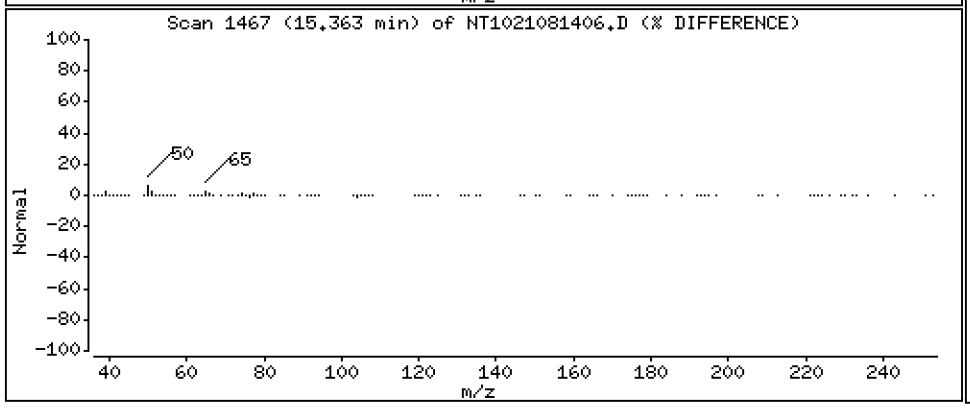
50 Diethylphthalate

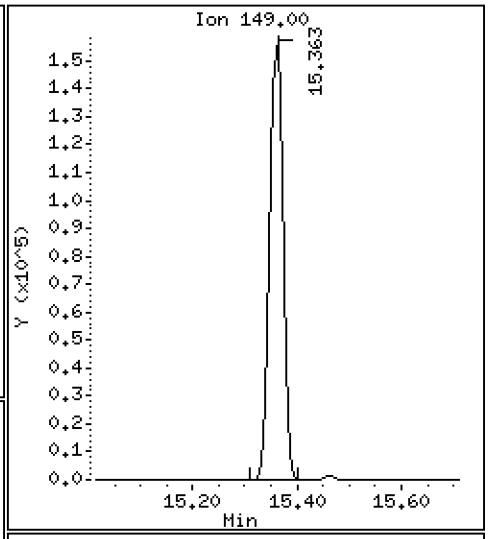
Concentration: 4.397 ug/mL

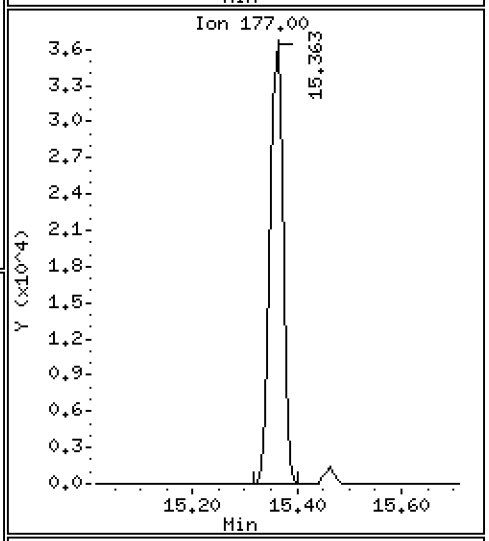


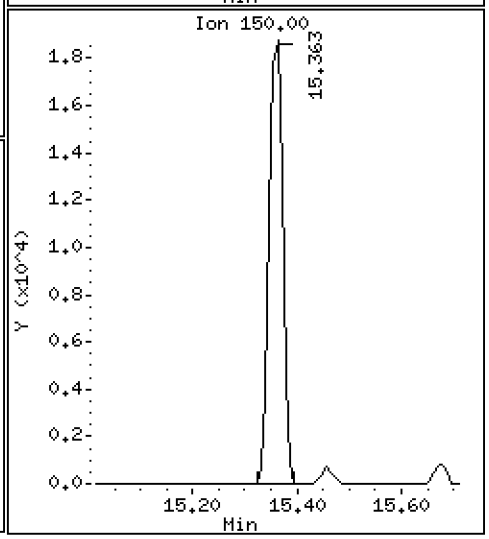












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

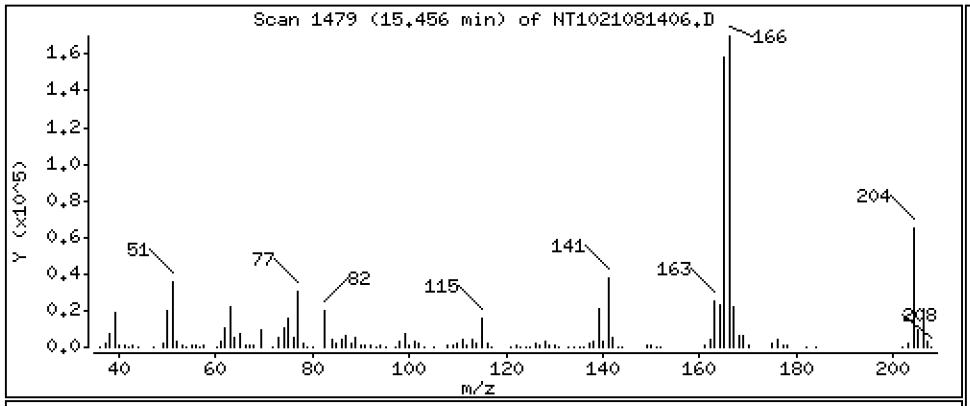
Operator: VTS

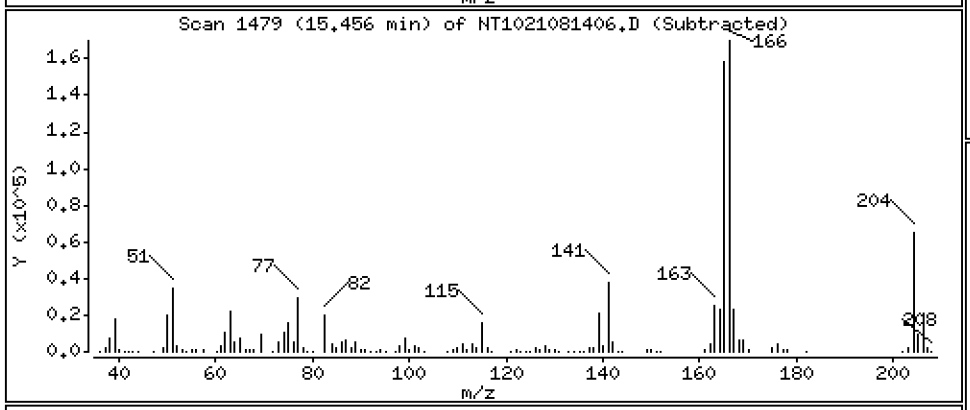
Column phase: ZB-5msi

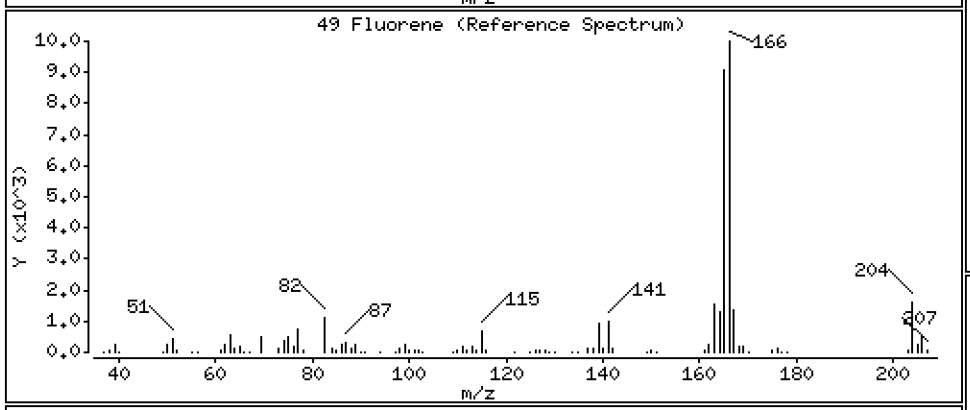
Column diameter: 0.25

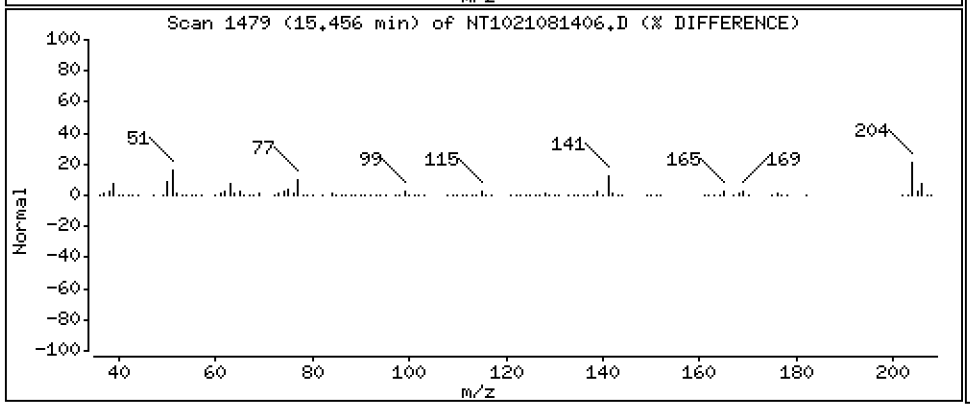
49 Fluorene

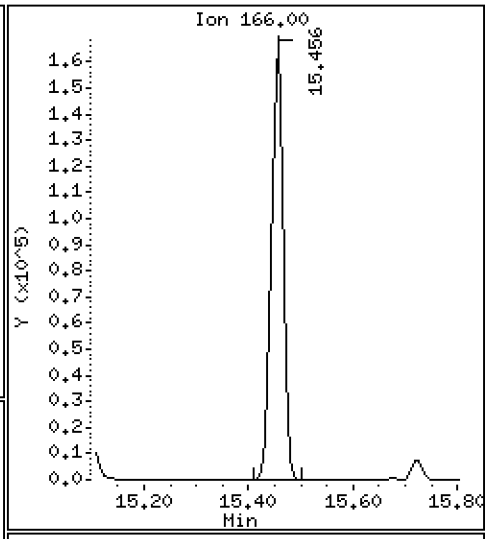
Concentration: 3.123 ug/mL

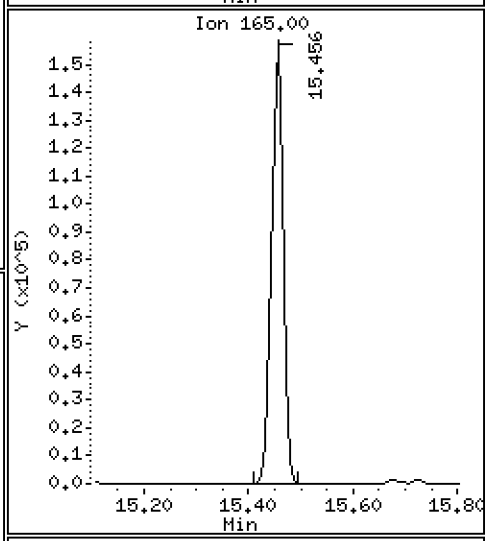


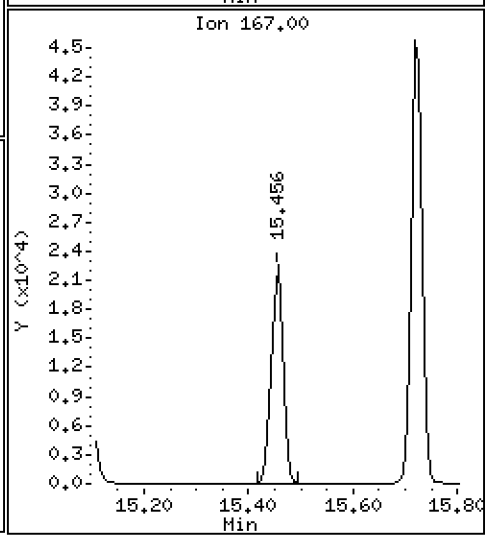












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

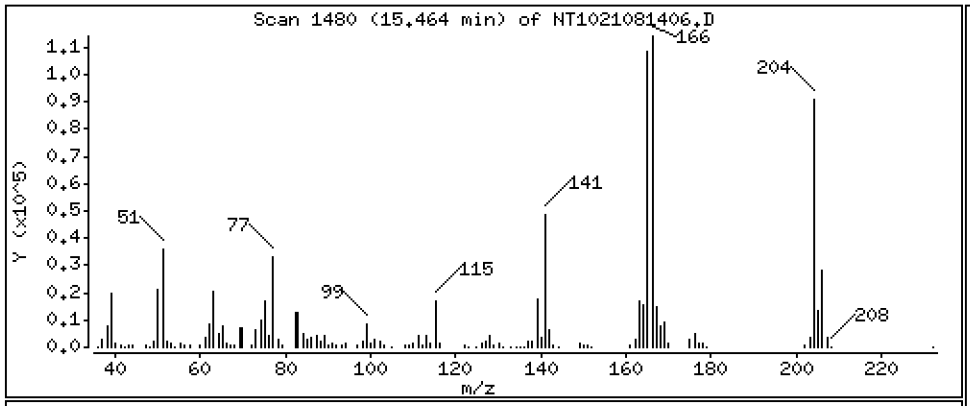
Operator: VTS

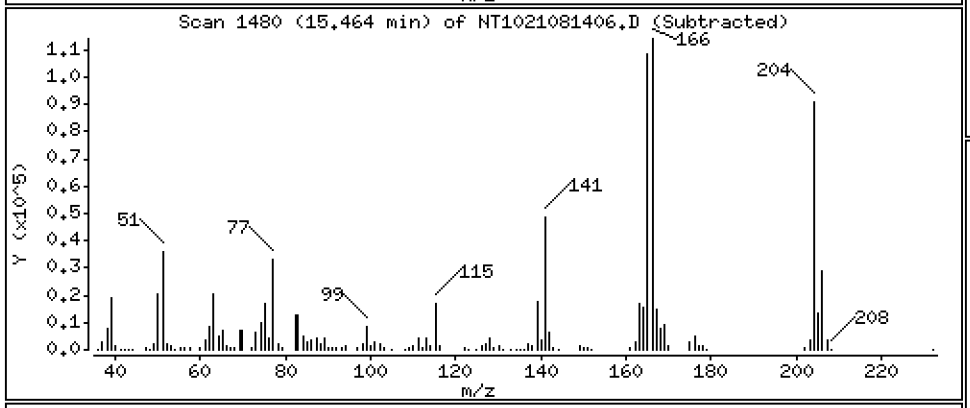
Column phase: ZB-5msi

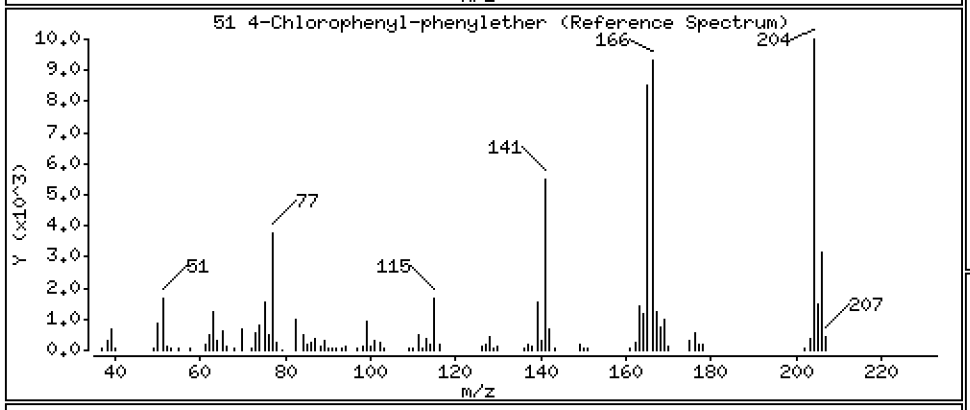
Column diameter: 0.25

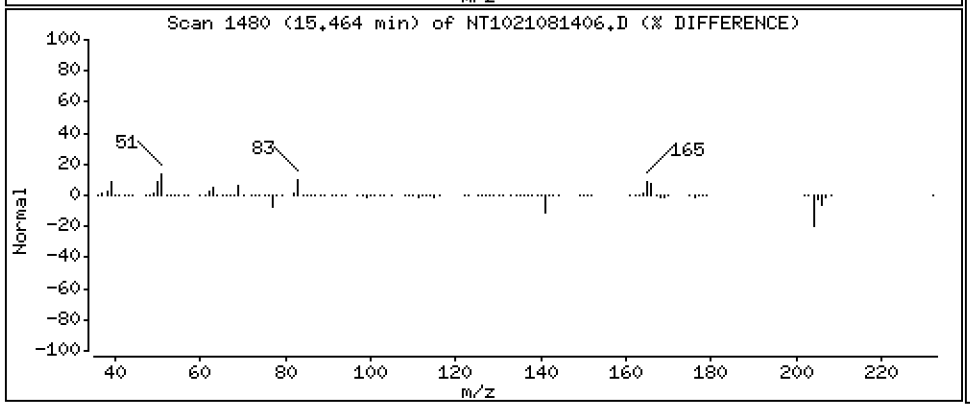
51 4-Chlorophenyl-phenylether

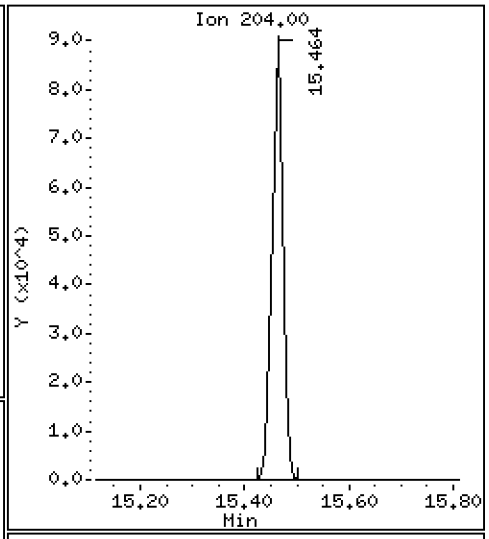
Concentration: 2.673 ug/mL

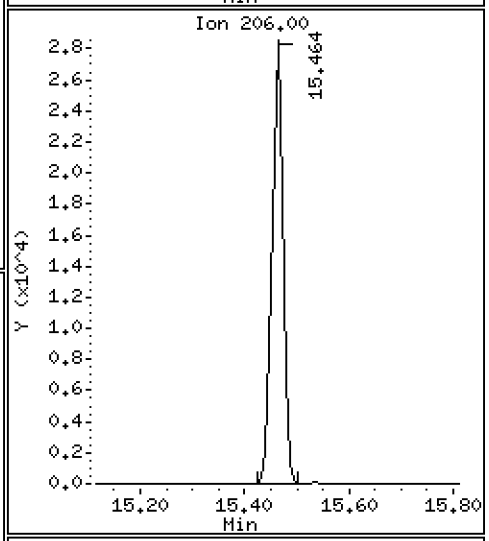


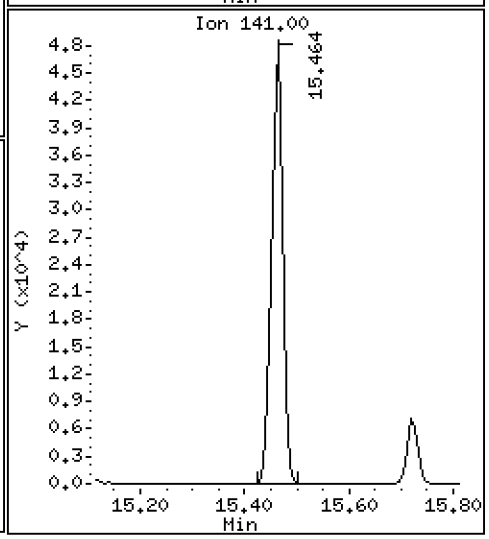












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

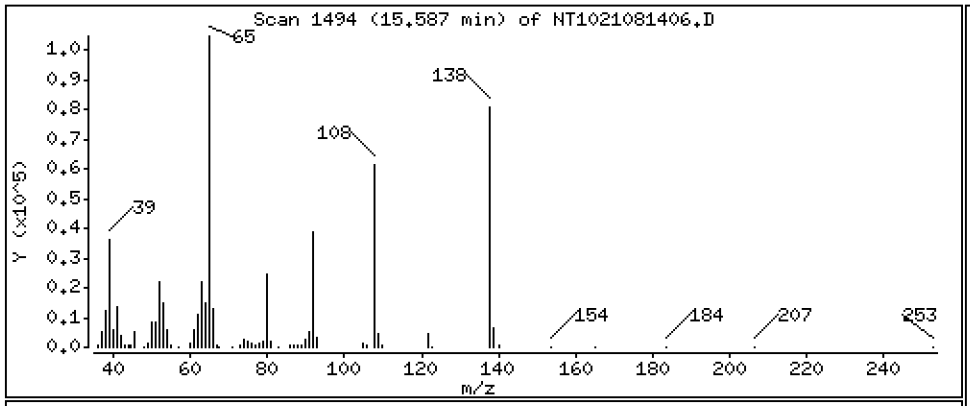
Operator: VTS

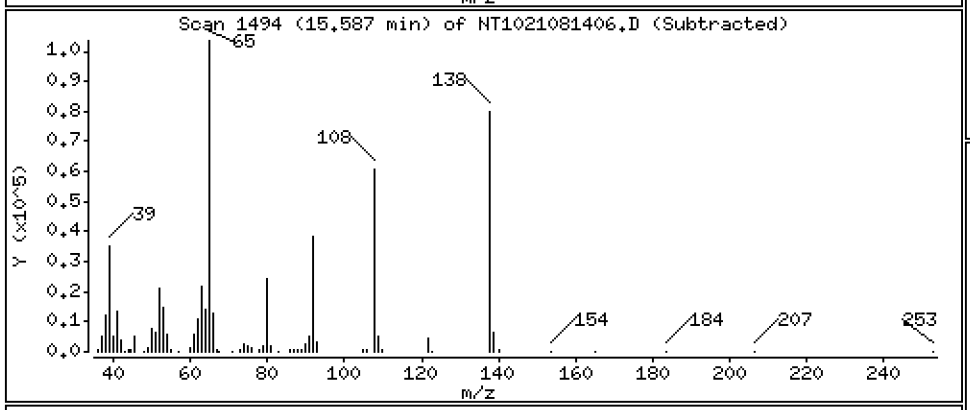
Column phase: ZB-5msi

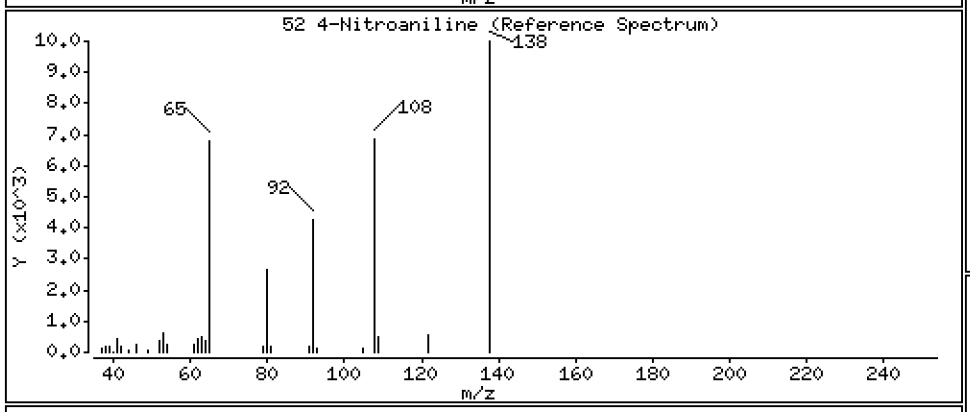
Column diameter: 0.25

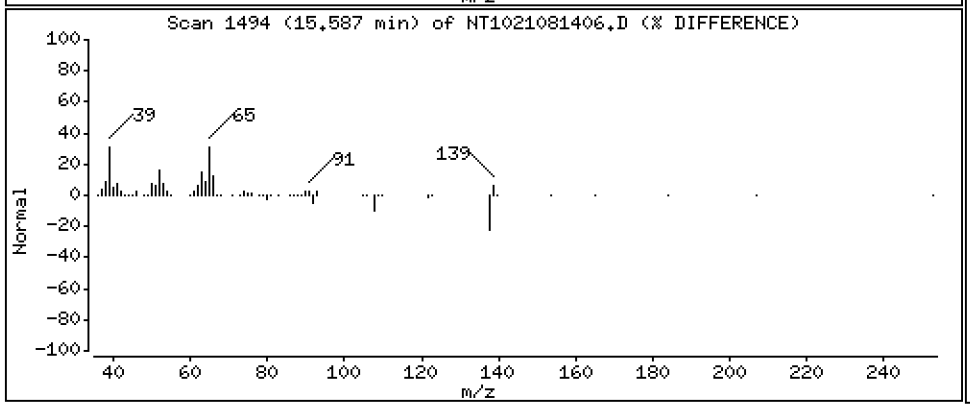
52 4-Nitroaniline

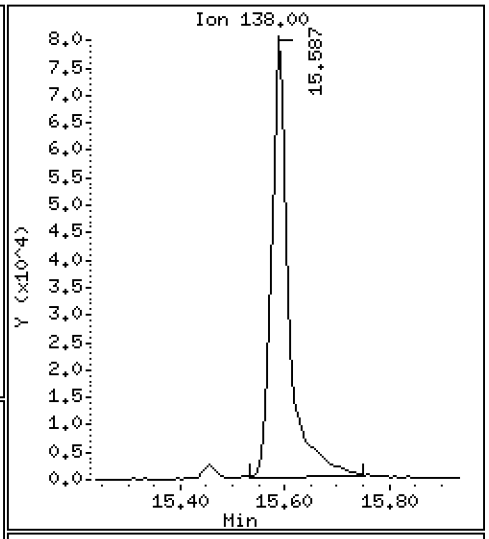
Concentration: 9.565 ug/mL

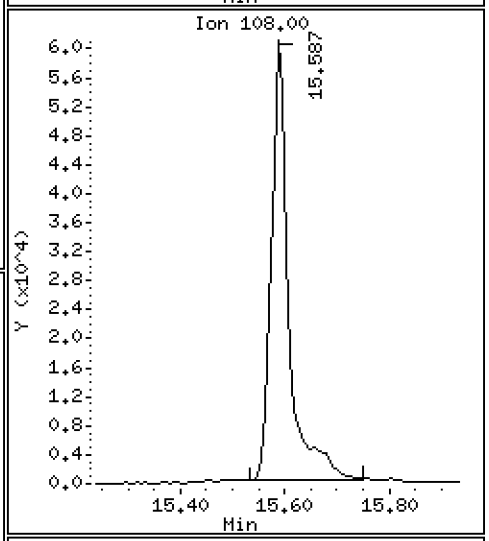


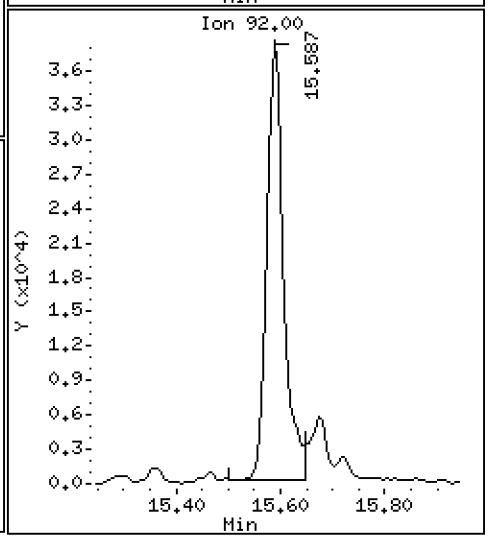












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

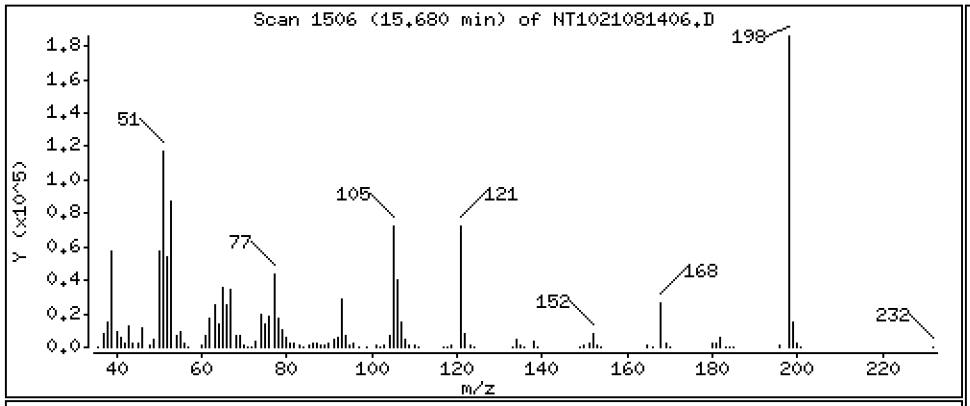
Operator: VTS

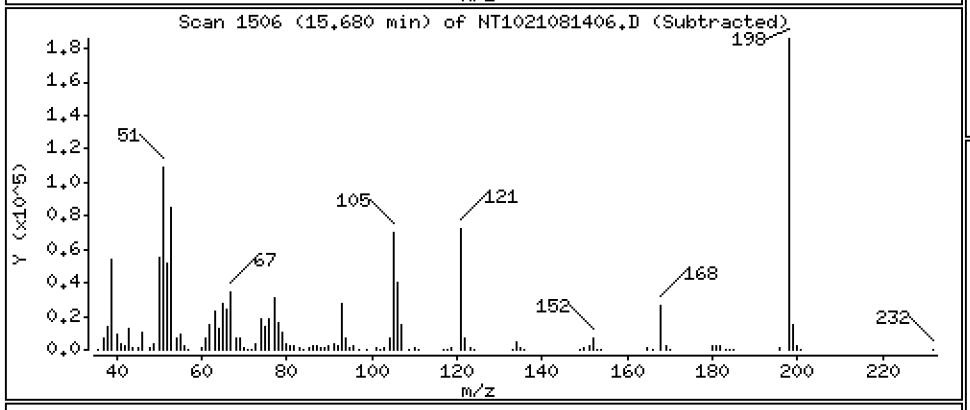
Column phase: ZB-5msi

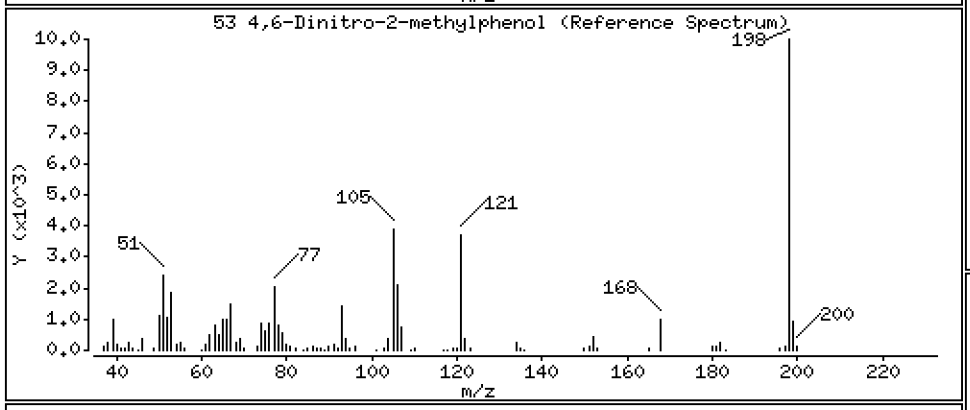
Column diameter: 0.25

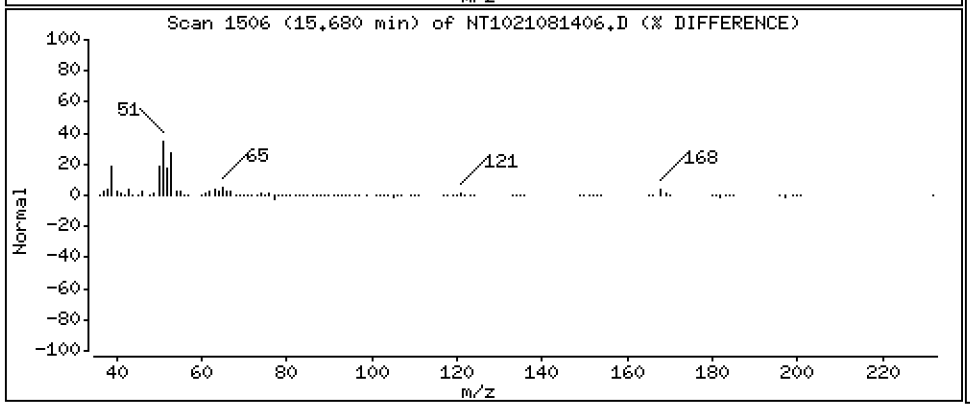
53 4,6-Dinitro-2-methylphenol

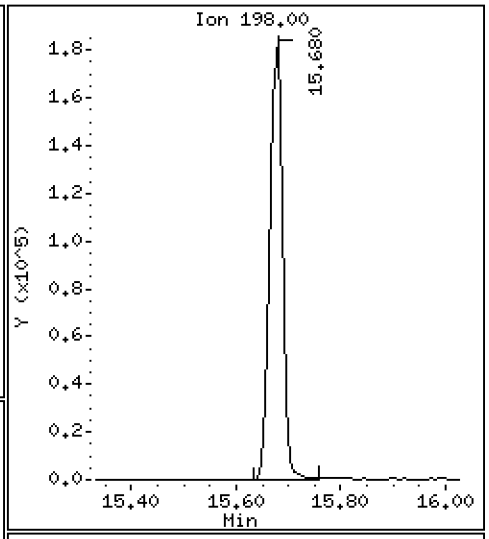
Concentration: 20.23 ug/mL

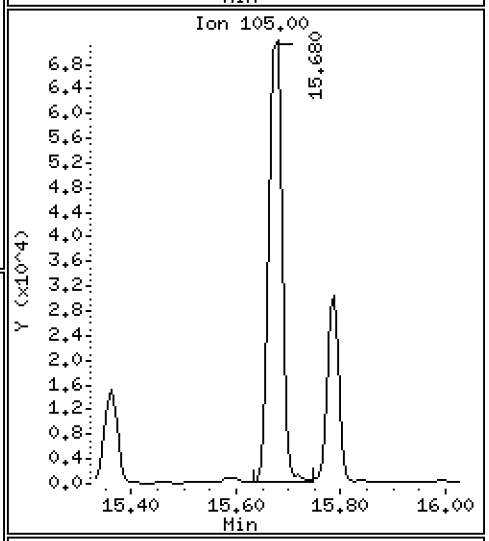


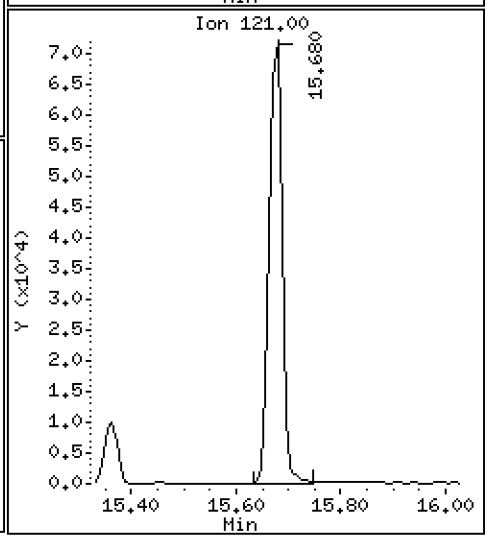












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

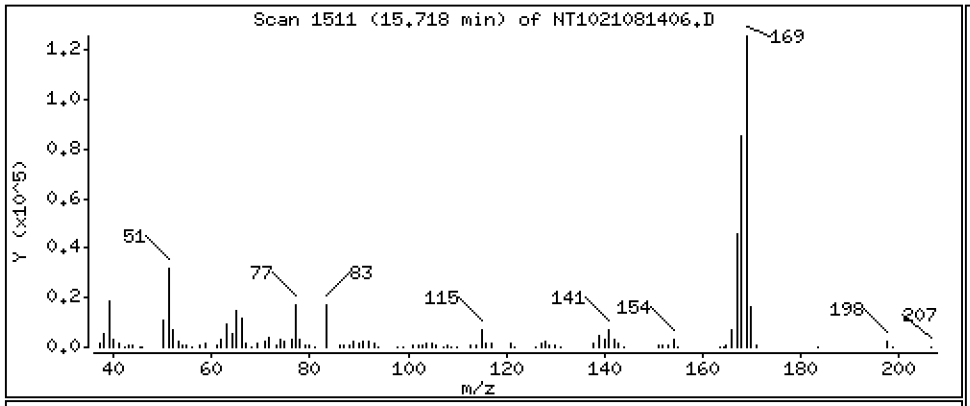
Operator: VTS

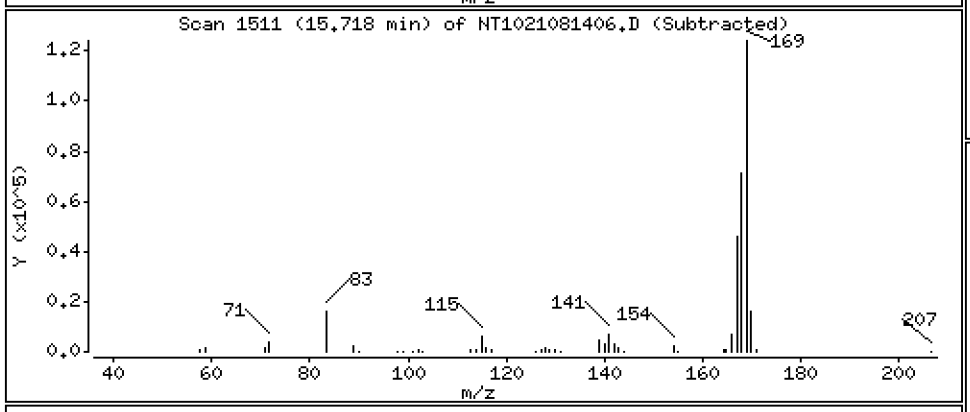
Column phase: ZB-5msi

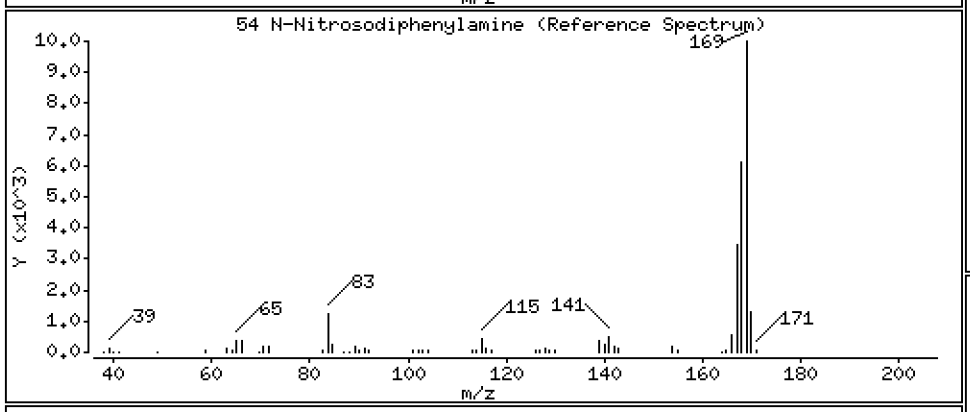
Column diameter: 0.25

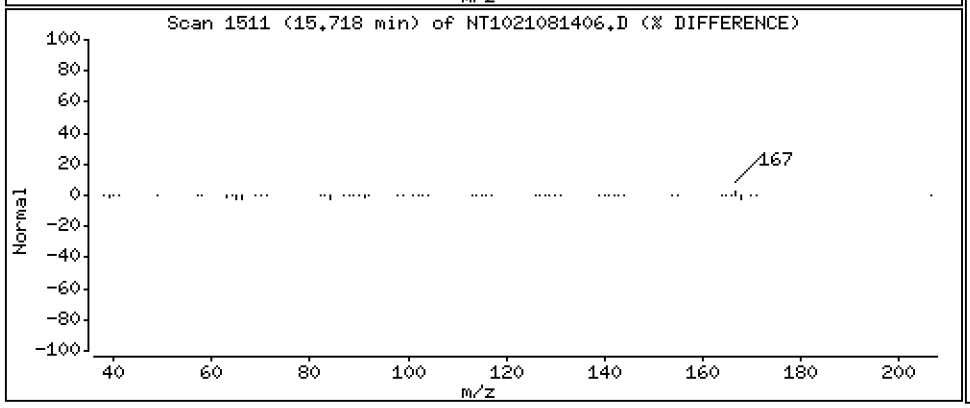
54 N-Nitrosodiphenylamine

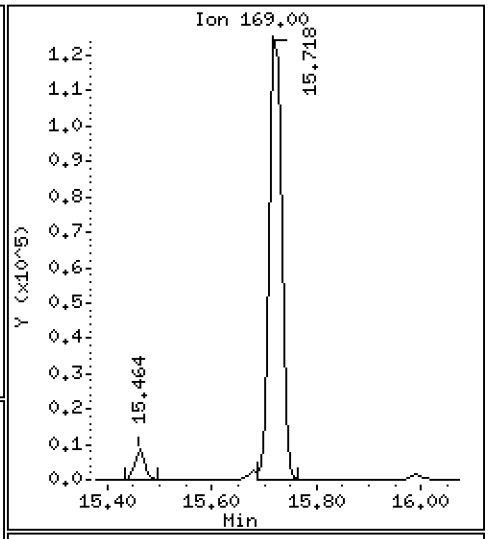
Concentration: 3.491 ug/mL

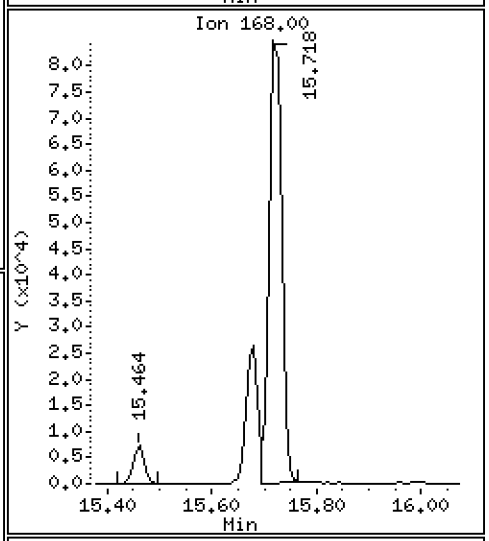


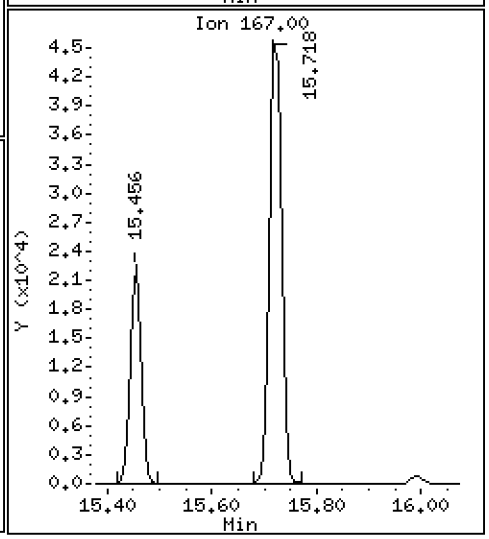












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

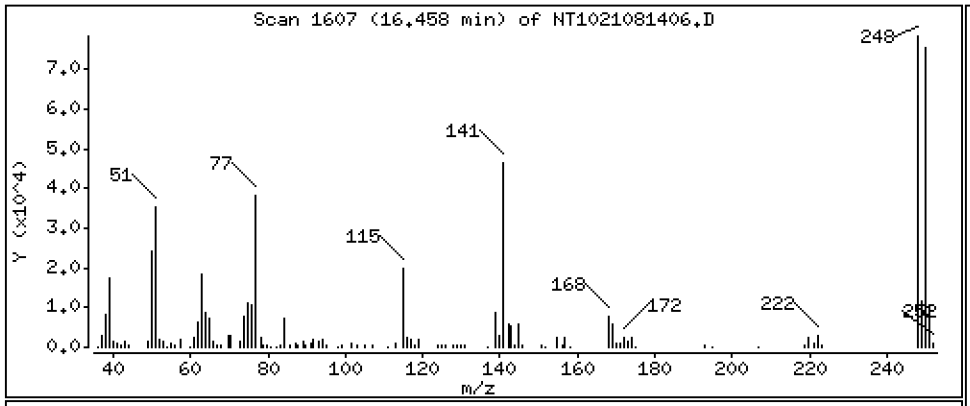
Operator: VTS

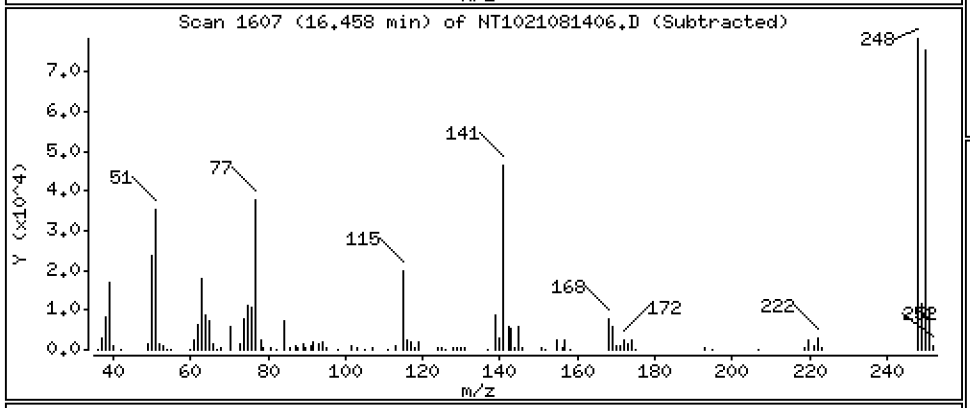
Column phase: ZB-5msi

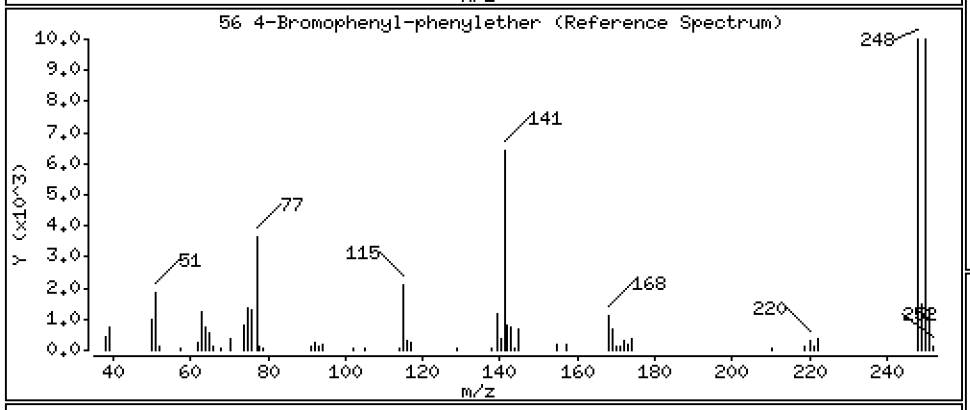
Column diameter: 0.25

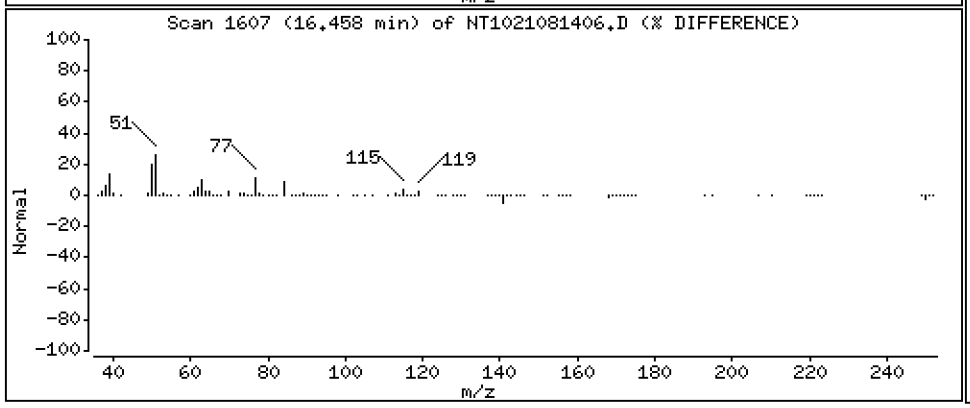
56 4-Bromophenyl-phenylether

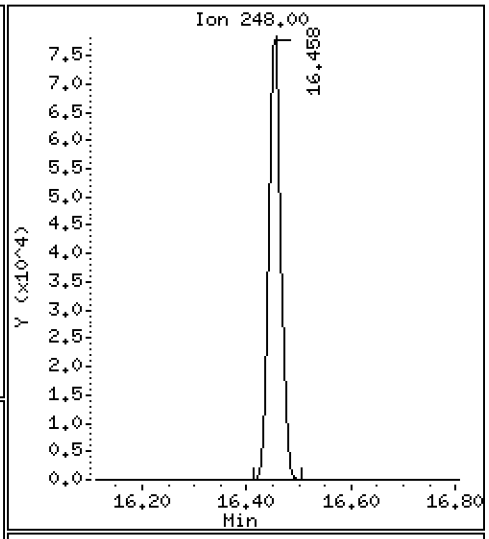
Concentration: 4.468 ug/mL

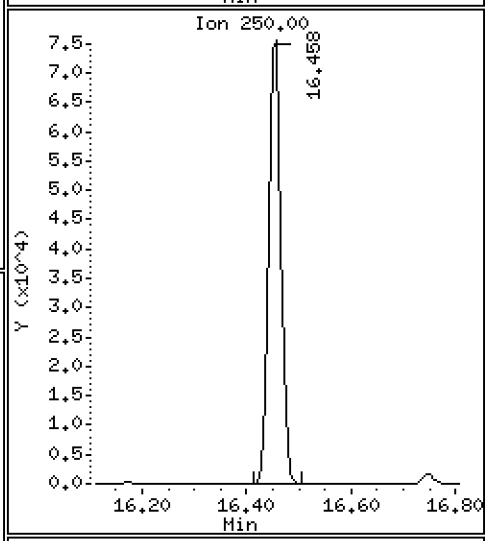


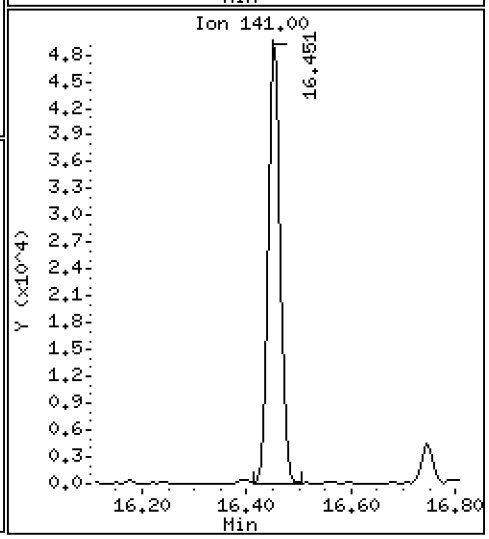












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

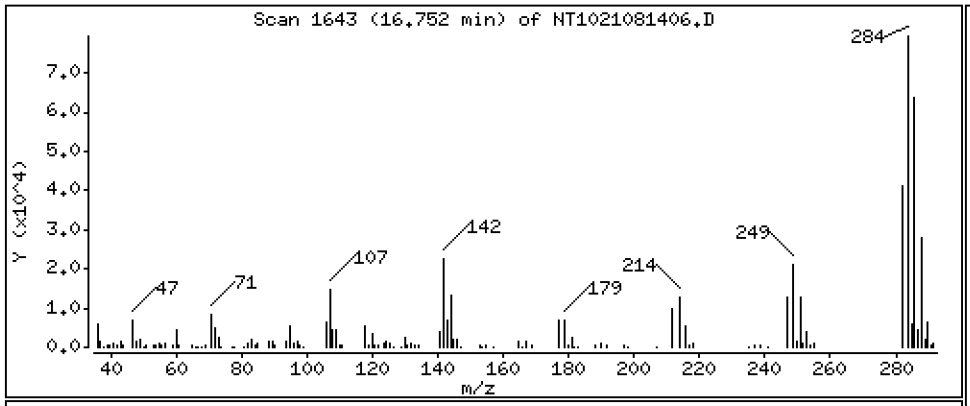
Operator: VTS

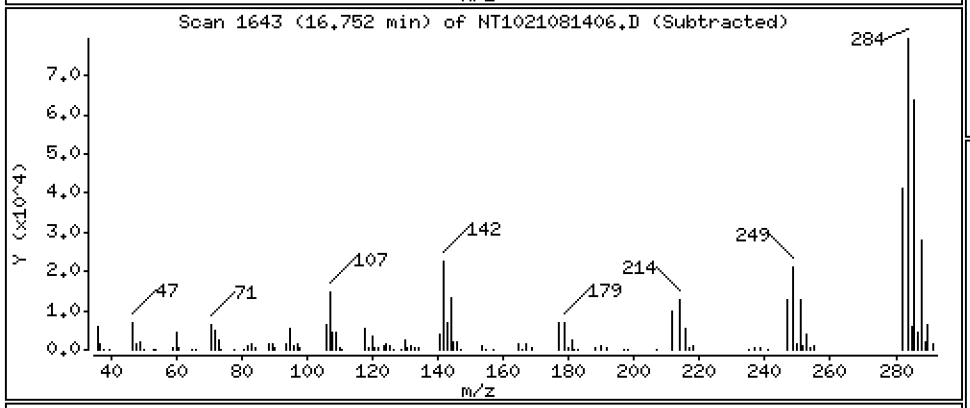
Column phase: ZB-5msi

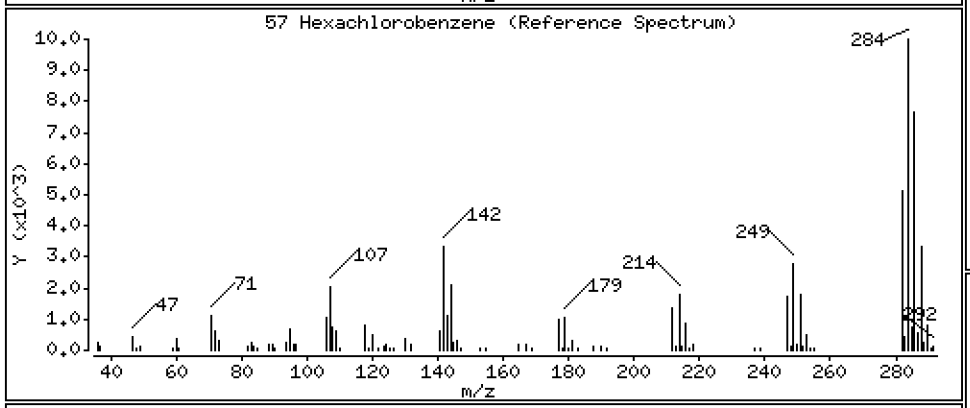
Column diameter: 0.25

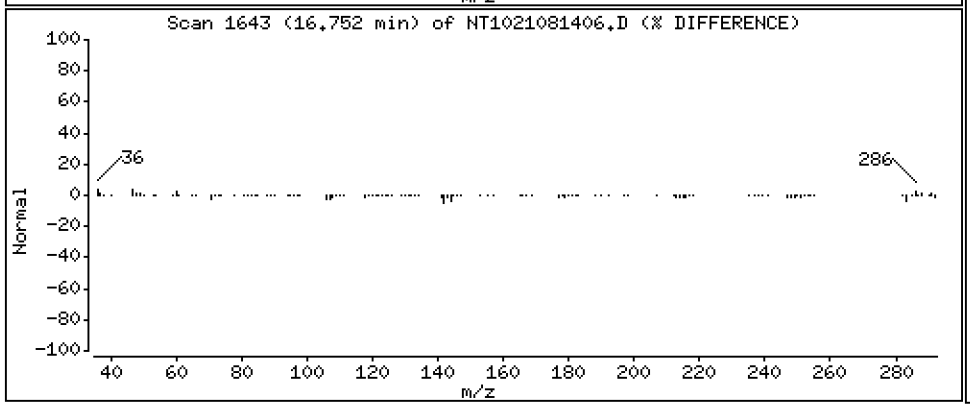
57 Hexachlorobenzene

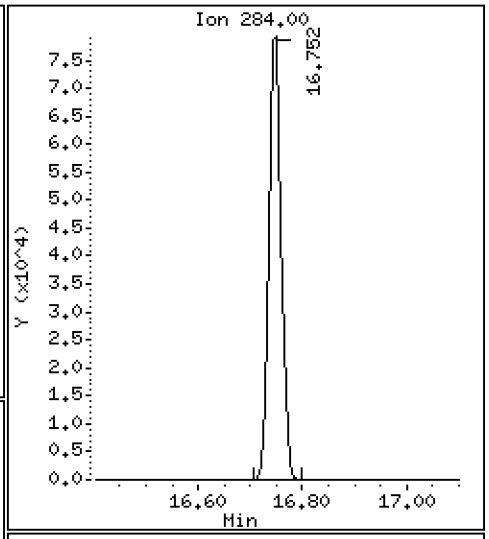
Concentration: 4.385 ug/mL

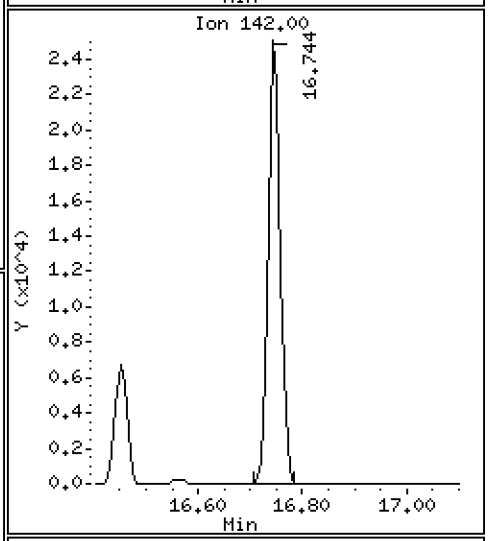


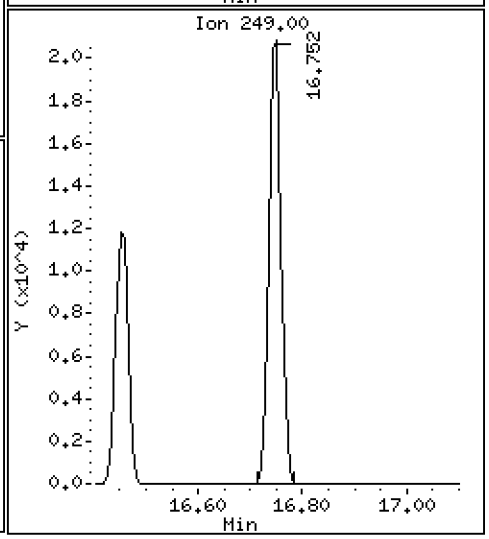












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

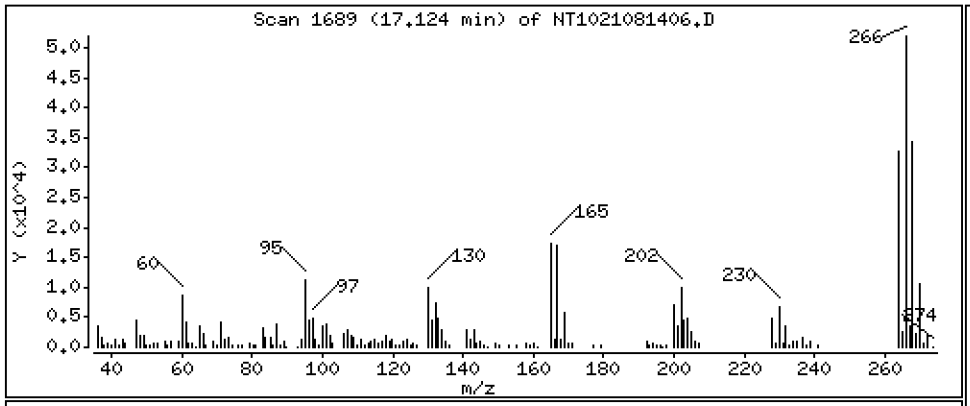
Operator: VTS

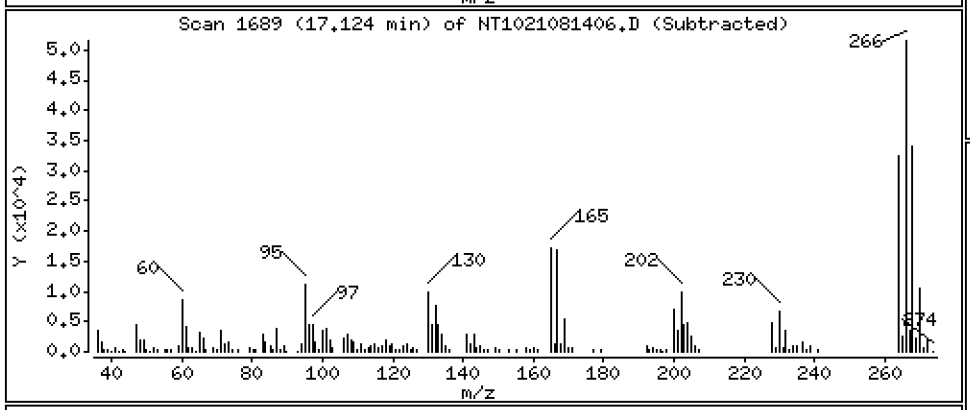
Column phase: ZB-5msi

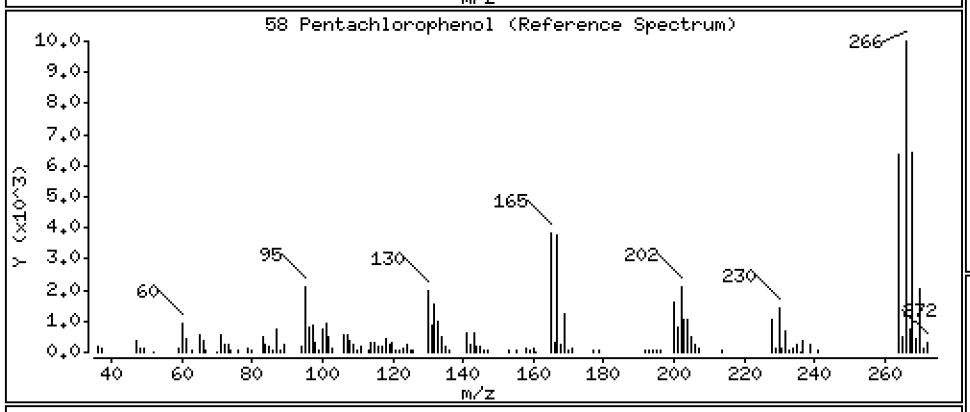
Column diameter: 0.25

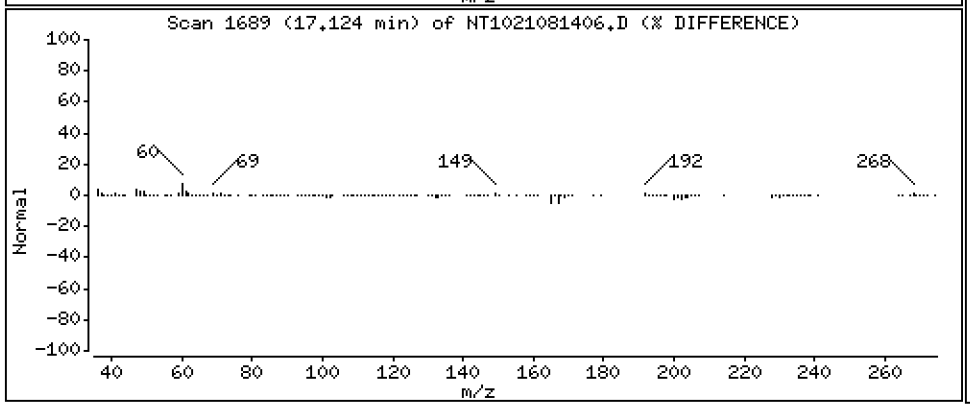
58 Pentachlorophenol

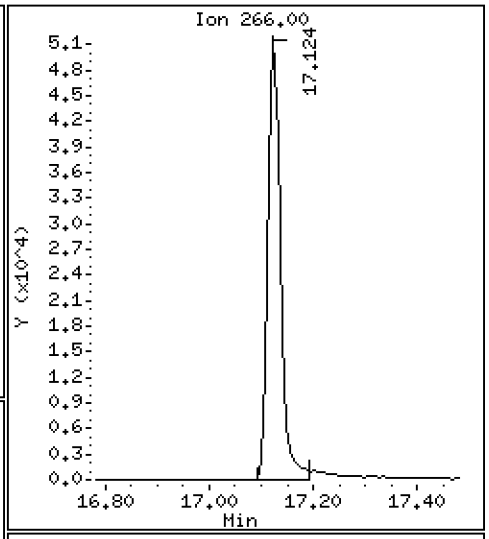
Concentration: 6.732 ug/mL

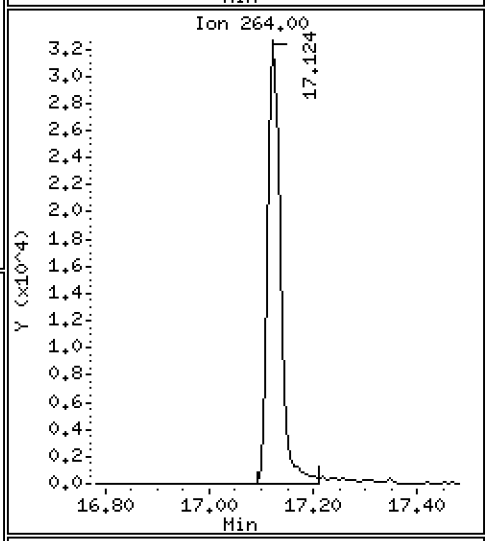


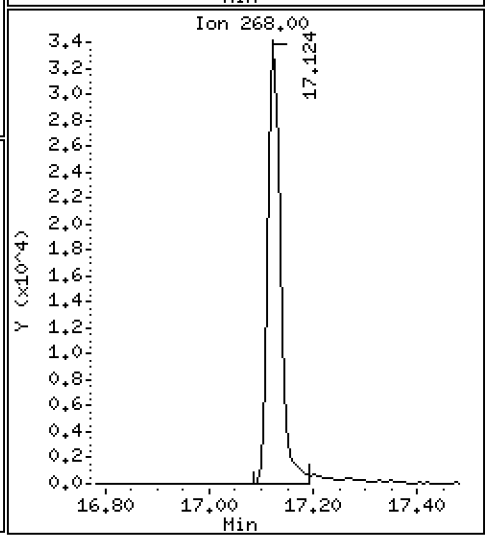












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Date : 14-AUG-2021 12:28

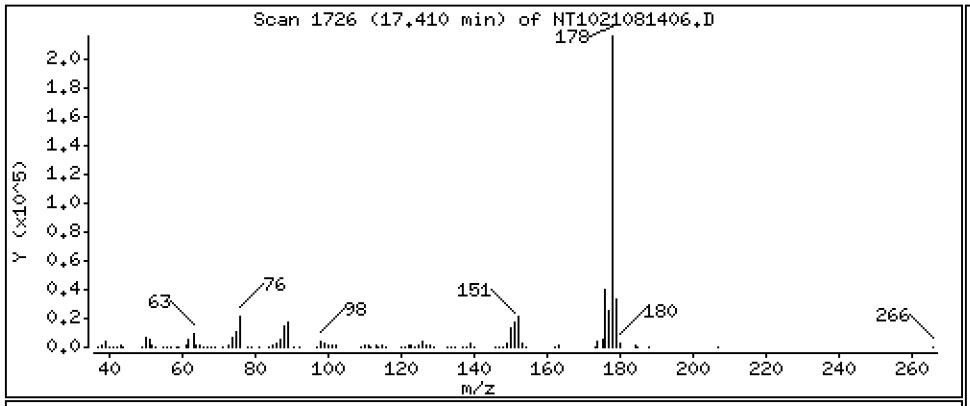
Client ID: Instrument: nt10.i

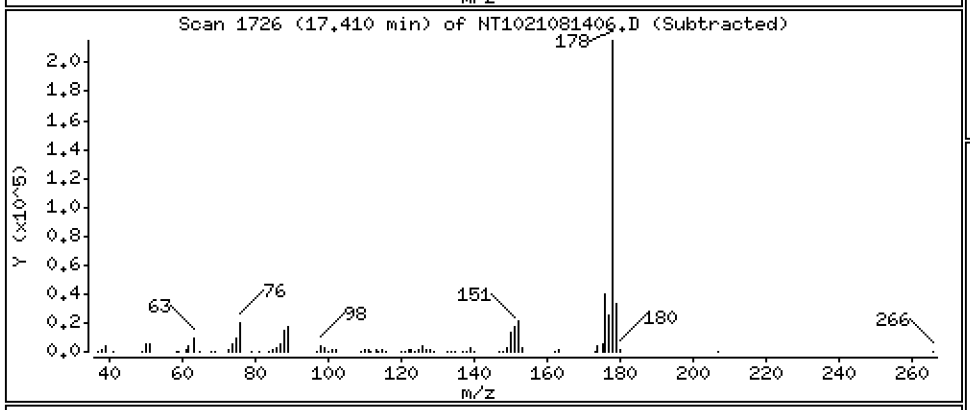
Sample Info: BJH0004-BS1

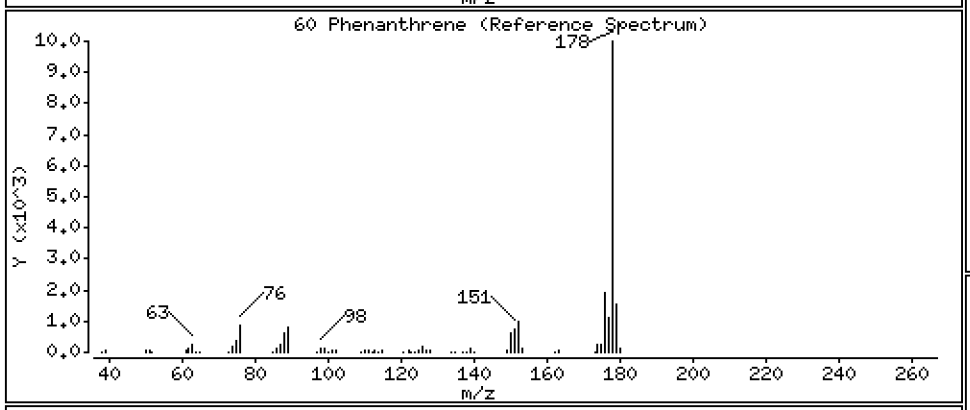
Operator: VTS

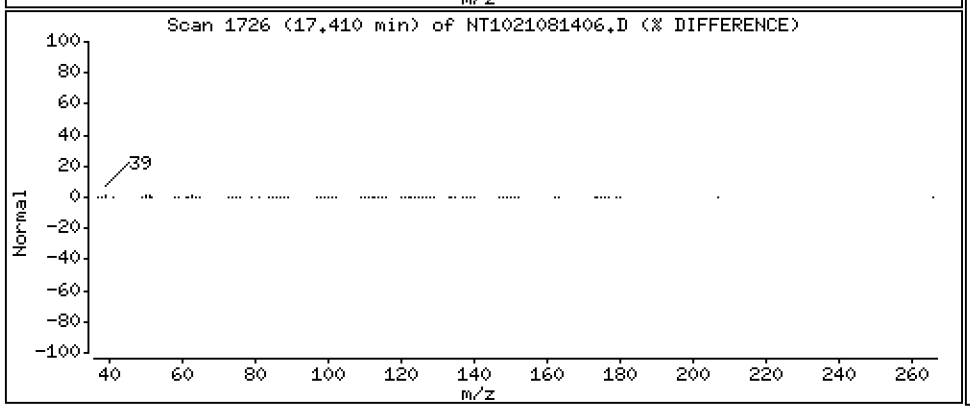
Column phase: ZB-5msi Column diameter: 0.25

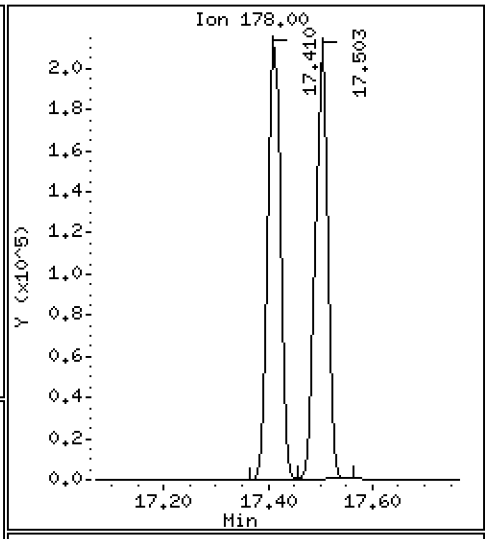
60 Phenanthrene Concentration: 4.103 ug/mL

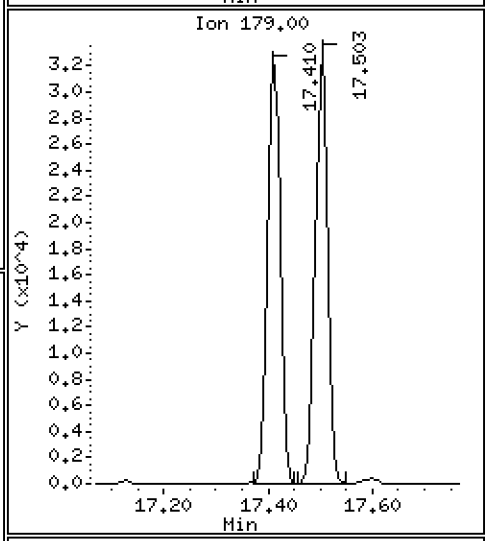


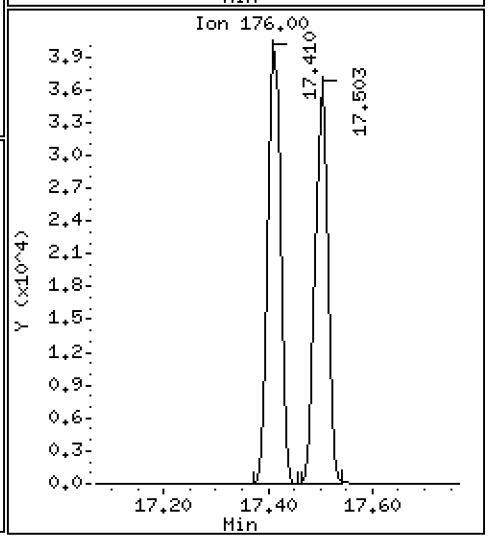












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

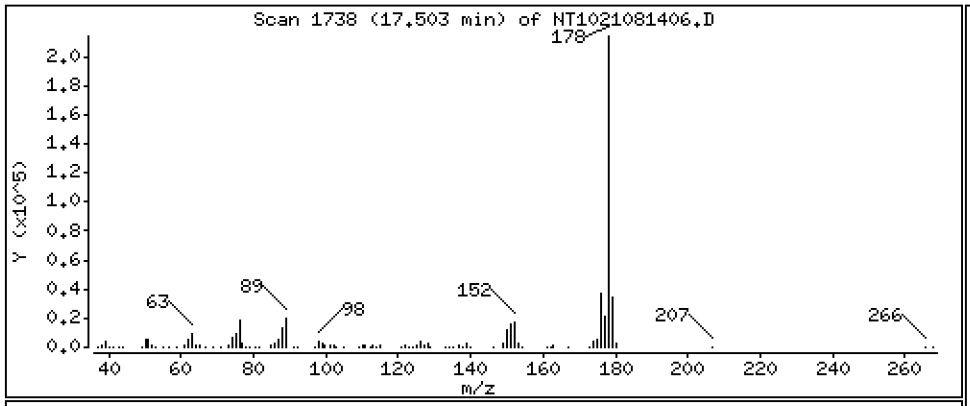
Operator: VTS

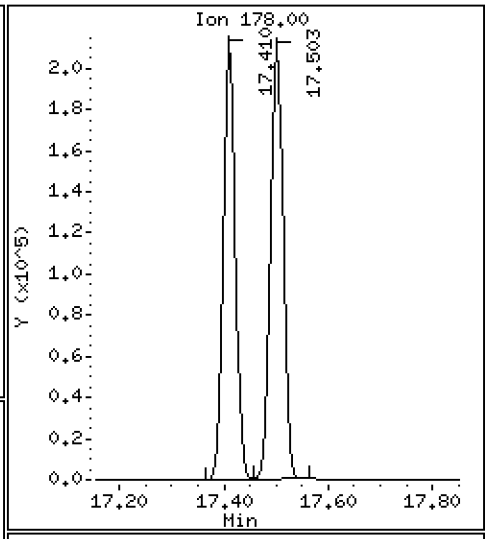
Column phase: ZB-5msi

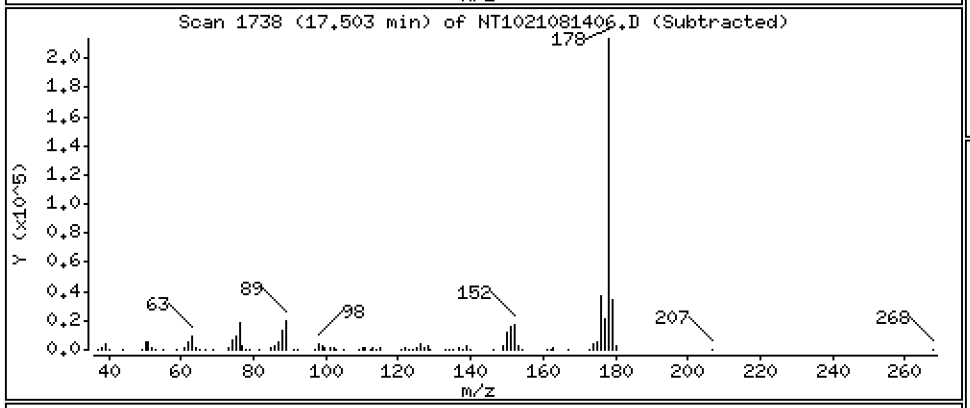
Column diameter: 0.25

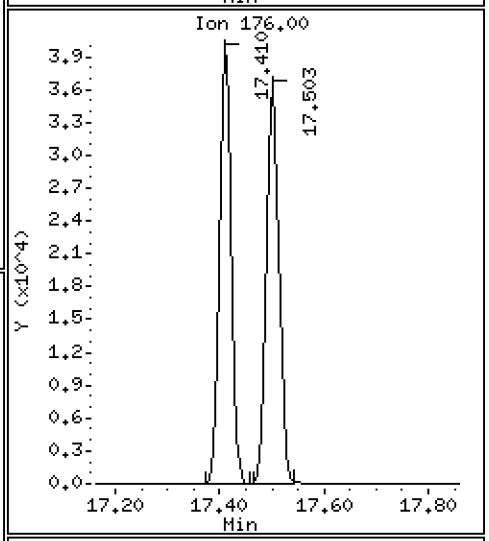
61 Anthracene

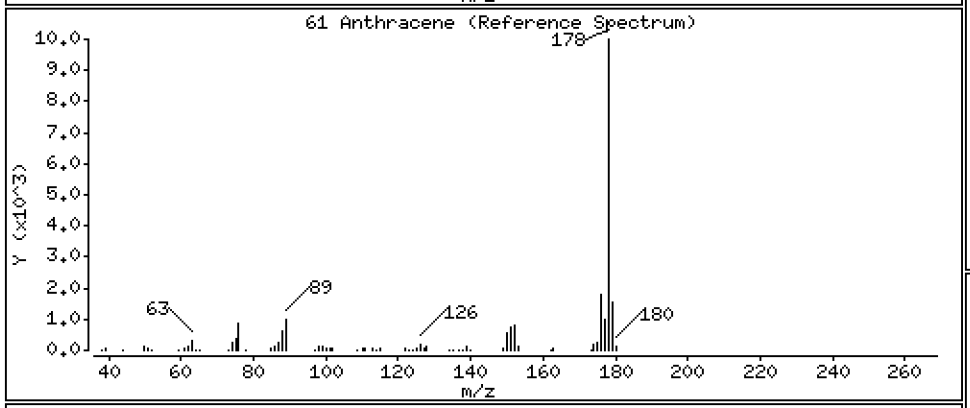
Concentration: 3.758 ug/mL

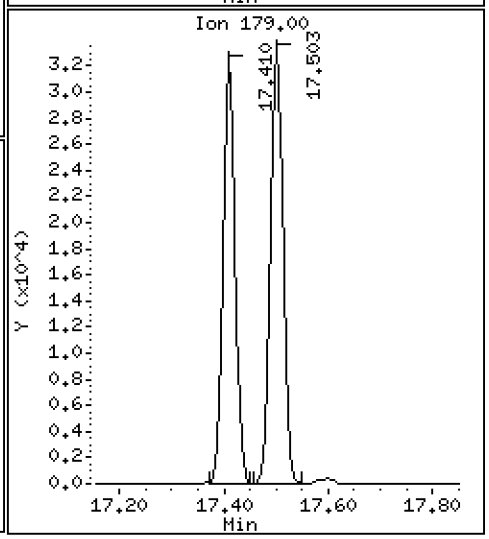


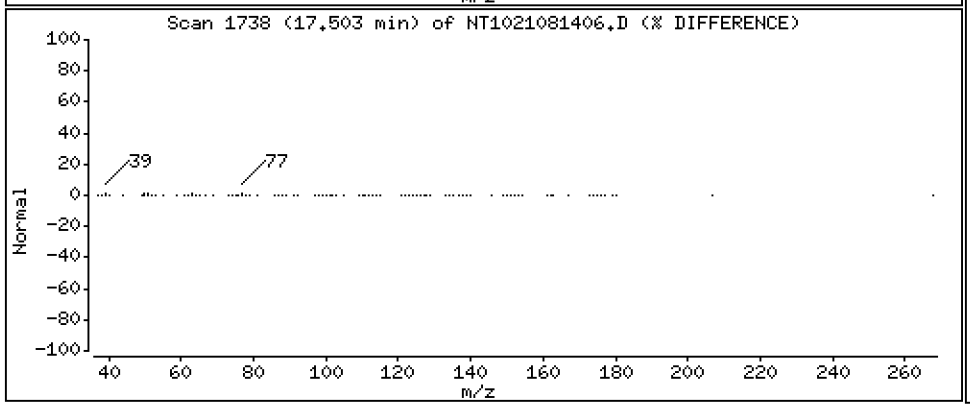












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081406.D

Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

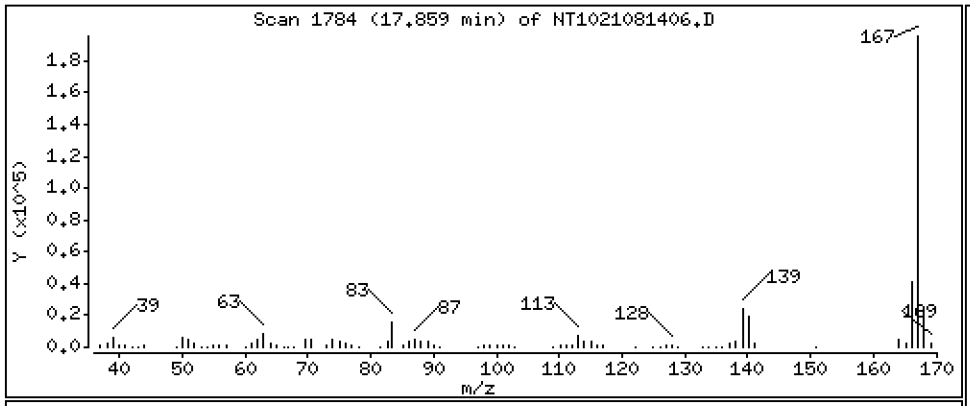
Operator: VTS

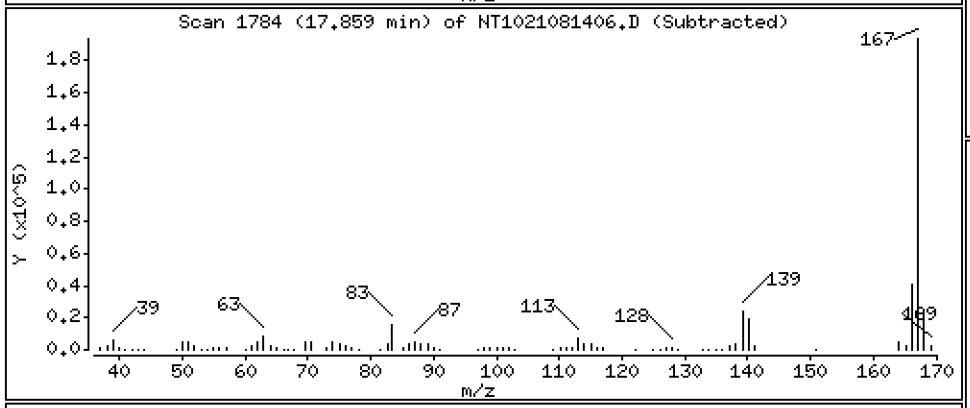
Column phase: ZB-5msi

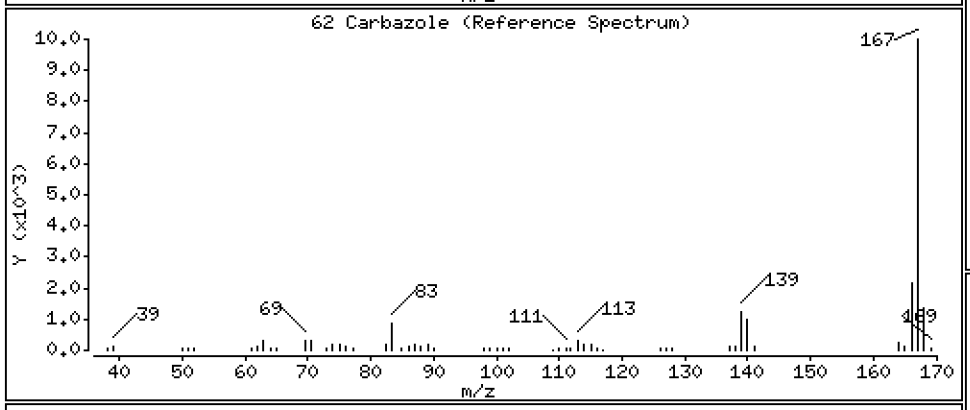
Column diameter: 0.25

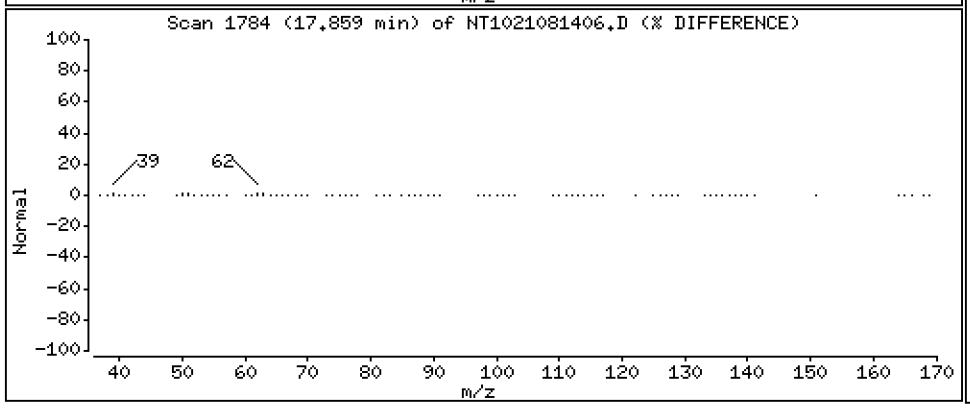
62 Carbazole

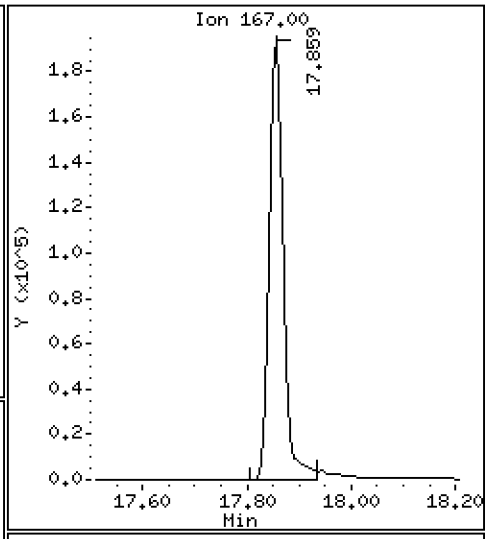
Concentration: 3.918 ug/mL

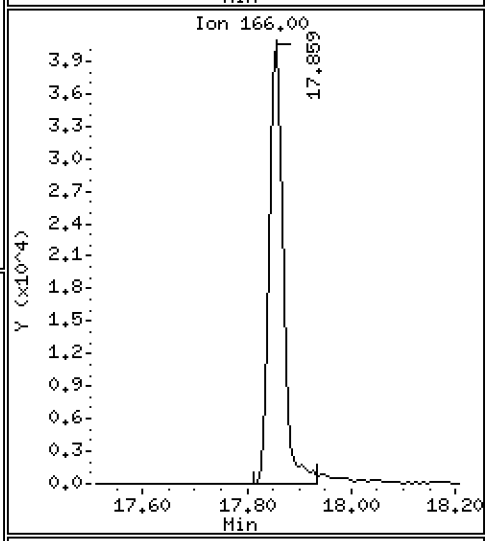


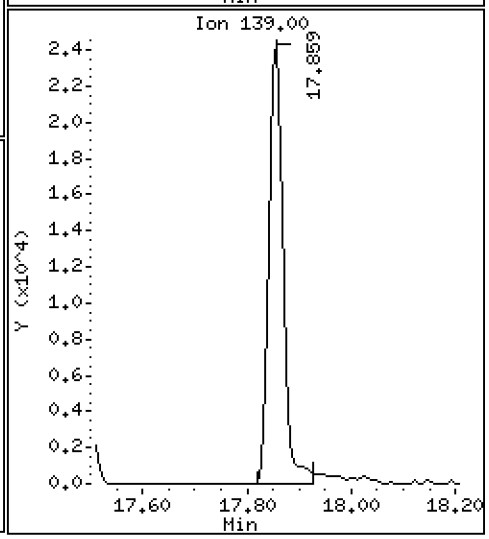












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

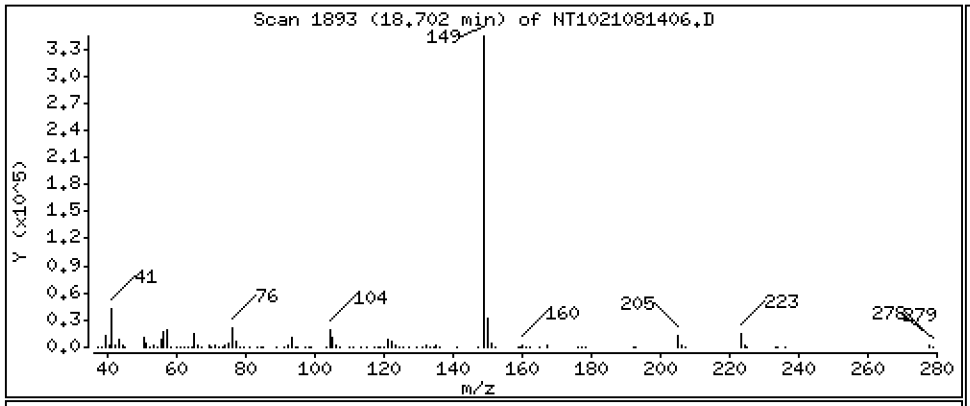
Operator: VTS

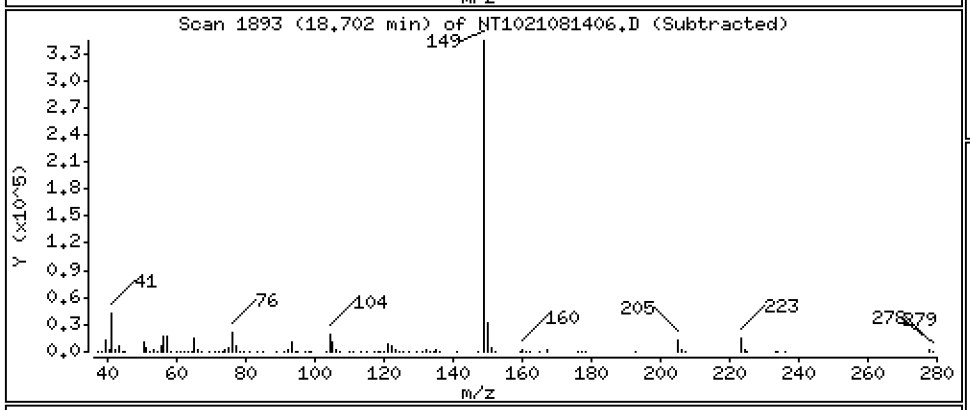
Column phase: ZB-5msi

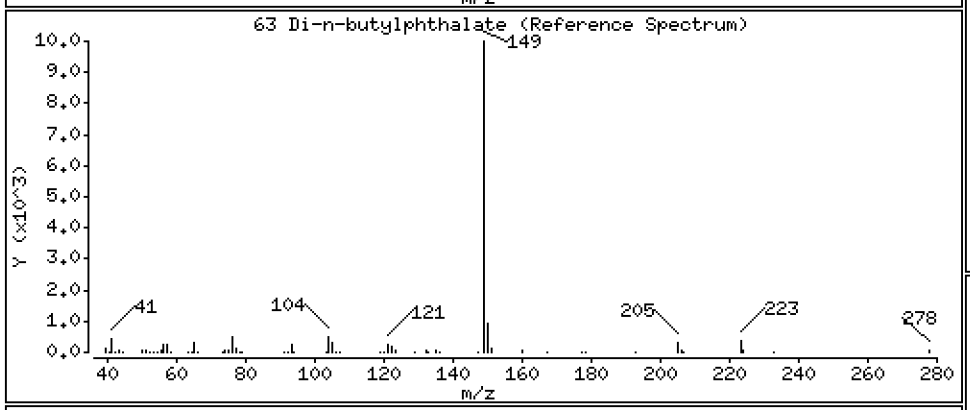
Column diameter: 0.25

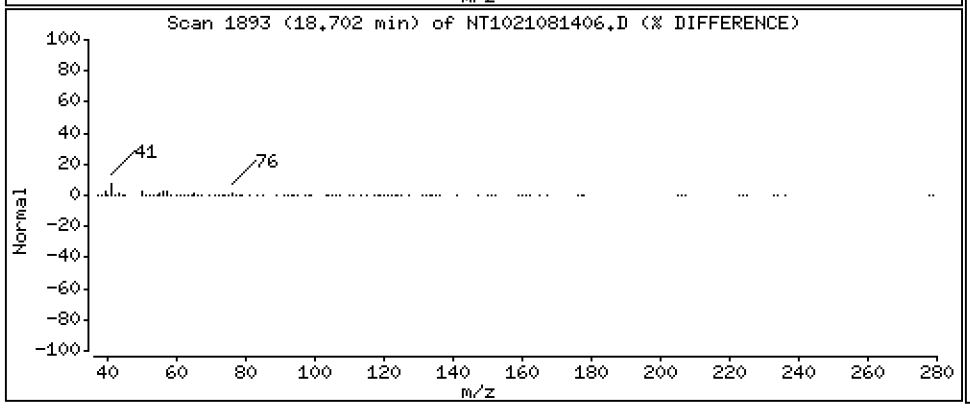
63 Di-n-butylphthalate

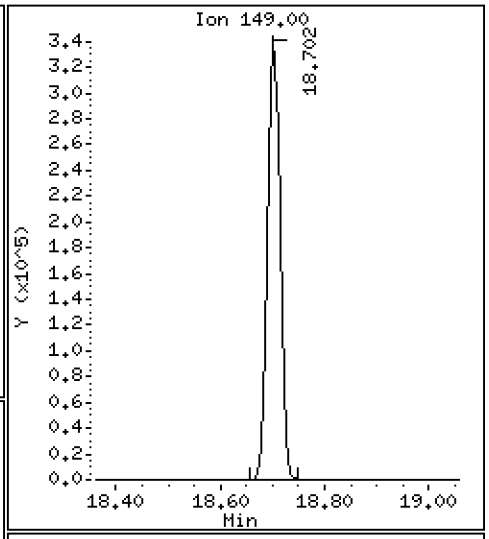
Concentration: 3.931 ug/mL

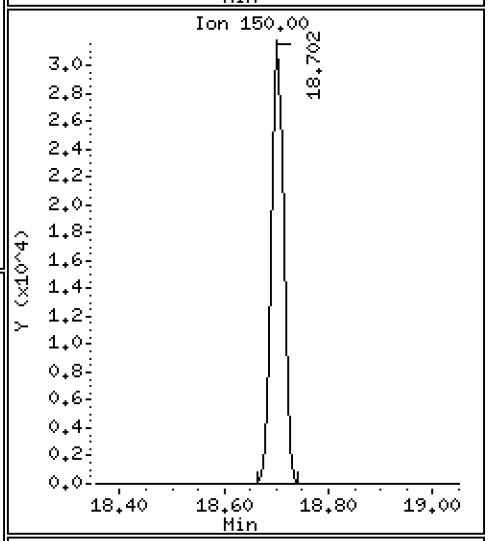


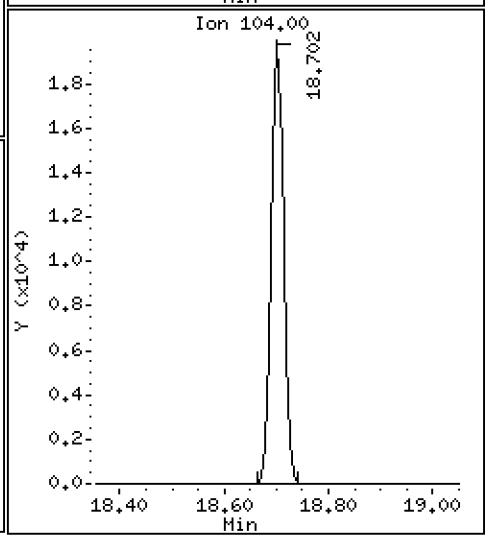












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

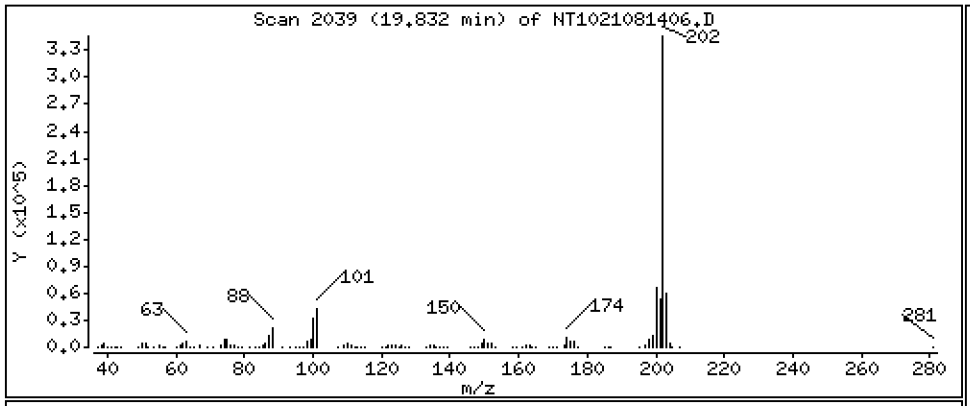
Operator: VTS

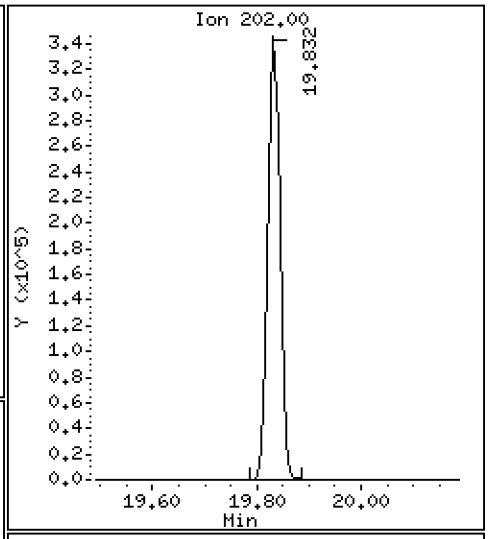
Column phase: ZB-5msi

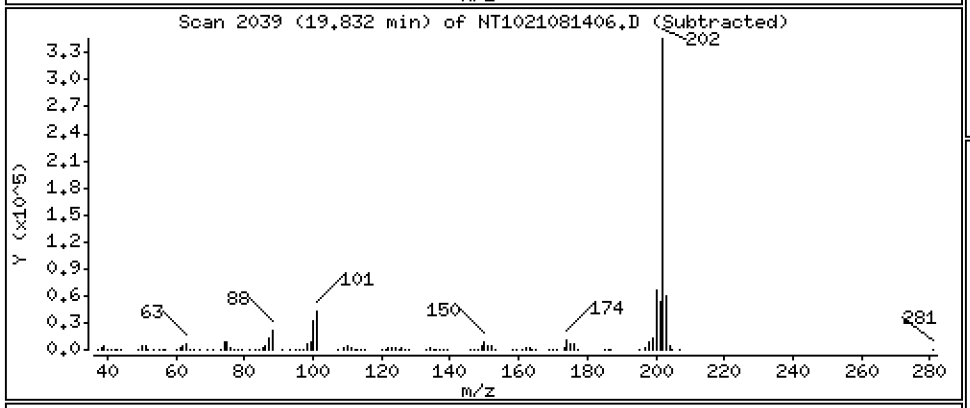
Column diameter: 0.25

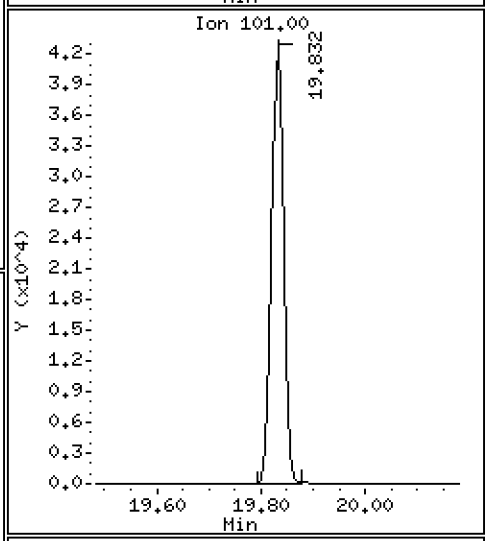
64 Fluoranthene

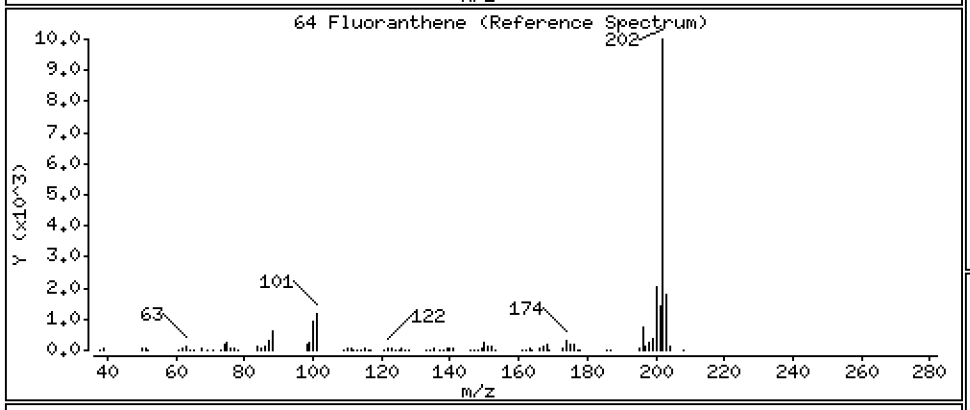
Concentration: 4.512 ug/mL

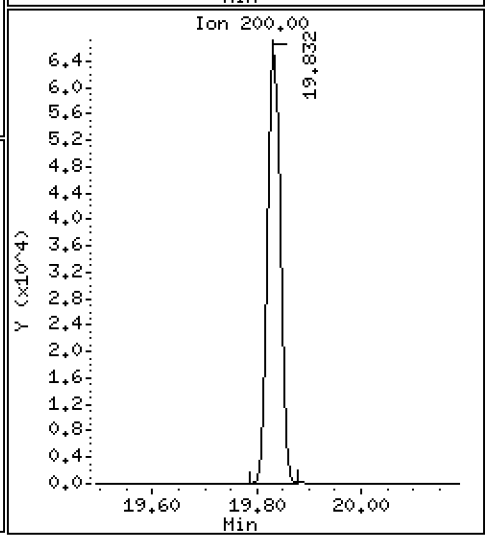


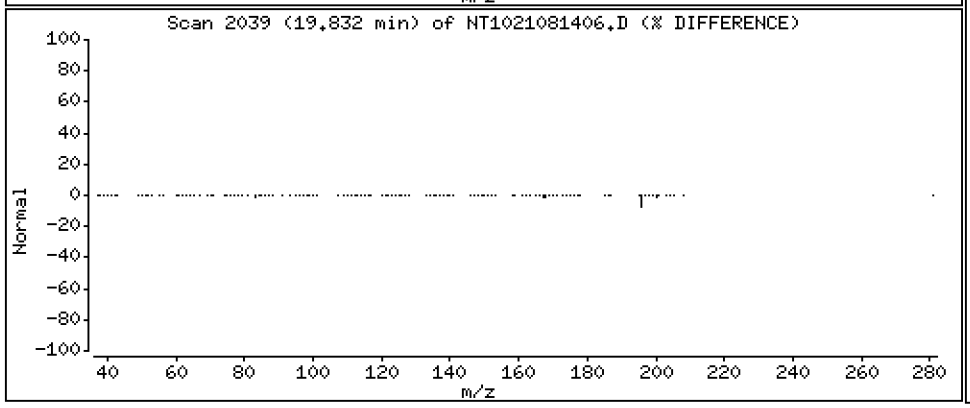












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081406.D

Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

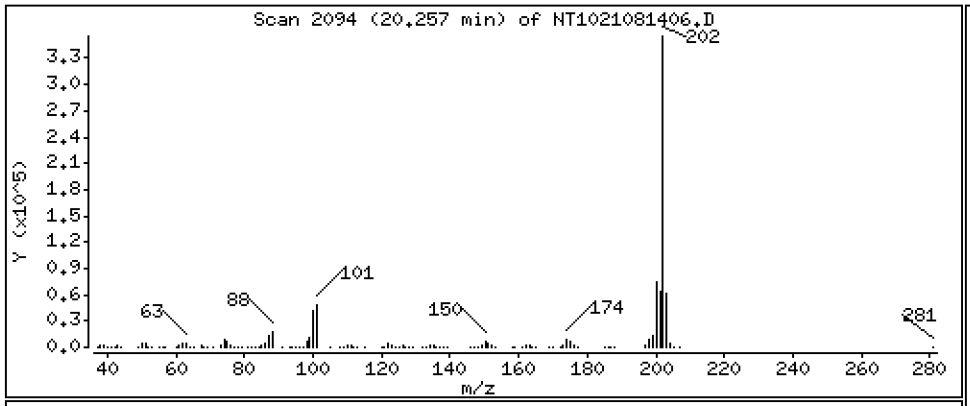
Operator: VTS

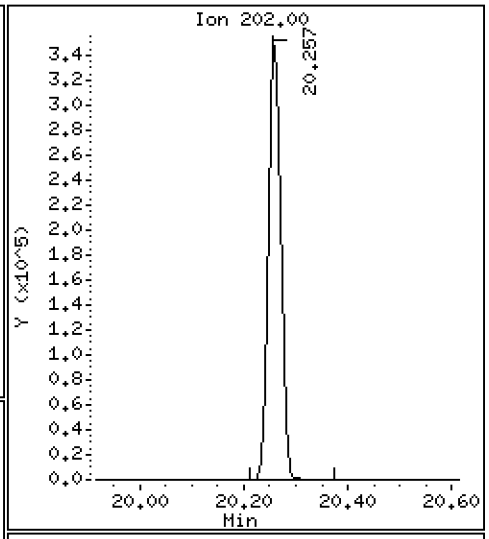
Column phase: ZB-5msi

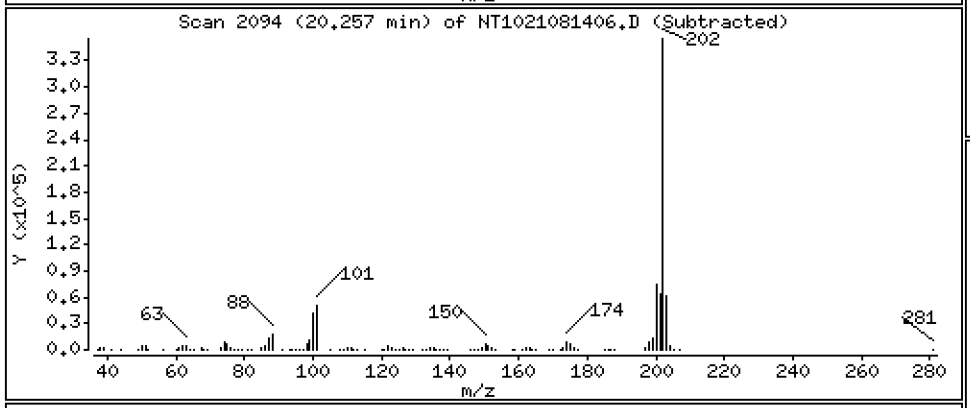
Column diameter: 0.25

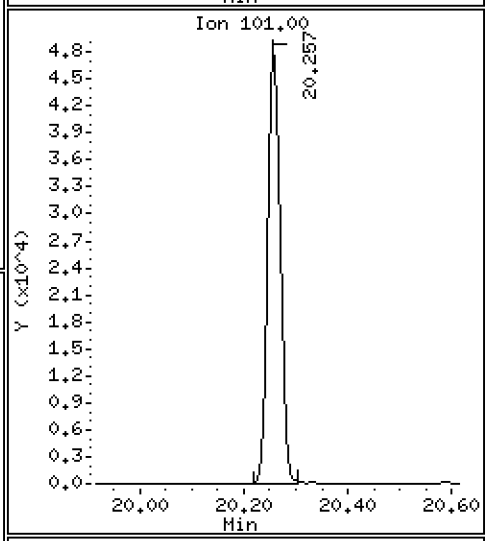
65 Pyrene

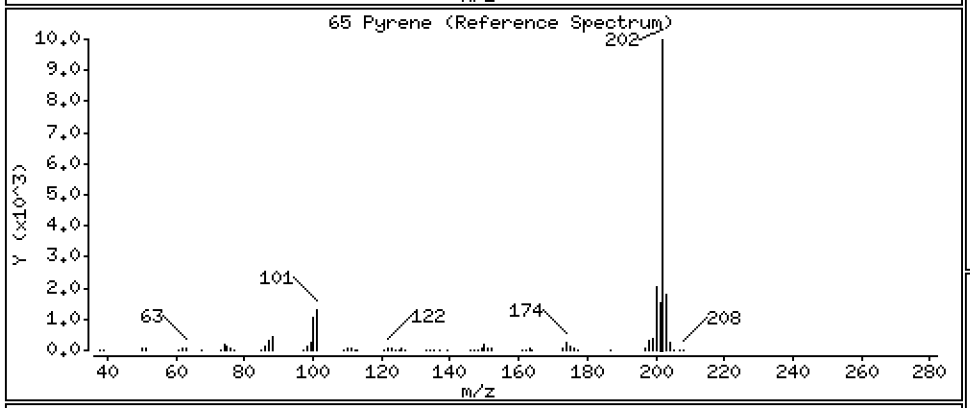
Concentration: 4.322 ug/mL

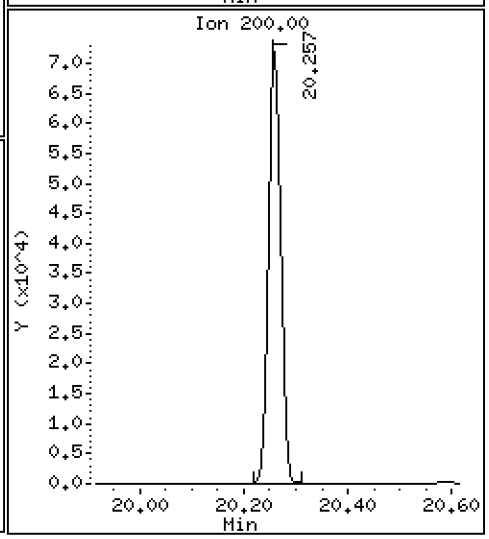


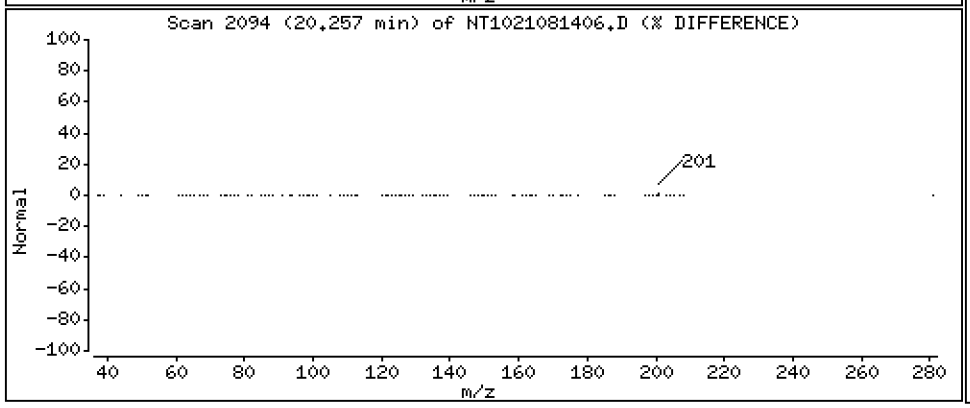












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

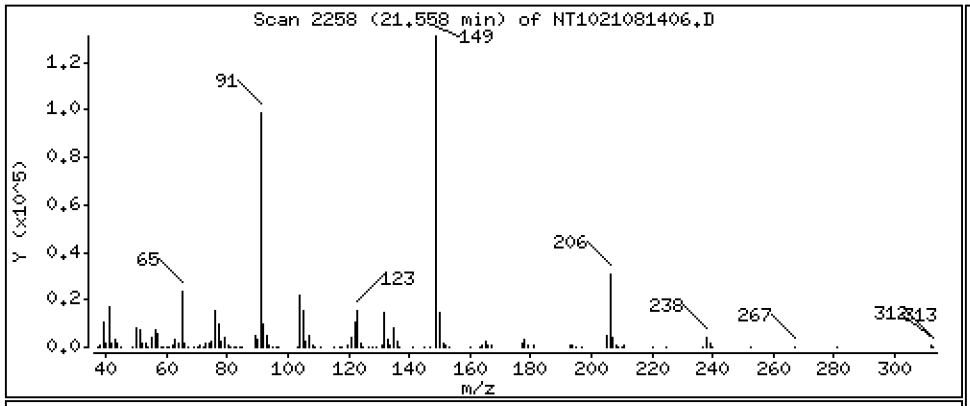
Operator: VTS

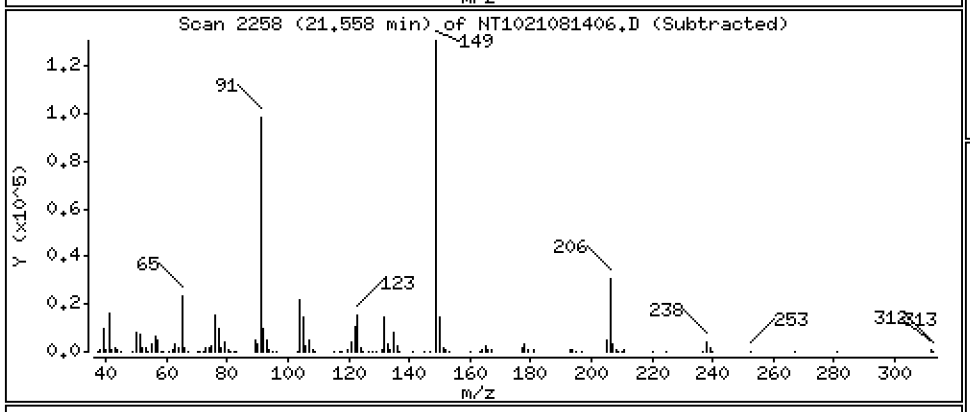
Column phase: ZB-5msi

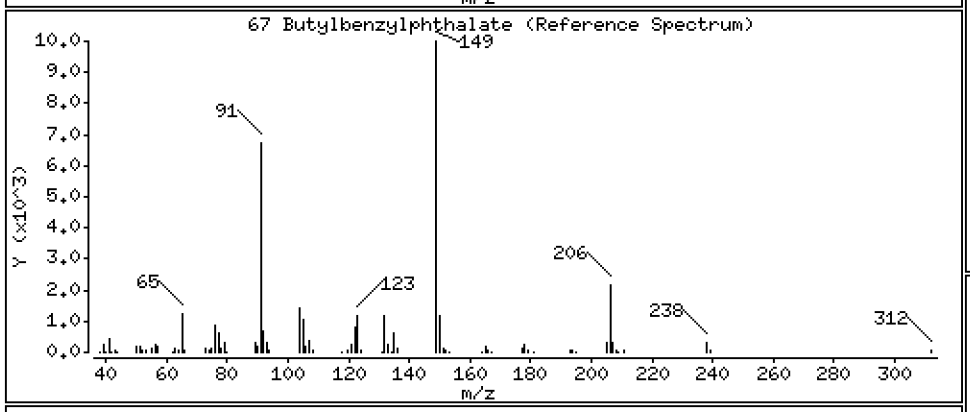
Column diameter: 0.25

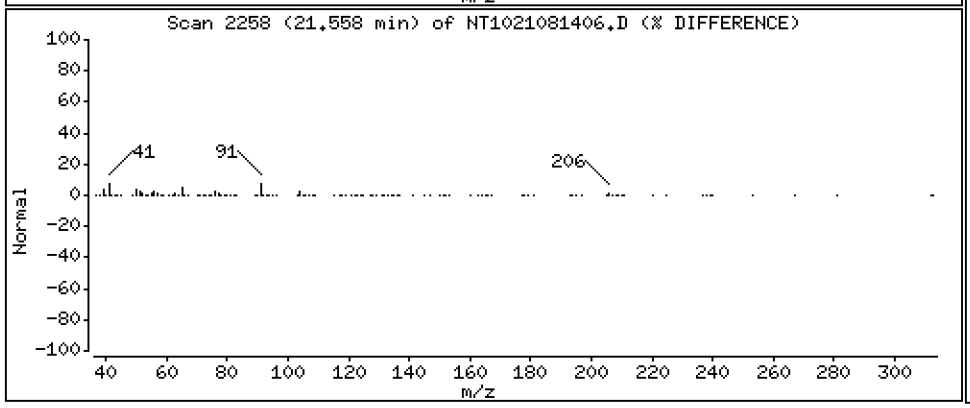
67 Butylbenzylphthalate

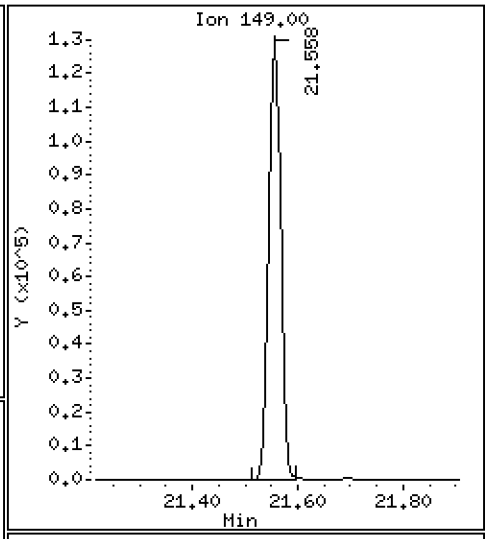
Concentration: 4.604 ug/mL

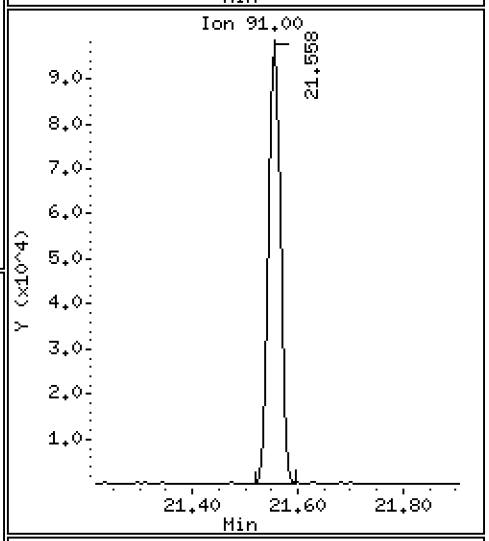


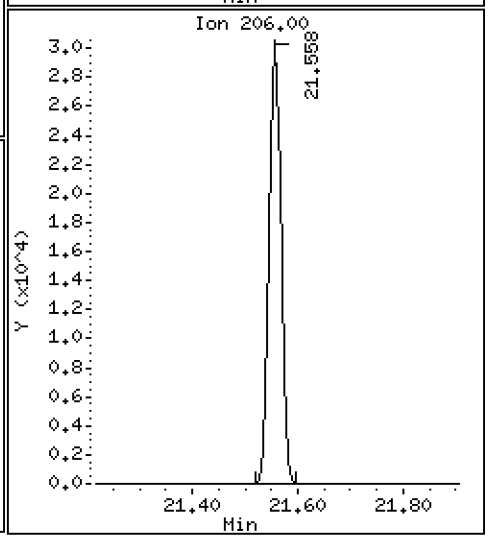












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

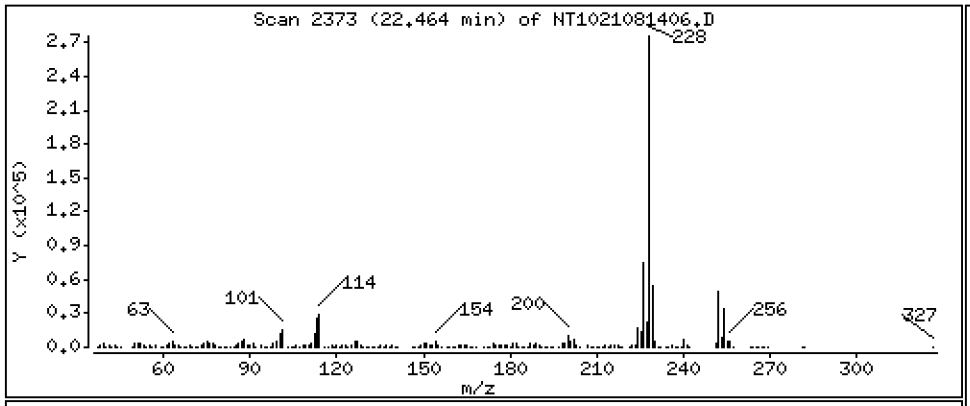
Operator: VTS

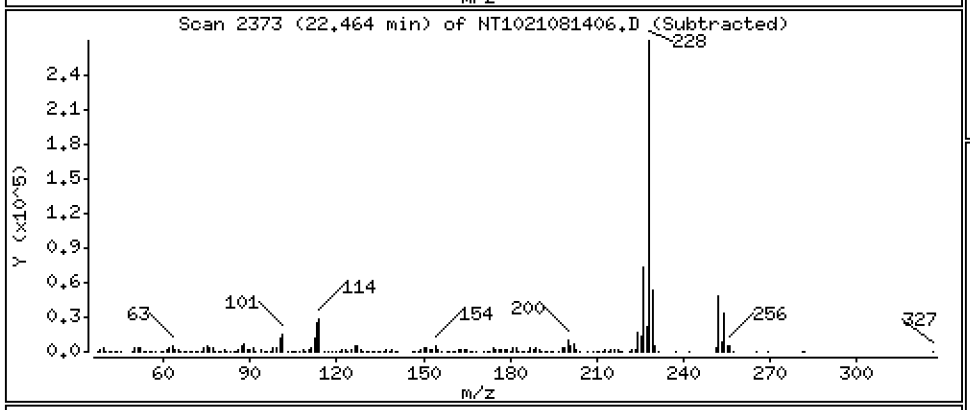
Column phase: ZB-5msi

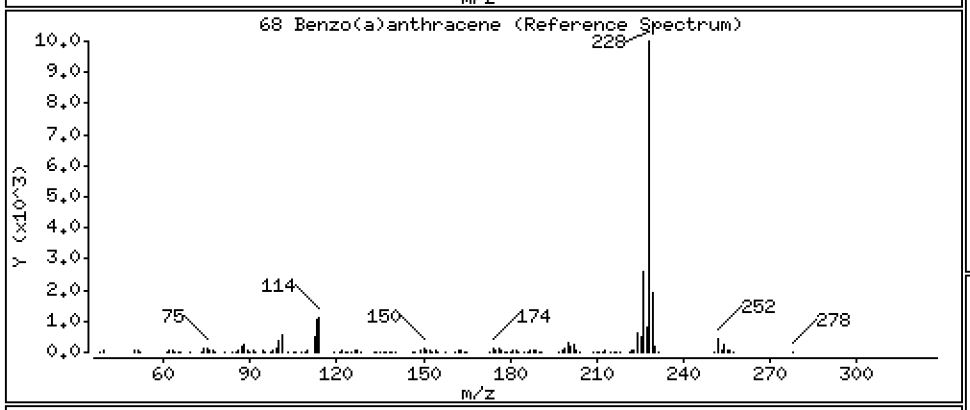
Column diameter: 0.25

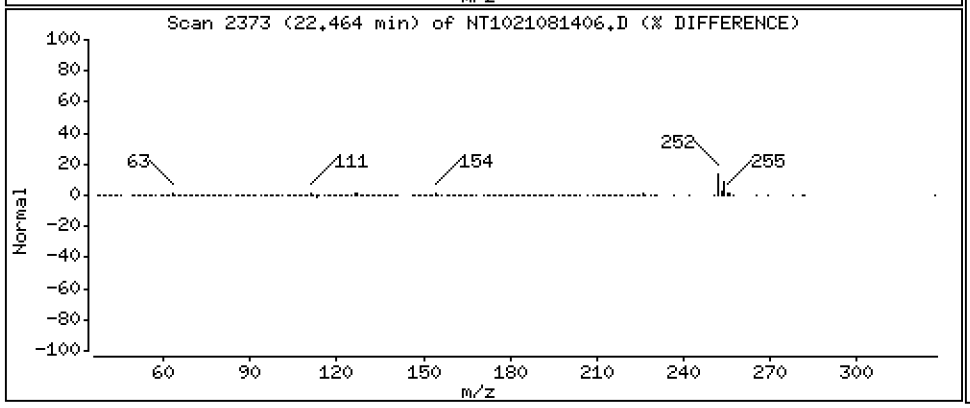
68 Benzo(a)anthracene

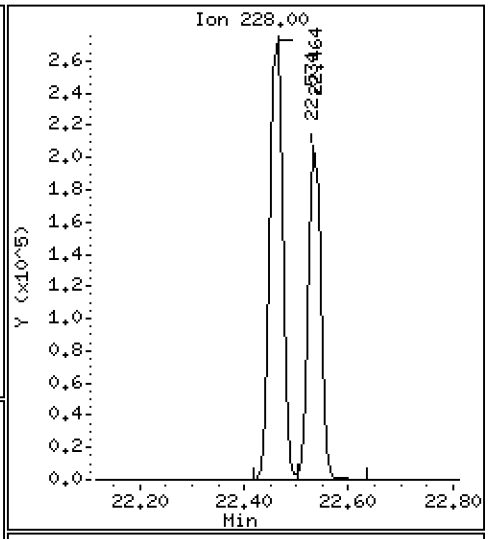
Concentration: 4.236 ug/mL

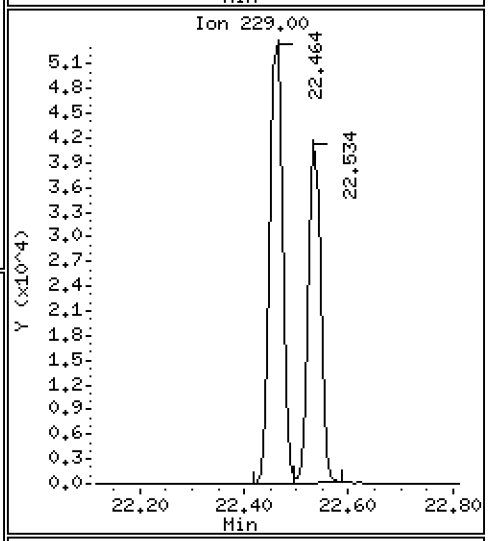


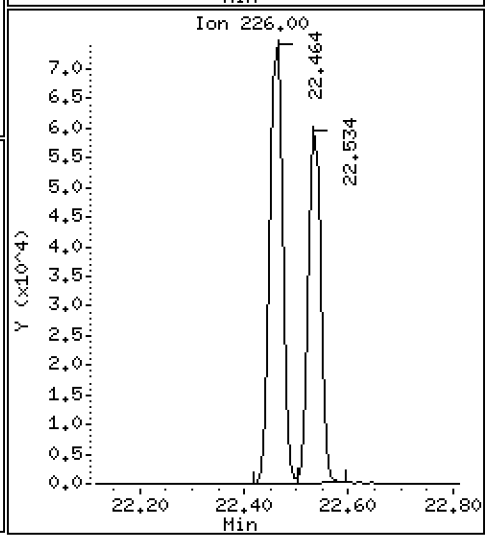












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081406.D

Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

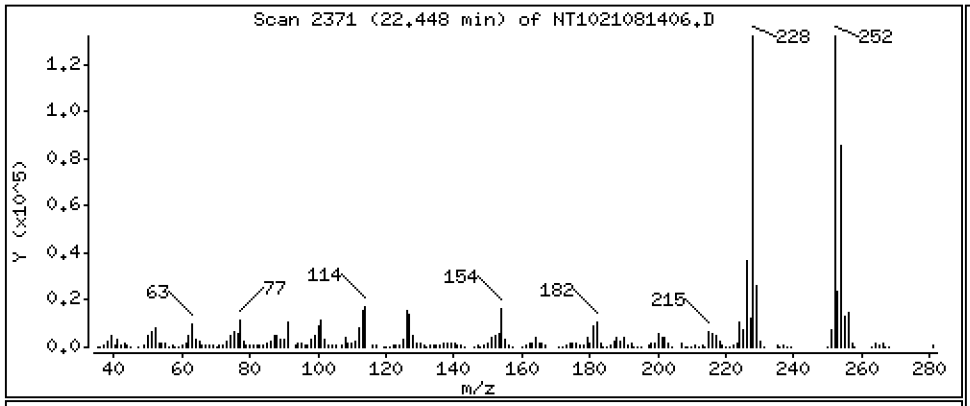
Operator: VTS

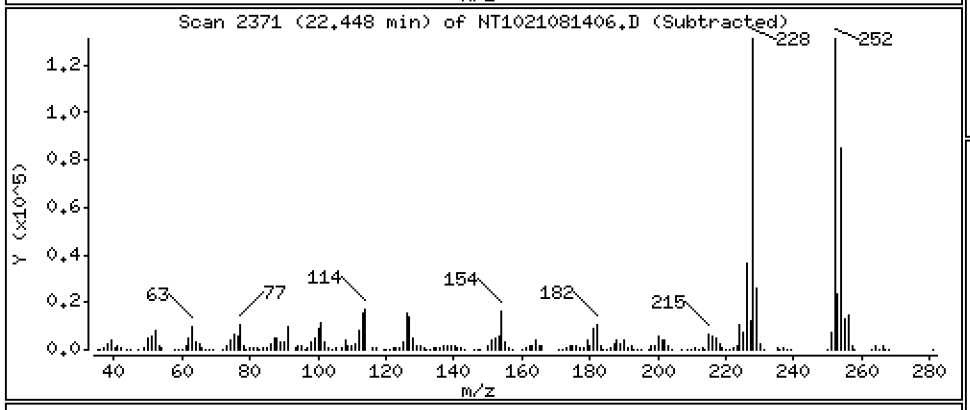
Column phase: ZB-5msi

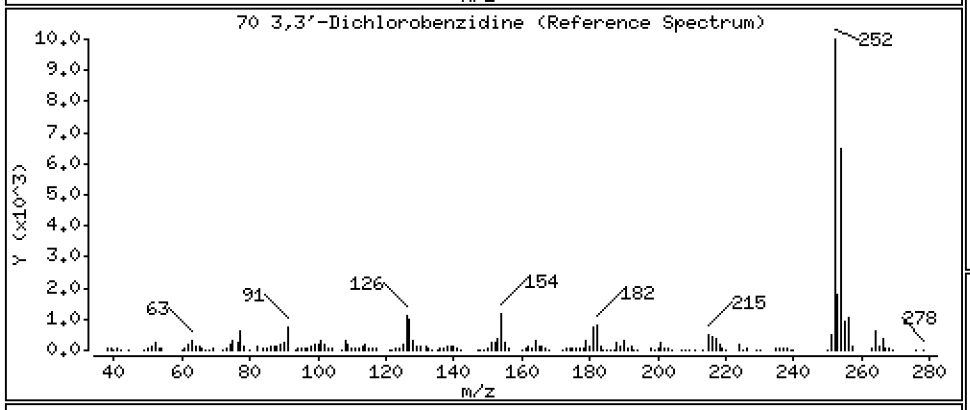
Column diameter: 0.25

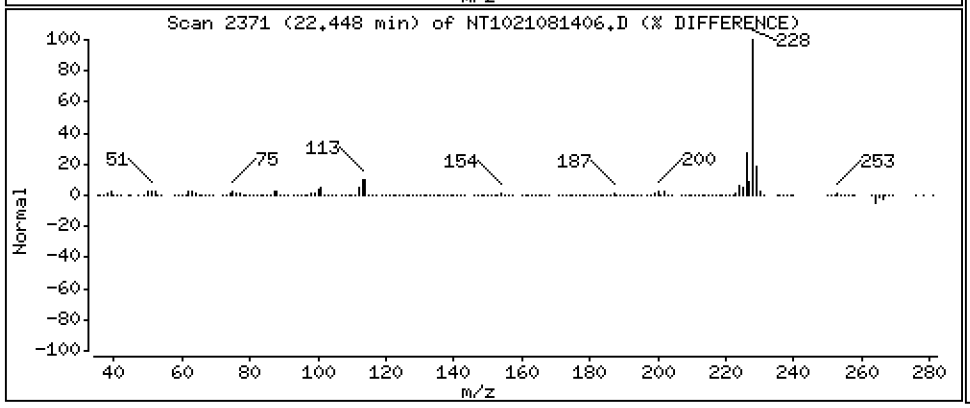
70 3,3'-Dichlorobenzidine

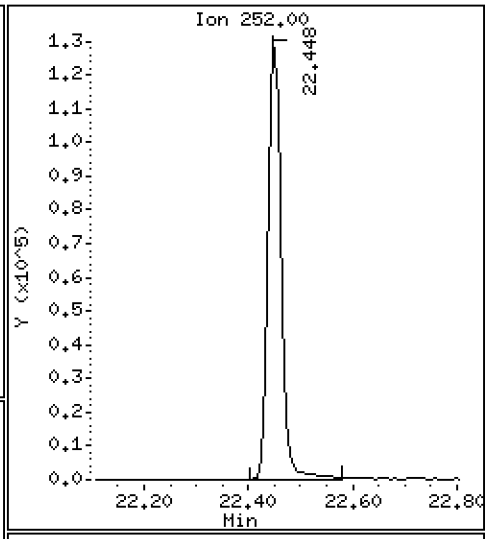
Concentration: 5.093 ug/mL

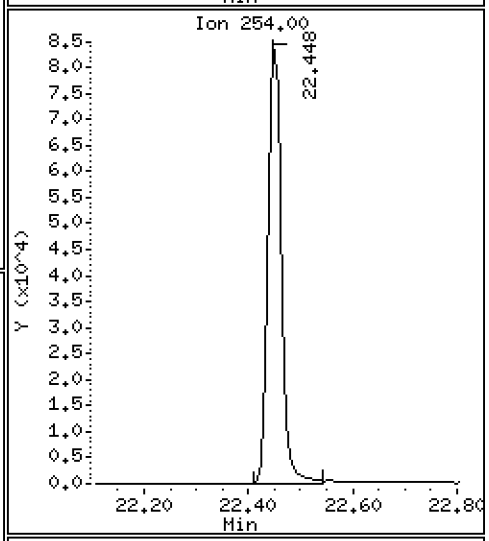


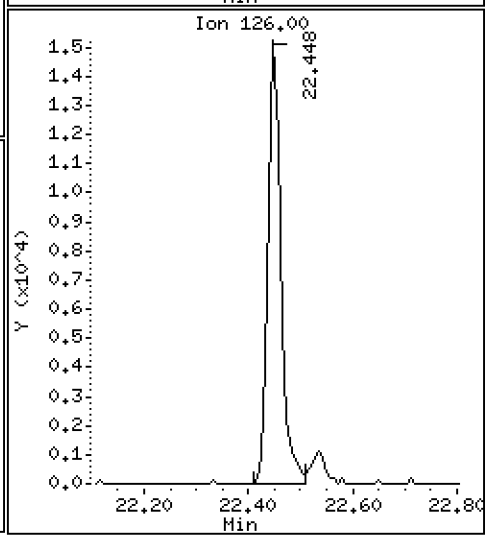












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

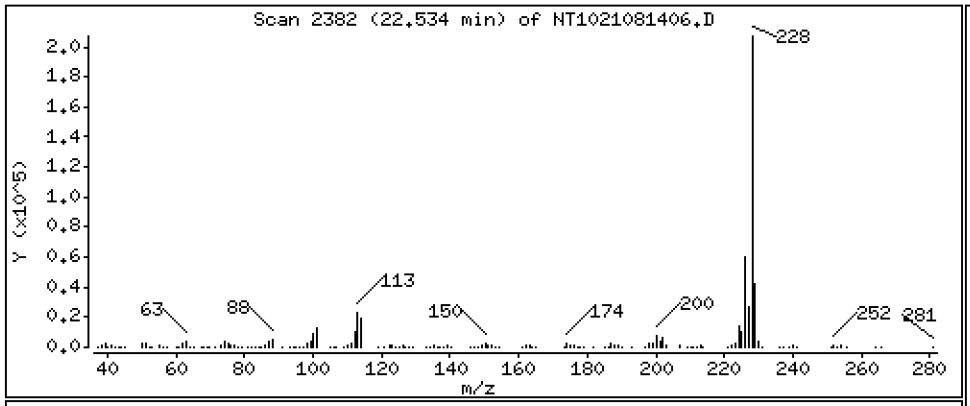
Operator: VTS

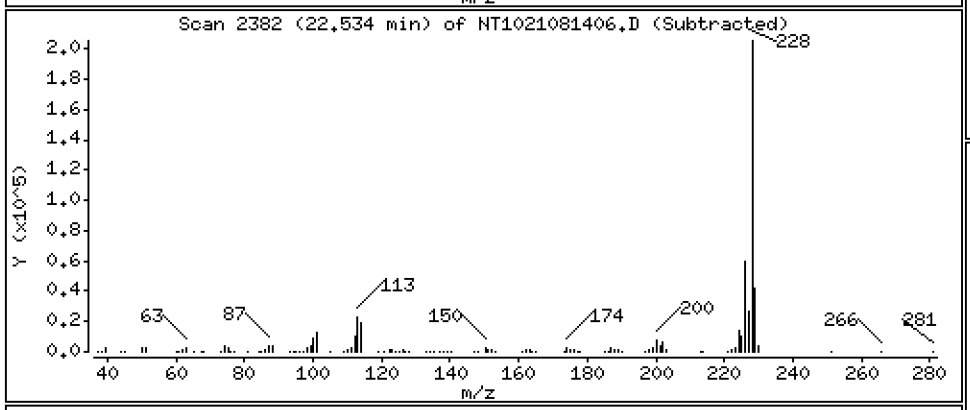
Column phase: ZB-5msi

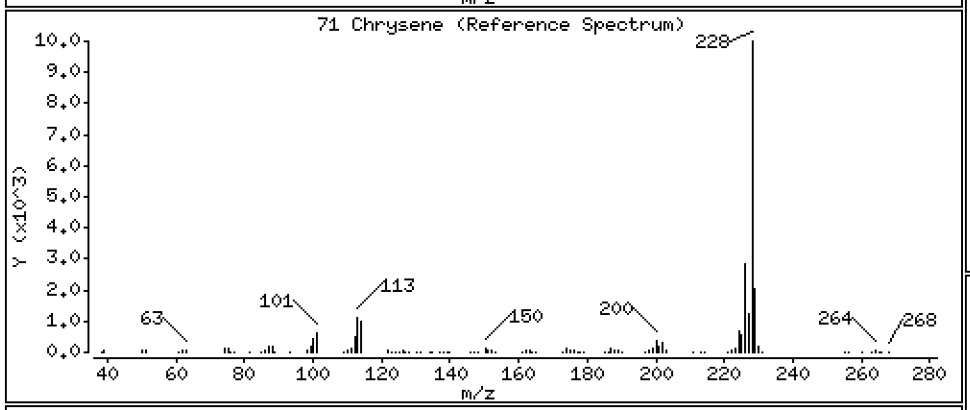
Column diameter: 0.25

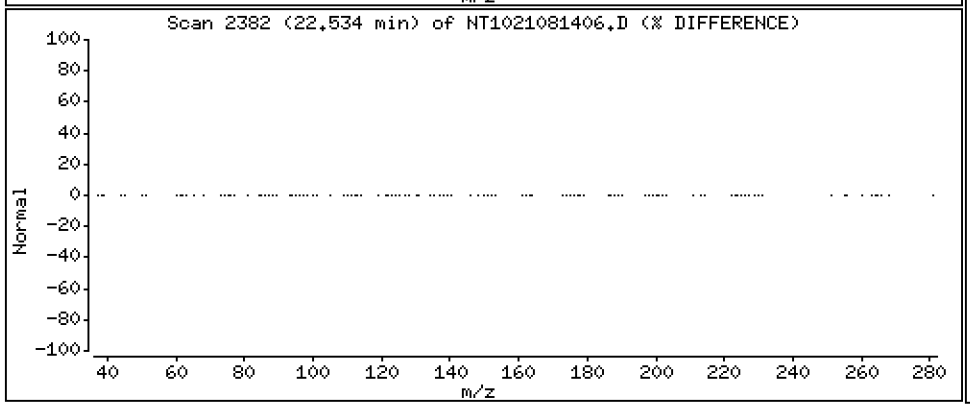
71 Chrysene

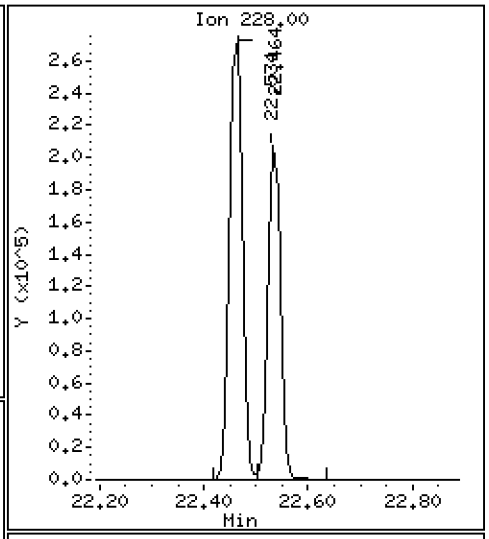
Concentration: 3.985 ug/mL

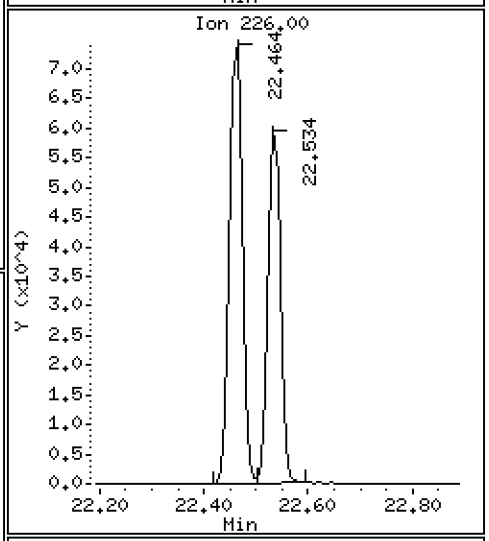


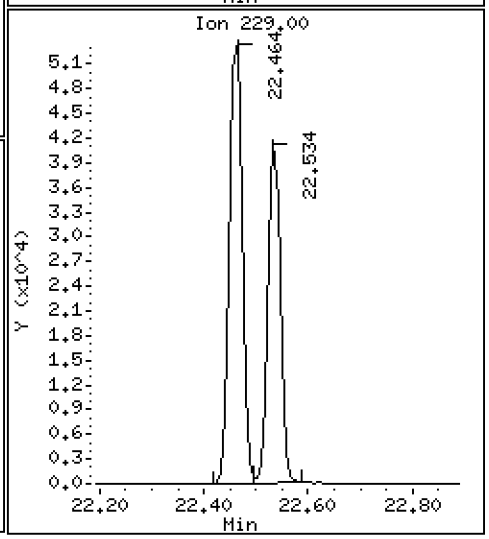












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

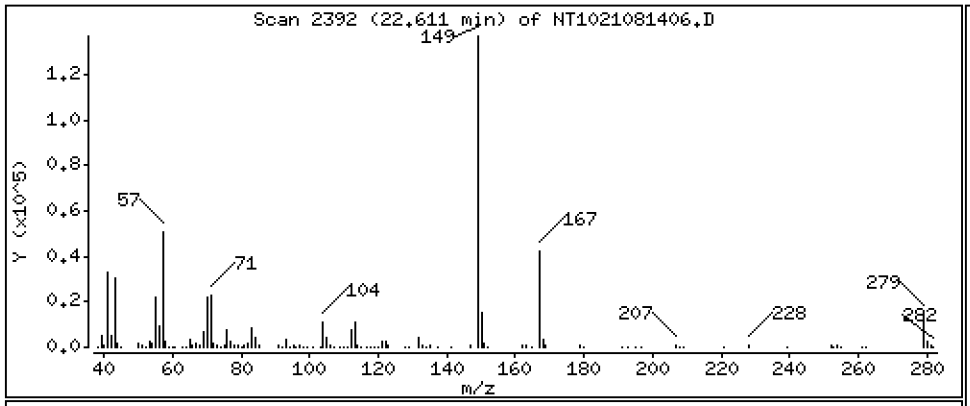
Operator: VTS

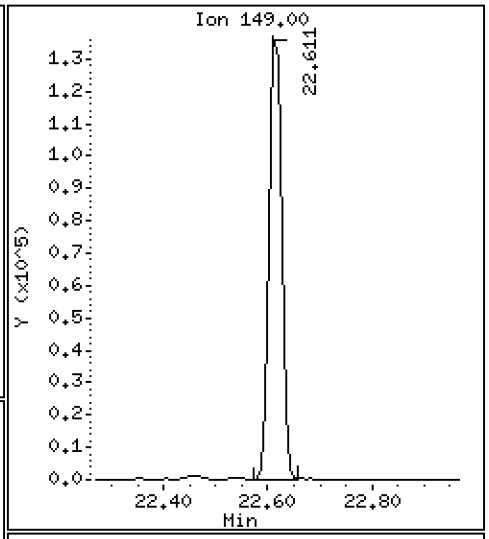
Column phase: ZB-5msi

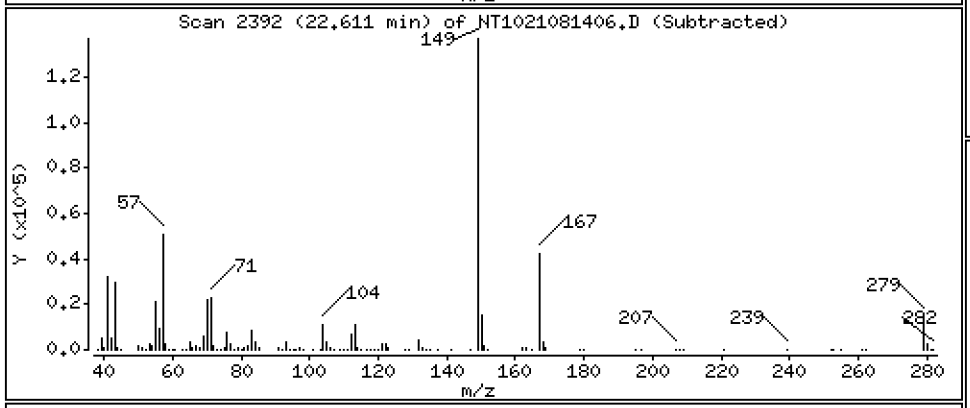
Column diameter: 0.25

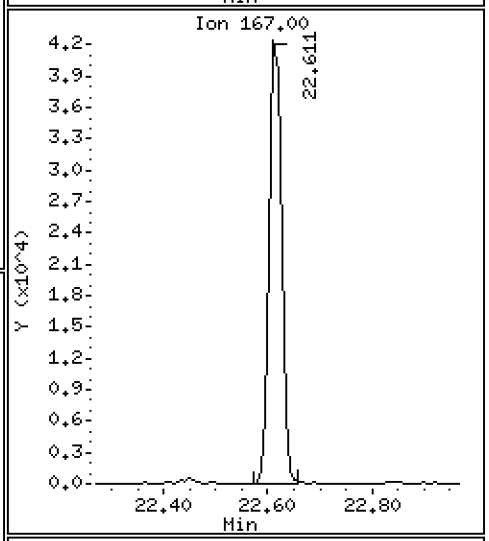
72 bis(2-Ethylhexyl)phthalate

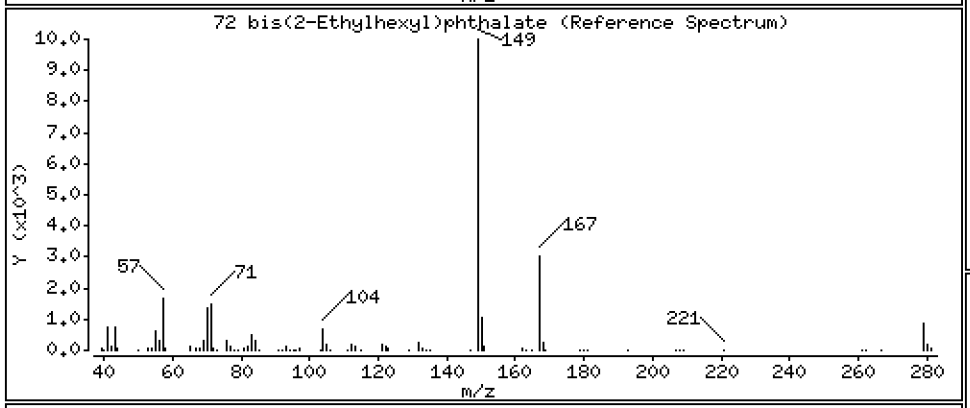
Concentration: 5.054 ug/mL

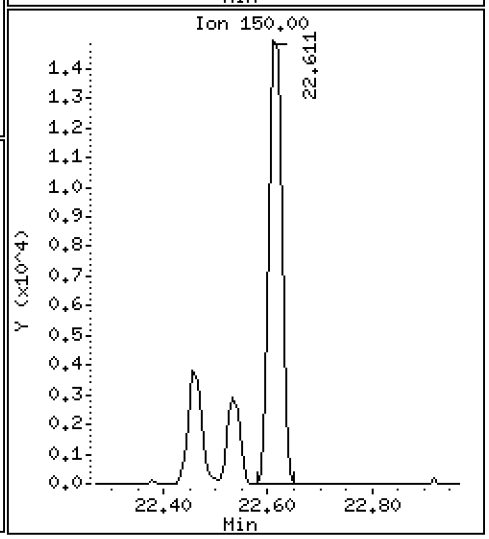


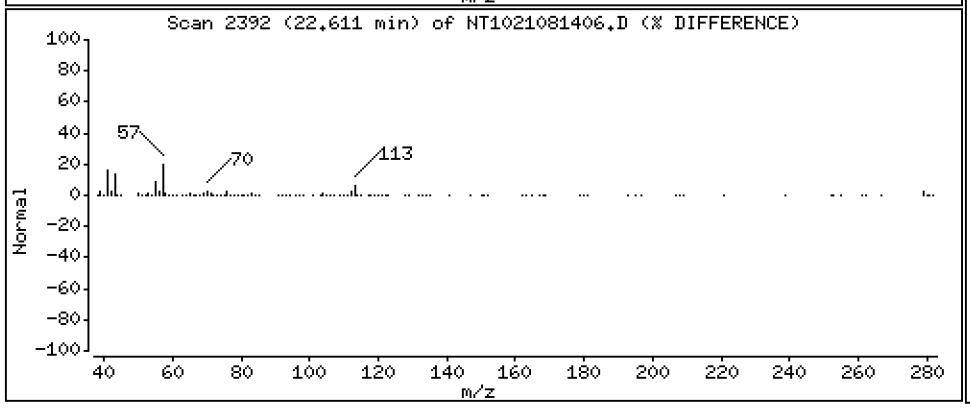












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

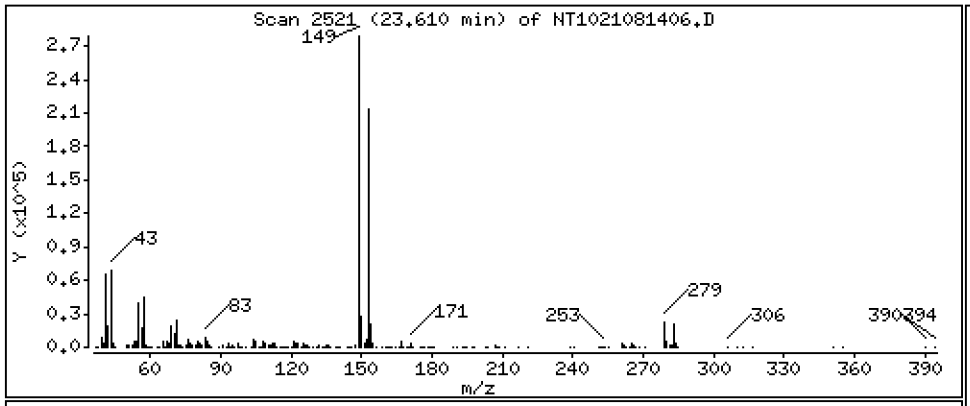
Operator: VTS

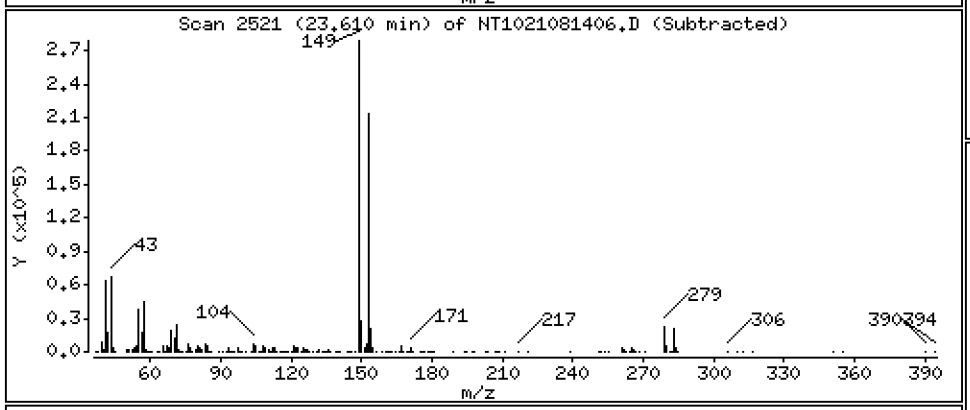
Column phase: ZB-5msi

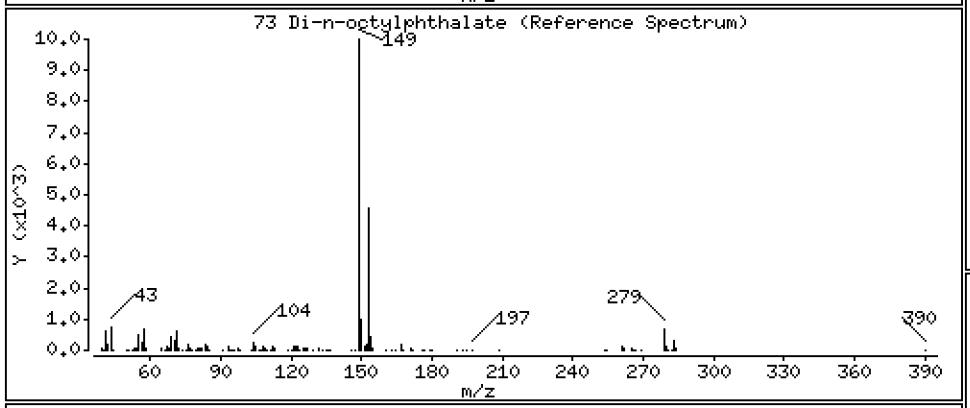
Column diameter: 0.25

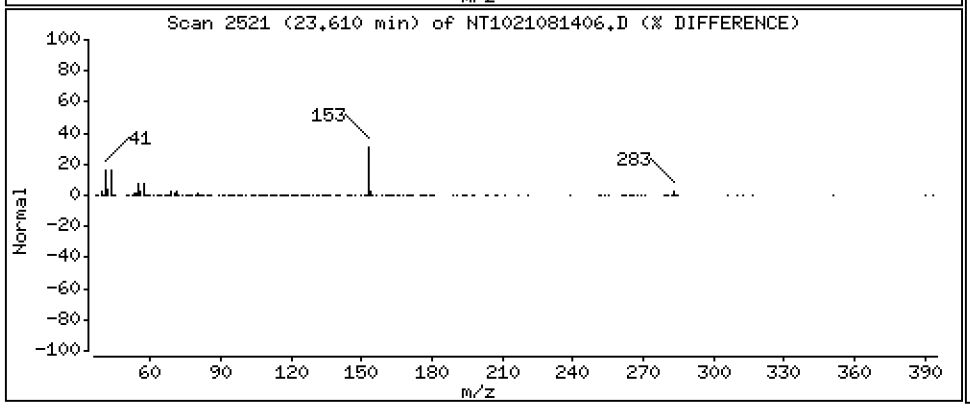
73 Di-n-octylphthalate

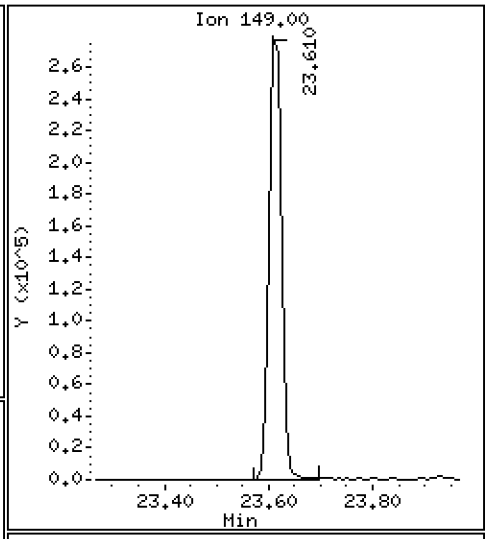
Concentration: 3.974 ug/mL

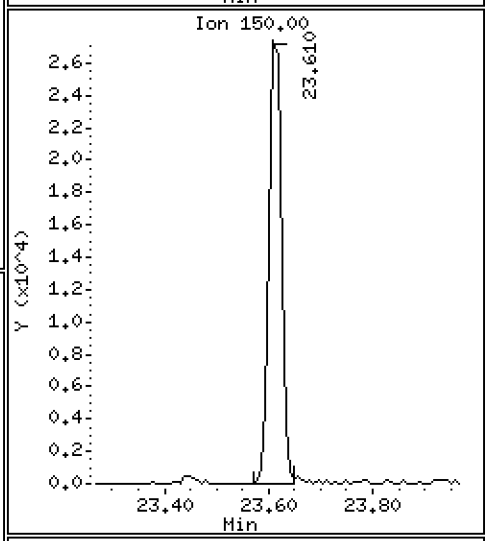


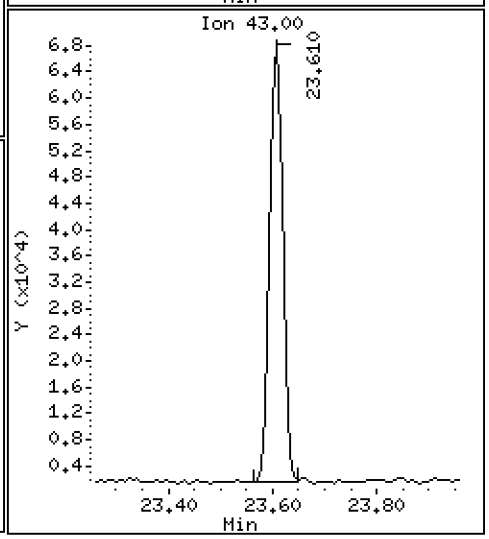












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

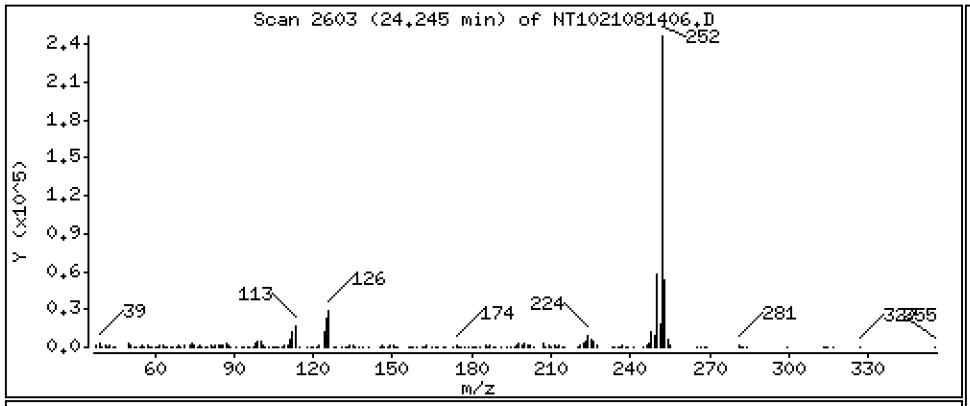
Operator: VTS

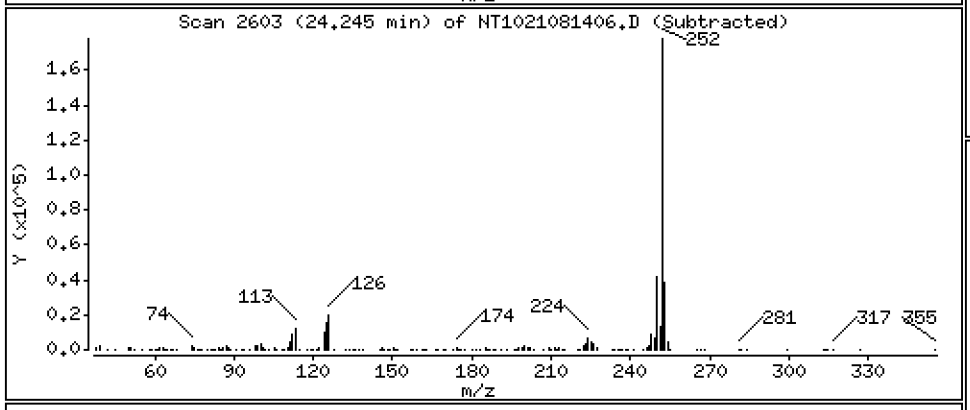
Column phase: ZB-5msi

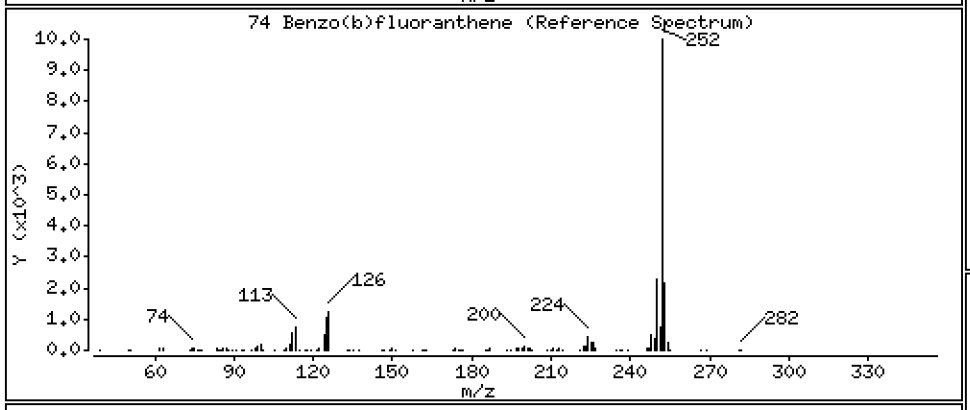
Column diameter: 0.25

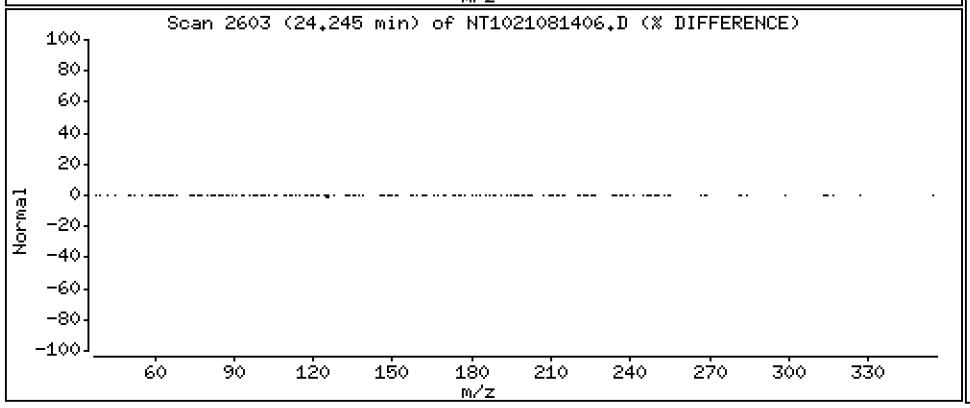
74 Benzo(b)fluoranthene

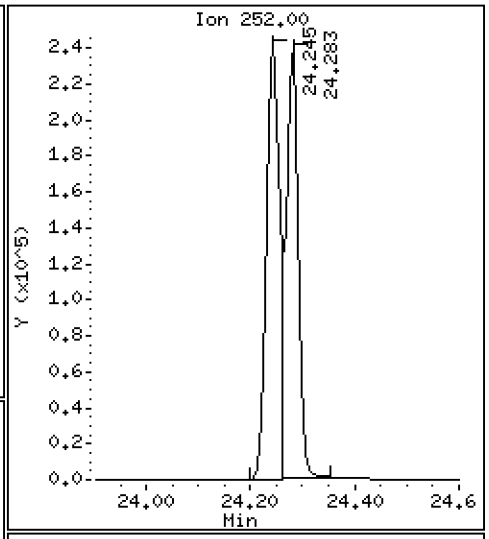
Concentration: 4.541 ug/mL

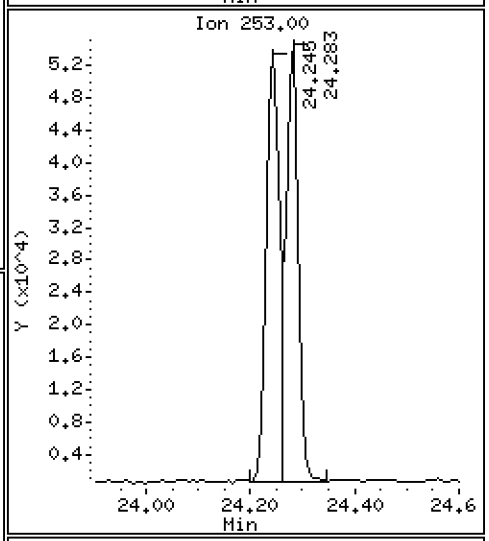


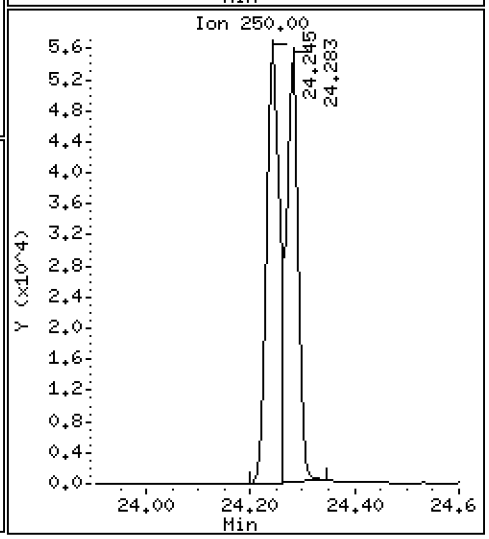












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

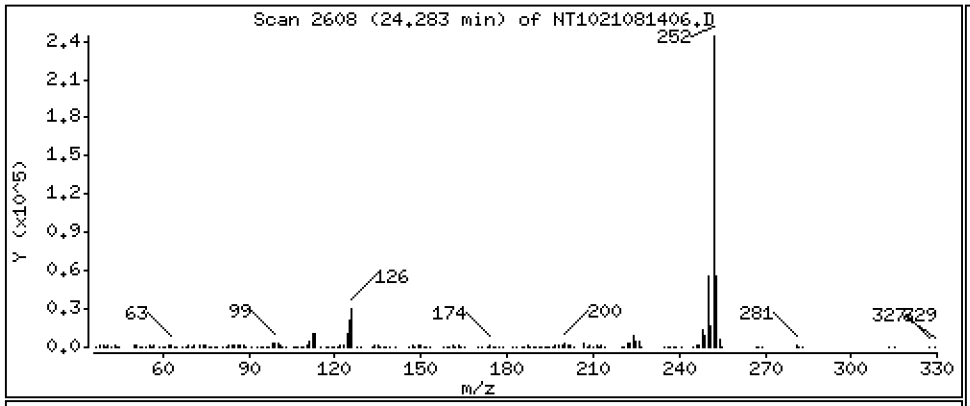
Operator: VTS

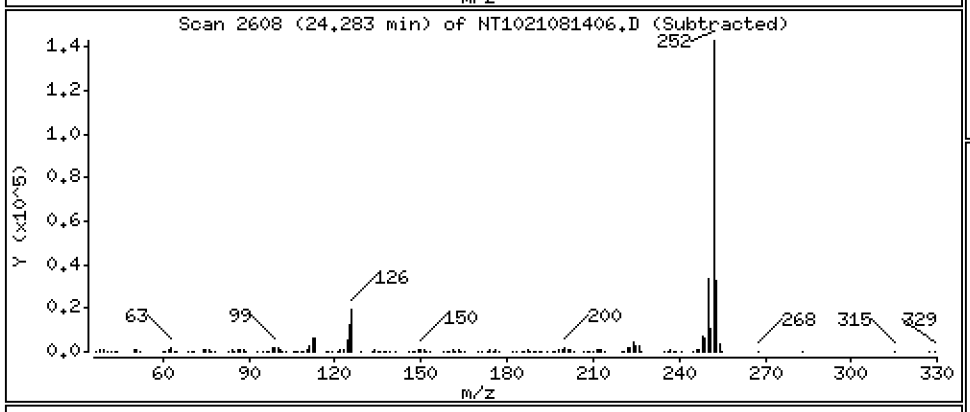
Column phase: ZB-5msi

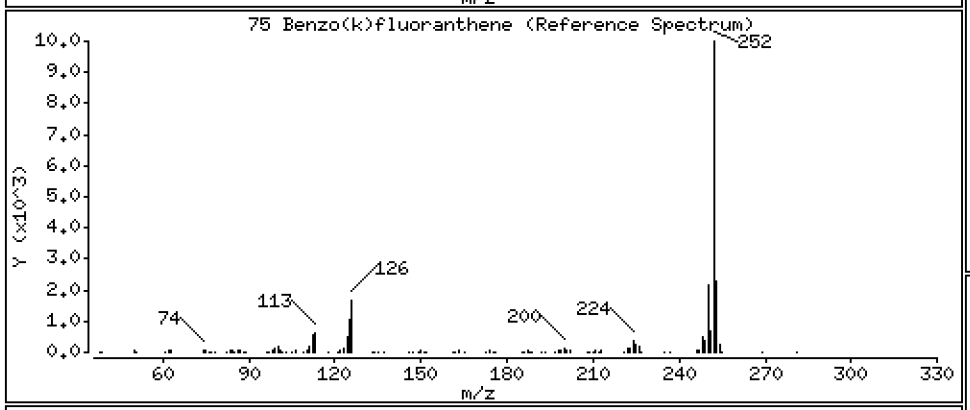
Column diameter: 0.25

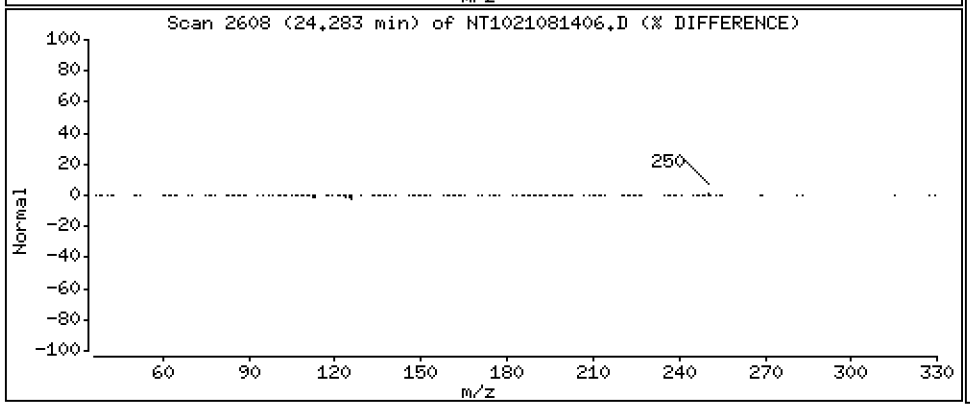
75 Benzo(k)fluoranthene

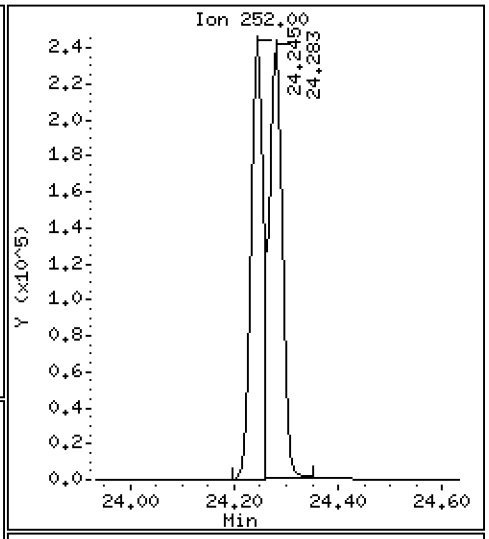
Concentration: 4.757 ug/mL

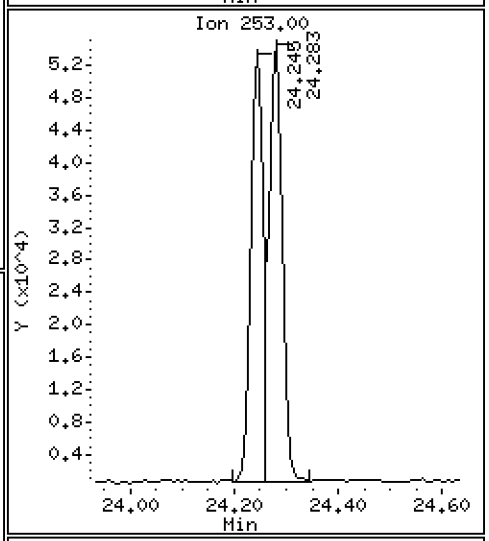


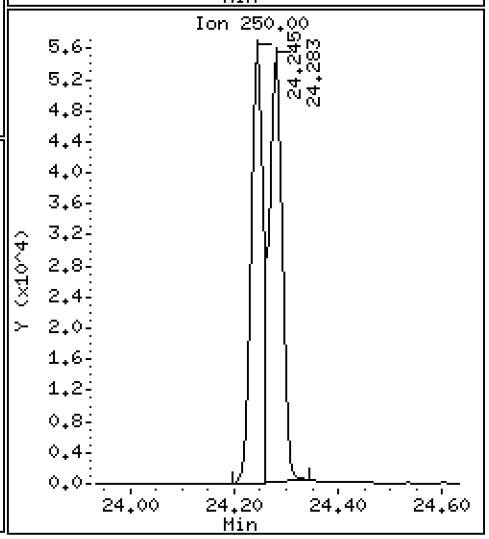












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

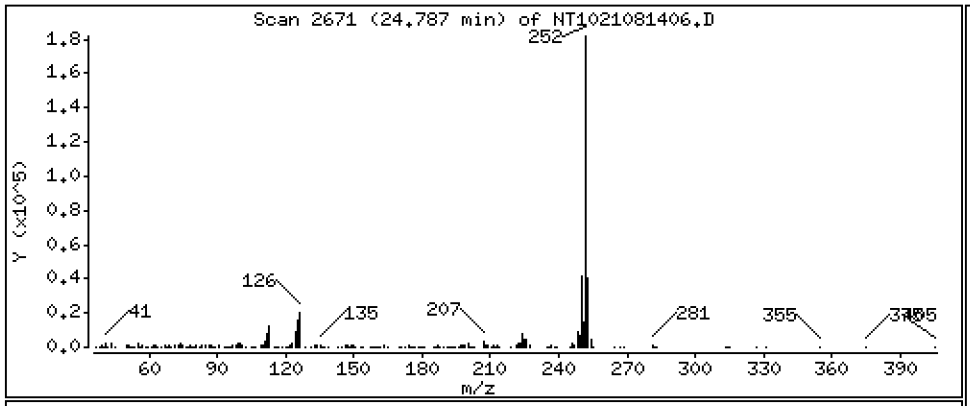
Operator: VTS

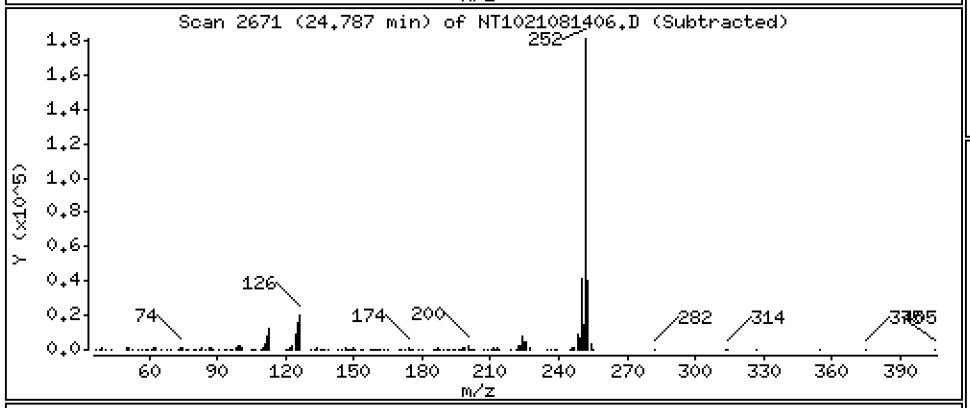
Column phase: ZB-5msi

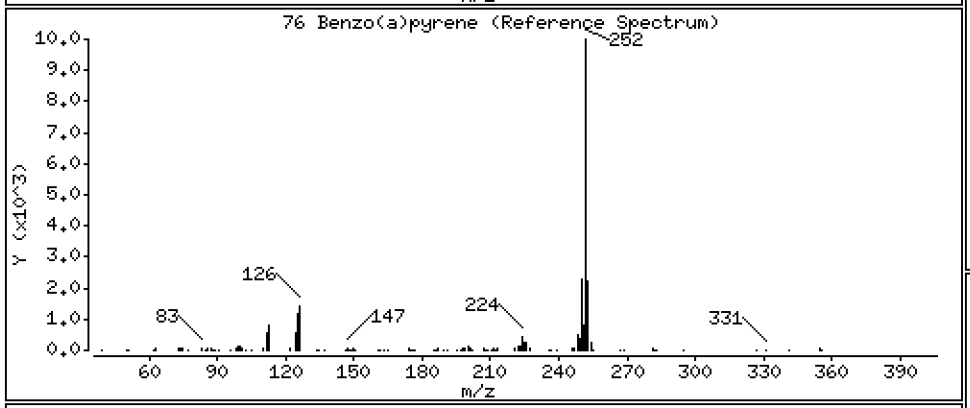
Column diameter: 0.25

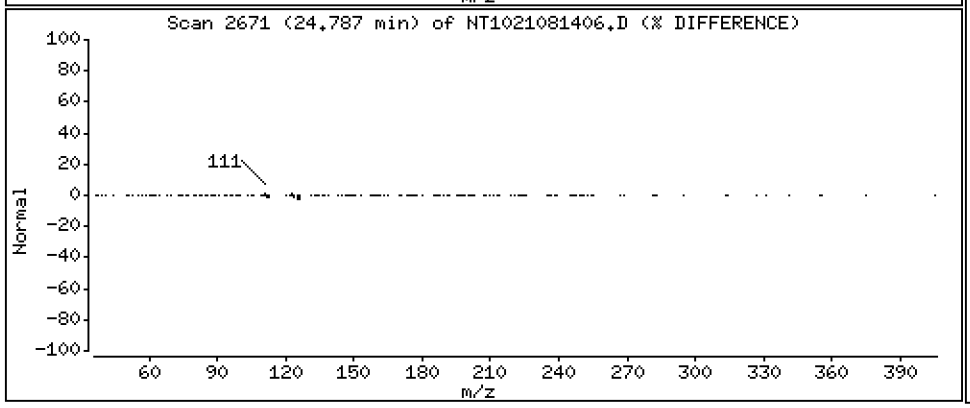
76 Benzo(a)pyrene

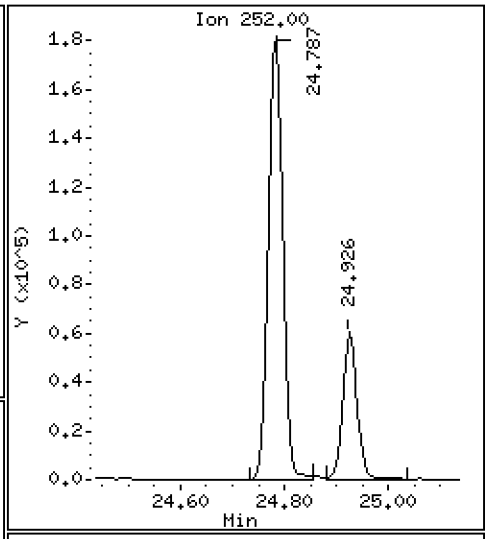
Concentration: 4.008 ug/mL

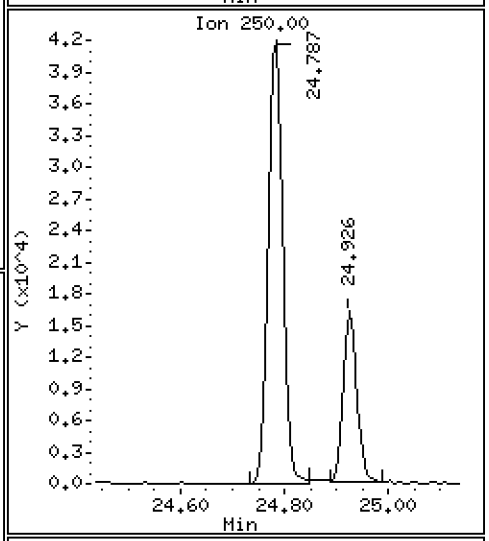


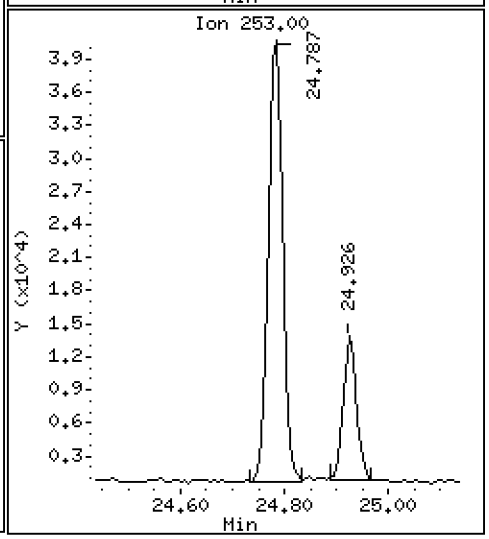












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

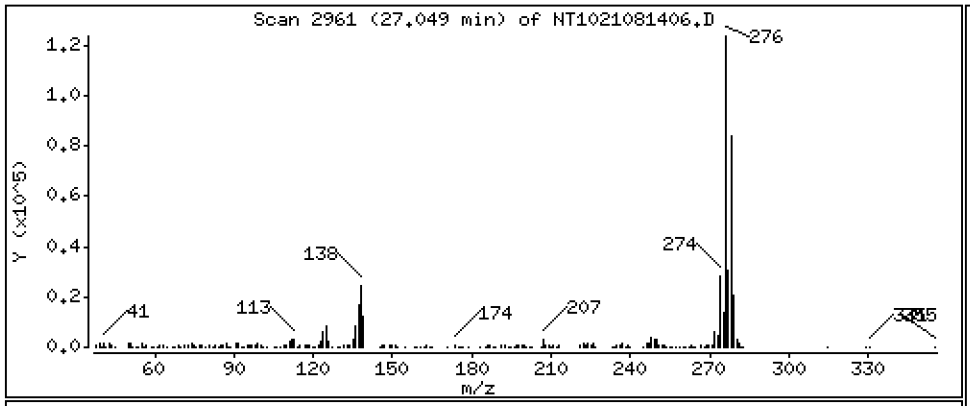
Operator: VTS

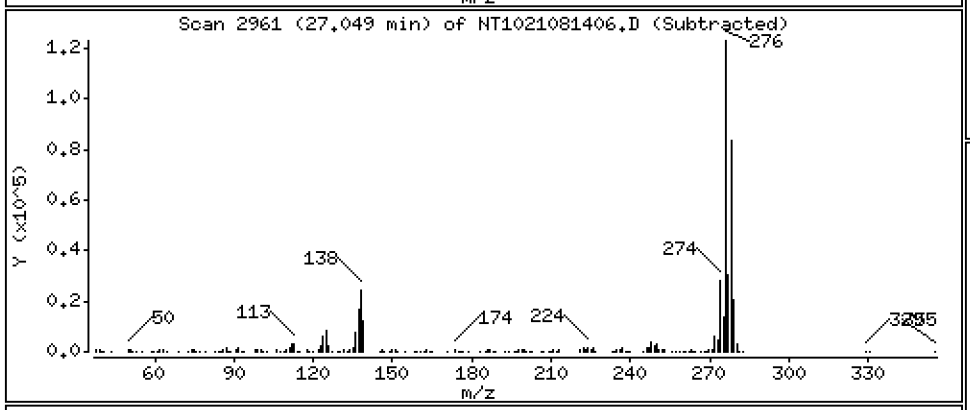
Column phase: ZB-5msi

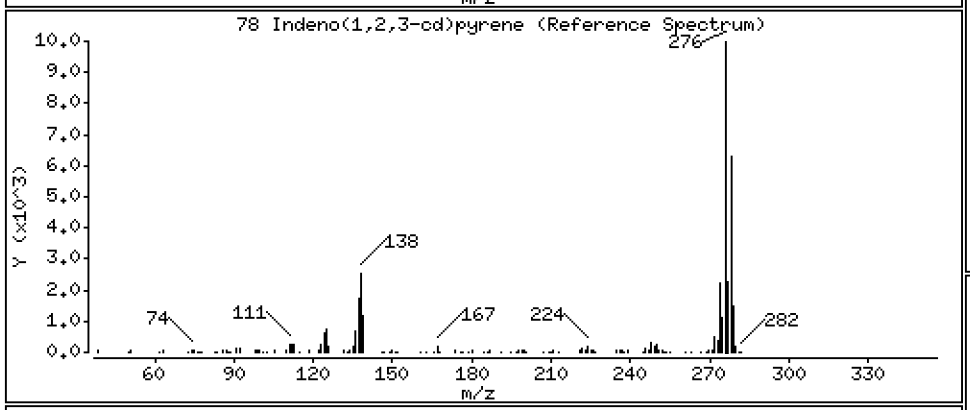
Column diameter: 0.25

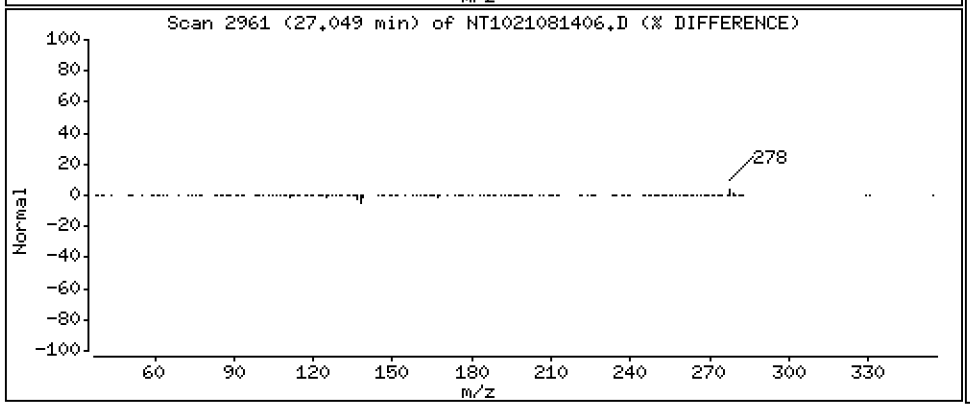
78 Indeno(1,2,3-cd)pyrene

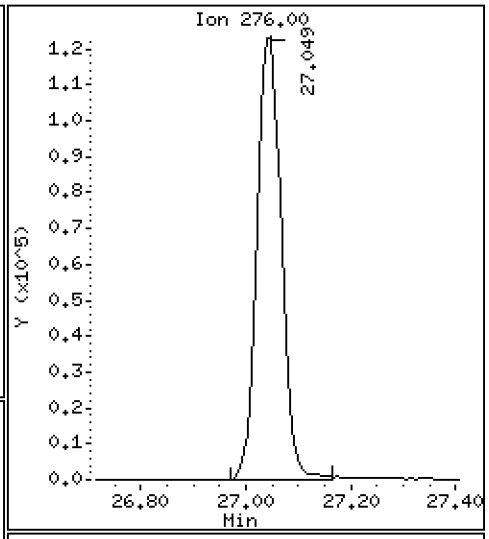
Concentration: 4.215 ug/mL

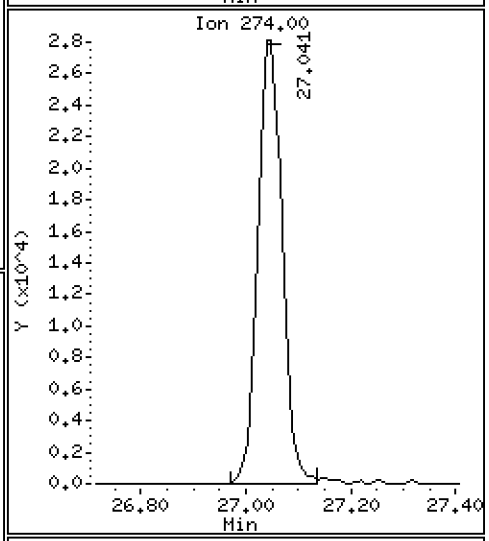


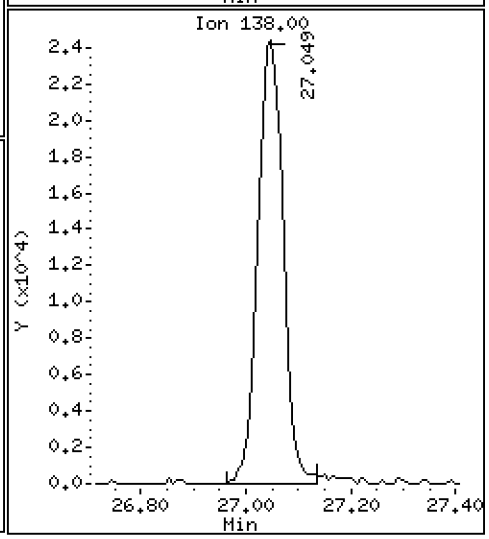












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

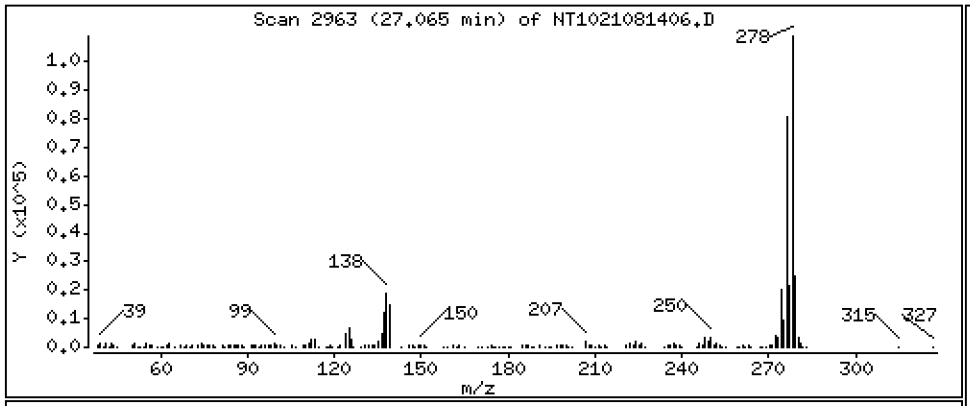
Operator: VTS

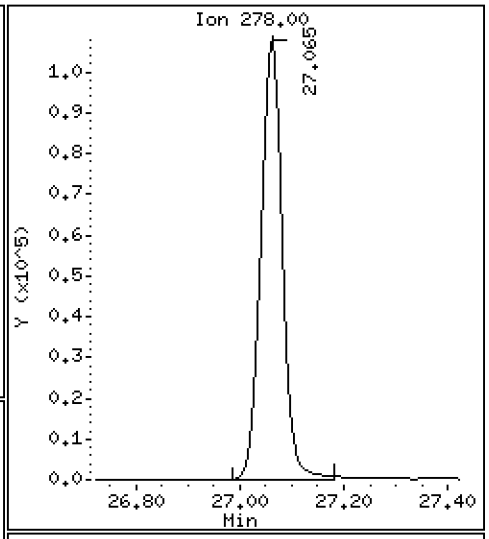
Column phase: ZB-5msi

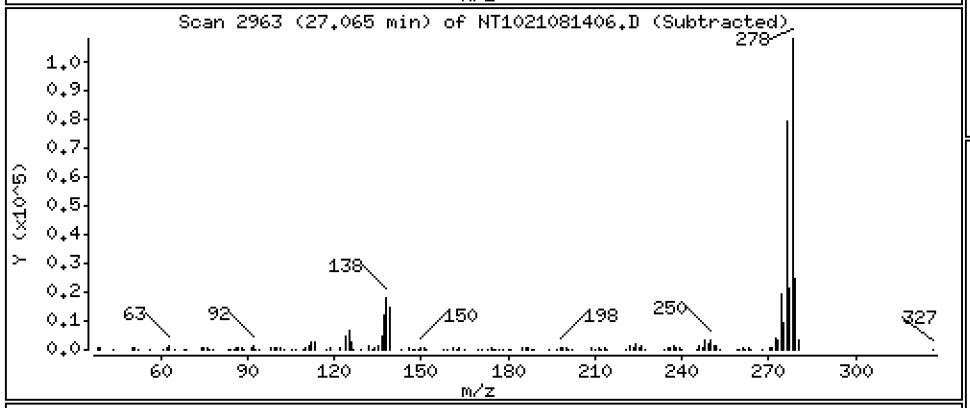
Column diameter: 0.25

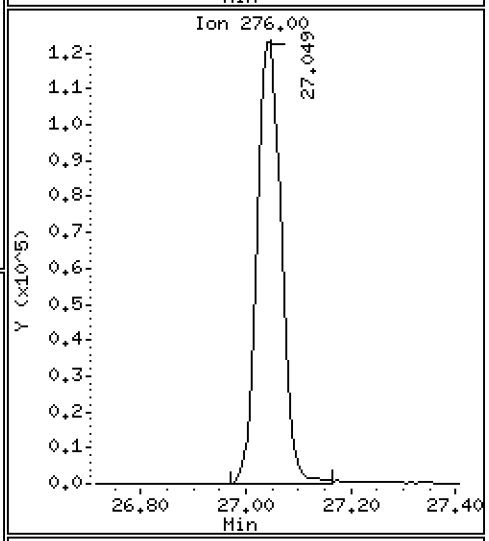
79 Dibenzo(a,h)anthracene

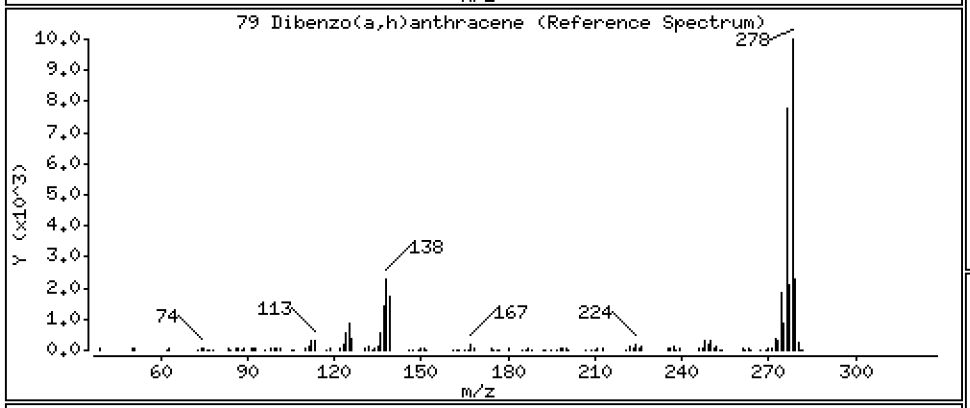
Concentration: 4.075 ug/mL

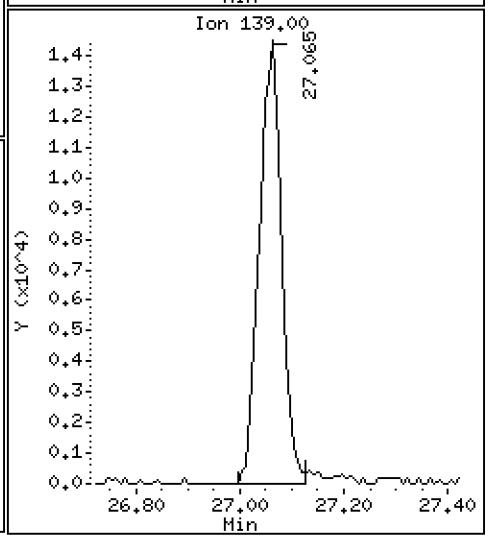


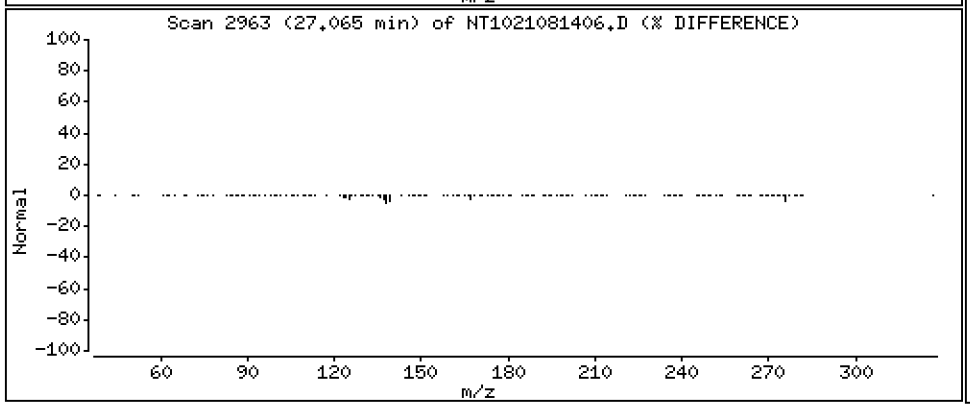












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

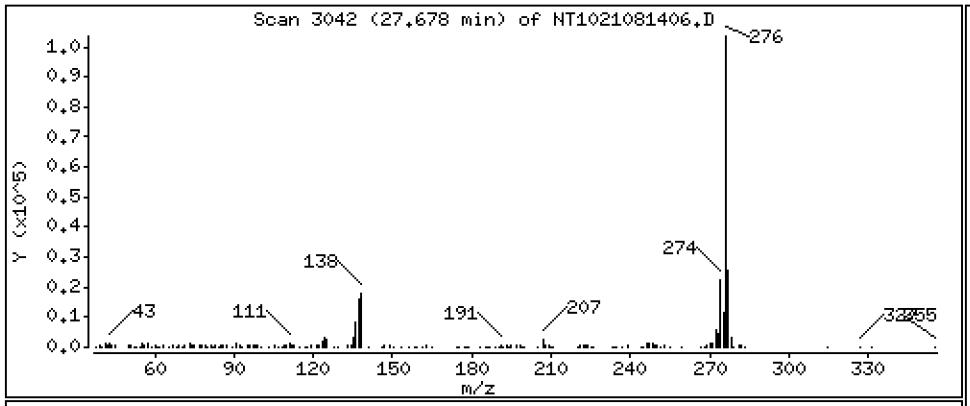
Operator: VTS

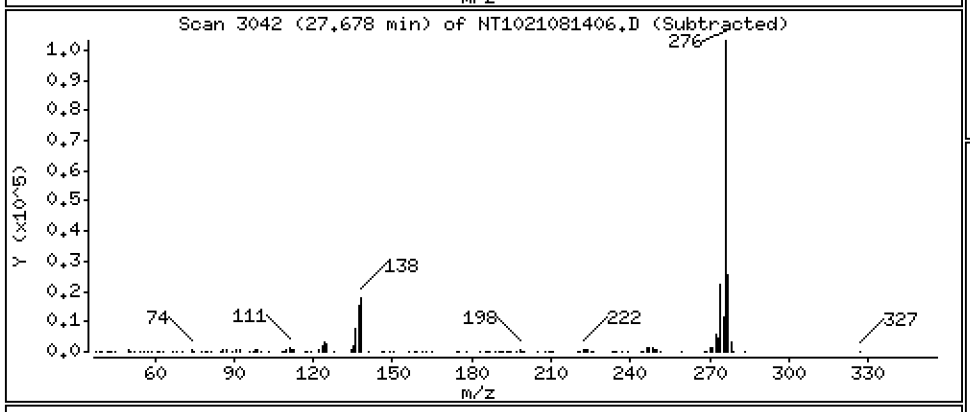
Column phase: ZB-5msi

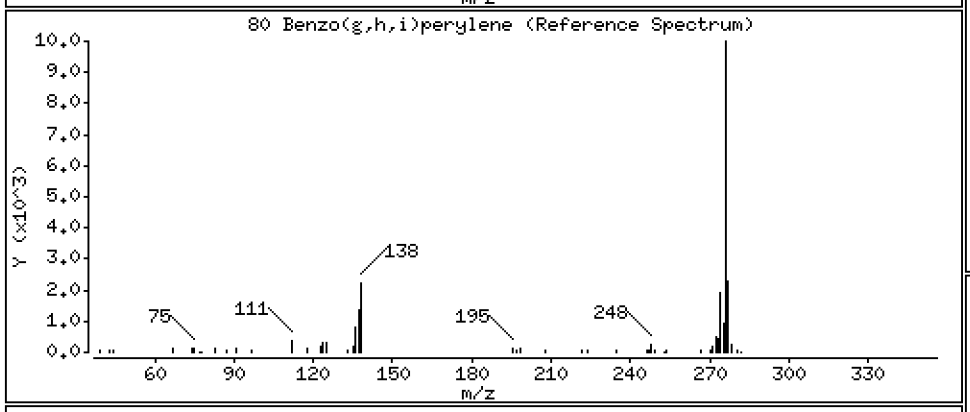
Column diameter: 0.25

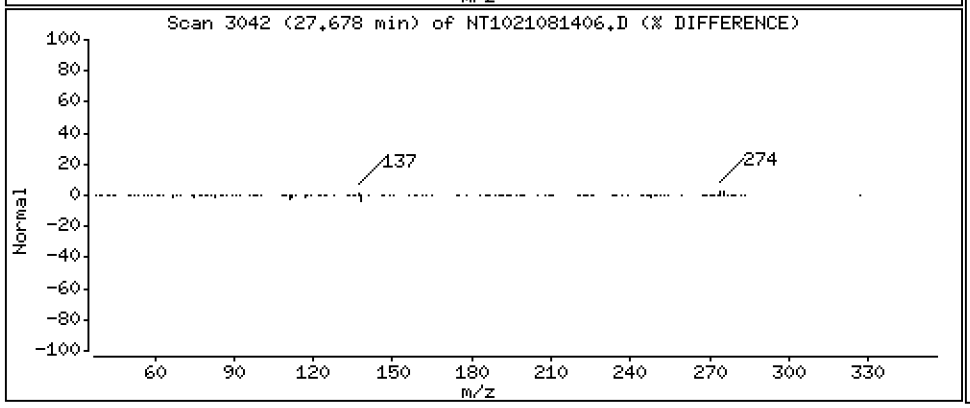
80 Benzo(g,h,i)perylene

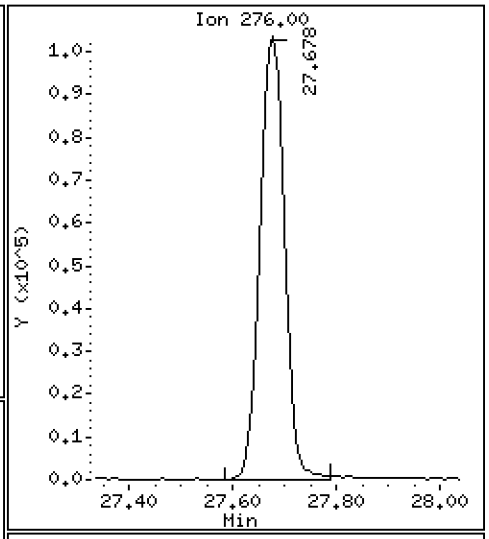
Concentration: 3.972 ug/mL

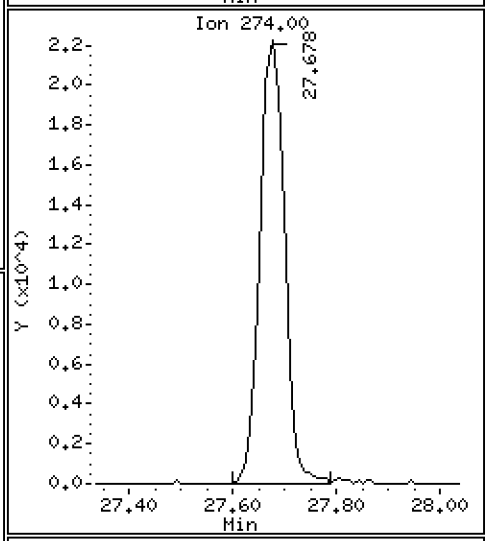


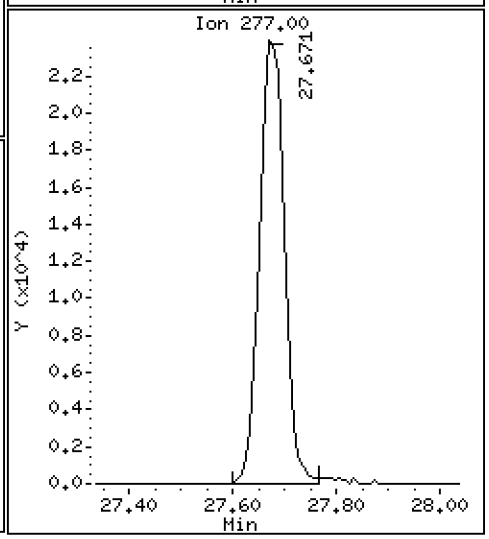












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

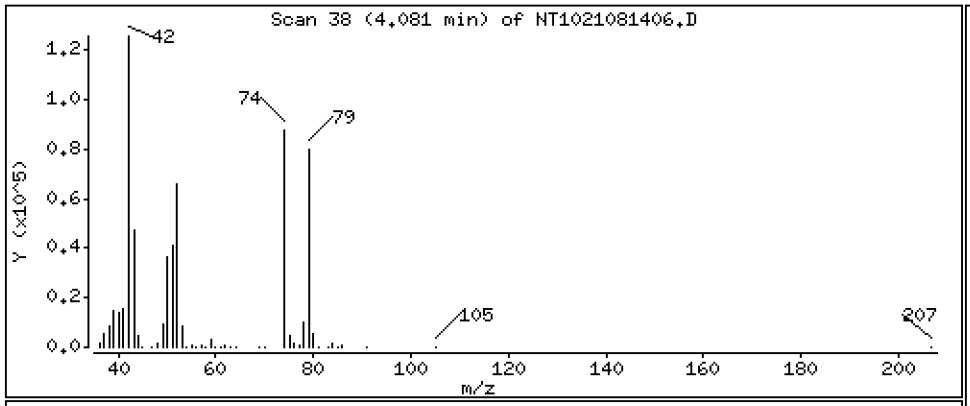
Operator: VTS

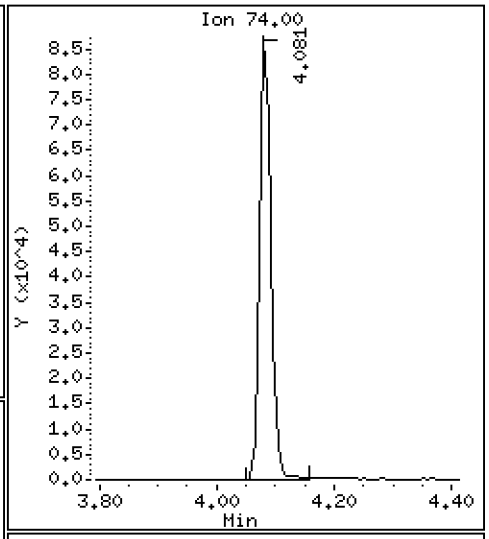
Column phase: ZB-5msi

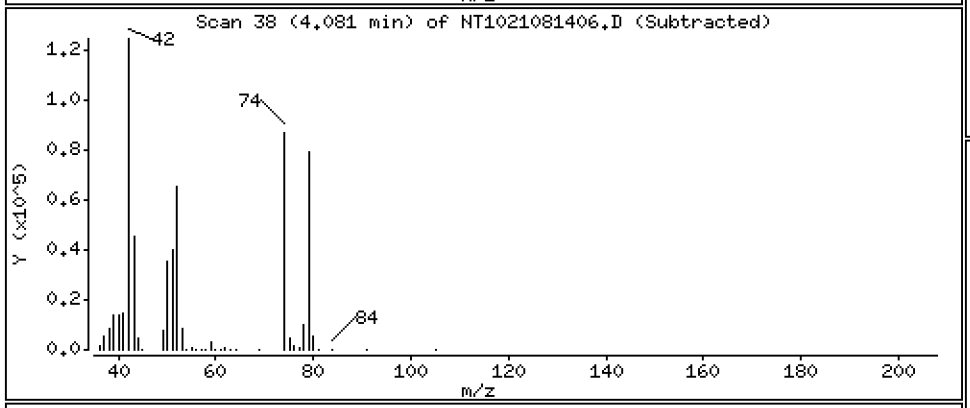
Column diameter: 0.25

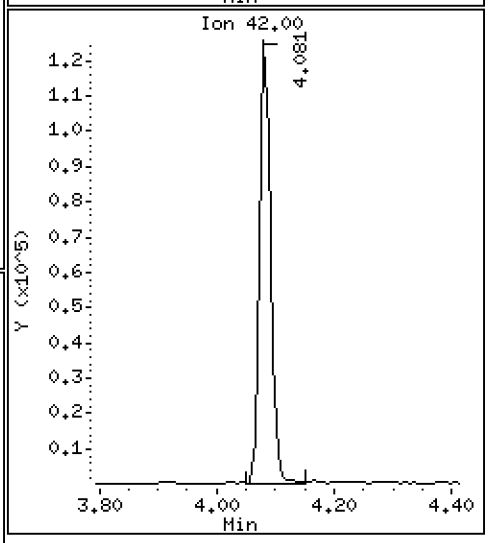
90 N-Nitrosodimethylamine

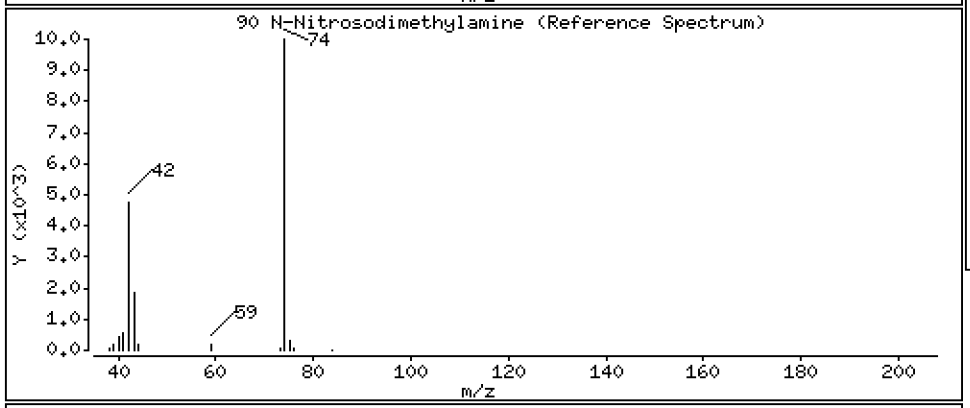
Concentration: 5.006 ug/mL

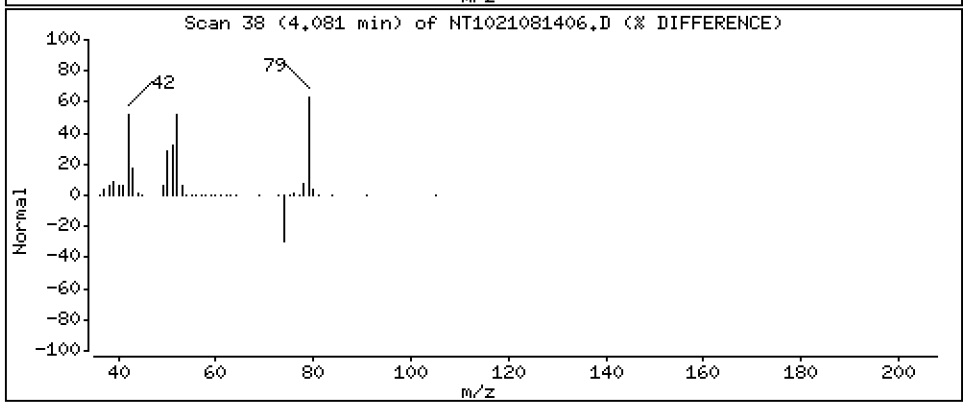












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

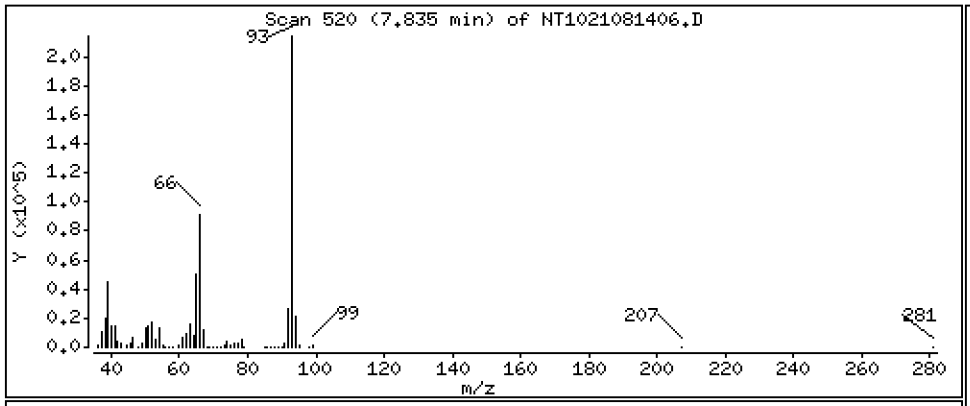
Operator: VTS

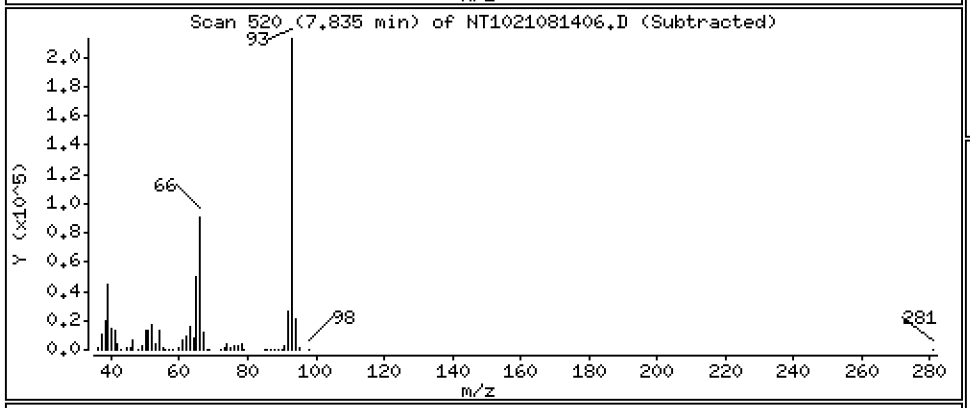
Column phase: ZB-5msi

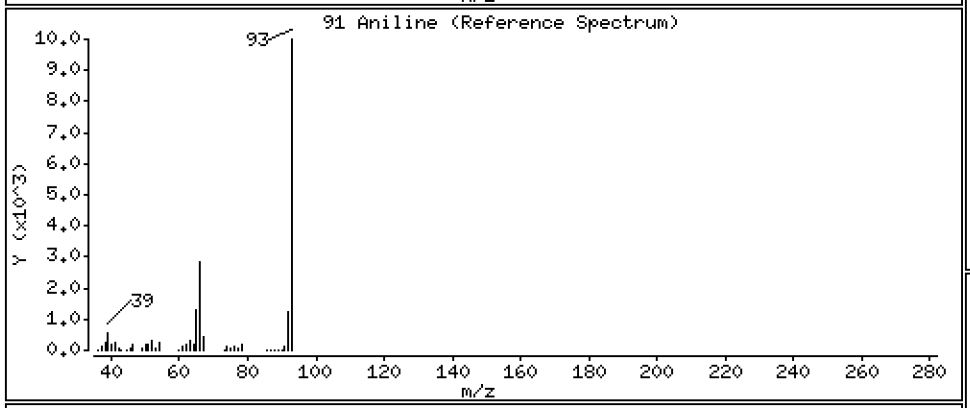
Column diameter: 0.25

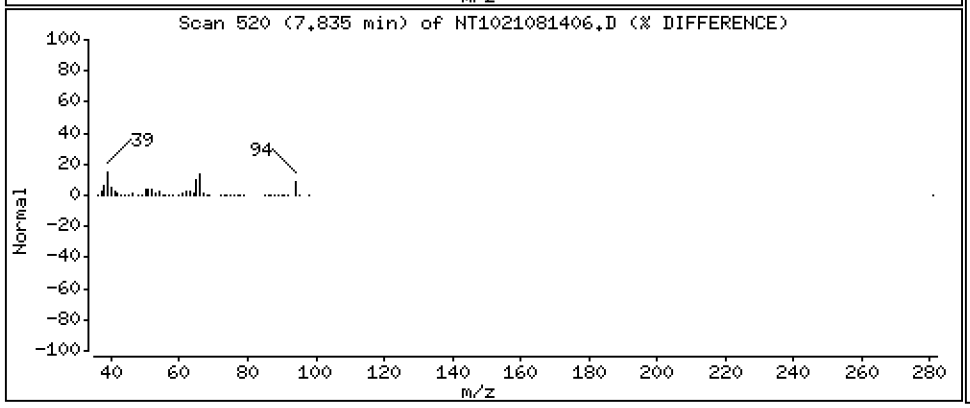
91 Aniline

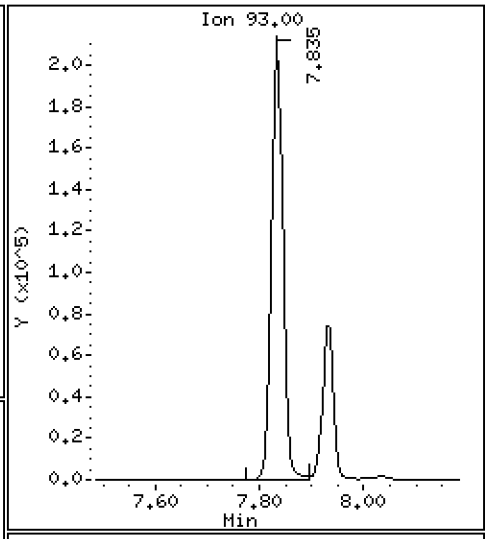
Concentration: 6.669 ug/mL

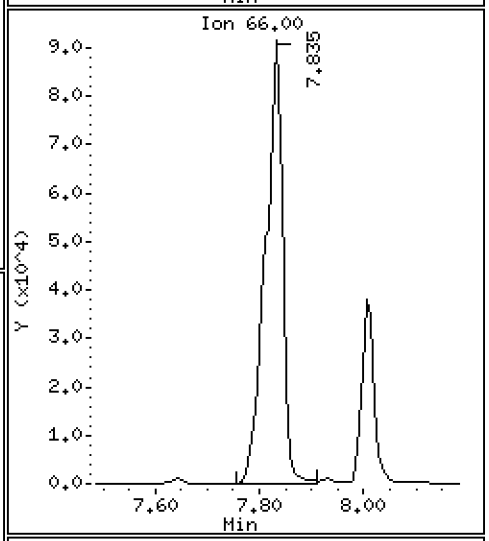


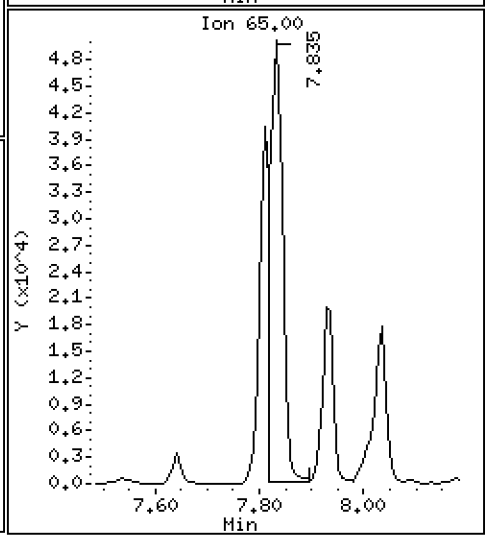












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

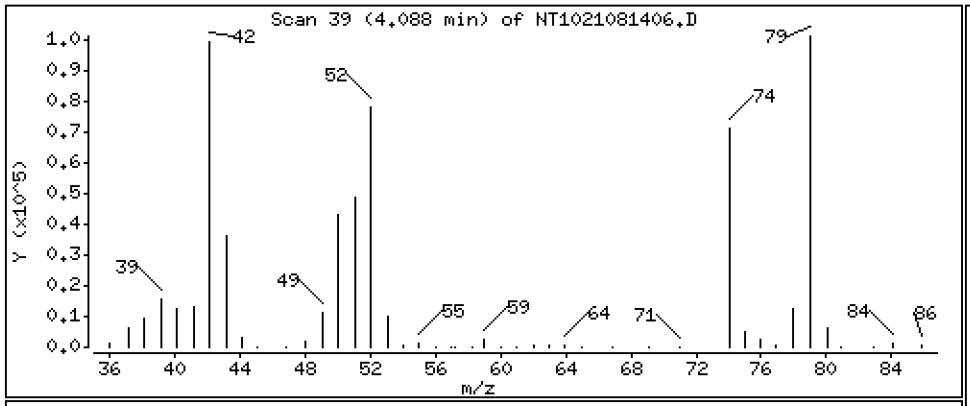
Operator: VTS

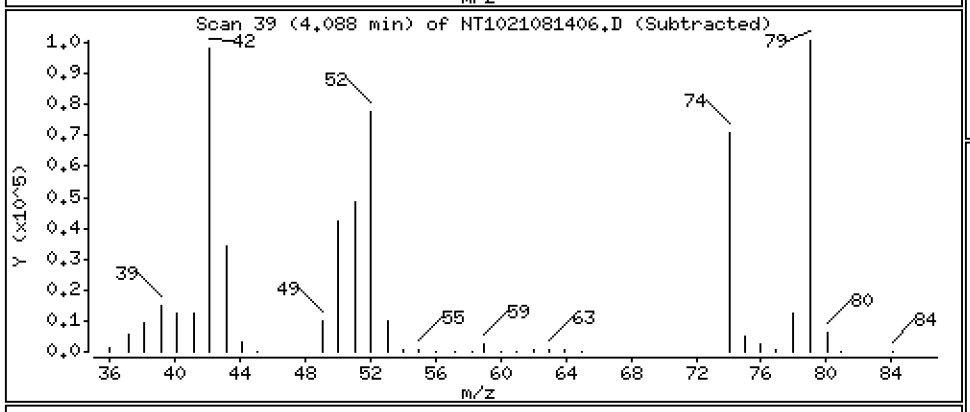
Column phase: ZB-5msi

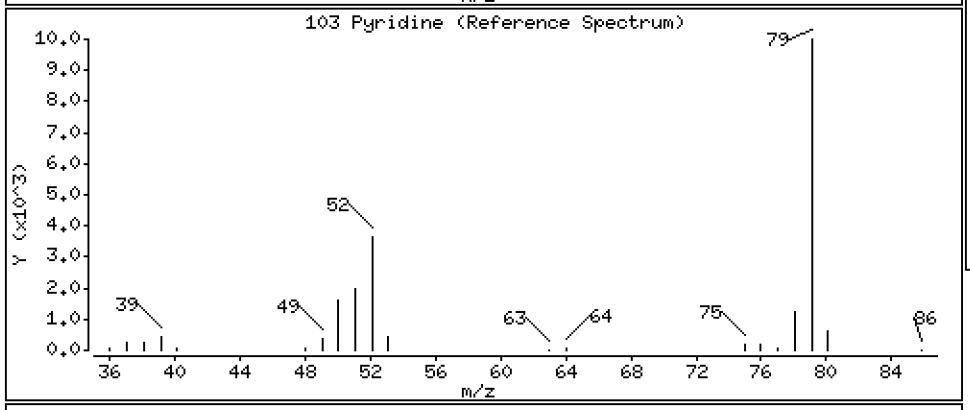
Column diameter: 0.25

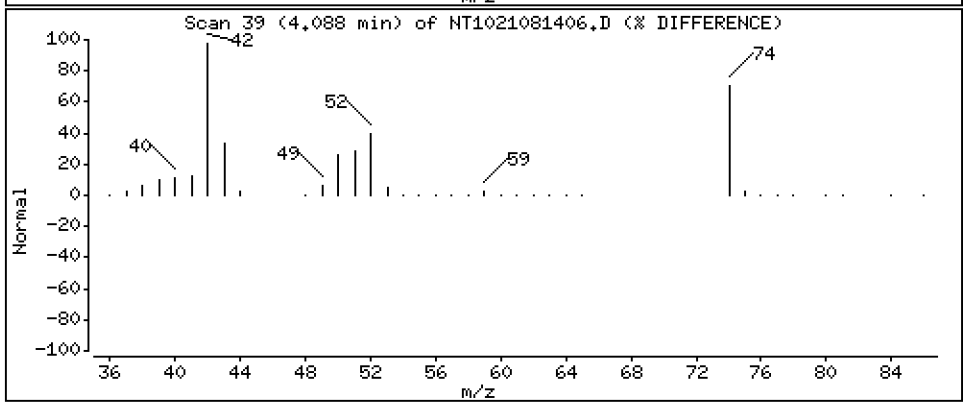
103 Pyridine

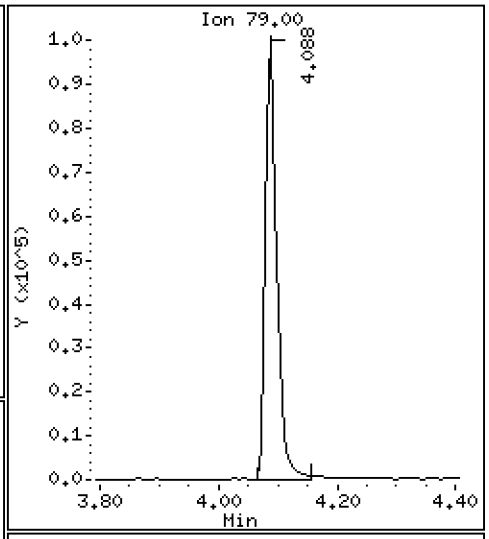
Concentration: 3.837 ug/mL

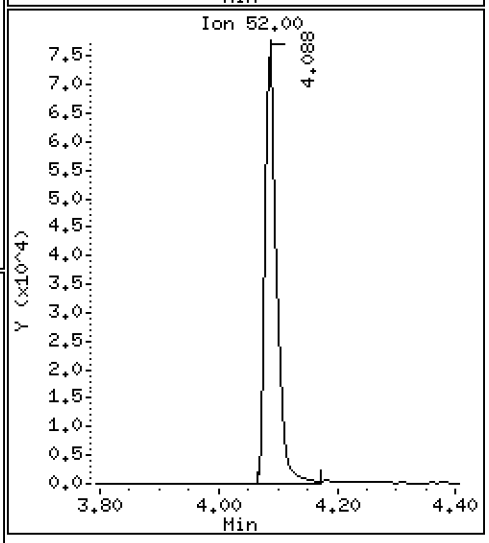












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

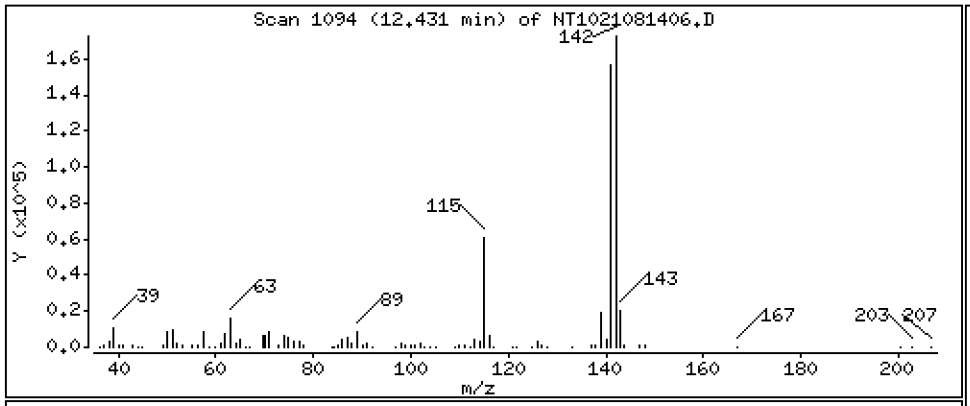
Operator: VTS

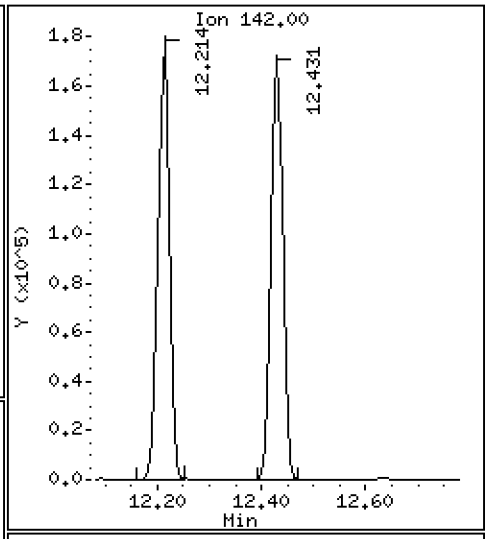
Column phase: ZB-5msi

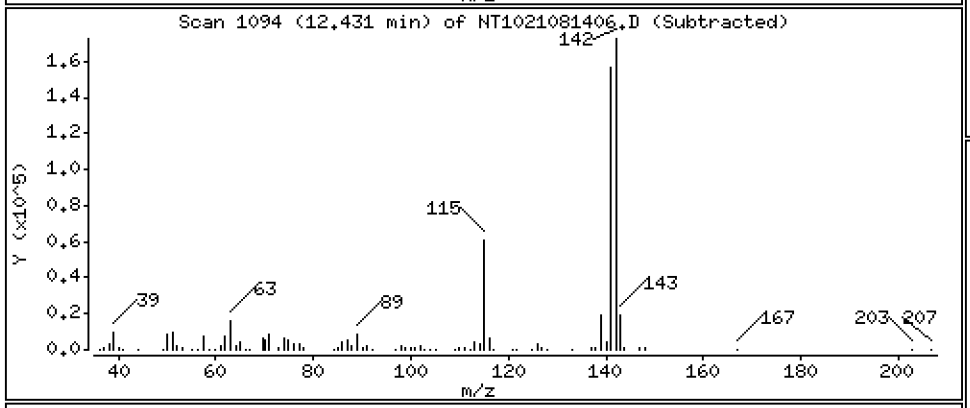
Column diameter: 0.25

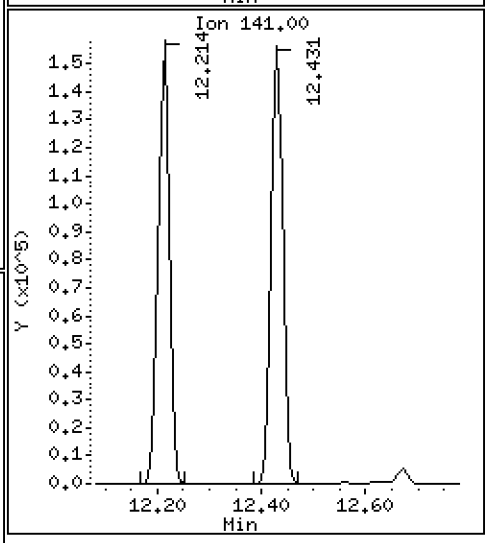
105 1-methylnaphthalene

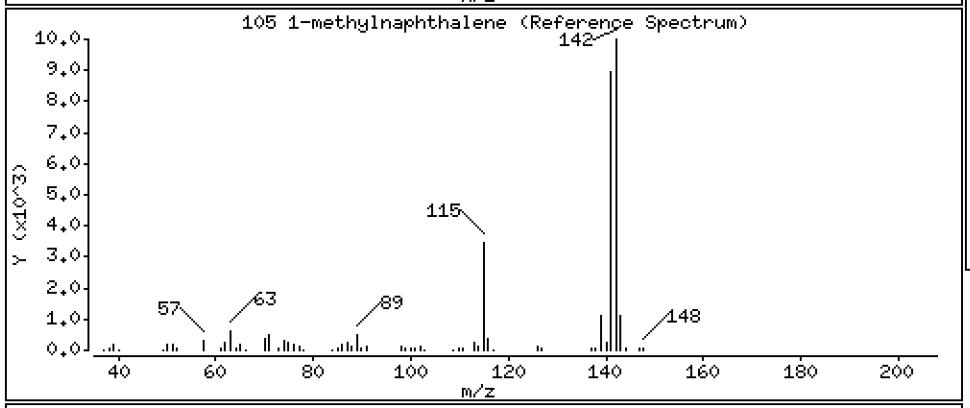
Concentration: 3.762 ug/mL

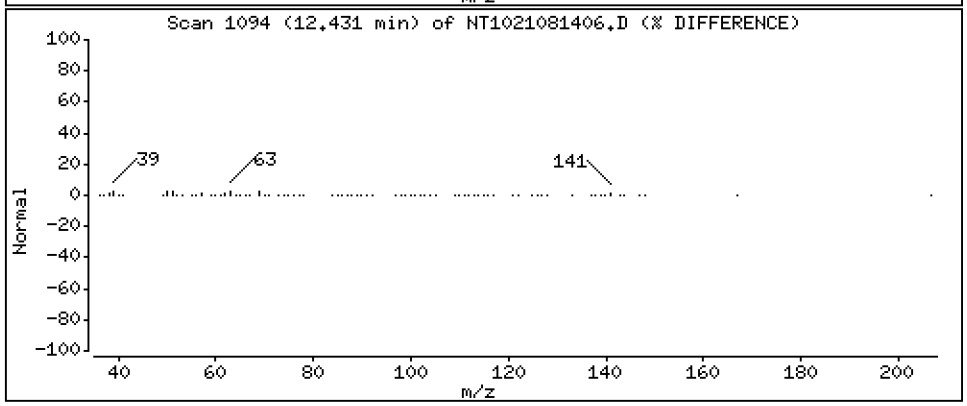












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

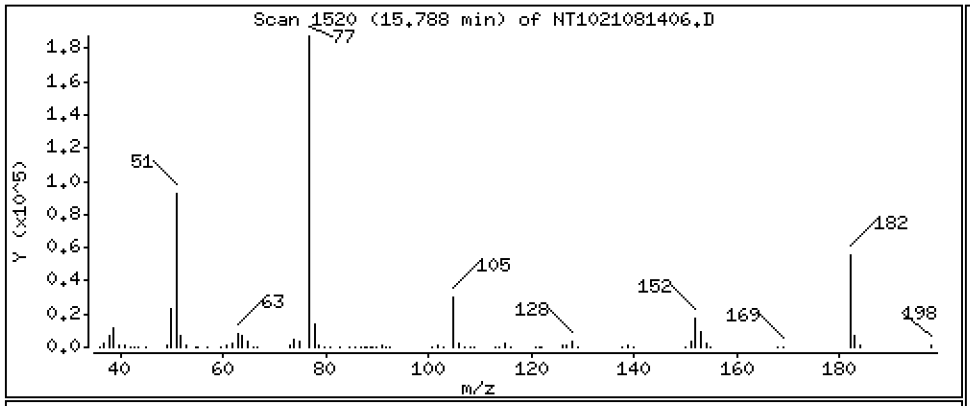
Operator: VTS

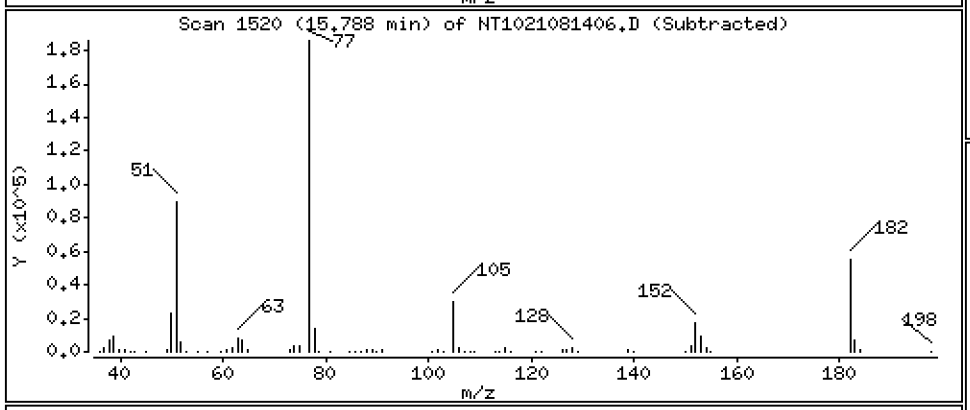
Column phase: ZB-5msi

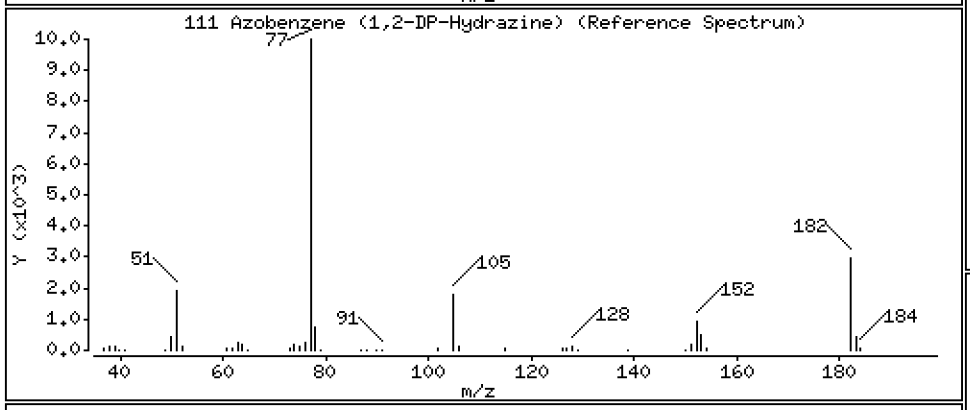
Column diameter: 0.25

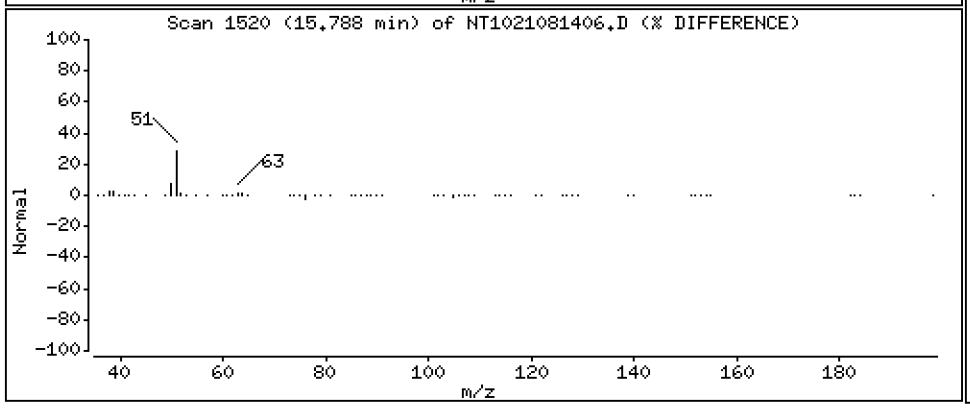
111 Azobenzene (1,2-DP-Hydrazine)

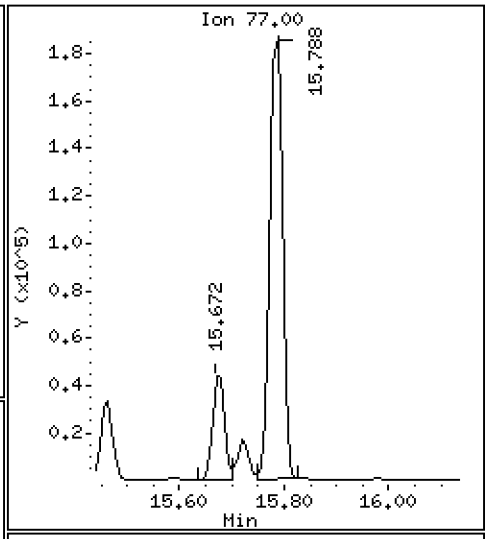
Concentration: 3.885 ug/mL

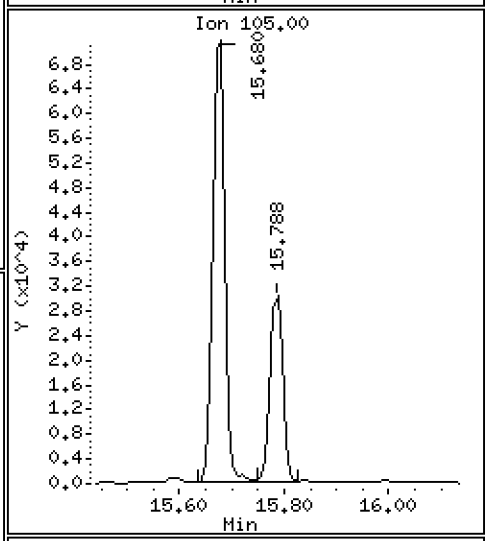


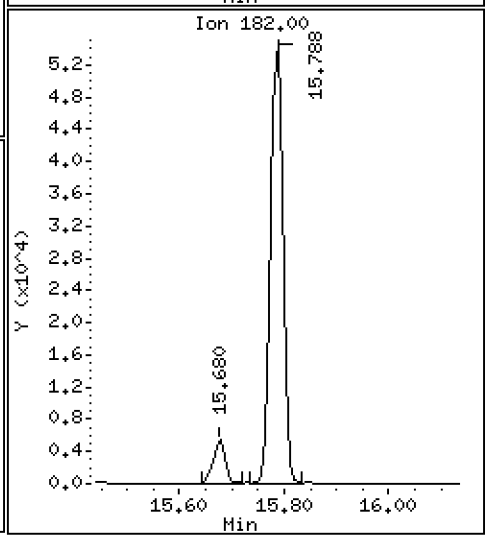












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Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

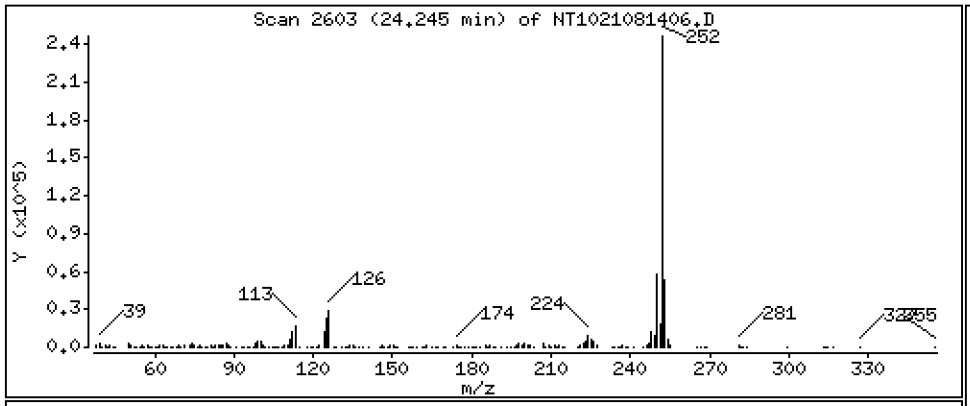
Operator: VTS

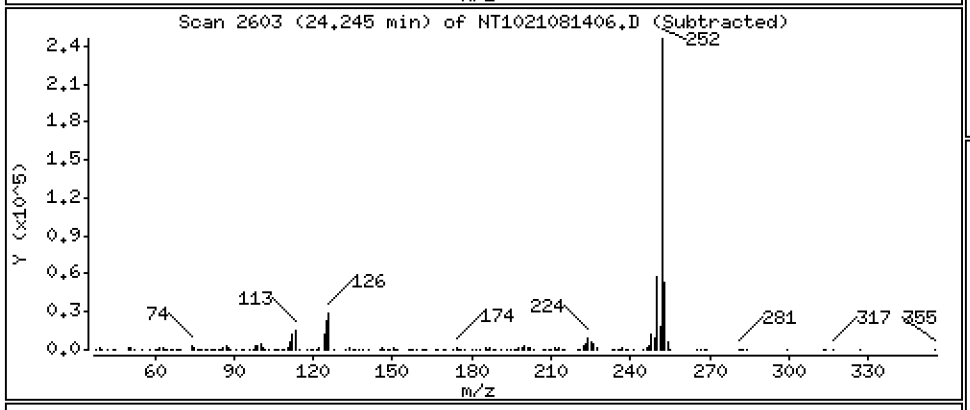
Column phase: ZB-5msi

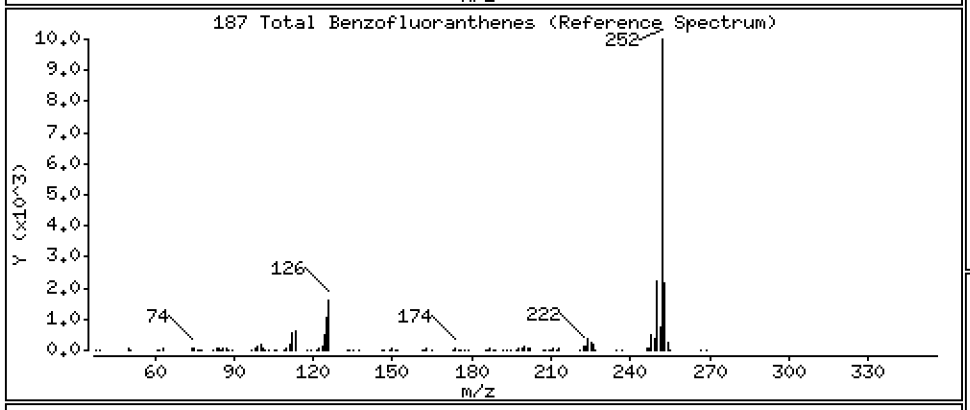
Column diameter: 0.25

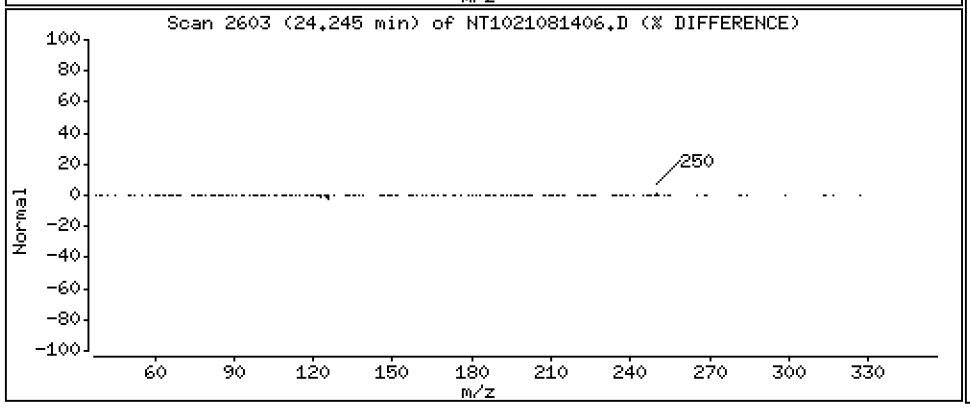
187 Total Benzofluoranthenes

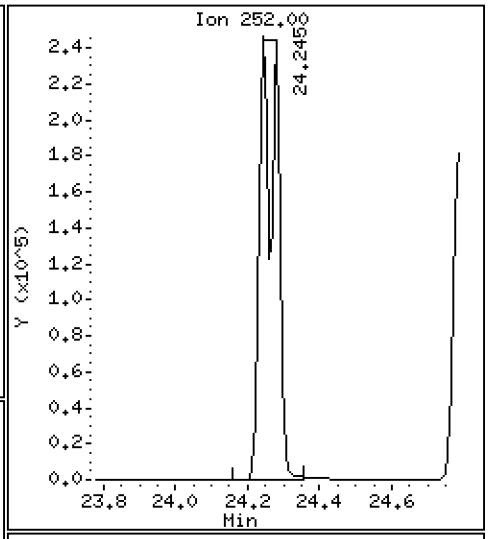
Concentration: 9.037 ug/mL

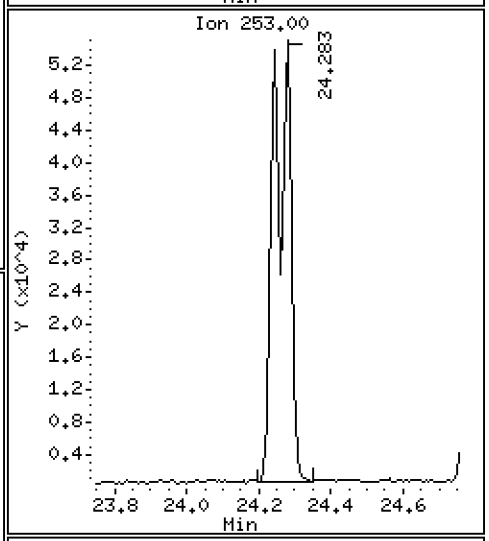


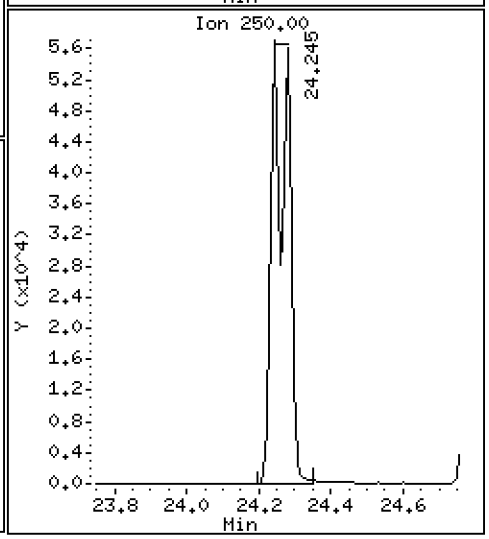












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081406.D

Date : 14-AUG-2021 12:28

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-BS1

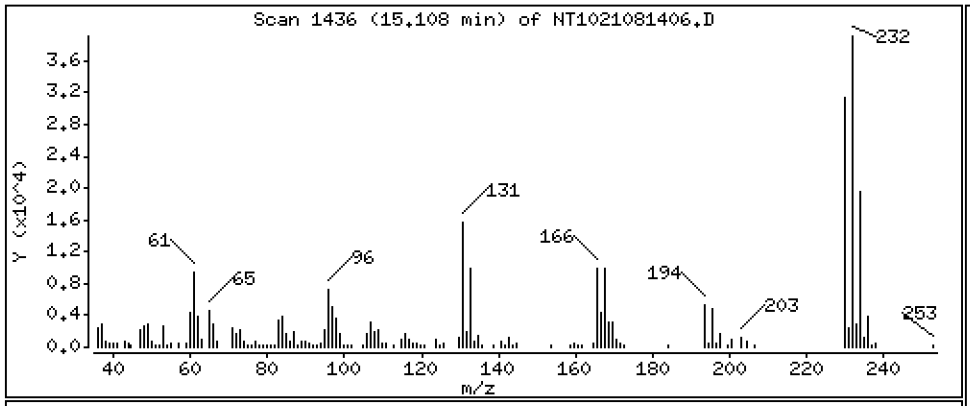
Operator: VTS

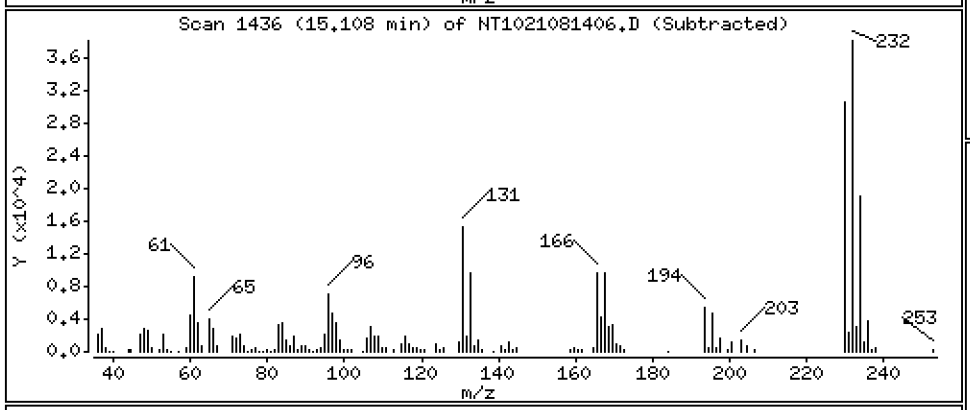
Column phase: ZB-5msi

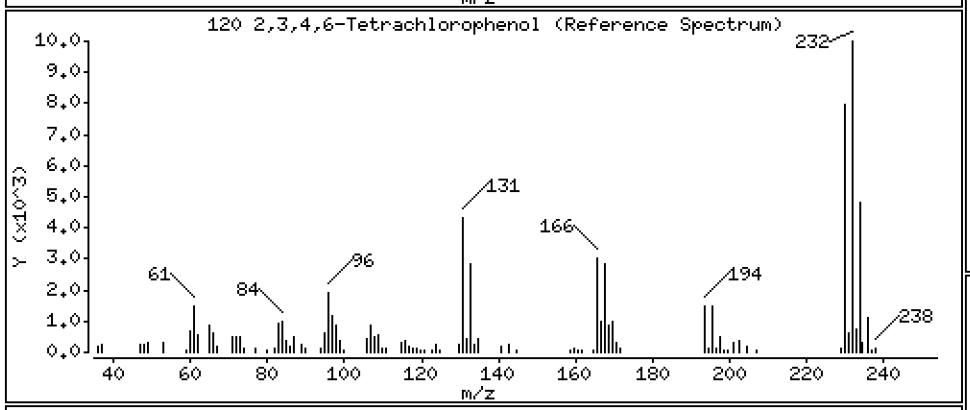
Column diameter: 0.25

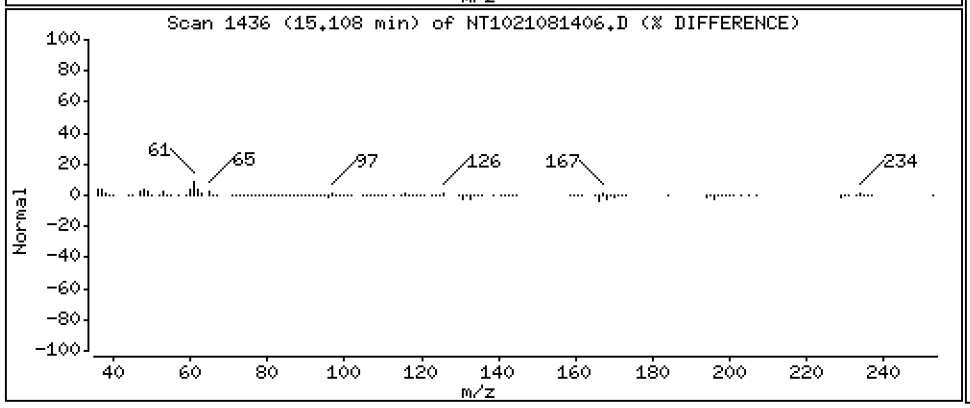
120 2,3,4,6-Tetrachlorophenol

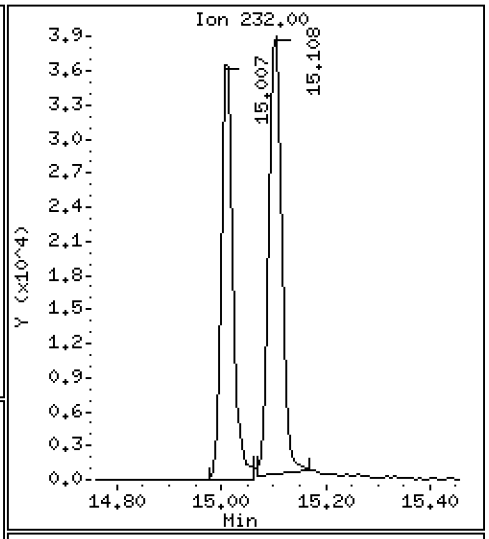
Concentration: 3.521 ug/mL

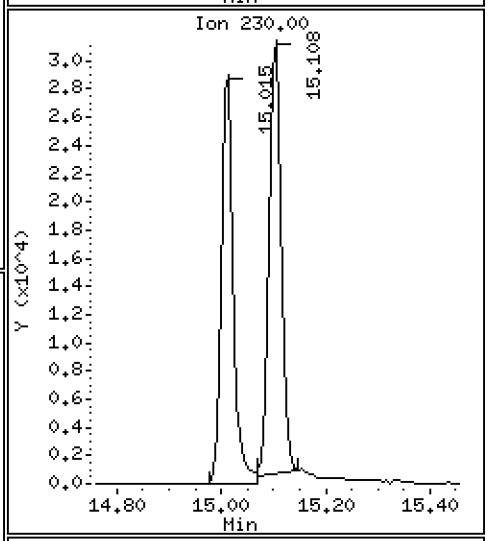


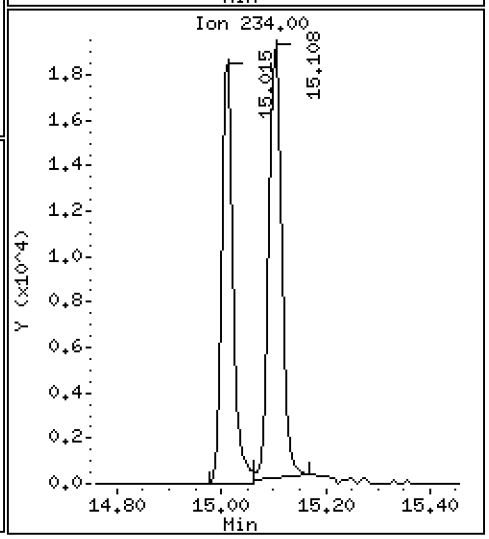












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210814.b\NT1021081406.D
Lab Smp Id: BJH0004-BS1
Inj Date : 14-AUG-2021 12:28
Operator : VTS Inst ID: nt10.i
Smp Info : BJH0004-BS1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$	1 2-Fluorophenol	112	6.211	6.204	(0.744)	159950	4.73859	4.739
$	2 Phenol-d5	99	7.788	7.788	(0.932)	243126	4.85273	4.853
	3 Phenol	94	7.811	7.811	(0.935)	168258	3.84200	3.842
$	5 2-Chlorophenol-d4	132	8.004	8.004	(0.958)	207100	5.86317	5.863
	4 Bis(2-Chloroethyl)ether	93	7.927	7.935	(0.949)	109368	3.12671	3.127
	6 2-Chlorophenol	128	8.035	8.035	(0.962)	131309	3.96117	3.961
	7 1,3-Dichlorobenzene	146	8.283	8.283	(0.992)	122959	3.37668	3.377
*	8 1,4-Dichlorobenzene-d4	152	8.353	8.353	(1.000)	85772	4.00000	
	9 1,4-Dichlorobenzene	146	8.384	8.384	(1.004)	108231	3.48114	3.481
$	10 1,2-Dichlorobenzene-d4	152	8.702	8.702	(1.042)	71555	3.14966	3.150
	12 1,2-Dichlorobenzene	146	8.725	8.726	(1.045)	113563	3.45308	3.453
	11 Benzyl alcohol	108	8.640	8.648	(1.034)	68820	3.35654	3.357
	14 2,2'-oxybis(1-Chloropropane)	121	8.935	8.935	(1.070)	37418	2.96572	2.966
	13 2-Methylphenol	108	8.896	8.896	(1.065)	86806	3.18444	3.184
	17 Hexachloroethane	117	9.300	9.300	(1.113)	47481	3.55276	3.553
	16 N-Nitroso-di-n-propylamine	70	9.191	9.191	(1.100)	58920	2.50552	2.506
	15 4-Methylphenol	108	9.168	9.160	(1.098)	101697	3.47647	3.476
$	18 Nitrobenzene-d5	82	9.439	9.440	(0.875)	132252	3.62735	3.627
	19 Nitrobenzene	77	9.470	9.471	(0.878)	132045	3.66575	3.666
	20 Isophorone	82	9.913	9.913	(0.919)	243451	3.58136	3.581
	21 2-Nitrophenol	139	10.091	10.091	(0.935)	73135	3.85794	3.858
	22 2,4-Dimethylphenol	107	10.175	10.184	(0.943)	188105	6.65639	6.656
	23 Bis(2-Chloroethoxy)methane	93	10.362	10.363	(0.960)	128963	3.65491	3.655
	24 Benzoic acid	105	10.422	10.430	(0.966)	261321	16.1997	16.20
	25 2,4-Dichlorophenol	162	10.549	10.549	(0.978)	256912	10.9719	10.97
	26 1,2,4-Trichlorobenzene	180	10.713	10.714	(0.993)	98510	3.72107	3.721
*	27 Naphthalene-d8	136	10.790	10.791	(1.000)	297264	4.00000	
	28 Naphthalene	128	10.829	10.837	(1.004)	289979	3.68595	3.686
	29 4-Chloroaniline	127	10.991	10.992	(1.019)	282910	7.22190	7.222
	30 Hexachlorobutadiene	225	11.192	11.192	(1.037)	60854	4.21010	4.210
	31 4-Chloro-3-methylphenol	107	11.974	11.982	(1.110)	329753	11.7955	11.80
	32 2-Methylnaphthalene	142	12.214	12.214	(1.132)	262353	3.60432	3.604
	33 Hexachlorocyclopentadiene	237	12.670	12.671	(0.882)	59093	3.25528	3.255

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	12.848	12.849	(0.895)	234712	12.4122	12.41
	35 2,4,5-Trichlorophenol	196	12.926	12.926	(0.900)	250446	12.4299	12.43
$	36 2-Fluorobiphenyl	172	12.995	13.003	(0.905)	290974	3.68138	3.681
	37 2-Chloronaphthalene	162	13.189	13.189	(0.919)	252677	3.82631	3.826
	38 2-Nitroaniline	65	13.483	13.483	(0.939)	295473	11.9391	11.94
	39 Dimethylphthalate	163	13.916	13.917	(0.969)	269559	4.22020	4.220
	40 Acenaphthylene	152	14.048	14.048	(0.978)	346919	3.69393	3.694
	41 2,6-Dinitrotoluene	165	14.048	14.048	(0.978)	174472	12.0473	12.05
*	42 Acenaphthene-d10	164	14.357	14.358	(1.000)	172117	4.00000	
	43 3-Nitroaniline	138	14.327	14.335	(0.998)	171864	9.57798	9.578
	44 Acenaphthene	153	14.427	14.427	(1.005)	208018	3.81511	3.815
	45 2,4-Dinitrophenol	184	14.543	14.543	(1.013)	146896	17.1286	17.13
	46 Dibenzofuran	168	14.752	14.752	(1.027)	332585	3.94528	3.945
	47 4-Nitrophenol	109	14.705	14.713	(1.024)	89431	12.8309	12.83
	48 2,4-Dinitrotoluene	165	14.844	14.853	(1.034)	250272	12.9368	12.94
	50 Diethylphthalate	149	15.362	15.363	(1.070)	266284	4.39703	4.397
	49 Fluorene	166	15.455	15.456	(1.076)	255225	3.12292	3.123
	51 4-Chlorophenyl-phenylether	204	15.463	15.463	(1.077)	126989	2.67305	2.673
	52 4-Nitroaniline	138	15.587	15.587	(1.086)	182338	9.56512	9.565
	53 4,6-Dinitro-2-methylphenol	198	15.679	15.680	(0.903)	294256	20.2339	20.23
	54 N-Nitrosodiphenylamine	169	15.718	15.726	(0.905)	194236	3.49090	3.491
$	55 2,4,6-Tribromophenol	330	15.988	15.996	(1.114)	97234	6.77485	6.775
	56 4-Bromophenyl-phenylether	248	16.458	16.458	(0.948)	126495	4.46750	4.468
	57 Hexachlorobenzene	284	16.752	16.752	(0.965)	130489	4.38523	4.385
	58 Pentachlorophenol	266	17.123	17.132	(0.986)	82507	6.73238	6.732
*	59 Phenanthrene-d10	188	17.363	17.364	(1.000)	310079	4.00000	
	60 Phenanthrene	178	17.410	17.418	(1.003)	344089	4.10345	4.103
	61 Anthracene	178	17.503	17.503	(1.008)	336951	3.75770	3.758
	62 Carbazole	167	17.858	17.859	(1.029)	346852	3.91827	3.918
	63 Di-n-butylphthalate	149	18.702	18.710	(1.077)	539820	3.93093	3.931
	64 Fluoranthene	202	19.831	19.839	(0.882)	531080	4.51198	4.512
	65 Pyrene	202	20.257	20.265	(0.901)	560792	4.32215	4.322
$	66 Terphenyl-d14	244	20.590	20.590	(0.916)	393815	4.25857	4.259
	67 Butylbenzylphthalate	149	21.557	21.558	(0.959)	196502	4.60429	4.604
	68 Benzo(a)anthracene	228	22.463	22.464	(0.999)	446420	4.23550	4.236
*	69 Chrysene-d12	240	22.487	22.495	(1.000)	282450	4.00000	
	70 3,3'-Dichlorobenzidine	252	22.448	22.456	(0.998)	215650	5.09305	5.093
	71 Chrysene	228	22.533	22.541	(1.002)	323856	3.98541	3.985
	72 bis(2-Ethylhexyl)phthalate	149	22.611	22.619	(0.958)	216406	5.05376	5.054
*	134 Di-n-octylphthalate-d4	153	23.601	23.610	(1.000)	389219	4.00000	
	73 Di-n-octylphthalate	149	23.609	23.617	(1.000)	433533	3.97442	3.974
	74 Benzo(b)fluoranthene	252	24.244	24.252	(0.974)	421780	4.54147	4.541
	75 Benzo(k)fluoranthene	252	24.283	24.283	(0.976)	437581	4.75652	4.757
	76 Benzo(a)pyrene	252	24.786	24.786	(0.996)	336383	4.00762	4.008
*	77 Perylene-d12	264	24.879	24.887	(1.000)	235684	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.049	27.057	(1.087)	400425	4.21519	4.215
	79 Dibenzo(a,h)anthracene	278	27.064	27.072	(1.088)	304032	4.07471	4.075
	80 Benzo(g,h,i)perylene	276	27.678	27.686	(1.112)	336738	3.97230	3.972
	90 N-Nitrosodimethylamine	74	4.080	4.065	(0.489)	115602	5.00603	5.006
	91 Aniline	93	7.834	7.834	(0.938)	304031	6.66876	6.669
	93 Benzidine	184	Compound Not Detected.					
	103 Pyridine	79	4.088	4.057	(0.489)	139379	3.83674	3.837
	105 1-methylnaphthalene	142	12.430	12.431	(1.152)	256906	3.76176	3.762
	111 Azobenzene (1,2-DP-Hydrazine)	77	15.787	15.788	(1.100)	300004	3.88517	3.885

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	CONCENTRATIONS FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.244	24.283	(0.974)	805935	9.03667	9.037
120 2,3,4,6-Tetrachlorophenol	232	15.107	15.108	(1.052)	64829	3.52061	3.521

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081406.D
Lab Smp Id: BJH0004-BS1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	85772	0.84
27 Naphthalene-d8	291658	145829	583316	297264	1.92
42 Acenaphthene-d10	163642	81821	327284	172117	5.18
59 Phenanthrene-d10	304099	152050	608198	310079	1.97
69 Chrysene-d12	199453	99727	398906	282450	41.61
134 Di-n-octylphthala	303639	151820	607278	389219	28.18
77 Perylene-d12	200082	100041	400164	235684	17.79

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.35	-0.00
27 Naphthalene-d8	10.79	10.29	11.29	10.79	-0.00
42 Acenaphthene-d10	14.36	13.86	14.86	14.36	-0.00
59 Phenanthrene-d10	17.36	16.86	17.86	17.36	-0.00
69 Chrysene-d12	22.50	22.00	23.00	22.49	-0.04
134 Di-n-octylphthala	23.61	23.11	24.11	23.60	-0.03
77 Perylene-d12	24.89	24.39	25.39	24.88	-0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081406.D

Lab ID: BJH0004-BS1
nt10.i, ABN.m, 14-AUG-2021 12:28

RT	CO-ELUTION COMPOUNDS
14.048	Acenaphthylene and 2,6-Dinitrotoluene

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
NONE			

RRT check based on Ccal File: NT1021081402.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS627

MS / MS DUPLICATE RECOVERY
EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/14/21 15:52
Batch:	BJH0004	Laboratory ID:	BJH0004-MS1
Preparation:	EPA 3546 (Microwave)	Sequence Name:	Matrix Spike
Initial/Final:	18.38 g / 1 mL	Source Sample:	LDW21-SS627

COMPOUND	SPIKE ADDED (ug/kg dry)	SAMPLE CONCENTRATION (ug/kg dry)	Q	MS CONCENTRATION (ug/kg dry)	Q	MS % REC. #	QC LIMITS REC.
Naphthalene	500	6.4	J	396		78.0	43 - 120
2-Methylnaphthalene	500	ND	U	397		79.4	43 - 120
Acenaphthylene	500	ND	U	395		79.0	42 - 120
Acenaphthene	500	ND	U	419		83.9	45 - 120
Fluorene	500	ND	U	394	Q	78.8	45 - 120
Phenanthrene	500	33.0		504		94.2	49 - 120
Anthracene	500	9.9	J	370	Q	72.0	45 - 120
Fluoranthene	500	133		623	Q	97.9	53 - 145
Pyrene	500	96.3		493		79.3	52 - 134
Butylbenzylphthalate	500	36.0		489		90.7	45 - 132
Benzo(a)anthracene	500	40.7		451		82.0	49 - 120
Chrysene	500	112		572		92.0	47 - 120
Benzofluoranthenes, Total	1000	118		1030		91.6	30 - 160
Benzo(a)pyrene	500	36.6		435		79.7	42 - 120
Indeno(1,2,3-cd)pyrene	500	28.6		329		60.1	42 - 163
Dibenzo(a,h)anthracene	500	ND	U	327		65.4	30 - 133
Benzo(g,h,i)perylene	500	26.7		260		46.7	46 - 148

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS627

MS / MS DUPLICATE RECOVERY
EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/14/21 16:32
Batch:	BJH0004	Laboratory ID:	BJH0004-MSD1
Preparation:	EPA 3546 (Microwave)	Sequence Name:	Matrix Spike Dup
Initial/Final:	18.38 g / 1 mL	Source Sample:	LDW21-SS627

COMPOUND	SPIKE ADDED (ug/kg dry)	MSD CONCENTRATION (ug/kg dry)	Q	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Naphthalene	500	365		71.8	8.10	30	43 - 120
2-Methylnaphthalene	500	372		74.4	6.53	30	43 - 120
Acenaphthylene	500	374		74.7	5.53	30	42 - 120
Acenaphthene	500	393		78.5	6.60	30	45 - 120
Fluorene	500	373	Q	74.7	5.33	30	45 - 120
Phenanthrene	500	459		85.1	9.40	30	49 - 120
Anthracene	500	377	Q	73.5	1.98	30	45 - 120
Fluoranthene	500	531	Q	79.5	15.9	30	53 - 145
Pyrene	500	426		65.9	14.6	30	52 - 134
Butylbenzylphthalate	500	471		87.0	3.78	30	45 - 132
Benzo(a)anthracene	500	430		77.8	4.72	30	49 - 120
Chrysene	500	492		75.8	15.2	30	47 - 120
Benzofluoranthenes, Total	1000	946		82.8	8.97	30	30 - 160
Benzo(a)pyrene	500	408		74.3	6.37	30	42 - 120
Indeno(1,2,3-cd)pyrene	500	311		56.4	5.73	30	42 - 163
Dibenzo(a,h)anthracene	500	320		64.1	2.10	30	30 - 133
Benzo(g,h,i)perylene	500	256	*	45.8 *	1.70	30	46 - 148

* Values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081411.D

Date : 14-AUG-2021 15:52

Client ID:

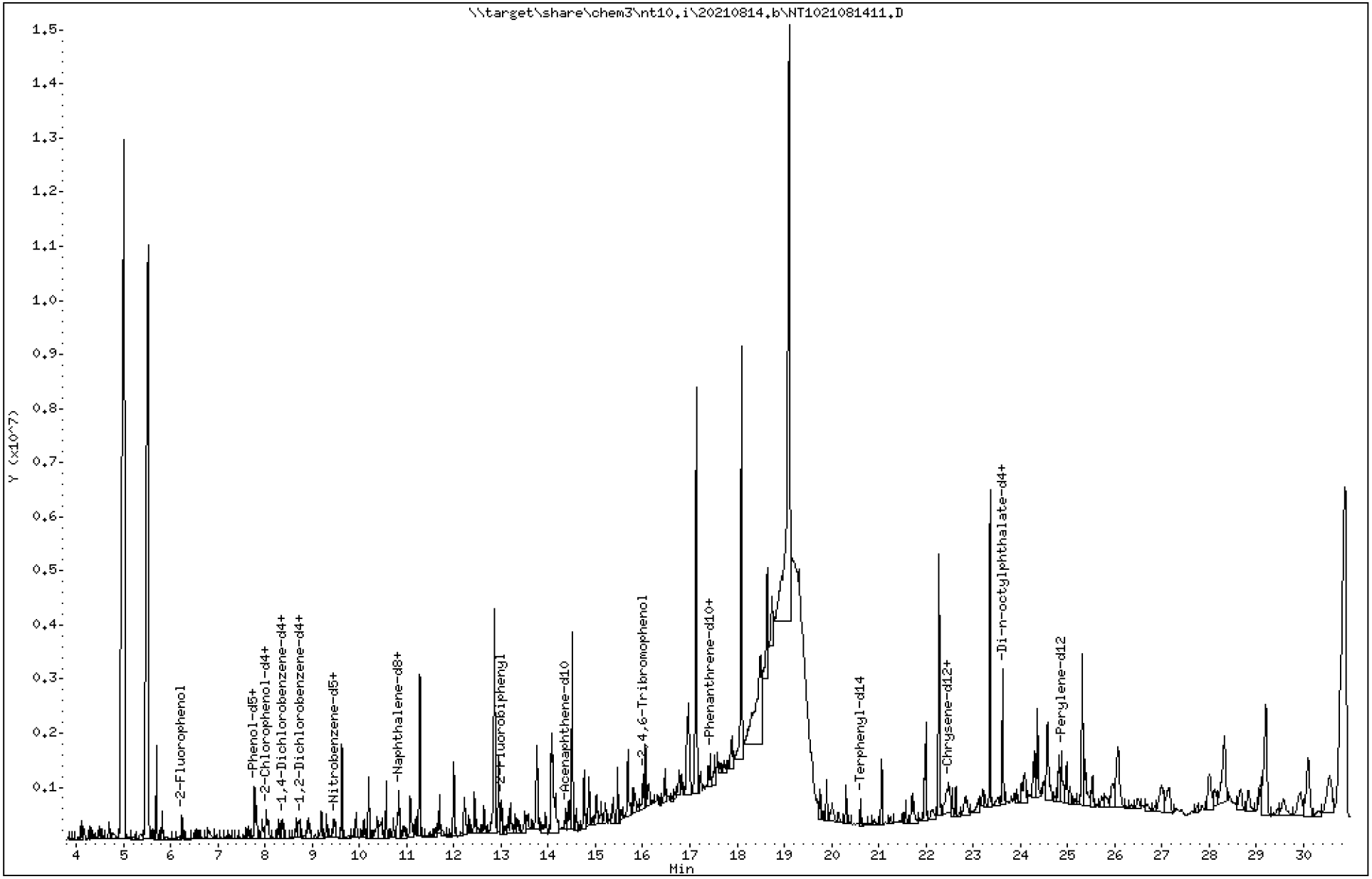
Instrument: nt10.i

Sample Info: BJH0004-MS1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

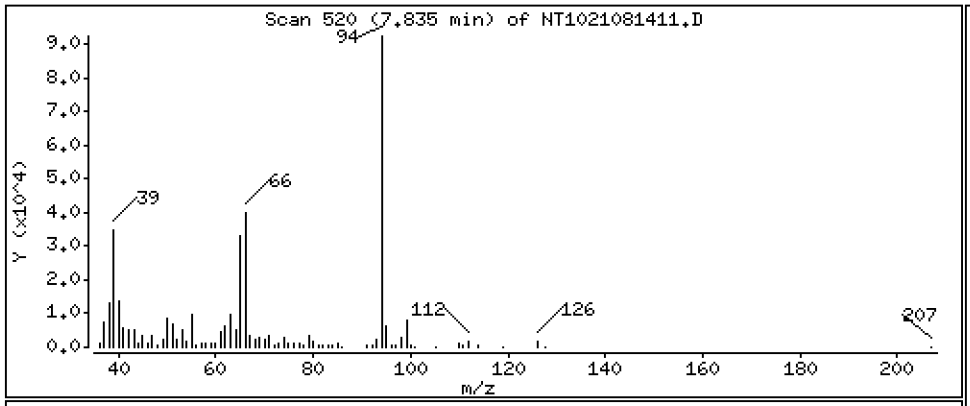
Operator: VTS

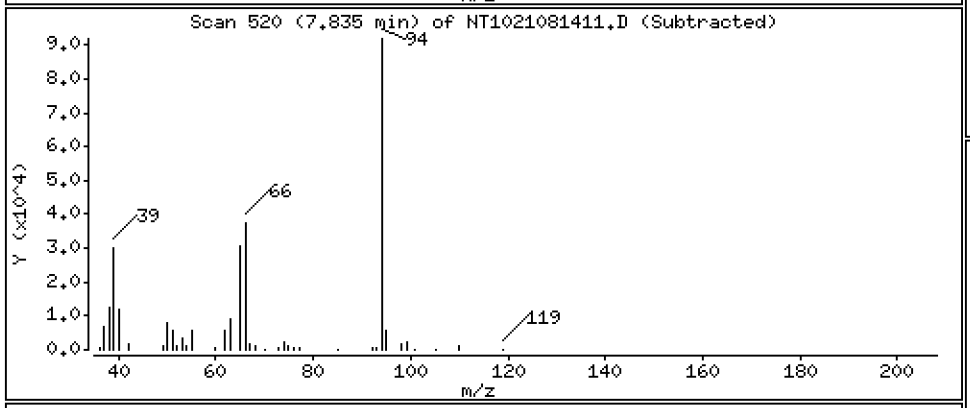
Column phase: ZB-5msi

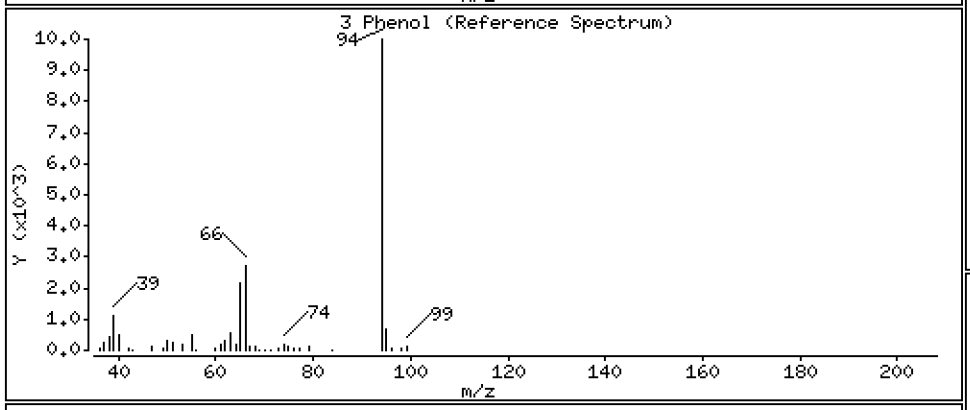
Column diameter: 0.25

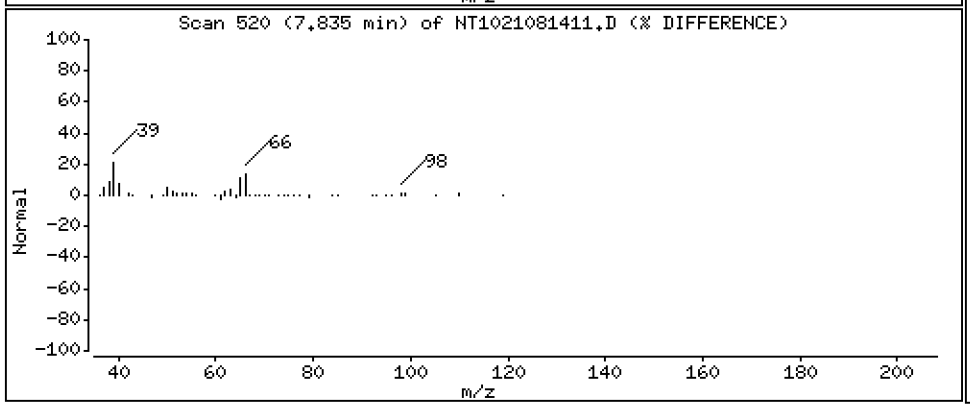
3 Phenol

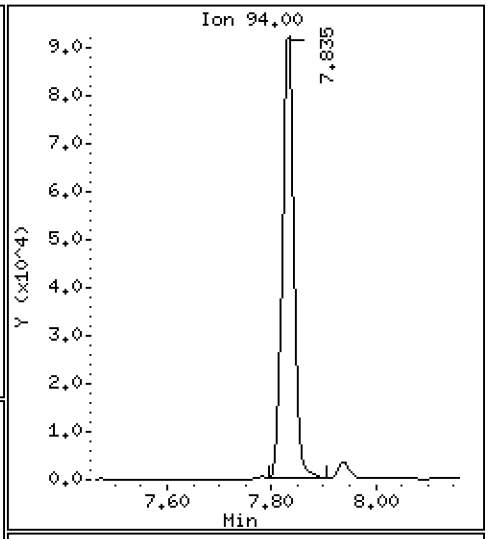
Concentration: 3.415 ug/mL

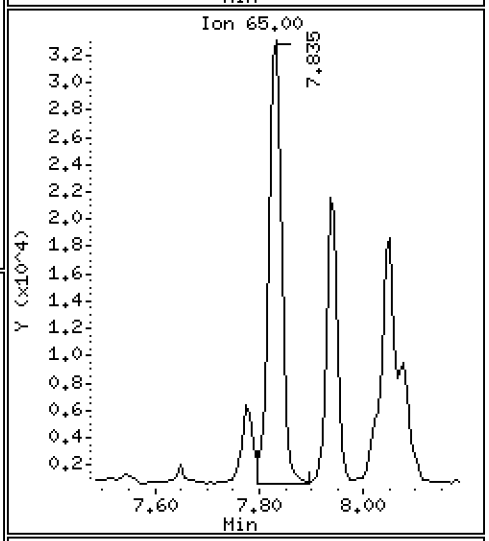


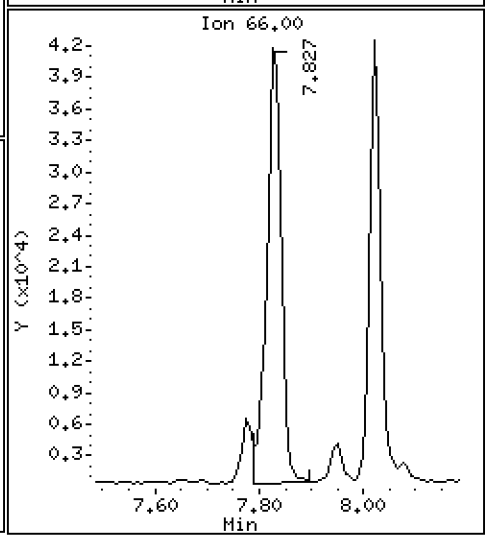












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

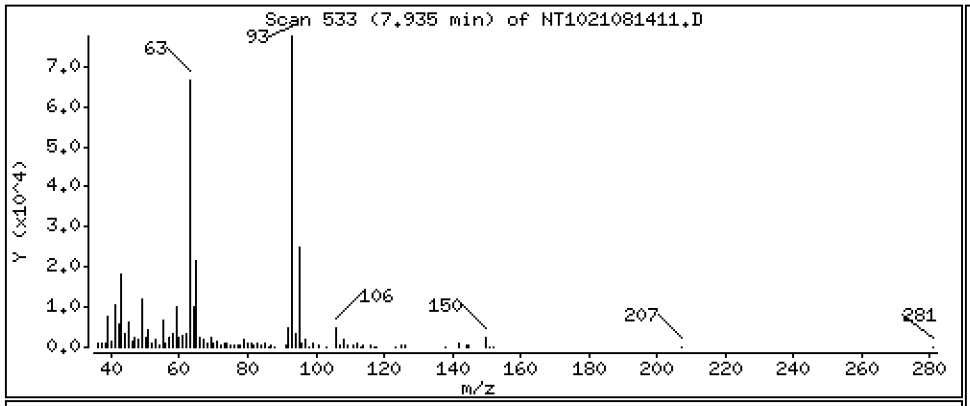
Operator: VTS

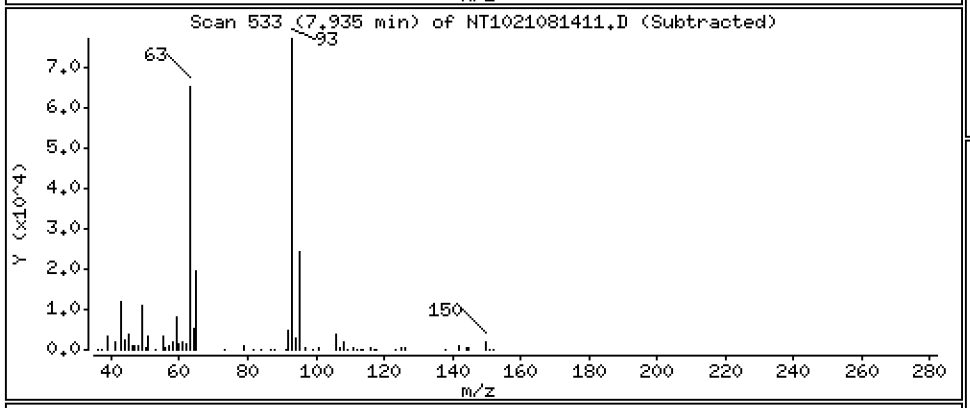
Column phase: ZB-5msi

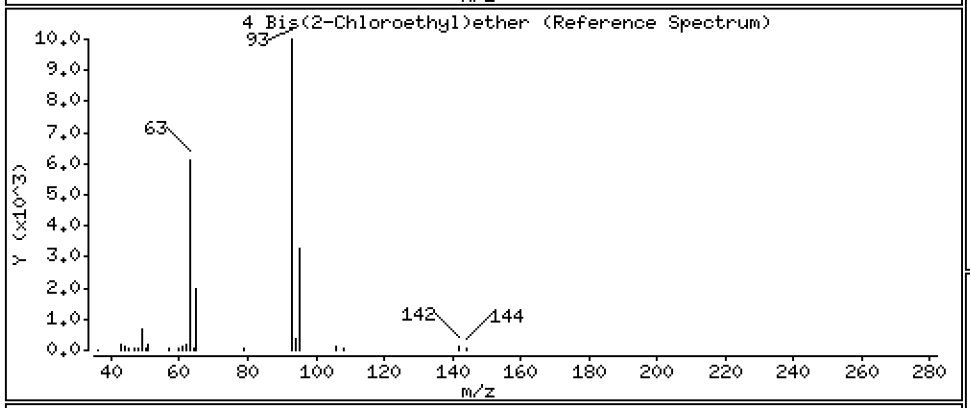
Column diameter: 0.25

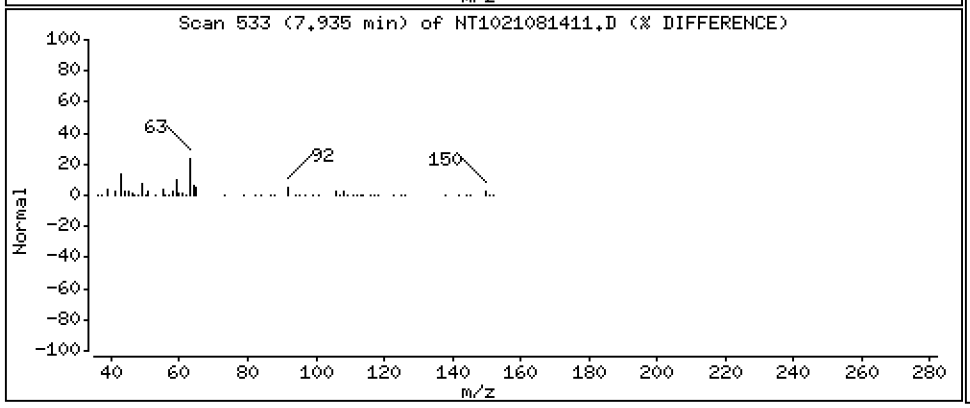
4 Bis(2-Chloroethyl)ether

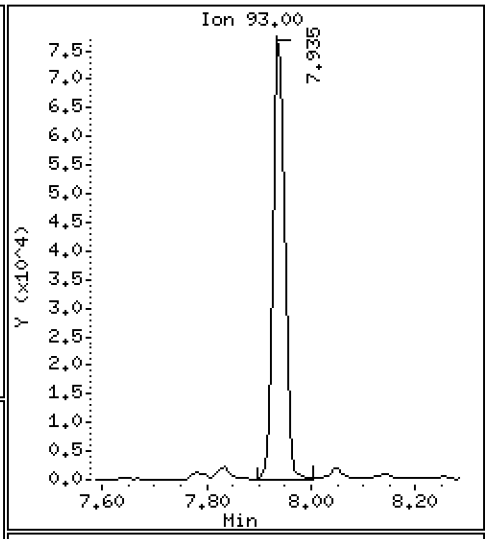
Concentration: 3.427 ug/mL

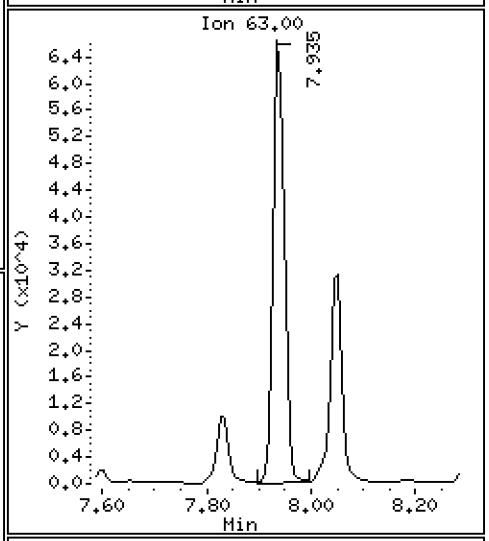


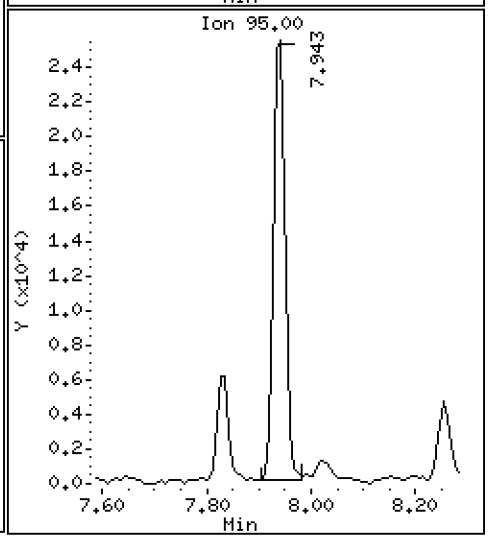












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

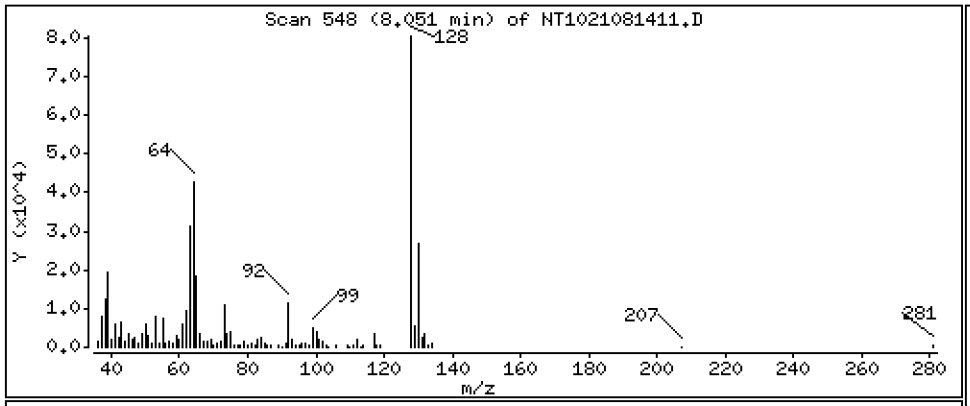
Operator: VTS

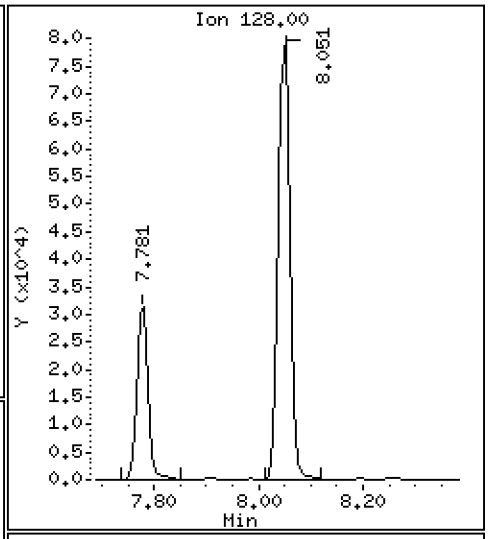
Column phase: ZB-5msi

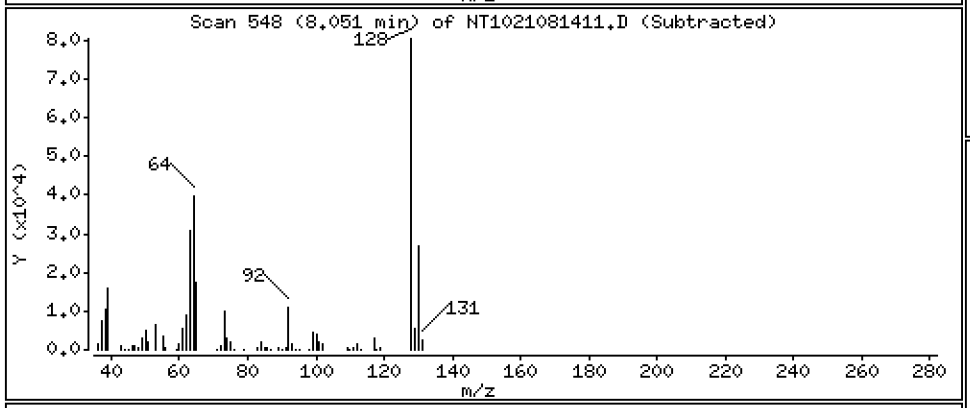
Column diameter: 0.25

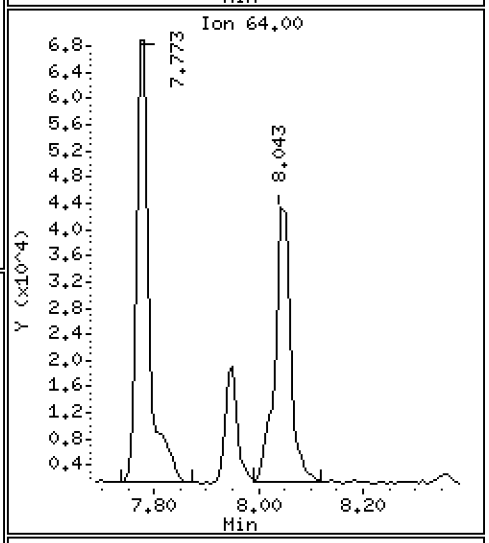
6 2-Chlorophenol

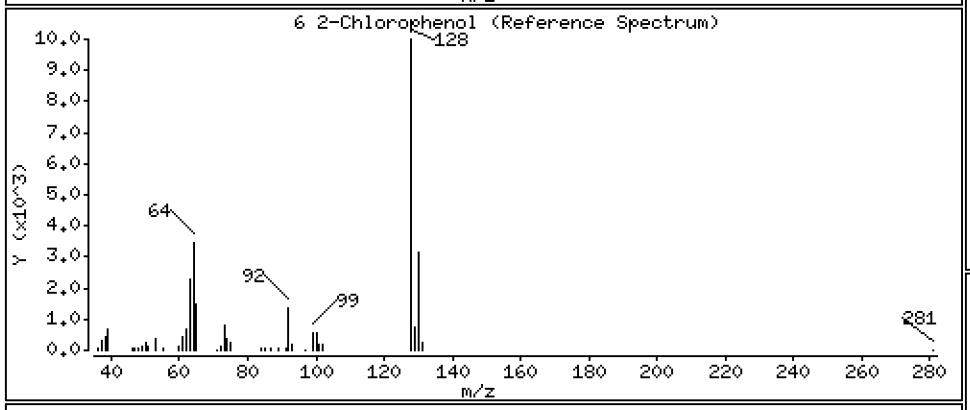
Concentration: 4.297 ug/mL

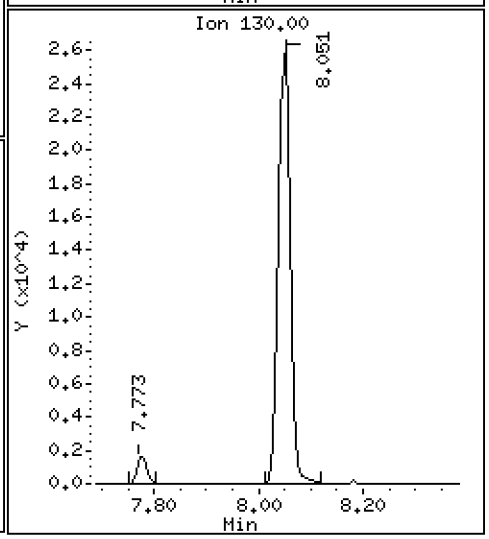


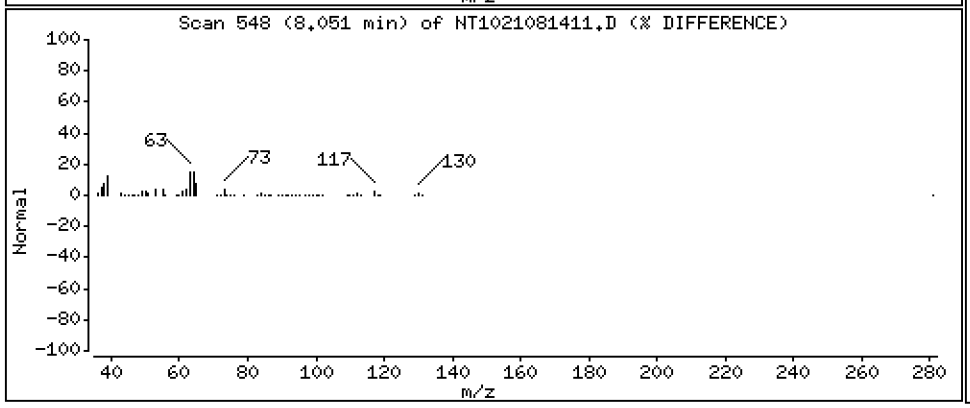












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

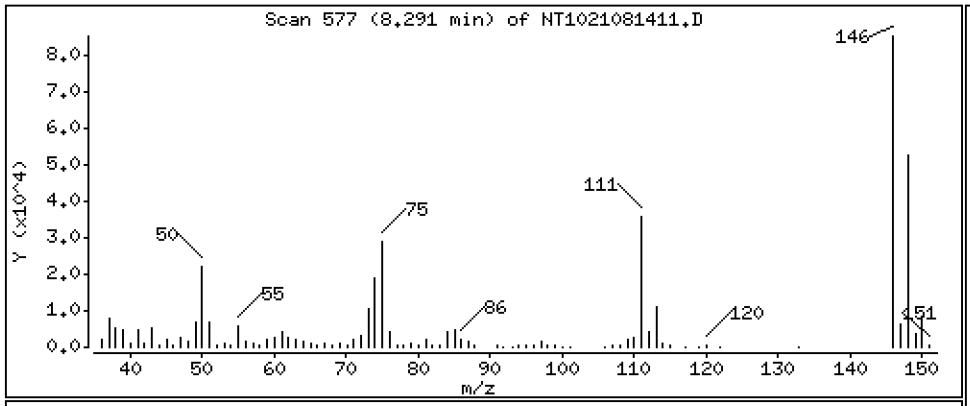
Operator: VTS

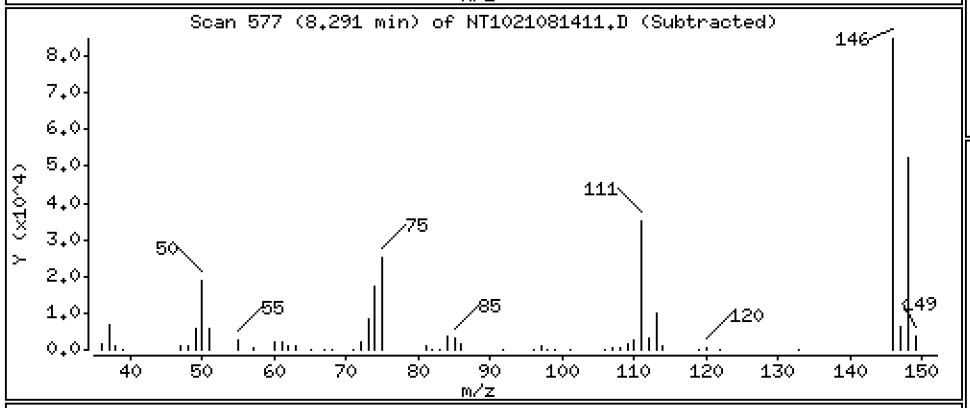
Column phase: ZB-5msi

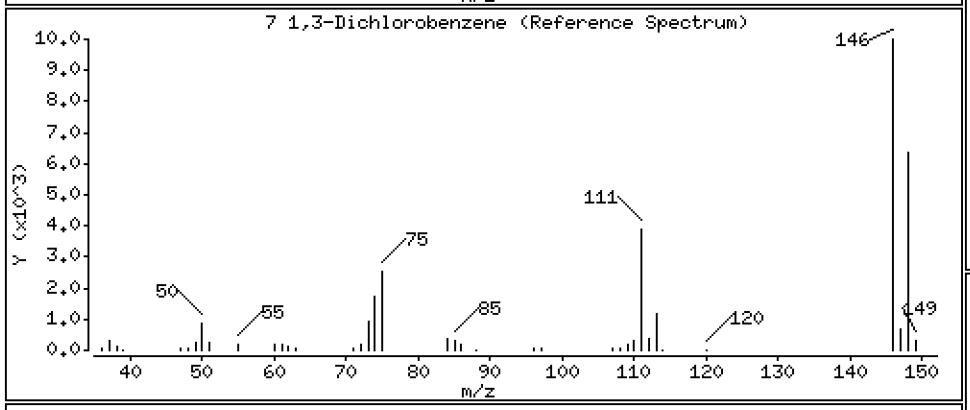
Column diameter: 0.25

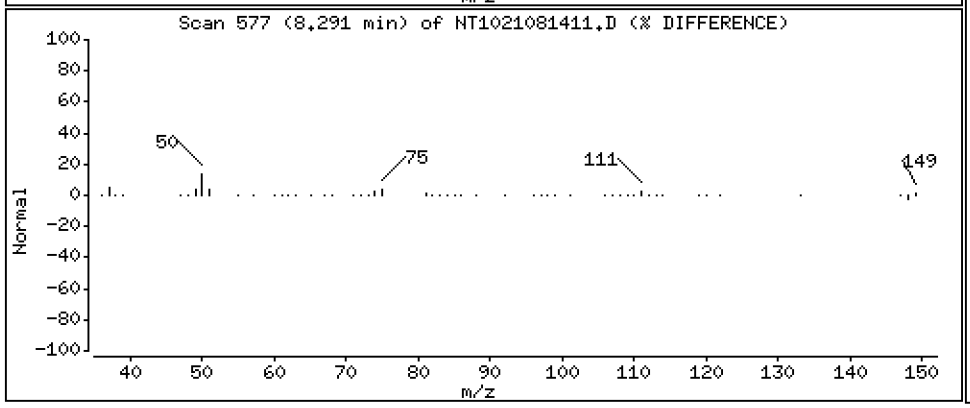
7 1,3-Dichlorobenzene

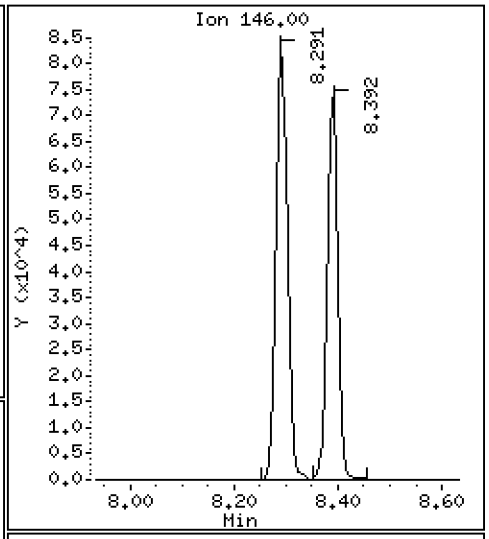
Concentration: 3.397 ug/mL

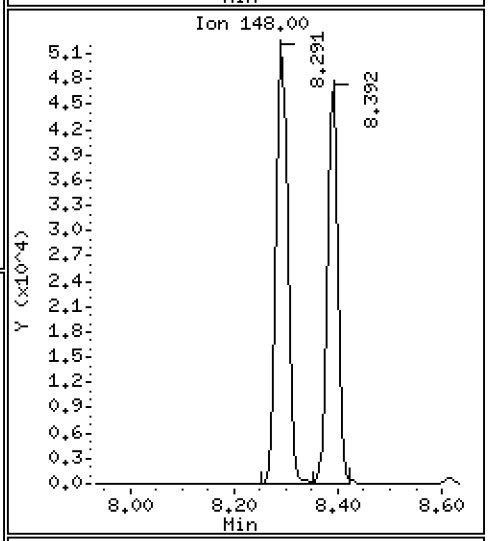


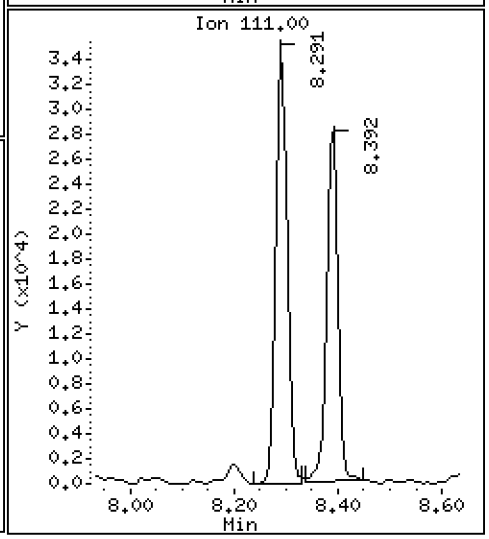












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

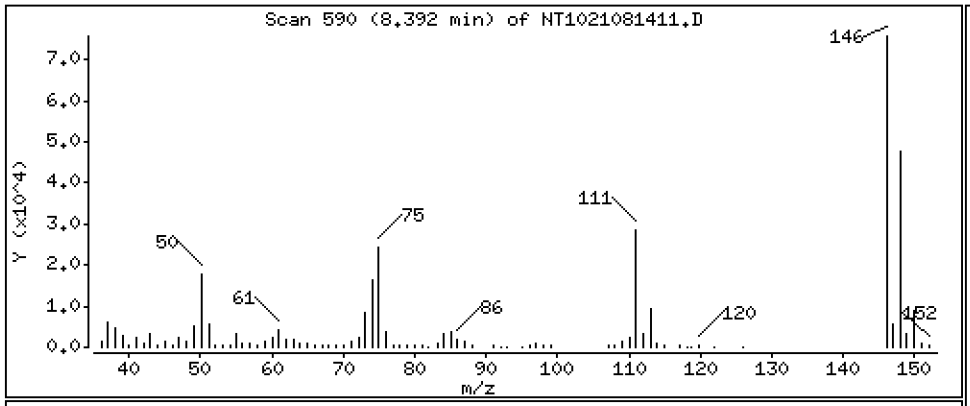
Operator: VTS

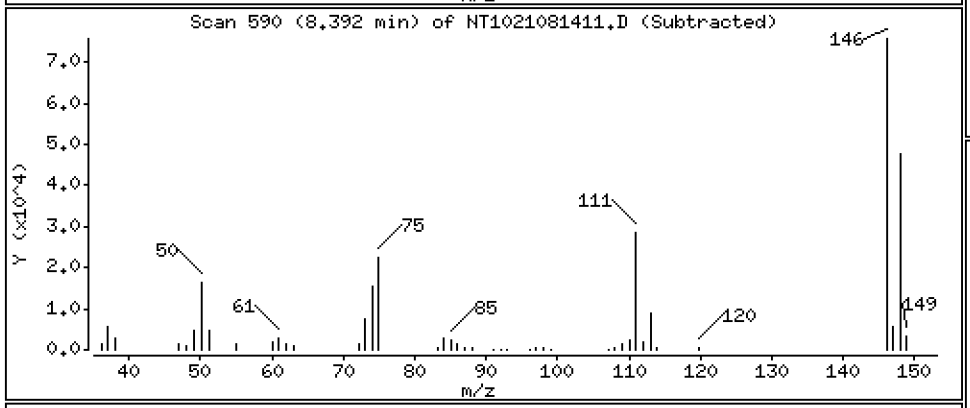
Column phase: ZB-5msi

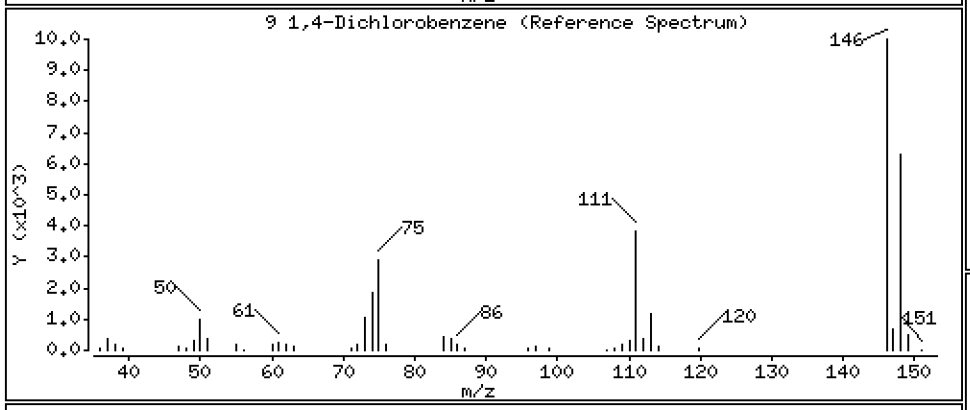
Column diameter: 0.25

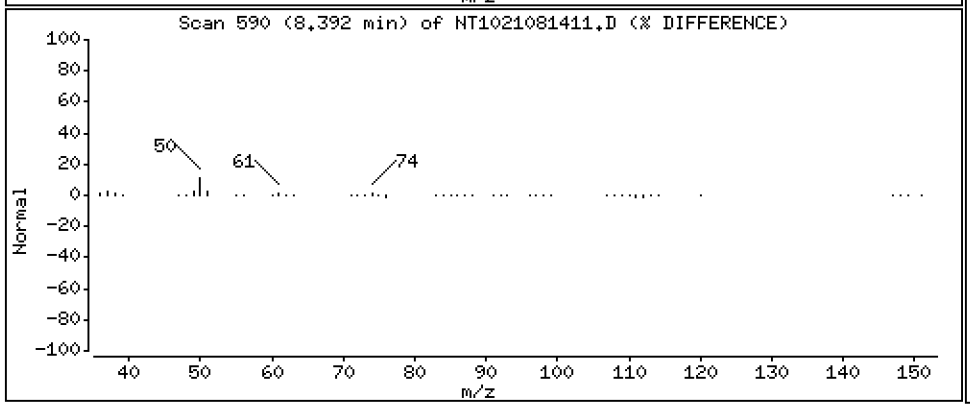
9 1,4-Dichlorobenzene

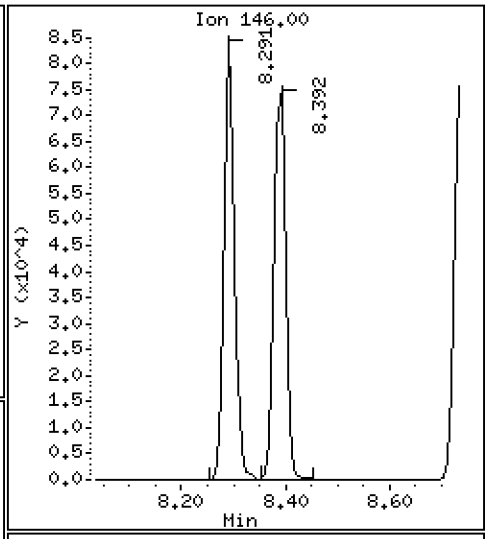
Concentration: 3.691 ug/mL

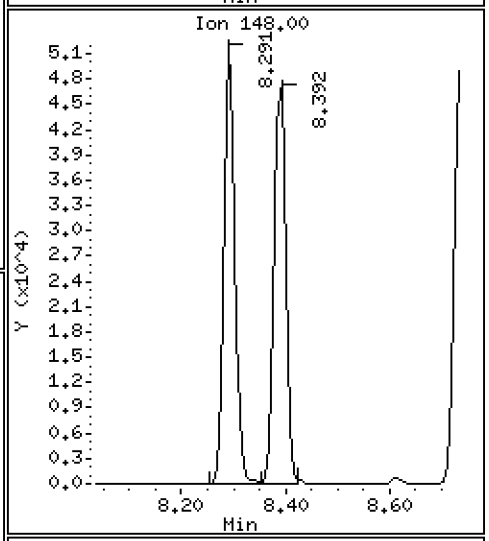


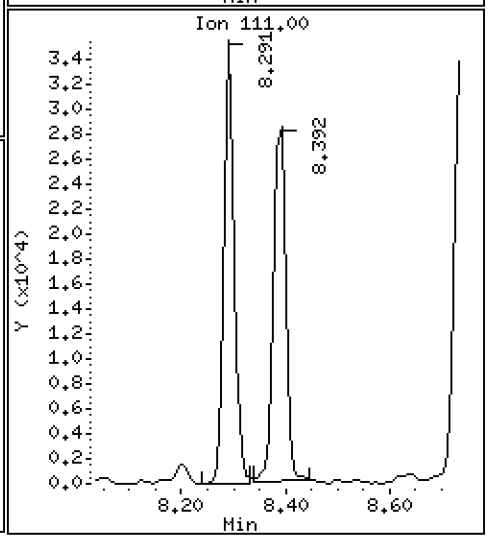












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

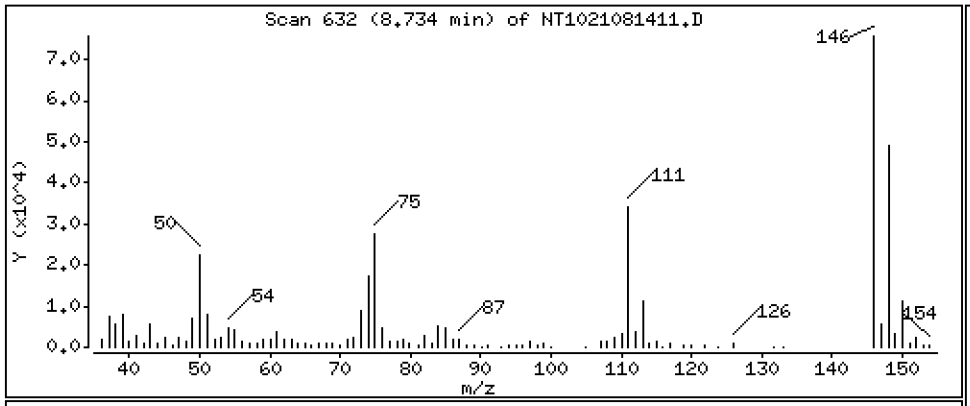
Operator: VTS

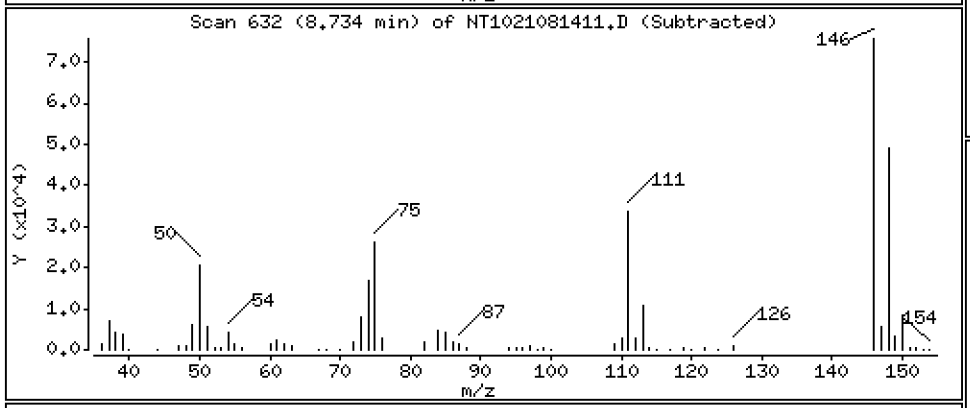
Column phase: ZB-5msi

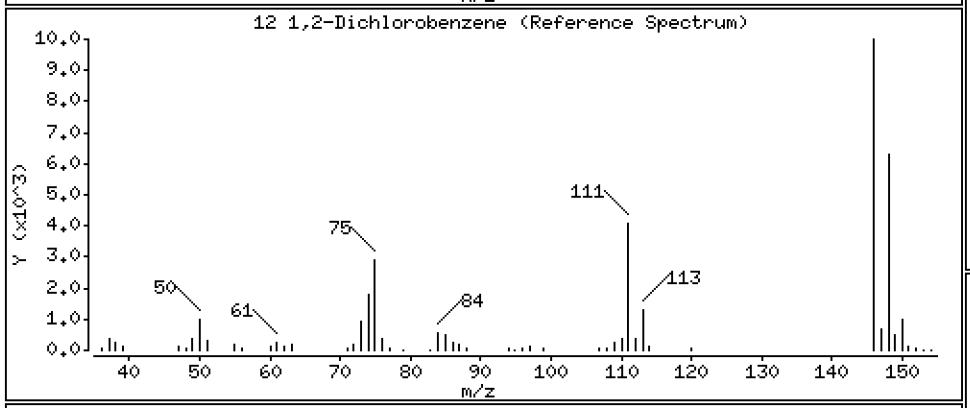
Column diameter: 0.25

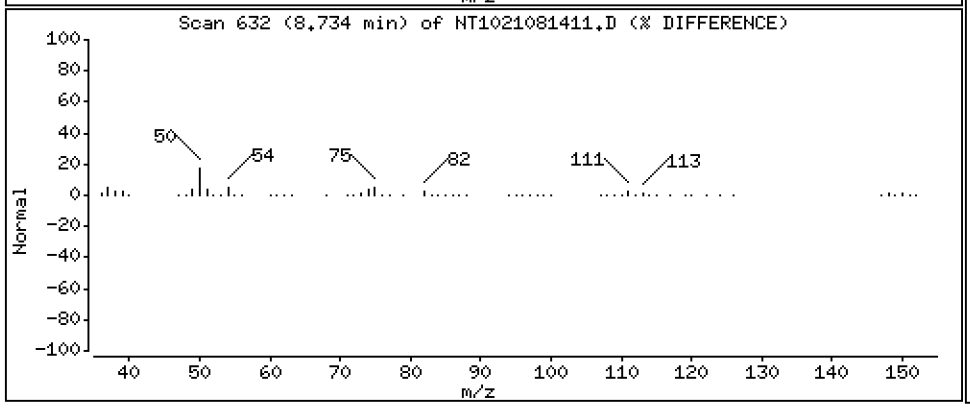
12 1,2-Dichlorobenzene

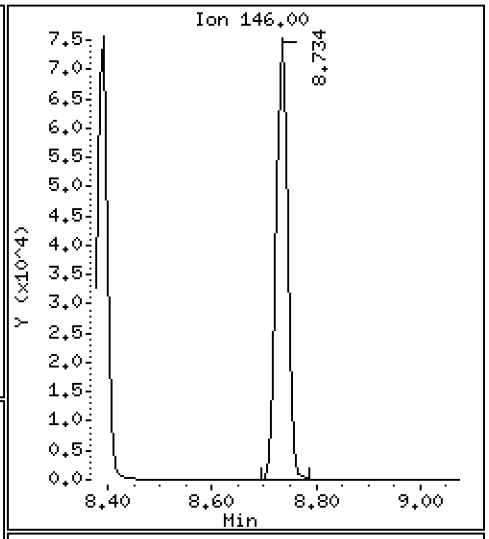
Concentration: 3.479 ug/mL

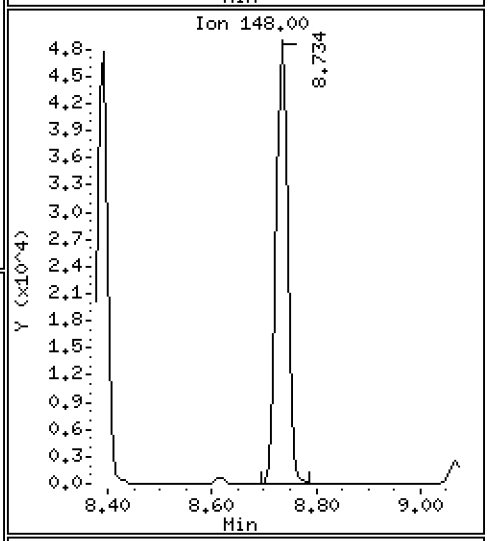


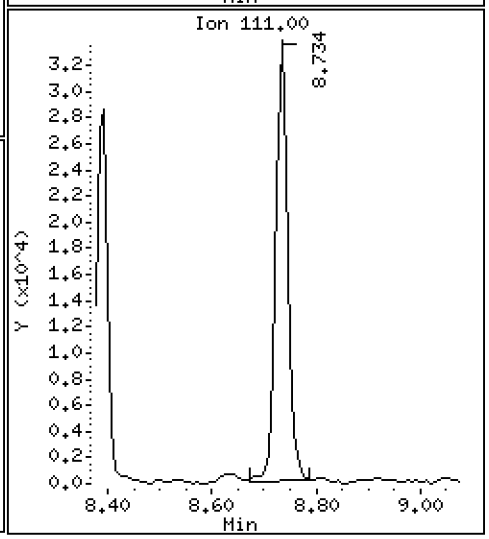












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

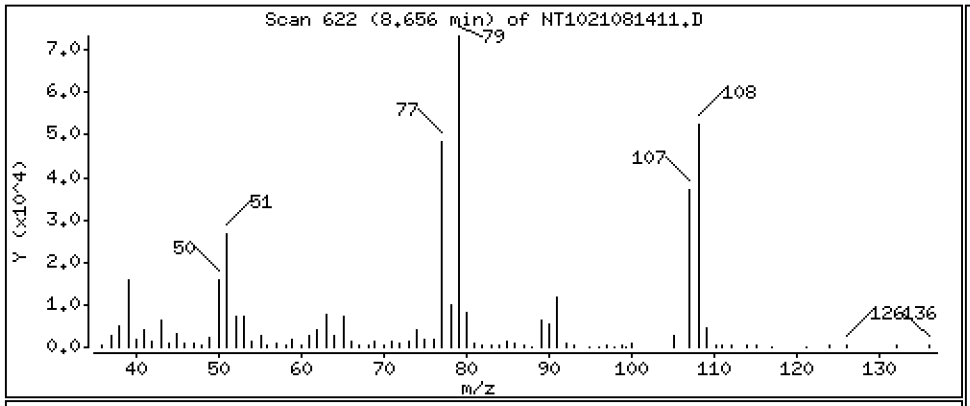
Operator: VTS

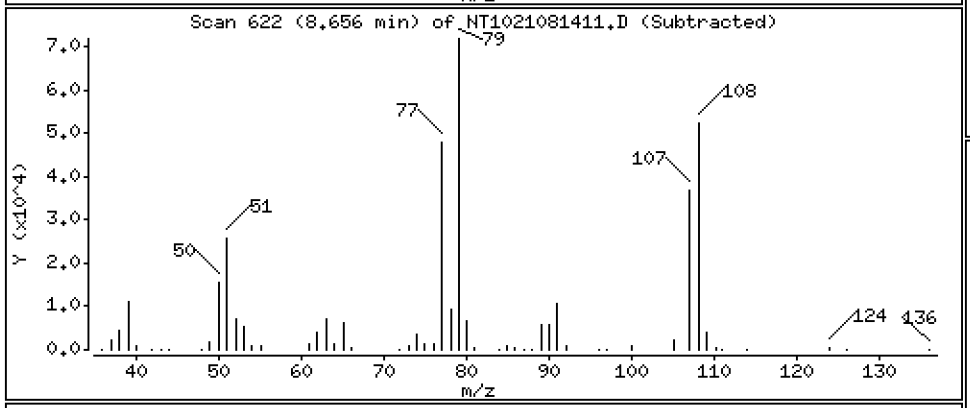
Column phase: ZB-5msi

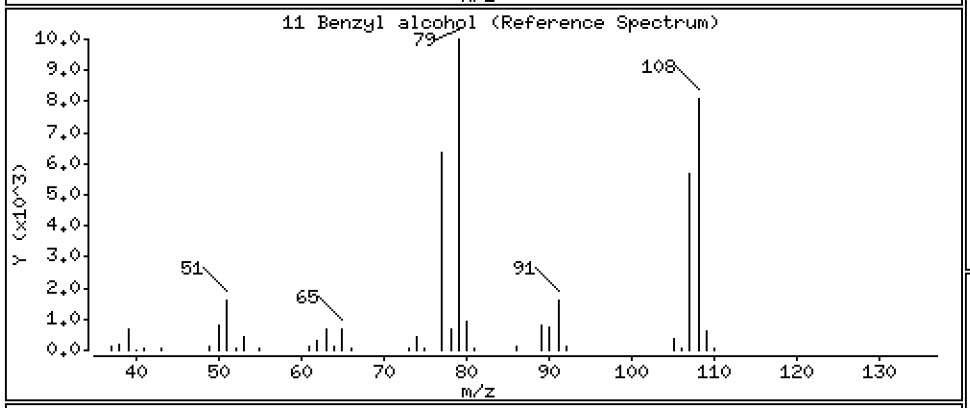
Column diameter: 0.25

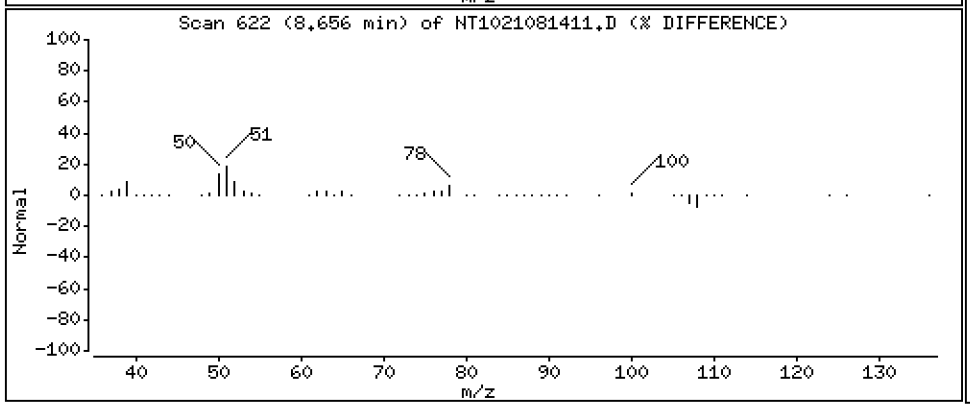
11 Benzyl alcohol

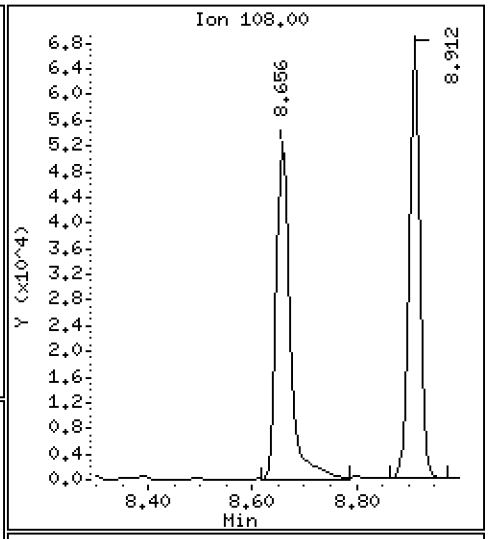
Concentration: 4.854 ug/mL

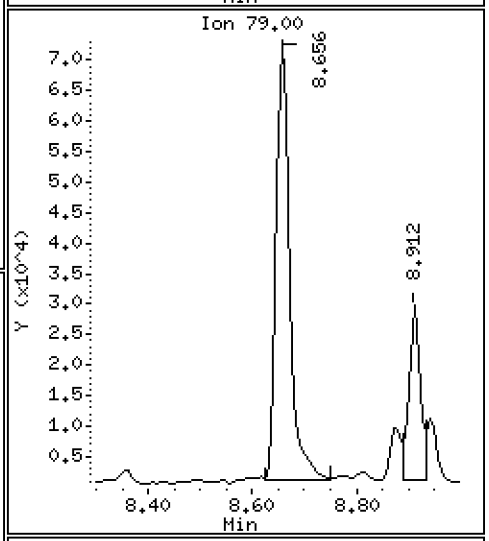


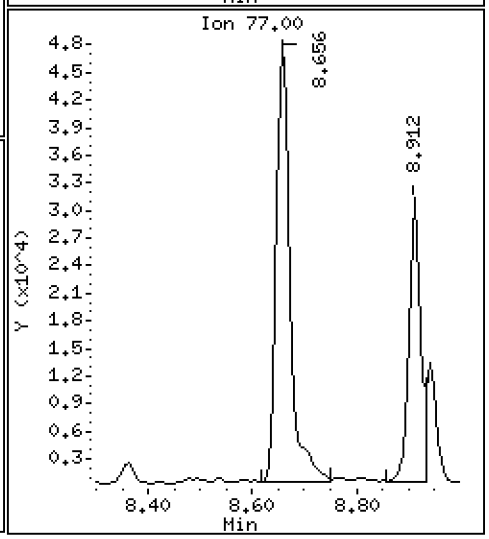












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

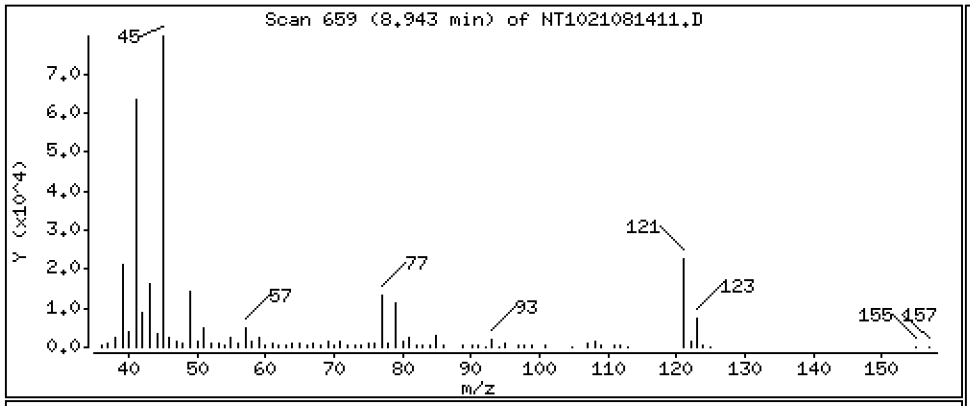
Operator: VTS

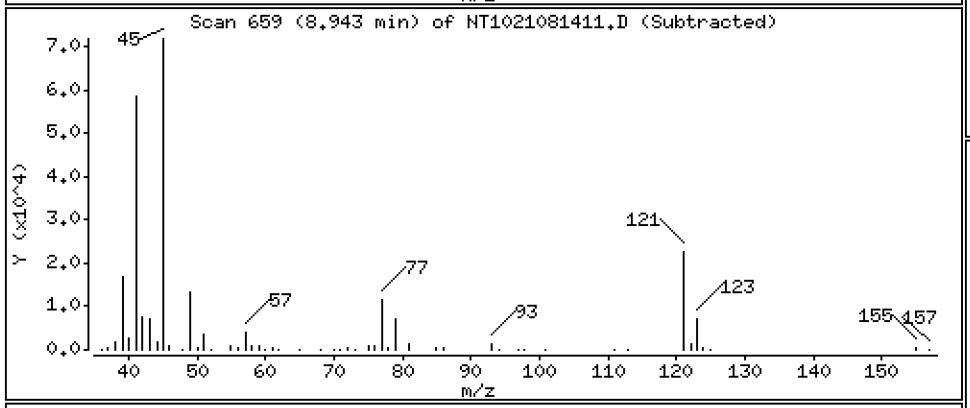
Column phase: ZB-5msi

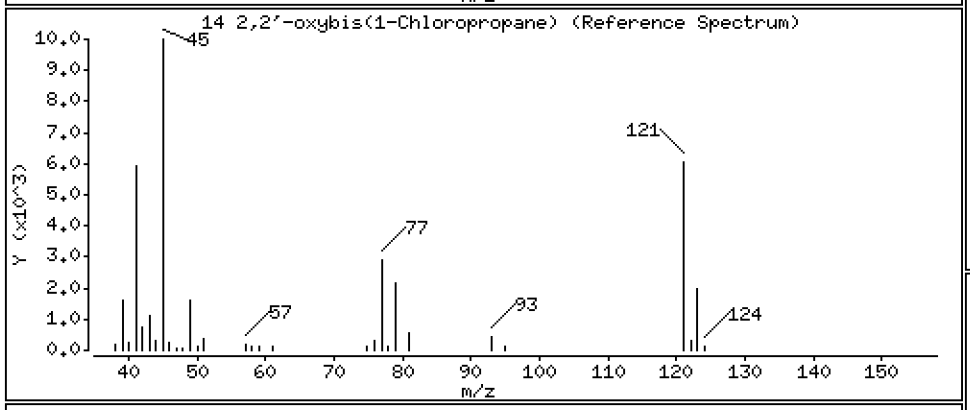
Column diameter: 0.25

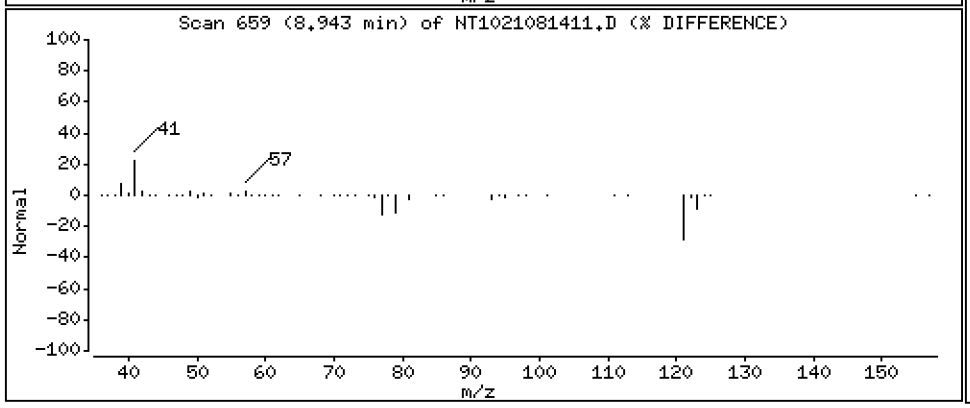
14 2,2'-oxybis(1-Chloropropane)

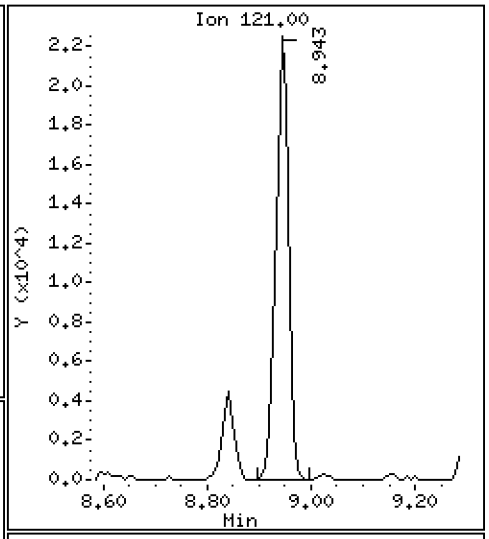
Concentration: 3.113 ug/mL

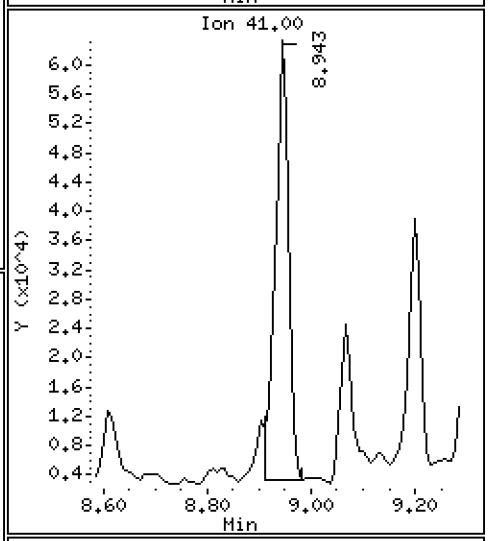


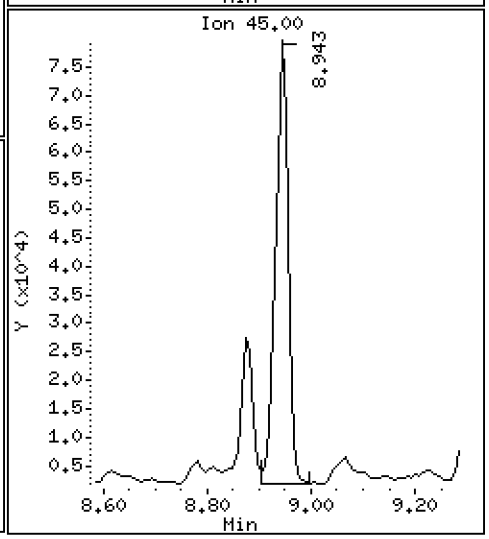












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

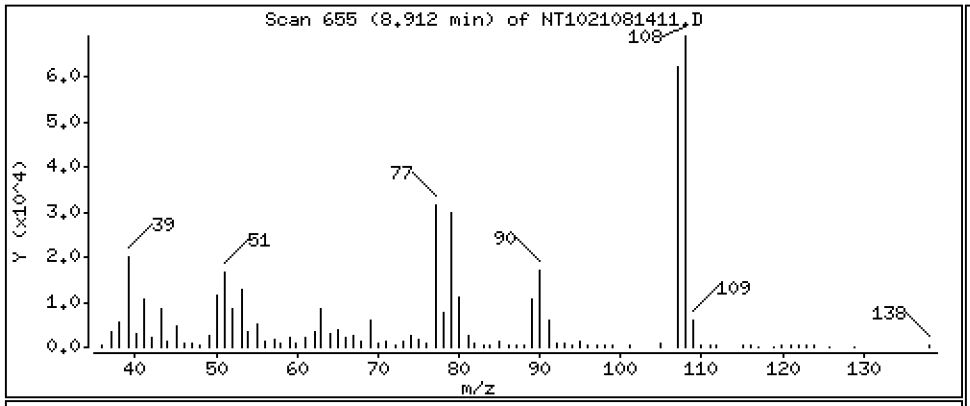
Operator: VTS

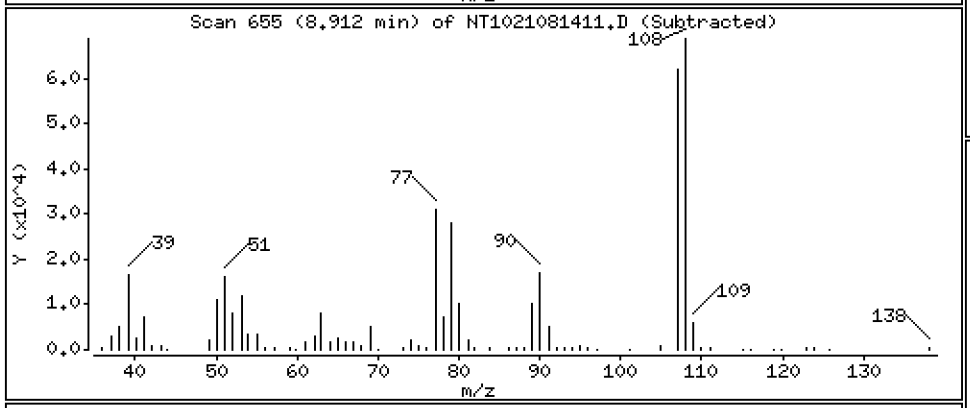
Column phase: ZB-5msi

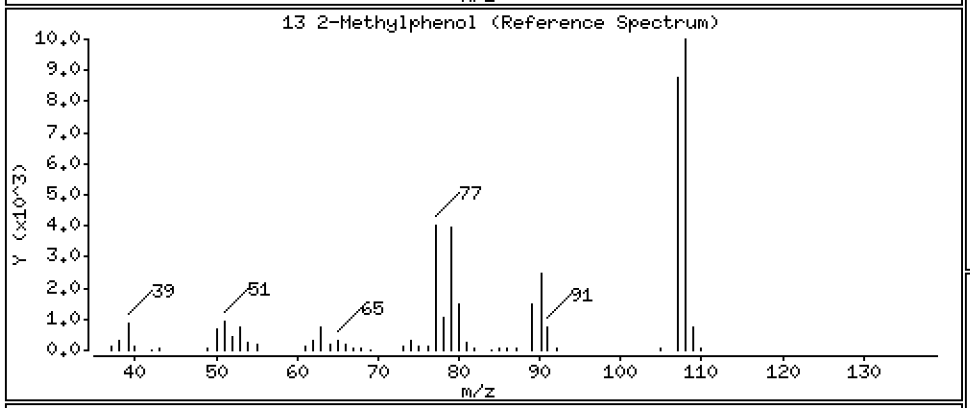
Column diameter: 0.25

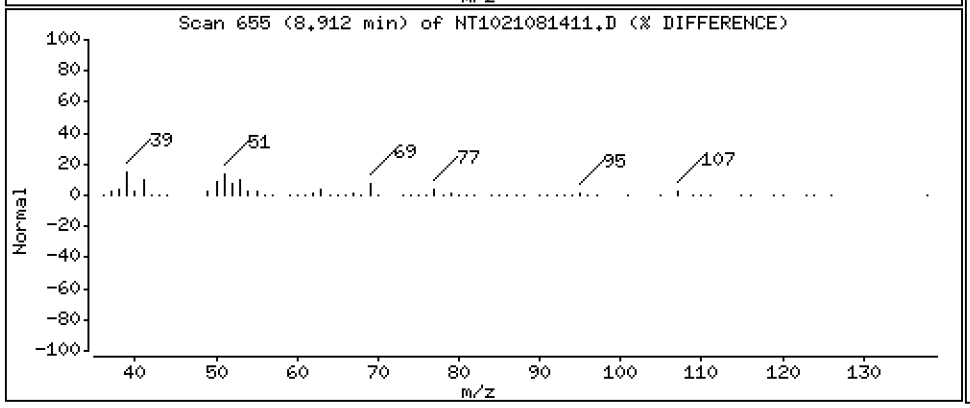
13 2-Methylphenol

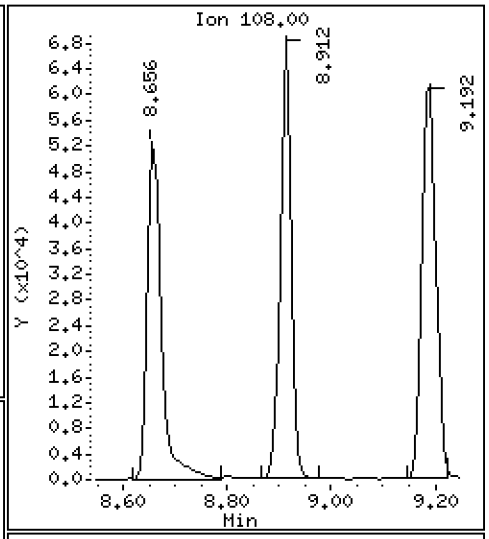
Concentration: 3.810 ug/mL

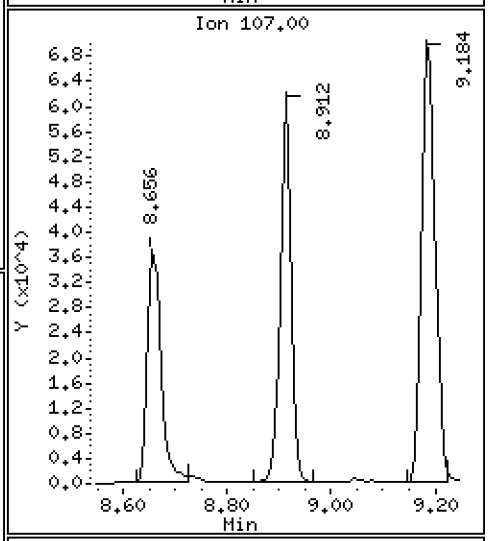


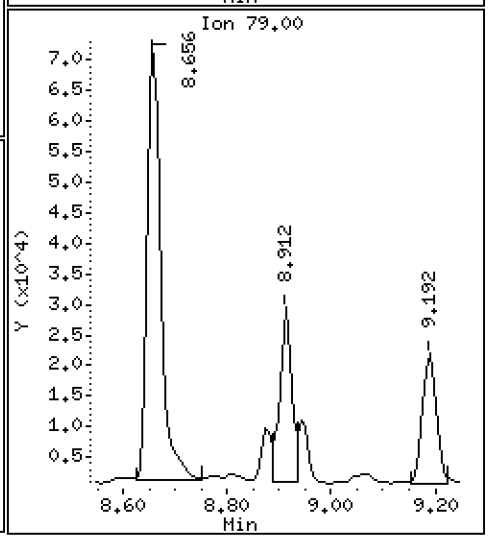












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

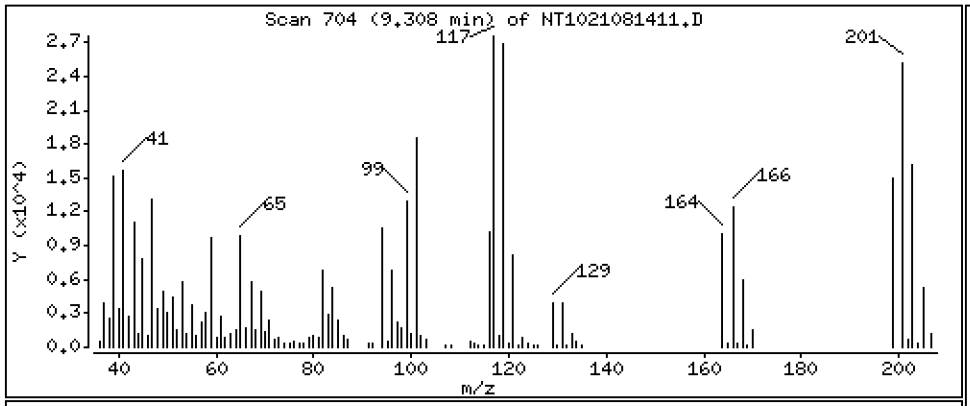
Operator: VTS

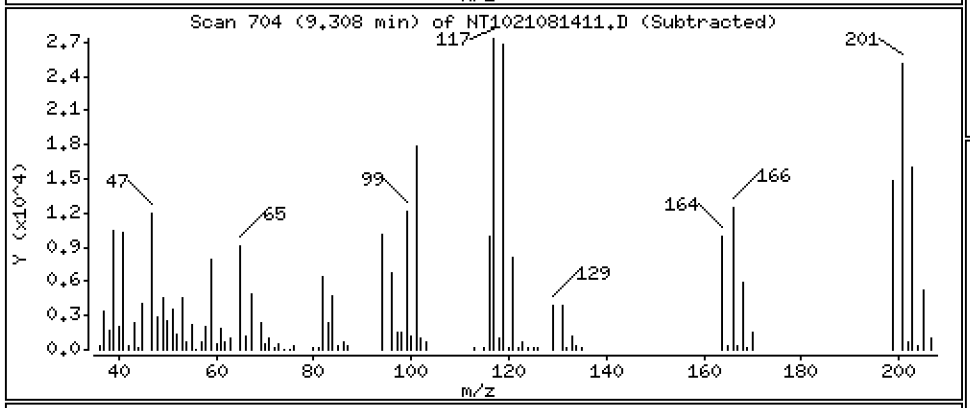
Column phase: ZB-5msi

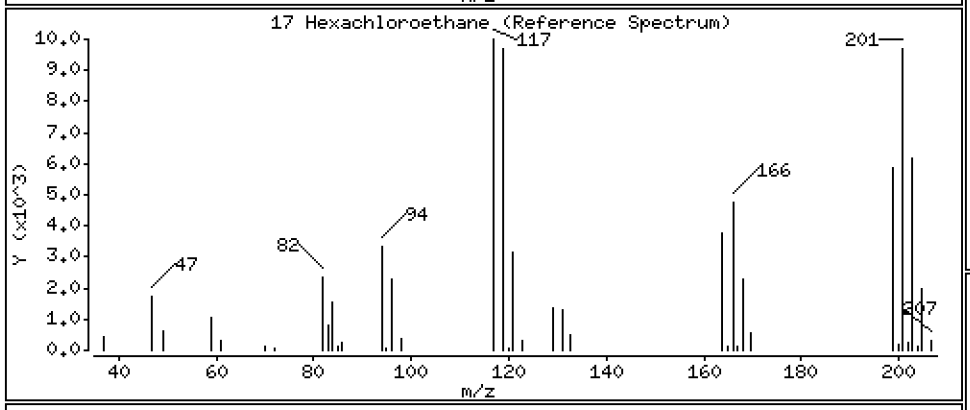
Column diameter: 0.25

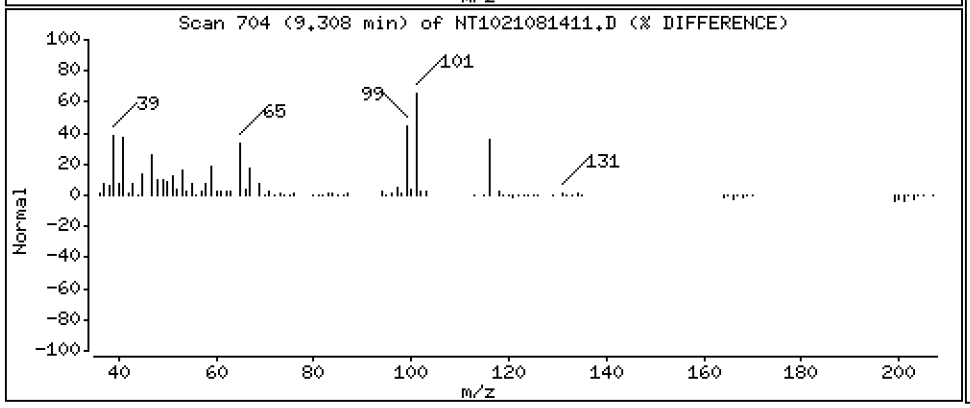
17 Hexachloroethane

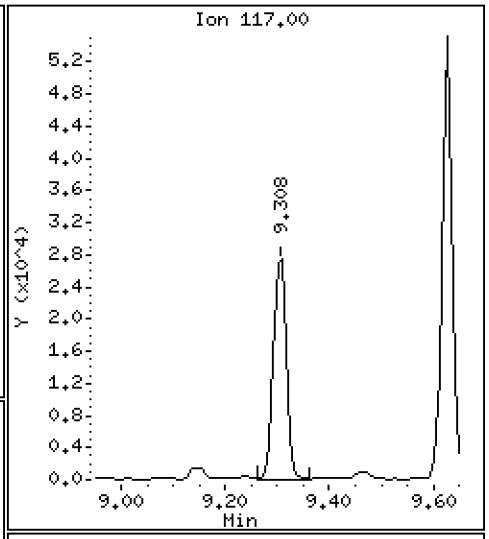
Concentration: 3.602 ug/mL

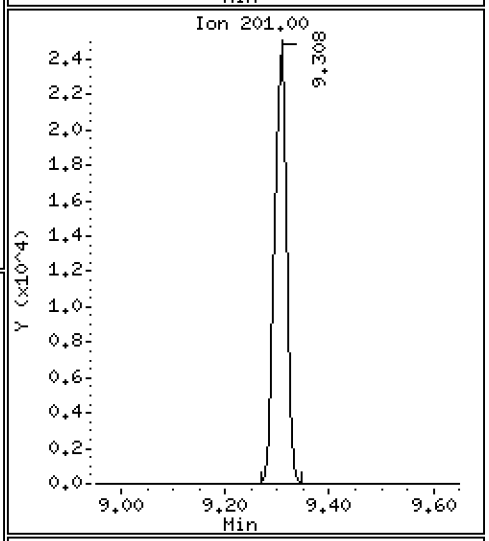


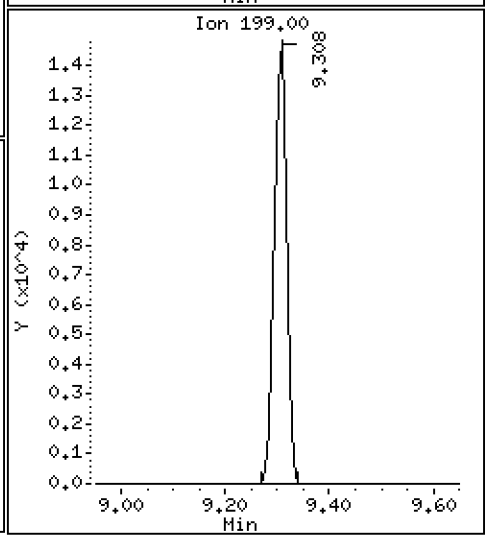












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

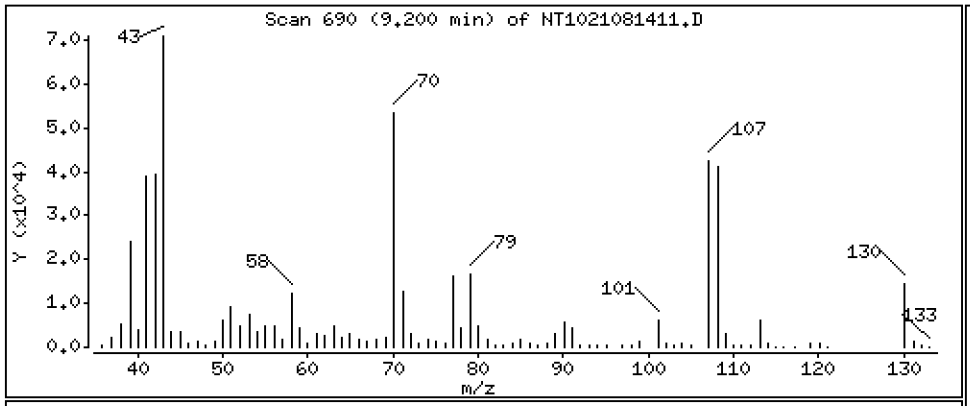
Operator: VTS

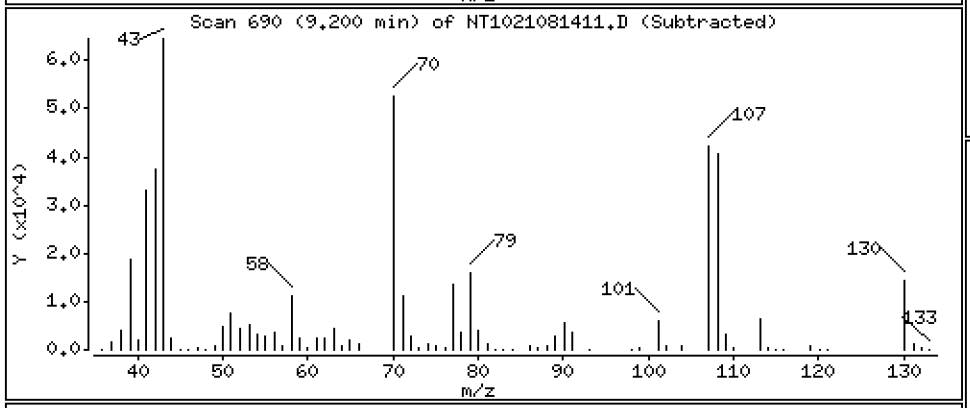
Column phase: ZB-5msi

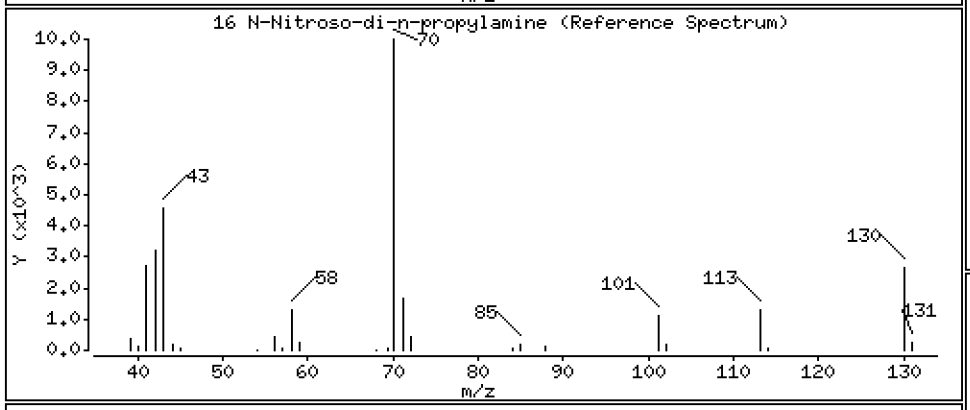
Column diameter: 0.25

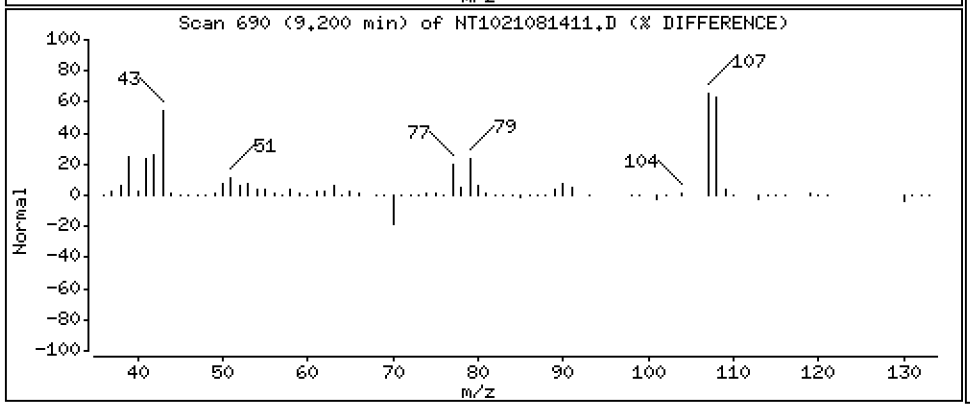
16 N-Nitroso-di-n-propylamine

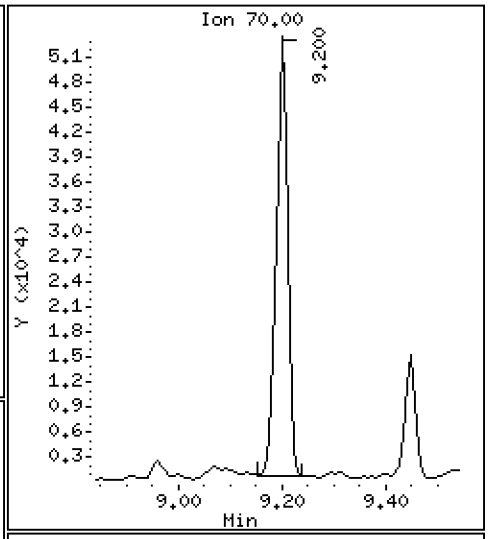
Concentration: 3.537 ug/mL

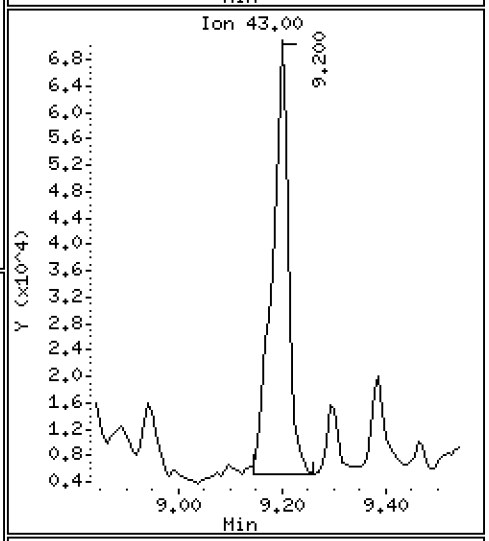


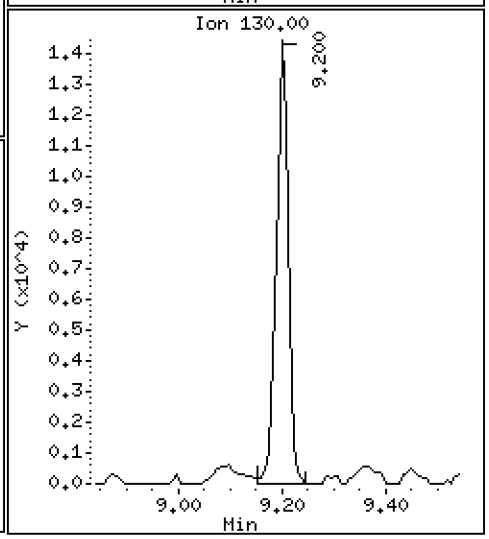












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

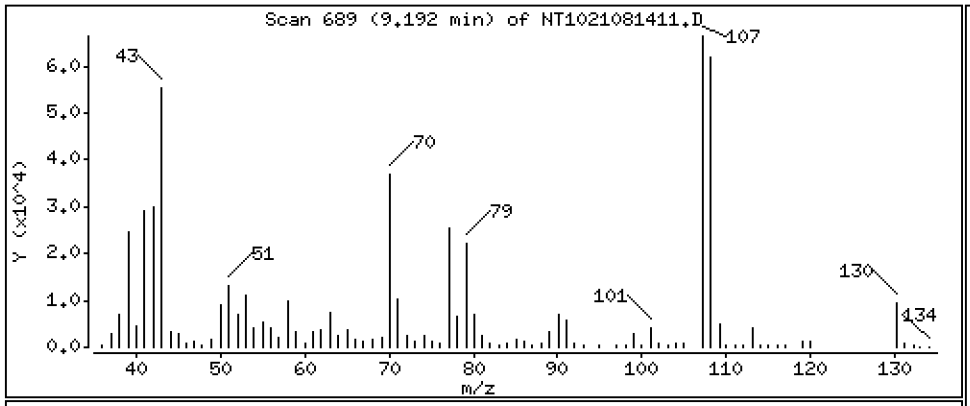
Operator: VTS

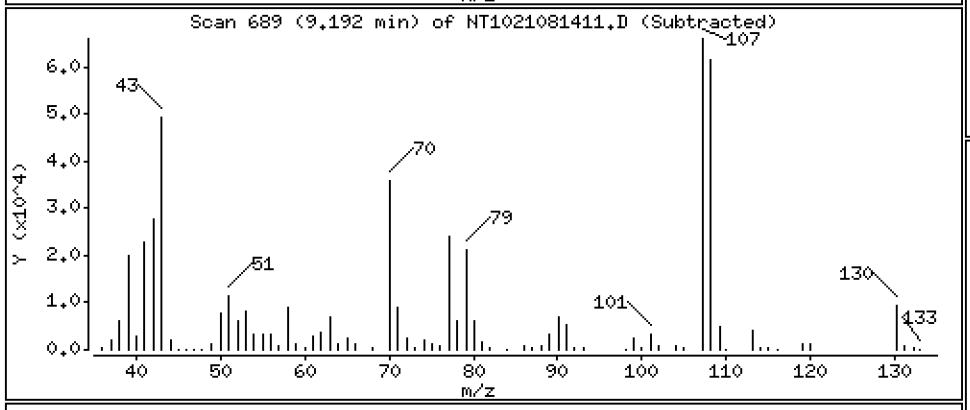
Column phase: ZB-5msi

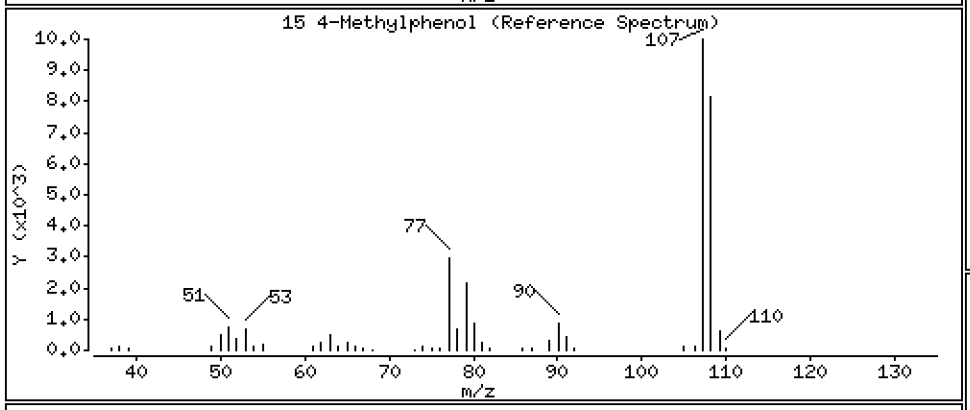
Column diameter: 0.25

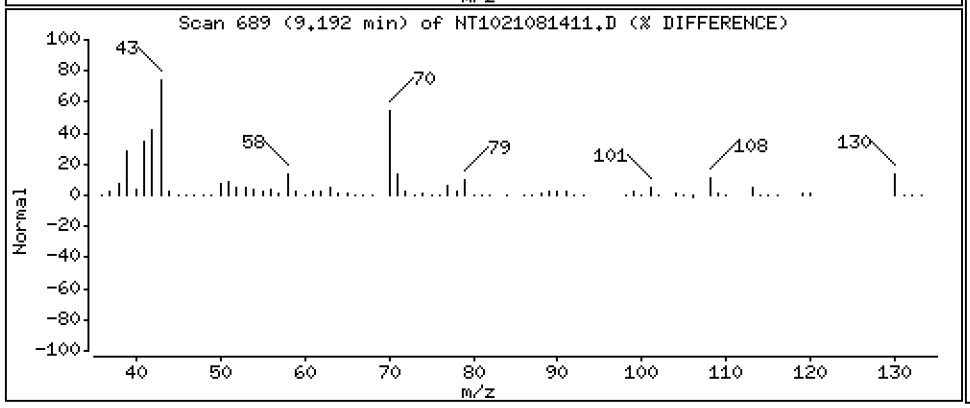
15 4-Methylphenol

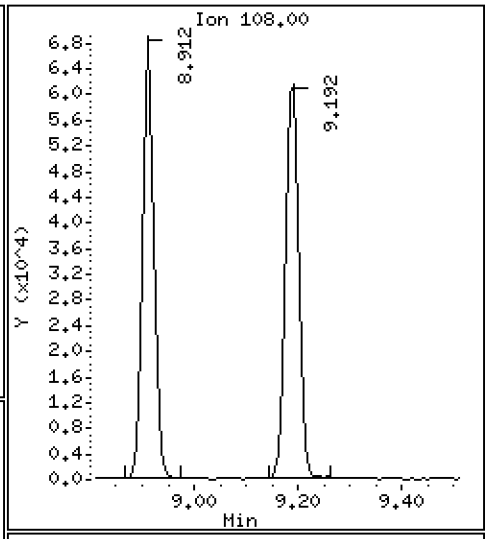
Concentration: 4.122 ug/mL

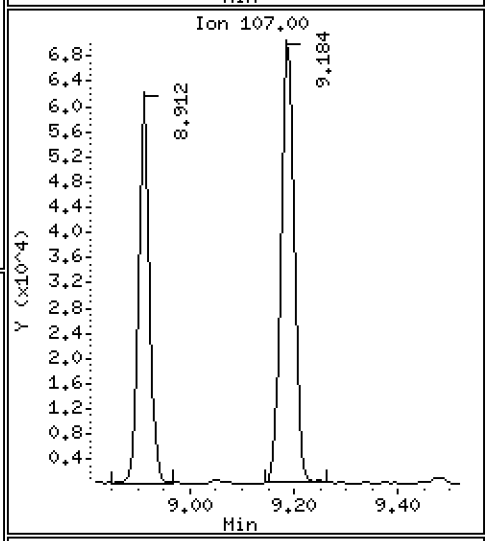


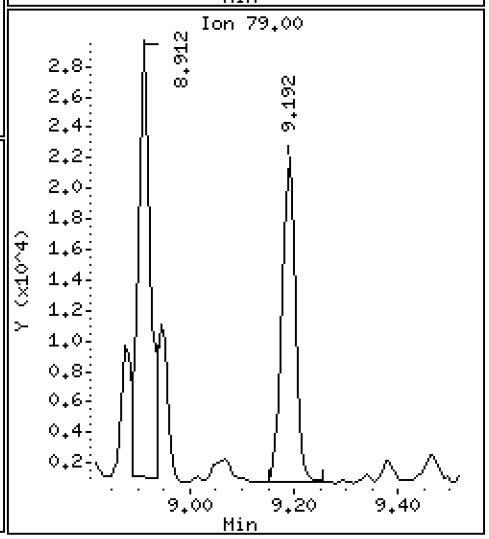












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

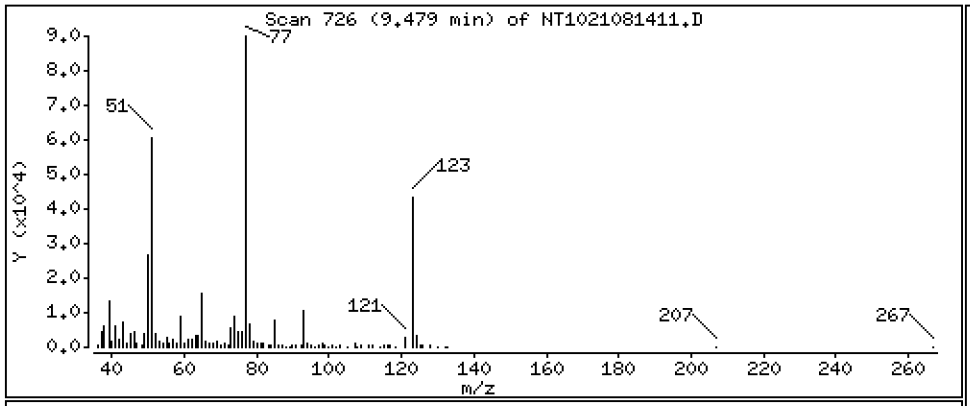
Operator: VTS

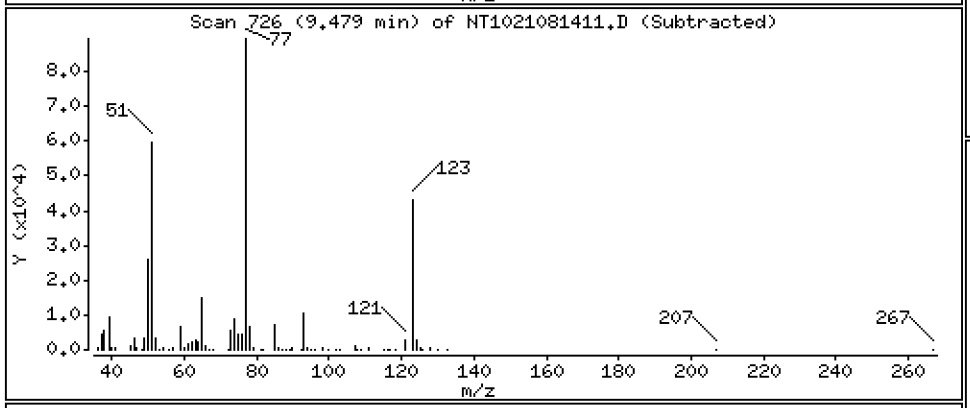
Column phase: ZB-5msi

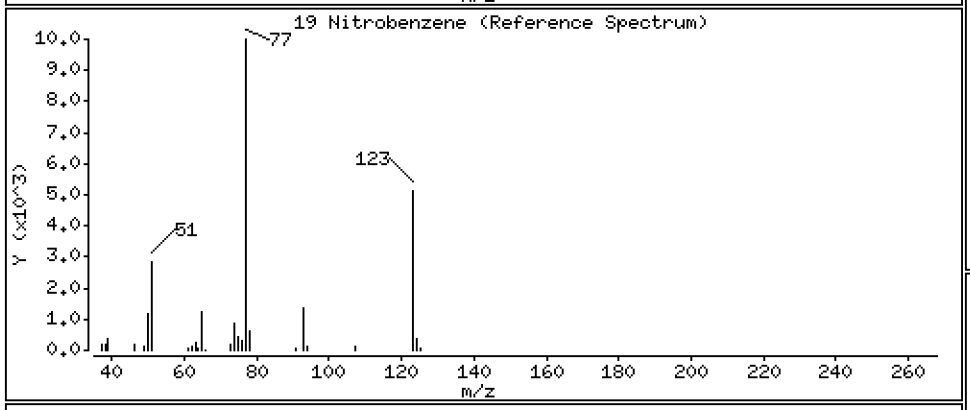
Column diameter: 0.25

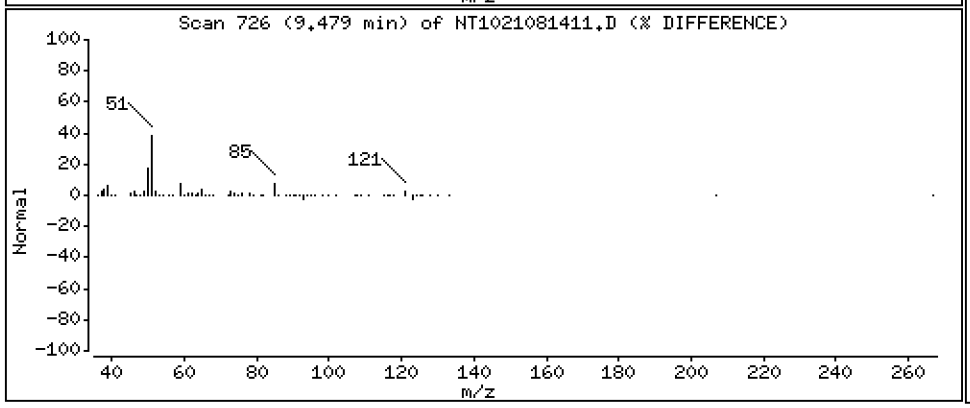
19 Nitrobenzene

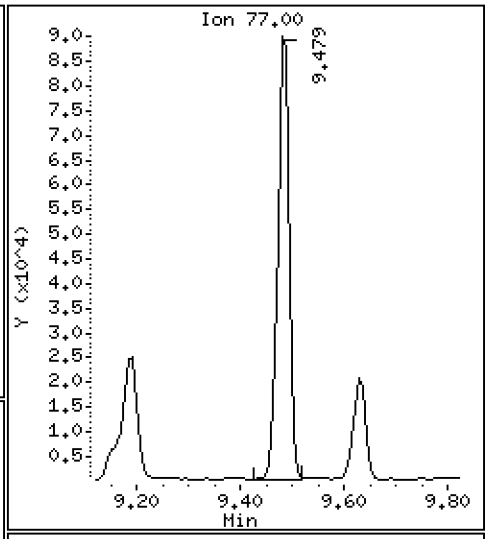
Concentration: 3.768 ug/mL

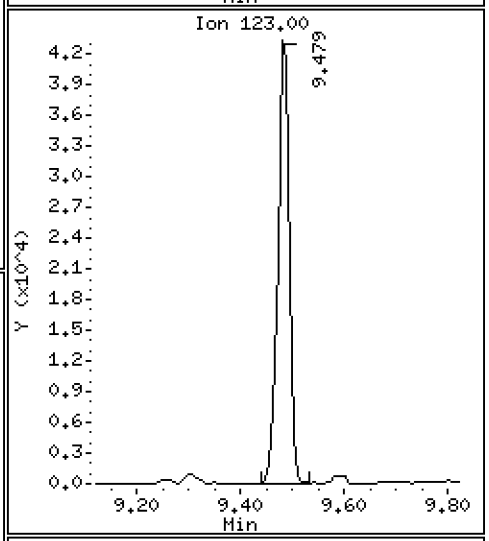


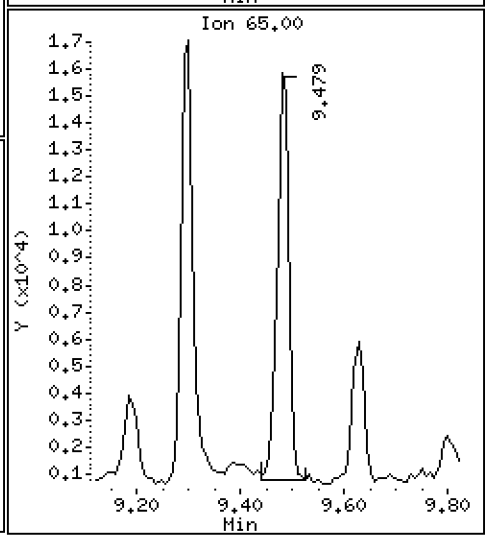












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

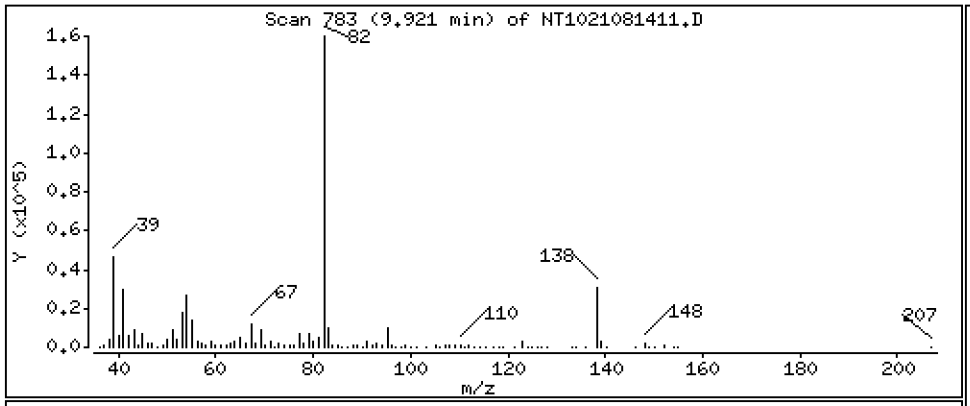
Operator: VTS

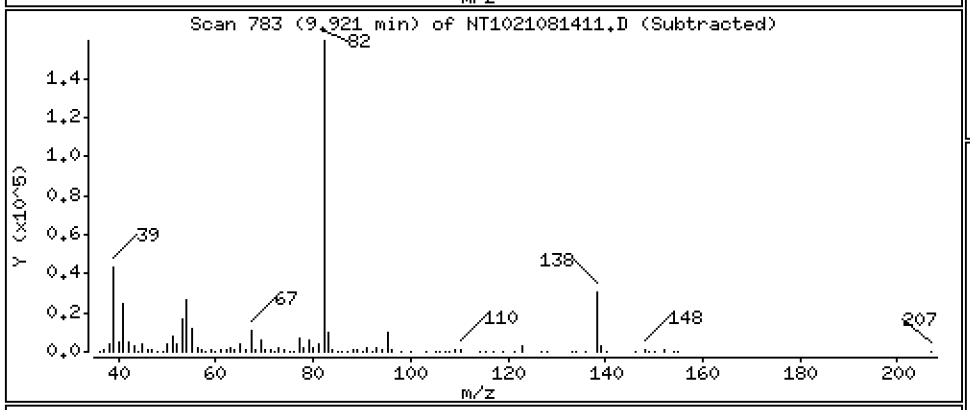
Column phase: ZB-5msi

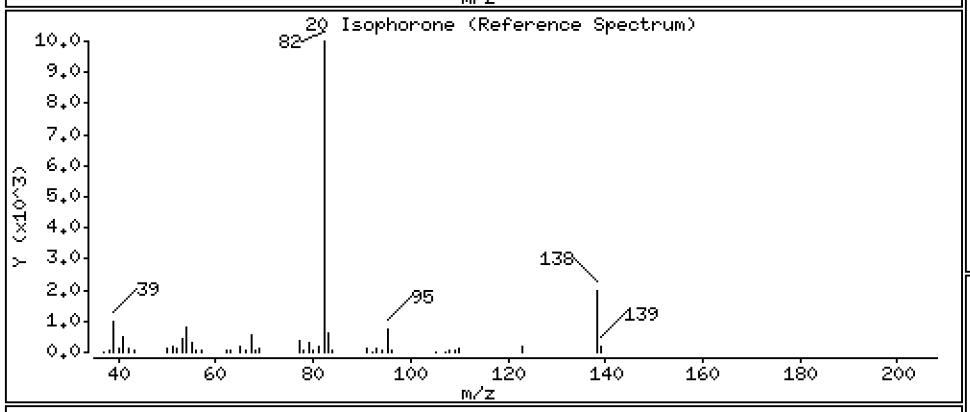
Column diameter: 0.25

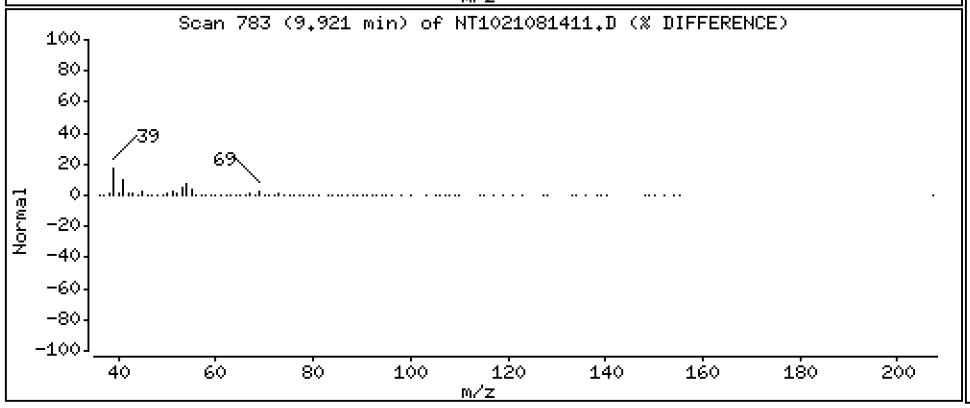
20 Isophorone

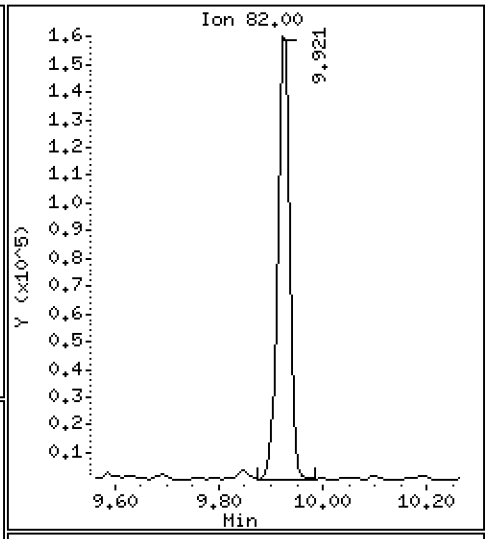
Concentration: 3.811 ug/mL

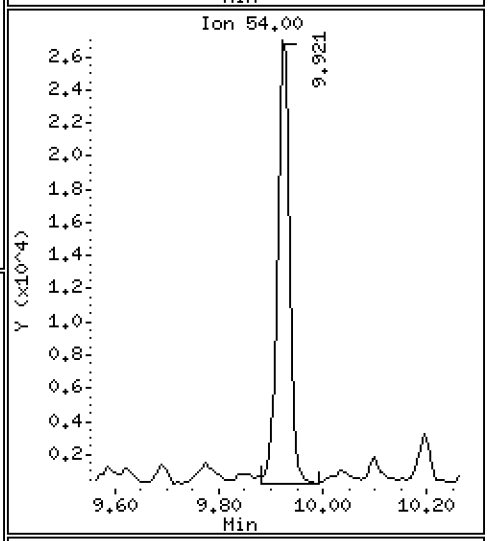


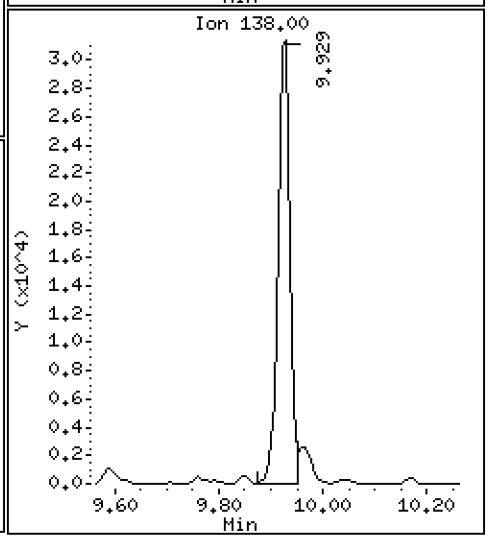












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

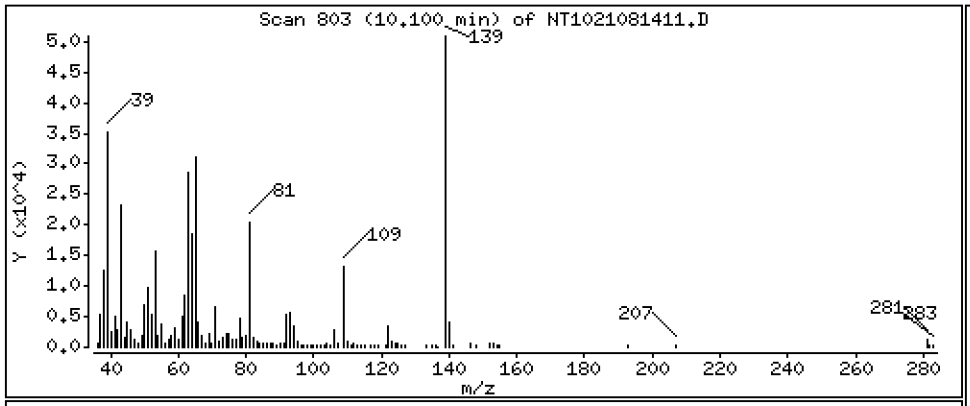
Operator: VTS

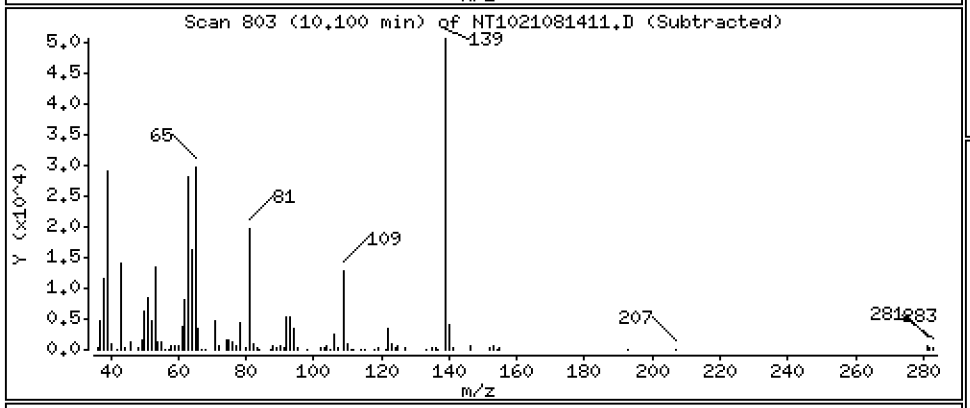
Column phase: ZB-5msi

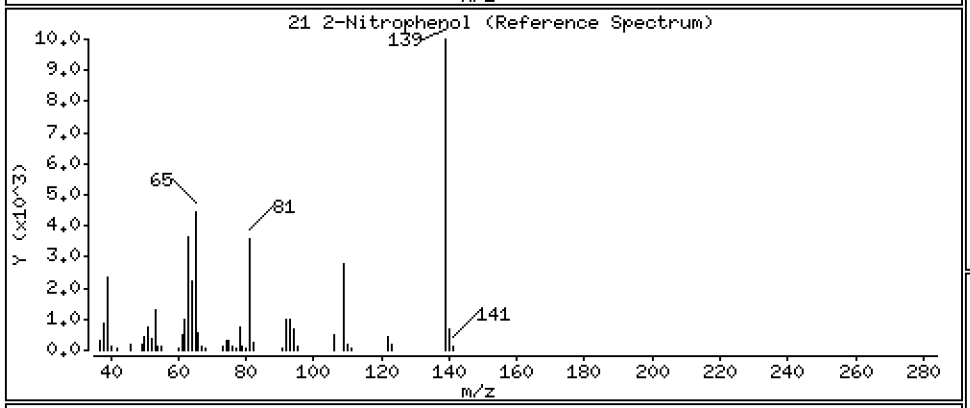
Column diameter: 0.25

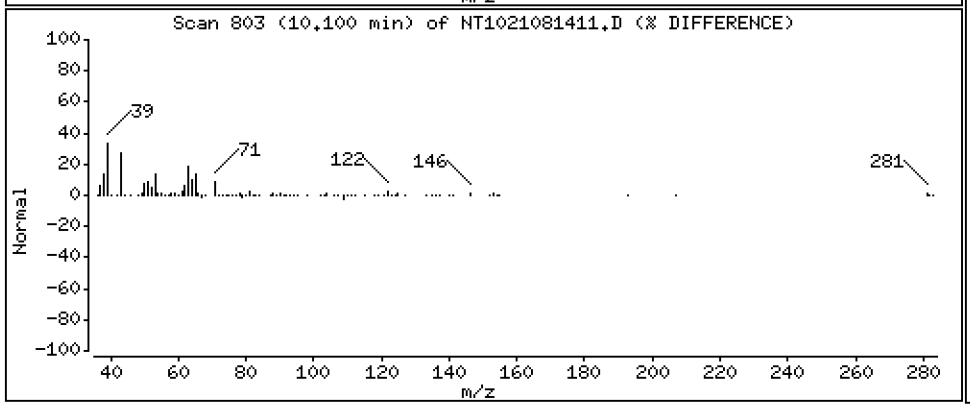
21 2-Nitrophenol

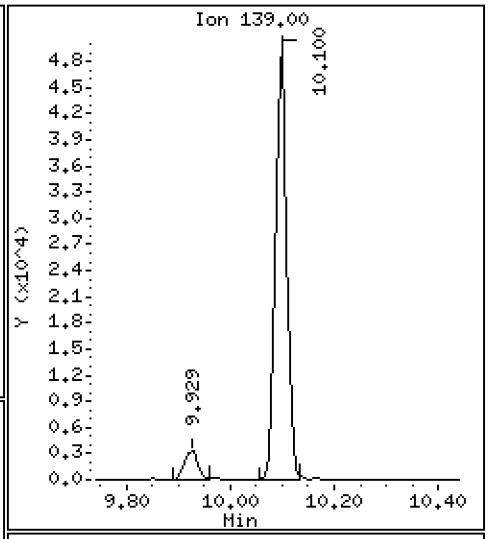
Concentration: 3.882 ug/mL

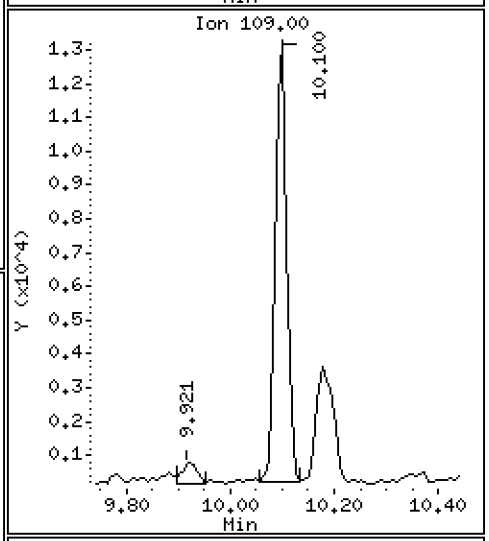


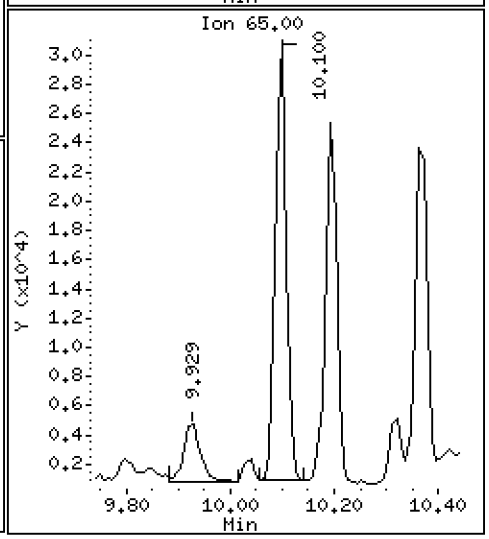












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081411.D

Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

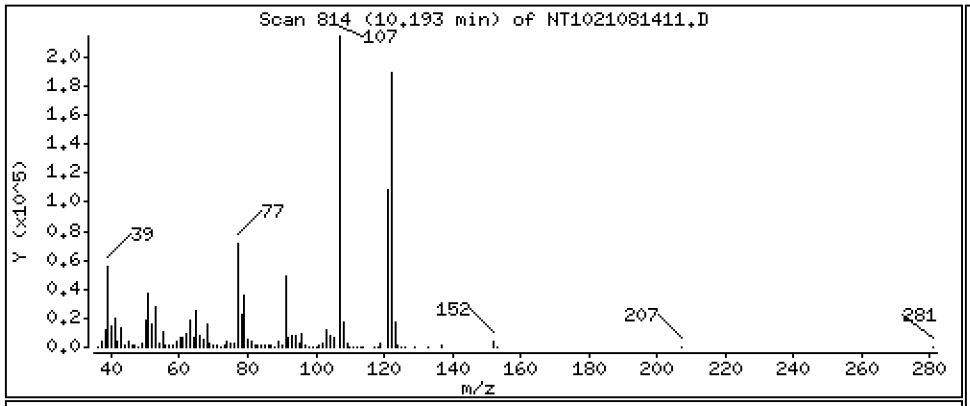
Operator: VTS

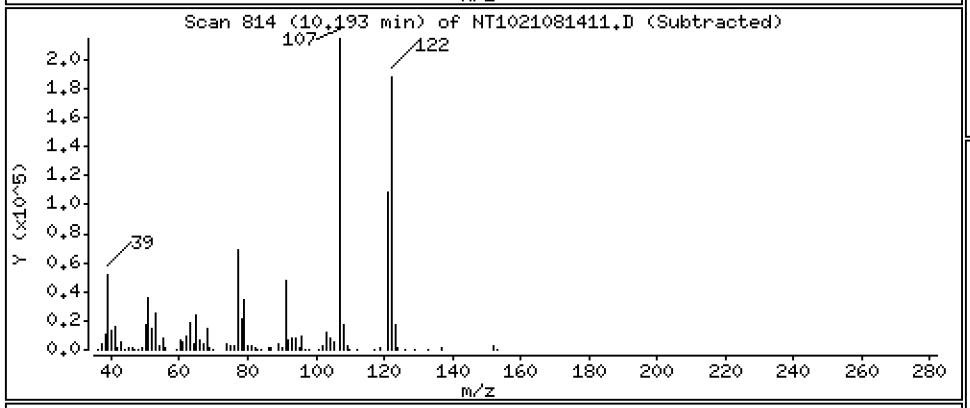
Column phase: ZB-5msi

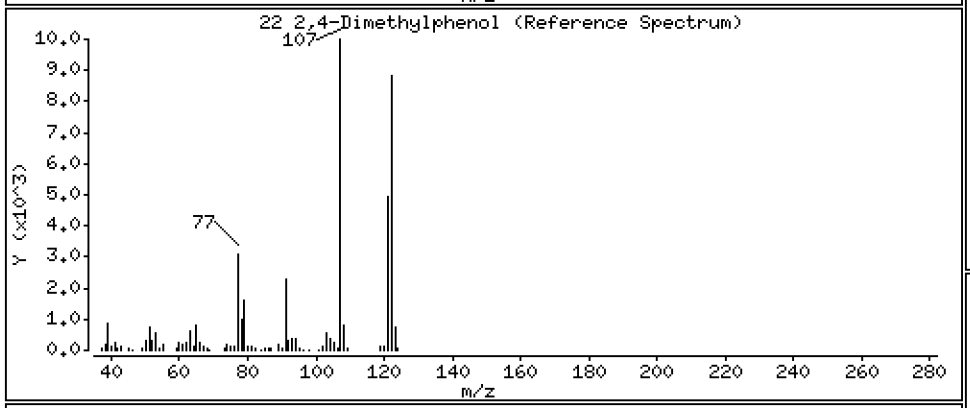
Column diameter: 0.25

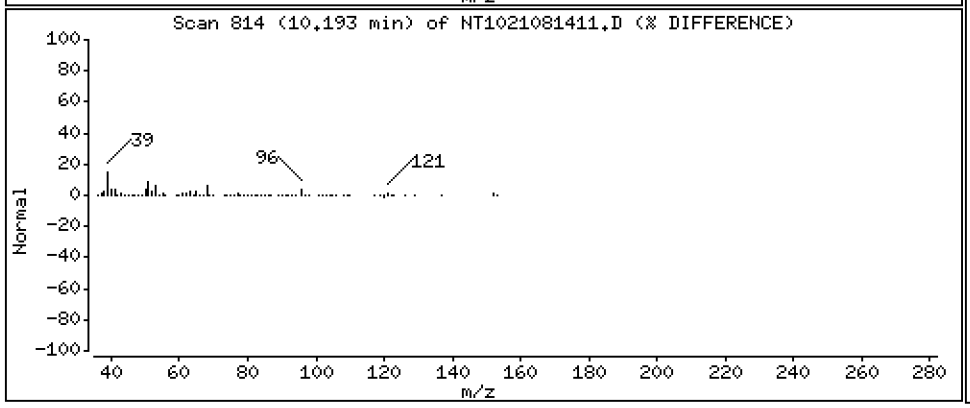
22 2,4-Dimethylphenol

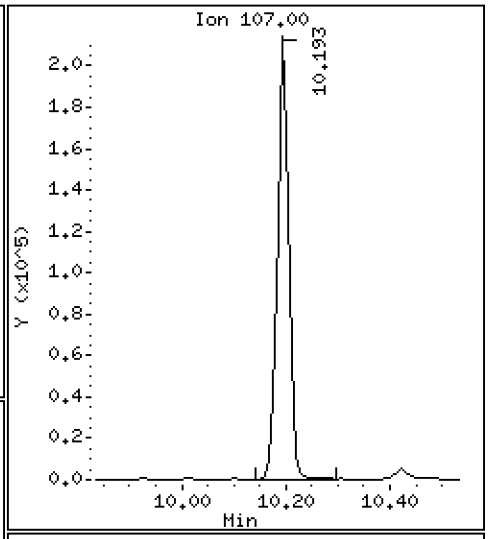
Concentration: 11.24 ug/mL

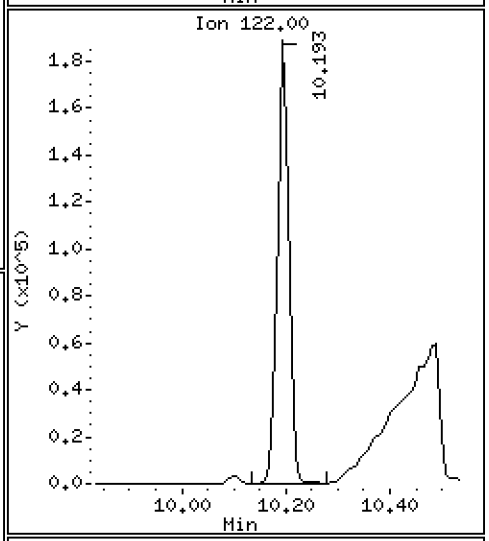


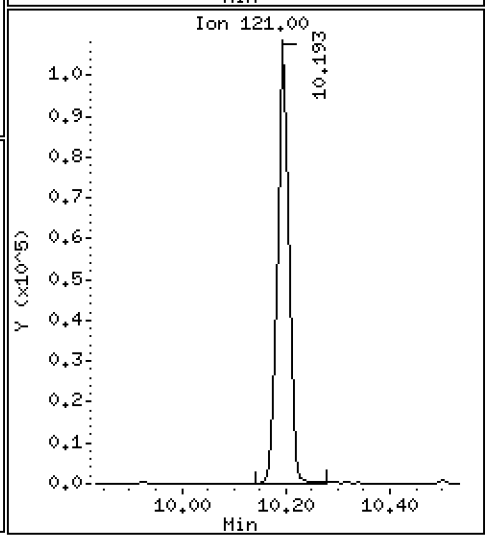












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

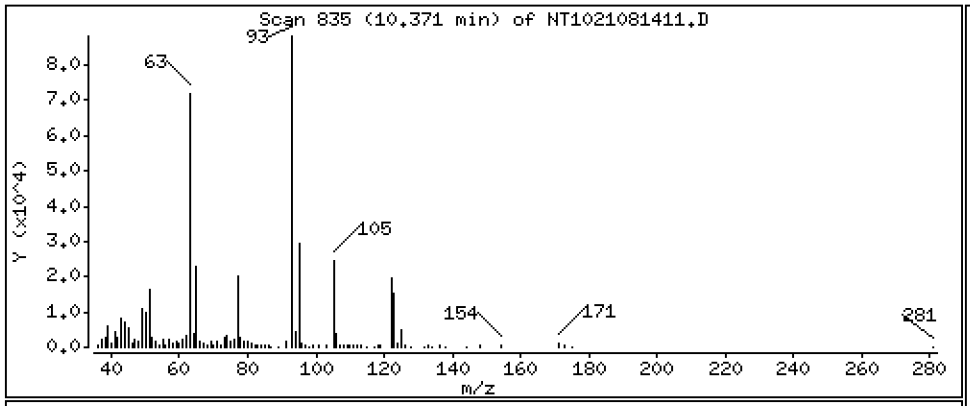
Operator: VTS

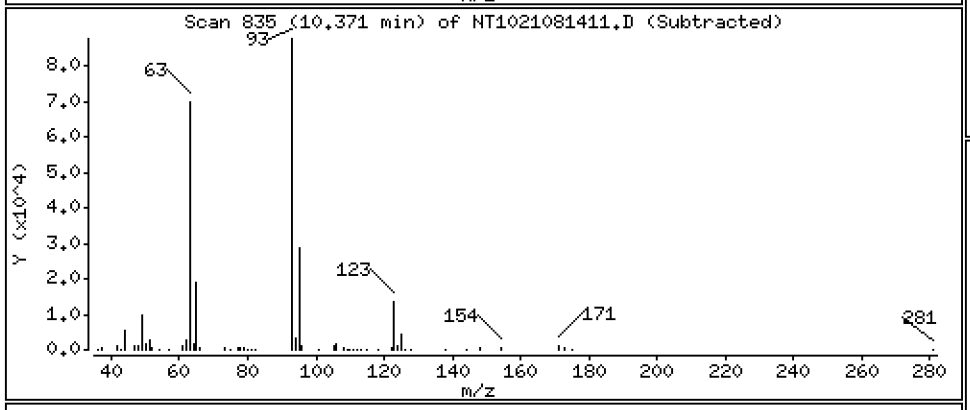
Column phase: ZB-5msi

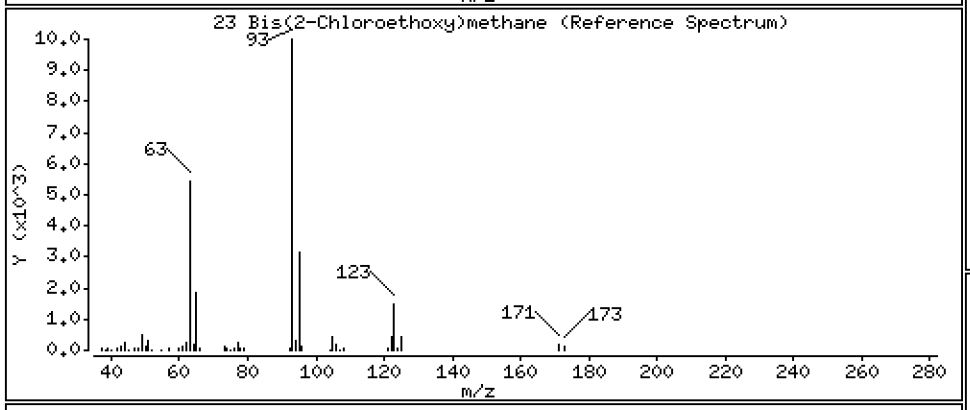
Column diameter: 0.25

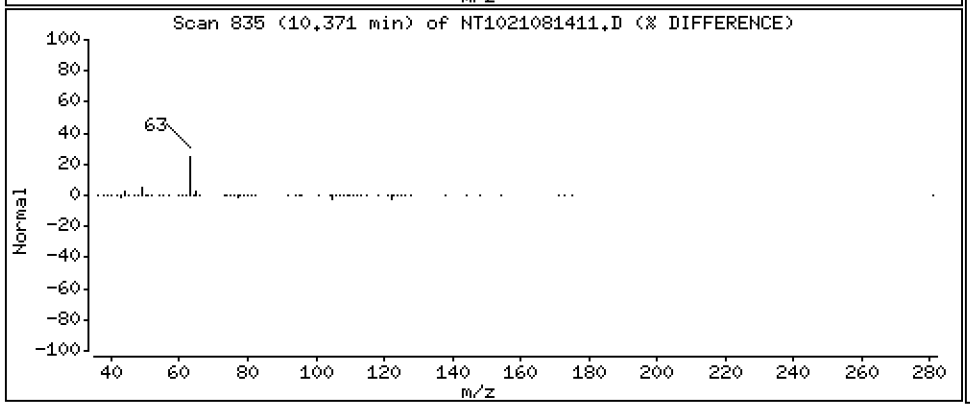
23 Bis(2-Chloroethoxy)methane

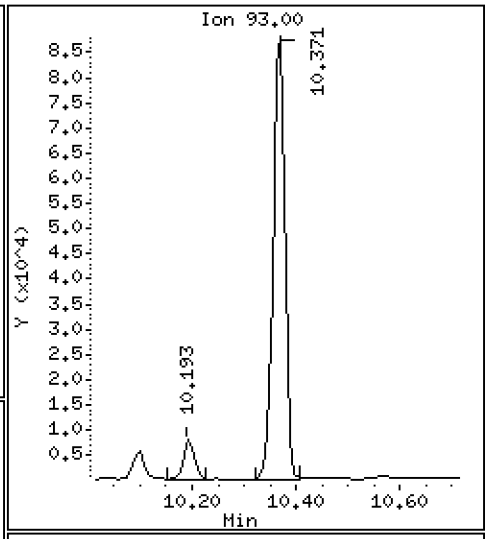
Concentration: 3.836 ug/mL

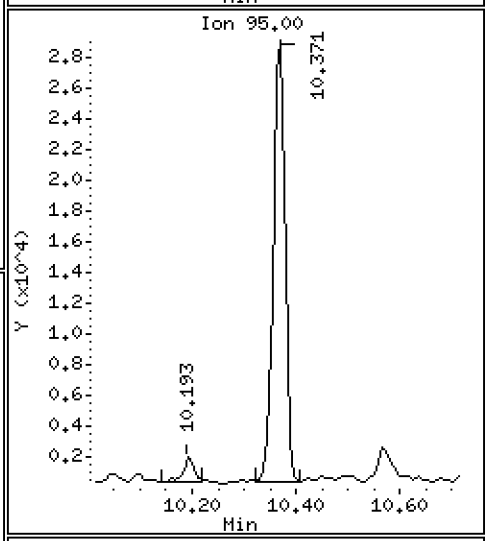


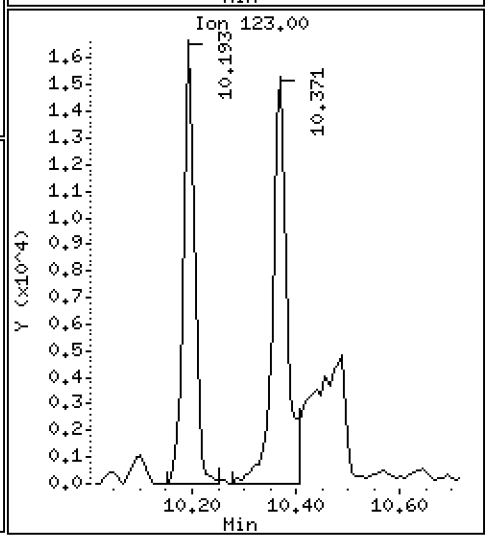












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

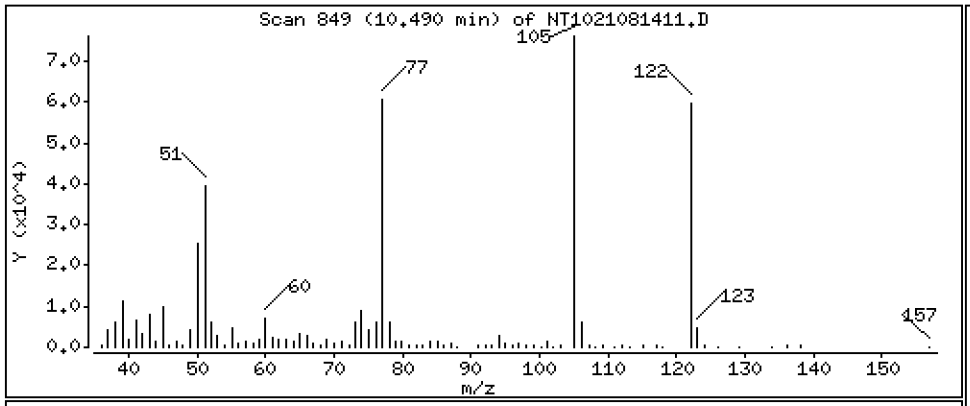
Operator: VTS

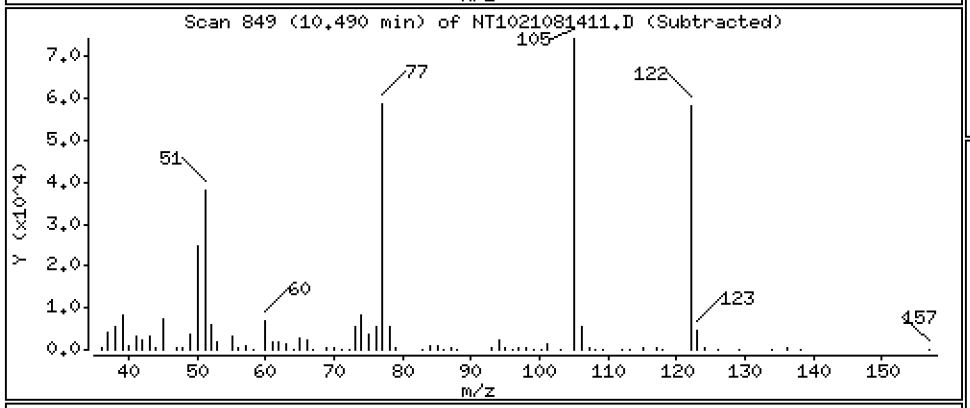
Column phase: ZB-5msi

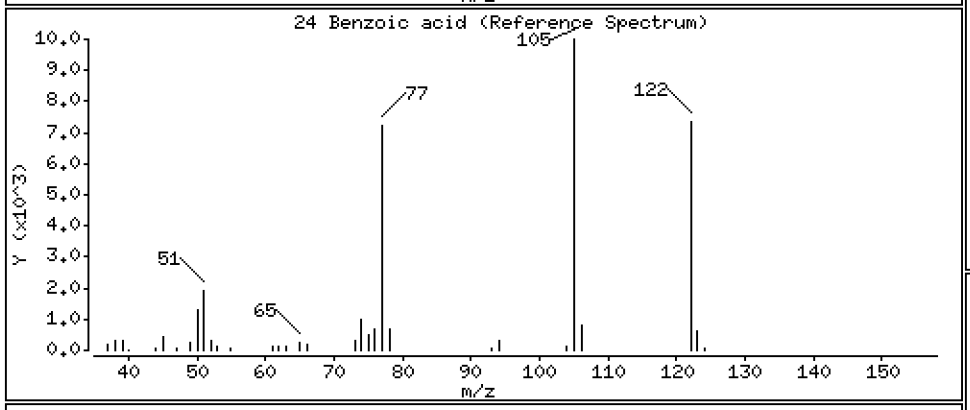
Column diameter: 0.25

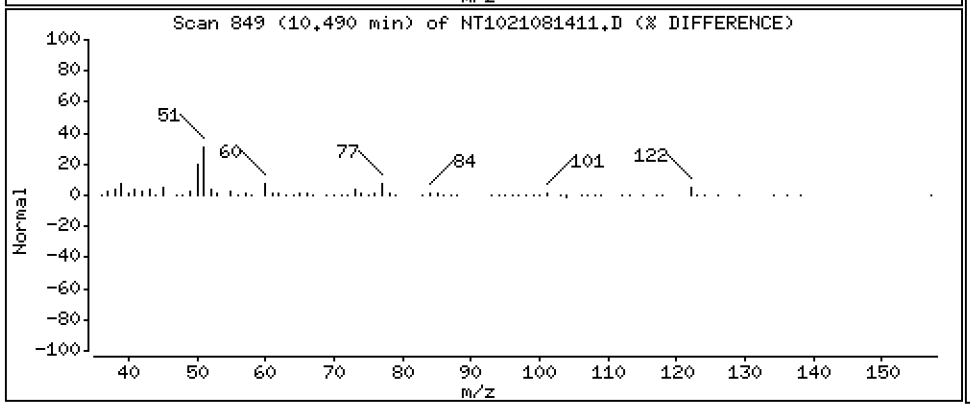
24 Benzoic acid

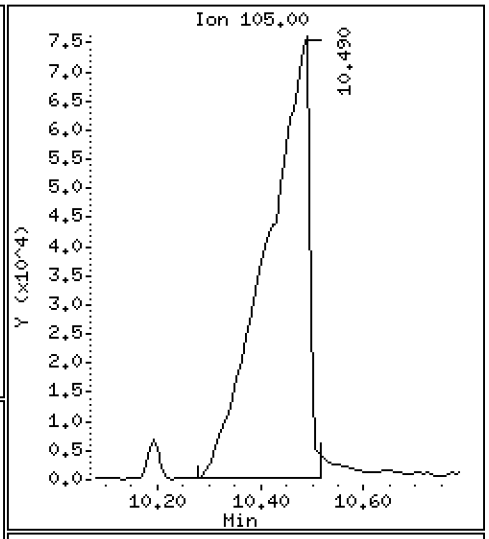
Concentration: 26.17 ug/mL

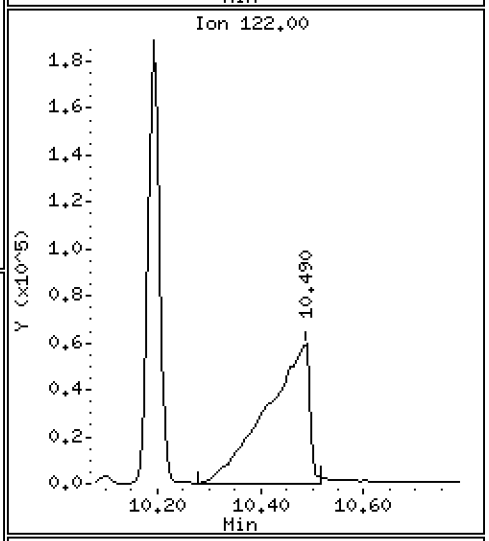


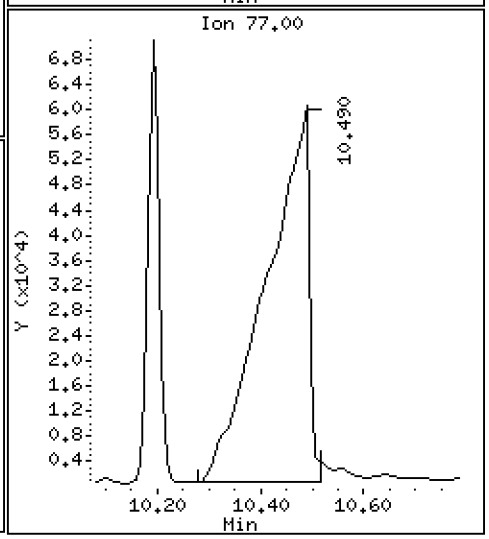












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

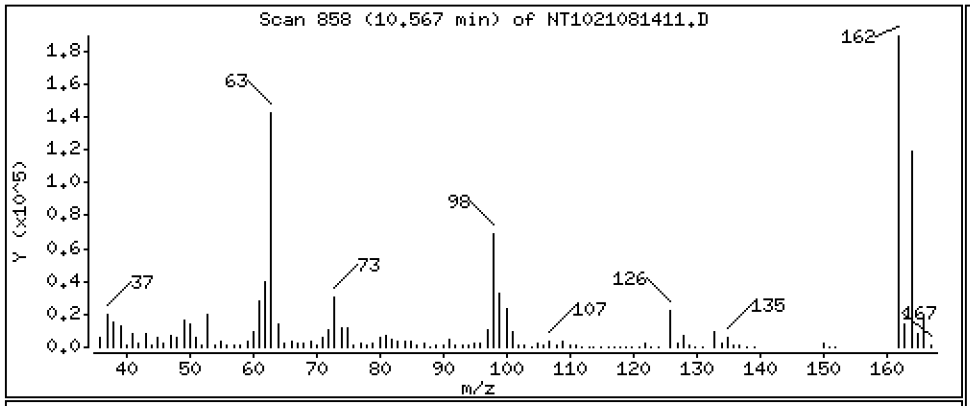
Operator: VTS

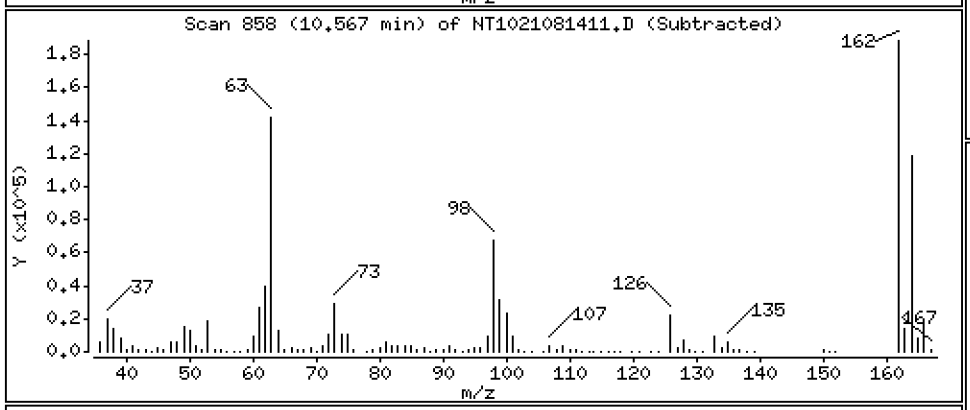
Column phase: ZB-5msi

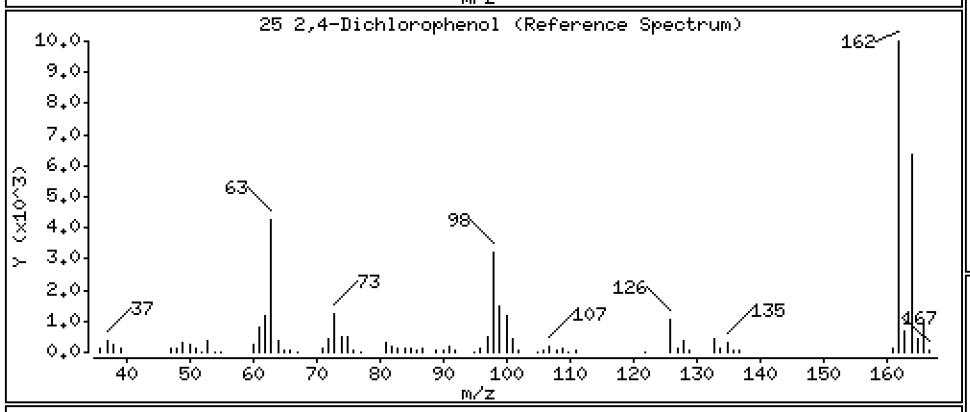
Column diameter: 0.25

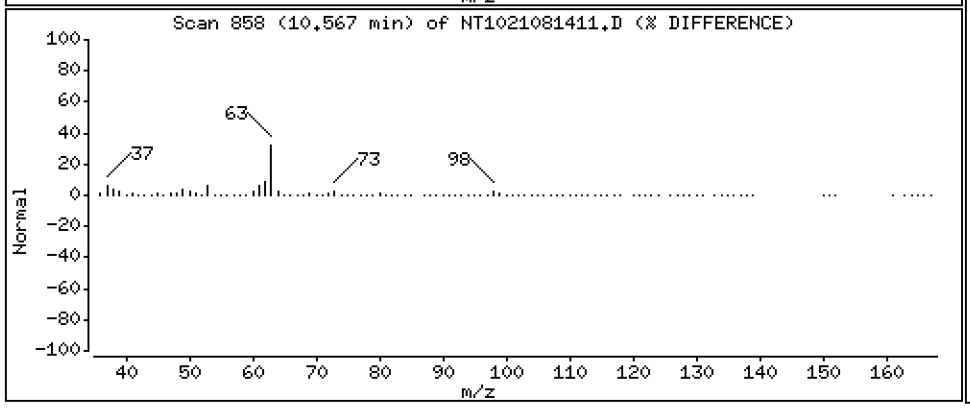
25 2,4-Dichlorophenol

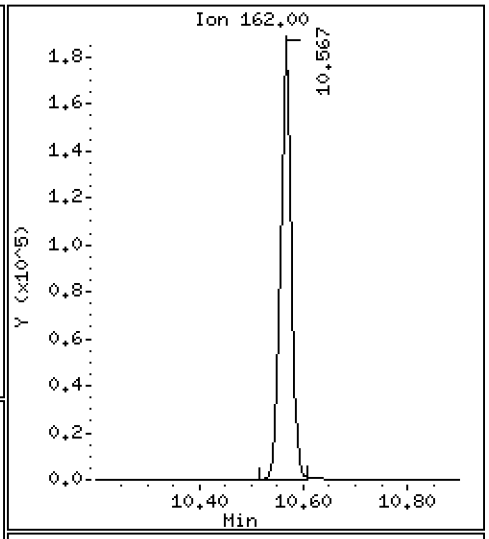
Concentration: 11.72 ug/mL

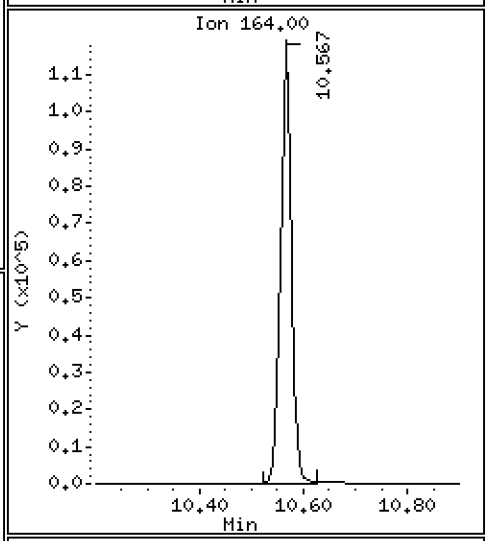


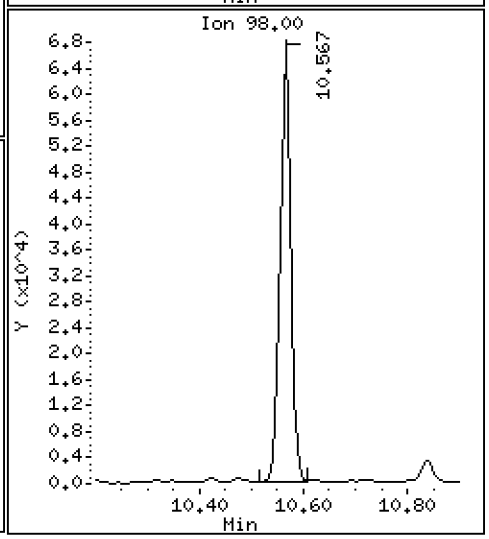












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

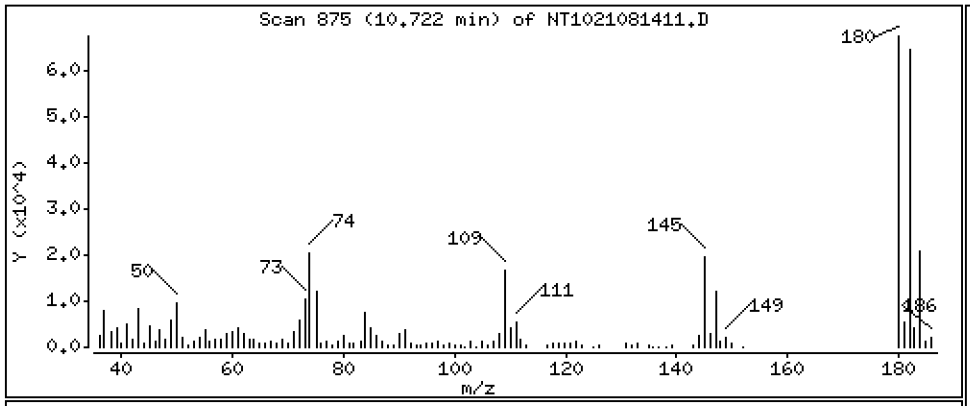
Operator: VTS

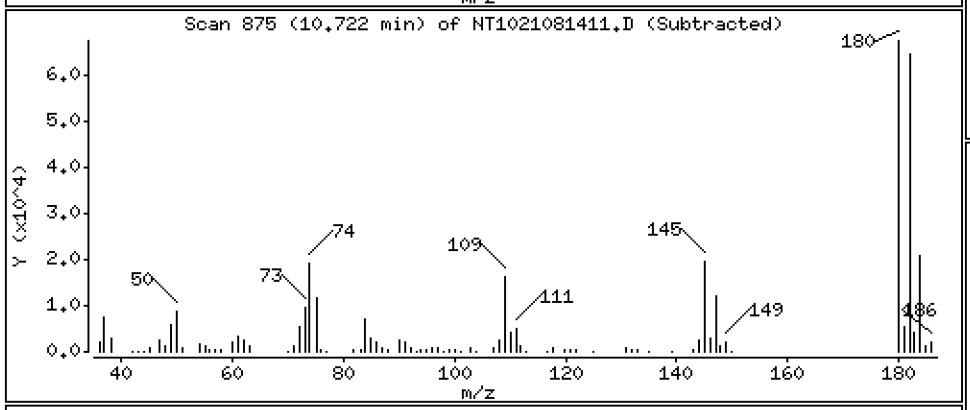
Column phase: ZB-5msi

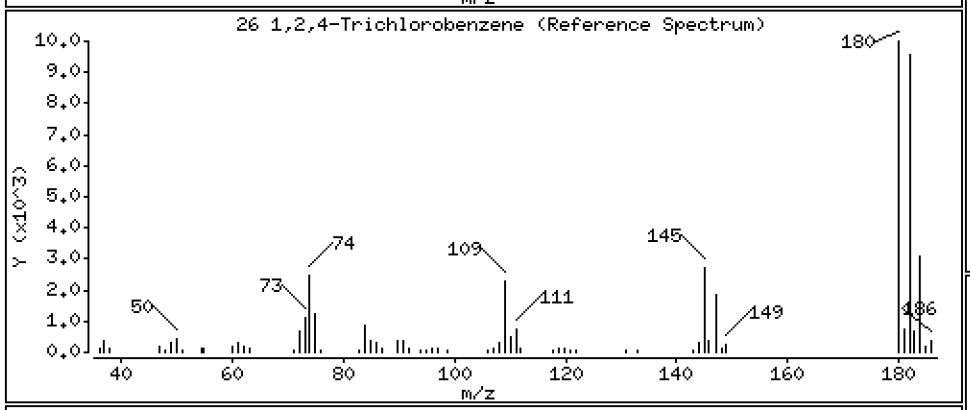
Column diameter: 0.25

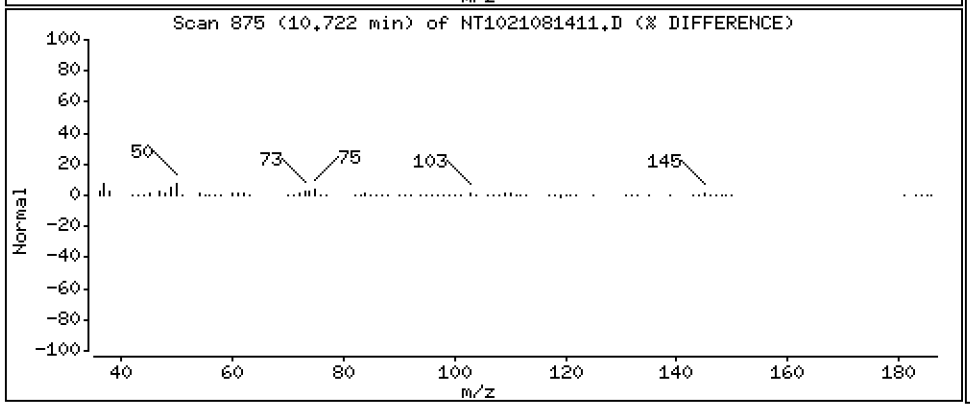
26 1,2,4-Trichlorobenzene

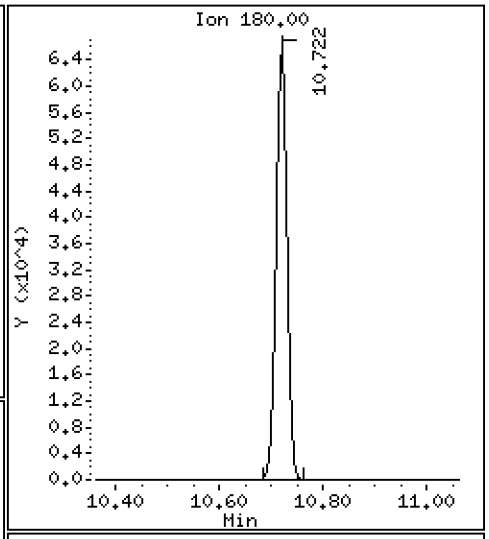
Concentration: 3.781 ug/mL

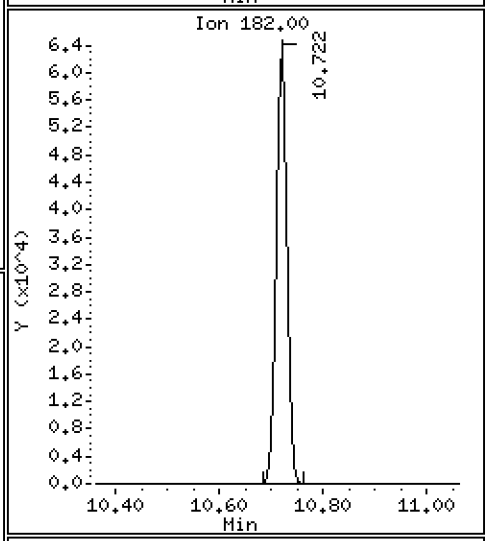


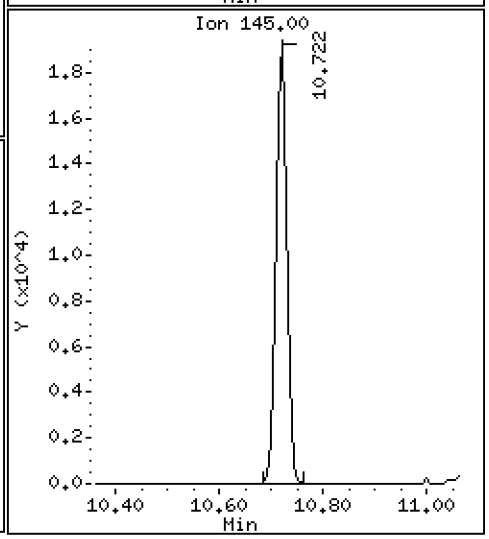












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

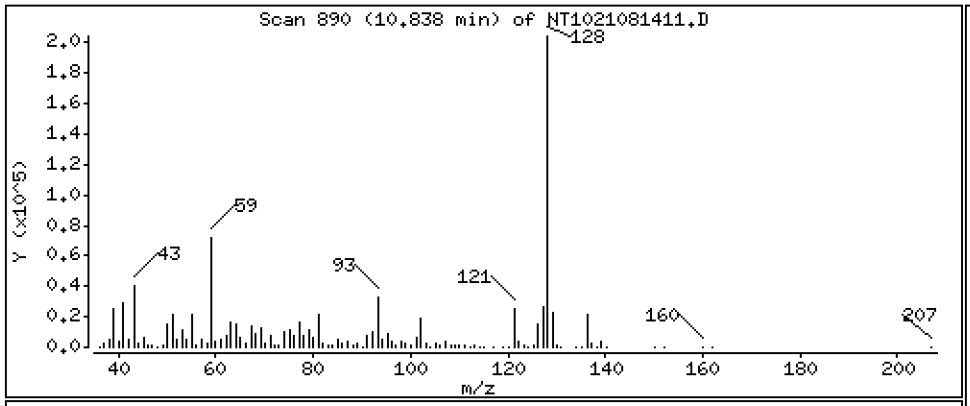
Operator: VTS

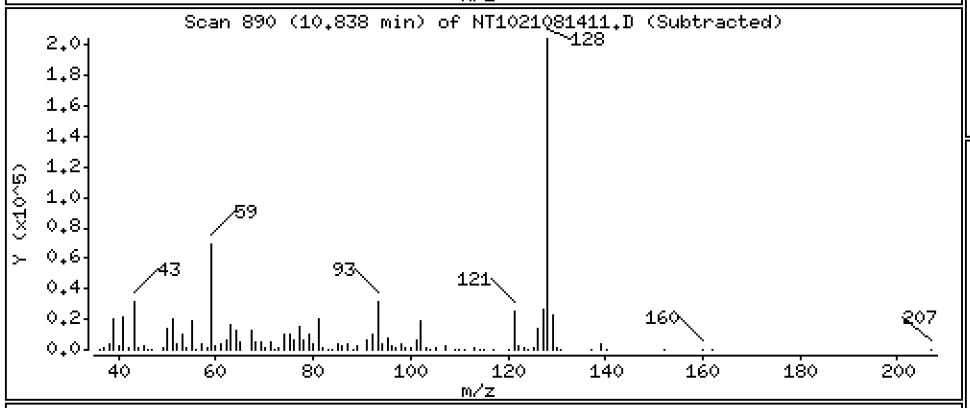
Column phase: ZB-5msi

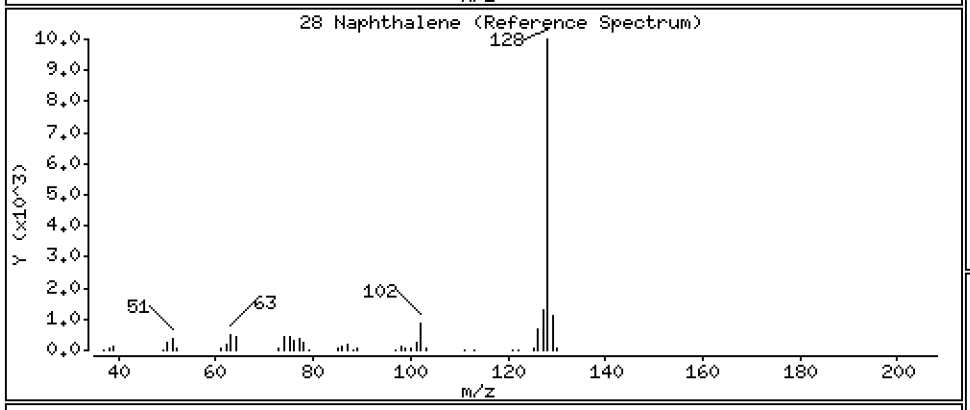
Column diameter: 0.25

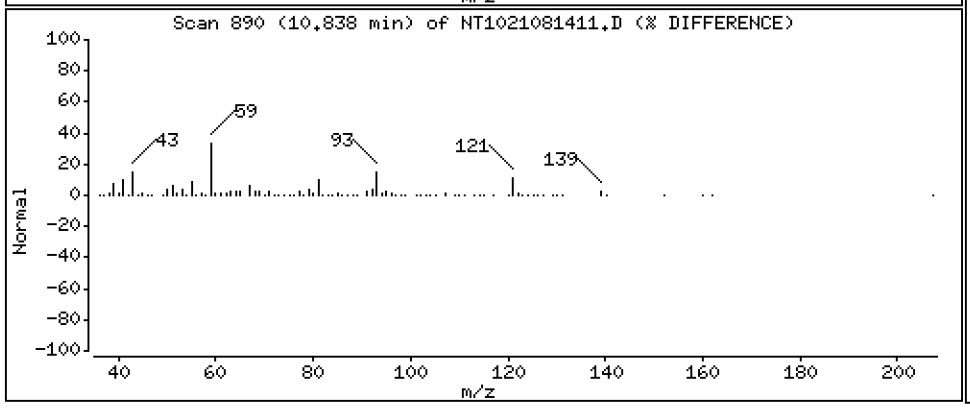
28 Naphthalene

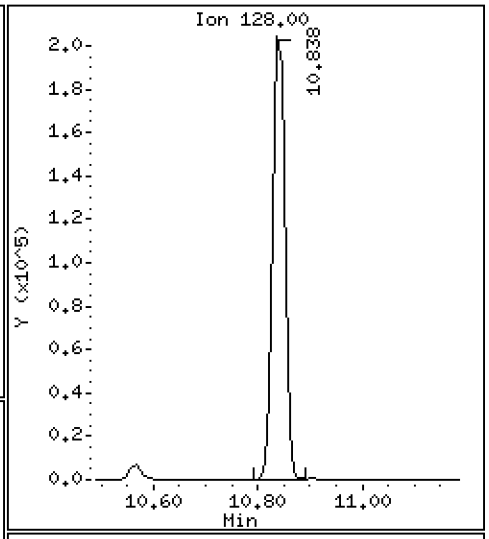
Concentration: 3.962 ug/mL

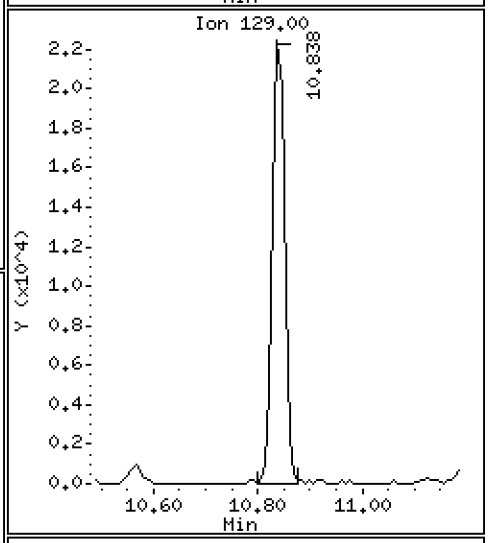


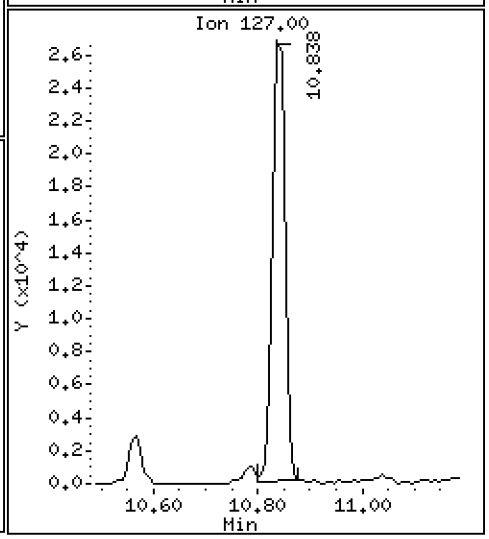












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

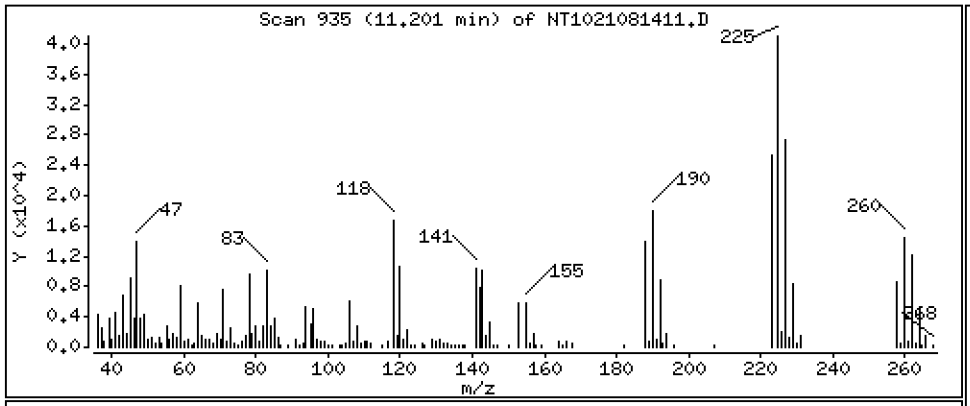
Operator: VTS

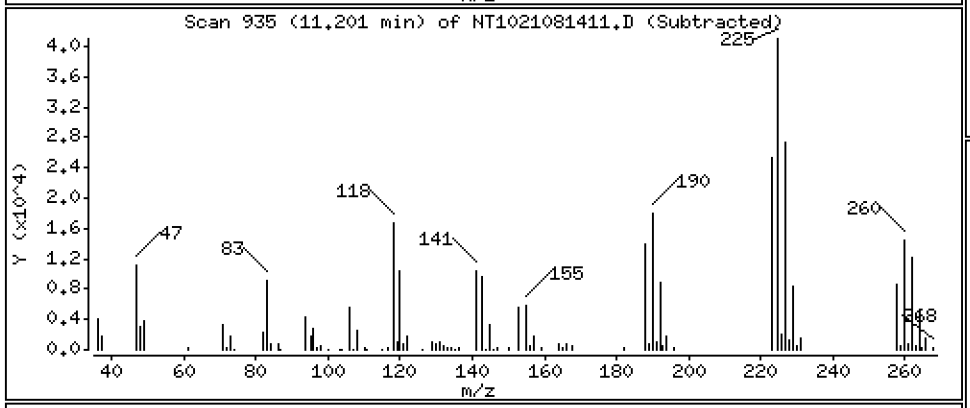
Column phase: ZB-5msi

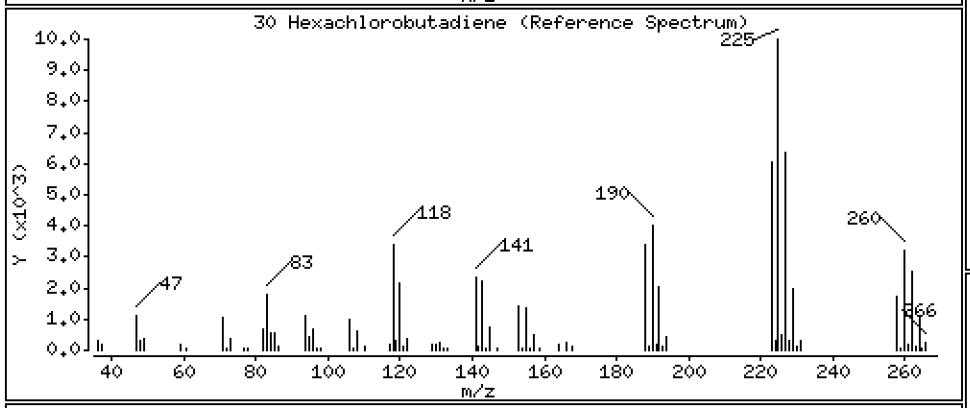
Column diameter: 0.25

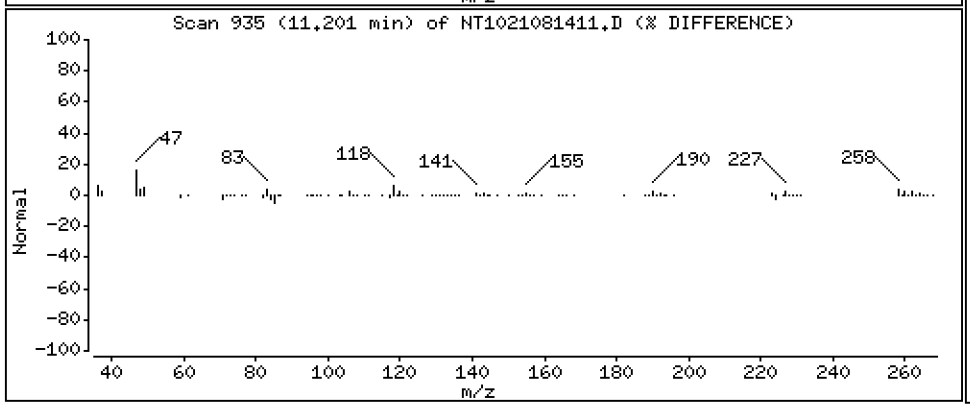
30 Hexachlorobutadiene

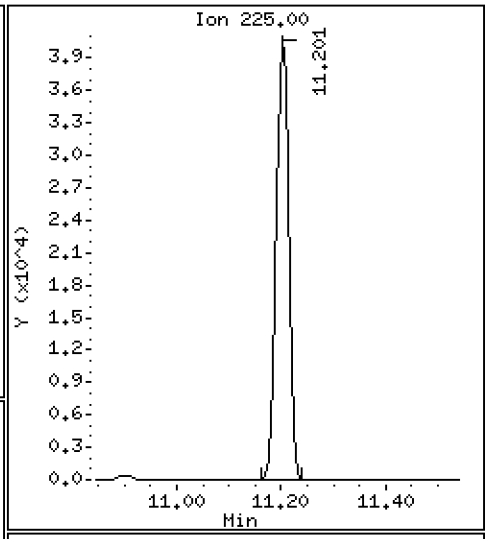
Concentration: 4.401 ug/mL

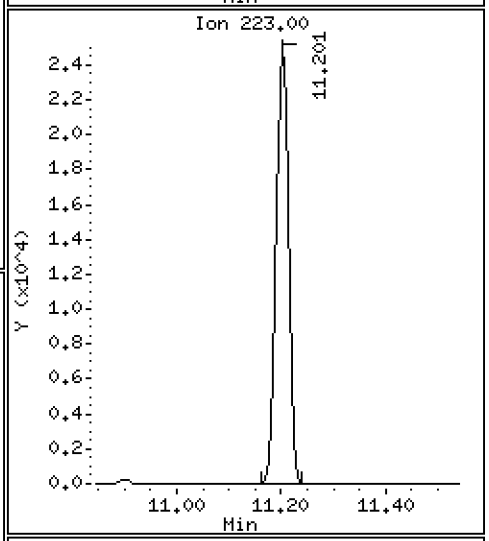


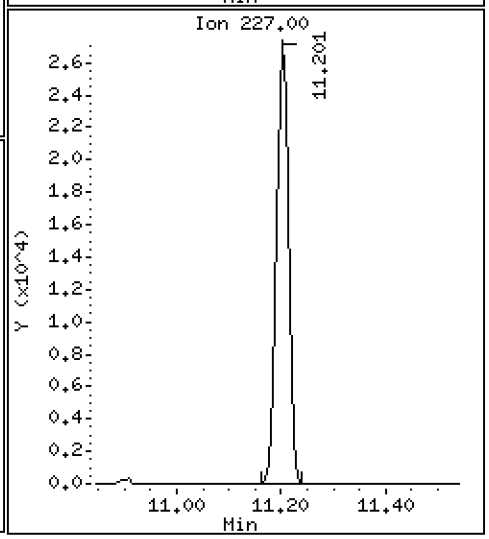












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

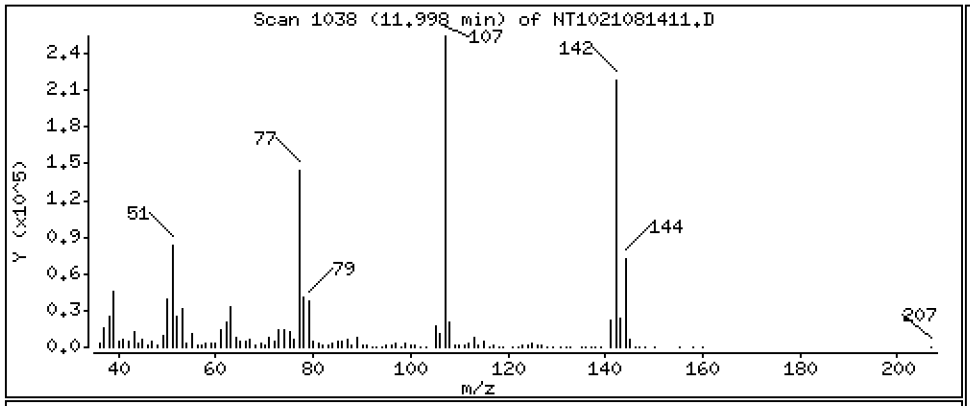
Operator: VTS

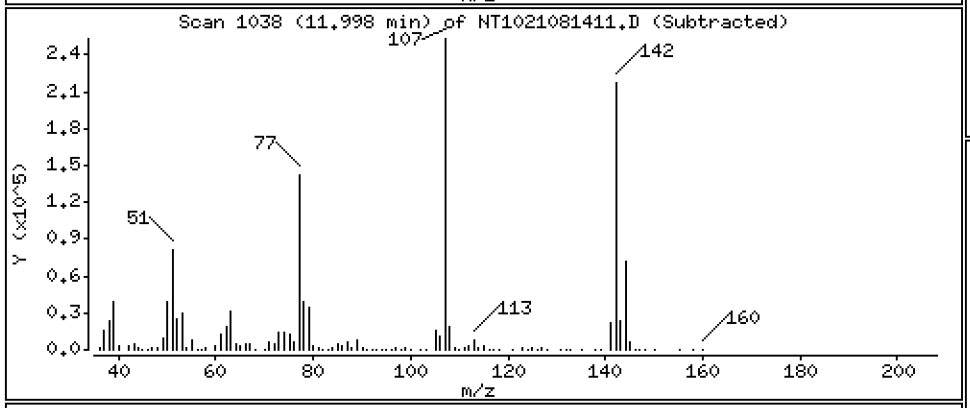
Column phase: ZB-5msi

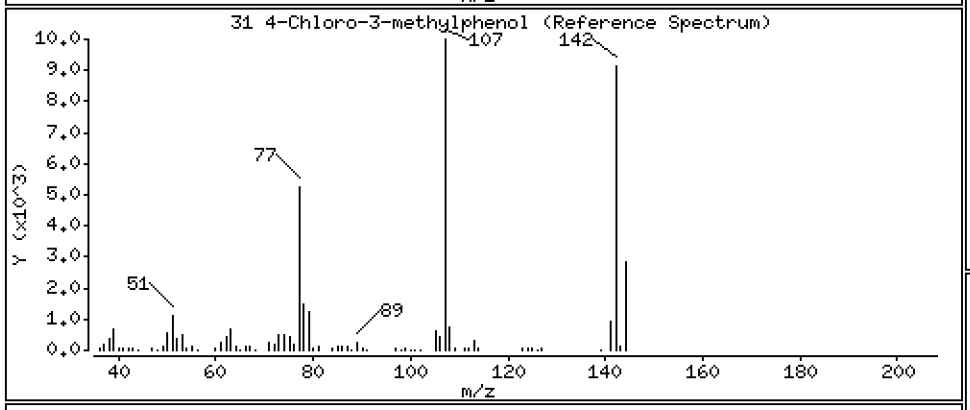
Column diameter: 0.25

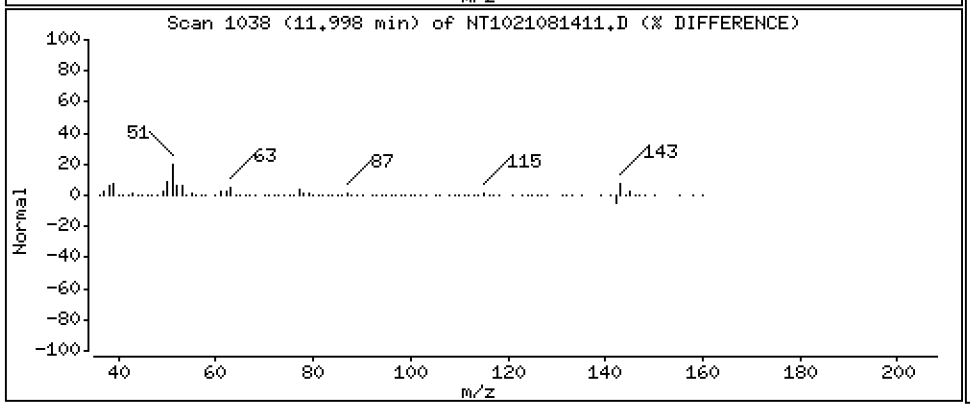
31 4-Chloro-3-methylphenol

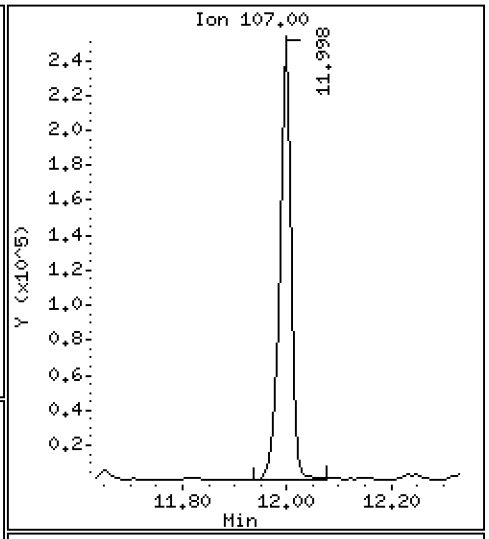
Concentration: 13.52 ug/mL

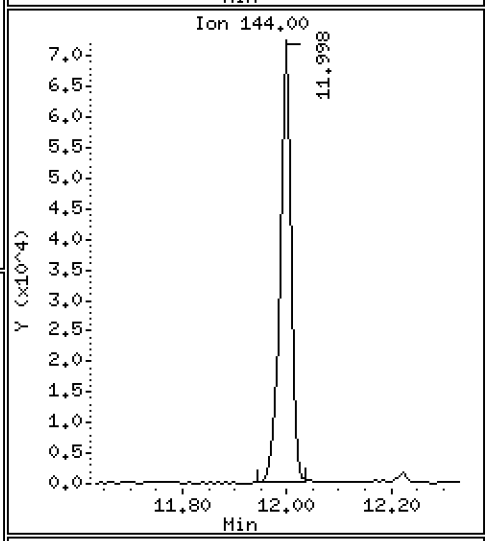


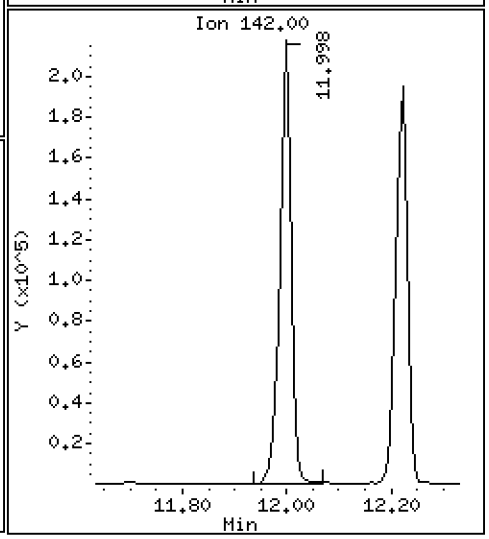












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

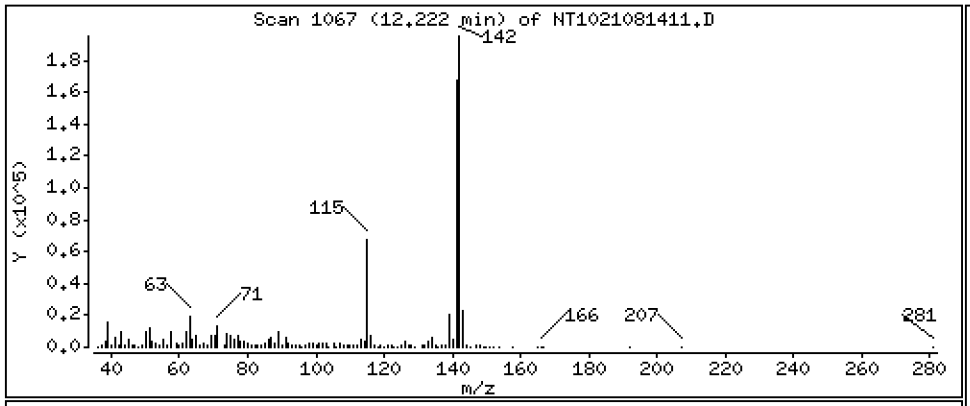
Operator: VTS

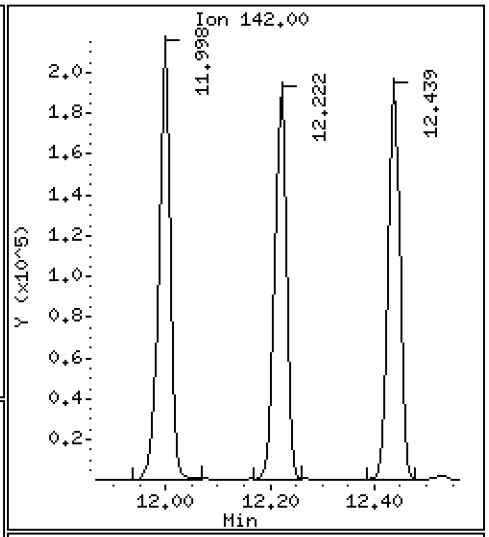
Column phase: ZB-5msi

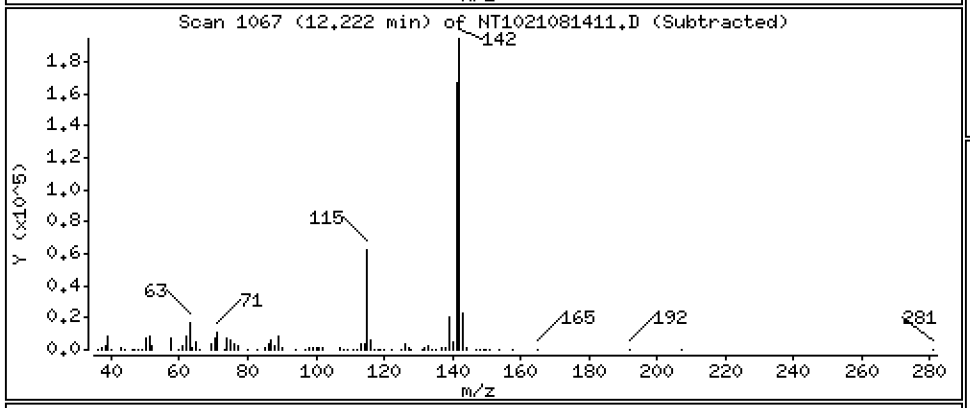
Column diameter: 0.25

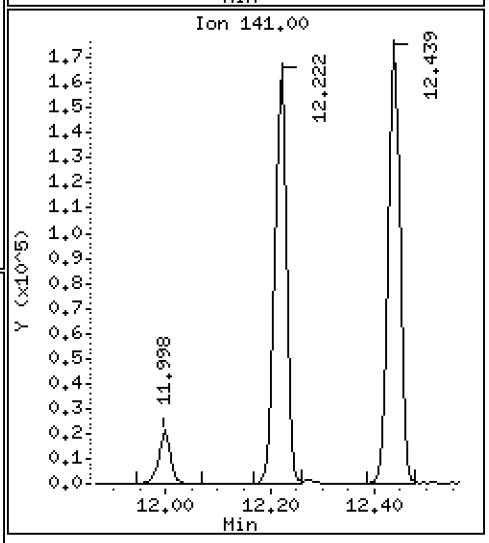
32 2-Methylnaphthalene

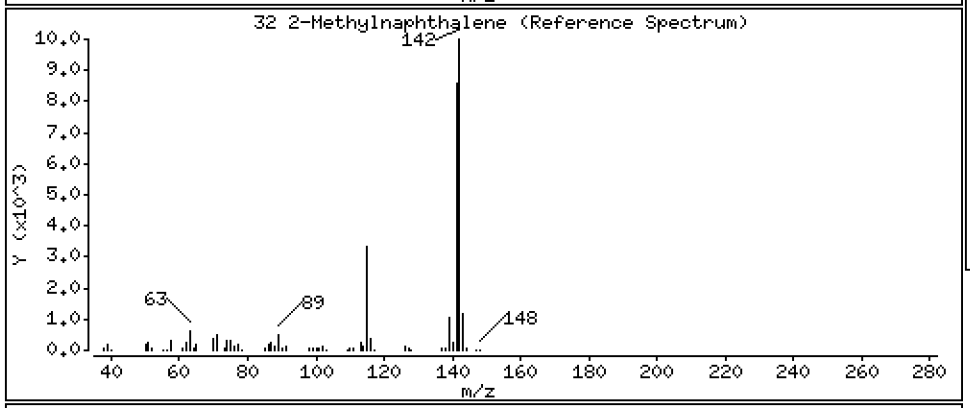
Concentration: 3.969 ug/mL

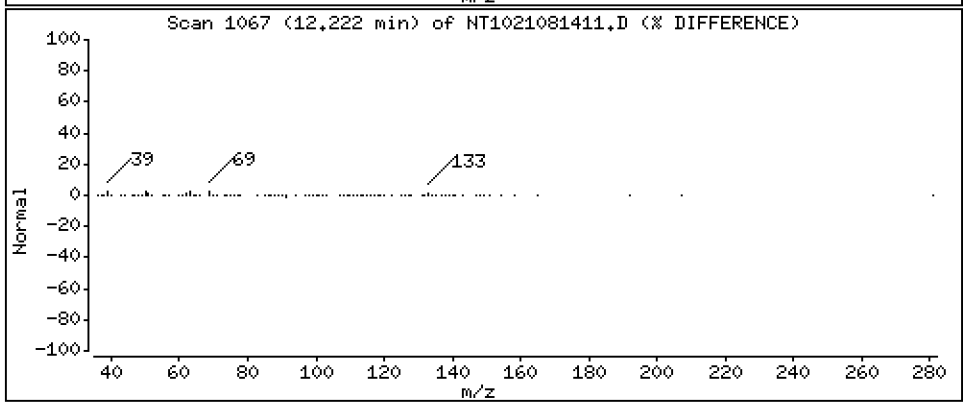












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

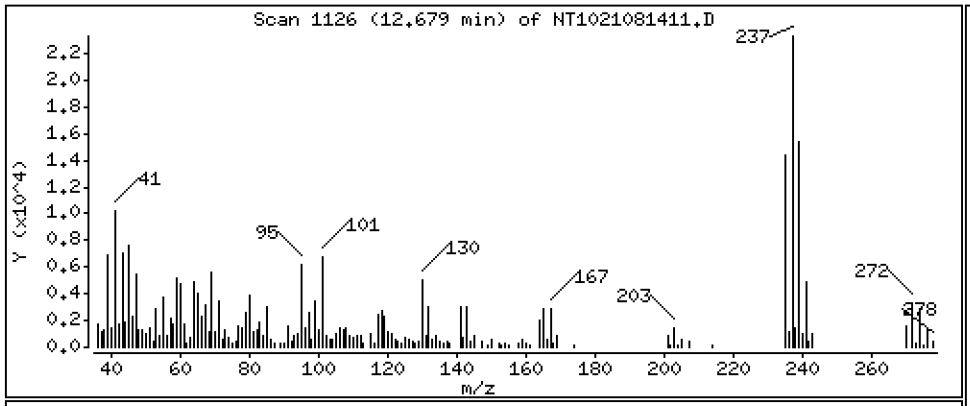
Operator: VTS

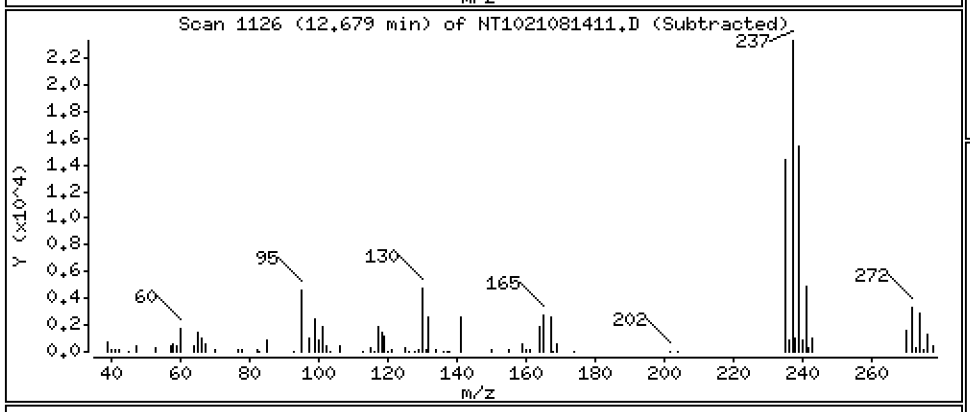
Column phase: ZB-5msi

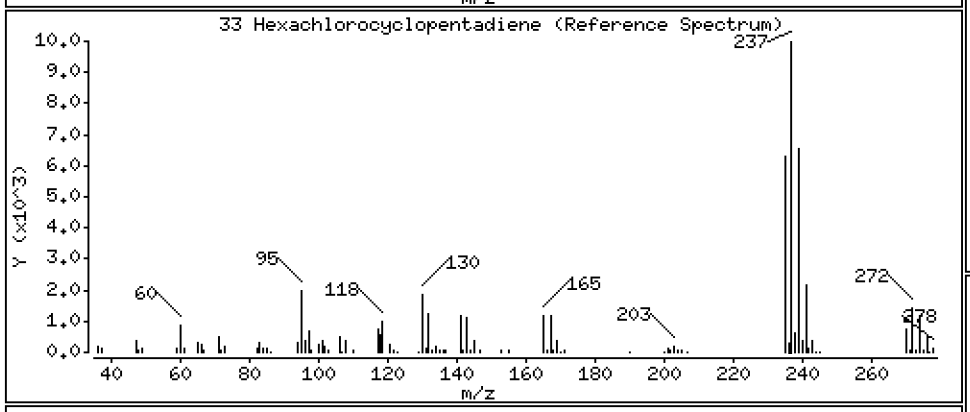
Column diameter: 0.25

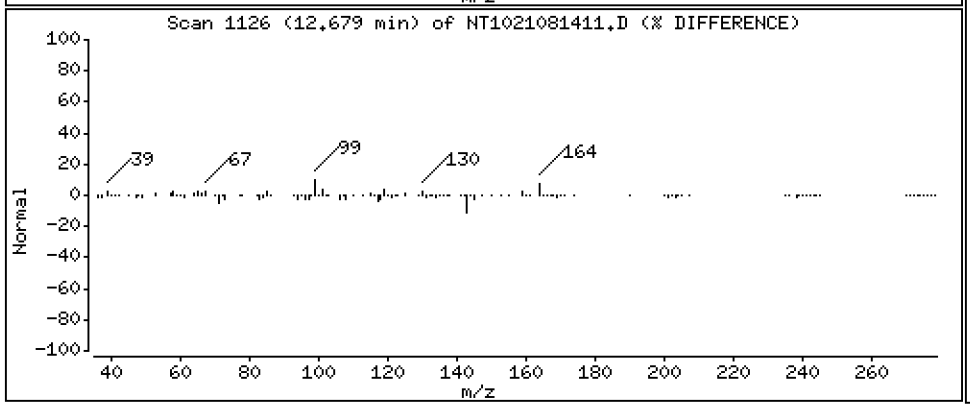
33 Hexachlorocyclopentadiene

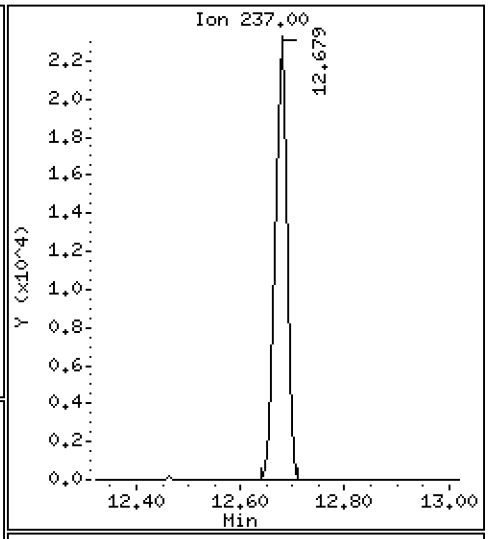
Concentration: 2.003 ug/mL

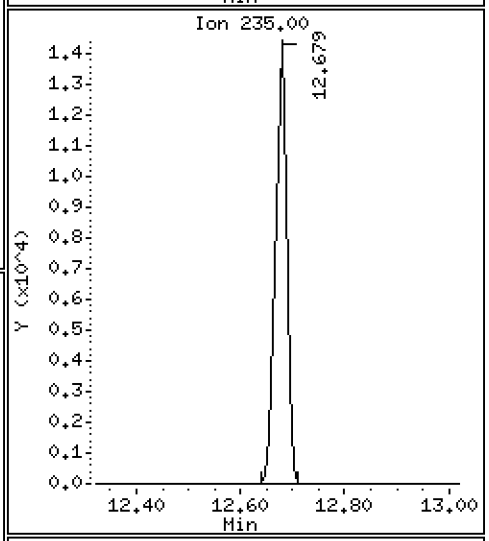


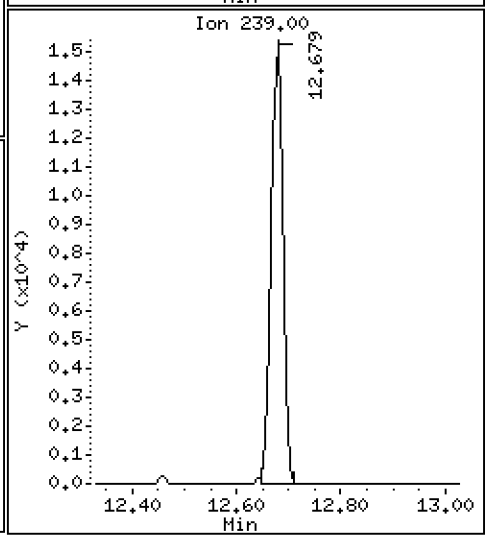












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

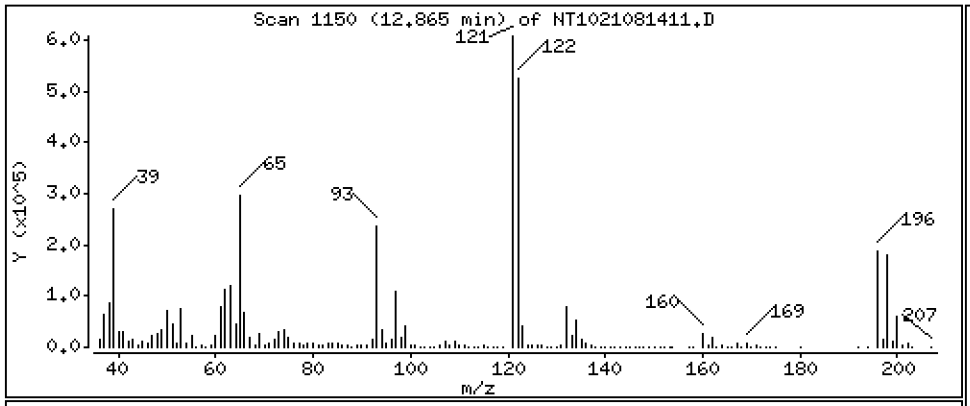
Operator: VTS

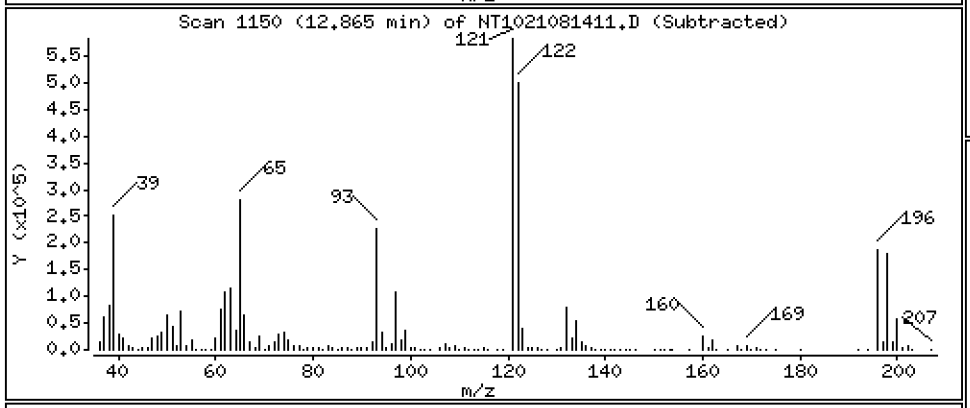
Column phase: ZB-5msi

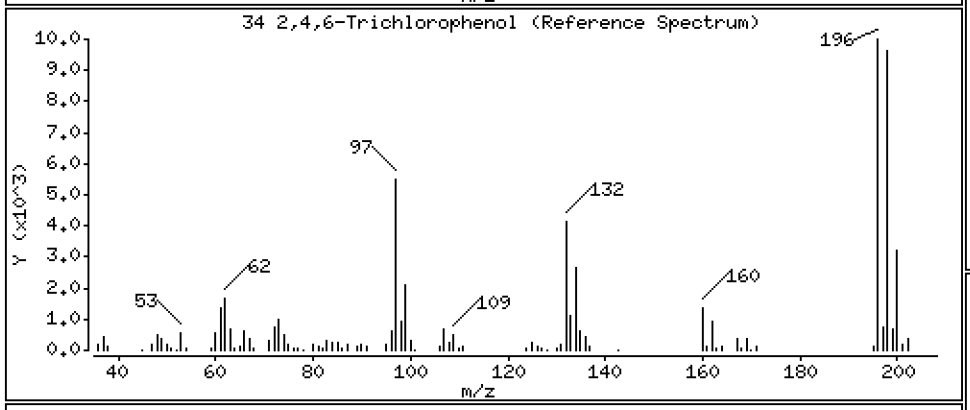
Column diameter: 0.25

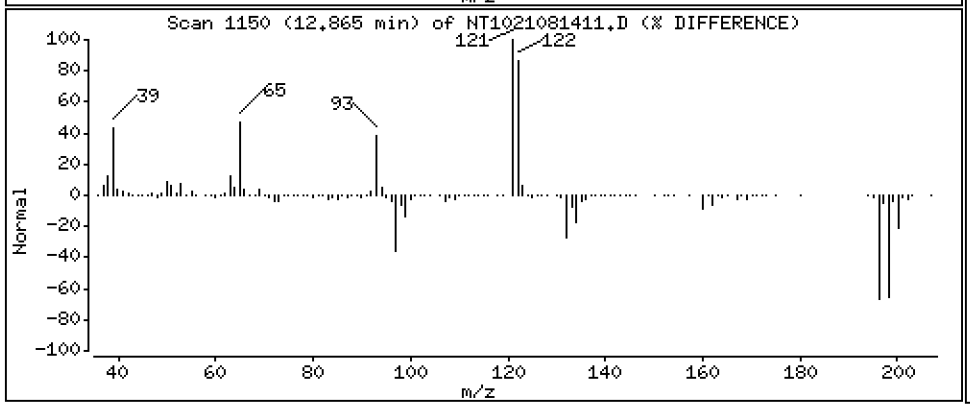
34 2,4,6-Trichlorophenol

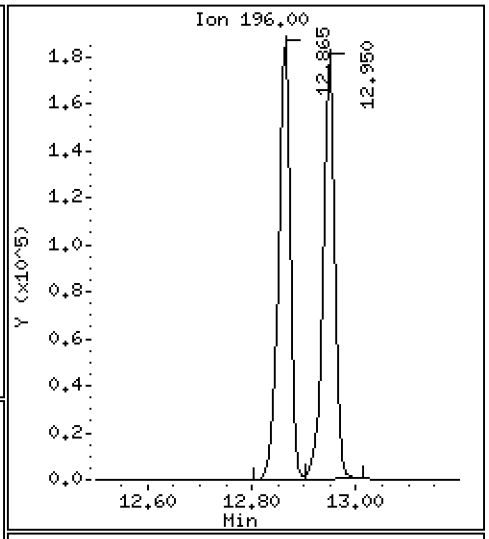
Concentration: 16.11 ug/mL

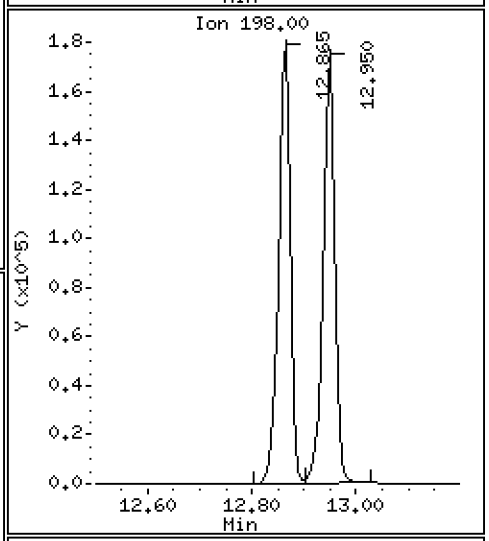


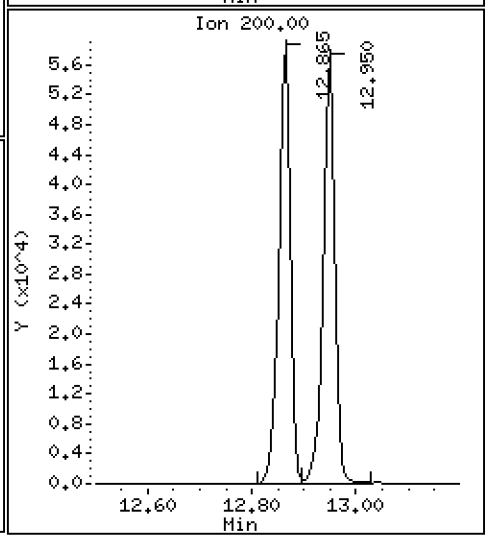












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

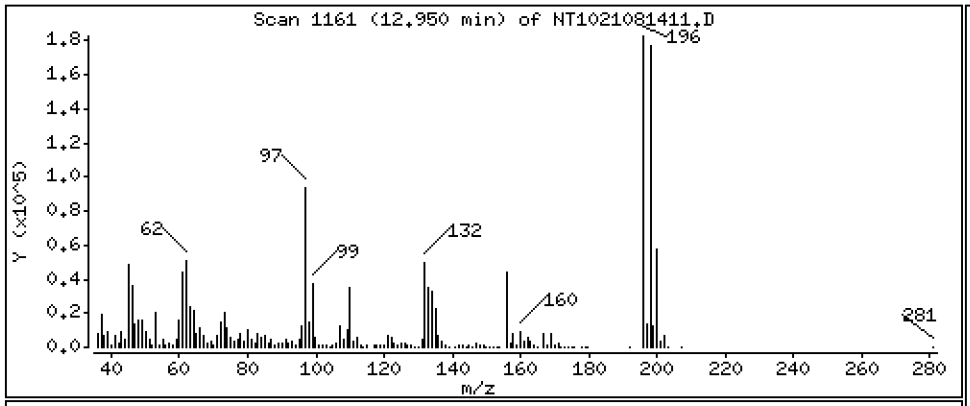
Operator: VTS

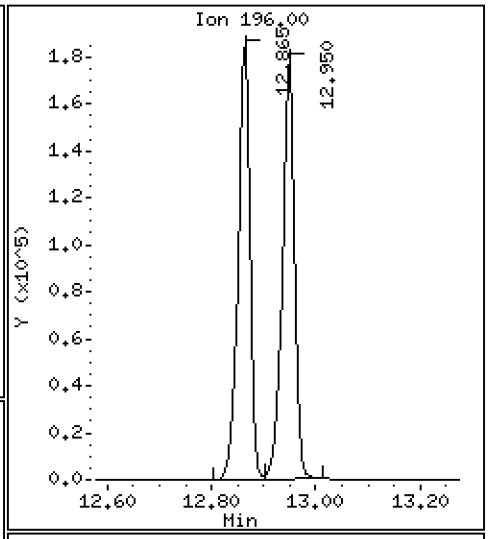
Column phase: ZB-5msi

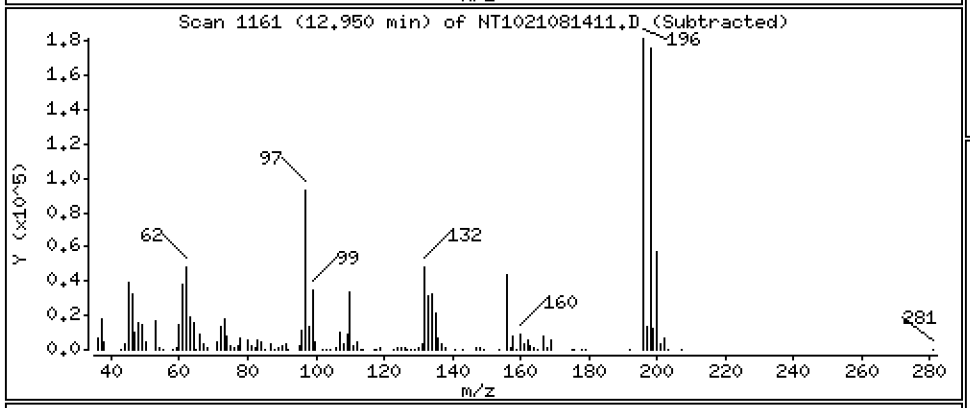
Column diameter: 0.25

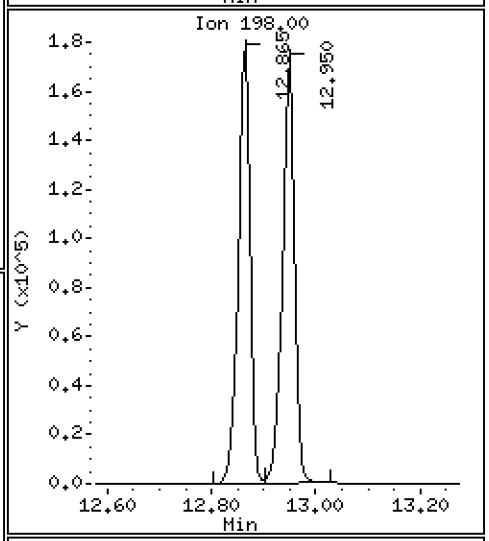
35 2,4,5-Trichlorophenol

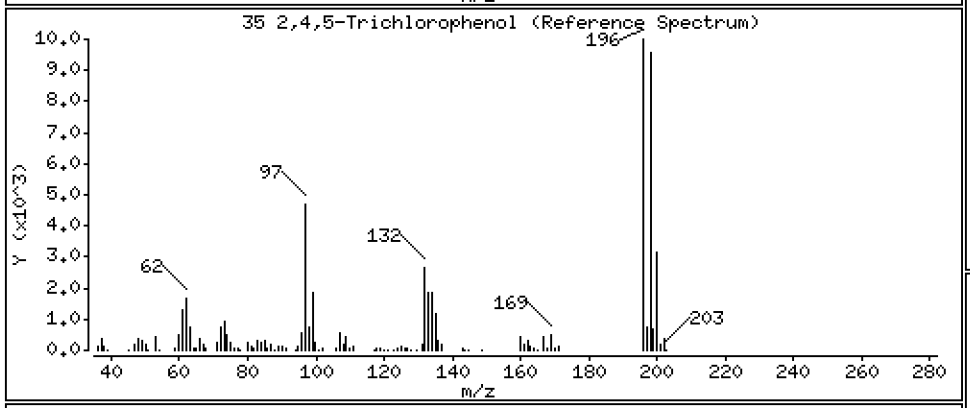
Concentration: 14.67 ug/mL

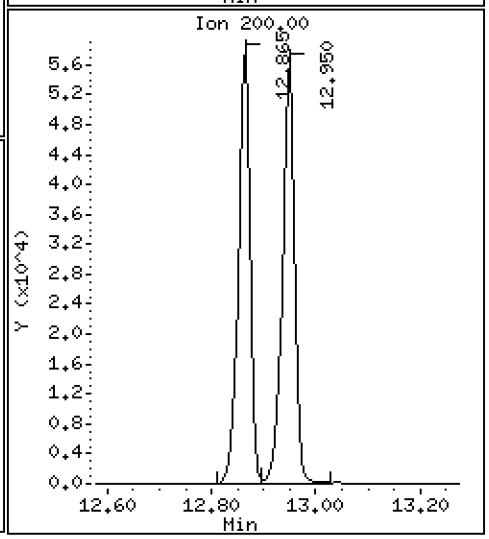


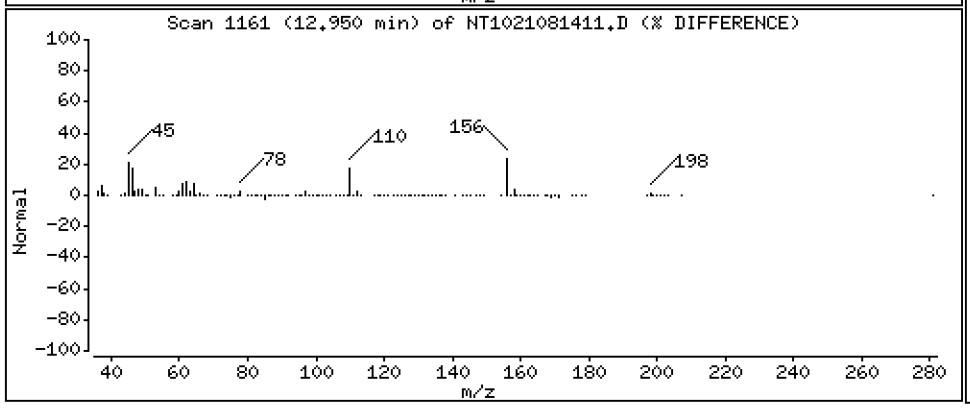












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

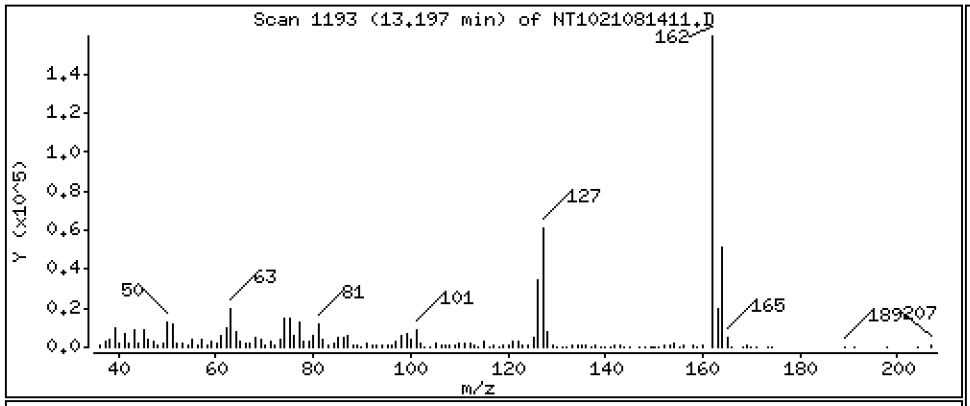
Operator: VTS

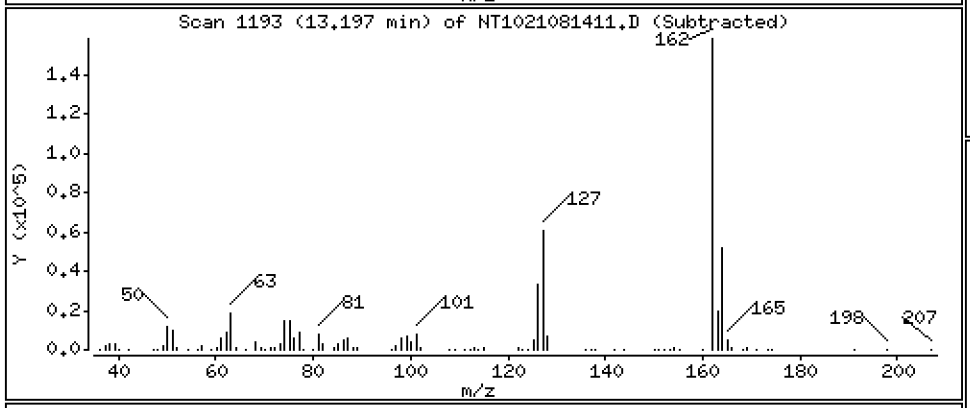
Column phase: ZB-5msi

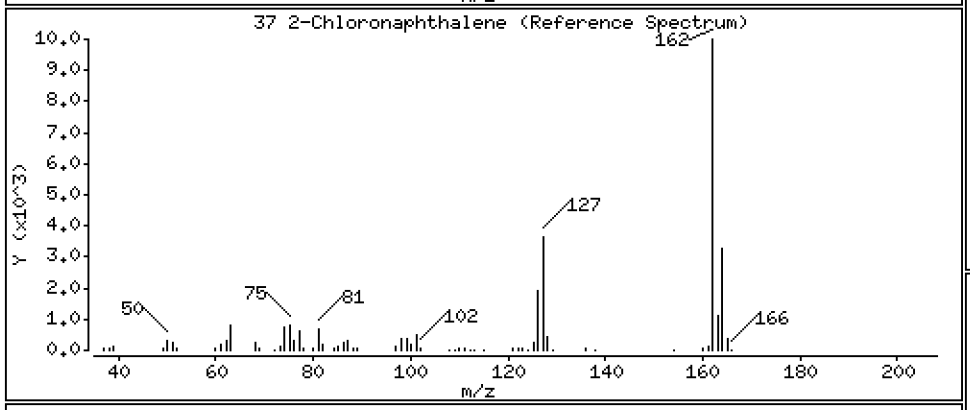
Column diameter: 0.25

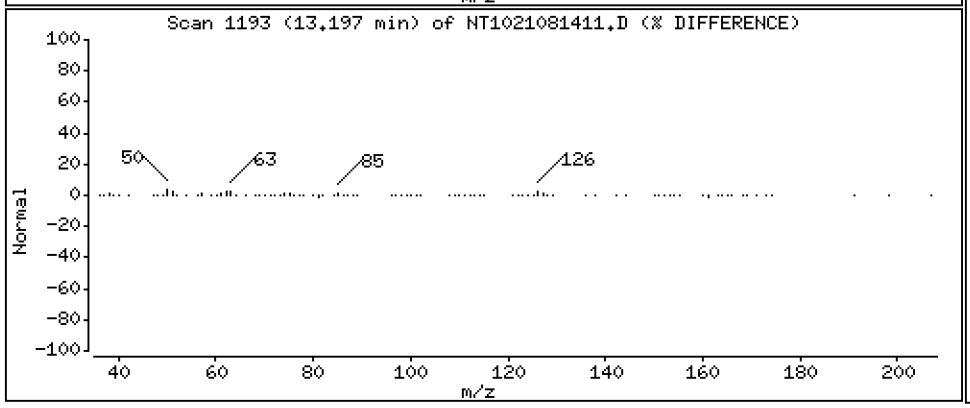
37 2-Chloronaphthalene

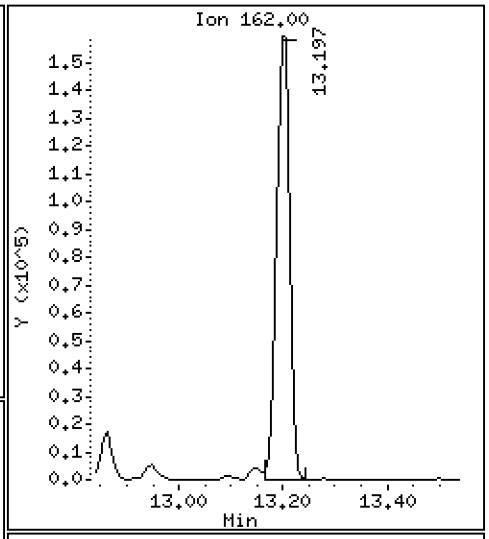
Concentration: 4.114 ug/mL

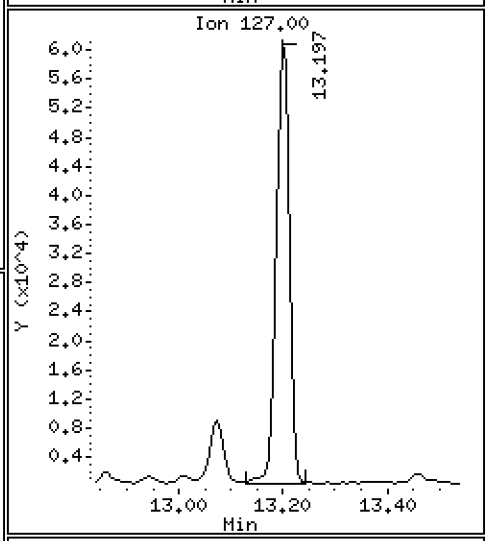


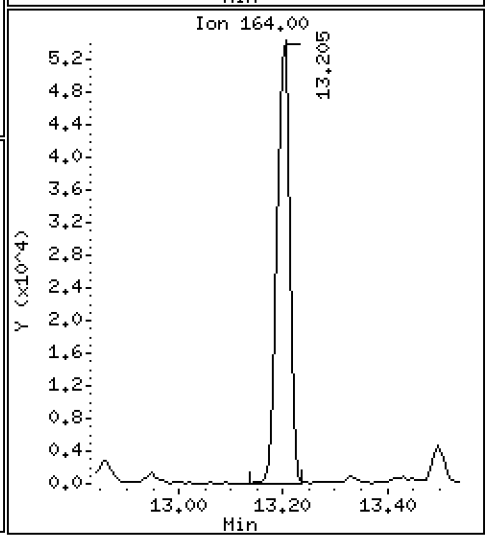












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

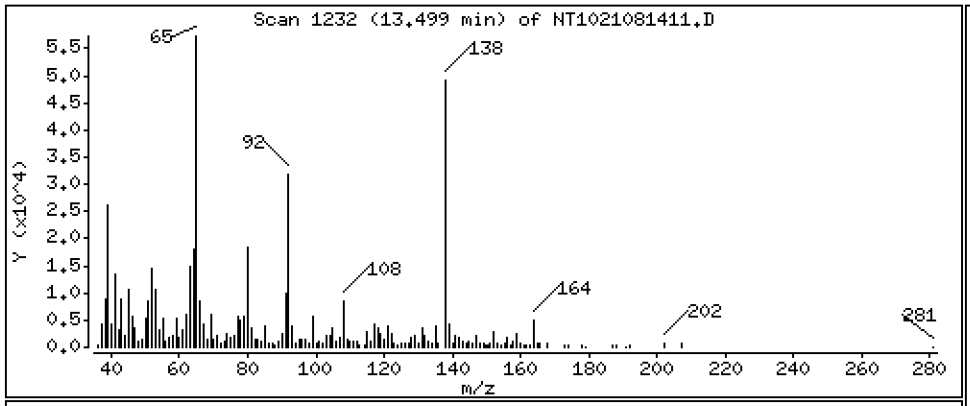
Operator: VTS

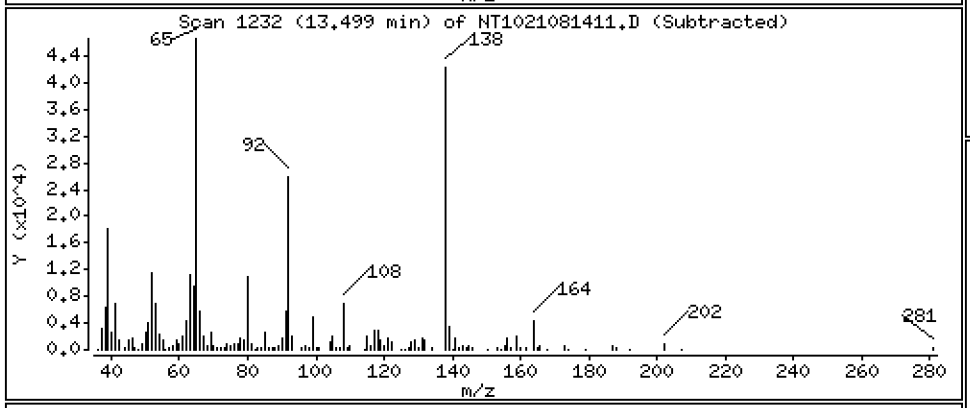
Column phase: ZB-5msi

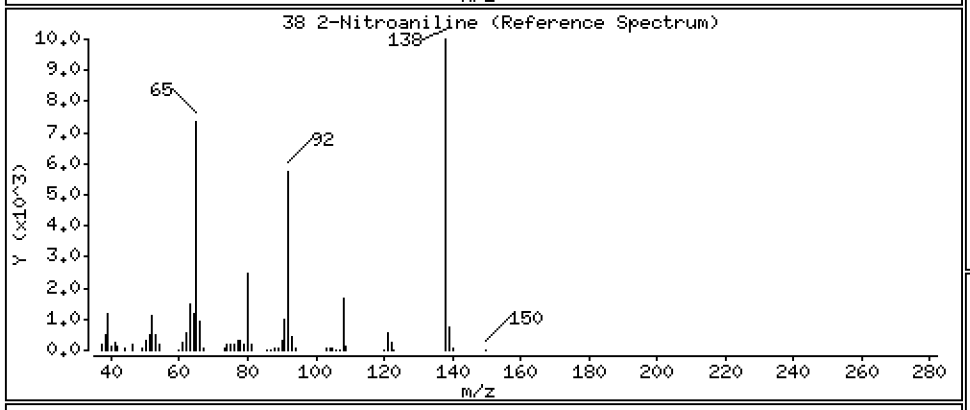
Column diameter: 0.25

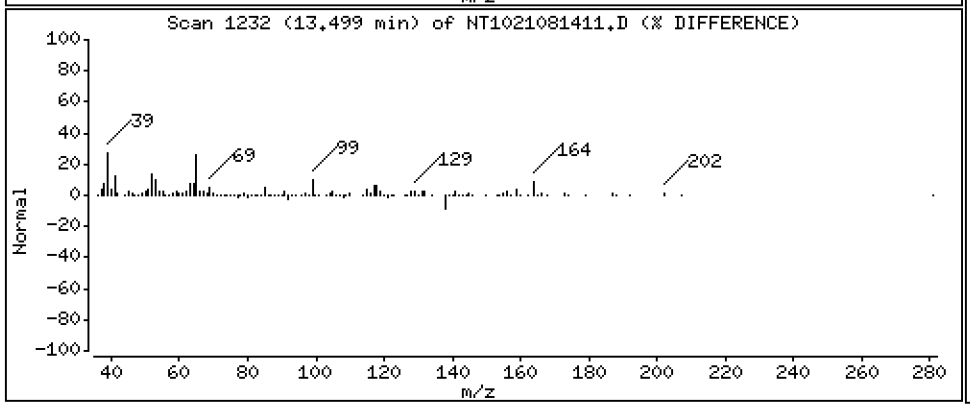
38 2-Nitroaniline

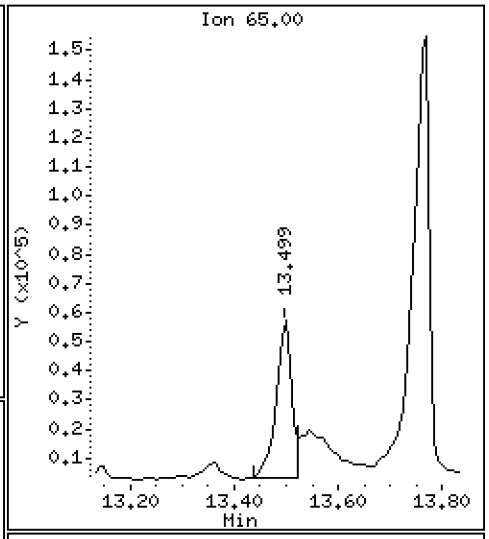
Concentration: 4.524 ug/mL

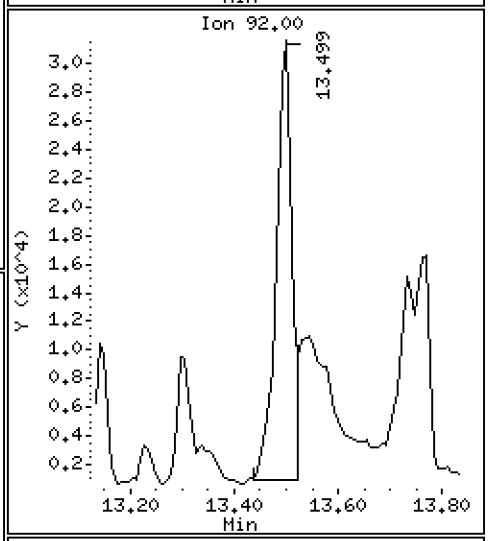


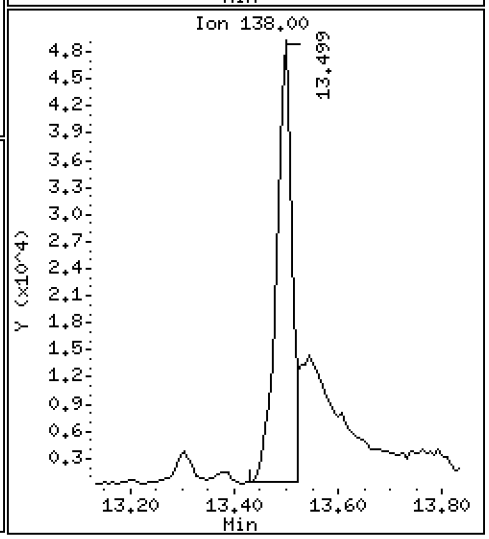












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

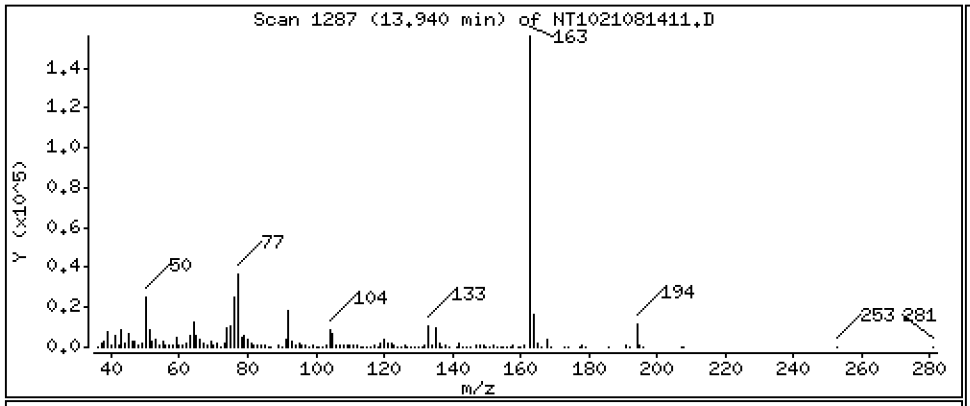
Operator: VTS

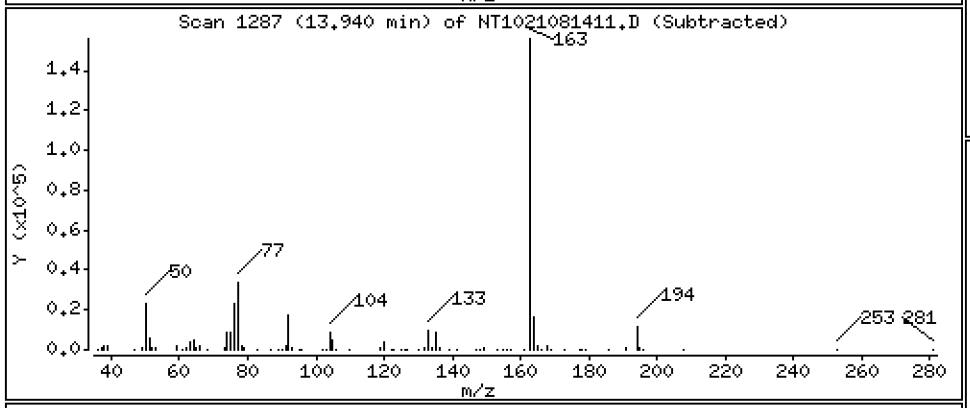
Column phase: ZB-5msi

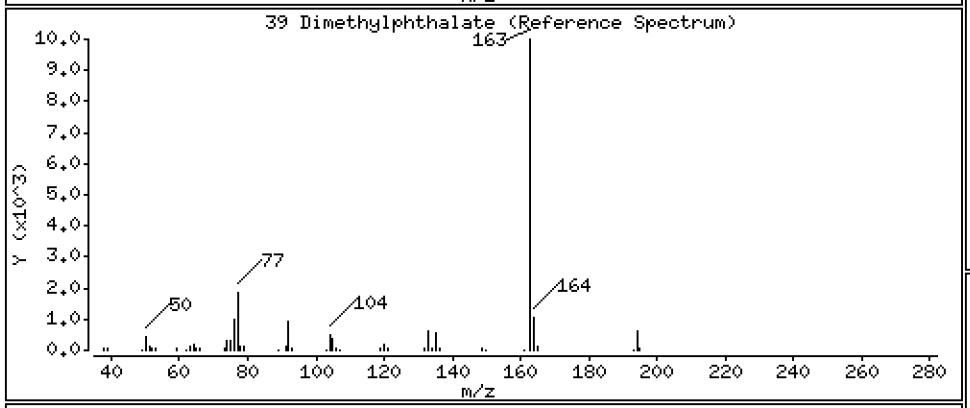
Column diameter: 0.25

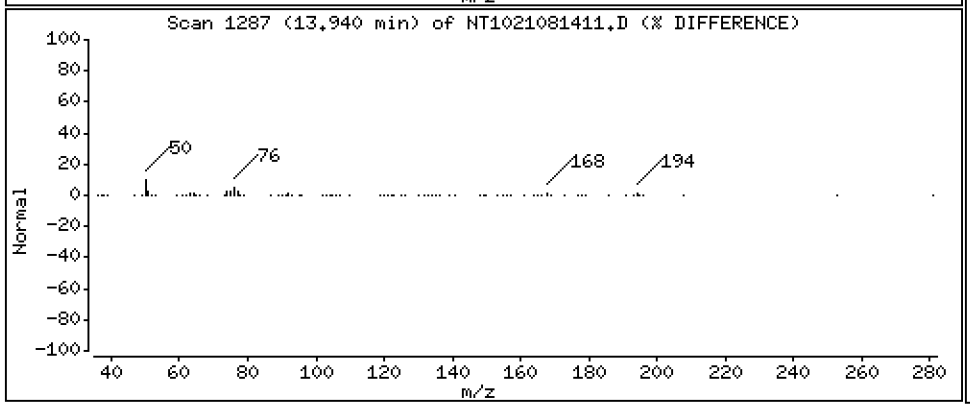
39 Dimethylphthalate

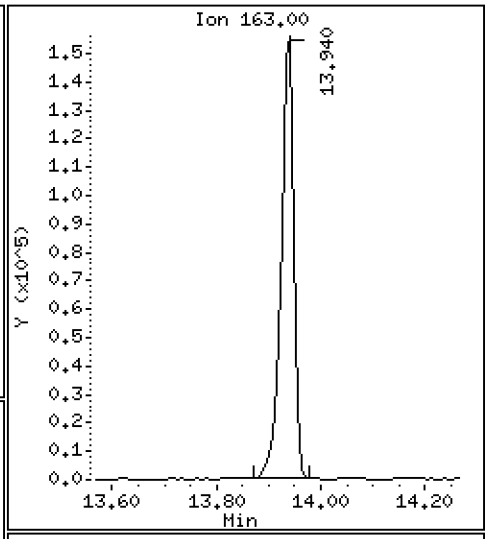
Concentration: 4.203 ug/mL

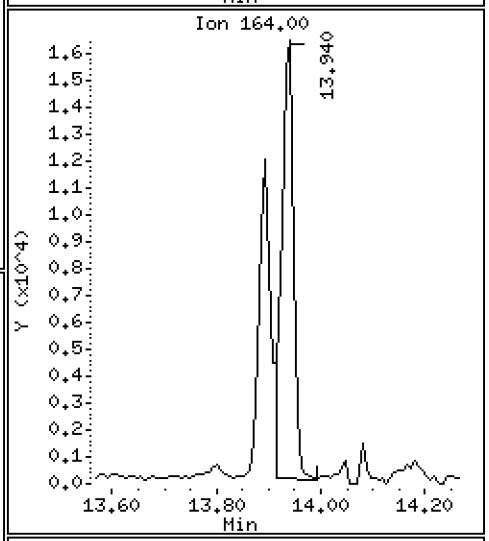


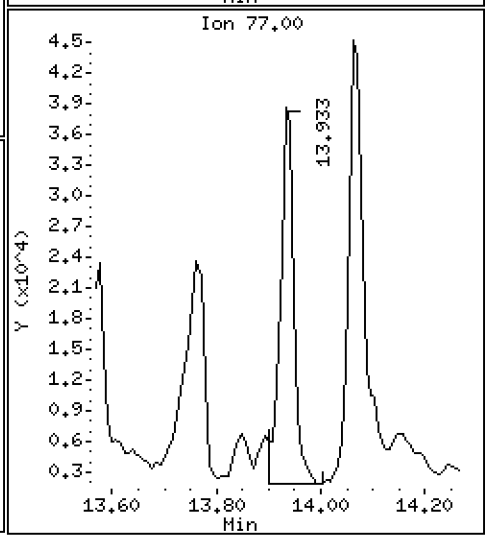












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

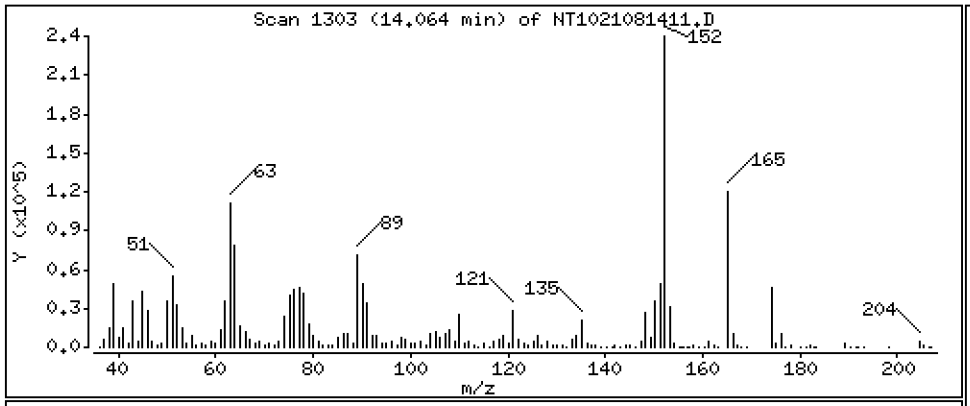
Operator: VTS

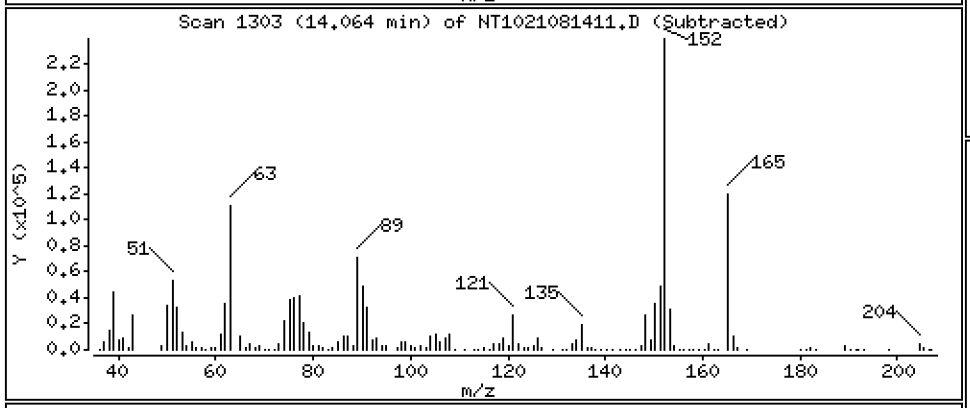
Column phase: ZB-5msi

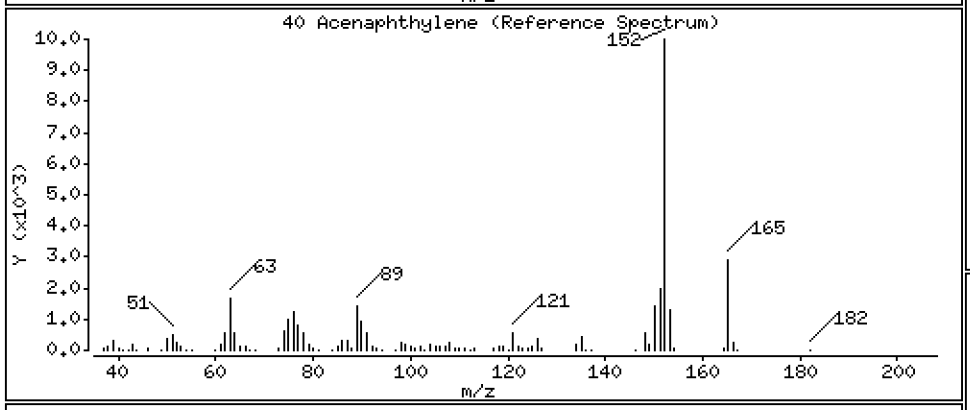
Column diameter: 0.25

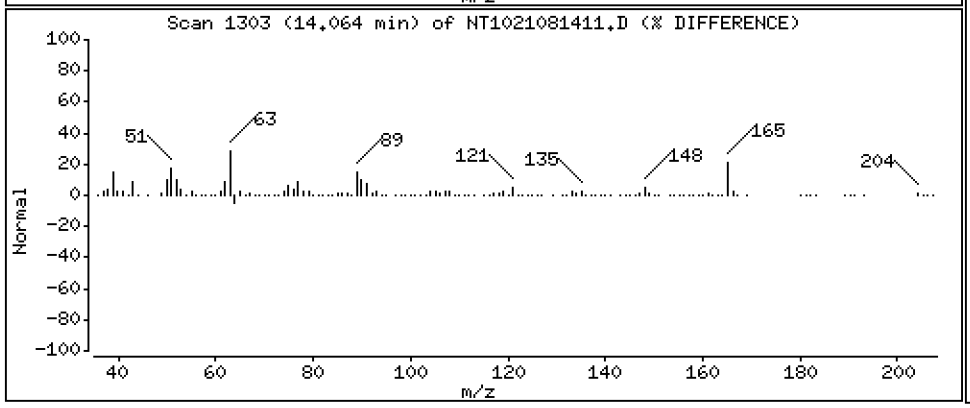
40 Acenaphthylene

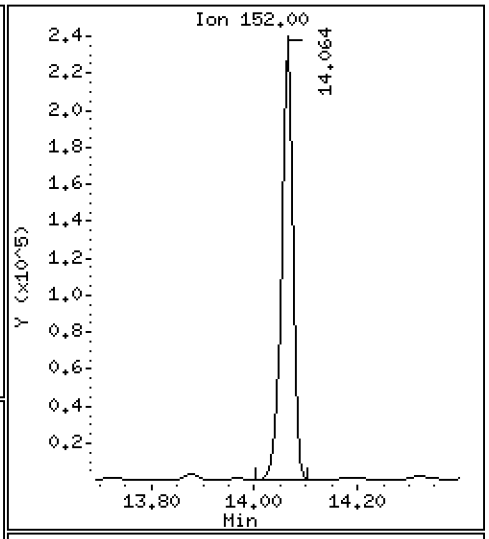
Concentration: 3.949 ug/mL

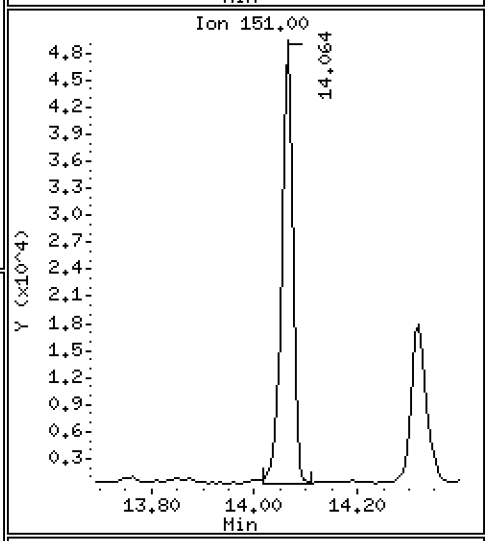


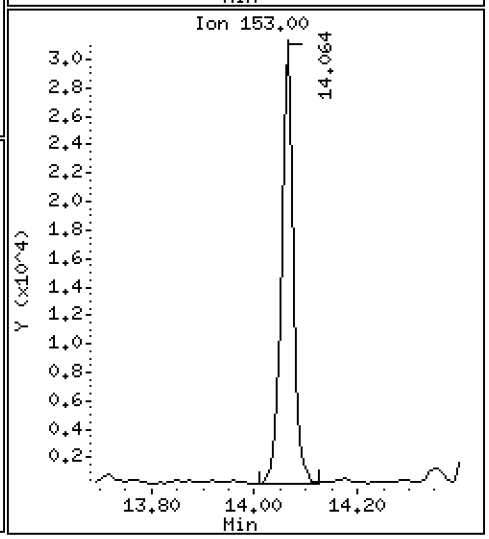












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

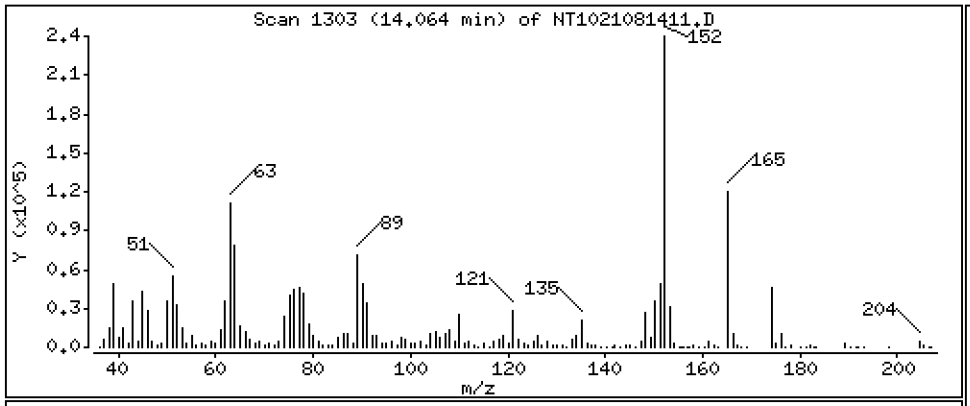
Operator: VTS

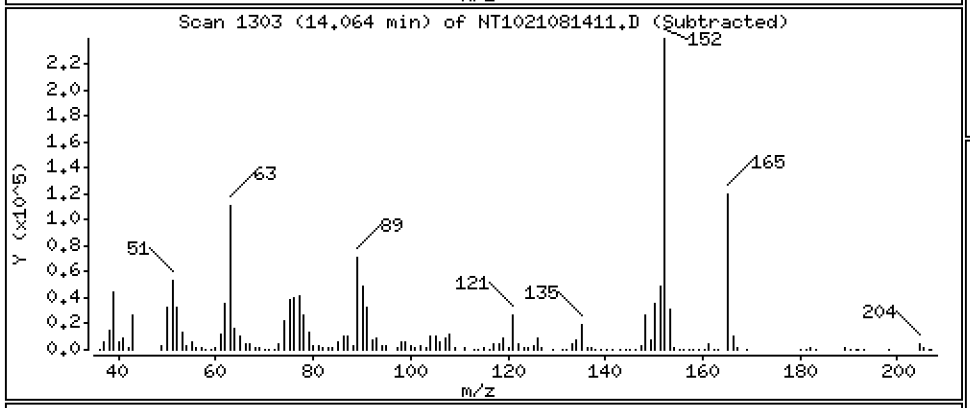
Column phase: ZB-5msi

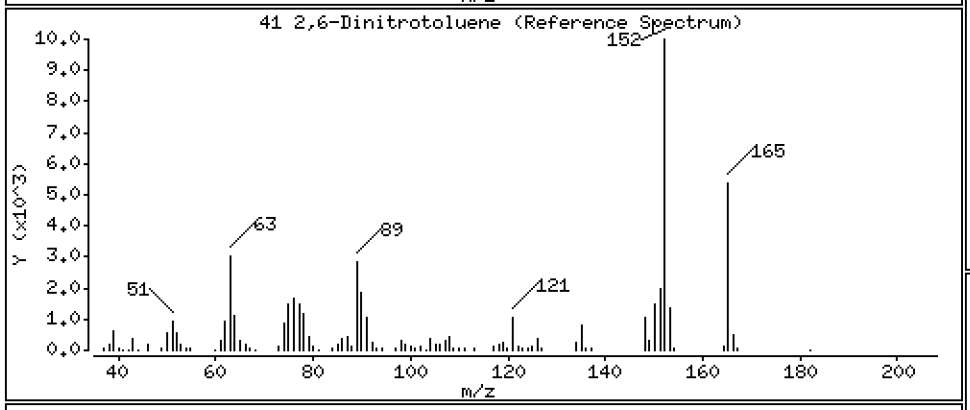
Column diameter: 0.25

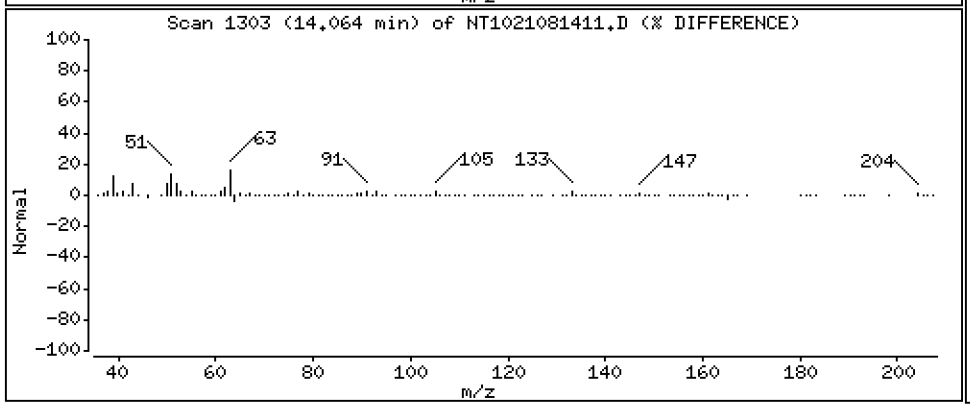
41 2,6-Dinitrotoluene

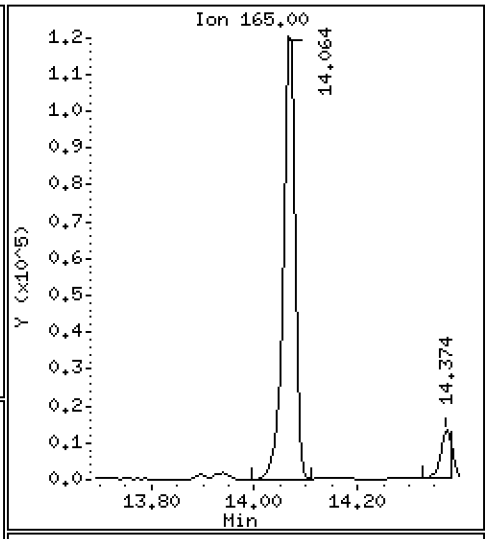
Concentration: 13.97 ug/mL

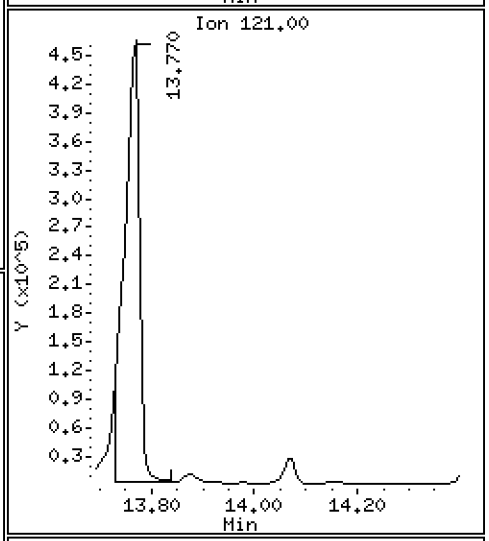


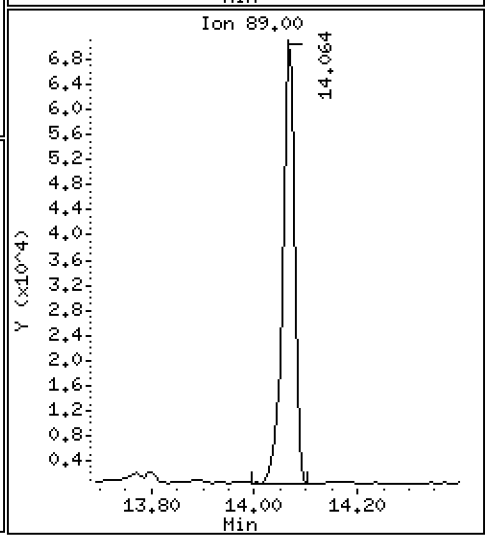












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

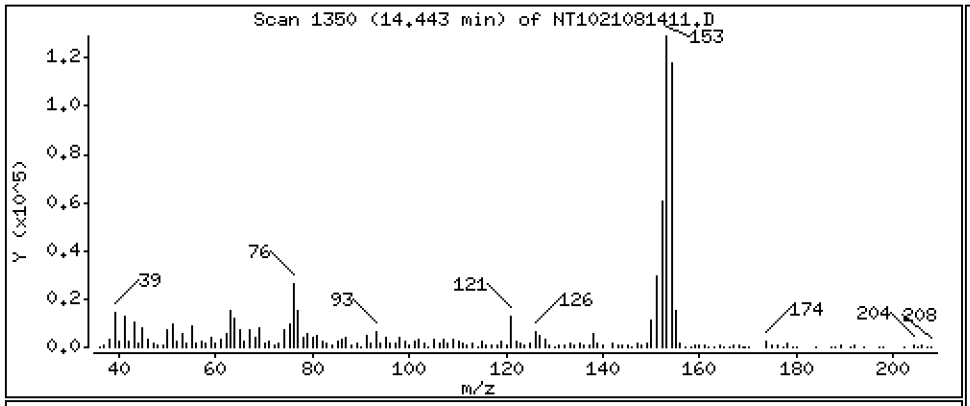
Operator: VTS

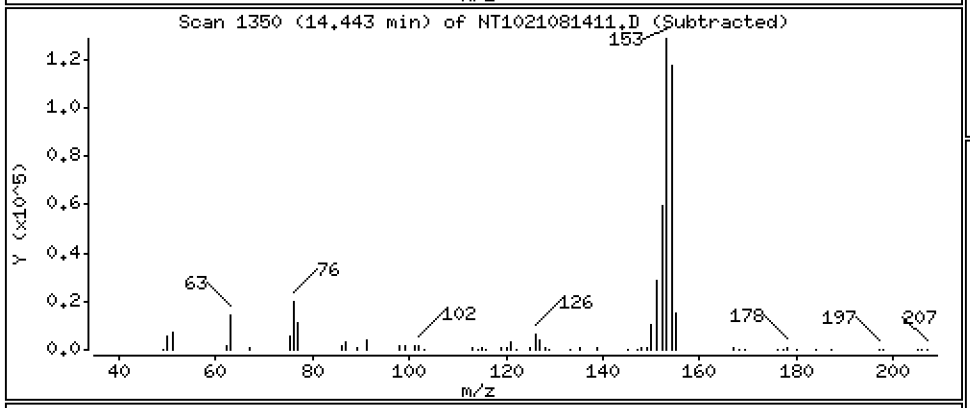
Column phase: ZB-5msi

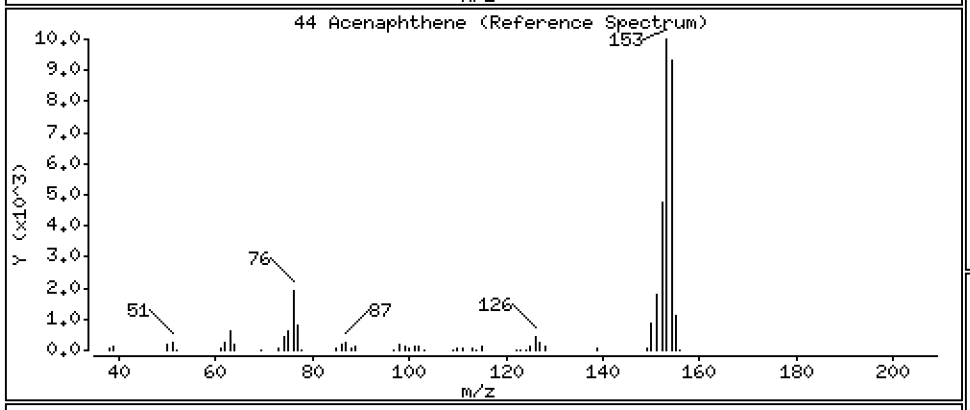
Column diameter: 0.25

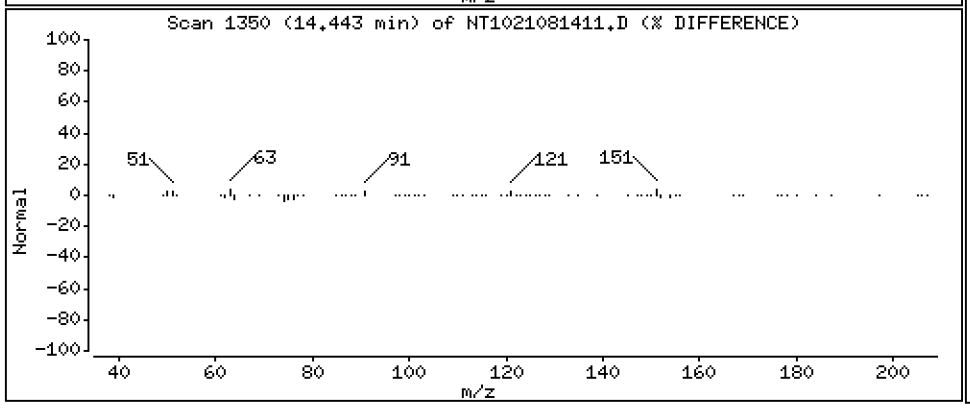
44 Acenaphthene

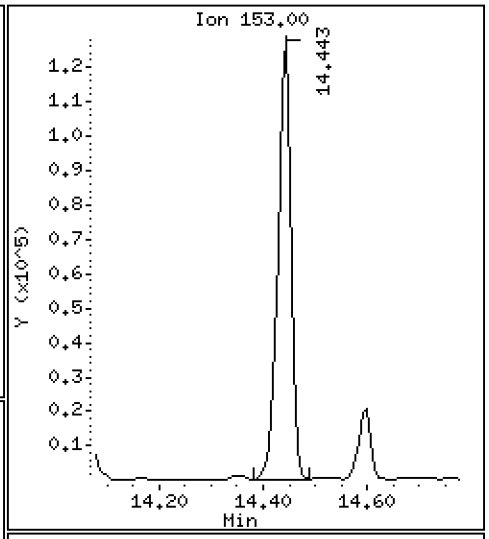
Concentration: 4.194 ug/mL

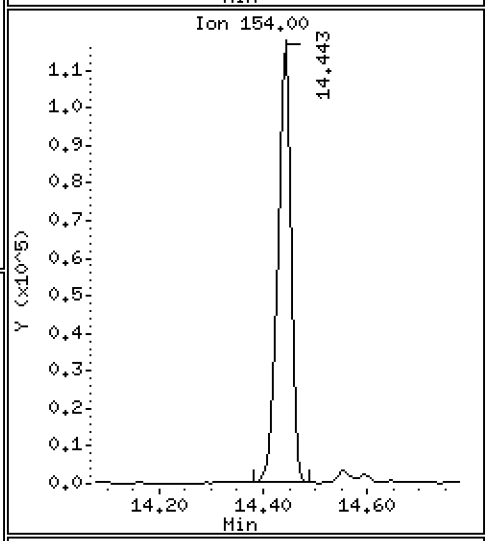


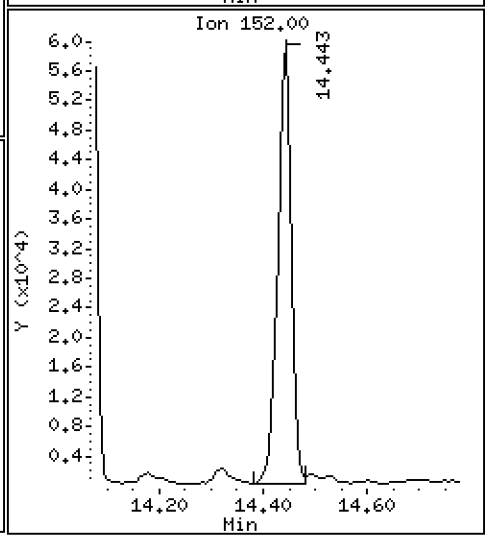












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

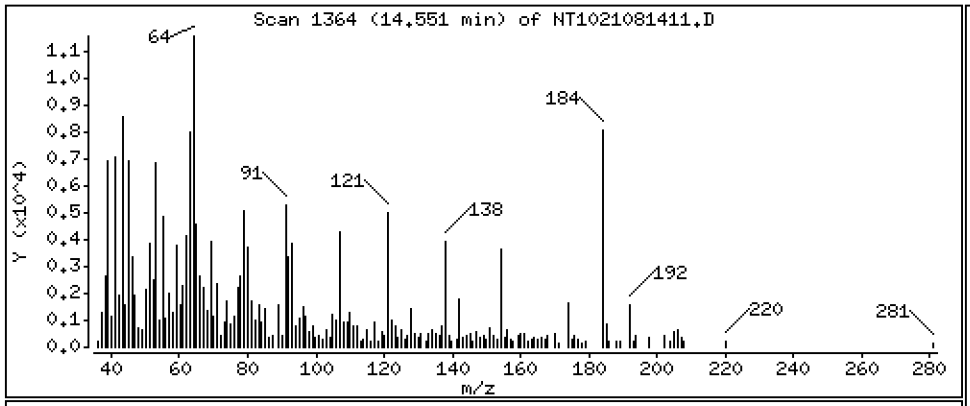
Operator: VTS

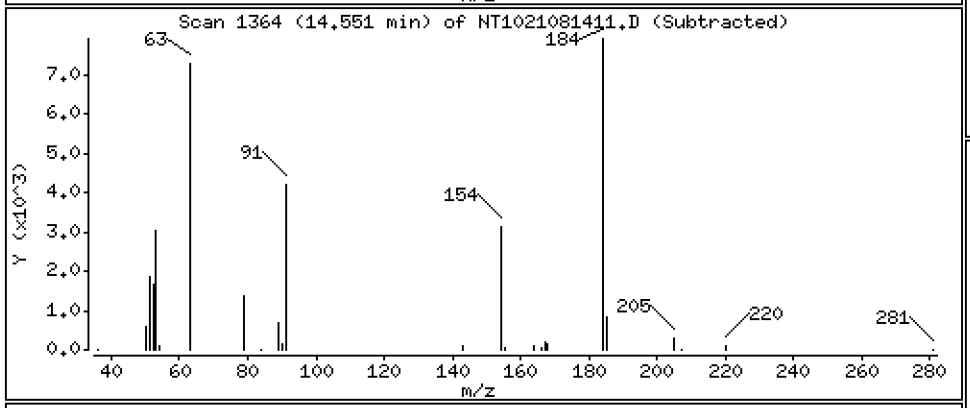
Column phase: ZB-5msi

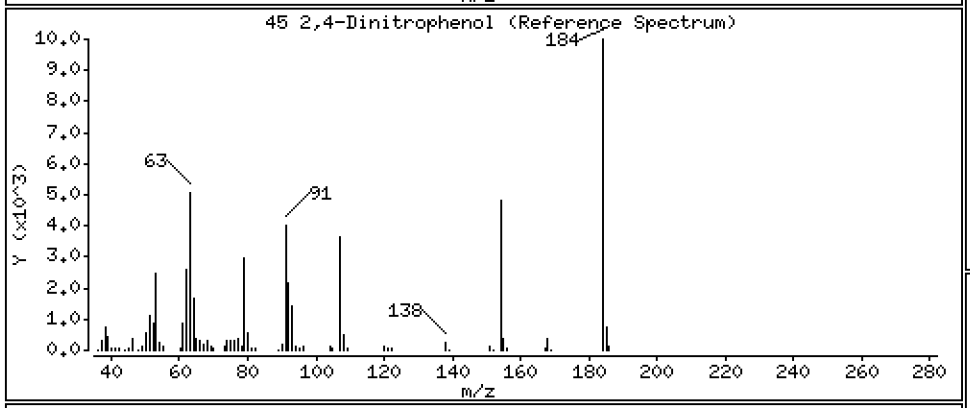
Column diameter: 0.25

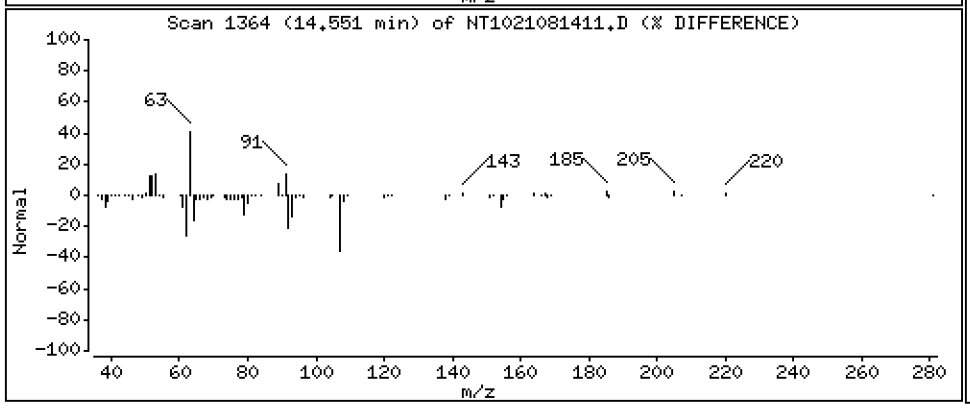
45 2,4-Dinitrophenol

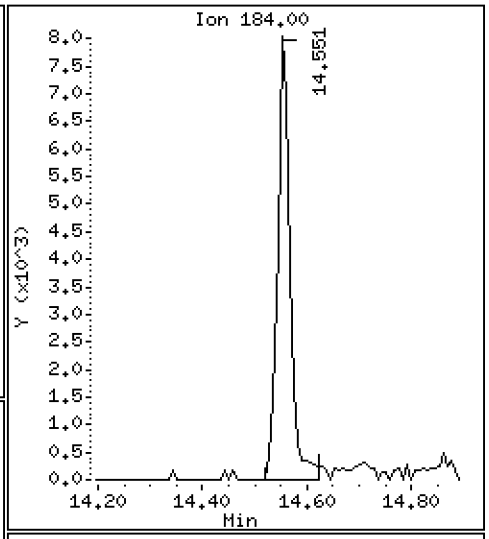
Concentration: 1.664 ug/mL

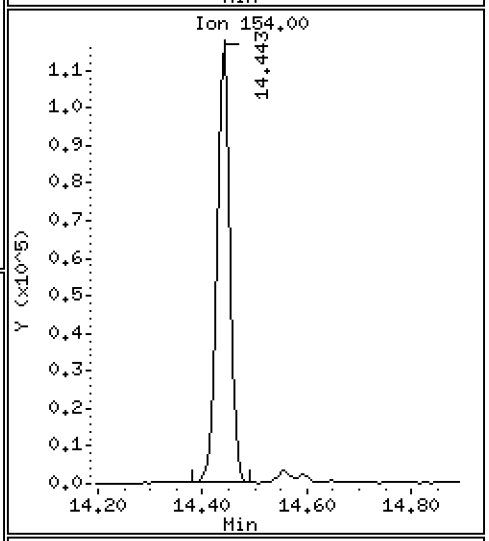


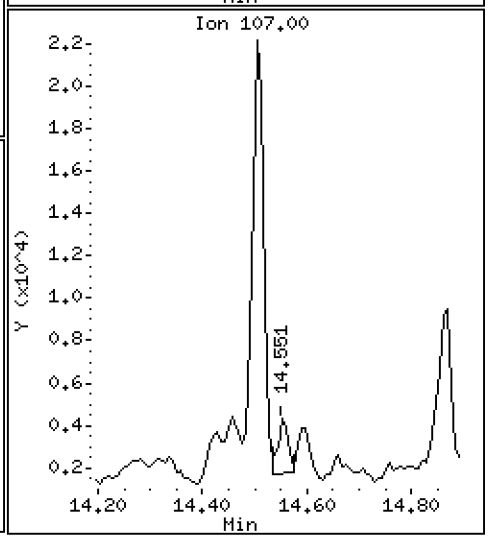












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

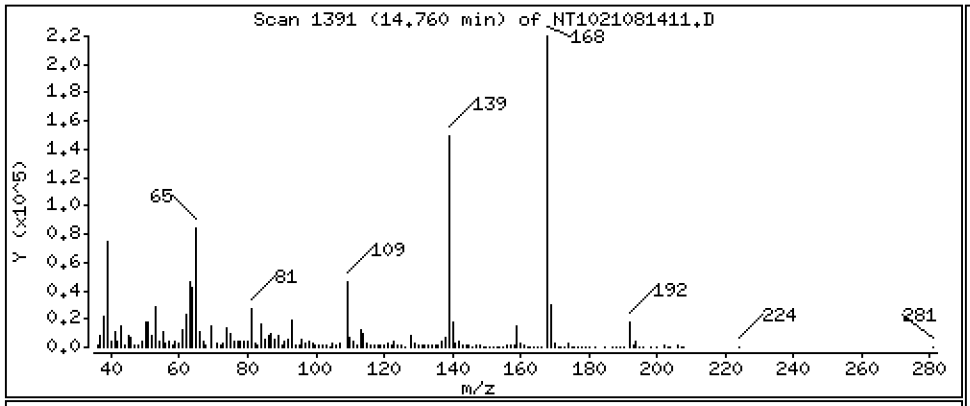
Operator: VTS

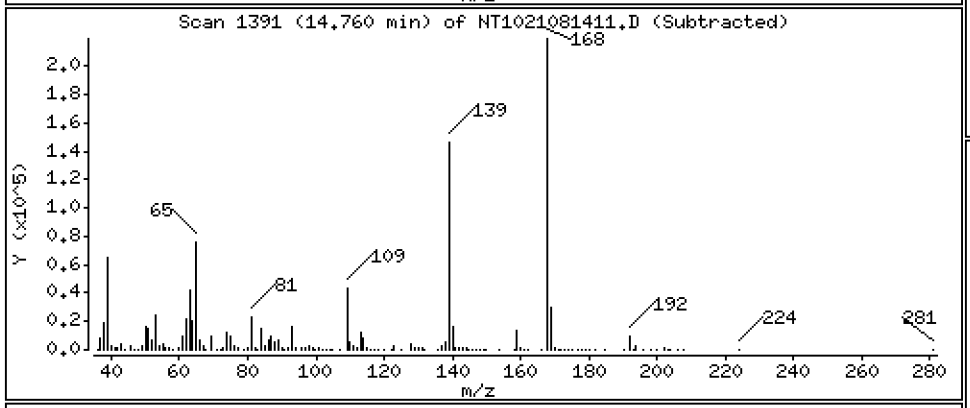
Column phase: ZB-5msi

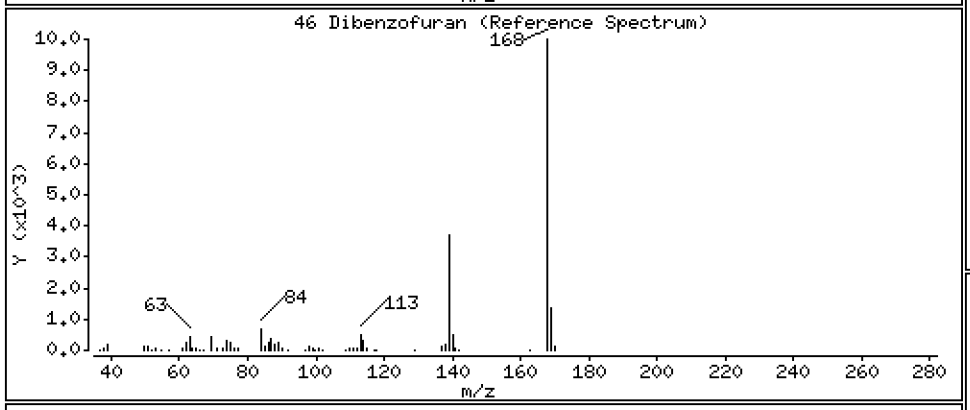
Column diameter: 0.25

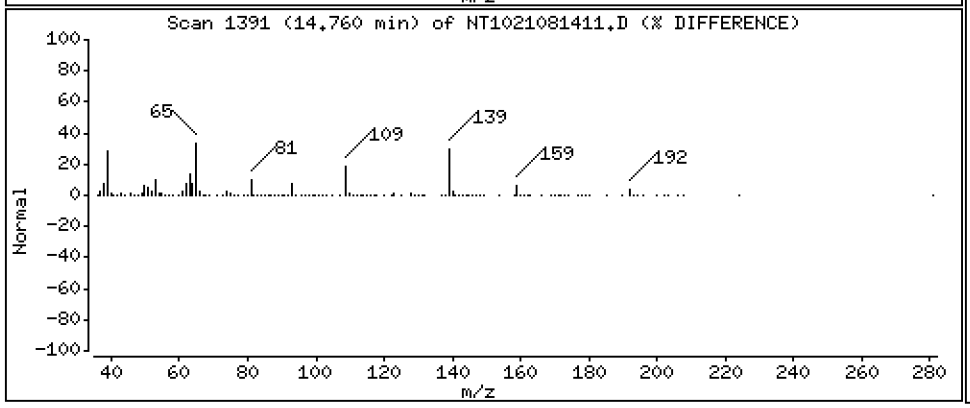
46 Dibenzofuran

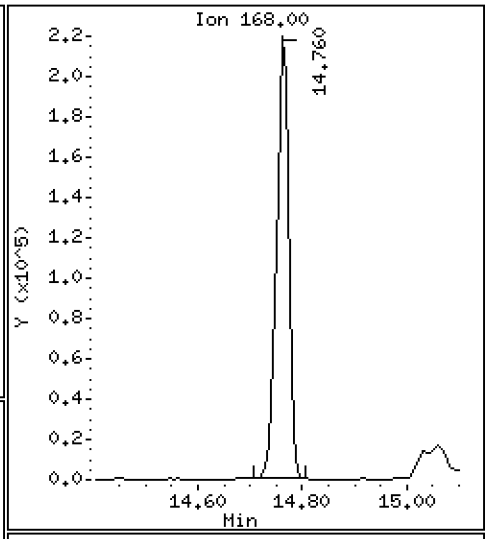
Concentration: 4.295 ug/mL

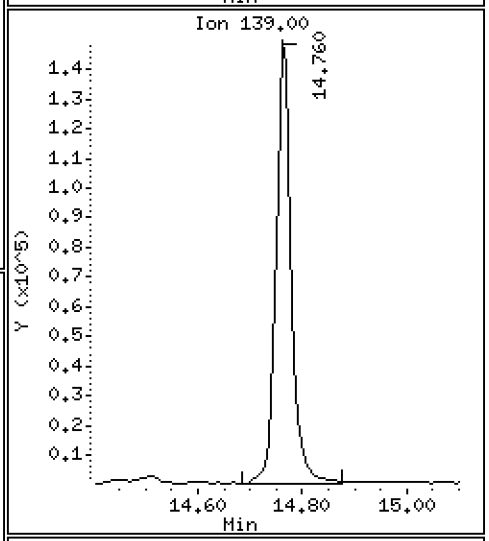


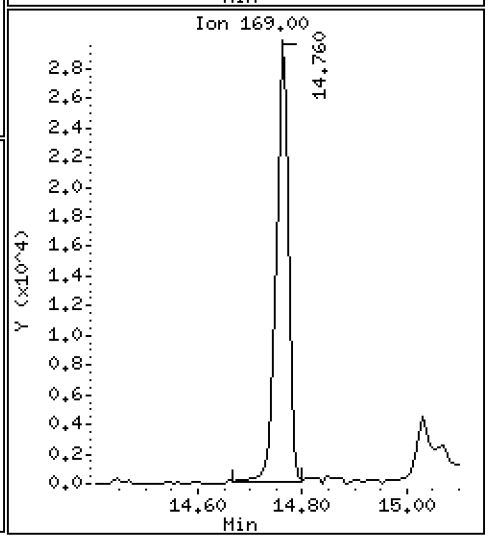












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

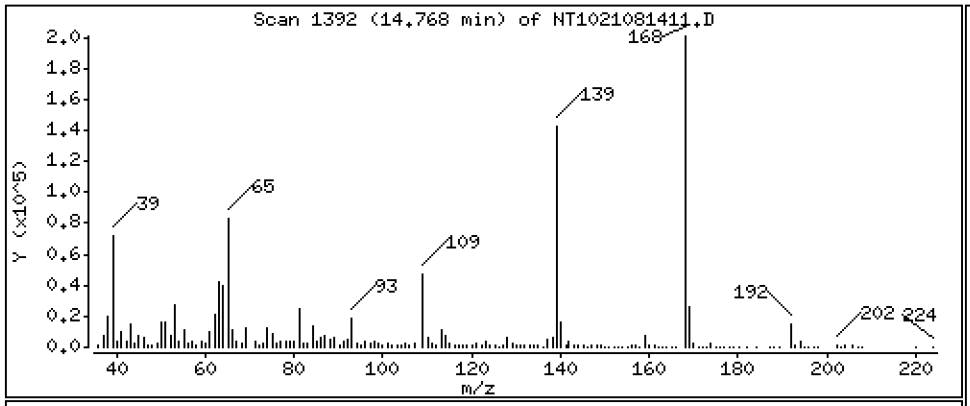
Operator: VTS

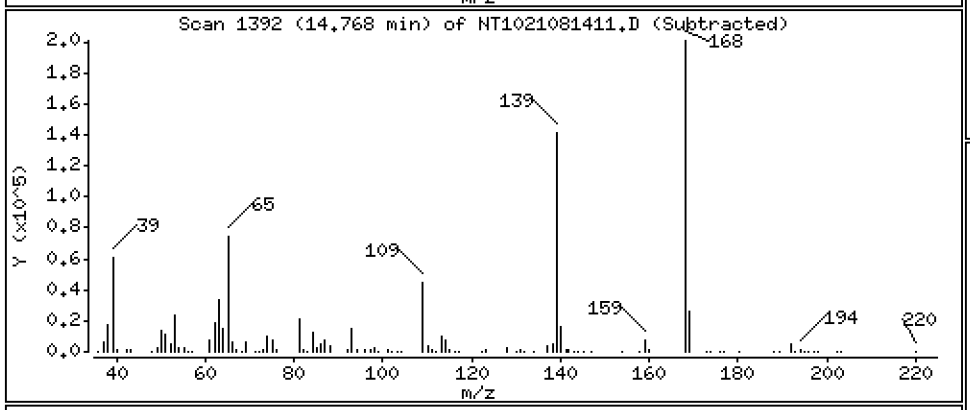
Column phase: ZB-5msi

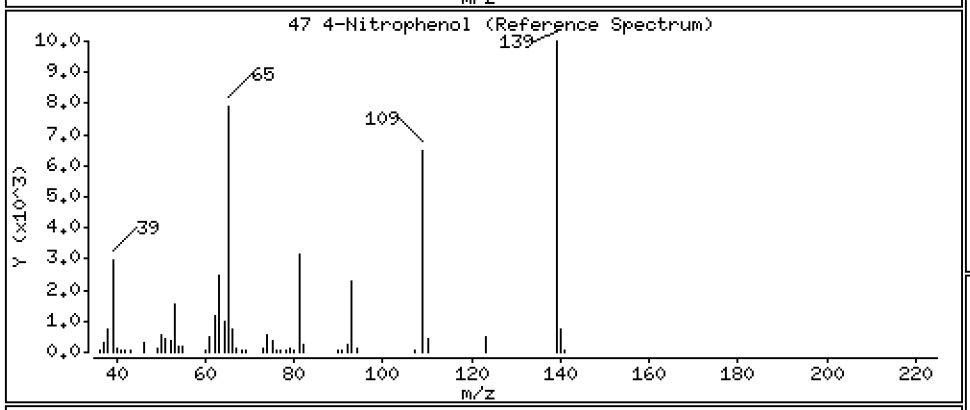
Column diameter: 0.25

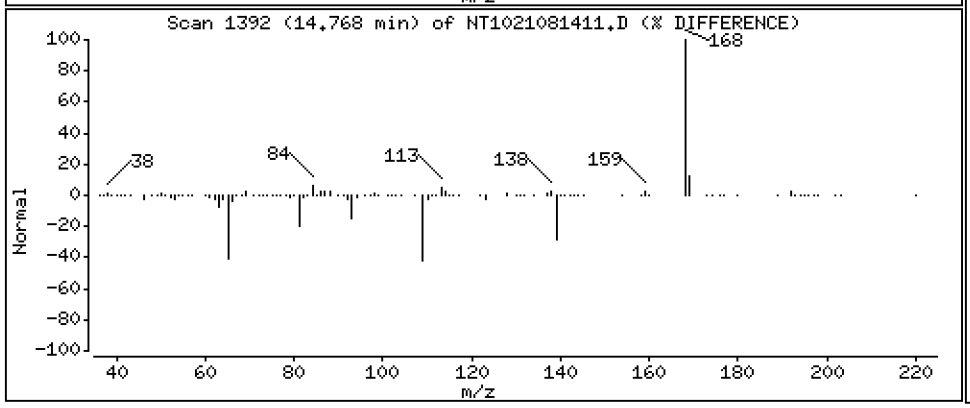
47 4-Nitrophenol

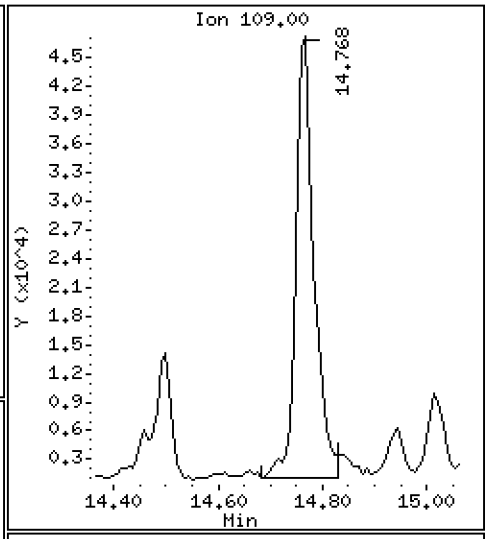
Concentration: 16.42 ug/mL

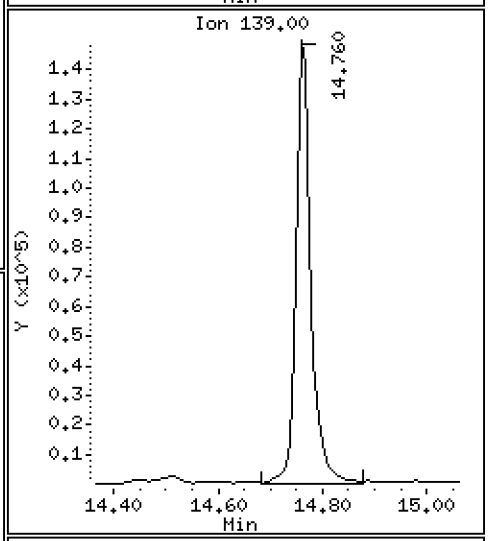


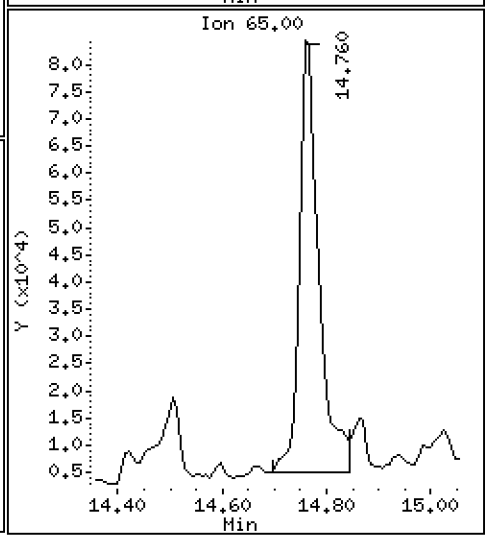












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

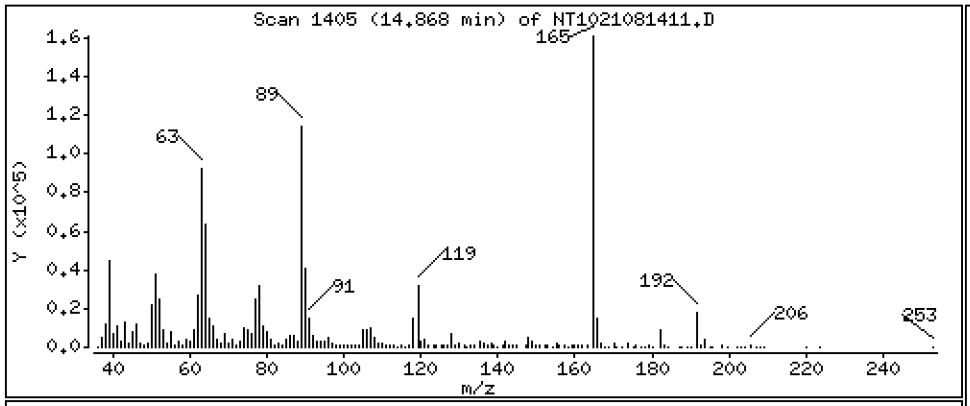
Operator: VTS

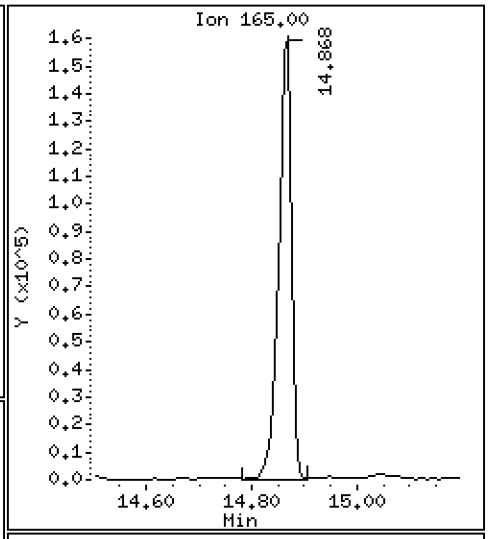
Column phase: ZB-5msi

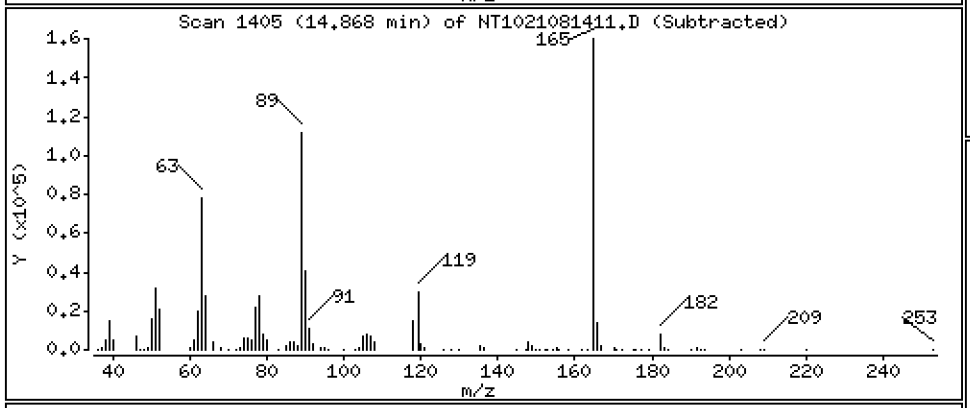
Column diameter: 0.25

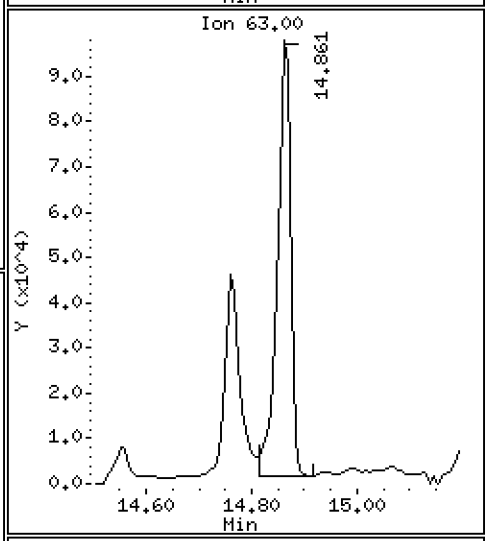
48 2,4-Dinitrotoluene

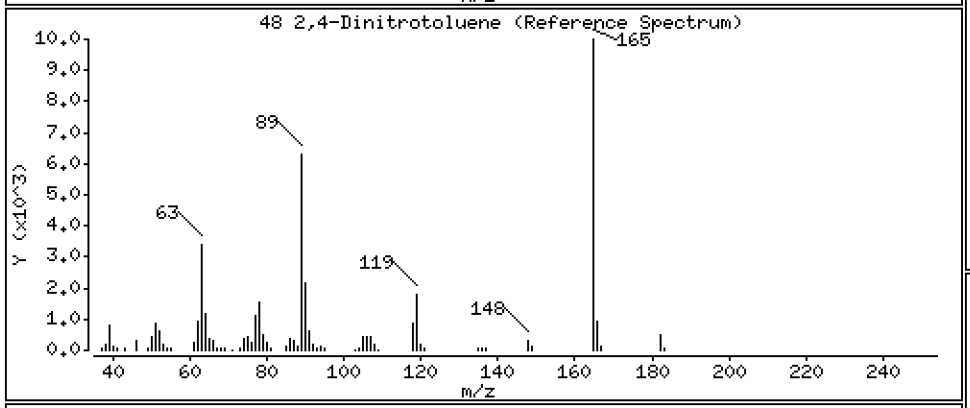
Concentration: 14.37 ug/mL

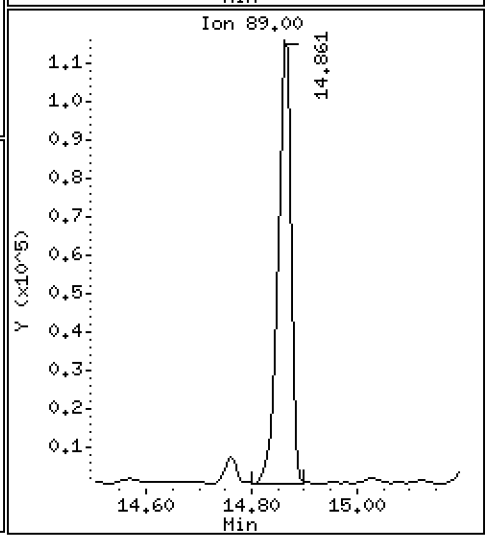


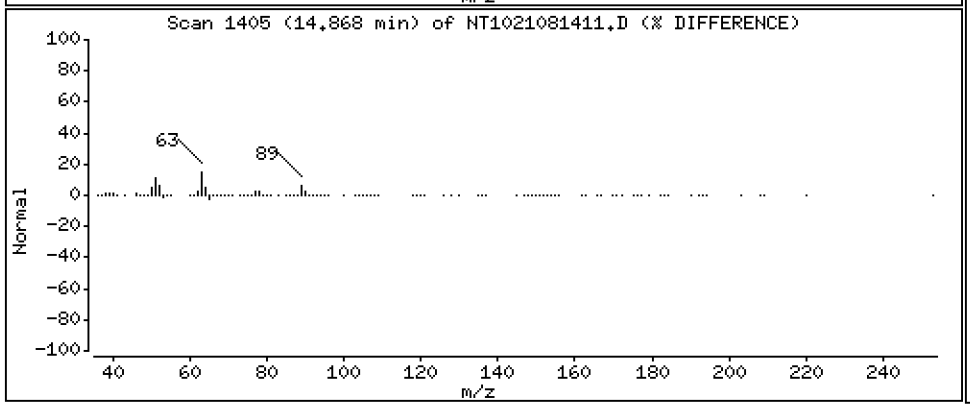












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081411.D

Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

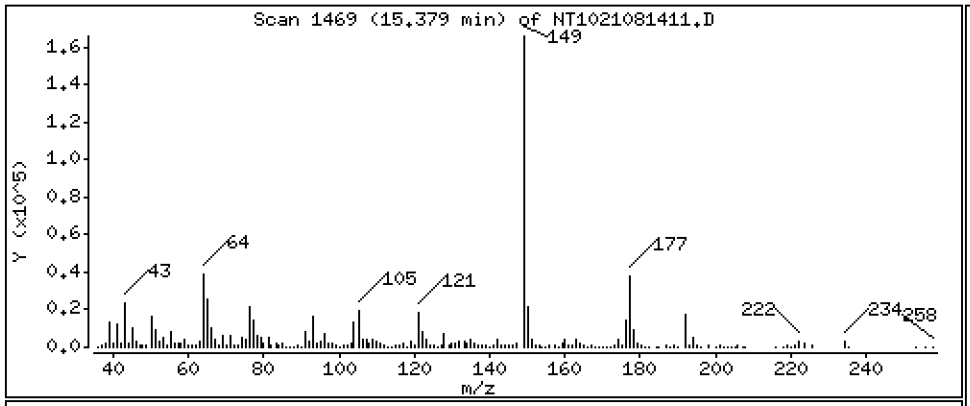
Operator: VTS

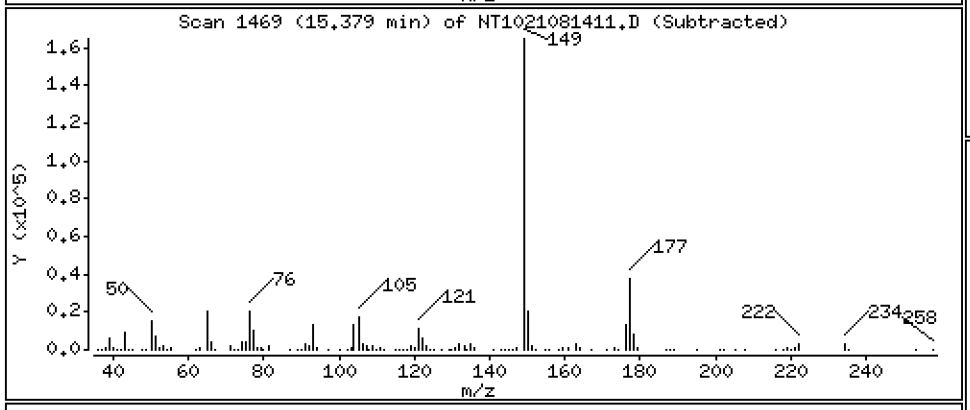
Column phase: ZB-5msi

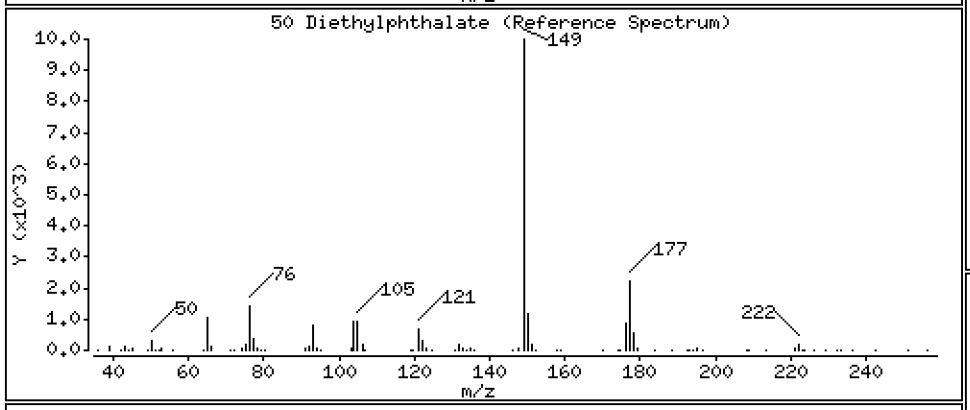
Column diameter: 0.25

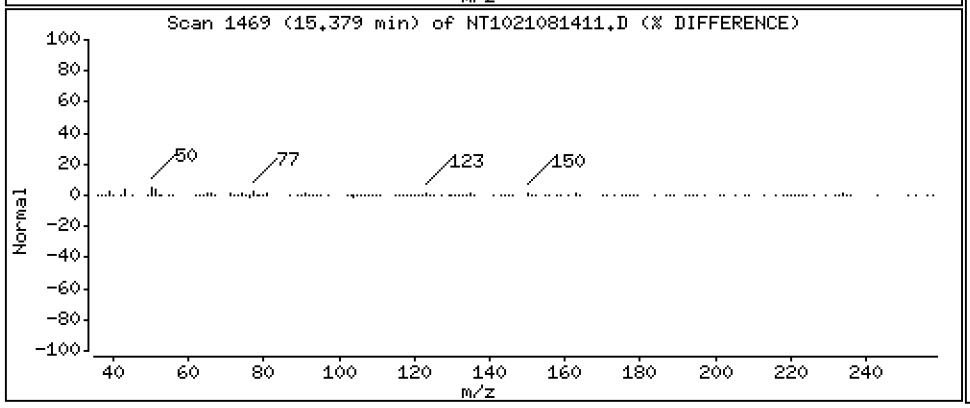
50 Diethylphthalate

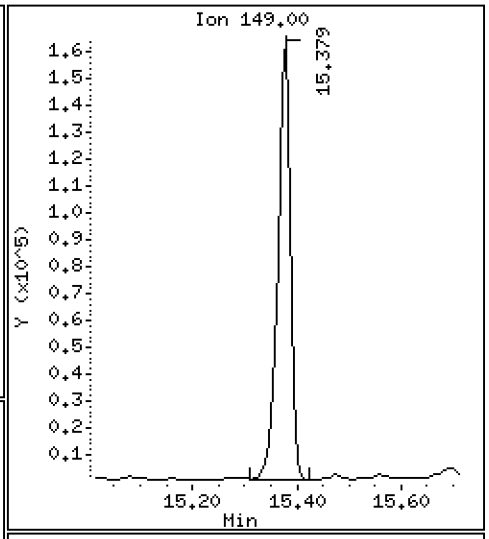
Concentration: 4.623 ug/mL

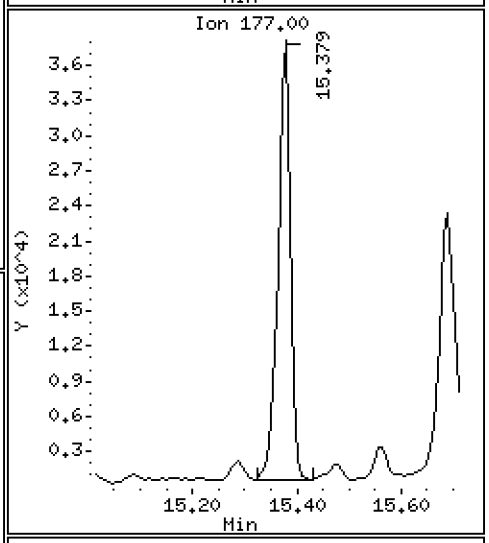


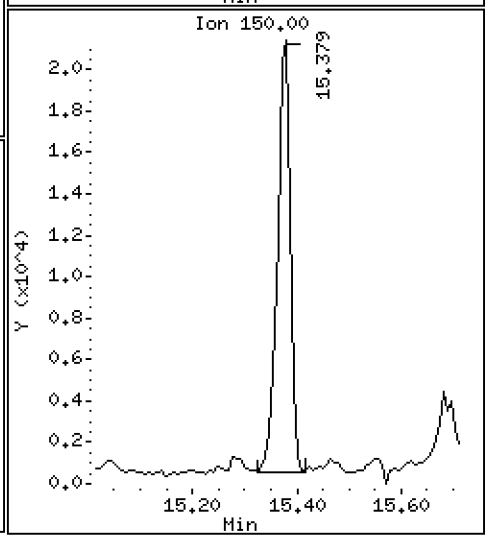












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

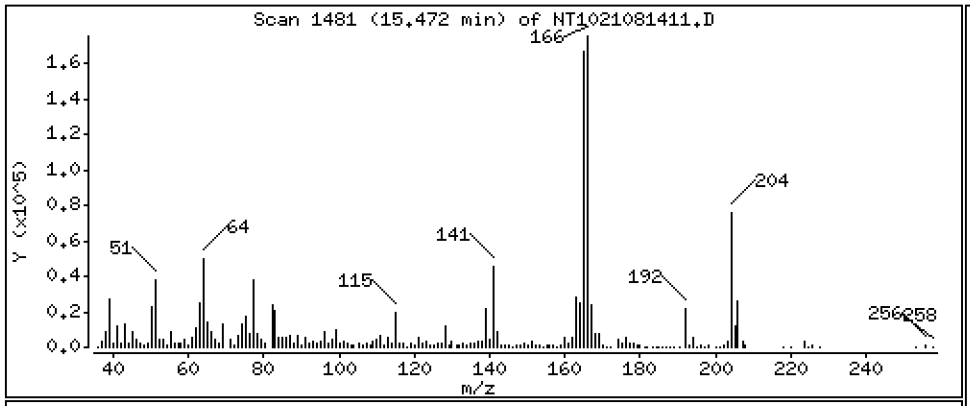
Operator: VTS

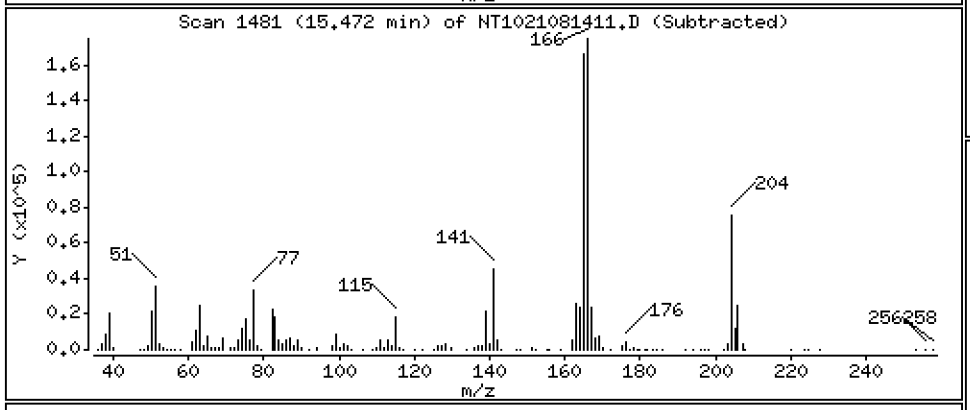
Column phase: ZB-5msi

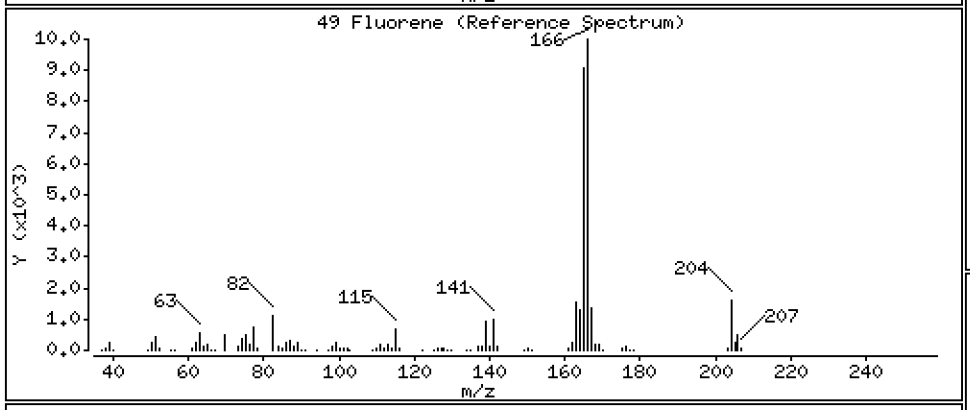
Column diameter: 0.25

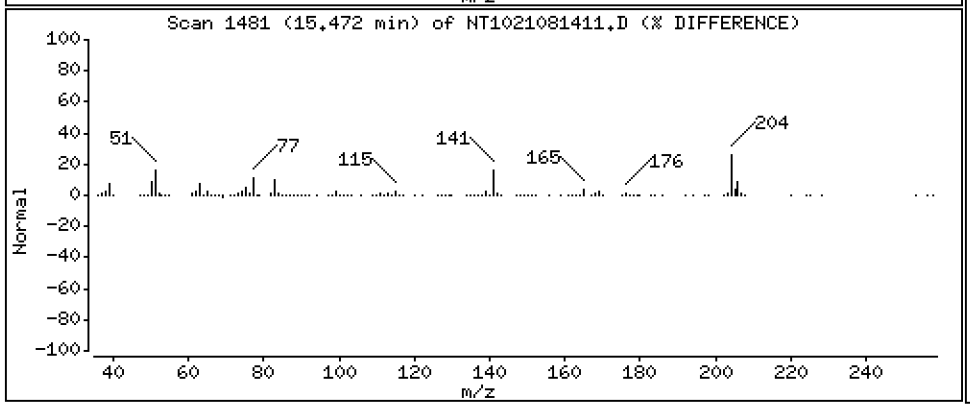
49 Fluorene

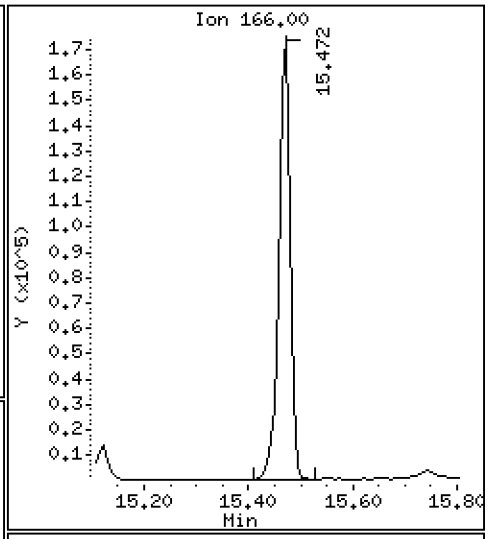
Concentration: 3.938 ug/mL

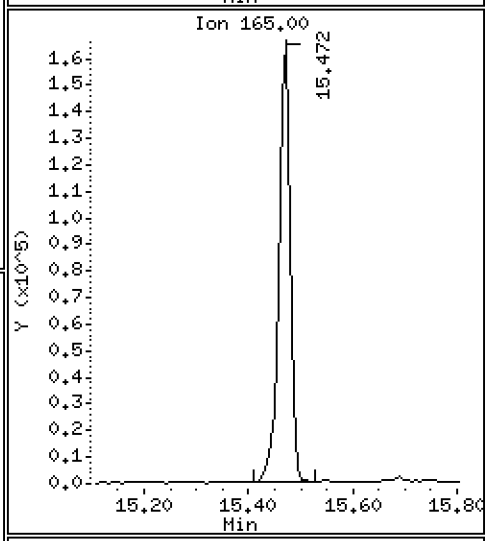


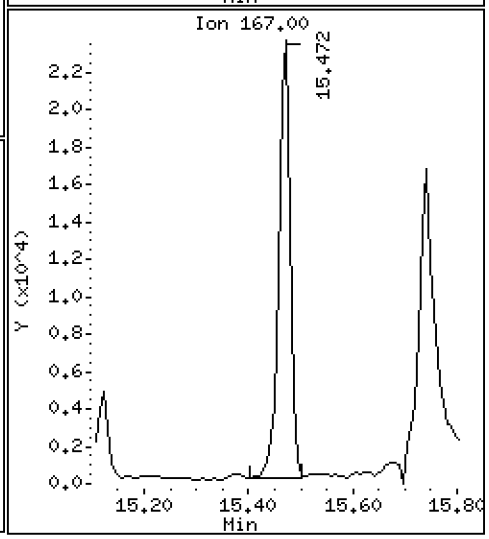












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

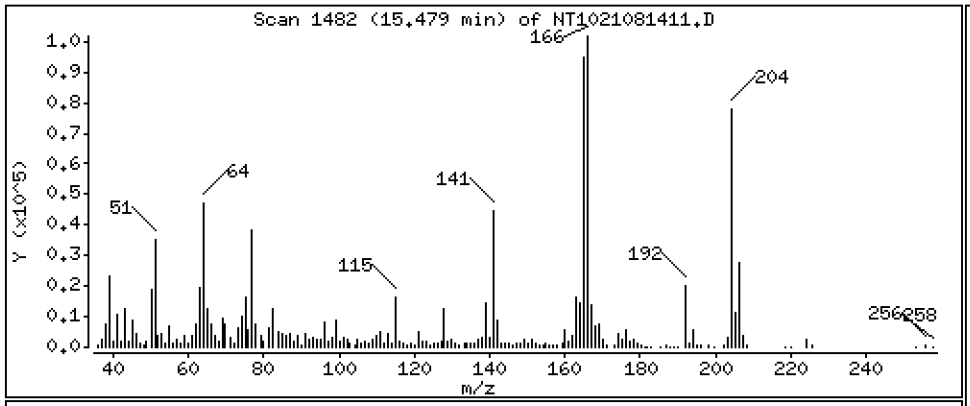
Operator: VTS

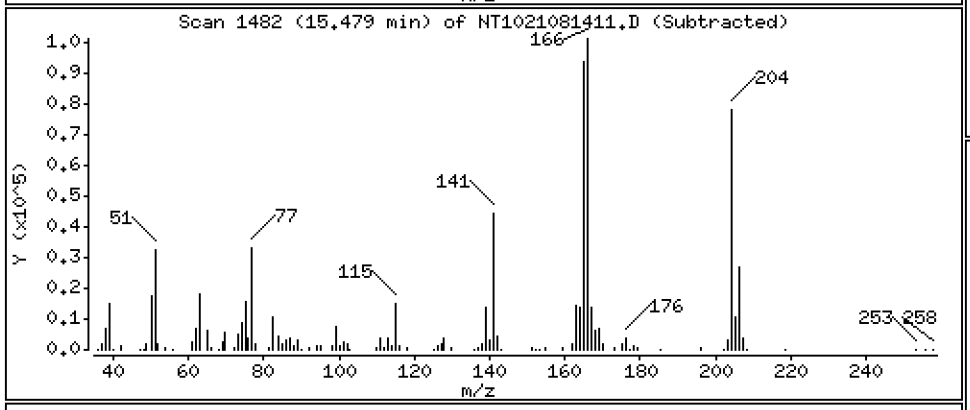
Column phase: ZB-5msi

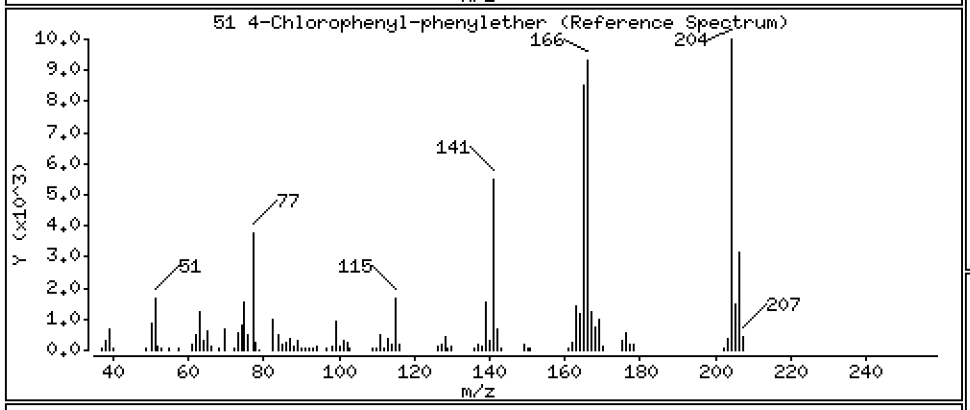
Column diameter: 0.25

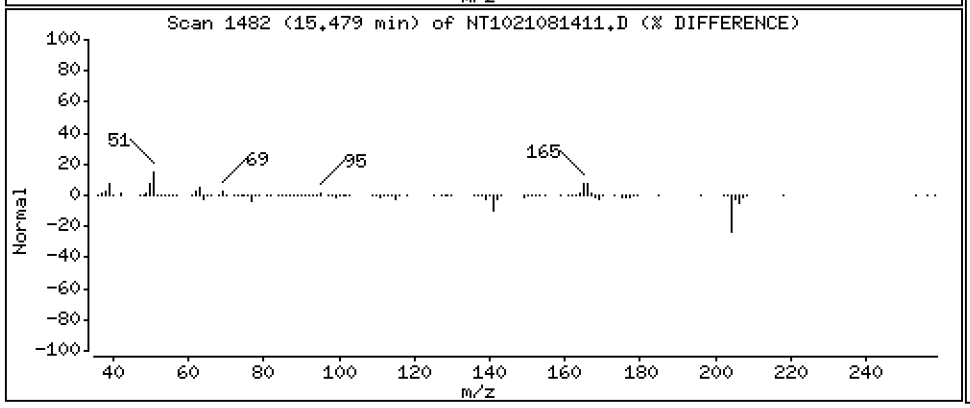
51 4-Chlorophenyl-phenylether

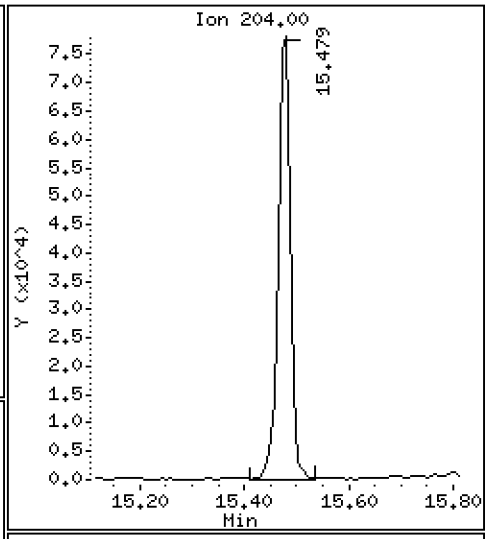
Concentration: 3.228 ug/mL

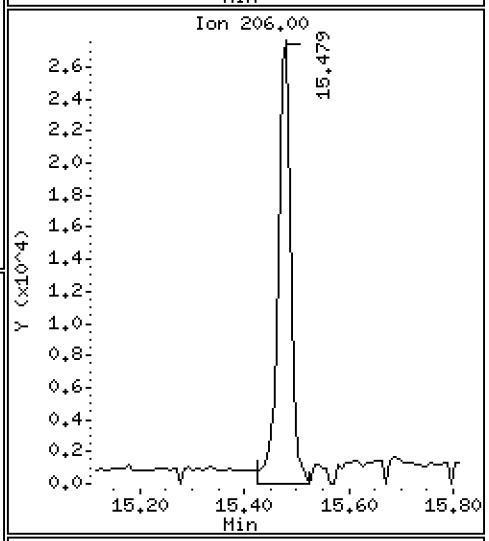


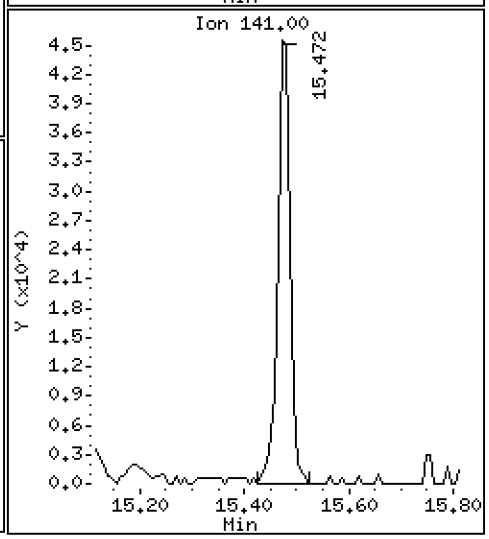












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081411.D

Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

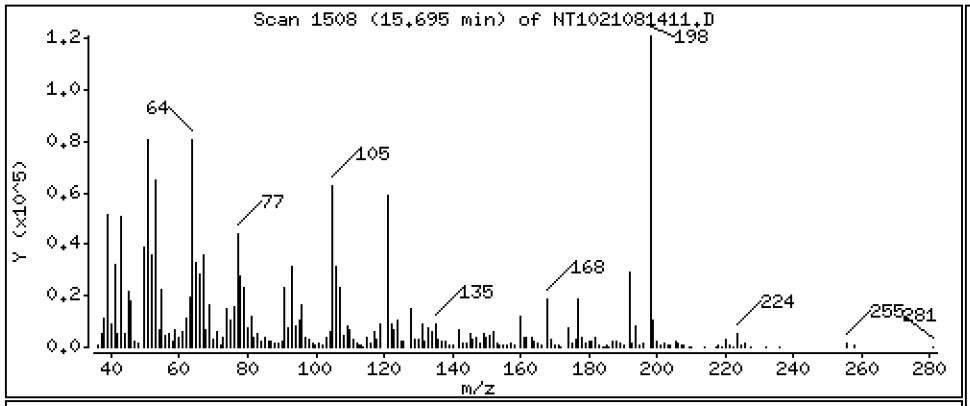
Operator: VTS

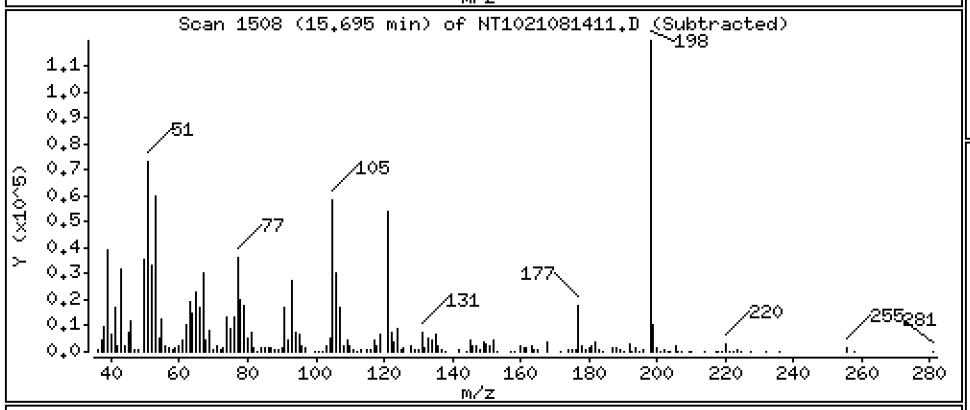
Column phase: ZB-5msi

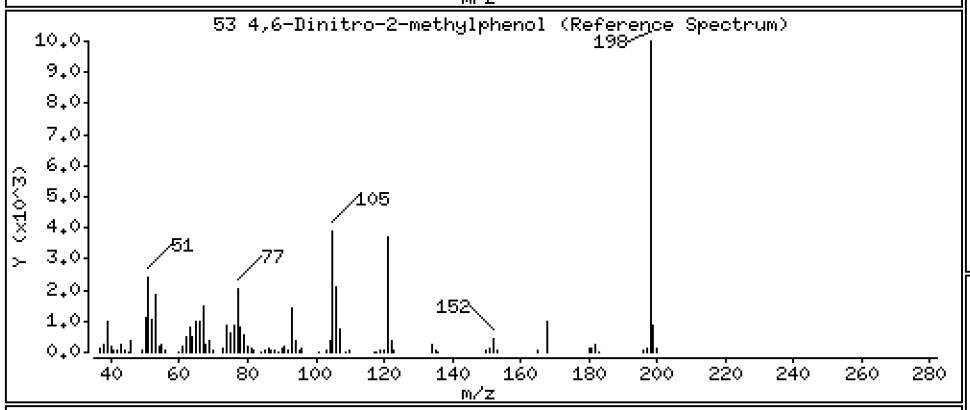
Column diameter: 0.25

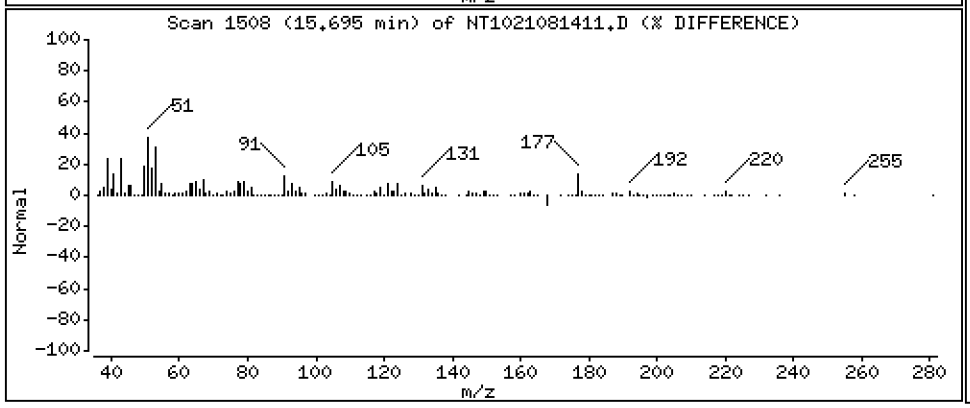
53 4,6-Dinitro-2-methylphenol

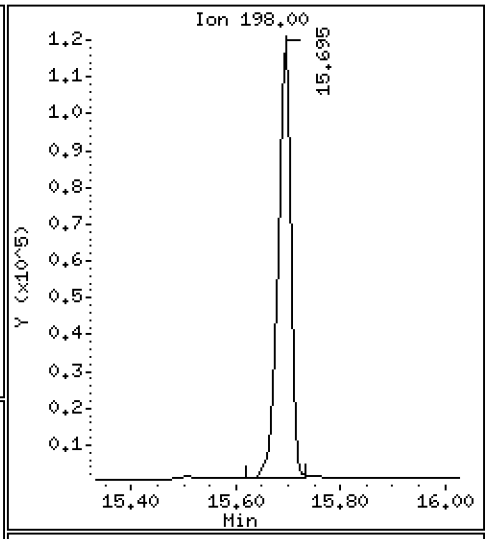
Concentration: 14.07 ug/mL

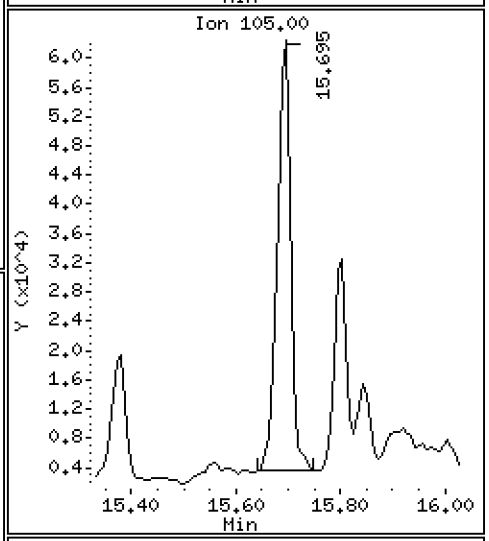


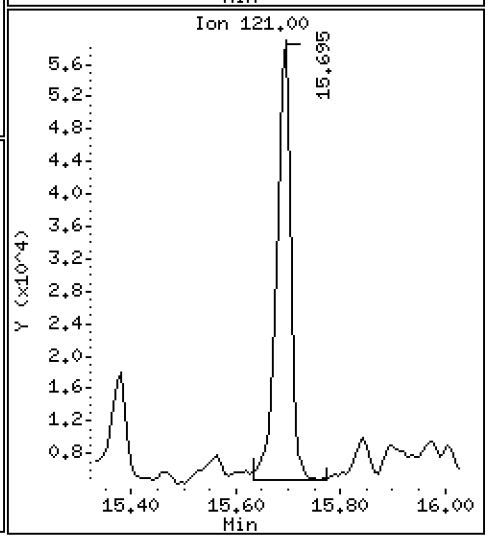












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

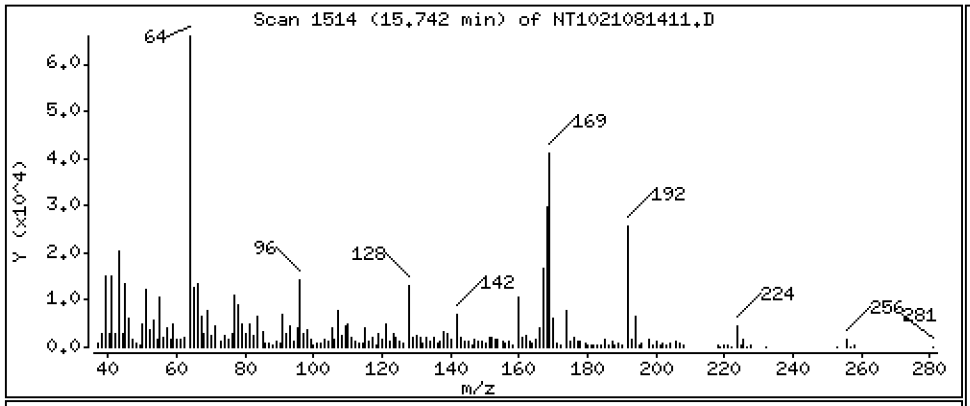
Operator: VTS

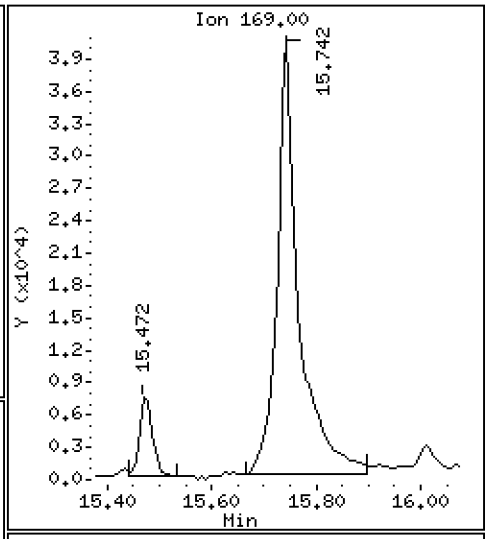
Column phase: ZB-5msi

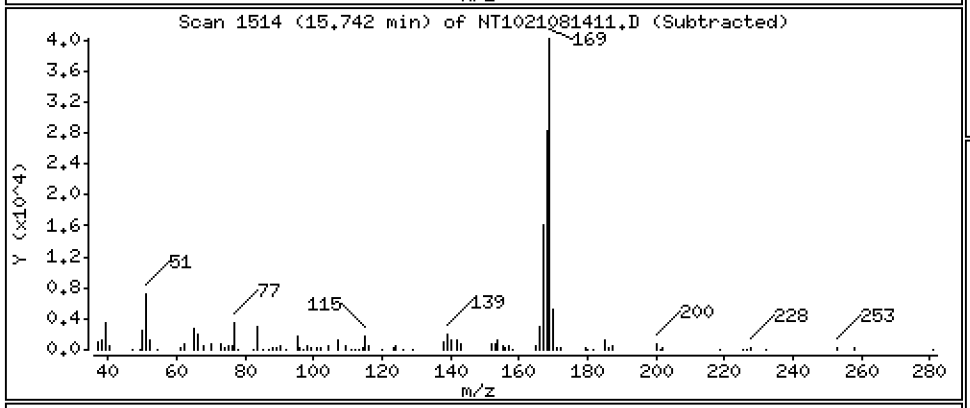
Column diameter: 0.25

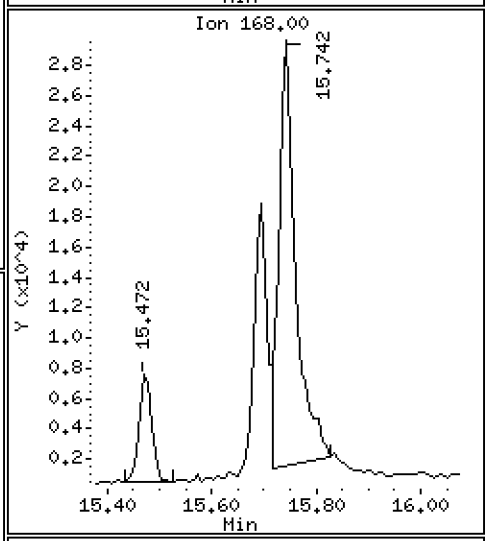
54 N-Nitrosodiphenylamine

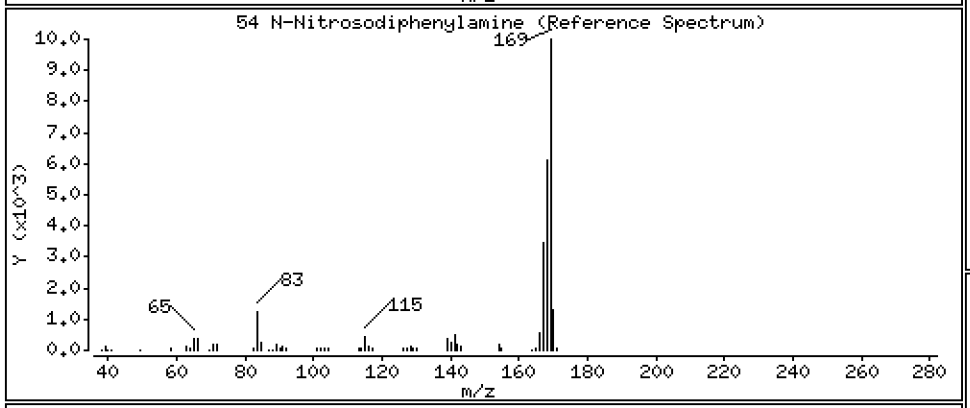
Concentration: 2.085 ug/mL

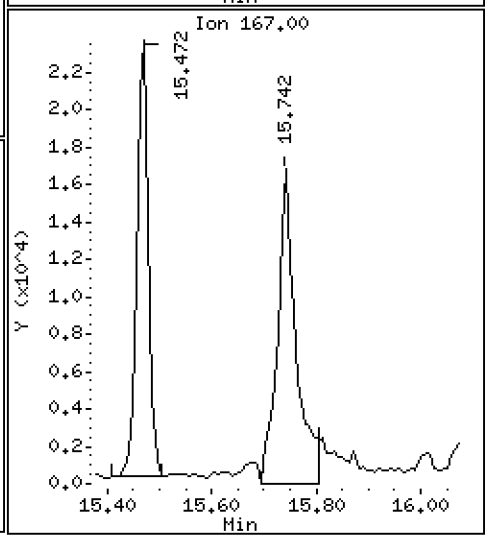


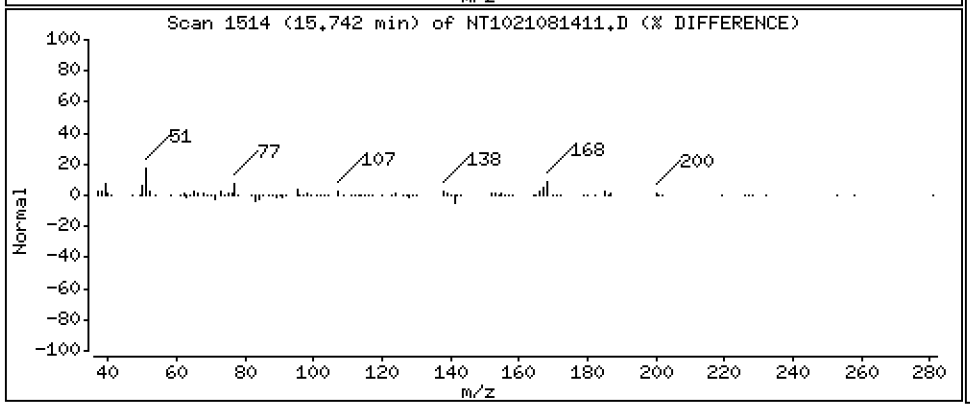












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

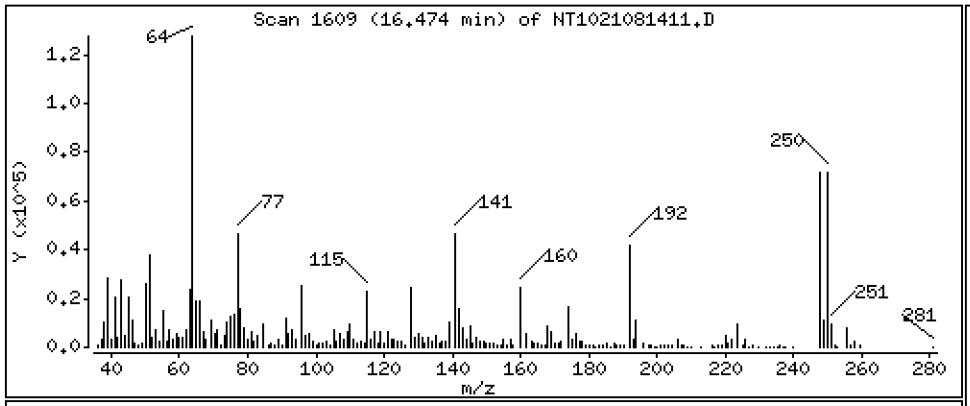
Operator: VTS

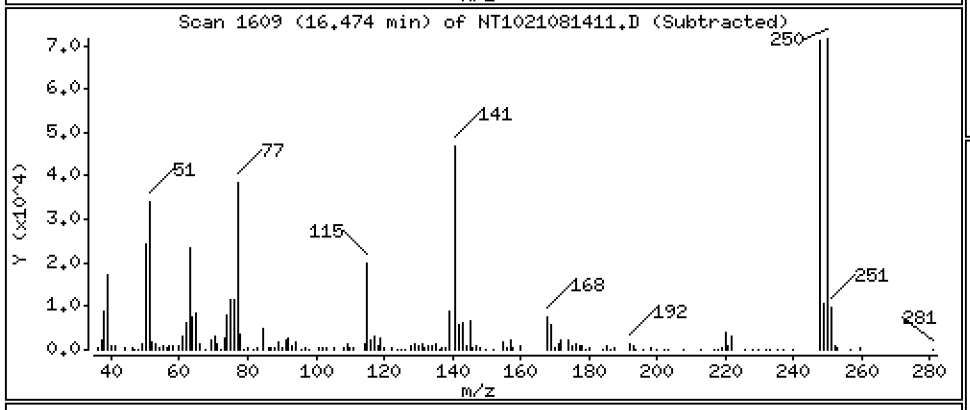
Column phase: ZB-5msi

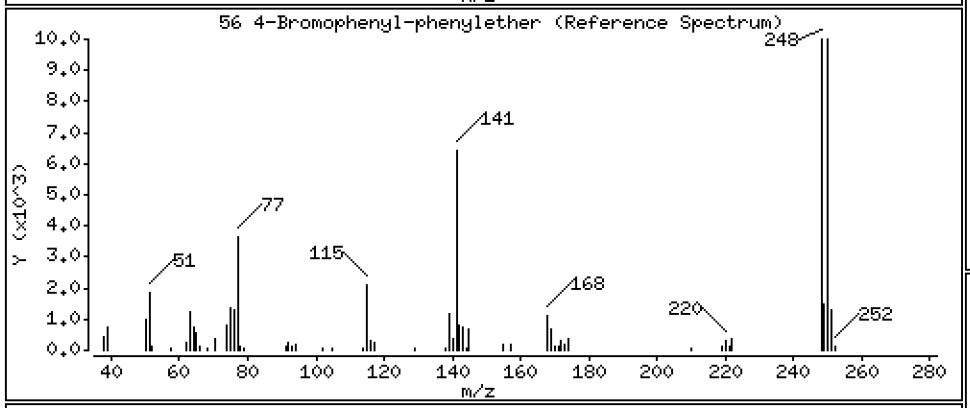
Column diameter: 0.25

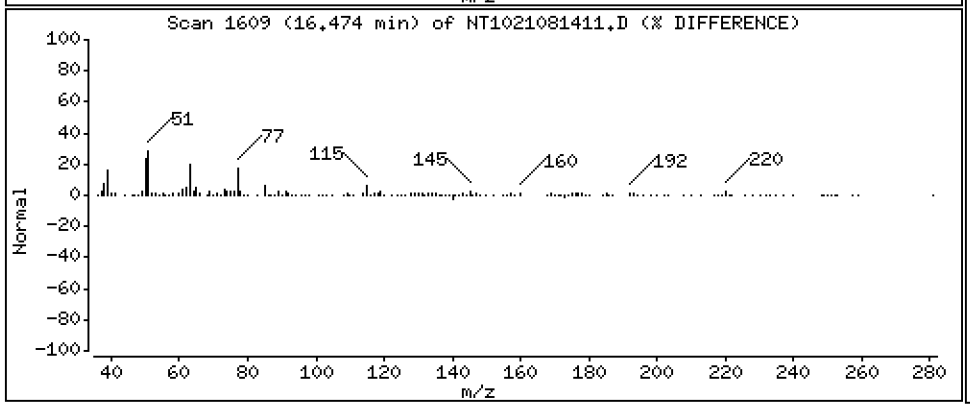
56 4-Bromophenyl-phenylether

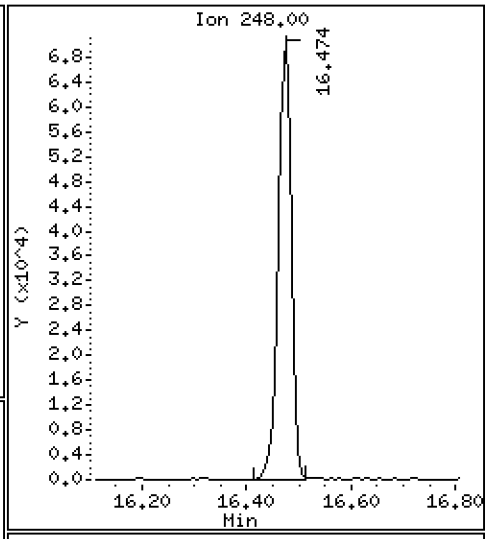
Concentration: 4.102 ug/mL

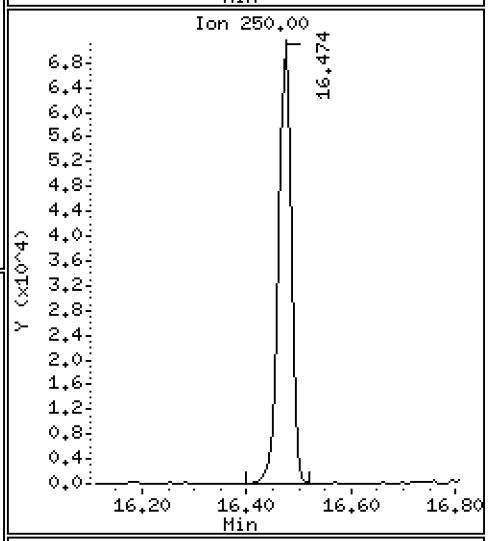


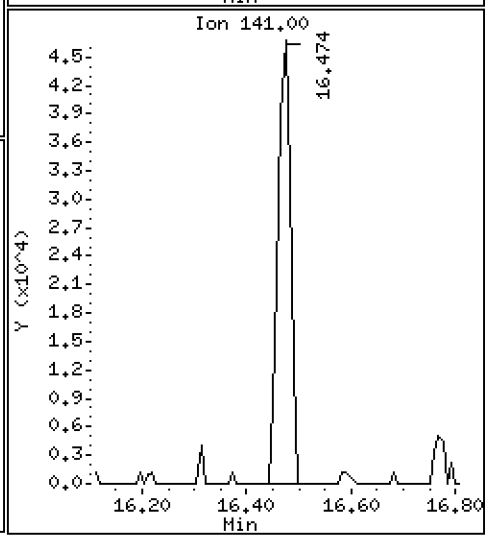












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081411.D

Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

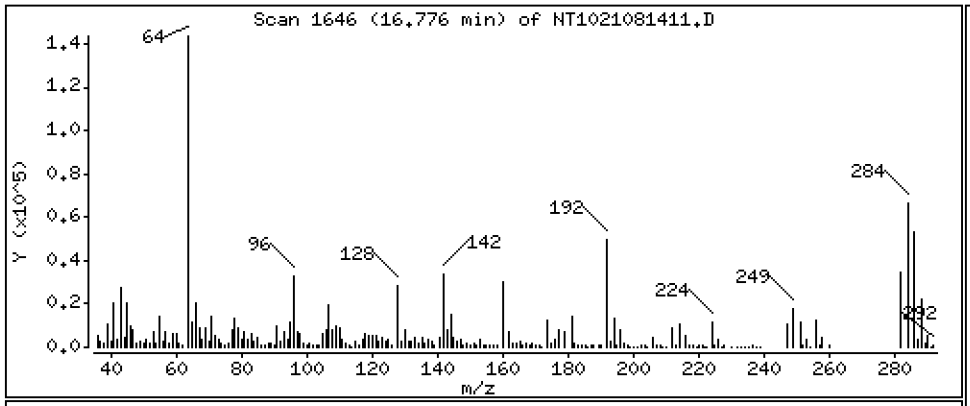
Operator: VTS

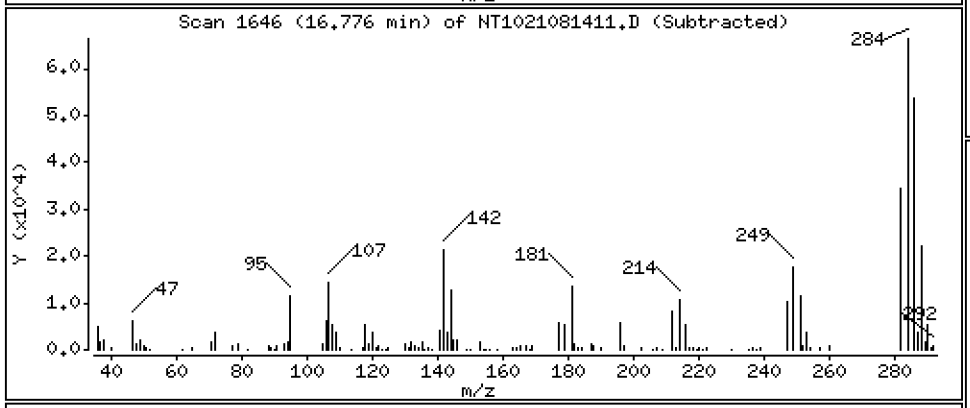
Column phase: ZB-5msi

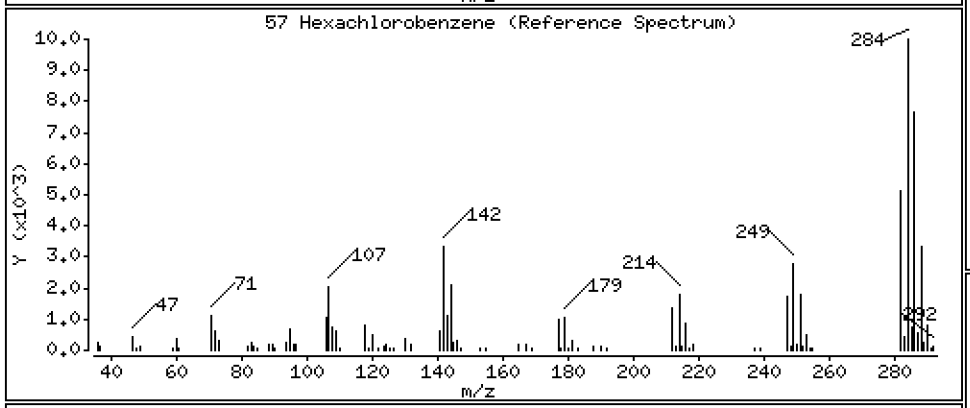
Column diameter: 0.25

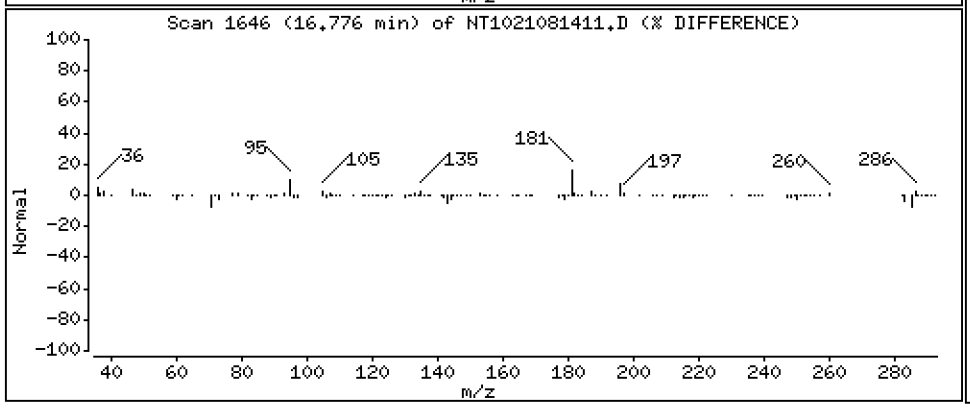
57 Hexachlorobenzene

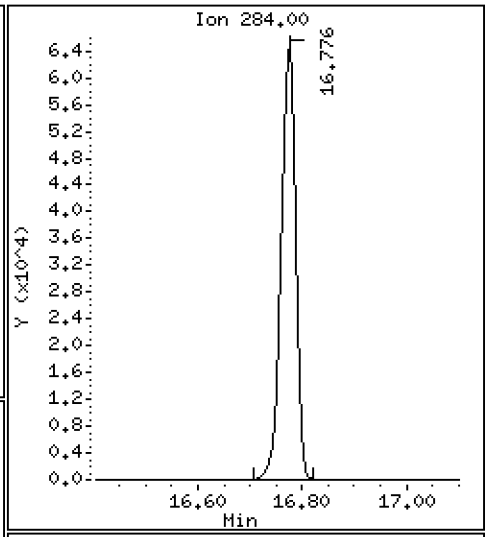
Concentration: 4.124 ug/mL

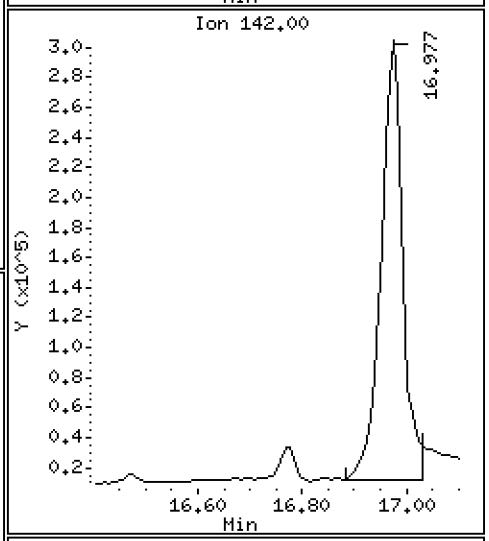


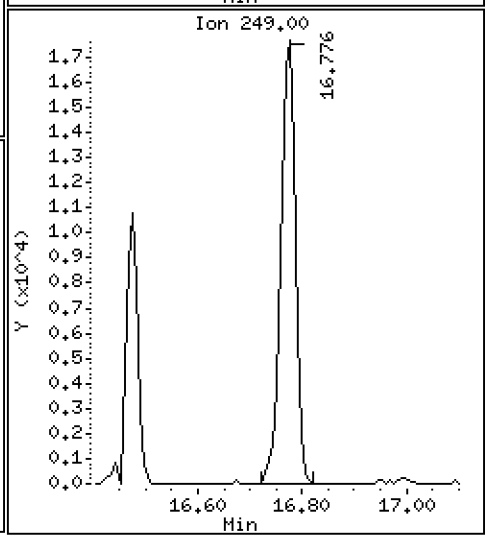












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

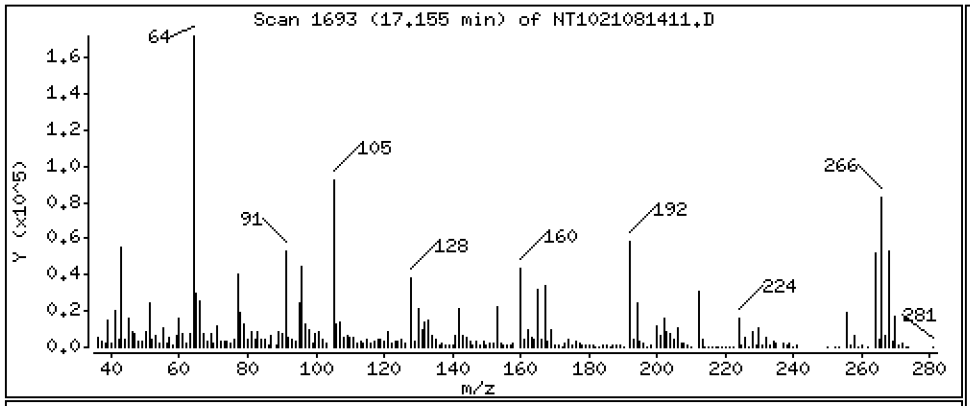
Operator: VTS

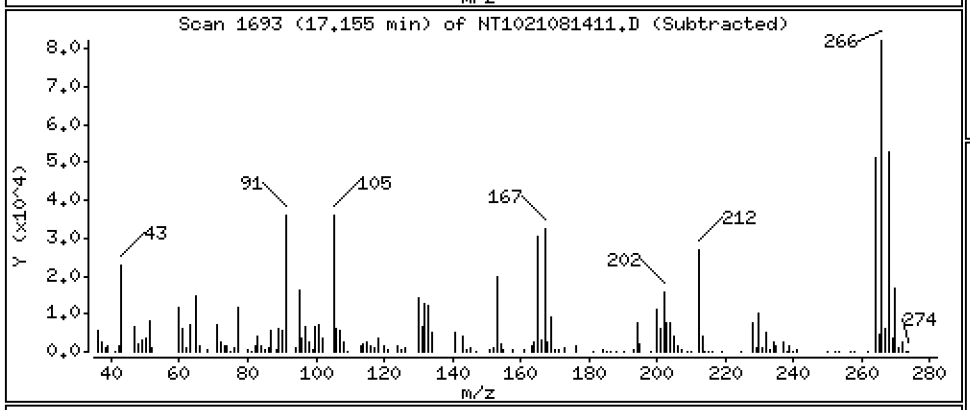
Column phase: ZB-5msi

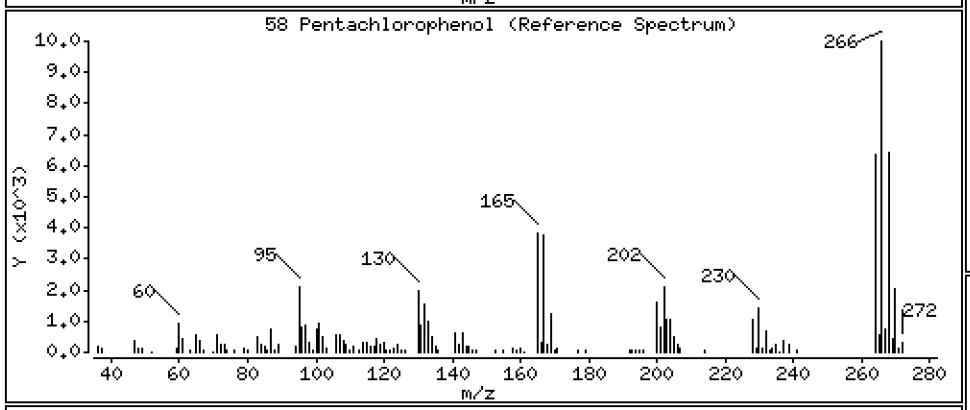
Column diameter: 0.25

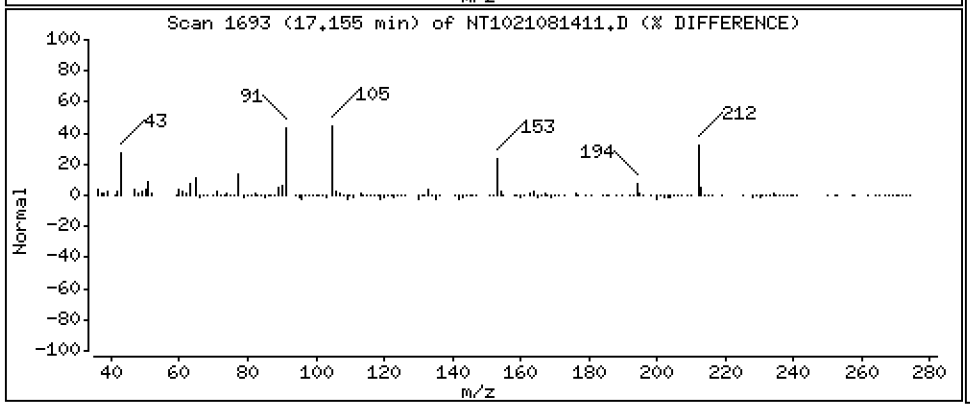
58 Pentachlorophenol

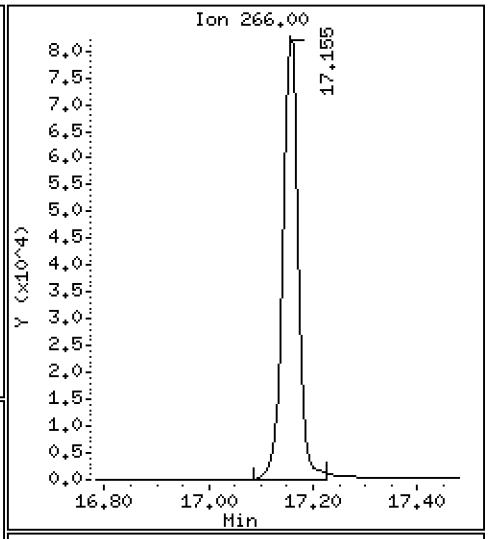
Concentration: 14.19 ug/mL

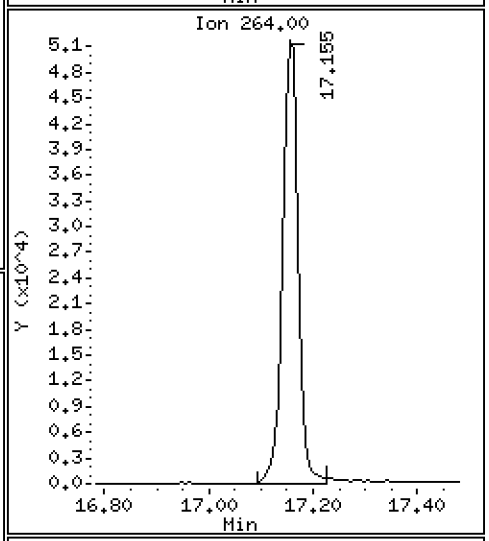


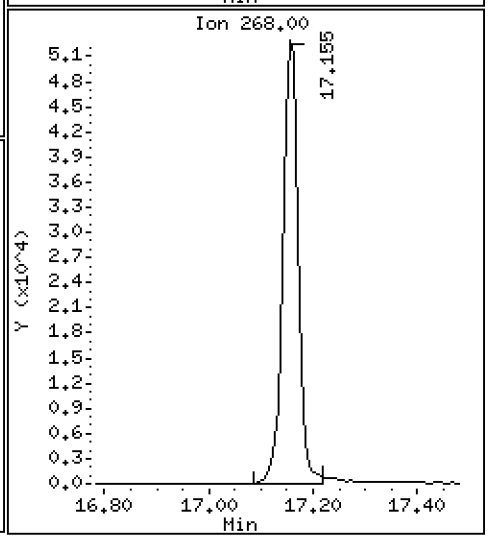












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

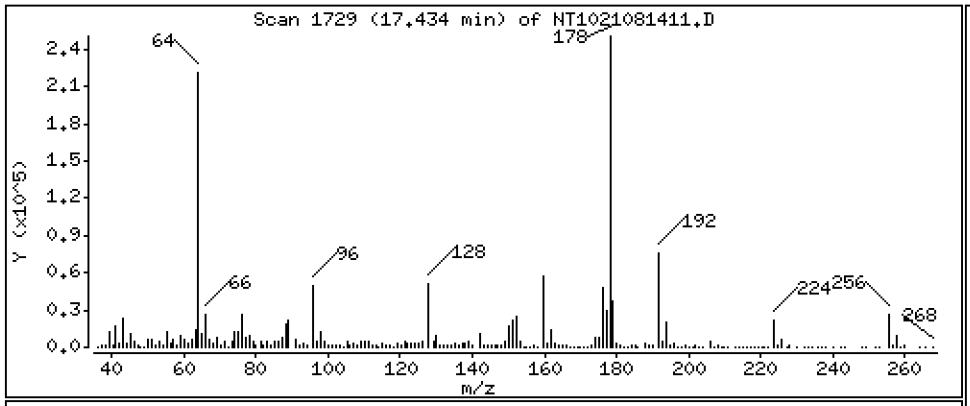
Operator: VTS

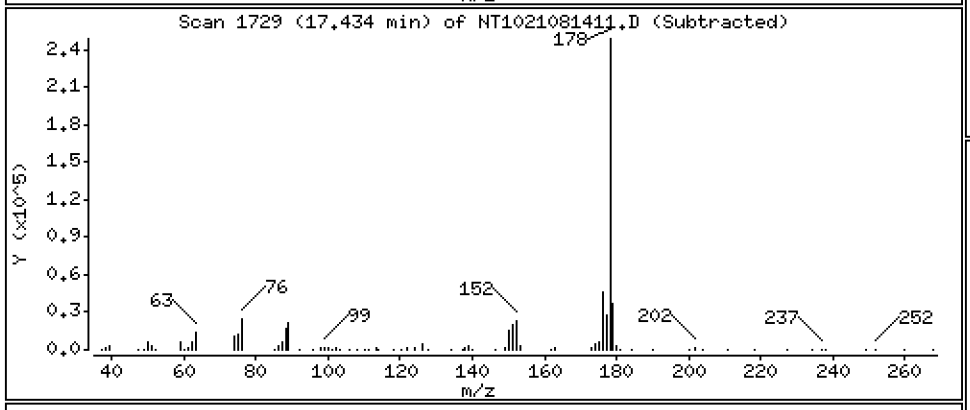
Column phase: ZB-5msi

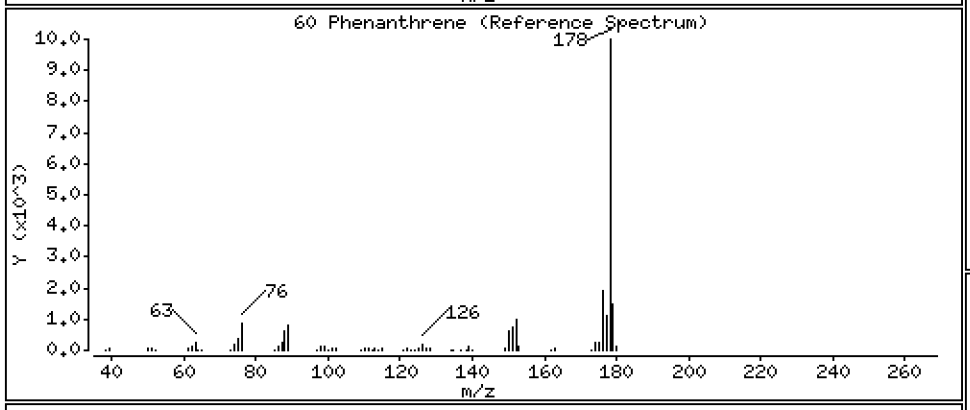
Column diameter: 0.25

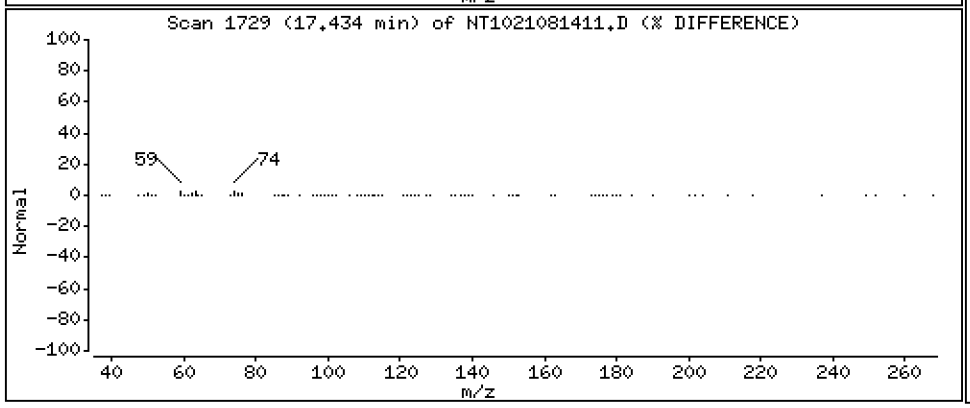
60 Phenanthrene

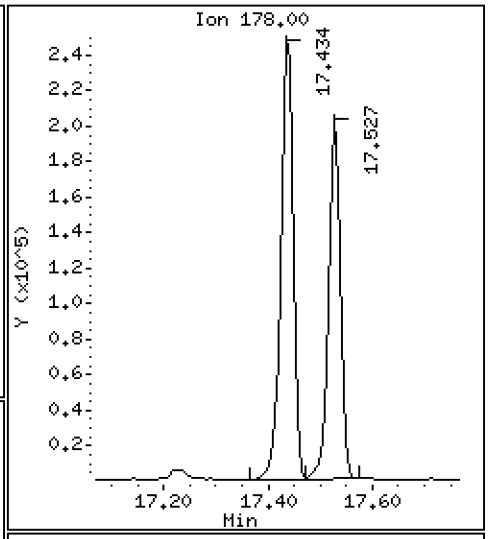
Concentration: 5.040 ug/mL

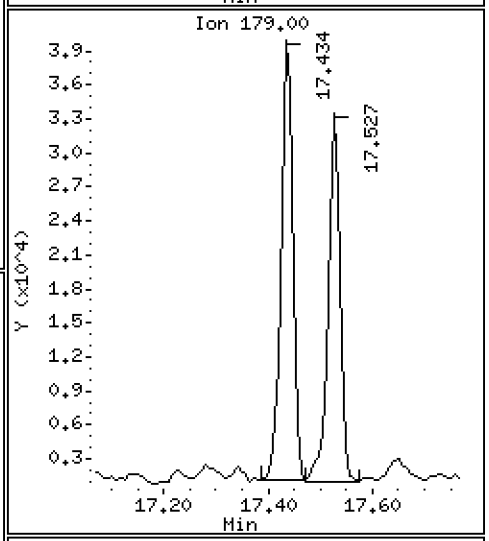


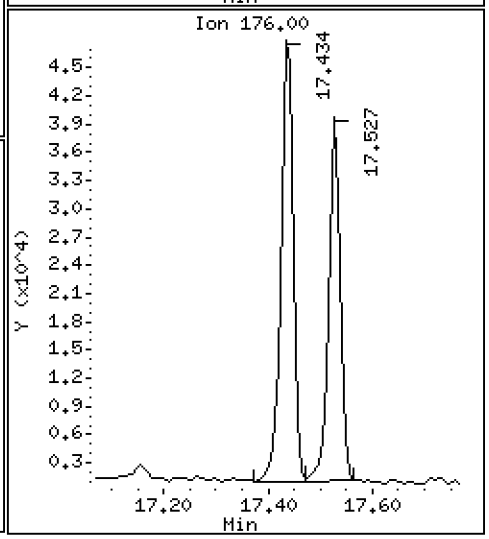












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081411.D

Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

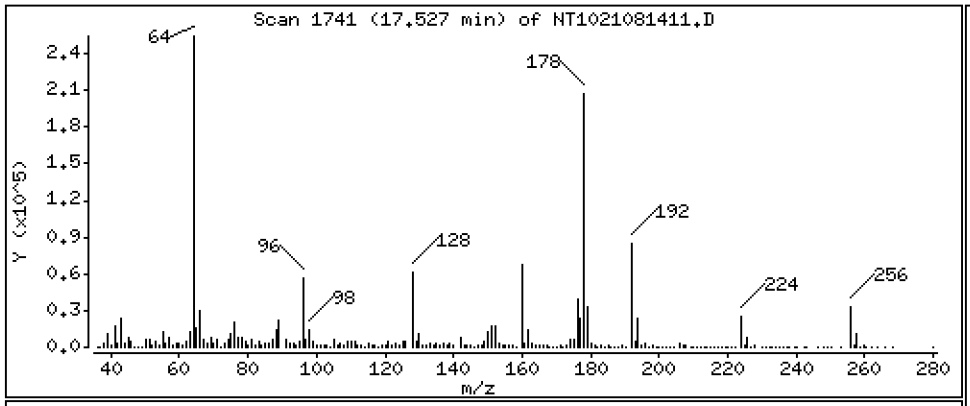
Operator: VTS

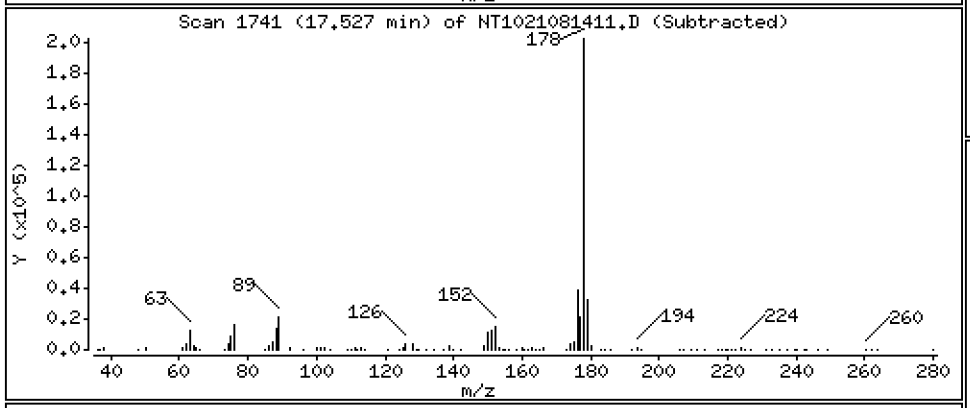
Column phase: ZB-5msi

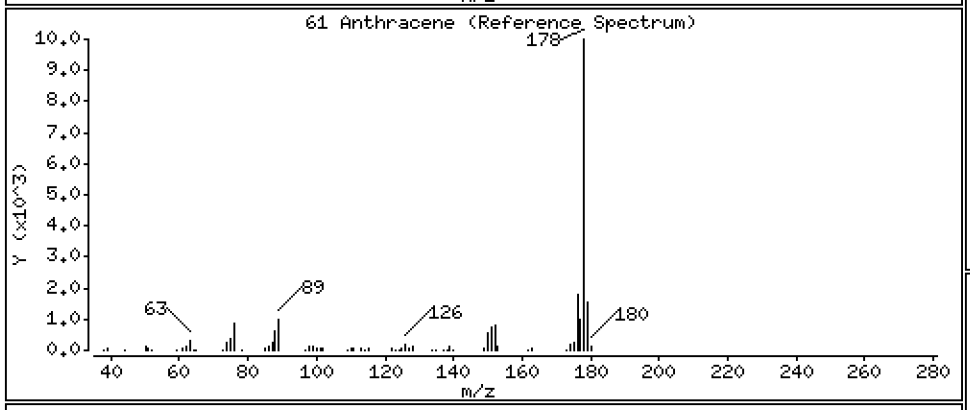
Column diameter: 0.25

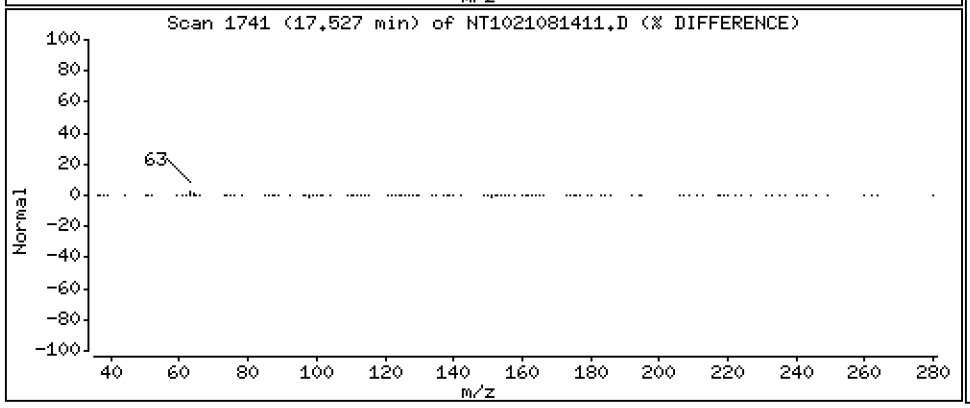
61 Anthracene

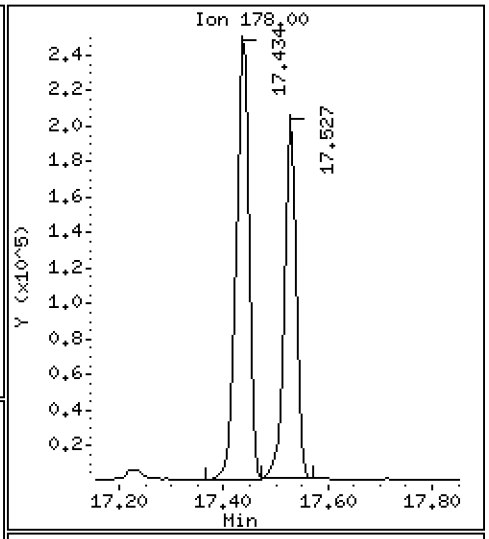
Concentration: 3.700 ug/mL

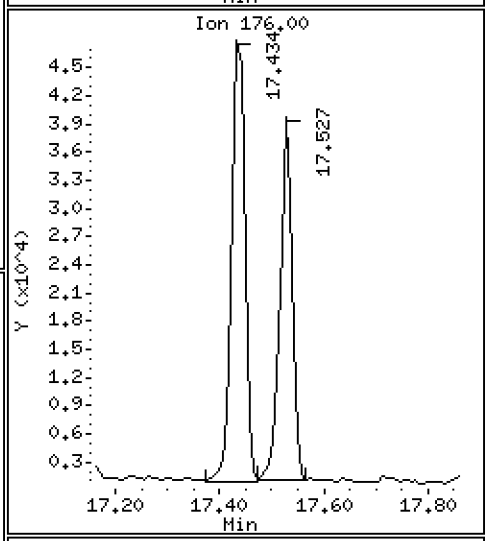


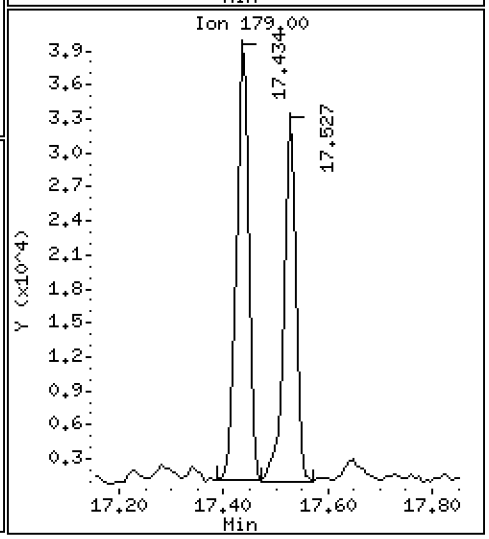












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081411.D

Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

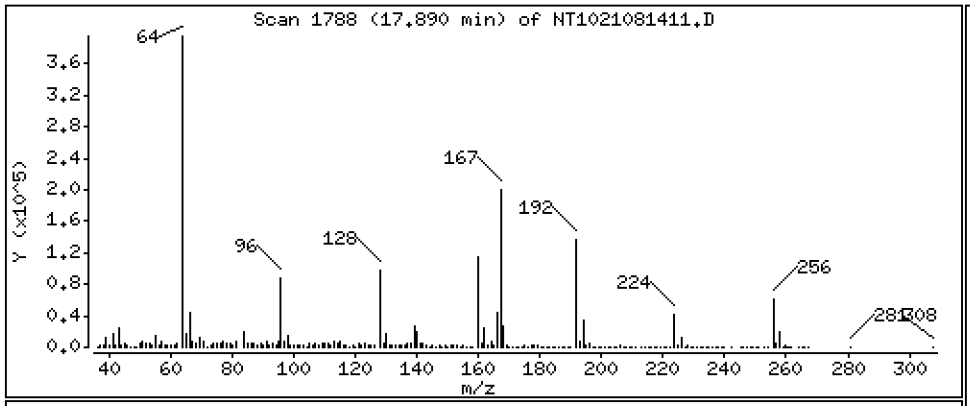
Operator: VTS

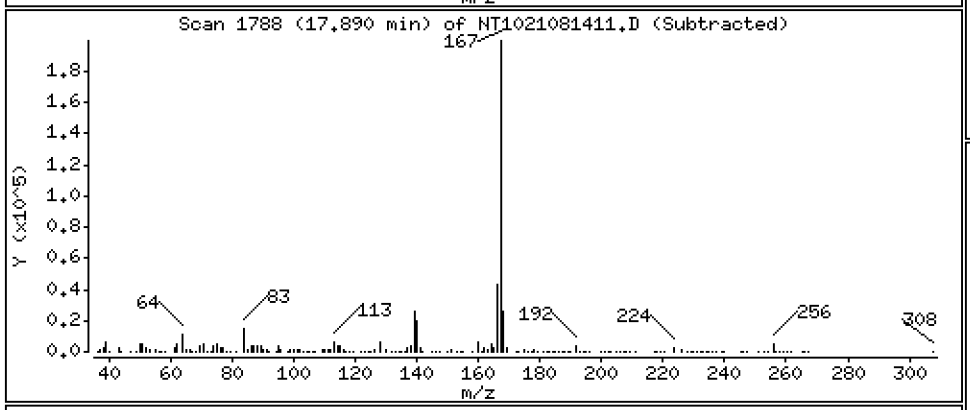
Column phase: ZB-5msi

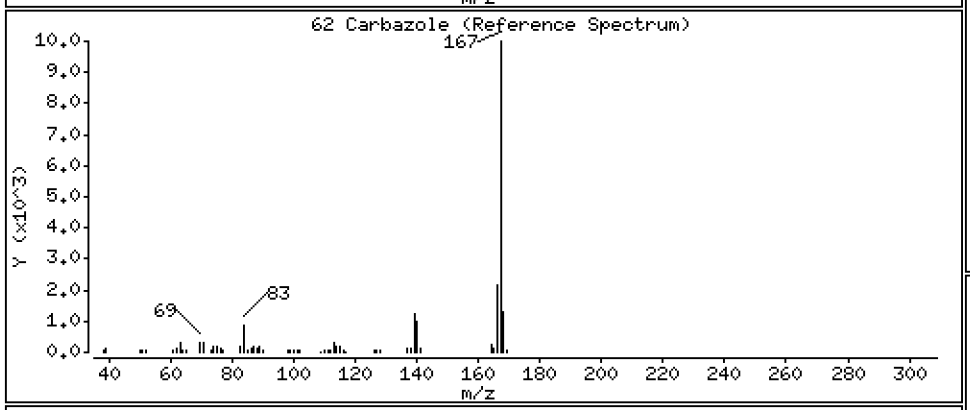
Column diameter: 0.25

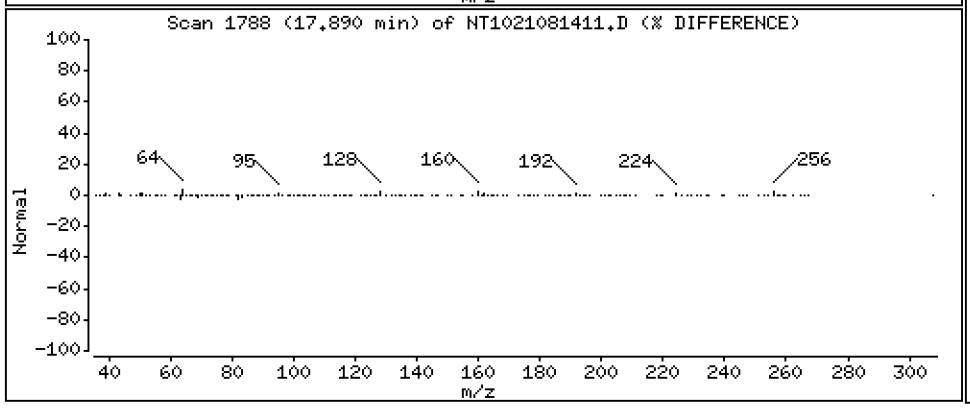
62 Carbazole

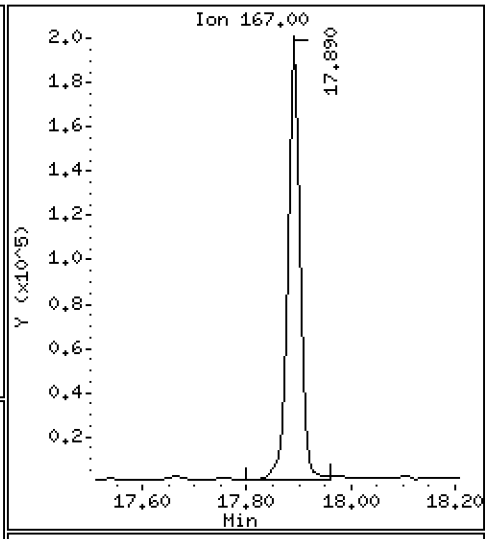
Concentration: 3.800 ug/mL

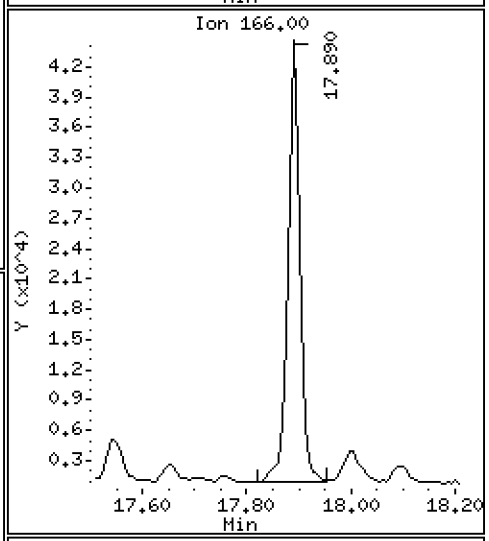


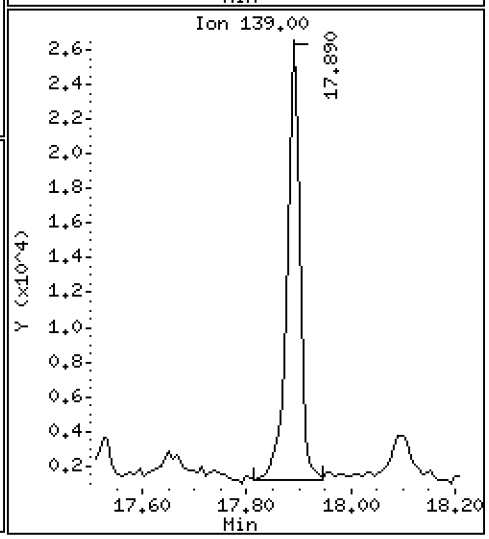












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

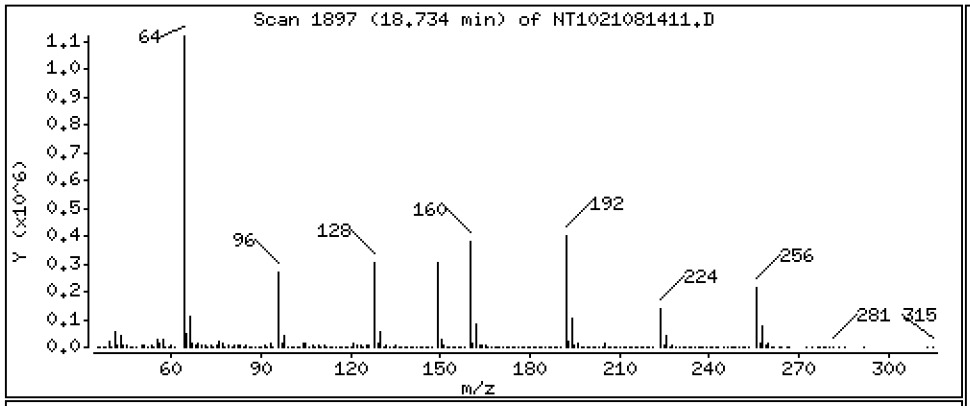
Operator: VTS

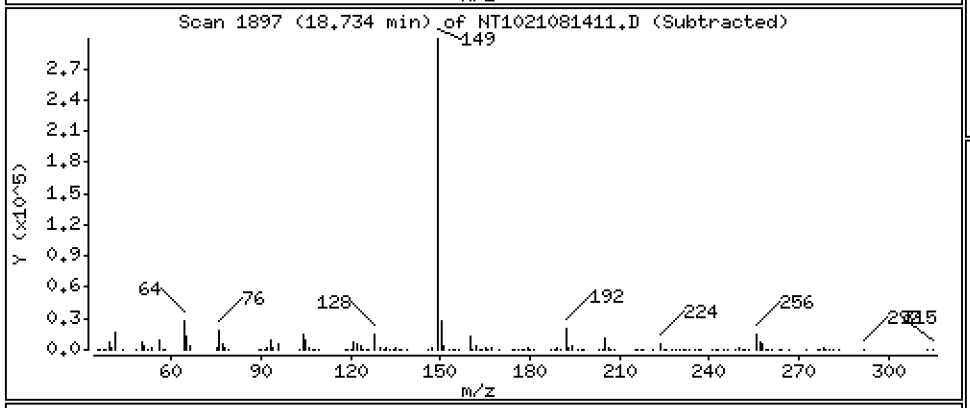
Column phase: ZB-5msi

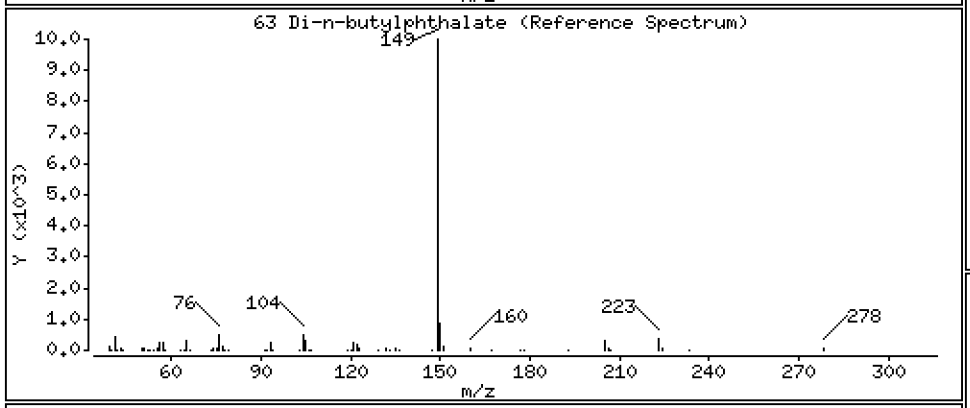
Column diameter: 0.25

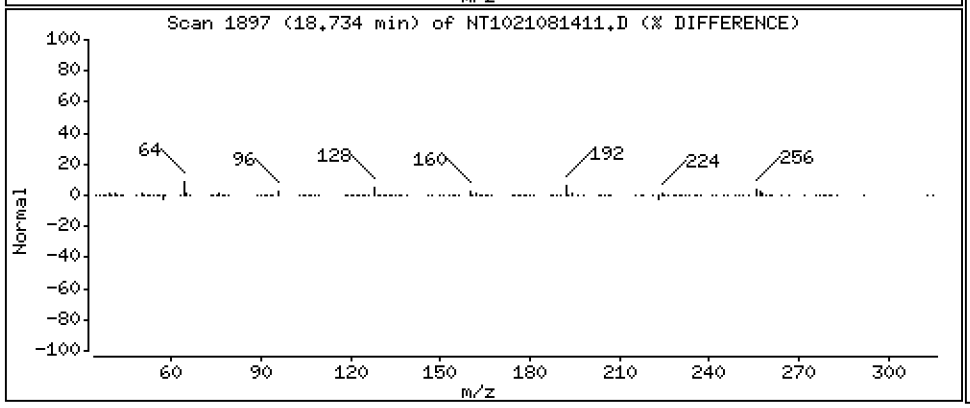
63 Di-n-butylphthalate

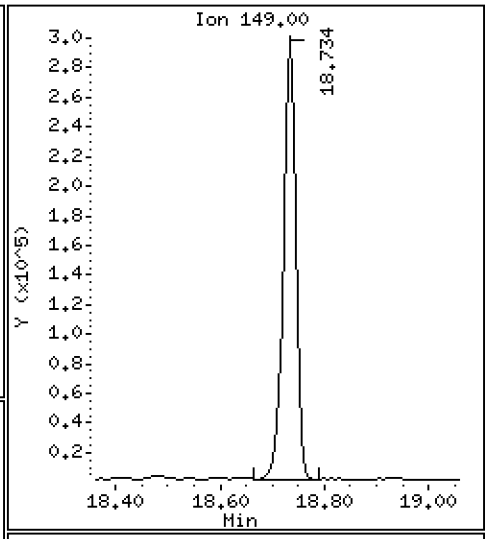
Concentration: 3.667 ug/mL

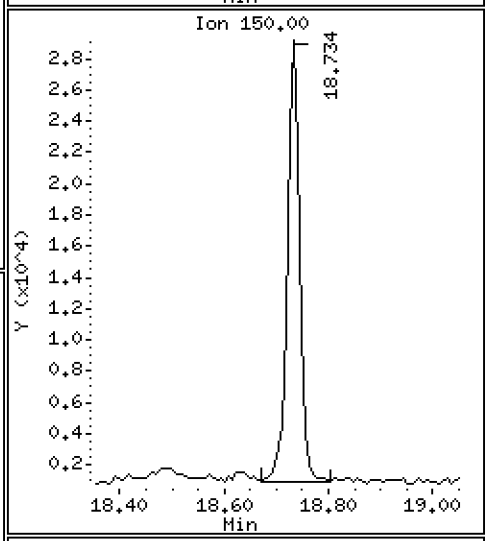


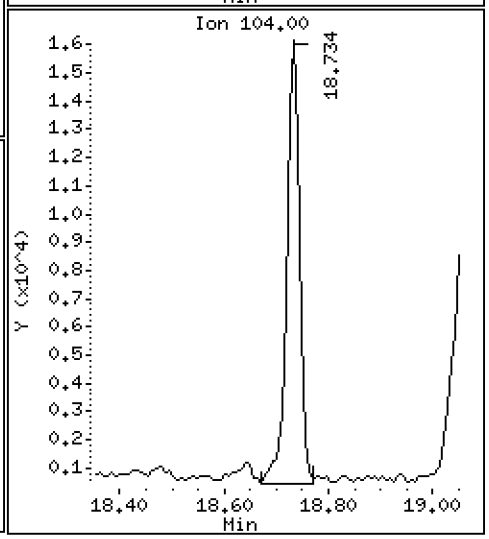












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

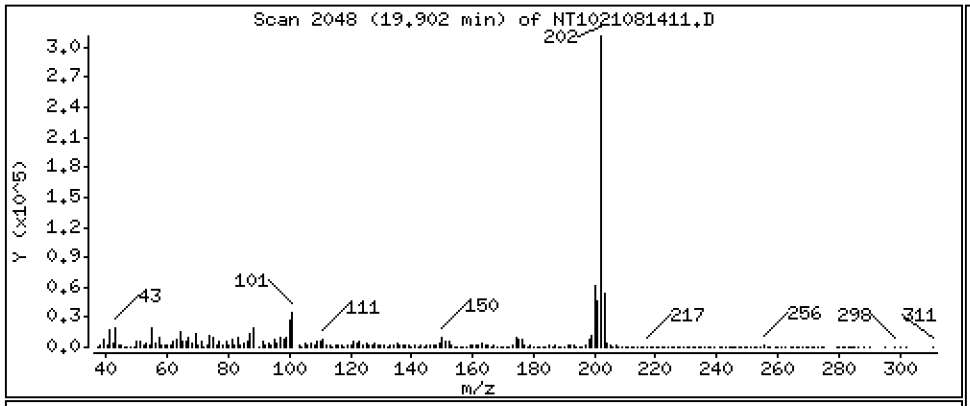
Operator: VTS

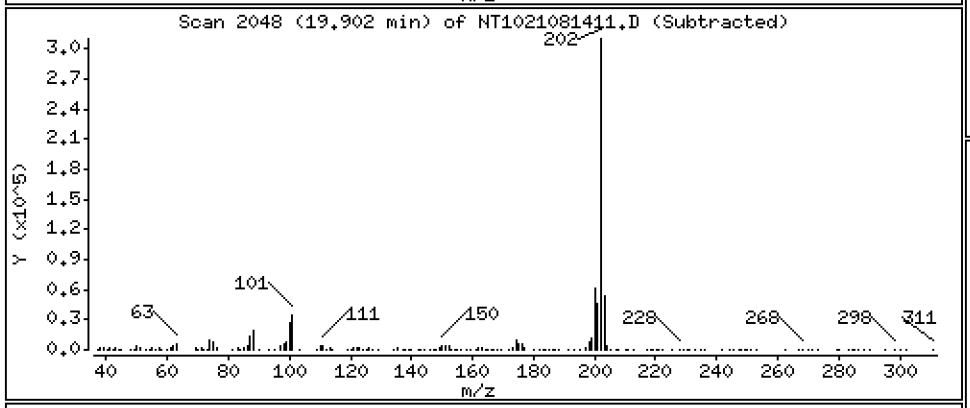
Column phase: ZB-5msi

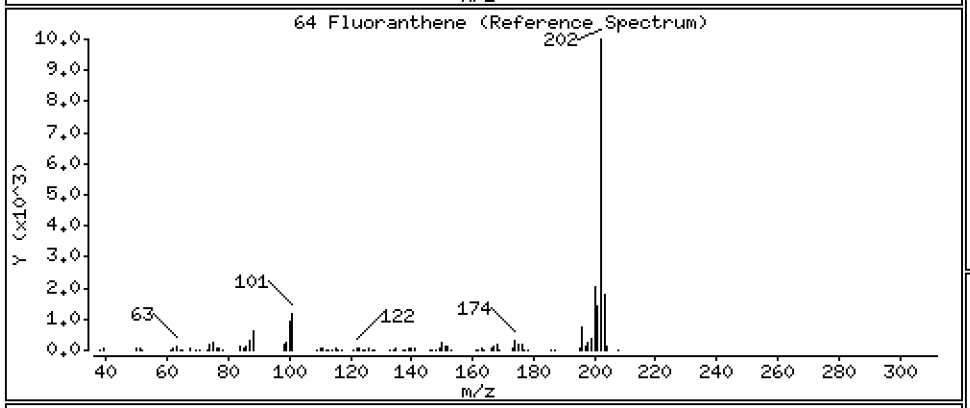
Column diameter: 0.25

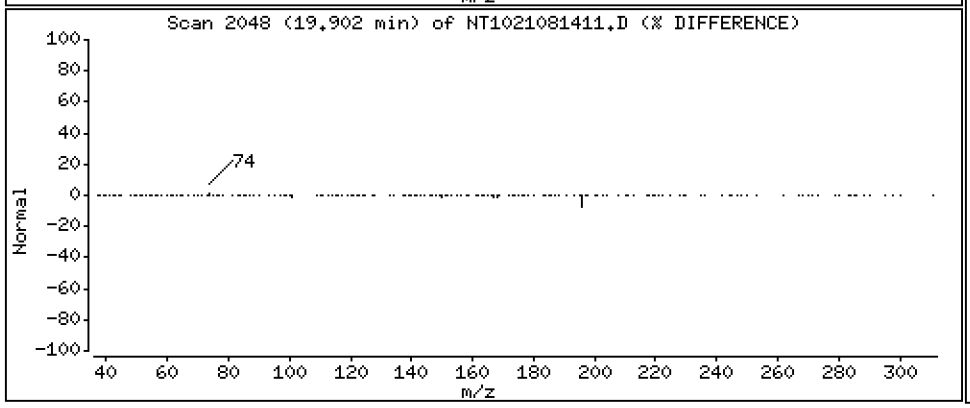
64 Fluoranthene

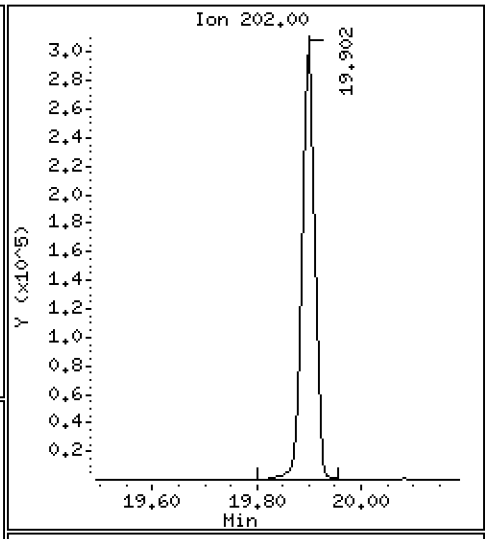
Concentration: 6.225 ug/mL

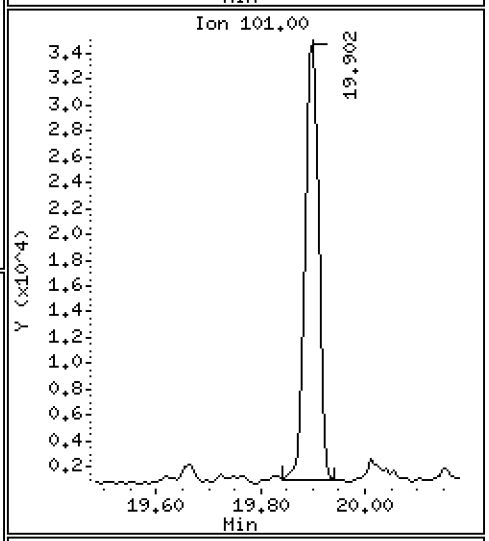


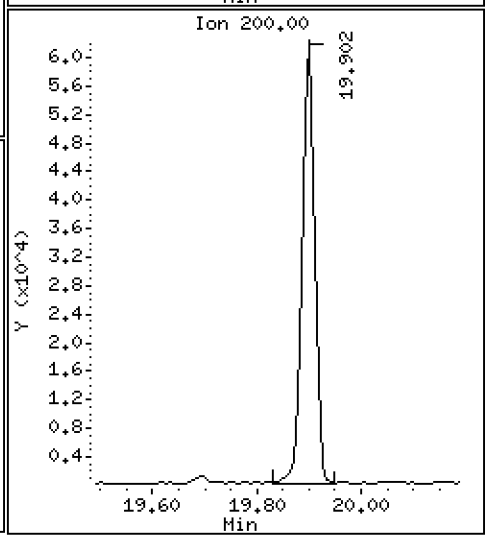












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

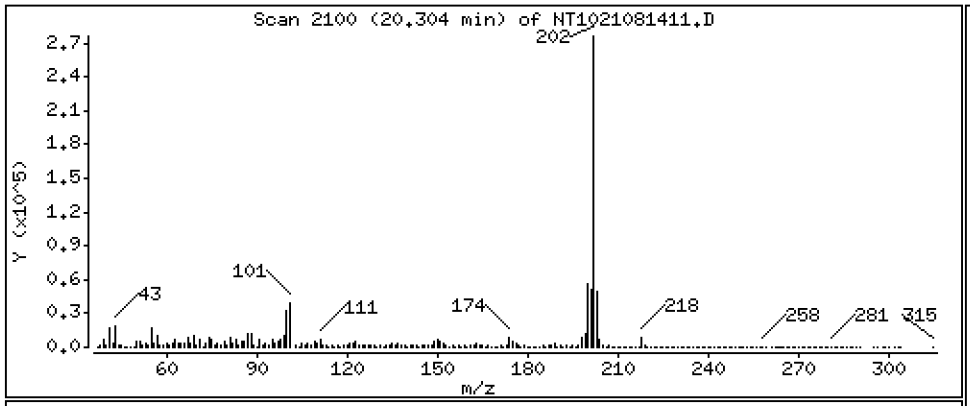
Operator: VTS

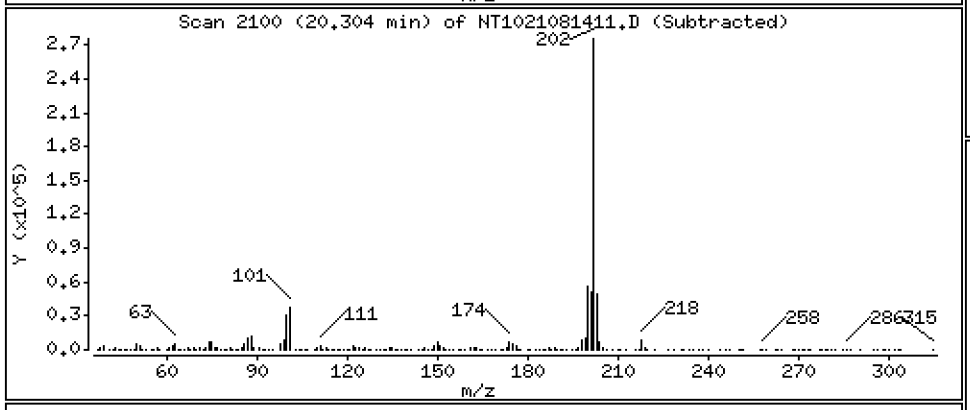
Column phase: ZB-5msi

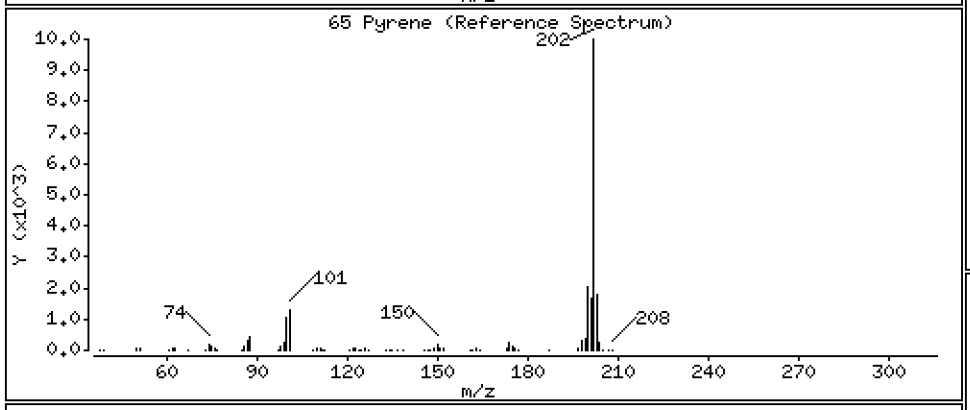
Column diameter: 0.25

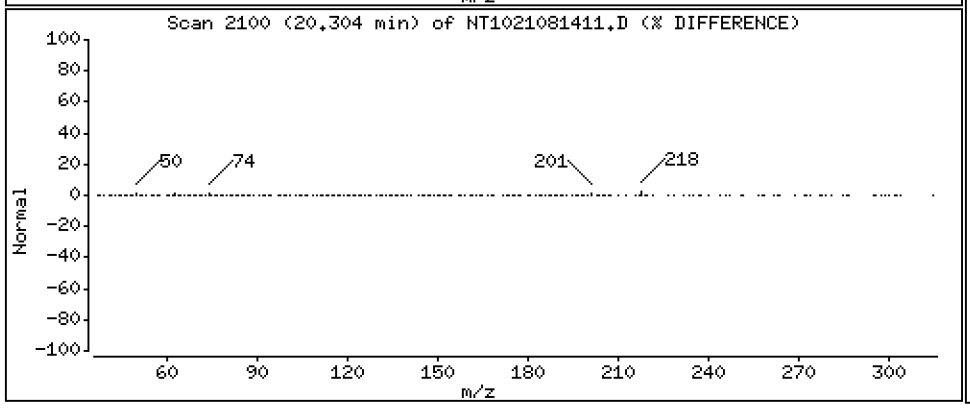
65 Pyrene

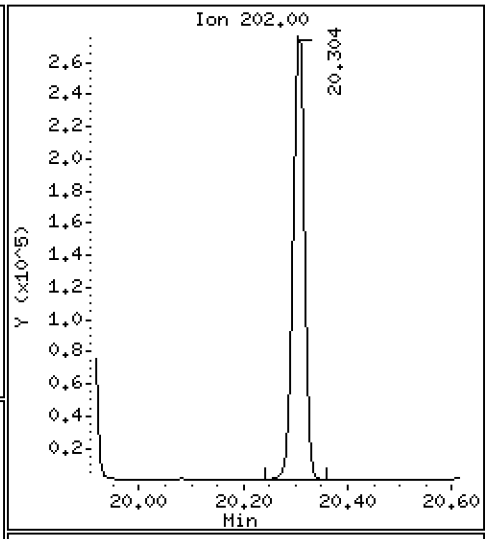
Concentration: 4.928 ug/mL

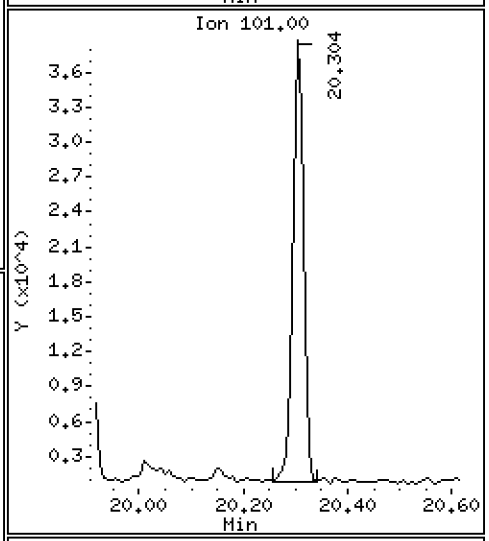


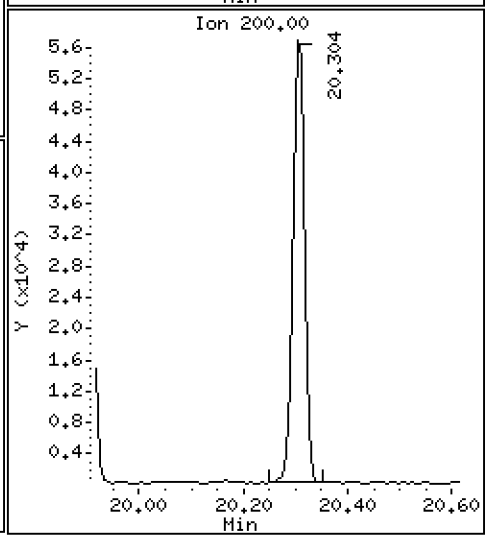












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

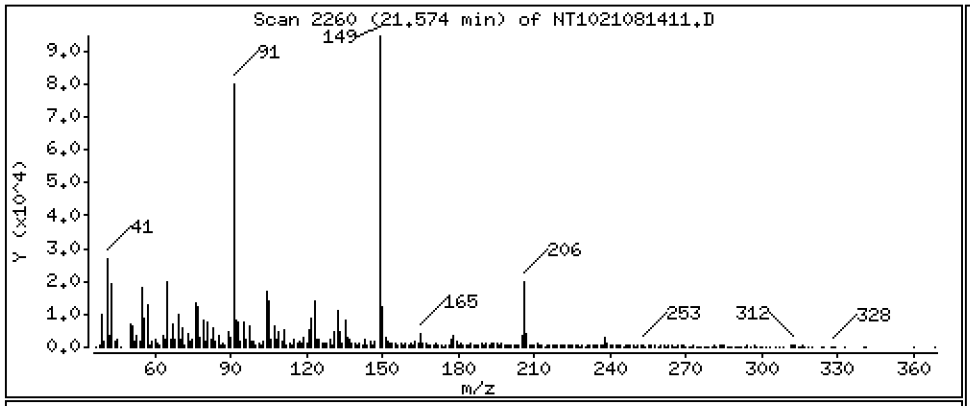
Operator: VTS

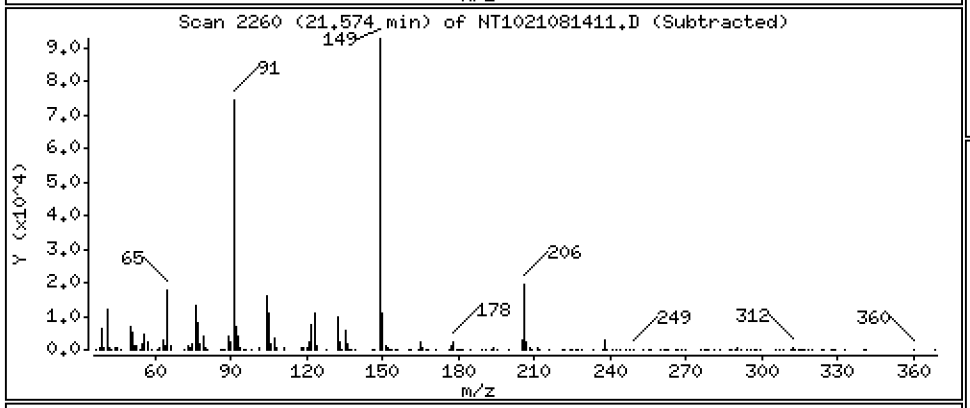
Column phase: ZB-5msi

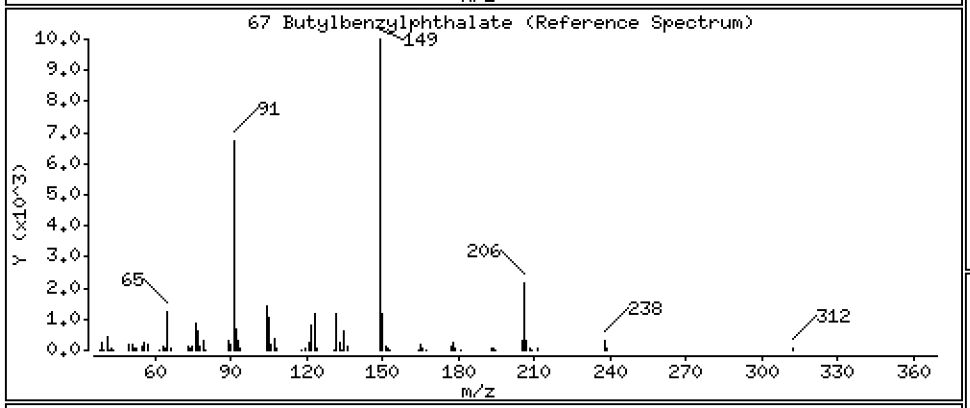
Column diameter: 0.25

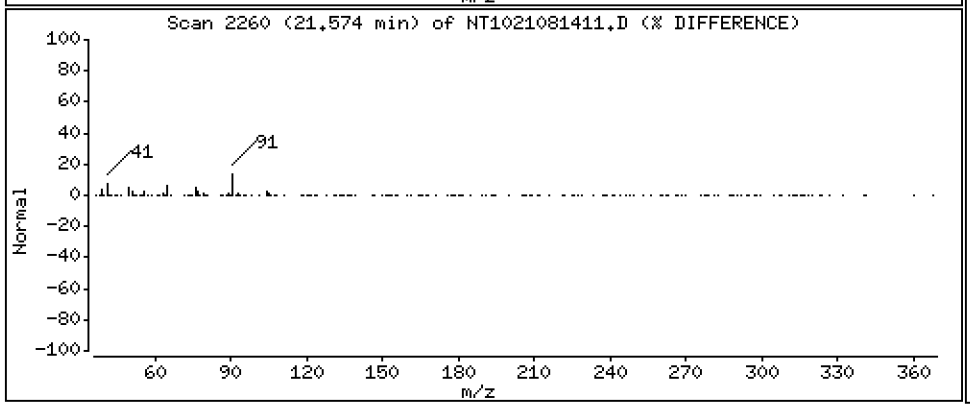
67 Butylbenzylphthalate

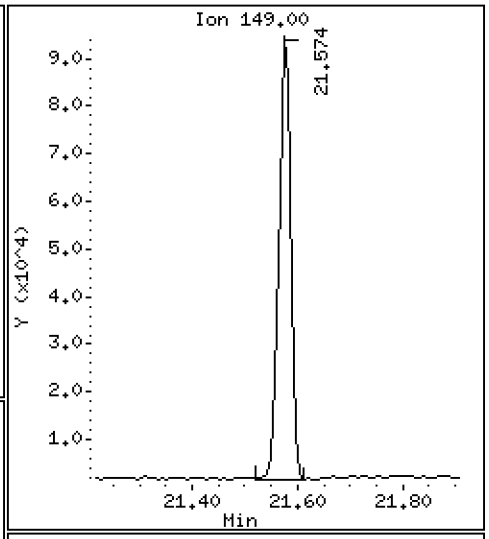
Concentration: 4.893 ug/mL

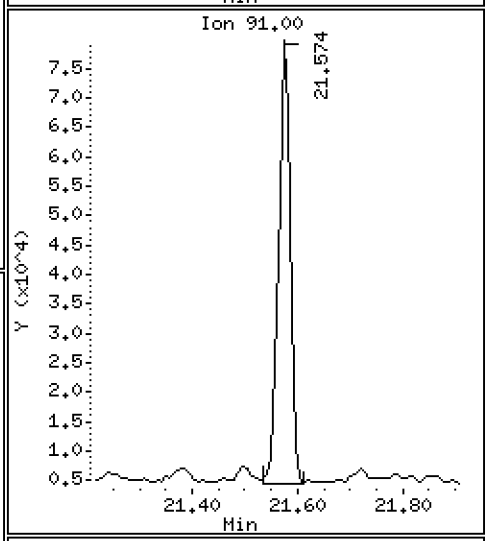


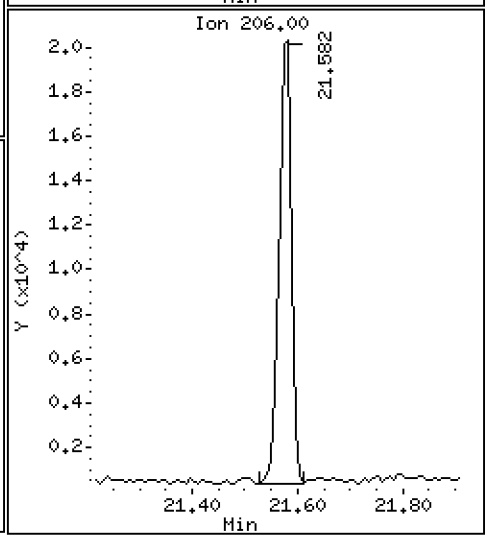












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

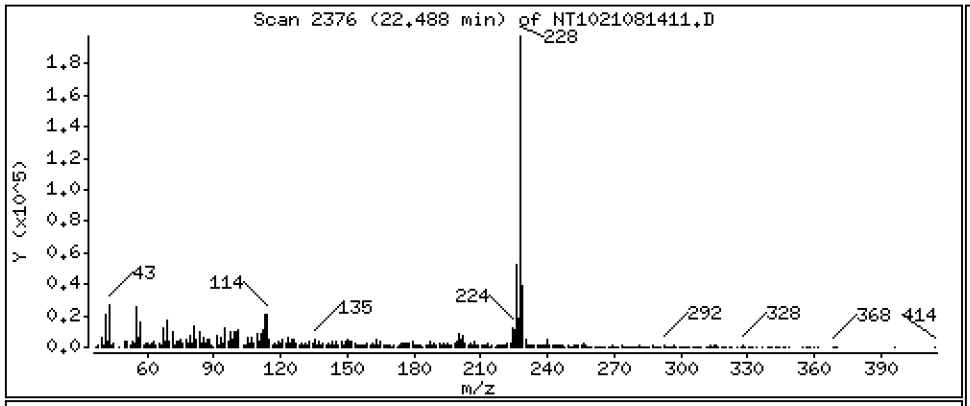
Operator: VTS

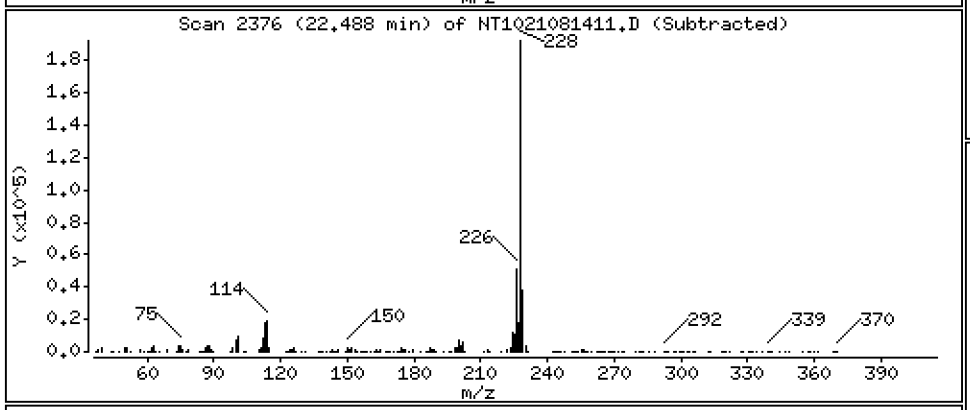
Column phase: ZB-5msi

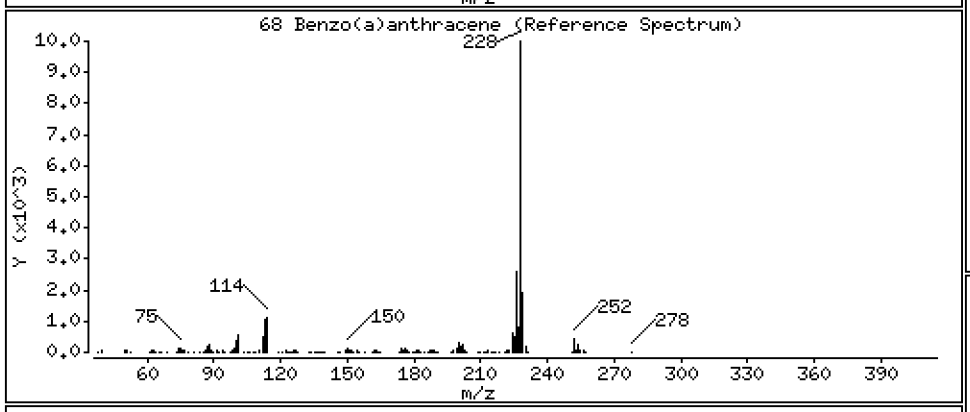
Column diameter: 0.25

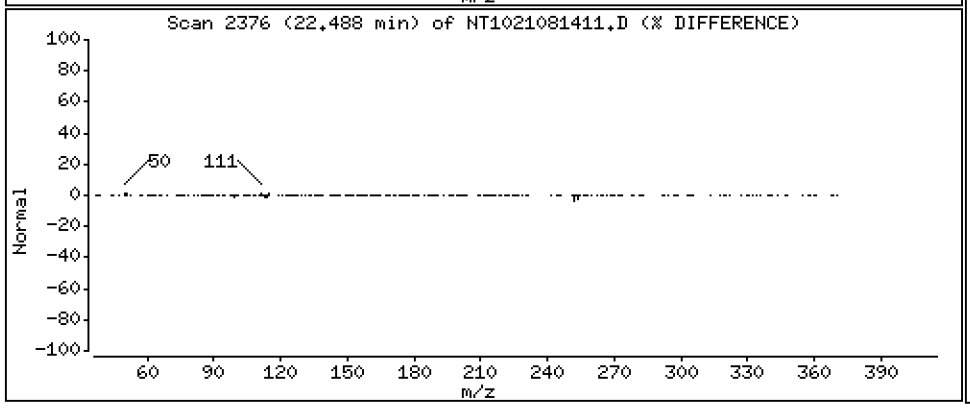
68 Benzo(a)anthracene

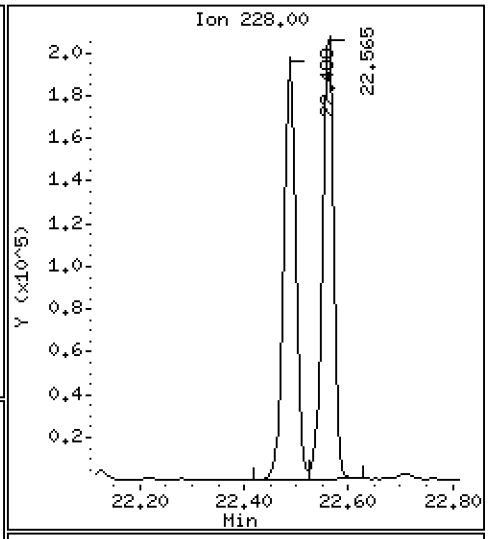
Concentration: 4.507 ug/mL

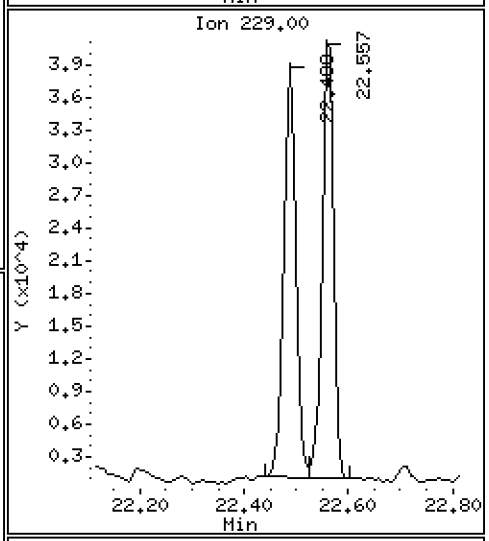


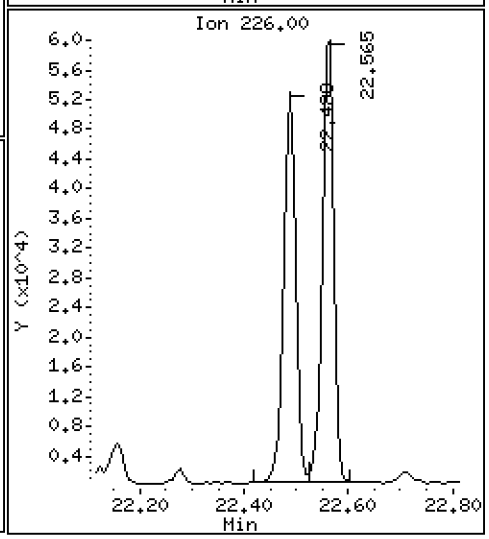












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081411.D

Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

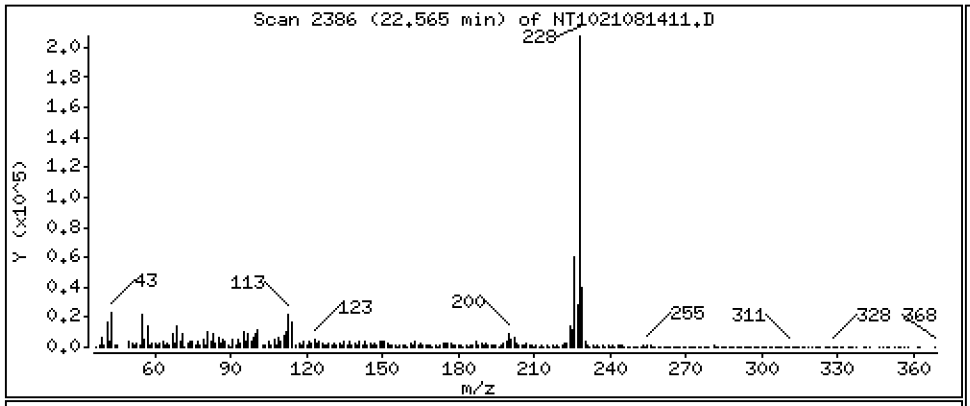
Operator: VTS

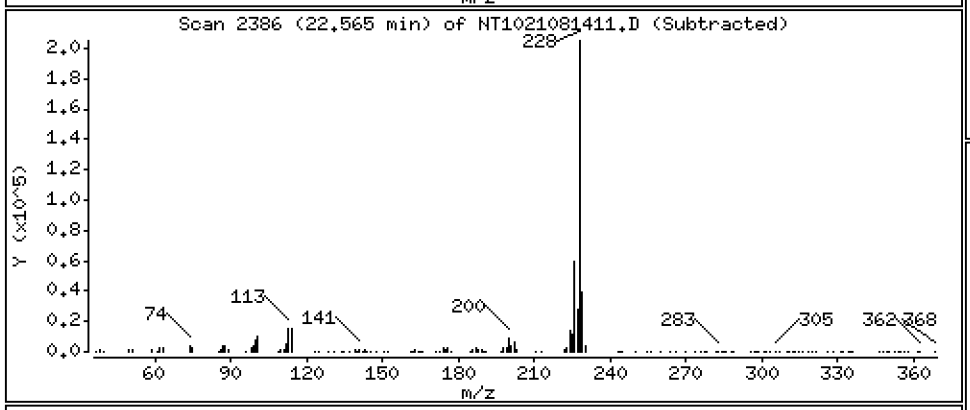
Column phase: ZB-5msi

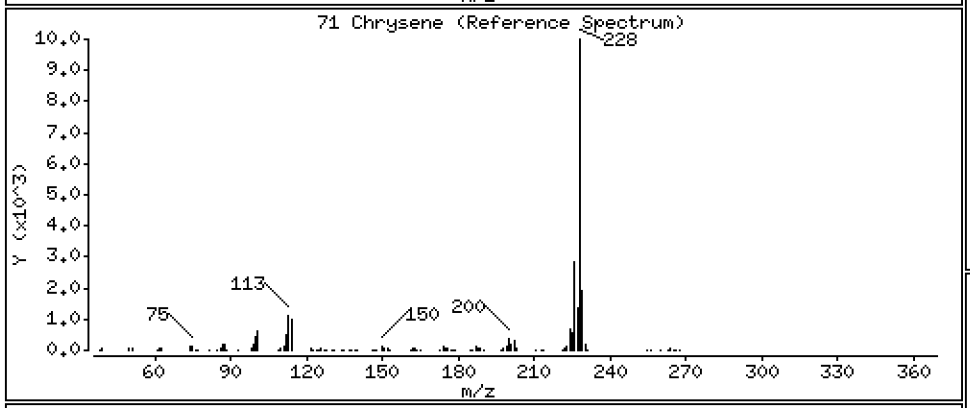
Column diameter: 0.25

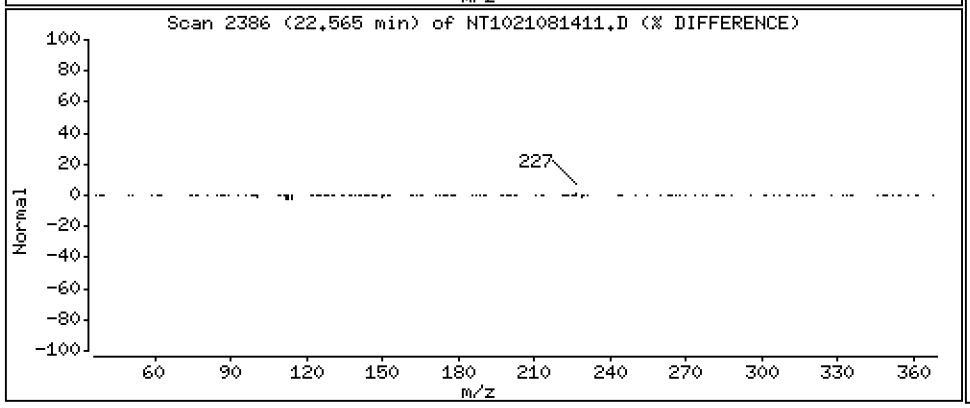
71 Chrysene

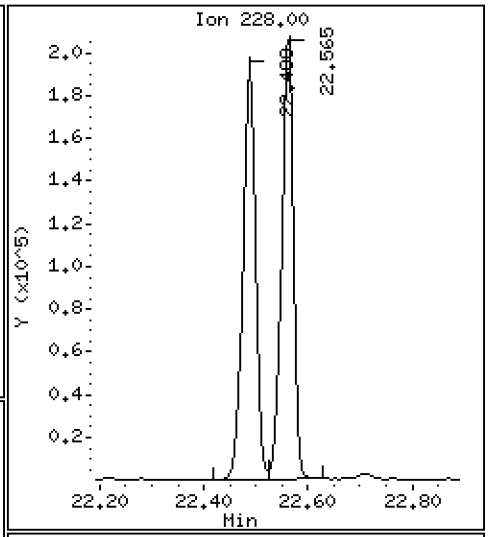
Concentration: 5.722 ug/mL

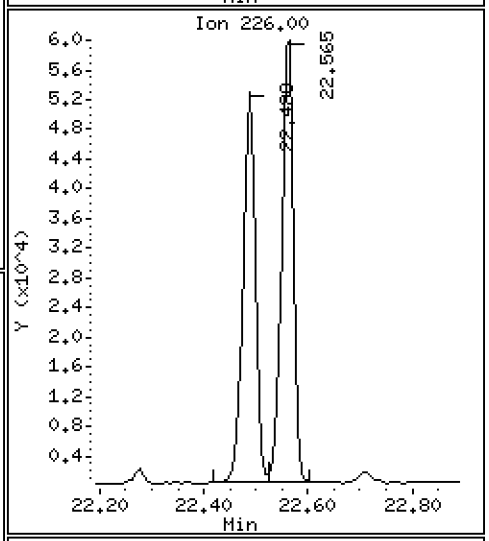


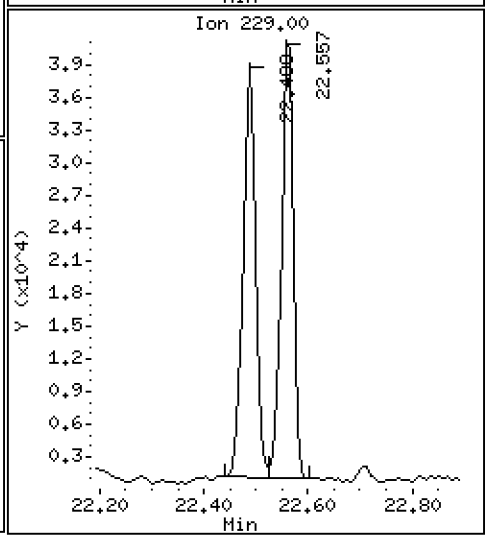












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081411.D

Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

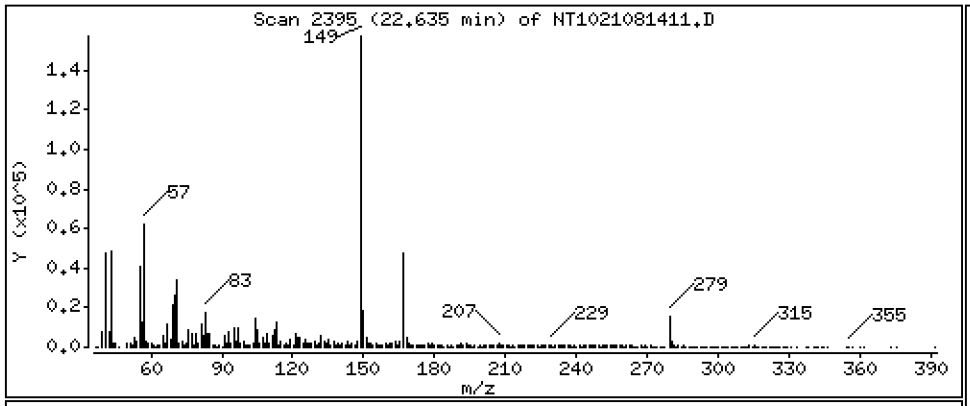
Operator: VTS

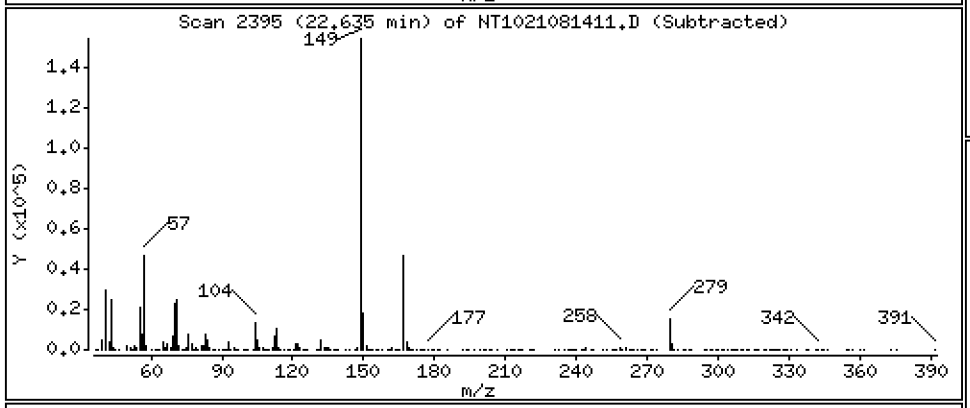
Column phase: ZB-5msi

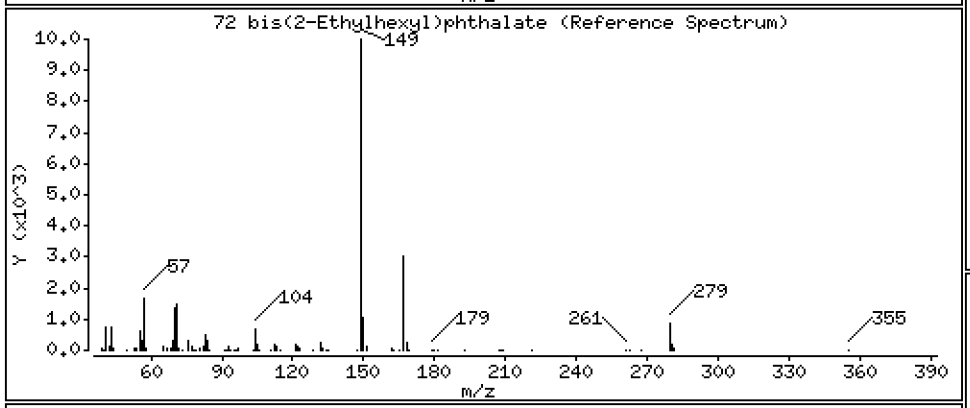
Column diameter: 0.25

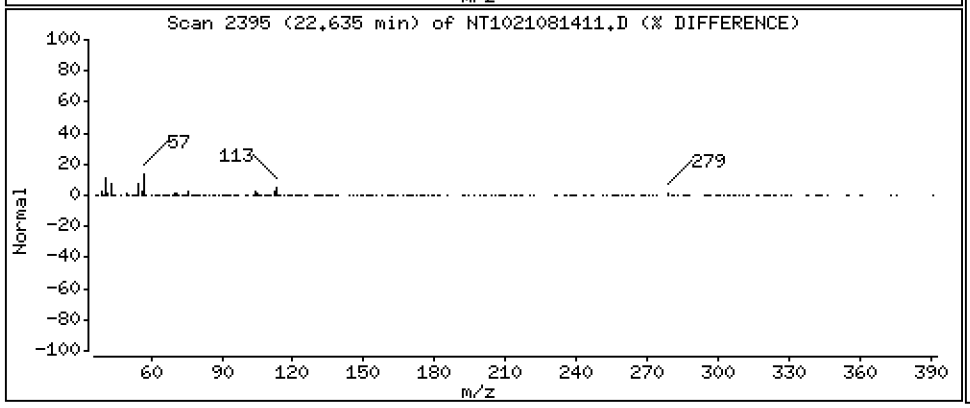
72 bis(2-Ethylhexyl)phthalate

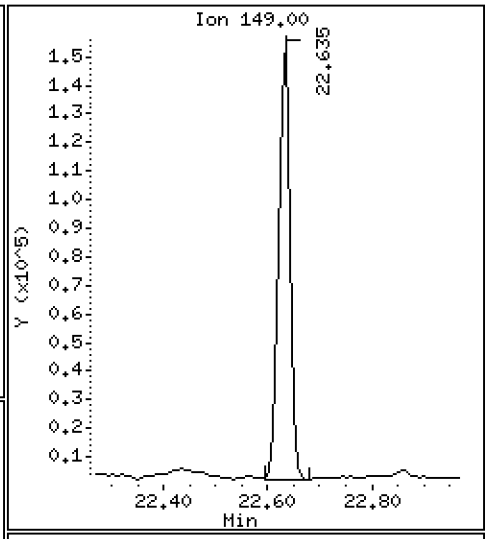
Concentration: 5.606 ug/mL

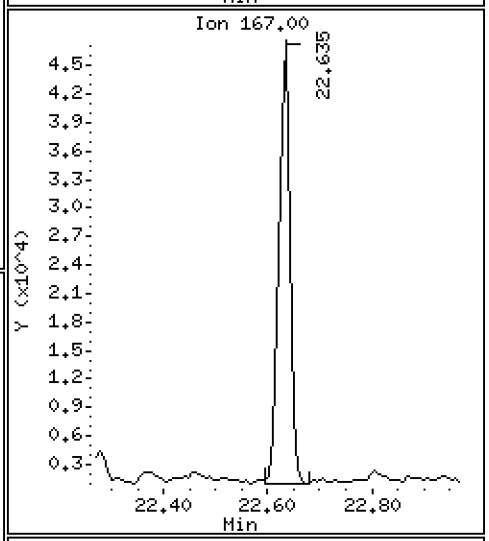


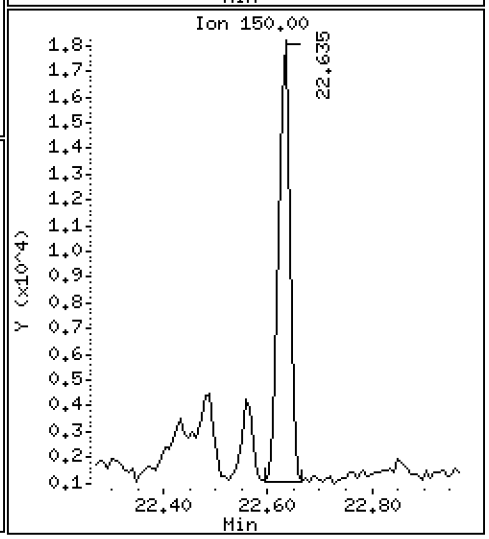












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

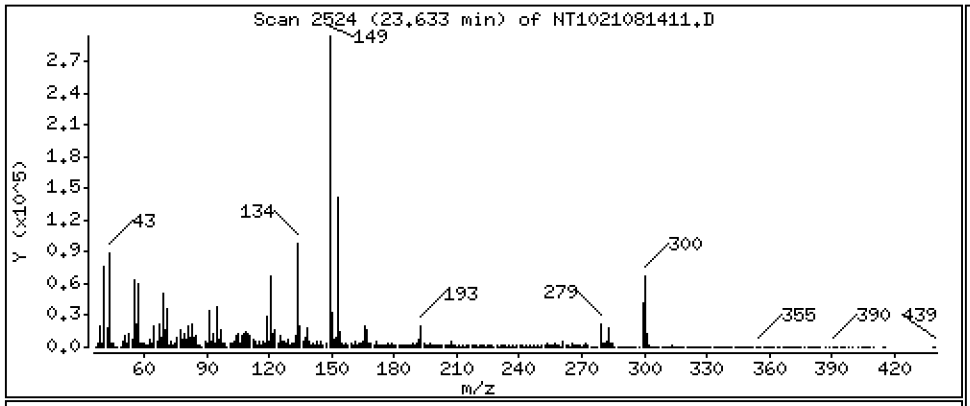
Operator: VTS

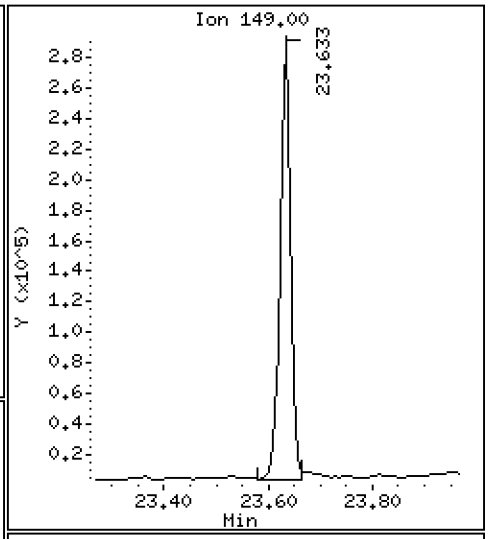
Column phase: ZB-5msi

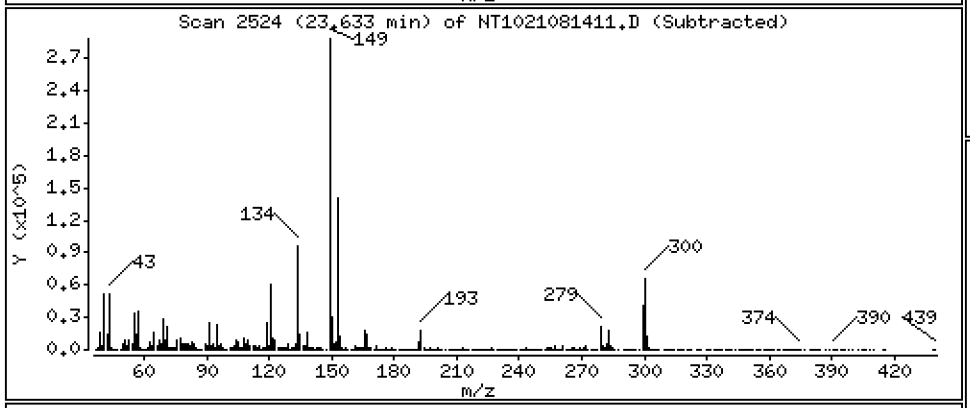
Column diameter: 0.25

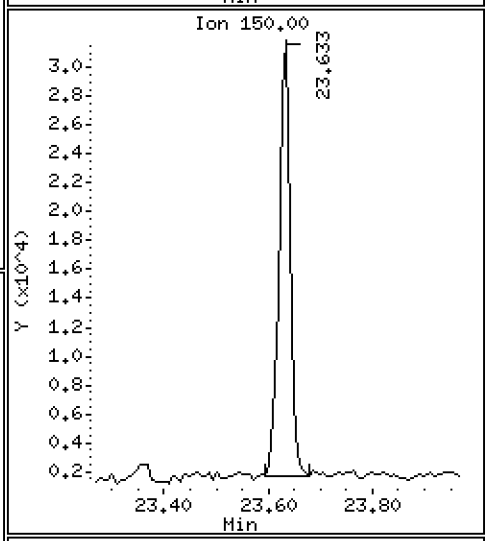
73 Di-n-octylphthalate

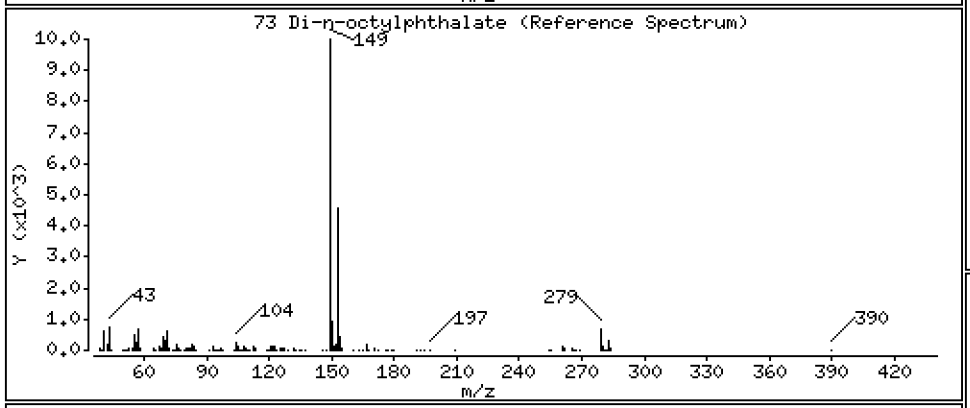
Concentration: 4.040 ug/mL

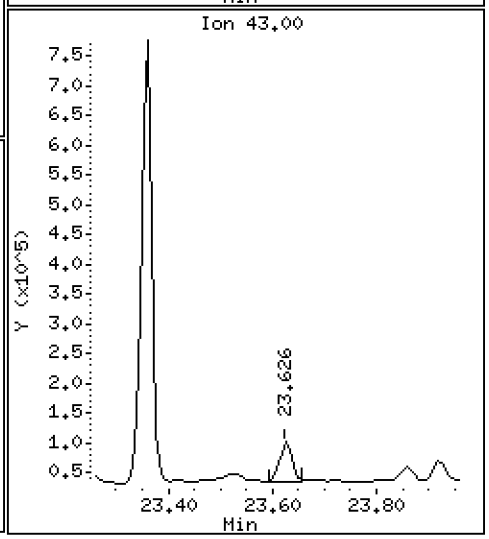


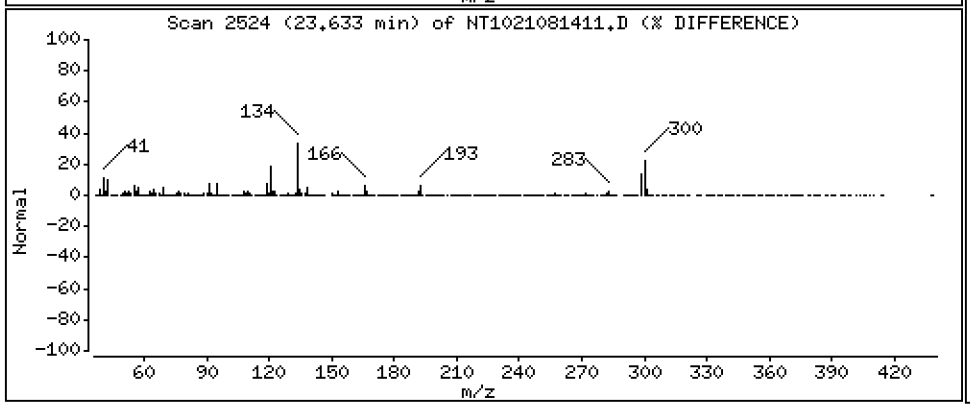












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

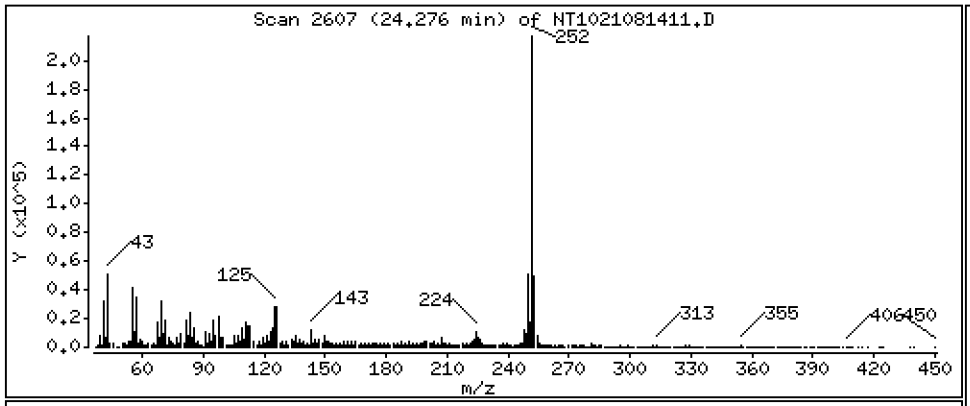
Operator: VTS

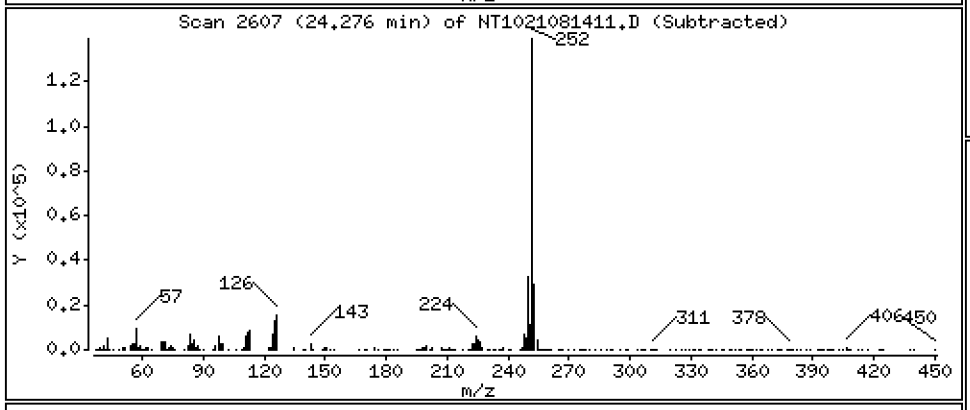
Column phase: ZB-5msi

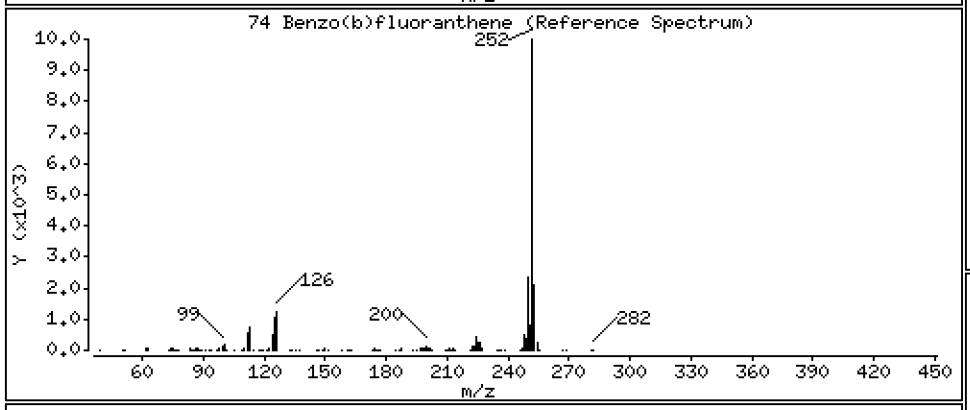
Column diameter: 0.25

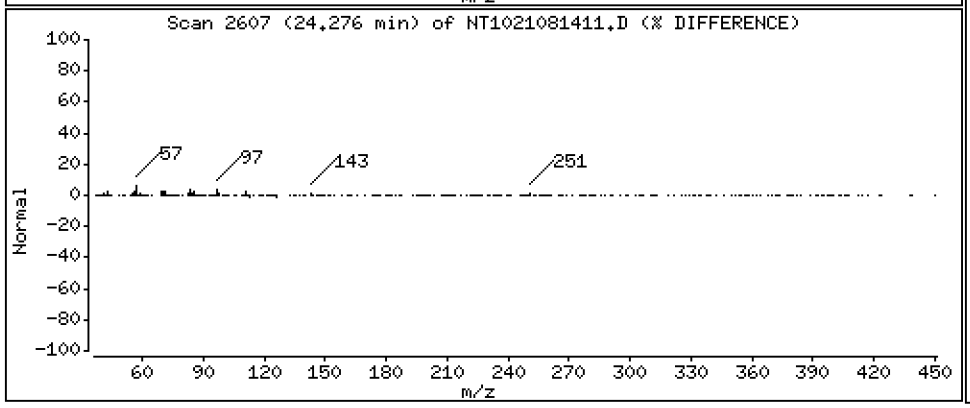
74 Benzo(b)fluoranthene

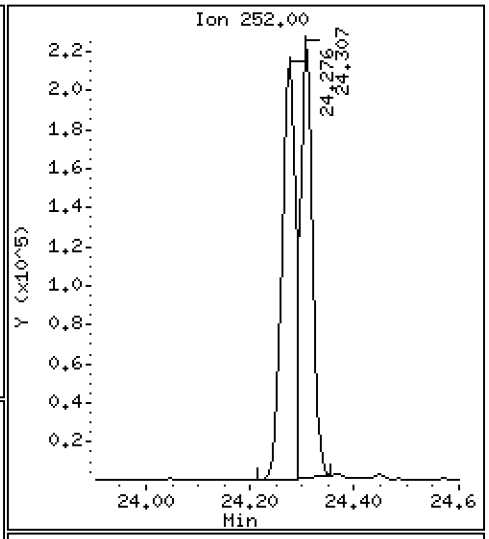
Concentration: 5.339 ug/mL

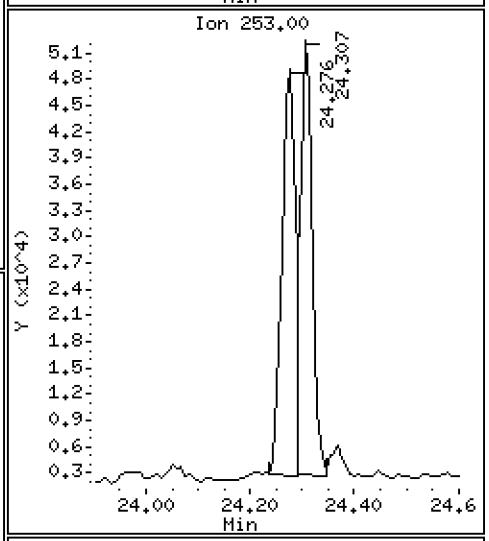


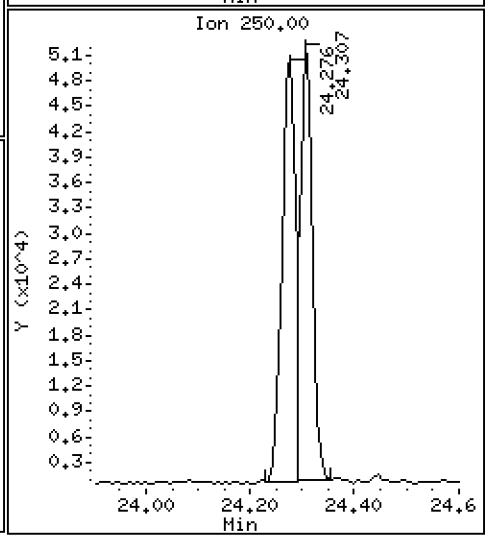












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

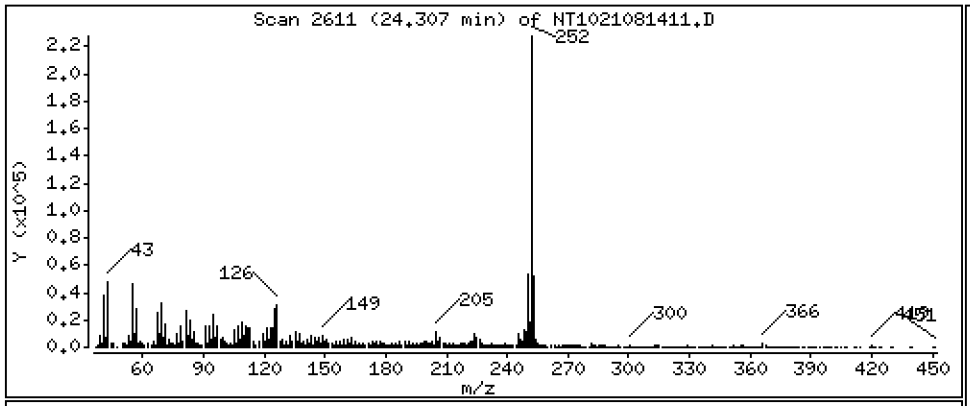
Operator: VTS

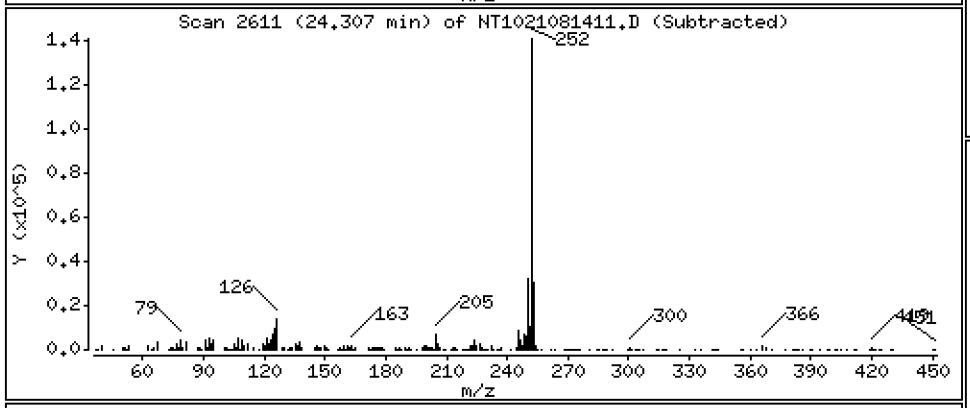
Column phase: ZB-5msi

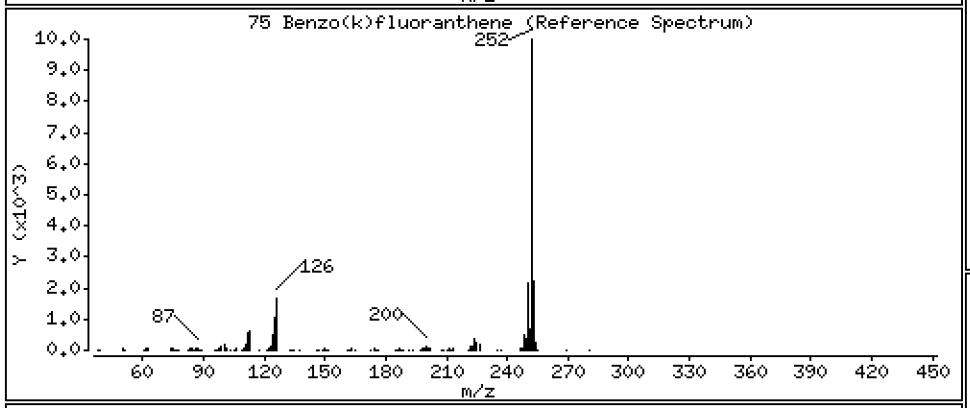
Column diameter: 0.25

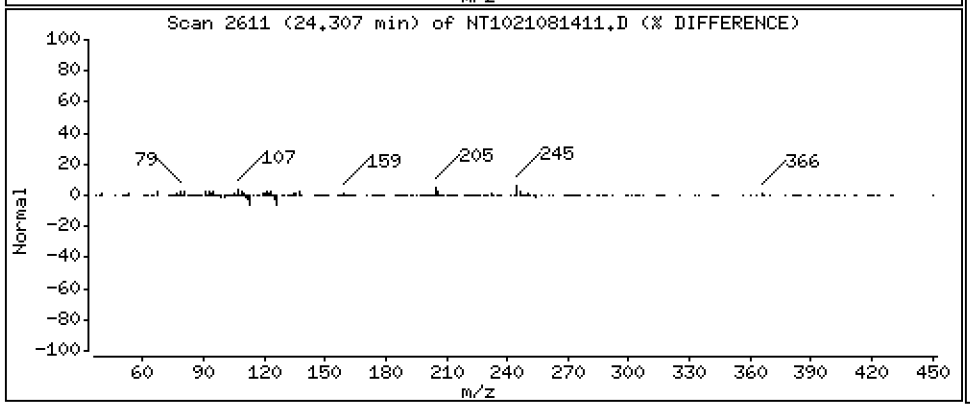
75 Benzo(k)fluoranthene

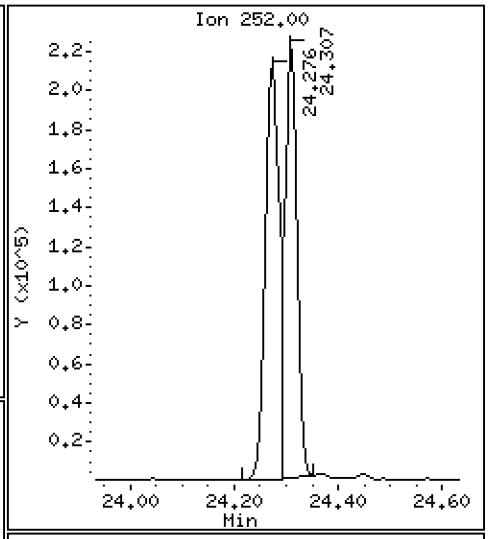
Concentration: 5.226 ug/mL

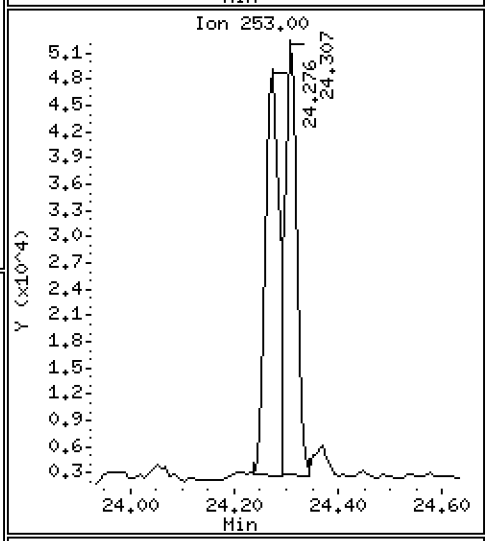


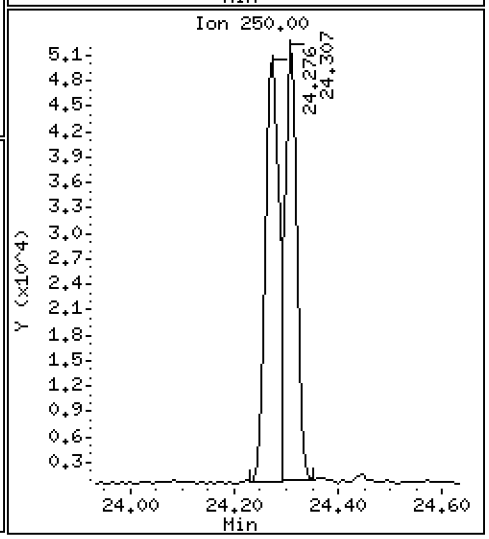












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

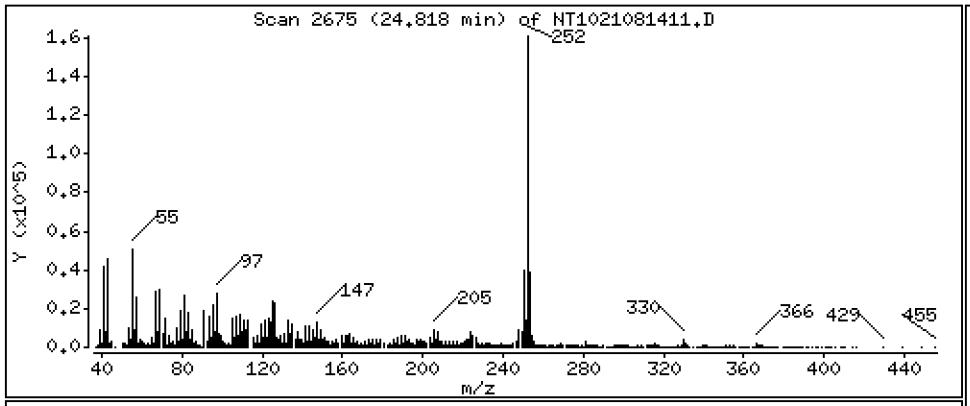
Operator: VTS

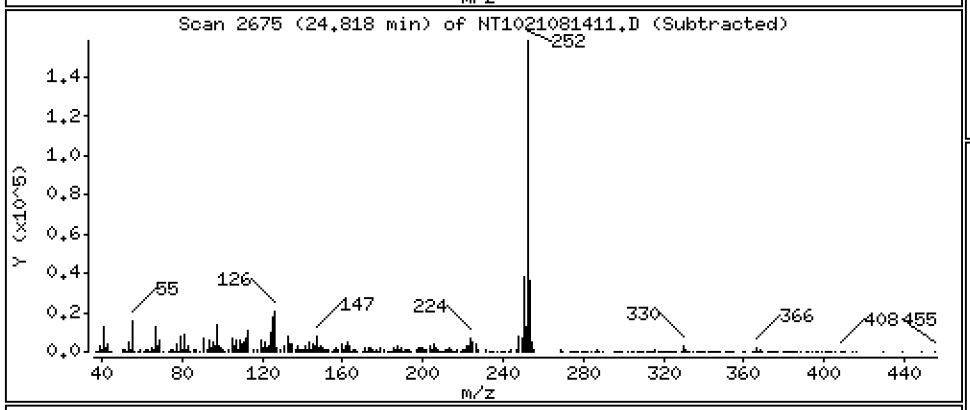
Column phase: ZB-5msi

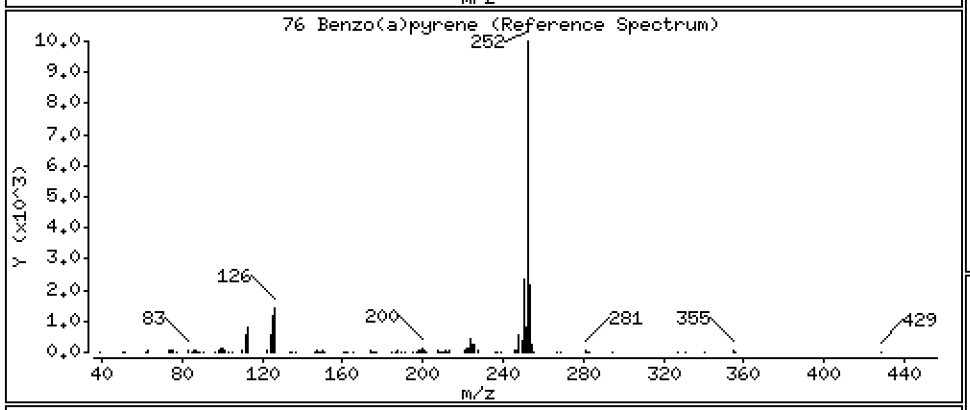
Column diameter: 0.25

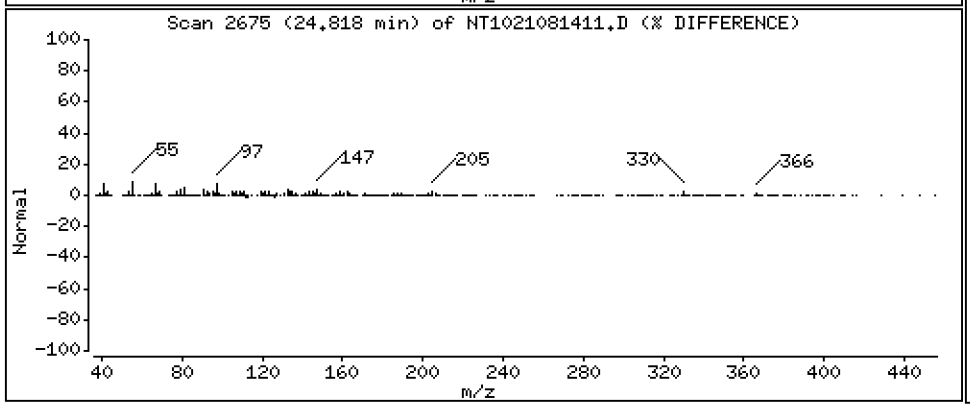
76 Benzo(a)pyrene

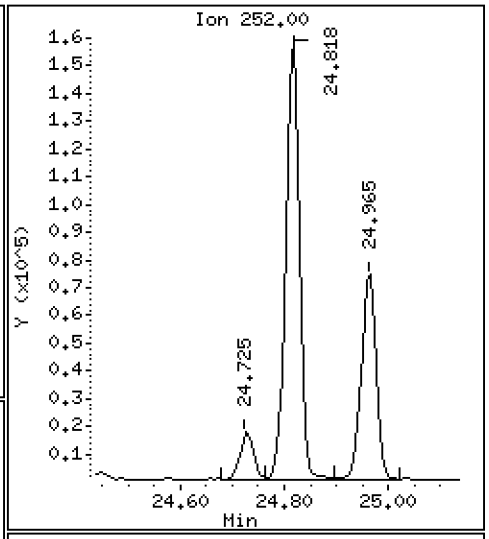
Concentration: 4.350 ug/mL

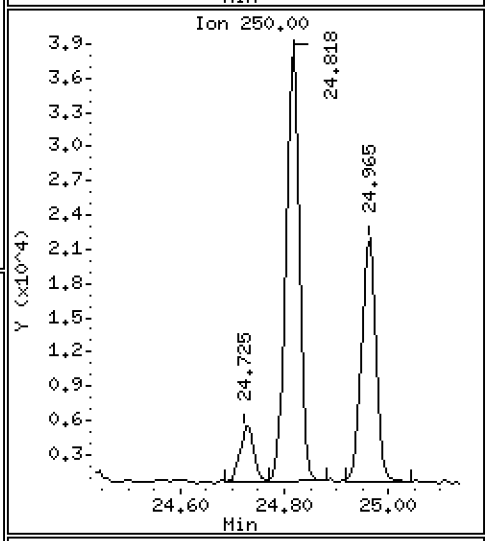


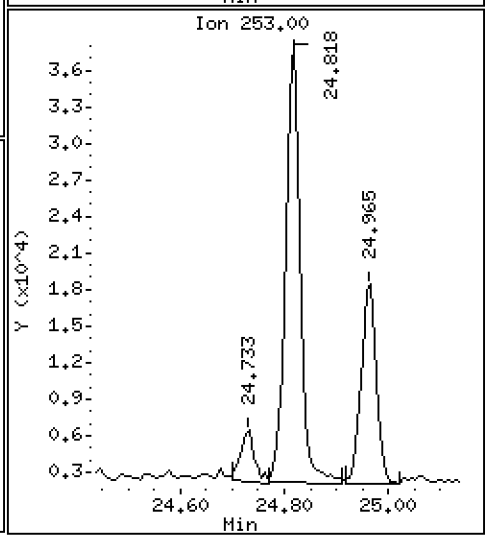












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

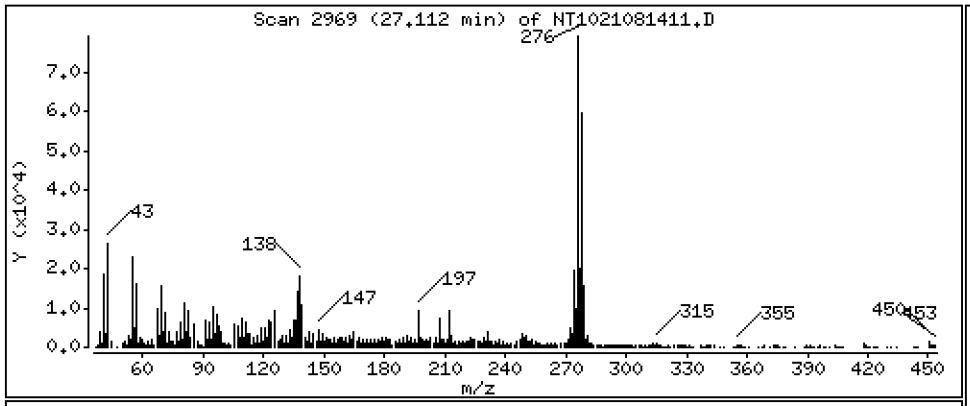
Operator: VTS

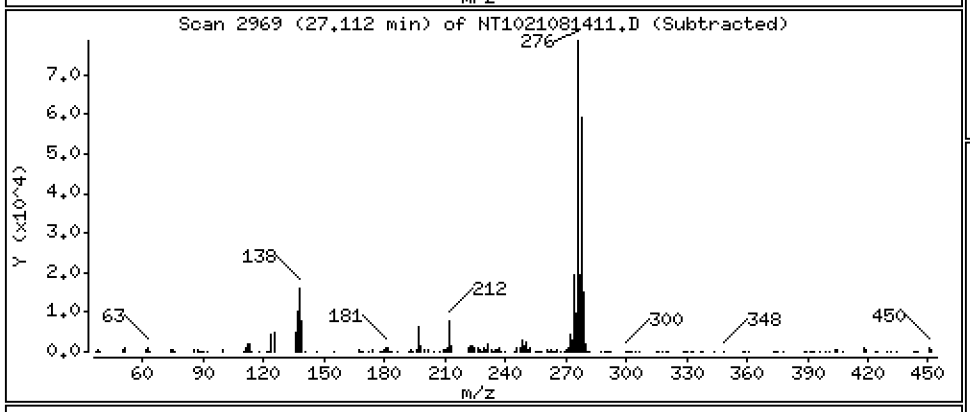
Column phase: ZB-5msi

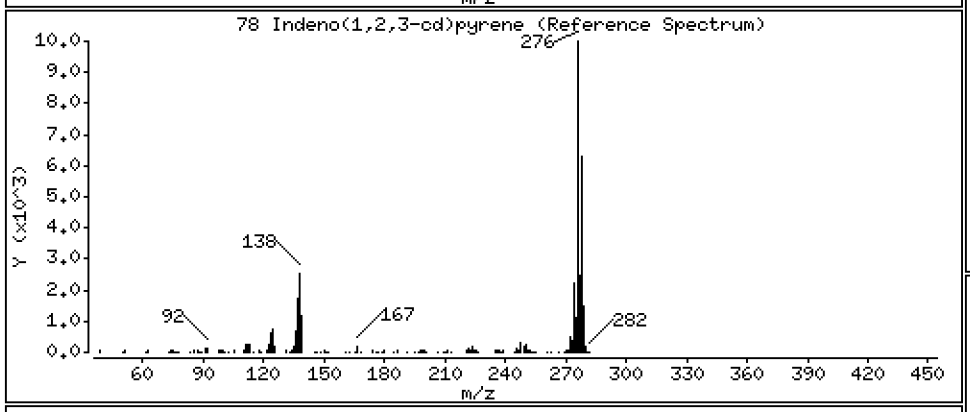
Column diameter: 0.25

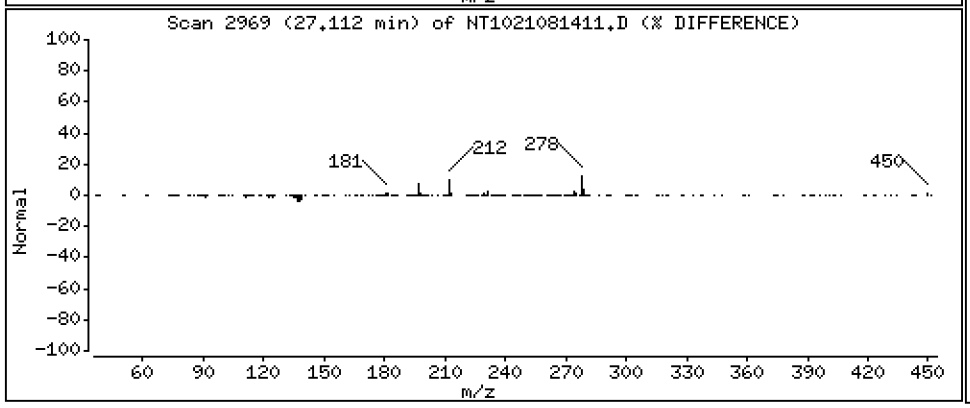
78 Indeno(1,2,3-cd)pyrene

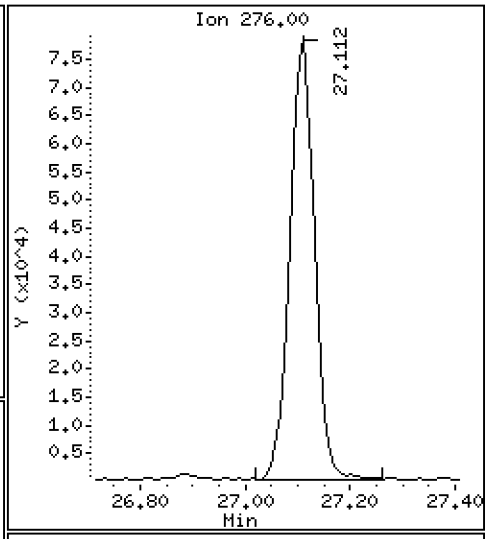
Concentration: 3.289 ug/mL

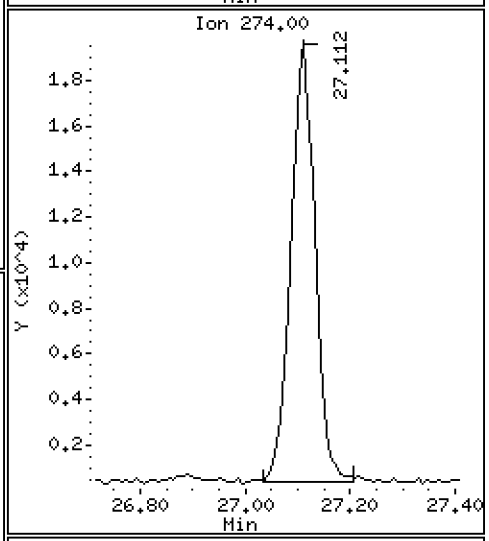


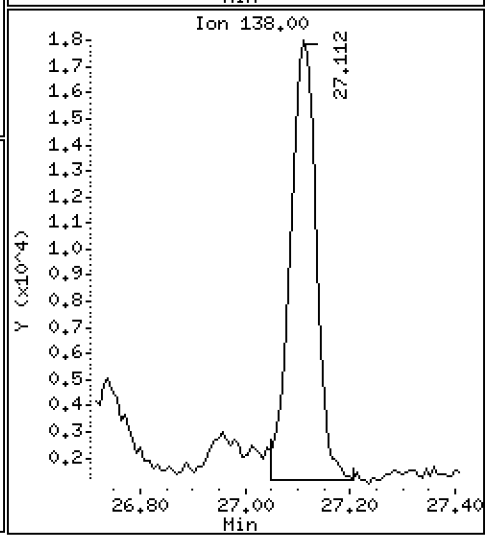












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

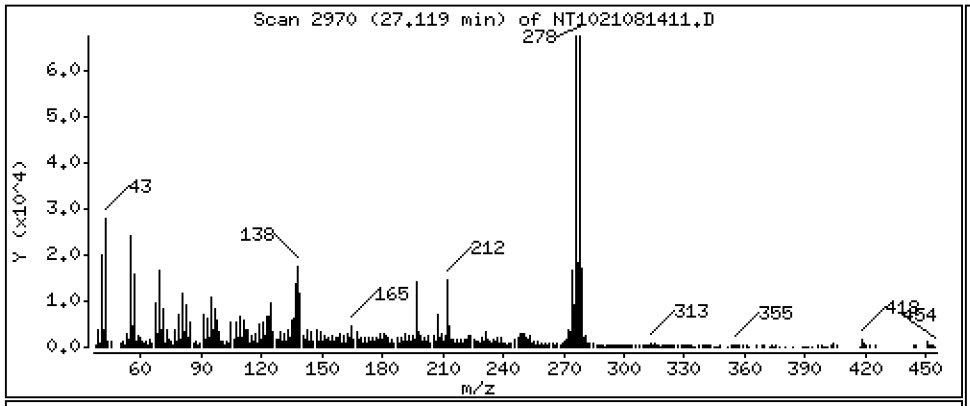
Operator: VTS

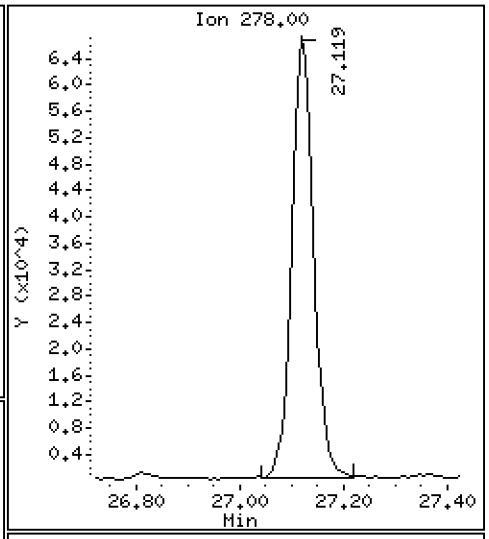
Column phase: ZB-5msi

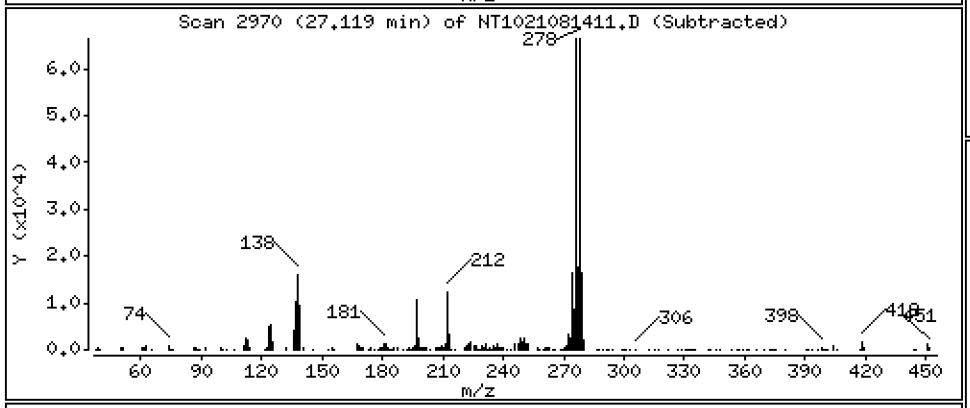
Column diameter: 0.25

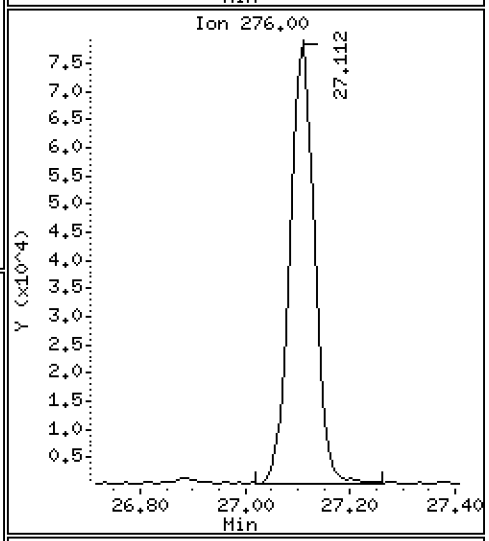
79 Dibenzo(a,h)anthracene

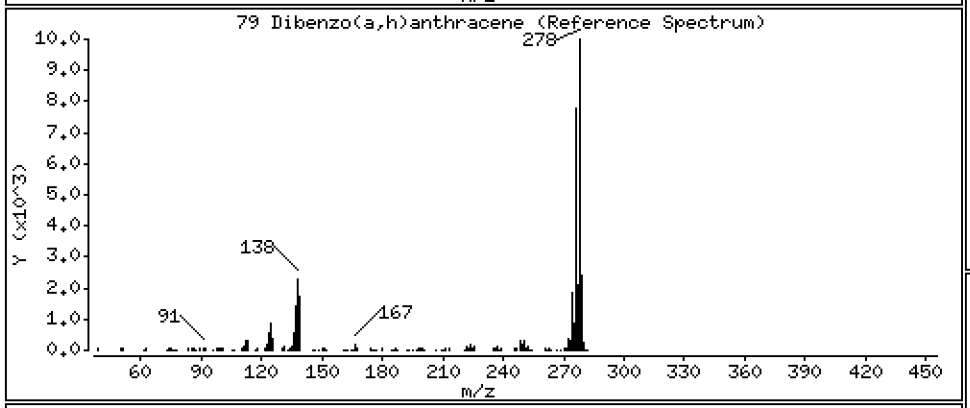
Concentration: 3.271 ug/mL

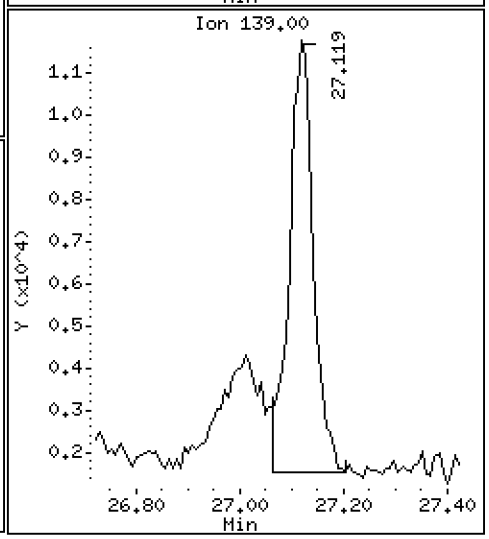


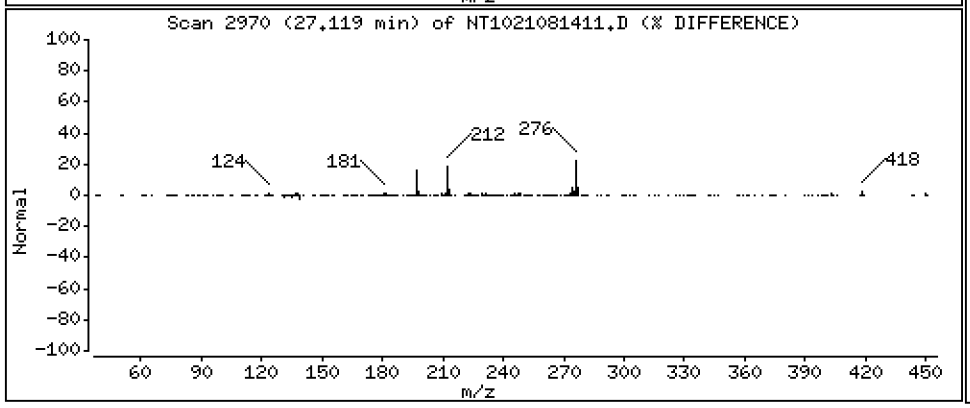












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

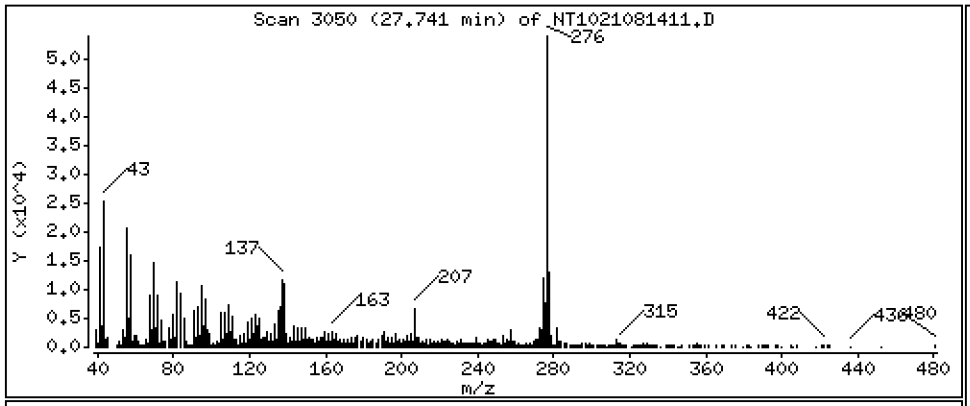
Operator: VTS

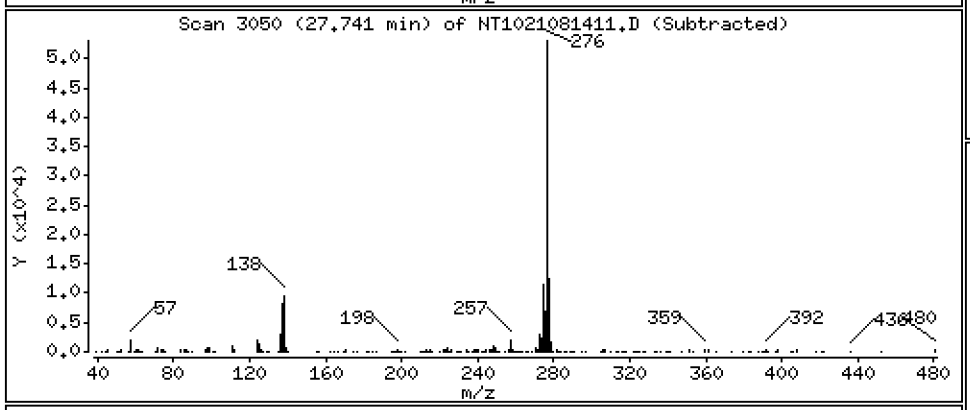
Column phase: ZB-5msi

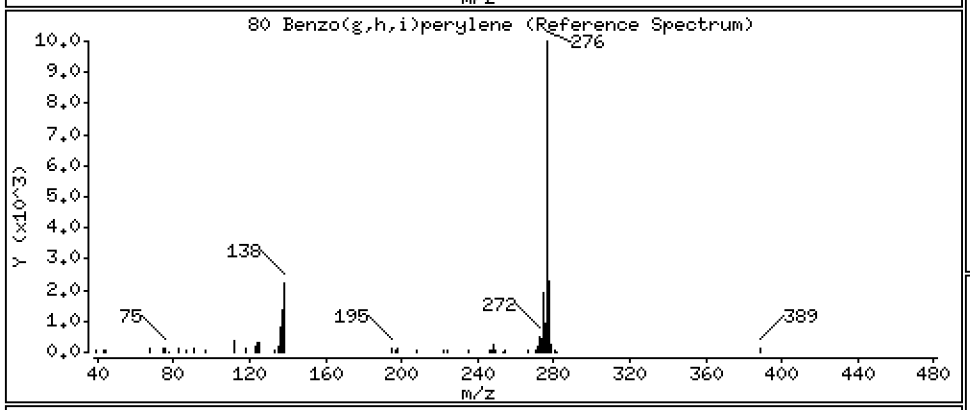
Column diameter: 0.25

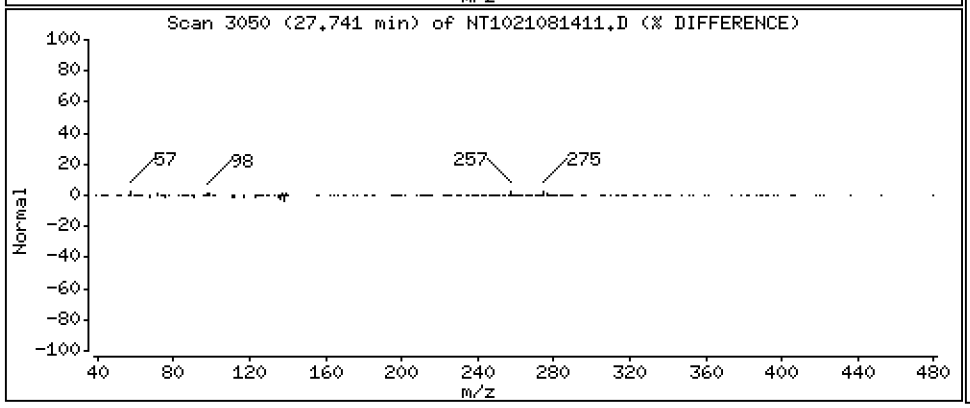
80 Benzo(g,h,i)perylene

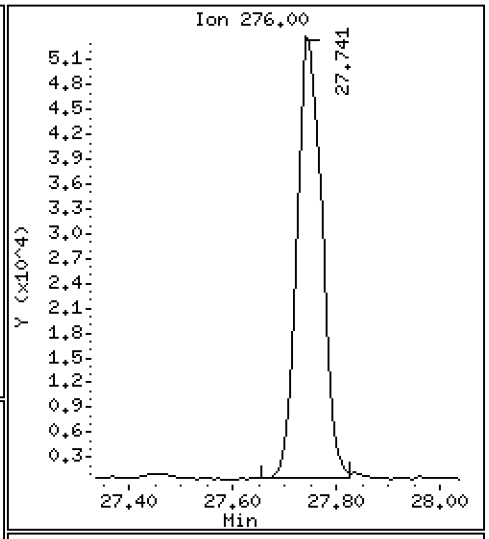
Concentration: 2.600 ug/mL

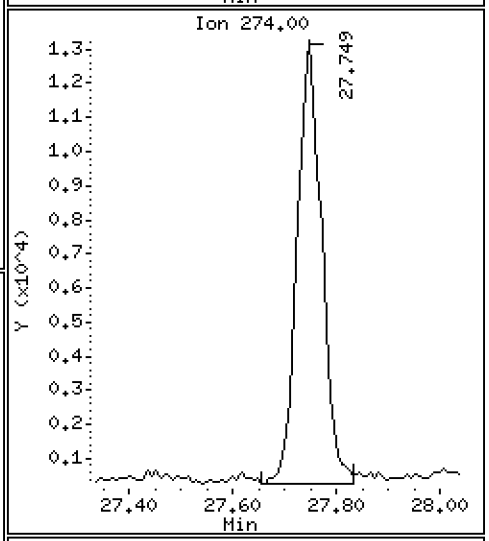


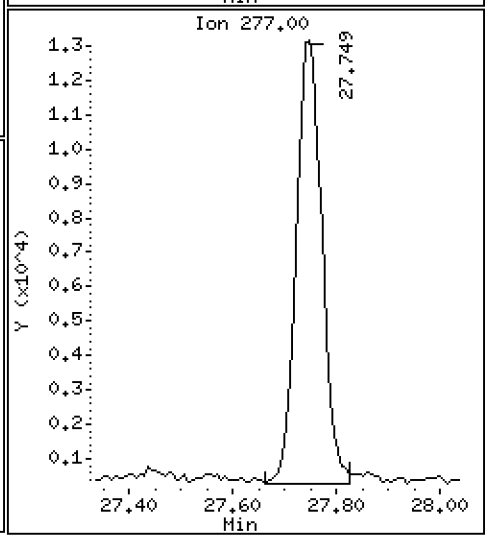












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

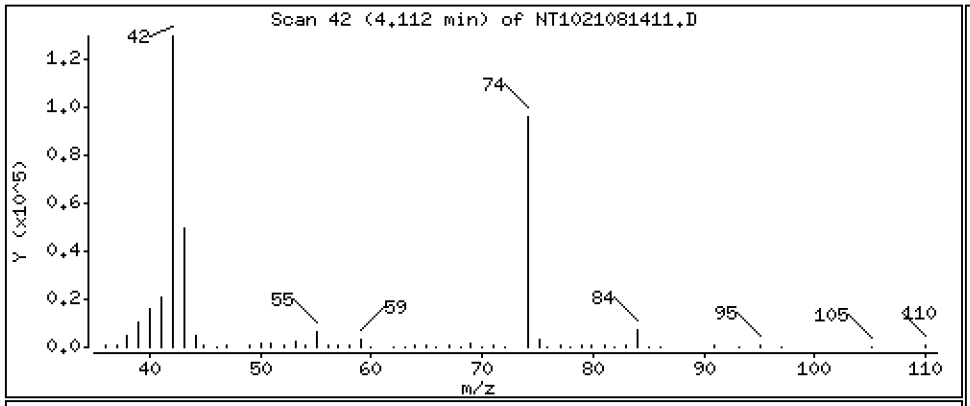
Operator: VTS

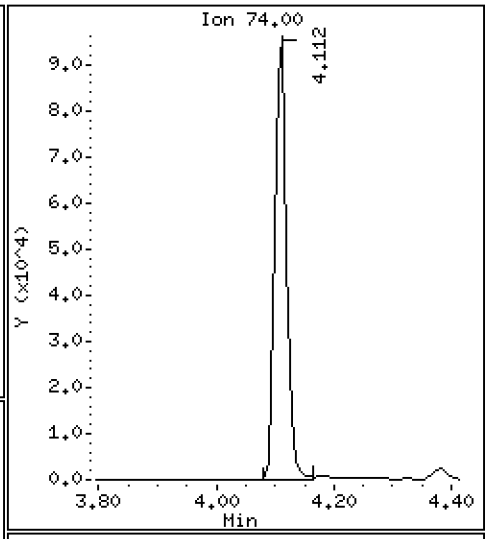
Column phase: ZB-5msi

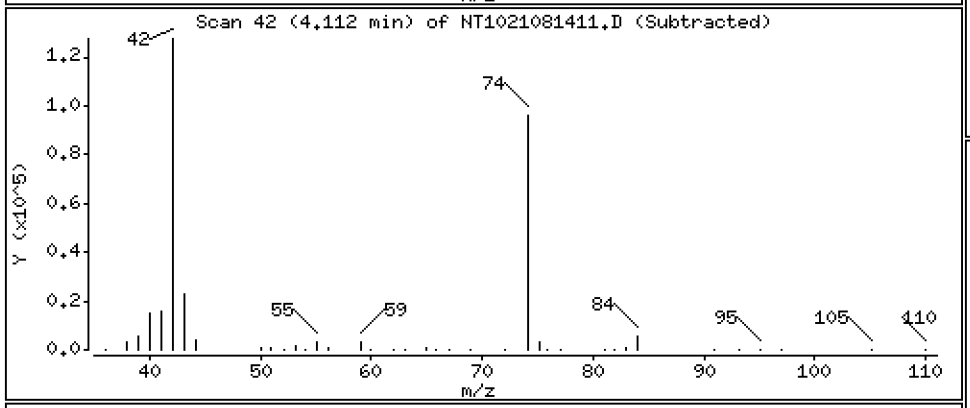
Column diameter: 0.25

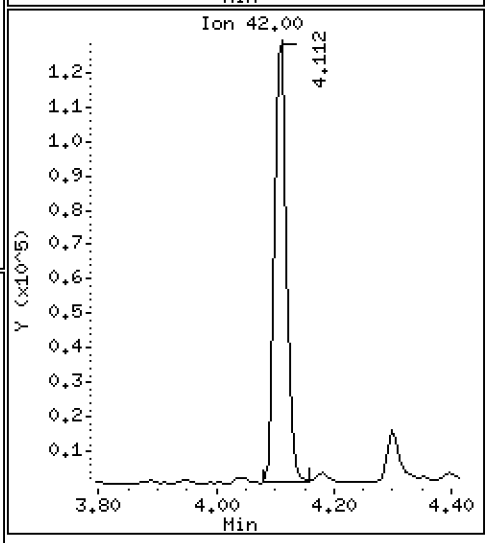
90 N-Nitrosodimethylamine

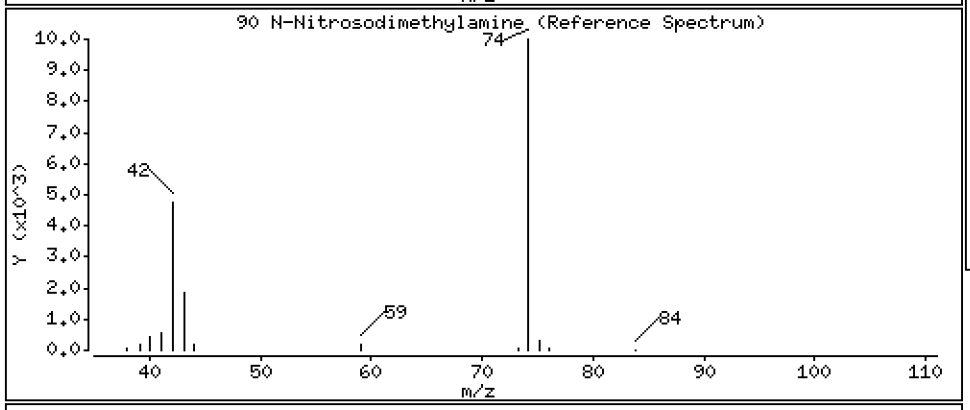
Concentration: 6.055 ug/mL

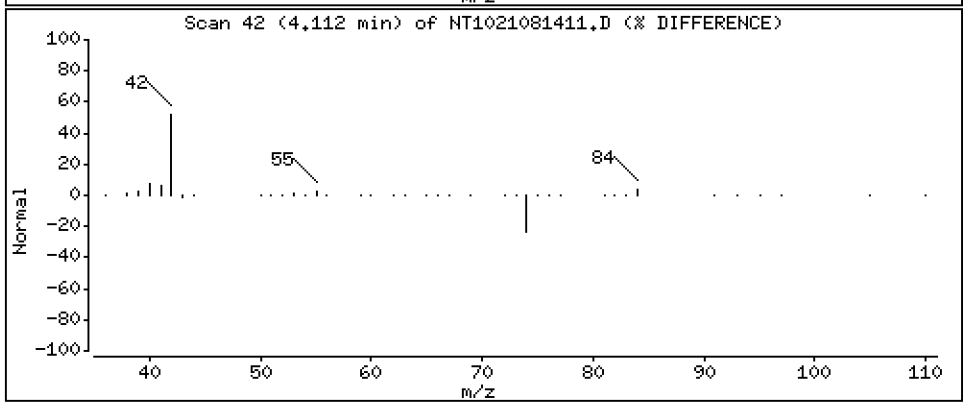












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

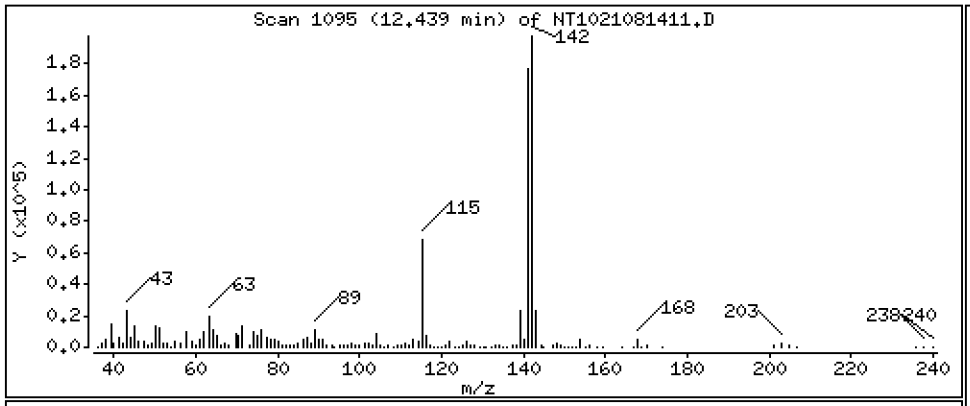
Operator: VTS

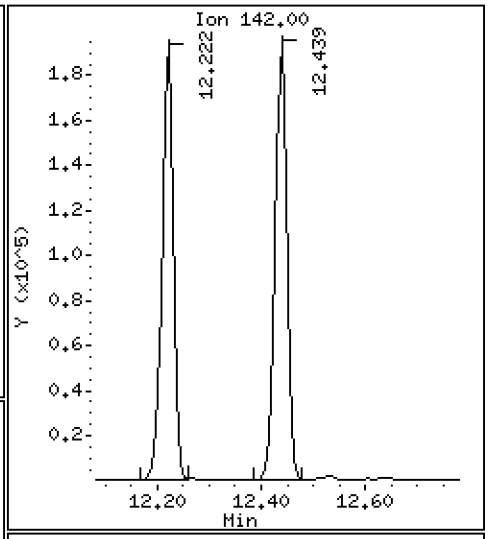
Column phase: ZB-5msi

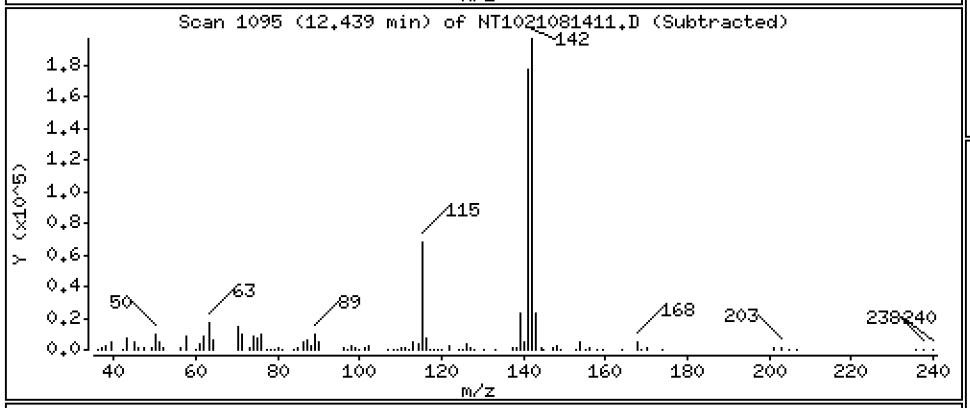
Column diameter: 0.25

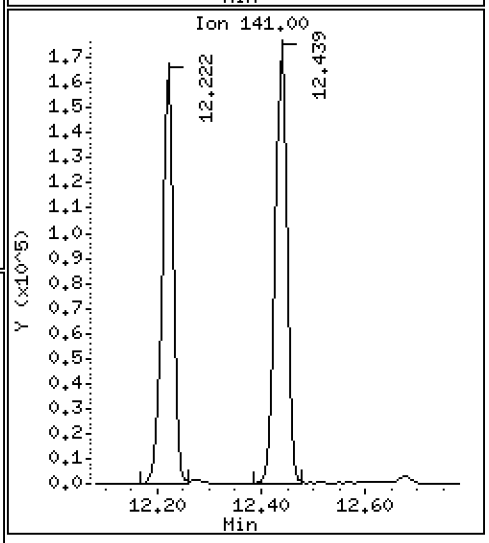
105 1-methylnaphthalene

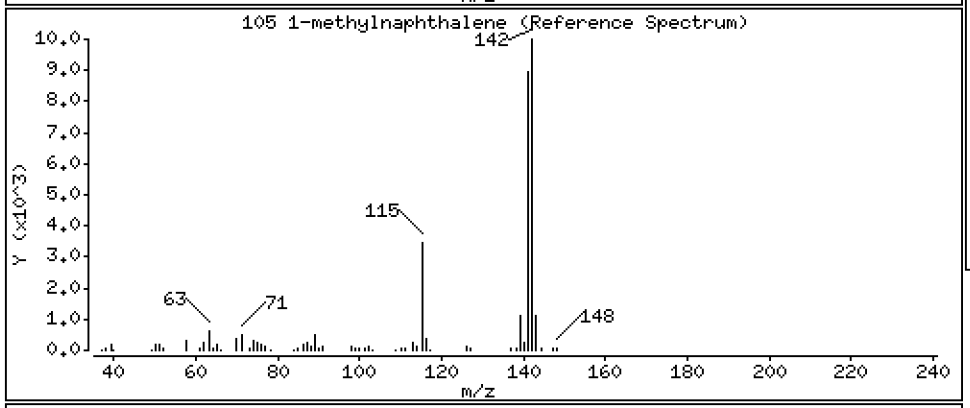
Concentration: 4.131 ug/mL

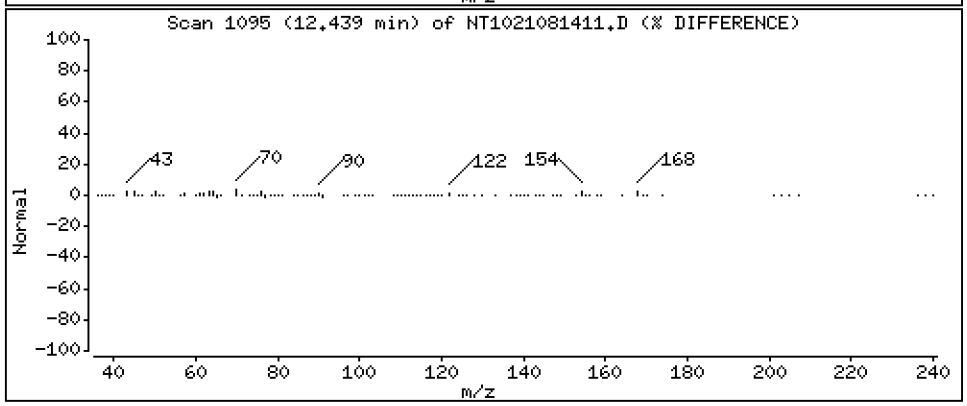












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

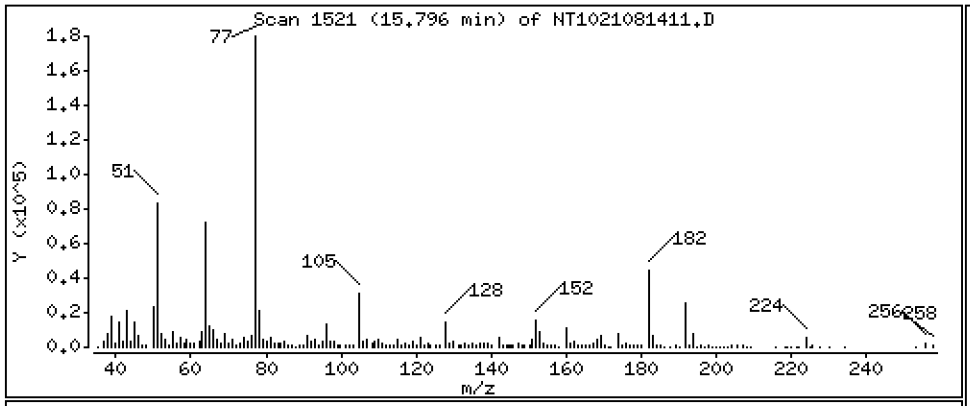
Operator: VTS

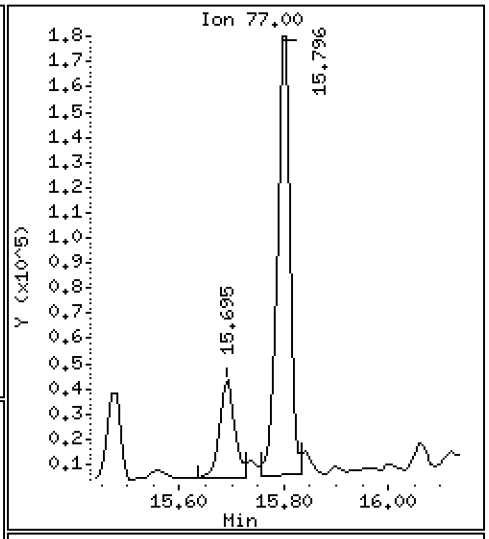
Column phase: ZB-5msi

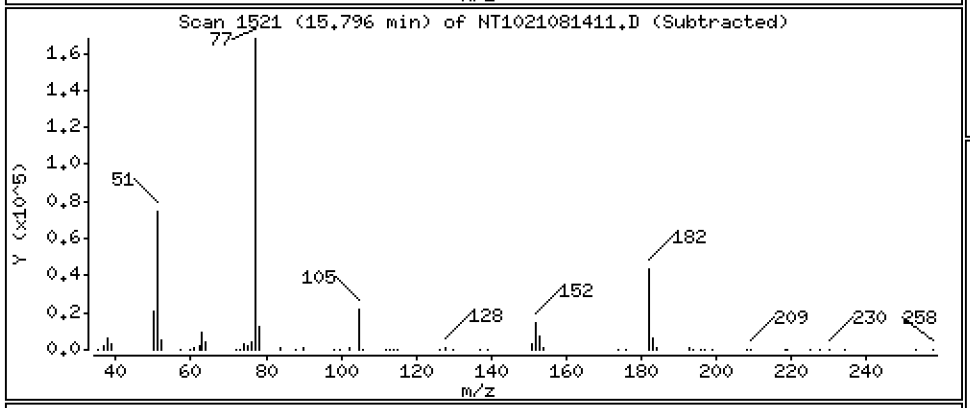
Column diameter: 0.25

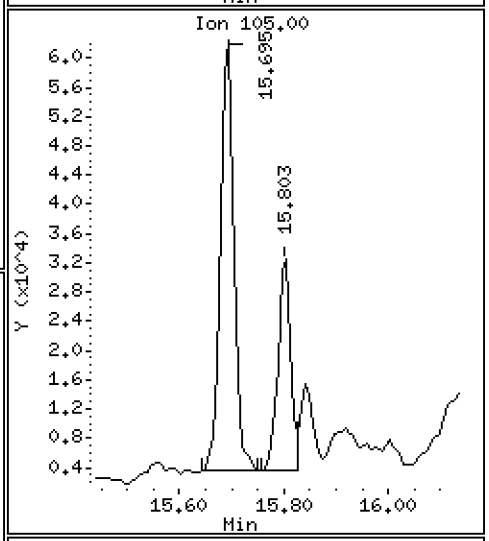
111 Azobenzene (1,2-DP-Hydrazine)

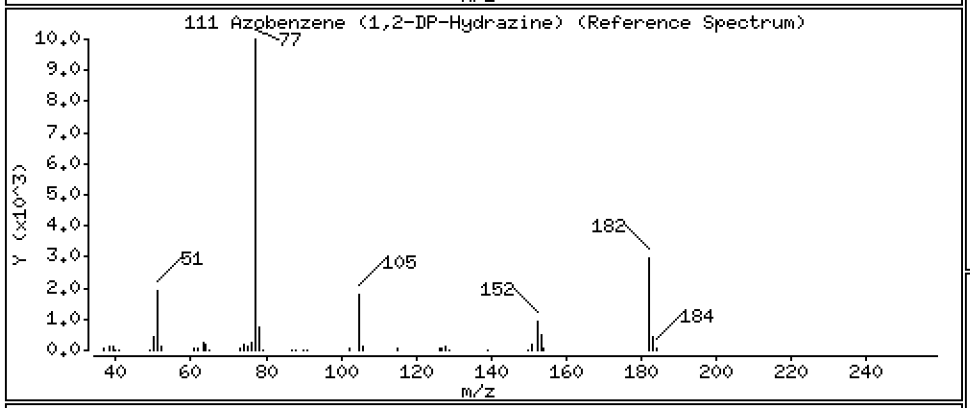
Concentration: 3.993 ug/mL

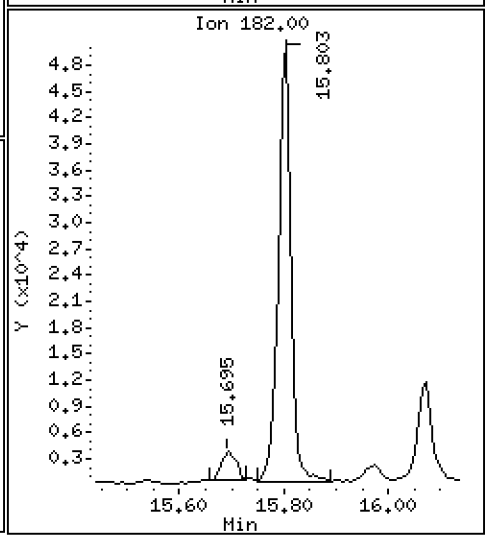


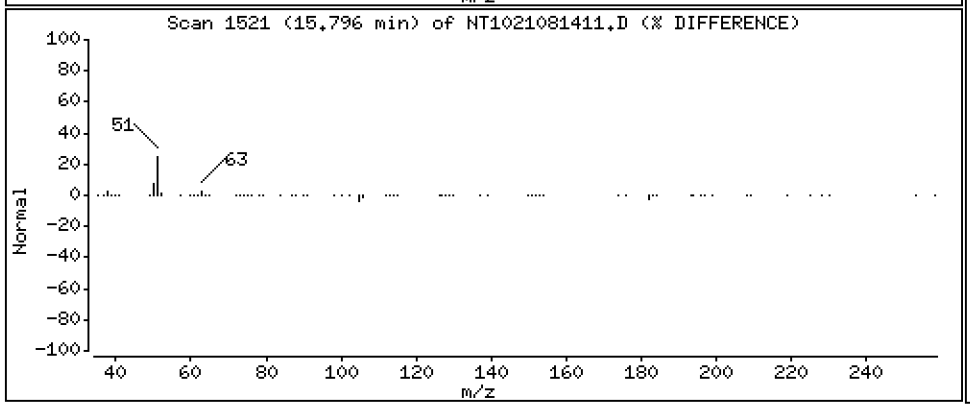












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Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

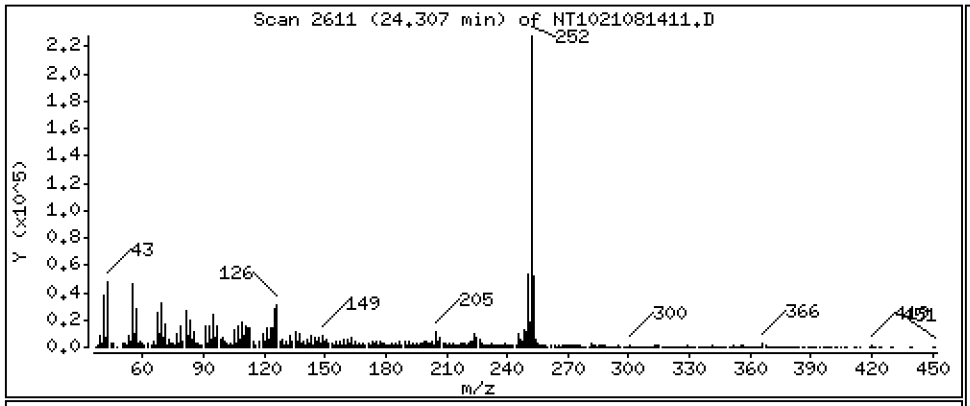
Operator: VTS

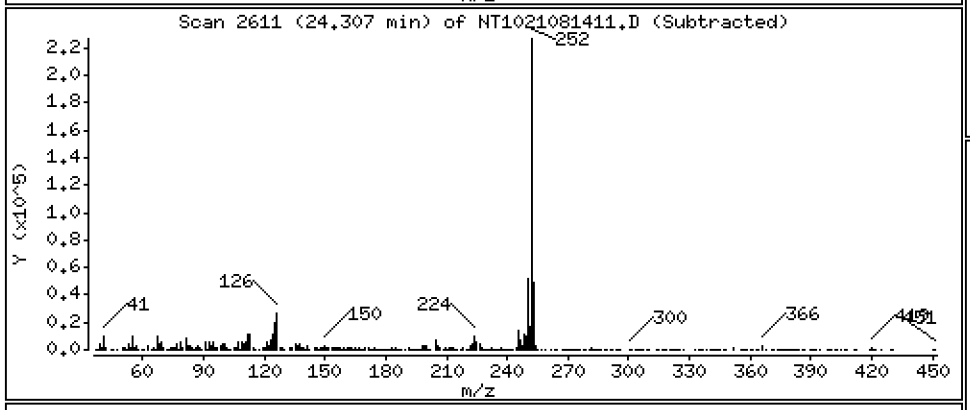
Column phase: ZB-5msi

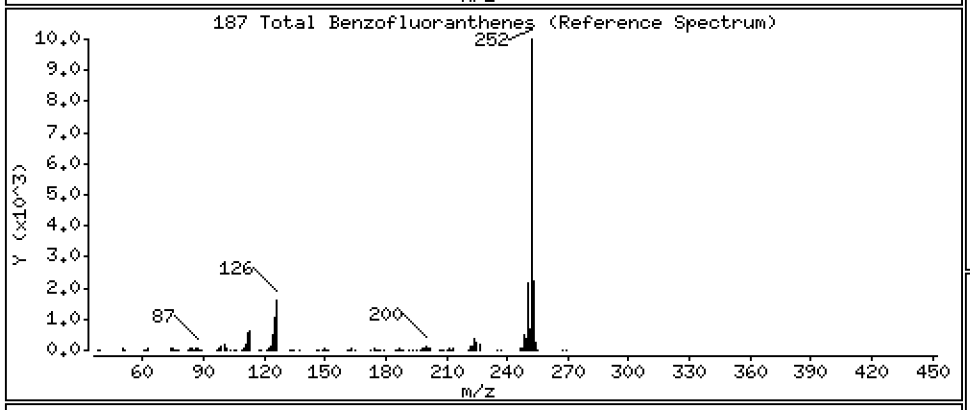
Column diameter: 0.25

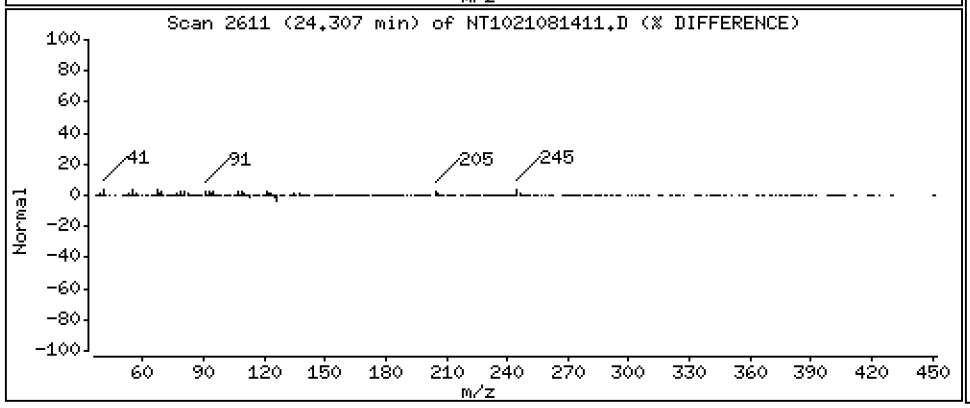
187 Total Benzofluoranthenes

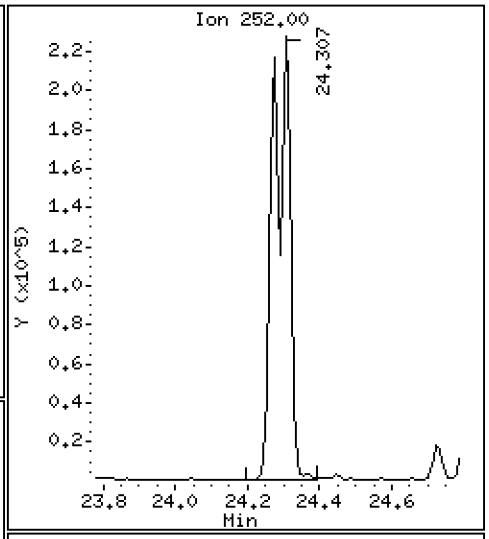
Concentration: 10.35 ug/mL

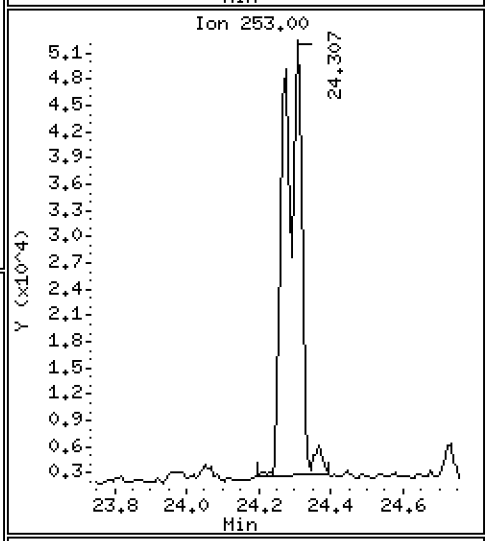


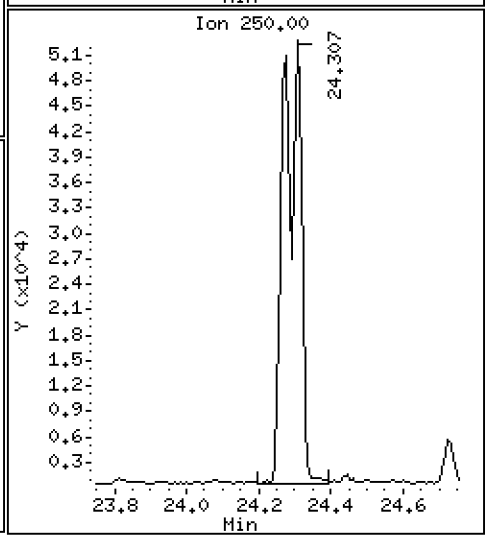












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081411.D

Date : 14-AUG-2021 15:52

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MS1

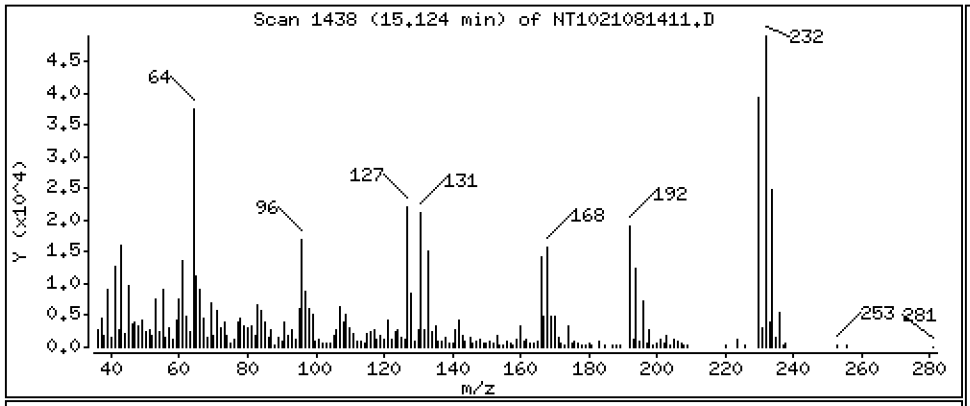
Operator: VTS

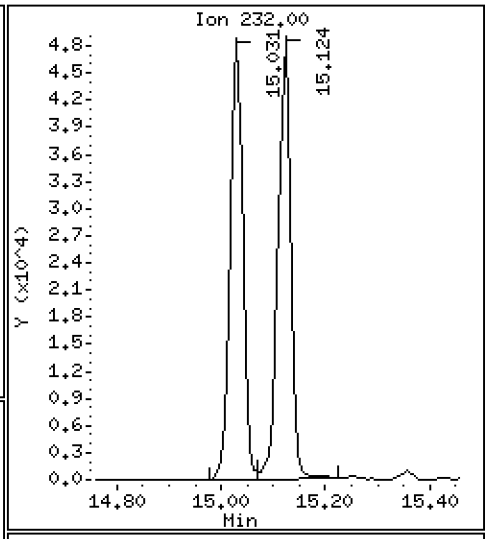
Column phase: ZB-5msi

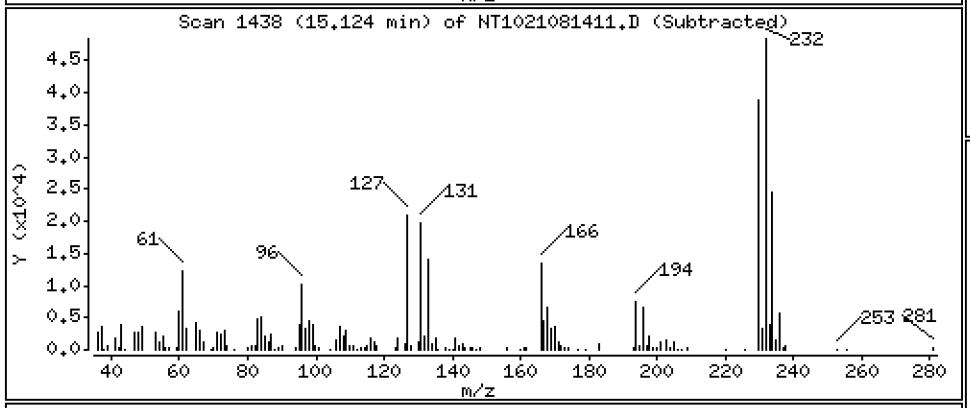
Column diameter: 0.25

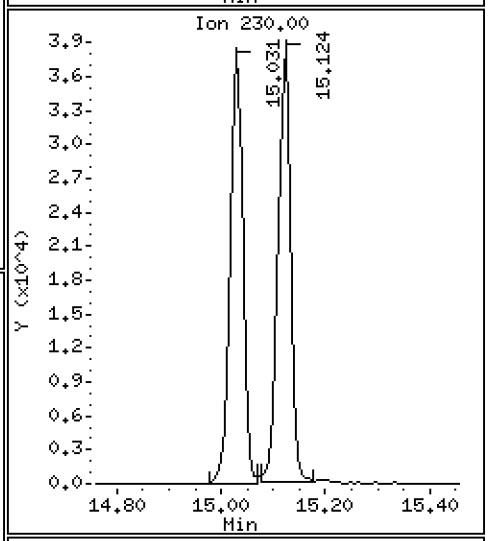
120 2,3,4,6-Tetrachlorophenol

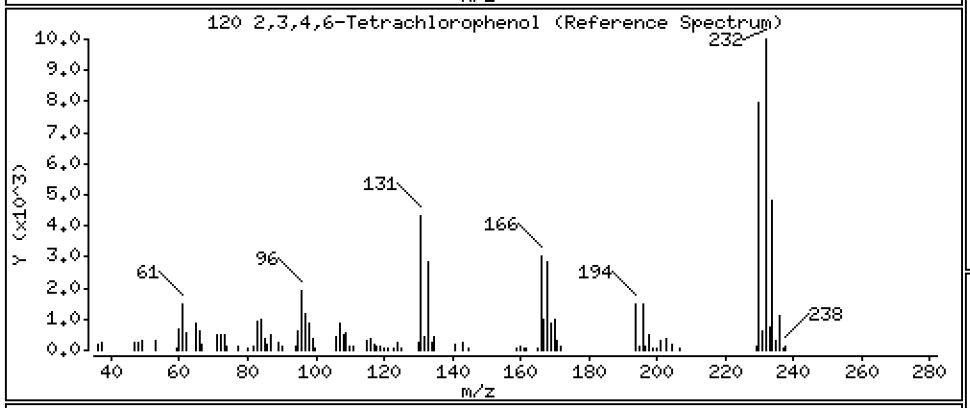
Concentration: 4.879 ug/mL

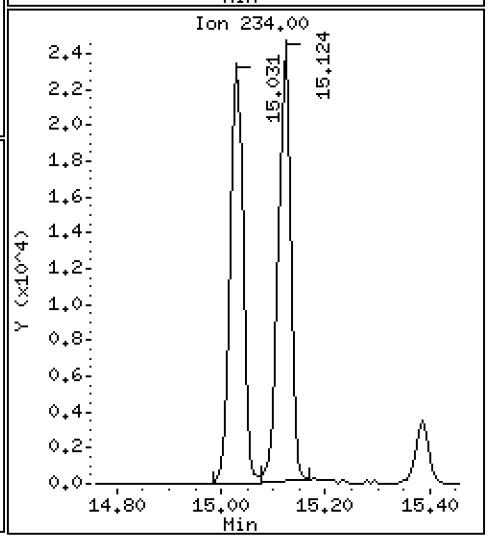


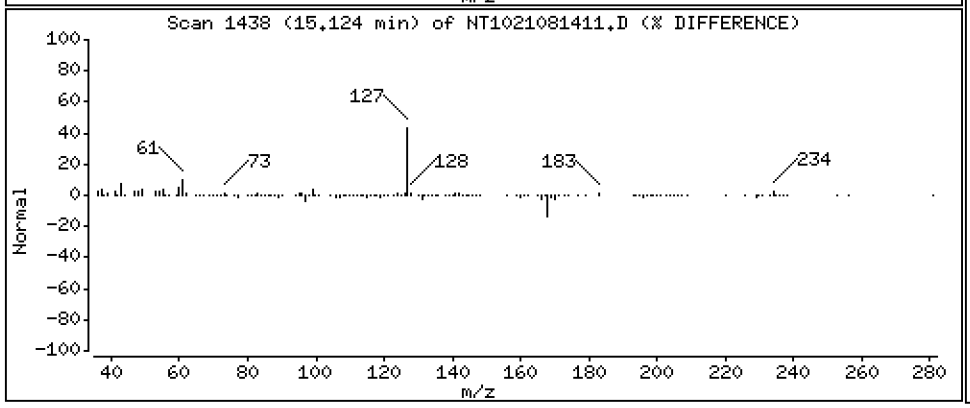












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

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Inj Date : 14-AUG-2021 15:52
Operator : VTS Inst ID: nt10.i
Smp Info : BJH0004-MS1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 11
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$ 1 2-Fluorophenol	112	6.235	6.204	(0.746)	149381	4.60714	4.607
$ 2 Phenol-d5	99	7.811	7.788	(0.934)	236764	4.91974	4.920
3 Phenol	94	7.834	7.811	(0.937)	143659	3.41496	3.415
$ 5 2-Chlorophenol-d4	132	8.020	8.004	(0.959)	191295	5.63803	5.638
4 Bis(2-Chloroethyl)ether	93	7.935	7.935	(0.949)	115131	3.42657	3.427
6 2-Chlorophenol	128	8.051	8.035	(0.963)	136827	4.29707	4.297
7 1,3-Dichlorobenzene	146	8.291	8.283	(0.992)	118828	3.39719	3.397
* 8 1,4-Dichlorobenzene-d4	152	8.361	8.353	(1.000)	82390	4.00000	
9 1,4-Dichlorobenzene	146	8.392	8.384	(1.004)	110234	3.69110	3.691
$ 10 1,2-Dichlorobenzene-d4	152	8.710	8.702	(1.042)	71261	3.26548	3.265
12 1,2-Dichlorobenzene	146	8.733	8.726	(1.045)	109890	3.47856	3.479
11 Benzyl alcohol	108	8.656	8.648	(1.035)	95608	4.85448	4.854
14 2,2'-oxybis(1-Chloropropane)	121	8.943	8.935	(1.070)	37732	3.11337	3.113
13 2-Methylphenol	108	8.912	8.896	(1.066)	99771	3.81030	3.810
17 Hexachloroethane	117	9.308	9.300	(1.113)	46235	3.60154	3.602
16 N-Nitroso-di-n-propylamine	70	9.199	9.191	(1.100)	79889	3.53666	3.537
15 4-Methylphenol	108	9.191	9.160	(1.099)	115813	4.12153	4.122
$ 18 Nitrobenzene-d5	82	9.447	9.440	(0.875)	145824	3.95278	3.953
19 Nitrobenzene	77	9.478	9.471	(0.878)	137347	3.76830	3.768
20 Isophorone	82	9.921	9.913	(0.919)	262119	3.81084	3.811
21 2-Nitrophenol	139	10.099	10.091	(0.935)	74478	3.88249	3.882
22 2,4-Dimethylphenol	107	10.193	10.184	(0.944)	321433	11.2413	11.24
23 Bis(2-Chloroethoxy)methane	93	10.371	10.363	(0.960)	136945	3.83570	3.836
24 Benzoic acid	105	10.490	10.430	(0.971)	435892	26.1701	26.17
25 2,4-Dichlorophenol	162	10.566	10.549	(0.978)	277736	11.7223	11.72
26 1,2,4-Trichlorobenzene	180	10.721	10.714	(0.993)	101282	3.78099	3.781
* 27 Naphthalene-d8	136	10.798	10.791	(1.000)	300785	4.00000	
28 Naphthalene	128	10.837	10.837	(1.004)	315396	3.96210	3.962
29 4-Chloroaniline	127	Compound Not Detected.					
30 Hexachlorobutadiene	225	11.200	11.192	(1.037)	64360	4.40053	4.401
31 4-Chloro-3-methylphenol	107	11.997	11.982	(1.111)	382407	13.5189	13.52
32 2-Methylnaphthalene	142	12.222	12.214	(1.132)	292326	3.96909	3.969
33 Hexachlorocyclopentadiene	237	12.678	12.671	(0.882)	35511	2.00323	2.003

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	12.864	12.849	(0.895)	297570	16.1146	16.11
	35 2,4,5-Trichlorophenol	196	12.949	12.926	(0.901)	288633	14.6695	14.67
$	36 2-Fluorobiphenyl	172	13.011	13.003	(0.905)	308188	3.99290	3.993
	37 2-Chloronaphthalene	162	13.197	13.189	(0.918)	265317	4.11430	4.114
	38 2-Nitroaniline	65	13.499	13.483	(0.939)	109325	4.52364	4.524
	39 Dimethylphthalate	163	13.940	13.917	(0.970)	262143	4.20275	4.203
	40 Acenaphthylene	152	14.064	14.048	(0.978)	362161	3.94892	3.949
	41 2,6-Dinitrotoluene	165	14.064	14.048	(0.978)	197638	13.9750	13.97
*	42 Acenaphthene-d10	164	14.373	14.358	(1.000)	168077	4.00000	
	43 3-Nitroaniline	138	Compound Not Detected.					
	44 Acenaphthene	153	14.443	14.427	(1.005)	223298	4.19379	4.194
	45 2,4-Dinitrophenol	184	14.551	14.543	(1.012)	13375	1.66382	1.664
	46 Dibenzofuran	168	14.760	14.752	(1.027)	353542	4.29469	4.295
	47 4-Nitrophenol	109	14.767	14.713	(1.027)	112265	16.4237	16.42
	48 2,4-Dinitrotoluene	165	14.868	14.853	(1.034)	271453	14.3689	14.37
	50 Diethylphthalate	149	15.378	15.363	(1.070)	273408	4.62319	4.623
	49 Fluorene	166	15.471	15.456	(1.076)	314310	3.93833	3.938
	51 4-Chlorophenyl-phenylether	204	15.479	15.463	(1.077)	149749	3.22790	3.228
	52 4-Nitroaniline	138	Compound Not Detected.					
	53 4,6-Dinitro-2-methylphenol	198	15.695	15.680	(0.903)	203038	14.0664	14.07
	54 N-Nitrosodiphenylamine	169	15.741	15.726	(0.905)	116054	2.08533	2.085
$	55 2,4,6-Tribromophenol	330	16.011	15.996	(1.114)	110870	7.90016	7.900
	56 4-Bromophenyl-phenylether	248	16.474	16.458	(0.947)	116182	4.10239	4.102
	57 Hexachlorobenzene	284	16.775	16.752	(0.965)	122742	4.12399	4.124
	58 Pentachlorophenol	266	17.155	17.132	(0.987)	177568	14.1929	14.19
*	59 Phenanthrene-d10	188	17.387	17.364	(1.000)	310146	4.00000	
	60 Phenanthrene	178	17.433	17.418	(1.003)	422683	5.03963	5.040
	61 Anthracene	178	17.526	17.503	(1.008)	331886	3.70042	3.700
	62 Carbazole	167	17.890	17.859	(1.029)	336422	3.79962	3.800
	63 Di-n-butylphthalate	149	18.733	18.710	(1.077)	502964	3.66689	3.667
	64 Fluoranthene	202	19.901	19.839	(0.884)	512086	6.22548	6.225
	65 Pyrene	202	20.304	20.265	(0.902)	446862	4.92827	4.928
$	66 Terphenyl-d14	244	20.613	20.590	(0.915)	255520	3.95385	3.954
	67 Butylbenzylphthalate	149	21.573	21.558	(0.958)	145946	4.89341	4.893
	68 Benzo(a)anthracene	228	22.487	22.464	(0.999)	331979	4.50708	4.507
*	69 Chrysene-d12	240	22.518	22.495	(1.000)	197387	4.00000	
	70 3,3'-Dichlorobenzidine	252	Compound Not Detected.					
	71 Chrysene	228	22.564	22.541	(1.002)	324952	5.72220	5.722
	72 bis(2-Ethylhexyl)phthalate	149	22.634	22.619	(0.958)	221565	5.60632	5.606
*	134 Di-n-octylphthalate-d4	153	23.625	23.610	(1.000)	359222	4.00000	
	73 Di-n-octylphthalate	149	23.633	23.617	(1.000)	406758	4.04035	4.040
	74 Benzo(b)fluoranthene	252	24.275	24.252	(0.974)	404376	5.33946	5.339
	75 Benzo(k)fluoranthene	252	24.306	24.283	(0.975)	392046	5.22600	5.226
	76 Benzo(a)pyrene	252	24.817	24.786	(0.996)	297772	4.35049	4.350
*	77 Perylene-d12	264	24.918	24.887	(1.000)	192189	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.111	27.057	(1.088)	254776	3.28894	3.289
	79 Dibenzo(a,h)anthracene	278	27.119	27.072	(1.088)	199040	3.27130	3.271
	80 Benzo(g,h,i)perylene	276	27.740	27.686	(1.113)	179727	2.59995	2.600
	90 N-Nitrosodimethylamine	74	4.111	4.065	(0.492)	134318	6.05526	6.055
	91 Aniline	93	Compound Not Detected.					
	93 Benzidine	184	Compound Not Detected.					
	103 Pyridine	79	Compound Not Detected.					
	105 1-methylnaphthalene	142	12.438	12.431	(1.152)	285492	4.13140	4.131
	111 Azobenzene (1,2-DP-Hydrazine)	77	15.795	15.788	(1.099)	301061	3.99257	3.993

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.306	24.283	(0.975)	752493	10.3469	10.35
120 2,3,4,6-Tetrachlorophenol	232	15.123	15.108	(1.052)	88352	4.87935	4.879

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081411.D
Lab Smp Id: BJH0004-MS1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	82390	-3.14
27 Naphthalene-d8	291658	145829	583316	300785	3.13
42 Acenaphthene-d10	163642	81821	327284	168077	2.71
59 Phenanthrene-d10	304099	152050	608198	310146	1.99
69 Chrysene-d12	199453	99727	398906	197387	-1.04
134 Di-n-octylphthala	303639	151820	607278	359222	18.31
77 Perylene-d12	200082	100041	400164	192189	-3.94

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.36	0.09
27 Naphthalene-d8	10.79	10.29	11.29	10.80	0.07
42 Acenaphthene-d10	14.36	13.86	14.86	14.37	0.11
59 Phenanthrene-d10	17.36	16.86	17.86	17.39	0.13
69 Chrysene-d12	22.50	22.00	23.00	22.52	0.10
134 Di-n-octylphthala	23.61	23.11	24.11	23.63	0.07
77 Perylene-d12	24.89	24.39	25.39	24.92	0.12

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081411.D

Lab ID: BJH0004-MS1
nt10.i, ABN.m, 14-AUG-2021 15:52

RT	CO-ELUTION COMPOUNDS
14.064	Acenaphthylene and 2,6-Dinitrotoluene

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
0.492	0.487	0.0051	N-Nitrosodimethylamine

RRT check based on Ccal File: NT1021081402.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

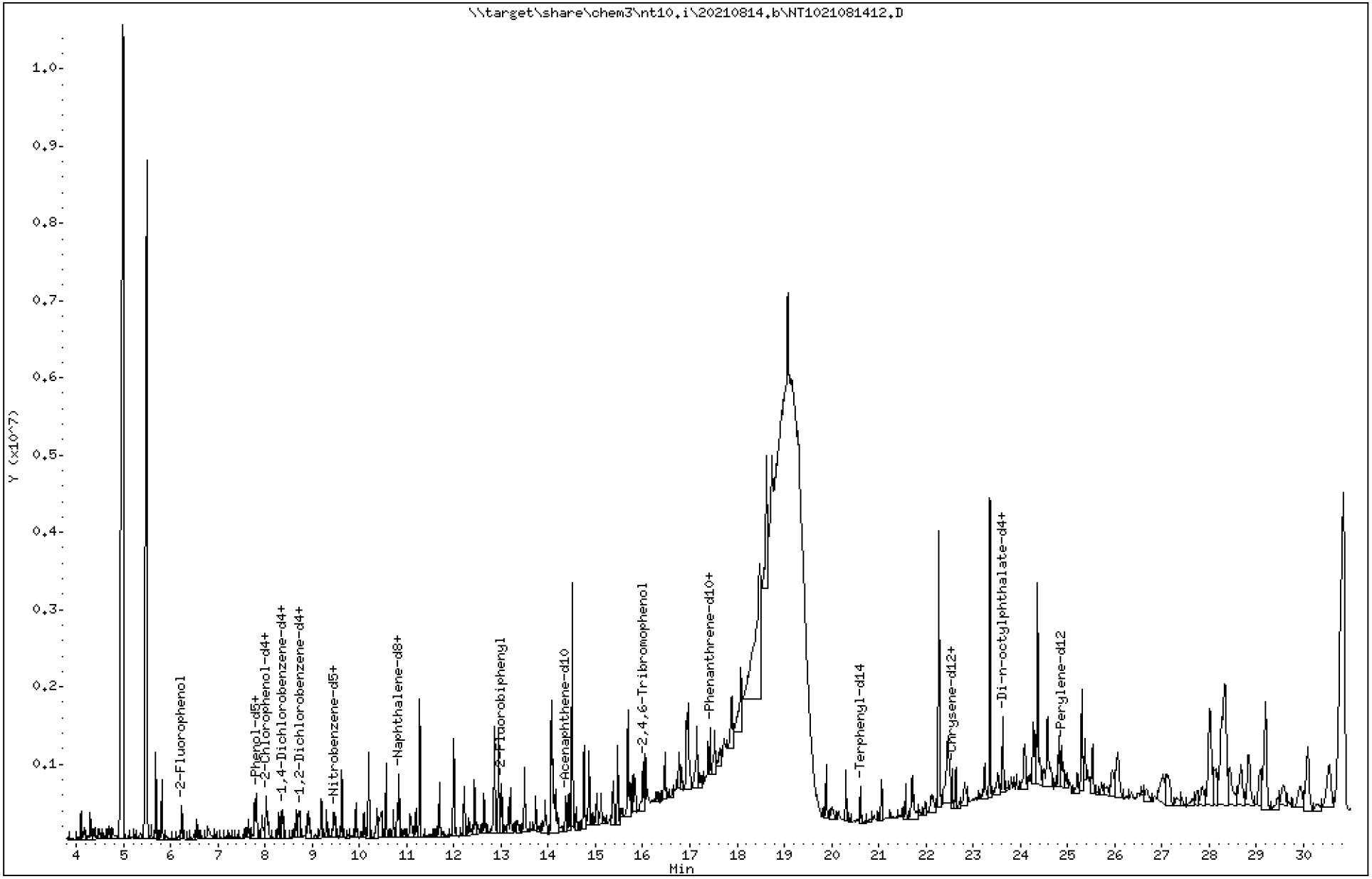
Instrument: nt10.i

Sample Info: BJH0004-MSD1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

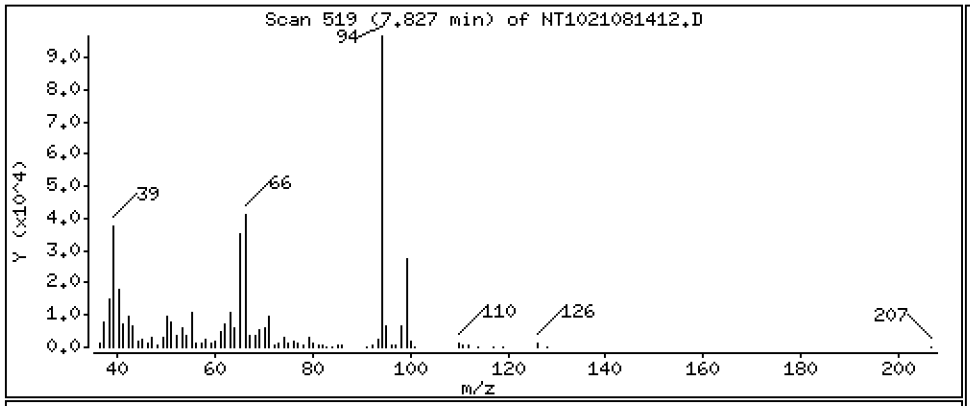
Operator: VTS

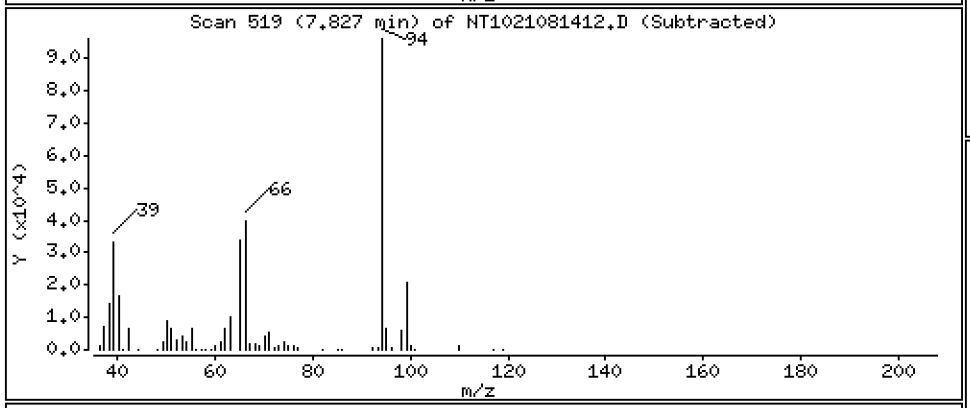
Column phase: ZB-5msi

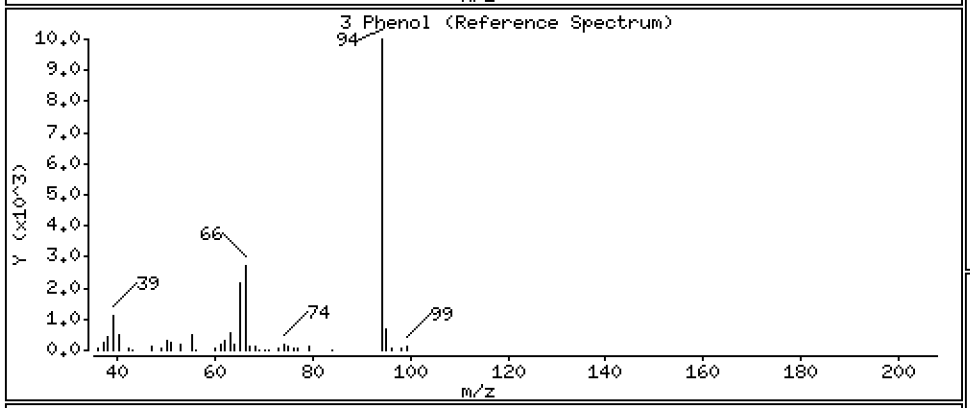
Column diameter: 0.25

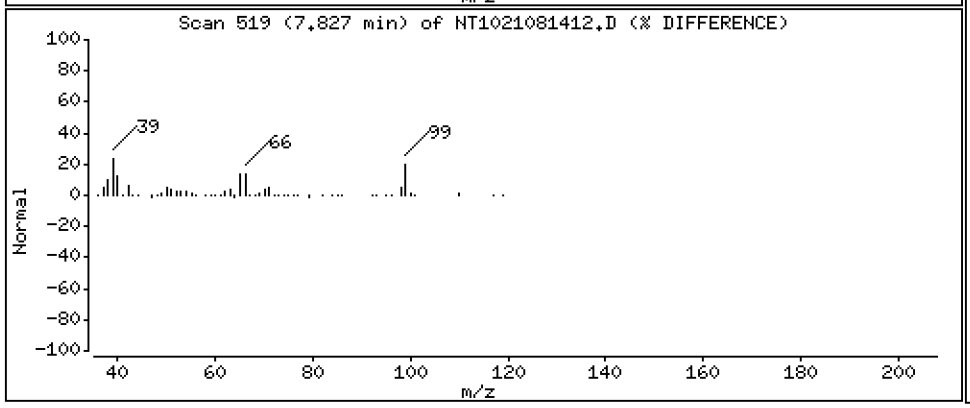
3 Phenol

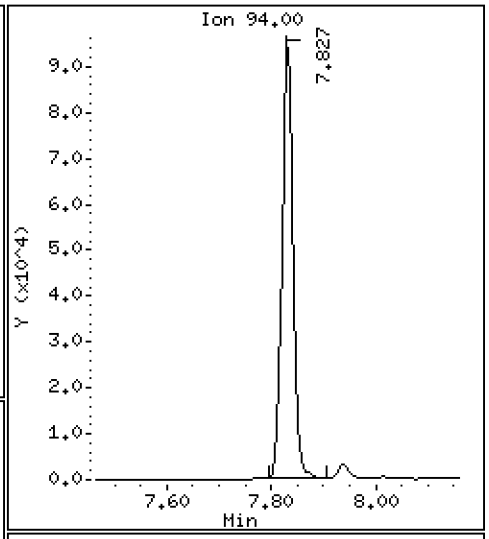
Concentration: 3.185 ug/mL

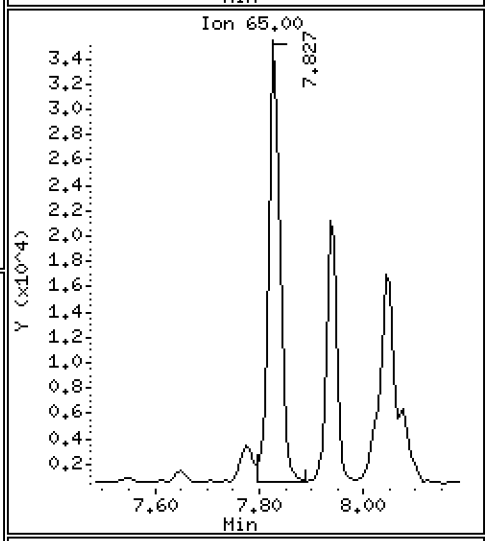


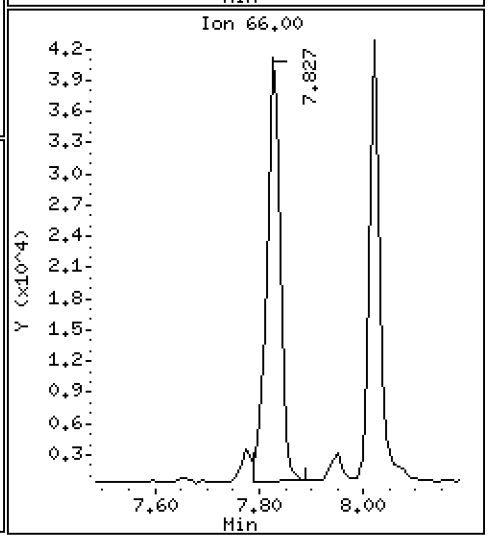












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

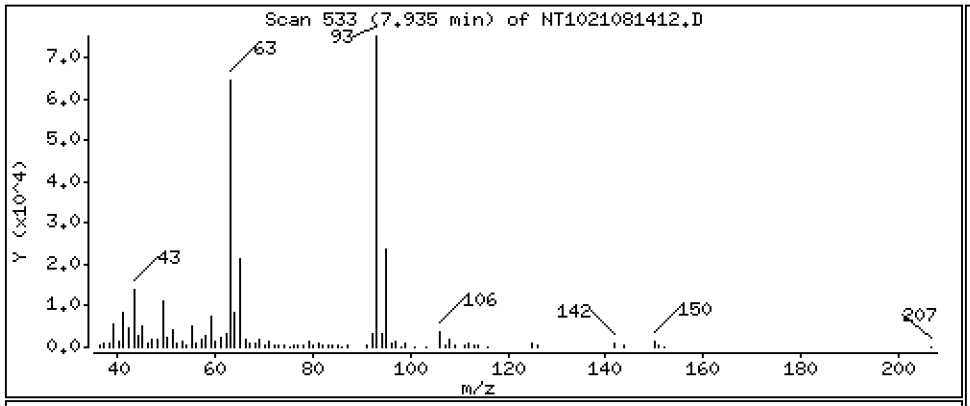
Operator: VTS

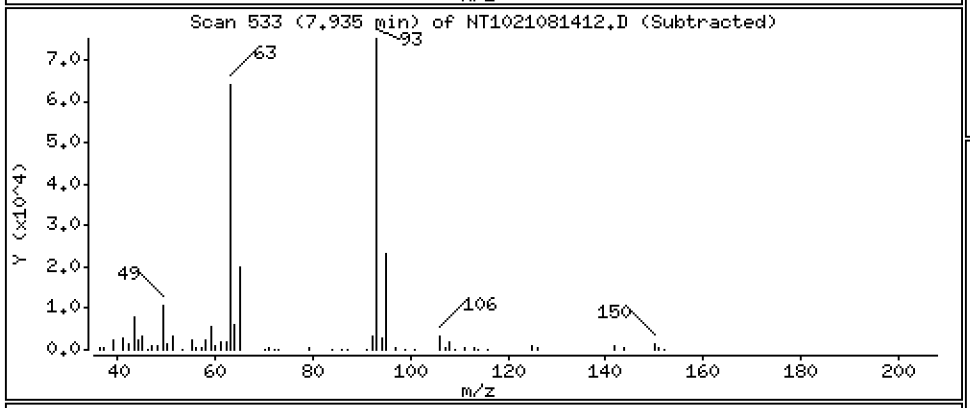
Column phase: ZB-5msi

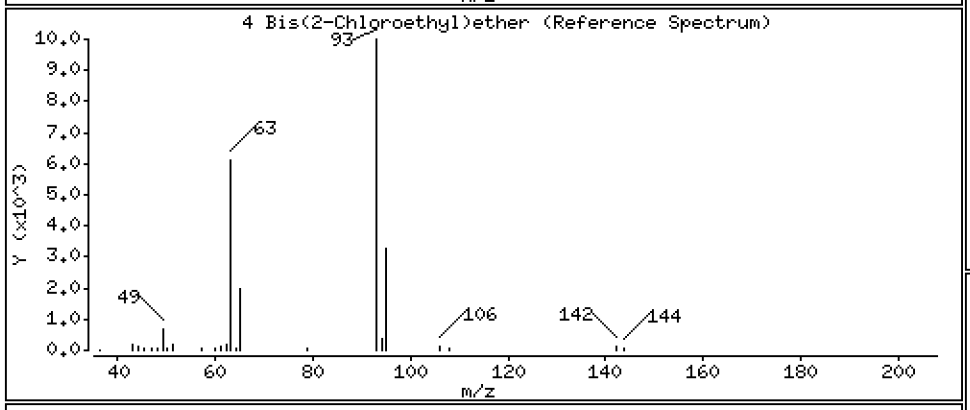
Column diameter: 0.25

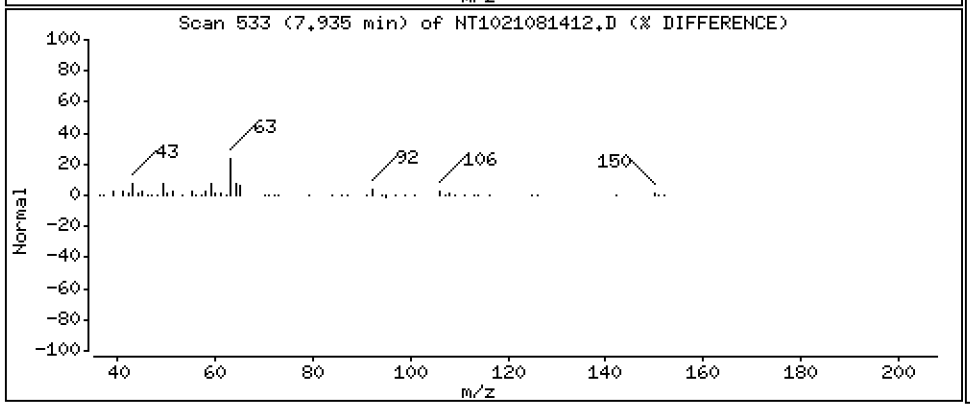
4 Bis(2-Chloroethyl)ether

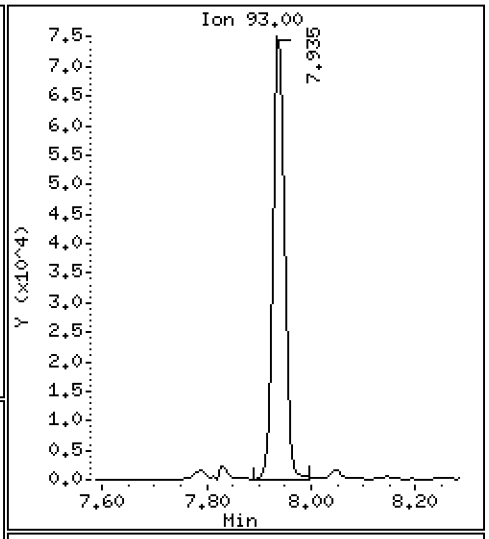
Concentration: 3.192 ug/mL

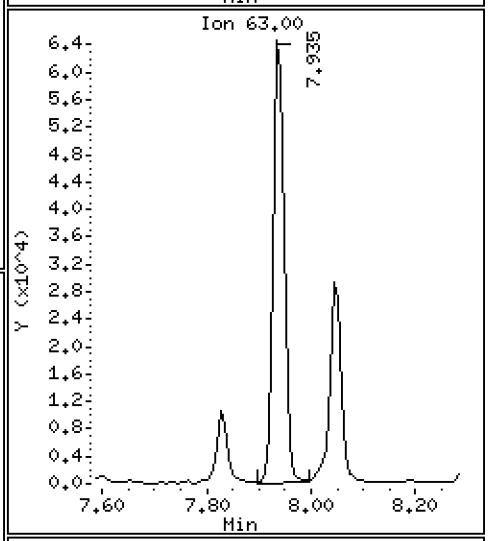


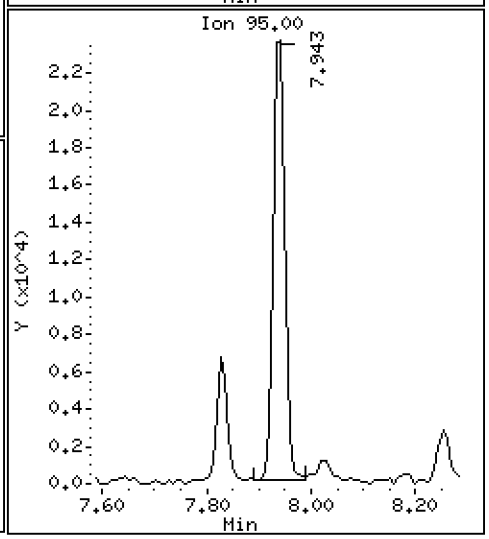












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

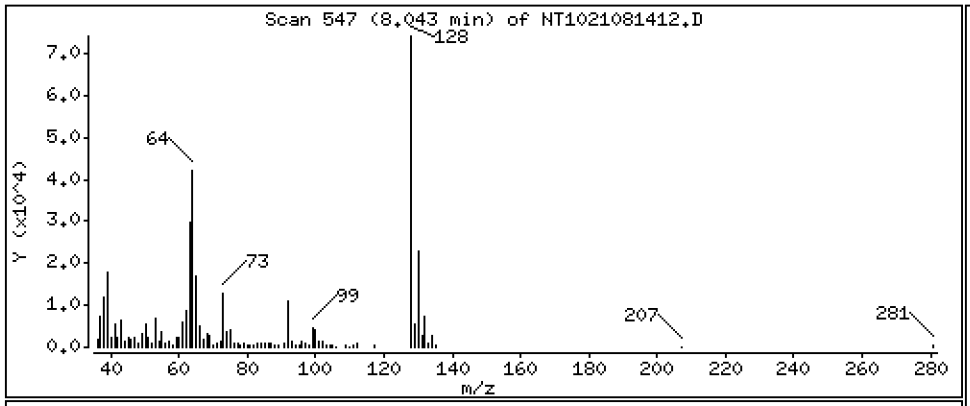
Operator: VTS

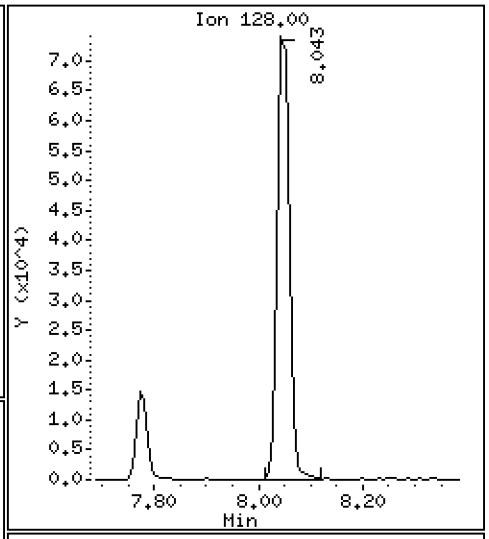
Column phase: ZB-5msi

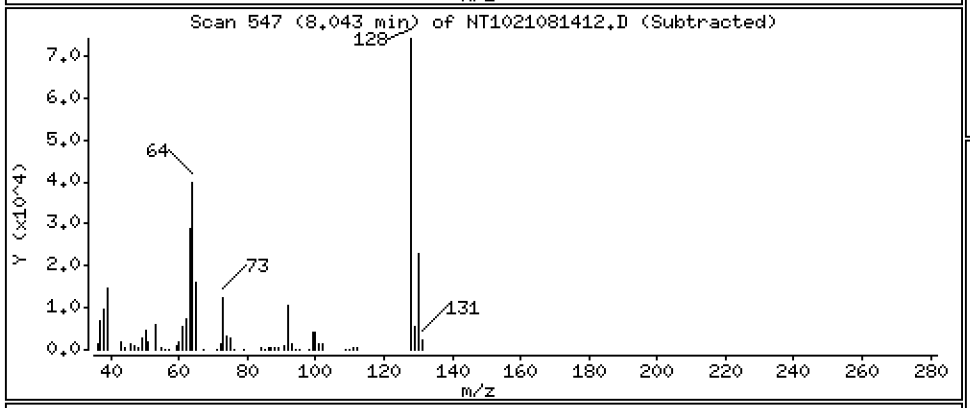
Column diameter: 0.25

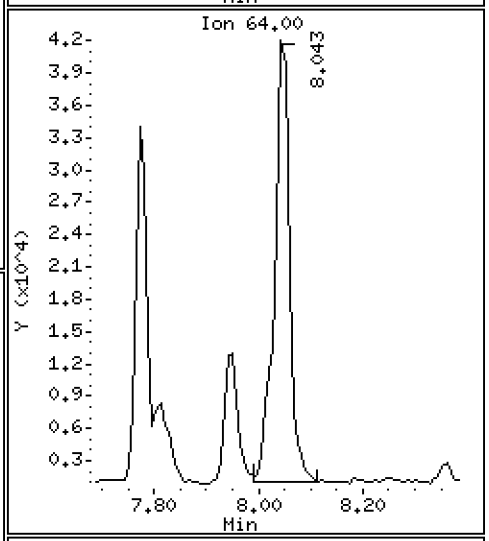
6 2-Chlorophenol

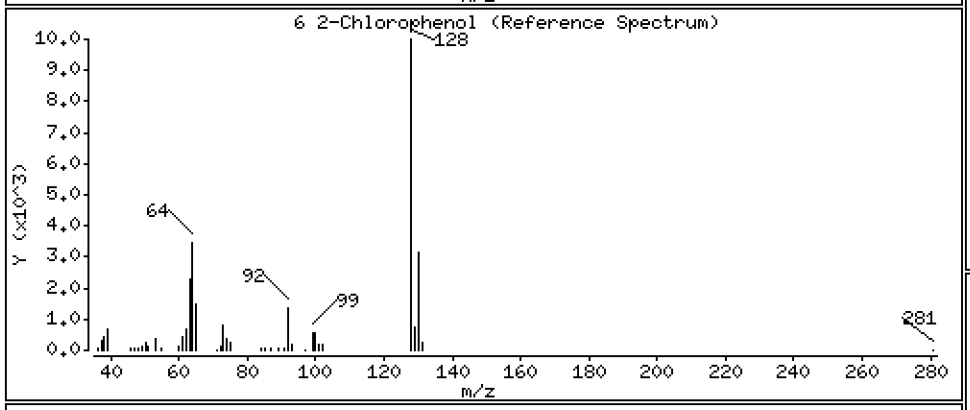
Concentration: 3.987 ug/mL

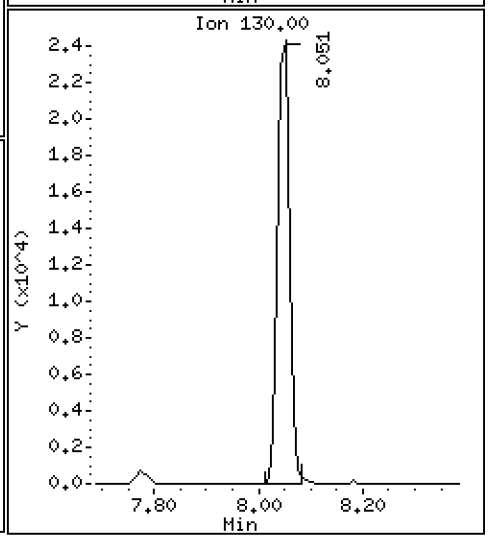


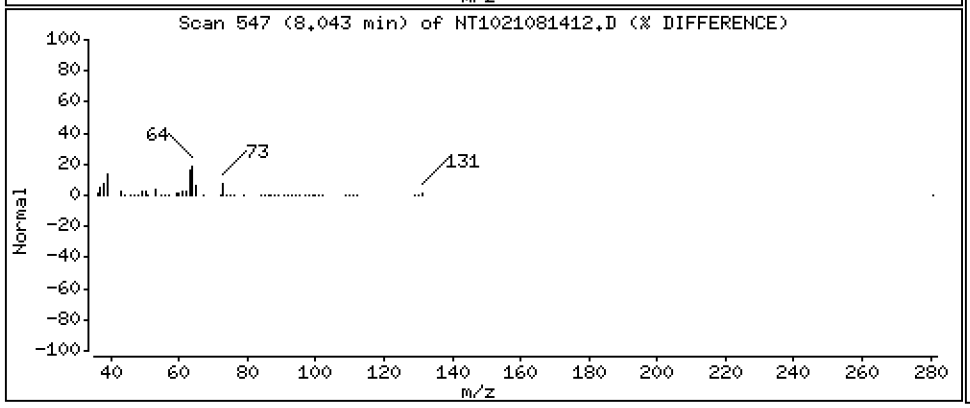












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

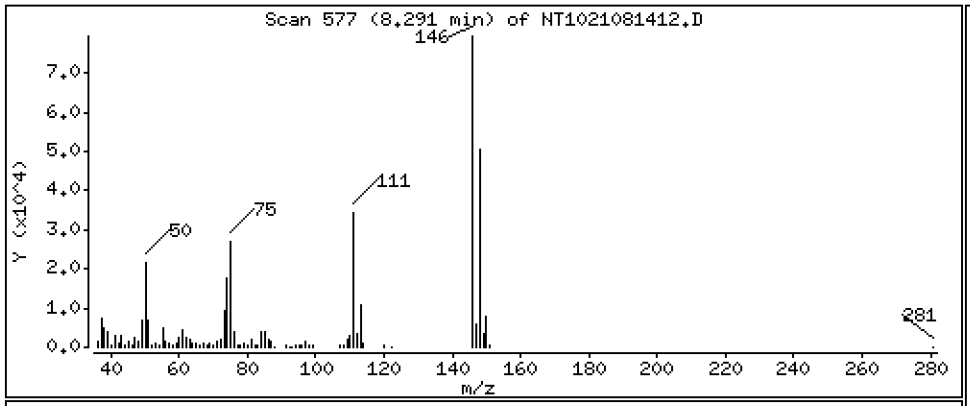
Operator: VTS

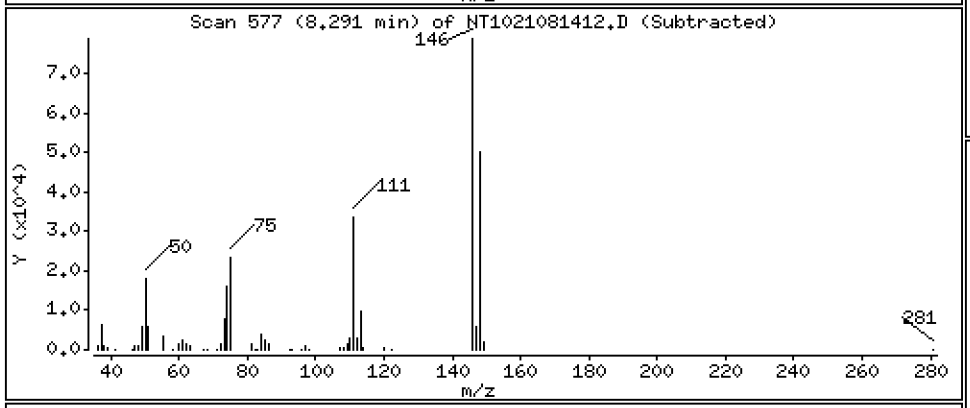
Column phase: ZB-5msi

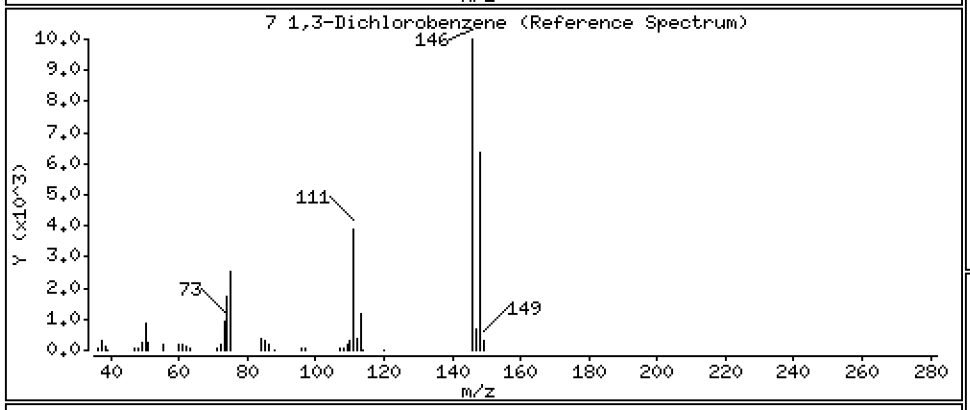
Column diameter: 0.25

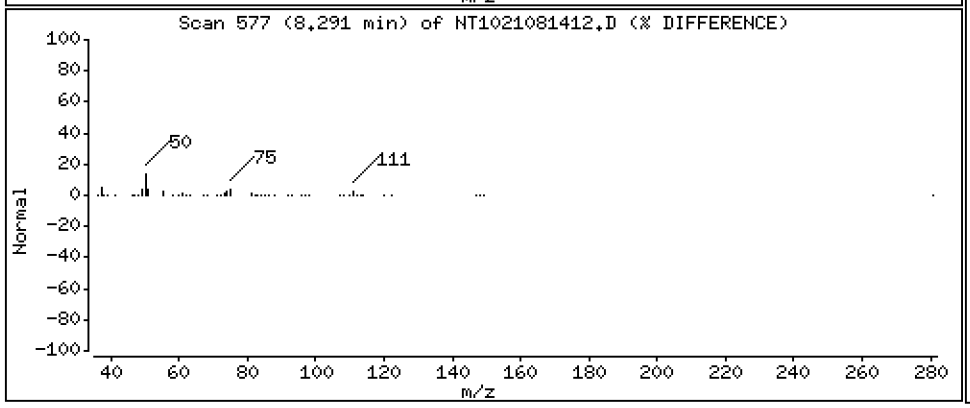
7 1,3-Dichlorobenzene

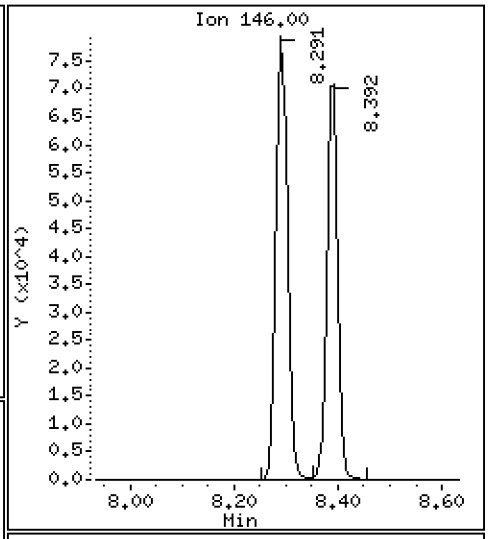
Concentration: 3.195 ug/mL

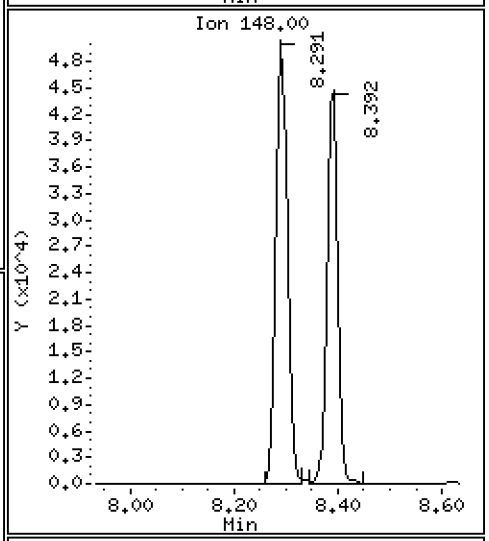


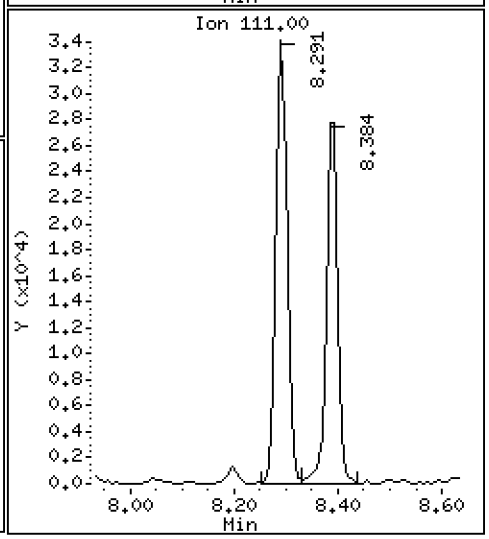












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

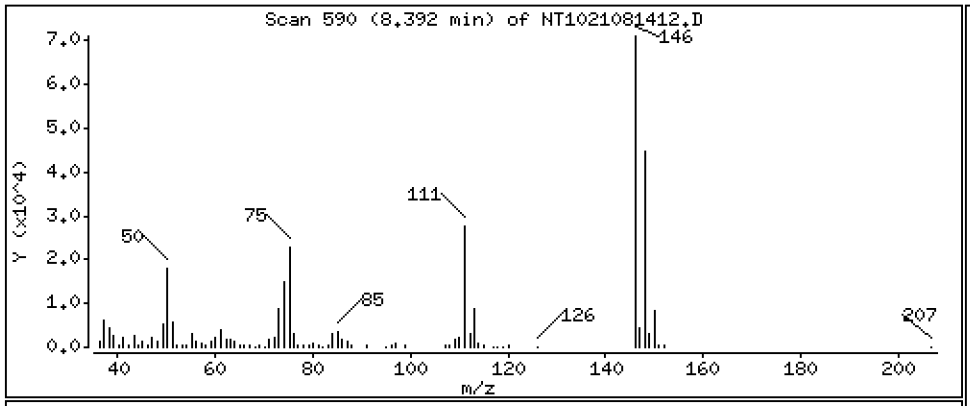
Operator: VTS

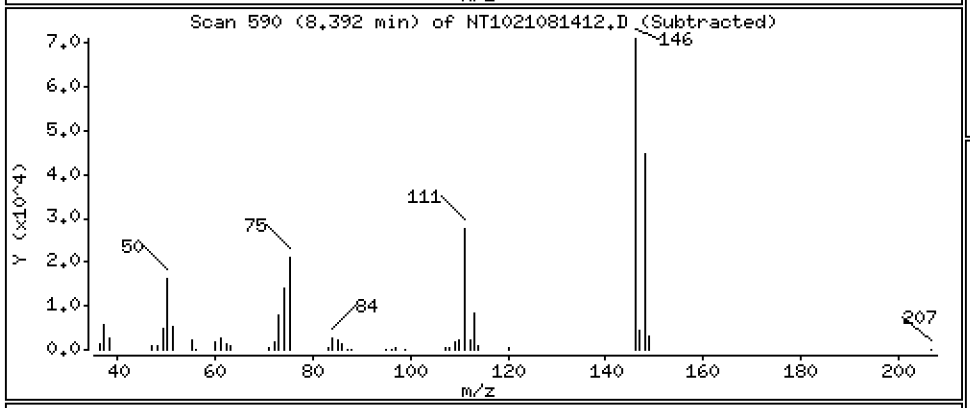
Column phase: ZB-5msi

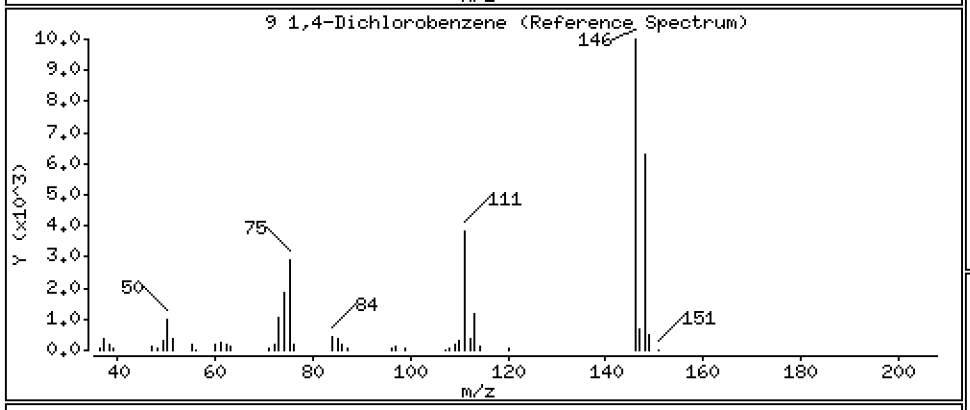
Column diameter: 0.25

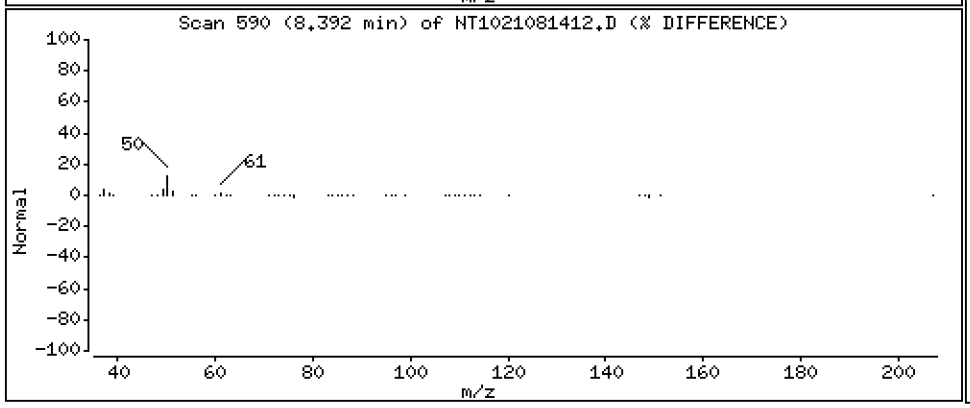
9 1,4-Dichlorobenzene

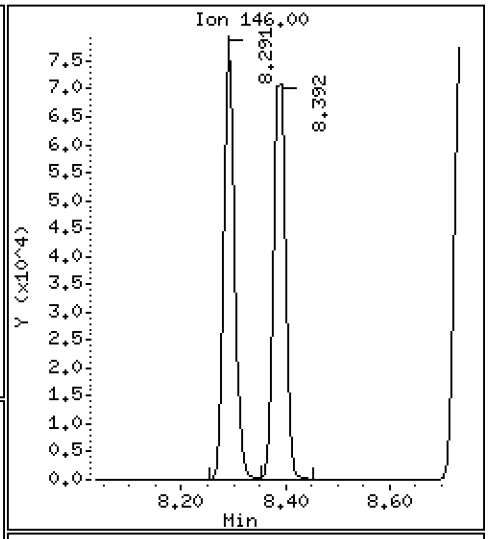
Concentration: 3.436 ug/mL

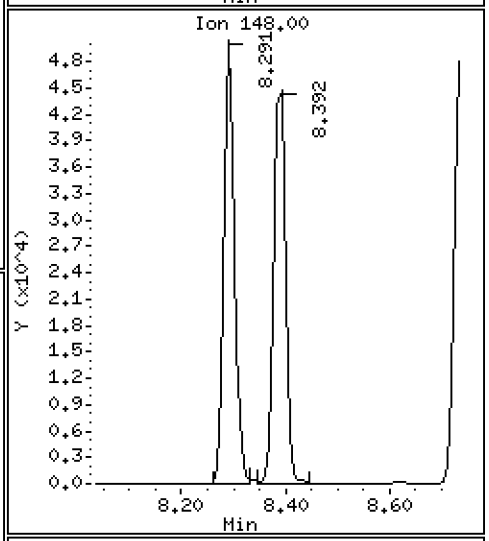


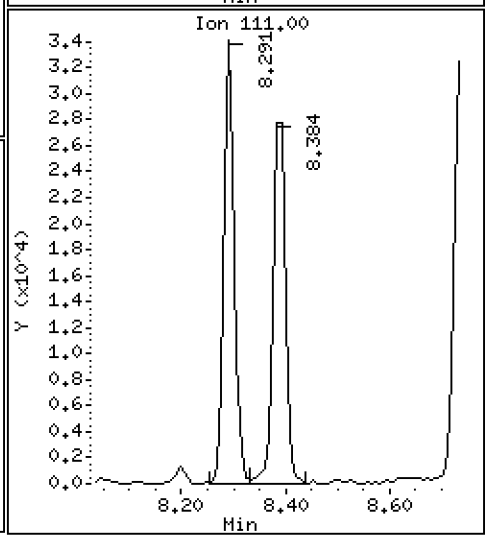












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

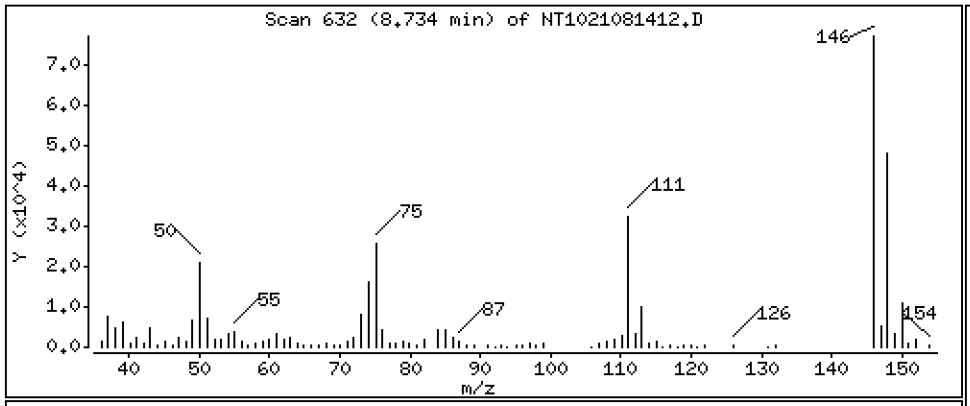
Operator: VTS

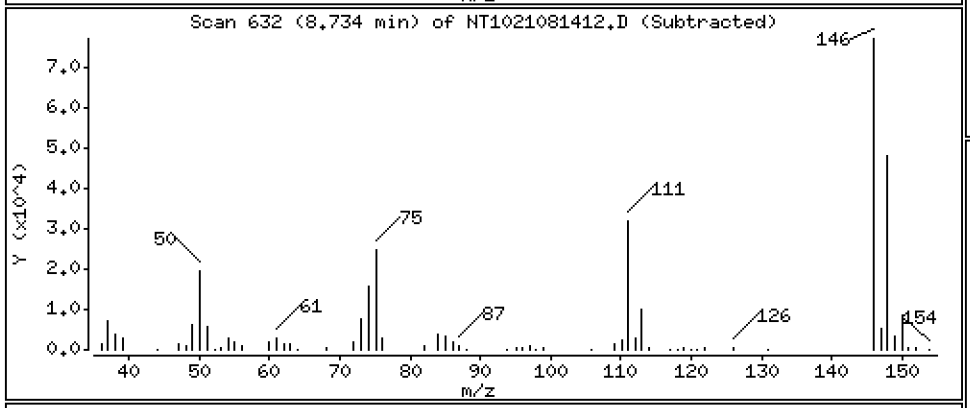
Column phase: ZB-5msi

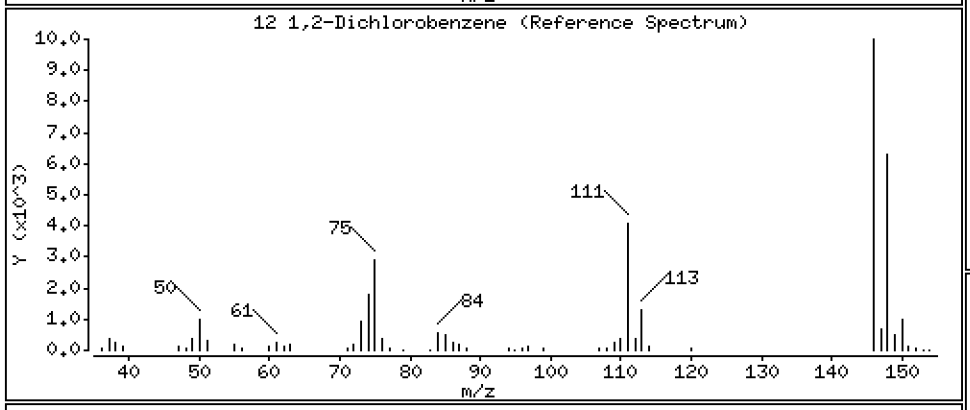
Column diameter: 0.25

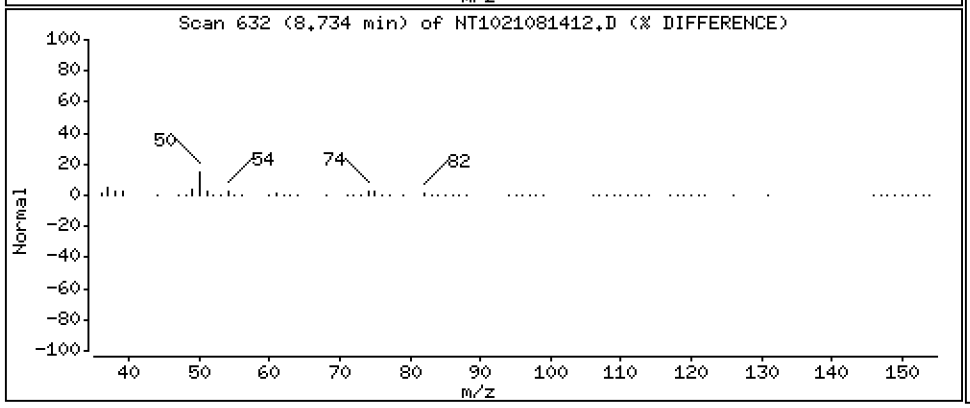
12 1,2-Dichlorobenzene

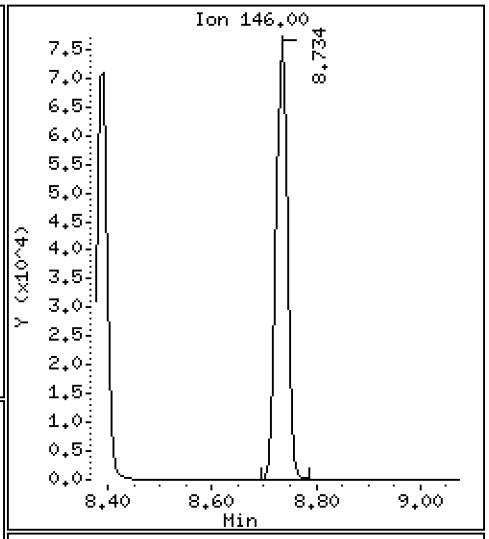
Concentration: 3.360 ug/mL

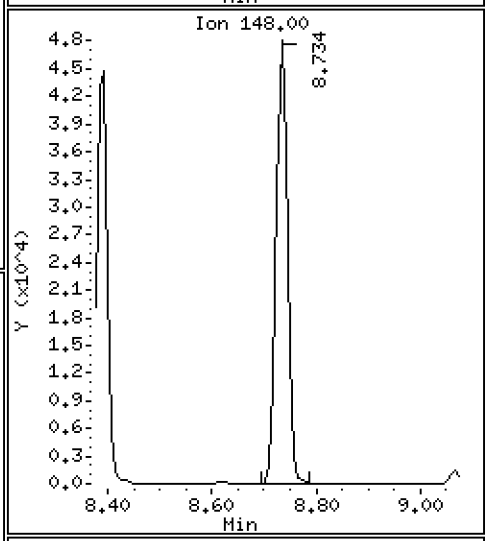


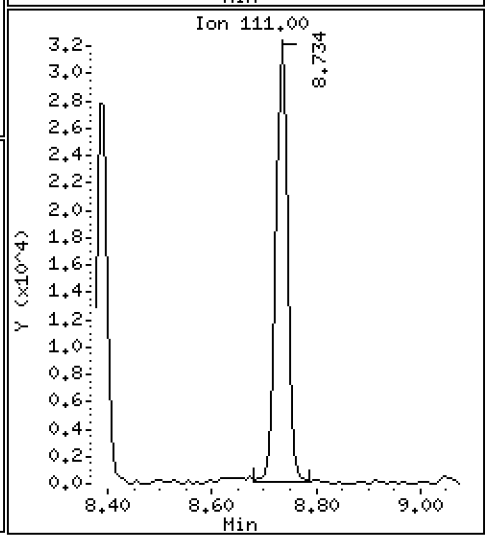












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

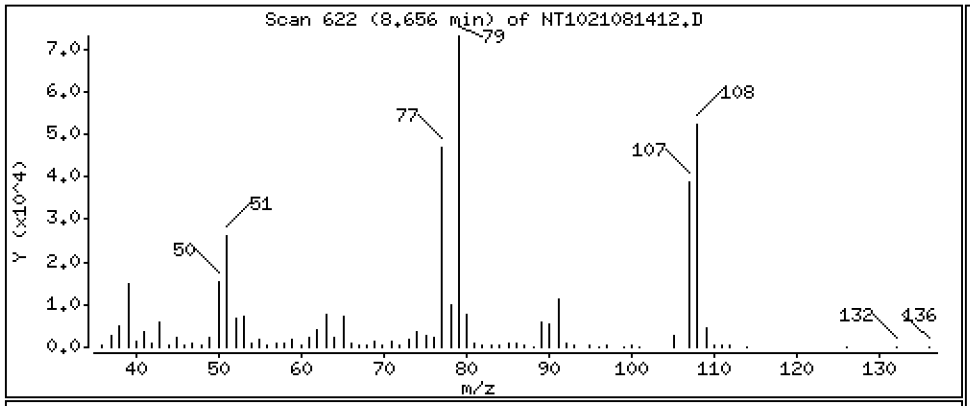
Operator: VTS

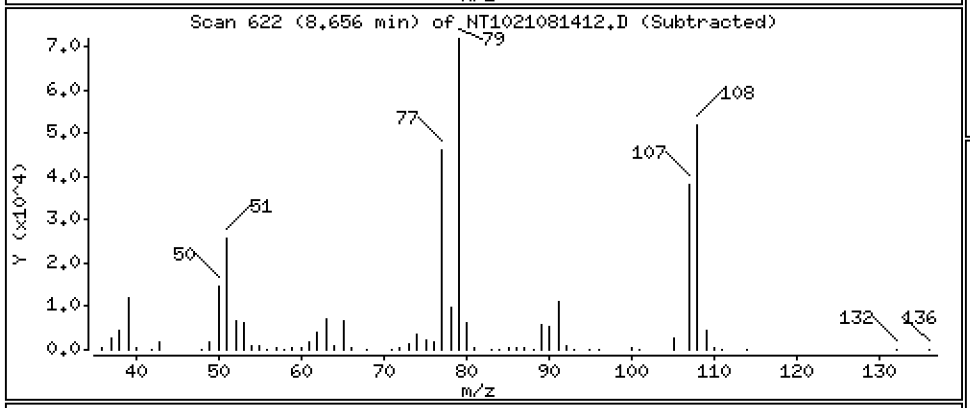
Column phase: ZB-5msi

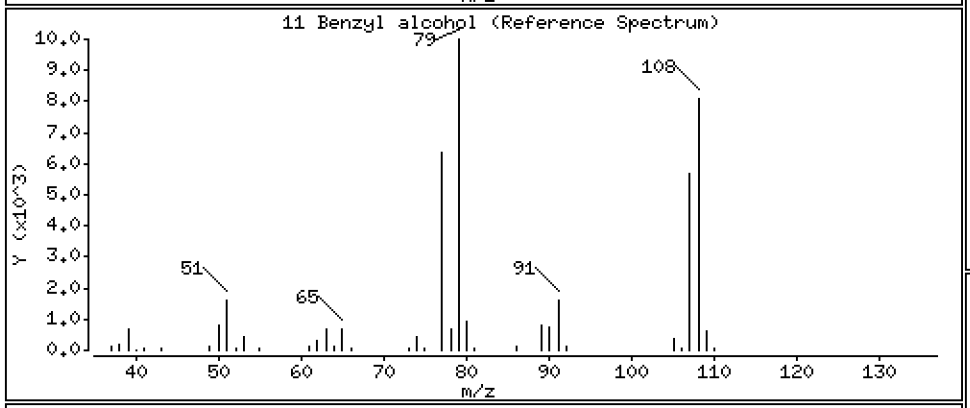
Column diameter: 0.25

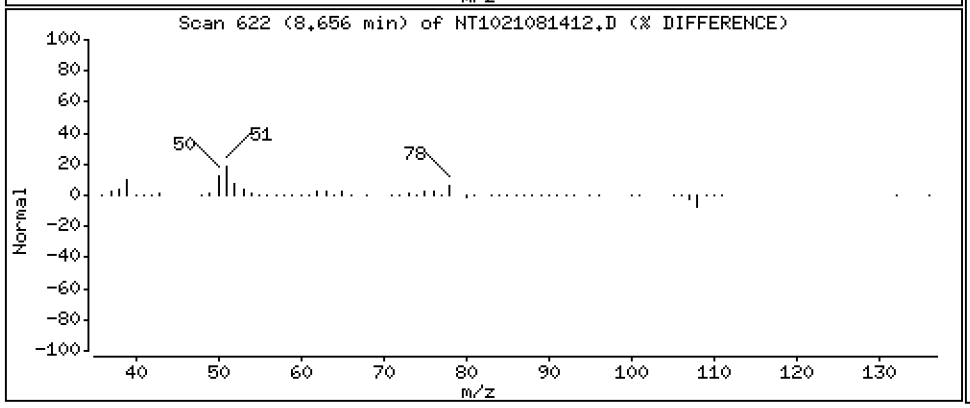
11 Benzyl alcohol

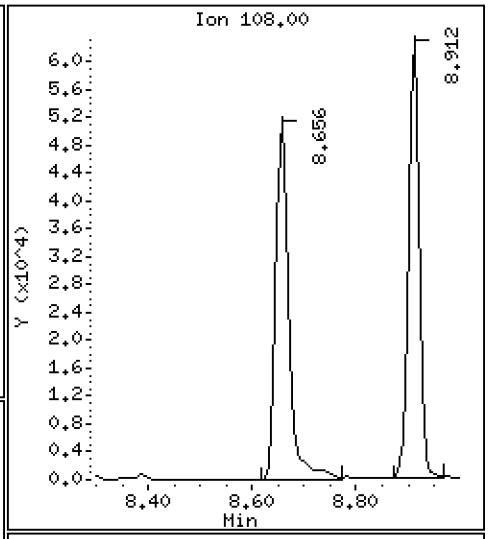
Concentration: 4.252 ug/mL

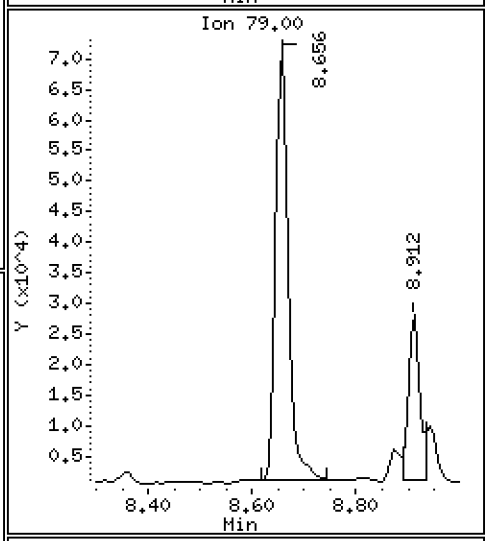


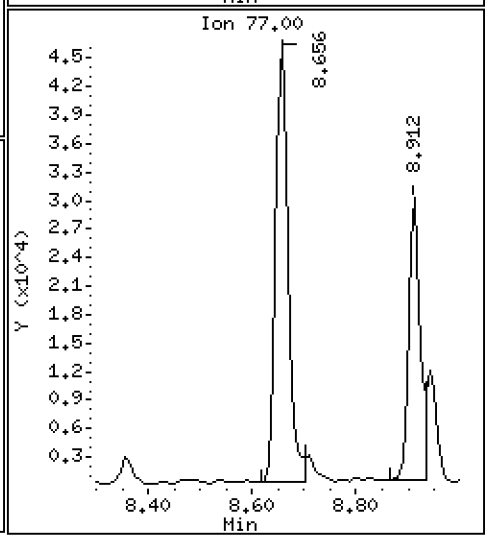












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

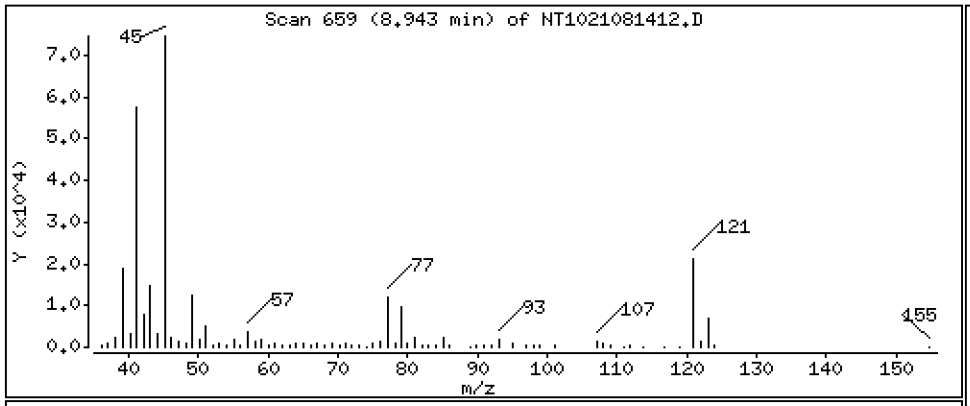
Operator: VTS

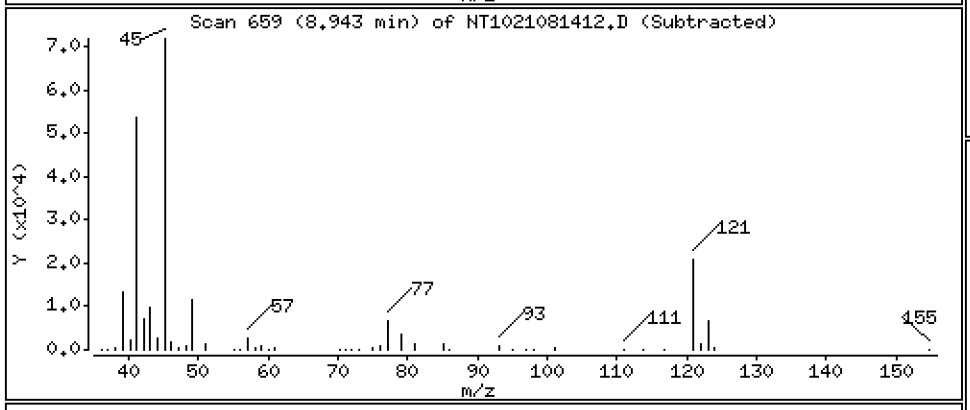
Column phase: ZB-5msi

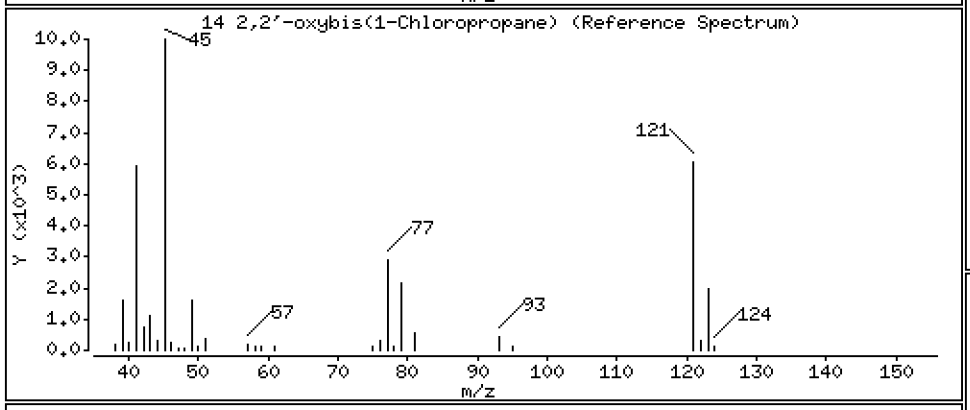
Column diameter: 0.25

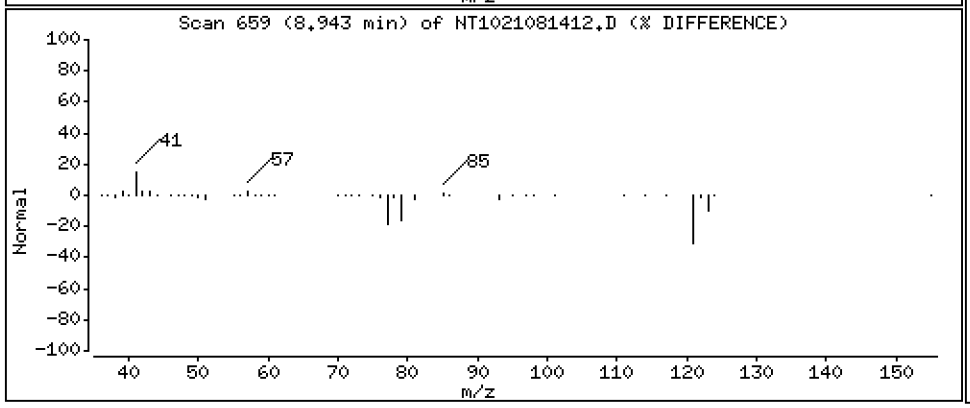
14 2,2'-oxybis(1-Chloropropane)

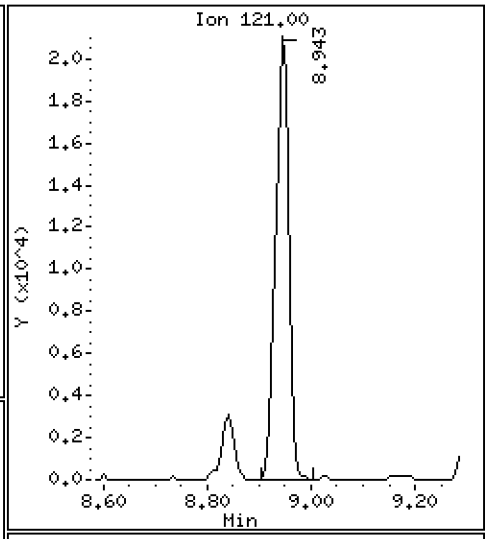
Concentration: 2.917 ug/mL

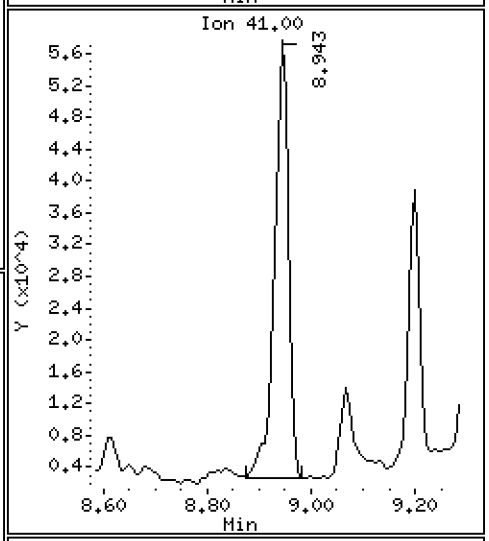


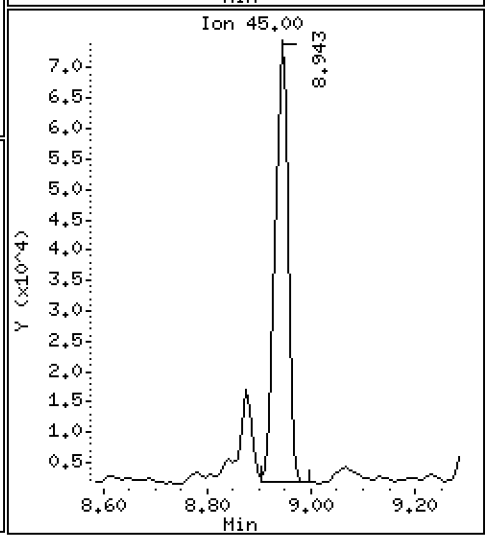












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

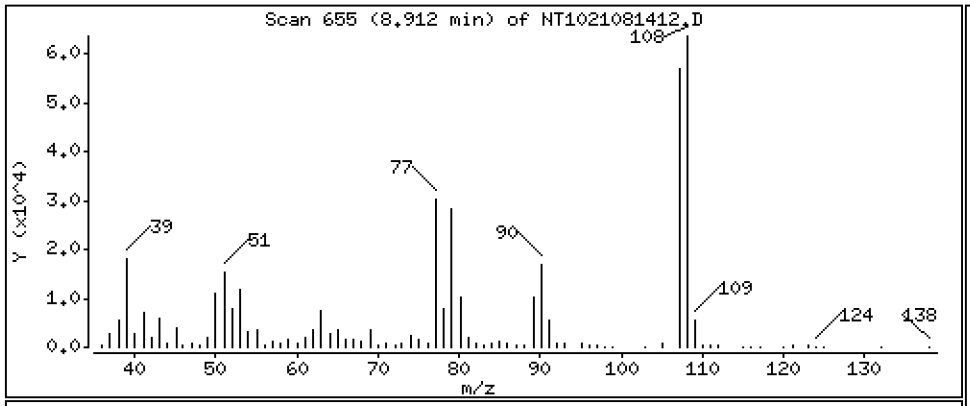
Operator: VTS

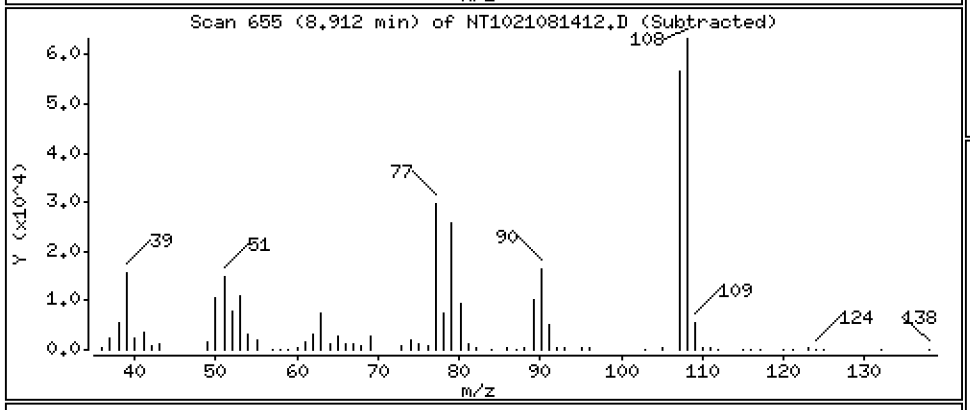
Column phase: ZB-5msi

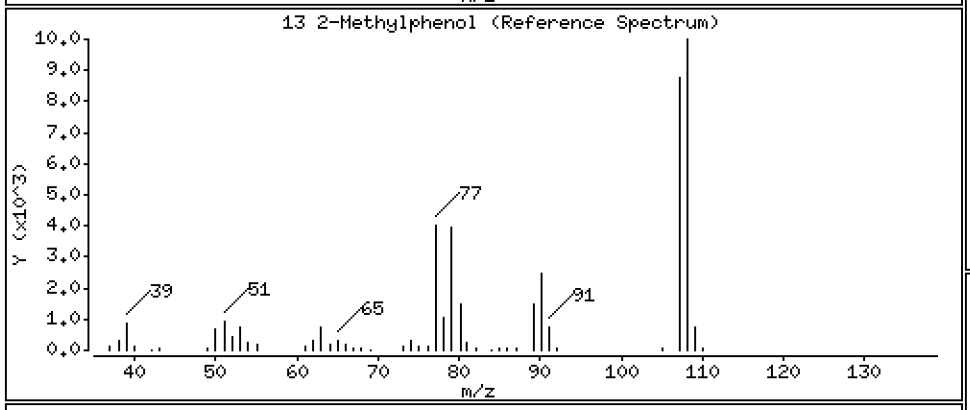
Column diameter: 0.25

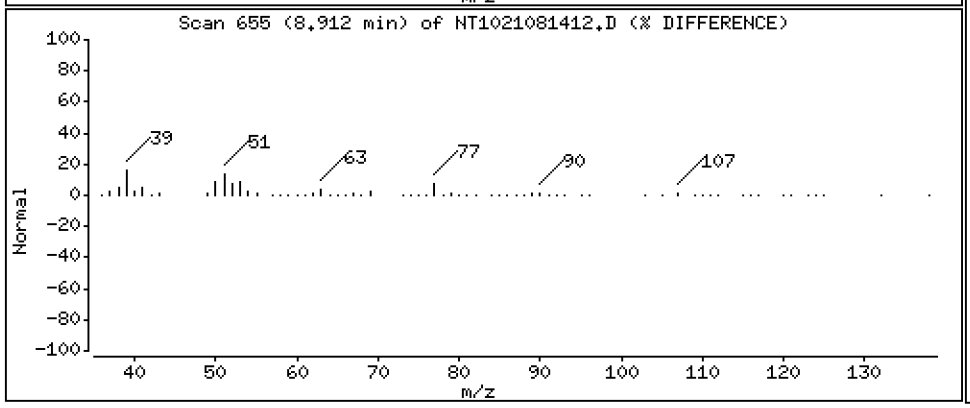
13 2-Methylphenol

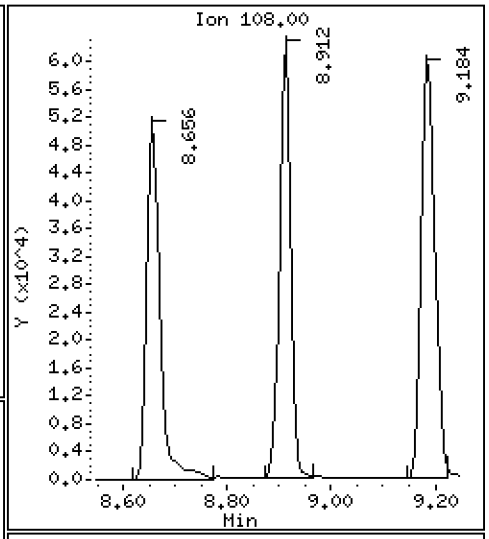
Concentration: 3.473 ug/mL

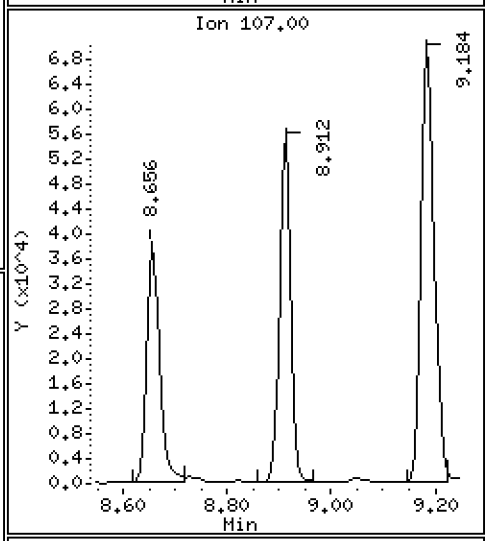


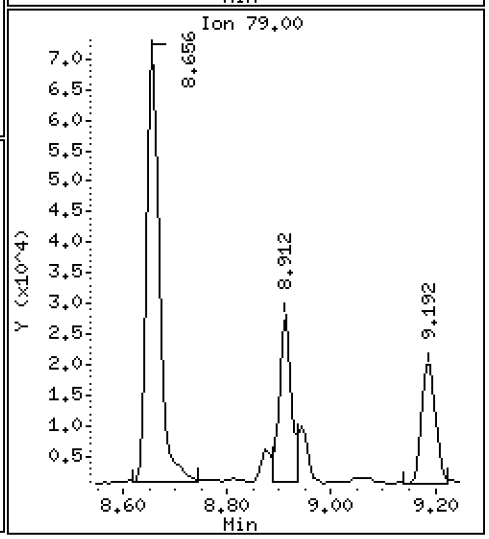












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

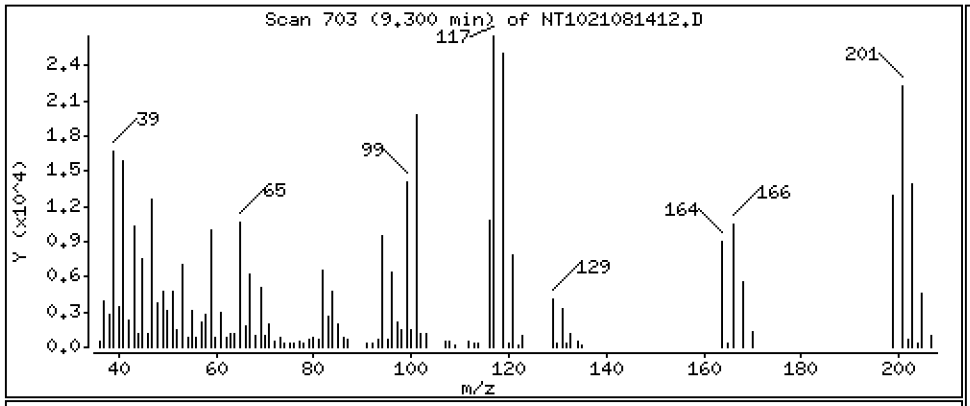
Operator: VTS

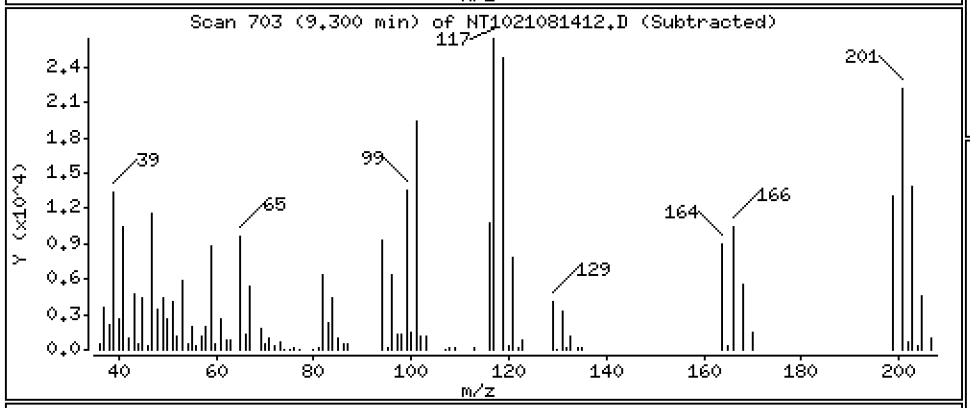
Column phase: ZB-5msi

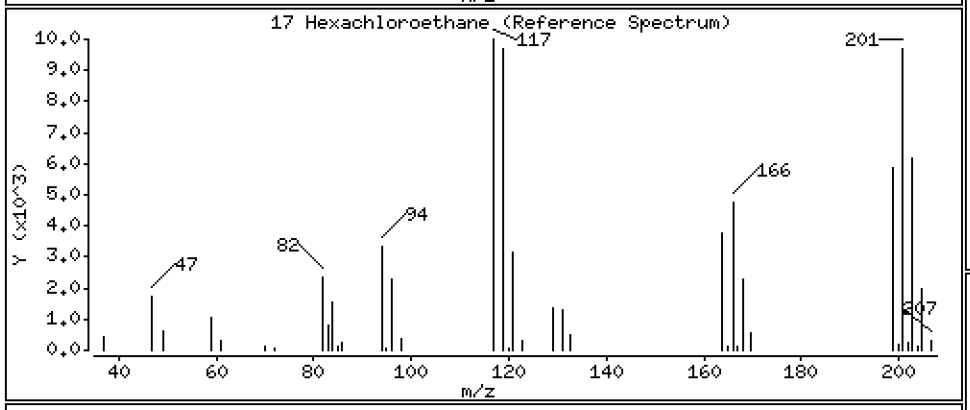
Column diameter: 0.25

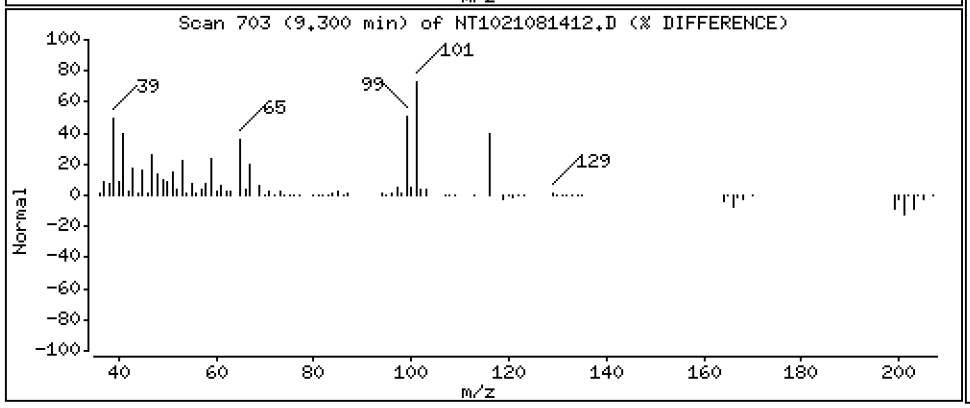
17 Hexachloroethane

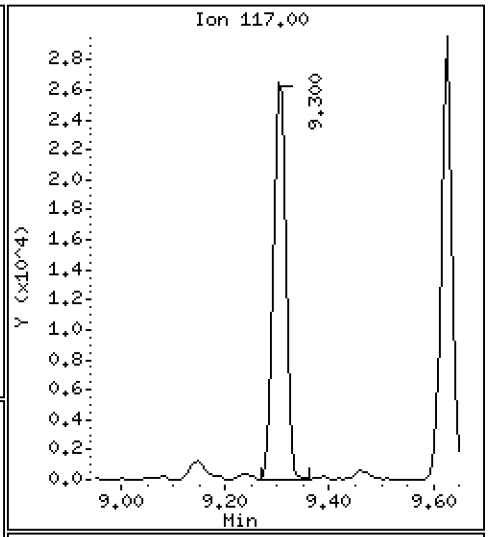
Concentration: 3.207 ug/mL

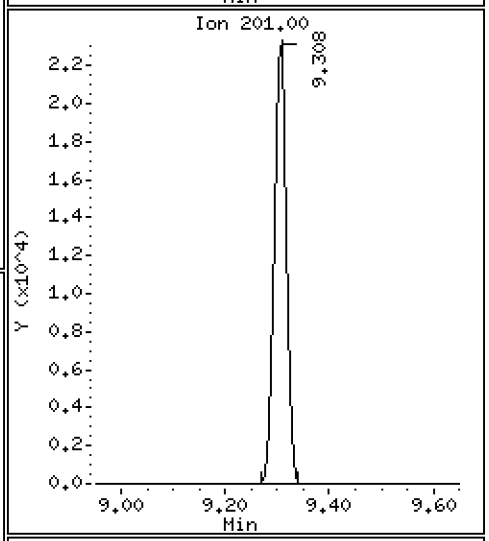


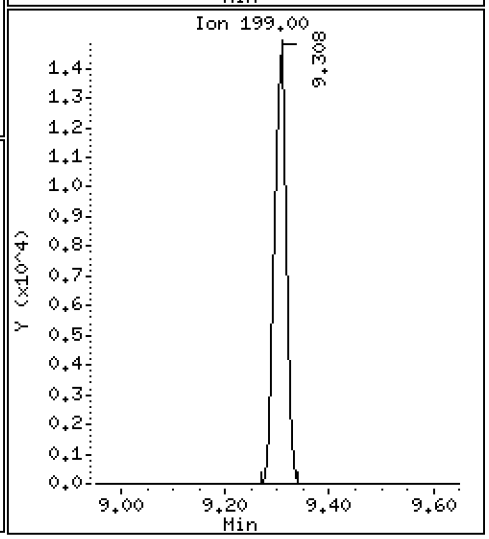












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

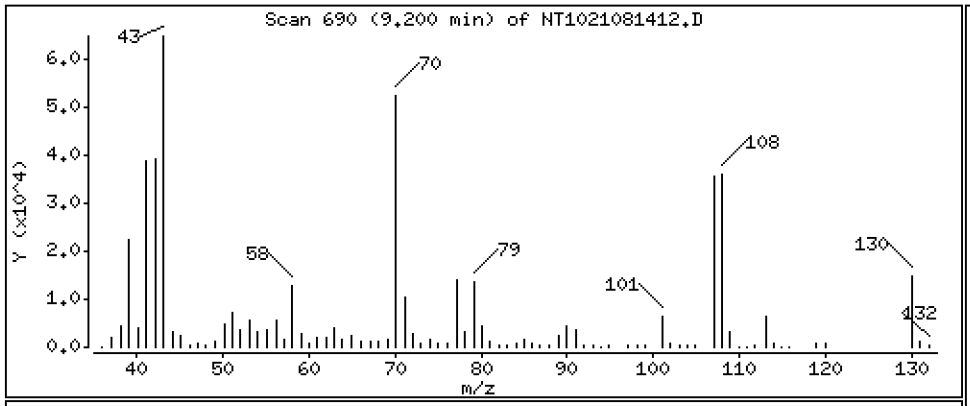
Operator: VTS

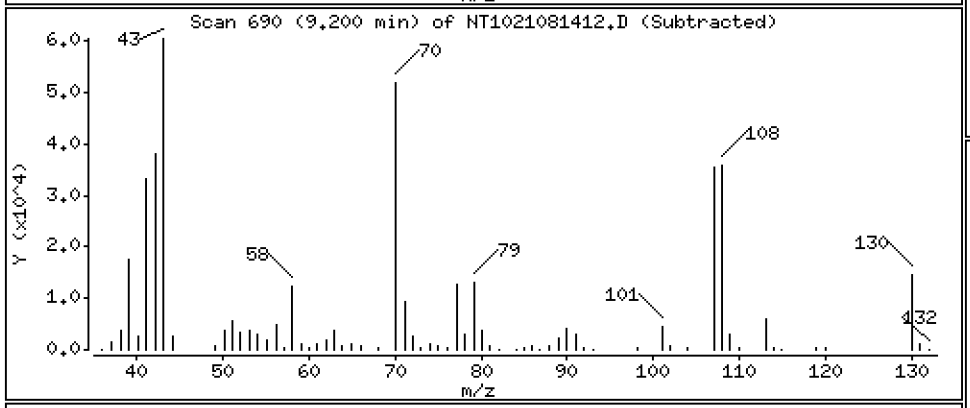
Column phase: ZB-5msi

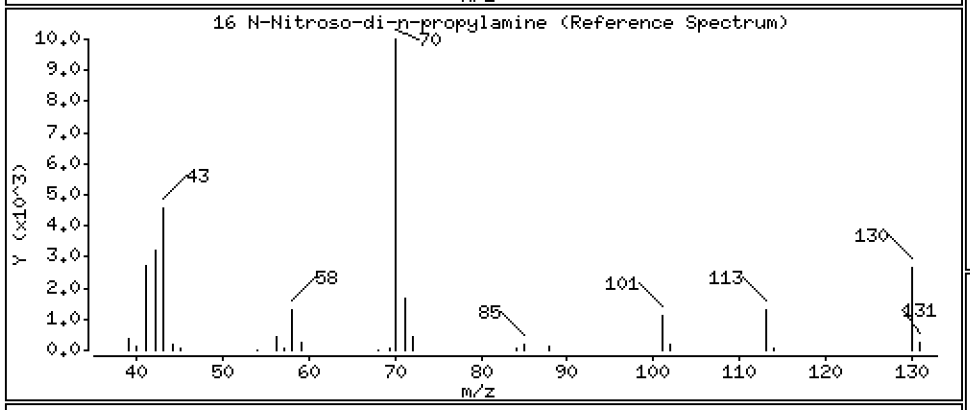
Column diameter: 0.25

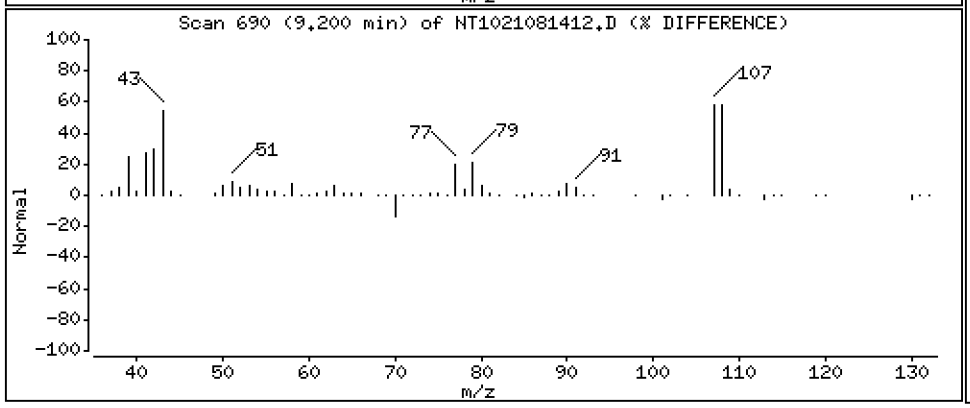
16 N-Nitroso-di-n-propylamine

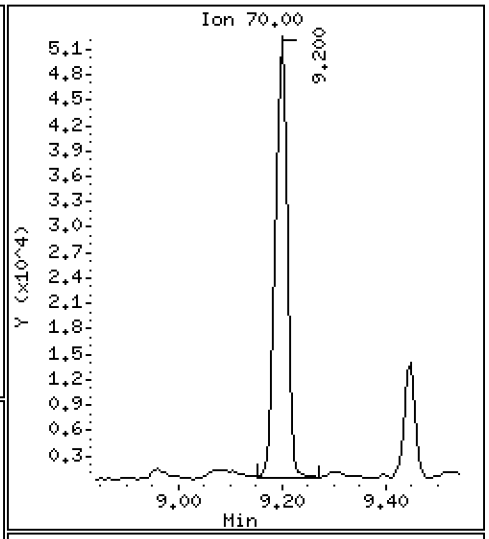
Concentration: 3.437 ug/mL

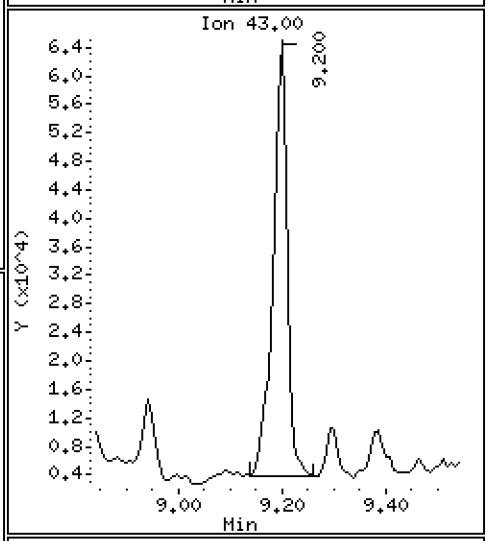


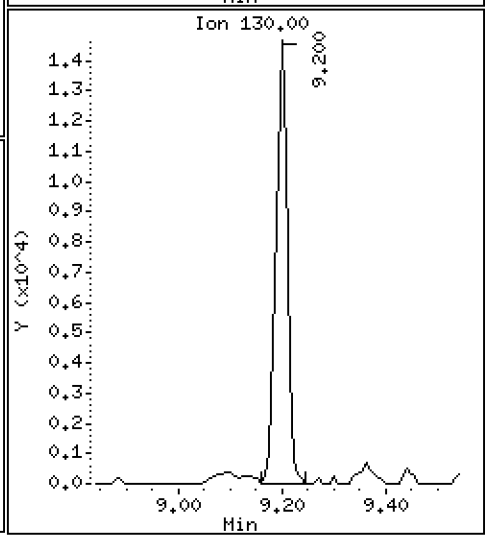












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

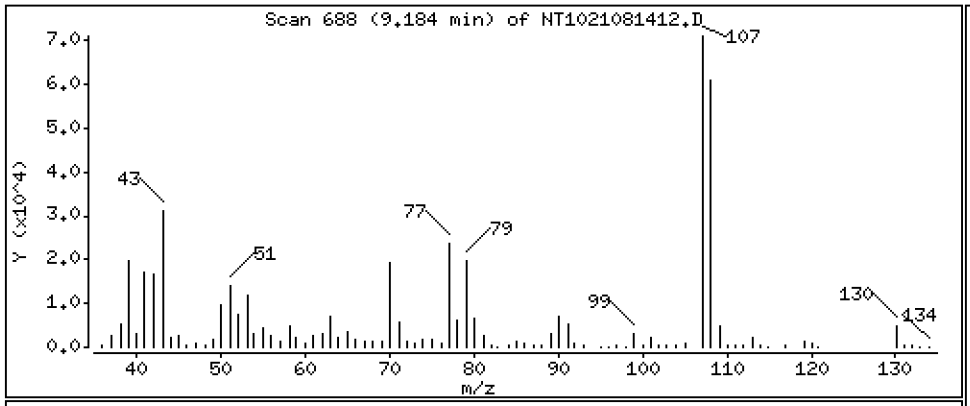
Operator: VTS

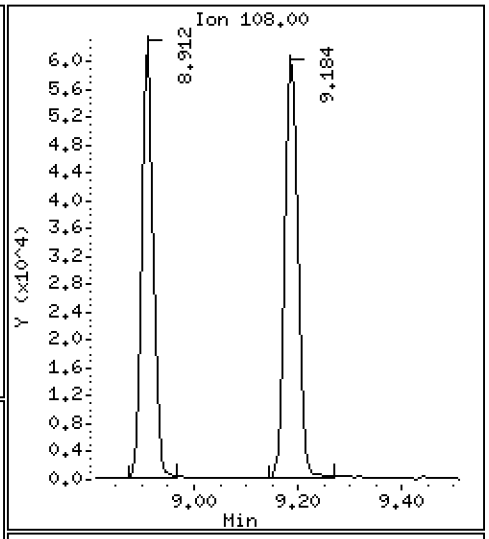
Column phase: ZB-5msi

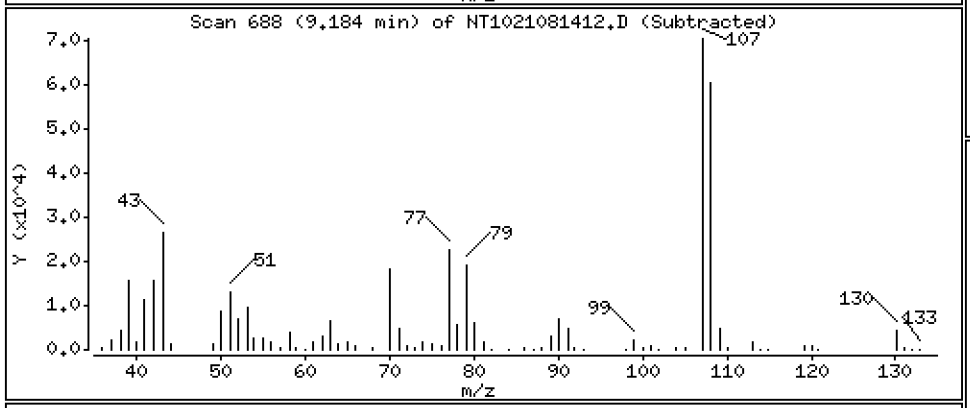
Column diameter: 0.25

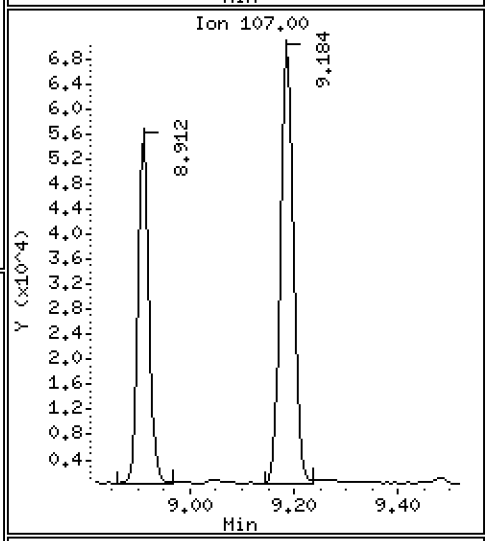
15 4-Methylphenol

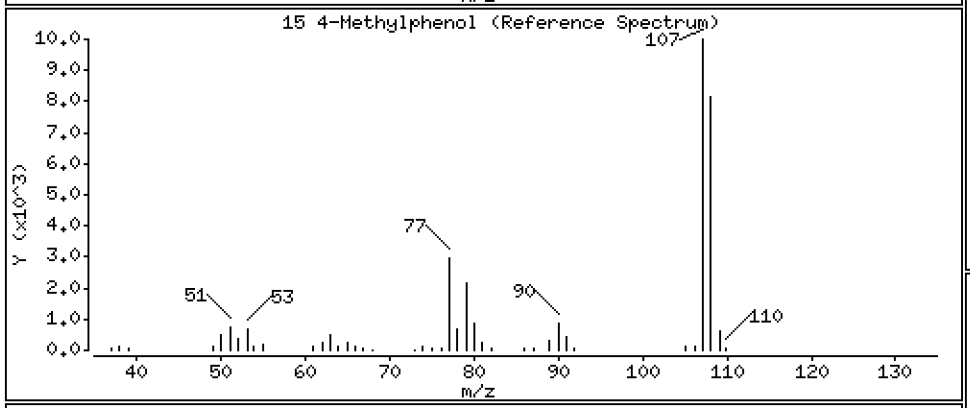
Concentration: 3.864 ug/mL

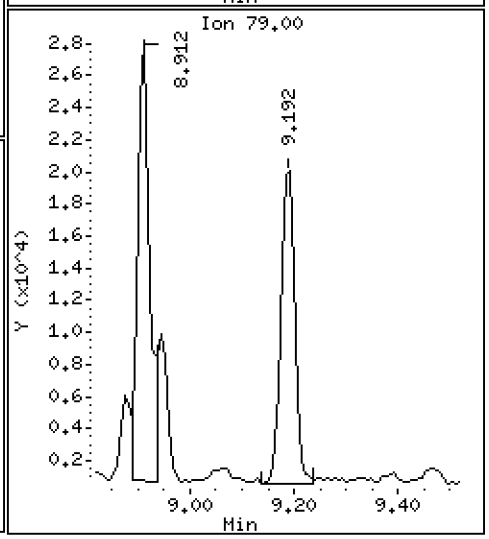


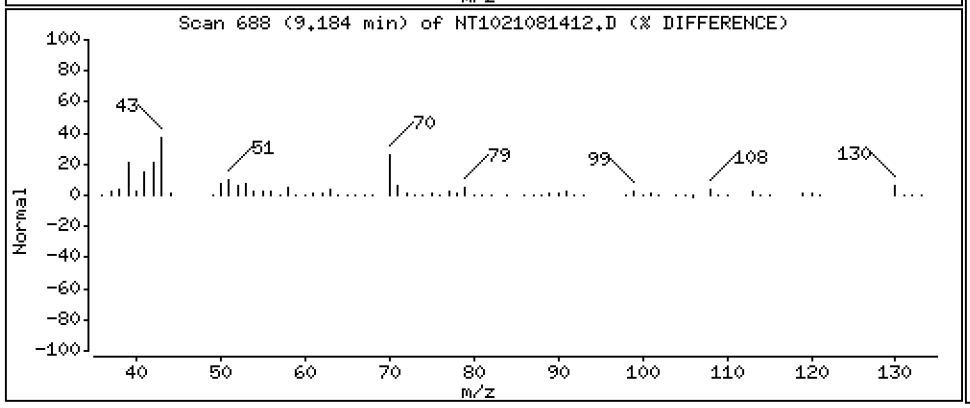












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

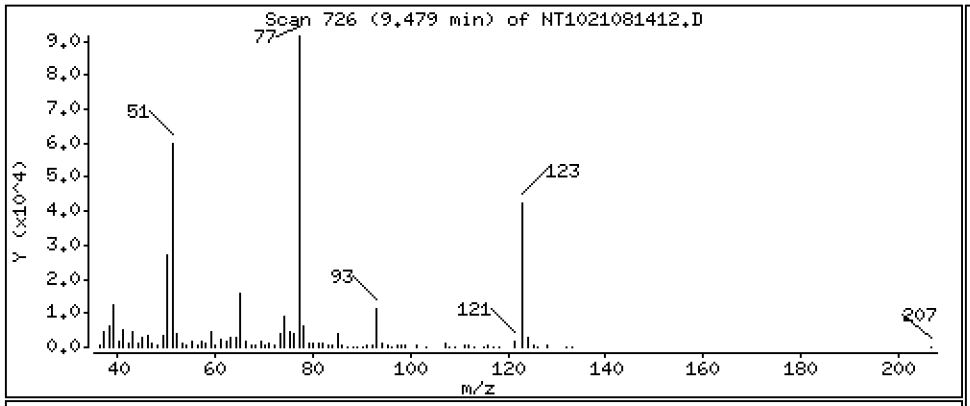
Operator: VTS

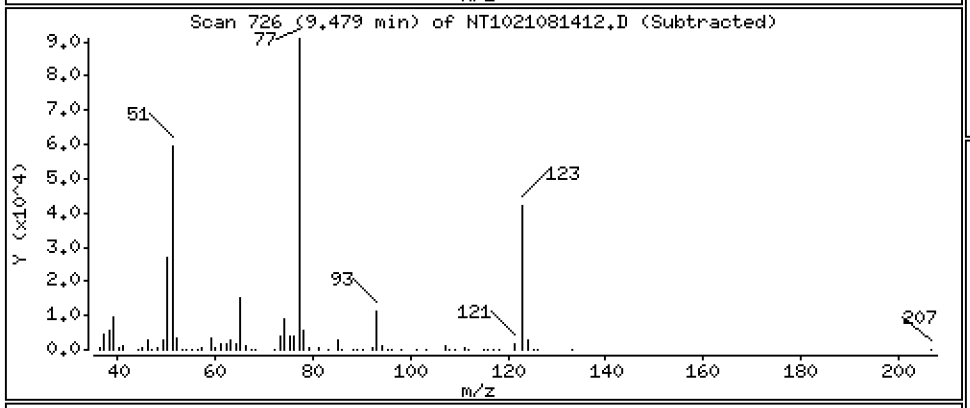
Column phase: ZB-5msi

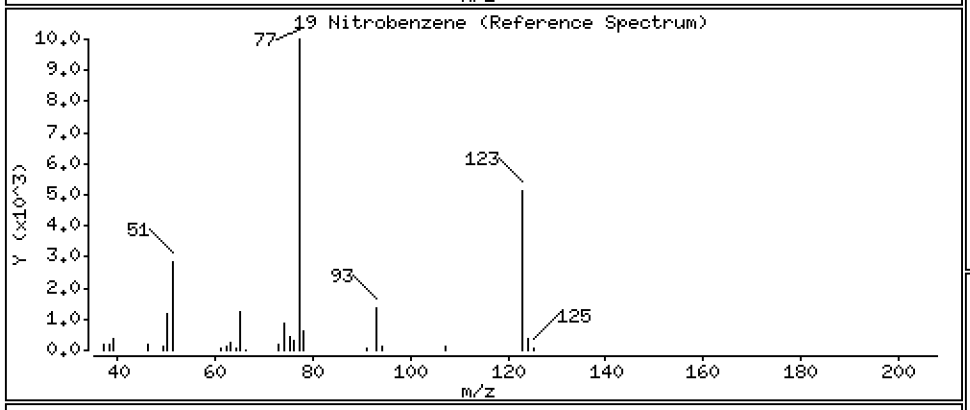
Column diameter: 0.25

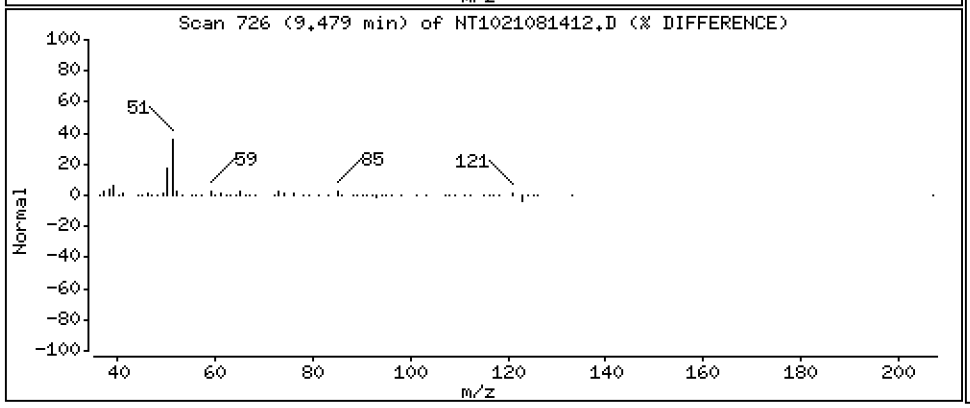
19 Nitrobenzene

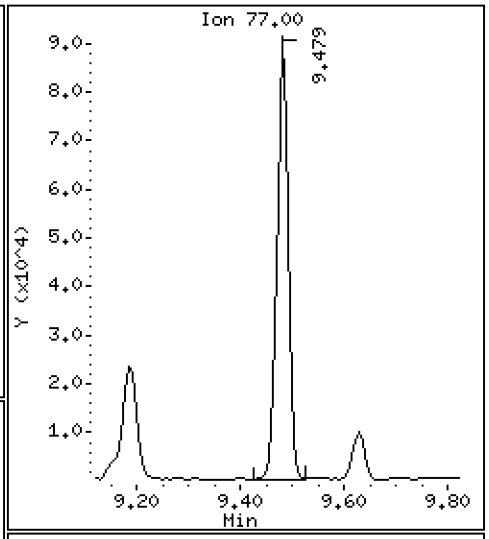
Concentration: 3.535 ug/mL

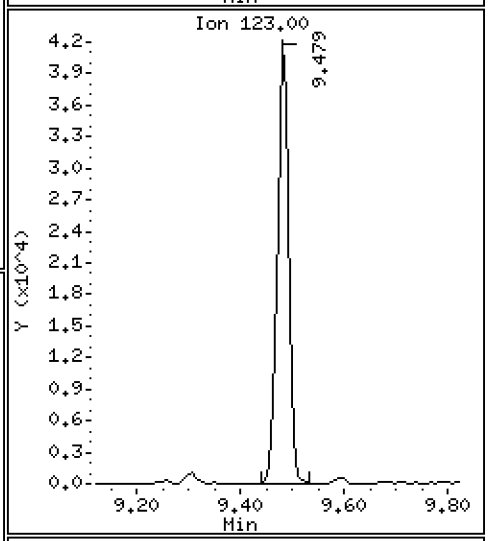


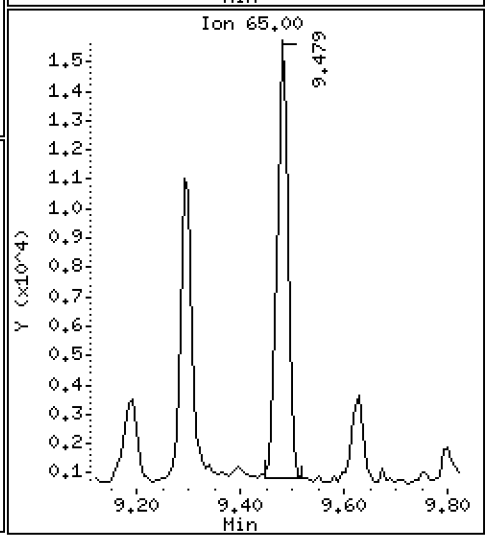












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

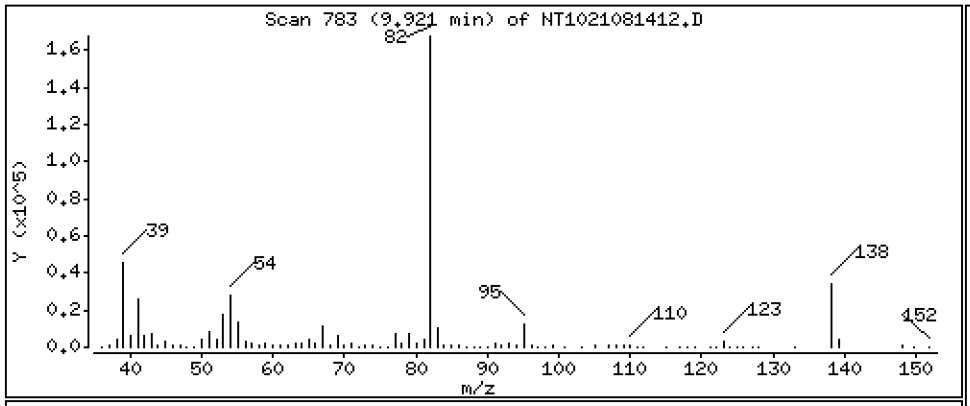
Operator: VTS

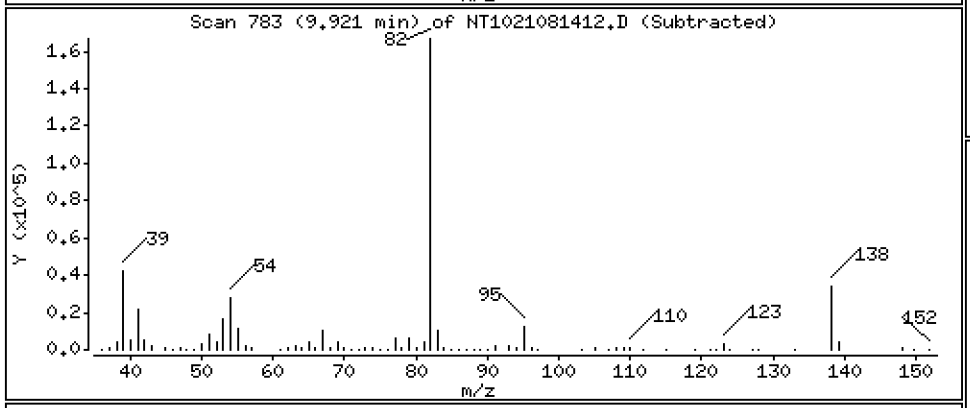
Column phase: ZB-5msi

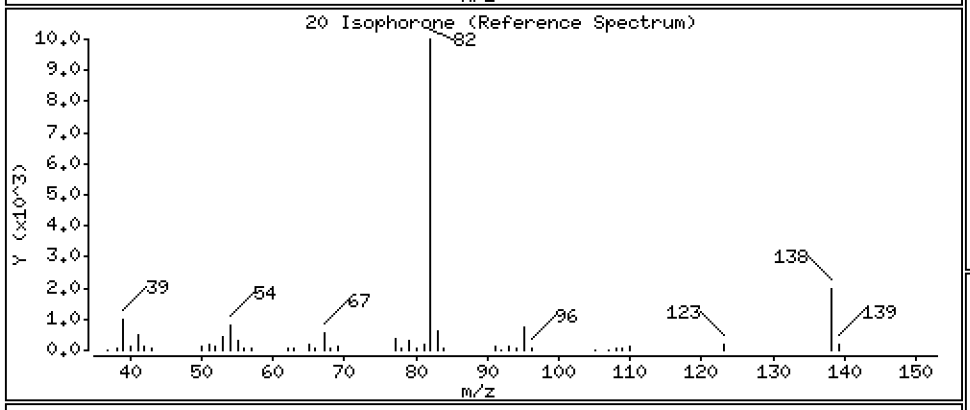
Column diameter: 0.25

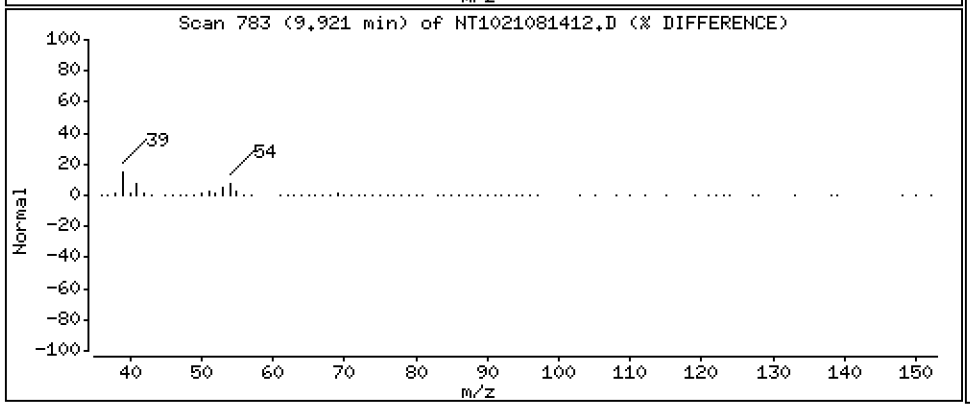
20 Isophorone

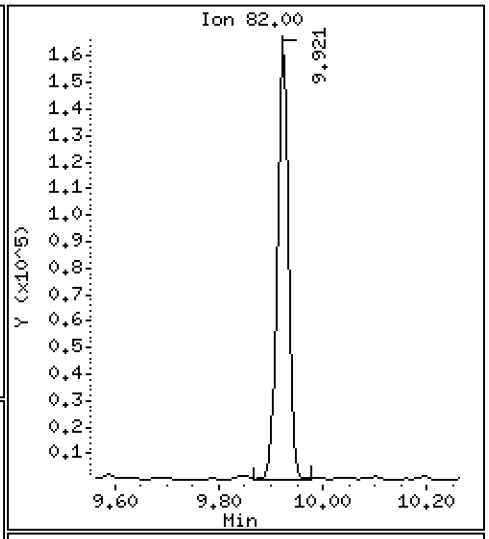
Concentration: 3.502 ug/mL

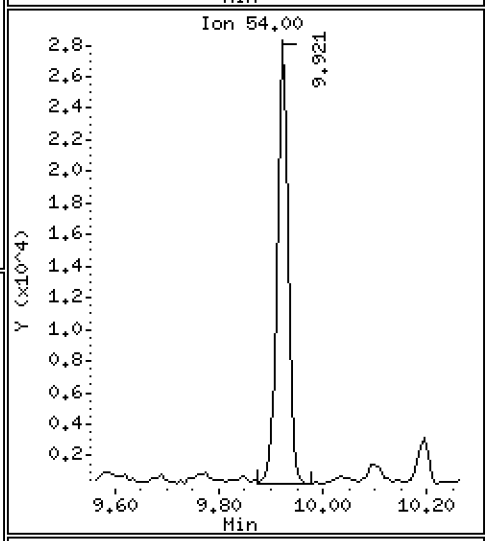


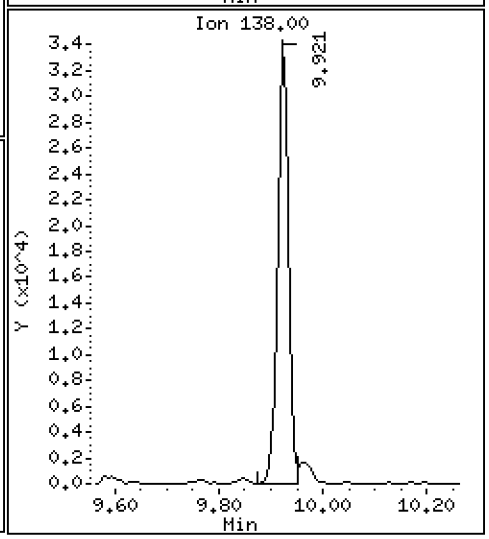












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

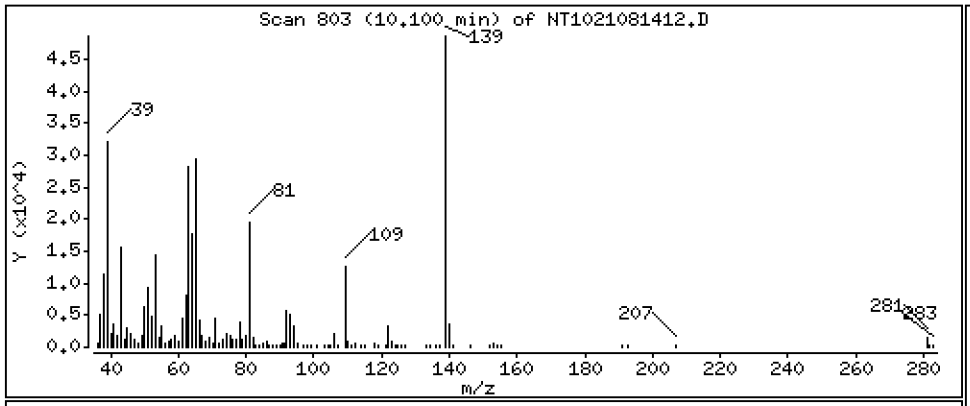
Operator: VTS

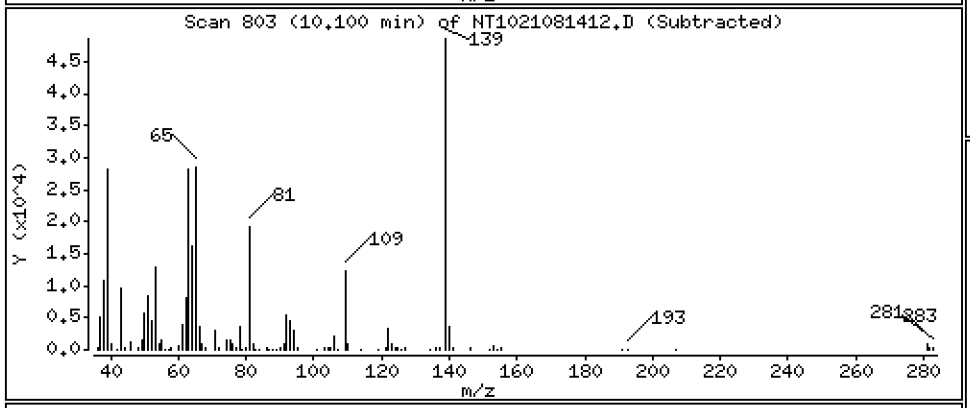
Column phase: ZB-5msi

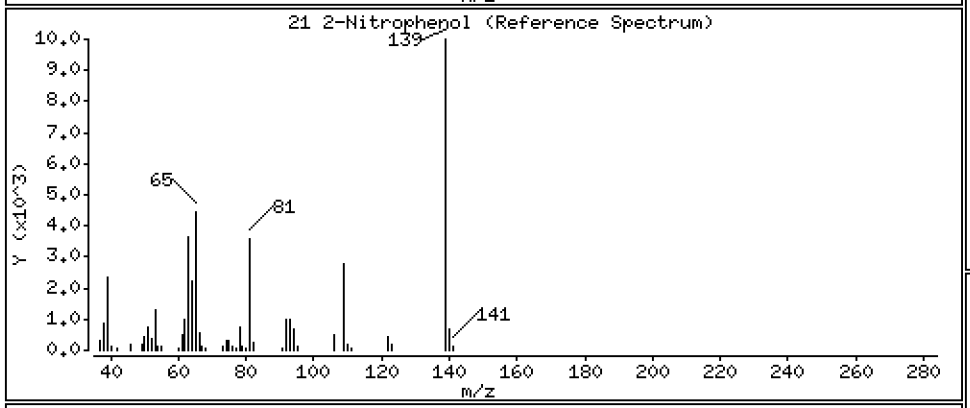
Column diameter: 0.25

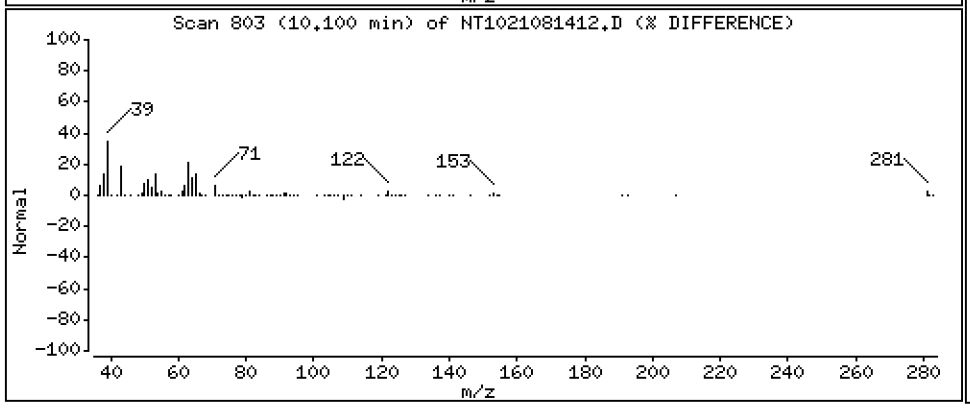
21 2-Nitrophenol

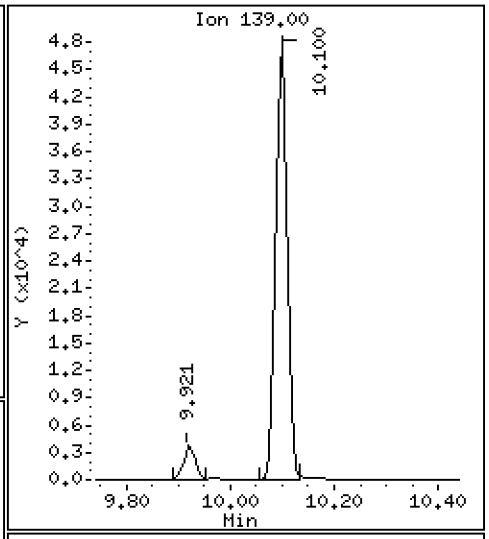
Concentration: 3.710 ug/mL

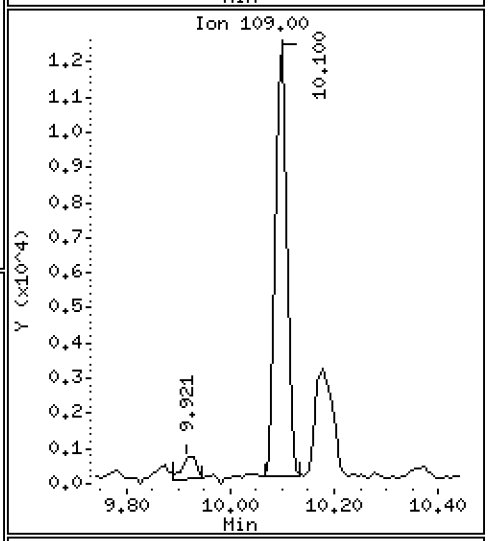


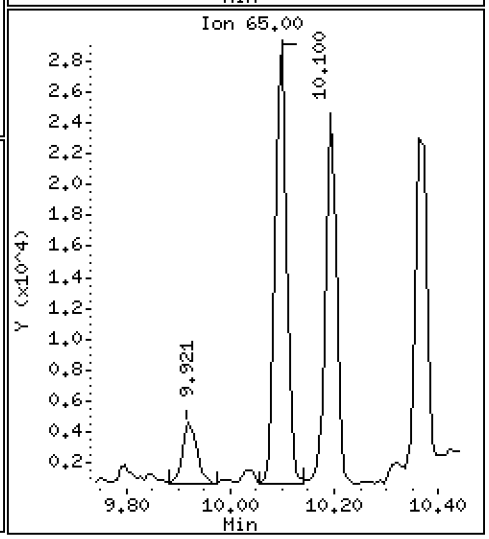












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

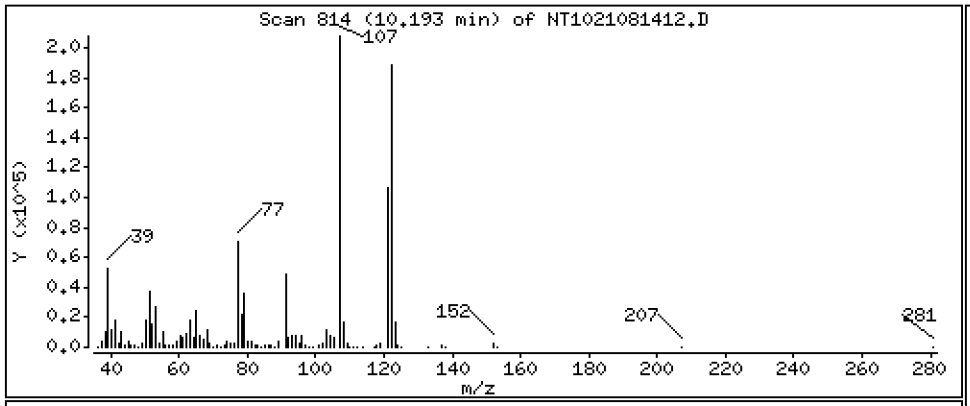
Operator: VTS

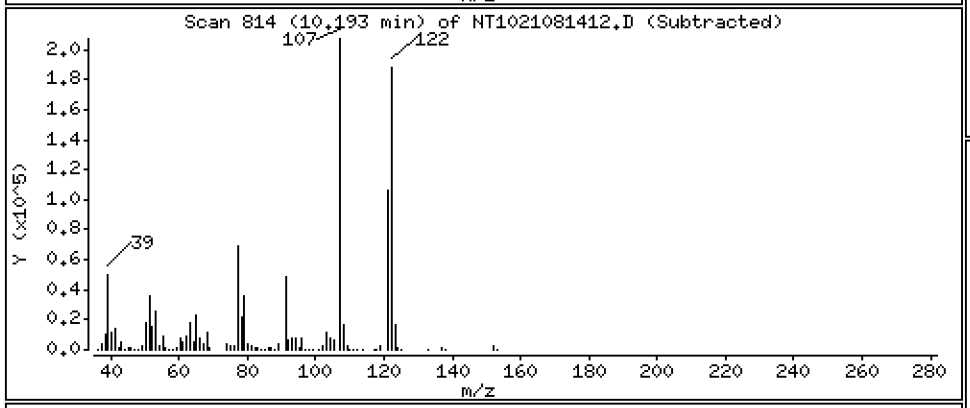
Column phase: ZB-5msi

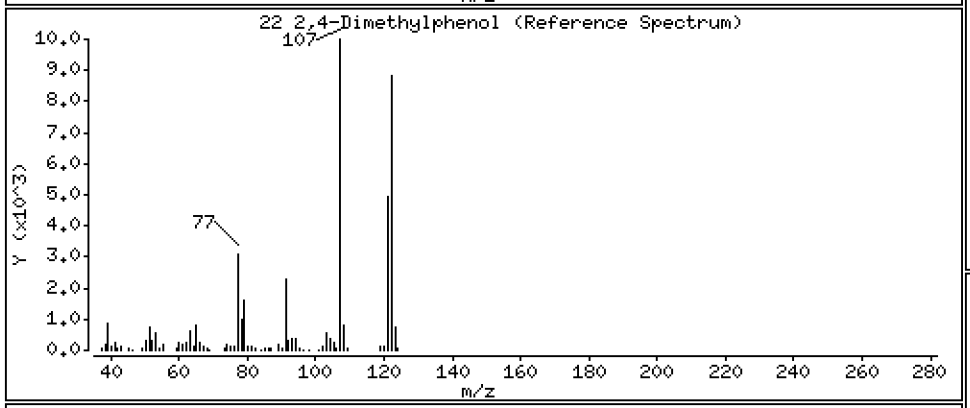
Column diameter: 0.25

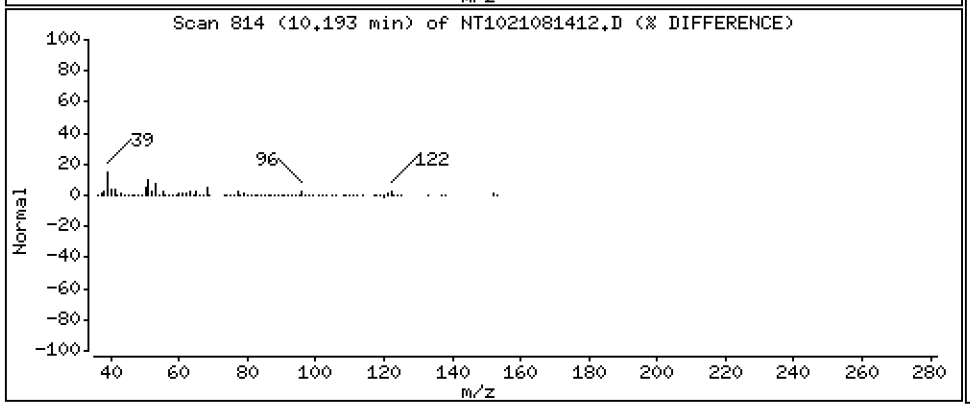
22 2,4-Dimethylphenol

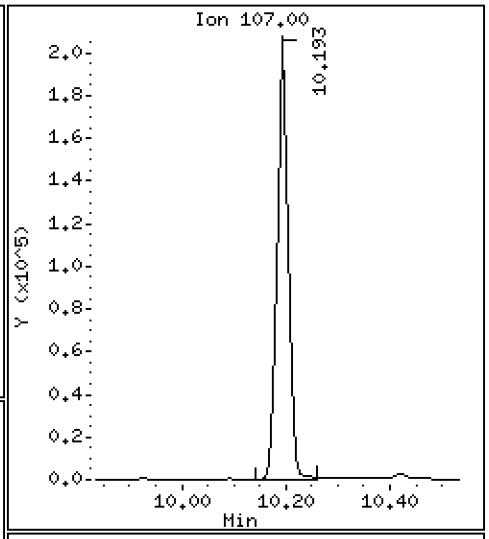
Concentration: 10.20 ug/mL

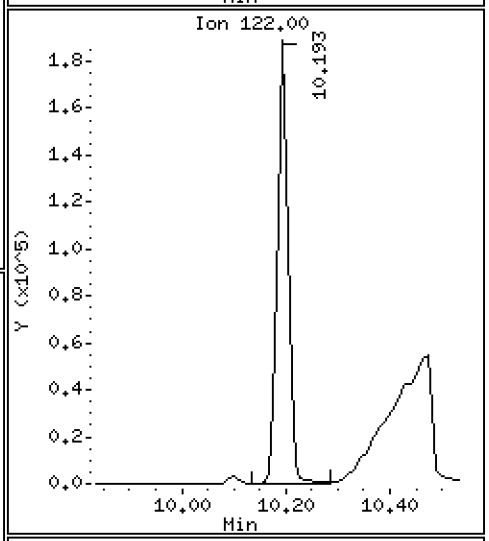


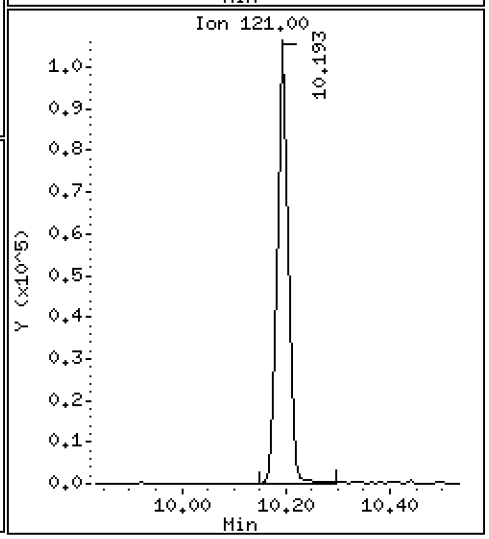












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

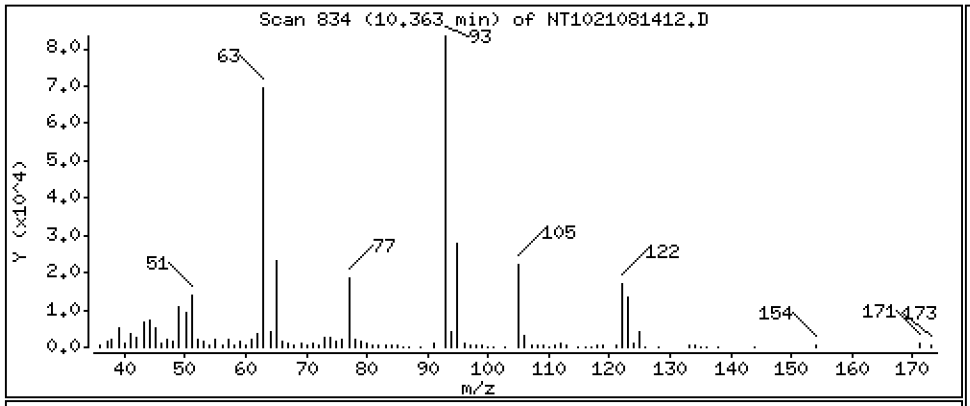
Operator: VTS

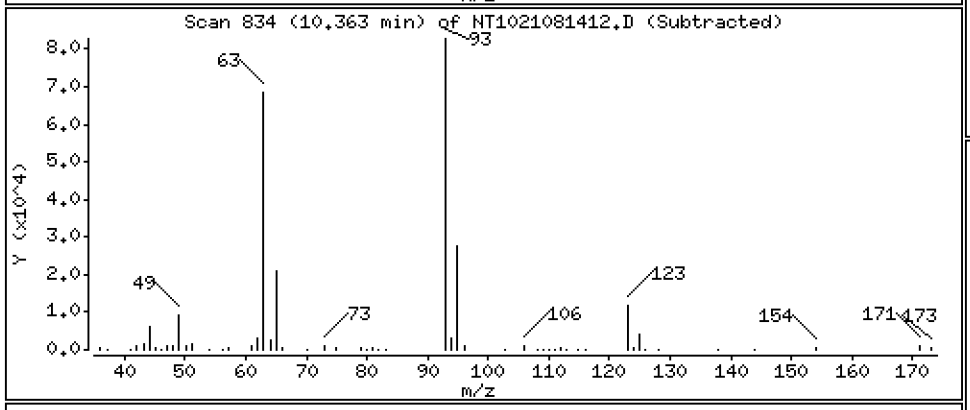
Column phase: ZB-5msi

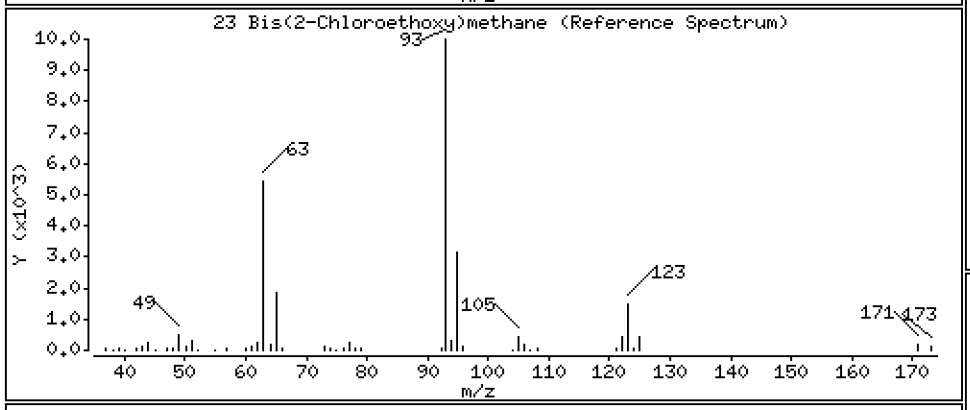
Column diameter: 0.25

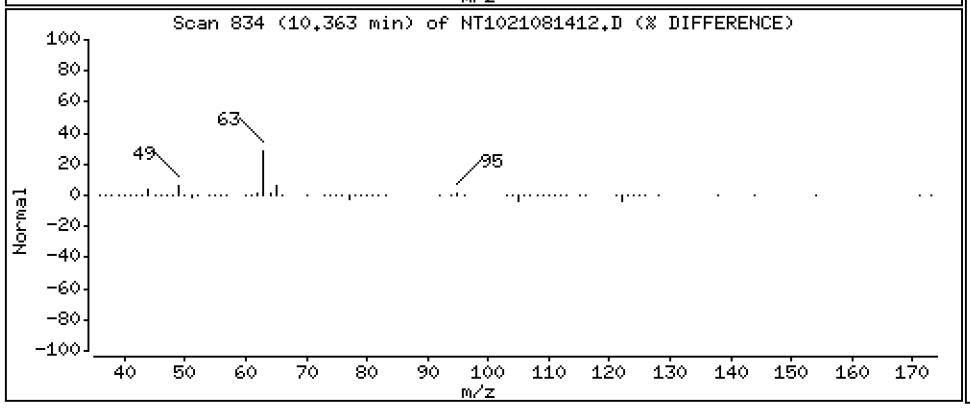
23 Bis(2-Chloroethoxy)methane

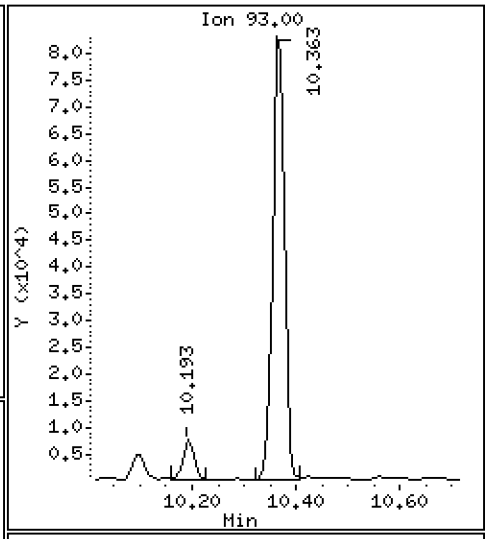
Concentration: 3.484 ug/mL

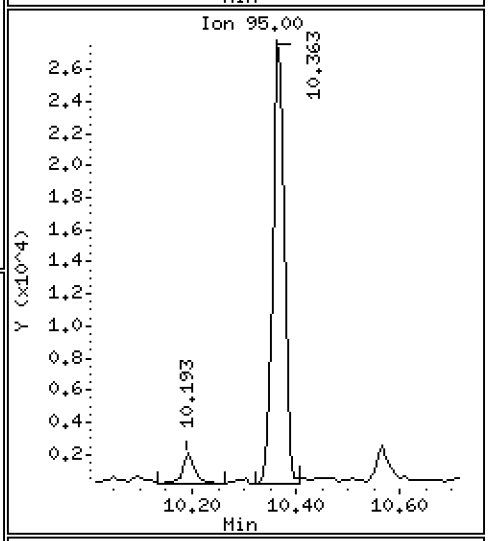


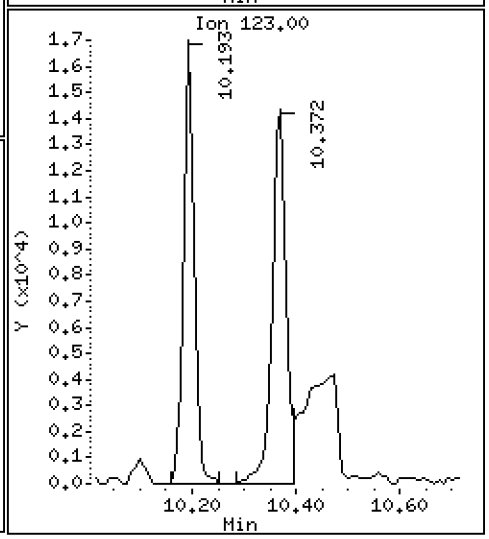












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

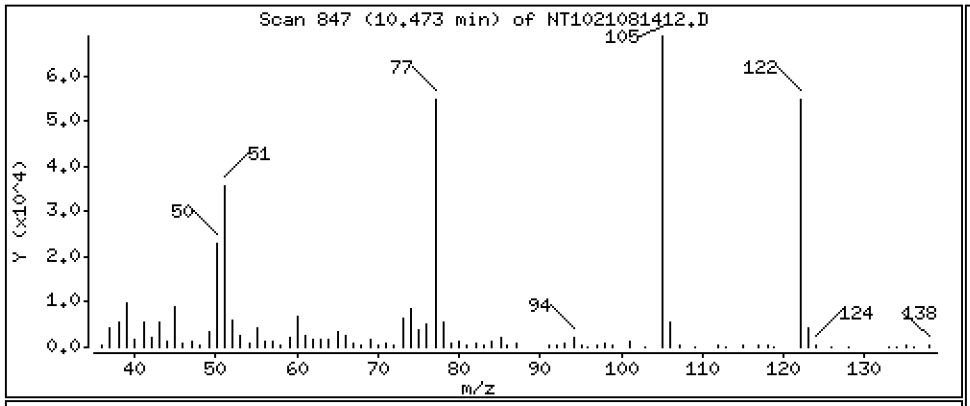
Operator: VTS

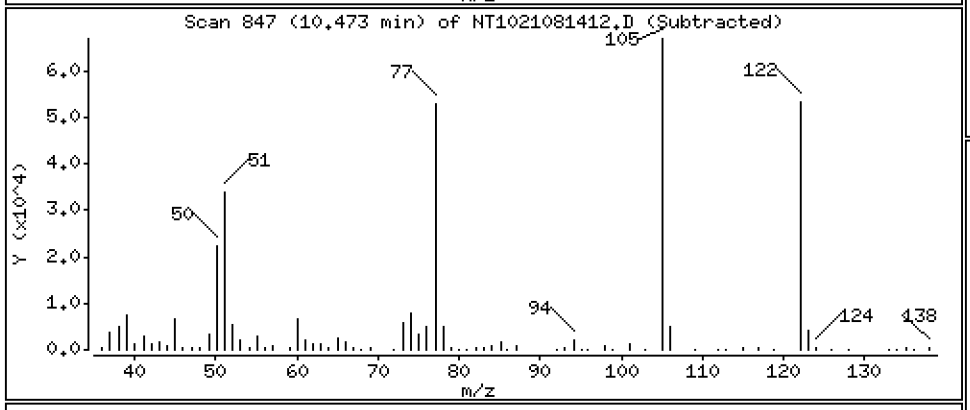
Column phase: ZB-5msi

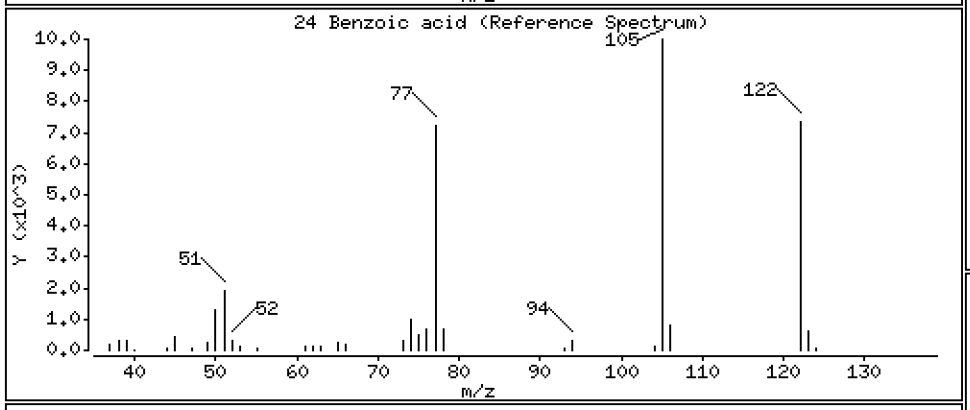
Column diameter: 0.25

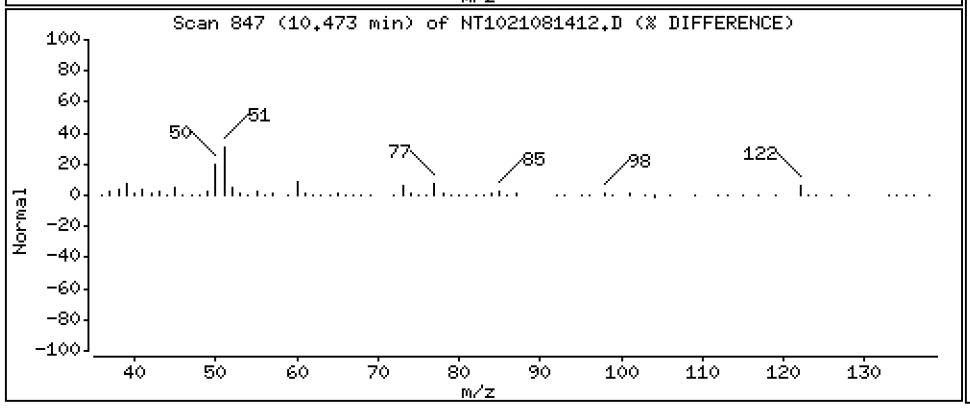
24 Benzoic acid

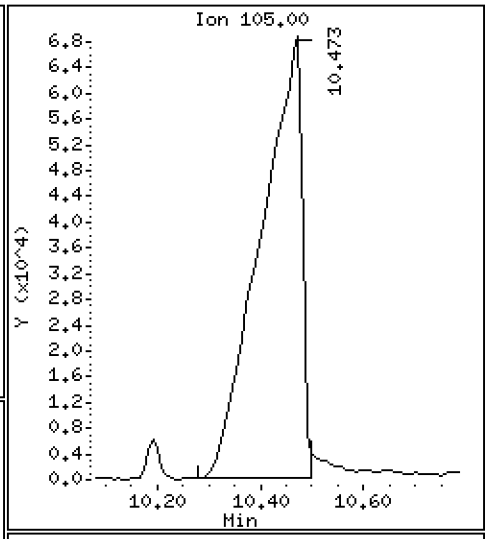
Concentration: 22.19 ug/mL

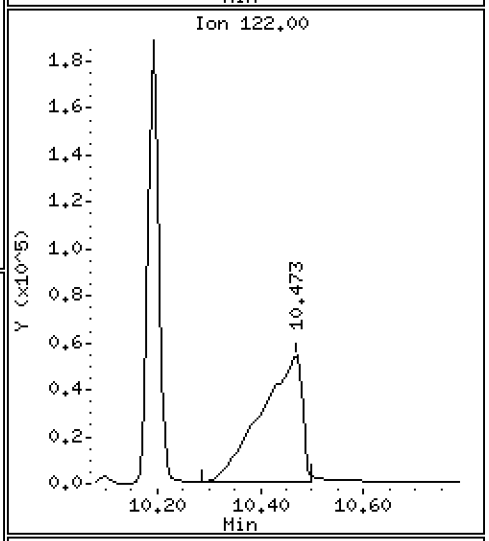


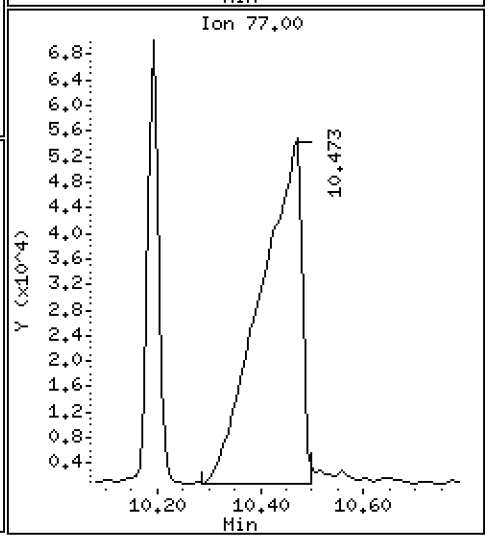












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

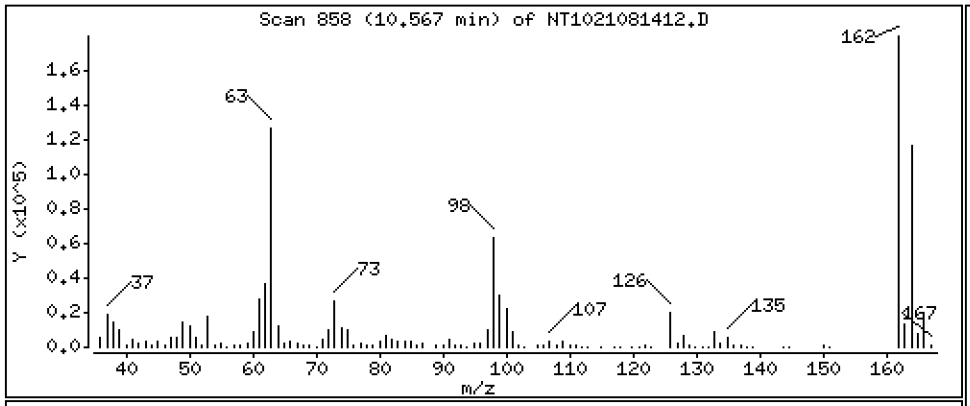
Operator: VTS

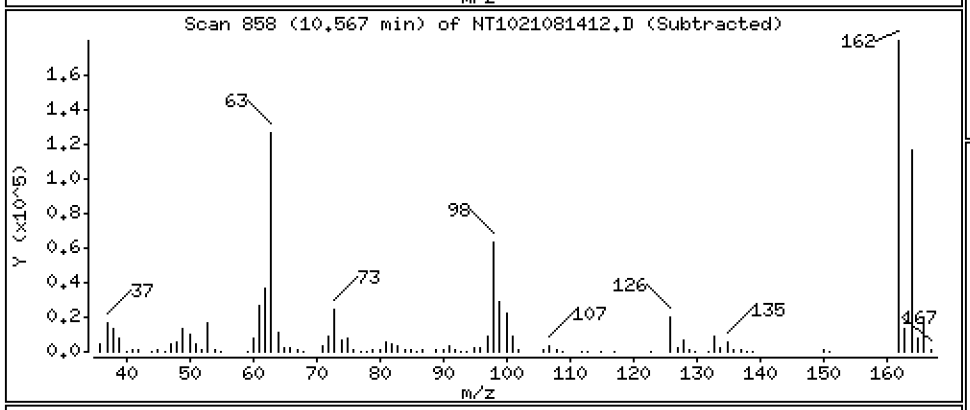
Column phase: ZB-5msi

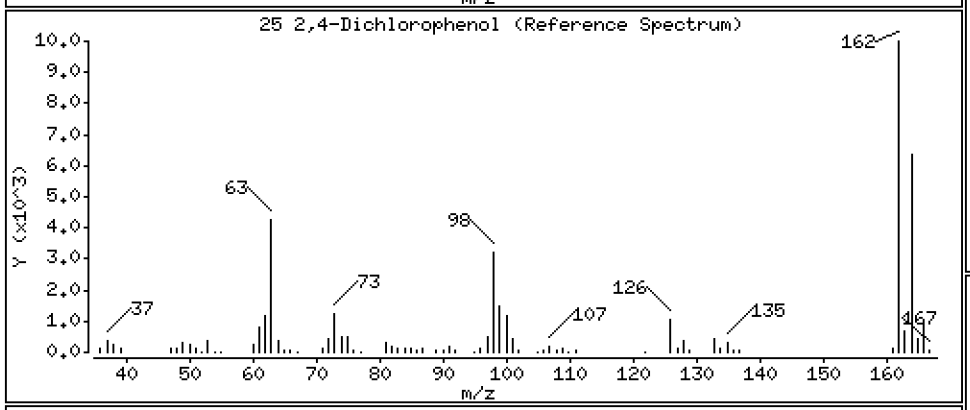
Column diameter: 0.25

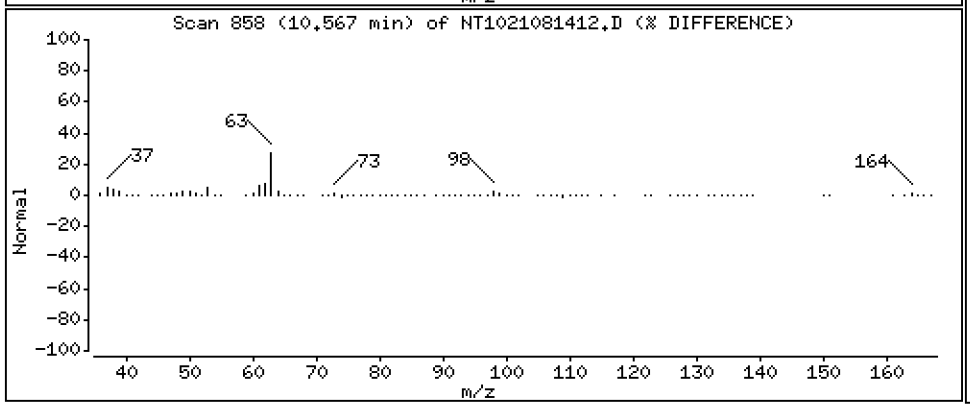
25 2,4-Dichlorophenol

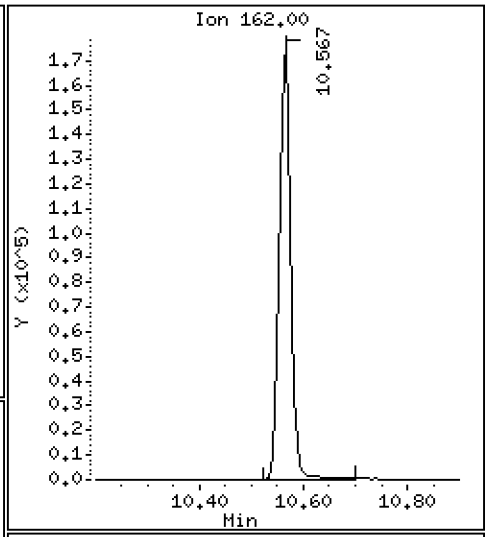
Concentration: 12.28 ug/mL

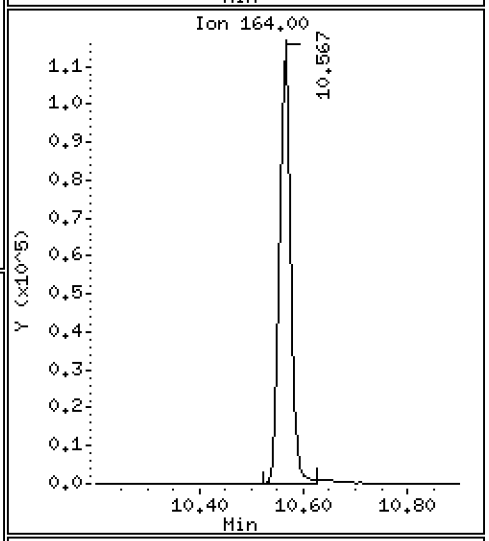


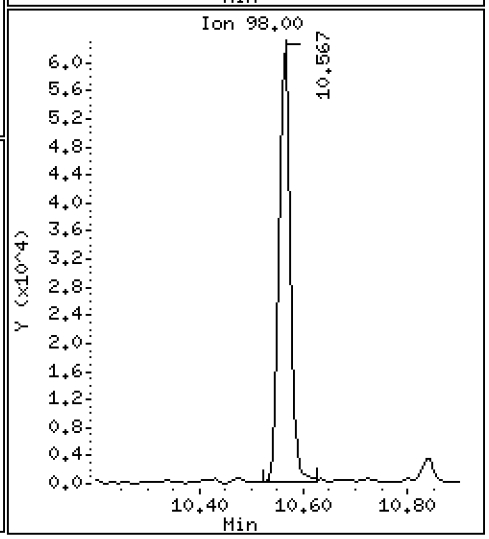












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

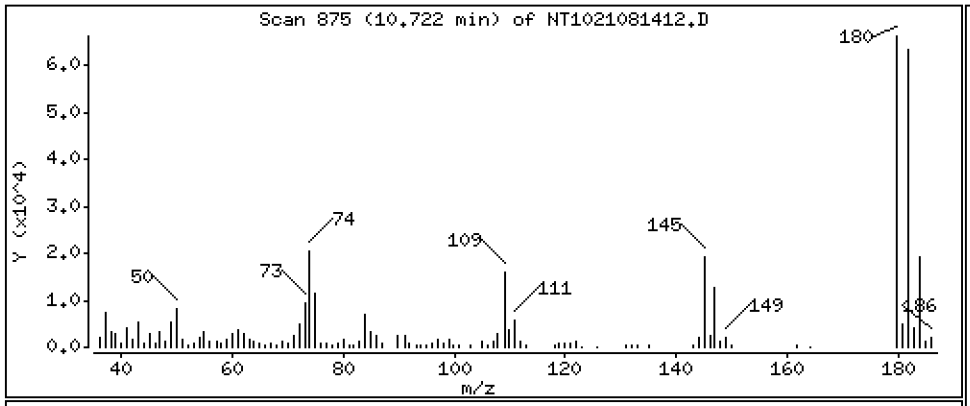
Operator: VTS

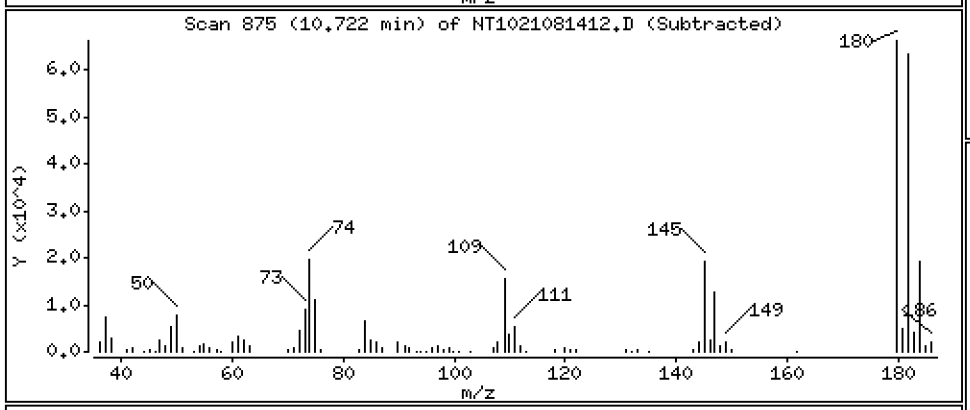
Column phase: ZB-5msi

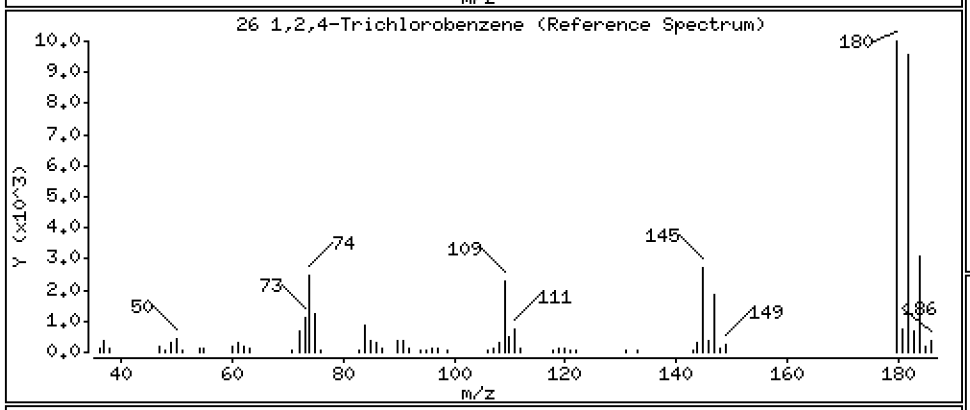
Column diameter: 0.25

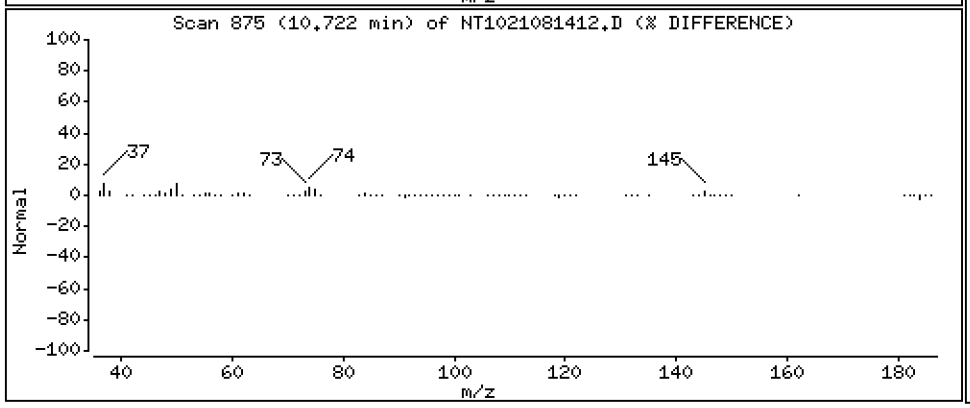
26 1,2,4-Trichlorobenzene

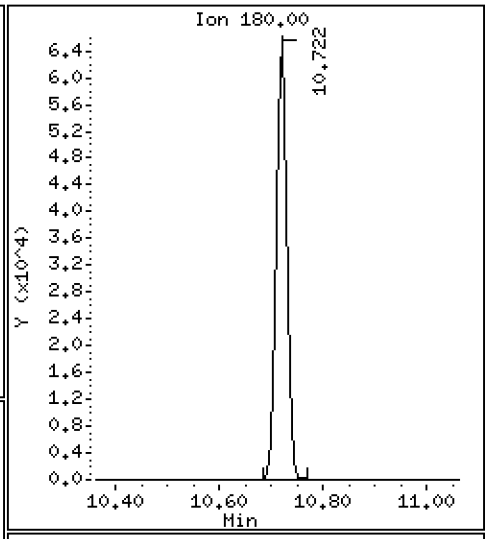
Concentration: 3.508 ug/mL

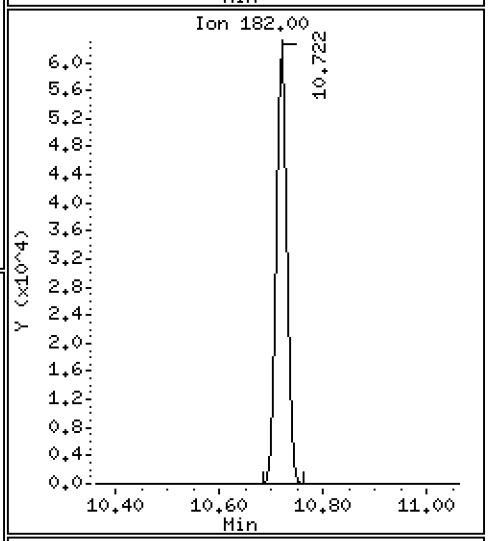


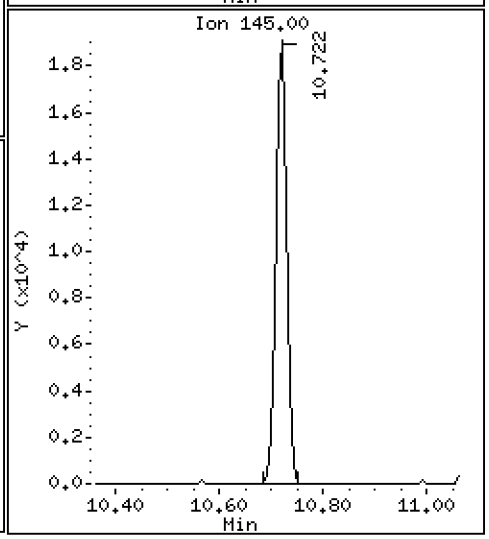












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

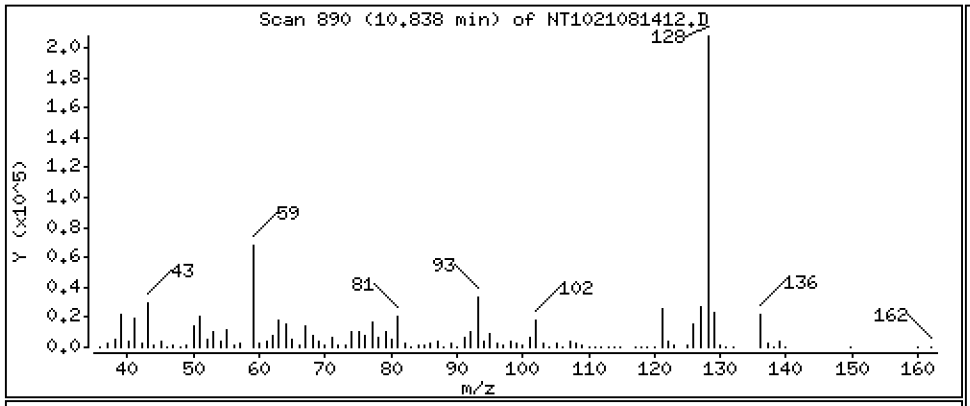
Operator: VTS

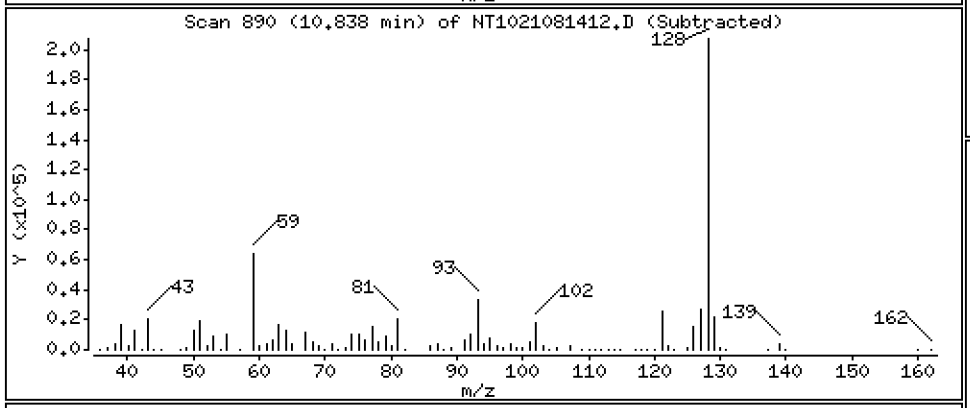
Column phase: ZB-5msi

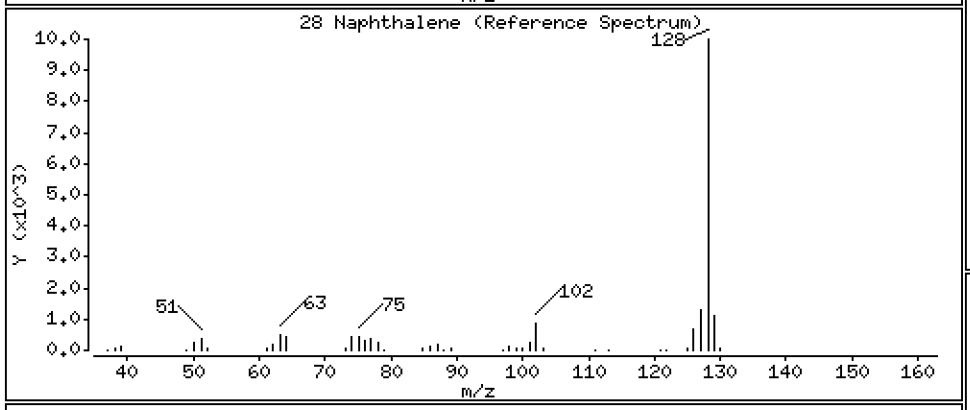
Column diameter: 0.25

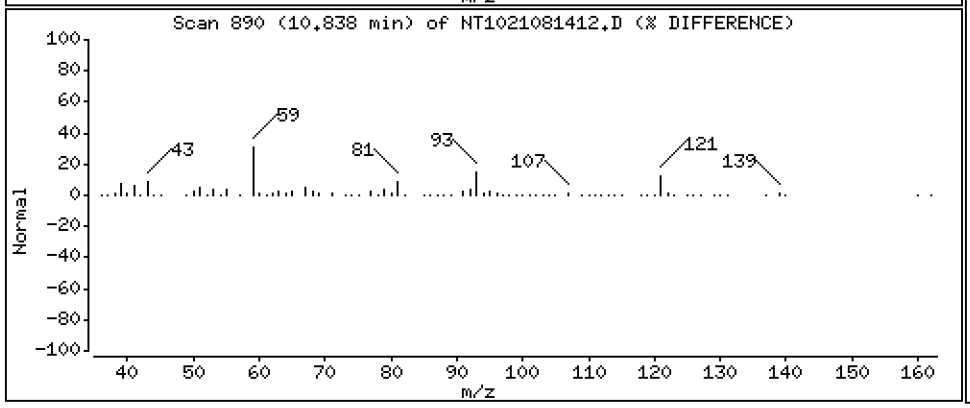
28 Naphthalene

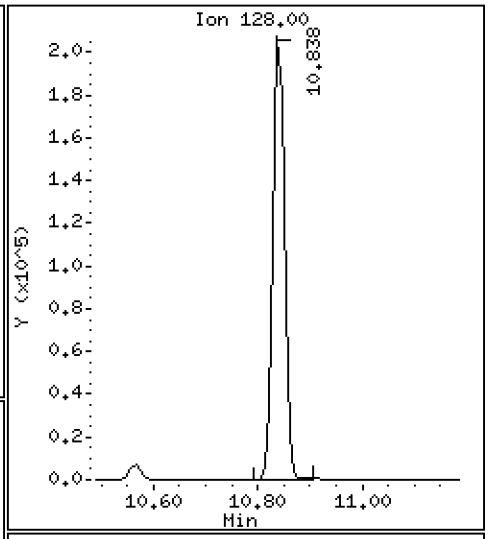
Concentration: 3.654 ug/mL

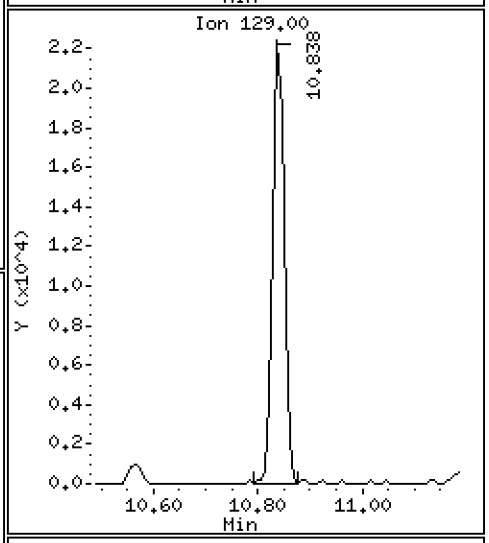


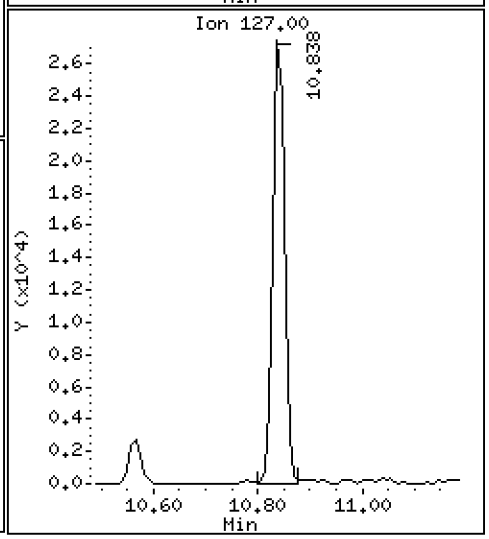












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

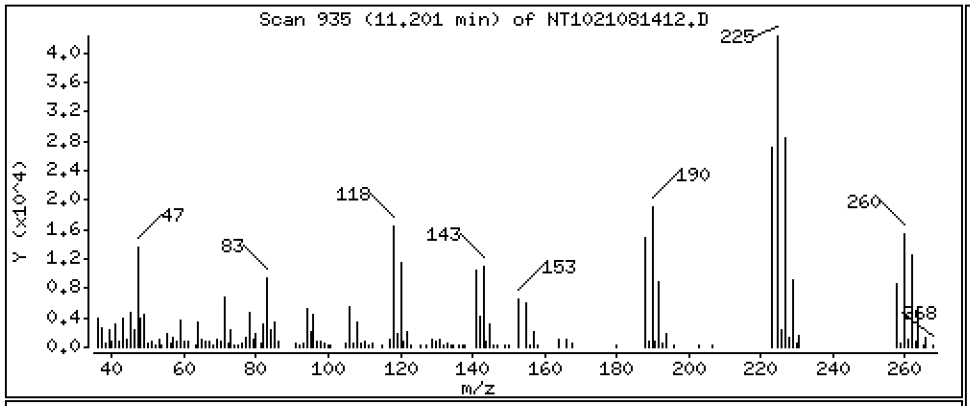
Operator: VTS

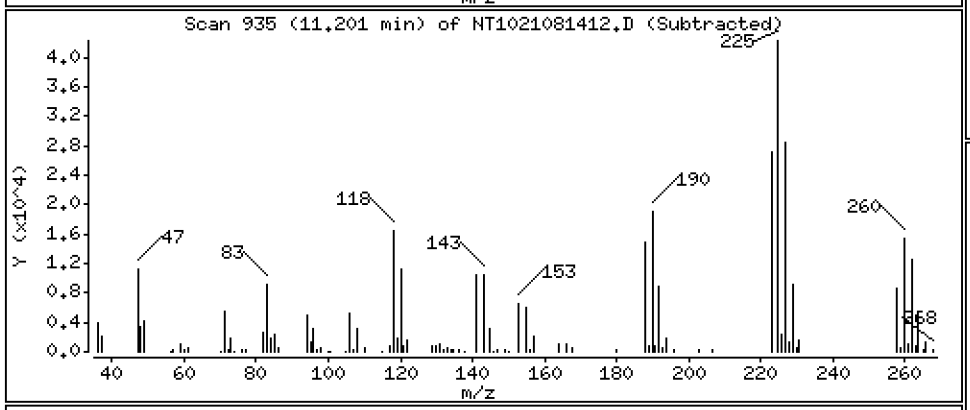
Column phase: ZB-5msi

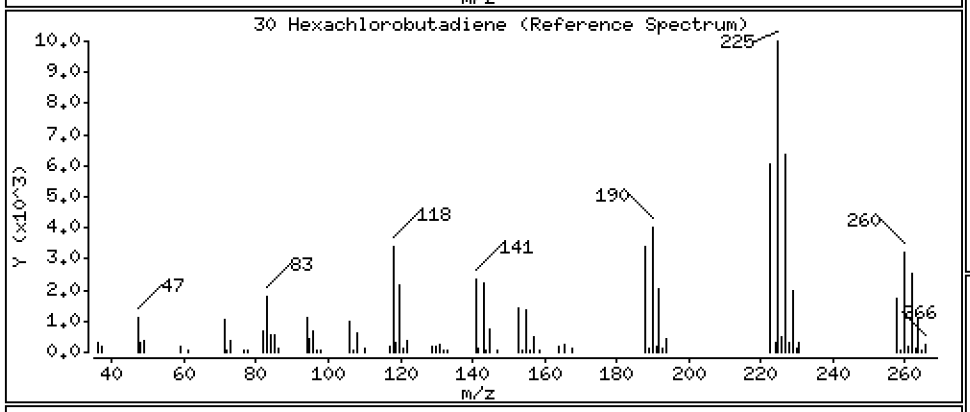
Column diameter: 0.25

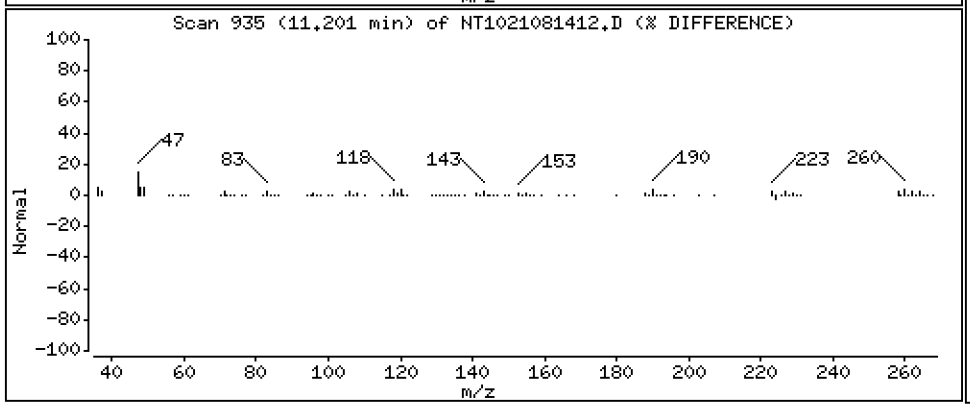
30 Hexachlorobutadiene

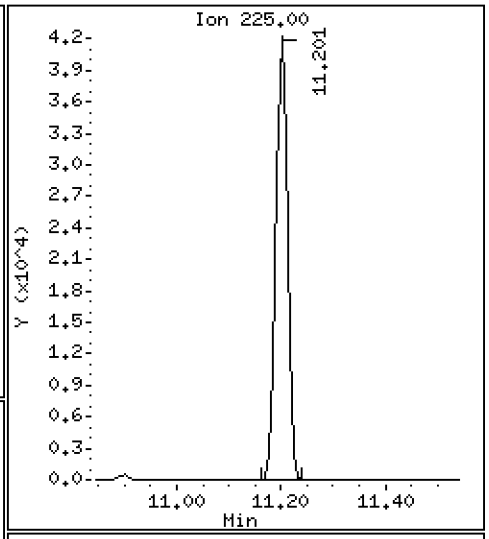
Concentration: 4.056 ug/mL

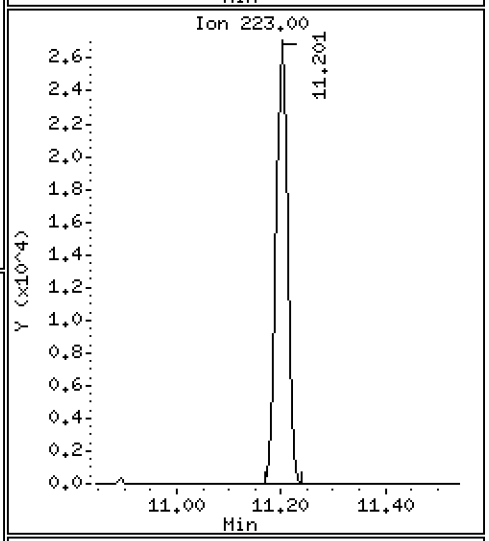


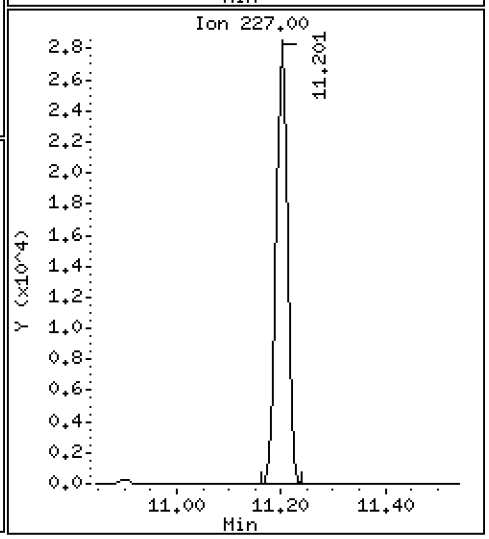












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

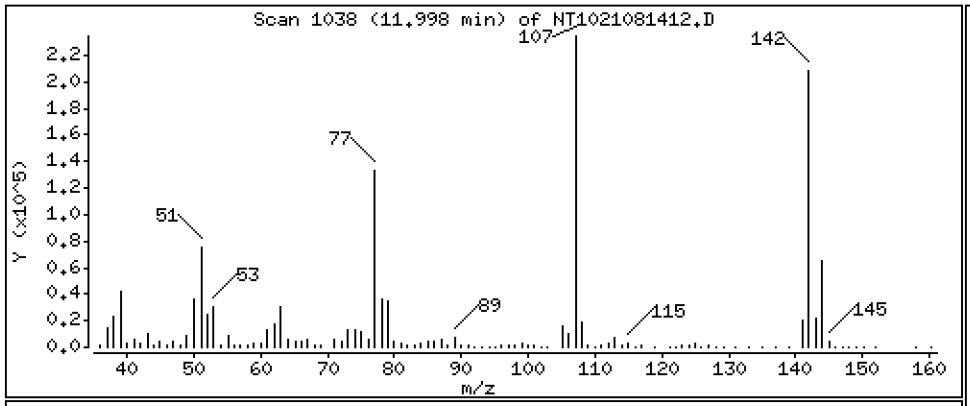
Operator: VTS

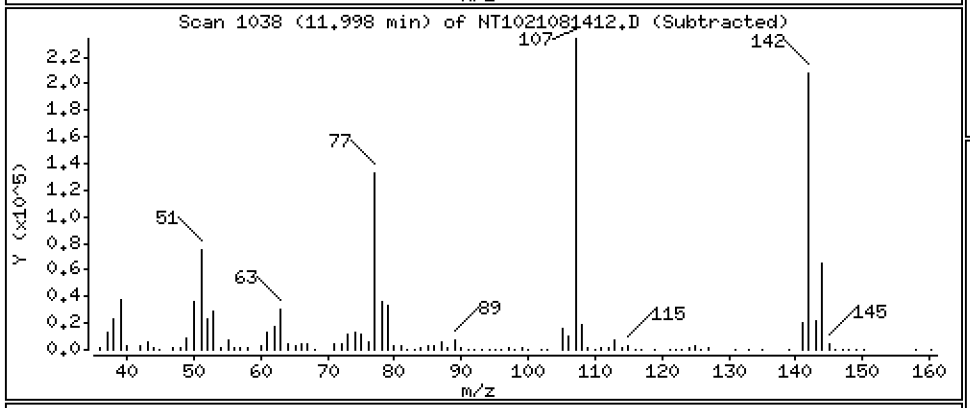
Column phase: ZB-5msi

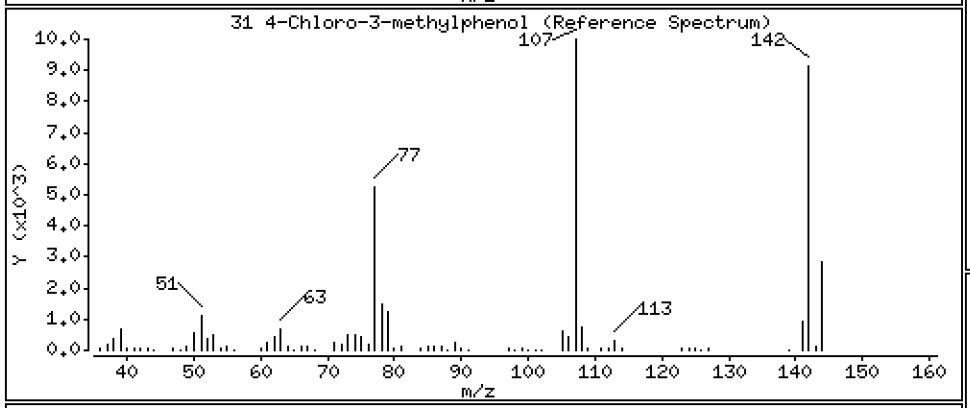
Column diameter: 0.25

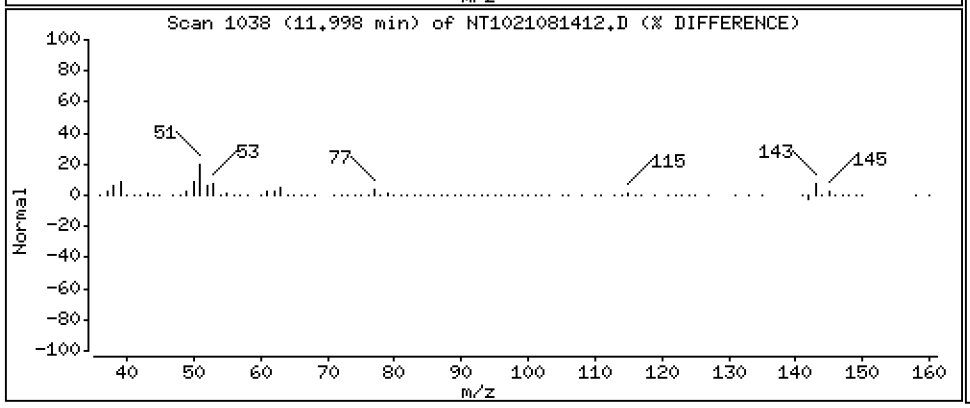
31 4-Chloro-3-methylphenol

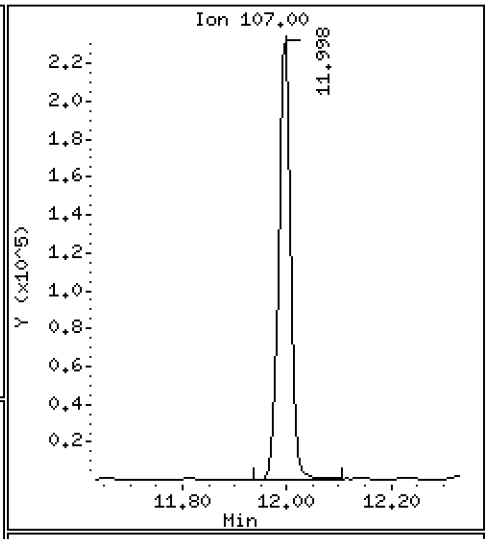
Concentration: 12.88 ug/mL

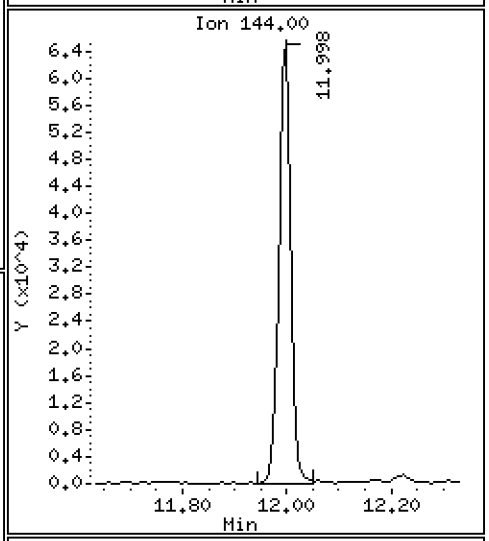


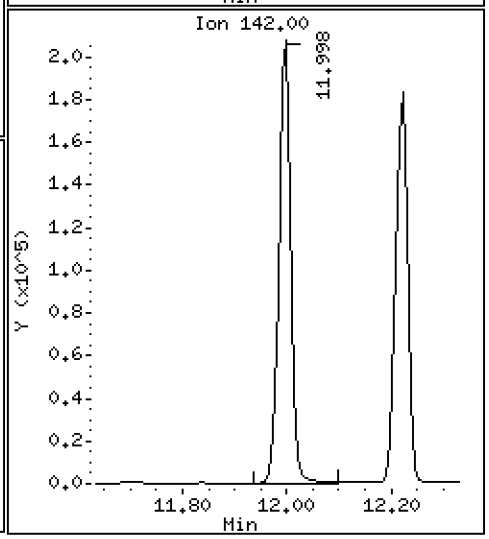












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

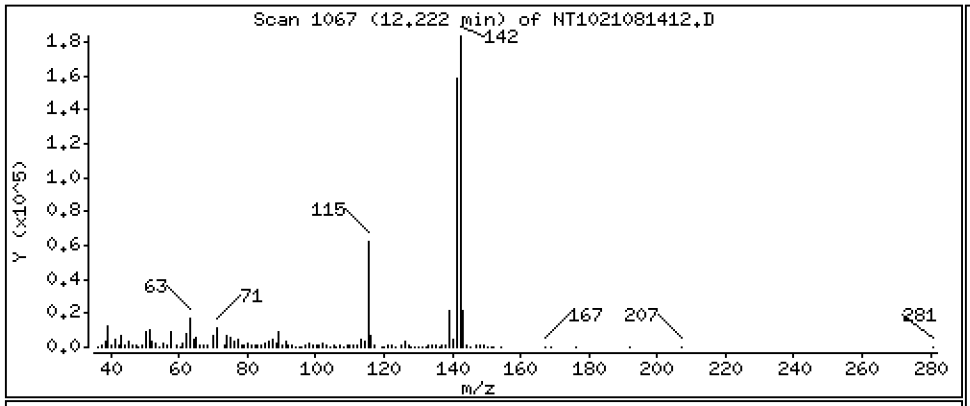
Operator: VTS

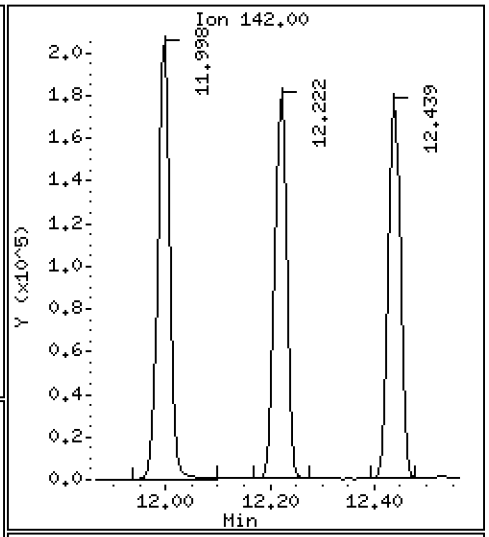
Column phase: ZB-5msi

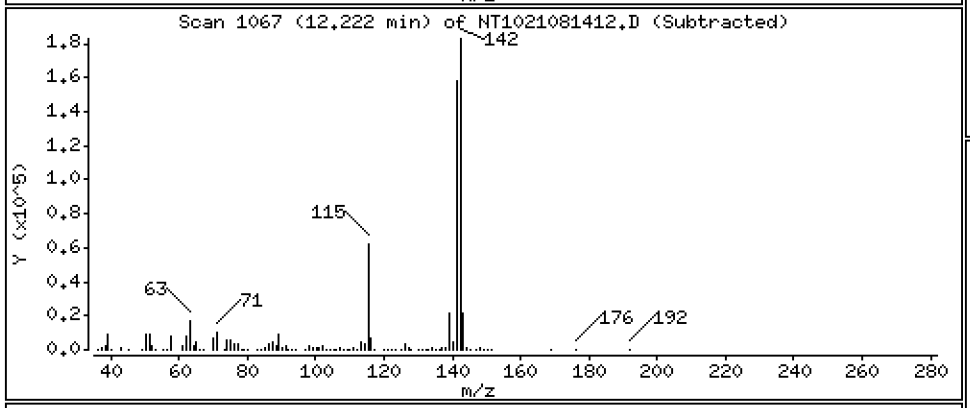
Column diameter: 0.25

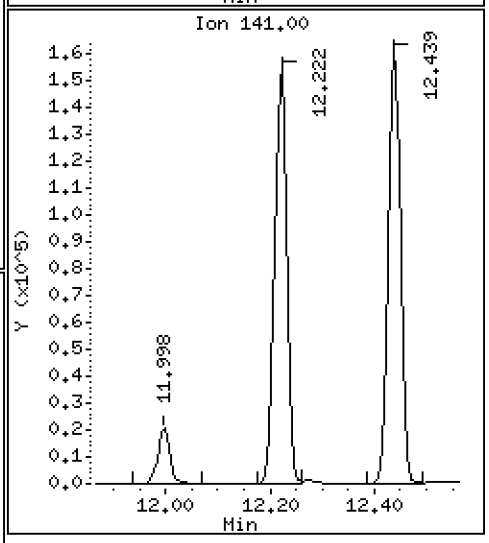
32 2-Methylnaphthalene

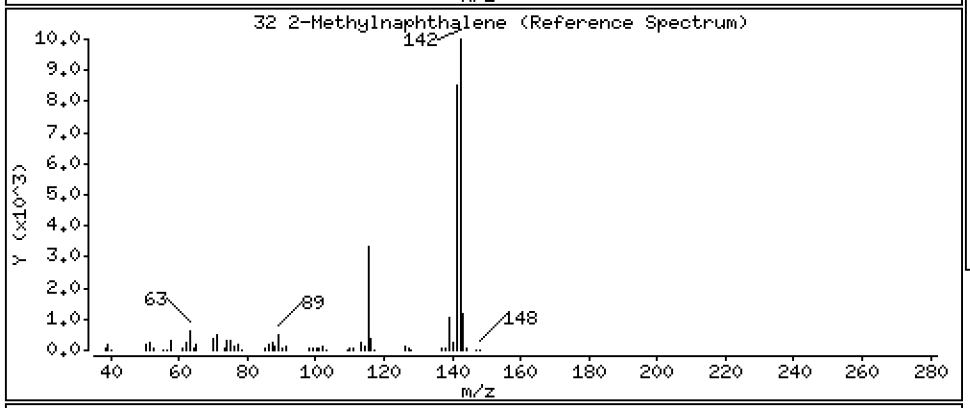
Concentration: 3.718 ug/mL

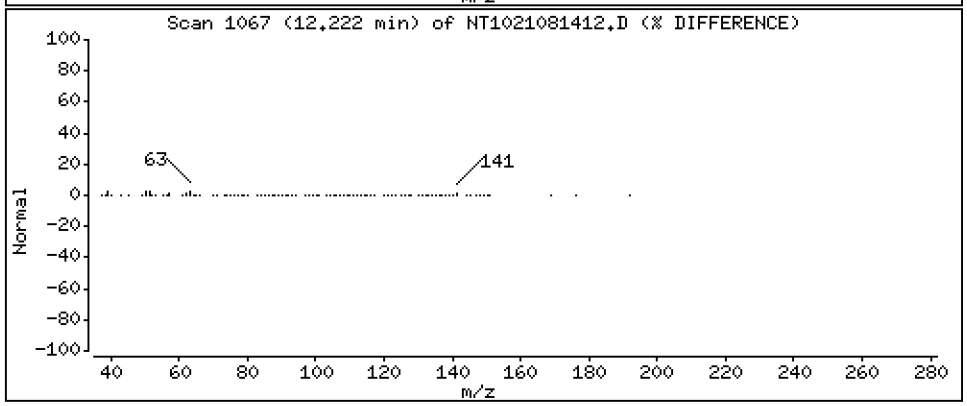












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

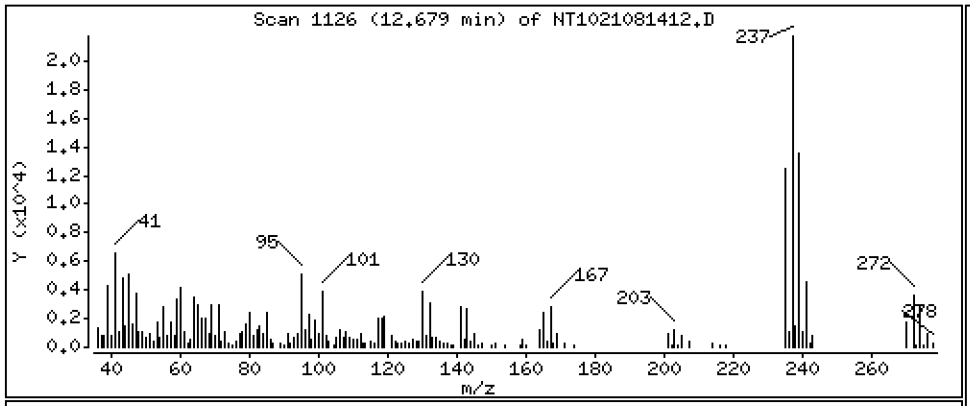
Operator: VTS

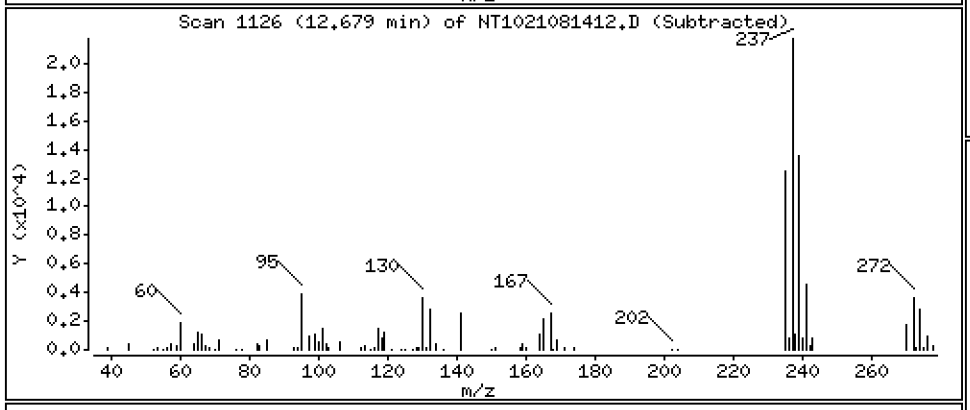
Column phase: ZB-5msi

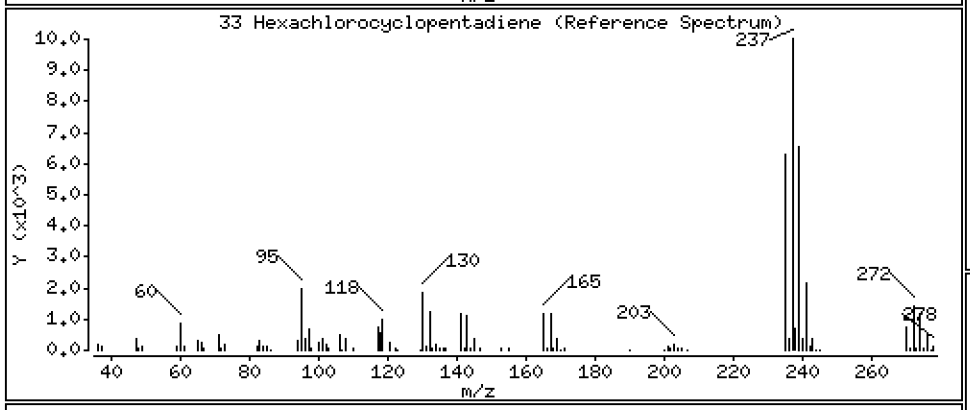
Column diameter: 0.25

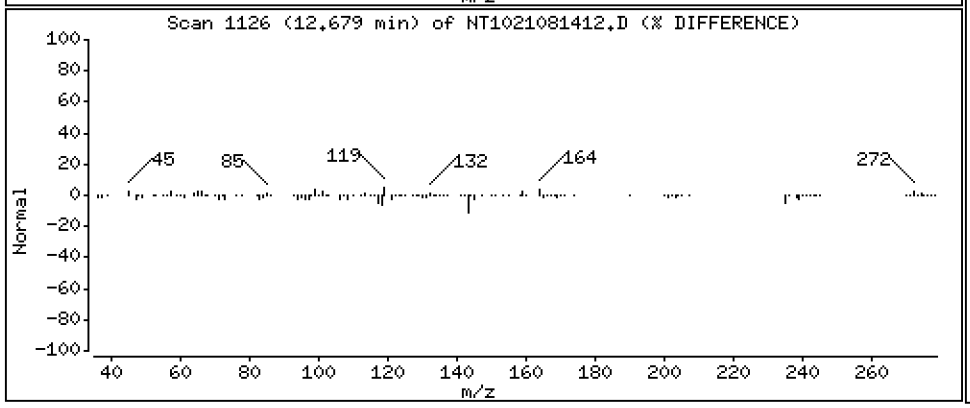
33 Hexachlorocyclopentadiene

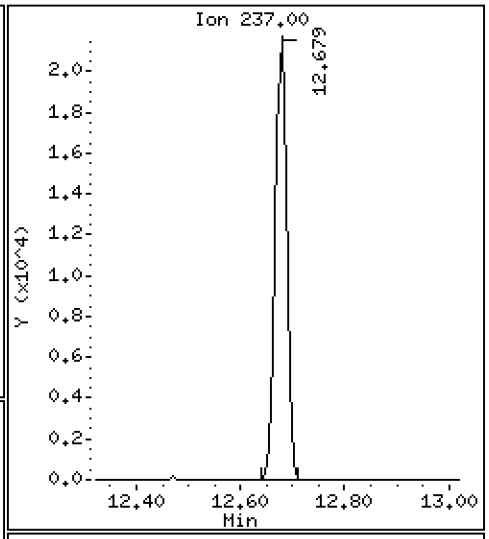
Concentration: 1.683 ug/mL

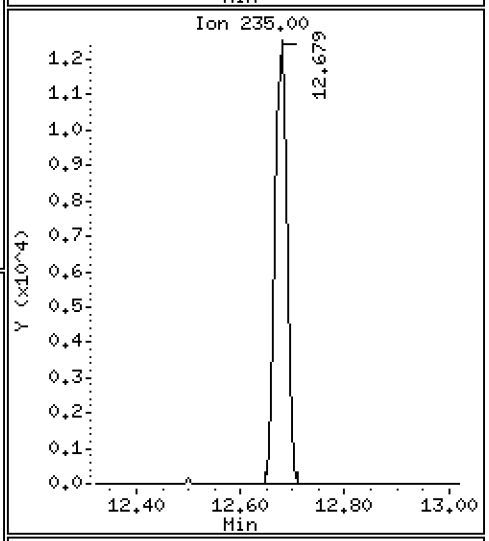


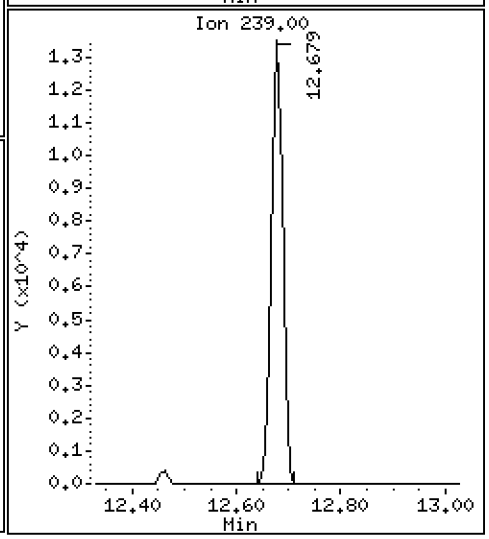












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

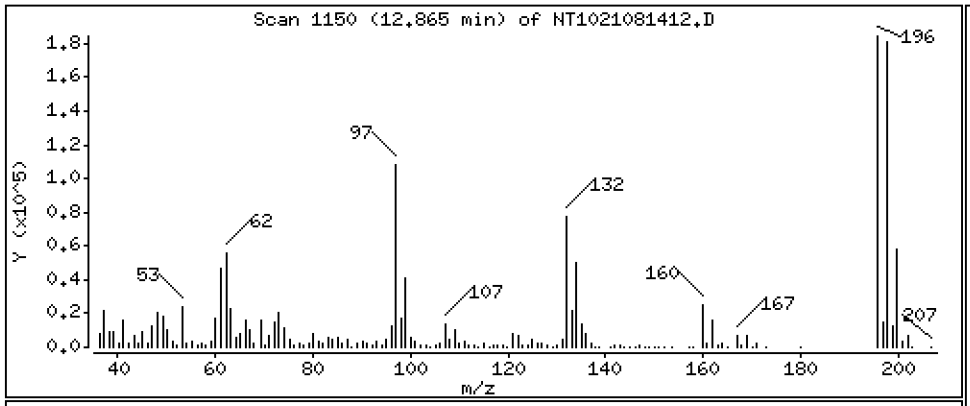
Operator: VTS

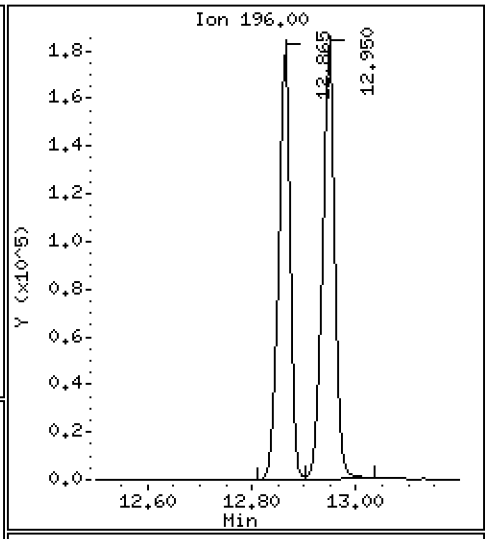
Column phase: ZB-5msi

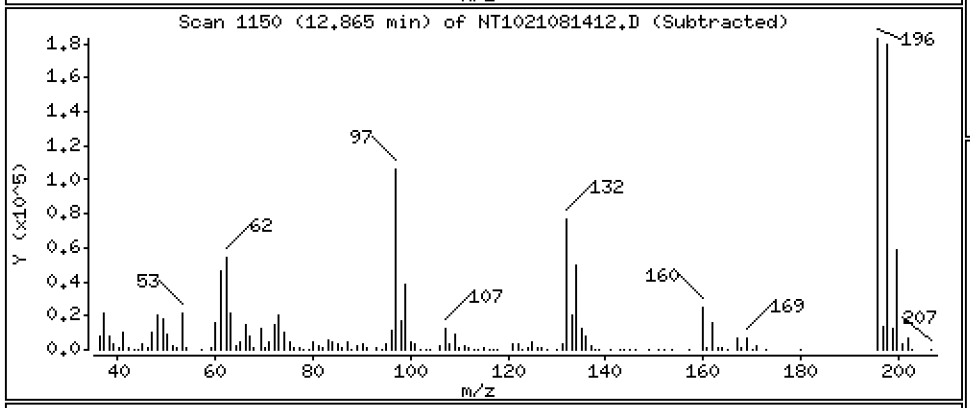
Column diameter: 0.25

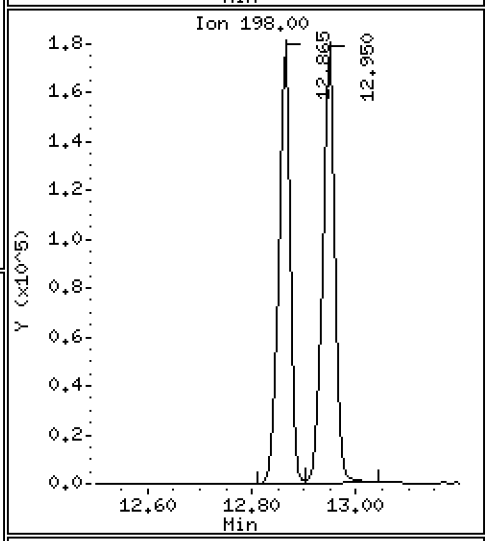
34 2,4,6-Trichlorophenol

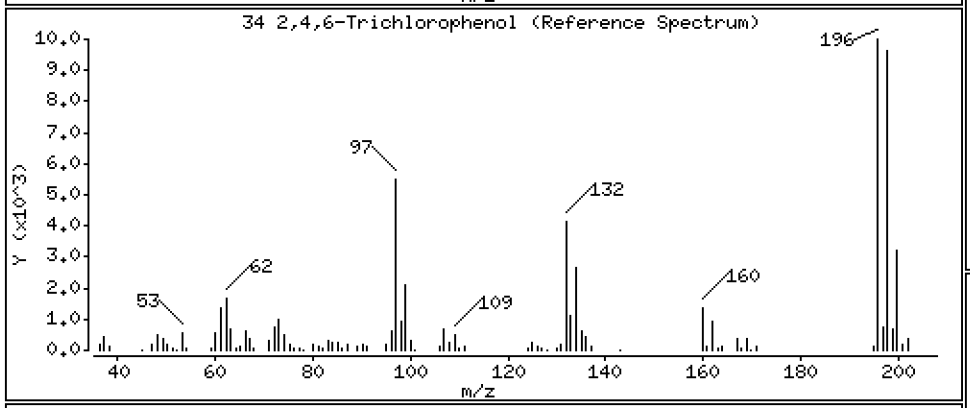
Concentration: 14.68 ug/mL

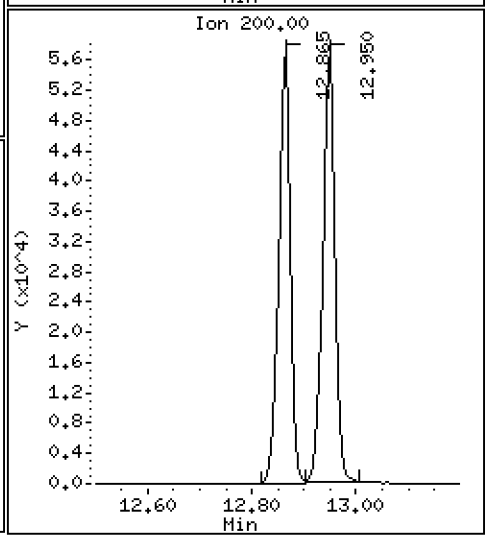


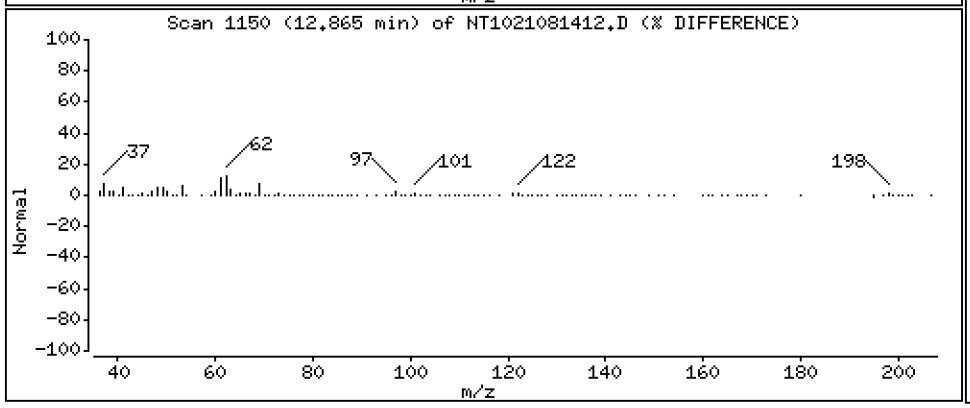












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

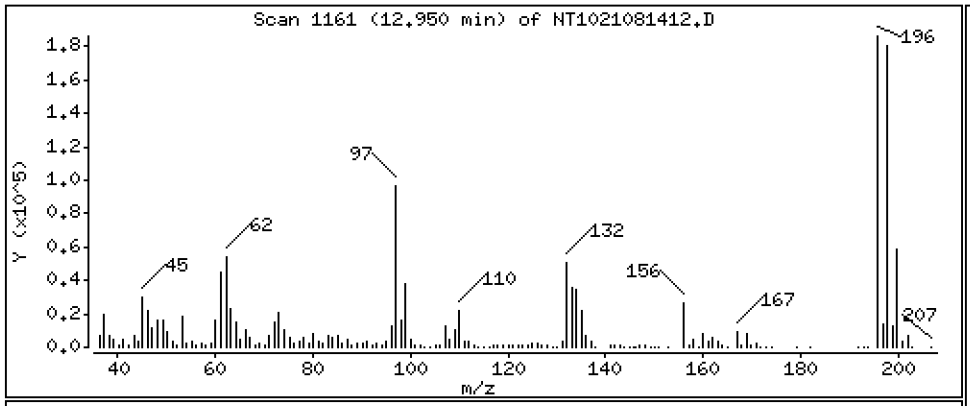
Operator: VTS

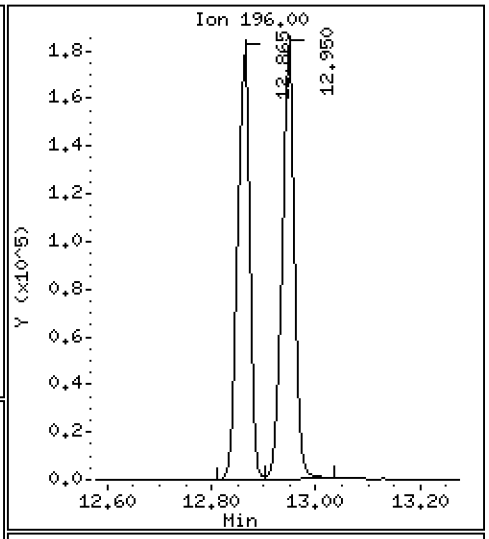
Column phase: ZB-5msi

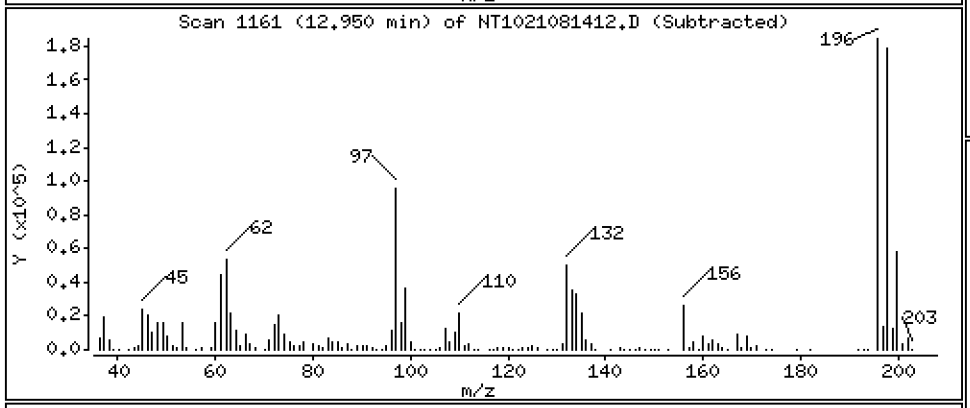
Column diameter: 0.25

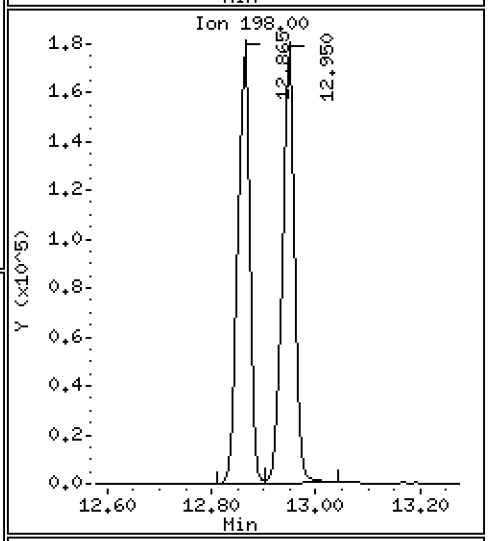
35 2,4,5-Trichlorophenol

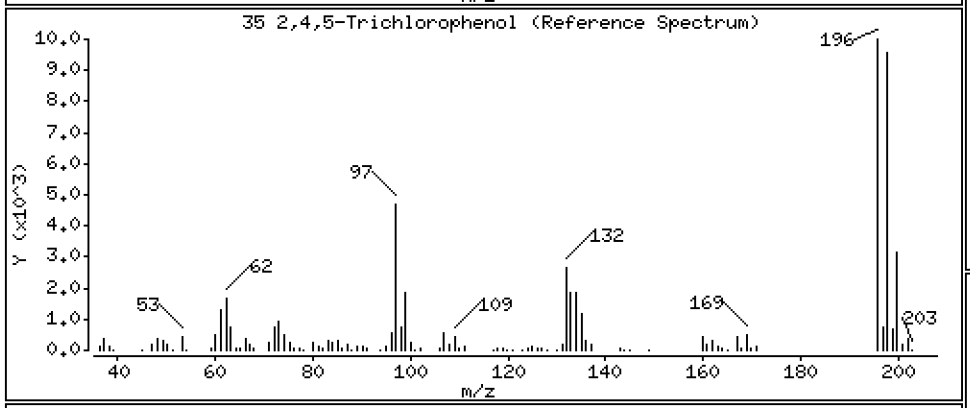
Concentration: 14.69 ug/mL

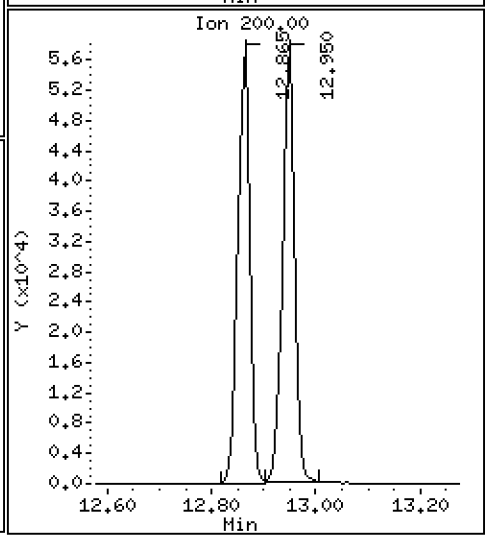


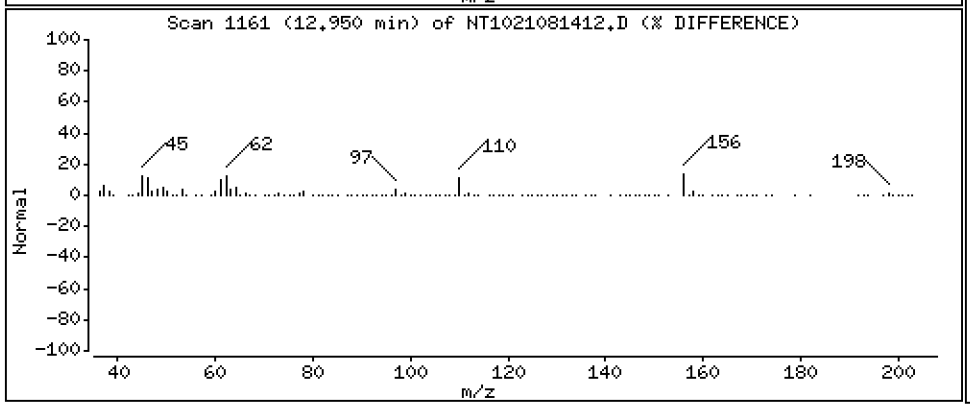












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

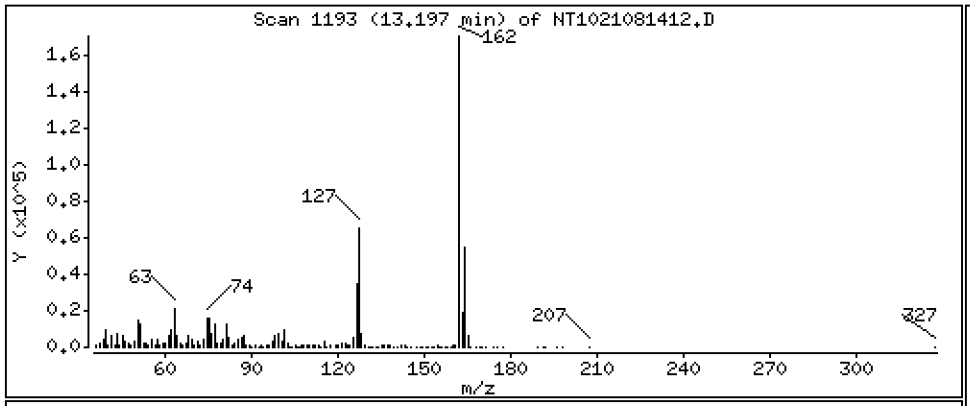
Operator: VTS

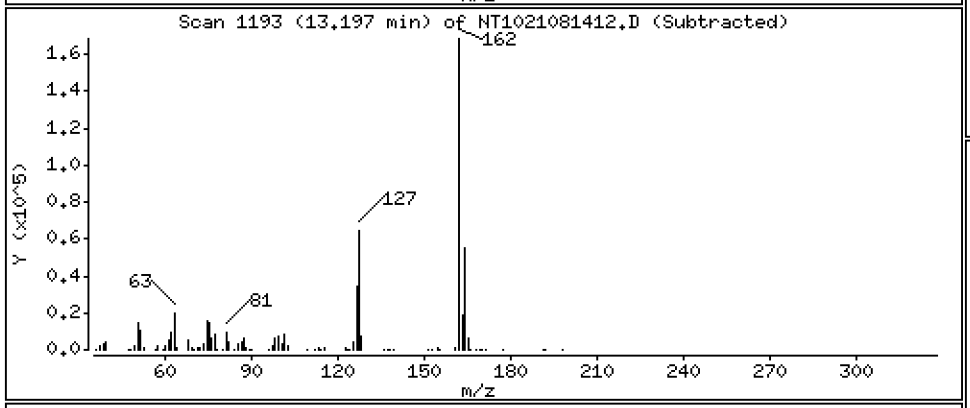
Column phase: ZB-5msi

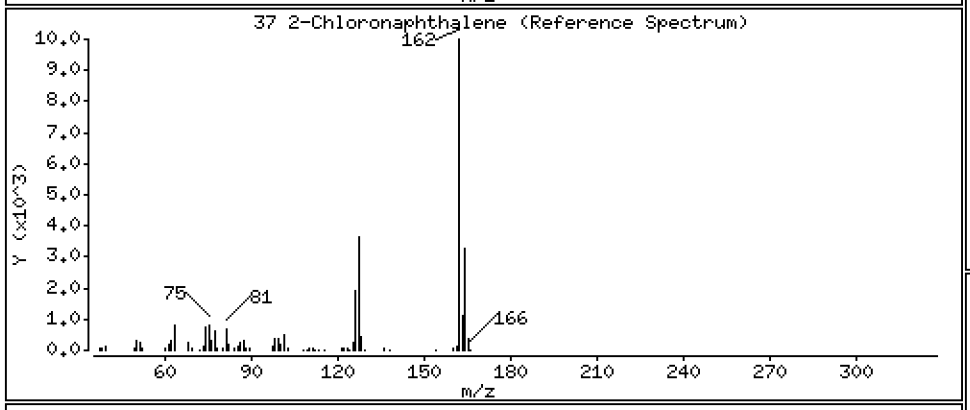
Column diameter: 0.25

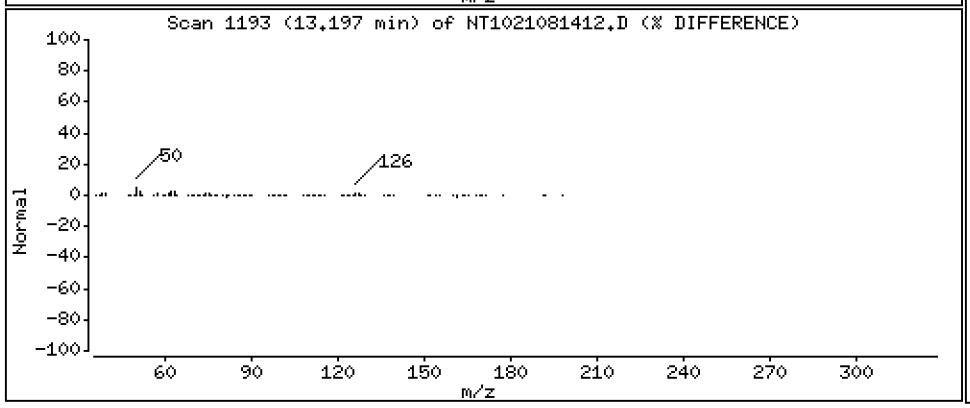
37 2-Chloronaphthalene

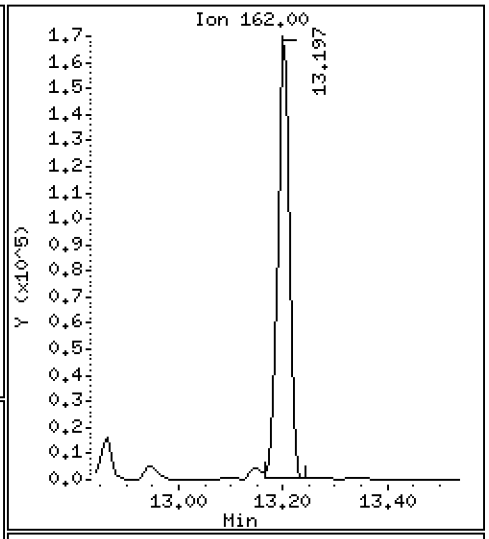
Concentration: 3.901 ug/mL

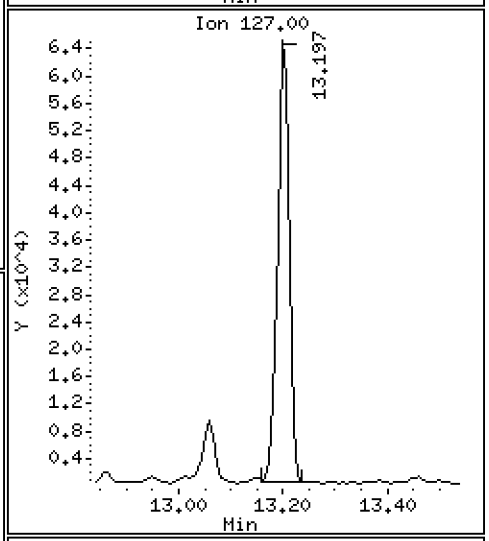


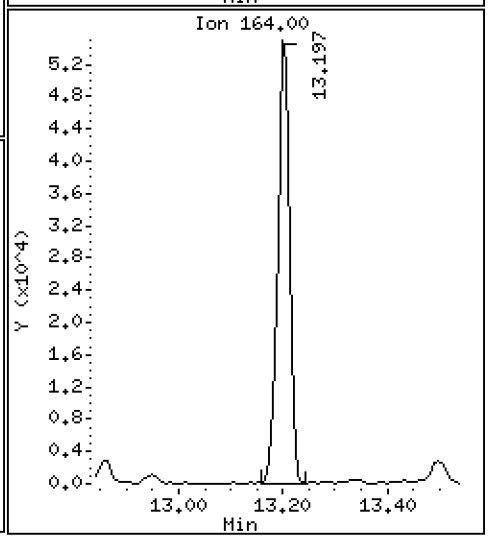












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

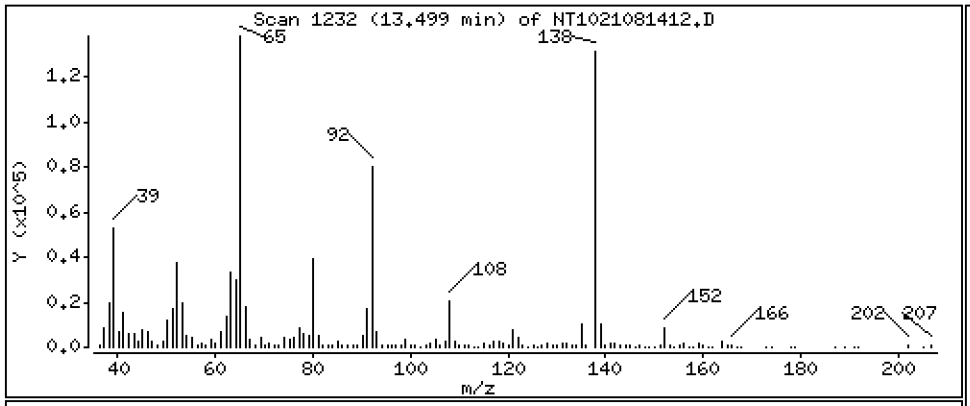
Operator: VTS

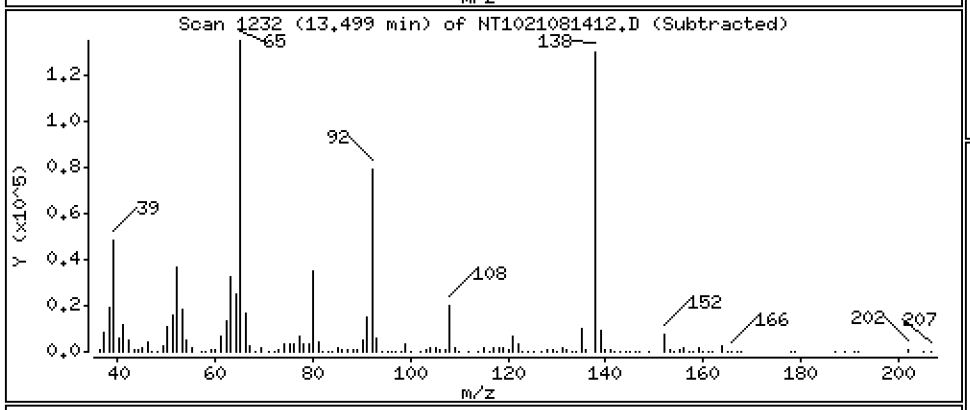
Column phase: ZB-5msi

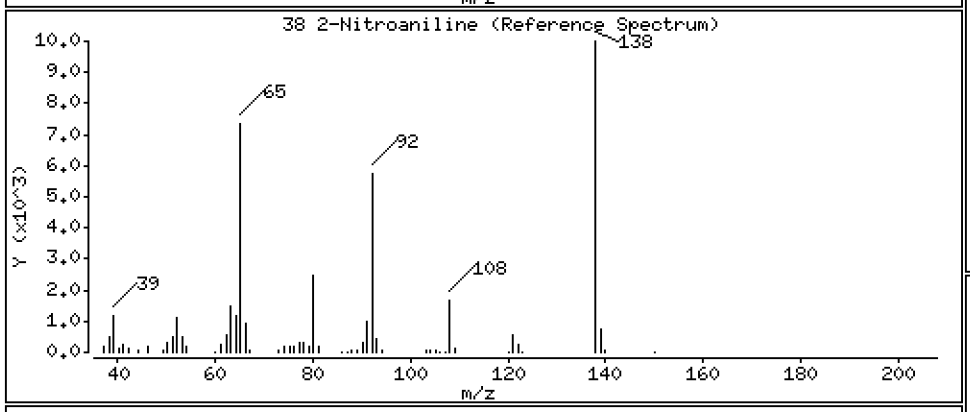
Column diameter: 0.25

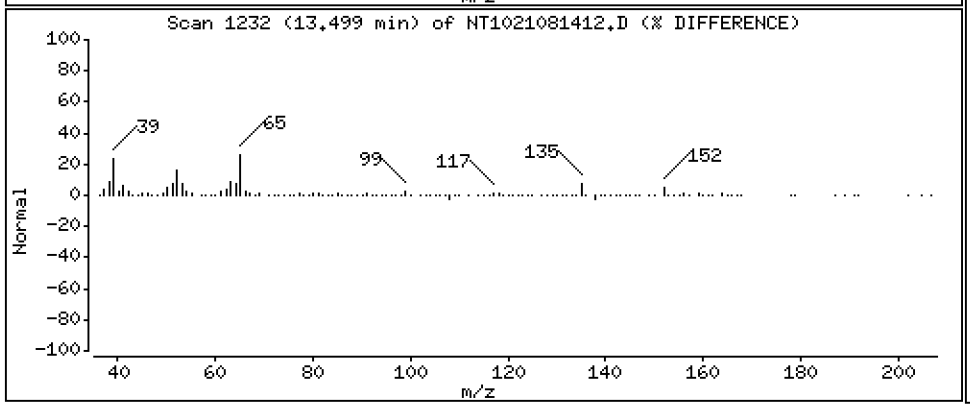
38 2-Nitroaniline

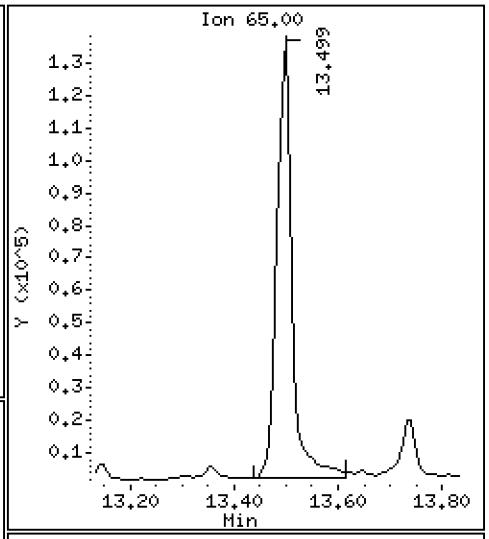
Concentration: 10.47 ug/mL

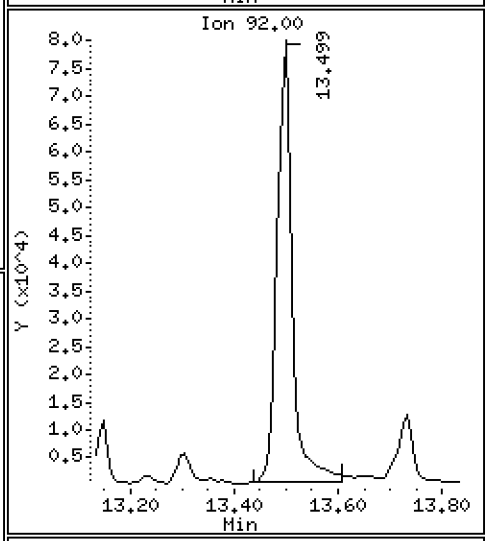


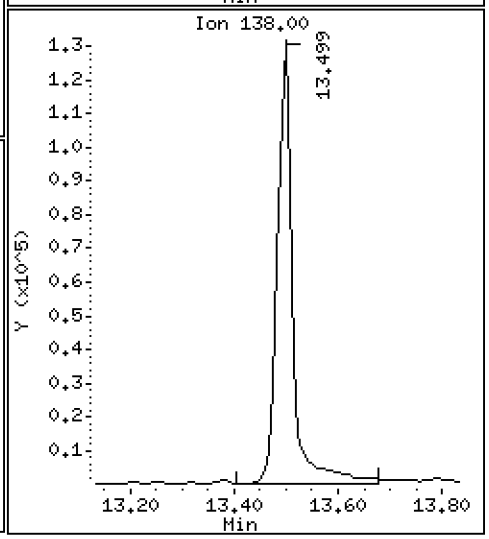












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

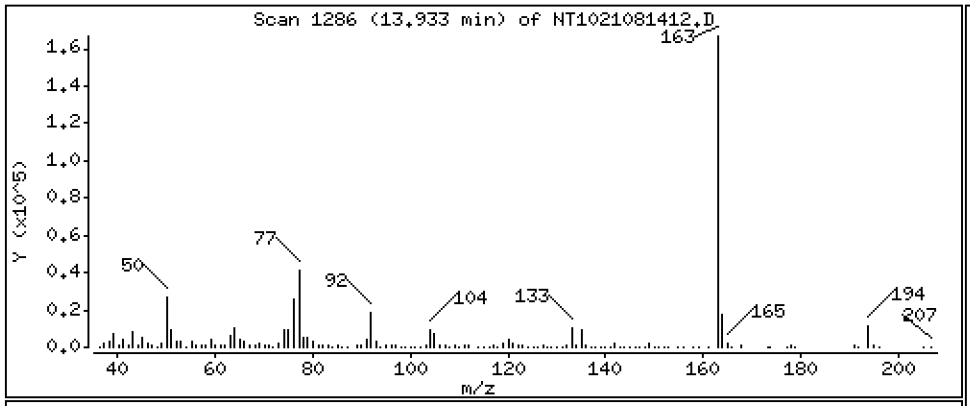
Operator: VTS

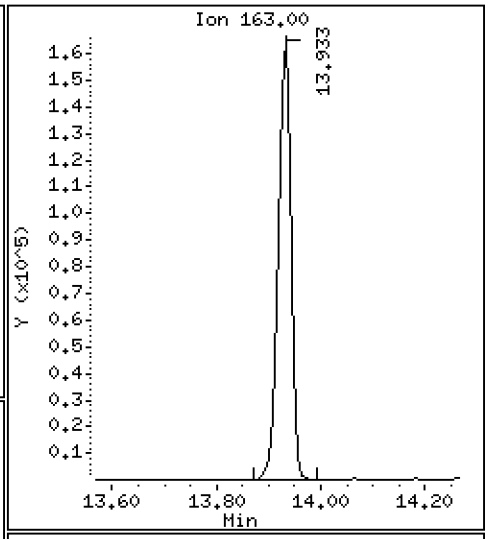
Column phase: ZB-5msi

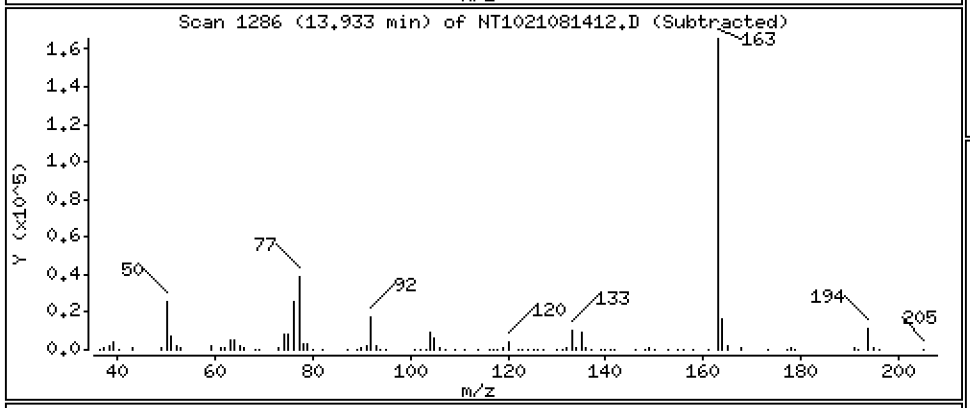
Column diameter: 0.25

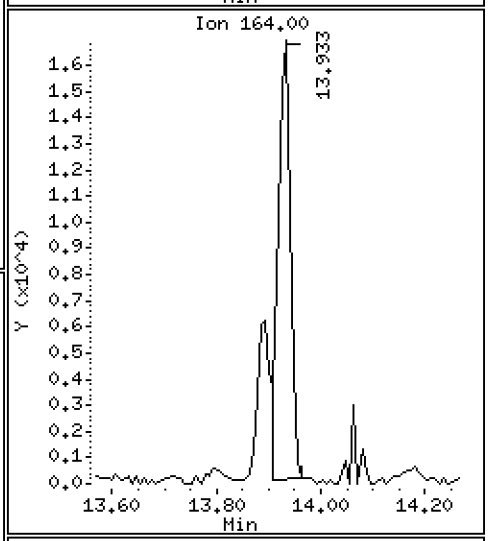
39 Dimethylphthalate

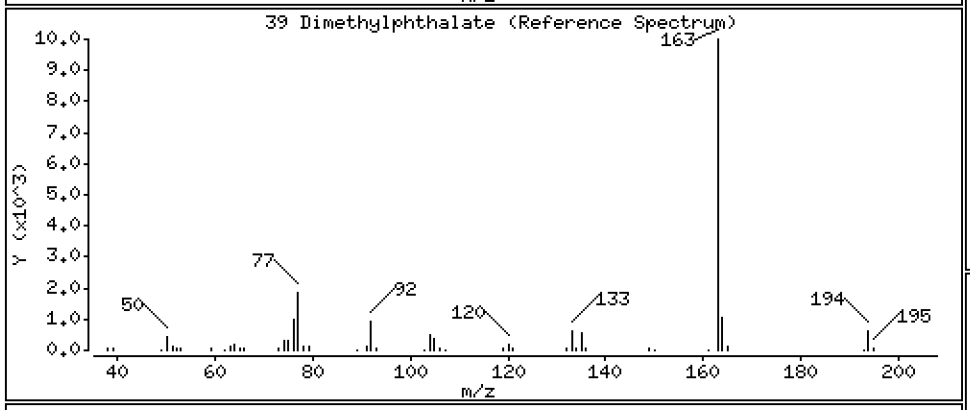
Concentration: 4.165 ug/mL

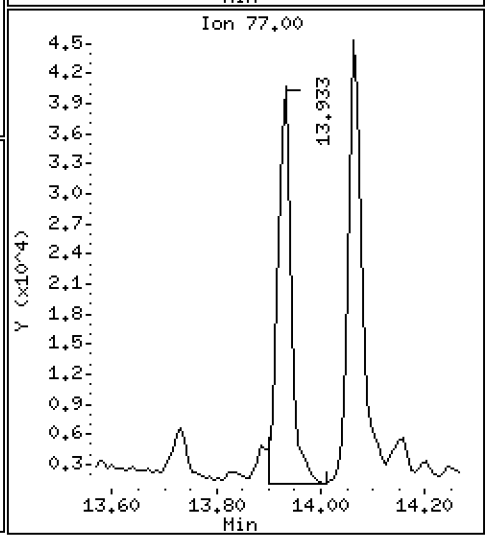


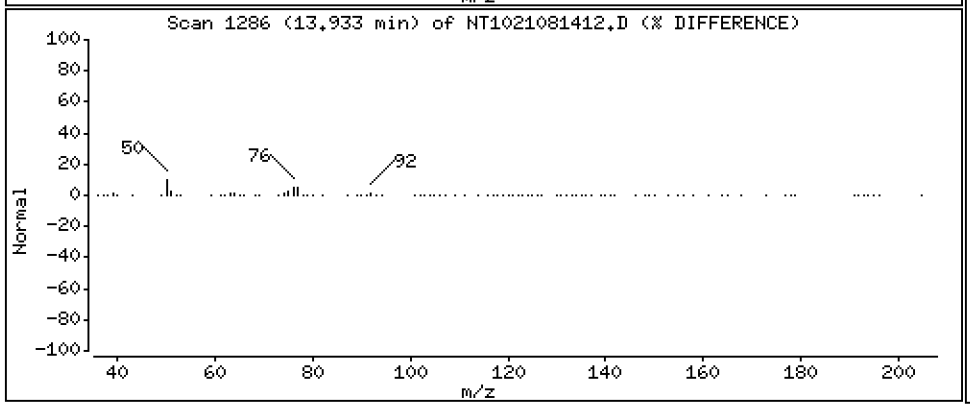












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

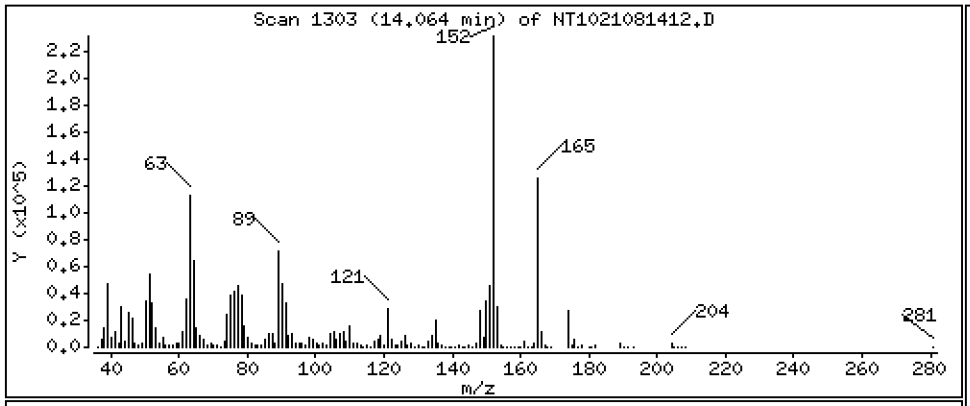
Operator: VTS

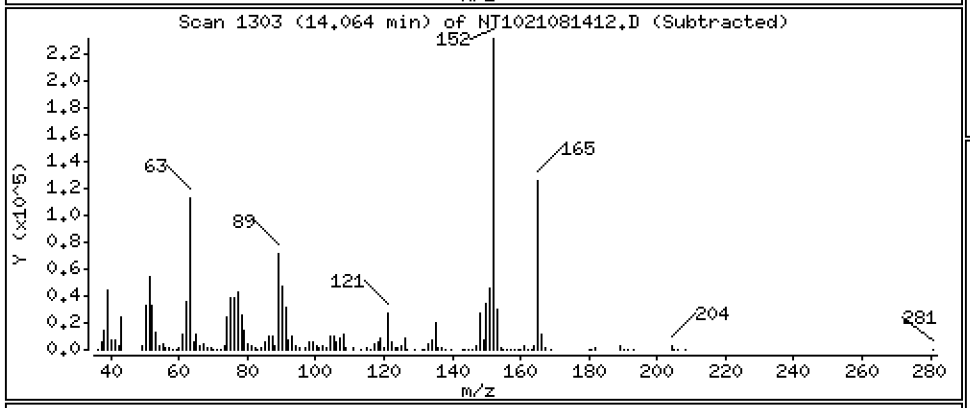
Column phase: ZB-5msi

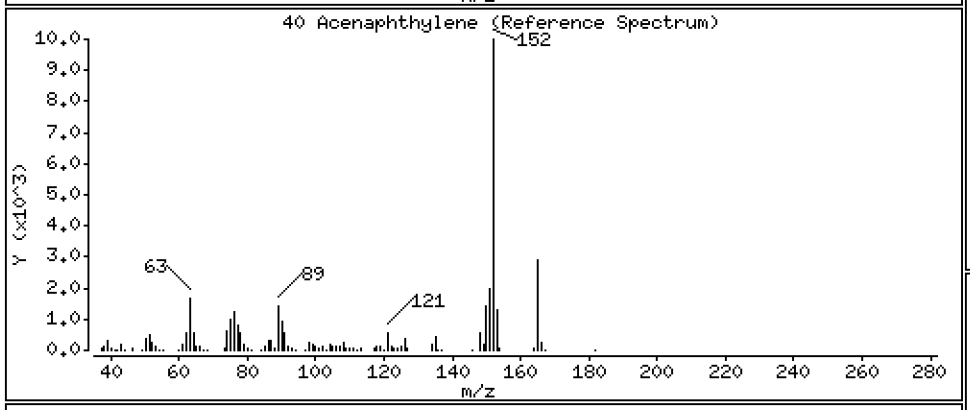
Column diameter: 0.25

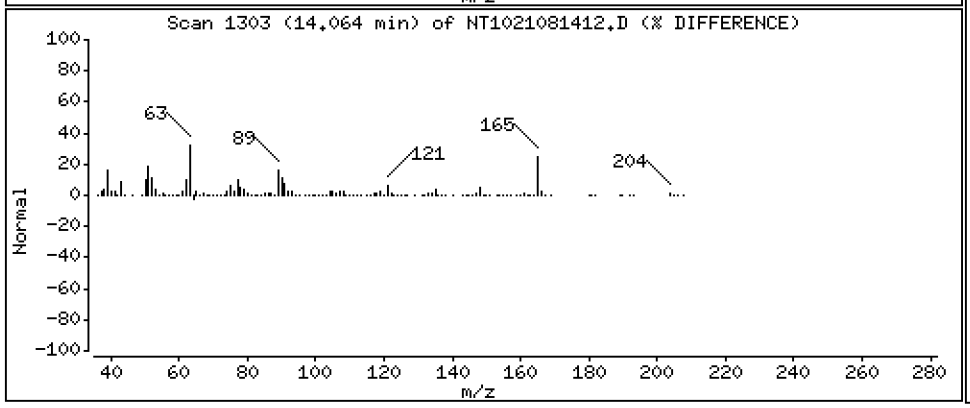
40 Acenaphthylene

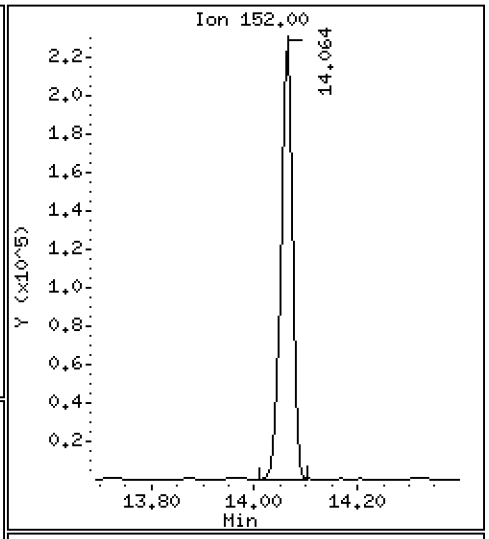
Concentration: 3.736 ug/mL

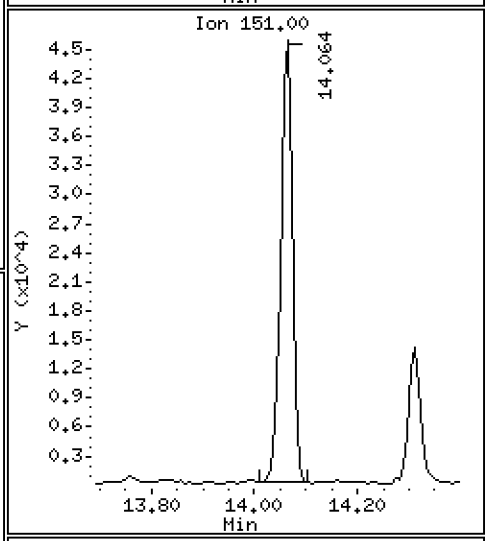


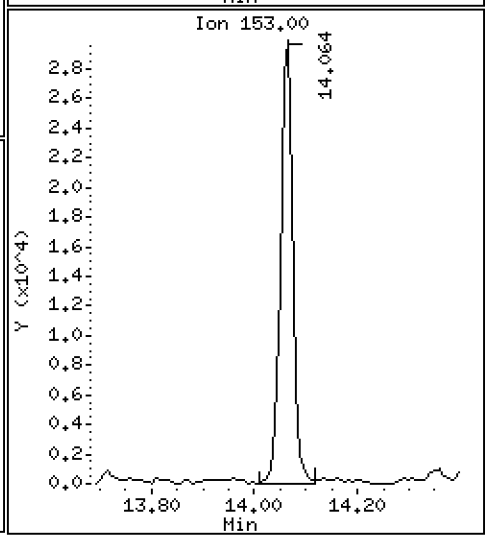












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

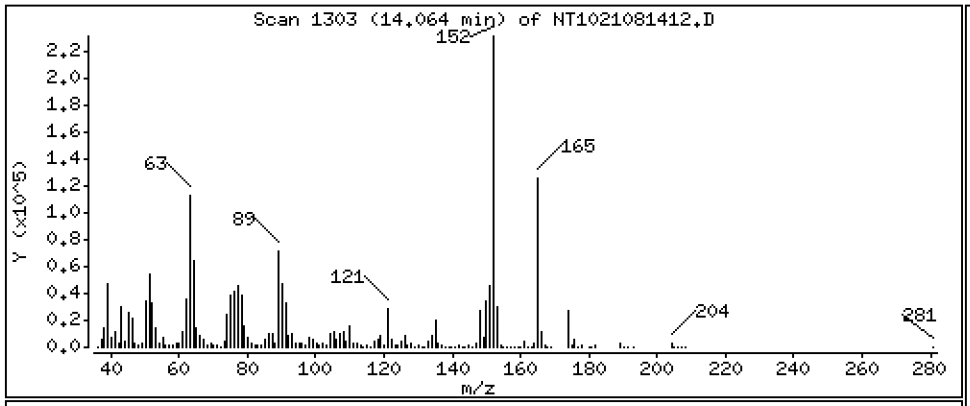
Operator: VTS

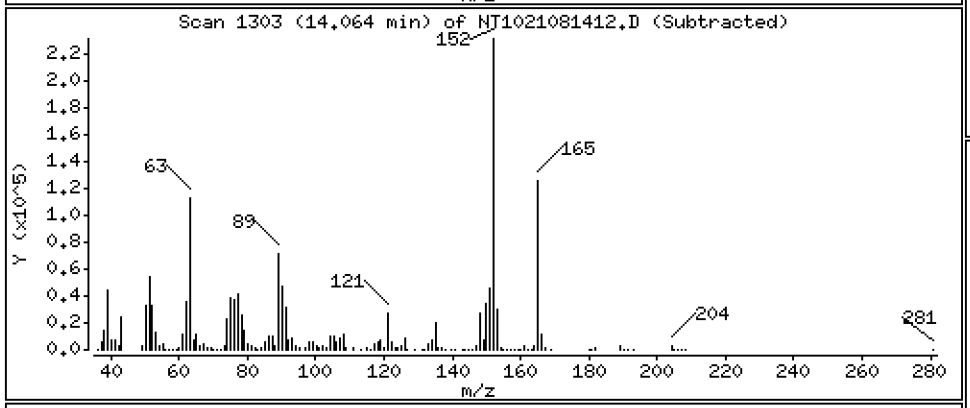
Column phase: ZB-5msi

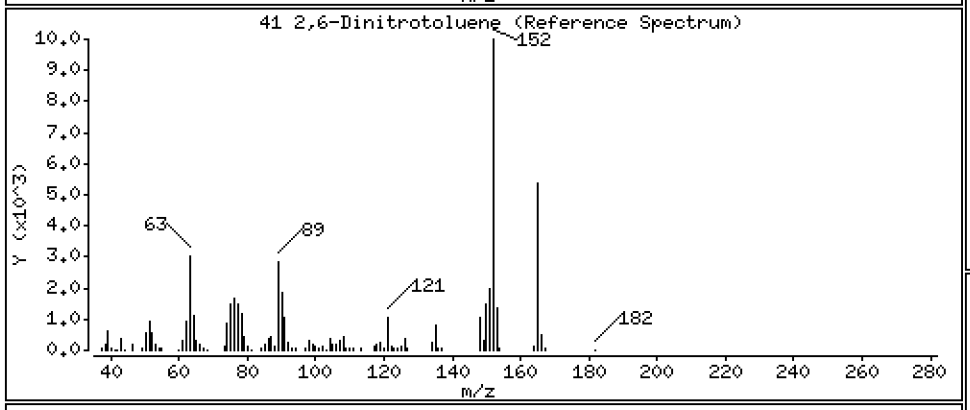
Column diameter: 0.25

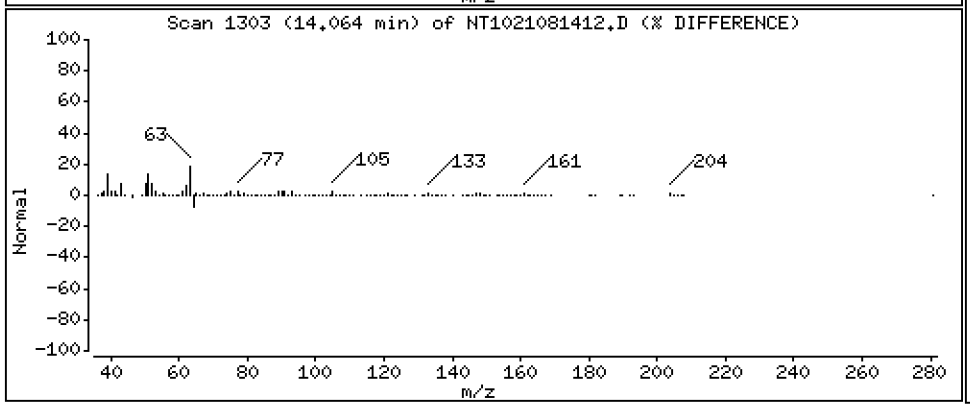
41 2,6-Dinitrotoluene

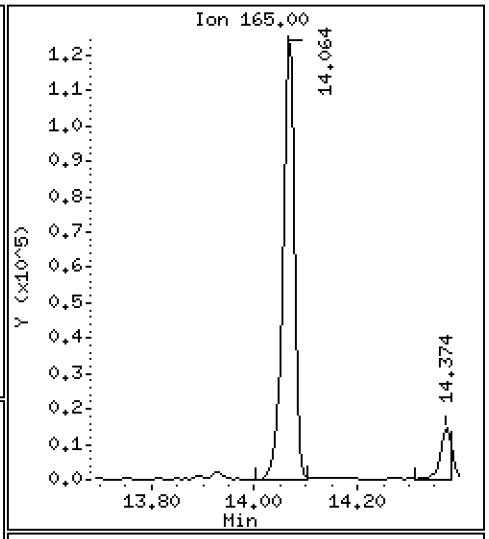
Concentration: 13.40 ug/mL

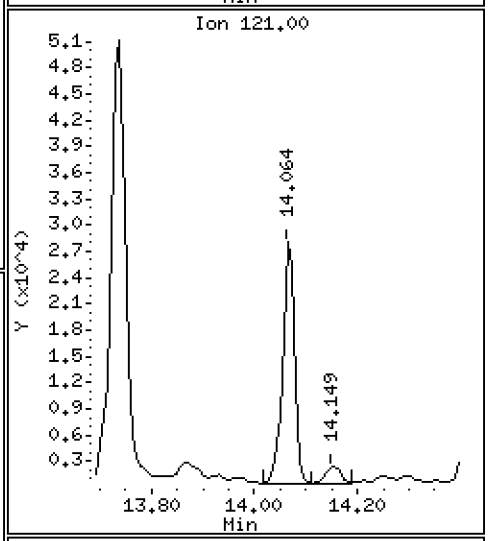


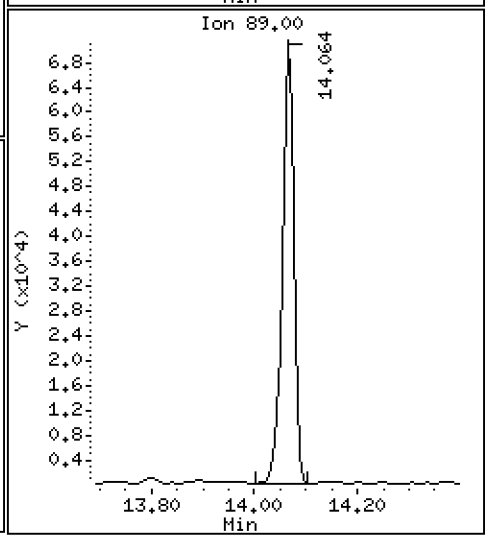












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

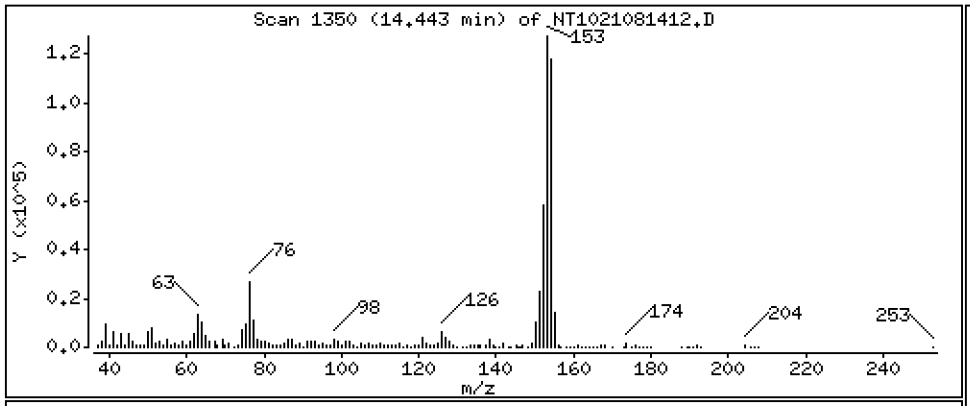
Operator: VTS

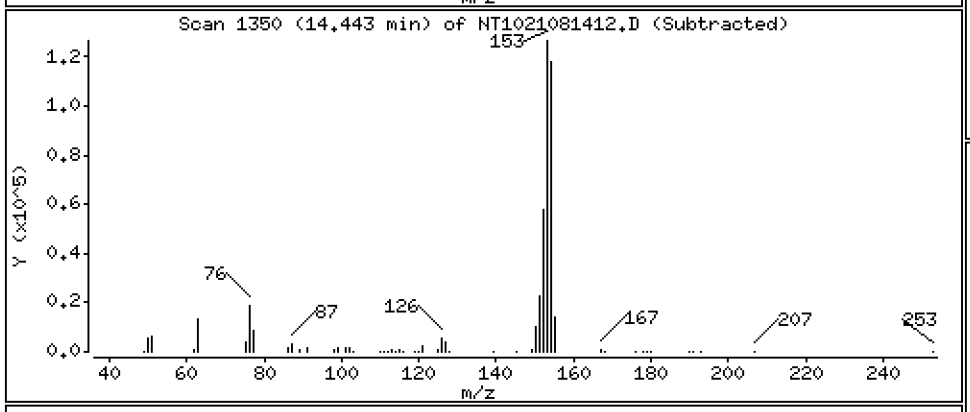
Column phase: ZB-5msi

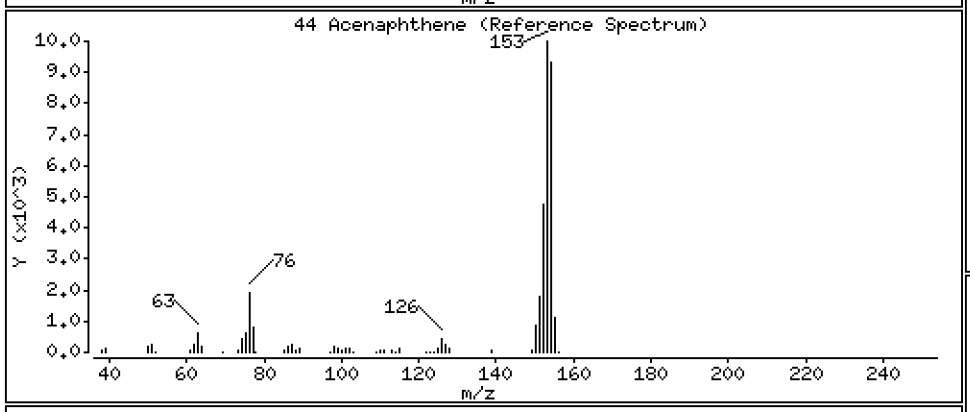
Column diameter: 0.25

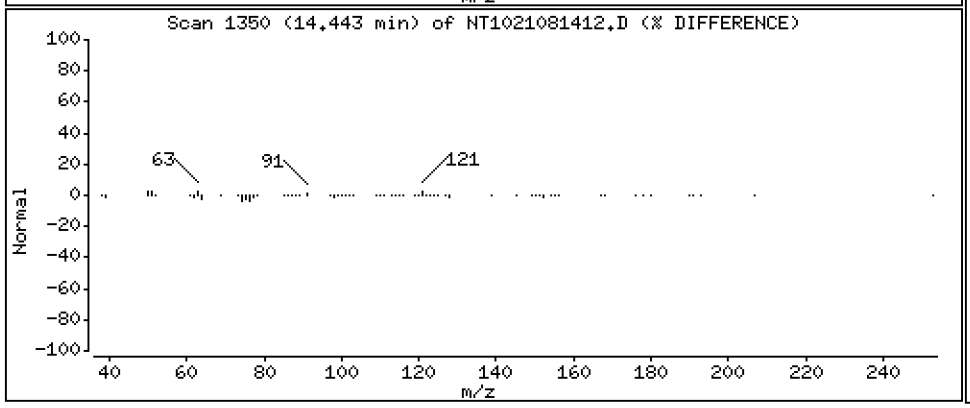
44 Acenaphthene

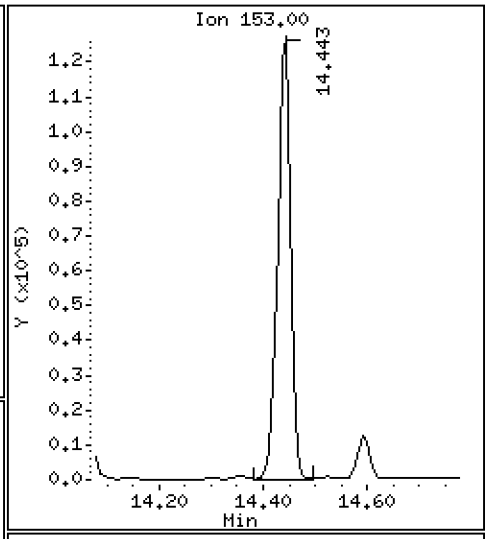
Concentration: 3.926 ug/mL

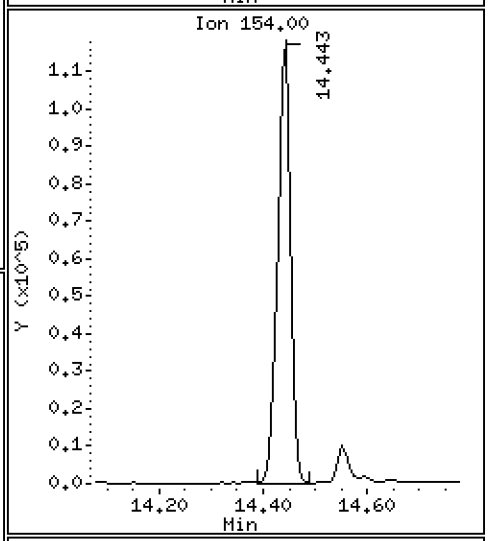


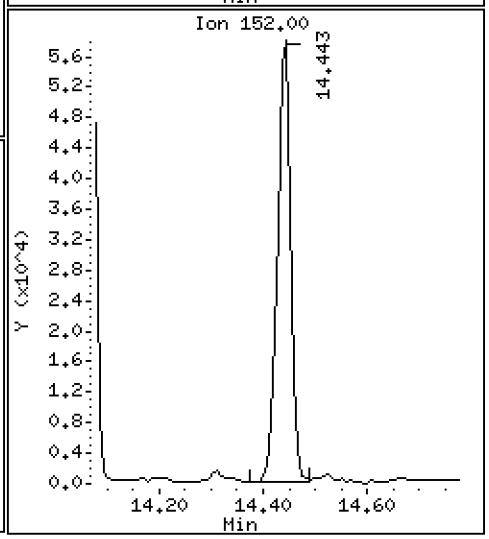












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

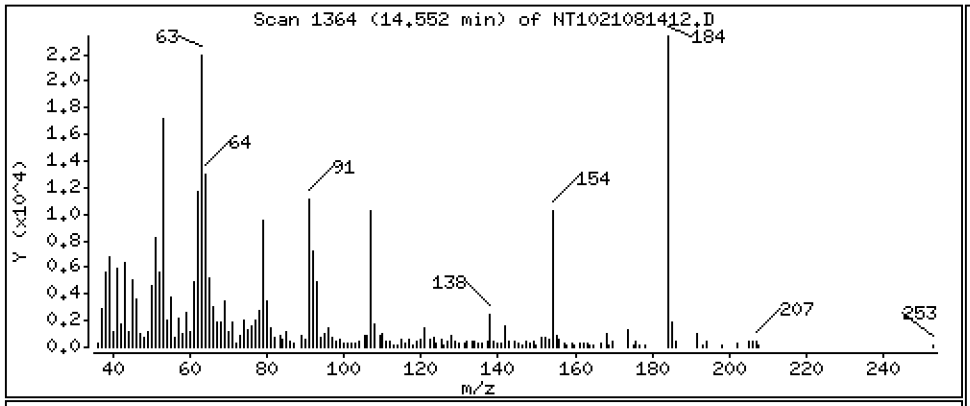
Operator: VTS

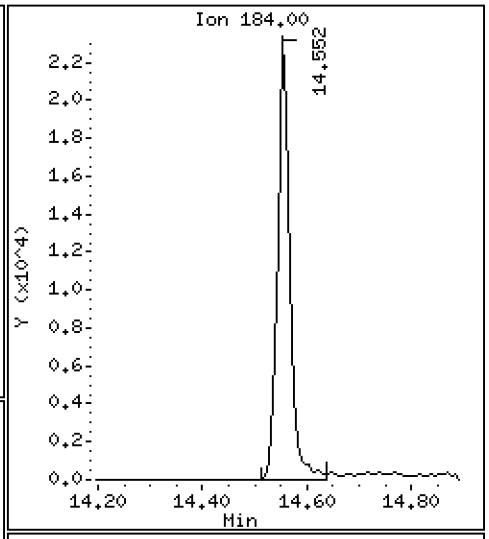
Column phase: ZB-5msi

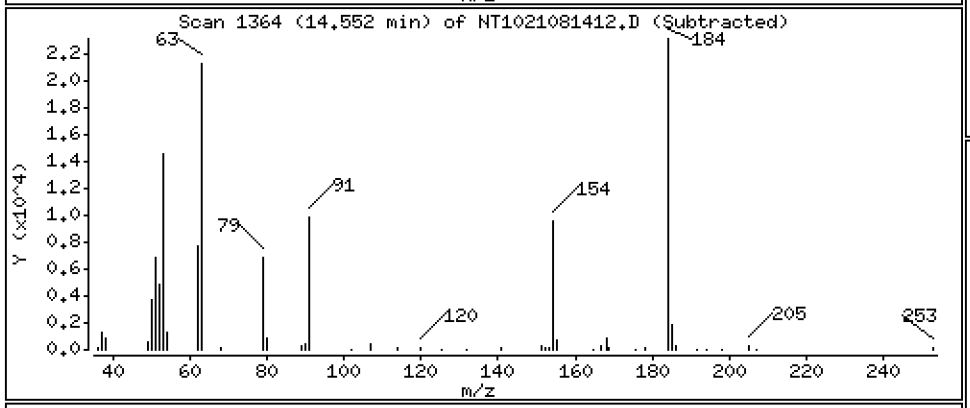
Column diameter: 0.25

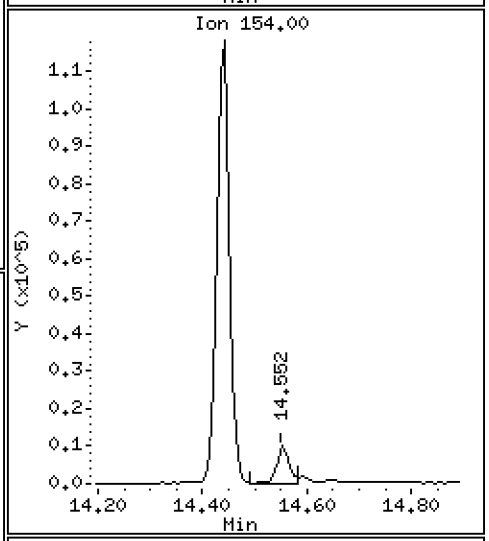
45 2,4-Dinitrophenol

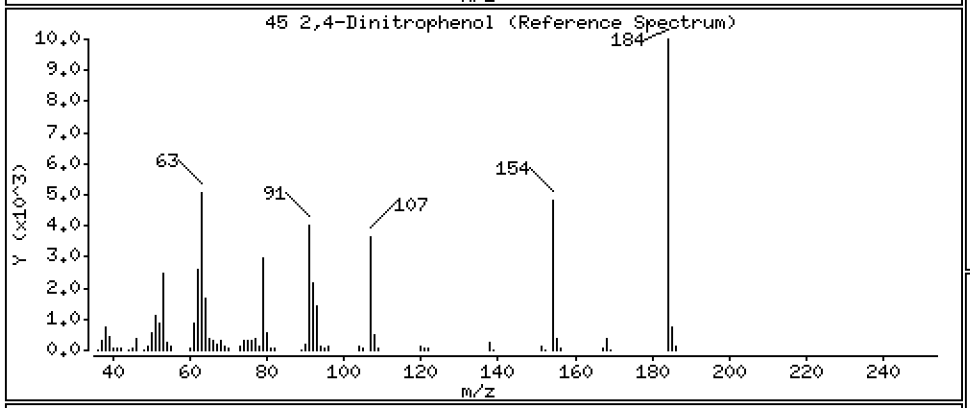
Concentration: 4.492 ug/mL

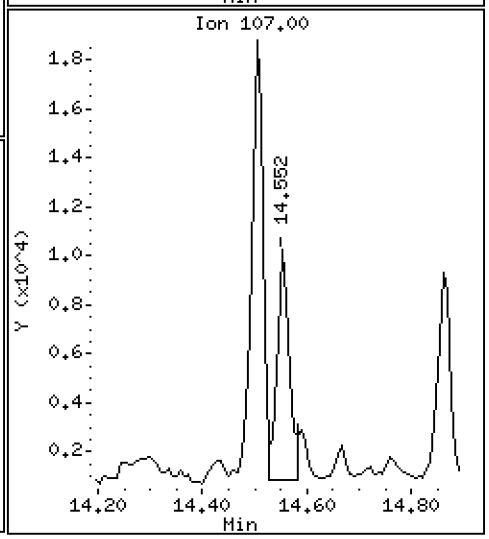


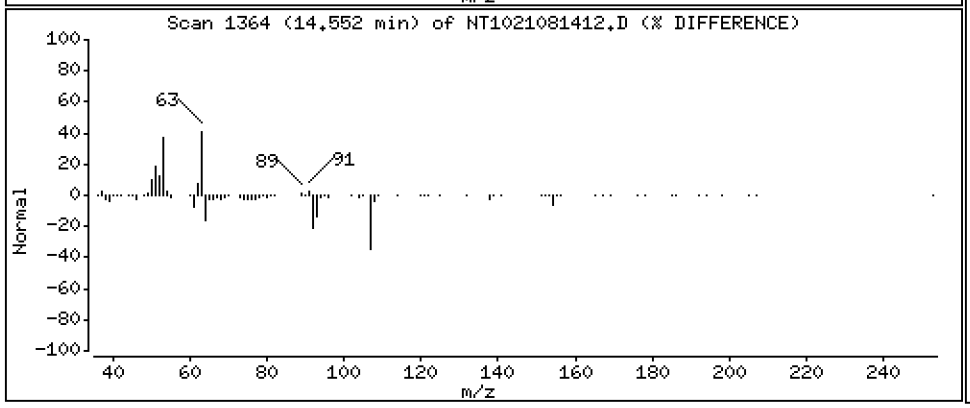












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

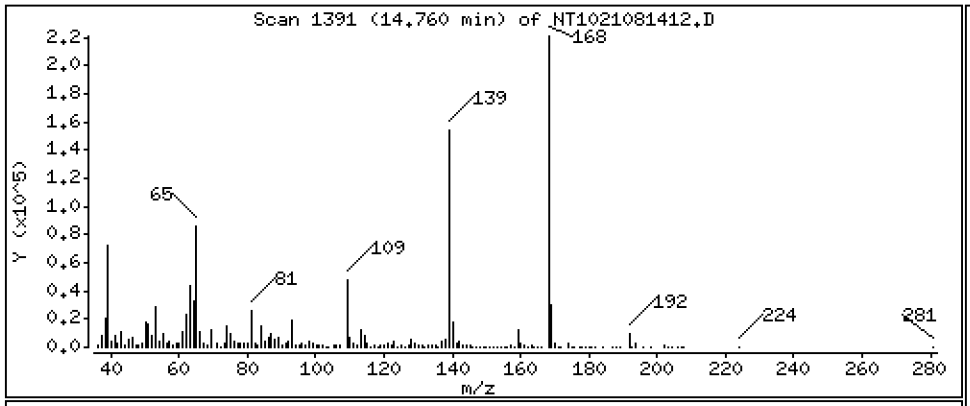
Operator: VTS

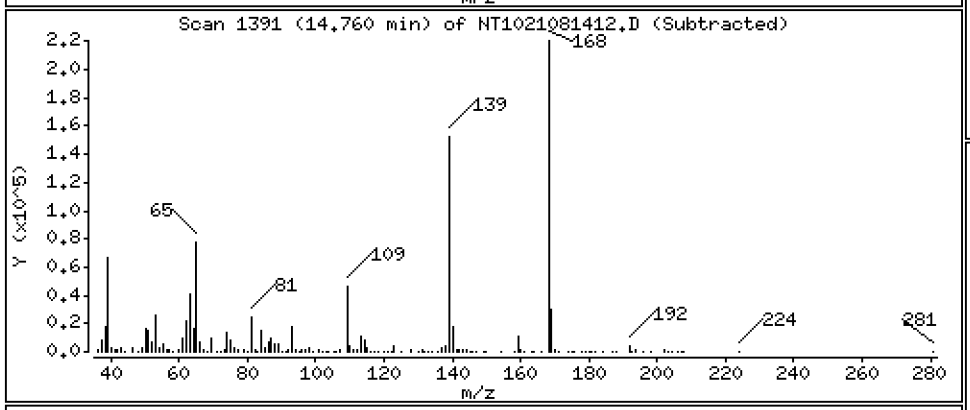
Column phase: ZB-5msi

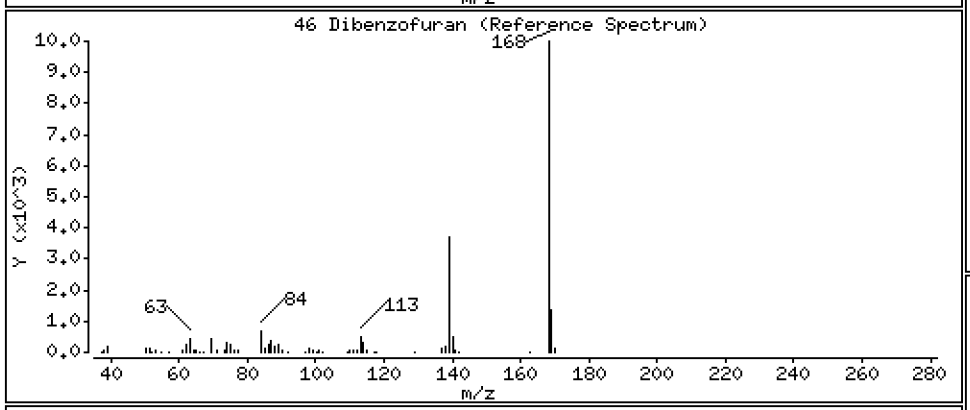
Column diameter: 0.25

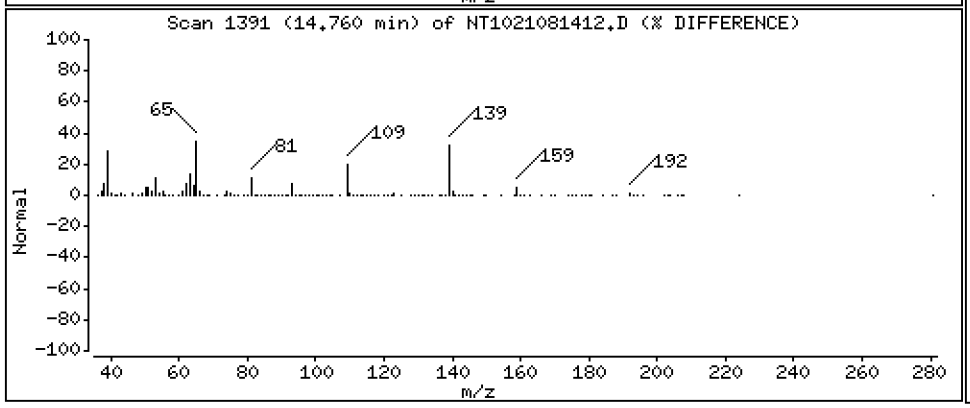
46 Dibenzofuran

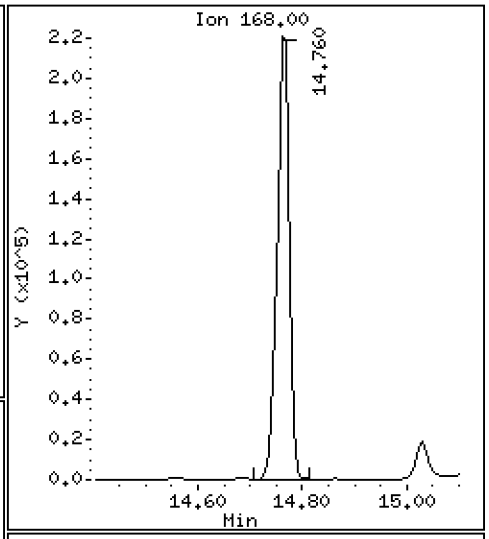
Concentration: 4.142 ug/mL

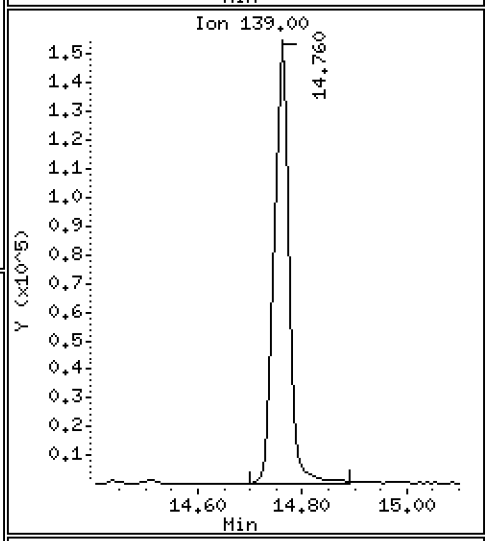


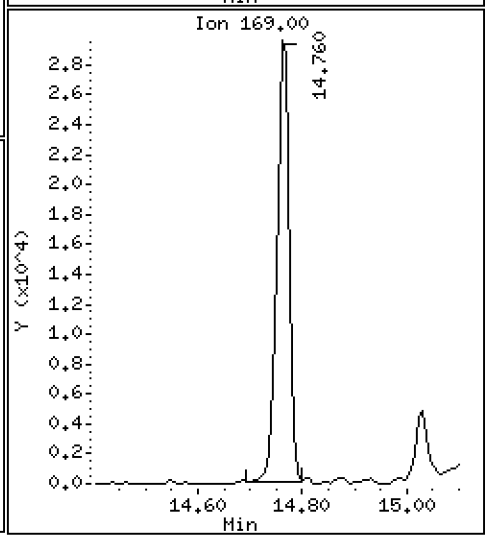












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

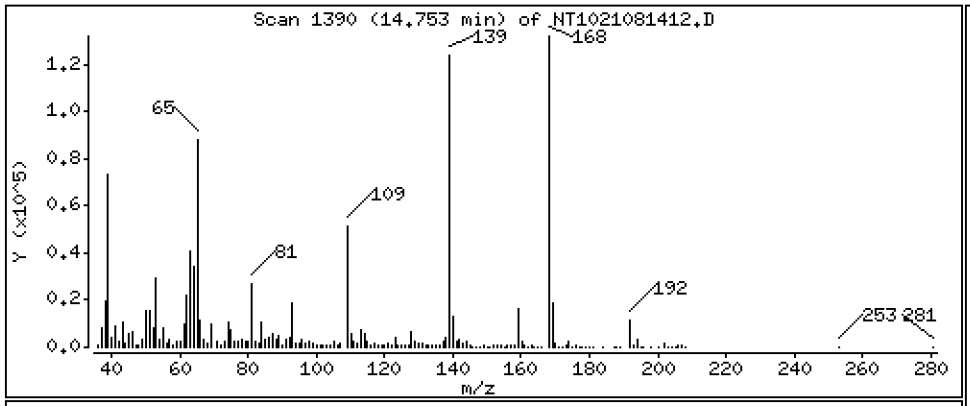
Operator: VTS

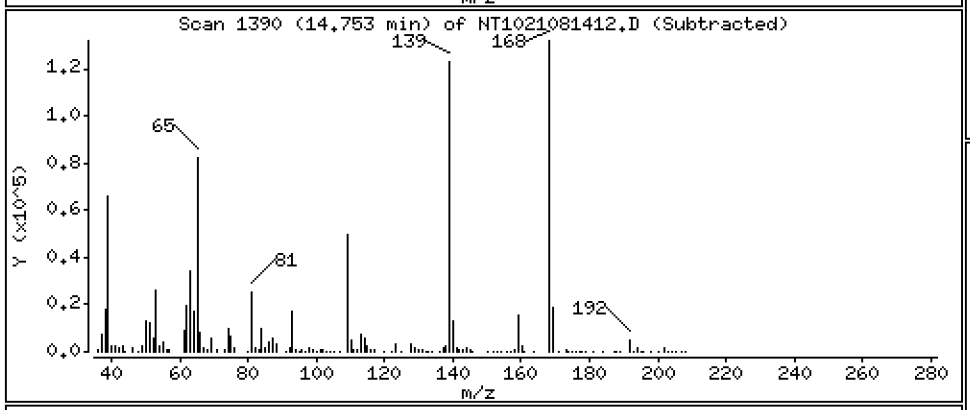
Column phase: ZB-5msi

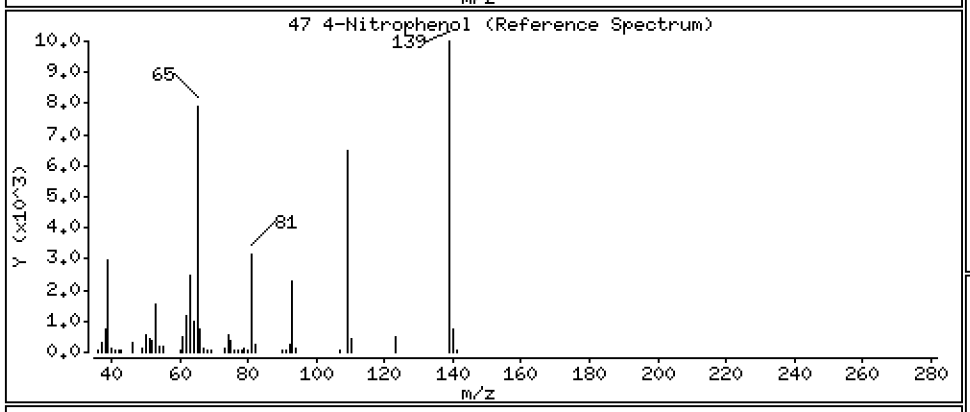
Column diameter: 0.25

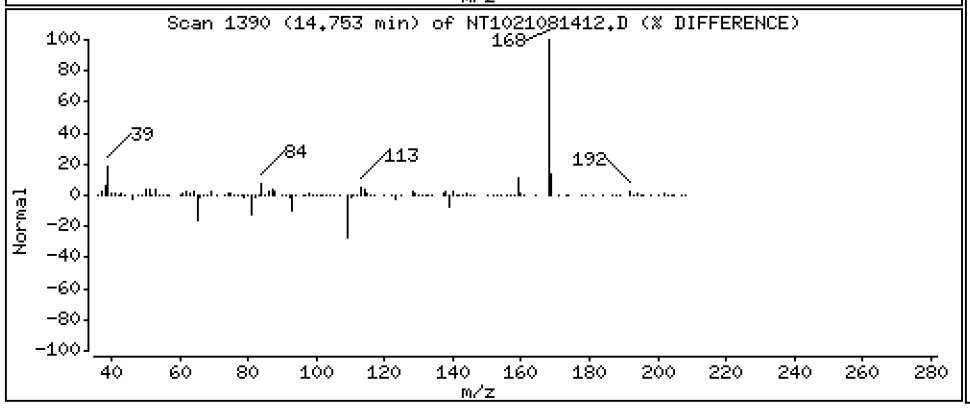
47 4-Nitrophenol

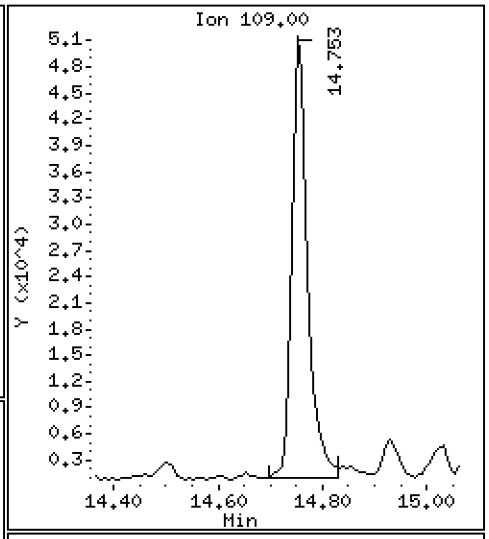
Concentration: 15.40 ug/mL

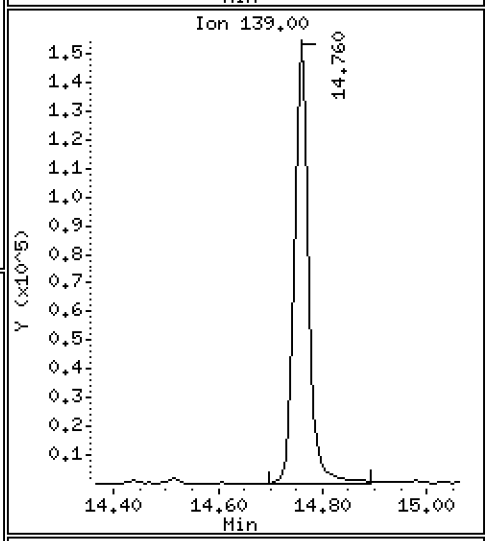


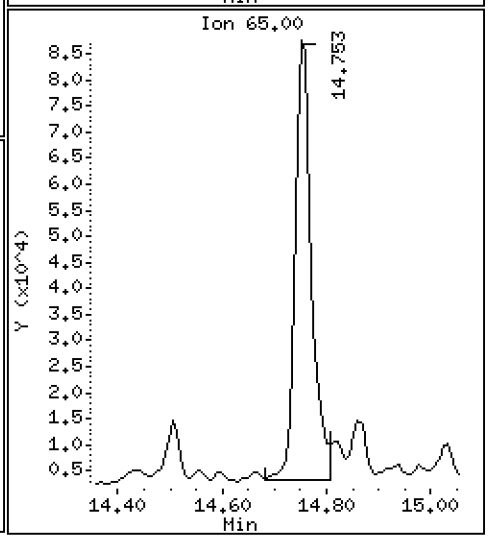












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

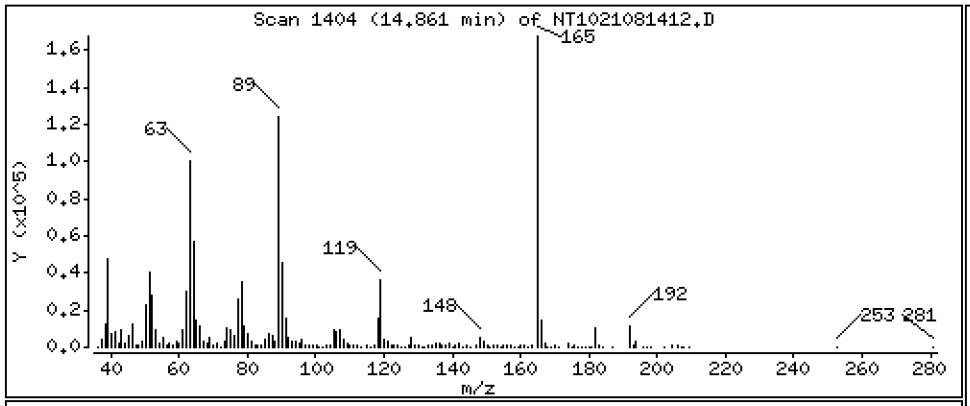
Operator: VTS

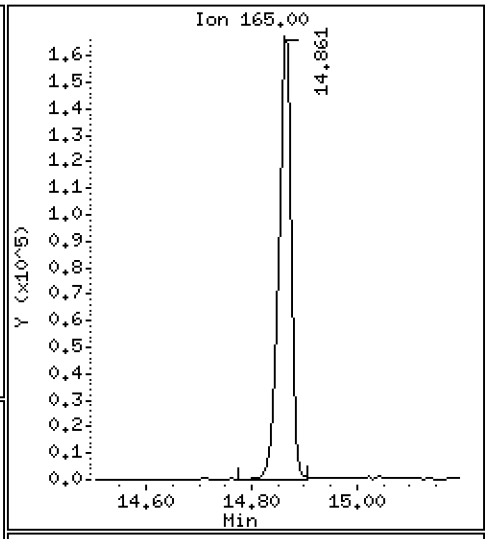
Column phase: ZB-5msi

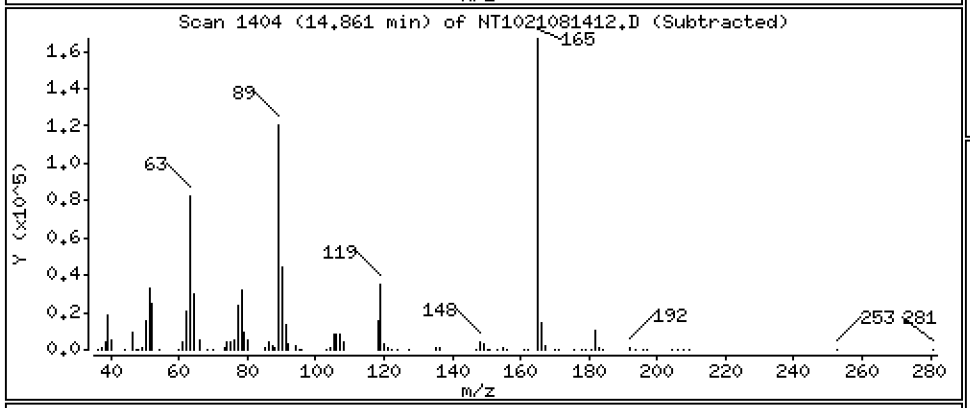
Column diameter: 0.25

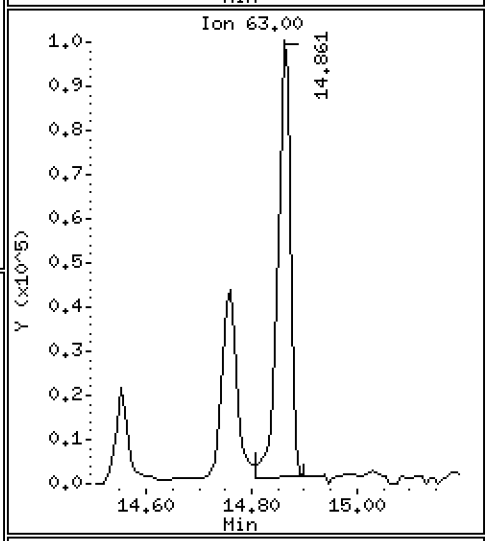
48 2,4-Dinitrotoluene

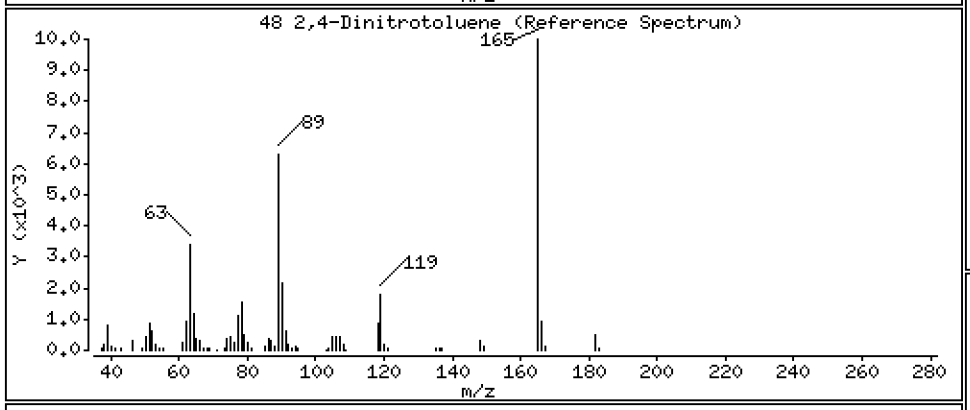
Concentration: 13.92 ug/mL

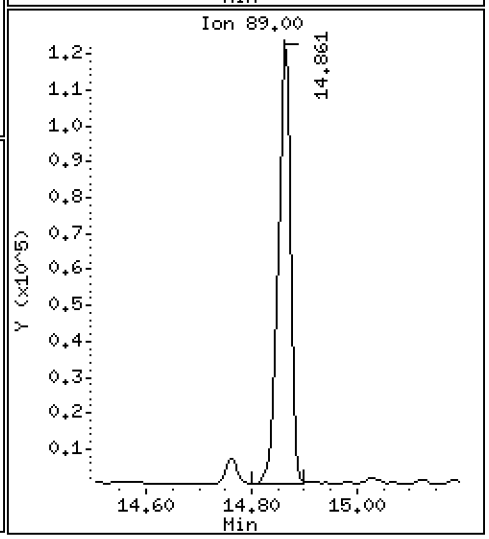


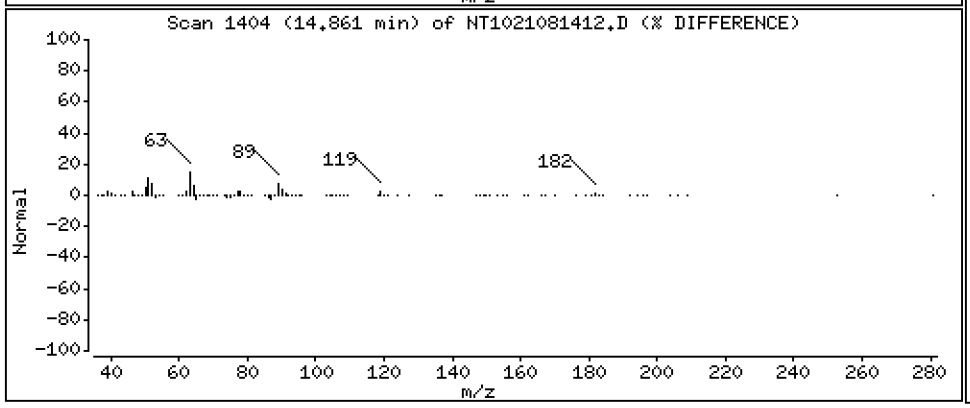












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

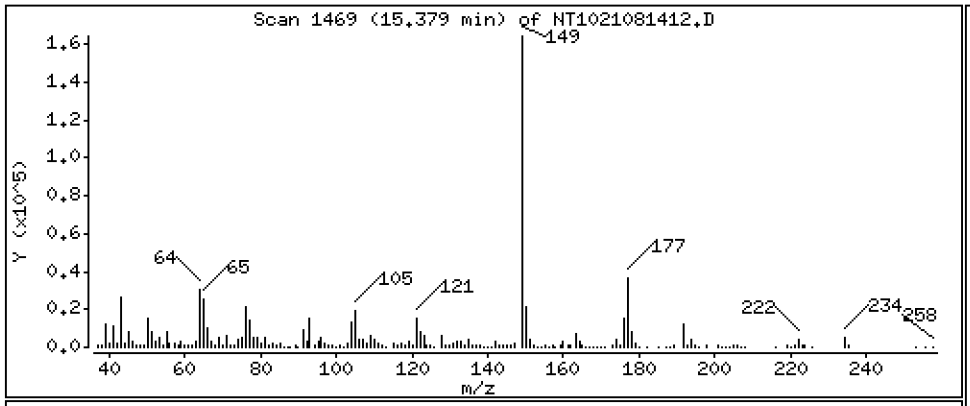
Operator: VTS

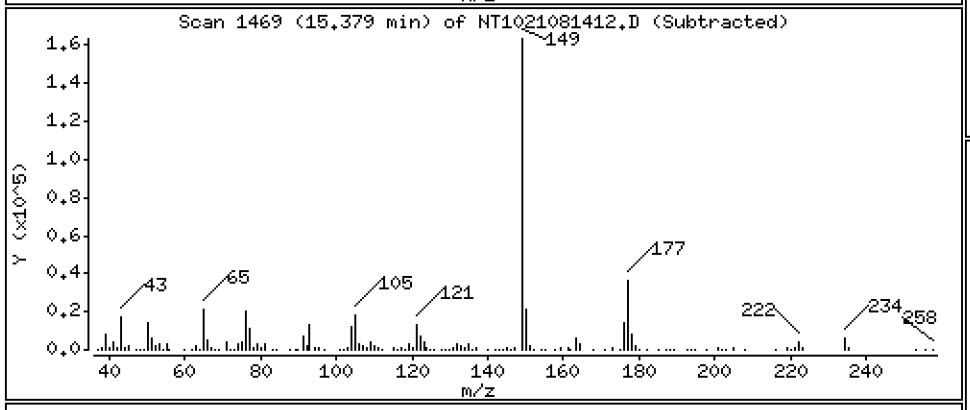
Column phase: ZB-5msi

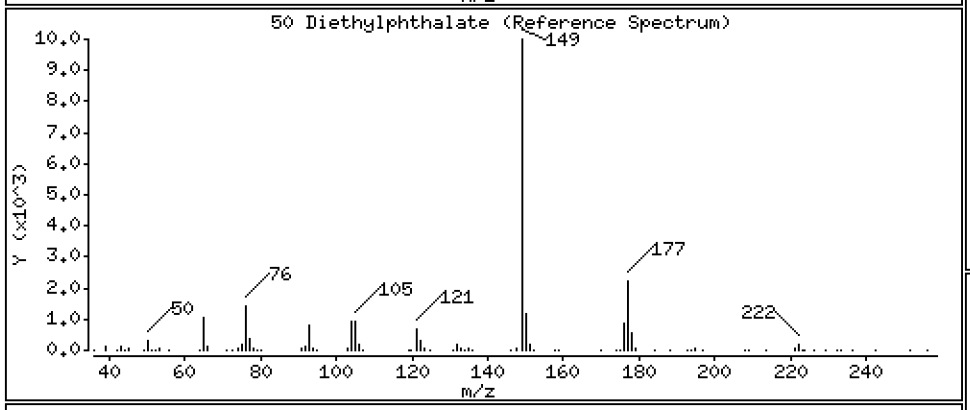
Column diameter: 0.25

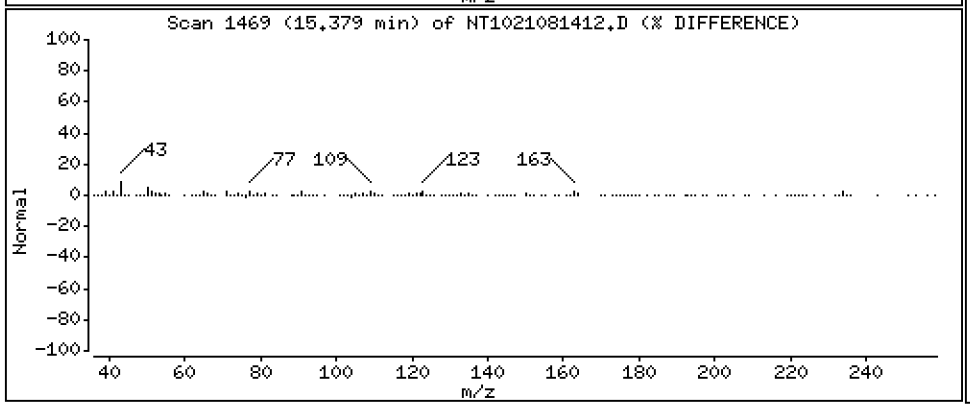
50 Diethylphthalate

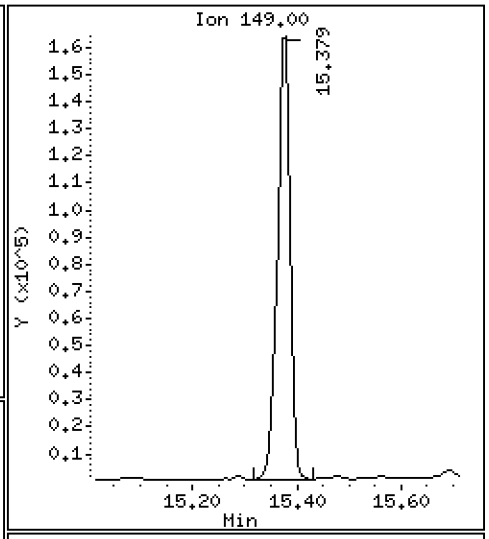
Concentration: 4.521 ug/mL

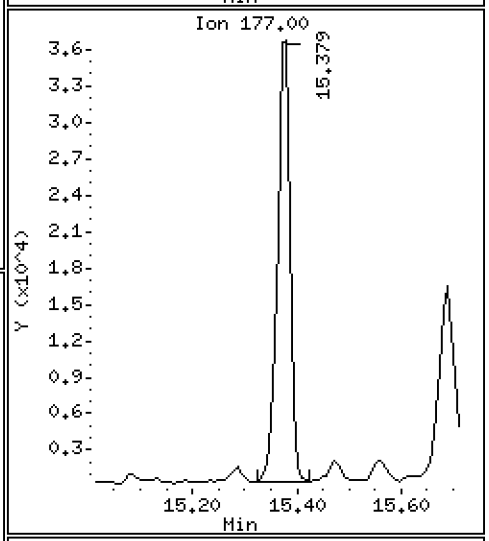


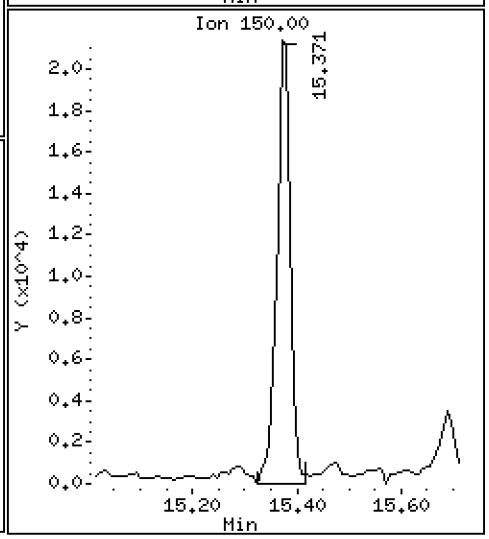












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

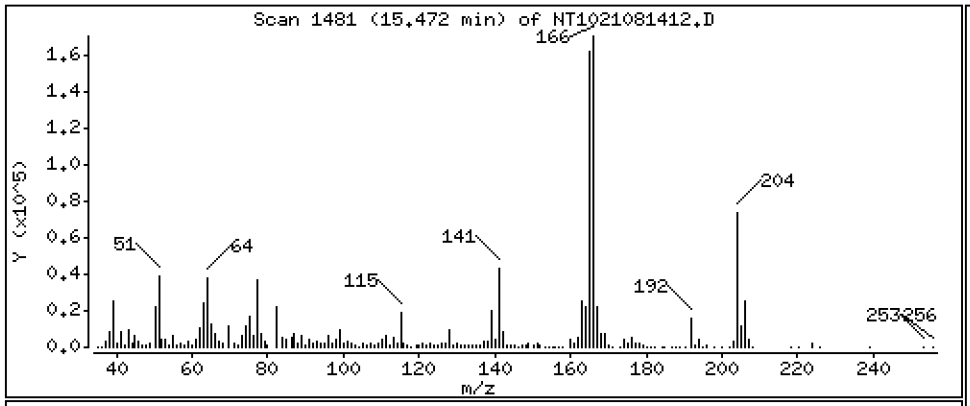
Operator: VTS

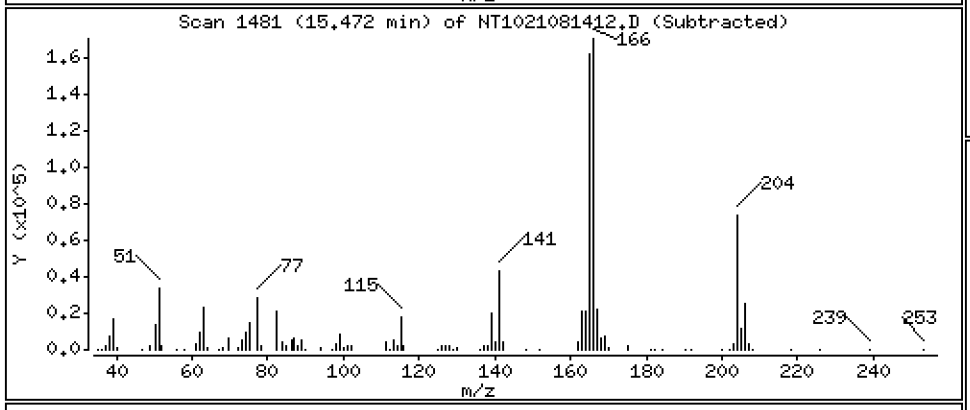
Column phase: ZB-5msi

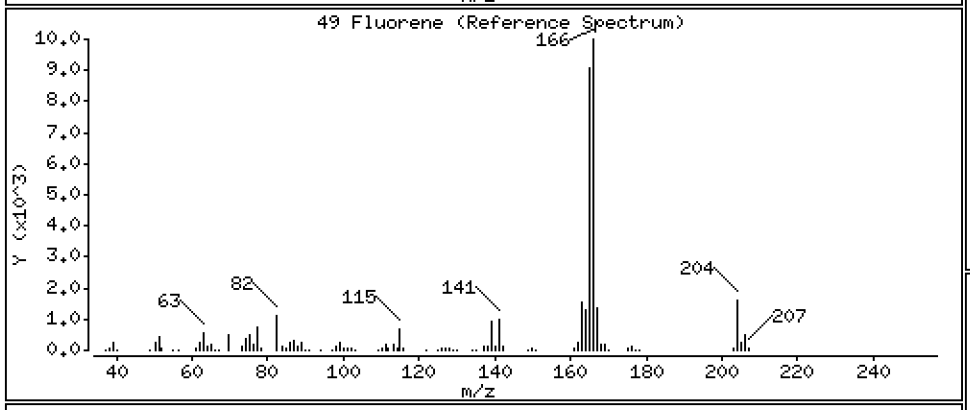
Column diameter: 0.25

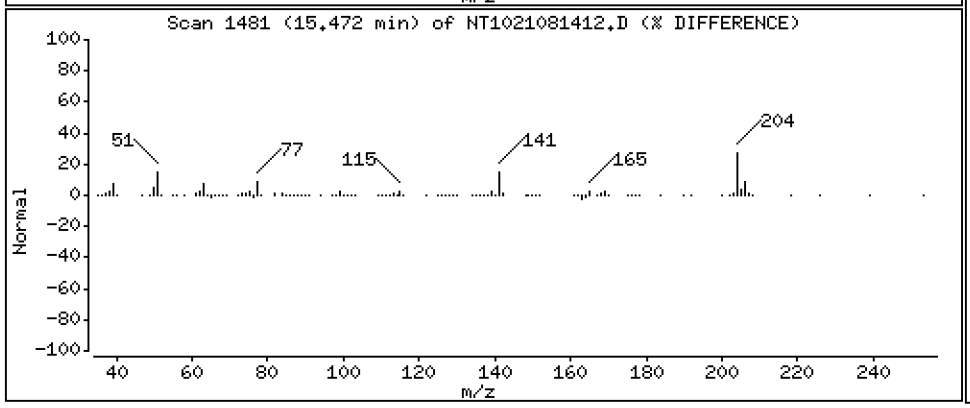
49 Fluorene

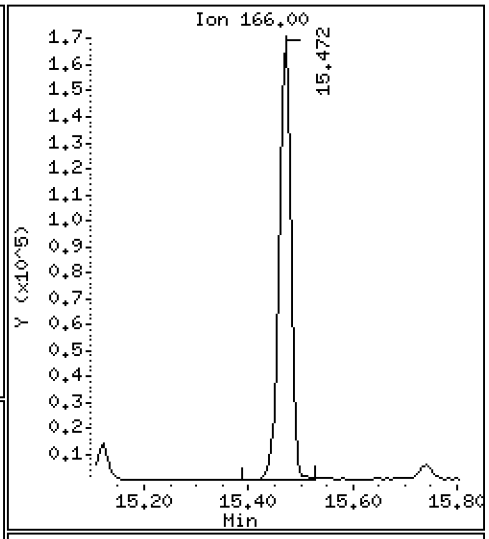
Concentration: 3.734 ug/mL

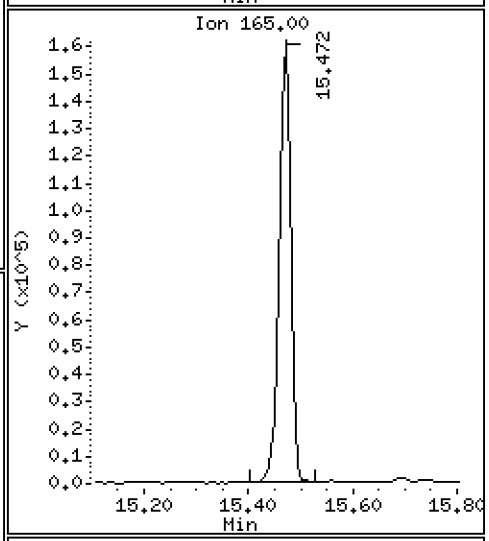


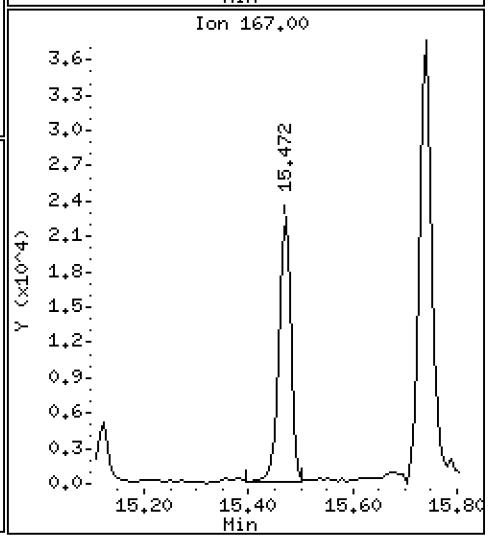












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

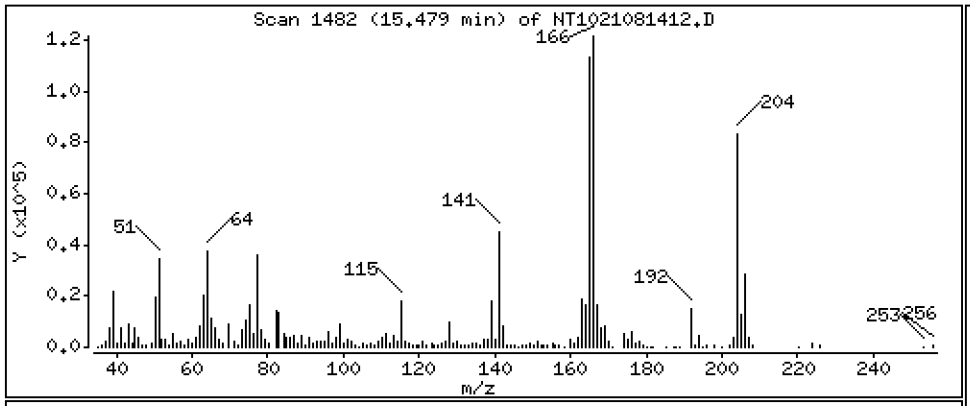
Operator: VTS

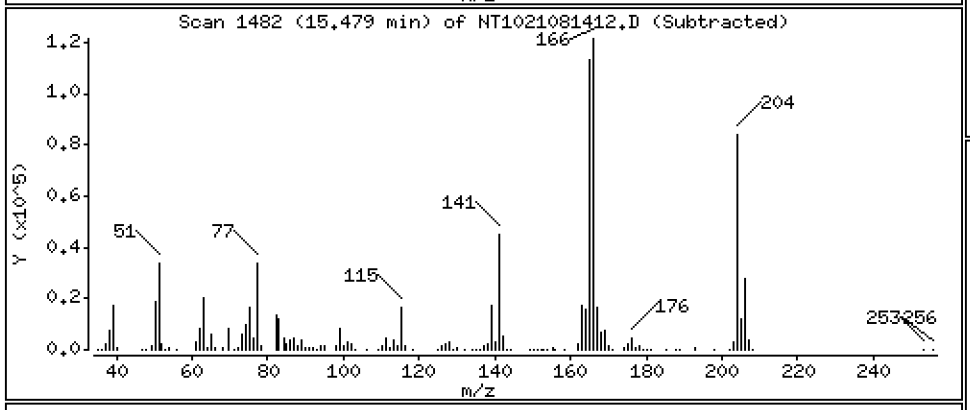
Column phase: ZB-5msi

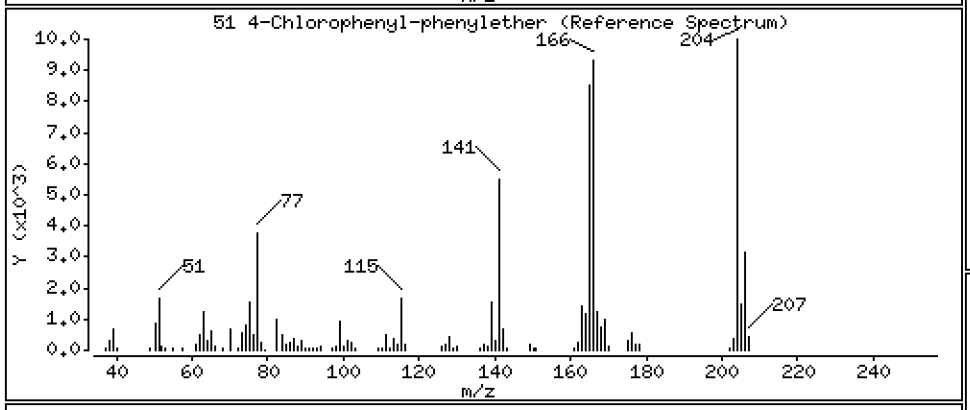
Column diameter: 0.25

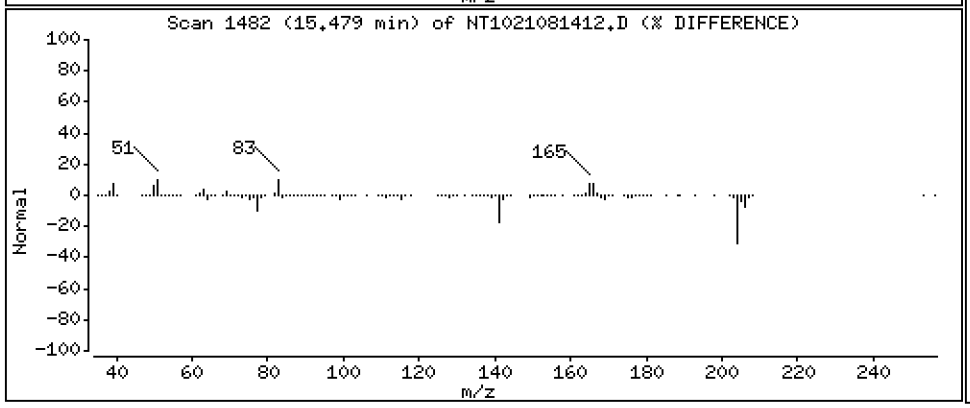
51 4-Chlorophenyl-phenylether

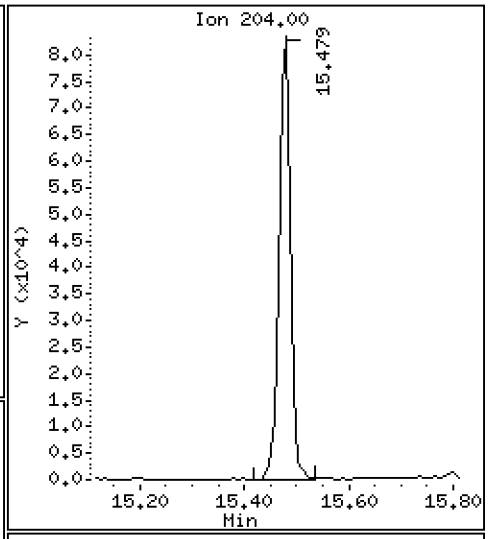
Concentration: 3.107 ug/mL

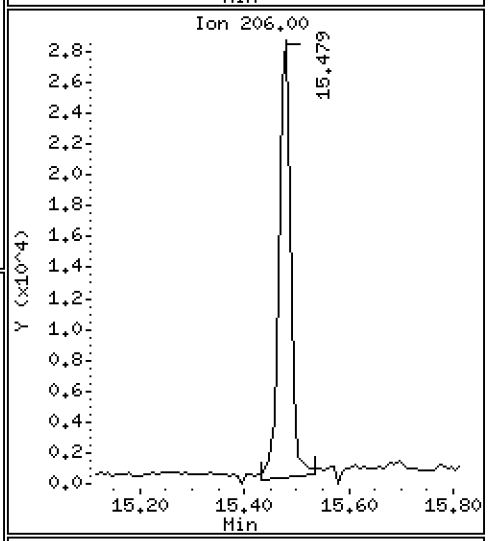


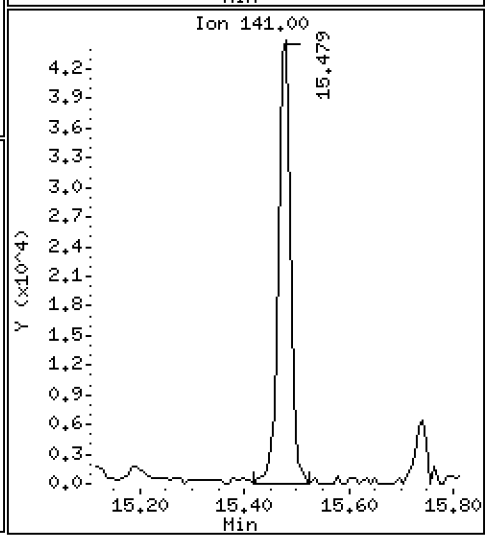












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

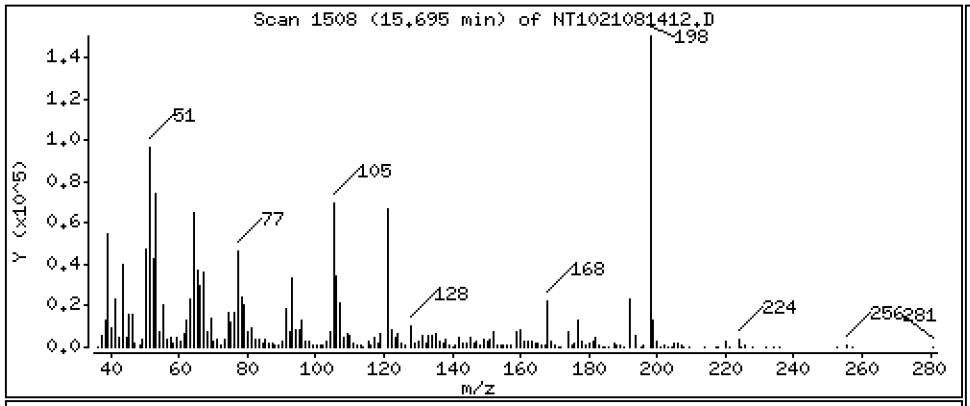
Operator: VTS

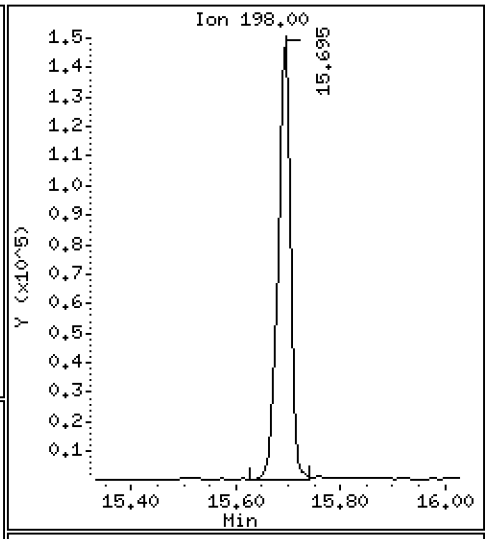
Column phase: ZB-5msi

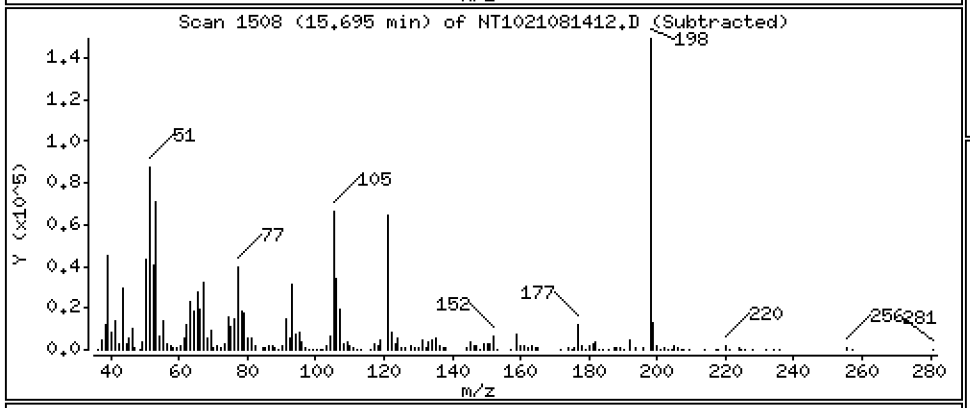
Column diameter: 0.25

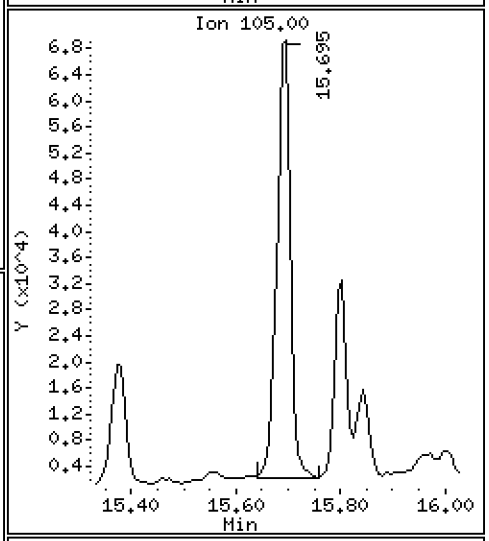
53 4,6-Dinitro-2-methylphenol

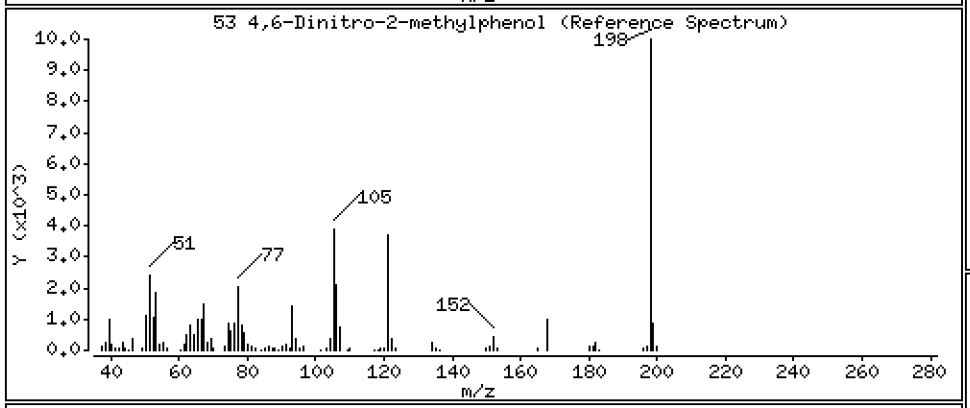
Concentration: 16.39 ug/mL

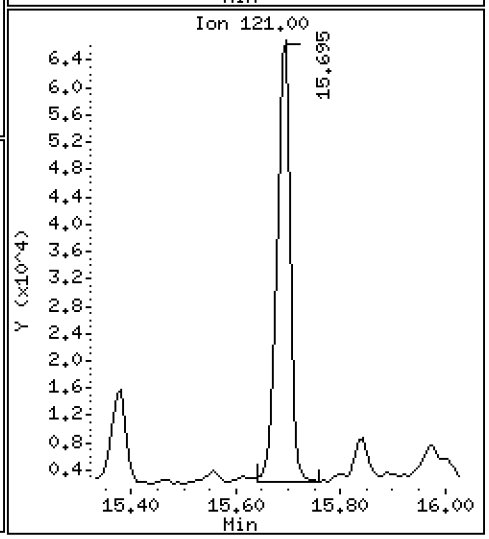


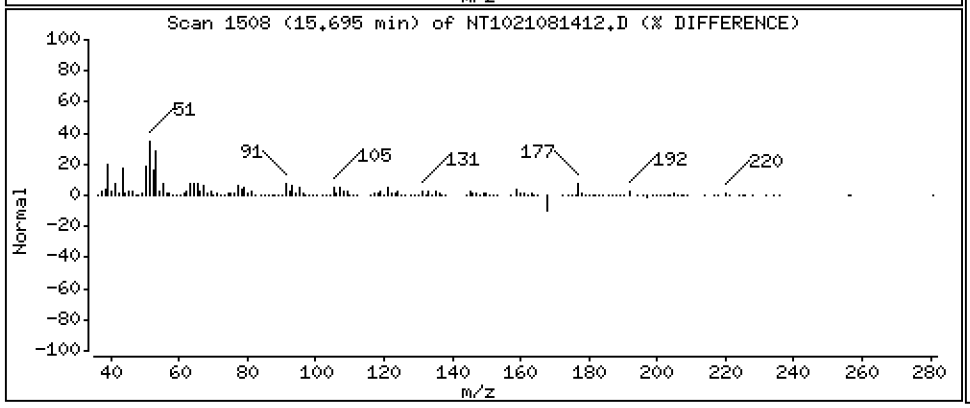












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

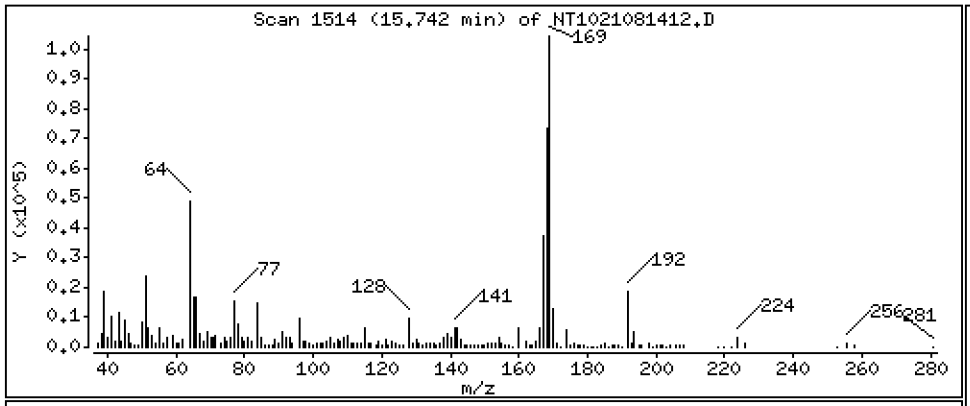
Operator: VTS

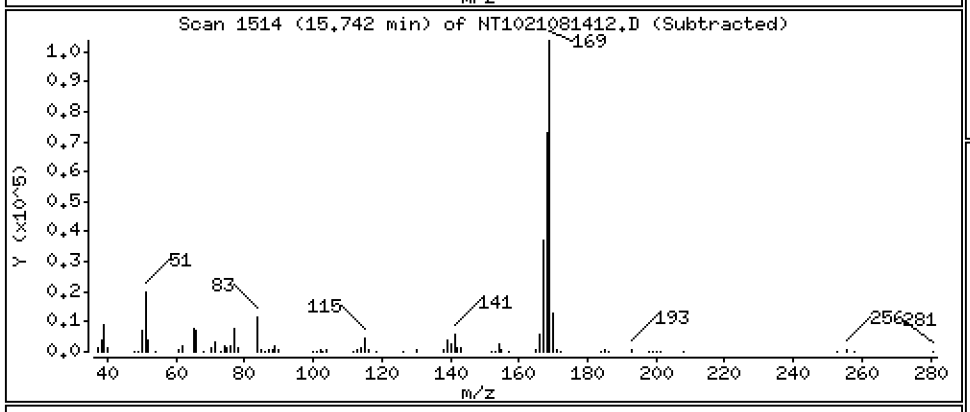
Column phase: ZB-5msi

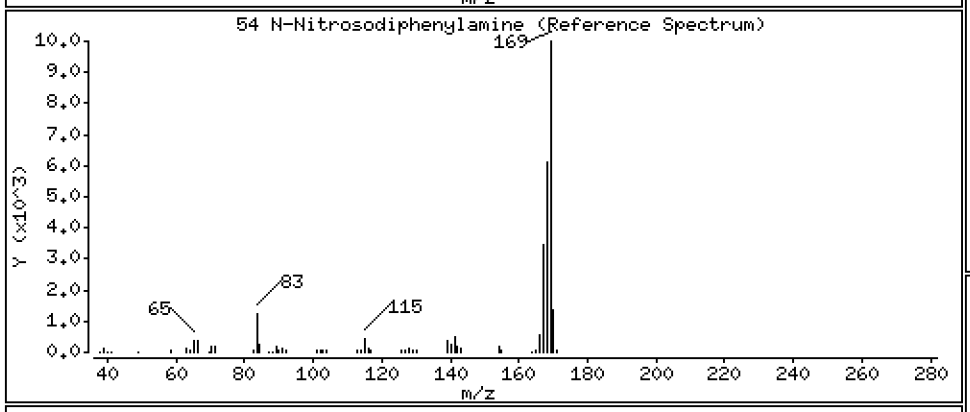
Column diameter: 0.25

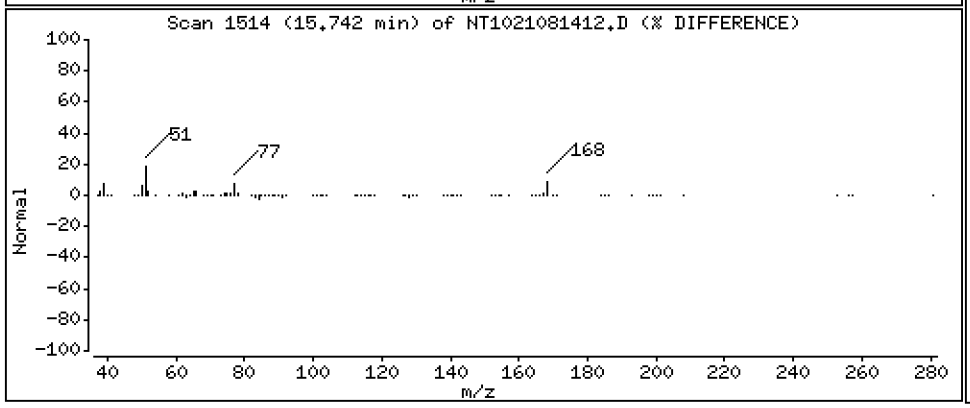
54 N-Nitrosodiphenylamine

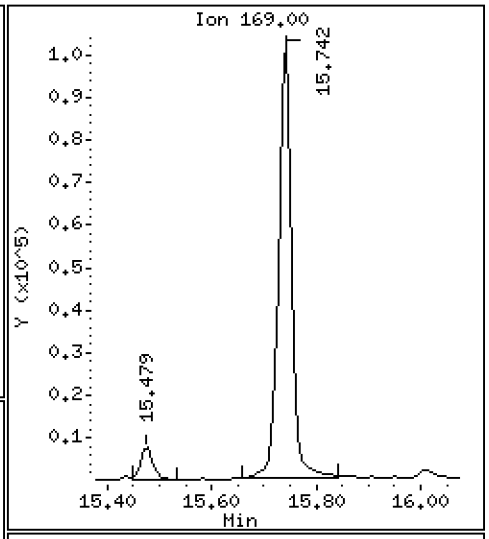
Concentration: 3.108 ug/mL

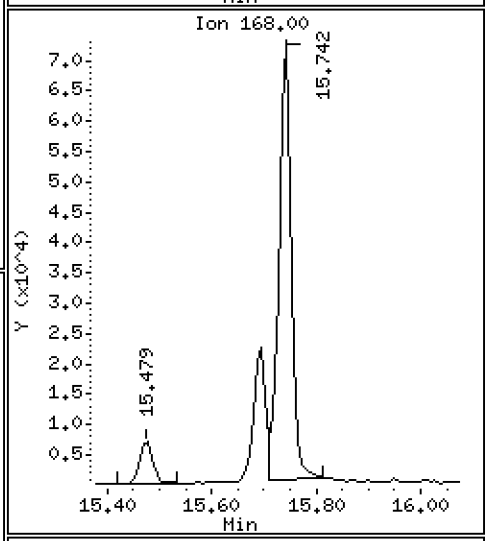


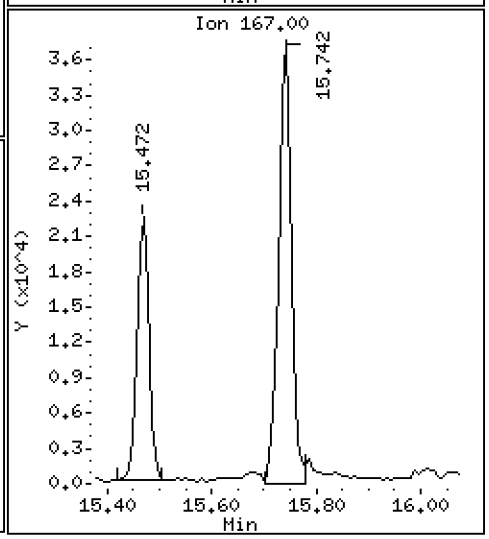












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

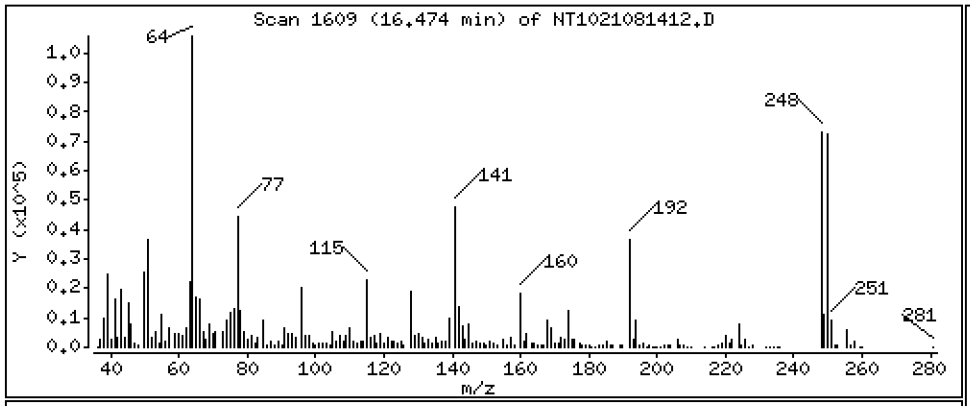
Operator: VTS

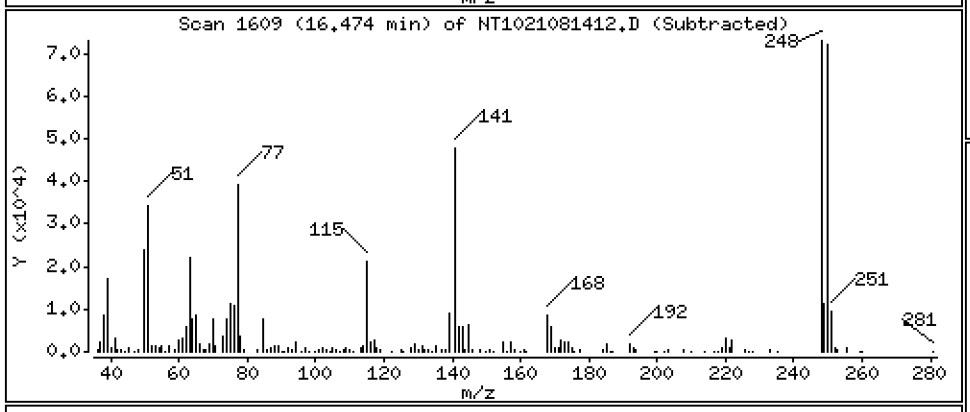
Column phase: ZB-5msi

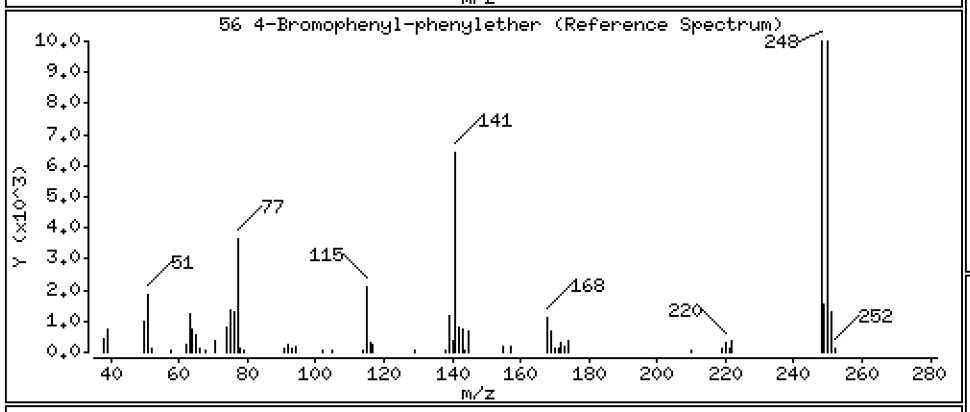
Column diameter: 0.25

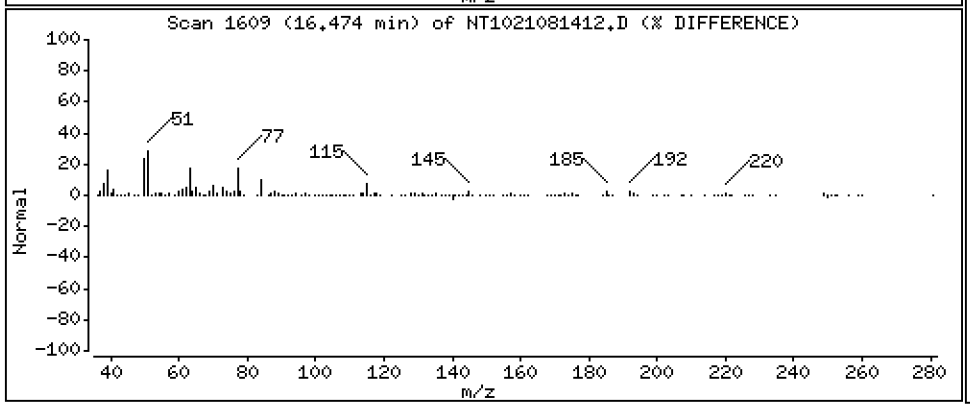
56 4-Bromophenyl-phenylether

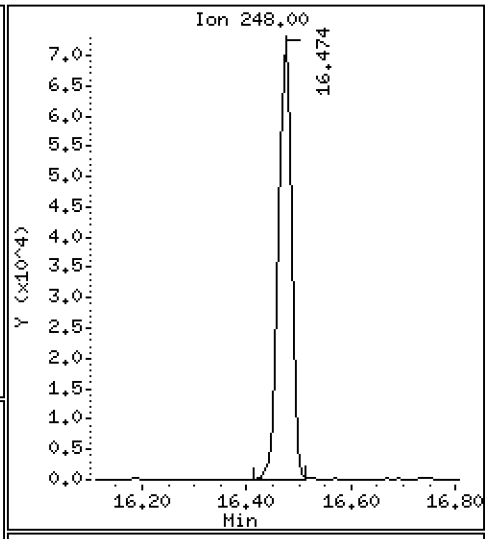
Concentration: 4.062 ug/mL

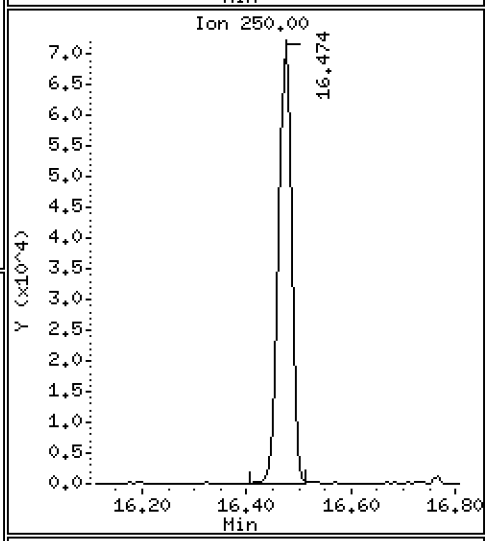


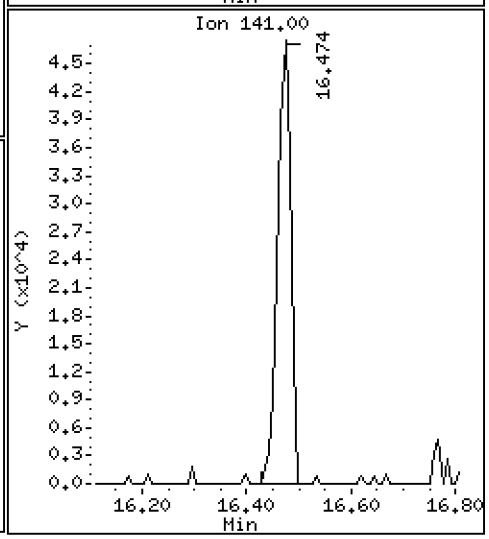












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

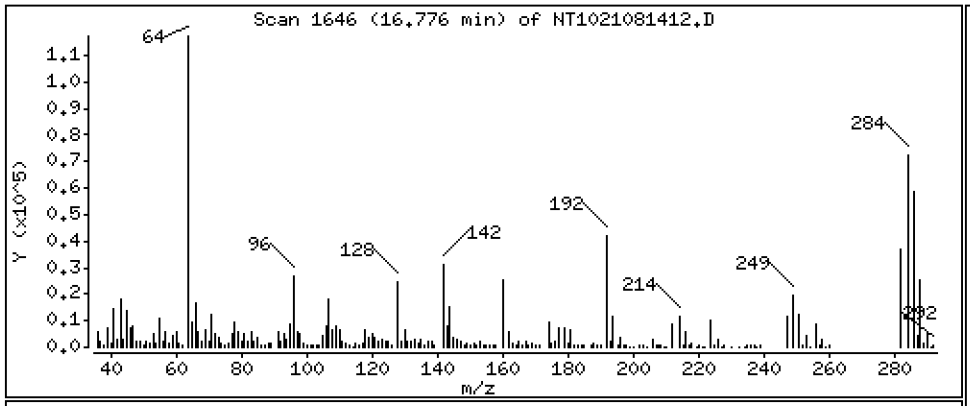
Operator: VTS

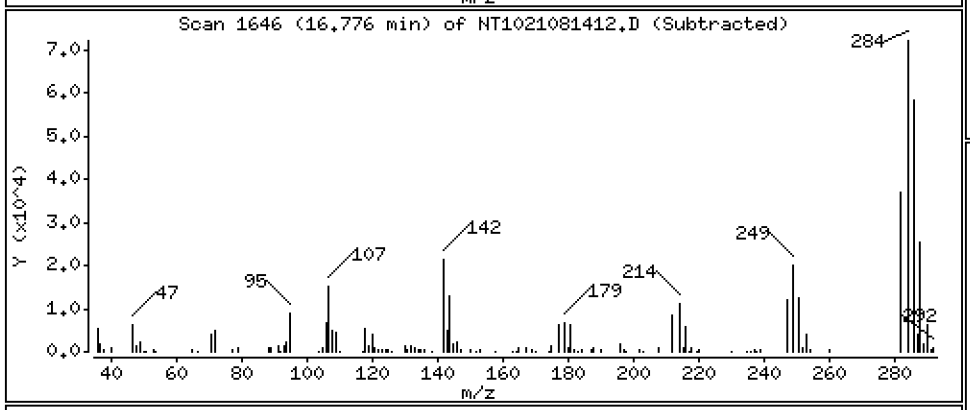
Column phase: ZB-5msi

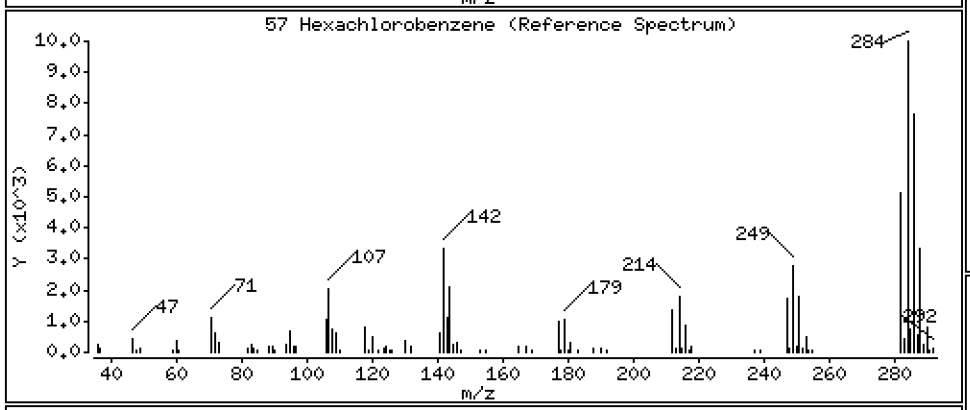
Column diameter: 0.25

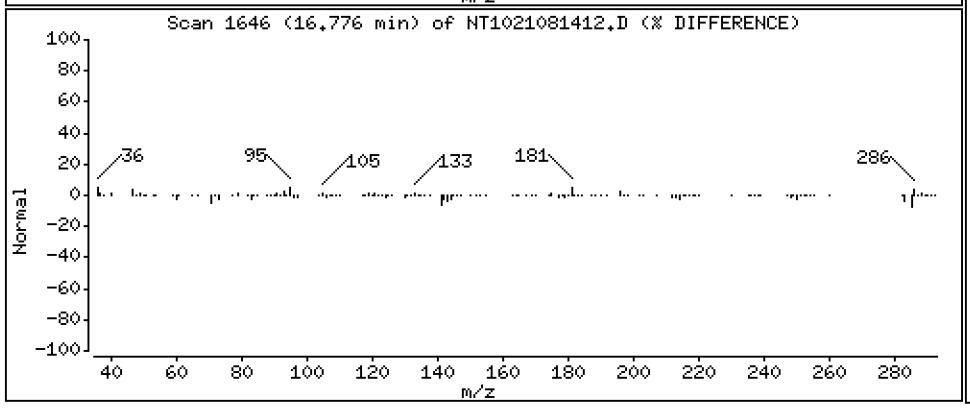
57 Hexachlorobenzene

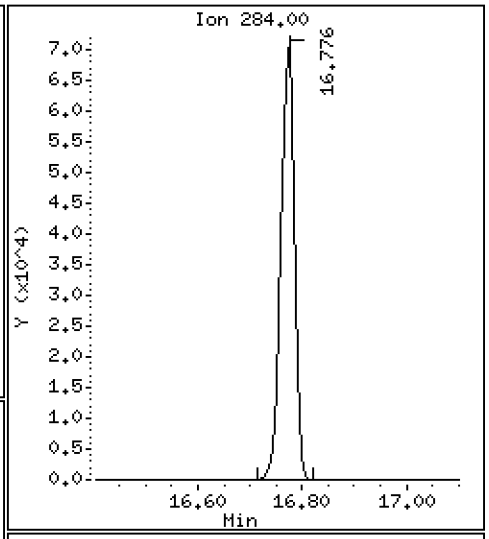
Concentration: 3.982 ug/mL

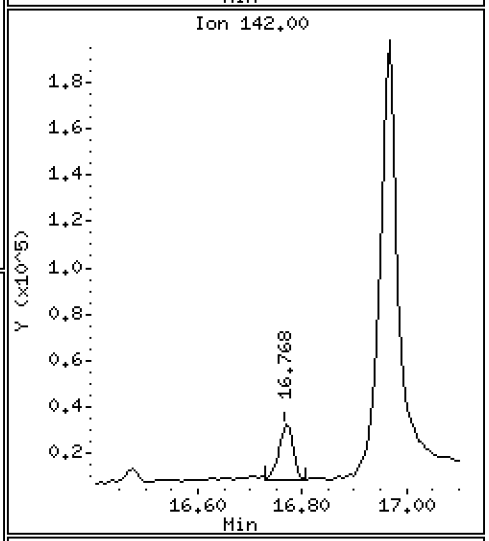


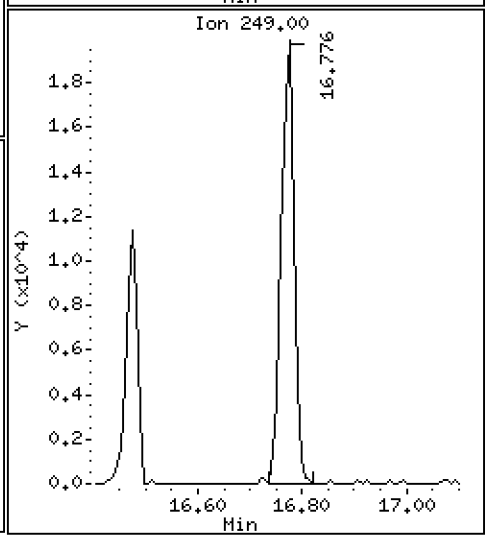












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

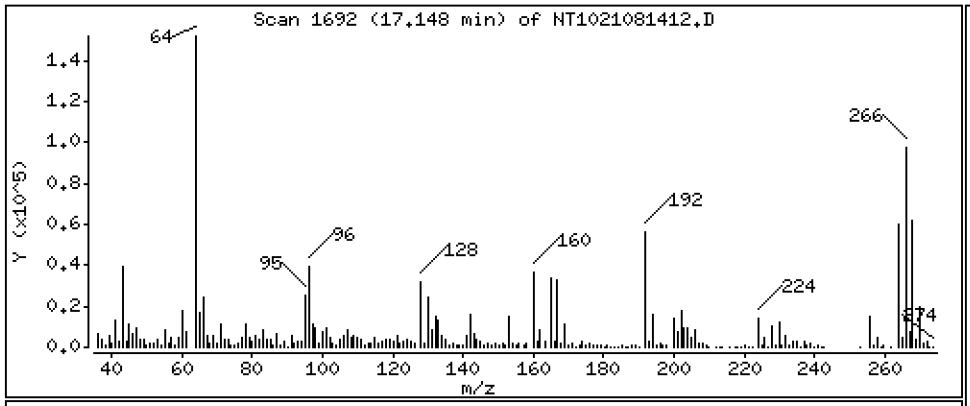
Operator: VTS

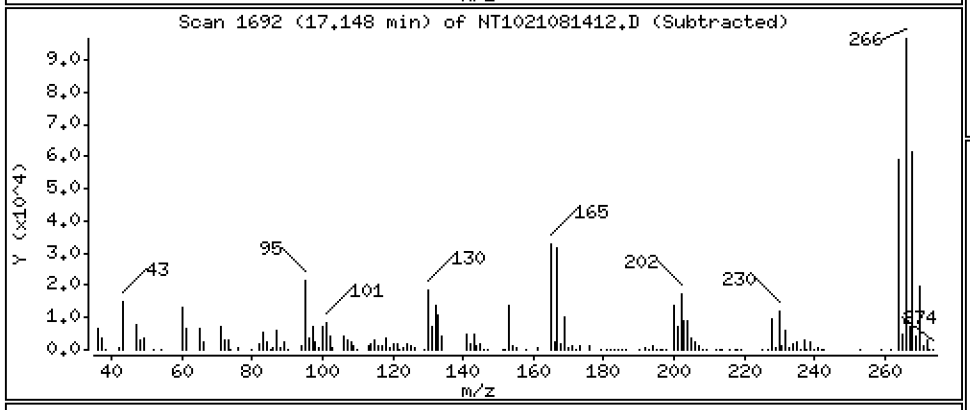
Column phase: ZB-5msi

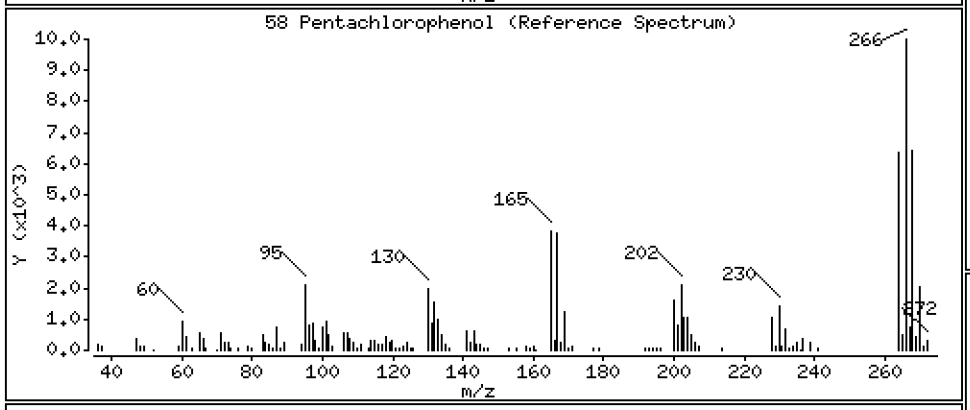
Column diameter: 0.25

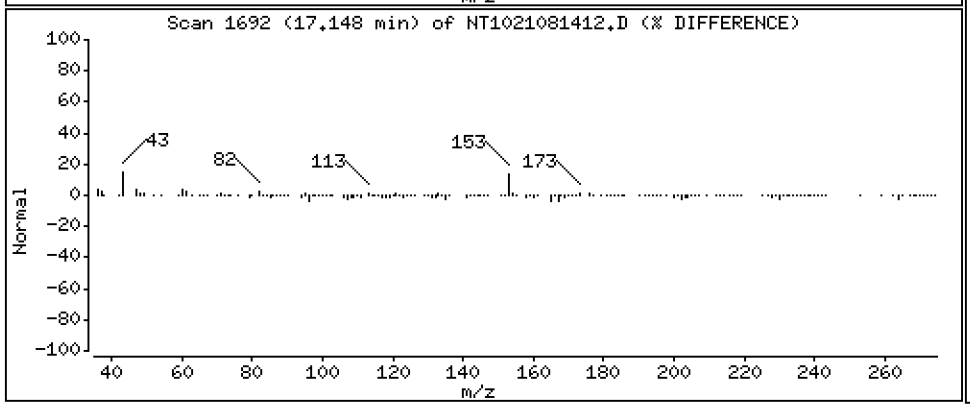
58 Pentachlorophenol

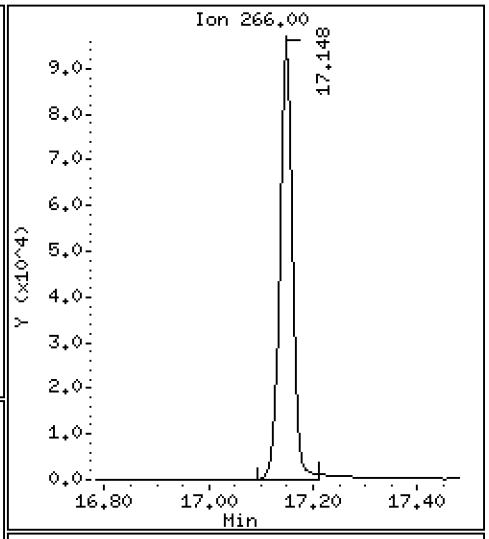
Concentration: 12.72 ug/mL

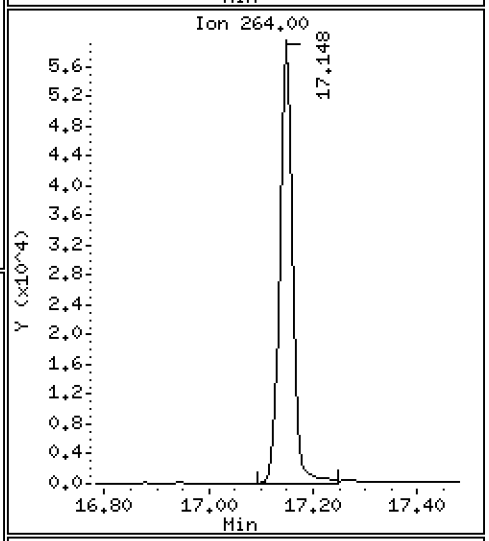


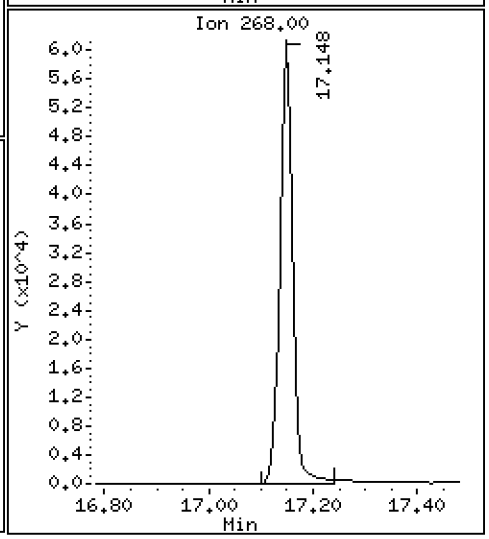












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

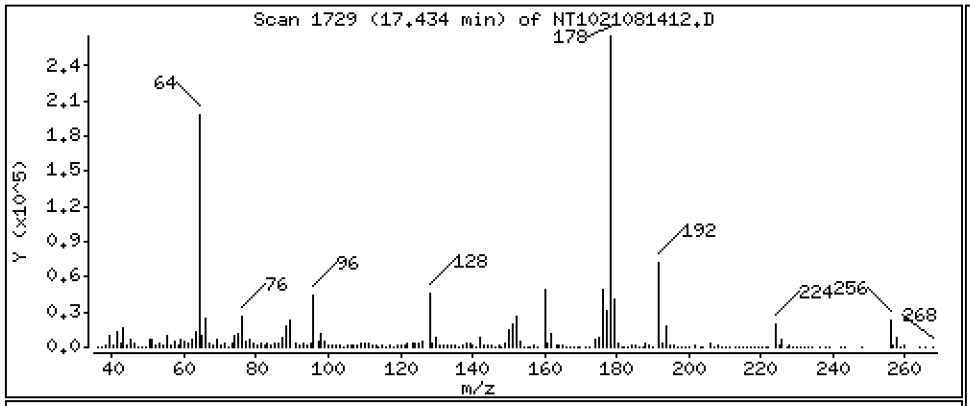
Operator: VTS

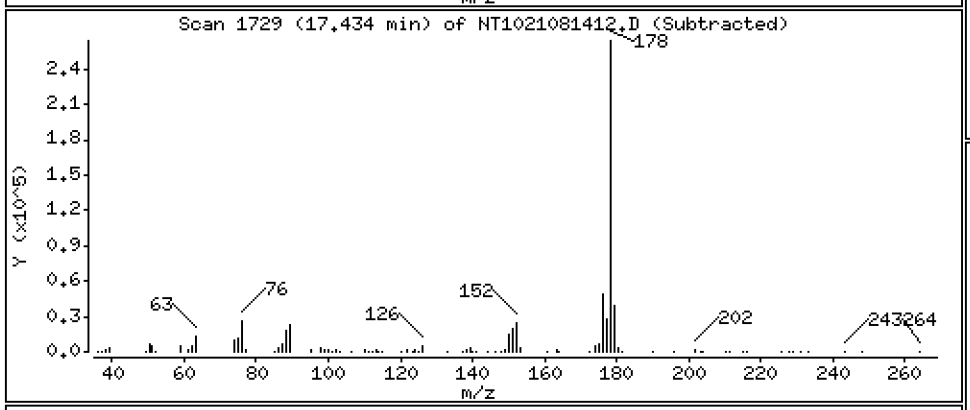
Column phase: ZB-5msi

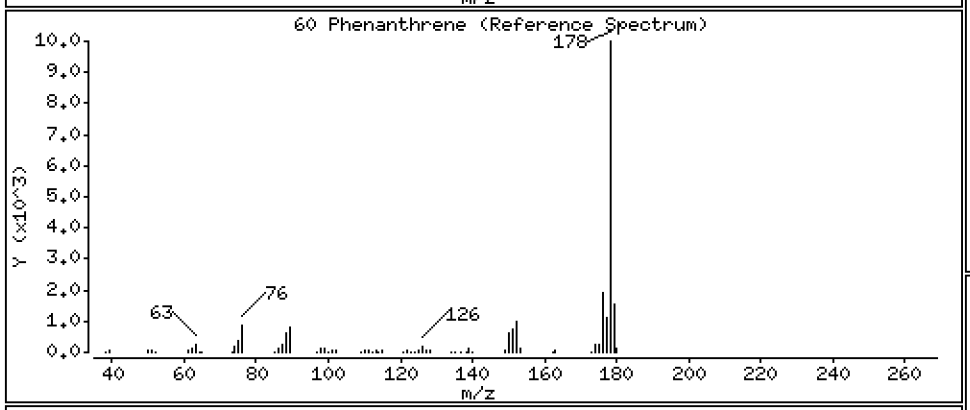
Column diameter: 0.25

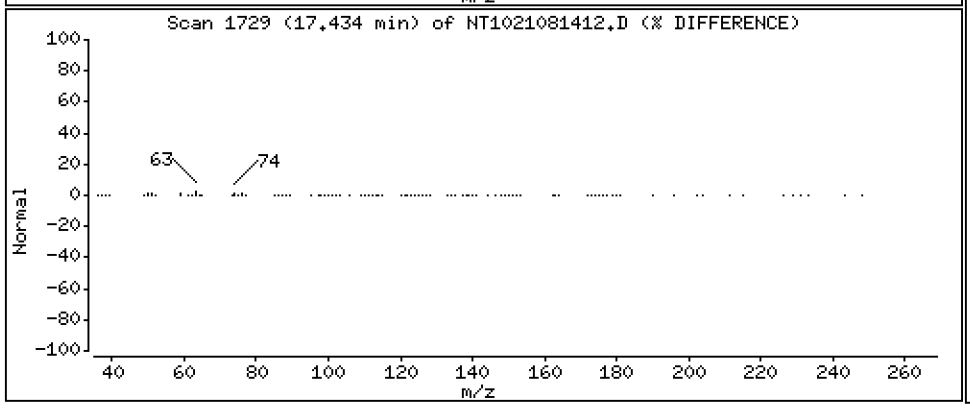
60 Phenanthrene

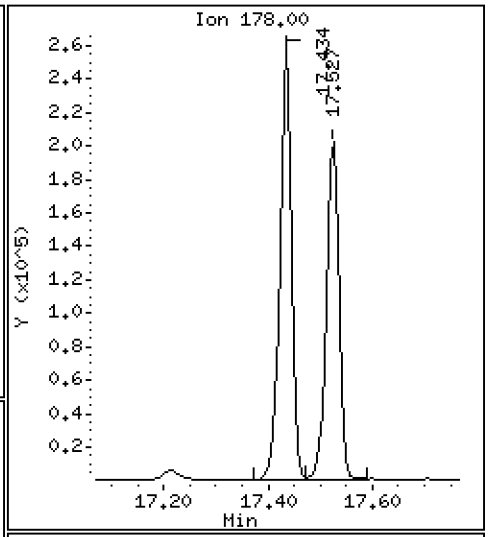
Concentration: 4.587 ug/mL

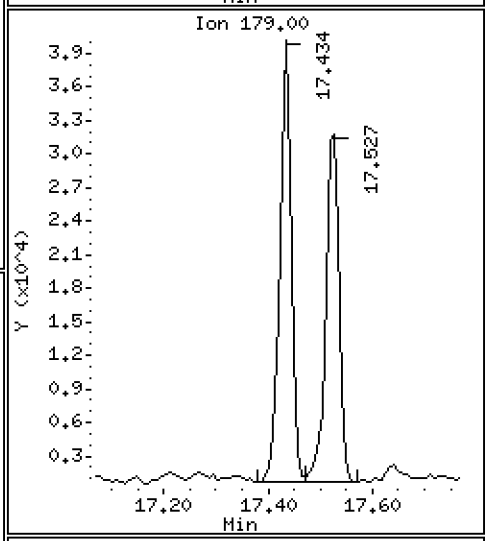


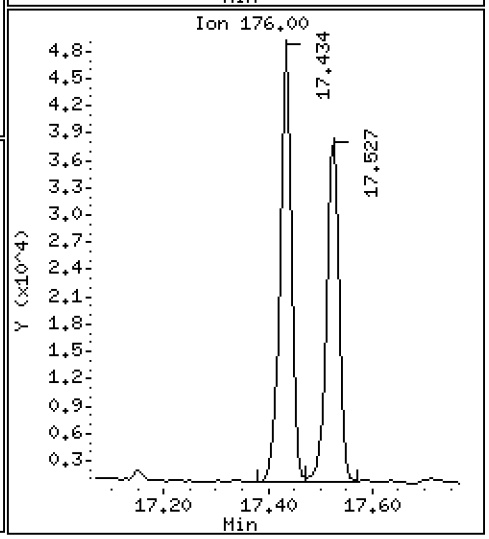












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

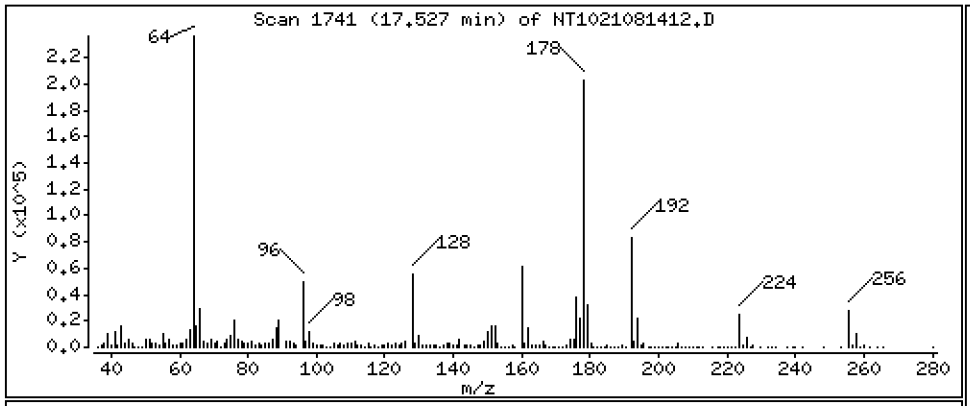
Operator: VTS

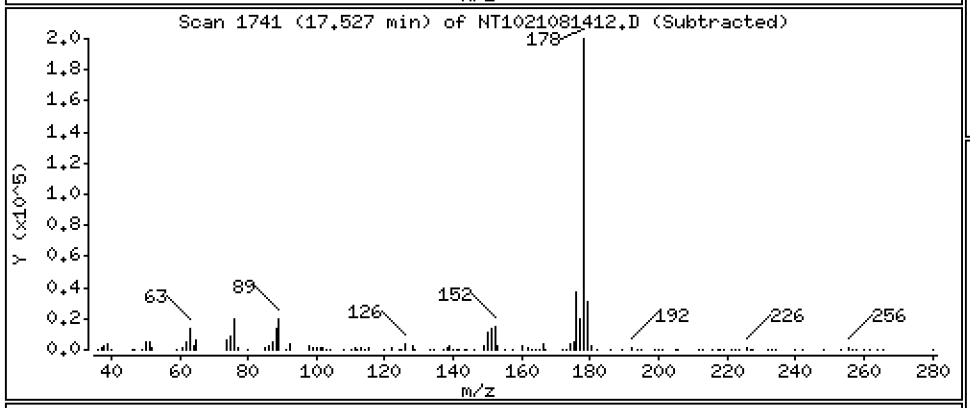
Column phase: ZB-5msi

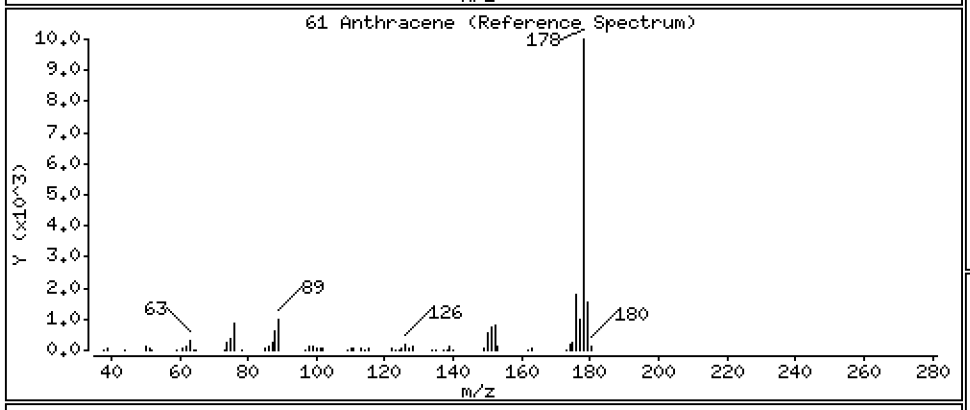
Column diameter: 0.25

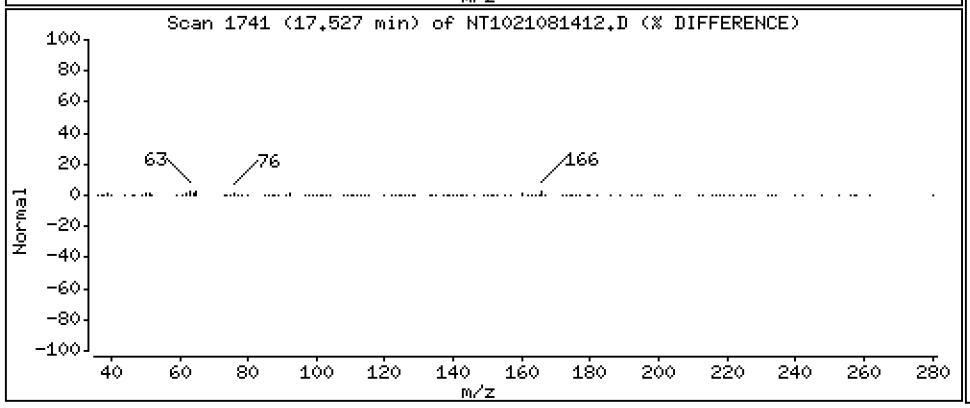
61 Anthracene

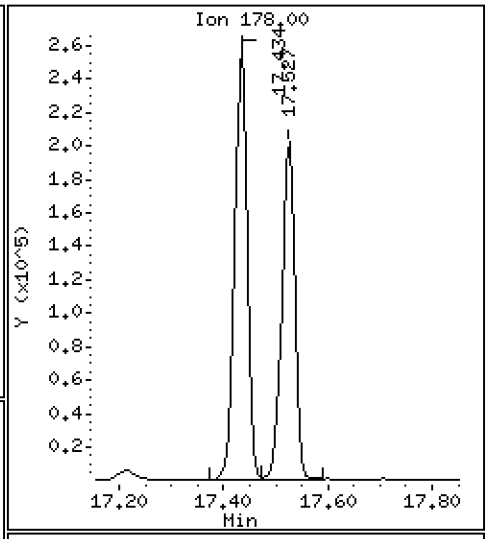
Concentration: 3.774 ug/mL

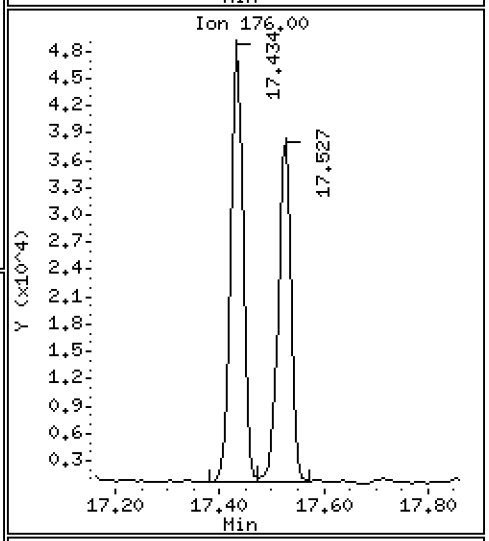


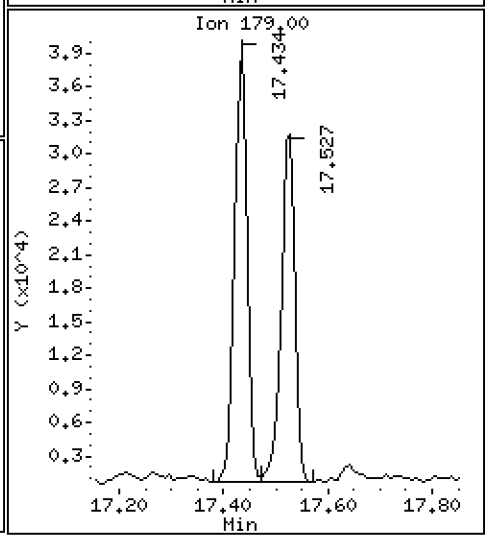












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

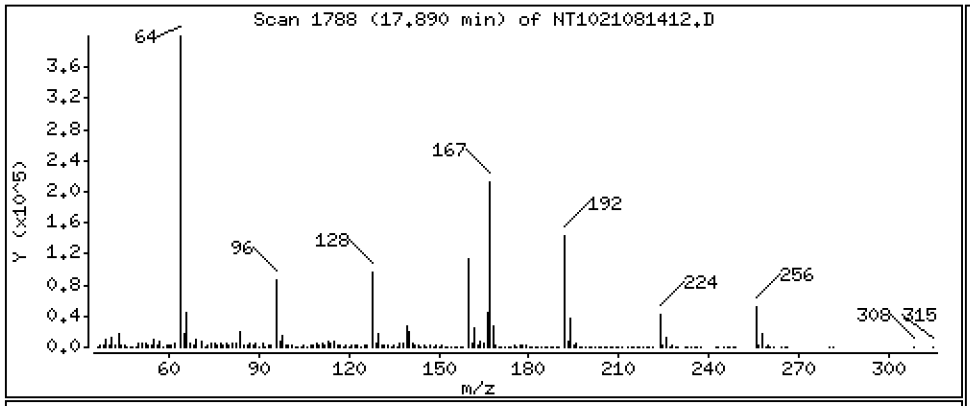
Operator: VTS

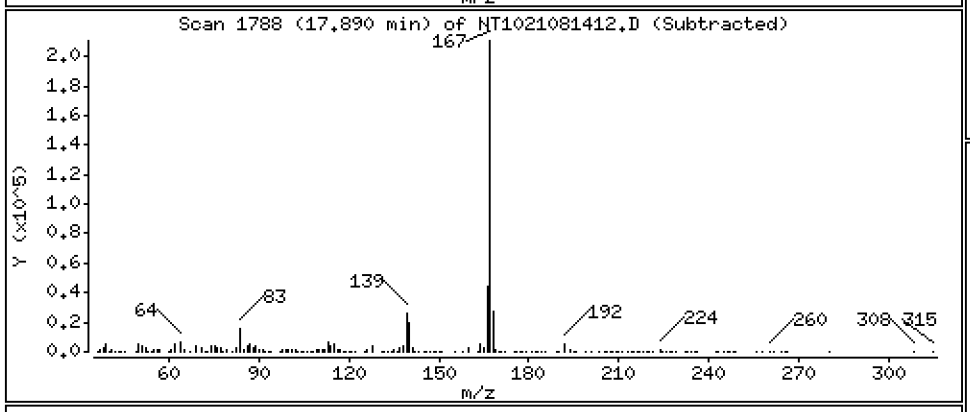
Column phase: ZB-5msi

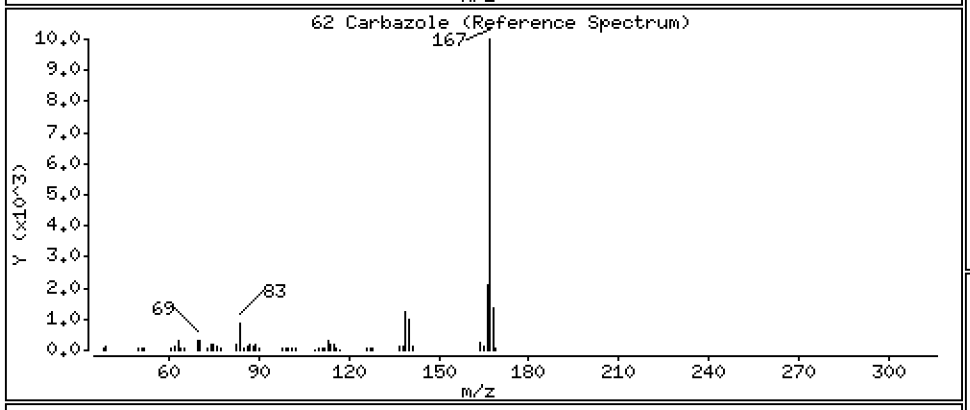
Column diameter: 0.25

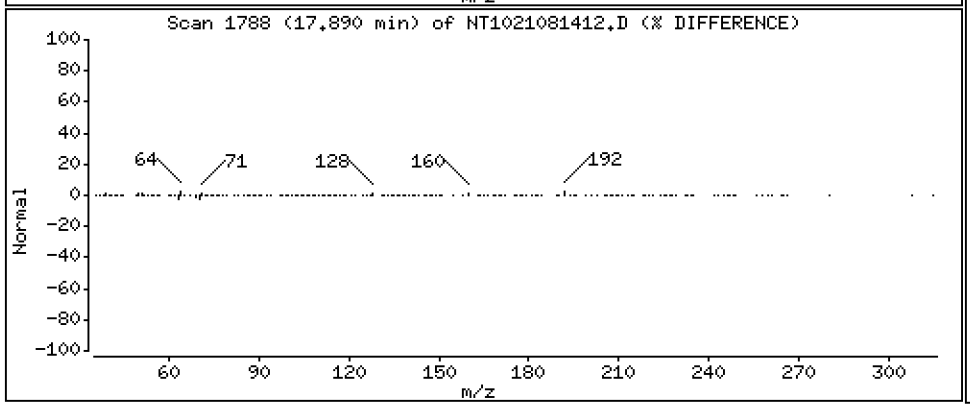
62 Carbazole

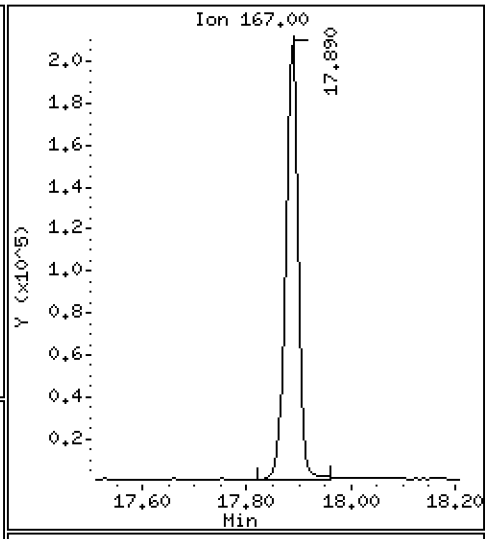
Concentration: 3.883 ug/mL

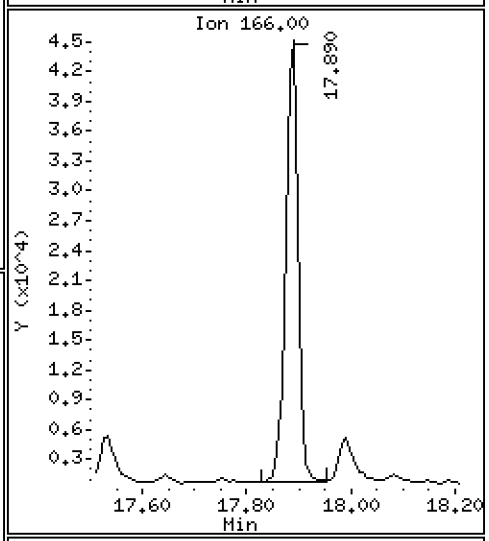


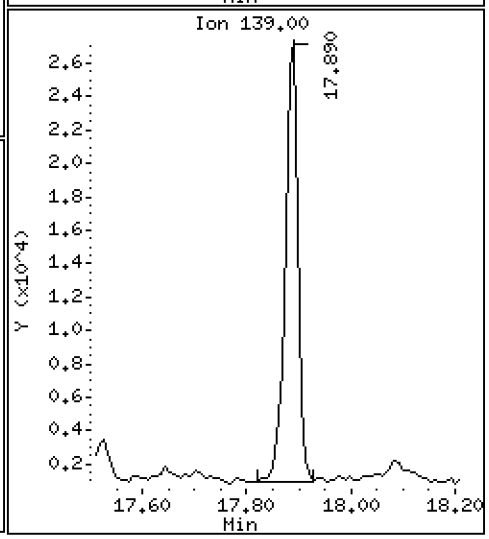












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

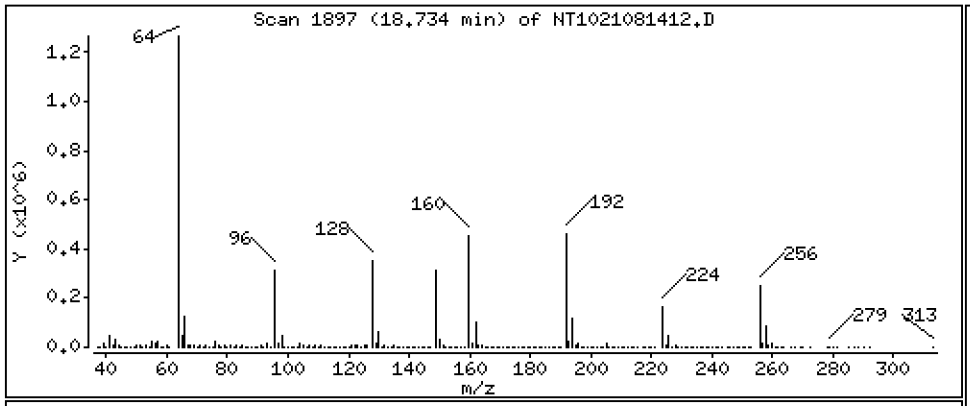
Operator: VTS

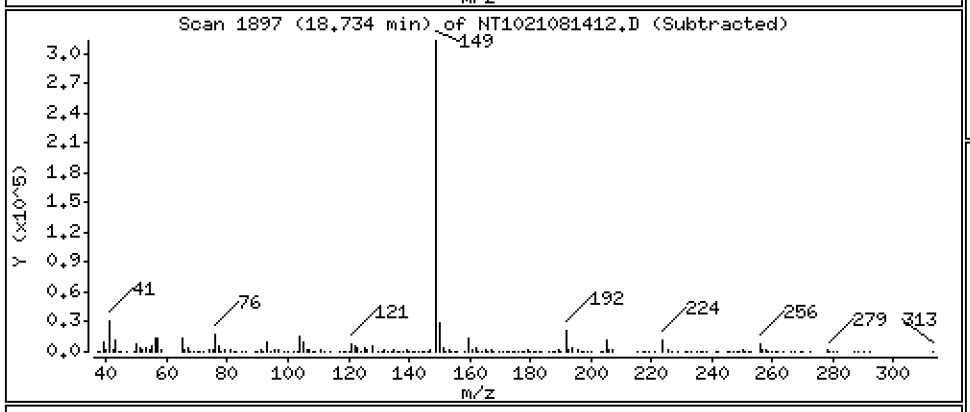
Column phase: ZB-5msi

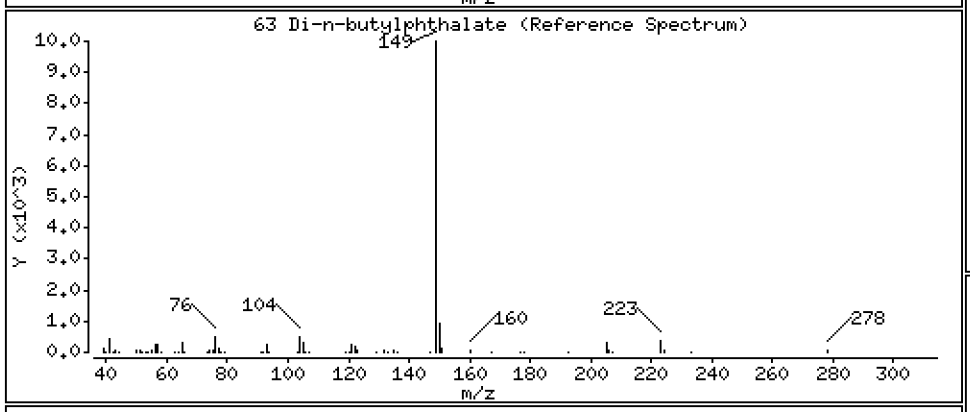
Column diameter: 0.25

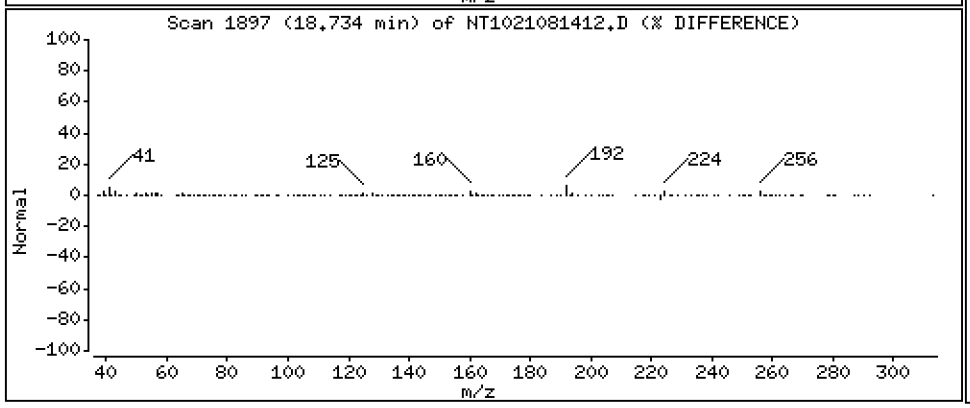
63 Di-n-butylphthalate

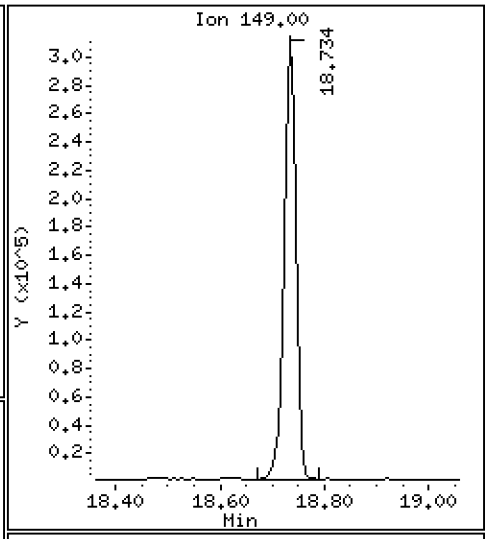
Concentration: 3.564 ug/mL

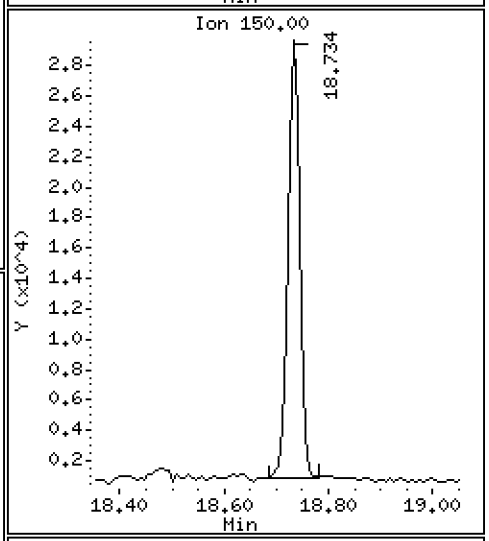


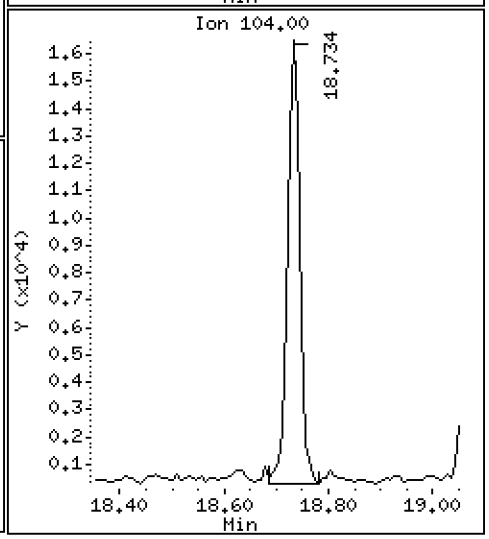












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

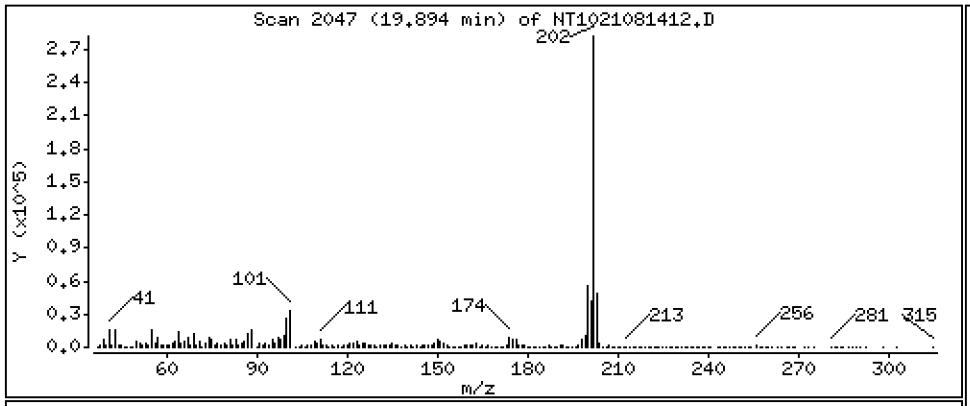
Operator: VTS

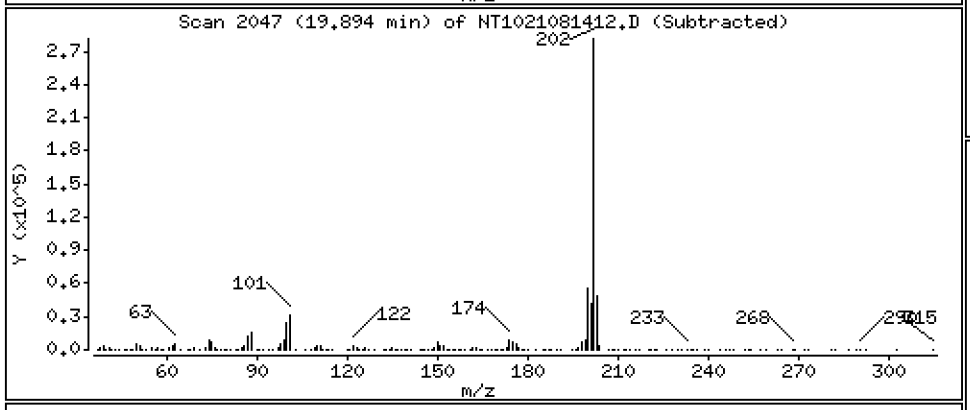
Column phase: ZB-5msi

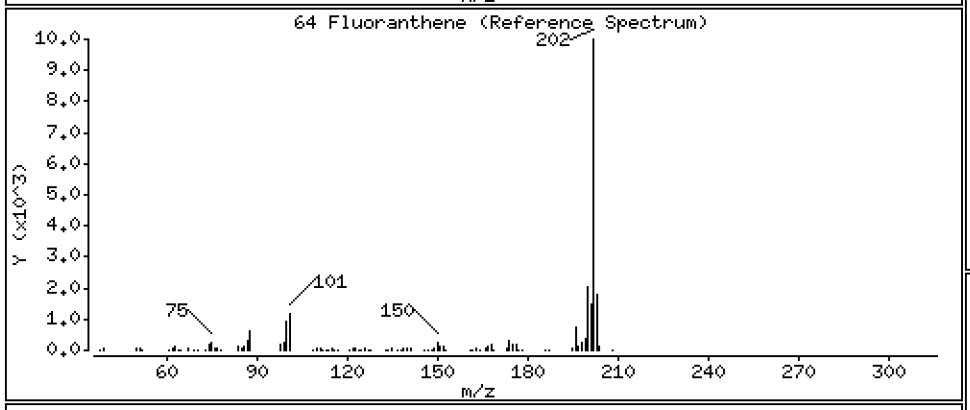
Column diameter: 0.25

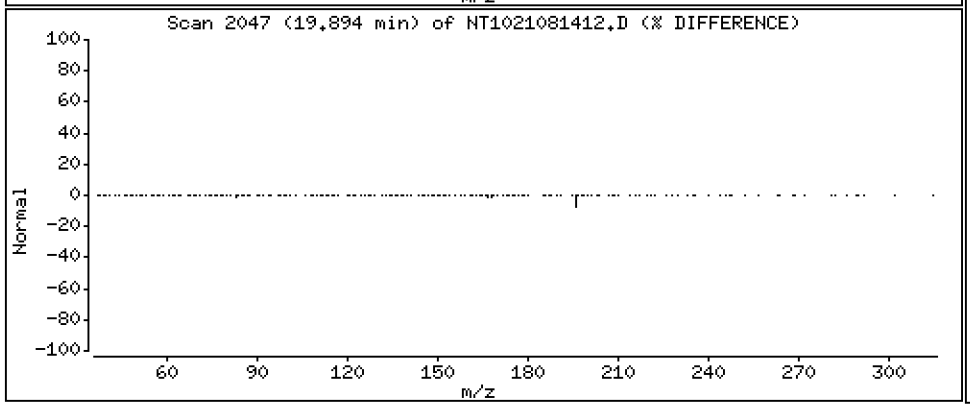
64 Fluoranthene

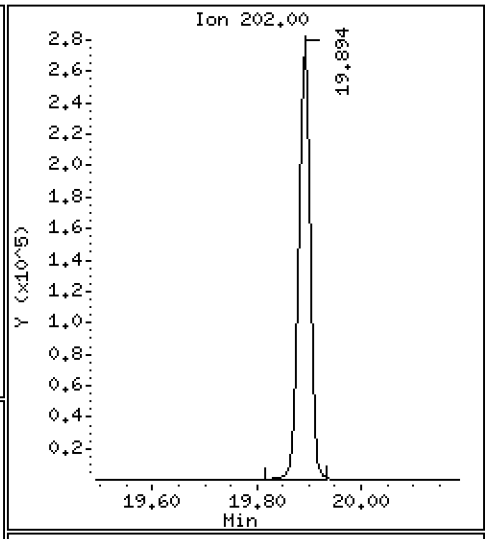
Concentration: 5.307 ug/mL

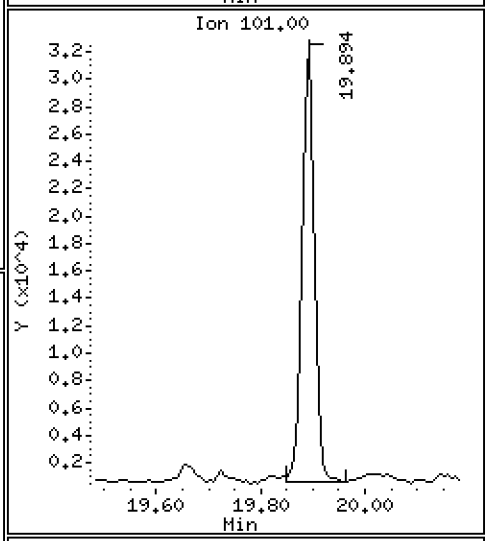


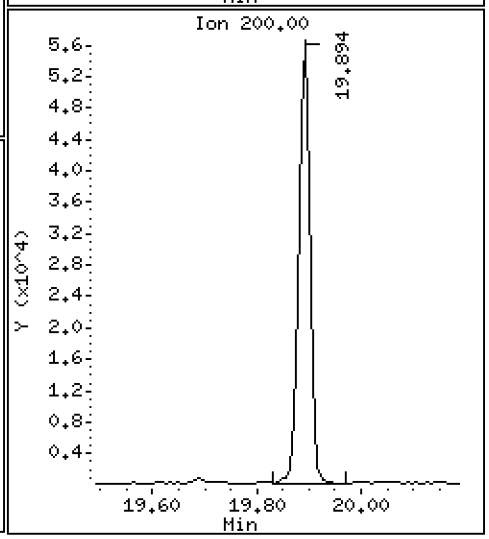












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

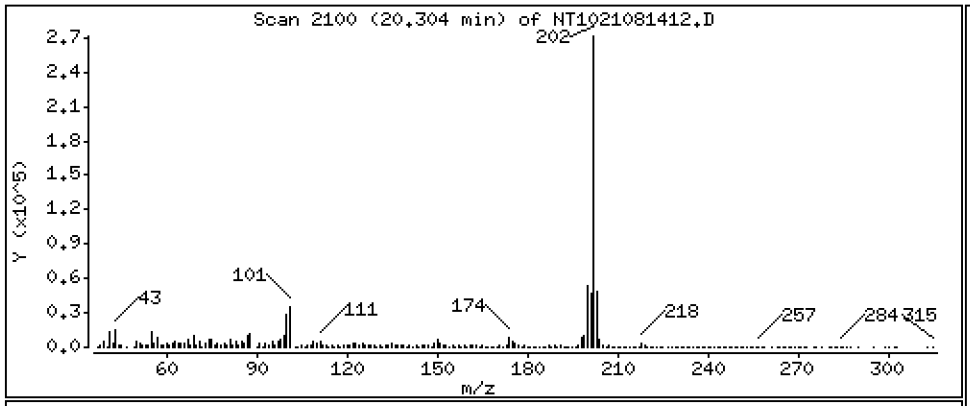
Operator: VTS

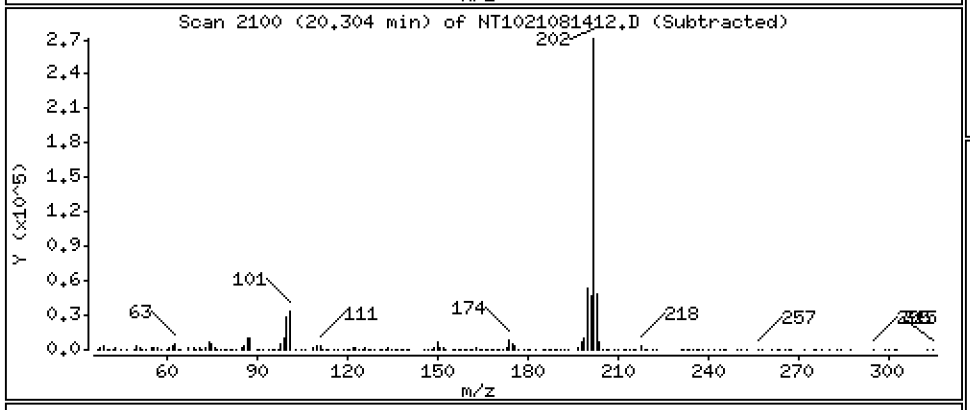
Column phase: ZB-5msi

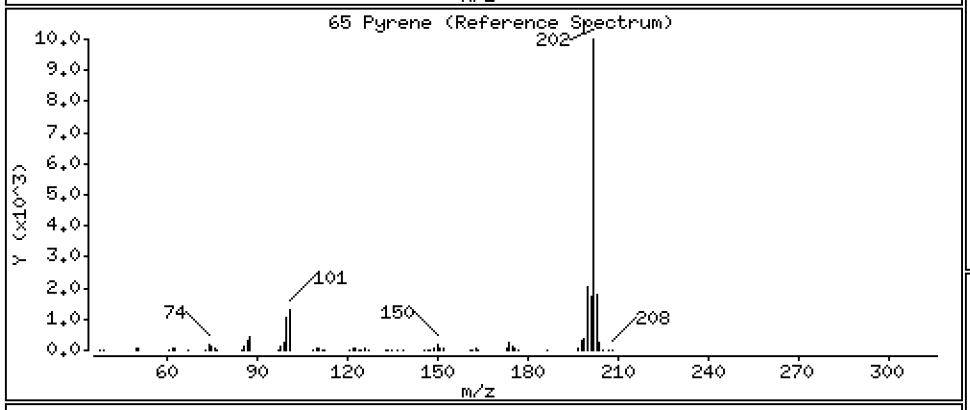
Column diameter: 0.25

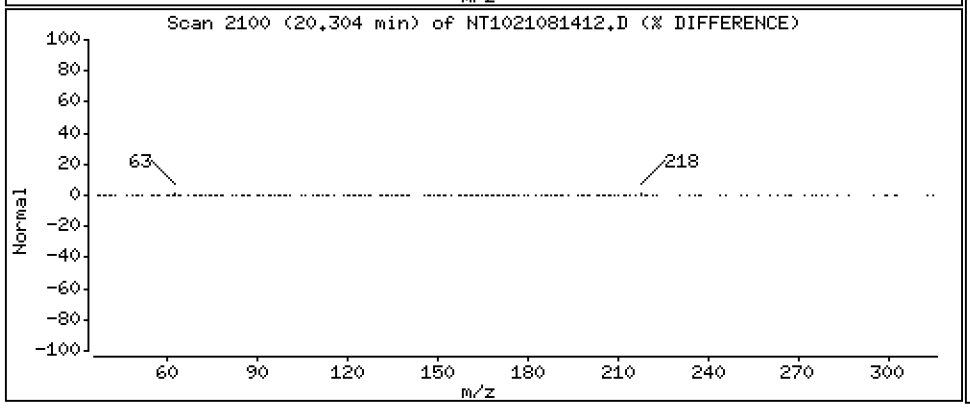
65 Pyrene

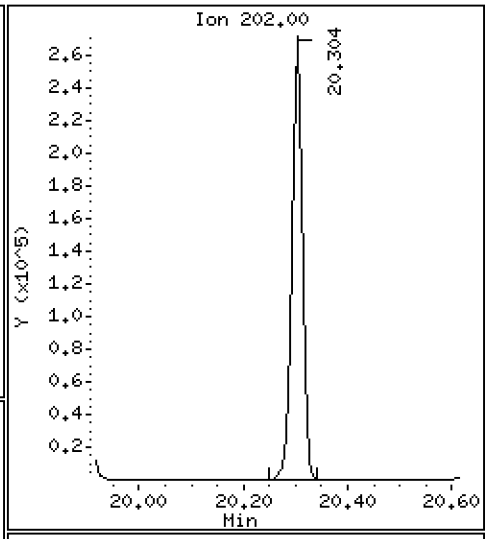
Concentration: 4.257 ug/mL

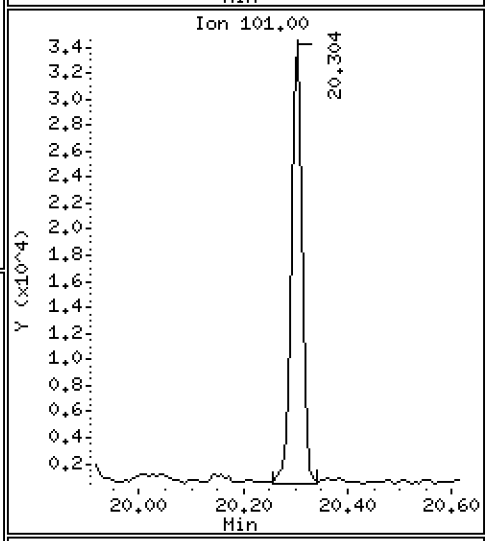


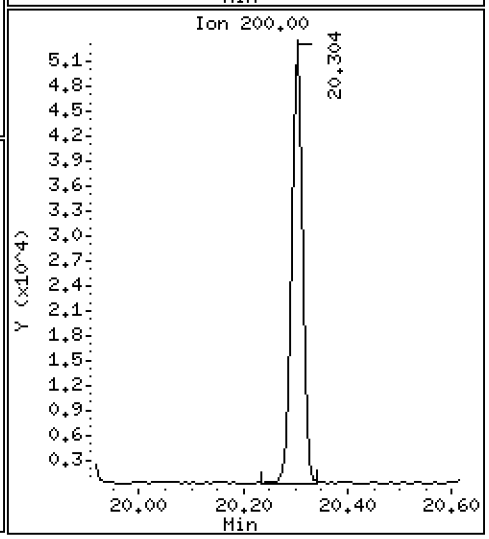












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

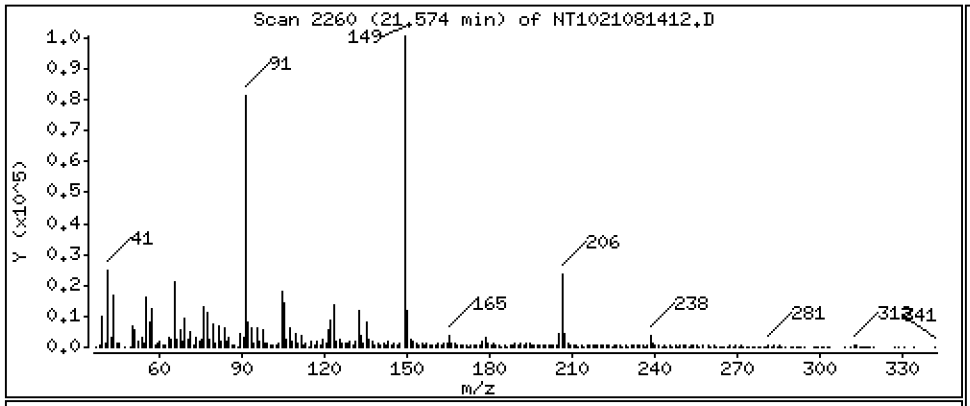
Operator: VTS

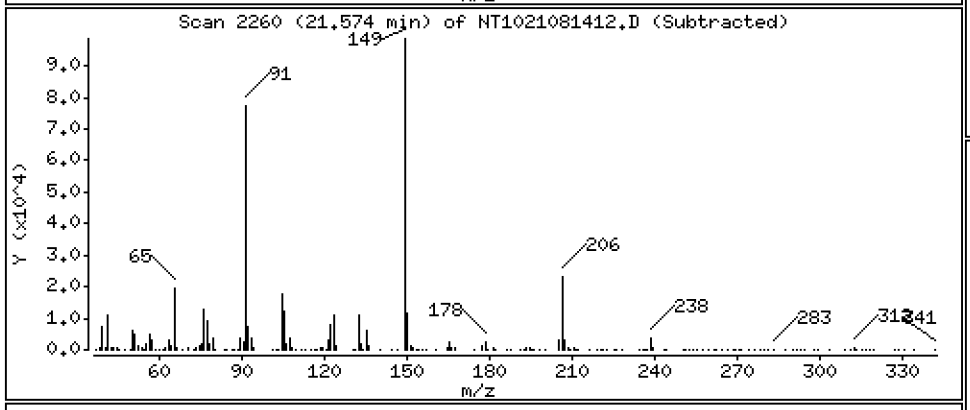
Column phase: ZB-5msi

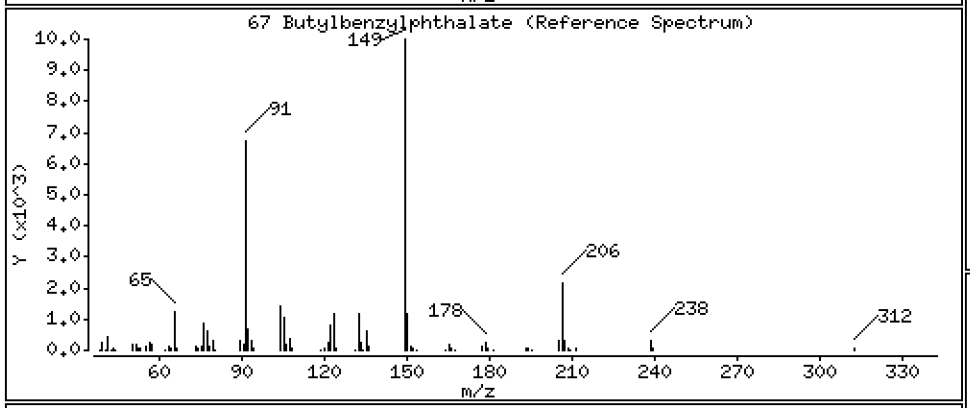
Column diameter: 0.25

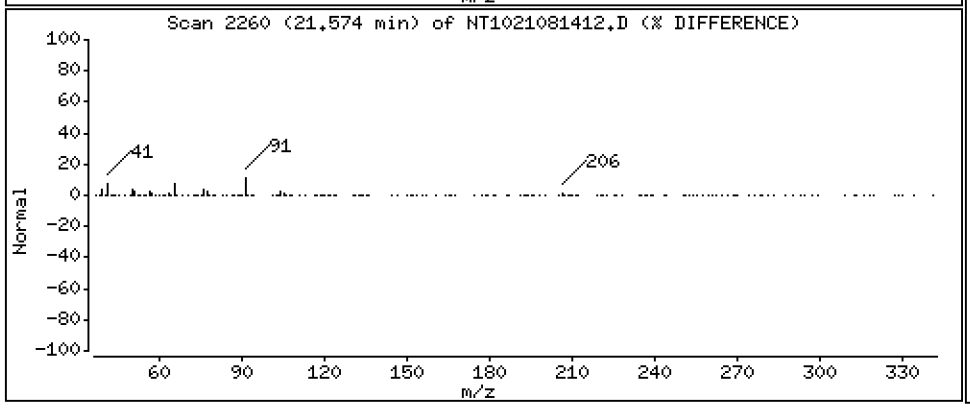
67 Butylbenzylphthalate

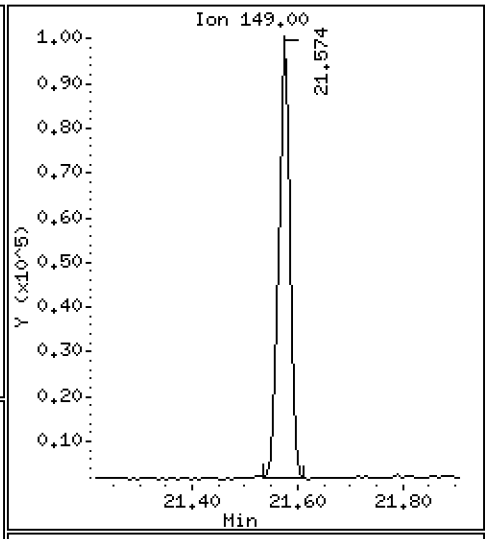
Concentration: 4.712 ug/mL

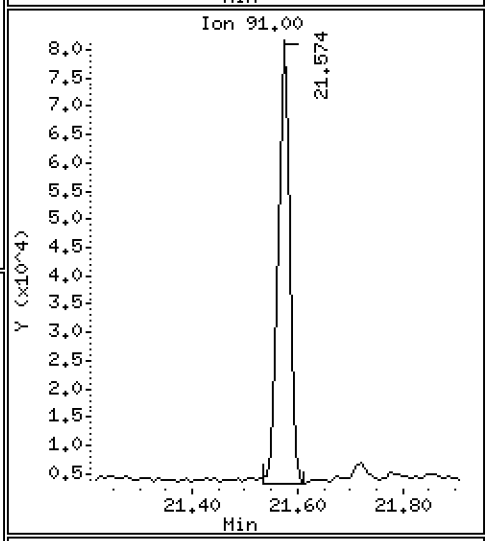


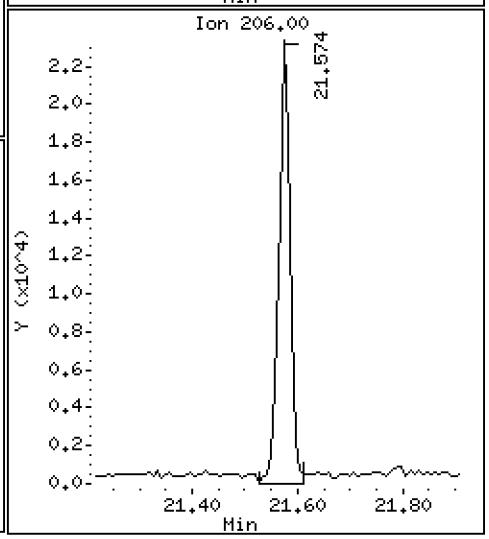












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D

Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

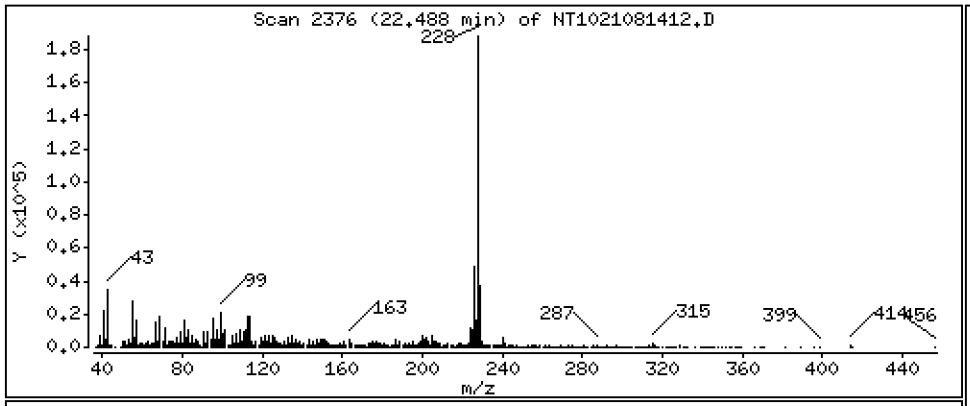
Operator: VTS

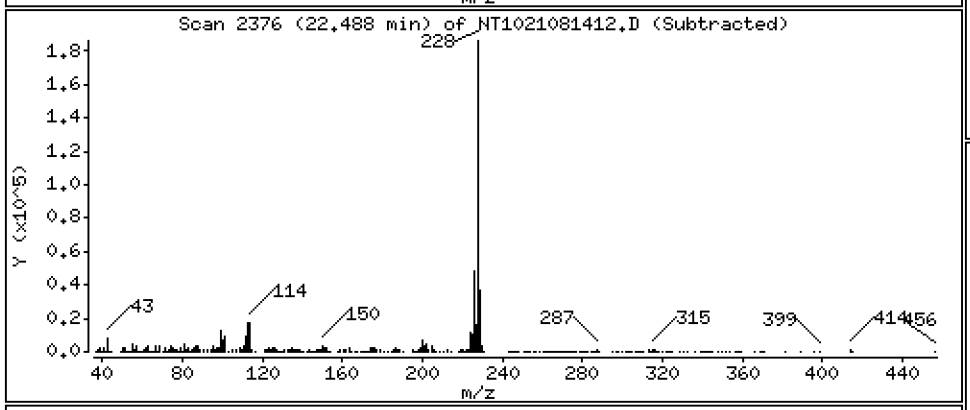
Column phase: ZB-5msi

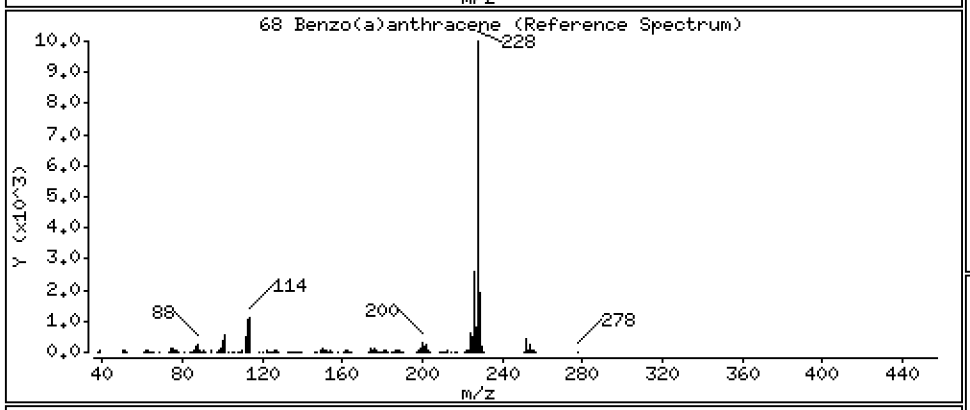
Column diameter: 0.25

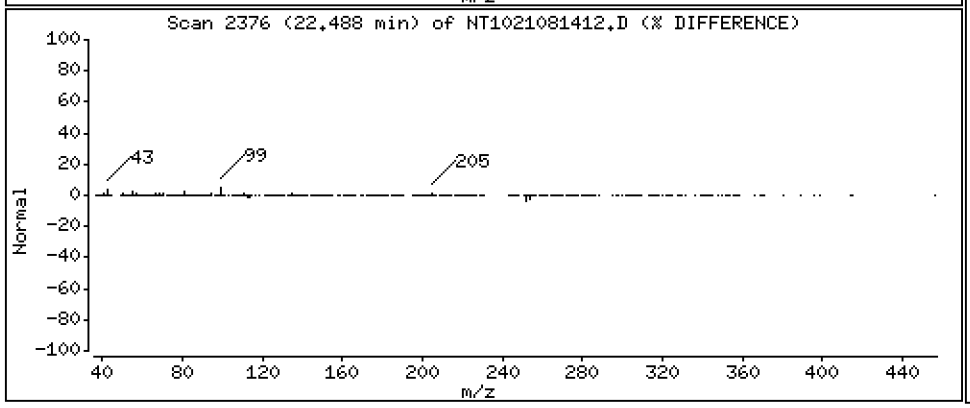
68 Benzo(a)anthracene

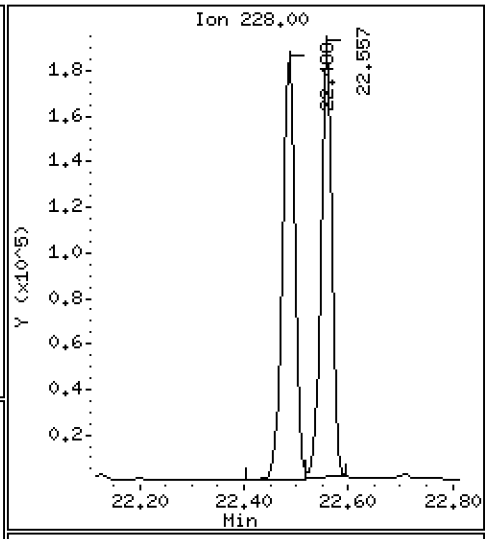
Concentration: 4.299 ug/mL

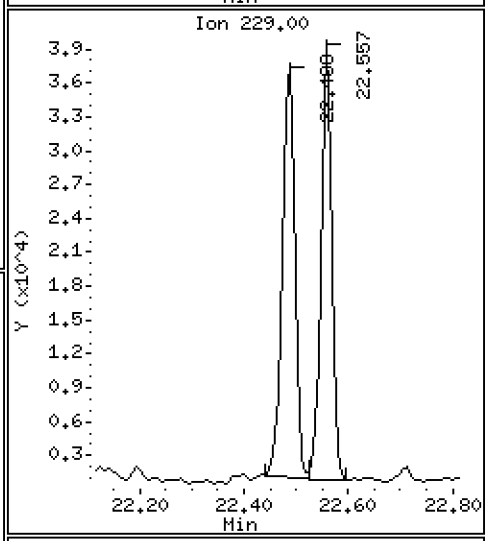


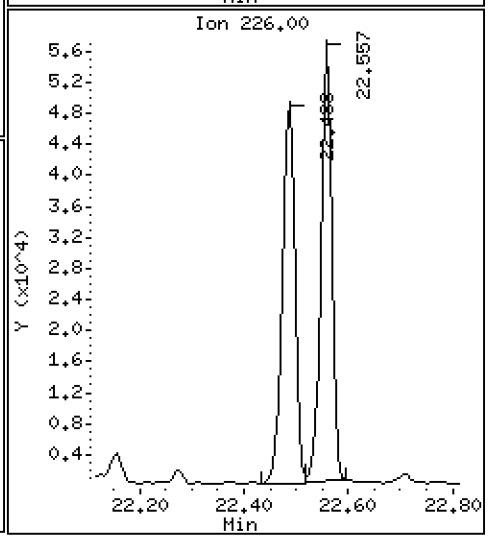












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

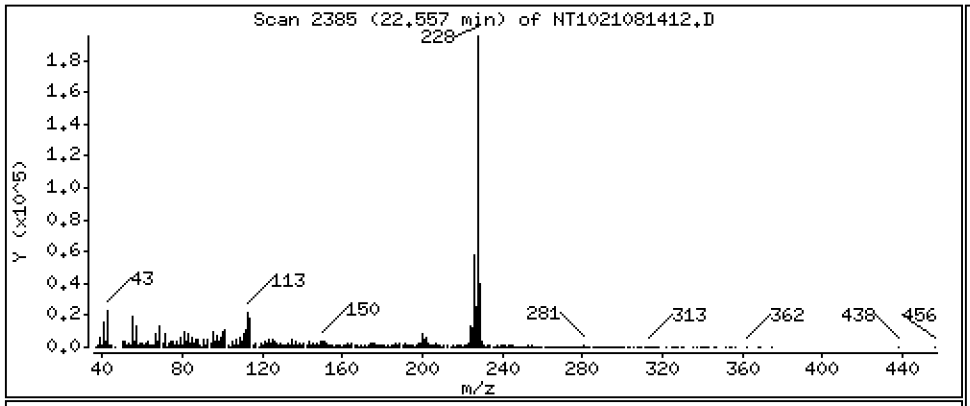
Operator: VTS

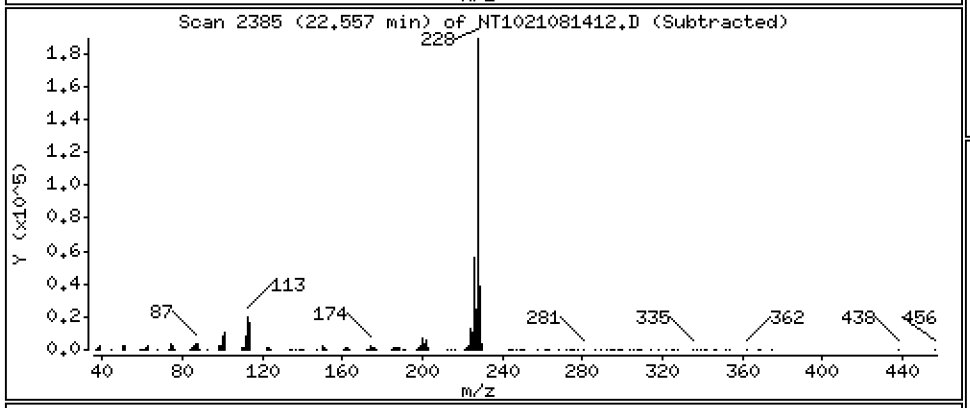
Column phase: ZB-5msi

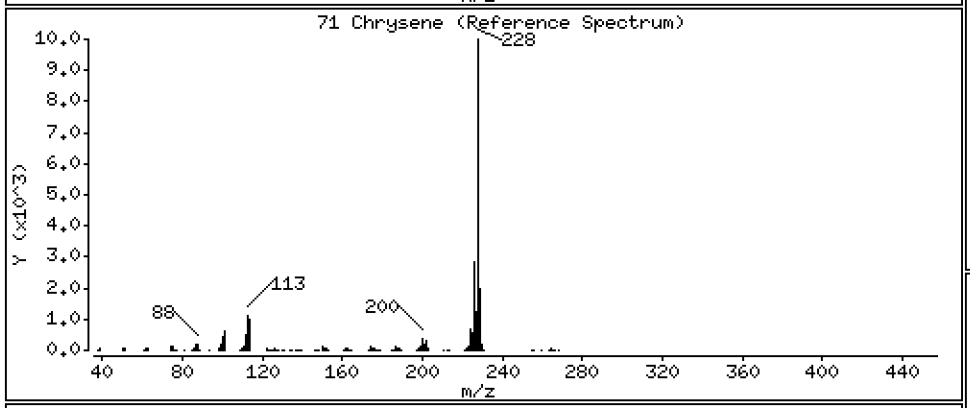
Column diameter: 0.25

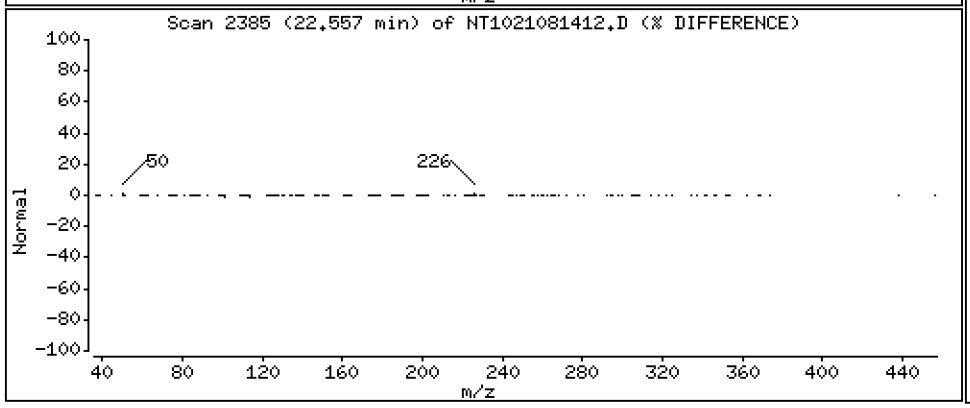
71 Chrysene

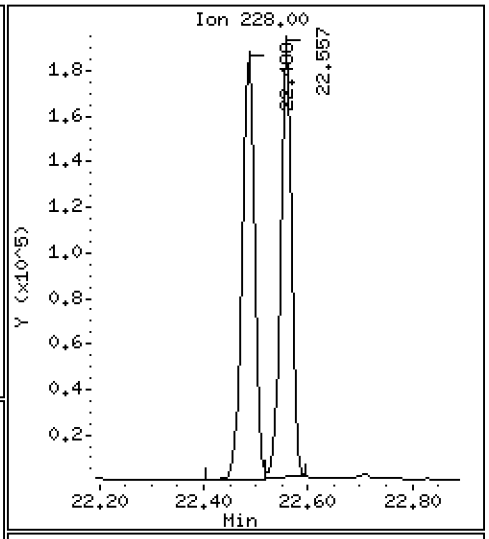
Concentration: 4.916 ug/mL

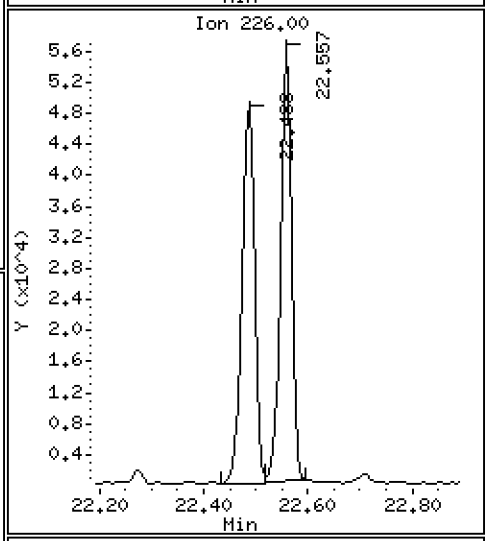


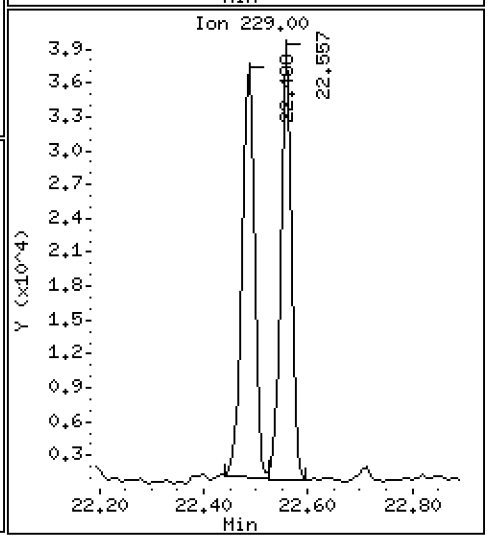












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

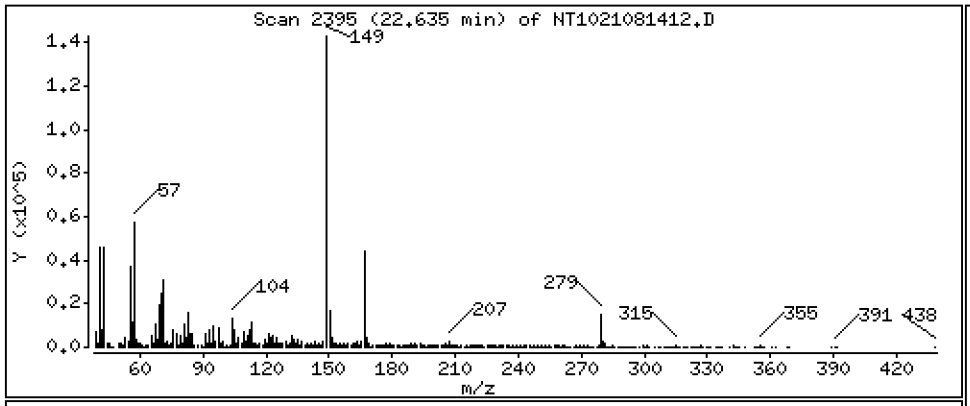
Operator: VTS

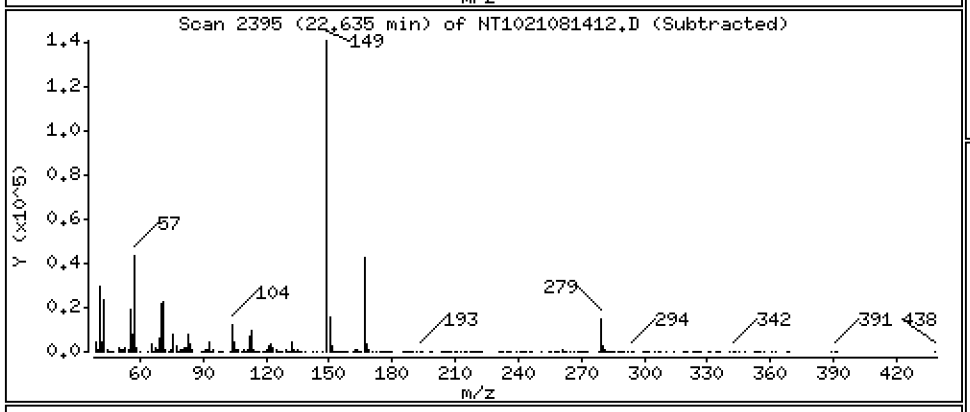
Column phase: ZB-5msi

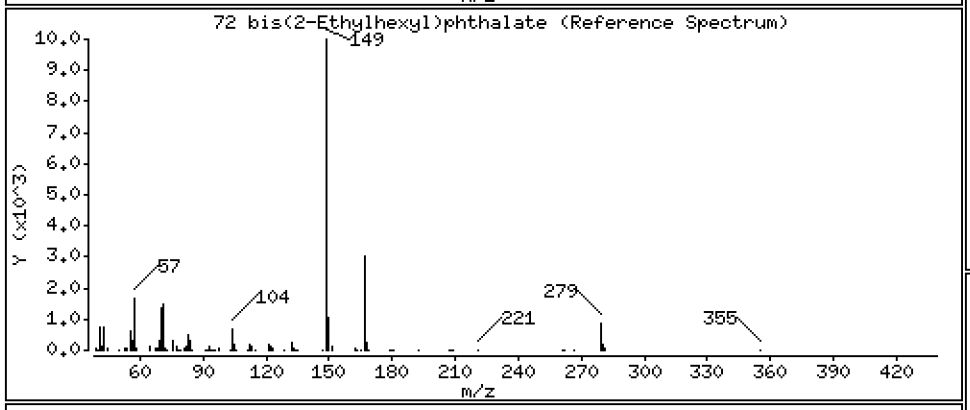
Column diameter: 0.25

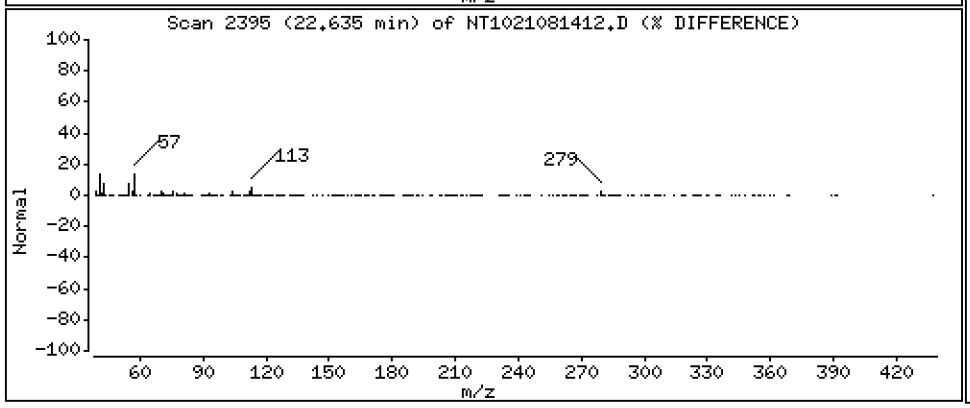
72 bis(2-Ethylhexyl)phthalate

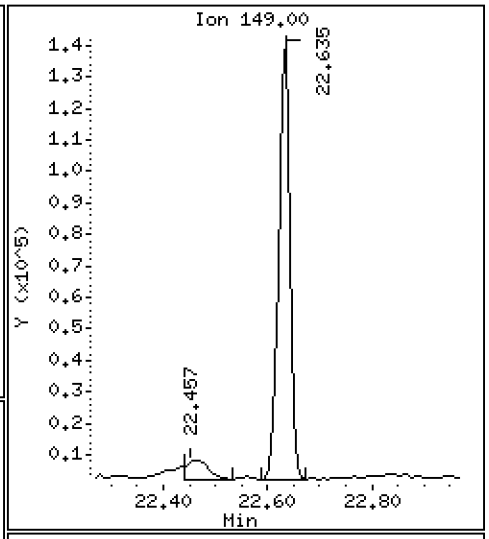
Concentration: 5.739 ug/mL

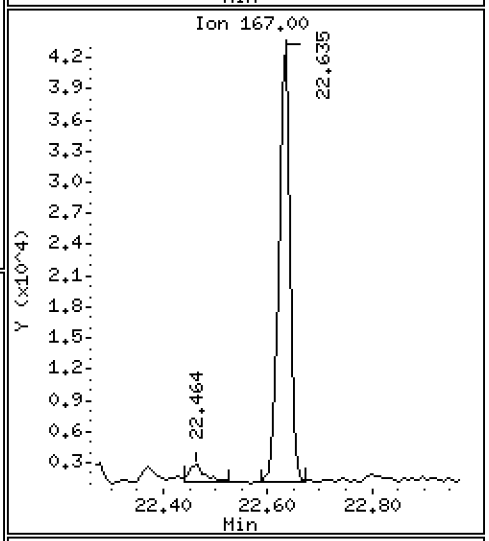


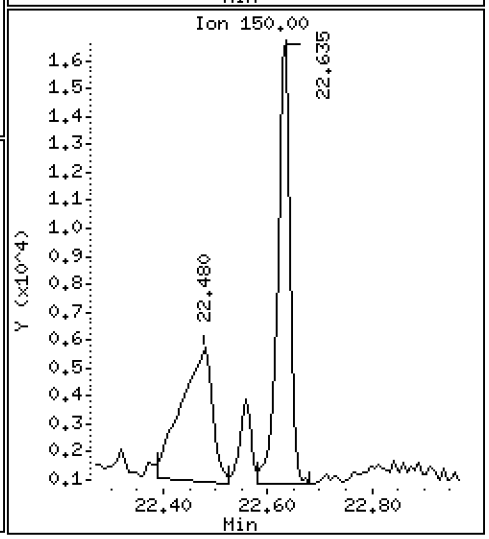












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

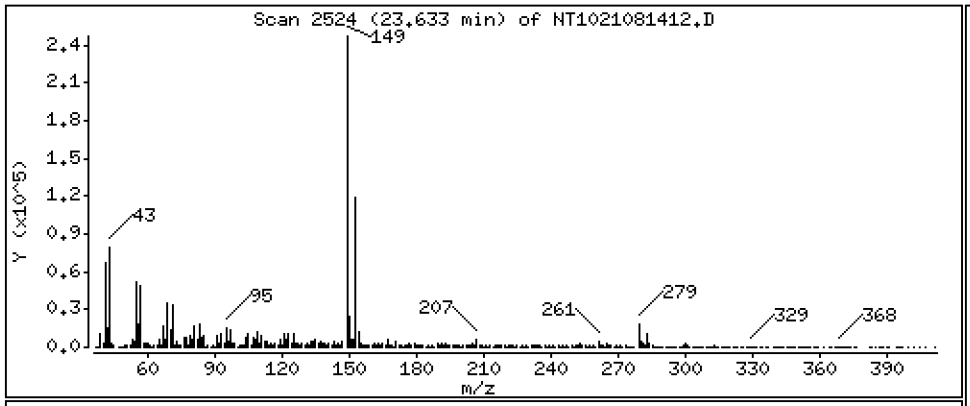
Operator: VTS

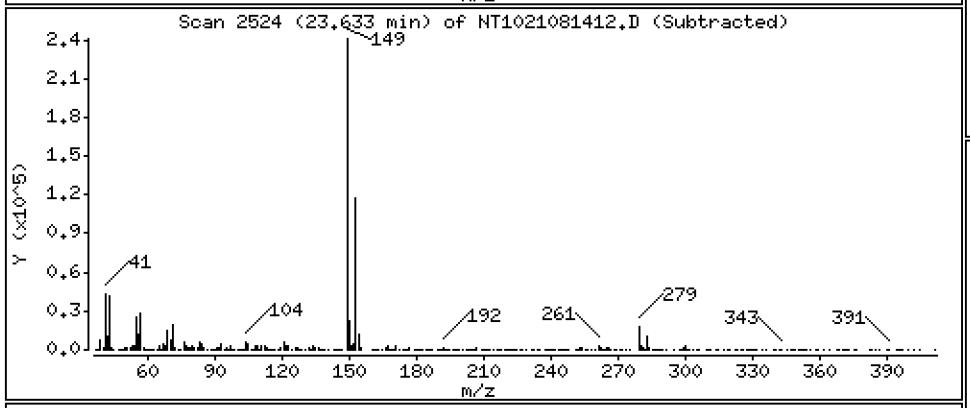
Column phase: ZB-5msi

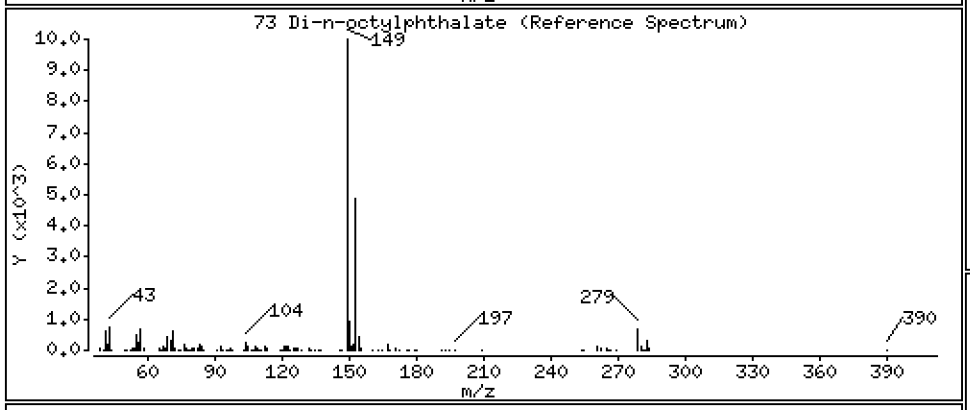
Column diameter: 0.25

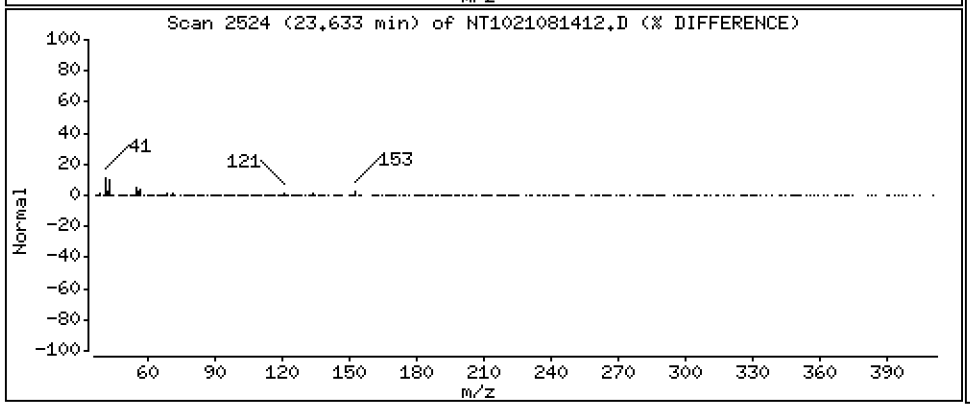
73 Di-n-octylphthalate

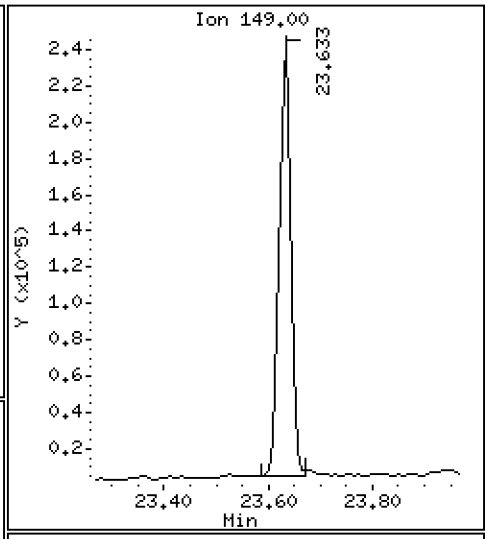
Concentration: 3.887 ug/mL

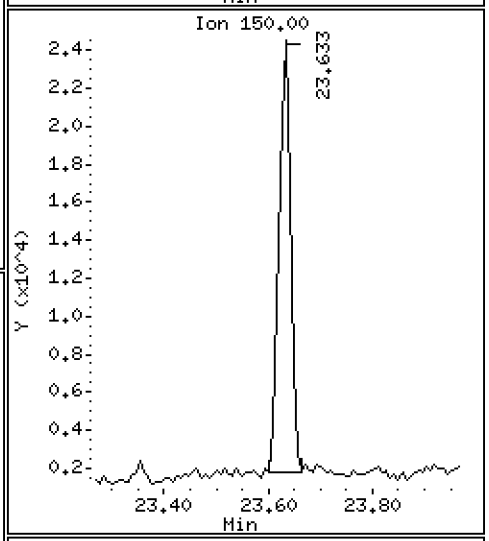


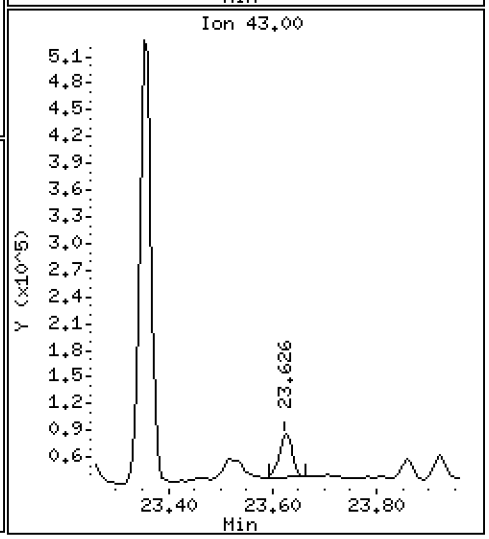












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

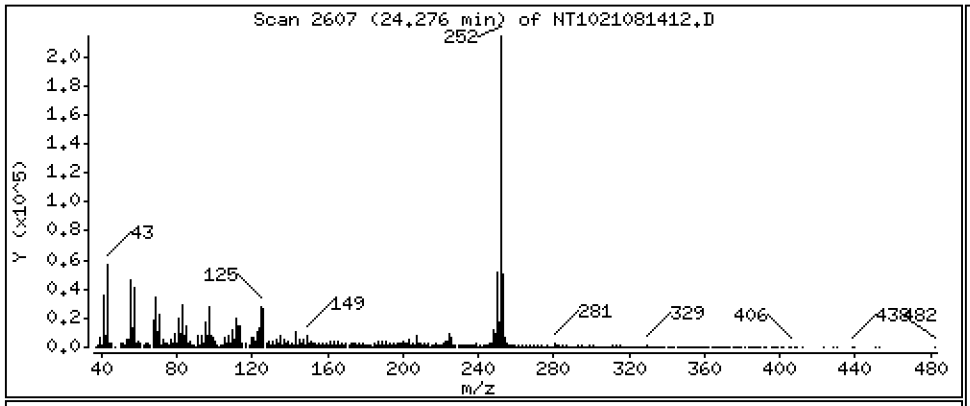
Operator: VTS

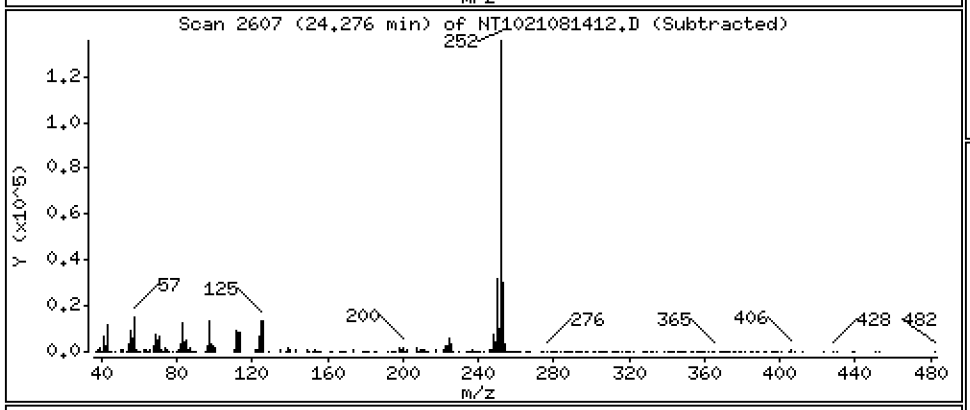
Column phase: ZB-5msi

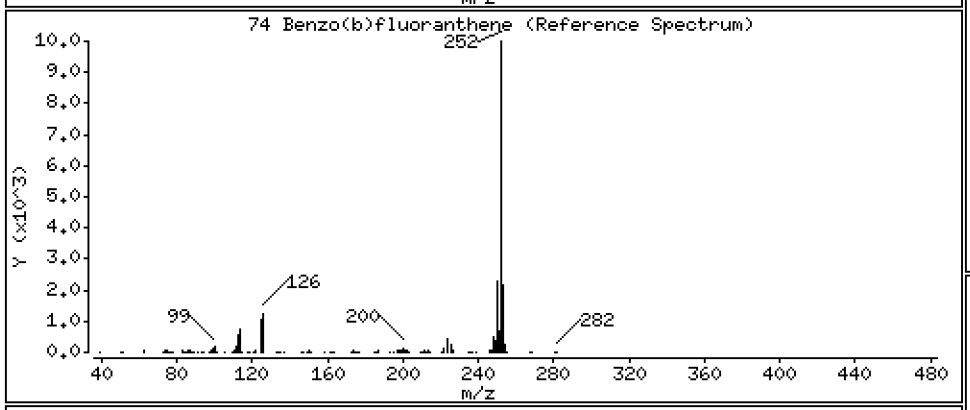
Column diameter: 0.25

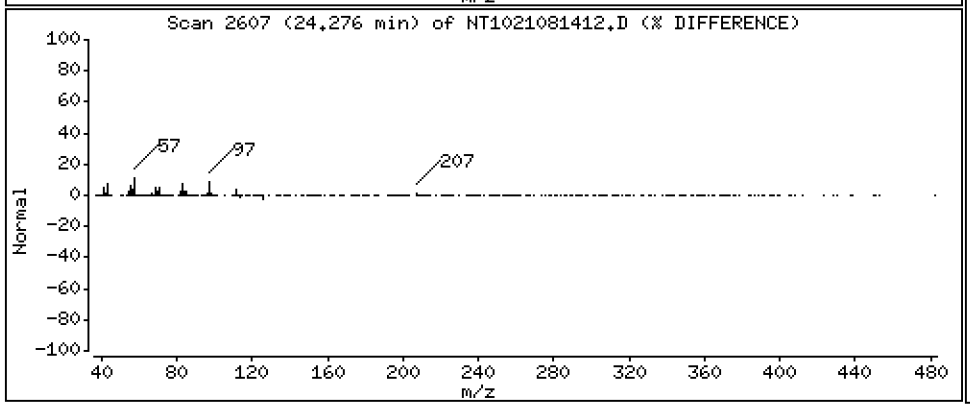
74 Benzo(b)fluoranthene

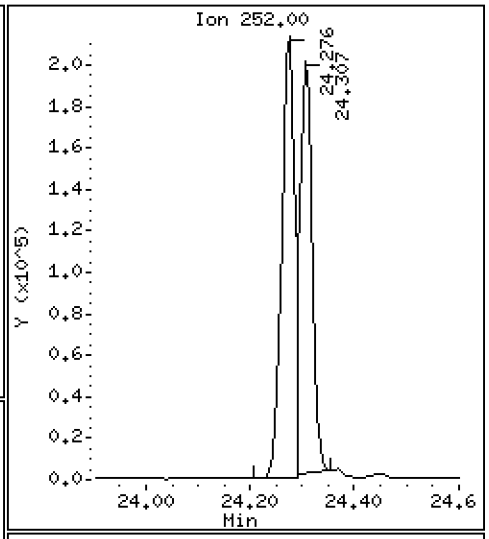
Concentration: 4.992 ug/mL

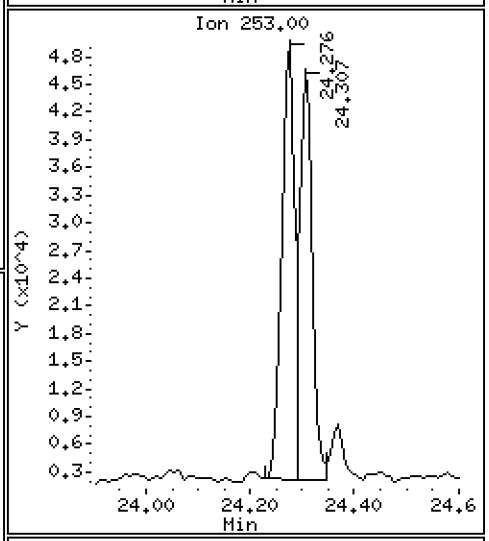


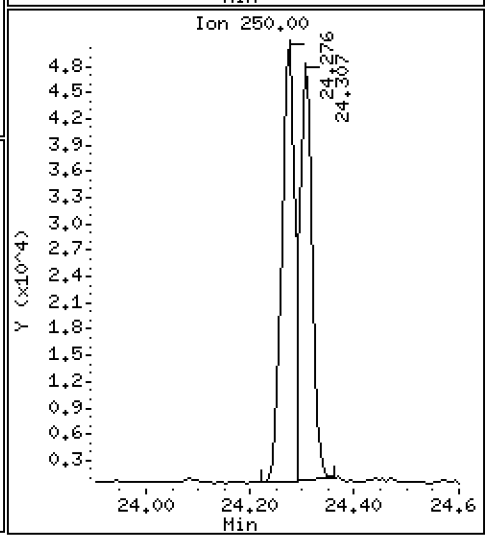












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

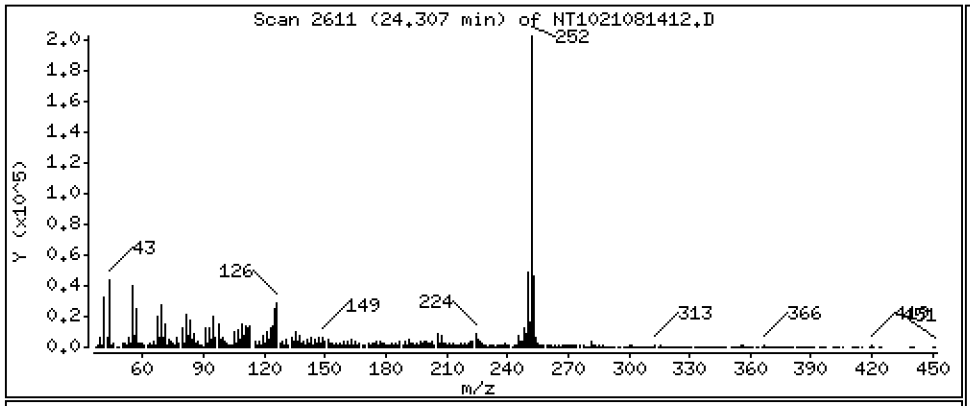
Operator: VTS

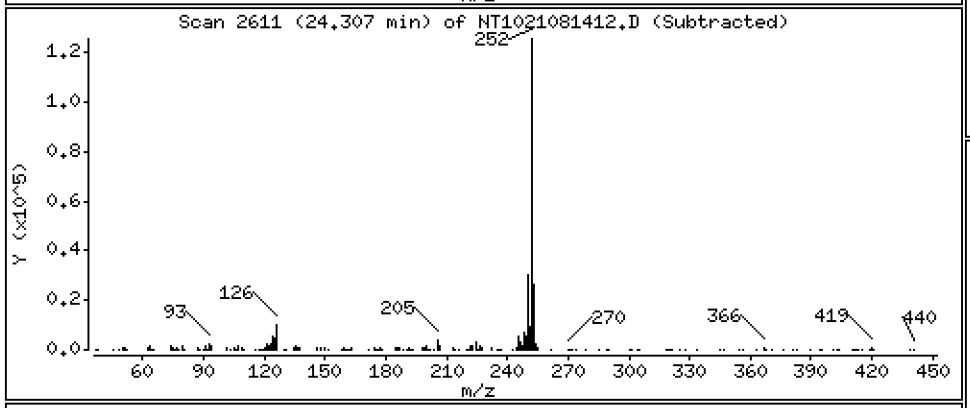
Column phase: ZB-5msi

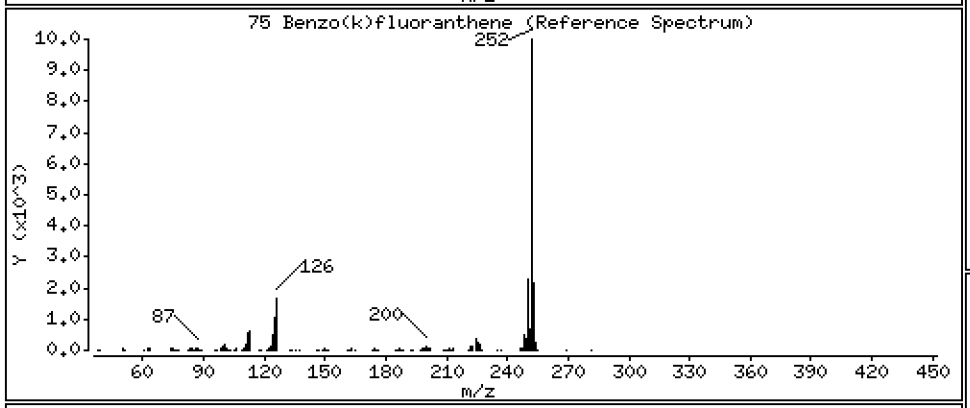
Column diameter: 0.25

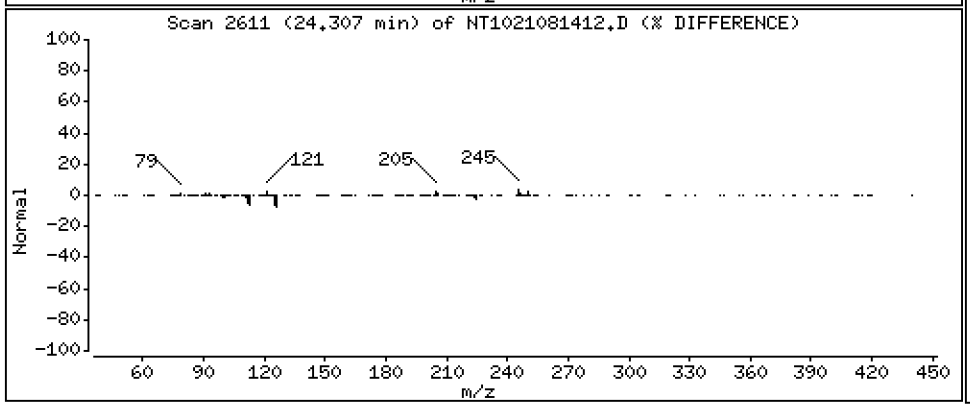
75 Benzo(k)fluoranthene

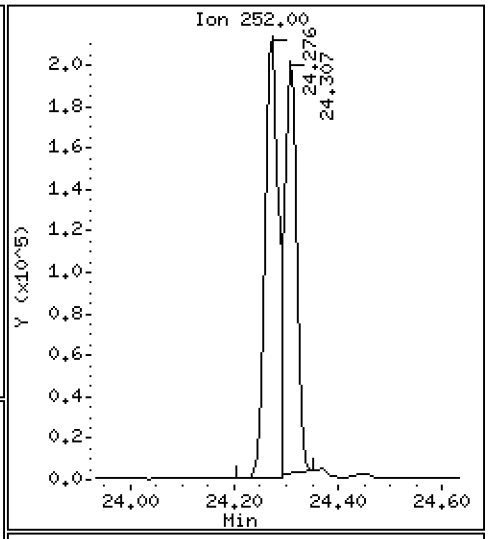
Concentration: 4.535 ug/mL

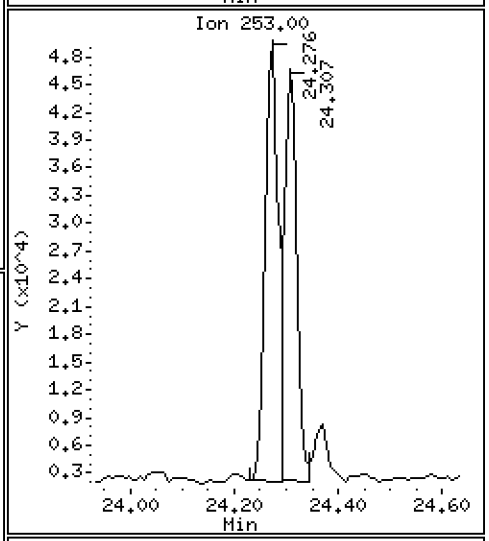


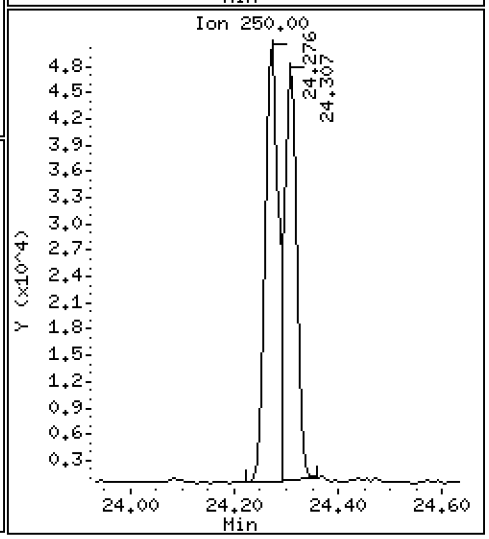












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

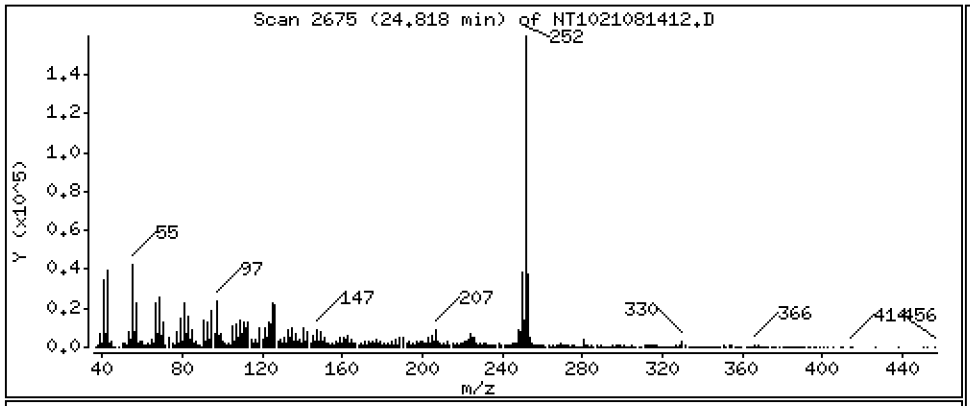
Operator: VTS

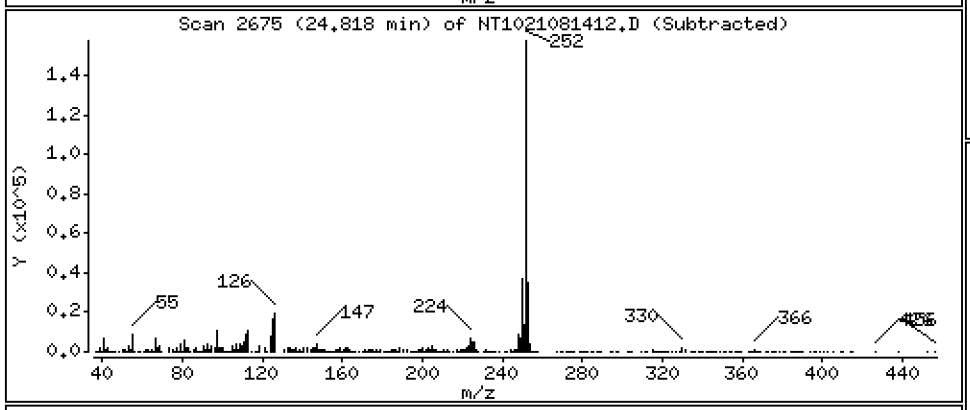
Column phase: ZB-5msi

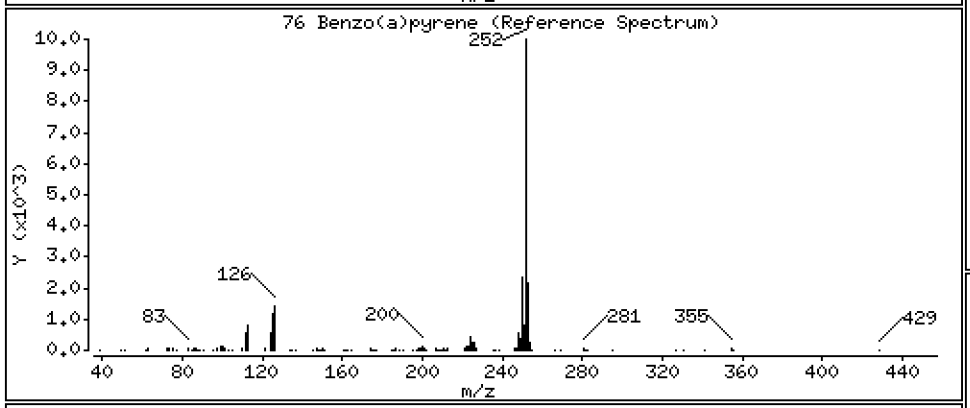
Column diameter: 0.25

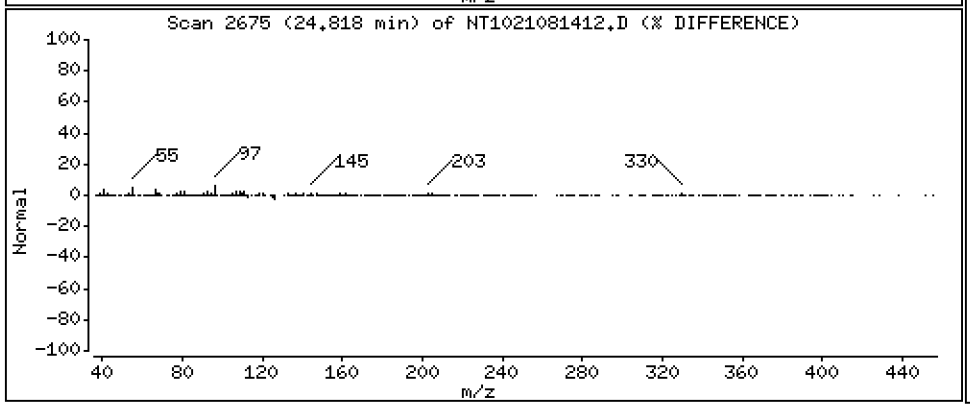
76 Benzo(a)pyrene

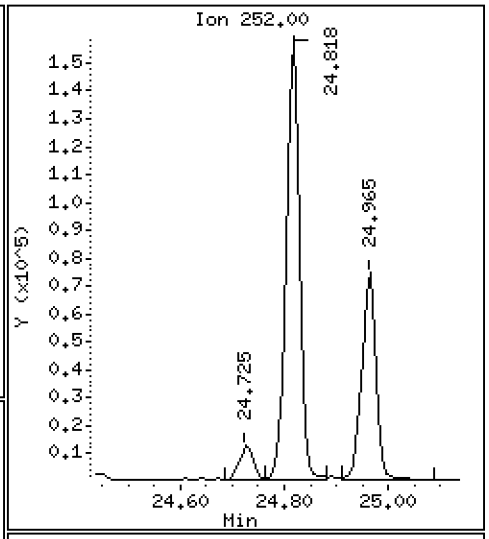
Concentration: 4.082 ug/mL

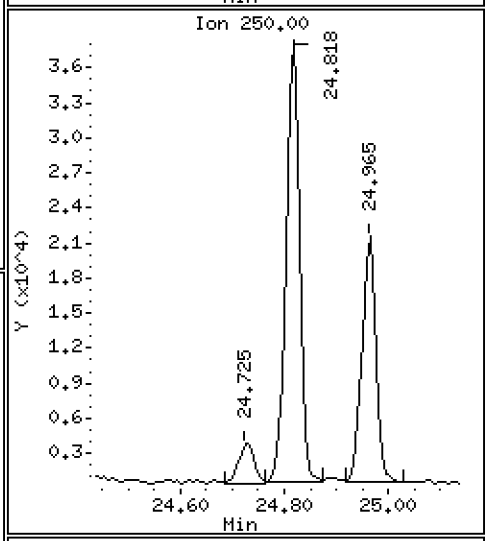


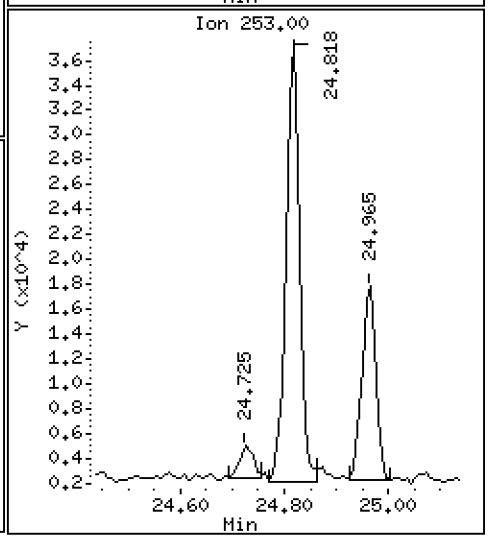












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

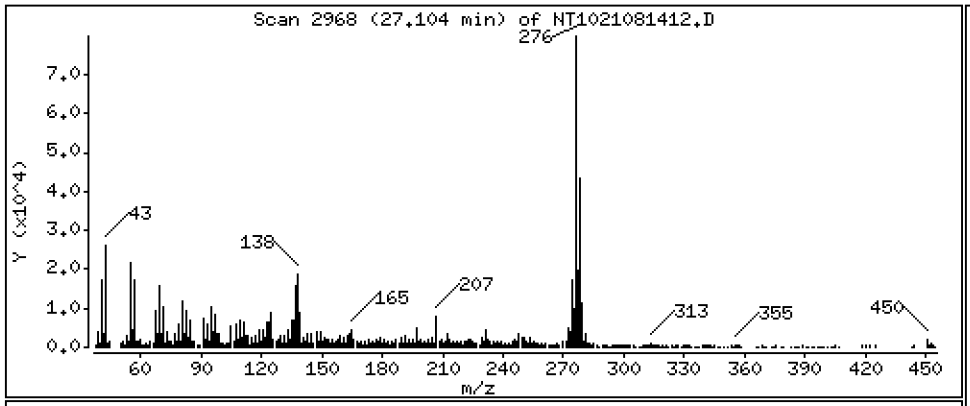
Operator: VTS

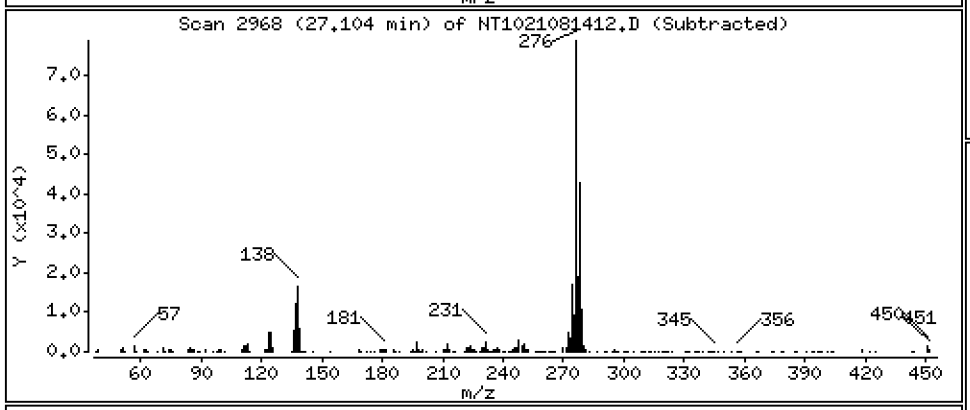
Column phase: ZB-5msi

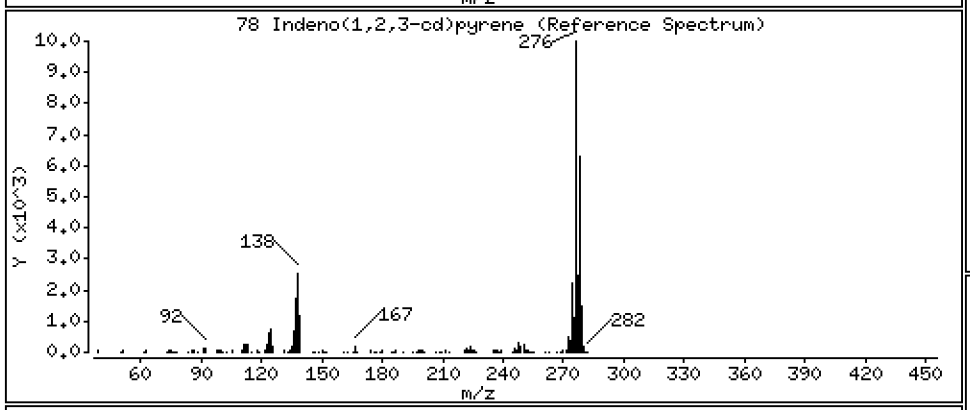
Column diameter: 0.25

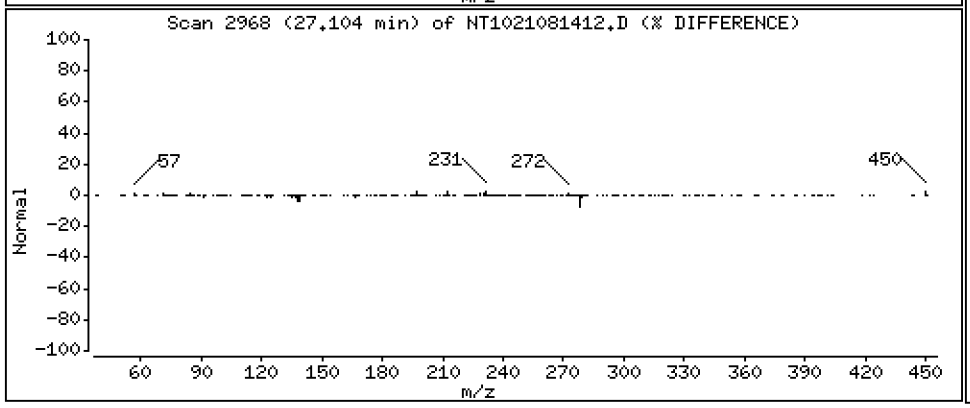
78 Indeno(1,2,3-cd)pyrene

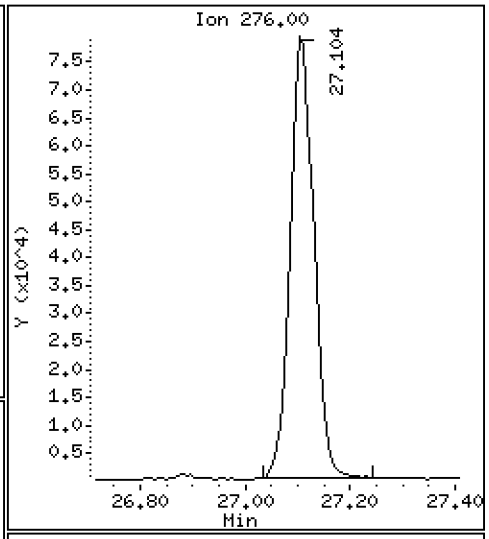
Concentration: 3.106 ug/mL

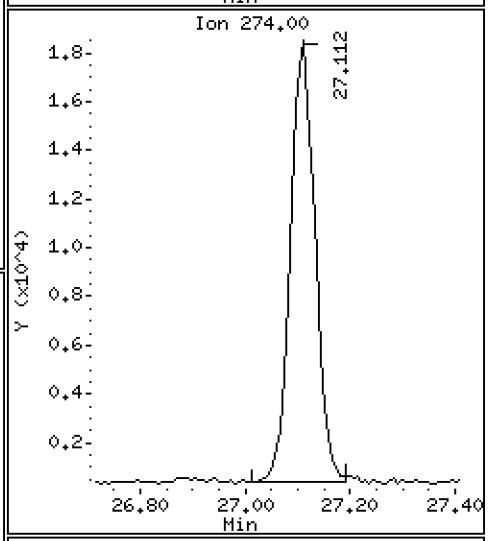


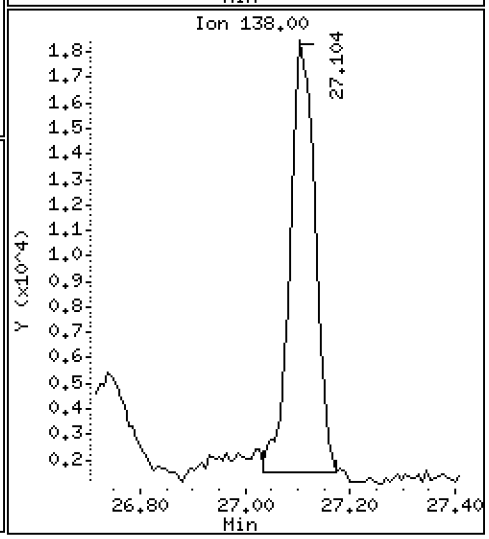












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

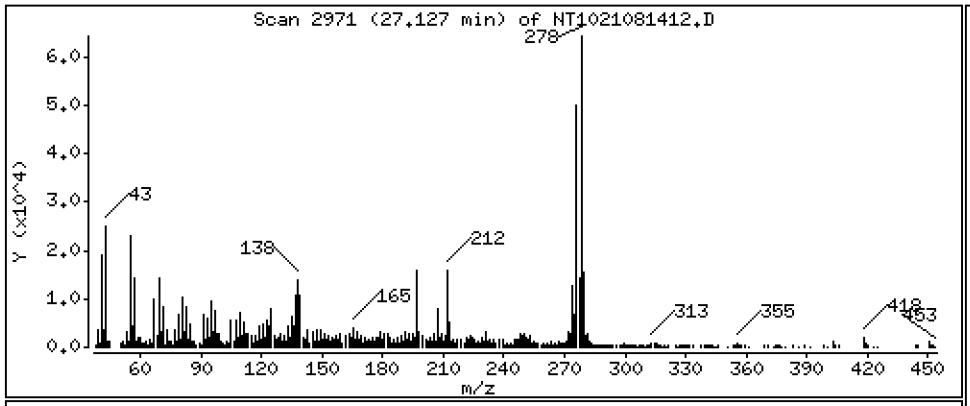
Operator: VTS

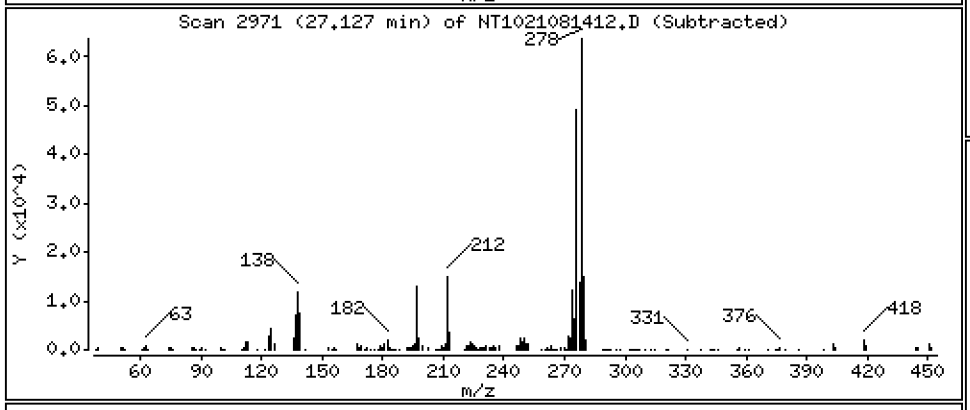
Column phase: ZB-5msi

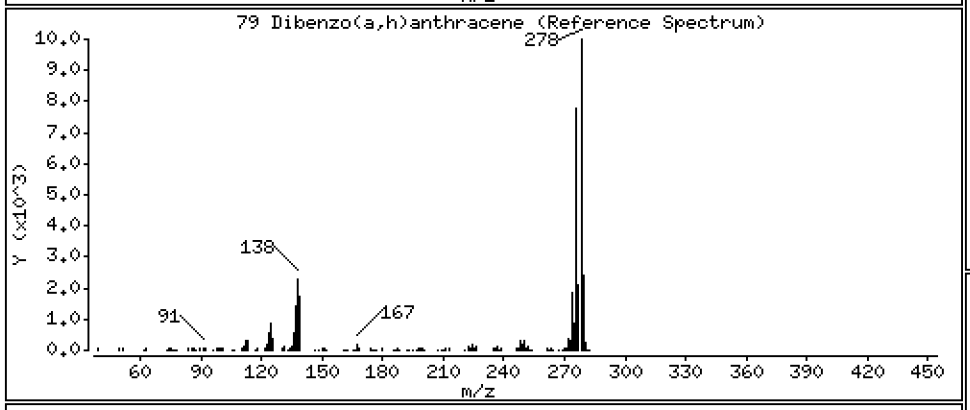
Column diameter: 0.25

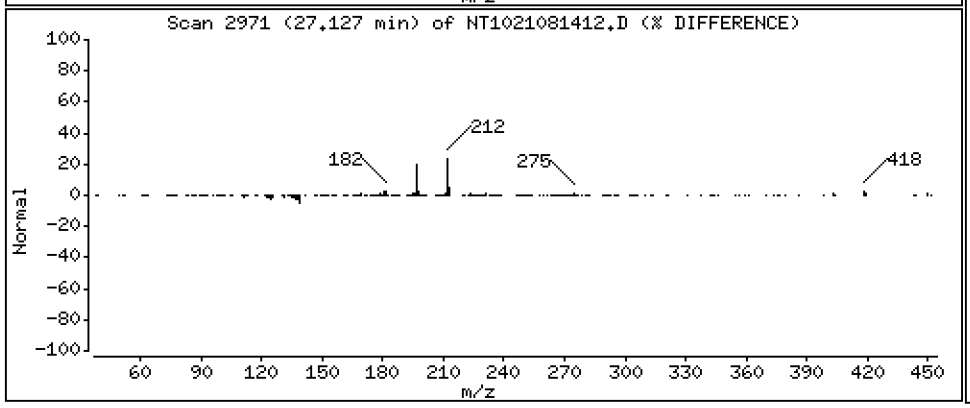
79 Dibenzo(a,h)anthracene

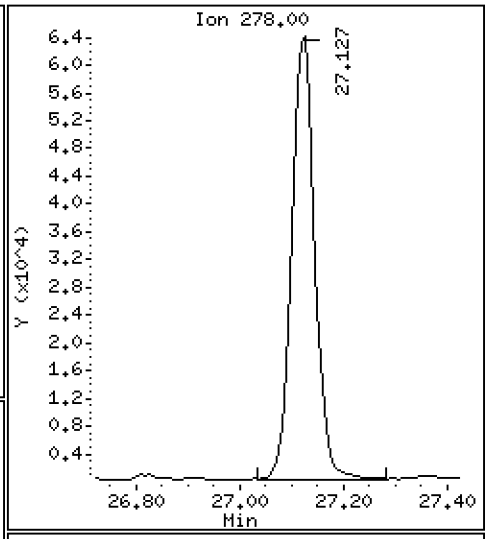
Concentration: 3.203 ug/mL

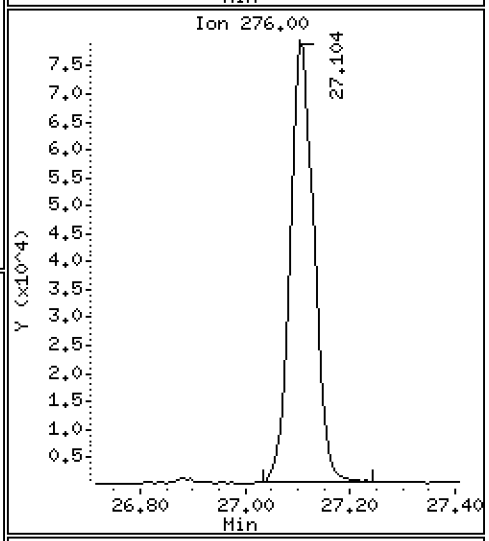


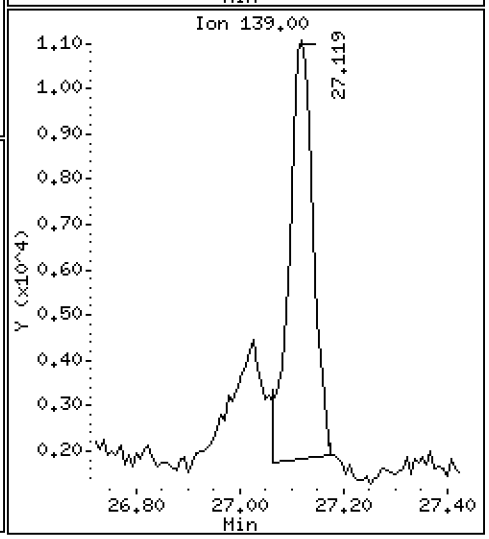












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

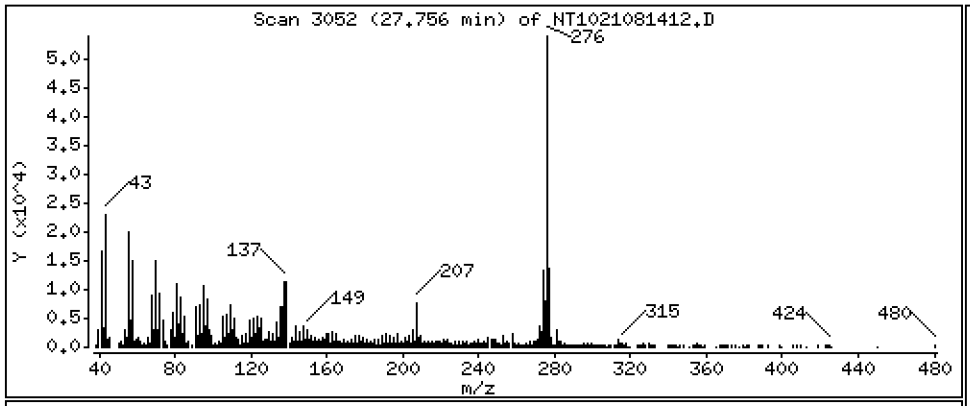
Operator: VTS

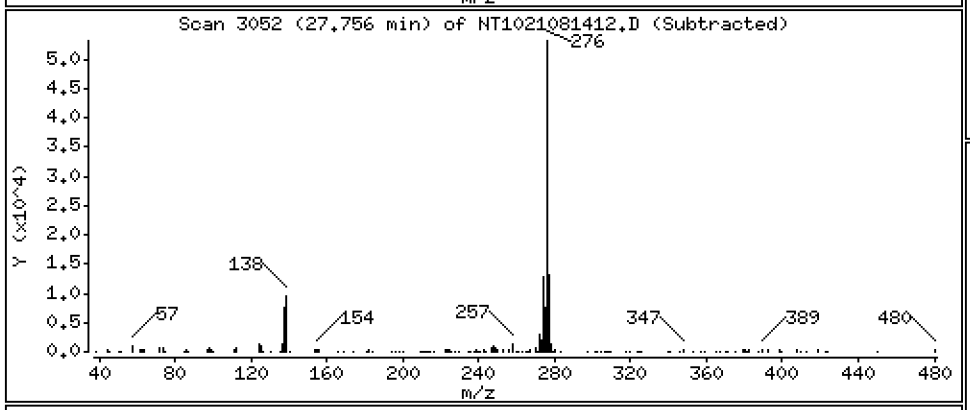
Column phase: ZB-5msi

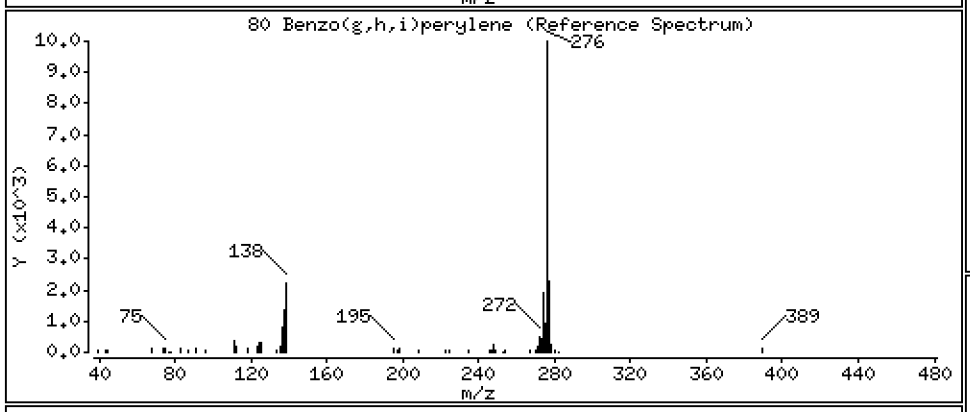
Column diameter: 0.25

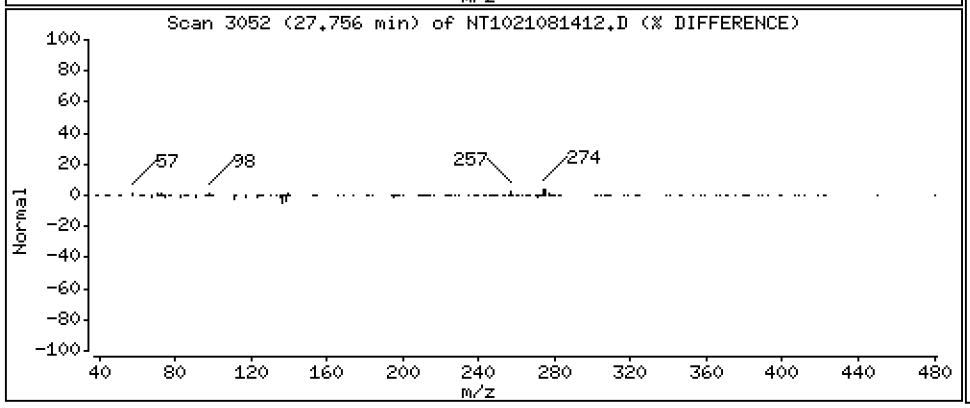
80 Benzo(g,h,i)perylene

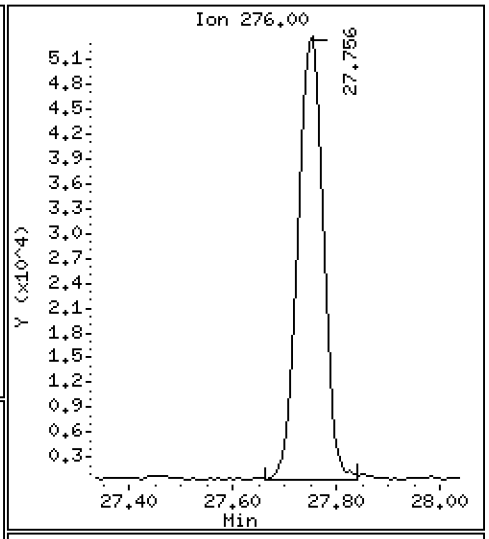
Concentration: 2.556 ug/mL

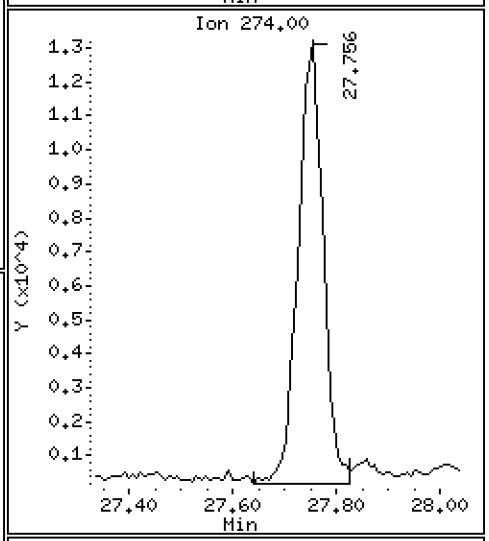


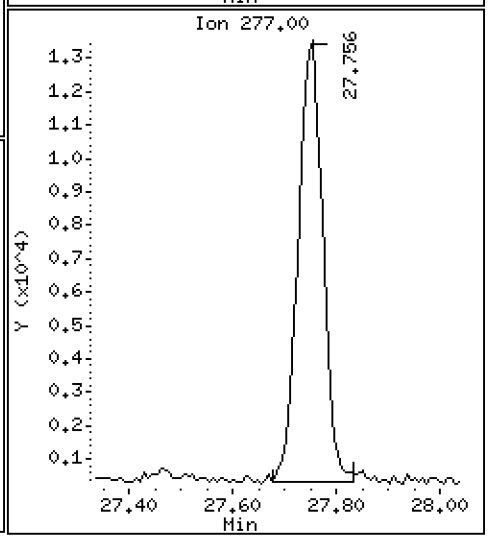












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

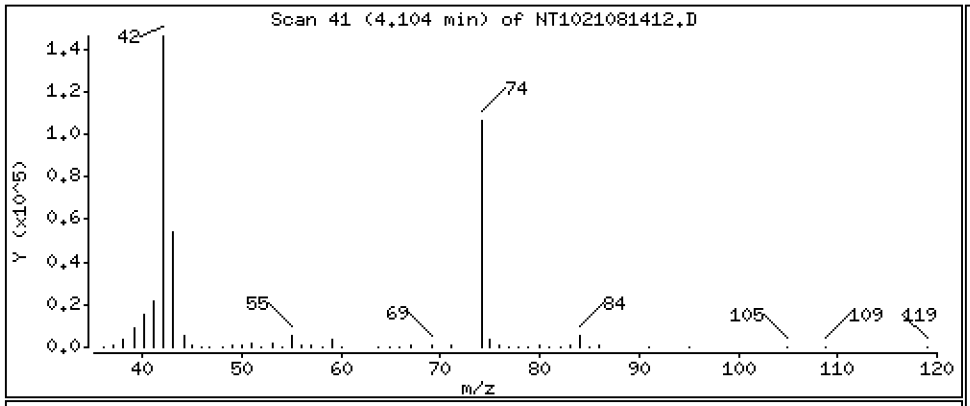
Operator: VTS

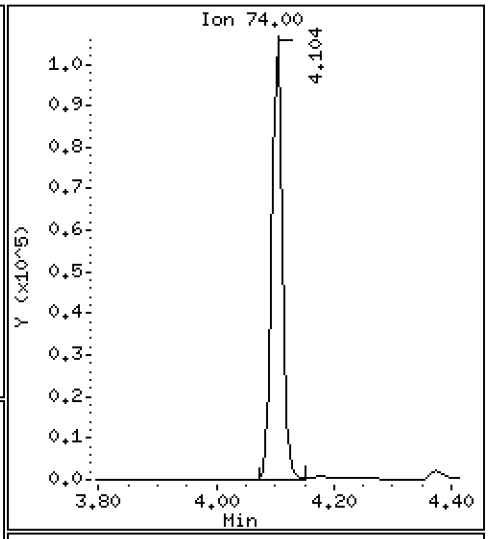
Column phase: ZB-5msi

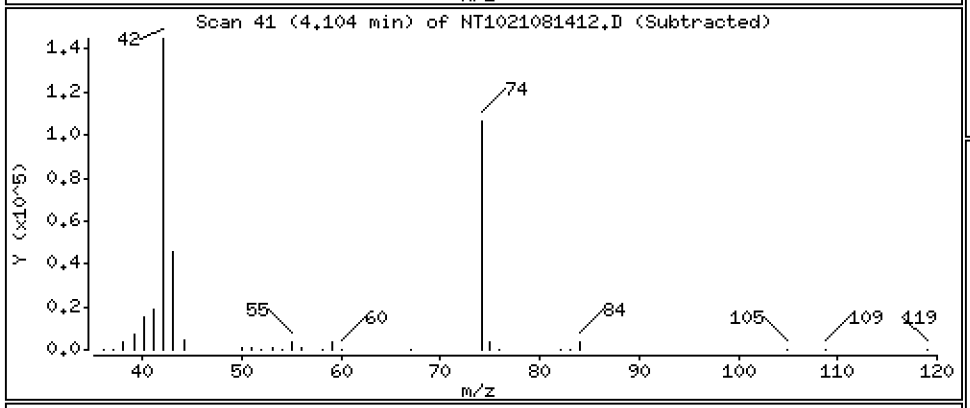
Column diameter: 0.25

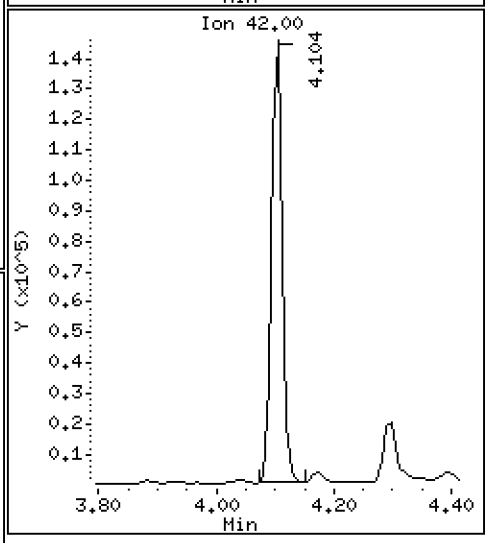
90 N-Nitrosodimethylamine

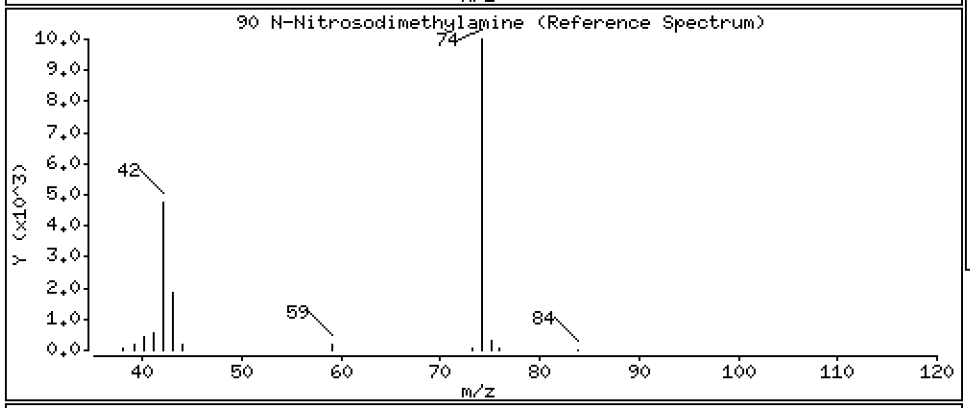
Concentration: 5.762 ug/mL

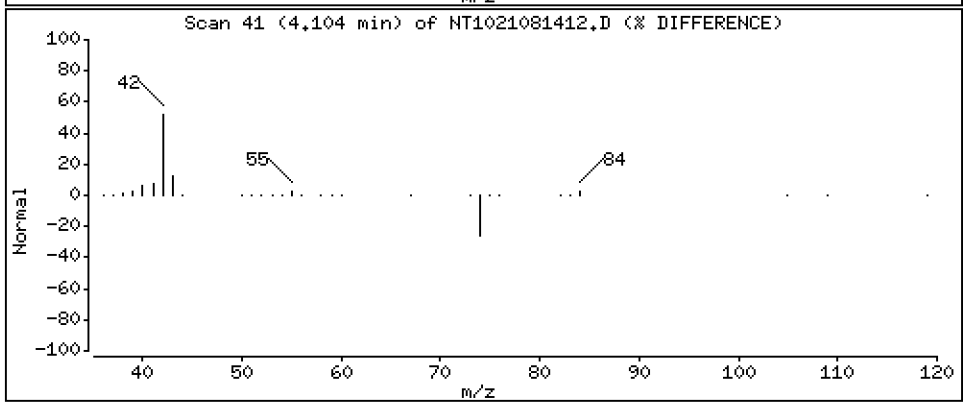












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

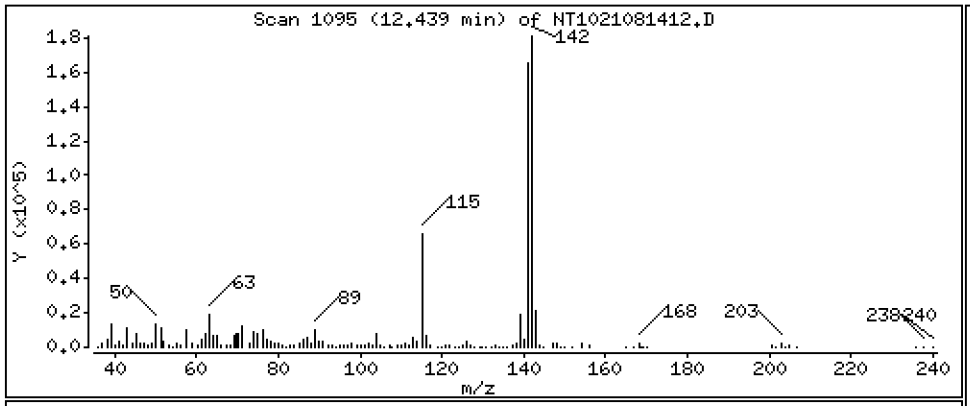
Operator: VTS

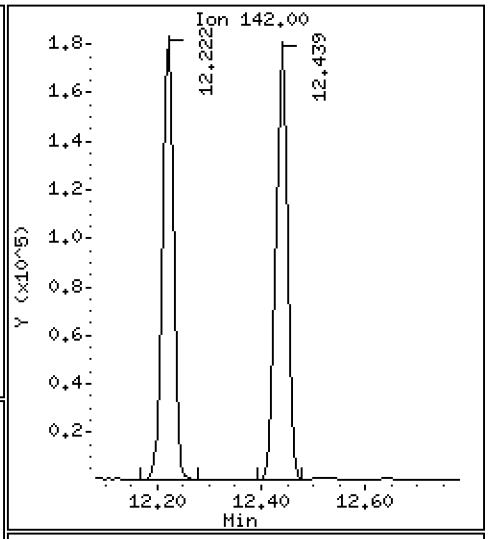
Column phase: ZB-5msi

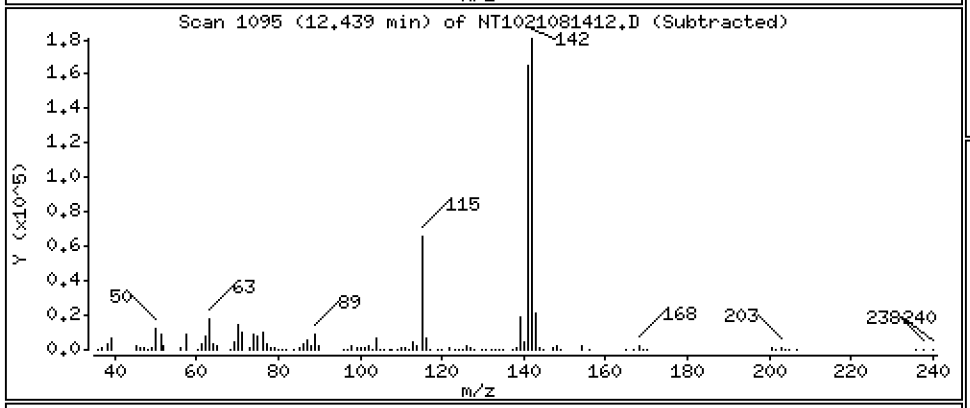
Column diameter: 0.25

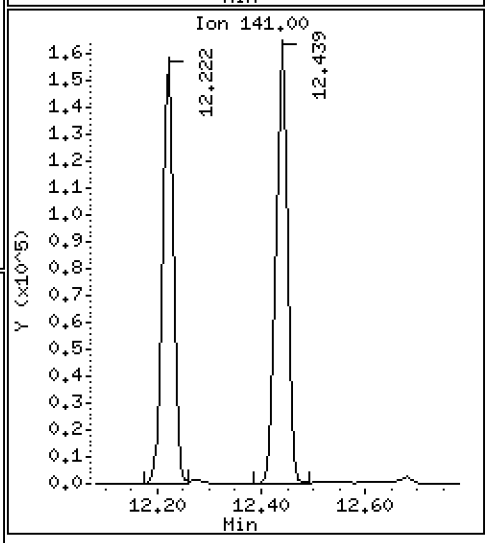
105 1-methylnaphthalene

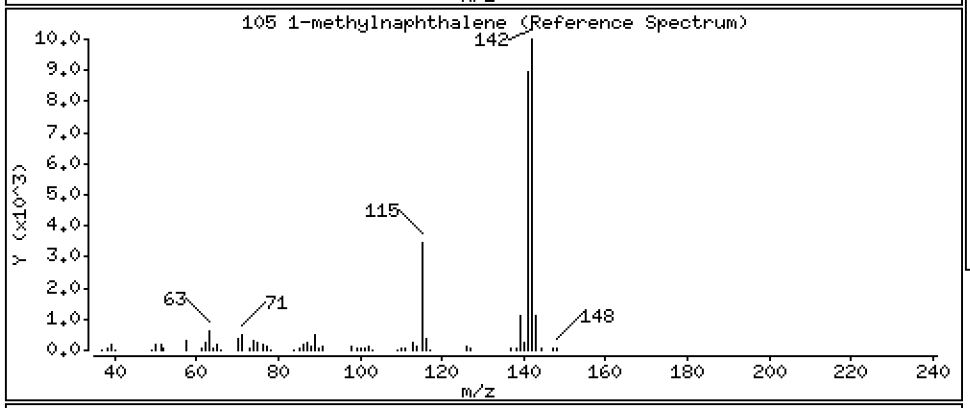
Concentration: 3.808 ug/mL

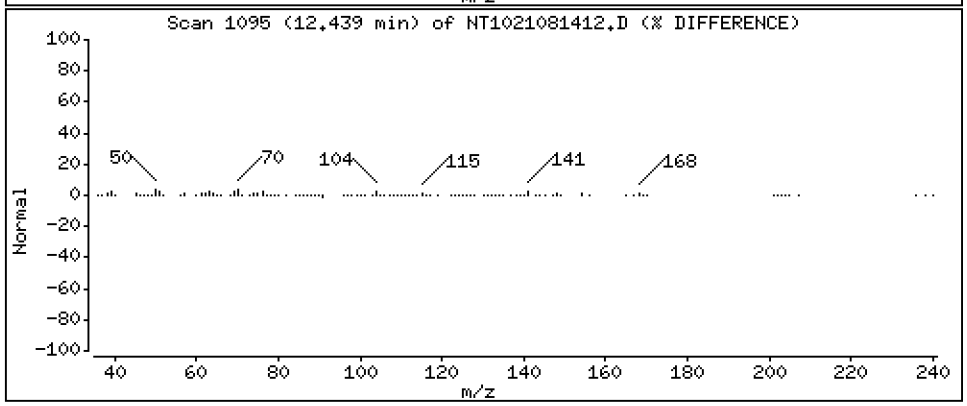












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

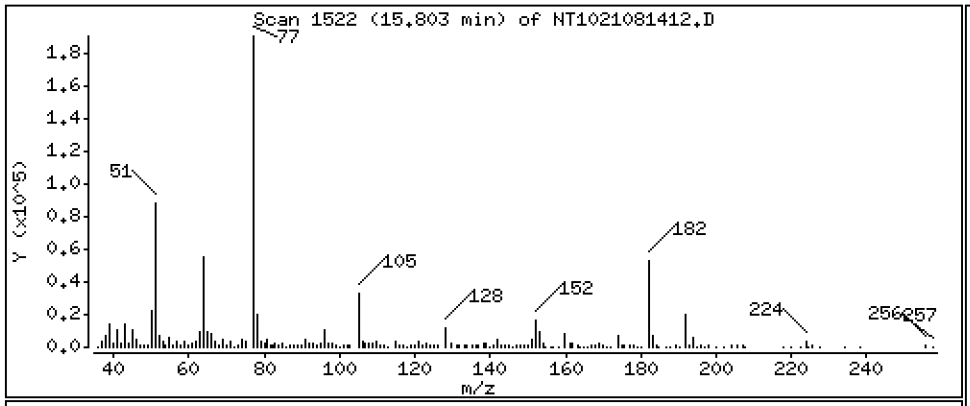
Operator: VTS

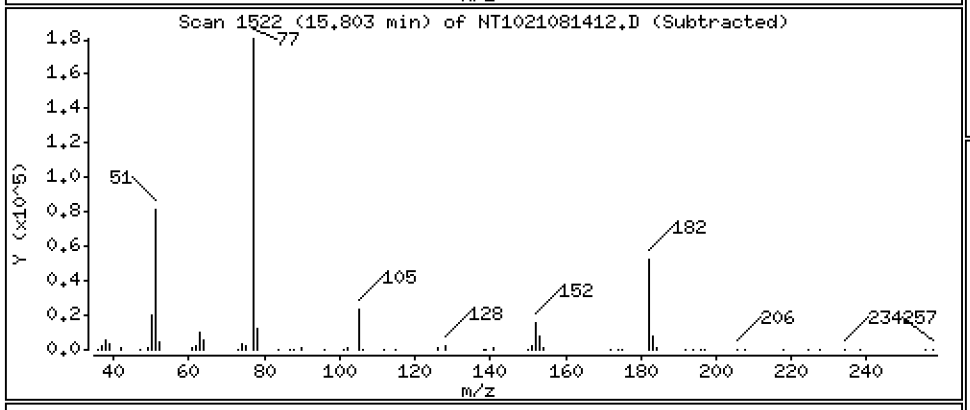
Column phase: ZB-5msi

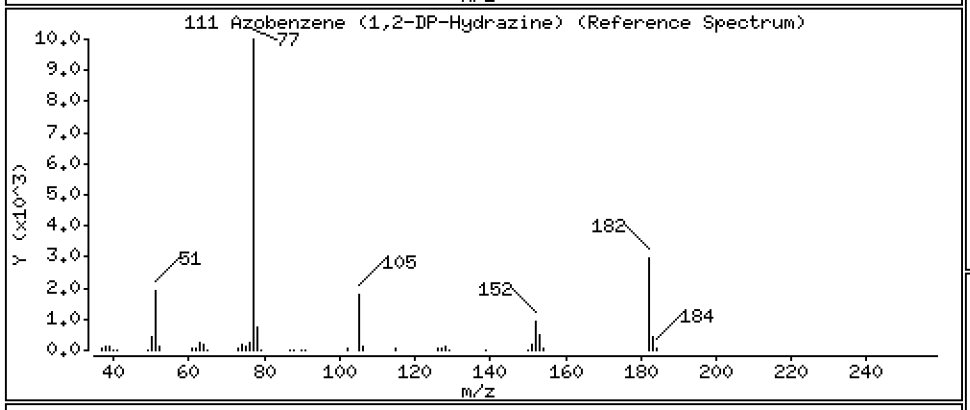
Column diameter: 0.25

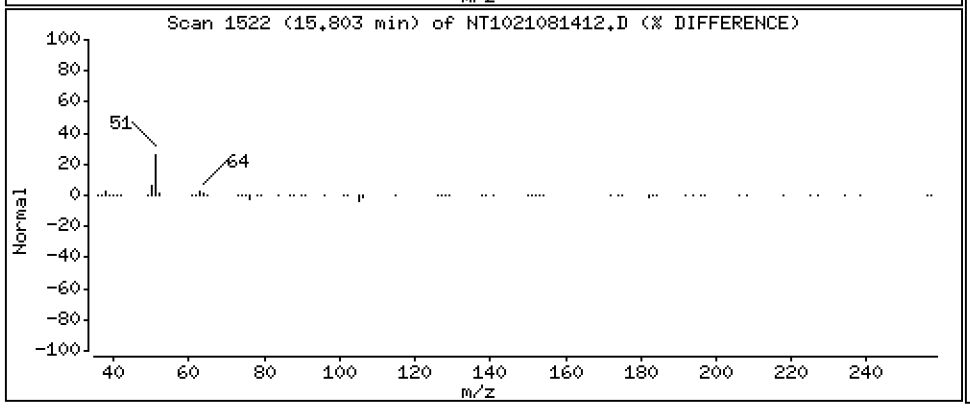
111 Azobenzene (1,2-DP-Hydrazine)

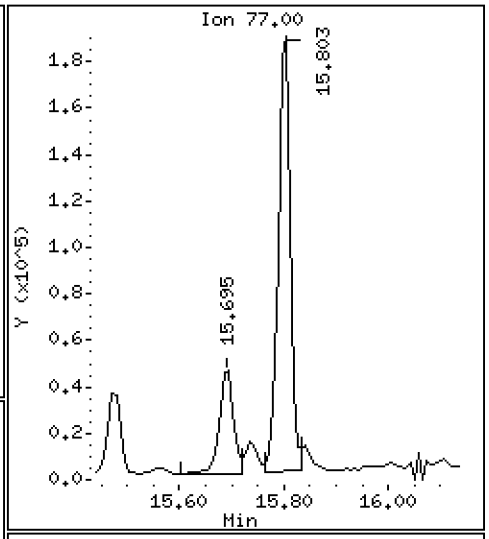
Concentration: 3.864 ug/mL

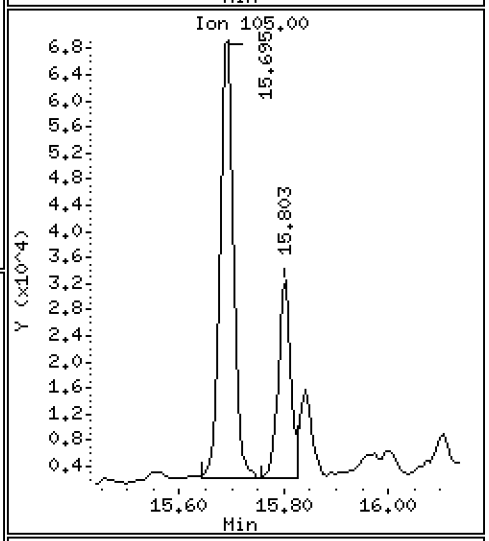


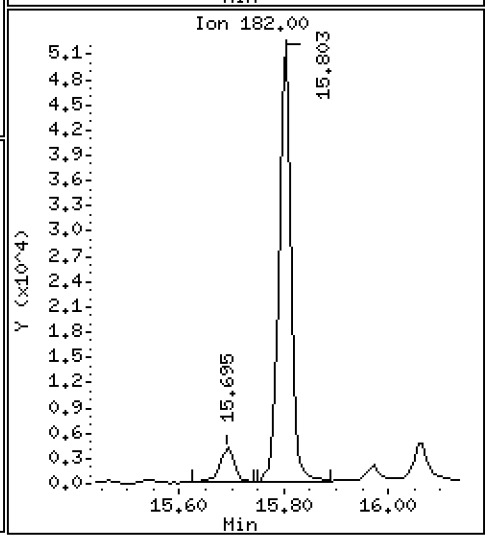












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

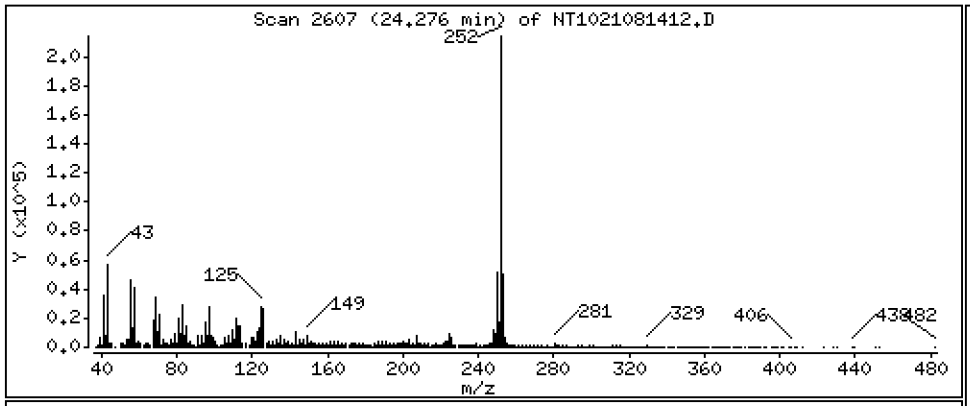
Operator: VTS

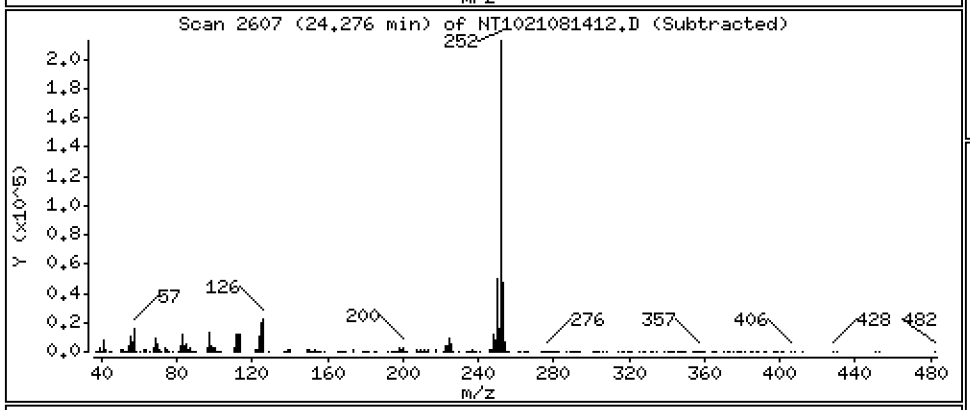
Column phase: ZB-5msi

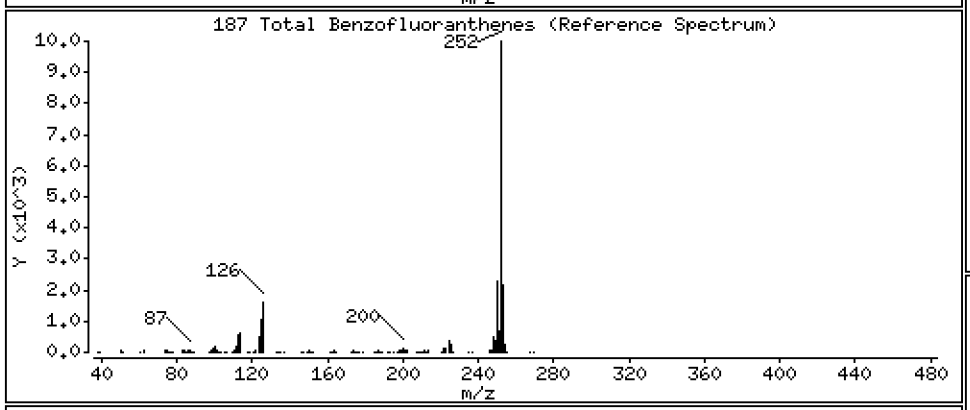
Column diameter: 0.25

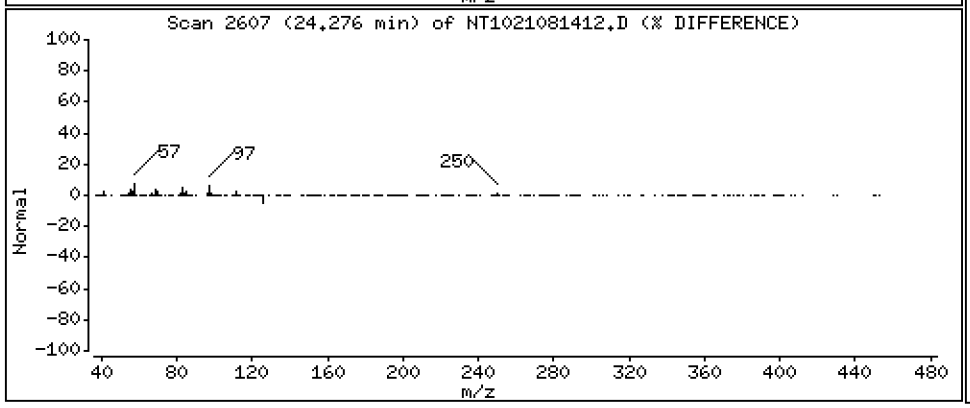
187 Total Benzofluoranthenes

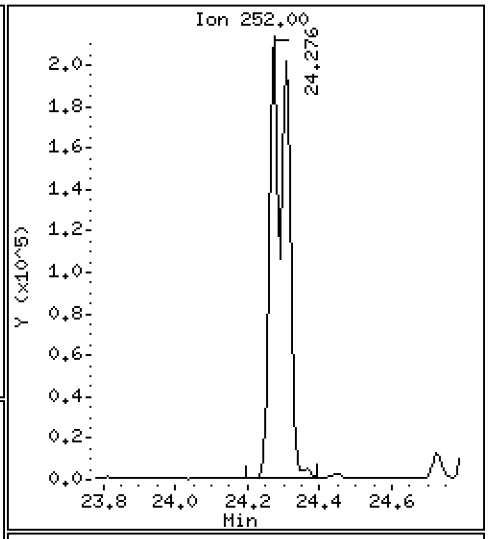
Concentration: 9.459 ug/mL

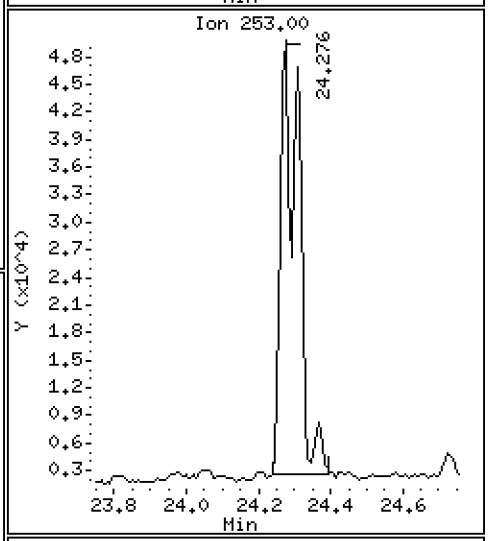


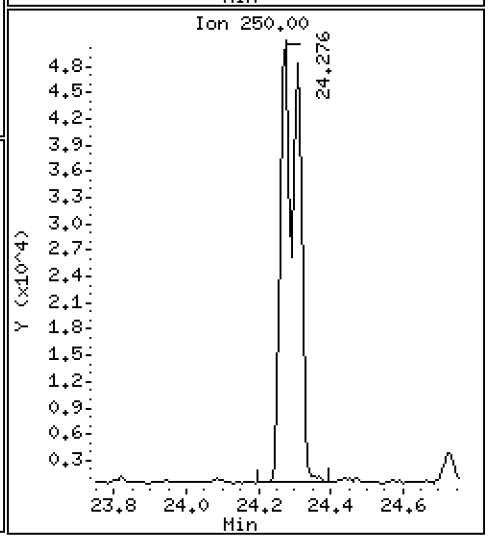












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Date : 14-AUG-2021 16:32

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-MSD1

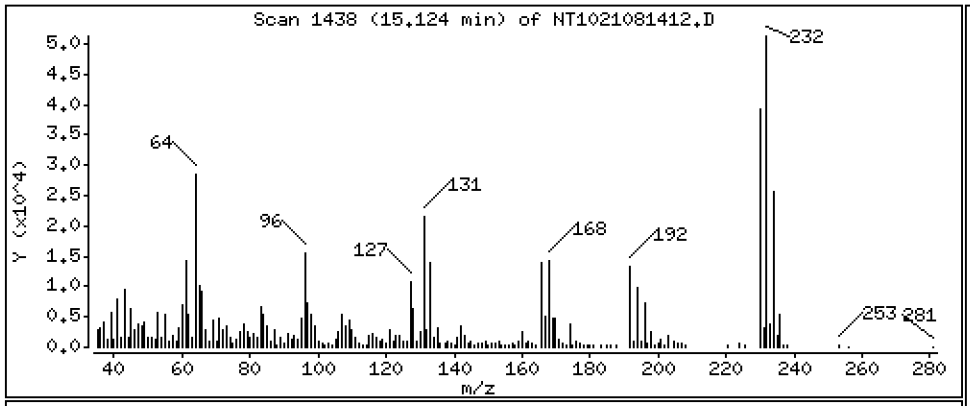
Operator: VTS

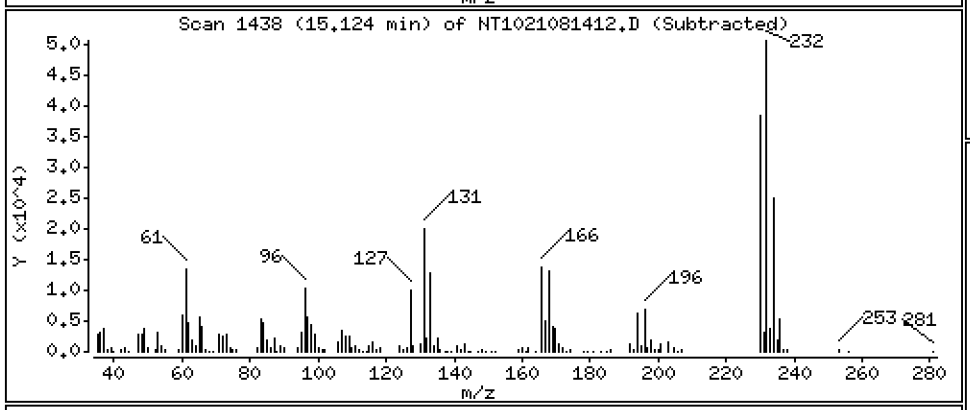
Column phase: ZB-5msi

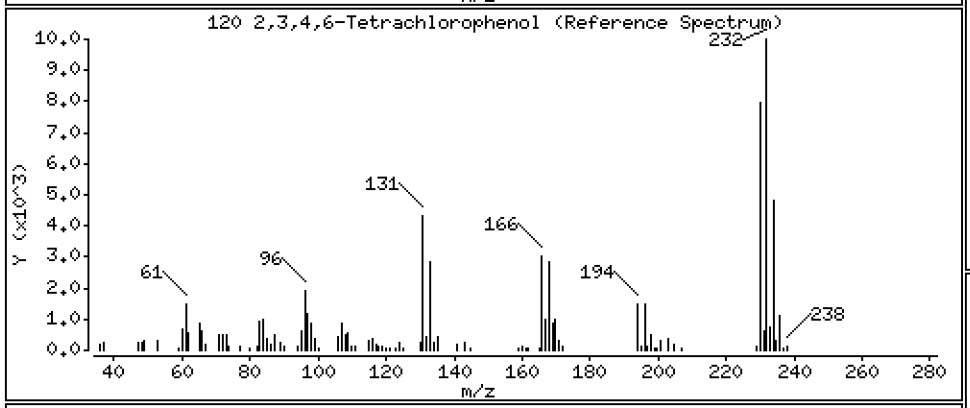
Column diameter: 0.25

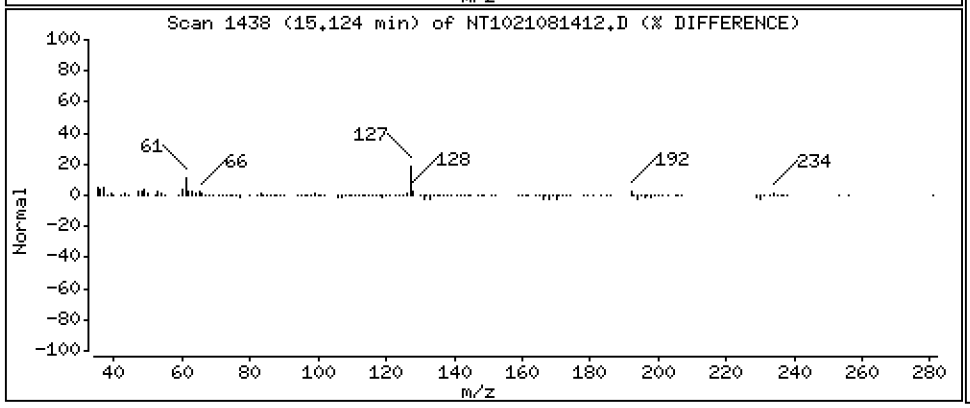
120 2,3,4,6-Tetrachlorophenol

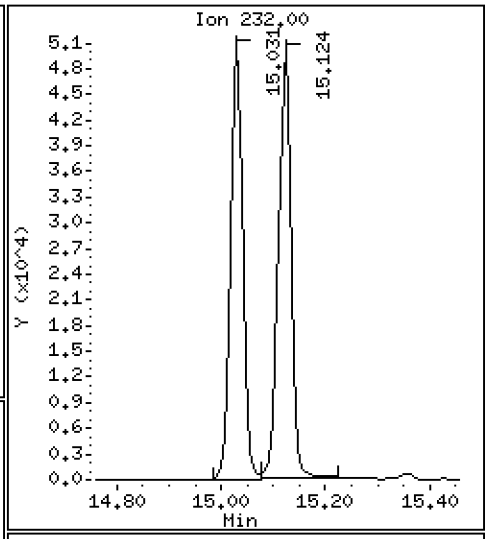
Concentration: 4.886 ug/mL

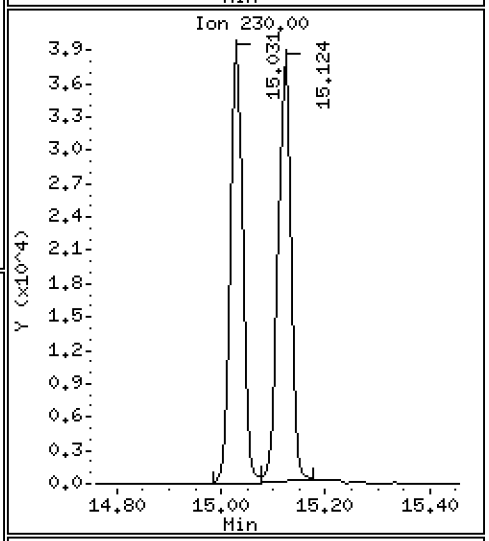


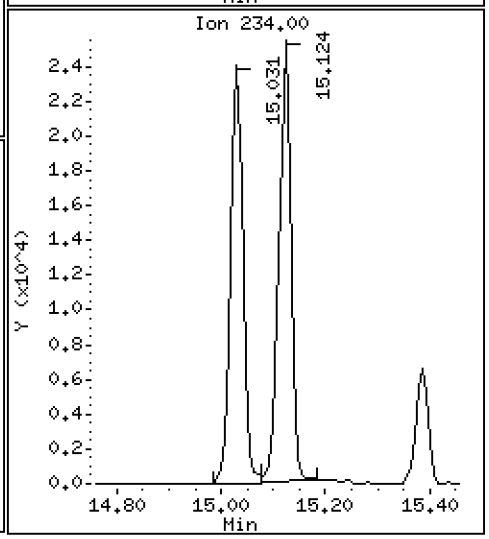












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210814.b\NT1021081412.D
Lab Smp Id: BJH0004-MSD1
Inj Date : 14-AUG-2021 16:32
Operator : VTS Inst ID: nt10.i
Smp Info : BJH0004-MSD1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 12
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$ 1 2-Fluorophenol	112	6.235	6.204	(0.746)	143204	4.25782	4.258
$ 2 Phenol-d5	99	7.811	7.788	(0.934)	225989	4.52699	4.527
3 Phenol	94	7.827	7.811	(0.936)	138986	3.18508	3.185
$ 5 2-Chlorophenol-d4	132	8.020	8.004	(0.959)	183364	5.20995	5.210
4 Bis(2-Chloroethyl)ether	93	7.935	7.935	(0.949)	111237	3.19164	3.192
6 2-Chlorophenol	128	8.043	8.035	(0.962)	131679	3.98670	3.987
7 1,3-Dichlorobenzene	146	8.291	8.283	(0.992)	115936	3.19533	3.195
* 8 1,4-Dichlorobenzene-d4	152	8.361	8.353	(1.000)	85463	4.00000	
9 1,4-Dichlorobenzene	146	8.392	8.384	(1.004)	106431	3.43562	3.436
$ 10 1,2-Dichlorobenzene-d4	152	8.710	8.702	(1.042)	69211	3.05750	3.057
12 1,2-Dichlorobenzene	146	8.733	8.726	(1.045)	110109	3.36016	3.360
11 Benzyl alcohol	108	8.656	8.648	(1.035)	86859	4.25167	4.252
14 2,2'-oxybis(1-Chloropropane)	121	8.943	8.935	(1.070)	36673	2.91719	2.917
13 2-Methylphenol	108	8.912	8.896	(1.066)	94329	3.47293	3.473
17 Hexachloroethane	117	9.300	9.300	(1.112)	42710	3.20733	3.207
16 N-Nitroso-di-n-propylamine	70	9.199	9.191	(1.100)	80538	3.43719	3.437
15 4-Methylphenol	108	9.184	9.160	(1.098)	112620	3.86379	3.864
$ 18 Nitrobenzene-d5	82	9.447	9.440	(0.875)	136400	3.56555	3.566
19 Nitrobenzene	77	9.478	9.471	(0.878)	133592	3.53464	3.535
20 Isophorone	82	9.921	9.913	(0.919)	249752	3.50162	3.502
21 2-Nitrophenol	139	10.099	10.091	(0.935)	73754	3.70976	3.710
22 2,4-Dimethylphenol	107	10.193	10.184	(0.944)	302353	10.1971	10.20
23 Bis(2-Chloroethoxy)methane	93	10.363	10.363	(0.960)	128994	3.48422	3.484
24 Benzoic acid	105	10.473	10.430	(0.970)	380153	22.1920	22.19
25 2,4-Dichlorophenol	162	10.566	10.549	(0.978)	301752	12.2820	12.28
26 1,2,4-Trichlorobenzene	180	10.721	10.714	(0.993)	97444	3.50806	3.508
* 27 Naphthalene-d8	136	10.799	10.791	(1.000)	311902	4.00000	
28 Naphthalene	128	10.837	10.837	(1.004)	301585	3.65357	3.654
29 4-Chloroaniline	127	Compound Not Detected.					
30 Hexachlorobutadiene	225	11.200	11.192	(1.037)	61514	4.05603	4.056
31 4-Chloro-3-methylphenol	107	11.997	11.982	(1.111)	377746	12.8781	12.88
32 2-Methylnaphthalene	142	12.222	12.214	(1.132)	283972	3.71823	3.718
33 Hexachlorocyclopentadiene	237	12.678	12.671	(0.882)	31187	1.68287	1.683

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	12.864	12.849	(0.895)	283356	14.6782	14.68
	35 2,4,5-Trichlorophenol	196	12.949	12.926	(0.901)	302229	14.6931	14.69
$	36 2-Fluorobiphenyl	172	13.011	13.003	(0.905)	316606	3.92374	3.924
	37 2-Chloronaphthalene	162	13.197	13.189	(0.918)	262998	3.90115	3.901
	38 2-Nitroaniline	65	13.499	13.483	(0.939)	264640	10.4745	10.47
	39 Dimethylphthalate	163	13.932	13.917	(0.969)	271580	4.16488	4.165
	40 Acenaphthylene	152	14.064	14.048	(0.978)	358238	3.73644	3.736
	41 2,6-Dinitrotoluene	165	14.064	14.048	(0.978)	198093	13.3986	13.40
*	42 Acenaphthene-d10	164	14.373	14.358	(1.000)	175711	4.00000	
	43 3-Nitroaniline	138	Compound Not Detected.					
	44 Acenaphthene	153	14.443	14.427	(1.005)	218531	3.92594	3.926
	45 2,4-Dinitrophenol	184	14.551	14.543	(1.012)	38018	4.49179	4.492
	46 Dibenzofuran	168	14.760	14.752	(1.027)	356499	4.14246	4.142
	47 4-Nitrophenol	109	14.752	14.713	(1.026)	109893	15.3971	15.40
	48 2,4-Dinitrotoluene	165	14.860	14.853	(1.034)	274994	13.9239	13.92
	50 Diethylphthalate	149	15.378	15.363	(1.070)	279489	4.52069	4.521
	49 Fluorene	166	15.471	15.456	(1.076)	311517	3.73375	3.734
	51 4-Chlorophenyl-phenylether	204	15.479	15.463	(1.077)	150698	3.10723	3.107
	52 4-Nitroaniline	138	Compound Not Detected.					
	53 4,6-Dinitro-2-methylphenol	198	15.695	15.680	(0.903)	248282	16.3901	16.39
	54 N-Nitrosodiphenylamine	169	15.741	15.726	(0.905)	181024	3.10837	3.108
$	55 2,4,6-Tribromophenol	330	16.011	15.996	(1.114)	112264	7.65416	7.654
	56 4-Bromophenyl-phenylether	248	16.474	16.458	(0.947)	120372	4.06167	4.062
	57 Hexachlorobenzene	284	16.775	16.752	(0.965)	124028	3.98223	3.982
	58 Pentachlorophenol	266	17.147	17.132	(0.986)	165860	12.7211	12.72
*	59 Phenanthrene-d10	188	17.387	17.364	(1.000)	324552	4.00000	
	60 Phenanthrene	178	17.433	17.418	(1.003)	402594	4.58705	4.587
	61 Anthracene	178	17.526	17.503	(1.008)	354234	3.77428	3.774
	62 Carbazole	167	17.890	17.859	(1.029)	359732	3.88255	3.883
	63 Di-n-butylphthalate	149	18.733	18.710	(1.077)	511336	3.56439	3.564
	64 Fluoranthene	202	19.894	19.839	(0.883)	445689	5.30695	5.307
	65 Pyrene	202	20.304	20.265	(0.902)	394139	4.25749	4.257
$	66 Terphenyl-d14	244	20.613	20.590	(0.915)	255327	3.86968	3.870
	67 Butylbenzylphthalate	149	21.573	21.558	(0.958)	143483	4.71197	4.712
	68 Benzo(a)anthracene	228	22.487	22.464	(0.999)	323306	4.29914	4.299
*	69 Chrysene-d12	240	22.518	22.495	(1.000)	201528	4.00000	
	70 3,3'-Dichlorobenzidine	252	Compound Not Detected.					
	71 Chrysene	228	22.557	22.541	(1.002)	285028	4.91603	4.916
	72 bis(2-Ethylhexyl)phthalate	149	22.634	22.619	(0.958)	209160	5.73860	5.739
*	134 Di-n-octylphthalate-d4	153	23.625	23.610	(1.000)	331293	4.00000	
	73 Di-n-octylphthalate	149	23.633	23.617	(1.000)	360890	3.88694	3.887
	74 Benzo(b)fluoranthene	252	24.275	24.252	(0.974)	390744	4.99160	4.992
	75 Benzo(k)fluoranthene	252	24.306	24.283	(0.975)	351658	4.53512	4.535
	76 Benzo(a)pyrene	252	24.817	24.786	(0.996)	288796	4.08208	4.082
*	77 Perylene-d12	264	24.918	24.887	(1.000)	198652	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.103	27.057	(1.088)	248677	3.10577	3.106
	79 Dibenzo(a,h)anthracene	278	27.127	27.072	(1.089)	201449	3.20317	3.203
	80 Benzo(g,h,i)perylene	276	27.756	27.686	(1.114)	182642	2.55616	2.556
	90 N-Nitrosodimethylamine	74	4.104	4.065	(0.491)	132579	5.76196	5.762
	91 Aniline	93	Compound Not Detected.					
	93 Benzidine	184	Compound Not Detected.					
	103 Pyridine	79	Compound Not Detected.					
	105 1-methylnaphthalene	142	12.438	12.431	(1.152)	272902	3.80844	3.808
	111 Azobenzene (1,2-DP-Hydrazine)	77	15.803	15.788	(1.099)	304614	3.86418	3.864

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	CONCENTRATIONS FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.275	24.283	(0.974)	711019	9.45859	9.459
120 2,3,4,6-Tetrachlorophenol	232	15.123	15.108	(1.052)	92485	4.88554	4.886

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081412.D
Lab Smp Id: BJH0004-MSD1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	85463	0.48
27 Naphthalene-d8	291658	145829	583316	311902	6.94
42 Acenaphthene-d10	163642	81821	327284	175711	7.38
59 Phenanthrene-d10	304099	152050	608198	324552	6.73
69 Chrysene-d12	199453	99727	398906	201528	1.04
134 Di-n-octylphthala	303639	151820	607278	331293	9.11
77 Perylene-d12	200082	100041	400164	198652	-0.71

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.36	0.09
27 Naphthalene-d8	10.79	10.29	11.29	10.80	0.07
42 Acenaphthene-d10	14.36	13.86	14.86	14.37	0.11
59 Phenanthrene-d10	17.36	16.86	17.86	17.39	0.13
69 Chrysene-d12	22.50	22.00	23.00	22.52	0.10
134 Di-n-octylphthala	23.61	23.11	24.11	23.63	0.07
77 Perylene-d12	24.89	24.39	25.39	24.92	0.12

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081412.D

Lab ID: BJH0004-MSD1
nt10.i, ABN.m, 14-AUG-2021 16:32

RT	CO-ELUTION COMPOUNDS
14.064	Acenaphthylene and 2,6-Dinitrotoluene

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
NONE			

RRT check based on Ccal File: NT1021081402.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Analytical Resources, Incorporated
Analytical Chemists and Consultants

STANDARD REFERENCE MATERIAL RECOVERY

EPA 8270E

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJH0004-SRM1
Batch: BJH0004
Initial/Final: 1 g / 1 mL
Preparation: EPA 3546 (Microwave)
Analyzed: 08/14/2021 13:13
Standard ID: I005667
Expires: 04/30/2022
Standard Lot#: CRM 143 (LRAC2475)
Description: CRM 143 BNAs - Sandy Loam

ANALYTE	TRUE (ug/kg wet)	FOUND (ug/kg wet)	MDL	MRL	Q	SRM % REC.	QC LIMITS REC.
Naphthalene	1920.0	1410	42.4	200		73.5	41 - 159
2-Methylnaphthalene	3600.0	2950	45.1	200		81.9	51 - 149
Acenaphthylene	5450.0	4060	62.4	200		74.5	57 - 142
Acenaphthene	4250.0	3470	52.2	200		81.8	59 - 141
Fluorene	5780.0	4290	146	200	Q	74.2	48 - 152
Phenanthrene	2210.0	1870	87.2	200	Q	84.6	40 - 160
Anthracene	3240.0	2150	71.9	200	Q	66.4	52 - 148
Fluoranthene	4060.0	4110	60.9	200	Q	101	46 - 155
Pyrene	6300.0	5430	56.8	200		86.1	27 - 173
Benzo(a)anthracene	3280.0	2880	59.6	200		88.0	33 - 167
Chrysene	1750.0	1500	60.6	200		85.6	62 - 139
Benzo(a)pyrene	1690.0	1110	42.3	200		65.4	44 - 156
Indeno(1,2,3-cd)pyrene	2670.0	2400	147	200		90.1	27 - 173
Dibenzo(a,h)anthracene	3030.0	2700	172	200		89.2	19 - 181
Benzo(g,h,i)perylene	2550.0	2350	136	200		92.1	40 - 160

* Values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081407.D

Date : 14-AUG-2021 13:13

Client ID:

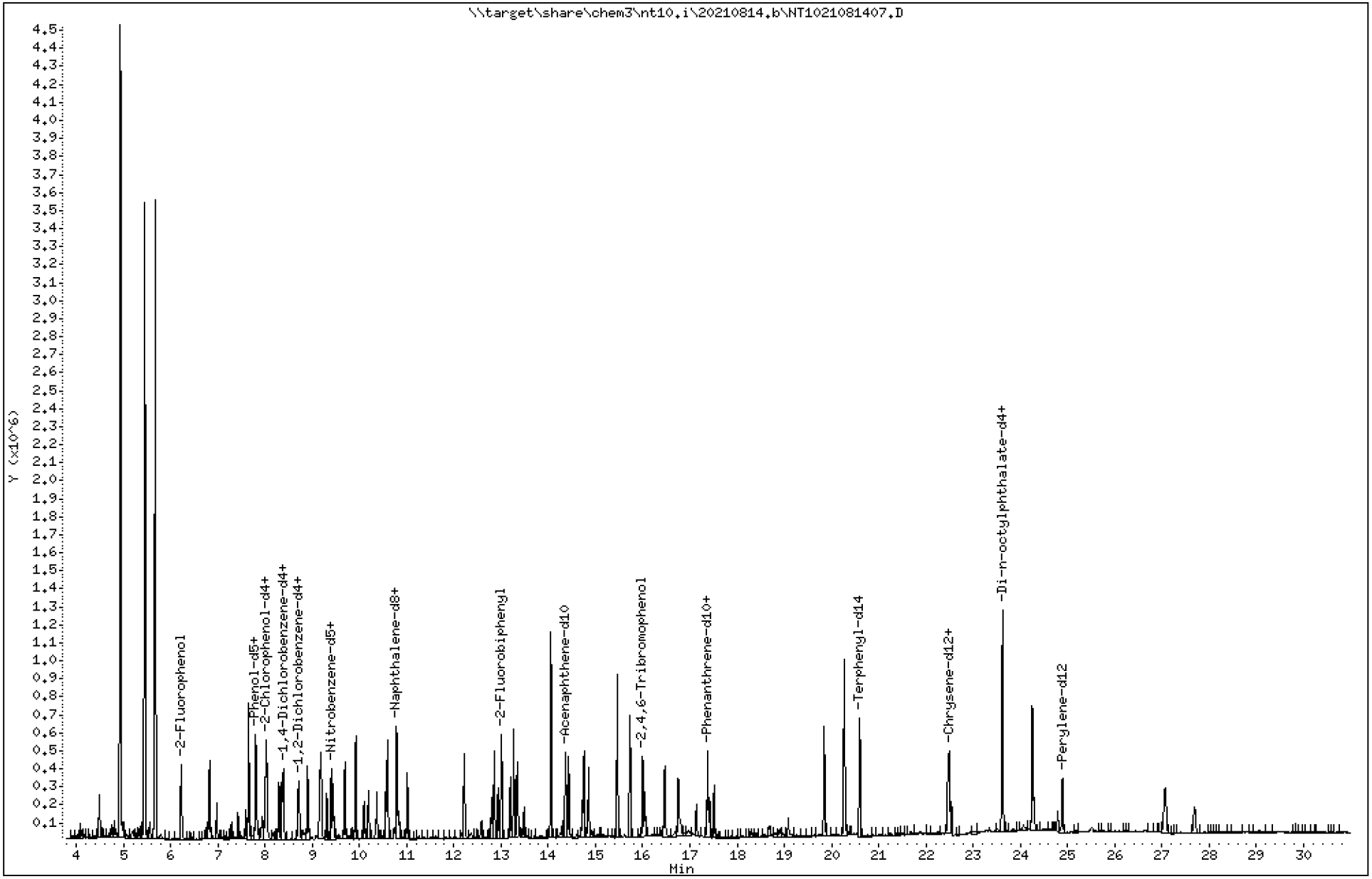
Instrument: nt10.i

Sample Info: BJH0004-SRM1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

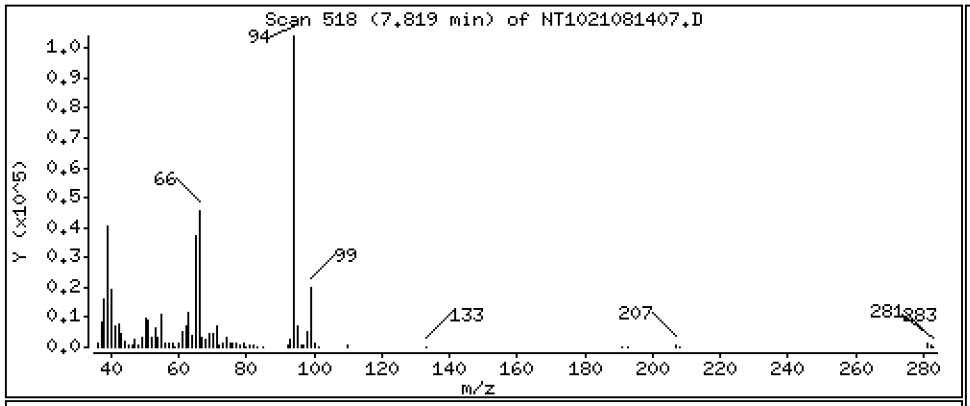
Operator: VTS

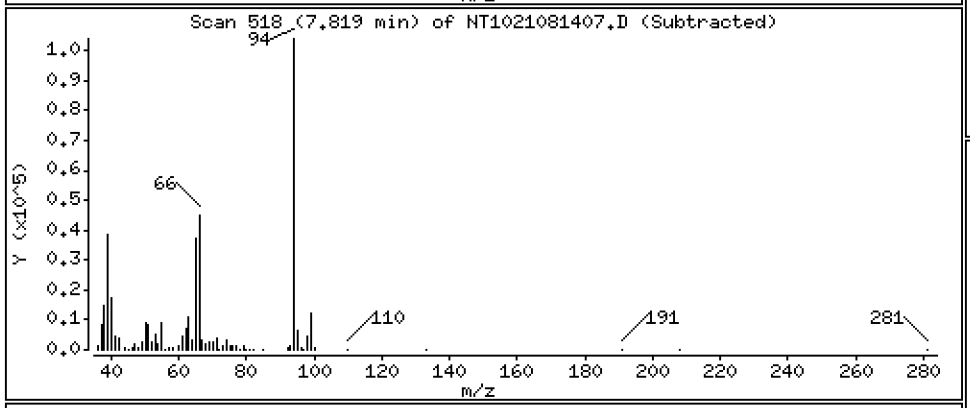
Column phase: ZB-5msi

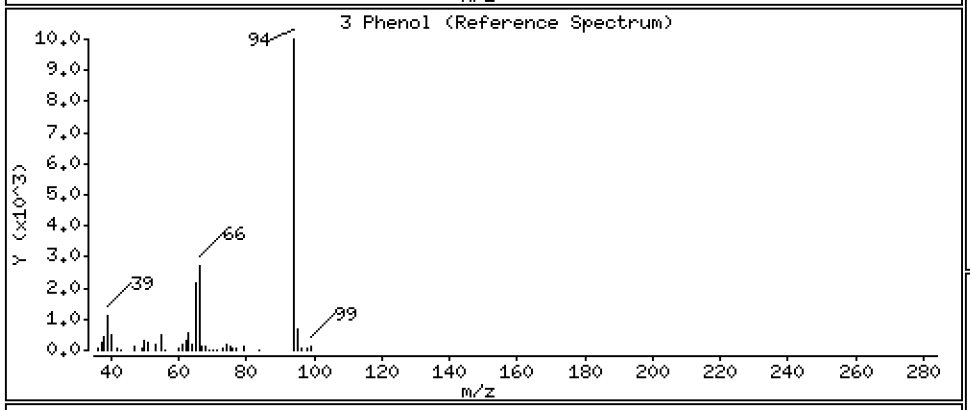
Column diameter: 0.25

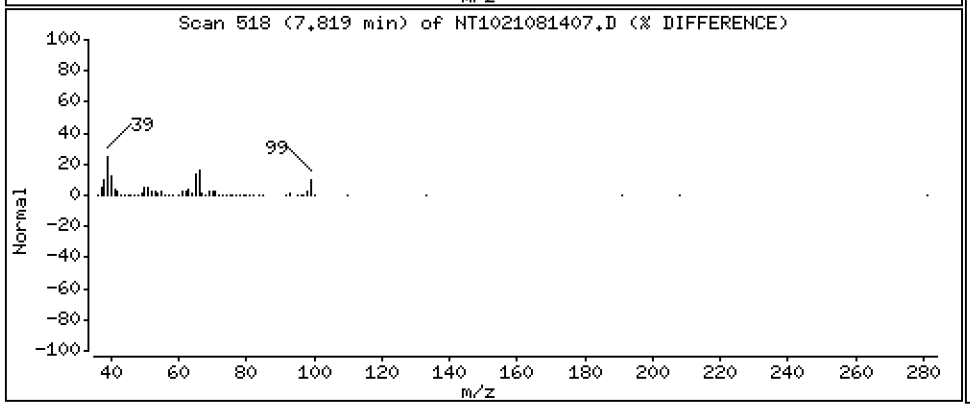
3 Phenol

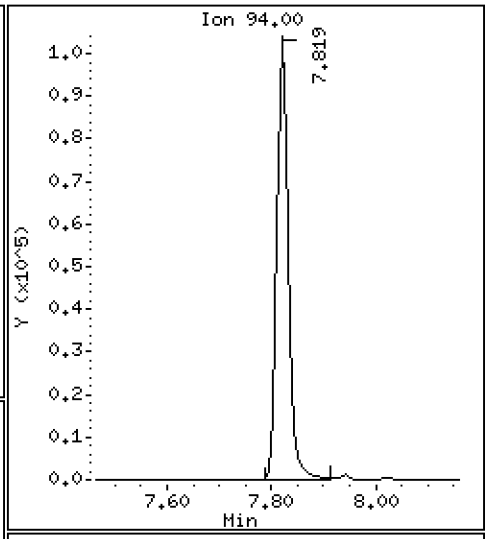
Concentration: 3.761 ug/mL

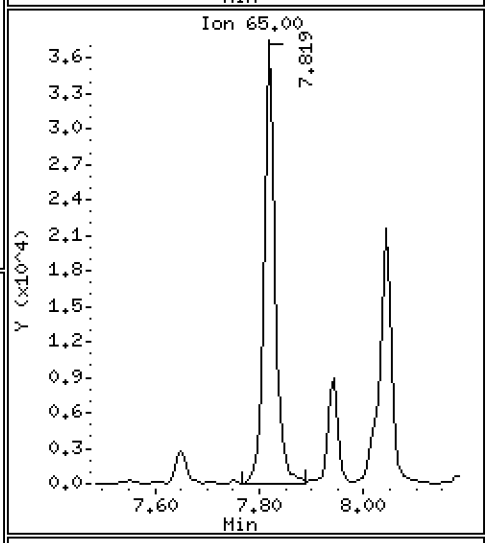


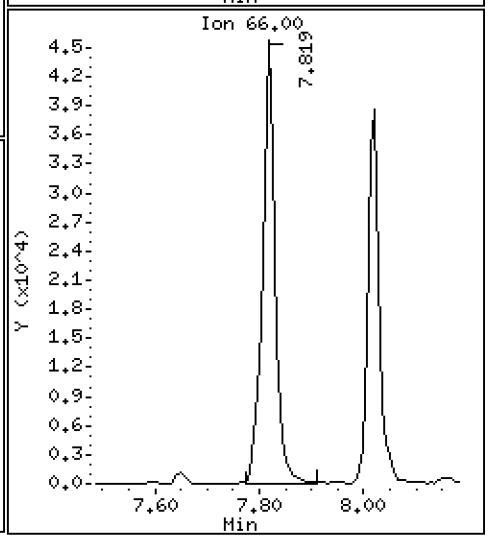












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

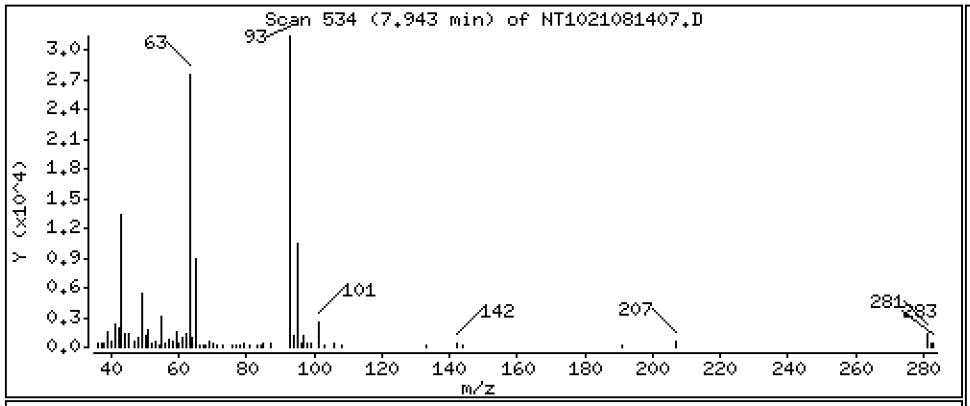
Operator: VTS

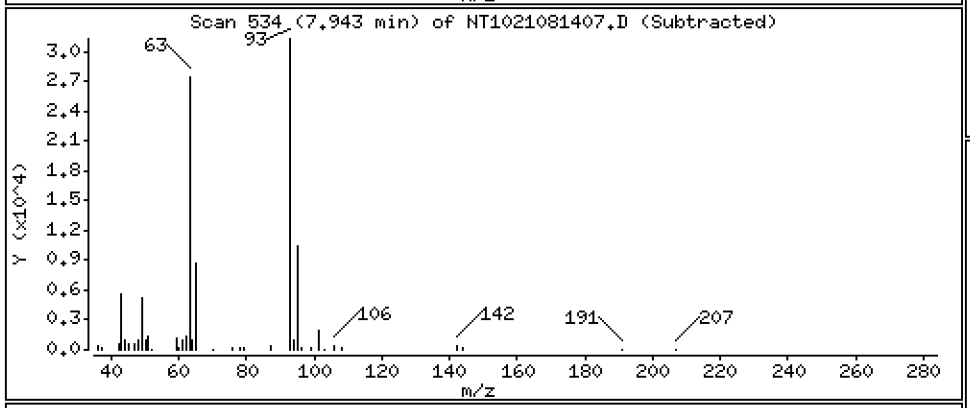
Column phase: ZB-5msi

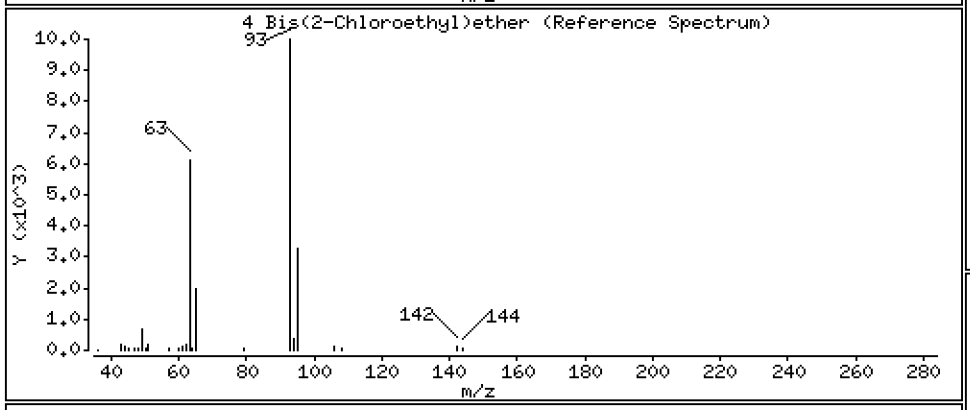
Column diameter: 0.25

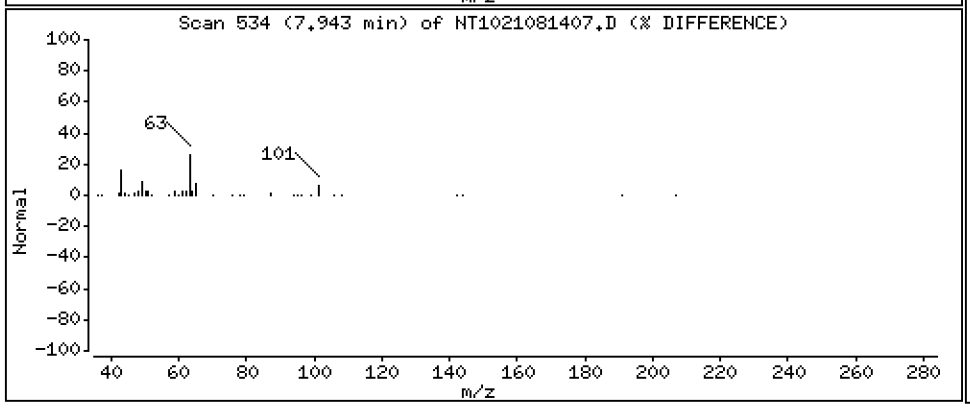
4 Bis(2-Chloroethyl)ether

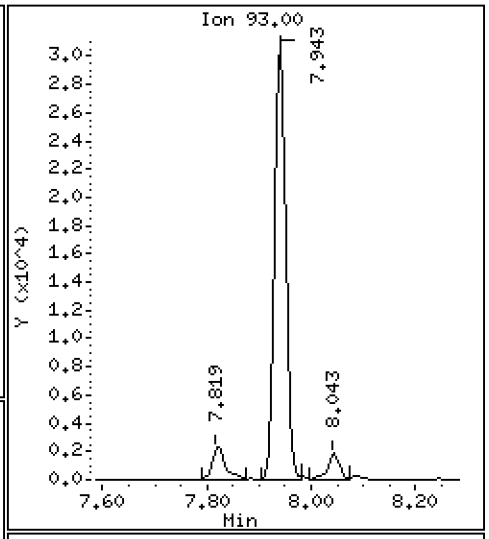
Concentration: 1.376 ug/mL

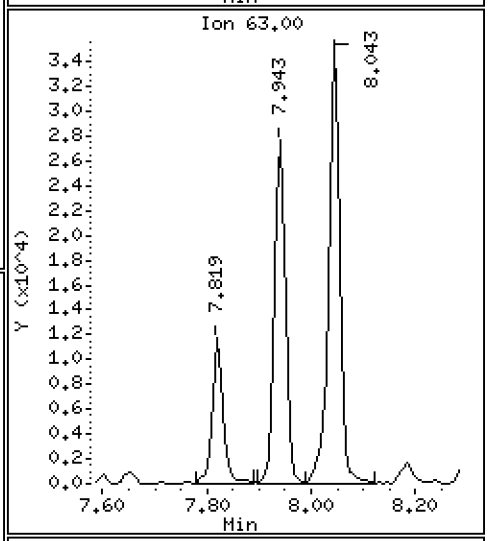


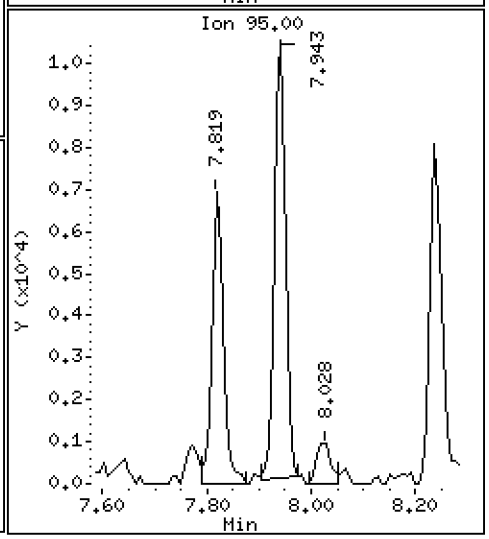












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

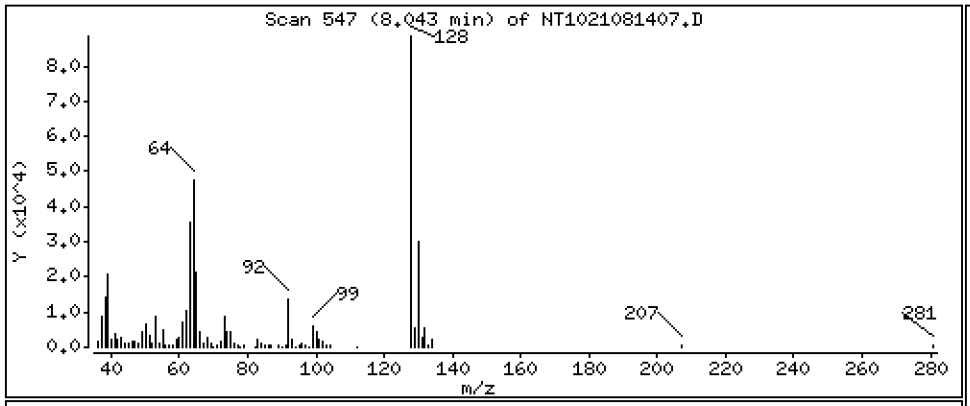
Operator: VTS

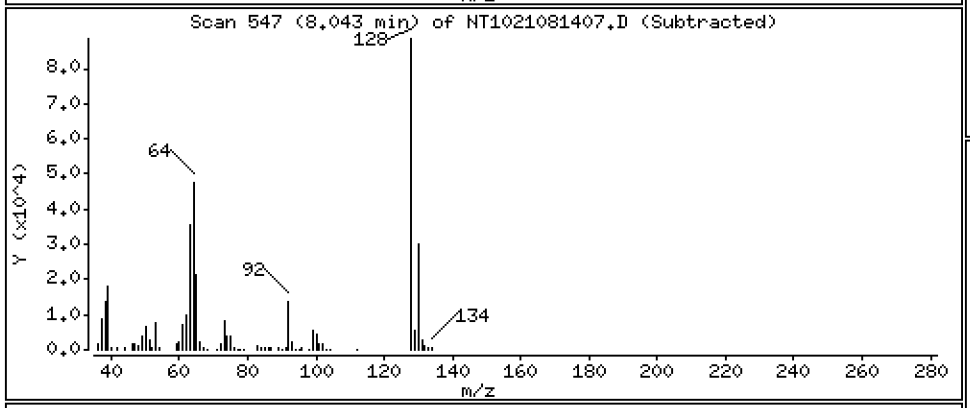
Column phase: ZB-5msi

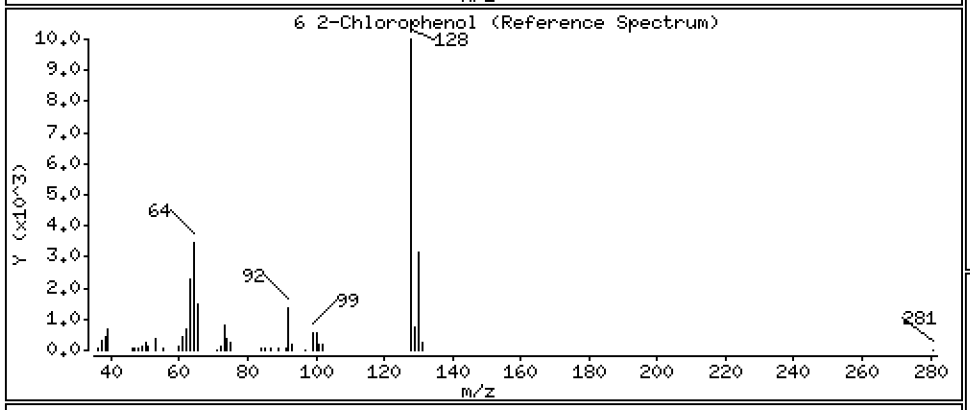
Column diameter: 0.25

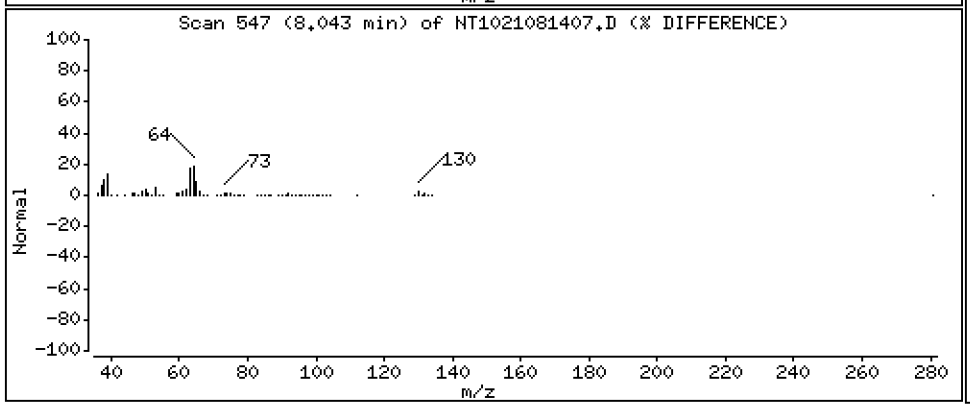
6 2-Chlorophenol

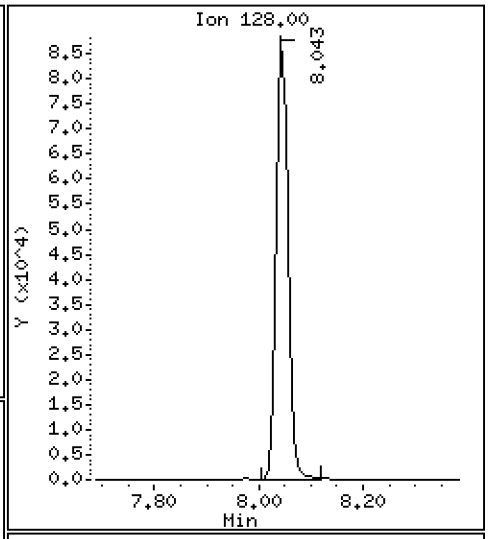
Concentration: 4.997 ug/mL

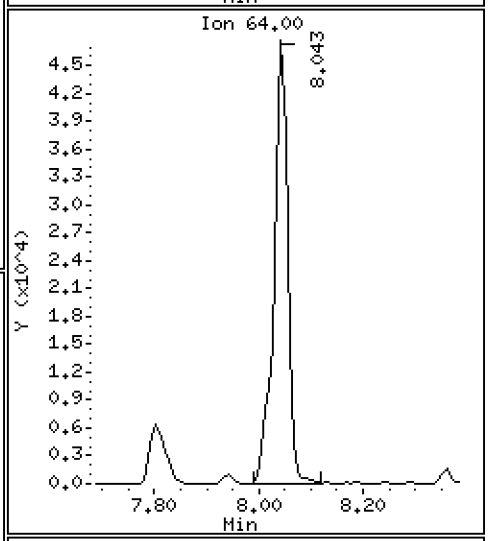


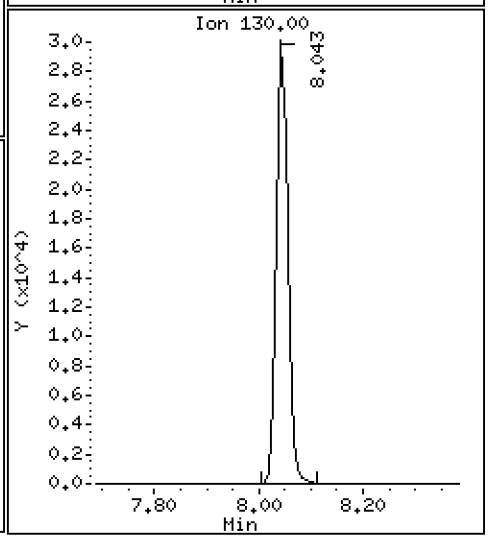












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

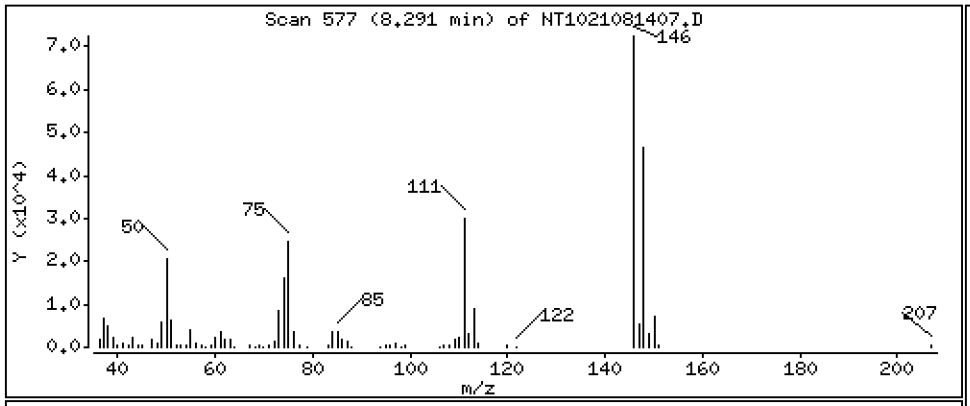
Operator: VTS

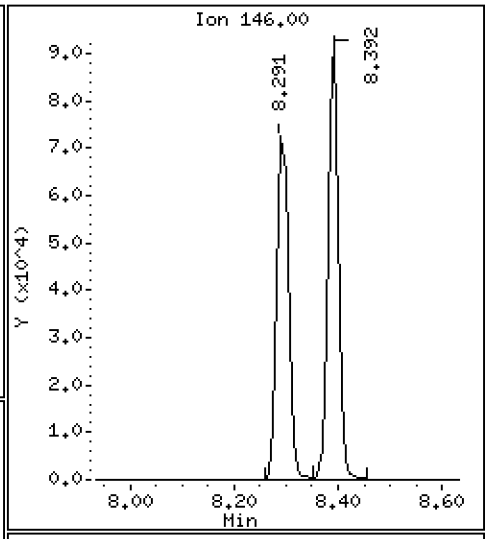
Column phase: ZB-5msi

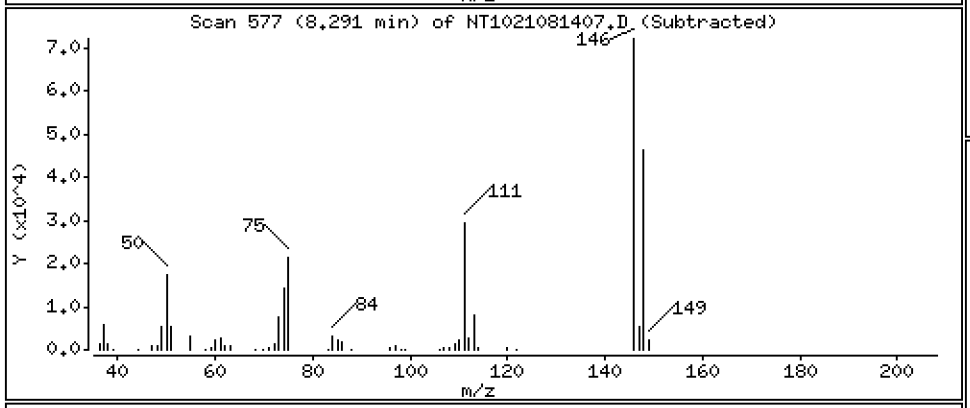
Column diameter: 0.25

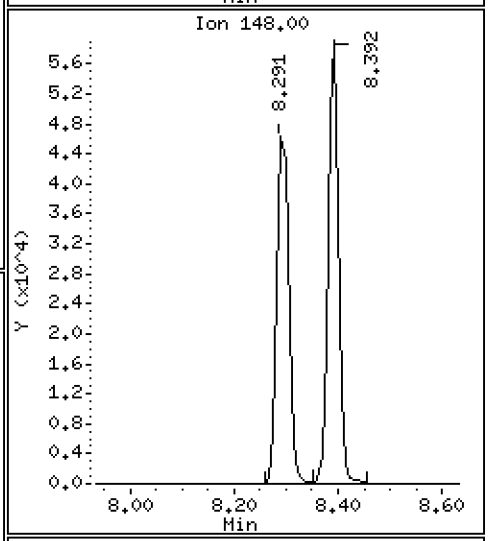
7 1,3-Dichlorobenzene

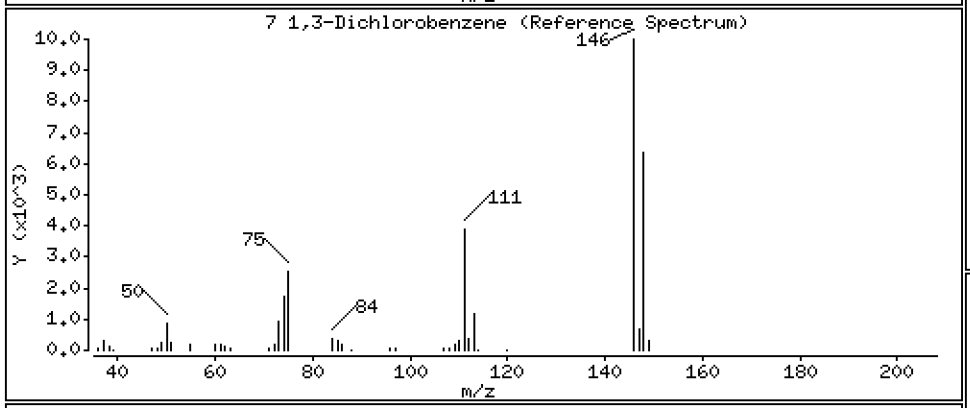
Concentration: 3.332 ug/mL

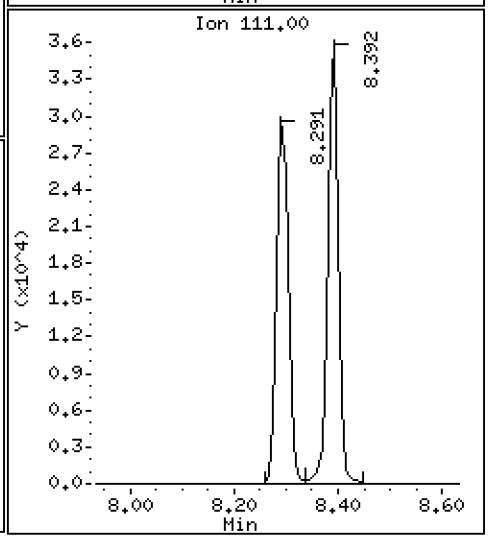


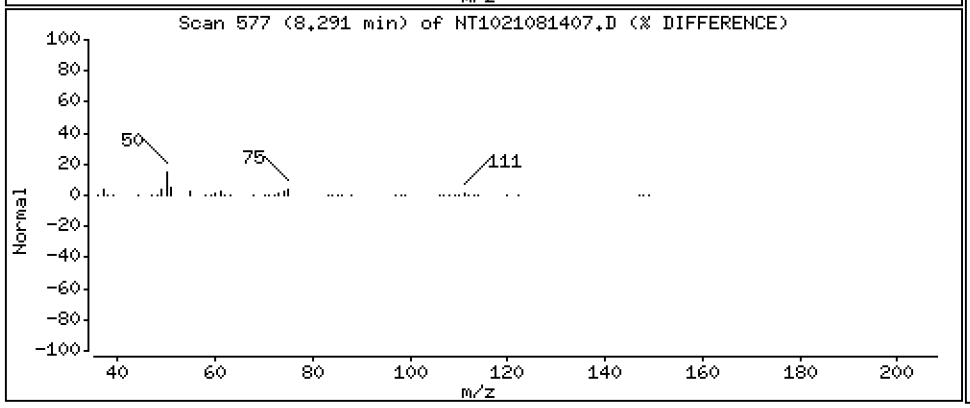












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

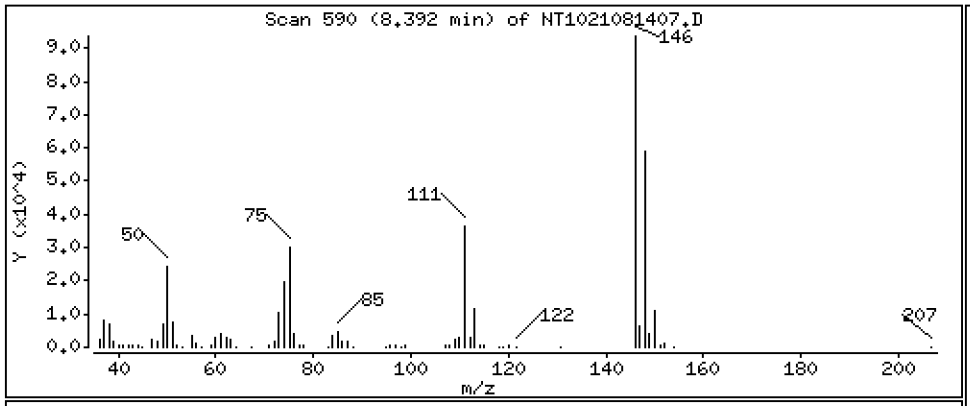
Operator: VTS

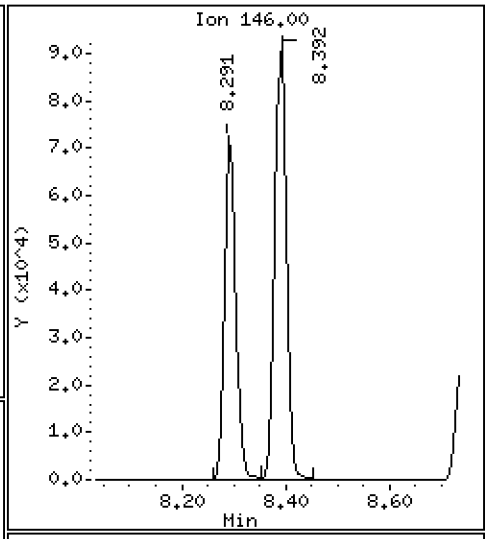
Column phase: ZB-5msi

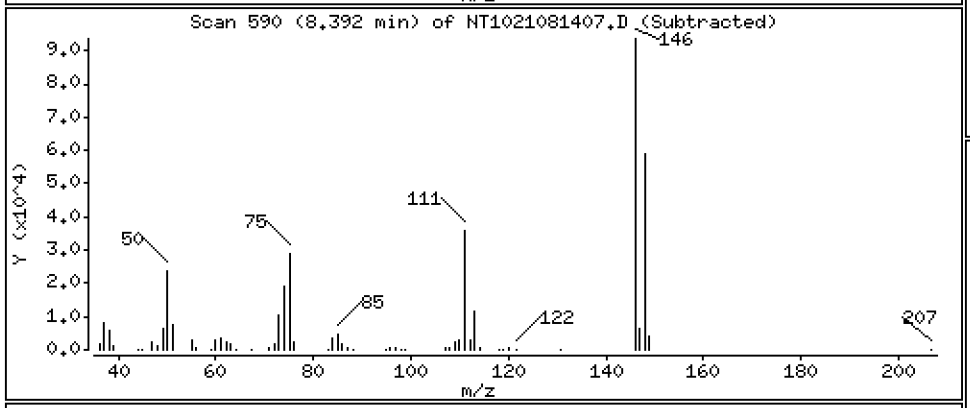
Column diameter: 0.25

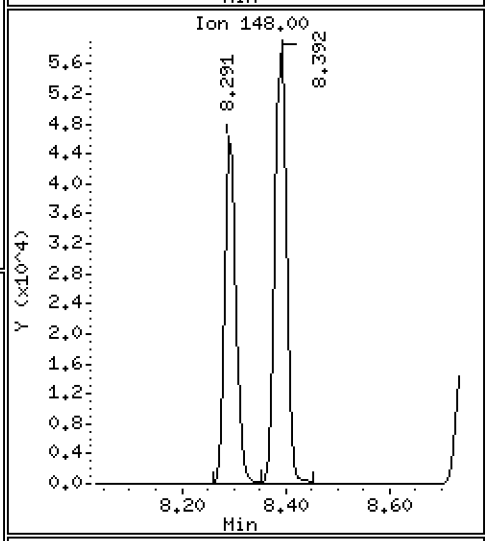
9 1,4-Dichlorobenzene

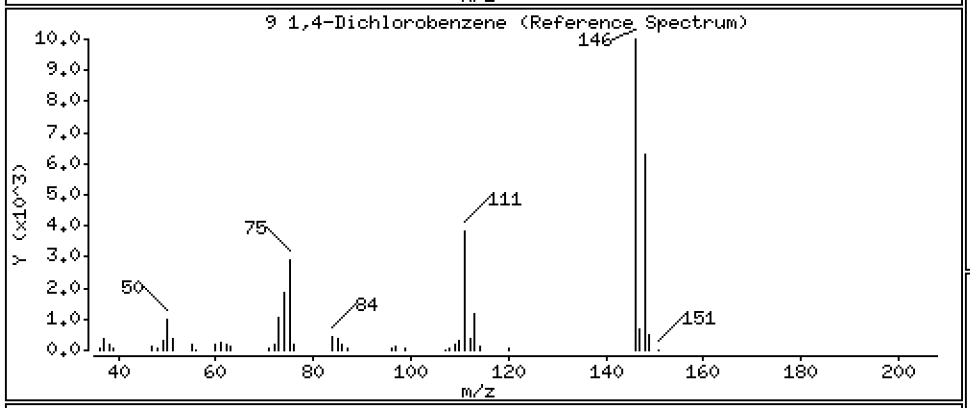
Concentration: 4.778 ug/mL

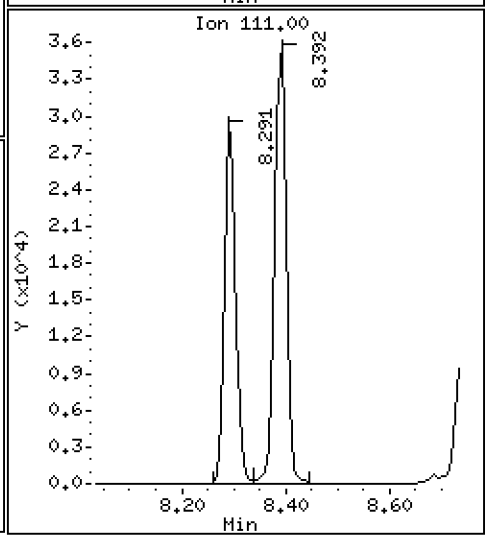


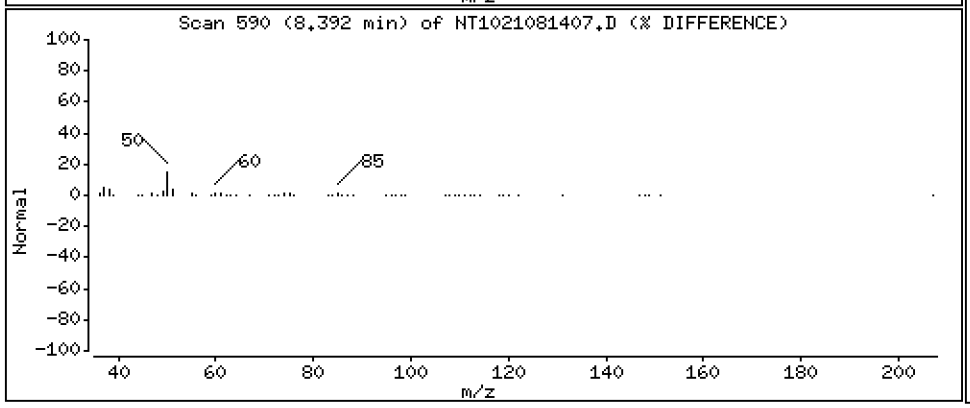












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

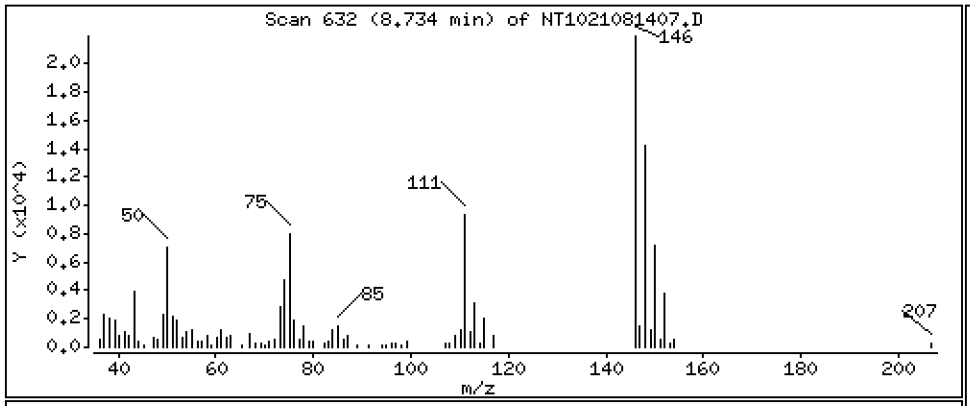
Operator: VTS

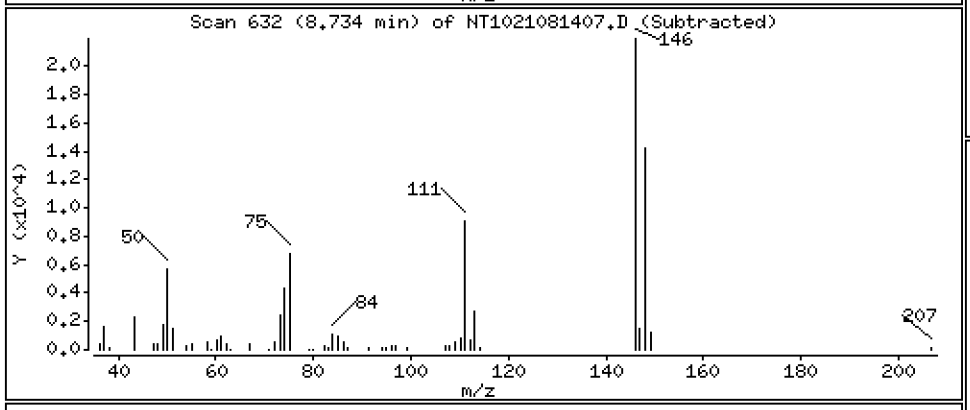
Column phase: ZB-5msi

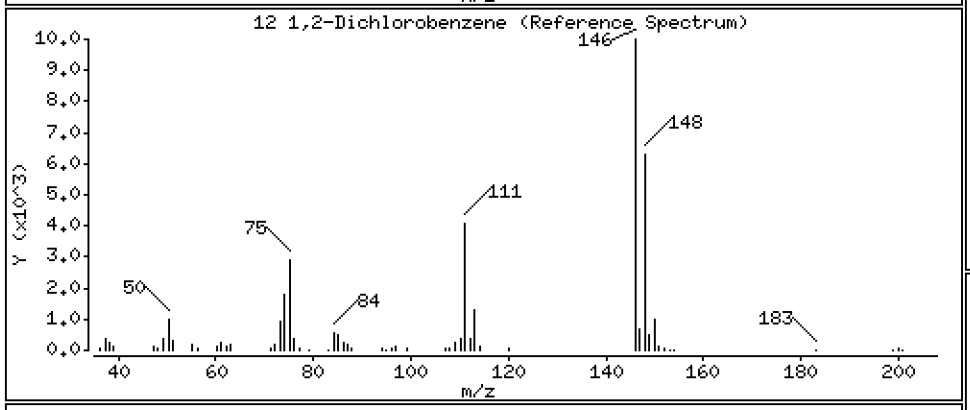
Column diameter: 0.25

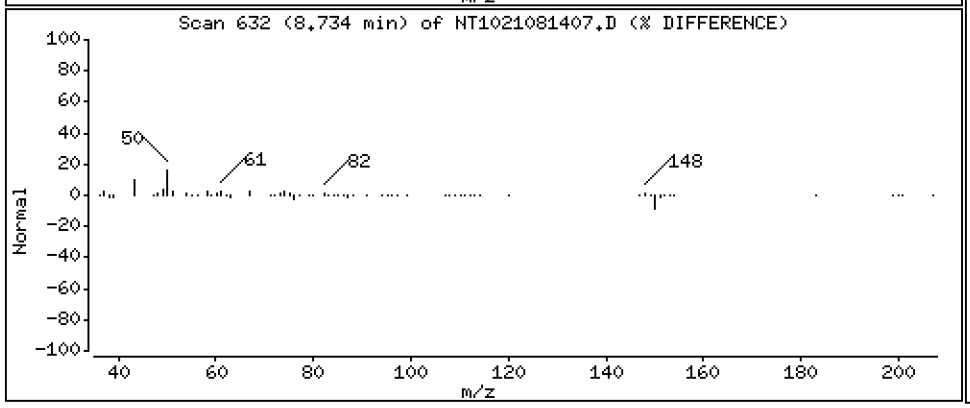
12 1,2-Dichlorobenzene

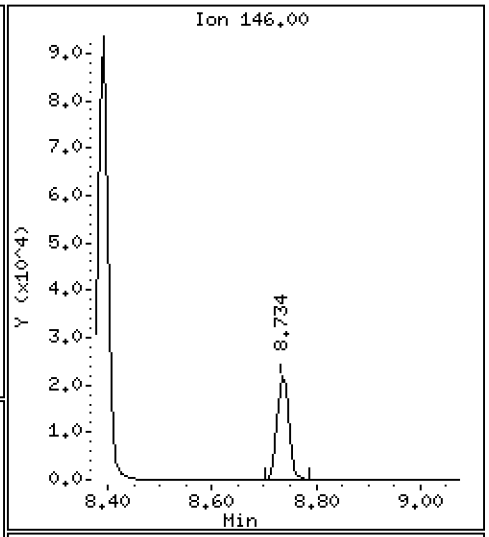
Concentration: 1.106 ug/mL

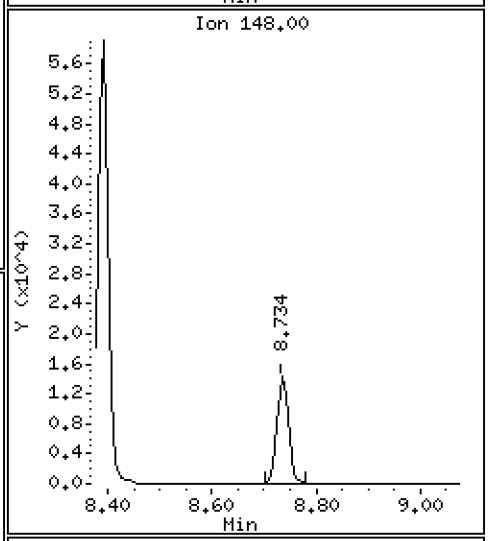


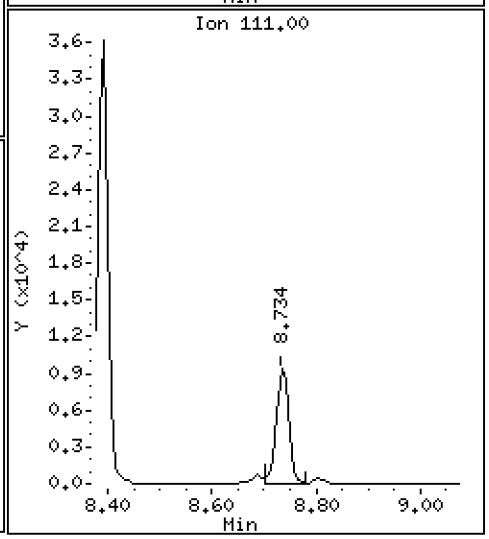












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

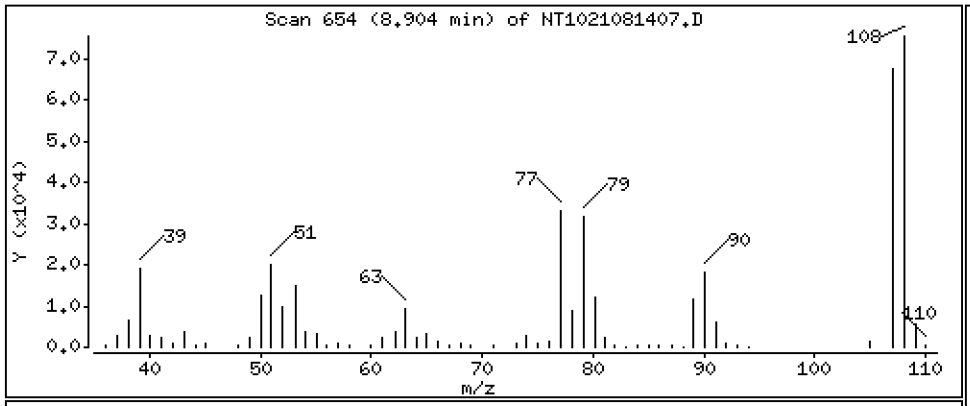
Operator: VTS

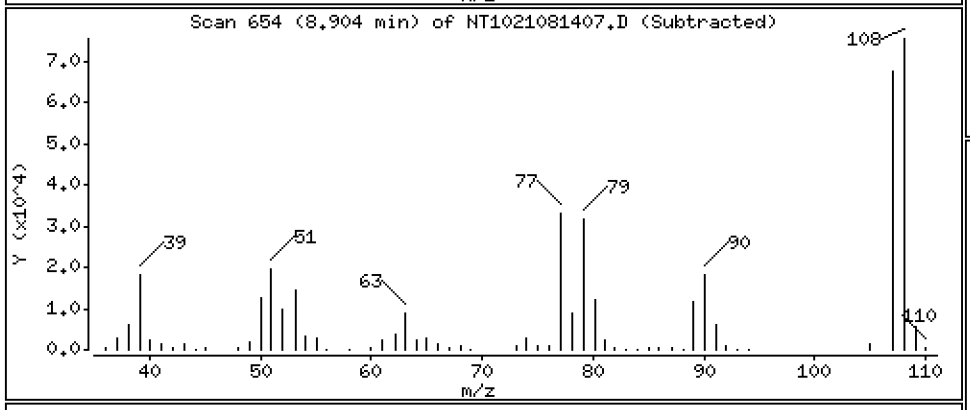
Column phase: ZB-5msi

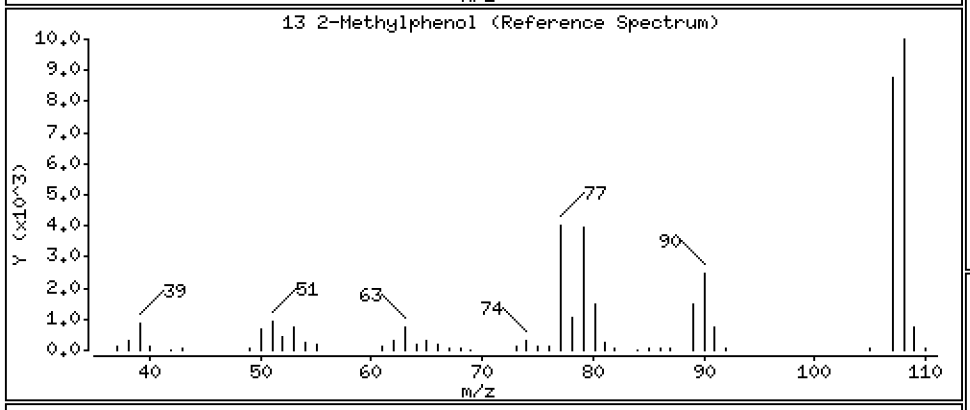
Column diameter: 0.25

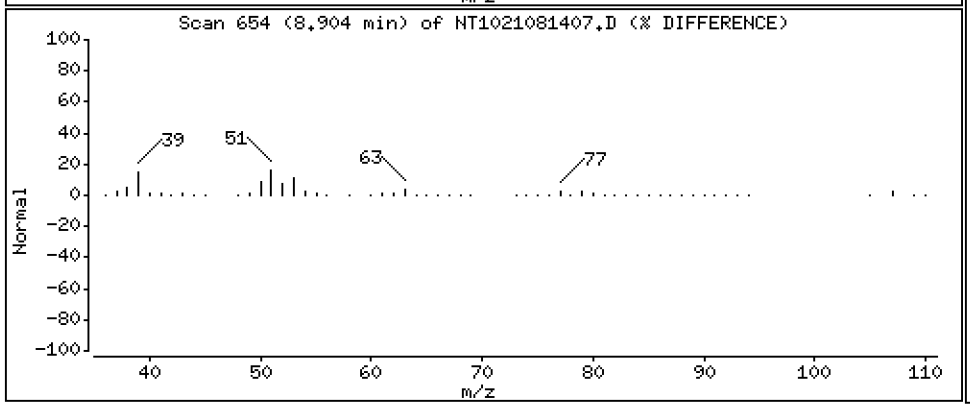
13 2-Methylphenol

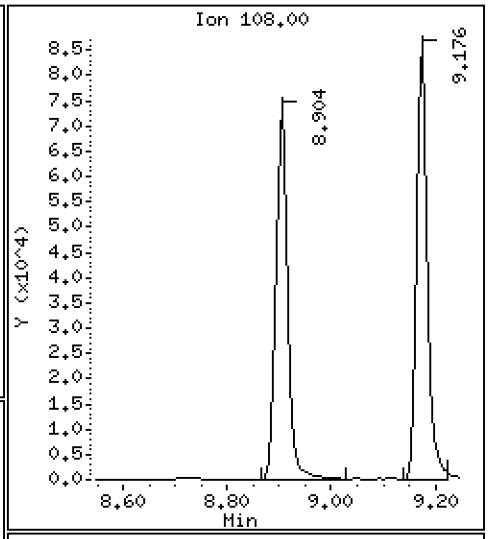
Concentration: 4.626 ug/mL

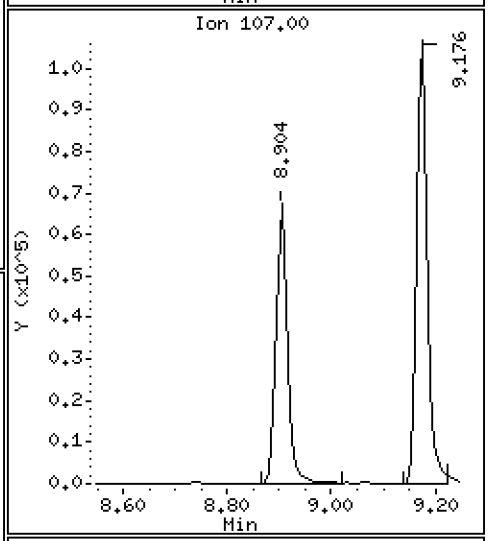


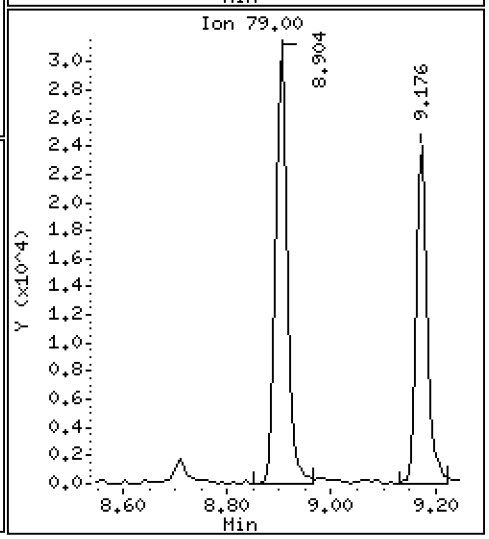












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

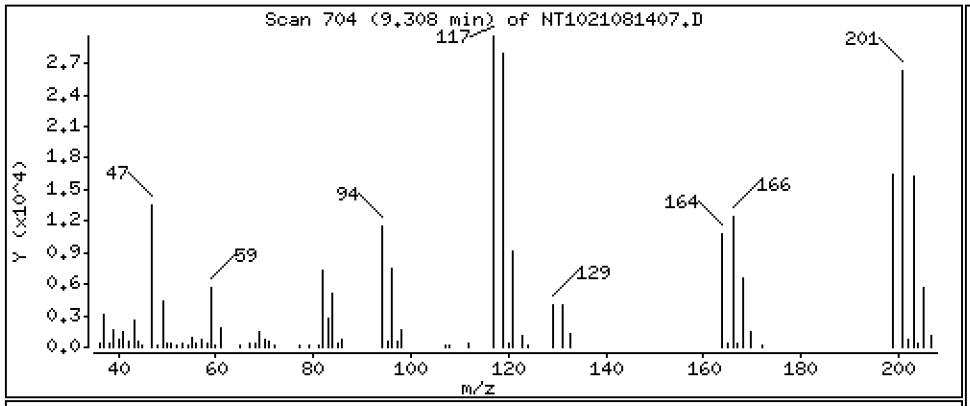
Operator: VTS

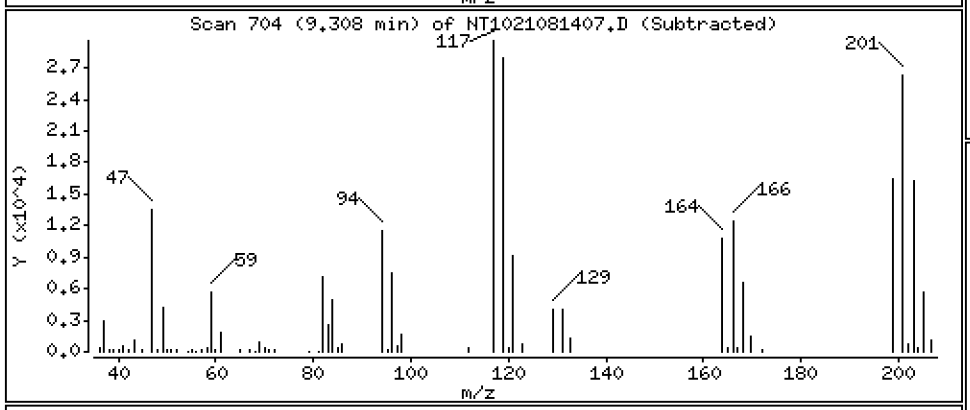
Column phase: ZB-5msi

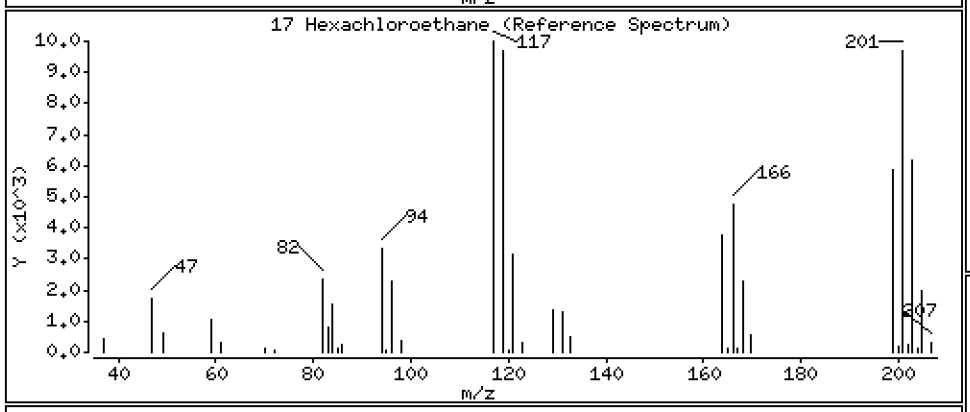
Column diameter: 0.25

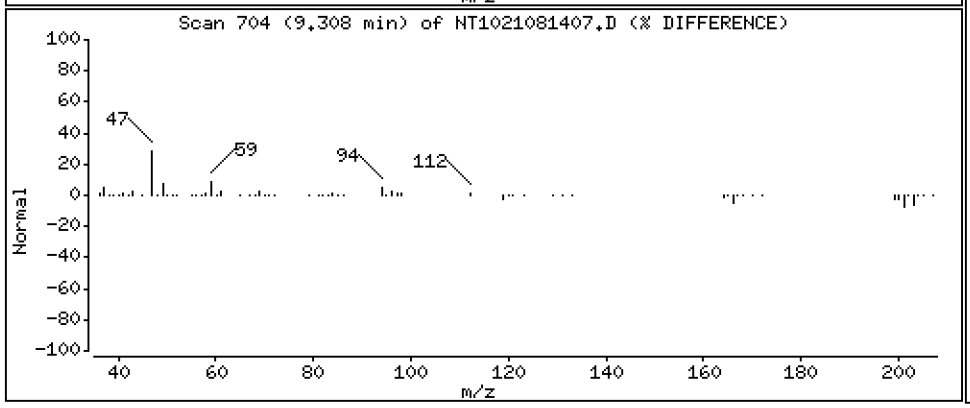
17 Hexachloroethane

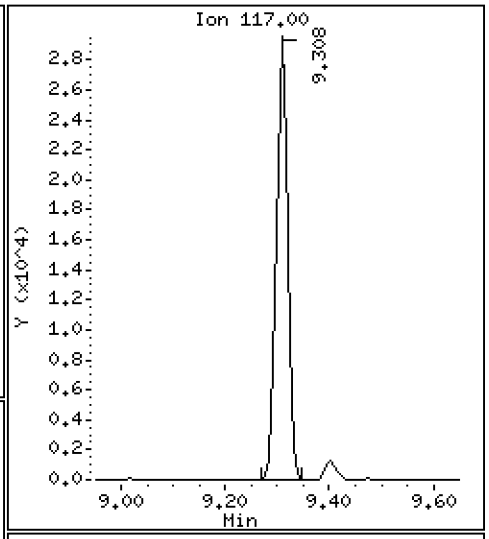
Concentration: 3.640 ug/mL

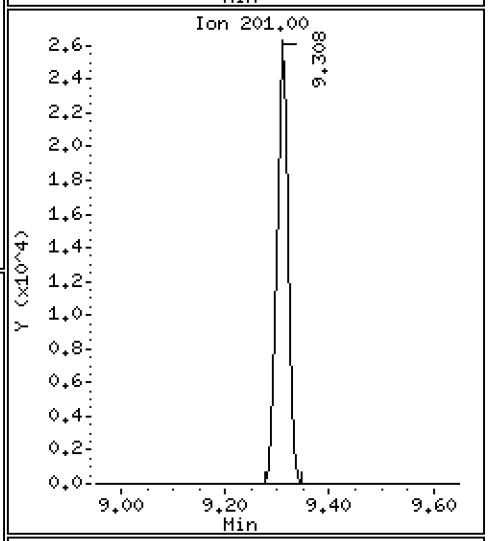


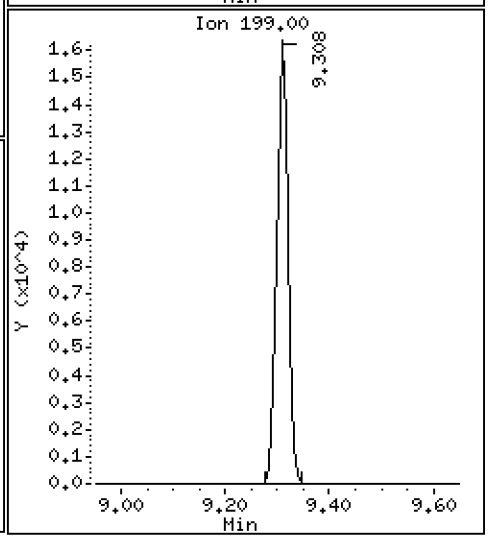












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

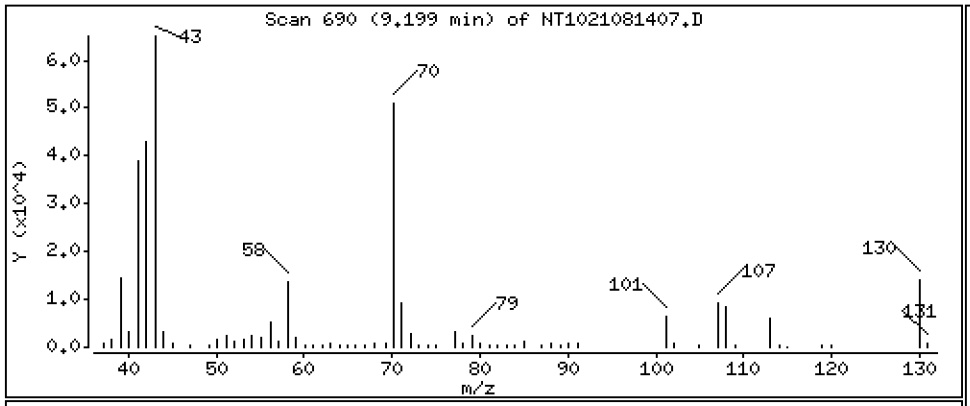
Operator: VTS

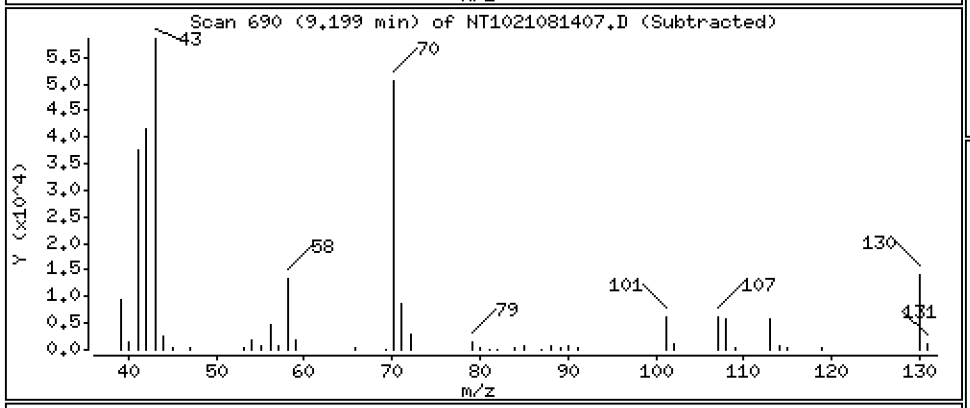
Column phase: ZB-5msi

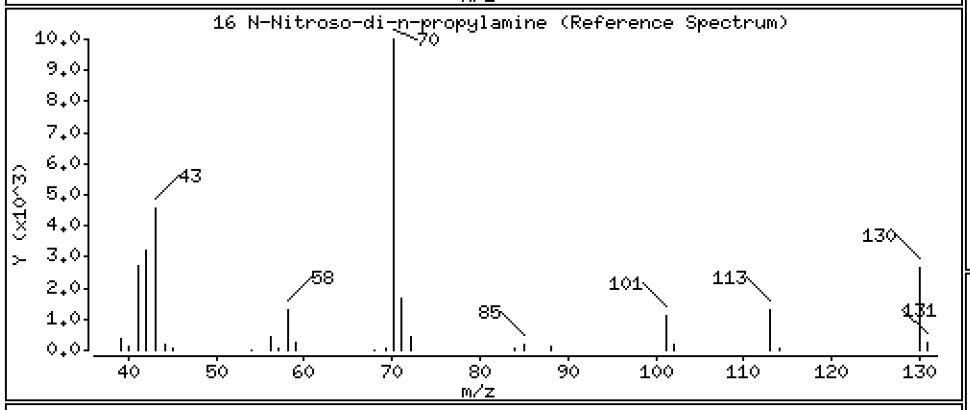
Column diameter: 0.25

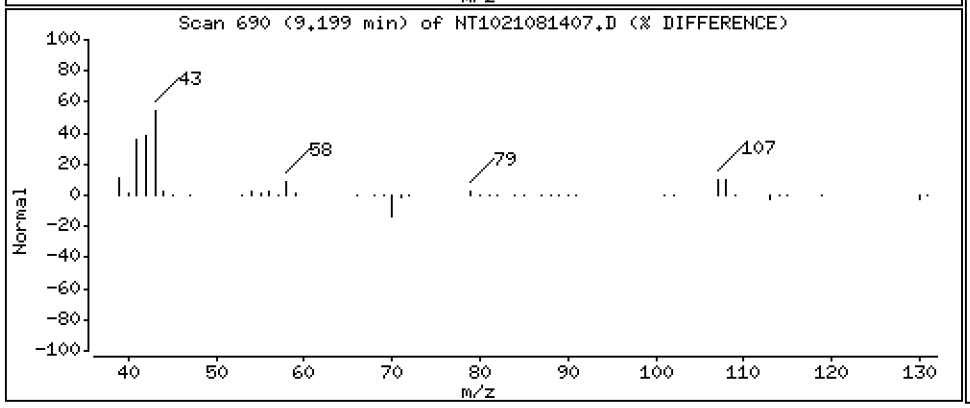
16 N-Nitroso-di-n-propylamine

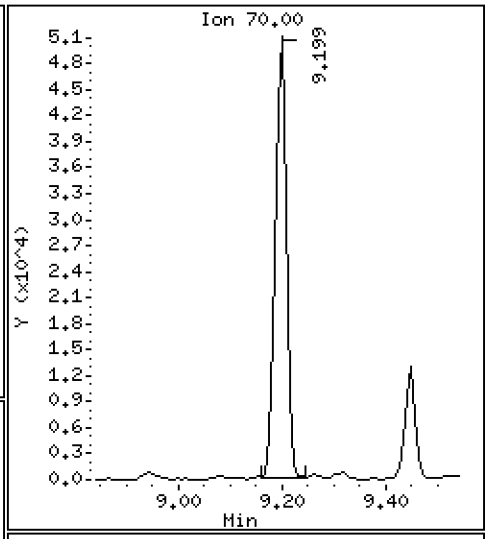
Concentration: 3.467 ug/mL

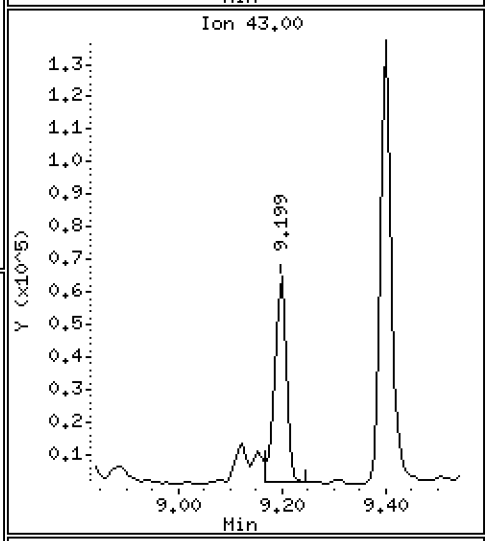


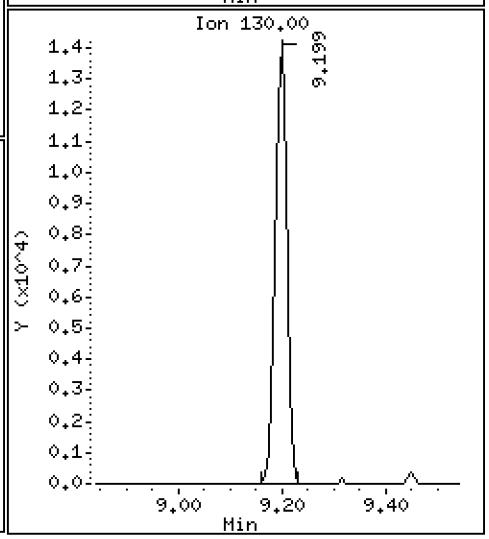












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

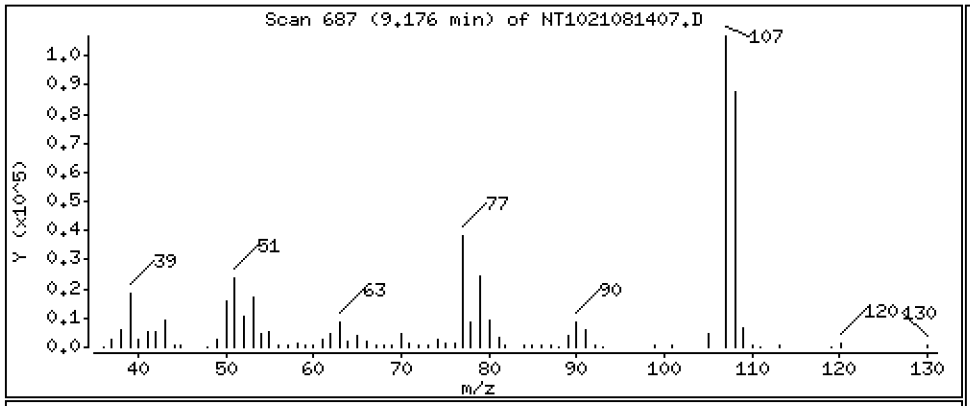
Operator: VTS

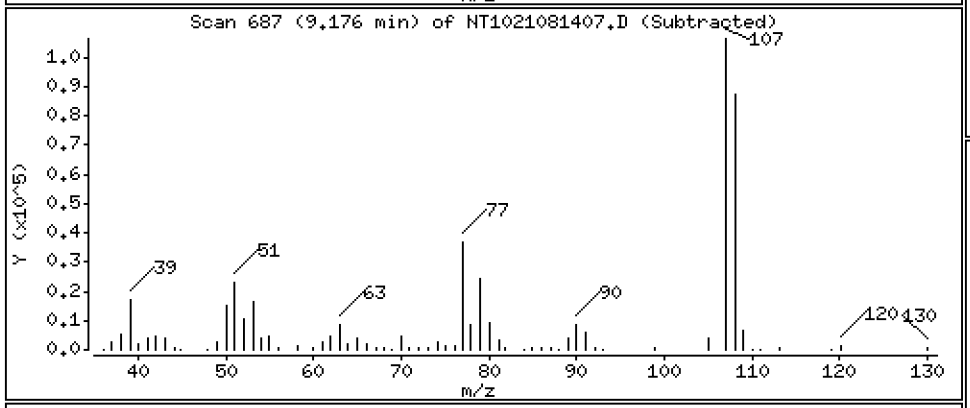
Column phase: ZB-5msi

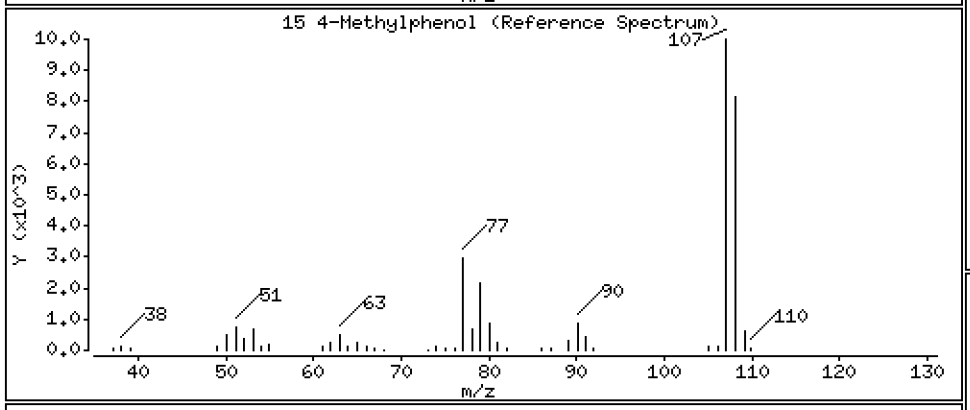
Column diameter: 0.25

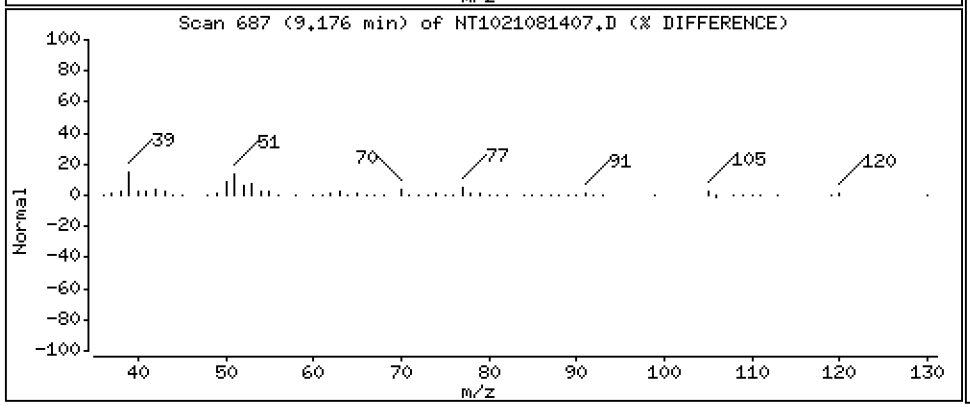
15 4-Methylphenol

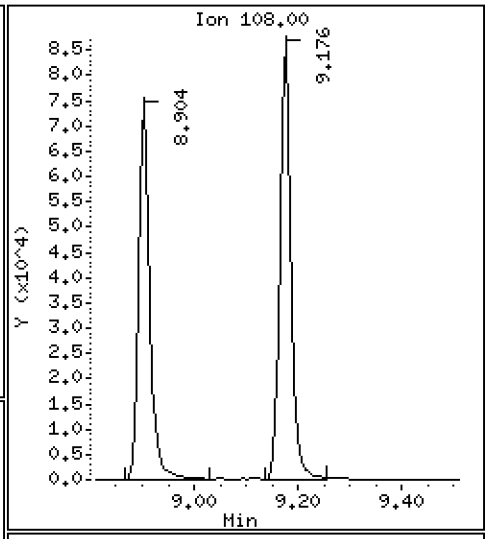
Concentration: 4.949 ug/mL

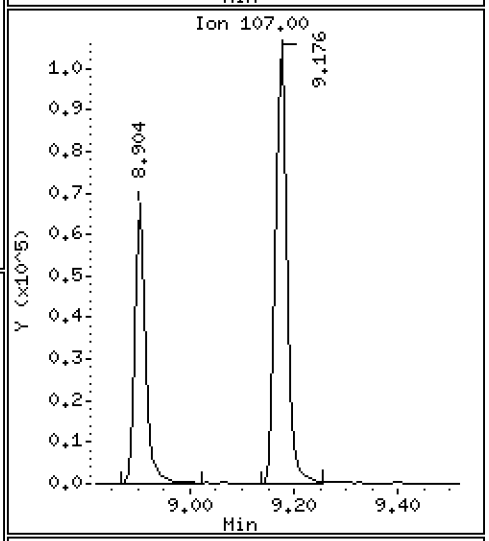


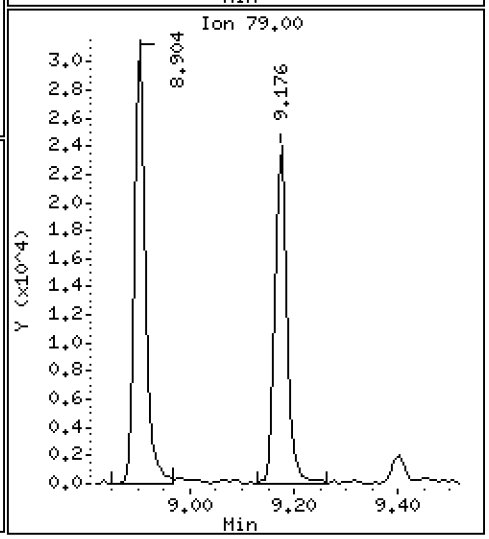












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

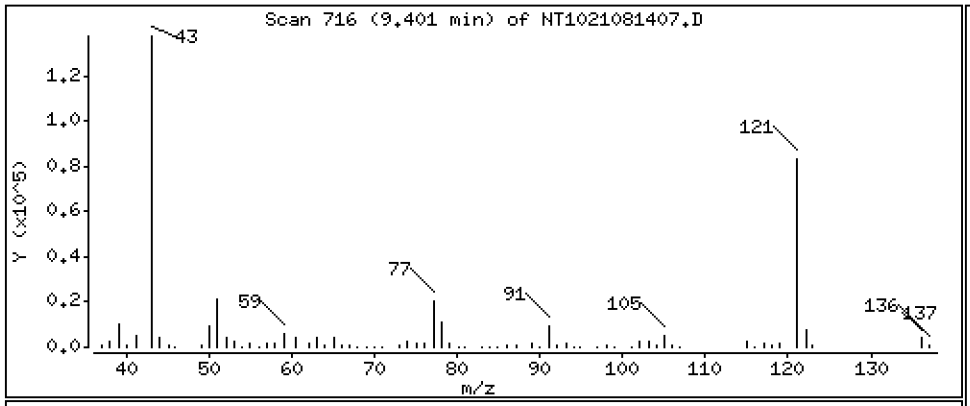
Operator: VTS

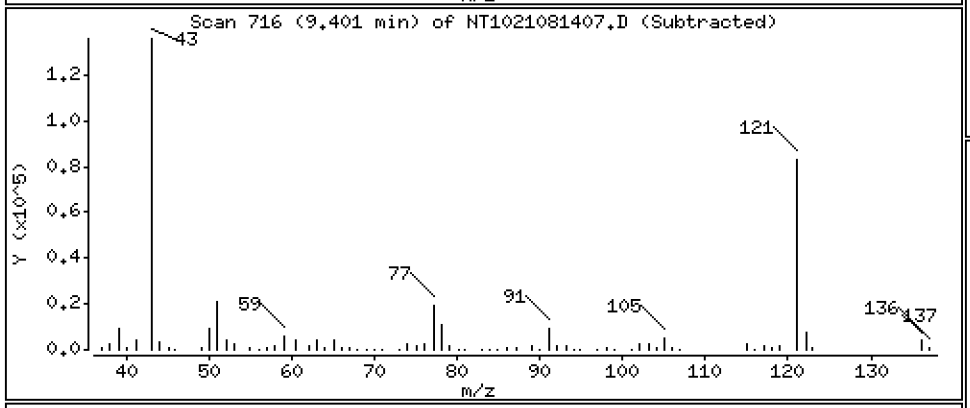
Column phase: ZB-5msi

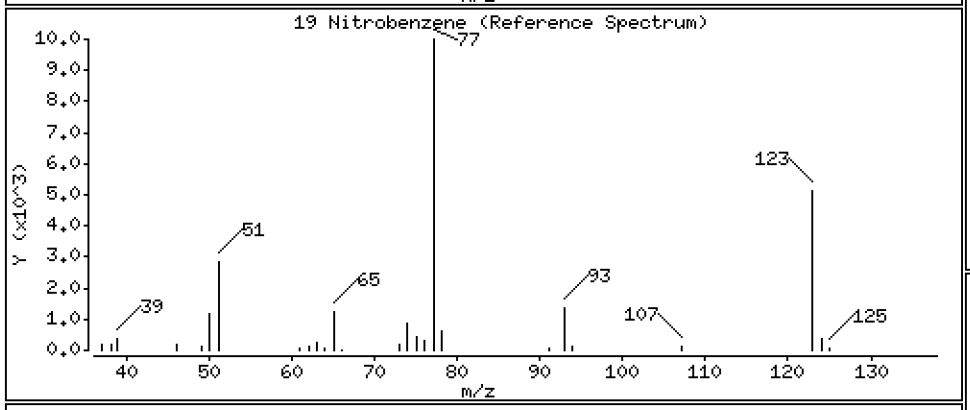
Column diameter: 0.25

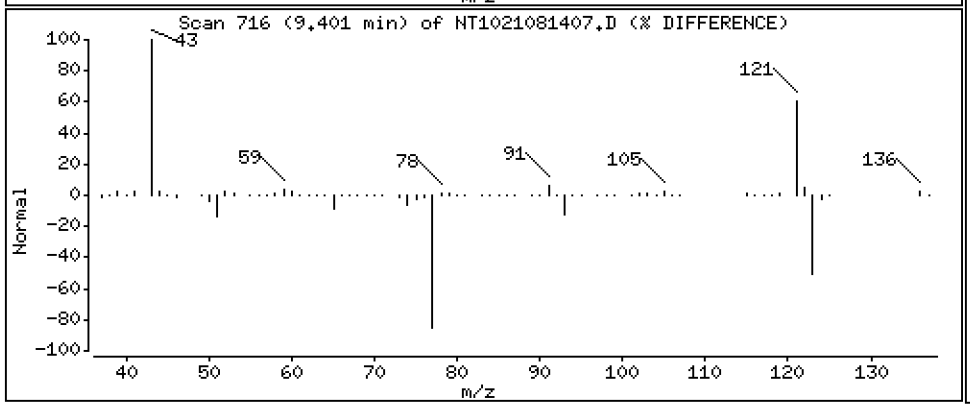
19 Nitrobenzene

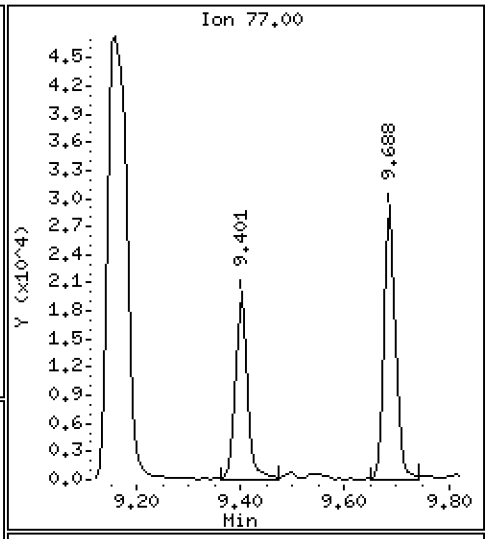
Concentration: 0.9419 ug/mL

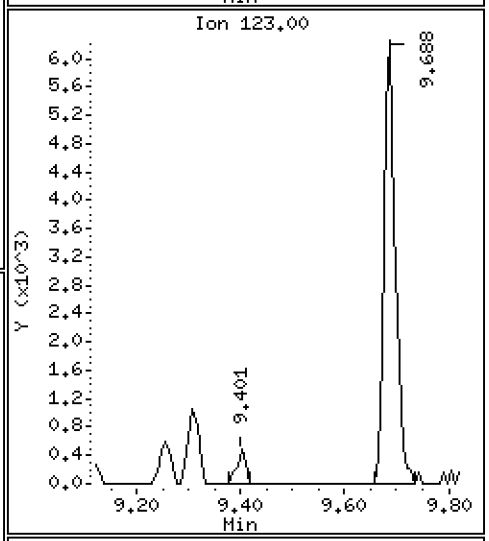


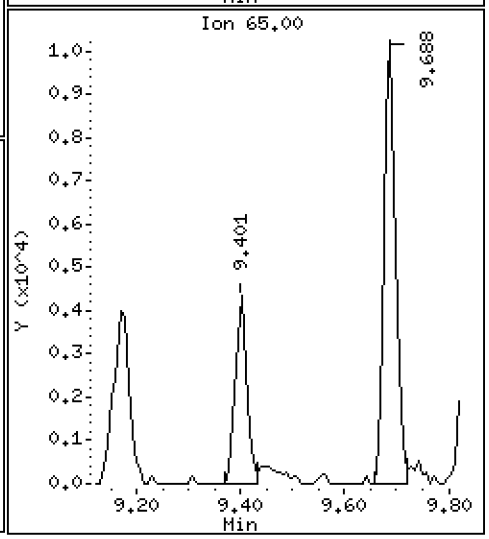












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

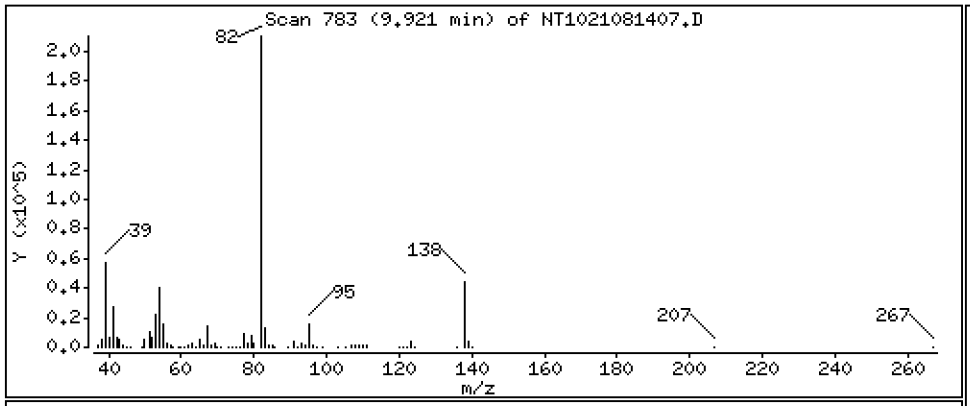
Operator: VTS

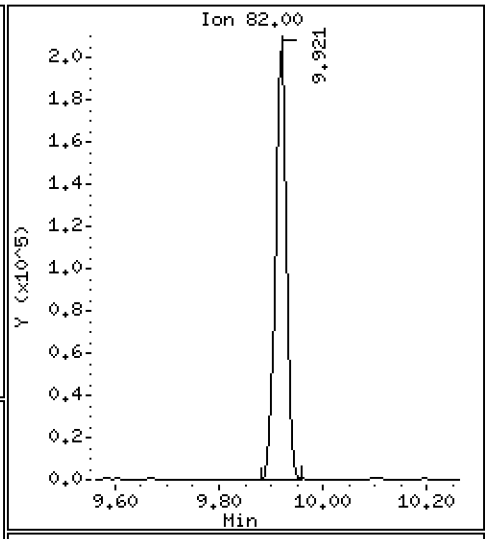
Column phase: ZB-5msi

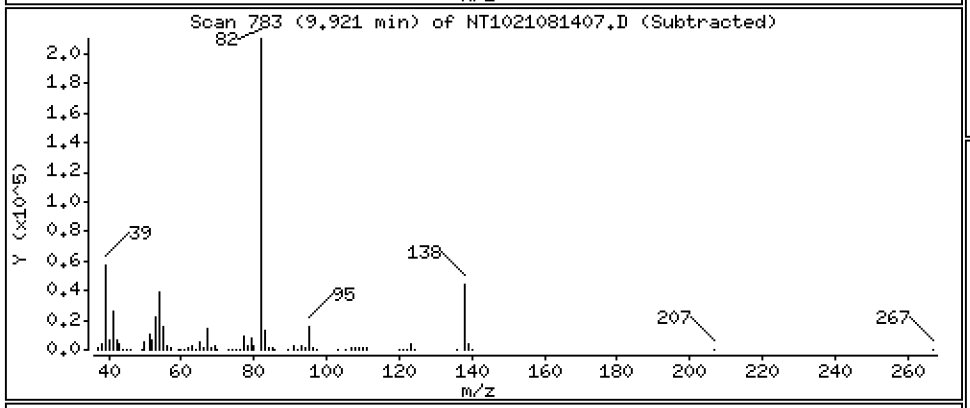
Column diameter: 0.25

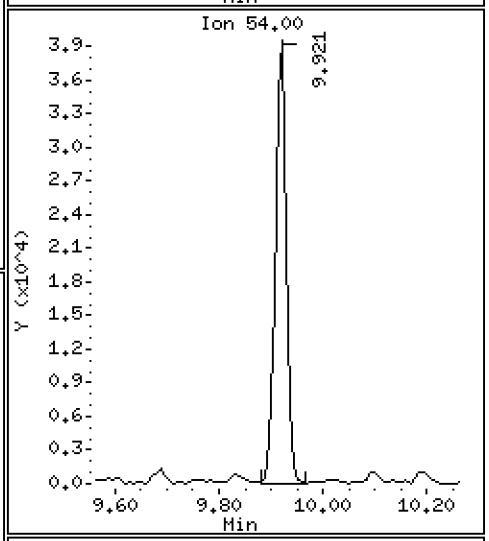
20 Isophorone

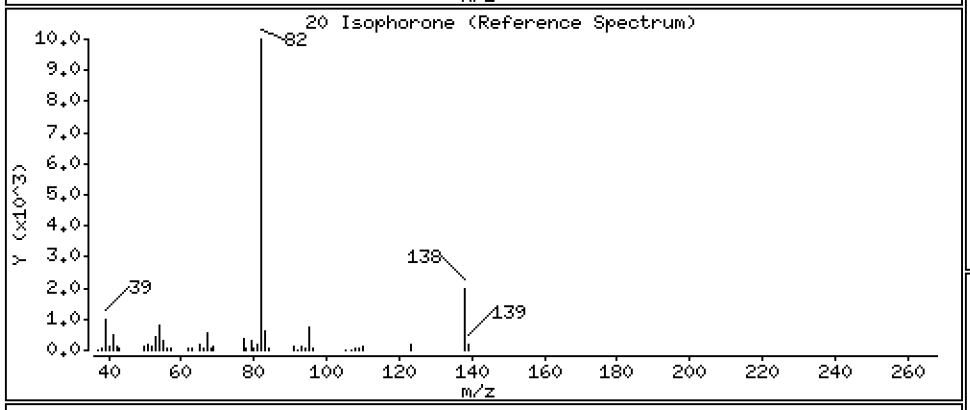
Concentration: 4.888 ug/mL

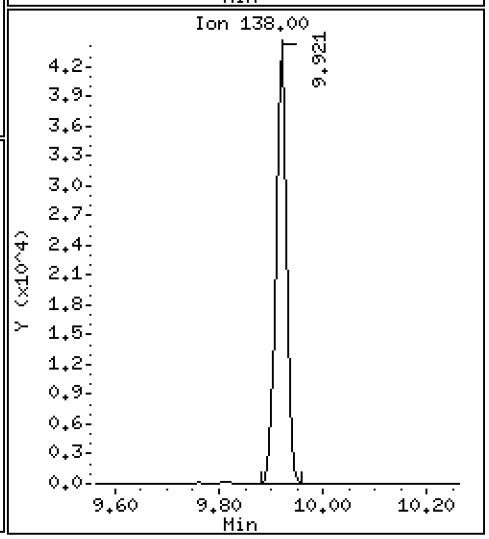


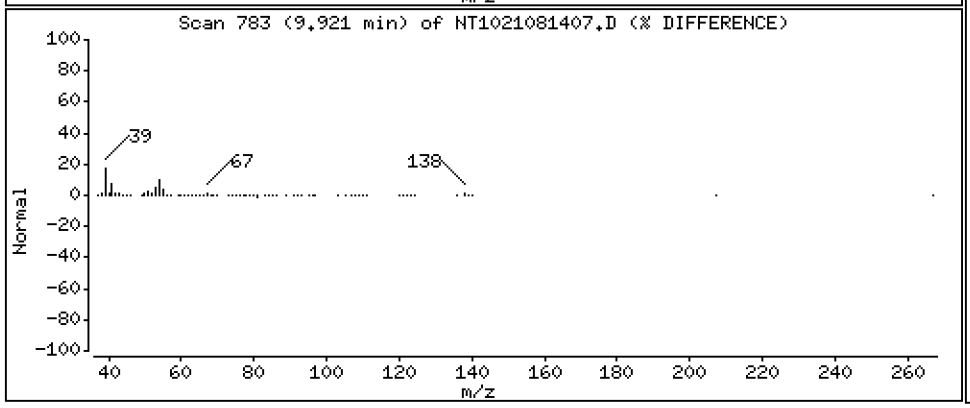












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

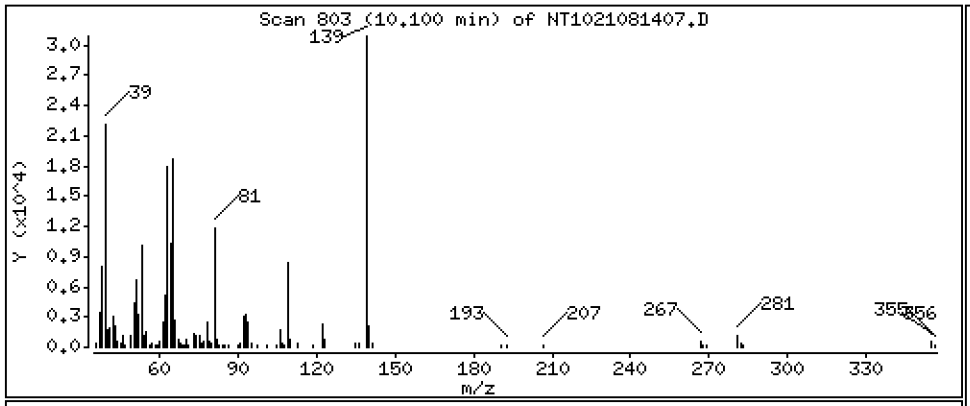
Operator: VTS

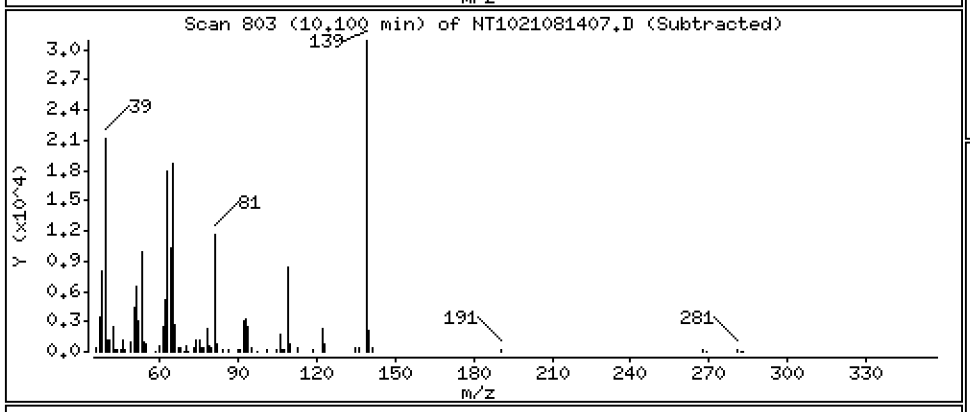
Column phase: ZB-5msi

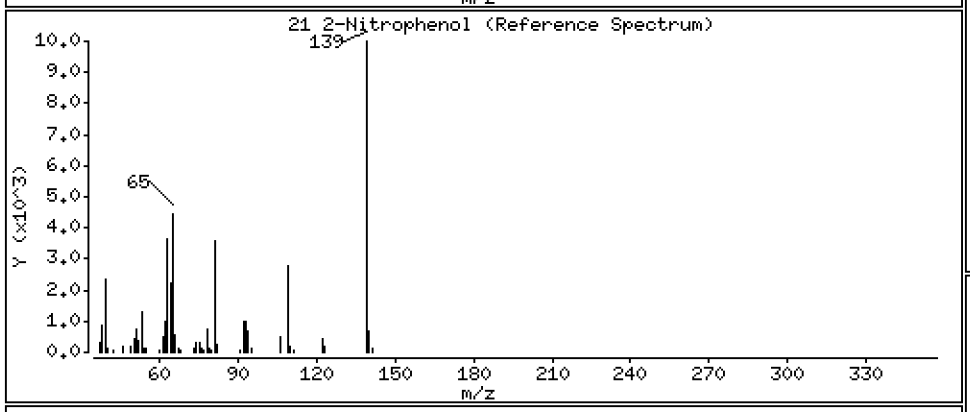
Column diameter: 0.25

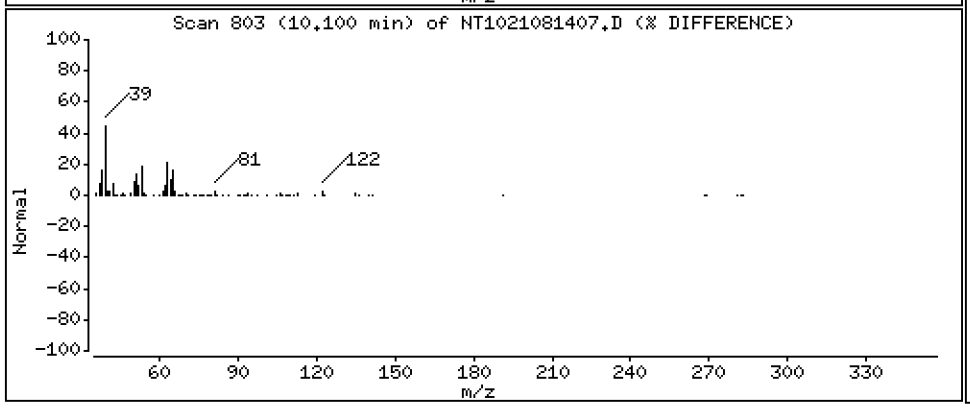
21 2-Nitrophenol

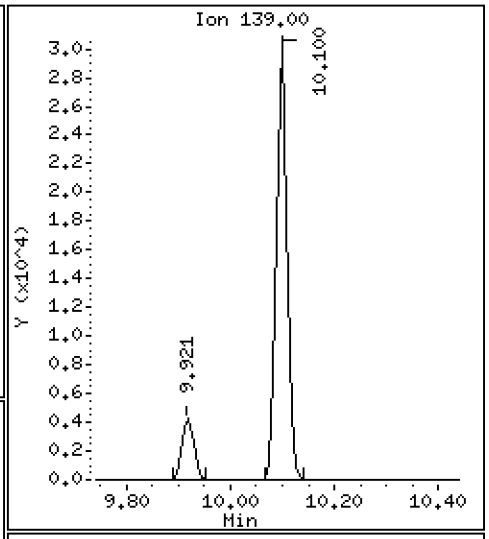
Concentration: 2.488 ug/mL

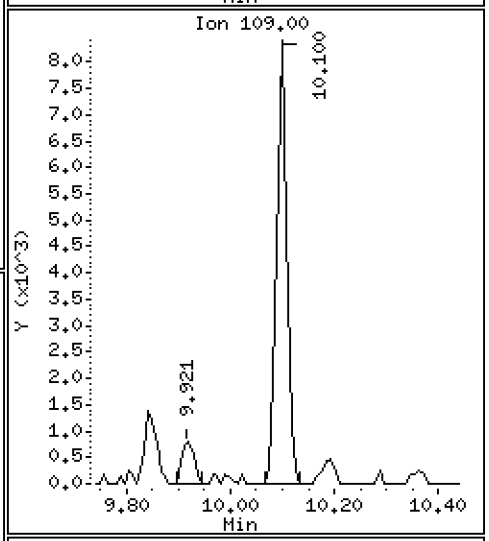


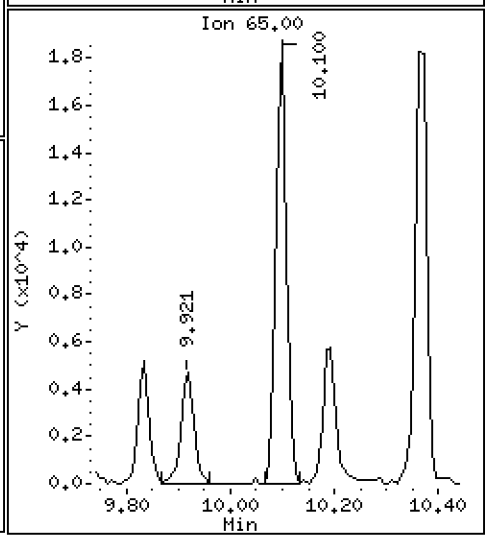












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

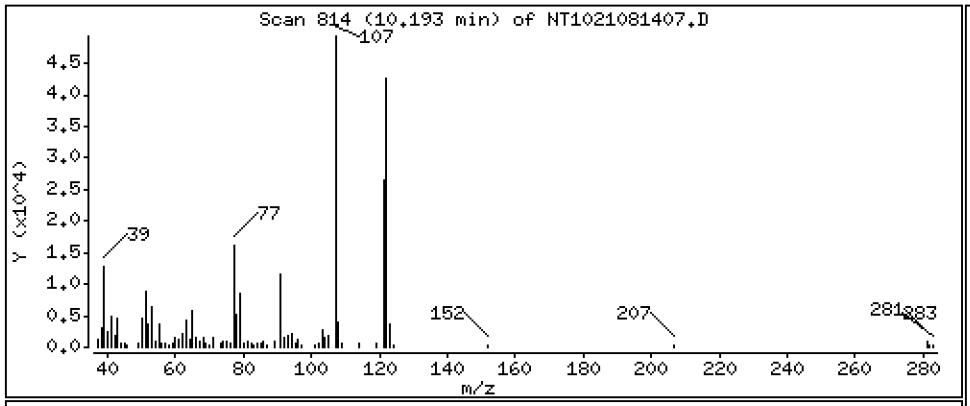
Operator: VTS

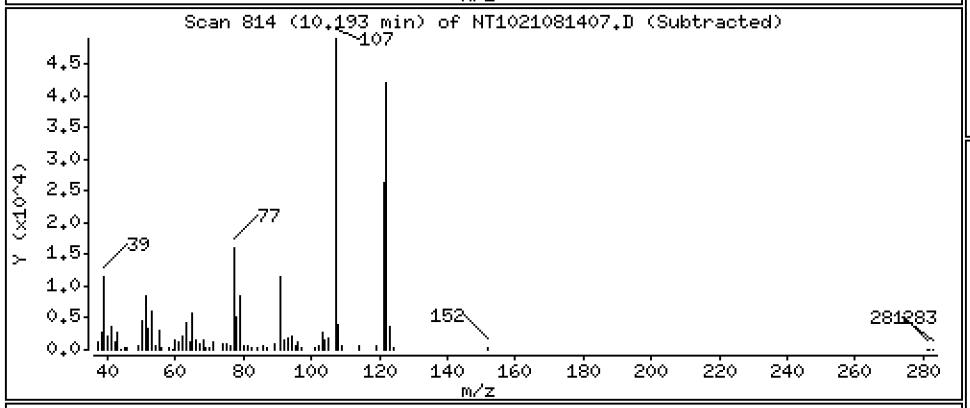
Column phase: ZB-5msi

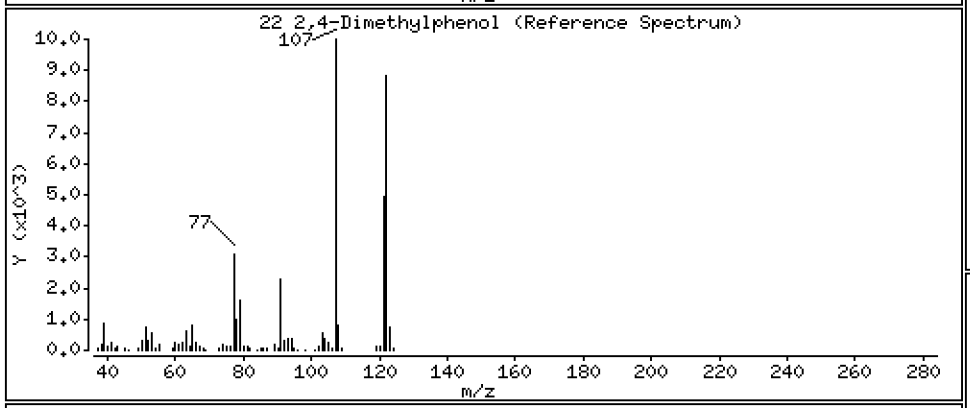
Column diameter: 0.25

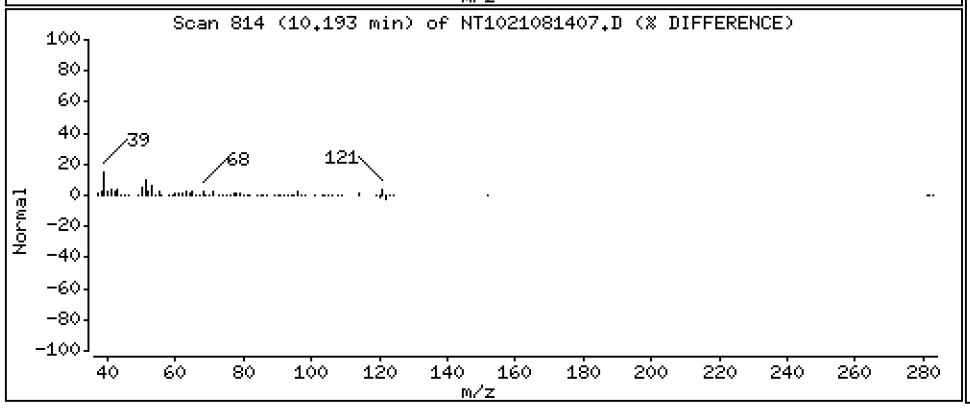
22 2,4-Dimethylphenol

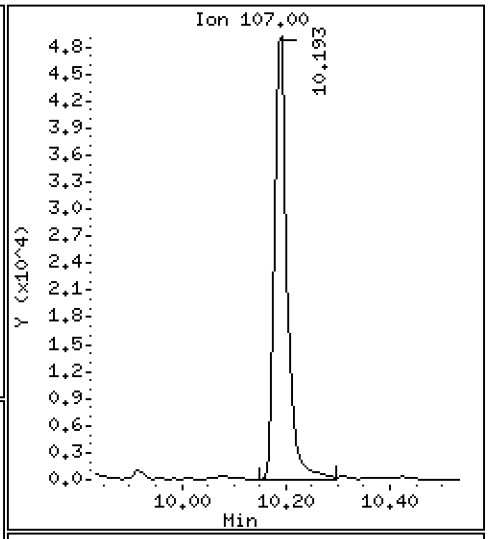
Concentration: 3.204 ug/mL

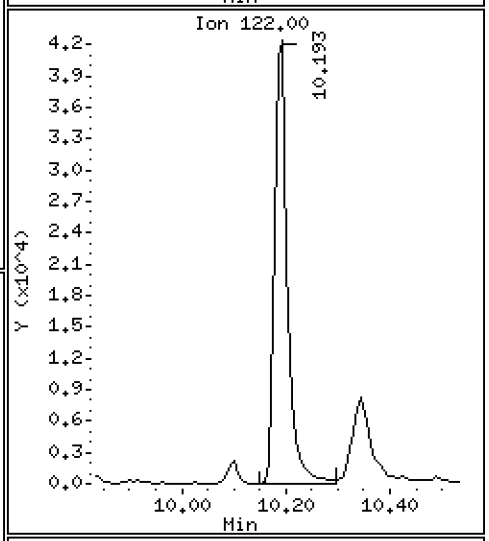


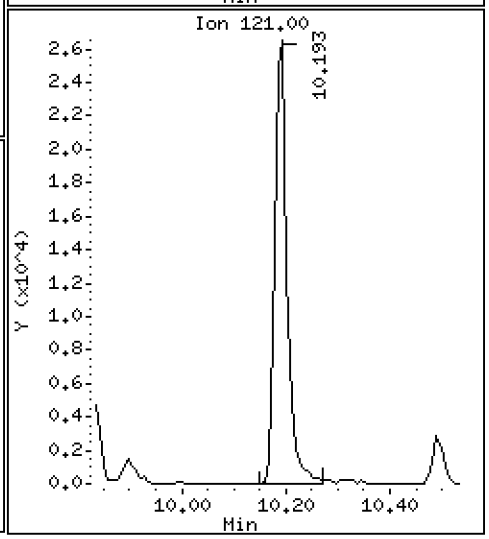












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

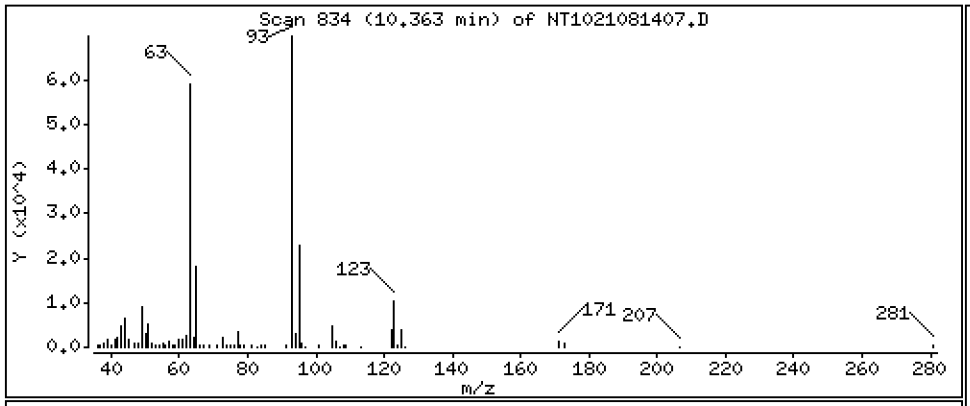
Operator: VTS

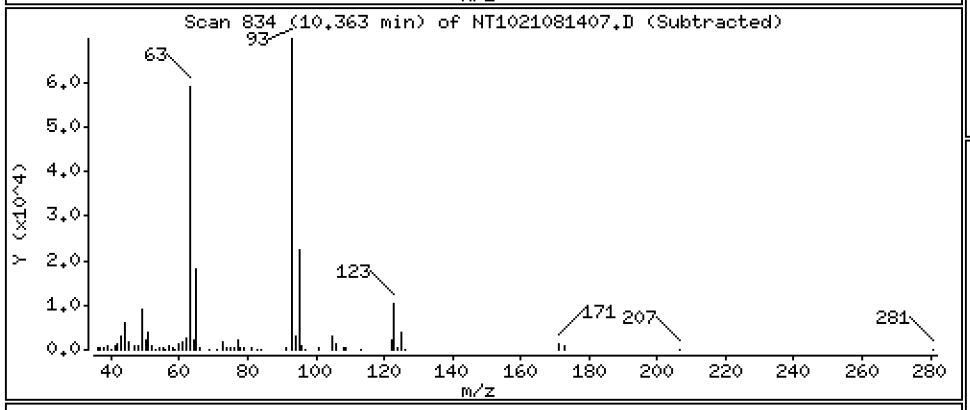
Column phase: ZB-5msi

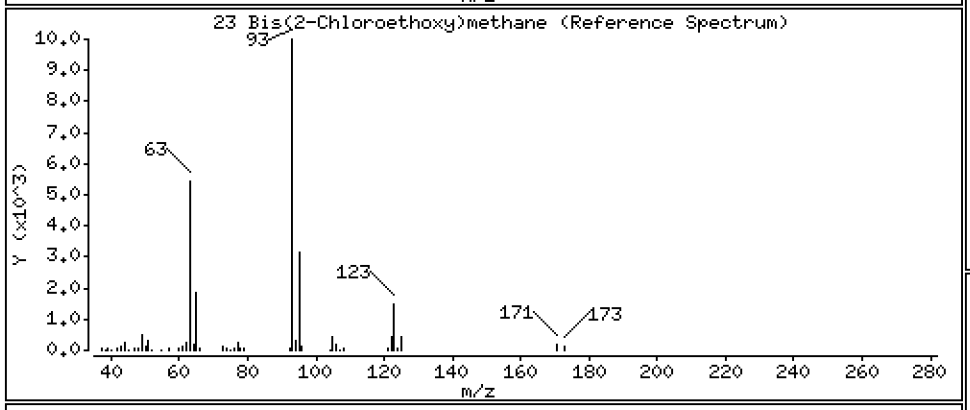
Column diameter: 0.25

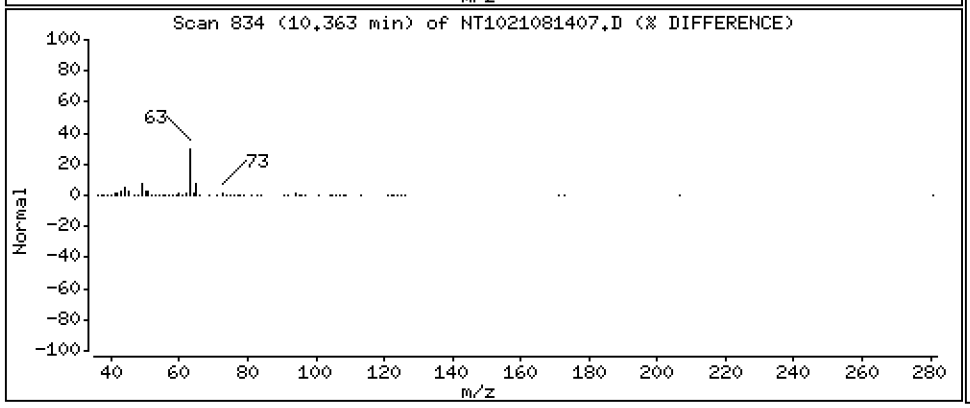
23 Bis(2-Chloroethoxy)methane

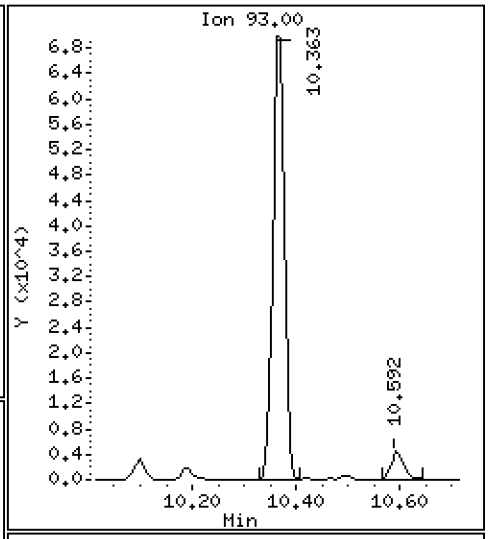
Concentration: 3.311 ug/mL

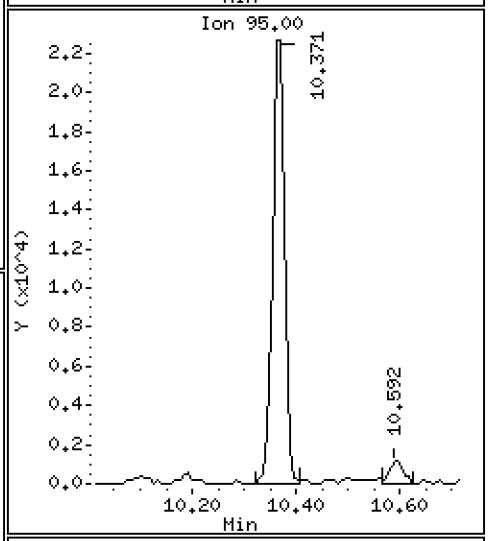


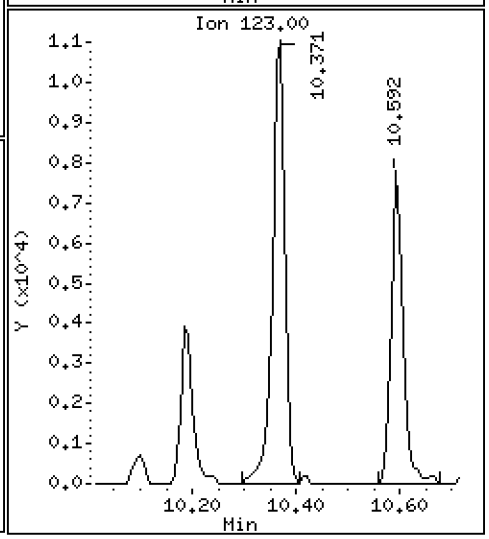












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

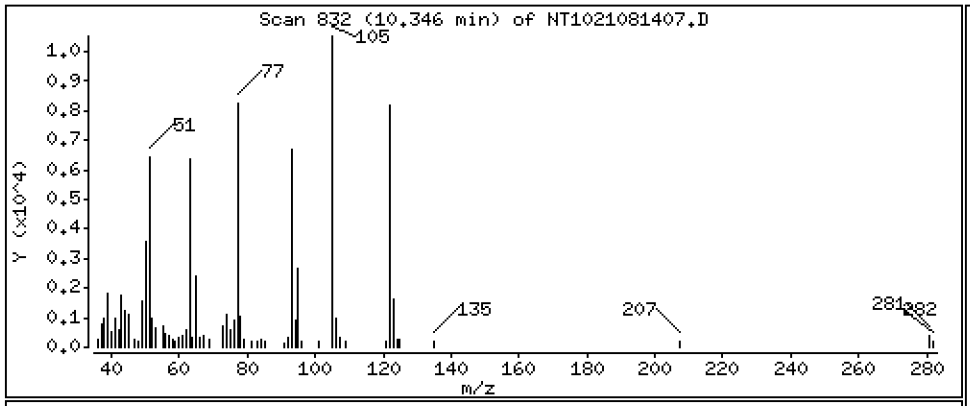
Operator: VTS

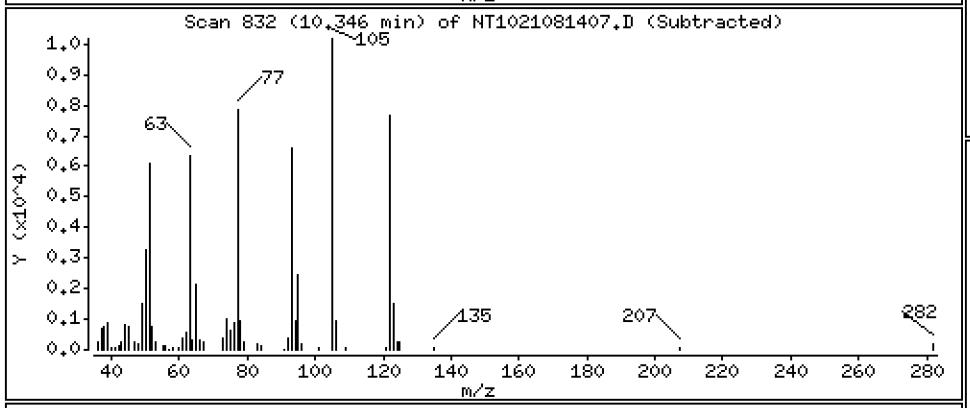
Column phase: ZB-5msi

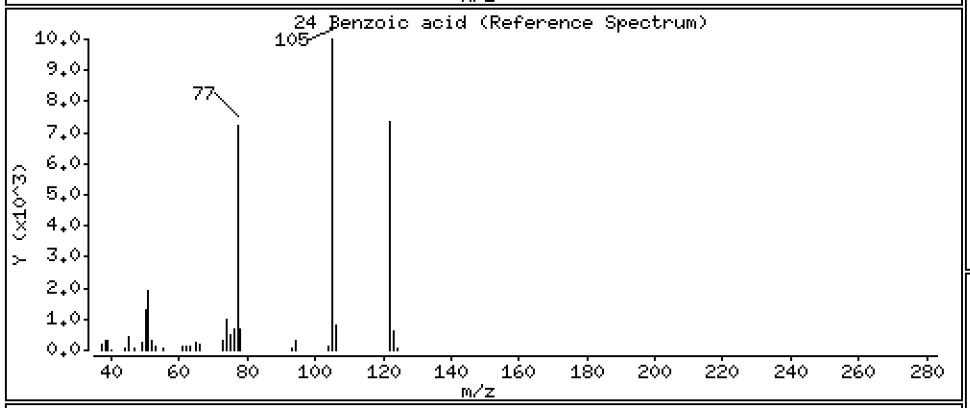
Column diameter: 0.25

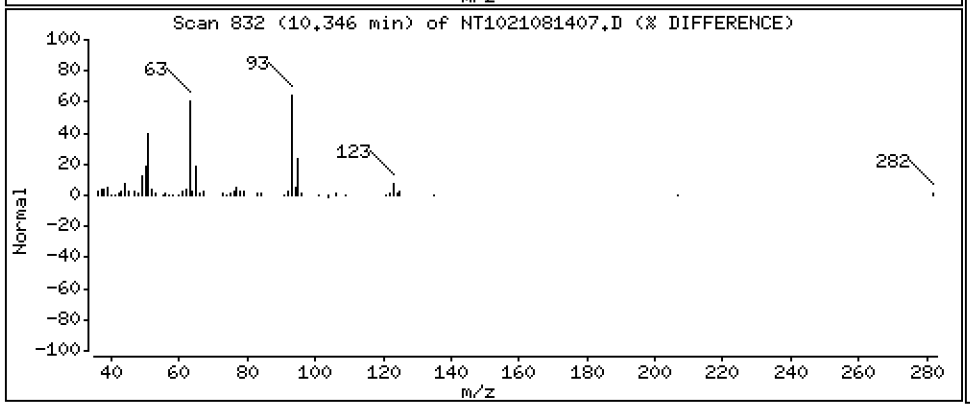
24 Benzoic acid

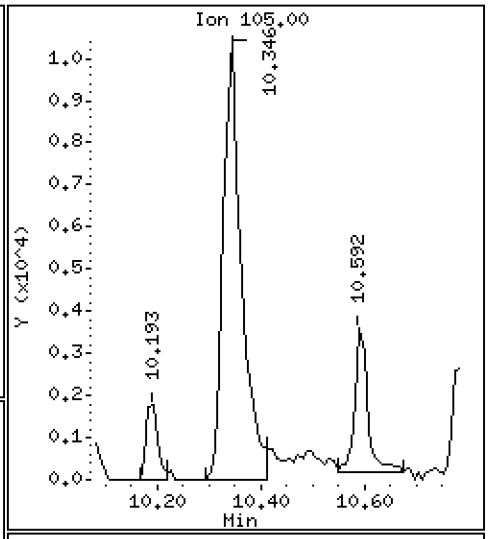
Concentration: 1.786 ug/mL

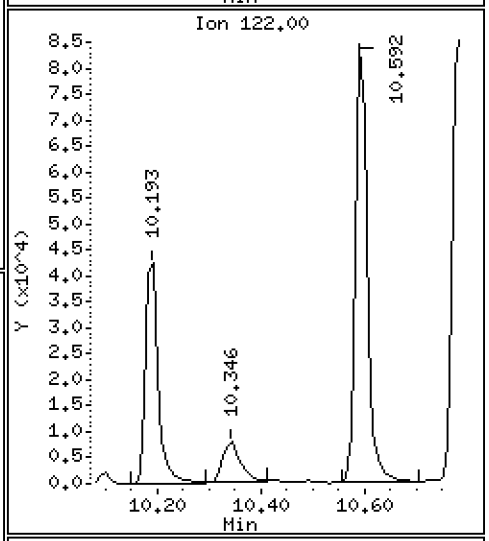


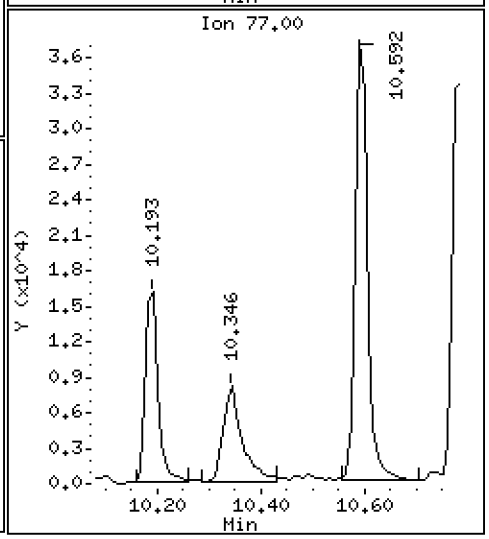












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

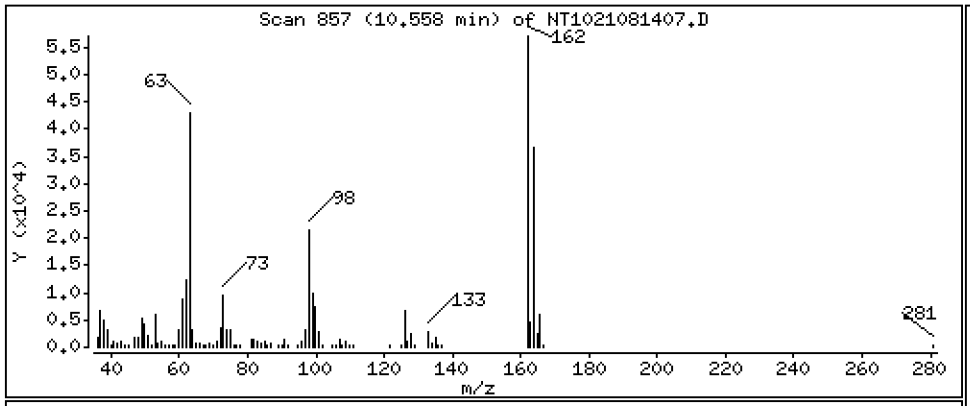
Operator: VTS

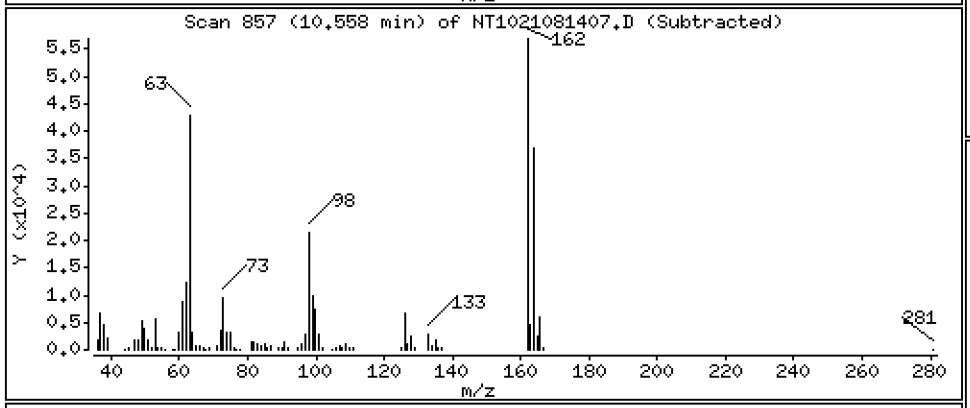
Column phase: ZB-5msi

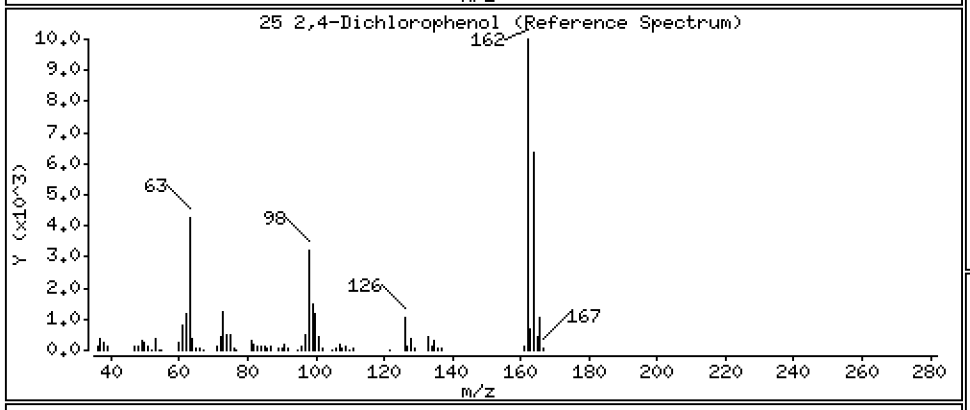
Column diameter: 0.25

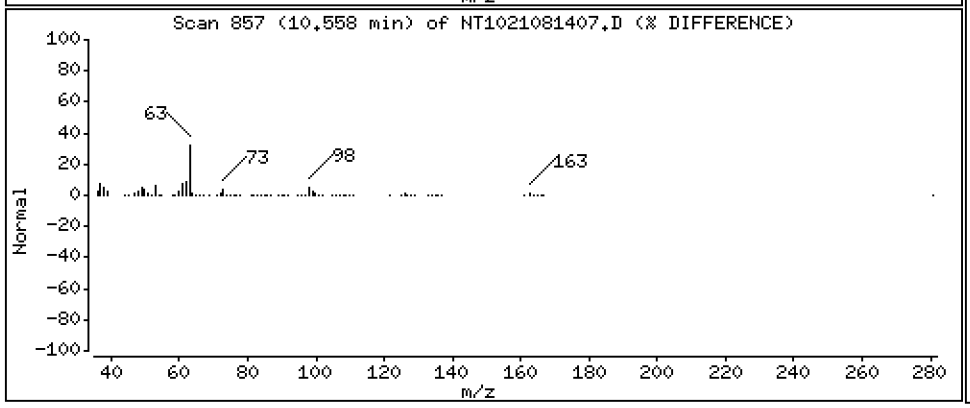
25 2,4-Dichlorophenol

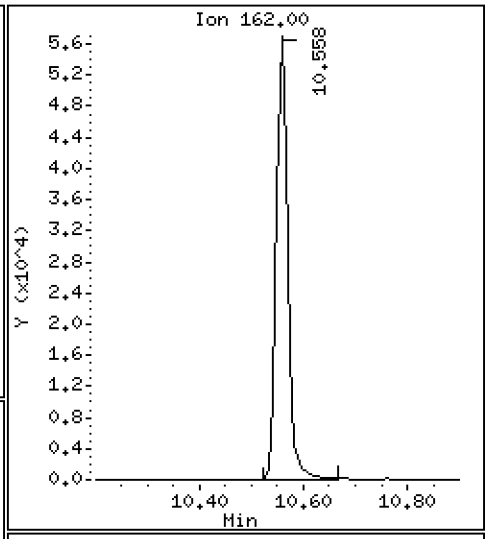
Concentration: 4.635 ug/mL

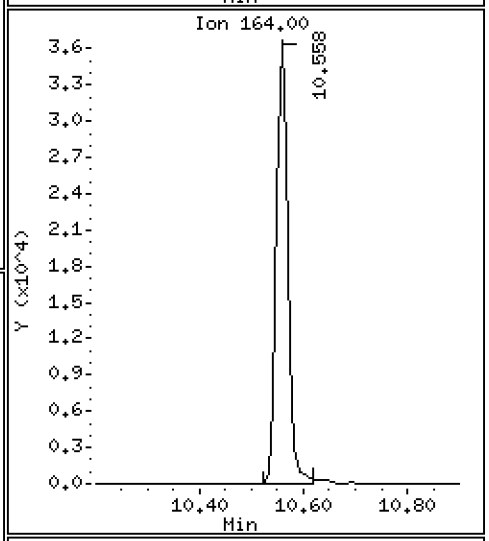


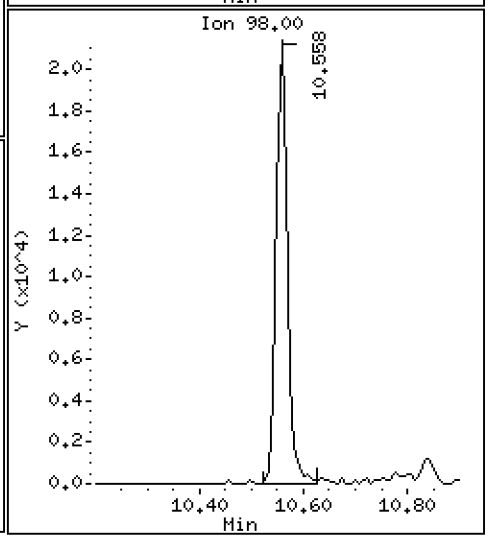












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

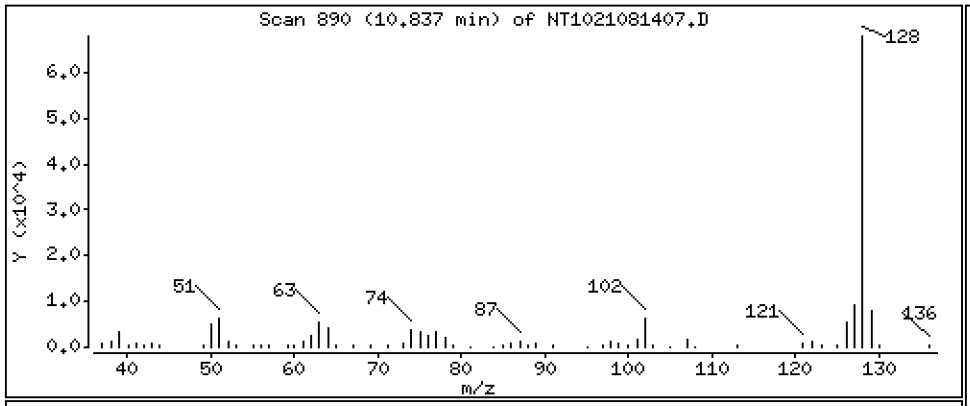
Operator: VTS

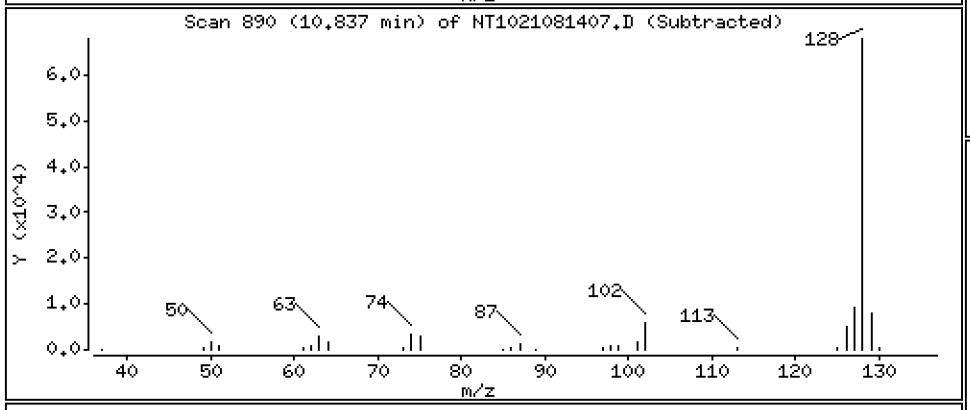
Column phase: ZB-5msi

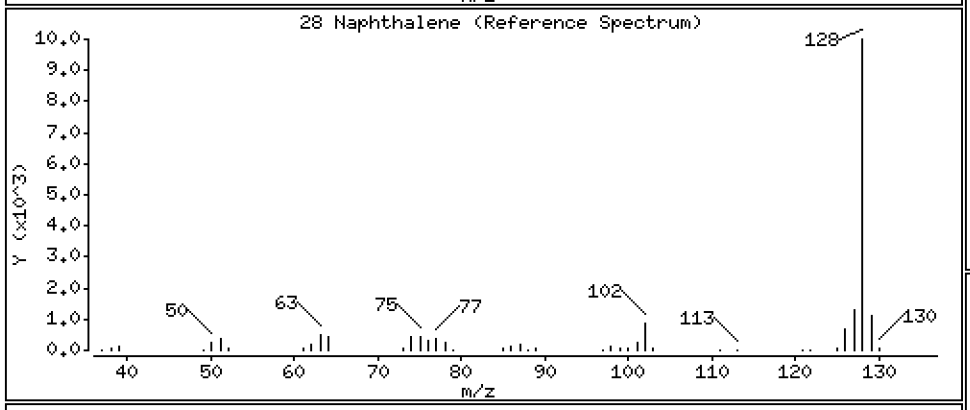
Column diameter: 0.25

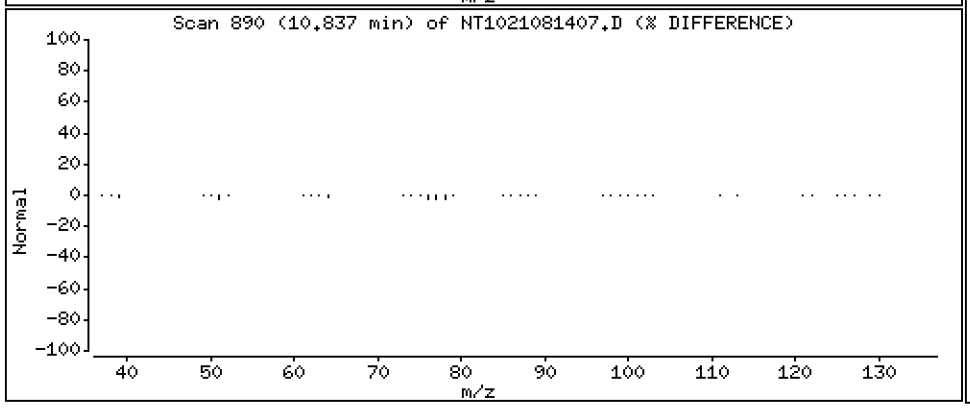
28 Naphthalene

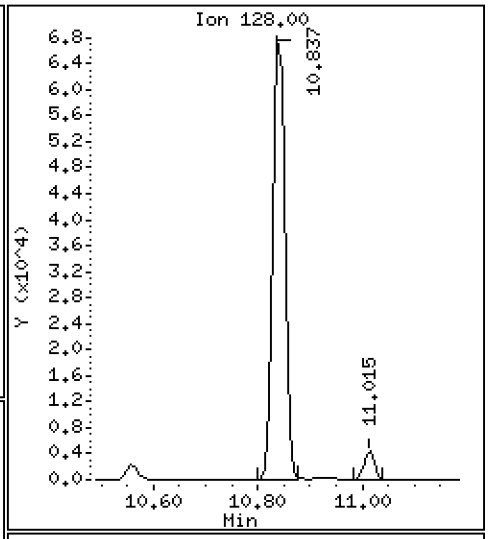
Concentration: 1.412 ug/mL

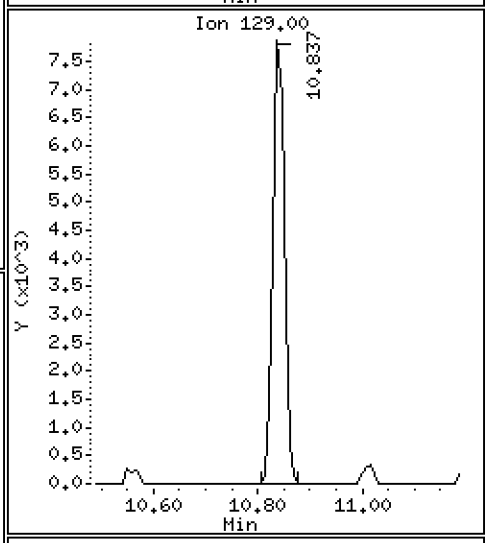


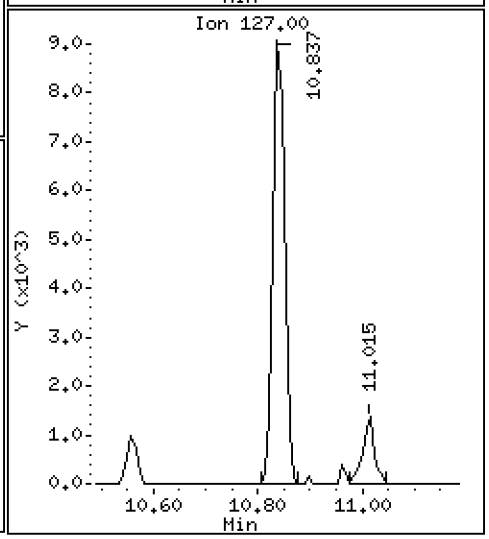












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

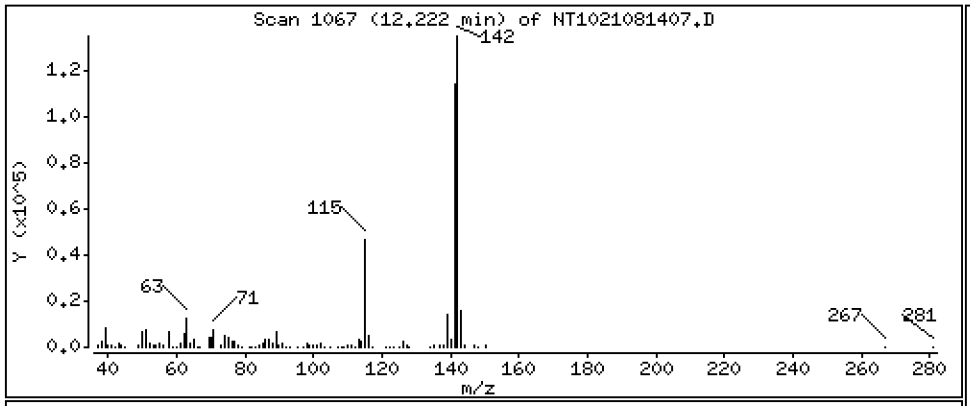
Operator: VTS

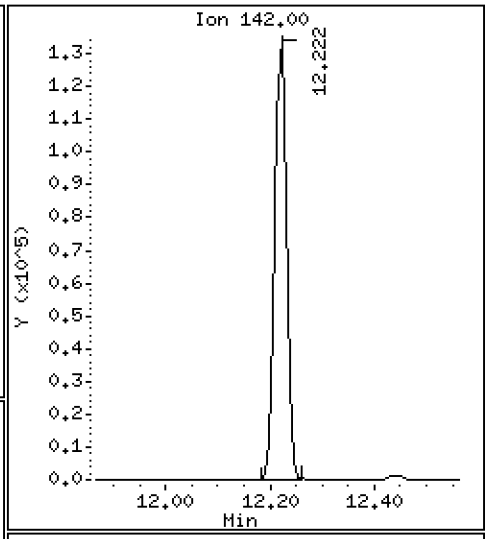
Column phase: ZB-5msi

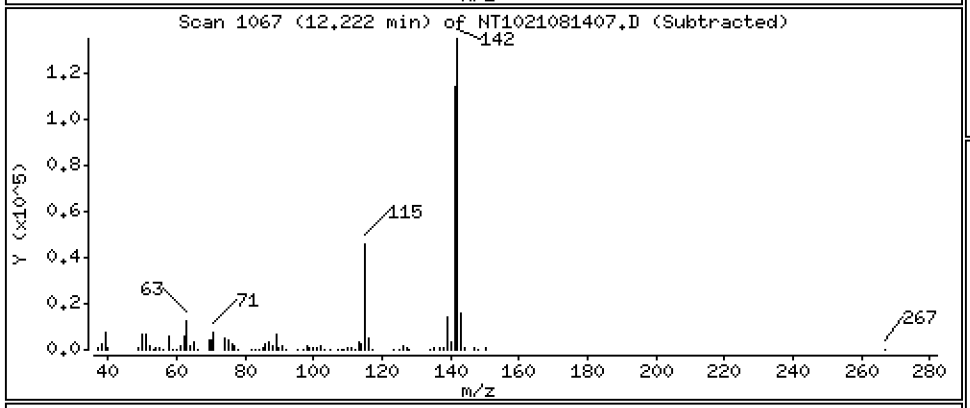
Column diameter: 0.25

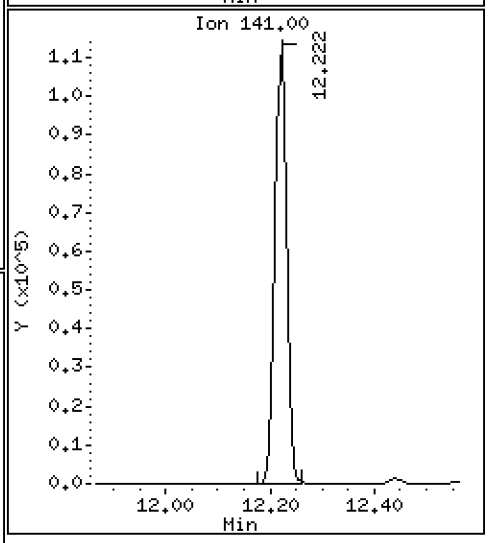
32 2-Methylnaphthalene

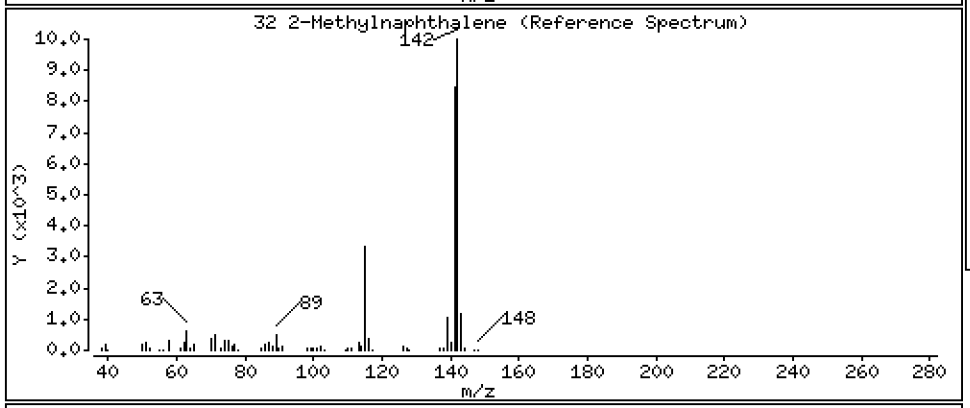
Concentration: 2.947 ug/mL

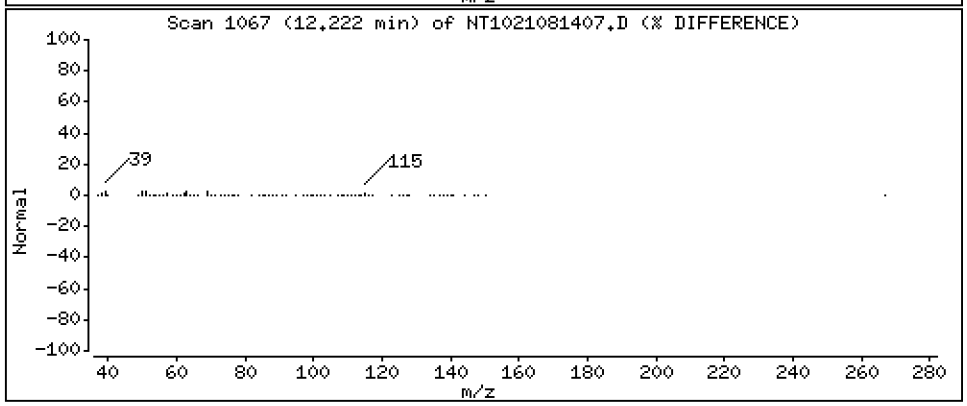












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

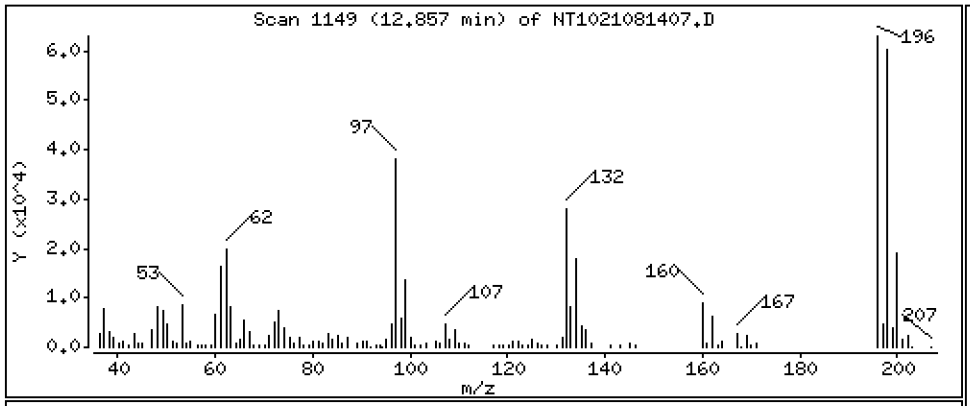
Operator: VTS

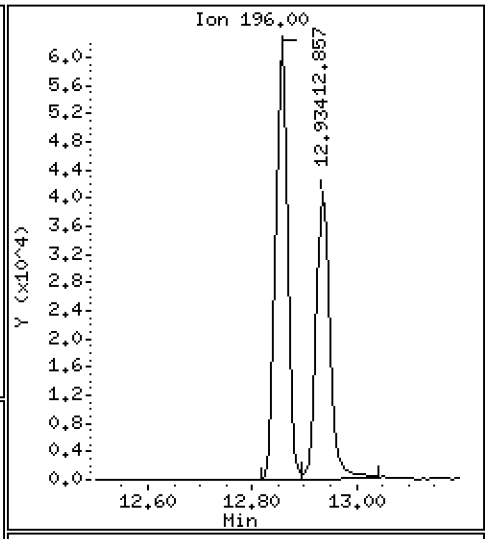
Column phase: ZB-5msi

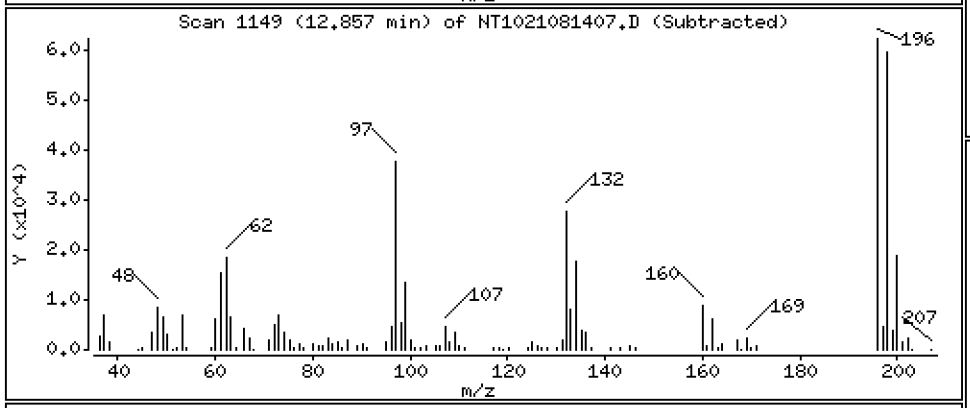
Column diameter: 0.25

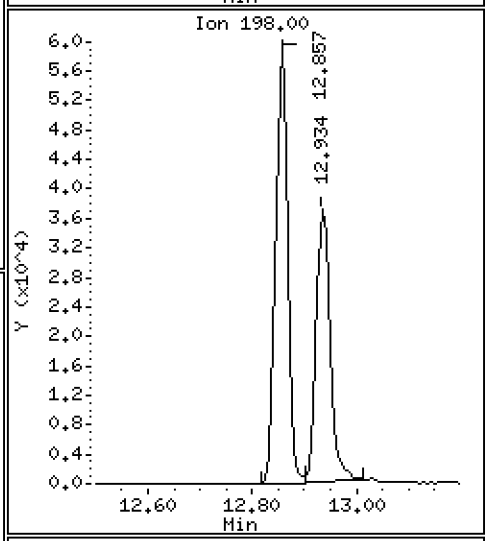
34 2,4,6-Trichlorophenol

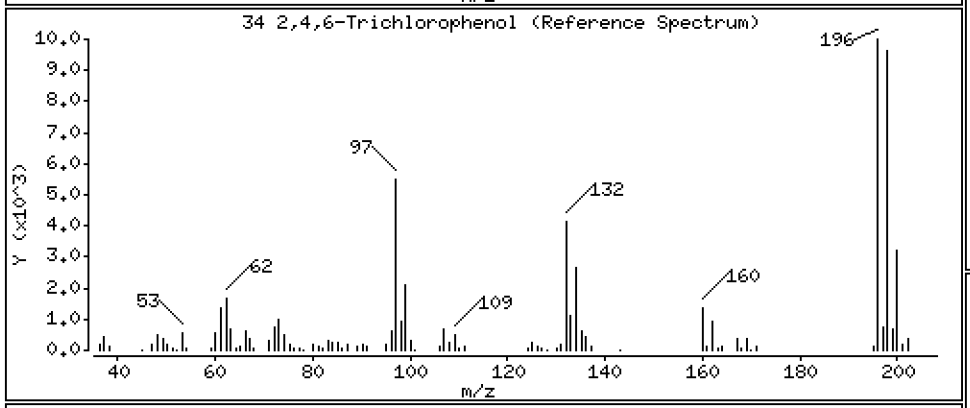
Concentration: 5.284 ug/mL

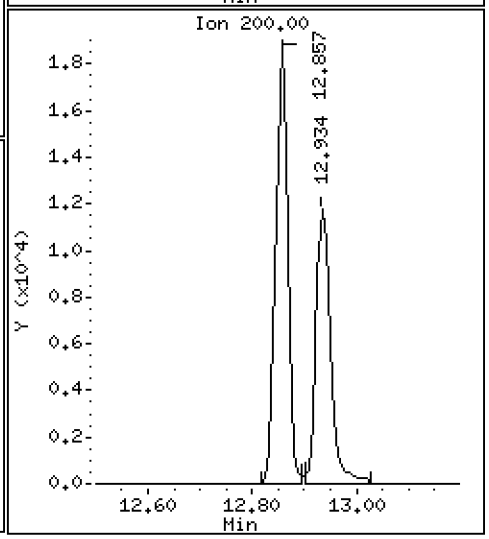


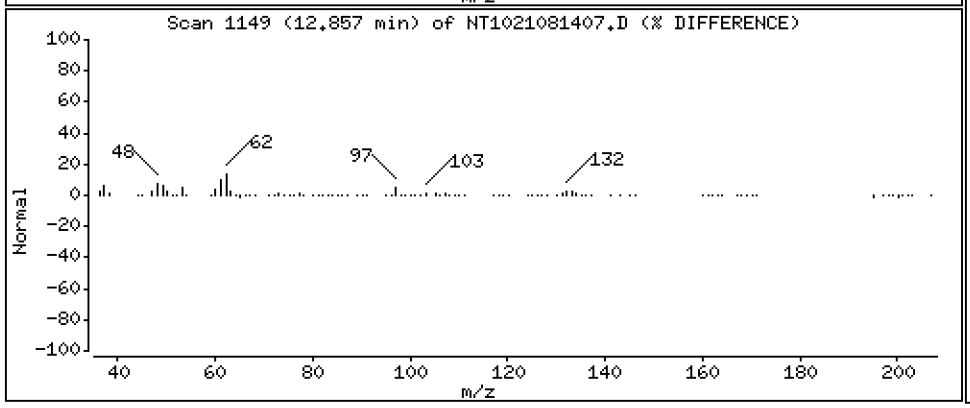












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

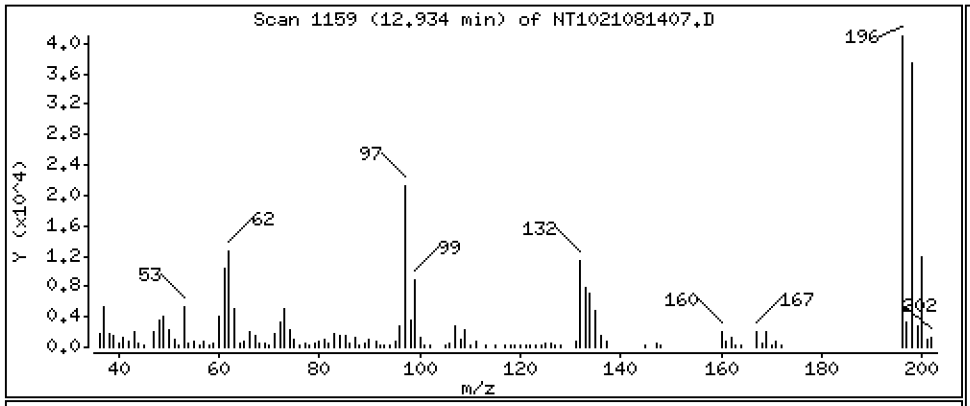
Operator: VTS

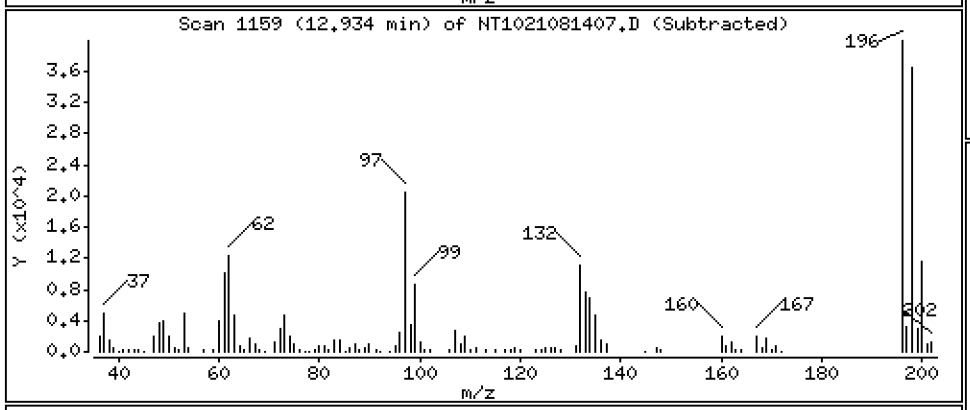
Column phase: ZB-5msi

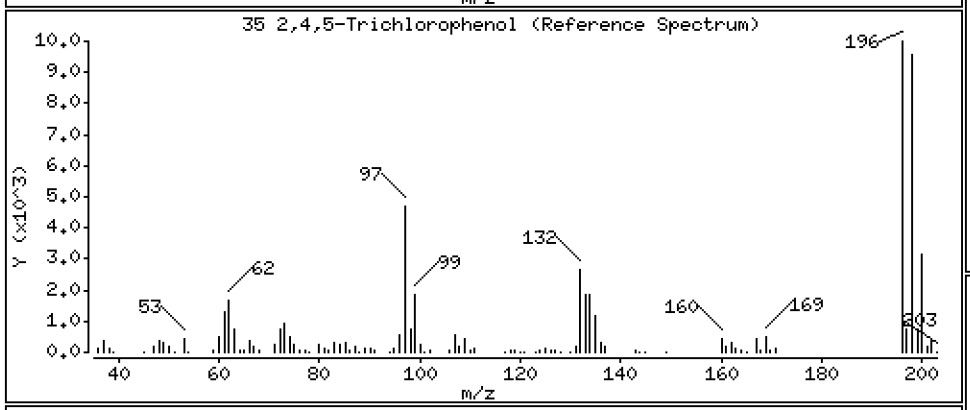
Column diameter: 0.25

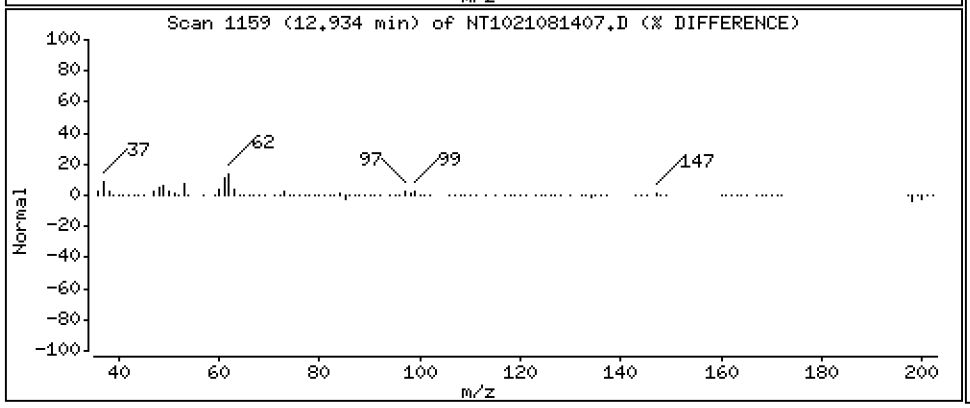
35 2,4,5-Trichlorophenol

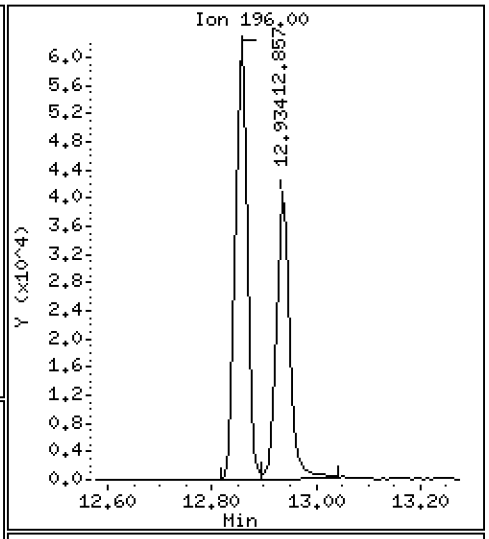
Concentration: 3.636 ug/mL

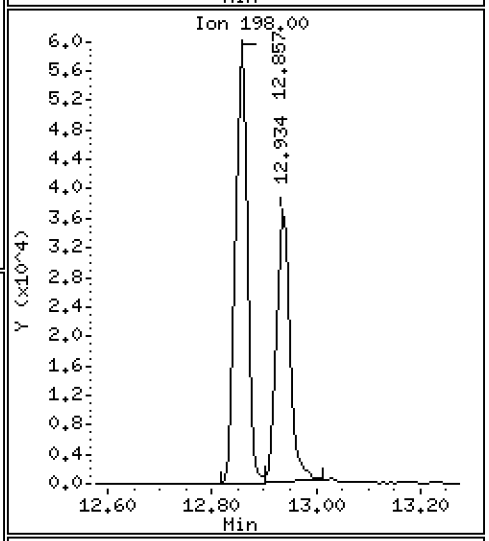


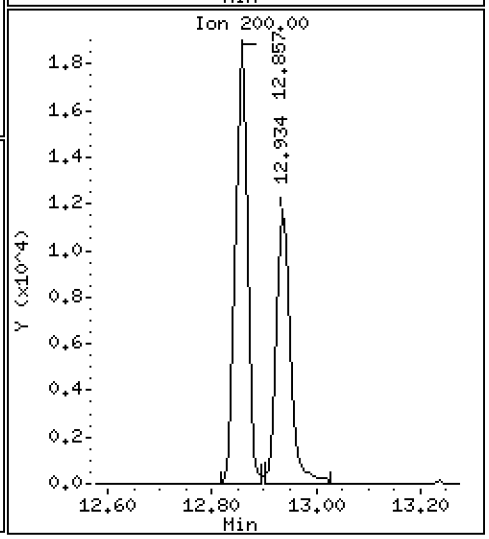












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

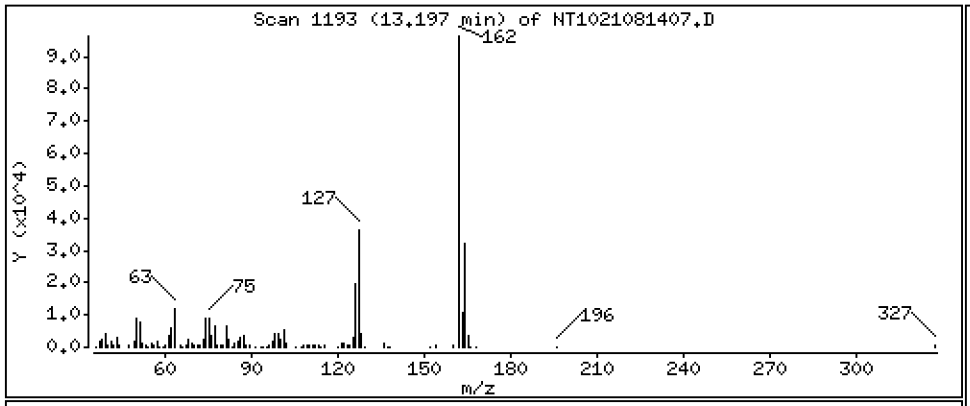
Operator: VTS

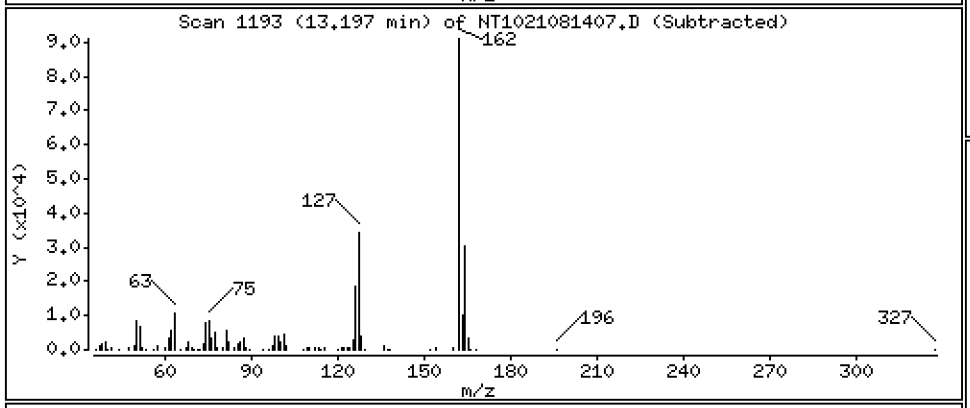
Column phase: ZB-5msi

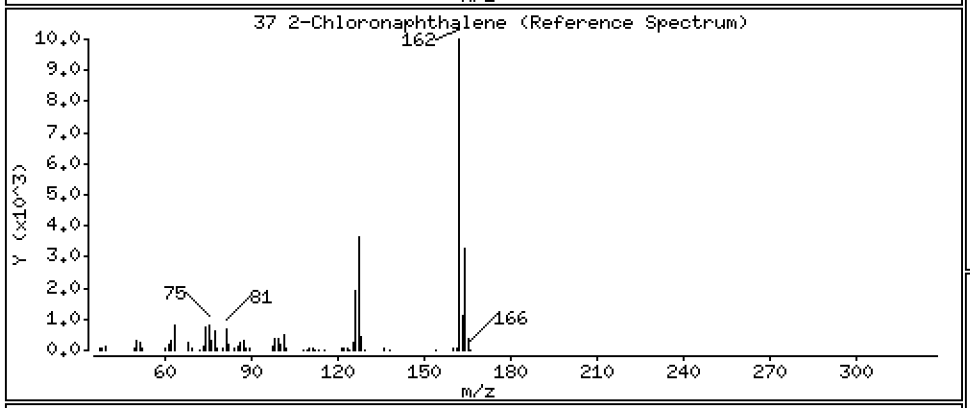
Column diameter: 0.25

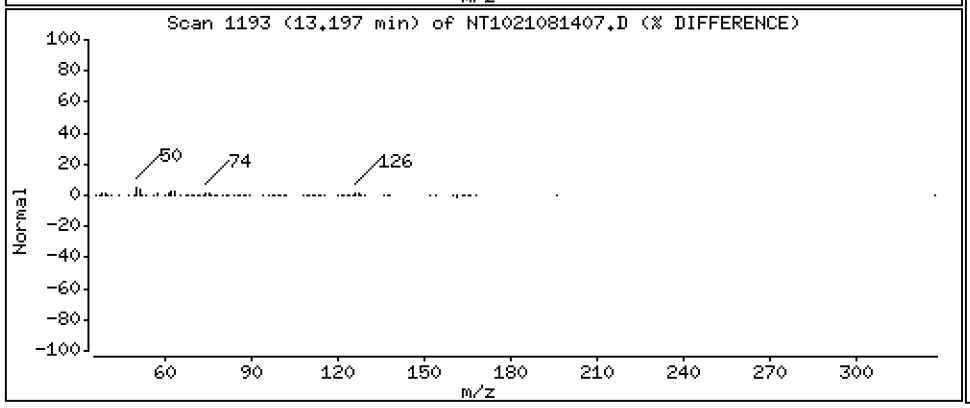
37 2-Chloronaphthalene

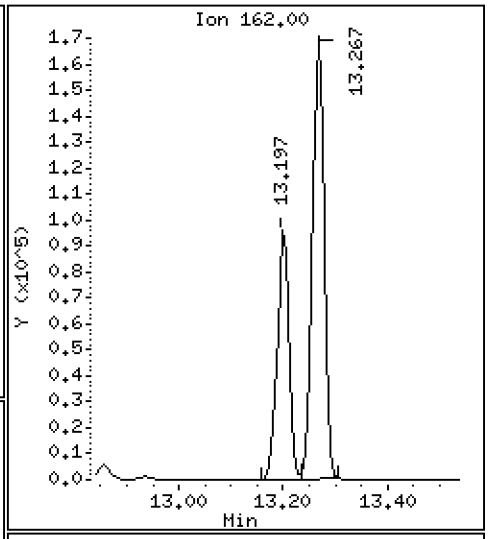
Concentration: 2.328 ug/mL

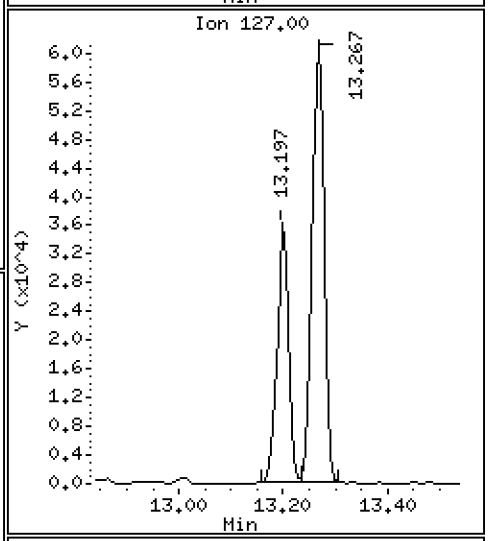


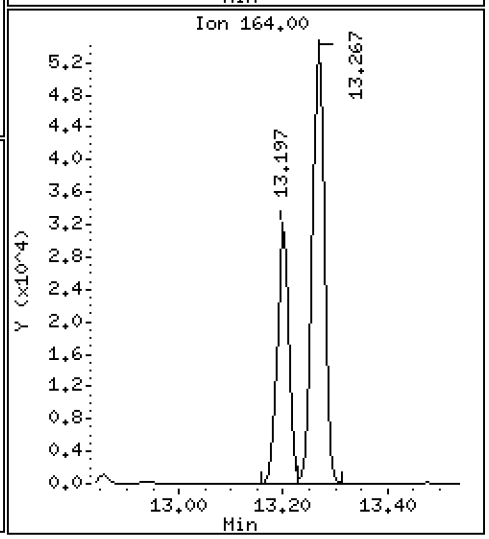












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

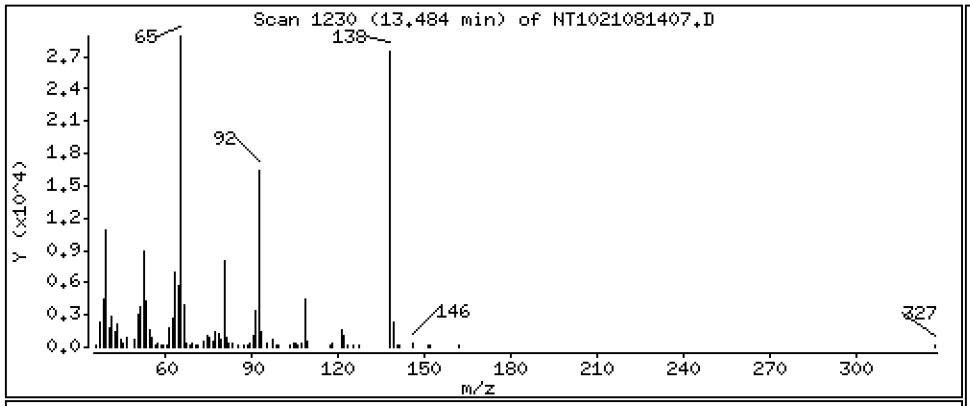
Operator: VTS

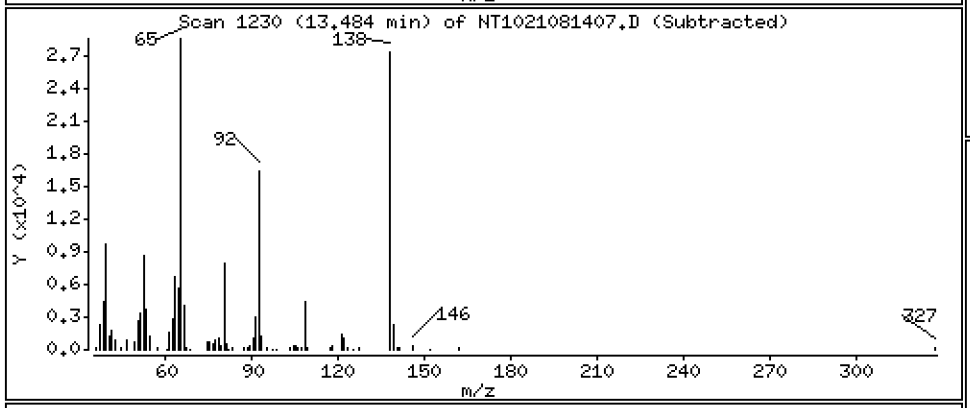
Column phase: ZB-5msi

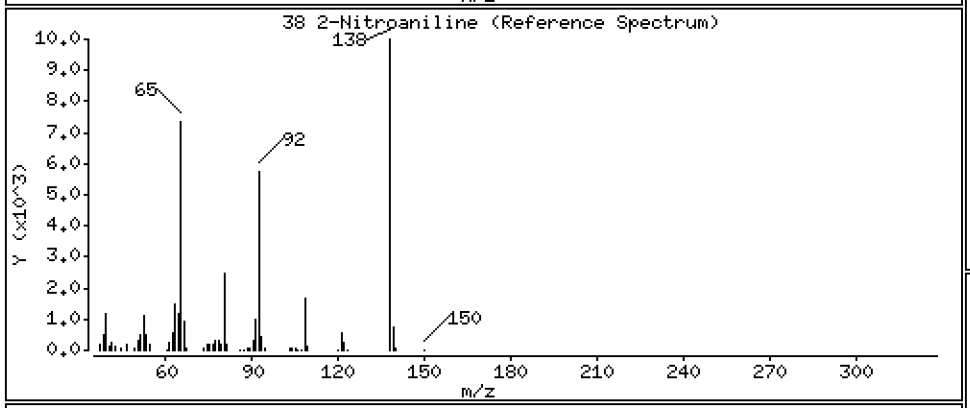
Column diameter: 0.25

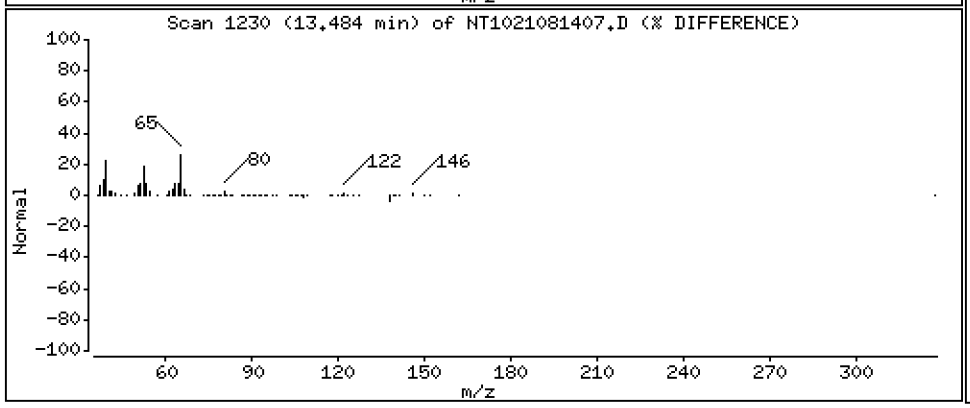
38 2-Nitroaniline

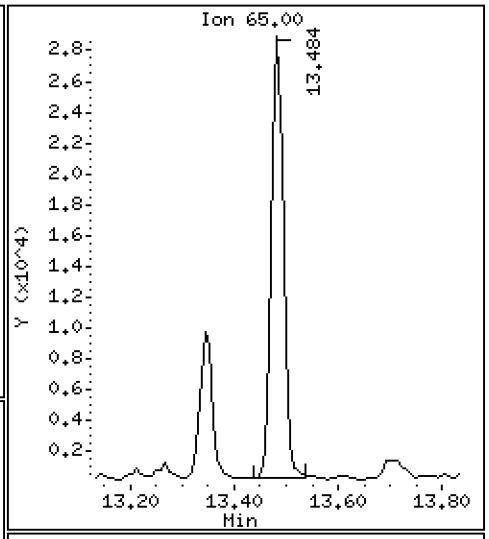
Concentration: 1.825 ug/mL

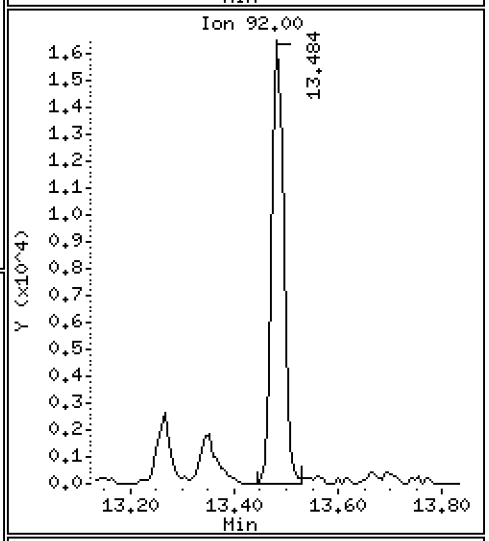


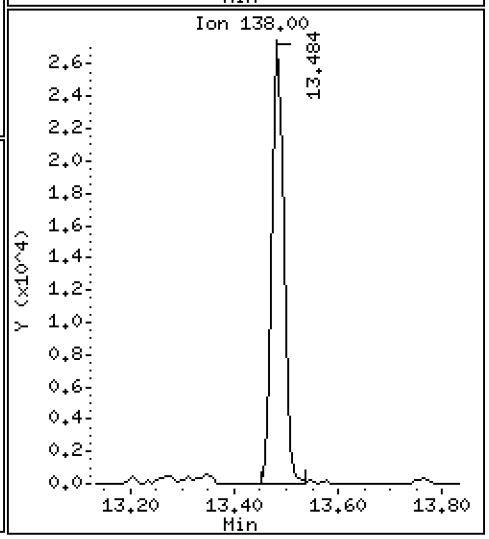












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

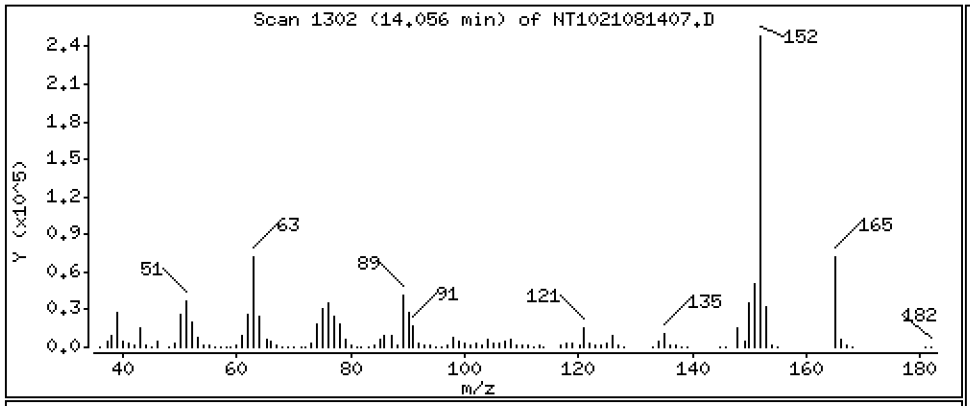
Operator: VTS

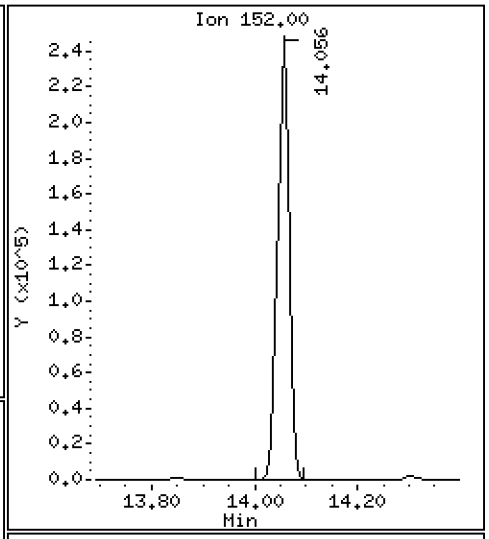
Column phase: ZB-5msi

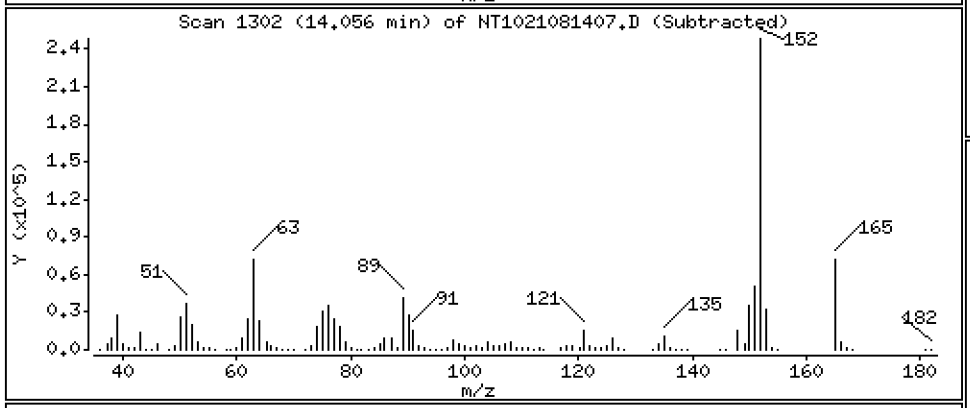
Column diameter: 0.25

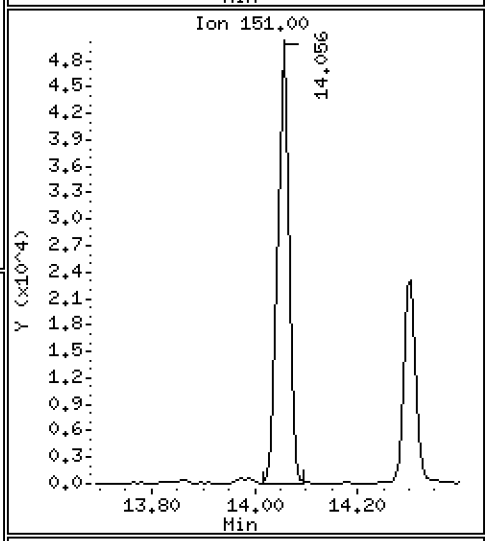
40 Acenaphthylene

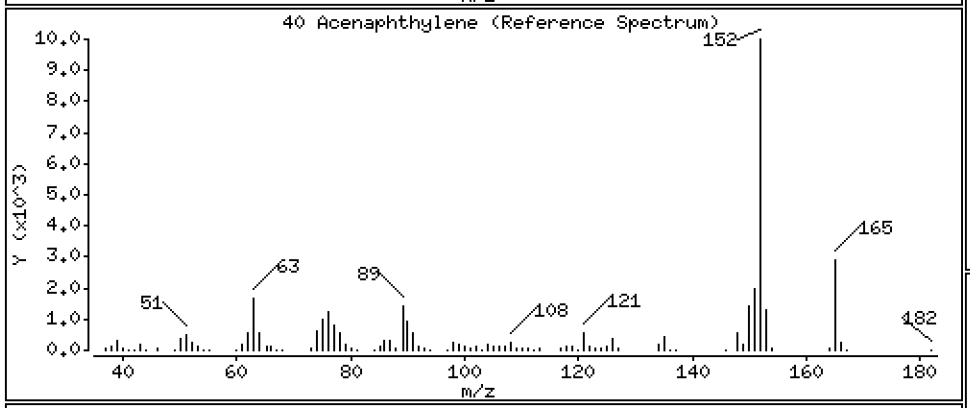
Concentration: 4.060 ug/mL

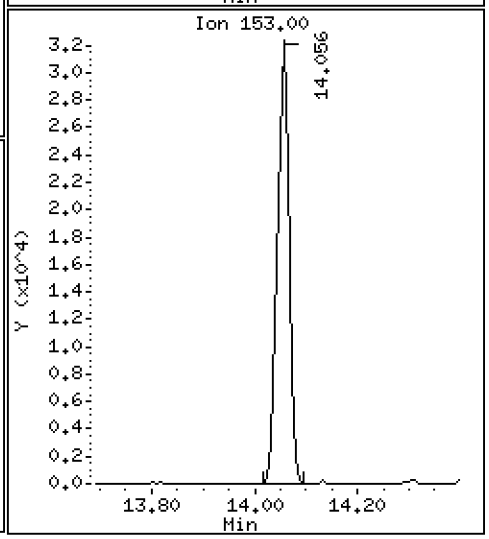


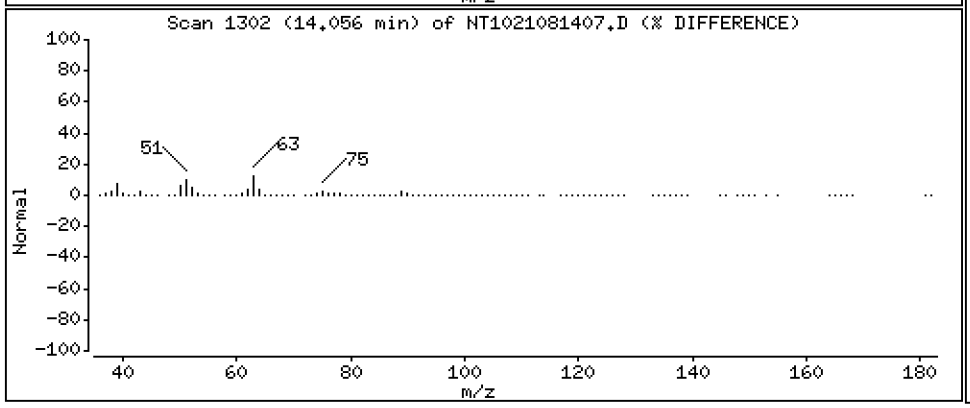












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

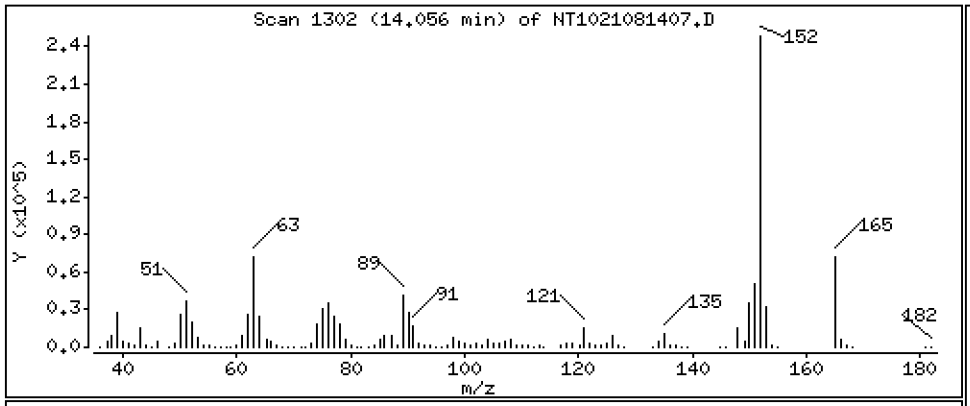
Operator: VTS

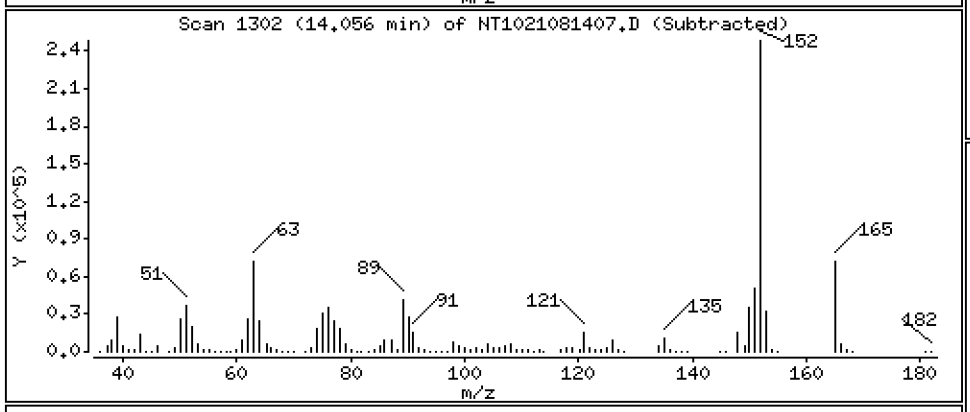
Column phase: ZB-5msi

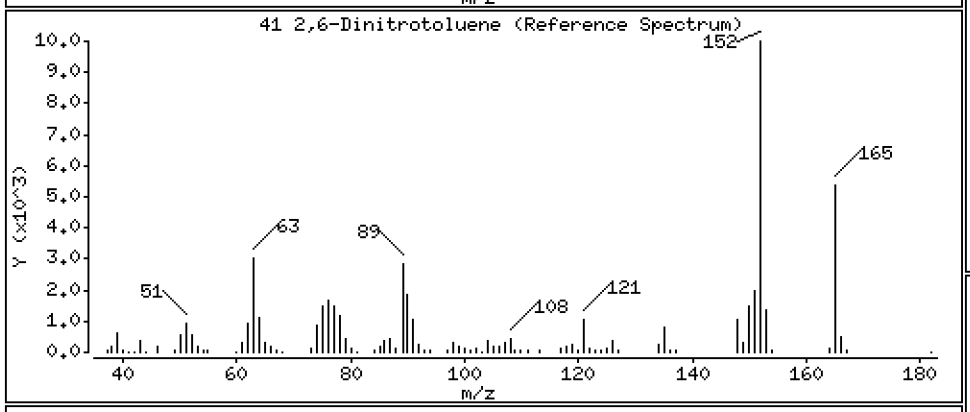
Column diameter: 0.25

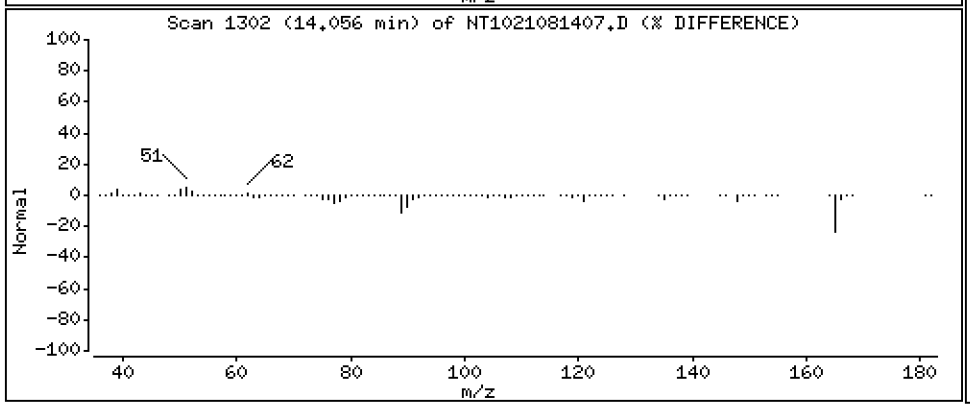
41 2,6-Dinitrotoluene

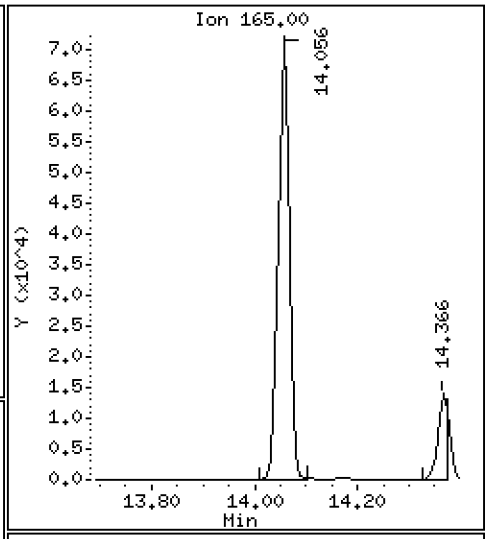
Concentration: 7.380 ug/mL

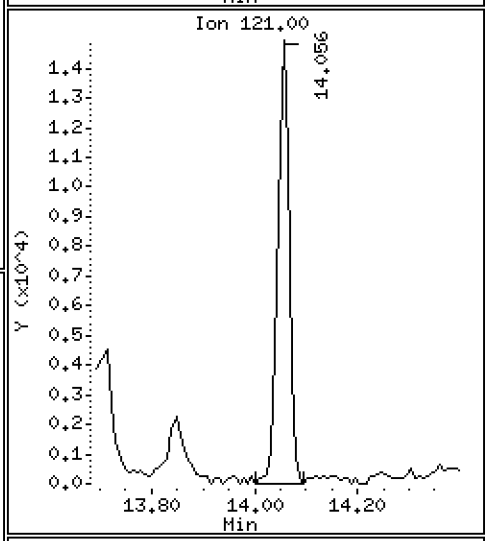


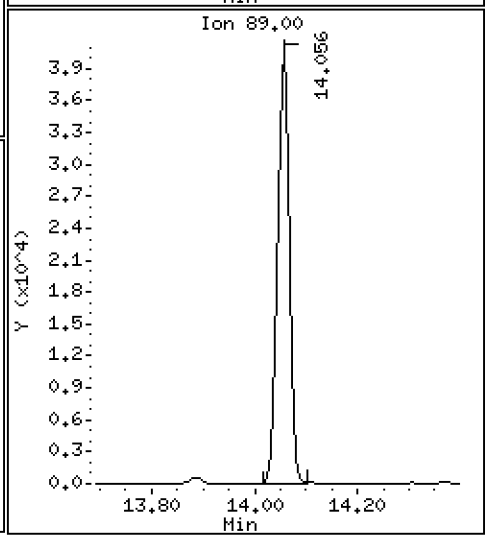












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

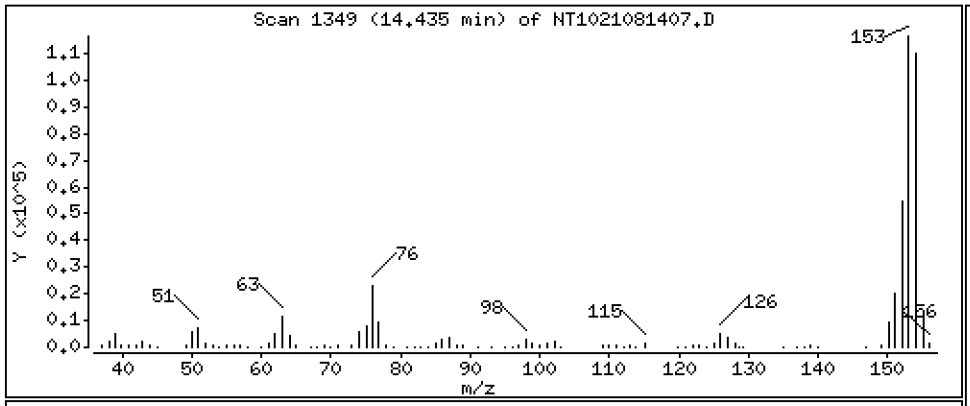
Operator: VTS

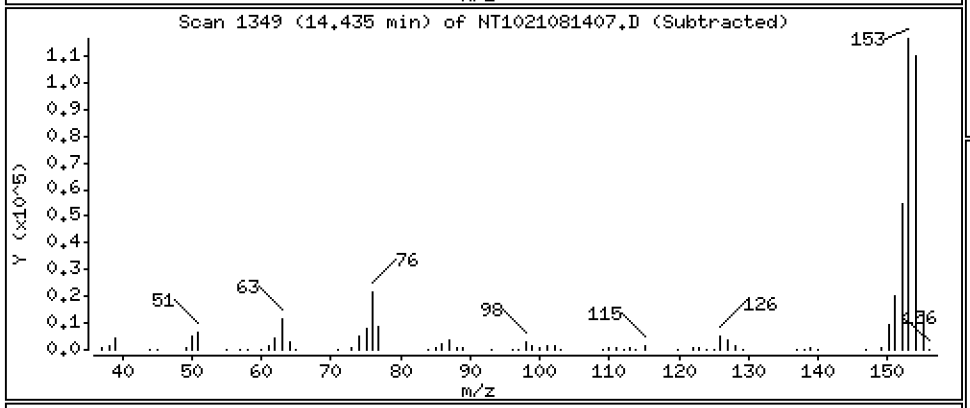
Column phase: ZB-5msi

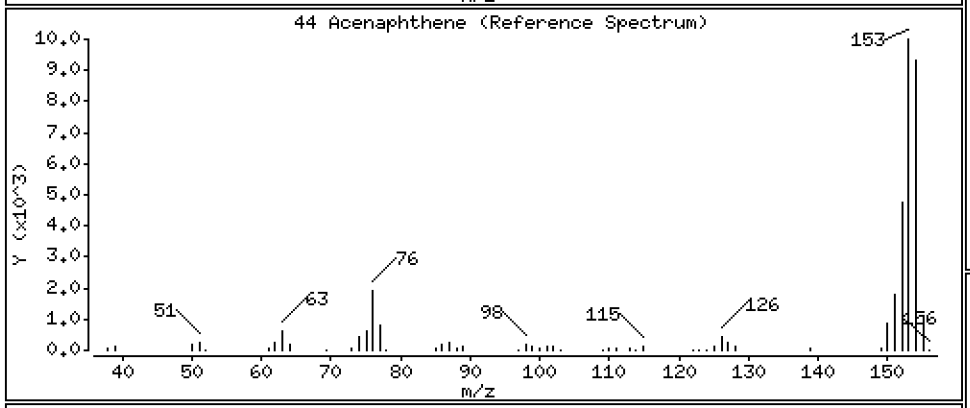
Column diameter: 0.25

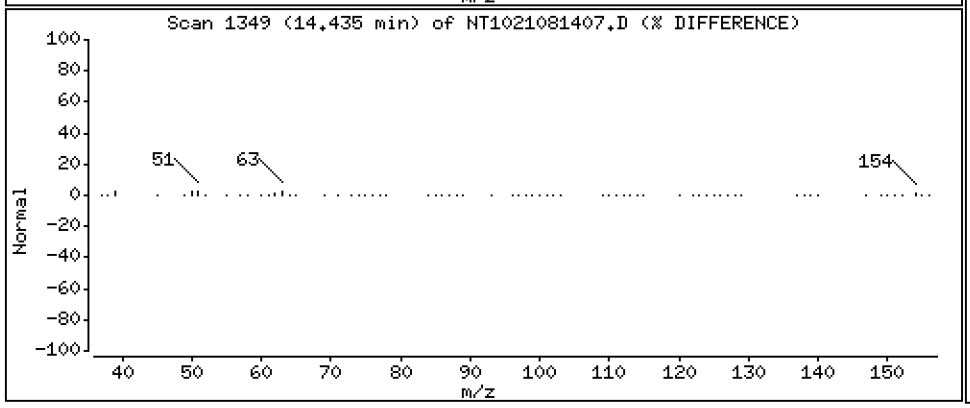
44 Acenaphthene

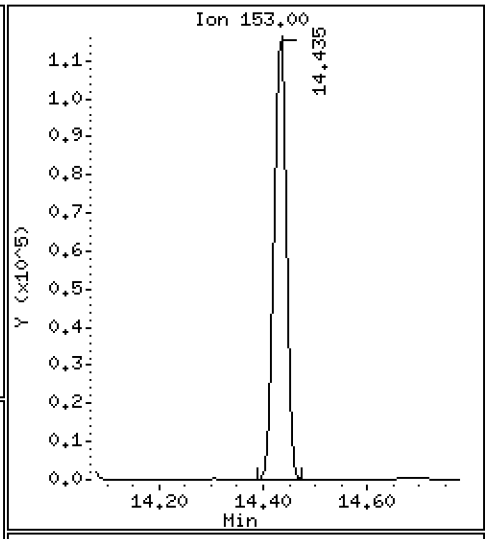
Concentration: 3.475 ug/mL

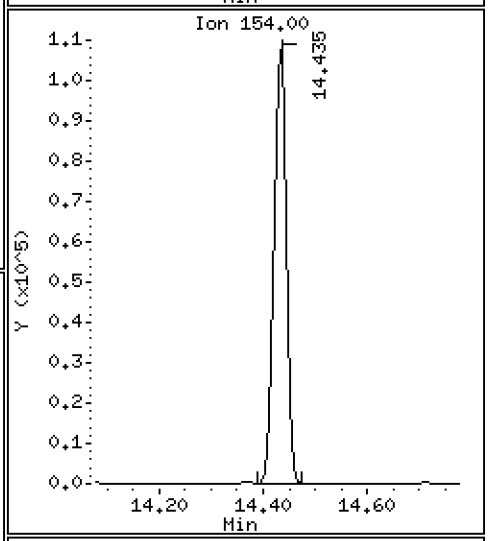


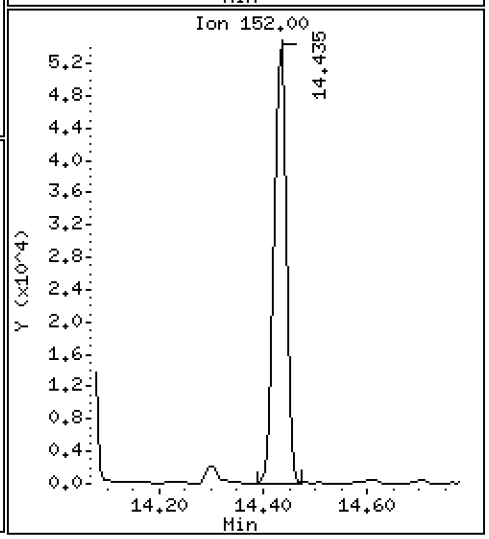












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

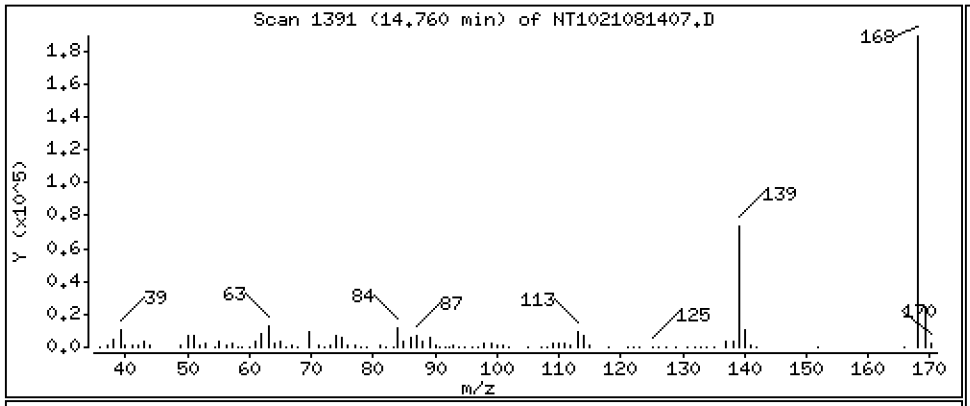
Operator: VTS

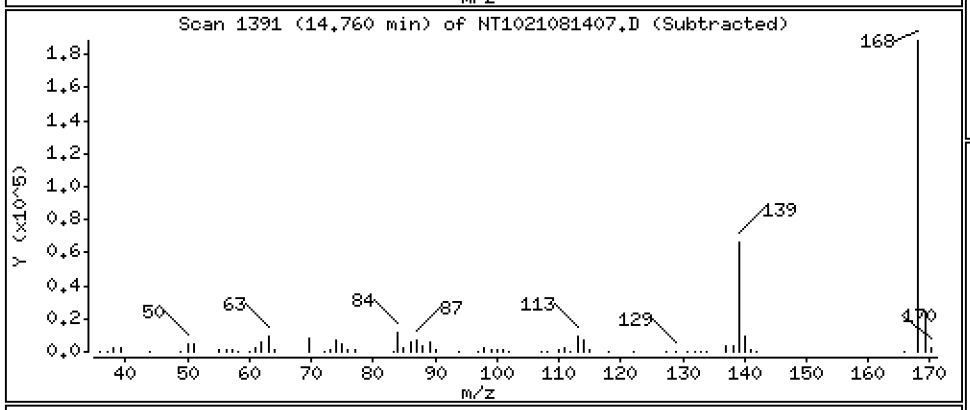
Column phase: ZB-5msi

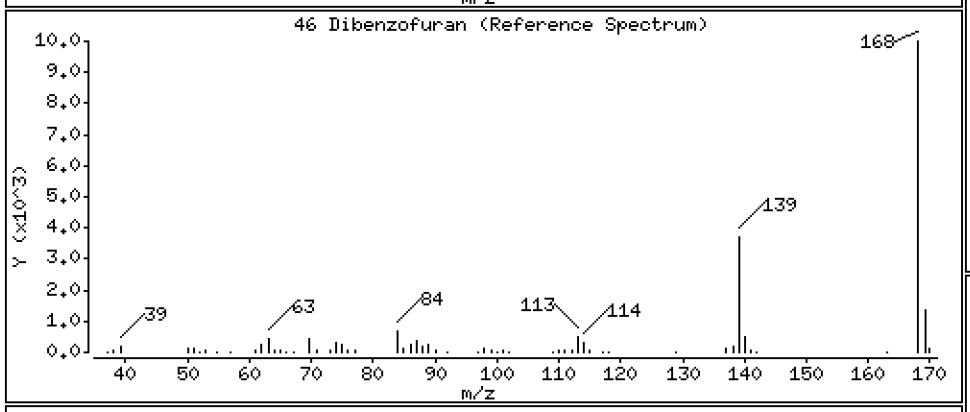
Column diameter: 0.25

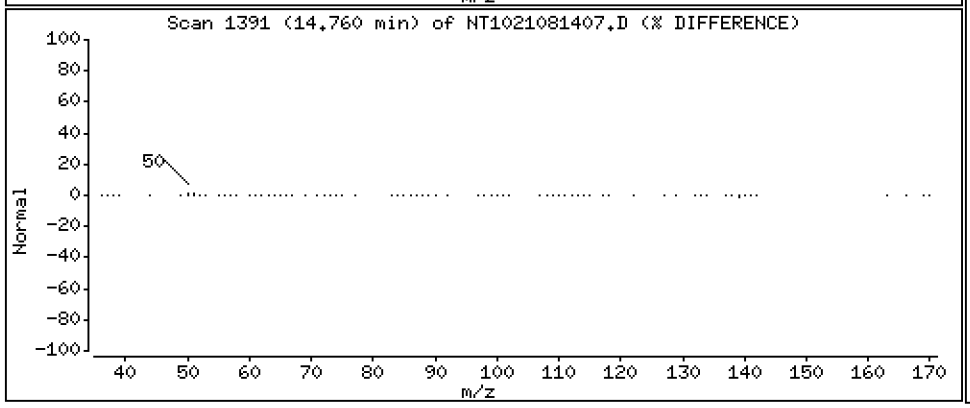
46 Dibenzofuran

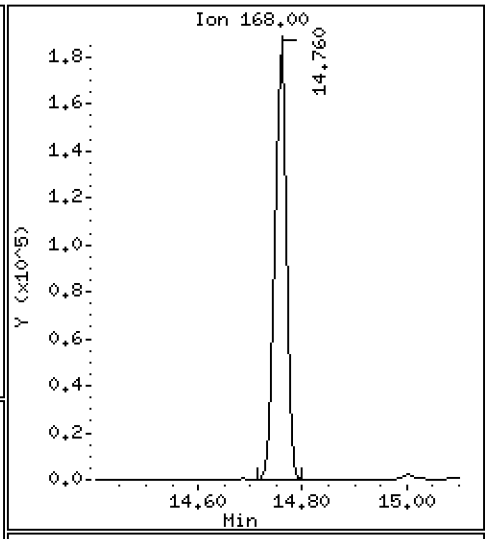
Concentration: 3.353 ug/mL

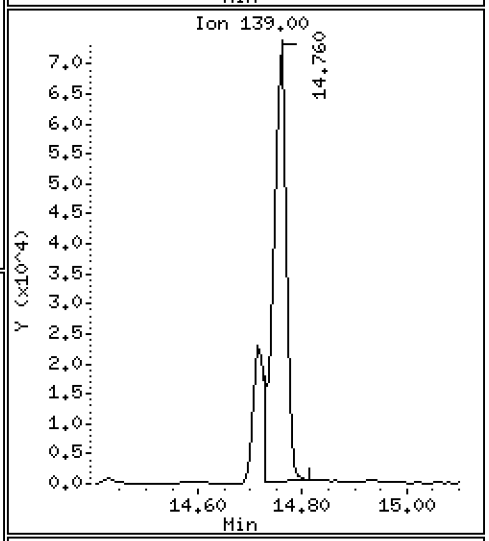


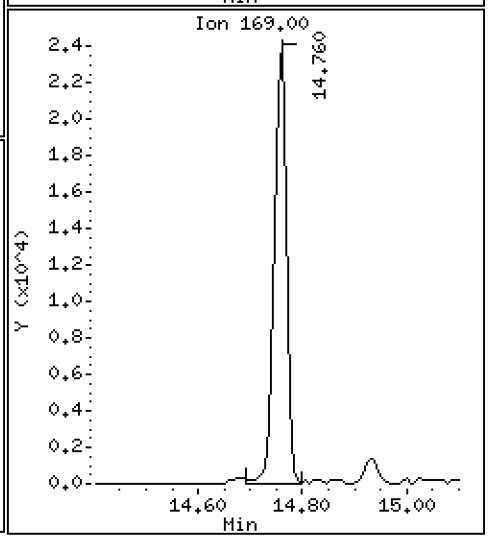












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

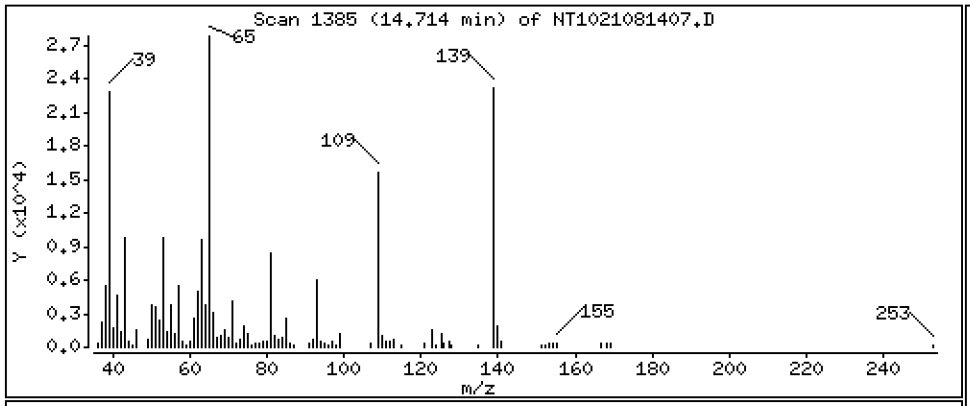
Operator: VTS

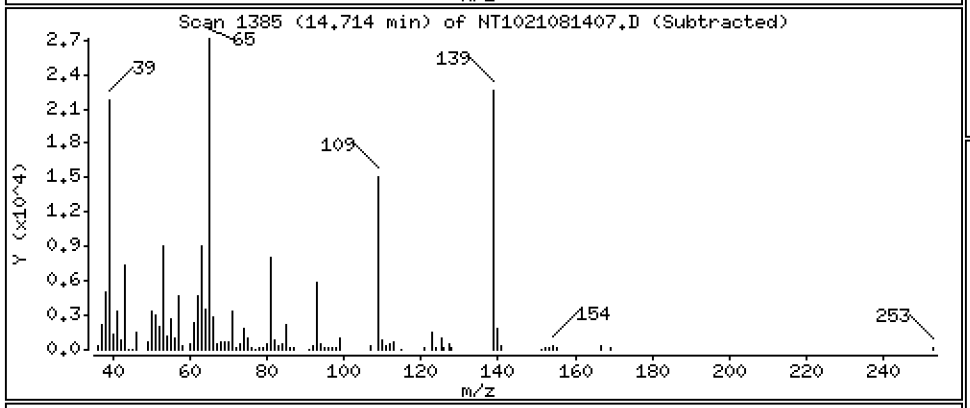
Column phase: ZB-5msi

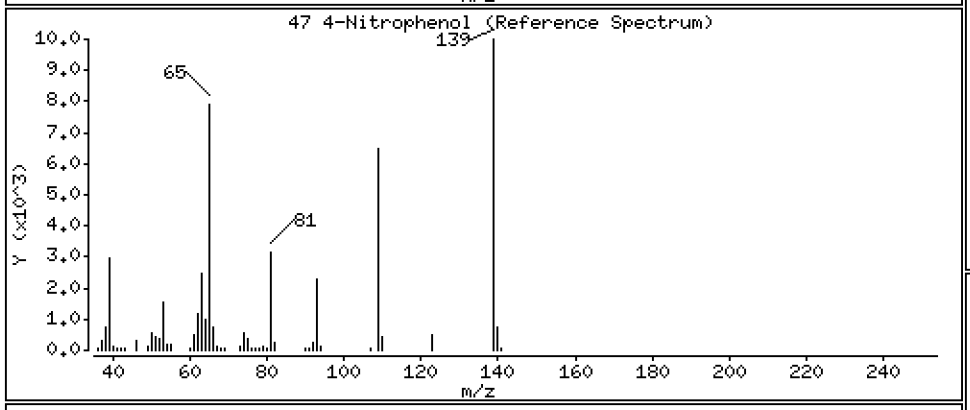
Column diameter: 0.25

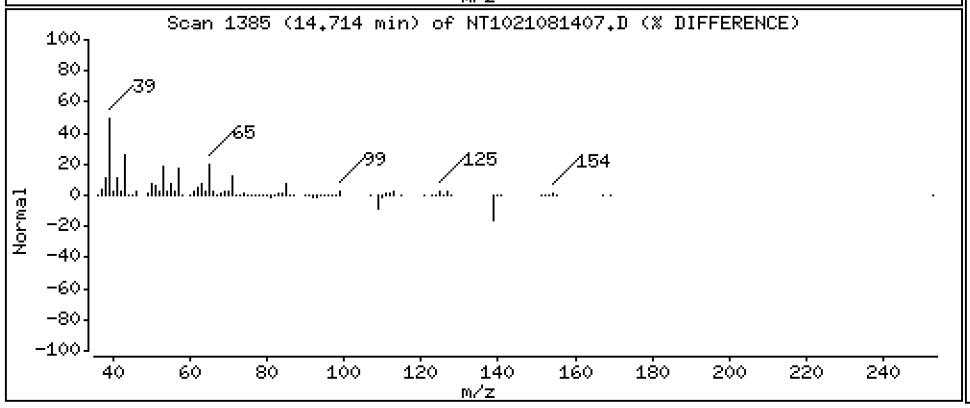
47 4-Nitrophenol

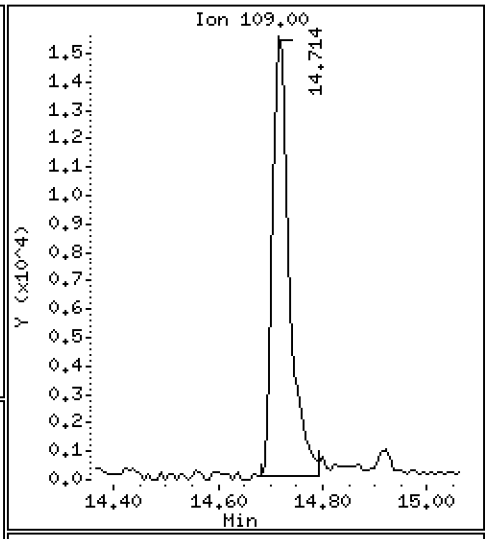
Concentration: 5.004 ug/mL

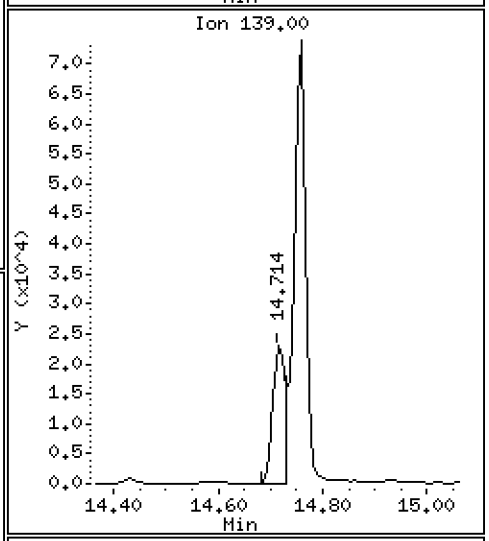


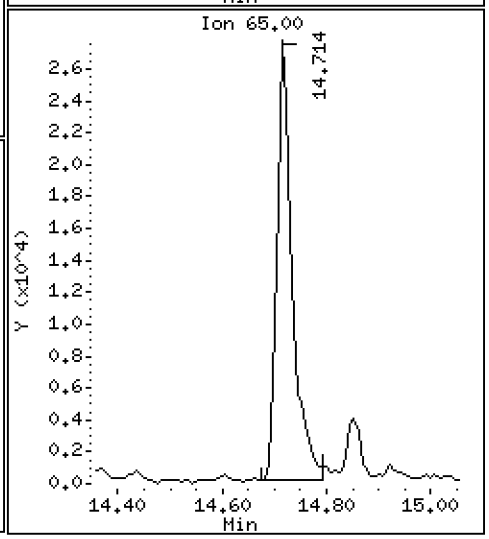












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

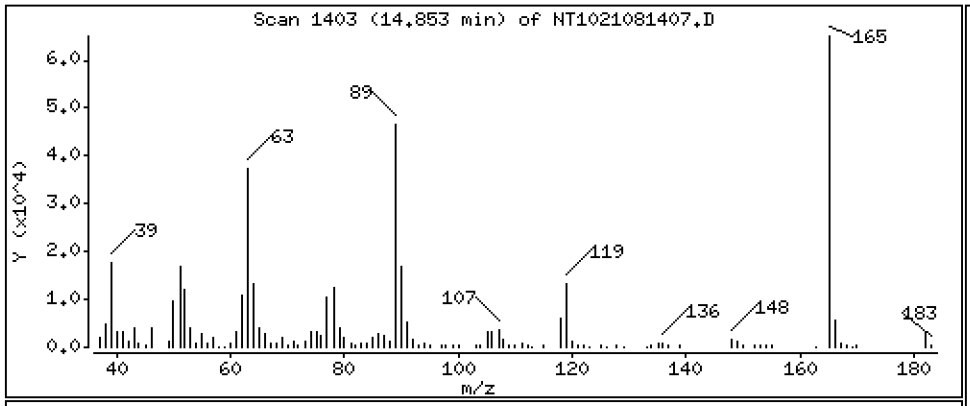
Operator: VTS

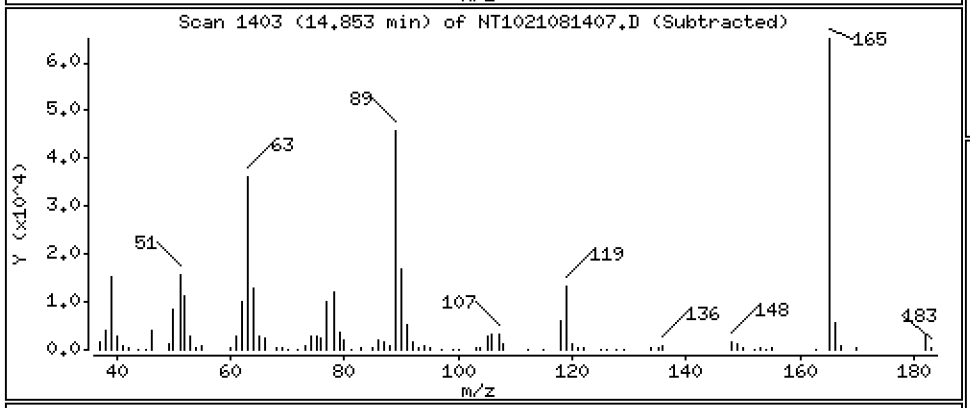
Column phase: ZB-5msi

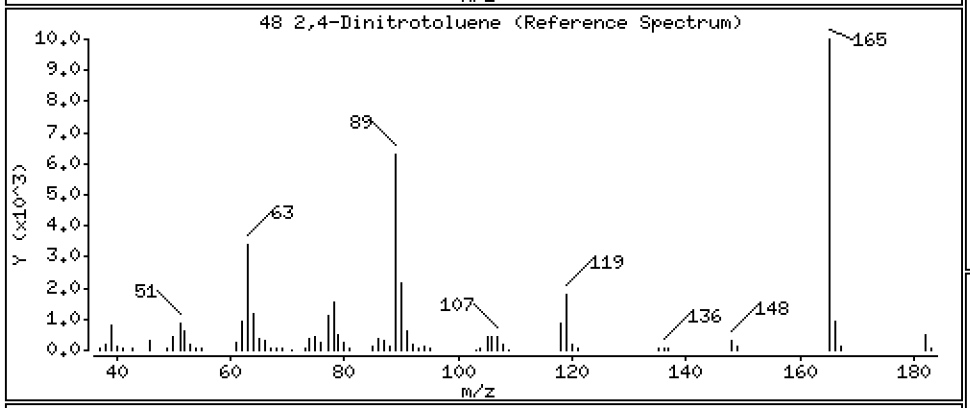
Column diameter: 0.25

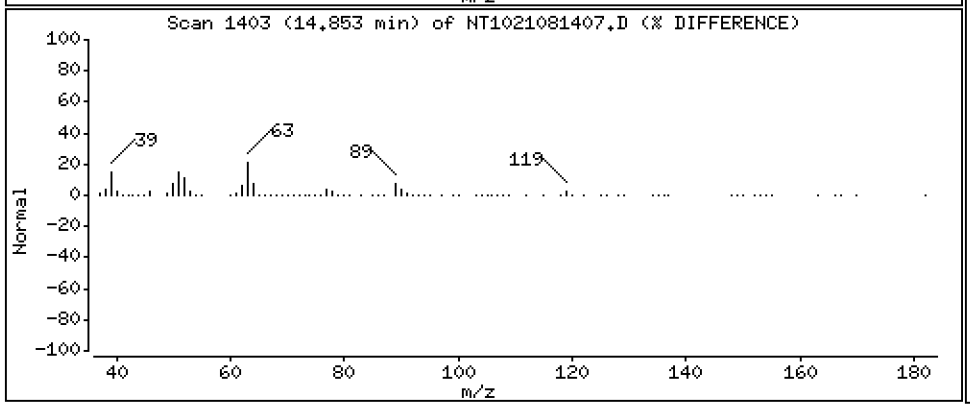
48 2,4-Dinitrotoluene

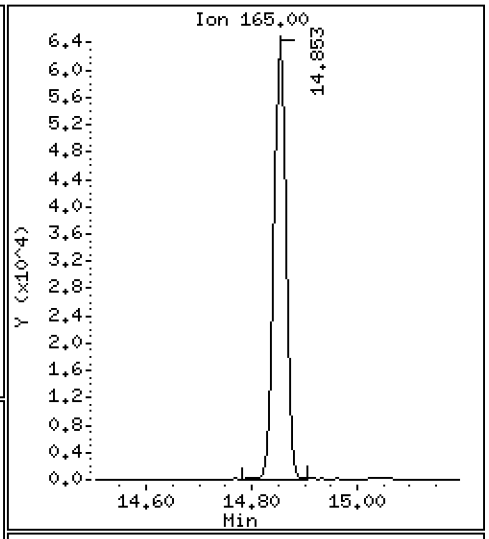
Concentration: 5.248 ug/mL

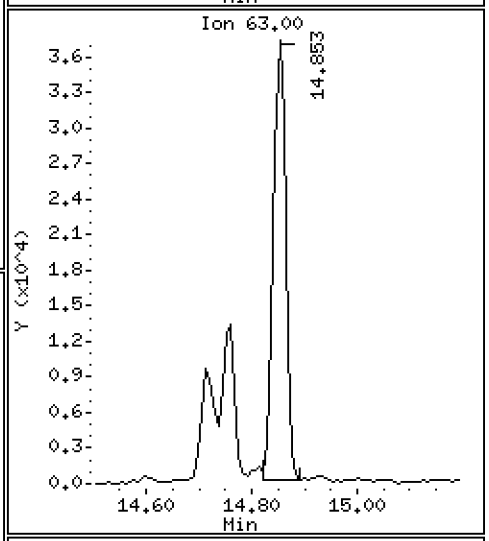


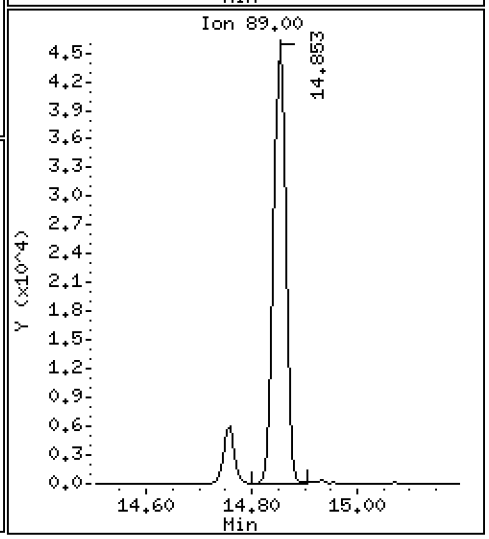












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

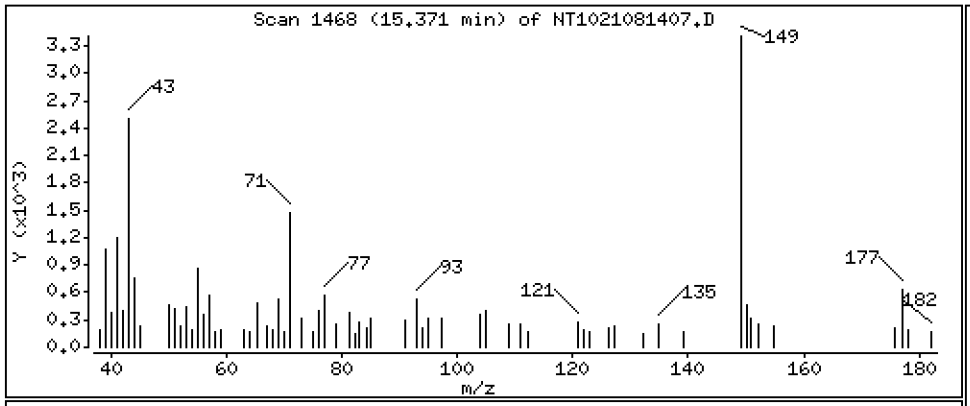
Operator: VTS

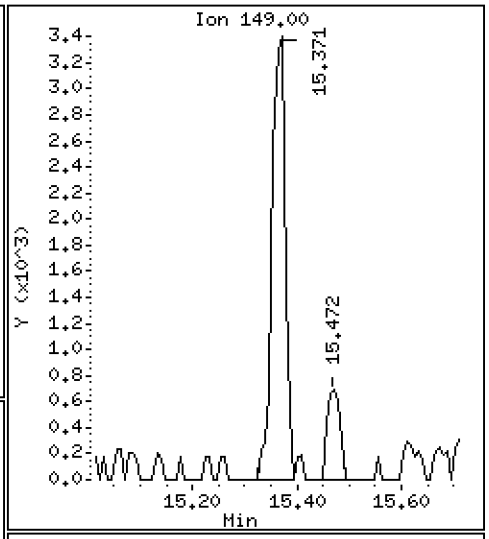
Column phase: ZB-5msi

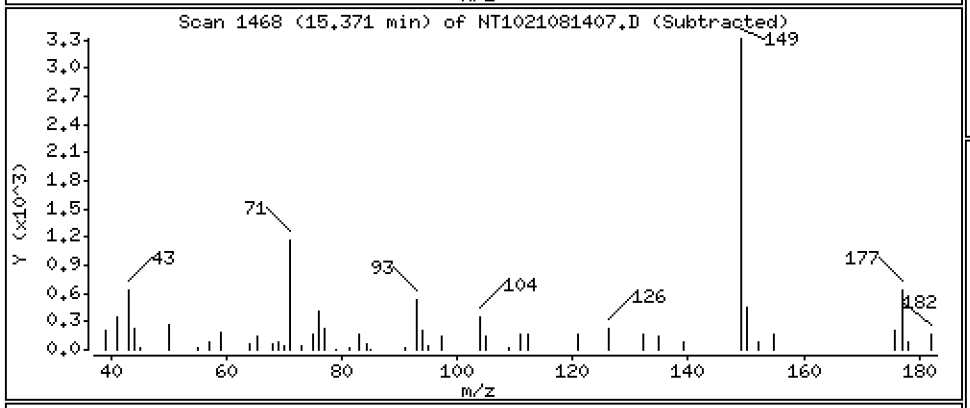
Column diameter: 0.25

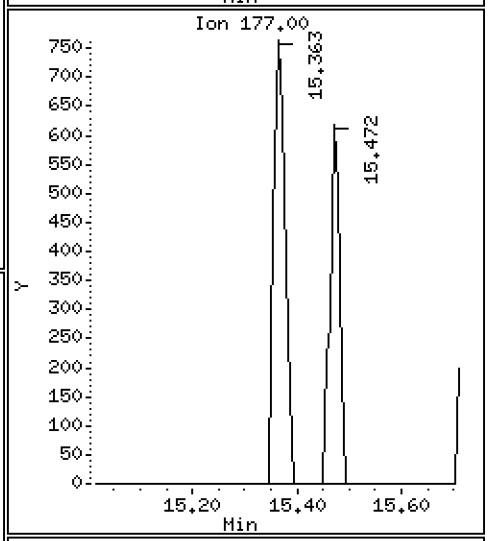
50 Diethylphthalate

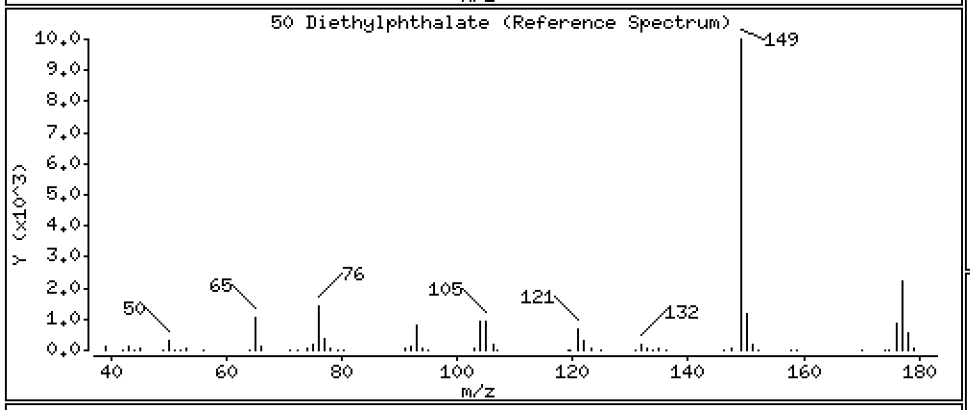
Concentration: 0.09778 ug/mL

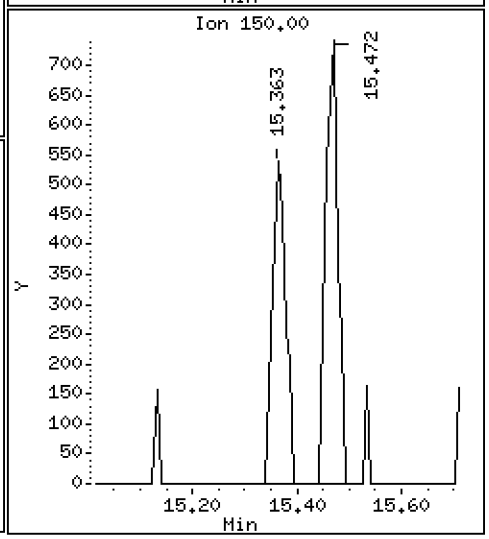


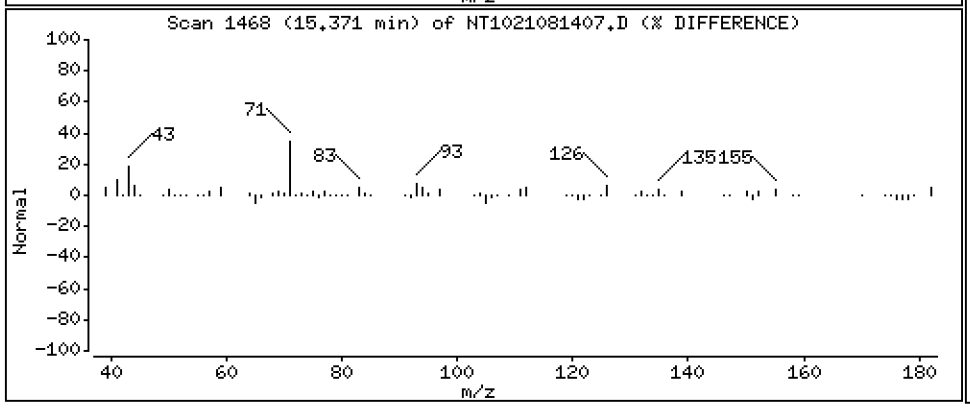












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

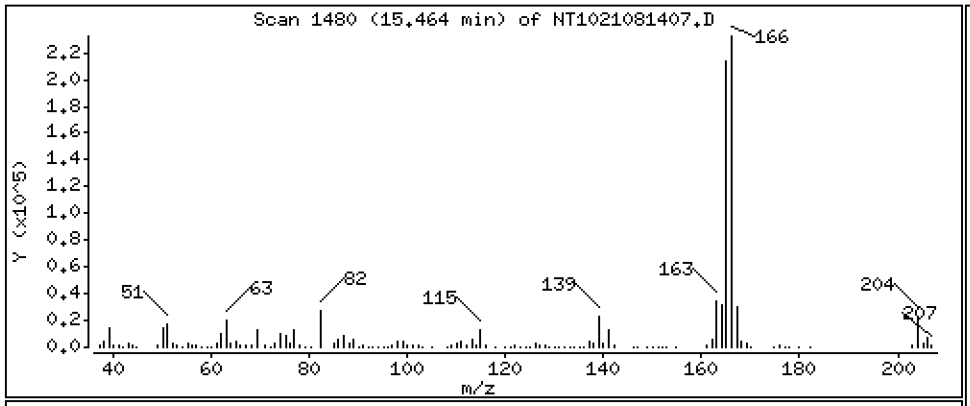
Operator: VTS

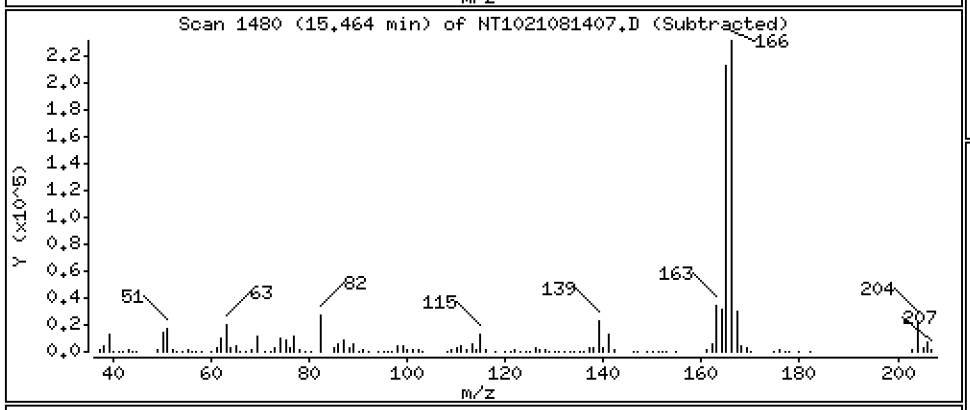
Column phase: ZB-5msi

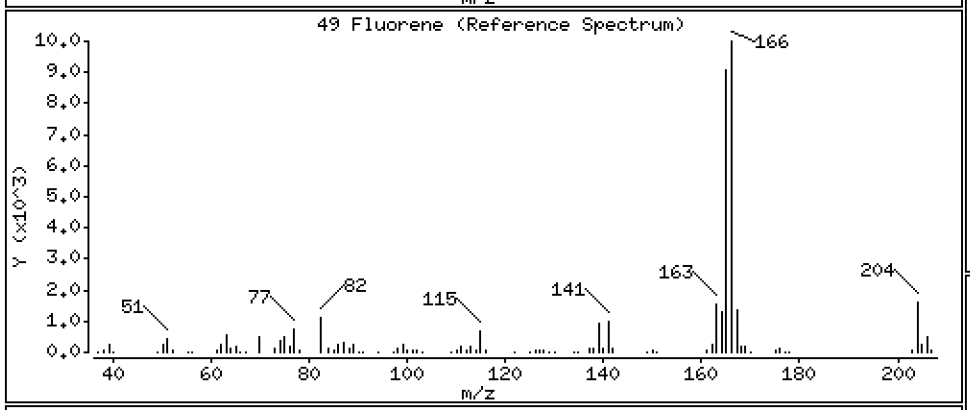
Column diameter: 0.25

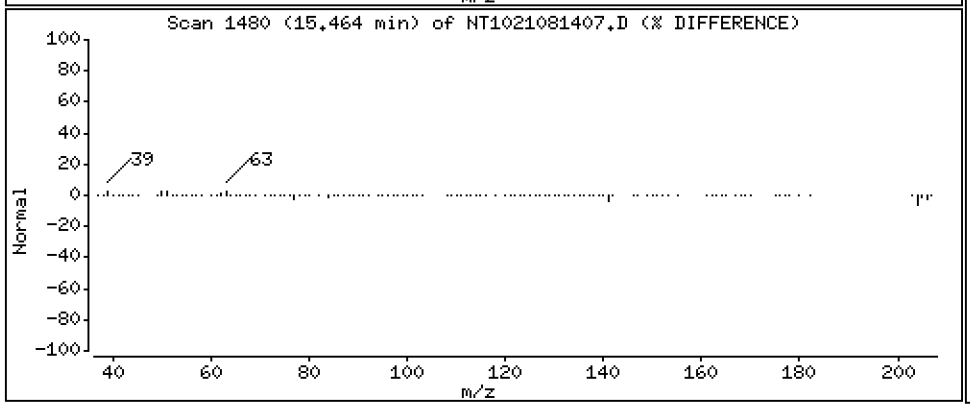
49 Fluorene

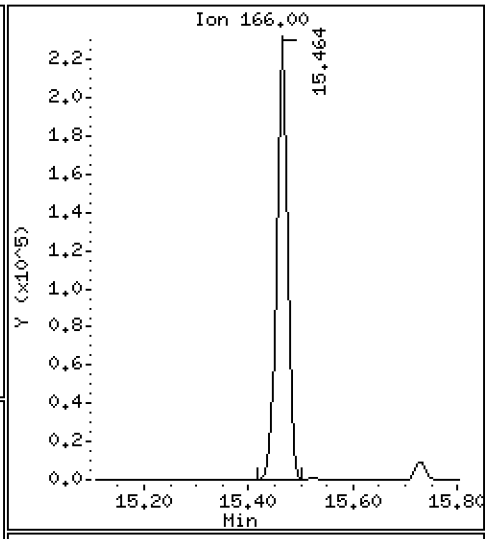
Concentration: 4.288 ug/mL

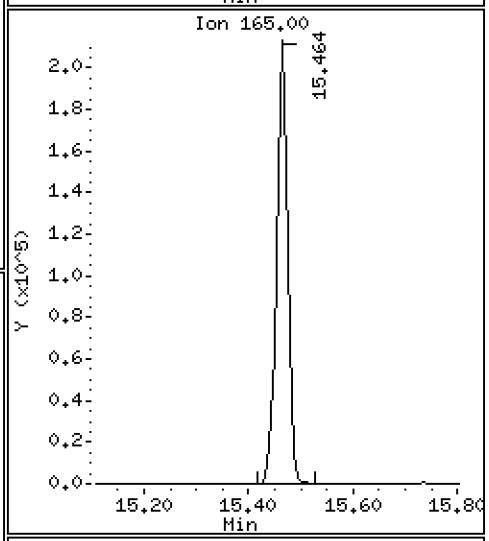


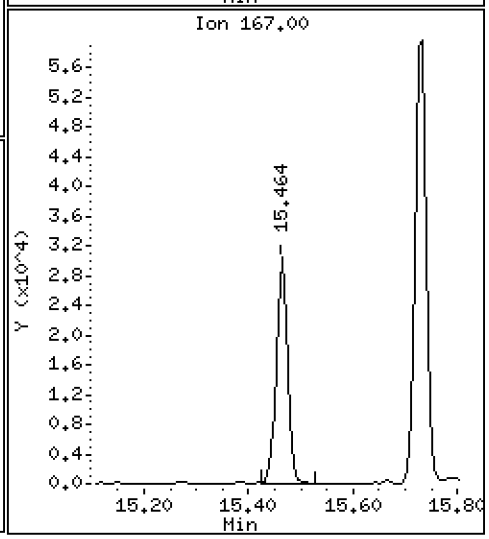












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081407.D

Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

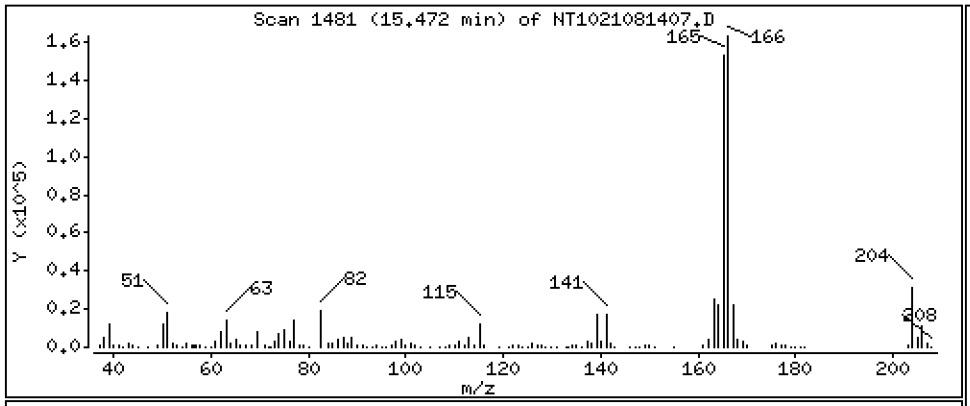
Operator: VTS

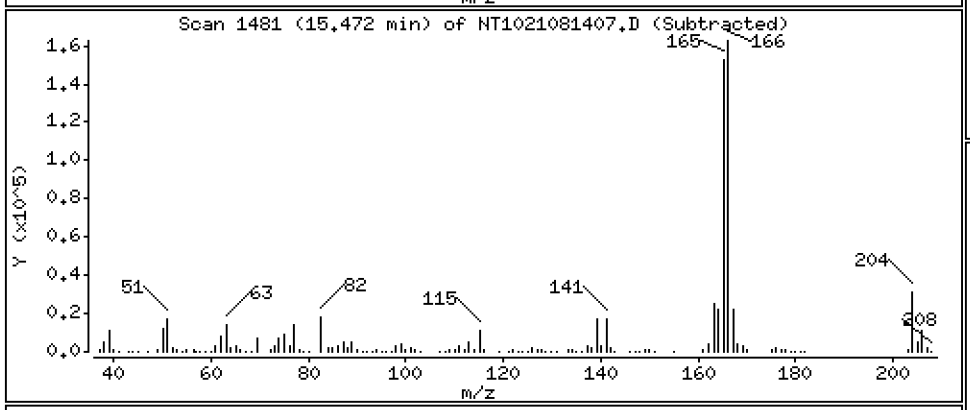
Column phase: ZB-5msi

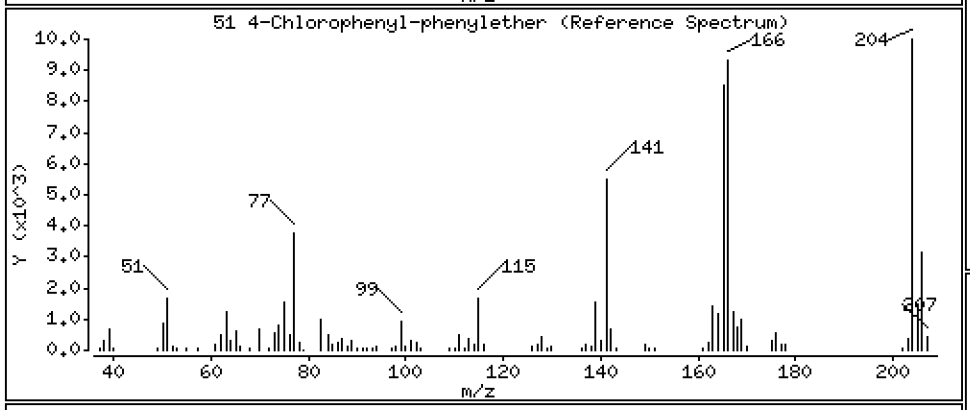
Column diameter: 0.25

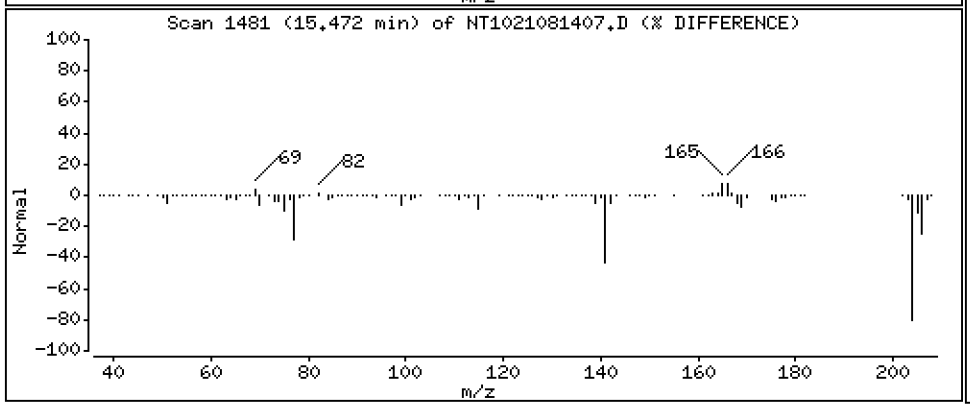
51 4-Chlorophenyl-phenylether

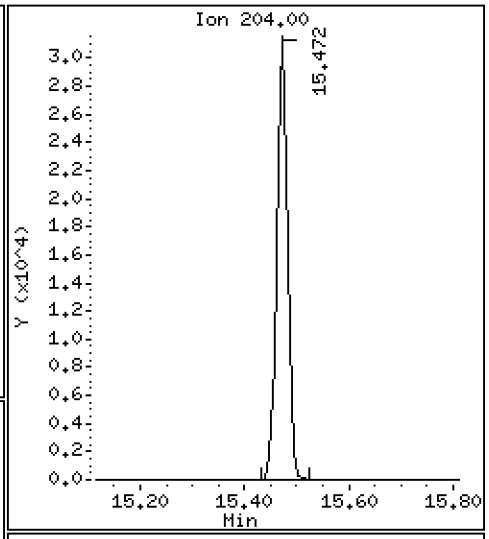
Concentration: 1.202 ug/mL

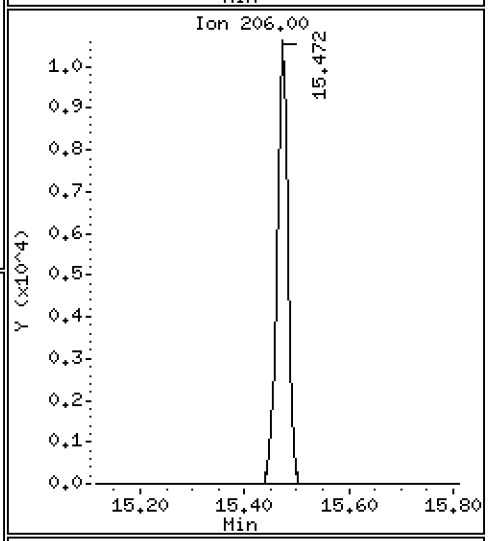


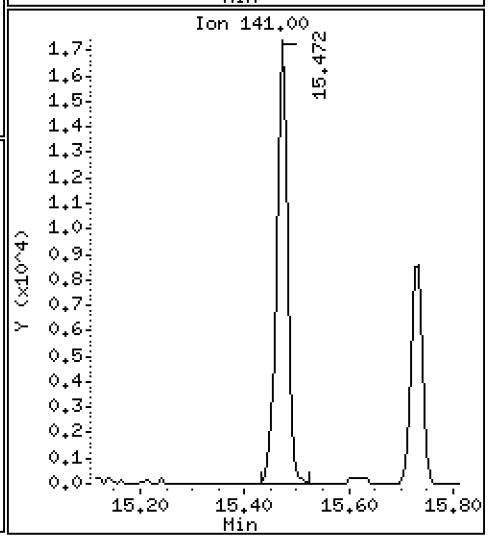












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

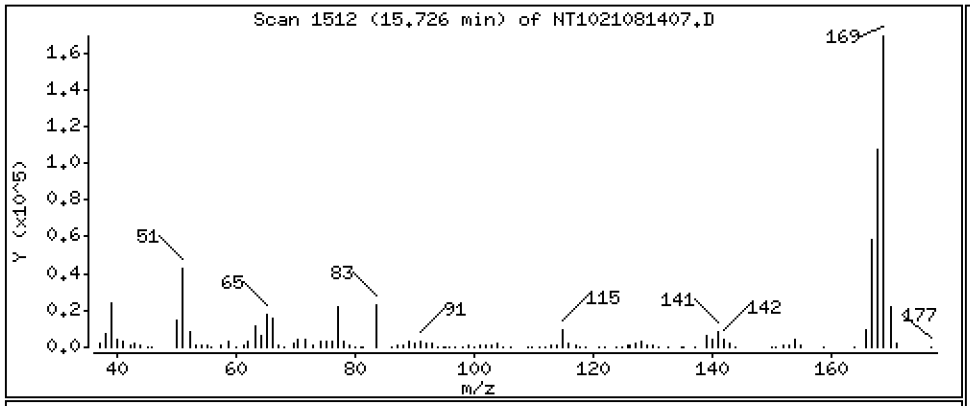
Operator: VTS

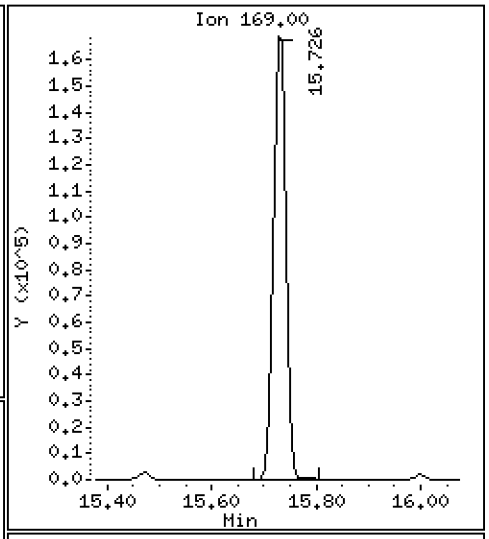
Column phase: ZB-5msi

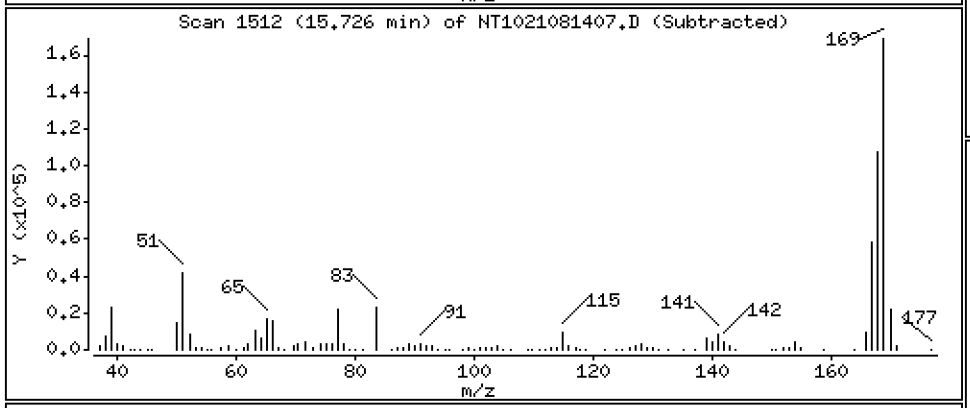
Column diameter: 0.25

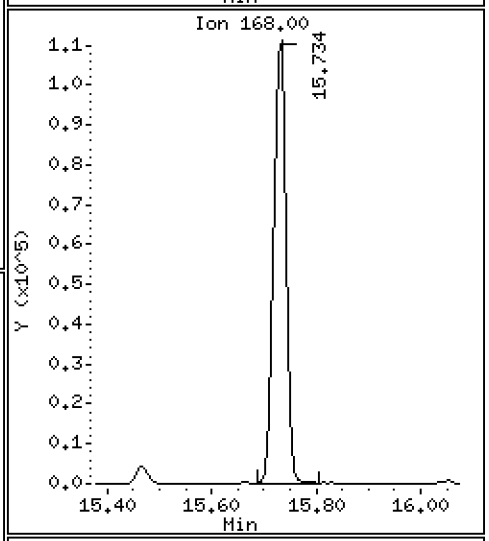
54 N-Nitrosodiphenylamine

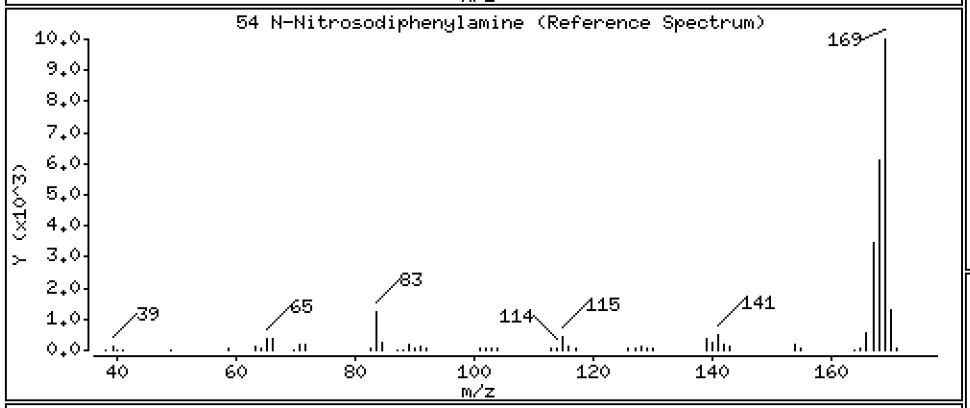
Concentration: 5.244 ug/mL

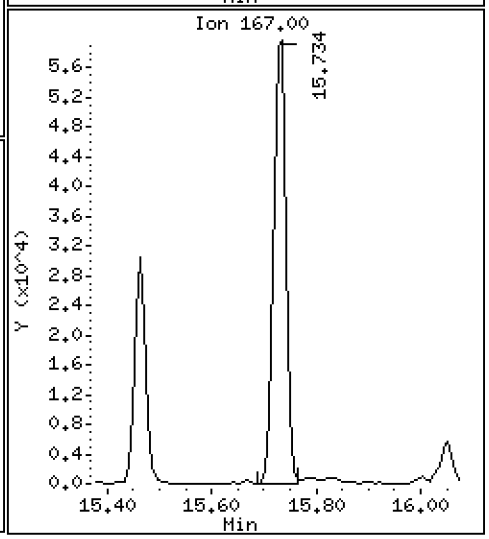


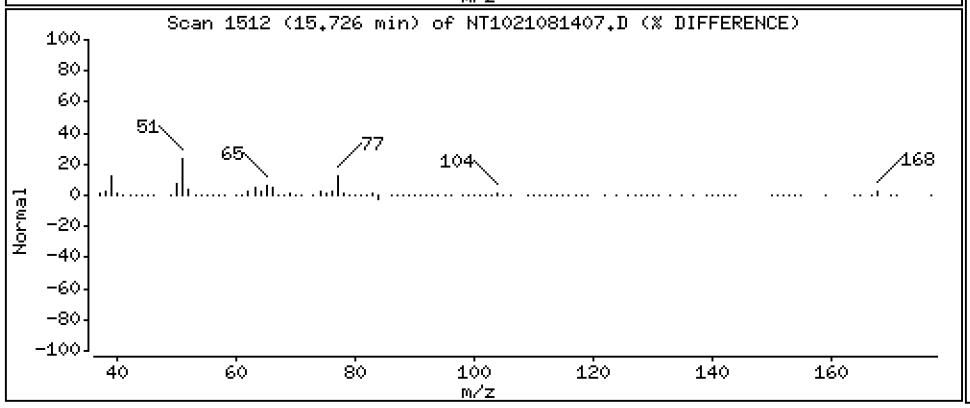












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

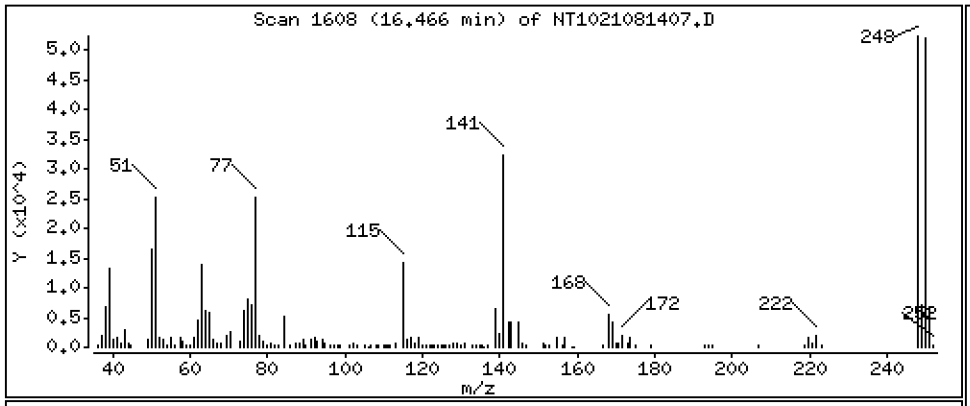
Operator: VTS

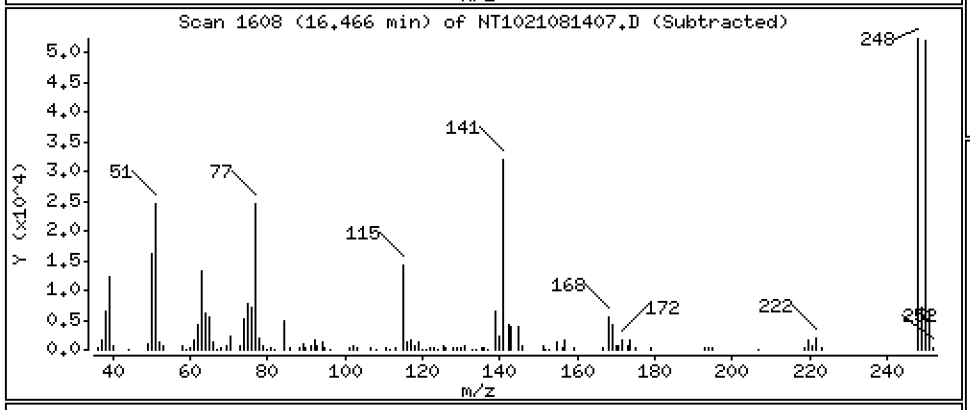
Column phase: ZB-5msi

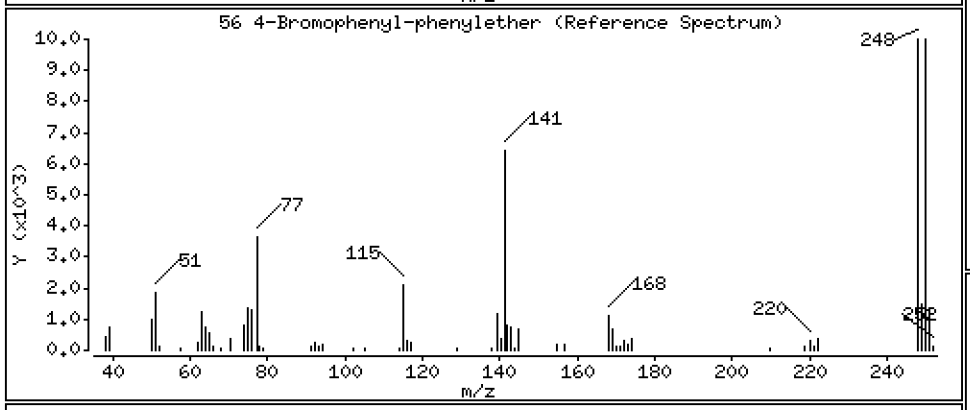
Column diameter: 0.25

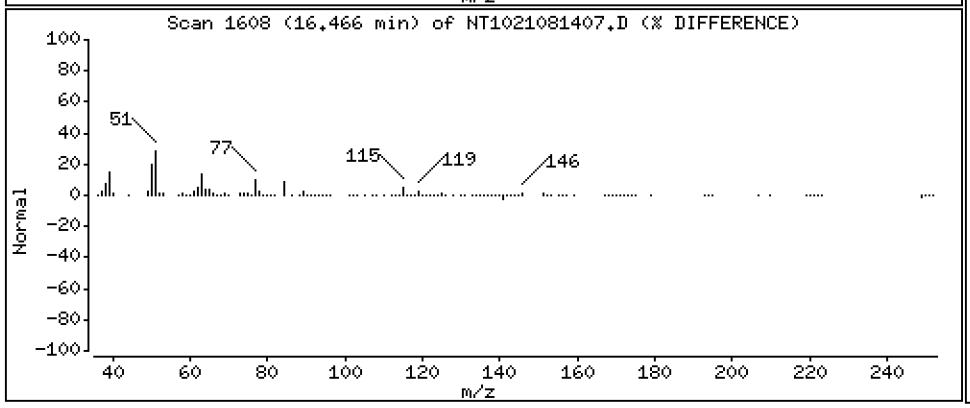
56 4-Bromophenyl-phenylether

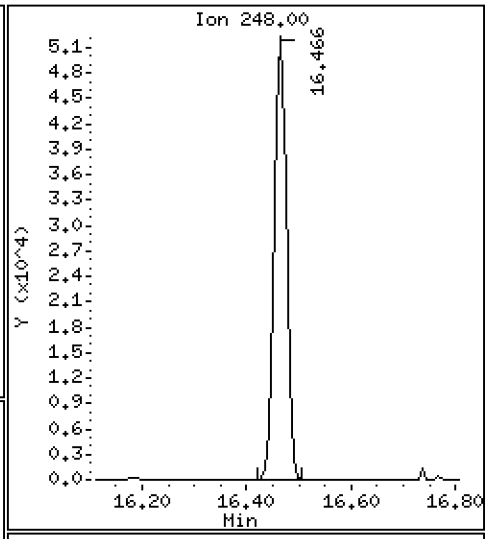
Concentration: 3.093 ug/mL

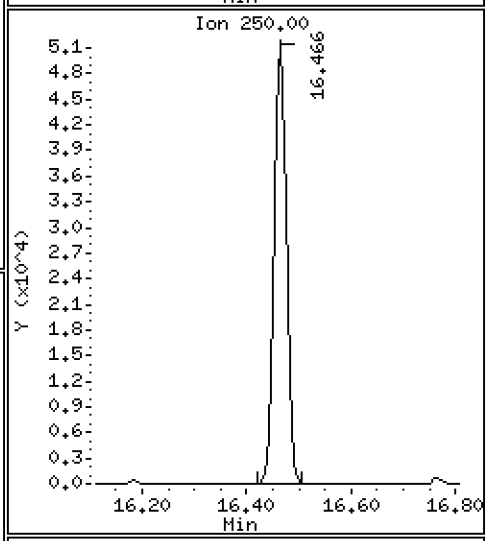


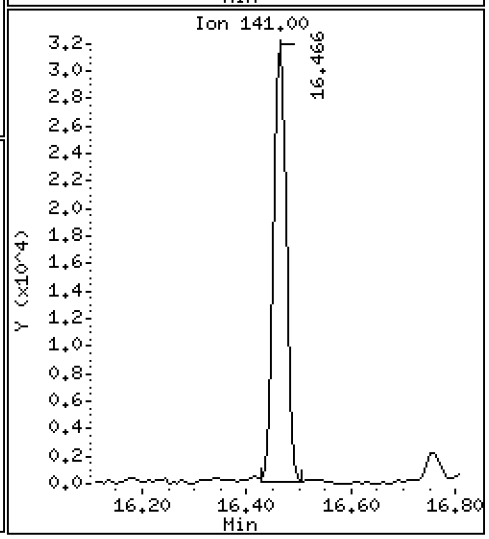












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

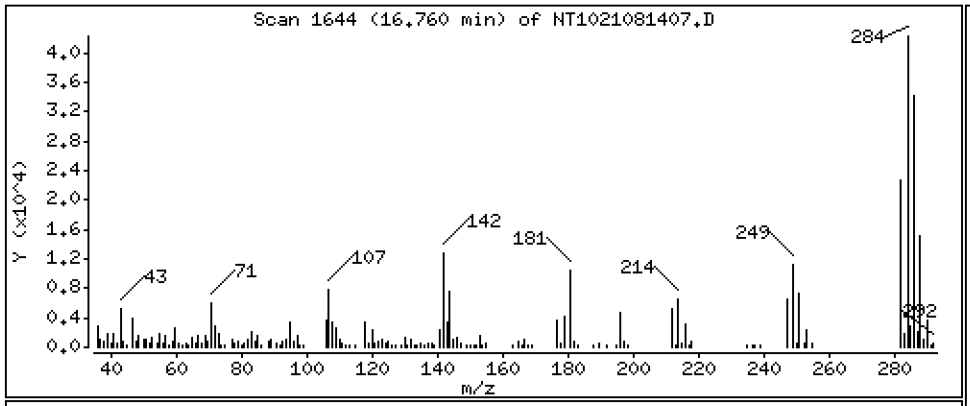
Operator: VTS

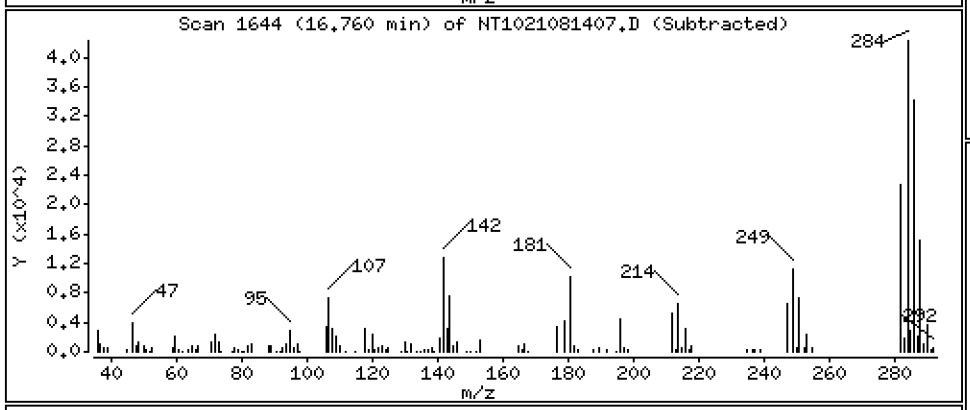
Column phase: ZB-5msi

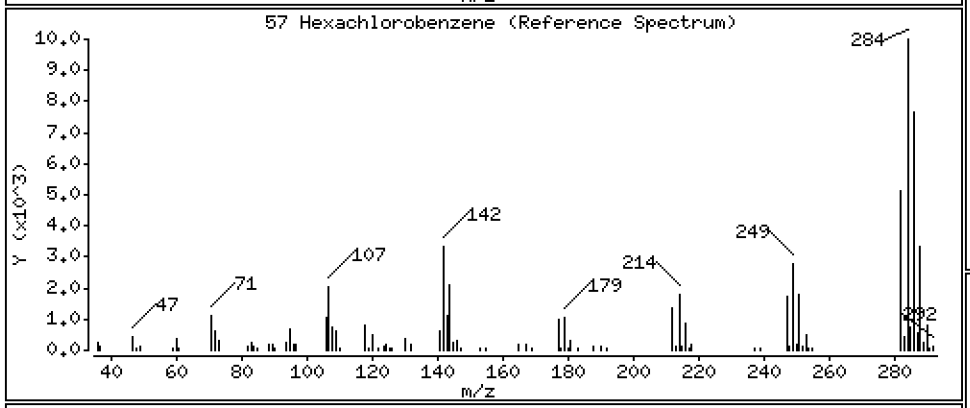
Column diameter: 0.25

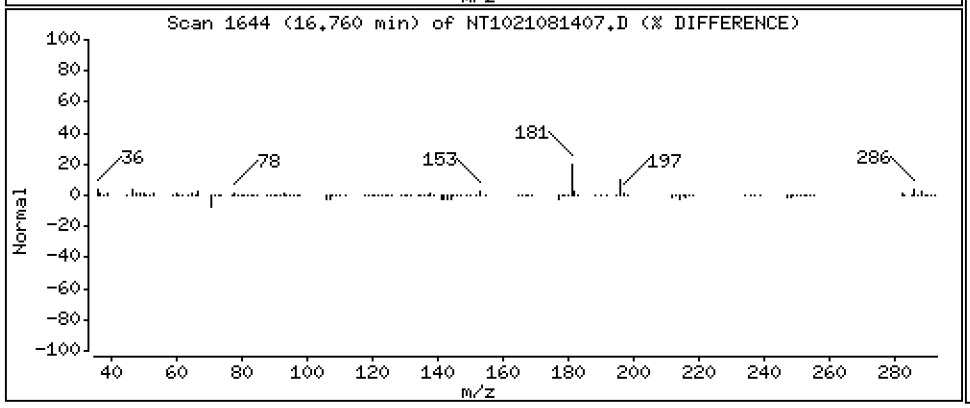
57 Hexachlorobenzene

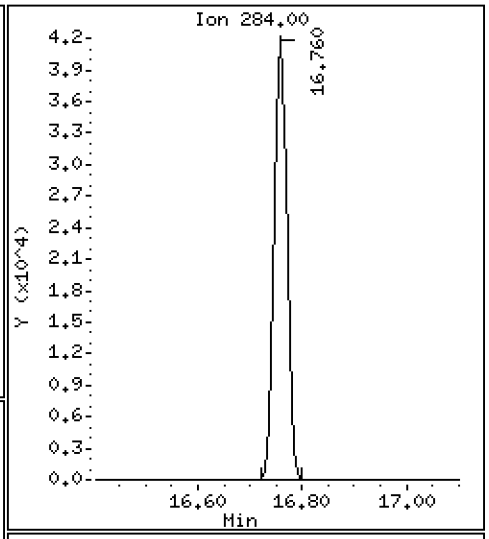
Concentration: 2.492 ug/mL

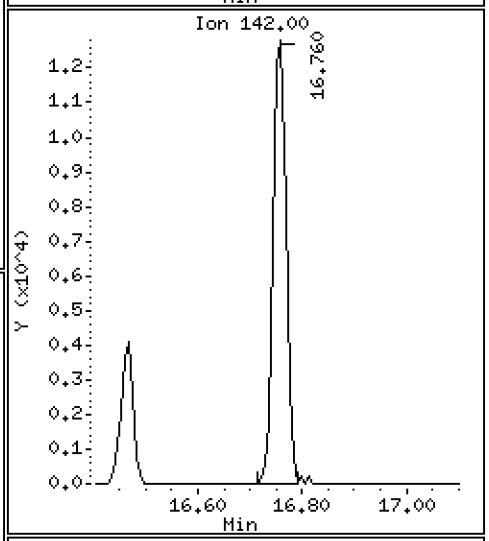


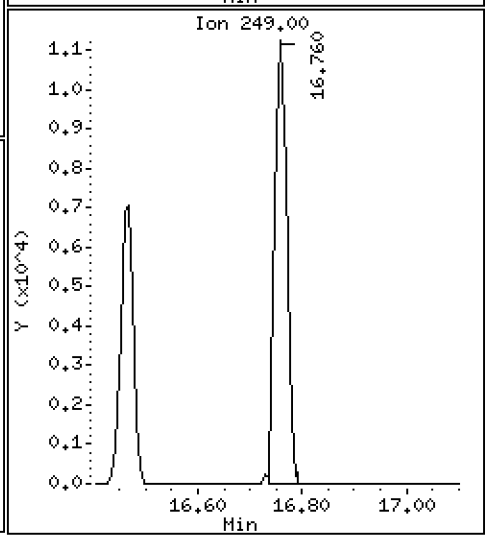












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

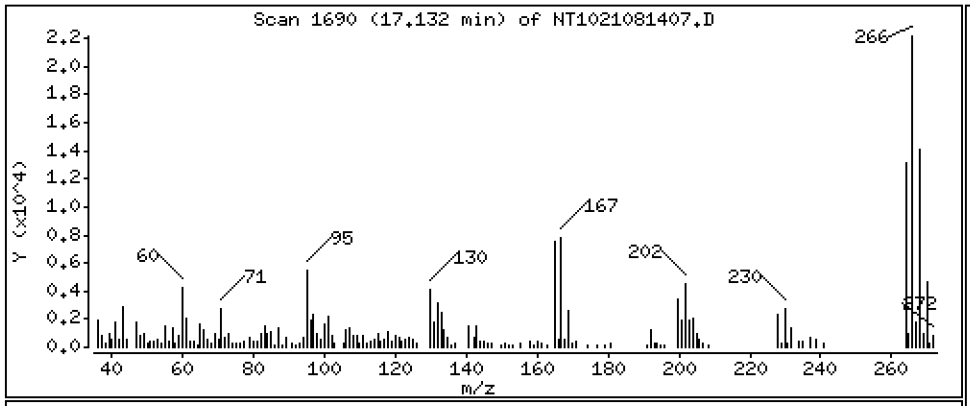
Operator: VTS

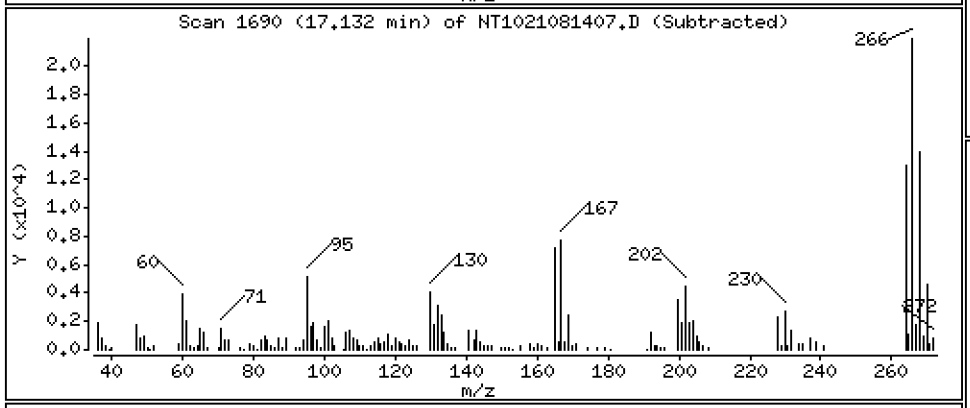
Column phase: ZB-5msi

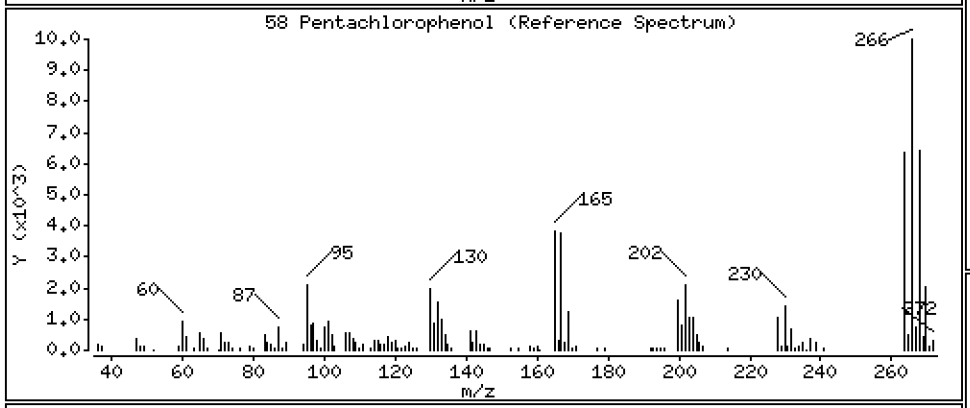
Column diameter: 0.25

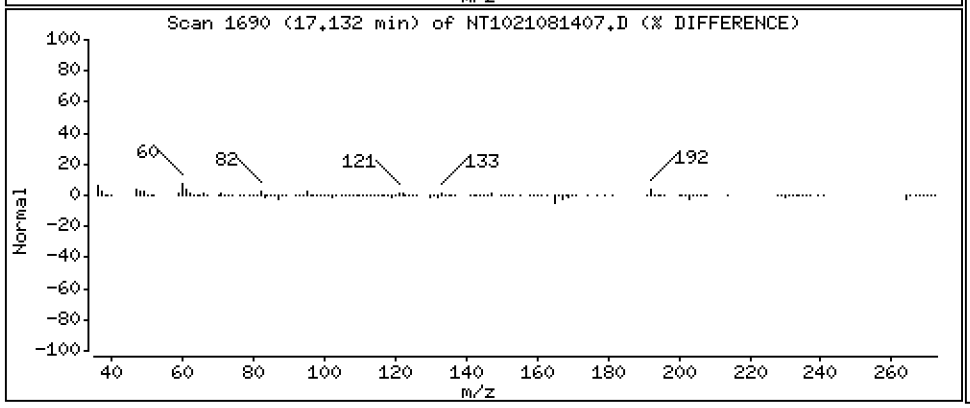
58 Pentachlorophenol

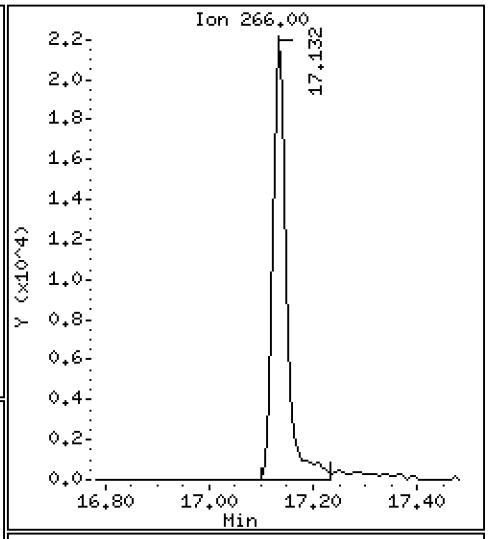
Concentration: 3.457 ug/mL

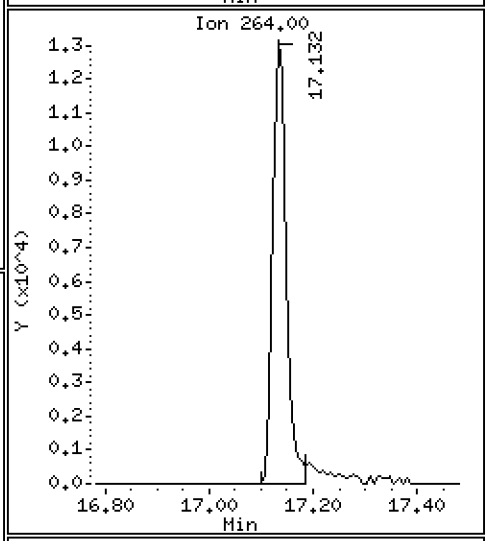


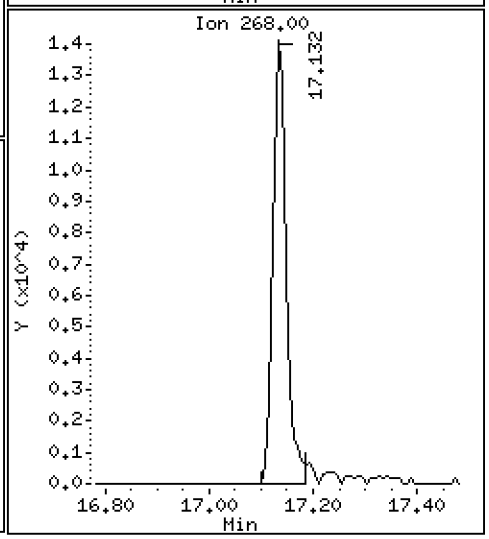












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

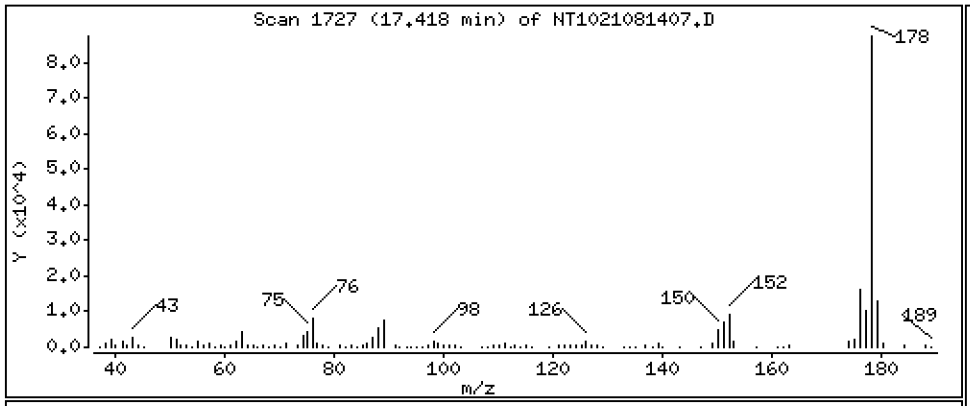
Operator: VTS

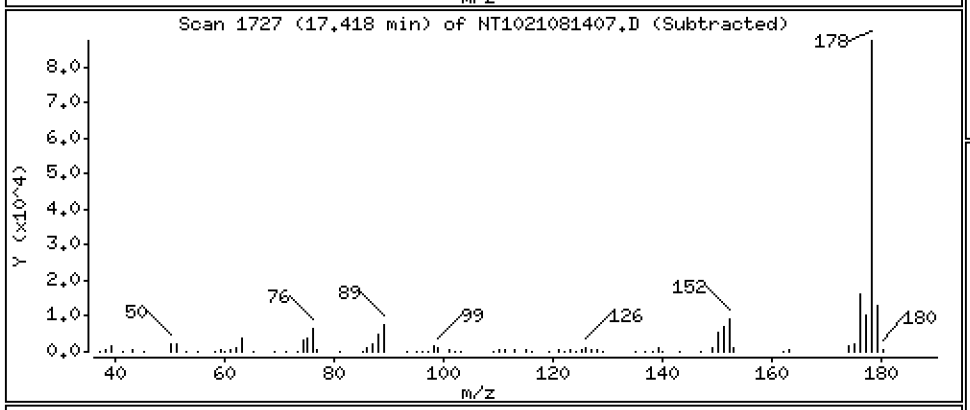
Column phase: ZB-5msi

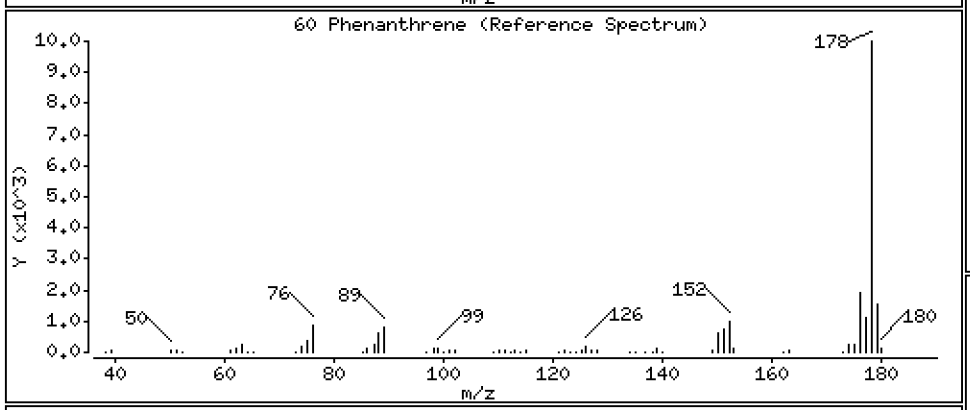
Column diameter: 0.25

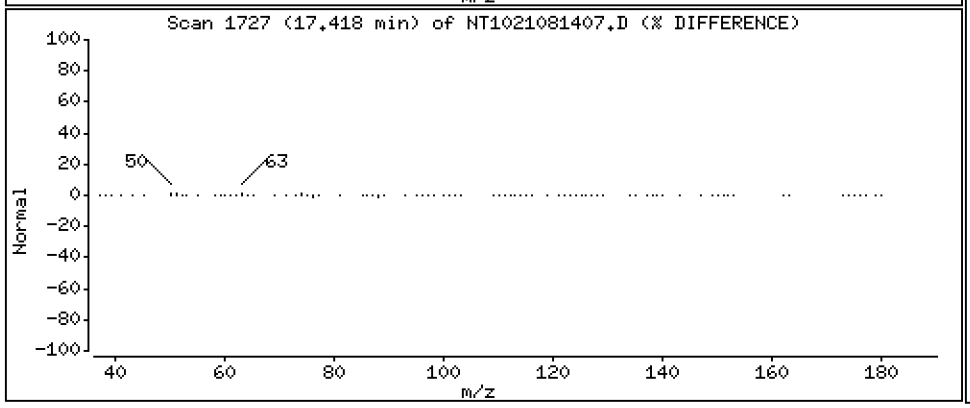
60 Phenanthrene

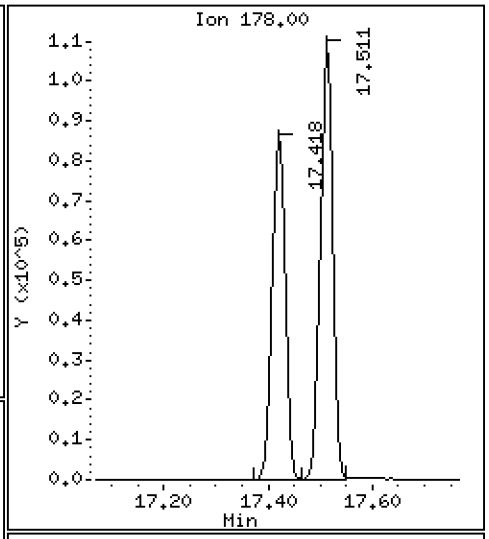
Concentration: 1.870 ug/mL

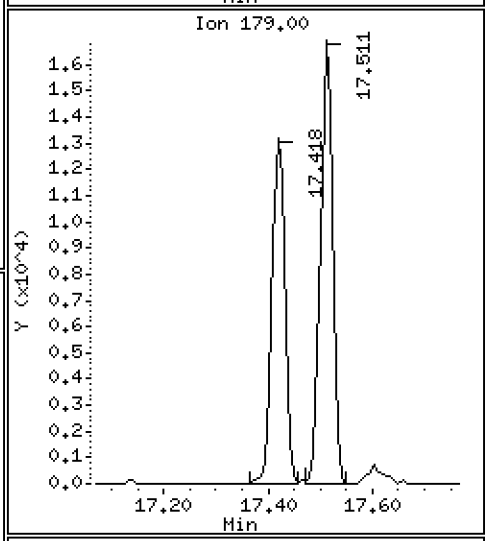


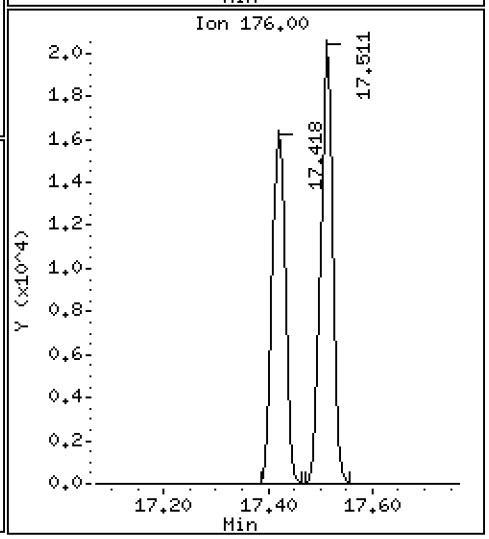












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

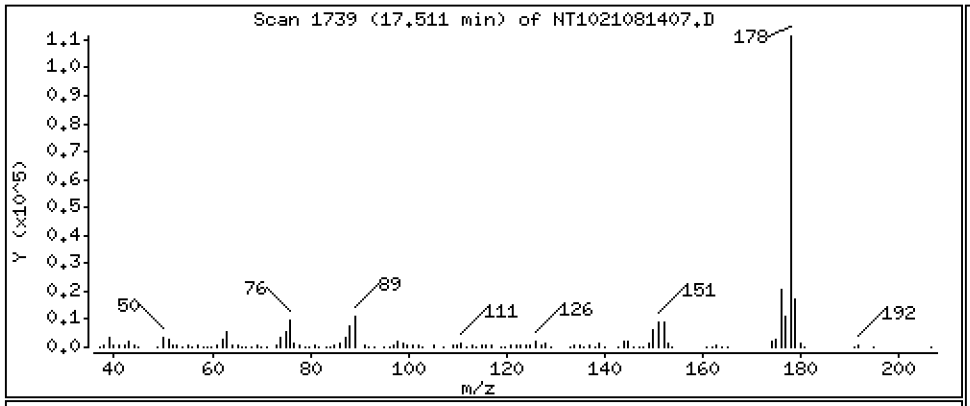
Operator: VTS

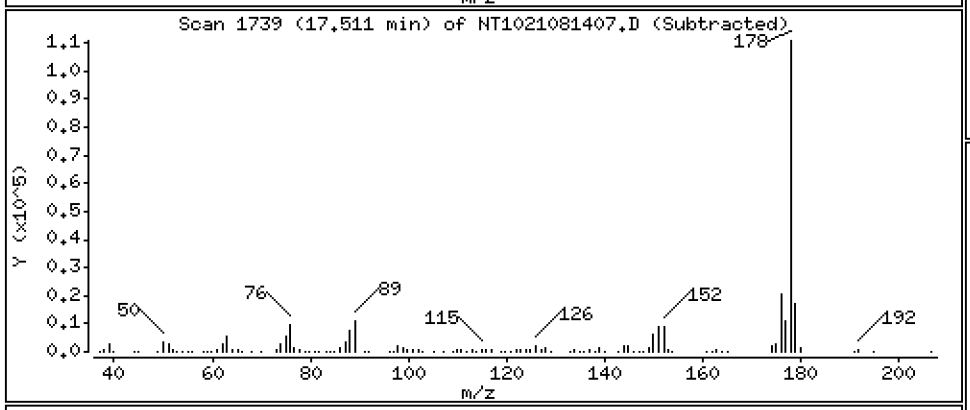
Column phase: ZB-5msi

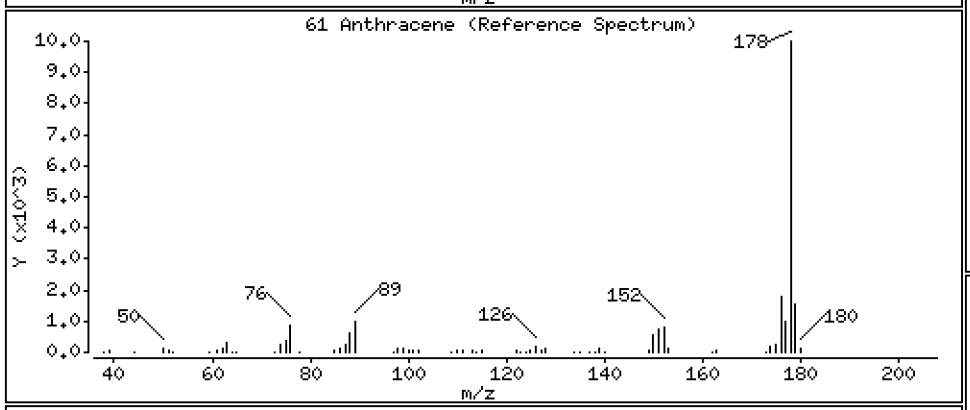
Column diameter: 0.25

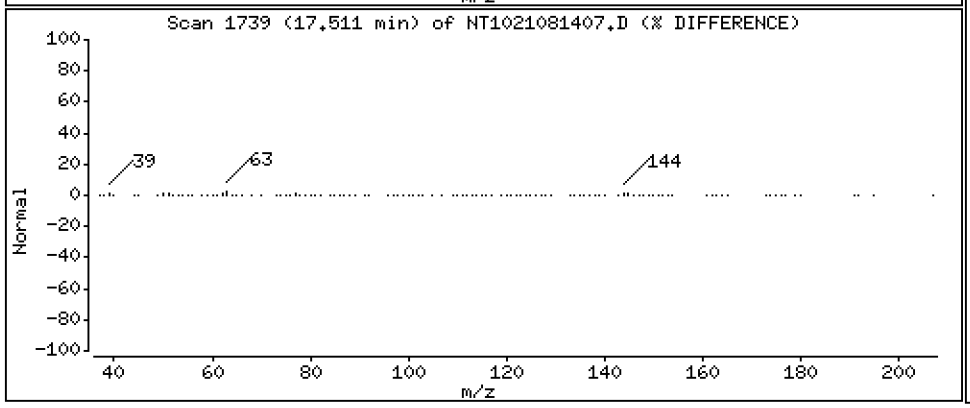
61 Anthracene

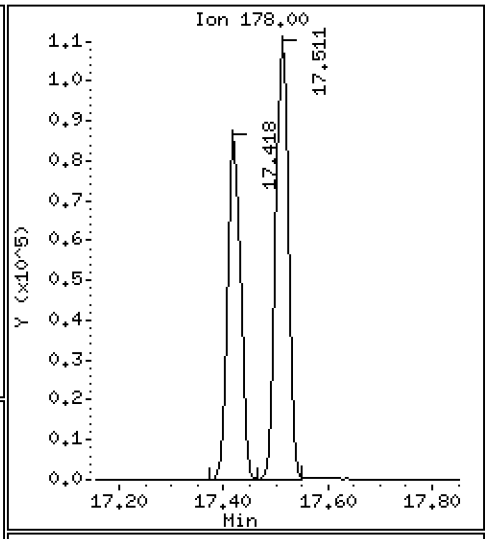
Concentration: 2.151 ug/mL

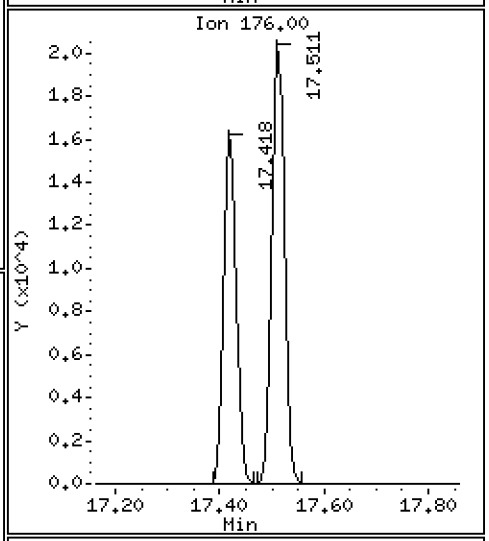


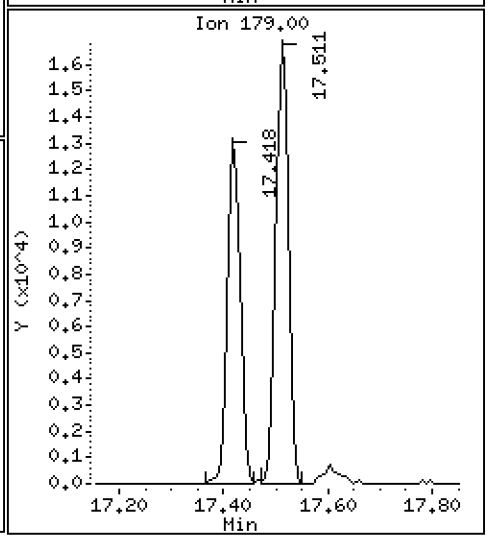












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081407.D

Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

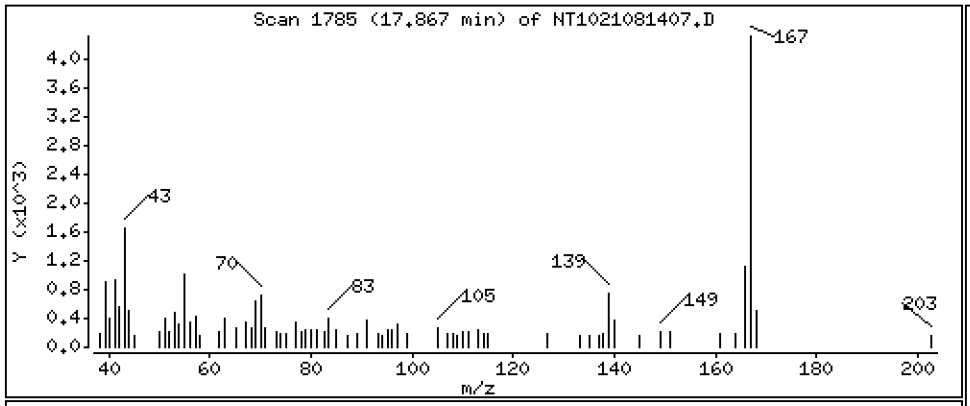
Operator: VTS

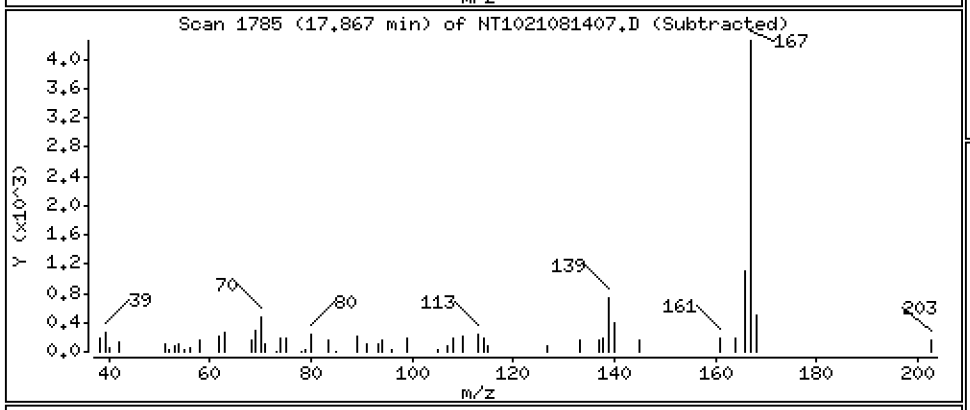
Column phase: ZB-5msi

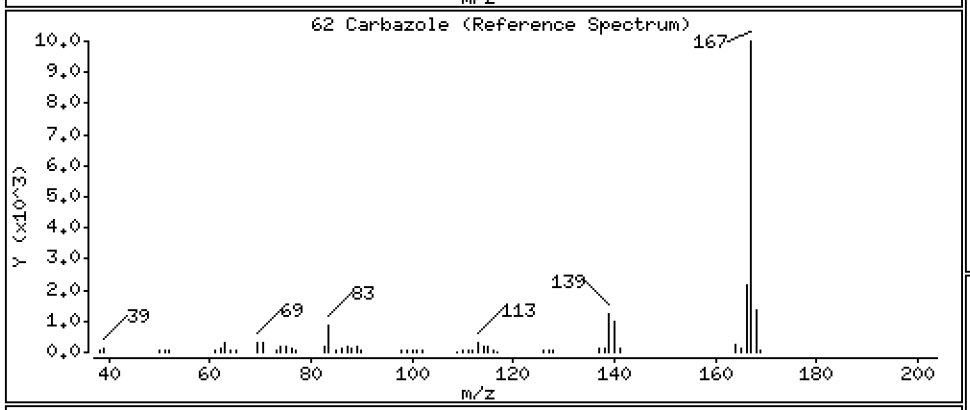
Column diameter: 0.25

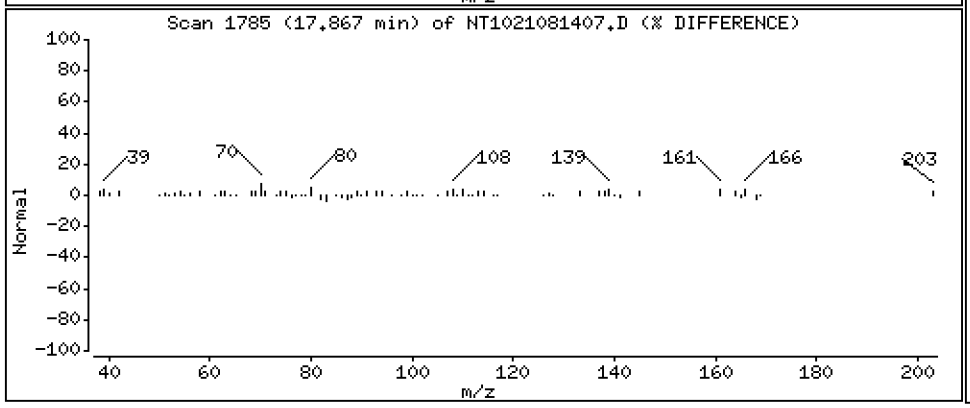
62 Carbazole

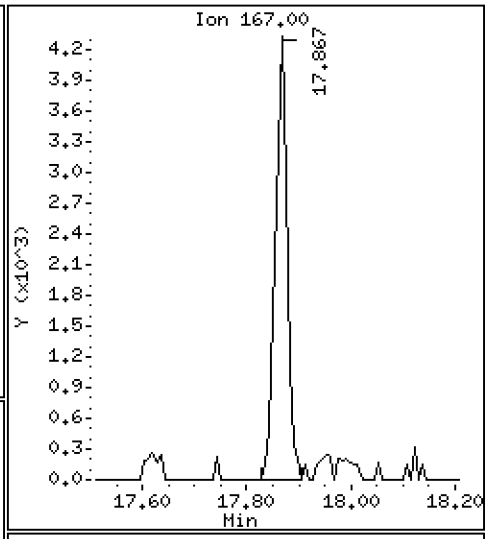
Concentration: 0.08216 ug/mL

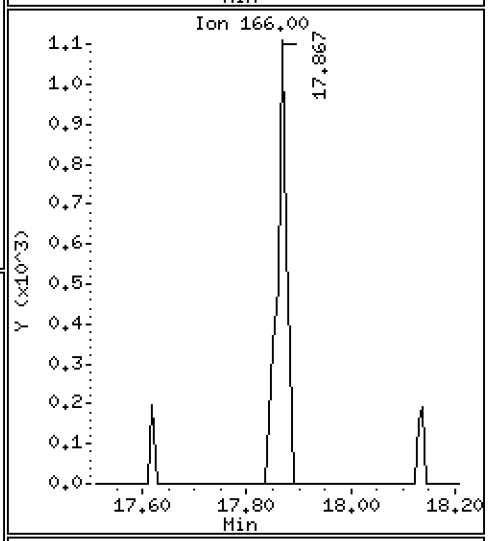


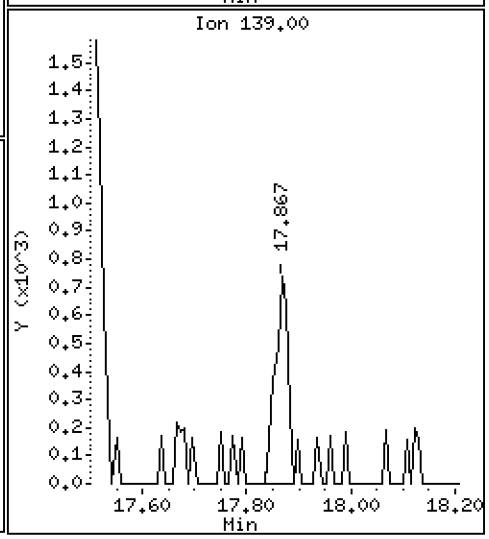












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

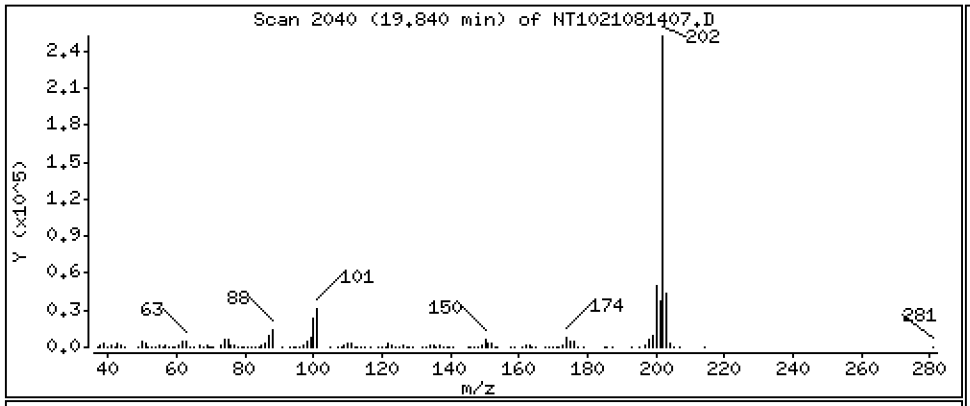
Operator: VTS

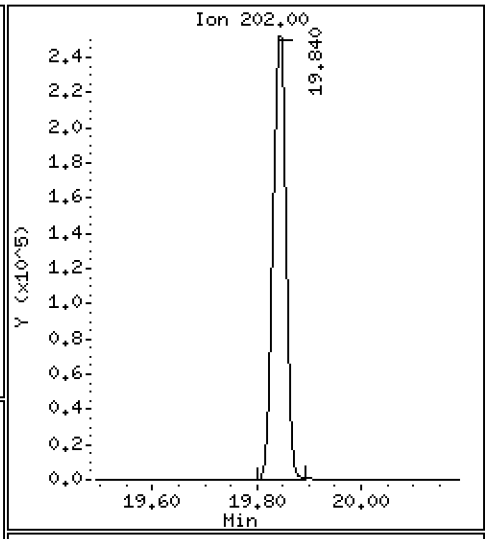
Column phase: ZB-5msi

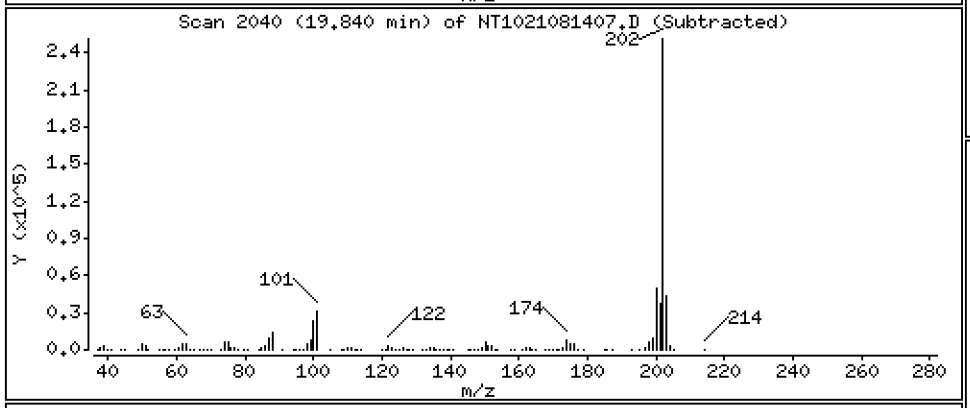
Column diameter: 0.25

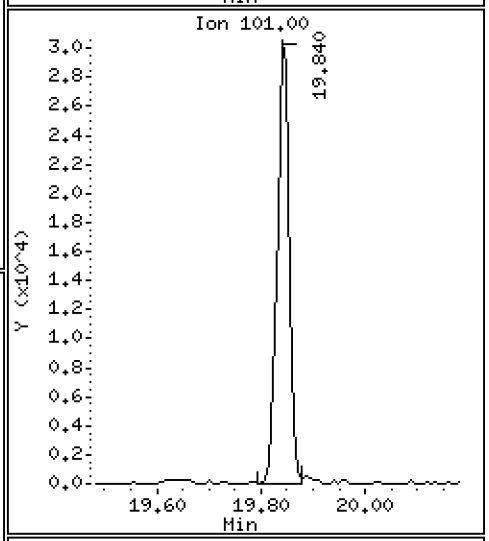
64 Fluoranthene

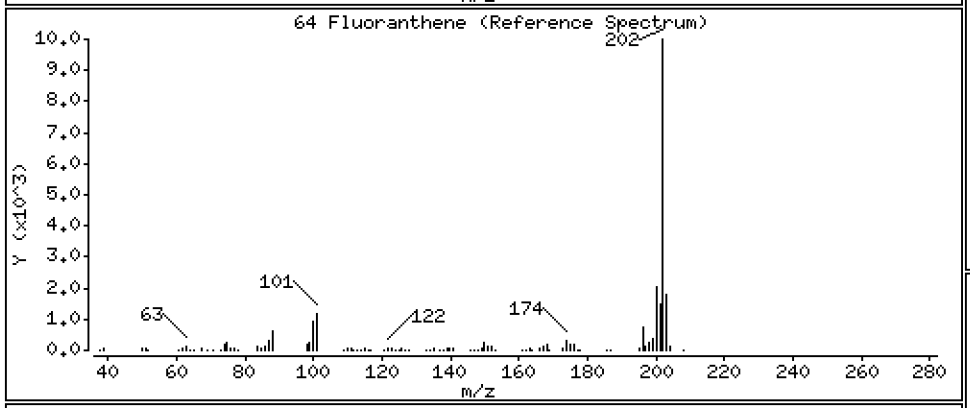
Concentration: 4.107 ug/mL

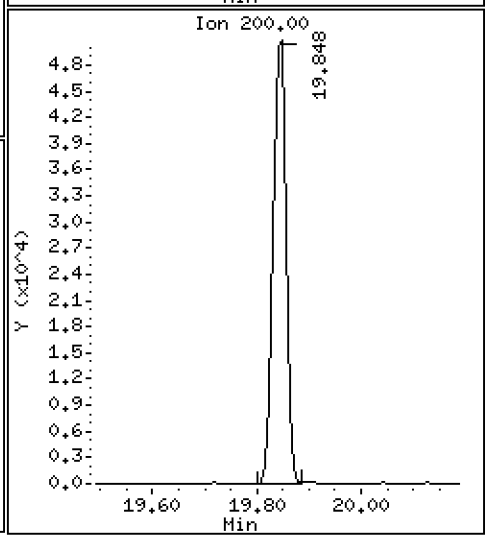


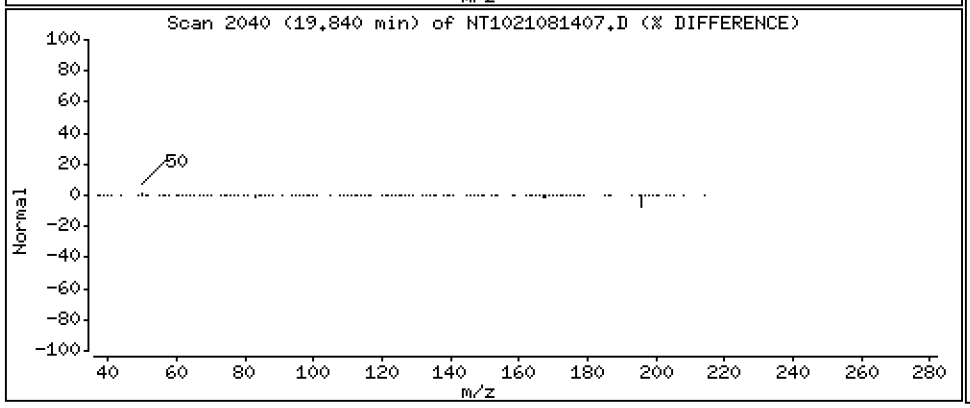












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

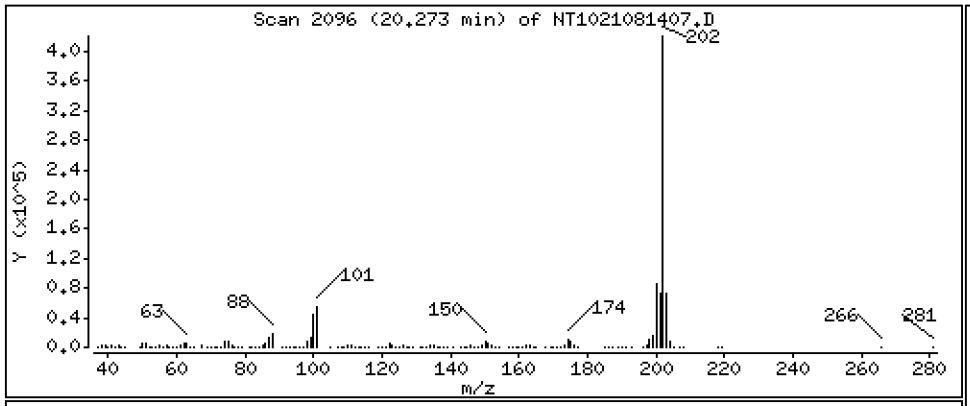
Operator: VTS

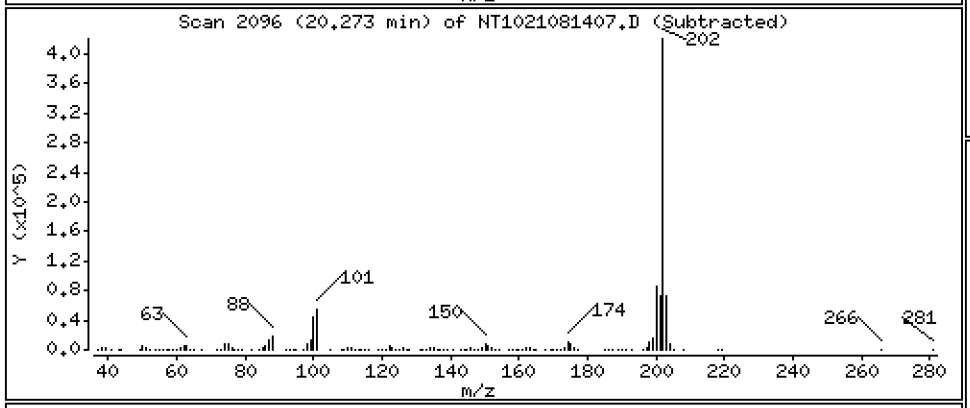
Column phase: ZB-5msi

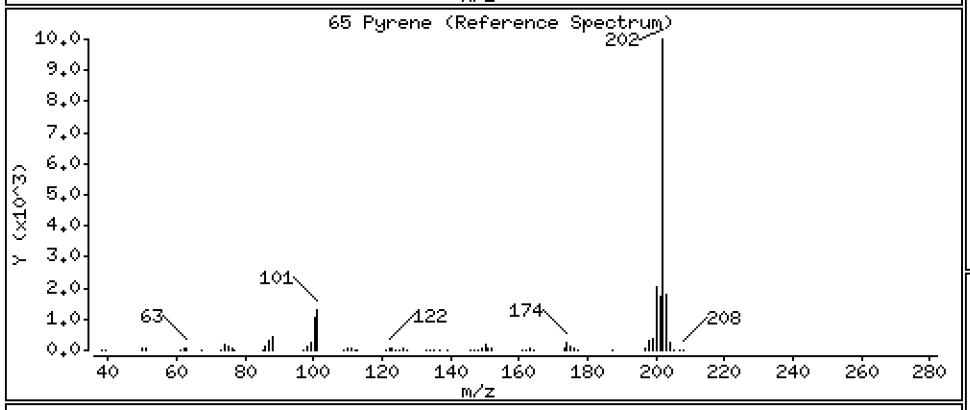
Column diameter: 0.25

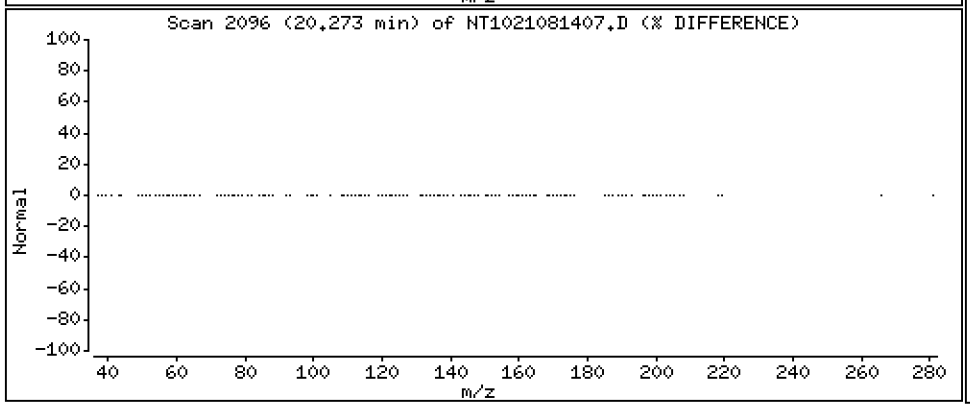
65 Pyrene

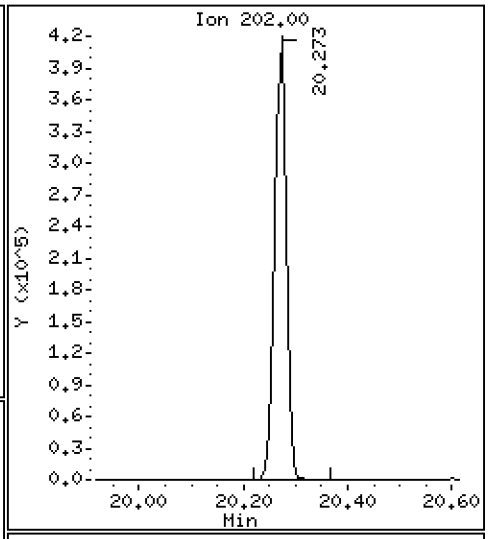
Concentration: 5.426 ug/mL

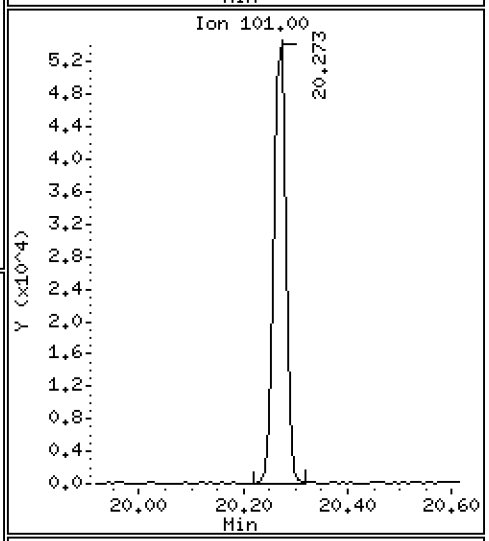


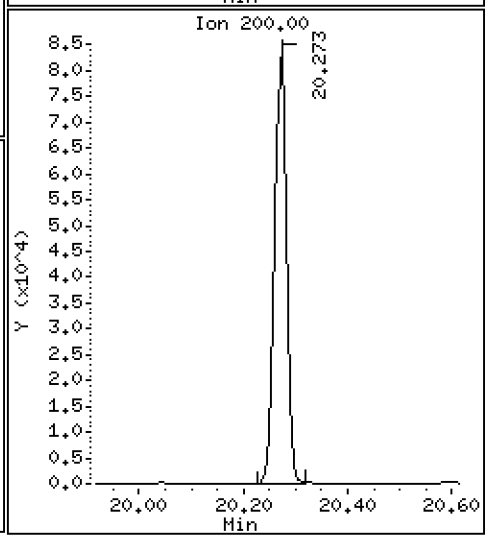












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081407.D

Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

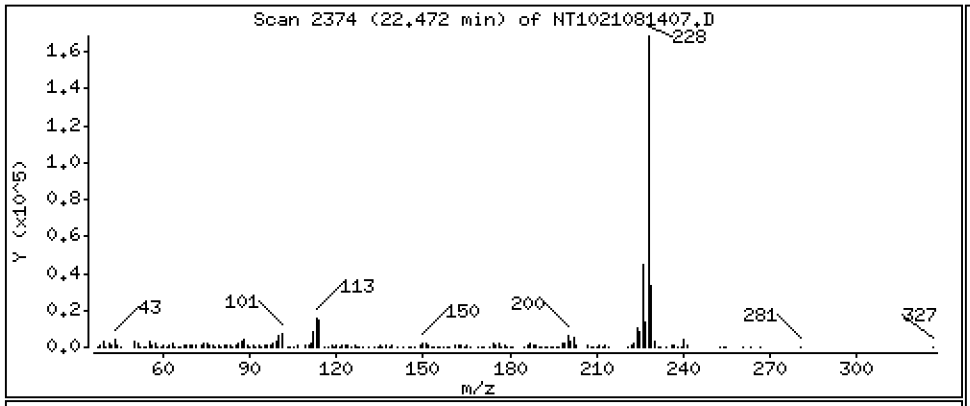
Operator: VTS

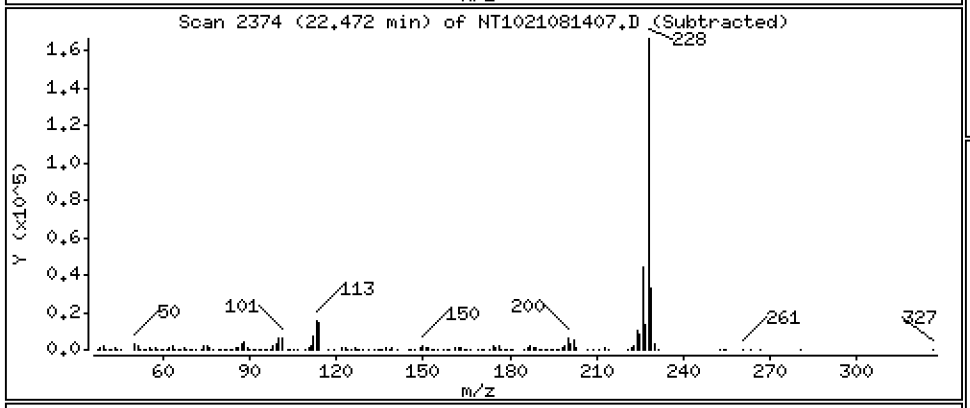
Column phase: ZB-5msi

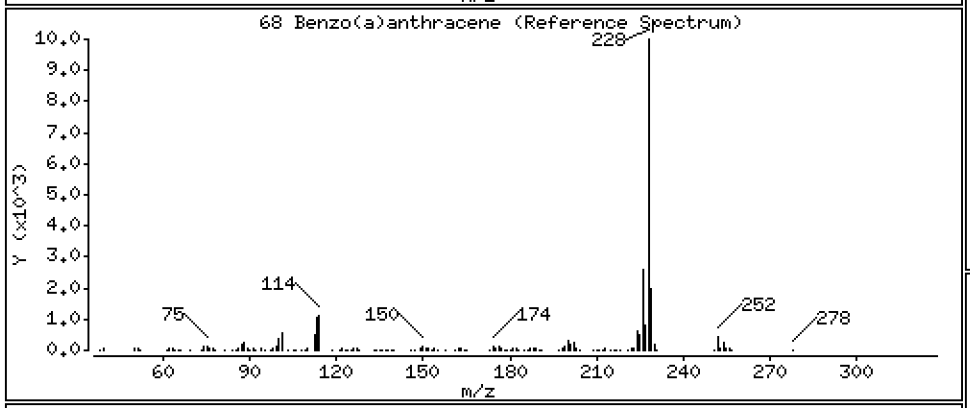
Column diameter: 0.25

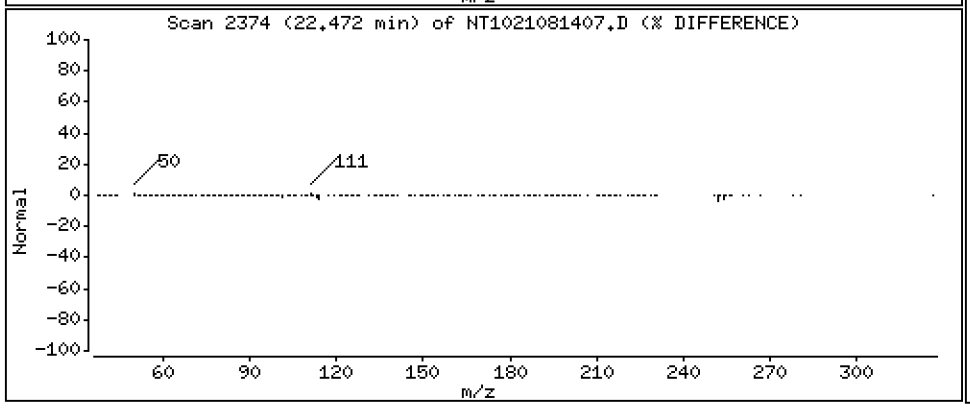
68 Benzo(a)anthracene

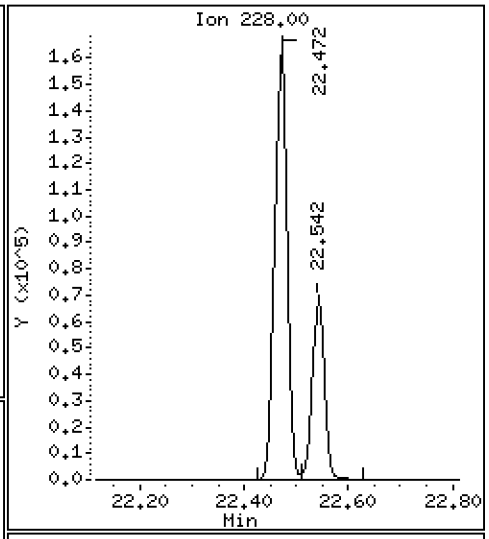
Concentration: 2.885 ug/mL

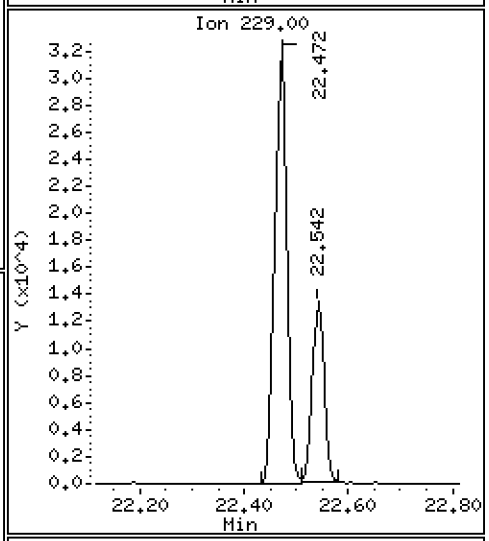


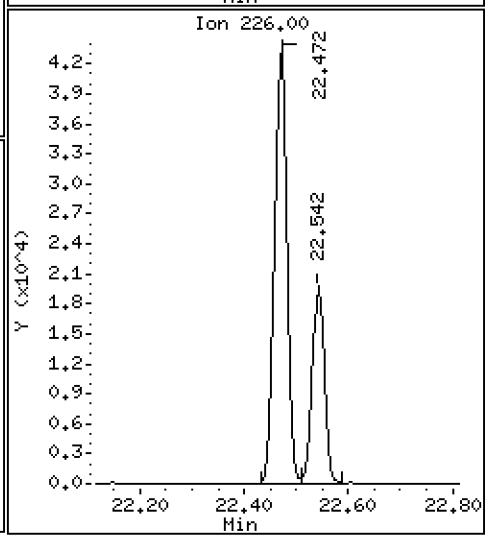












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

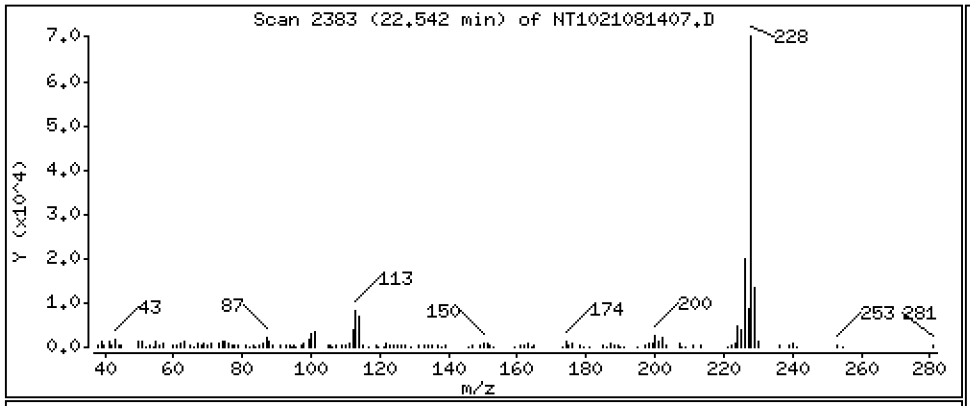
Operator: VTS

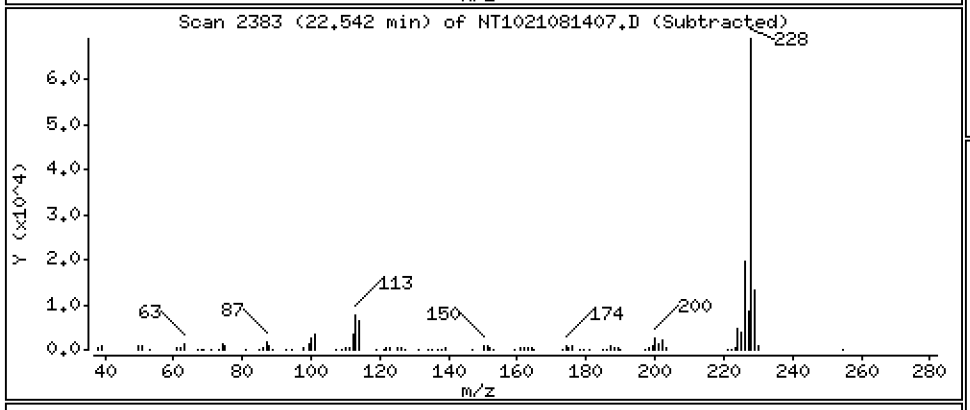
Column phase: ZB-5msi

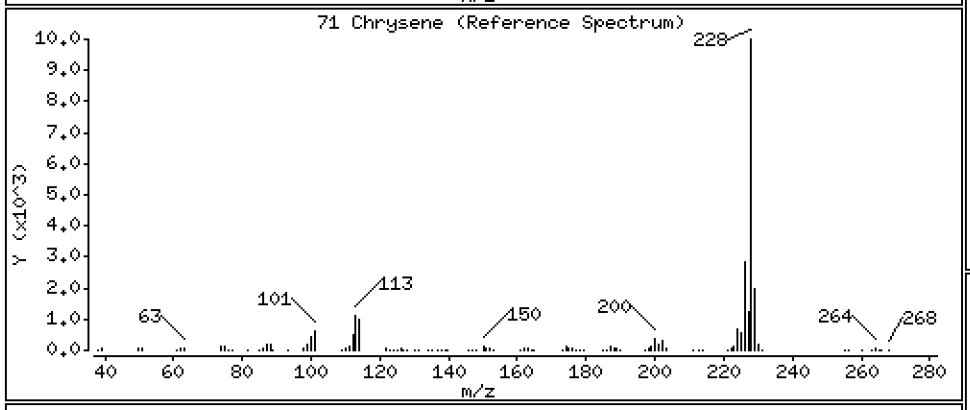
Column diameter: 0.25

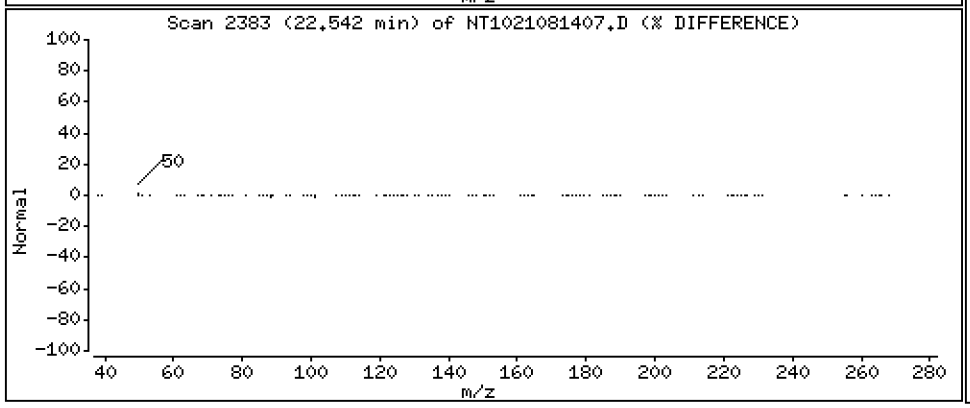
71 Chrysene

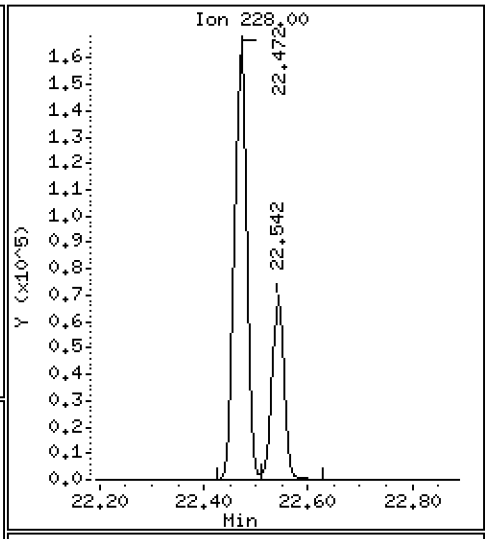
Concentration: 1.498 ug/mL

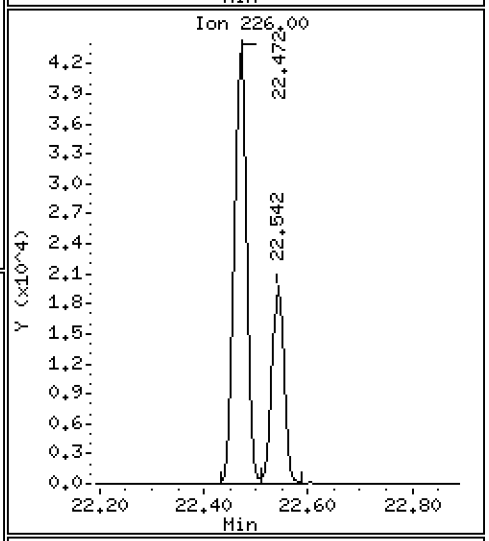


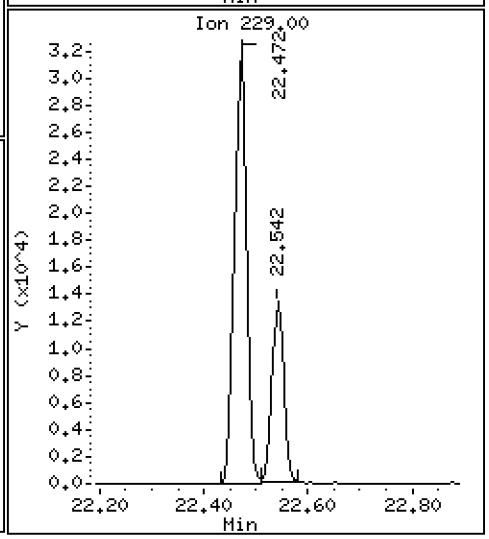












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

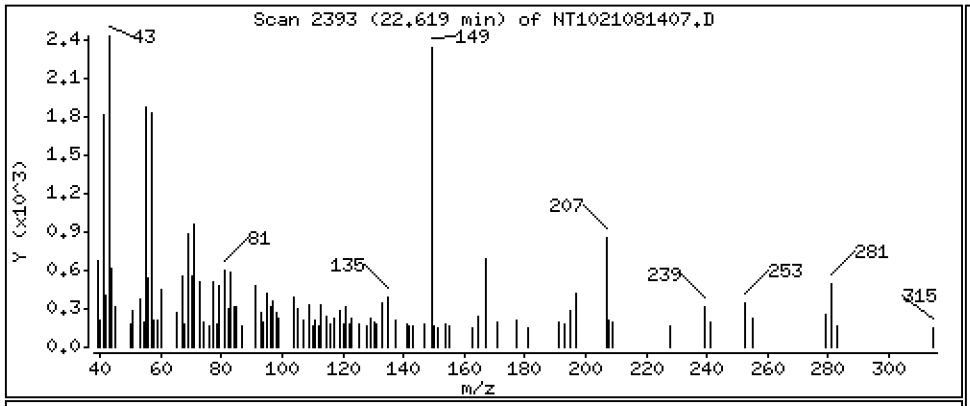
Operator: VTS

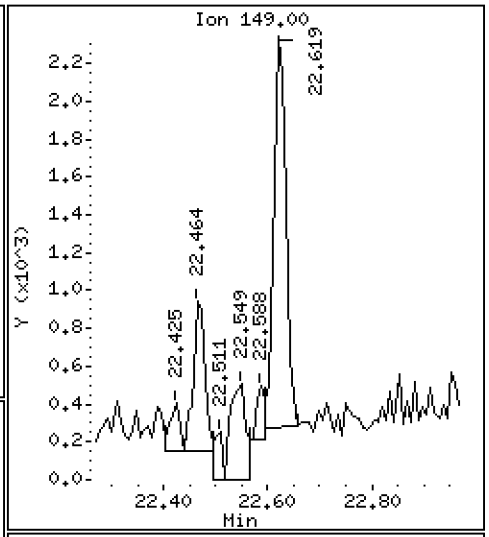
Column phase: ZB-5msi

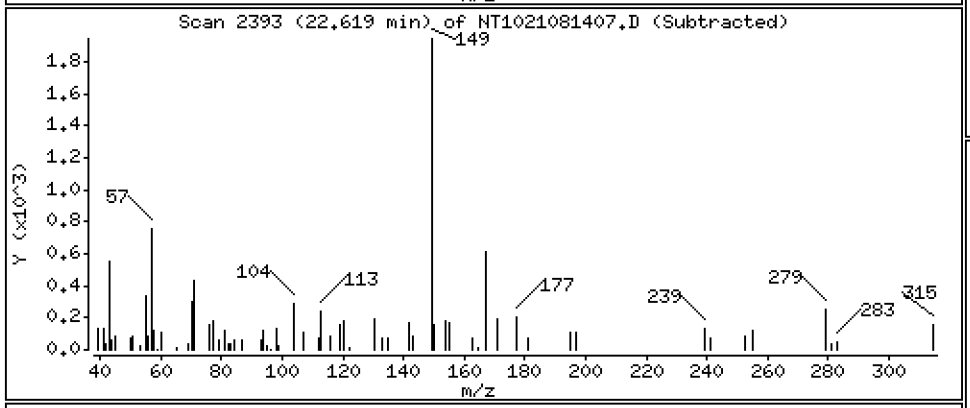
Column diameter: 0.25

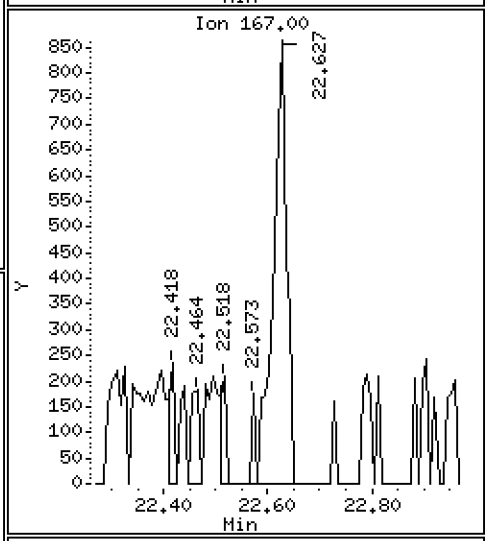
72 bis(2-Ethylhexyl)phthalate

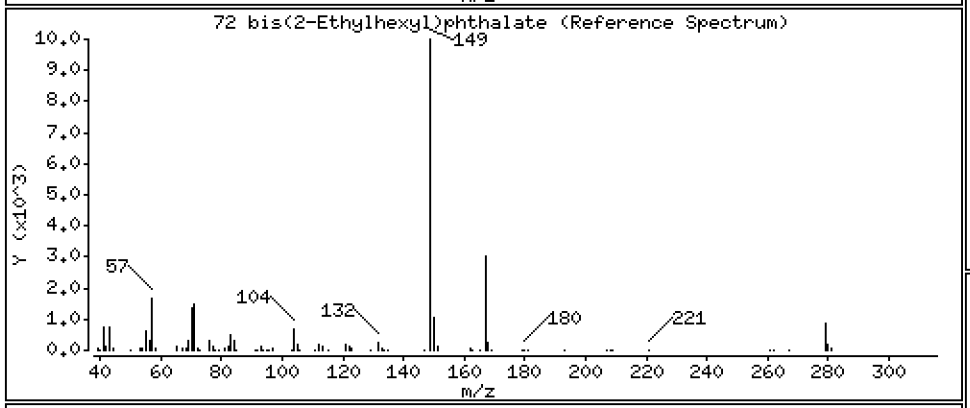
Concentration: 0.08404 ug/mL

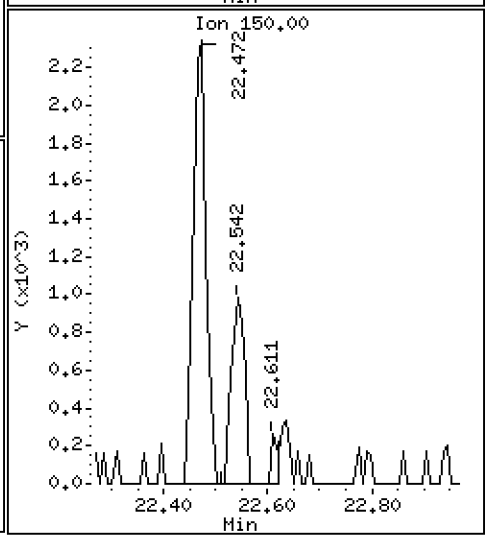


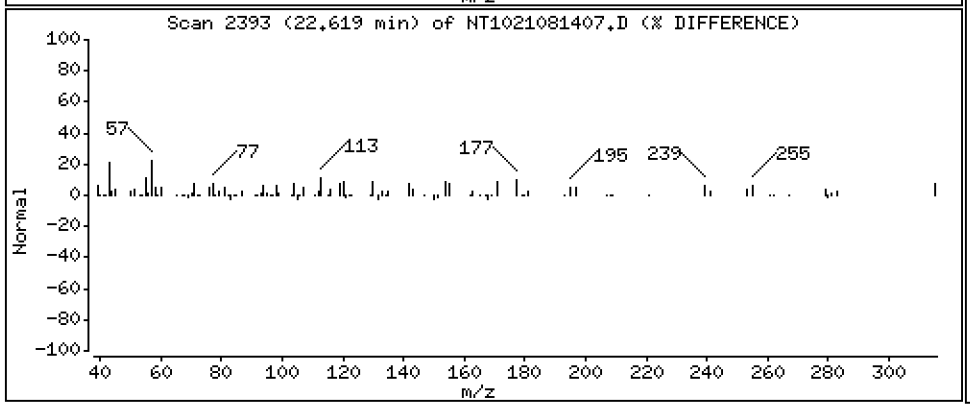












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081407.D

Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

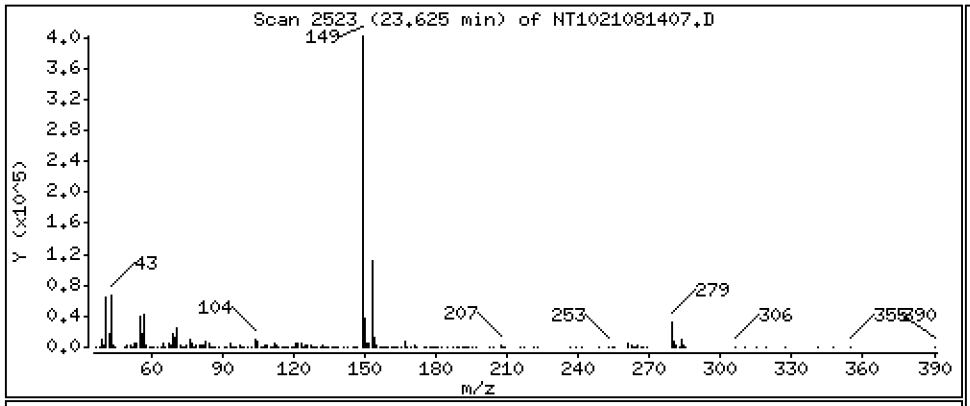
Operator: VTS

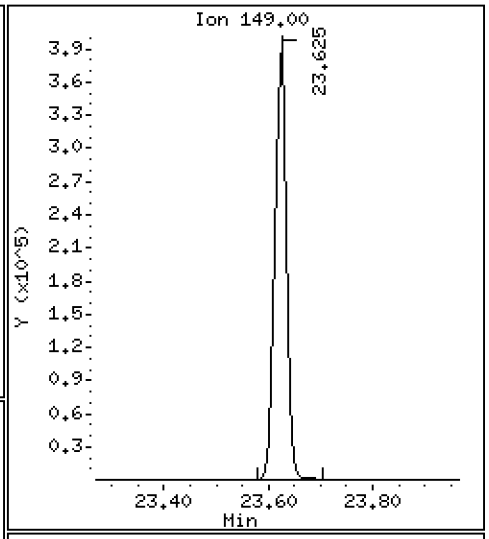
Column phase: ZB-5msi

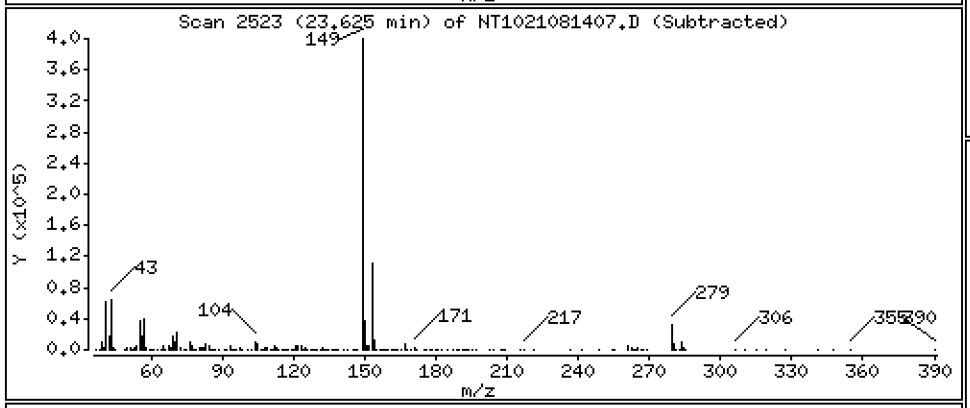
Column diameter: 0.25

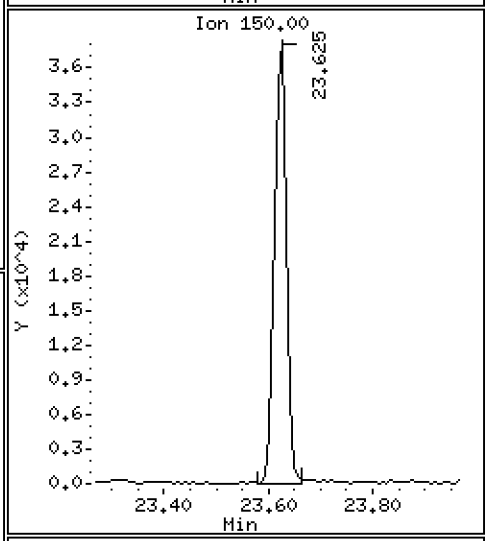
73 Di-n-octylphthalate

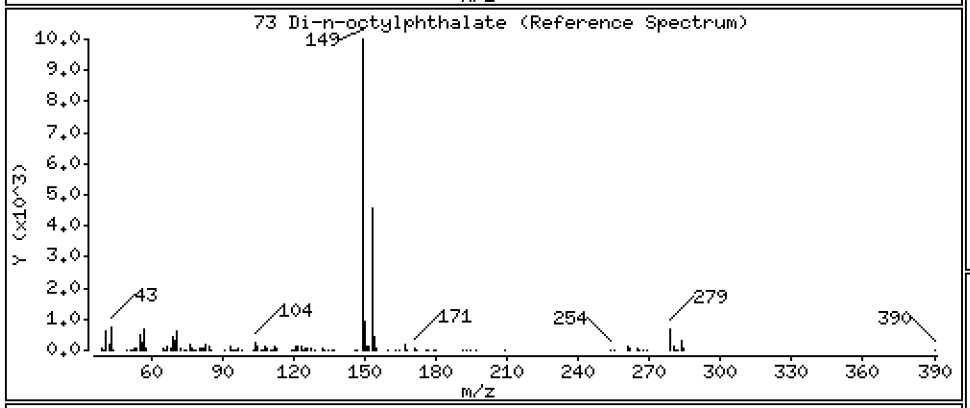
Concentration: 5.985 ug/mL

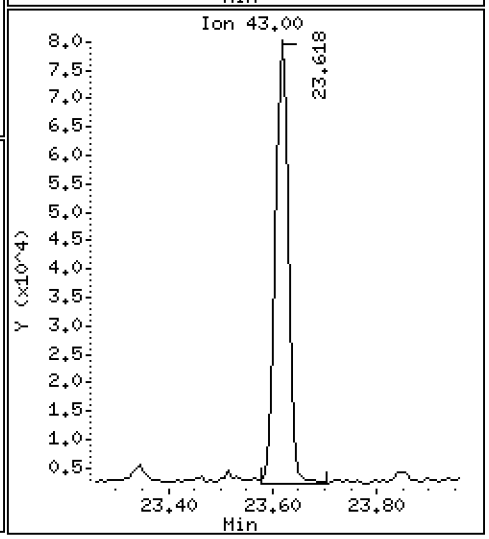


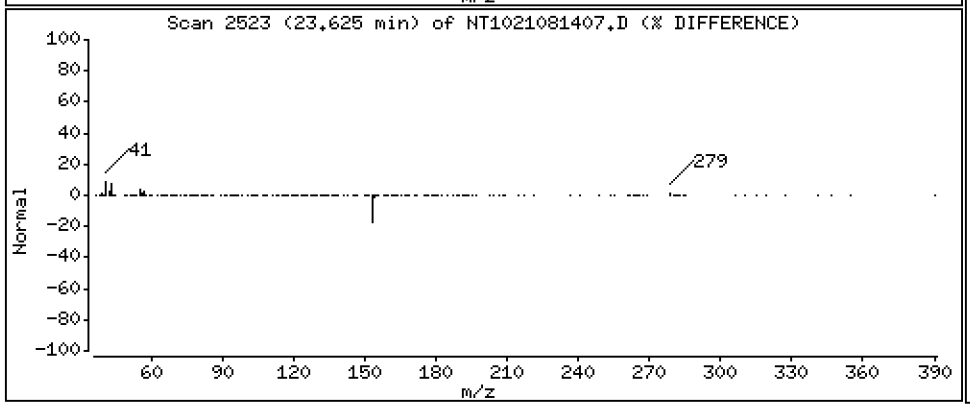












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

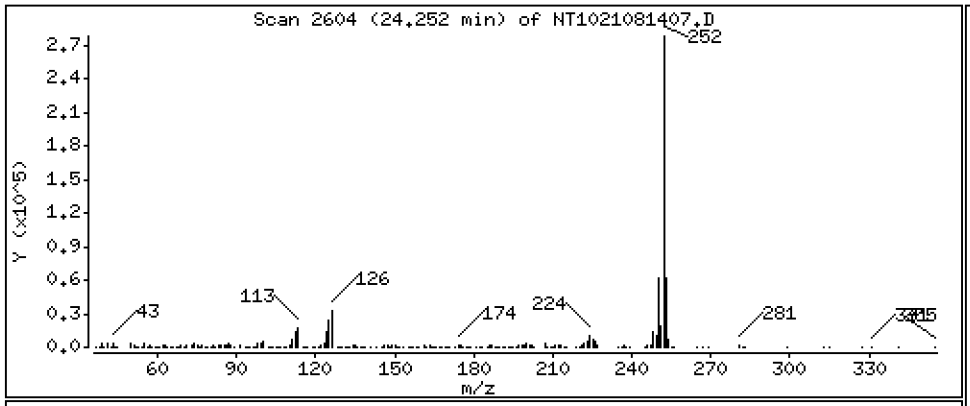
Operator: VTS

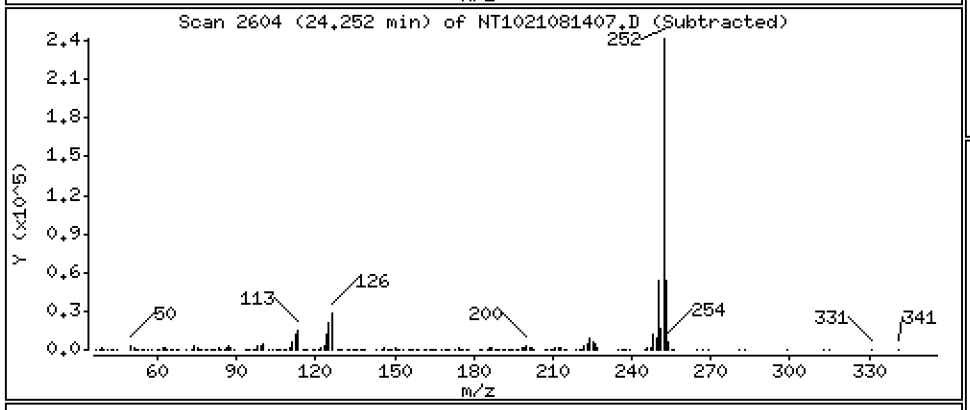
Column phase: ZB-5msi

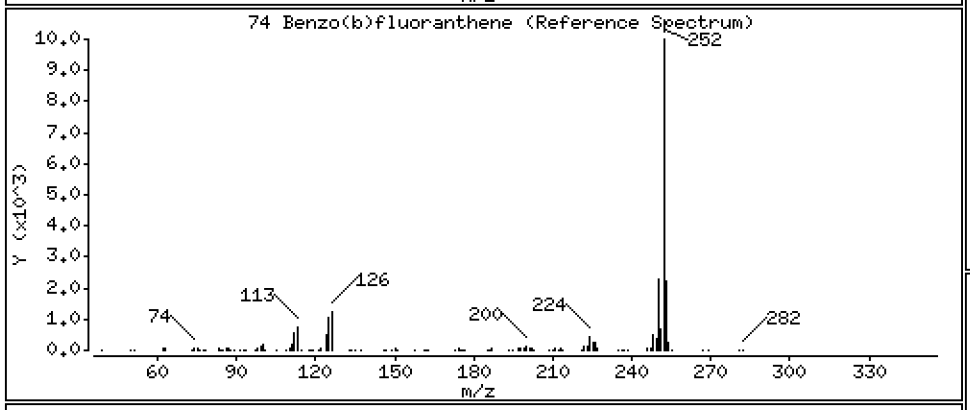
Column diameter: 0.25

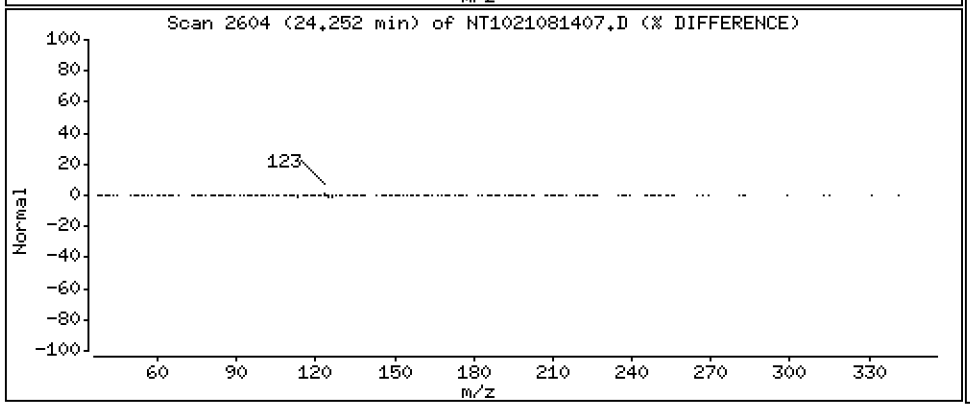
74 Benzo(b)fluoranthene

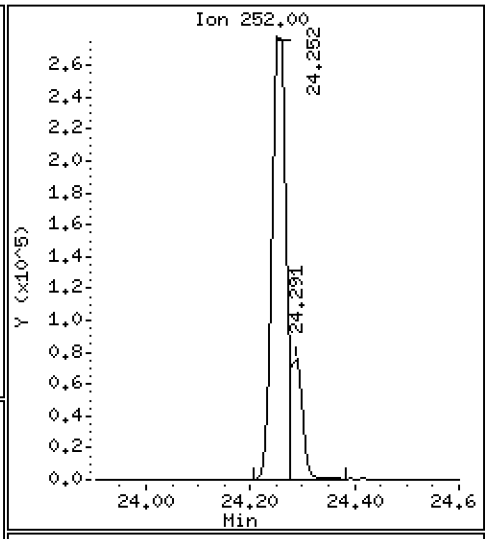
Concentration: 5.889 ug/mL

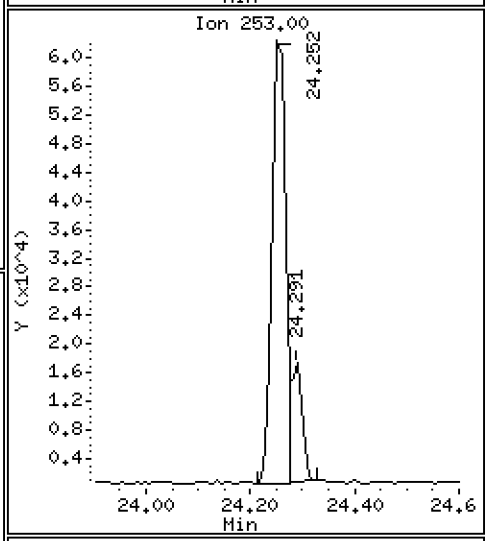


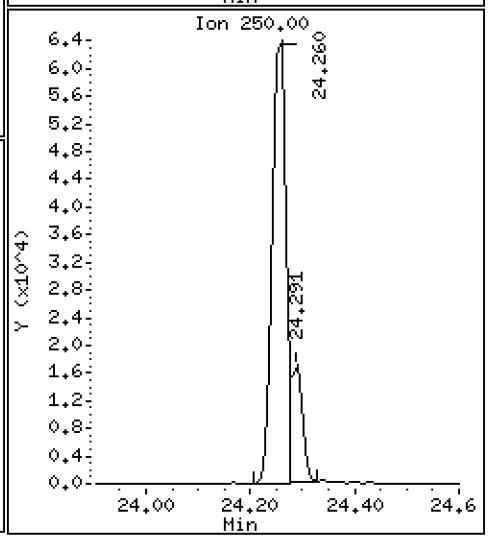












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Date : 14-AUG-2021 13:13

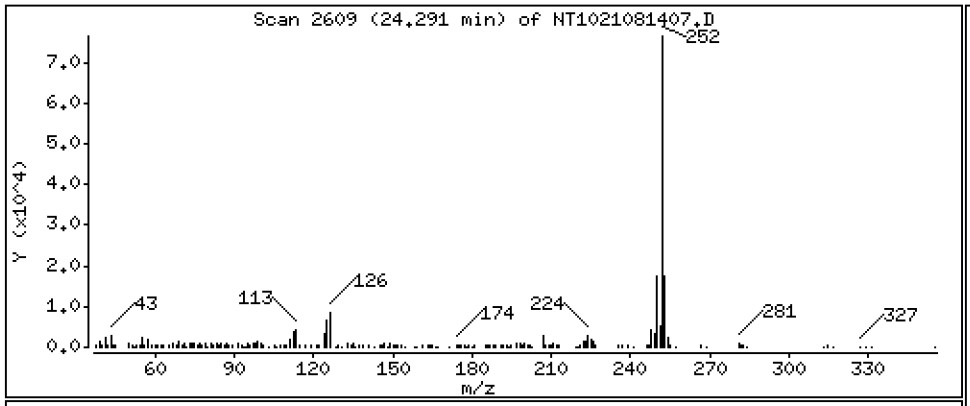
Client ID: Instrument: nt10.i

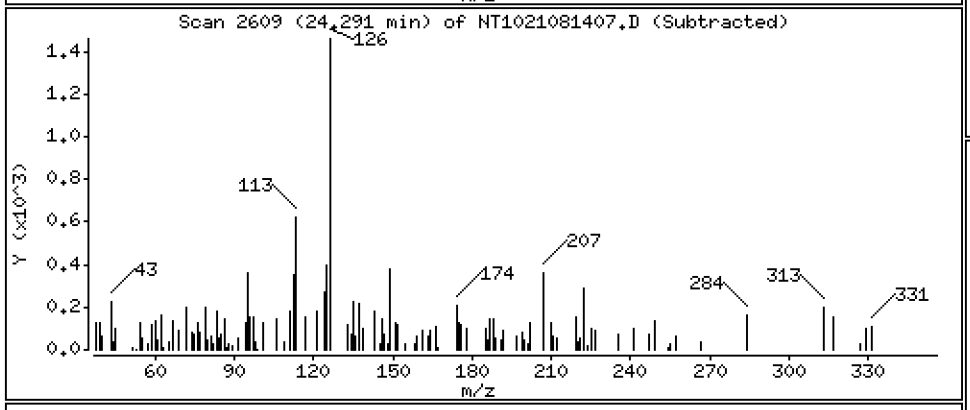
Sample Info: BJH0004-SRM1

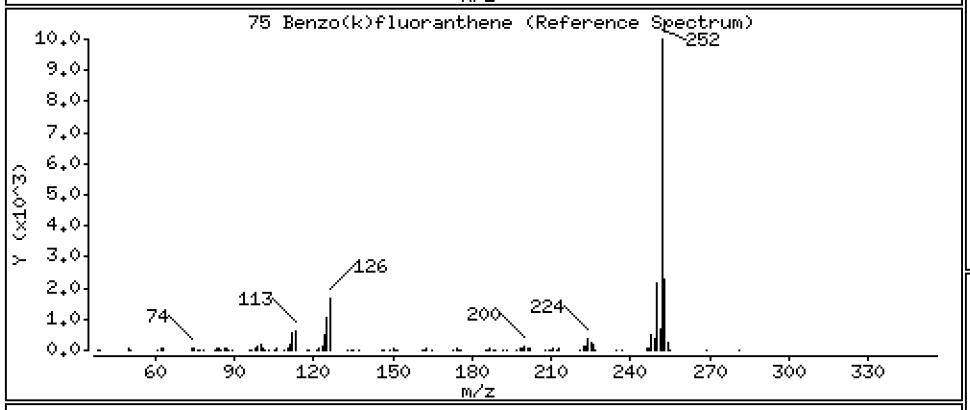
Operator: VTS

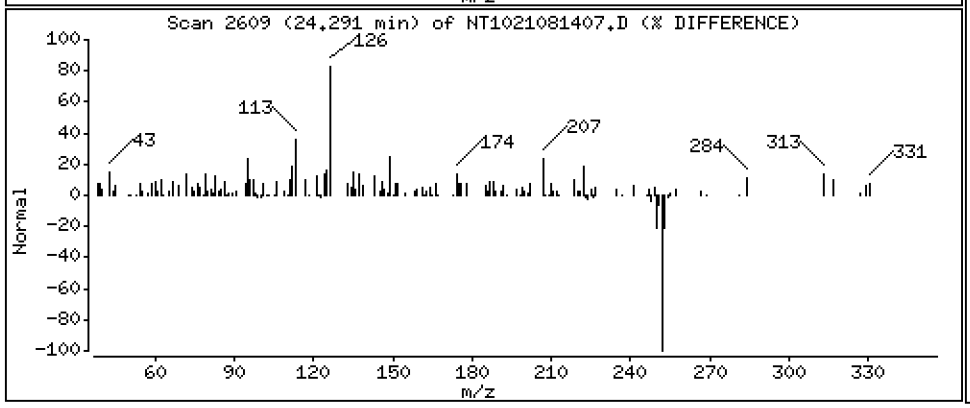
Column phase: ZB-5msi Column diameter: 0.25

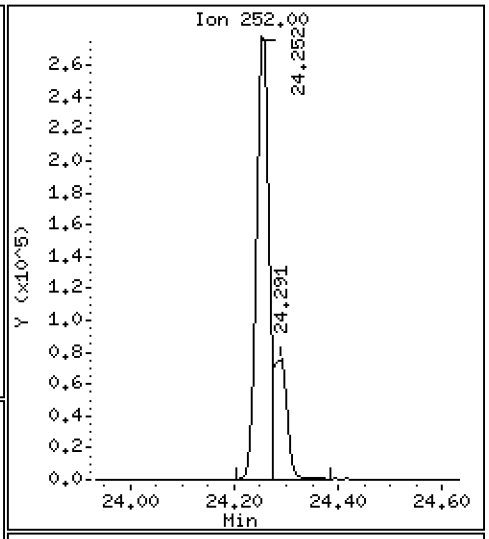
75 Benzo(k)fluoranthene Concentration: 1.716 ug/mL

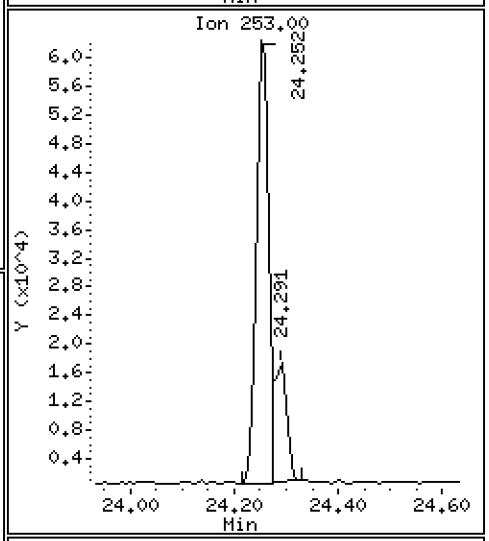


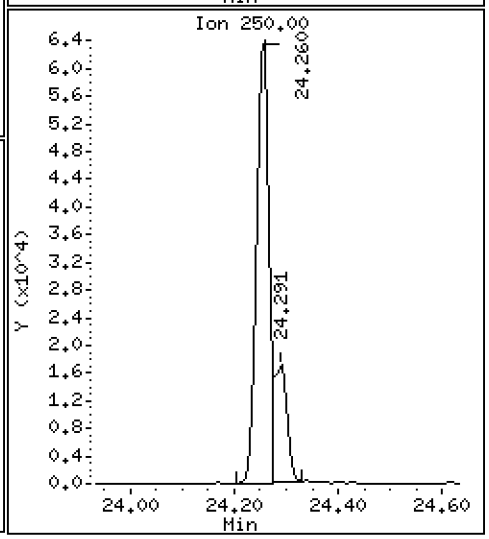












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

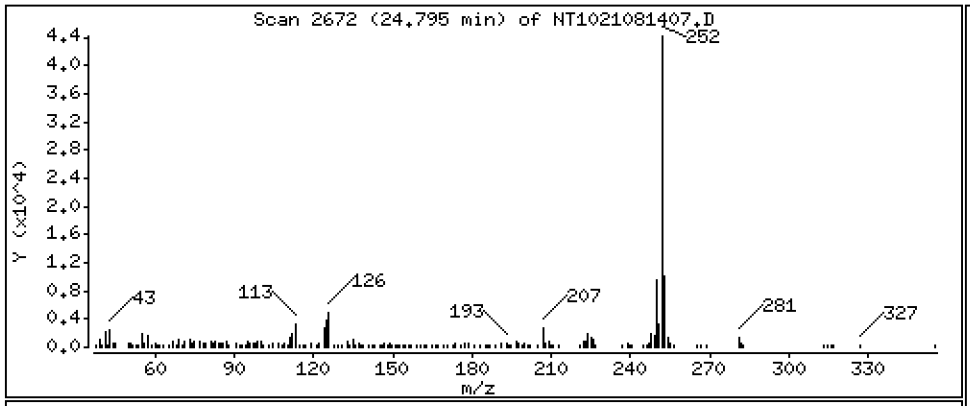
Operator: VTS

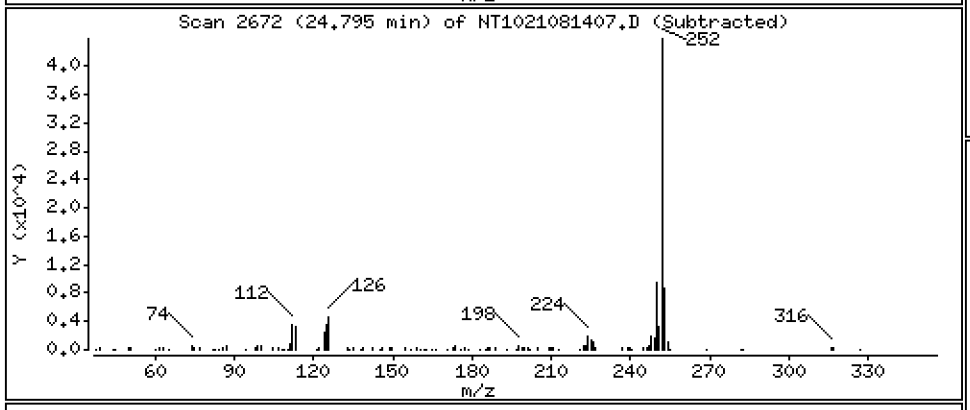
Column phase: ZB-5msi

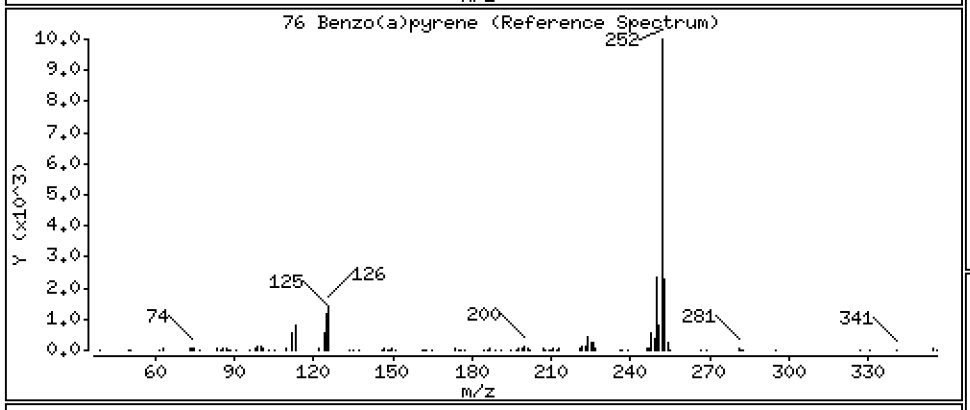
Column diameter: 0.25

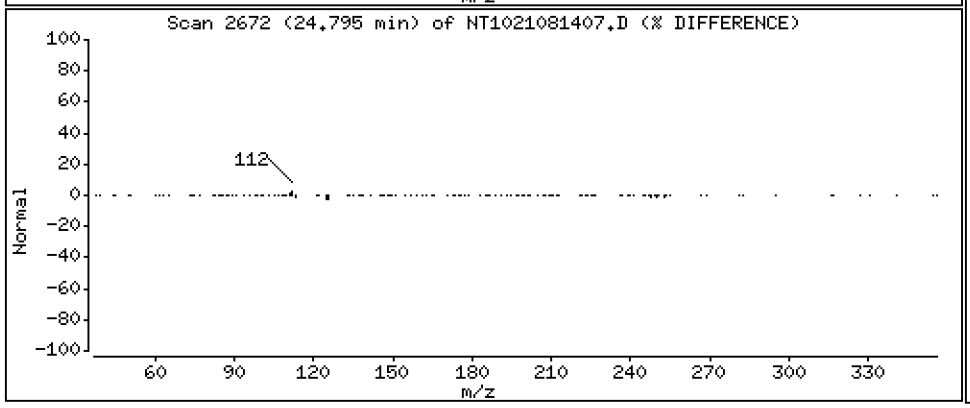
76 Benzo(a)pyrene

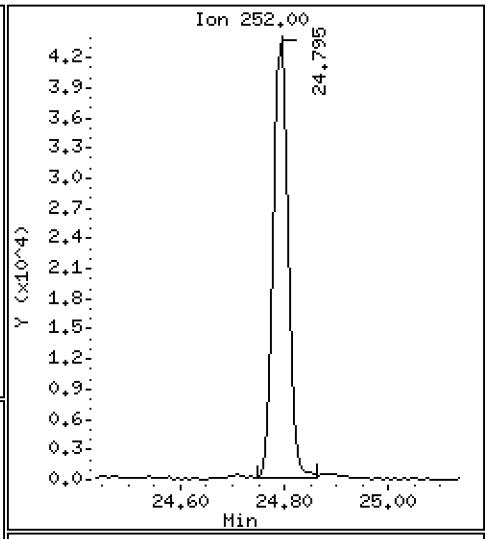
Concentration: 1.105 ug/mL

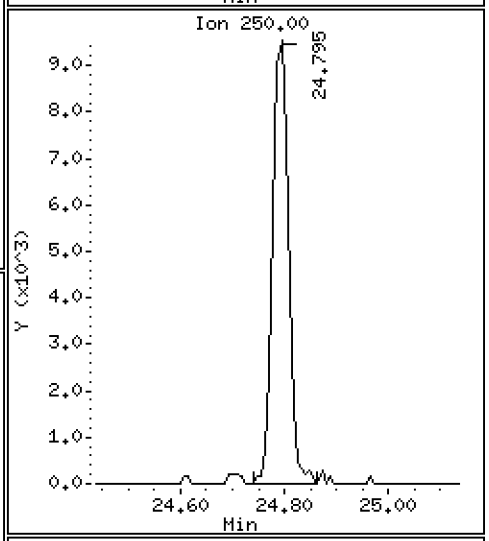


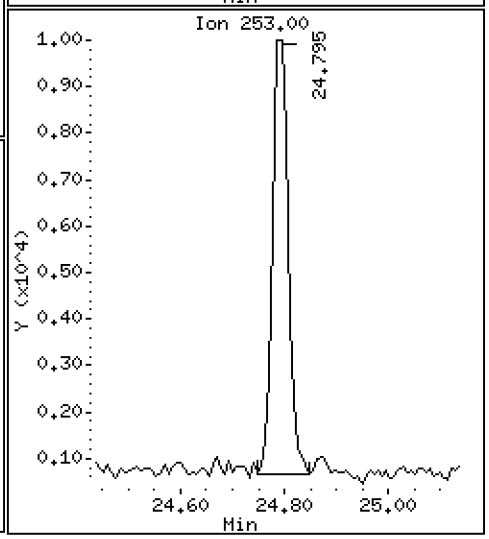












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

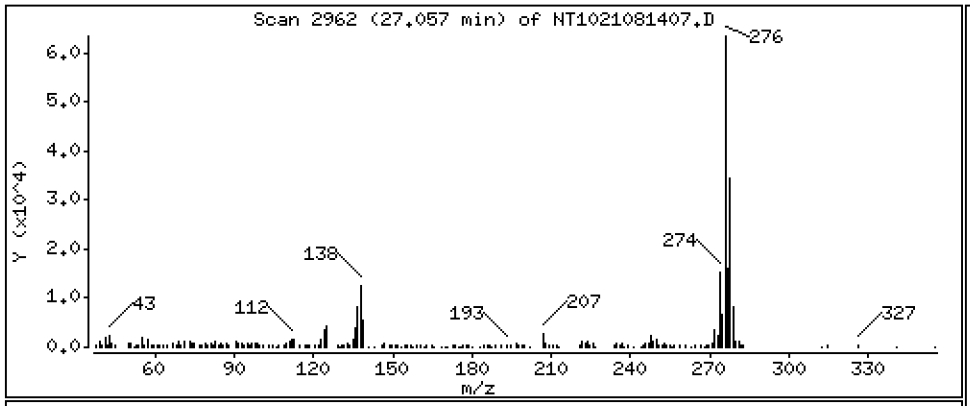
Operator: VTS

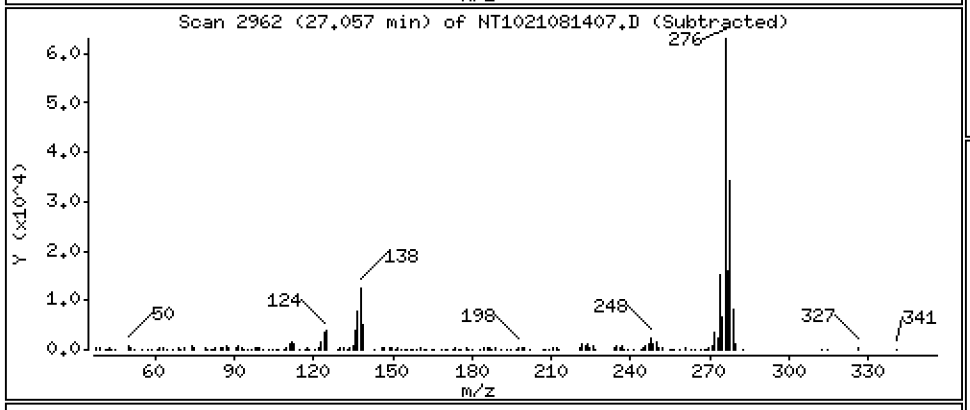
Column phase: ZB-5msi

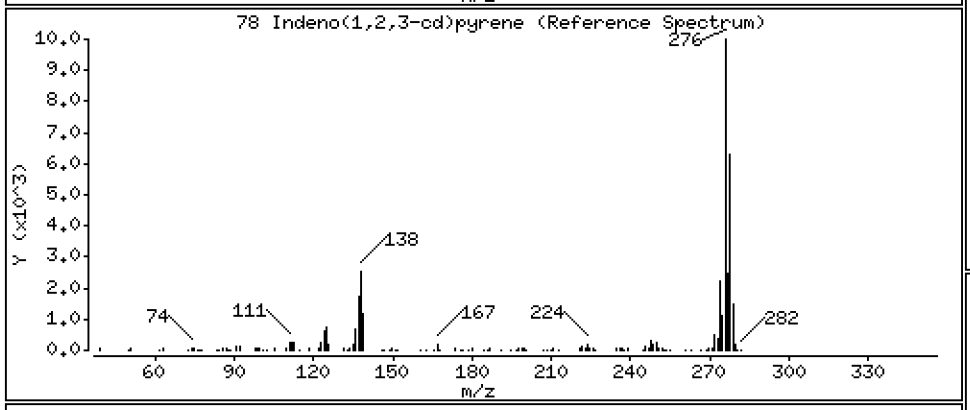
Column diameter: 0.25

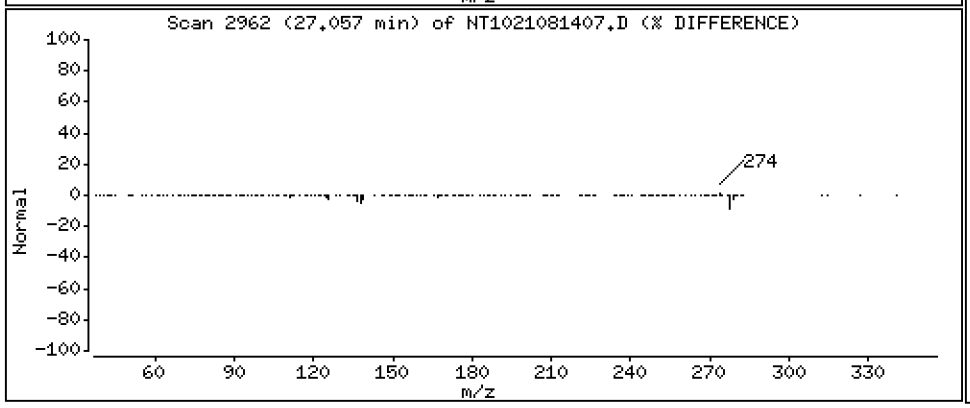
78 Indeno(1,2,3-cd)pyrene

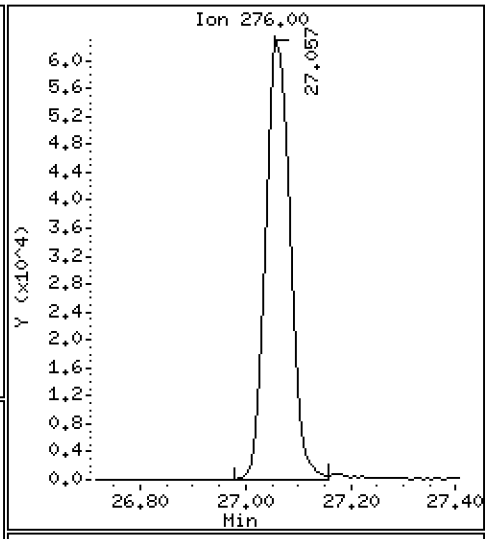
Concentration: 2.405 ug/mL

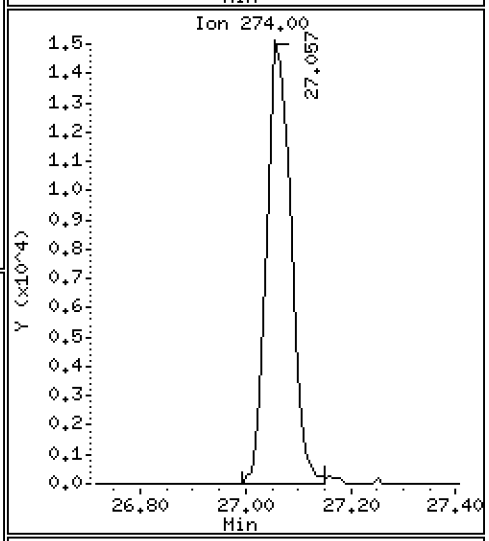


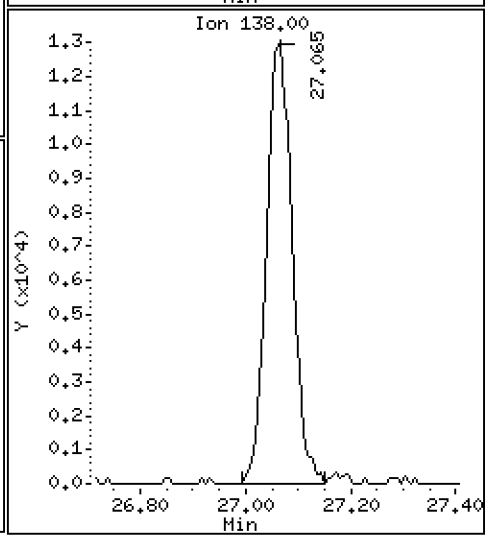












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

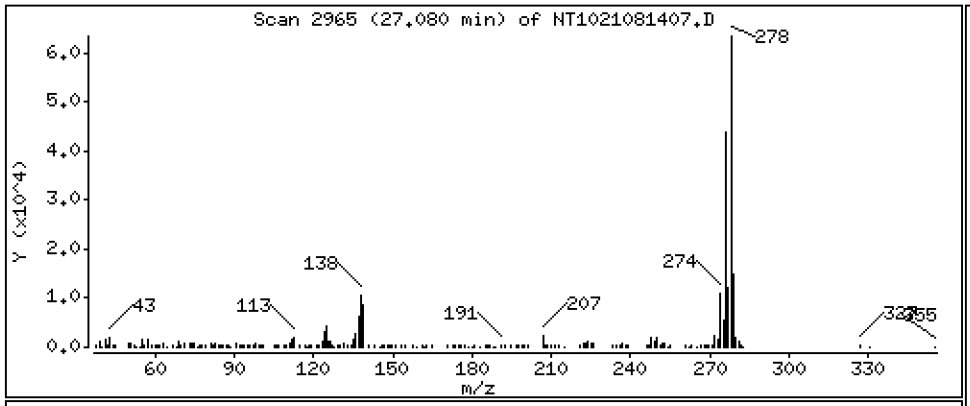
Operator: VTS

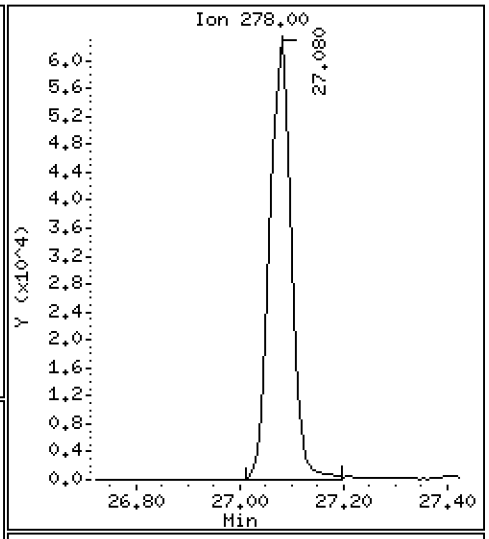
Column phase: ZB-5msi

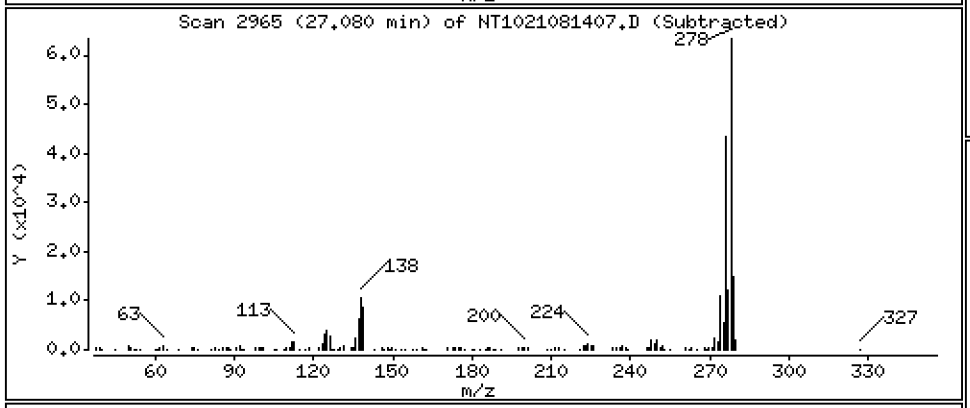
Column diameter: 0.25

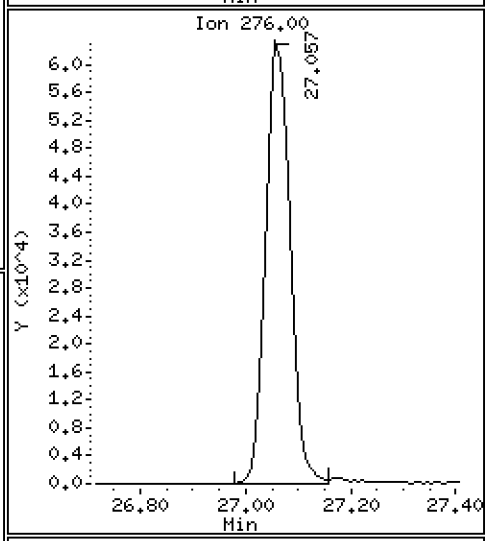
79 Dibenzo(a,h)anthracene

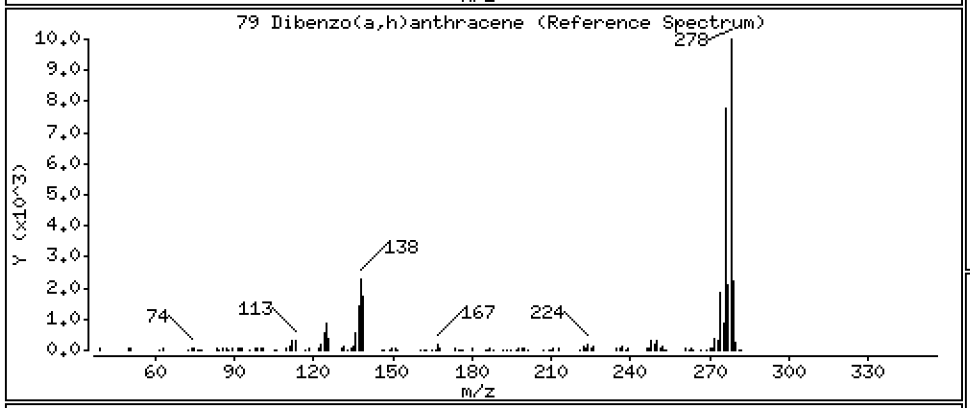
Concentration: 2.702 ug/mL

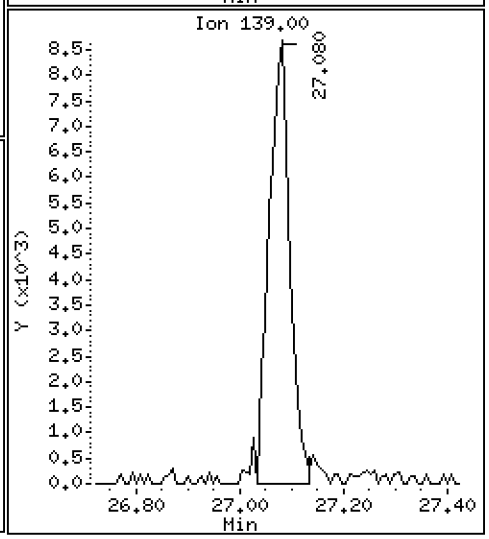


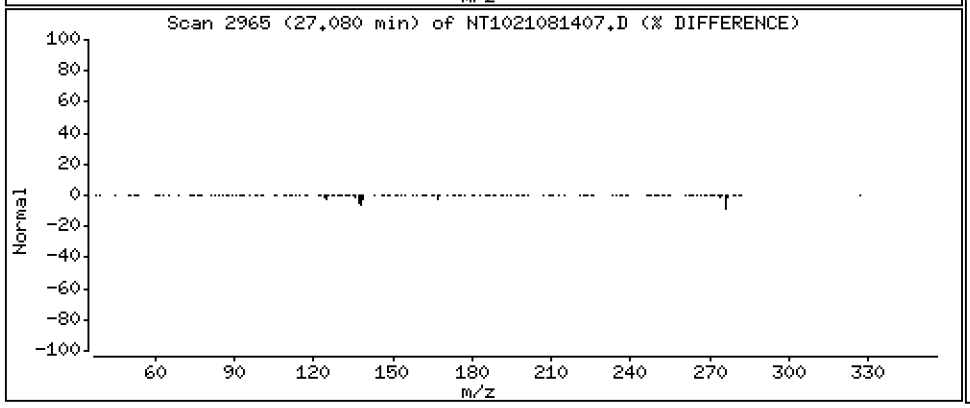












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

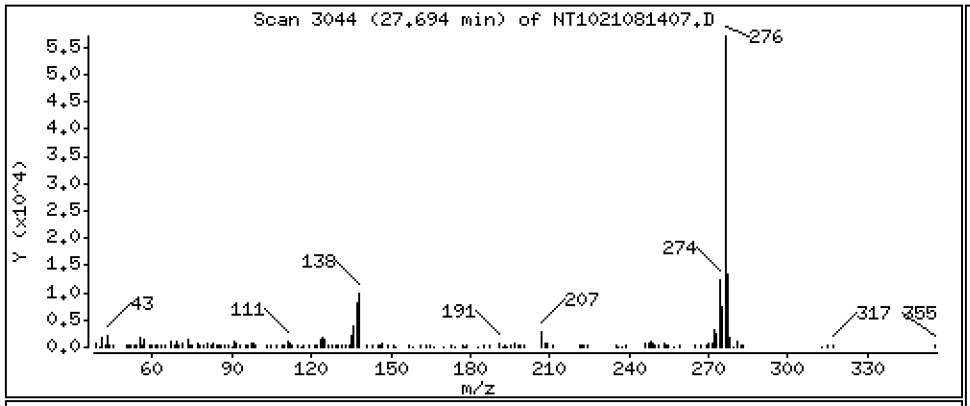
Operator: VTS

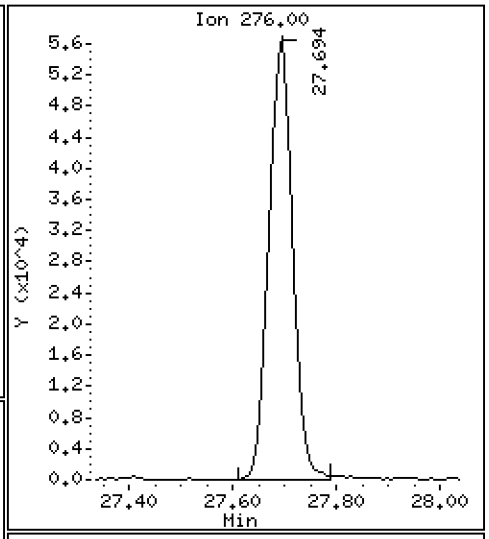
Column phase: ZB-5msi

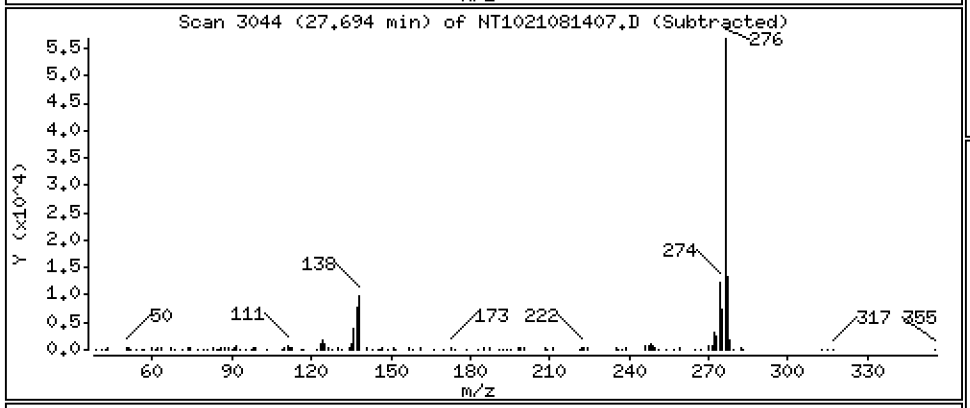
Column diameter: 0.25

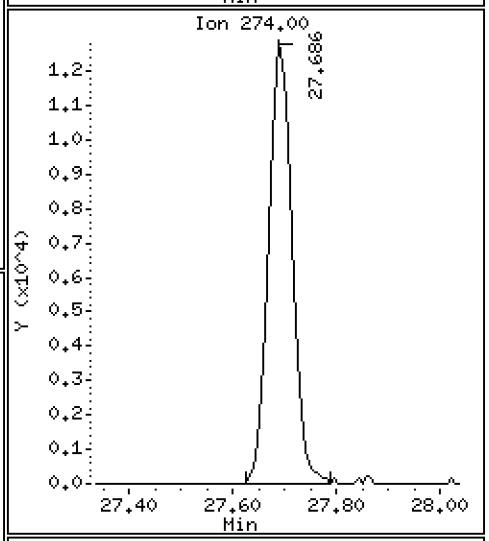
80 Benzo(g,h,i)perylene

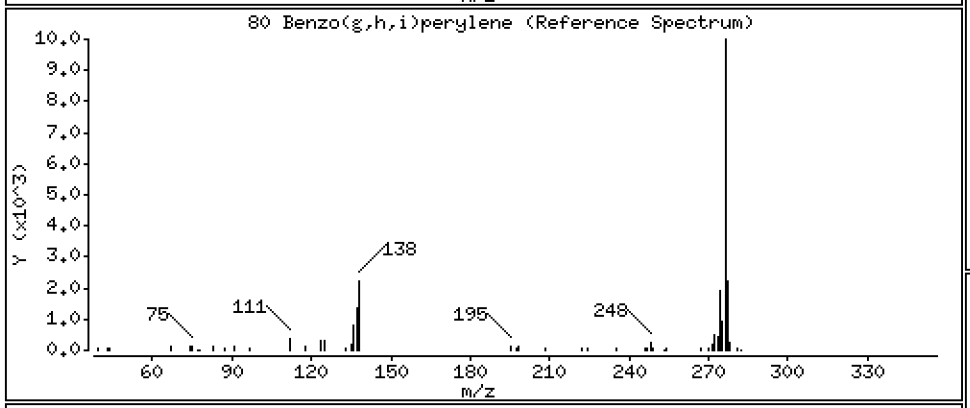
Concentration: 2.349 ug/mL

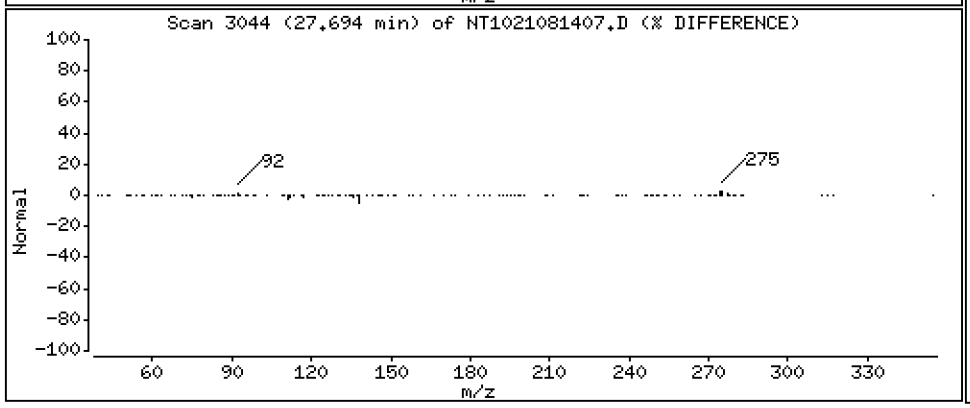


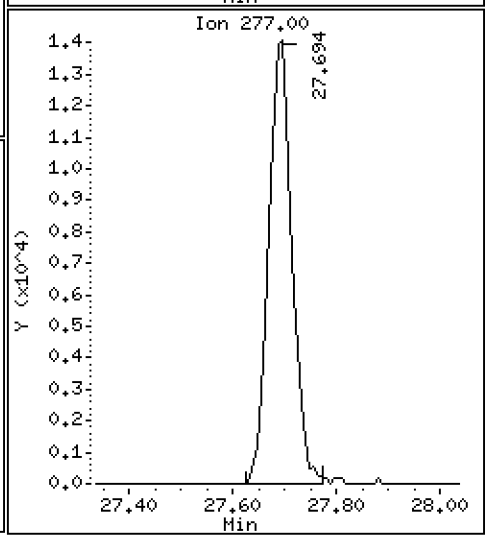












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

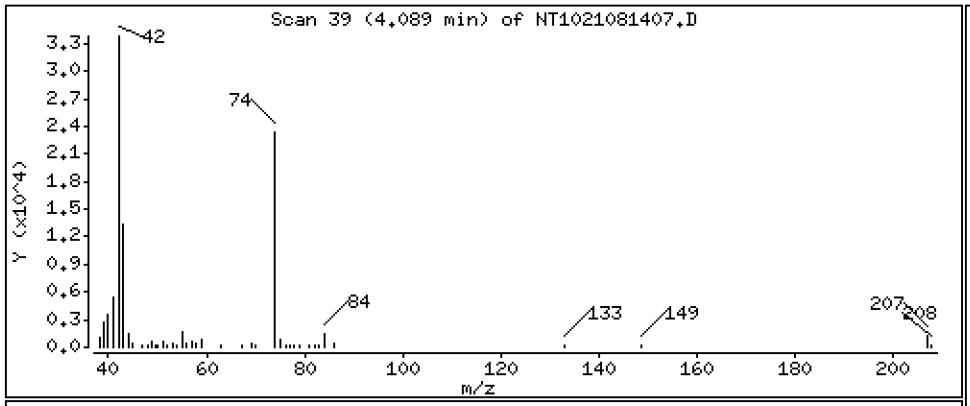
Operator: VTS

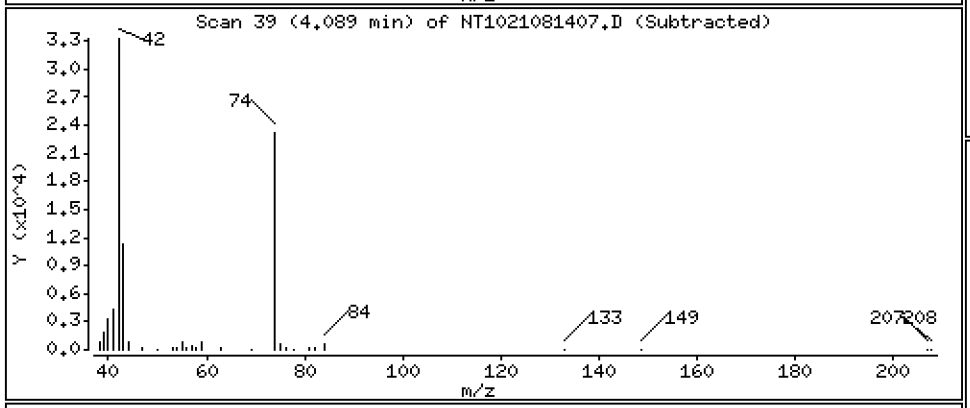
Column phase: ZB-5msi

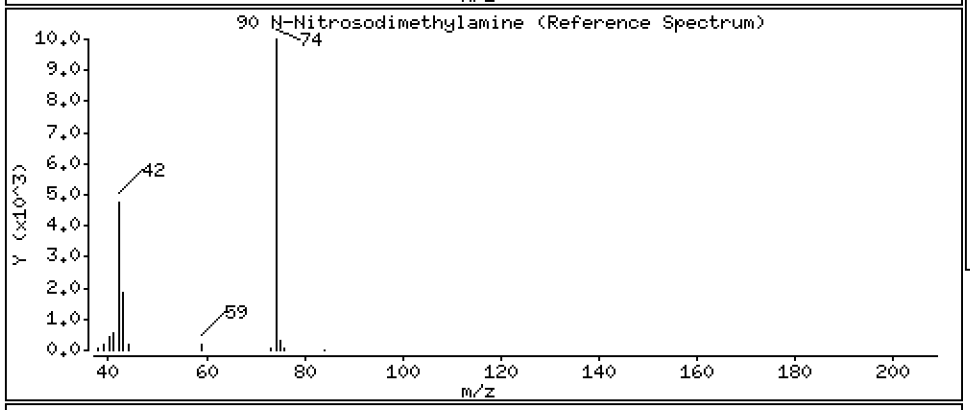
Column diameter: 0.25

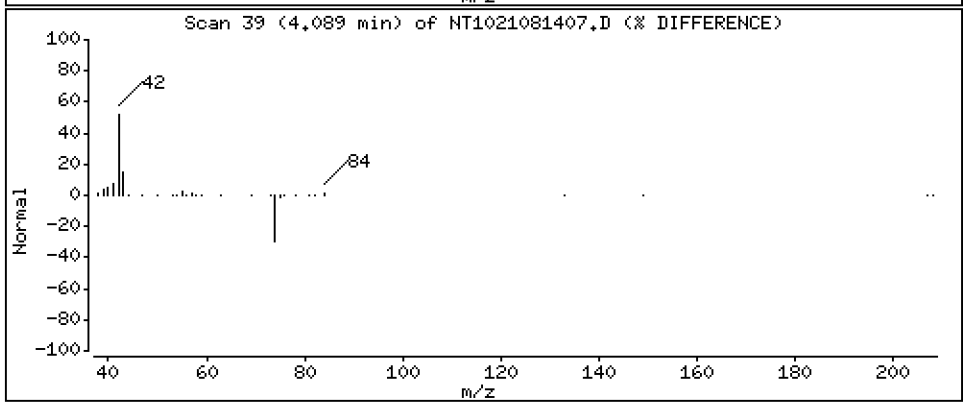
90 N-Nitrosodimethylamine

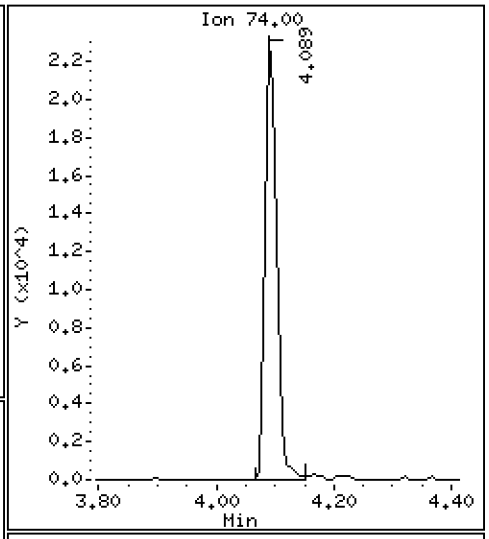
Concentration: 1.484 ug/mL

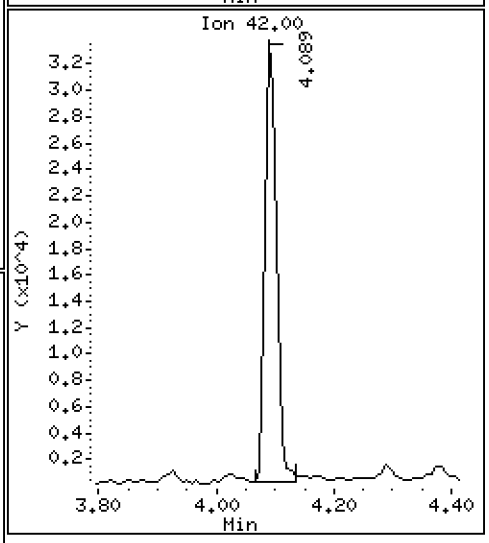












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

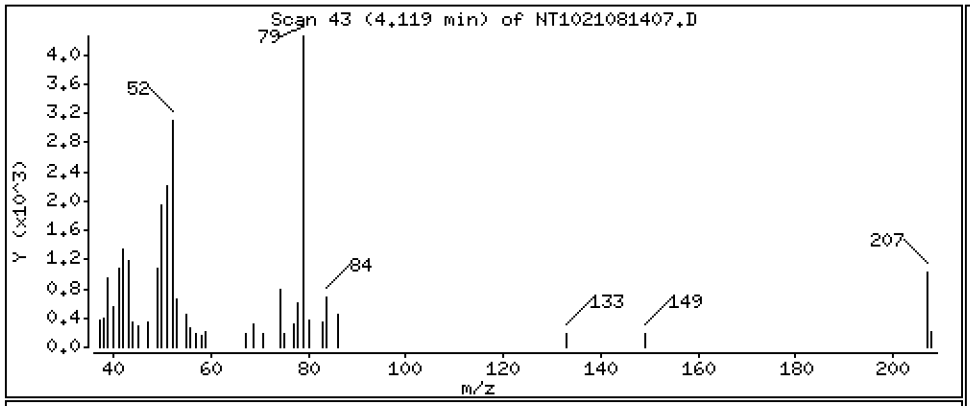
Operator: VTS

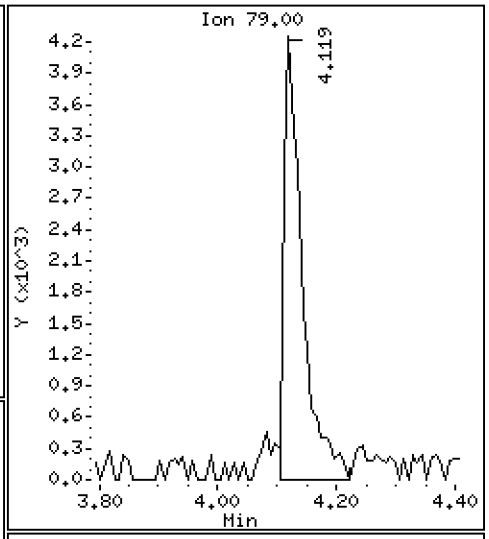
Column phase: ZB-5msi

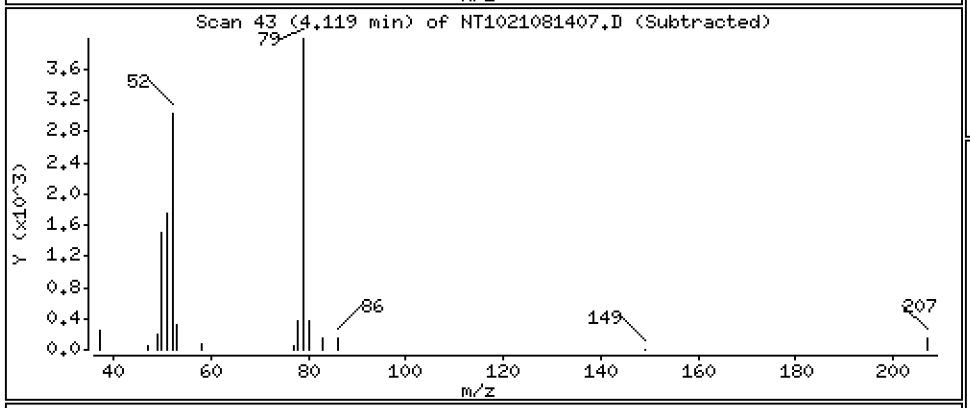
Column diameter: 0.25

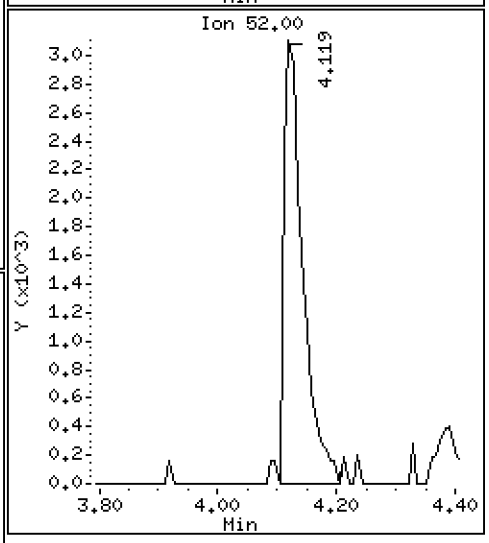
103 Pyridine

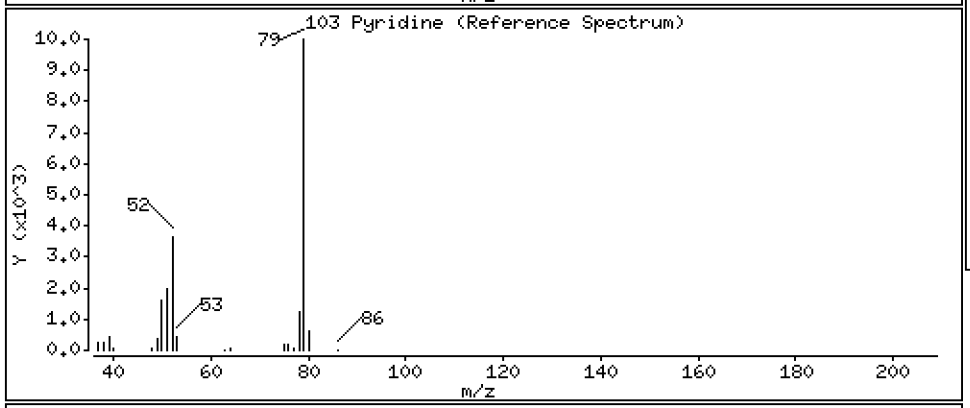
Concentration: 0.2801 ug/mL

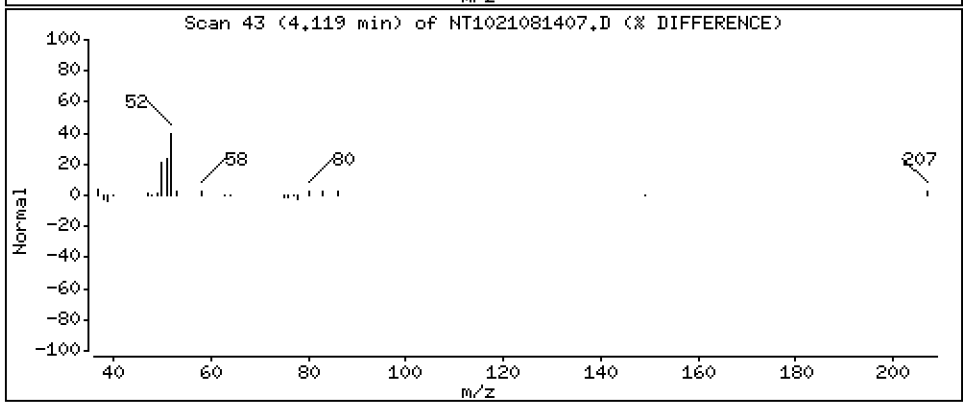












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Date : 14-AUG-2021 13:13

Client ID:

Instrument: nt10.i

Sample Info: BJH0004-SRM1

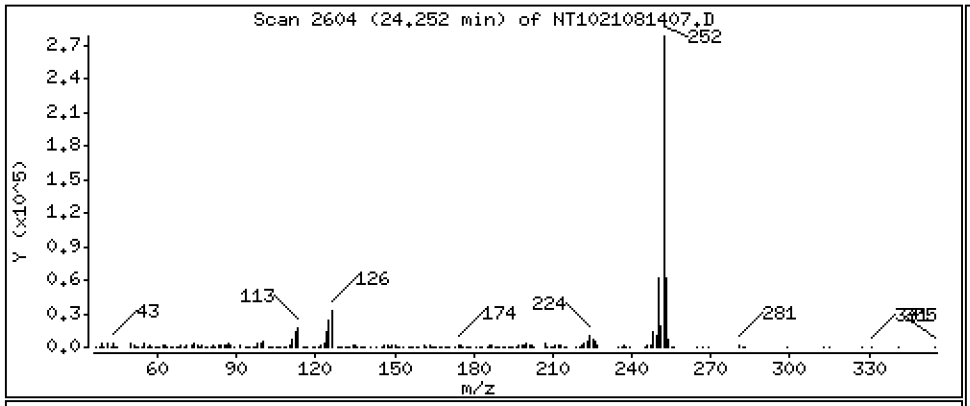
Operator: VTS

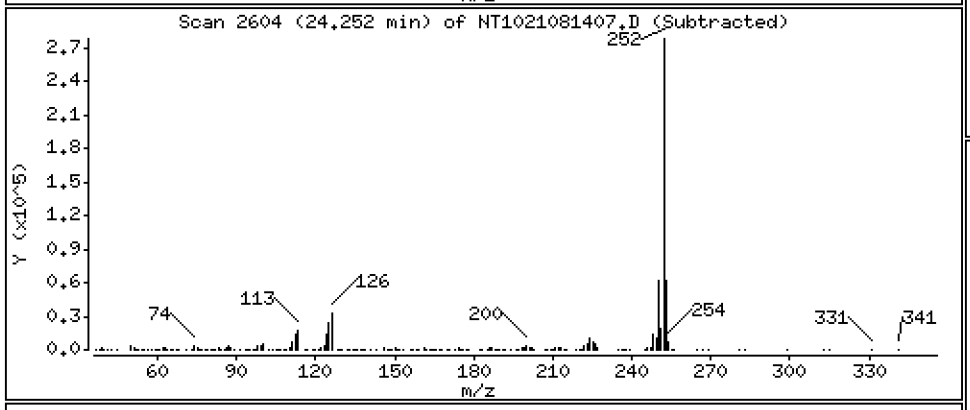
Column phase: ZB-5msi

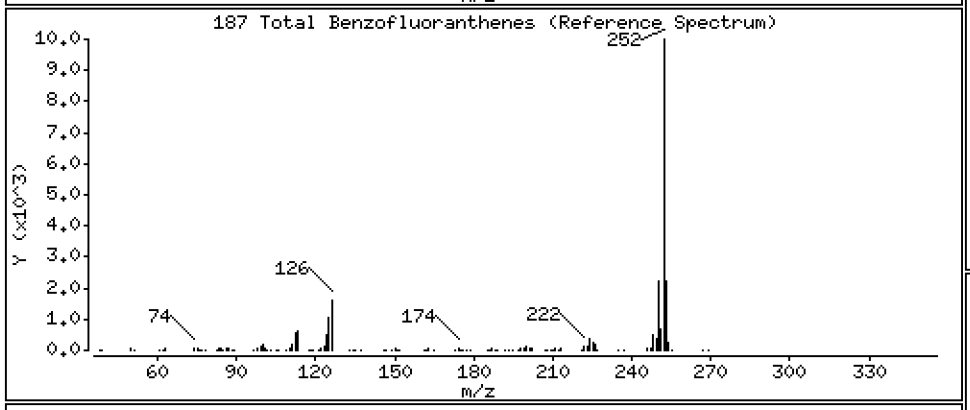
Column diameter: 0.25

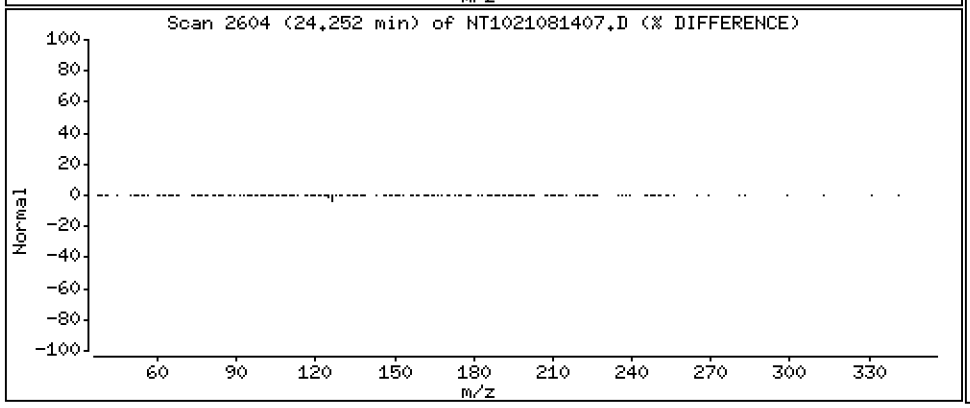
187 Total Benzofluoranthenes

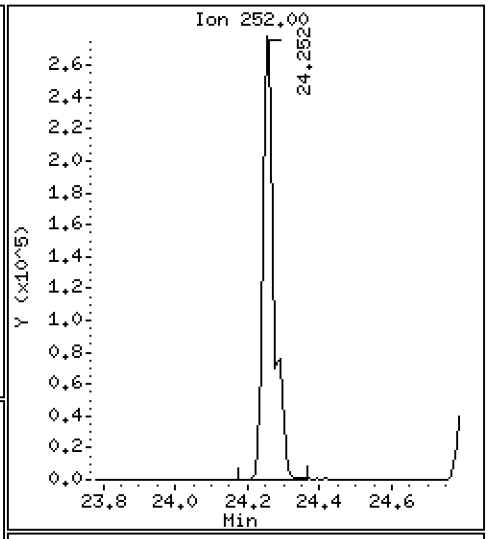
Concentration: 7.517 ug/mL

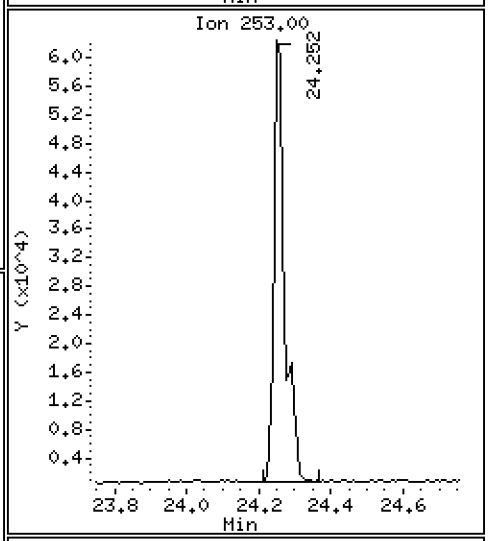


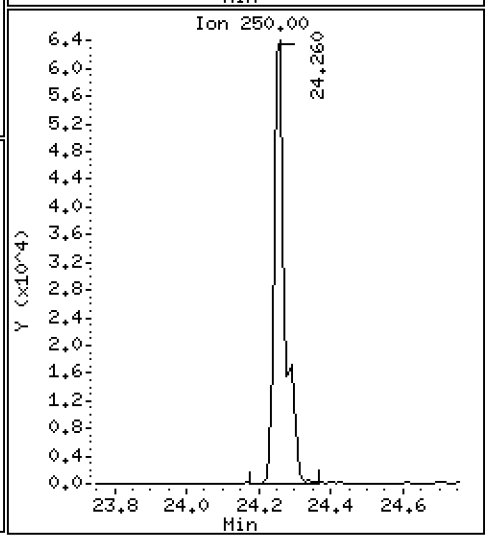












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210814.b\NT1021081407.D
Lab Smp Id: BJH0004-SRM1
Inj Date : 14-AUG-2021 13:13
Operator : VTS Inst ID: nt10.i
Smp Info : BJH0004-SRM1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$ 1	2-Fluorophenol	112	6.227	6.204	(0.745)	150154	4.94110	4.941
$ 2	Phenol-d5	99	7.803	7.788	(0.933)	224982	4.98797	4.988
3	Phenol	94	7.819	7.811	(0.935)	148302	3.76140	3.761
$ 5	2-Chlorophenol-d4	132	8.020	8.004	(0.959)	201794	6.34574	6.346
4	Bis(2-Chloroethyl)ether	93	7.942	7.935	(0.950)	43316	1.37552	1.376
6	2-Chlorophenol	128	8.043	8.035	(0.962)	149139	4.99738	4.997
7	1,3-Dichlorobenzene	146	8.291	8.283	(0.992)	109230	3.33191	3.332
* 8	1,4-Dichlorobenzene-d4	152	8.361	8.353	(1.000)	77219	4.00000	
9	1,4-Dichlorobenzene	146	8.392	8.384	(1.004)	133752	4.77849	4.778
$ 10	1,2-Dichlorobenzene-d4	152	8.710	8.702	(1.042)	72325	3.53617	3.536
12	1,2-Dichlorobenzene	146	8.733	8.726	(1.045)	32759	1.10643	1.106
11	Benzyl alcohol	108	Compound Not Detected.					
14	2,2'-oxybis(1-Chloropropane)	121	Compound Not Detected.					
13	2-Methylphenol	108	8.904	8.896	(1.065)	113518	4.62562	4.626
17	Hexachloroethane	117	9.308	9.300	(1.113)	43792	3.63967	3.640
16	N-Nitroso-di-n-propylamine	70	9.199	9.191	(1.100)	73392	3.46661	3.467
15	4-Methylphenol	108	9.176	9.160	(1.097)	130347	4.94940	4.949
$ 18	Nitrobenzene-d5	82	9.447	9.440	(0.875)	122862	3.65179	3.652
19	Nitrobenzene	77	9.401	9.471	(0.871)	31310	0.94194	0.9419
20	Isophorone	82	9.921	9.913	(0.919)	306631	4.88825	4.888
21	2-Nitrophenol	139	10.099	10.091	(0.935)	43336	2.48812	2.488
22	2,4-Dimethylphenol	107	10.193	10.184	(0.944)	83543	3.20368	3.204
23	Bis(2-Chloroethoxy)methane	93	10.362	10.363	(0.960)	107809	3.31106	3.311
24	Benzoic acid	105	10.345	10.430	(0.958)	25874	1.78614	1.786
25	2,4-Dichlorophenol	162	10.558	10.549	(0.978)	100145	4.63475	4.635
26	1,2,4-Trichlorobenzene	180	Compound Not Detected.					
* 27	Naphthalene-d8	136	10.798	10.791	(1.000)	274310	4.00000	
28	Naphthalene	128	10.837	10.837	(1.004)	102486	1.41172	1.412
29	4-Chloroaniline	127	Compound Not Detected.					
30	Hexachlorobutadiene	225	Compound Not Detected.					
31	4-Chloro-3-methylphenol	107	Compound Not Detected.					
32	2-Methylnaphthalene	142	12.222	12.214	(1.132)	197921	2.94666	2.947
33	Hexachlorocyclopentadiene	237	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	12.856	12.849	(0.895)	97190	5.28410	5.284
	35 2,4,5-Trichlorophenol	196	12.934	12.926	(0.900)	71259	3.63602	3.636
$	36 2-Fluorobiphenyl	172	13.003	13.003	(0.905)	288517	3.75286	3.753
	37 2-Chloronaphthalene	162	13.197	13.189	(0.919)	149529	2.32796	2.328
	38 2-Nitroaniline	65	13.483	13.483	(0.939)	43923	1.82465	1.825
	39 Dimethylphthalate	163	Compound Not Detected.					
	40 Acenaphthylene	152	14.056	14.048	(0.978)	370866	4.05987	4.060
	41 2,6-Dinitrotoluene	165	14.056	14.048	(0.978)	103955	7.37980	7.380
*	42 Acenaphthene-d10	164	14.365	14.358	(1.000)	167413	4.00000	
	43 3-Nitroaniline	138	Compound Not Detected.					
	44 Acenaphthene	153	14.435	14.427	(1.005)	184285	3.47481	3.475
	45 2,4-Dinitrophenol	184	Compound Not Detected.					
	46 Dibenzofuran	168	14.760	14.752	(1.027)	274936	3.35306	3.353
	47 4-Nitrophenol	109	14.713	14.713	(1.024)	33618	5.00421	5.004
	48 2,4-Dinitrotoluene	165	14.852	14.853	(1.034)	98757	5.24827	5.248
	50 Diethylphthalate	149	15.370	15.363	(1.070)	5760	0.09778	0.09778
	49 Fluorene	166	15.463	15.456	(1.076)	340879	4.28818	4.288
	51 4-Chlorophenyl-phenylether	204	15.471	15.463	(1.077)	55537	1.20187	1.202
	52 4-Nitroaniline	138	Compound Not Detected.					
	53 4,6-Dinitro-2-methylphenol	198	Compound Not Detected.					
	54 N-Nitrosodiphenylamine	169	15.726	15.726	(0.905)	268068	5.24415	5.244
$	55 2,4,6-Tribromophenol	330	15.996	15.996	(1.113)	95847	6.86513	6.865
	56 4-Bromophenyl-phenylether	248	16.466	16.458	(0.948)	80470	3.09349	3.093
	57 Hexachlorobenzene	284	16.760	16.752	(0.965)	68136	2.49240	2.492
	58 Pentachlorophenol	266	17.131	17.132	(0.986)	38584	3.45651	3.457
*	59 Phenanthrene-d10	188	17.371	17.364	(1.000)	284872	4.00000	
	60 Phenanthrene	178	17.418	17.418	(1.003)	144039	1.86974	1.870
	61 Anthracene	178	17.510	17.503	(1.008)	177160	2.15052	2.151
	62 Carbazole	167	17.866	17.859	(1.029)	6682	0.08216	0.08216
	63 Di-n-butylphthalate	149	Compound Not Detected.					
	64 Fluoranthene	202	19.839	19.839	(0.882)	417184	4.10656	4.107
	65 Pyrene	202	20.273	20.265	(0.901)	607576	5.42553	5.426
$	66 Terphenyl-d14	244	20.598	20.590	(0.916)	344037	4.31043	4.310
	67 Butylbenzylphthalate	149	Compound Not Detected.					
	68 Benzo(a)anthracene	228	22.471	22.464	(0.999)	262431	2.88483	2.885
*	69 Chrysene-d12	240	22.495	22.495	(1.000)	243780	4.00000	
	70 3,3'-Dichlorobenzidine	252	Compound Not Detected.					
	71 Chrysene	228	22.541	22.541	(1.002)	105060	1.49797	1.498
	72 bis(2-Ethylhexyl)phthalate	149	22.618	22.619	(0.958)	3217	0.08404	0.08404
*	134 Di-n-octylphthalate-d4	153	23.609	23.610	(1.000)	347932	4.00000	
	73 Di-n-octylphthalate	149	23.625	23.617	(1.001)	583571	5.98473	5.985
	74 Benzo(b)fluoranthene	252	24.252	24.252	(0.974)	490156	5.88906	5.889
	75 Benzo(k)fluoranthene	252	24.291	24.283	(0.976)	141452	1.71570	1.716
	76 Benzo(a)pyrene	252	24.794	24.786	(0.996)	83141	1.10527	1.105
*	77 Perylene-d12	264	24.895	24.887	(1.000)	211217	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.057	27.057	(1.087)	204731	2.40481	2.405
	79 Dibenzo(a,h)anthracene	278	27.080	27.072	(1.088)	180650	2.70158	2.702
	80 Benzo(g,h,i)perylene	276	27.694	27.686	(1.112)	178455	2.34898	2.349
	90 N-Nitrosodimethylamine	74	4.088	4.065	(0.489)	30855	1.48414	1.484
	91 Aniline	93	Compound Not Detected.					
	93 Benzidine	184	Compound Not Detected.					
	103 Pyridine	79	4.119	4.057	(0.493)	9162	0.28014	0.2801
	105 1-methylnaphthalene	142	Compound Not Detected.					
	111 Azobenzene (1,2-DP-Hydrazine)	77	Compound Not Detected.					

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.252	24.283	(0.974)	600779	7.51665	7.517
120 2,3,4,6-Tetrachlorophenol	232	Compound Not Detected.					

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081407.D
Lab Smp Id: BJH0004-SRM1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	77219	-9.22
27 Naphthalene-d8	291658	145829	583316	274310	-5.95
42 Acenaphthene-d10	163642	81821	327284	167413	2.30
59 Phenanthrene-d10	304099	152050	608198	284872	-6.32
69 Chrysene-d12	199453	99727	398906	243780	22.22
134 Di-n-octylphthala	303639	151820	607278	347932	14.59
77 Perylene-d12	200082	100041	400164	211217	5.57

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.36	0.09
27 Naphthalene-d8	10.79	10.29	11.29	10.80	0.07
42 Acenaphthene-d10	14.36	13.86	14.86	14.37	0.05
59 Phenanthrene-d10	17.36	16.86	17.86	17.37	0.04
69 Chrysene-d12	22.50	22.00	23.00	22.50	-0.00
134 Di-n-octylphthala	23.61	23.11	24.11	23.61	-0.00
77 Perylene-d12	24.89	24.39	25.39	24.90	0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081407.D

Lab ID: BJH0004-SRM1
nt10.i, ABN.m, 14-AUG-2021 13:13

RT	CO-ELUTION COMPOUNDS
14.056	Acenaphthylene and 2,6-Dinitrotoluene

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
0.871	0.878	-0.0071	Nitrobenzene
0.958	0.967	-0.0086	Benzoic acid
0.493	0.486	0.0069	Pyridine

RRT check based on Ccal File: NT1021081402.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Analytical Resources, Incorporated
Analytical Chemists and Consultants

MASS SPECTROMETER
INSTRUMENT PERFORMANCE CHECK
EPA 8270E

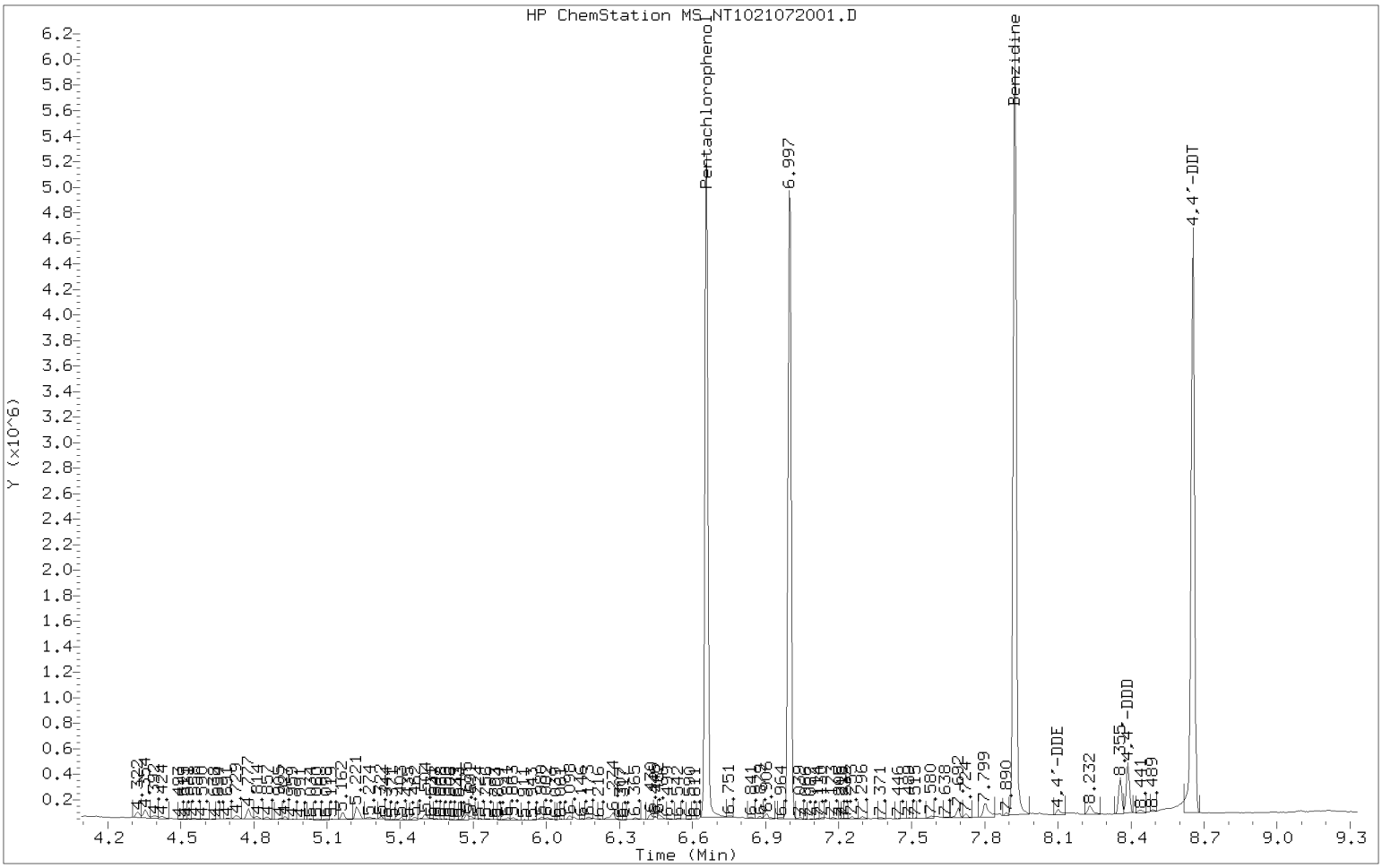
Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Lab File ID:	NT1021072001.D	Injection Date:	07/20/21
Instrument ID:	NT10	Injection Time:	11:51
Sequence:	SJG0249	Lab Sample ID:	SJG0249-TUN1

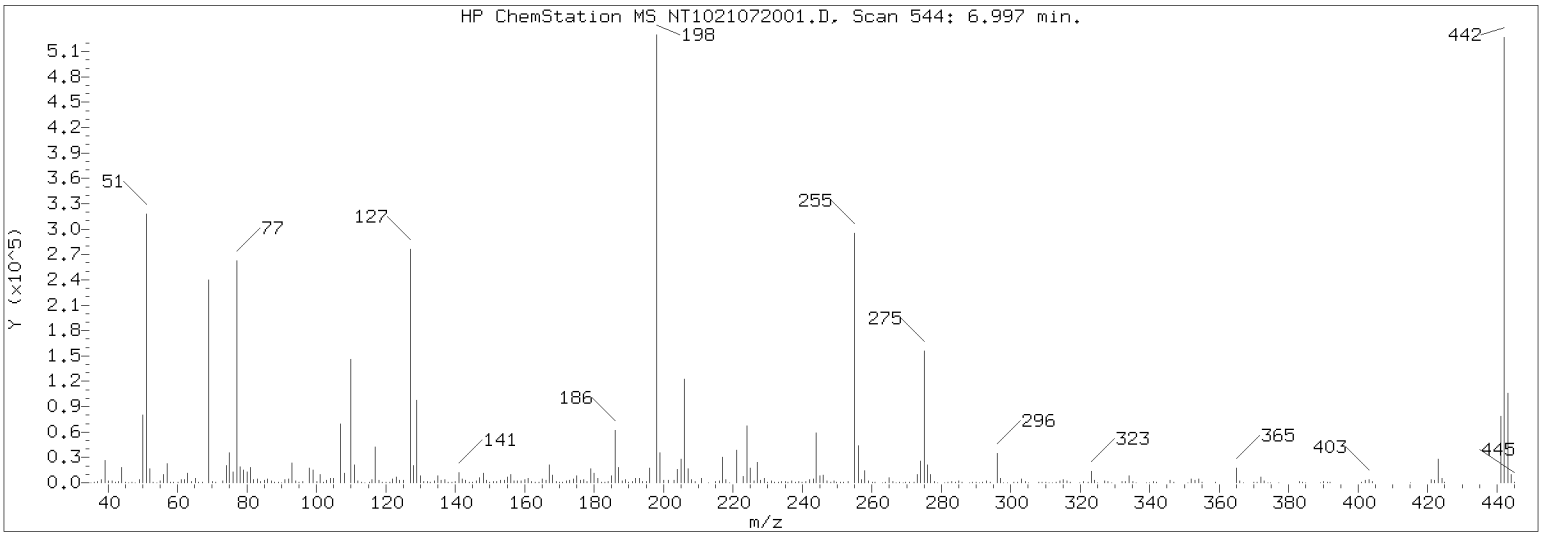
m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
68	Less than 2% of 69	0	PASS
69	Less than 100% of 198	45.2	PASS
70	Less than 2% of 69	0.361	PASS
197	Less than 2% of 198	0	PASS
198	Base peak, 100% relative abundance	100	PASS
199	5 - 9% of 198	6.77	PASS
365	1 - 100% of 198	3.6	PASS
441	Less than 150% of 443	73.4	PASS
442	1 - 200% of 198	120	PASS
443	15 - 24% of 442	20.1	PASS
4,4'-DDD	Less than 20% of		
4,4'-DDE	Less than 20% of		
4,4'-DDT	Base peak, 100% relative abundance		

Client Sample ID	Lab Sample ID	Lab File ID	Date Analyzed	Time Analyzed
MS Tune	SJG0249-TUN1	NT1021072001.D	07/20/2021	11:51
Cal Standard	SJG0249-CAL5	NT1021072004.D	07/20/2021	13:41
Cal Standard	SJG0249-CAL7	NT1021072005.D	07/20/2021	14:19
Cal Standard	SJG0249-CAL1	NT1021072006.D	07/20/2021	14:57
Cal Standard	SJG0249-CAL6	NT1021072007.D	07/20/2021	15:36
Cal Standard	SJG0249-CAL2	NT1021072008.D	07/20/2021	16:14
Cal Standard	SJG0249-CAL4	NT1021072009.D	07/20/2021	16:52
Cal Standard	SJG0249-CAL3	NT1021072010.D	07/20/2021	17:30
Secondary Cal Check	SJG0249-SCV1	NT1021072013.D	07/20/2021	19:24
Initial Cal Blank	SJG0249-ICB1	NT1021072015ICB.D	07/20/2021	20:40
Calibration Check	SJG0249-CCV1	NT1021072019.D	07/20/2021	23:13

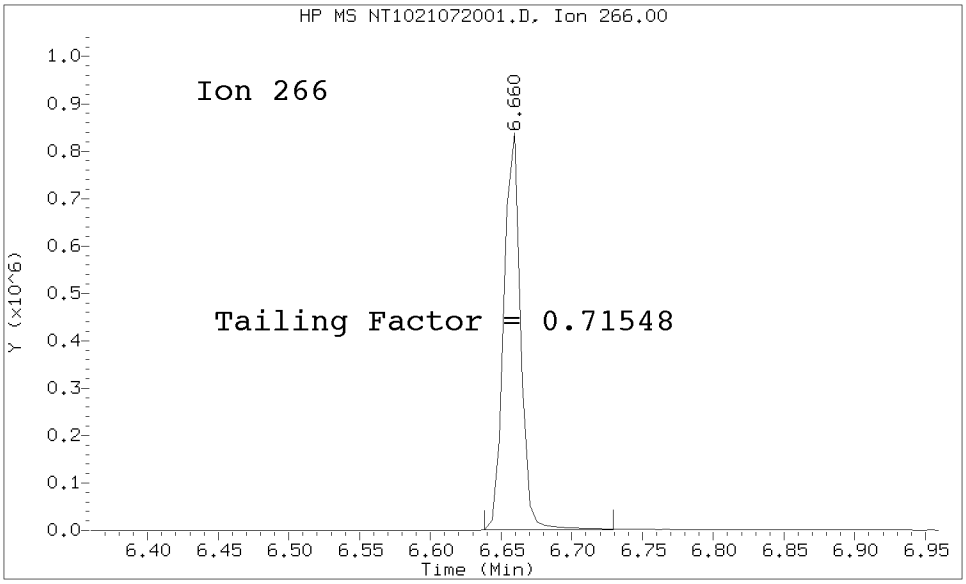
DFTPP TAILING FACTOR AND BREAKDOWN GRAPHIC REPORT

Datafile Analyzed: /20210720.b/NT1021072001.D/NT1021072001.D
Method Used: \20210720.b\DFTPP8270E.m Inst: nt10
Injection Date: 20-JUL-2021 11:51 Operator: YZ/VTS
Sample Info: SJG0249-TUN1 SJG0249-TUN1
Report Date: 07/21/2021 09:29



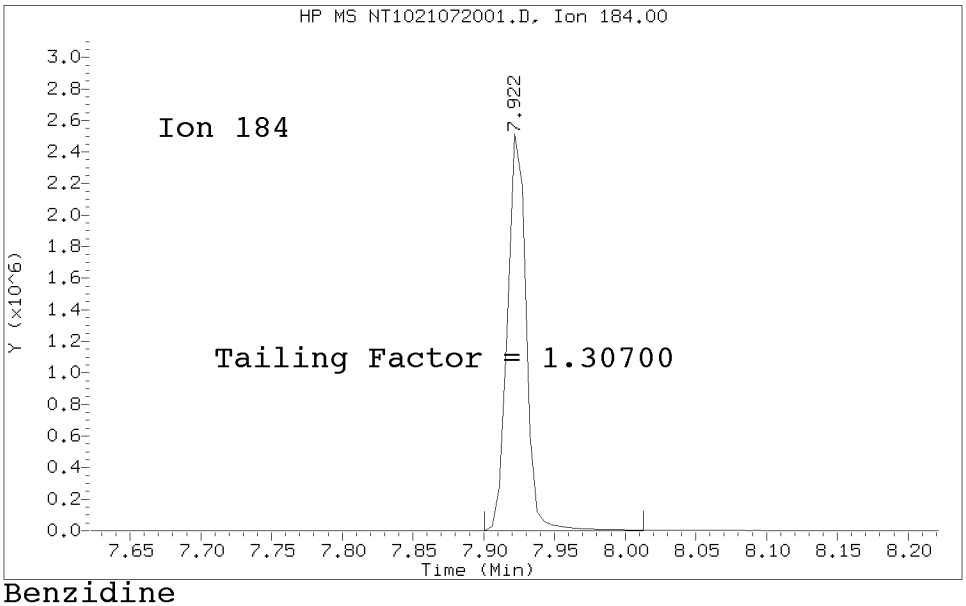


Datafile Analyzed: /20210720.b/NT1021072001.D/NT1021072001.D
Method Used: \20210720.b\DFTPP8270E.m\sw846ddt.m Inst: nt10
Injection Date: 20-JUL-2021 11:51 Operator: YZ/VTS
Sample Info: SJG0249-TUN1
Report Date: 07/21/2021 09:29



Pentachlorophenol
==========
Exp. RT = 6.670
Found RT = 6.660

Tail Factor = 0.715 Maximum Allowed = 2.0



Benzidine
==========
Exp. RT = 7.932
Found RT = 7.922

Tail Factor = 1.307 Maximum Allowed = 2.0

8270 TAILING FACTOR/BREAKDOWN SUMMARY RESULTS

TAILING ANALYSIS SUMMARY

Compound	Tail Factor	Max Allowed	Test
Pentachlorophenol	0.7154762	2.000	PASS
Benzidine	1.3070045	2.000	PASS

DDT DEGRADATION BREAKDOWN ANALYSIS SUMMARY

Compound	Response	%Breakdown	Max Allowed	Test
4,4-DDT	861080			N/A
4,4-DDE	3247	0.4	20.0	PASS
4,4-DDD	78258	8.3	20.0	PASS
4,4-DDD + DDE	81505	8.6	20.0	PASS

Tuning Sample, nt10.i/20210720.b/NT1021072001.D, *** PASSED ***

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
198	Base Peak, 100% relative abundance	100.00
68	Less than 2.00% of mass 69	0.00 (0.00)
69	Mass 69 relative abundance	45.22
70	Less than 2.00% of mass 69	0.16 (0.36)
197	Less than 2.00% of mass 198	0.00
199	5.00 - 9.00% of mass 198	6.77
365	1.00 - 100.00% of mass 198	3.60
441	Less than 150.00% of mass 443	17.75 (73.41)
442	Less than 200.00% of mass 198	120.12
443	15.00 - 24.00% of mass 442	24.18 (20.13)

Data File: NT1021072001.D
Spectrum: Avg. Scans 543-545 (7.00), Background Scan 538
Location of Maximum: 442.00
Number of points: 315

m/z	Y	m/z	Y	m/z	Y	m/z	Y
35.00	97	127.00	213568	208.00	2747	301.00	435
36.00	102	128.00	16084	209.00	772	302.00	621
37.00	1023	129.00	76192	211.00	4573	303.00	3789
38.00	2875	130.00	6313	213.00	257	304.00	1023
39.00	19288	131.00	1157	214.00	56	305.00	59
40.00	893	132.00	668	215.00	847	308.00	565
41.00	392	133.00	270	216.00	1910	309.00	267
45.00	247	134.00	2061	217.00	23720	310.00	403
47.00	115	135.00	5942	218.00	3013	311.00	120
48.00	315	136.00	2185	219.00	323	312.00	156
49.00	1808	137.00	2924	221.00	29520	313.00	233
50.00	60312	138.00	851	223.00	5974	314.00	1790
51.00	238784	139.00	249	224.00	52640	315.00	3084
52.00	12239	140.00	953	225.00	13466	316.00	2021
53.00	449	141.00	9067	226.00	1578	317.00	445
55.00	645	142.00	3338	227.00	18616	320.00	130
56.00	6956	143.00	2161	228.00	2645	321.00	1092
57.00	16254	144.00	548	229.00	4246	322.00	578
58.00	334	145.00	724	230.00	696	323.00	11343
60.00	184	146.00	1640	231.00	1946	324.00	2265
61.00	2485	147.00	4681	232.00	449	325.00	212
62.00	2929	148.00	9258	233.00	456	326.00	135
63.00	8278	149.00	2062	234.00	1207	327.00	2025
64.00	1211	150.00	545	235.00	1535	328.00	1133
65.00	4005	151.00	1311	236.00	899	329.00	264
66.00	353	152.00	739	237.00	1876	331.00	52
67.00	150	153.00	2937	238.00	361	332.00	1018
69.00	185472	154.00	2247	239.00	814	333.00	1243
70.00	670	155.00	4897	240.00	822	334.00	6808
73.00	1163	156.00	7533	241.00	1307	335.00	1799
74.00	16015	157.00	1735	242.00	3063	336.00	221
75.00	26632	158.00	1781	243.00	3610	339.00	168
76.00	9926	159.00	1249	244.00	47488	340.00	190
77.00	198912	160.00	2494	245.00	6220	341.00	1390
78.00	14053	161.00	4217	246.00	7317	342.00	398
79.00	11529	162.00	1179	247.00	1480	346.00	2384
80.00	9567	163.00	407	248.00	357	347.00	487
81.00	13534	164.00	611	249.00	1734	350.00	62
82.00	2945	165.00	2830	250.00	405	351.00	195
83.00	3034	166.00	2095	251.00	308	352.00	3444
84.00	25	167.00	15236	252.00	402	353.00	2580
85.00	2308	168.00	7422	253.00	816	354.00	3703
86.00	3081	169.00	1376	255.00	235136	355.00	712
87.00	1697	170.00	723	256.00	34288	359.00	284
88.00	574	171.00	804	257.00	2772	365.00	14750
89.00	434	172.00	1519	258.00	11230	366.00	2166
90.00	150	173.00	2186	259.00	1986	367.00	146
91.00	2728	174.00	3659	260.00	394	370.00	400
92.00	3390	175.00	6887	261.00	428	371.00	1044

93.00	17952	176.00	2460	263.00	149	372.00	6150
94.00	1361	177.00	2990	264.00	316	373.00	1652
95.00	190	178.00	1211	265.00	4543	374.00	152
96.00	696	179.00	12799	266.00	770	375.00	13
98.00	13038	180.00	8728	270.00	182	377.00	170
99.00	11796	181.00	4587	271.00	569	383.00	1590
100.00	1080	182.00	719	272.00	663	384.00	511
101.00	7282	183.00	562	273.00	8035	385.00	122
102.00	409	184.00	1276	274.00	19960	389.00	168
103.00	2534	185.00	6353	275.00	125688	390.00	1023
104.00	4319	186.00	49384	276.00	17272	391.00	656
105.00	3992	187.00	14151	277.00	8366	392.00	532
107.00	53632	188.00	1497	278.00	1331	401.00	336
108.00	8678	189.00	2677	279.00	229	402.00	2443
110.00	111424	190.00	434	282.00	307	403.00	3396
111.00	15978	191.00	1525	283.00	1218	404.00	1191
112.00	2002	192.00	3886	284.00	701	405.00	110
113.00	658	193.00	4430	285.00	1708	410.00	73
114.00	193	194.00	818	286.00	271	415.00	155
115.00	197	195.00	790	288.00	54	421.00	3283
116.00	3138	196.00	13671	289.00	315	422.00	2997
117.00	32520	198.00	410112	290.00	339	423.00	24632
118.00	2653	199.00	27752	291.00	161	424.00	4873
119.00	571	200.00	2045	292.00	426	425.00	434
120.00	566	201.00	2500	293.00	2027	441.00	72792
121.00	229	203.00	2269	294.00	523	442.00	492608
122.00	3211	204.00	13001	296.00	28176	443.00	99152
123.00	5137	205.00	21752	297.00	3971	444.00	9091
124.00	2221	206.00	94832	298.00	295	445.00	500
125.00	2426	207.00	12405	299.00	190		

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EG00057	Instrument:	NT10
Calibration Date:	07/20/2021	Column (1):	ZB-5MSi
Comments:	ABN20 and 625 ICAL		

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RRF		RRF		RRF		RRF		RRF		RRF
Naphthalene	0.2	1.036931	0.5	1.02908	1	0.9865737	2.5	1.040489	5	1.074841	10	1.120425
2-Methylnaphthalene	0.2	0.8466469	0.5	0.9121989	1	0.9161921	2.5	0.9471432	5	1.034231	10	1.079203
Acenaphthylene	0.2	2.335031	0.5	2.424526	1	2.207063	2.5	2.188491	5	2.121074	10	2.065696
Acenaphthene	0.2	1.212817	0.5	1.214735	1	1.201259	2.5	1.250713	5	1.300179	10	1.340088
Fluorene	0.2	1.963937	0.5	1.965156	1	1.856569	2.5	1.824916	5	1.781345	10	2.024929
Phenanthrene	0.2	1.029064	0.5	1.065704	1	1.027404	2.5	1.054312	5	1.095657	10	1.131872
Anthracene	0.2	0.9699274	0.5	1.097466	1	1.097175	2.5	1.167315	5	1.209662	10	1.255789
Fluoranthene	0.2	1.452244	0.5	1.538913	1	1.463423	2.5	1.628943	5	1.75479	10	1.850337
Pyrene	0.2	1.584812	0.5	1.6561	1	1.613544	2.5	1.898895	5	2.045418	10	2.109404
Butylbenzylphthalate	0.2	0.5586117	0.5	0.6041672	1	0.5754632	2.5	0.6306443	5	0.638775	10	0.6205861
Benzo(a)anthracene	0.2	1.55882	0.5	1.54063	1	1.466187	2.5	1.484303	5	1.504691	10	1.485042
Chrysene	0.2	1.09572	0.5	1.115027	1	1.066907	2.5	1.145704	5	1.191833	10	1.211905
Benzofluoranthenes, Total	0.4	1.470611	1	1.53175	2	1.441642	5	1.508011	10	1.52226	20	1.559977
Benzo(a)pyrene	0.2	1.331089	0.5	1.388389	1	1.331773	2.5	1.421804	5	1.463516	10	1.510761
Indeno(1,2,3-cd)pyrene	0.2	1.627122	0.5	1.716892	1	1.627729	2.5	1.603368	5	1.589352	10	1.571037
Dibenzo(a,h)anthracene	0.2	1.307336	0.5	1.413538	1	1.294105	2.5	1.263264	5	1.236905	10	1.19344
Benzo(g,h,i)perylene	0.2	1.452228	0.5	1.474829	1	1.409262	2.5	1.417817	5	1.468303	10	1.4415
1,2-Dichlorobenzene-d4	0.2	1.008611	0.5	1.079733	1	1.021324	2.5	1.046348	5	1.076343	10	1.088358
Nitrobenzene-d5	0.2	0.467901	0.5	0.4932423	1	0.4706624	2.5	0.4815074	5	0.4962438	10	0.5163909
2-Fluorobiphenyl	0.2	1.827053	0.5	1.893292	1	1.829625	2.5	1.799519	5	1.852653	10	1.856875
p-Terphenyl-d14	0.2	1.42928	0.5	1.457029	1	1.374708	2.5	1.307571	5	1.267802	10	1.204026

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EG00057	Instrument:	NT10
Calibration Date:	07/20/2021	Column (1):	ZB-5MSi
Comments:	ABN20 and 625 ICAL		

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RRF		RRF		RRF		RRF		RRF		RRF
Naphthalene	20	1.121907										
2-Methylnaphthalene	20	1.120509										
Acenaphthylene	20	1.936356										
Acenaphthene	20	1.350303										
Fluorene	20	1.878383										
Phenanthrene	20	1.167939										
Anthracene	20	1.299772										
Fluoranthene	20	1.979693										
Pyrene	20	1.954116										
Butylbenzylphthalate	20	0.6025314										
Benzo(a)anthracene	20	1.408853										
Chrysene	20	1.22846										
Benzofluoranthenes, Total	40	1.561207										
Benzo(a)pyrene	20	1.524502										
Indeno(1,2,3-cd)pyrene	20	1.550286										
Dibenzo(a,h)anthracene	20	1.155827										
Benzo(g,h,i)perylene	20	1.407198										
1,2-Dichlorobenzene-d4	20	1.095609										
Nitrobenzene-d5	20	0.5082723										
2-Fluorobiphenyl	20	1.799104										
p-Terphenyl-d14	20	1.12695										

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INITIAL CALIBRATION DATA
EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EG00057	Instrument:	NT10
Calibration Date:	07/20/2021	Column (1):	ZB-5MSi
Comments:	ABN20 and 625 ICAL		

COMPOUND	Mean RRF	RRF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Naphthalene	1.058607	4.7			RSD (15)	
2-Methylnaphthalene	0.9794463	10.2			RSD (15)	
Acenaphthylene	2.182605	7.5			RSD (15)	
Acenaphthene	1.267156	5.0			RSD (15)	
Fluorene	1.899319	4.6			RSD (15)	
Phenanthrene	1.081707	4.9			RSD (15)	
Anthracene	1.156729	9.7			RSD (15)	
Fluoranthene	1.666906	12.1			RSD (15)	
Pyrene	1.83747	11.8			RSD (15)	
Butylbenzylphthalate	0.604397	4.8			RSD (15)	
Benzo(a)anthracene	1.492647	3.3			RSD (15)	
Chrysene	1.150794	5.4			RSD (15)	
Benzofluoranthenes, Total	1.513637	2.9			RSD (15)	
Benzo(a)pyrene	1.424548	5.6			RSD (15)	
Indeno(1,2,3-cd)pyrene	1.612255	3.4			RSD (15)	
Dibenzo(a,h)anthracene	1.266345	6.6			RSD (15)	
Benzo(g,h,i)perylene	1.438734	1.9			RSD (15)	
1,2-Dichlorobenzene-d4	1.059475	3.2			RSD (15)	
Nitrobenzene-d5	0.4906029	3.7			RSD (15)	
2-Fluorobiphenyl	1.836874	1.8			RSD (15)	
p-Terphenyl-d14	1.309624	9.2			RSD (15)	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Printed: 7/21/2021 10:31:52AM

ANALYSIS SEQUENCE

SJG0249

Instrument: NT10 Element Column ID: J006337
Calibration ID: EG00057 Tune File: 200228.U
EM Voltage: 1953

Lab Number	Sample Name	Analysis	Container	Order	STD ID	ISTD ID	Comments
SJG0249-TUN1	MS Tune	QC		1	J006358	J002469	
SJG0249-CAL5	CAL 5	QC		2	J007208	J002469	
SJG0249-CAL7	CAL 20	QC		3	J007206	J002469	
SJG0249-CAL1	CAL 0.2	QC		4	J007212	J002469	
SJG0249-CAL6	CAL 10	QC		5	J007207	J002469	
SJG0249-CAL2	CAL 0.5	QC		6	J007211	J002469	
SJG0249-CAL4	CAL 2.5	QC		7	J007209	J002469	
SJG0249-CAL3	CAL 1.0	QC		8	J007210	J002469	
SJG0249-SCV1	SCV 5.0	QC		9	J007215	J002469	
SJG0249-ICB1	Initial Cal Blank	QC		10	I008417	J002469	
BJG0105-BLK1	Blank	QC		11		J002469	
BJG0105-BS1	LCS	QC		12		J002469	
BJG0105-BSD1	LCS Dup	QC		13		J002469	
21G0046-01	SS-07-01-2021	625 SVOC 0.2ug/L	A 01	14		J002469	version
SJG0249-CCV1	Calibration Check	QC		15	J007208	J002469	

INTERNAL STANDARD SUMMARY FOR DATABATCH - \\target\share\chem3\nt10.i\20210720.b

	Time	Filename	LabID	ClientId	DF															
1	1151	NT1021072001.D	SJG0249-TUN1		1	|NO ISTDS FOUND||														
2	1206	NT1021072002.D	SJG0249-ICV1		1	| 9.37	140667||11.87	516414||15.50	297034||18.56	520011||23.60	478099||26.39	515602||24.64	867424|							
3	1254	NT1021072003.D	SJG0250-ICV1		1	| 9.38	161240||11.87	564295||15.50	308564||18.56	557306||23.60	508538||26.40	526232||24.64	802478|							
4	1341	NT1021072004.D	SJG0249-CAL5		1	| 9.38	105518||11.87	373252||15.51	212025||18.56	362039||23.61	338032||26.40	375340||24.64	565512|							
5	1419	NT1021072005.D	SJG0249-CAL7		1	| 9.37	94447||11.87	347437||15.51	201591||18.56	333130||23.61	312792||26.41	326526||24.65	607852|							
6	1457	NT1021072006.D	SJG0249-CAL1		1	| 9.37	136921||11.87	460995||15.50	235089||18.55	420382||23.60	383200||26.40	387322||24.64	521067|							
7	1536	NT1021072007.D	SJG0249-CAL6		1	| 9.37	89726||11.87	321946||15.50	185729||18.56	315612||23.61	298153||26.40	317304||24.64	522019|							
8	1614	NT1021072008.D	SJG0249-CAL2		1	| 9.37	134122||11.86	462215||15.50	242680||18.55	417099||23.60	386595||26.40	397318||24.64	541468|							
9	1652	NT1021072009.D	SJG0249-CAL4		1	| 9.37	104970||11.87	371078||15.50	208846||18.55	360965||23.60	341969||26.40	367200||24.64	516798|							
10	1730	NT1021072010.D	SJG0249-CAL3		1	| 9.37	118740||11.86	405845||15.50	216746||18.55	372134||23.60	356061||26.40	371772||24.64	495765|							
11	1808	NT1021072011.D	SJG0250-CAL1		1	| 9.37	147612||11.86	492435||15.50	244073||18.55	425533||23.60	396140||26.39	401737||24.64	505226|							
12	1846	NT1021072012.D	SJG0250-CAL2		1	| 9.37	146384||11.86	484054||15.50	244176||18.55	423629||23.60	380973||26.40	394261||24.64	483057|							
13	1924	NT1021072013.D	SJG0249-SCV1		1	| 9.37	97788||11.87	342760||15.50	192459||18.55	332308||23.60	319618||26.40	334503||24.64	476118|							
14	2002	NT1021072014.D	SJG0249-ICB1		1	| 9.36	120249||11.86	432914||15.50	227633||18.55	396549||23.60	352021||26.39	369383||24.64	446571|							
15	2040	NT1021072015.D	BJG0105-BLK1		1	| 9.36	125755||11.86	449656||15.50	228276||18.55	401727||23.60	352799||26.39	366360||24.64	452323|							
16	2040	NT1021072015ICB.D	SJG0249-ICB1		1	| 9.36	125755||11.86	449656||15.50	228276||18.55	401727||23.60	352799||26.39	366360||24.64	452323|							
17	2118	NT1021072016.D	BJG0105-BS1		1	| 9.37	102285||11.86	398103||15.50	194269||18.55	319981||23.60	320168||26.39	327583||24.64	481456|							
18	2157	NT1021072017.D	BJG0105-BSD1		1	| 9.37	106413||11.86	418990||15.50	203579||18.56	343465||23.60	337523||26.40	339074||24.64	535112|							
19	2235	NT1021072018.D	21G0046-01		1	| 9.37	110052||11.87	446402||15.52	157534||18.57	254292||23.61	262473||26.42	281949||24.65	445090|							
20	2313	NT1021072019.D	SJG0249-CCV1		1	| 9.37	99108||11.87	355338||15.50	203538||18.56	348847||23.61	304145||26.40	315567||24.64	529930|							

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem3\nt10.i\20210720.b

Instrument: nt10.i Date: 20-JUL-2021

Time	Filename	LabID	DF	Manually Integrated Compounds
1151	NT1021072001.D	SJG0249-TUN1	1	NO MANUAL INTEGRATION
1206	NT1021072002.D	SJG0249-ICV1	1	1,2-Dichlorobenzene-d4,
1254	NT1021072003.D	SJG0250-ICV1	1	NO MANUAL INTEGRATION
1341	NT1021072004.D	SJG0249-CAL5	1	NO MANUAL INTEGRATION
1419	NT1021072005.D	SJG0249-CAL7	1	NO MANUAL INTEGRATION
1457	NT1021072006.D	SJG0249-CAL1	1	2,4-Dinitrophenol, Pentachlorophenol, 2,3,4,6-Tetrachlorophenol, 2,4,6-Tribromophenol,
1536	NT1021072007.D	SJG0249-CAL6	1	NO MANUAL INTEGRATION
1614	NT1021072008.D	SJG0249-CAL2	1	Benzoic acid, 2,4-Dinitrophenol,
1652	NT1021072009.D	SJG0249-CAL4	1	NO MANUAL INTEGRATION
1730	NT1021072010.D	SJG0249-CAL3	1	NO MANUAL INTEGRATION
1808	NT1021072011.D	SJG0250-CAL1	1	NO MANUAL INTEGRATION
1846	NT1021072012.D	SJG0250-CAL2	1	NO MANUAL INTEGRATION
1924	NT1021072013.D	SJG0249-SCV1	1	NO MANUAL INTEGRATION
2002	NT1021072014.D	SJG0249-ICB1	1	NO MANUAL INTEGRATION
2040	NT1021072015.D	BJG0105-BLK1	1	NO MANUAL INTEGRATION
2040	NT1021072015ICB.D	SJG0249-ICB1	1	NO MANUAL INTEGRATION
2118	NT1021072016.D	BJG0105-BS1	1	NO MANUAL INTEGRATION

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem3\nt10.i\20210720.b

Instrument: nt10.i Date: 20-JUL-2021

Time	Filename	LabID	DF	Manually Integrated Compounds
2157	NT1021072017.D	BJG0105-BSD1	1	NO MANUAL INTEGRATION
2235	NT1021072018.D	21G0046-01	1	NO MANUAL INTEGRATION
2313	NT1021072019.D	SJG0249-CCV1	1	NO MANUAL INTEGRATION

Security Status Report

Date: 21-Jul-2021 10:28

NT1021072001.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072002.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072003.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072004.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072005.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072006.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072007.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072008.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072009.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072010.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072011.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072012.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072013.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072014.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072015.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072015ICB.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072016.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072017.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072018.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072019.D	Data Locked	van, 21-Jul-2021 10:28

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INITIAL CALIBRATION DATA

Start Cal Date : 20-JUL-2021 13:41
End Cal Date : 20-JUL-2021 17:30
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Target Version : 4.14
Integrator : HP RTE
Method file : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Last Edit : 21-Jul-2021 07:11 van

Calibration File Names:
Level 1: \\target\share\chem3\nt10.i\20210720.b\NT1021072006.D
Level 2: \\target\share\chem3\nt10.i\20210720.b\NT1021072008.D
Level 3: \\target\share\chem3\nt10.i\20210720.b\NT1021072010.D
Level 4: \\target\share\chem3\nt10.i\20210720.b\NT1021072009.D
Level 5: \\target\share\chem3\nt10.i\20210720.b\NT1021072004.D
Level 6: \\target\share\chem3\nt10.i\20210720.b\NT1021072007.D
Level 7: \\target\share\chem3\nt10.i\20210720.b\NT1021072005.D

Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
186 Carbaryl	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
179 n-Decane	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
180 n-Octadecane	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
169 4-tert-Butylphenol	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
170 N,N-Dimethylaniline	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
171 2,3-Dimethylaniline	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
172 2,4-Dimethylaniline	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
173 2,5-Dimethylaniline	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
174 2,6-Dimethylaniline	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
175 3,4-Dimethylaniline	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
176 3,5-Dimethylaniline	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
177 p-Benzoquinone	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
168 Pentachlorobenzene	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
145 4,4'-DDE	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
146 4,4'-DDD	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
147 4,4'-DDT	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
148 Dieldrin	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
149 TCMX	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
150 DCBP	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
138 Chlorobenzilate	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
139 Isodrin	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
140 Diallate A	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
141 Diallate B	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
142 1,2-Dibromo-3-Chloropropane	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
135 2,3,5,6-Tetrachlorophenol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
136 2,3,4,5-tetrachlorophenol	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
133 Butylatedhydroxytoluene	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
132 3,6-Dimethylphenanthrene	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
131 1-Methylphenanthrene	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
130 Dibenzothiophene	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
129 1-Methylfluorene	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
128 N-Hexadecane	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
127 2-Isopropylnaphthalene	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
126 N-Tetradecane	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
144 alpha-Terpineol	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
125 Safrole	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
124 3,4-Dimethylphenol	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
123 Acetophenone	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-
122 Furfuraldehyde	+++++ / +++++	+++++	+++++	+++++	+++++	+++++	AVRG		0.000e+000		0.000e+000	<-

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
143 1,4-Dioxane	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
121 Quinoline	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
120 2,3,4,6-Tetrachlorophenol	1758	6323	17271	50303	114156	208626						
	474318						QUAD	0.000e+000	2.37766	-0.10861	0.99975	
178 2-Benzyl-4-Chlorophenol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
119 7,12-Dimethylbenz(a)anthracen	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
118 Triphenyl Phosphate	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
117 Butyl Diphenyl Phosphate	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
116 Dibutyl Phenyl Phosphate	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
115 Tributyl Phosphate	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
114 Beta-Pinene	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
113 Diphenyl Oxide	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
112 Biphenyl	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
111 Azobenzene (1,2-DP-Hydrazine)	1.85623	1.94765	1.78246	1.78487	1.74003	1.76346						
	1.68709						AVRG		1.79454		4.71591	
110 Tetrachloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
109 3,4,5-Trichloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
181 3,4,6-Trichloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
108 4,5,6-Trichloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
184 3,4-Dichloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
107 4,5-Dichloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
182 4,6-Dichloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
185 4-Chloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
106 Guaiacol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
105 1-methylnaphthalene	0.81636	0.84639	0.85743	0.88349	0.98052	1.00798						
	1.04061						AVRG		0.91897		9.66660	
151 1,2,4,5-Tetrachlorobenzene	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
152 Benzo(e)pyrene	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
153 Chlorpyrifos	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
154 Diazinon	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
155 Kelthane	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
156 Methyl Parathion	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
157 Ethyl Parathion	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
158 Ethion	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
159 4-Nonylphenol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
160 Tetraethyl Tin	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
161 1,2,3-Trichloronaphthalene	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
162 1,2,3,4-Tetrachloronapthalene	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-

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Method file : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Last Edit : 21-Jul-2021 07:11 van

Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
163 1,2,3,5,8-Pentachloronaphthal	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
164 1,2,3,4,6,7-Hexachloronaphtha	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
165 1,2,3,4,5,6,7-Heptachloronaph	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
166 Octachloronaphthalene	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
167 2,2',4,4',5-Pentabromobipheny	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
3 Phenol	2.02759	2.07650	2.11400	2.12463	2.07728	1.98711						
	1.88944						AVRG		2.04236		4.04448	
4 Bis(2-Chloroethyl)ether	1.77051	1.77438	1.61971	1.62105	1.56342	1.56155						
	1.50805						AVRG		1.63124		6.36862	

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Integrator : HP RTE
Method file : \\target\share\chem3\nt10.i\20210720.b\ABN.m
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Compound	0.2000000 Level 1	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2
	20.0000 Level 7										
6 2-Chlorophenol	1.56879	1.56830	1.56662	1.55657	1.55303	1.50965					
	1.49842						AVRG		1.54591		1.90208
7 1,3-Dichlorobenzene	1.83040	1.78786	1.68883	1.70295	1.67385	1.62957					
	1.57383						AVRG		1.69818		5.17826
9 1,4-Dichlorobenzene	1.44594	1.47555	1.39293	1.46206	1.46198	1.46787					
	1.44314						AVRG		1.44992		1.90595
11 Benzyl alcohol	0.85261	0.95734	0.90248	0.95741	1.00495	1.00265					
	1.01579						AVRG		0.95617		6.29030
12 1,2-Dichlorobenzene	1.60735	1.57027	1.49928	1.54843	1.52257	1.51810					
	1.47000						AVRG		1.53371		2.98662
13 2-Methylphenol	1.19821	1.27758	1.30490	1.29904	1.30359	1.25927					
	1.25615						AVRG		1.27125		2.99485
14 2,2'-oxybis(1-Chloropropane)	0.56967	0.72185	0.50625	0.58627	0.57294	0.56718					
	0.59456						AVRG		0.58839		11.11016

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Compound	0.2000000 Level 1	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2
	20.0000 Level 7										
15 4-Methylphenol	1.28687	1.32130	1.37527	1.41349	1.41997	1.36969					
	1.36293						AVRG		1.36422		3.47887
16 N-Nitroso-di-n-propylamine	1.07069	1.15244	1.03834	1.11070	1.10861	1.11508					
	1.08089						AVRG		1.09668		3.35362
17 Hexachloroethane	0.57099	0.62355	0.56412	0.61291	0.64388	0.67043					
	0.67693						AVRG		0.62326		7.13553
19 Nitrobenzene	0.47974	0.48424	0.46587	0.48479	0.49055	0.50067					
	0.48705						AVRG		0.48470		2.18696
20 Isophorone	0.79094	0.85318	0.81513	0.92093	0.96570	1.02701					
	1.03006						AVRG		0.91471		10.70930
21 2-Nitrophenol	3960	11307	21947	54450	118855	212169					
	468128						QUAD	0.000e+000	3.96806	-0.19435	0.99986
22 2,4-Dimethylphenol	+++++	0.40212	0.40857	0.39218	0.37651	0.36379					
	0.33838						AVRG		0.38026		6.91894

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2
23 Bis(2-Chloroethoxy)methane	0.54252	0.52942	0.48847	0.45981	0.41954	0.43802					
	0.44578						AVRG		0.47479		9.88982
24 Benzoic acid	+++++	7308	29541	157082	409897	750246					
	1766787						QUAD	0.000e+000	4.74934	-0.16196	0.99890
25 2,4-Dichlorophenol	+++++	0.30375	0.31785	0.31453	0.32781	0.31884					
	0.30770						AVRG		0.31508		2.71896
26 1,2,4-Trichlorobenzene	0.40165	0.38749	0.35495	0.35713	0.34827	0.33470					
	0.30941						AVRG		0.35623		8.69912
28 Naphthalene	1.03693	1.02908	0.98657	1.04049	1.07484	1.12043					
	1.12191						AVRG		1.05861		4.71542
29 4-Chloroaniline	+++++	0.44420	0.44658	0.53034	0.58708	0.59935					
	0.55521						AVRG		0.52713		12.85915
30 Hexachlorobutadiene	0.18803	0.19845	0.19175	0.20189	0.19835	0.19788					
	0.18514						AVRG		0.19450		3.20672

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2
31 4-Chloro-3-methylphenol	+++++	0.31009	0.33344	0.36979	0.39190	0.41426					
	0.43756						AVRG		0.37617		12.85915
32 2-Methylnaphthalene	0.84665	0.91220	0.91619	0.94714	1.03423	1.07920					
	1.12051						AVRG		0.97945		10.21444
33 Hexachlorocyclopentadiene	+++++	0.36267	0.35879	0.41713	0.45356	0.46683					
	0.47228						AVRG		0.42188		12.12061
34 2,4,6-Trichlorophenol	+++++	0.34951	0.40008	0.42891	0.48269	0.48124					
	0.49434						AVRG		0.43946		13.02338
35 2,4,5-Trichlorophenol	+++++	0.35167	0.42836	0.48000	0.50911	0.52111					
	0.51928						AVRG		0.46826		14.29003
37 2-Chloronaphthalene	1.51653	1.54937	1.47710	1.51387	1.55418	1.57989					
	1.55191						AVRG		1.53469		2.22784
38 2-Nitroaniline	+++++	0.51648	0.53642	0.56997	0.59151	0.61946					
	0.61708						AVRG		0.57515		7.35937

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Compound	0.2000000 Level 1	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2
	20.0000 Level 7										
39 Dimethylphthalate	1.60952	1.64552	1.56578	1.51670	1.45541	1.37106					
	1.22696						AVRG		1.48442		9.88727
40 Acenaphthylene	2.33503	2.42453	2.20706	2.18849	2.12107	2.06570					
	1.93636						AVRG		2.18261		7.49317
41 2,6-Dinitrotoluene	+++++	0.34574	0.32956	0.34220	0.34018	0.33394					
	0.32778						AVRG		0.33657		2.15091
43 3-Nitroaniline	+++++	0.39552	0.39644	0.41634	0.42045	0.42954					
	0.44378						AVRG		0.41701		4.51348
44 Acenaphthene	1.21282	1.21474	1.20126	1.25071	1.30018	1.34009					
	1.35030						AVRG		1.26716		4.95320
45 2,4-Dinitrophenol	+++++	4658	15878	71900	199198	416627					
	1045886						QUAD	0.000e+000	5.24865	-0.27098	0.99829
46 Dibenzofuran	1.84670	1.91495	1.92502	1.91332	2.02227	2.04777					
	2.04381						AVRG		1.95912		4.00122

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2
47 4-Nitrophenol	+++++	5725	12797	38038	83143	155407					
	336901						QUAD	0.000e+000	6.26571	-0.17745	0.99960
48 2,4-Dinitrotoluene	+++++	0.38825	0.40683	0.45880	0.47528	0.48873					
	0.47969						AVRG		0.44960		9.31750
49 Fluorene	1.96394	1.96516	1.85657	1.82492	1.78134	2.02493					
	1.87838						AVRG		1.89932		4.61042
50 Diethylphthalate	1.46277	1.46214	1.43073	1.43525	1.38464	1.34310					
	1.33326						AVRG		1.40741		3.84056
51 4-Chlorophenyl-phenylether	1.20780	1.18039	1.10428	1.07948	1.07420	1.05885					
	1.02348						AVRG		1.10407		6.03311
52 4-Nitroaniline	+++++	0.44201	0.44841	0.35284	0.45328	0.48147					
	0.48011						AVRG		0.44302		10.64593
53 4,6-Dinitro-2-methylphenol	+++++	21392	53196	155247	335508	617159					
	1360119						QUAD	0.000e+000	5.46342	-0.14007	0.99979

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Compound	0.2000000 Level 1	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2
	20.0000 Level 7										
54 N-Nitrosodiphenylamine	0.77939	0.83063	0.75330	0.72806	0.67900	0.63583					
	0.61812						AVRG		0.71776		10.79929
56 4-Bromophenyl-phenylether	0.33588	0.35894	0.35252	0.37432	0.38248	0.37705					
	0.37560						AVRG		0.36525		4.59434
57 Hexachlorobenzene	0.41534	0.43397	0.40403	0.39115	0.37443	0.35097					
	0.31711						AVRG		0.38386		10.41369
58 Pentachlorophenol	+++++	7904	19753	63956	146536	261311					
	583309						QUAD	0.000e+000	6.43656	-0.41765	0.99965
60 Phenanthrene	1.02906	1.06570	1.02740	1.05431	1.09566	1.13187					
	1.16794						AVRG		1.08171		4.90253
61 Anthracene	0.96993	1.09747	1.09717	1.16732	1.20966	1.25579					
	1.29977						AVRG		1.15673		9.67460
62 Carbazole	0.98239	1.09655	1.09672	1.13576	1.16120	1.21205					
	1.30881						AVRG		1.14193		8.95418

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2
63 Di-n-butylphthalate	24909	70285	128417	354715	784033	1480696					
	3251209						QUAD	0.000e+000	0.57606	-0.00664	0.99964
64 Fluoranthene	1.45224	1.53891	1.46342	1.62894	1.75479	1.85034					
	1.97969						AVRG		1.66691		12.11060
65 Pyrene	1.58481	1.65610	1.61354	1.89889	2.04542	2.10940					
	1.95412						AVRG		1.83747		11.78692
67 Butylbenzylphthalate	0.55861	0.60417	0.57546	0.63064	0.63878	0.62059					
	0.60253						AVRG		0.60440		4.80950
68 Benzo(a)anthracene	1.55882	1.54063	1.46619	1.48430	1.50469	1.48504					
	1.40885						AVRG		1.49265		3.31332
70 3,3'-Dichlorobenzidine	0.55423	0.61669	0.60384	0.58869	0.56147	0.58655					
	0.68601						AVRG		0.59964		7.32572
71 Chrysene	1.09572	1.11503	1.06691	1.14570	1.19183	1.21191					
	1.22846						AVRG		1.15079		5.35973

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2
72 bis(2-Ethylhexyl)phthalate	0.39999	0.40678	0.41944	0.46442	0.47428	0.47607					
	0.43951						AVRG		0.44007		7.30486
73 Di-n-octylphthalate	1.16108	1.17379	1.09783	1.11307	1.11508	1.11957					
	1.06675						AVRG		1.12102		3.25176
74 Benzo(b)fluoranthene	1.44980	1.53360	1.47163	1.55390	1.59461	1.66504					
	1.76502						AVRG		1.57623		7.00302
75 Benzo(k)fluoranthene	1.56521	1.58839	1.52997	1.59533	1.57306	1.57538					
	1.50208						AVRG		1.56134		2.14548
187 Total Benzofluoranthenes	1.47061	1.53175	1.44164	1.50801	1.52226	1.55998					
	1.56121						AVRG		1.51364		2.93963
76 Benzo(a)pyrene	1.33109	1.38839	1.33177	1.42180	1.46352	1.51076					
	1.52450						AVRG		1.42455		5.55691
78 Indeno(1,2,3-cd)pyrene	1.62712	1.71689	1.62773	1.60337	1.58935	1.57104					
	1.55029						AVRG		1.61225		3.35470

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79 Dibenzo(a,h)anthracene	1.30734	1.41354	1.29410	1.26326	1.23691	1.19344						
	1.15583						AVRG		1.26634		6.64783	
80 Benzo(g,h,i)perylene	1.45223	1.47483	1.40926	1.41782	1.46830	1.44150						
	1.40720						AVRG		1.43873		1.93860	
90 N-Nitrosodimethylamine	1.06974	1.15513	1.06476	1.12445	1.10407	1.05614						
	0.96421						AVRG		1.07693		5.67955	
91 Aniline	+++++	2.34643	2.12831	2.12506	2.08465	2.06542						
	2.00682						AVRG		2.12612		5.49224	
92 1,2-Diphenylhydrazine	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
93 Benzidine	+++++	0.67357	0.69643	0.69242	0.75758	0.81026						
	0.94374						AVRG		0.76233		13.42082	
96 p-Cymene	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-

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97 Caffeine	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
98 Retene	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
99 Perylene	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
100 3-beta-Coprostanol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
101 Cholesterol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
102 beta-Sitosterol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
103 Pyridine	1.75912	1.83290	1.56881	1.71540	1.64817	1.64046						
	+++++						AVRG		1.69414		5.57682	

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Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
188 2,6-Dichlorophenol	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
189 N-Nitrosomethylethylamine	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
$ 1 2-Fluorophenol	1.54902	1.68452	1.59378	1.60683	1.59581	1.54264						
	1.44654						AVRG		1.57416		4.64021	
$ 137 d8-1,4-Dioxane	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
$ 2 Phenol-d5	2.05724	2.22754	2.12740	2.30702	2.43055	2.58148						
	2.62402						AVRG		2.33647		9.34387	
$ 5 2-Chlorophenol-d4	1.62283	1.67788	1.59477	1.63220	1.64701	1.66605						
	1.69009						AVRG		1.64726		2.02911	
$ 10 1,2-Dichlorobenzene-d4	1.00861	1.07973	1.02132	1.04635	1.07634	1.08836						
	1.09561						AVRG		1.05948		3.23536	

ARI Labs, Inc.

INITIAL CALIBRATION DATA

Start Cal Date : 20-JUL-2021 13:41
End Cal Date : 20-JUL-2021 17:30
Quant Method : ISTD
Origin : Force
Target Version : 4.14
Integrator : HP RTE
Method file : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Last Edit : 21-Jul-2021 07:11 van

Compound	0.2000000 Level 1 / 20.0000 Level 7	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2
$ 18 Nitrobenzene-d5	0.46790	0.49324	0.47066	0.48151	0.49624	0.51639					
	0.50827						AVRG		0.49060		3.73234
$ 36 2-Fluorobiphenyl	1.82705	1.89329	1.82963	1.79952	1.85265	1.85688					
	1.79910						AVRG		1.83687		1.83313
$ 55 2,4,6-Tribromophenol	1420	11603	22328	60594	134897	235650					
	518511						QUAD	0.000e+000	3.02177	-0.04190	0.99986
$ 66 Terphenyl-d14	1.42928	1.45703	1.37471	1.30757	1.26780	1.20403					
	1.12695						AVRG		1.30962		9.17118
$ 85 p-Cresol-d4	+++++	+++++	+++++	+++++	+++++	+++++					
	+++++						AVRG		0.000e+000		0.000e+000 <-
$ 86 Anthracene-d10	+++++	+++++	+++++	+++++	+++++	+++++					
	+++++						AVRG		0.000e+000		0.000e+000 <-
$ 87 Fluoranthene-d10	+++++	+++++	+++++	+++++	+++++	+++++					
	+++++						AVRG		0.000e+000		0.000e+000 <-

ARI Labs, Inc.

INITIAL CALIBRATION DATA

Start Cal Date : 20-JUL-2021 13:41
End Cal Date : 20-JUL-2021 17:30
Quant Method : ISTD
Origin : Force
Target Version : 4.14
Integrator : HP RTE
Method file : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Last Edit : 21-Jul-2021 07:11 van

Compound	0.2000000 Level 1	0.5000000 Level 2	1.0000 Level 3	2.5000 Level 4	5.0000 Level 5	10.0000 Level 6	Curve	Coefficients b	m1	m2	%RSD or R^2	
	20.0000 Level 7											
$ 88 Dibenz(a,h)anthracene-d14	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
$ 89 Diphenyl-d10	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-
$ 95 D10-1-methylnaphthalene	+++++	+++++	+++++	+++++	+++++	+++++						
	+++++						AVRG		0.000e+000		0.000e+000	<-

ARI Labs, Inc.

INITIAL CALIBRATION DATA

Start Cal Date : 20-JUL-2021 13:41
End Cal Date : 20-JUL-2021 17:30
Quant Method : ISTD
Origin : Force
Target Version : 4.14
Integrator : HP RTE
Method file : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Last Edit : 21-Jul-2021 07:11 van

Curve	Formula	Units
Averaged	Amt = Rsp/m1	Response
Quad	Amt = b + m1*Rsp + m2*Rsp^2	Response

ARI Labs, Inc.
RETENTION TIME SUMMARY REPORT

Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Batch File: \\target\share\chem3\nt10.i\20210720.b
Inst ID: nt10.i

ID:	RT01	RT02	RT03	RT04	RT05	RT06	RT07
FILENAME:	NT1021072004	NT1021072005	NT1021072006	NT1021072007	NT1021072008	NT1021072009	NT1021072010
INJ.DATE:	20-JUL-2021	20-JUL-2021	20-JUL-2021	20-JUL-2021	20-JUL-2021	20-JUL-2021	20-JUL-2021
INJ.TIME:	13:41	14:19	14:57	15:36	16:14	16:52	17:30

Compound	RT01	RT02	RT03	RT04	RT05	RT06	RT07	EXPEC RT	RT WINDOW	AVG RT	STD DEV
$ 1 2-Fluorophenol	7.131	7.130	7.123	7.123	7.123	7.115	7.123	7.123	4.123-10.123	7.124	0.005
186 Carbaryl	+++++	+++++	+++++	+++++	+++++	+++++	+++++	18.785	15.785-21.785	+++++	+++++
179 n-Decane	+++++	+++++	+++++	+++++	+++++	+++++	+++++	8.599	5.599-11.599	+++++	+++++
180 n-Octadecane	+++++	+++++	+++++	+++++	+++++	+++++	+++++	17.908	14.908-20.908	+++++	+++++
169 4-tert-Butylphenol	+++++	+++++	+++++	+++++	+++++	+++++	+++++	20.871	17.871-23.871	+++++	+++++
170 N,N-Dimethylaniline	+++++	+++++	+++++	+++++	+++++	+++++	+++++	19.494	16.494-22.494	+++++	+++++
171 2,3-Dimethylaniline	+++++	+++++	+++++	+++++	+++++	+++++	+++++	19.559	16.559-22.559	+++++	+++++
172 2,4-Dimethylaniline	+++++	+++++	+++++	+++++	+++++	+++++	+++++	19.559	16.559-22.559	+++++	+++++
173 2,5-Dimethylaniline	+++++	+++++	+++++	+++++	+++++	+++++	+++++	23.210	20.210-26.210	+++++	+++++
174 2,6-Dimethylaniline	+++++	+++++	+++++	+++++	+++++	+++++	+++++	19.196	16.196-22.196	+++++	+++++
175 3,4-Dimethylaniline	+++++	+++++	+++++	+++++	+++++	+++++	+++++	19.559	16.559-22.559	+++++	+++++
176 3,5-Dimethylaniline	+++++	+++++	+++++	+++++	+++++	+++++	+++++	20.686	17.686-23.686	+++++	+++++
177 p-Benzoquinone	+++++	+++++	+++++	+++++	+++++	+++++	+++++	8.244	5.244-11.244	+++++	+++++
168 Pentachlorobenzene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	15.842	12.842-18.842	+++++	+++++
145 4,4'-DDE	+++++	+++++	+++++	+++++	+++++	+++++	+++++	47.212	44.212-50.212	+++++	+++++
146 4,4'-DDD	+++++	+++++	+++++	+++++	+++++	+++++	+++++	47.746	44.746-50.746	+++++	+++++
147 4,4'-DDT	+++++	+++++	+++++	+++++	+++++	+++++	+++++	48.216	45.216-51.216	+++++	+++++

Reviewer 1 _____ Date:_____
Reviewer 2 _____ Date:_____

ARI Labs, Inc.
RETENTION TIME SUMMARY REPORT

Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Batch File: \\target\share\chem3\nt10.i\20210720.b
Inst ID: nt10.i

Compound	RT01	RT02	RT03	RT04	RT05	RT06	RT07	EXPEC RT	RT WINDOW	AVG RT	STD DEV
148 Dieldrin	+++++	+++++	+++++	+++++	+++++	+++++	+++++	47.281	44.281-50.281	+++++	+++++
149 TCMX	+++++	+++++	+++++	+++++	+++++	+++++	+++++	43.387	40.387-46.387	+++++	+++++
150 DCBP	+++++	+++++	+++++	+++++	+++++	+++++	+++++	50.989	47.989-53.989	+++++	+++++
138 Chlorobenzilate	+++++	+++++	+++++	+++++	+++++	+++++	+++++	67.733	64.733-70.733	+++++	+++++
139 Isodrin	+++++	+++++	+++++	+++++	+++++	+++++	+++++	65.067	62.067-68.067	+++++	+++++
140 Diallate A	+++++	+++++	+++++	+++++	+++++	+++++	+++++	65.487	62.487-68.487	+++++	+++++
141 Diallate B	+++++	+++++	+++++	+++++	+++++	+++++	+++++	65.487	62.487-68.487	+++++	+++++
142 1,2-Dibromo-3-Chloropr	+++++	+++++	+++++	+++++	+++++	+++++	+++++	49.917	46.917-52.917	+++++	+++++
135 2,3,5,6-Tetrachlorophe	+++++	+++++	+++++	+++++	+++++	+++++	+++++	16.672	13.672-19.672	+++++	+++++
136 2,3,4,5-tetrachlorophe	+++++	+++++	+++++	+++++	+++++	+++++	+++++	39.317	36.317-42.317	+++++	+++++
$ 137 d8-1,4-Dioxane	+++++	+++++	+++++	+++++	+++++	+++++	+++++	2.445	0.000-5.445	+++++	+++++
* 134 Di-n-octylphthalate-d4	24.643	24.651	24.643	24.643	24.643	24.643	24.643	24.643	21.643-27.643	24.644	0.003
133 Butylatedhydroxytoluen	+++++	+++++	+++++	+++++	+++++	+++++	+++++	15.668	12.668-18.668	+++++	+++++
132 3,6-Dimethylphenanthre	+++++	+++++	+++++	+++++	+++++	+++++	+++++	65.450	62.450-68.450	+++++	+++++
131 1-Methylphenanthrene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	64.400	61.400-67.400	+++++	+++++
130 Dibenzothiophene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	62.100	59.100-65.100	+++++	+++++
129 1-Methylfluorene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	54.912	51.912-57.912	+++++	+++++
128 N-Hexadecane	+++++	+++++	+++++	+++++	+++++	+++++	+++++	54.212	51.212-57.212	+++++	+++++
127 2-Isopropylnaphthalene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	57.650	54.650-60.650	+++++	+++++
126 N-Tetradecane	+++++	+++++	+++++	+++++	+++++	+++++	+++++	56.750	53.750-59.750	+++++	+++++
144 alpha-Terpineol	+++++	+++++	+++++	+++++	+++++	+++++	+++++	11.498	8.498-14.498	+++++	+++++
125 Safrole	+++++	+++++	+++++	+++++	+++++	+++++	+++++	52.166	49.166-55.166	+++++	+++++

ARI Labs, Inc.
RETENTION TIME SUMMARY REPORT

Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Batch File: \\target\share\chem3\nt10.i\20210720.b
Inst ID: nt10.i

Compound	RT01	RT02	RT03	RT04	RT05	RT06	RT07	EXPEC RT	RT WINDOW	AVG RT	STD DEV
124 3,4-Dimethylphenol	+++++	+++++	+++++	+++++	+++++	+++++	+++++	50.617	47.617-53.617	+++++	+++++
123 Acetophenone	+++++	+++++	+++++	+++++	+++++	+++++	+++++	10.686	7.686-13.686	+++++	+++++
122 Furfuraldehyde	+++++	+++++	+++++	+++++	+++++	+++++	+++++	43.467	40.467-46.467	+++++	+++++
143 1,4-Dioxane	+++++	+++++	+++++	+++++	+++++	+++++	+++++	2.697	0.000-5.697	+++++	+++++
121 Quinoline	+++++	+++++	+++++	+++++	+++++	+++++	+++++	54.500	51.500-57.500	+++++	+++++
120 2,3,4,6-Tetrachlorophe	16.235	16.234	16.235	16.227	16.227	16.227	16.227	16.227	13.227-19.227	16.230	0.004
178 2-Benzyl-4-Chloropheno	+++++	+++++	+++++	+++++	+++++	+++++	+++++	18.963	15.963-21.963	+++++	+++++
119 7,12-Dimethylbenz(a)an	+++++	+++++	+++++	+++++	+++++	+++++	+++++	47.069	44.069-50.069	+++++	+++++
118 Triphenyl Phosphate	+++++	+++++	+++++	+++++	+++++	+++++	+++++	21.215	18.215-24.215	+++++	+++++
117 Butyl Diphenyl Phospha	+++++	+++++	+++++	+++++	+++++	+++++	+++++	17.057	14.057-20.057	+++++	+++++
116 Dibutyl Phenyl Phospha	+++++	+++++	+++++	+++++	+++++	+++++	+++++	18.747	15.747-21.747	+++++	+++++
115 Tributyl Phosphate	+++++	+++++	+++++	+++++	+++++	+++++	+++++	17.049	14.049-20.049	+++++	+++++
114 Beta-Pinene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	48.950	45.950-51.950	+++++	+++++
113 Diphenyl Oxide	+++++	+++++	+++++	+++++	+++++	+++++	+++++	14.341	11.341-17.341	+++++	+++++
112 Biphenyl	+++++	+++++	+++++	+++++	+++++	+++++	+++++	14.632	11.632-17.632	+++++	+++++
111 Azobenzene (1,2-DP-Hyd	16.930	16.937	16.922	16.929	16.922	16.922	16.914	16.914	13.914-19.914	16.925	0.008
110 Tetrachloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++	+++++	17.366	14.366-20.366	+++++	+++++
109 3,4,5-Trichloroguaiaco	+++++	+++++	+++++	+++++	+++++	+++++	+++++	15.070	12.070-18.070	+++++	+++++
181 3,4,6-Trichloroguaiaco	+++++	+++++	+++++	+++++	+++++	+++++	+++++	15.232	12.232-18.232	+++++	+++++
108 4,5,6-Trichloroguaiaco	+++++	+++++	+++++	+++++	+++++	+++++	+++++	16.374	13.374-19.374	+++++	+++++
184 3,4-Dichloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++	+++++	13.208	10.208-16.208	+++++	+++++
107 4,5-Dichloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++	+++++	14.160	11.160-17.160	+++++	+++++
182 4,6-Dichloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++	+++++	14.160	11.160-17.160	+++++	+++++
185 4-Chloroguaiacol	+++++	+++++	+++++	+++++	+++++	+++++	+++++	11.737	8.737-14.737	+++++	+++++

ARI Labs, Inc.
RETENTION TIME SUMMARY REPORT

Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Batch File: \\target\share\chem3\nt10.i\20210720.b
Inst ID: nt10.i

Compound	RT01	RT02	RT03	RT04	RT05	RT06	RT07	EXPEC RT	RT WINDOW	AVG RT	STD DEV
106 Guaiacol	+++++	+++++	+++++	+++++	+++++	+++++	+++++	9.227	6.227-12.227	+++++	+++++
105 1-methylnaphthalene	13.542	13.542	13.534	13.534	13.534	13.534	13.534	13.534	10.534-16.534	13.537	0.004
151 1,2,4,5-Tetrachloroben	+++++	+++++	+++++	+++++	+++++	+++++	+++++	11.499	8.499-14.499	+++++	+++++
152 Benzo(e)pyrene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	30.943	27.943-33.943	+++++	+++++
153 Chlorpyrifos	+++++	+++++	+++++	+++++	+++++	+++++	+++++	27.781	24.781-30.781	+++++	+++++
154 Diazinon	+++++	+++++	+++++	+++++	+++++	+++++	+++++	26.082	23.082-29.082	+++++	+++++
155 Kelthane	+++++	+++++	+++++	+++++	+++++	+++++	+++++	28.270	25.270-31.270	+++++	+++++
156 Methyl Parathion	+++++	+++++	+++++	+++++	+++++	+++++	+++++	26.586	23.586-29.586	+++++	+++++
157 Ethyl Parathion	+++++	+++++	+++++	+++++	+++++	+++++	+++++	27.276	24.276-30.276	+++++	+++++
158 Ethion	+++++	+++++	+++++	+++++	+++++	+++++	+++++	24.503	21.503-27.503	+++++	+++++
159 4-Nonylphenol	+++++	+++++	+++++	+++++	+++++	+++++	+++++	25.261	22.261-28.261	+++++	+++++
160 Tetraethyl Tin	+++++	+++++	+++++	+++++	+++++	+++++	+++++	19.528	16.528-22.528	+++++	+++++
161 1,2,3-Trichloronaphtha	+++++	+++++	+++++	+++++	+++++	+++++	+++++	36.246	33.246-39.246	+++++	+++++
162 1,2,3,4-Tetrachloronap	+++++	+++++	+++++	+++++	+++++	+++++	+++++	37.506	34.506-40.506	+++++	+++++
163 1,2,3,5,8-Pentachloron	+++++	+++++	+++++	+++++	+++++	+++++	+++++	38.893	35.893-41.893	+++++	+++++
164 1,2,3,4,6,7-Hexachloro	+++++	+++++	+++++	+++++	+++++	+++++	+++++	39.681	36.681-42.681	+++++	+++++
165 1,2,3,4,5,6,7-Heptachl	+++++	+++++	+++++	+++++	+++++	+++++	+++++	41.123	38.123-44.123	+++++	+++++
166 Octachloronaphthalene	+++++	+++++	+++++	+++++	+++++	+++++	+++++	42.253	39.253-45.253	+++++	+++++
167 2,2',4,4',5-Pentabromo	+++++	+++++	+++++	+++++	+++++	+++++	+++++	42.033	39.033-45.033	+++++	+++++
$ 2 Phenol-d5	8.714	8.722	8.707	8.714	8.707	8.707	8.706	8.706	5.706-11.706	8.711	0.006
3 Phenol	8.738	8.745	8.730	8.737	8.730	8.730	8.730	8.730	5.730-11.730	8.734	0.006
4 Bis(2-Chloroethyl)ethe	8.923	8.923	8.907	8.915	8.907	8.907	8.907	8.907	5.907-11.907	8.913	0.007
$ 5 2-Chlorophenol-d4	9.016	9.015	9.008	9.008	9.000	9.008	9.000	9.000	6.000-12.000	9.008	0.006

ARI Labs, Inc.
RETENTION TIME SUMMARY REPORT

Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Batch File: \\target\share\chem3\nt10.i\20210720.b
Inst ID: nt10.i

Compound	RT01	RT02	RT03	RT04	RT05	RT06	RT07	EXPEC RT	RT WINDOW	AVG RT	STD DEV
6 2-Chlorophenol	9.039	9.039	9.031	9.039	9.031	9.031	9.031	9.031	6.031-12.031	9.034	0.004
7 1,3-Dichlorobenzene	9.317	9.309	9.302	9.309	9.309	9.302	9.302	9.302	6.302-12.302	9.307	0.006
* 8 1,4-Dichlorobenzene-d4	9.379	9.371	9.371	9.371	9.371	9.371	9.371	9.371	6.371-12.371	9.373	0.003
9 1,4-Dichlorobenzene	9.410	9.410	9.402	9.402	9.402	9.402	9.402	9.402	6.402-12.402	9.405	0.004
$ 10 1,2-Dichlorobenzene-d4	9.744	9.744	9.736	9.736	9.736	9.736	9.736	9.736	6.736-12.736	9.738	0.004
11 Benzyl alcohol	9.643	9.651	9.635	9.643	9.635	9.635	9.635	9.635	6.635-12.635	9.640	0.006
12 1,2-Dichlorobenzene	9.767	9.767	9.760	9.759	9.760	9.759	9.759	9.759	6.759-12.759	9.762	0.004
13 2-Methylphenol	9.861	9.860	9.853	9.860	9.853	9.853	9.853	9.853	6.853-12.853	9.856	0.004
14 2,2'-oxybis(1-Chloropr	9.946	9.946	9.938	9.938	9.938	9.938	9.930	9.930	6.930-12.930	9.939	0.005
15 4-Methylphenol	10.125	10.132	10.117	10.124	10.117	10.117	10.117	10.117	7.117-13.117	10.121	0.006
16 N-Nitroso-di-n-propyla	10.202	10.217	10.194	10.202	10.194	10.194	10.194	10.194	7.194-13.194	10.200	0.009
17 Hexachloroethane	10.357	10.357	10.349	10.357	10.349	10.349	10.349	10.349	7.349-13.349	10.353	0.004
$ 18 Nitrobenzene-d5	10.482	10.489	10.474	10.481	10.474	10.474	10.474	10.474	7.474-13.474	10.478	0.006
19 Nitrobenzene	10.520	10.528	10.512	10.520	10.512	10.512	10.512	10.512	7.512-13.512	10.517	0.006
20 Isophorone	10.963	10.978	10.947	10.955	10.947	10.947	10.947	10.947	7.947-13.947	10.955	0.012
21 2-Nitrophenol	11.149	11.149	11.141	11.140	11.140	11.140	11.140	11.140	8.140-14.140	11.143	0.004
22 2,4-Dimethylphenol	11.183	11.183	11.174	11.174	11.166	11.166	11.166	11.166	8.166-14.166	11.173	0.008
23 Bis(2-Chloroethoxy)met	11.387	11.387	11.378	11.387	11.378	11.378	11.378	11.378	8.378-14.378	11.382	0.005
24 Benzoic acid	11.378	11.522	+++++	11.429	11.276	11.327	11.293	11.293	8.293-14.293	11.371	0.093
25 2,4-Dichlorophenol	11.590	11.599	11.582	11.590	11.582	11.582	11.582	11.582	8.582-14.582	11.587	0.007
26 1,2,4-Trichlorobenzene	11.786	11.786	11.779	11.779	11.779	11.779	11.778	11.778	8.778-14.778	11.781	0.004
* 27 Naphthalene-d8	11.871	11.871	11.871	11.871	11.863	11.871	11.863	11.863	8.863-14.863	11.869	0.004
28 Naphthalene	11.918	11.917	11.910	11.910	11.910	11.910	11.910	11.910	8.910-14.910	11.912	0.004
29 4-Chloroaniline	12.049	12.056	12.041	12.049	12.041	12.041	12.041	12.041	9.041-15.041	12.045	0.006

ARI Labs, Inc.
RETENTION TIME SUMMARY REPORT

Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Batch File: \\target\share\chem3\nt10.i\20210720.b
Inst ID: nt10.i

Compound	RT01	RT02	RT03	RT04	RT05	RT06	RT07	EXPEC RT	RT WINDOW	AVG RT	STD DEV
30 Hexachlorobutadiene	12.265	12.265	12.265	12.265	12.258	12.258	12.257	12.257	9.257-15.257	12.262	0.004
31 4-Chloro-3-methylpheno	12.993	13.000	12.985	12.993	12.985	12.985	12.985	12.985	9.985-15.985	12.989	0.006
32 2-Methylnaphthalene	13.318	13.318	13.310	13.310	13.310	13.310	13.310	13.310	10.310-16.310	13.312	0.004
33 Hexachlorocyclopentadi	13.775	13.774	13.774	13.774	13.774	13.767	13.767	13.767	10.767-16.767	13.772	0.004
34 2,4,6-Trichlorophenol	13.937	13.937	13.929	13.929	13.929	13.929	13.929	13.929	10.929-16.929	13.931	0.004
35 2,4,5-Trichlorophenol	14.007	14.006	13.999	13.999	13.999	13.999	13.999	13.999	10.999-16.999	14.001	0.004
$ 36 2-Fluorobiphenyl	14.100	14.099	14.092	14.092	14.092	14.092	14.092	14.092	11.092-17.092	14.094	0.004
37 2-Chloronaphthalene	14.316	14.316	14.308	14.316	14.308	14.308	14.308	14.308	11.308-17.308	14.312	0.004
38 2-Nitroaniline	14.579	14.595	14.579	14.579	14.571	14.571	14.571	14.571	11.571-17.571	14.578	0.008
39 Dimethylphthalate	15.005	15.013	14.997	15.005	14.997	14.997	14.997	14.997	11.997-17.997	15.002	0.006
40 Acenaphthylene	15.191	15.198	15.183	15.191	15.183	15.183	15.183	15.183	12.183-18.183	15.187	0.006
41 2,6-Dinitrotoluene	15.152	15.167	15.144	15.152	15.144	15.144	15.144	15.144	12.144-18.144	15.150	0.009
* 42 Acenaphthene-d10	15.508	15.508	15.500	15.500	15.500	15.500	15.500	15.500	12.500-18.500	15.502	0.004
43 3-Nitroaniline	15.446	15.461	15.431	15.446	15.431	15.431	15.431	15.431	12.431-18.431	15.439	0.012
44 Acenaphthene	15.578	15.577	15.570	15.570	15.562	15.562	15.562	15.562	12.562-18.562	15.569	0.007
45 2,4-Dinitrophenol	15.655	15.670	15.655	15.655	15.647	15.639	15.647	15.647	12.647-18.647	15.653	0.010
46 Dibenzofuran	15.902	15.910	15.894	15.902	15.887	15.894	15.894	15.894	12.894-18.894	15.898	0.008
47 4-Nitrophenol	15.740	15.763	15.740	15.740	15.732	15.732	15.732	15.732	12.732-18.732	15.740	0.011
48 2,4-Dinitrotoluene	15.964	15.979	15.956	15.964	15.956	15.956	15.956	15.956	12.956-18.956	15.962	0.009
49 Fluorene	16.614	16.621	16.606	16.613	16.606	16.606	16.606	16.606	13.606-19.606	16.610	0.006
50 Diethylphthalate	16.459	16.474	16.451	16.467	16.451	16.451	16.451	16.451	13.451-19.451	16.458	0.009
51 4-Chlorophenyl-phenyle	16.598	16.598	16.598	16.598	16.598	16.590	16.590	16.590	13.590-19.590	16.596	0.004
52 4-Nitroaniline	16.721	16.760	16.706	16.729	16.706	16.706	16.706	16.706	13.706-19.706	16.719	0.020
53 4,6-Dinitro-2-methylph	16.806	16.829	16.798	16.814	16.791	16.798	16.791	16.791	13.791-19.791	16.804	0.014

ARI Labs, Inc.
RETENTION TIME SUMMARY REPORT

Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Batch File: \\target\share\chem3\nt10.i\20210720.b
Inst ID: nt10.i

Compound	RT01	RT02	RT03	RT04	RT05	RT06	RT07	EXPEC RT	RT WINDOW	AVG RT	STD DEV
54 N-Nitrosodiphenylamine	16.853	16.868	16.845	16.852	16.845	16.845	16.845	16.845	13.845-19.845	16.850	0.009
$ 55 2,4,6-Tribromophenol	17.153	17.161	17.145	17.153	17.145	17.145	17.145	17.145	14.145-20.145	17.150	0.006
56 4-Bromophenyl-phenylet	17.608	17.608	17.608	17.608	17.608	17.600	17.608	17.608	14.608-20.608	17.607	0.003
57 Hexachlorobenzene	17.933	17.932	17.925	17.925	17.925	17.925	17.925	17.925	14.925-20.925	17.927	0.004
58 Pentachlorophenol	18.289	18.289	18.289	18.289	18.289	18.281	18.289	18.289	15.289-21.289	18.288	0.003
* 59 Phenanthrene-d10	18.560	18.559	18.552	18.559	18.552	18.552	18.552	18.552	15.552-21.552	18.555	0.004
60 Phenanthrene	18.606	18.614	18.606	18.606	18.598	18.606	18.606	18.606	15.606-21.606	18.606	0.004
61 Anthracene	18.707	18.706	18.699	18.699	18.699	18.699	18.699	18.699	15.699-21.699	18.701	0.004
62 Carbazole	19.032	19.039	19.031	19.031	19.024	19.024	19.024	19.024	16.024-22.024	19.029	0.006
63 Di-n-butylphthalate	19.805	19.805	19.797	19.805	19.797	19.797	19.797	19.797	16.797-22.797	19.801	0.004
64 Fluoranthene	20.981	20.989	20.981	20.981	20.981	20.981	20.981	20.981	17.981-23.981	20.982	0.003
65 Pyrene	21.407	21.414	21.407	21.414	21.407	21.407	21.407	21.407	18.407-24.407	21.409	0.004
$ 66 Terphenyl-d14	21.685	21.685	21.678	21.677	21.678	21.678	21.677	21.677	18.677-24.677	21.680	0.004
67 Butylbenzylphthalate	22.607	22.607	22.599	22.607	22.599	22.599	22.599	22.599	19.599-25.599	22.602	0.004
68 Benzo(a)anthracene	23.575	23.582	23.567	23.575	23.567	23.567	23.567	23.567	20.567-26.567	23.571	0.006
* 69 Chrysene-d12	23.606	23.605	23.598	23.606	23.598	23.598	23.598	23.598	20.598-26.598	23.601	0.004
70 3,3'-Dichlorobenzidine	23.528	23.544	23.528	23.528	23.520	23.528	23.528	23.528	20.528-26.528	23.529	0.007
71 Chrysene	23.644	23.660	23.644	23.652	23.644	23.644	23.644	23.644	20.644-26.644	23.648	0.006
72 bis(2-Ethylhexyl)phtha	23.621	23.621	23.621	23.621	23.621	23.621	23.621	23.621	20.621-26.621	23.621	0.000
73 Di-n-octylphthalate	24.659	24.658	24.651	24.651	24.651	24.651	24.651	24.651	21.651-27.651	24.653	0.004
74 Benzo(b)fluoranthene	25.564	25.572	25.556	25.564	25.556	25.556	25.556	25.556	22.556-28.556	25.561	0.006
75 Benzo(k)fluoranthene	25.611	25.626	25.603	25.611	25.603	25.603	25.603	25.603	22.603-28.603	25.608	0.009
187 Total Benzofluoranthen	25.611	25.626	25.603	25.564	25.603	25.556	25.603	25.603	22.603-28.603	25.595	0.025
76 Benzo(a)pyrene	26.277	26.292	26.269	26.276	26.269	26.269	26.269	26.269	23.269-29.269	26.274	0.009

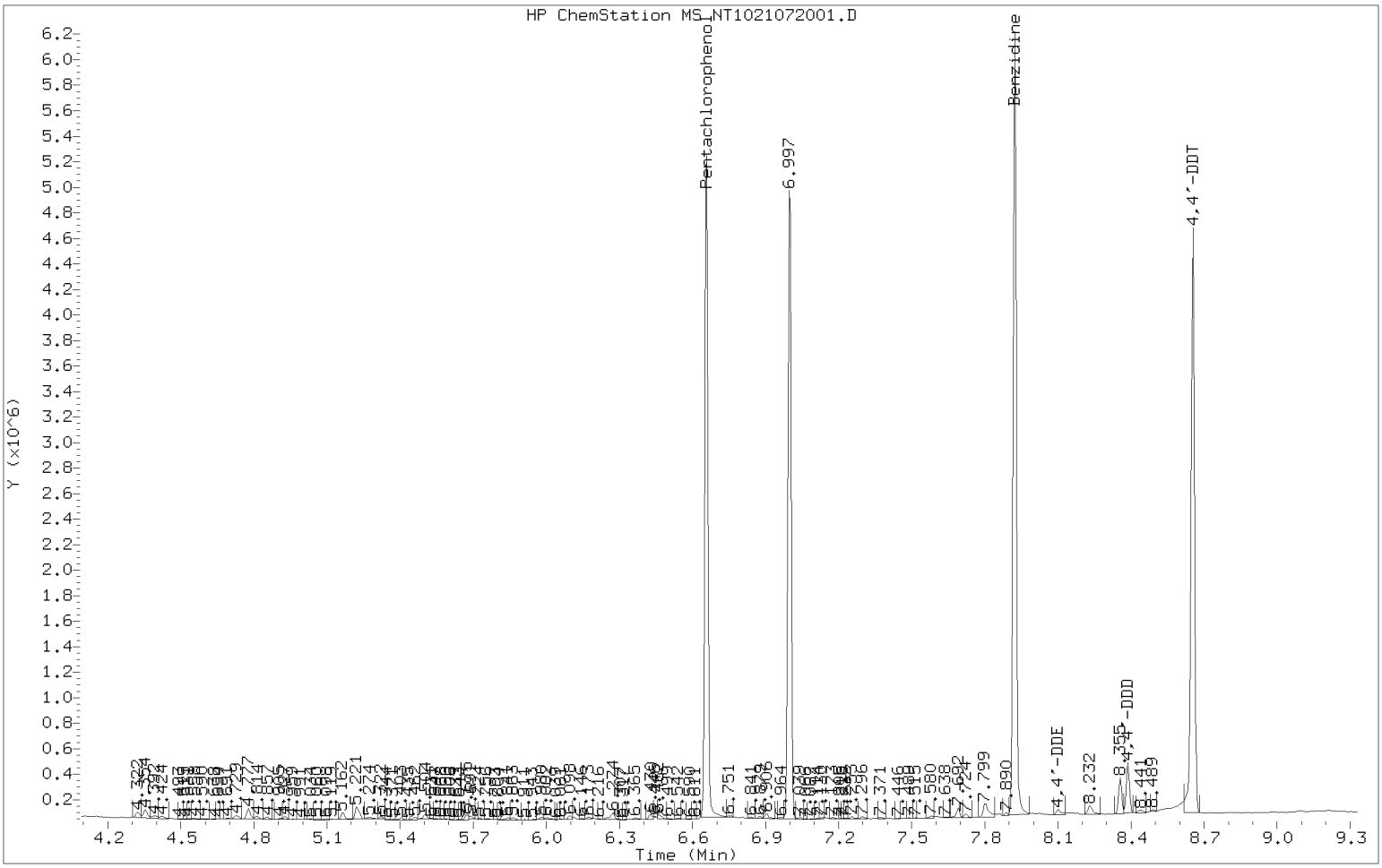
ARI Labs, Inc.
RETENTION TIME SUMMARY REPORT

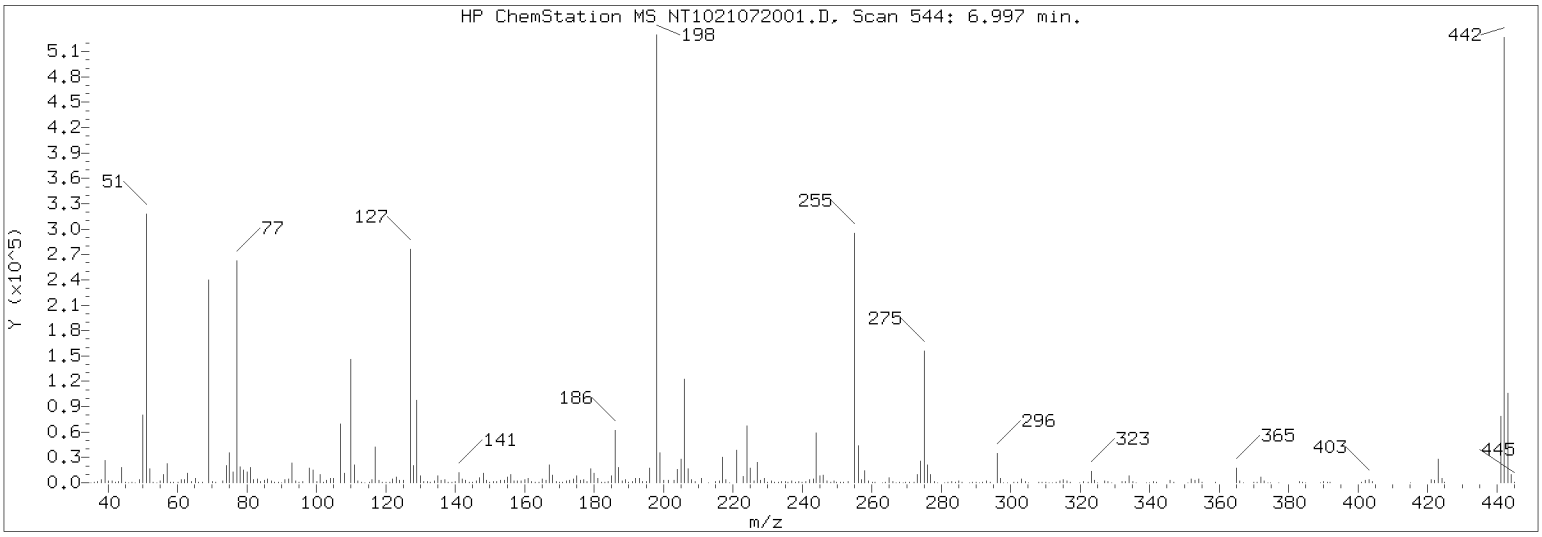
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Batch File: \\target\share\chem3\nt10.i\20210720.b
Inst ID: nt10.i

Compound	RT01	RT02	RT03	RT04	RT05	RT06	RT07	EXPEC RT	RT WINDOW	AVG RT	STD DEV
* 77 Perylene-d12	26.401	26.408	26.400	26.400	26.400	26.400	26.400	26.400	23.400-29.400	26.402	0.003
78 Indeno(1,2,3-cd)pyrene	29.317	29.340	29.301	29.324	29.309	29.309	29.301	29.301	26.301-32.301	29.314	0.014
79 Dibenzo(a,h)anthracene	29.332	29.371	29.324	29.340	29.324	29.324	29.316	29.316	26.316-32.316	29.333	0.018
80 Benzo(g,h,i)perylene	30.187	30.225	30.171	30.202	30.171	30.179	30.171	30.171	27.171-33.171	30.186	0.021
$ 85 p-Cresol-d4	#####	#####	#####	#####	#####	#####	#####	51.633	48.633-54.633	#####	#####
$ 86 Anthracene-d10	#####	#####	#####	#####	#####	#####	#####	63.533	60.533-66.533	#####	#####
$ 87 Fluoranthene-d10	#####	#####	#####	#####	#####	#####	#####	60.273	57.273-63.273	#####	#####
$ 88 Dibenz(a,h)anthracene-	#####	#####	#####	#####	#####	#####	#####	78.600	75.600-81.600	#####	#####
$ 89 Diphenyl-d10	#####	#####	#####	#####	#####	#####	#####	50.841	47.841-53.841	#####	#####
90 N-Nitrosodimethylamine	4.983	4.998	4.967	4.975	4.975	4.960	4.960	4.960	1.960-7.960	4.974	0.014
91 Aniline	8.838	8.845	8.830	8.838	8.830	8.830	8.830	8.830	5.830-11.830	8.835	0.006
92 1,2-Diphenylhydrazine	#####	#####	#####	#####	#####	#####	#####	56.160	53.160-59.160	#####	#####
93 Benzidine	21.221	21.229	21.221	21.221	21.221	21.213	21.221	21.221	18.221-24.221	21.221	0.004
$ 95 D10-1-methylnaphthalen	#####	#####	#####	#####	#####	#####	#####	52.075	49.075-55.075	#####	#####
96 p-Cymene	#####	#####	#####	#####	#####	#####	#####	49.250	46.250-52.250	#####	#####
97 Caffeine	#####	#####	#####	#####	#####	#####	#####	61.202	58.202-64.202	#####	#####
98 Retene	#####	#####	#####	#####	#####	#####	#####	18.248	15.248-21.248	#####	#####
99 Perylene	#####	#####	#####	#####	#####	#####	#####	26.008	23.008-29.008	#####	#####
100 3-beta-Coprostanol	#####	#####	#####	#####	#####	#####	#####	25.411	22.411-28.411	#####	#####
101 Cholesterol	#####	#####	#####	#####	#####	#####	#####	26.023	23.023-29.023	#####	#####
102 beta-Sitosterol	#####	#####	#####	#####	#####	#####	#####	79.550	76.550-82.550	#####	#####
103 Pyridine	4.998	4.990	4.998	4.975	4.998	4.975	4.983	4.983	1.983-7.983	4.988	0.011
188 2,6-Dichlorophenol	#####	#####	#####	#####	#####	#####	#####	11.874	8.874-14.874	#####	#####
189 N-Nitrosomethylethylam	#####	#####	#####	#####	#####	#####	#####	5.818	2.818-8.818	#####	#####

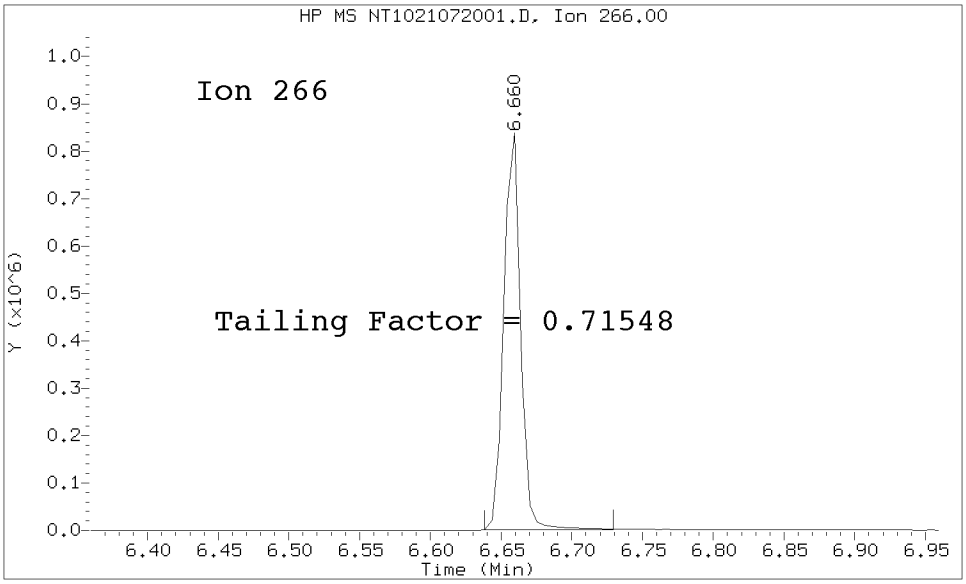
DFTPP TAILING FACTOR AND BREAKDOWN GRAPHIC REPORT

Datafile Analyzed: /20210720.b/NT1021072001.D/NT1021072001.D
Method Used: \20210720.b\DFTPP8270E.m Inst: nt10
Injection Date: 20-JUL-2021 11:51 Operator: YZ/VTS
Sample Info: SJG0249-TUN1 SJG0249-TUN1
Report Date: 07/21/2021 09:29



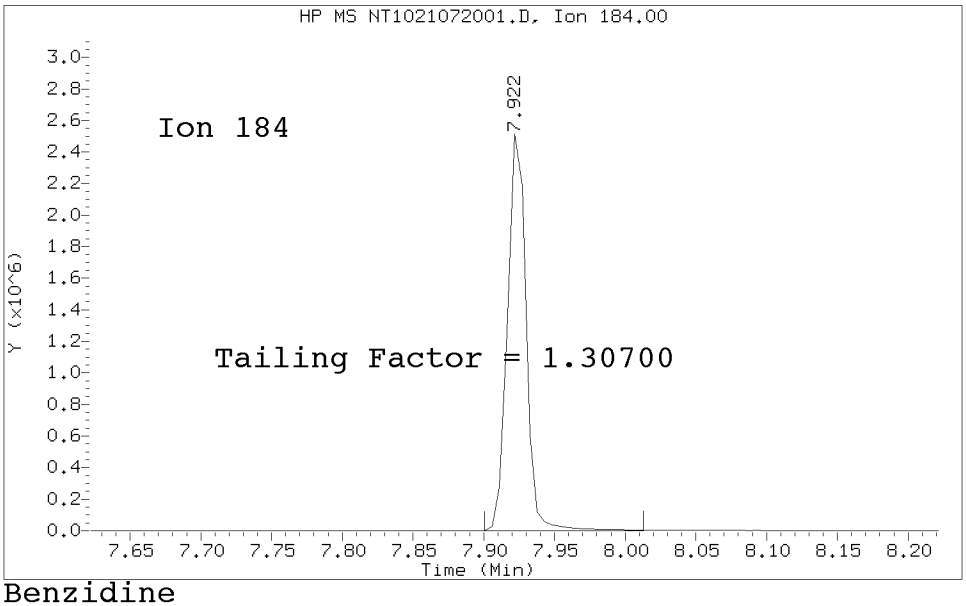


Datafile Analyzed: /20210720.b/NT1021072001.D/NT1021072001.D
Method Used: \20210720.b\DFTPP8270E.m\sw846ddt.m Inst: nt10
Injection Date: 20-JUL-2021 11:51 Operator: YZ/VTS
Sample Info: SJG0249-TUN1
Report Date: 07/21/2021 09:29



Pentachlorophenol
==========
Exp. RT = 6.670
Found RT = 6.660

Tail Factor = 0.715 Maximum Allowed = 2.0



Benzidine
==========
Exp. RT = 7.932
Found RT = 7.922

Tail Factor = 1.307 Maximum Allowed = 2.0

8270 TAILING FACTOR/BREAKDOWN SUMMARY RESULTS

TAILING ANALYSIS SUMMARY

Compound	Tail Factor	Max Allowed	Test
Pentachlorophenol	0.7154762	2.000	PASS
Benzidine	1.3070045	2.000	PASS

DDT DEGRADATION BREAKDOWN ANALYSIS SUMMARY

Compound	Response	%Breakdown	Max Allowed	Test
4,4-DDT	861080			N/A
4,4-DDE	3247	0.4	20.0	PASS
4,4-DDD	78258	8.3	20.0	PASS
4,4-DDD + DDE	81505	8.6	20.0	PASS

Tuning Sample, nt10.i/20210720.b/NT1021072001.D, *** PASSED ***

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
198	Base Peak, 100% relative abundance	100.00
68	Less than 2.00% of mass 69	0.00 (0.00)
69	Mass 69 relative abundance	45.22
70	Less than 2.00% of mass 69	0.16 (0.36)
197	Less than 2.00% of mass 198	0.00
199	5.00 - 9.00% of mass 198	6.77
365	1.00 - 100.00% of mass 198	3.60
441	Less than 150.00% of mass 443	17.75 (73.41)
442	Less than 200.00% of mass 198	120.12
443	15.00 - 24.00% of mass 442	24.18 (20.13)

Data File: NT1021072001.D
Spectrum: Avg. Scans 543-545 (7.00), Background Scan 538
Location of Maximum: 442.00
Number of points: 315

m/z	Y	m/z	Y	m/z	Y	m/z	Y
35.00	97	127.00	213568	208.00	2747	301.00	435
36.00	102	128.00	16084	209.00	772	302.00	621
37.00	1023	129.00	76192	211.00	4573	303.00	3789
38.00	2875	130.00	6313	213.00	257	304.00	1023
39.00	19288	131.00	1157	214.00	56	305.00	59
40.00	893	132.00	668	215.00	847	308.00	565
41.00	392	133.00	270	216.00	1910	309.00	267
45.00	247	134.00	2061	217.00	23720	310.00	403
47.00	115	135.00	5942	218.00	3013	311.00	120
48.00	315	136.00	2185	219.00	323	312.00	156
49.00	1808	137.00	2924	221.00	29520	313.00	233
50.00	60312	138.00	851	223.00	5974	314.00	1790
51.00	238784	139.00	249	224.00	52640	315.00	3084
52.00	12239	140.00	953	225.00	13466	316.00	2021
53.00	449	141.00	9067	226.00	1578	317.00	445
55.00	645	142.00	3338	227.00	18616	320.00	130
56.00	6956	143.00	2161	228.00	2645	321.00	1092
57.00	16254	144.00	548	229.00	4246	322.00	578
58.00	334	145.00	724	230.00	696	323.00	11343
60.00	184	146.00	1640	231.00	1946	324.00	2265
61.00	2485	147.00	4681	232.00	449	325.00	212
62.00	2929	148.00	9258	233.00	456	326.00	135
63.00	8278	149.00	2062	234.00	1207	327.00	2025
64.00	1211	150.00	545	235.00	1535	328.00	1133
65.00	4005	151.00	1311	236.00	899	329.00	264
66.00	353	152.00	739	237.00	1876	331.00	52
67.00	150	153.00	2937	238.00	361	332.00	1018
69.00	185472	154.00	2247	239.00	814	333.00	1243
70.00	670	155.00	4897	240.00	822	334.00	6808
73.00	1163	156.00	7533	241.00	1307	335.00	1799
74.00	16015	157.00	1735	242.00	3063	336.00	221
75.00	26632	158.00	1781	243.00	3610	339.00	168
76.00	9926	159.00	1249	244.00	47488	340.00	190
77.00	198912	160.00	2494	245.00	6220	341.00	1390
78.00	14053	161.00	4217	246.00	7317	342.00	398
79.00	11529	162.00	1179	247.00	1480	346.00	2384
80.00	9567	163.00	407	248.00	357	347.00	487
81.00	13534	164.00	611	249.00	1734	350.00	62
82.00	2945	165.00	2830	250.00	405	351.00	195
83.00	3034	166.00	2095	251.00	308	352.00	3444
84.00	25	167.00	15236	252.00	402	353.00	2580
85.00	2308	168.00	7422	253.00	816	354.00	3703
86.00	3081	169.00	1376	255.00	235136	355.00	712
87.00	1697	170.00	723	256.00	34288	359.00	284
88.00	574	171.00	804	257.00	2772	365.00	14750
89.00	434	172.00	1519	258.00	11230	366.00	2166
90.00	150	173.00	2186	259.00	1986	367.00	146
91.00	2728	174.00	3659	260.00	394	370.00	400
92.00	3390	175.00	6887	261.00	428	371.00	1044

93.00	17952	176.00	2460	263.00	149	372.00	6150
94.00	1361	177.00	2990	264.00	316	373.00	1652
95.00	190	178.00	1211	265.00	4543	374.00	152
96.00	696	179.00	12799	266.00	770	375.00	13
98.00	13038	180.00	8728	270.00	182	377.00	170
99.00	11796	181.00	4587	271.00	569	383.00	1590
100.00	1080	182.00	719	272.00	663	384.00	511
101.00	7282	183.00	562	273.00	8035	385.00	122
102.00	409	184.00	1276	274.00	19960	389.00	168
103.00	2534	185.00	6353	275.00	125688	390.00	1023
104.00	4319	186.00	49384	276.00	17272	391.00	656
105.00	3992	187.00	14151	277.00	8366	392.00	532
107.00	53632	188.00	1497	278.00	1331	401.00	336
108.00	8678	189.00	2677	279.00	229	402.00	2443
110.00	111424	190.00	434	282.00	307	403.00	3396
111.00	15978	191.00	1525	283.00	1218	404.00	1191
112.00	2002	192.00	3886	284.00	701	405.00	110
113.00	658	193.00	4430	285.00	1708	410.00	73
114.00	193	194.00	818	286.00	271	415.00	155
115.00	197	195.00	790	288.00	54	421.00	3283
116.00	3138	196.00	13671	289.00	315	422.00	2997
117.00	32520	198.00	410112	290.00	339	423.00	24632
118.00	2653	199.00	27752	291.00	161	424.00	4873
119.00	571	200.00	2045	292.00	426	425.00	434
120.00	566	201.00	2500	293.00	2027	441.00	72792
121.00	229	203.00	2269	294.00	523	442.00	492608
122.00	3211	204.00	13001	296.00	28176	443.00	99152
123.00	5137	205.00	21752	297.00	3971	444.00	9091
124.00	2221	206.00	94832	298.00	295	445.00	500
125.00	2426	207.00	12405	299.00	190		

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072004.D

Date : 20-JUL-2021 13:41

Client ID:

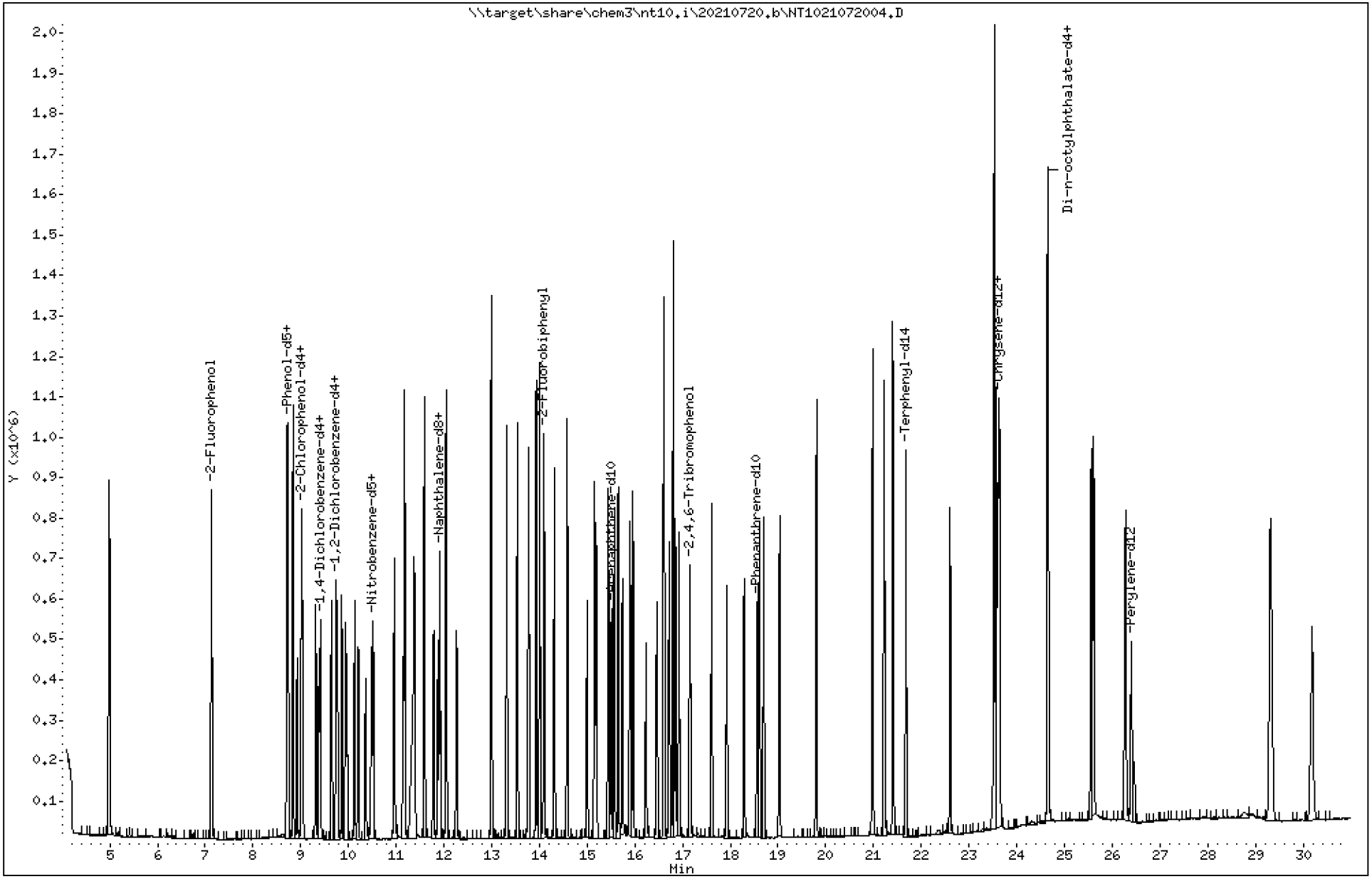
Instrument: nt10.i

Sample Info: SJG0249-CAL5

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

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Inj Date : 20-JUL-2021 13:41
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-CAL5
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 2 Calibration Sample, Level: 5
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
$ 1 2-Fluorophenol	112	7.130	7.122	(0.760)	315726	7.50000	7.603
$ 2 Phenol-d5	99	8.714	8.706	(0.929)	480876	7.50000	7.802
3 Phenol	94	8.737	8.729	(0.932)	273988	5.00000	5.085
$ 5 2-Chlorophenol-d4	132	9.015	8.999	(0.961)	325854	7.50000	7.499
4 Bis(2-Chloroethyl)ether	93	8.922	8.907	(0.951)	206211	5.00000	4.792
6 2-Chlorophenol	128	9.038	9.030	(0.964)	204841	5.00000	5.023
7 1,3-Dichlorobenzene	146	9.317	9.301	(0.993)	220776	5.00000	4.928
* 8 1,4-Dichlorobenzene-d4	152	9.379	9.371	(1.000)	105518	4.00000	
9 1,4-Dichlorobenzene	146	9.410	9.402	(1.003)	192831	5.00000	5.042
$ 10 1,2-Dichlorobenzene-d4	152	9.744	9.736	(1.039)	141967	5.00000	5.080
12 1,2-Dichlorobenzene	146	9.767	9.759	(1.041)	200823	5.00000	4.964
11 Benzyl alcohol	108	9.643	9.635	(1.028)	132550	5.00000	5.255
14 2,2'-oxybis(1-Chloropropane)	121	9.946	9.930	(1.060)	75569	5.00000	4.869
13 2-Methylphenol	108	9.860	9.852	(1.051)	171940	5.00000	5.127
17 Hexachloroethane	117	10.357	10.349	(1.104)	84926	5.00000	5.165
16 N-Nitroso-di-n-propylamine	70	10.202	10.194	(1.088)	146223	5.00000	5.054
15 4-Methylphenol	108	10.124	10.116	(1.079)	187291	5.00000	5.204
$ 18 Nitrobenzene-d5	82	10.481	10.473	(0.883)	231530	5.00000	5.057
19 Nitrobenzene	77	10.520	10.512	(0.886)	228874	5.00000	5.060
20 Isophorone	82	10.962	10.946	(0.923)	450561	5.00000	5.279
21 2-Nitrophenol	139	11.149	11.140	(0.939)	118855	5.00000	4.975
22 2,4-Dimethylphenol	107	11.183	11.165	(0.942)	351332	10.0000	9.901
23 Bis(2-Chloroethoxy)methane	93	11.386	11.378	(0.959)	195742	5.00000	4.418
24 Benzoic acid	105	11.378	11.293	(0.958)	409897	20.0000	20.08
25 2,4-Dichlorophenol	162	11.590	11.581	(0.976)	305889	10.0000	10.40
26 1,2,4-Trichlorobenzene	180	11.786	11.778	(0.993)	162492	5.00000	4.888
* 27 Naphthalene-d8	136	11.871	11.863	(1.000)	373252	4.00000	
28 Naphthalene	128	11.917	11.909	(1.004)	501483	5.00000	5.077
29 4-Chloroaniline	127	12.048	12.040	(1.015)	547819	10.0000	11.14
30 Hexachlorobutadiene	225	12.265	12.257	(1.033)	92541	5.00000	5.099
31 4-Chloro-3-methylphenol	107	12.992	12.984	(1.094)	365695	10.0000	10.42
32 2-Methylnaphthalene	142	13.317	13.309	(1.122)	482536	5.00000	5.280
33 Hexachlorocyclopentadiene	237	13.774	13.766	(0.888)	240415	10.0000	10.75

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
	34 2,4,6-Trichlorophenol	196	13.937	13.929	(0.899)	255854	10.0000	10.98
	35 2,4,5-Trichlorophenol	196	14.006	13.998	(0.903)	269862	10.0000	10.87
$	36 2-Fluorobiphenyl	172	14.099	14.091	(0.909)	491011	5.00000	5.043
	37 2-Chloronaphthalene	162	14.316	14.308	(0.923)	411906	5.00000	5.063
	38 2-Nitroaniline	65	14.579	14.571	(0.940)	313535	10.0000	10.28
	39 Dimethylphthalate	163	15.005	14.997	(0.968)	385728	5.00000	4.902
	40 Acenaphthylene	152	15.190	15.182	(0.980)	562151	5.00000	4.859
	41 2,6-Dinitrotoluene	165	15.152	15.144	(0.977)	180317	10.0000	10.11
*	42 Acenaphthene-d10	164	15.508	15.500	(1.000)	212025	4.00000	
	43 3-Nitroaniline	138	15.446	15.430	(0.996)	222864	10.0000	10.08
	44 Acenaphthene	153	15.577	15.561	(1.004)	344588	5.00000	5.130
	45 2,4-Dinitrophenol	184	15.654	15.647	(1.009)	199198	20.0000	18.77
	46 Dibenzofuran	168	15.902	15.894	(1.025)	535966	5.00000	5.161
	47 4-Nitrophenol	109	15.739	15.732	(1.015)	83143	10.0000	9.719
	48 2,4-Dinitrotoluene	165	15.964	15.956	(1.029)	251926	10.0000	10.57
	50 Diethylphthalate	149	16.458	16.451	(1.061)	366972	5.00000	4.919
	49 Fluorene	166	16.613	16.605	(1.071)	472112	5.00000	4.689
	51 4-Chlorophenyl-phenylether	204	16.598	16.590	(1.070)	284697	5.00000	4.865
	52 4-Nitroaniline	138	16.721	16.705	(1.078)	240269	10.0000	10.23
	53 4,6-Dinitro-2-methylphenol	198	16.806	16.791	(0.906)	335508	20.0000	19.77
	54 N-Nitrosodiphenylamine	169	16.852	16.844	(0.908)	307280	5.00000	4.730
$	55 2,4,6-Tribromophenol	330	17.153	17.145	(1.106)	134897	7.50000	7.622
	56 4-Bromophenyl-phenylether	248	17.608	17.608	(0.949)	173090	5.00000	5.236
	57 Hexachlorobenzene	284	17.932	17.924	(0.966)	169450	5.00000	4.877
	58 Pentachlorophenol	266	18.288	18.289	(0.985)	146536	10.0000	10.15
*	59 Phenanthrene-d10	188	18.559	18.551	(1.000)	362039	4.00000	
	60 Phenanthrene	178	18.606	18.605	(1.002)	495838	5.00000	5.064
	61 Anthracene	178	18.706	18.698	(1.008)	547431	5.00000	5.229
	62 Carbazole	167	19.031	19.023	(1.025)	525500	5.00000	5.084
	63 Di-n-butylphthalate	149	19.805	19.797	(1.067)	784033	5.00000	4.865
	64 Fluoranthene	202	20.981	20.981	(0.889)	741469	5.00000	5.264
	65 Pyrene	202	21.406	21.406	(0.907)	864271	5.00000	5.566
$	66 Terphenyl-d14	244	21.685	21.677	(0.919)	535697	5.00000	4.840
	67 Butylbenzylphthalate	149	22.606	22.598	(0.958)	269908	5.00000	5.284
	68 Benzo(a)anthracene	228	23.574	23.566	(0.999)	635792	5.00000	5.040
*	69 Chrysene-d12	240	23.605	23.597	(1.000)	338032	4.00000	
	70 3,3'-Dichlorobenzidine	252	23.528	23.528	(0.997)	711735	15.0000	14.05
	71 Chrysene	228	23.644	23.644	(1.002)	503597	5.00000	5.178
	72 bis(2-Ethylhexyl)phthalate	149	23.621	23.620	(0.959)	335263	5.00000	5.389
*	134 Di-n-octylphthalate-d4	153	24.643	24.642	(1.000)	565512	4.00000	
	73 Di-n-octylphthalate	149	24.658	24.650	(1.001)	788238	5.00000	4.973
	74 Benzo(b)fluoranthene	252	25.564	25.556	(0.968)	748152	5.00000	5.058
	75 Benzo(k)fluoranthene	252	25.610	25.602	(0.970)	738039	5.00000	5.038
	76 Benzo(a)pyrene	252	26.276	26.268	(0.995)	686645	5.00000	5.137
*	77 Perylene-d12	264	26.400	26.400	(1.000)	375340	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	29.316	29.300	(1.110)	745684	5.00000	4.929
	79 Dibenzo(a,h)anthracene	278	29.332	29.316	(1.111)	580325	5.00000	4.884
	80 Benzo(g,h,i)perylene	276	30.186	30.170	(1.143)	688891	5.00000	5.103
	90 N-Nitrosodimethylamine	74	4.982	4.959	(0.531)	291247	10.0000	10.25
	91 Aniline	93	8.838	8.830	(0.942)	549921	10.0000	9.805
	93 Benzidine	184	21.221	21.220	(0.899)	640218	10.0000	9.938
	103 Pyridine	79	4.998	4.982	(0.533)	217389	5.00000	4.864
	105 1-methylnaphthalene	142	13.542	13.534	(1.141)	457476	5.00000	5.335
	111 Azobenzene (1,2-DP-Hydrazine)	77	16.929	16.914	(1.092)	461163	5.00000	4.848

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
187 Total Benzofluoranthenes	252	25.610	25.602	(0.970)	1428413	10.0000	10.06
120 2,3,4,6-Tetrachlorophenol	232	16.234	16.227	(1.047)	114156	5.00000	4.995

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072004.D Page 1
Report Date: 21-Jul-2021 09:25

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072004.D
Lab Smp Id: SJG0249-CAL5
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	105518	0.00
27 Naphthalene-d8	373252	186626	746504	373252	0.00
42 Acenaphthene-d10	212025	106013	424050	212025	0.00
59 Phenanthrene-d10	362039	181020	724078	362039	0.00
69 Chrysene-d12	338032	169016	676064	338032	0.00
134 Di-n-octylphthala	565512	282756	1131024	565512	0.00
77 Perylene-d12	375340	187670	750680	375340	0.00

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.38	0.00
27 Naphthalene-d8	11.87	11.37	12.37	11.87	0.00
42 Acenaphthene-d10	15.51	15.01	16.01	15.51	0.00
59 Phenanthrene-d10	18.56	18.06	19.06	18.56	0.00
69 Chrysene-d12	23.61	23.11	24.11	23.61	0.00
134 Di-n-octylphthala	24.64	24.14	25.14	24.64	0.00
77 Perylene-d12	26.40	25.90	26.90	26.40	0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072004.D

Lab ID: SJG0249-CAL5
nt10.i, ABN.m, 20-JUL-2021 13:41

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
0.958	0.952	0.0065	Benzoic acid

RRT check based on Ccal File: NT1021072010.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

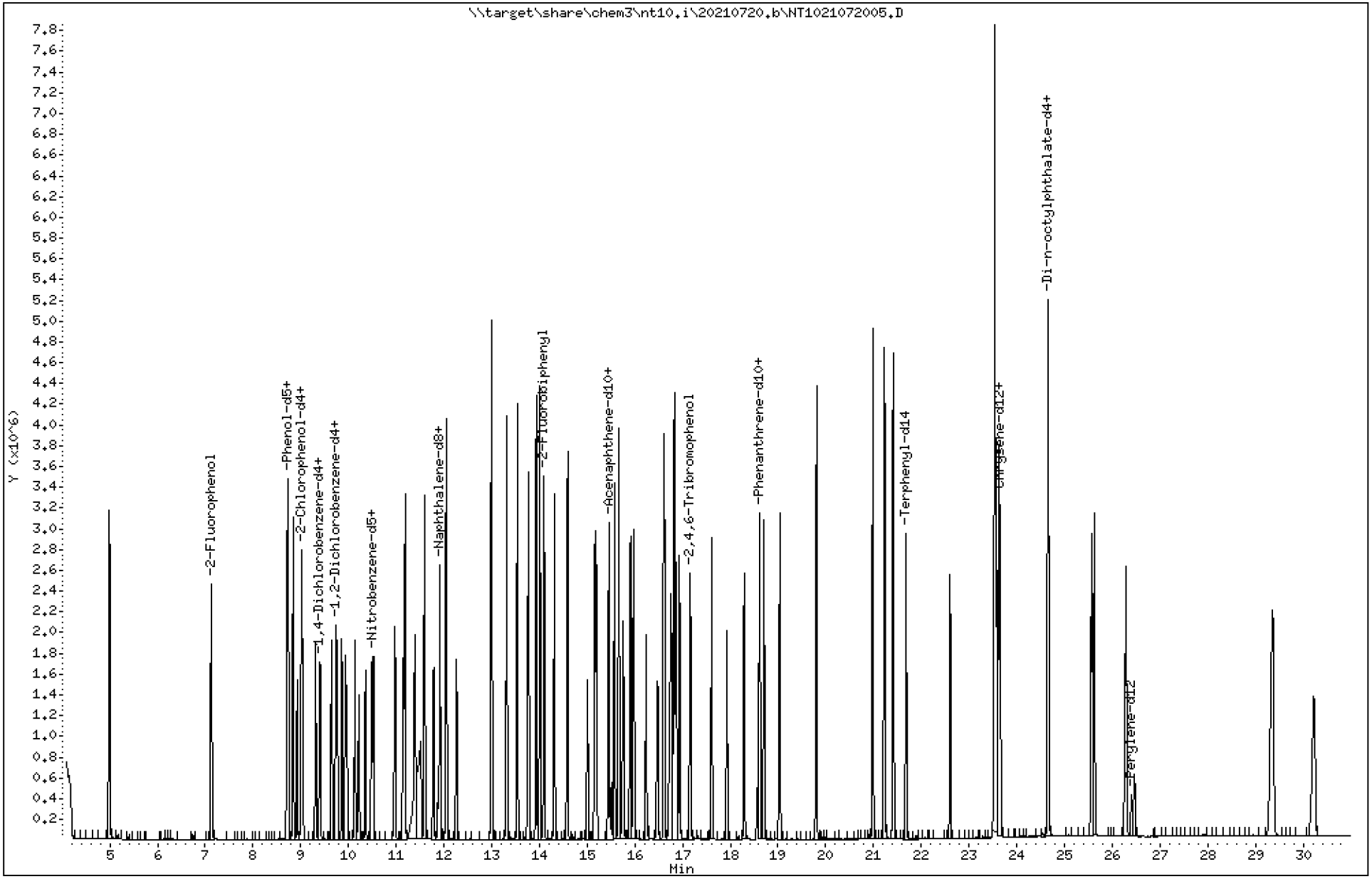
* Only compounds listed in the work order have been verified by the analyst *

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072005.D
Date : 20-JUL-2021 14:19
Client ID:
Sample Info: SJG0249-CAL7

Instrument: nt10.i

Operator: VTS

Column phase: ZB-5msi
Column diameter: 0.25



ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210720.b\NT1021072005.D
Lab Smp Id: SJG0249-CAL7
Inj Date : 20-JUL-2021 14:19
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-CAL7
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 3 Calibration Sample, Level: 7
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
$ 1 2-Fluorophenol	112	7.130	7.122	(0.761)	1024658	30.0000	27.57
$ 2 Phenol-d5	99	8.721	8.706	(0.931)	1858730	30.0000	33.69
3 Phenol	94	8.745	8.729	(0.933)	892261	20.0000	18.50
$ 5 2-Chlorophenol-d4	132	9.015	8.999	(0.962)	1197177	30.0000	30.78
4 Bis(2-Chloroethyl)ether	93	8.922	8.907	(0.952)	712153	20.0000	18.49
6 2-Chlorophenol	128	9.038	9.030	(0.964)	707607	20.0000	19.39
7 1,3-Dichlorobenzene	146	9.309	9.301	(0.993)	743218	20.0000	18.54
* 8 1,4-Dichlorobenzene-d4	152	9.371	9.371	(1.000)	94447	4.00000	
9 1,4-Dichlorobenzene	146	9.410	9.402	(1.004)	681500	20.0000	19.91
$ 10 1,2-Dichlorobenzene-d4	152	9.743	9.736	(1.040)	517385	20.0000	20.68
12 1,2-Dichlorobenzene	146	9.767	9.759	(1.042)	694184	20.0000	19.17
11 Benzyl alcohol	108	9.650	9.635	(1.030)	479692	20.0000	21.25
14 2,2'-oxybis(1-Chloropropane)	121	9.945	9.930	(1.061)	280771	20.0000	20.21
13 2-Methylphenol	108	9.860	9.852	(1.052)	593198	20.0000	19.76
17 Hexachloroethane	117	10.357	10.349	(1.105)	319669	20.0000	21.72
16 N-Nitroso-di-n-propylamine	70	10.217	10.194	(1.090)	510433	20.0000	19.71
15 4-Methylphenol	108	10.132	10.116	(1.081)	643623	20.0000	19.98
$ 18 Nitrobenzene-d5	82	10.489	10.473	(0.884)	882963	20.0000	20.72
19 Nitrobenzene	77	10.527	10.512	(0.887)	846103	20.0000	20.10
20 Isophorone	82	10.977	10.946	(0.925)	1789398	20.0000	22.52
21 2-Nitrophenol	139	11.148	11.140	(0.939)	468128	20.0000	19.97
22 2,4-Dimethylphenol	107	11.182	11.165	(0.942)	1175663	40.0000	35.59
23 Bis(2-Chloroethoxy)methane	93	11.386	11.378	(0.959)	774410	20.0000	18.78
24 Benzoic acid	105	11.522	11.293	(0.971)	1766787	80.0000	79.85
25 2,4-Dichlorophenol	162	11.598	11.581	(0.977)	1069047	40.0000	39.06
26 1,2,4-Trichlorobenzene	180	11.786	11.778	(0.993)	537499	20.0000	17.37
* 27 Naphthalene-d8	136	11.871	11.863	(1.000)	347437	4.00000	
28 Naphthalene	128	11.917	11.909	(1.004)	1948960	20.0000	21.20
29 4-Chloroaniline	127	12.056	12.040	(1.016)	1928990	40.0000	42.13
30 Hexachlorobutadiene	225	12.265	12.257	(1.033)	321630	20.0000	19.04
31 4-Chloro-3-methylphenol	107	13.000	12.984	(1.095)	1520244	40.0000	46.53
32 2-Methylnaphthalene	142	13.317	13.309	(1.122)	1946531	20.0000	22.88
33 Hexachlorocyclopentadiene	237	13.774	13.766	(0.888)	952077	40.0000	44.78

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
	34 2,4,6-Trichlorophenol	196	13.936	13.929	(0.899)	996548	40.0000	45.00
	35 2,4,5-Trichlorophenol	196	14.006	13.998	(0.903)	1046819	40.0000	44.36
$	36 2-Fluorobiphenyl	172	14.099	14.091	(0.909)	1813416	20.0000	19.59
	37 2-Chloronaphthalene	162	14.316	14.308	(0.923)	1564251	20.0000	20.22
	38 2-Nitroaniline	65	14.594	14.571	(0.941)	1243981	40.0000	42.92
	39 Dimethylphthalate	163	15.012	14.997	(0.968)	1236717	20.0000	16.53
	40 Acenaphthylene	152	15.198	15.182	(0.980)	1951760	20.0000	17.74
	41 2,6-Dinitrotoluene	165	15.167	15.144	(0.978)	660785	40.0000	38.96
*	42 Acenaphthene-d10	164	15.507	15.500	(1.000)	201591	4.00000	
	43 3-Nitroaniline	138	15.461	15.430	(0.997)	894627	40.0000	42.57
	44 Acenaphthene	153	15.577	15.561	(1.004)	1361045	20.0000	21.31
	45 2,4-Dinitrophenol	184	15.670	15.647	(1.010)	1045886	80.0000	79.75
	46 Dibenzofuran	168	15.909	15.894	(1.026)	2060073	20.0000	20.86
	47 4-Nitrophenol	109	15.762	15.732	(1.016)	336901	40.0000	39.90
	48 2,4-Dinitrotoluene	165	15.979	15.956	(1.030)	967010	40.0000	42.68
	50 Diethylphthalate	149	16.474	16.451	(1.062)	1343870	20.0000	18.95
	49 Fluorene	166	16.621	16.605	(1.072)	1893326	20.0000	19.78
	51 4-Chlorophenyl-phenylether	204	16.597	16.590	(1.070)	1031618	20.0000	18.54
	52 4-Nitroaniline	138	16.759	16.705	(1.081)	967854	40.0000	43.35
	53 4,6-Dinitro-2-methylphenol	198	16.829	16.791	(0.907)	1360119	80.0000	79.89
	54 N-Nitrosodiphenylamine	169	16.867	16.844	(0.909)	1029577	20.0000	17.22
$	55 2,4,6-Tribromophenol	330	17.160	17.145	(1.107)	518511	30.0000	29.98
	56 4-Bromophenyl-phenylether	248	17.607	17.608	(0.949)	625617	20.0000	20.57
	57 Hexachlorobenzene	284	17.932	17.924	(0.966)	528199	20.0000	16.52
	58 Pentachlorophenol	266	18.288	18.289	(0.985)	583309	40.0000	39.96
*	59 Phenanthrene-d10	188	18.559	18.551	(1.000)	333130	4.00000	
	60 Phenanthrene	178	18.613	18.605	(1.003)	1945377	20.0000	21.59
	61 Anthracene	178	18.706	18.698	(1.008)	2164965	20.0000	22.47
	62 Carbazole	167	19.039	19.023	(1.026)	2180014	20.0000	22.92
	63 Di-n-butylphthalate	149	19.805	19.797	(1.067)	3251209	20.0000	19.96
	64 Fluoranthene	202	20.988	20.981	(0.889)	3096161	20.0000	23.75
	65 Pyrene	202	21.414	21.406	(0.907)	3056160	20.0000	21.27
$	66 Terphenyl-d14	244	21.685	21.677	(0.919)	1762505	20.0000	17.21
	67 Butylbenzylphthalate	149	22.606	22.598	(0.958)	942335	20.0000	19.94
	68 Benzo(a)anthracene	228	23.582	23.566	(0.999)	2203389	20.0000	18.88
*	69 Chrysene-d12	240	23.605	23.597	(1.000)	312792	4.00000	
	70 3,3'-Dichlorobenzidine	252	23.543	23.528	(0.997)	3218667	60.0000	68.64
	71 Chrysene	228	23.659	23.644	(1.002)	1921263	20.0000	21.35
	72 bis(2-Ethylhexyl)phthalate	149	23.620	23.620	(0.958)	1335777	20.0000	19.97
*	134 Di-n-octylphthalate-d4	153	24.650	24.642	(1.000)	607852	4.00000	
	73 Di-n-octylphthalate	149	24.658	24.650	(1.000)	3242129	20.0000	19.03
	74 Benzo(b)fluoranthene	252	25.571	25.556	(0.968)	2881628	20.0000	22.40
	75 Benzo(k)fluoranthene	252	25.626	25.602	(0.970)	2452335	20.0000	19.24
	76 Benzo(a)pyrene	252	26.291	26.268	(0.996)	2488947	20.0000	21.40
*	77 Perylene-d12	264	26.408	26.400	(1.000)	326526	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	29.339	29.300	(1.111)	2531043	20.0000	19.23
	79 Dibenzo(a,h)anthracene	278	29.370	29.316	(1.112)	1887038	20.0000	18.25
	80 Benzo(g,h,i)perylene	276	30.225	30.170	(1.145)	2297434	20.0000	19.56
	90 N-Nitrosodimethylamine	74	4.998	4.959	(0.533)	910670	40.0000	35.81
	91 Aniline	93	8.845	8.830	(0.944)	1895386	40.0000	37.76
	93 Benzidine	184	21.228	21.220	(0.899)	2951948	40.0000	49.52
	103 Pyridine	79	4.990	4.982	(0.533)	810537	20.0000	20.26
	105 1-methylnaphthalene	142	13.542	13.534	(1.141)	1807732	20.0000	22.65
	111 Azobenzene (1,2-DP-Hydrazine)	77	16.937	16.914	(1.092)	1700506	20.0000	18.80

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
187 Total Benzofluoranthenes	252	25.626	25.602	(0.970)	5097748	40.0000	41.26
120 2,3,4,6-Tetrachlorophenol	232	16.234	16.227	(1.047)	474318	20.0000	19.97

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072005.D Page 1
Report Date: 21-Jul-2021 09:25

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072005.D
Lab Smp Id: SJG0249-CAL7
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	94447	-10.49
27 Naphthalene-d8	373252	186626	746504	347437	-6.92
42 Acenaphthene-d10	212025	106013	424050	201591	-4.92
59 Phenanthrene-d10	362039	181020	724078	333130	-7.99
69 Chrysene-d12	338032	169016	676064	312792	-7.47
134 Di-n-octylphthala	565512	282756	1131024	607852	7.49
77 Perylene-d12	375340	187670	750680	326526	-13.01

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.37	-0.09
27 Naphthalene-d8	11.87	11.37	12.37	11.87	-0.00
42 Acenaphthene-d10	15.51	15.01	16.01	15.51	-0.00
59 Phenanthrene-d10	18.56	18.06	19.06	18.56	-0.00
69 Chrysene-d12	23.61	23.11	24.11	23.61	-0.00
134 Di-n-octylphthala	24.64	24.14	25.14	24.65	0.03
77 Perylene-d12	26.40	25.90	26.90	26.41	0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072005.D

Lab ID: SJG0249-CAL7
nt10.i, ABN.m, 20-JUL-2021 14:19

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
0.971	0.952	0.0187	Benzoic acid

RRT check based on Ccal File: NT1021072010.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

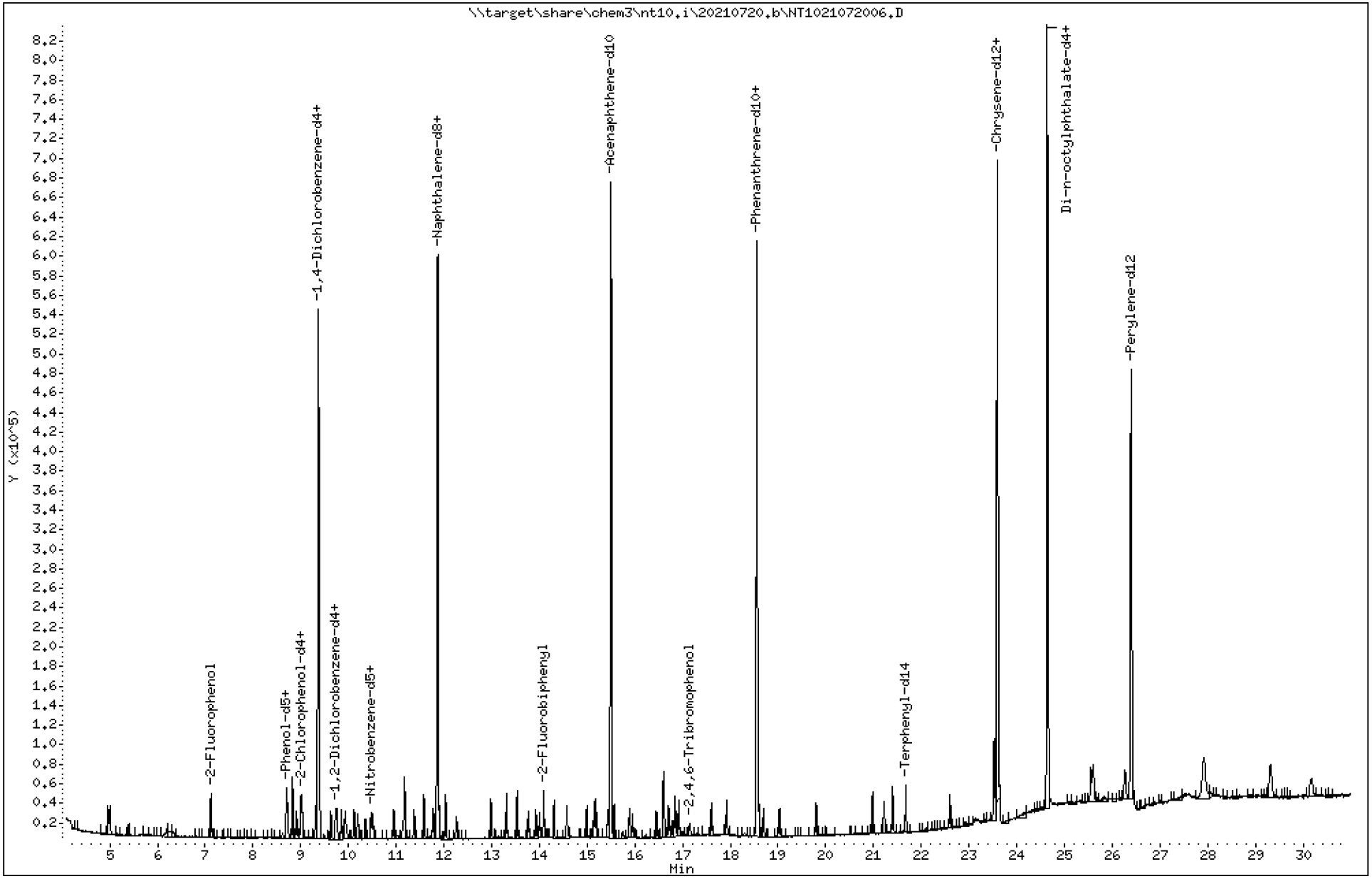
* Only compounds listed in the work order have been verified by the analyst *

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072006.D
Date : 20-JUL-2021 14:57
Client ID:
Sample Info: SJG0249-CAL1

Instrument: nt10.i

Operator: VTS

Column phase: ZB-5msi
Column diameter: 0.25



ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210720.b\NT1021072006.D
Lab Smp Id: SJG0249-CAL1
Inj Date : 20-JUL-2021 14:57
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-CAL1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 4 Calibration Sample, Level: 1
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
$ 1 2-Fluorophenol	112	7.122	7.122	(0.760)	15907	0.30000	0.2952
$ 2 Phenol-d5	99	8.706	8.706	(0.929)	21126	0.30000	0.2641
3 Phenol	94	8.729	8.729	(0.932)	13881	0.20000	0.1986
$ 5 2-Chlorophenol-d4	132	9.007	8.999	(0.961)	16665	0.30000	0.2956
4 Bis(2-Chloroethyl)ether	93	8.907	8.907	(0.950)	12121	0.20000	0.2171
6 2-Chlorophenol	128	9.030	9.030	(0.964)	10740	0.20000	0.2030
7 1,3-Dichlorobenzene	146	9.301	9.301	(0.993)	12531	0.20000	0.2156
* 8 1,4-Dichlorobenzene-d4	152	9.371	9.371	(1.000)	136921	4.00000	
9 1,4-Dichlorobenzene	146	9.402	9.402	(1.003)	9899	0.20000	0.1995
$ 10 1,2-Dichlorobenzene-d4	152	9.736	9.736	(1.039)	6905	0.20000	0.1904
12 1,2-Dichlorobenzene	146	9.759	9.759	(1.041)	11004	0.20000	0.2096
11 Benzyl alcohol	108	9.635	9.635	(1.028)	5837	0.20000	0.1783
14 2,2'-oxybis(1-Chloropropane)	121	9.938	9.930	(1.060)	3900	0.20000	0.1936
13 2-Methylphenol	108	9.852	9.852	(1.051)	8203	0.20000	0.1885
17 Hexachloroethane	117	10.349	10.349	(1.104)	3909	0.20000	0.1832
16 N-Nitroso-di-n-propylamine	70	10.194	10.194	(1.088)	7330	0.20000	0.1953
15 4-Methylphenol	108	10.116	10.116	(1.080)	8810	0.20000	0.1887
$ 18 Nitrobenzene-d5	82	10.473	10.473	(0.882)	10785	0.20000	0.1907
19 Nitrobenzene	77	10.512	10.512	(0.886)	11058	0.20000	0.1980
20 Isophorone	82	10.947	10.946	(0.922)	18231	0.20000	0.1729
21 2-Nitrophenol	139	11.140	11.140	(0.938)	3960	0.20000	0.1363
22 2,4-Dimethylphenol	107	11.174	11.165	(0.941)	18393	0.40000	0.4197
23 Bis(2-Chloroethoxy)methane	93	11.378	11.378	(0.958)	12505	0.20000	0.2285
24 Benzoic acid	105	Compound Not Detected.					
25 2,4-Dichlorophenol	162	11.581	11.581	(0.976)	12818	0.40000	0.3530
26 1,2,4-Trichlorobenzene	180	11.778	11.778	(0.992)	9258	0.20000	0.2255
* 27 Naphthalene-d8	136	11.871	11.863	(1.000)	460995	4.00000	
28 Naphthalene	128	11.909	11.909	(1.003)	23901	0.20000	0.1959
29 4-Chloroaniline	127	12.041	12.040	(1.014)	19015	0.40000	0.3130
30 Hexachlorobutadiene	225	12.265	12.257	(1.033)	4334	0.20000	0.1933
31 4-Chloro-3-methylphenol	107	12.985	12.984	(1.094)	12067	0.40000	0.2783
32 2-Methylnaphthalene	142	13.310	13.309	(1.121)	19515	0.20000	0.1729
33 Hexachlorocyclopentadiene	237	13.774	13.766	(0.889)	7086	0.40000	0.2858

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
	34 2,4,6-Trichlorophenol	196	13.929	13.929	(0.899)	6539	0.40000	0.2532
	35 2,4,5-Trichlorophenol	196	13.998	13.998	(0.903)	7620	0.40000	0.2769
$	36 2-Fluorobiphenyl	172	14.091	14.091	(0.909)	21476	0.20000	0.1989
	37 2-Chloronaphthalene	162	14.308	14.308	(0.923)	17826	0.20000	0.1976
	38 2-Nitroaniline	65	14.579	14.571	(0.941)	10879	0.40000	0.3218
	39 Dimethylphthalate	163	14.997	14.997	(0.968)	18919	0.20000	0.2169
	40 Acenaphthylene	152	15.183	15.182	(0.980)	27447	0.20000	0.2140
	41 2,6-Dinitrotoluene	165	15.144	15.144	(0.977)	6824	0.40000	0.3450
*	42 Acenaphthene-d10	164	15.500	15.500	(1.000)	235089	4.00000	
	43 3-Nitroaniline	138	15.430	15.430	(0.996)	8214	0.40000	0.3351
	44 Acenaphthene	153	15.569	15.561	(1.004)	14256	0.20000	0.1914
	45 2,4-Dinitrophenol	184	15.654	15.647	(1.010)	96	0.80000	0.008573(M)
	46 Dibenzofuran	168	15.894	15.894	(1.025)	21707	0.20000	0.1885
	47 4-Nitrophenol	109	15.739	15.732	(1.015)	1292	0.40000	0.1377
	48 2,4-Dinitrotoluene	165	15.956	15.956	(1.029)	7165	0.40000	0.2712
	50 Diethylphthalate	149	16.451	16.451	(1.061)	17194	0.20000	0.2079
	49 Fluorene	166	16.605	16.605	(1.071)	23085	0.20000	0.2068
	51 4-Chlorophenyl-phenylether	204	16.597	16.590	(1.071)	14197	0.20000	0.2188
	52 4-Nitroaniline	138	16.705	16.705	(1.078)	9454	0.40000	0.3631
	53 4,6-Dinitro-2-methylphenol	198	16.798	16.791	(0.905)	3657	0.80000	0.1901
	54 N-Nitrosodiphenylamine	169	16.844	16.844	(0.908)	16382	0.20000	0.2172
$	55 2,4,6-Tribromophenol	330	17.145	17.145	(1.106)	1420	0.30000	0.07300(M)
	56 4-Bromophenyl-phenylether	248	17.608	17.608	(0.949)	7060	0.20000	0.1839
	57 Hexachlorobenzene	284	17.924	17.924	(0.966)	8730	0.20000	0.2164
	58 Pentachlorophenol	266	18.288	18.289	(0.986)	1318	0.40000	0.08070(M)
*	59 Phenanthrene-d10	188	18.551	18.551	(1.000)	420382	4.00000	
	60 Phenanthrene	178	18.605	18.605	(1.003)	21630	0.20000	0.1903
	61 Anthracene	178	18.698	18.698	(1.008)	20387	0.20000	0.1677
	62 Carbazole	167	19.031	19.023	(1.026)	20649	0.20000	0.1721
	63 Di-n-butylphthalate	149	19.797	19.797	(1.067)	24909	0.20000	0.1364
	64 Fluoranthene	202	20.981	20.981	(0.889)	27825	0.20000	0.1742
	65 Pyrene	202	21.406	21.406	(0.907)	30365	0.20000	0.1725
$	66 Terphenyl-d14	244	21.677	21.677	(0.919)	27385	0.20000	0.2183
	67 Butylbenzylphthalate	149	22.599	22.598	(0.958)	10703	0.20000	0.1848
	68 Benzo(a)anthracene	228	23.566	23.566	(0.999)	29867	0.20000	0.2089
*	69 Chrysene-d12	240	23.597	23.597	(1.000)	383200	4.00000	
	70 3,3'-Dichlorobenzidine	252	23.528	23.528	(0.997)	31857	0.60000	0.5546
	71 Chrysene	228	23.644	23.644	(1.002)	20994	0.20000	0.1904
	72 bis(2-Ethylhexyl)phthalate	149	23.621	23.620	(0.959)	10421	0.20000	0.1818
*	134 Di-n-octylphthalate-d4	153	24.642	24.642	(1.000)	521067	4.00000	
	73 Di-n-octylphthalate	149	24.650	24.650	(1.000)	30250	0.20000	0.2071
	74 Benzo(b)fluoranthene	252	25.556	25.556	(0.968)	28077	0.20000	0.1840
	75 Benzo(k)fluoranthene	252	25.602	25.602	(0.970)	30312	0.20000	0.2005
	76 Benzo(a)pyrene	252	26.268	26.268	(0.995)	25778	0.20000	0.1869
*	77 Perylene-d12	264	26.400	26.400	(1.000)	387322	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	29.300	29.300	(1.110)	31511	0.20000	0.2018
	79 Dibenzo(a,h)anthracene	278	29.324	29.316	(1.111)	25318	0.20000	0.2065
	80 Benzo(g,h,i)perylene	276	30.170	30.170	(1.143)	28124	0.20000	0.2019
	90 N-Nitrosodimethylamine	74	4.967	4.959	(0.530)	14647	0.40000	0.3973
	91 Aniline	93	8.830	8.830	(0.942)	31794	0.40000	0.4369
	93 Benzidine	184	21.220	21.220	(0.899)	21179	0.40000	0.2900
	103 Pyridine	79	4.998	4.982	(0.533)	12043	0.20000	0.2077
	105 1-methylnaphthalene	142	13.534	13.534	(1.140)	18817	0.20000	0.1777
	111 Azobenzene (1,2-DP-Hydrazine)	77	16.921	16.914	(1.092)	21819	0.20000	0.2069

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
187 Total Benzofluoranthenes	252	25.602	25.602	(0.970)	56960	0.40000	0.3886
120 2,3,4,6-Tetrachlorophenol	232	16.234	16.227	(1.047)	1758	0.20000	0.07110(M)

QC Flag Legend

M - Compound response manually integrated.

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072006.D Page 1
Report Date: 21-Jul-2021 09:25

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072006.D
Lab Smp Id: SJG0249-CAL1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	136921	29.76
27 Naphthalene-d8	373252	186626	746504	460995	23.51
42 Acenaphthene-d10	212025	106013	424050	235089	10.88
59 Phenanthrene-d10	362039	181020	724078	420382	16.12
69 Chrysene-d12	338032	169016	676064	383200	13.36
134 Di-n-octylphthala	565512	282756	1131024	521067	-7.86
77 Perylene-d12	375340	187670	750680	387322	3.19

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.37	-0.08
27 Naphthalene-d8	11.87	11.37	12.37	11.87	-0.00
42 Acenaphthene-d10	15.51	15.01	16.01	15.50	-0.05
59 Phenanthrene-d10	18.56	18.06	19.06	18.55	-0.04
69 Chrysene-d12	23.61	23.11	24.11	23.60	-0.03
134 Di-n-octylphthala	24.64	24.14	25.14	24.64	-0.00
77 Perylene-d12	26.40	25.90	26.90	26.40	-0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072006.D

Lab ID: SJG0249-CAL1
nt10.i, ABN.m, 20-JUL-2021 14:57

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
NONE			

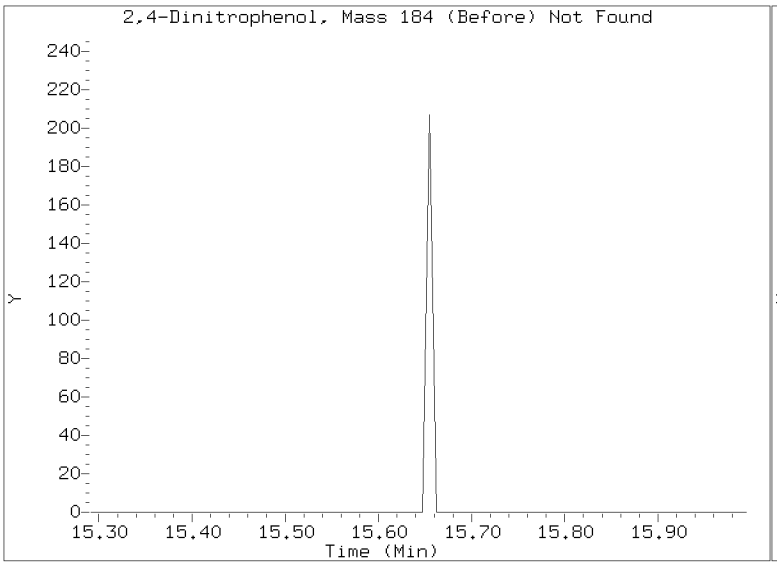
RRT check based on Ccal File: NT1021072010.D

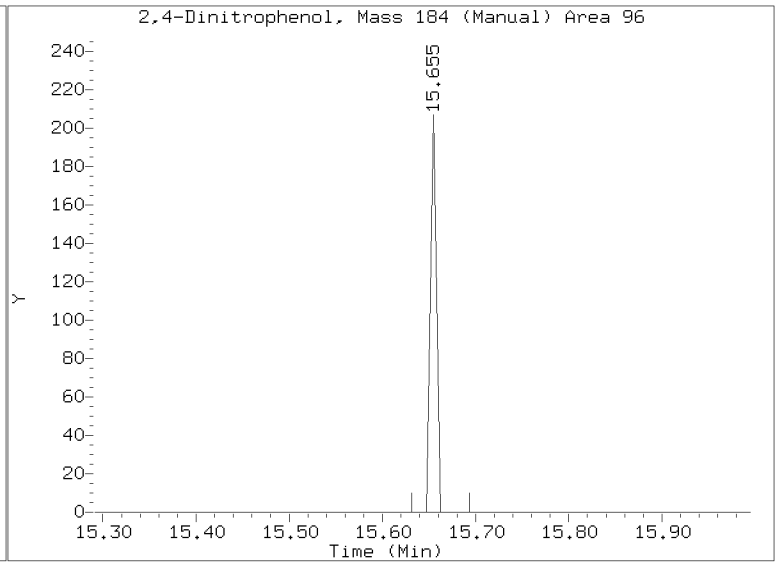
On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

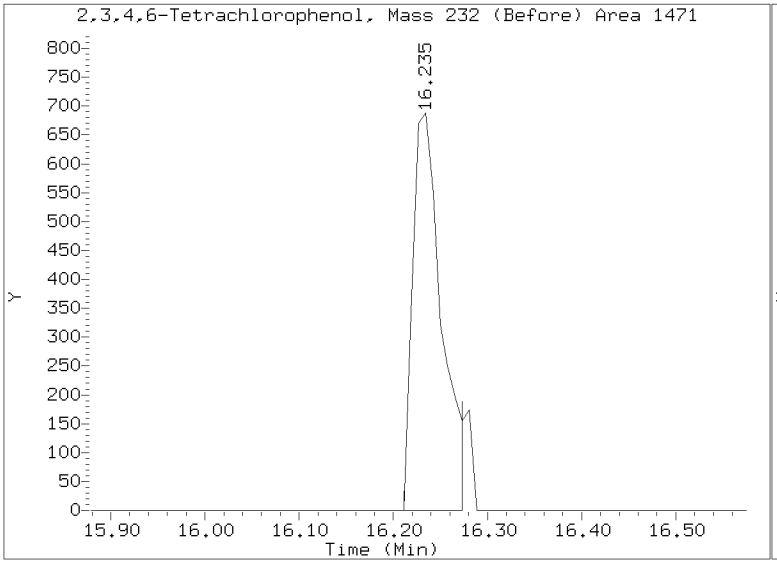
* Only compounds listed in the work order have been verified by the analyst *

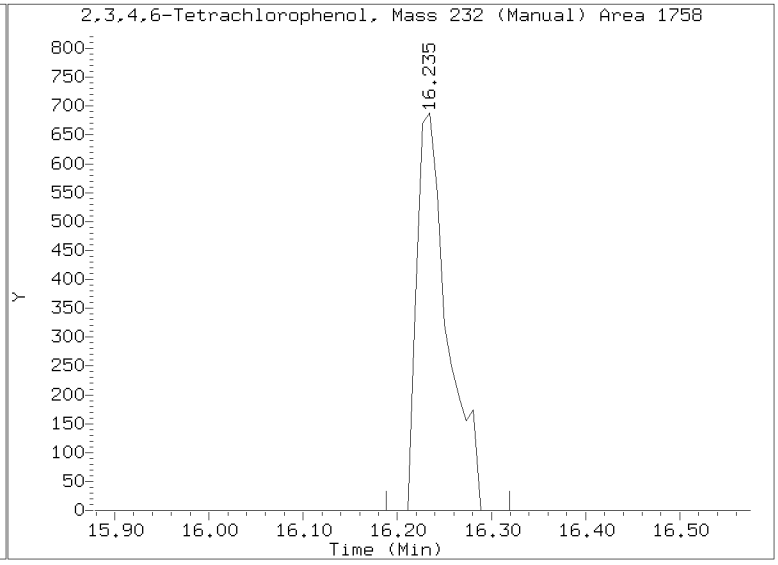
Quant Ion Manual Peak Adjustment Report

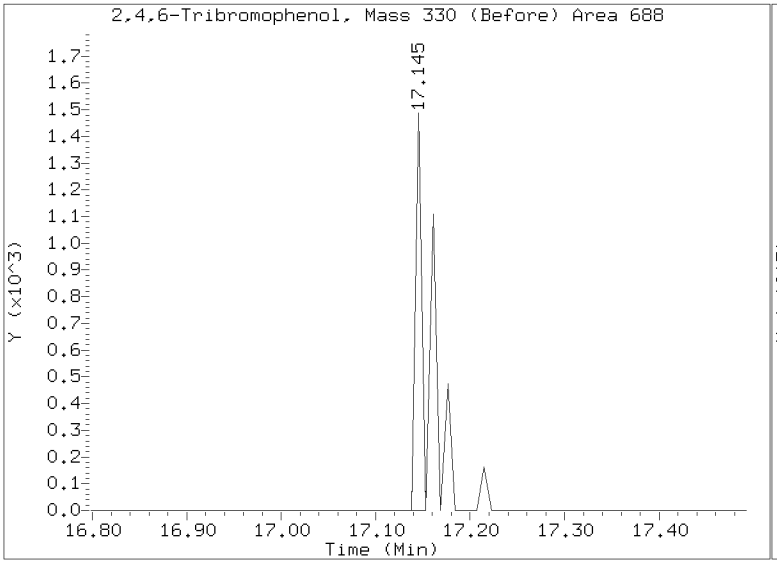
Datafile: //target/share/chem3/nt10.i/20210720.b/NT1021072006.D
Injection Date: 20-JUL-2021 14:57
Lab ID:SJG0249-CAL1 Client ID:
Report Date: 07/21/2021 09:25

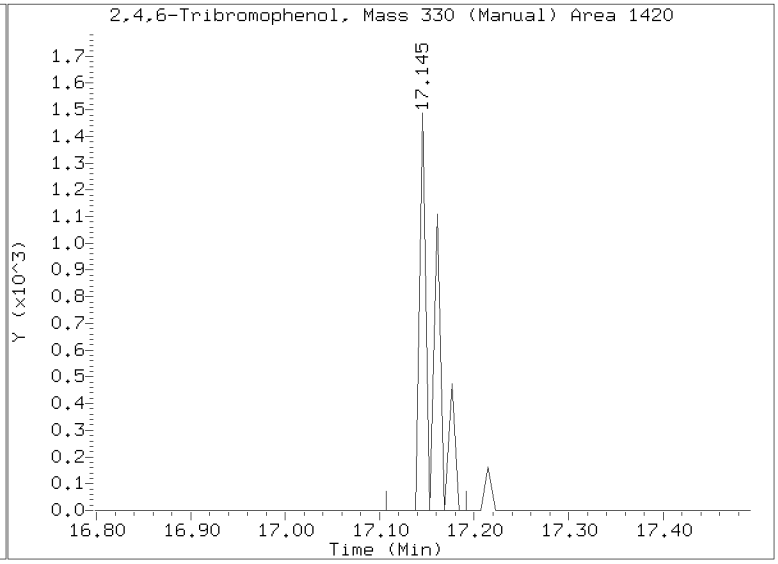












Quant Ion Manual Peak Adjustment Report

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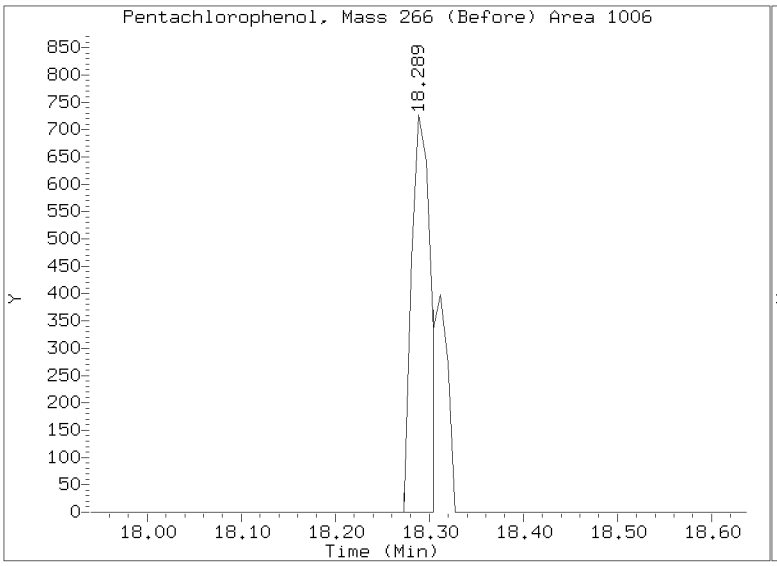
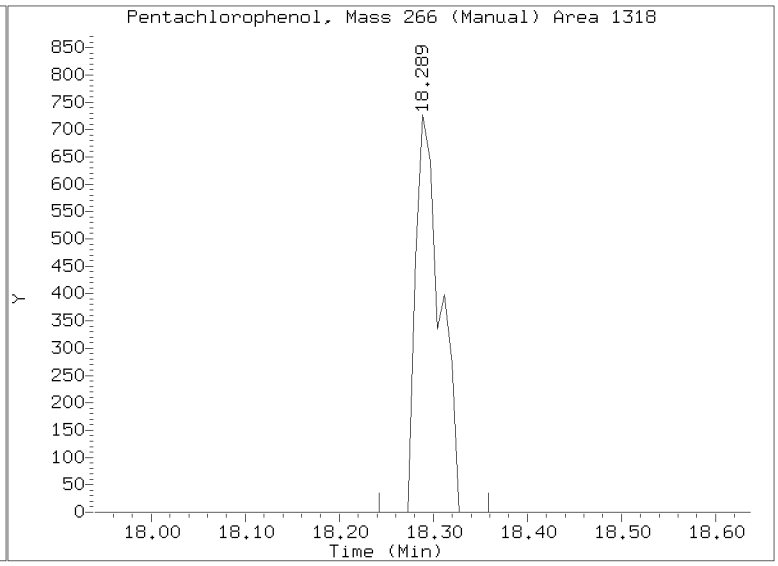
Injection Date: 20-JUL-2021 14:57
Lab ID:SJG0249-CAL1 Client ID:
Report Date: 07/21/2021 09:25





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Page 1

Date : 20-JUL-2021 15:36

Client ID:

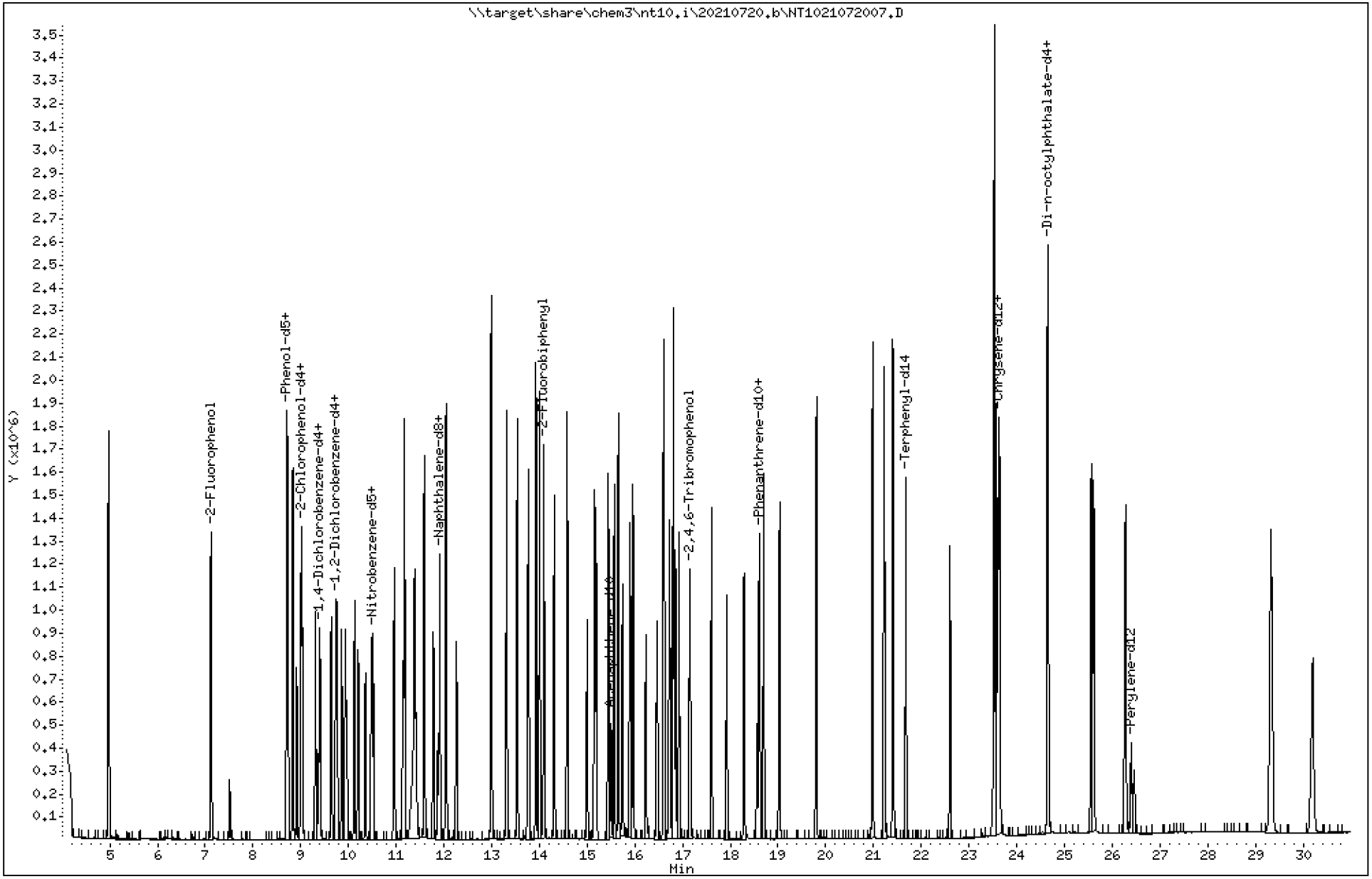
Instrument: nt10.i

Sample Info: SJG0249-CAL6

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210720.b\NT1021072007.D
Lab Smp Id: SJG0249-CAL6
Inj Date : 20-JUL-2021 15:36
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-CAL6
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 5 Calibration Sample, Level: 6
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
$ 1 2-Fluorophenol	112	7.122	7.122	(0.760)	519055	15.0000	14.70
$ 2 Phenol-d5	99	8.714	8.706	(0.930)	868596	15.0000	16.57
3 Phenol	94	8.737	8.729	(0.932)	445738	10.0000	9.729
$ 5 2-Chlorophenol-d4	132	9.007	8.999	(0.961)	560579	15.0000	15.17
4 Bis(2-Chloroethyl)ether	93	8.915	8.907	(0.951)	350280	10.0000	9.573
6 2-Chlorophenol	128	9.038	9.030	(0.964)	338638	10.0000	9.765
7 1,3-Dichlorobenzene	146	9.309	9.301	(0.993)	365538	10.0000	9.596
* 8 1,4-Dichlorobenzene-d4	152	9.371	9.371	(1.000)	89726	4.00000	
9 1,4-Dichlorobenzene	146	9.402	9.402	(1.003)	329266	10.0000	10.12
$ 10 1,2-Dichlorobenzene-d4	152	9.736	9.736	(1.039)	244135	10.0000	10.27
12 1,2-Dichlorobenzene	146	9.759	9.759	(1.041)	340533	10.0000	9.898
11 Benzyl alcohol	108	9.642	9.635	(1.029)	224910	10.0000	10.49
14 2,2'-oxybis(1-Chloropropane)	121	9.938	9.930	(1.060)	127228	10.0000	9.640
13 2-Methylphenol	108	9.860	9.852	(1.052)	282474	10.0000	9.906
17 Hexachloroethane	117	10.357	10.349	(1.105)	150387	10.0000	10.76
16 N-Nitroso-di-n-propylamine	70	10.201	10.194	(1.089)	250129	10.0000	10.17
15 4-Methylphenol	108	10.124	10.116	(1.080)	307242	10.0000	10.04
$ 18 Nitrobenzene-d5	82	10.481	10.473	(0.883)	415625	10.0000	10.53
19 Nitrobenzene	77	10.520	10.512	(0.886)	402975	10.0000	10.33
20 Isophorone	82	10.954	10.946	(0.923)	826603	10.0000	11.23
21 2-Nitrophenol	139	11.140	11.140	(0.938)	212169	10.0000	10.12
22 2,4-Dimethylphenol	107	11.174	11.165	(0.941)	585597	20.0000	19.13
23 Bis(2-Chloroethoxy)methane	93	11.386	11.378	(0.959)	352546	10.0000	9.225
24 Benzoic acid	105	11.428	11.293	(0.963)	750246	40.0000	40.75
25 2,4-Dichlorophenol	162	11.590	11.581	(0.976)	513248	20.0000	20.24
26 1,2,4-Trichlorobenzene	180	11.778	11.778	(0.992)	269392	10.0000	9.396
* 27 Naphthalene-d8	136	11.871	11.863	(1.000)	321946	4.00000	
28 Naphthalene	128	11.909	11.909	(1.003)	901791	10.0000	10.58
29 4-Chloroaniline	127	12.048	12.040	(1.015)	964797	20.0000	22.74
30 Hexachlorobutadiene	225	12.265	12.257	(1.033)	159263	10.0000	10.17
31 4-Chloro-3-methylphenol	107	12.992	12.984	(1.094)	666840	20.0000	22.02
32 2-Methylnaphthalene	142	13.309	13.309	(1.121)	868613	10.0000	11.02
33 Hexachlorocyclopentadiene	237	13.774	13.766	(0.889)	433516	20.0000	22.13

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
	34 2,4,6-Trichlorophenol	196	13.929	13.929	(0.899)	446897	20.0000	21.90
	35 2,4,5-Trichlorophenol	196	13.998	13.998	(0.903)	483929	20.0000	22.26
$	36 2-Fluorobiphenyl	172	14.091	14.091	(0.909)	862189	10.0000	10.11
	37 2-Chloronaphthalene	162	14.316	14.308	(0.924)	733578	10.0000	10.29
	38 2-Nitroaniline	65	14.579	14.571	(0.941)	575258	20.0000	21.54
	39 Dimethylphthalate	163	15.004	14.997	(0.968)	636612	10.0000	9.236
	40 Acenaphthylene	152	15.190	15.182	(0.980)	959149	10.0000	9.464
	41 2,6-Dinitrotoluene	165	15.152	15.144	(0.978)	310116	20.0000	19.84
*	42 Acenaphthene-d10	164	15.500	15.500	(1.000)	185729	4.00000	
	43 3-Nitroaniline	138	15.445	15.430	(0.997)	398889	20.0000	20.60
	44 Acenaphthene	153	15.569	15.561	(1.004)	622233	10.0000	10.58
	45 2,4-Dinitrophenol	184	15.654	15.647	(1.010)	416627	40.0000	41.64
	46 Dibenzofuran	168	15.902	15.894	(1.026)	950824	10.0000	10.45
	47 4-Nitrophenol	109	15.739	15.732	(1.015)	155407	20.0000	20.47
	48 2,4-Dinitrotoluene	165	15.963	15.956	(1.030)	453859	20.0000	21.74
	50 Diethylphthalate	149	16.466	16.451	(1.062)	623633	10.0000	9.543
	49 Fluorene	166	16.613	16.605	(1.072)	940220	10.0000	10.66
	51 4-Chlorophenyl-phenylether	204	16.597	16.590	(1.071)	491646	10.0000	9.590
	52 4-Nitroaniline	138	16.729	16.705	(1.079)	447114	20.0000	21.74
	53 4,6-Dinitro-2-methylphenol	198	16.813	16.791	(0.906)	617159	40.0000	40.59
	54 N-Nitrosodiphenylamine	169	16.852	16.844	(0.908)	501688	10.0000	8.859
$	55 2,4,6-Tribromophenol	330	17.153	17.145	(1.107)	235650	15.0000	15.07
	56 4-Bromophenyl-phenylether	248	17.608	17.608	(0.949)	297501	10.0000	10.32
	57 Hexachlorobenzene	284	17.924	17.924	(0.966)	276925	10.0000	9.143
	58 Pentachlorophenol	266	18.288	18.289	(0.985)	261311	20.0000	20.17
*	59 Phenanthrene-d10	188	18.559	18.551	(1.000)	315612	4.00000	
	60 Phenanthrene	178	18.605	18.605	(1.002)	893081	10.0000	10.46
	61 Anthracene	178	18.698	18.698	(1.008)	990855	10.0000	10.86
	62 Carbazole	167	19.031	19.023	(1.025)	956347	10.0000	10.61
	63 Di-n-butylphthalate	149	19.805	19.797	(1.067)	1480696	10.0000	10.23
	64 Fluoranthene	202	20.981	20.981	(0.889)	1379209	10.0000	11.10
	65 Pyrene	202	21.414	21.406	(0.907)	1572313	10.0000	11.48
$	66 Terphenyl-d14	244	21.677	21.677	(0.918)	897460	10.0000	9.194
	67 Butylbenzylphthalate	149	22.606	22.598	(0.958)	462574	10.0000	10.27
	68 Benzo(a)anthracene	228	23.574	23.566	(0.999)	1106924	10.0000	9.949
*	69 Chrysene-d12	240	23.605	23.597	(1.000)	298153	4.00000	
	70 3,3'-Dichlorobenzidine	252	23.528	23.528	(0.997)	1311607	30.0000	29.35
	71 Chrysene	228	23.651	23.644	(1.002)	903333	10.0000	10.53
	72 bis(2-Ethylhexyl)phthalate	149	23.620	23.620	(0.959)	621299	10.0000	10.82
*	134 Di-n-octylphthalate-d4	153	24.642	24.642	(1.000)	522019	4.00000	
	73 Di-n-octylphthalate	149	24.650	24.650	(1.000)	1461096	10.0000	9.987
	74 Benzo(b)fluoranthene	252	25.564	25.556	(0.968)	1320808	10.0000	10.56
	75 Benzo(k)fluoranthene	252	25.610	25.602	(0.970)	1249685	10.0000	10.09
	76 Benzo(a)pyrene	252	26.276	26.268	(0.995)	1198426	10.0000	10.61
*	77 Perylene-d12	264	26.400	26.400	(1.000)	317304	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	29.324	29.300	(1.111)	1246241	10.0000	9.744
	79 Dibenzo(a,h)anthracene	278	29.339	29.316	(1.111)	946708	10.0000	9.424
	80 Benzo(g,h,i)perylene	276	30.201	30.170	(1.144)	1143484	10.0000	10.02
	90 N-Nitrosodimethylamine	74	4.975	4.959	(0.531)	473814	20.0000	19.61
	91 Aniline	93	8.837	8.830	(0.943)	926610	20.0000	19.43
	93 Benzidine	184	21.220	21.220	(0.899)	1207909	20.0000	21.26
	103 Pyridine	79	4.975	4.982	(0.531)	367980	10.0000	9.683
	105 1-methylnaphthalene	142	13.534	13.534	(1.140)	811285	10.0000	10.97
	111 Azobenzene (1,2-DP-Hydrazine)	77	16.929	16.914	(1.092)	818813	10.0000	9.827

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
187 Total Benzofluoranthenes	252	25.564	25.602	(0.968)	2474934	20.0000	20.61
120 2,3,4,6-Tetrachlorophenol	232	16.226	16.227	(1.047)	208626	10.0000	10.13

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072007.D Page 1
Report Date: 21-Jul-2021 09:25

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072007.D
Lab Smp Id: SJG0249-CAL6
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	89726	-14.97
27 Naphthalene-d8	373252	186626	746504	321946	-13.75
42 Acenaphthene-d10	212025	106013	424050	185729	-12.40
59 Phenanthrene-d10	362039	181020	724078	315612	-12.82
69 Chrysene-d12	338032	169016	676064	298153	-11.80
134 Di-n-octylphthala	565512	282756	1131024	522019	-7.69
77 Perylene-d12	375340	187670	750680	317304	-15.46

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.37	-0.08
27 Naphthalene-d8	11.87	11.37	12.37	11.87	-0.00
42 Acenaphthene-d10	15.51	15.01	16.01	15.50	-0.05
59 Phenanthrene-d10	18.56	18.06	19.06	18.56	-0.00
69 Chrysene-d12	23.61	23.11	24.11	23.61	-0.00
134 Di-n-octylphthala	24.64	24.14	25.14	24.64	-0.00
77 Perylene-d12	26.40	25.90	26.90	26.40	-0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072007.D

Lab ID: SJG0249-CAL6
nt10.i, ABN.m, 20-JUL-2021 15:36

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
0.963	0.952	0.0108	Benzoic acid

RRT check based on Ccal File: NT1021072010.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072008.D

Page 1

Date : 20-JUL-2021 16:14

Client ID:

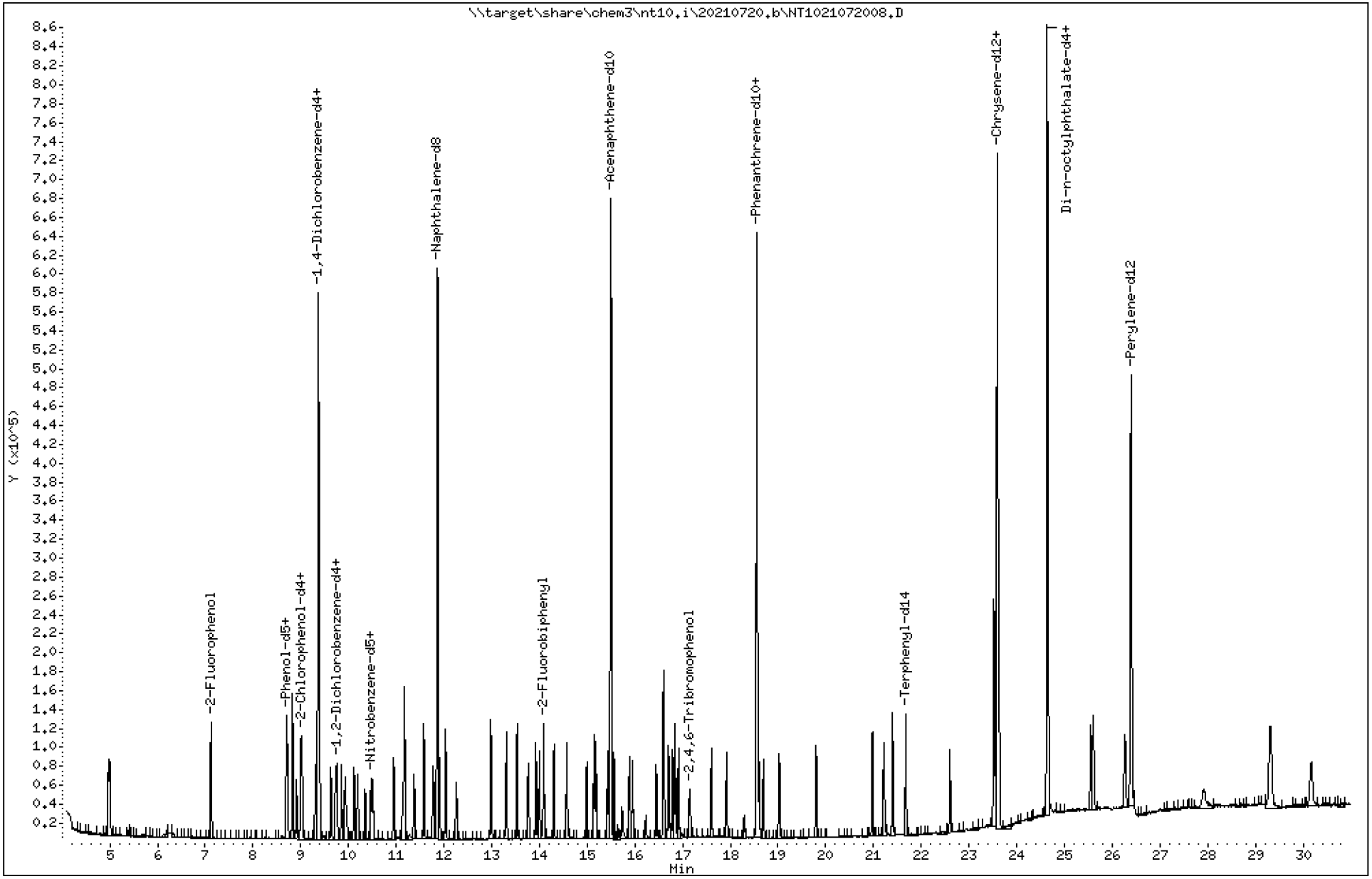
Instrument: nt10.i

Sample Info: SJG0249-CAL2

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210720.b\NT1021072008.D
Lab Smp Id: SJG0249-CAL2
Inj Date : 20-JUL-2021 16:14
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-CAL2
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 6 Calibration Sample, Level: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
$ 1 2-Fluorophenol	112	7.122	7.122	(0.760)	42362	0.75000	0.8026
$ 2 Phenol-d5	99	8.706	8.706	(0.929)	56018	0.75000	0.7150
3 Phenol	94	8.729	8.729	(0.932)	34813	0.50000	0.5084
$ 5 2-Chlorophenol-d4	132	9.000	8.999	(0.960)	42195	0.75000	0.7639
4 Bis(2-Chloroethyl)ether	93	8.907	8.907	(0.950)	29748	0.50000	0.5439
6 2-Chlorophenol	128	9.030	9.030	(0.964)	26293	0.50000	0.5072
7 1,3-Dichlorobenzene	146	9.309	9.301	(0.993)	29974	0.50000	0.5264
* 8 1,4-Dichlorobenzene-d4	152	9.371	9.371	(1.000)	134122	4.00000	
9 1,4-Dichlorobenzene	146	9.402	9.402	(1.003)	24738	0.50000	0.5088
$ 10 1,2-Dichlorobenzene-d4	152	9.736	9.736	(1.039)	18102	0.50000	0.5096
12 1,2-Dichlorobenzene	146	9.759	9.759	(1.041)	26326	0.50000	0.5119
11 Benzyl alcohol	108	9.635	9.635	(1.028)	16050	0.50000	0.5006
14 2,2'-oxybis(1-Chloropropane)	121	9.938	9.930	(1.060)	12102	0.50000	0.6134
13 2-Methylphenol	108	9.852	9.852	(1.051)	21419	0.50000	0.5025
17 Hexachloroethane	117	10.349	10.349	(1.104)	10454	0.50000	0.5002
16 N-Nitroso-di-n-propylamine	70	10.194	10.194	(1.088)	19321	0.50000	0.5254
15 4-Methylphenol	108	10.116	10.116	(1.080)	22152	0.50000	0.4843
$ 18 Nitrobenzene-d5	82	10.473	10.473	(0.883)	28498	0.50000	0.5027
19 Nitrobenzene	77	10.512	10.512	(0.886)	27978	0.50000	0.4995
20 Isophorone	82	10.946	10.946	(0.923)	49294	0.50000	0.4664
21 2-Nitrophenol	139	11.140	11.140	(0.939)	11307	0.50000	0.3878
22 2,4-Dimethylphenol	107	11.165	11.165	(0.941)	46467	1.00000	1.058
23 Bis(2-Chloroethoxy)methane	93	11.378	11.378	(0.959)	30588	0.50000	0.5575
24 Benzoic acid	105	11.276	11.293	(0.951)	7308	2.00000	0.3002(M)
25 2,4-Dichlorophenol	162	11.581	11.581	(0.976)	35100	1.00000	0.9641
26 1,2,4-Trichlorobenzene	180	11.778	11.778	(0.993)	22388	0.50000	0.5439
* 27 Naphthalene-d8	136	11.863	11.863	(1.000)	462215	4.00000	
28 Naphthalene	128	11.909	11.909	(1.004)	59457	0.50000	0.4861
29 4-Chloroaniline	127	12.041	12.040	(1.015)	51329	1.00000	0.8427
30 Hexachlorobutadiene	225	12.257	12.257	(1.033)	11466	0.50000	0.5102
31 4-Chloro-3-methylphenol	107	12.984	12.984	(1.095)	35832	1.00000	0.8243
32 2-Methylnaphthalene	142	13.310	13.309	(1.122)	52704	0.50000	0.4657
33 Hexachlorocyclopentadiene	237	13.774	13.766	(0.889)	22003	1.00000	0.8597

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
	34 2,4,6-Trichlorophenol	196	13.929	13.929	(0.899)	21205	1.00000	0.7953
	35 2,4,5-Trichlorophenol	196	13.998	13.998	(0.903)	21336	1.00000	0.7510
$	36 2-Fluorobiphenyl	172	14.091	14.091	(0.909)	57433	0.50000	0.5154
	37 2-Chloronaphthalene	162	14.308	14.308	(0.923)	47000	0.50000	0.5048
	38 2-Nitroaniline	65	14.571	14.571	(0.940)	31335	1.00000	0.8980
	39 Dimethylphthalate	163	14.997	14.997	(0.968)	49917	0.50000	0.5543
	40 Acenaphthylene	152	15.183	15.182	(0.980)	73548	0.50000	0.5554
	41 2,6-Dinitrotoluene	165	15.144	15.144	(0.977)	20976	1.00000	1.027
*	42 Acenaphthene-d10	164	15.500	15.500	(1.000)	242680	4.00000	
	43 3-Nitroaniline	138	15.430	15.430	(0.996)	23996	1.00000	0.9485
	44 Acenaphthene	153	15.561	15.561	(1.004)	36849	0.50000	0.4793
	45 2,4-Dinitrophenol	184	15.647	15.647	(1.009)	4658	2.00000	0.4026(M)
	46 Dibenzofuran	168	15.886	15.894	(1.025)	58090	0.50000	0.4887
	47 4-Nitrophenol	109	15.732	15.732	(1.015)	5725	1.00000	0.5909
	48 2,4-Dinitrotoluene	165	15.956	15.956	(1.029)	23555	1.00000	0.8635
	50 Diethylphthalate	149	16.451	16.451	(1.061)	44354	0.50000	0.5194
	49 Fluorene	166	16.605	16.605	(1.071)	59613	0.50000	0.5173
	51 4-Chlorophenyl-phenylether	204	16.597	16.590	(1.071)	35807	0.50000	0.5346
	52 4-Nitroaniline	138	16.705	16.705	(1.078)	26817	1.00000	0.9977
	53 4,6-Dinitro-2-methylphenol	198	16.790	16.791	(0.905)	21392	2.00000	1.119
	54 N-Nitrosodiphenylamine	169	16.844	16.844	(0.908)	43307	0.50000	0.5786
$	55 2,4,6-Tribromophenol	330	17.145	17.145	(1.106)	11603	0.75000	0.5775
	56 4-Bromophenyl-phenylether	248	17.608	17.608	(0.949)	18714	0.50000	0.4914
	57 Hexachlorobenzene	284	17.924	17.924	(0.966)	22626	0.50000	0.5653
	58 Pentachlorophenol	266	18.288	18.289	(0.986)	7904	1.00000	0.4873
*	59 Phenanthrene-d10	188	18.551	18.551	(1.000)	417099	4.00000	
	60 Phenanthrene	178	18.598	18.605	(1.002)	55563	0.50000	0.4926
	61 Anthracene	178	18.698	18.698	(1.008)	57219	0.50000	0.4744
	62 Carbazole	167	19.023	19.023	(1.025)	57171	0.50000	0.4801
	63 Di-n-butylphthalate	149	19.797	19.797	(1.067)	70285	0.50000	0.3875
	64 Fluoranthene	202	20.981	20.981	(0.889)	74367	0.50000	0.4616
	65 Pyrene	202	21.406	21.406	(0.907)	80030	0.50000	0.4506
$	66 Terphenyl-d14	244	21.677	21.677	(0.919)	70410	0.50000	0.5563
	67 Butylbenzylphthalate	149	22.598	22.598	(0.958)	29196	0.50000	0.4998
	68 Benzo(a)anthracene	228	23.566	23.566	(0.999)	74450	0.50000	0.5161
*	69 Chrysene-d12	240	23.597	23.597	(1.000)	386595	4.00000	
	70 3,3'-Dichlorobenzidine	252	23.520	23.528	(0.997)	89403	1.50000	1.543
	71 Chrysene	228	23.644	23.644	(1.002)	53883	0.50000	0.4845
	72 bis(2-Ethylhexyl)phthalate	149	23.621	23.620	(0.959)	27532	0.50000	0.4622
*	134 Di-n-octylphthalate-d4	153	24.642	24.642	(1.000)	541468	4.00000	
	73 Di-n-octylphthalate	149	24.650	24.650	(1.000)	79446	0.50000	0.5235
	74 Benzo(b)fluoranthene	252	25.556	25.556	(0.968)	76166	0.50000	0.4865
	75 Benzo(k)fluoranthene	252	25.602	25.602	(0.970)	78887	0.50000	0.5087
	76 Benzo(a)pyrene	252	26.268	26.268	(0.995)	68954	0.50000	0.4873
*	77 Perylene-d12	264	26.400	26.400	(1.000)	397318	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	29.308	29.300	(1.110)	85269	0.50000	0.5325
	79 Dibenzo(a,h)anthracene	278	29.324	29.316	(1.111)	70203	0.50000	0.5581
	80 Benzo(g,h,i)perylene	276	30.170	30.170	(1.143)	73247	0.50000	0.5125
	90 N-Nitrosodimethylamine	74	4.975	4.959	(0.531)	38732	1.00000	1.073
	91 Aniline	93	8.830	8.830	(0.942)	78677	1.00000	1.104
	93 Benzidine	184	21.220	21.220	(0.899)	65100	1.00000	0.8836
	103 Pyridine	79	4.998	4.982	(0.533)	30729	0.50000	0.5410
	105 1-methylnaphthalene	142	13.534	13.534	(1.141)	48902	0.50000	0.4605
	111 Azobenzene (1,2-DP-Hydrazine)	77	16.921	16.914	(1.092)	59082	0.50000	0.5427

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
187 Total Benzofluoranthenes	252	25.602	25.602	(0.970)	152148	1.00000	1.012
120 2,3,4,6-Tetrachlorophenol	232	16.226	16.227	(1.047)	6323	0.50000	0.2475

QC Flag Legend

M - Compound response manually integrated.

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072008.D Page 1
Report Date: 21-Jul-2021 09:28

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072008.D
Lab Smp Id: SJG0249-CAL2
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	134122	27.11
27 Naphthalene-d8	373252	186626	746504	462215	23.83
42 Acenaphthene-d10	212025	106013	424050	242680	14.46
59 Phenanthrene-d10	362039	181020	724078	417099	15.21
69 Chrysene-d12	338032	169016	676064	386595	14.37
134 Di-n-octylphthala	565512	282756	1131024	541468	-4.25
77 Perylene-d12	375340	187670	750680	397318	5.86

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.37	-0.08
27 Naphthalene-d8	11.87	11.37	12.37	11.86	-0.07
42 Acenaphthene-d10	15.51	15.01	16.01	15.50	-0.05
59 Phenanthrene-d10	18.56	18.06	19.06	18.55	-0.04
69 Chrysene-d12	23.61	23.11	24.11	23.60	-0.03
134 Di-n-octylphthala	24.64	24.14	25.14	24.64	-0.00
77 Perylene-d12	26.40	25.90	26.90	26.40	-0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072008.D

Lab ID: SJG0249-CAL2
nt10.i, ABN.m, 20-JUL-2021 16:14

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
NONE			

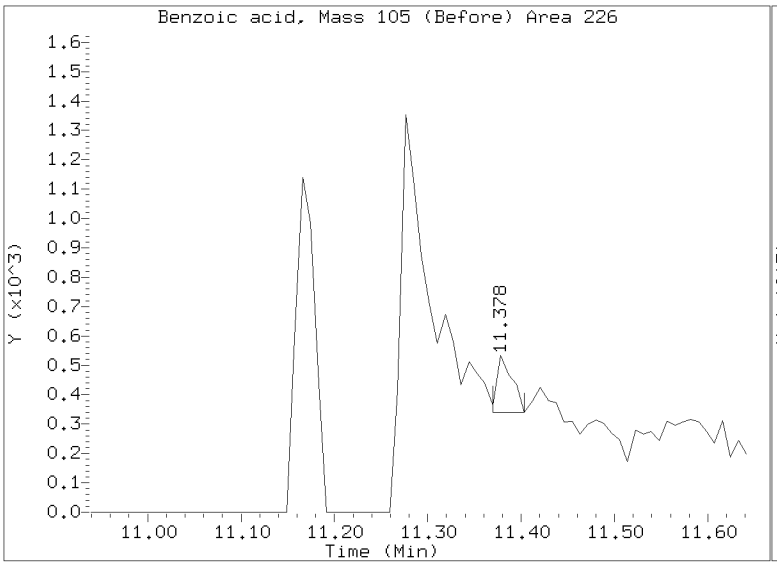
RRT check based on Ccal File: NT1021072010.D

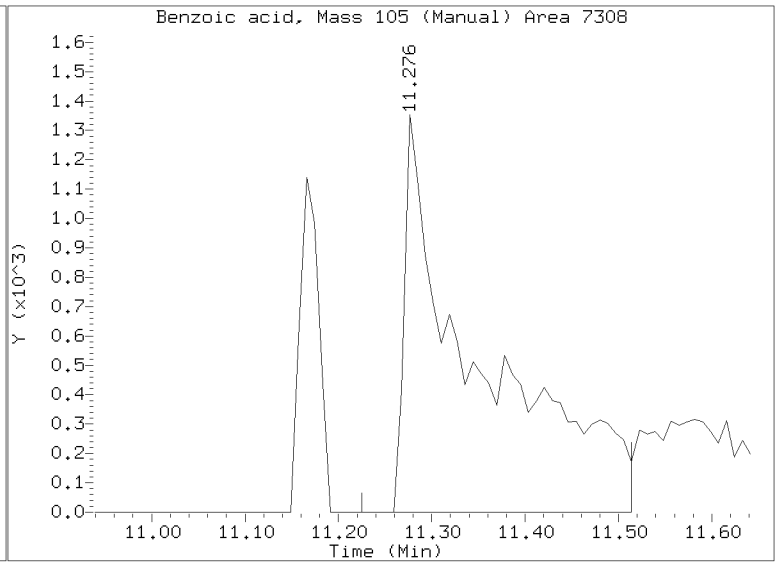
On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

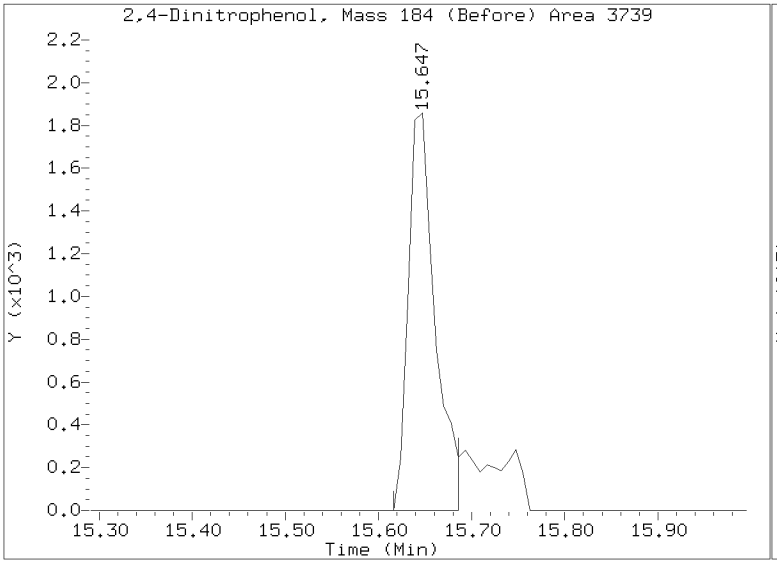
* Only compounds listed in the work order have been verified by the analyst *

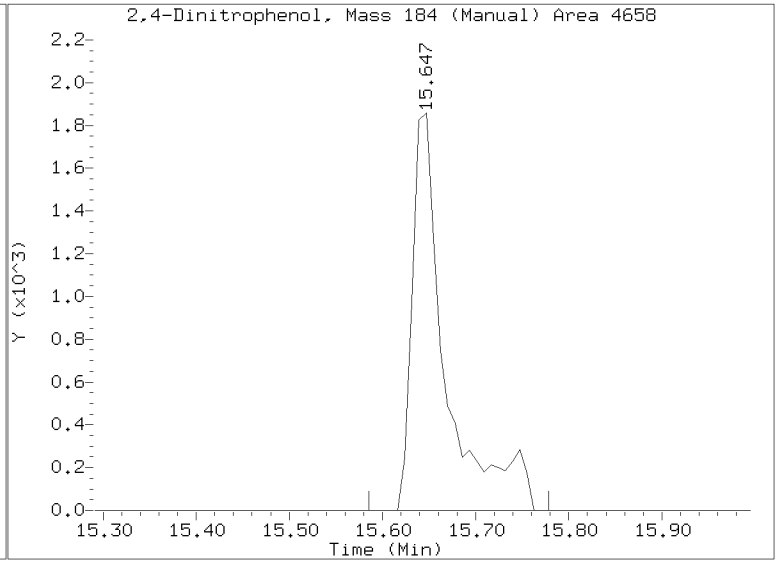
Quant Ion Manual Peak Adjustment Report

Datafile: //target/share/chem3/nt10.i/20210720.b/NT1021072008.D
Injection Date: 20-JUL-2021 16:14
Lab ID:SJG0249-CAL2 Client ID:
Report Date: 07/21/2021 09:28









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Date : 20-JUL-2021 16:52

Client ID:

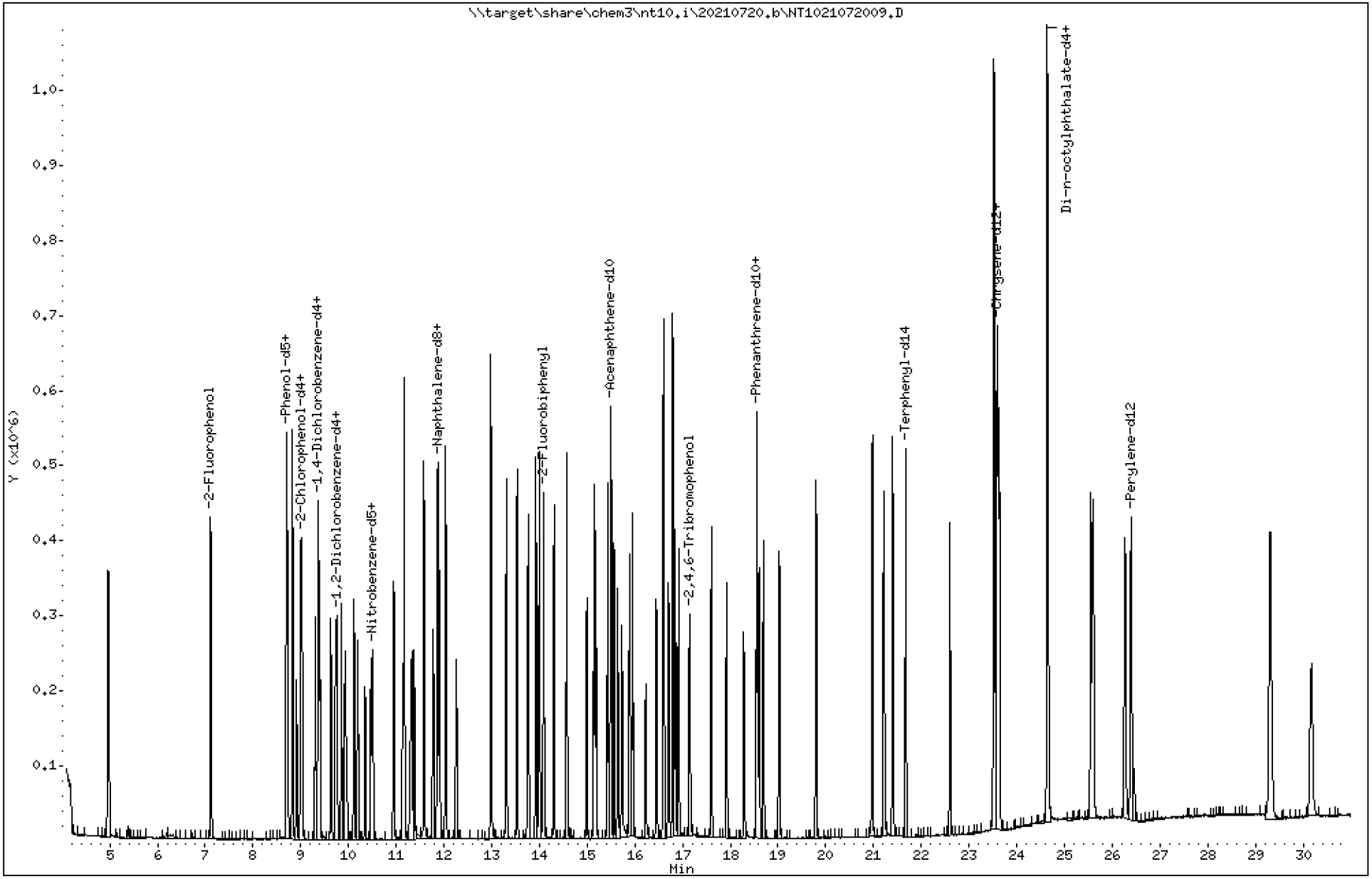
Instrument: nt10.i

Sample Info: SJG0249-CAL4

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210720.b\NT1021072009.D
Lab Smp Id: SJG0249-CAL4
Inj Date : 20-JUL-2021 16:52
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-CAL4
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 7 Calibration Sample, Level: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
$	1 2-Fluorophenol	112	7.114	7.122	(0.759)	158127	3.75000	3.828
$	2 Phenol-d5	99	8.706	8.706	(0.929)	227032	3.75000	3.703
	3 Phenol	94	8.729	8.729	(0.932)	139389	2.50000	2.601
$	5 2-Chlorophenol-d4	132	9.007	8.999	(0.961)	160624	3.75000	3.716
	4 Bis(2-Chloroethyl)ether	93	8.907	8.907	(0.950)	106351	2.50000	2.484
	6 2-Chlorophenol	128	9.030	9.030	(0.964)	102121	2.50000	2.517
	7 1,3-Dichlorobenzene	146	9.301	9.301	(0.993)	111724	2.50000	2.507
*	8 1,4-Dichlorobenzene-d4	152	9.371	9.371	(1.000)	104970	4.00000	
	9 1,4-Dichlorobenzene	146	9.402	9.402	(1.003)	95920	2.50000	2.521
$	10 1,2-Dichlorobenzene-d4	152	9.736	9.736	(1.039)	68647	2.50000	2.469
	12 1,2-Dichlorobenzene	146	9.759	9.759	(1.041)	101587	2.50000	2.524
	11 Benzyl alcohol	108	9.635	9.635	(1.028)	62812	2.50000	2.503
	14 2,2'-oxybis(1-Chloropropane)	121	9.938	9.930	(1.060)	38463	2.50000	2.491
	13 2-Methylphenol	108	9.852	9.852	(1.051)	85225	2.50000	2.555
	17 Hexachloroethane	117	10.349	10.349	(1.104)	40211	2.50000	2.459
	16 N-Nitroso-di-n-propylamine	70	10.194	10.194	(1.088)	72869	2.50000	2.532
	15 4-Methylphenol	108	10.116	10.116	(1.080)	92734	2.50000	2.590
$	18 Nitrobenzene-d5	82	10.473	10.473	(0.882)	111673	2.50000	2.454
	19 Nitrobenzene	77	10.512	10.512	(0.886)	112435	2.50000	2.500
	20 Isophorone	82	10.946	10.946	(0.922)	213585	2.50000	2.517
	21 2-Nitrophenol	139	11.140	11.140	(0.938)	54450	2.50000	2.312
	22 2,4-Dimethylphenol	107	11.165	11.165	(0.941)	181910	5.00000	5.157
	23 Bis(2-Chloroethoxy)methane	93	11.378	11.378	(0.958)	106641	2.50000	2.421
	24 Benzoic acid	105	11.327	11.293	(0.954)	157082	10.0000	7.926
	25 2,4-Dichlorophenol	162	11.581	11.581	(0.976)	145895	5.00000	4.991
	26 1,2,4-Trichlorobenzene	180	11.778	11.778	(0.992)	82826	2.50000	2.506
*	27 Naphthalene-d8	136	11.871	11.863	(1.000)	371078	4.00000	
	28 Naphthalene	128	11.909	11.909	(1.003)	241314	2.50000	2.457
	29 4-Chloroaniline	127	12.040	12.040	(1.014)	245995	5.00000	5.030
	30 Hexachlorobutadiene	225	12.257	12.257	(1.033)	46823	2.50000	2.595
	31 4-Chloro-3-methylphenol	107	12.984	12.984	(1.094)	171528	5.00000	4.915
	32 2-Methylnaphthalene	142	13.310	13.309	(1.121)	219665	2.50000	2.418
	33 Hexachlorocyclopentadiene	237	13.766	13.766	(0.888)	108895	5.00000	4.944

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
	34 2,4,6-Trichlorophenol	196	13.929	13.929	(0.899)	111971	5.00000	4.880
	35 2,4,5-Trichlorophenol	196	13.998	13.998	(0.903)	125307	5.00000	5.125
$	36 2-Fluorobiphenyl	172	14.091	14.091	(0.909)	234889	2.50000	2.449
	37 2-Chloronaphthalene	162	14.308	14.308	(0.923)	197604	2.50000	2.466
	38 2-Nitroaniline	65	14.571	14.571	(0.940)	148795	5.00000	4.955
	39 Dimethylphthalate	163	14.997	14.997	(0.968)	197973	2.50000	2.554
	40 Acenaphthylene	152	15.182	15.182	(0.980)	285661	2.50000	2.507
	41 2,6-Dinitrotoluene	165	15.144	15.144	(0.977)	89333	5.00000	5.084
*	42 Acenaphthene-d10	164	15.500	15.500	(1.000)	208846	4.00000	
	43 3-Nitroaniline	138	15.430	15.430	(0.996)	108689	5.00000	4.992
	44 Acenaphthene	153	15.561	15.561	(1.004)	163254	2.50000	2.468
	45 2,4-Dinitrophenol	184	15.639	15.647	(1.009)	71900	10.0000	7.099
	46 Dibenzofuran	168	15.894	15.894	(1.025)	249743	2.50000	2.442
	47 4-Nitrophenol	109	15.732	15.732	(1.015)	38038	5.00000	4.541
	48 2,4-Dinitrotoluene	165	15.956	15.956	(1.029)	119774	5.00000	5.102
	50 Diethylphthalate	149	16.451	16.451	(1.061)	187342	2.50000	2.549
	49 Fluorene	166	16.605	16.605	(1.071)	238204	2.50000	2.402
	51 4-Chlorophenyl-phenylether	204	16.590	16.590	(1.070)	140903	2.50000	2.444
	52 4-Nitroaniline	138	16.705	16.705	(1.078)	92111	5.00000	3.982
	53 4,6-Dinitro-2-methylphenol	198	16.798	16.791	(0.905)	155247	10.0000	9.295
	54 N-Nitrosodiphenylamine	169	16.844	16.844	(0.908)	164252	2.50000	2.536
$	55 2,4,6-Tribromophenol	330	17.145	17.145	(1.106)	60594	3.75000	3.493
	56 4-Bromophenyl-phenylether	248	17.600	17.608	(0.949)	84448	2.50000	2.562
	57 Hexachlorobenzene	284	17.924	17.924	(0.966)	88245	2.50000	2.548
	58 Pentachlorophenol	266	18.280	18.289	(0.985)	63956	5.00000	4.509
*	59 Phenanthrene-d10	188	18.551	18.551	(1.000)	360965	4.00000	
	60 Phenanthrene	178	18.605	18.605	(1.003)	237856	2.50000	2.437
	61 Anthracene	178	18.698	18.698	(1.008)	263350	2.50000	2.523
	62 Carbazole	167	19.023	19.023	(1.025)	256230	2.50000	2.486
	63 Di-n-butylphthalate	149	19.797	19.797	(1.067)	354715	2.50000	2.239
	64 Fluoranthene	202	20.981	20.981	(0.889)	348155	2.50000	2.443
	65 Pyrene	202	21.406	21.406	(0.907)	405852	2.50000	2.584
$	66 Terphenyl-d14	244	21.677	21.677	(0.919)	279468	2.50000	2.496
	67 Butylbenzylphthalate	149	22.598	22.598	(0.958)	134788	2.50000	2.609
	68 Benzo(a)anthracene	228	23.566	23.566	(0.999)	317241	2.50000	2.486
*	69 Chrysene-d12	240	23.597	23.597	(1.000)	341969	4.00000	
	70 3,3'-Dichlorobenzidine	252	23.528	23.528	(0.997)	377463	7.50000	7.363
	71 Chrysene	228	23.644	23.644	(1.002)	244872	2.50000	2.489
	72 bis(2-Ethylhexyl)phthalate	149	23.621	23.620	(0.959)	150006	2.50000	2.638
*	134 Di-n-octylphthalate-d4	153	24.642	24.642	(1.000)	516798	4.00000	
	73 Di-n-octylphthalate	149	24.650	24.650	(1.000)	359520	2.50000	2.482
	74 Benzo(b)fluoranthene	252	25.556	25.556	(0.968)	356621	2.50000	2.465
	75 Benzo(k)fluoranthene	252	25.602	25.602	(0.970)	366129	2.50000	2.554
	76 Benzo(a)pyrene	252	26.268	26.268	(0.995)	326304	2.50000	2.495
*	77 Perylene-d12	264	26.400	26.400	(1.000)	367200	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	29.308	29.300	(1.110)	367973	2.50000	2.486
	79 Dibenzo(a,h)anthracene	278	29.324	29.316	(1.111)	289919	2.50000	2.494
	80 Benzo(g,h,i)perylene	276	30.178	30.170	(1.143)	325389	2.50000	2.464
	90 N-Nitrosodimethylamine	74	4.959	4.959	(0.529)	147542	5.00000	5.221
	91 Aniline	93	8.830	8.830	(0.942)	278835	5.00000	4.998
	93 Benzidine	184	21.213	21.220	(0.899)	295984	5.00000	4.541
	103 Pyridine	79	4.975	4.982	(0.531)	112541	2.50000	2.531
	105 1-methylnaphthalene	142	13.534	13.534	(1.140)	204902	2.50000	2.403
	111 Azobenzene (1,2-DP-Hydrazine)	77	16.921	16.914	(1.092)	232977	2.50000	2.487

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
187 Total Benzofluoranthenes	252	25.556	25.602	(0.968)	692177	5.00000	4.981
120 2,3,4,6-Tetrachlorophenol	232	16.226	16.227	(1.047)	50303	2.50000	2.266

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072009.D Page 1
Report Date: 21-Jul-2021 09:25

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072009.D
Lab Smp Id: SJG0249-CAL4
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	104970	-0.52
27 Naphthalene-d8	373252	186626	746504	371078	-0.58
42 Acenaphthene-d10	212025	106013	424050	208846	-1.50
59 Phenanthrene-d10	362039	181020	724078	360965	-0.30
69 Chrysene-d12	338032	169016	676064	341969	1.16
134 Di-n-octylphthala	565512	282756	1131024	516798	-8.61
77 Perylene-d12	375340	187670	750680	367200	-2.17

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.37	-0.08
27 Naphthalene-d8	11.87	11.37	12.37	11.87	-0.00
42 Acenaphthene-d10	15.51	15.01	16.01	15.50	-0.05
59 Phenanthrene-d10	18.56	18.06	19.06	18.55	-0.04
69 Chrysene-d12	23.61	23.11	24.11	23.60	-0.03
134 Di-n-octylphthala	24.64	24.14	25.14	24.64	-0.00
77 Perylene-d12	26.40	25.90	26.90	26.40	-0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072009.D

Lab ID: SJG0249-CAL4
nt10.i, ABN.m, 20-JUL-2021 16:52

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
NONE			

RRT check based on Ccal File: NT1021072010.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072010.D

Date : 20-JUL-2021 17:30

Client ID:

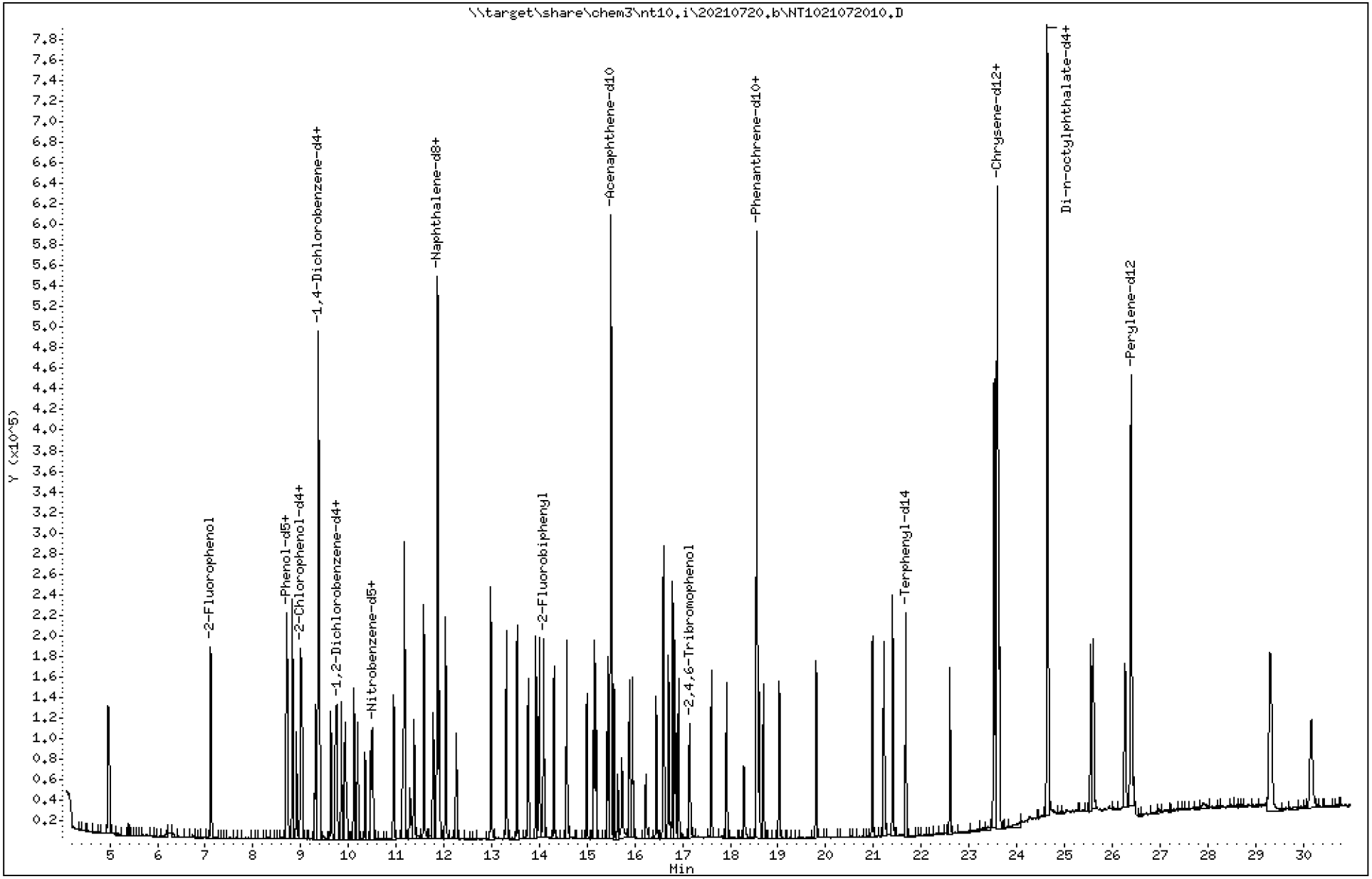
Instrument: nt10.i

Sample Info: SJG0249-CAL3

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210720.b\NT1021072010.D
Lab Smp Id: SJG0249-CAL3
Inj Date : 20-JUL-2021 17:30
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-CAL3
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 8 Calibration Sample, Level: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
$ 1 2-Fluorophenol	112	7.122	7.122	(0.760)	70967	1.50000	1.519
$ 2 Phenol-d5	99	8.706	8.706	(0.929)	94728	1.50000	1.366
3 Phenol	94	8.729	8.729	(0.932)	62754	1.00000	1.035
$ 5 2-Chlorophenol-d4	132	8.999	8.999	(0.960)	71011	1.50000	1.452
4 Bis(2-Chloroethyl)ether	93	8.907	8.907	(0.950)	48081	1.00000	0.9929
6 2-Chlorophenol	128	9.030	9.030	(0.964)	46505	1.00000	1.013
7 1,3-Dichlorobenzene	146	9.301	9.301	(0.993)	50133	1.00000	0.9945
* 8 1,4-Dichlorobenzene-d4	152	9.371	9.371	(1.000)	118740	4.00000	
9 1,4-Dichlorobenzene	146	9.402	9.402	(1.003)	41349	1.00000	0.9607
$ 10 1,2-Dichlorobenzene-d4	152	9.736	9.736	(1.039)	30318	1.00000	0.9640
12 1,2-Dichlorobenzene	146	9.759	9.759	(1.041)	44506	1.00000	0.9775
11 Benzyl alcohol	108	9.635	9.635	(1.028)	26790	1.00000	0.9438
14 2,2'-oxybis(1-Chloropropane)	121	9.930	9.930	(1.060)	15028	1.00000	0.8604
13 2-Methylphenol	108	9.852	9.852	(1.051)	38736	1.00000	1.026
17 Hexachloroethane	117	10.349	10.349	(1.104)	16746	1.00000	0.9051
16 N-Nitroso-di-n-propylamine	70	10.194	10.194	(1.088)	30823	1.00000	0.9468
15 4-Methylphenol	108	10.116	10.116	(1.080)	40825	1.00000	1.008
$ 18 Nitrobenzene-d5	82	10.473	10.473	(0.883)	47754	1.00000	0.9594
19 Nitrobenzene	77	10.512	10.512	(0.886)	47268	1.00000	0.9611
20 Isophorone	82	10.946	10.946	(0.923)	82704	1.00000	0.8911
21 2-Nitrophenol	139	11.140	11.140	(0.939)	21947	1.00000	0.8561
22 2,4-Dimethylphenol	107	11.165	11.165	(0.941)	82909	2.00000	2.149
23 Bis(2-Chloroethoxy)methane	93	11.378	11.378	(0.959)	49561	1.00000	1.029
24 Benzoic acid	105	11.293	11.293	(0.952)	29541	4.00000	1.379
25 2,4-Dichlorophenol	162	11.581	11.581	(0.976)	64499	2.00000	2.018
26 1,2,4-Trichlorobenzene	180	11.778	11.778	(0.993)	36014	1.00000	0.9964
* 27 Naphthalene-d8	136	11.863	11.863	(1.000)	405845	4.00000	
28 Naphthalene	128	11.909	11.909	(1.004)	100099	1.00000	0.9320
29 4-Chloroaniline	127	12.040	12.040	(1.015)	90622	2.00000	1.694
30 Hexachlorobutadiene	225	12.257	12.257	(1.033)	19455	1.00000	0.9859
31 4-Chloro-3-methylphenol	107	12.984	12.984	(1.095)	67663	2.00000	1.773
32 2-Methylnaphthalene	142	13.309	13.309	(1.122)	92958	1.00000	0.9354
33 Hexachlorocyclopentadiene	237	13.766	13.766	(0.888)	38883	2.00000	1.701

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
	34 2,4,6-Trichlorophenol	196	13.929	13.929	(0.899)	43358	2.00000	1.821
	35 2,4,5-Trichlorophenol	196	13.998	13.998	(0.903)	46423	2.00000	1.830
$	36 2-Fluorobiphenyl	172	14.091	14.091	(0.909)	99141	1.00000	0.9961
	37 2-Chloronaphthalene	162	14.308	14.308	(0.923)	80039	1.00000	0.9625
	38 2-Nitroaniline	65	14.571	14.571	(0.940)	58133	2.00000	1.865
	39 Dimethylphthalate	163	14.997	14.997	(0.968)	84844	1.00000	1.055
	40 Acenaphthylene	152	15.182	15.182	(0.980)	119593	1.00000	1.011
	41 2,6-Dinitrotoluene	165	15.144	15.144	(0.977)	35715	2.00000	1.958
*	42 Acenaphthene-d10	164	15.500	15.500	(1.000)	216746	4.00000	
	43 3-Nitroaniline	138	15.430	15.430	(0.996)	42963	2.00000	1.901
	44 Acenaphthene	153	15.561	15.561	(1.004)	65092	1.00000	0.9480
	45 2,4-Dinitrophenol	184	15.646	15.647	(1.009)	15878	4.00000	1.532
	46 Dibenzofuran	168	15.894	15.894	(1.025)	104310	1.00000	0.9826
	47 4-Nitrophenol	109	15.731	15.732	(1.015)	12797	2.00000	1.477
	48 2,4-Dinitrotoluene	165	15.956	15.956	(1.029)	44089	2.00000	1.810
	50 Diethylphthalate	149	16.451	16.451	(1.061)	77526	1.00000	1.017
	49 Fluorene	166	16.605	16.605	(1.071)	100601	1.00000	0.9775
	51 4-Chlorophenyl-phenylether	204	16.590	16.590	(1.070)	59837	1.00000	1.000
	52 4-Nitroaniline	138	16.705	16.705	(1.078)	48595	2.00000	2.024
	53 4,6-Dinitro-2-methylphenol	198	16.790	16.791	(0.905)	53196	4.00000	3.113
	54 N-Nitrosodiphenylamine	169	16.844	16.844	(0.908)	70082	1.00000	1.050
$	55 2,4,6-Tribromophenol	330	17.145	17.145	(1.106)	22328	1.50000	1.243
	56 4-Bromophenyl-phenylether	248	17.608	17.608	(0.949)	32796	1.00000	0.9651
	57 Hexachlorobenzene	284	17.924	17.924	(0.966)	37588	1.00000	1.053
	58 Pentachlorophenol	266	18.288	18.289	(0.986)	19753	2.00000	1.362
*	59 Phenanthrene-d10	188	18.551	18.551	(1.000)	372134	4.00000	
	60 Phenanthrene	178	18.605	18.605	(1.003)	95583	1.00000	0.9498
	61 Anthracene	178	18.698	18.698	(1.008)	102074	1.00000	0.9485
	62 Carbazole	167	19.023	19.023	(1.025)	102032	1.00000	0.9604
	63 Di-n-butylphthalate	149	19.797	19.797	(1.067)	128417	1.00000	0.7920
	64 Fluoranthene	202	20.981	20.981	(0.889)	130267	1.00000	0.8779
	65 Pyrene	202	21.406	21.406	(0.907)	143630	1.00000	0.8781
$	66 Terphenyl-d14	244	21.677	21.677	(0.919)	122370	1.00000	1.050
	67 Butylbenzylphthalate	149	22.598	22.598	(0.958)	51225	1.00000	0.9521
	68 Benzo(a)anthracene	228	23.566	23.566	(0.999)	130513	1.00000	0.9823
*	69 Chrysene-d12	240	23.597	23.597	(1.000)	356061	4.00000	
	70 3,3'-Dichlorobenzidine	252	23.528	23.528	(0.997)	161252	3.00000	3.021
	71 Chrysene	228	23.644	23.644	(1.002)	94971	1.00000	0.9271
	72 bis(2-Ethylhexyl)phthalate	149	23.620	23.620	(0.959)	51986	1.00000	0.9531
*	134 Di-n-octylphthalate-d4	153	24.642	24.642	(1.000)	495765	4.00000	
	73 Di-n-octylphthalate	149	24.650	24.650	(1.000)	136066	1.00000	0.9793
	74 Benzo(b)fluoranthene	252	25.556	25.556	(0.968)	136778	1.00000	0.9336
	75 Benzo(k)fluoranthene	252	25.602	25.602	(0.970)	142200	1.00000	0.9799
	76 Benzo(a)pyrene	252	26.268	26.268	(0.995)	123779	1.00000	0.9349
*	77 Perylene-d12	264	26.400	26.400	(1.000)	371772	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	29.300	29.300	(1.110)	151286	1.00000	1.010
	79 Dibenzo(a,h)anthracene	278	29.316	29.316	(1.110)	120278	1.00000	1.022
	80 Benzo(g,h,i)perylene	276	30.170	30.170	(1.143)	130981	1.00000	0.9795
	90 N-Nitrosodimethylamine	74	4.959	4.959	(0.529)	63215	2.00000	1.977
	91 Aniline	93	8.830	8.830	(0.942)	126358	2.00000	2.002
	93 Benzidine	184	21.220	21.220	(0.899)	123985	2.00000	1.827
	103 Pyridine	79	4.982	4.982	(0.532)	46570	1.00000	0.9260
	105 1-methylnaphthalene	142	13.534	13.534	(1.141)	86996	1.00000	0.9330
	111 Azobenzene (1,2-DP-Hydrazine)	77	16.914	16.914	(1.091)	96585	1.00000	0.9933

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
187 Total Benzofluoranthenes	252	25.602	25.602	(0.970)	267981	2.00000	1.905
120 2,3,4,6-Tetrachlorophenol	232	16.226	16.227	(1.047)	17271	1.00000	0.7551

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072010.D Page 1
Report Date: 21-Jul-2021 09:25

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072010.D
Lab Smp Id: SJG0249-CAL3
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	118740	12.53
27 Naphthalene-d8	373252	186626	746504	405845	8.73
42 Acenaphthene-d10	212025	106013	424050	216746	2.23
59 Phenanthrene-d10	362039	181020	724078	372134	2.79
69 Chrysene-d12	338032	169016	676064	356061	5.33
134 Di-n-octylphthala	565512	282756	1131024	495765	-12.33
77 Perylene-d12	375340	187670	750680	371772	-0.95

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.37	-0.09
27 Naphthalene-d8	11.87	11.37	12.37	11.86	-0.07
42 Acenaphthene-d10	15.51	15.01	16.01	15.50	-0.05
59 Phenanthrene-d10	18.56	18.06	19.06	18.55	-0.04
69 Chrysene-d12	23.61	23.11	24.11	23.60	-0.03
134 Di-n-octylphthala	24.64	24.14	25.14	24.64	-0.00
77 Perylene-d12	26.40	25.90	26.90	26.40	-0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072010.D

Lab ID: SJG0249-CAL3
nt10.i, ABN.m, 20-JUL-2021 17:30

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
NONE			

RRT check based on Ccal File: NT1021072010.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

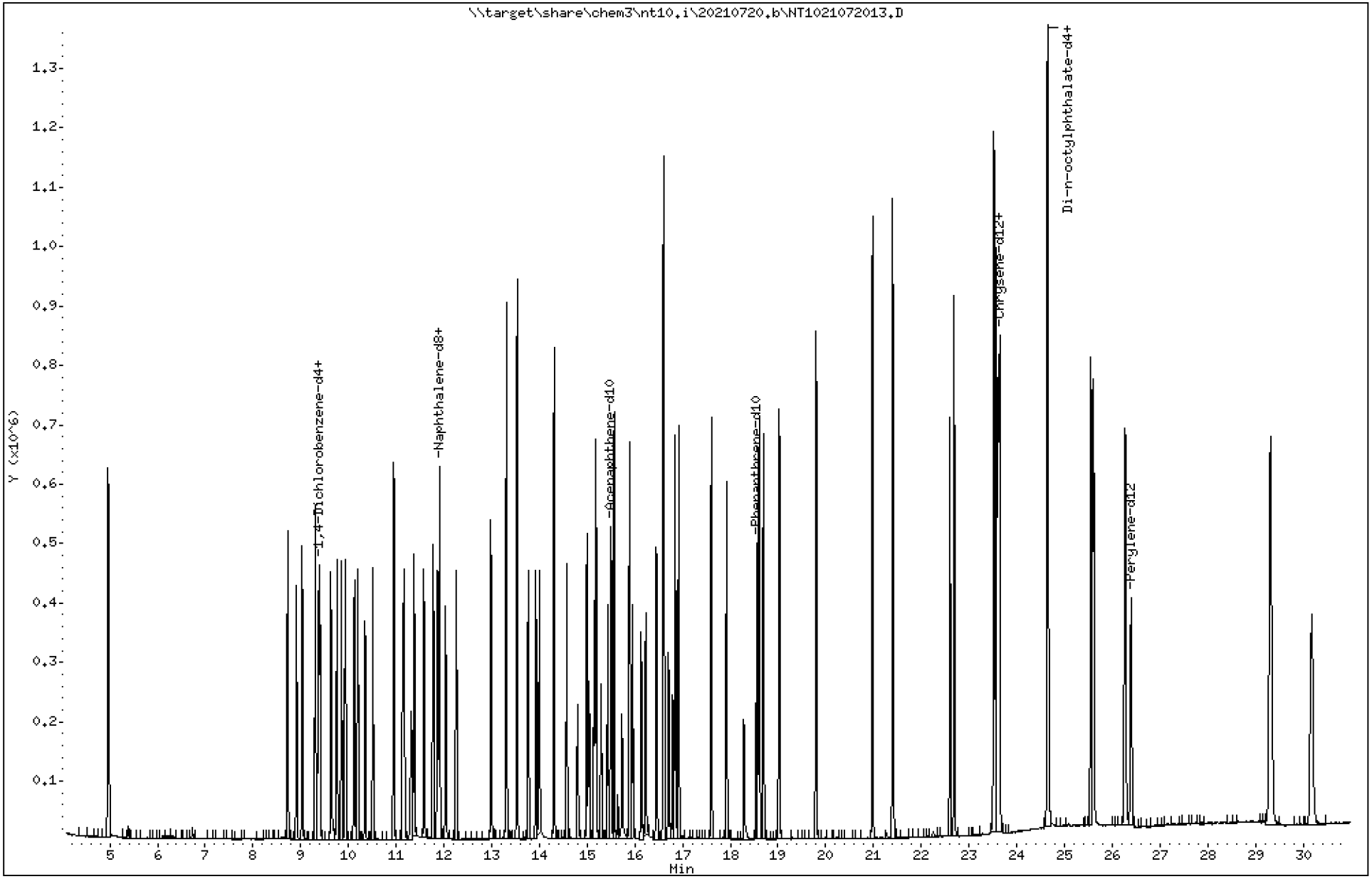
Instrument: nt10.i

Sample Info: SJG0249-SCV1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

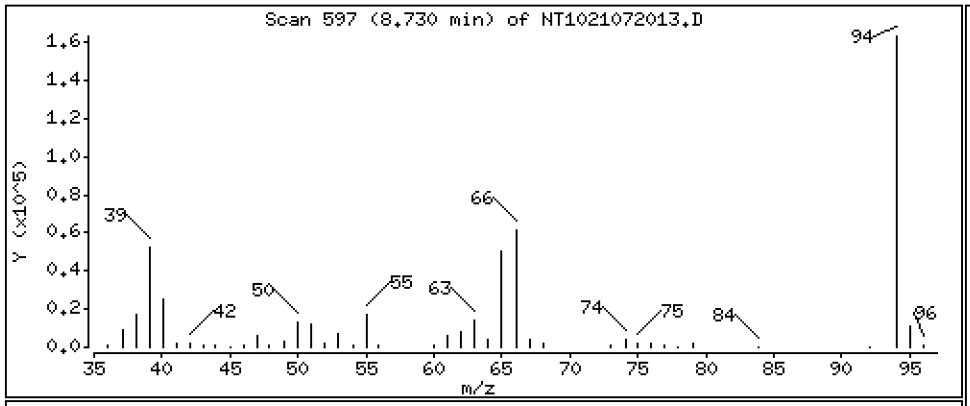
Operator: VTS

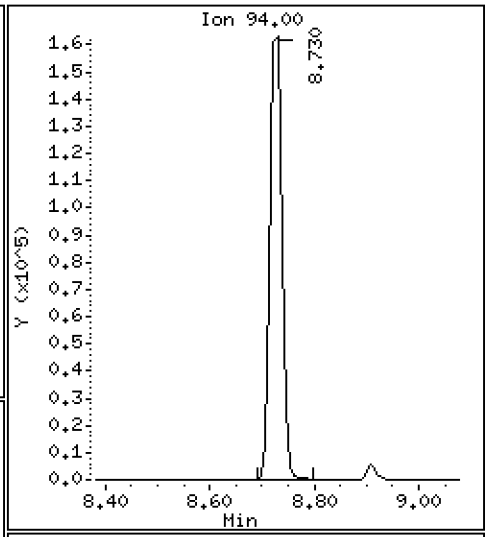
Column phase: ZB-5msi

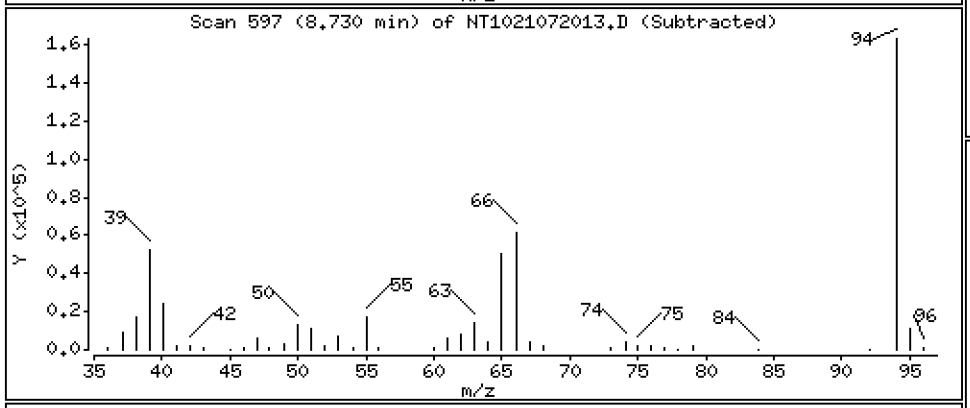
Column diameter: 0.25

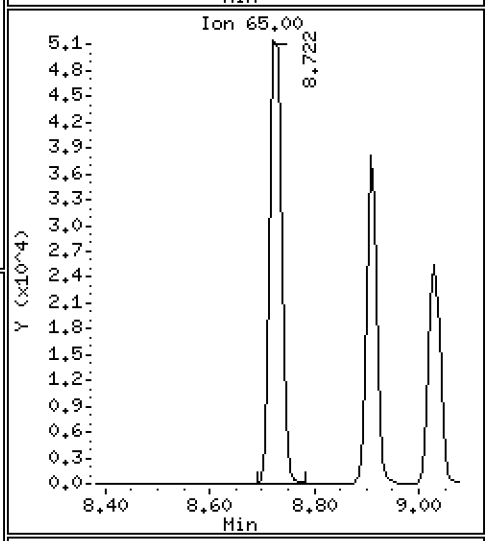
3 Phenol

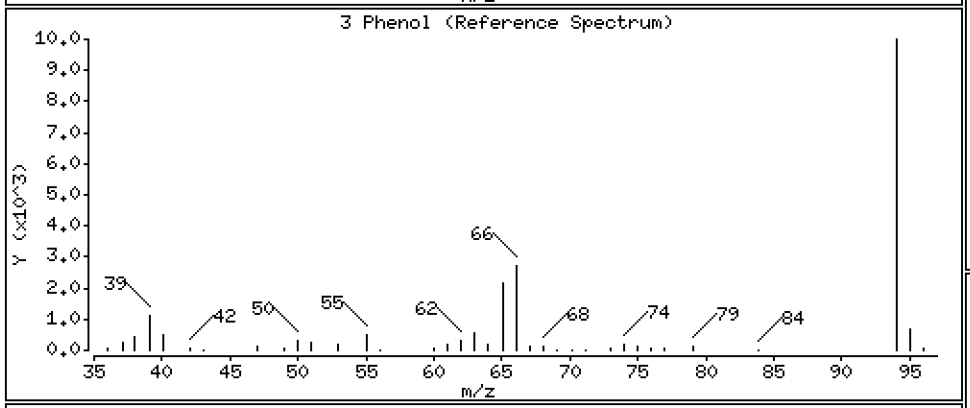
Concentration: 4.922 ug/mL

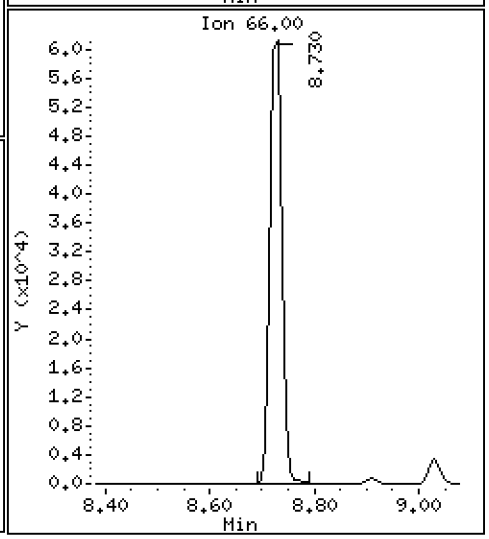


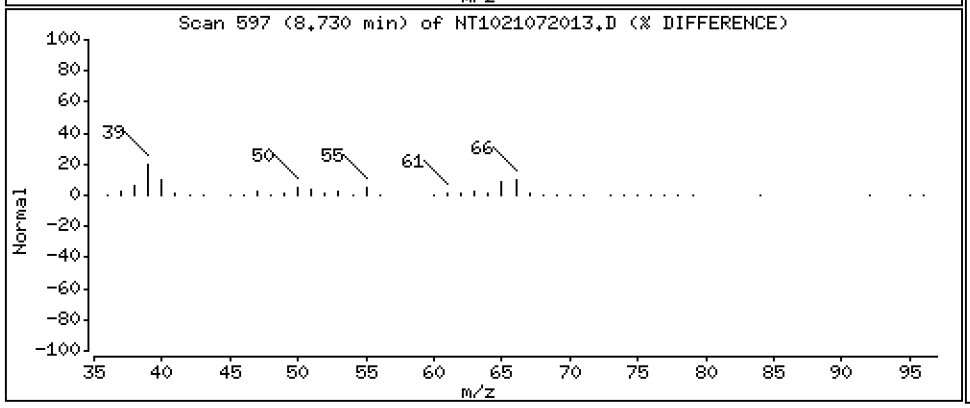












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

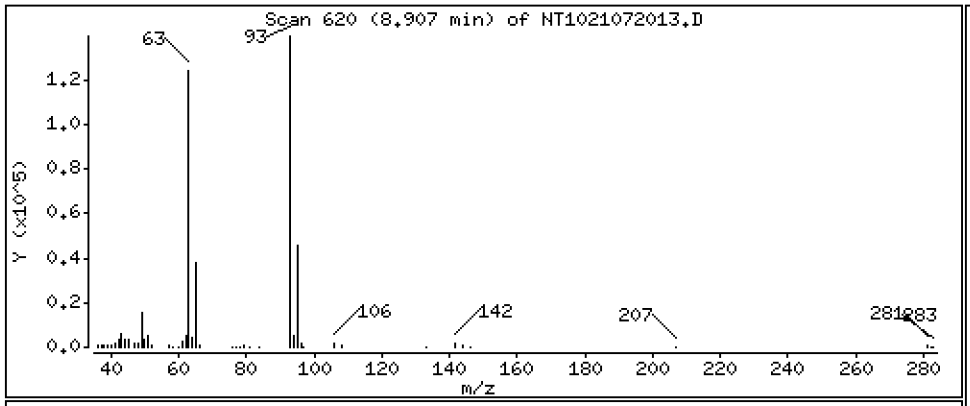
Operator: VTS

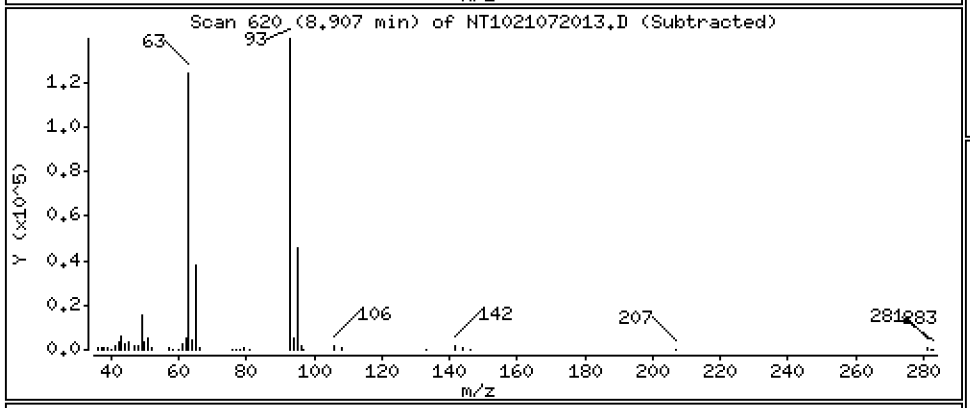
Column phase: ZB-5msi

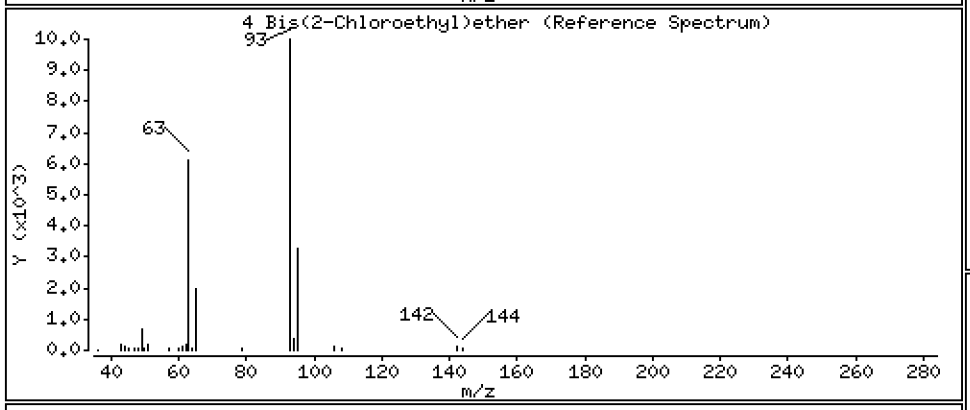
Column diameter: 0.25

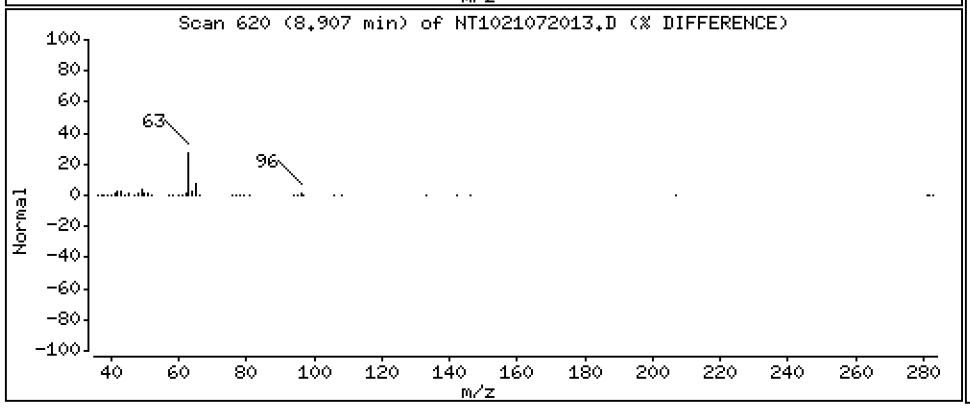
4 Bis(2-Chloroethyl)ether

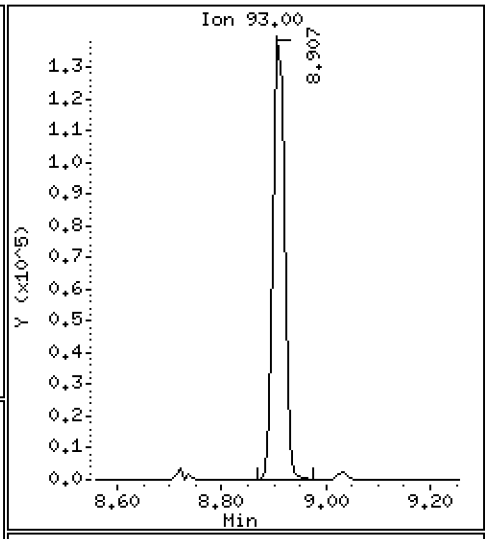
Concentration: 5.023 ug/mL

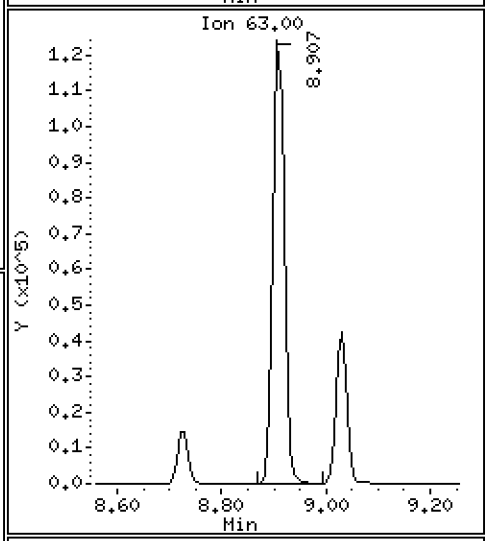


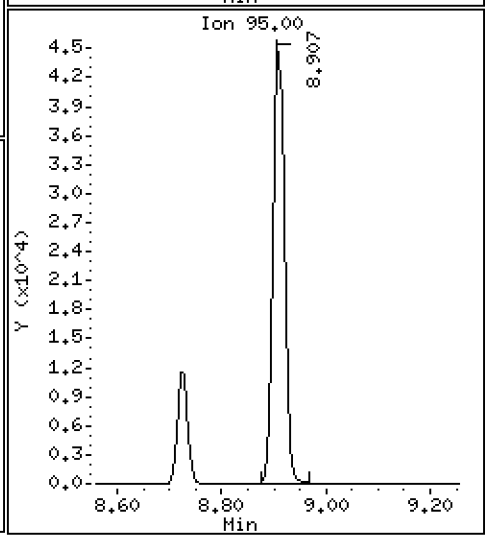












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

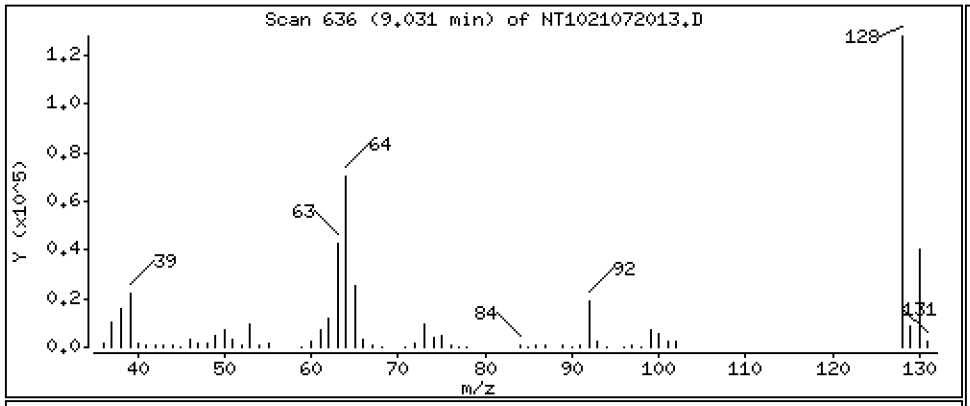
Operator: VTS

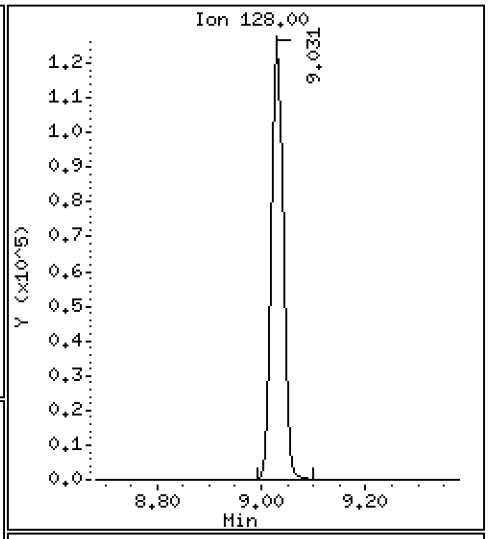
Column phase: ZB-5msi

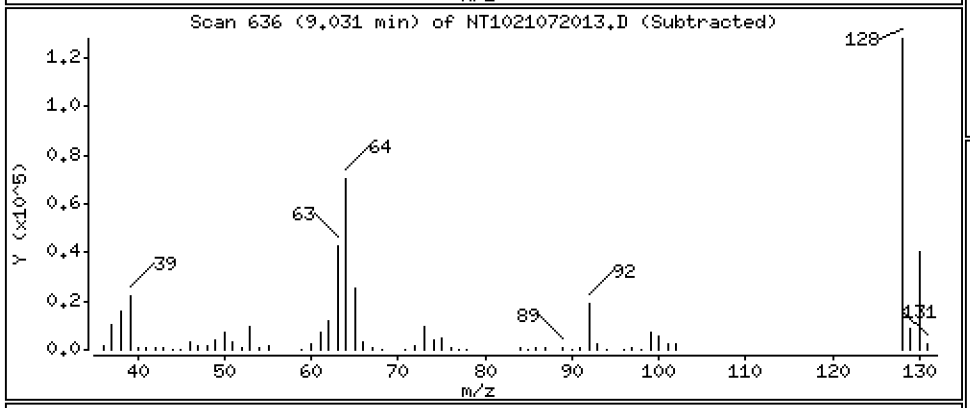
Column diameter: 0.25

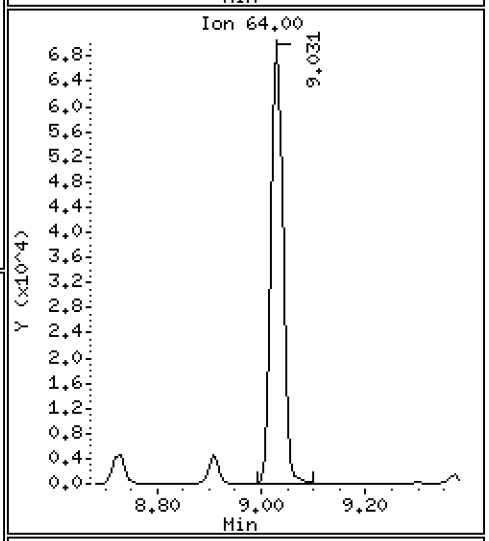
6 2-Chlorophenol

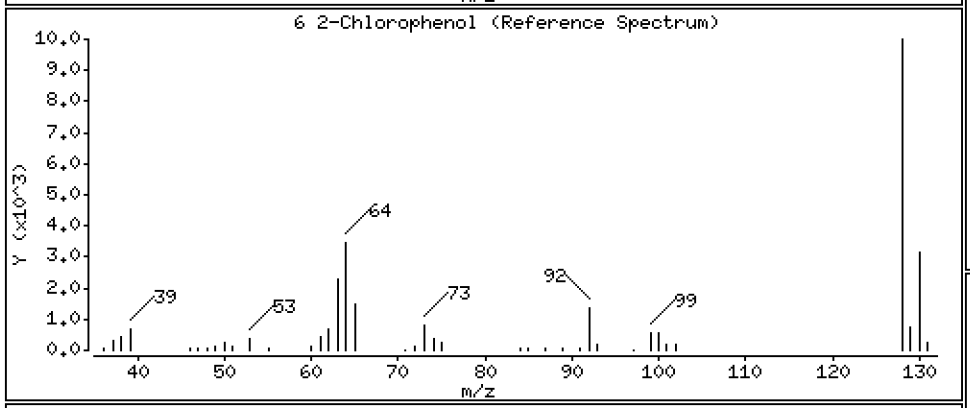
Concentration: 4.975 ug/mL

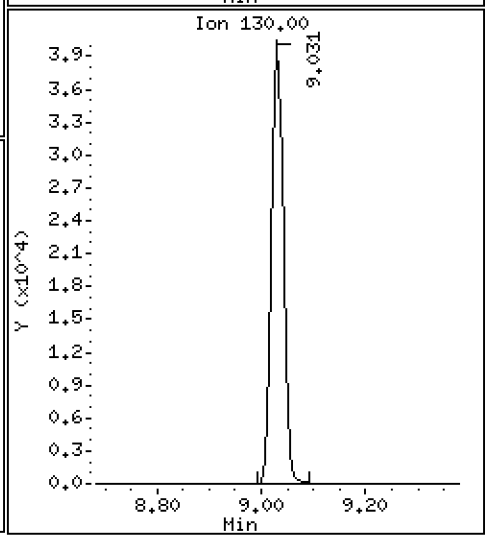


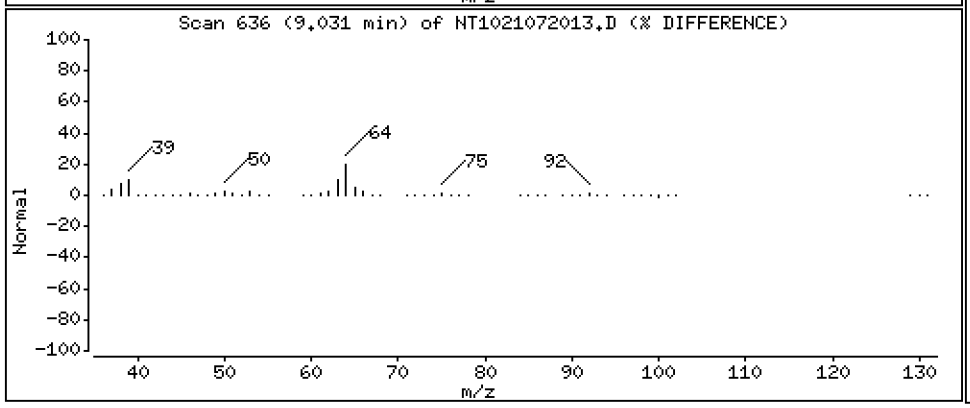












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

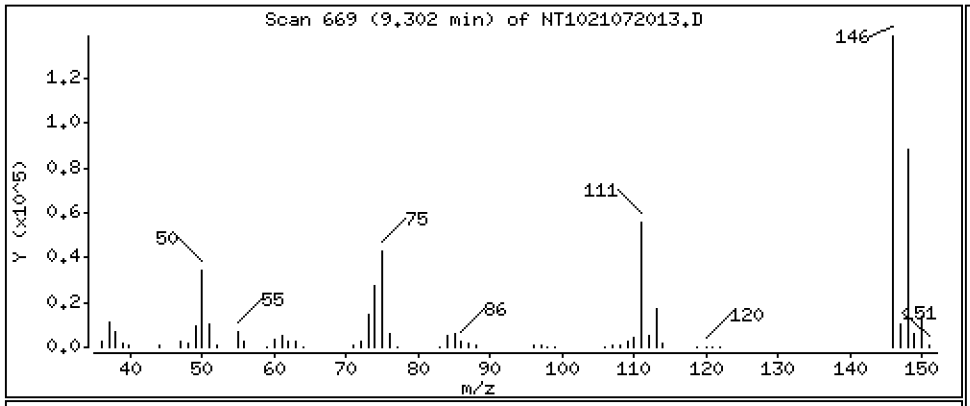
Operator: VTS

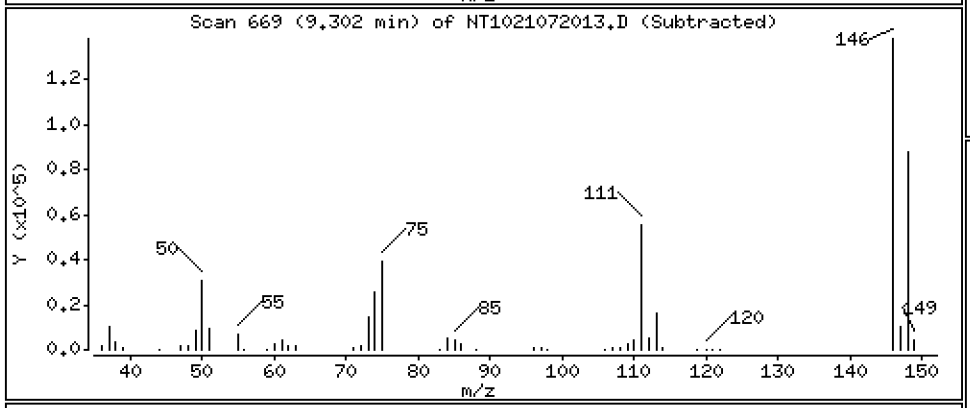
Column phase: ZB-5msi

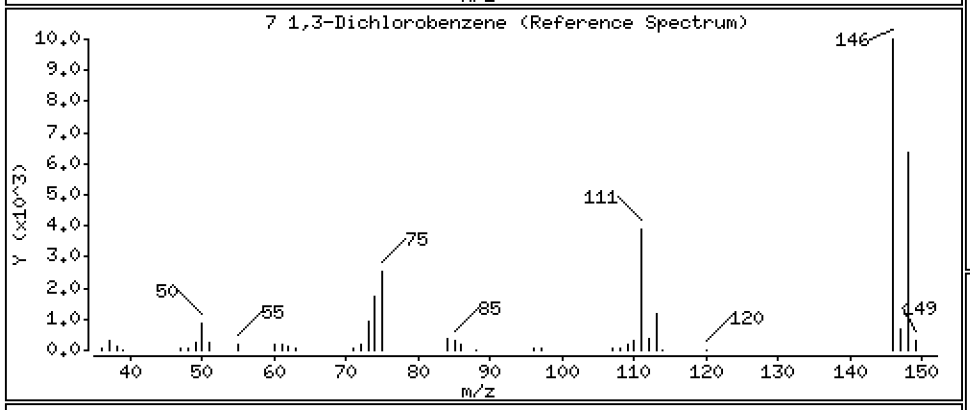
Column diameter: 0.25

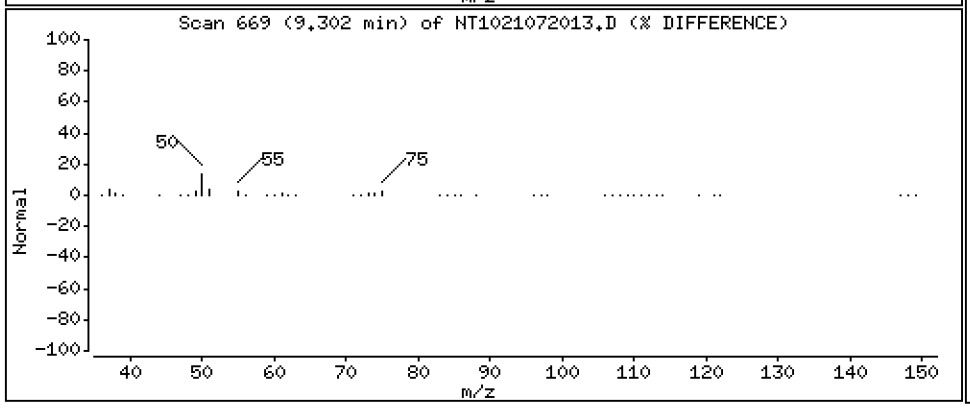
7 1,3-Dichlorobenzene

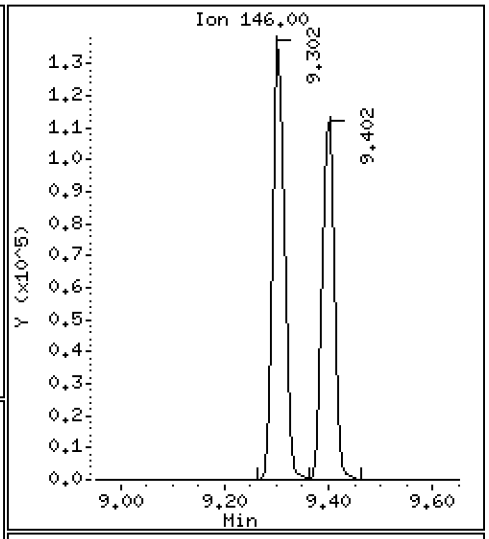
Concentration: 4.997 ug/mL

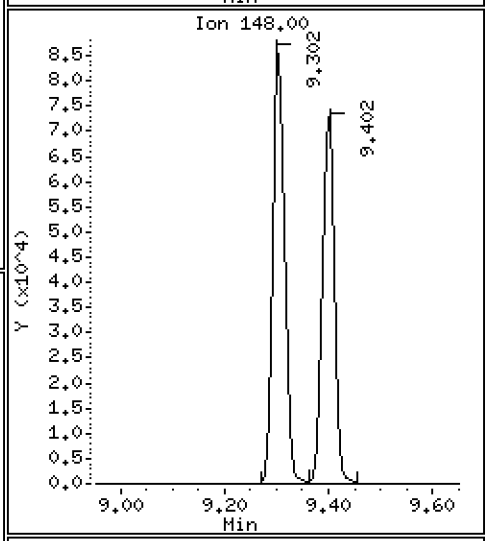


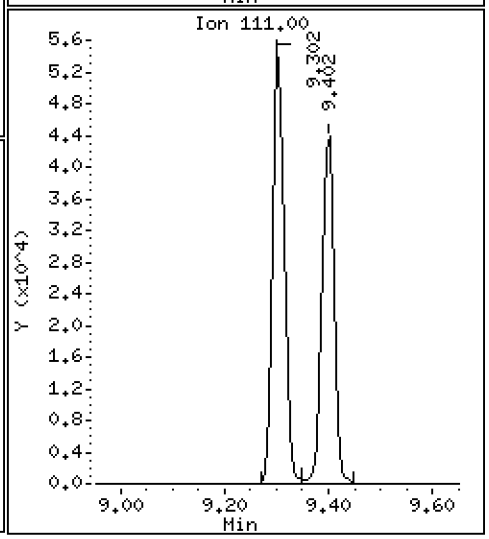












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

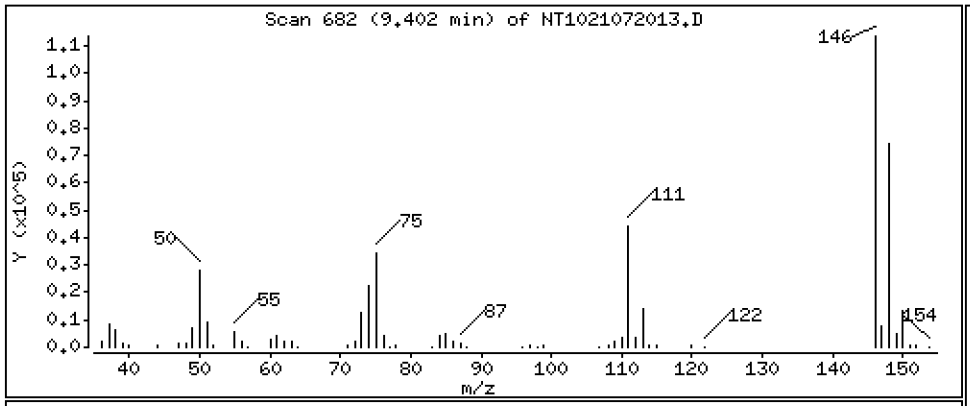
Operator: VTS

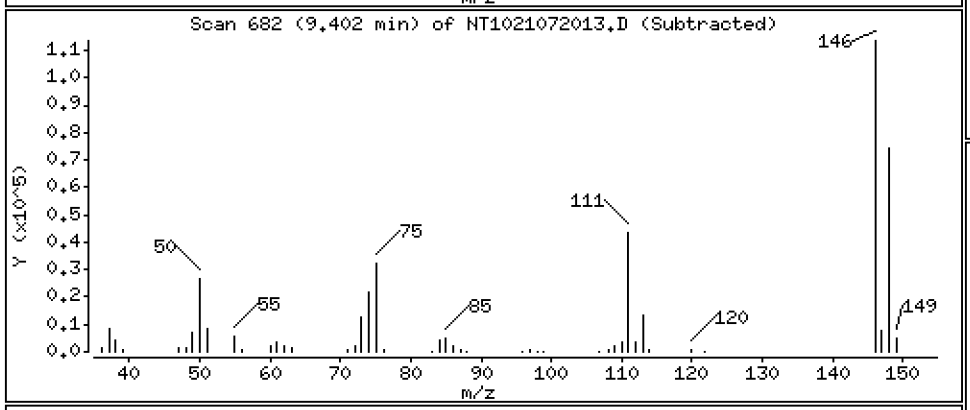
Column phase: ZB-5msi

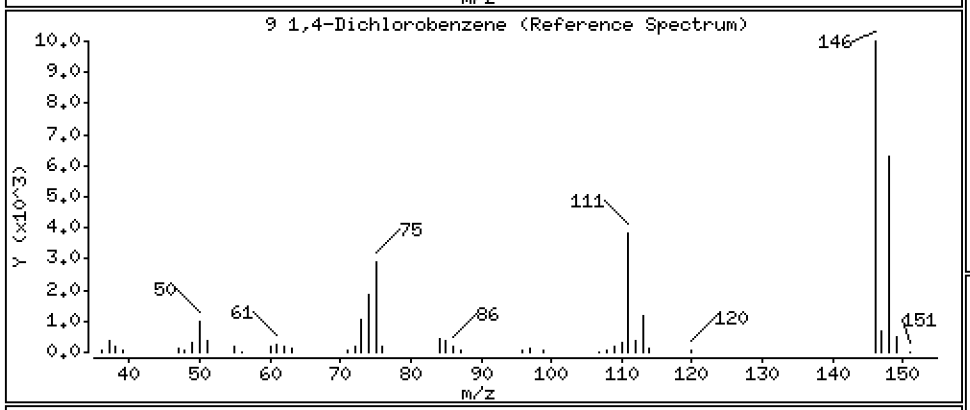
Column diameter: 0.25

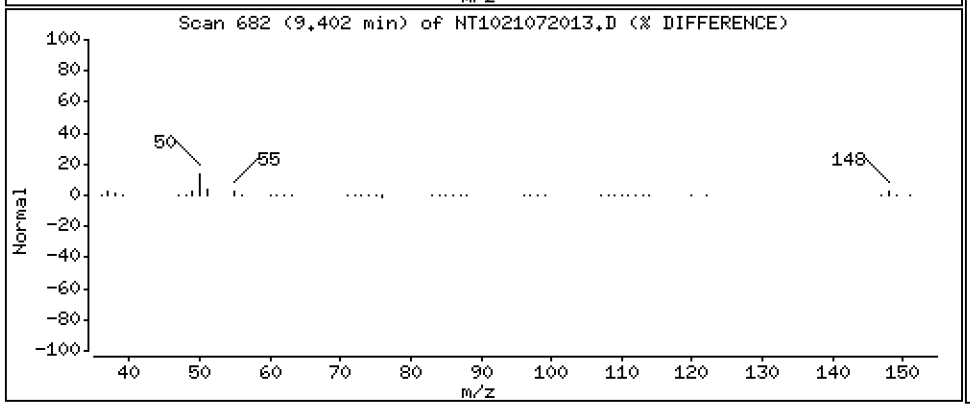
9 1,4-Dichlorobenzene

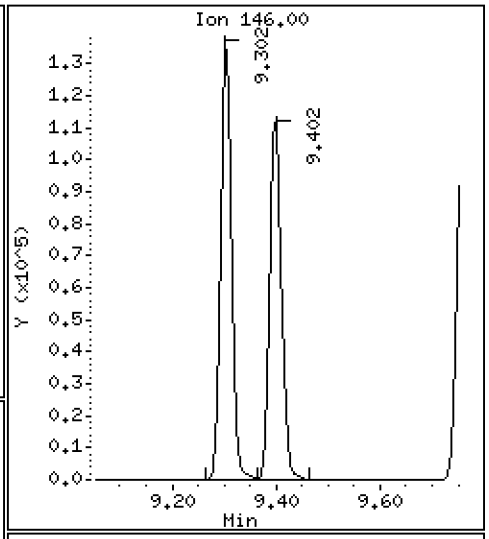
Concentration: 4.998 ug/mL

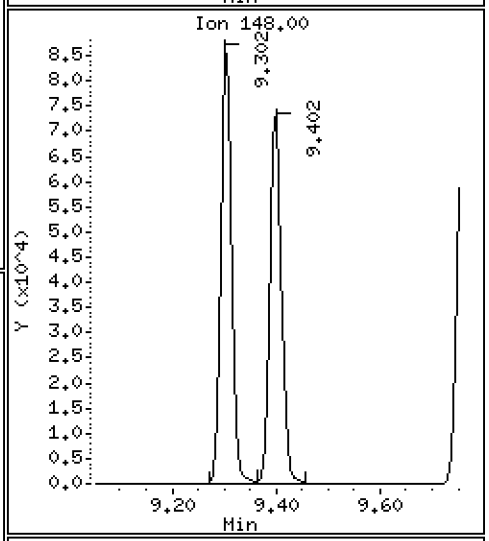


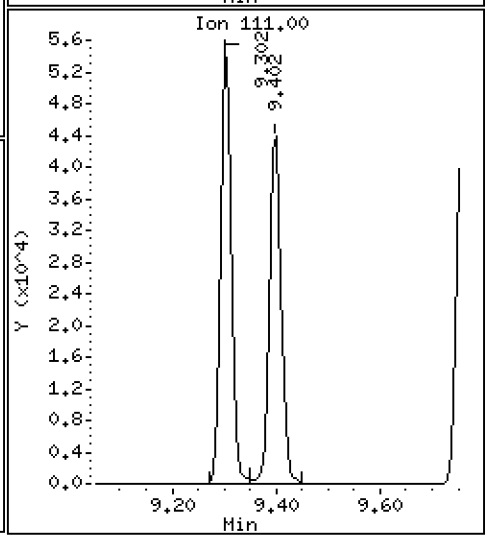












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

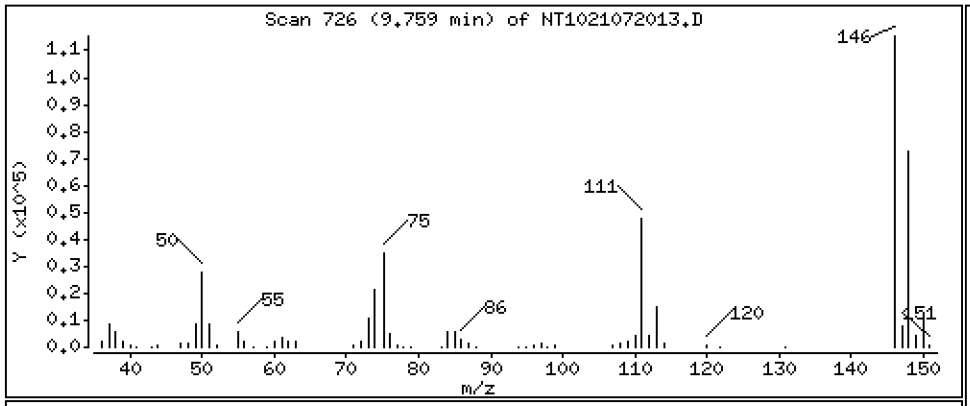
Operator: VTS

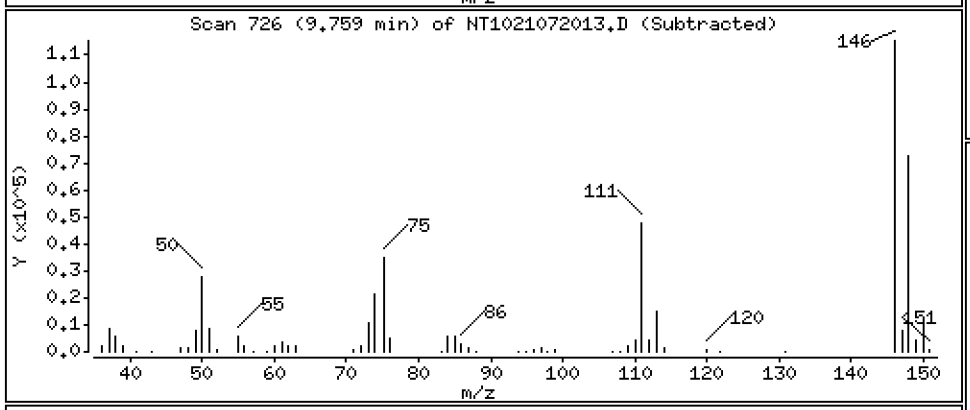
Column phase: ZB-5msi

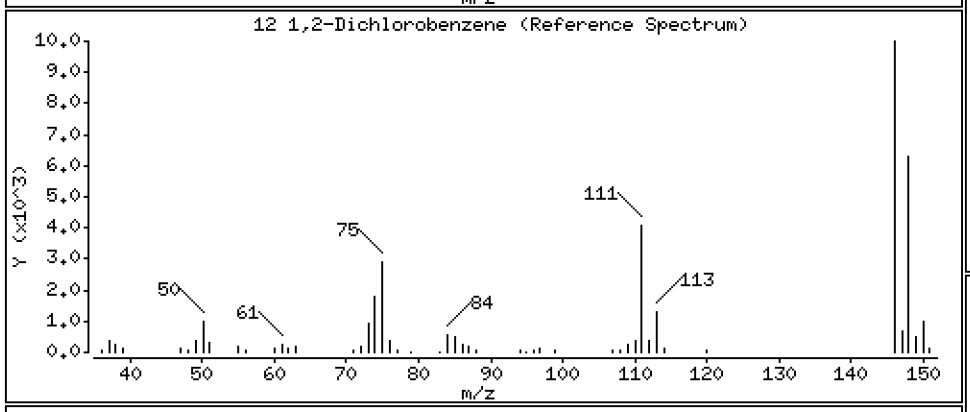
Column diameter: 0.25

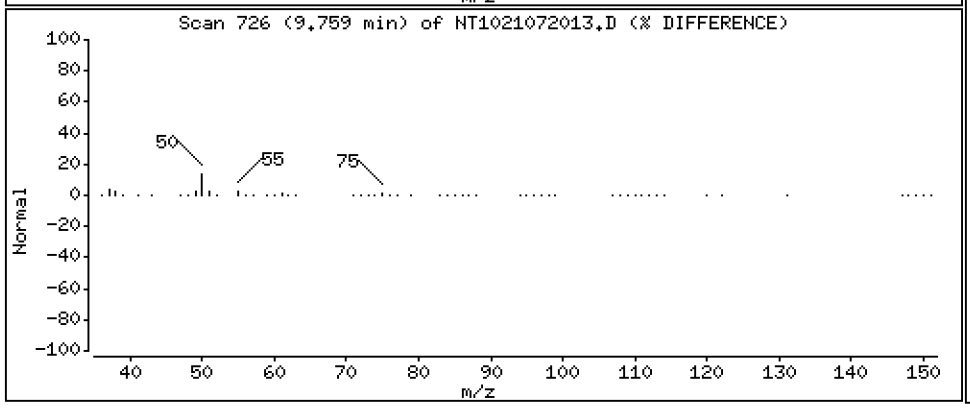
12 1,2-Dichlorobenzene

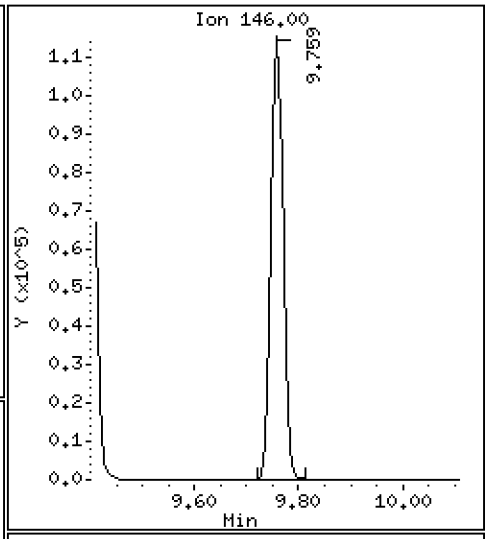
Concentration: 4.742 ug/mL

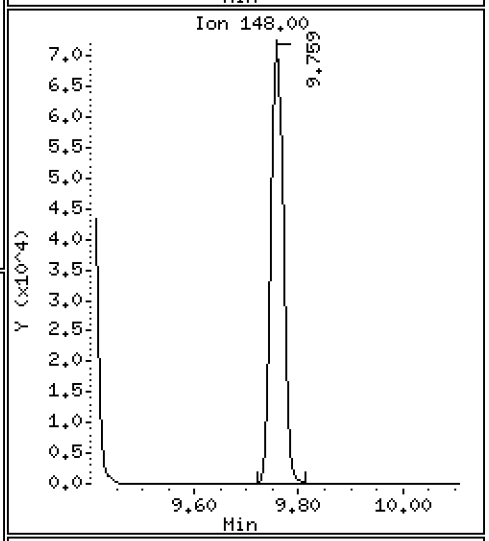


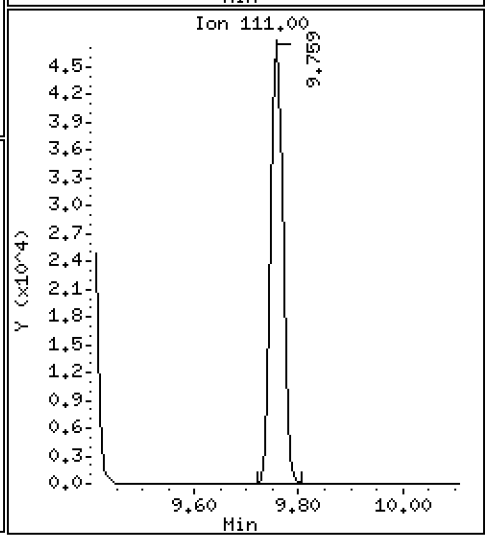












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

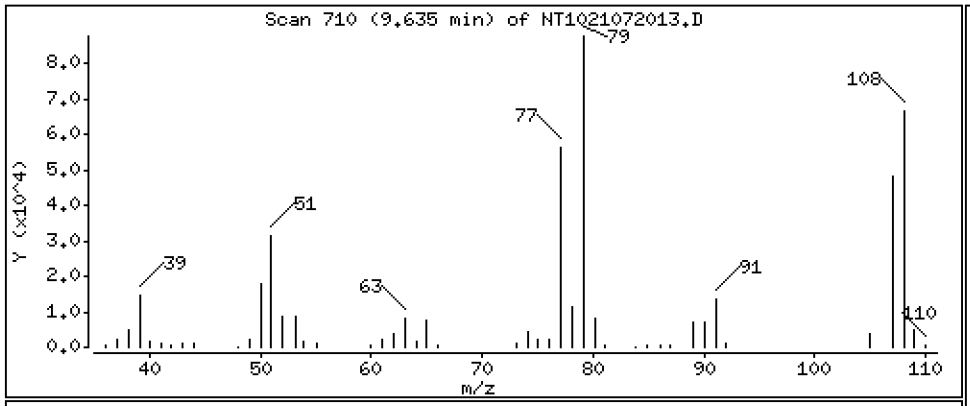
Operator: VTS

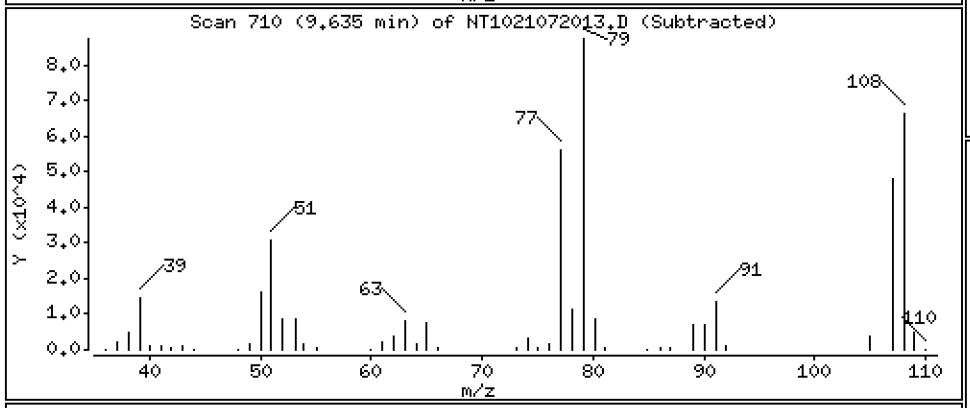
Column phase: ZB-5msi

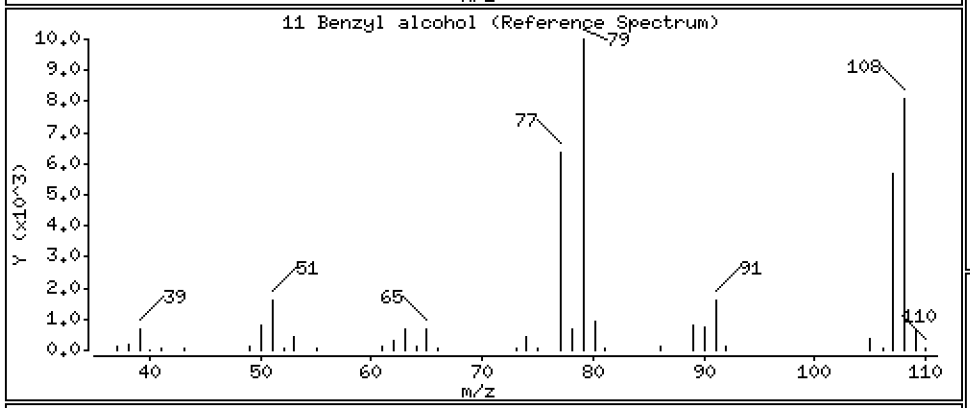
Column diameter: 0.25

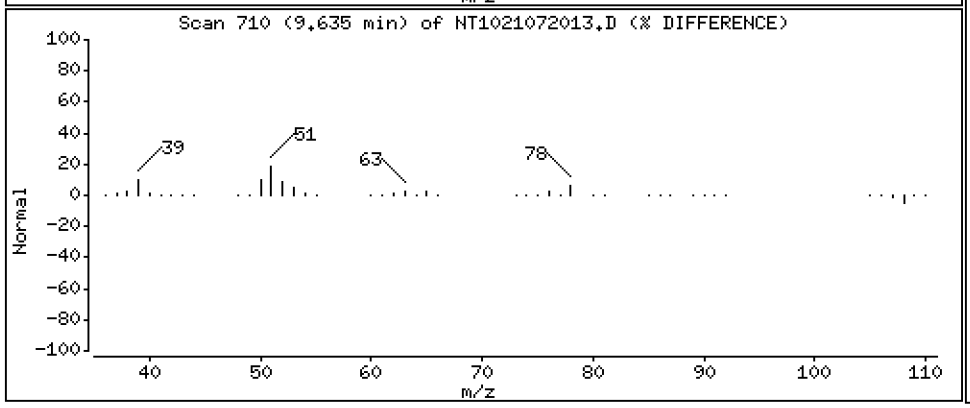
11 Benzyl alcohol

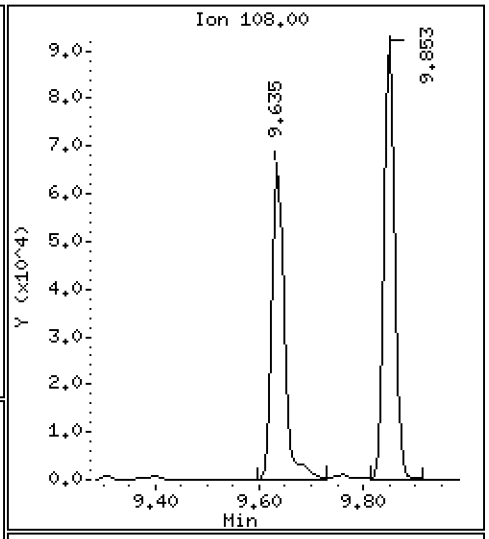
Concentration: 4.516 ug/mL

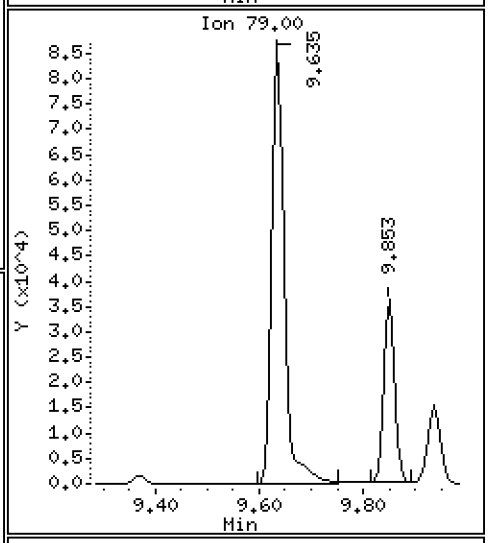


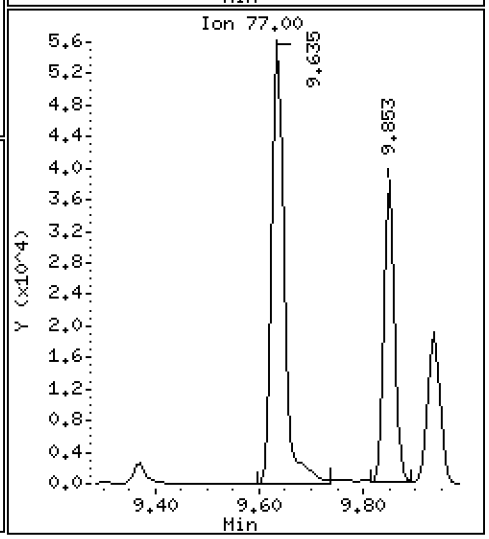












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Date : 20-JUL-2021 19:24

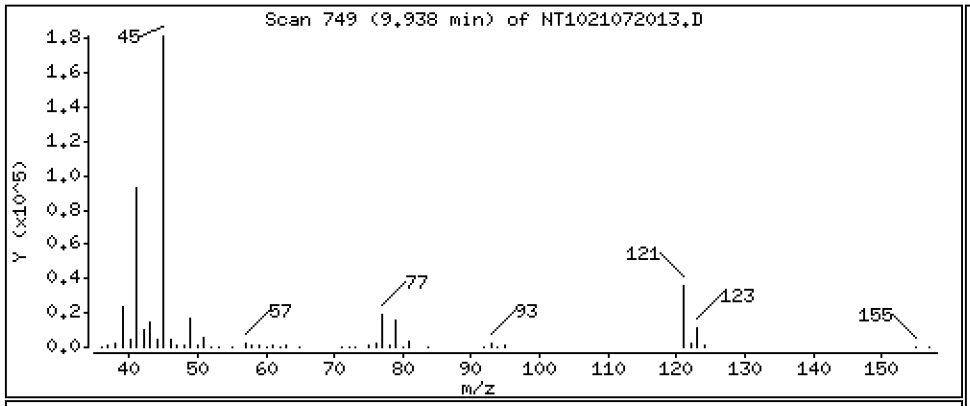
Client ID: Instrument: nt10.i

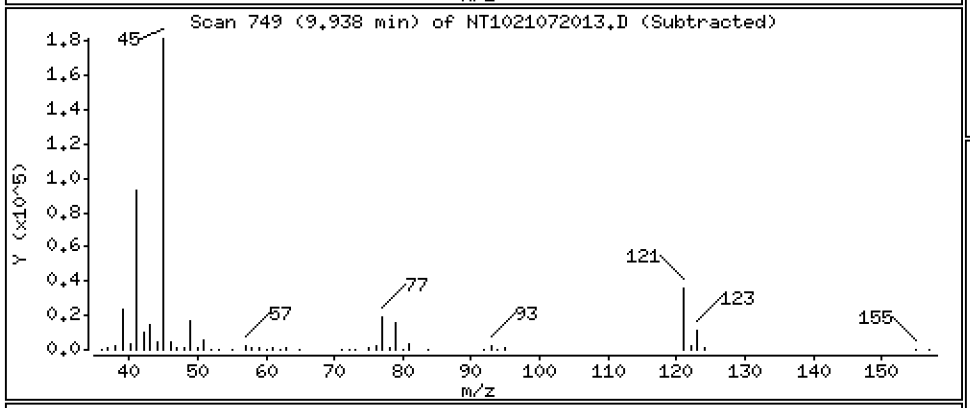
Sample Info: SJG0249-SCV1

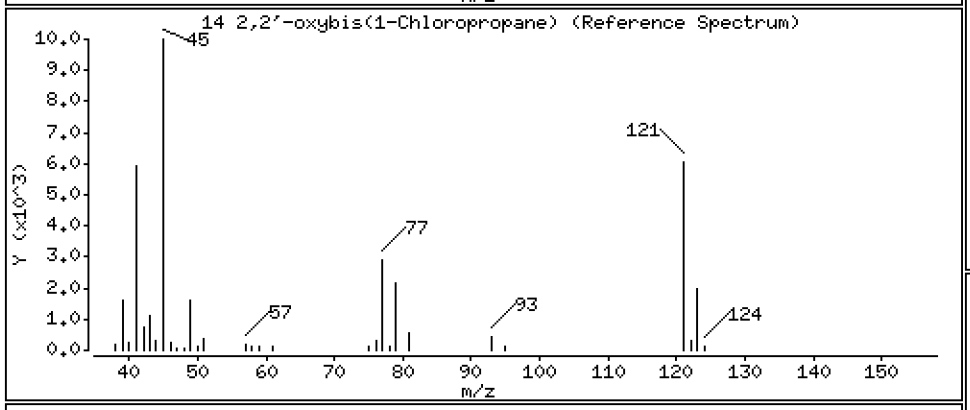
Operator: VTS

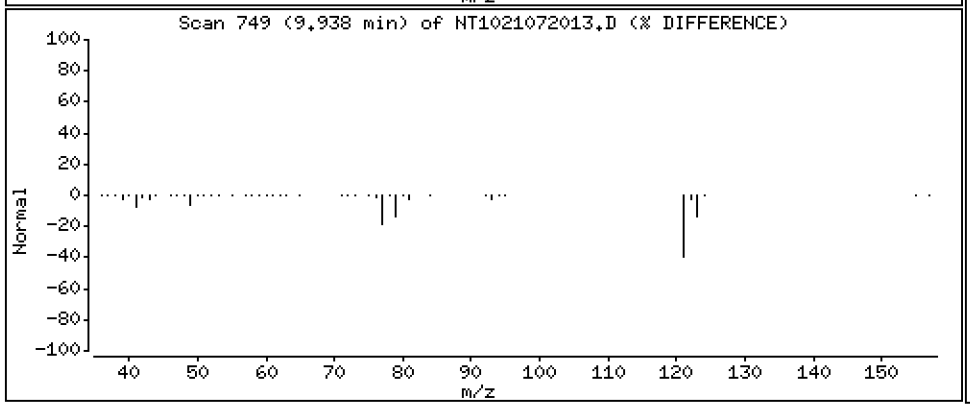
Column phase: ZB-5msi Column diameter: 0.25

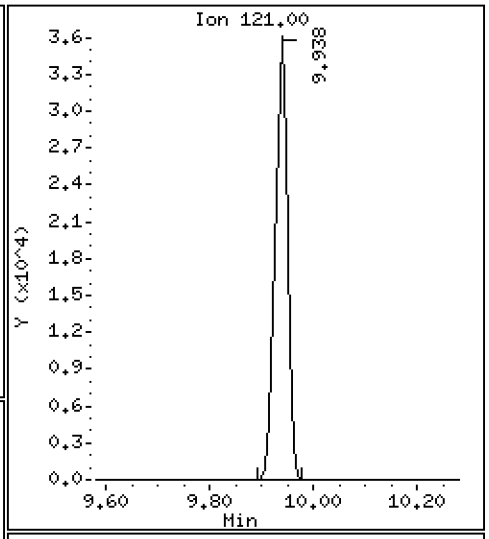
14 2,2'-oxybis(1-Chloropropane) Concentration: 4.048 ug/mL

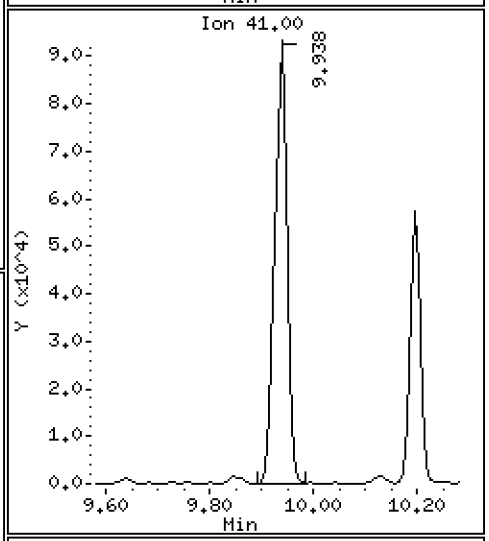


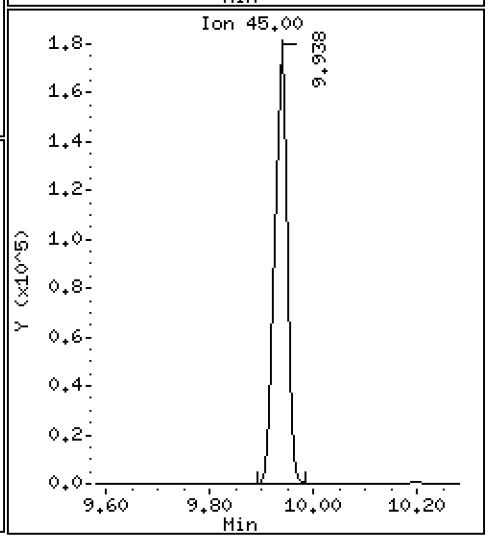












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

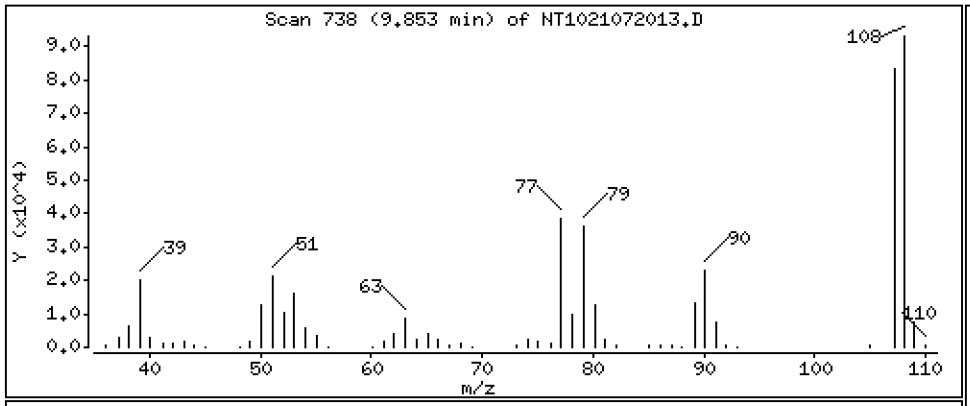
Operator: VTS

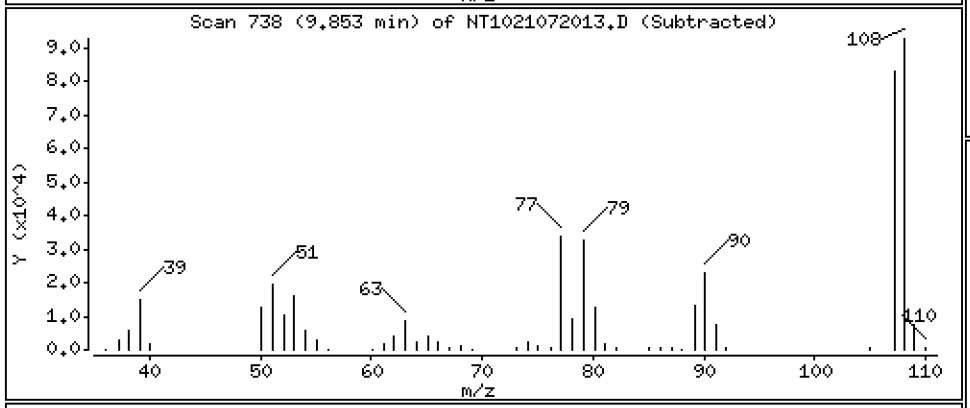
Column phase: ZB-5msi

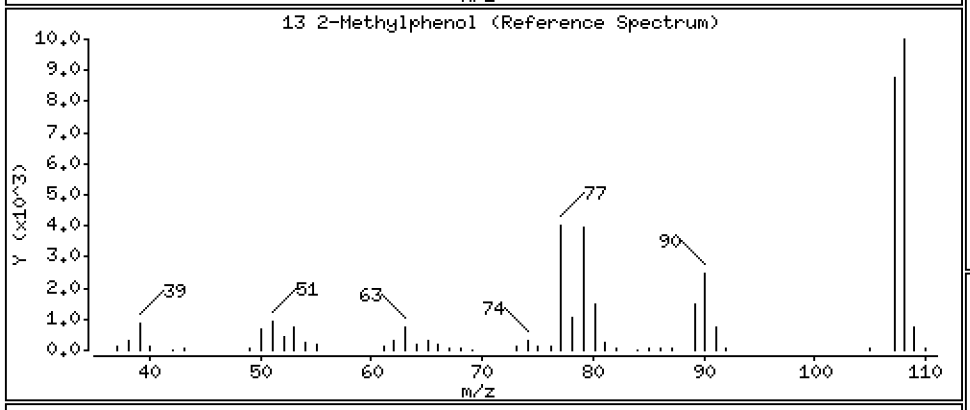
Column diameter: 0.25

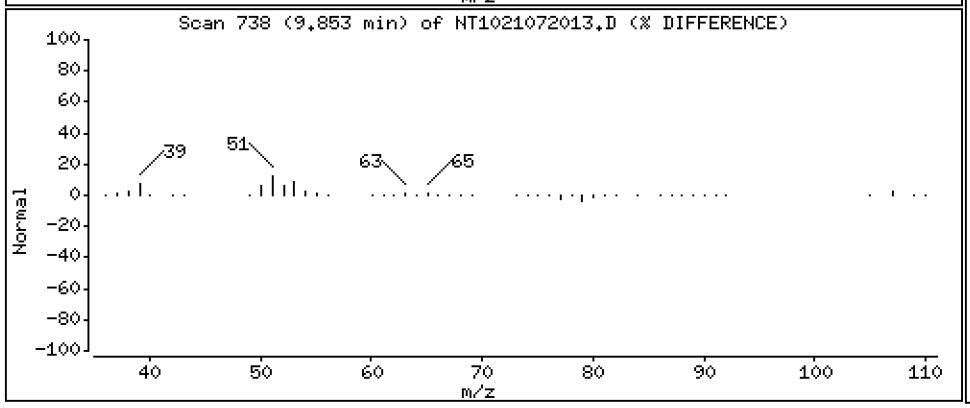
13 2-Methylphenol

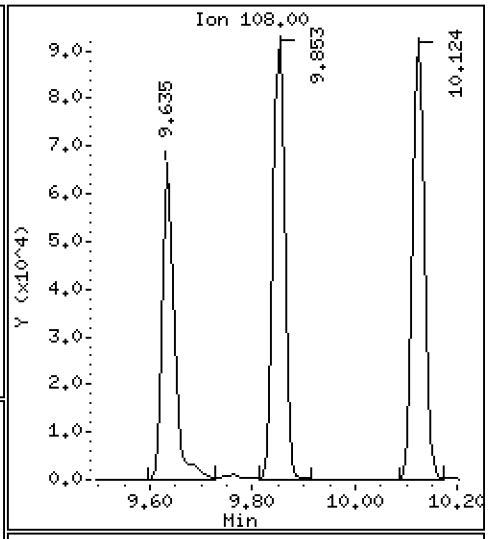
Concentration: 4.397 ug/mL

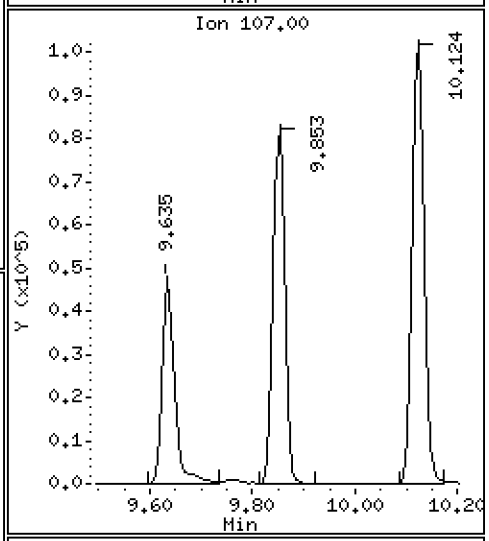


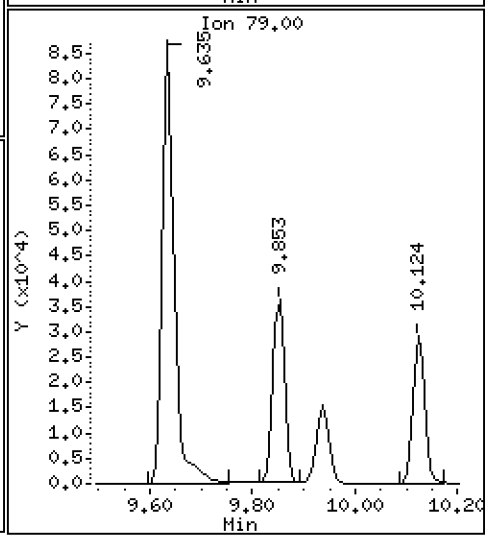












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

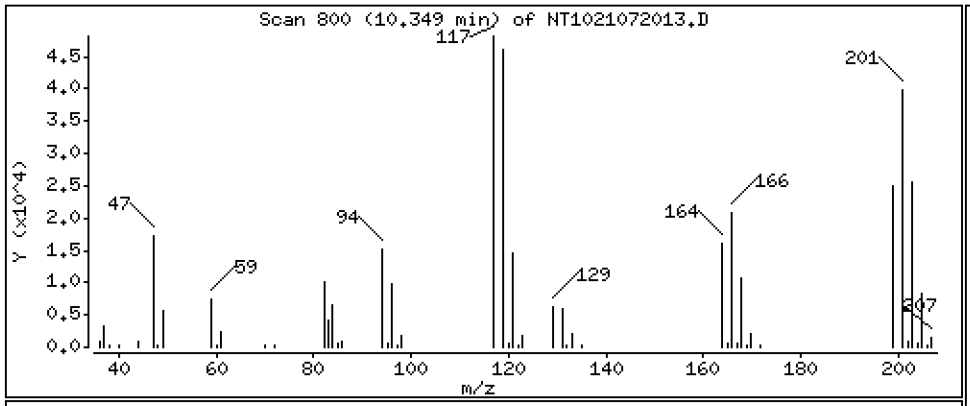
Operator: VTS

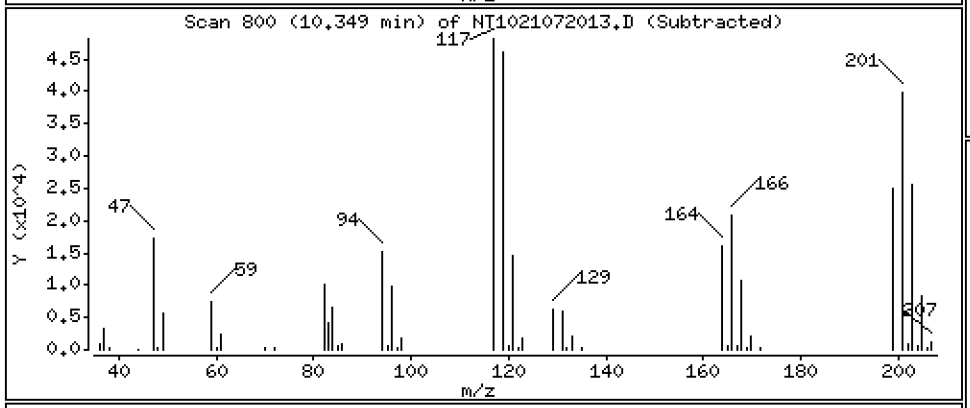
Column phase: ZB-5msi

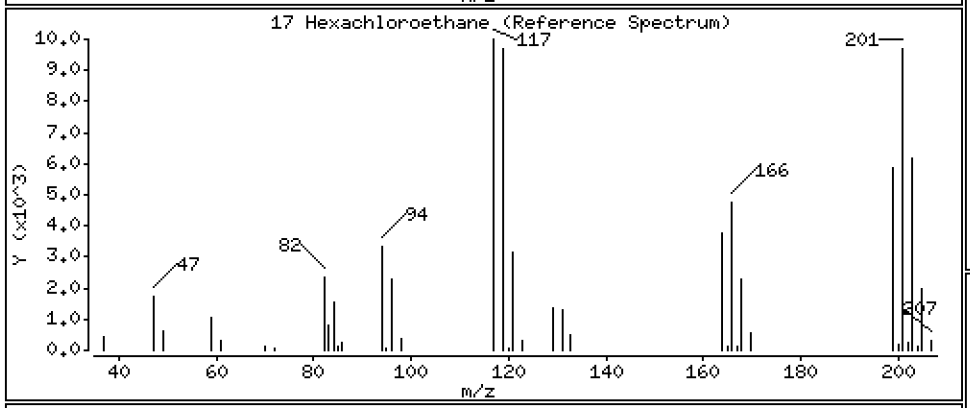
Column diameter: 0.25

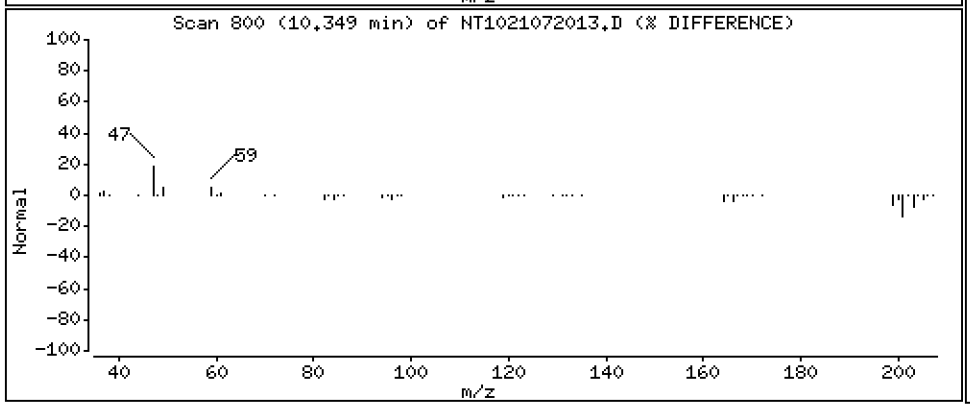
17 Hexachloroethane

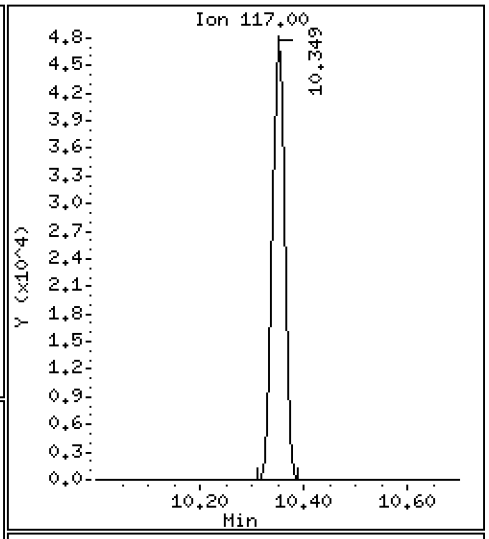
Concentration: 4.914 ug/mL

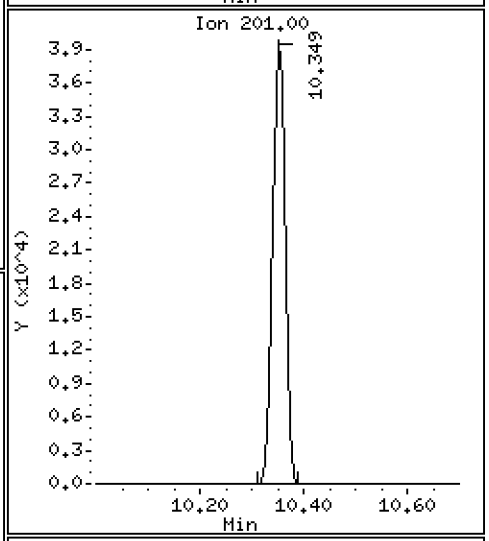


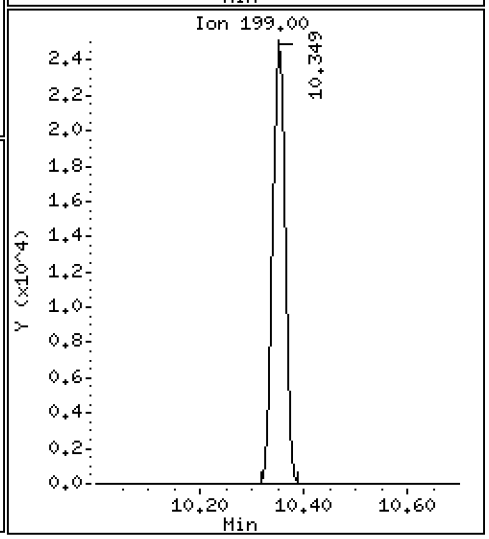












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

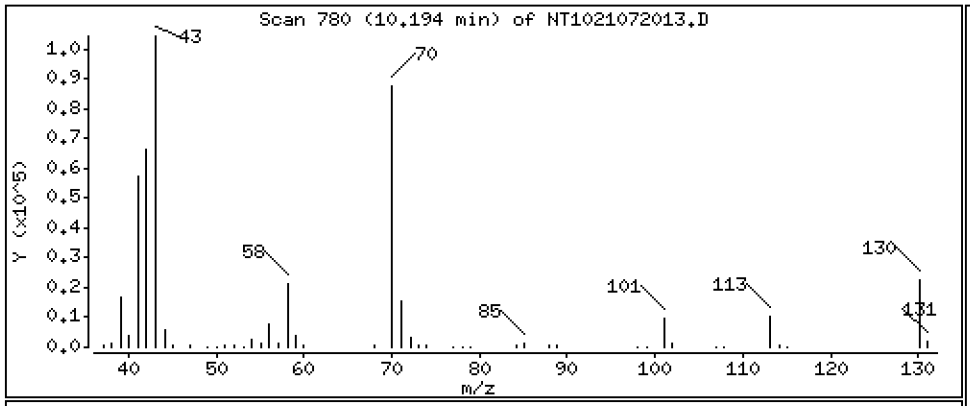
Operator: VTS

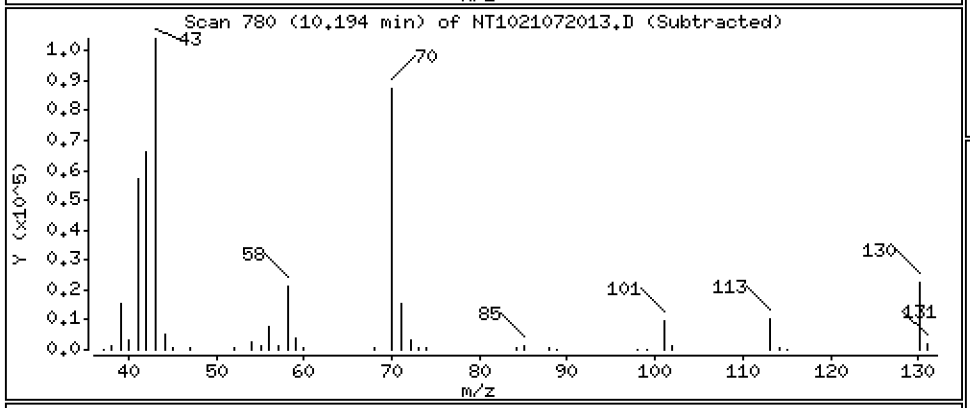
Column phase: ZB-5msi

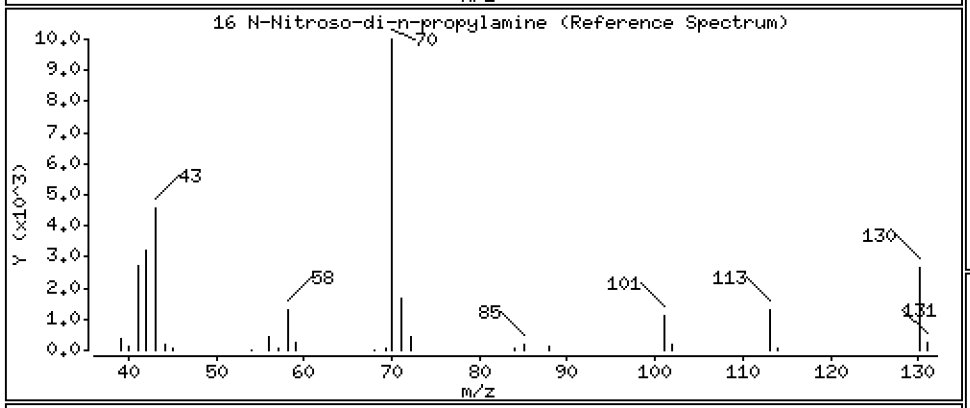
Column diameter: 0.25

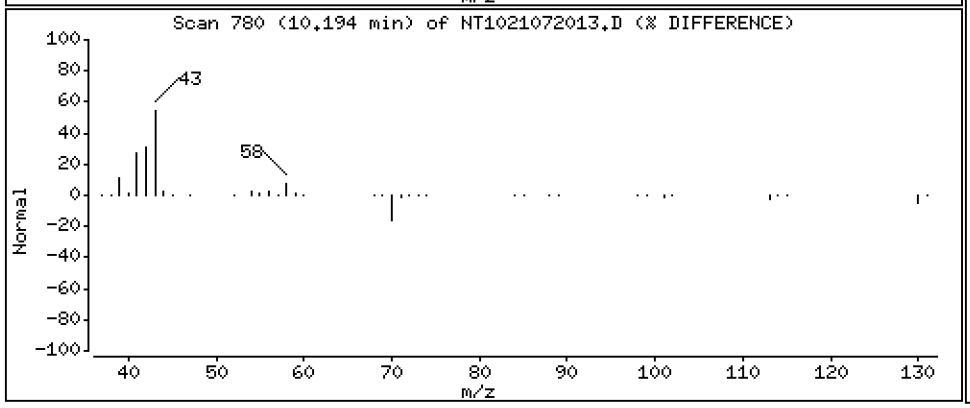
16 N-Nitroso-di-n-propylamine

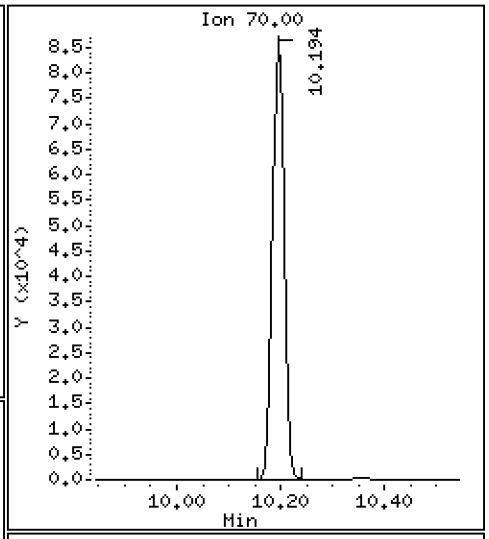
Concentration: 4.742 ug/mL

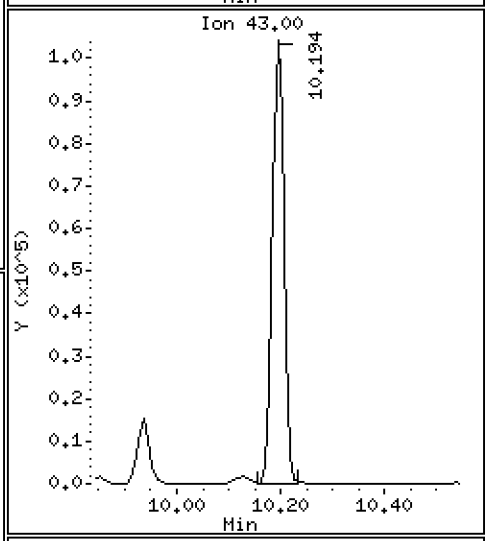


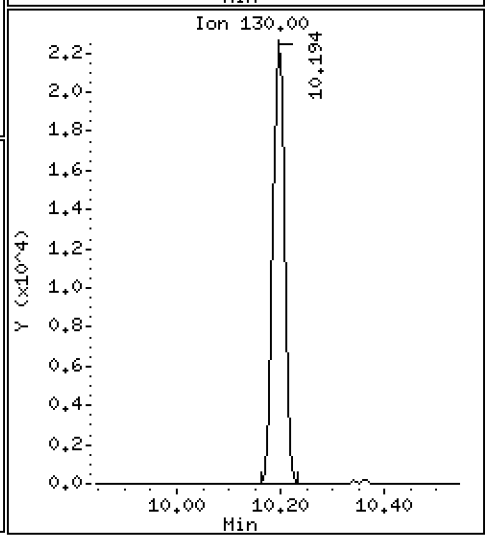












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

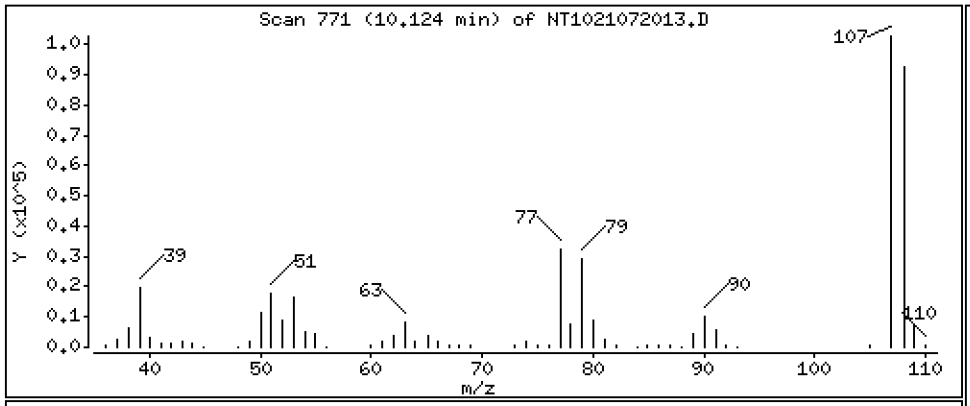
Operator: VTS

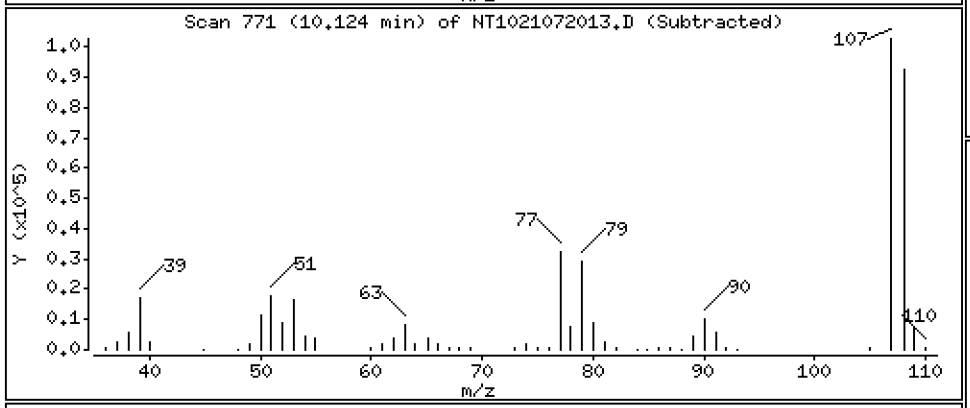
Column phase: ZB-5msi

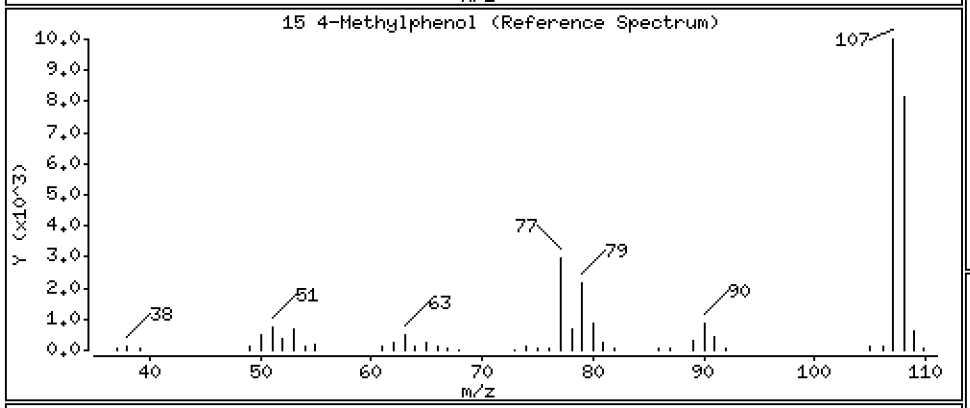
Column diameter: 0.25

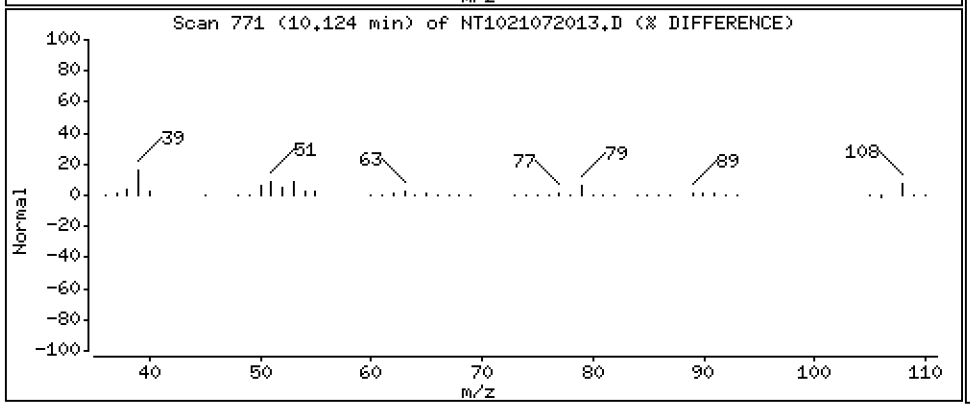
15 4-Methylphenol

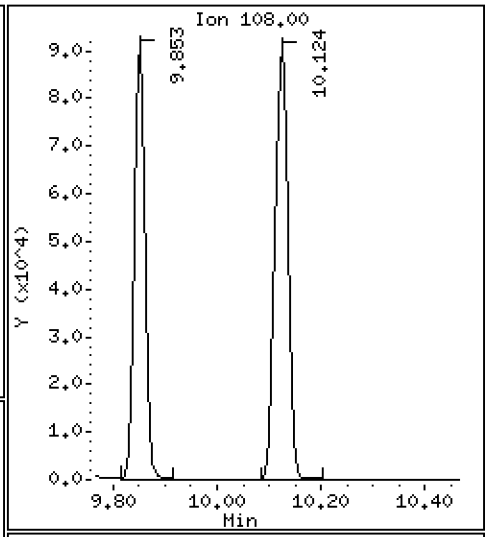
Concentration: 4.667 ug/mL

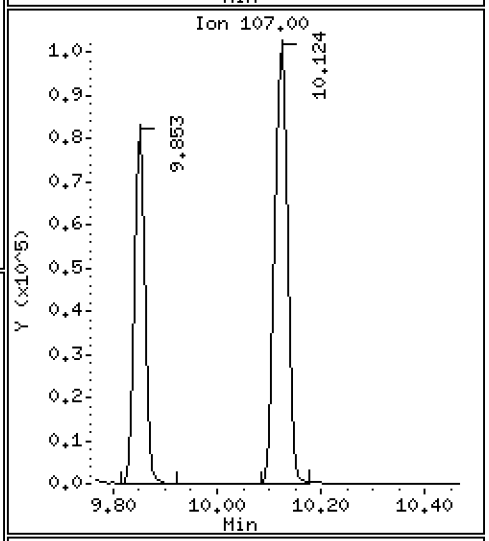


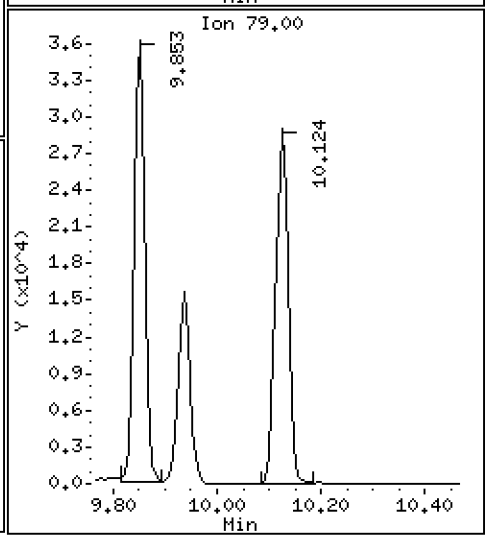












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

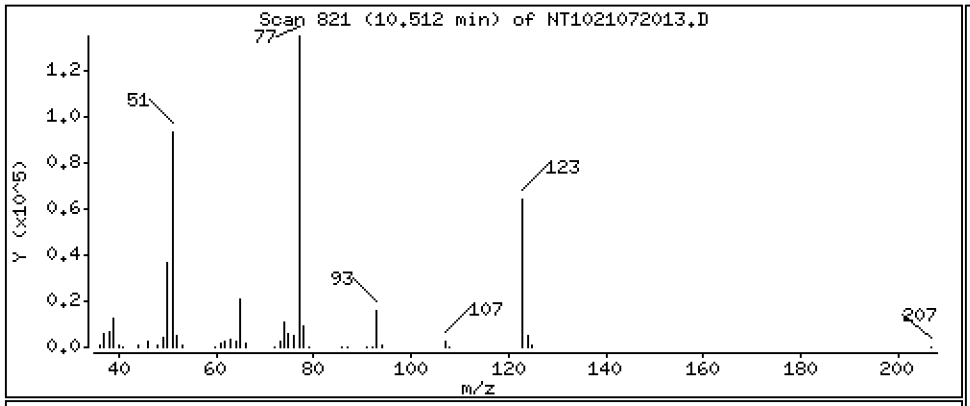
Operator: VTS

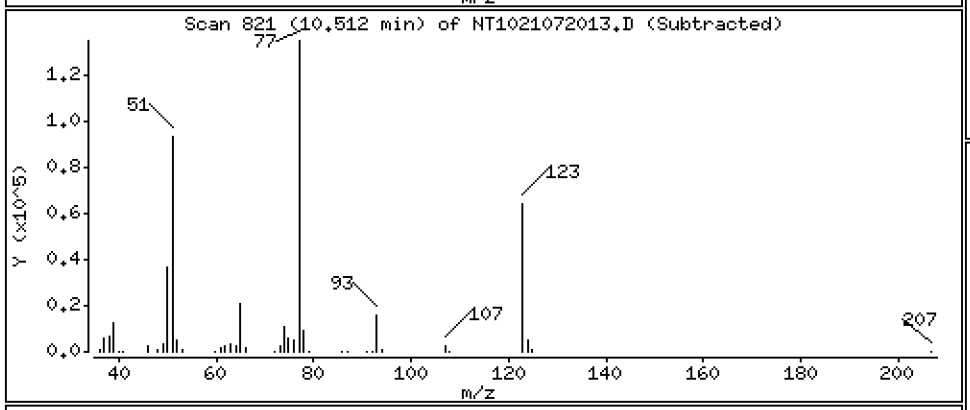
Column phase: ZB-5msi

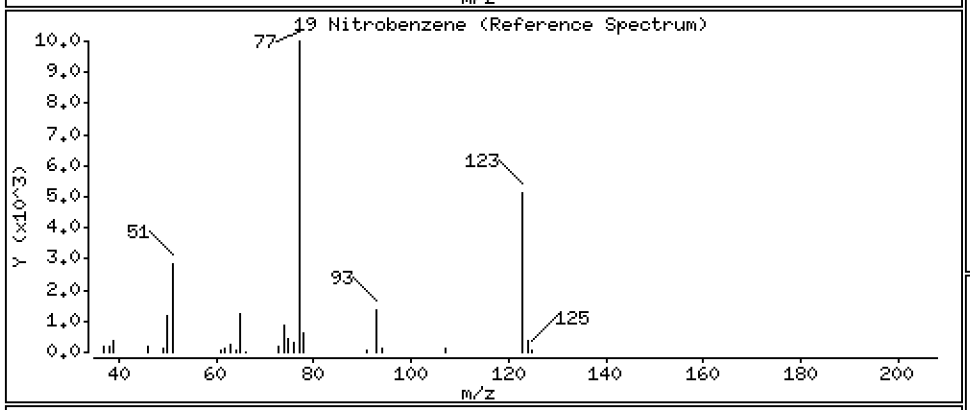
Column diameter: 0.25

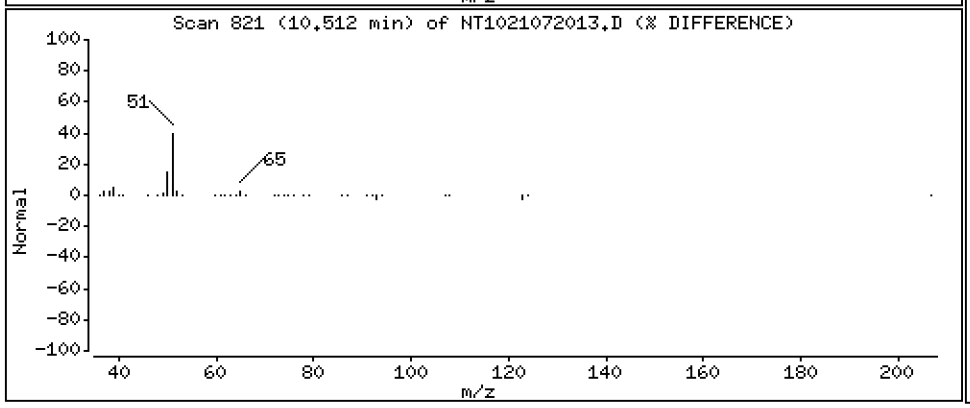
19 Nitrobenzene

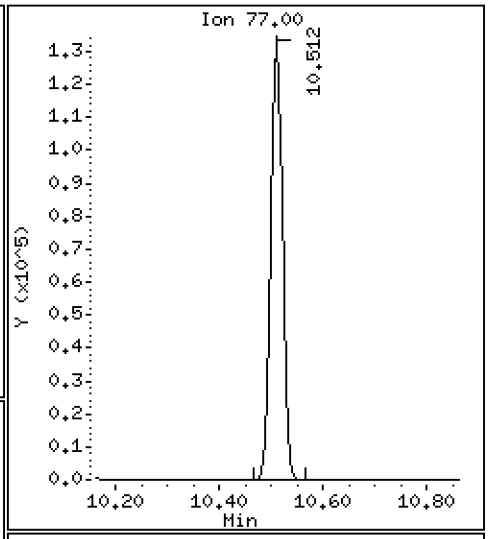
Concentration: 4.741 ug/mL

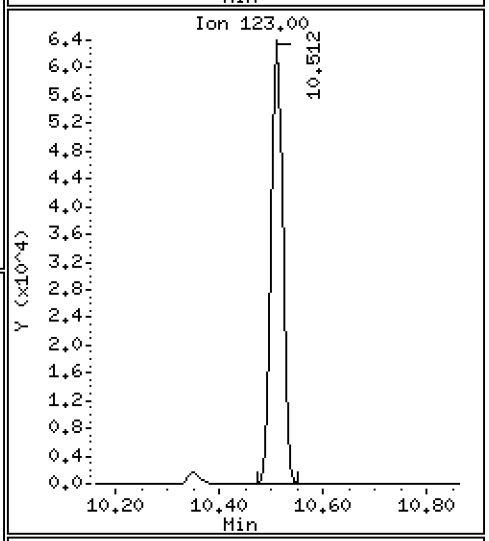


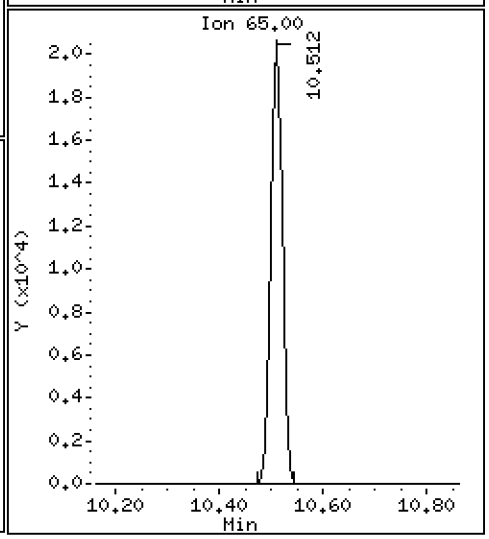












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

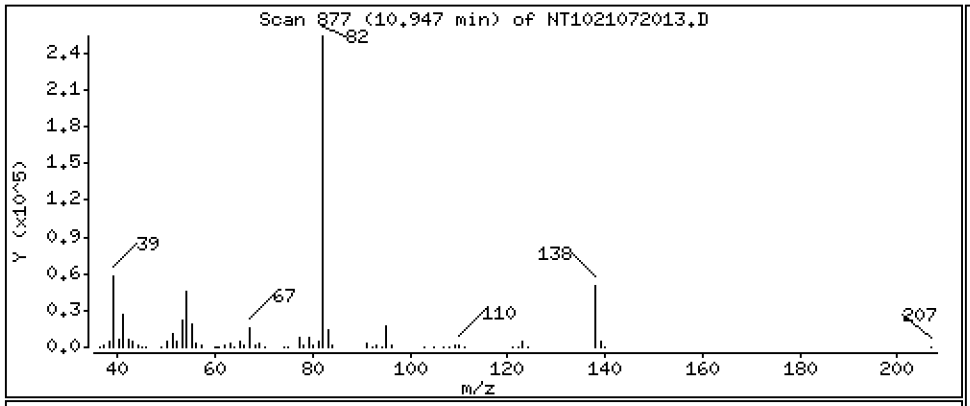
Operator: VTS

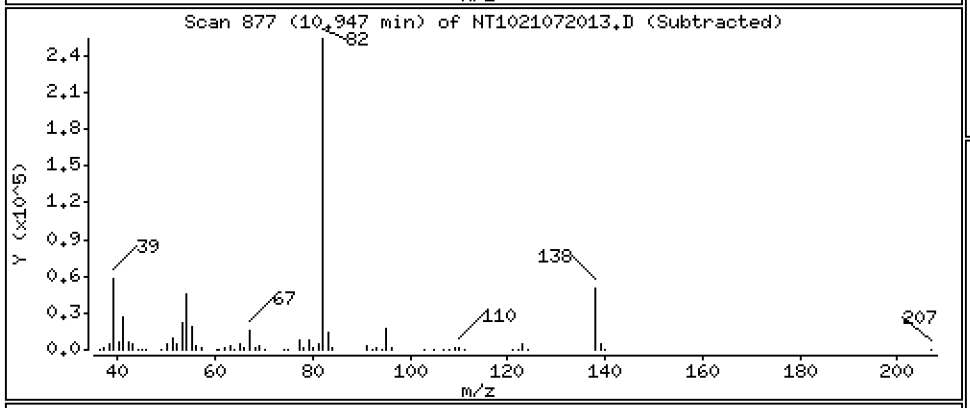
Column phase: ZB-5msi

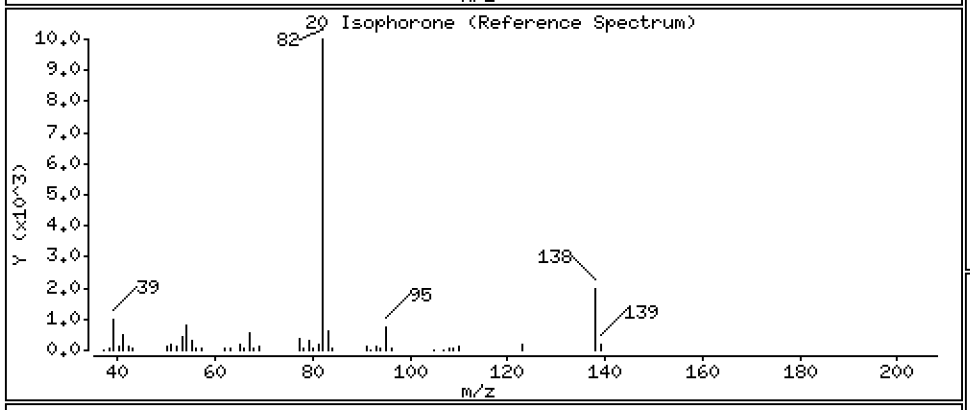
Column diameter: 0.25

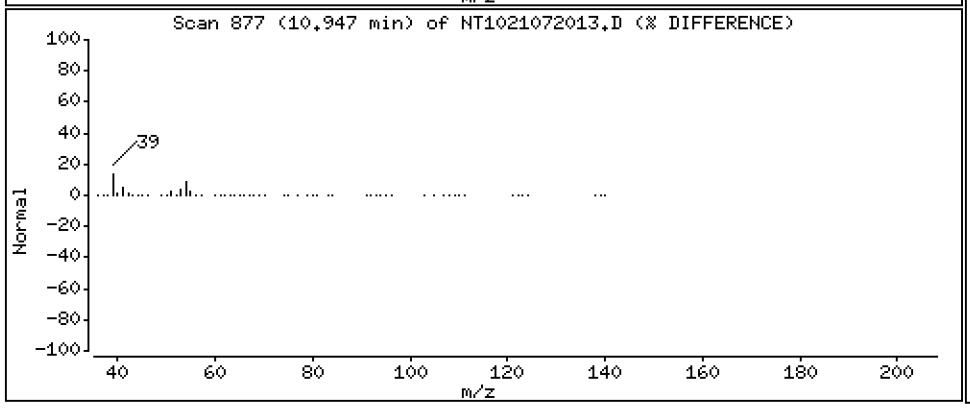
20 Isophorone

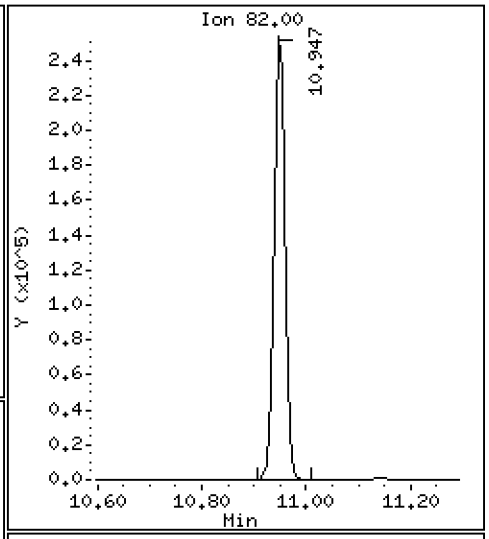
Concentration: 4.950 ug/mL

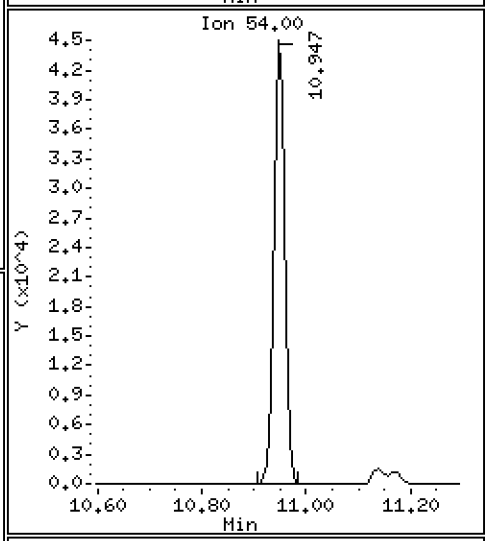


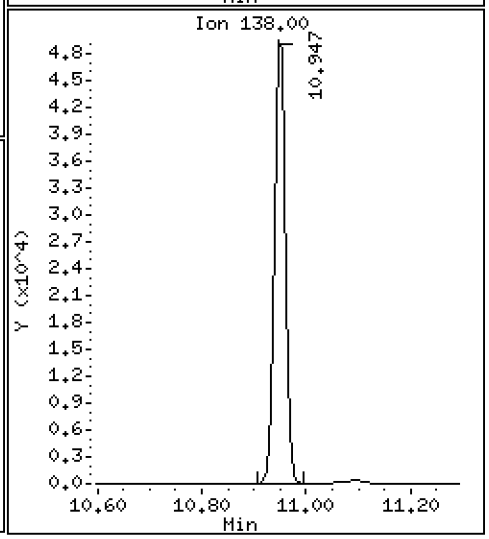












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

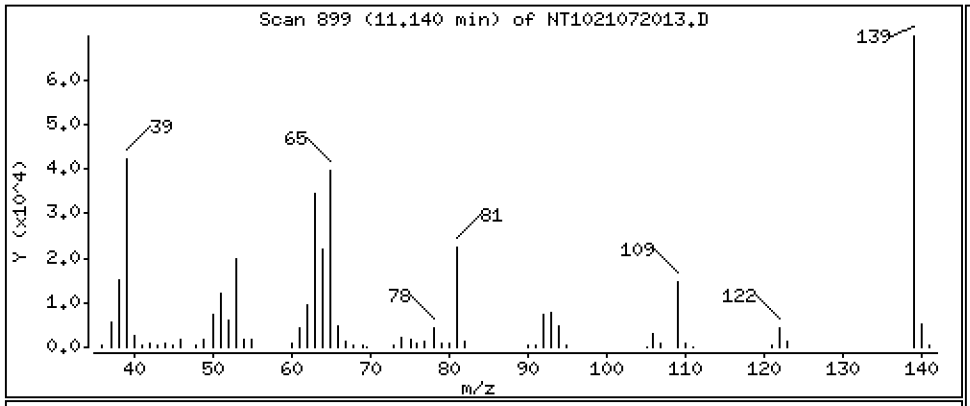
Operator: VTS

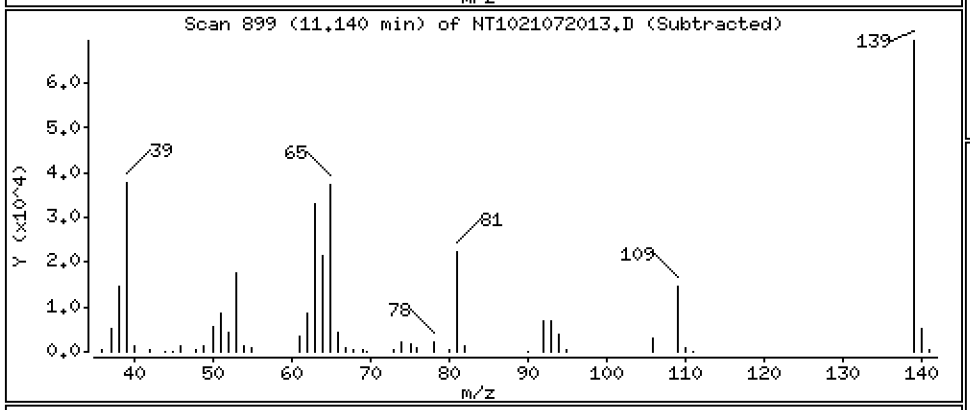
Column phase: ZB-5msi

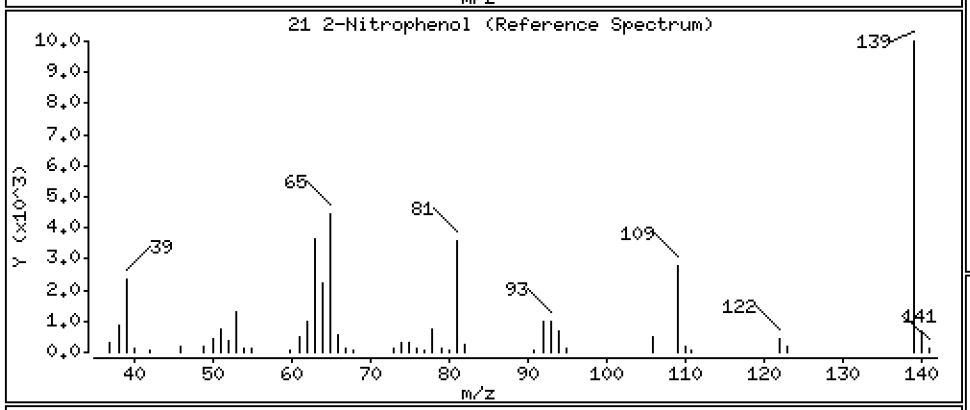
Column diameter: 0.25

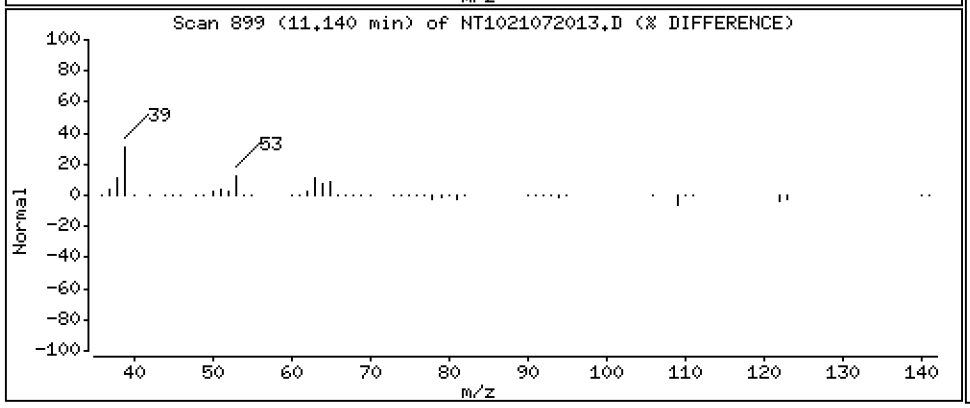
21 2-Nitrophenol

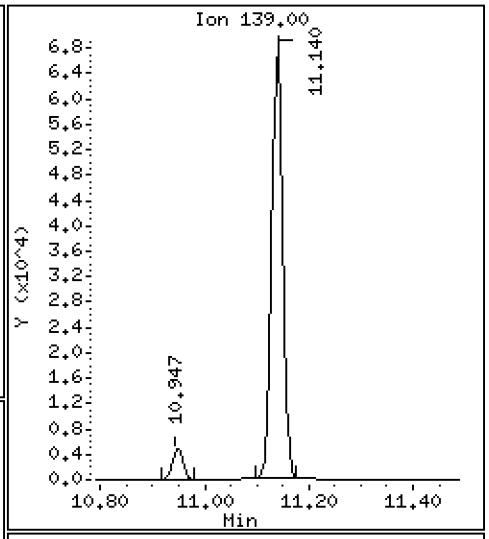
Concentration: 4.514 ug/mL

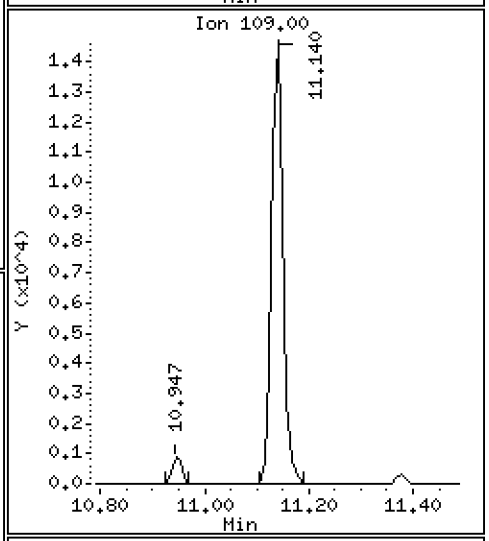


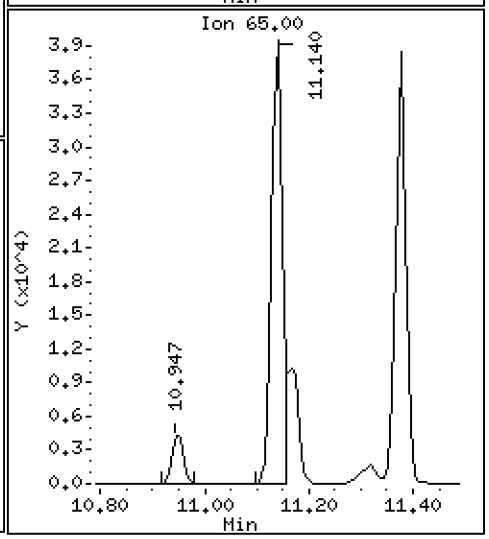












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

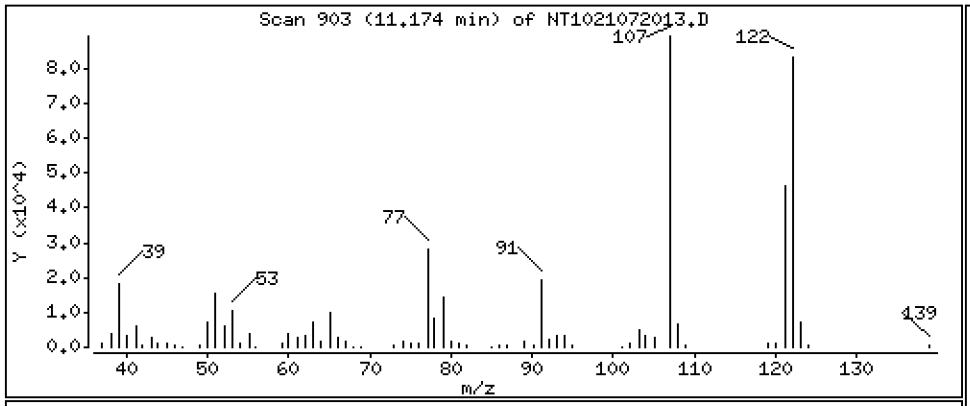
Operator: VTS

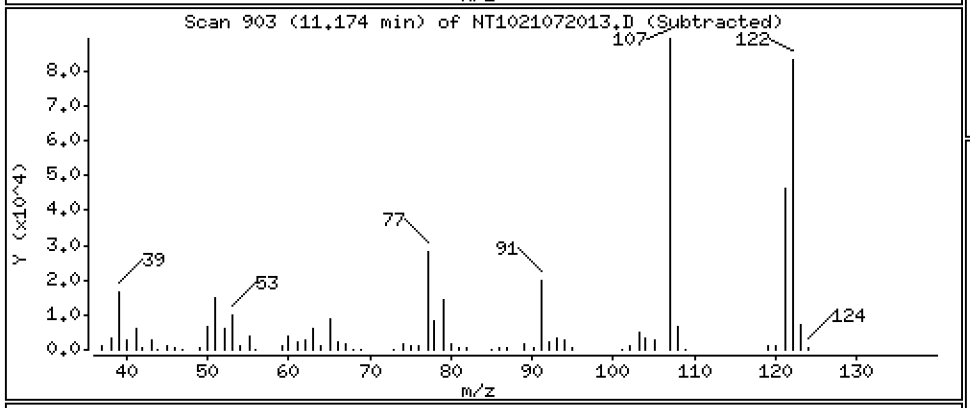
Column phase: ZB-5msi

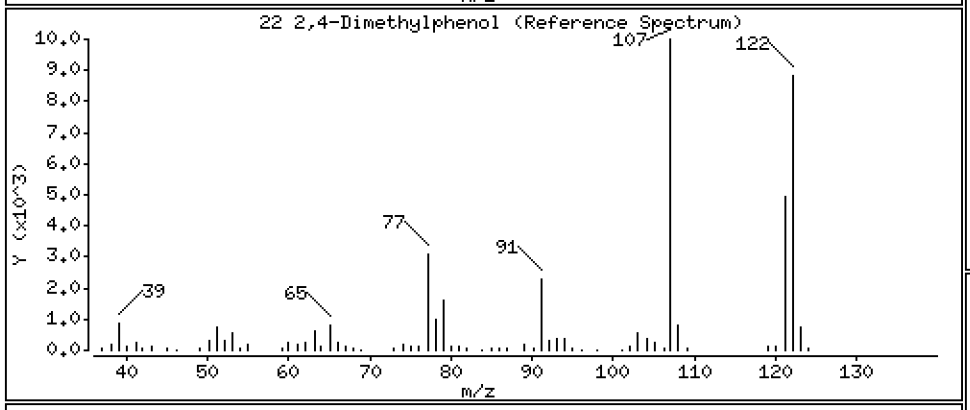
Column diameter: 0.25

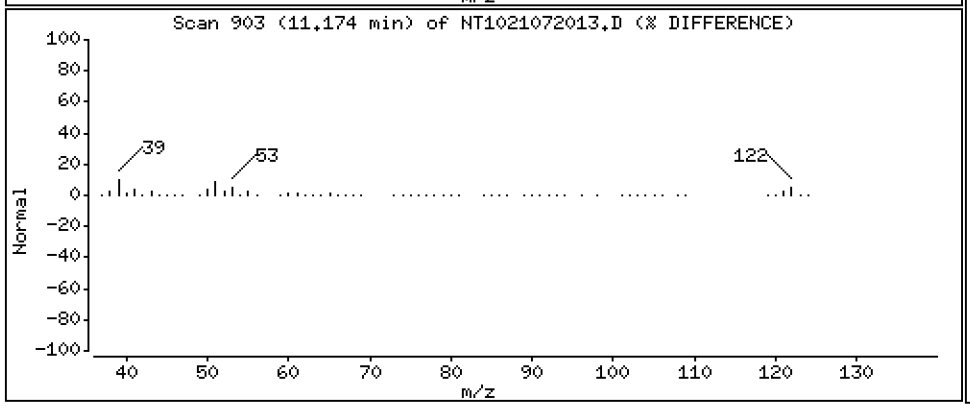
22 2,4-Dimethylphenol

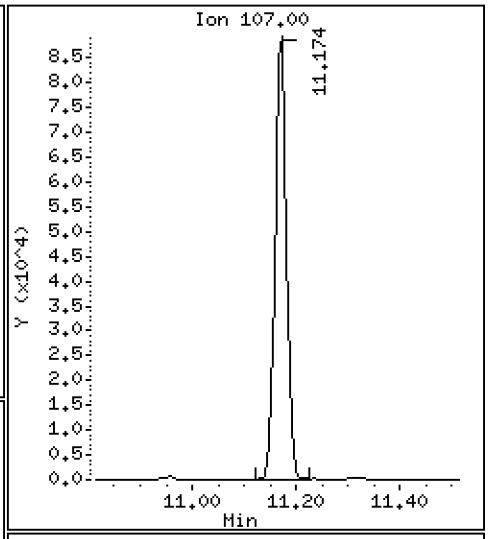
Concentration: 4.365 ug/mL

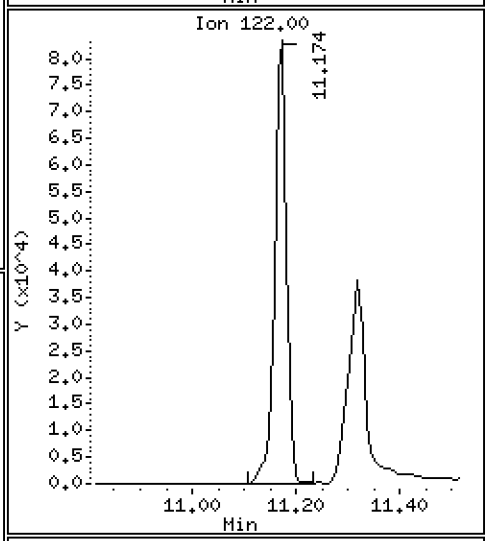


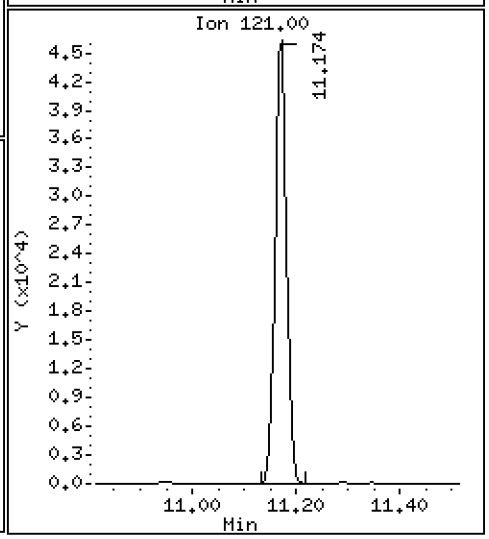












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

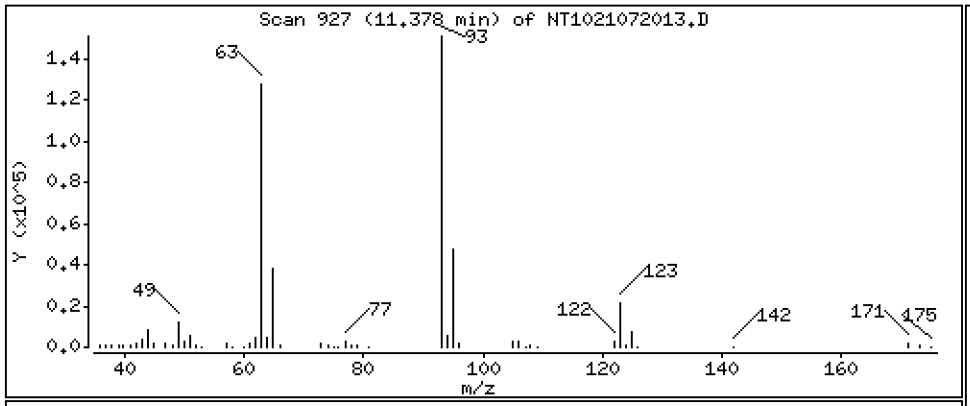
Operator: VTS

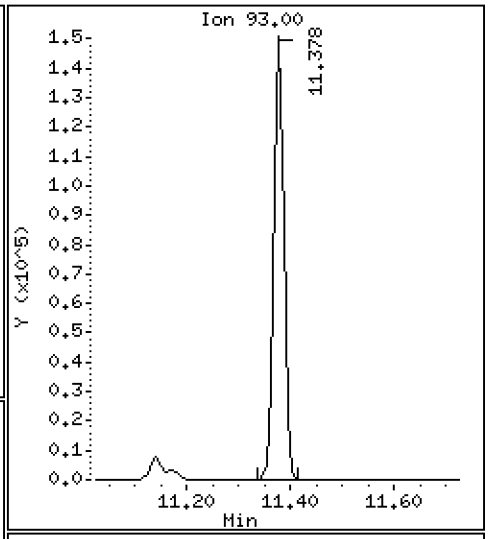
Column phase: ZB-5msi

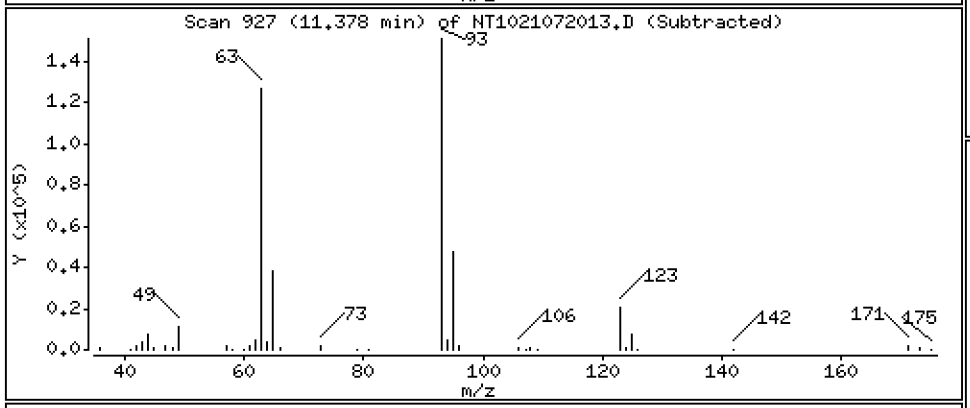
Column diameter: 0.25

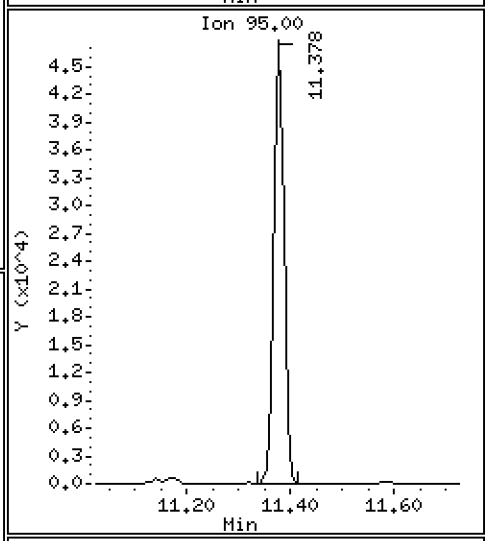
23 Bis(2-Chloroethoxy)methane

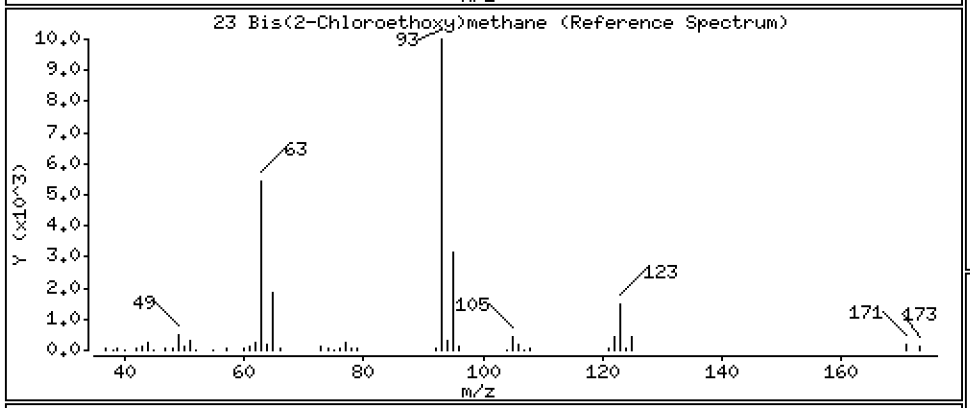
Concentration: 5.003 ug/mL

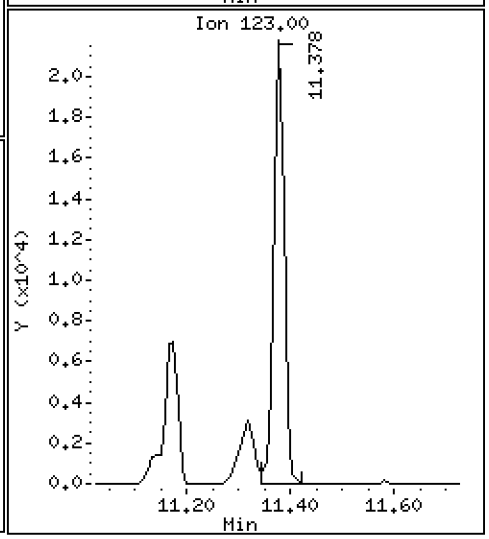


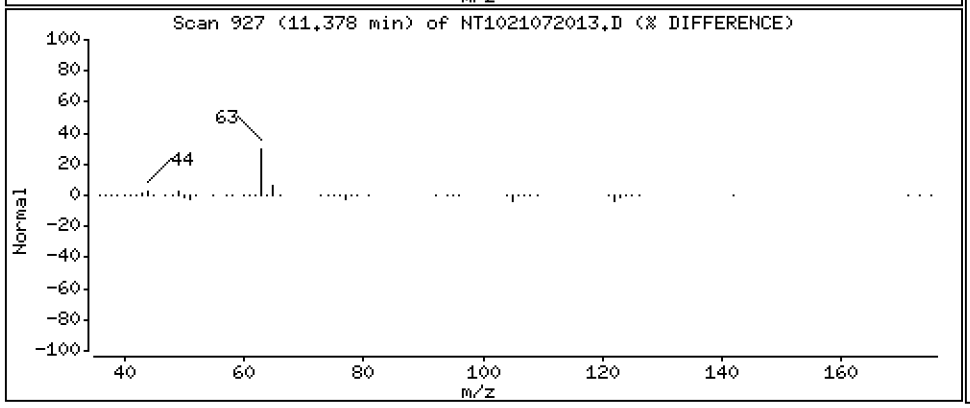












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

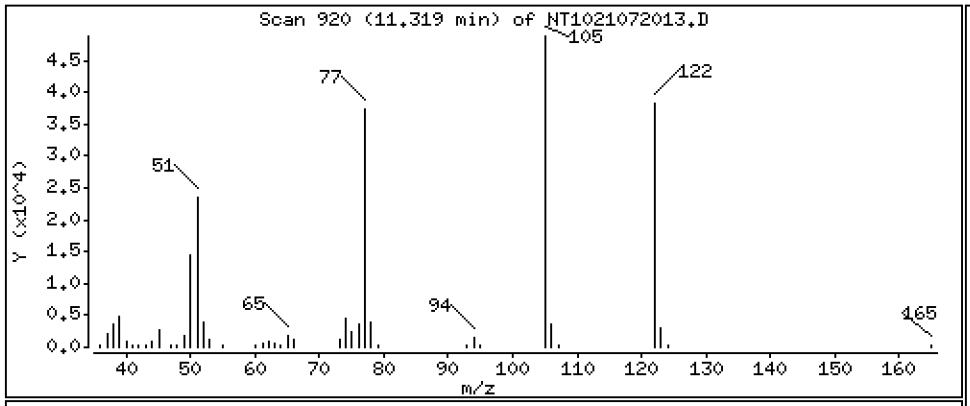
Operator: VTS

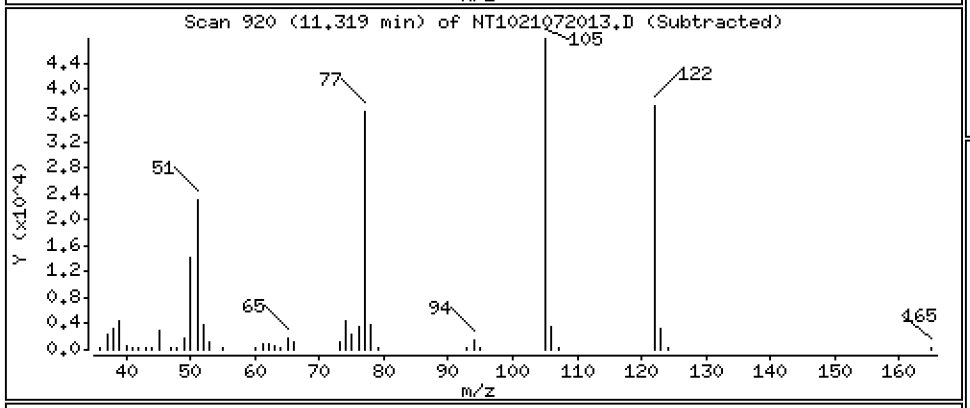
Column phase: ZB-5msi

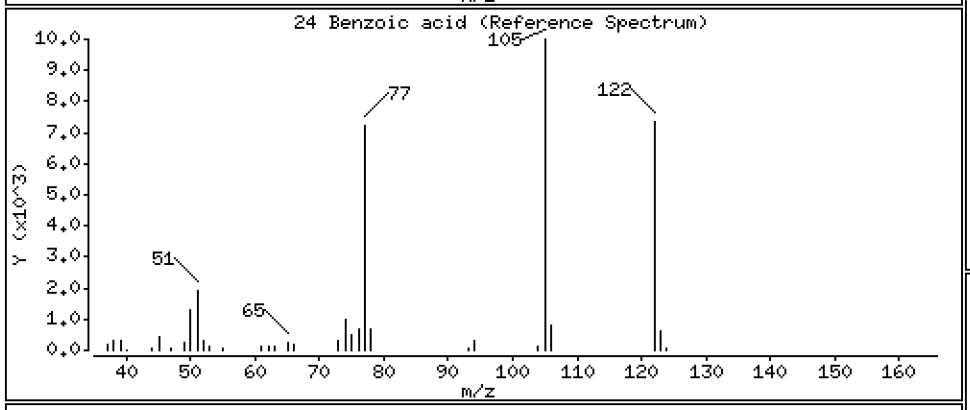
Column diameter: 0.25

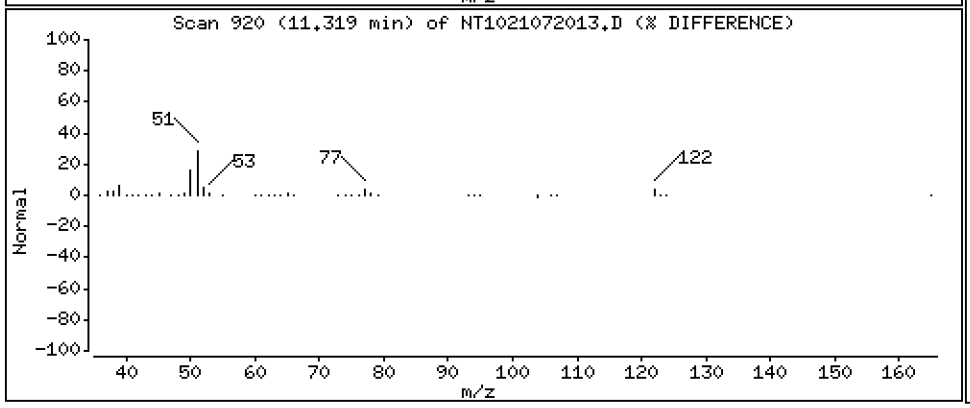
24 Benzoic acid

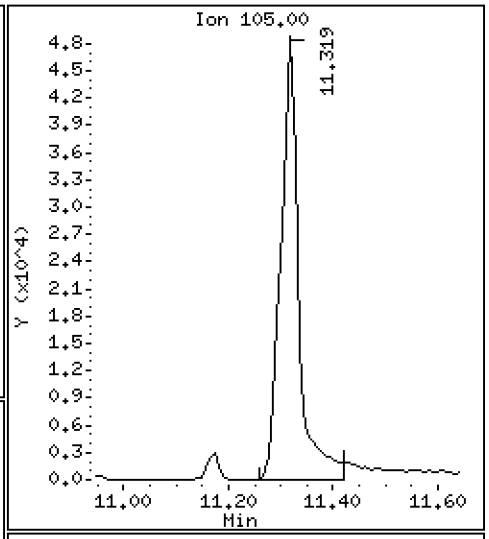
Concentration: 6.356 ug/mL

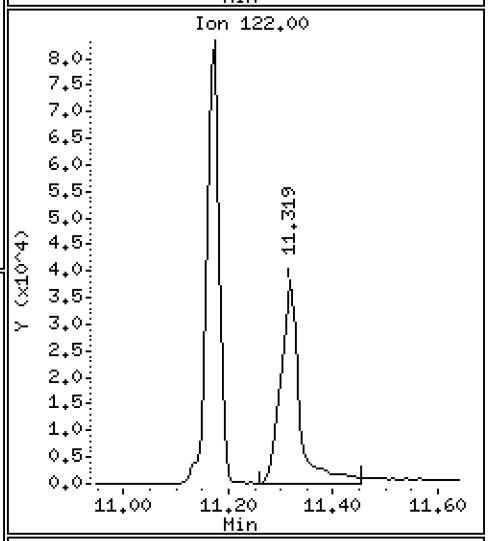


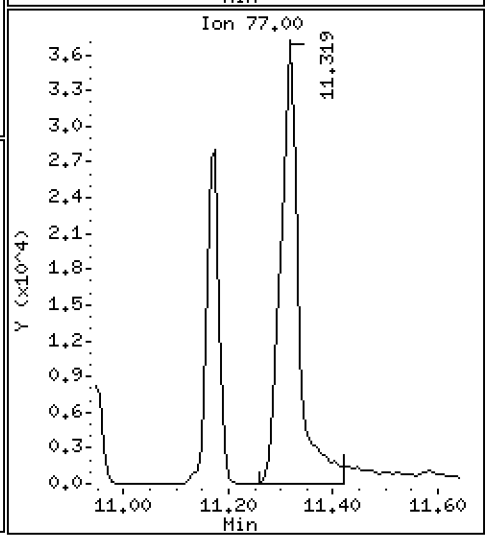












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

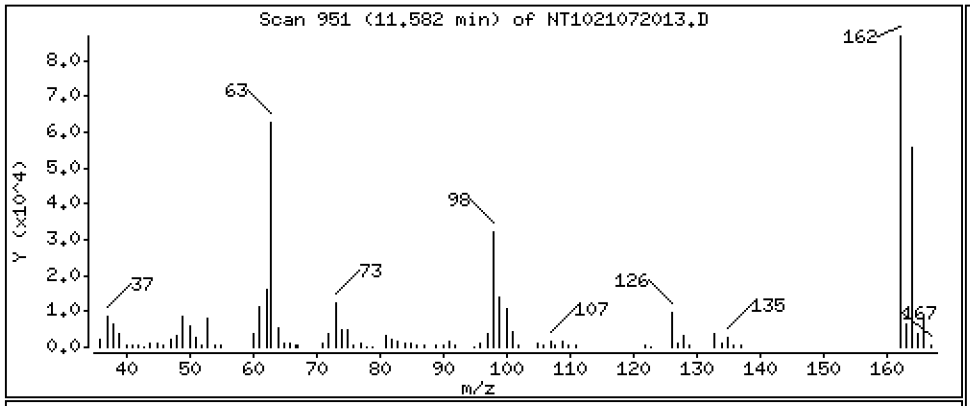
Operator: VTS

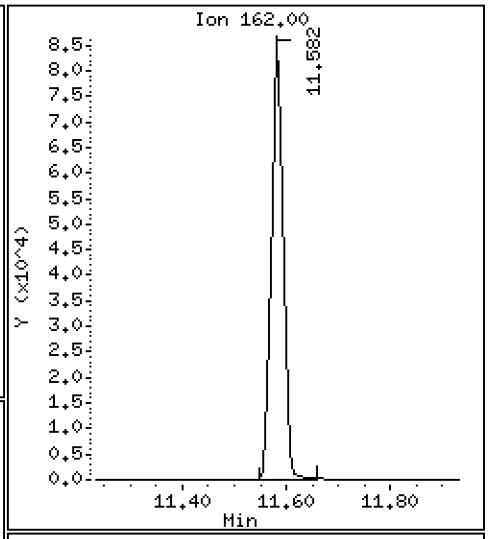
Column phase: ZB-5msi

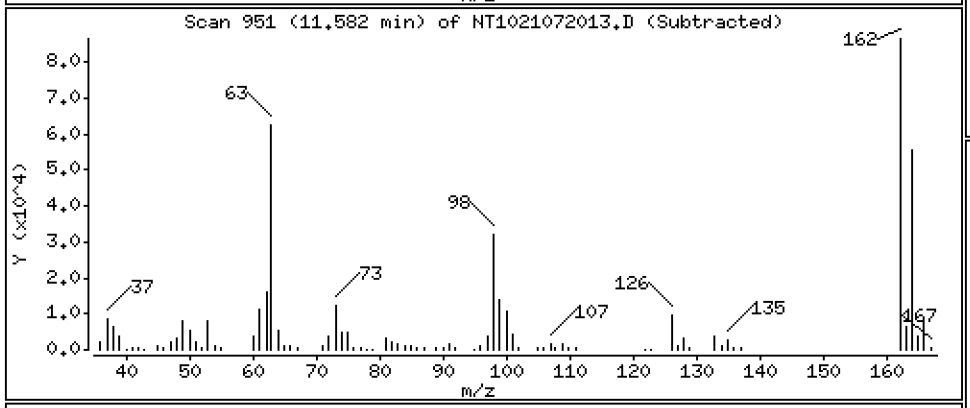
Column diameter: 0.25

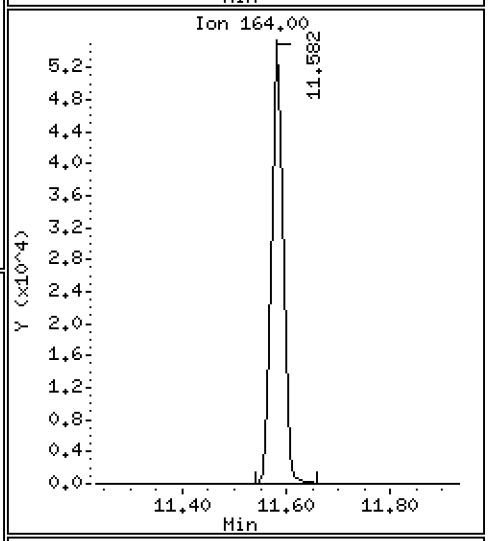
25 2,4-Dichlorophenol

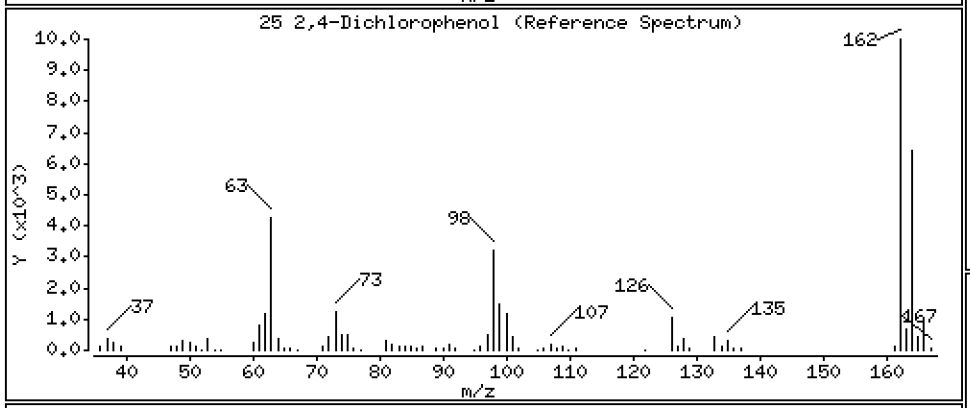
Concentration: 4.974 ug/mL

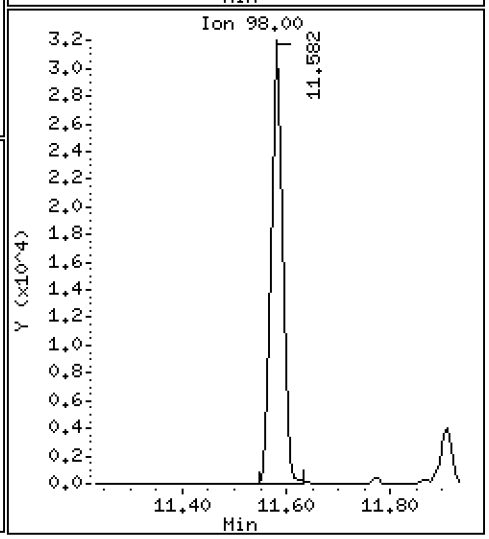


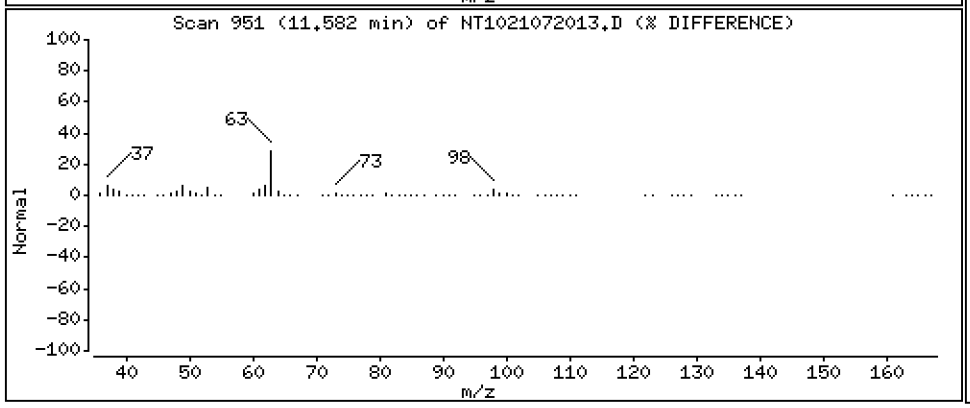












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

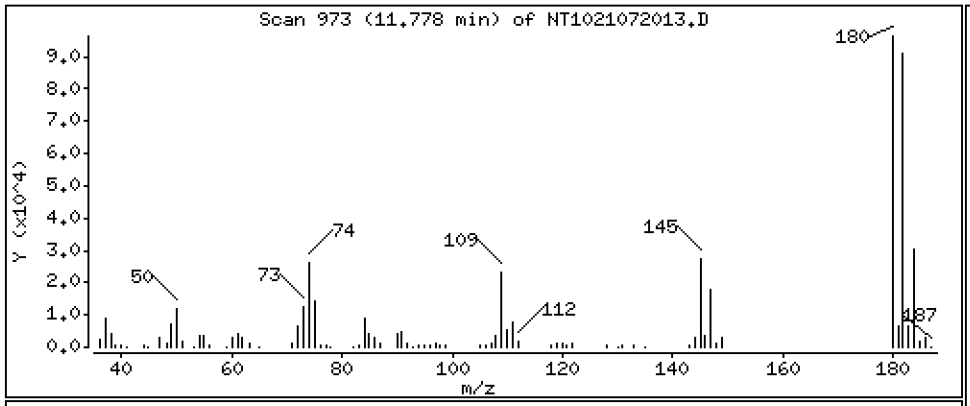
Operator: VTS

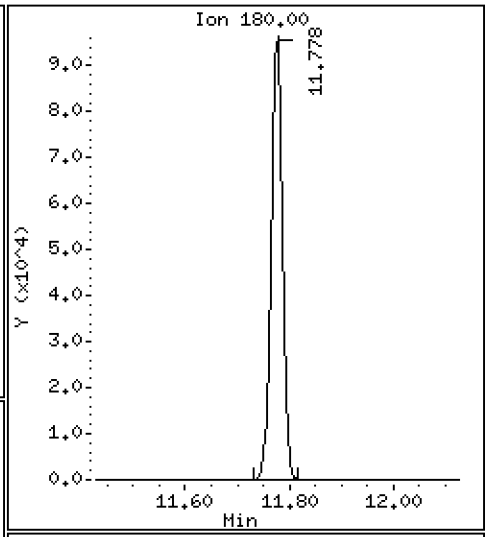
Column phase: ZB-5msi

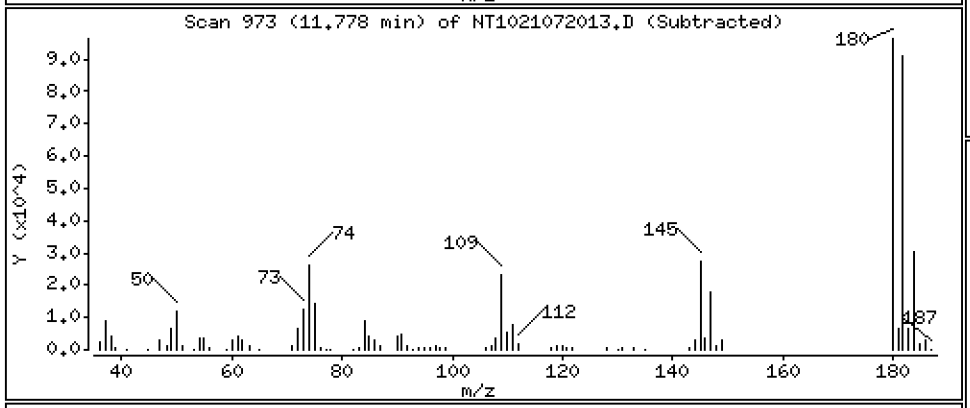
Column diameter: 0.25

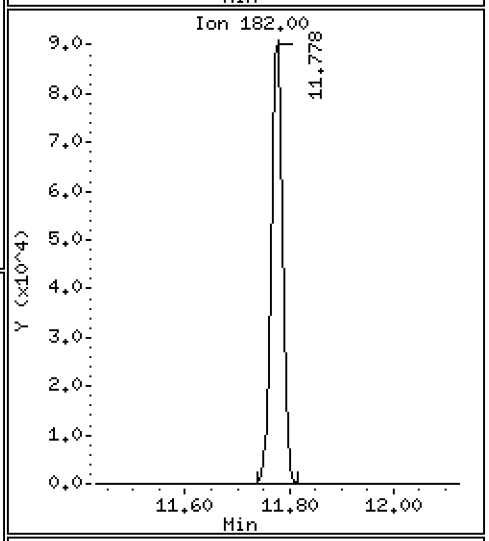
26 1,2,4-Trichlorobenzene

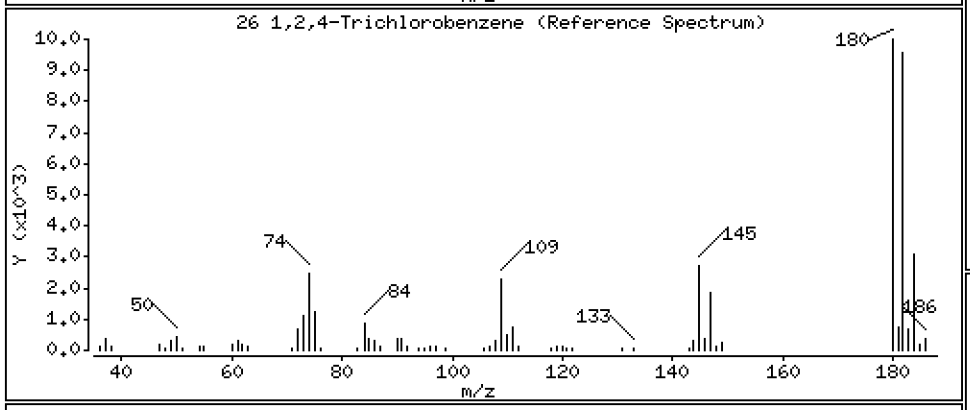
Concentration: 4.922 ug/mL

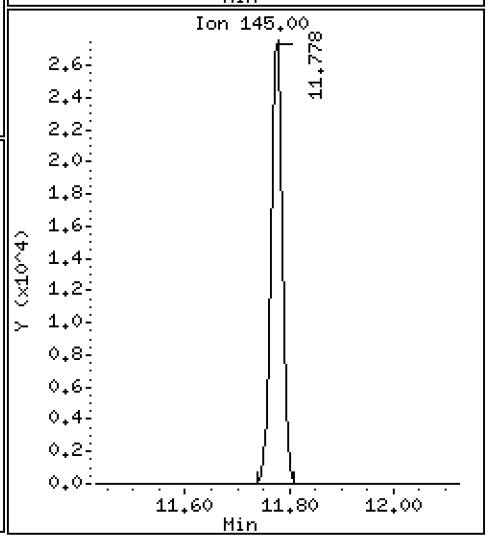


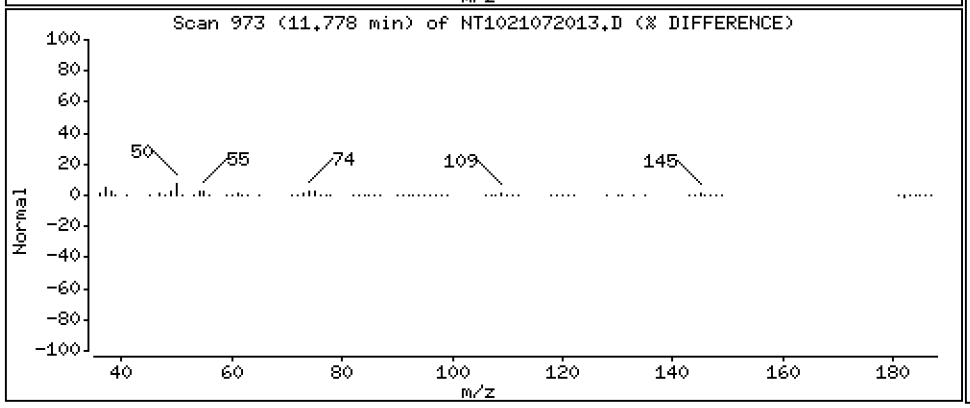












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

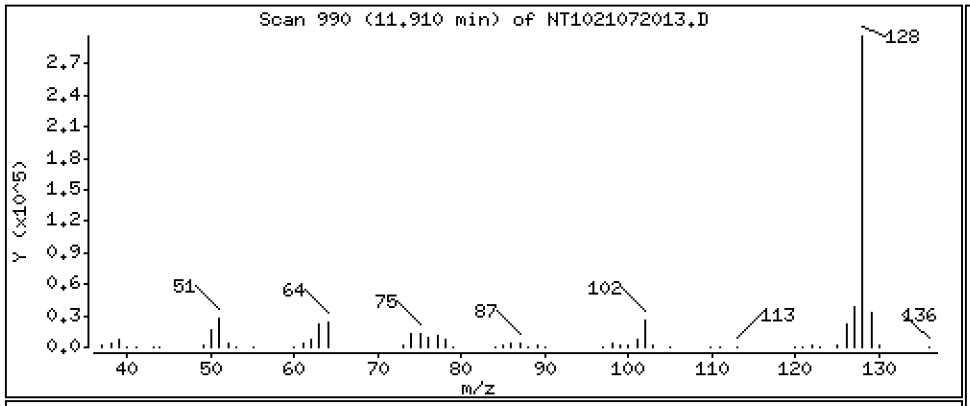
Operator: VTS

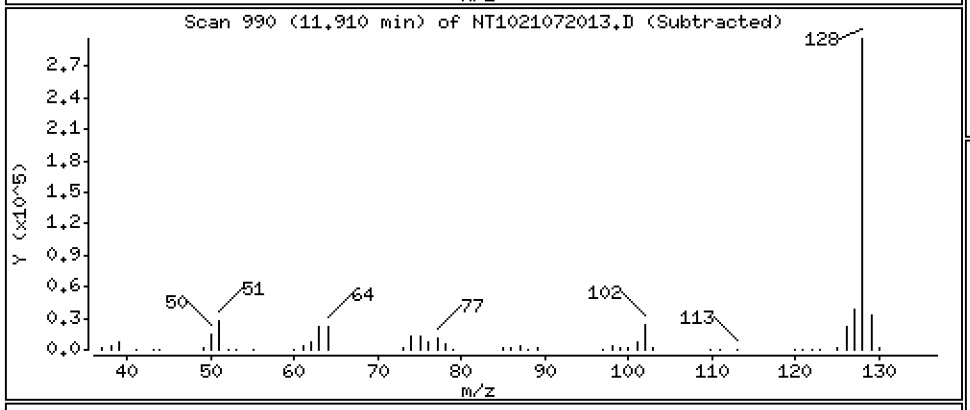
Column phase: ZB-5msi

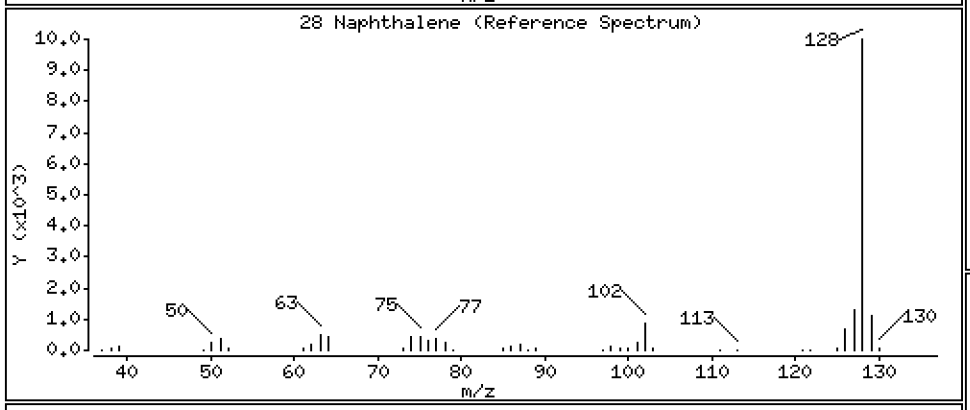
Column diameter: 0.25

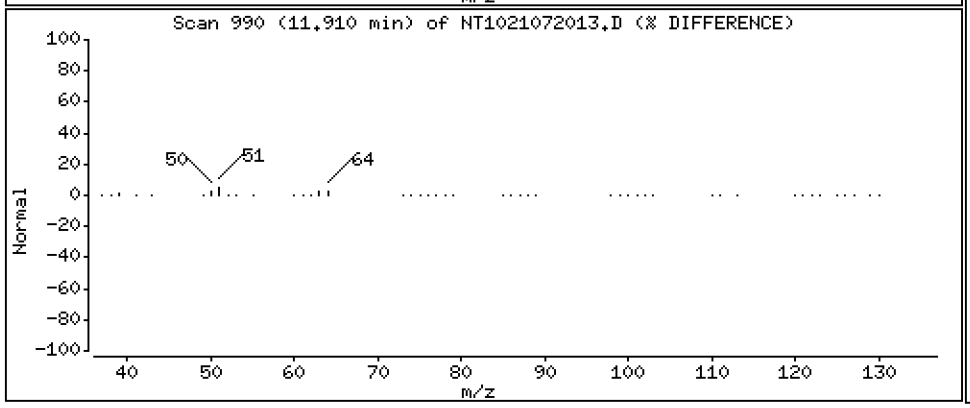
28 Naphthalene

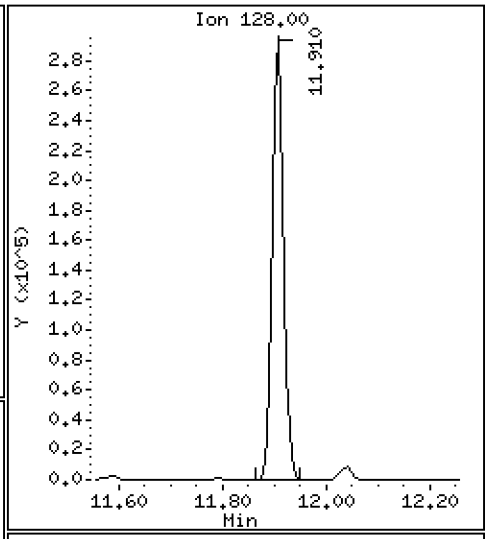
Concentration: 4.991 ug/mL

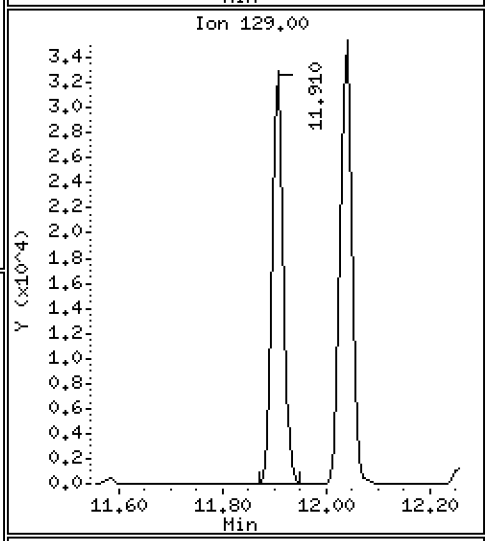


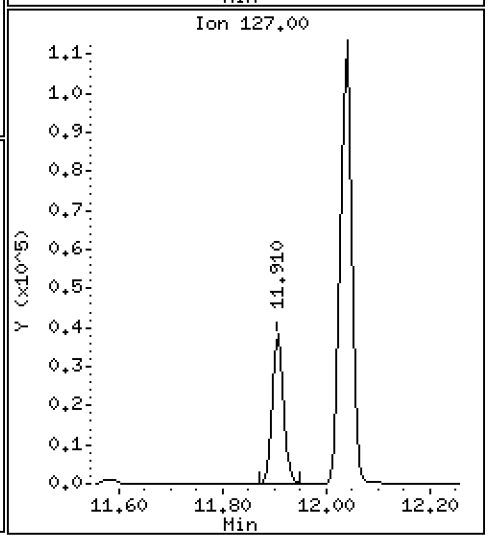












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

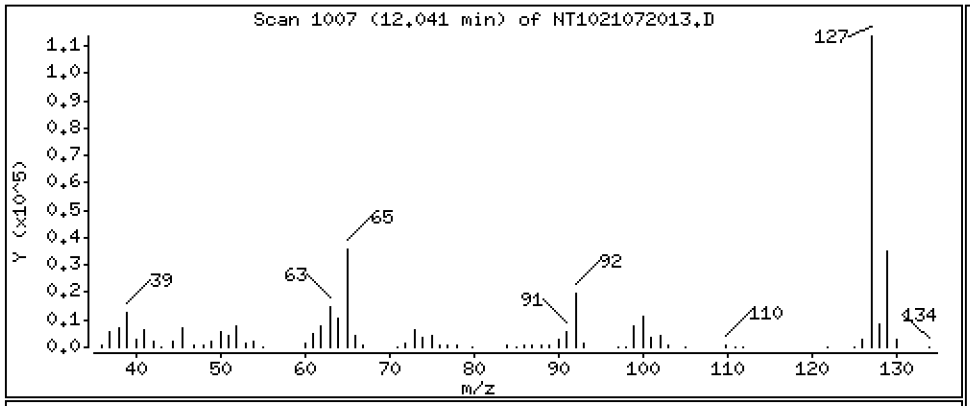
Operator: VTS

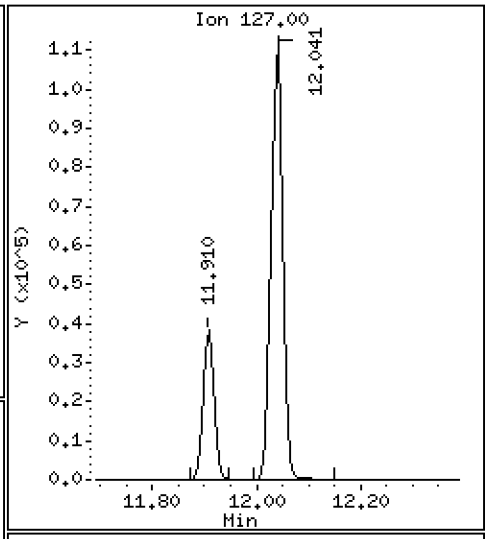
Column phase: ZB-5msi

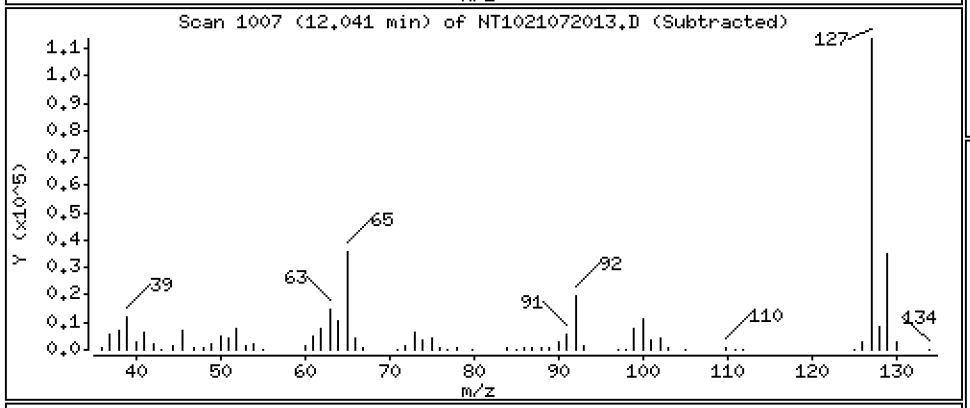
Column diameter: 0.25

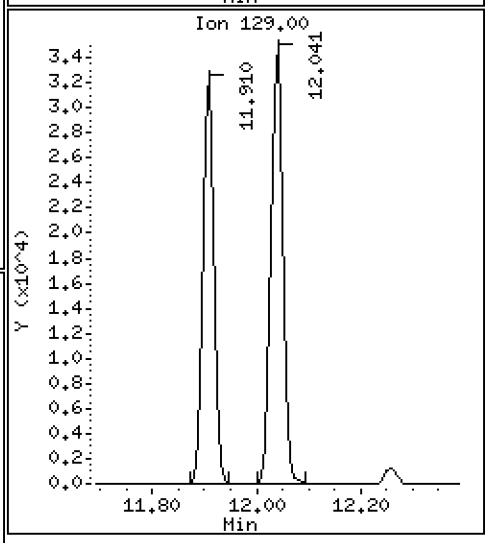
29 4-Chloroaniline

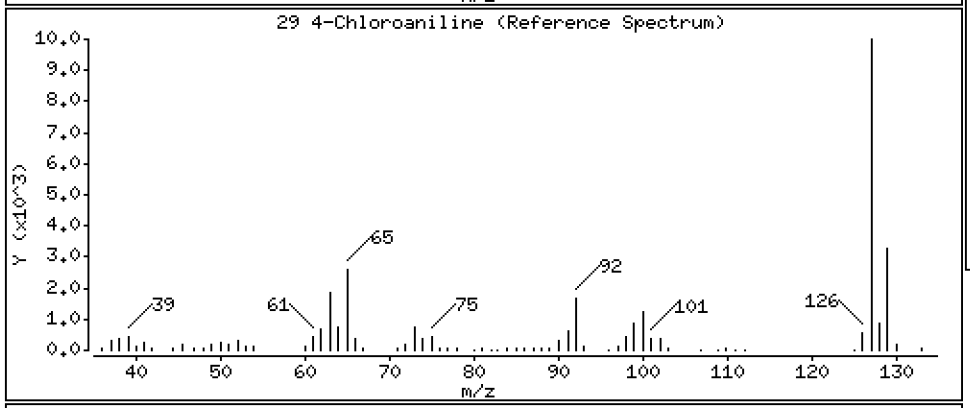
Concentration: 4.141 ug/mL

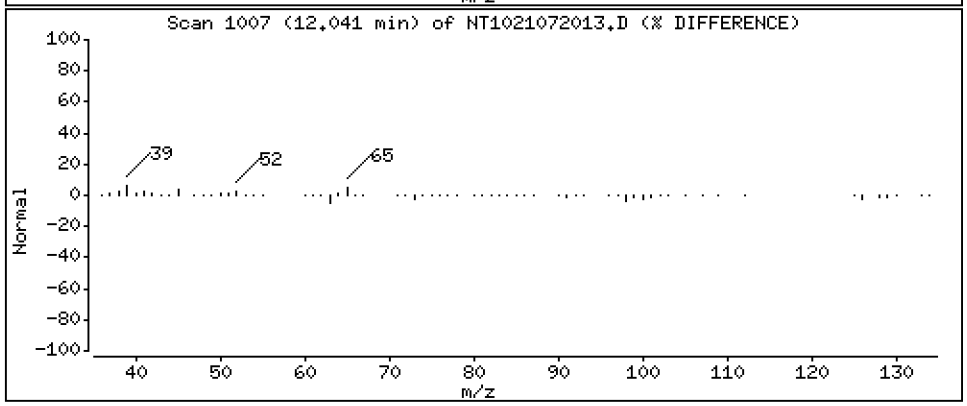












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

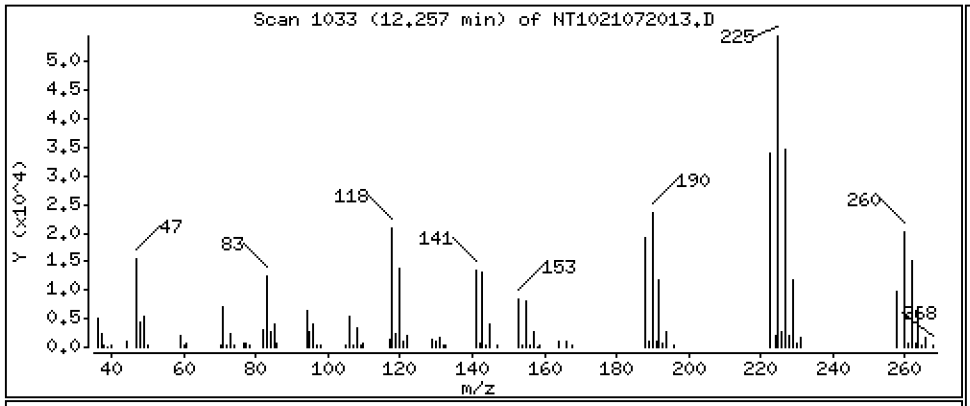
Operator: VTS

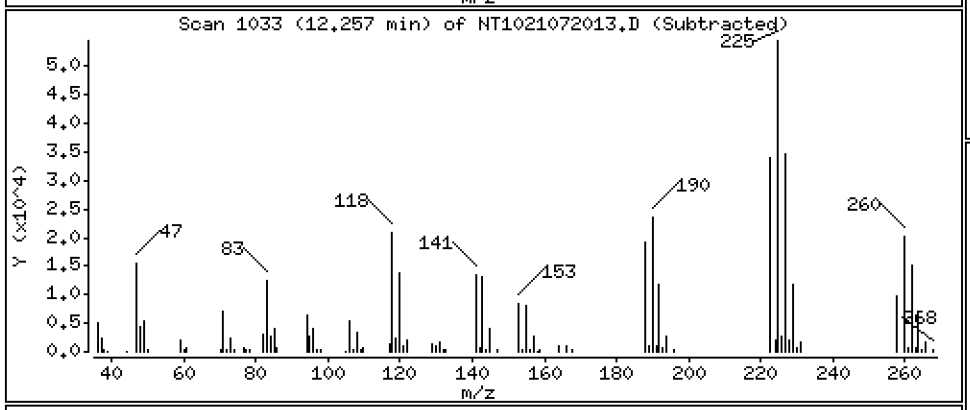
Column phase: ZB-5msi

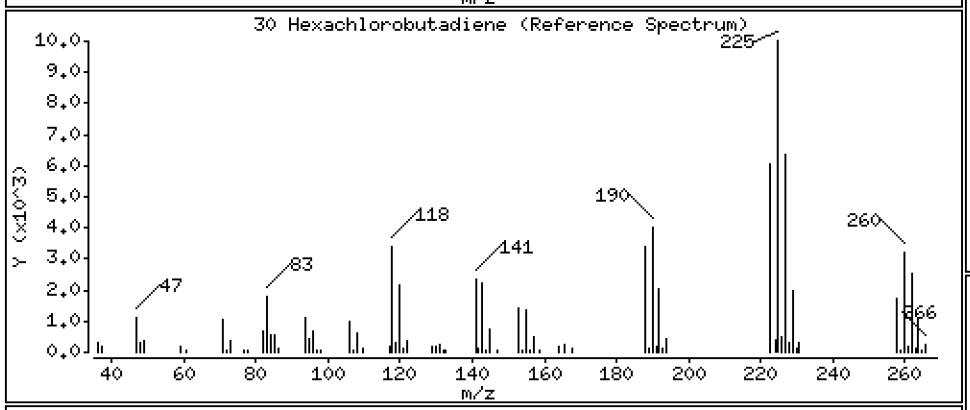
Column diameter: 0.25

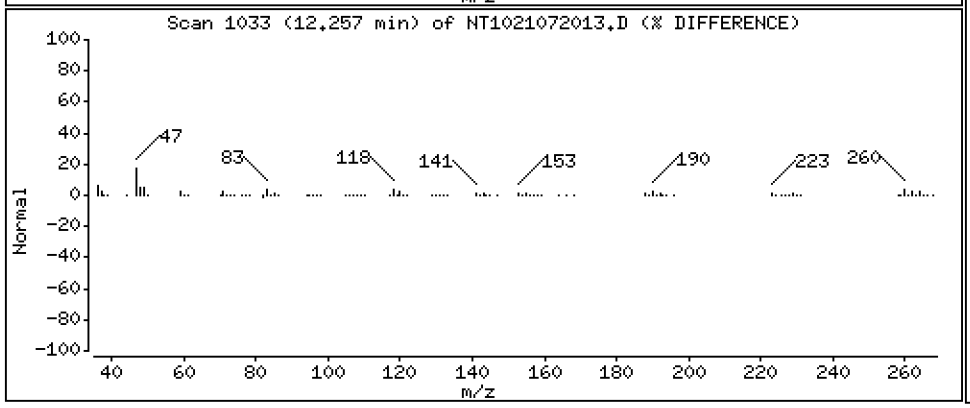
30 Hexachlorobutadiene

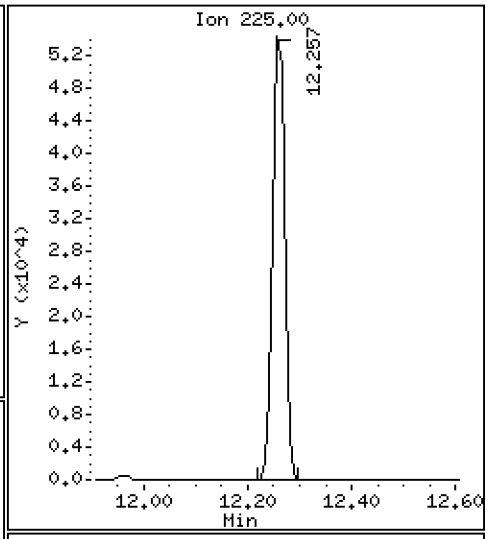
Concentration: 4.966 ug/mL

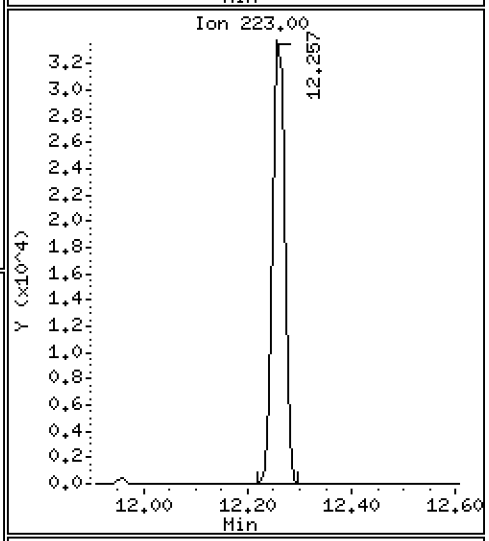


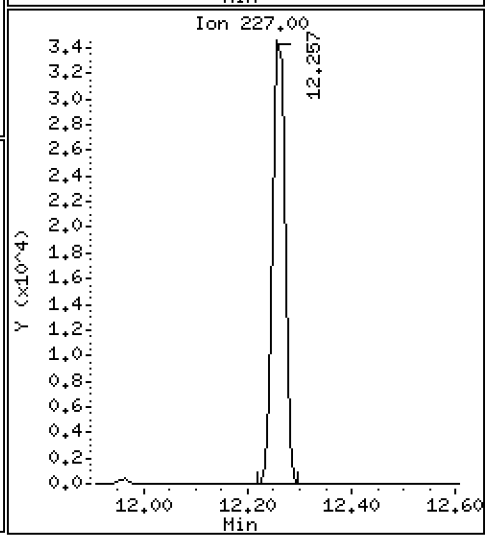












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

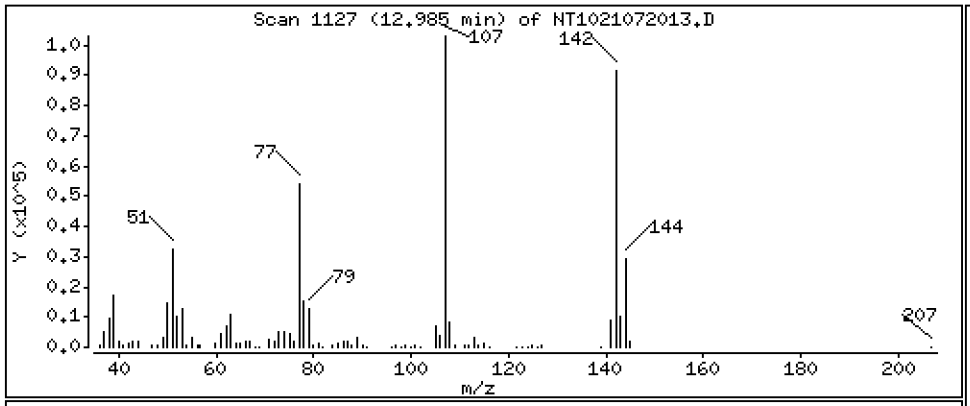
Operator: VTS

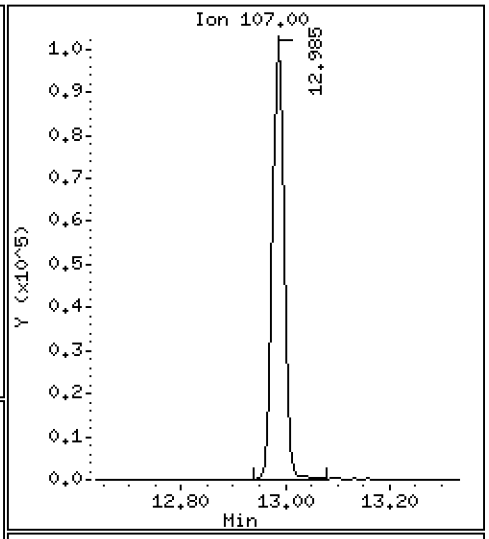
Column phase: ZB-5msi

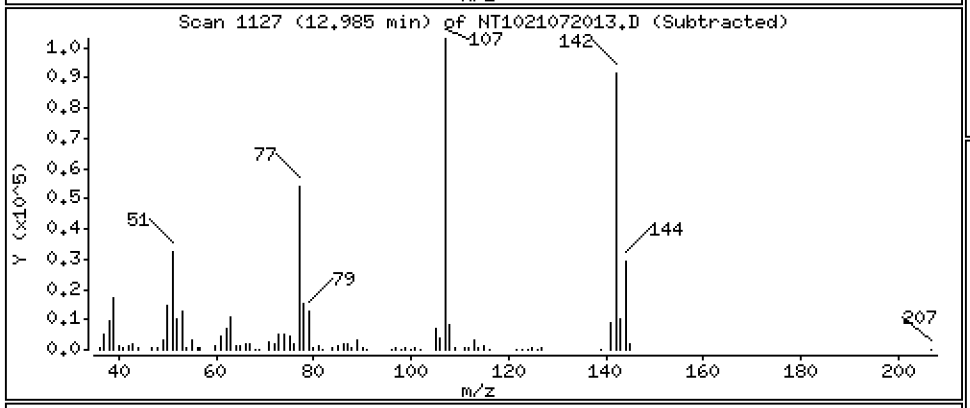
Column diameter: 0.25

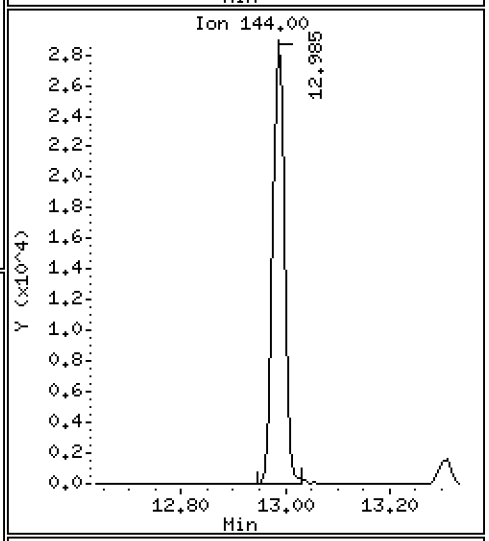
31 4-Chloro-3-methylphenol

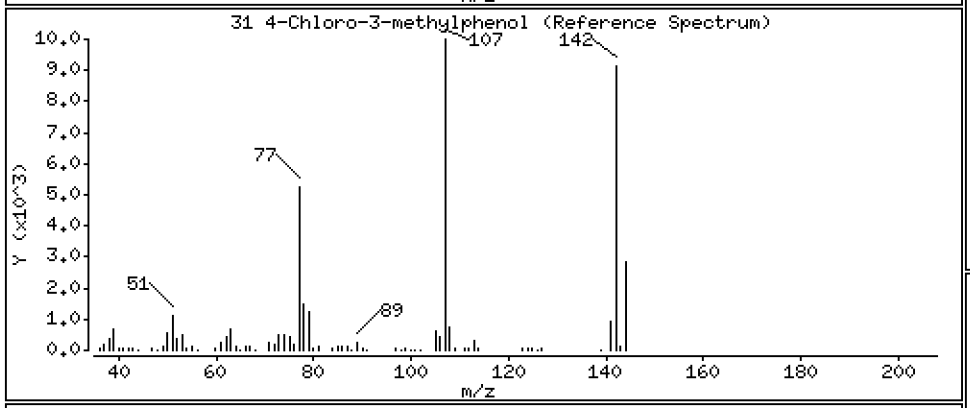
Concentration: 4.652 ug/mL

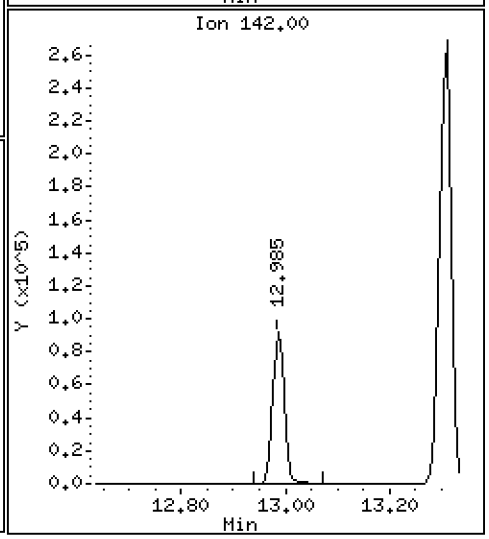


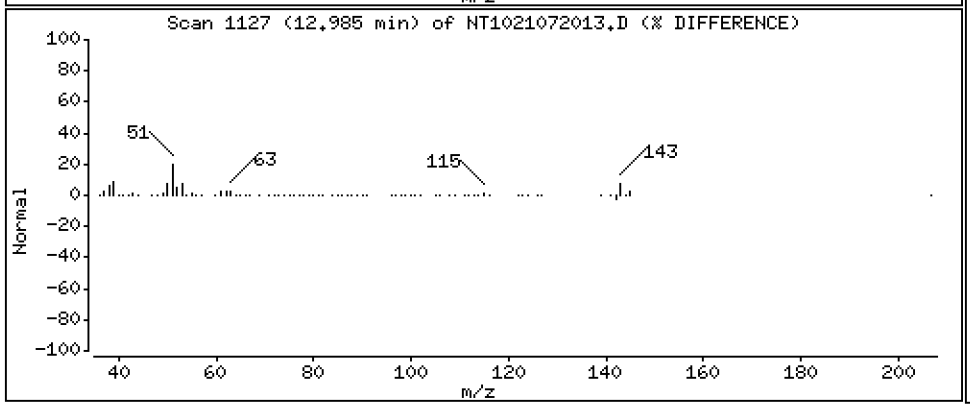












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

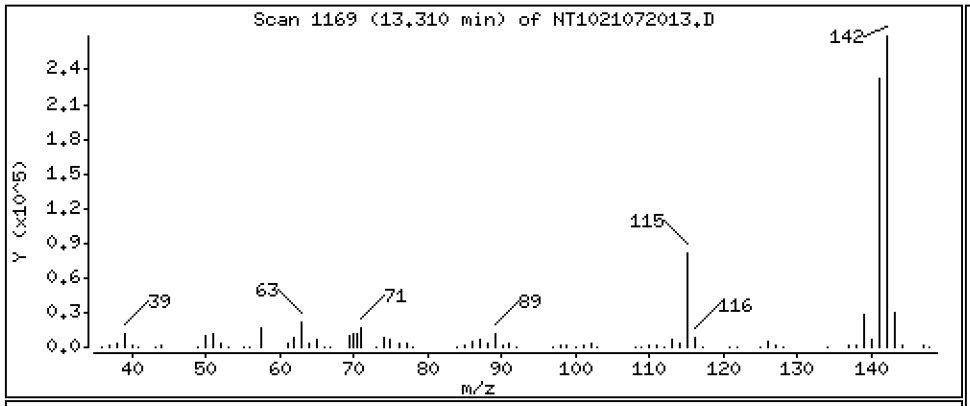
Operator: VTS

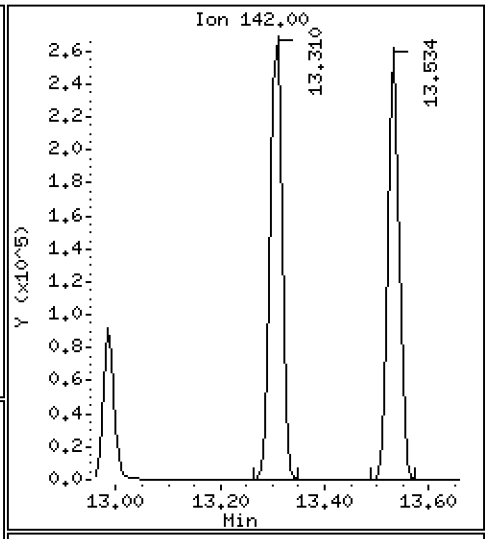
Column phase: ZB-5msi

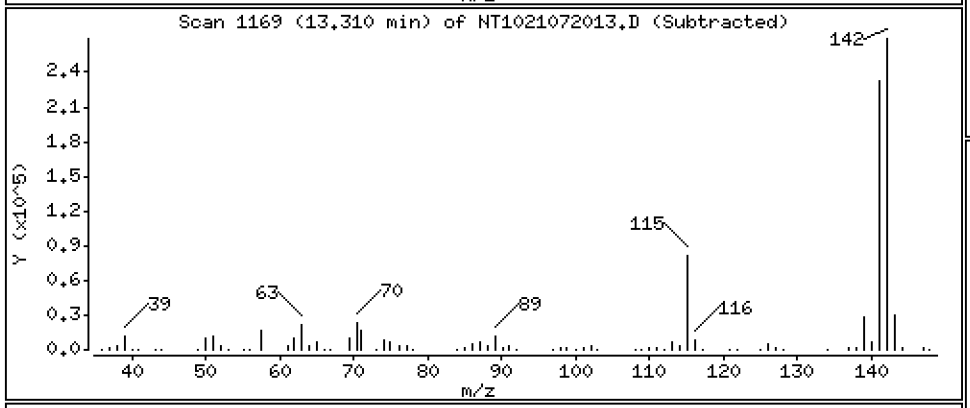
Column diameter: 0.25

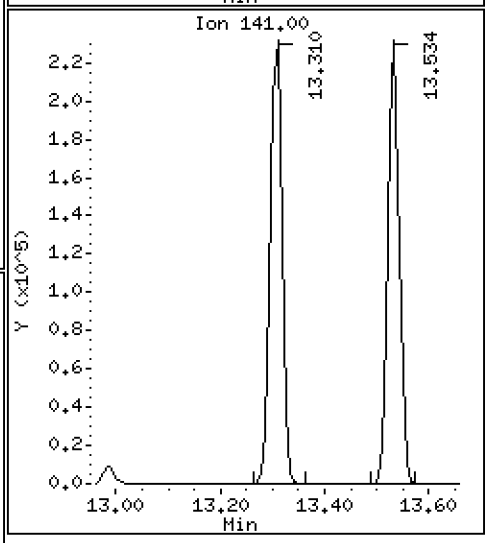
32 2-Methylnaphthalene

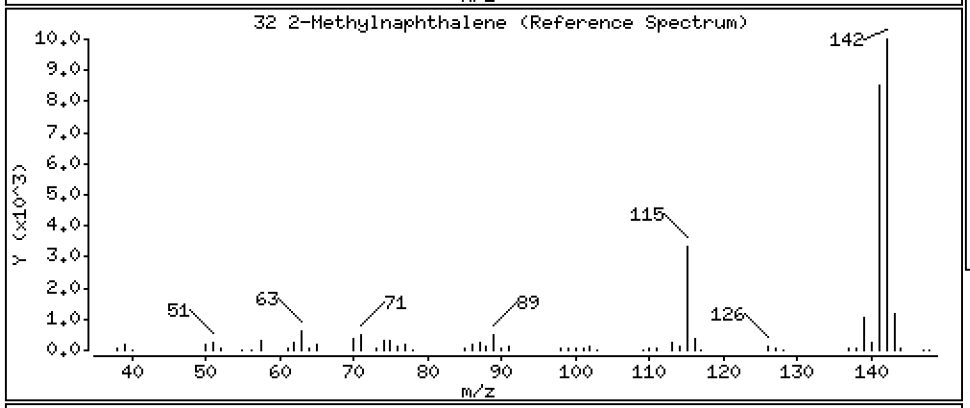
Concentration: 4.782 ug/mL

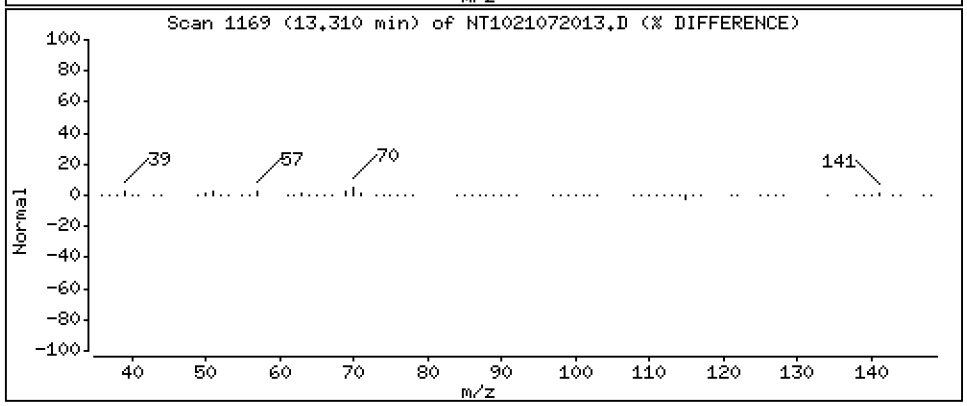












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Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

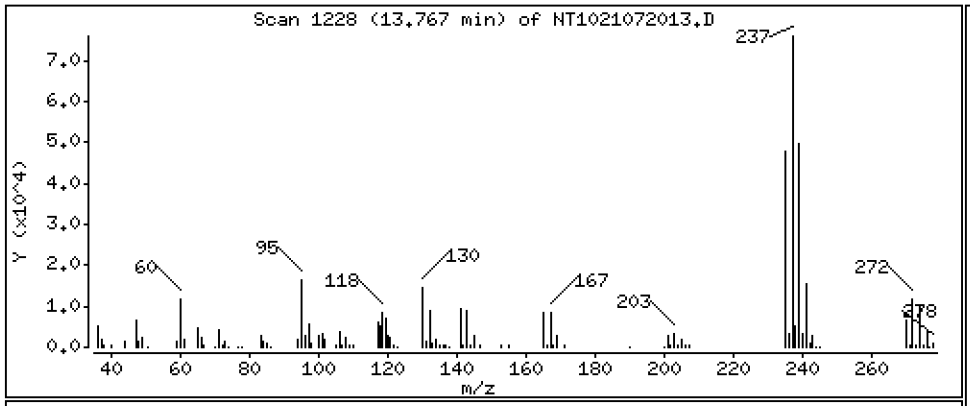
Operator: VTS

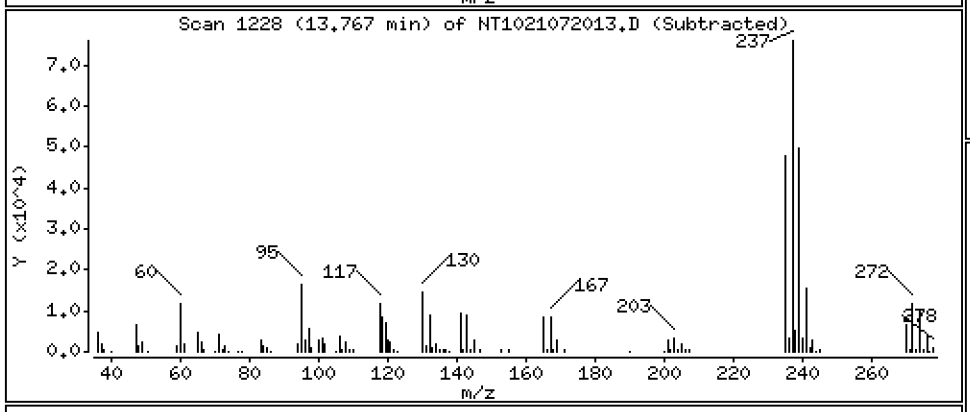
Column phase: ZB-5msi

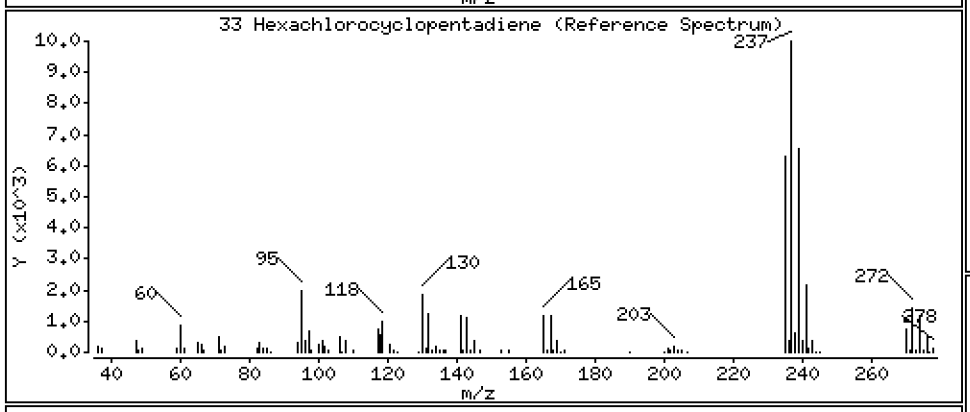
Column diameter: 0.25

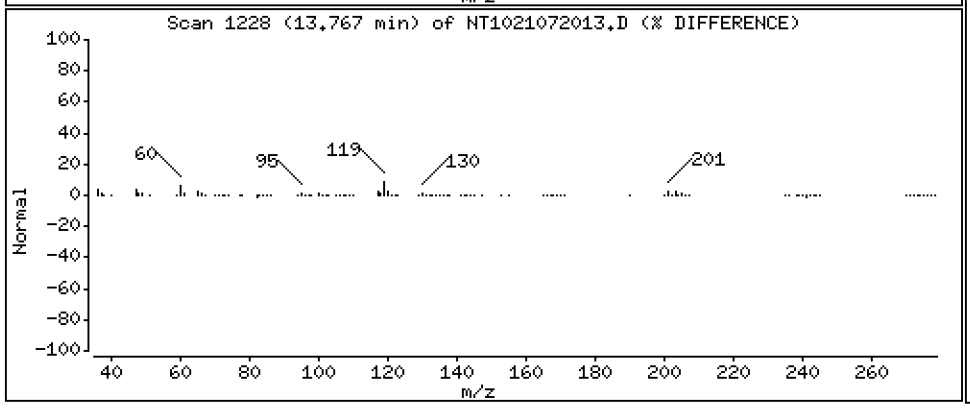
33 Hexachlorocyclopentadiene

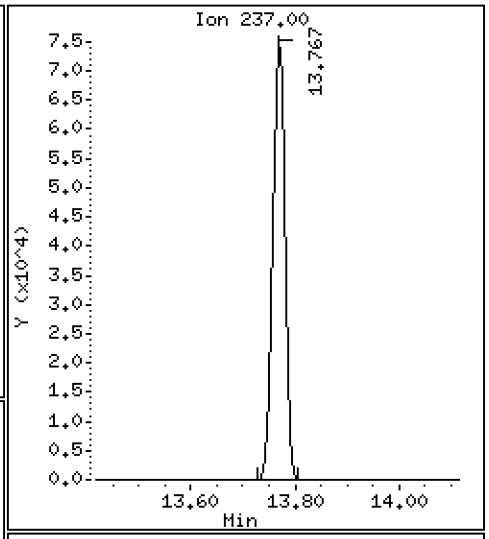
Concentration: 5.671 ug/mL

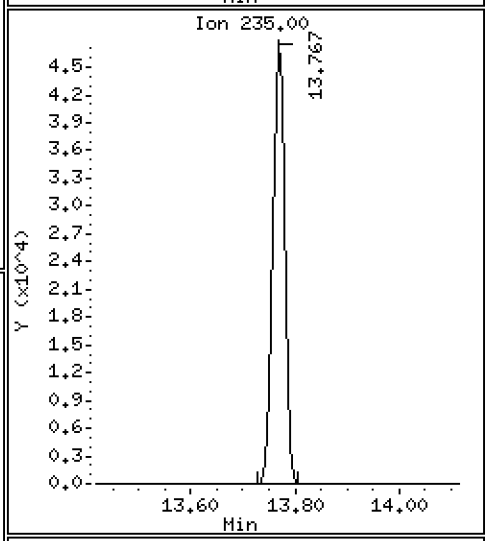


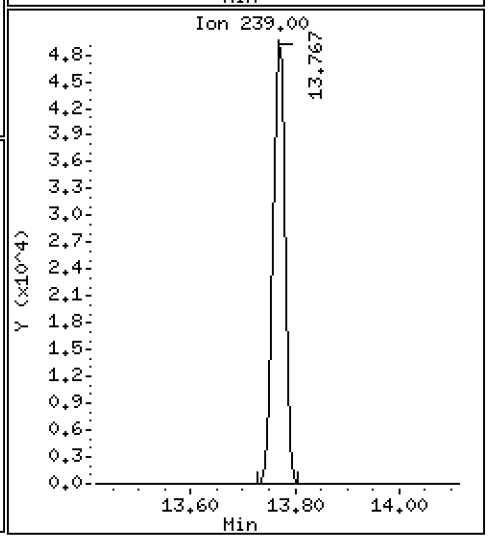












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

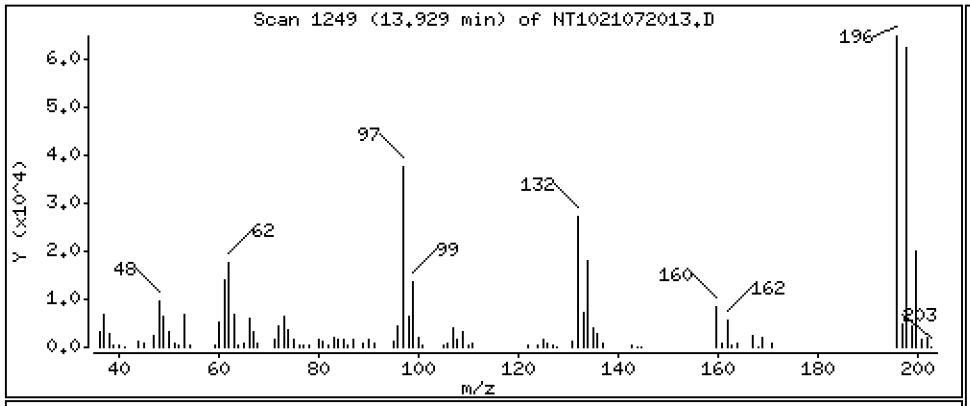
Operator: VTS

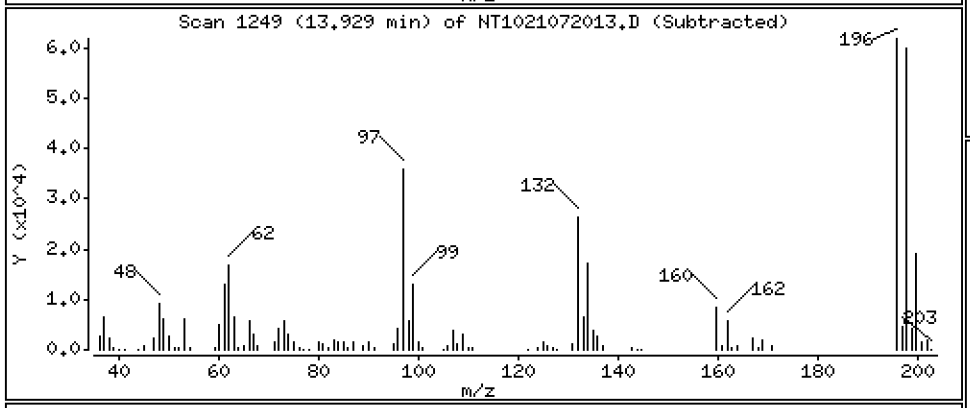
Column phase: ZB-5msi

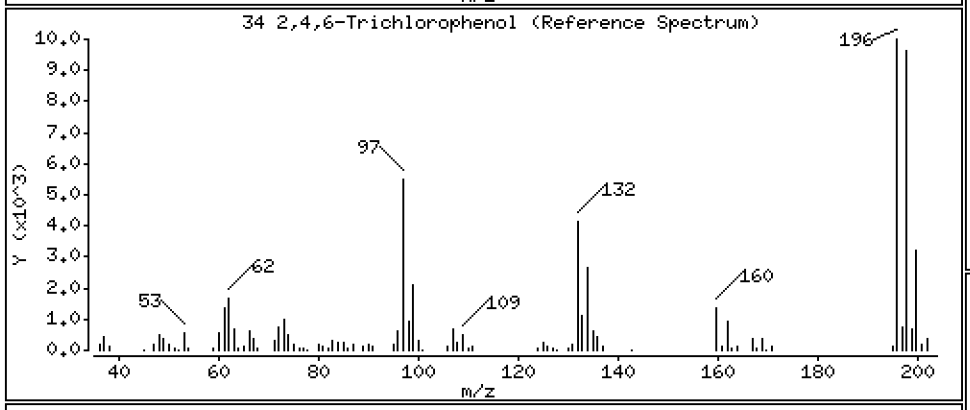
Column diameter: 0.25

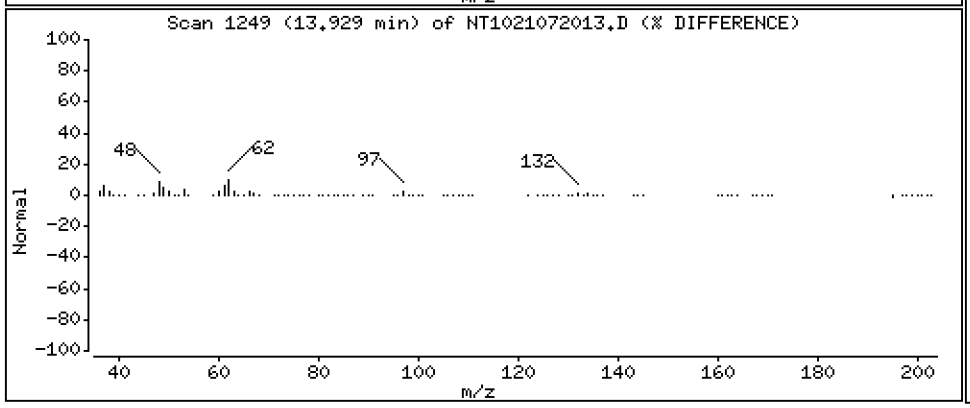
34 2,4,6-Trichlorophenol

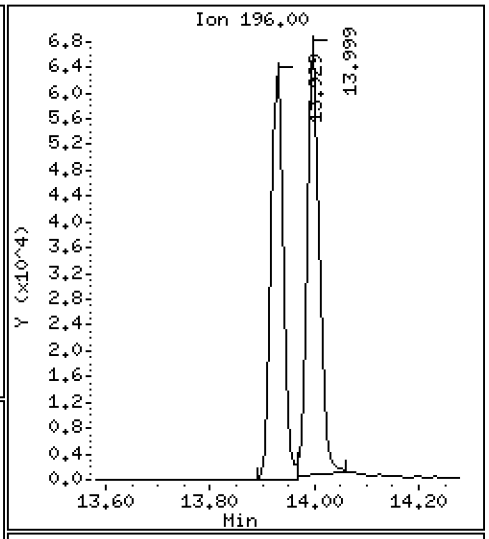
Concentration: 4.713 ug/mL

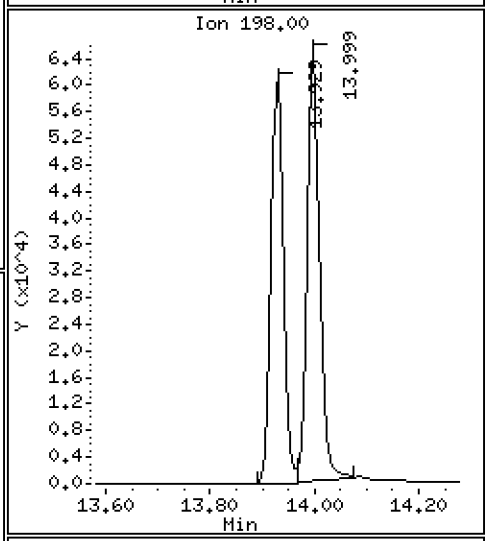


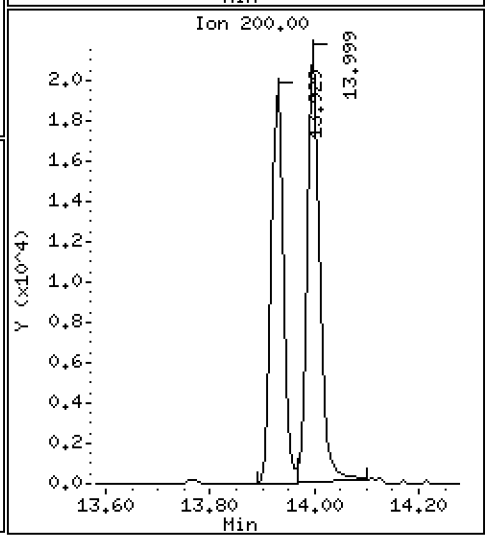












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

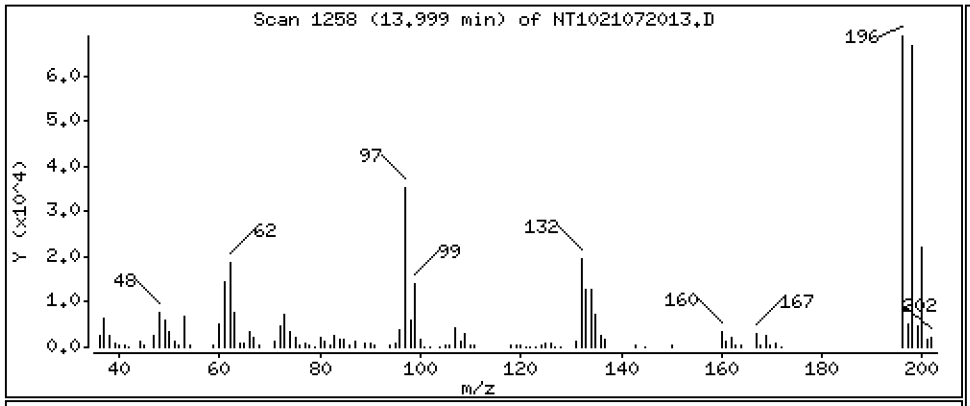
Operator: VTS

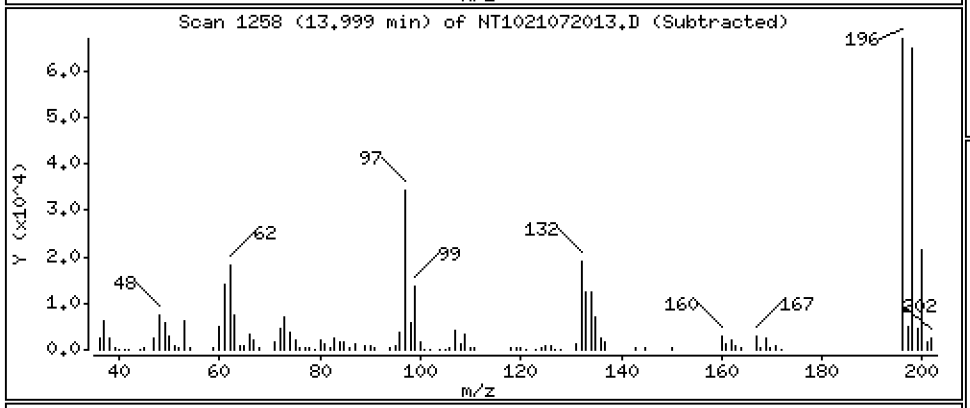
Column phase: ZB-5msi

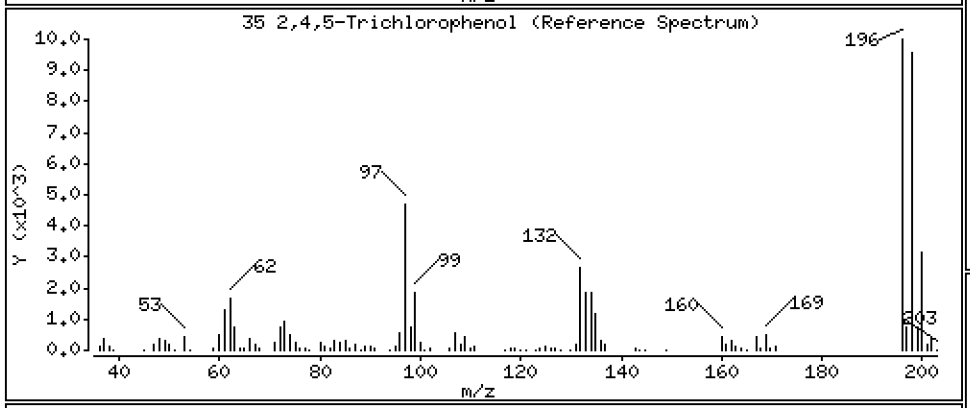
Column diameter: 0.25

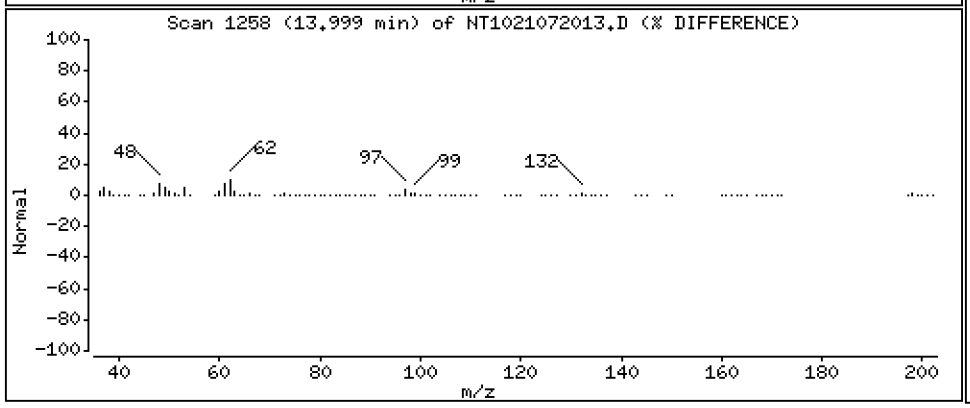
35 2,4,5-Trichlorophenol

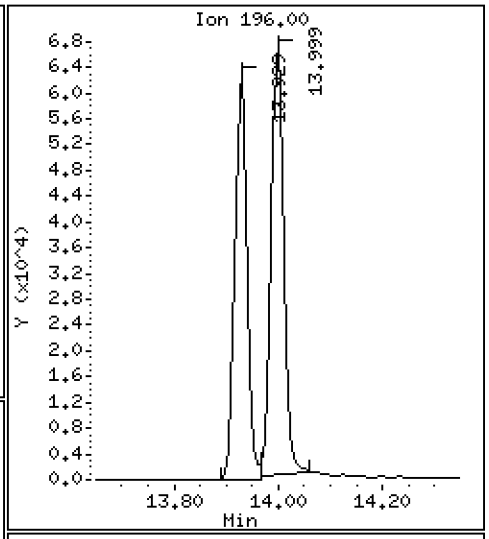
Concentration: 4.721 ug/mL

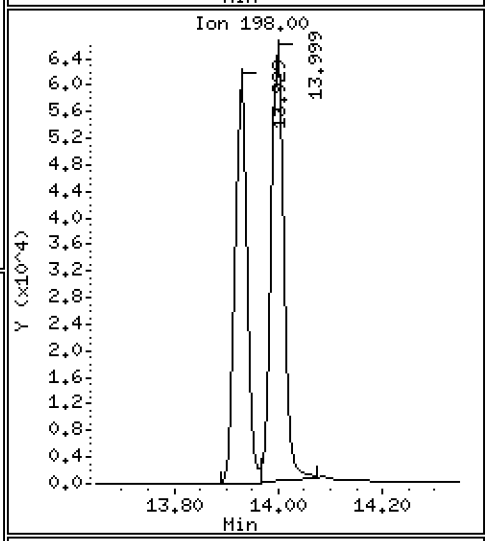


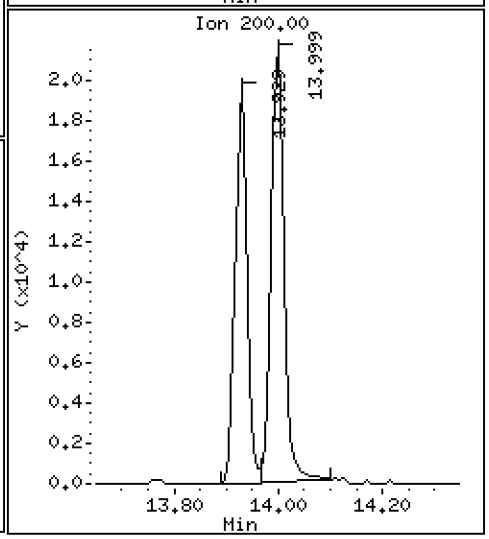












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

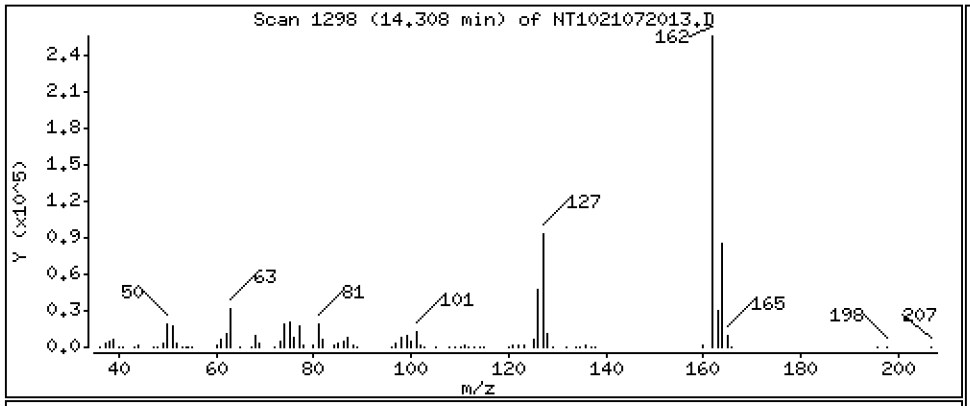
Operator: VTS

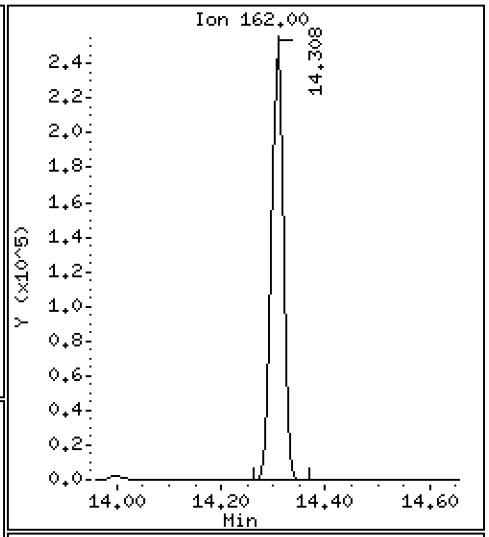
Column phase: ZB-5msi

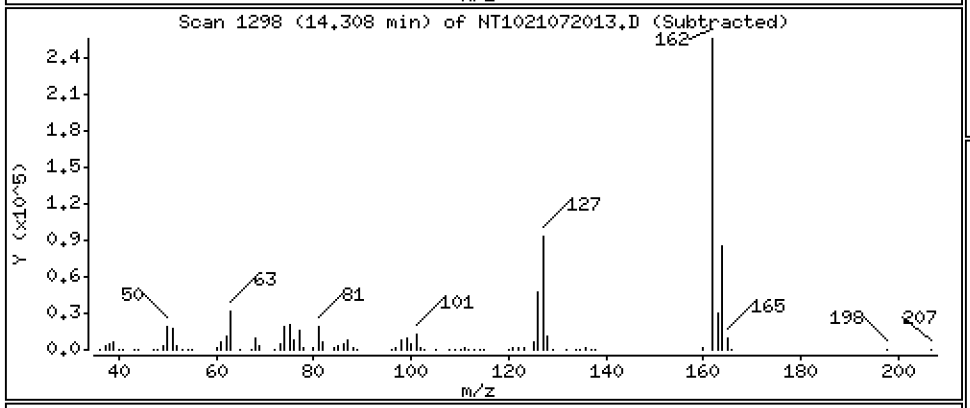
Column diameter: 0.25

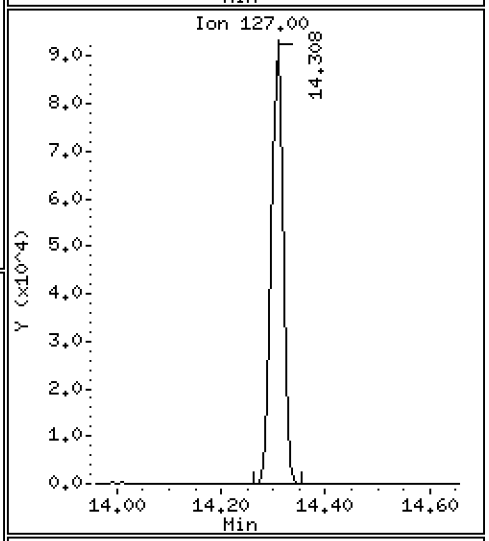
37 2-Chloronaphthalene

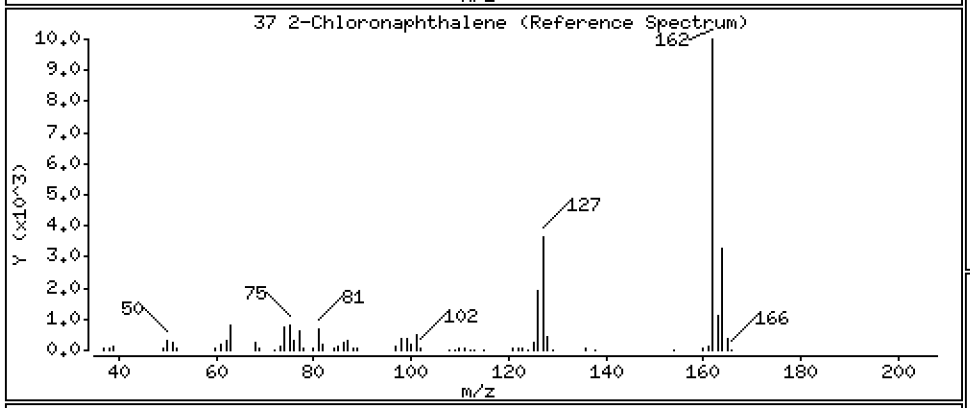
Concentration: 5.085 ug/mL

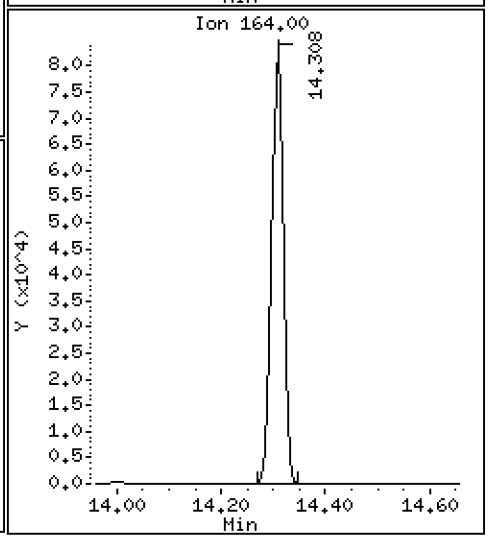


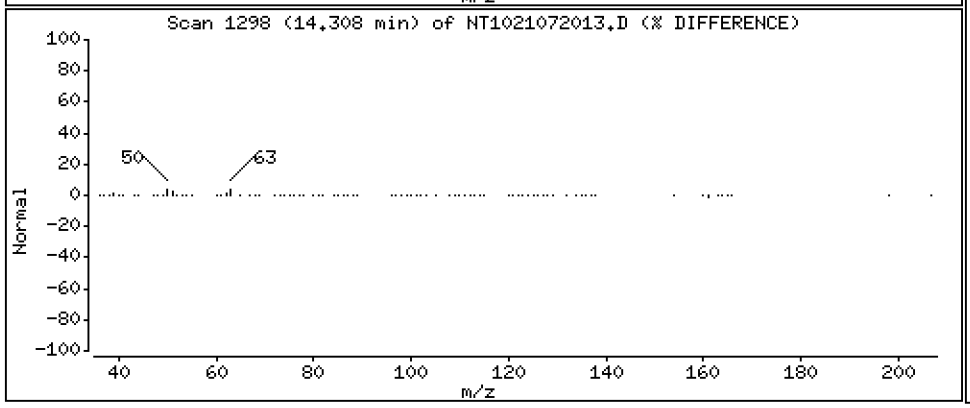












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

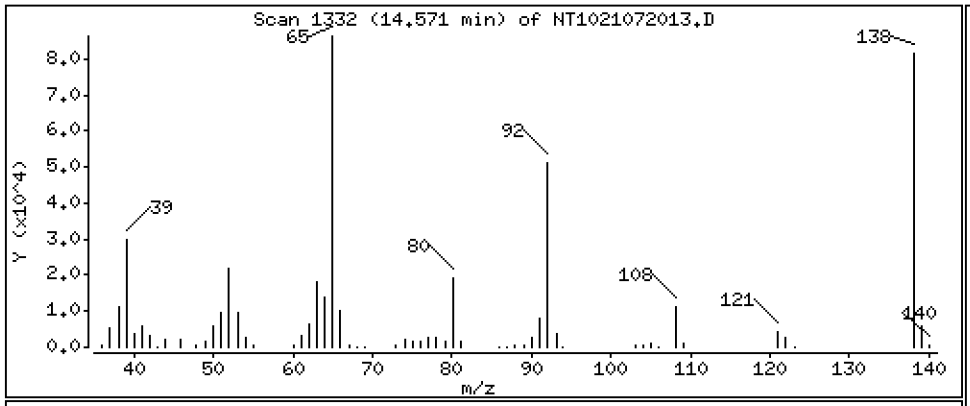
Operator: VTS

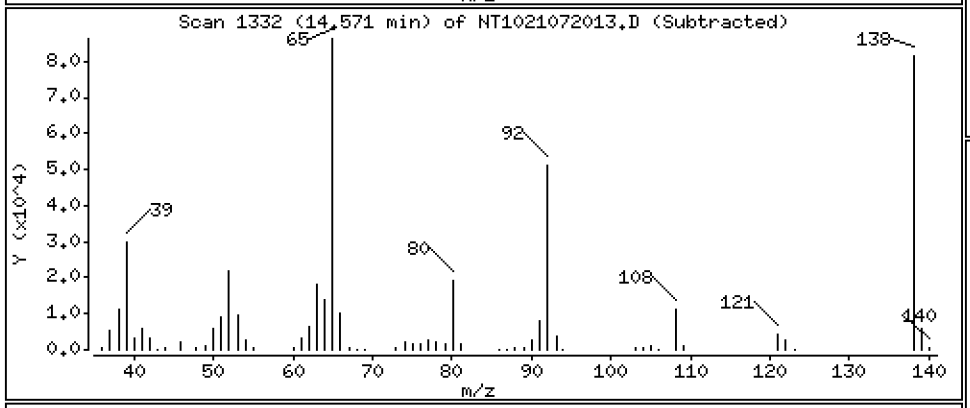
Column phase: ZB-5msi

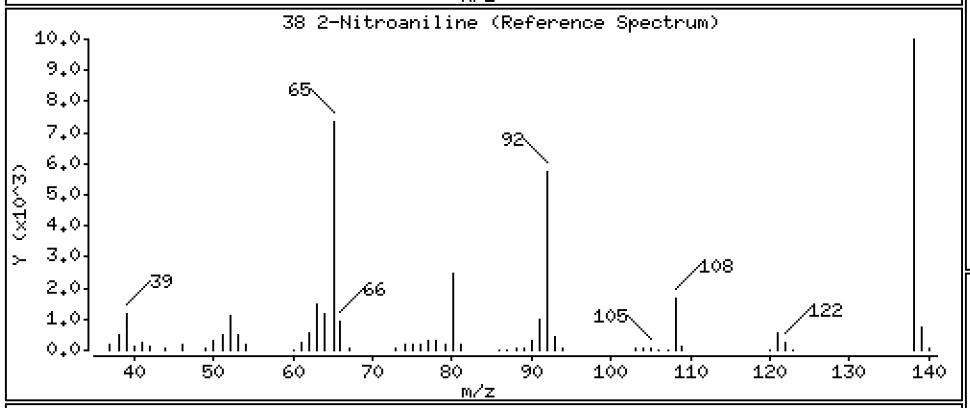
Column diameter: 0.25

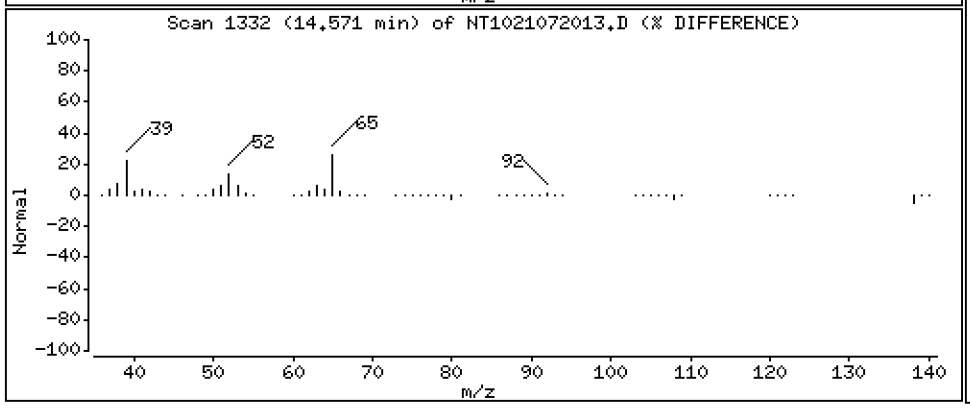
38 2-Nitroaniline

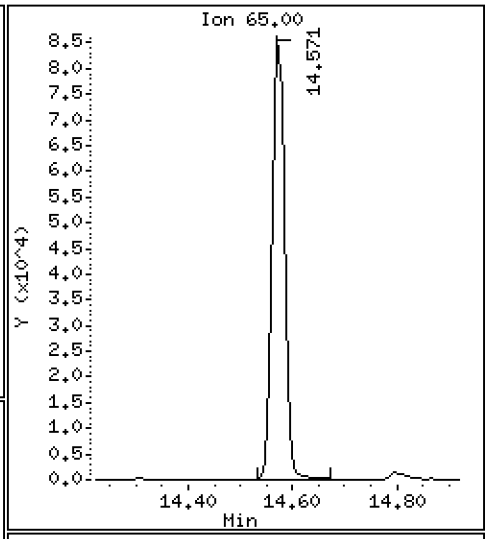
Concentration: 4.848 ug/mL

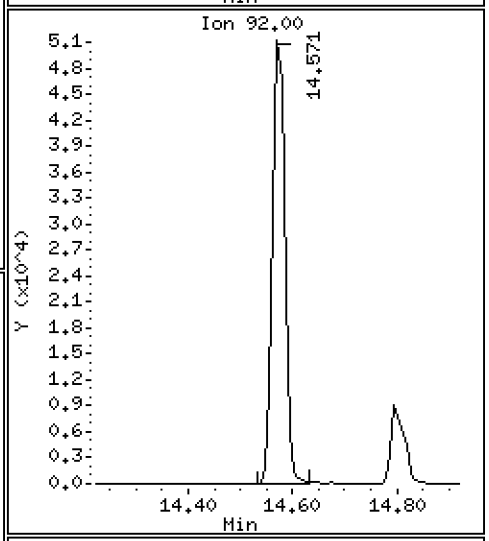


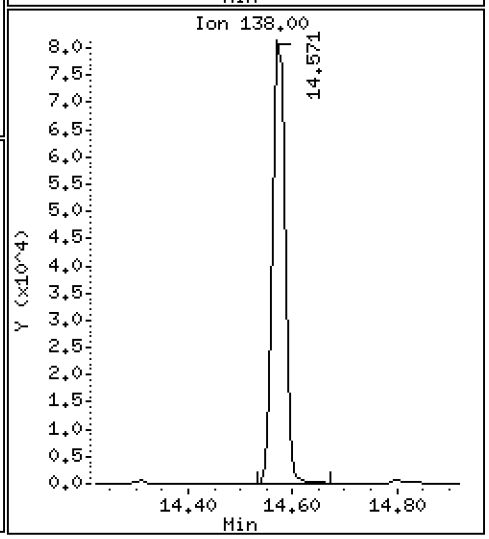












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

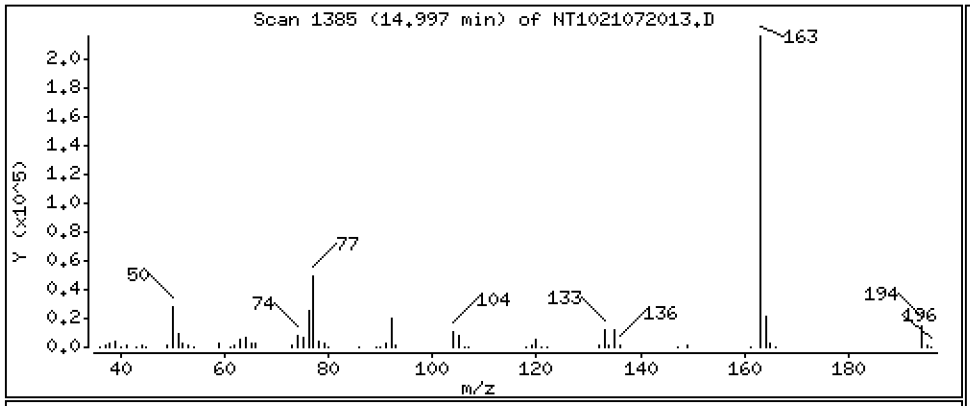
Operator: VTS

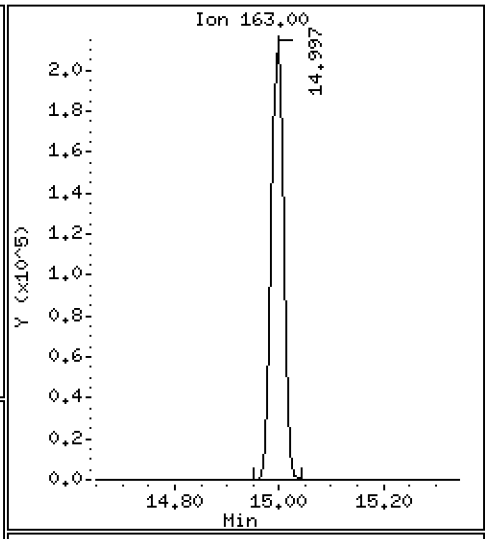
Column phase: ZB-5msi

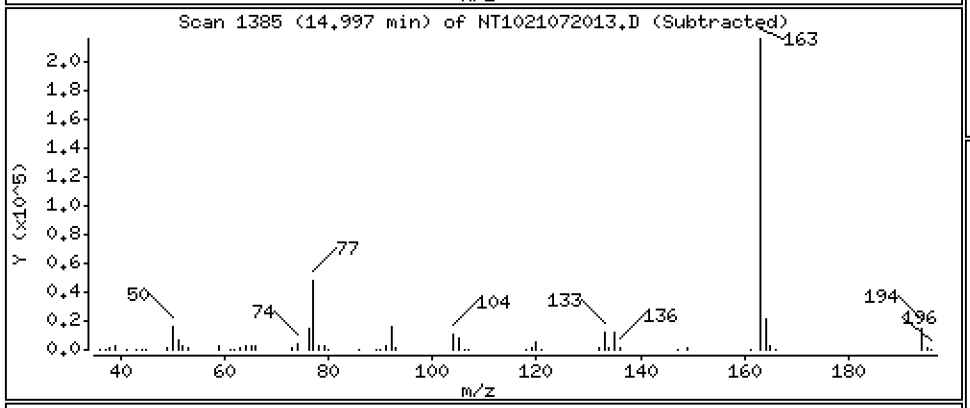
Column diameter: 0.25

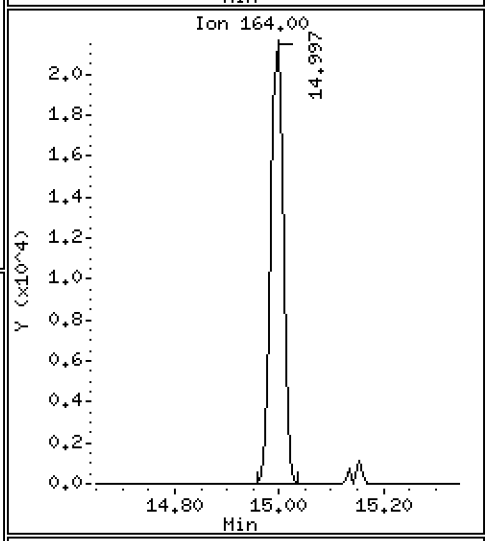
39 Dimethylphthalate

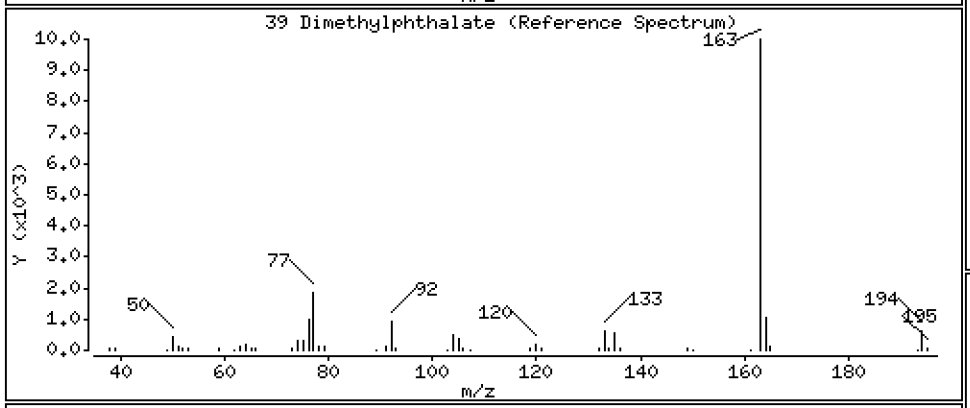
Concentration: 4.656 ug/mL

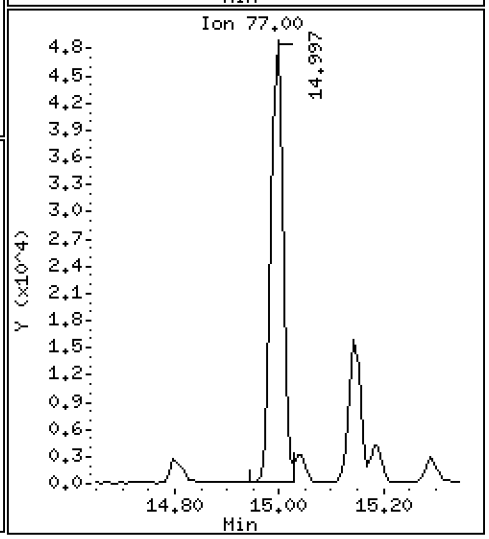


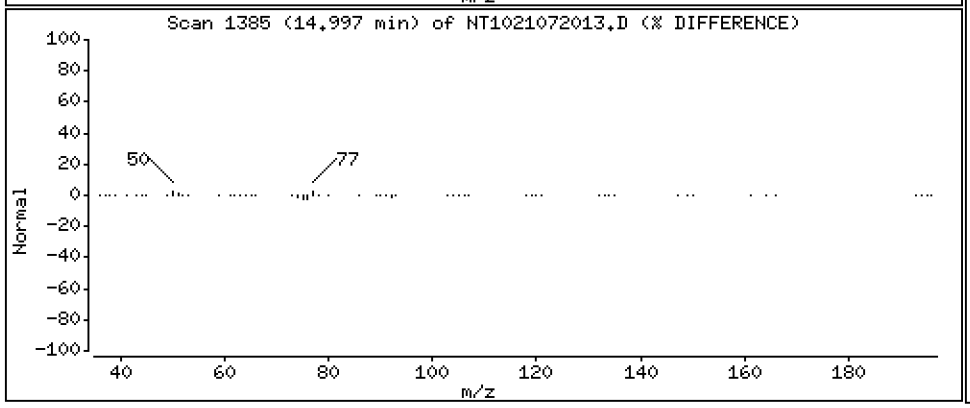












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

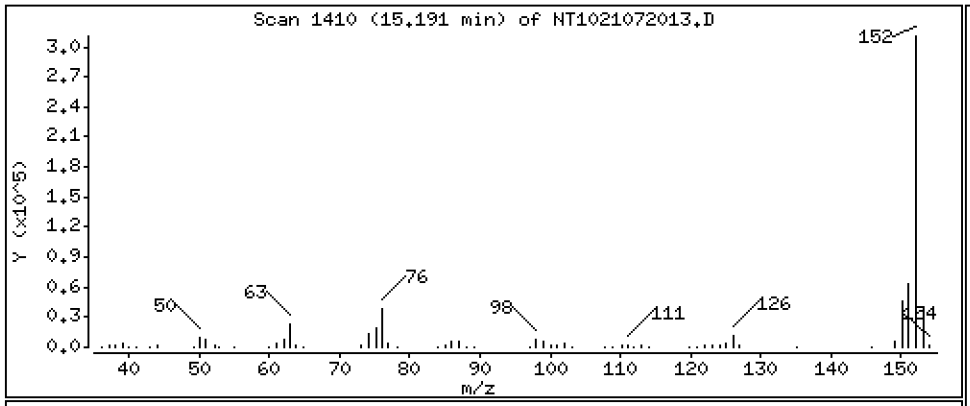
Operator: VTS

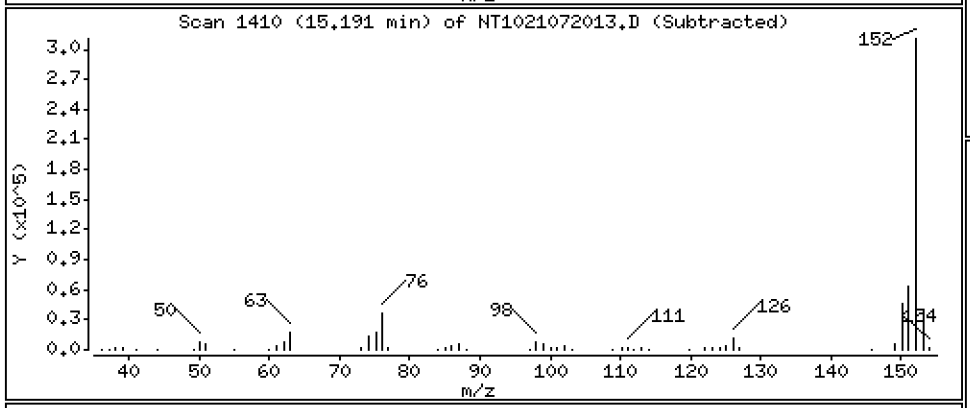
Column phase: ZB-5msi

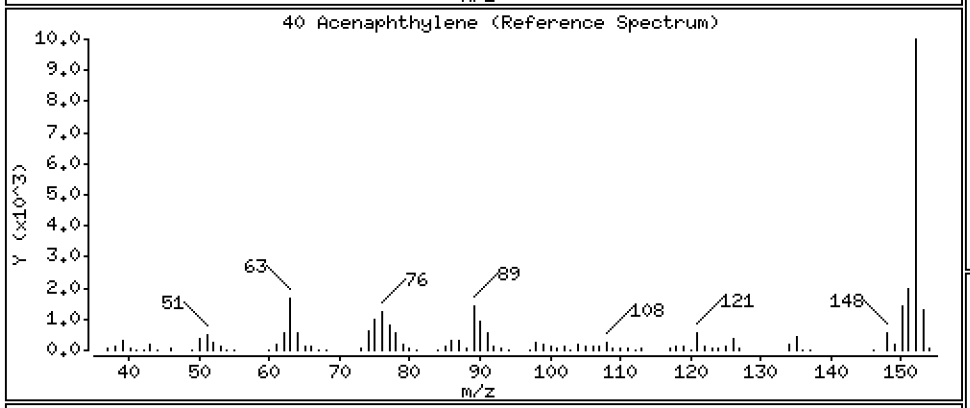
Column diameter: 0.25

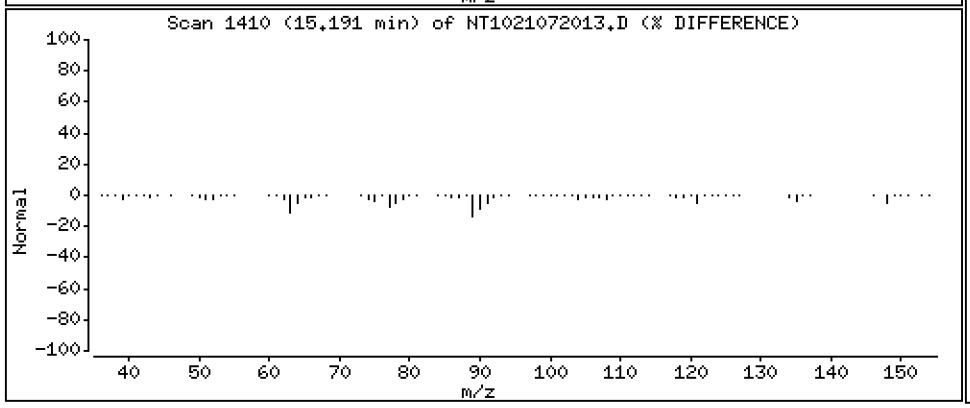
40 Acenaphthylene

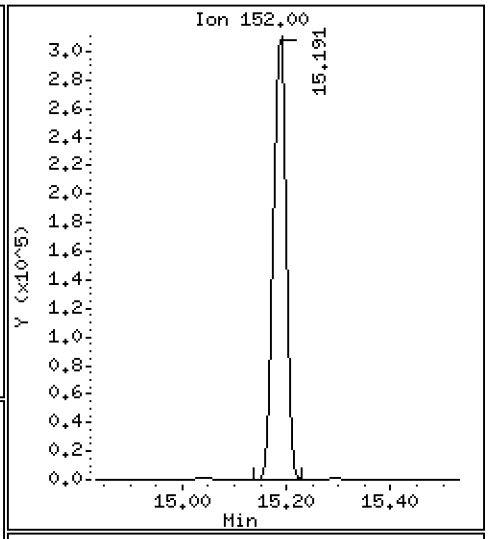
Concentration: 4.846 ug/mL

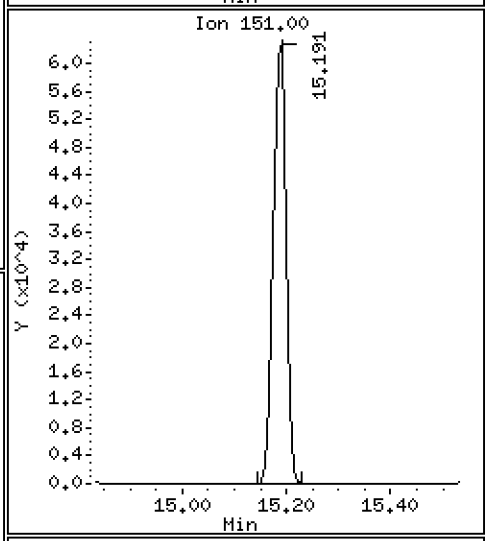


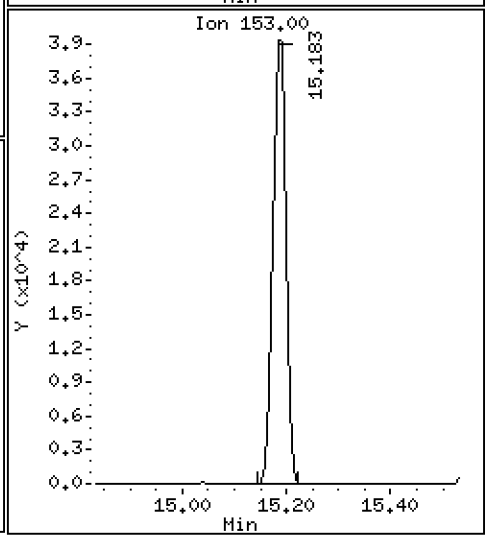












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

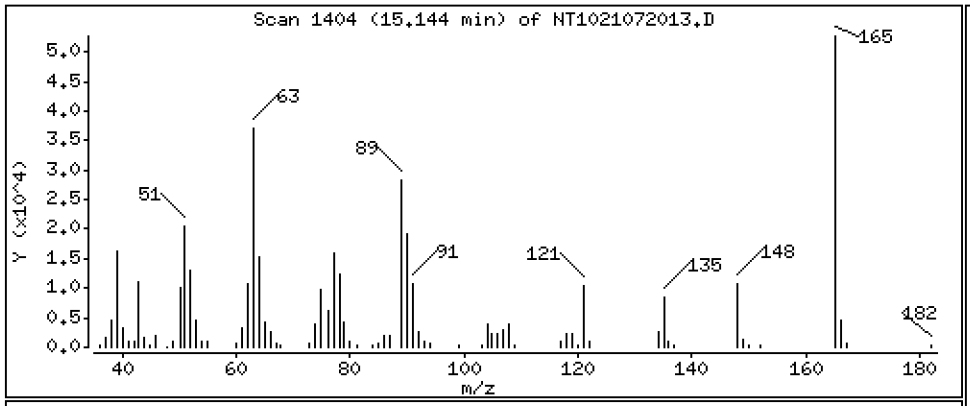
Operator: VTS

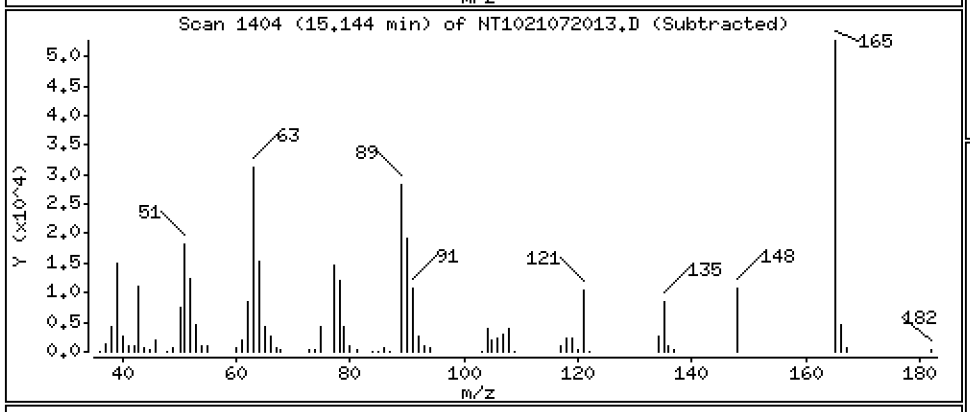
Column phase: ZB-5msi

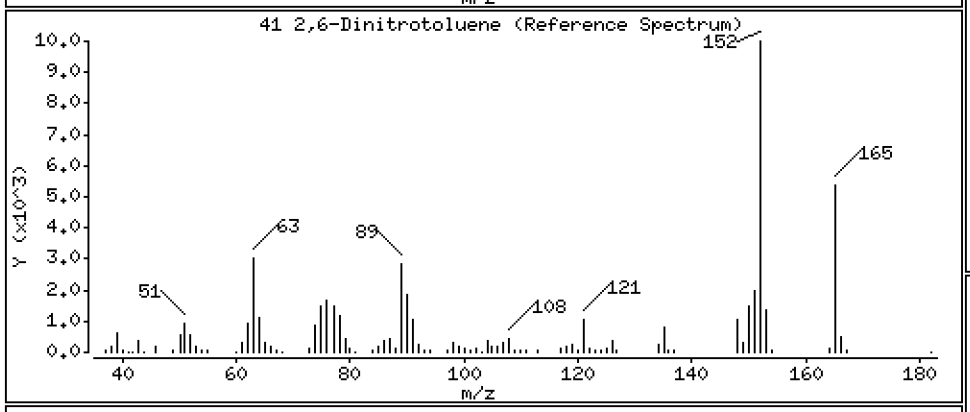
Column diameter: 0.25

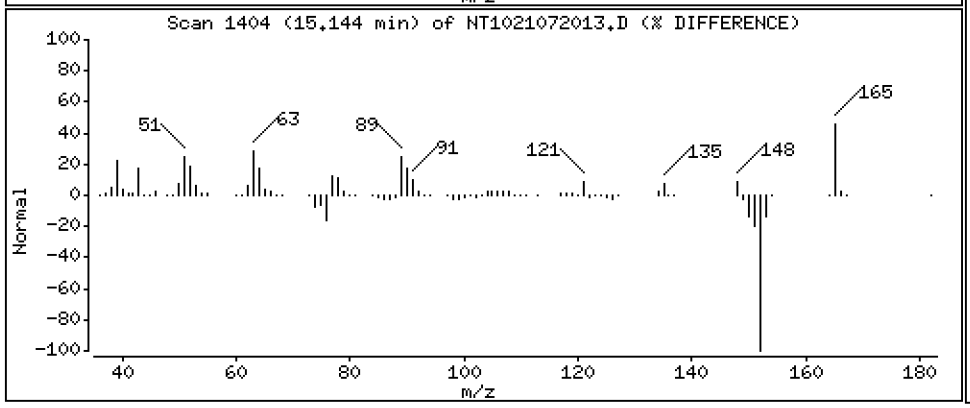
41 2,6-Dinitrotoluene

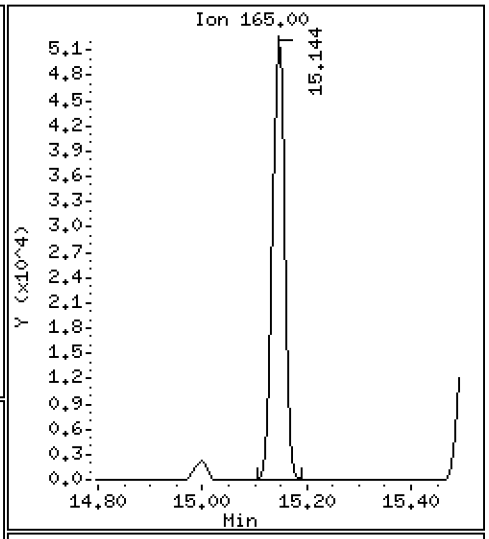
Concentration: 4.973 ug/mL

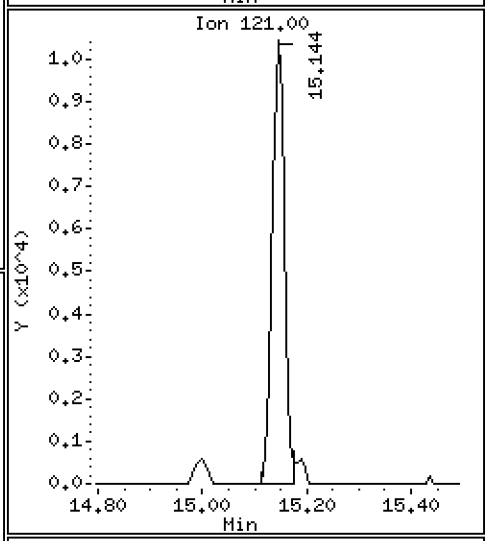


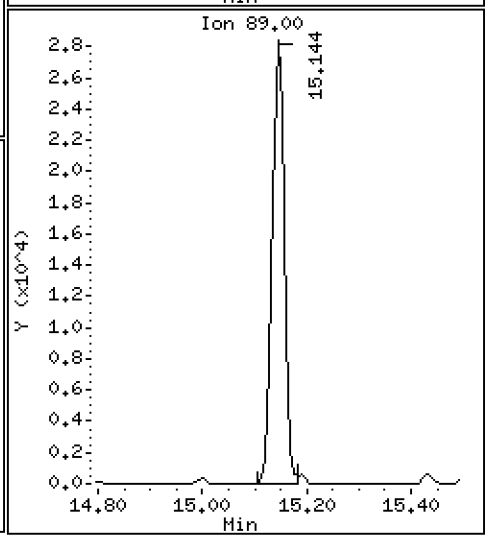












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

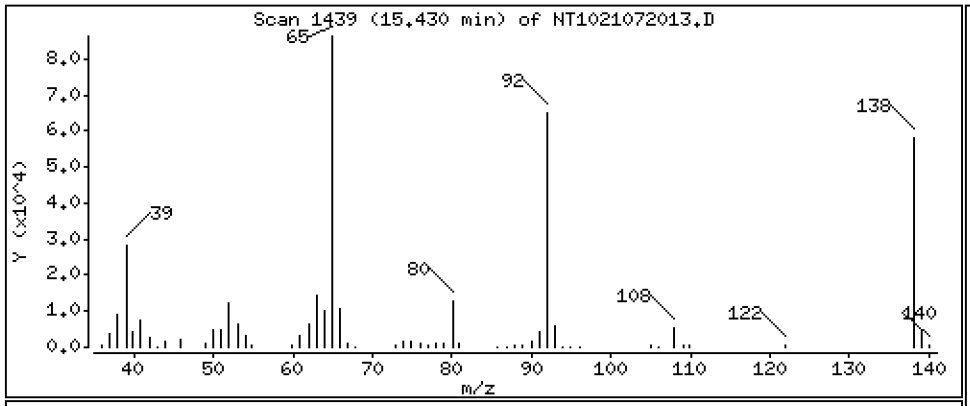
Operator: VTS

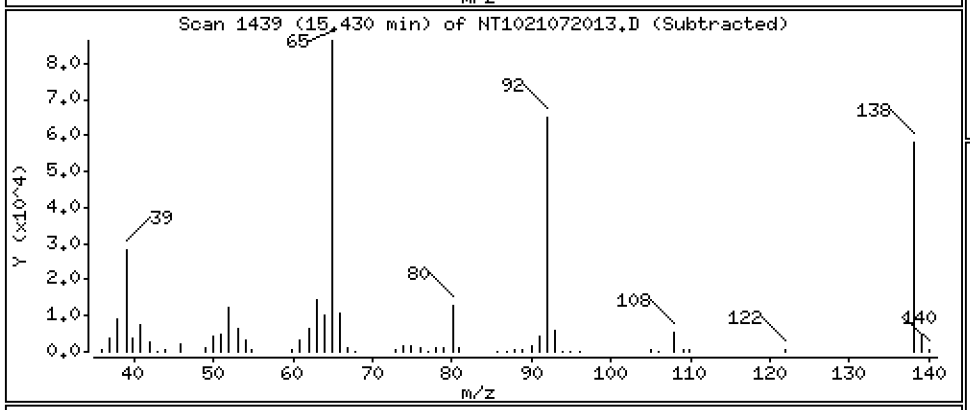
Column phase: ZB-5msi

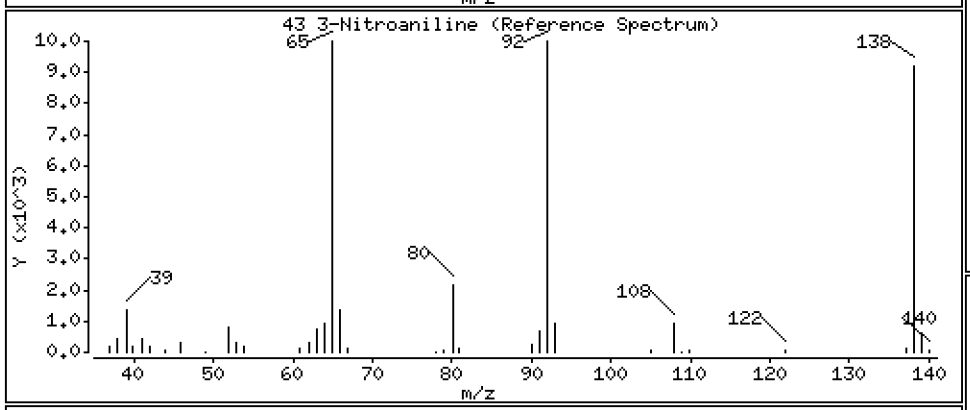
Column diameter: 0.25

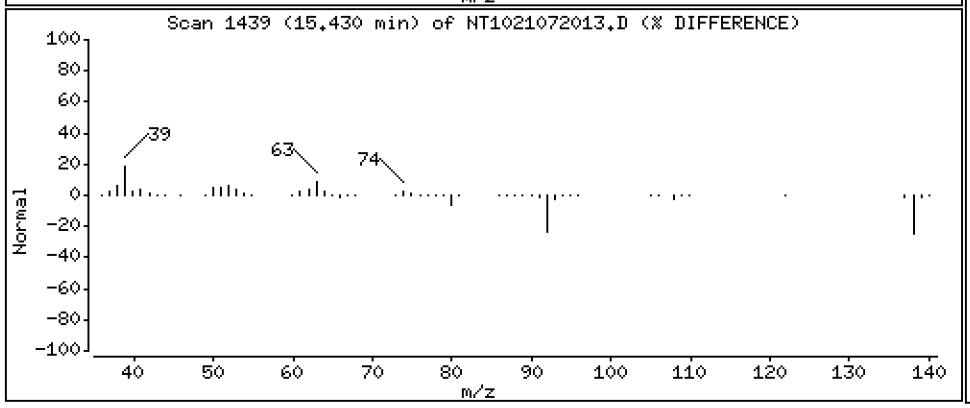
43 3-Nitroaniline

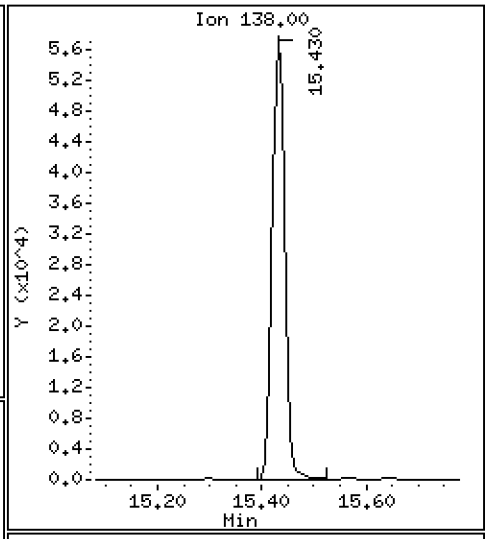
Concentration: 4.557 ug/mL

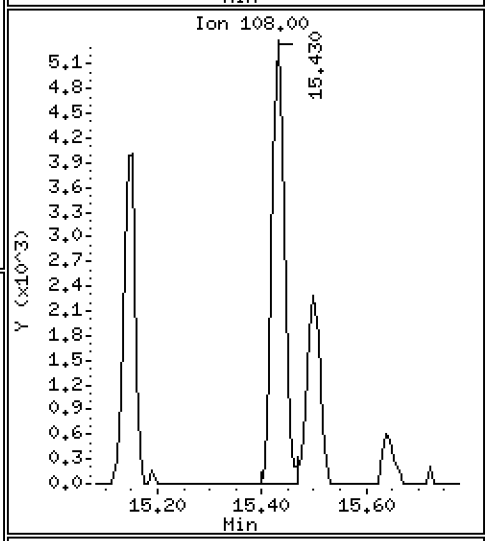


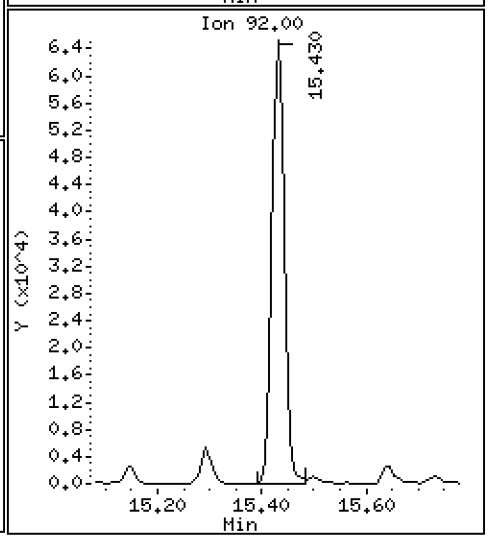












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

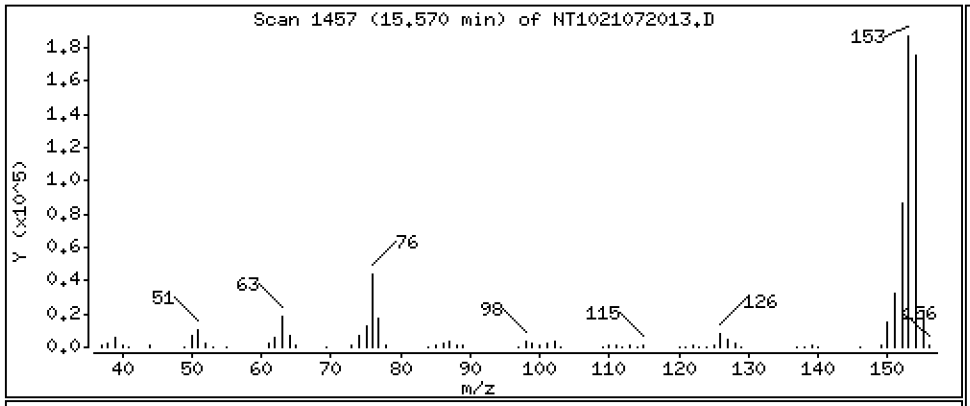
Operator: VTS

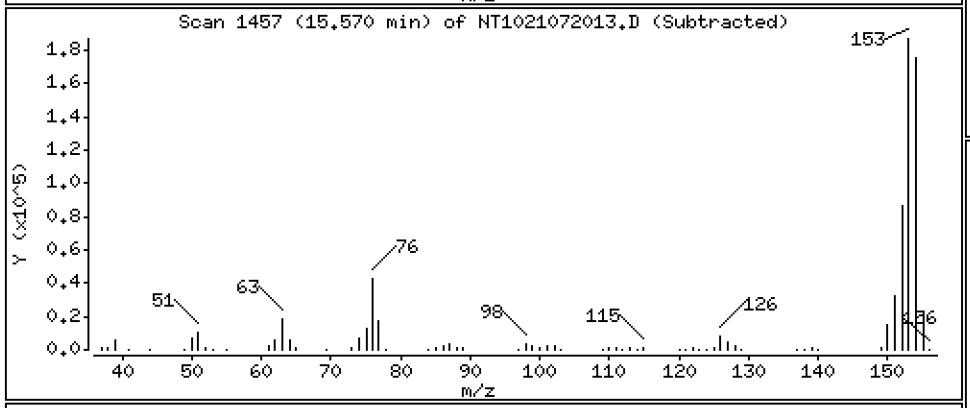
Column phase: ZB-5msi

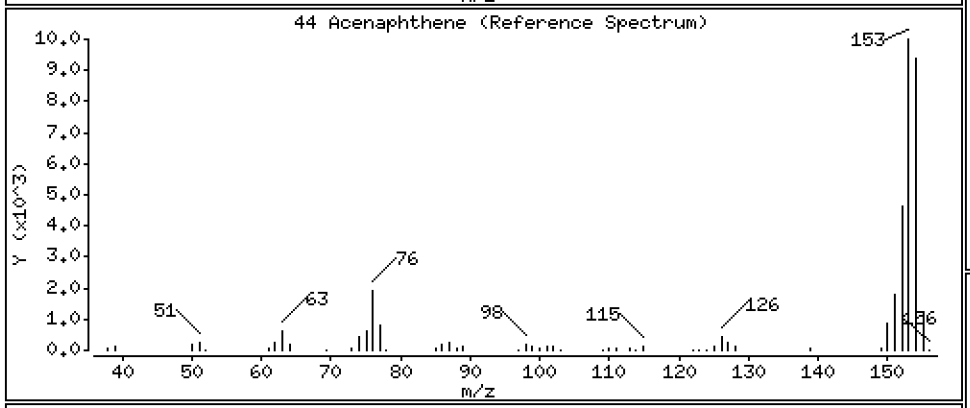
Column diameter: 0.25

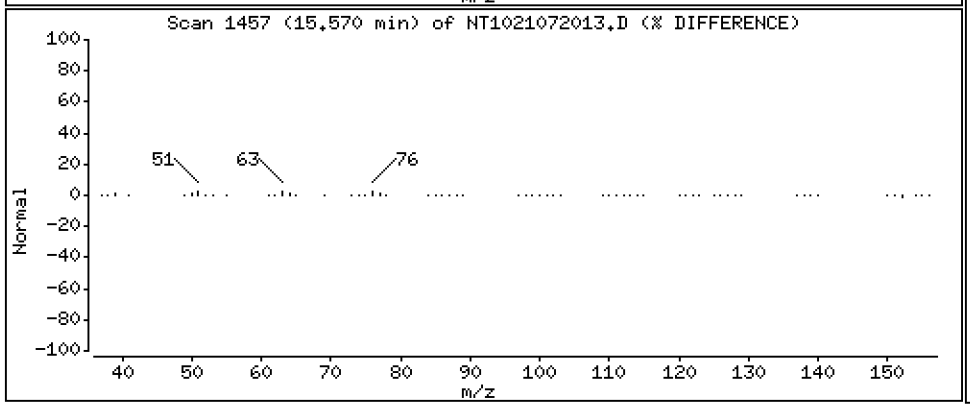
44 Acenaphthene

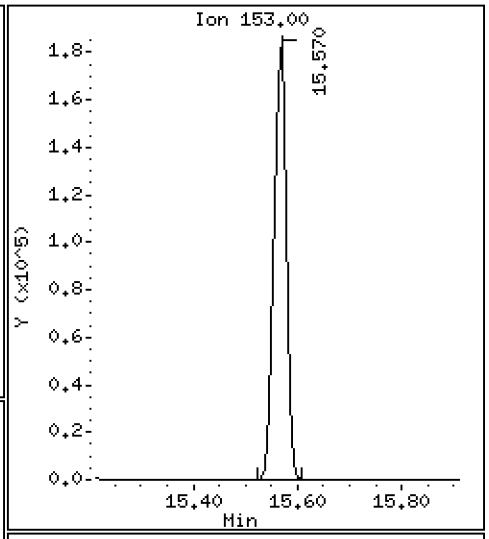
Concentration: 4.792 ug/mL

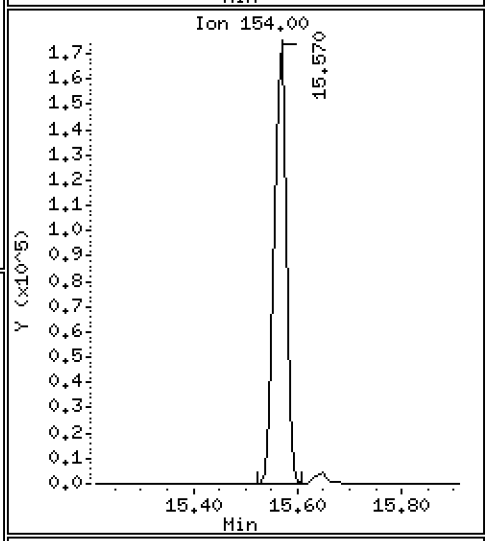


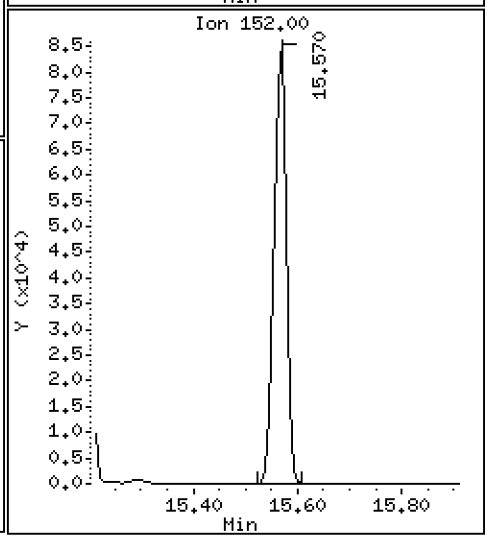












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

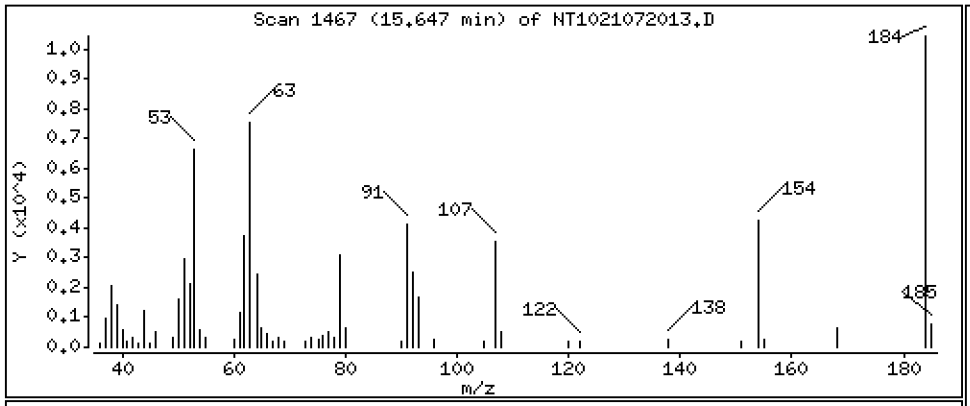
Operator: VTS

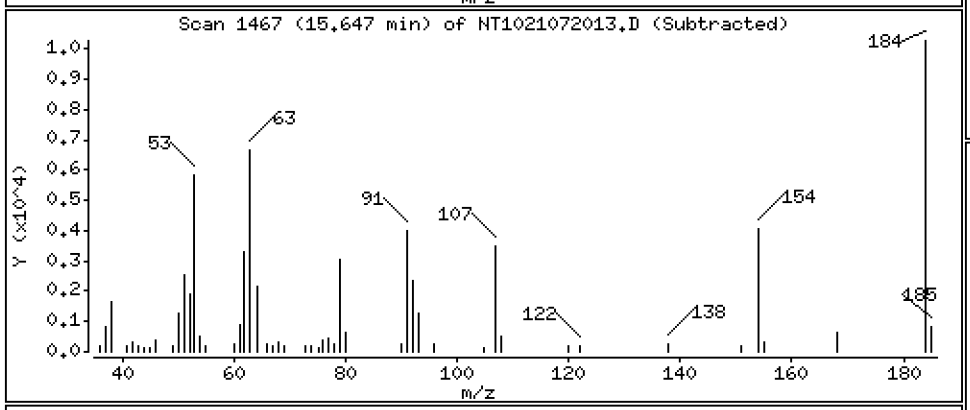
Column phase: ZB-5msi

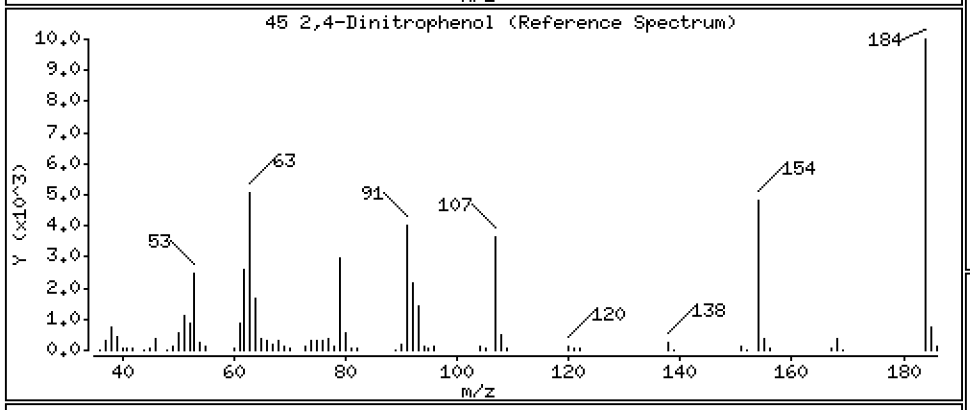
Column diameter: 0.25

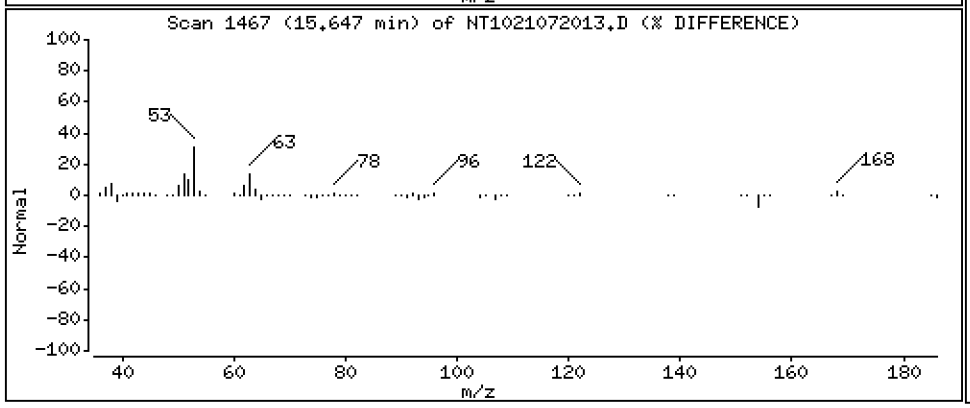
45 2,4-Dinitrophenol

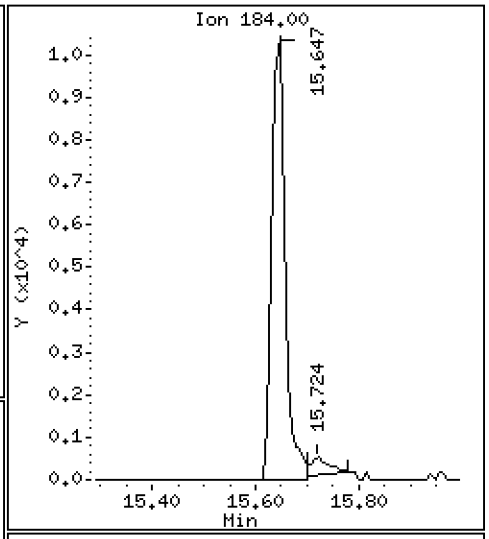
Concentration: 1.928 ug/mL

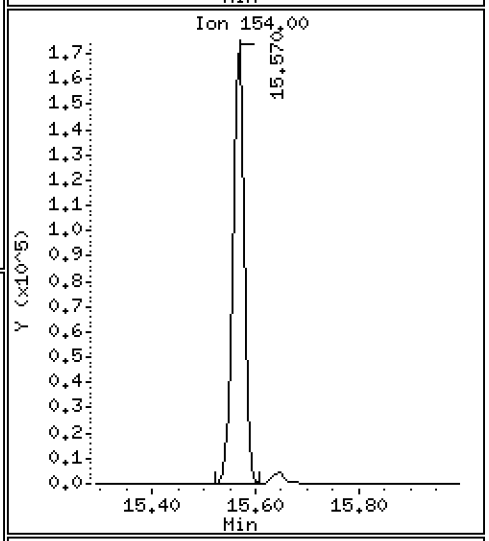


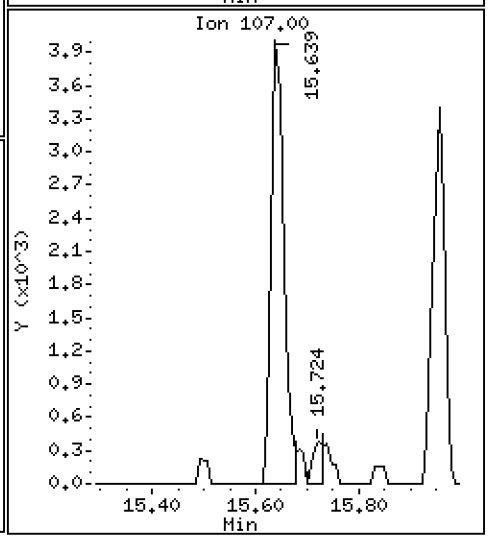












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

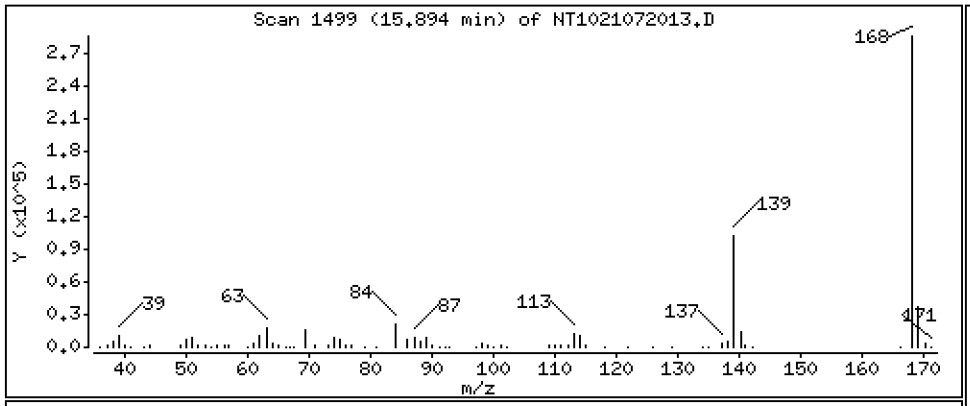
Operator: VTS

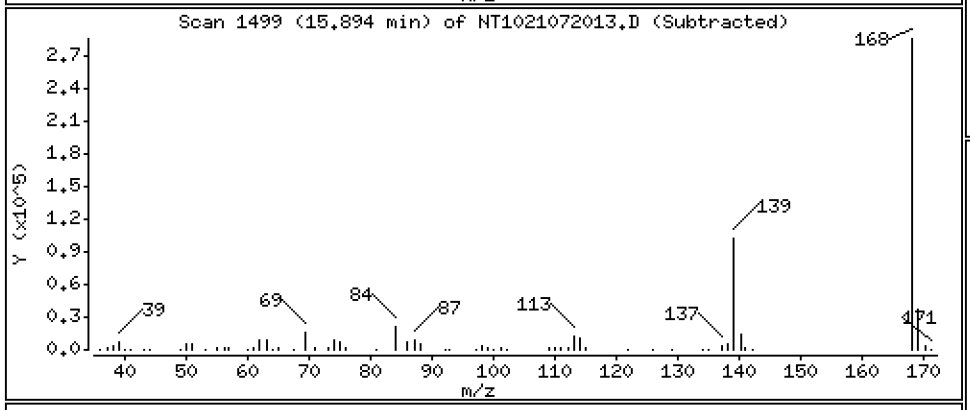
Column phase: ZB-5msi

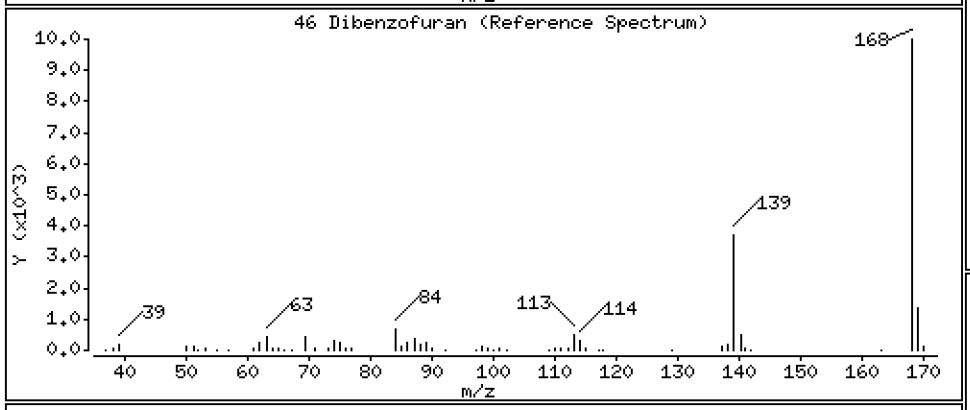
Column diameter: 0.25

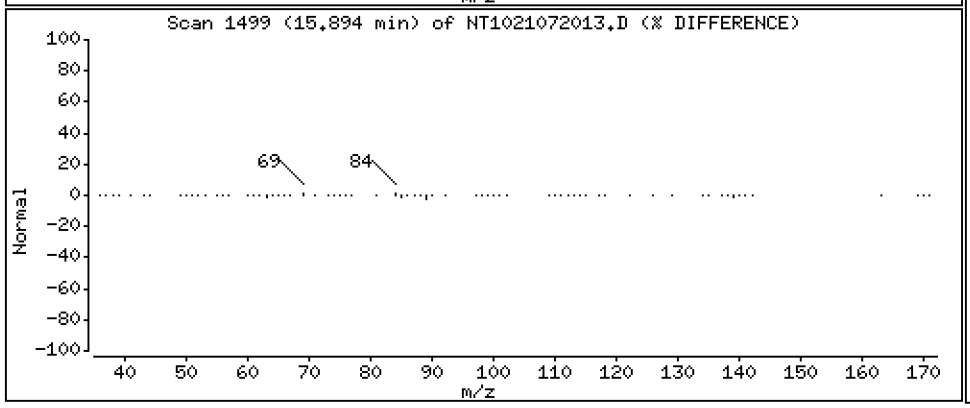
46 Dibenzofuran

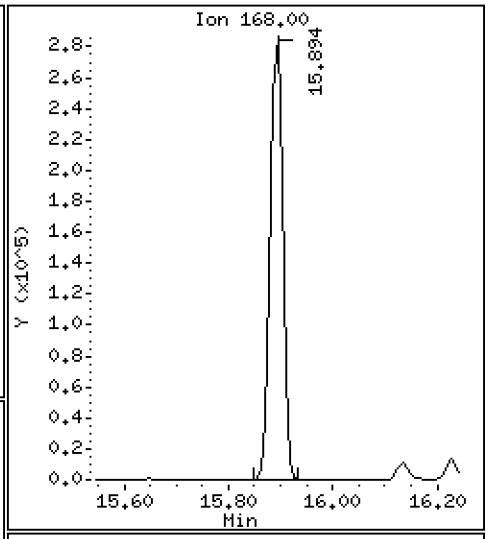
Concentration: 4.833 ug/mL

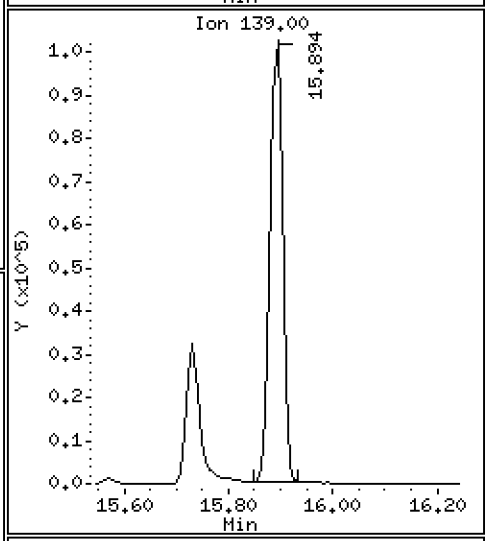


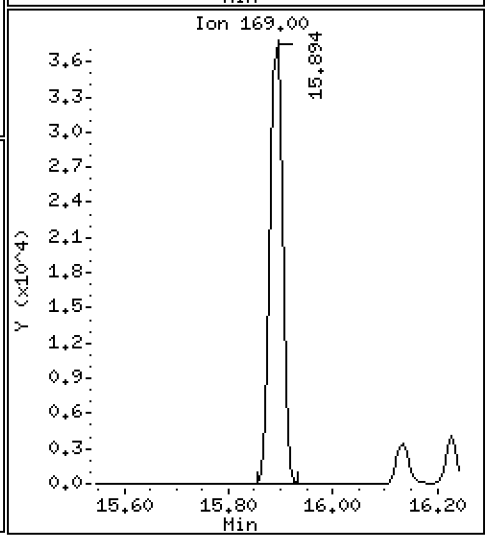












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

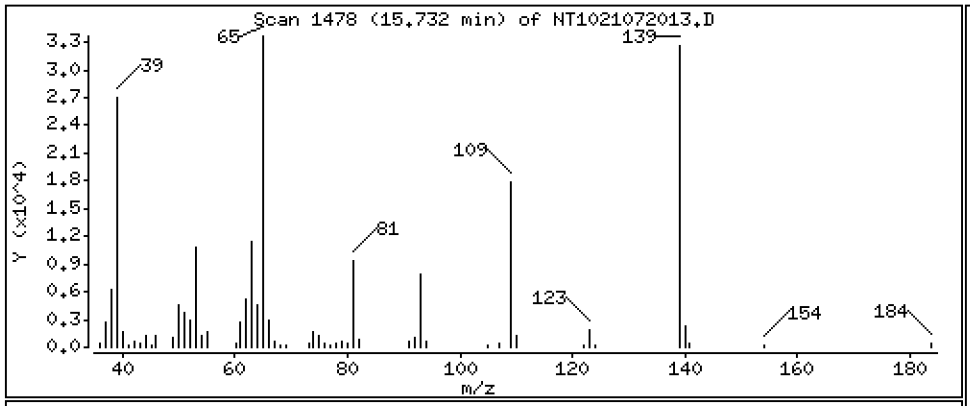
Operator: VTS

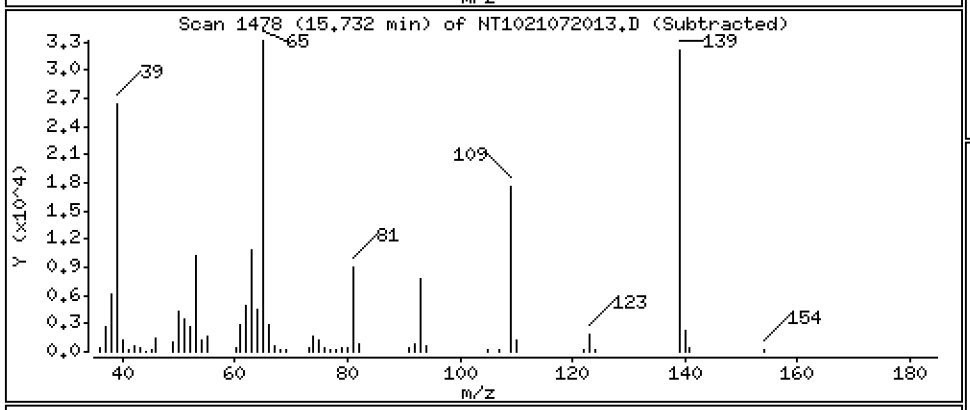
Column phase: ZB-5msi

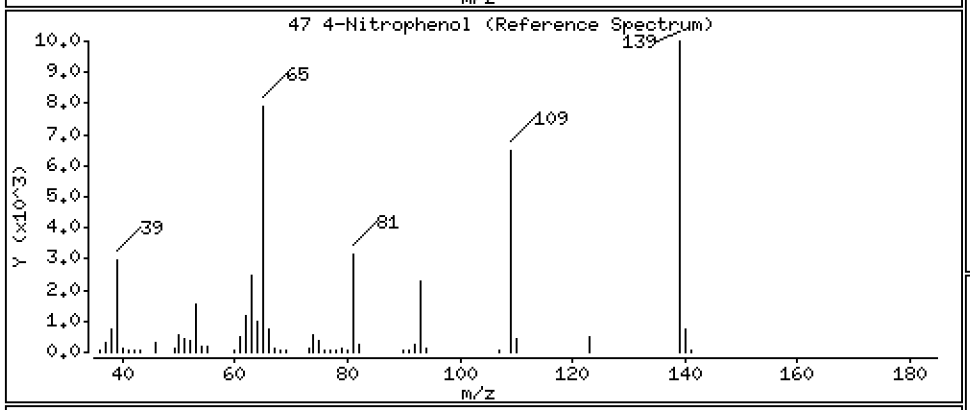
Column diameter: 0.25

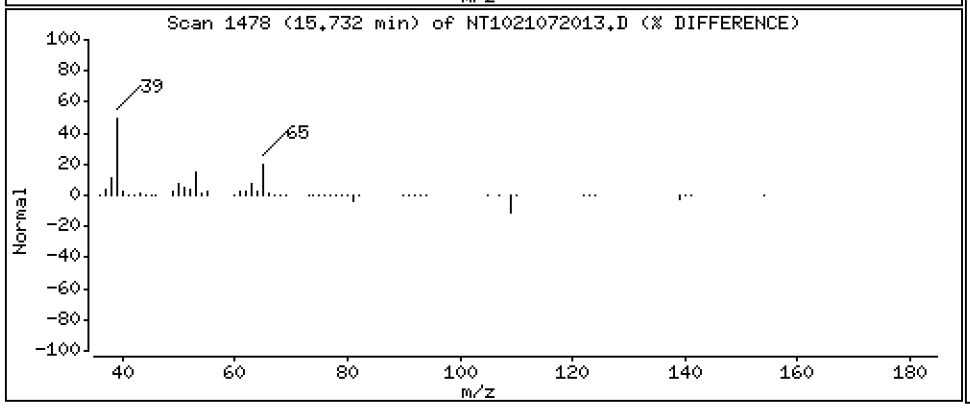
47 4-Nitrophenol

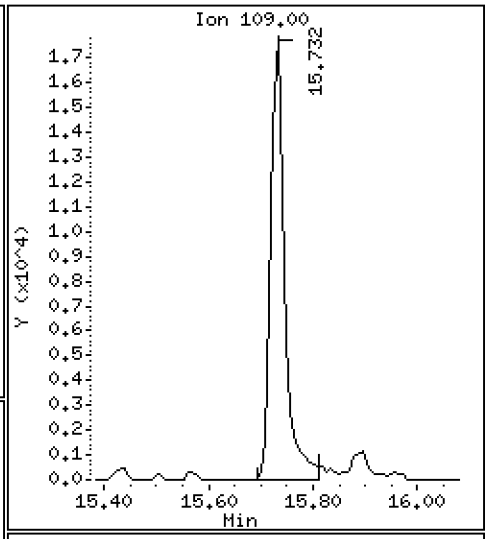
Concentration: 4.089 ug/mL

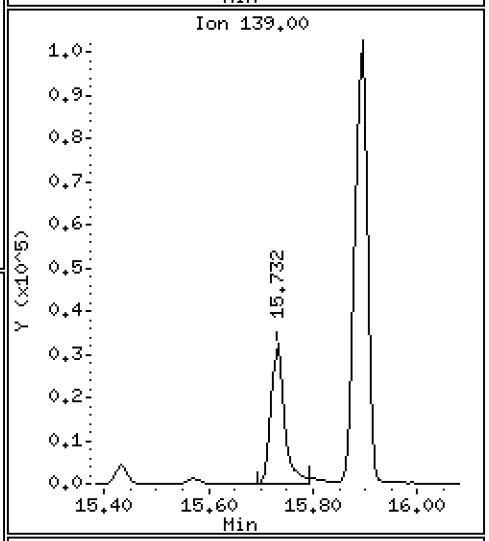


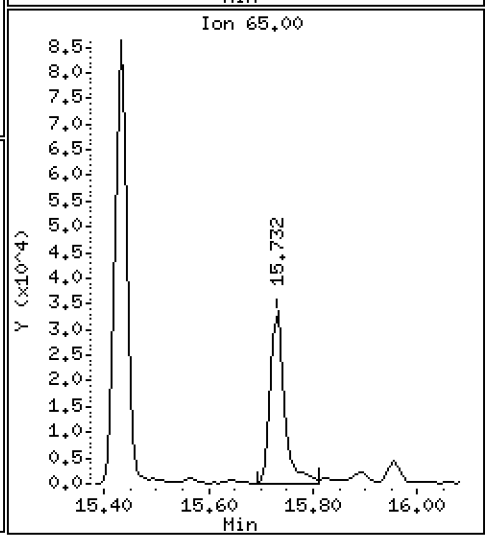












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

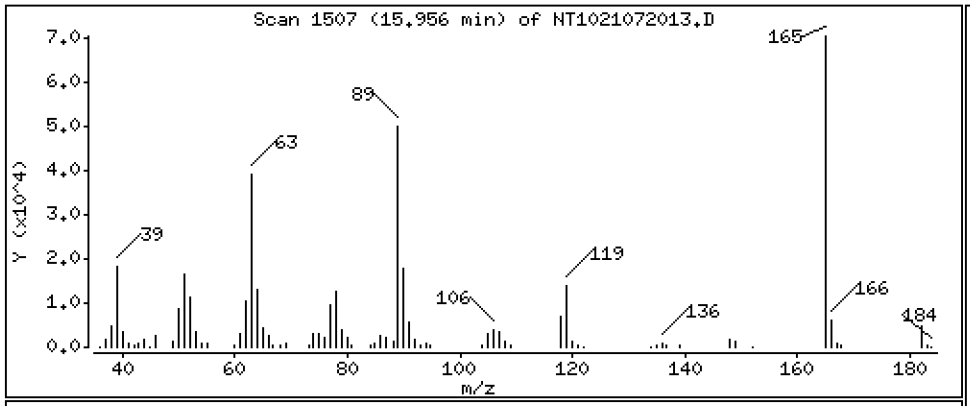
Operator: VTS

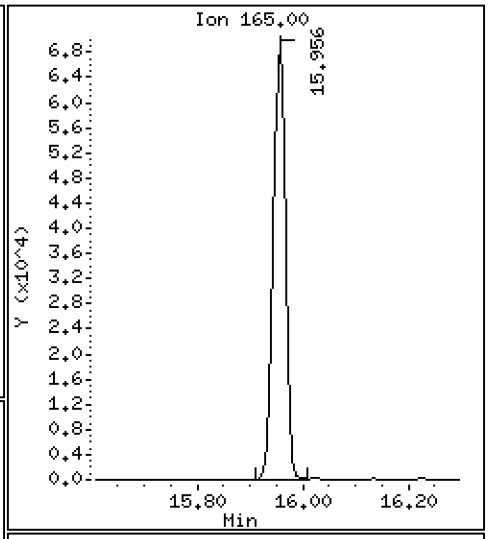
Column phase: ZB-5msi

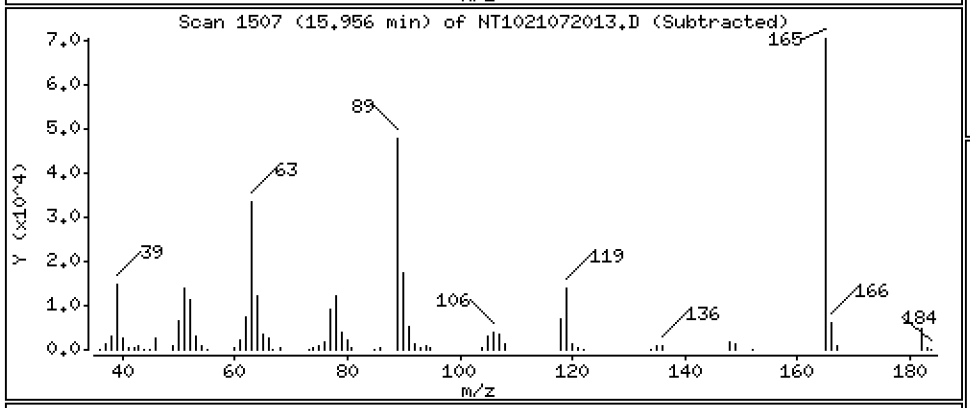
Column diameter: 0.25

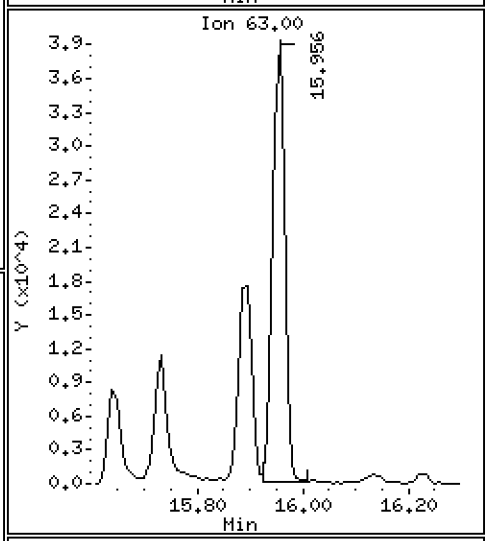
48 2,4-Dinitrotoluene

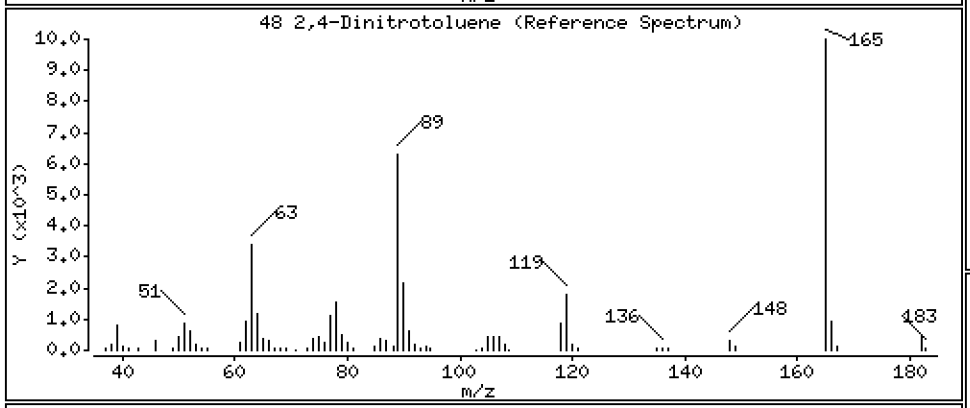
Concentration: 4.929 ug/mL

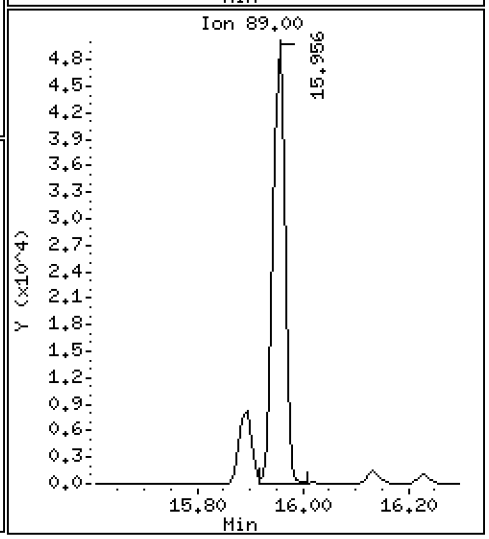


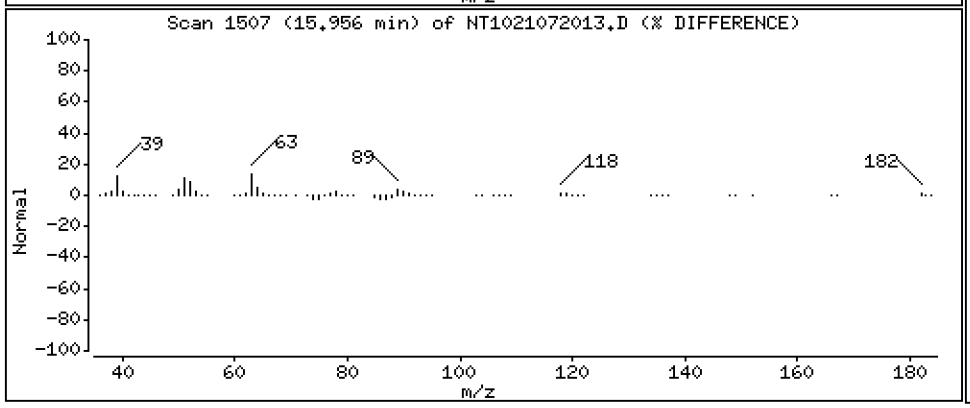












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

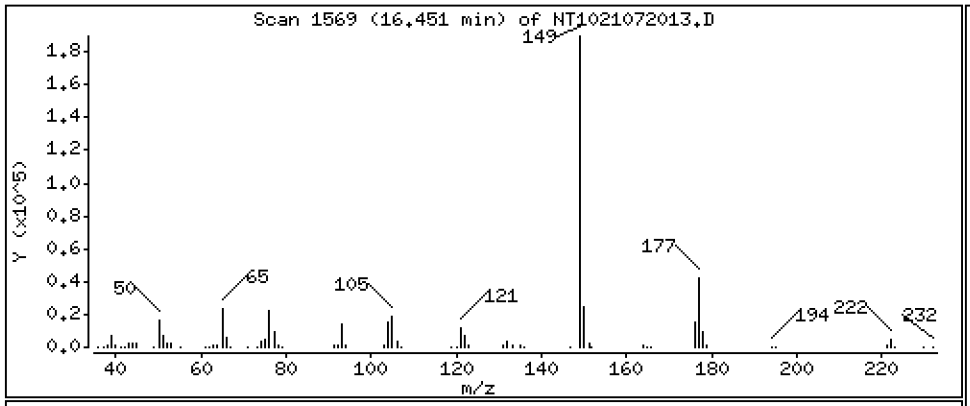
Operator: VTS

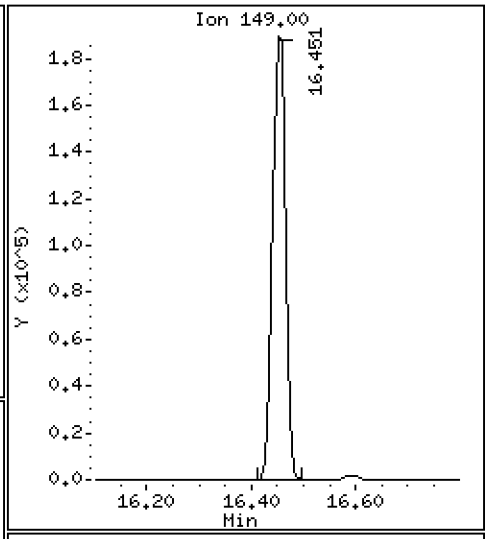
Column phase: ZB-5msi

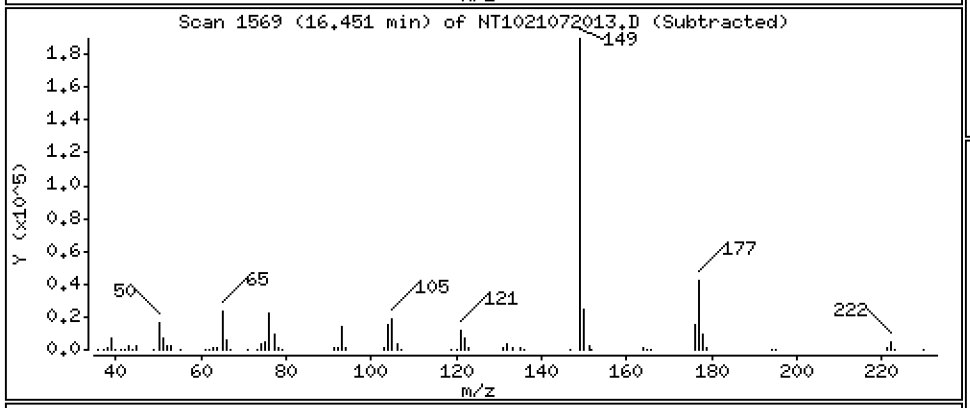
Column diameter: 0.25

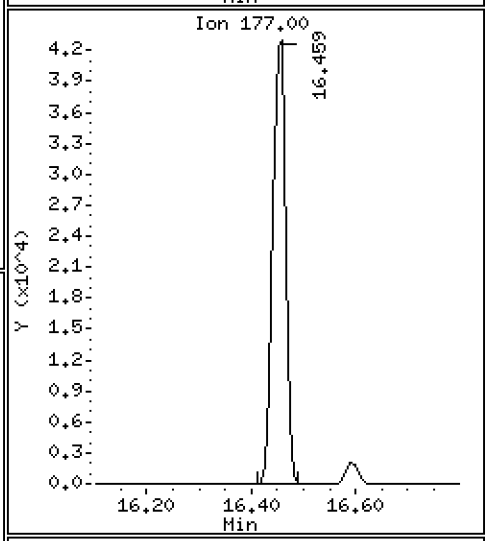
50 Diethylphthalate

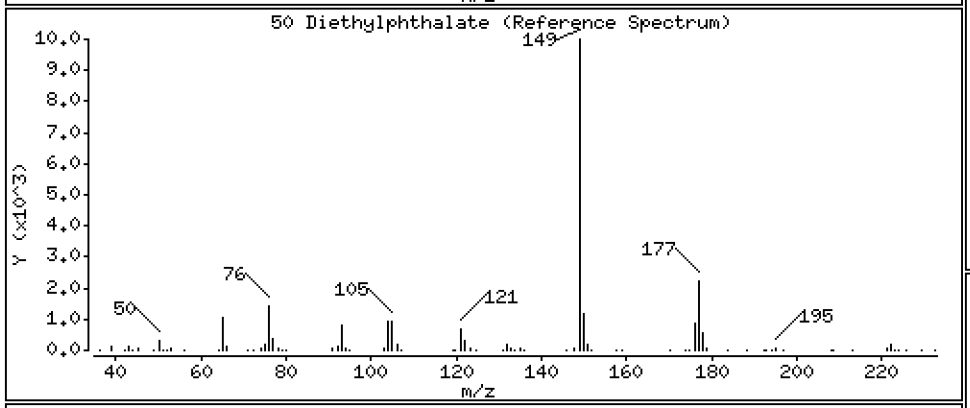
Concentration: 4.598 ug/mL

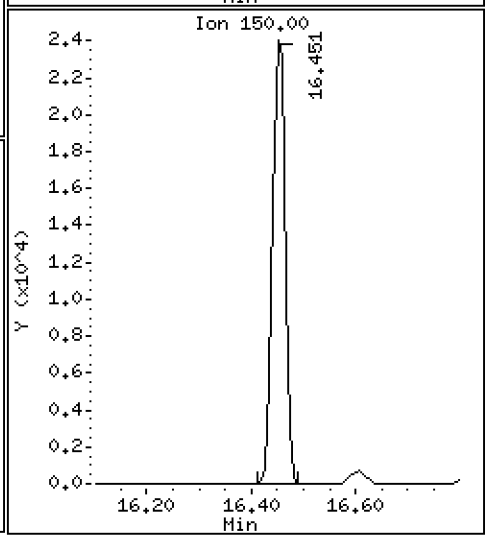


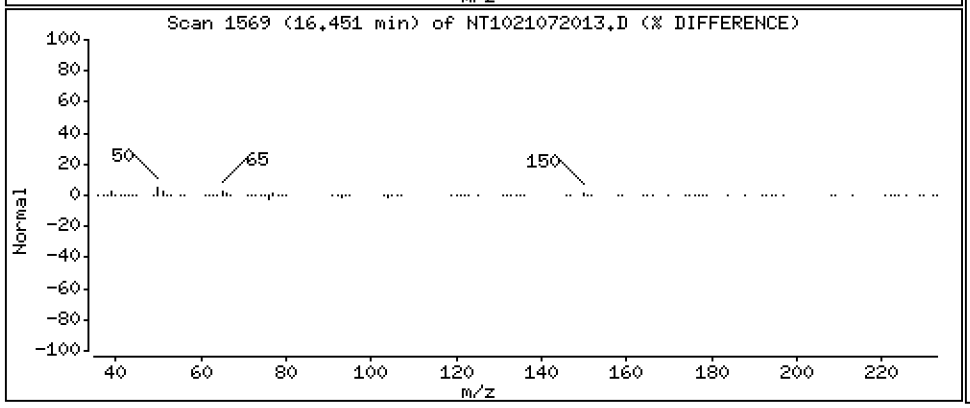












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

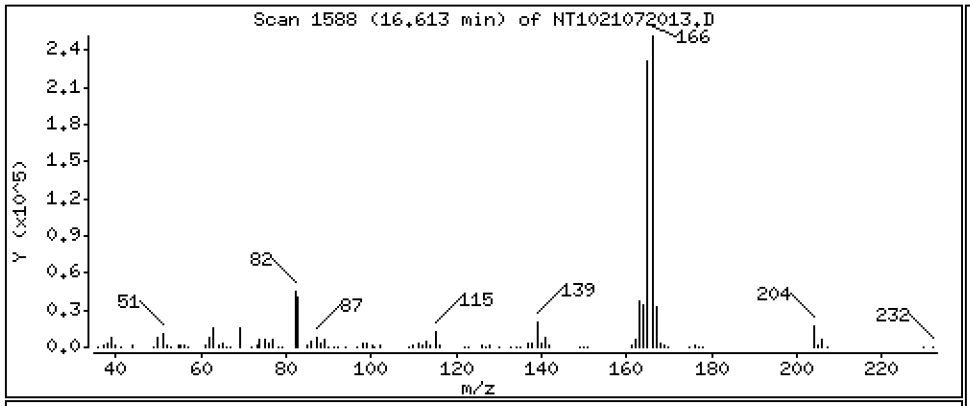
Operator: VTS

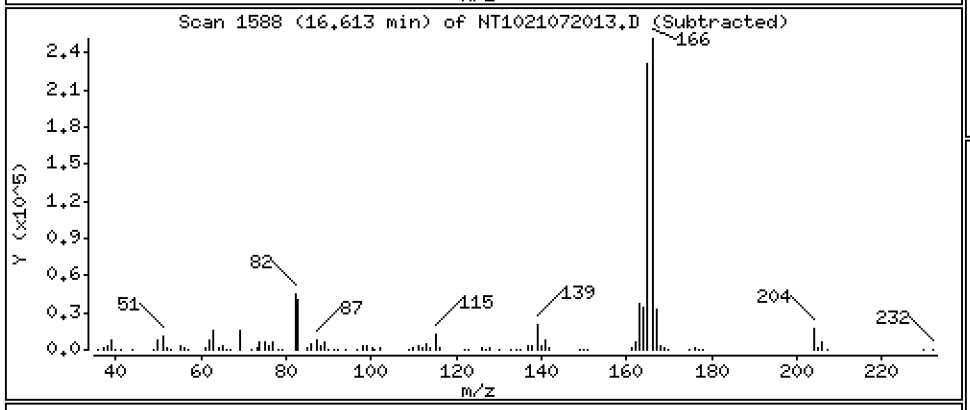
Column phase: ZB-5msi

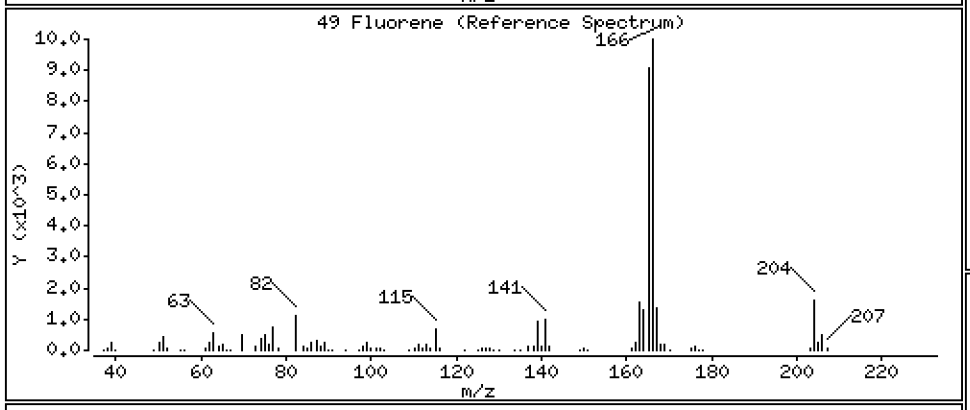
Column diameter: 0.25

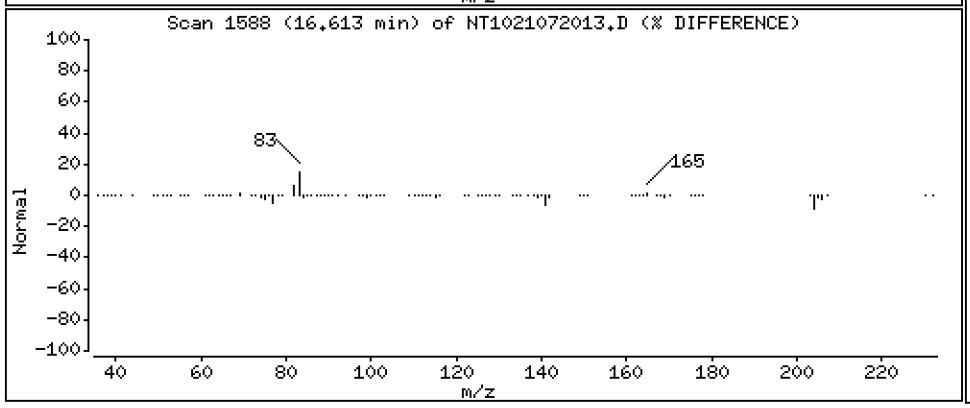
49 Fluorene

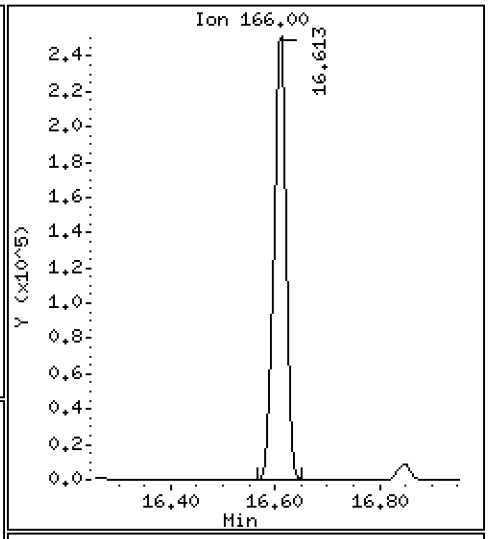
Concentration: 4.477 ug/mL

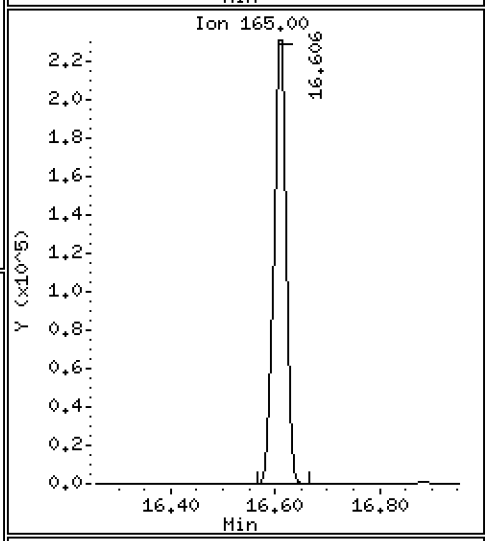


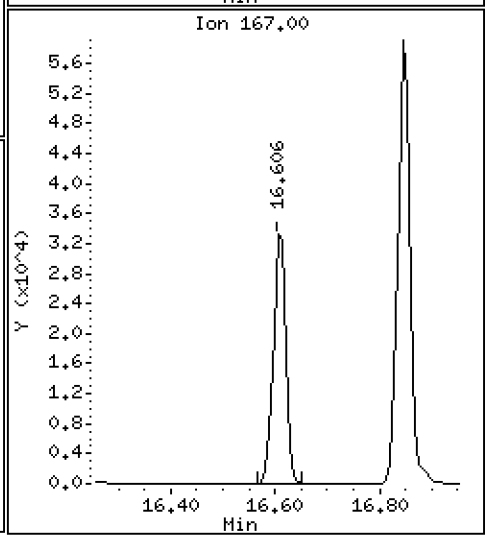












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

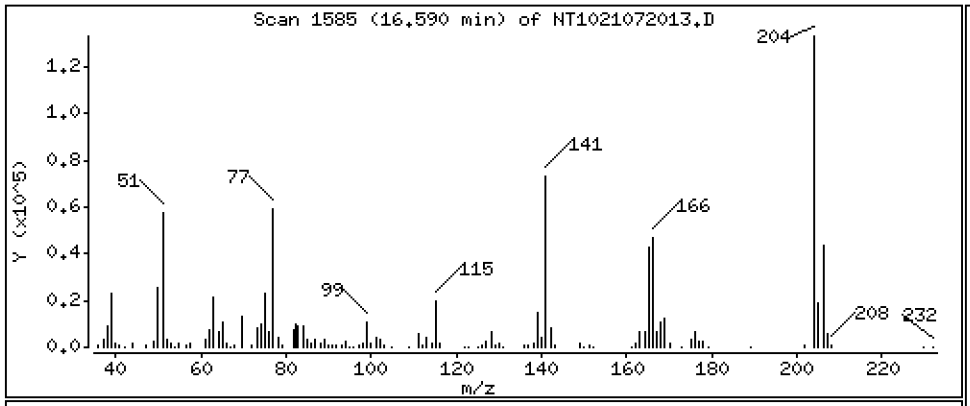
Operator: VTS

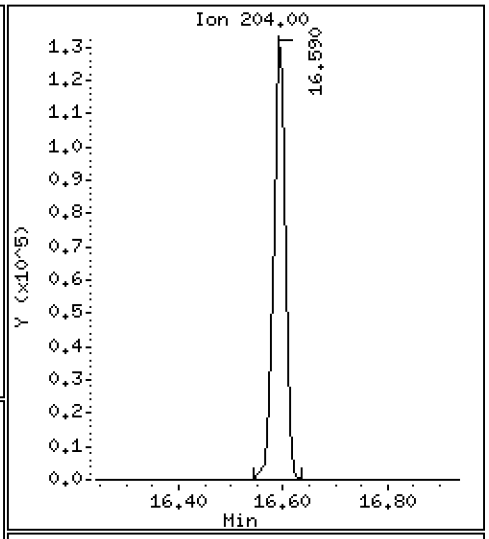
Column phase: ZB-5msi

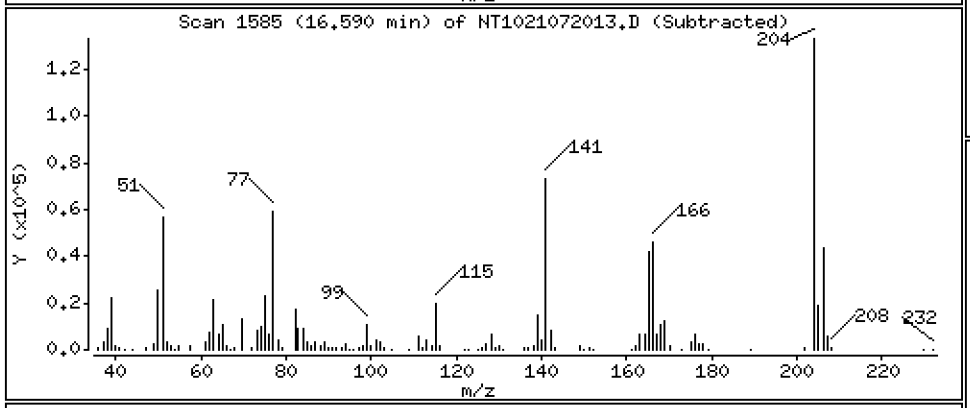
Column diameter: 0.25

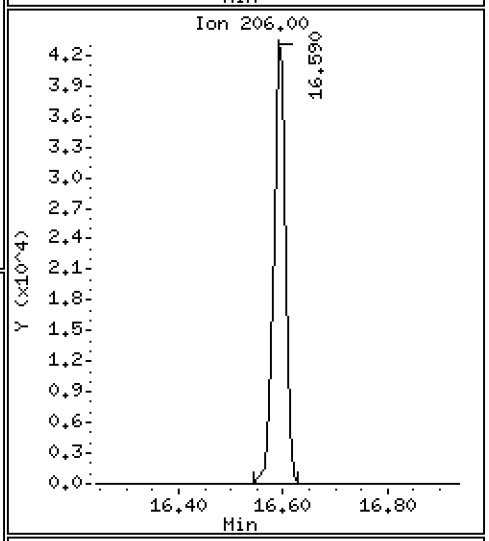
51 4-Chlorophenyl-phenylether

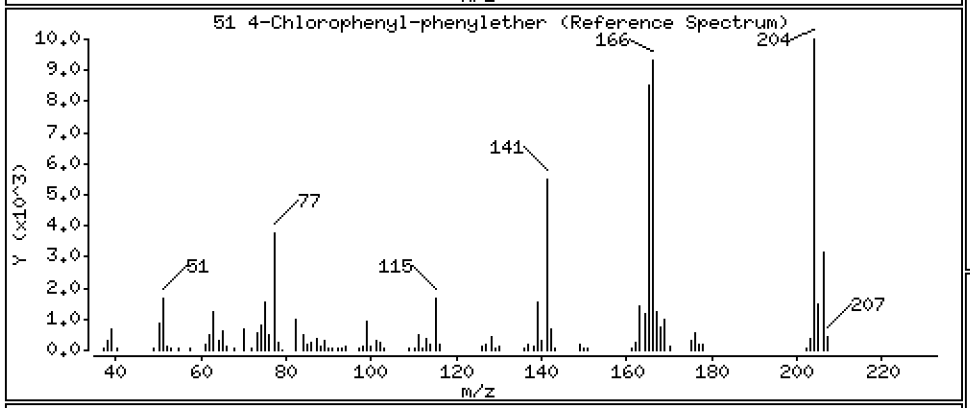
Concentration: 4.594 ug/mL

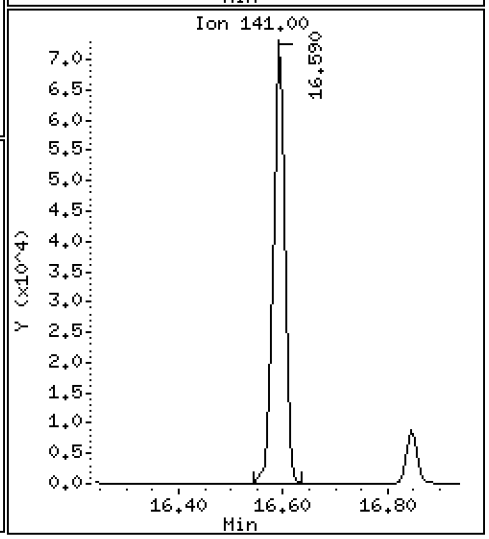


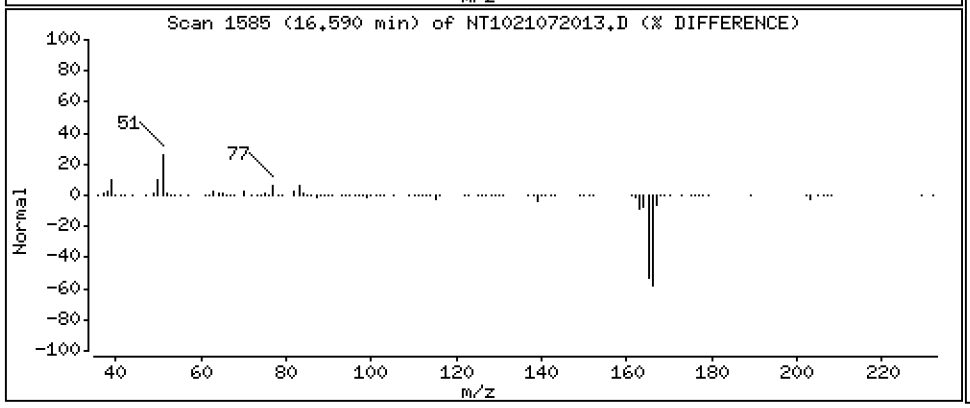












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

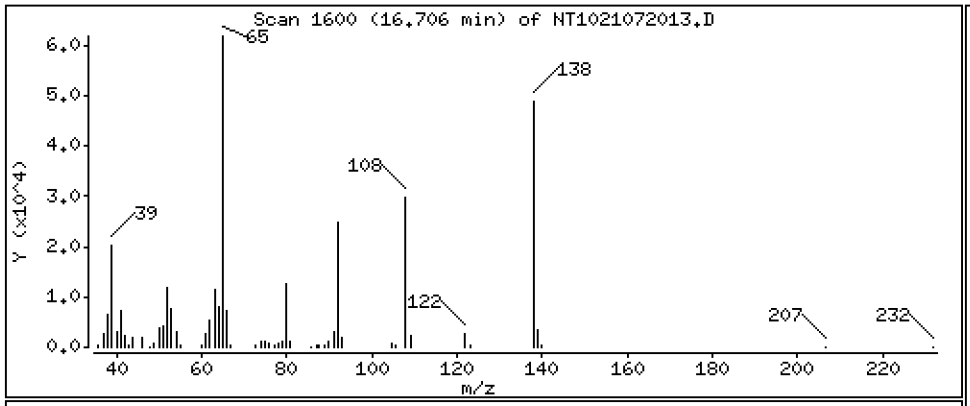
Operator: VTS

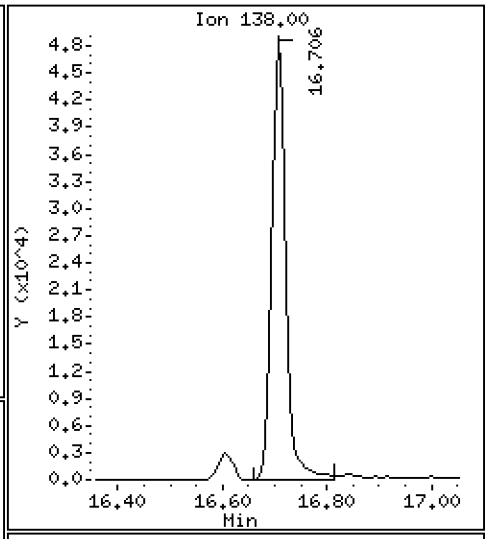
Column phase: ZB-5msi

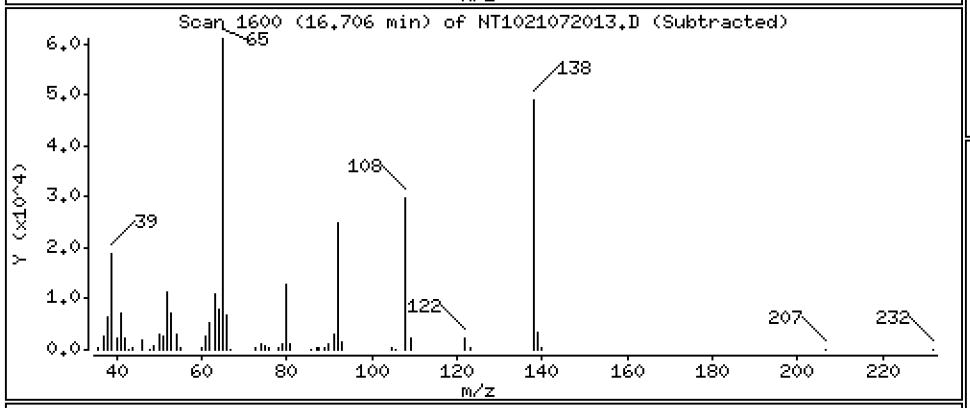
Column diameter: 0.25

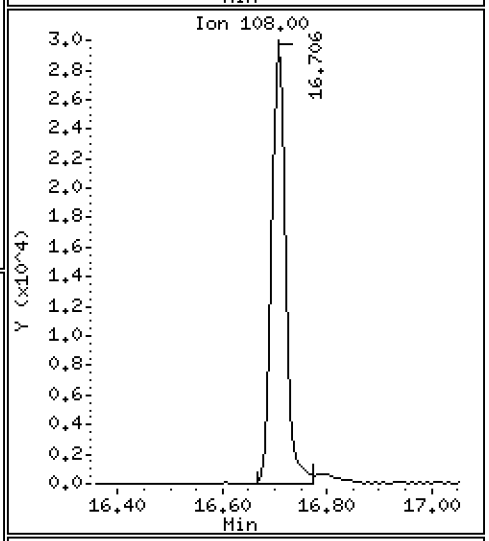
52 4-Nitroaniline

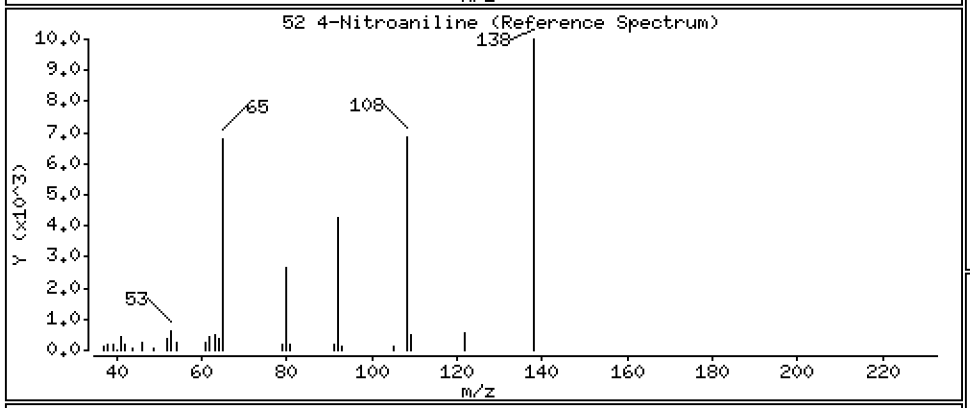
Concentration: 4.048 ug/mL

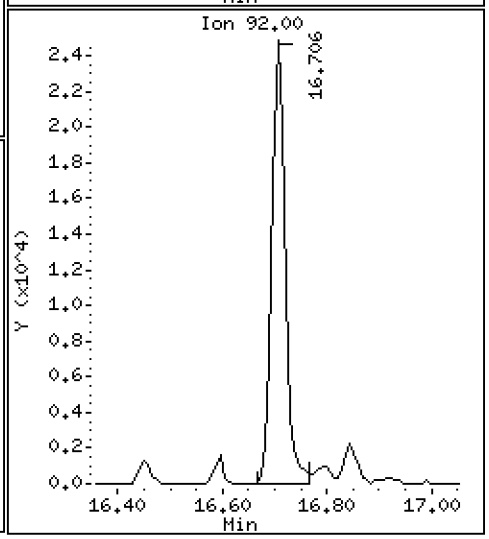


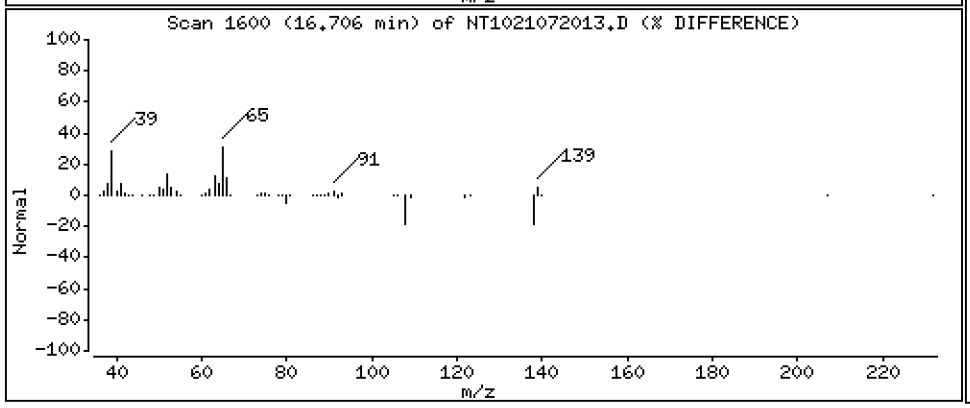












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

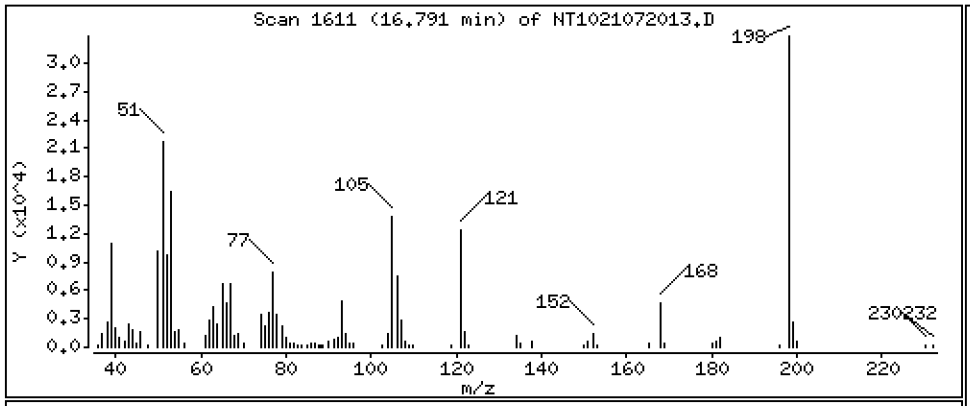
Operator: VTS

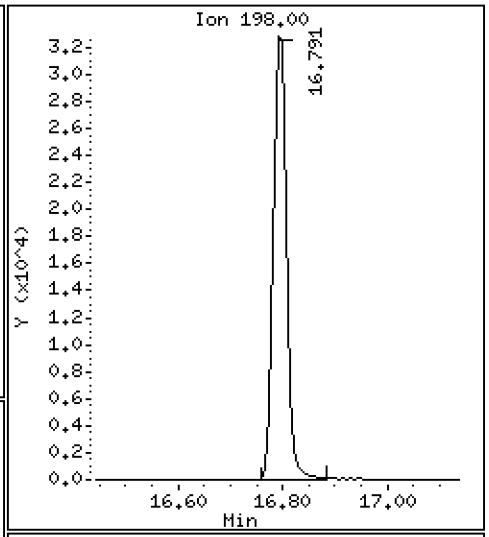
Column phase: ZB-5msi

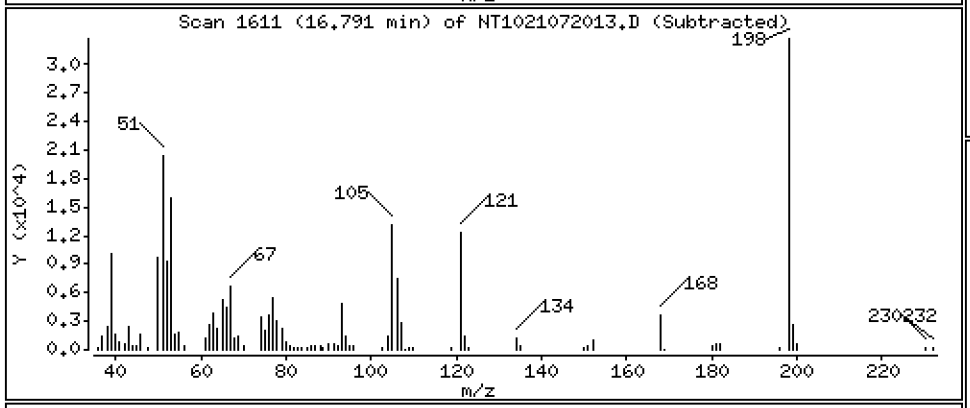
Column diameter: 0.25

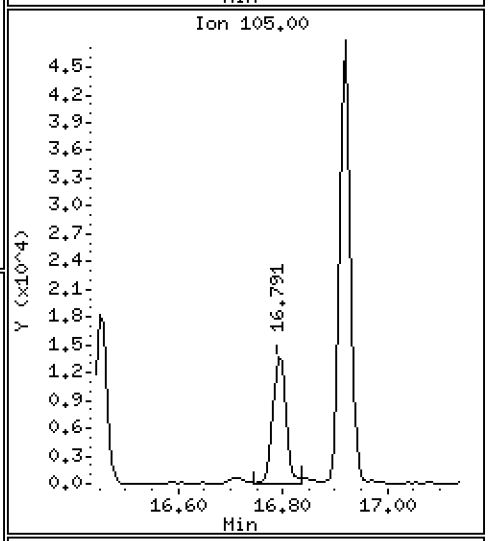
53 4,6-Dinitro-2-methylphenol

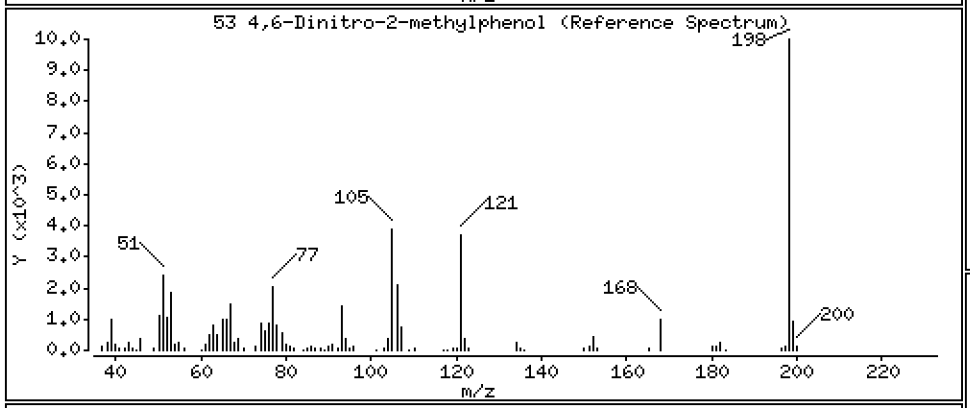
Concentration: 3.646 ug/mL

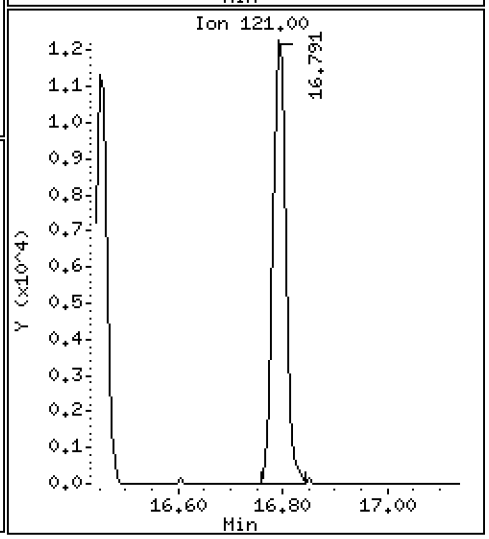


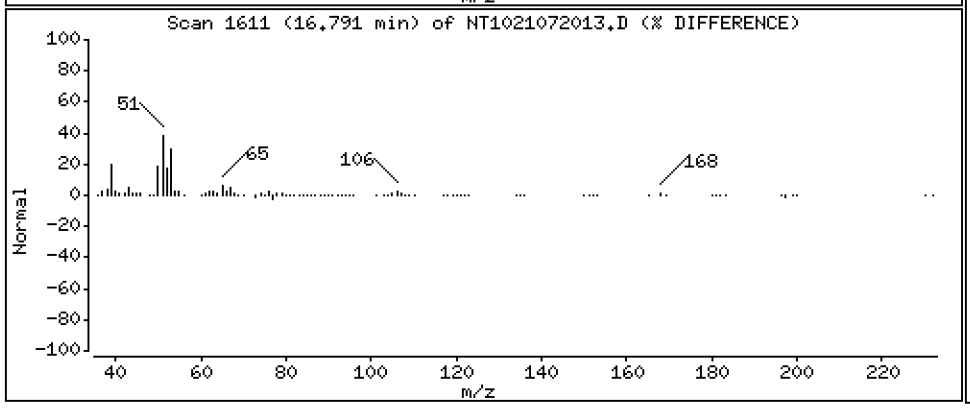












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

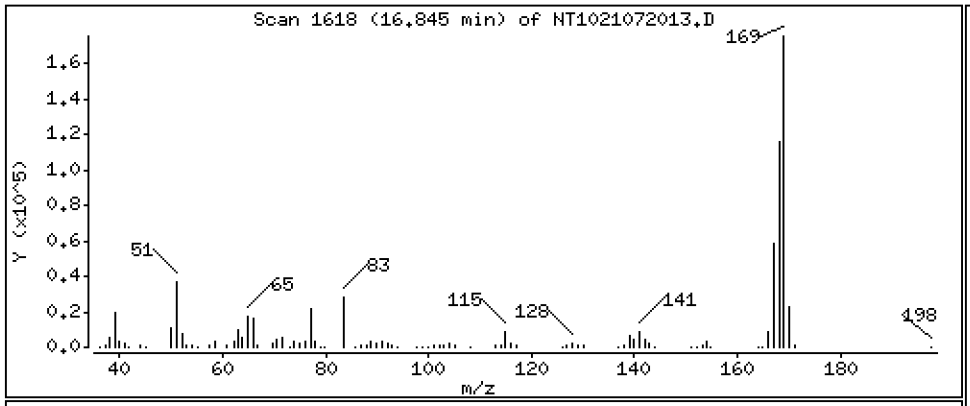
Operator: VTS

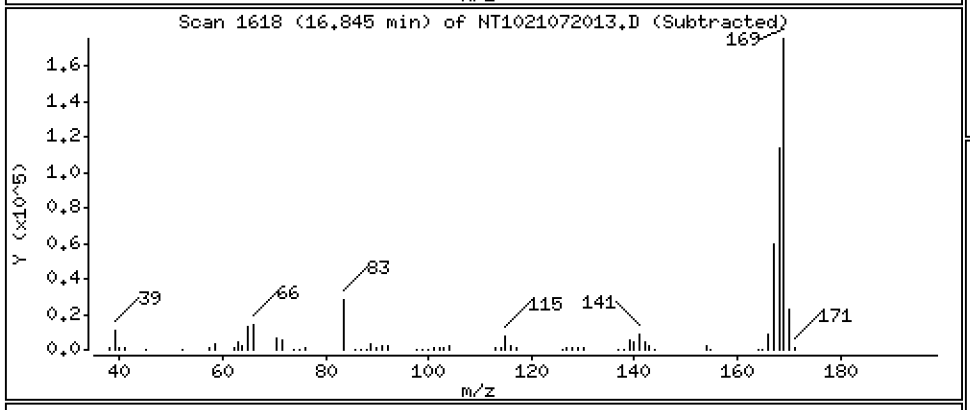
Column phase: ZB-5msi

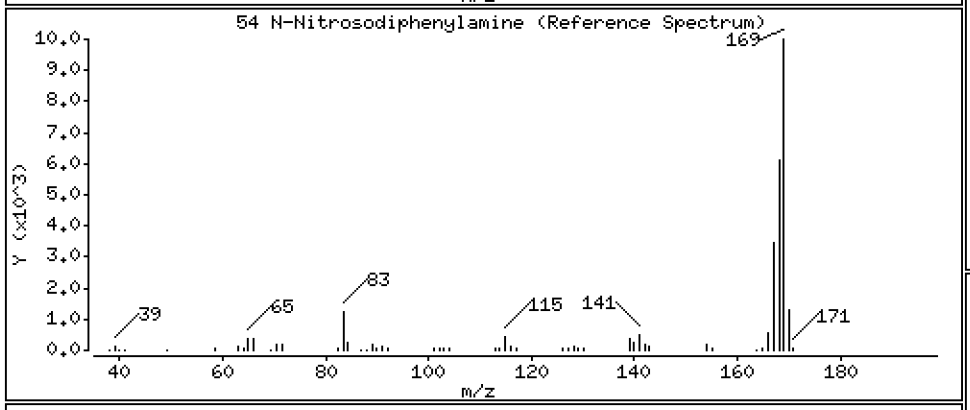
Column diameter: 0.25

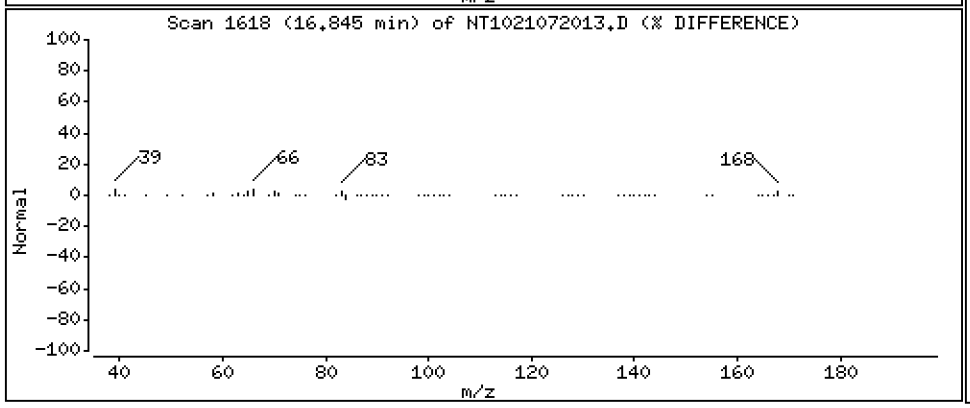
54 N-Nitrosodiphenylamine

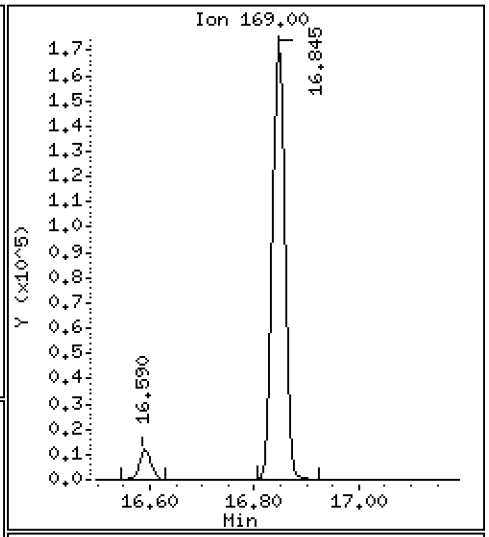
Concentration: 4.546 ug/mL

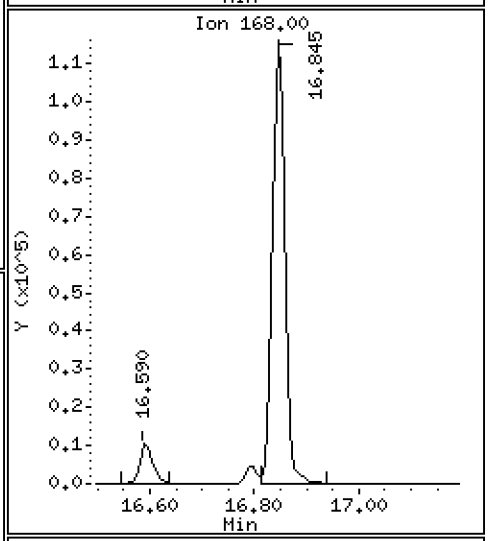


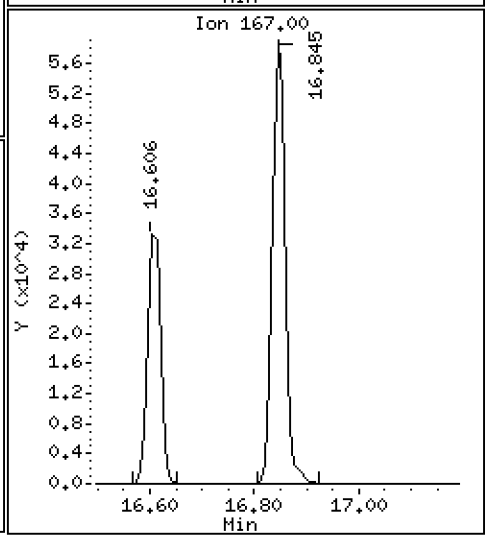












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

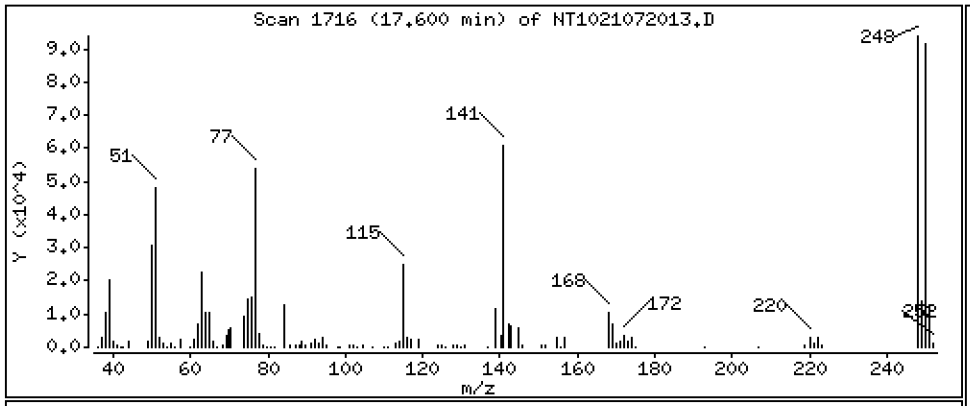
Operator: VTS

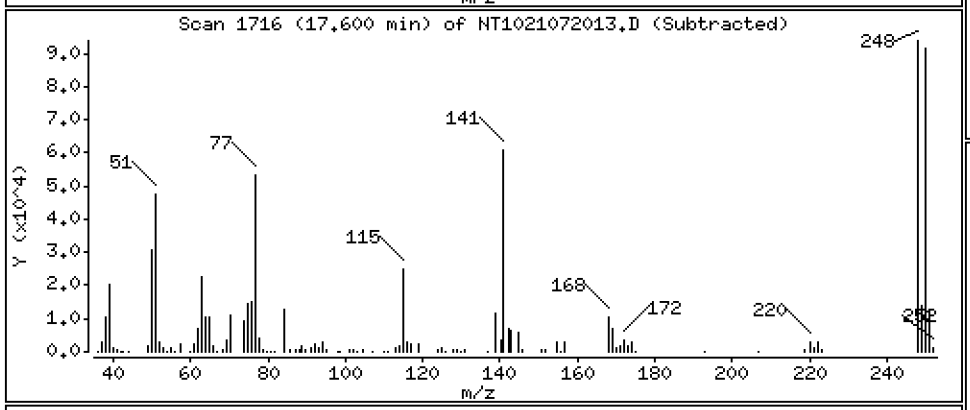
Column phase: ZB-5msi

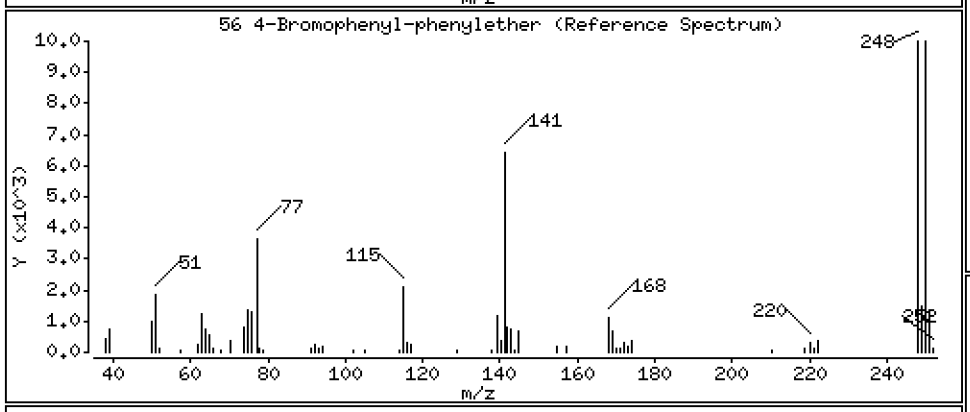
Column diameter: 0.25

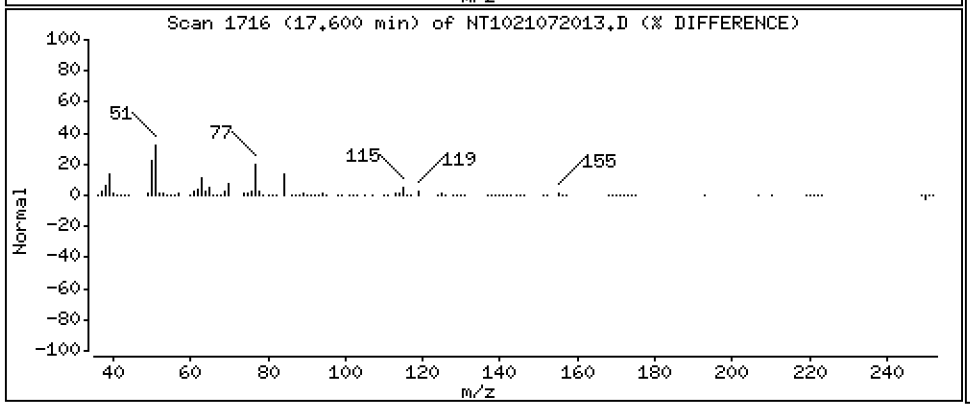
56 4-Bromophenyl-phenylether

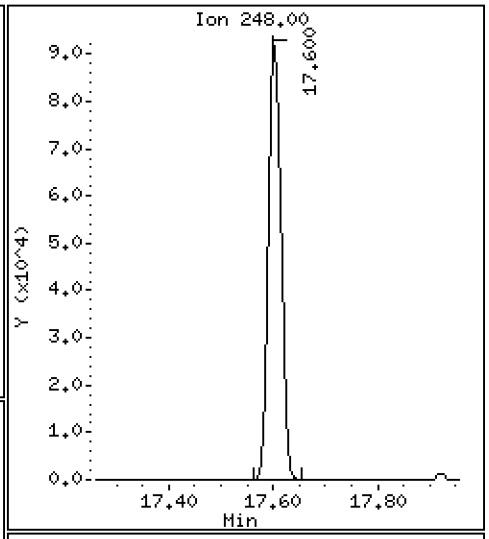
Concentration: 4.934 ug/mL

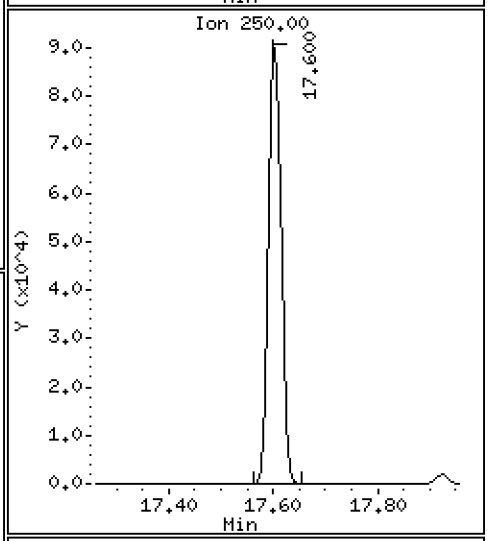


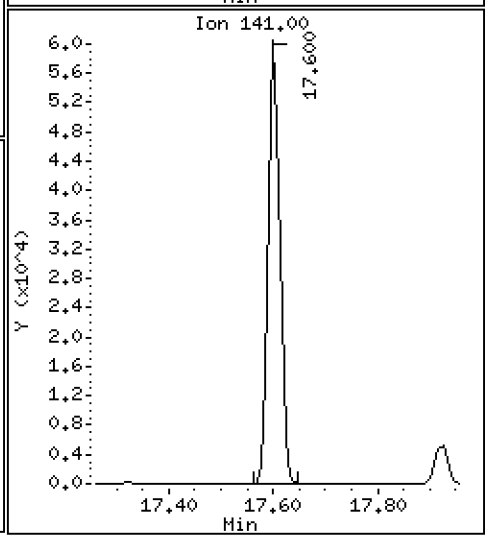












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

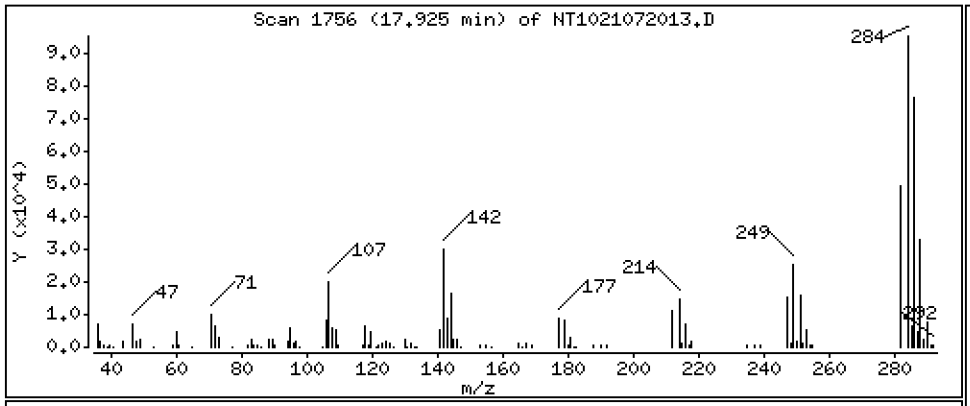
Operator: VTS

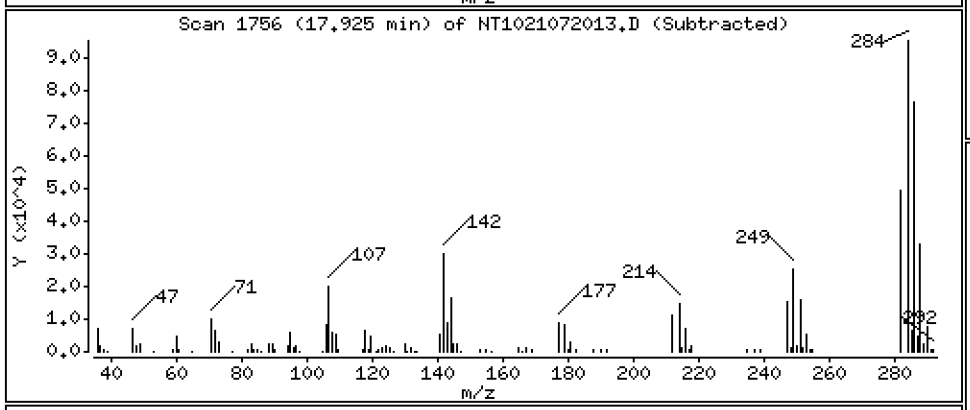
Column phase: ZB-5msi

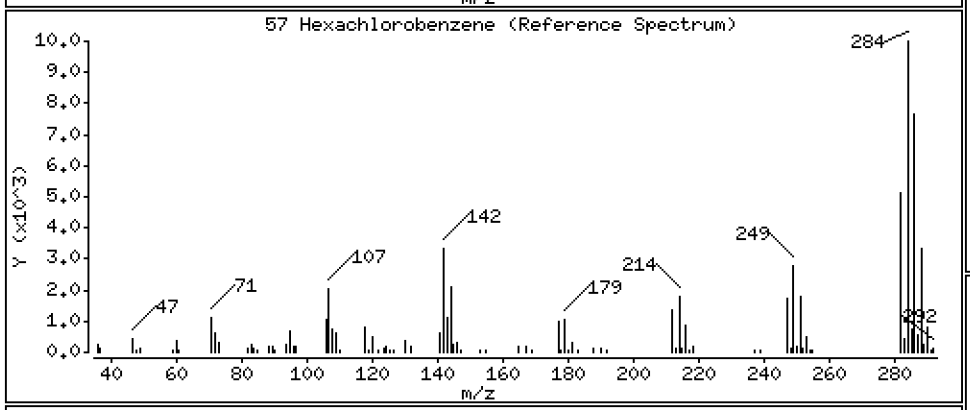
Column diameter: 0.25

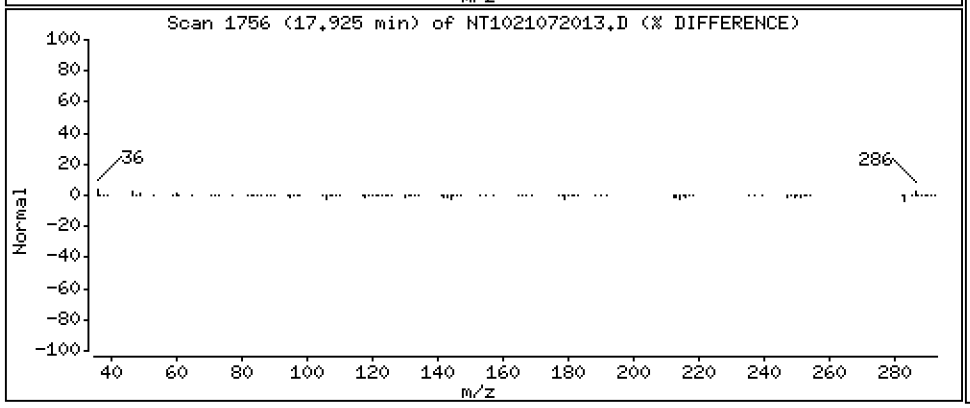
57 Hexachlorobenzene

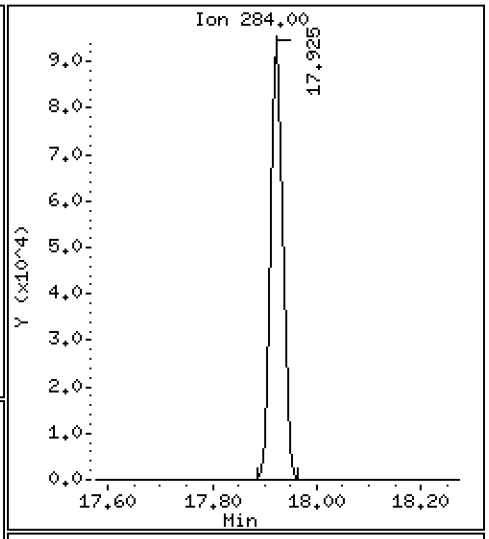
Concentration: 4.773 ug/mL

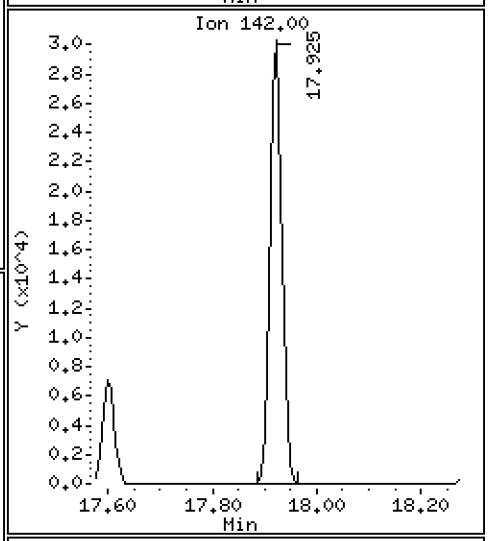


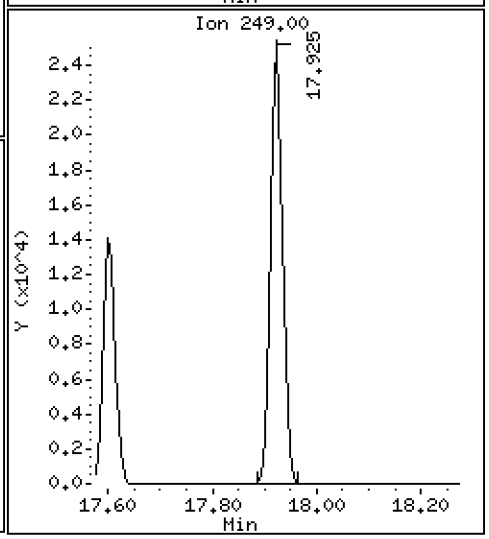












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

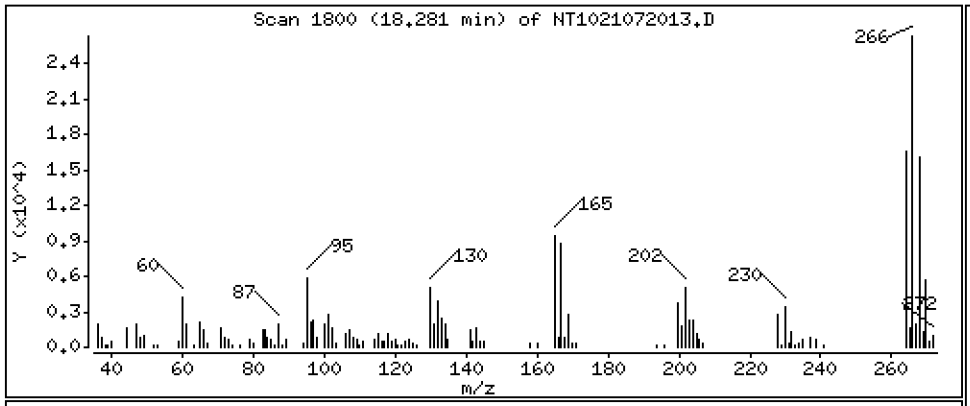
Operator: VTS

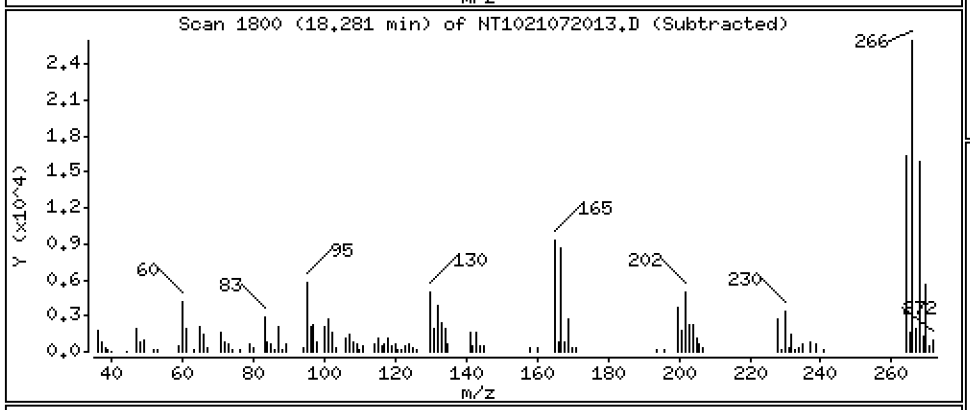
Column phase: ZB-5msi

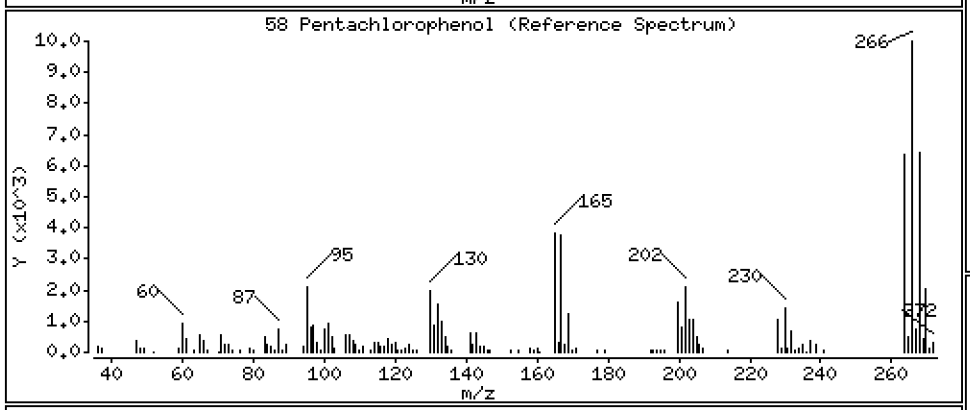
Column diameter: 0.25

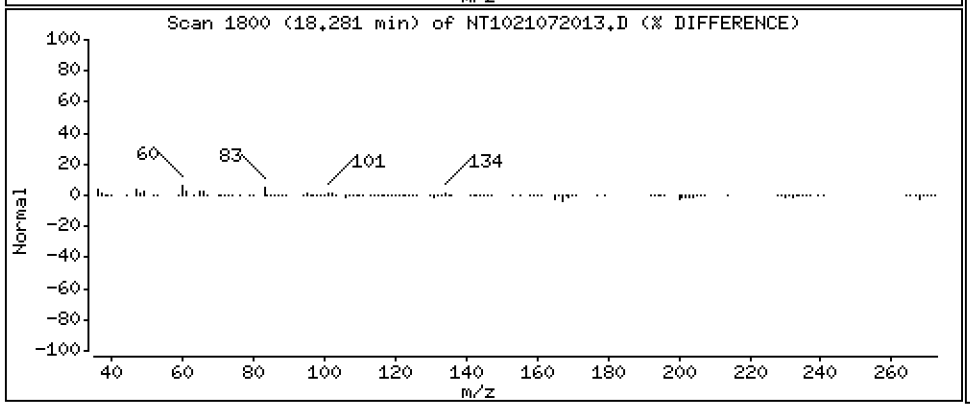
58 Pentachlorophenol

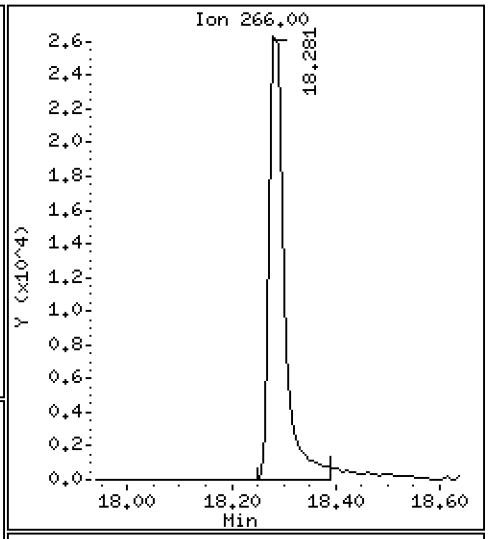
Concentration: 3.987 ug/mL

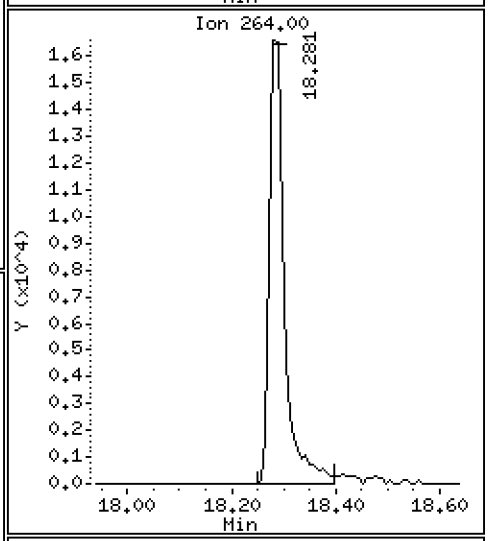


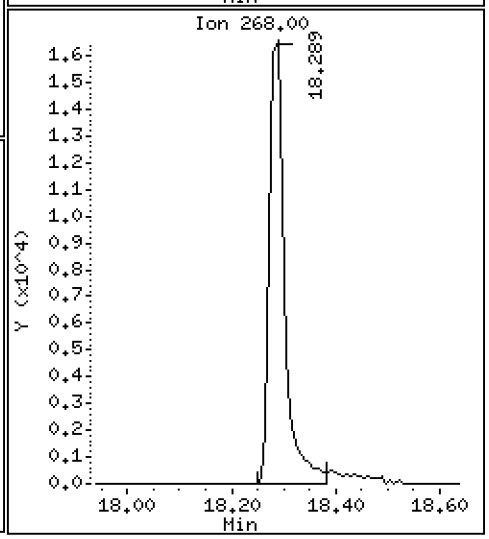












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

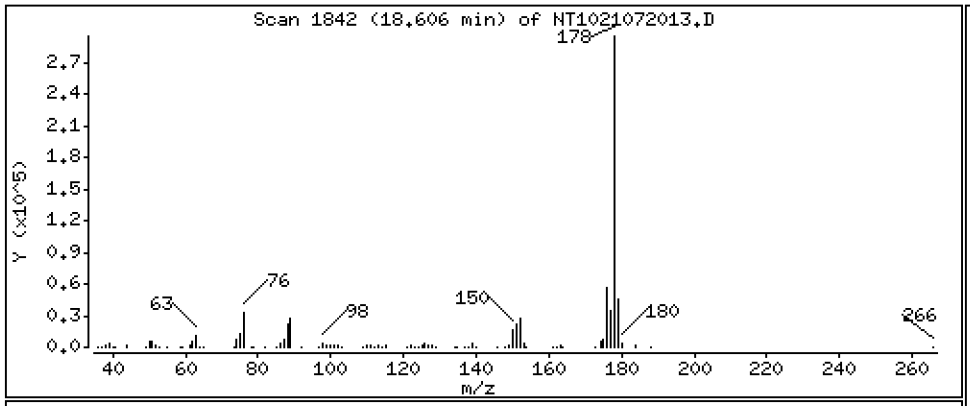
Operator: VTS

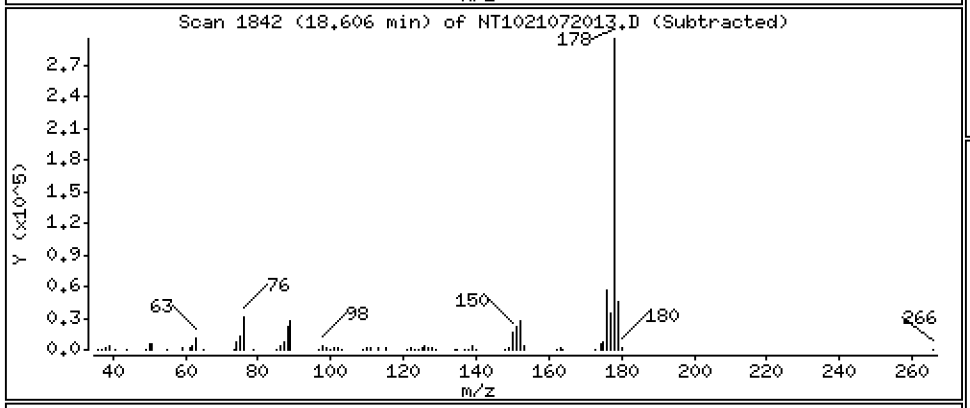
Column phase: ZB-5msi

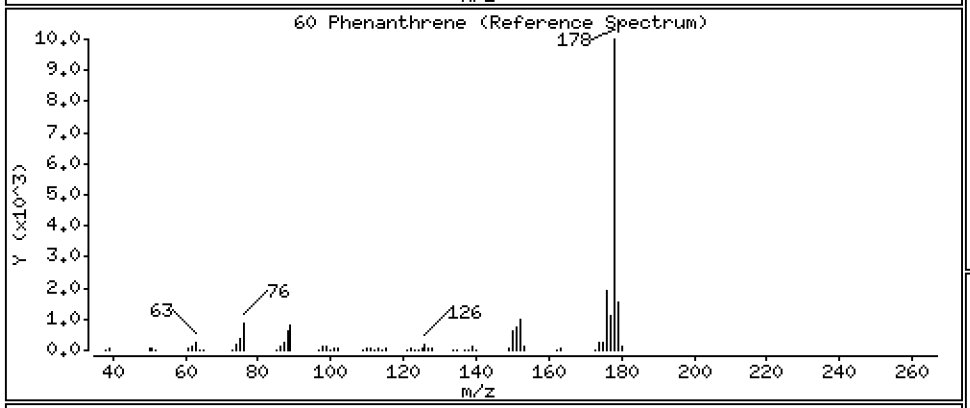
Column diameter: 0.25

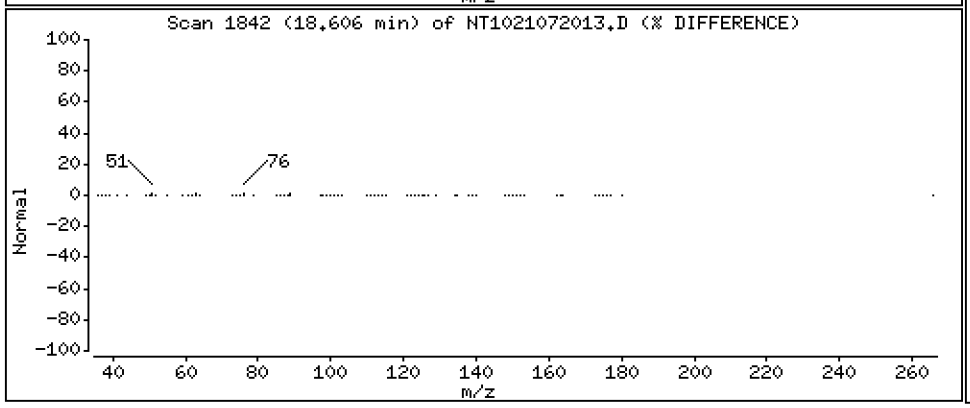
60 Phenanthrene

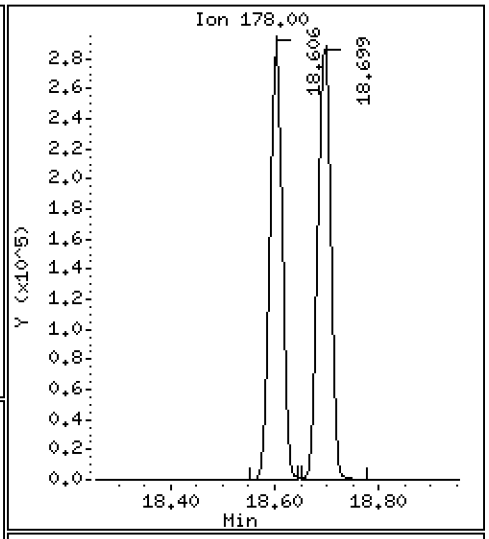
Concentration: 5.038 ug/mL

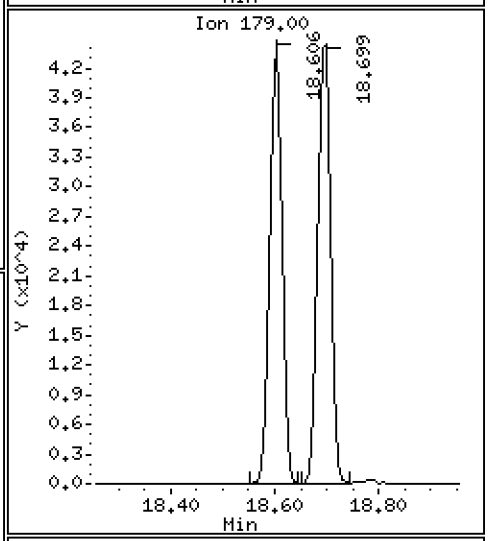


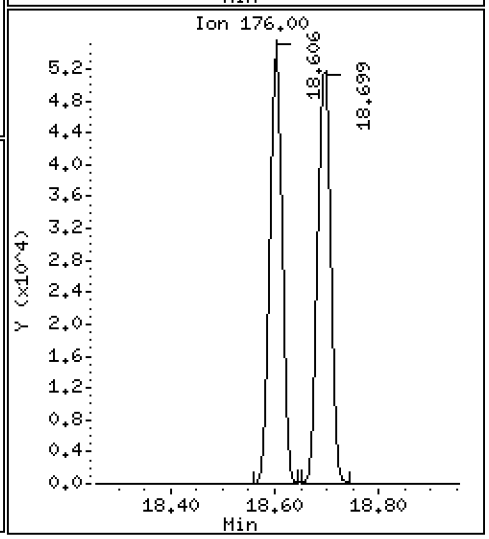












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

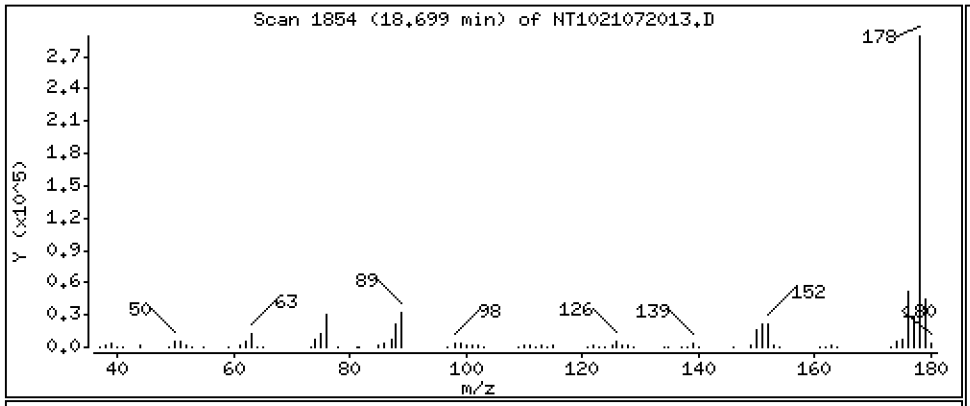
Operator: VTS

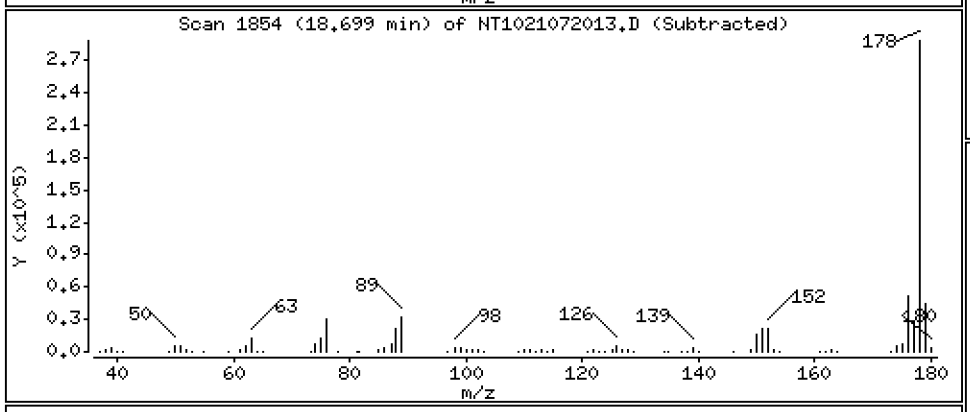
Column phase: ZB-5msi

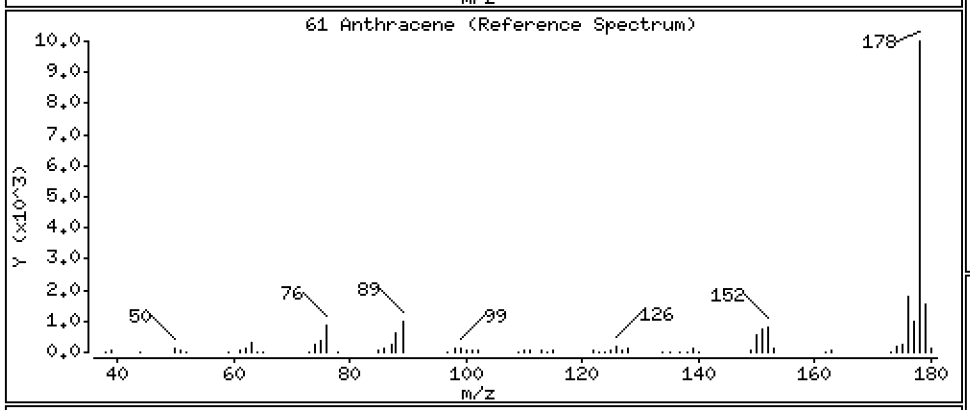
Column diameter: 0.25

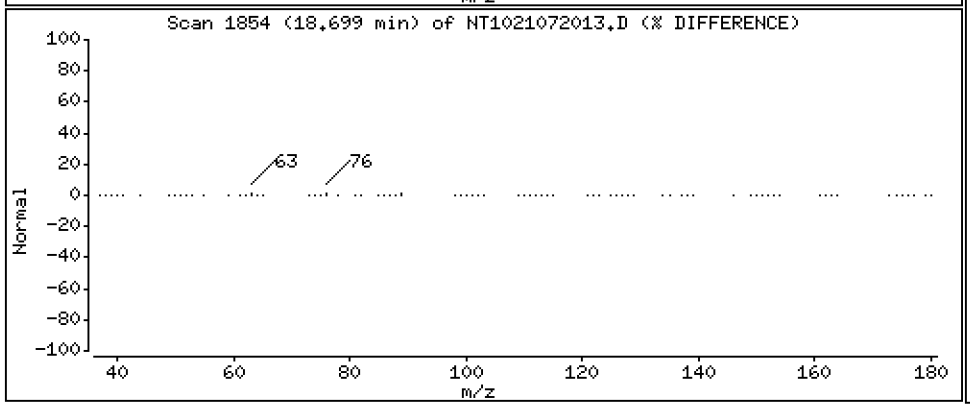
61 Anthracene

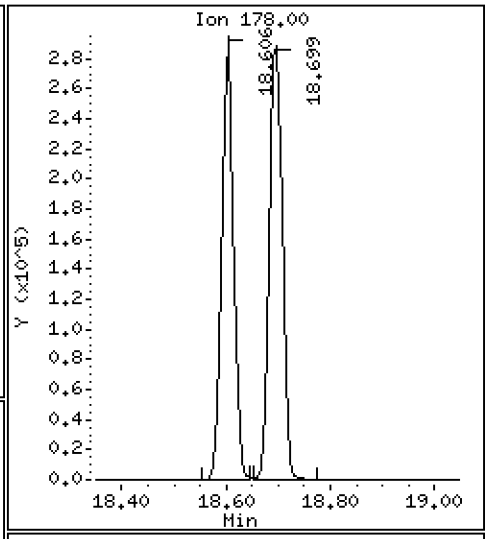
Concentration: 5.020 ug/mL

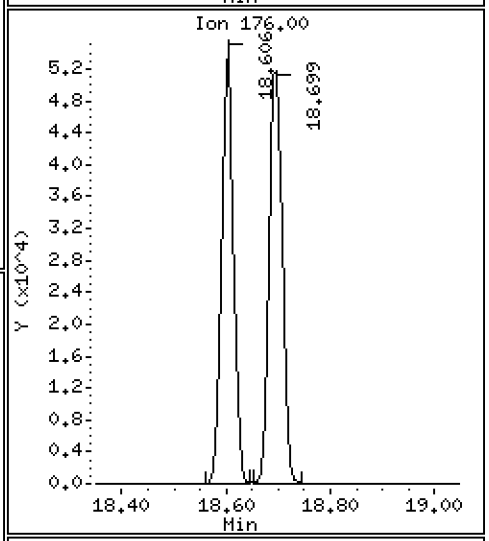


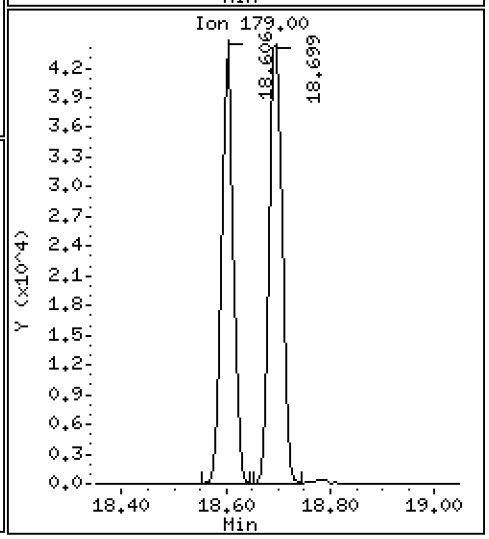












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

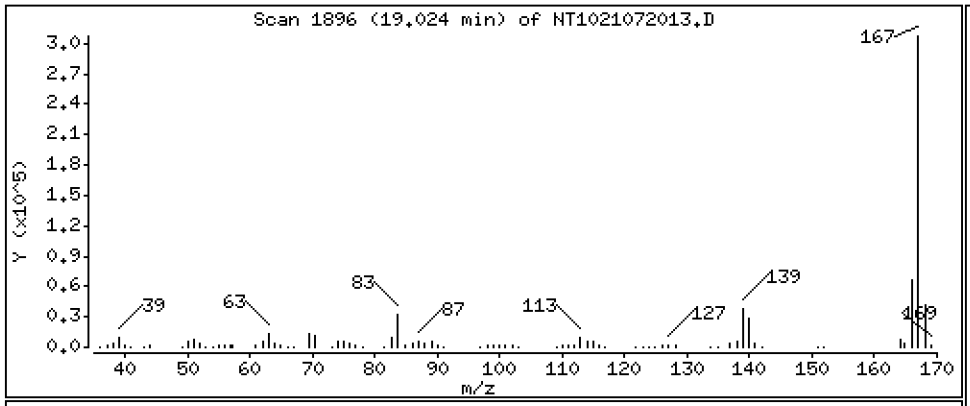
Operator: VTS

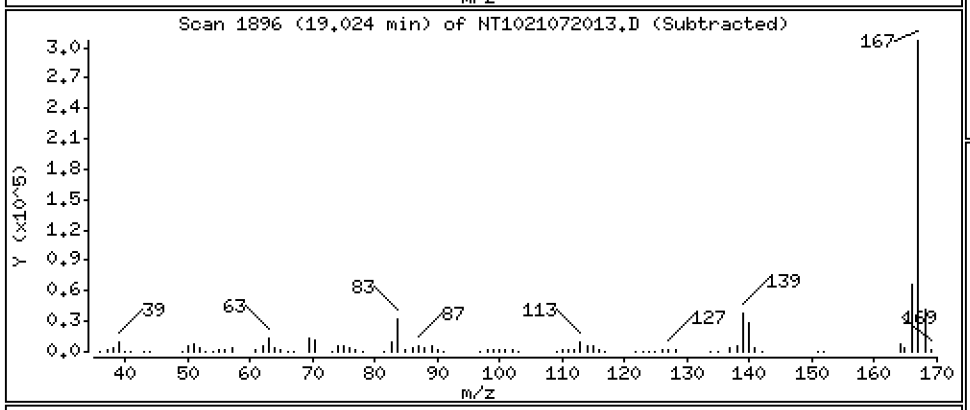
Column phase: ZB-5msi

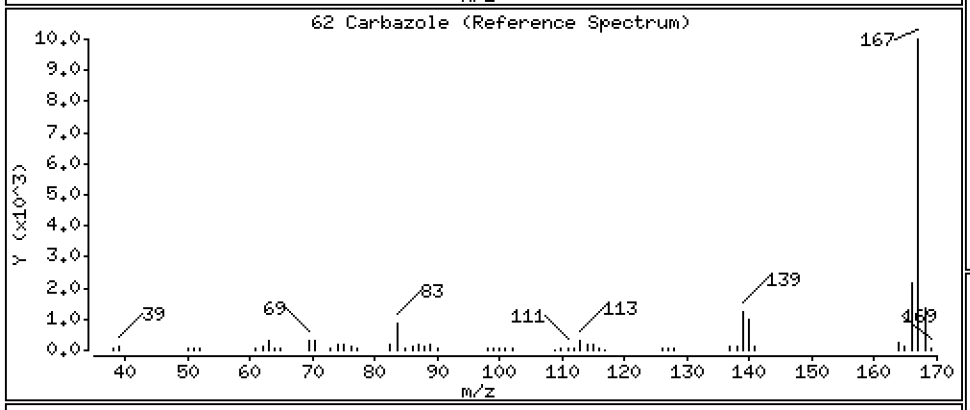
Column diameter: 0.25

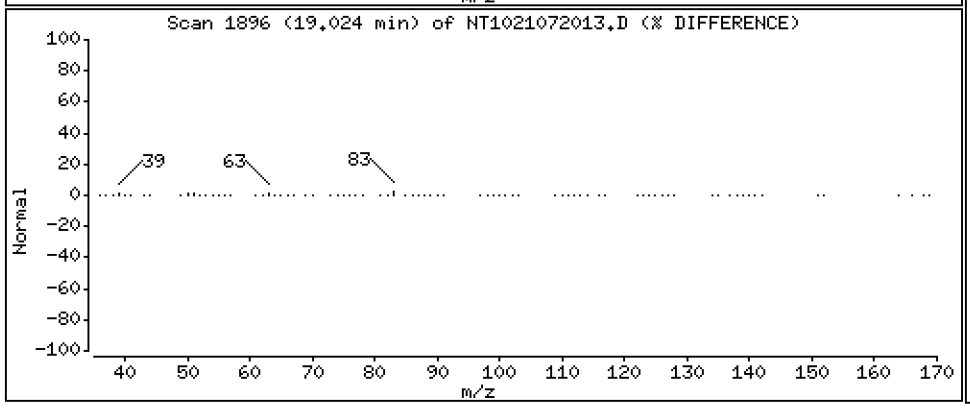
62 Carbazole

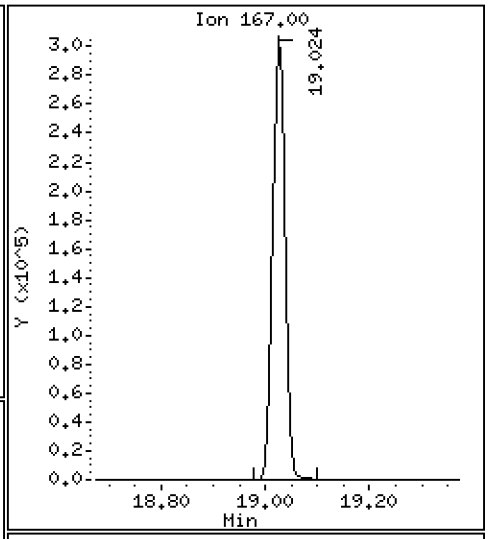
Concentration: 5.033 ug/mL

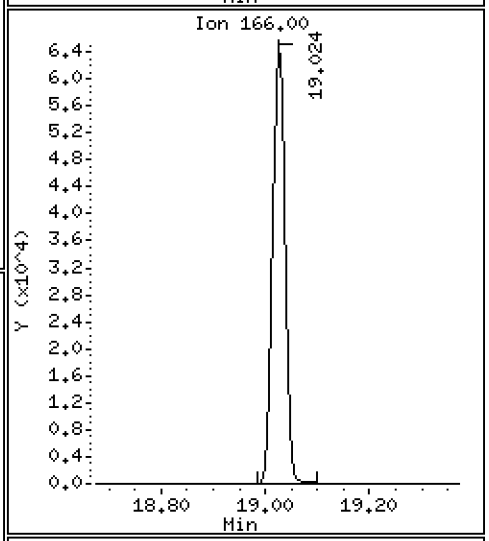


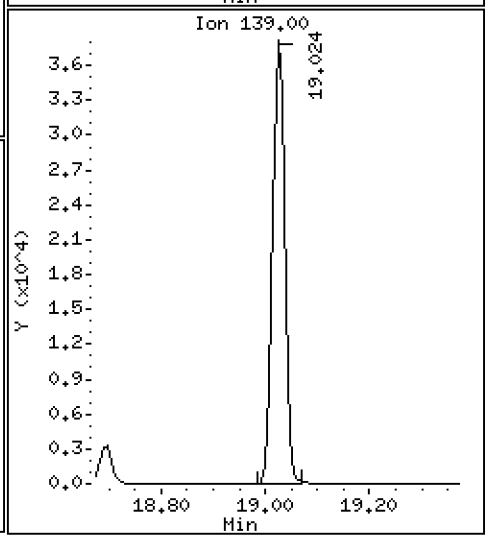












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

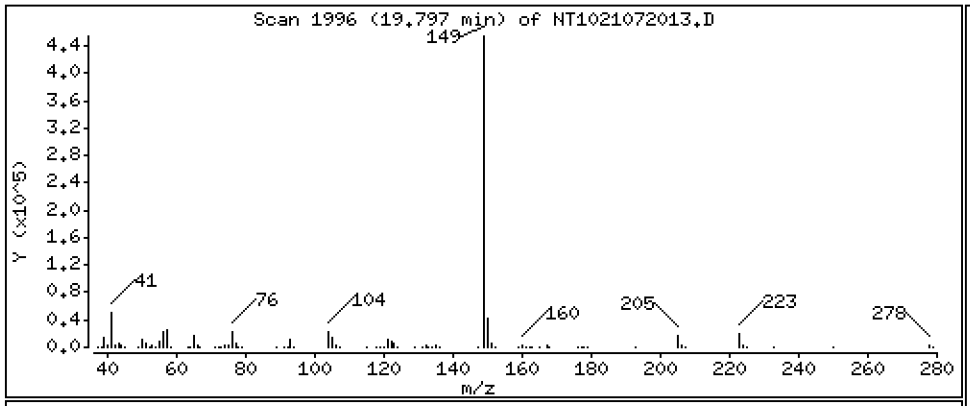
Operator: VTS

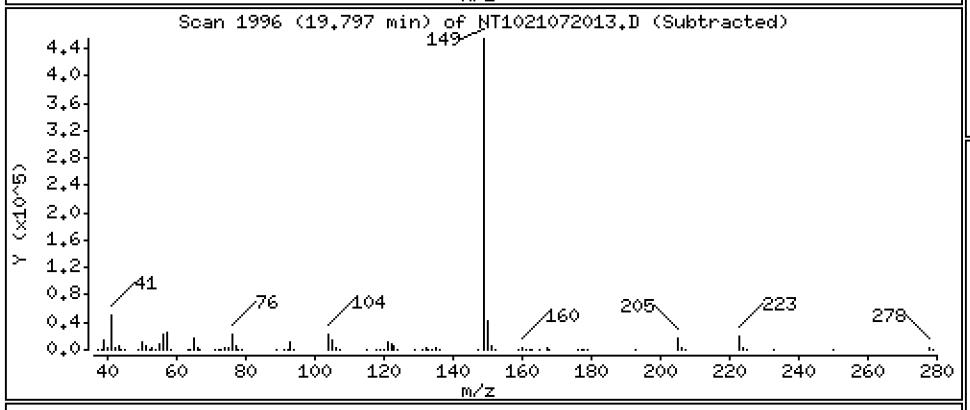
Column phase: ZB-5msi

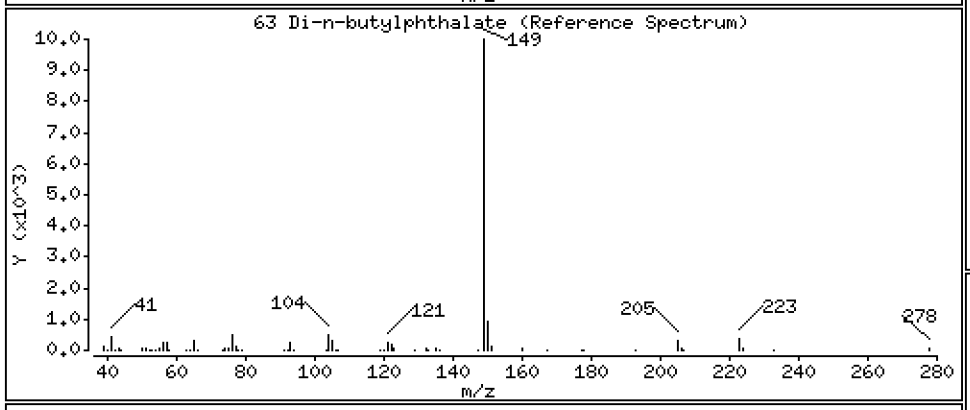
Column diameter: 0.25

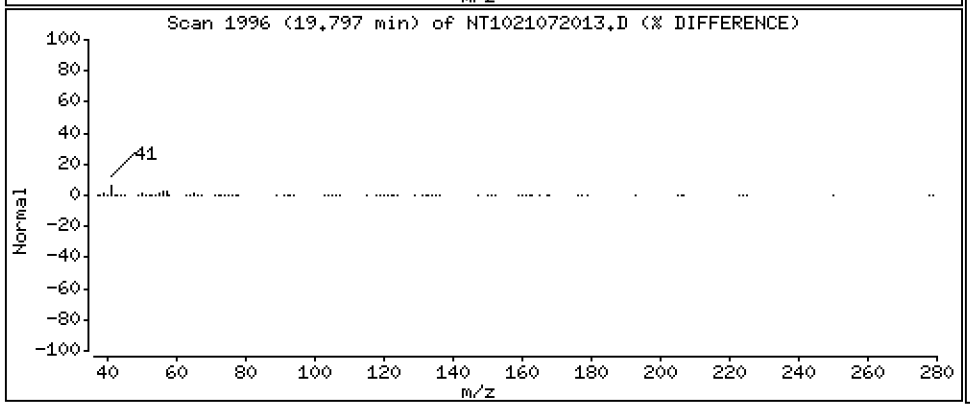
63 Di-n-butylphthalate

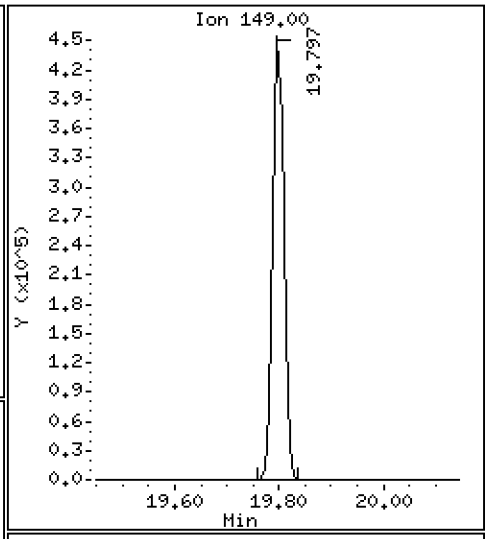
Concentration: 4.276 ug/mL

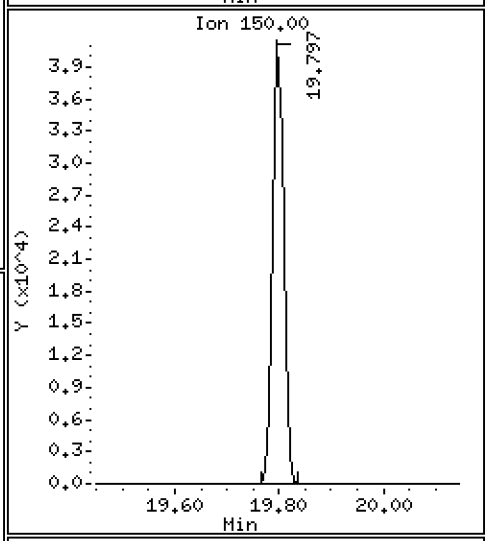


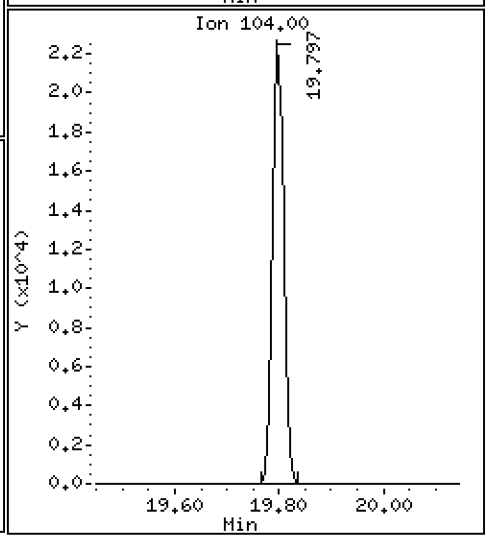












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

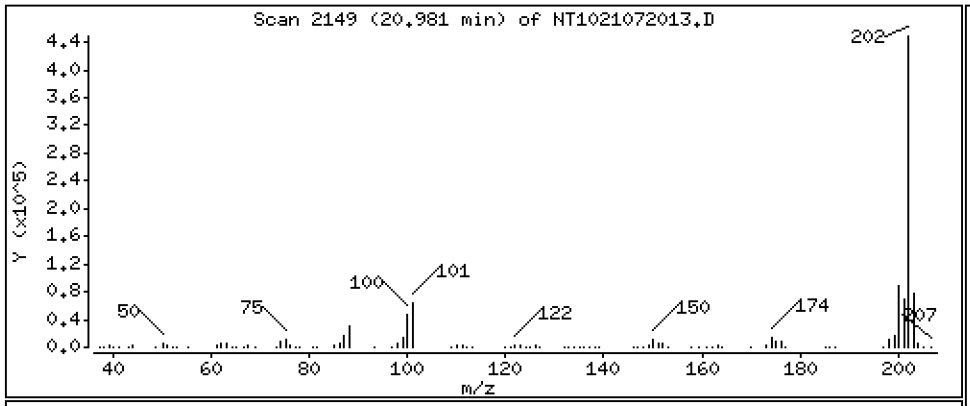
Operator: VTS

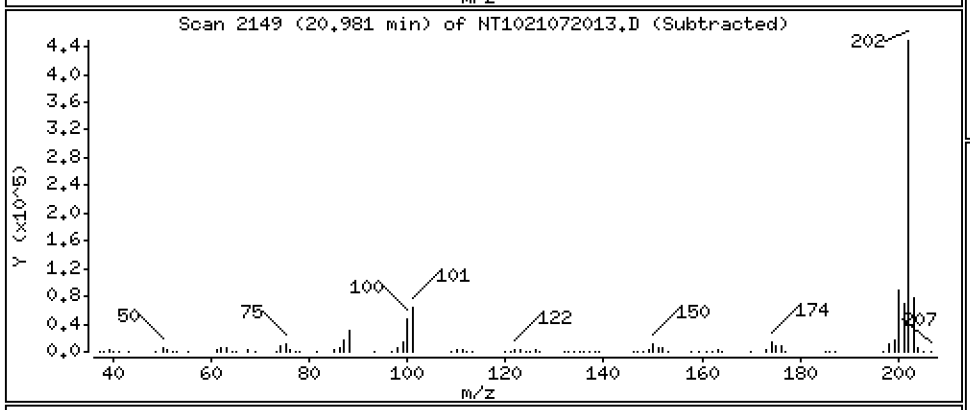
Column phase: ZB-5msi

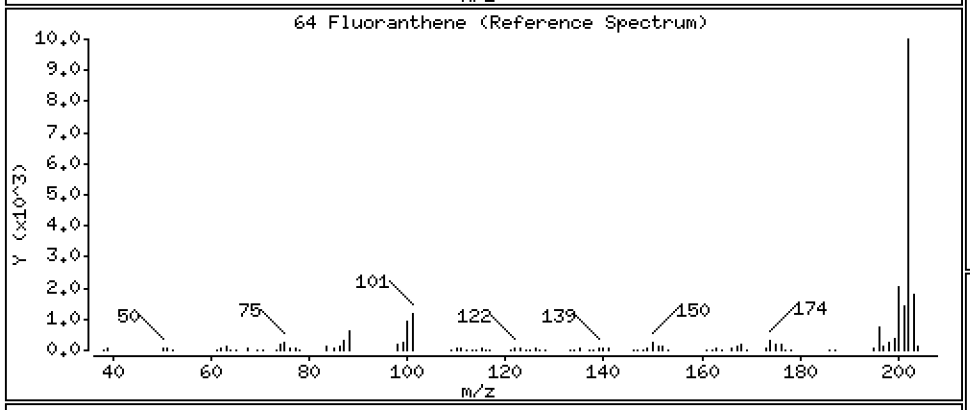
Column diameter: 0.25

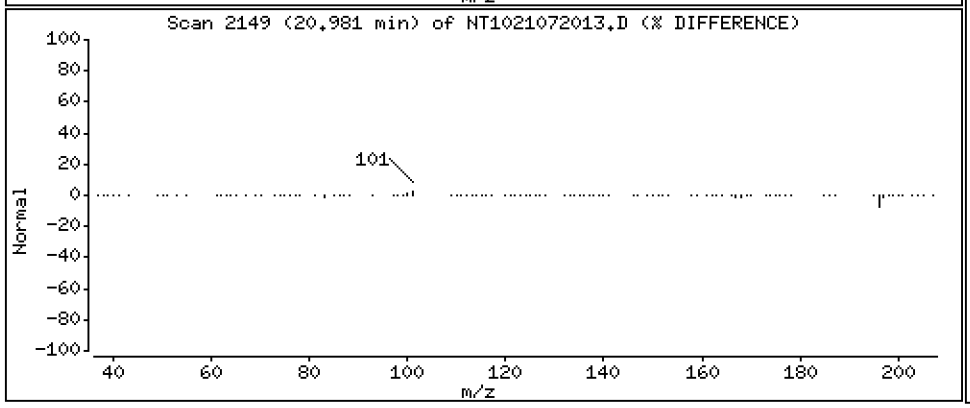
64 Fluoranthene

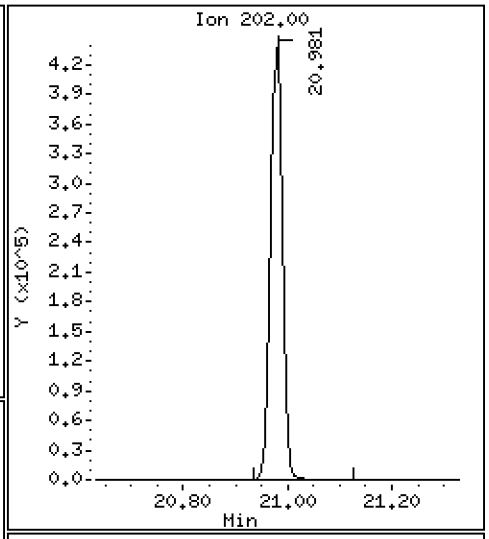
Concentration: 4.950 ug/mL

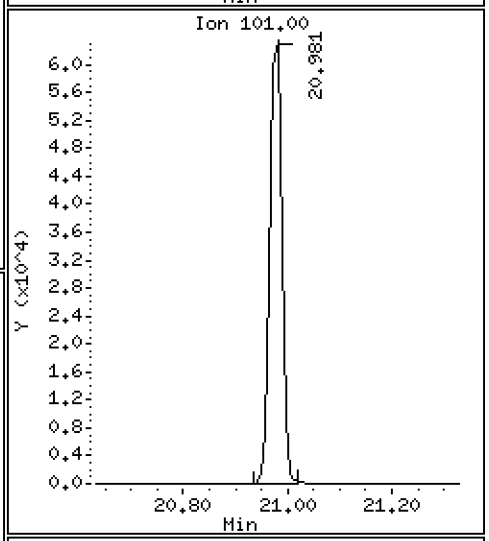


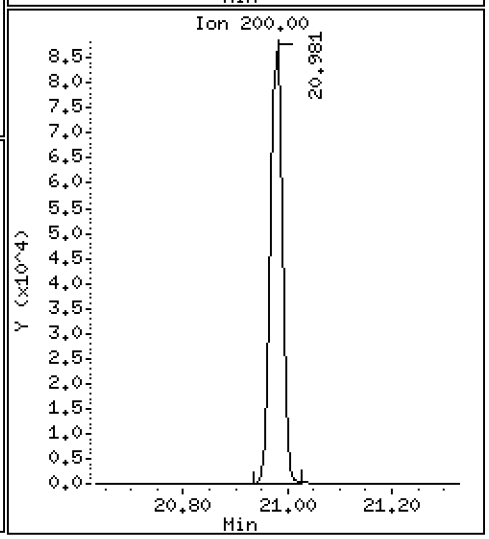












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

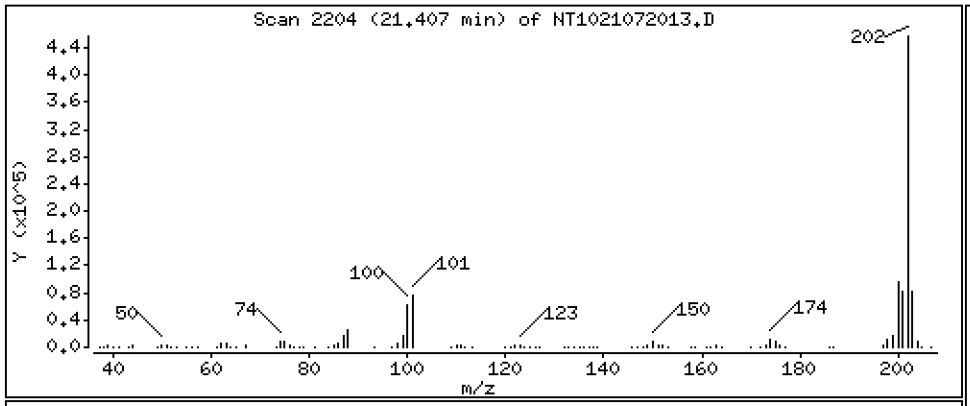
Operator: VTS

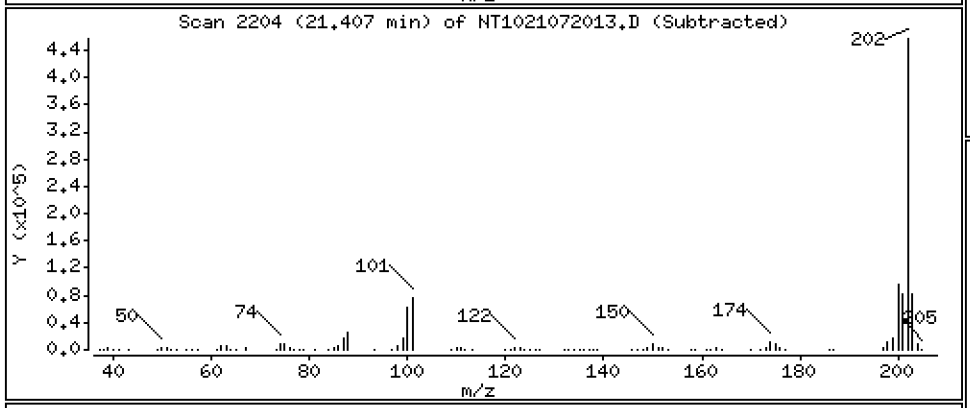
Column phase: ZB-5msi

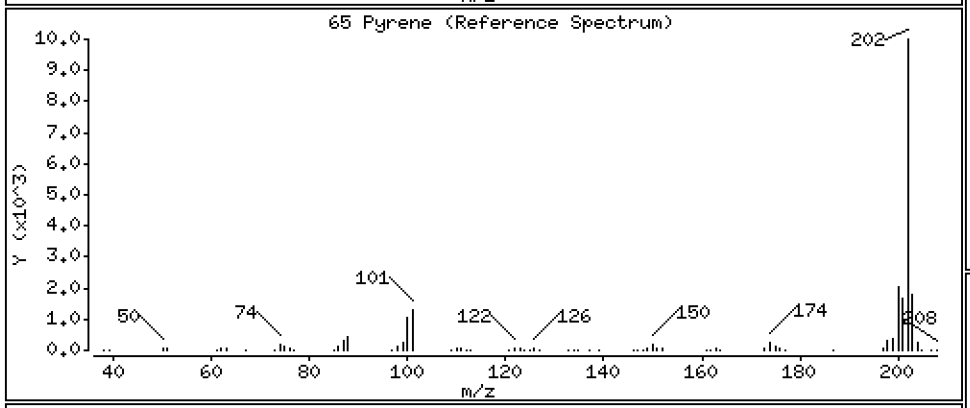
Column diameter: 0.25

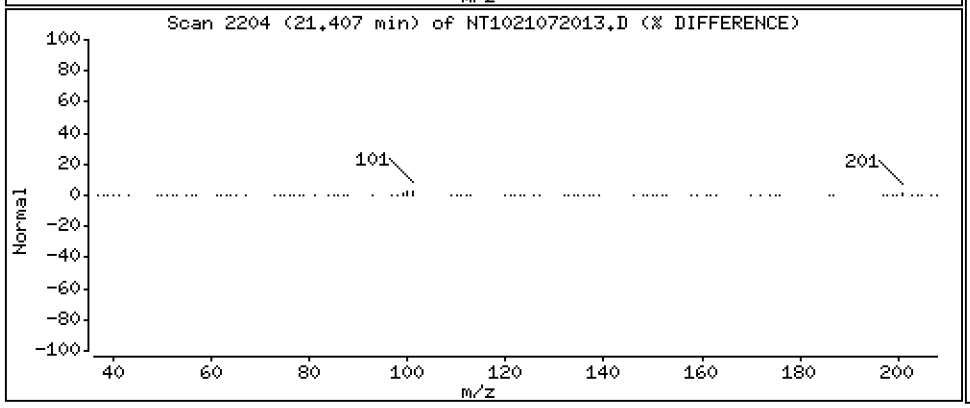
65 Pyrene

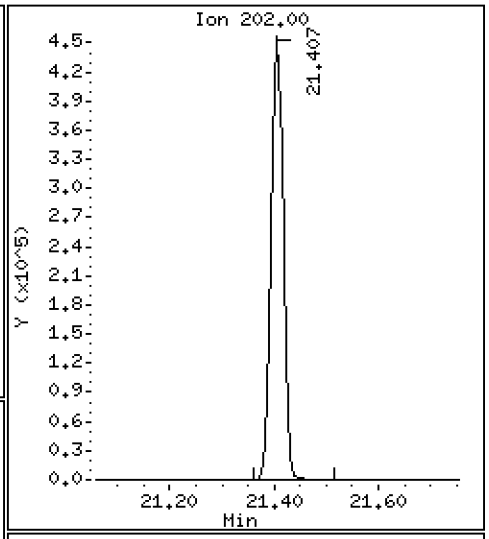
Concentration: 5.254 ug/mL

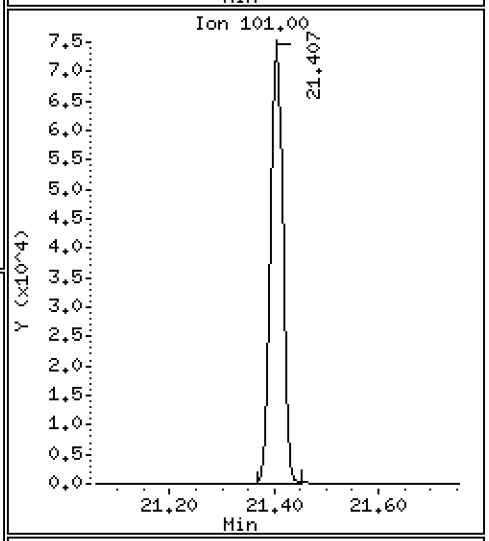


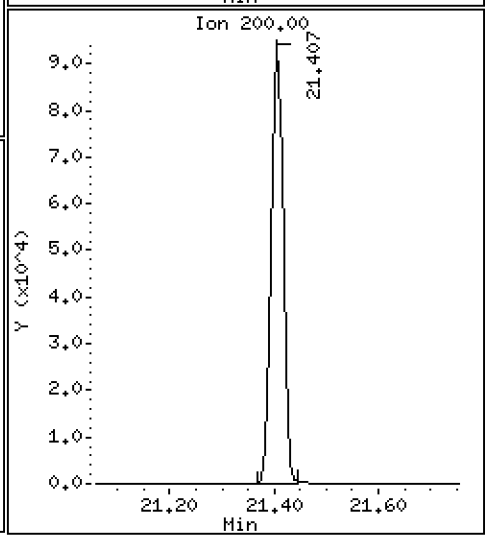












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

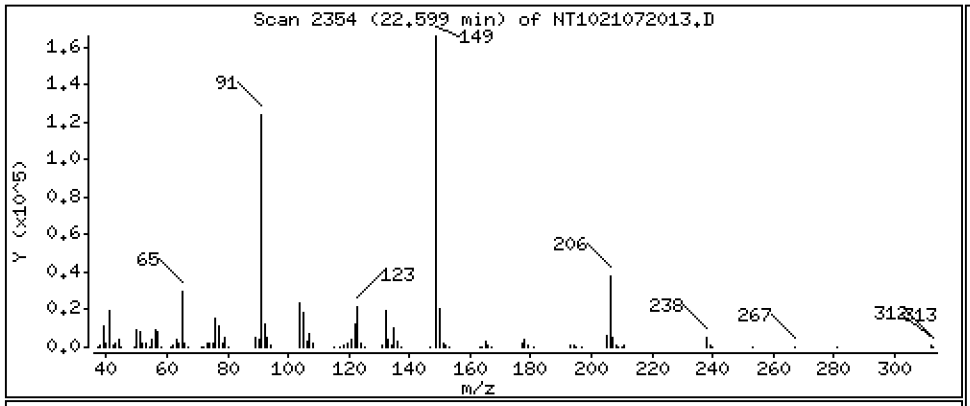
Operator: VTS

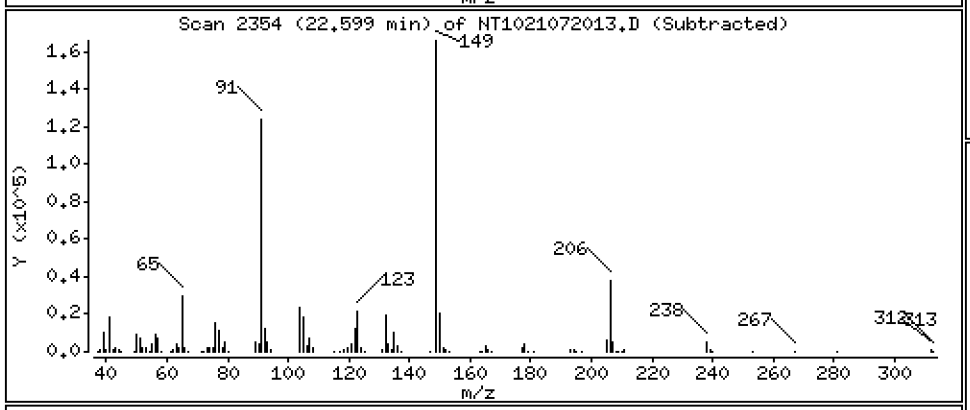
Column phase: ZB-5msi

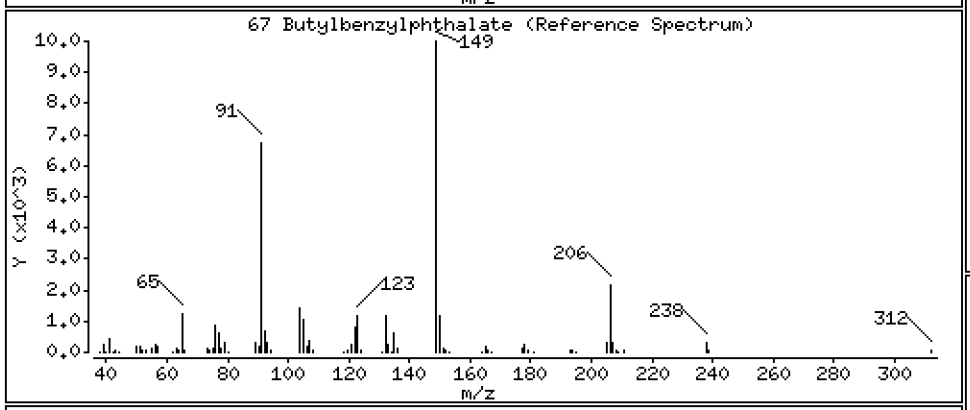
Column diameter: 0.25

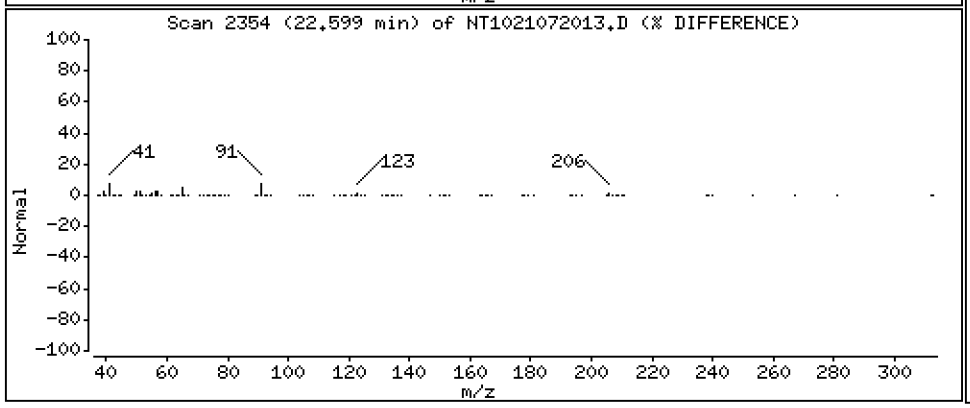
67 Butylbenzylphthalate

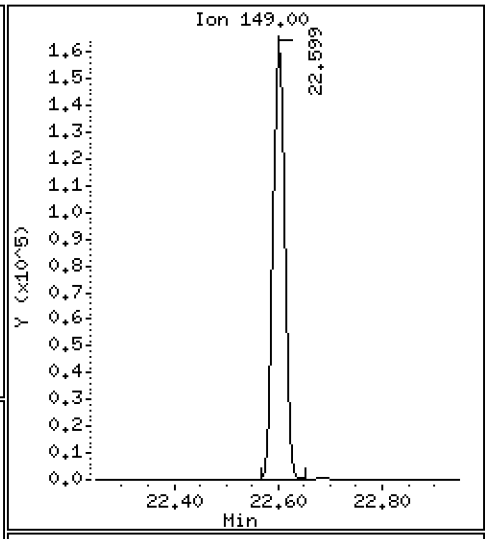
Concentration: 4.974 ug/mL

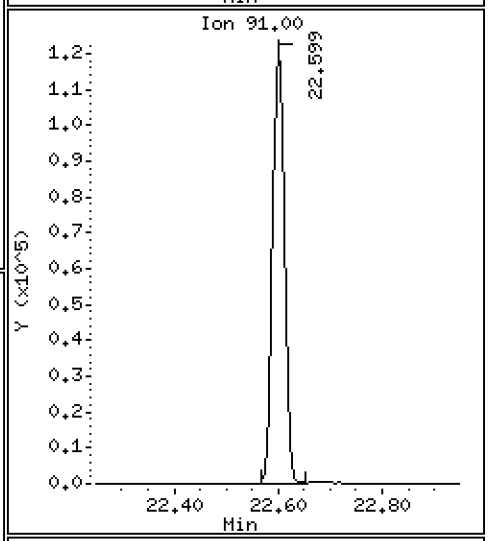


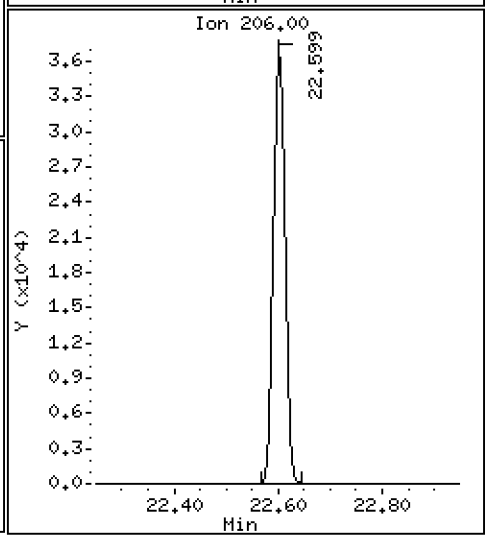












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

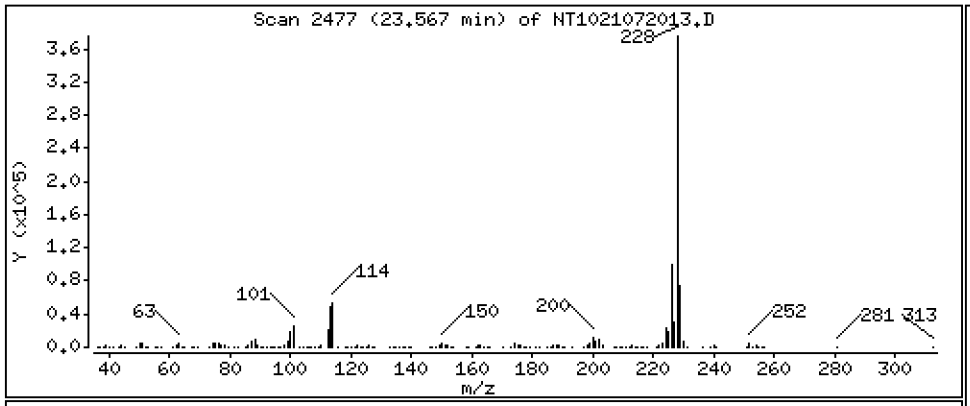
Operator: VTS

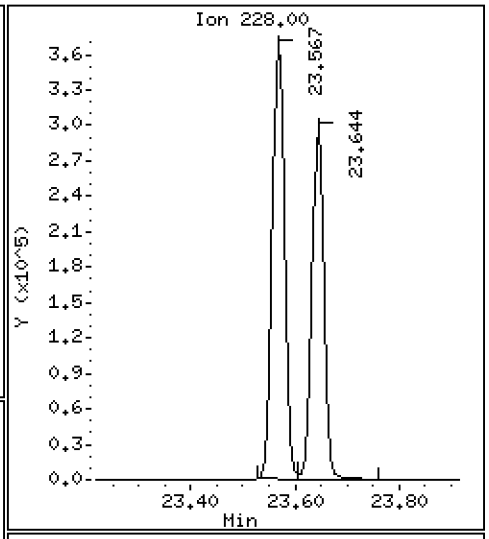
Column phase: ZB-5msi

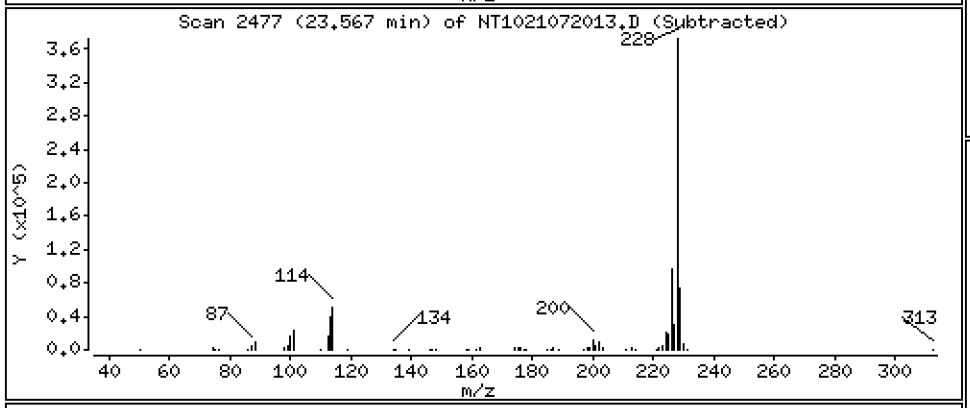
Column diameter: 0.25

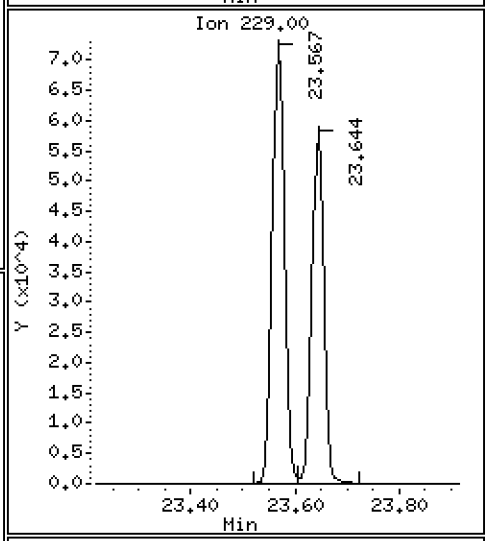
68 Benzo(a)anthracene

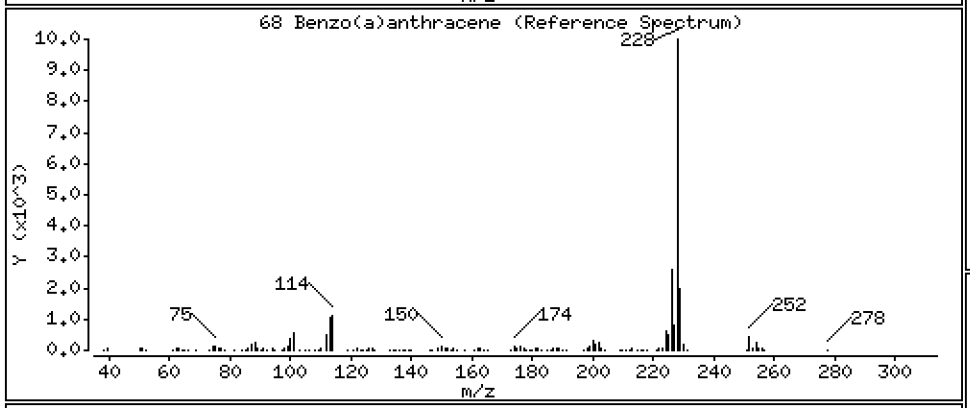
Concentration: 4.800 ug/mL

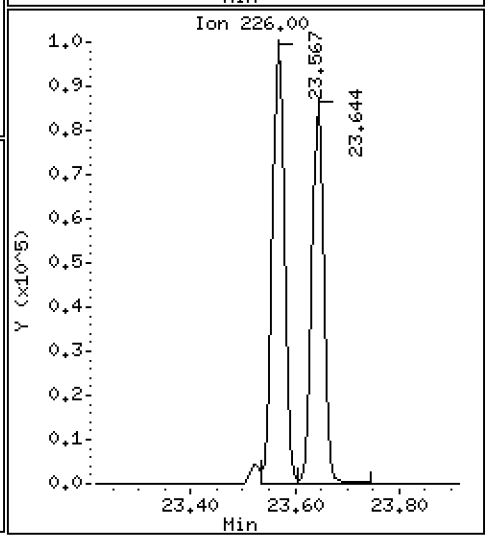


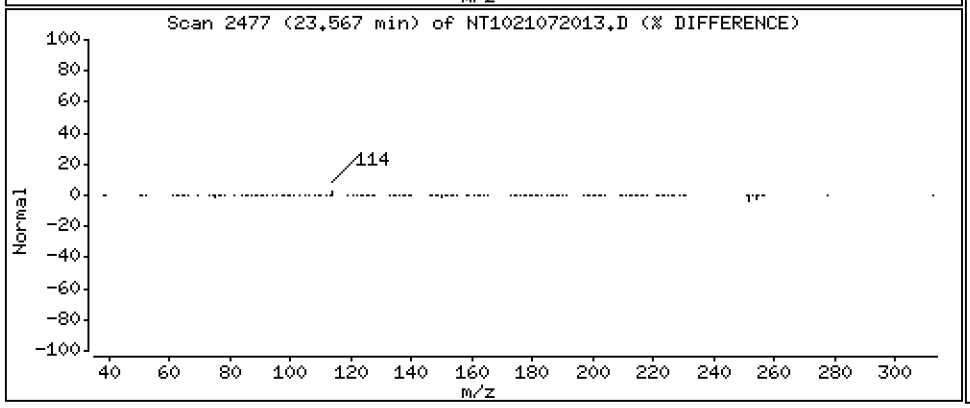












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

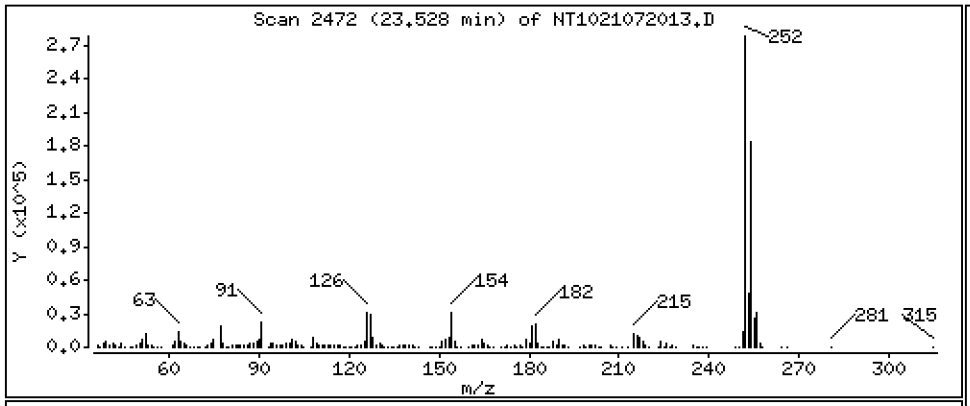
Operator: VTS

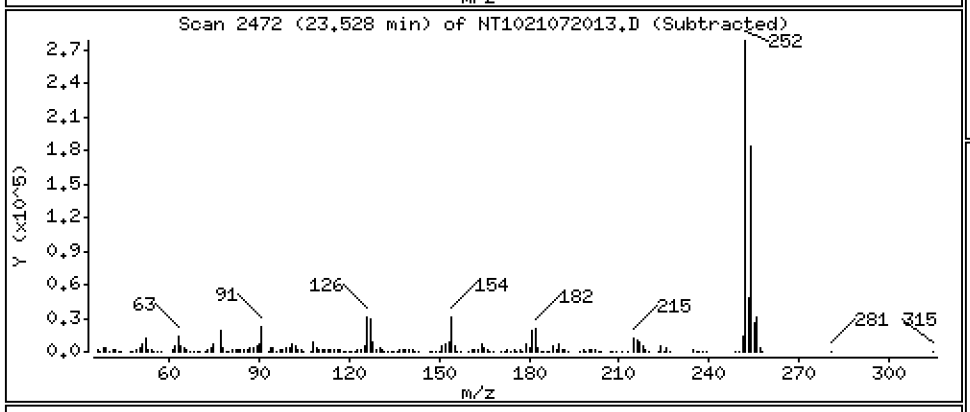
Column phase: ZB-5msi

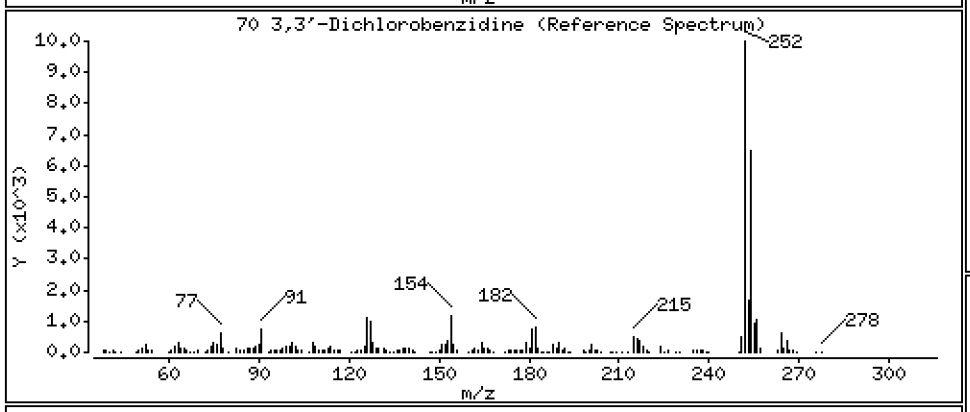
Column diameter: 0.25

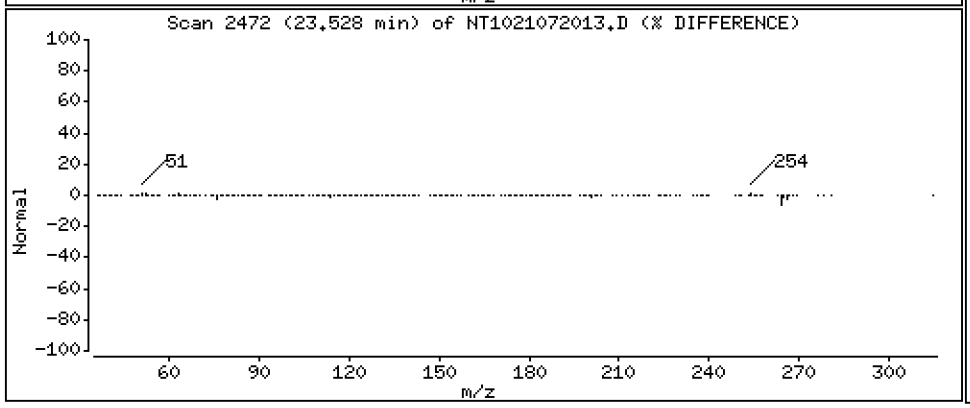
70 3,3'-Dichlorobenzidine

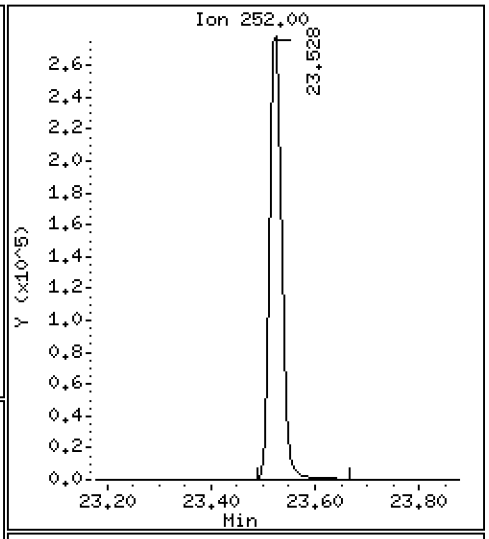
Concentration: 9.013 ug/mL

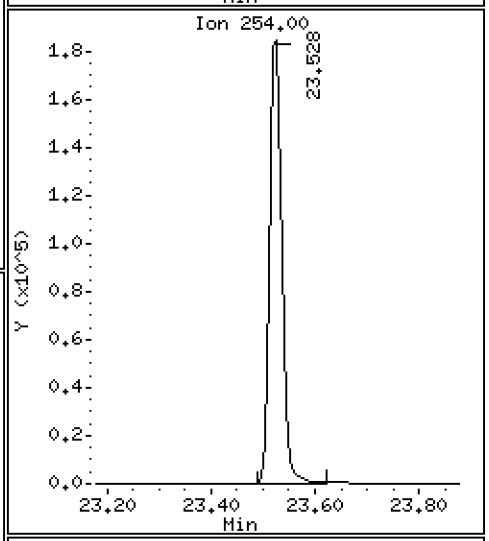


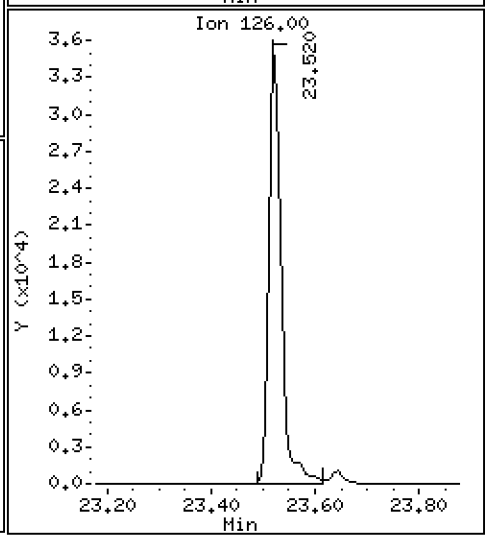












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

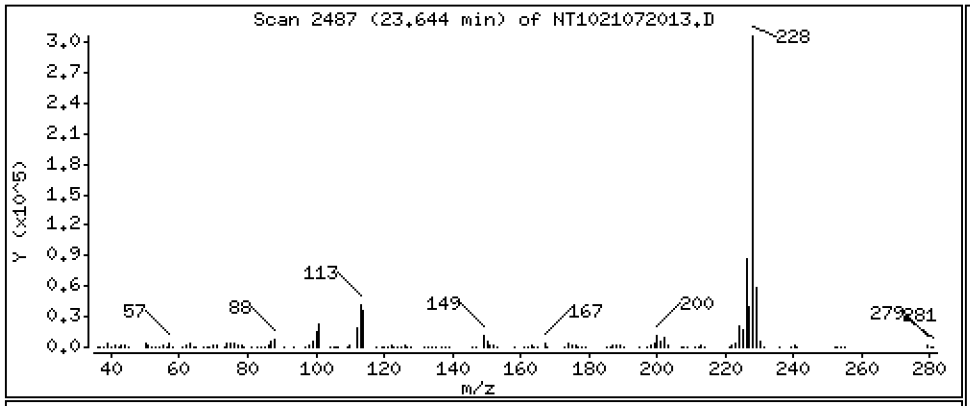
Operator: VTS

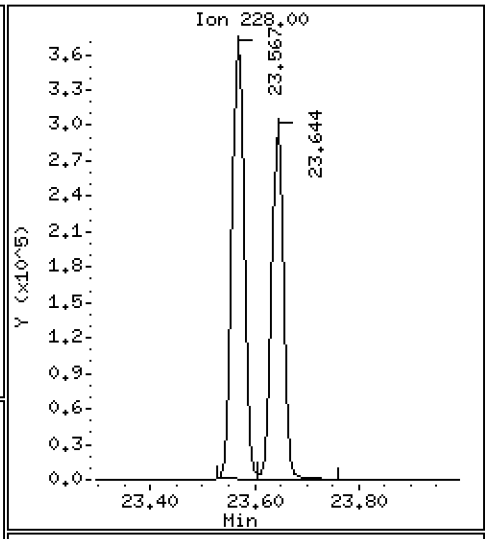
Column phase: ZB-5msi

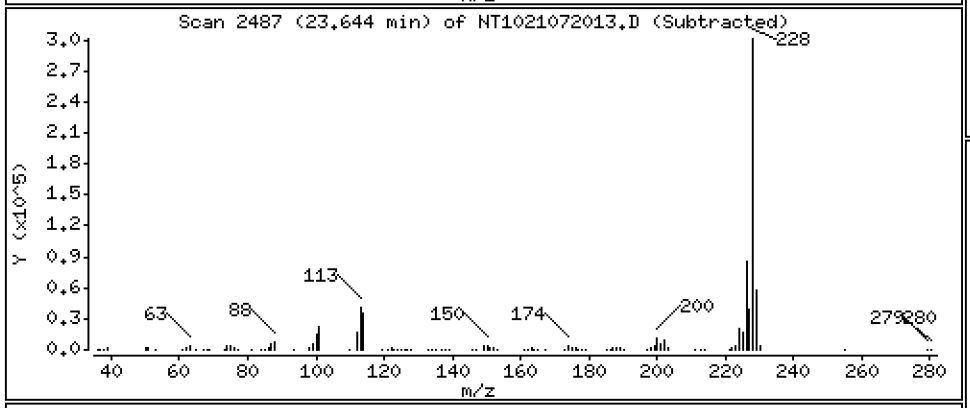
Column diameter: 0.25

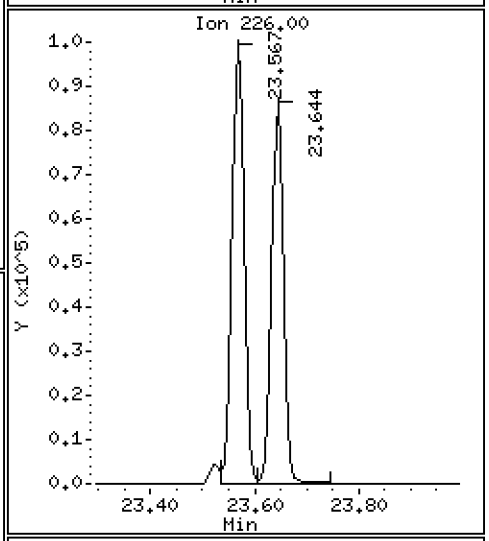
71 Chrysene

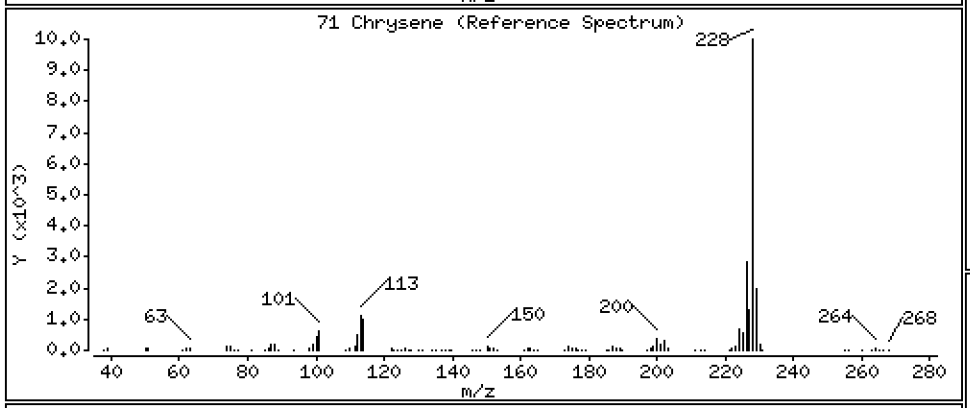
Concentration: 4.859 ug/mL

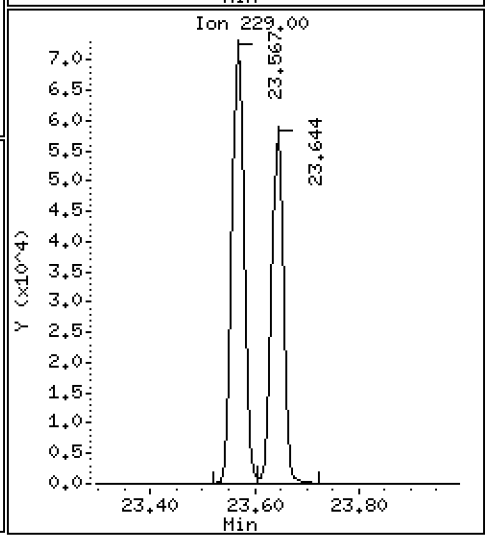


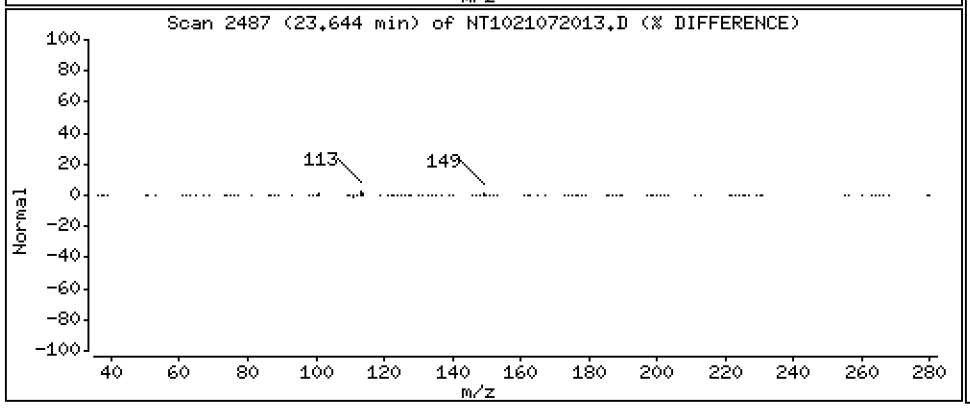












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

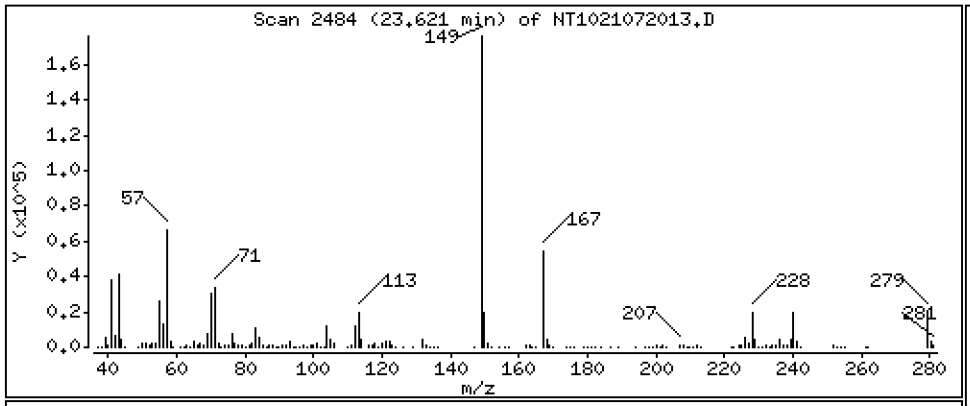
Operator: VTS

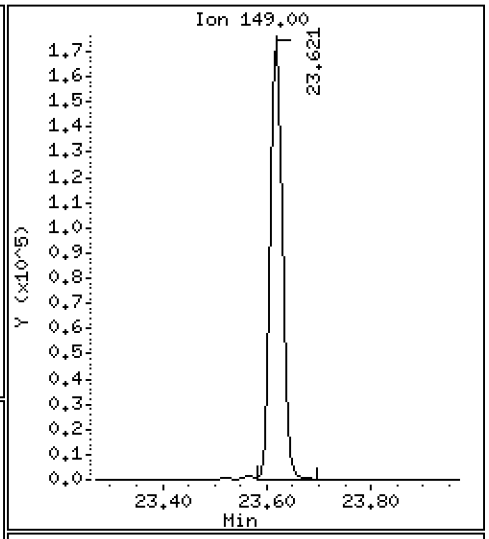
Column phase: ZB-5msi

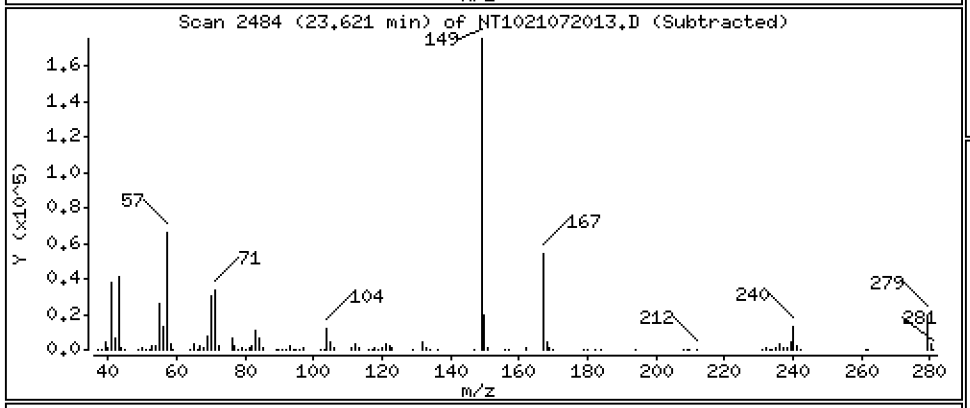
Column diameter: 0.25

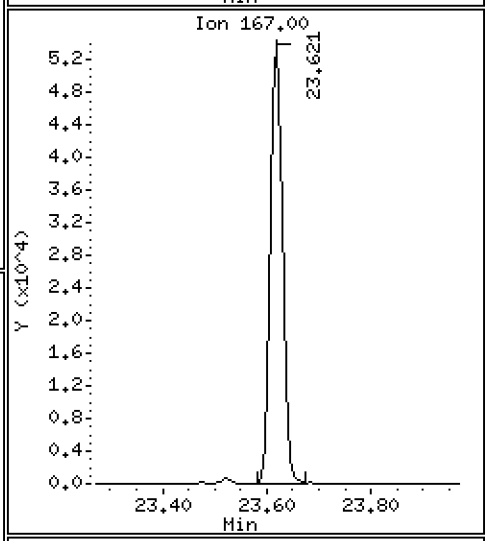
72 bis(2-Ethylhexyl)phthalate

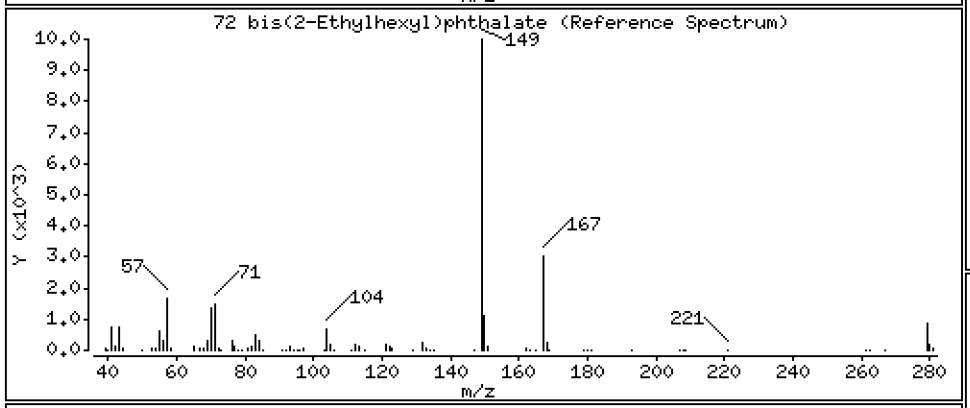
Concentration: 5.117 ug/mL

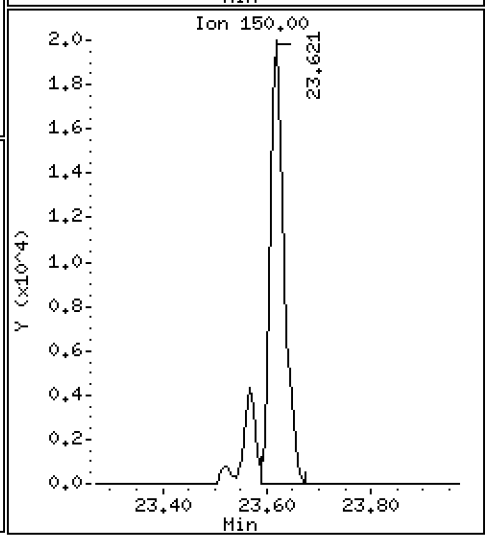


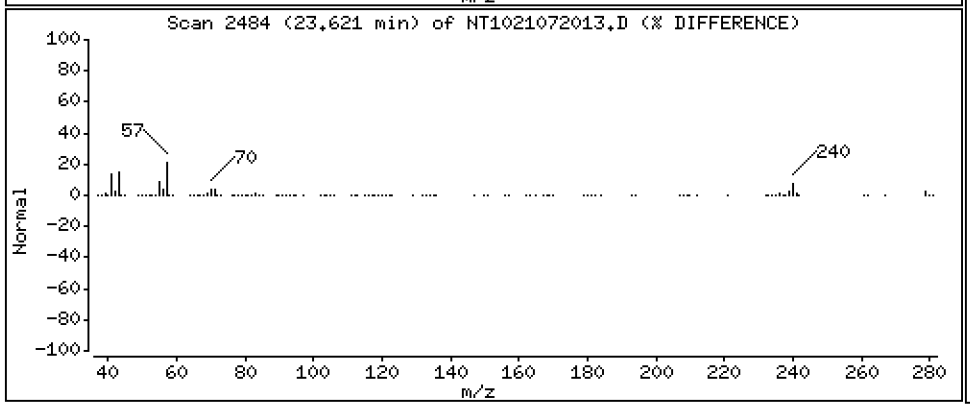












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

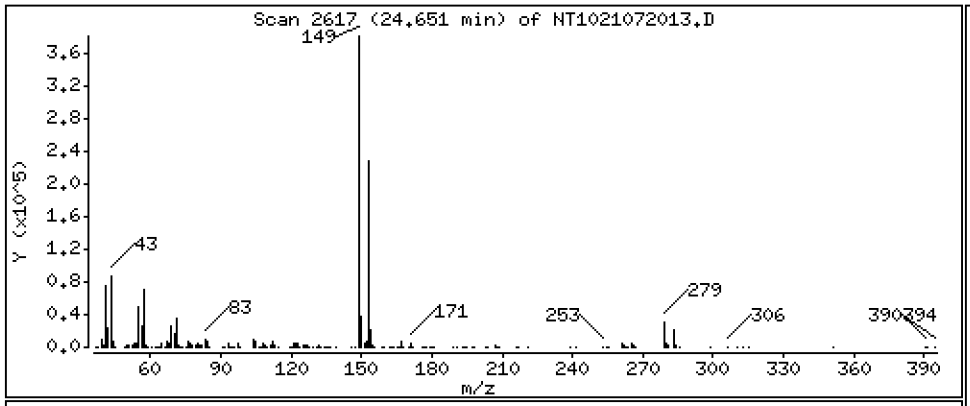
Operator: VTS

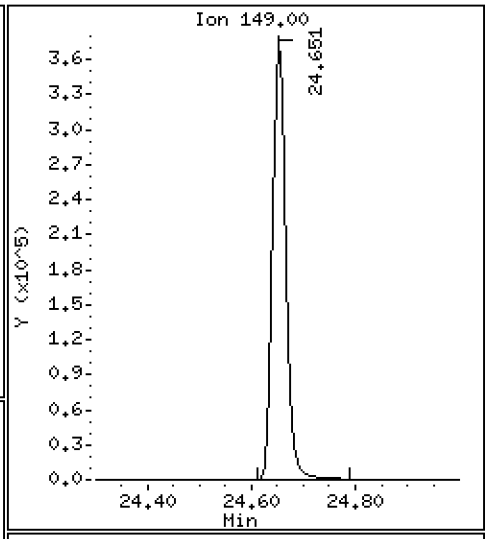
Column phase: ZB-5msi

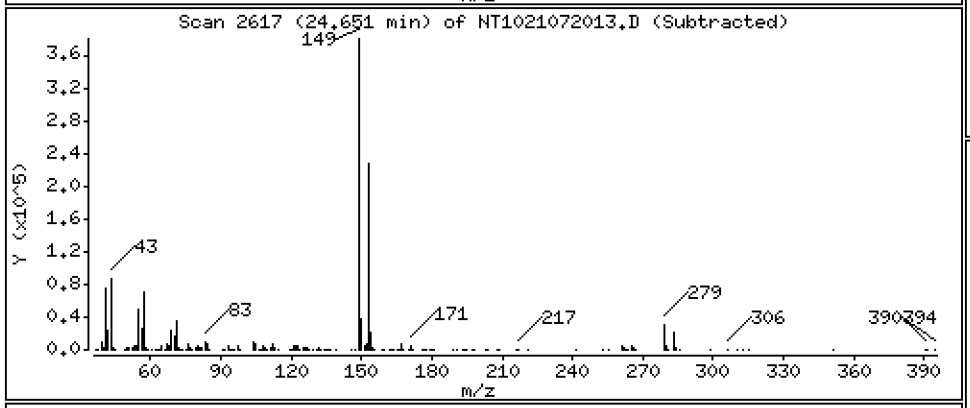
Column diameter: 0.25

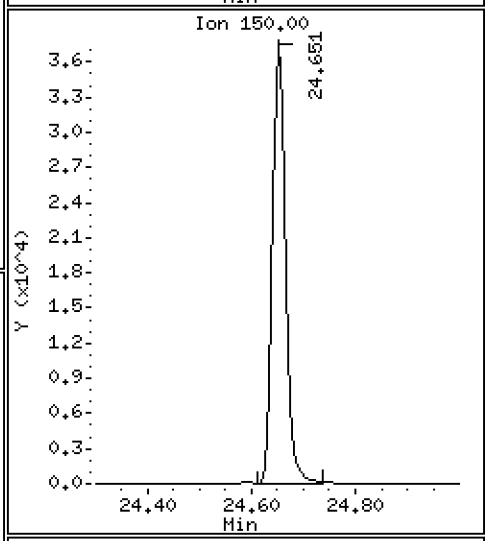
73 Di-n-octylphthalate

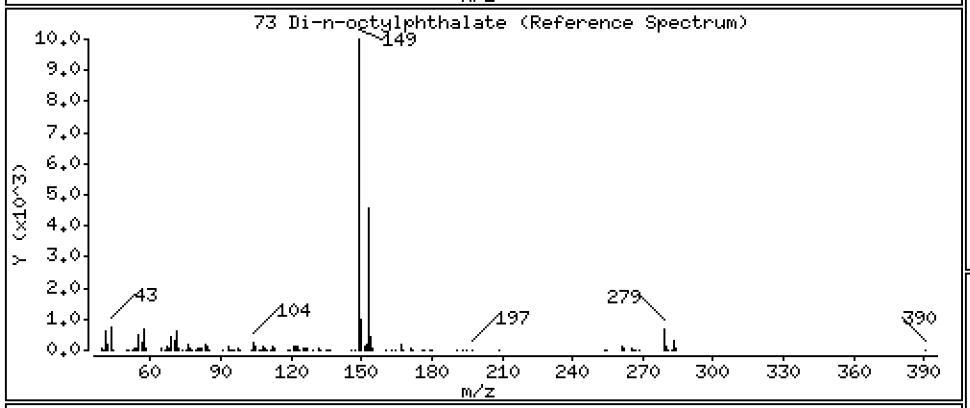
Concentration: 4.741 ug/mL

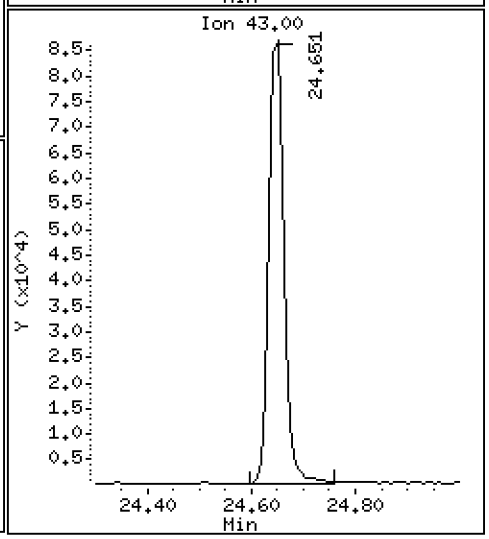


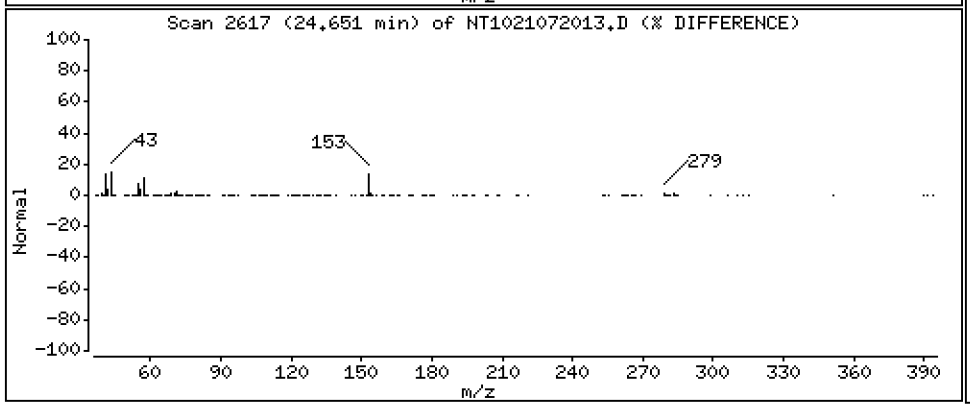












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

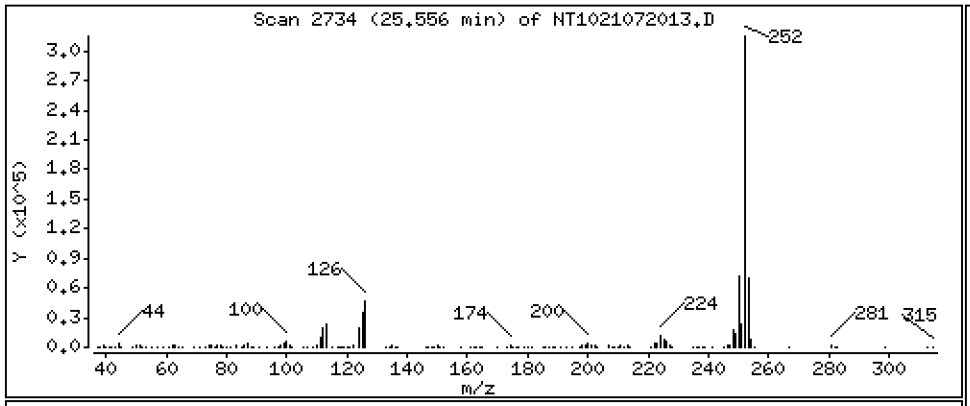
Operator: VTS

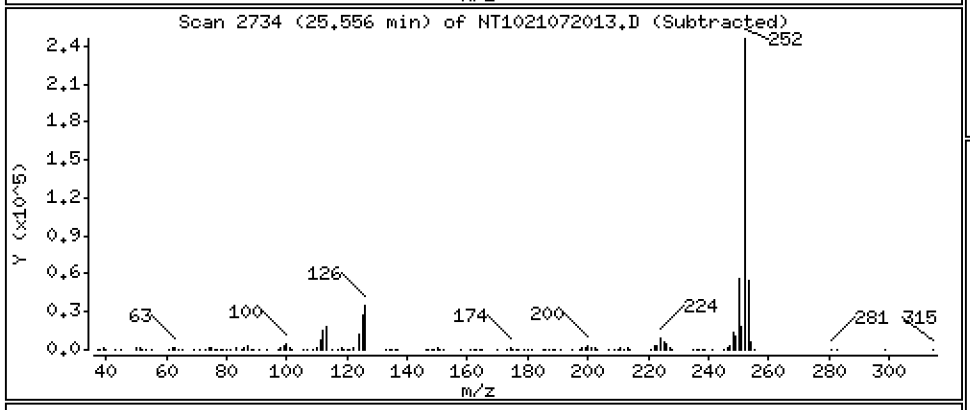
Column phase: ZB-5msi

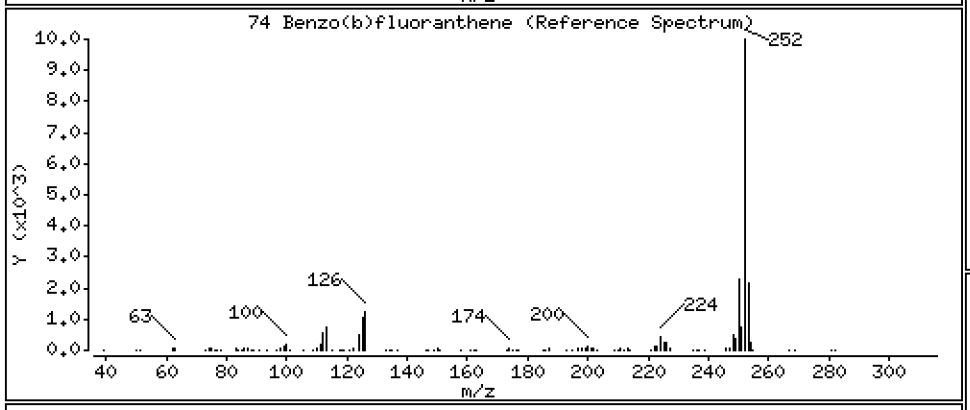
Column diameter: 0.25

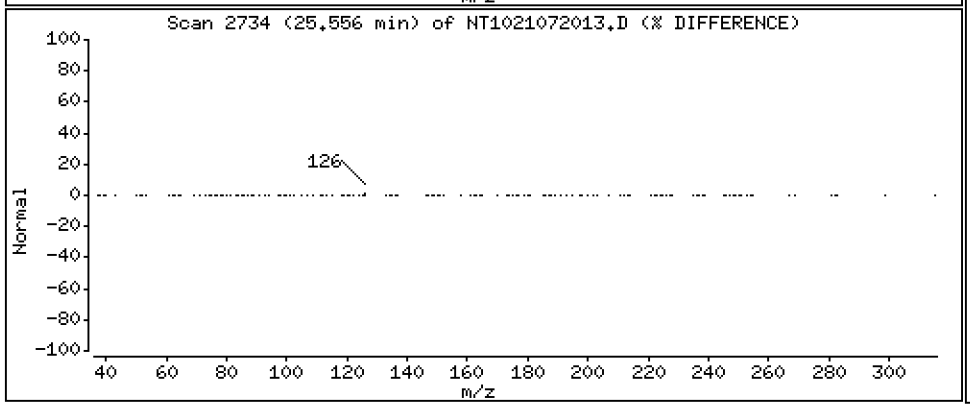
74 Benzo(b)fluoranthene

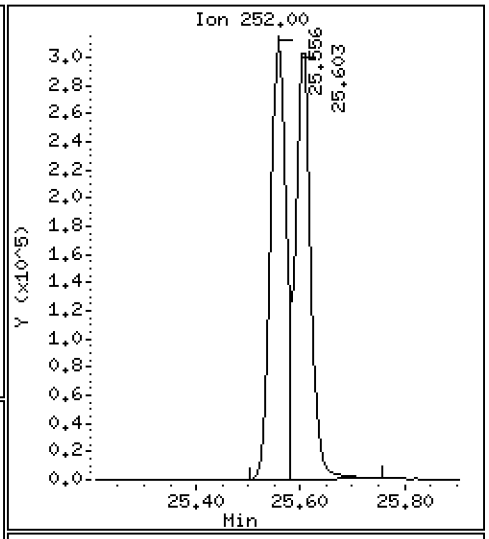
Concentration: 4.778 ug/mL

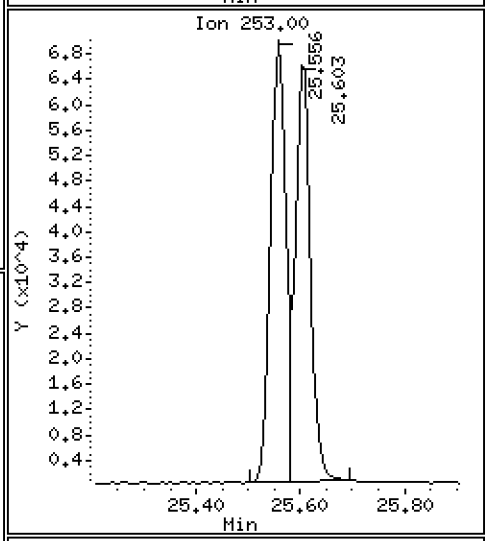


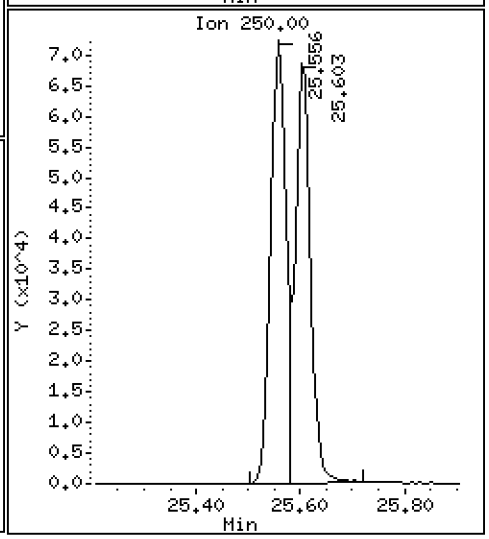












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

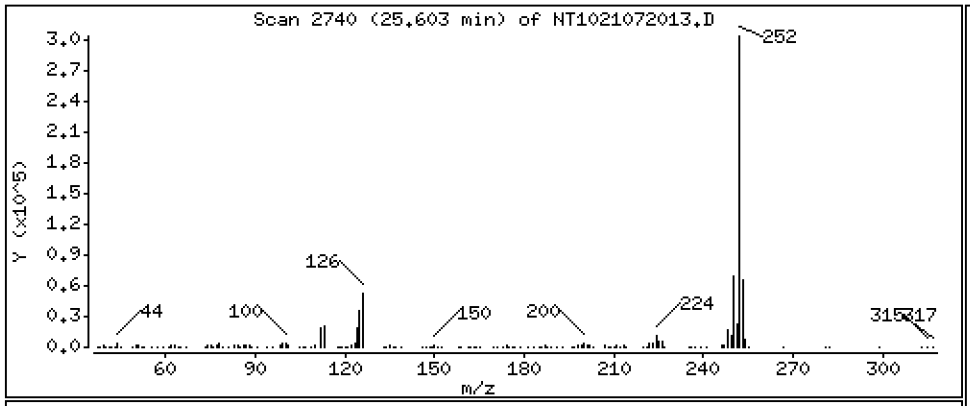
Operator: VTS

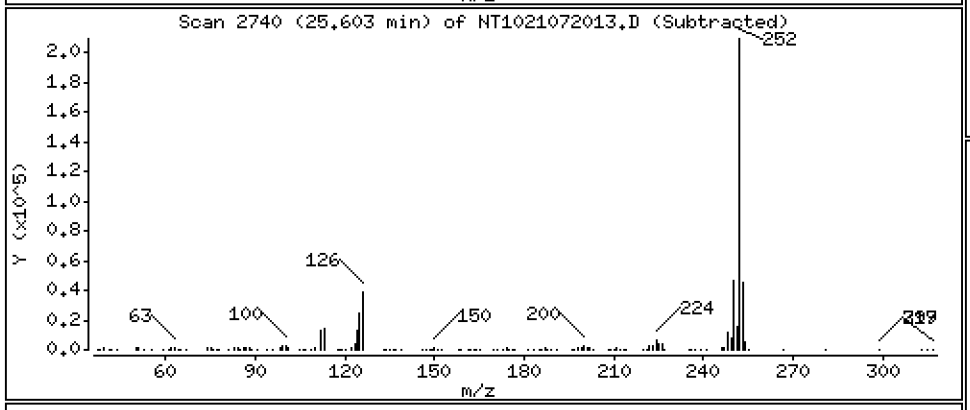
Column phase: ZB-5msi

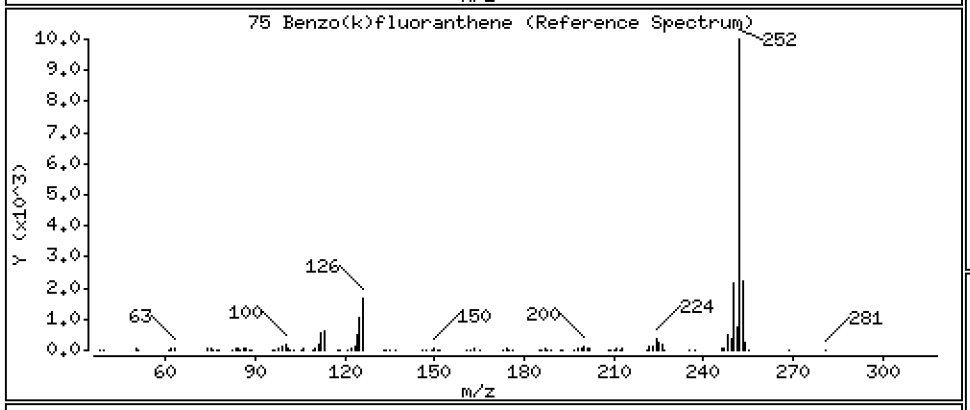
Column diameter: 0.25

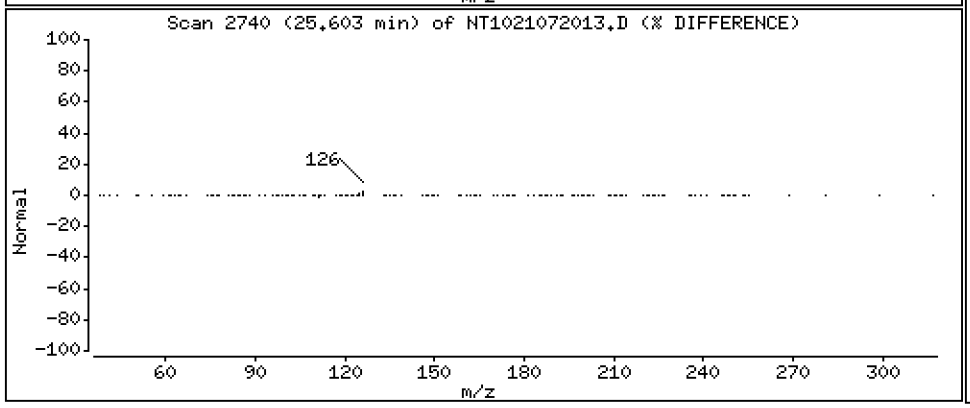
75 Benzo(k)fluoranthene

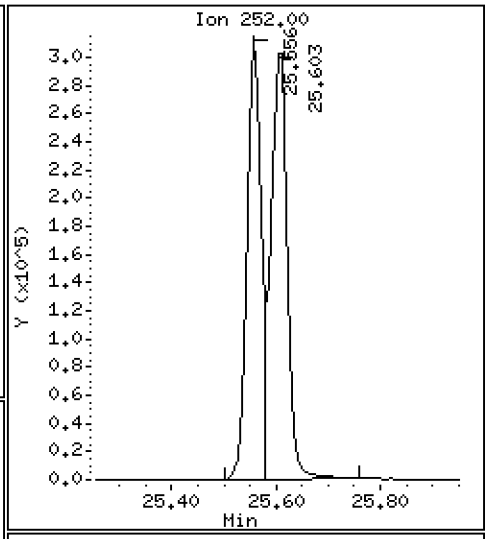
Concentration: 5.137 ug/mL

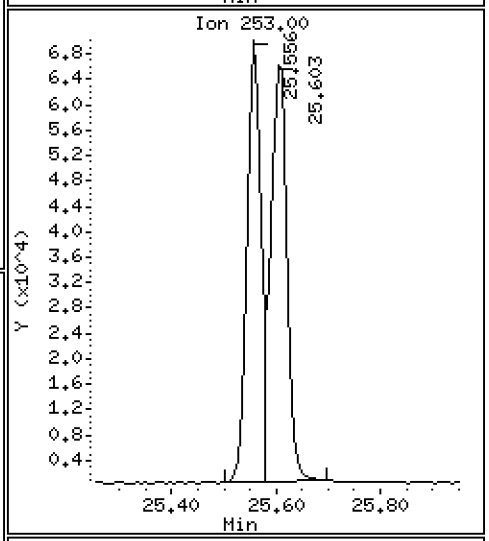


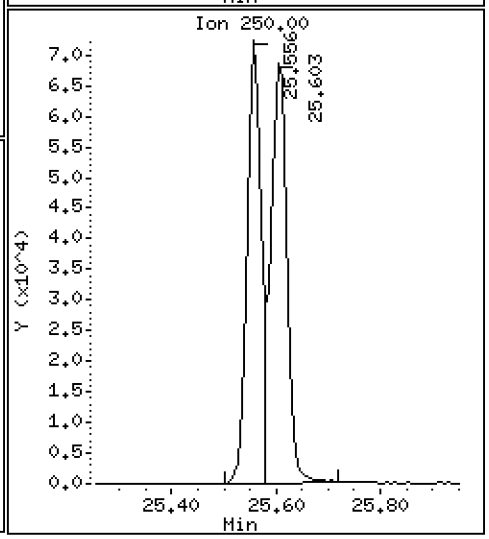












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

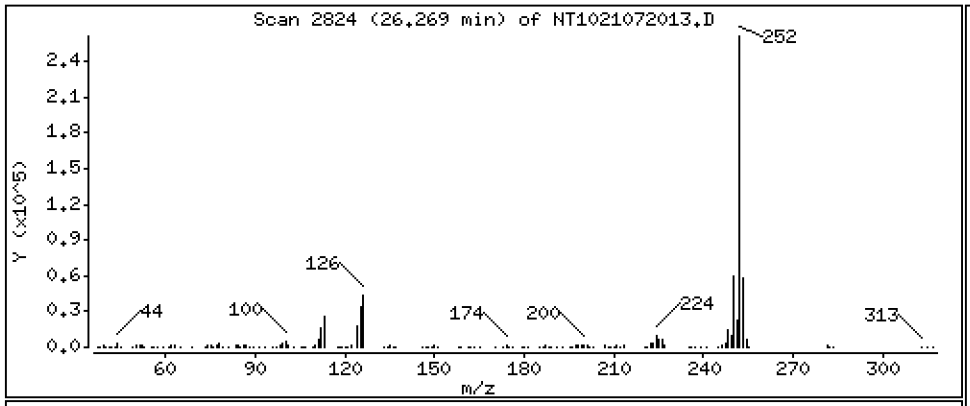
Operator: VTS

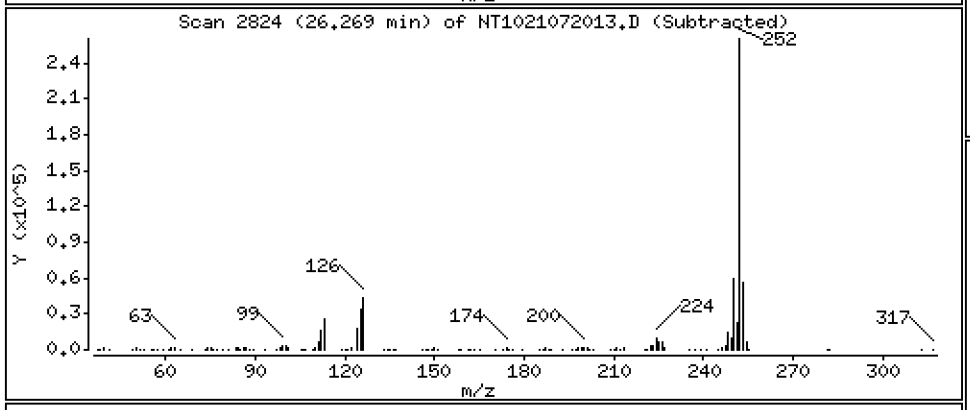
Column phase: ZB-5msi

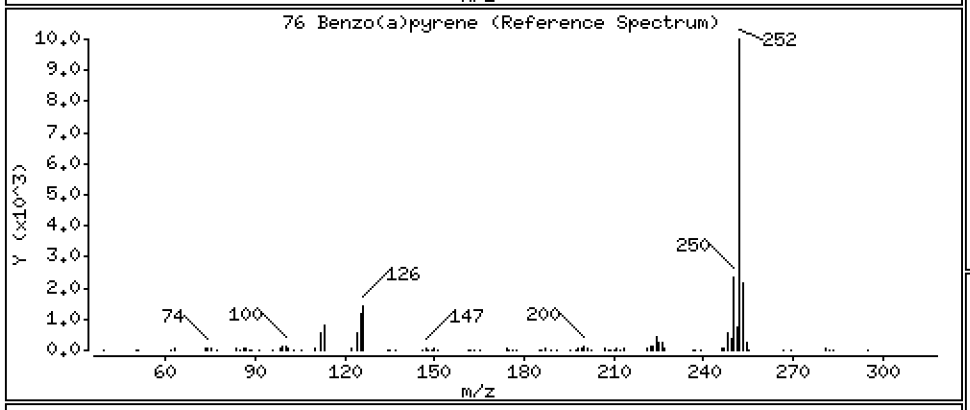
Column diameter: 0.25

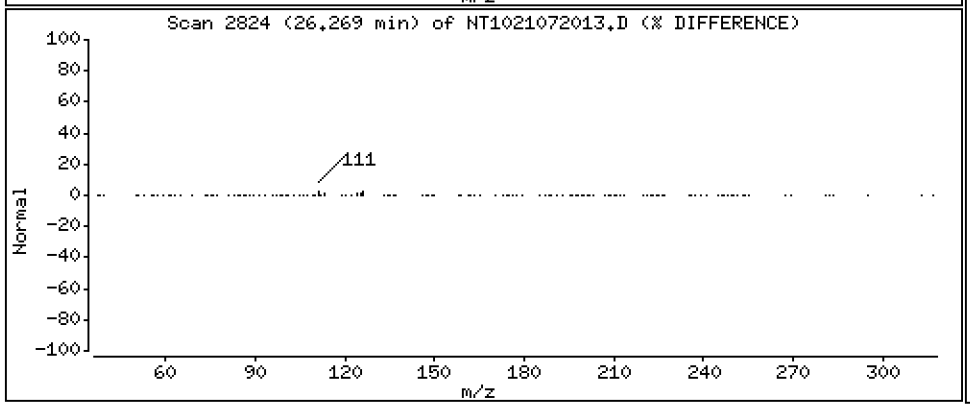
76 Benzo(a)pyrene

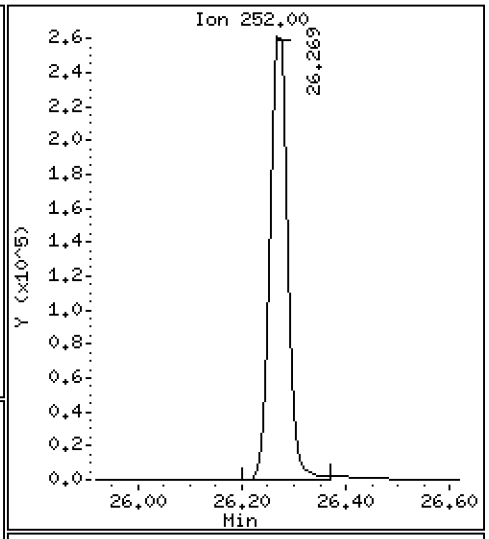
Concentration: 4.977 ug/mL

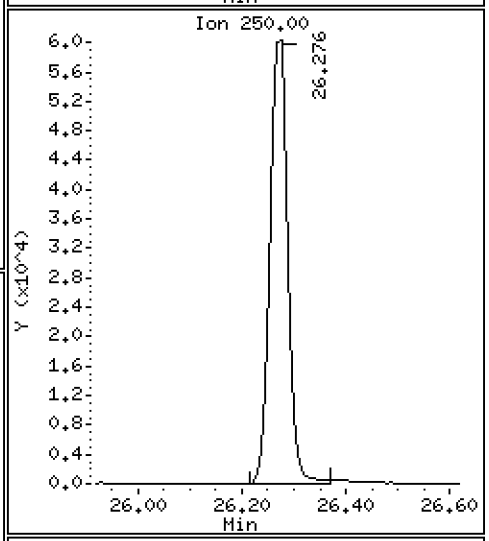


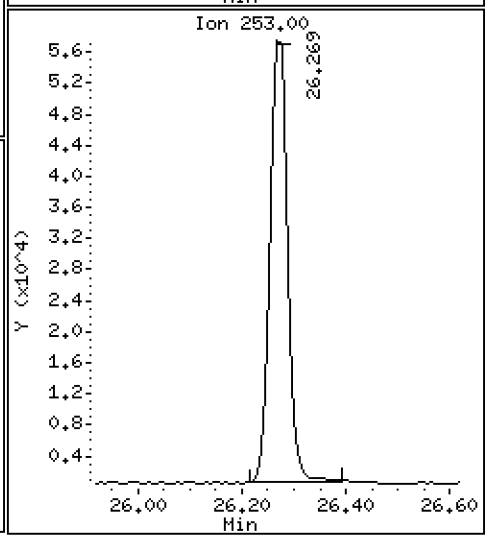












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

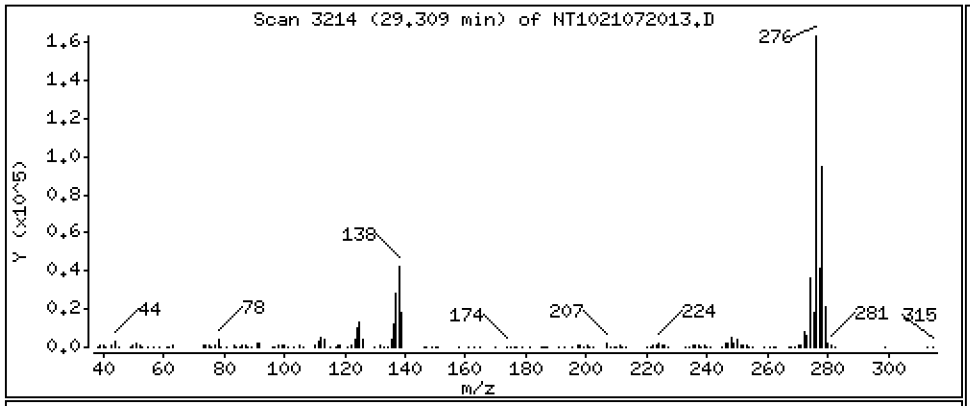
Operator: VTS

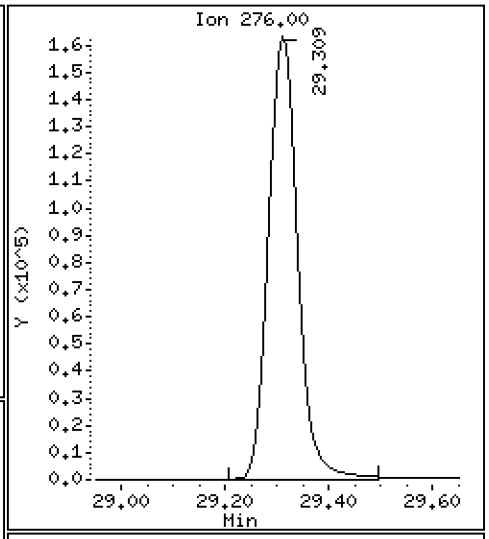
Column phase: ZB-5msi

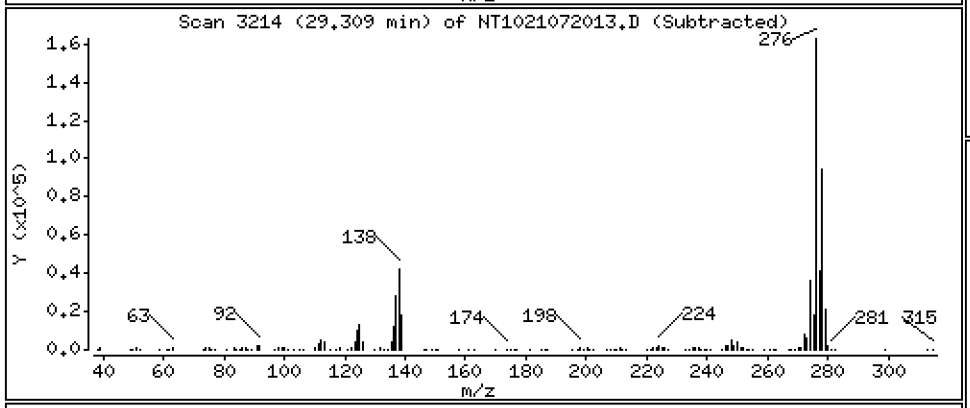
Column diameter: 0.25

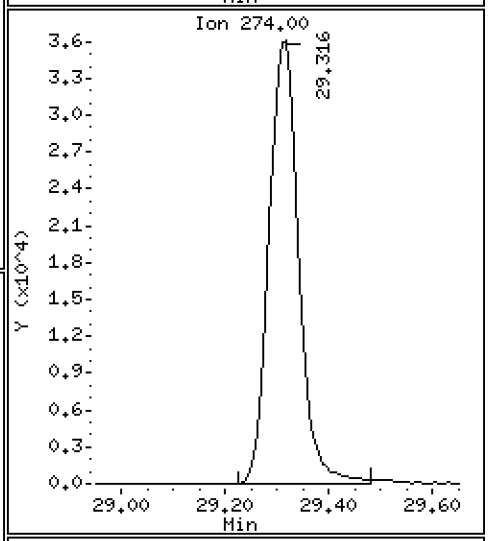
78 Indeno(1,2,3-cd)pyrene

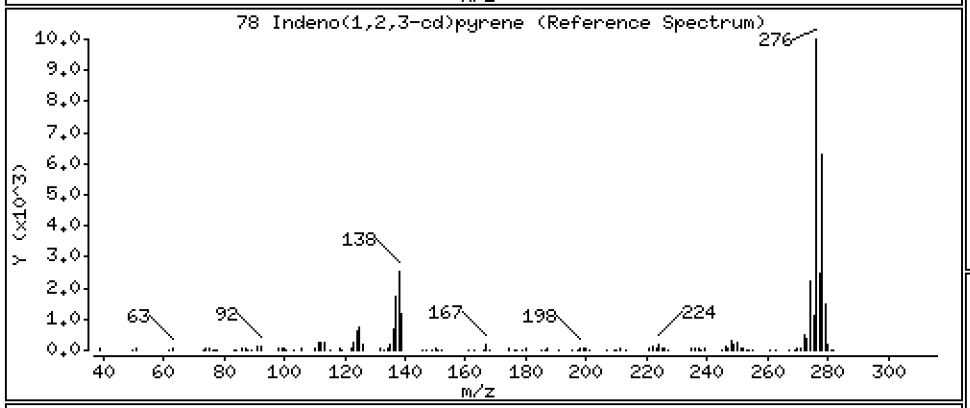
Concentration: 4.743 ug/mL

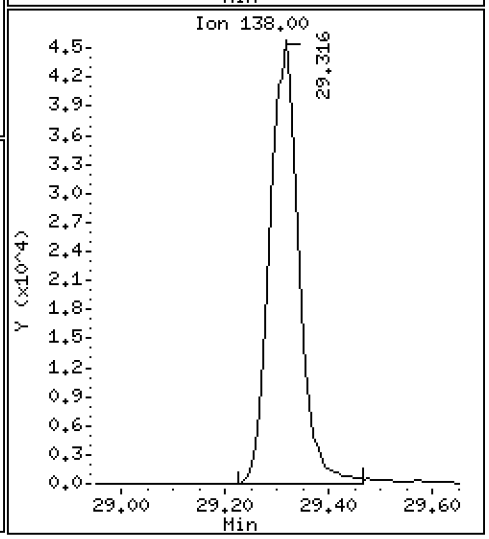


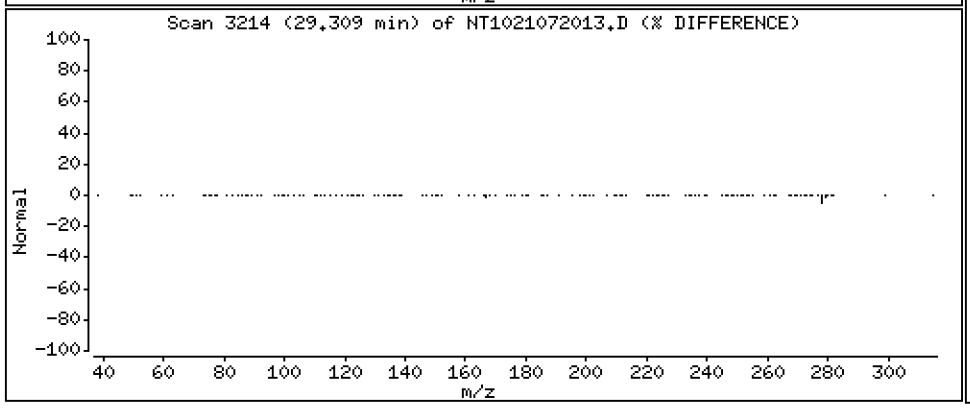












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

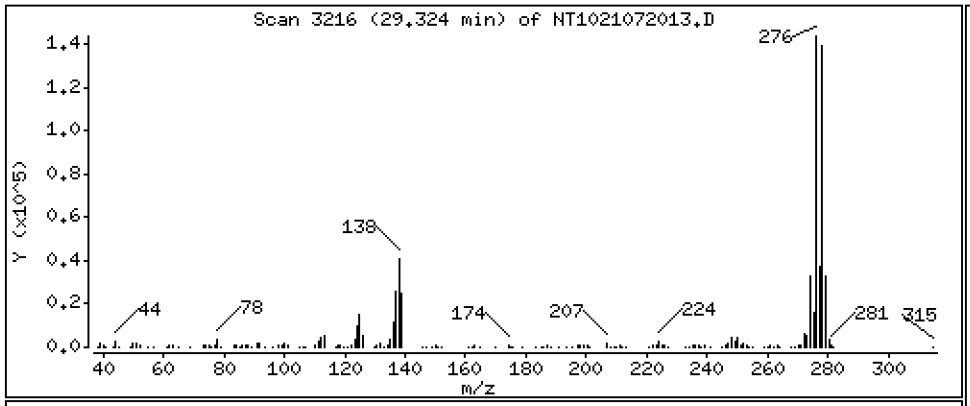
Operator: VTS

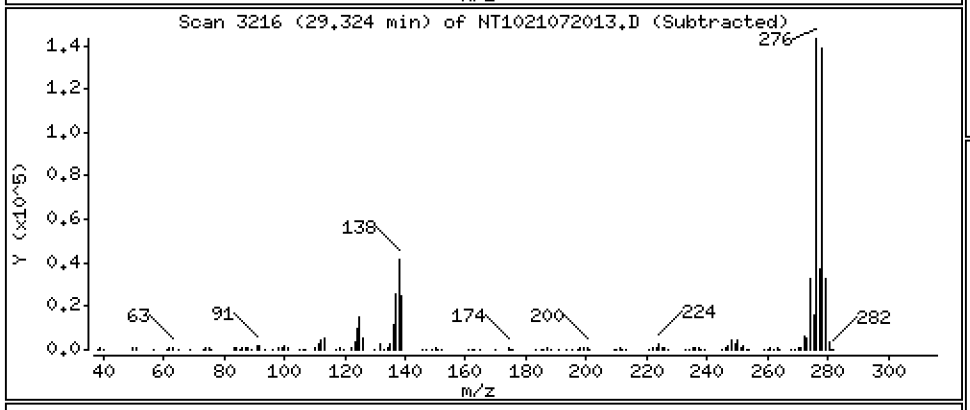
Column phase: ZB-5msi

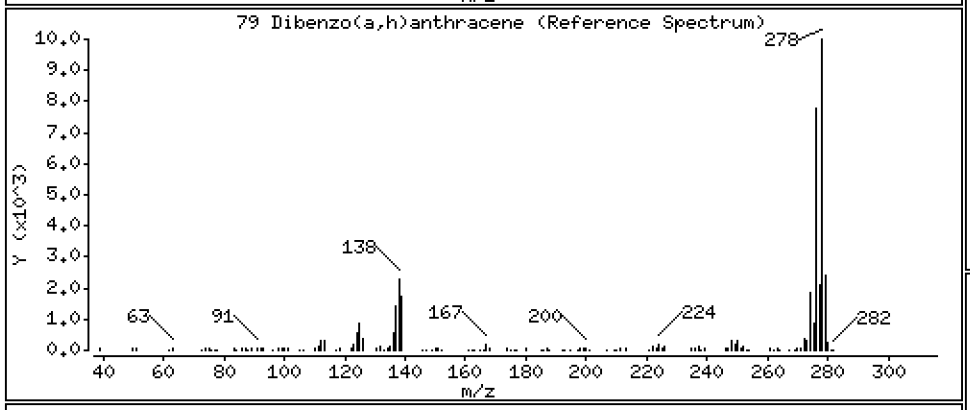
Column diameter: 0.25

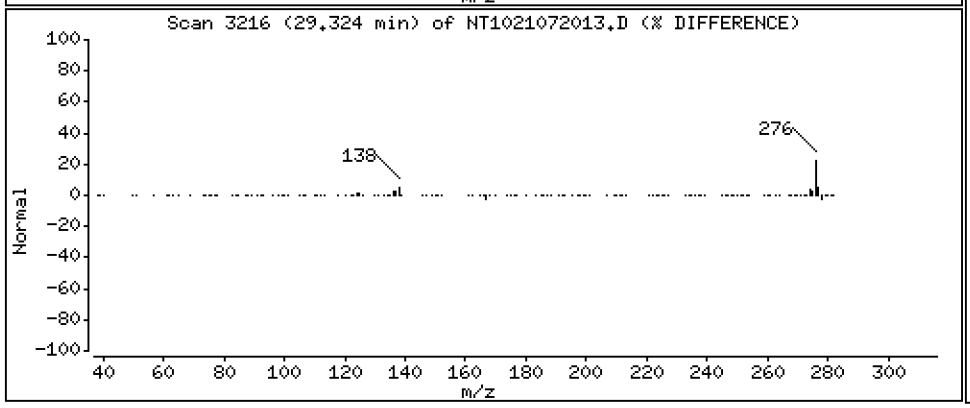
79 Dibenzo(a,h)anthracene

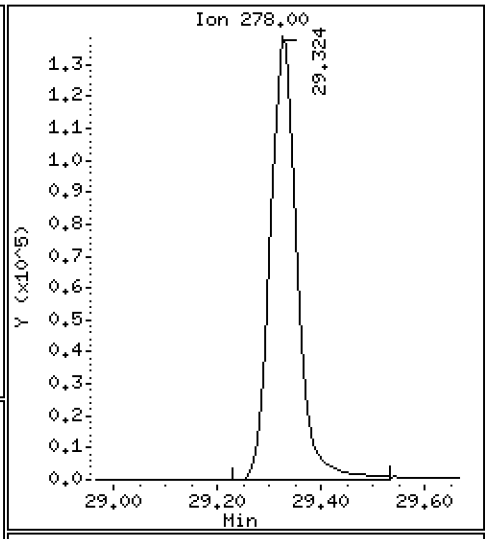
Concentration: 4.703 ug/mL

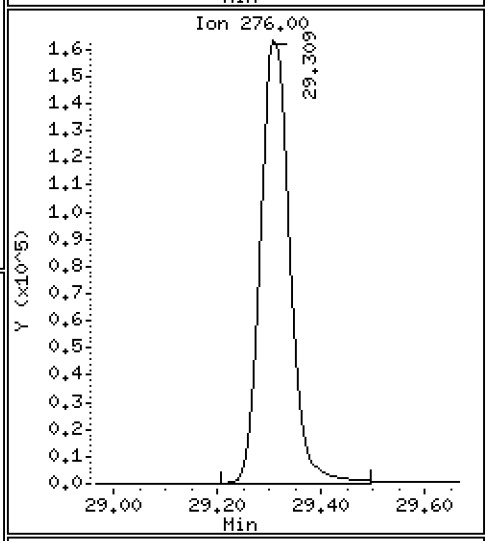


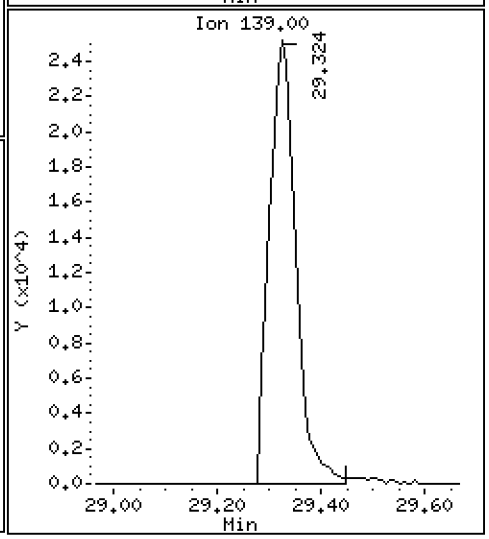












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

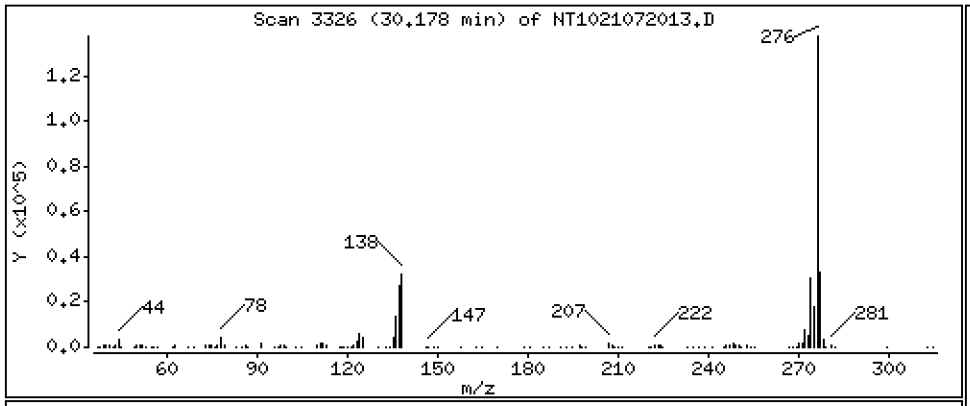
Operator: VTS

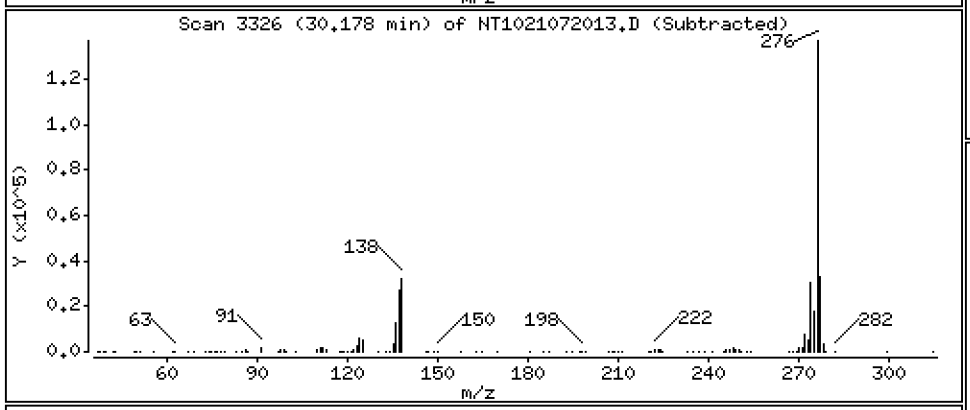
Column phase: ZB-5msi

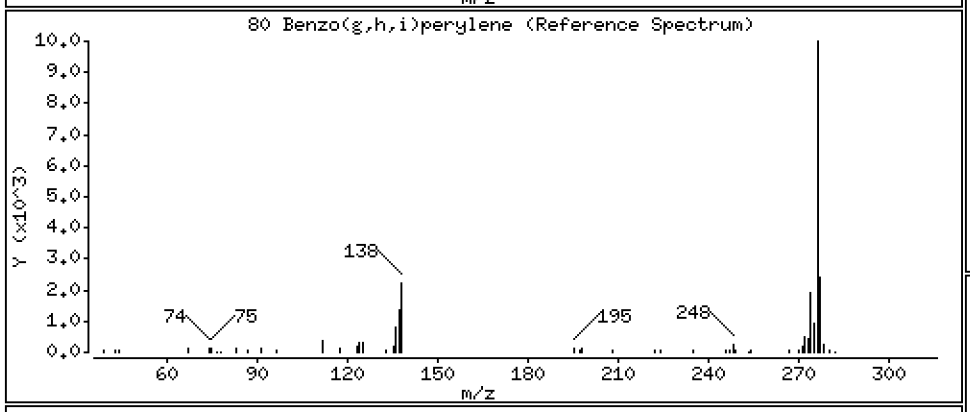
Column diameter: 0.25

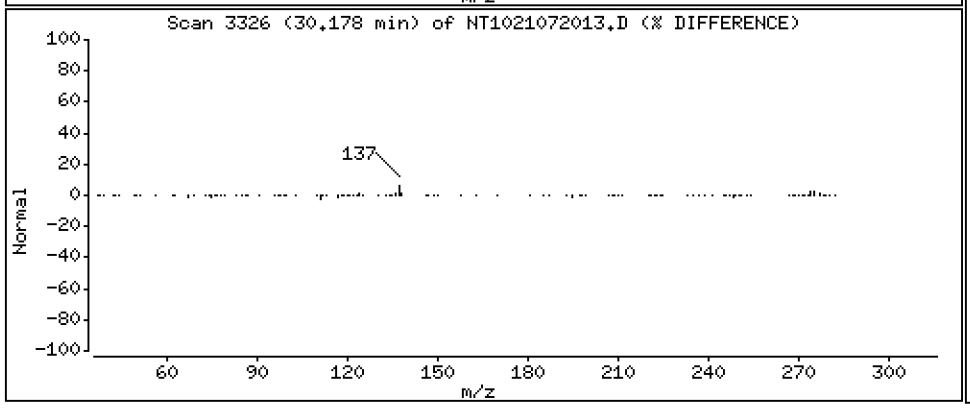
80 Benzo(g,h,i)perylene

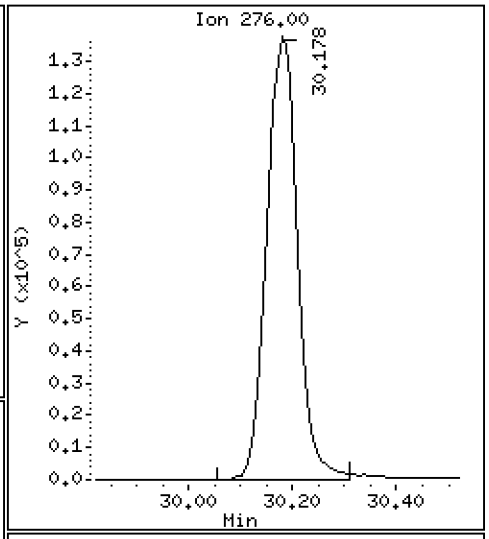
Concentration: 4.714 ug/mL

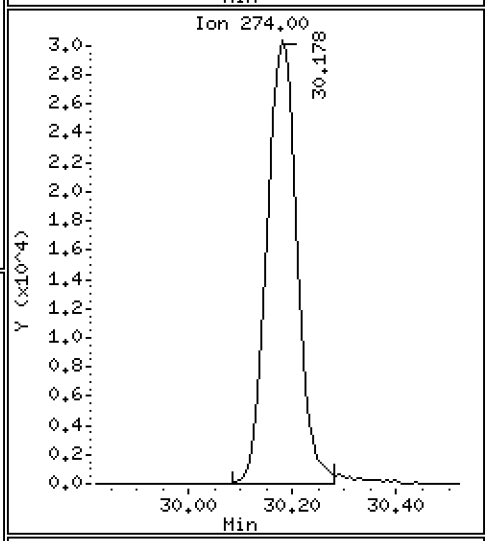


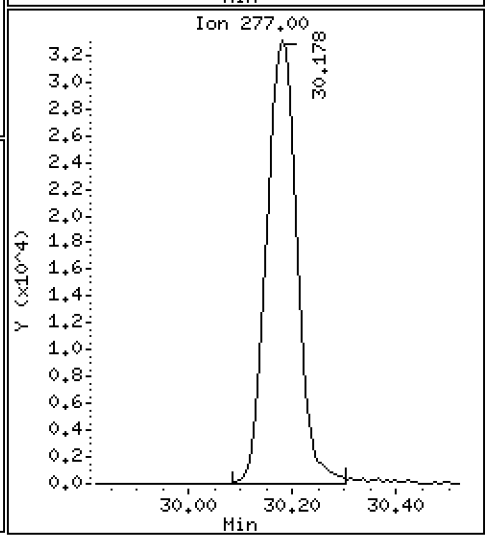












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

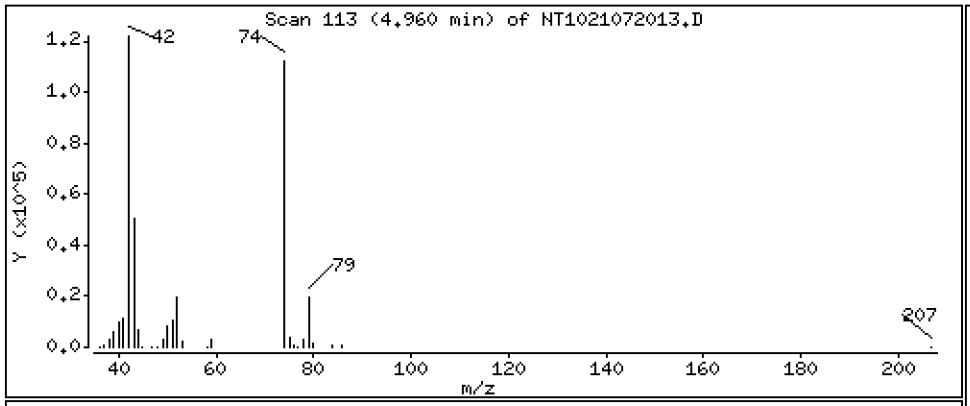
Operator: VTS

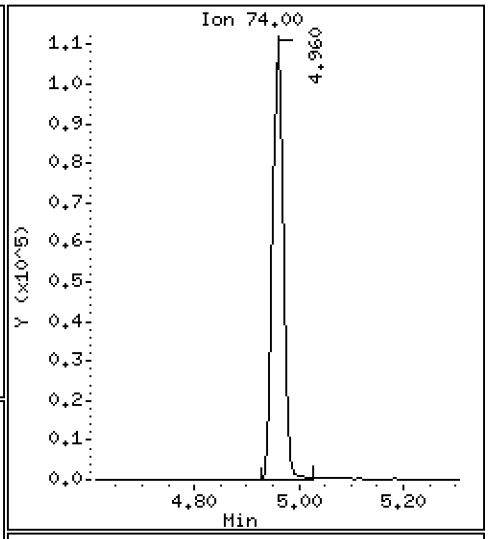
Column phase: ZB-5msi

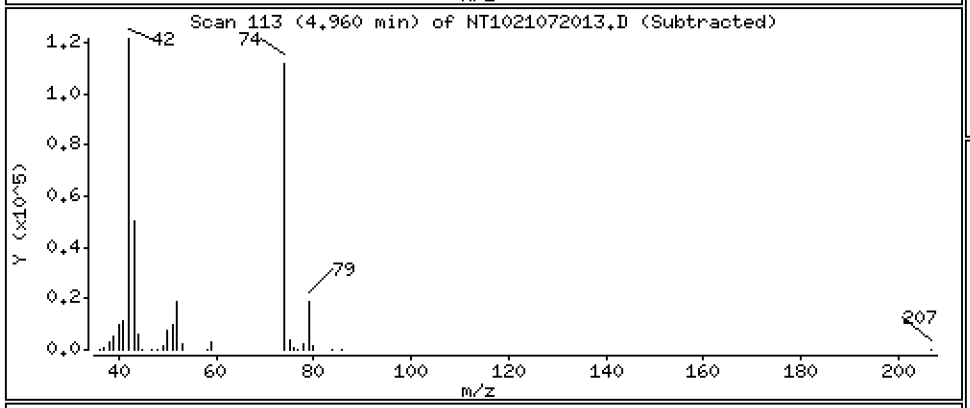
Column diameter: 0.25

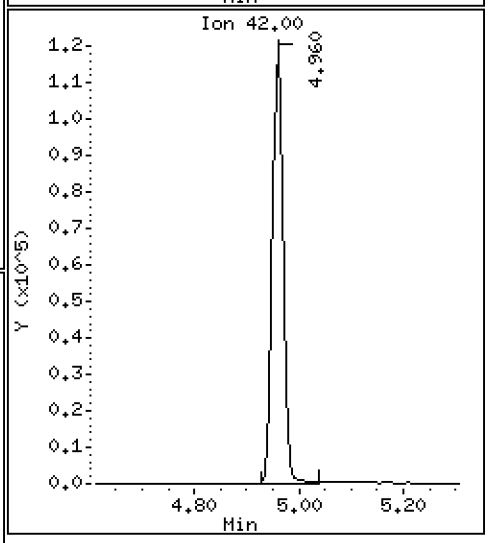
90 N-Nitrosodimethylamine

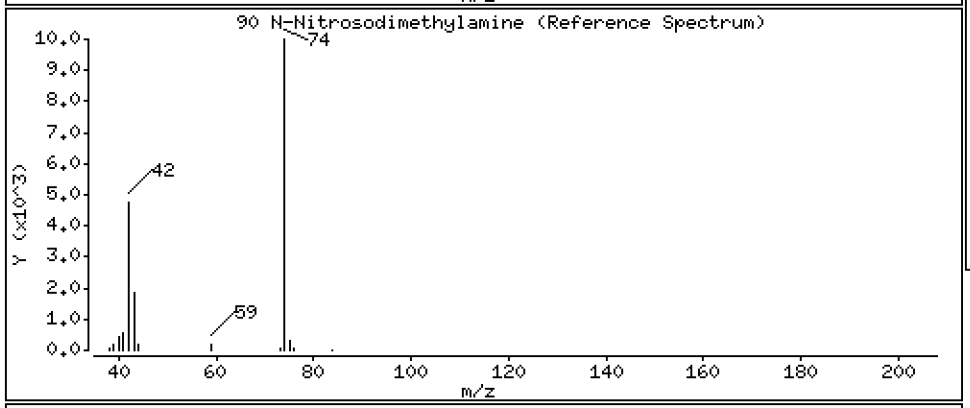
Concentration: 5.630 ug/mL

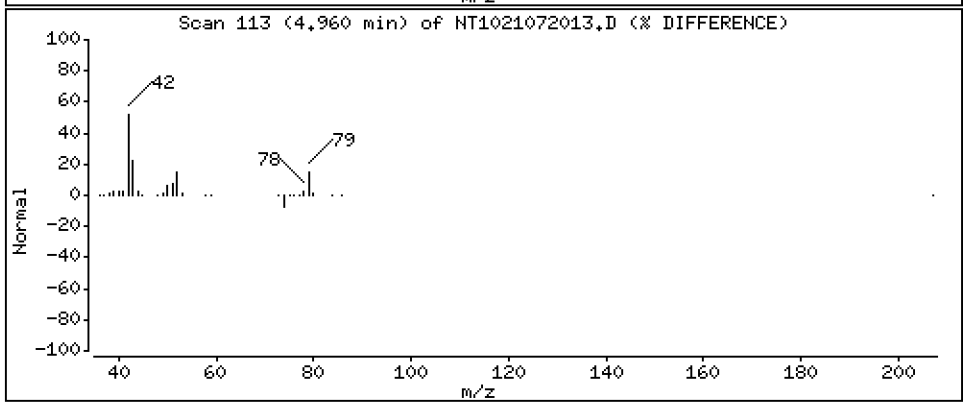












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

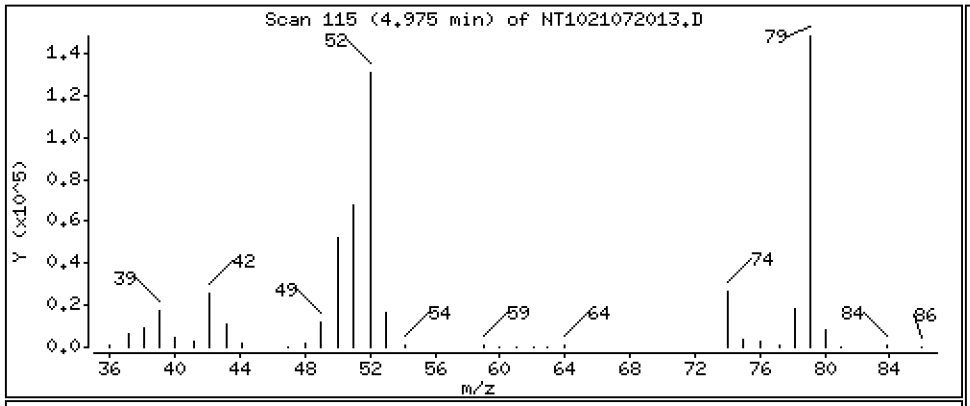
Operator: VTS

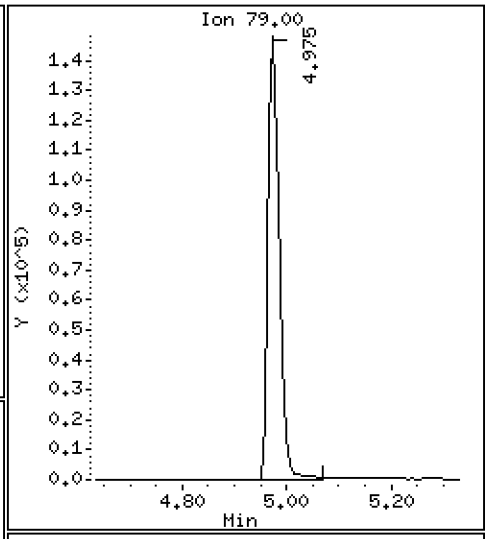
Column phase: ZB-5msi

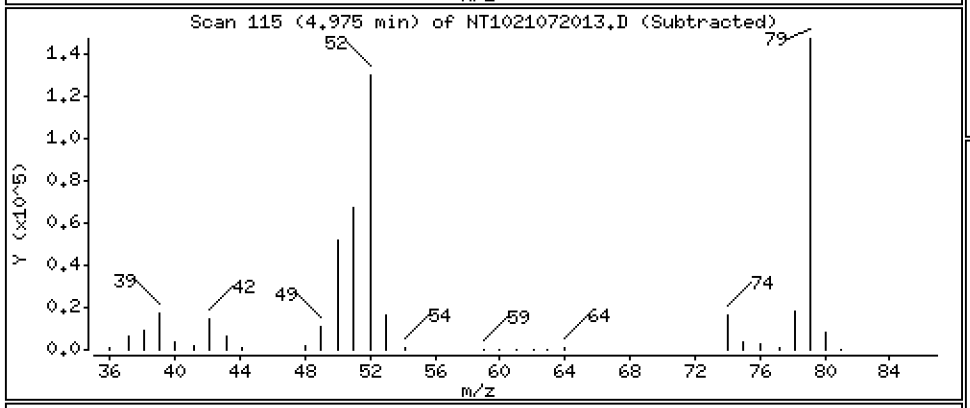
Column diameter: 0.25

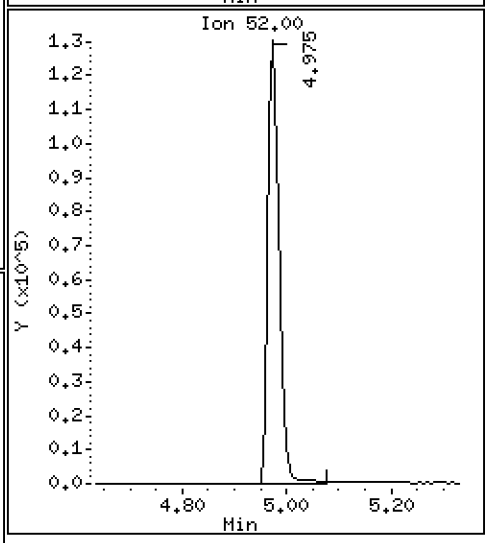
103 Pyridine

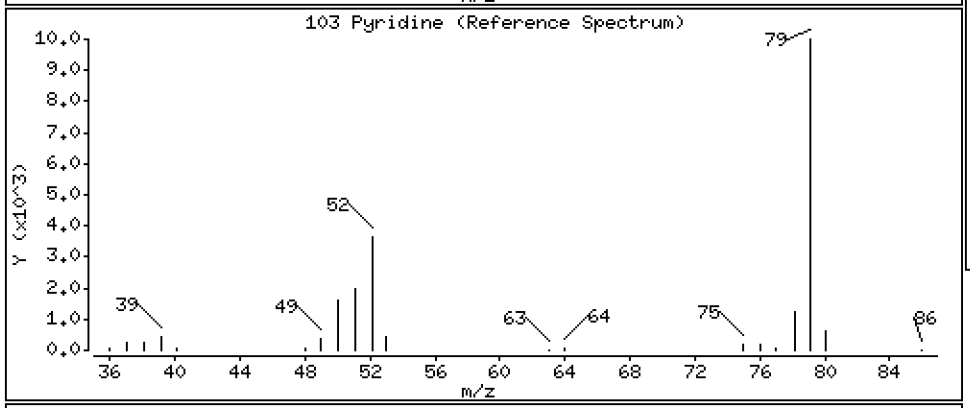
Concentration: 5.038 ug/mL

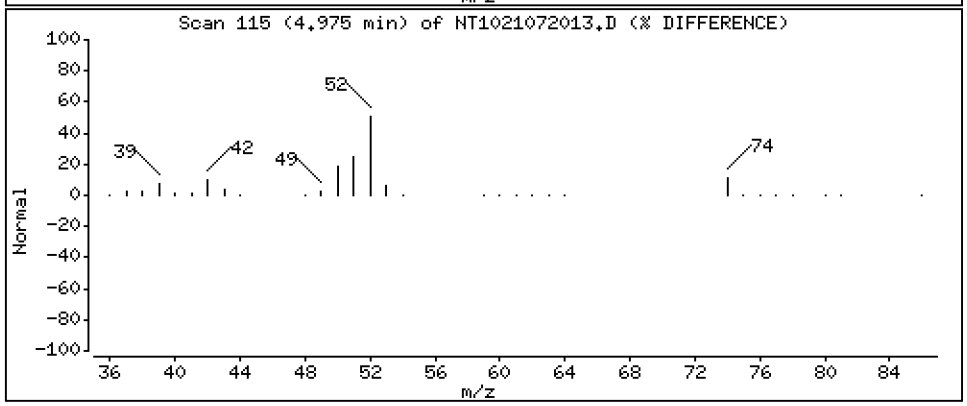












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

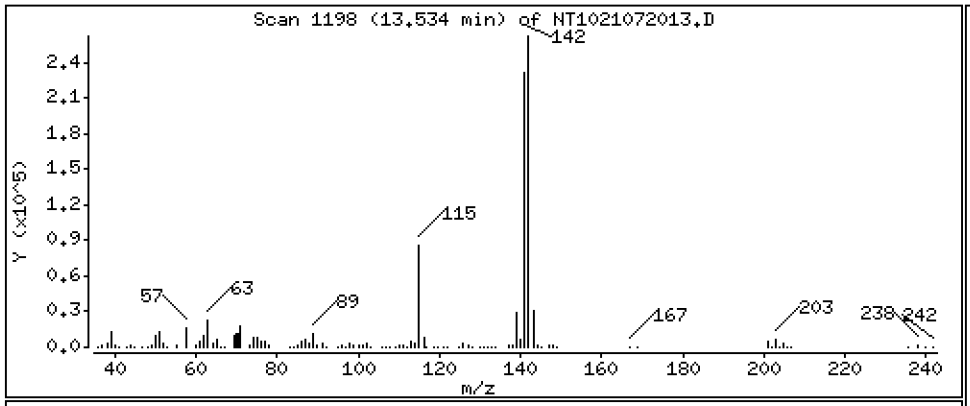
Operator: VTS

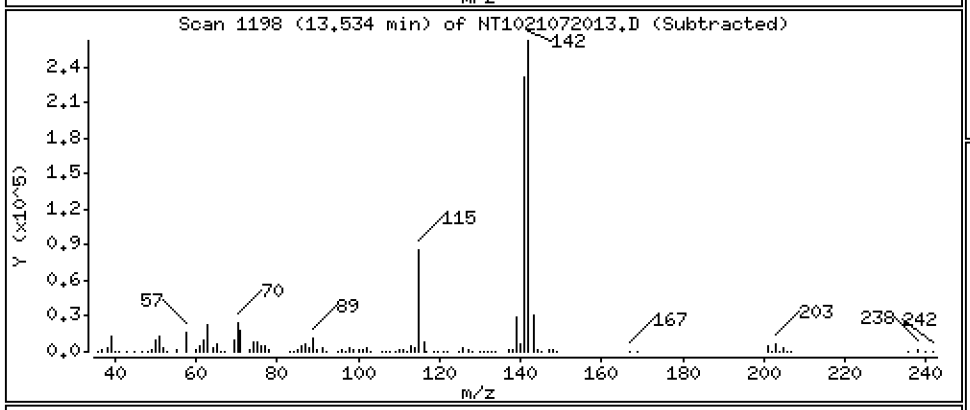
Column phase: ZB-5msi

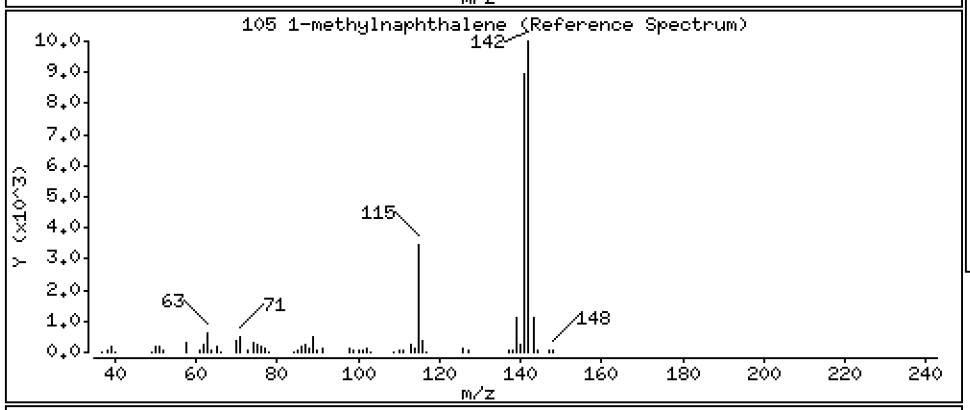
Column diameter: 0.25

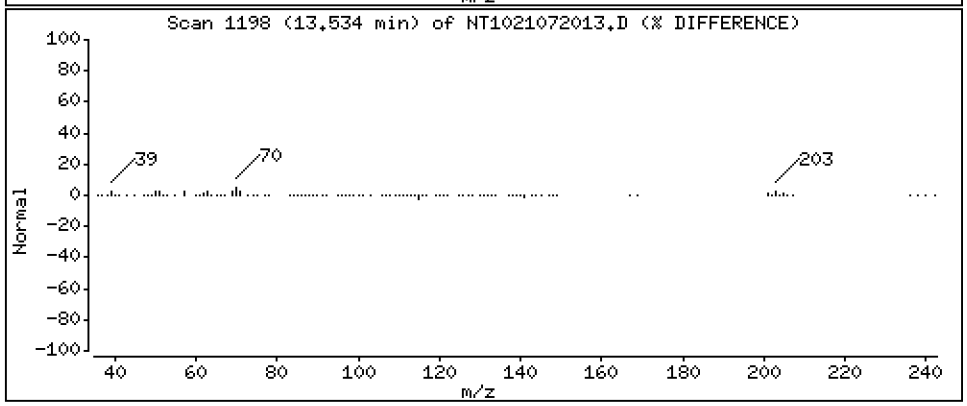
105 1-methylnaphthalene

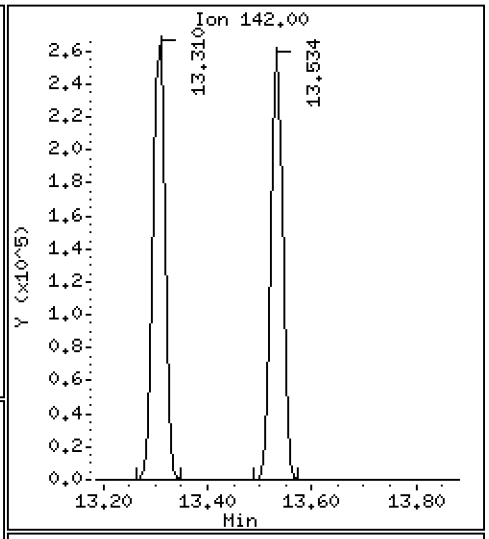
Concentration: 4.923 ug/mL

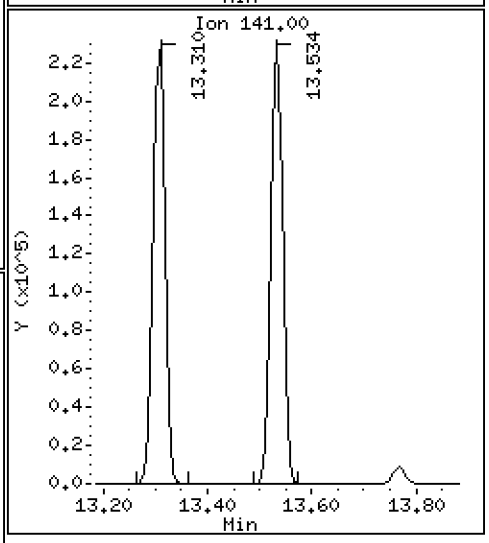












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

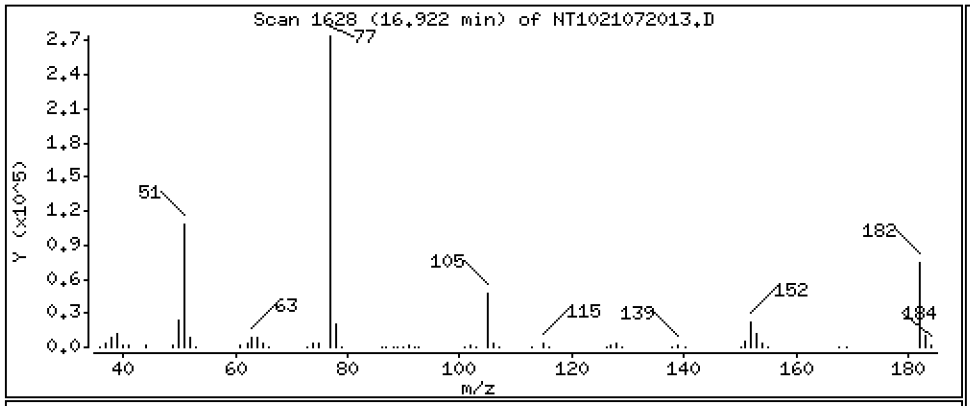
Operator: VTS

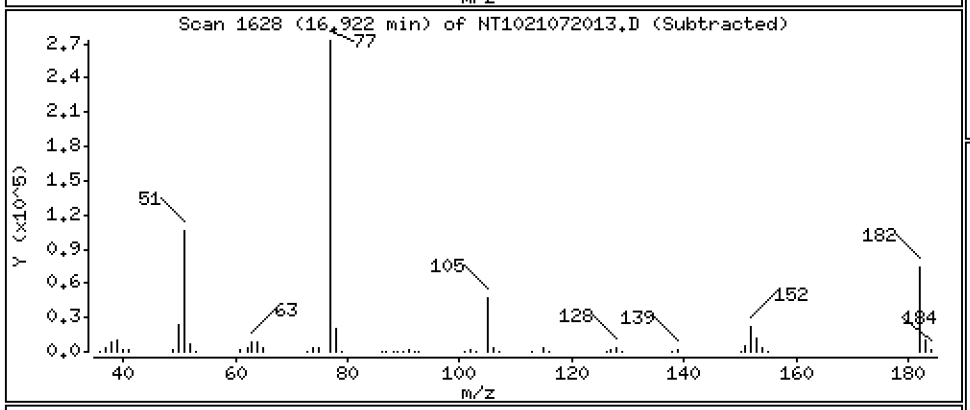
Column phase: ZB-5msi

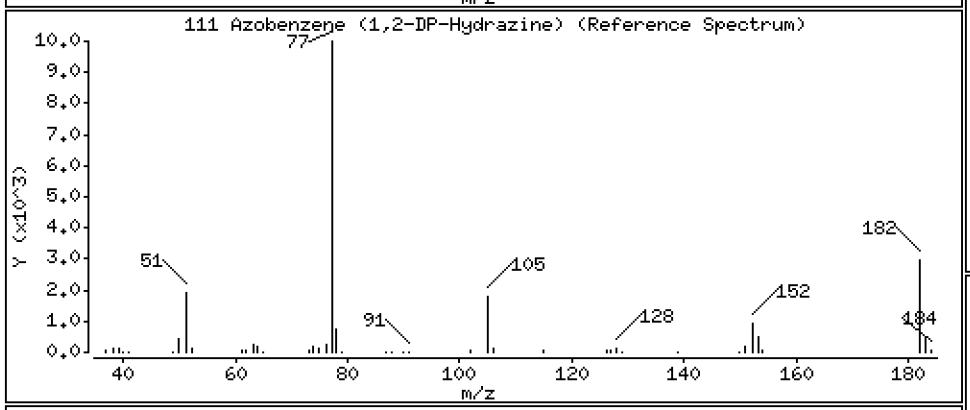
Column diameter: 0.25

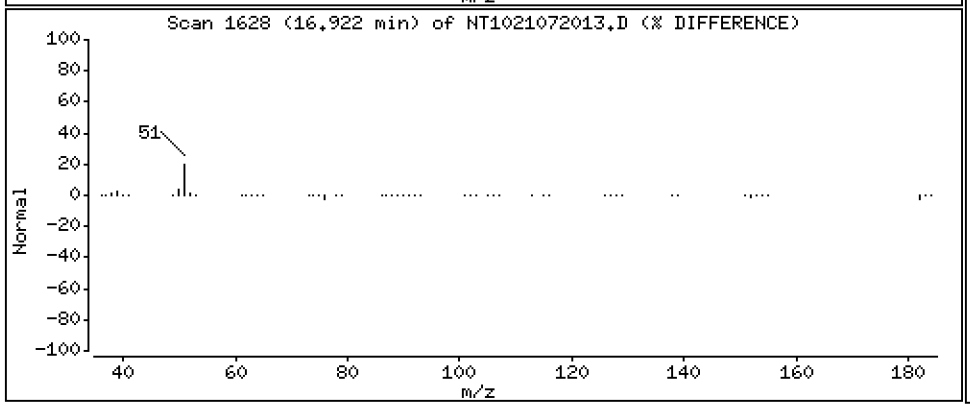
111 Azobenzene (1,2-DP-Hydrazine)

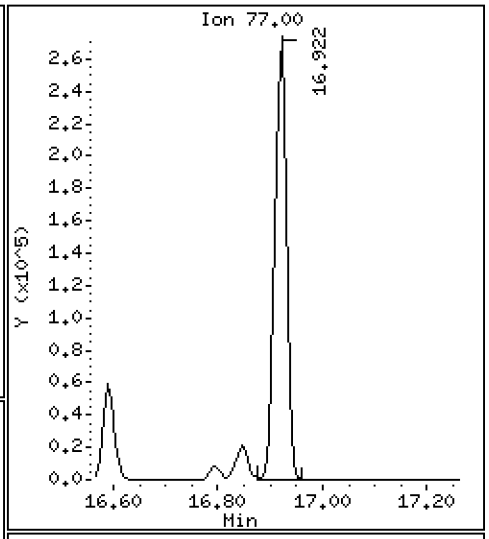
Concentration: 4.749 ug/mL

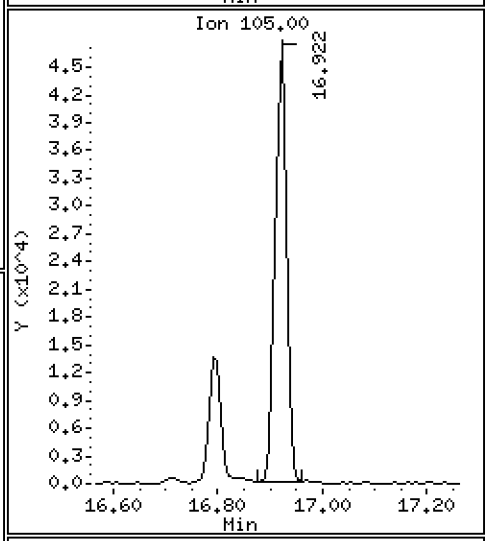


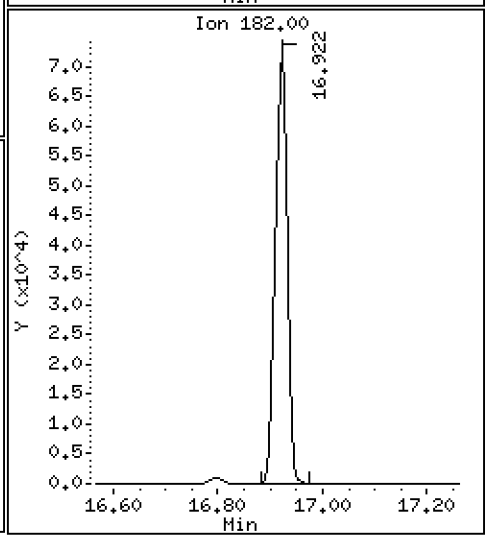












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

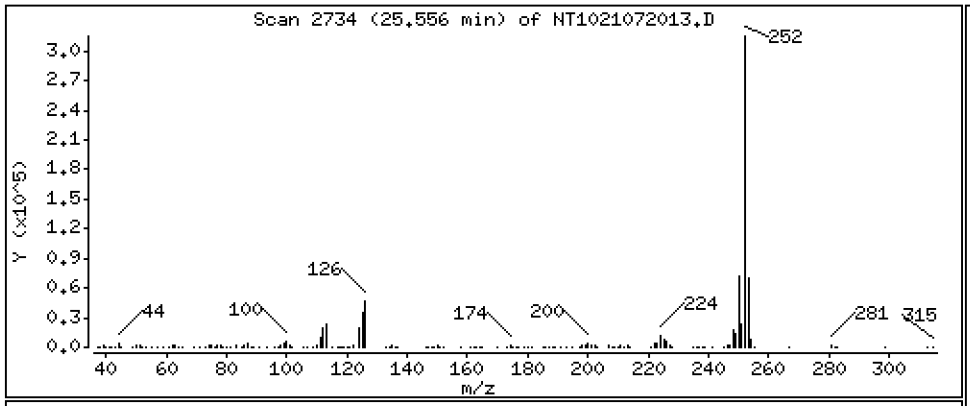
Operator: VTS

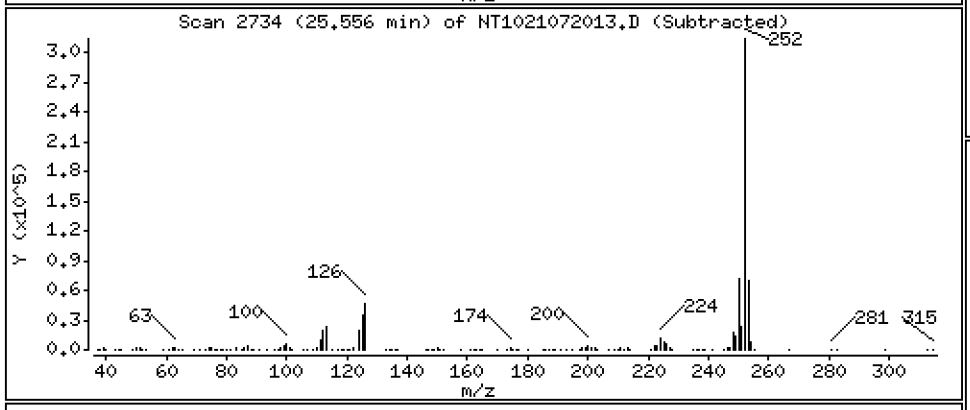
Column phase: ZB-5msi

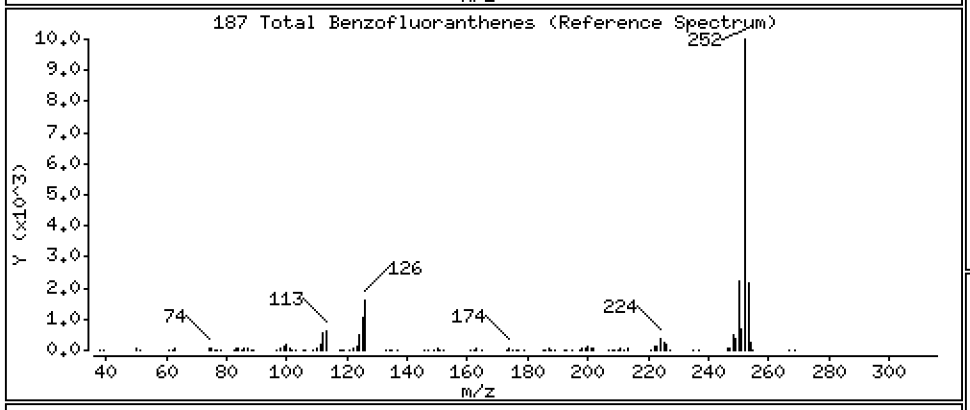
Column diameter: 0.25

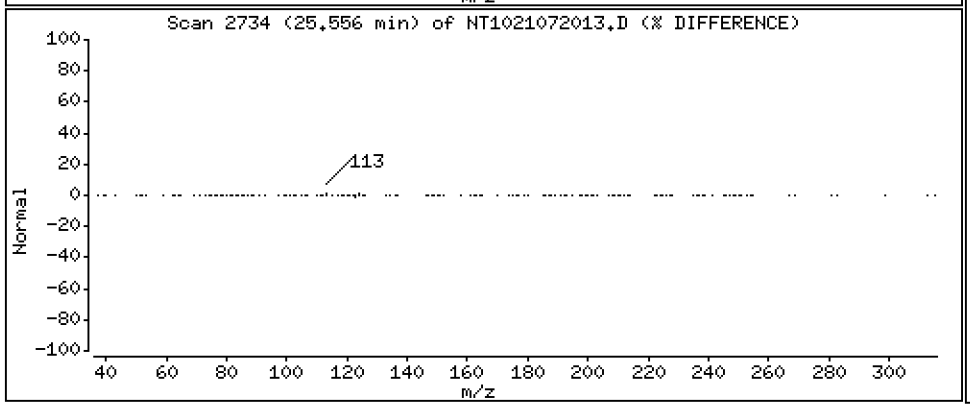
187 Total Benzofluoranthenes

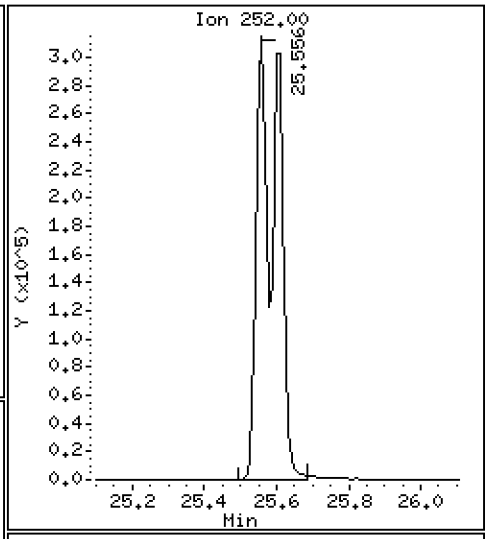
Concentration: 9.829 ug/mL

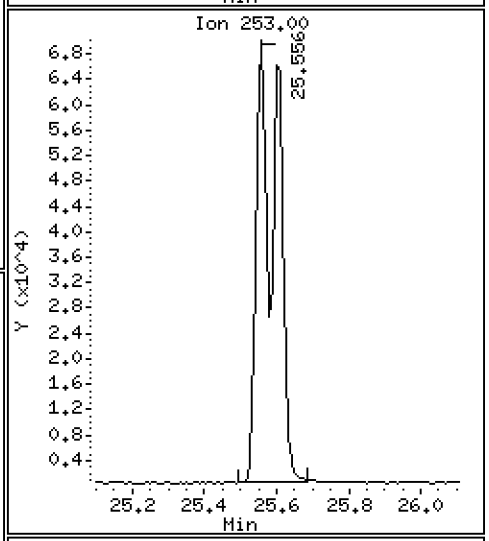


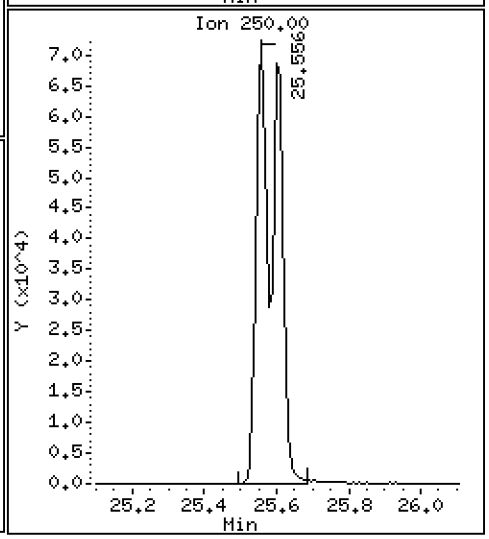












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

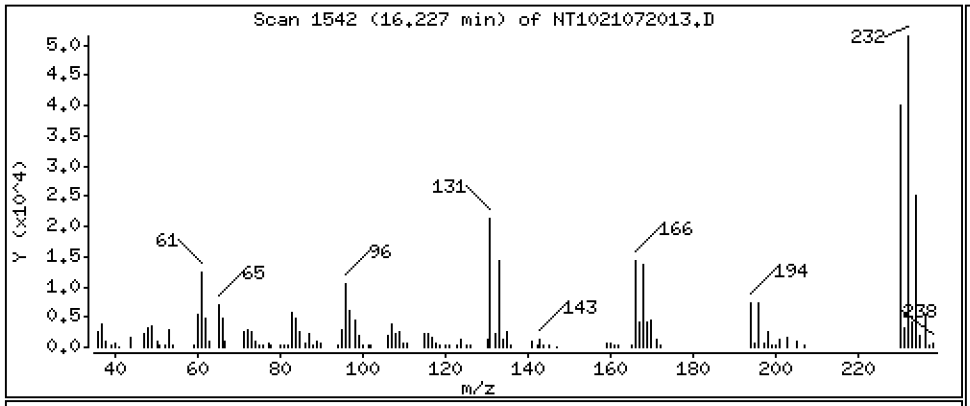
Operator: VTS

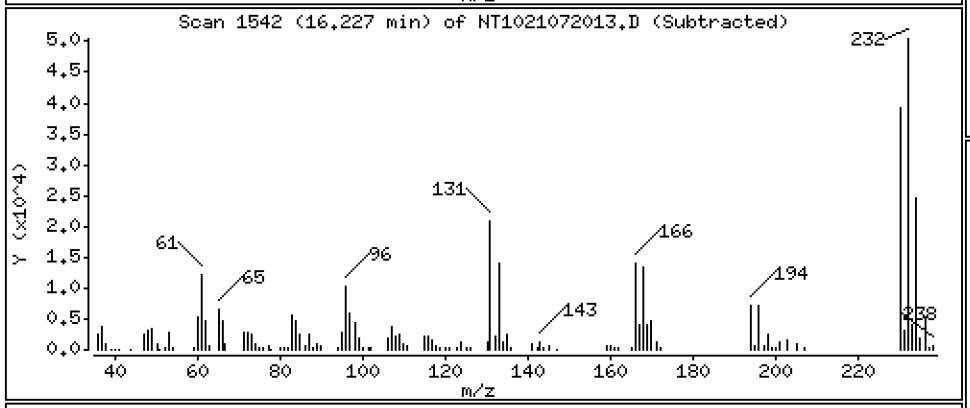
Column phase: ZB-5msi

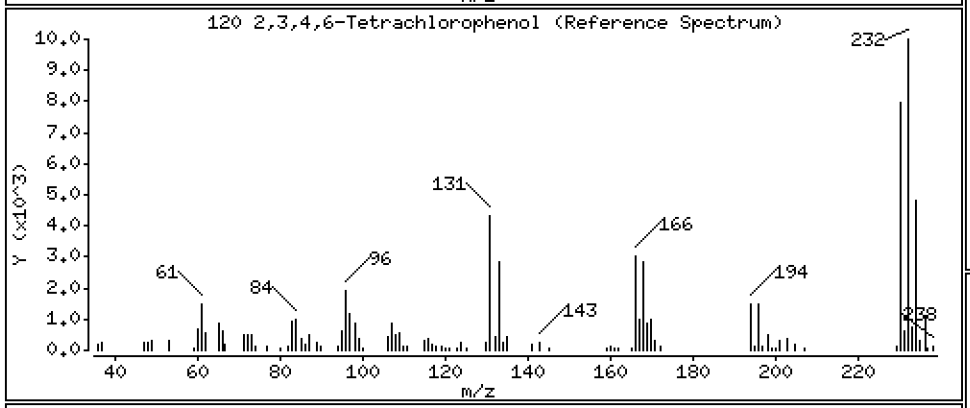
Column diameter: 0.25

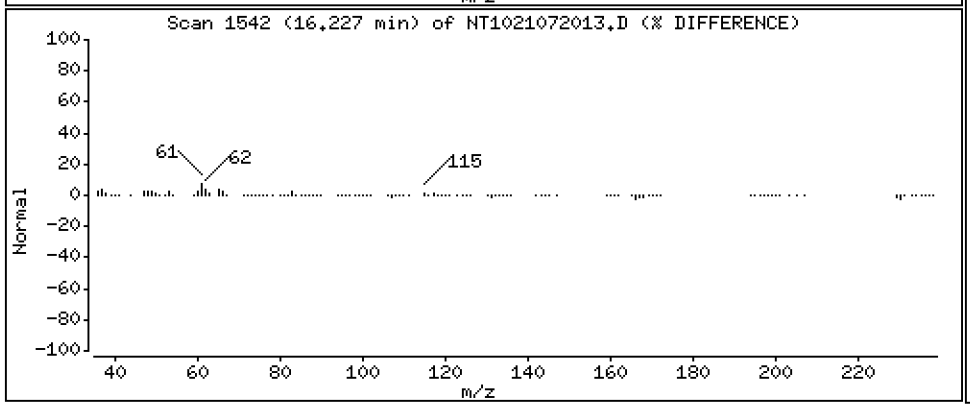
120 2,3,4,6-Tetrachlorophenol

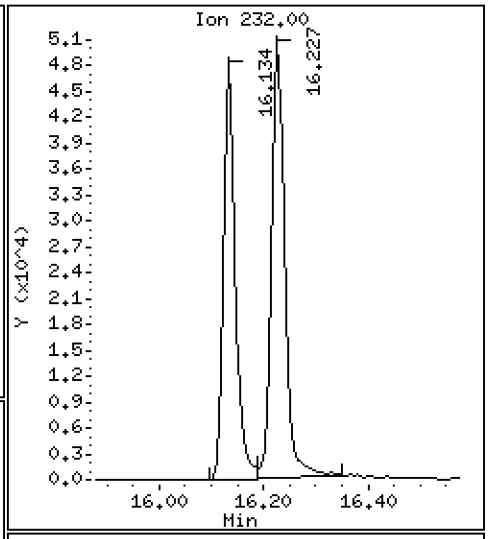
Concentration: 4.472 ug/mL

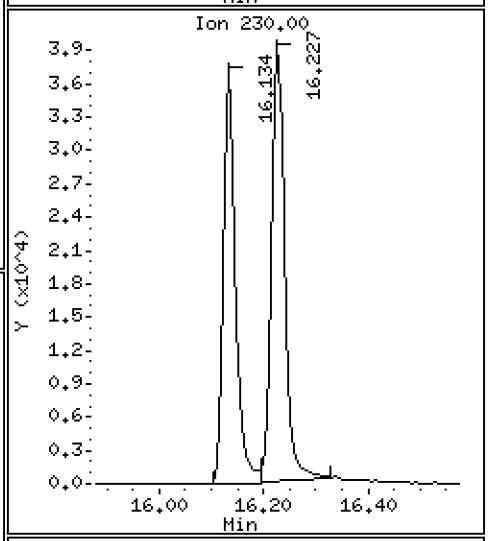


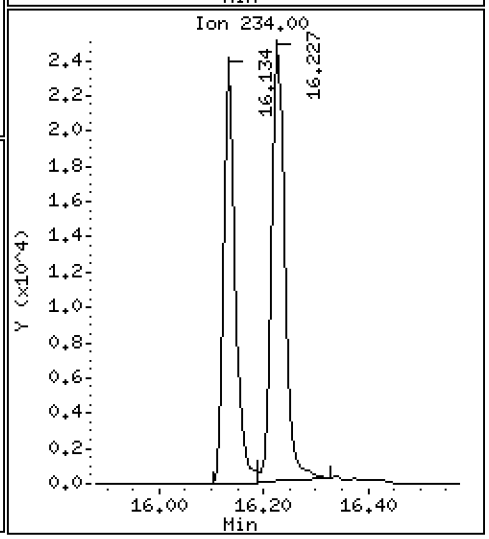












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

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Lab Smp Id: SJG0249-SCV1
Inj Date : 20-JUL-2021 19:24
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-SCV1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 11
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$ 1	2-Fluorophenol	112	Compound Not Detected.					
$ 2	Phenol-d5	99	Compound Not Detected.					
3	Phenol	94	8.729	8.729	(0.932)	245742	4.92176	4.922
$ 5	2-Chlorophenol-d4	132	Compound Not Detected.					
4	Bis(2-Chloroethyl)ether	93	8.907	8.907	(0.950)	200306	5.02286	5.023
6	2-Chlorophenol	128	9.030	9.030	(0.964)	188022	4.97506	4.975
7	1,3-Dichlorobenzene	146	9.301	9.301	(0.993)	207447	4.99685	4.997
* 8	1,4-Dichlorobenzene-d4	152	9.371	9.371	(1.000)	97788	4.00000	
9	1,4-Dichlorobenzene	146	9.402	9.402	(1.003)	177164	4.99810	4.998
$ 10	1,2-Dichlorobenzene-d4	152	Compound Not Detected.					
12	1,2-Dichlorobenzene	146	9.759	9.759	(1.041)	177797	4.74192	4.742
11	Benzyl alcohol	108	9.635	9.635	(1.028)	105562	4.51591	4.516
14	2,2'-oxybis(1-Chloropropane)	121	9.937	9.930	(1.060)	58233	4.04836	4.048
13	2-Methylphenol	108	9.852	9.852	(1.051)	136656	4.39716	4.397
17	Hexachloroethane	117	10.349	10.349	(1.104)	74881	4.91448	4.914
16	N-Nitroso-di-n-propylamine	70	10.194	10.194	(1.088)	127139	4.74213	4.742
15	4-Methylphenol	108	10.124	10.116	(1.080)	155634	4.66654	4.667
$ 18	Nitrobenzene-d5	82	Compound Not Detected.					
19	Nitrobenzene	77	10.512	10.512	(0.886)	196910	4.74090	4.741
20	Isophorone	82	10.946	10.946	(0.922)	387996	4.95012	4.950
21	2-Nitrophenol	139	11.140	11.140	(0.938)	98881	4.51420	4.514
22	2,4-Dimethylphenol	107	11.174	11.165	(0.941)	142239	4.36525	4.365
23	Bis(2-Chloroethoxy)methane	93	11.378	11.378	(0.958)	203559	5.00327	5.003
24	Benzoic acid	105	11.318	11.293	(0.953)	116014	6.35582	6.356
25	2,4-Dichlorophenol	162	11.581	11.581	(0.976)	134290	4.97384	4.974
26	1,2,4-Trichlorobenzene	180	11.778	11.778	(0.992)	150244	4.92195	4.922
* 27	Naphthalene-d8	136	11.871	11.863	(1.000)	342760	4.00000	
28	Naphthalene	128	11.909	11.909	(1.003)	452705	4.99058	4.991
29	4-Chloroaniline	127	12.040	12.040	(1.014)	187038	4.14081	4.141
30	Hexachlorobutadiene	225	12.257	12.257	(1.033)	82774	4.96649	4.966
31	4-Chloro-3-methylphenol	107	12.984	12.984	(1.094)	149957	4.65209	4.652
32	2-Methylnaphthalene	142	13.309	13.309	(1.121)	401309	4.78154	4.782
33	Hexachlorocyclopentadiene	237	13.766	13.766	(0.888)	115119	5.67132	5.671

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	13.929	13.929	(0.899)	99659	4.71321	4.713
	35 2,4,5-Trichlorophenol	196	13.998	13.998	(0.903)	106355	4.72059	4.721
$	36 2-Fluorobiphenyl	172	Compound Not Detected.					
	37 2-Chloronaphthalene	162	14.308	14.308	(0.923)	375518	5.08547	5.085
	38 2-Nitroaniline	65	14.571	14.571	(0.940)	134149	4.84759	4.848
	39 Dimethylphthalate	163	14.997	14.997	(0.968)	332569	4.65636	4.656
	40 Acenaphthylene	152	15.190	15.182	(0.980)	508864	4.84561	4.846
	41 2,6-Dinitrotoluene	165	15.144	15.144	(0.977)	80529	4.97282	4.973
*	42 Acenaphthene-d10	164	15.500	15.500	(1.000)	192459	4.00000	
	43 3-Nitroaniline	138	15.430	15.430	(0.996)	91440	4.55733	4.557
	44 Acenaphthene	153	15.569	15.561	(1.004)	292165	4.79203	4.792
	45 2,4-Dinitrophenol	184	15.646	15.647	(1.009)	17760	1.92814	1.928
	46 Dibenzofuran	168	15.894	15.894	(1.025)	455534	4.83261	4.833
	47 4-Nitrophenol	109	15.731	15.732	(1.015)	31544	4.08873	4.089
	48 2,4-Dinitrotoluene	165	15.956	15.956	(1.029)	106632	4.92932	4.929
	50 Diethylphthalate	149	16.450	16.451	(1.061)	311333	4.59754	4.598
	49 Fluorene	166	16.613	16.605	(1.072)	409103	4.47668	4.477
	51 4-Chlorophenyl-phenylether	204	16.590	16.590	(1.070)	244020	4.59359	4.594
	52 4-Nitroaniline	138	16.705	16.705	(1.078)	86292	4.04827	4.048
	53 4,6-Dinitro-2-methylphenol	198	16.790	16.791	(0.905)	55674	3.64558	3.646
	54 N-Nitrosodiphenylamine	169	16.844	16.844	(0.908)	271104	4.54648	4.546
$	55 2,4,6-Tribromophenol	330	Compound Not Detected.					
	56 4-Bromophenyl-phenylether	248	17.600	17.608	(0.949)	149720	4.93404	4.934
	57 Hexachlorobenzene	284	17.924	17.924	(0.966)	152202	4.77276	4.773
	58 Pentachlorophenol	266	18.280	18.289	(0.985)	51991	3.98721	3.987
*	59 Phenanthrene-d10	188	18.551	18.551	(1.000)	332308	4.00000	
	60 Phenanthrene	178	18.605	18.605	(1.003)	452776	5.03840	5.038
	61 Anthracene	178	18.698	18.698	(1.008)	482395	5.01984	5.020
	62 Carbazole	167	19.023	19.023	(1.025)	477437	5.03266	5.033
	63 Di-n-butylphthalate	149	19.797	19.797	(1.067)	630478	4.27610	4.276
	64 Fluoranthene	202	20.981	20.981	(0.889)	659364	4.95043	4.950
	65 Pyrene	202	21.406	21.406	(0.907)	771424	5.25414	5.254
$	66 Terphenyl-d14	244	Compound Not Detected.					
	67 Butylbenzylphthalate	149	22.598	22.598	(0.958)	240211	4.97393	4.974
	68 Benzo(a)anthracene	228	23.566	23.566	(0.999)	572518	4.80022	4.800
*	69 Chrysene-d12	240	23.597	23.597	(1.000)	319618	4.00000	
	70 3,3'-Dichlorobenzidine	252	23.528	23.528	(0.997)	431848	9.01302	9.013
	71 Chrysene	228	23.644	23.644	(1.002)	446802	4.85899	4.859
	72 bis(2-Ethylhexyl)phthalate	149	23.620	23.620	(0.959)	268021	5.11675	5.117
*	134 Di-n-octylphthalate-d4	153	24.642	24.642	(1.000)	476118	4.00000	
	73 Di-n-octylphthalate	149	24.650	24.650	(1.000)	632575	4.74070	4.741
	74 Benzo(b)fluoranthene	252	25.556	25.556	(0.968)	629813	4.77806	4.778
	75 Benzo(k)fluoranthene	252	25.602	25.602	(0.970)	670704	5.13679	5.137
	76 Benzo(a)pyrene	252	26.268	26.268	(0.995)	592916	4.97710	4.977
*	77 Perylene-d12	264	26.400	26.400	(1.000)	334503	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	29.308	29.300	(1.110)	639525	4.74333	4.743
	79 Dibenzo(a,h)anthracene	278	29.324	29.316	(1.111)	498001	4.70260	4.703
	80 Benzo(g,h,i)perylene	276	30.178	30.170	(1.143)	567139	4.71378	4.714
	90 N-Nitrosodimethylamine	74	4.959	4.959	(0.529)	148222	5.62990	5.630
	91 Aniline	93	Compound Not Detected.					
	93 Benzidine	184	Compound Not Detected.					
	103 Pyridine	79	4.974	4.982	(0.531)	208649	5.03780	5.038
	105 1-methylnaphthalene	142	13.534	13.534	(1.140)	387646	4.92271	4.923
	111 Azobenzene (1,2-DP-Hydrazine)	77	16.921	16.914	(1.092)	410043	4.74895	4.749

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
187 Total Benzofluoranthenes	252	25.556	25.602	(0.968)	1244090	9.82856	9.829
120 2,3,4,6-Tetrachlorophenol	232	16.226	16.227	(1.047)	92537	4.47241	4.472

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D Page 1
Report Date: 21-Jul-2021 09:25

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072013.D
Lab Smp Id: SJG0249-SCV1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	97788	-7.33
27 Naphthalene-d8	373252	186626	746504	342760	-8.17
42 Acenaphthene-d10	212025	106013	424050	192459	-9.23
59 Phenanthrene-d10	362039	181020	724078	332308	-8.21
69 Chrysene-d12	338032	169016	676064	319618	-5.45
134 Di-n-octylphthala	565512	282756	1131024	476118	-15.81
77 Perylene-d12	375340	187670	750680	334503	-10.88

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.37	-0.09
27 Naphthalene-d8	11.87	11.37	12.37	11.87	-0.00
42 Acenaphthene-d10	15.51	15.01	16.01	15.50	-0.05
59 Phenanthrene-d10	18.56	18.06	19.06	18.55	-0.04
69 Chrysene-d12	23.61	23.11	24.11	23.60	-0.03
134 Di-n-octylphthala	24.64	24.14	25.14	24.64	-0.00
77 Perylene-d12	26.40	25.90	26.90	26.40	-0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072013.D

Lab ID: SJG0249-SCV1
nt10.i, ABN.m, 20-JUL-2021 19:24

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

** FIRST SURROGATE NOT FOUND. ICAL Check not performed **

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
NONE			

RRT check based on Ccal File: NT1021072010.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072015ICB.D

Date : 20-JUL-2021 20:40

Client ID:

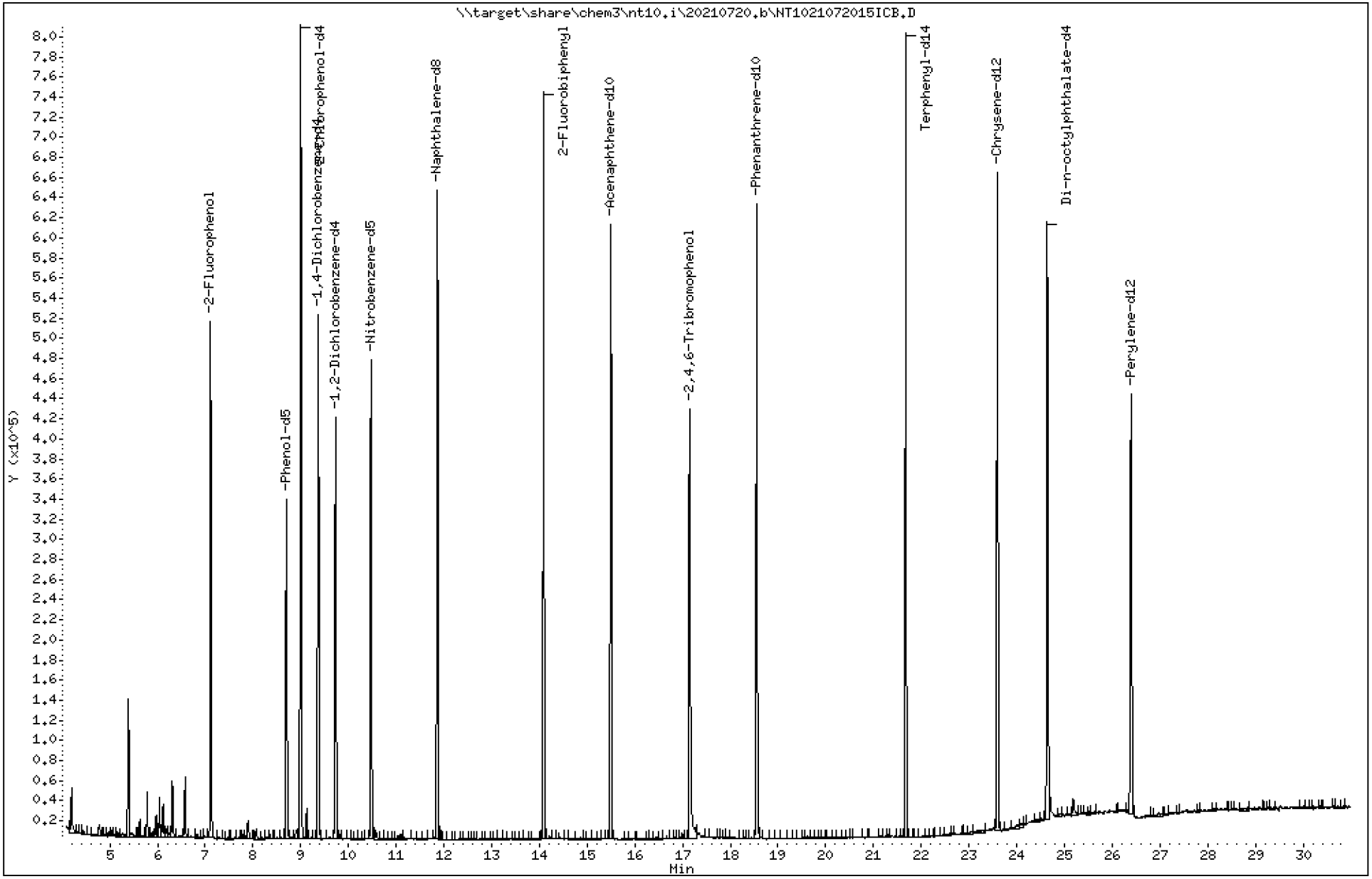
Instrument: nt10.i

Sample Info: SJG0249-ICB1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210720.b\NT1021072015ICB.D
Lab Smp Id: SJG0249-ICB1
Inj Date : 20-JUL-2021 20:40
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-ICB1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 13
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$ 1 2-Fluorophenol	112	7.115	7.122	(0.760)	179589	3.62882	3.629
$ 2 Phenol-d5	99	8.698	8.706	(0.929)	156829	2.13502	2.135
3 Phenol	94	Compound Not Detected.					
$ 5 2-Chlorophenol-d4	132	9.000	8.999	(0.961)	307538	5.93843	5.938
4 Bis(2-Chloroethyl)ether	93	Compound Not Detected.					
6 2-Chlorophenol	128	Compound Not Detected.					
7 1,3-Dichlorobenzene	146	Compound Not Detected.					
* 8 1,4-Dichlorobenzene-d4	152	9.363	9.371	(1.000)	125755	4.00000	
9 1,4-Dichlorobenzene	146	Compound Not Detected.					
$ 10 1,2-Dichlorobenzene-d4	152	9.728	9.736	(1.039)	98197	2.94810	2.948
12 1,2-Dichlorobenzene	146	Compound Not Detected.					
11 Benzyl alcohol	108	Compound Not Detected.					
14 2,2'-oxybis(1-Chloropropane)	121	Compound Not Detected.					
13 2-Methylphenol	108	Compound Not Detected.					
17 Hexachloroethane	117	Compound Not Detected.					
16 N-Nitroso-di-n-propylamine	70	Compound Not Detected.					
15 4-Methylphenol	108	Compound Not Detected.					
$ 18 Nitrobenzene-d5	82	10.473	10.473	(0.883)	211223	3.82993	3.830
19 Nitrobenzene	77	Compound Not Detected.					
20 Isophorone	82	Compound Not Detected.					
21 2-Nitrophenol	139	Compound Not Detected.					
22 2,4-Dimethylphenol	107	Compound Not Detected.					
23 Bis(2-Chloroethoxy)methane	93	Compound Not Detected.					
24 Benzoic acid	105	Compound Not Detected.					
25 2,4-Dichlorophenol	162	Compound Not Detected.					
26 1,2,4-Trichlorobenzene	180	Compound Not Detected.					
* 27 Naphthalene-d8	136	11.863	11.863	(1.000)	449656	4.00000	
28 Naphthalene	128	Compound Not Detected.					
29 4-Chloroaniline	127	Compound Not Detected.					
30 Hexachlorobutadiene	225	Compound Not Detected.					
31 4-Chloro-3-methylphenol	107	Compound Not Detected.					
32 2-Methylnaphthalene	142	Compound Not Detected.					
33 Hexachlorocyclopentadiene	237	Compound Not Detected.					

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	CONCENTRATIONS FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	Compound Not Detected.					
	35 2,4,5-Trichlorophenol	196	Compound Not Detected.					
$	36 2-Fluorobiphenyl	172	14.091	14.091	(0.909)	385710	3.67944	3.679
	37 2-Chloronaphthalene	162	Compound Not Detected.					
	38 2-Nitroaniline	65	Compound Not Detected.					
	39 Dimethylphthalate	163	Compound Not Detected.					
	40 Acenaphthylene	152	Compound Not Detected.					
	41 2,6-Dinitrotoluene	165	Compound Not Detected.					
*	42 Acenaphthene-d10	164	15.500	15.500	(1.000)	228276	4.00000	
	43 3-Nitroaniline	138	Compound Not Detected.					
	44 Acenaphthene	153	Compound Not Detected.					
	45 2,4-Dinitrophenol	184	Compound Not Detected.					
	46 Dibenzofuran	168	Compound Not Detected.					
	47 4-Nitrophenol	109	Compound Not Detected.					
	48 2,4-Dinitrotoluene	165	Compound Not Detected.					
	50 Diethylphthalate	149	Compound Not Detected.					
	49 Fluorene	166	Compound Not Detected.					
	51 4-Chlorophenyl-phenylether	204	Compound Not Detected.					
	52 4-Nitroaniline	138	Compound Not Detected.					
	53 4,6-Dinitro-2-methylphenol	198	Compound Not Detected.					
	54 N-Nitrosodiphenylamine	169	Compound Not Detected.					
$	55 2,4,6-Tribromophenol	330	17.145	17.145	(1.106)	103883	5.46583	5.466
	56 4-Bromophenyl-phenylether	248	Compound Not Detected.					
	57 Hexachlorobenzene	284	Compound Not Detected.					
	58 Pentachlorophenol	266	Compound Not Detected.					
*	59 Phenanthrene-d10	188	18.551	18.551	(1.000)	401727	4.00000	
	60 Phenanthrene	178	Compound Not Detected.					
	61 Anthracene	178	Compound Not Detected.					
	62 Carbazole	167	Compound Not Detected.					
	63 Di-n-butylphthalate	149	Compound Not Detected.					
	64 Fluoranthene	202	Compound Not Detected.					
	65 Pyrene	202	Compound Not Detected.					
$	66 Terphenyl-d14	244	21.677	21.677	(0.919)	450643	3.90138	3.901
	67 Butylbenzylphthalate	149	Compound Not Detected.					
	68 Benzo(a)anthracene	228	Compound Not Detected.					
*	69 Chrysene-d12	240	23.597	23.597	(1.000)	352799	4.00000	
	70 3,3'-Dichlorobenzidine	252	Compound Not Detected.					
	71 Chrysene	228	Compound Not Detected.					
	72 bis(2-Ethylhexyl)phthalate	149	Compound Not Detected.					
*	134 Di-n-octylphthalate-d4	153	24.643	24.642	(1.000)	452323	4.00000	
	73 Di-n-octylphthalate	149	Compound Not Detected.					
	74 Benzo(b)fluoranthene	252	Compound Not Detected.					
	75 Benzo(k)fluoranthene	252	Compound Not Detected.					
	76 Benzo(a)pyrene	252	Compound Not Detected.					
*	77 Perylene-d12	264	26.392	26.400	(1.000)	366360	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	Compound Not Detected.					
	79 Dibenzo(a,h)anthracene	278	Compound Not Detected.					
	80 Benzo(g,h,i)perylene	276	Compound Not Detected.					
	90 N-Nitrosodimethylamine	74	Compound Not Detected.					
	91 Aniline	93	Compound Not Detected.					
	93 Benzidine	184	Compound Not Detected.					
	103 Pyridine	79	Compound Not Detected.					
	105 1-methylnaphthalene	142	Compound Not Detected.					
	111 Azobenzene (1,2-DP-Hydrazine)	77	Compound Not Detected.					

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	CONCENTRATIONS FINAL (ug/mL)
187 Total Benzofluoranthenes	252	Compound Not Detected.					
120 2,3,4,6-Tetrachlorophenol	232	Compound Not Detected.					

Data File: NT1021072015ICB.D
Report Date: 21-Jul-2021 09:25

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072015ICB.D
Lab Smp Id: SJG0249-ICB1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	125755	19.18
27 Naphthalene-d8	373252	186626	746504	449656	20.47
42 Acenaphthene-d10	212025	106013	424050	228276	7.66
59 Phenanthrene-d10	362039	181020	724078	401727	10.96
69 Chrysene-d12	338032	169016	676064	352799	4.37
134 Di-n-octylphthala	565512	282756	1131024	452323	-20.02
77 Perylene-d12	375340	187670	750680	366360	-2.39

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.36	-0.17
27 Naphthalene-d8	11.87	11.37	12.37	11.86	-0.07
42 Acenaphthene-d10	15.51	15.01	16.01	15.50	-0.05
59 Phenanthrene-d10	18.56	18.06	19.06	18.55	-0.04
69 Chrysene-d12	23.61	23.11	24.11	23.60	-0.03
134 Di-n-octylphthala	24.64	24.14	25.14	24.64	-0.00
77 Perylene-d12	26.40	25.90	26.90	26.39	-0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072015ICB.D

Lab ID: SJG0249-ICB1
nt10.i, ABN.m, 20-JUL-2021 20:40

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
NONE			

RRT check based on Ccal File: NT1021072010.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8270E

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Calibration: EG00057
Sequence: SJG0249

SDG: 21G0286
Project: Lower Duwamish AOC4
Laboratory ID: SJG0249-SCV1
Sequence Name: SCV 5.0
Standard ID: J007215

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
Naphthalene	5.0000	5.0	-0.2	20.00
2-Methylnaphthalene	5.0000	4.8	-4.4	20.00
Acenaphthylene	5.0000	4.8	-3.1	20.00
Acenaphthene	5.0000	4.8	-4.2	20.00
Fluorene	5.0000	4.5	-10.5	20.00
Phenanthrene	5.0000	5.0	0.8	20.00
Anthracene	5.0000	5.0	0.4	20.00
Fluoranthene	5.0000	5.0	-1.0	20.00
Pyrene	5.0000	5.3	5.1	20.00
Butylbenzylphthalate	5.0000	5.0	-0.5	20.00
Benzo(a)anthracene	5.0000	4.8	-4.0	20.00
Chrysene	5.0000	4.9	-2.8	20.00
Benzofluoranthenes, Total	10.000	9.8	-1.7	20.00
Benzo(a)pyrene	5.0000	5.0	-0.5	20.00
Indeno(1,2,3-cd)pyrene	5.0000	4.7	-5.1	20.00
Dibenzo(a,h)anthracene	5.0000	4.7	-5.9	20.00
Benzo(g,h,i)perylene	5.0000	4.7	-5.7	20.00

* Indicates values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

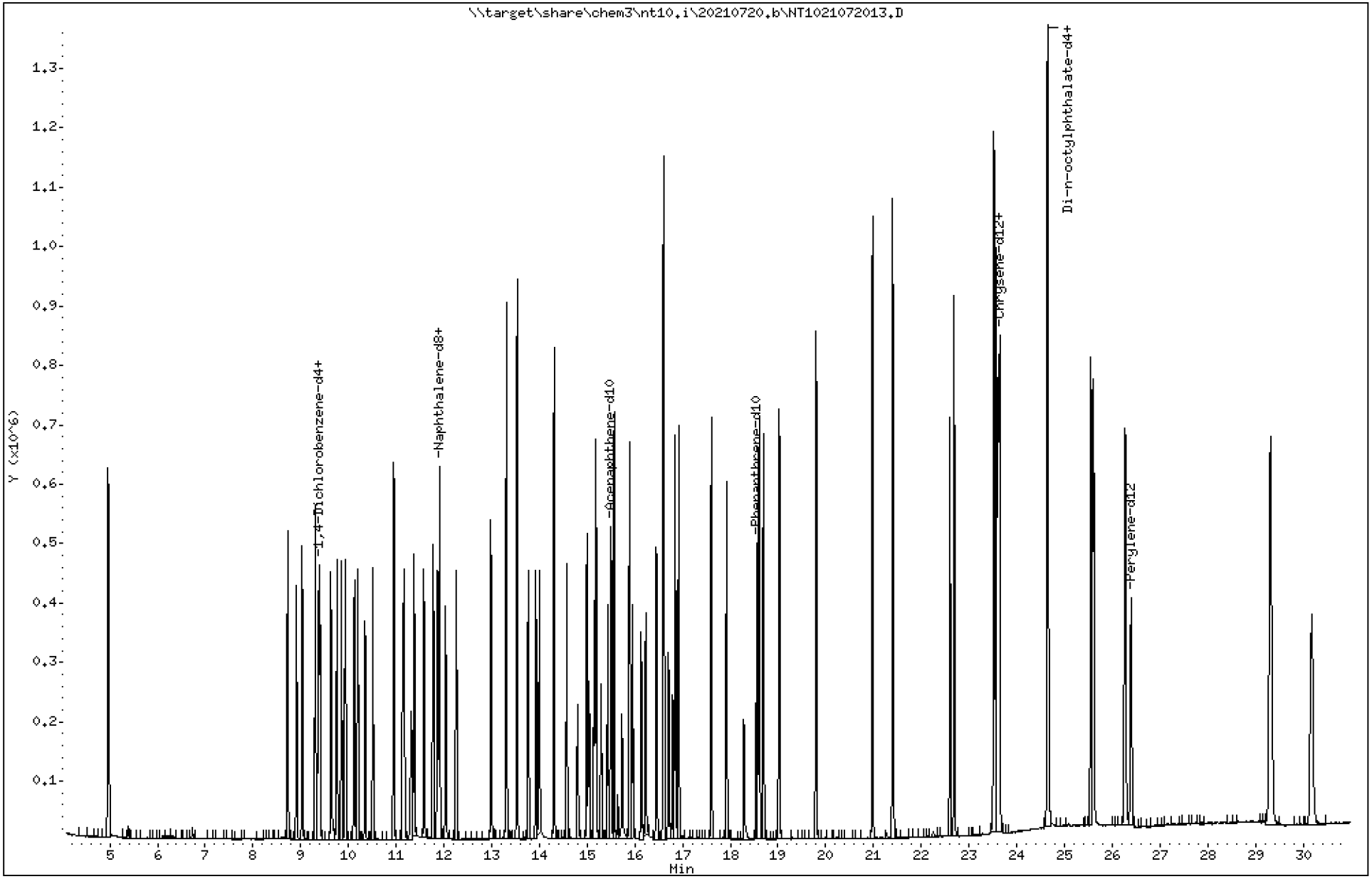
Instrument: nt10.i

Sample Info: SJG0249-SCV1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

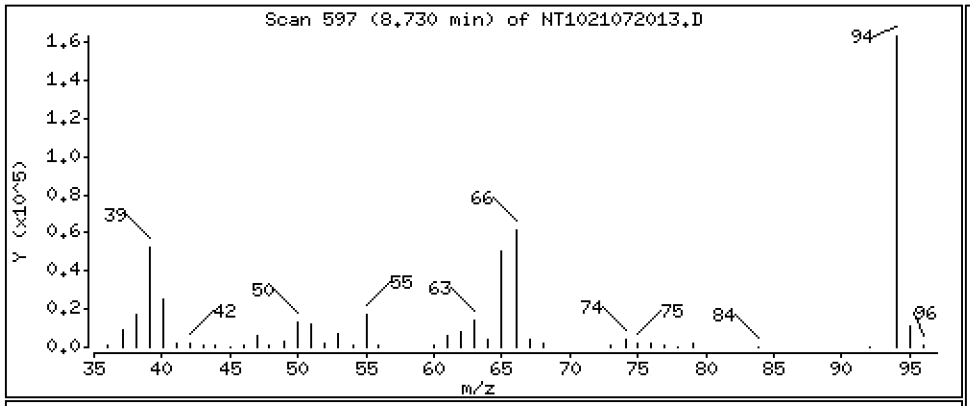
Operator: VTS

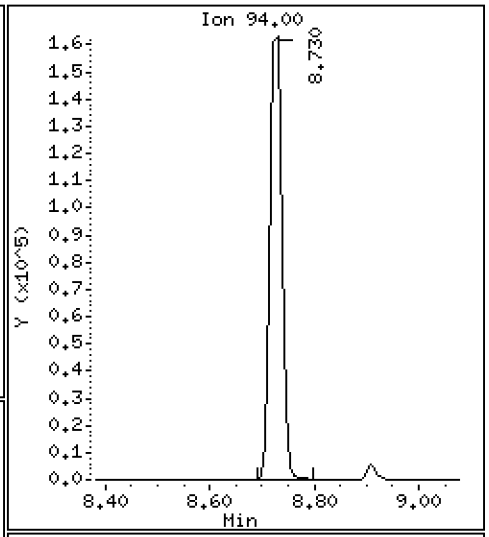
Column phase: ZB-5msi

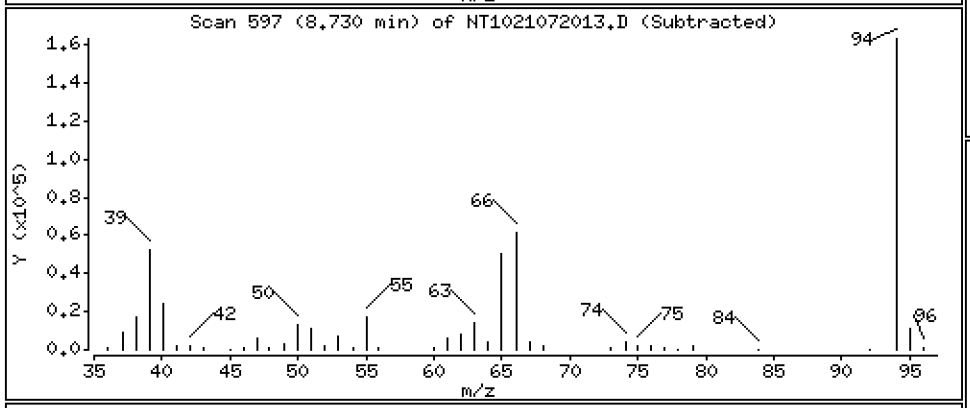
Column diameter: 0.25

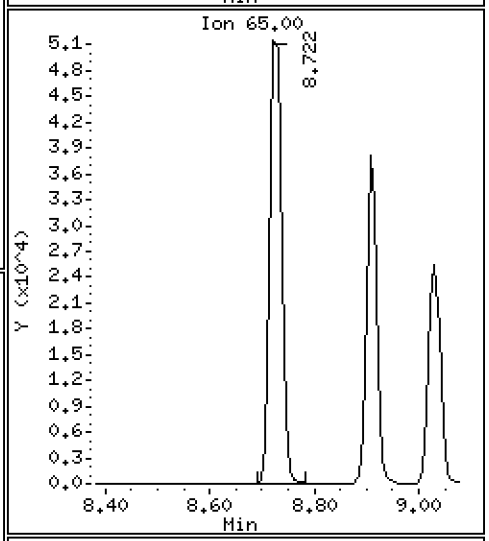
3 Phenol

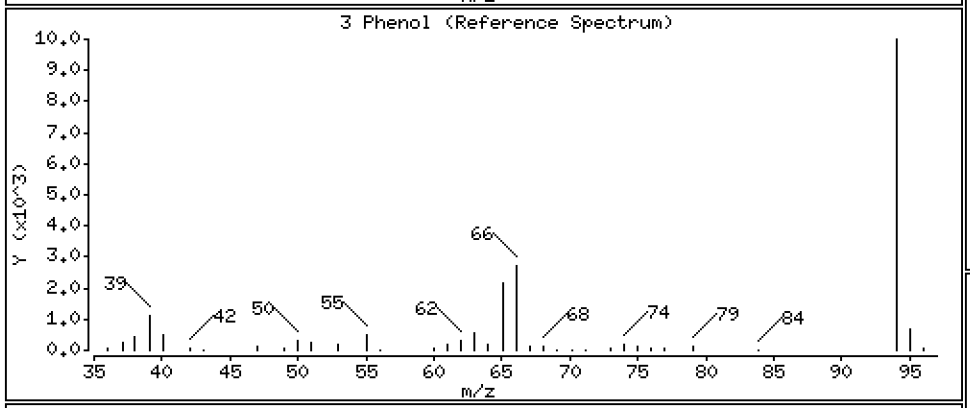
Concentration: 4.922 ug/mL

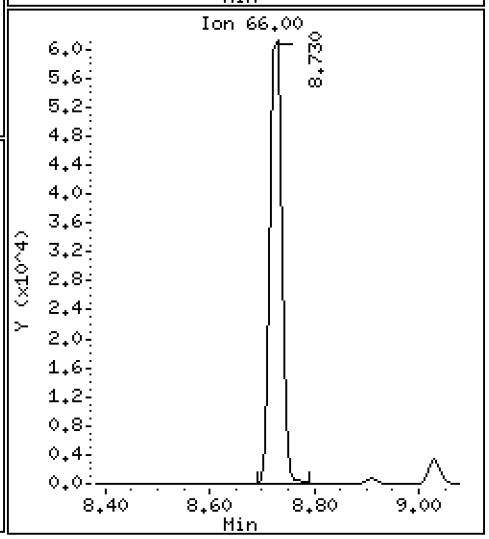


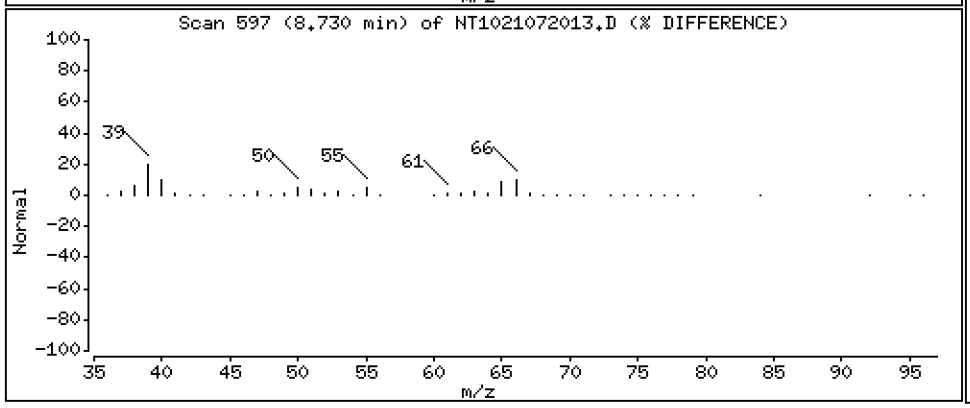












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

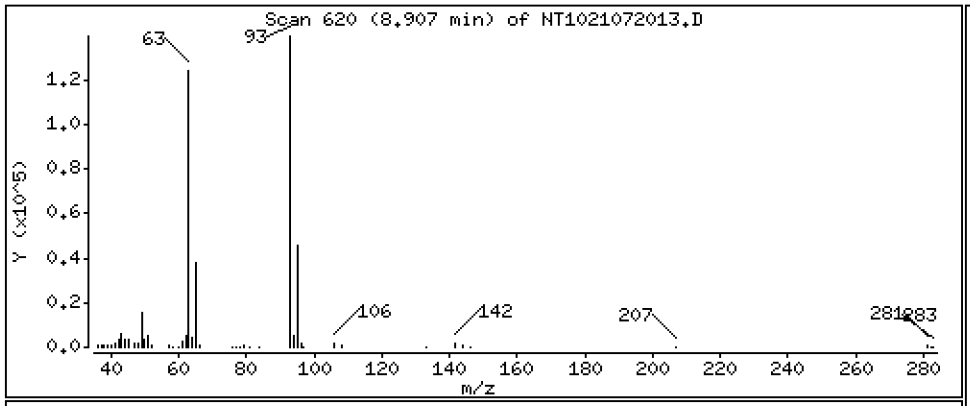
Operator: VTS

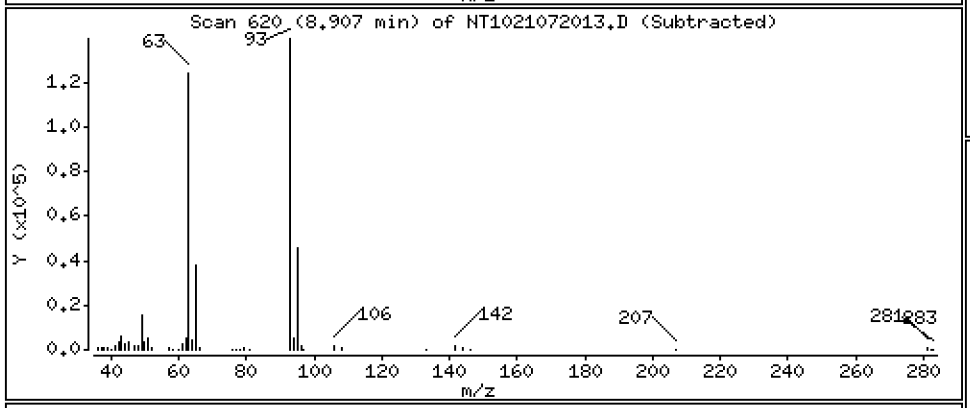
Column phase: ZB-5msi

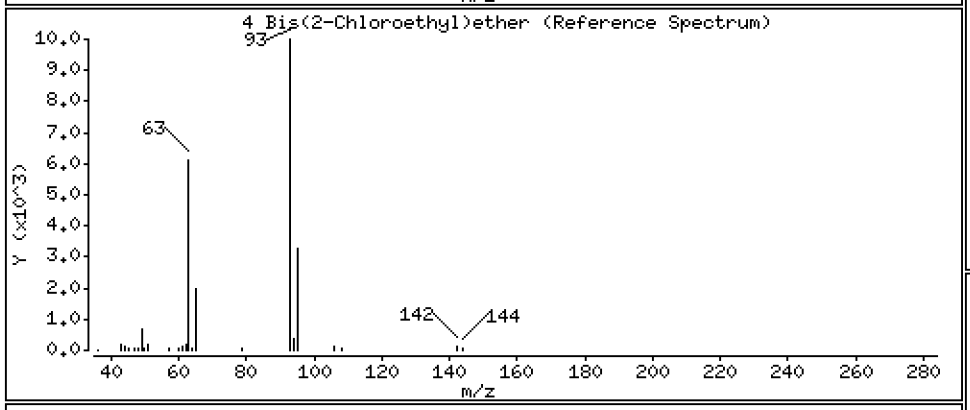
Column diameter: 0.25

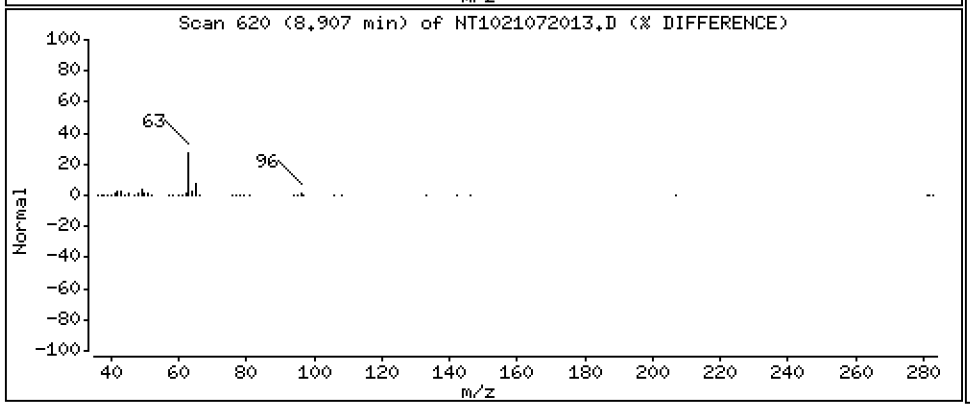
4 Bis(2-Chloroethyl)ether

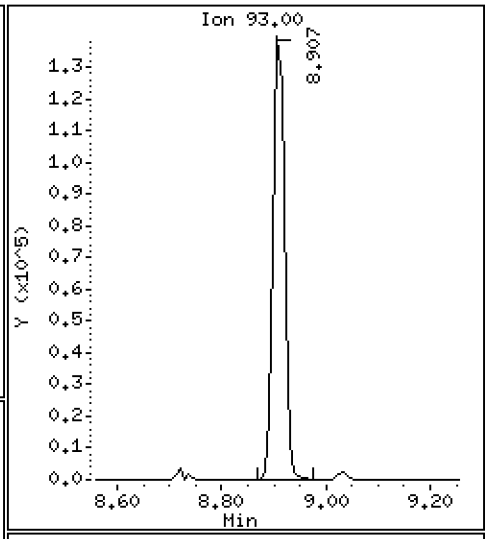
Concentration: 5.023 ug/mL

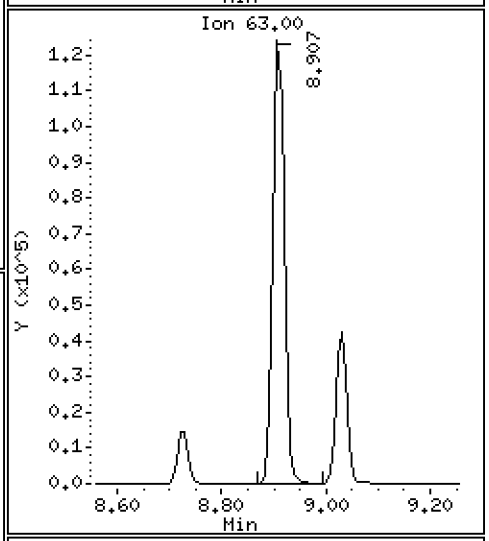


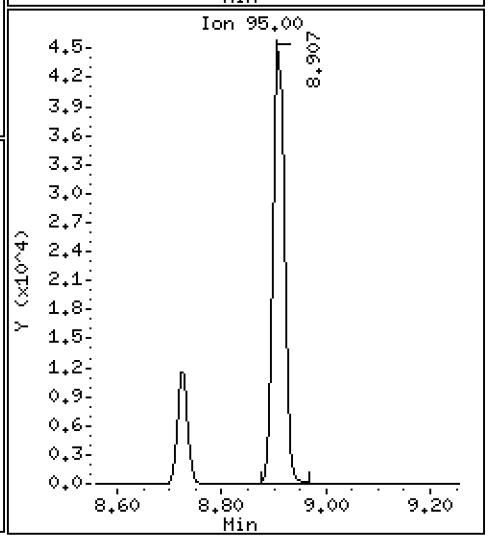












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

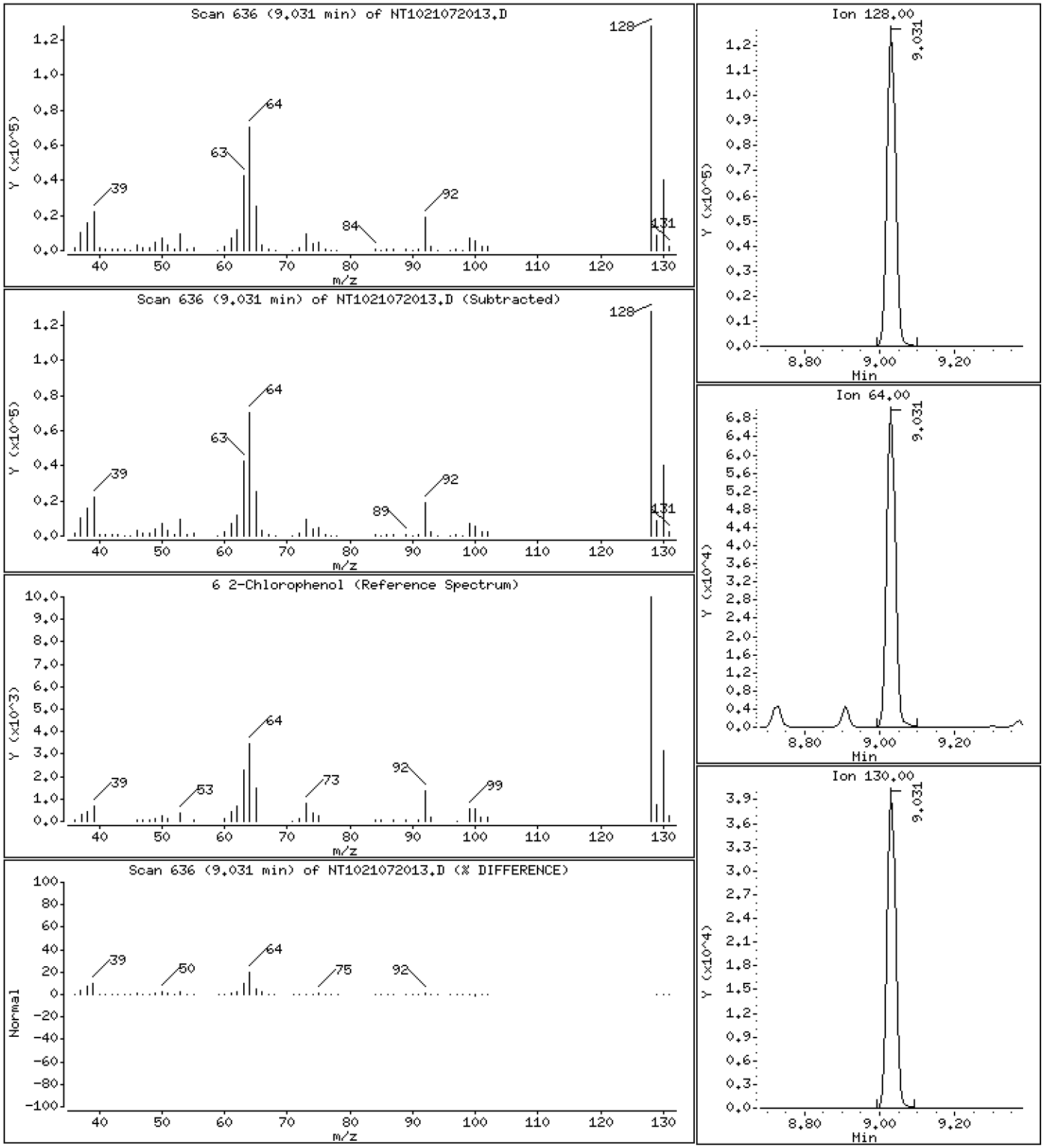
Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25

6 2-Chlorophenol

Concentration: 4.975 ug/mL



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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

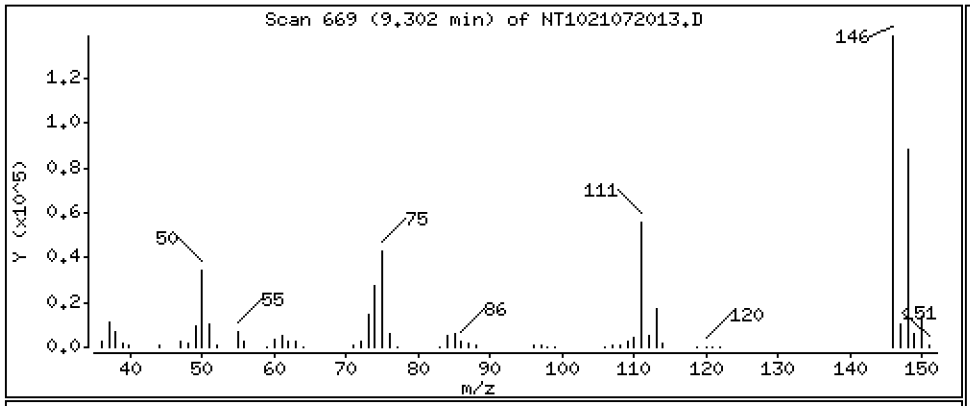
Operator: VTS

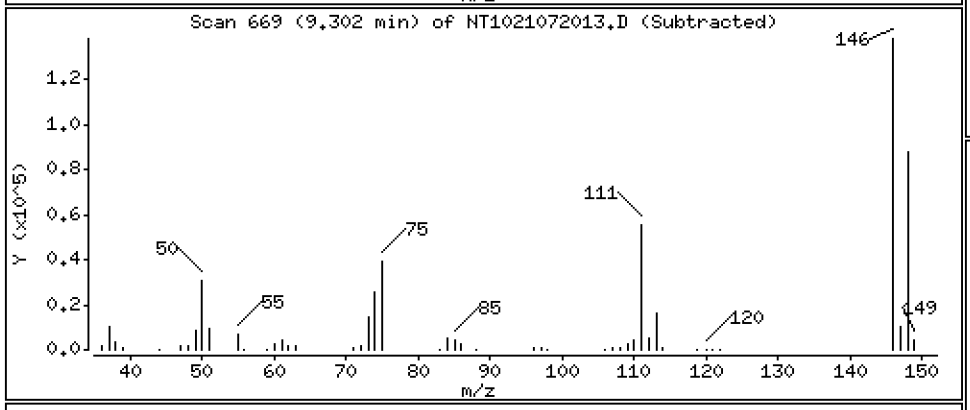
Column phase: ZB-5msi

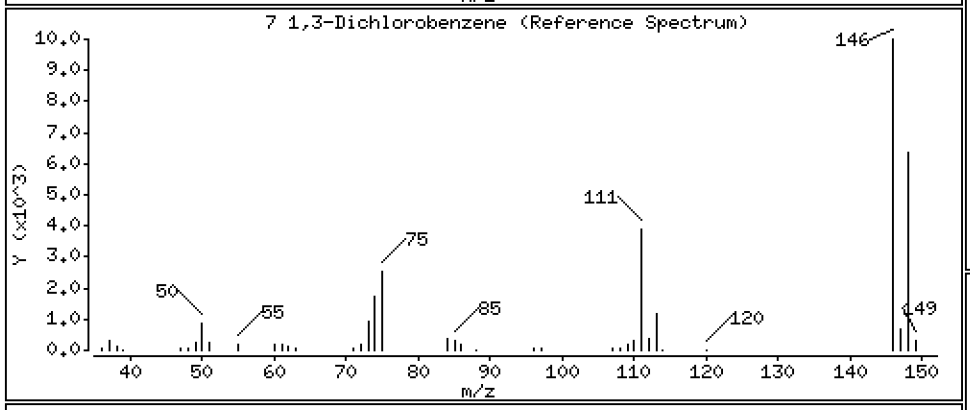
Column diameter: 0.25

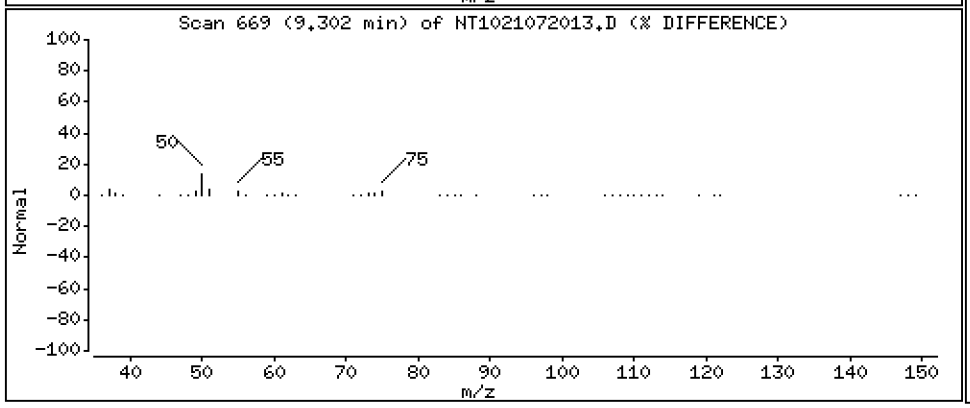
7 1,3-Dichlorobenzene

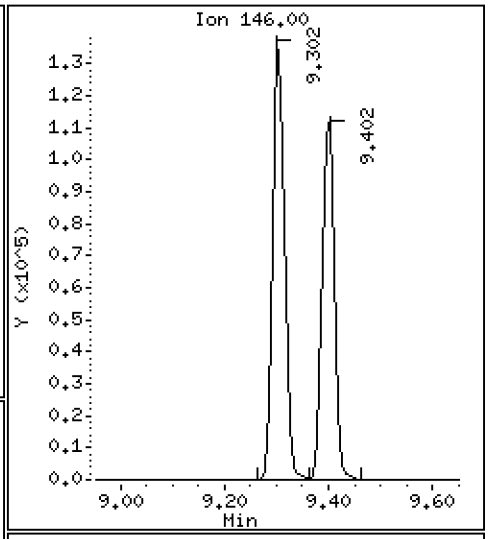
Concentration: 4.997 ug/mL

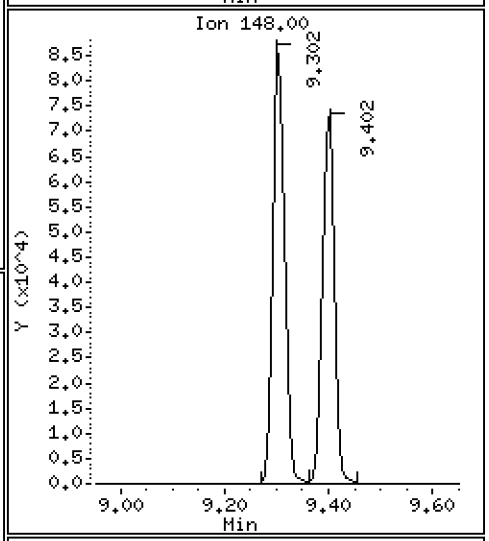


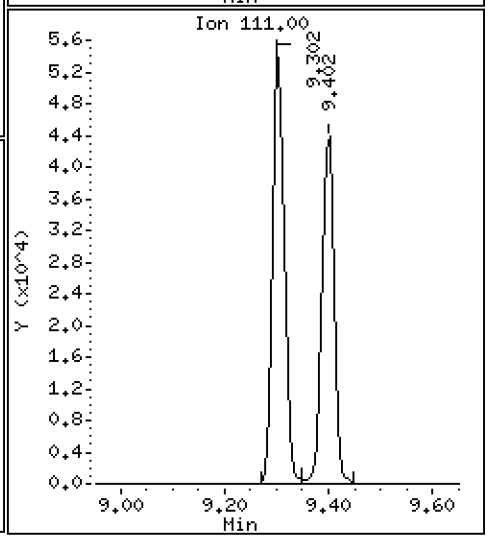












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

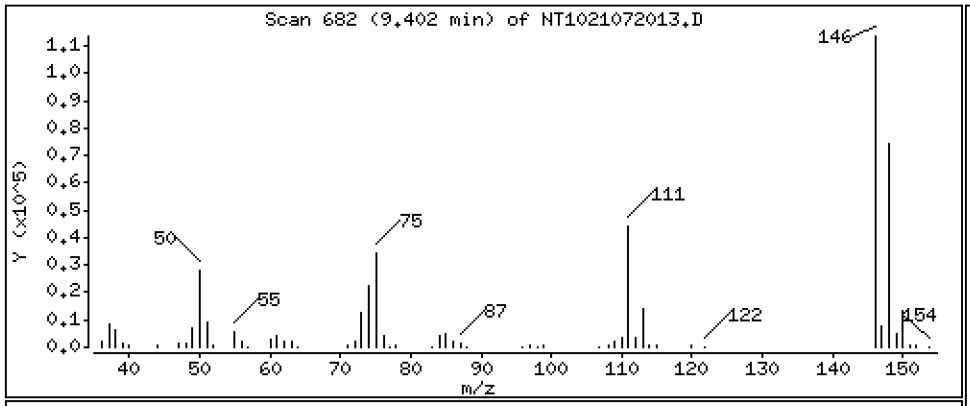
Operator: VTS

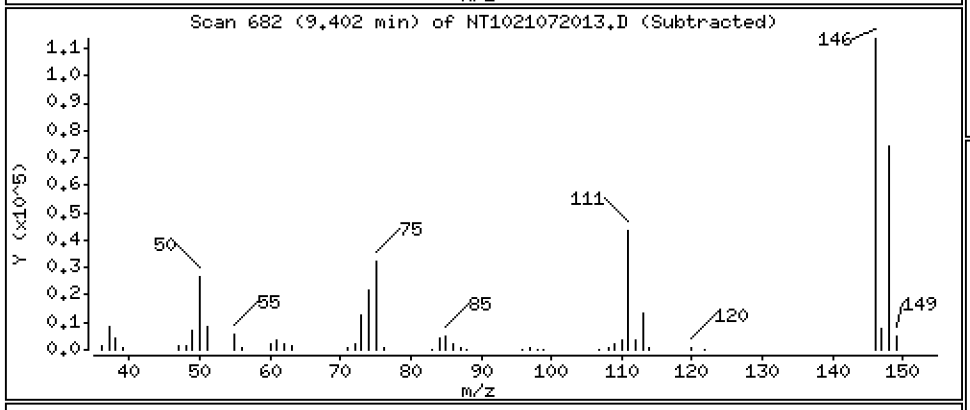
Column phase: ZB-5msi

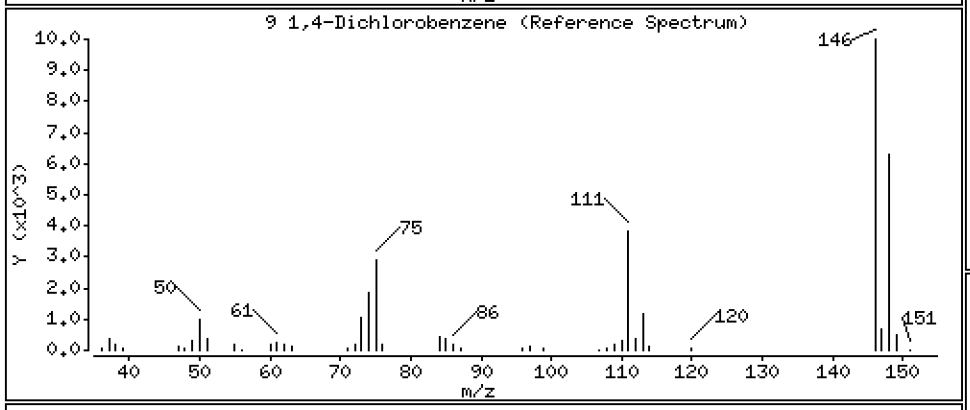
Column diameter: 0.25

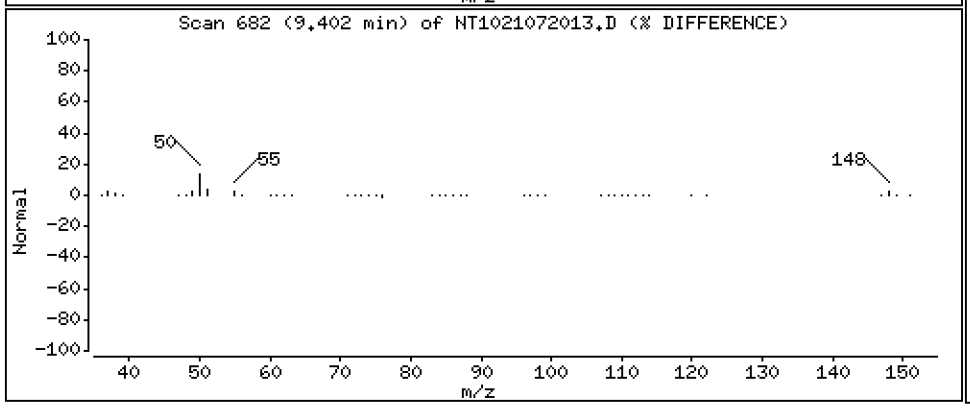
9 1,4-Dichlorobenzene

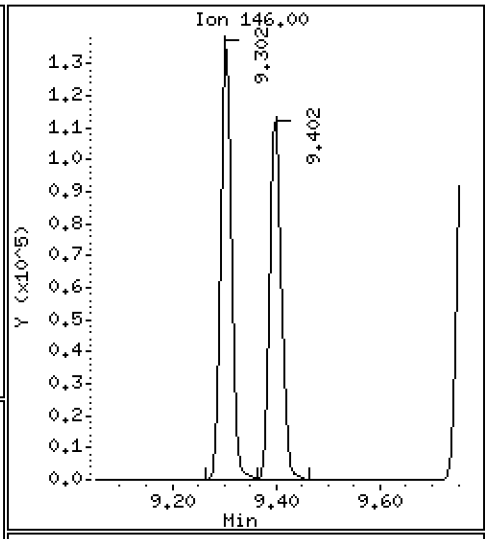
Concentration: 4.998 ug/mL

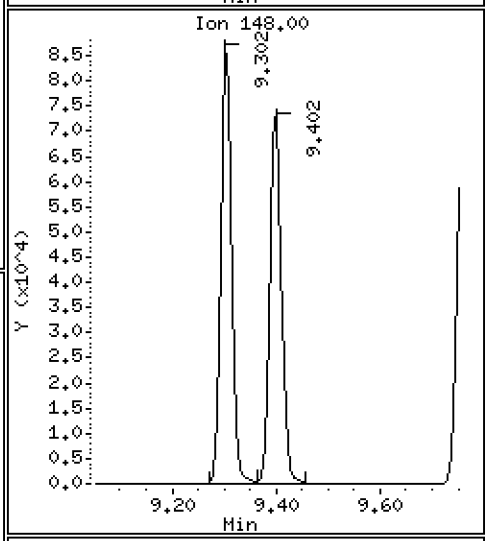


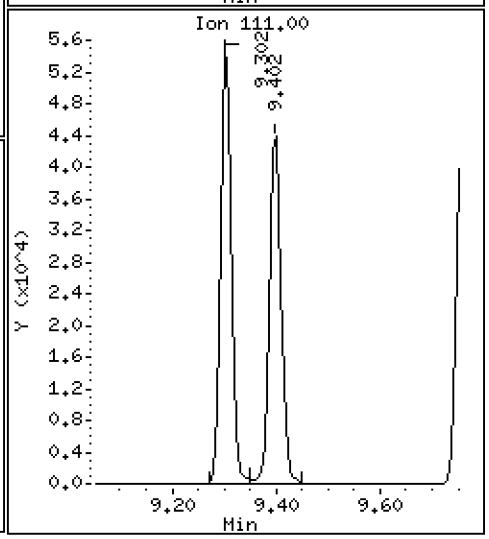












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

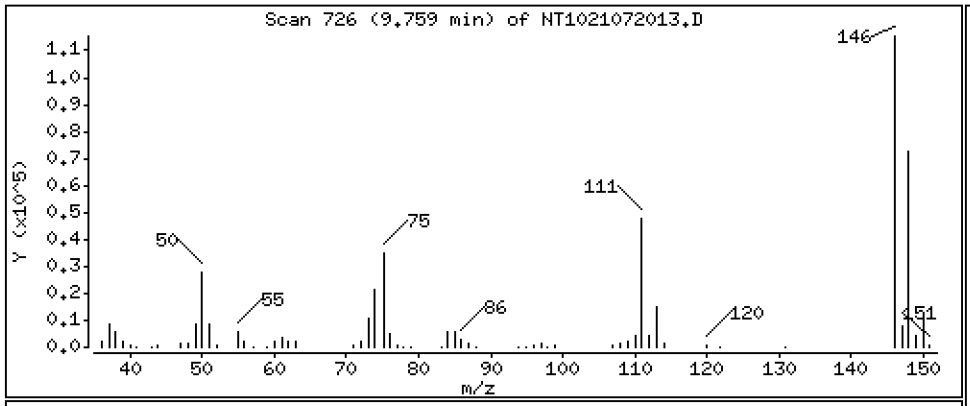
Operator: VTS

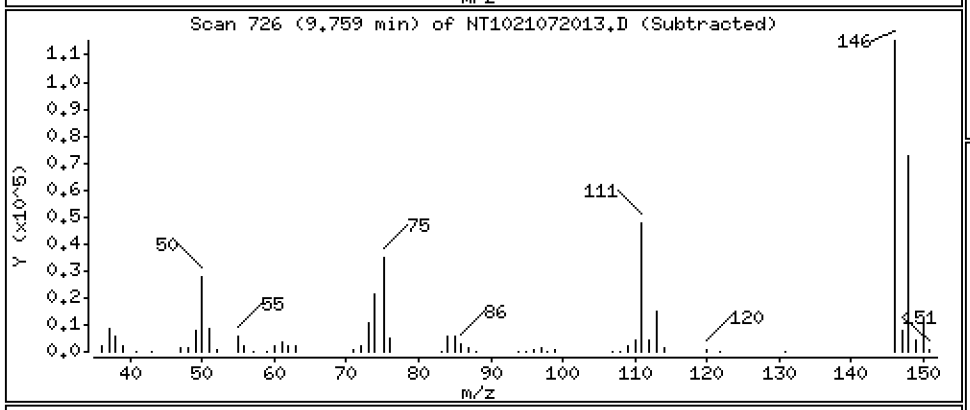
Column phase: ZB-5msi

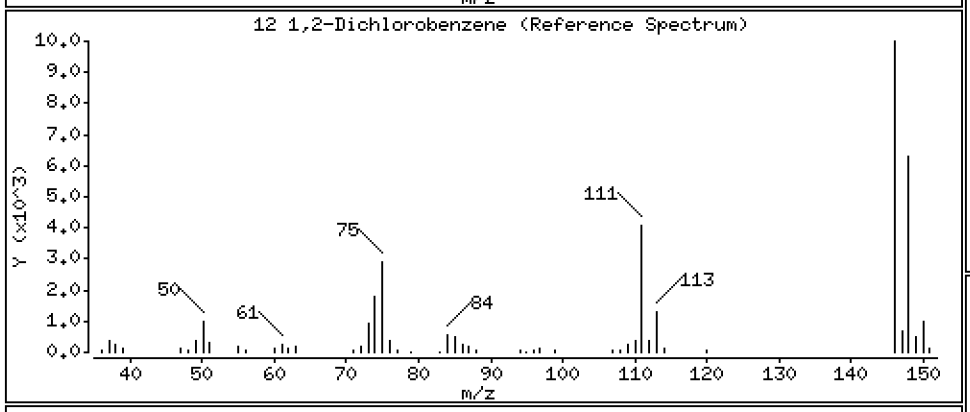
Column diameter: 0.25

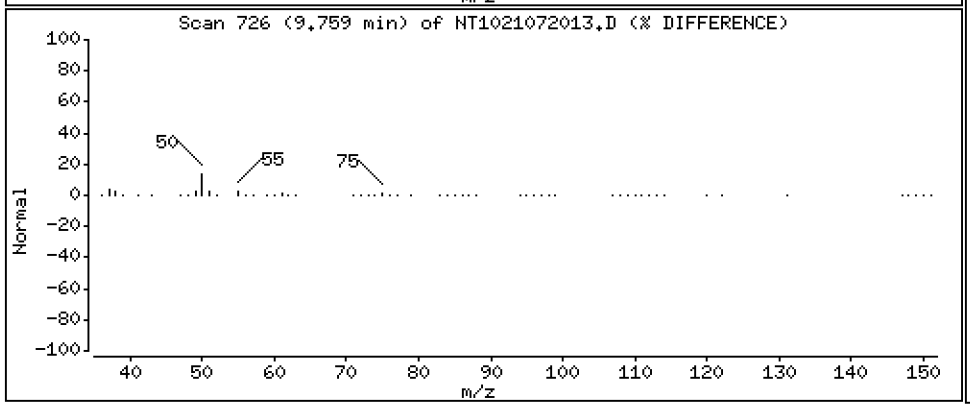
12 1,2-Dichlorobenzene

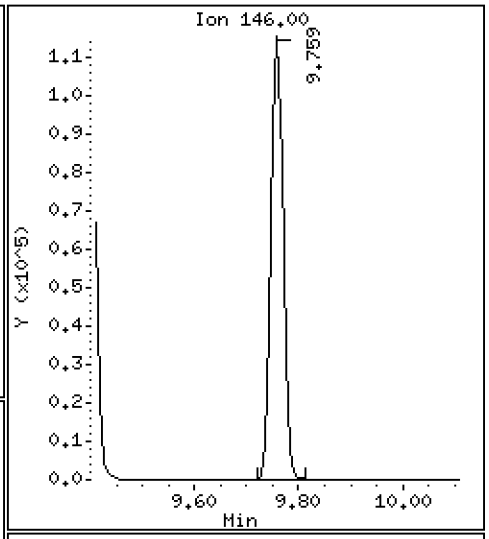
Concentration: 4.742 ug/mL

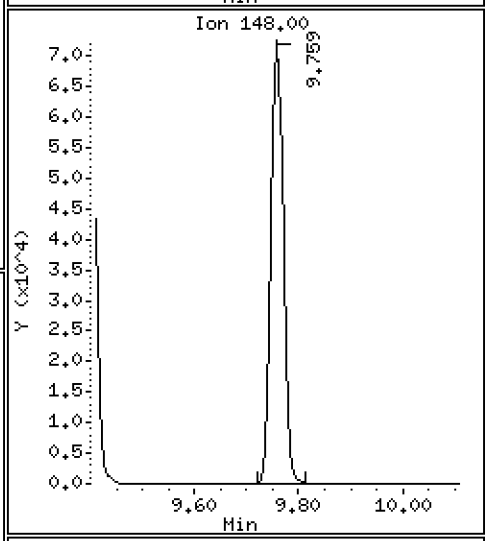


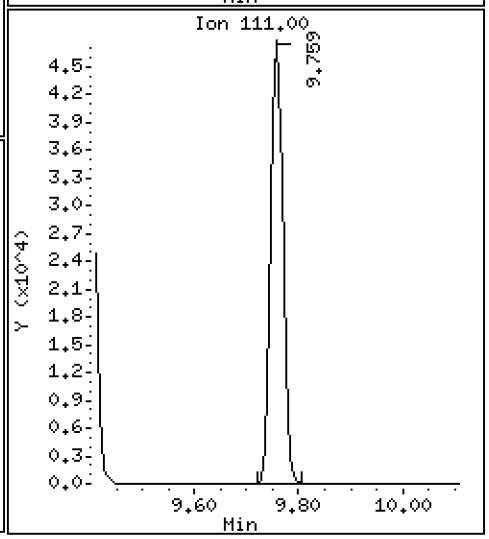












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

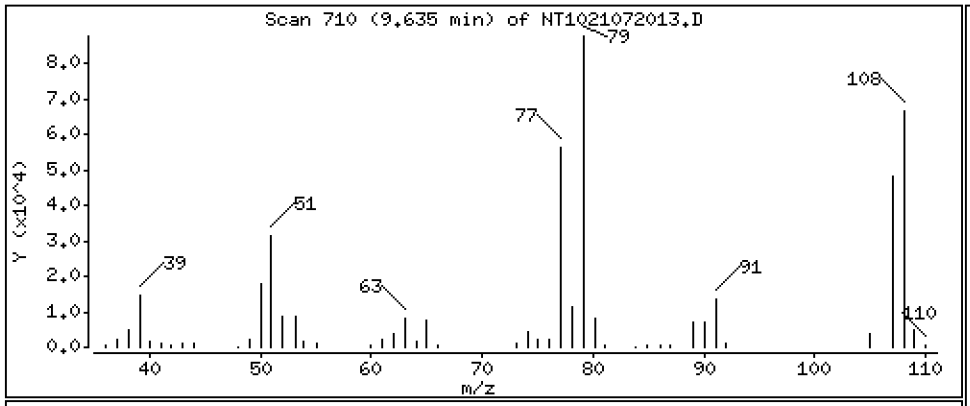
Operator: VTS

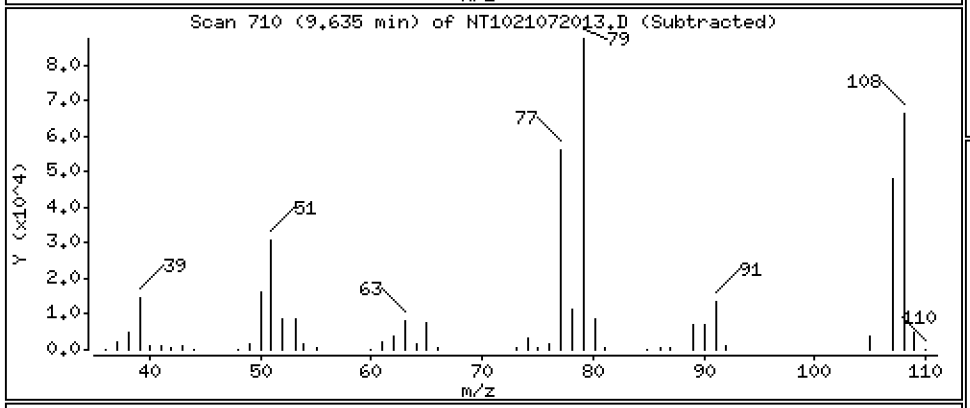
Column phase: ZB-5msi

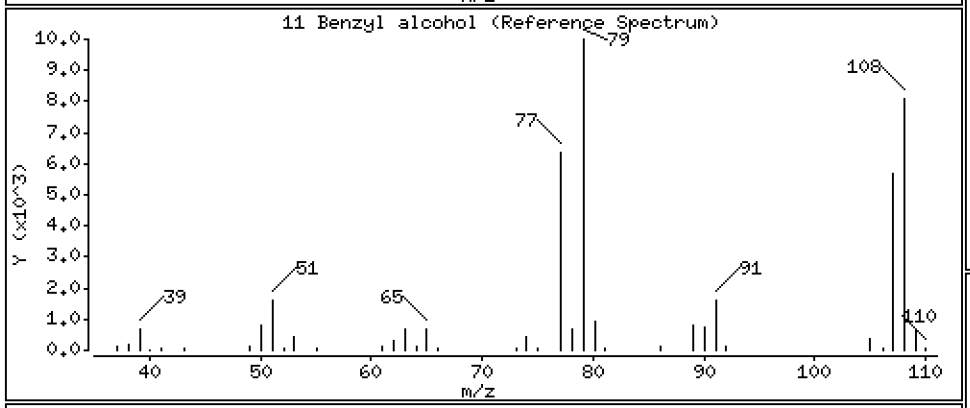
Column diameter: 0.25

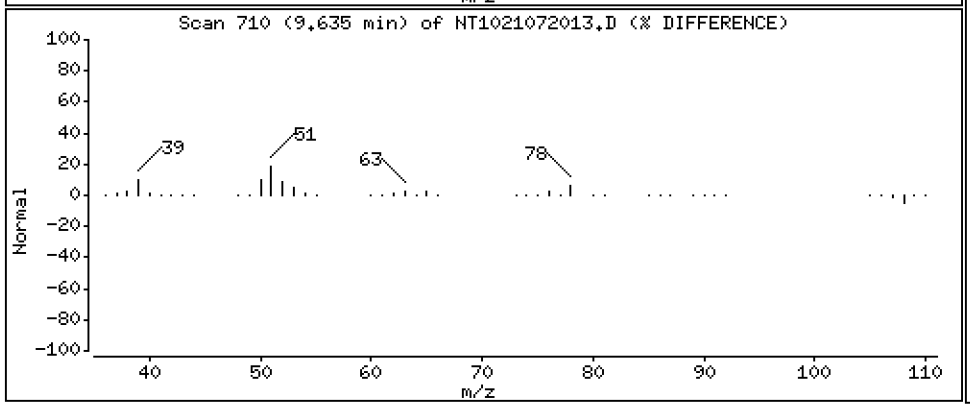
11 Benzyl alcohol

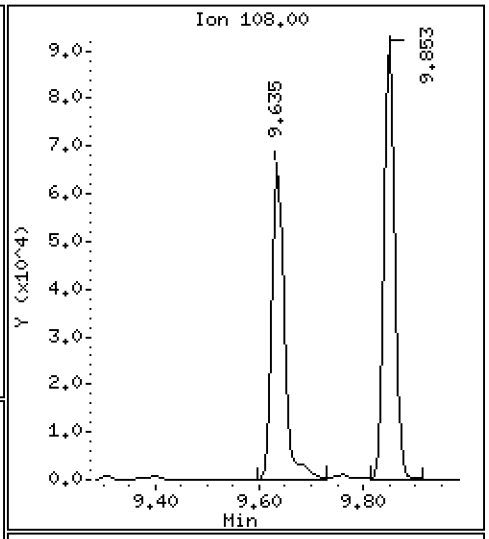
Concentration: 4.516 ug/mL

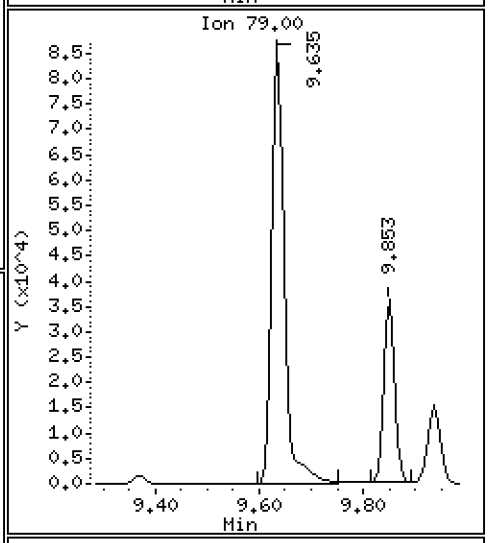


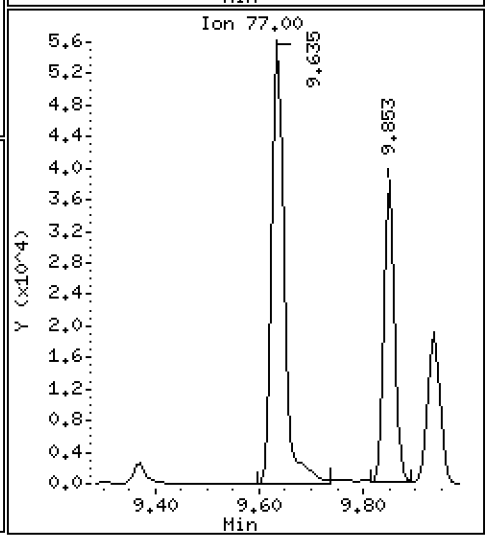












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

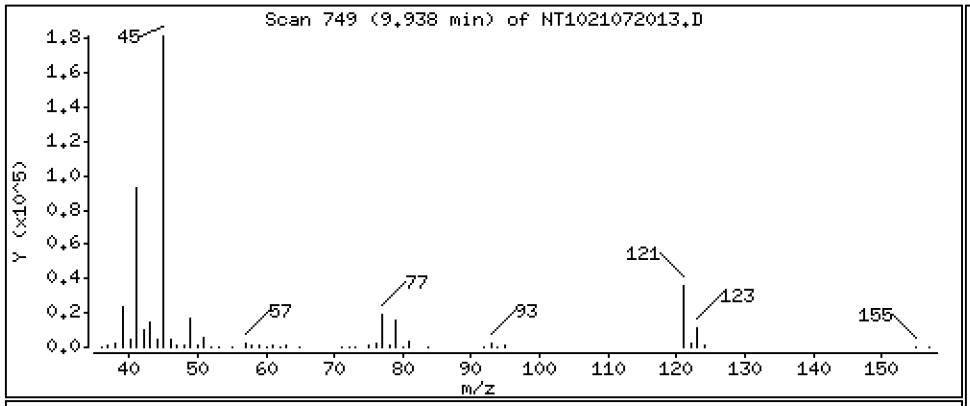
Operator: VTS

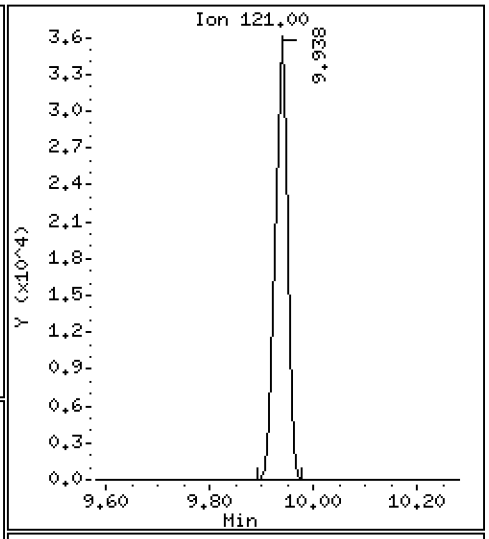
Column phase: ZB-5msi

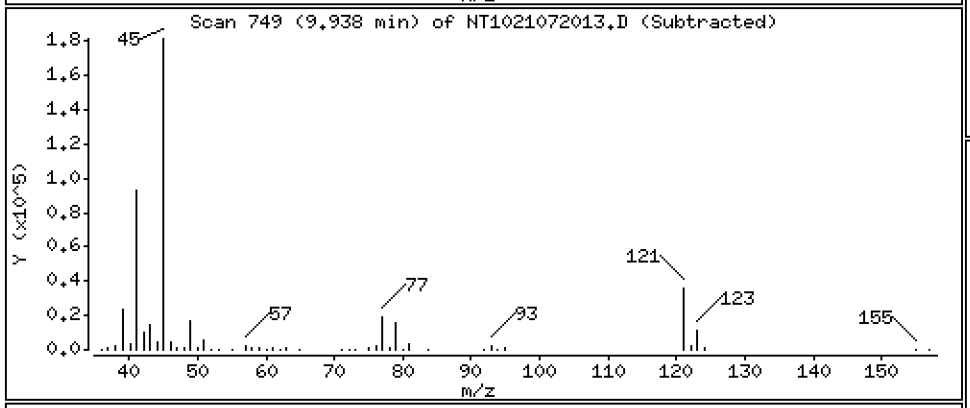
Column diameter: 0.25

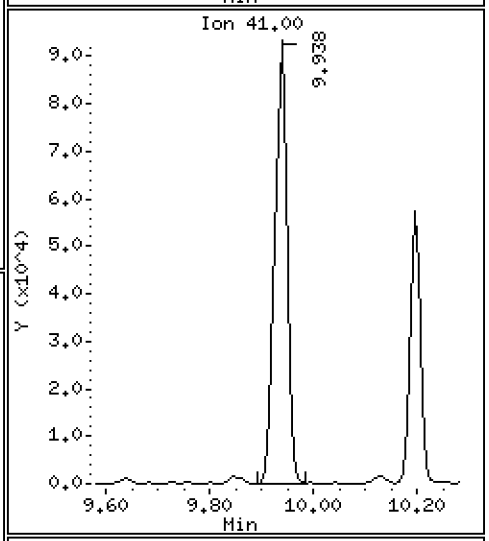
14 2,2'-oxybis(1-Chloropropane)

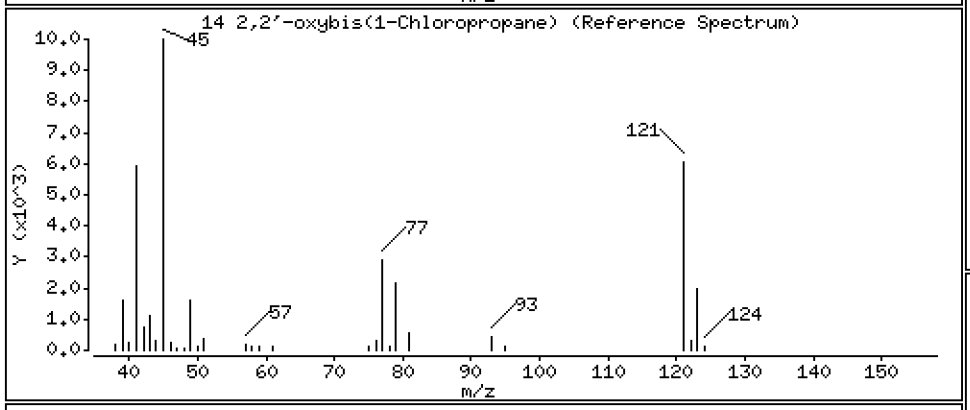
Concentration: 4.048 ug/mL

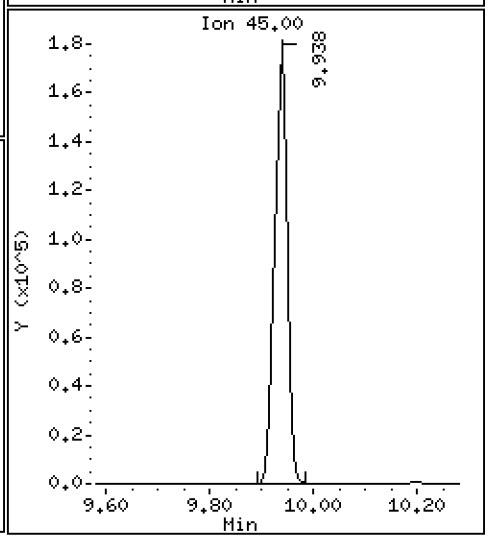


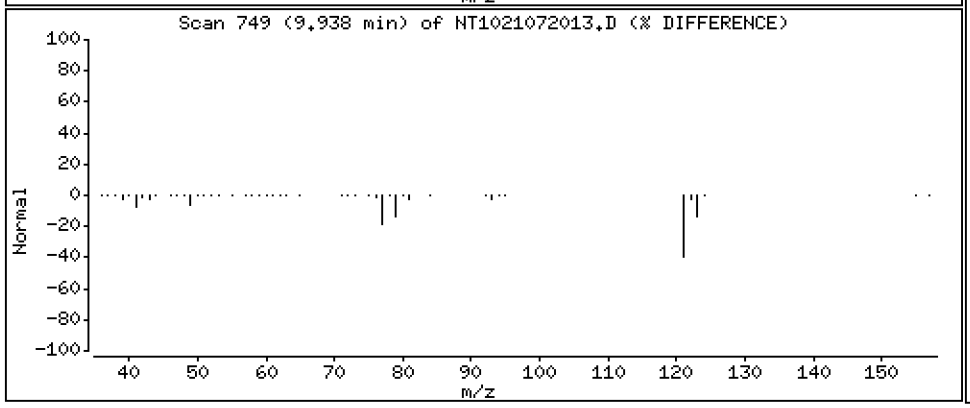












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

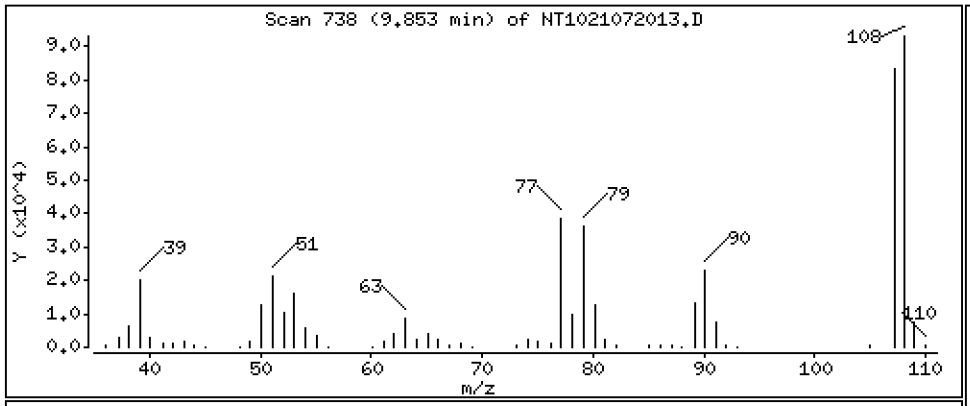
Operator: VTS

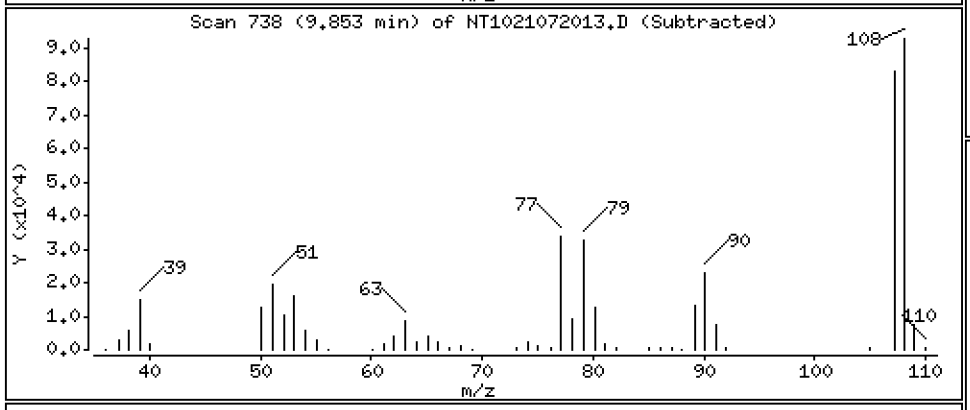
Column phase: ZB-5msi

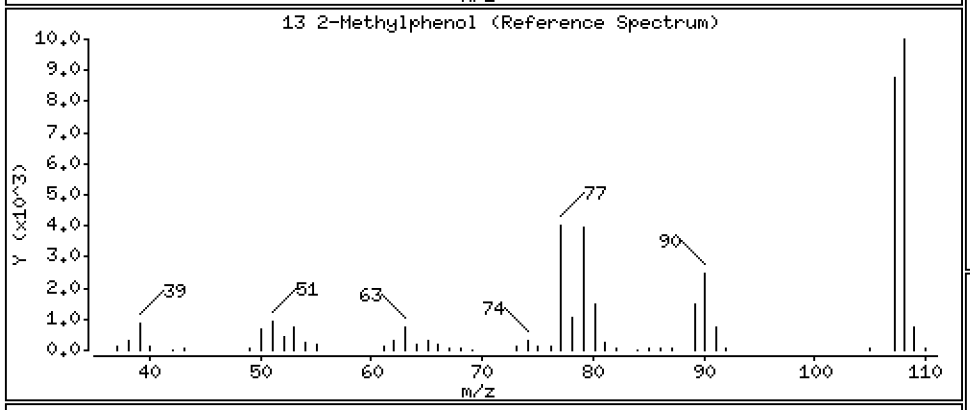
Column diameter: 0.25

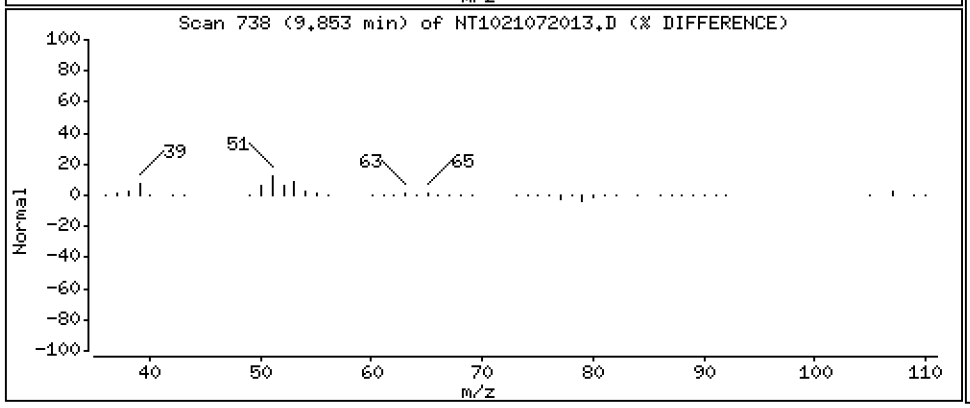
13 2-Methylphenol

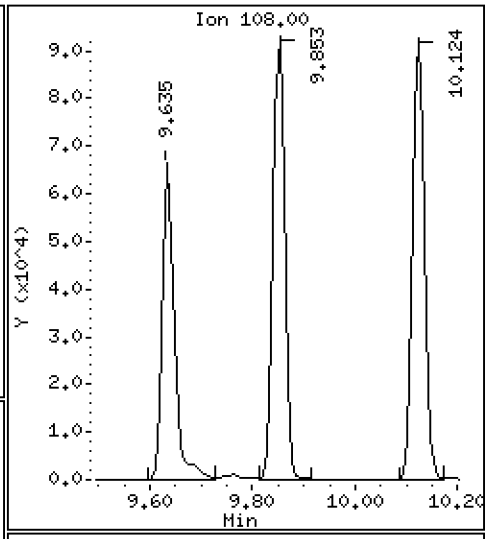
Concentration: 4.397 ug/mL

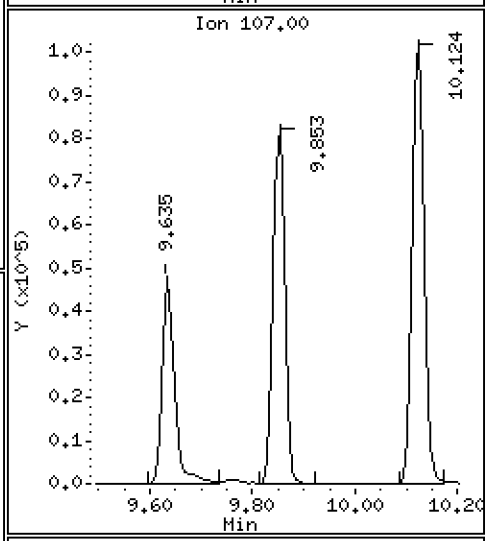


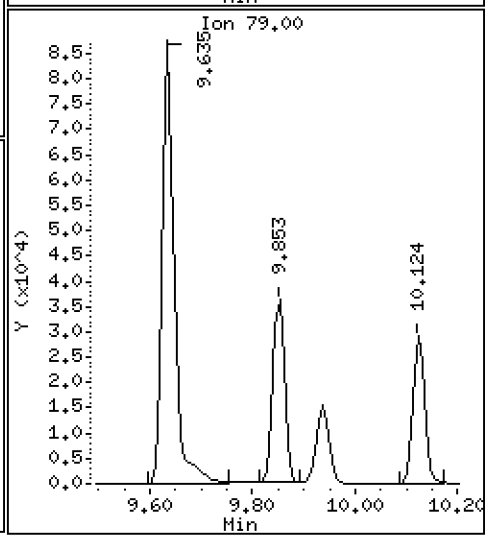












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

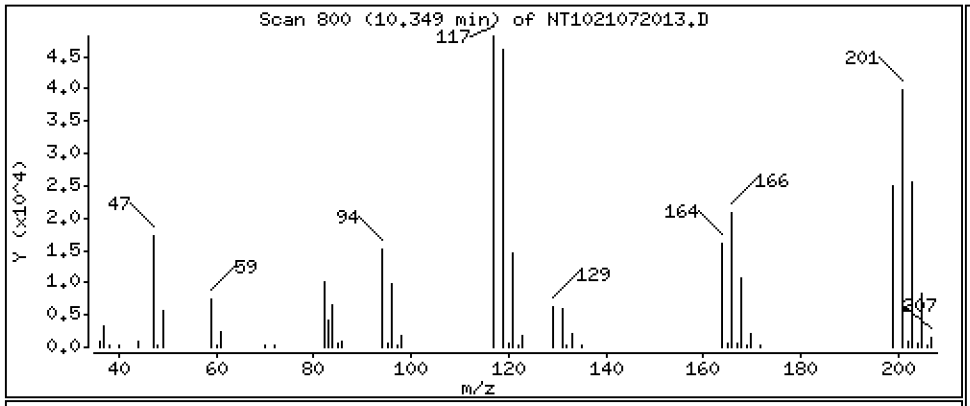
Operator: VTS

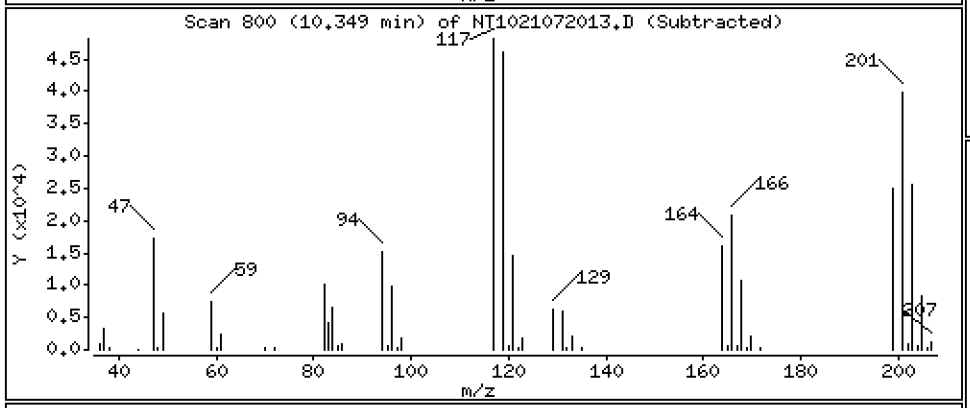
Column phase: ZB-5msi

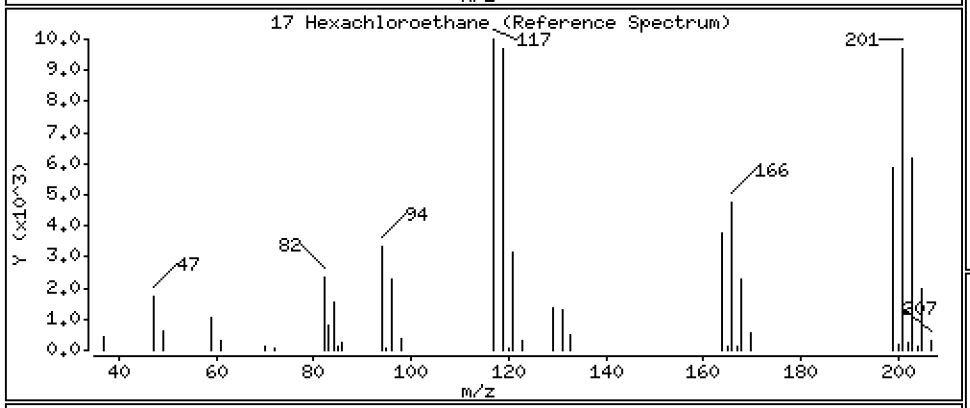
Column diameter: 0.25

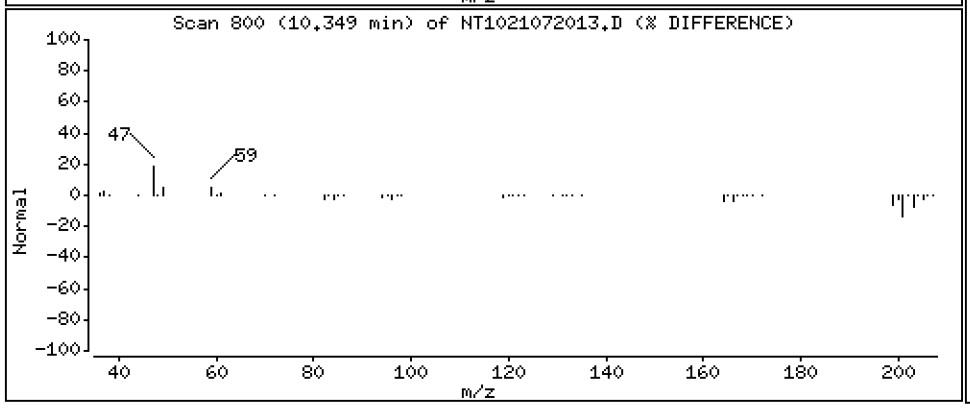
17 Hexachloroethane

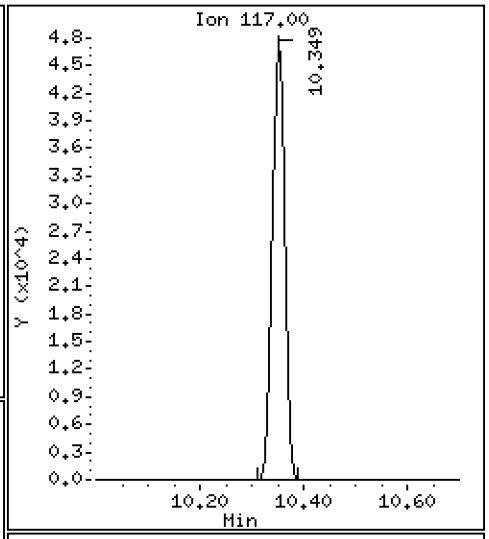
Concentration: 4.914 ug/mL

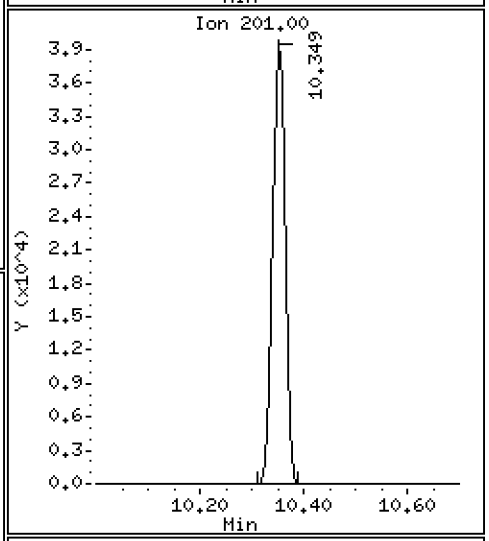


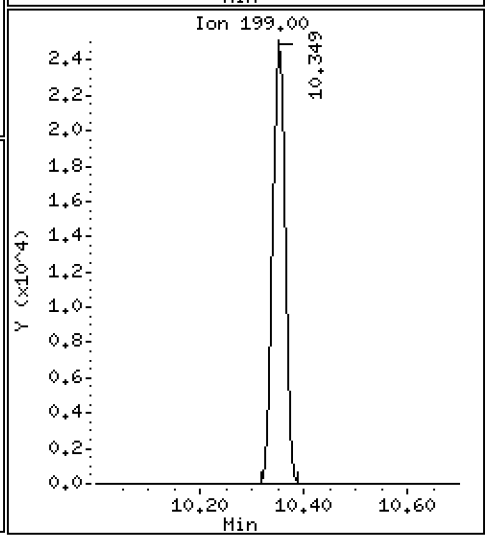












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

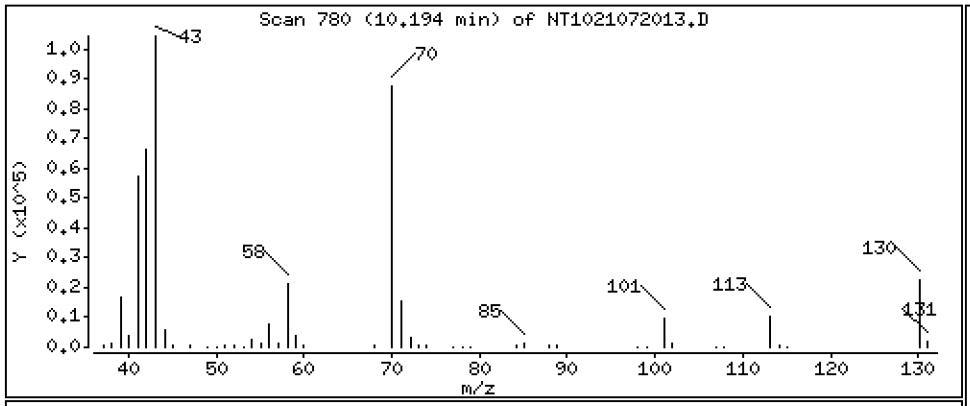
Operator: VTS

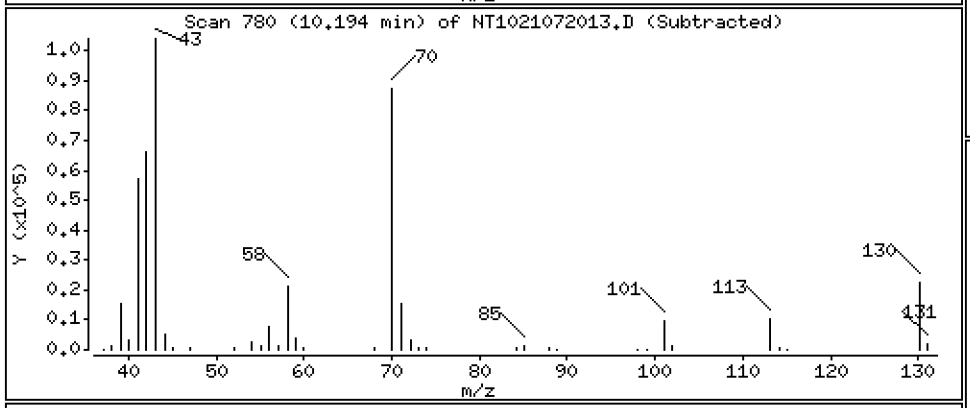
Column phase: ZB-5msi

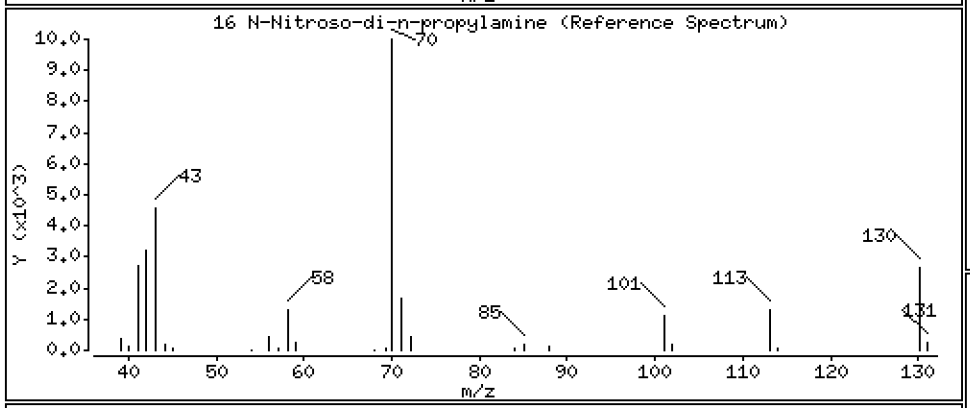
Column diameter: 0.25

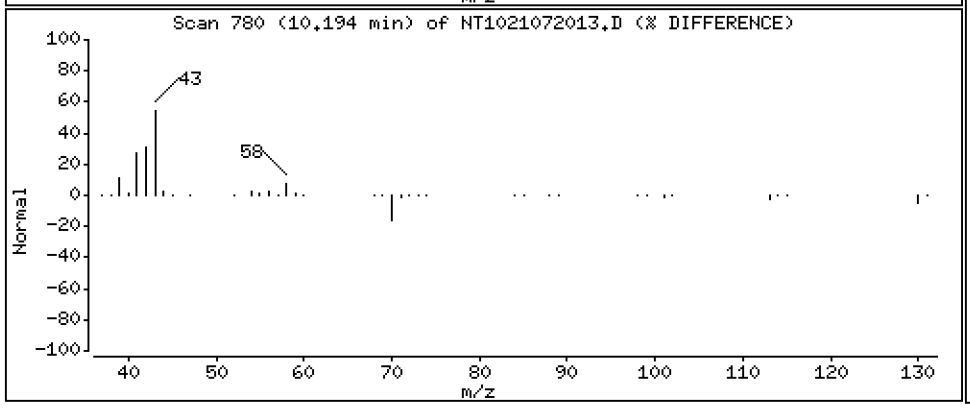
16 N-Nitroso-di-n-propylamine

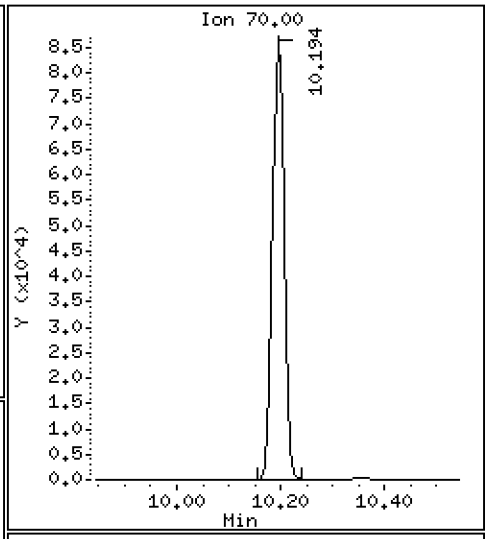
Concentration: 4.742 ug/mL

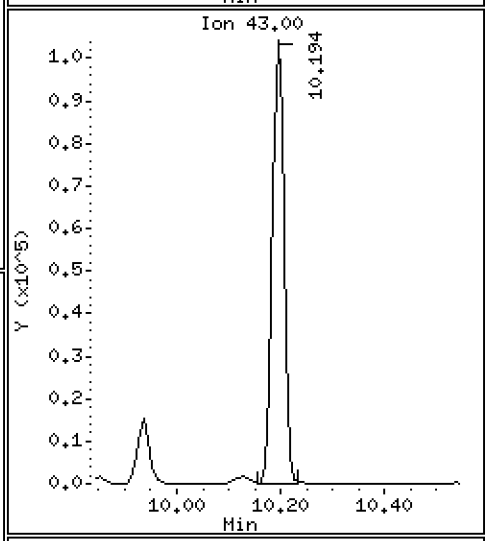


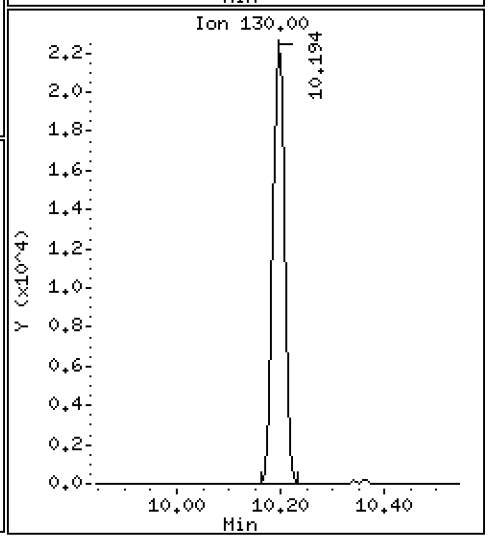












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

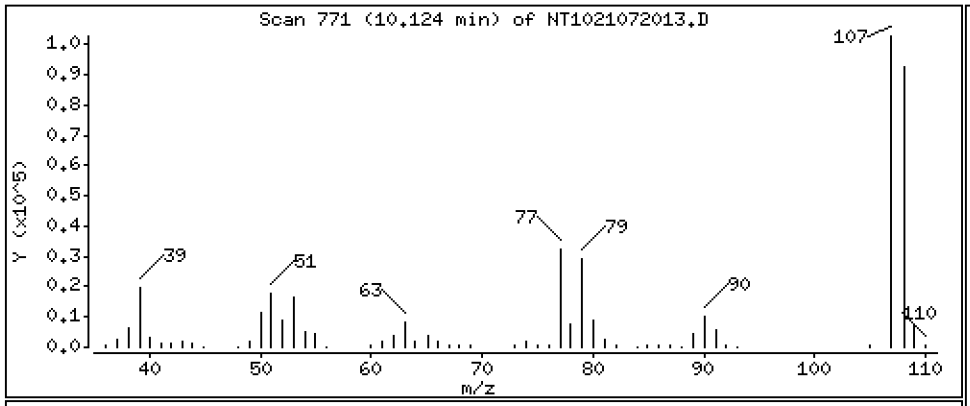
Operator: VTS

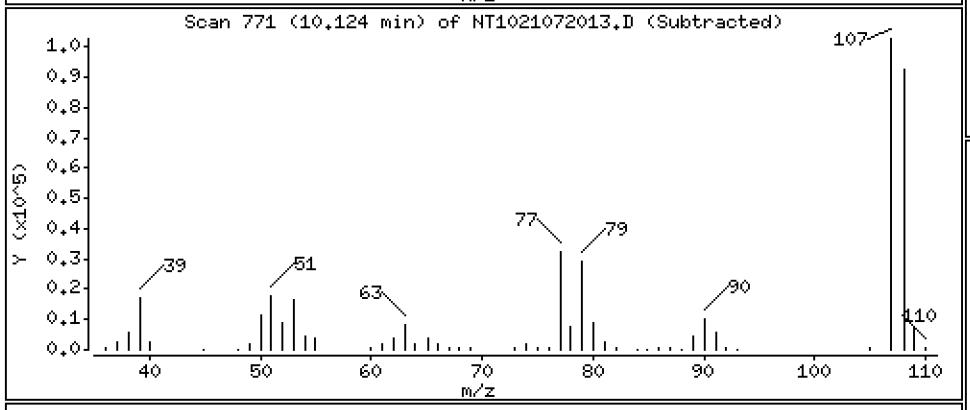
Column phase: ZB-5msi

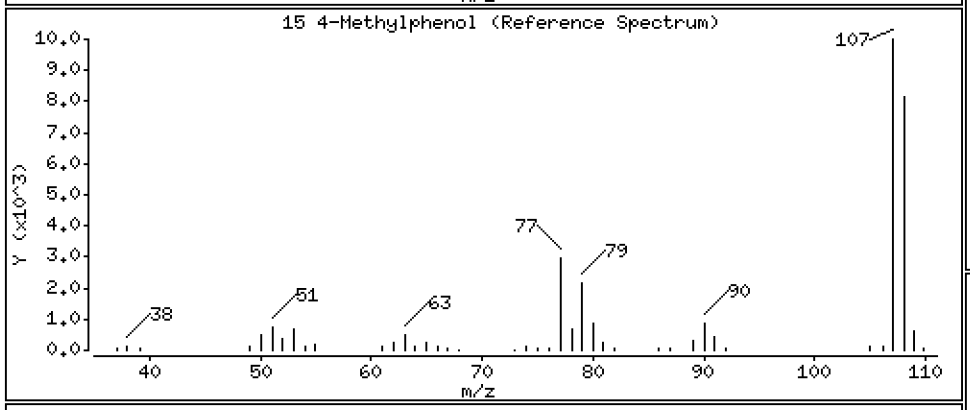
Column diameter: 0.25

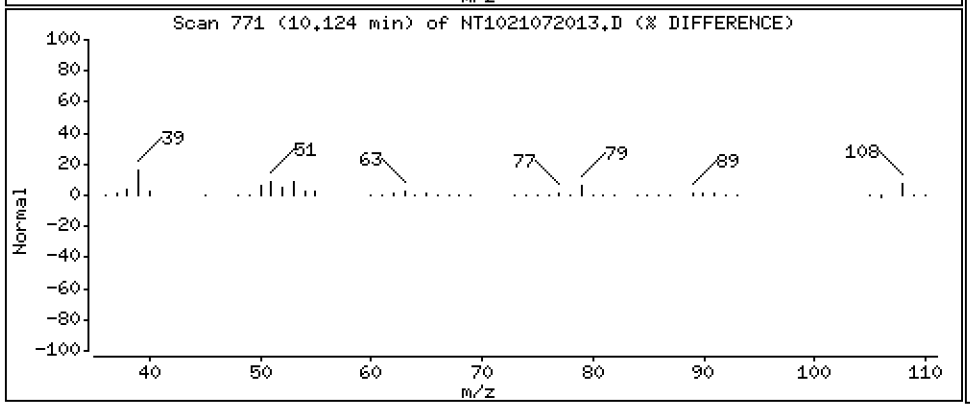
15 4-Methylphenol

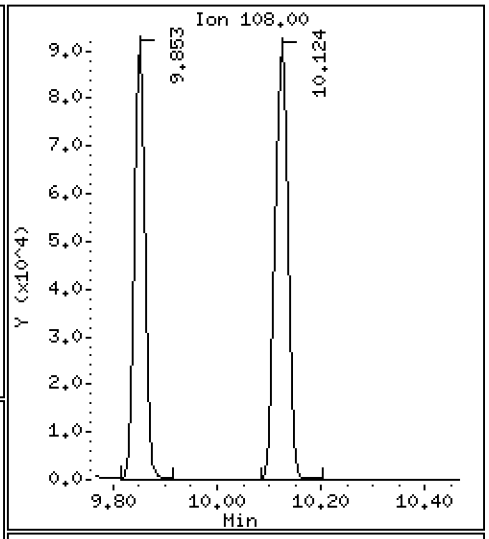
Concentration: 4.667 ug/mL

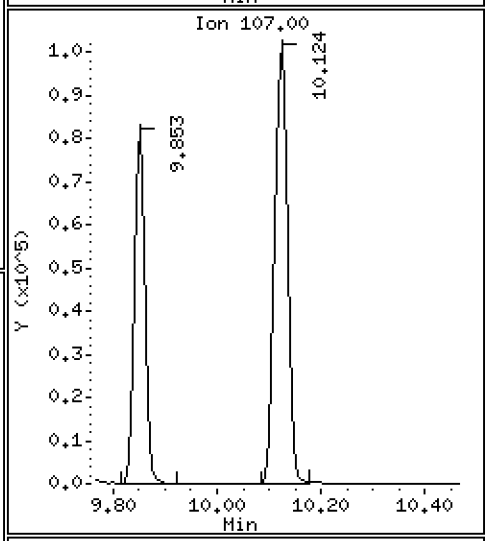


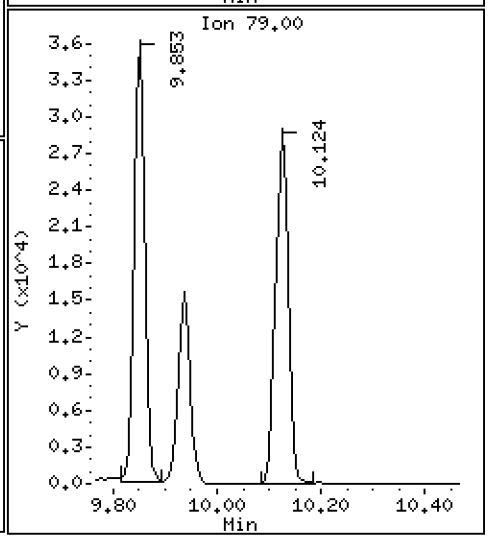












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

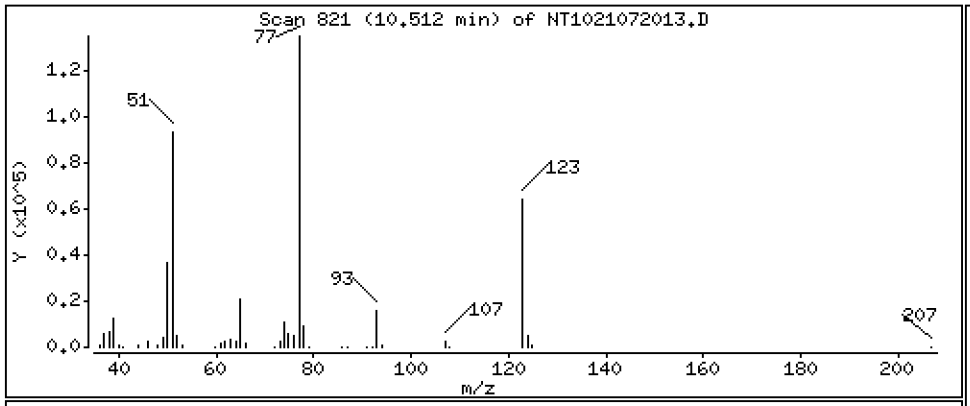
Operator: VTS

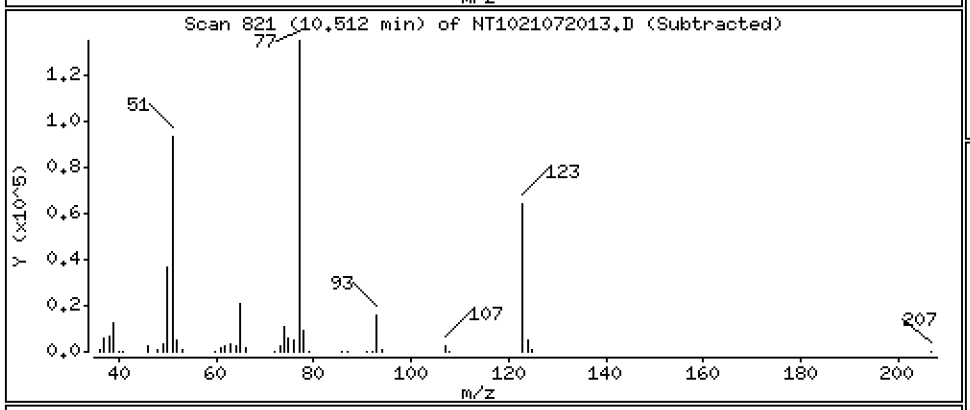
Column phase: ZB-5msi

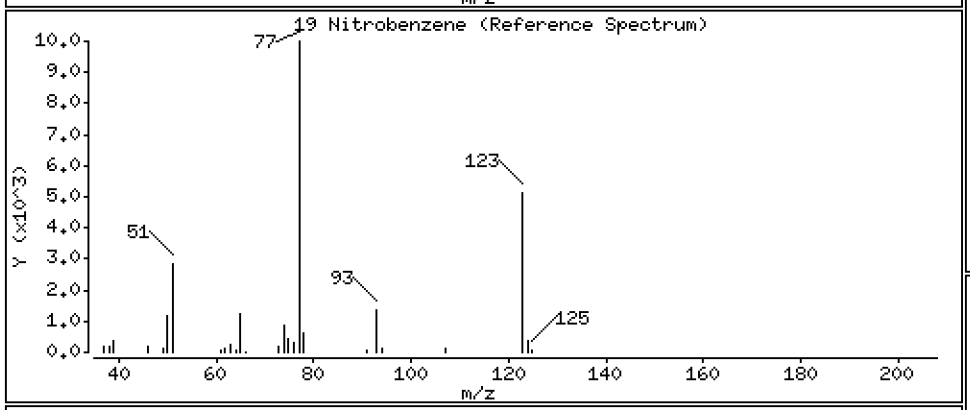
Column diameter: 0.25

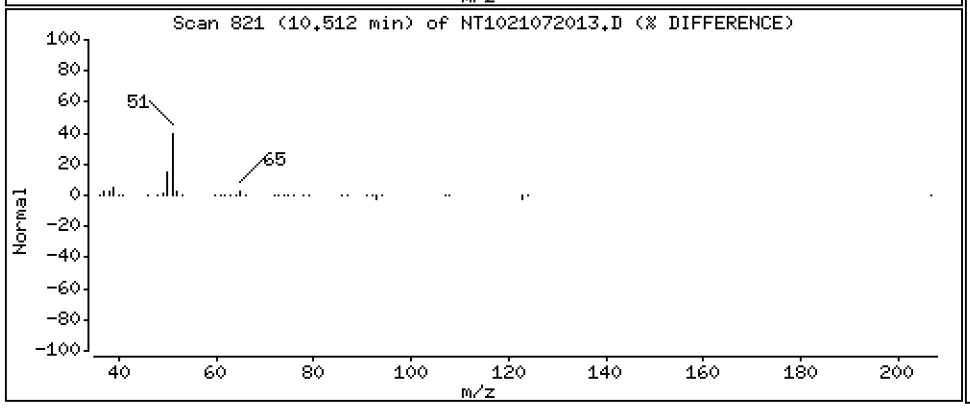
19 Nitrobenzene

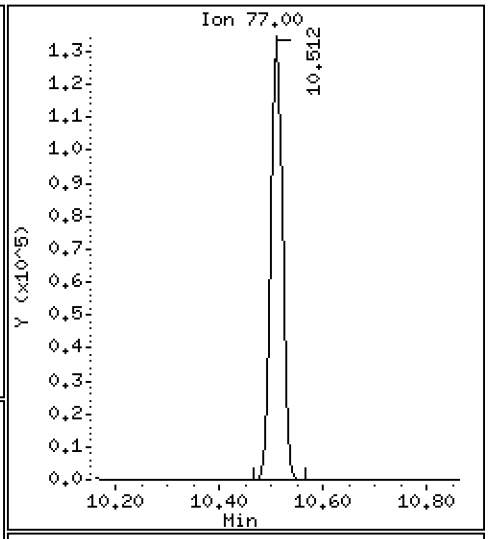
Concentration: 4.741 ug/mL

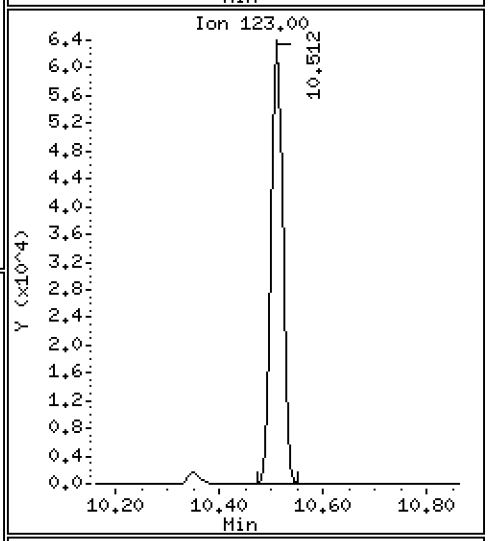


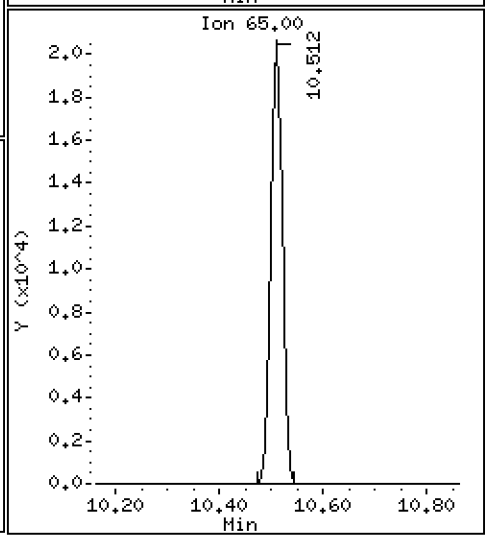












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

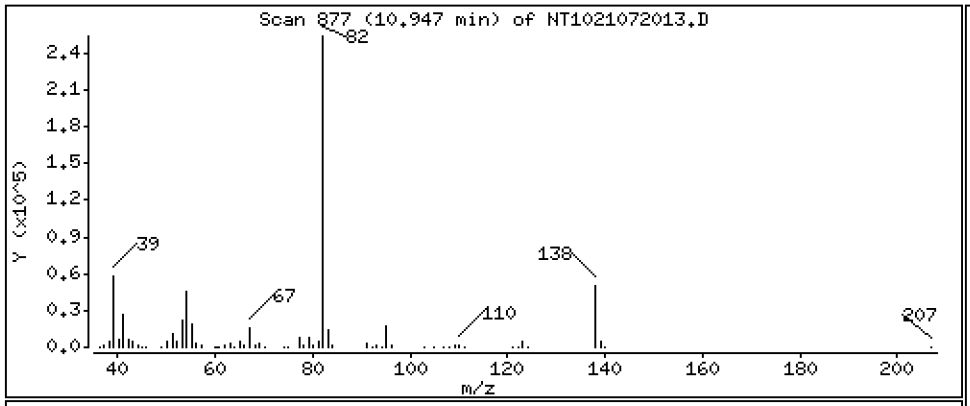
Operator: VTS

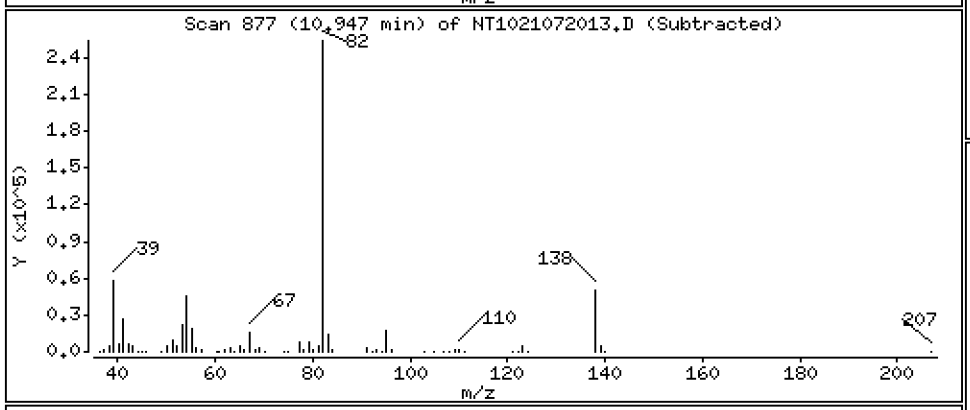
Column phase: ZB-5msi

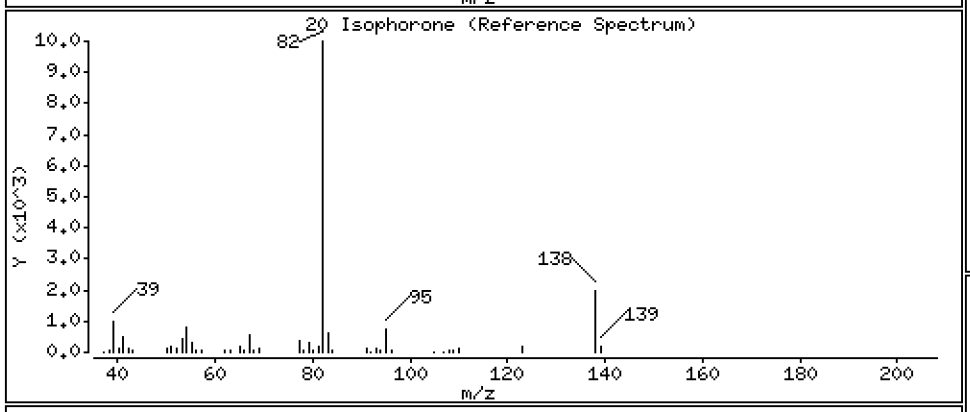
Column diameter: 0.25

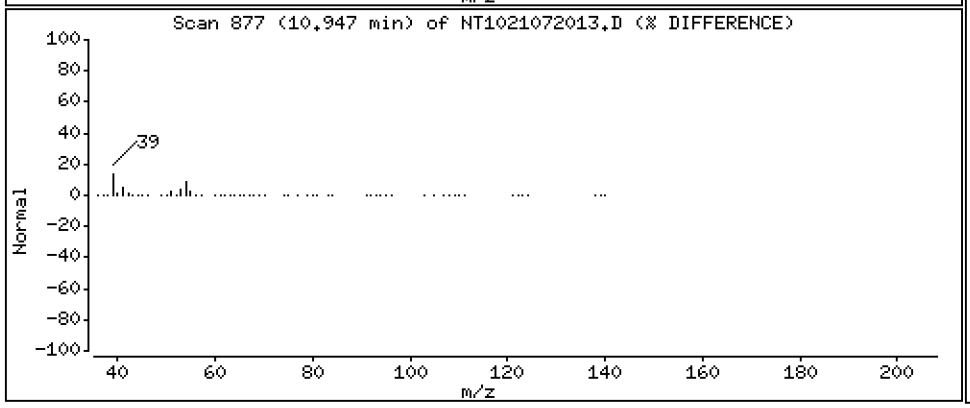
20 Isophorone

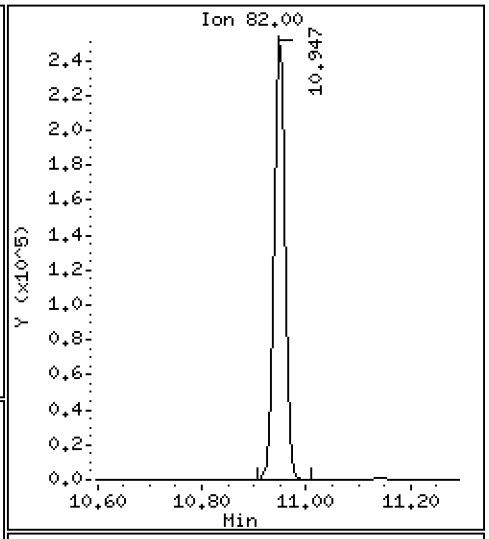
Concentration: 4.950 ug/mL

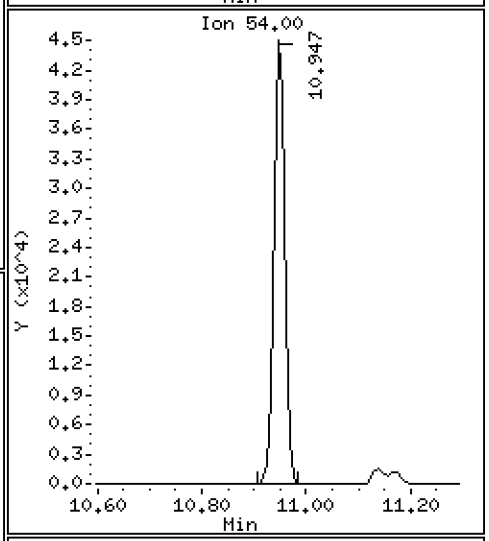


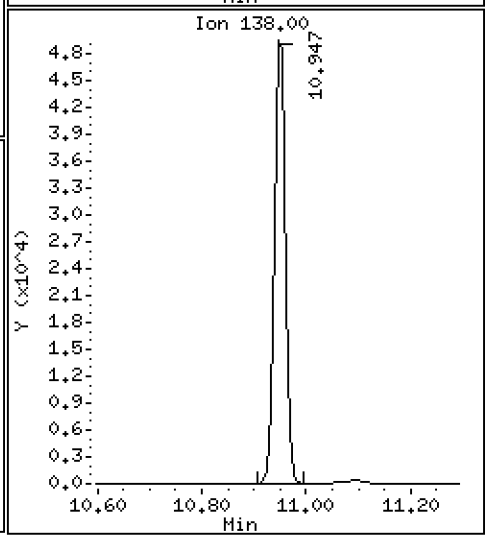












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

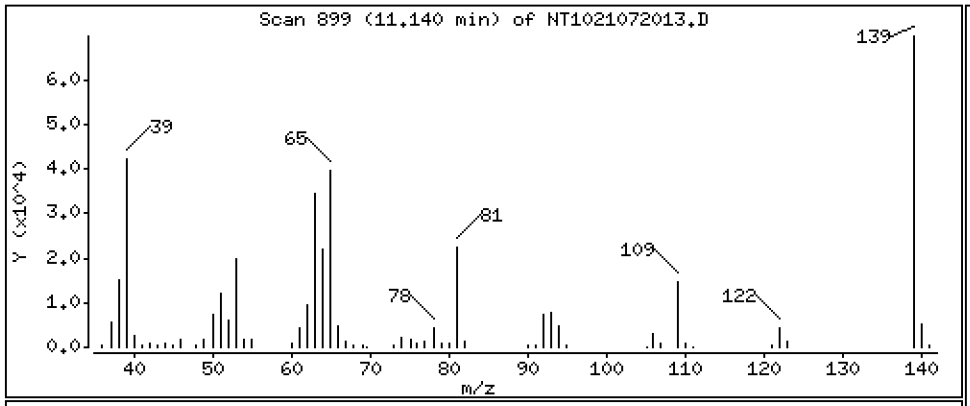
Operator: VTS

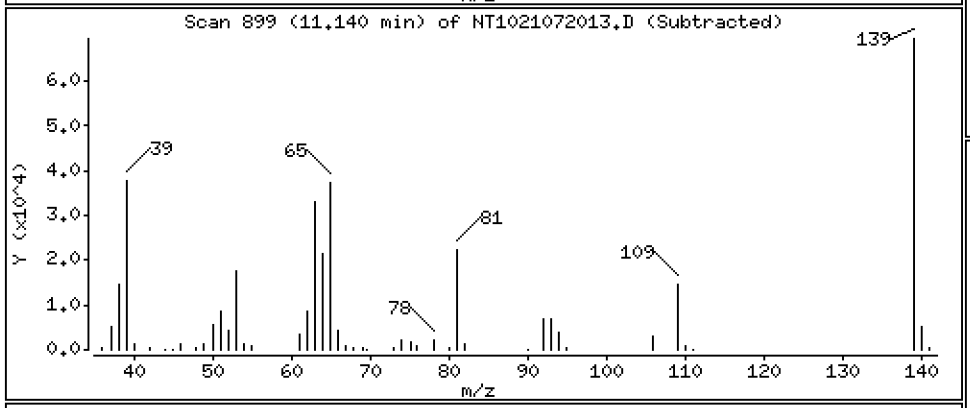
Column phase: ZB-5msi

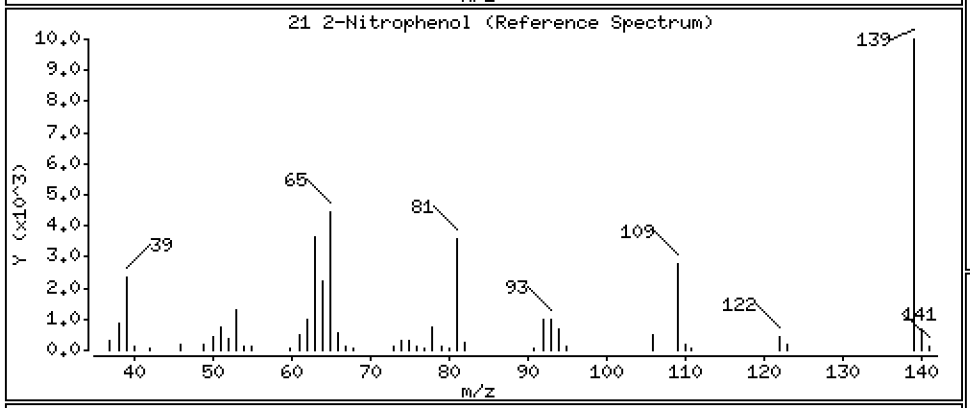
Column diameter: 0.25

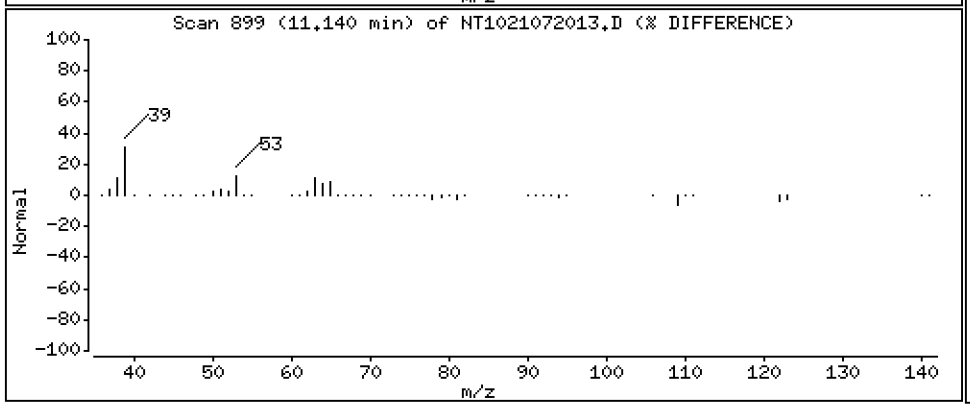
21 2-Nitrophenol

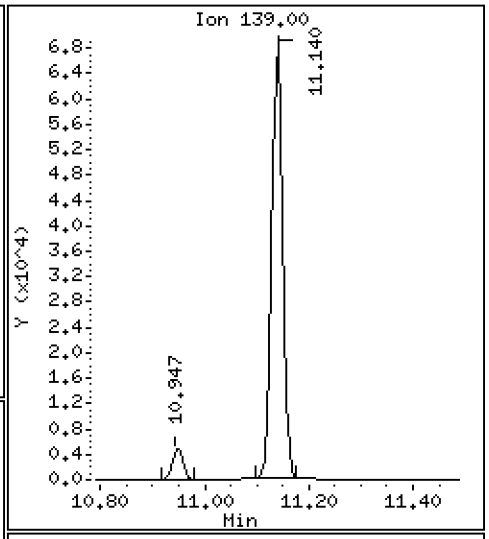
Concentration: 4.514 ug/mL

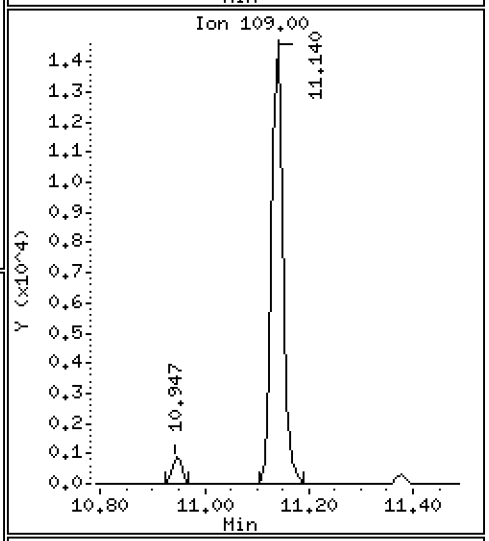


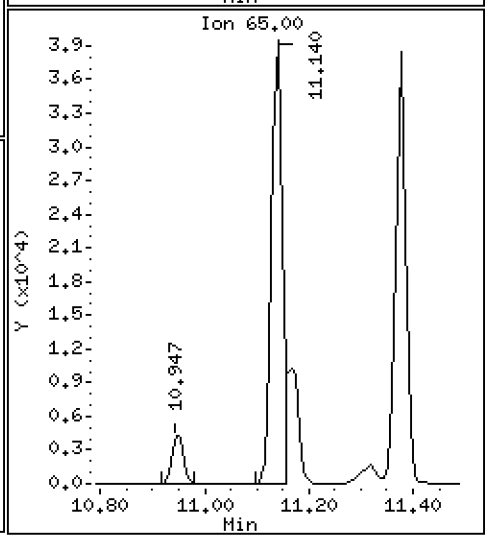












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

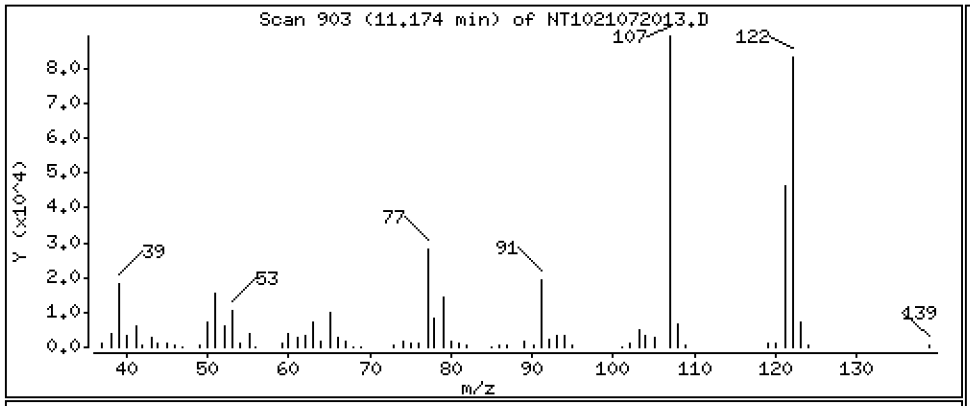
Operator: VTS

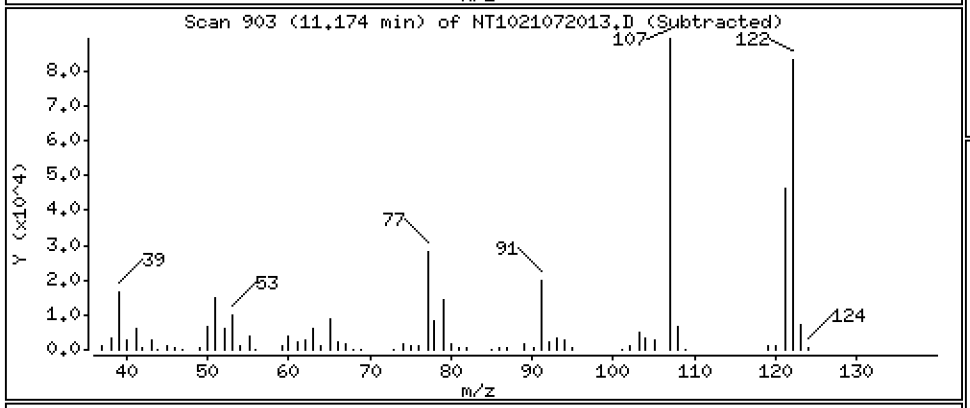
Column phase: ZB-5msi

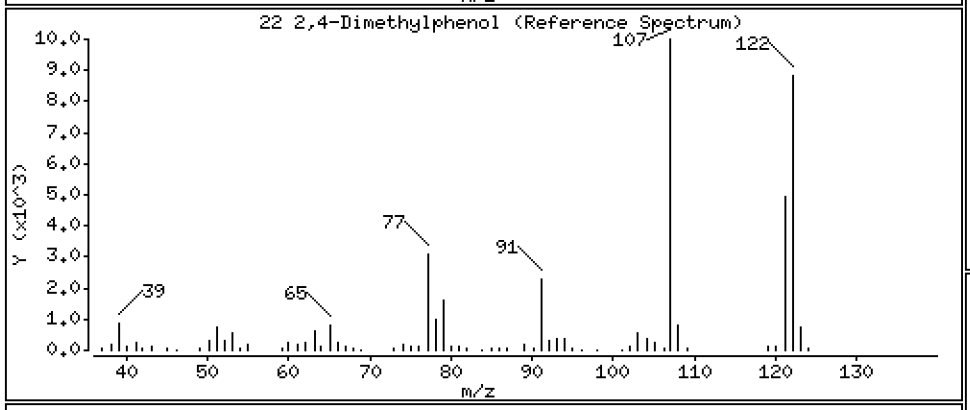
Column diameter: 0.25

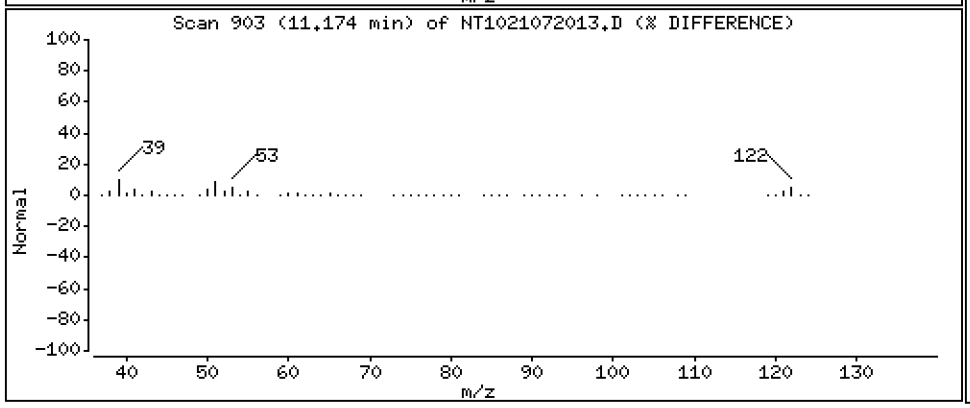
22 2,4-Dimethylphenol

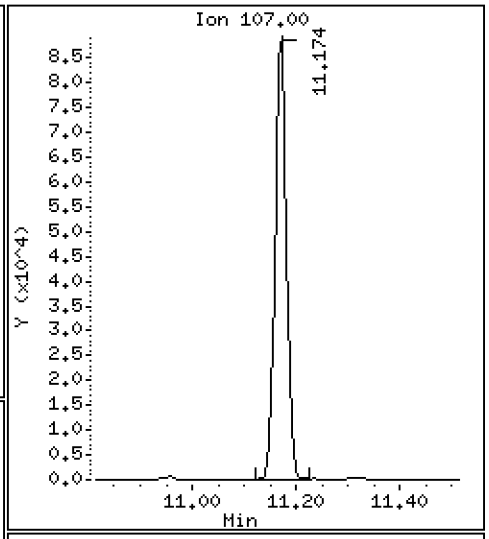
Concentration: 4.365 ug/mL

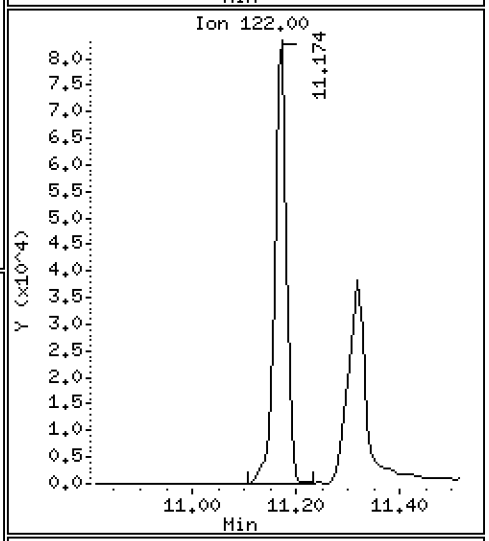


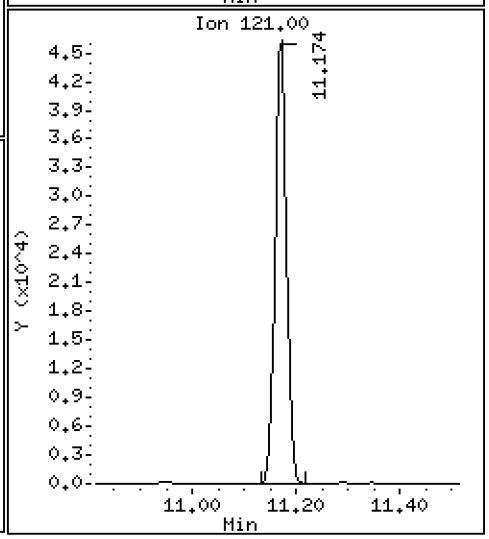












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

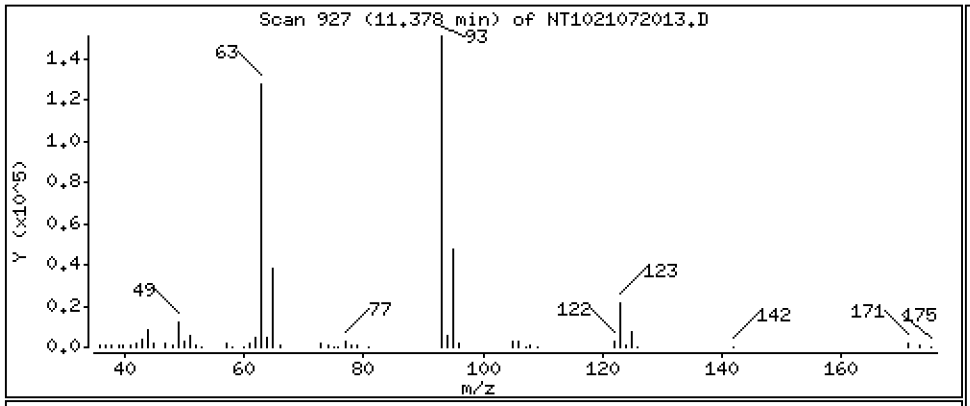
Operator: VTS

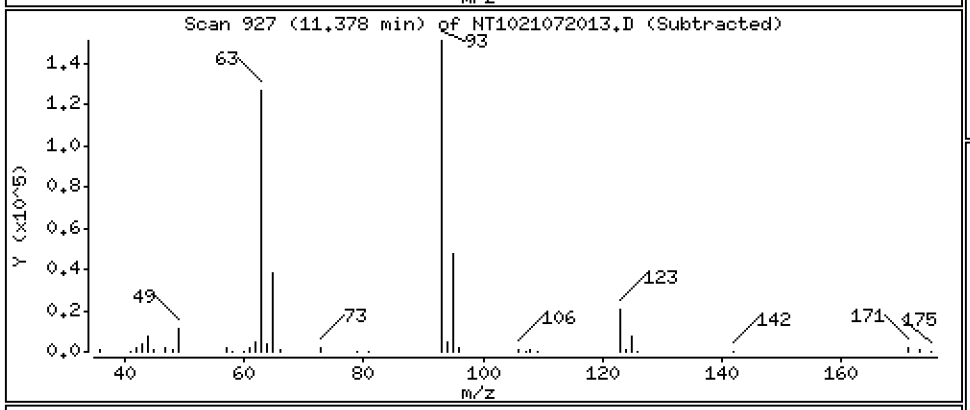
Column phase: ZB-5msi

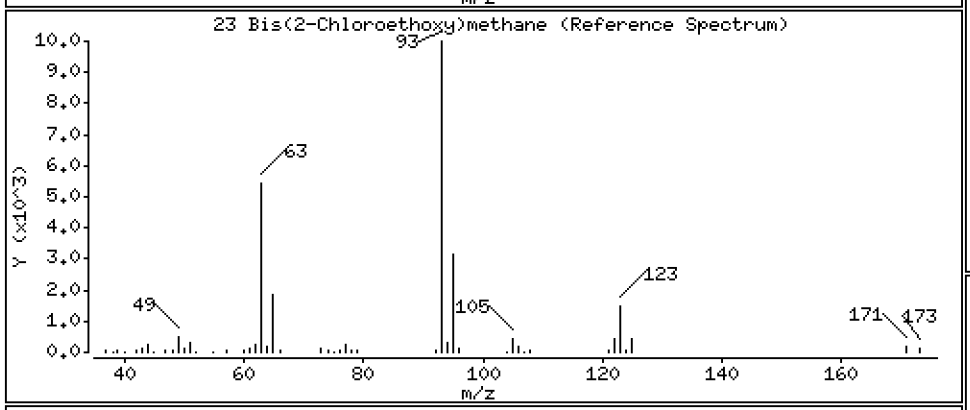
Column diameter: 0.25

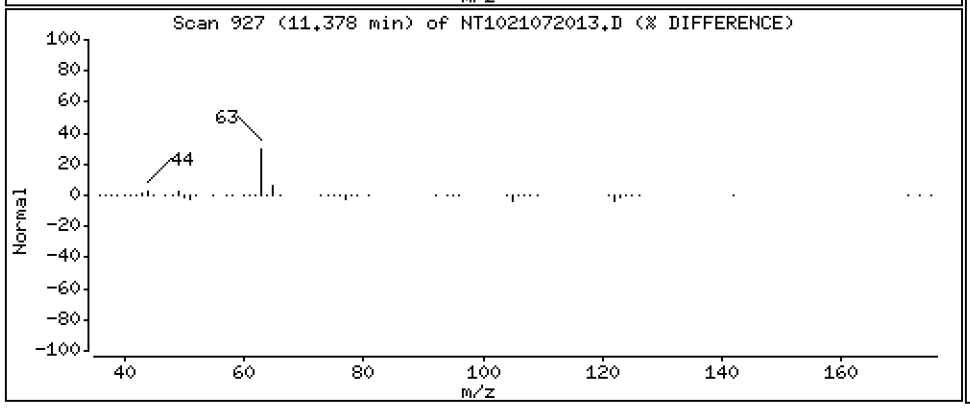
23 Bis(2-Chloroethoxy)methane

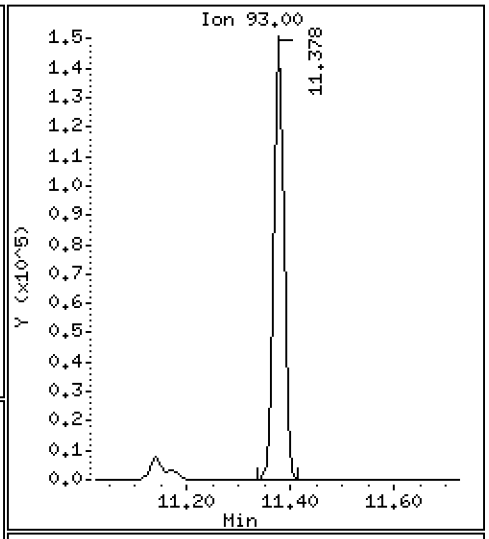
Concentration: 5.003 ug/mL

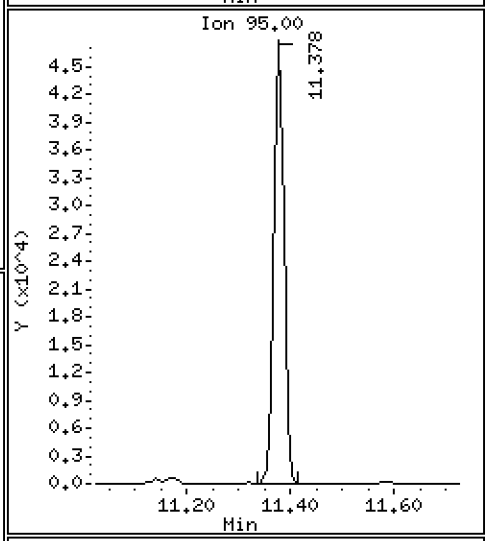


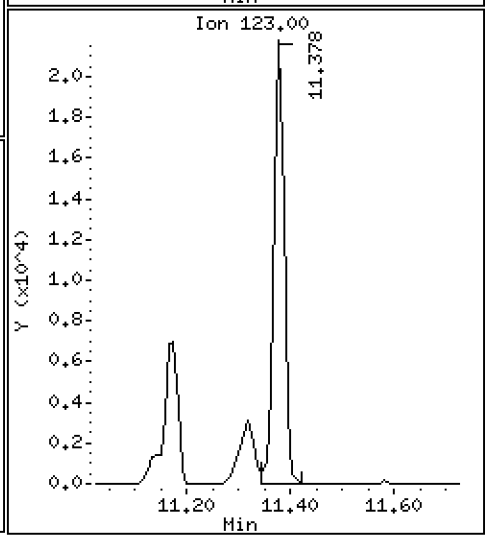












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

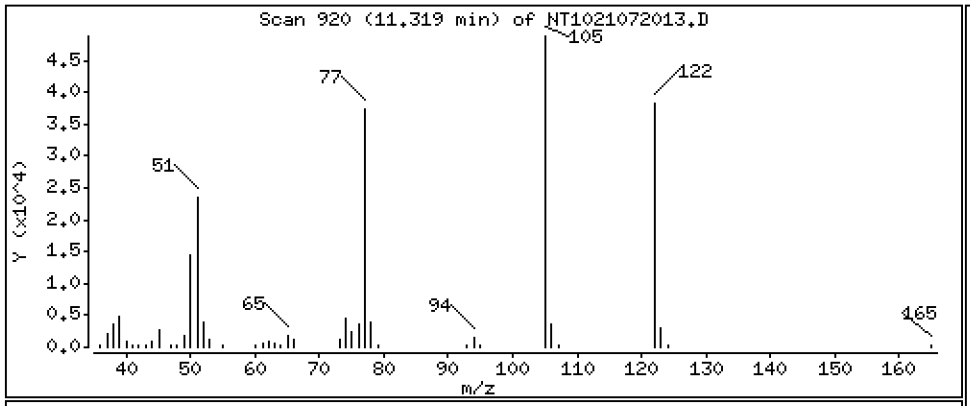
Operator: VTS

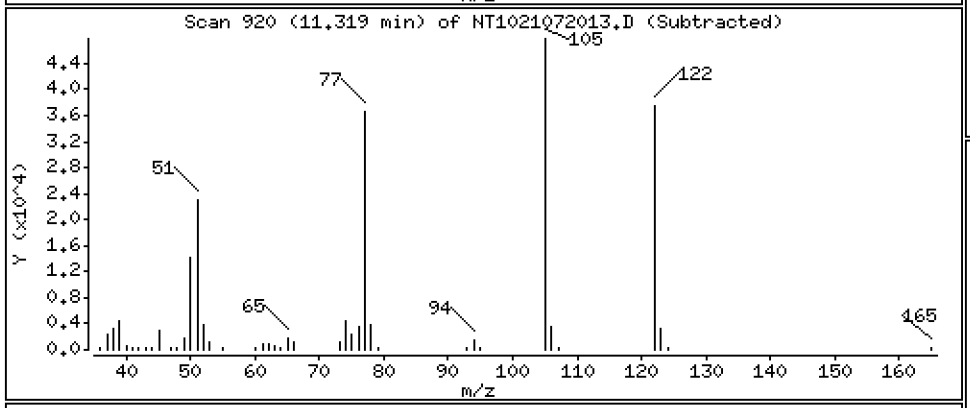
Column phase: ZB-5msi

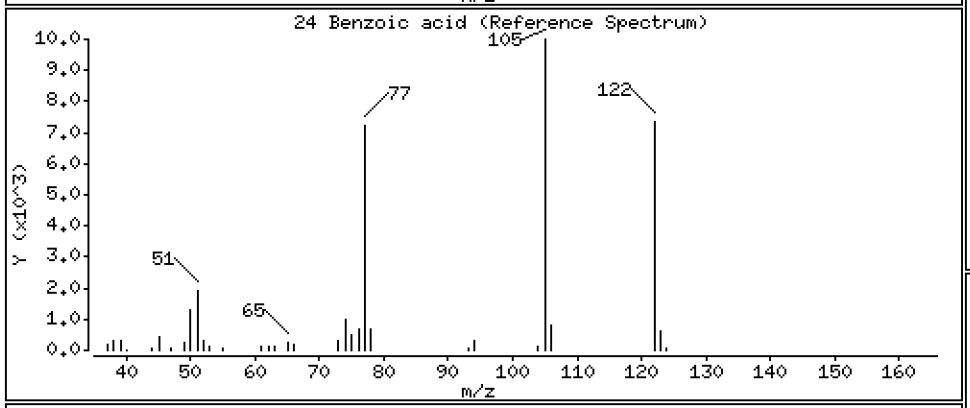
Column diameter: 0.25

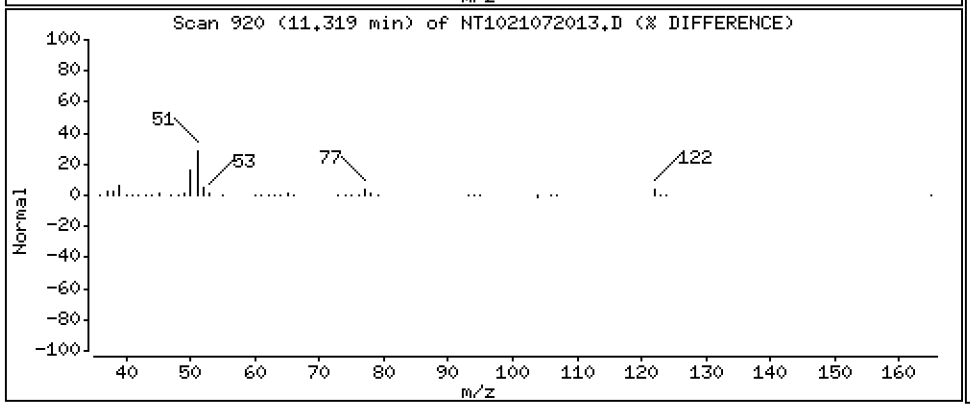
24 Benzoic acid

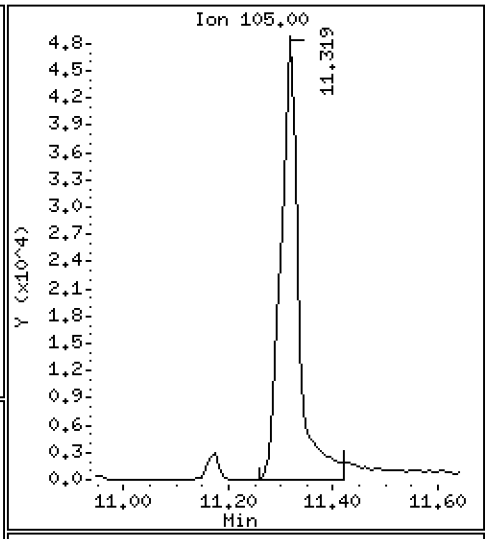
Concentration: 6.356 ug/mL

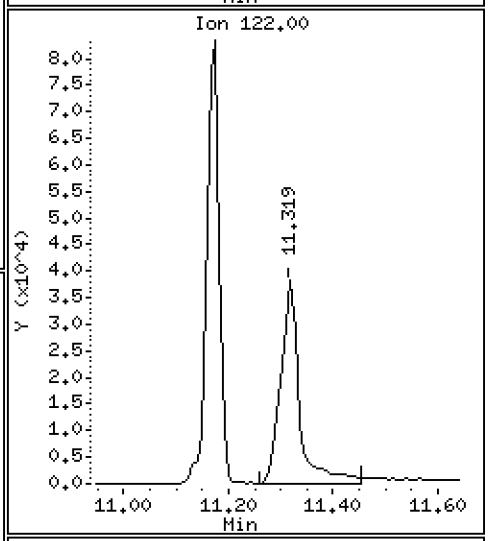


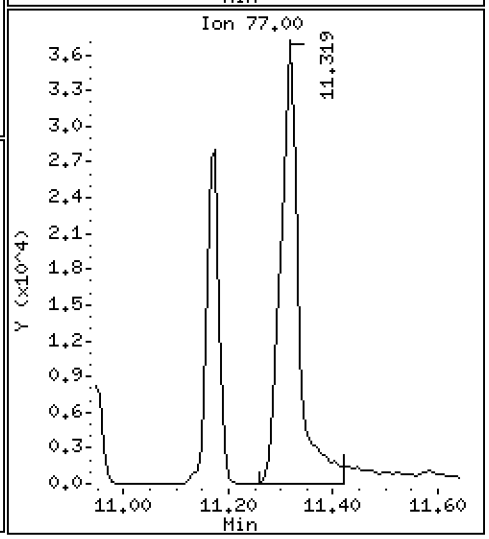












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

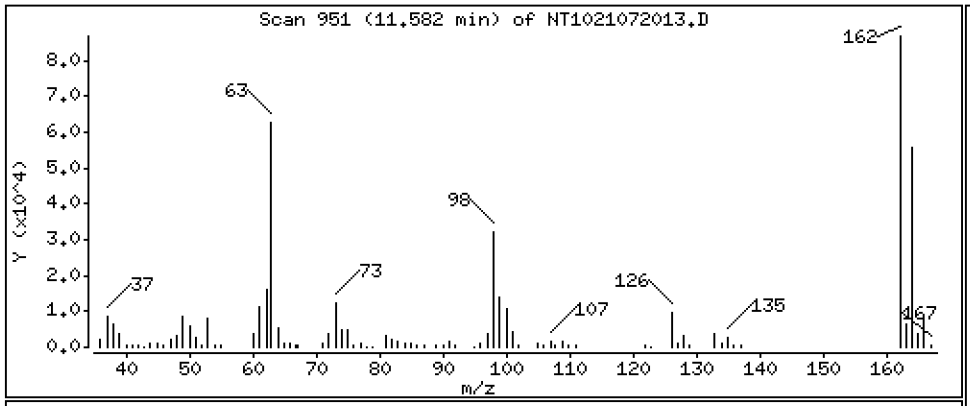
Operator: VTS

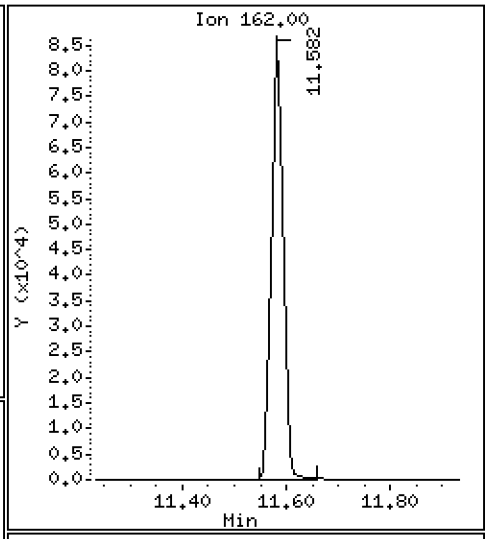
Column phase: ZB-5msi

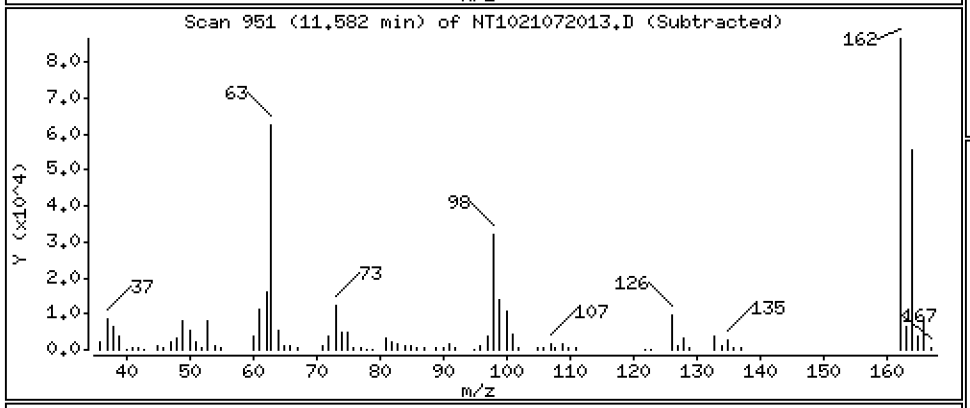
Column diameter: 0.25

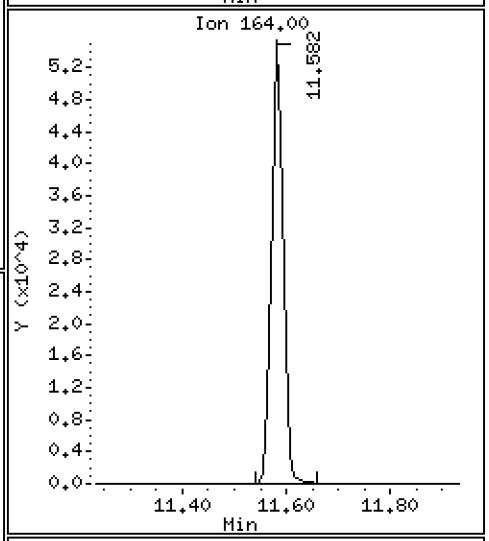
25 2,4-Dichlorophenol

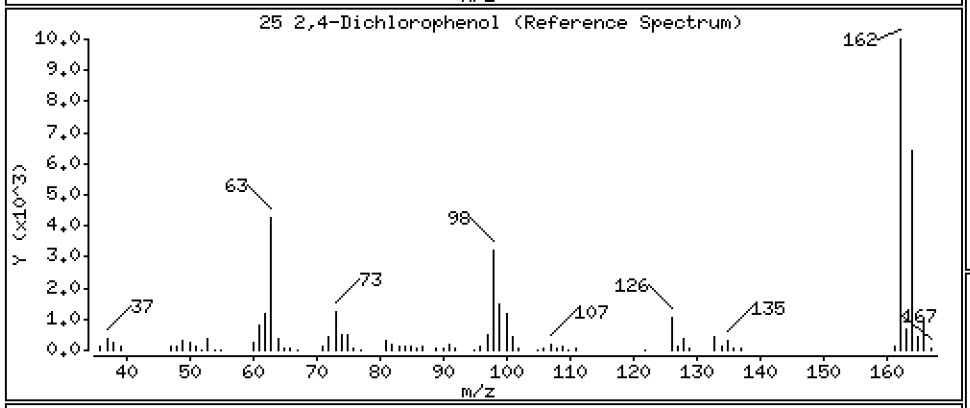
Concentration: 4.974 ug/mL

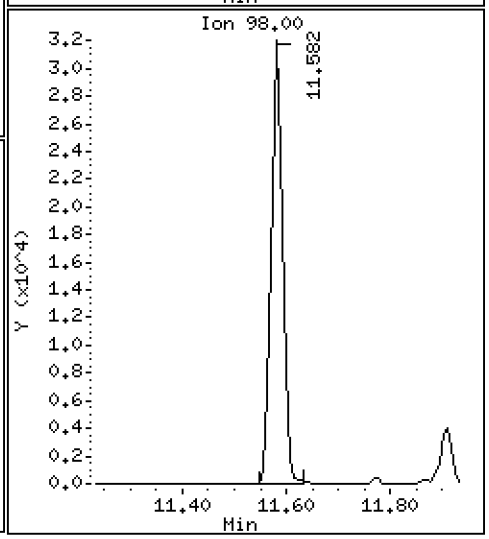


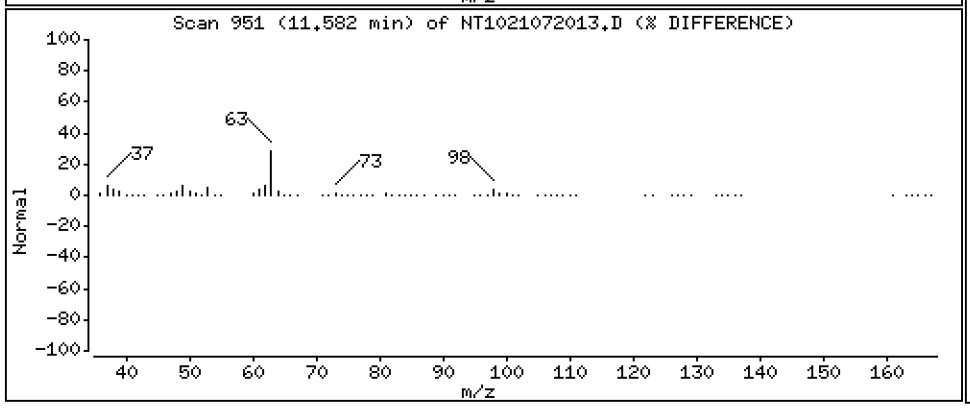












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

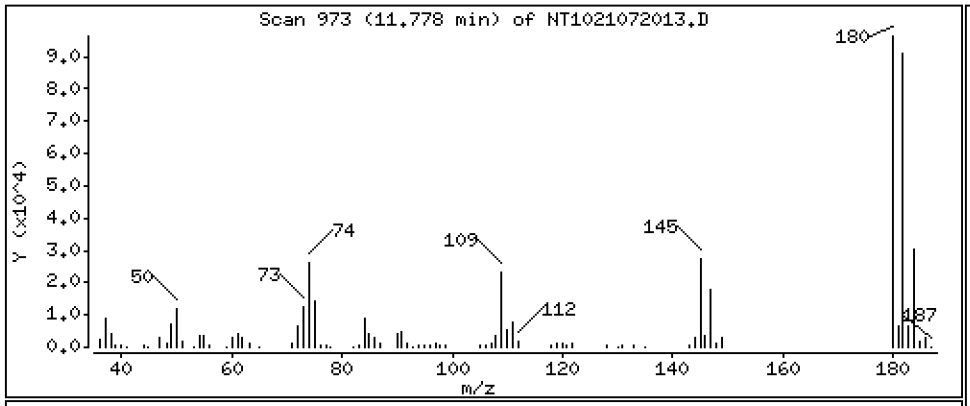
Operator: VTS

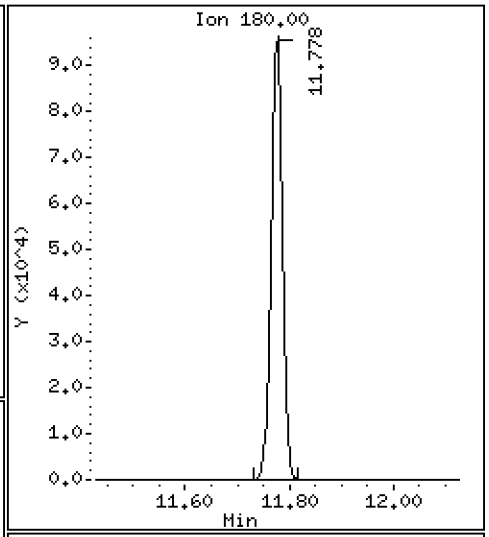
Column phase: ZB-5msi

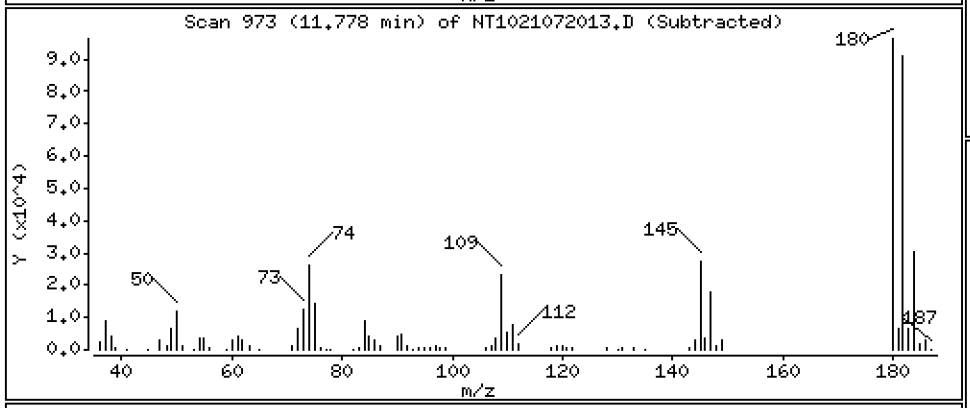
Column diameter: 0.25

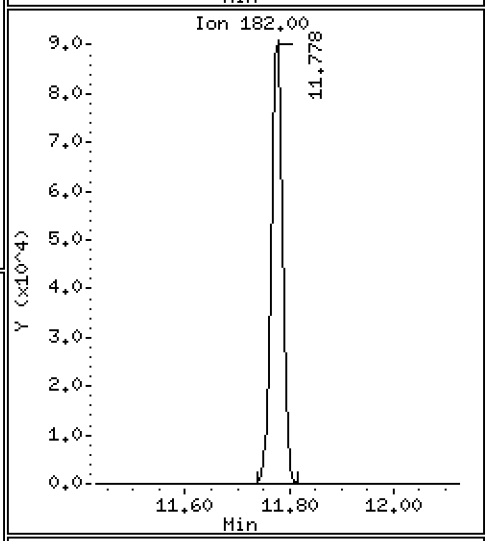
26 1,2,4-Trichlorobenzene

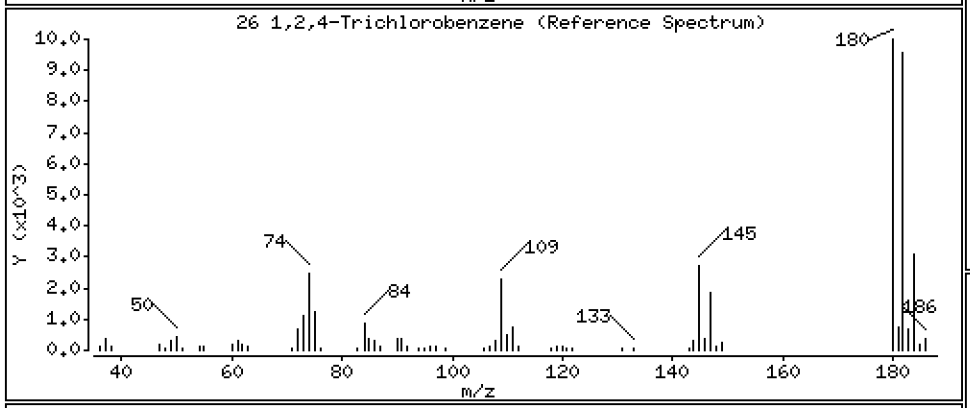
Concentration: 4.922 ug/mL

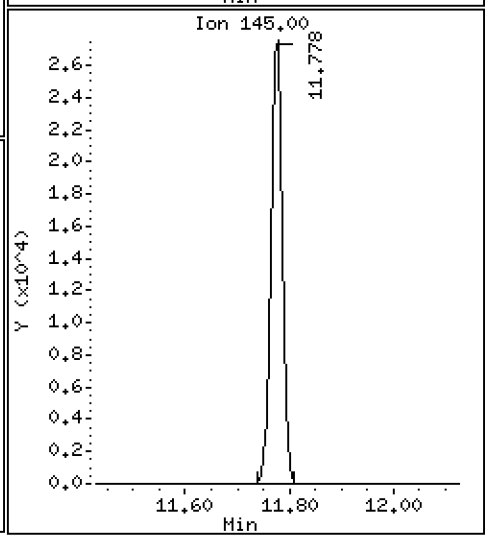


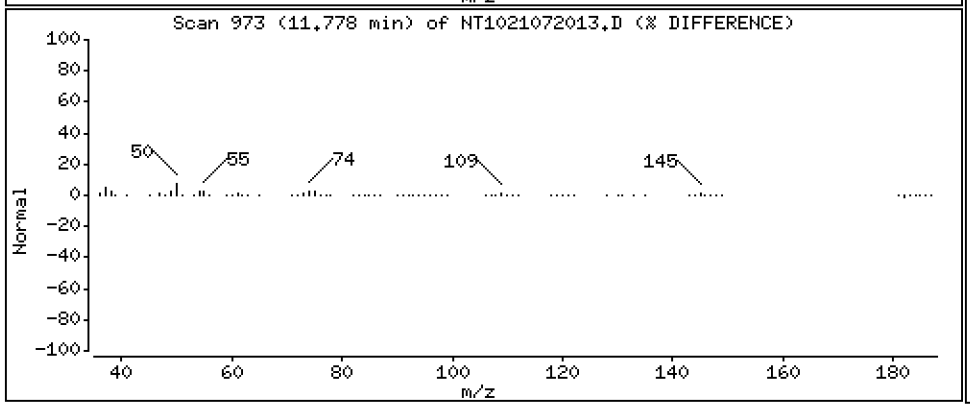












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

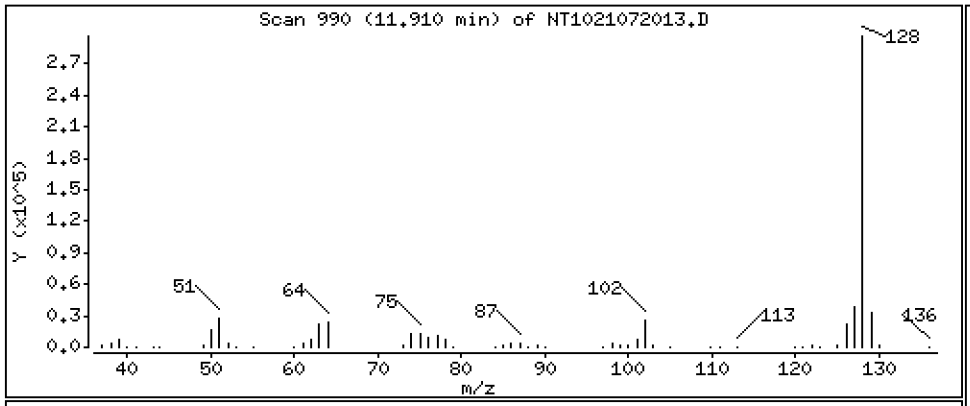
Operator: VTS

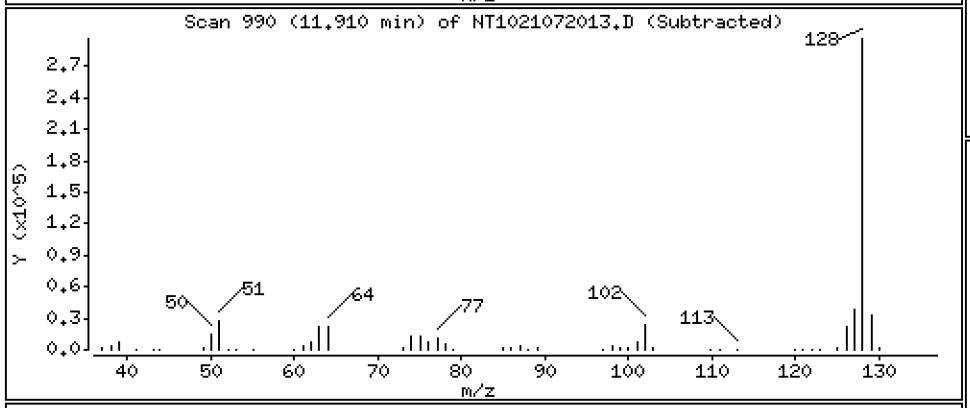
Column phase: ZB-5msi

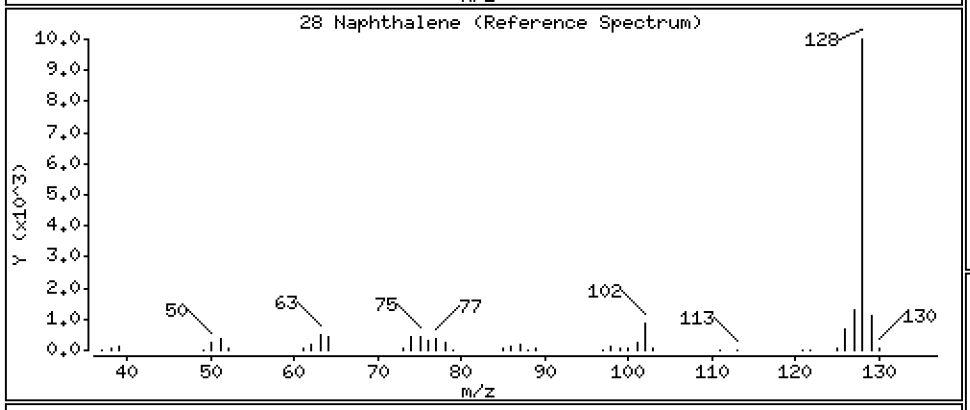
Column diameter: 0.25

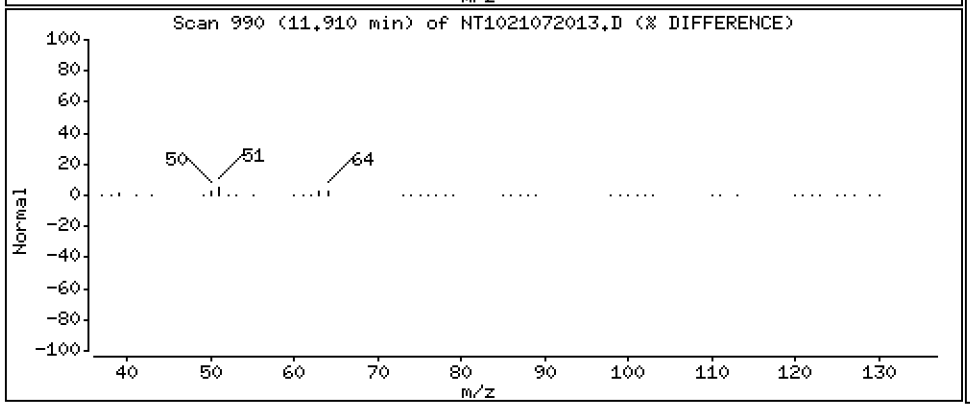
28 Naphthalene

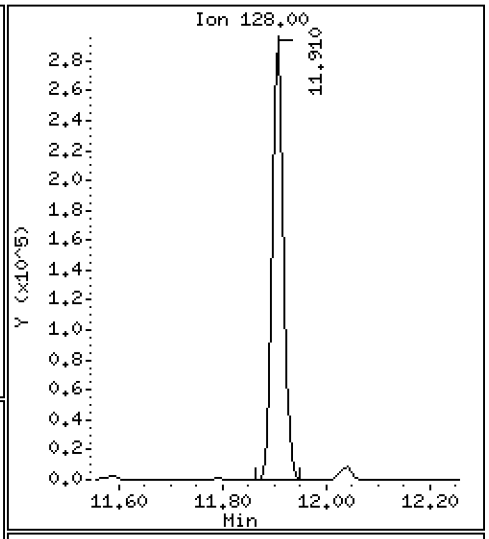
Concentration: 4.991 ug/mL

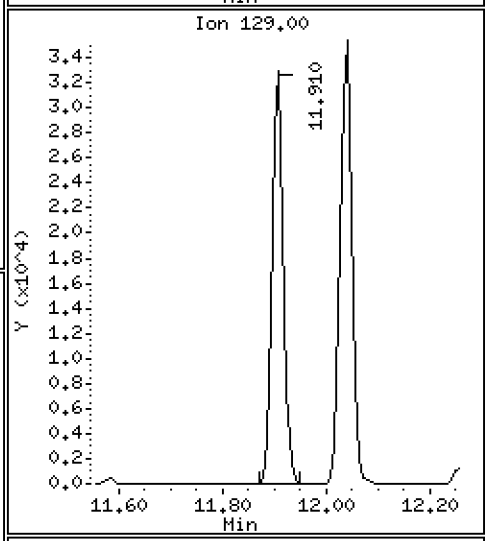


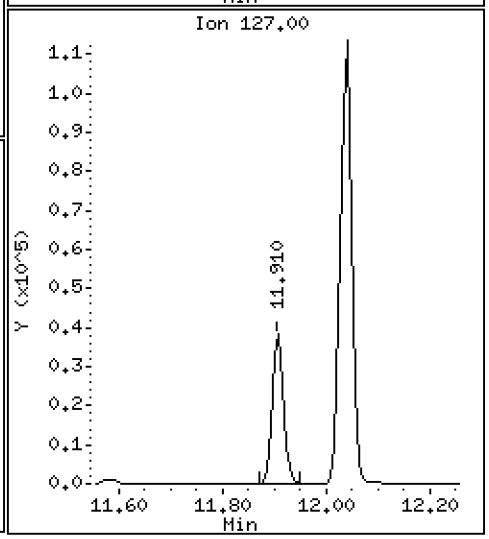












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

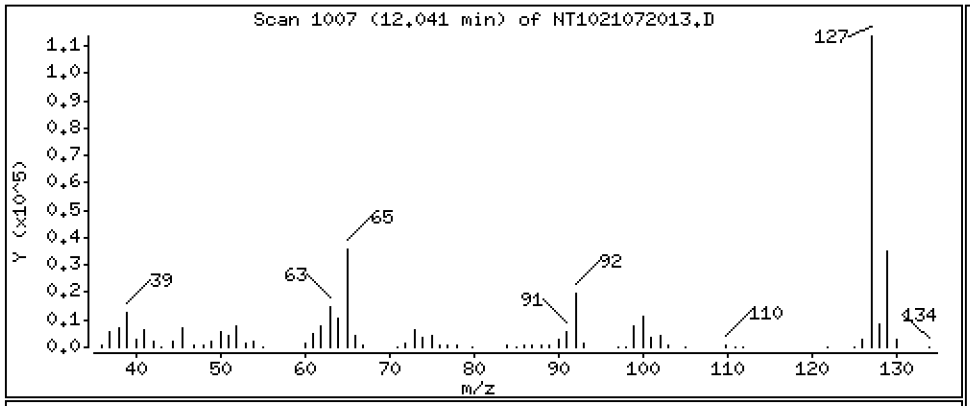
Operator: VTS

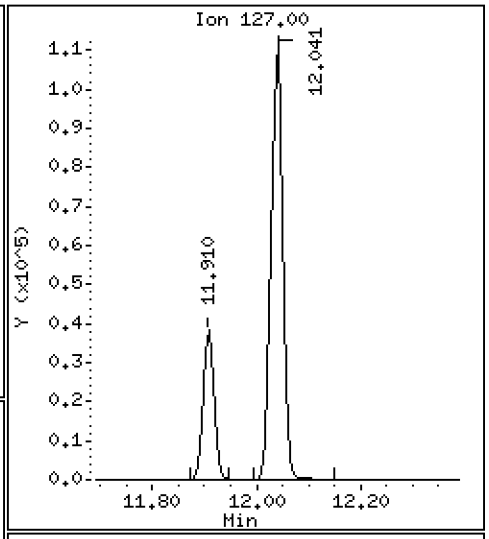
Column phase: ZB-5msi

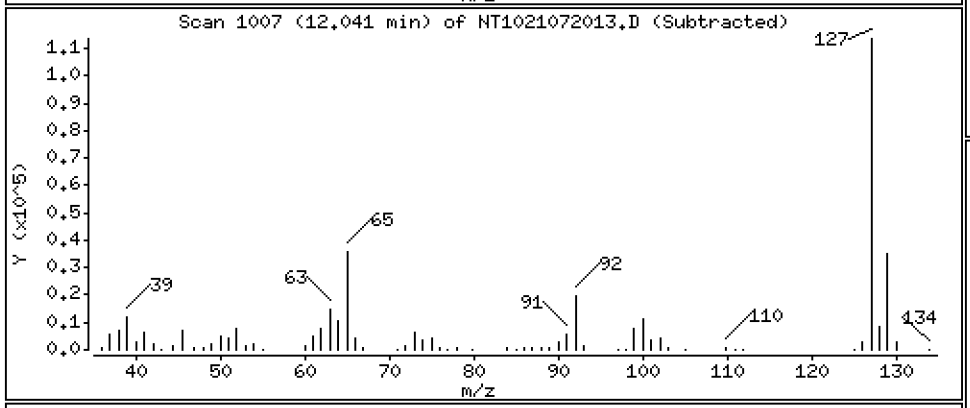
Column diameter: 0.25

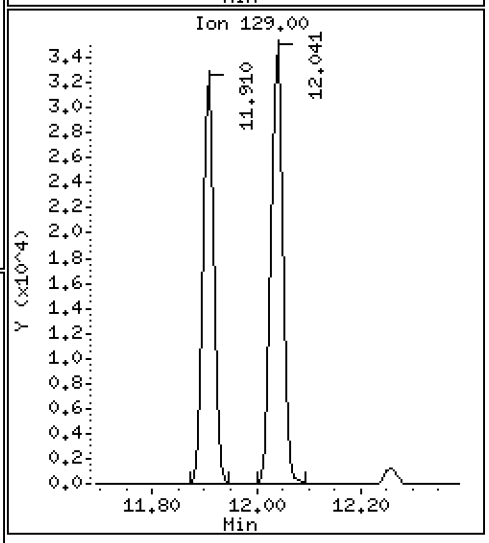
29 4-Chloroaniline

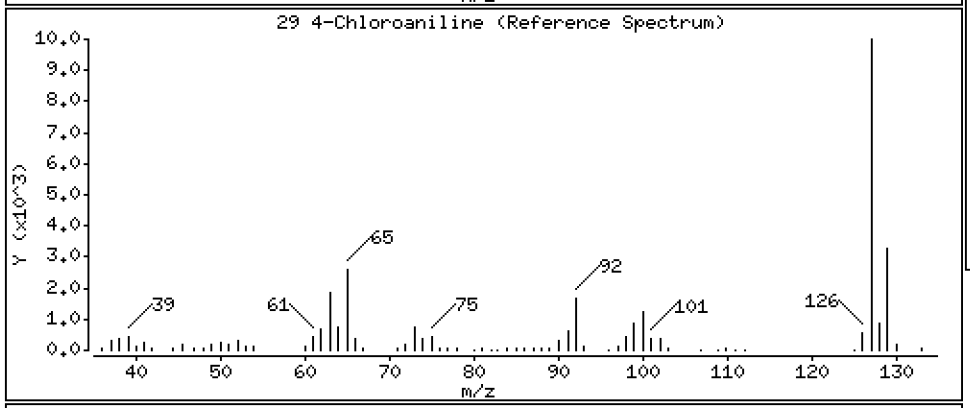
Concentration: 4.141 ug/mL

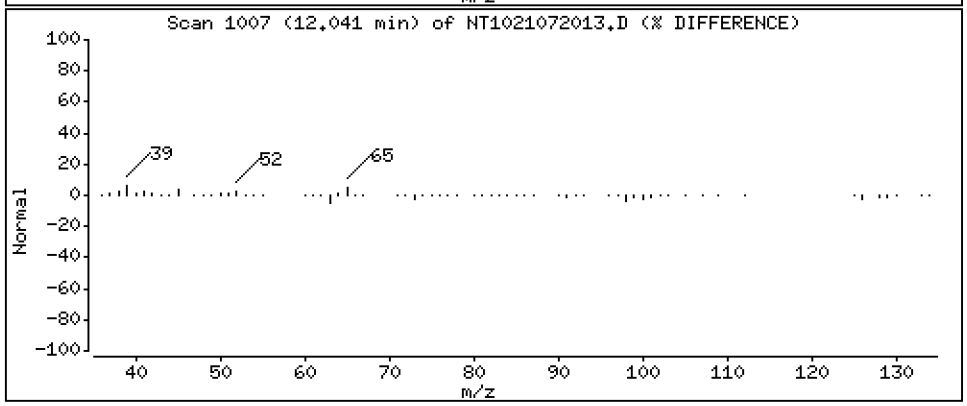












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

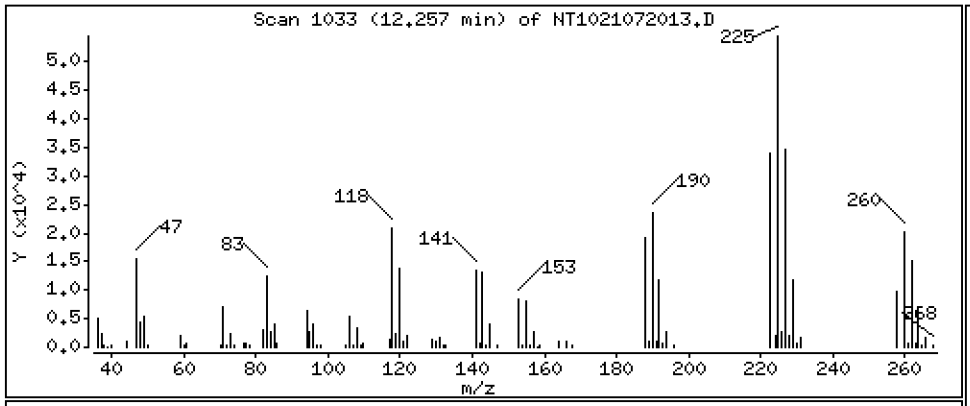
Operator: VTS

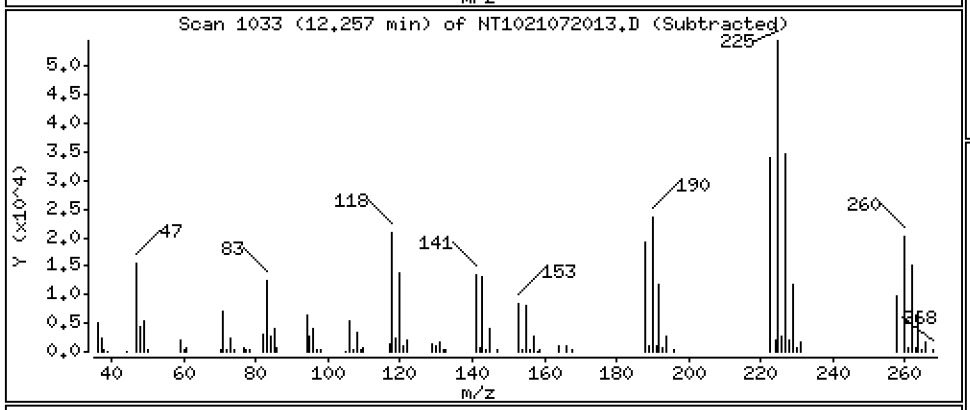
Column phase: ZB-5msi

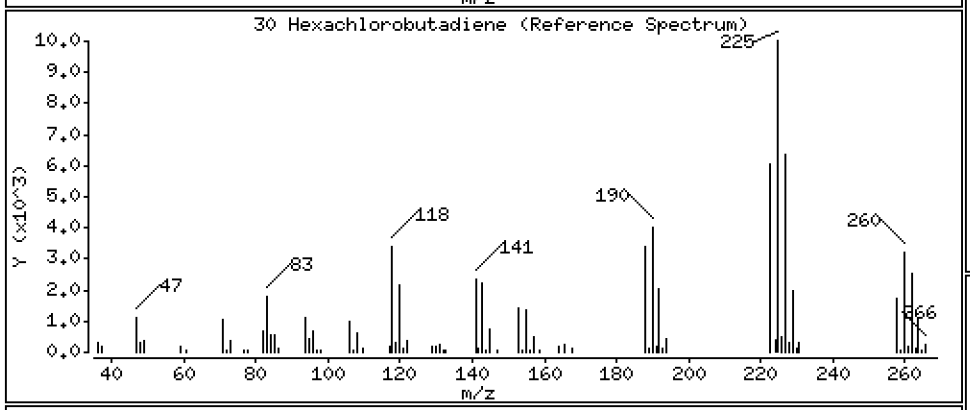
Column diameter: 0.25

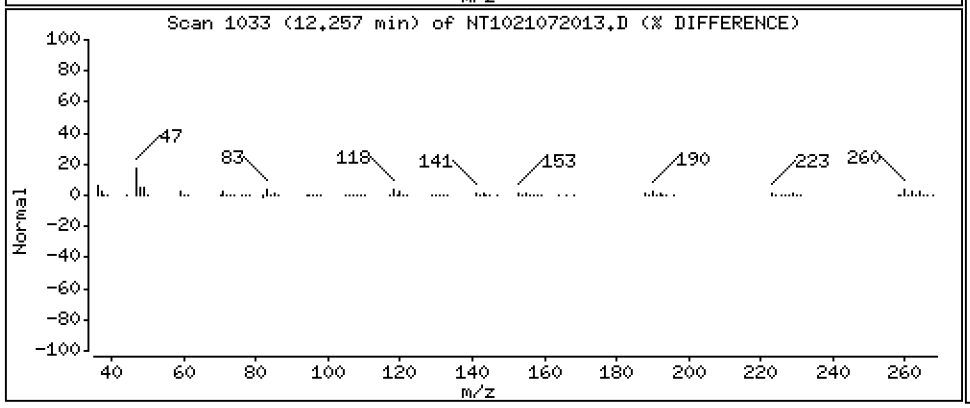
30 Hexachlorobutadiene

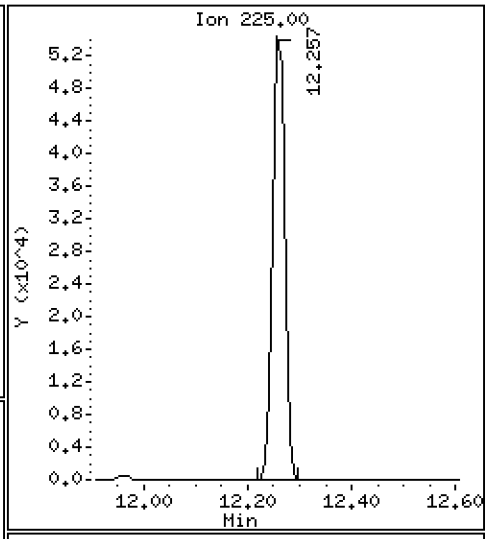
Concentration: 4.966 ug/mL

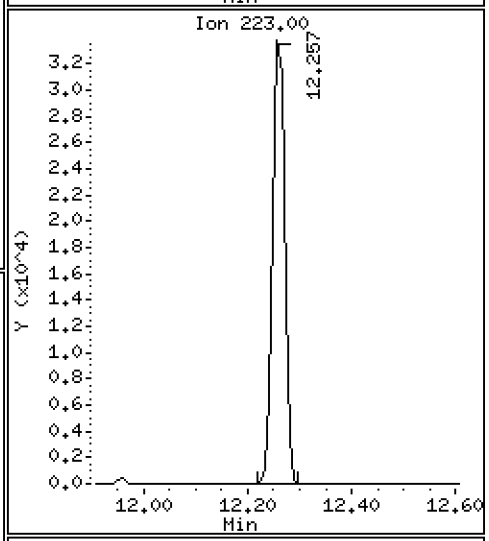


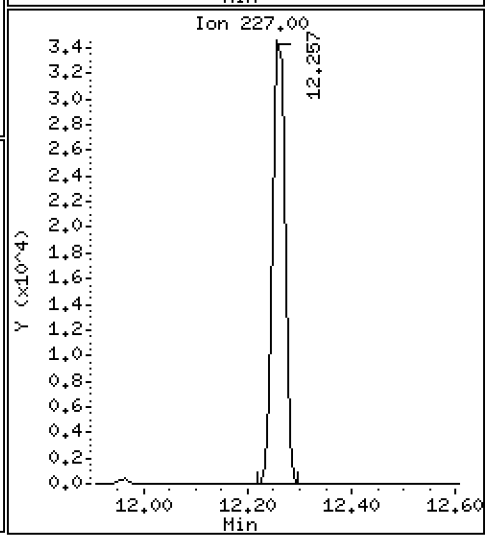












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

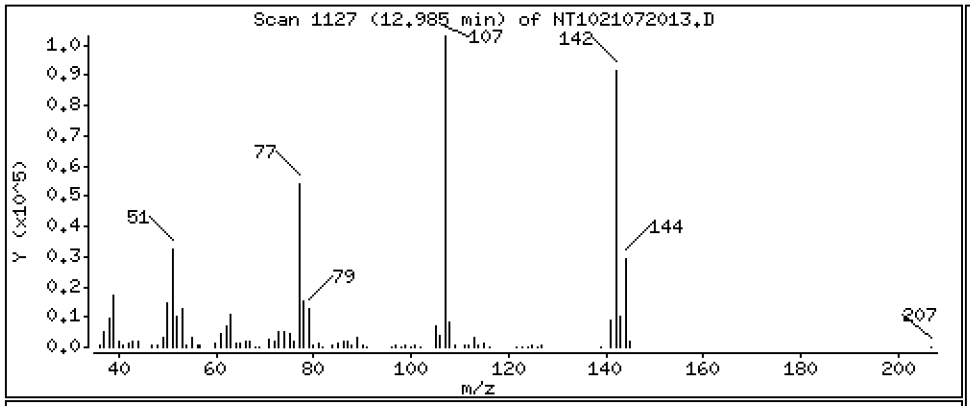
Operator: VTS

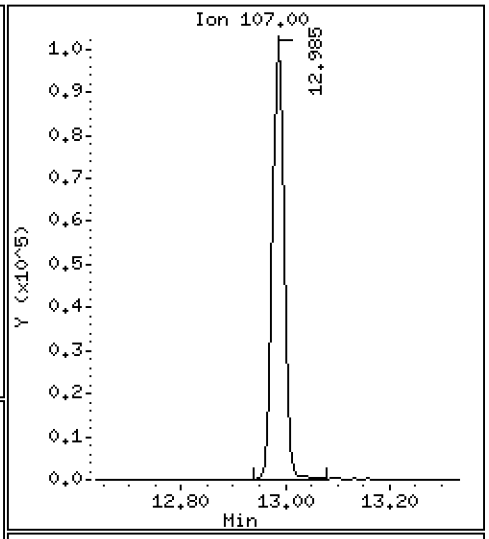
Column phase: ZB-5msi

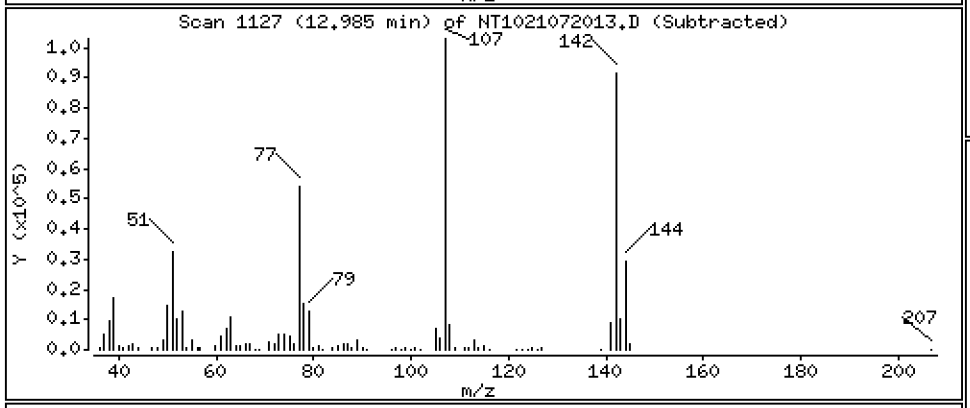
Column diameter: 0.25

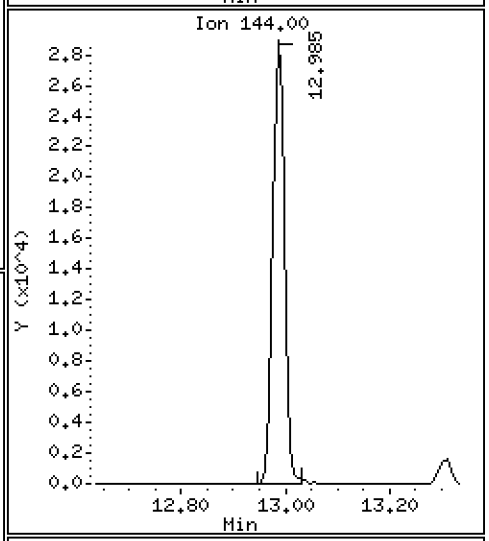
31 4-Chloro-3-methylphenol

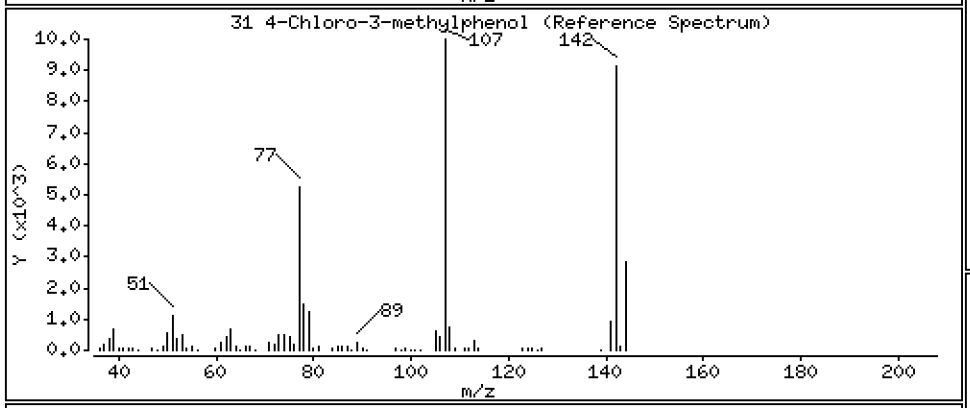
Concentration: 4.652 ug/mL

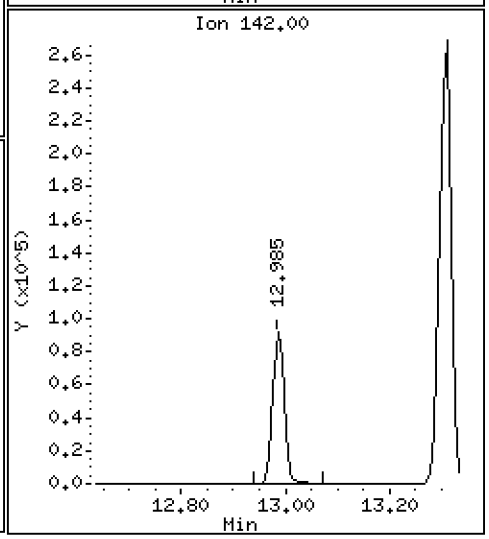


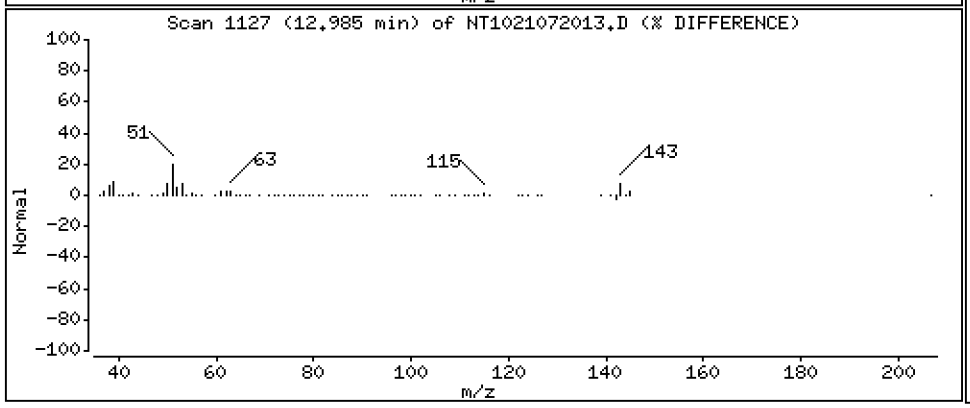












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

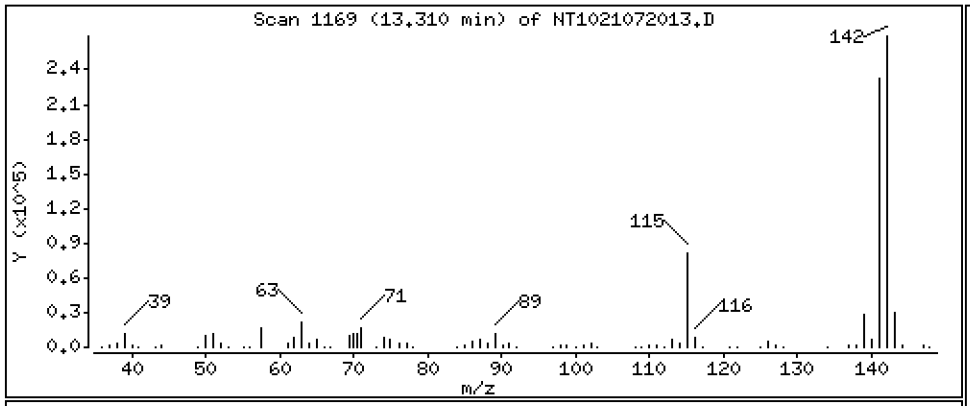
Operator: VTS

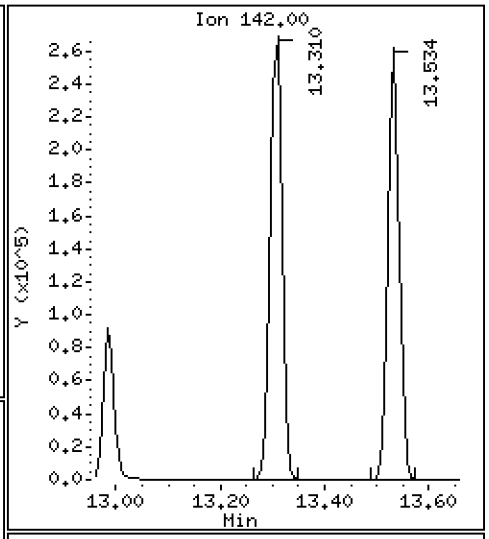
Column phase: ZB-5msi

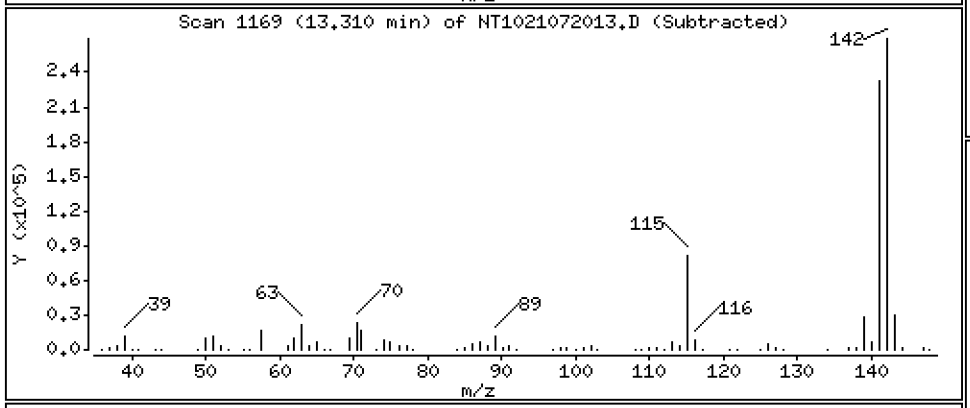
Column diameter: 0.25

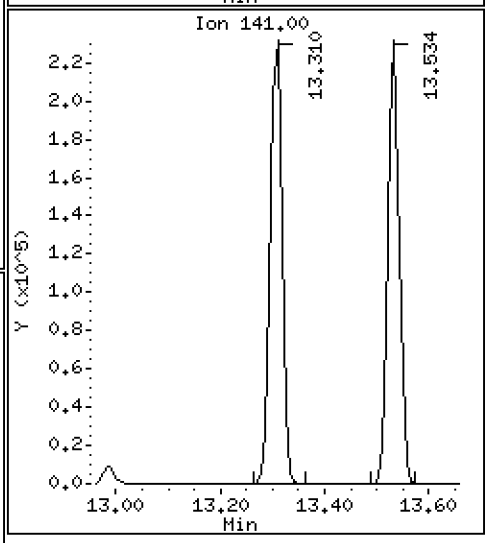
32 2-Methylnaphthalene

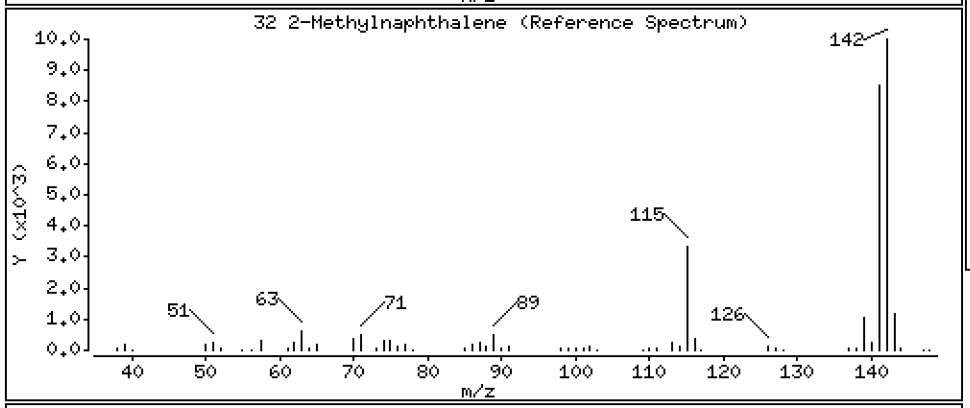
Concentration: 4.782 ug/mL

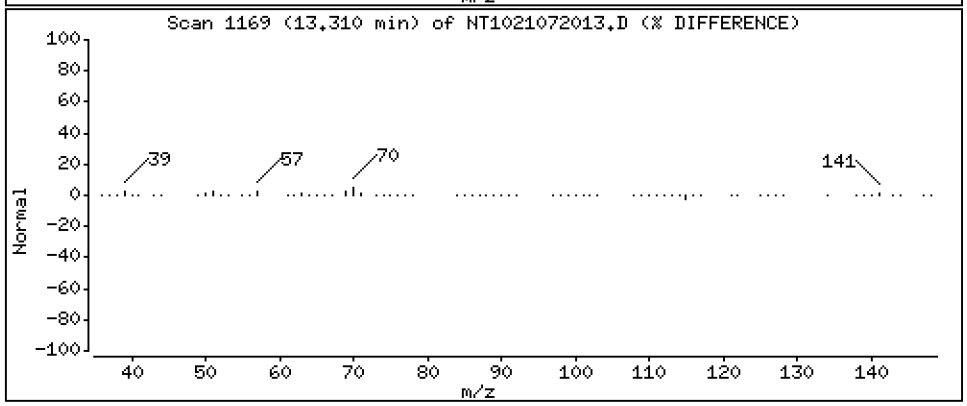












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

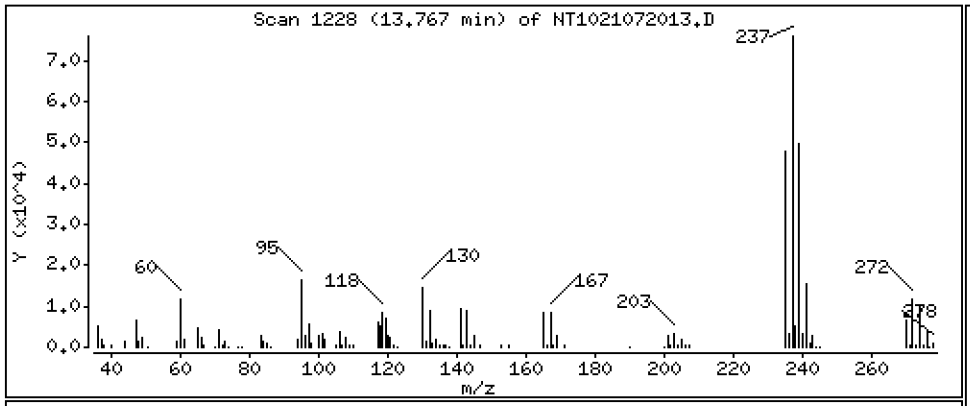
Operator: VTS

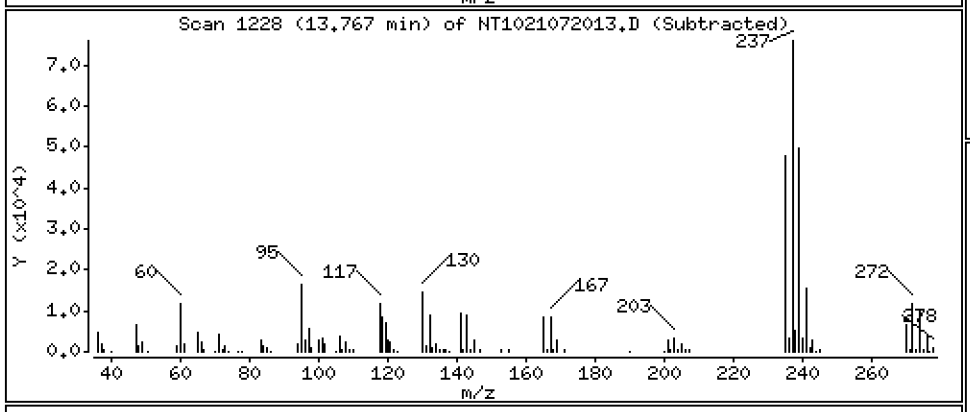
Column phase: ZB-5msi

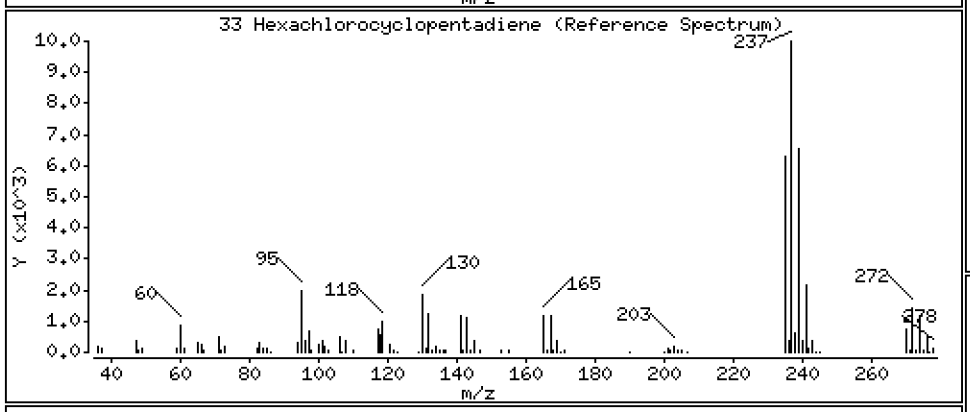
Column diameter: 0.25

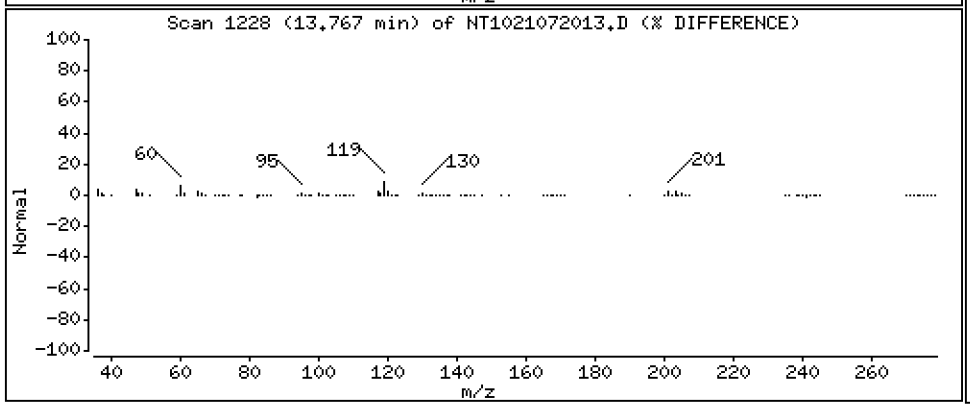
33 Hexachlorocyclopentadiene

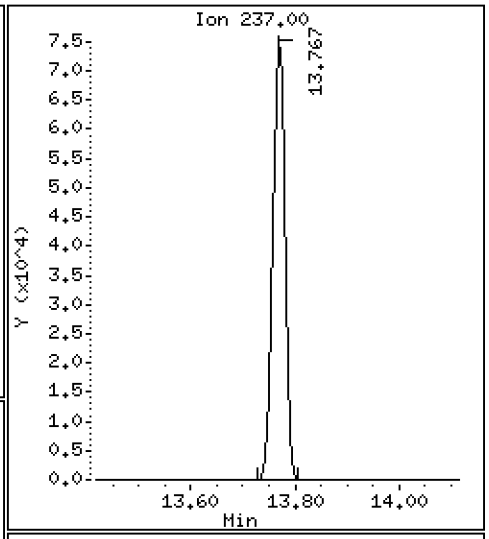
Concentration: 5.671 ug/mL

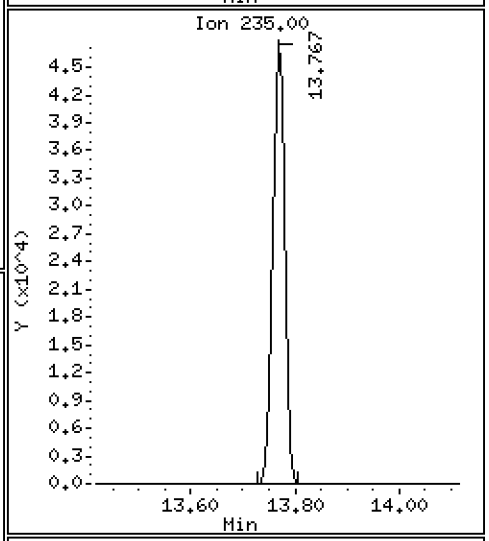


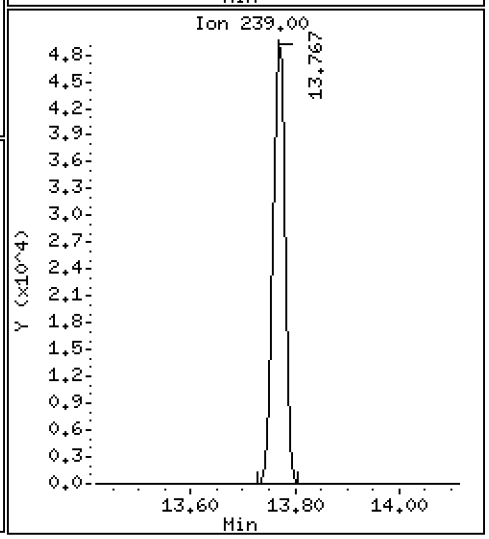












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

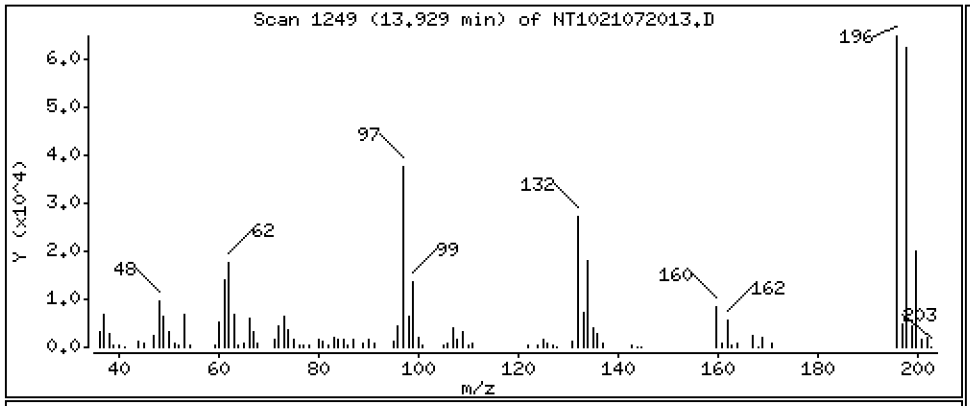
Operator: VTS

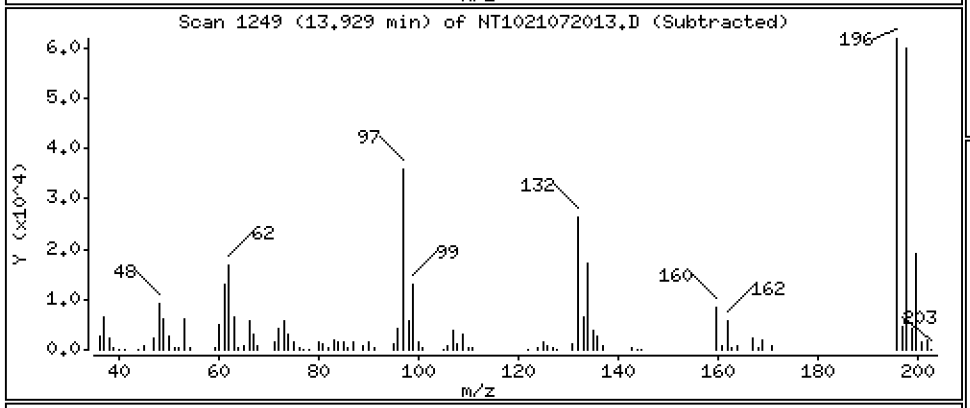
Column phase: ZB-5msi

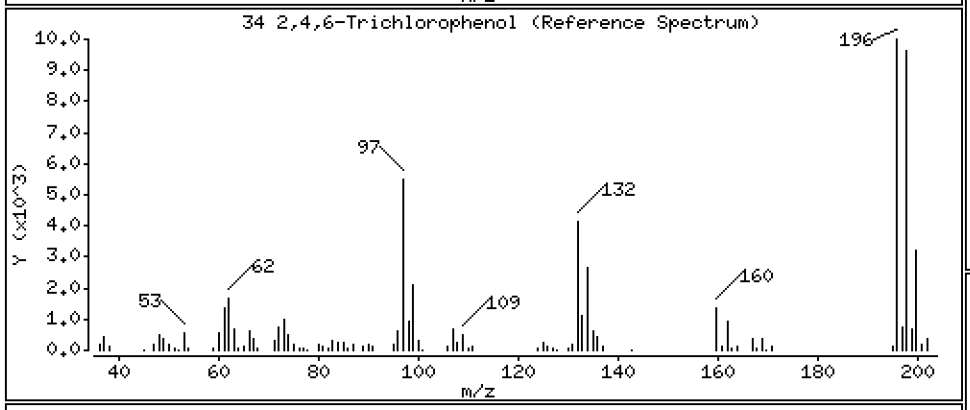
Column diameter: 0.25

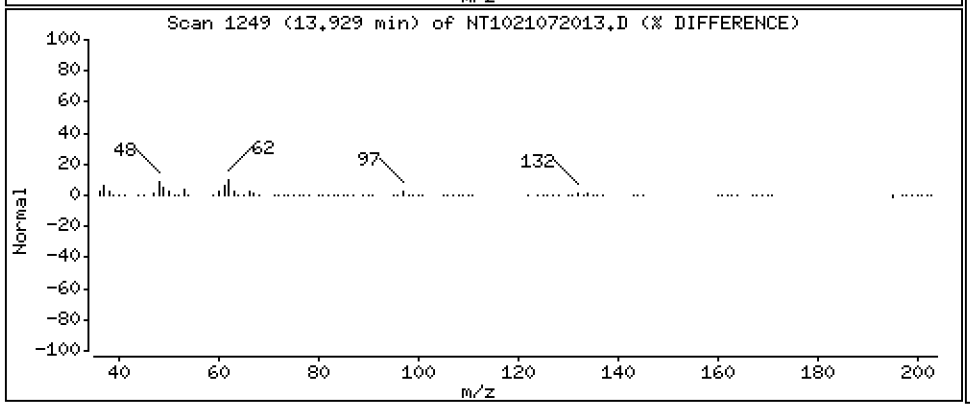
34 2,4,6-Trichlorophenol

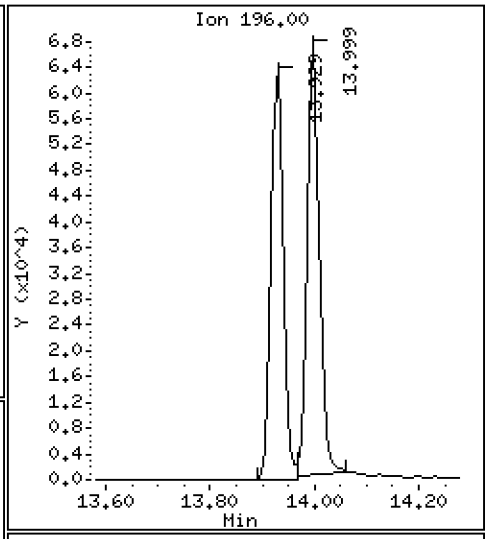
Concentration: 4.713 ug/mL

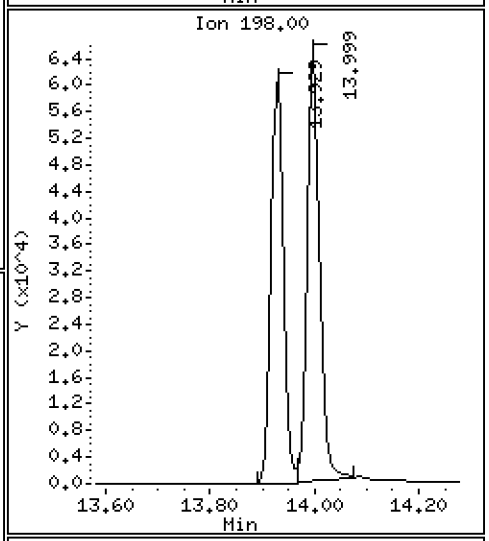


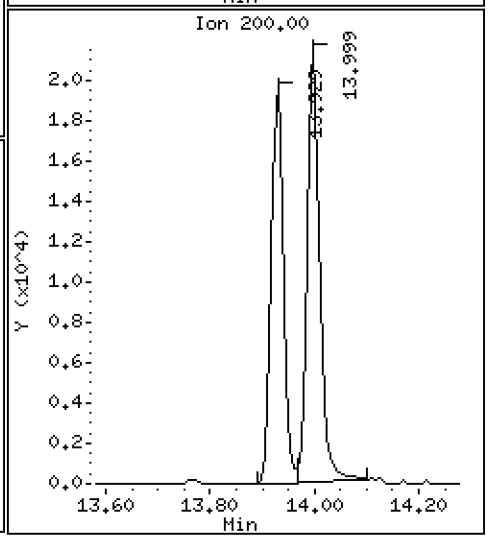












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

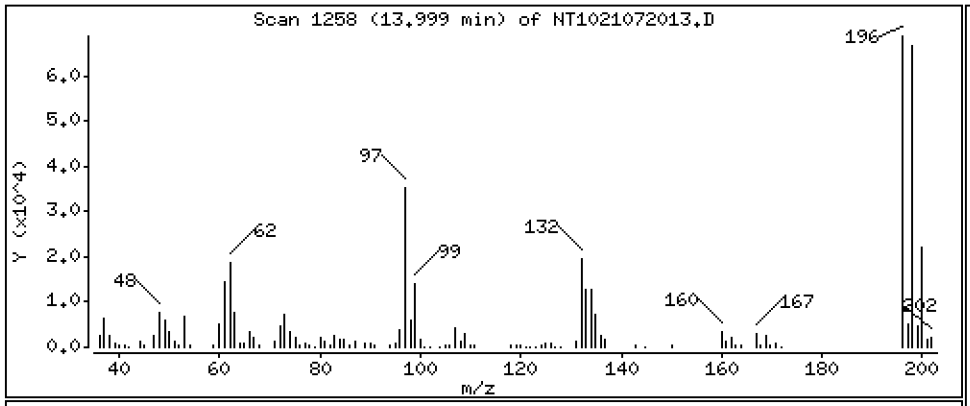
Operator: VTS

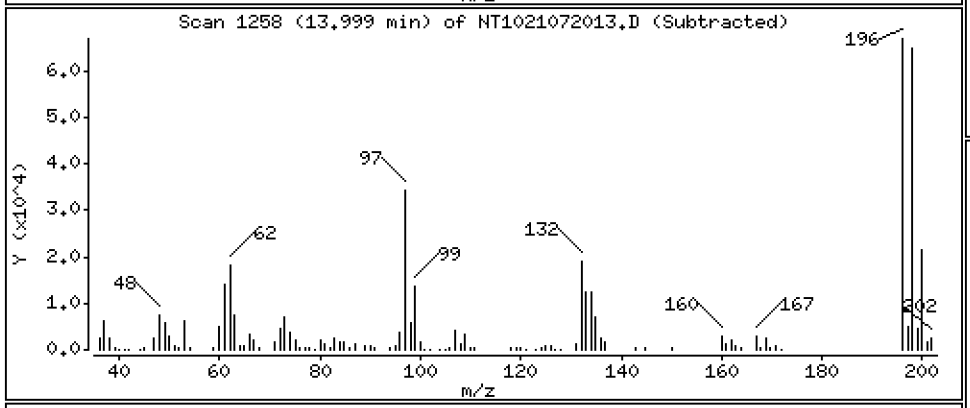
Column phase: ZB-5msi

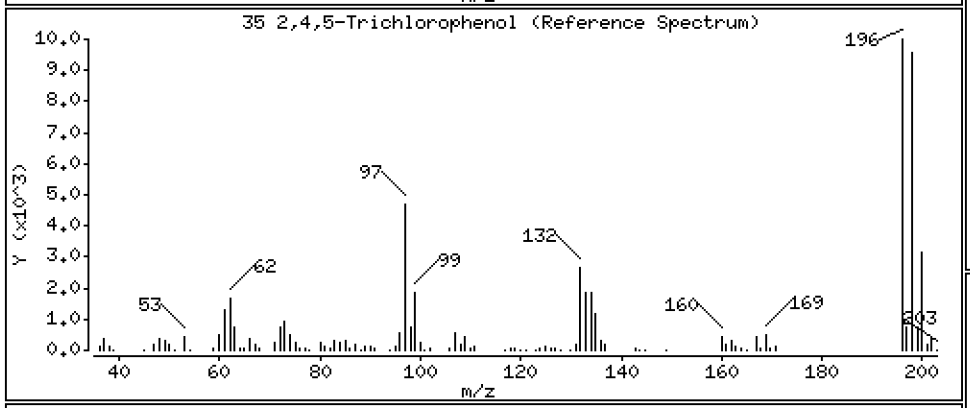
Column diameter: 0.25

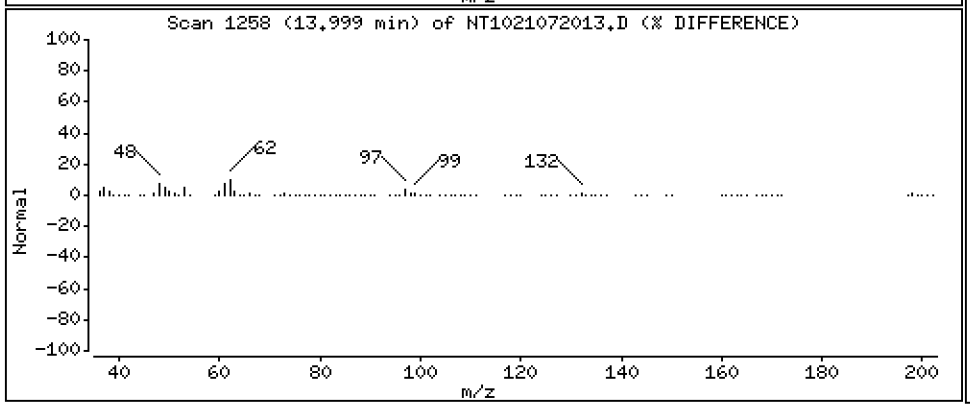
35 2,4,5-Trichlorophenol

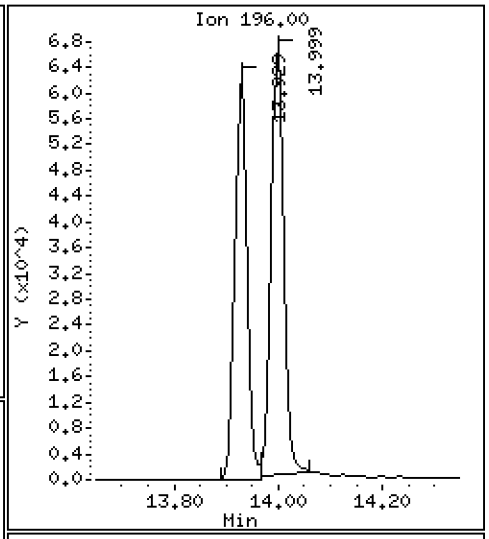
Concentration: 4.721 ug/mL

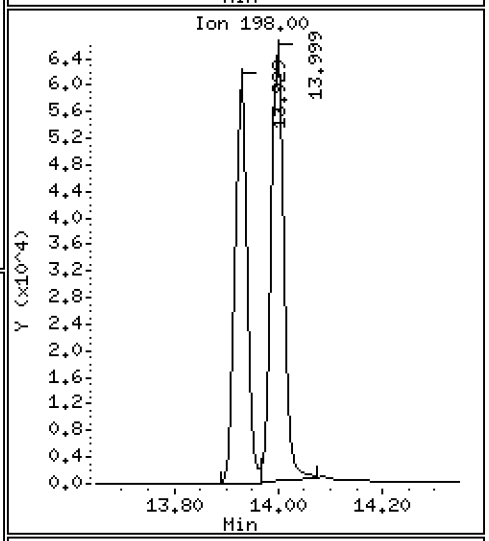


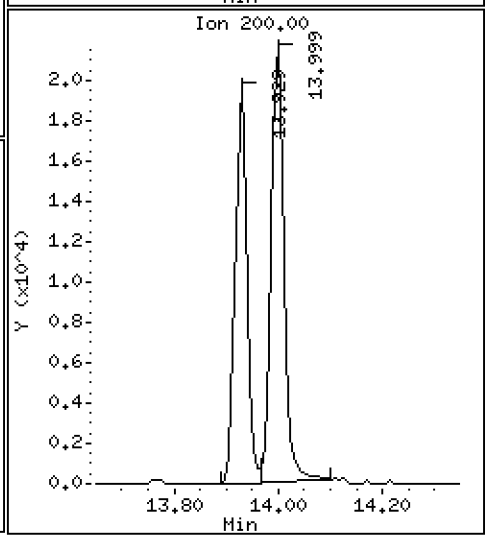












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

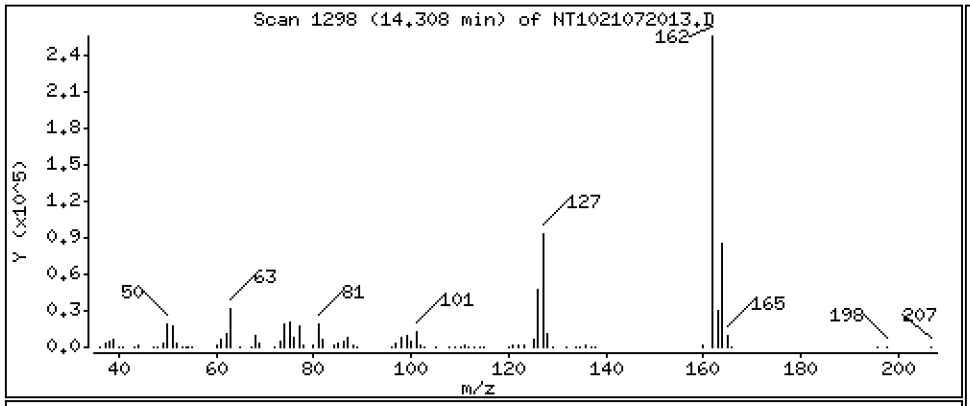
Operator: VTS

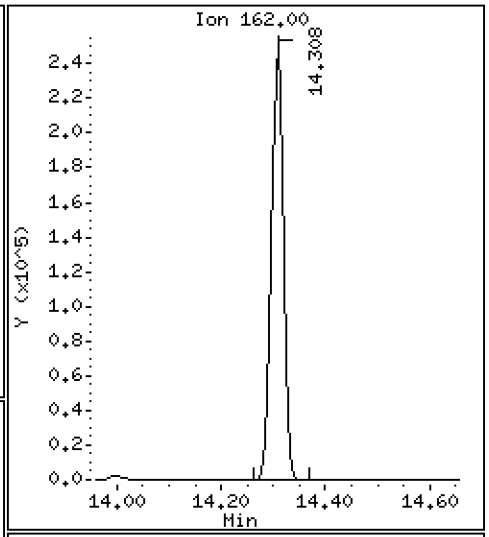
Column phase: ZB-5msi

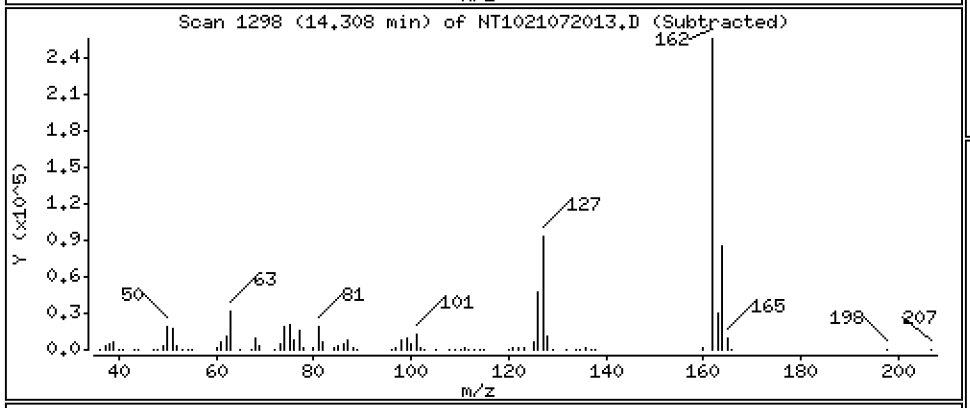
Column diameter: 0.25

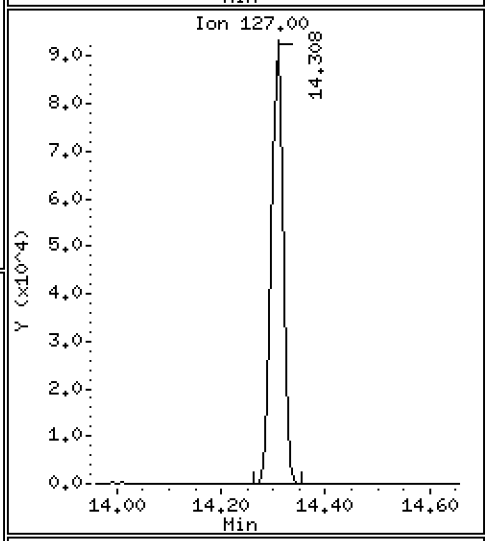
37 2-Chloronaphthalene

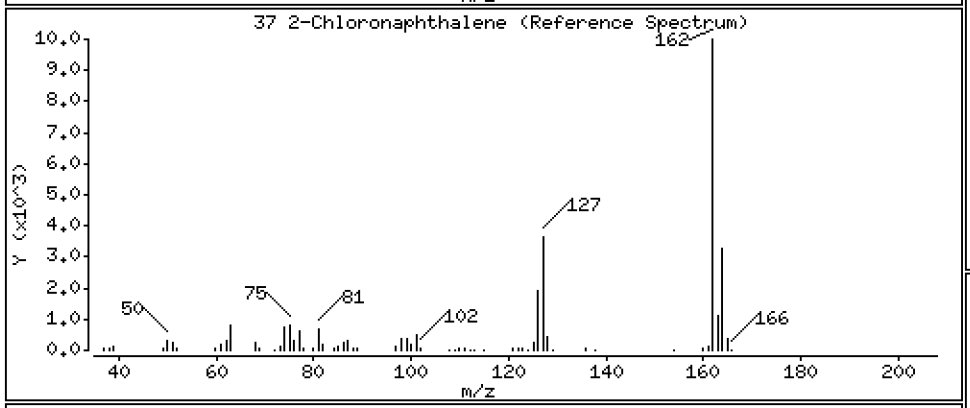
Concentration: 5.085 ug/mL

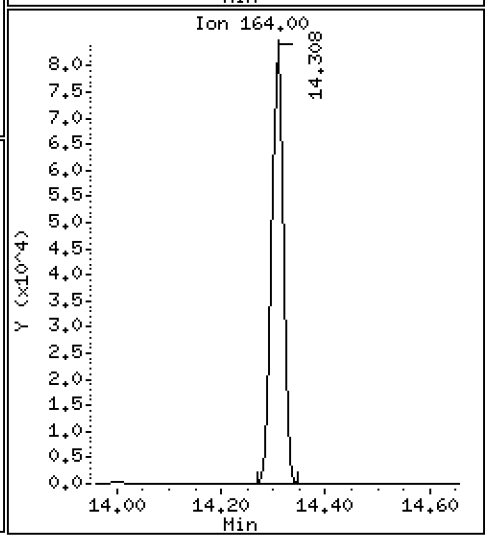


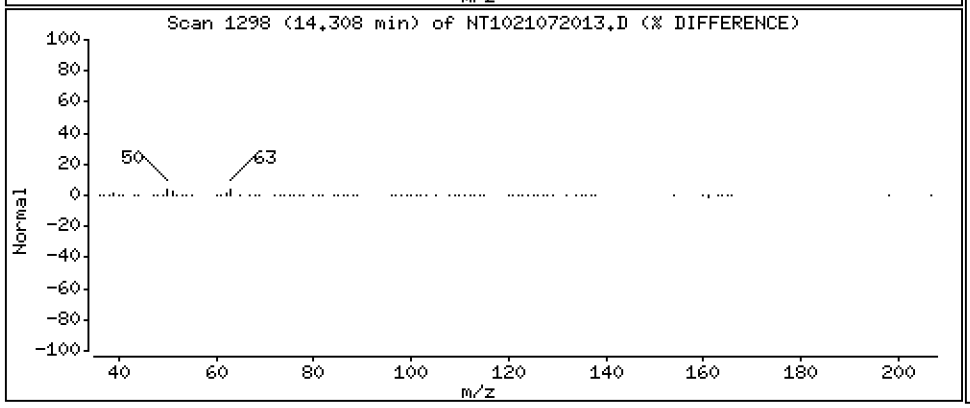












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

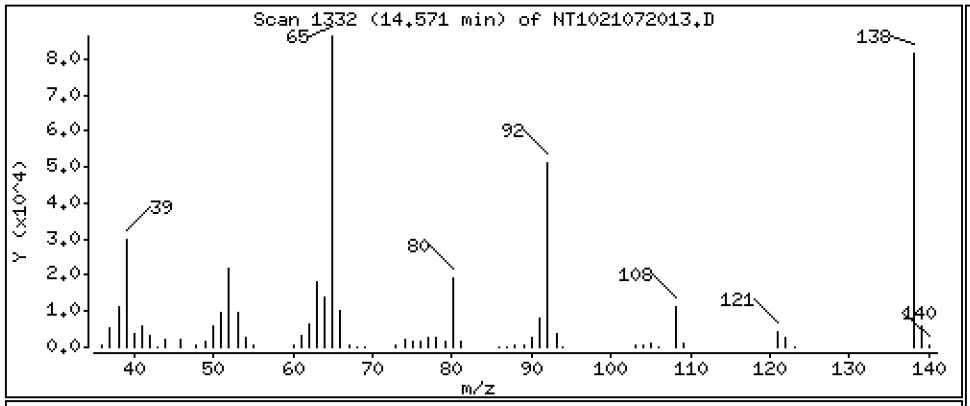
Operator: VTS

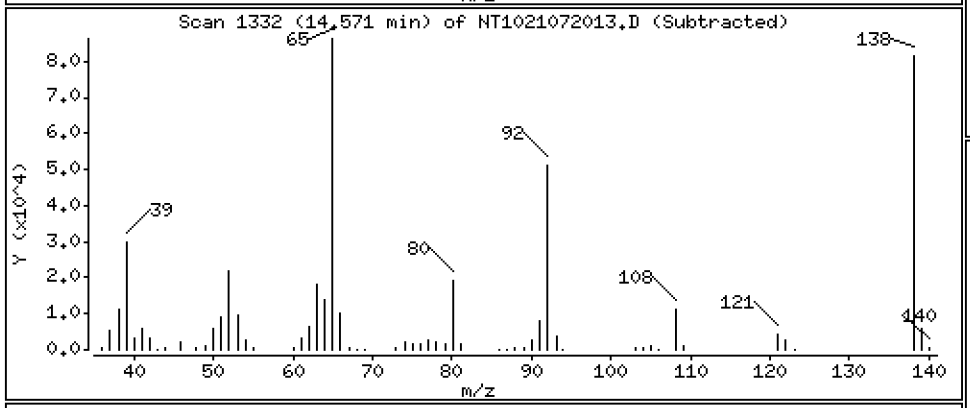
Column phase: ZB-5msi

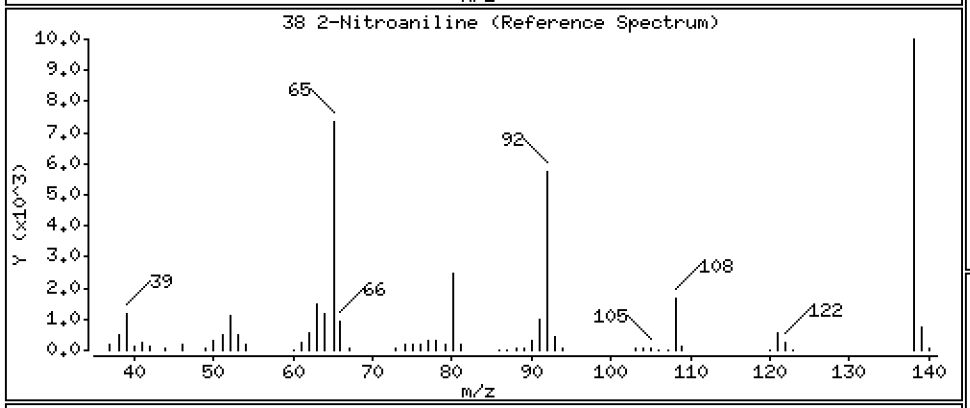
Column diameter: 0.25

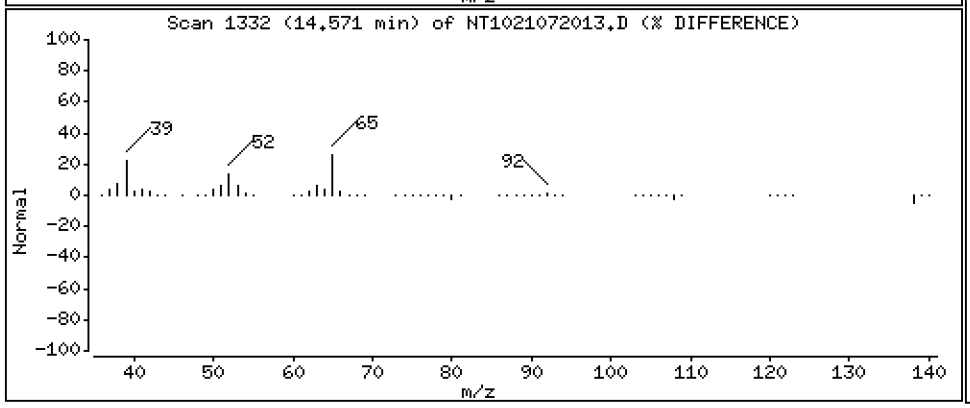
38 2-Nitroaniline

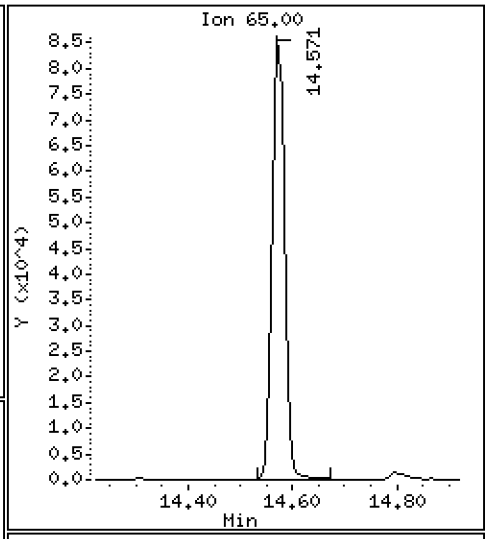
Concentration: 4.848 ug/mL

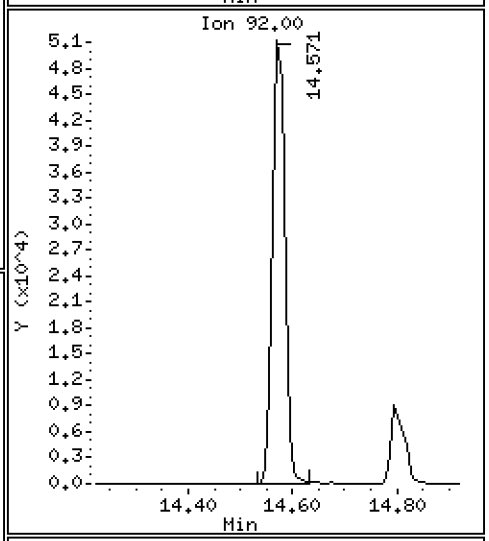


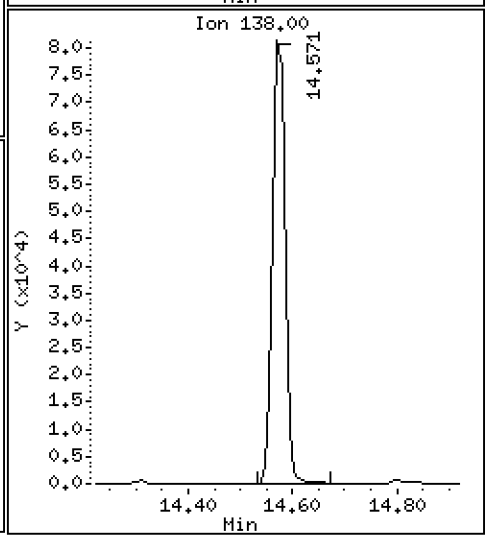












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

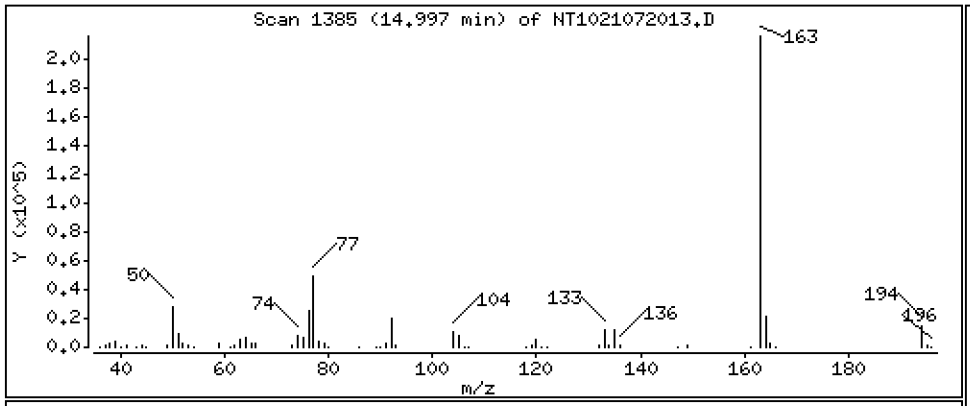
Operator: VTS

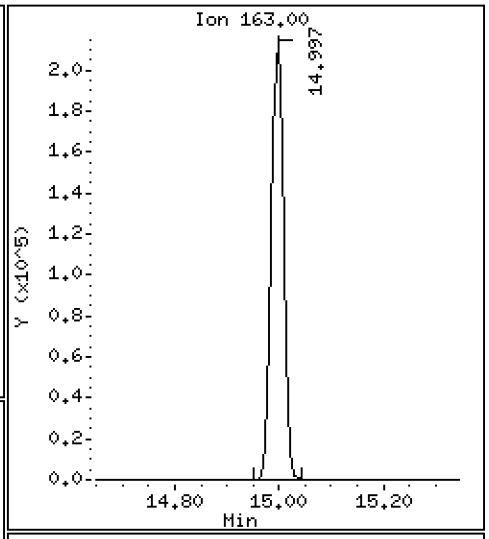
Column phase: ZB-5msi

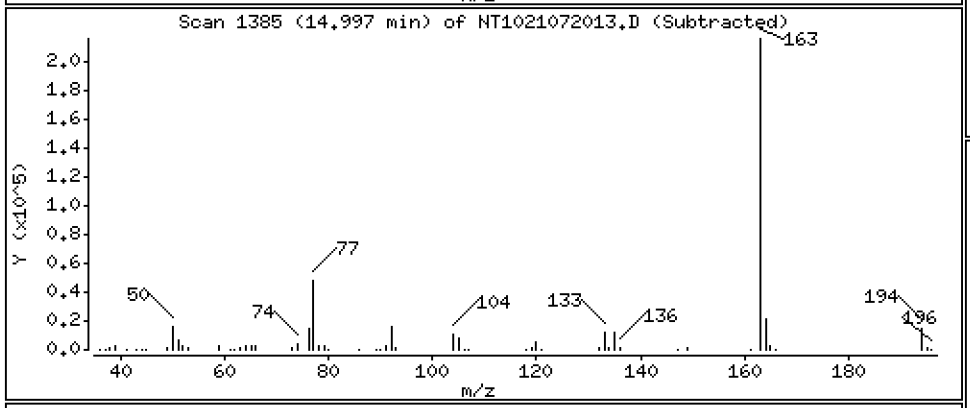
Column diameter: 0.25

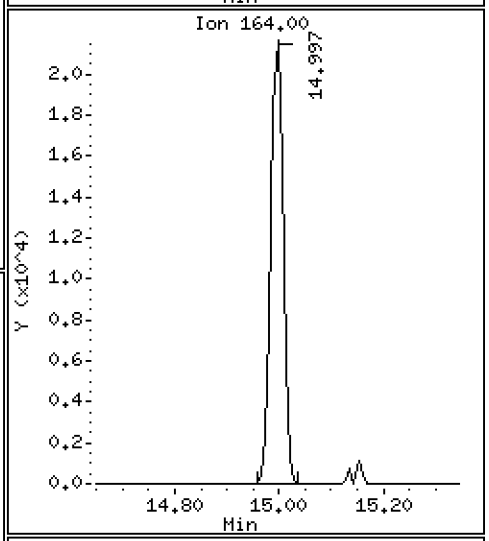
39 Dimethylphthalate

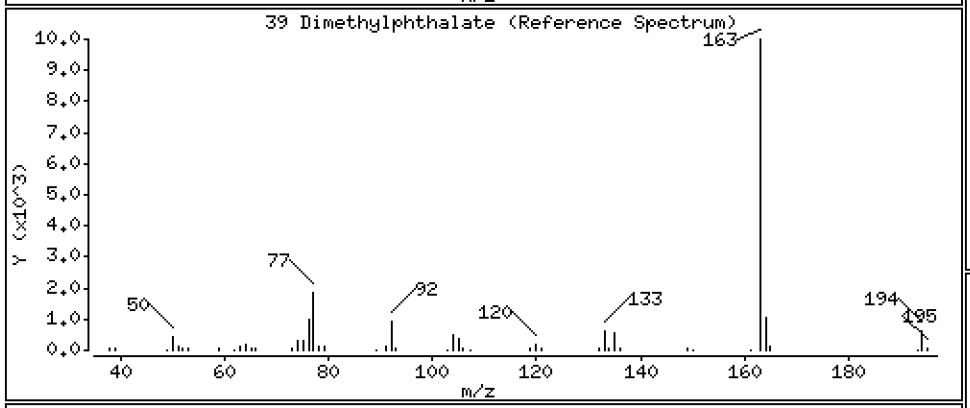
Concentration: 4.656 ug/mL

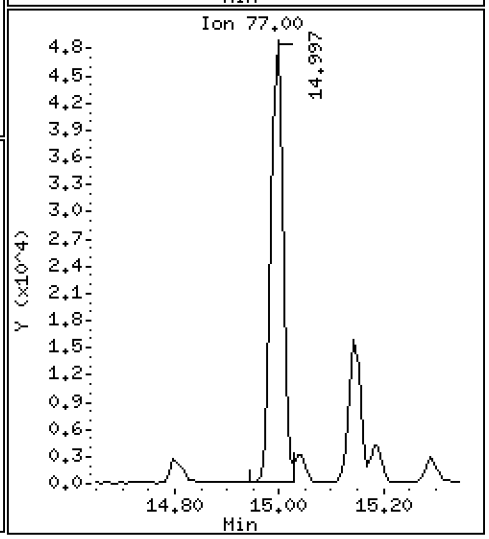


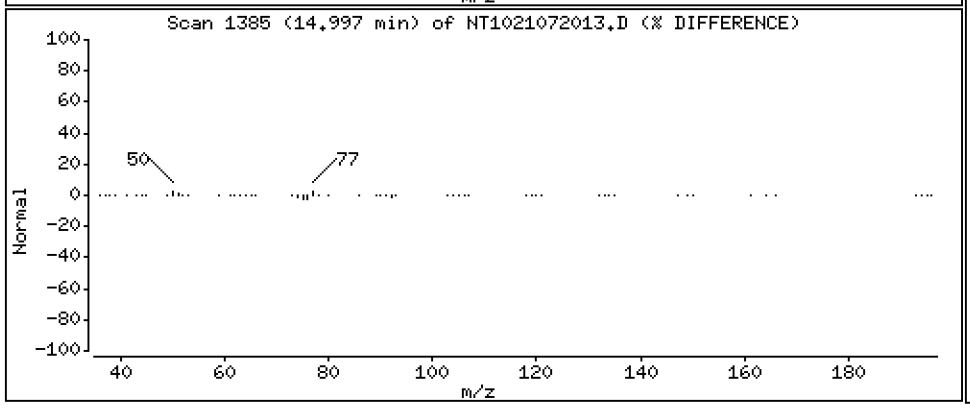












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

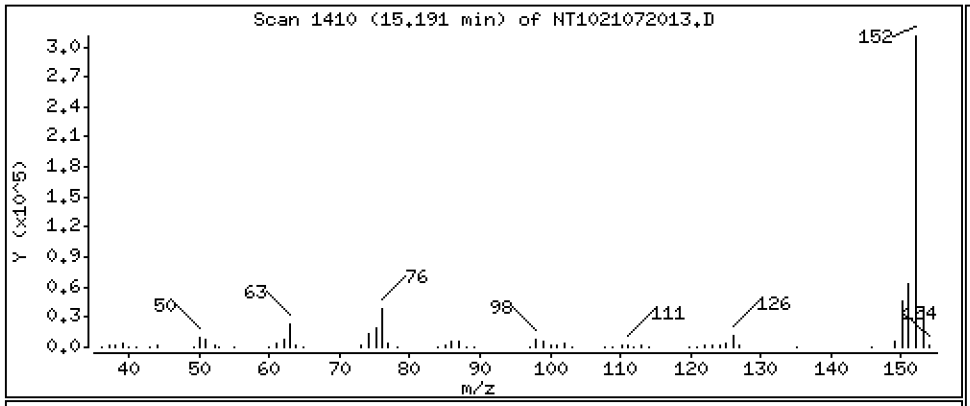
Operator: VTS

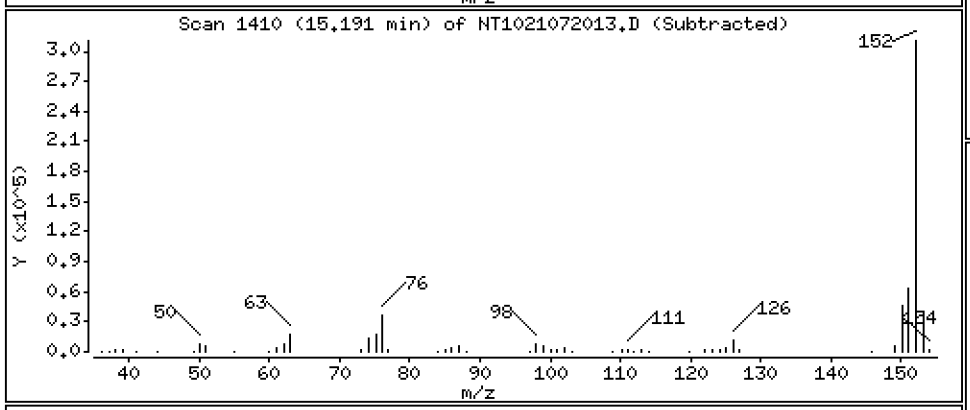
Column phase: ZB-5msi

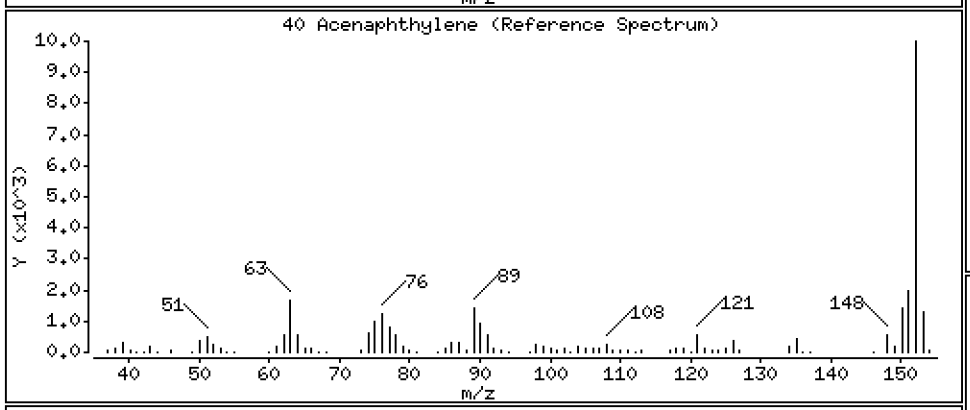
Column diameter: 0.25

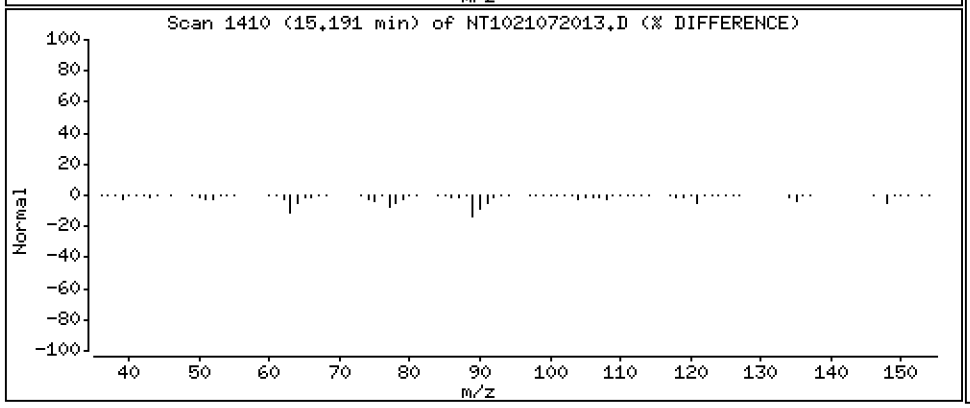
40 Acenaphthylene

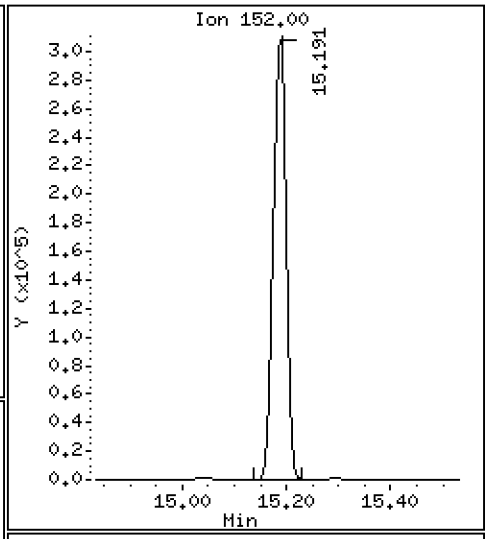
Concentration: 4.846 ug/mL

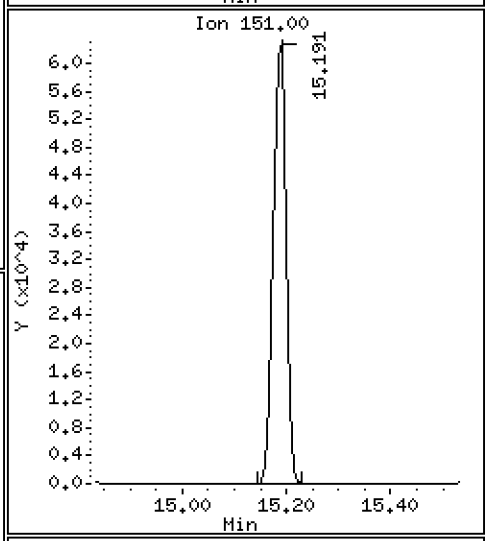


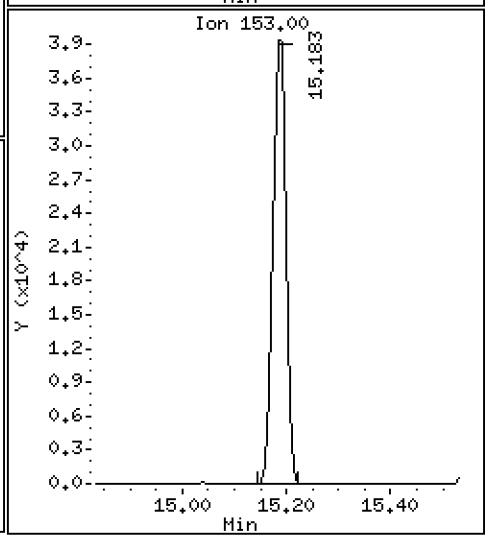












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

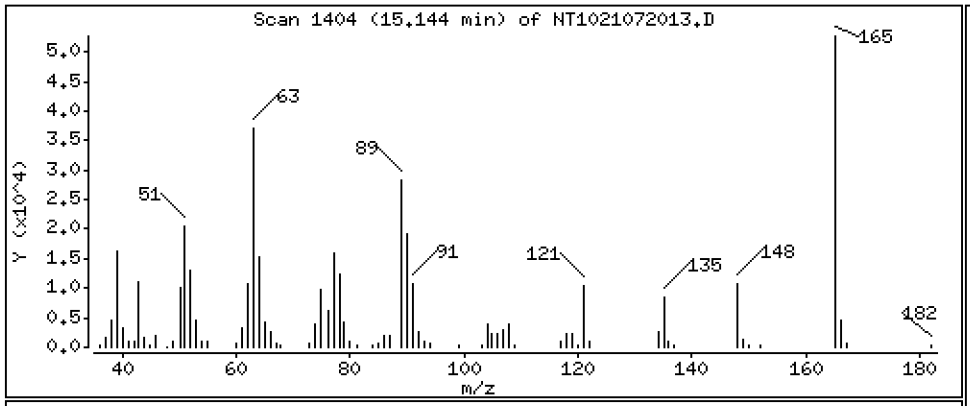
Operator: VTS

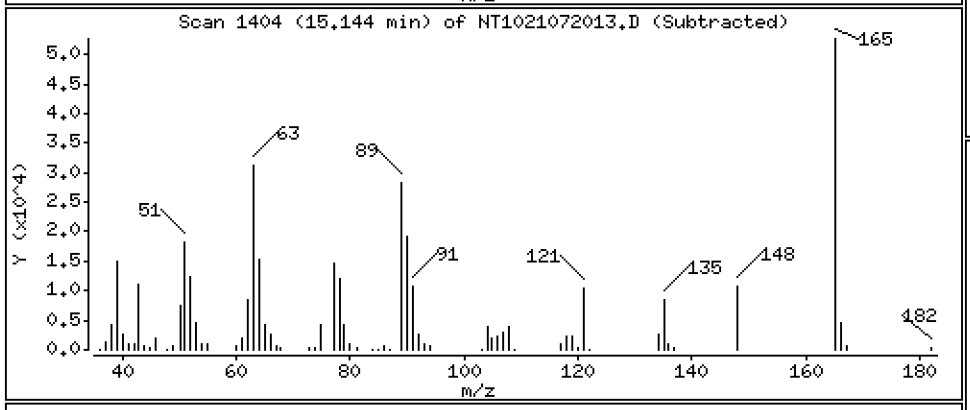
Column phase: ZB-5msi

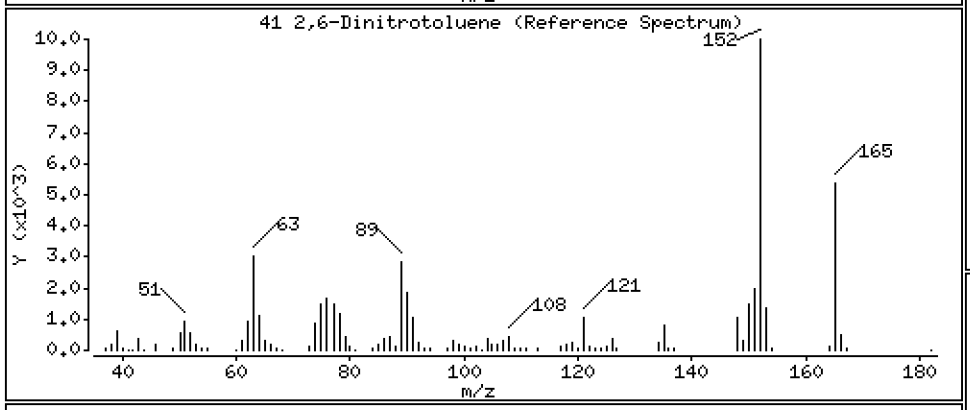
Column diameter: 0.25

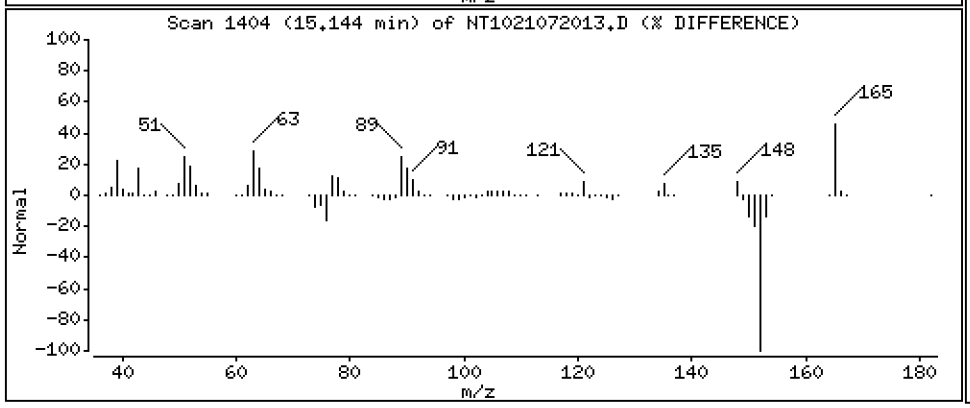
41 2,6-Dinitrotoluene

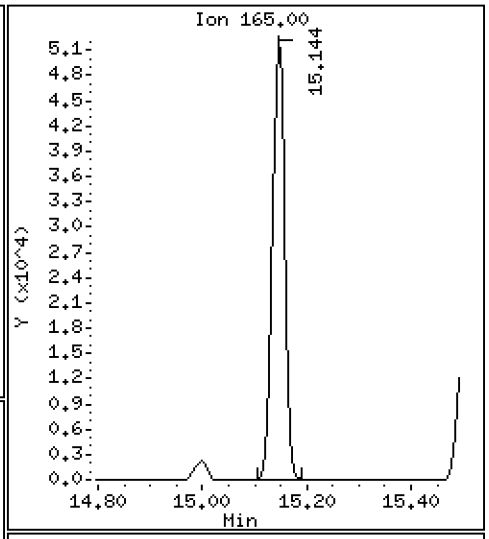
Concentration: 4.973 ug/mL

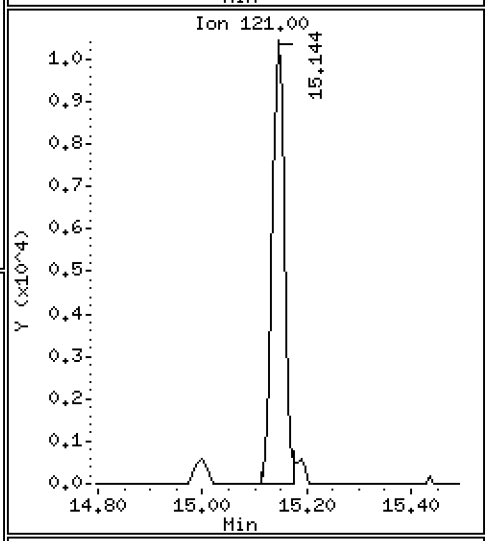


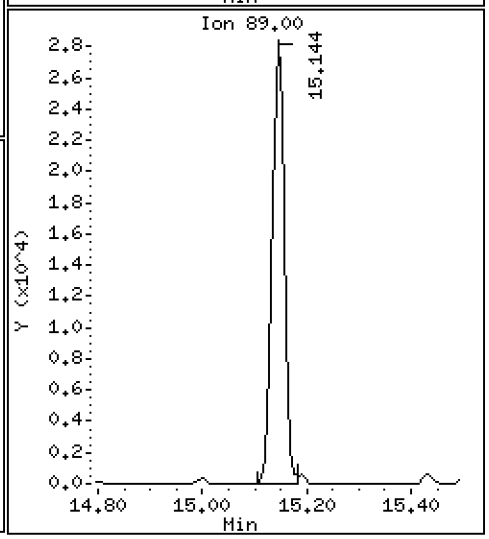












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

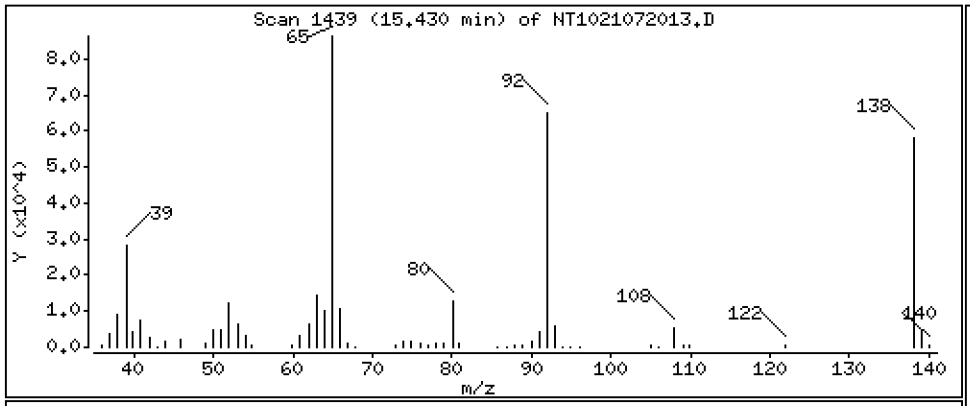
Operator: VTS

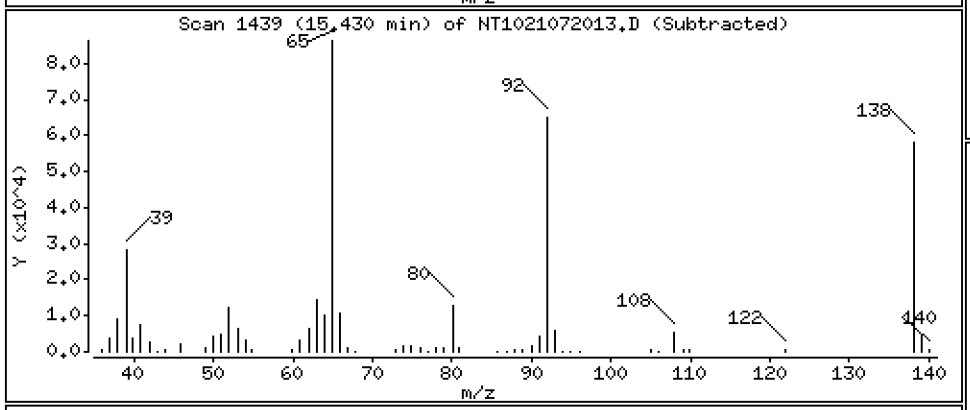
Column phase: ZB-5msi

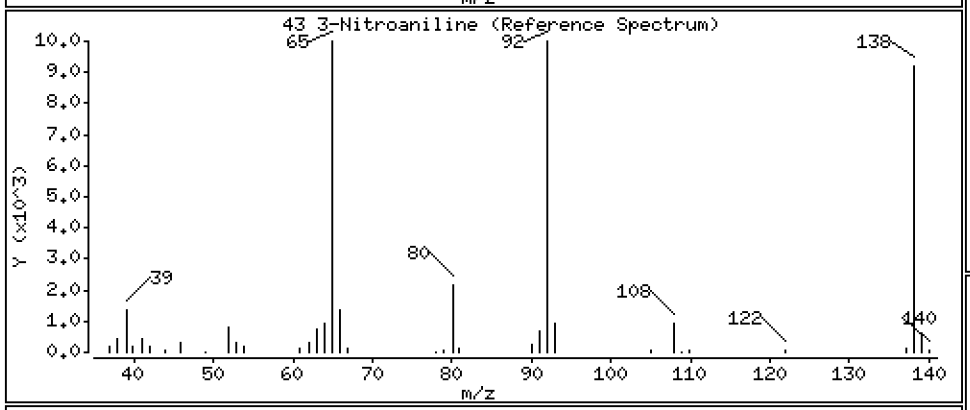
Column diameter: 0.25

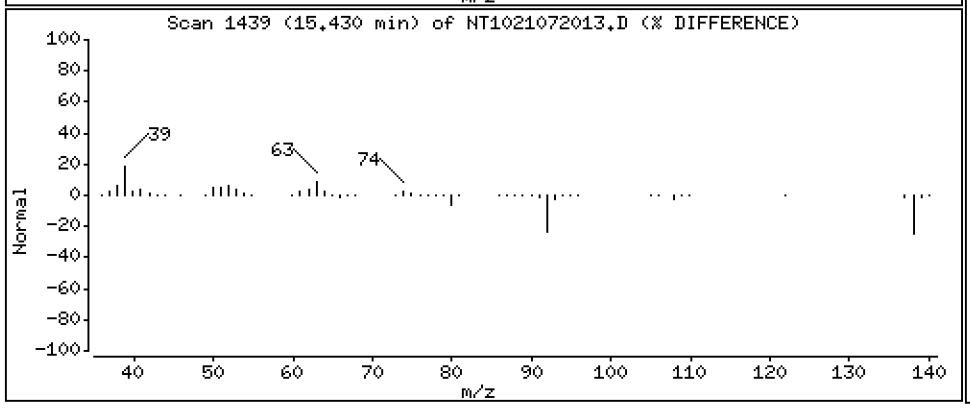
43 3-Nitroaniline

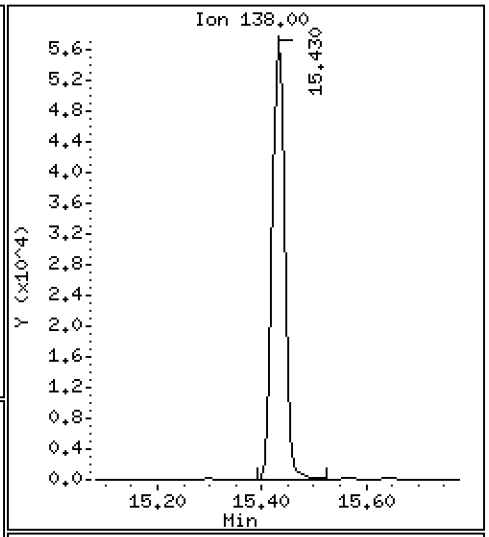
Concentration: 4.557 ug/mL

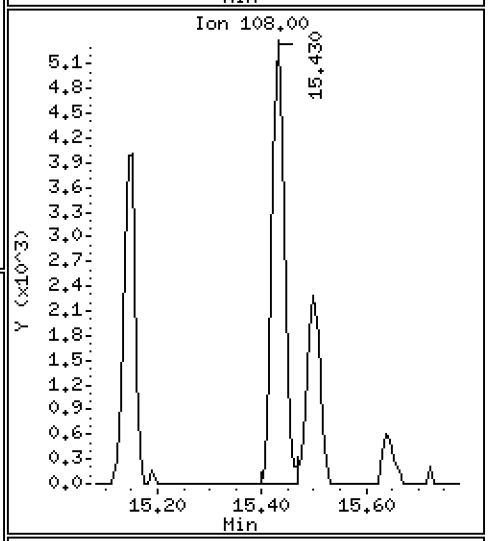


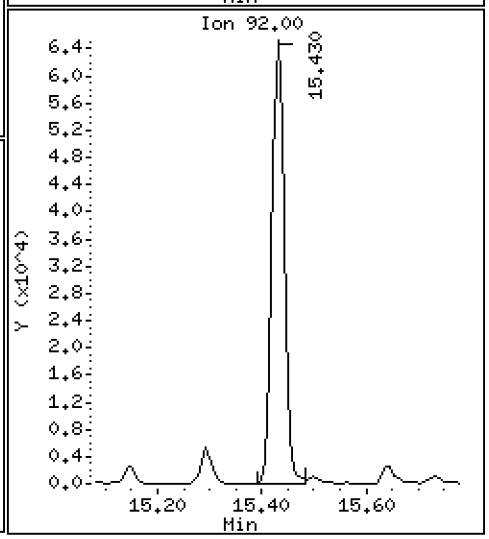












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

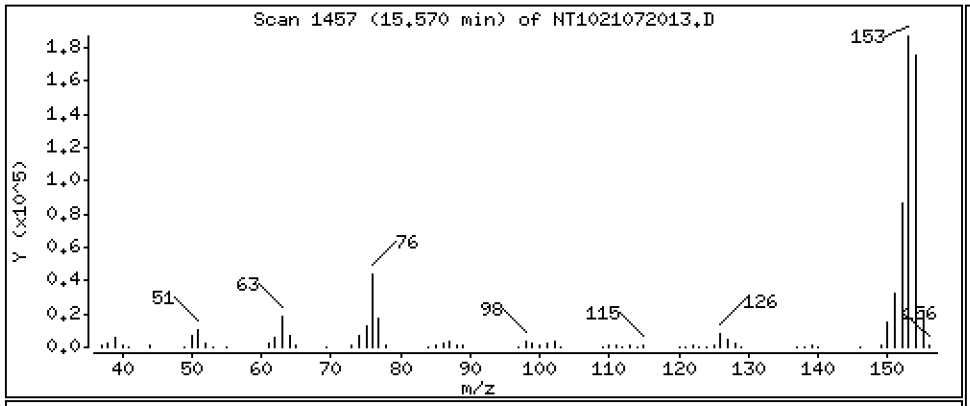
Operator: VTS

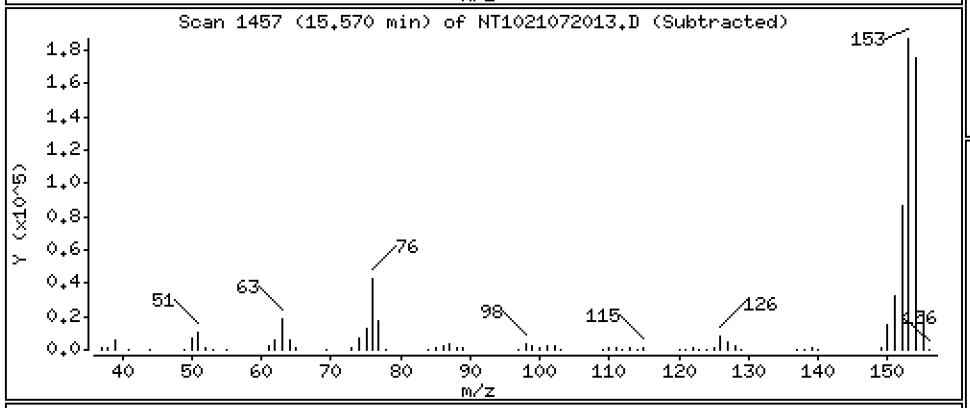
Column phase: ZB-5msi

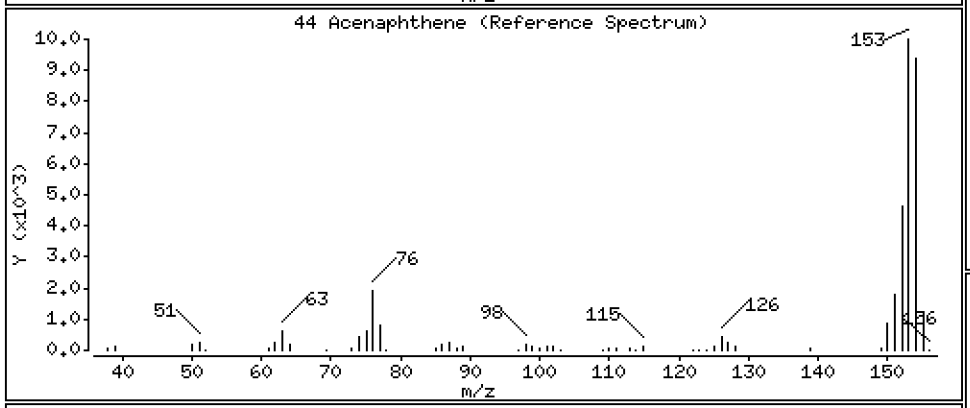
Column diameter: 0.25

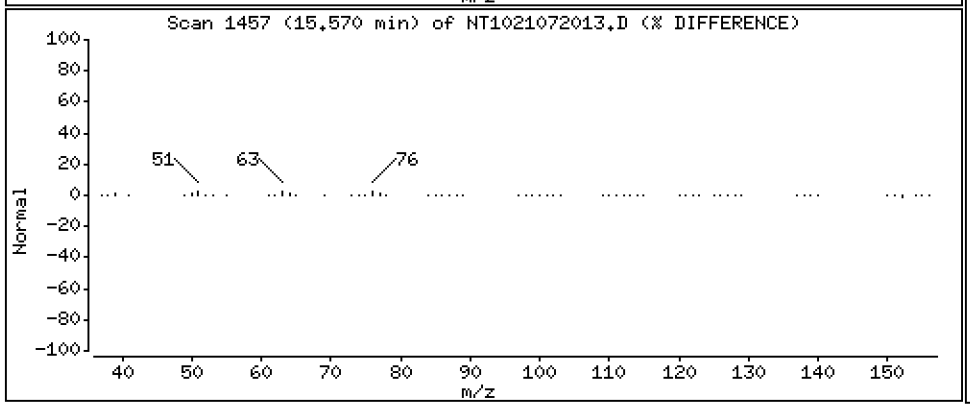
44 Acenaphthene

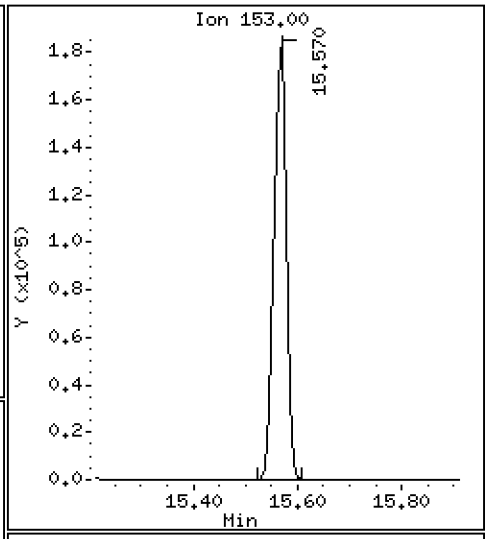
Concentration: 4.792 ug/mL

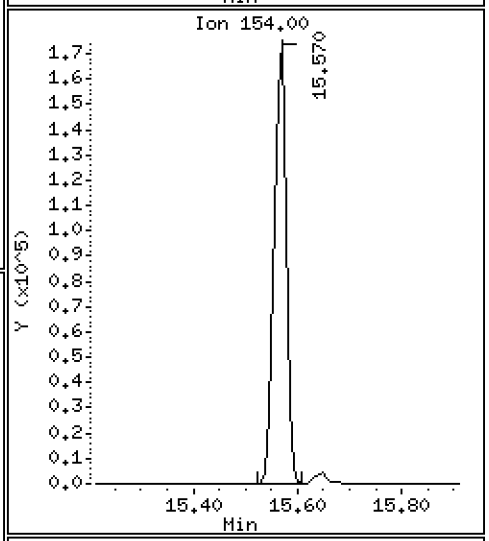


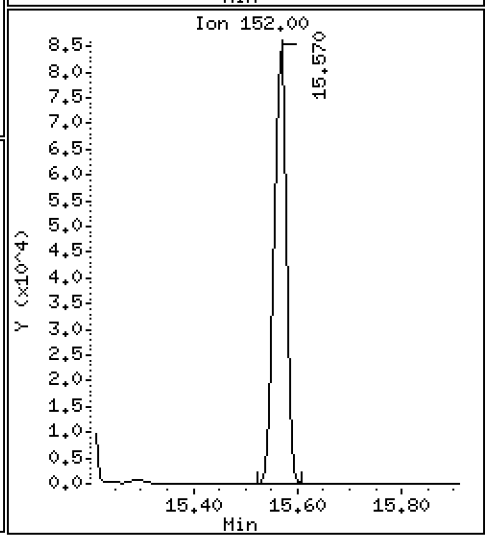












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

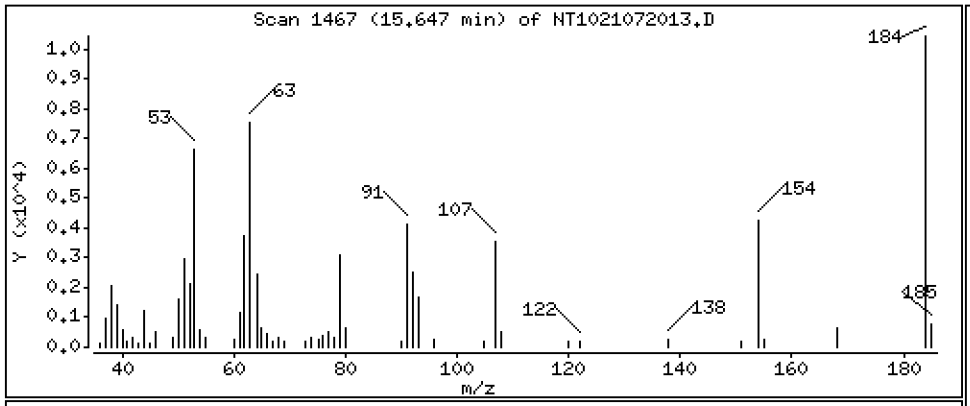
Operator: VTS

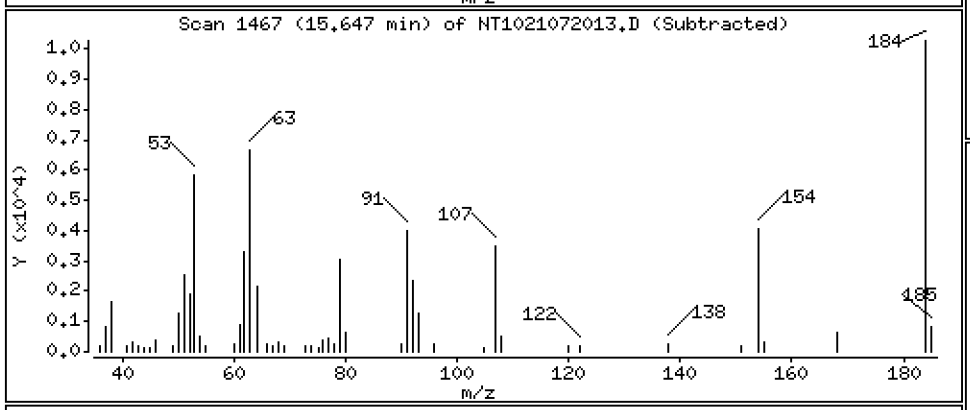
Column phase: ZB-5msi

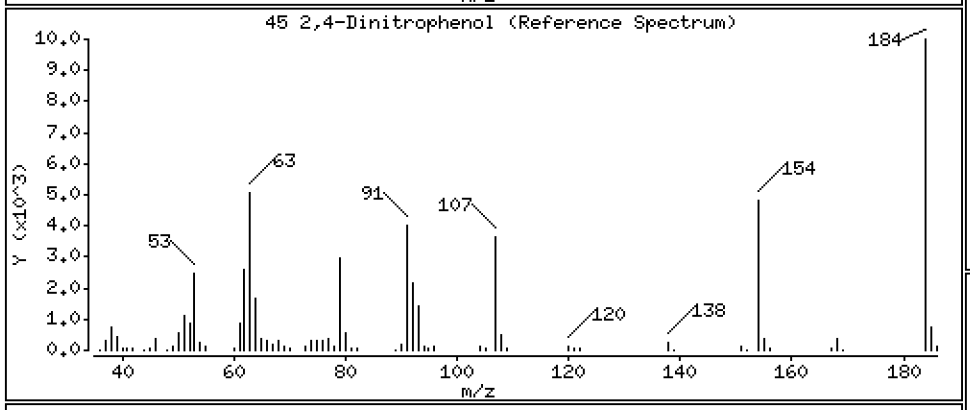
Column diameter: 0.25

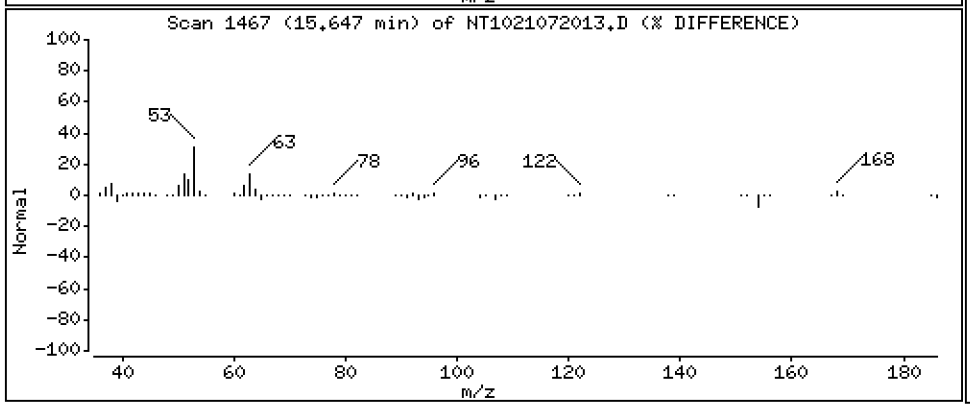
45 2,4-Dinitrophenol

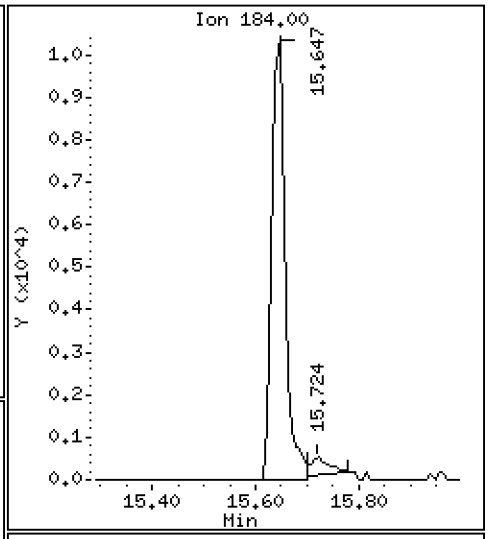
Concentration: 1.928 ug/mL

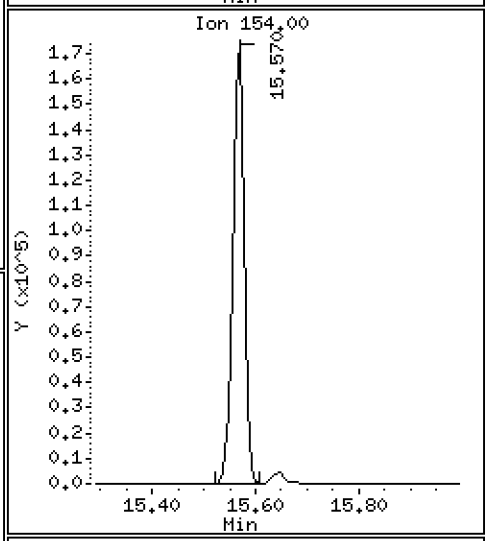


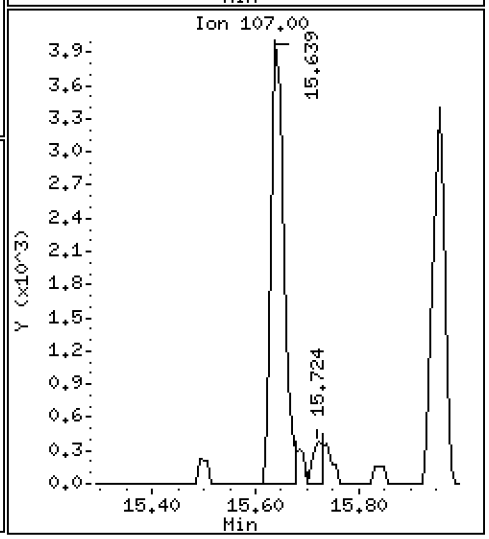












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

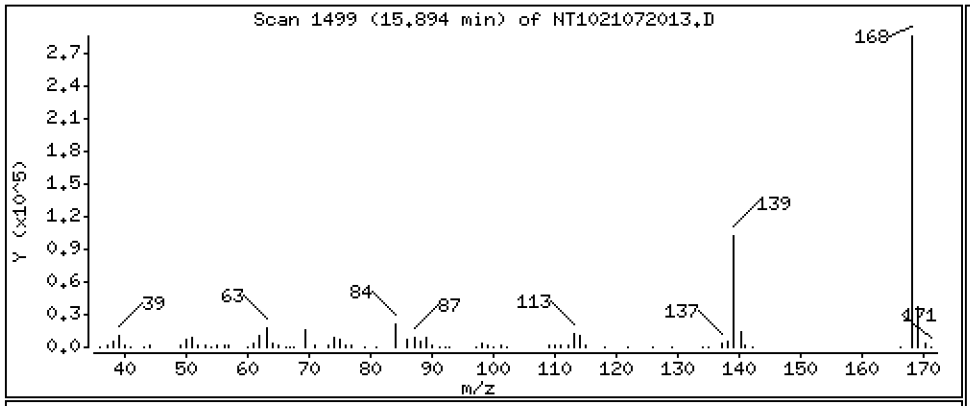
Operator: VTS

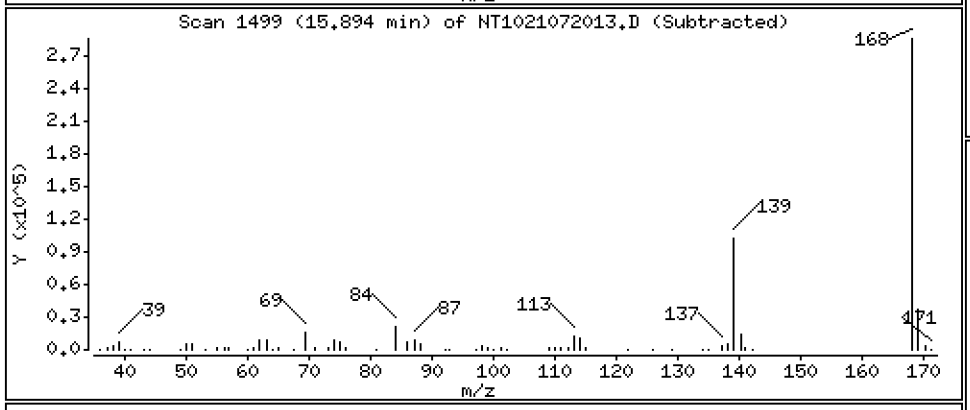
Column phase: ZB-5msi

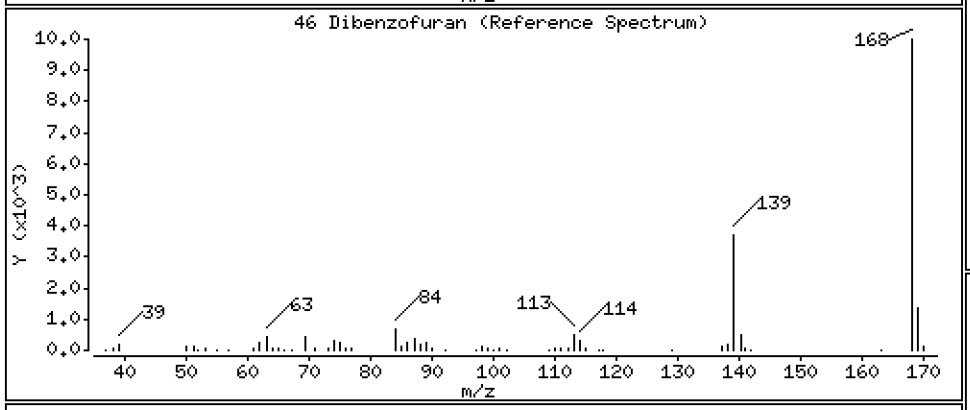
Column diameter: 0.25

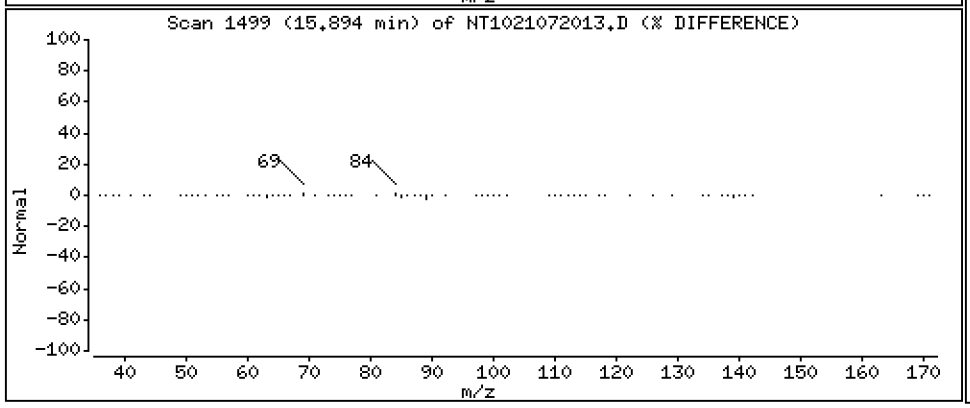
46 Dibenzofuran

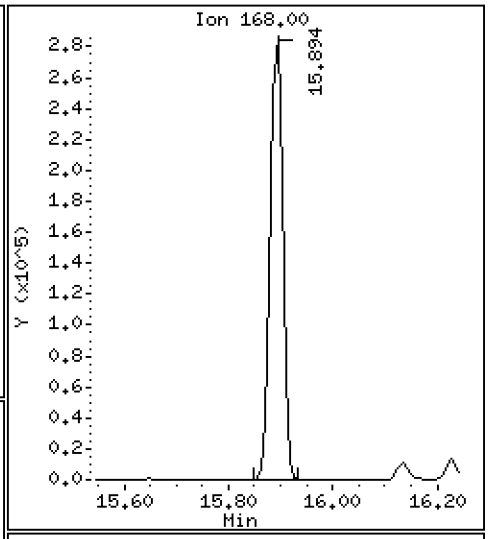
Concentration: 4.833 ug/mL

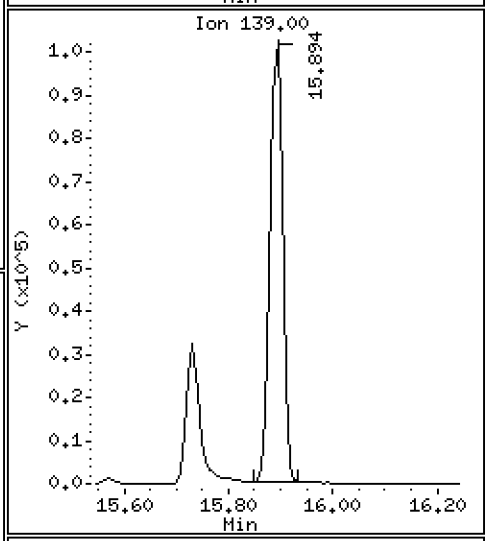


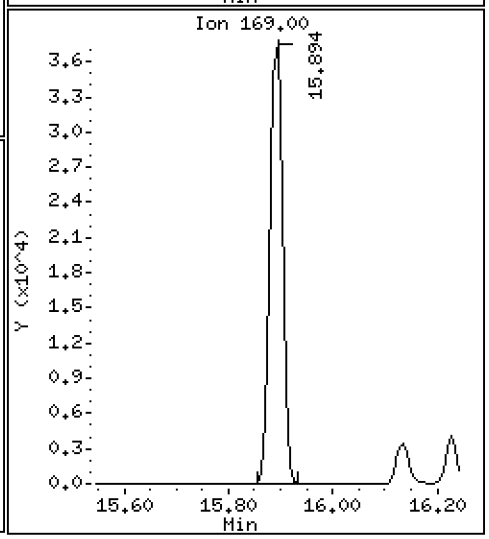












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

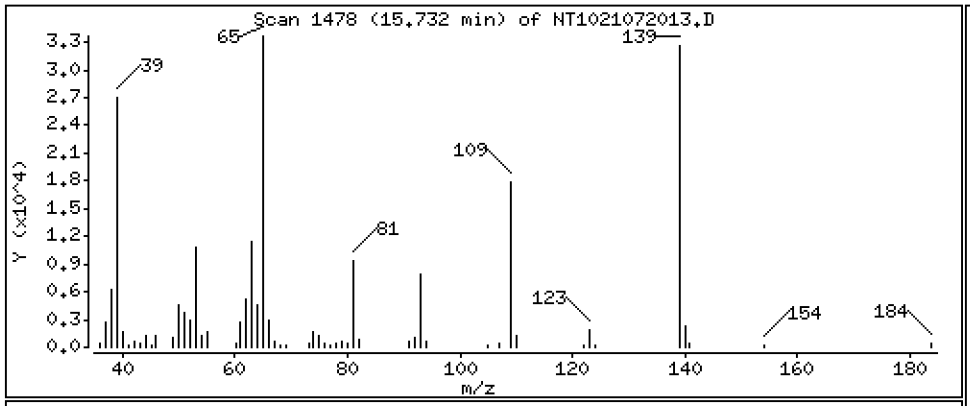
Operator: VTS

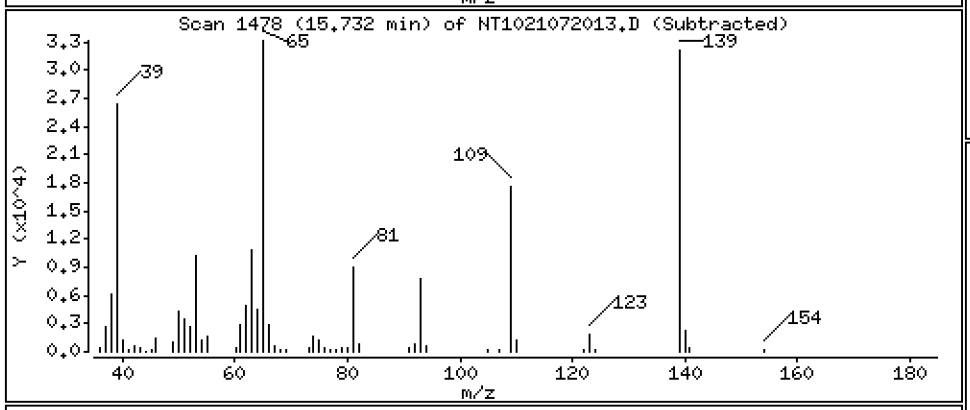
Column phase: ZB-5msi

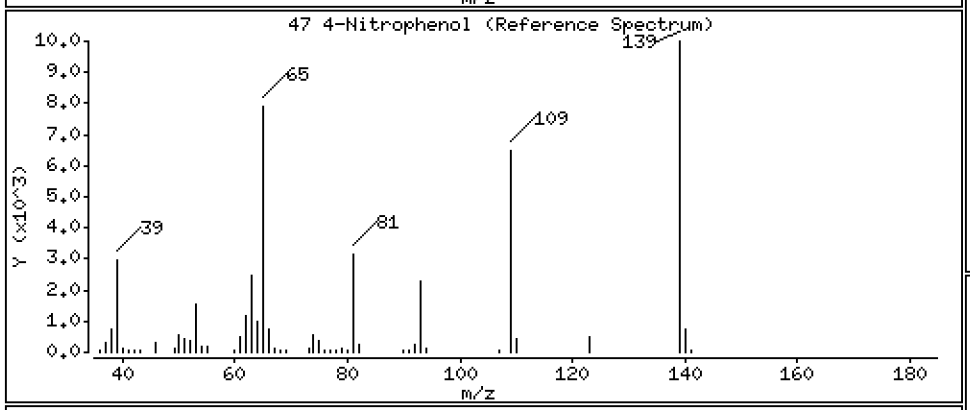
Column diameter: 0.25

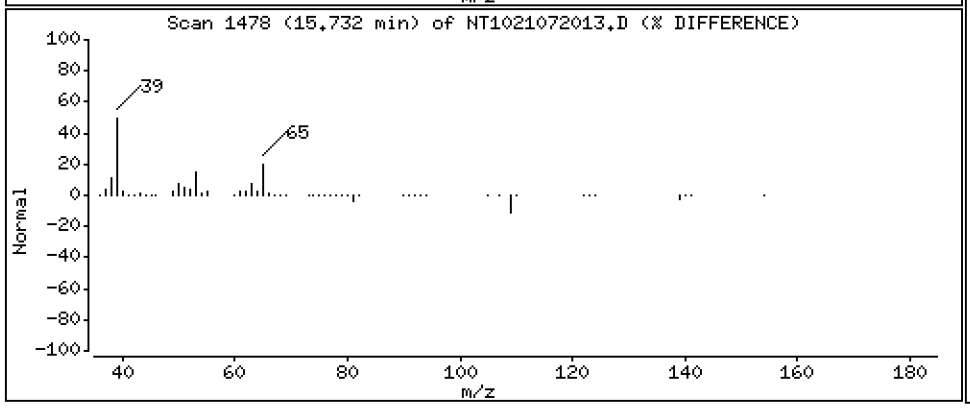
47 4-Nitrophenol

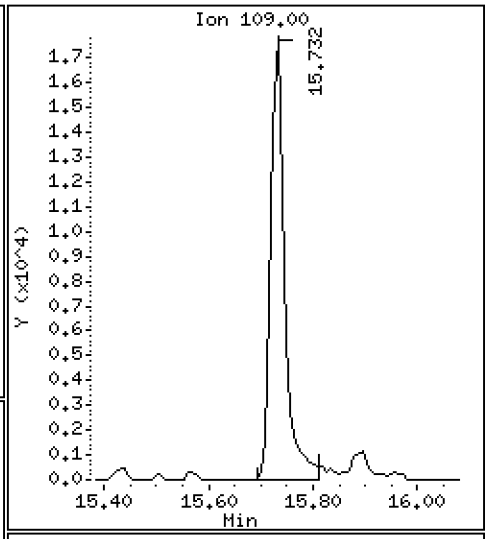
Concentration: 4.089 ug/mL

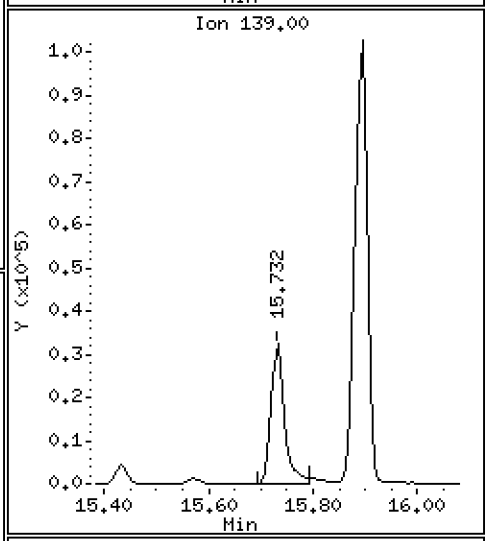


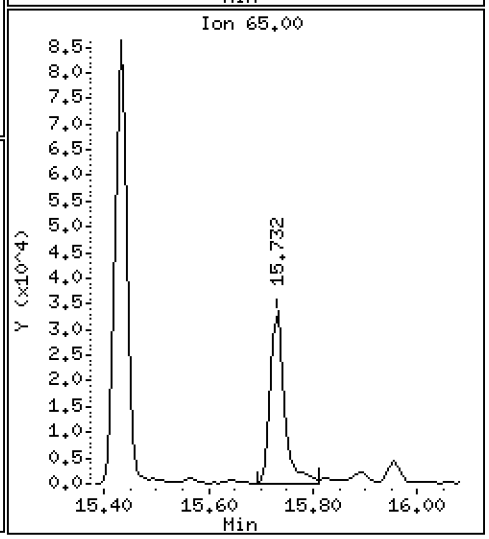












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

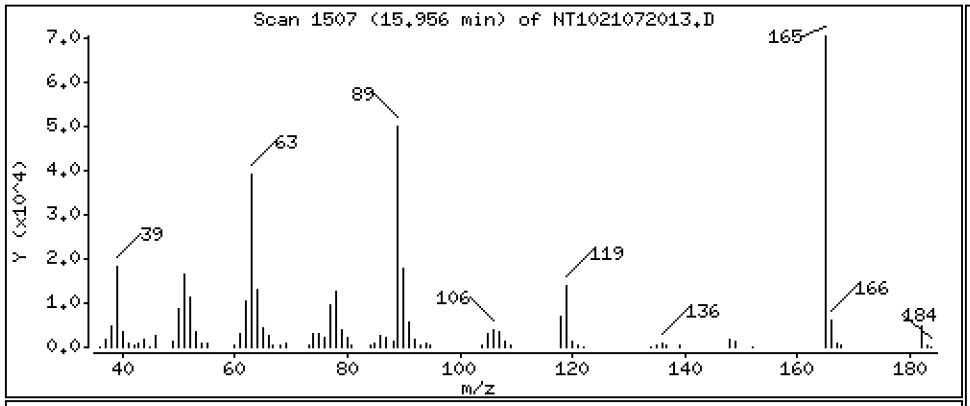
Operator: VTS

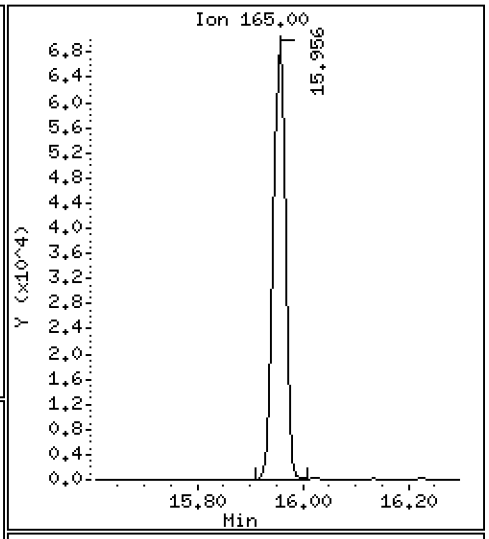
Column phase: ZB-5msi

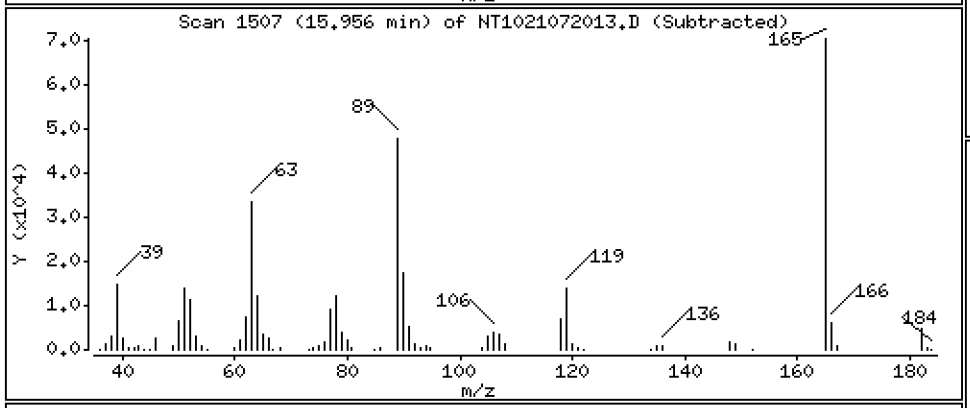
Column diameter: 0.25

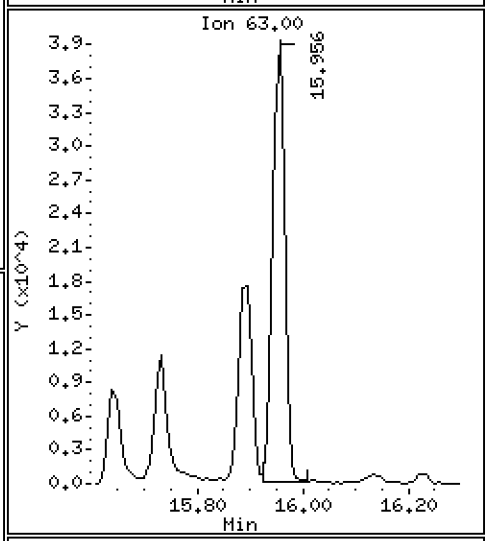
48 2,4-Dinitrotoluene

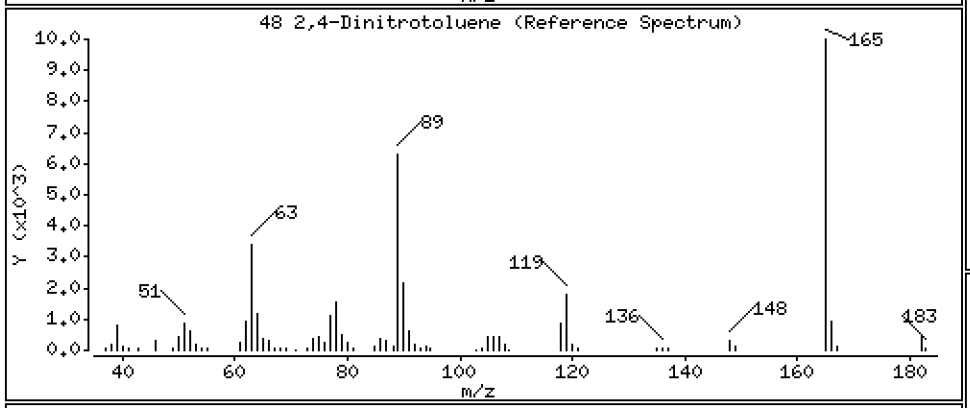
Concentration: 4.929 ug/mL

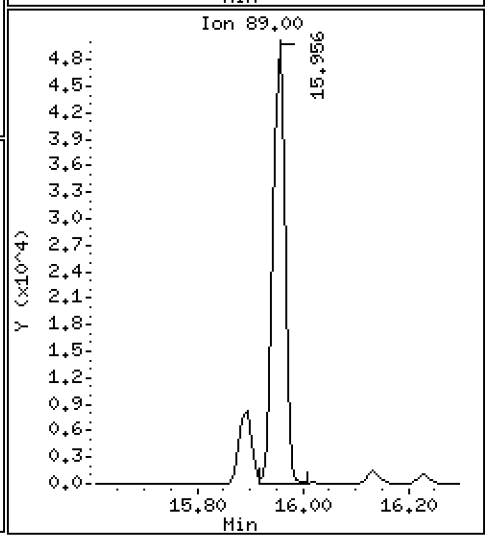


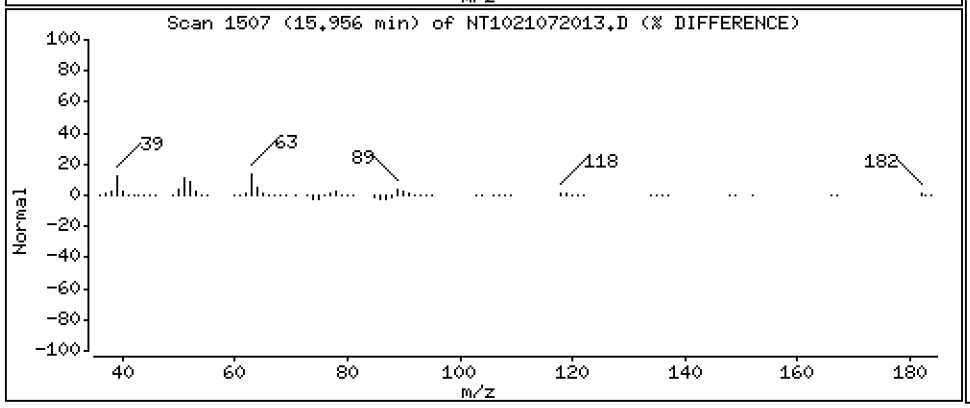












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

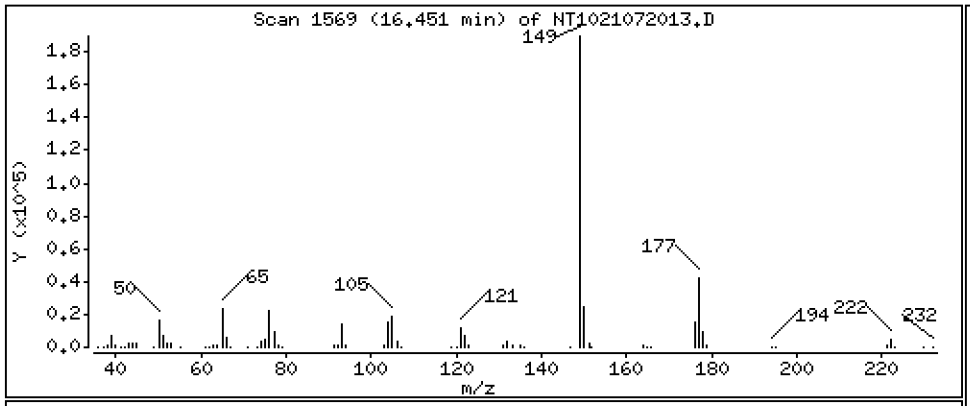
Operator: VTS

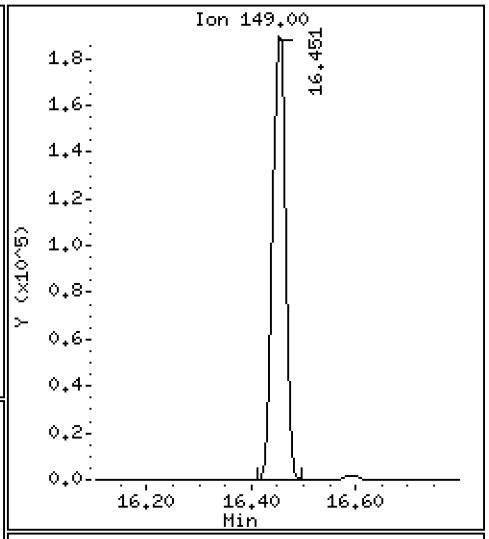
Column phase: ZB-5msi

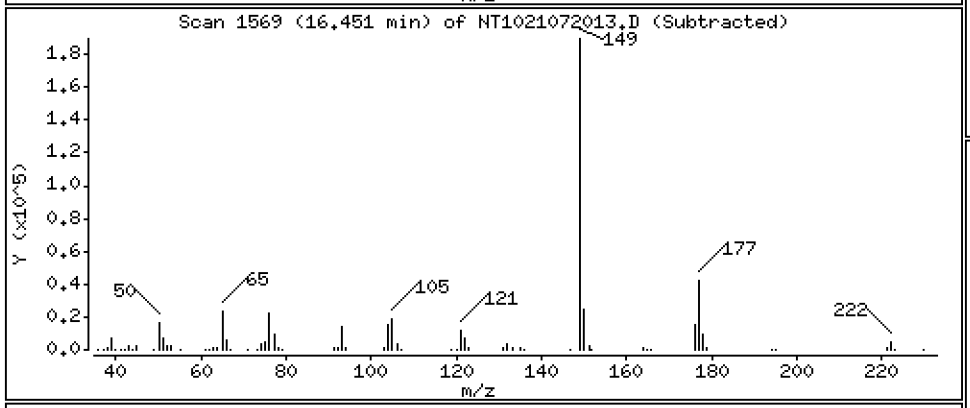
Column diameter: 0.25

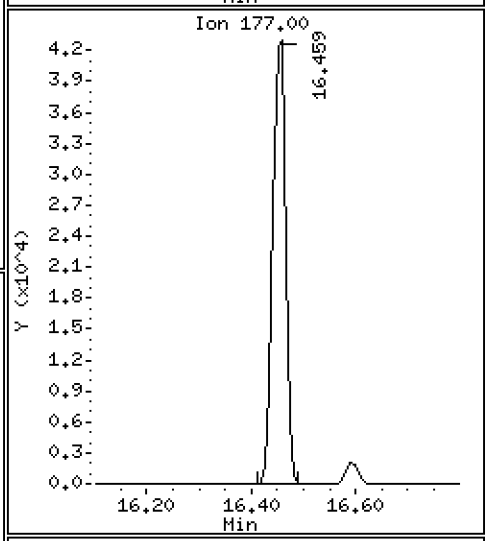
50 Diethylphthalate

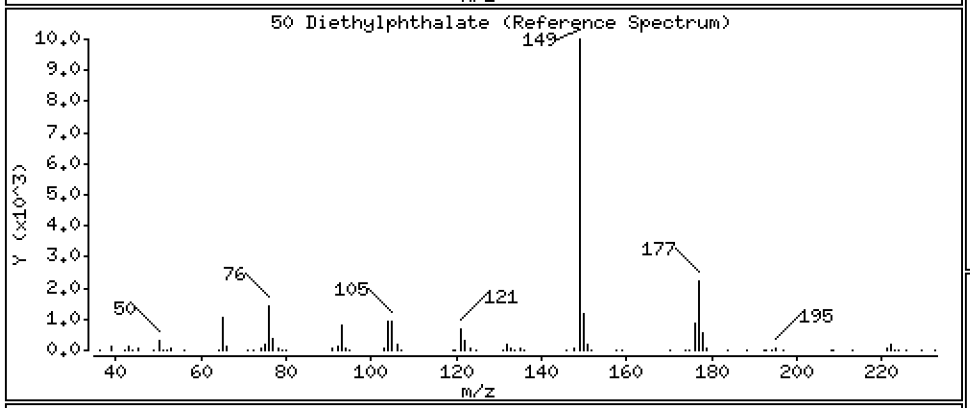
Concentration: 4.598 ug/mL

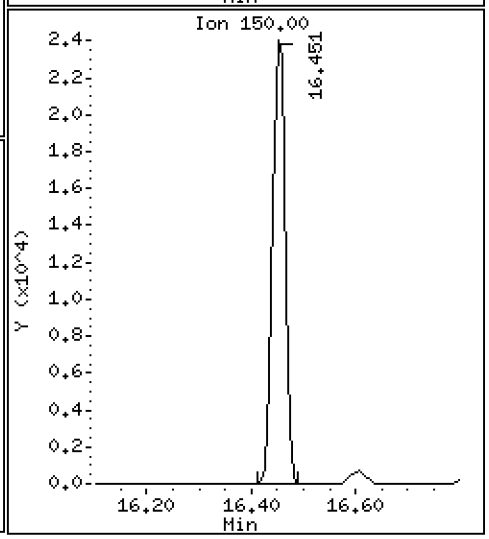


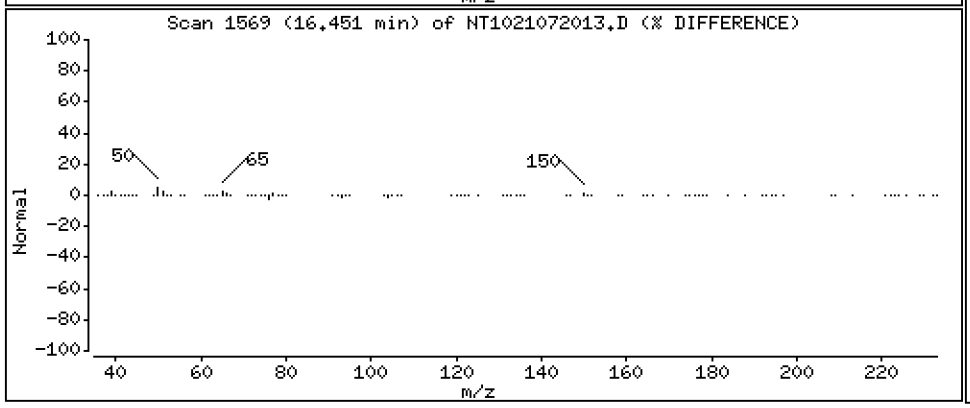












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

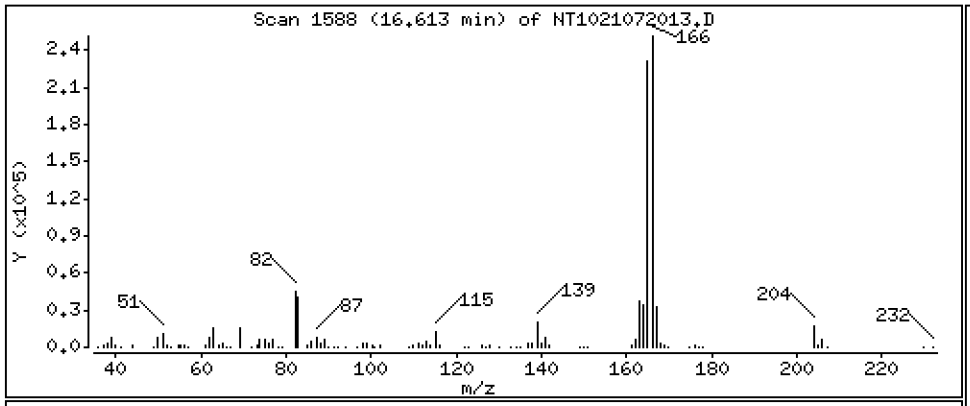
Operator: VTS

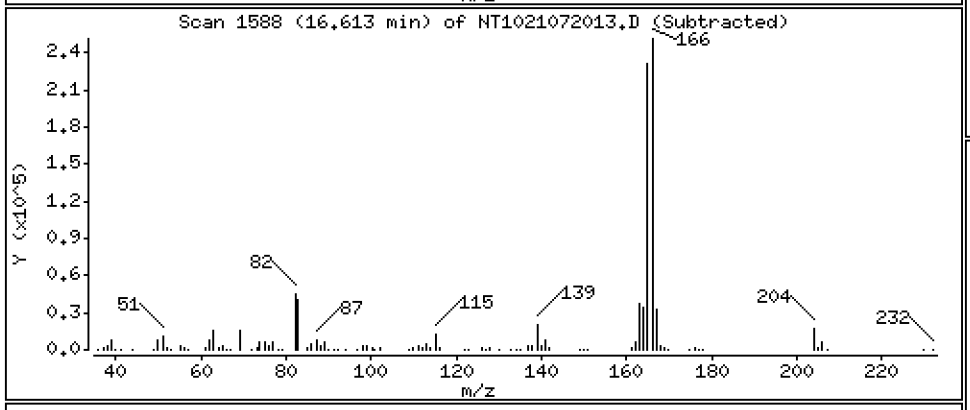
Column phase: ZB-5msi

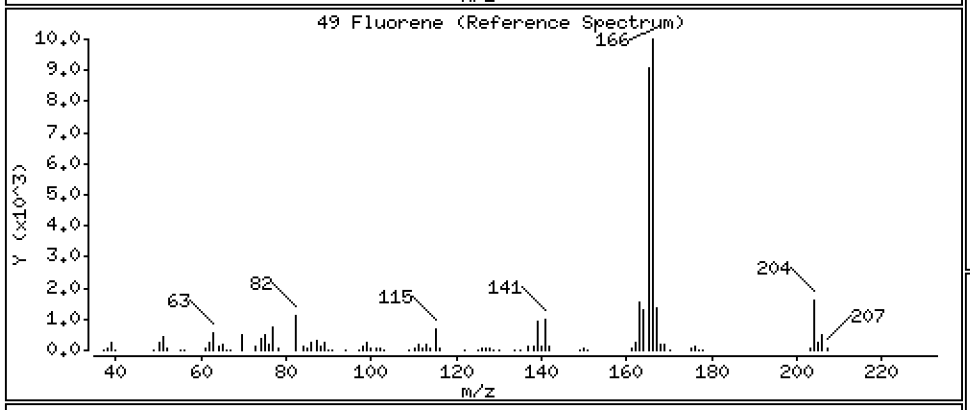
Column diameter: 0.25

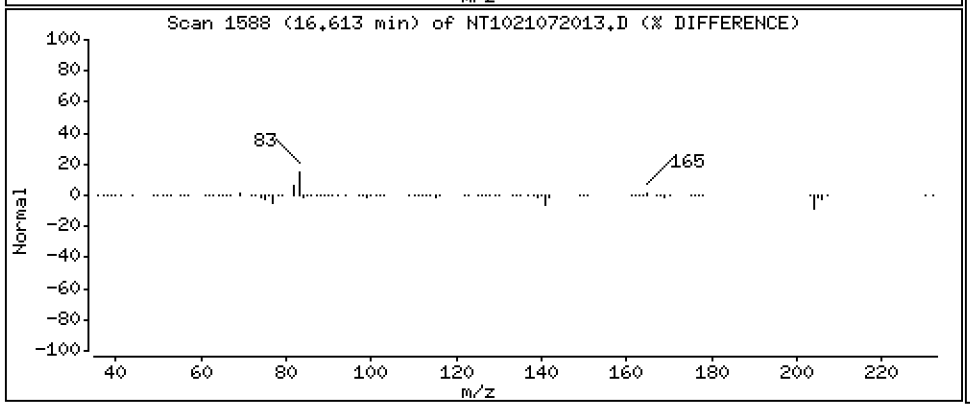
49 Fluorene

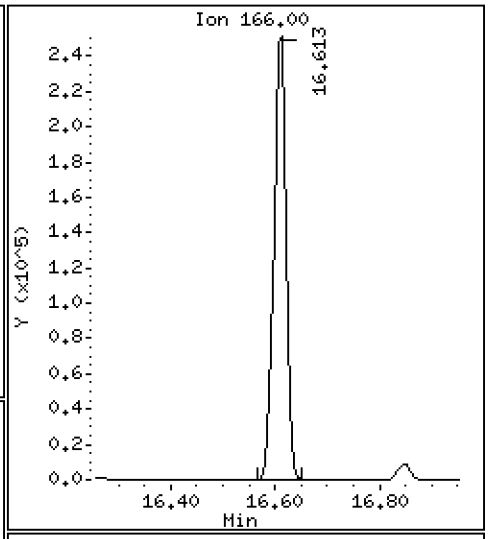
Concentration: 4.477 ug/mL

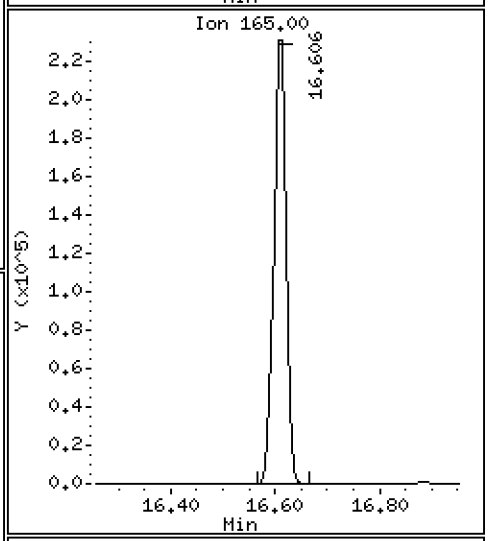


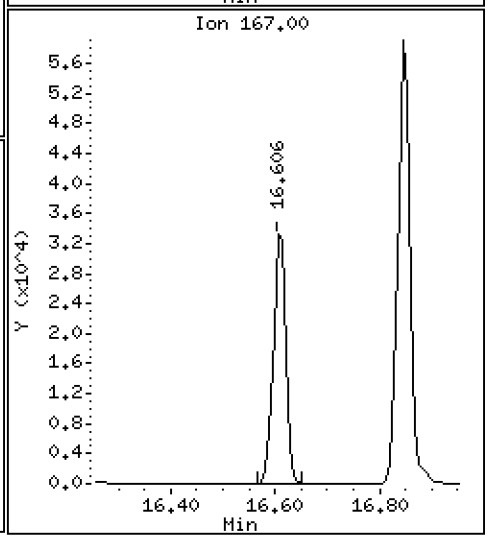












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

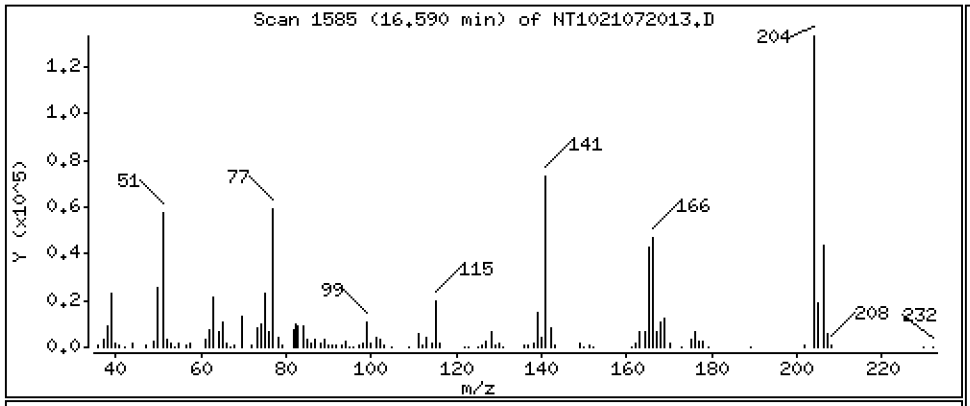
Operator: VTS

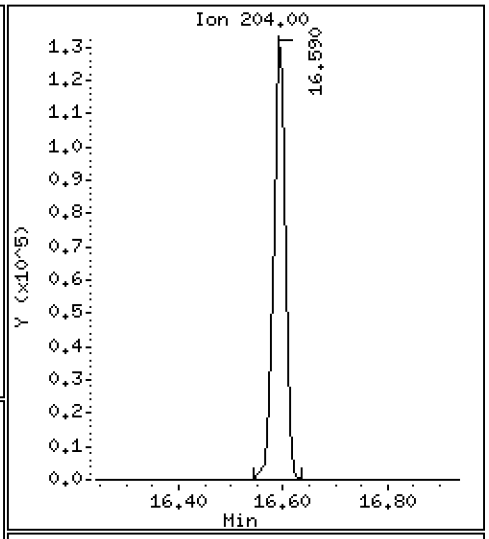
Column phase: ZB-5msi

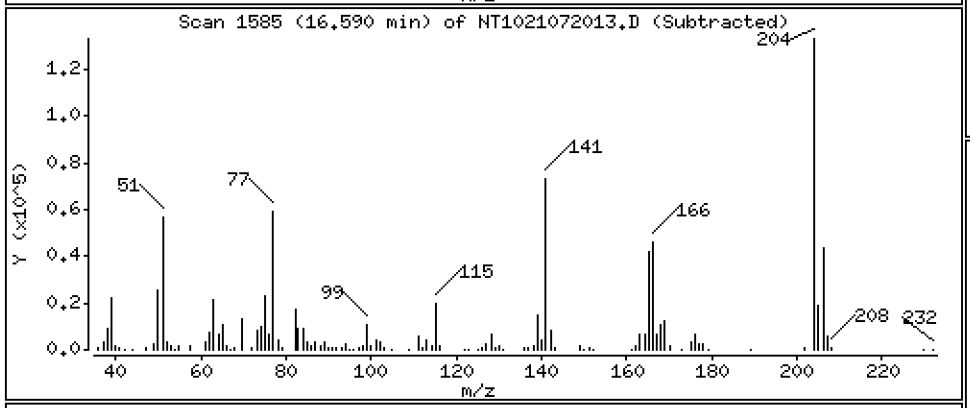
Column diameter: 0.25

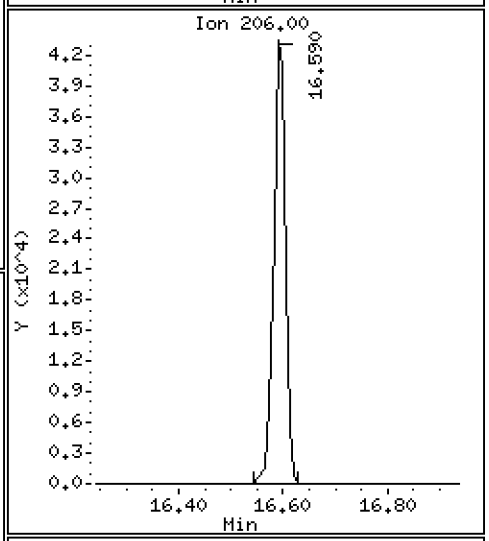
51 4-Chlorophenyl-phenylether

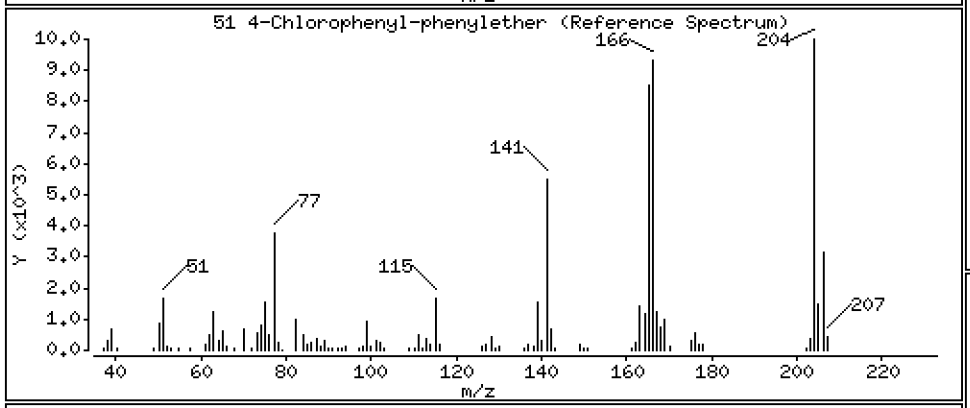
Concentration: 4.594 ug/mL

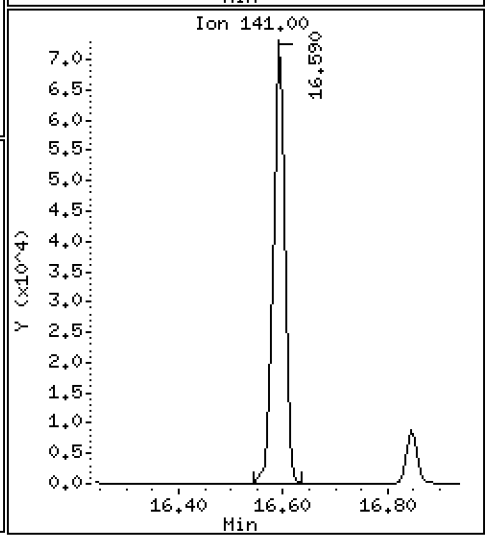


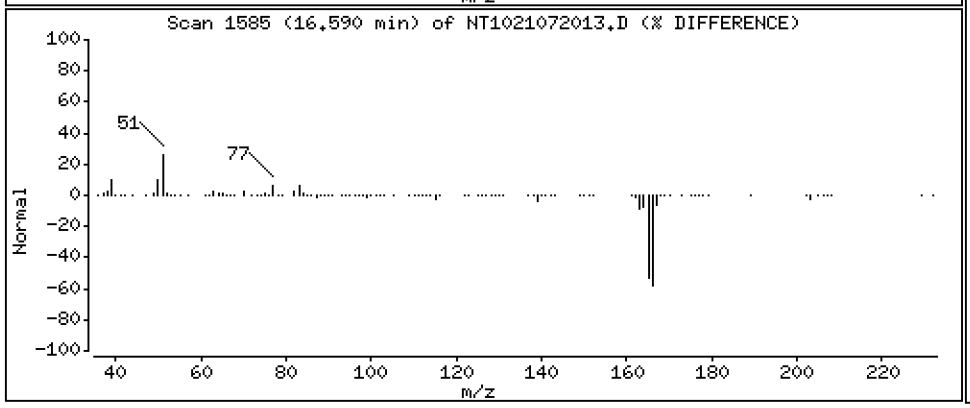












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

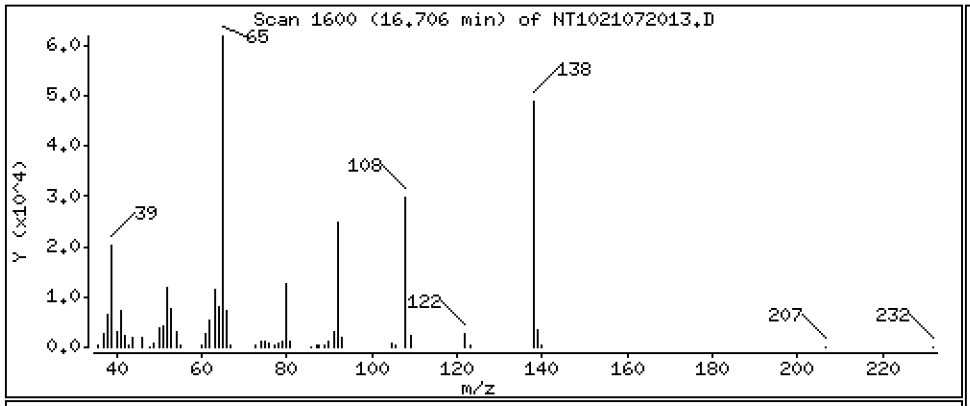
Operator: VTS

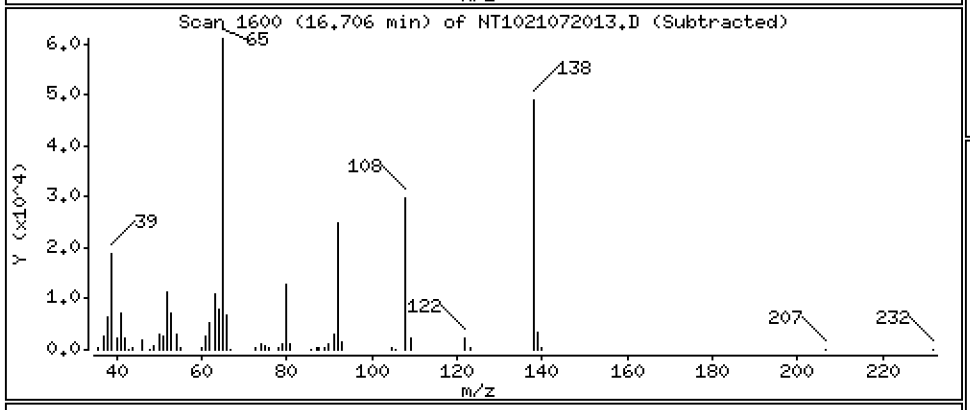
Column phase: ZB-5msi

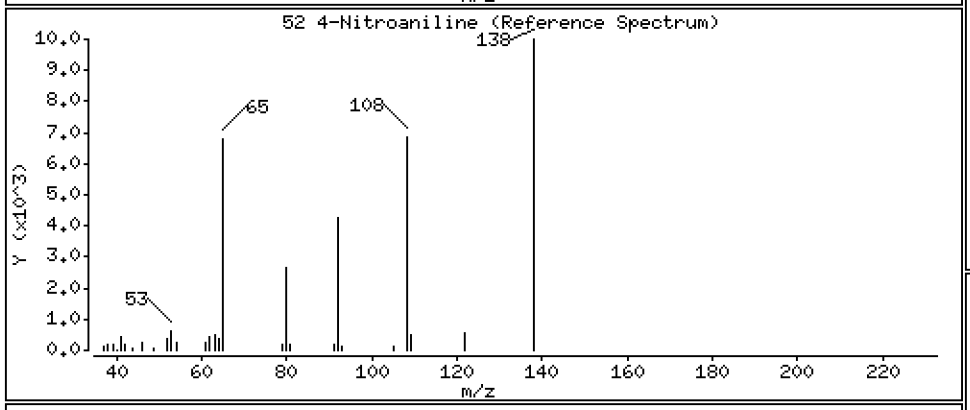
Column diameter: 0.25

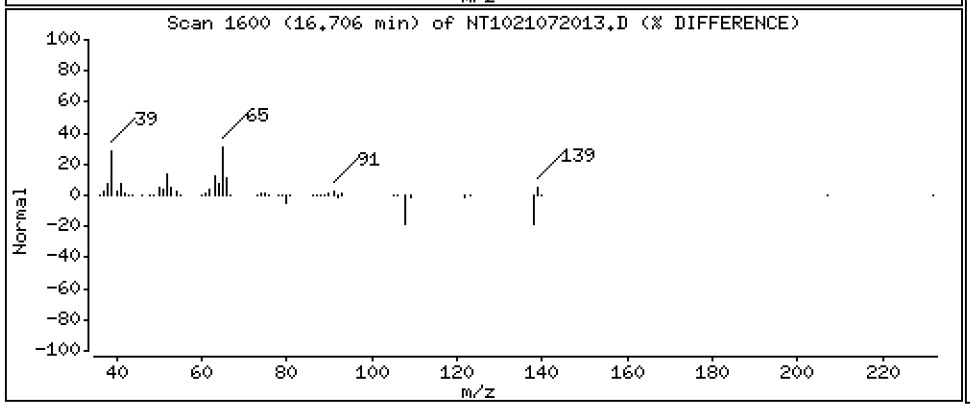
52 4-Nitroaniline

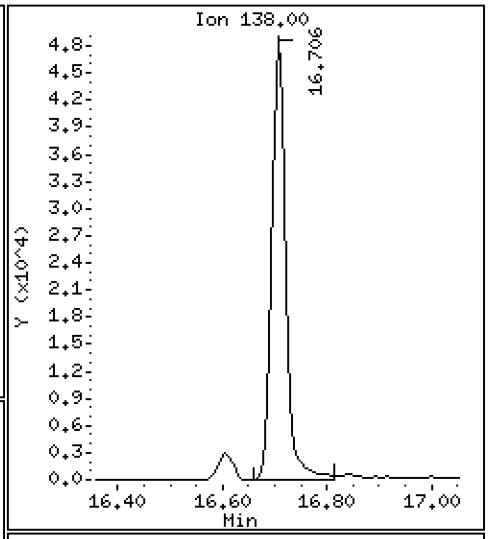
Concentration: 4.048 ug/mL

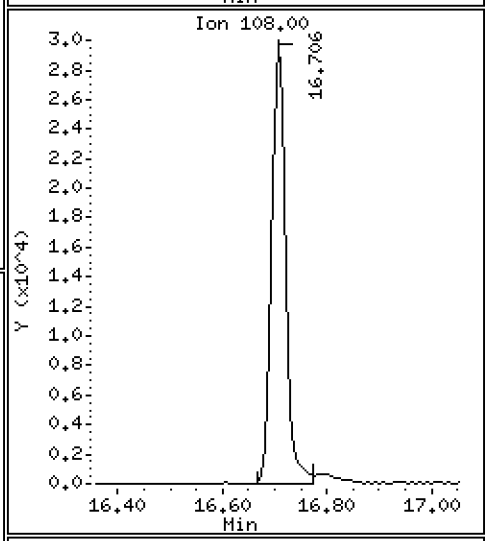


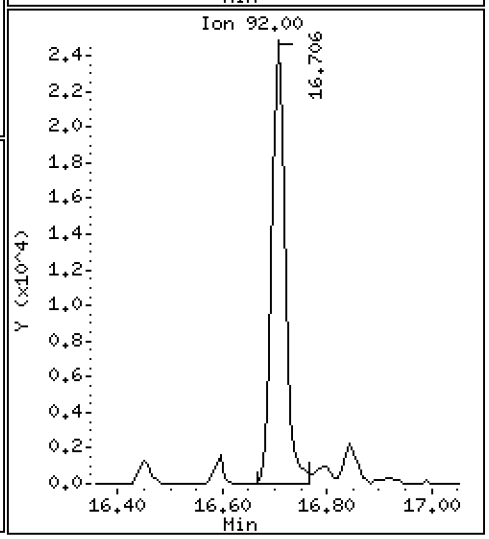












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

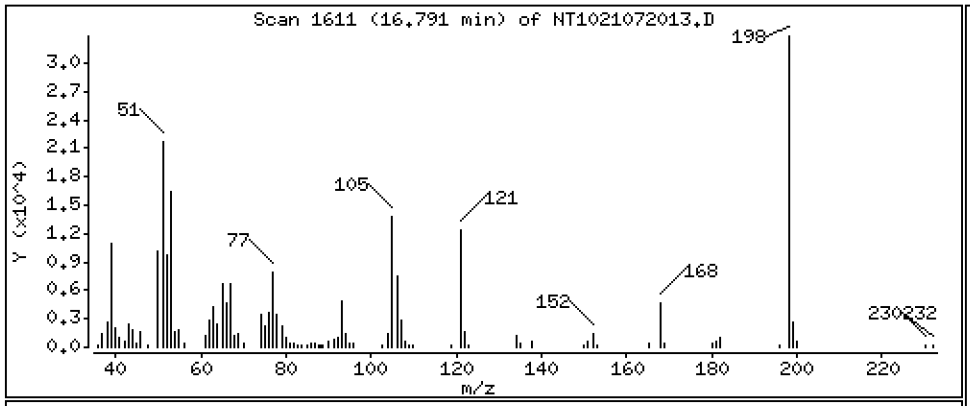
Operator: VTS

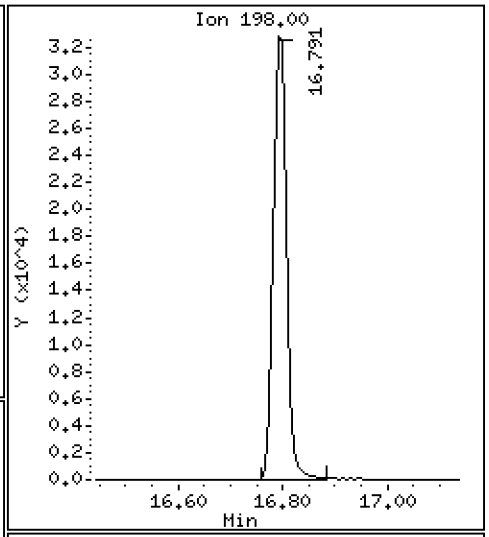
Column phase: ZB-5msi

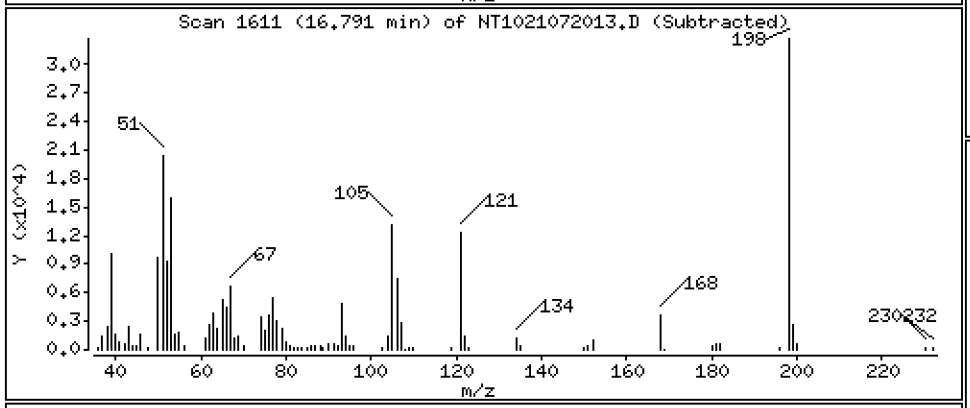
Column diameter: 0.25

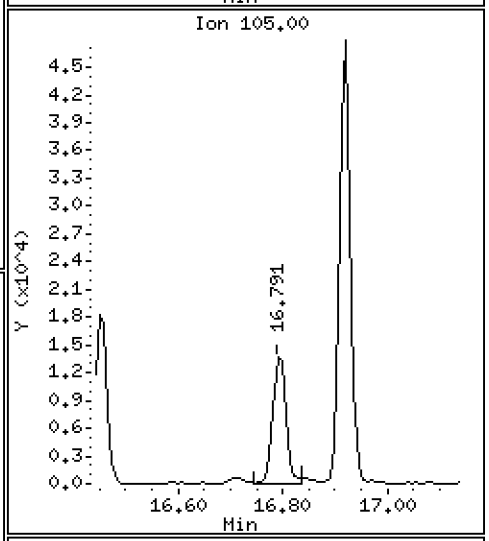
53 4,6-Dinitro-2-methylphenol

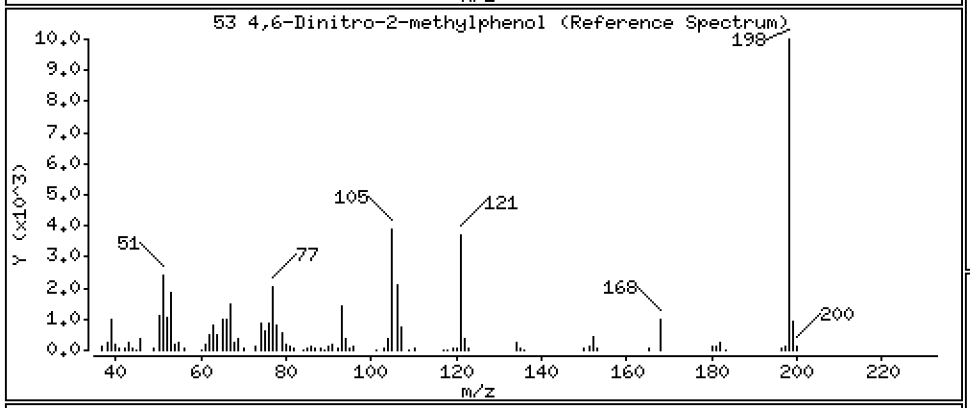
Concentration: 3.646 ug/mL

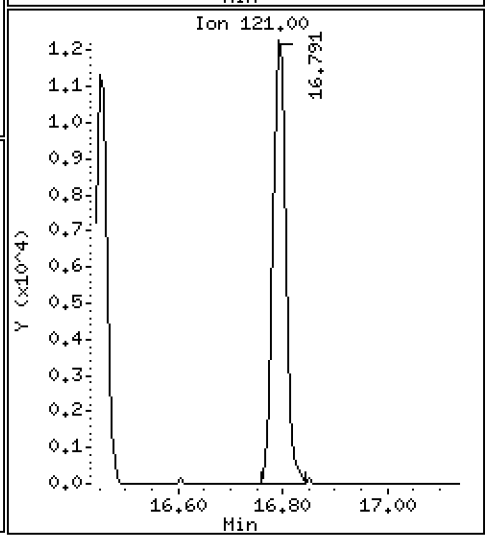


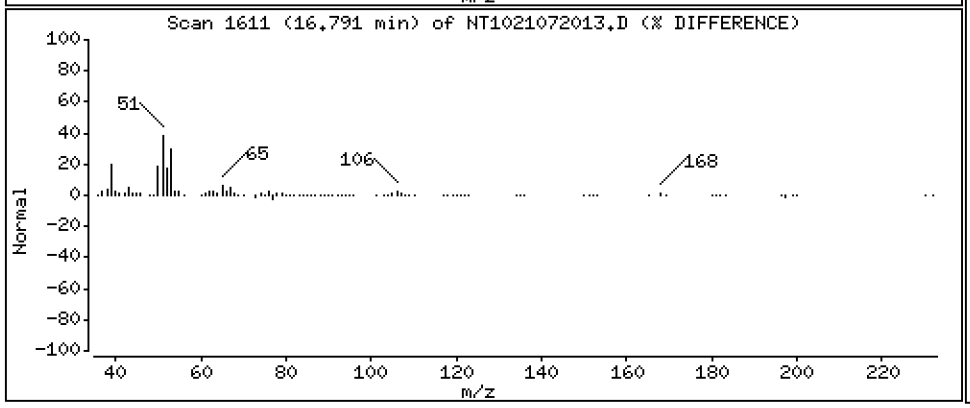












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

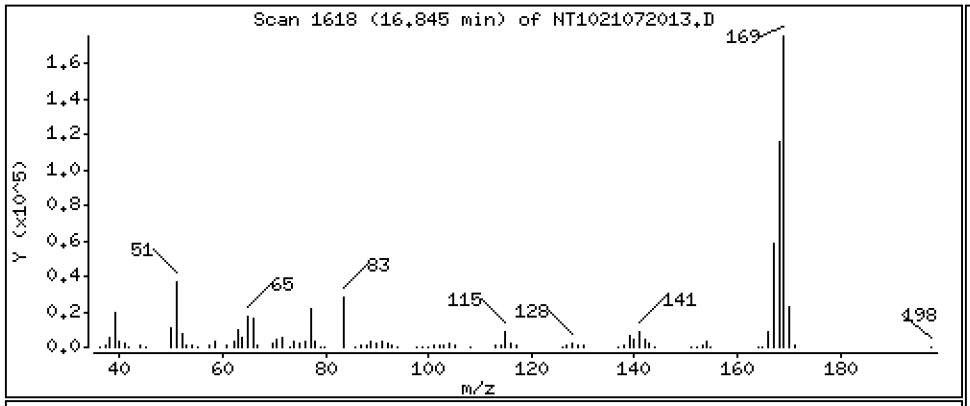
Operator: VTS

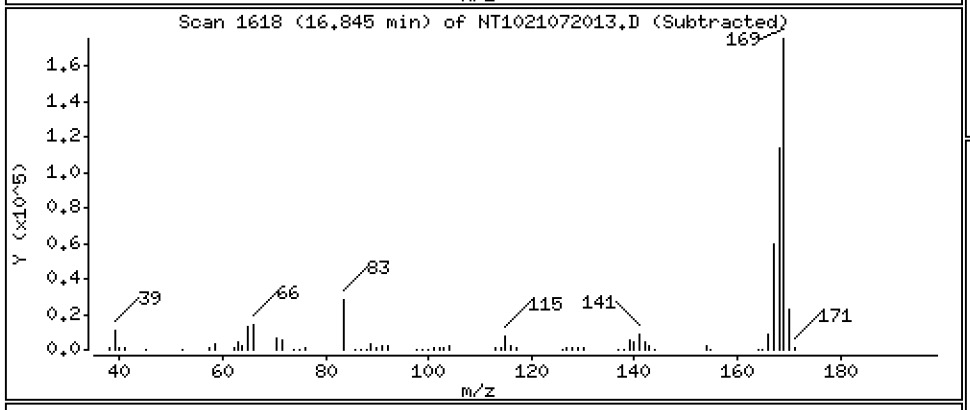
Column phase: ZB-5msi

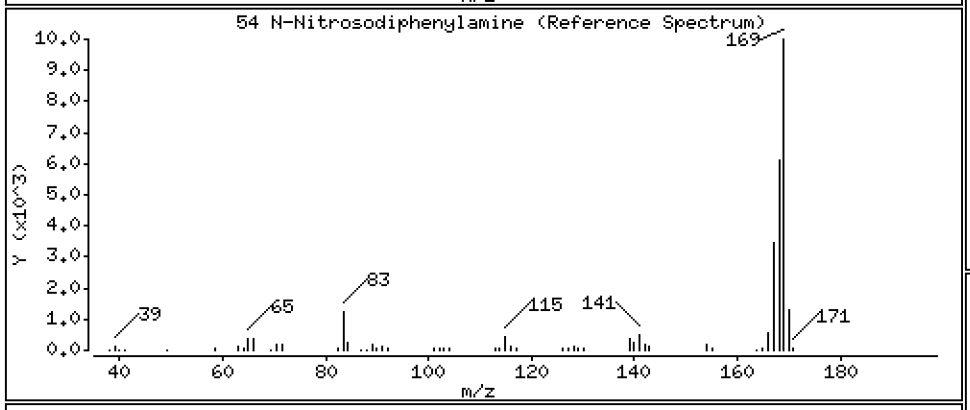
Column diameter: 0.25

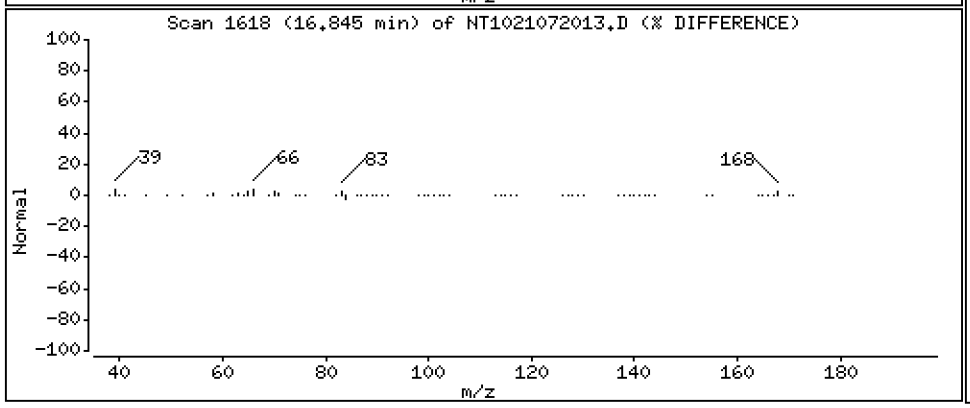
54 N-Nitrosodiphenylamine

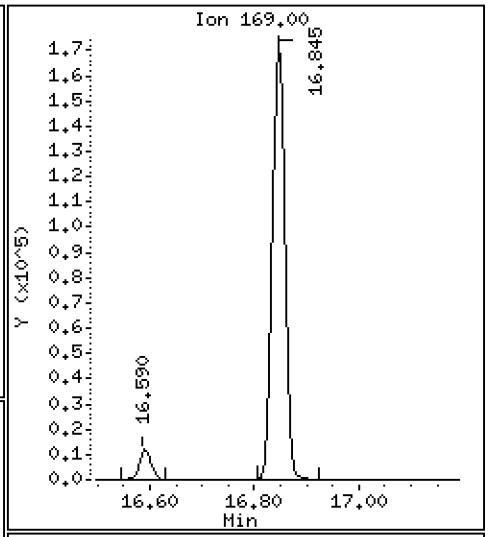
Concentration: 4.546 ug/mL

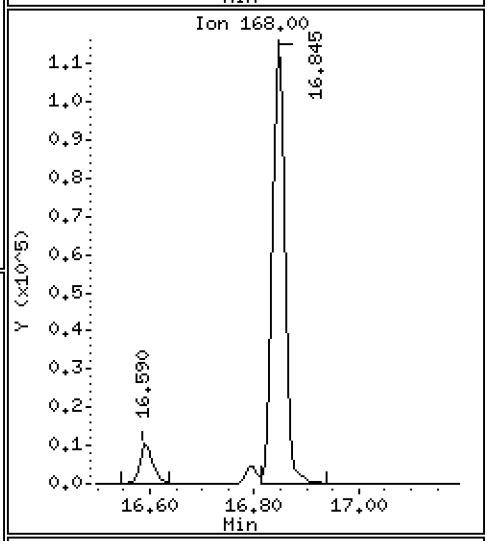


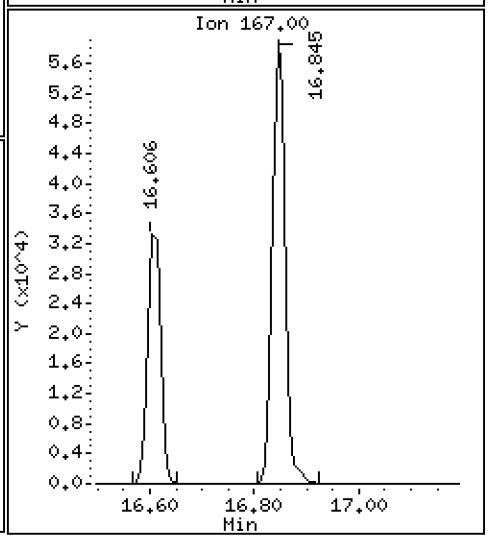












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

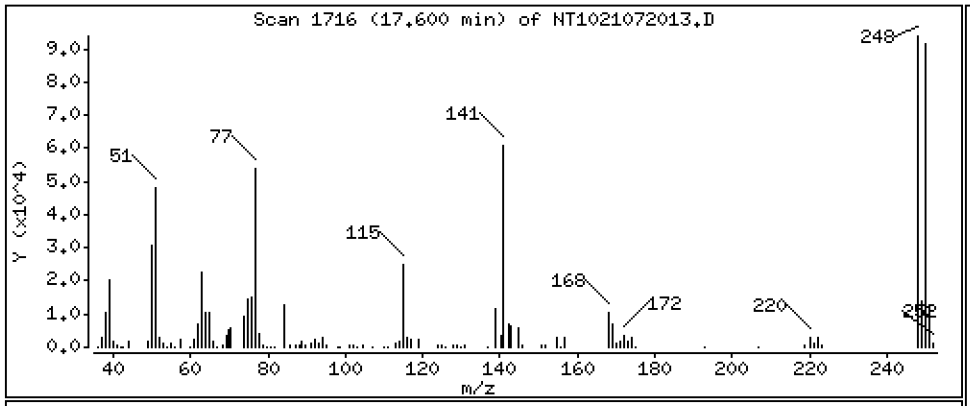
Operator: VTS

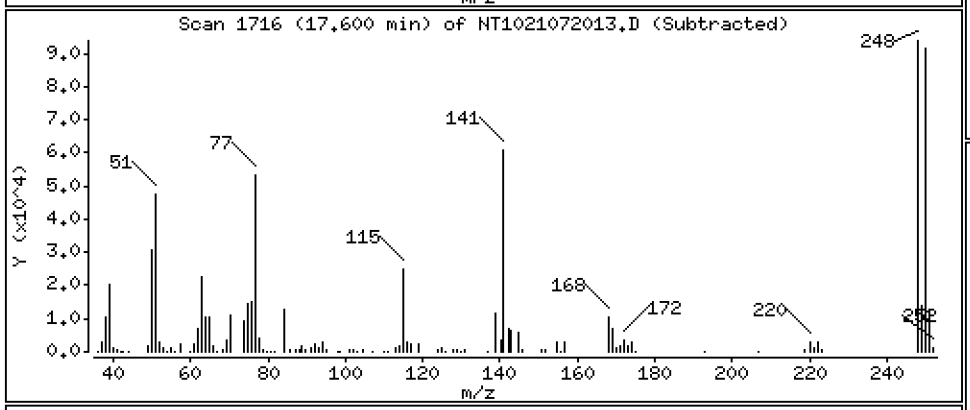
Column phase: ZB-5msi

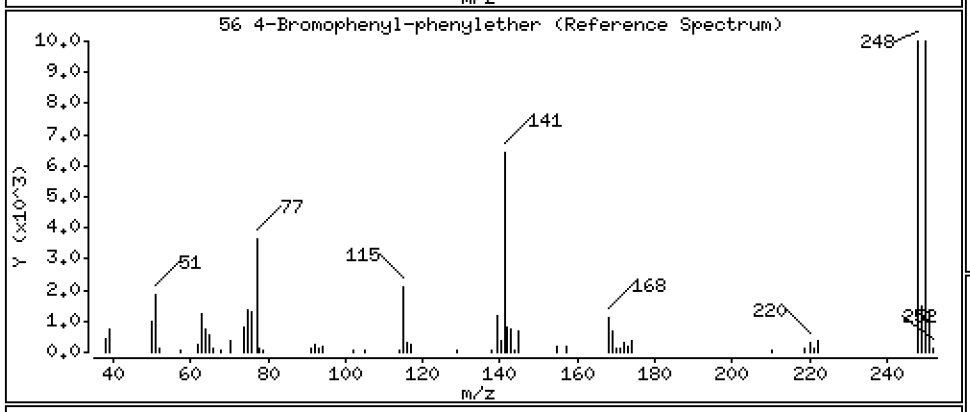
Column diameter: 0.25

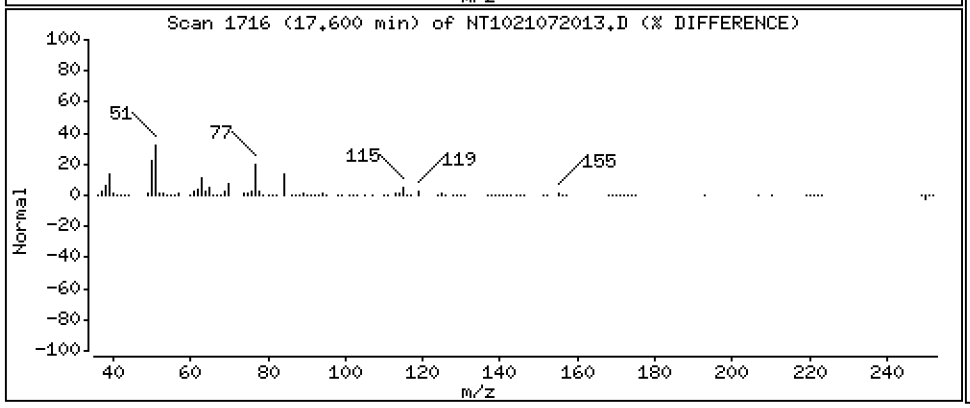
56 4-Bromophenyl-phenylether

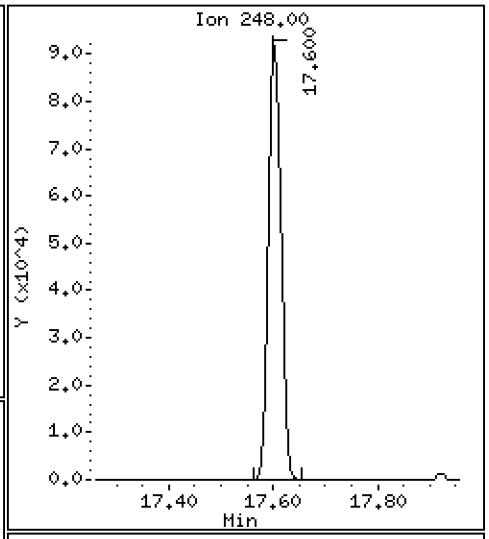
Concentration: 4.934 ug/mL

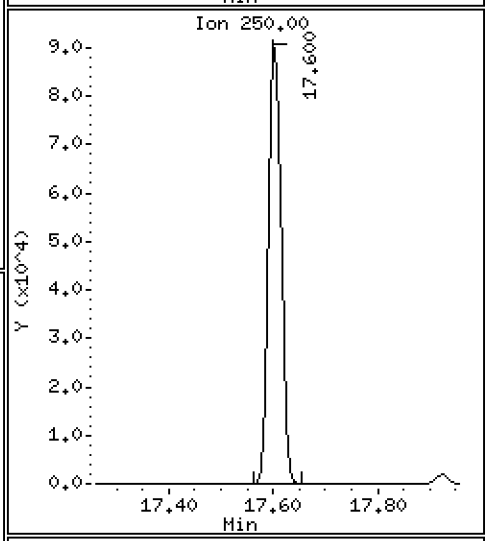


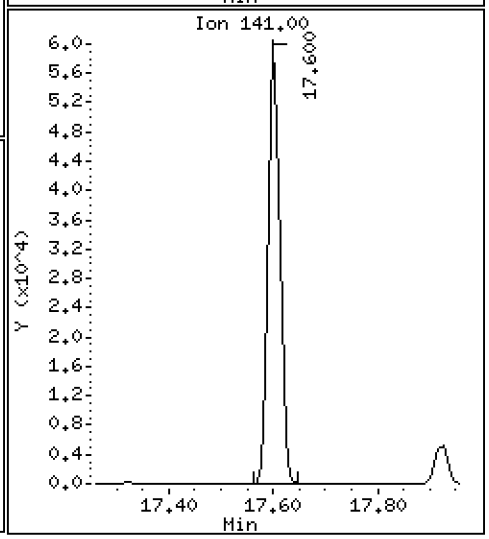












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

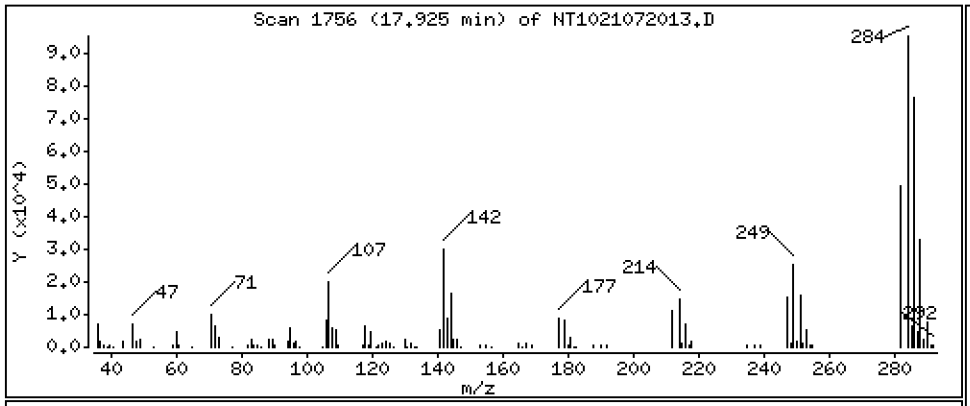
Operator: VTS

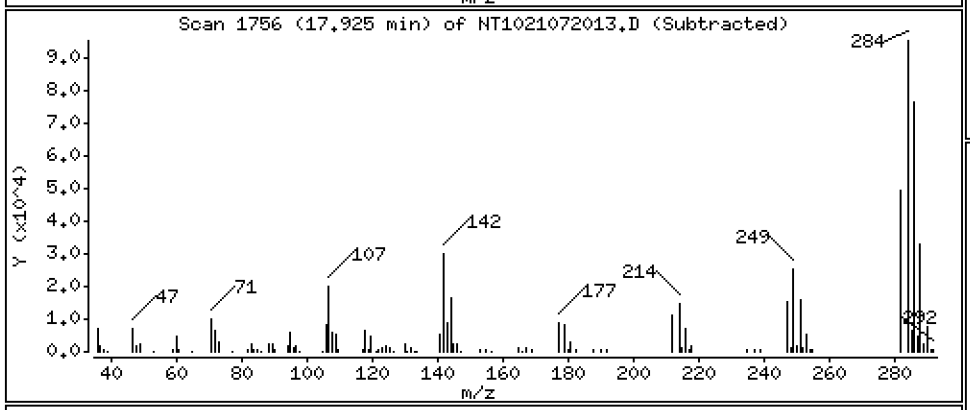
Column phase: ZB-5msi

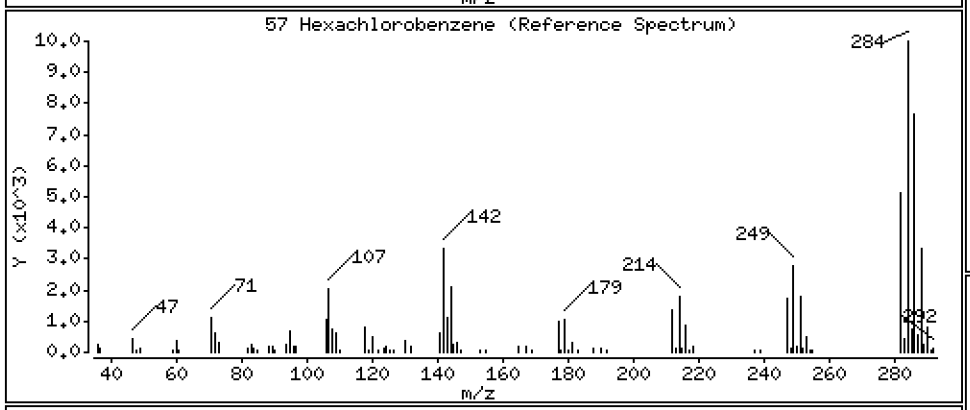
Column diameter: 0.25

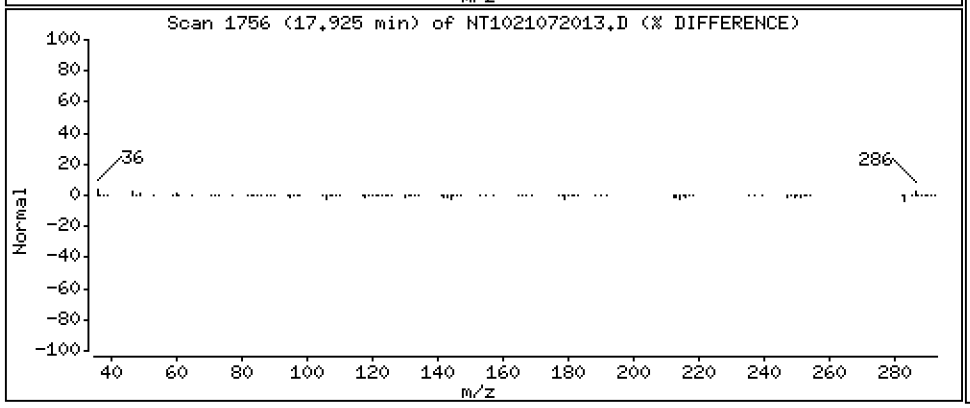
57 Hexachlorobenzene

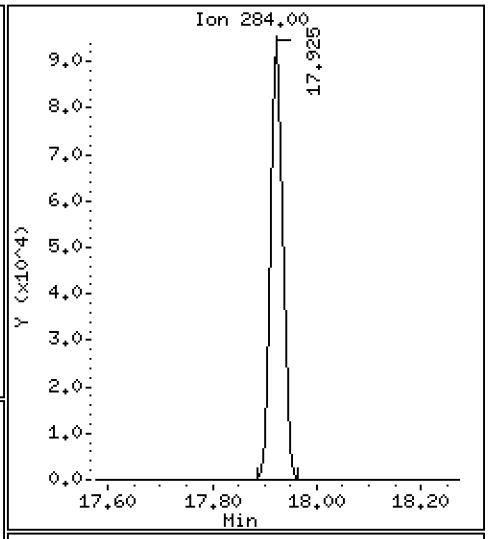
Concentration: 4.773 ug/mL

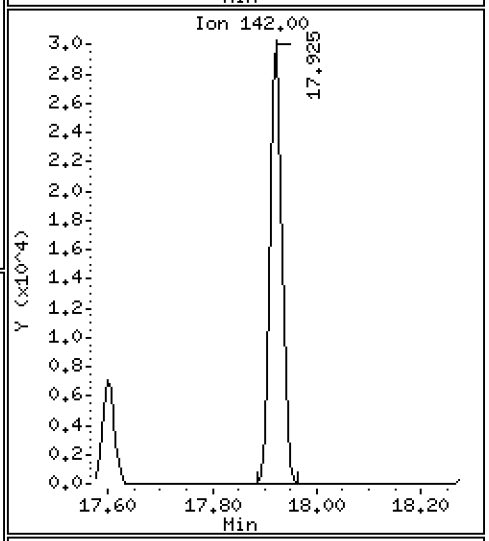


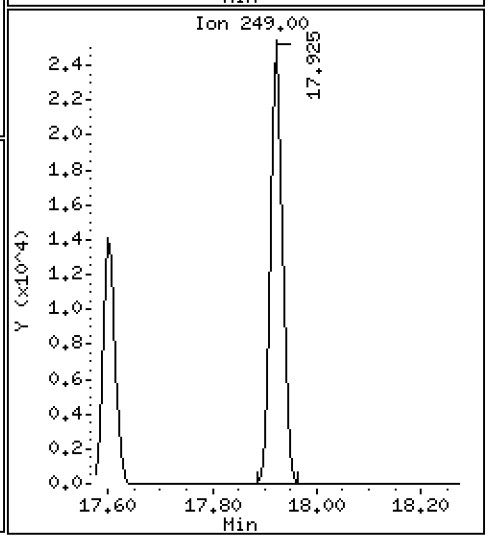












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

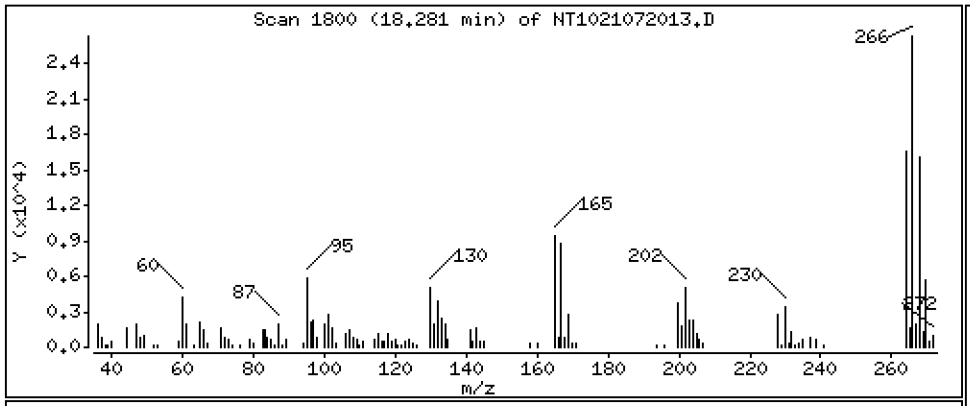
Operator: VTS

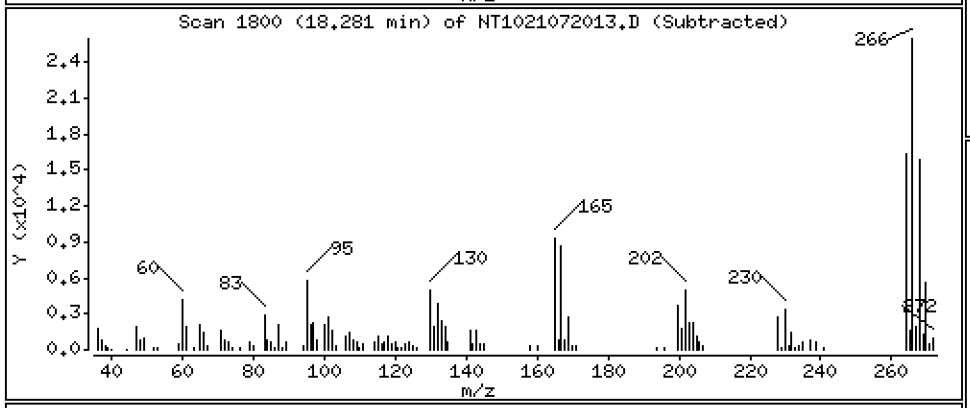
Column phase: ZB-5msi

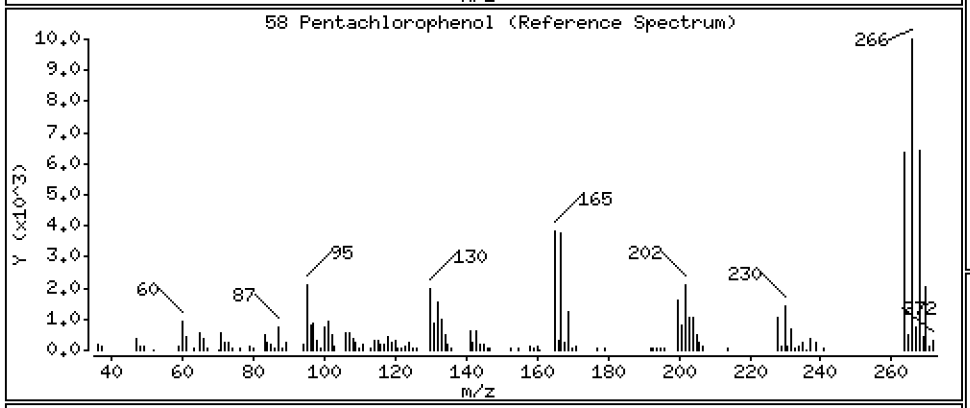
Column diameter: 0.25

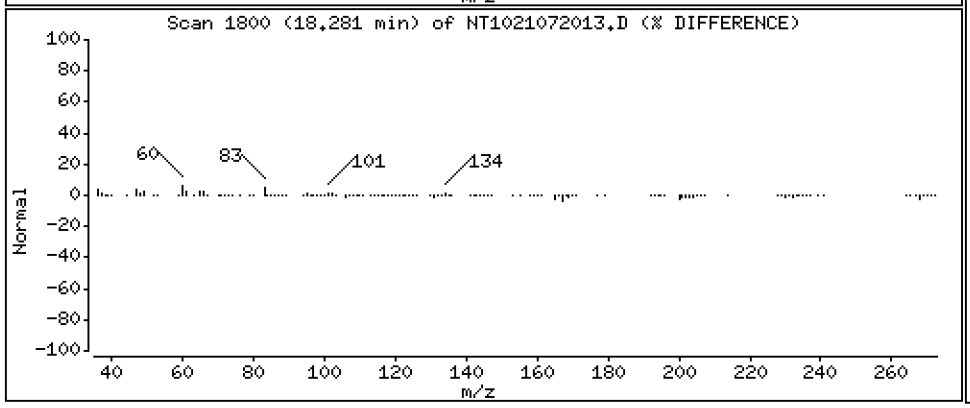
58 Pentachlorophenol

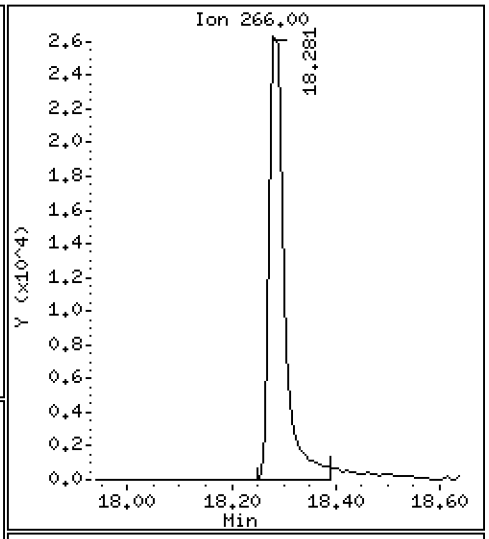
Concentration: 3.987 ug/mL

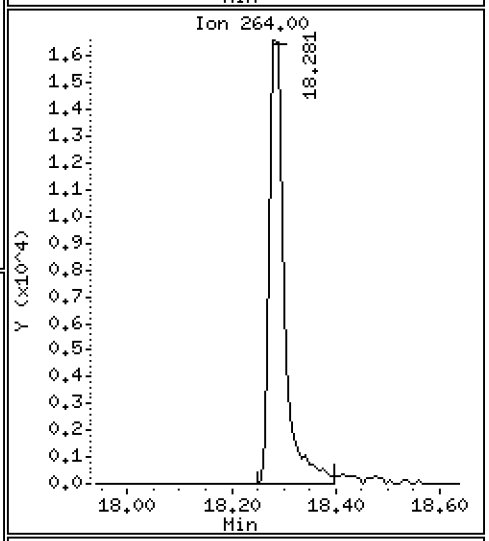


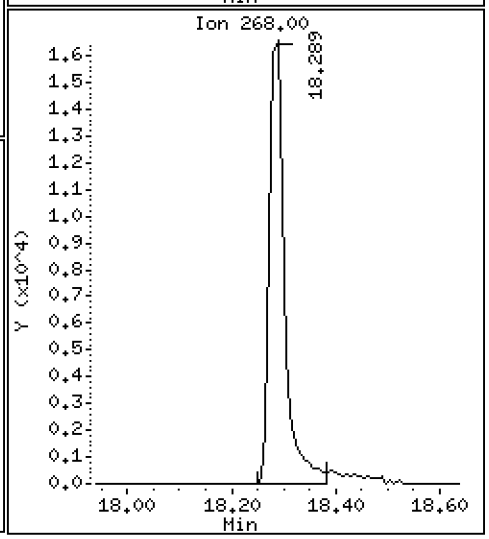












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

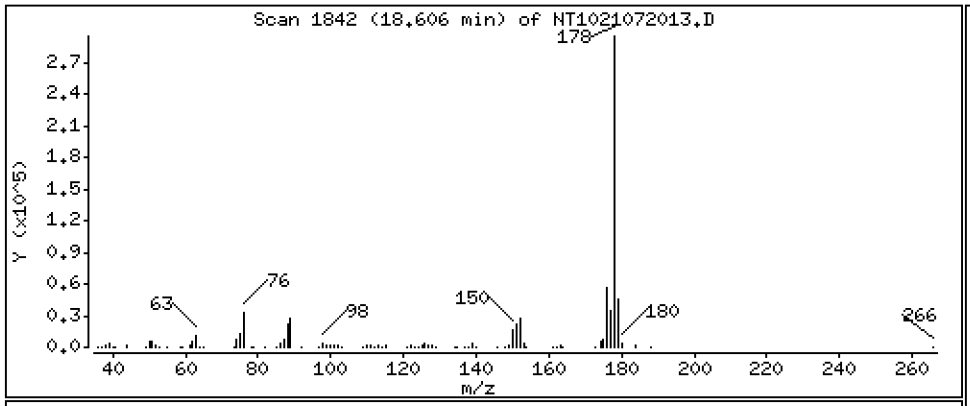
Operator: VTS

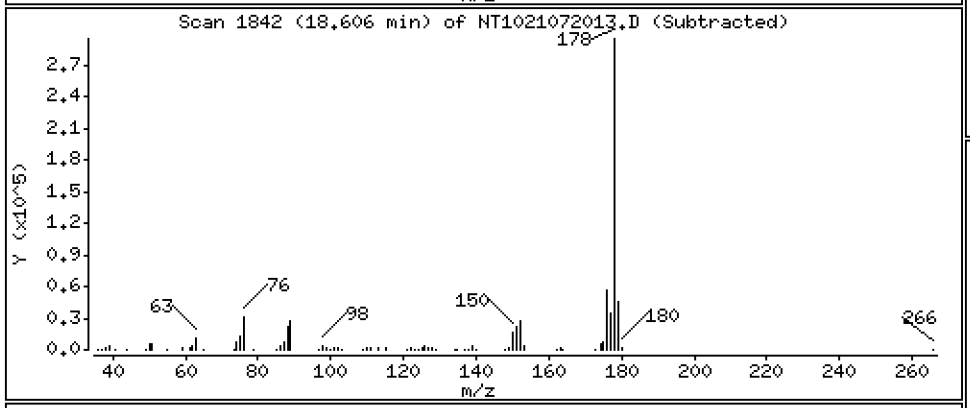
Column phase: ZB-5msi

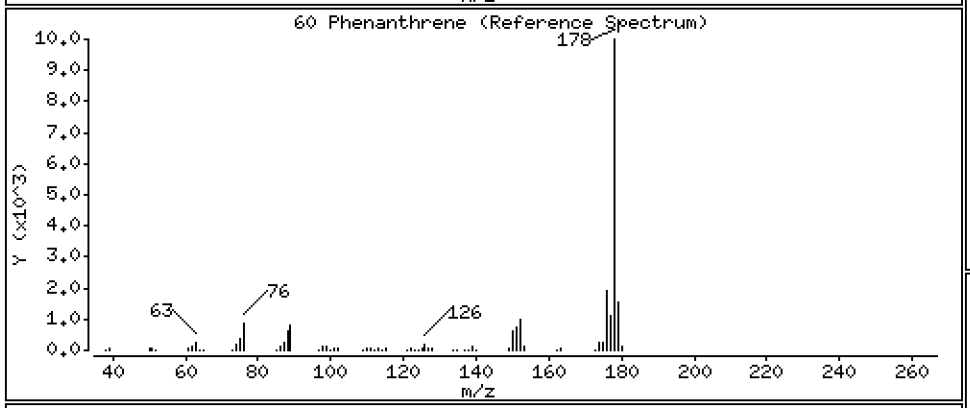
Column diameter: 0.25

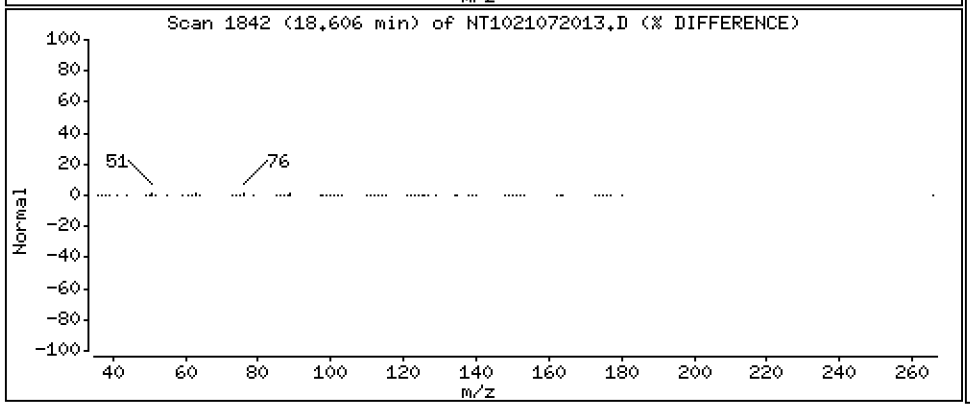
60 Phenanthrene

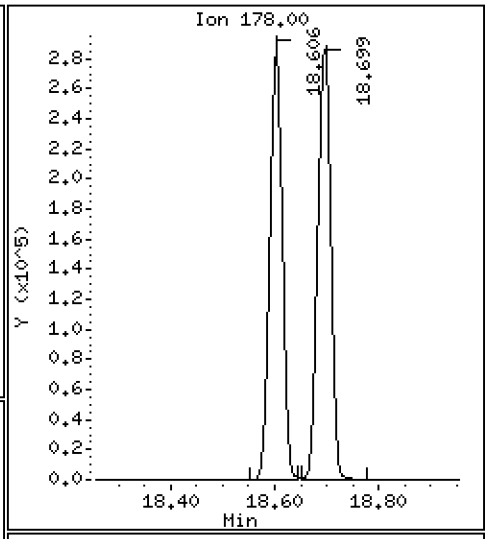
Concentration: 5.038 ug/mL

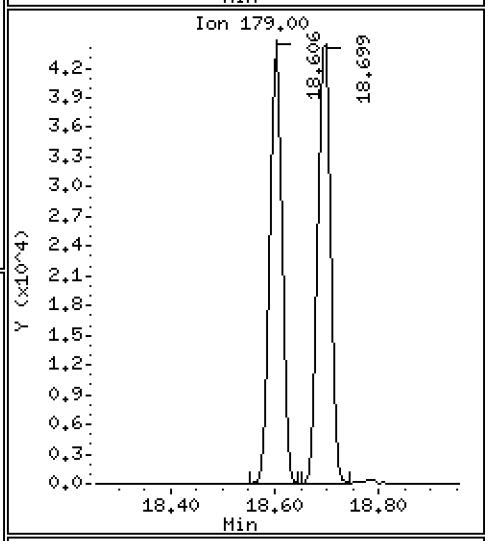


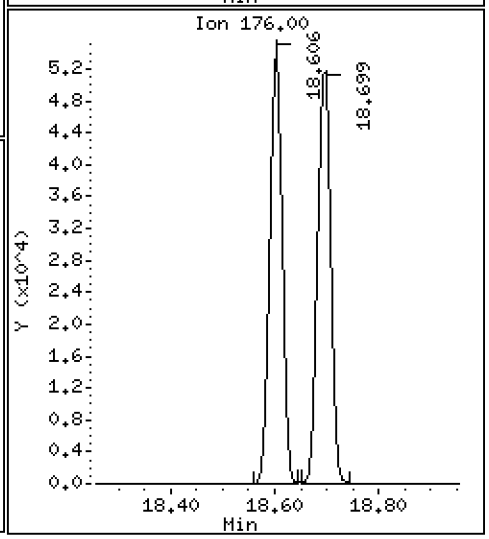












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

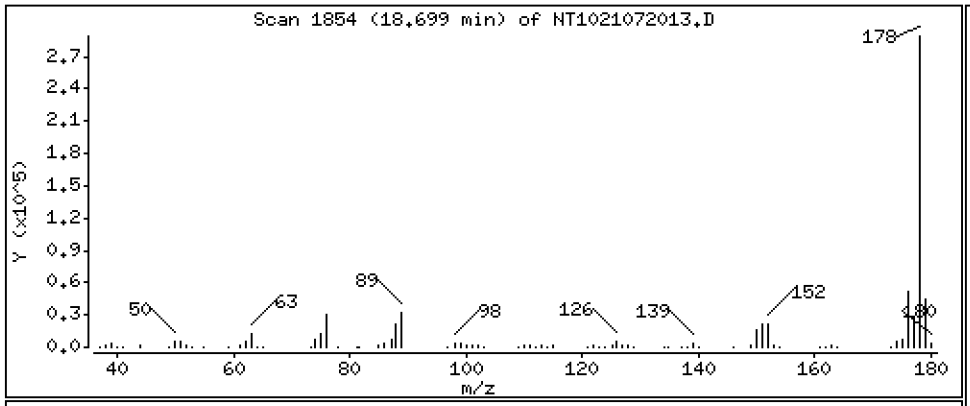
Operator: VTS

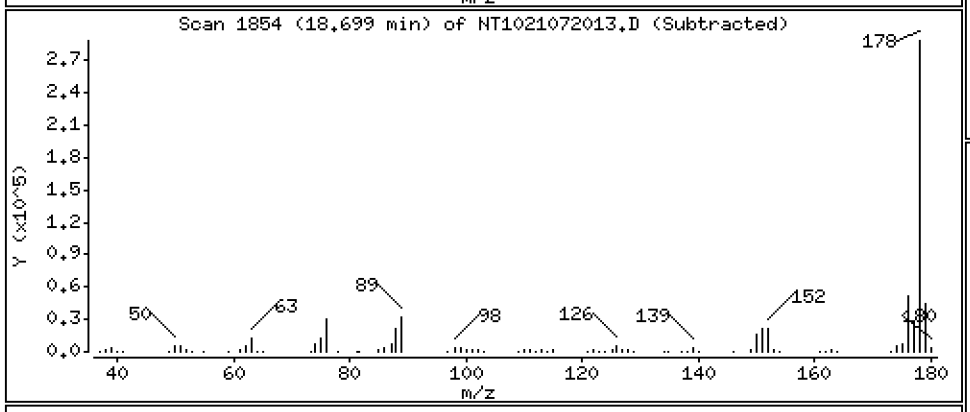
Column phase: ZB-5msi

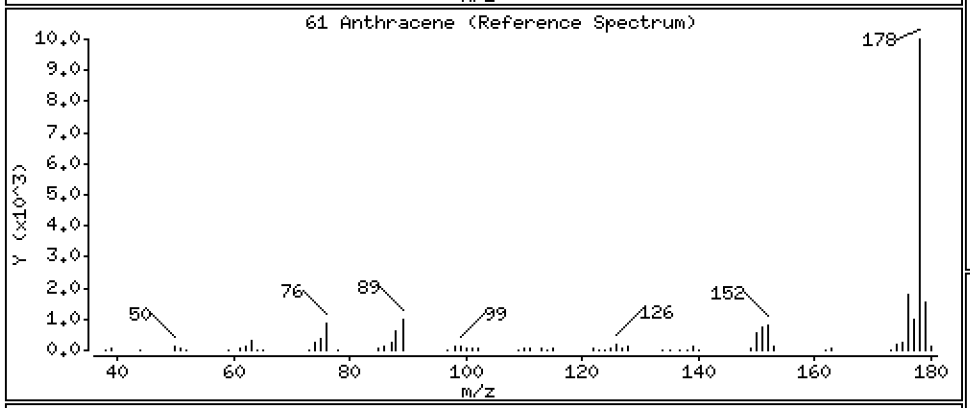
Column diameter: 0.25

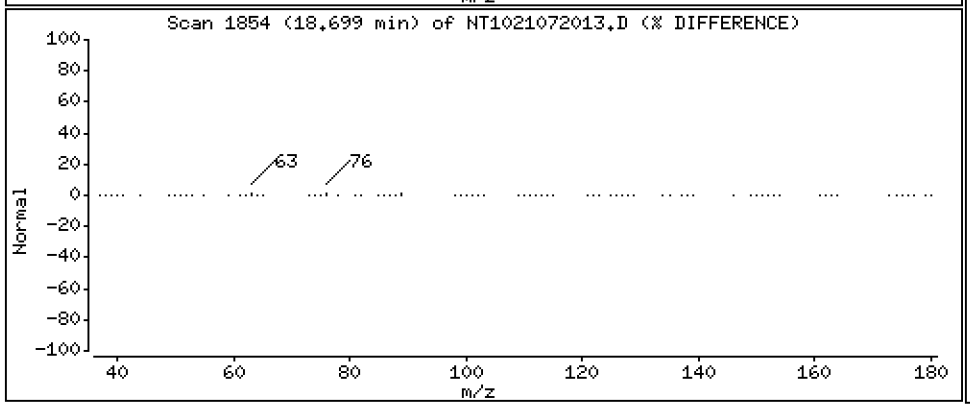
61 Anthracene

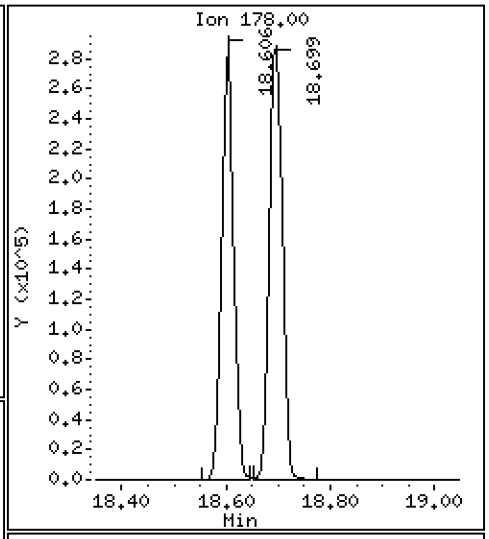
Concentration: 5.020 ug/mL

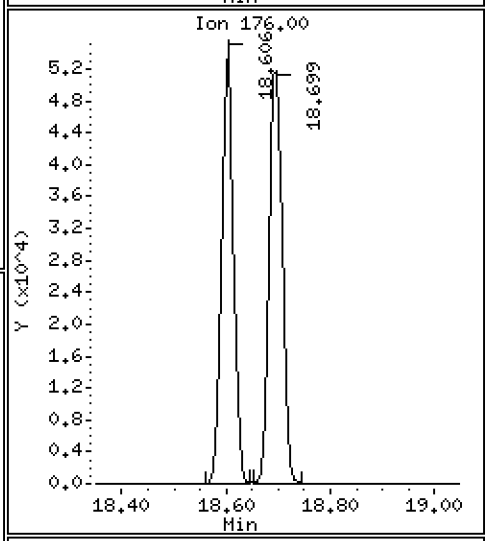


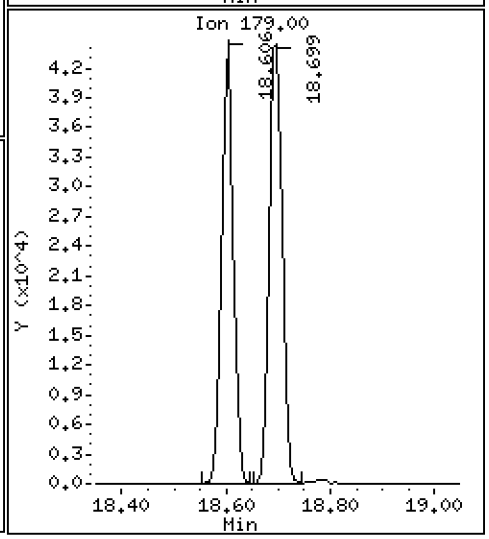












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

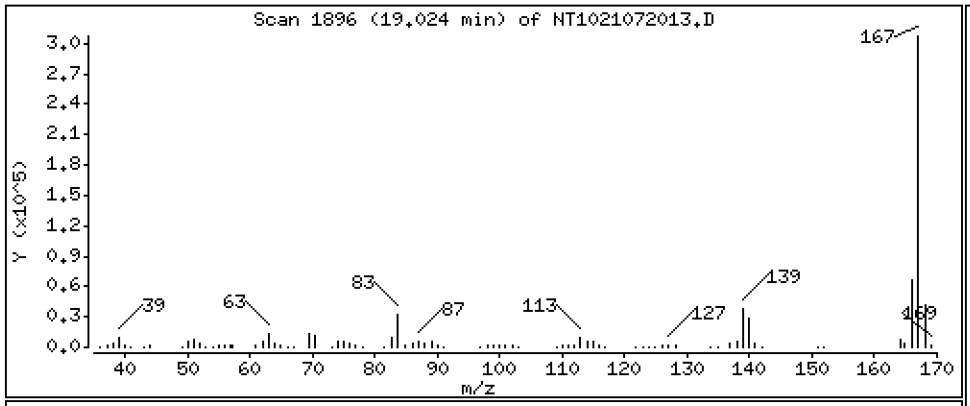
Operator: VTS

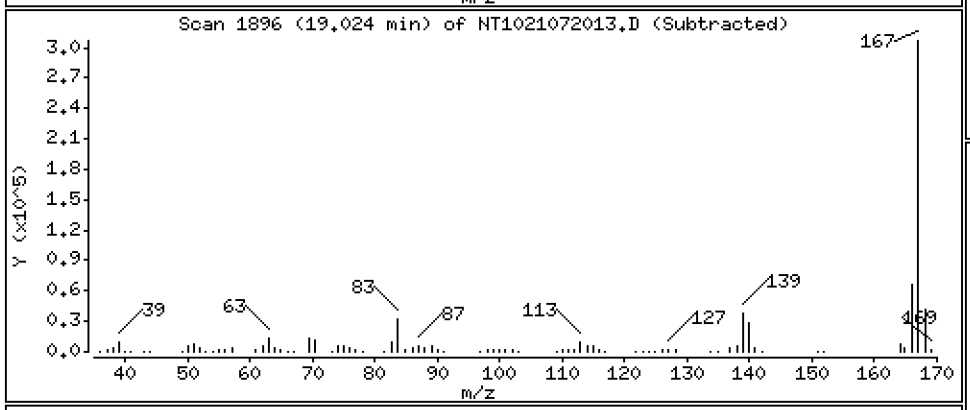
Column phase: ZB-5msi

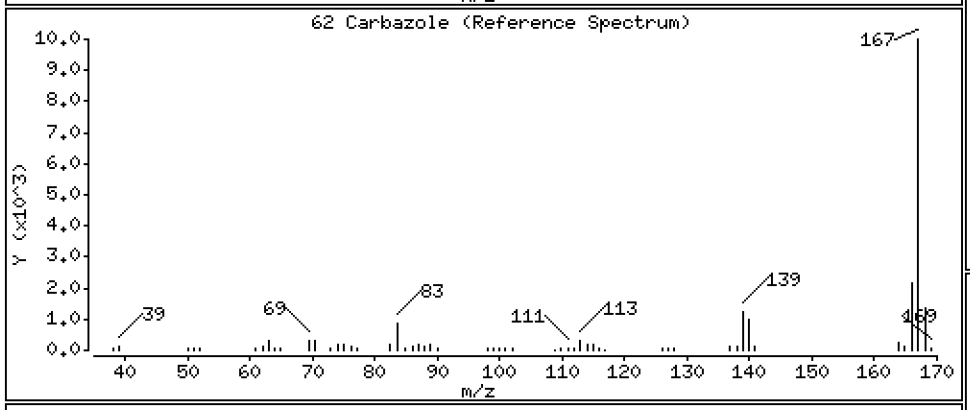
Column diameter: 0.25

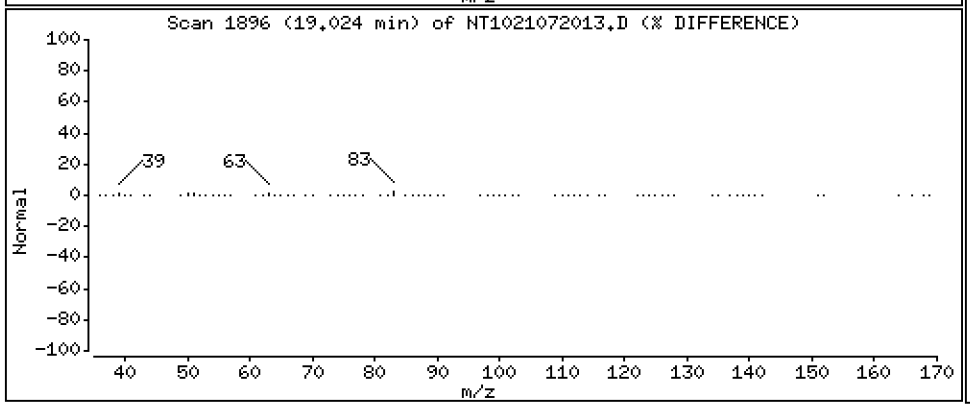
62 Carbazole

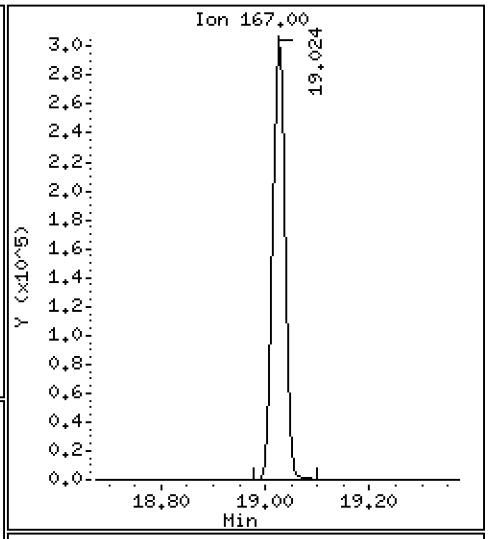
Concentration: 5.033 ug/mL

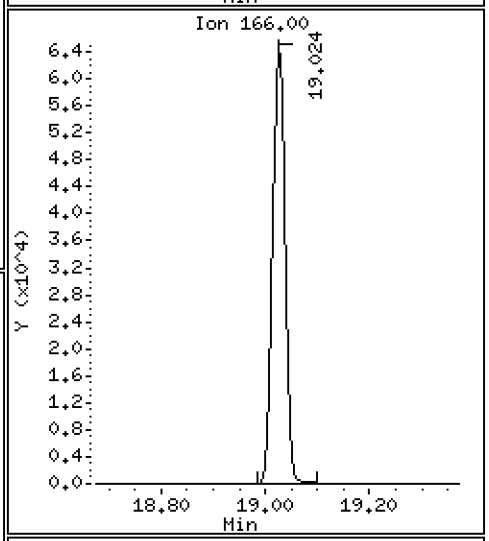


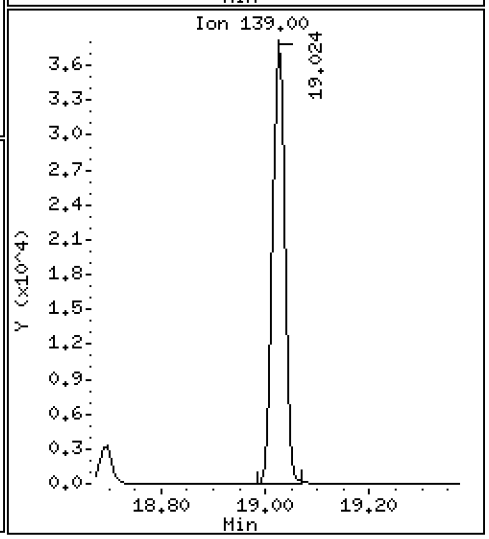












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

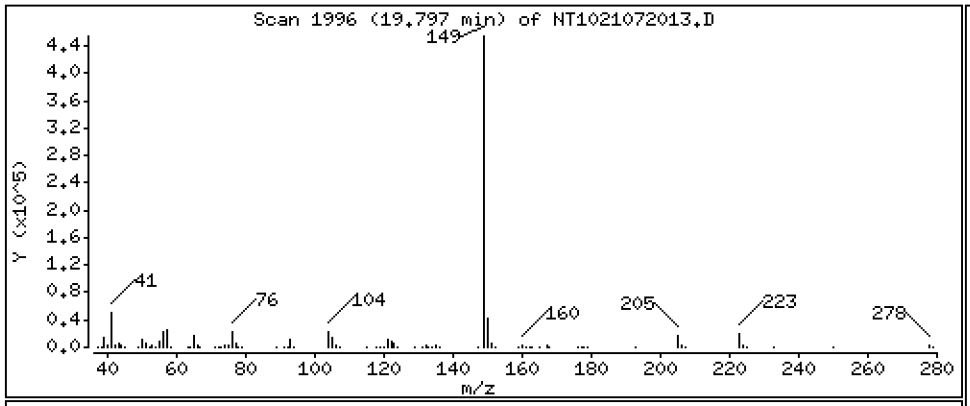
Operator: VTS

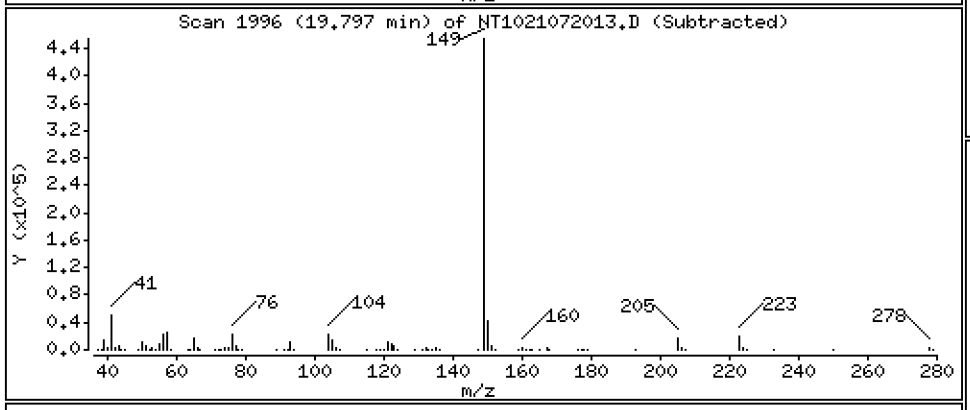
Column phase: ZB-5msi

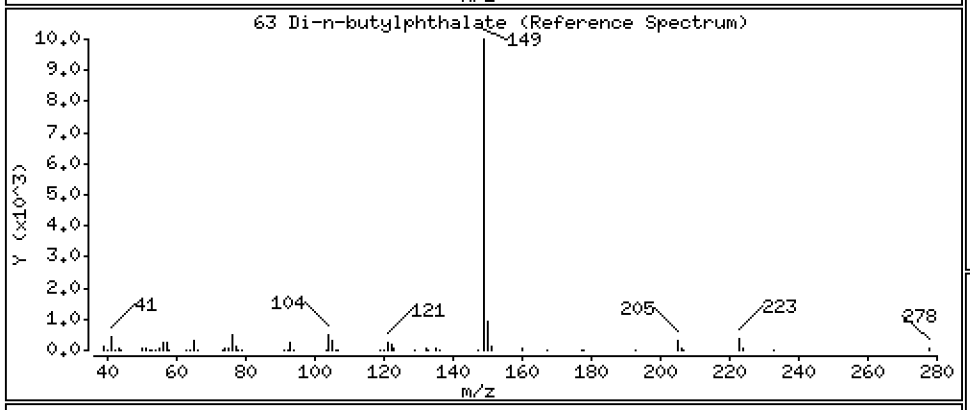
Column diameter: 0.25

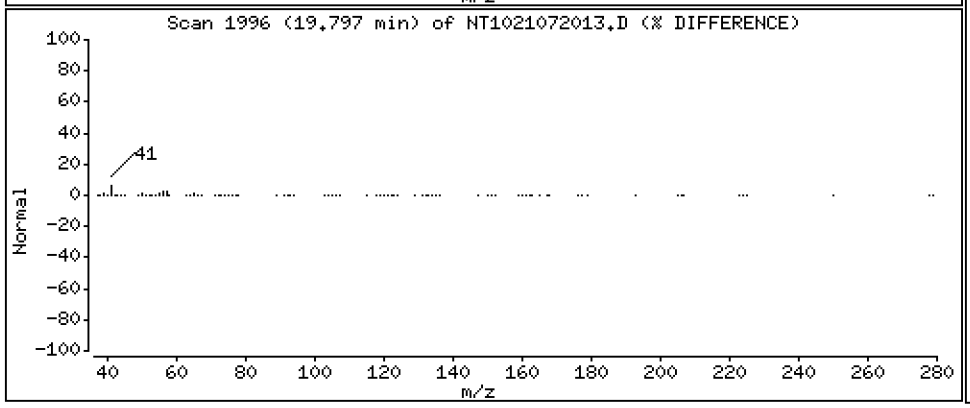
63 Di-n-butylphthalate

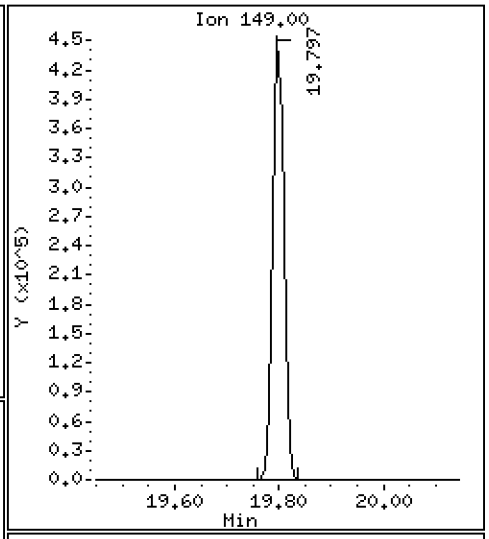
Concentration: 4.276 ug/mL

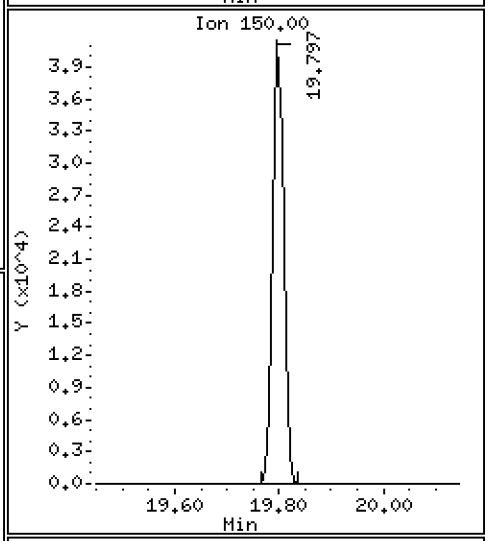


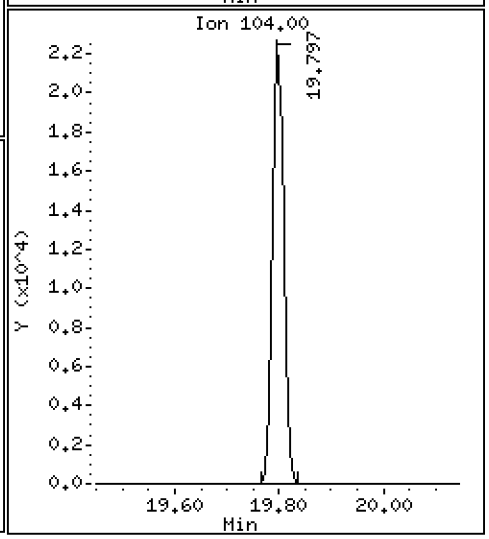












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

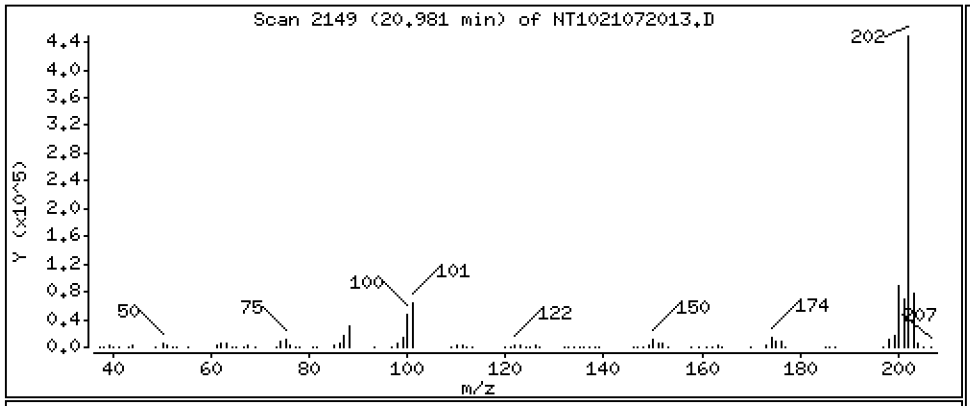
Operator: VTS

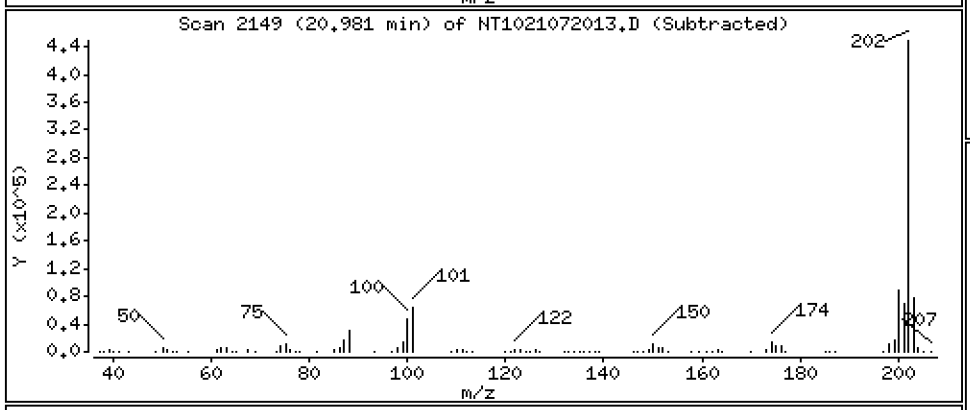
Column phase: ZB-5msi

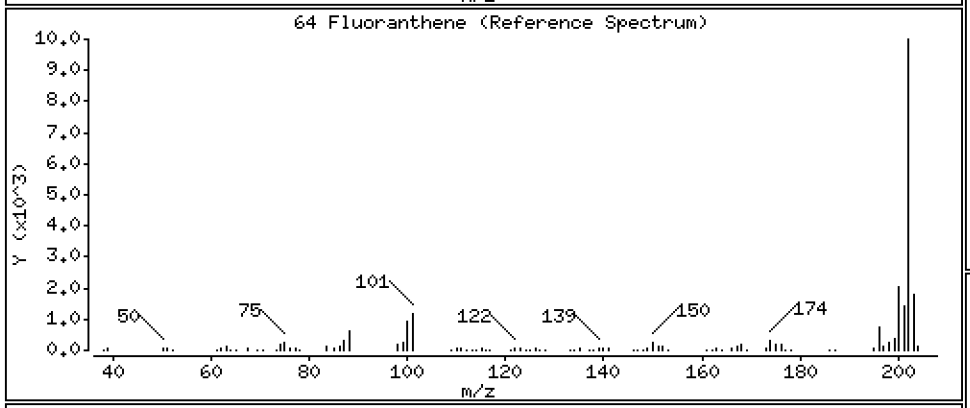
Column diameter: 0.25

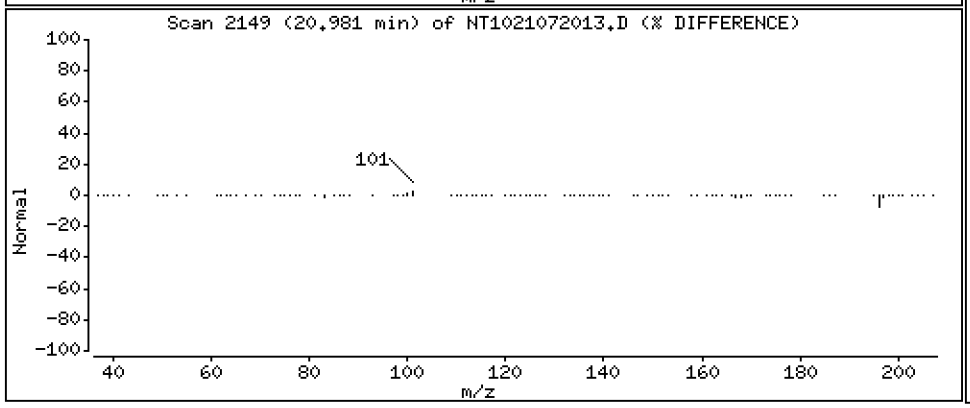
64 Fluoranthene

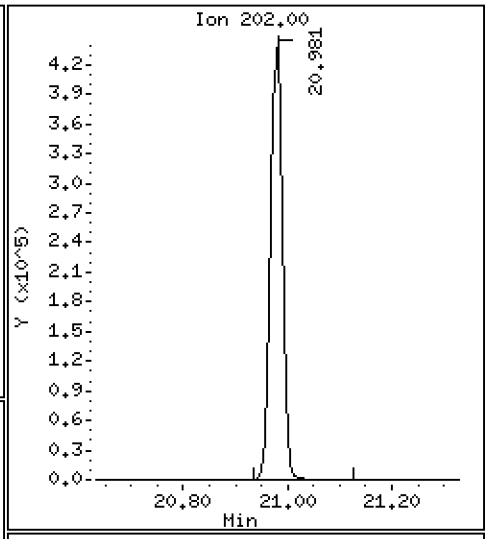
Concentration: 4.950 ug/mL

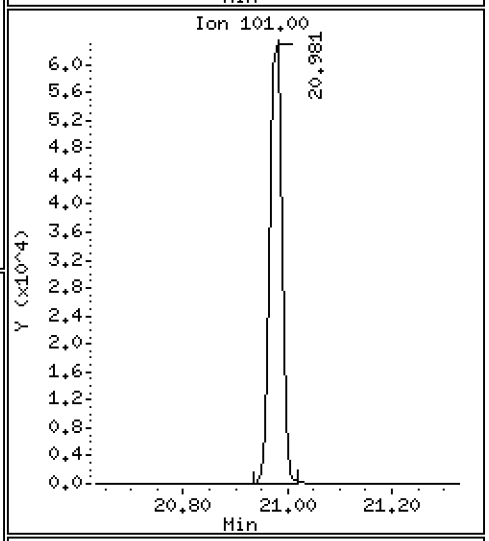


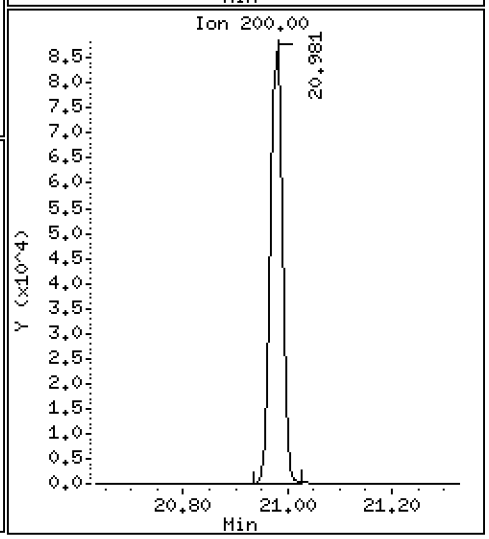












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

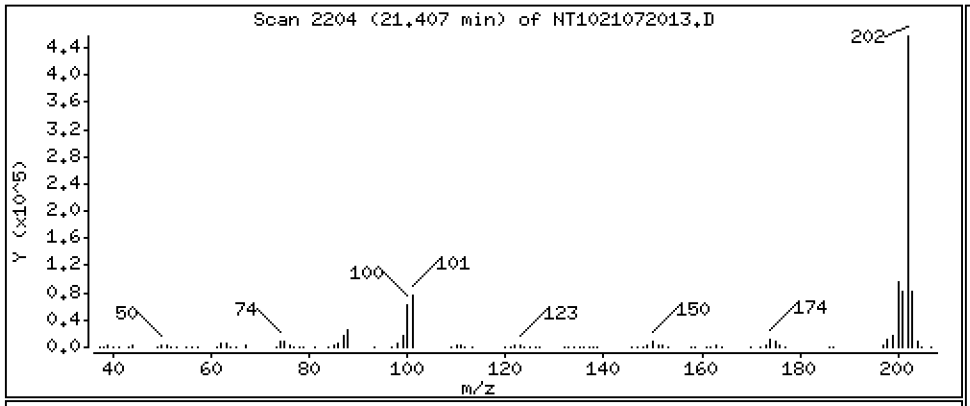
Operator: VTS

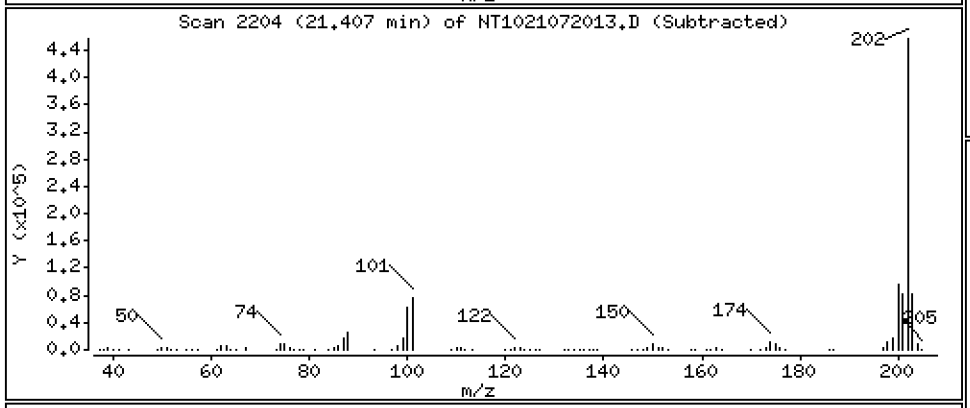
Column phase: ZB-5msi

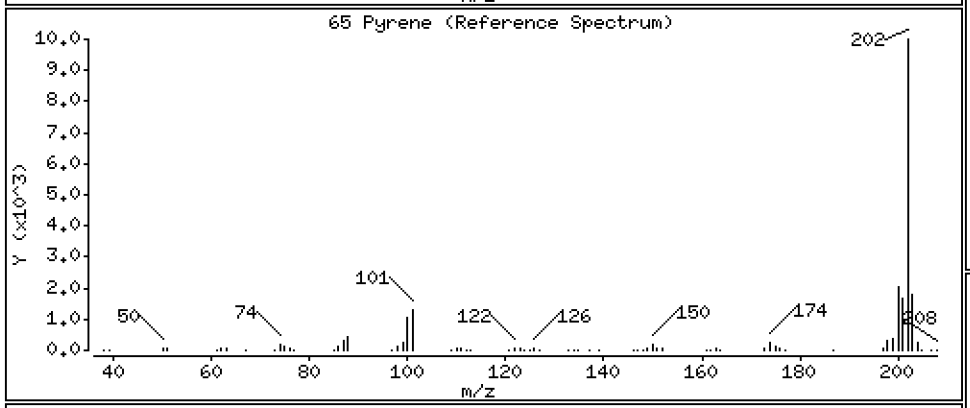
Column diameter: 0.25

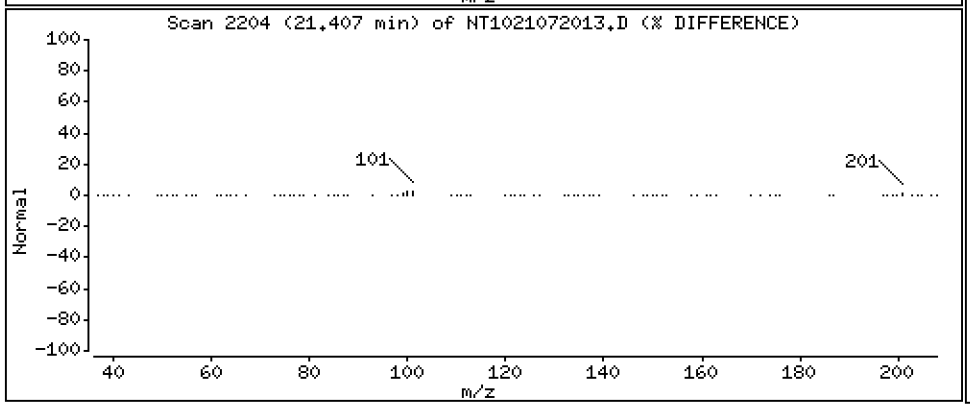
65 Pyrene

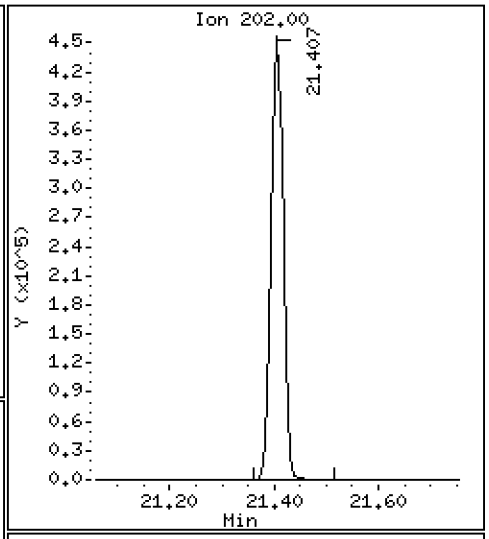
Concentration: 5.254 ug/mL

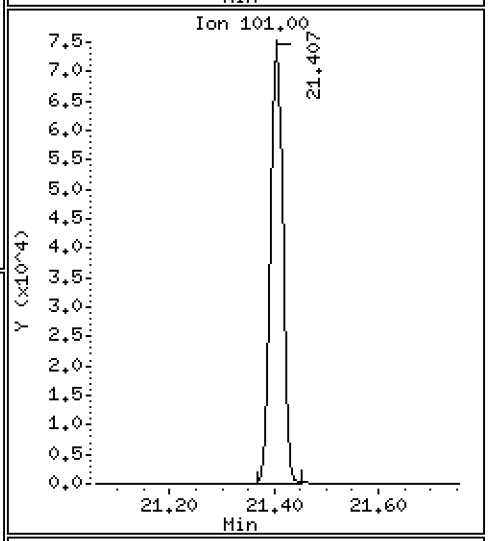


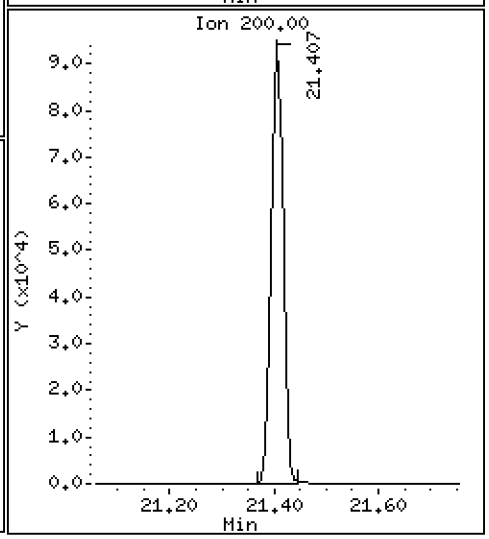












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

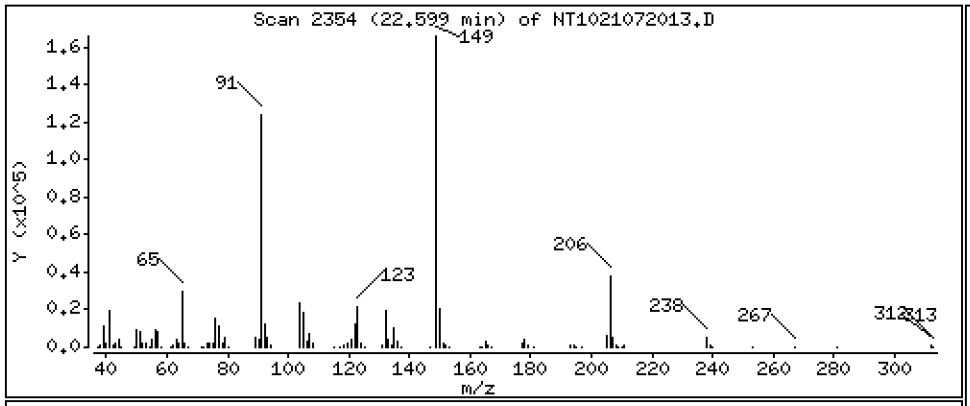
Operator: VTS

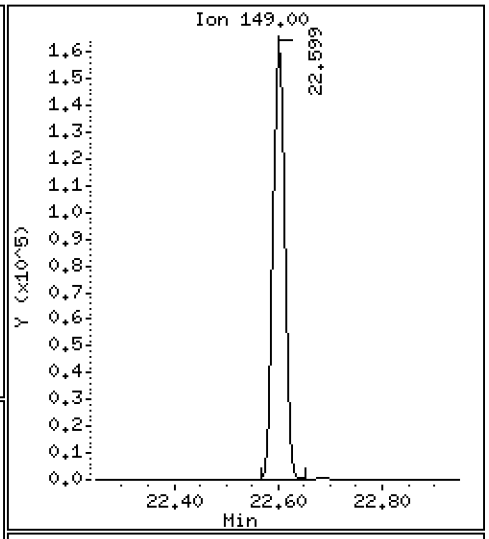
Column phase: ZB-5msi

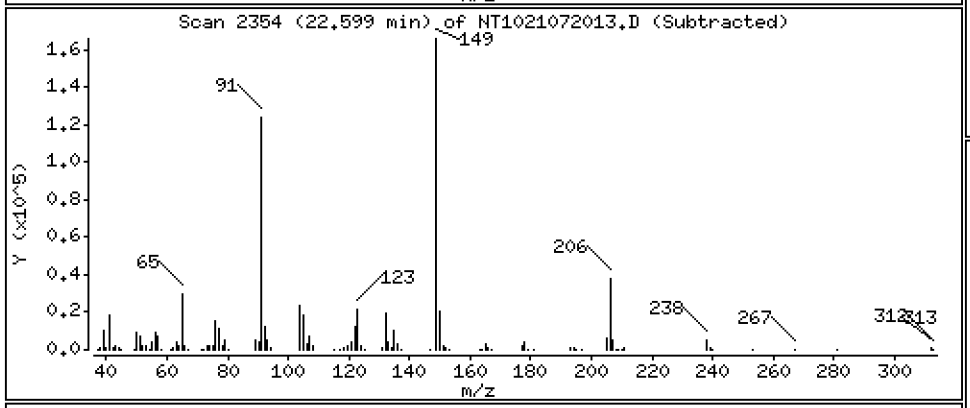
Column diameter: 0.25

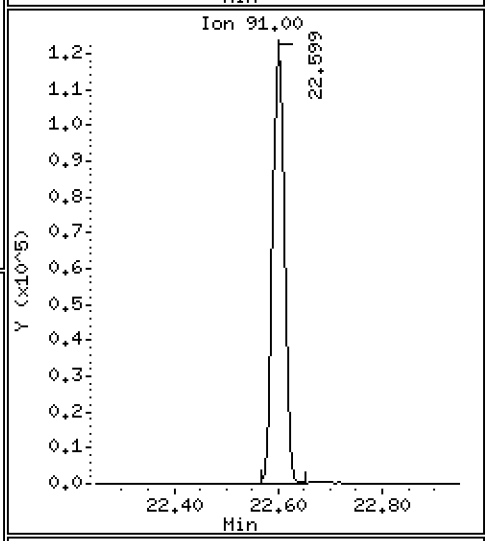
67 Butylbenzylphthalate

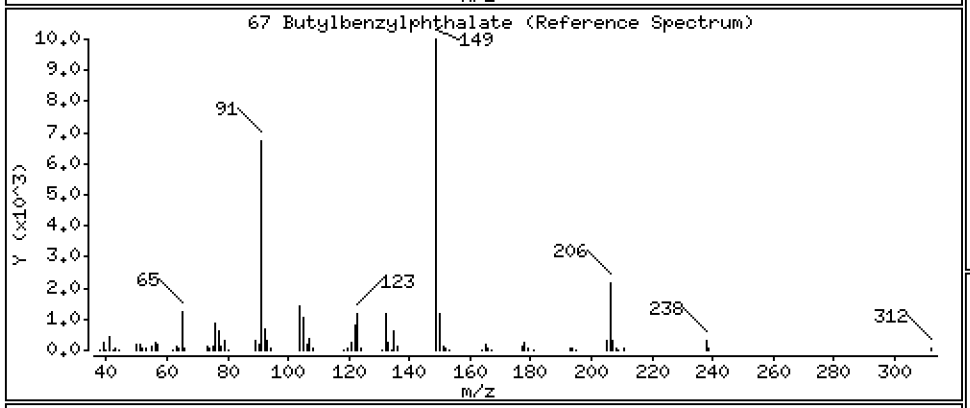
Concentration: 4.974 ug/mL

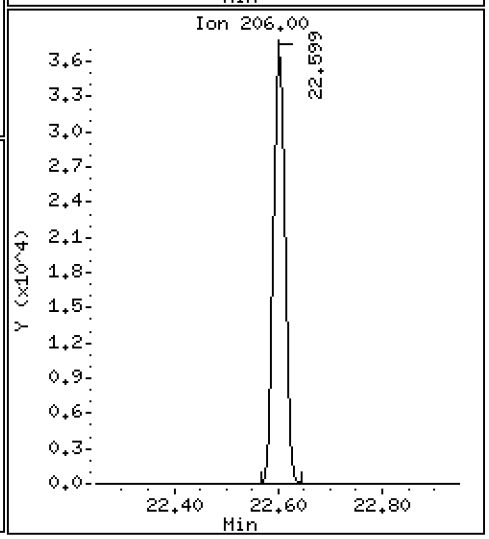


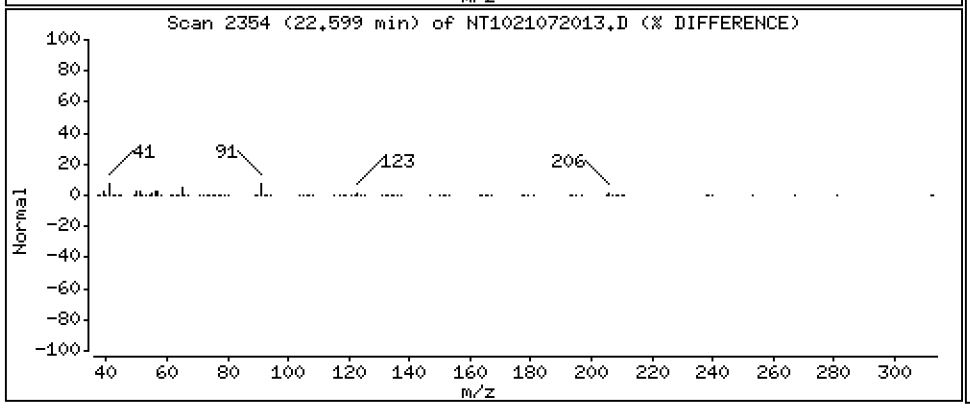












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

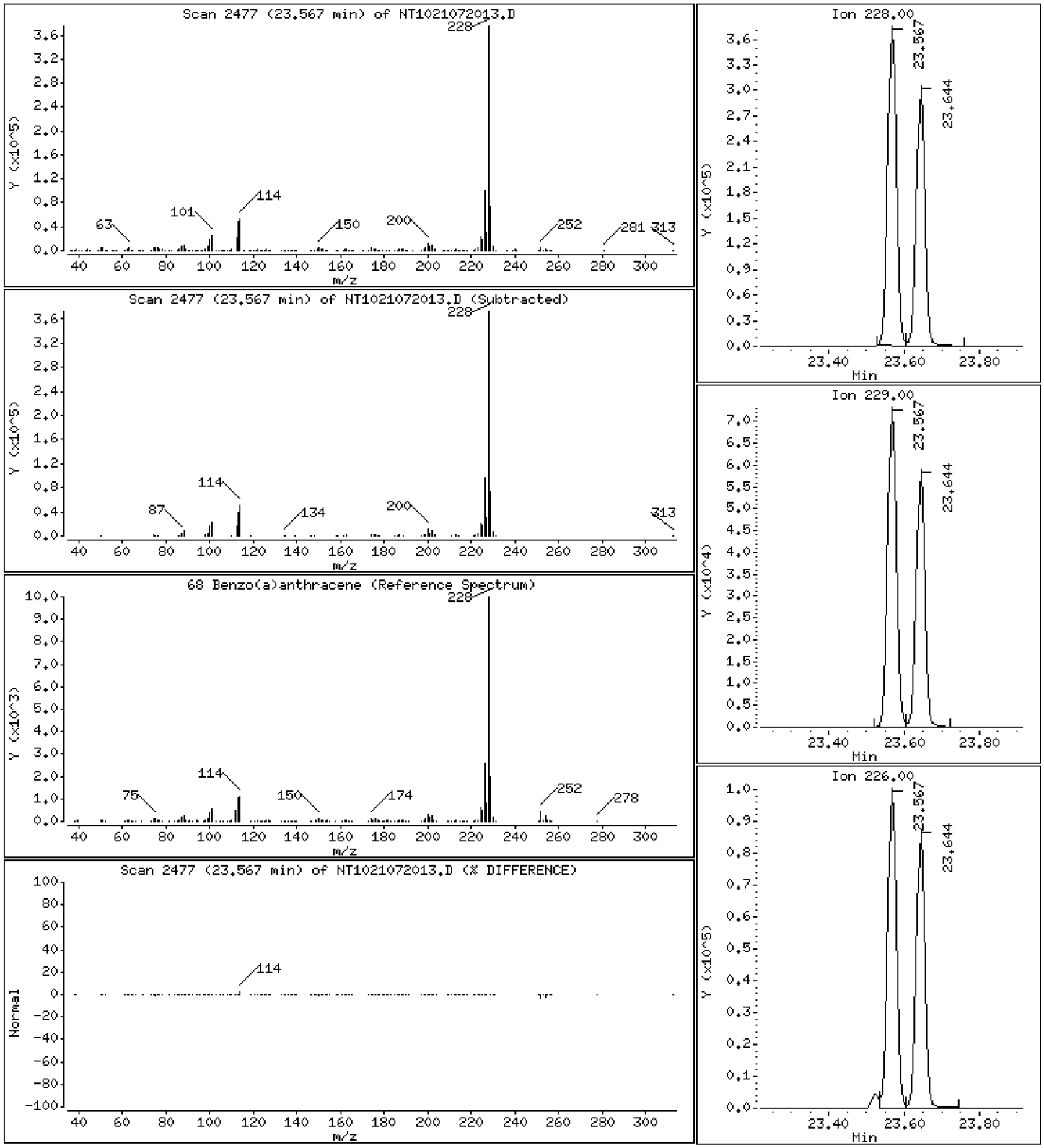
Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25

68 Benzo(a)anthracene

Concentration: 4.800 ug/mL



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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

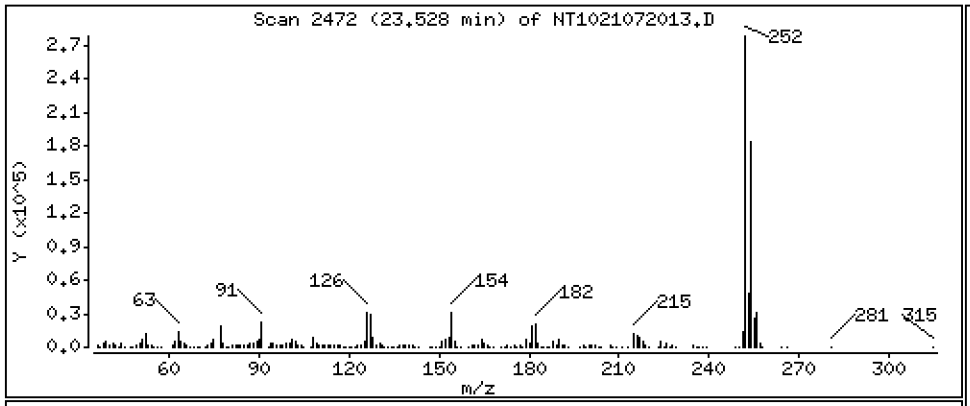
Operator: VTS

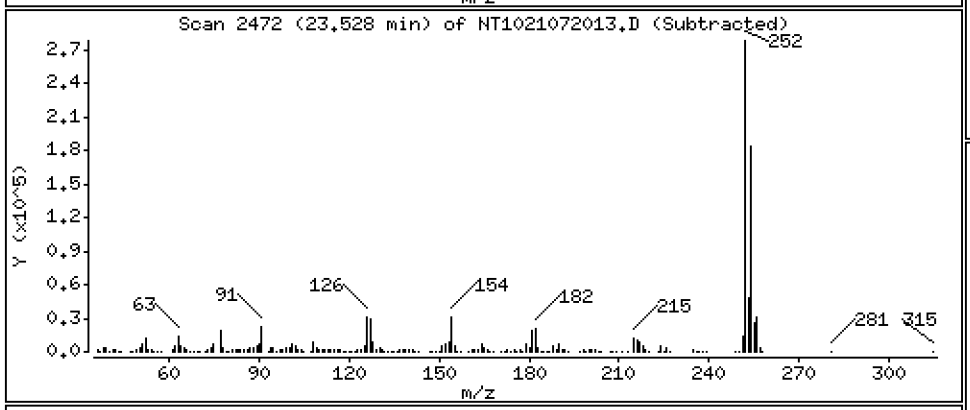
Column phase: ZB-5msi

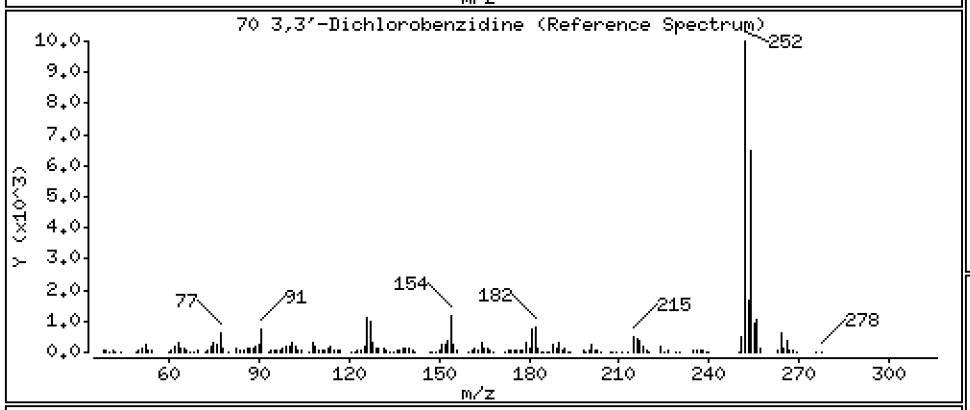
Column diameter: 0.25

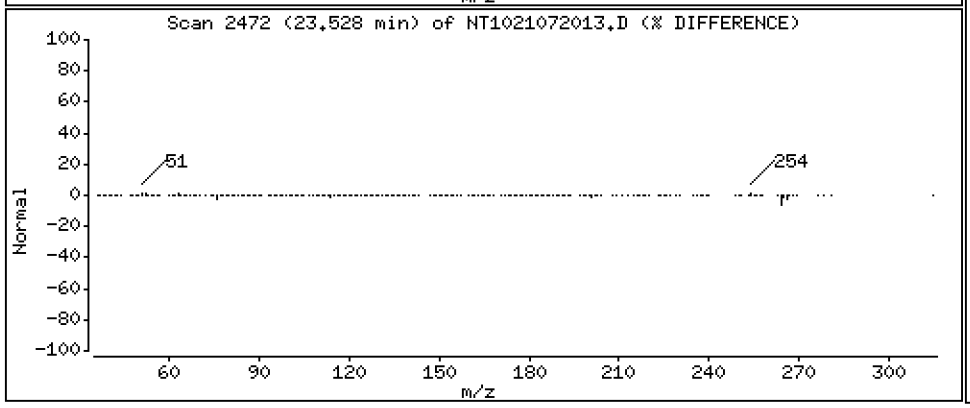
70 3,3'-Dichlorobenzidine

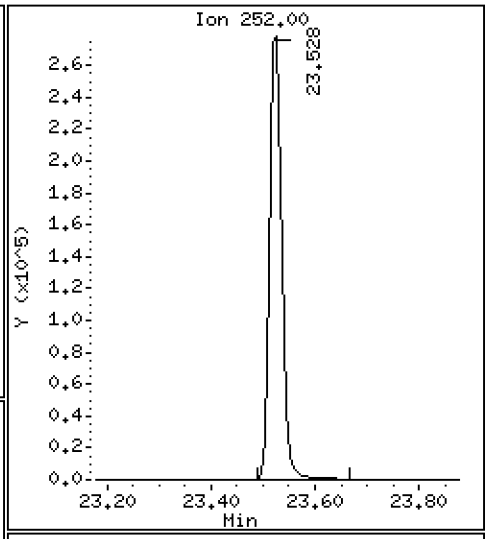
Concentration: 9.013 ug/mL

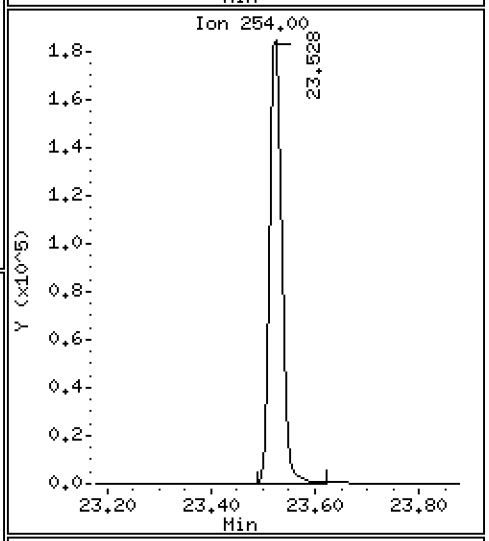


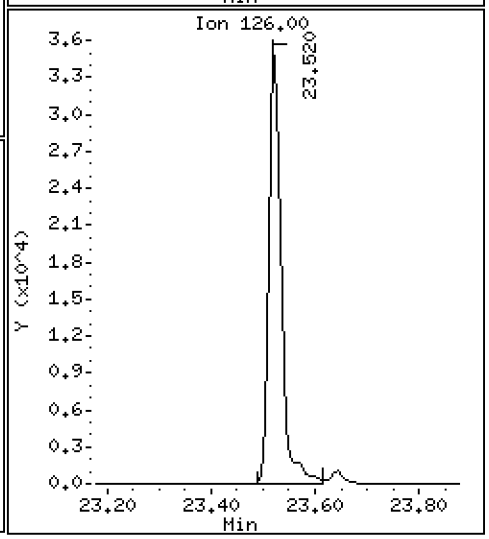












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

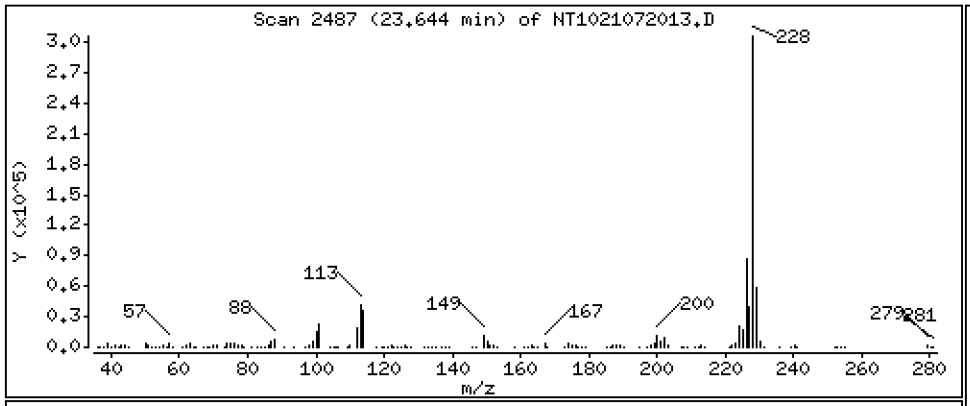
Operator: VTS

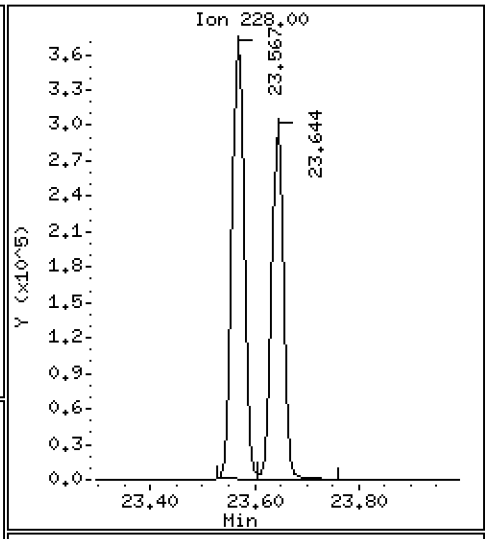
Column phase: ZB-5msi

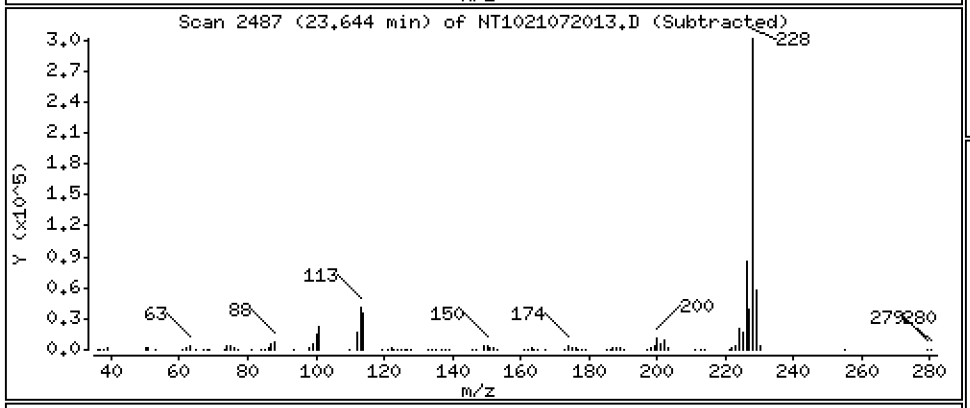
Column diameter: 0.25

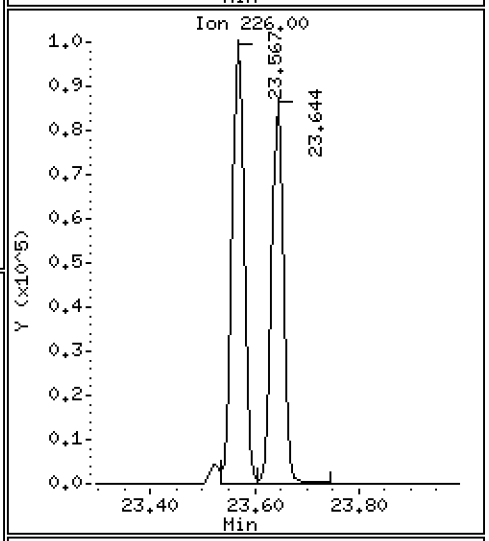
71 Chrysene

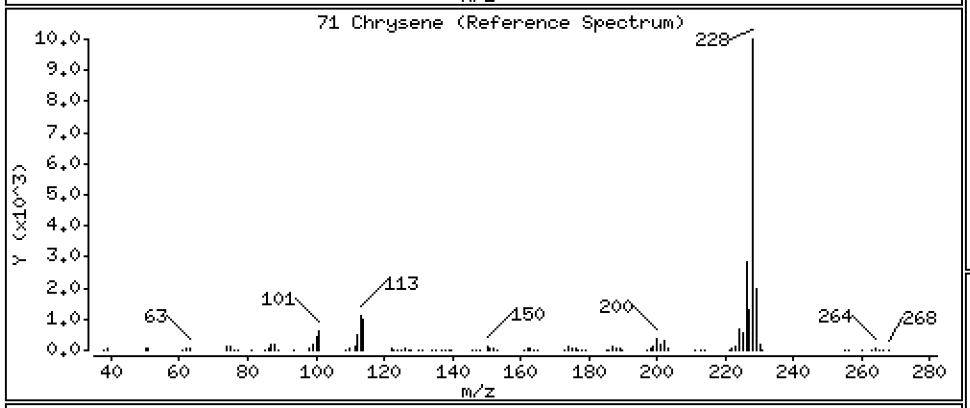
Concentration: 4.859 ug/mL

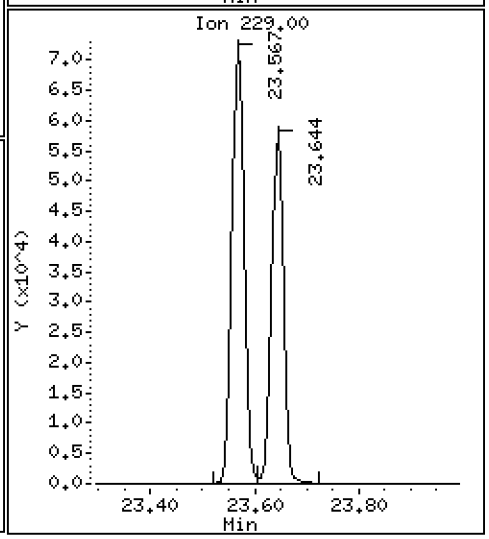


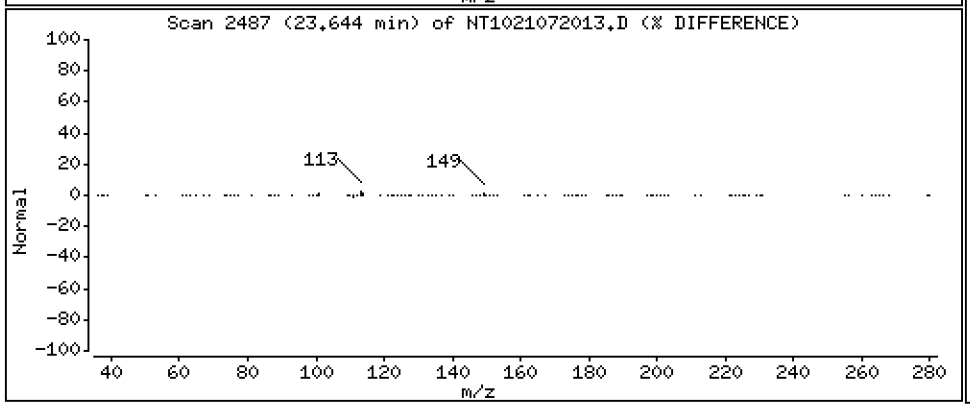












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

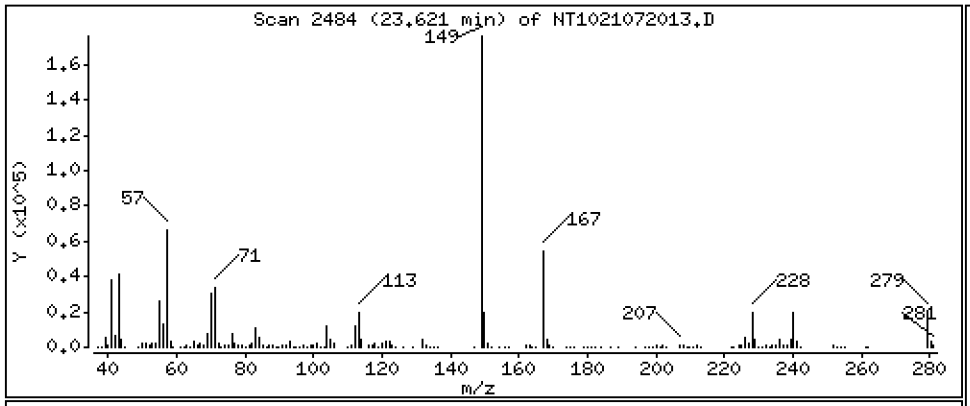
Operator: VTS

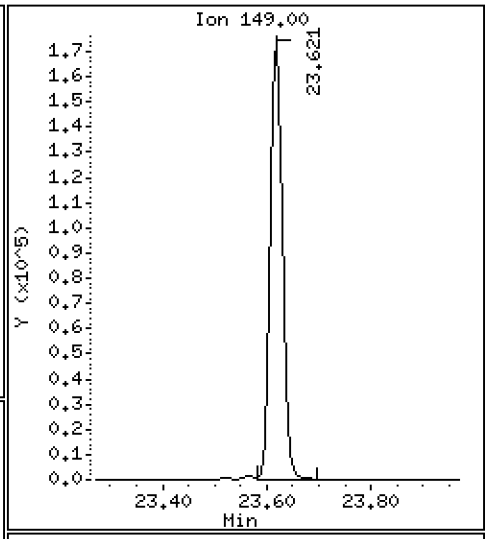
Column phase: ZB-5msi

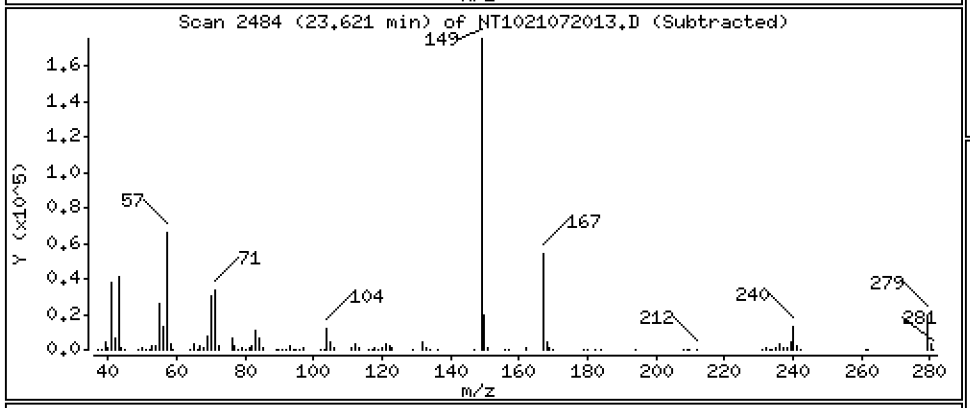
Column diameter: 0.25

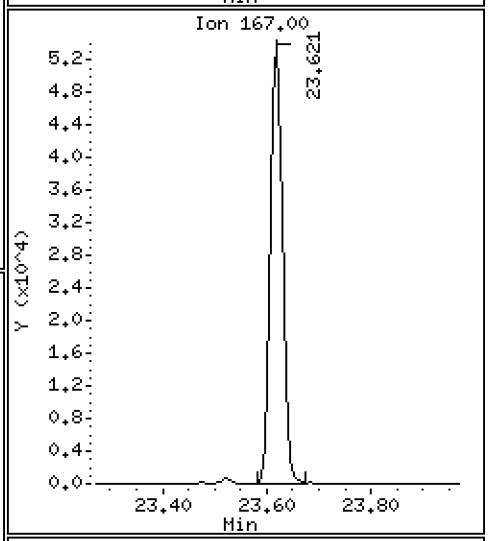
72 bis(2-Ethylhexyl)phthalate

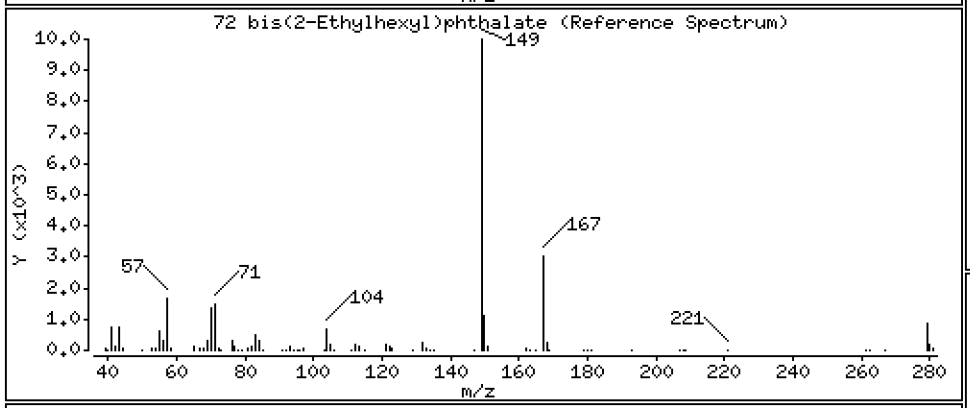
Concentration: 5.117 ug/mL

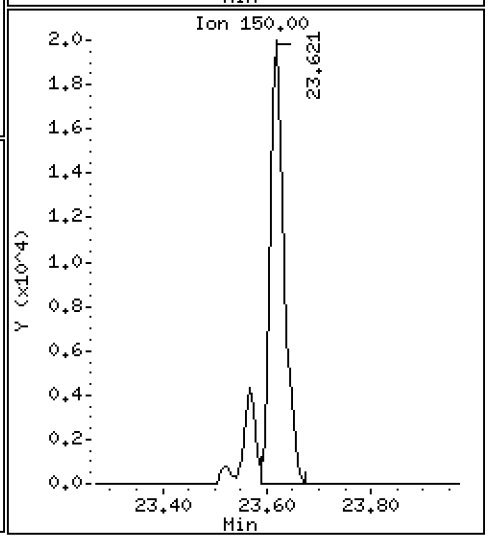


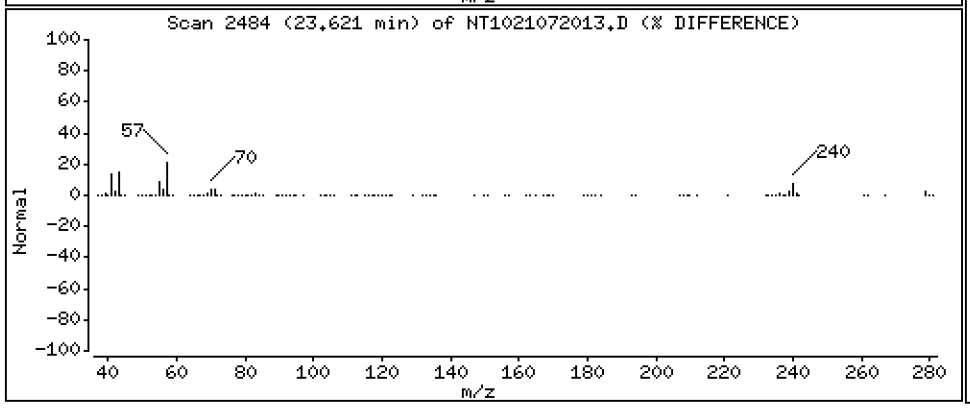












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

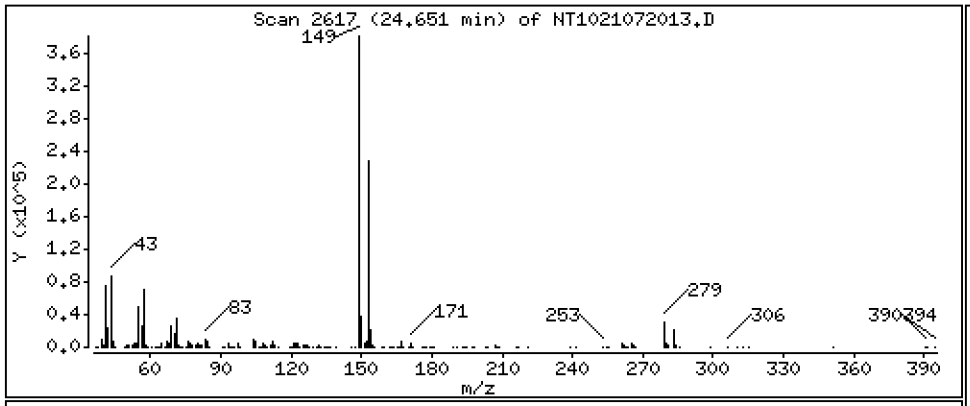
Operator: VTS

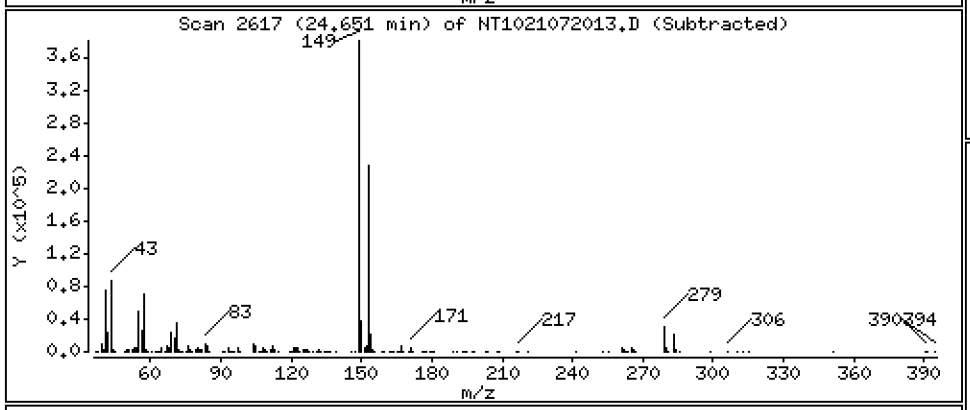
Column phase: ZB-5msi

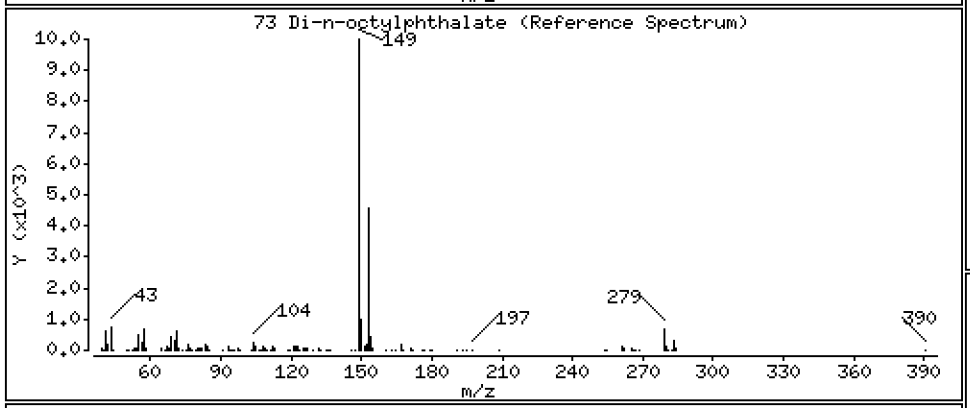
Column diameter: 0.25

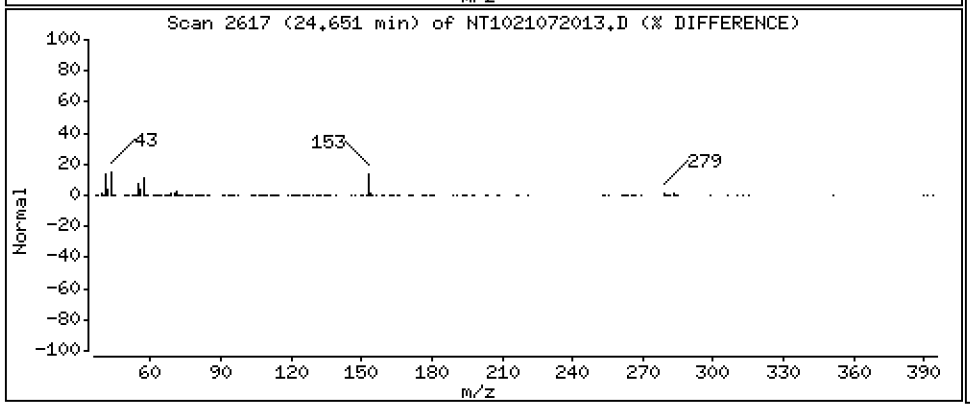
73 Di-n-octylphthalate

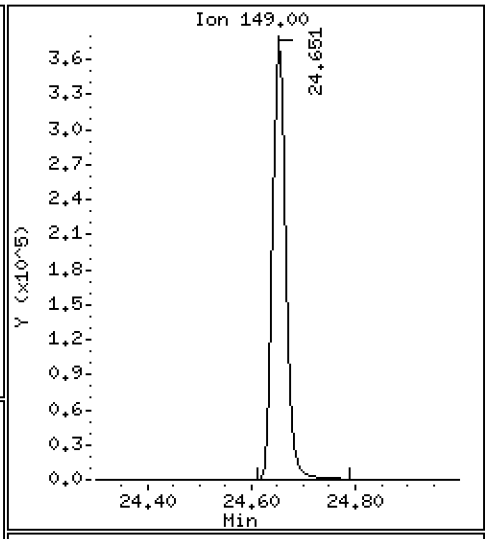
Concentration: 4.741 ug/mL

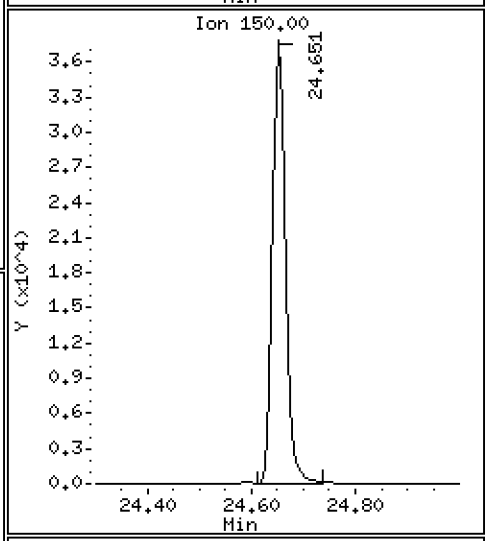


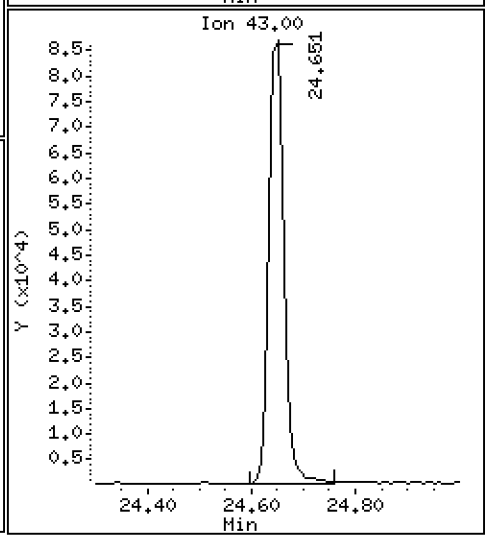












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

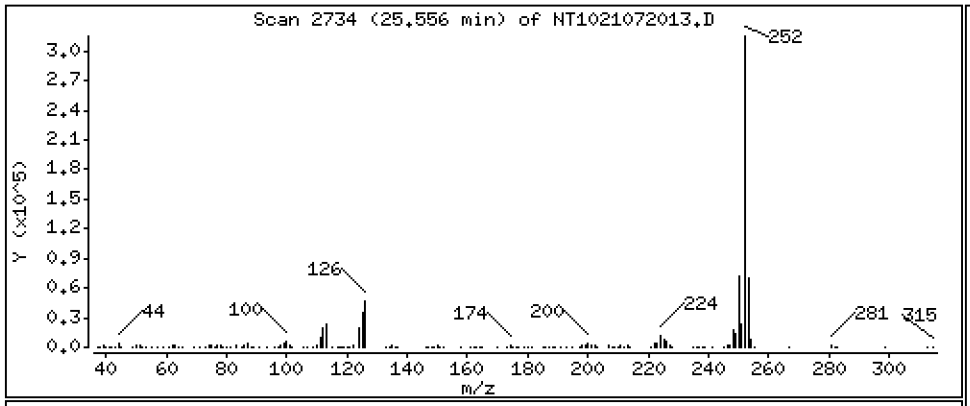
Operator: VTS

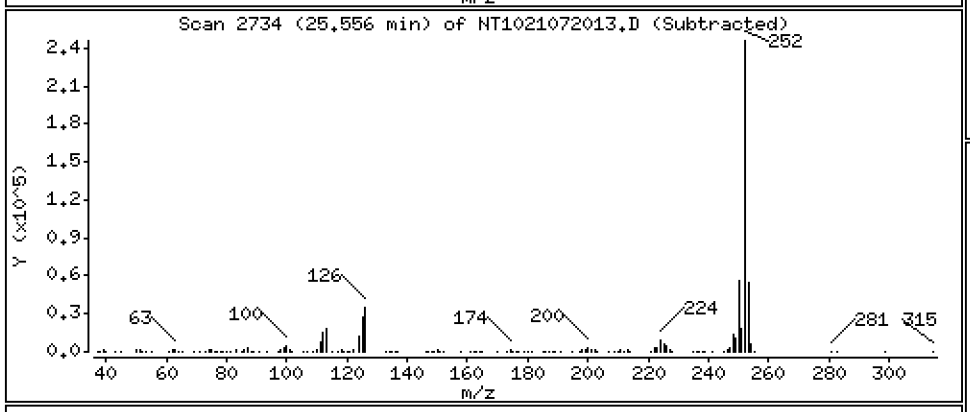
Column phase: ZB-5msi

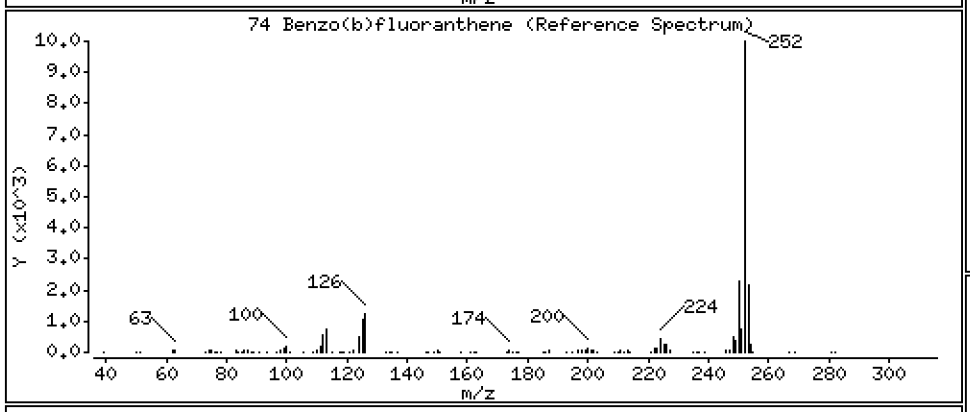
Column diameter: 0.25

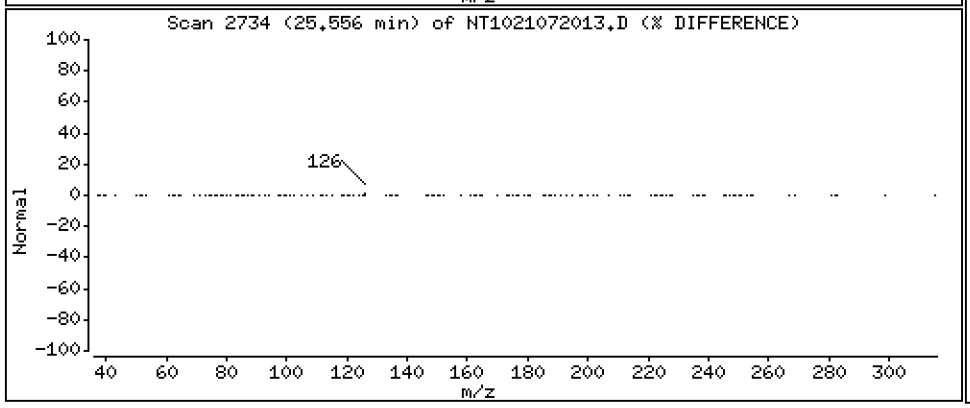
74 Benzo(b)fluoranthene

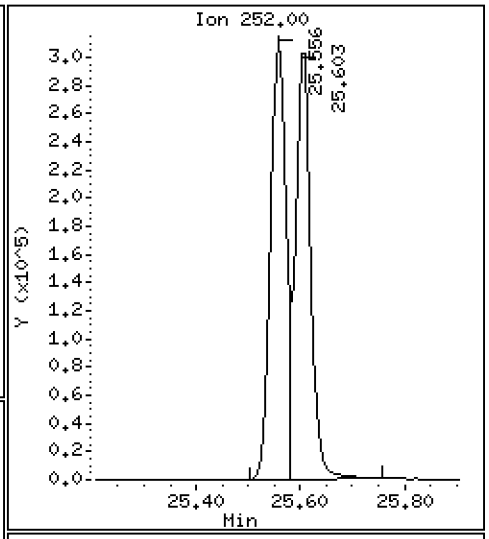
Concentration: 4.778 ug/mL

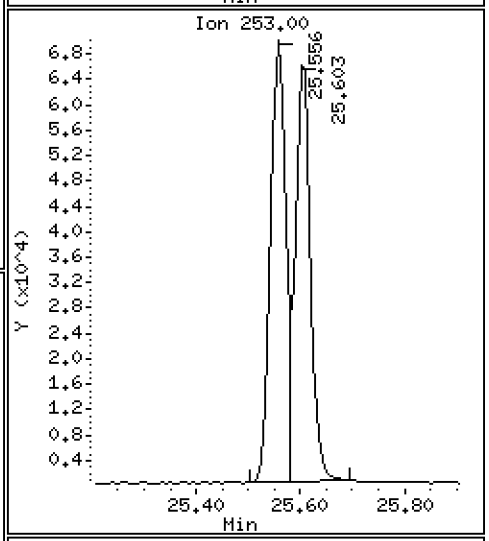


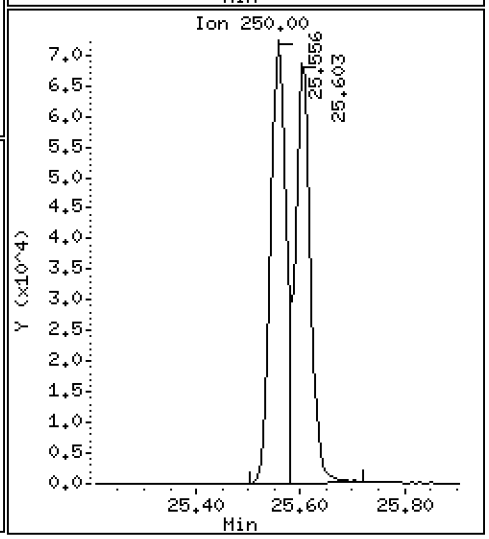












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

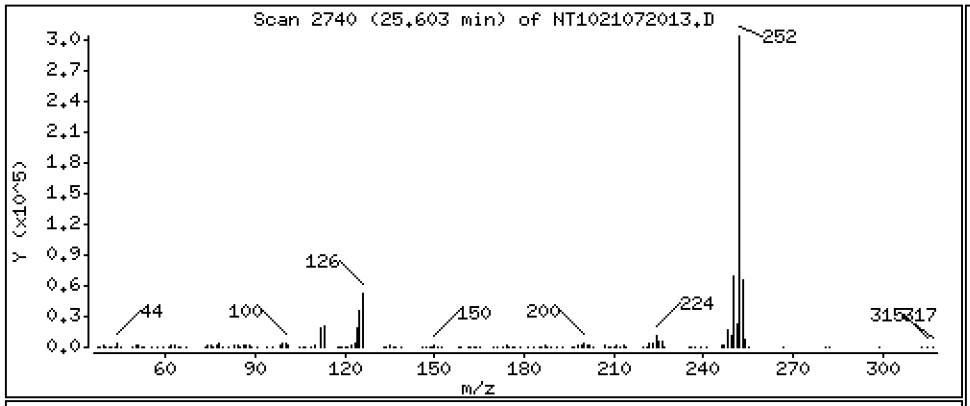
Operator: VTS

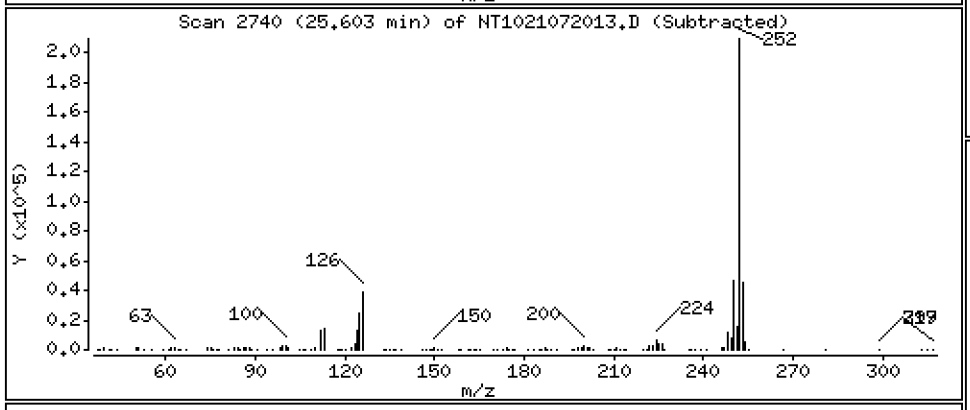
Column phase: ZB-5msi

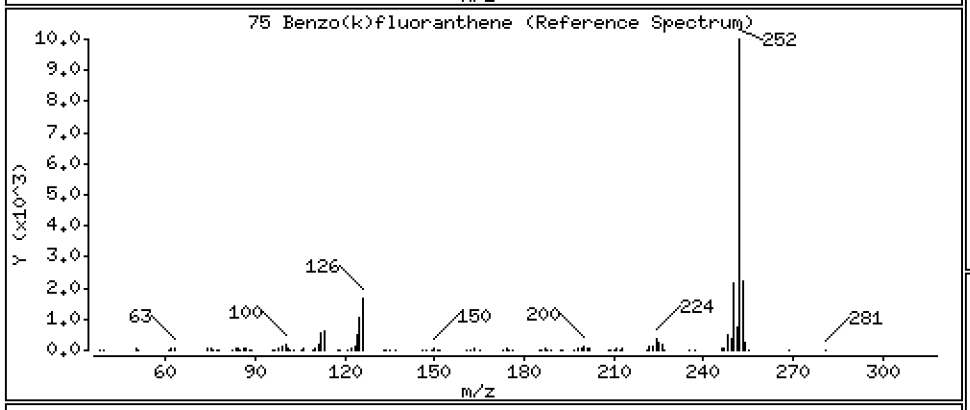
Column diameter: 0.25

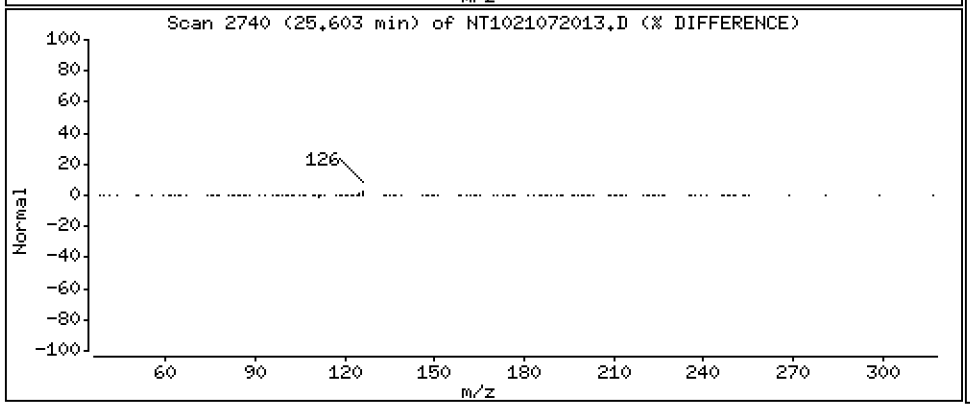
75 Benzo(k)fluoranthene

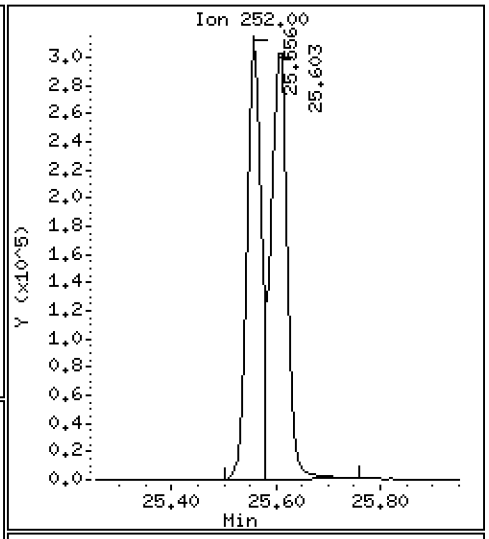
Concentration: 5.137 ug/mL

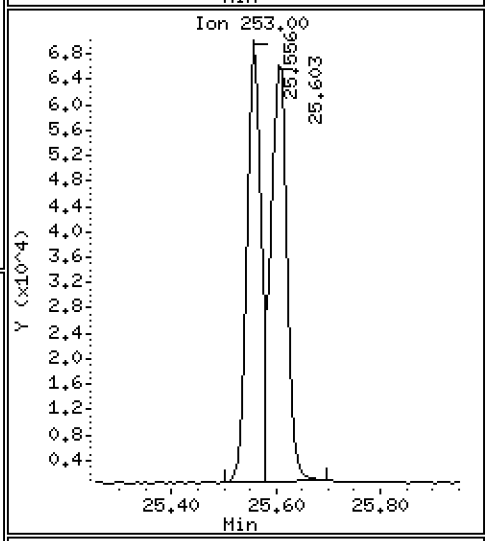


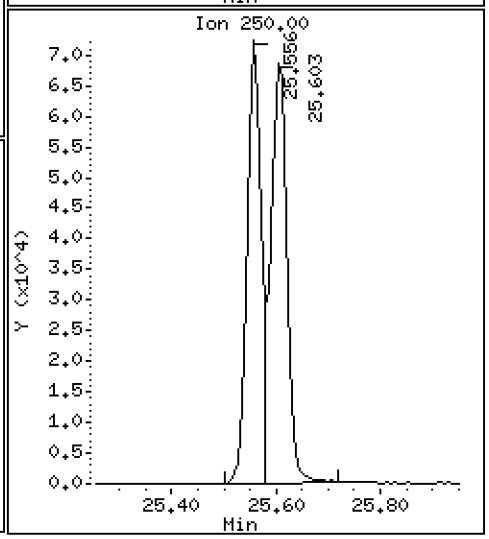












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

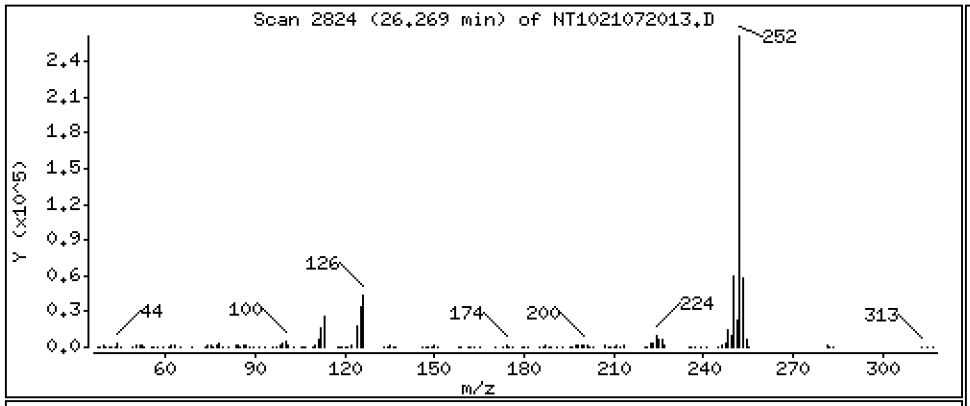
Operator: VTS

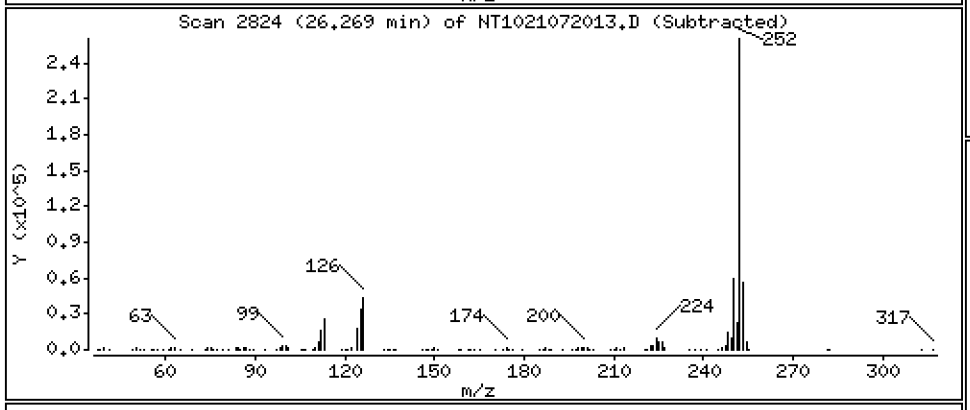
Column phase: ZB-5msi

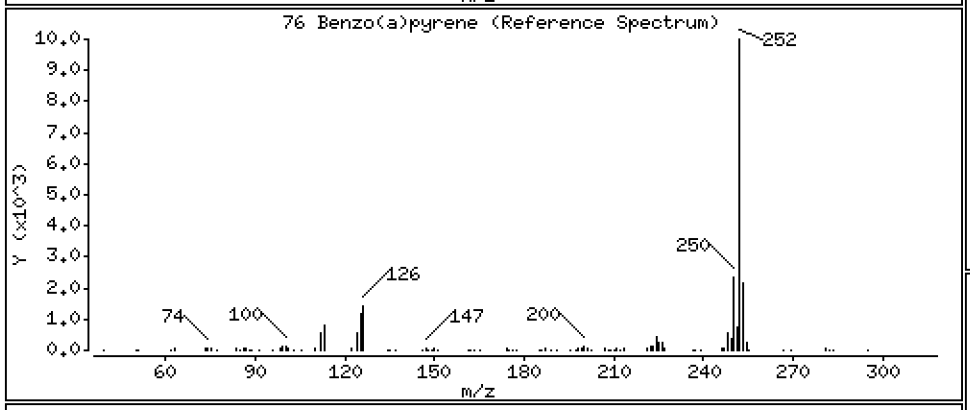
Column diameter: 0.25

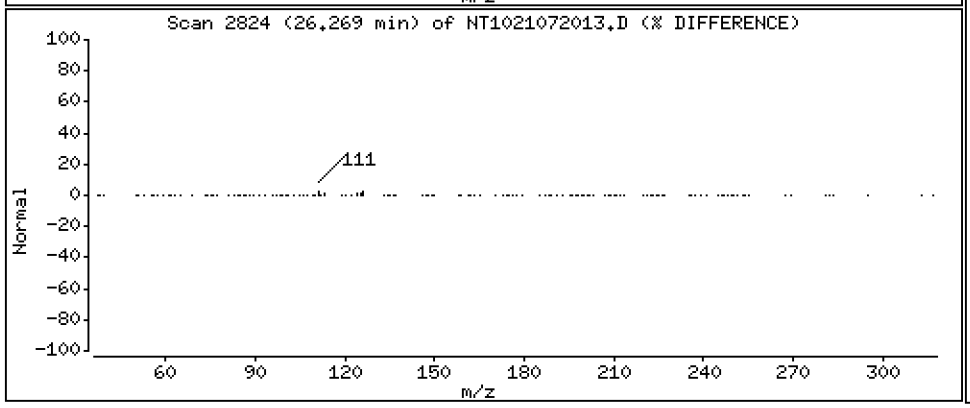
76 Benzo(a)pyrene

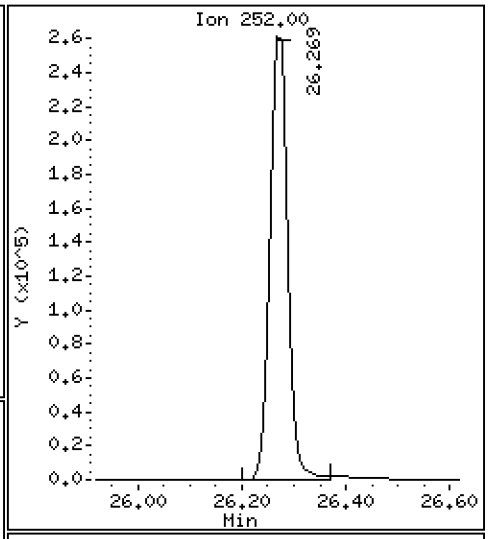
Concentration: 4.977 ug/mL

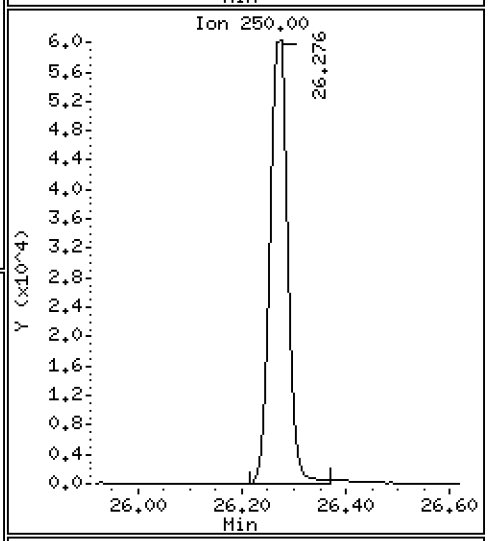


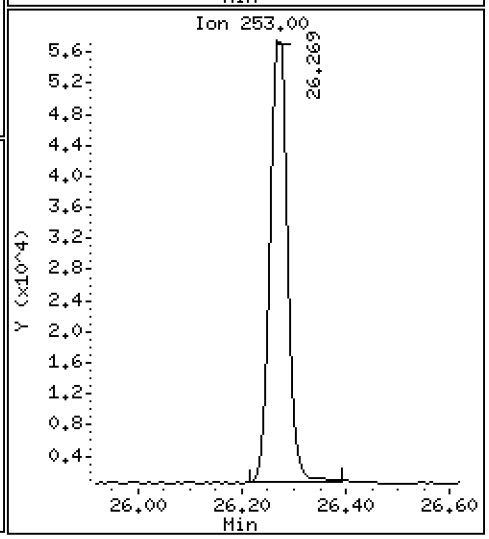












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

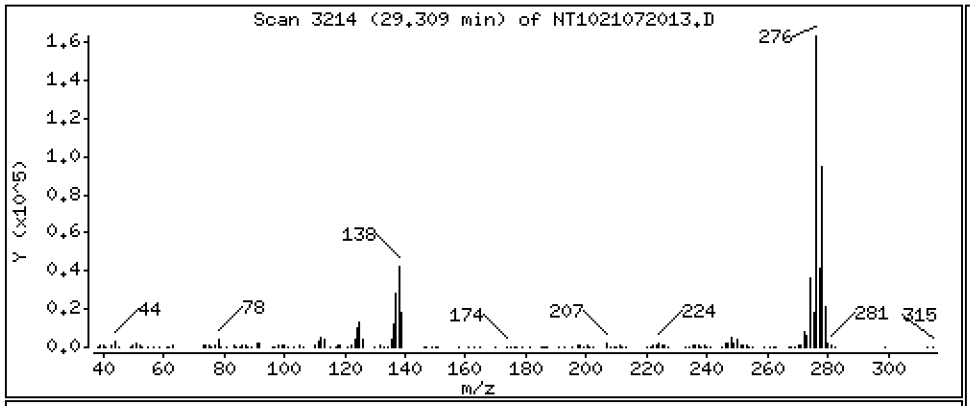
Operator: VTS

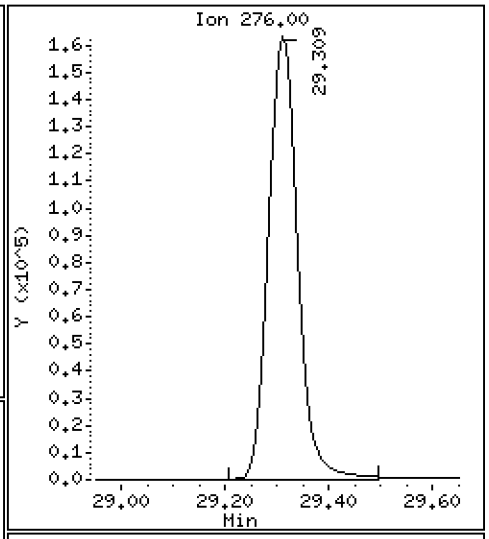
Column phase: ZB-5msi

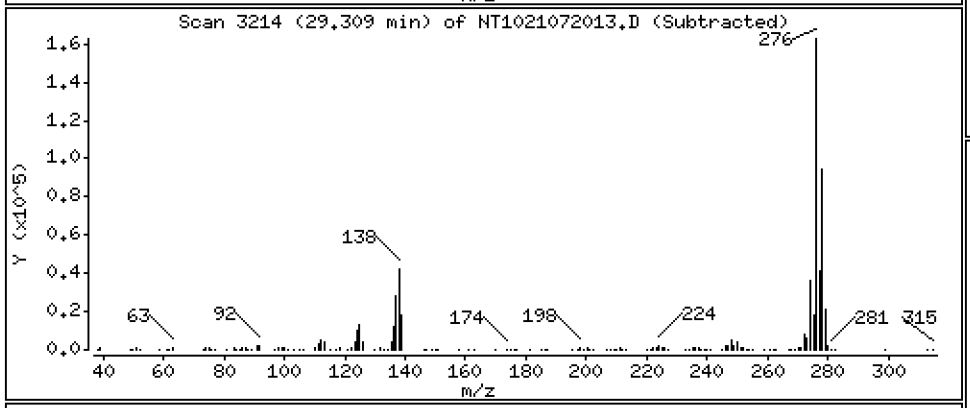
Column diameter: 0.25

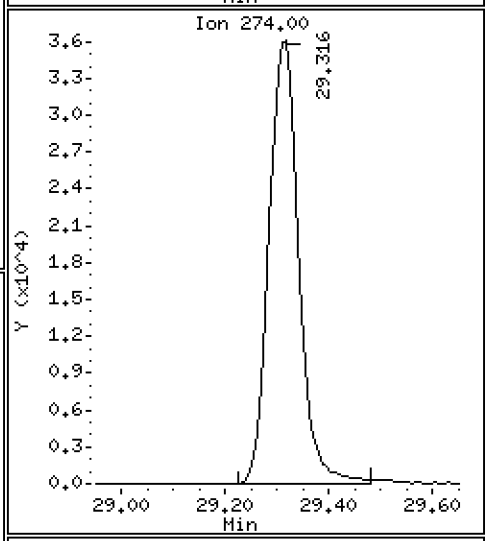
78 Indeno(1,2,3-cd)pyrene

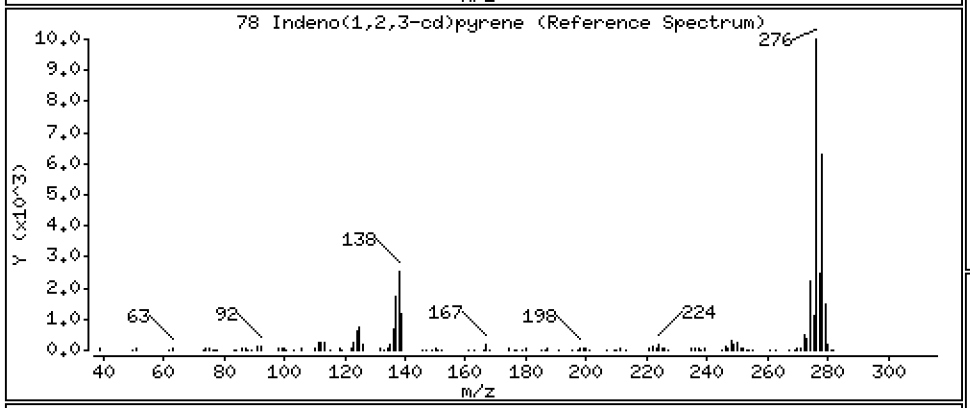
Concentration: 4.743 ug/mL

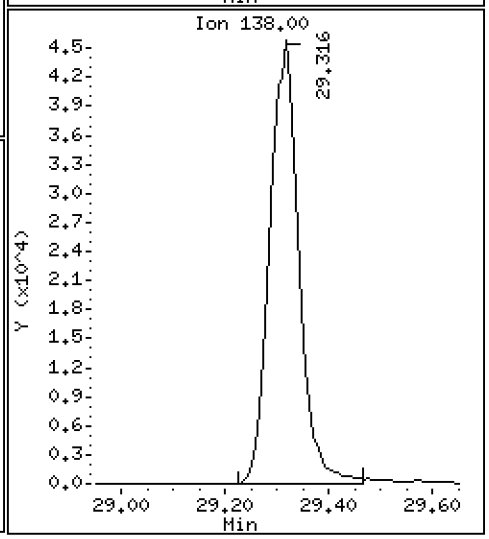


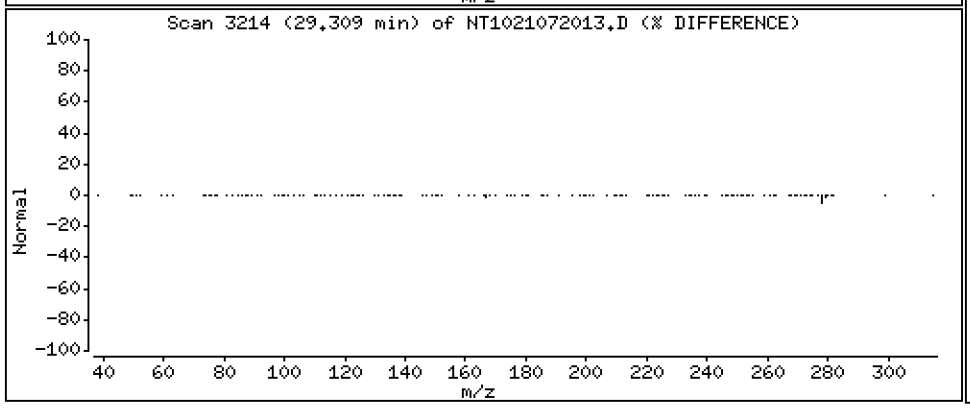












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

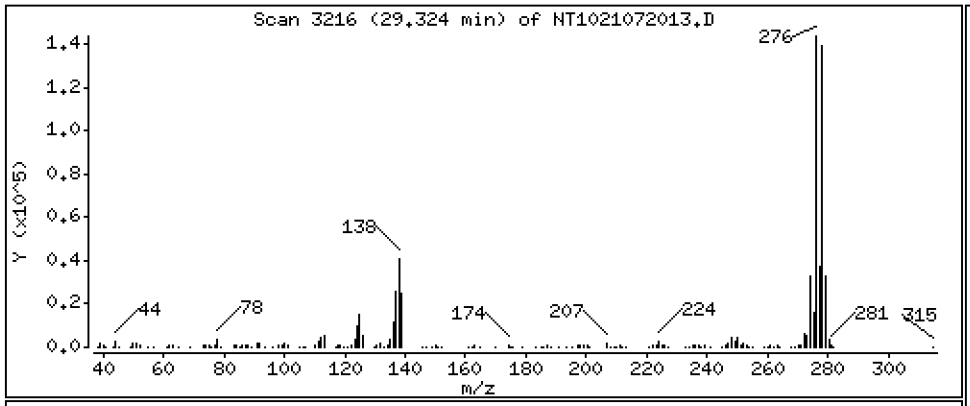
Operator: VTS

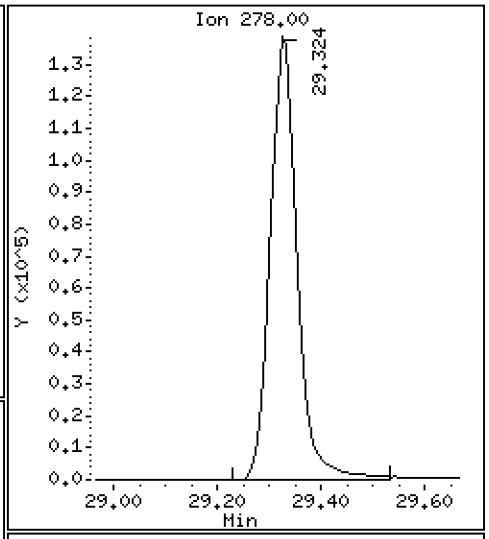
Column phase: ZB-5msi

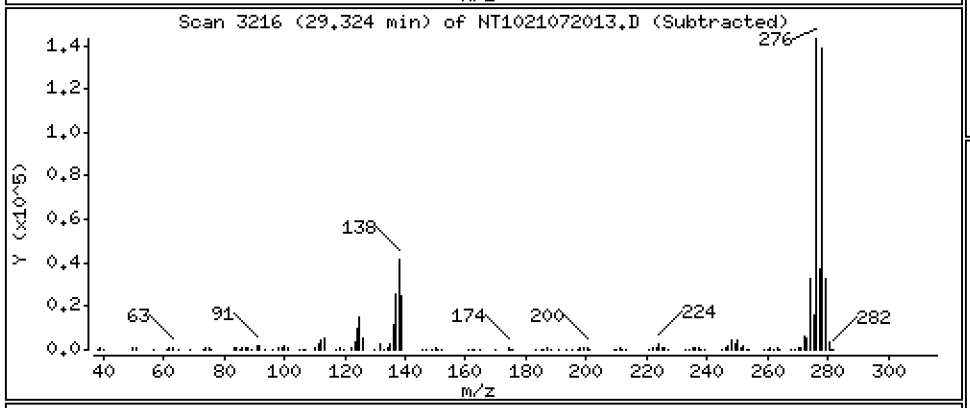
Column diameter: 0.25

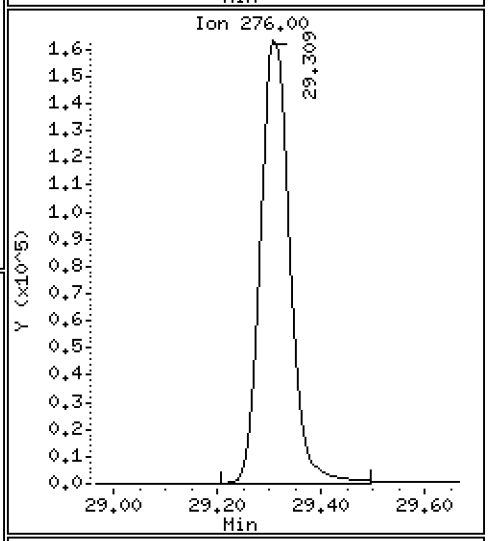
79 Dibenzo(a,h)anthracene

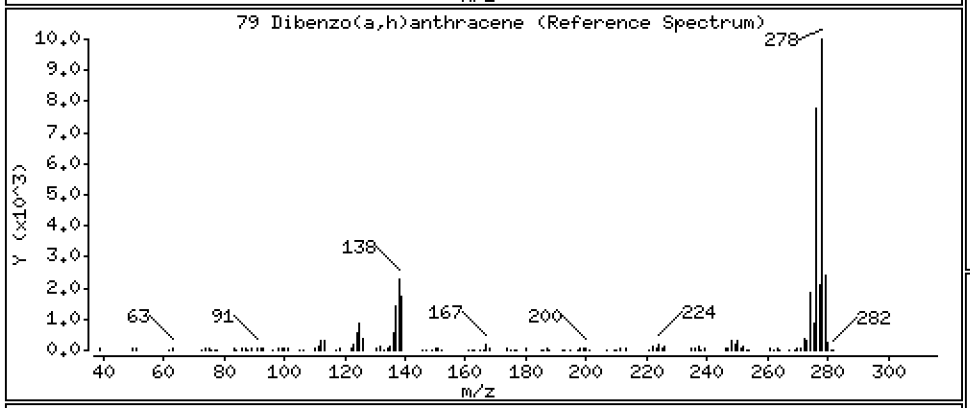
Concentration: 4.703 ug/mL

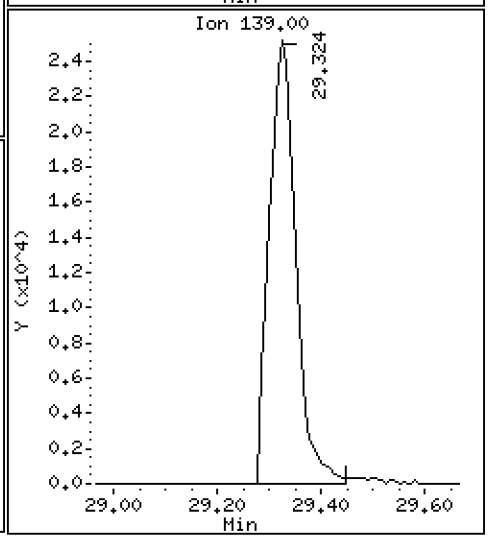


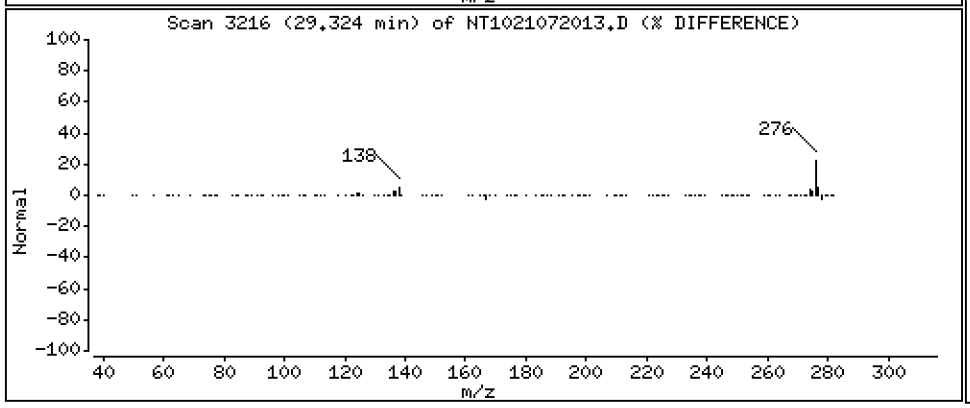












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

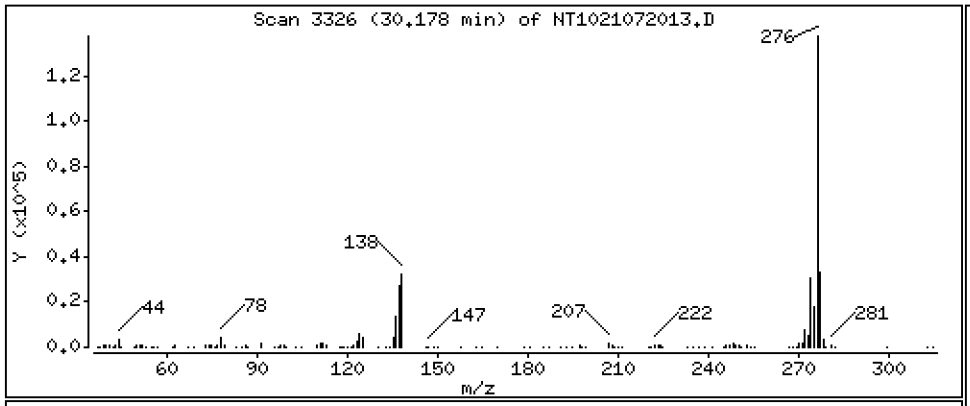
Operator: VTS

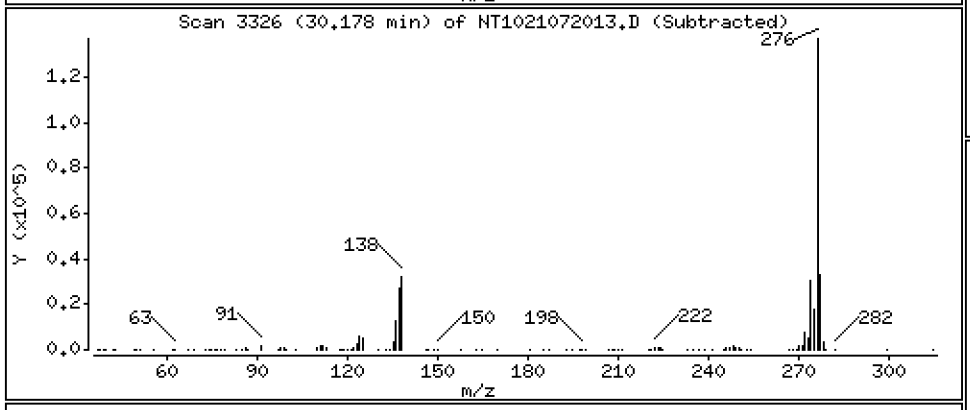
Column phase: ZB-5msi

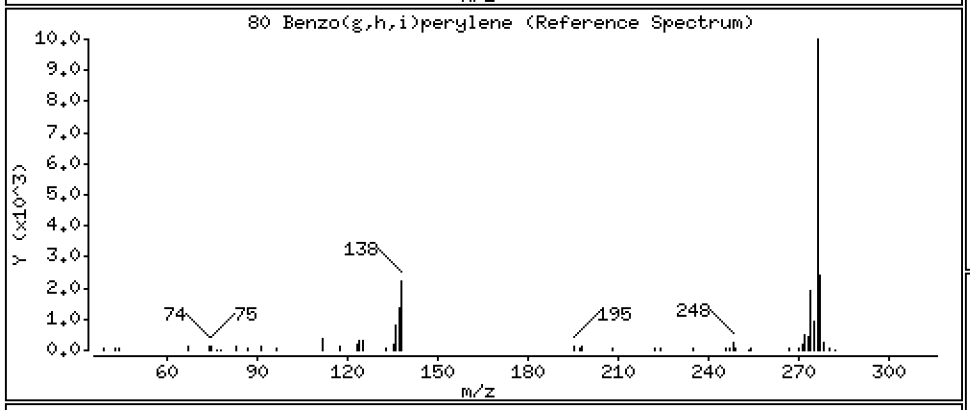
Column diameter: 0.25

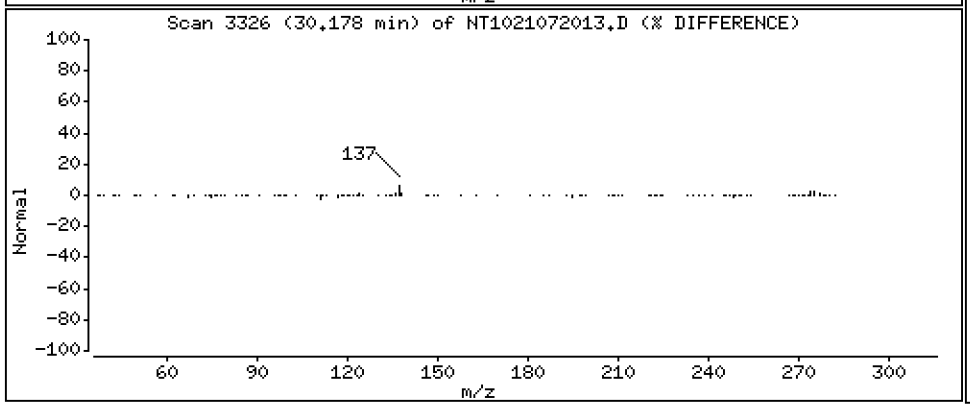
80 Benzo(g,h,i)perylene

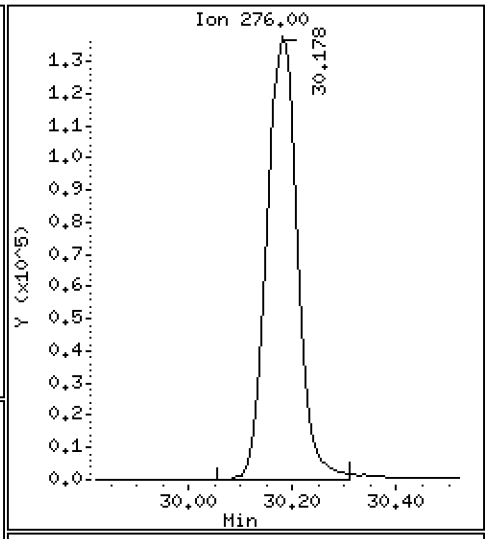
Concentration: 4.714 ug/mL

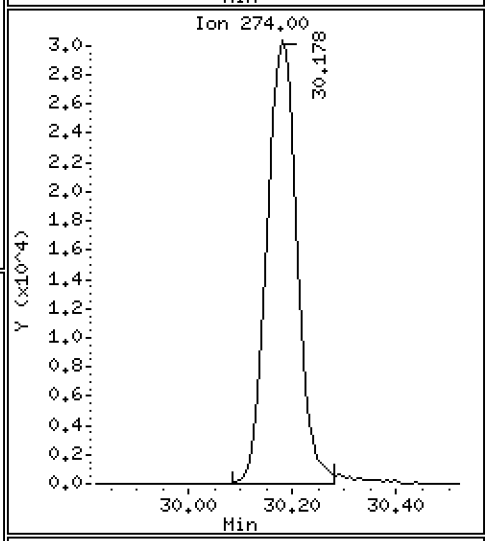


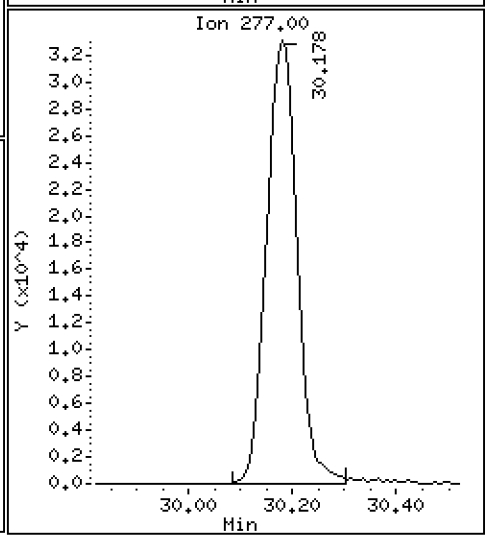












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

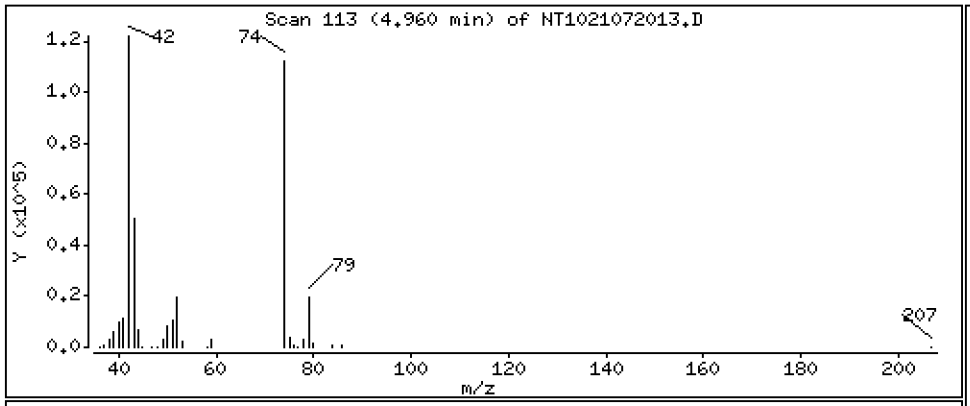
Operator: VTS

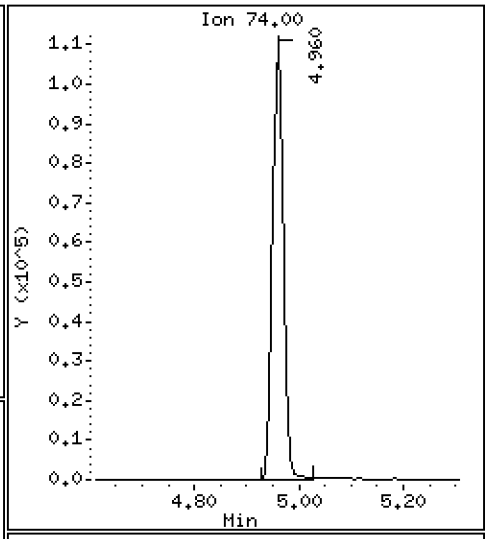
Column phase: ZB-5msi

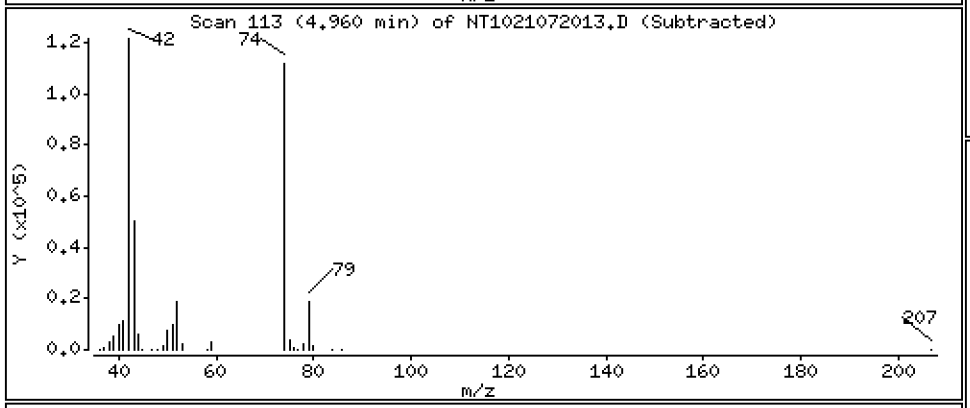
Column diameter: 0.25

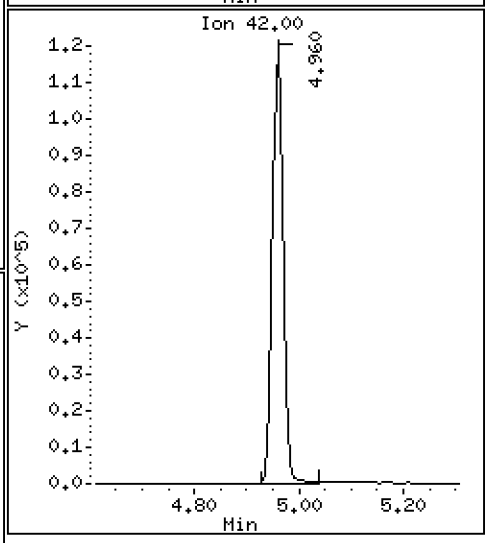
90 N-Nitrosodimethylamine

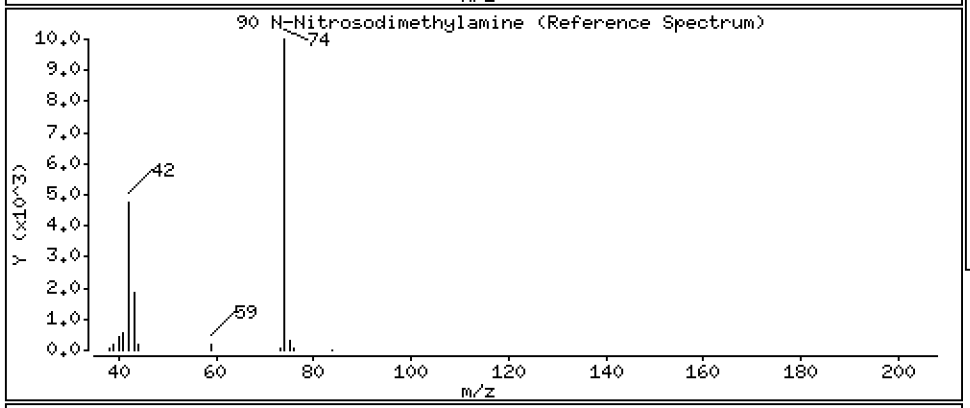
Concentration: 5.630 ug/mL

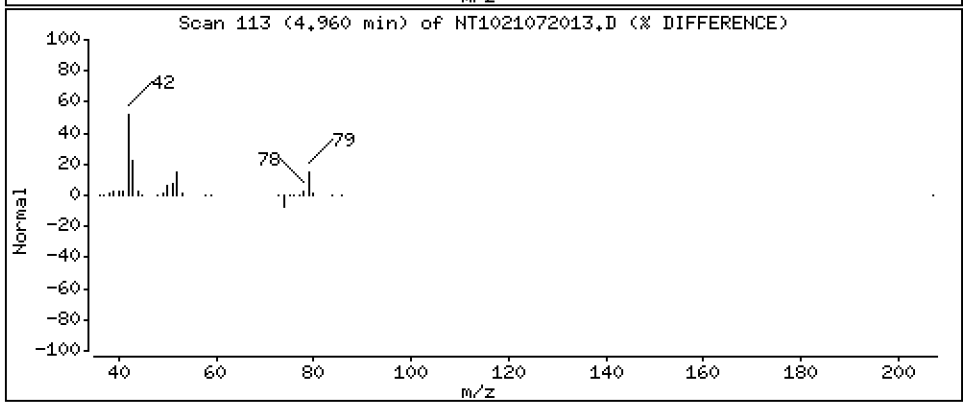












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

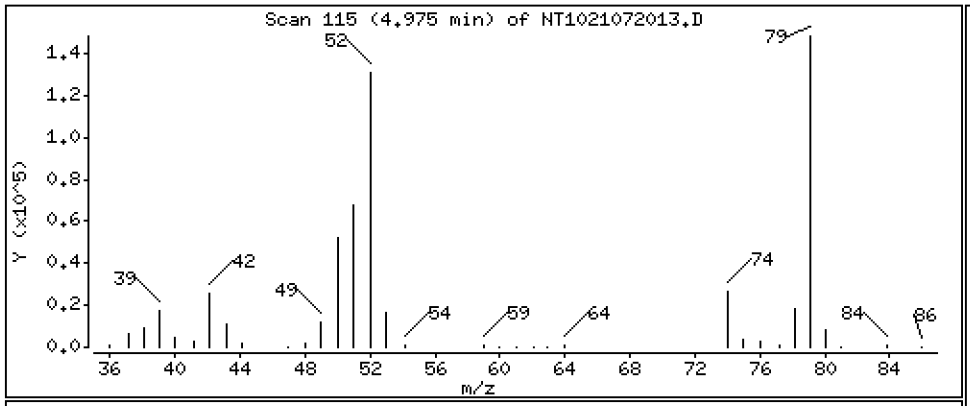
Operator: VTS

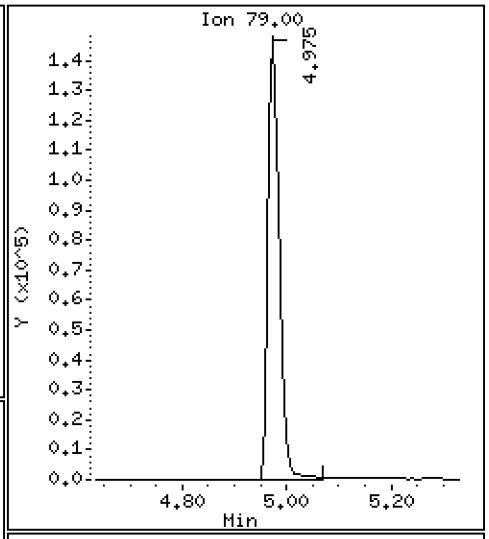
Column phase: ZB-5msi

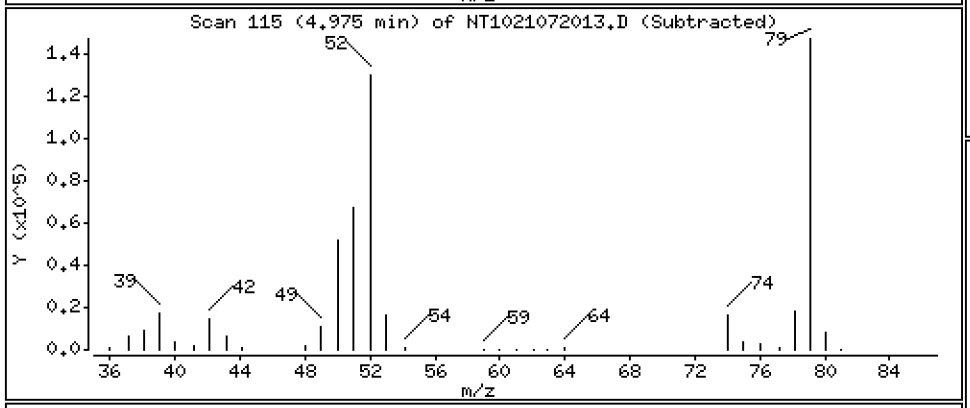
Column diameter: 0.25

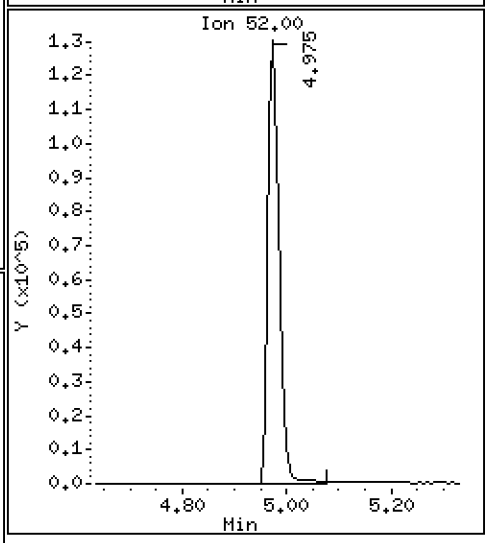
103 Pyridine

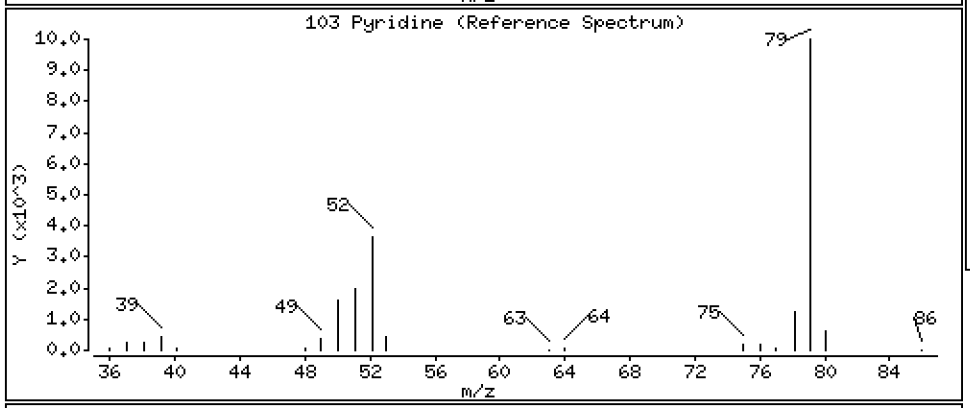
Concentration: 5.038 ug/mL

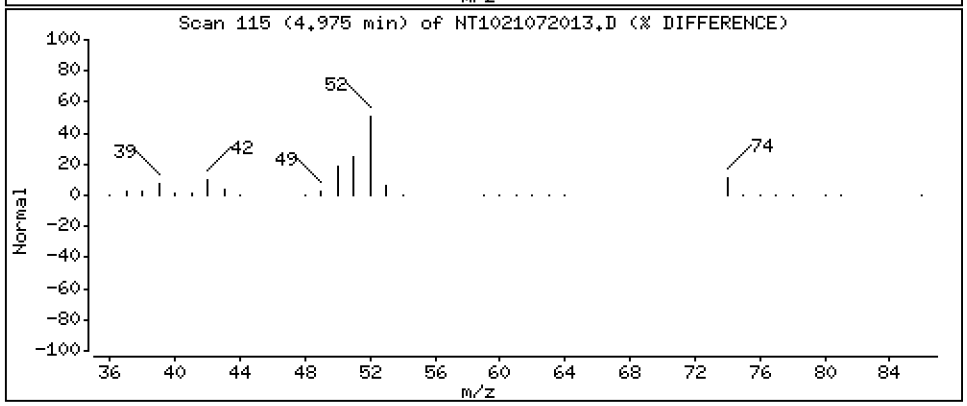












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

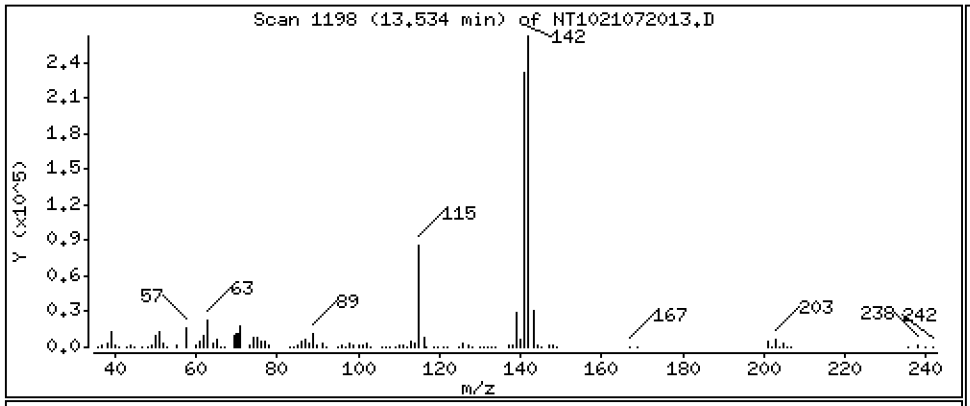
Operator: VTS

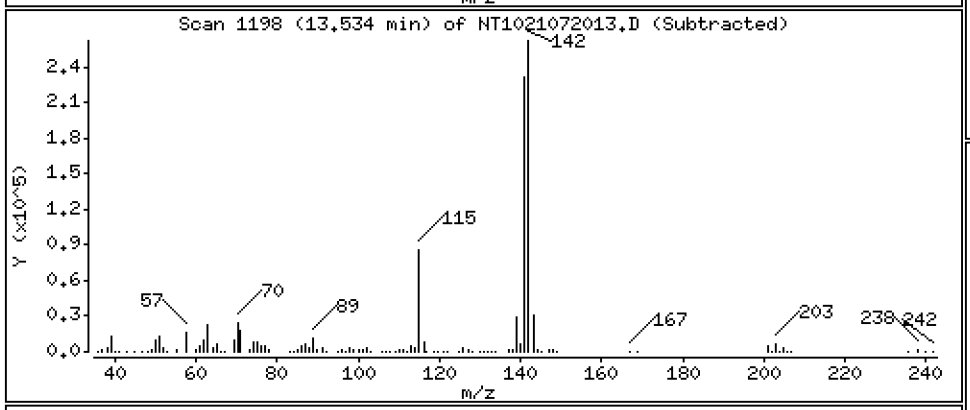
Column phase: ZB-5msi

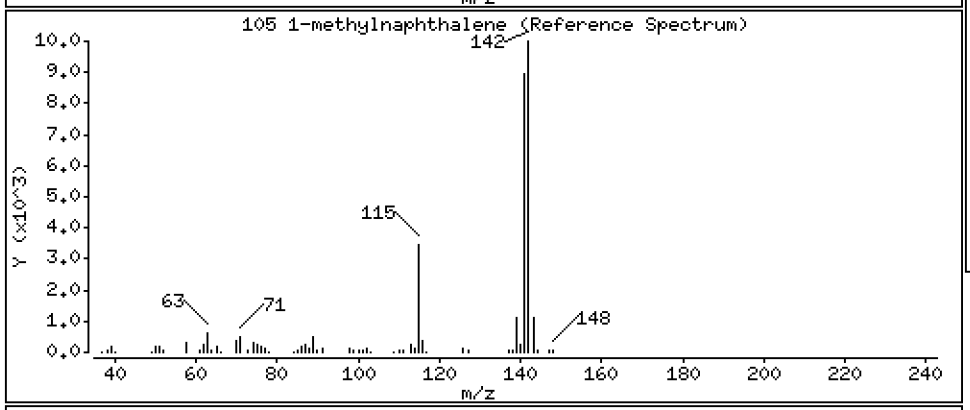
Column diameter: 0.25

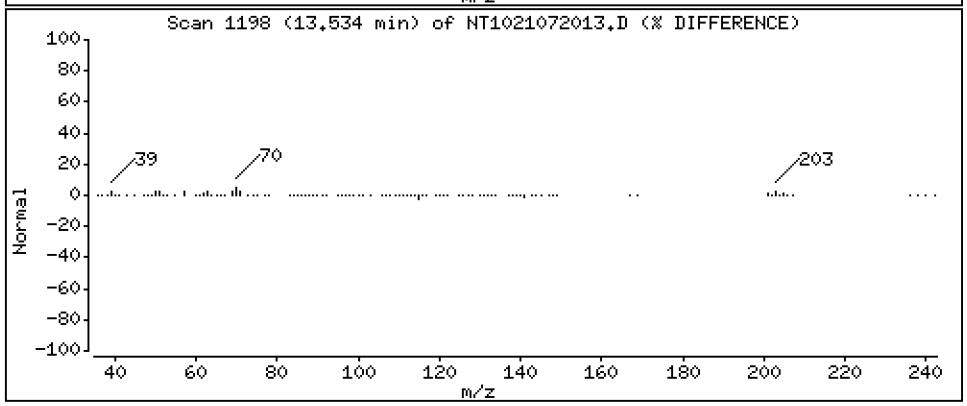
105 1-methylnaphthalene

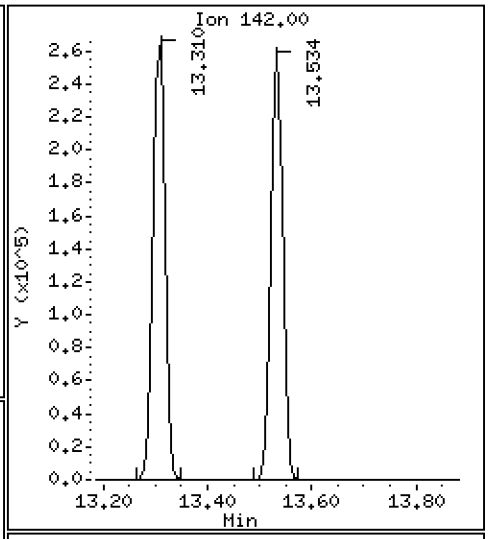
Concentration: 4.923 ug/mL

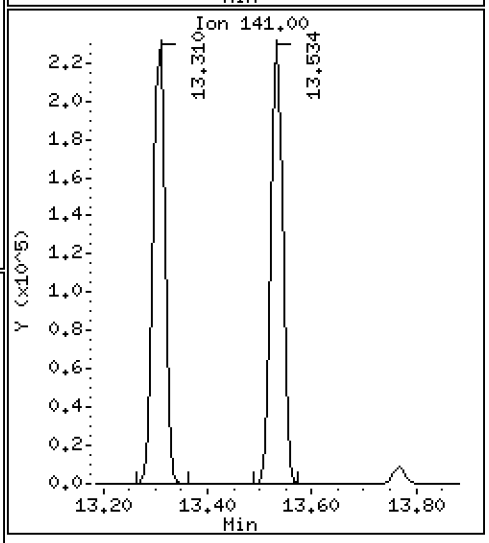












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

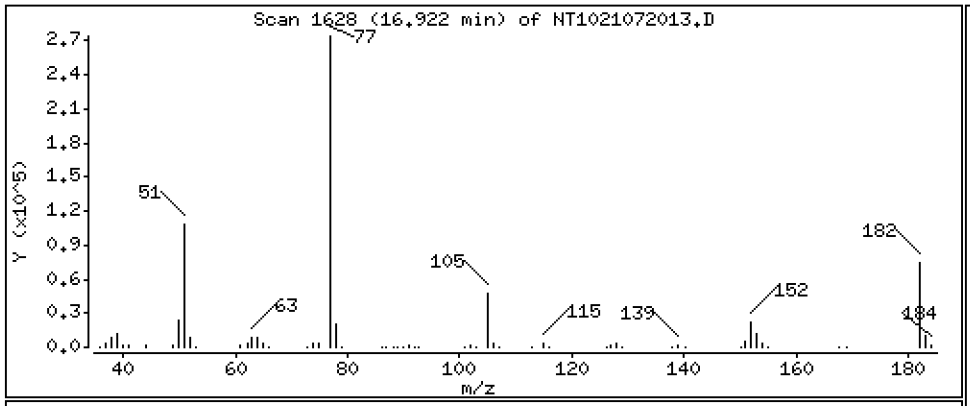
Operator: VTS

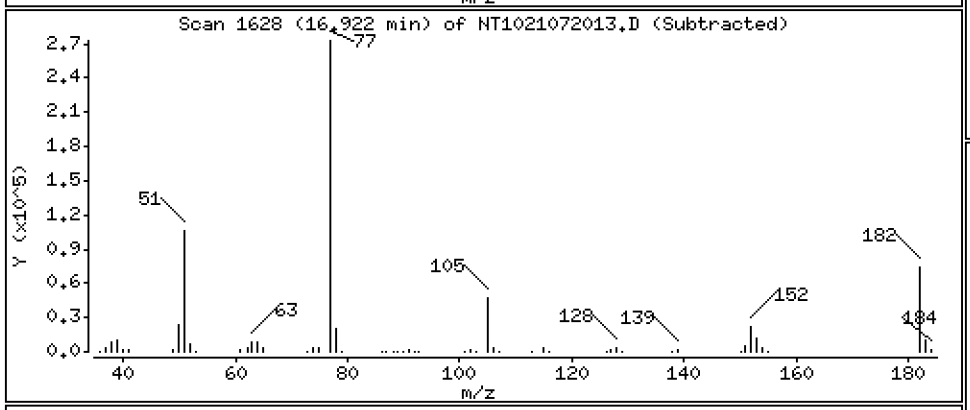
Column phase: ZB-5msi

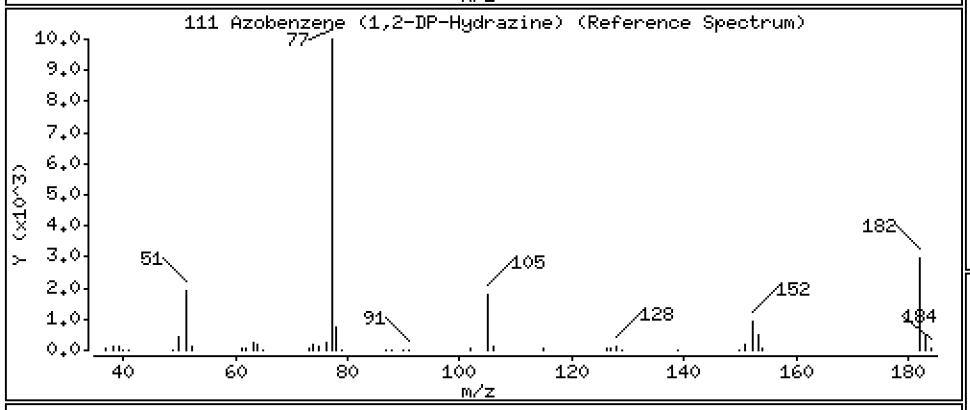
Column diameter: 0.25

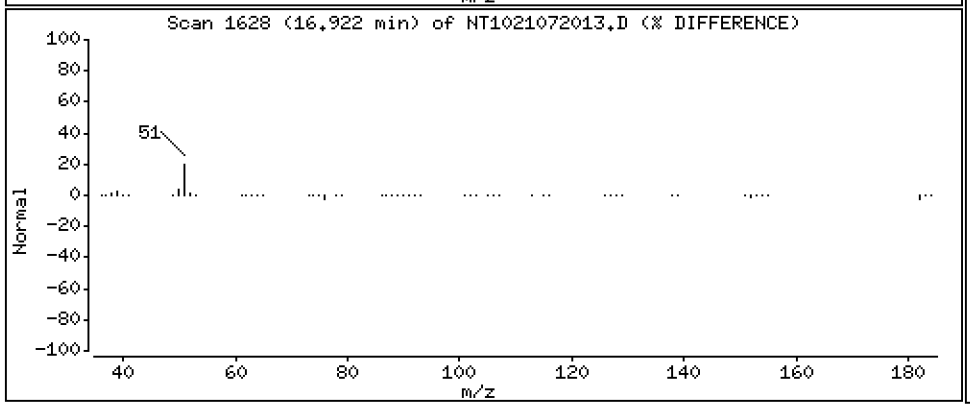
111 Azobenzene (1,2-DP-Hydrazine)

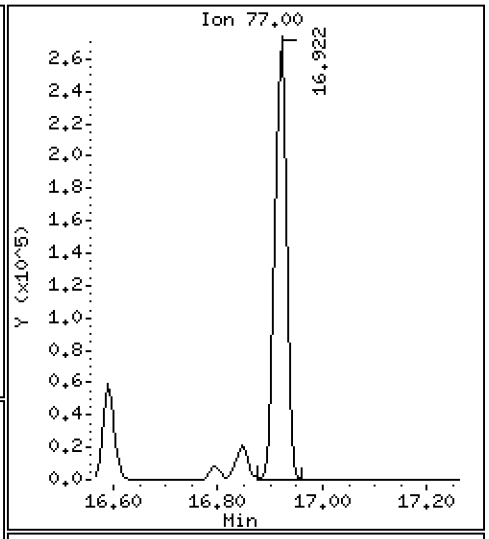
Concentration: 4.749 ug/mL

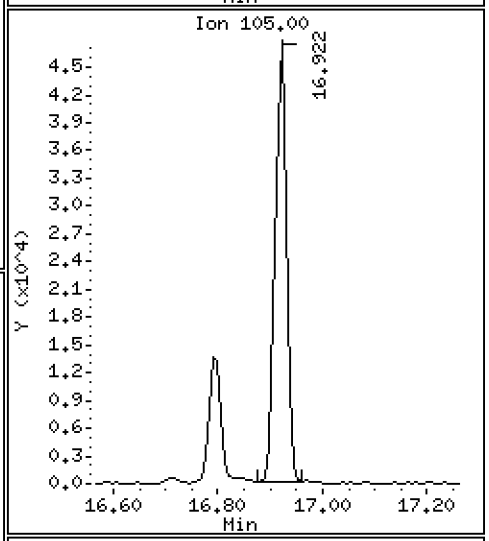


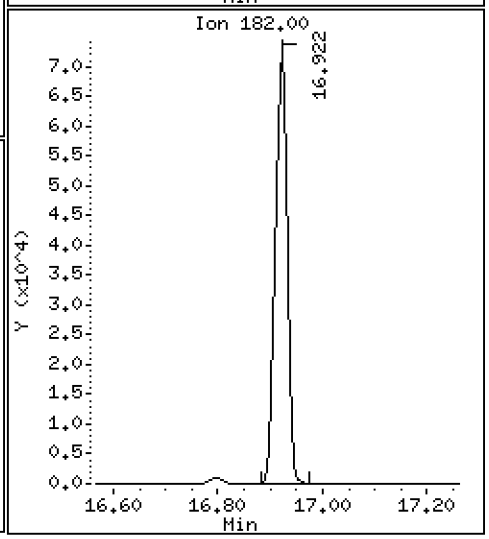












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Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

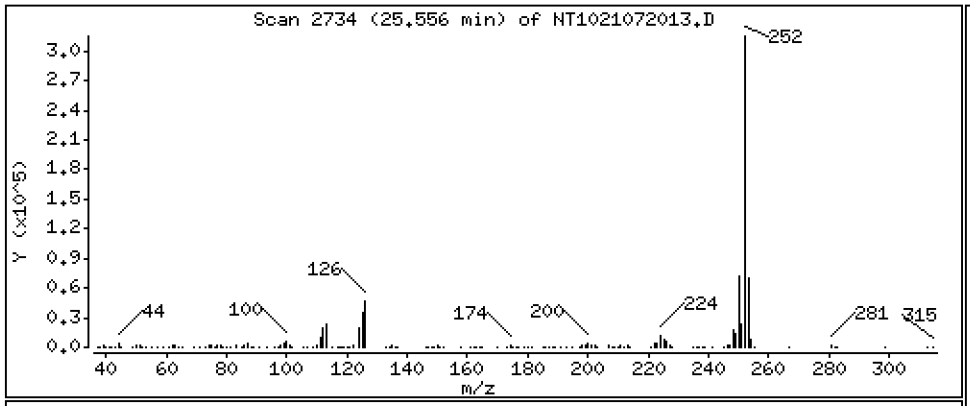
Operator: VTS

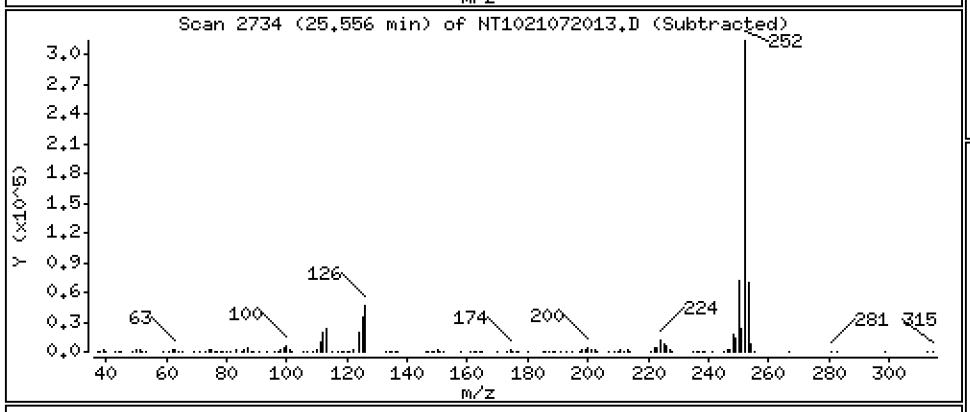
Column phase: ZB-5msi

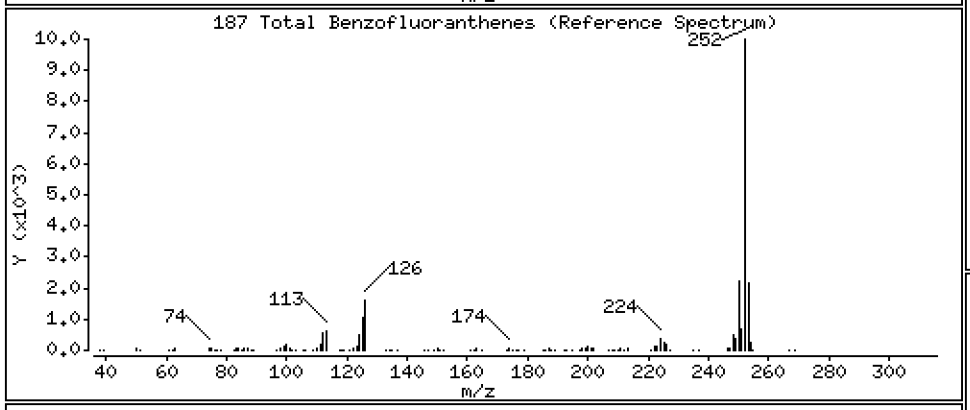
Column diameter: 0.25

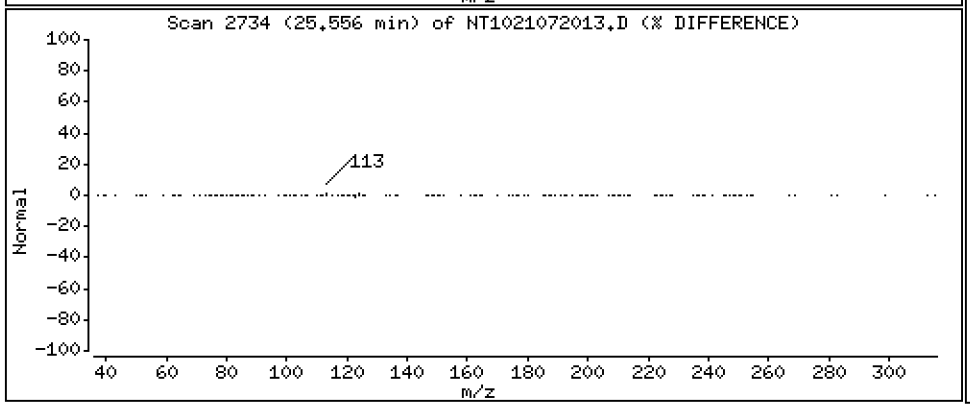
187 Total Benzofluoranthenes

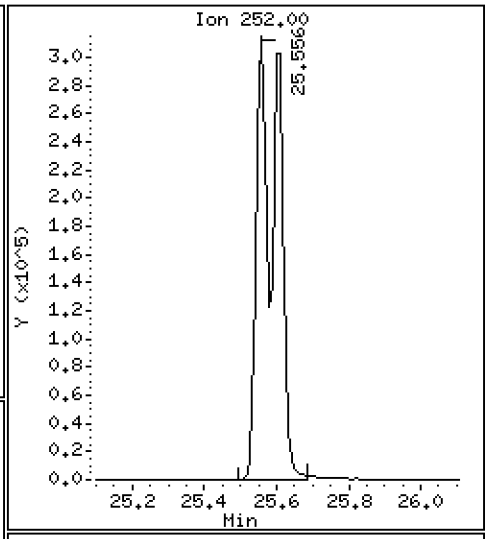
Concentration: 9.829 ug/mL

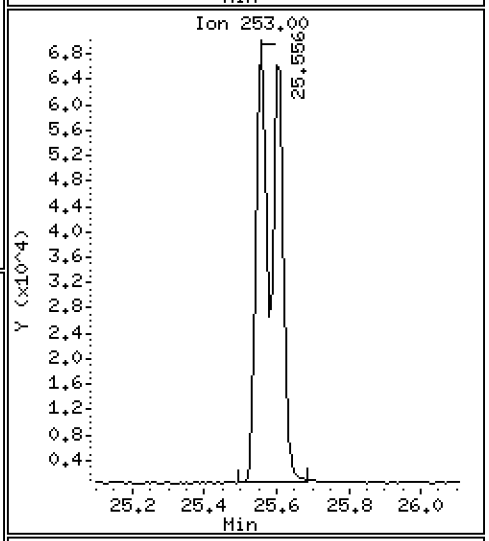


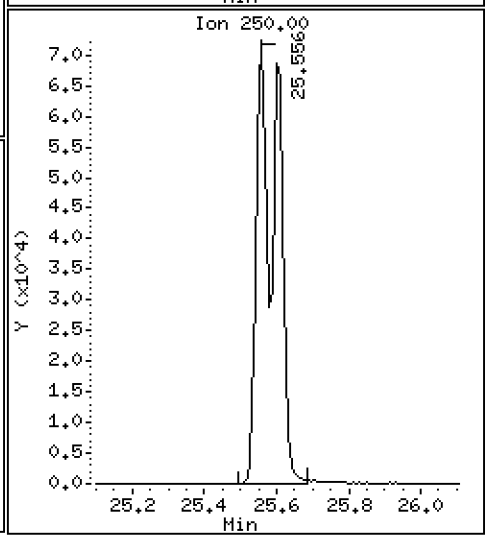












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

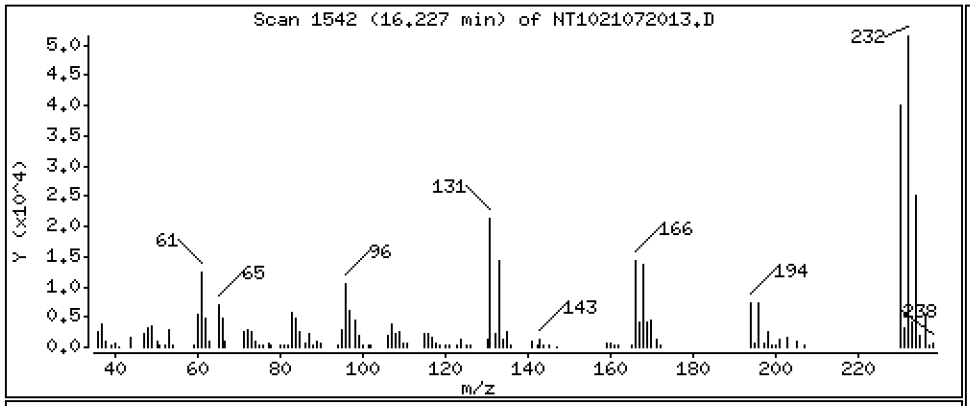
Operator: VTS

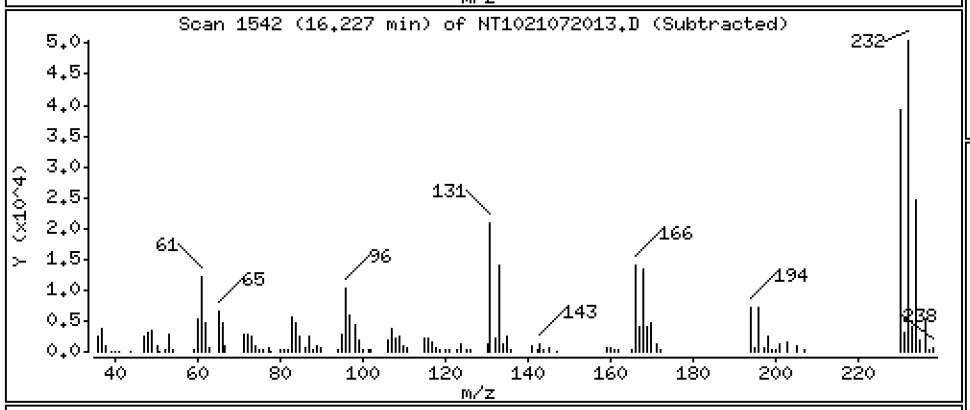
Column phase: ZB-5msi

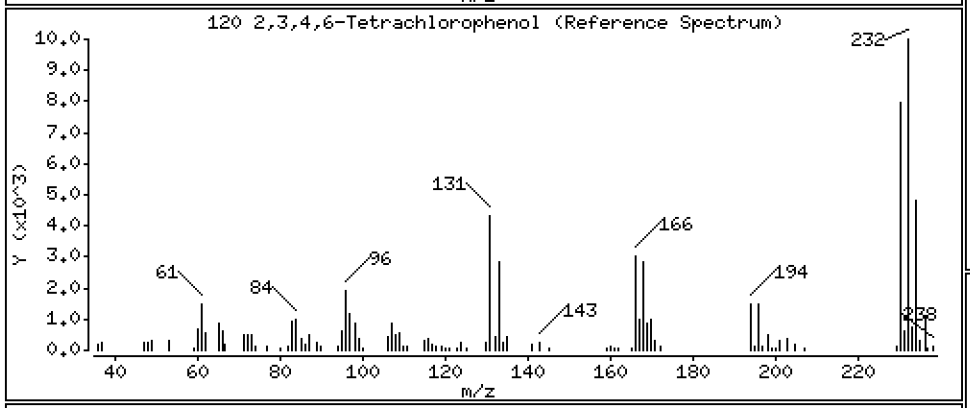
Column diameter: 0.25

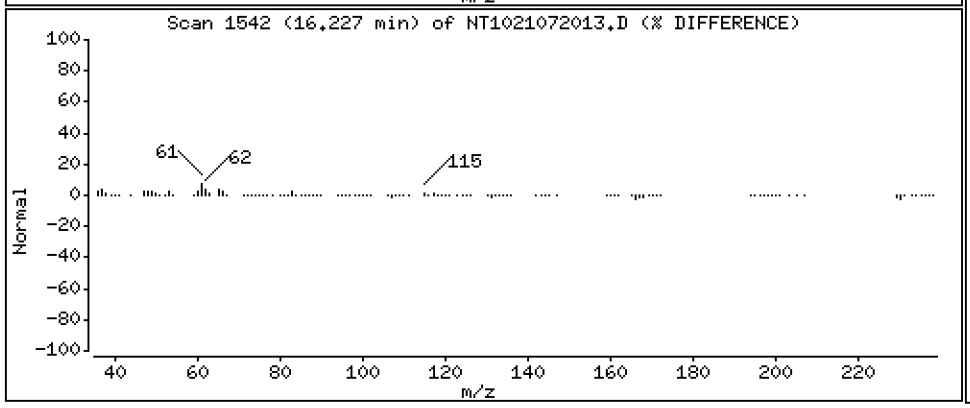
120 2,3,4,6-Tetrachlorophenol

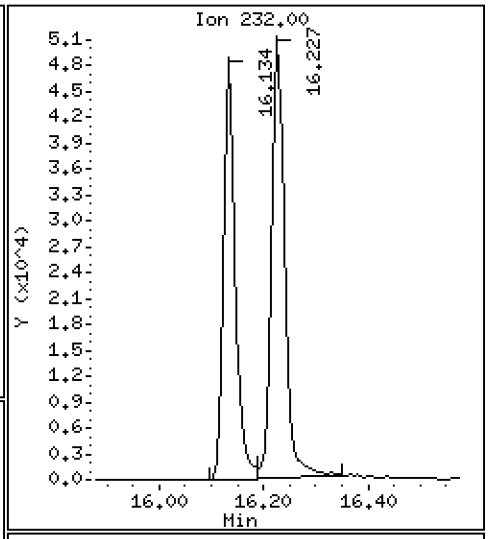
Concentration: 4.472 ug/mL

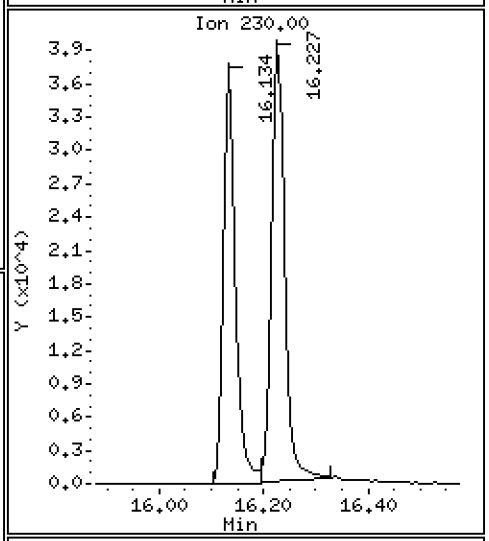


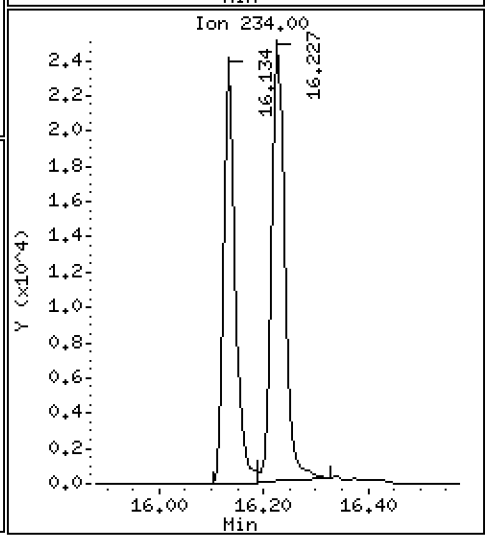












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D
Lab Smp Id: SJG0249-SCV1
Inj Date : 20-JUL-2021 19:24
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-SCV1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 11
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$ 1	2-Fluorophenol	112	Compound Not Detected.					
$ 2	Phenol-d5	99	Compound Not Detected.					
3	Phenol	94	8.729	8.729	(0.932)	245742	4.92176	4.922
$ 5	2-Chlorophenol-d4	132	Compound Not Detected.					
4	Bis(2-Chloroethyl)ether	93	8.907	8.907	(0.950)	200306	5.02286	5.023
6	2-Chlorophenol	128	9.030	9.030	(0.964)	188022	4.97506	4.975
7	1,3-Dichlorobenzene	146	9.301	9.301	(0.993)	207447	4.99685	4.997
* 8	1,4-Dichlorobenzene-d4	152	9.371	9.371	(1.000)	97788	4.00000	
9	1,4-Dichlorobenzene	146	9.402	9.402	(1.003)	177164	4.99810	4.998
$ 10	1,2-Dichlorobenzene-d4	152	Compound Not Detected.					
12	1,2-Dichlorobenzene	146	9.759	9.759	(1.041)	177797	4.74192	4.742
11	Benzyl alcohol	108	9.635	9.635	(1.028)	105562	4.51591	4.516
14	2,2'-oxybis(1-Chloropropane)	121	9.937	9.930	(1.060)	58233	4.04836	4.048
13	2-Methylphenol	108	9.852	9.852	(1.051)	136656	4.39716	4.397
17	Hexachloroethane	117	10.349	10.349	(1.104)	74881	4.91448	4.914
16	N-Nitroso-di-n-propylamine	70	10.194	10.194	(1.088)	127139	4.74213	4.742
15	4-Methylphenol	108	10.124	10.116	(1.080)	155634	4.66654	4.667
$ 18	Nitrobenzene-d5	82	Compound Not Detected.					
19	Nitrobenzene	77	10.512	10.512	(0.886)	196910	4.74090	4.741
20	Isophorone	82	10.946	10.946	(0.922)	387996	4.95012	4.950
21	2-Nitrophenol	139	11.140	11.140	(0.938)	98881	4.51420	4.514
22	2,4-Dimethylphenol	107	11.174	11.165	(0.941)	142239	4.36525	4.365
23	Bis(2-Chloroethoxy)methane	93	11.378	11.378	(0.958)	203559	5.00327	5.003
24	Benzoic acid	105	11.318	11.293	(0.953)	116014	6.35582	6.356
25	2,4-Dichlorophenol	162	11.581	11.581	(0.976)	134290	4.97384	4.974
26	1,2,4-Trichlorobenzene	180	11.778	11.778	(0.992)	150244	4.92195	4.922
* 27	Naphthalene-d8	136	11.871	11.863	(1.000)	342760	4.00000	
28	Naphthalene	128	11.909	11.909	(1.003)	452705	4.99058	4.991
29	4-Chloroaniline	127	12.040	12.040	(1.014)	187038	4.14081	4.141
30	Hexachlorobutadiene	225	12.257	12.257	(1.033)	82774	4.96649	4.966
31	4-Chloro-3-methylphenol	107	12.984	12.984	(1.094)	149957	4.65209	4.652
32	2-Methylnaphthalene	142	13.309	13.309	(1.121)	401309	4.78154	4.782
33	Hexachlorocyclopentadiene	237	13.766	13.766	(0.888)	115119	5.67132	5.671

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	13.929	13.929	(0.899)	99659	4.71321	4.713
	35 2,4,5-Trichlorophenol	196	13.998	13.998	(0.903)	106355	4.72059	4.721
$	36 2-Fluorobiphenyl	172	Compound Not Detected.					
	37 2-Chloronaphthalene	162	14.308	14.308	(0.923)	375518	5.08547	5.085
	38 2-Nitroaniline	65	14.571	14.571	(0.940)	134149	4.84759	4.848
	39 Dimethylphthalate	163	14.997	14.997	(0.968)	332569	4.65636	4.656
	40 Acenaphthylene	152	15.190	15.182	(0.980)	508864	4.84561	4.846
	41 2,6-Dinitrotoluene	165	15.144	15.144	(0.977)	80529	4.97282	4.973
*	42 Acenaphthene-d10	164	15.500	15.500	(1.000)	192459	4.00000	
	43 3-Nitroaniline	138	15.430	15.430	(0.996)	91440	4.55733	4.557
	44 Acenaphthene	153	15.569	15.561	(1.004)	292165	4.79203	4.792
	45 2,4-Dinitrophenol	184	15.646	15.647	(1.009)	17760	1.92814	1.928
	46 Dibenzofuran	168	15.894	15.894	(1.025)	455534	4.83261	4.833
	47 4-Nitrophenol	109	15.731	15.732	(1.015)	31544	4.08873	4.089
	48 2,4-Dinitrotoluene	165	15.956	15.956	(1.029)	106632	4.92932	4.929
	50 Diethylphthalate	149	16.450	16.451	(1.061)	311333	4.59754	4.598
	49 Fluorene	166	16.613	16.605	(1.072)	409103	4.47668	4.477
	51 4-Chlorophenyl-phenylether	204	16.590	16.590	(1.070)	244020	4.59359	4.594
	52 4-Nitroaniline	138	16.705	16.705	(1.078)	86292	4.04827	4.048
	53 4,6-Dinitro-2-methylphenol	198	16.790	16.791	(0.905)	55674	3.64558	3.646
	54 N-Nitrosodiphenylamine	169	16.844	16.844	(0.908)	271104	4.54648	4.546
$	55 2,4,6-Tribromophenol	330	Compound Not Detected.					
	56 4-Bromophenyl-phenylether	248	17.600	17.608	(0.949)	149720	4.93404	4.934
	57 Hexachlorobenzene	284	17.924	17.924	(0.966)	152202	4.77276	4.773
	58 Pentachlorophenol	266	18.280	18.289	(0.985)	51991	3.98721	3.987
*	59 Phenanthrene-d10	188	18.551	18.551	(1.000)	332308	4.00000	
	60 Phenanthrene	178	18.605	18.605	(1.003)	452776	5.03840	5.038
	61 Anthracene	178	18.698	18.698	(1.008)	482395	5.01984	5.020
	62 Carbazole	167	19.023	19.023	(1.025)	477437	5.03266	5.033
	63 Di-n-butylphthalate	149	19.797	19.797	(1.067)	630478	4.27610	4.276
	64 Fluoranthene	202	20.981	20.981	(0.889)	659364	4.95043	4.950
	65 Pyrene	202	21.406	21.406	(0.907)	771424	5.25414	5.254
$	66 Terphenyl-d14	244	Compound Not Detected.					
	67 Butylbenzylphthalate	149	22.598	22.598	(0.958)	240211	4.97393	4.974
	68 Benzo(a)anthracene	228	23.566	23.566	(0.999)	572518	4.80022	4.800
*	69 Chrysene-d12	240	23.597	23.597	(1.000)	319618	4.00000	
	70 3,3'-Dichlorobenzidine	252	23.528	23.528	(0.997)	431848	9.01302	9.013
	71 Chrysene	228	23.644	23.644	(1.002)	446802	4.85899	4.859
	72 bis(2-Ethylhexyl)phthalate	149	23.620	23.620	(0.959)	268021	5.11675	5.117
*	134 Di-n-octylphthalate-d4	153	24.642	24.642	(1.000)	476118	4.00000	
	73 Di-n-octylphthalate	149	24.650	24.650	(1.000)	632575	4.74070	4.741
	74 Benzo(b)fluoranthene	252	25.556	25.556	(0.968)	629813	4.77806	4.778
	75 Benzo(k)fluoranthene	252	25.602	25.602	(0.970)	670704	5.13679	5.137
	76 Benzo(a)pyrene	252	26.268	26.268	(0.995)	592916	4.97710	4.977
*	77 Perylene-d12	264	26.400	26.400	(1.000)	334503	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	29.308	29.300	(1.110)	639525	4.74333	4.743
	79 Dibenzo(a,h)anthracene	278	29.324	29.316	(1.111)	498001	4.70260	4.703
	80 Benzo(g,h,i)perylene	276	30.178	30.170	(1.143)	567139	4.71378	4.714
	90 N-Nitrosodimethylamine	74	4.959	4.959	(0.529)	148222	5.62990	5.630
	91 Aniline	93	Compound Not Detected.					
	93 Benzidine	184	Compound Not Detected.					
	103 Pyridine	79	4.974	4.982	(0.531)	208649	5.03780	5.038
	105 1-methylnaphthalene	142	13.534	13.534	(1.140)	387646	4.92271	4.923
	111 Azobenzene (1,2-DP-Hydrazine)	77	16.921	16.914	(1.092)	410043	4.74895	4.749

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	CONCENTRATIONS FINAL (ug/mL)
187 Total Benzofluoranthenes	252	25.556	25.602	(0.968)	1244090	9.82856	9.829
120 2,3,4,6-Tetrachlorophenol	232	16.226	16.227	(1.047)	92537	4.47241	4.472

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D Page 1
Report Date: 21-Jul-2021 09:25

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072013.D
Lab Smp Id: SJG0249-SCV1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	97788	-7.33
27 Naphthalene-d8	373252	186626	746504	342760	-8.17
42 Acenaphthene-d10	212025	106013	424050	192459	-9.23
59 Phenanthrene-d10	362039	181020	724078	332308	-8.21
69 Chrysene-d12	338032	169016	676064	319618	-5.45
134 Di-n-octylphthala	565512	282756	1131024	476118	-15.81
77 Perylene-d12	375340	187670	750680	334503	-10.88

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.37	-0.09
27 Naphthalene-d8	11.87	11.37	12.37	11.87	-0.00
42 Acenaphthene-d10	15.51	15.01	16.01	15.50	-0.05
59 Phenanthrene-d10	18.56	18.06	19.06	18.55	-0.04
69 Chrysene-d12	23.61	23.11	24.11	23.60	-0.03
134 Di-n-octylphthala	24.64	24.14	25.14	24.64	-0.00
77 Perylene-d12	26.40	25.90	26.90	26.40	-0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072013.D

Lab ID: SJG0249-SCV1
nt10.i, ABN.m, 20-JUL-2021 19:24

RT	CO-ELUTION COMPOUNDS

NO CO-ELUTIONS

** FIRST SURROGATE NOT FOUND. ICAL Check not performed **

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND

NONE

RRT check based on Ccal File: NT1021072010.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8270E

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Calibration: EG00057
Laboratory ID: SJG0249-SCV1
Sequence: SJG0249
Standard ID: J007215

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
Naphthalene	5.0000	5.0	-0.2	20.00
2-Methylnaphthalene	5.0000	4.8	-4.4	20.00
Acenaphthylene	5.0000	4.8	-3.1	20.00
Acenaphthene	5.0000	4.8	-4.2	20.00
Fluorene	5.0000	4.5	-10.5	20.00
Phenanthrene	5.0000	5.0	0.8	20.00
Anthracene	5.0000	5.0	0.4	20.00
Fluoranthene	5.0000	5.0	-1.0	20.00
Pyrene	5.0000	5.3	5.1	20.00
Butylbenzylphthalate	5.0000	5.0	-0.5	20.00
Benzo(a)anthracene	5.0000	4.8	-4.0	20.00
Chrysene	5.0000	4.9	-2.8	20.00
Benzofluoranthenes, Total	10.000	9.8	-1.7	20.00
Benzo(a)pyrene	5.0000	5.0	-0.5	20.00
Indeno(1,2,3-cd)pyrene	5.0000	4.7	-5.1	20.00
Dibenzo(a,h)anthracene	5.0000	4.7	-5.9	20.00
Benzo(g,h,i)perylene	5.0000	4.7	-5.7	20.00

* Values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

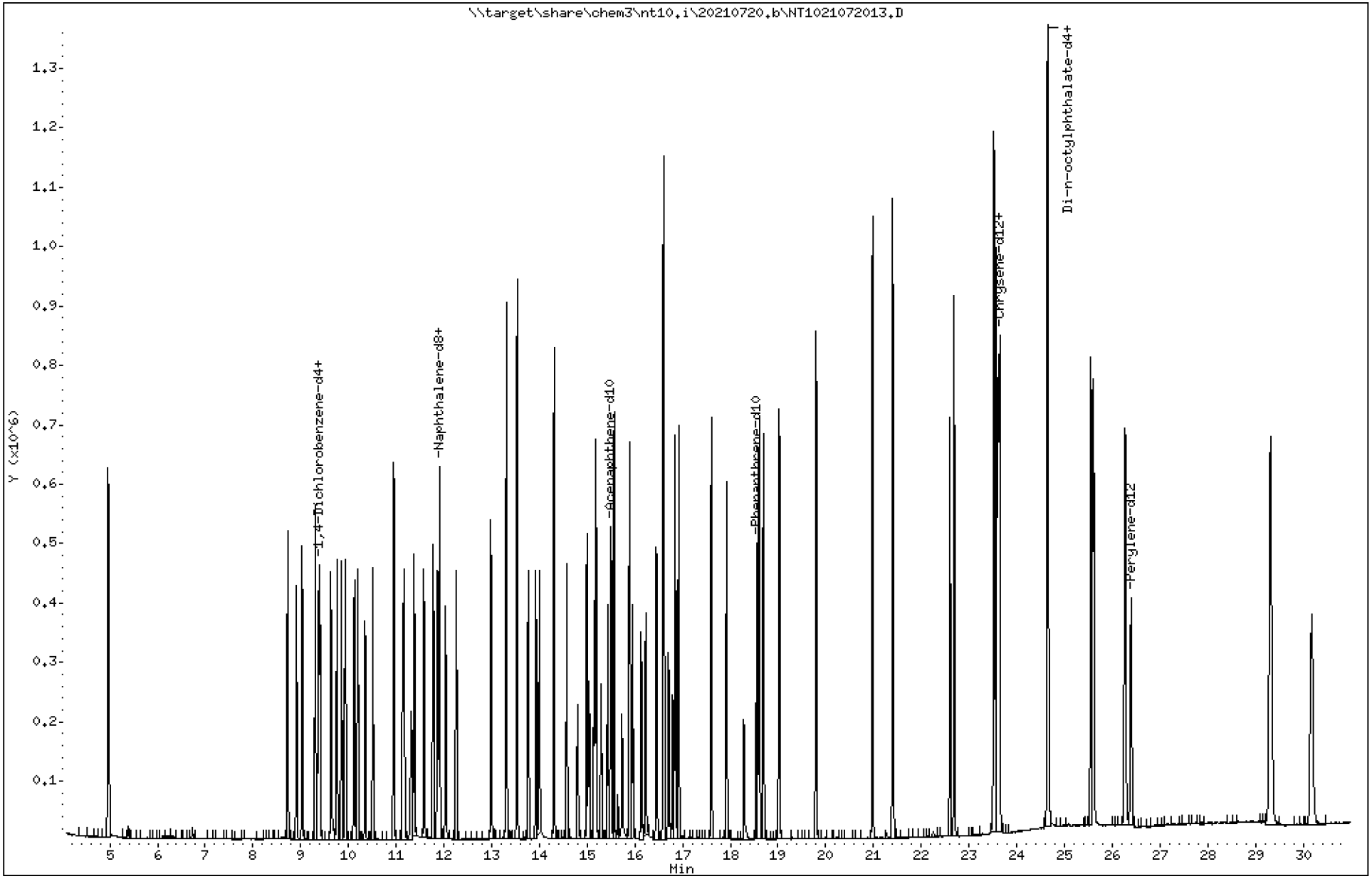
Instrument: nt10.i

Sample Info: SJG0249-SCV1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

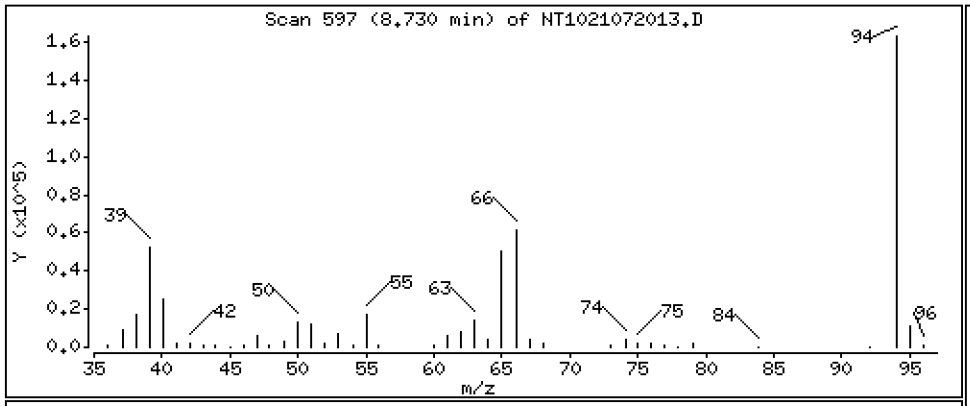
Operator: VTS

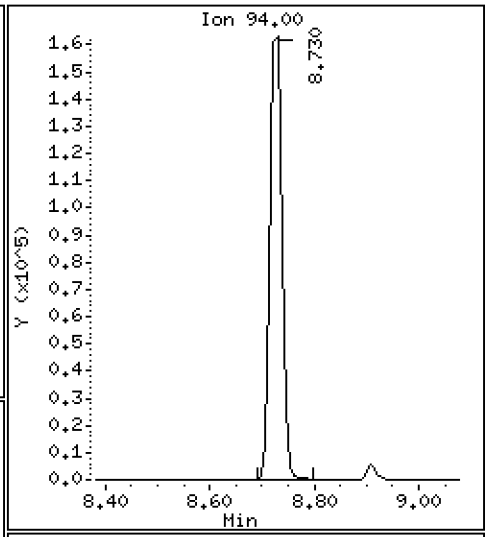
Column phase: ZB-5msi

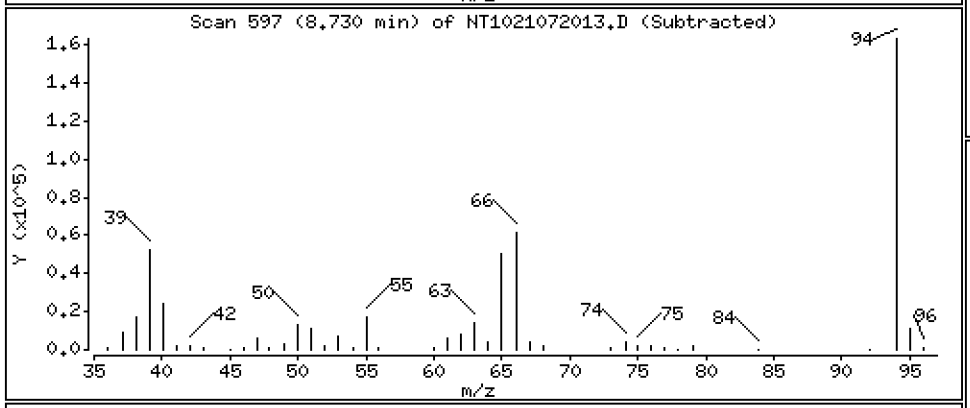
Column diameter: 0.25

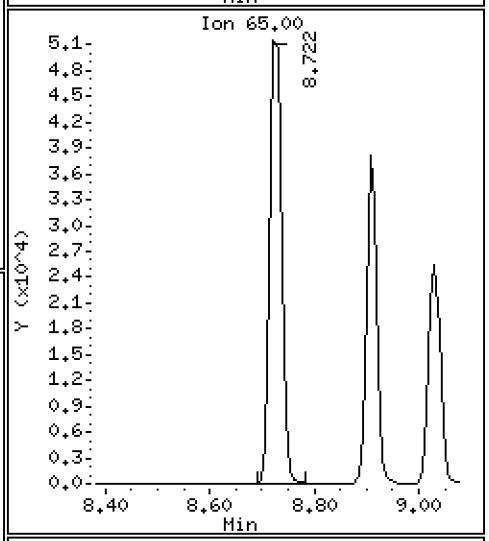
3 Phenol

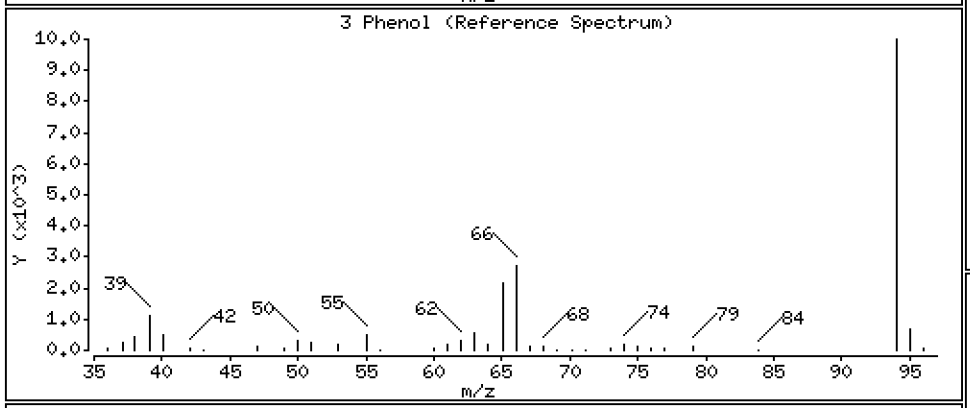
Concentration: 4.922 ug/mL

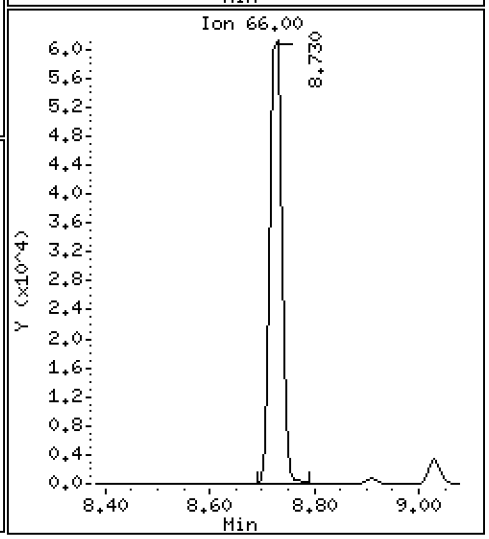


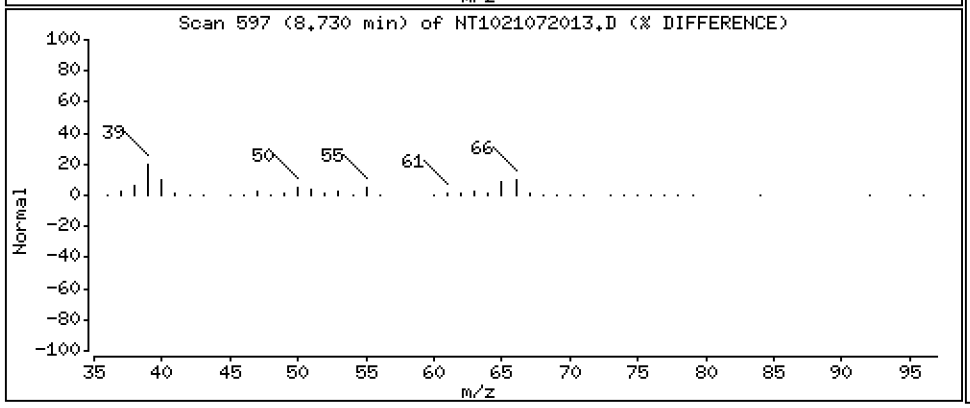












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

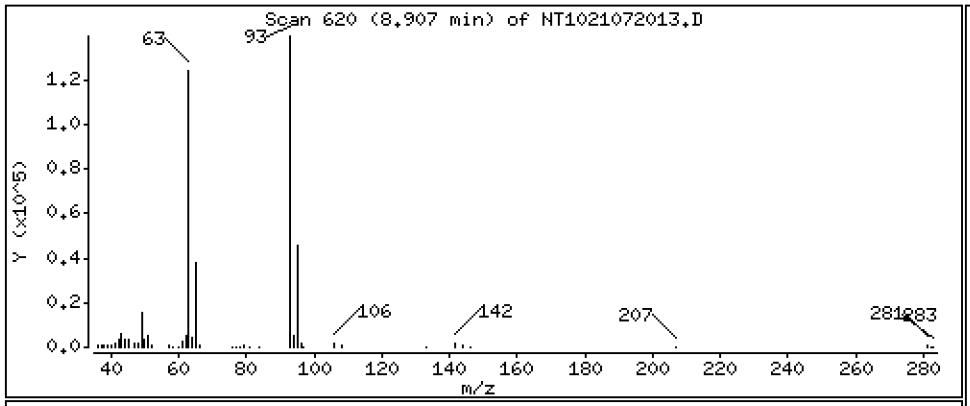
Operator: VTS

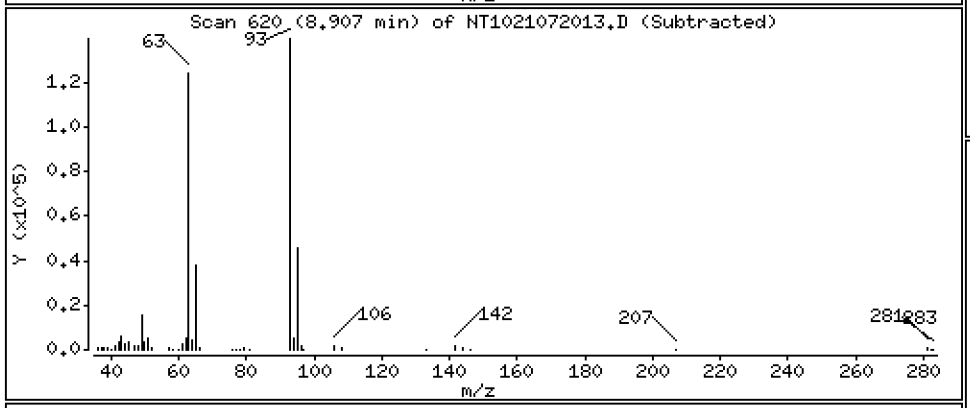
Column phase: ZB-5msi

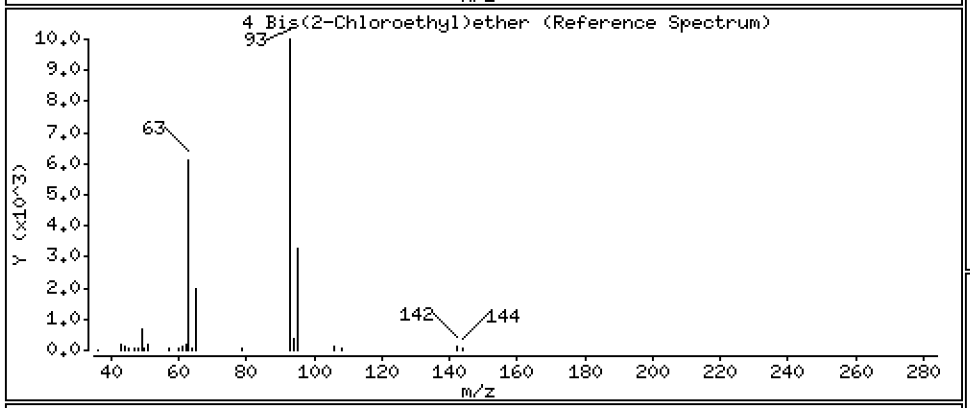
Column diameter: 0.25

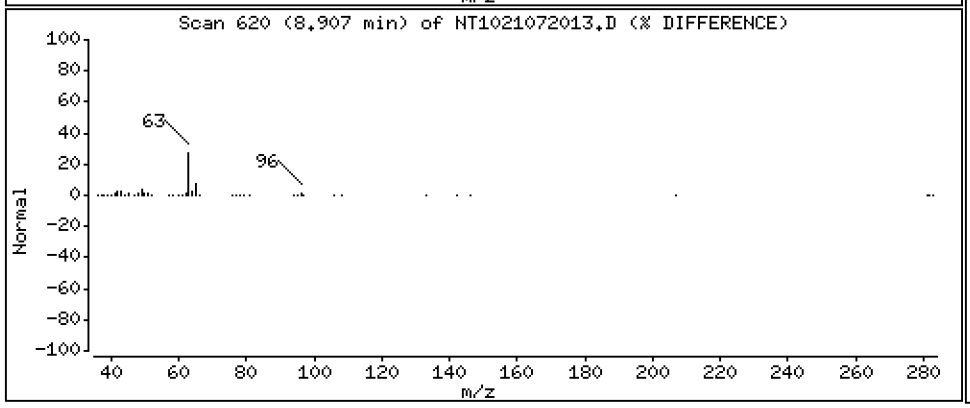
4 Bis(2-Chloroethyl)ether

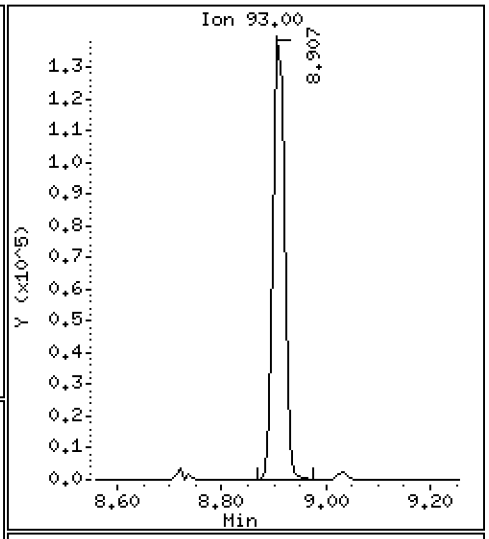
Concentration: 5.023 ug/mL

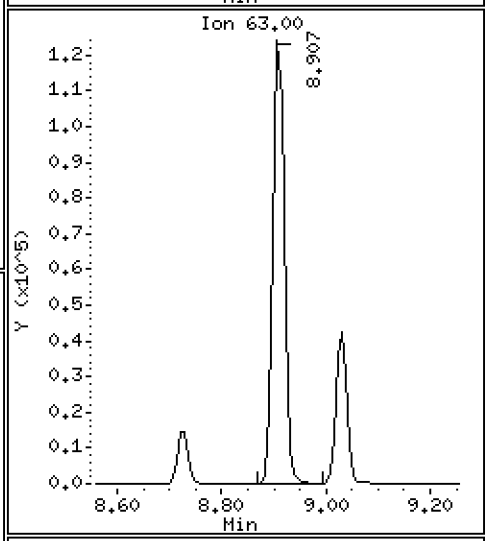


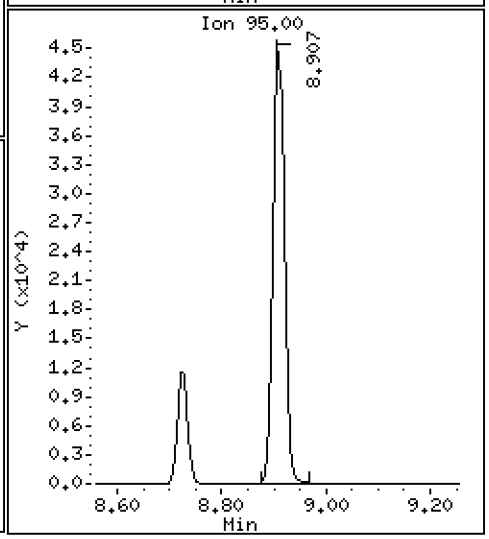












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

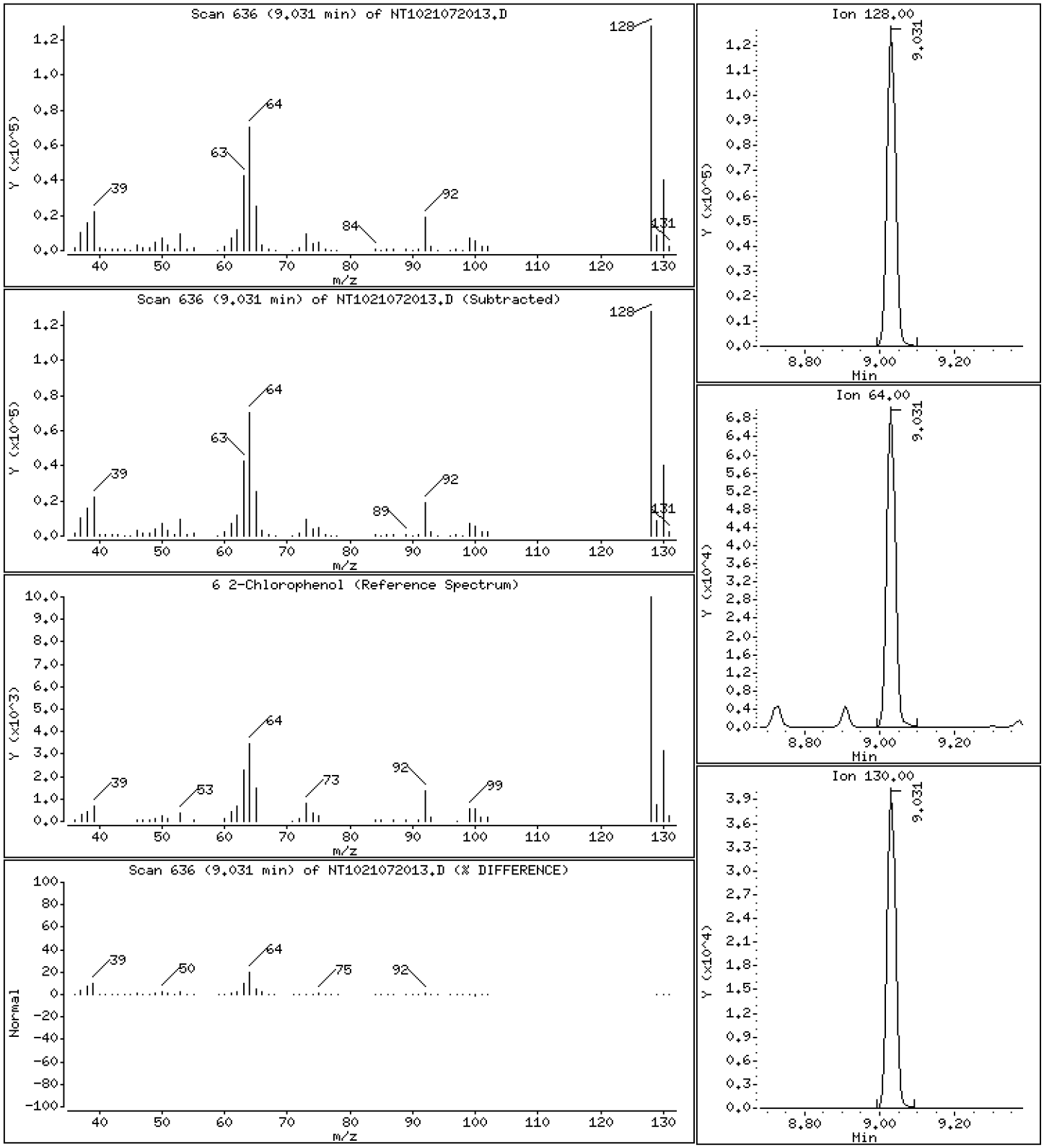
Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25

6 2-Chlorophenol

Concentration: 4.975 ug/mL



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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

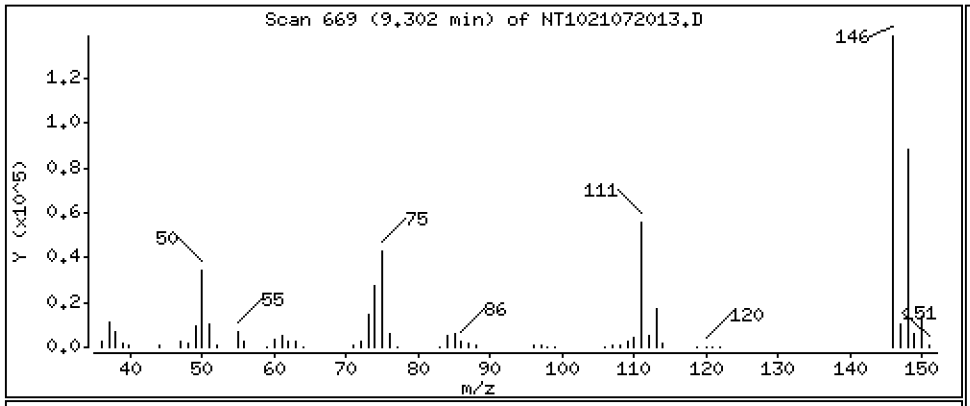
Operator: VTS

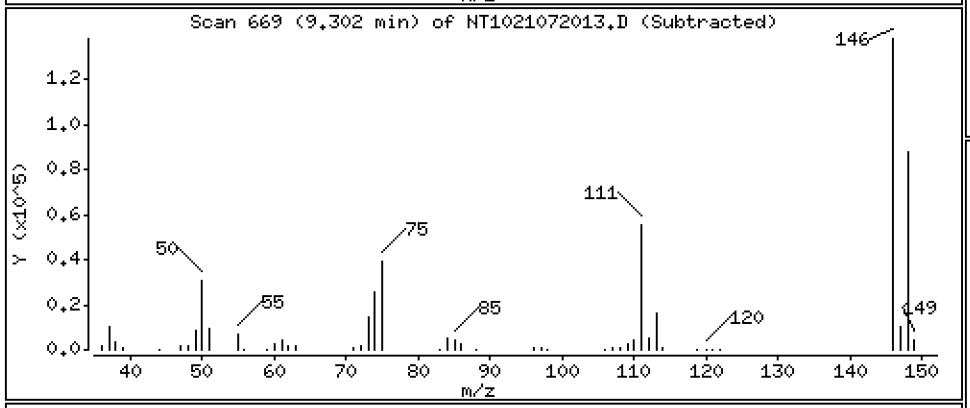
Column phase: ZB-5msi

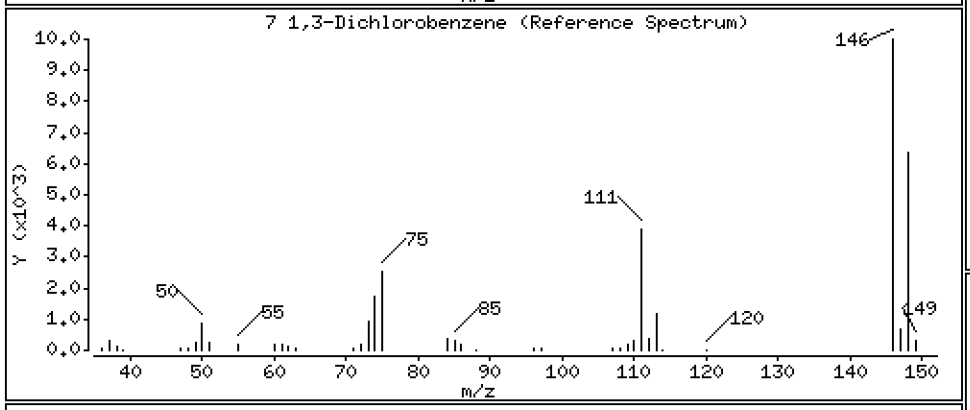
Column diameter: 0.25

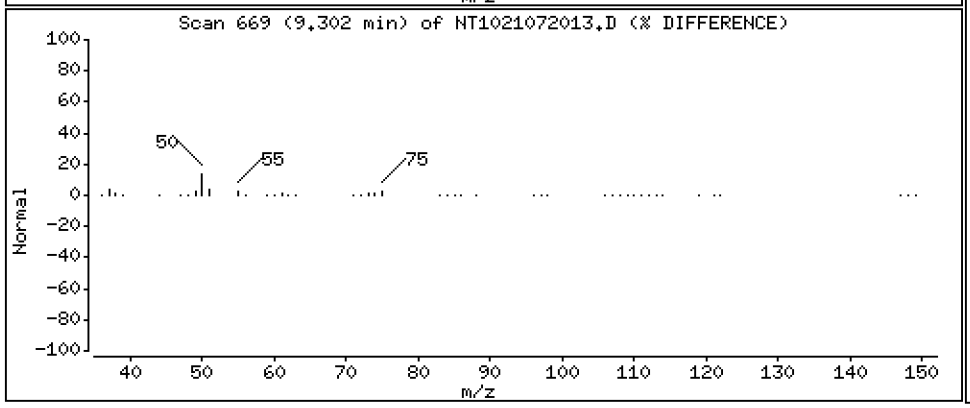
7 1,3-Dichlorobenzene

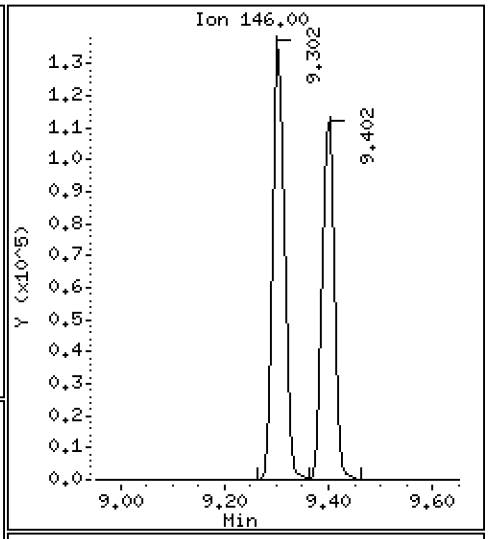
Concentration: 4.997 ug/mL

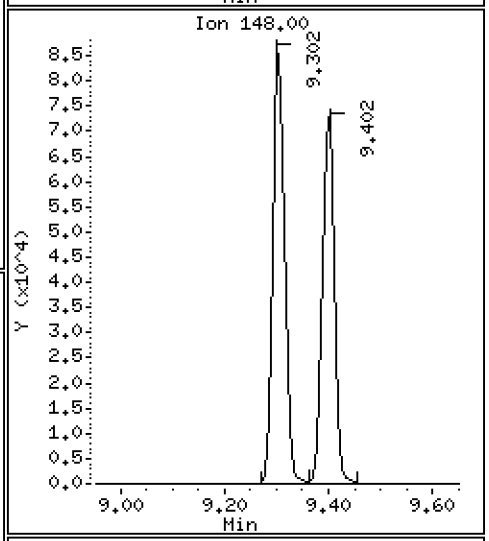


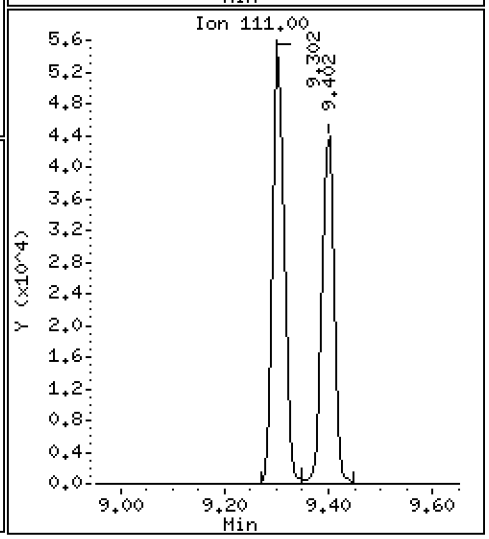












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

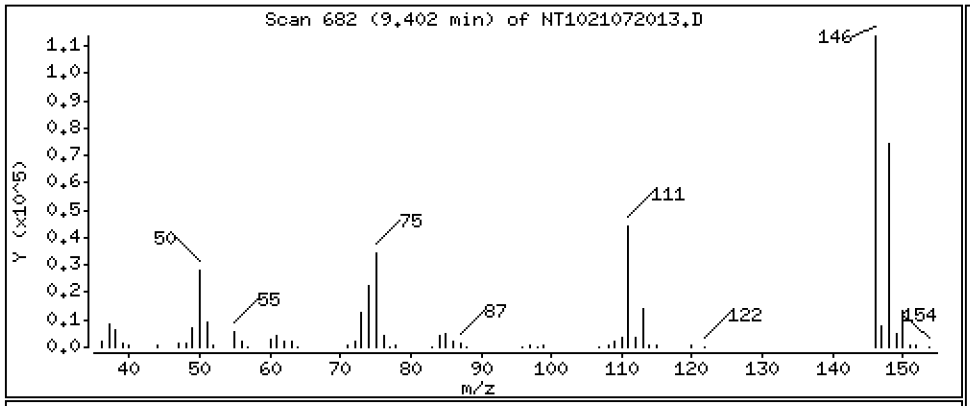
Operator: VTS

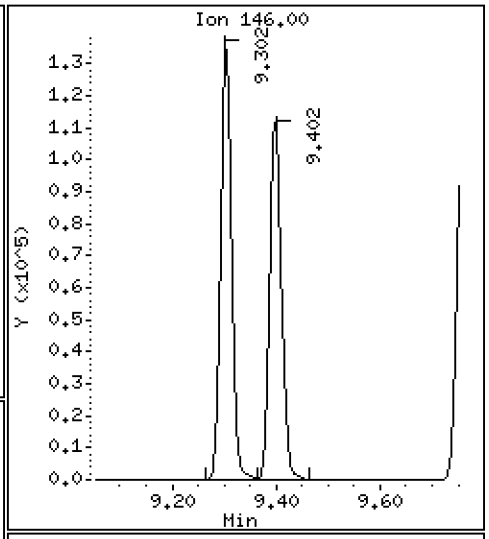
Column phase: ZB-5msi

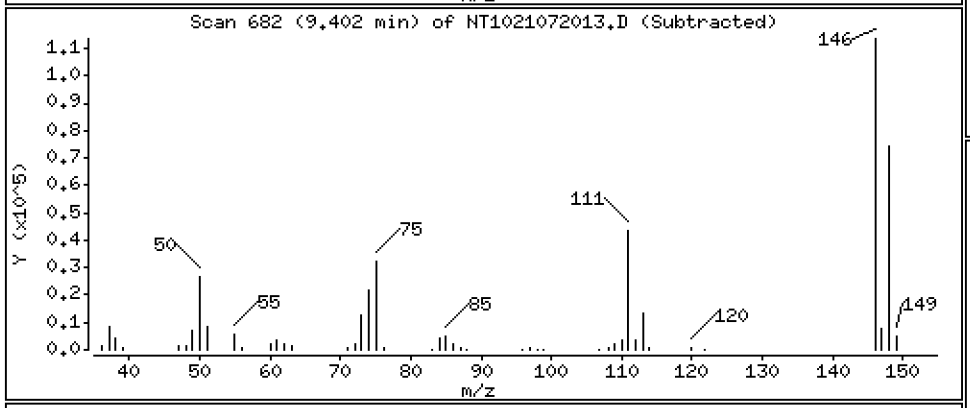
Column diameter: 0.25

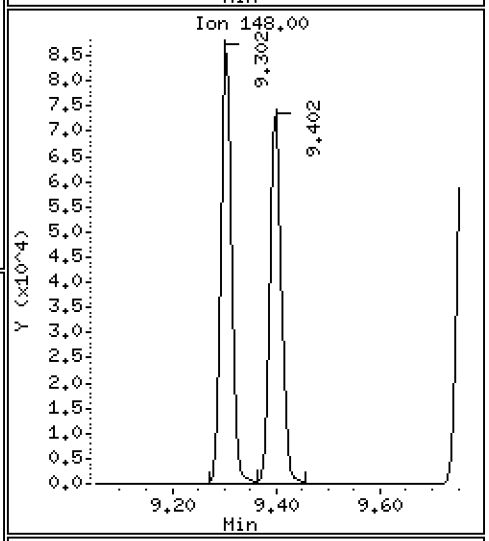
9 1,4-Dichlorobenzene

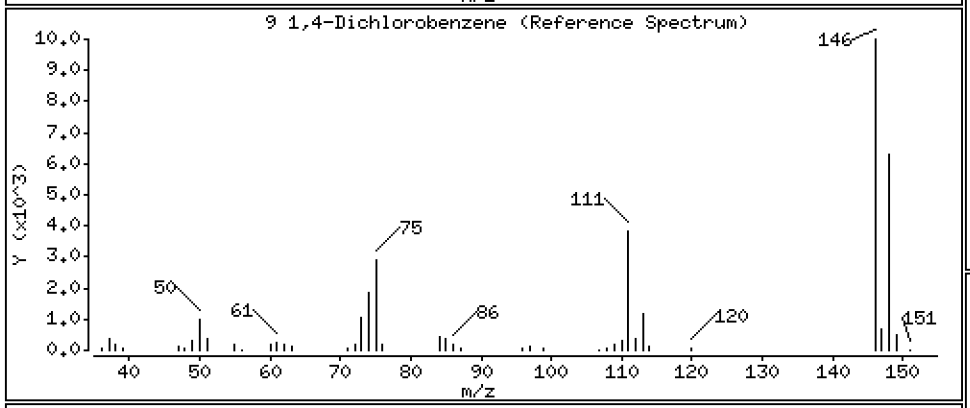
Concentration: 4.998 ug/mL

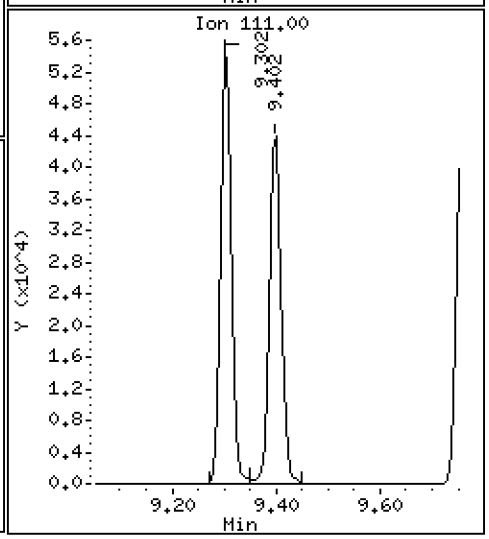


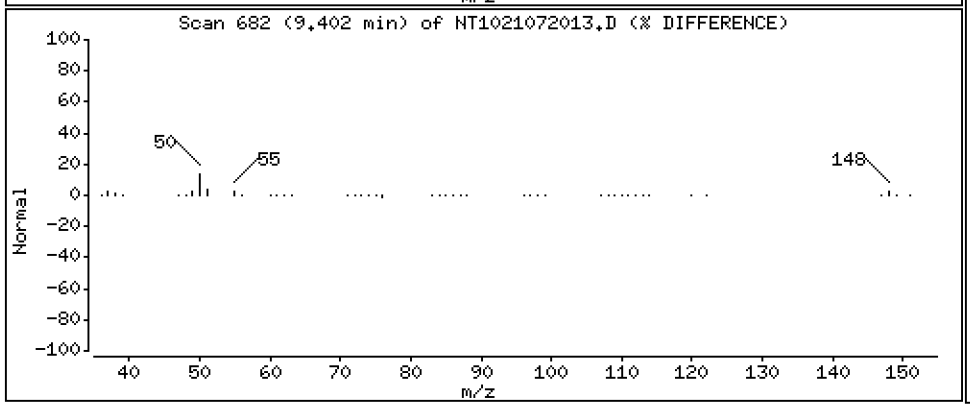












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

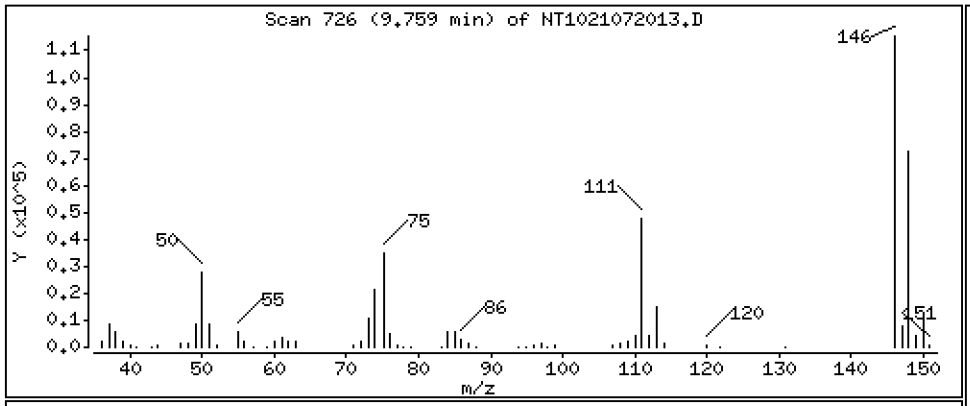
Operator: VTS

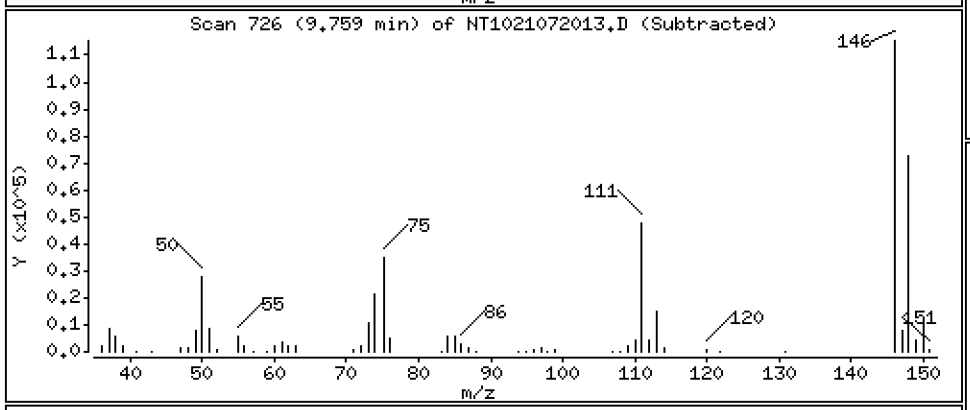
Column phase: ZB-5msi

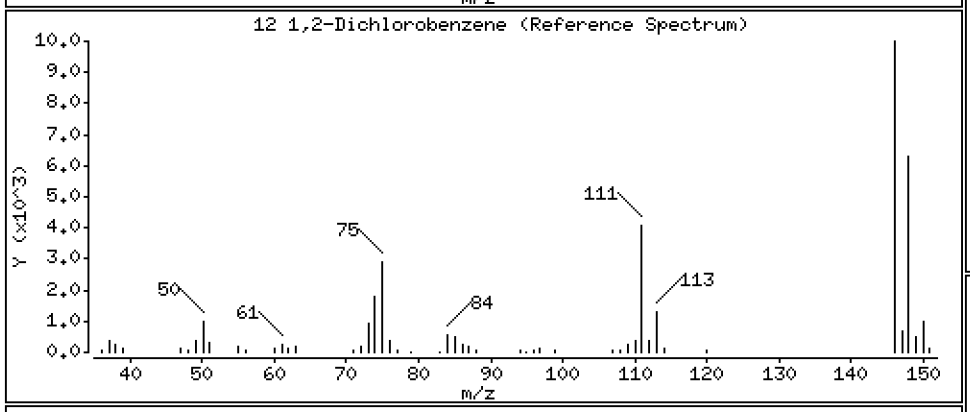
Column diameter: 0.25

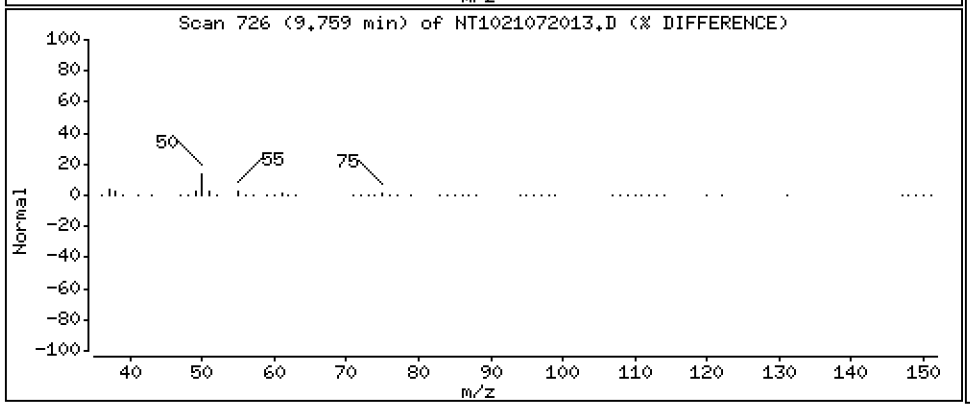
12 1,2-Dichlorobenzene

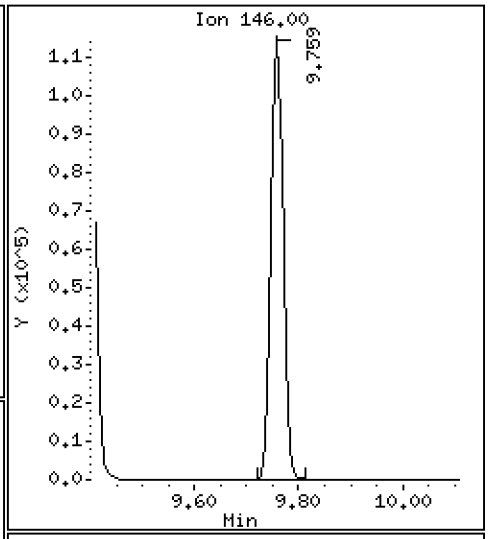
Concentration: 4.742 ug/mL

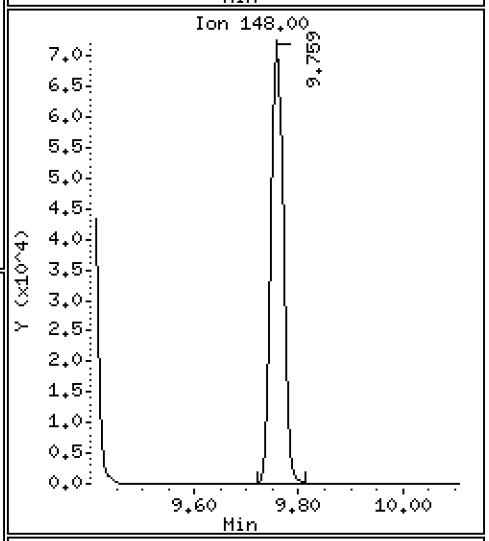


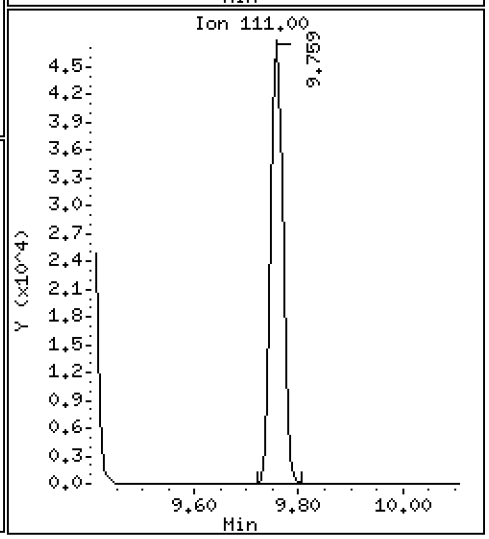












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

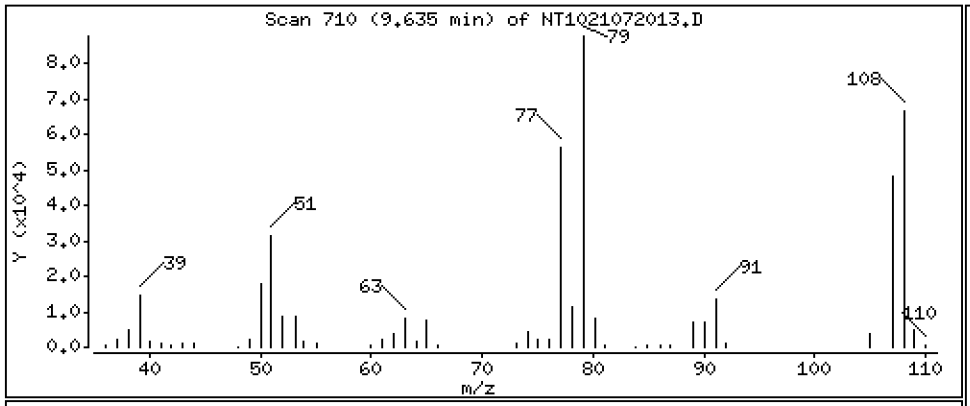
Operator: VTS

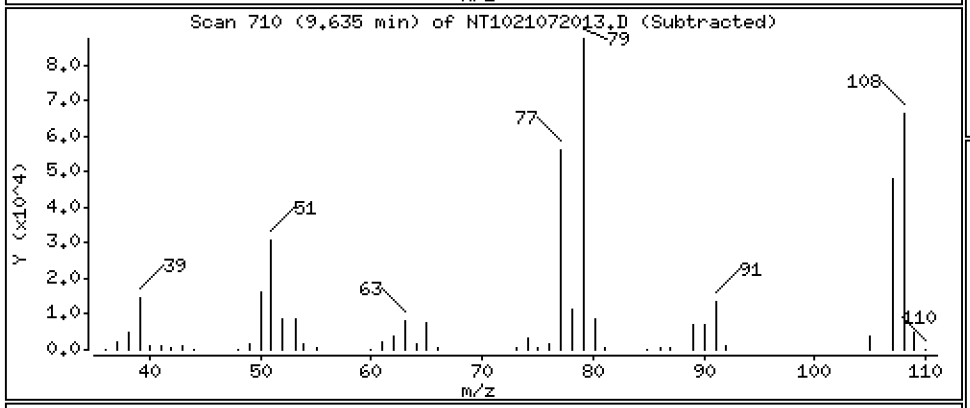
Column phase: ZB-5msi

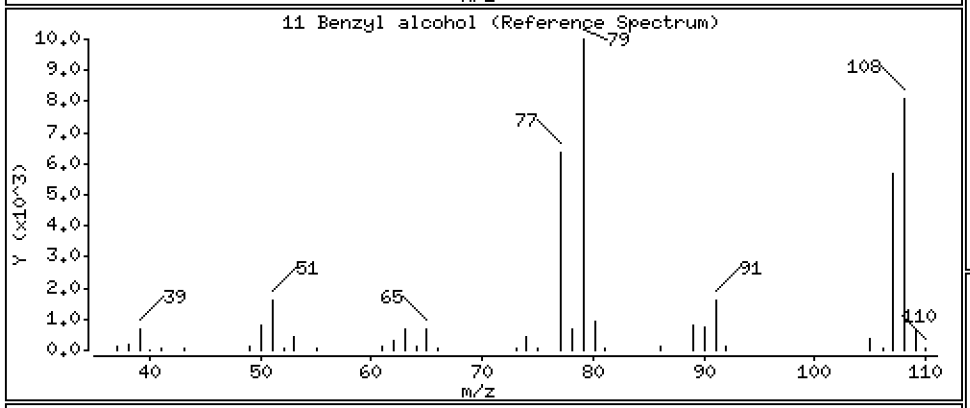
Column diameter: 0.25

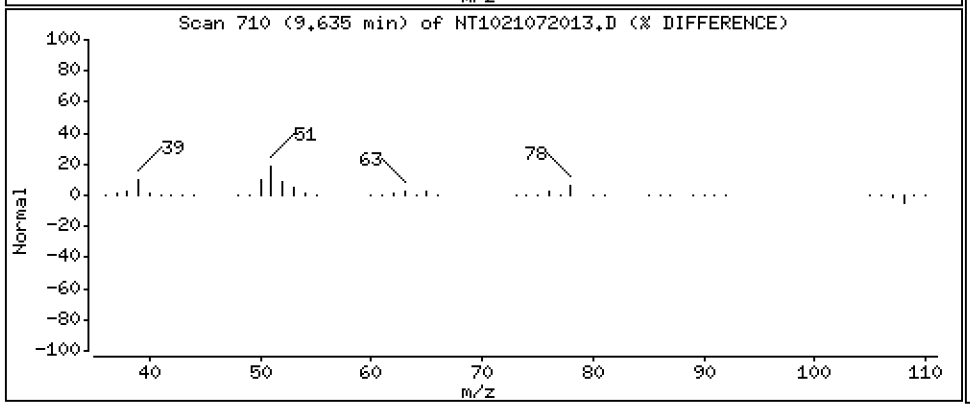
11 Benzyl alcohol

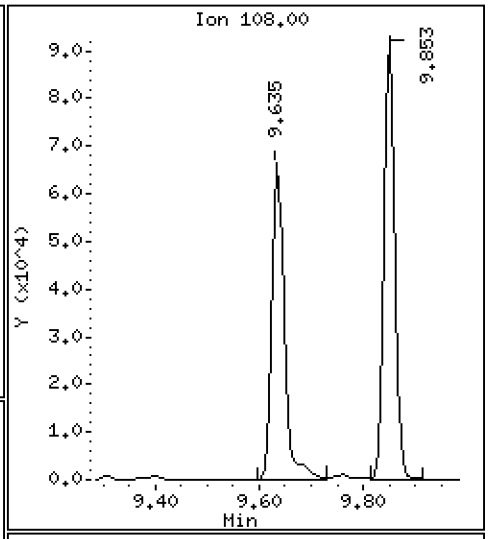
Concentration: 4.516 ug/mL

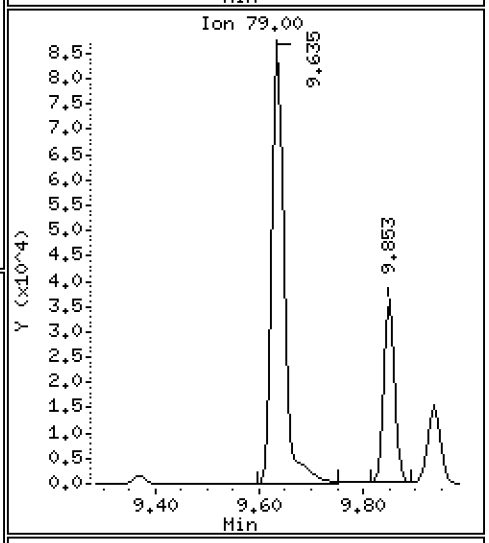


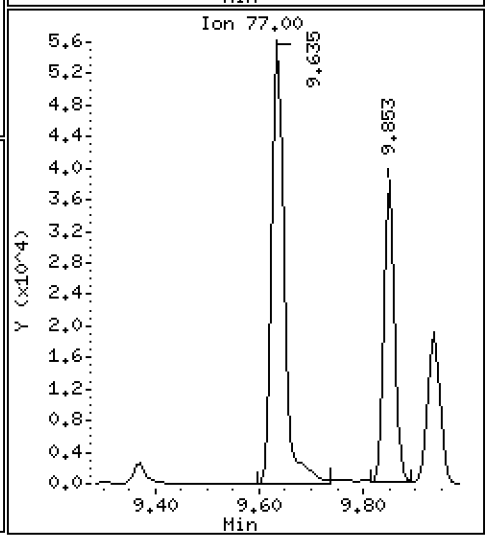












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

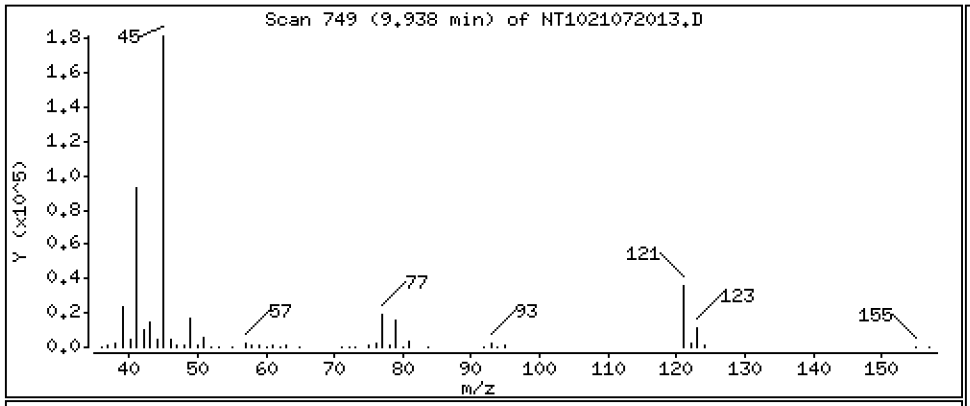
Operator: VTS

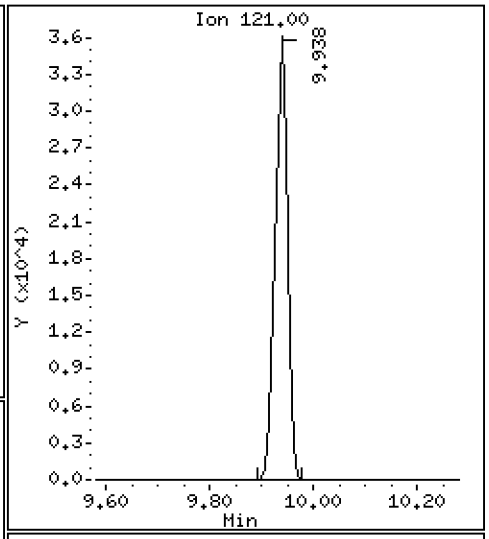
Column phase: ZB-5msi

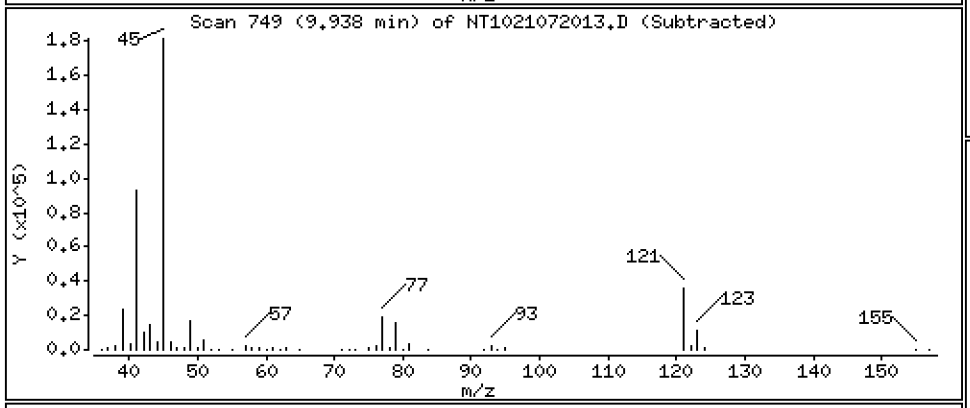
Column diameter: 0.25

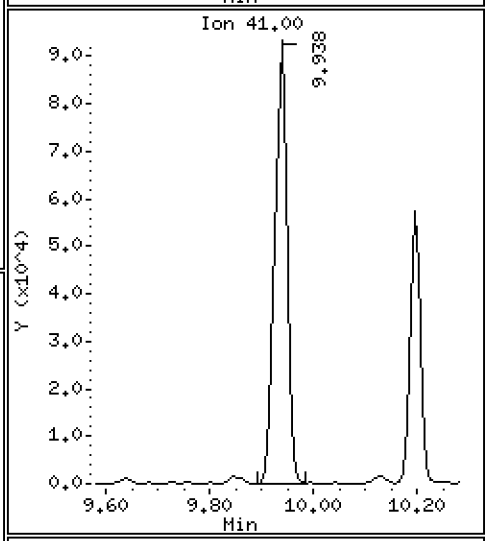
14 2,2'-oxybis(1-Chloropropane)

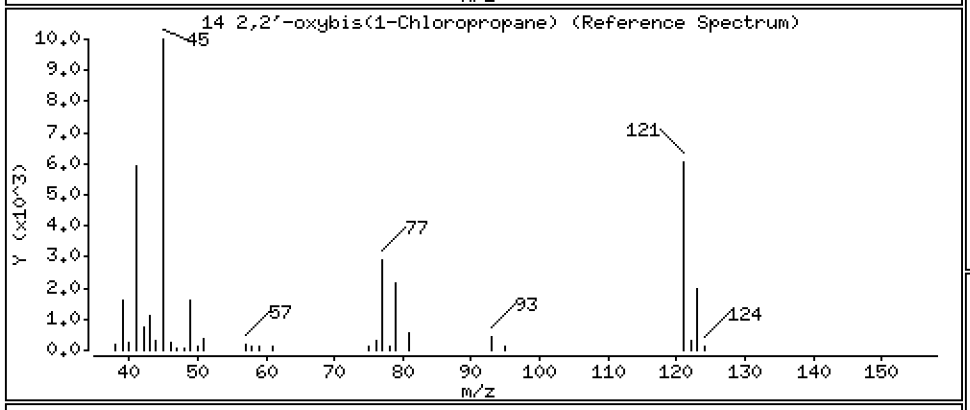
Concentration: 4.048 ug/mL

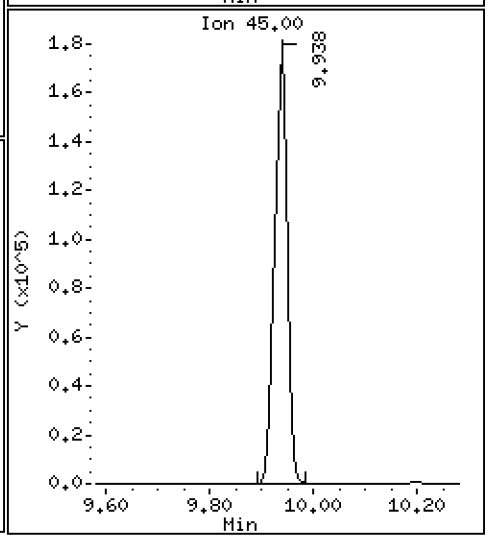


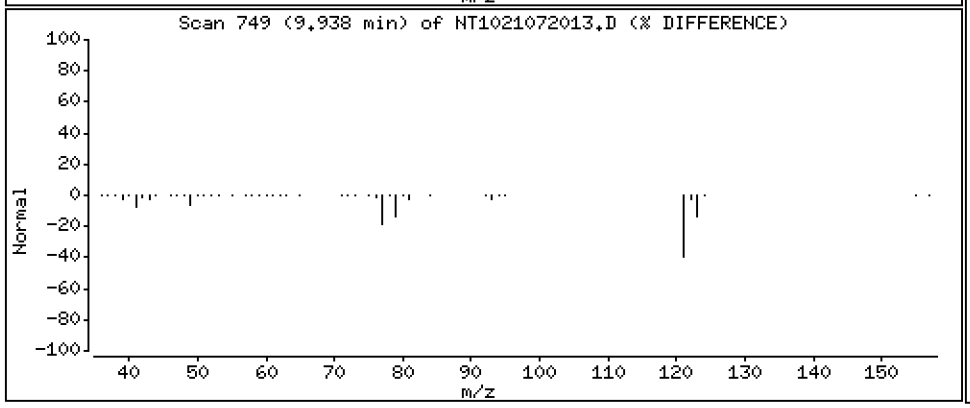












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

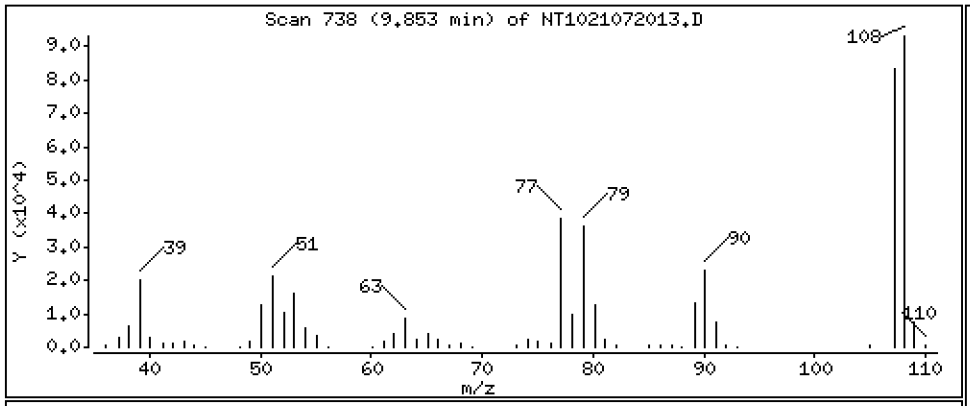
Operator: VTS

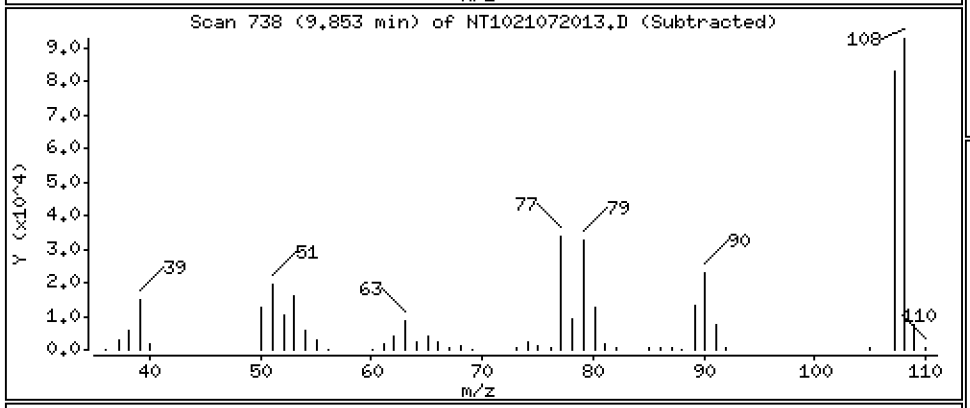
Column phase: ZB-5msi

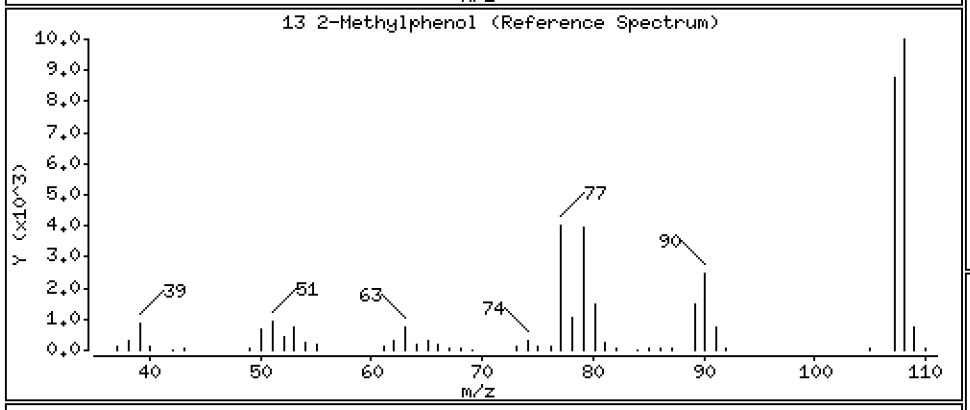
Column diameter: 0.25

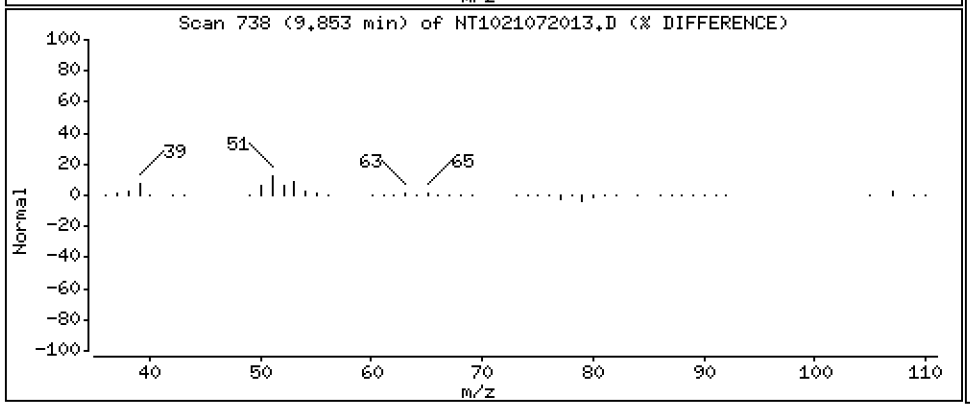
13 2-Methylphenol

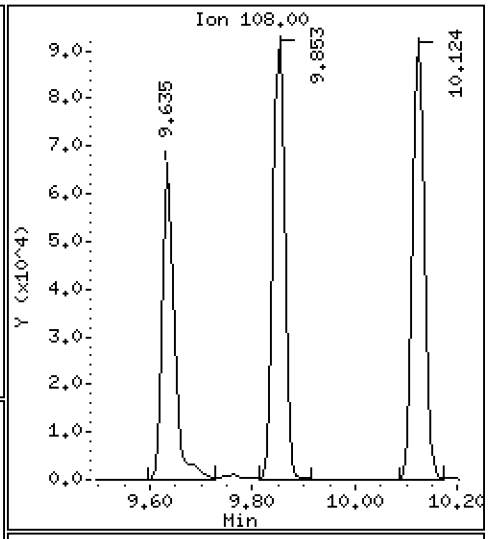
Concentration: 4.397 ug/mL

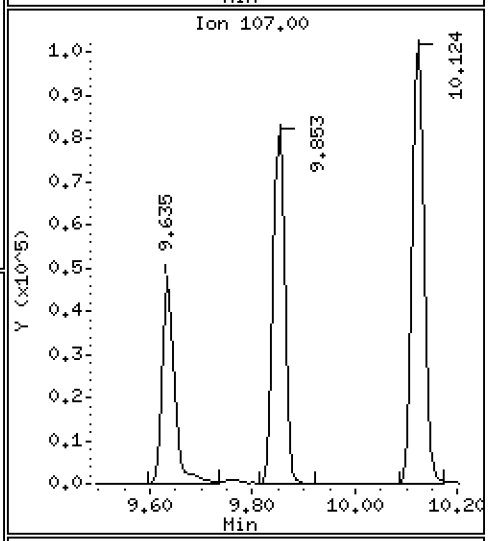


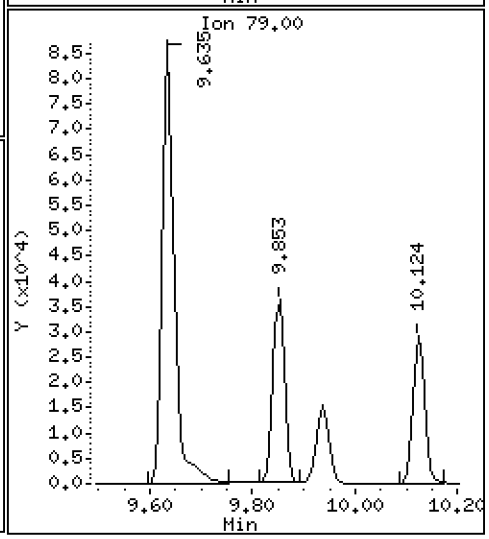












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

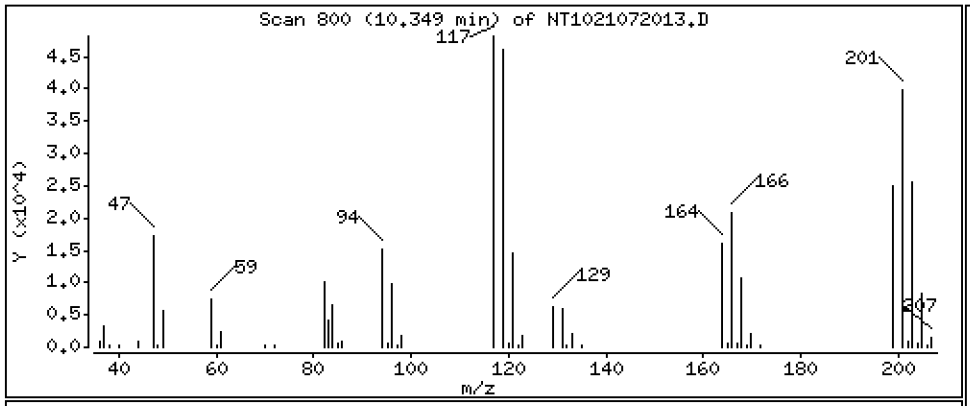
Operator: VTS

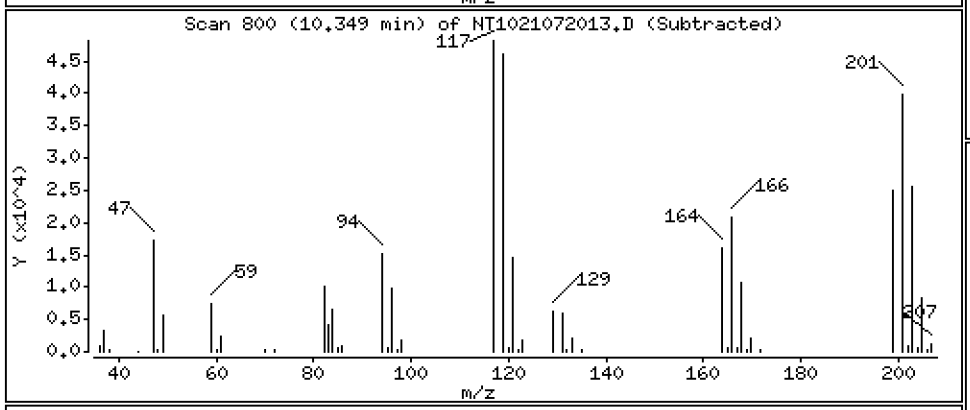
Column phase: ZB-5msi

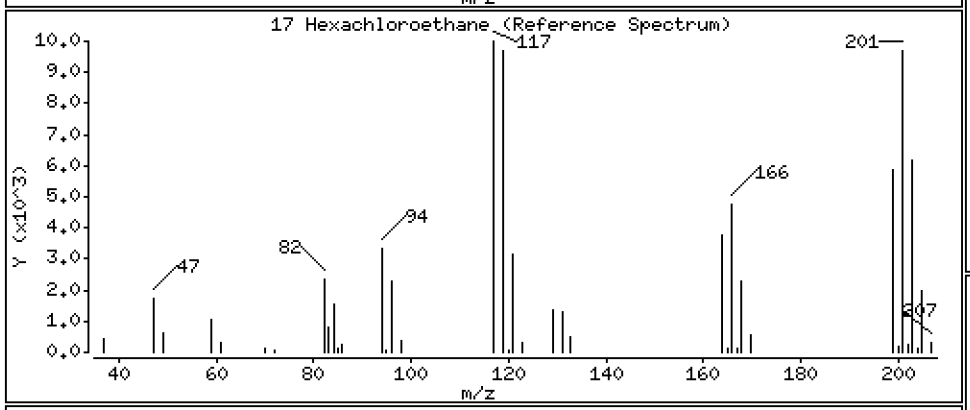
Column diameter: 0.25

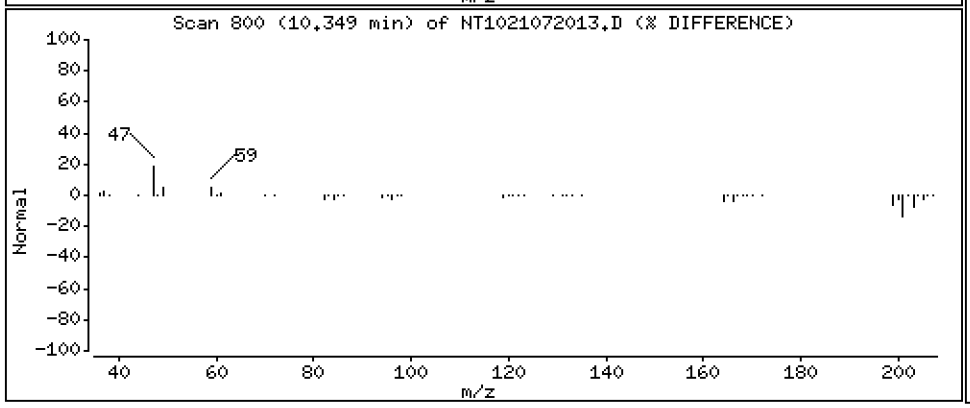
17 Hexachloroethane

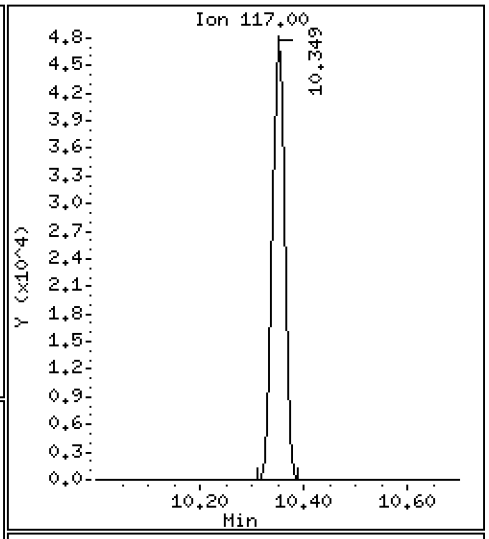
Concentration: 4.914 ug/mL

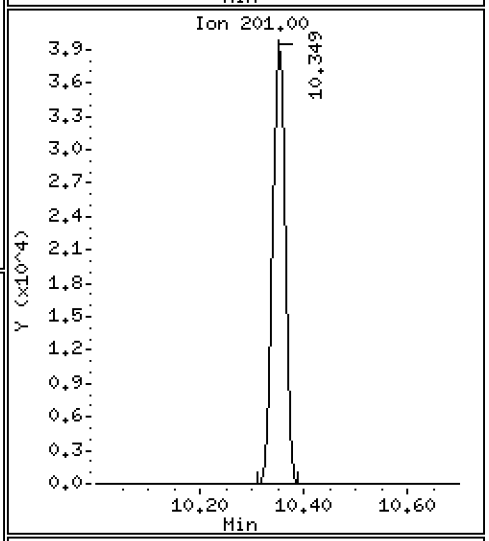


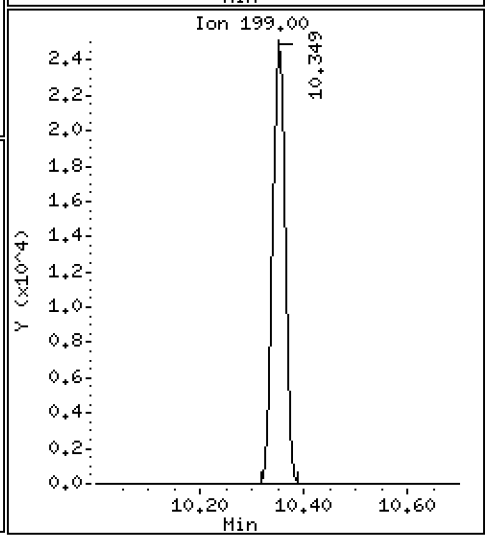












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

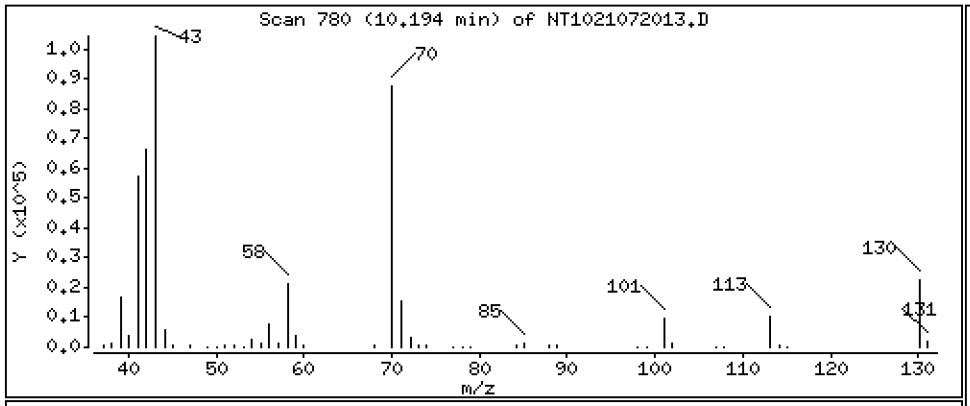
Operator: VTS

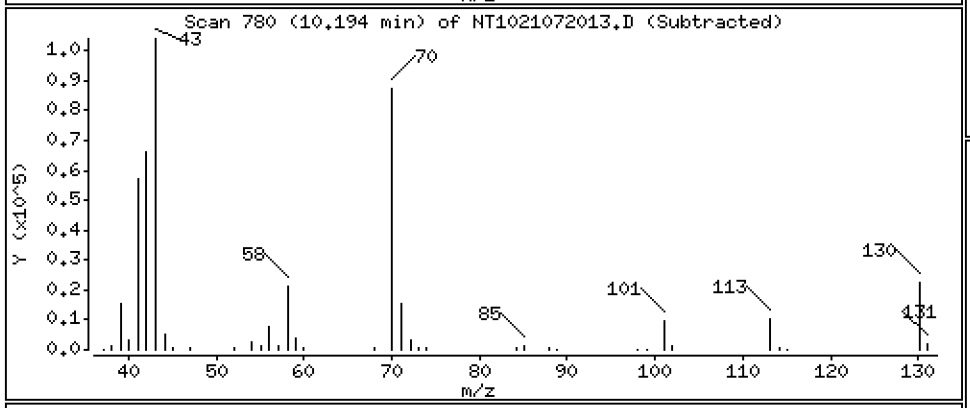
Column phase: ZB-5msi

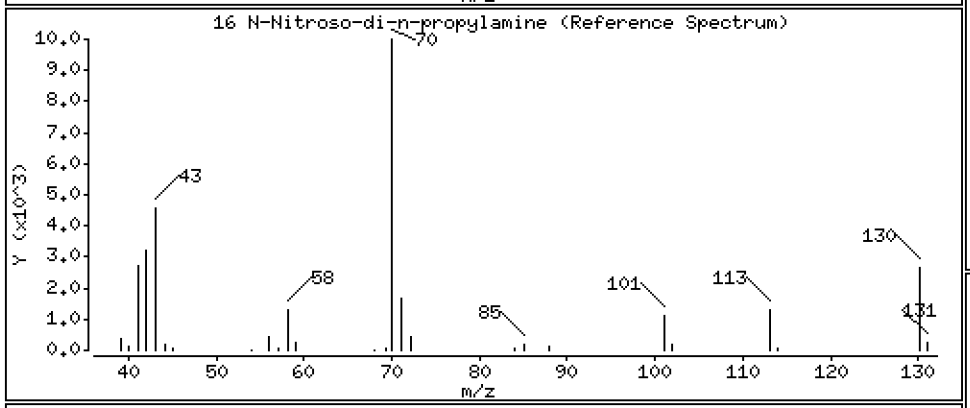
Column diameter: 0.25

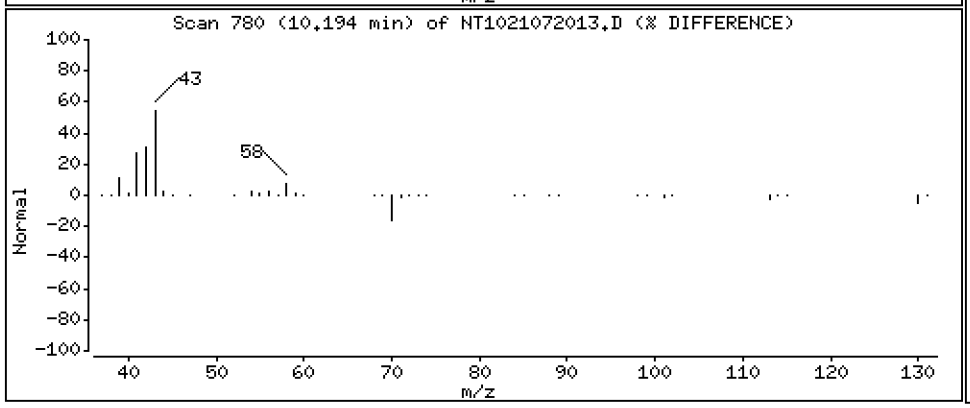
16 N-Nitroso-di-n-propylamine

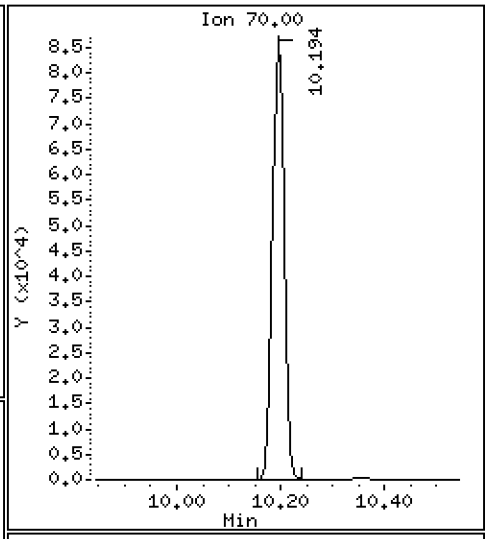
Concentration: 4.742 ug/mL

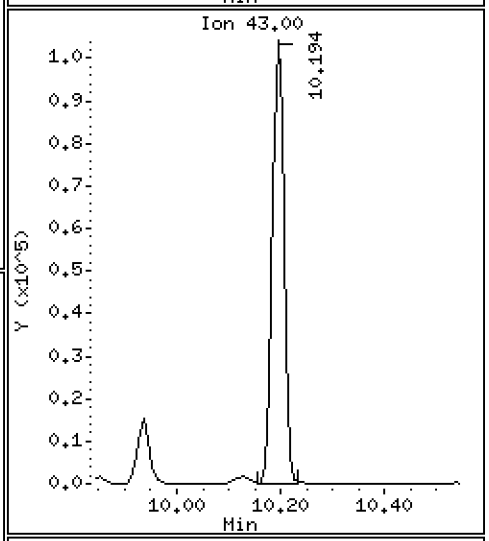


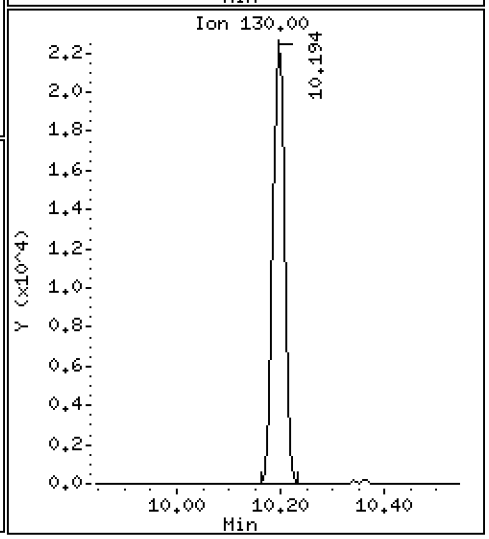












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

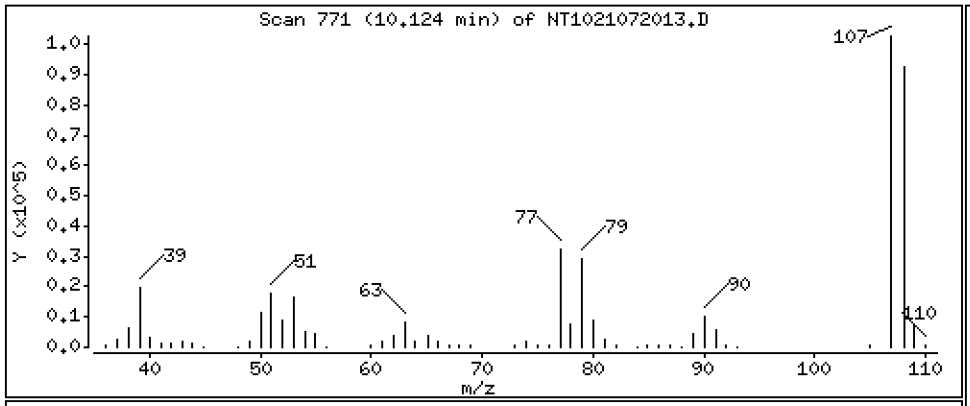
Operator: VTS

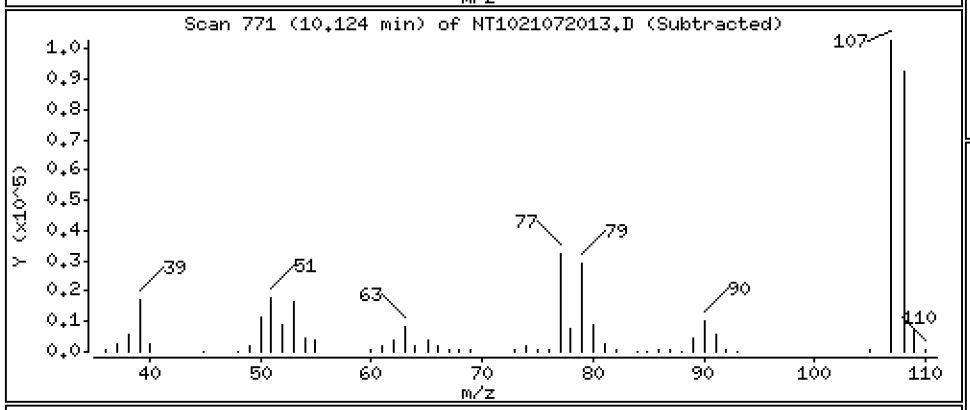
Column phase: ZB-5msi

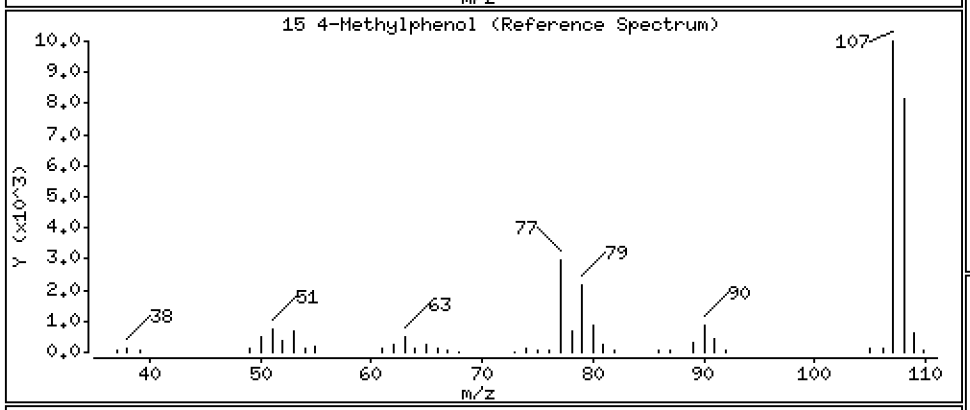
Column diameter: 0.25

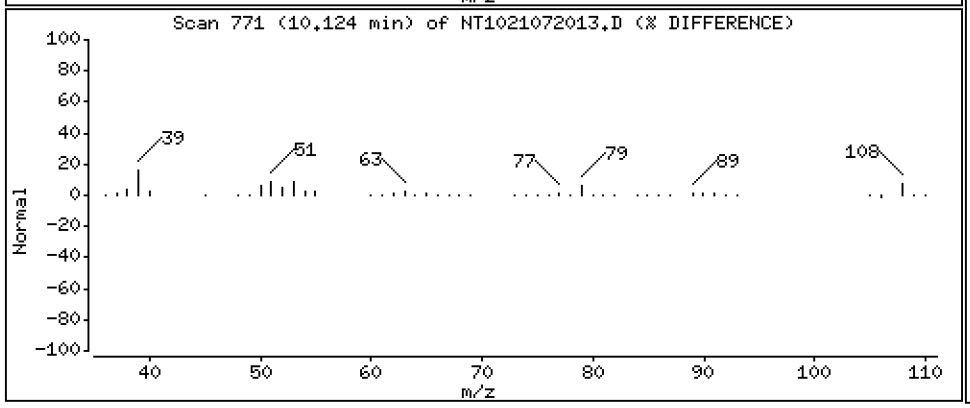
15 4-Methylphenol

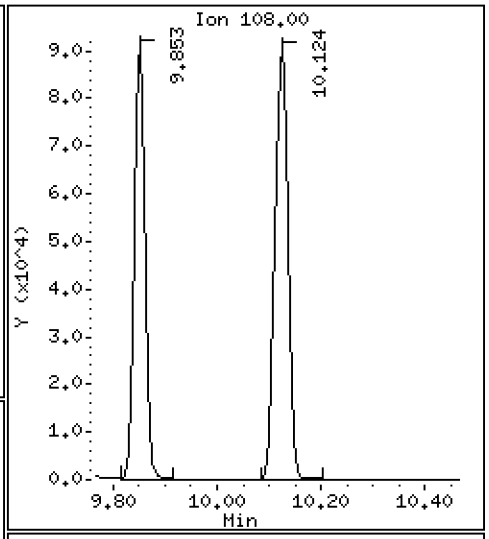
Concentration: 4.667 ug/mL

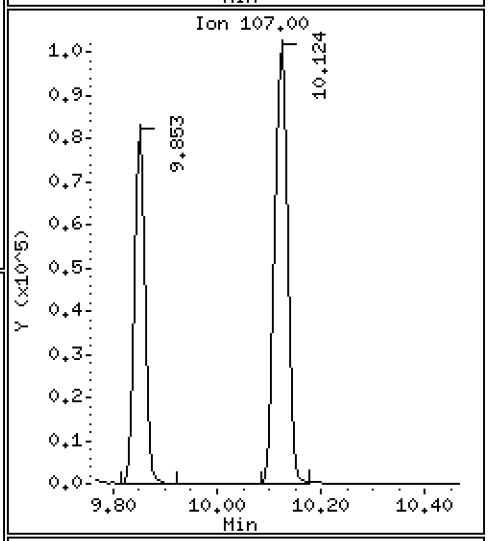


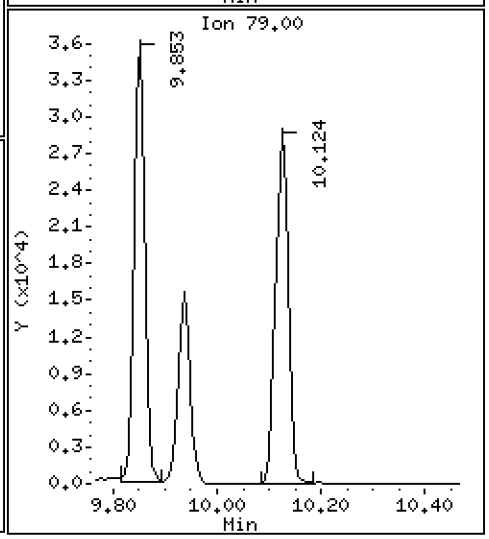












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

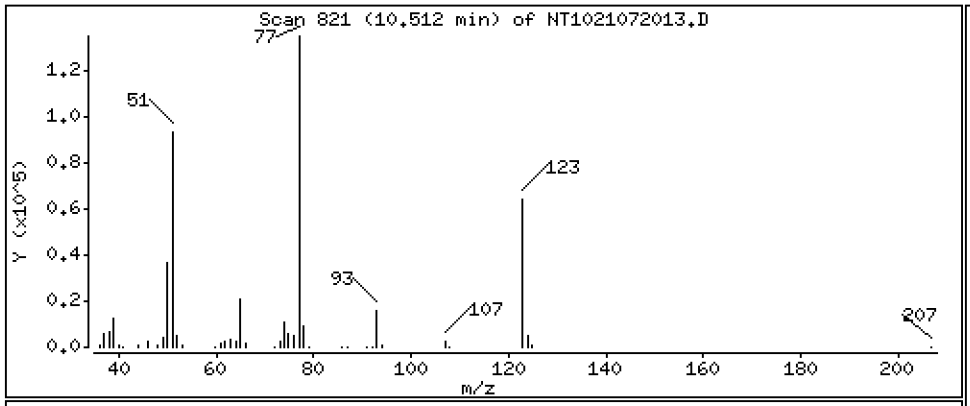
Operator: VTS

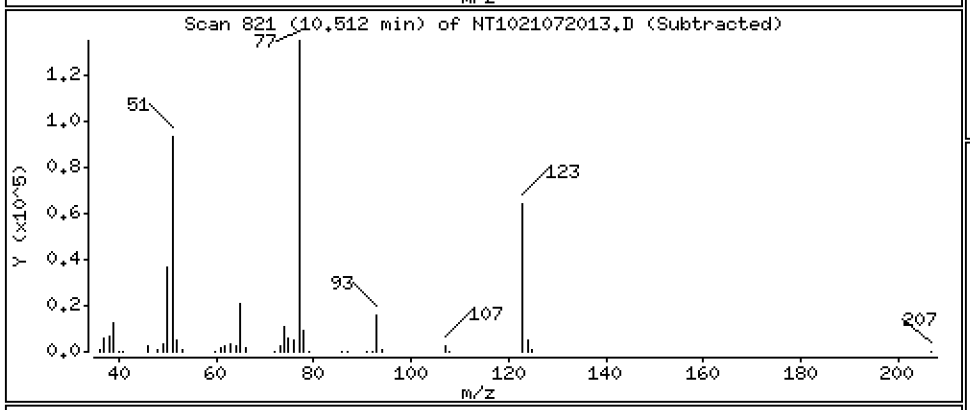
Column phase: ZB-5msi

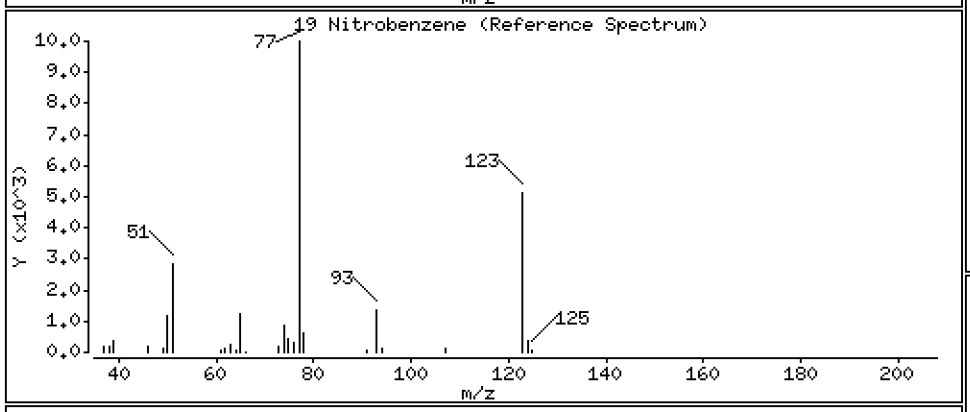
Column diameter: 0.25

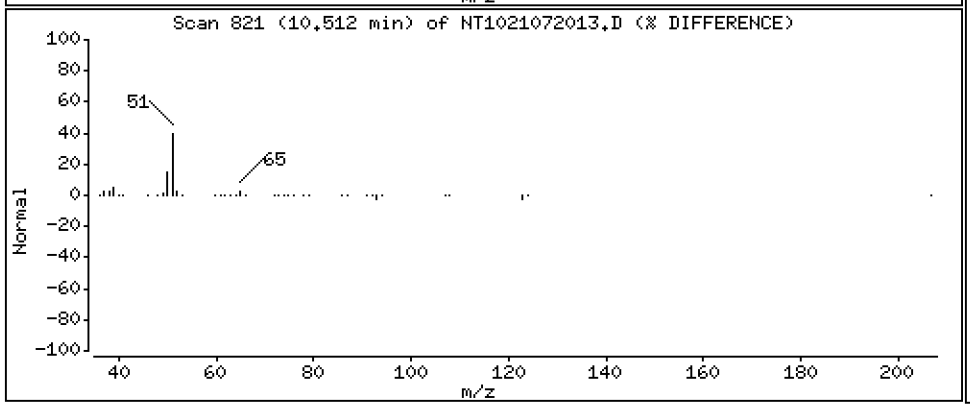
19 Nitrobenzene

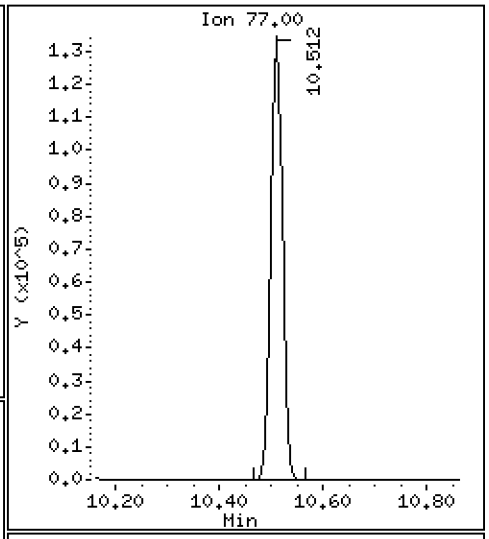
Concentration: 4.741 ug/mL

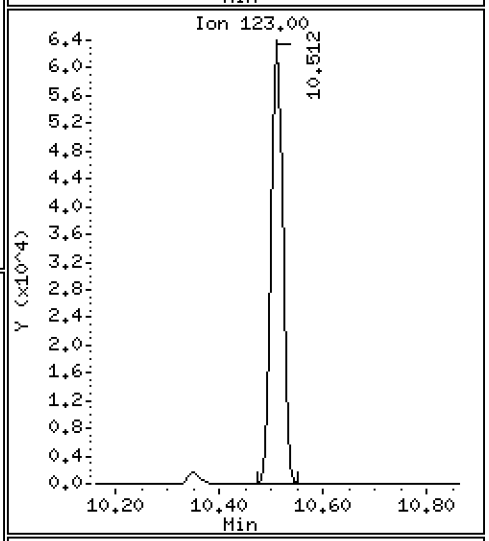


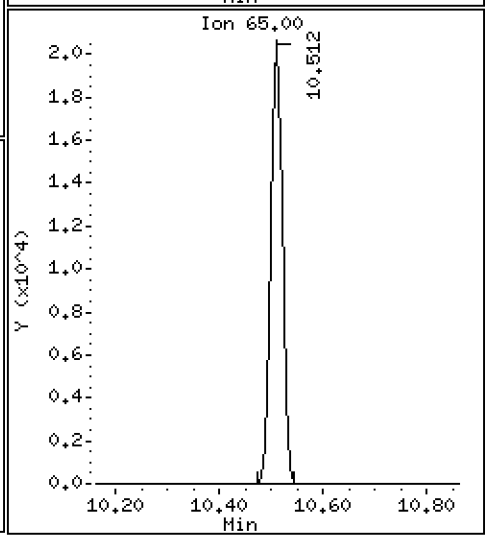












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

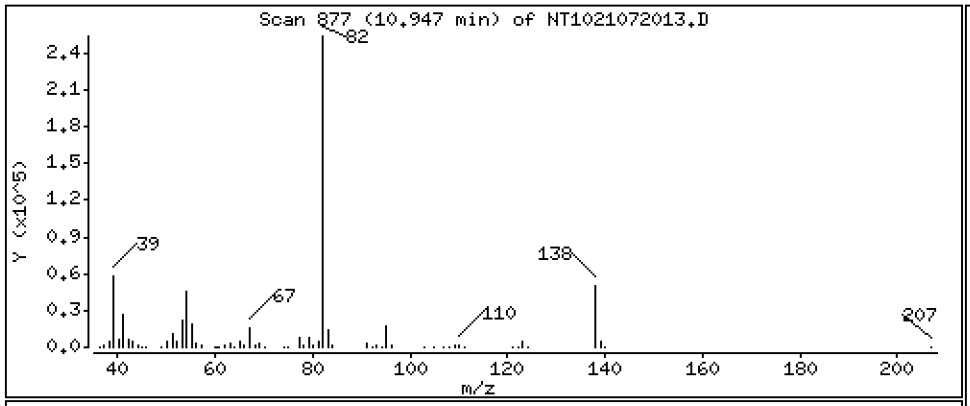
Operator: VTS

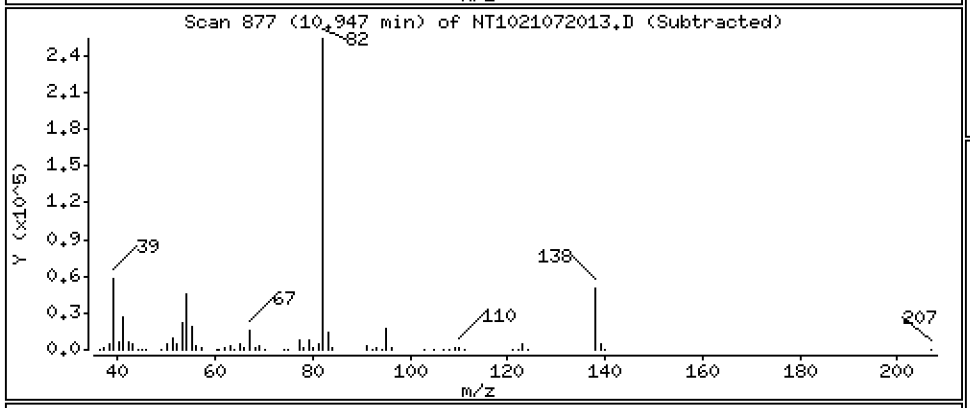
Column phase: ZB-5msi

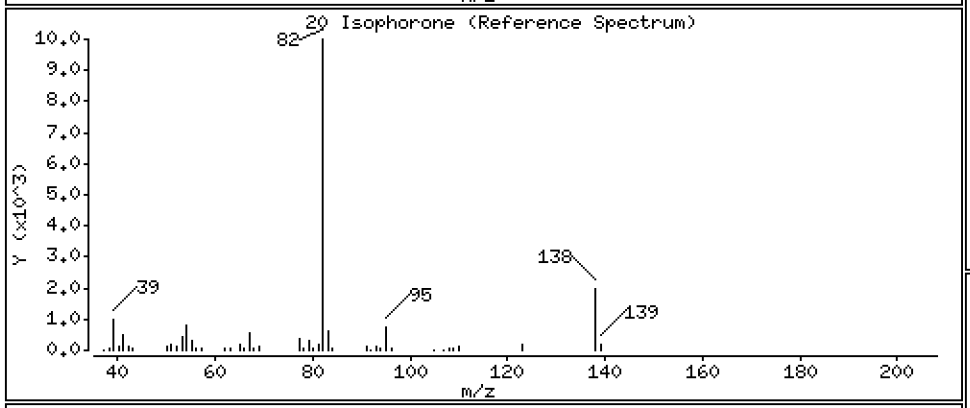
Column diameter: 0.25

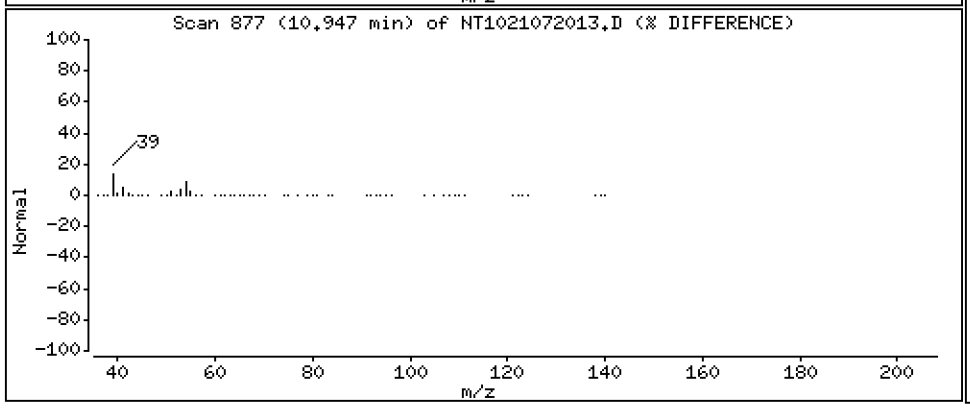
20 Isophorone

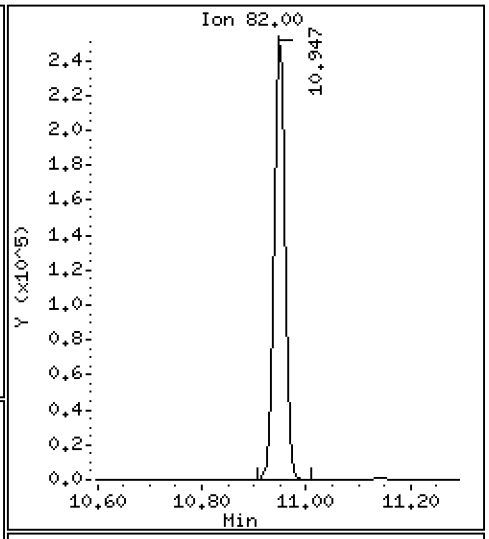
Concentration: 4.950 ug/mL

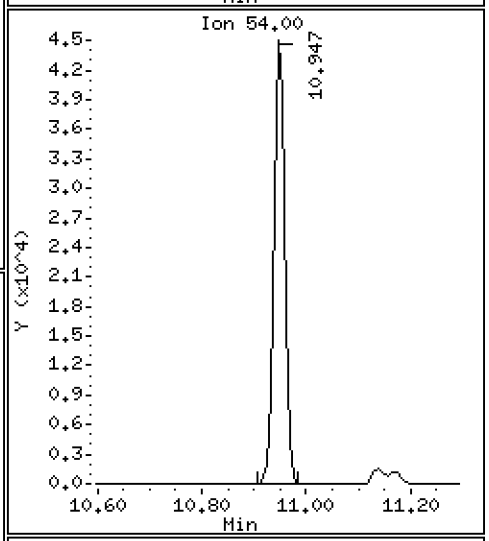


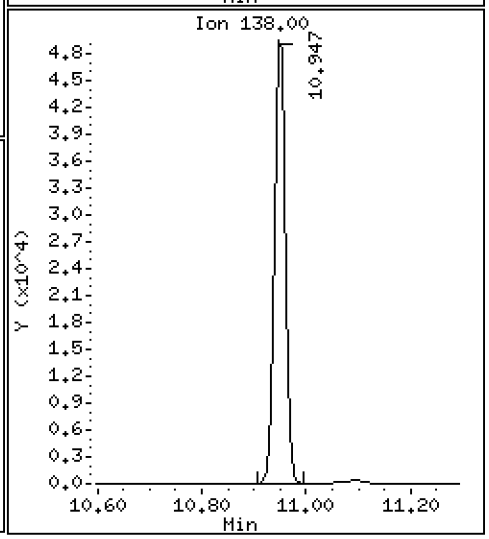












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

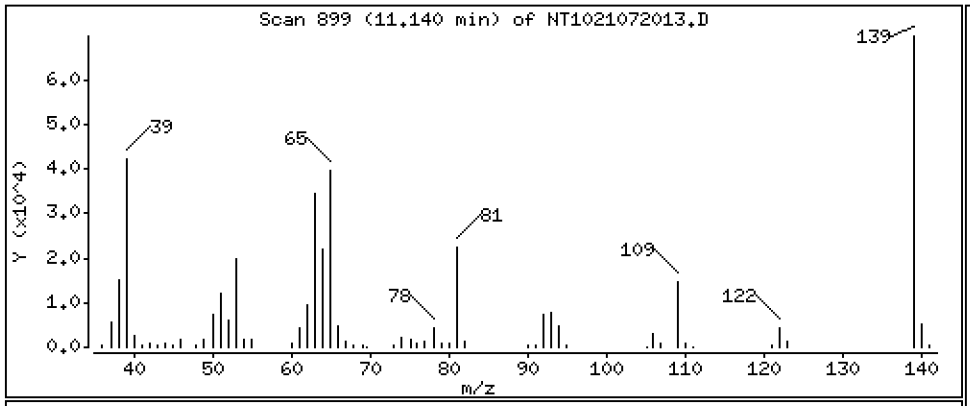
Operator: VTS

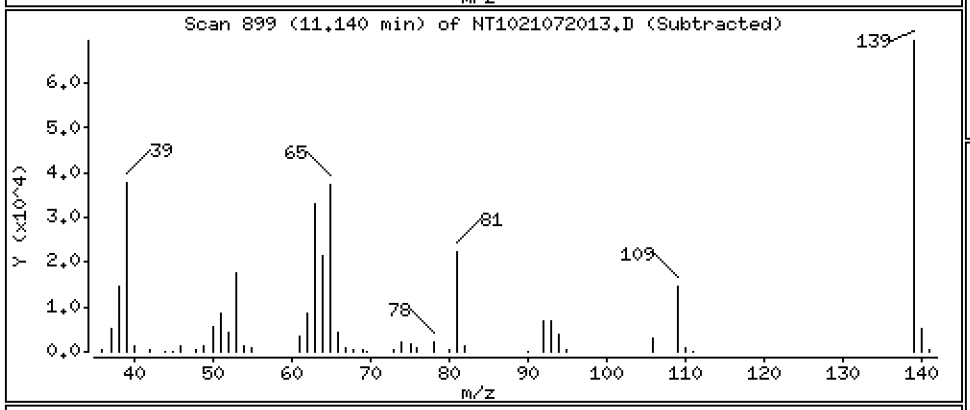
Column phase: ZB-5msi

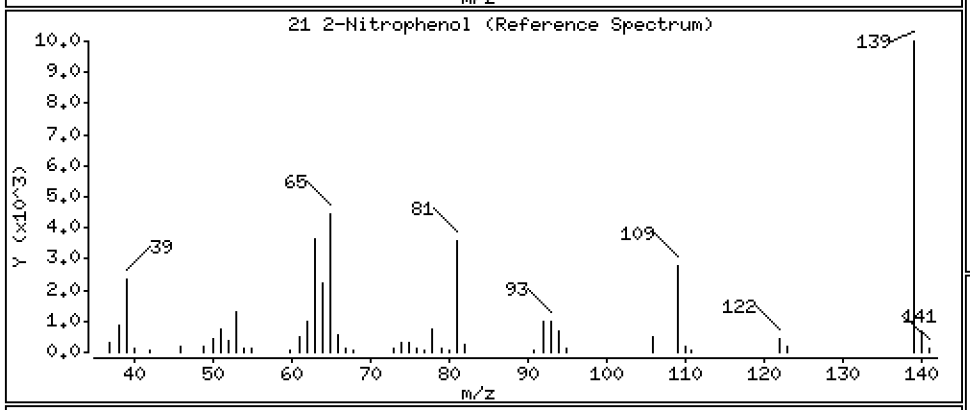
Column diameter: 0.25

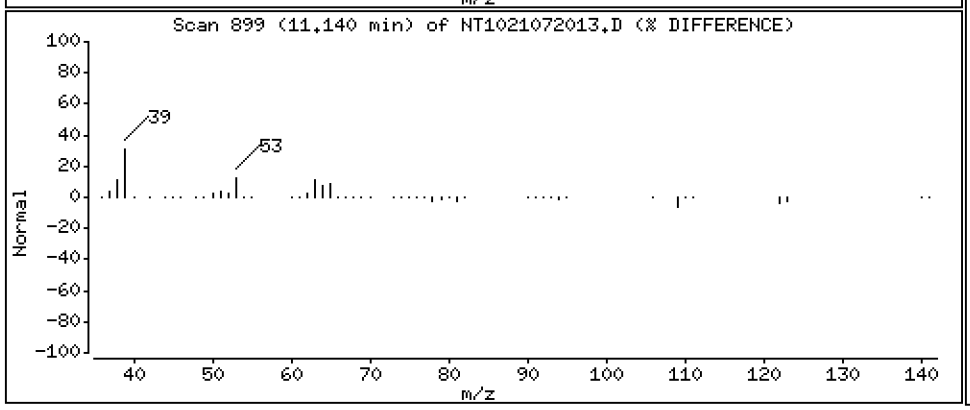
21 2-Nitrophenol

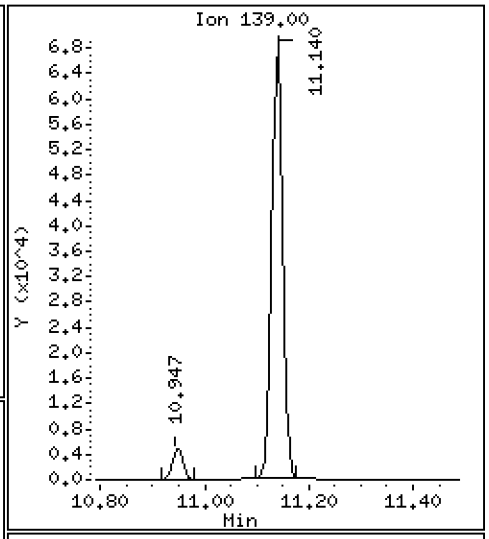
Concentration: 4.514 ug/mL

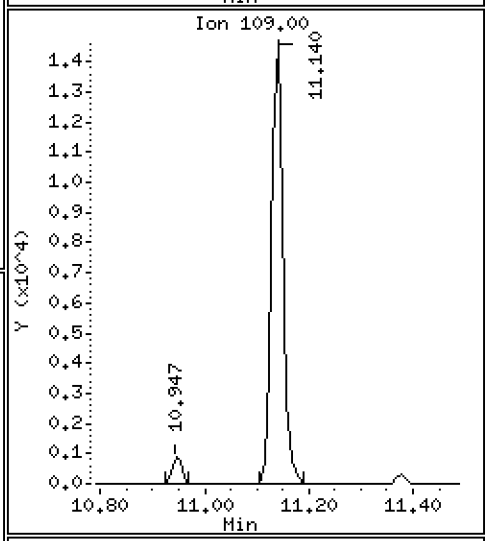


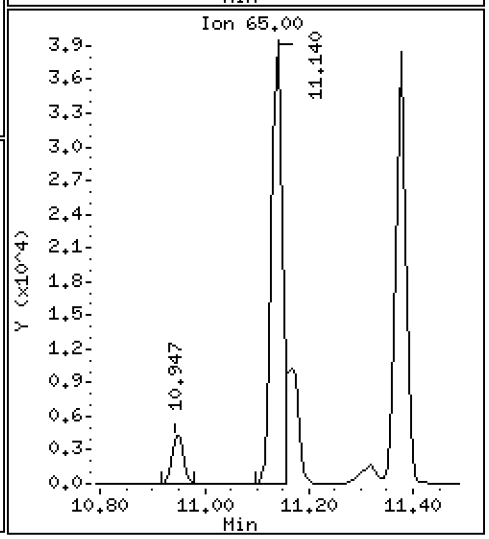












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

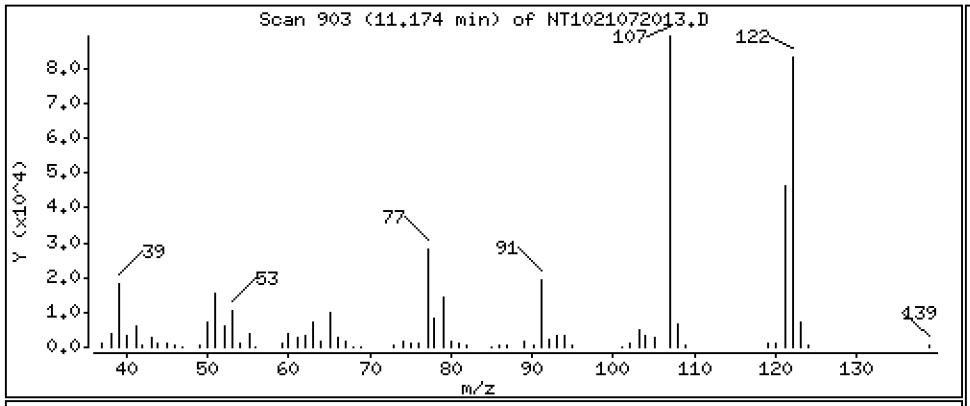
Operator: VTS

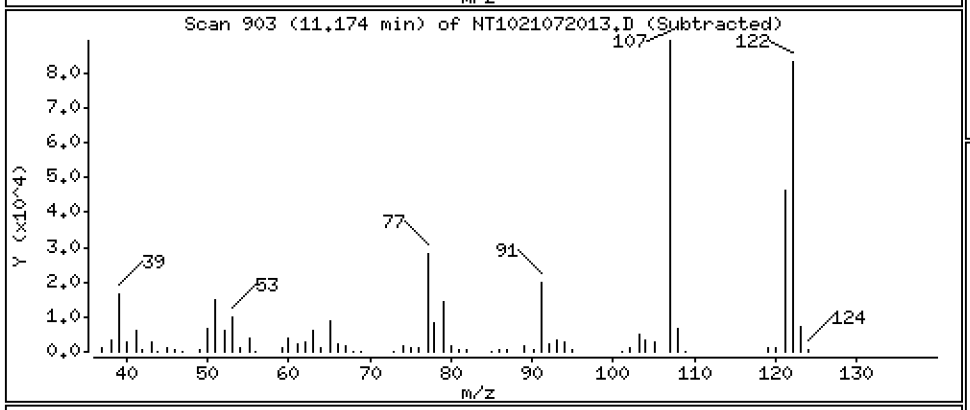
Column phase: ZB-5msi

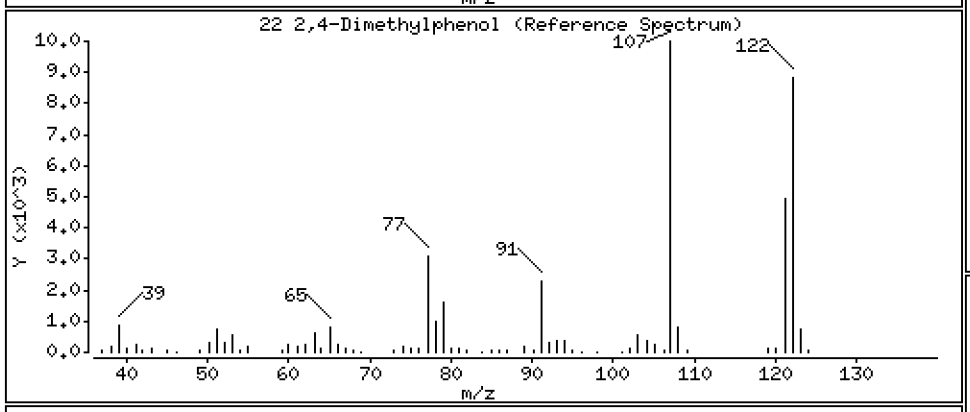
Column diameter: 0.25

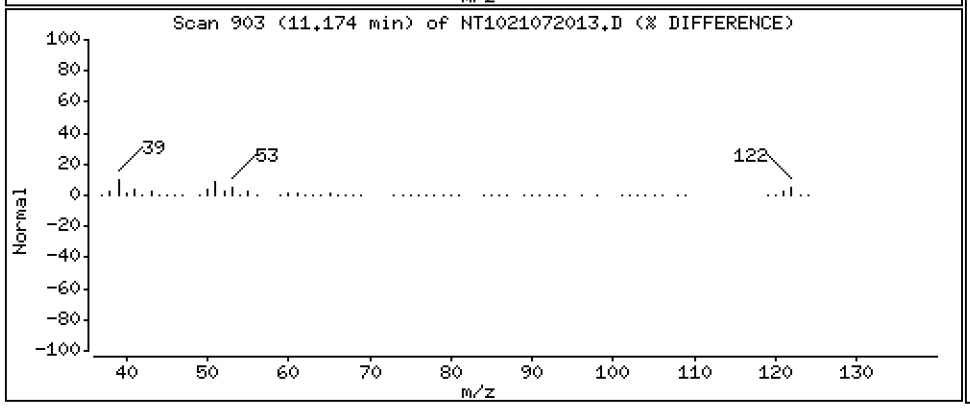
22 2,4-Dimethylphenol

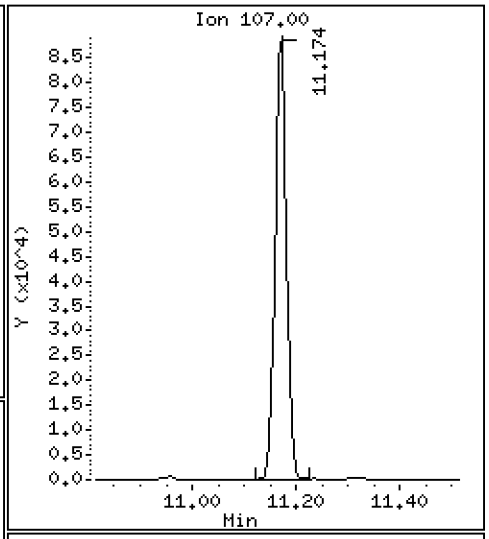
Concentration: 4.365 ug/mL

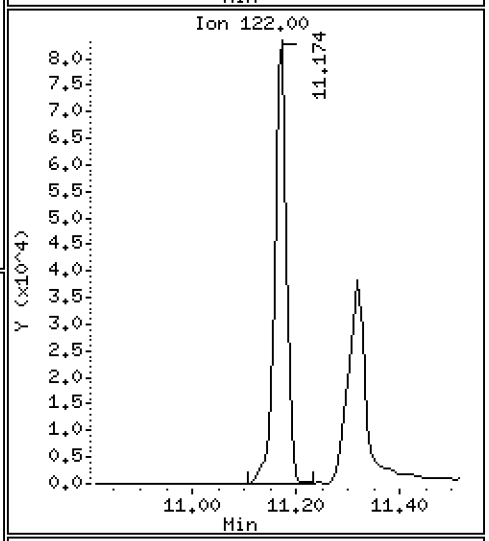


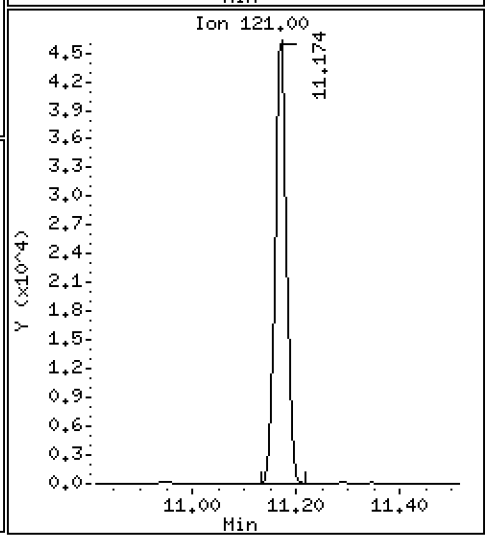












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

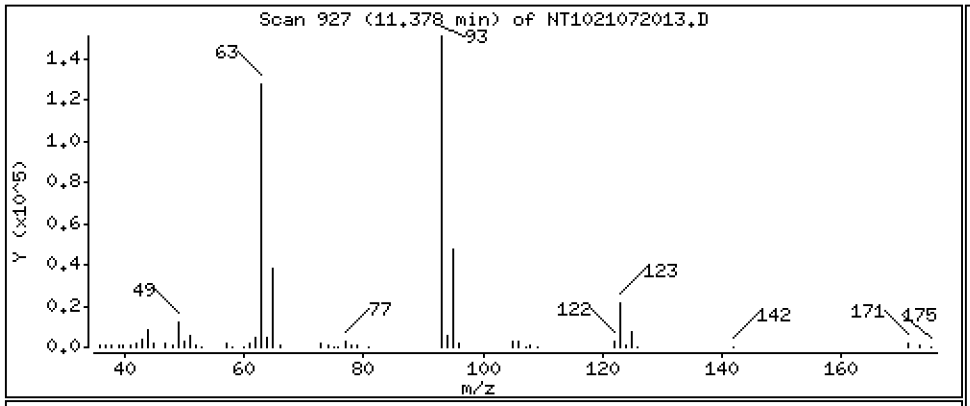
Operator: VTS

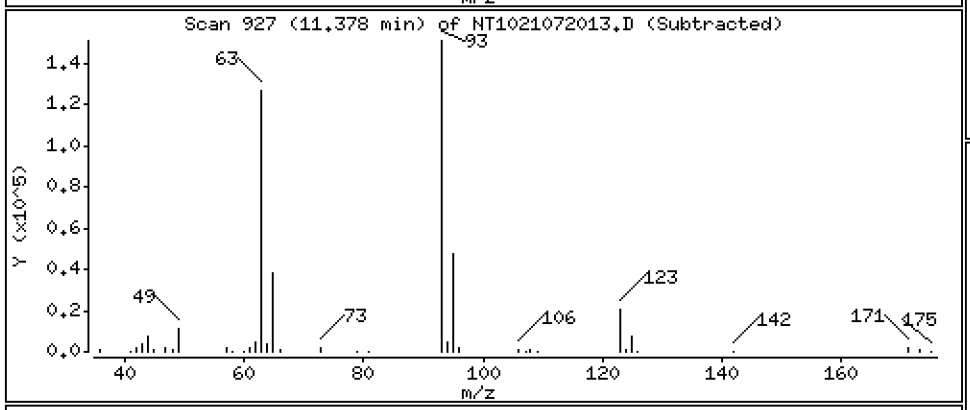
Column phase: ZB-5msi

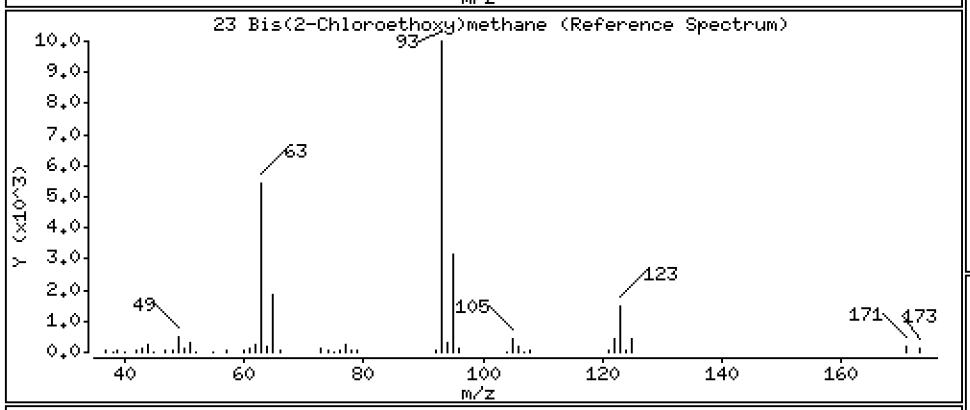
Column diameter: 0.25

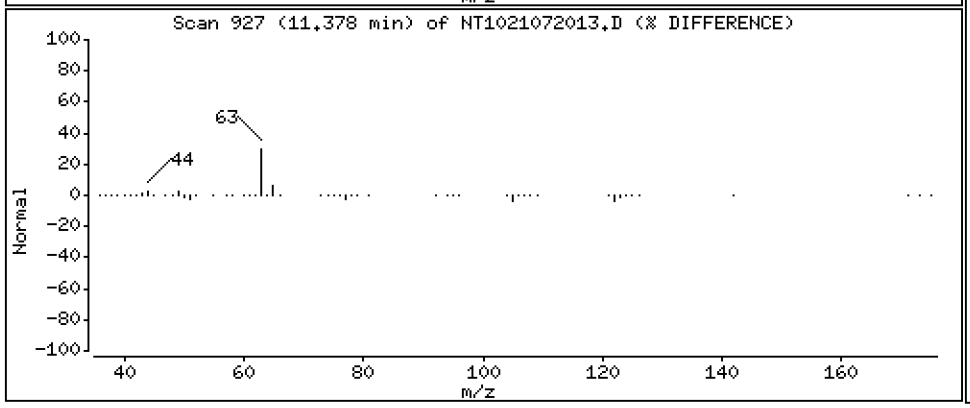
23 Bis(2-Chloroethoxy)methane

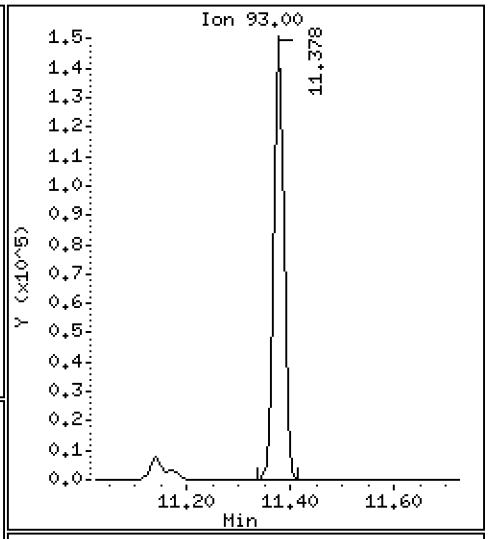
Concentration: 5.003 ug/mL

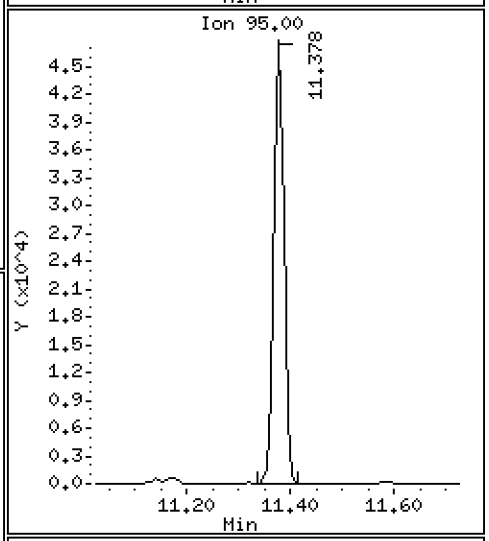


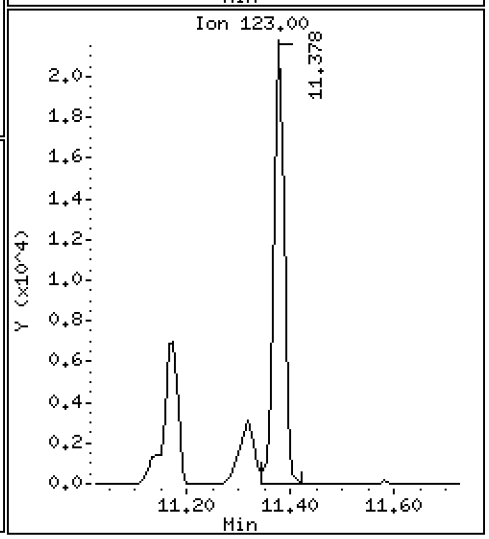












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

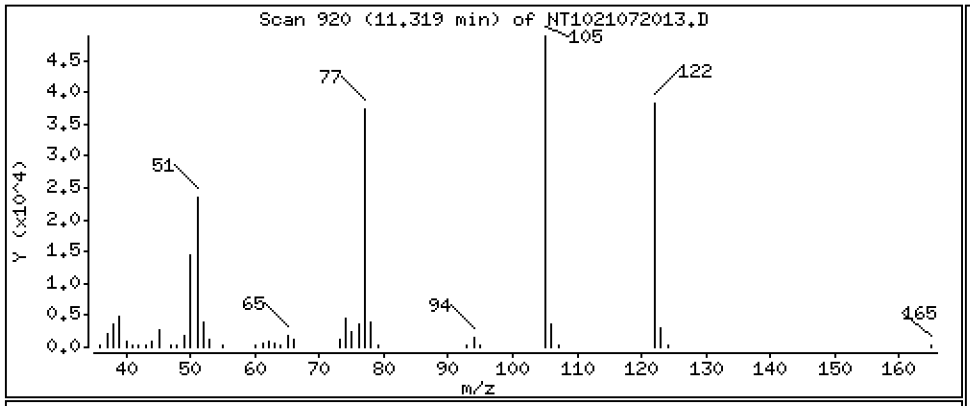
Operator: VTS

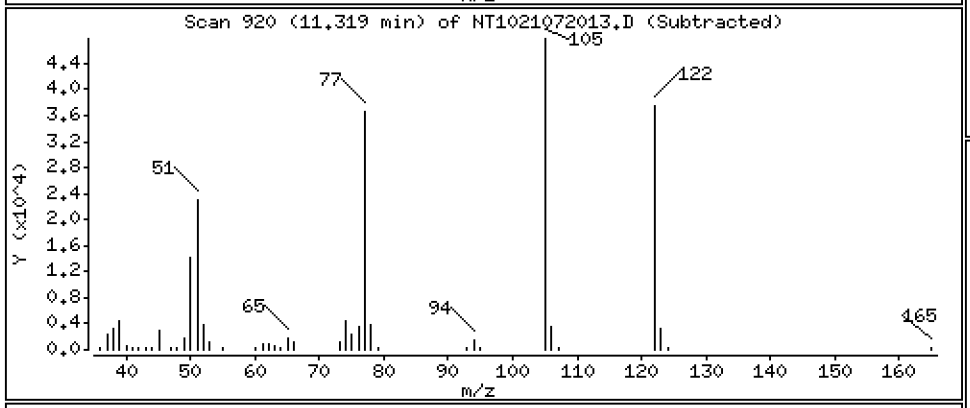
Column phase: ZB-5msi

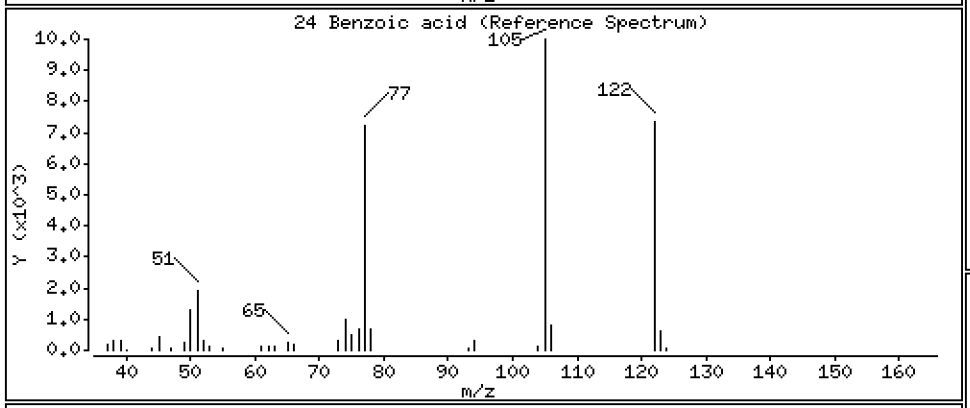
Column diameter: 0.25

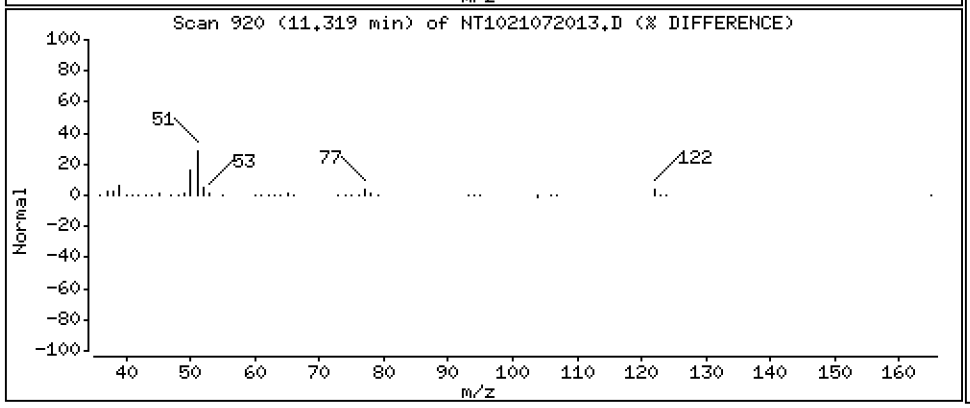
24 Benzoic acid

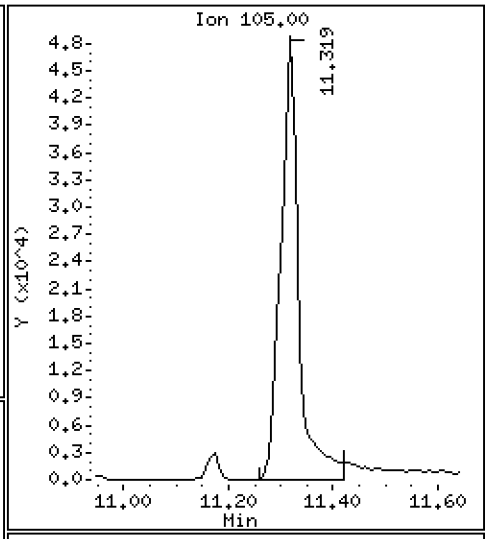
Concentration: 6.356 ug/mL

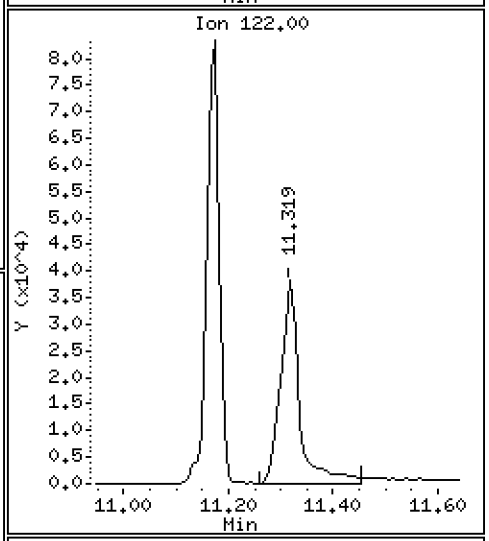


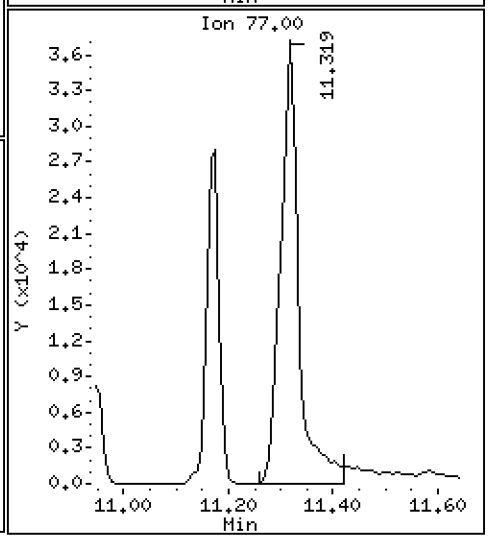












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

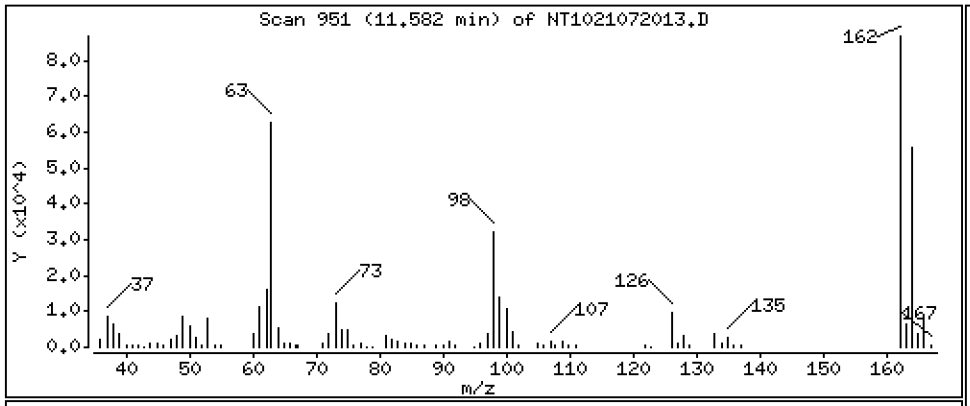
Operator: VTS

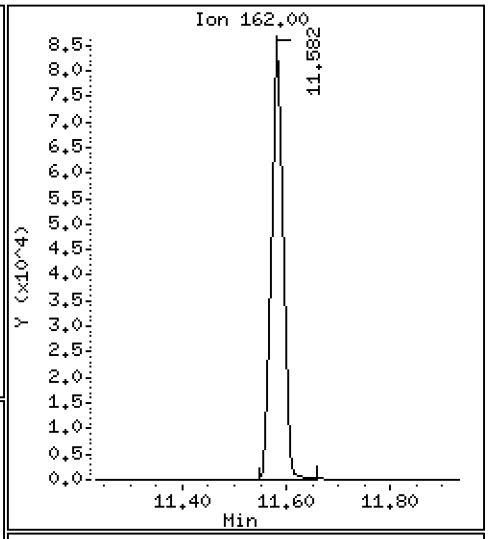
Column phase: ZB-5msi

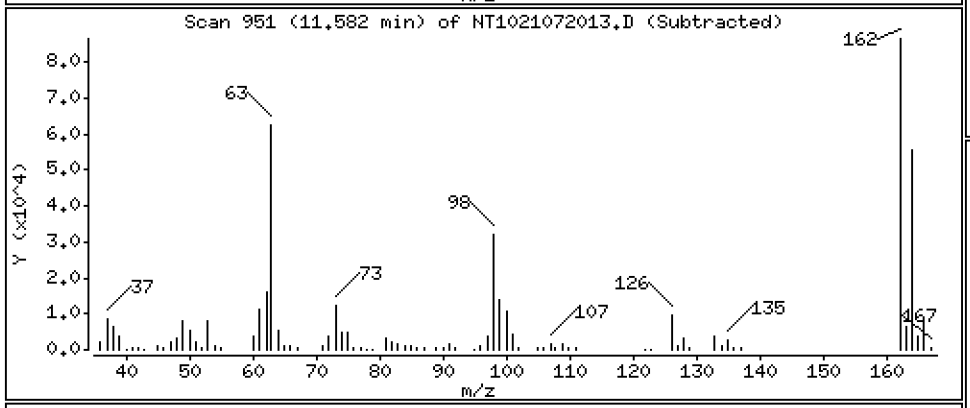
Column diameter: 0.25

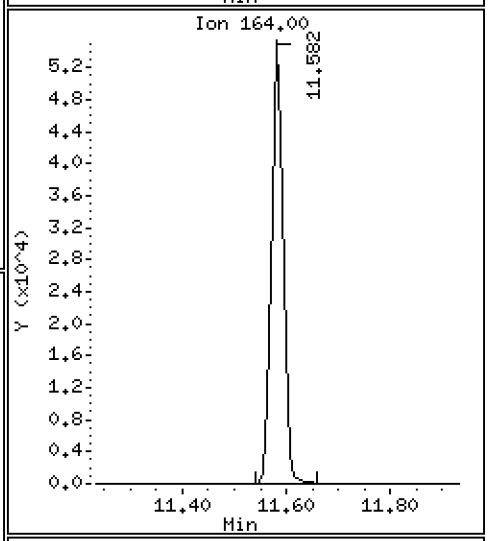
25 2,4-Dichlorophenol

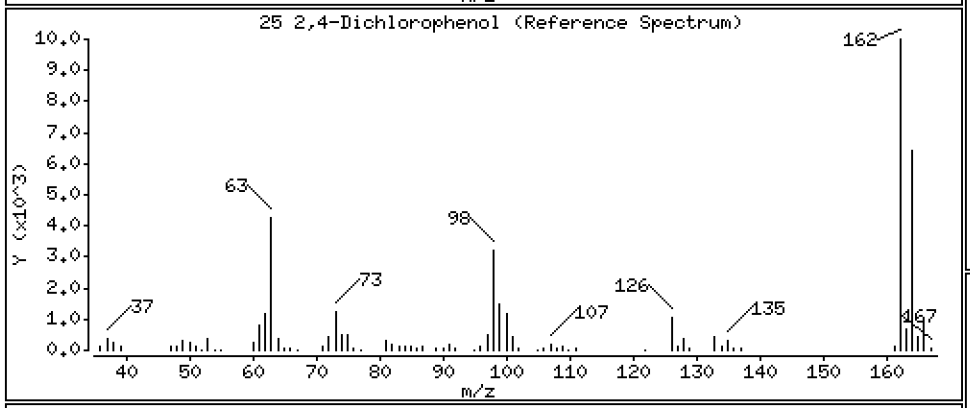
Concentration: 4.974 ug/mL

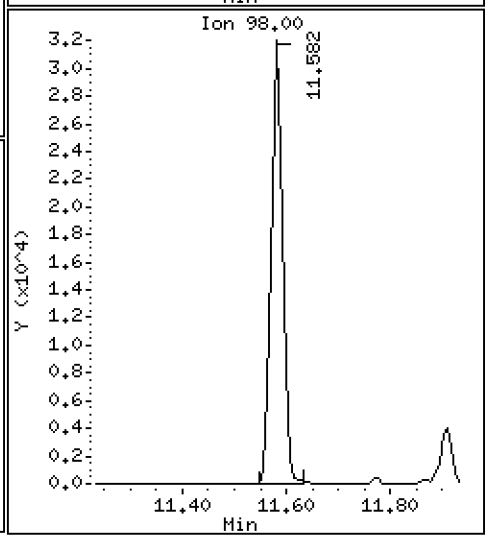


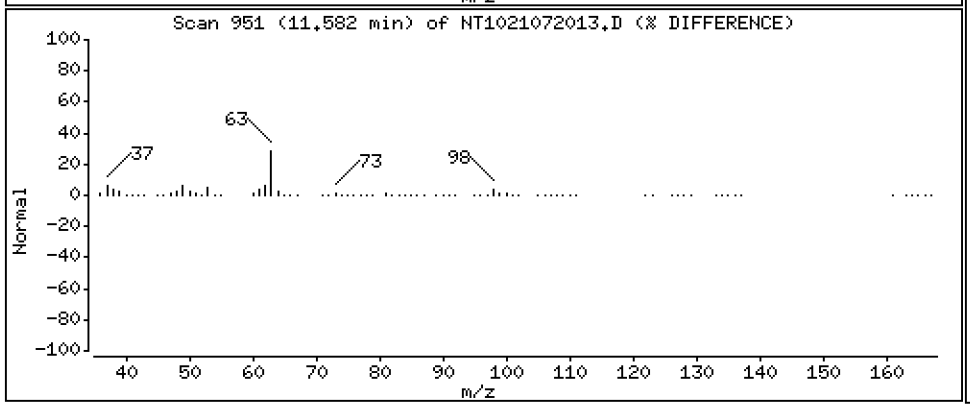












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

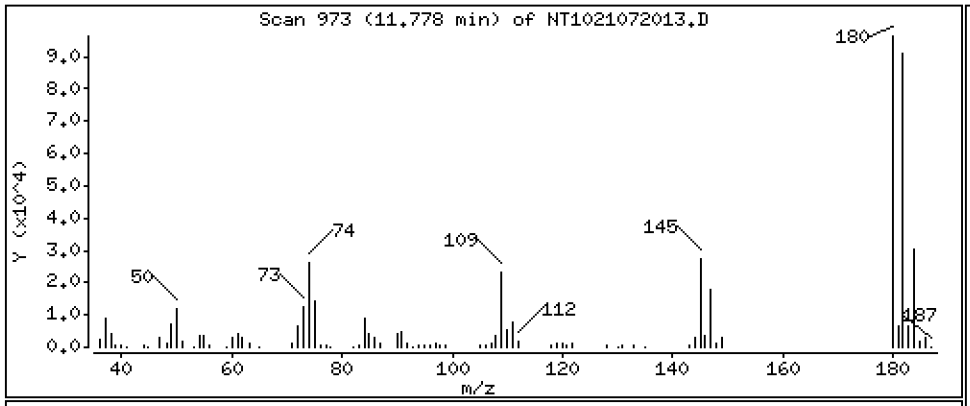
Operator: VTS

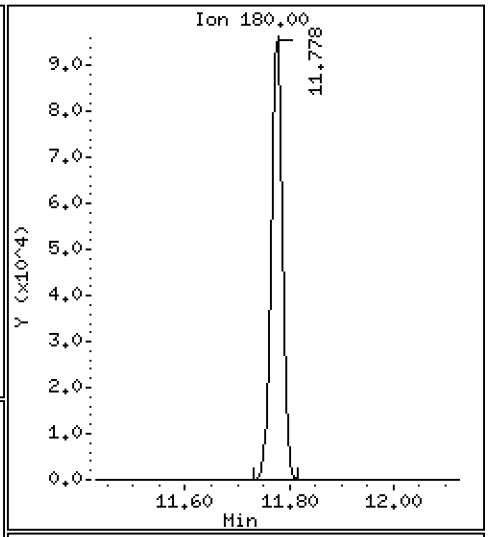
Column phase: ZB-5msi

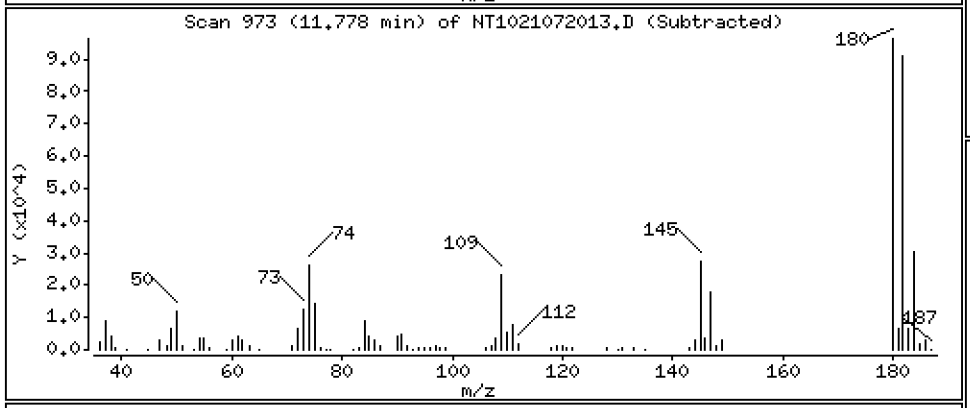
Column diameter: 0.25

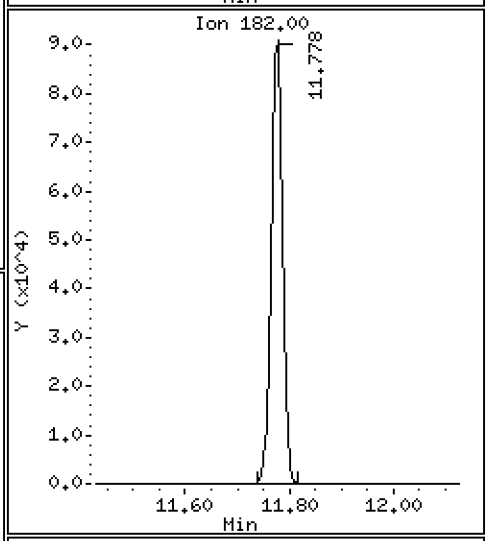
26 1,2,4-Trichlorobenzene

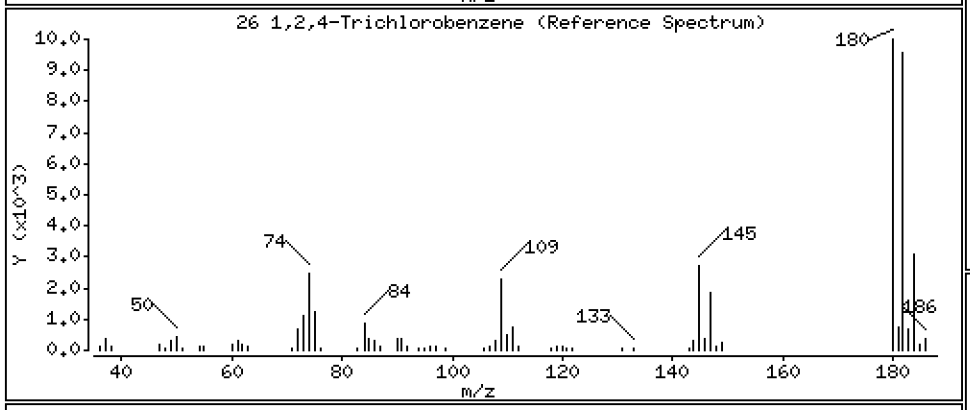
Concentration: 4.922 ug/mL

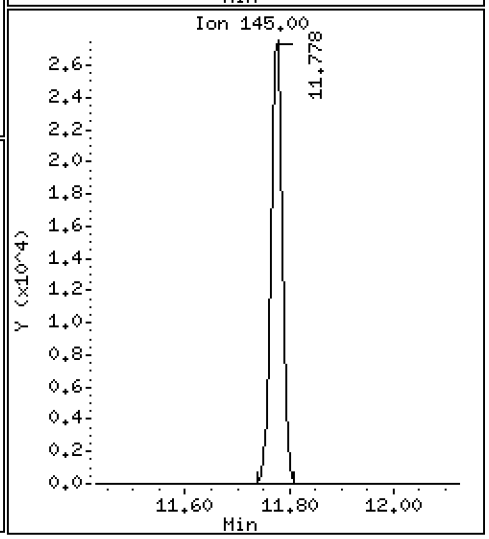


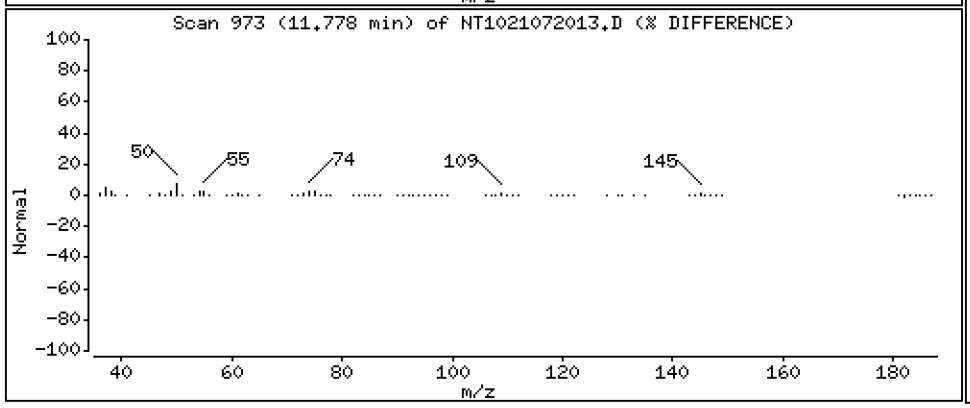












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

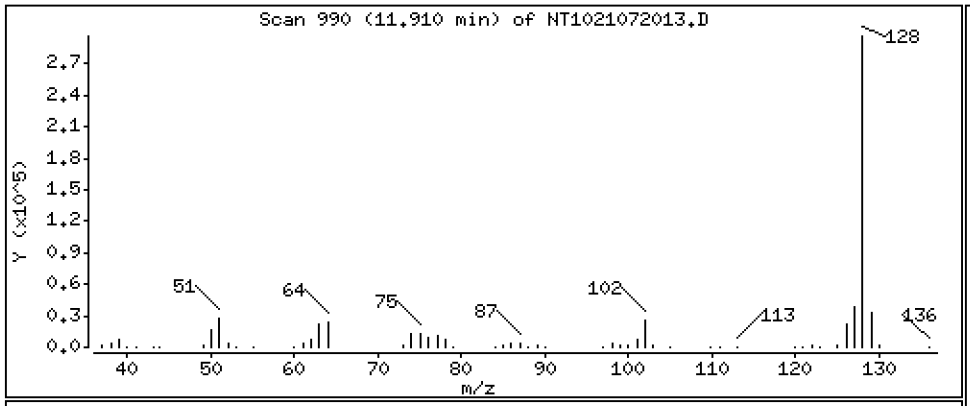
Operator: VTS

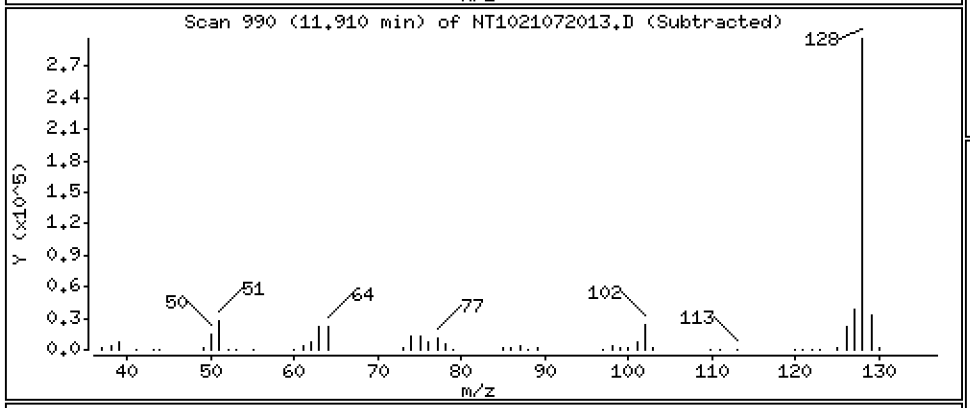
Column phase: ZB-5msi

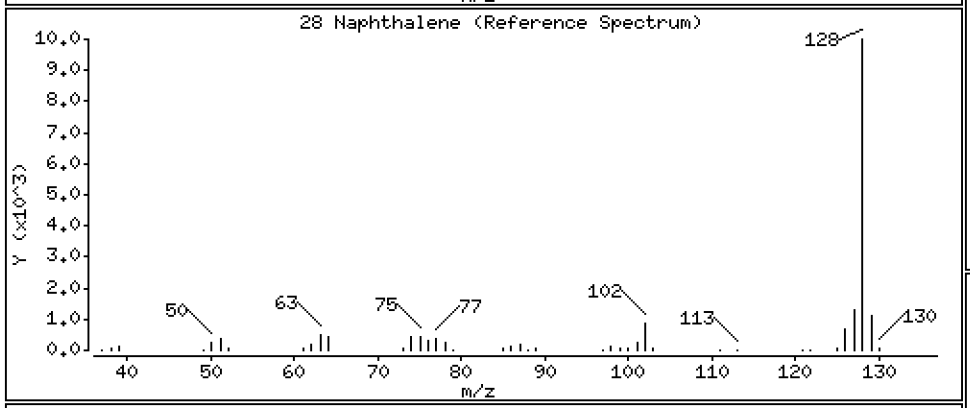
Column diameter: 0.25

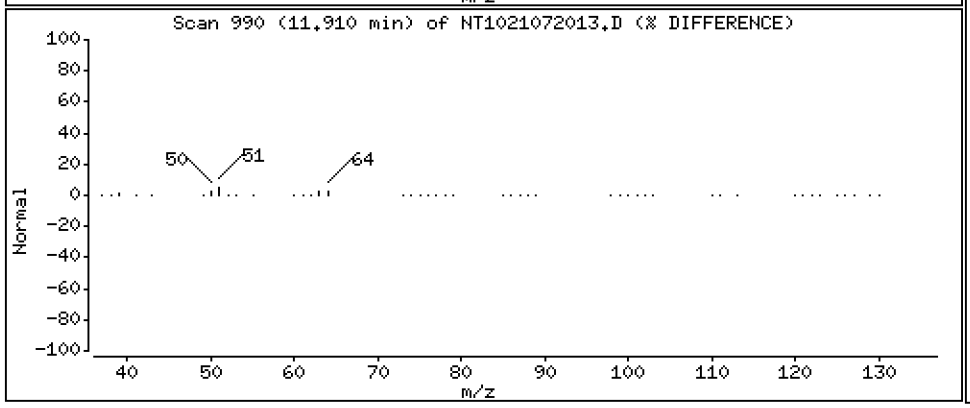
28 Naphthalene

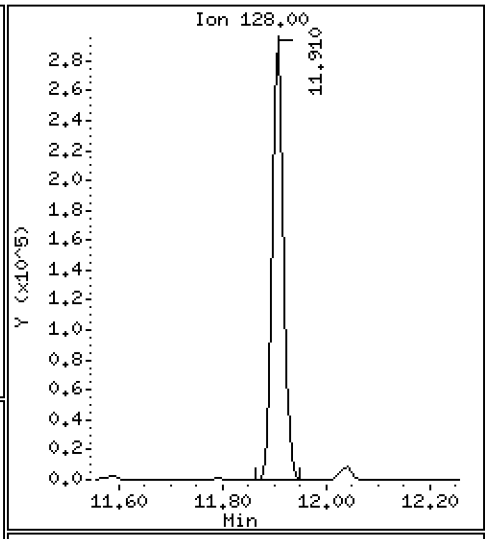
Concentration: 4.991 ug/mL

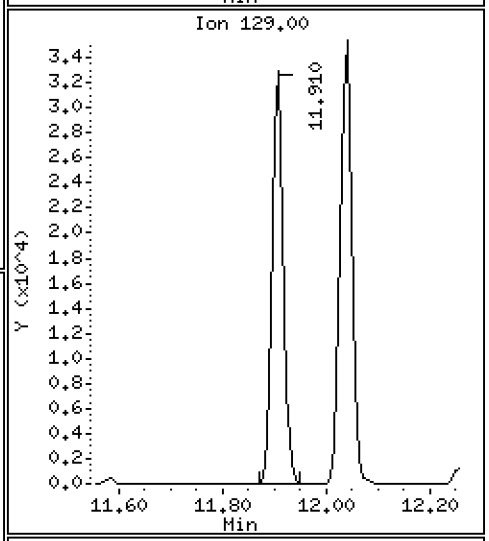


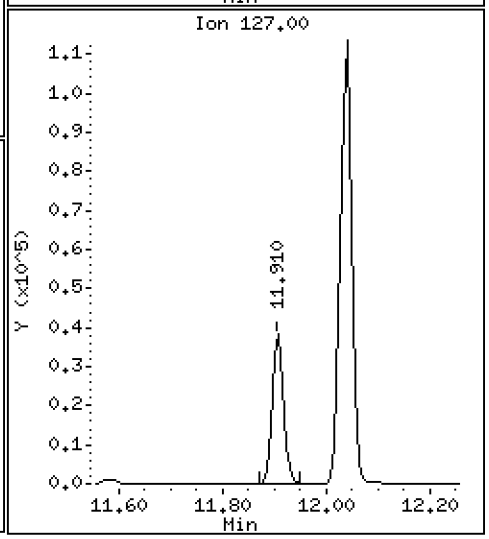












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

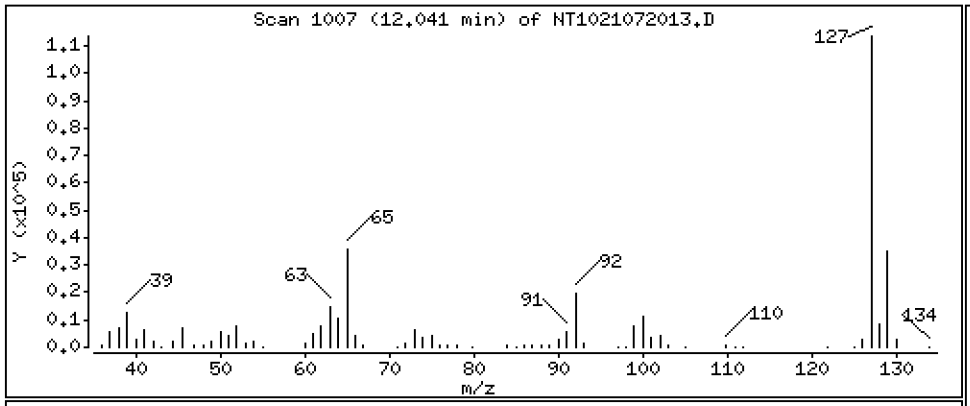
Operator: VTS

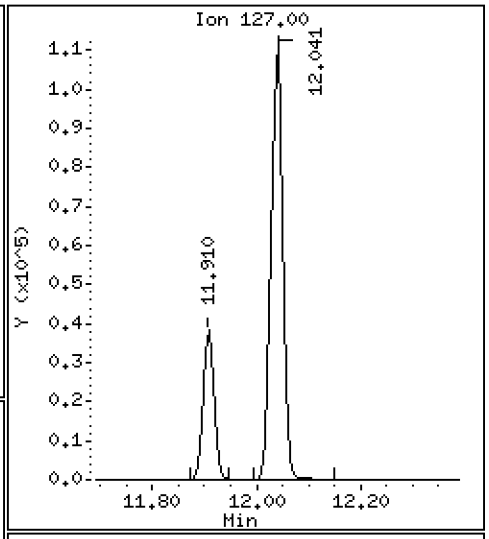
Column phase: ZB-5msi

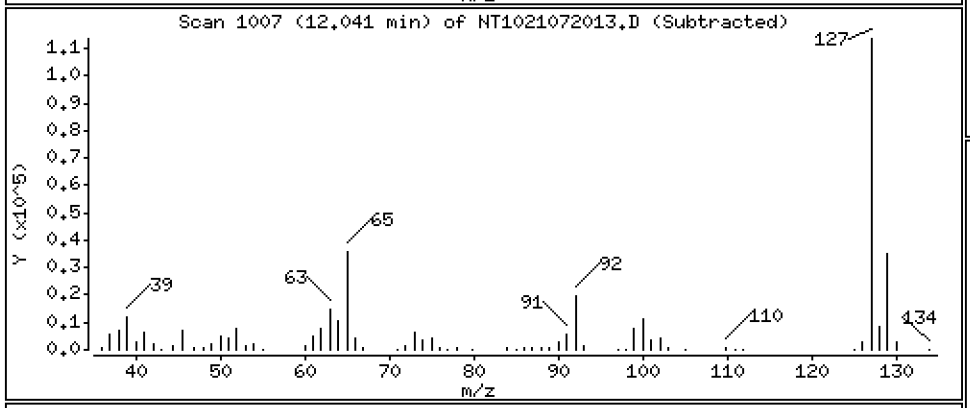
Column diameter: 0.25

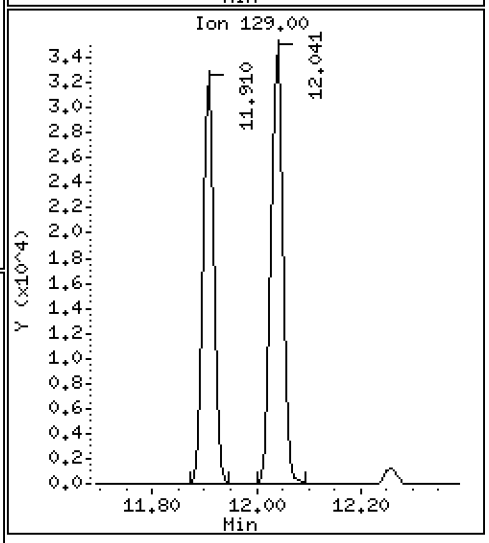
29 4-Chloroaniline

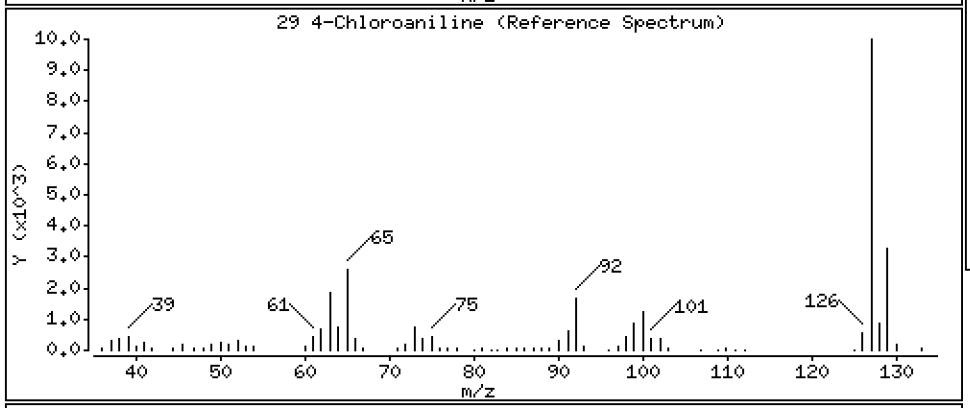
Concentration: 4.141 ug/mL

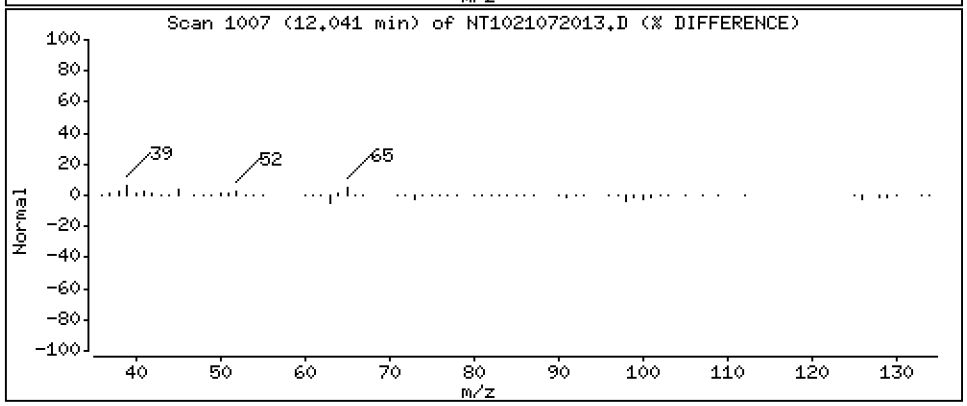












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

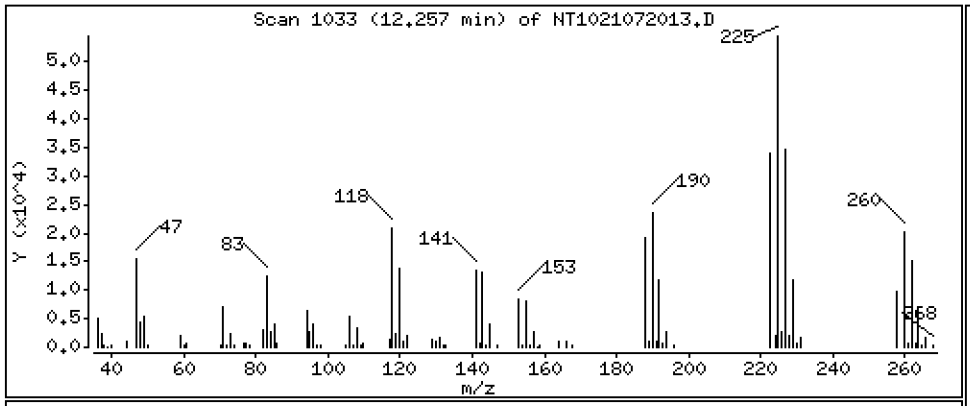
Operator: VTS

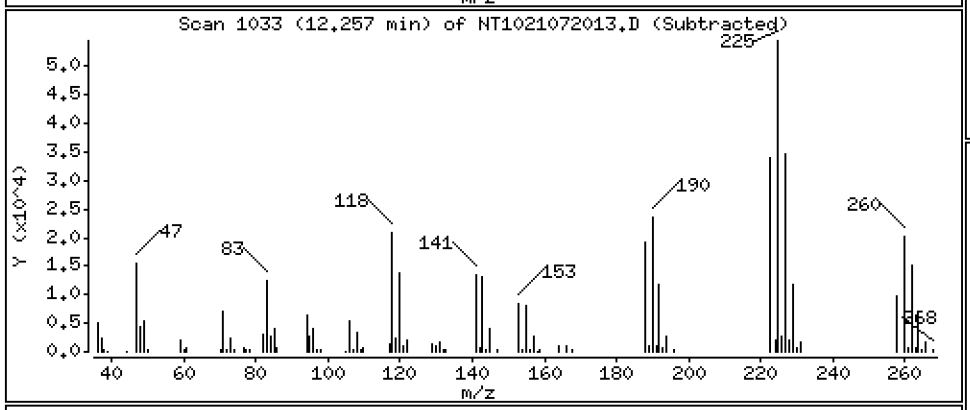
Column phase: ZB-5msi

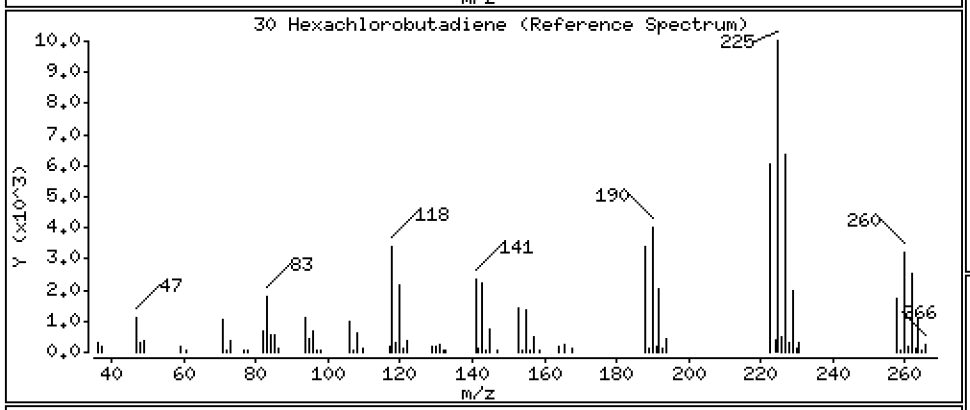
Column diameter: 0.25

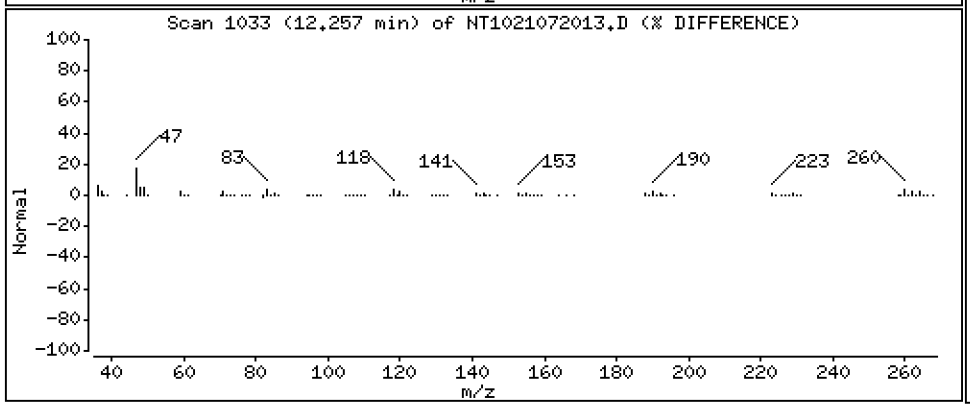
30 Hexachlorobutadiene

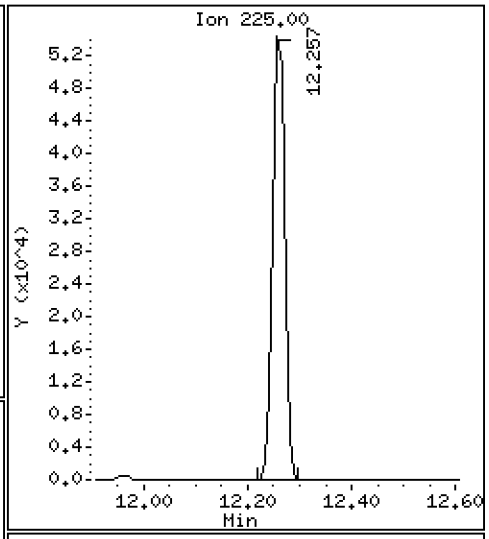
Concentration: 4.966 ug/mL

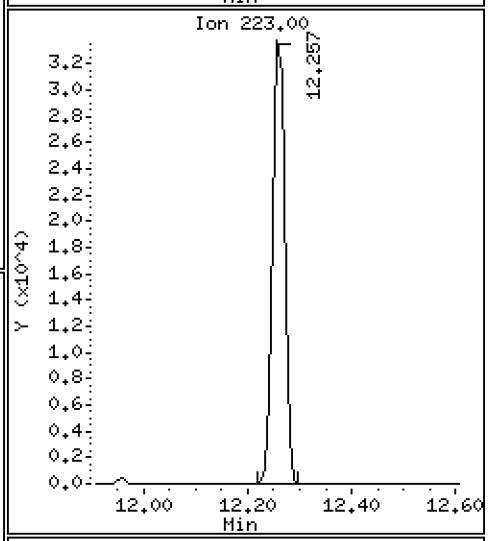


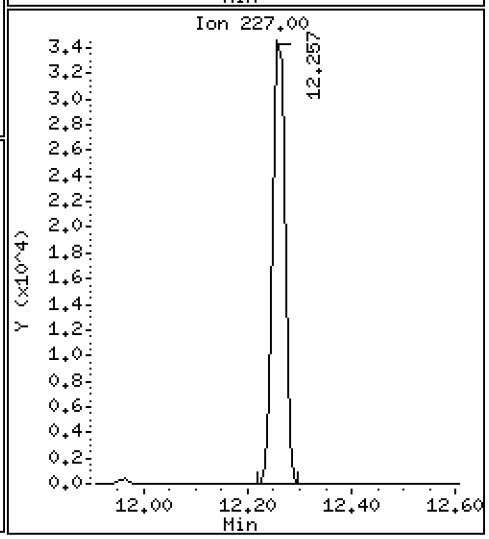












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

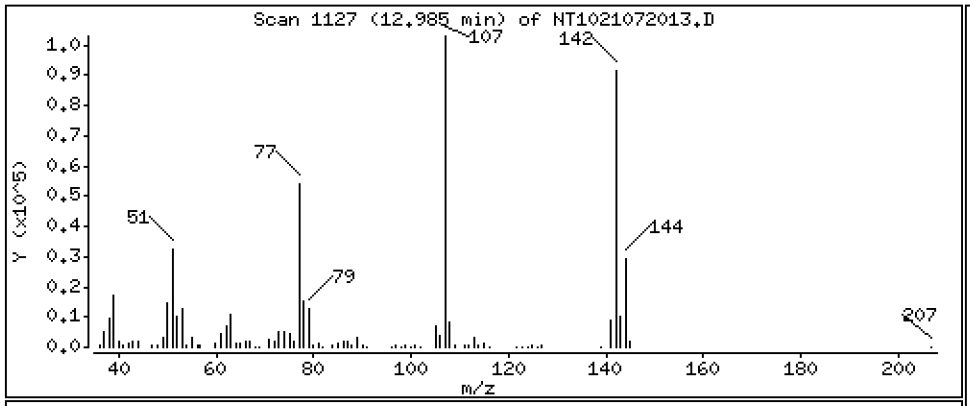
Operator: VTS

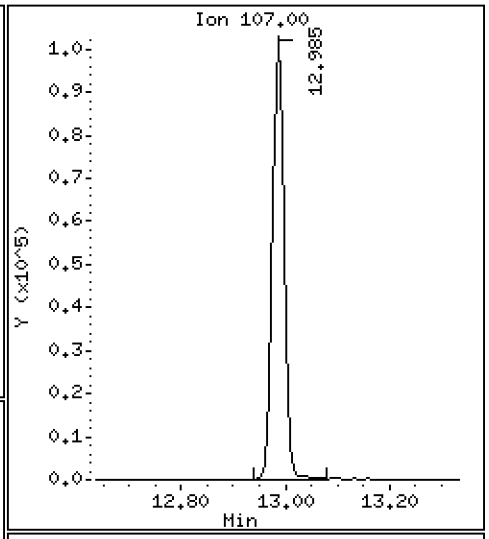
Column phase: ZB-5msi

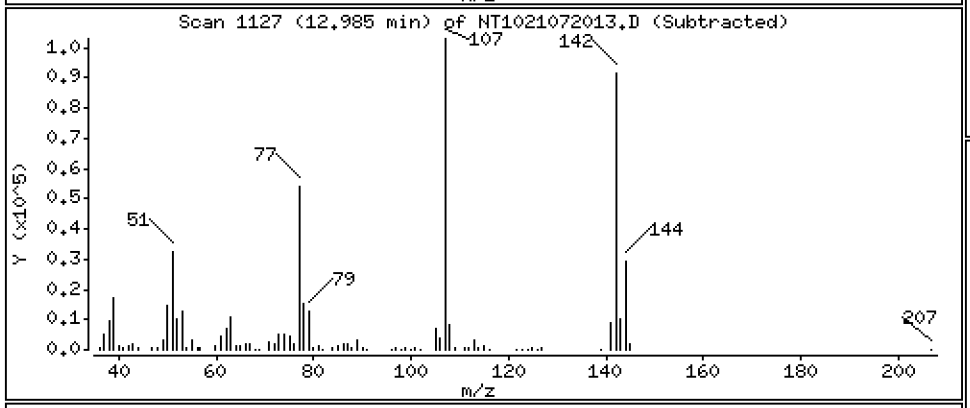
Column diameter: 0.25

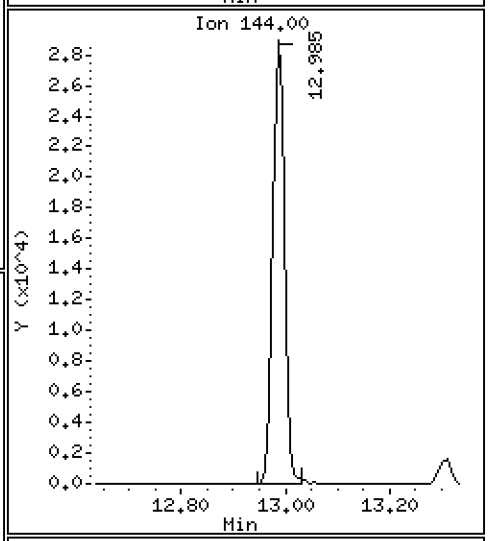
31 4-Chloro-3-methylphenol

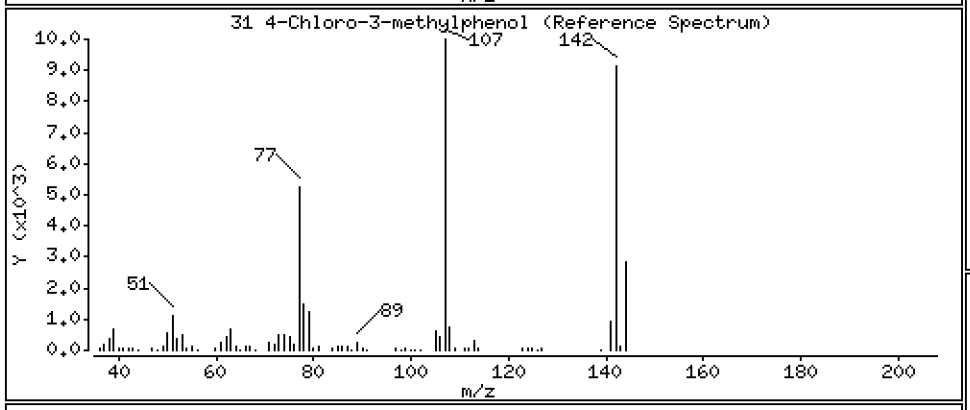
Concentration: 4.652 ug/mL

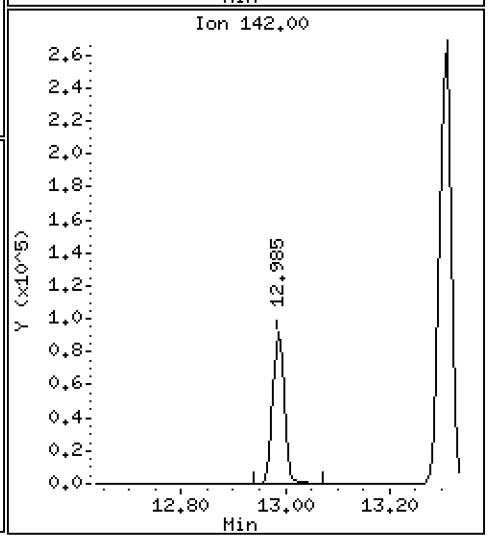


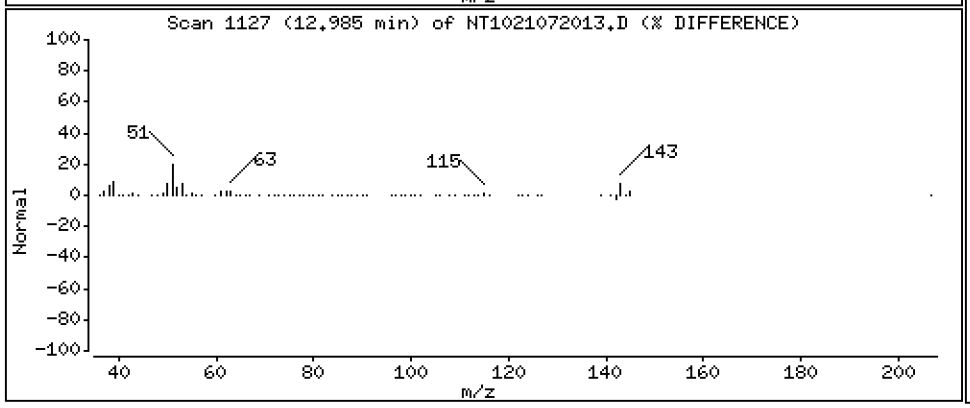












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

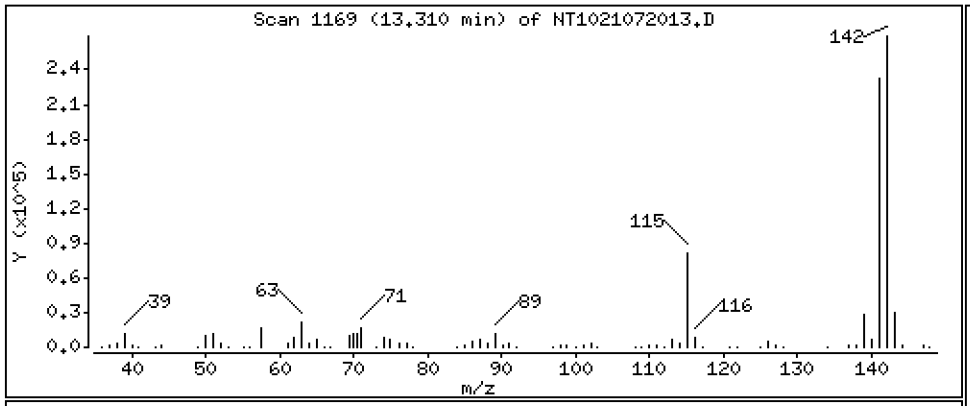
Operator: VTS

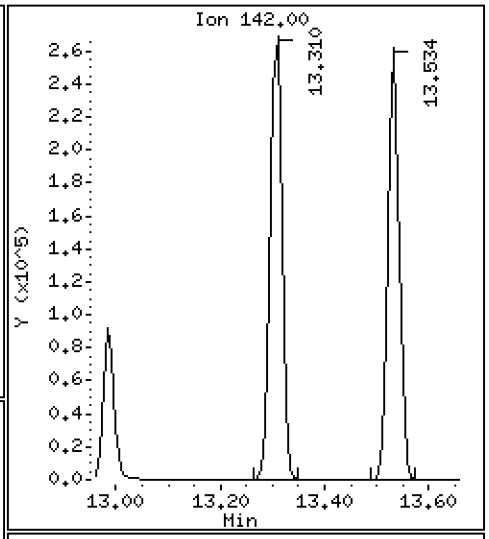
Column phase: ZB-5msi

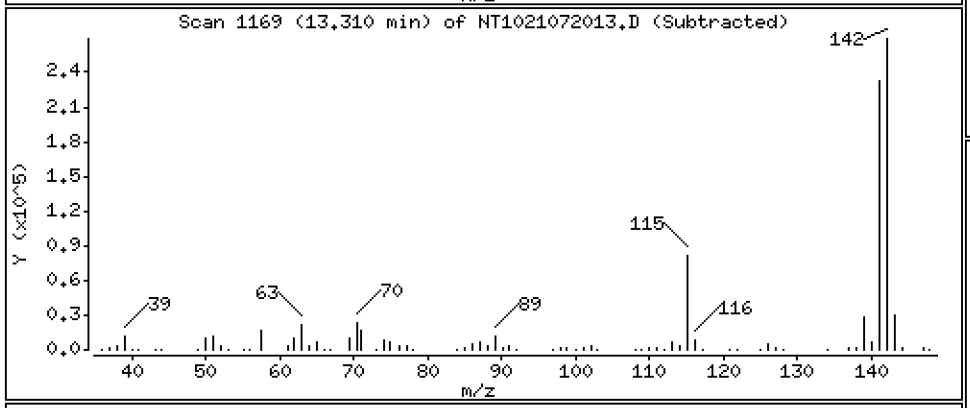
Column diameter: 0.25

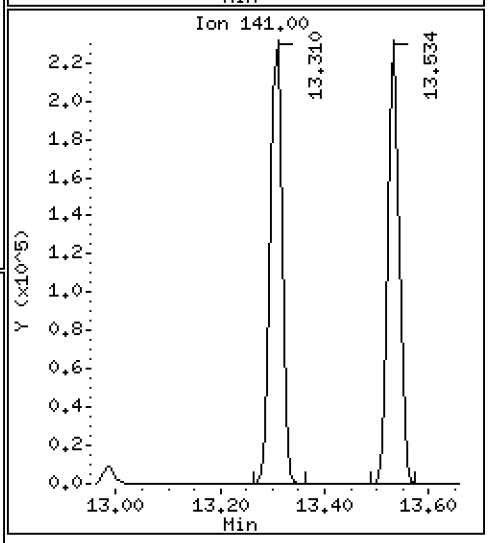
32 2-Methylnaphthalene

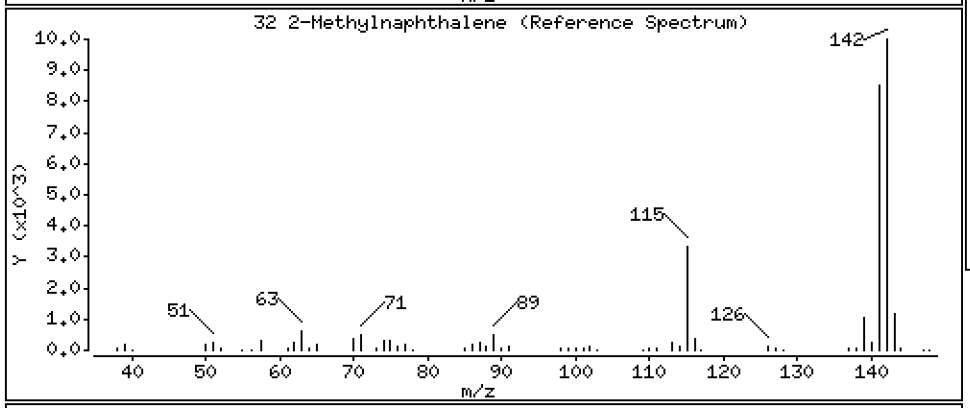
Concentration: 4.782 ug/mL

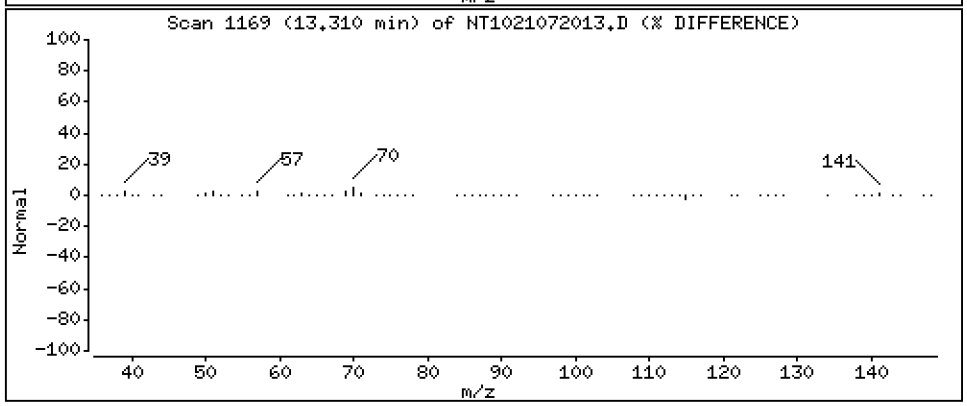












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

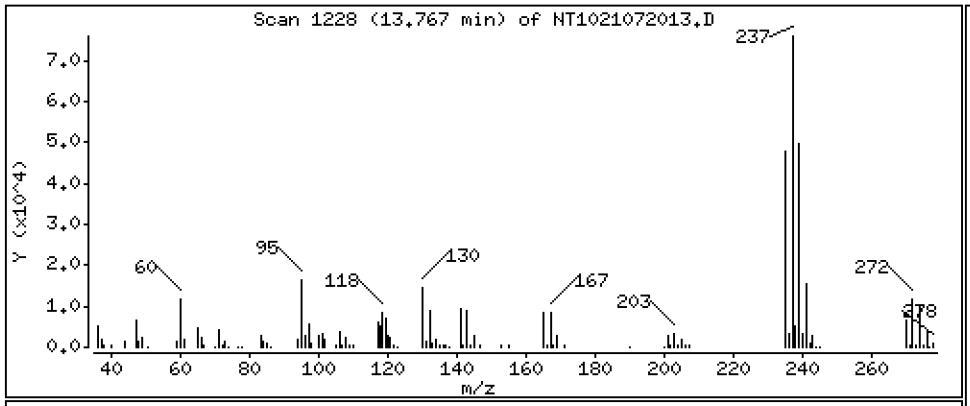
Operator: VTS

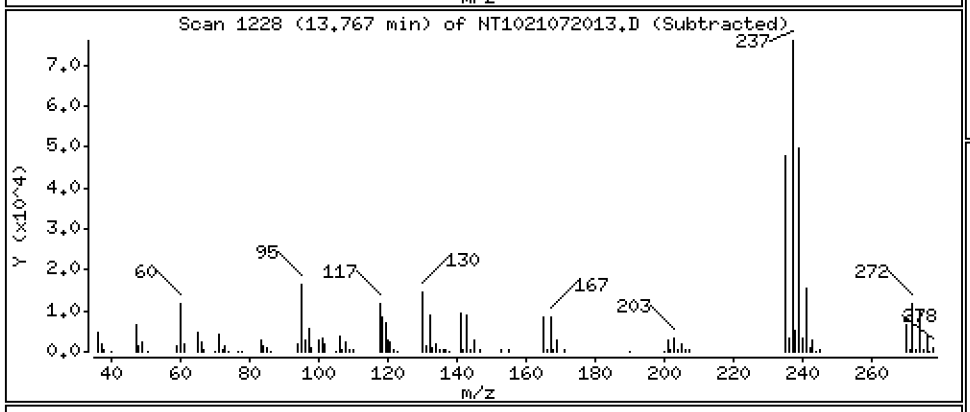
Column phase: ZB-5msi

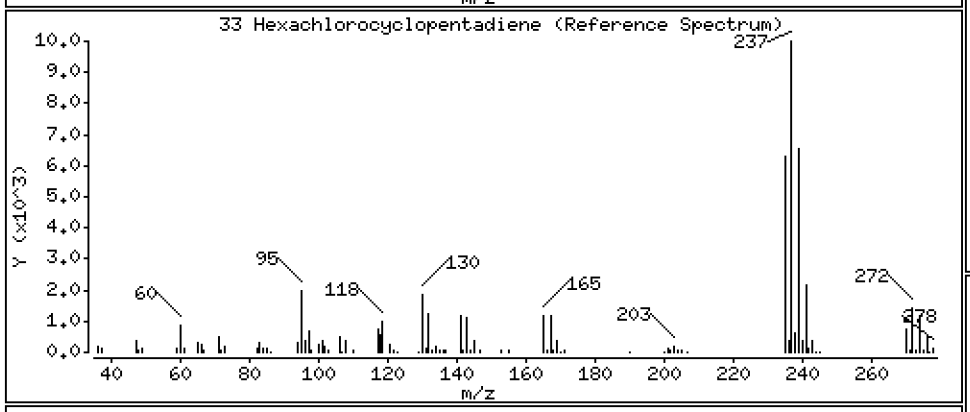
Column diameter: 0.25

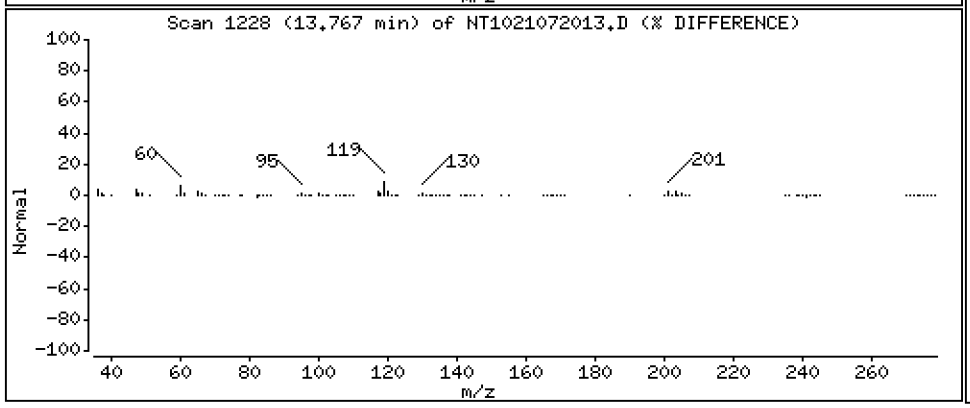
33 Hexachlorocyclopentadiene

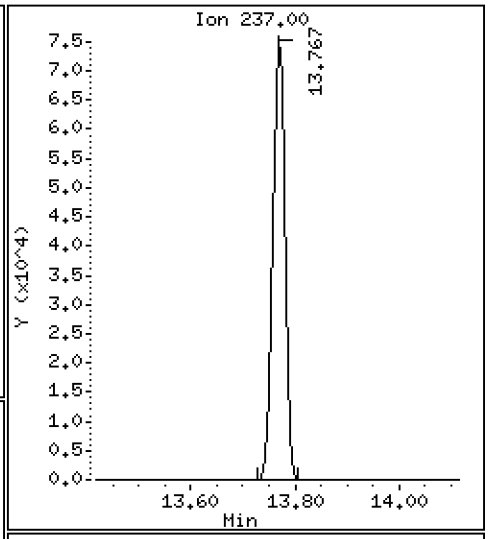
Concentration: 5.671 ug/mL

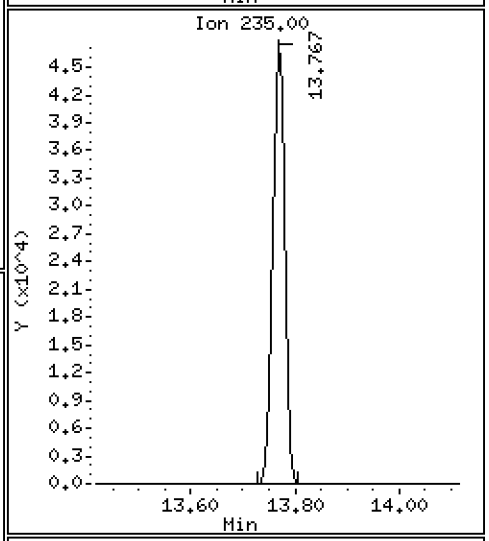


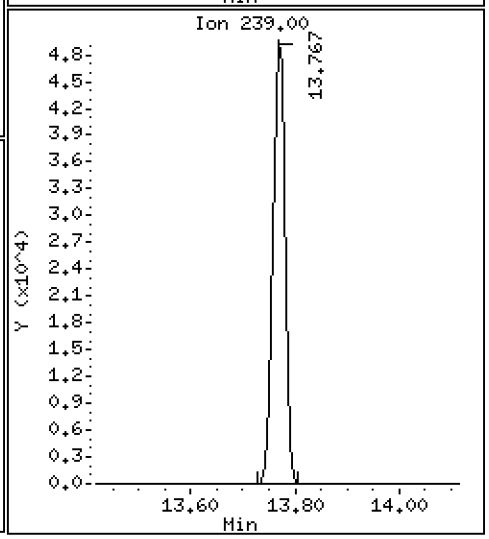












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

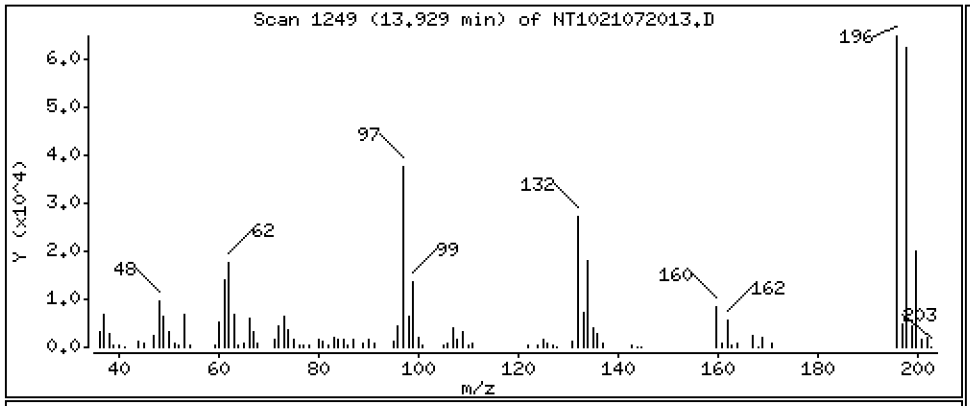
Operator: VTS

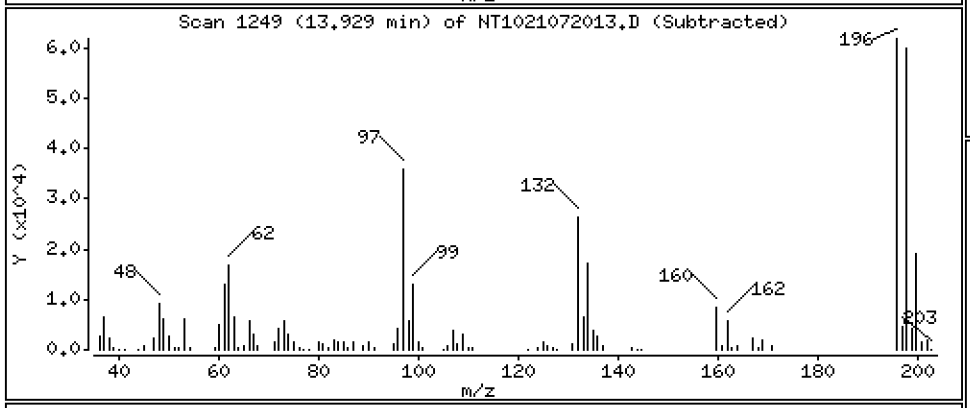
Column phase: ZB-5msi

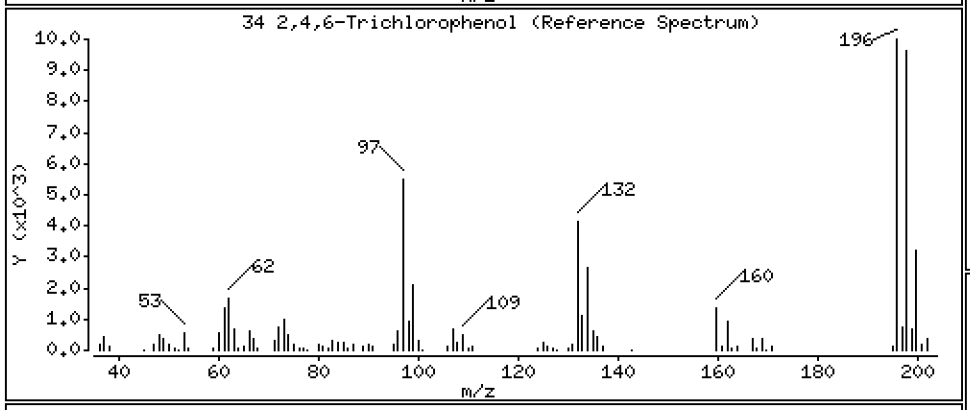
Column diameter: 0.25

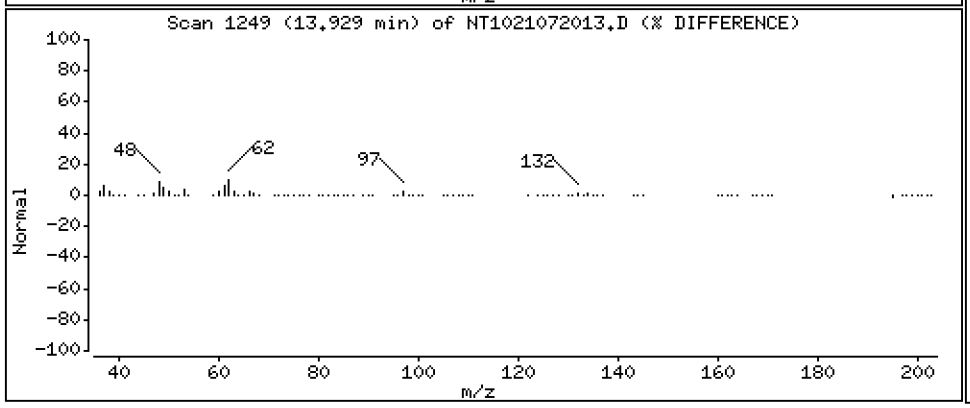
34 2,4,6-Trichlorophenol

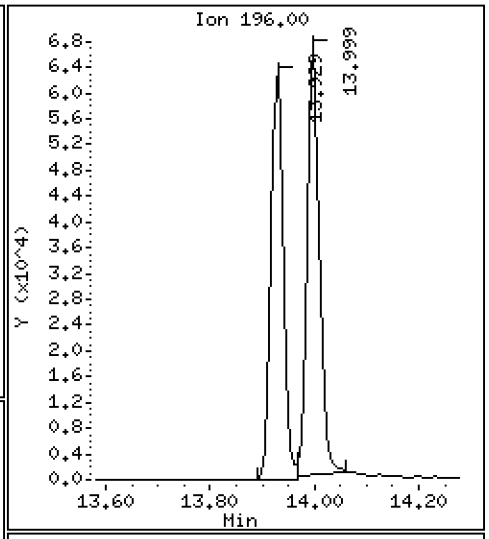
Concentration: 4.713 ug/mL

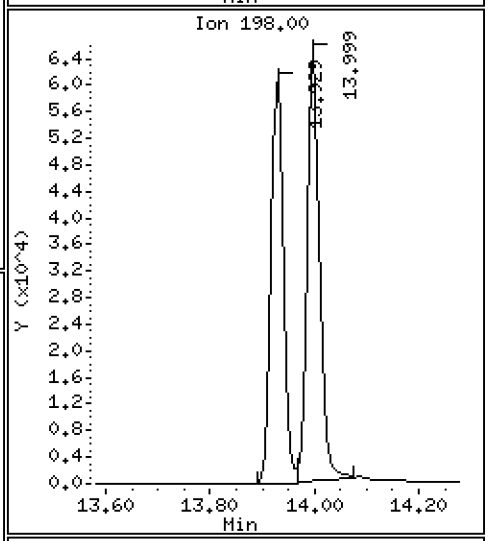


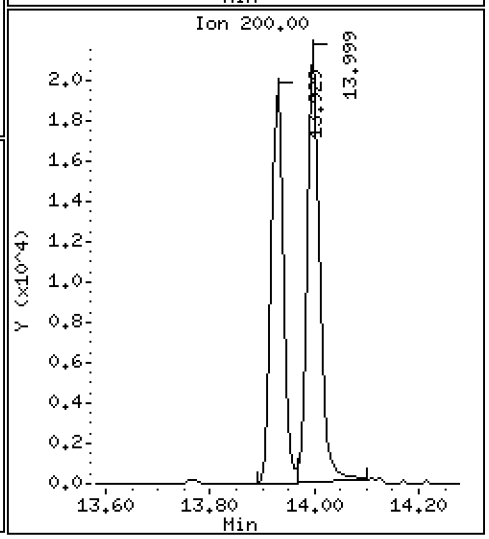












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

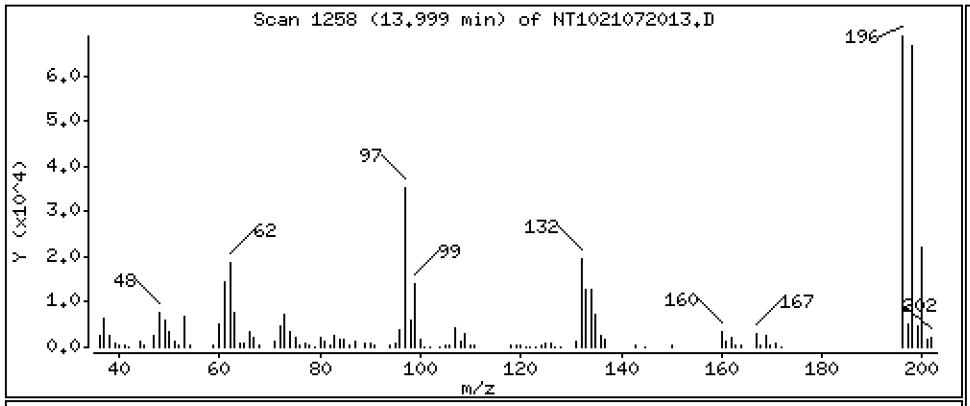
Operator: VTS

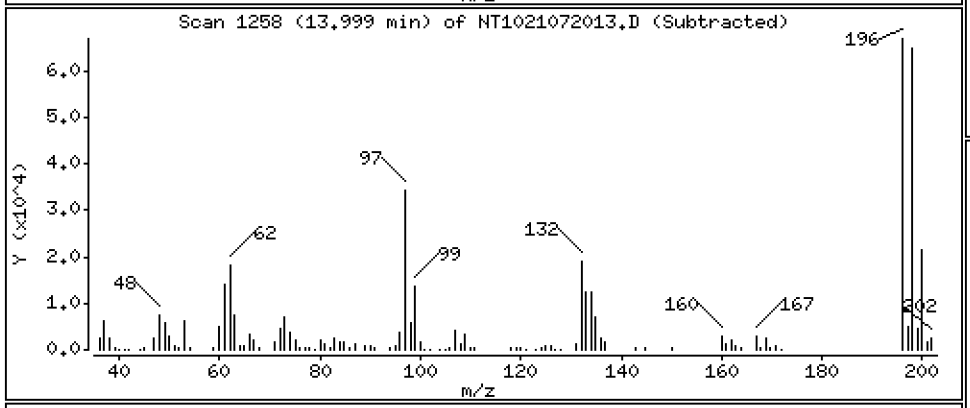
Column phase: ZB-5msi

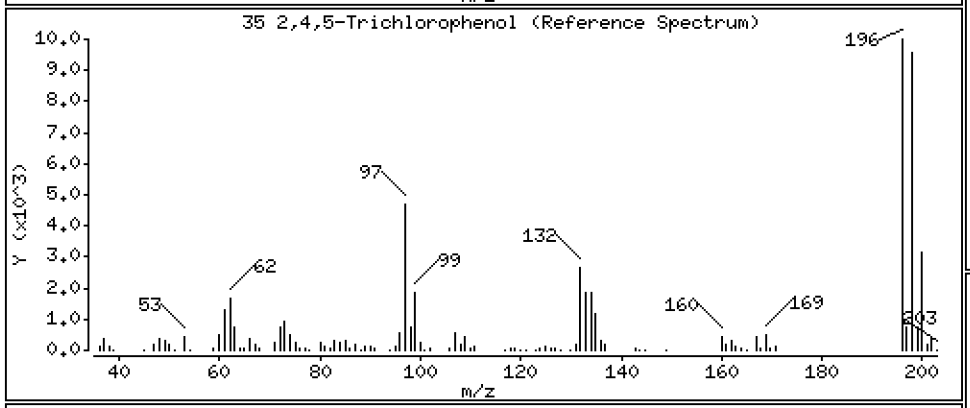
Column diameter: 0.25

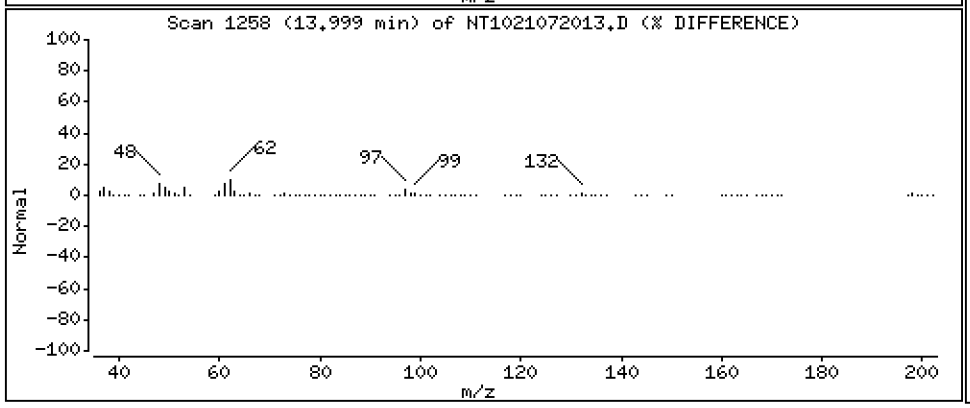
35 2,4,5-Trichlorophenol

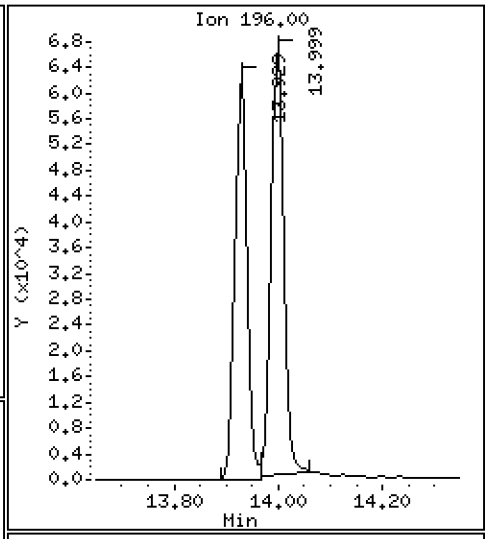
Concentration: 4.721 ug/mL

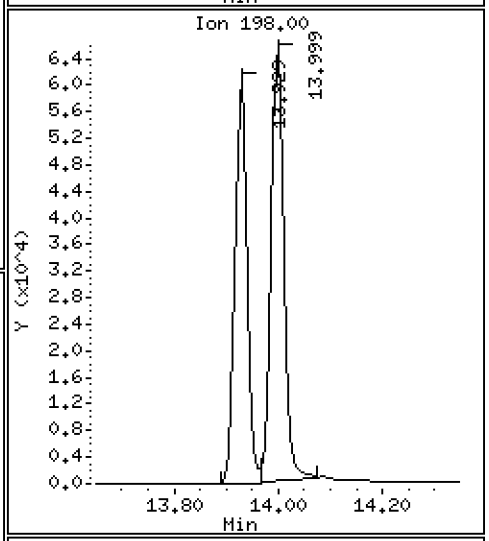


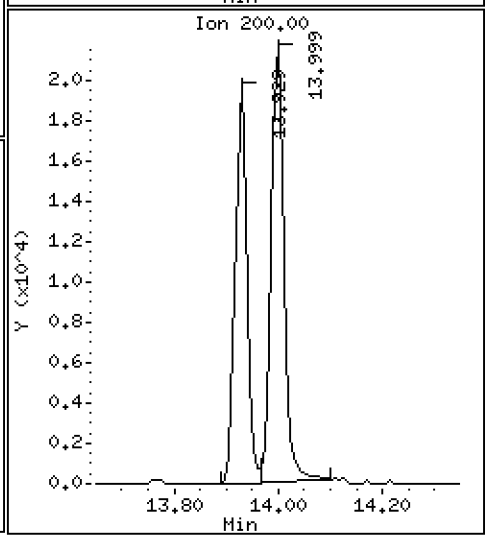












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

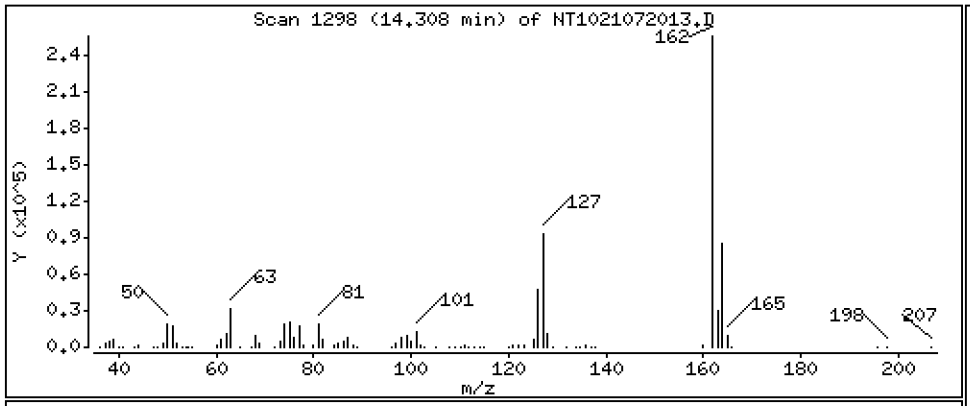
Operator: VTS

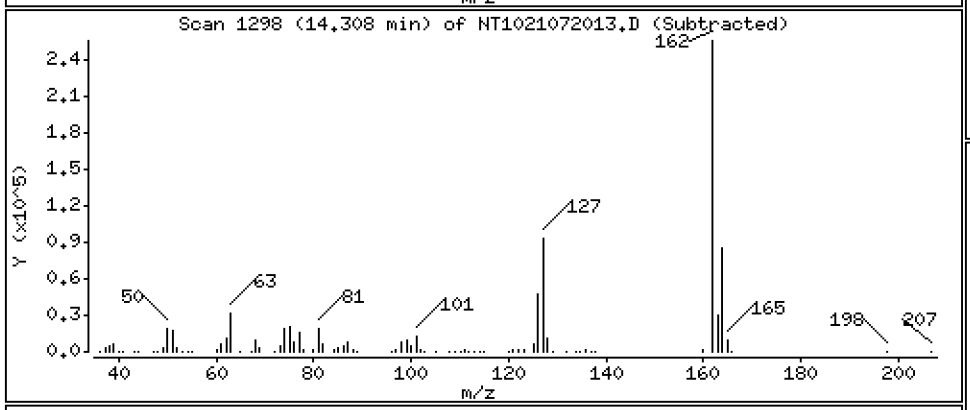
Column phase: ZB-5msi

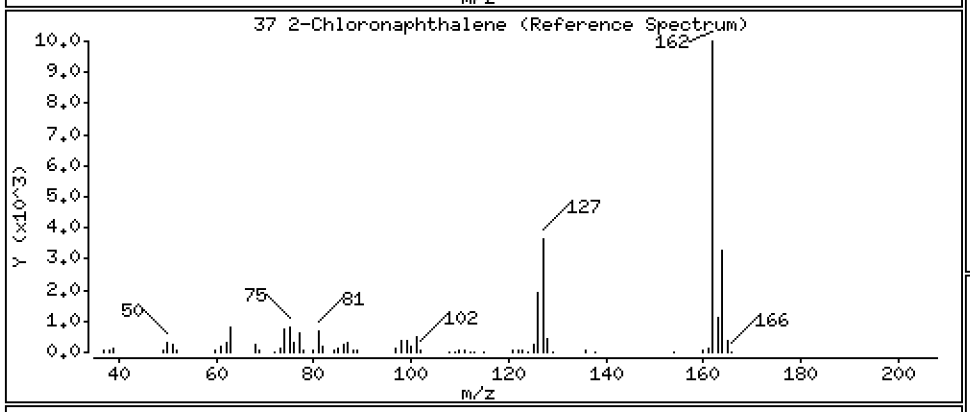
Column diameter: 0.25

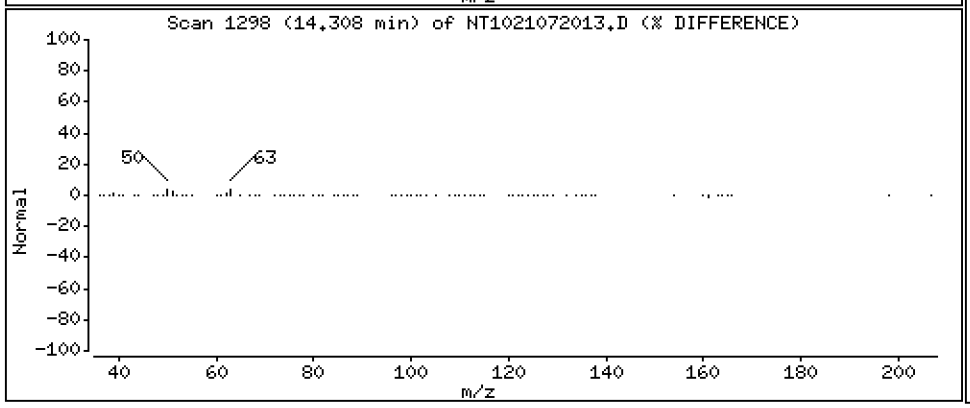
37 2-Chloronaphthalene

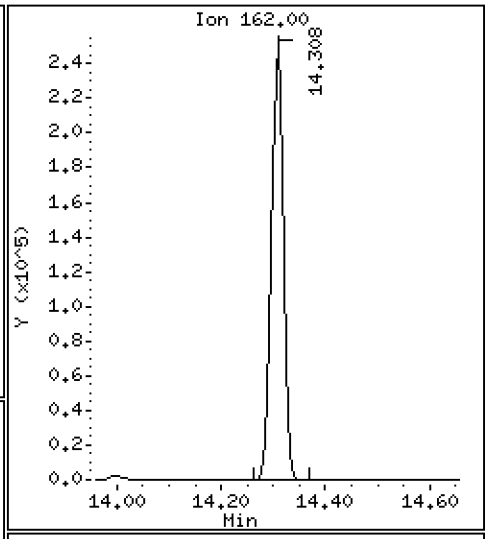
Concentration: 5.085 ug/mL

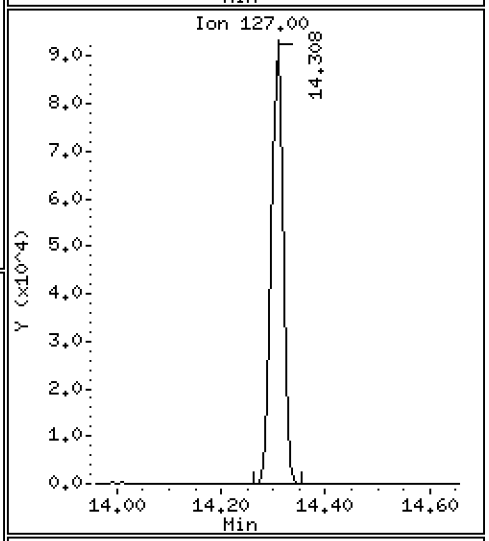


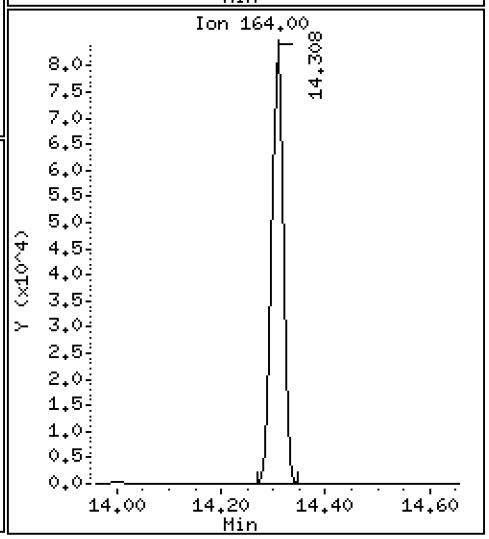












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

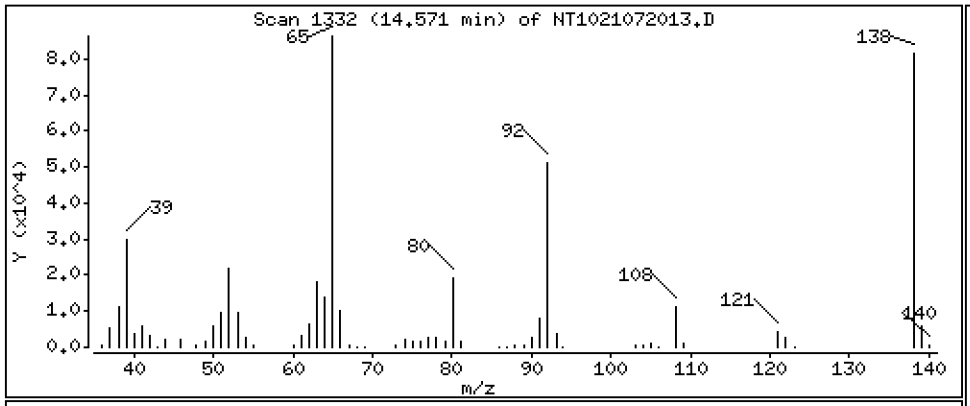
Operator: VTS

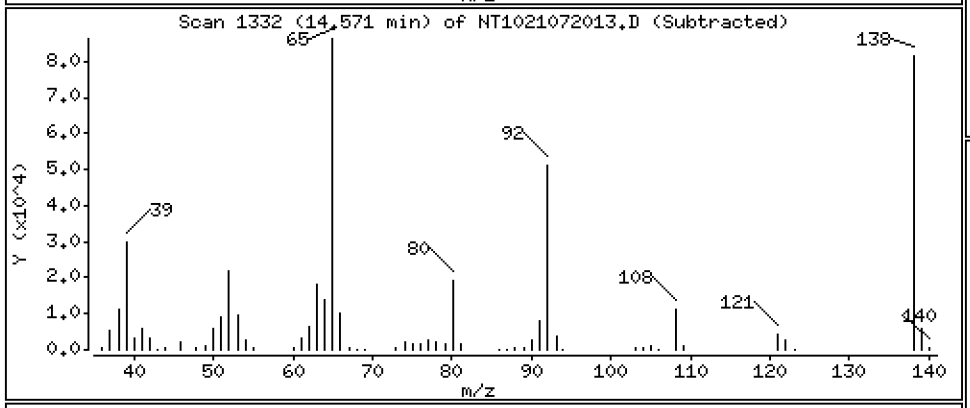
Column phase: ZB-5msi

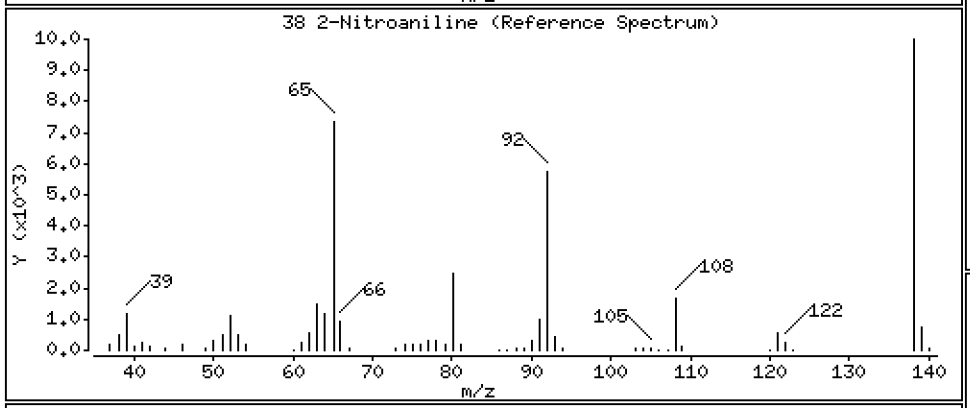
Column diameter: 0.25

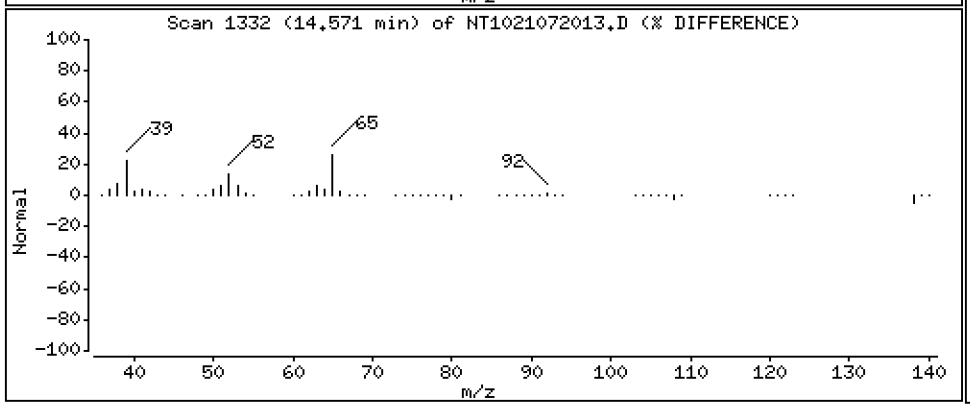
38 2-Nitroaniline

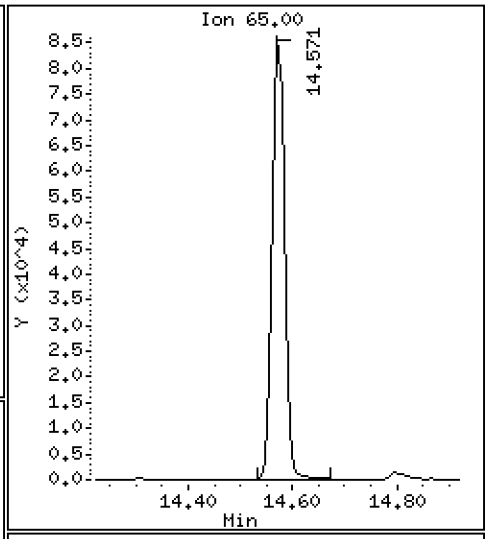
Concentration: 4.848 ug/mL

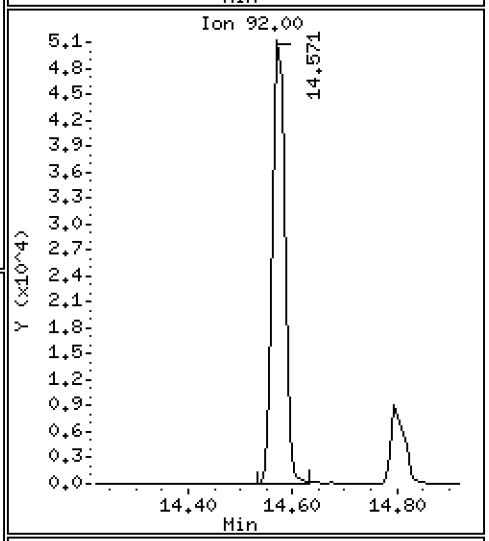


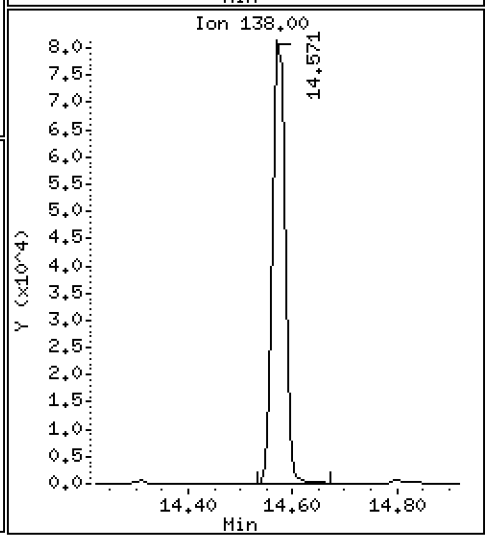












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

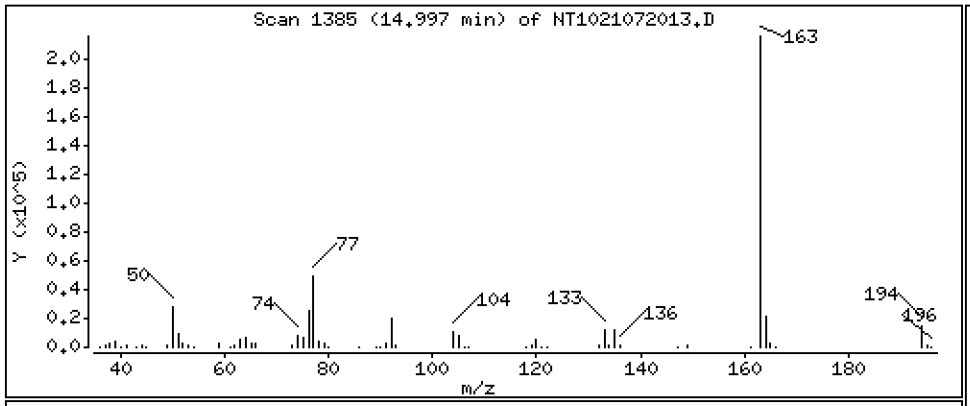
Operator: VTS

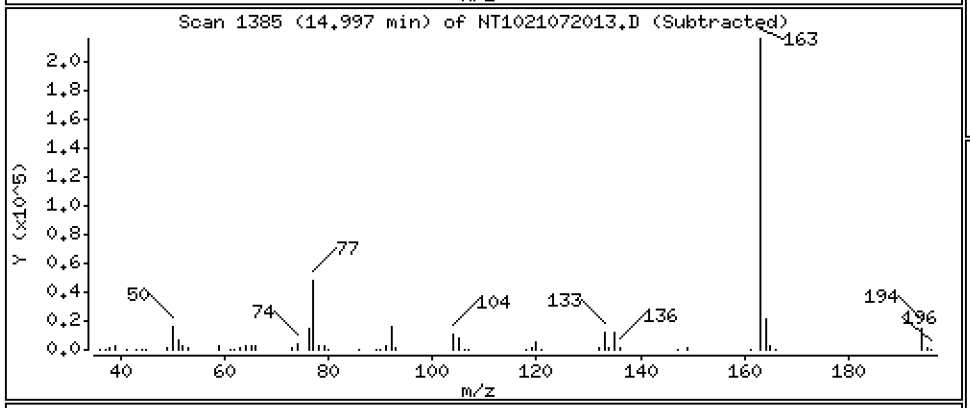
Column phase: ZB-5msi

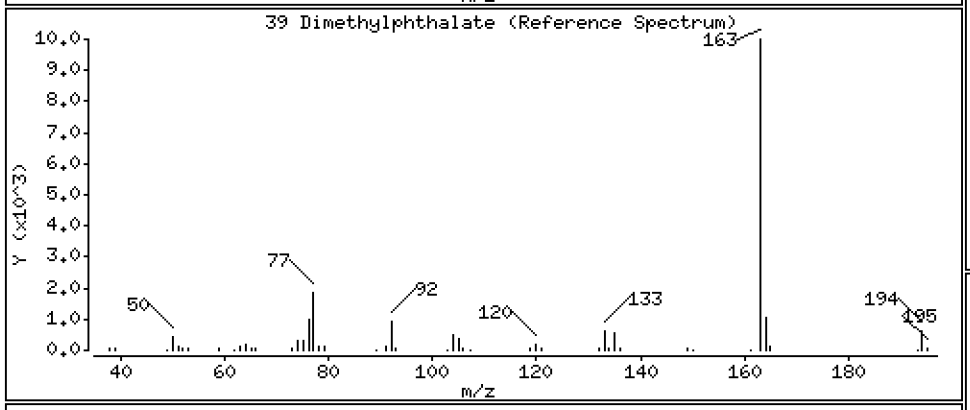
Column diameter: 0.25

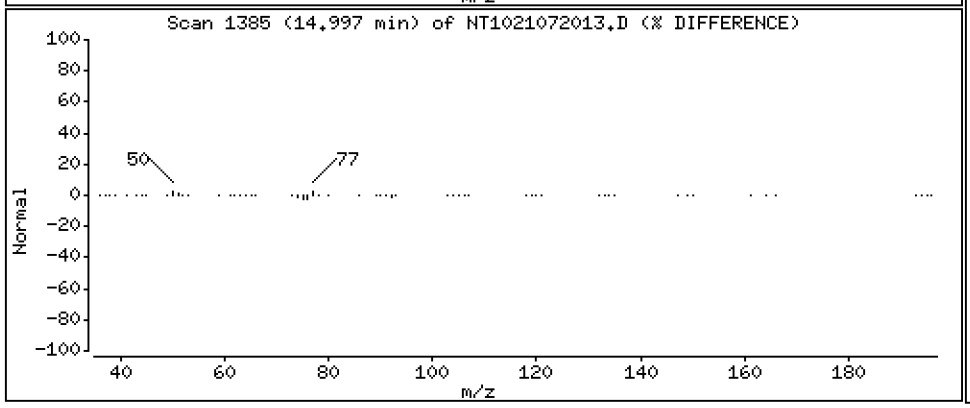
39 Dimethylphthalate

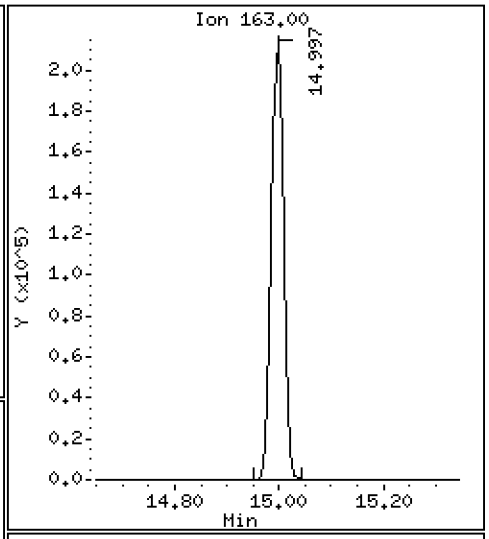
Concentration: 4.656 ug/mL

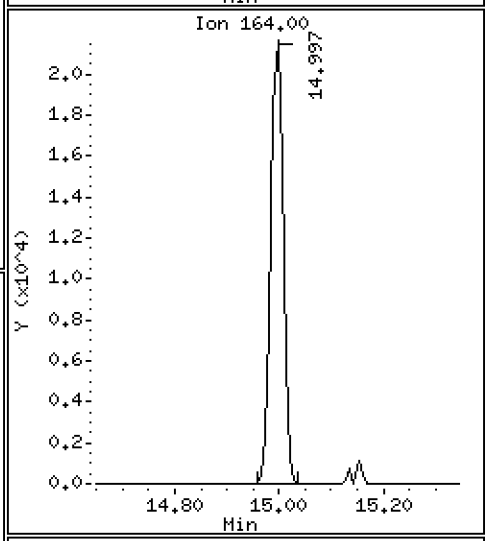


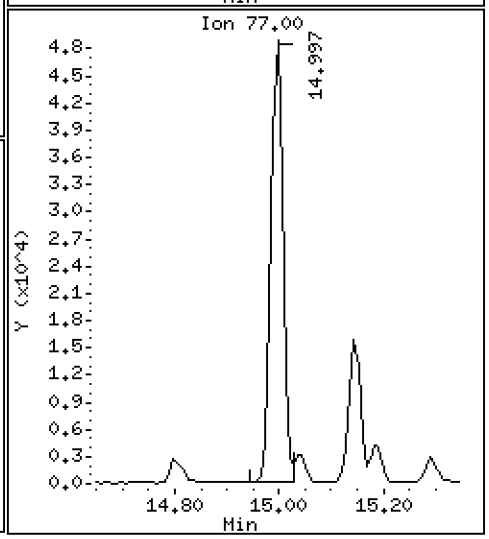












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

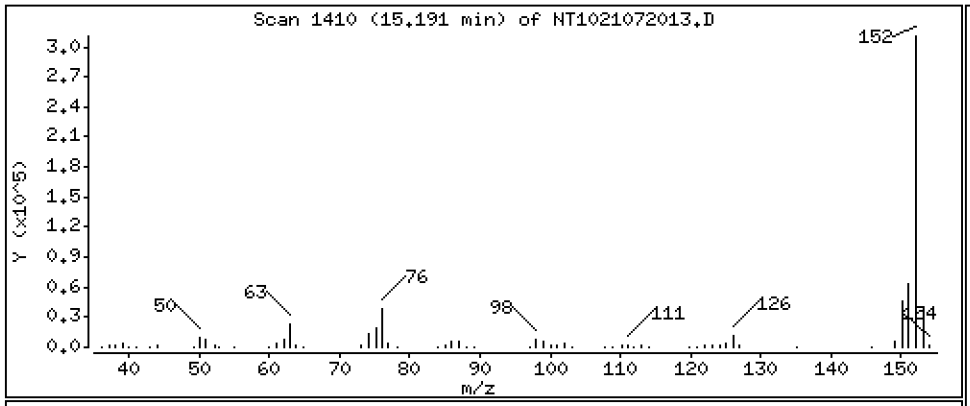
Operator: VTS

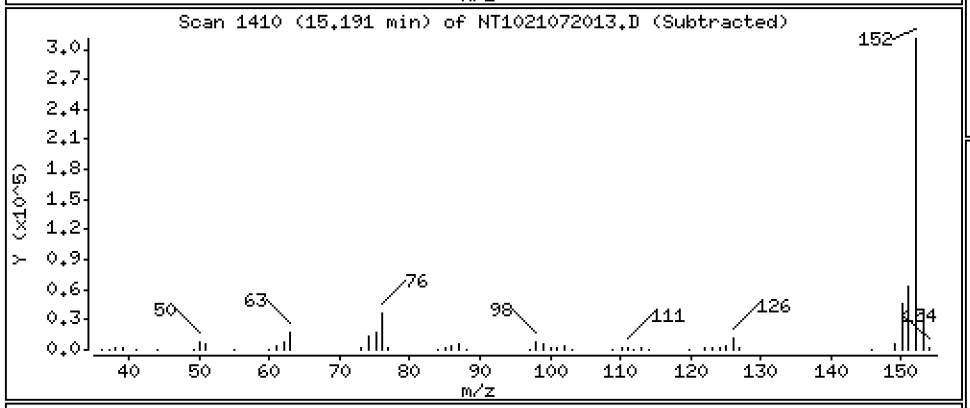
Column phase: ZB-5msi

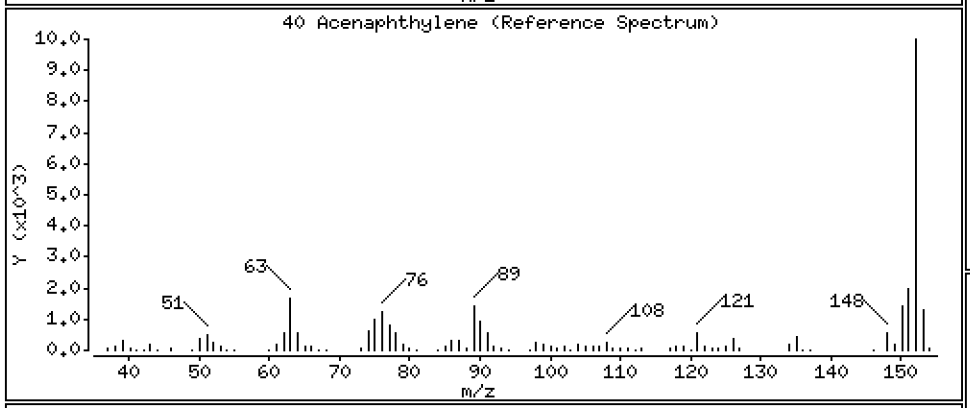
Column diameter: 0.25

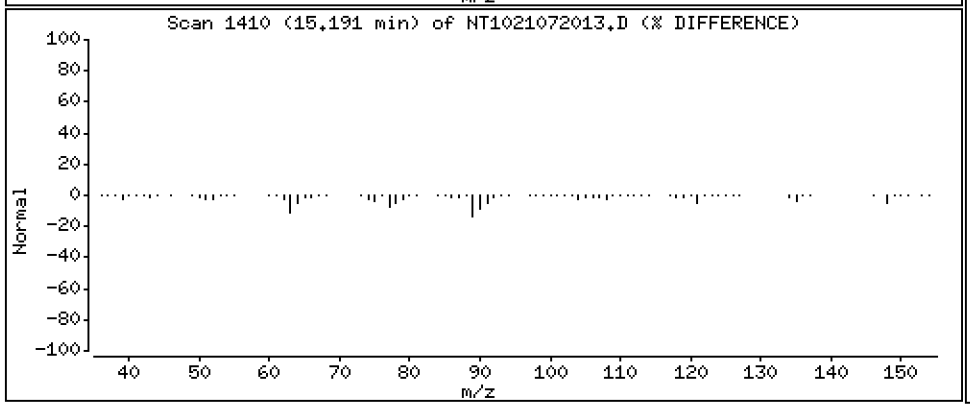
40 Acenaphthylene

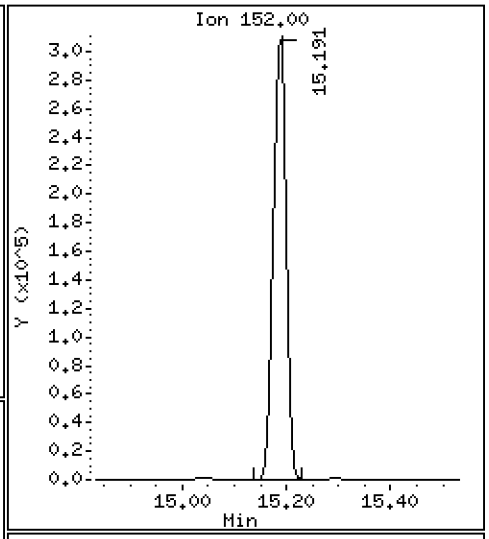
Concentration: 4.846 ug/mL

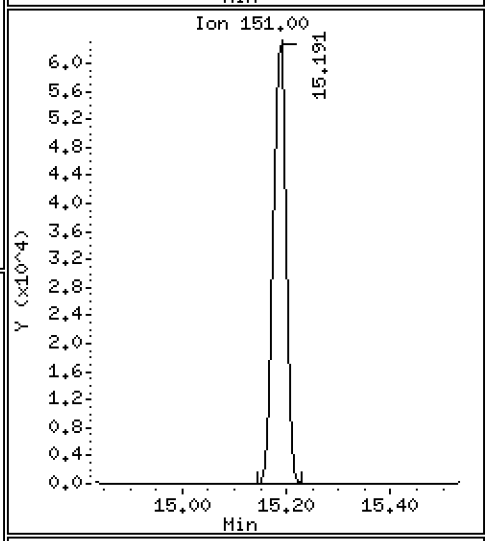


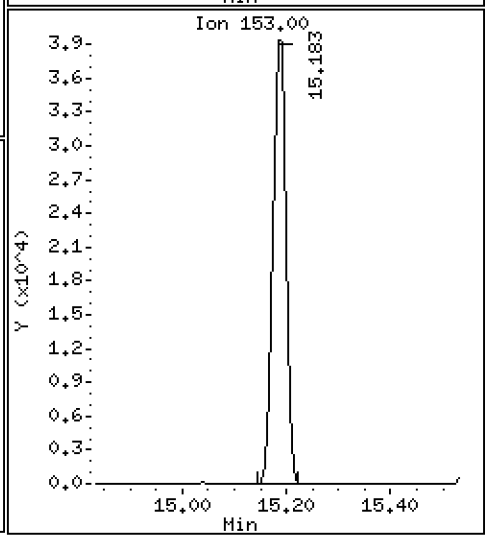












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

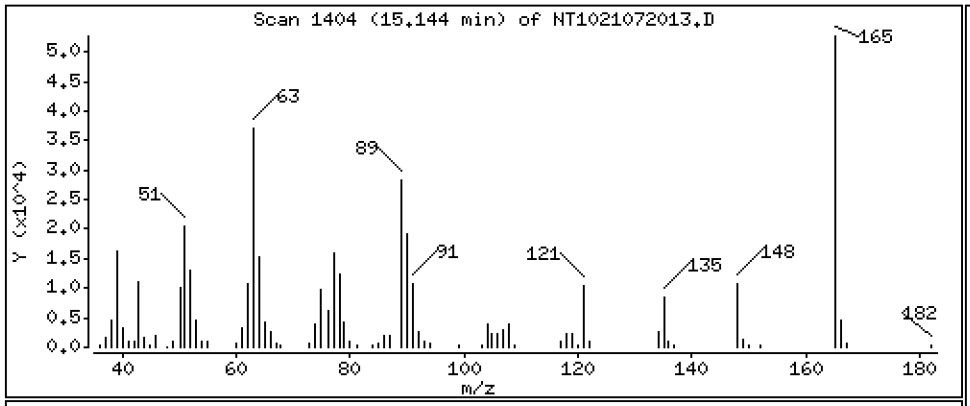
Operator: VTS

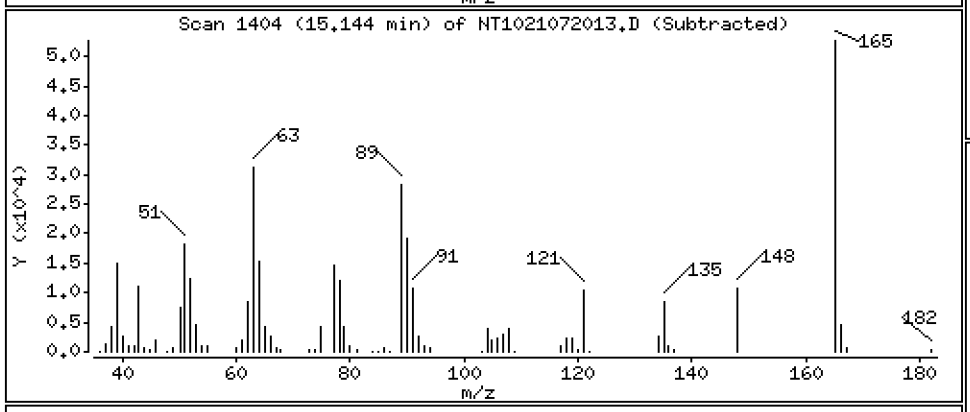
Column phase: ZB-5msi

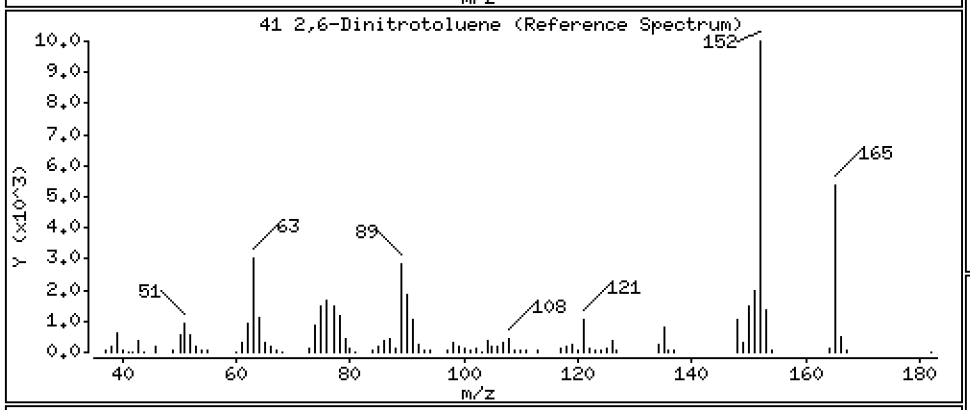
Column diameter: 0.25

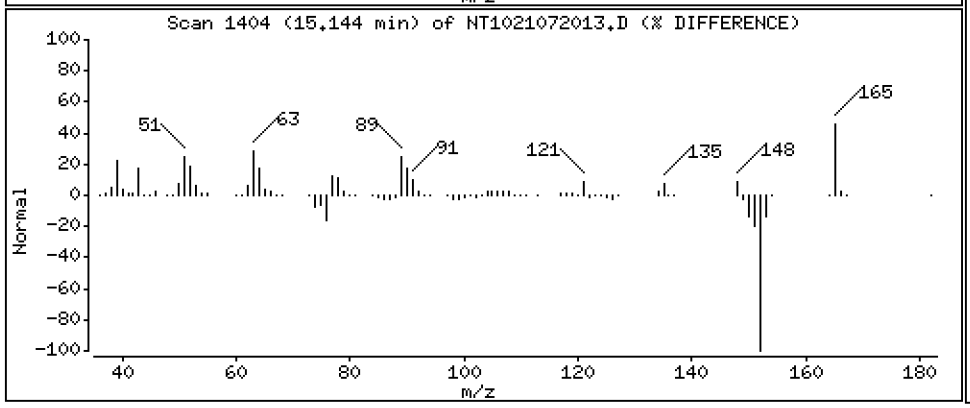
41 2,6-Dinitrotoluene

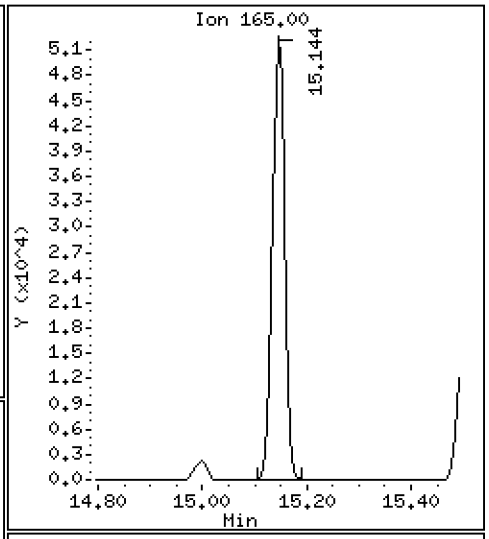
Concentration: 4.973 ug/mL

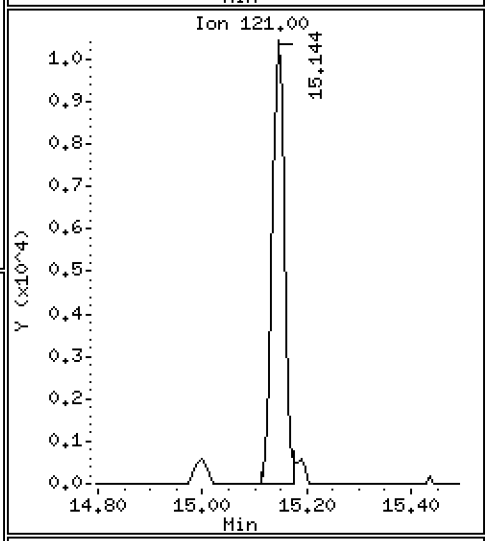


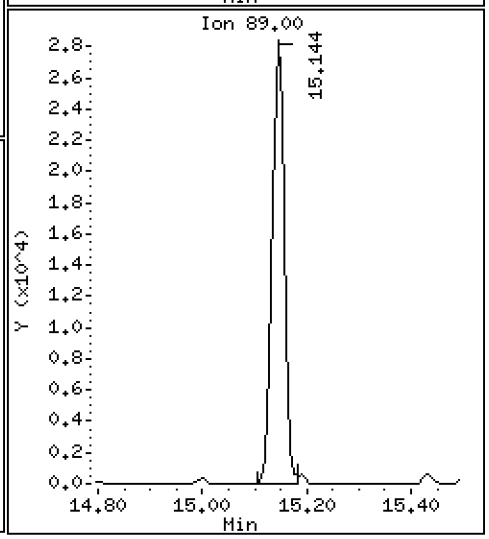












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

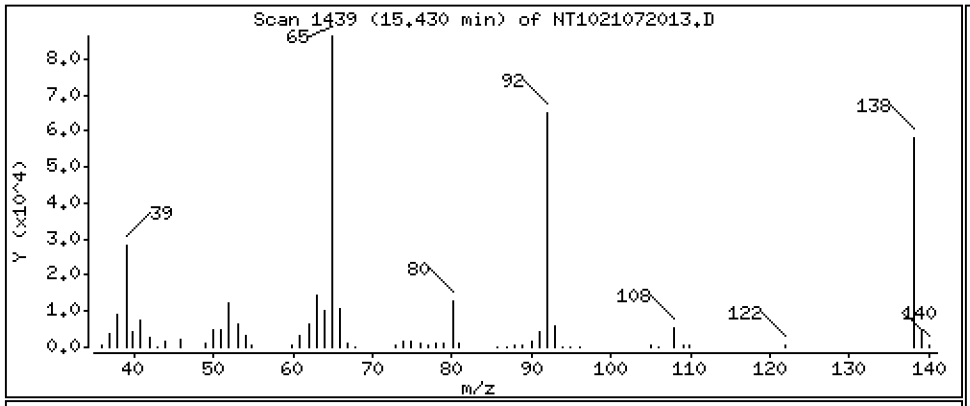
Operator: VTS

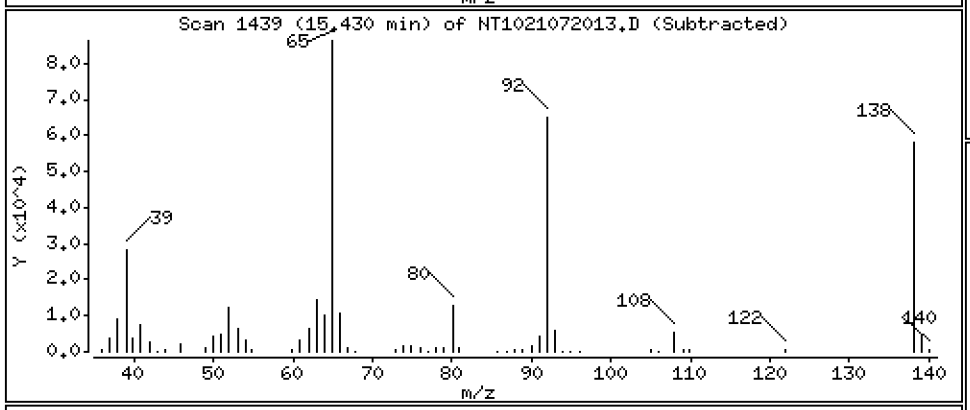
Column phase: ZB-5msi

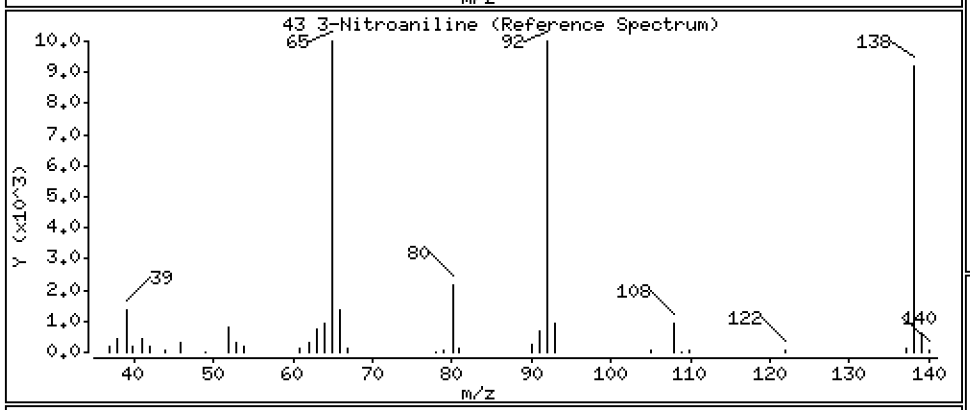
Column diameter: 0.25

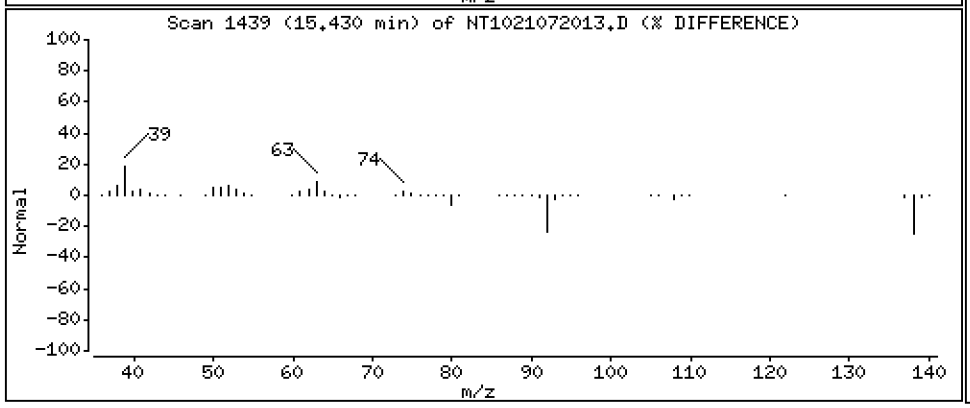
43 3-Nitroaniline

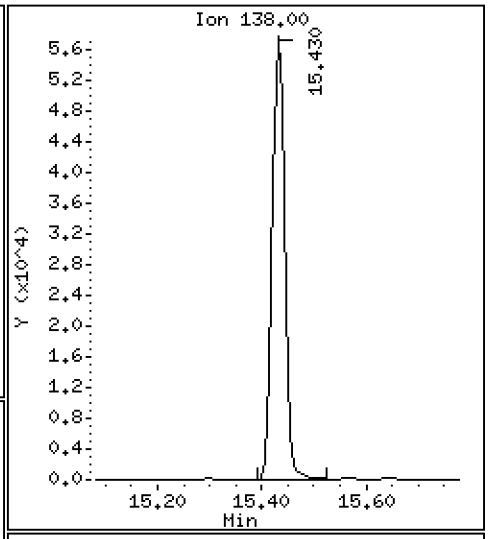
Concentration: 4.557 ug/mL

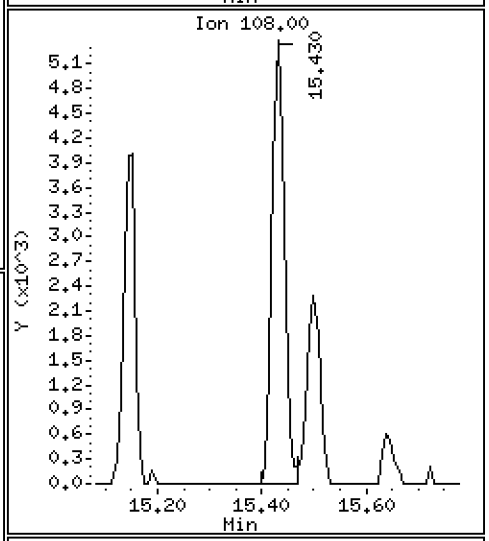


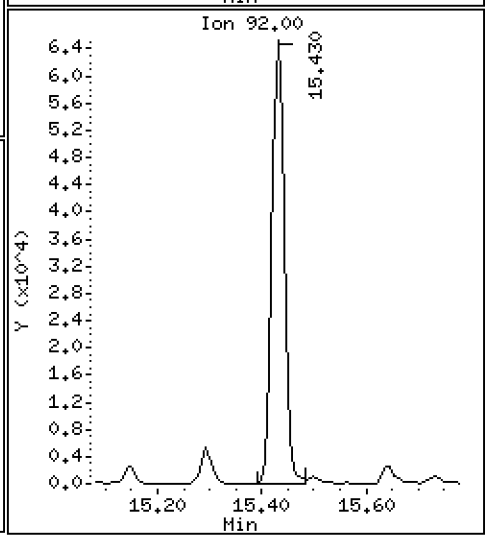












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

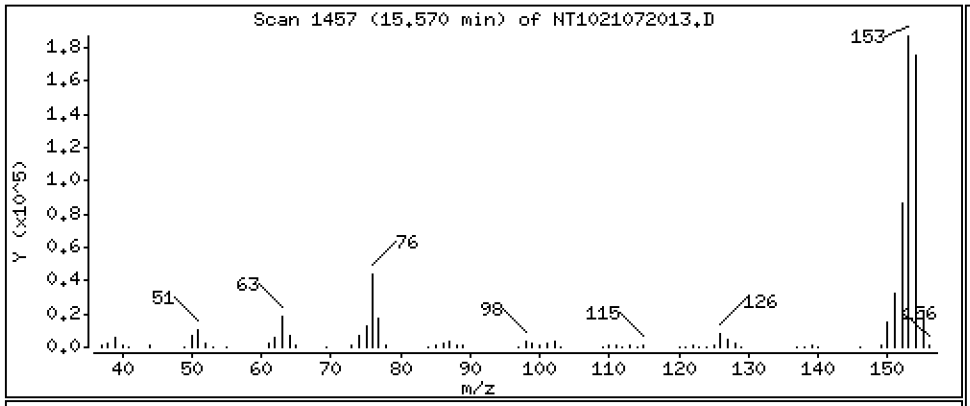
Operator: VTS

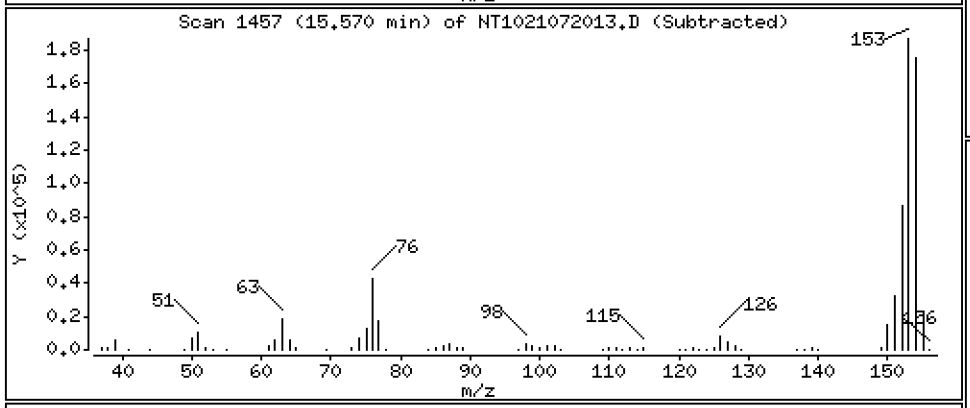
Column phase: ZB-5msi

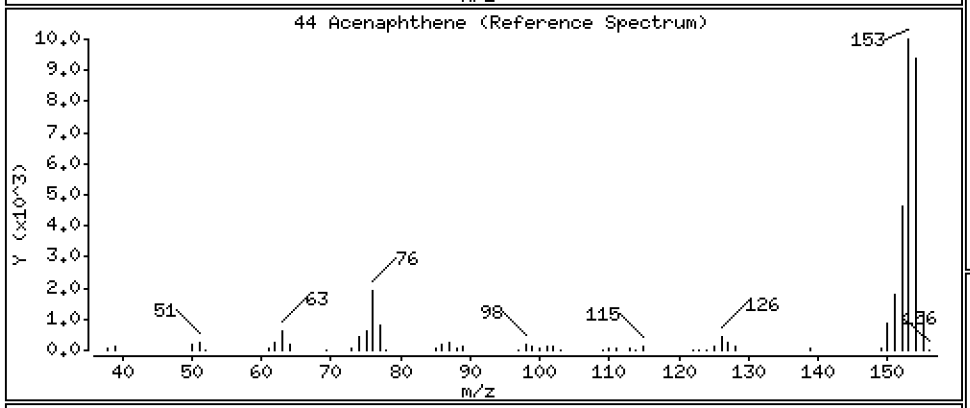
Column diameter: 0.25

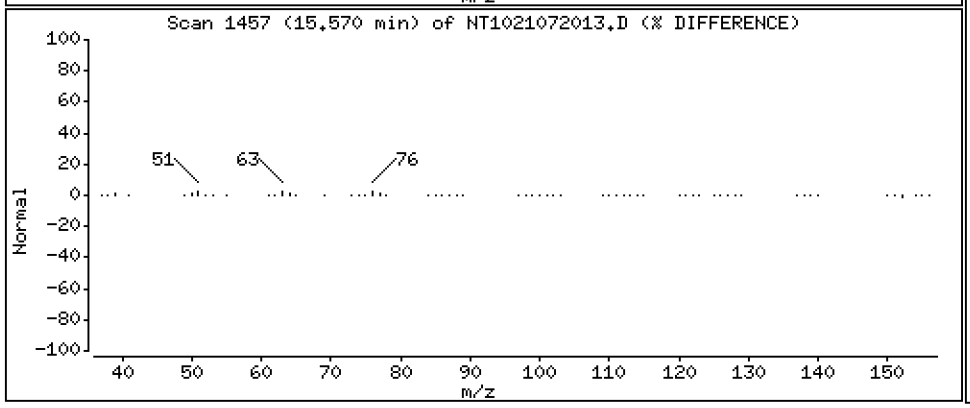
44 Acenaphthene

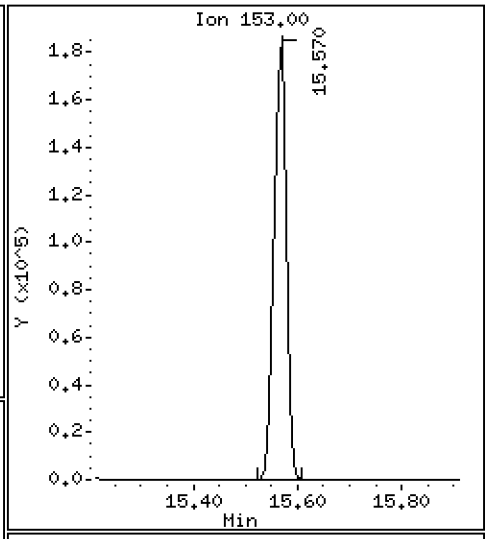
Concentration: 4.792 ug/mL

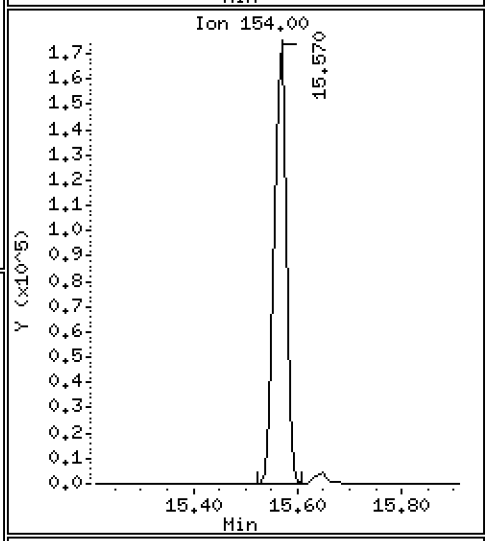


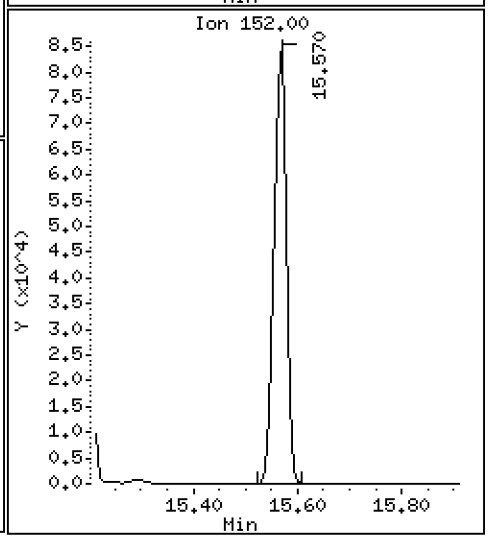












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

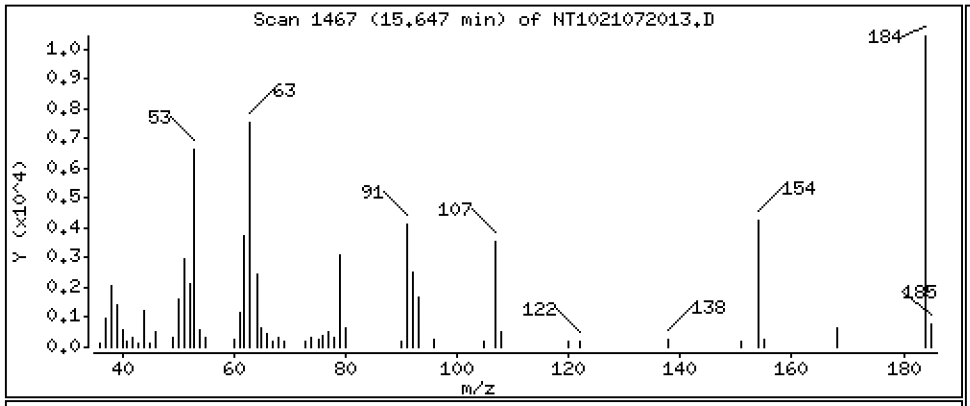
Operator: VTS

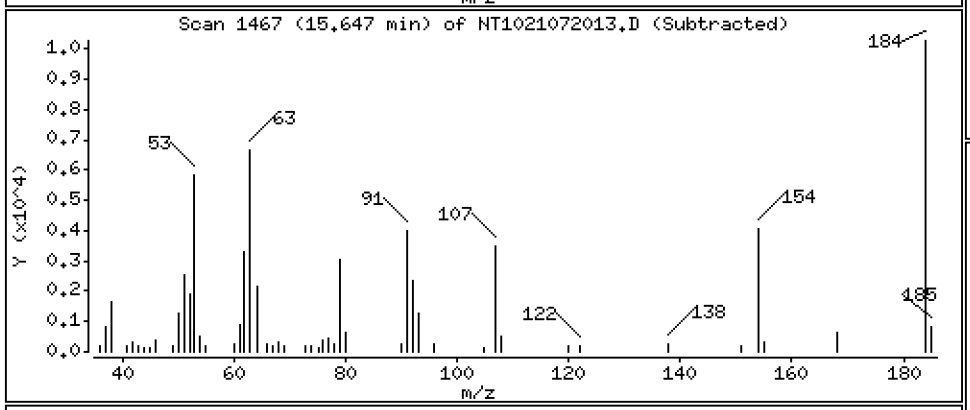
Column phase: ZB-5msi

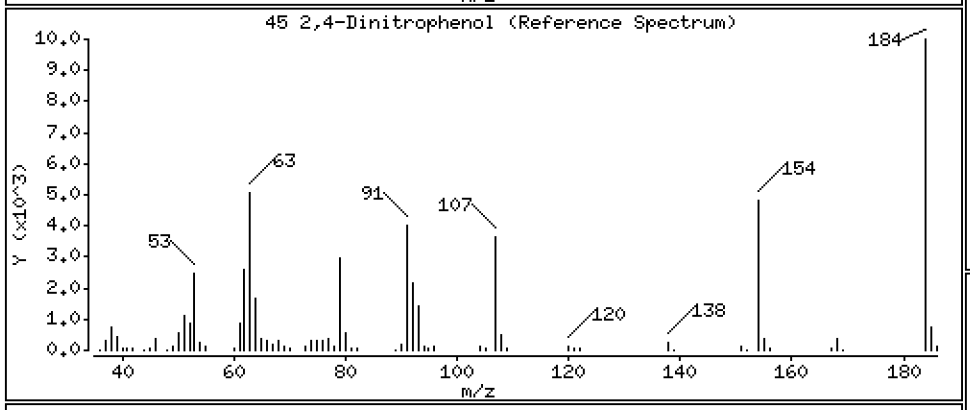
Column diameter: 0.25

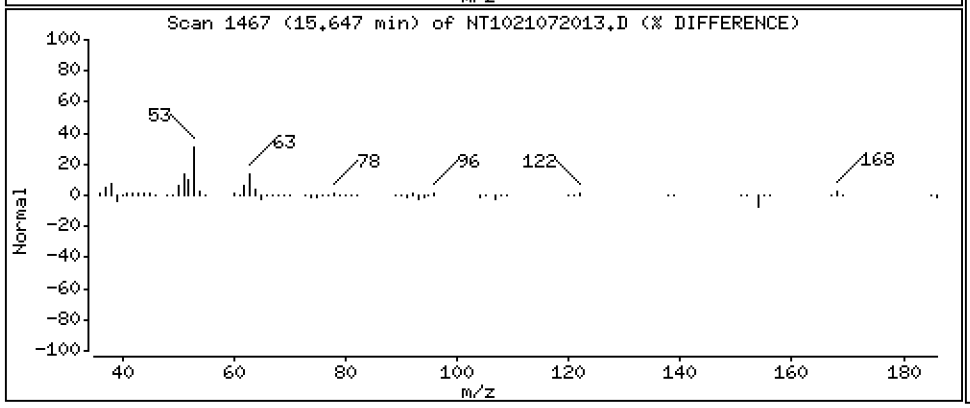
45 2,4-Dinitrophenol

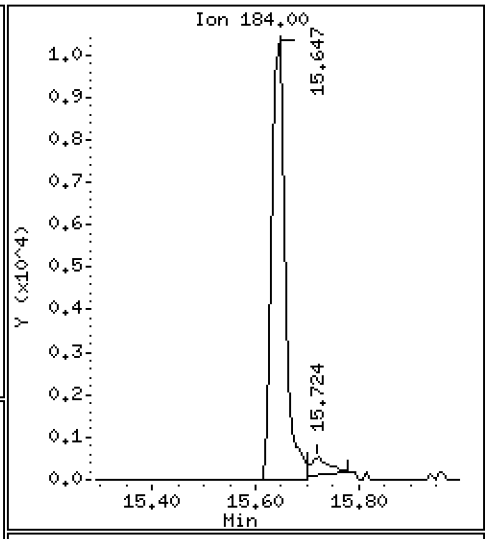
Concentration: 1.928 ug/mL

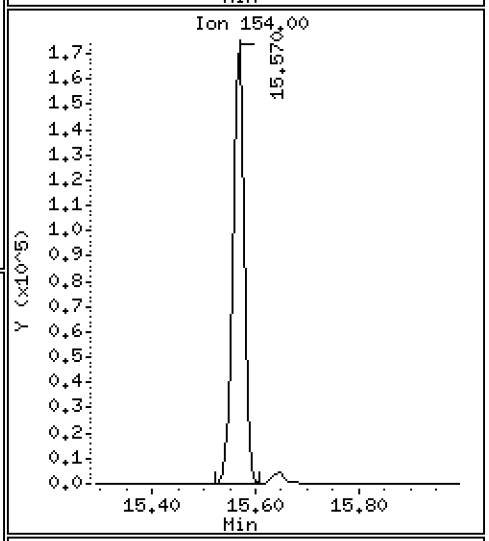


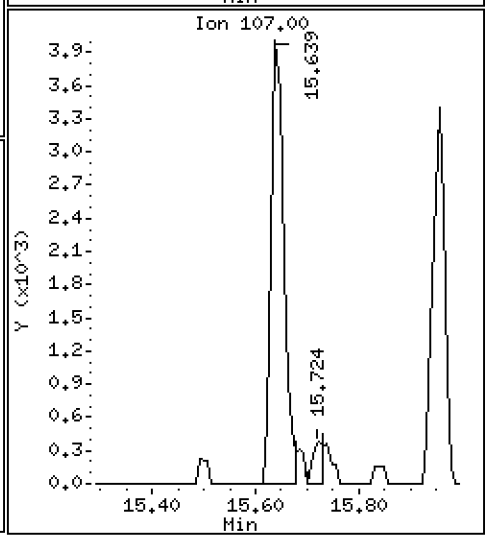












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

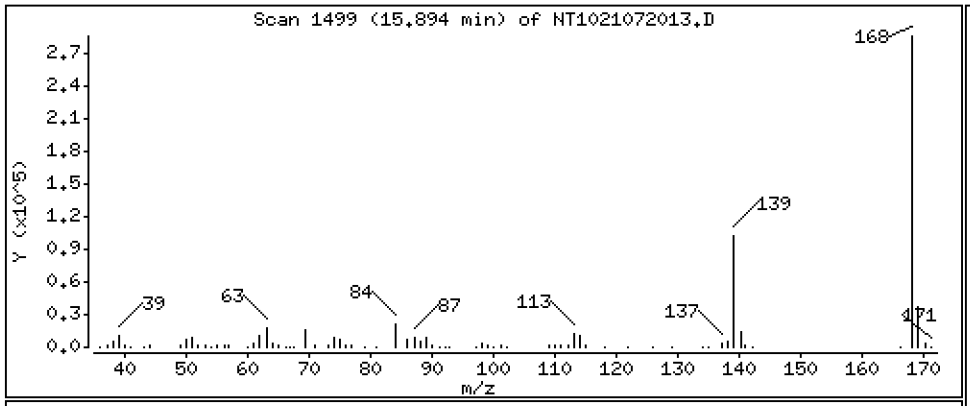
Operator: VTS

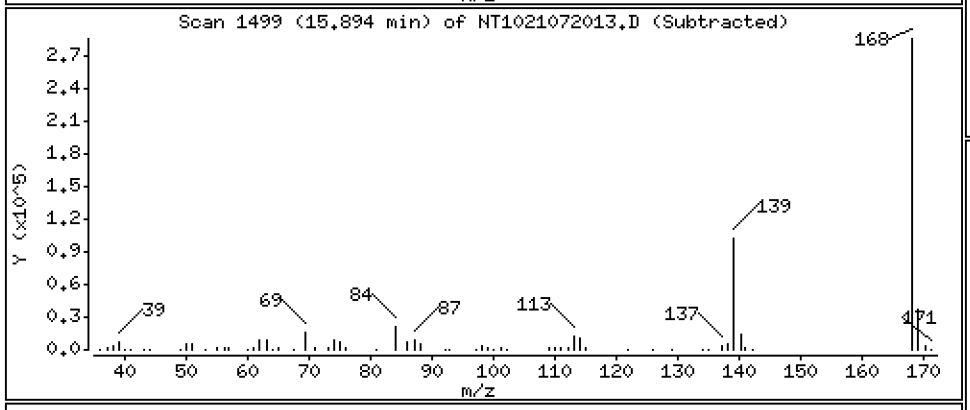
Column phase: ZB-5msi

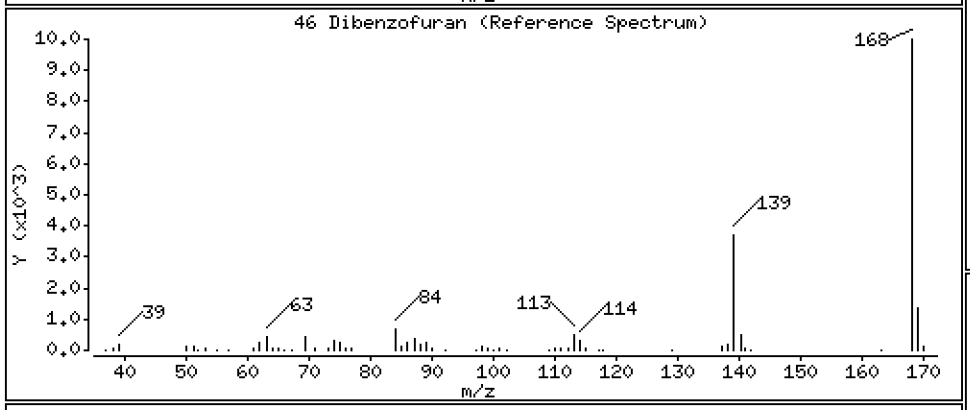
Column diameter: 0.25

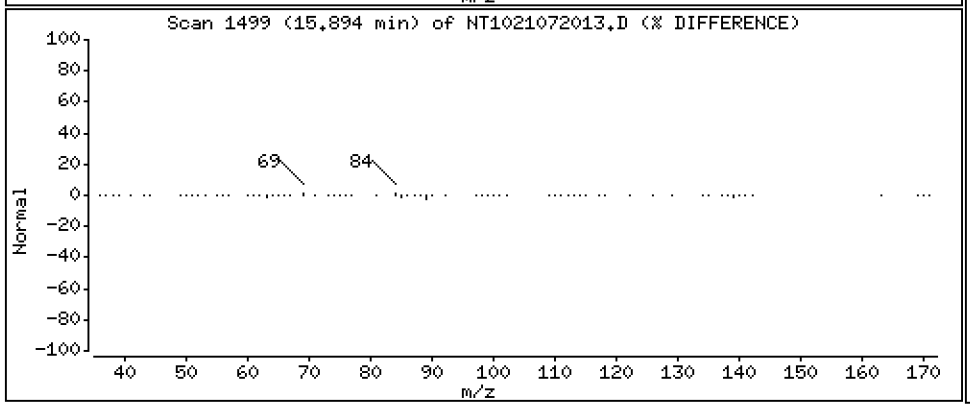
46 Dibenzofuran

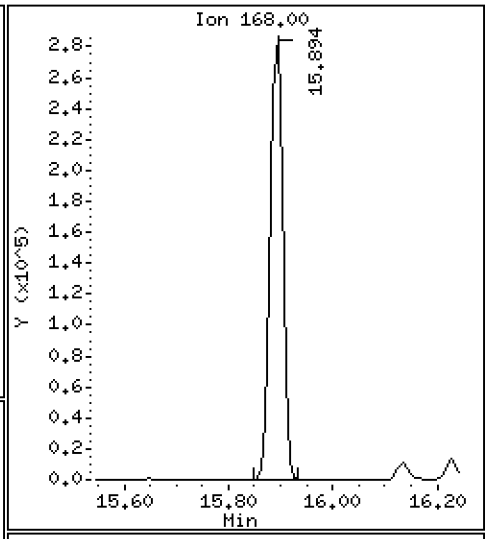
Concentration: 4.833 ug/mL

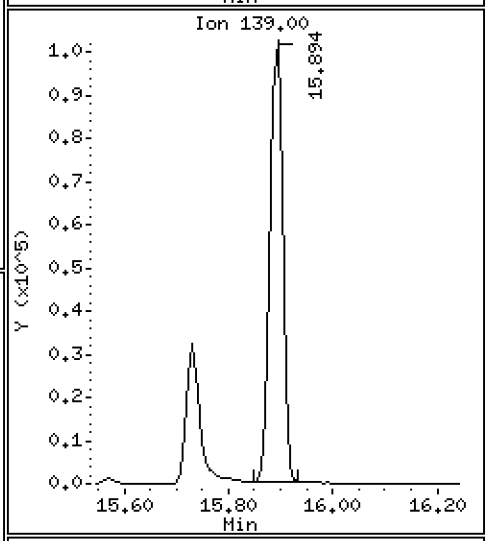


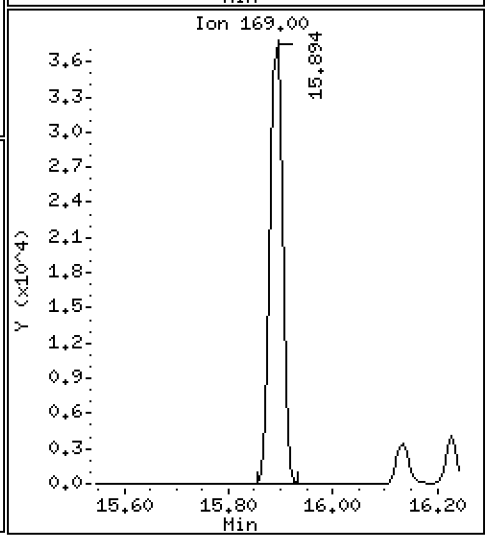












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

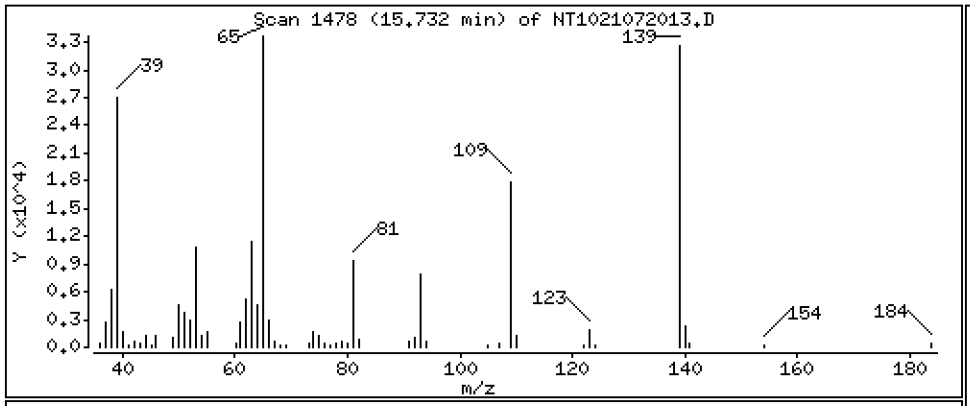
Operator: VTS

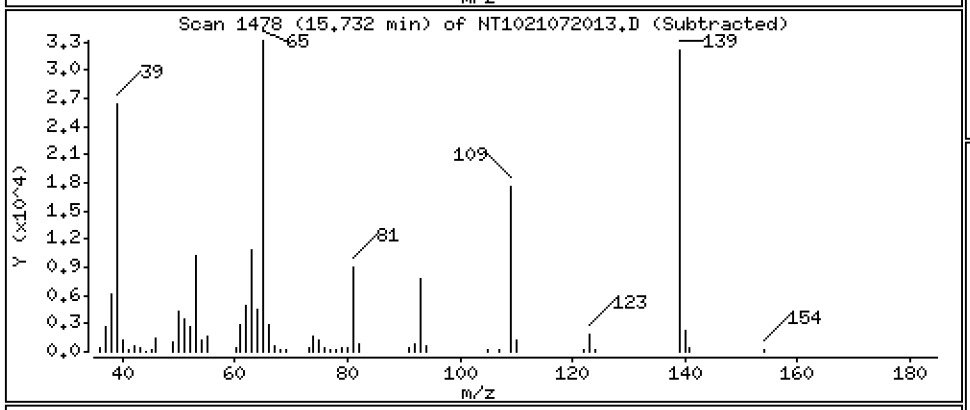
Column phase: ZB-5msi

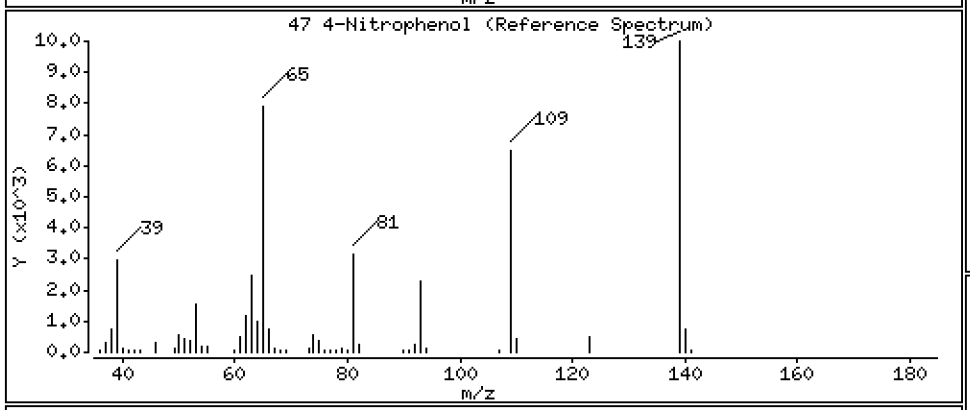
Column diameter: 0.25

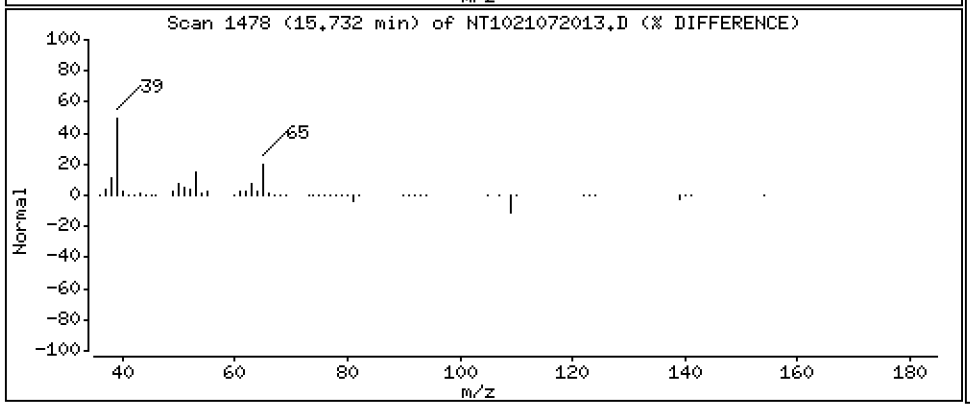
47 4-Nitrophenol

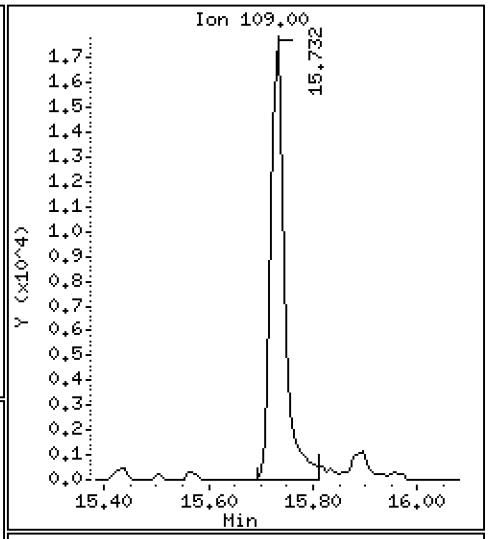
Concentration: 4.089 ug/mL

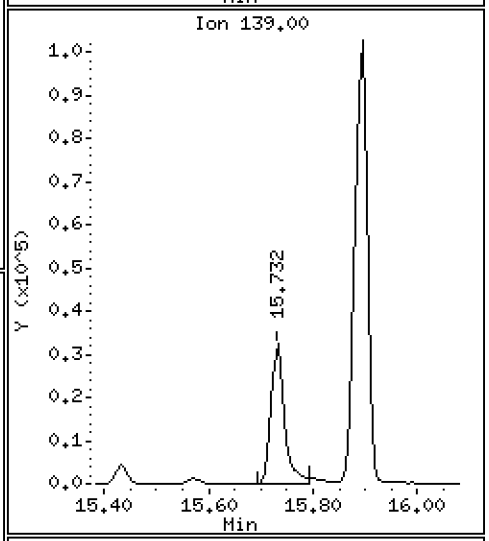


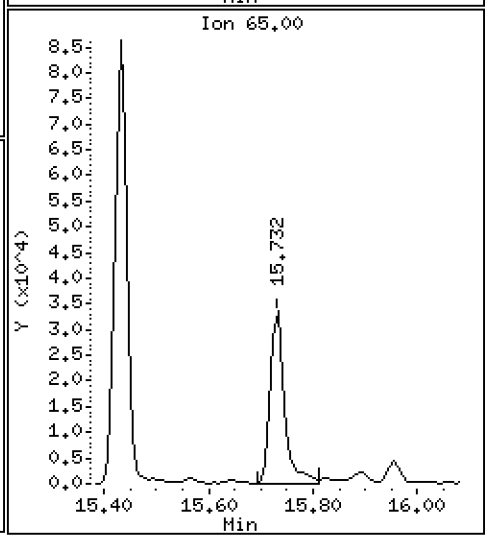












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

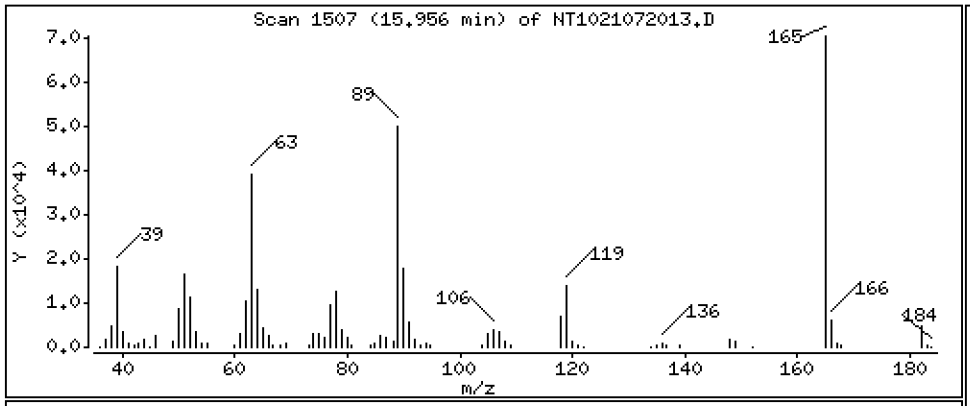
Operator: VTS

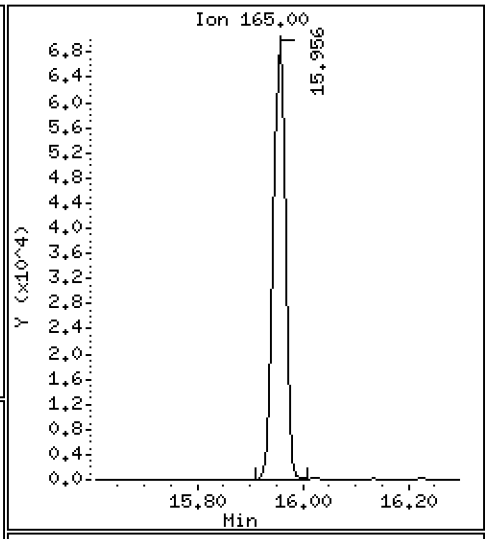
Column phase: ZB-5msi

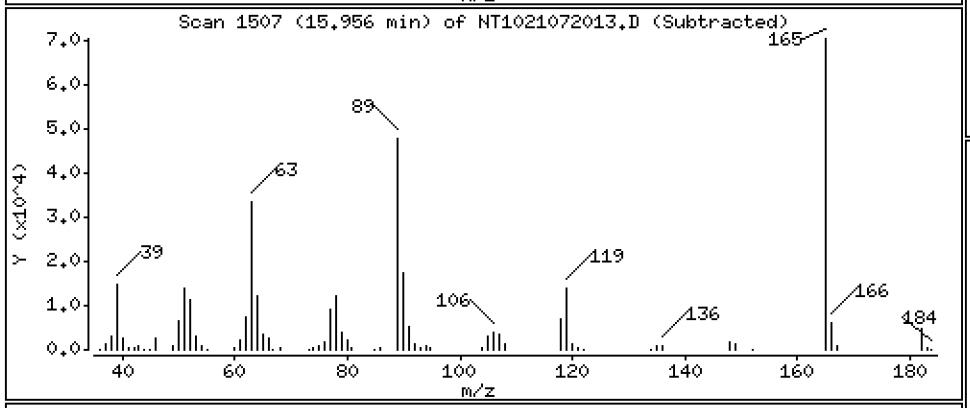
Column diameter: 0.25

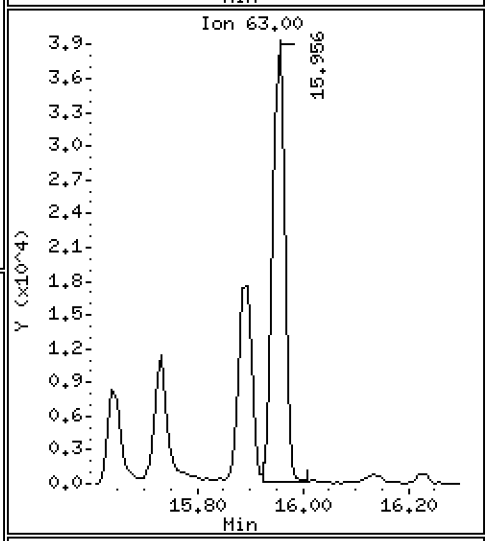
48 2,4-Dinitrotoluene

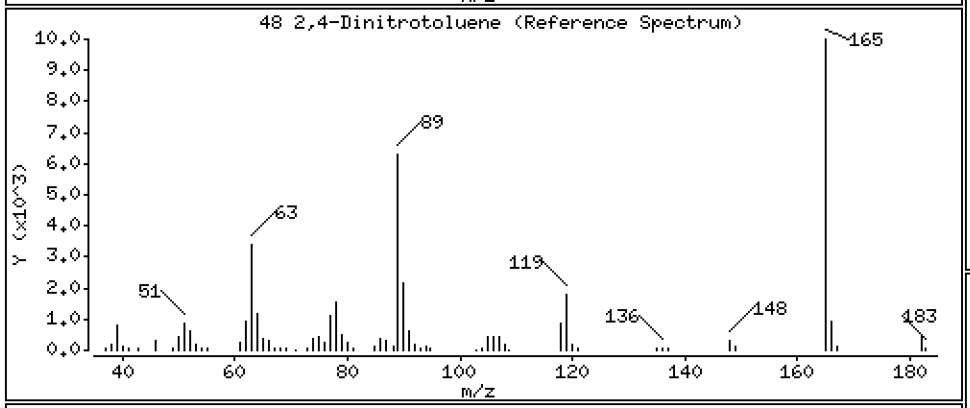
Concentration: 4.929 ug/mL

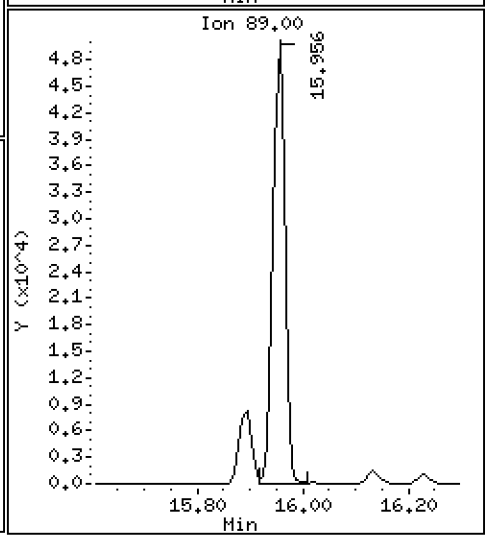


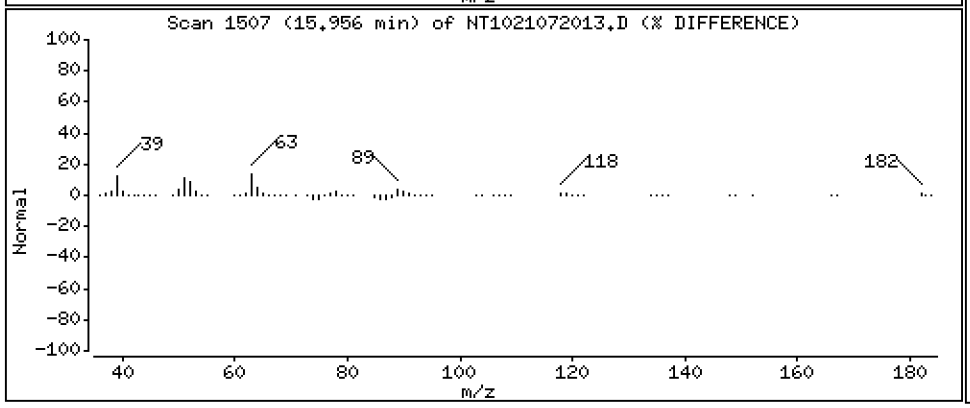












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

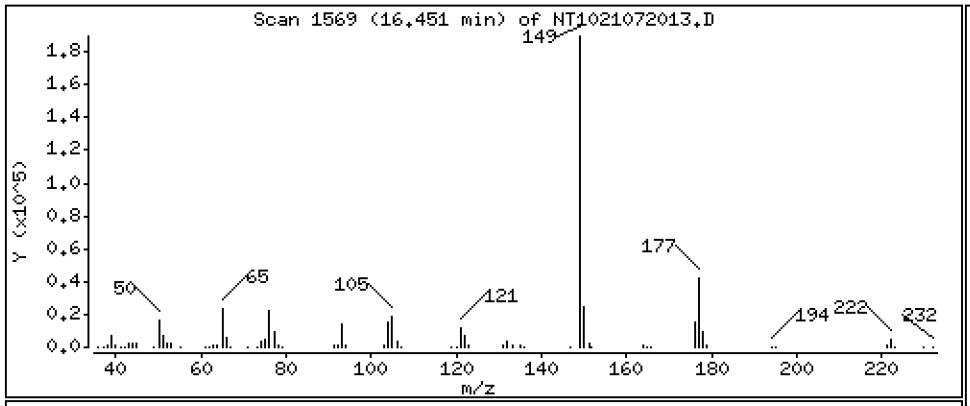
Operator: VTS

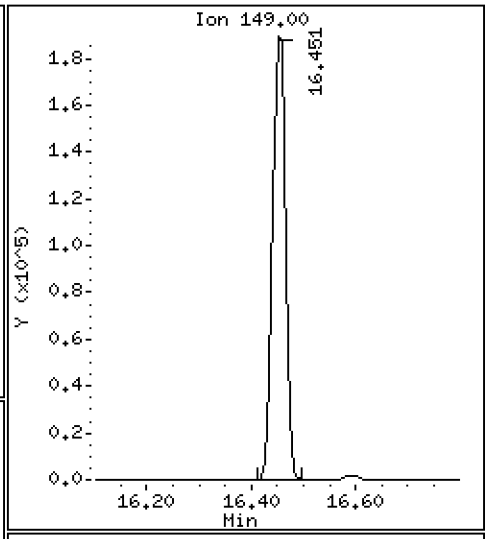
Column phase: ZB-5msi

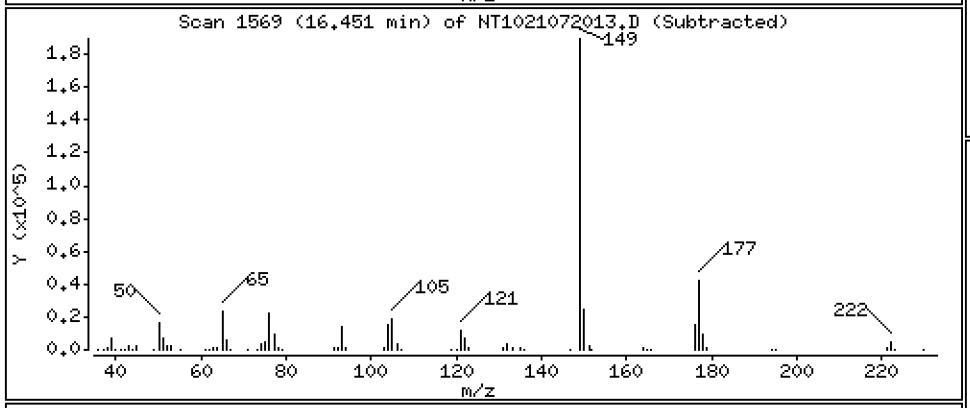
Column diameter: 0.25

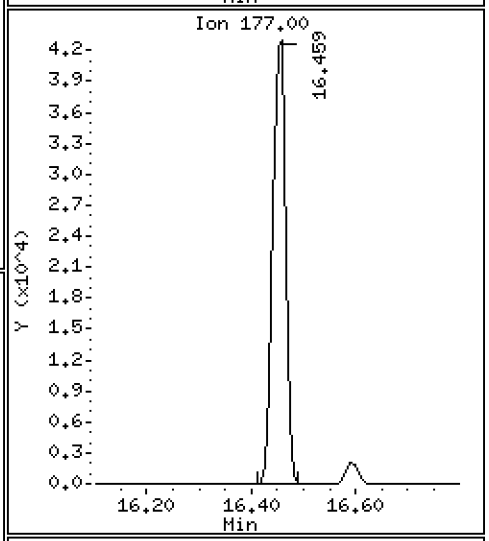
50 Diethylphthalate

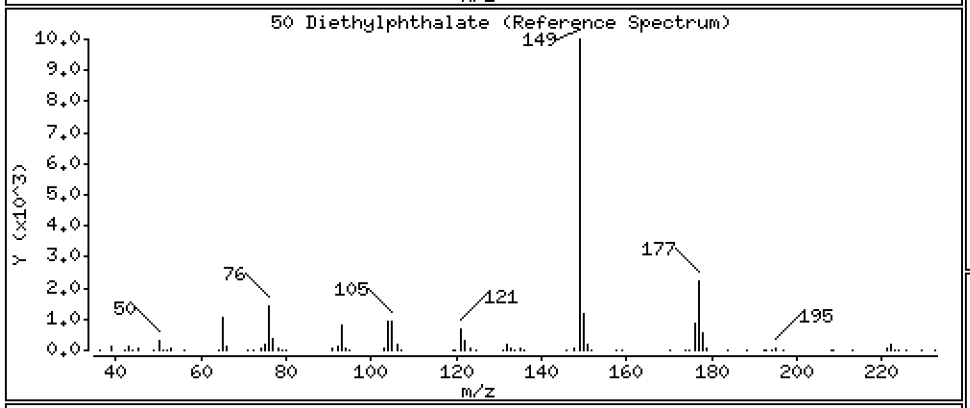
Concentration: 4.598 ug/mL

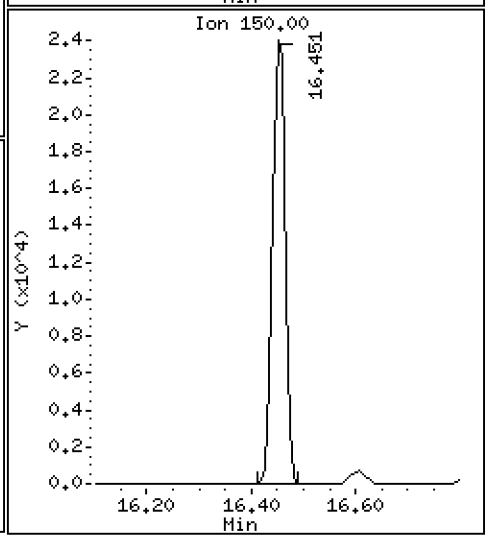


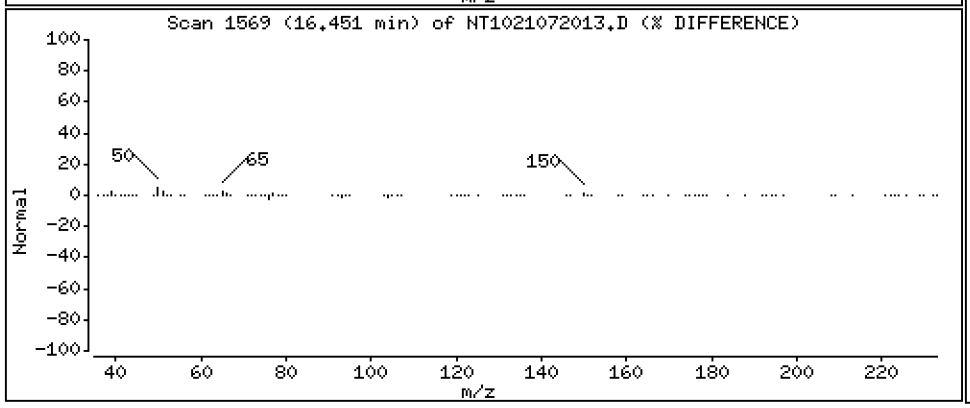












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

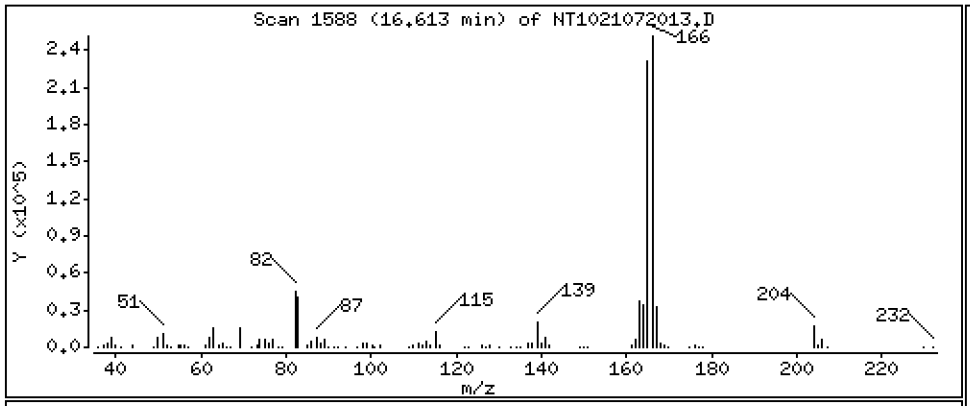
Operator: VTS

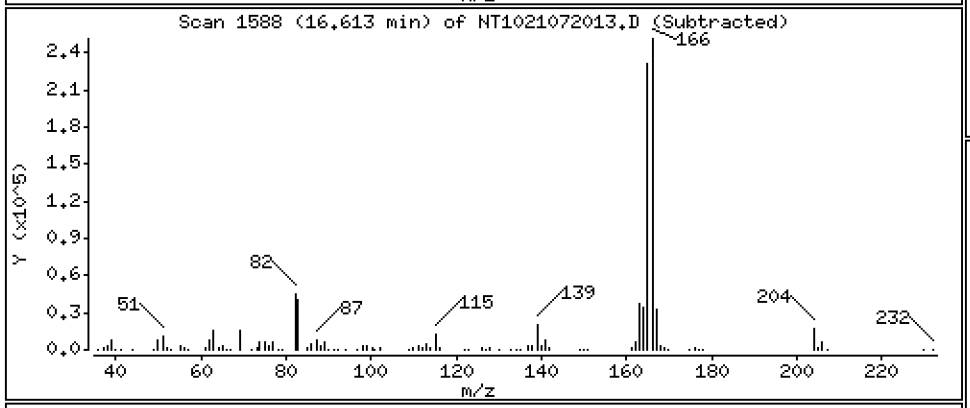
Column phase: ZB-5msi

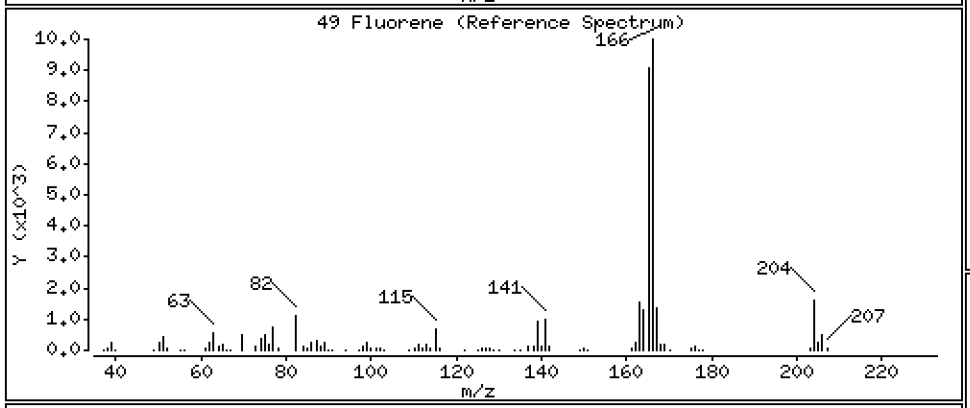
Column diameter: 0.25

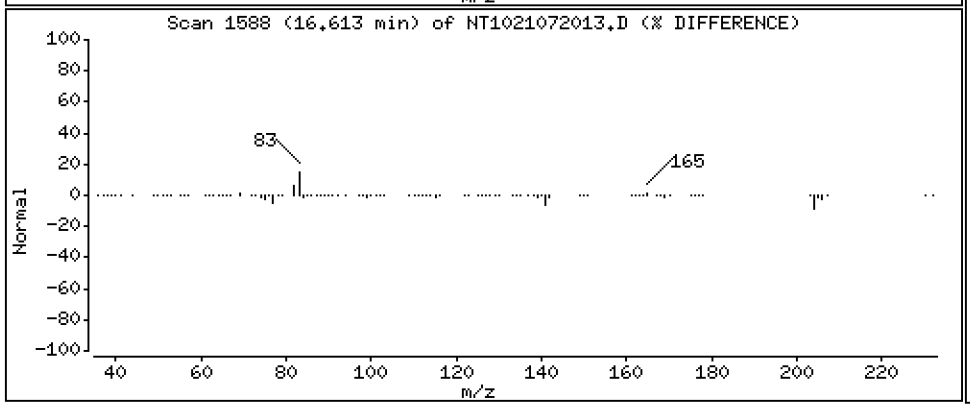
49 Fluorene

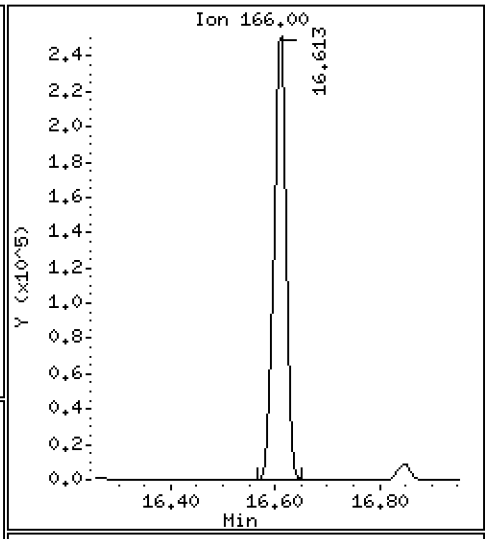
Concentration: 4.477 ug/mL

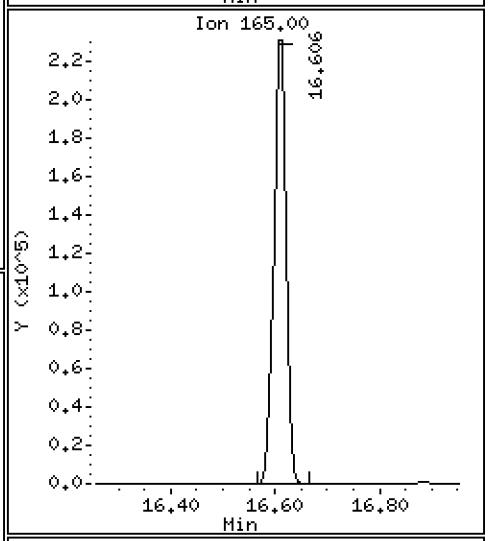


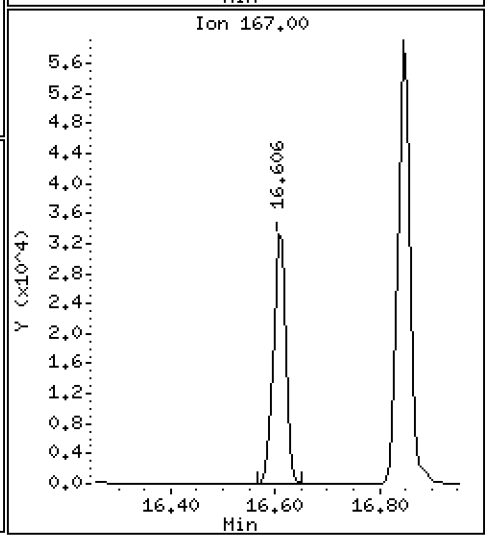












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

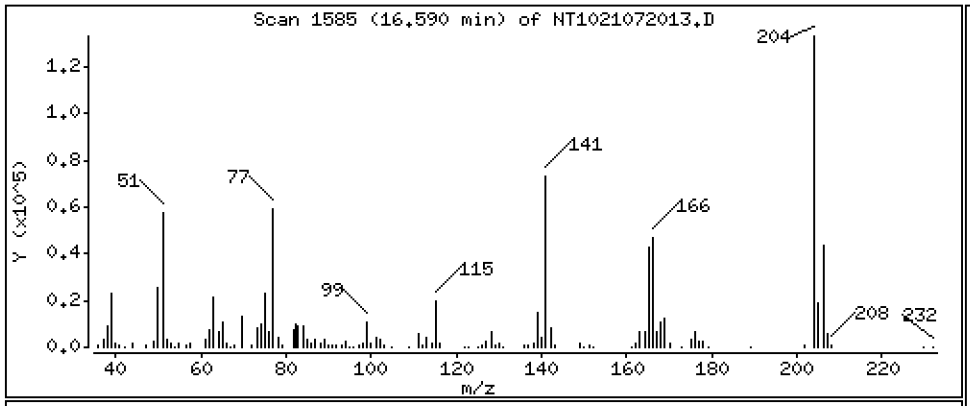
Operator: VTS

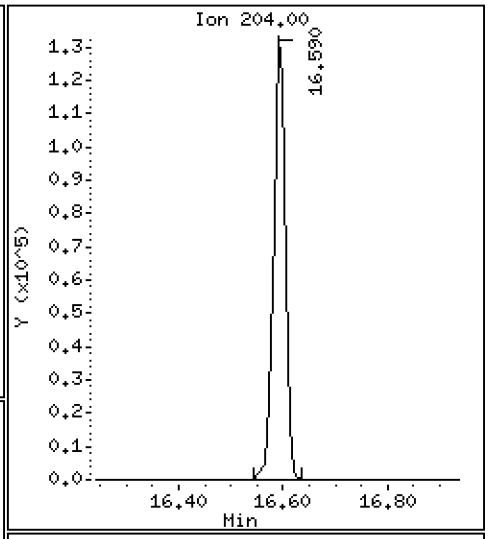
Column phase: ZB-5msi

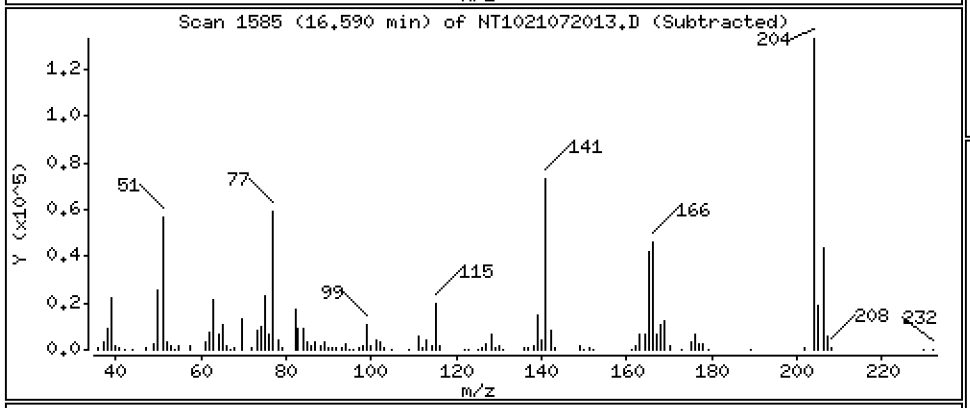
Column diameter: 0.25

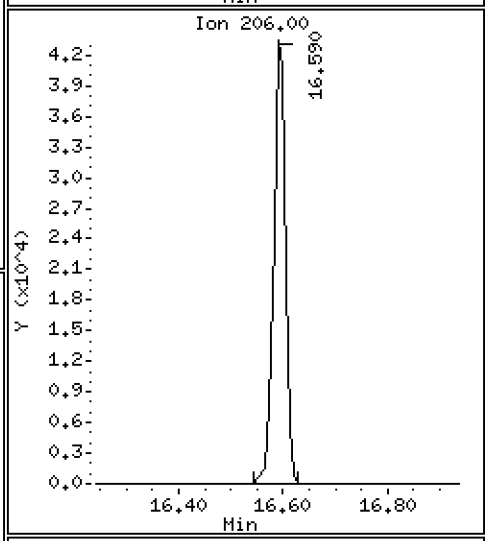
51 4-Chlorophenyl-phenylether

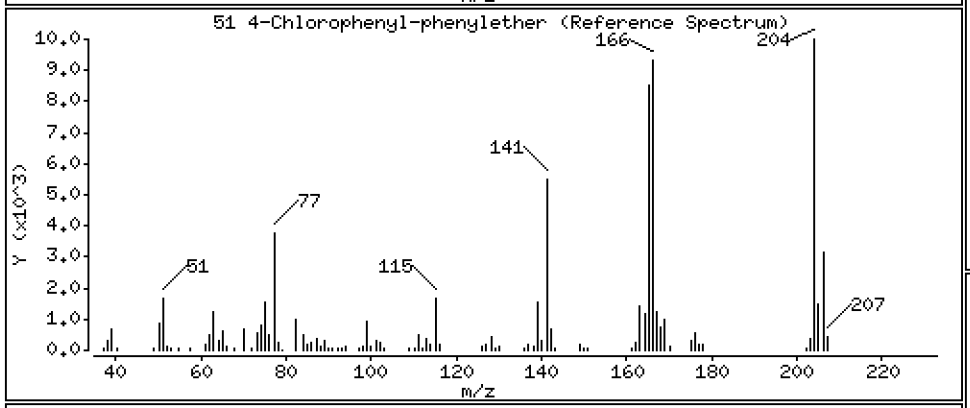
Concentration: 4.594 ug/mL

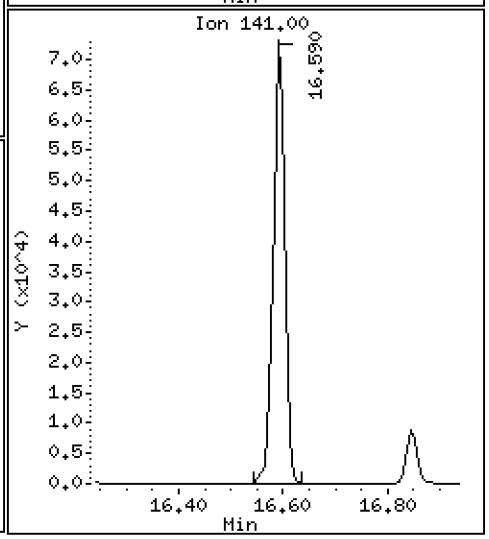


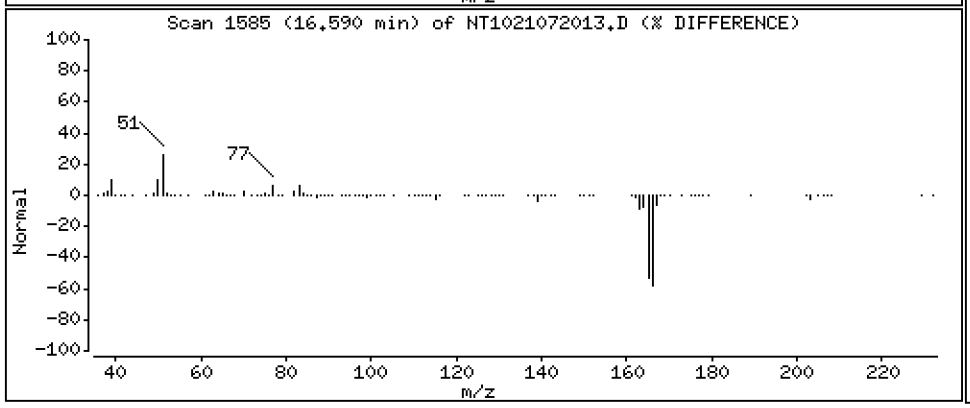












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

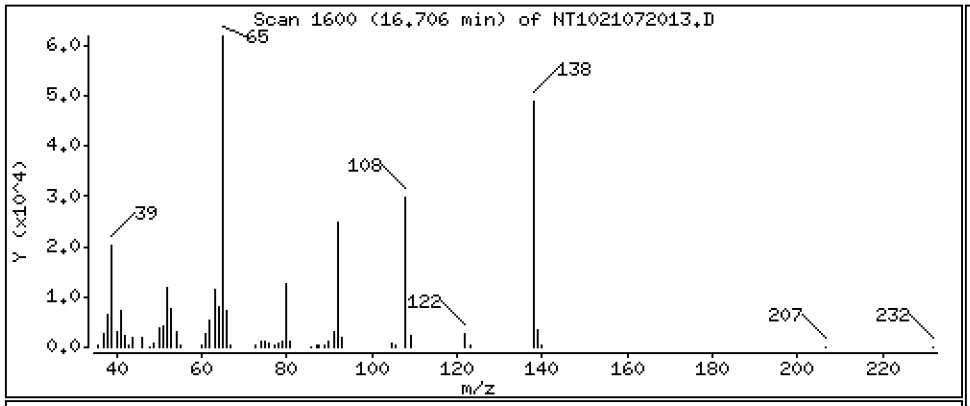
Operator: VTS

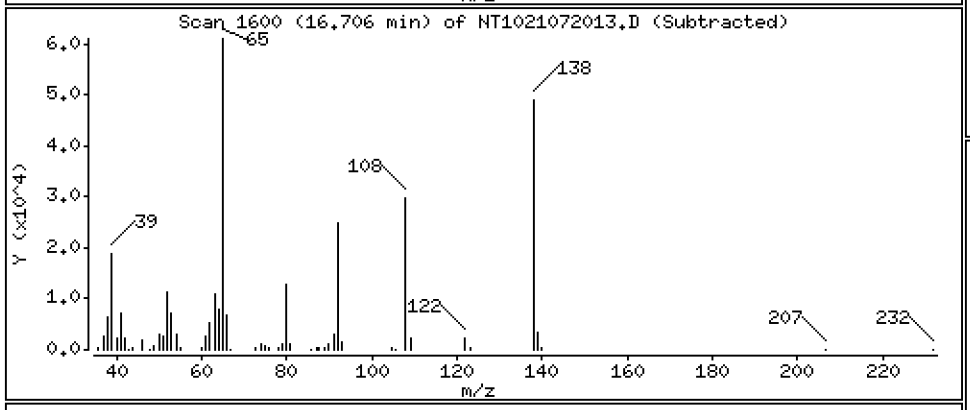
Column phase: ZB-5msi

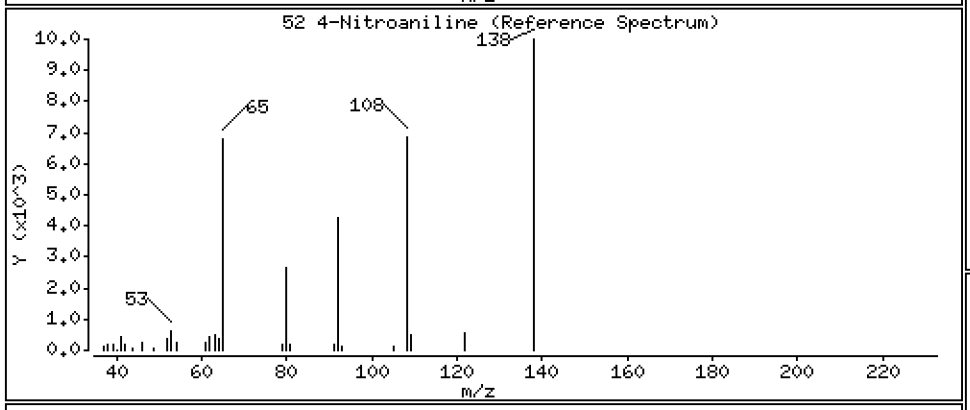
Column diameter: 0.25

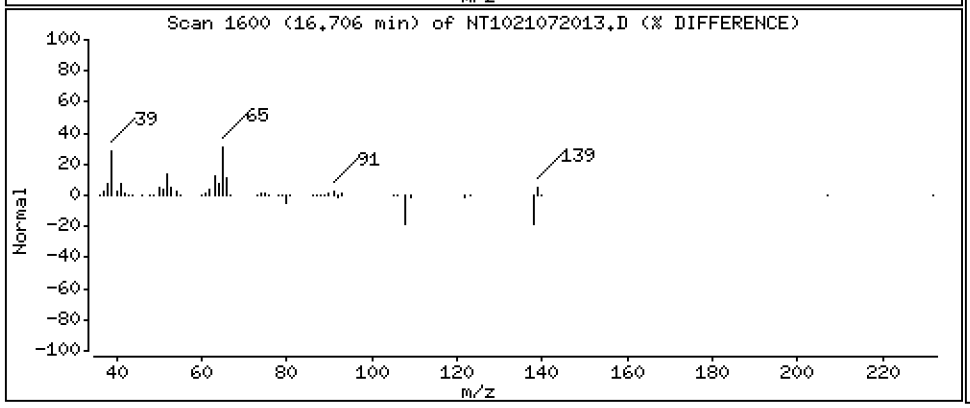
52 4-Nitroaniline

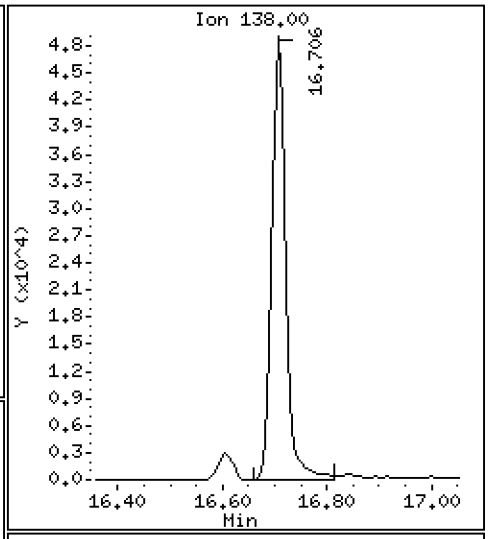
Concentration: 4.048 ug/mL

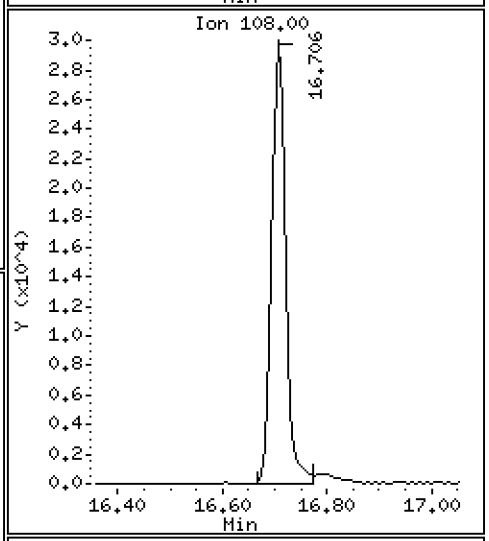


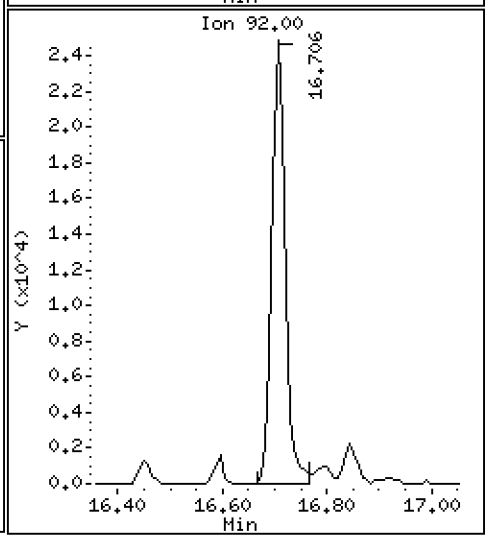












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

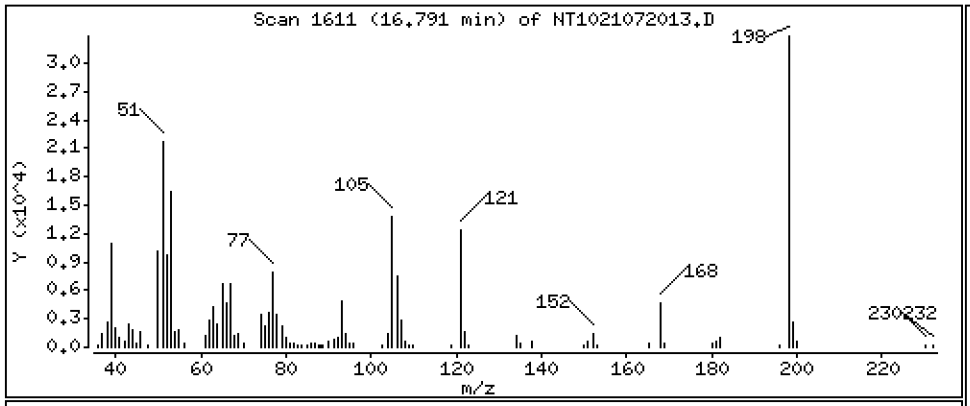
Operator: VTS

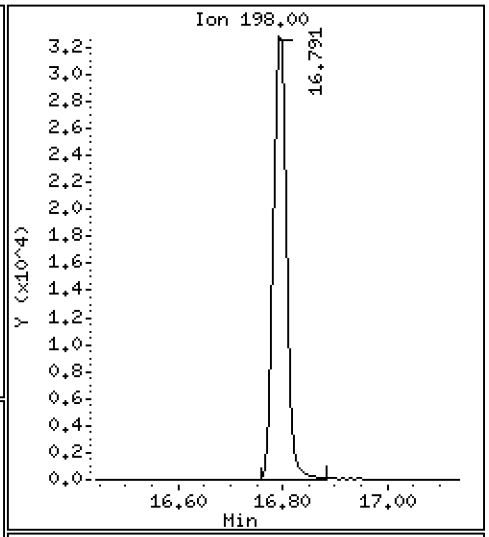
Column phase: ZB-5msi

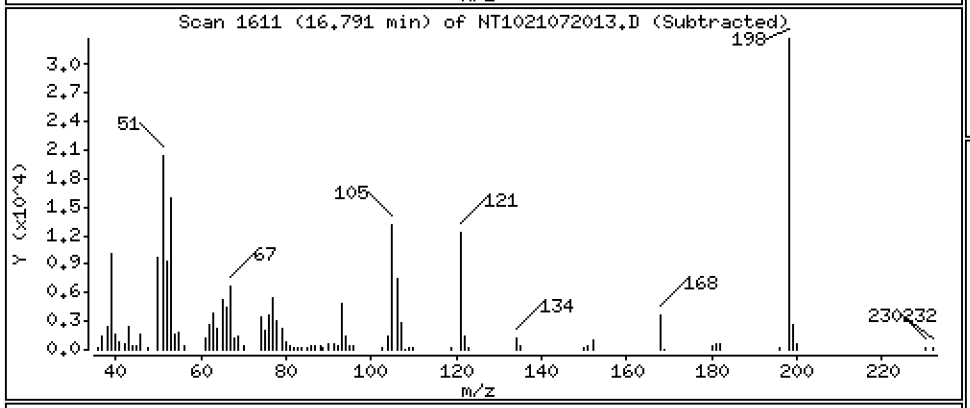
Column diameter: 0.25

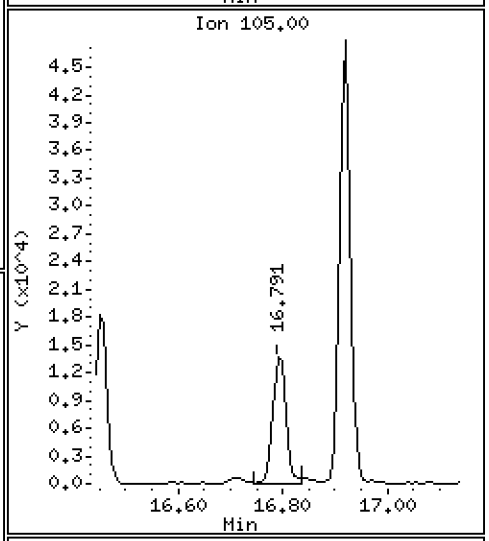
53 4,6-Dinitro-2-methylphenol

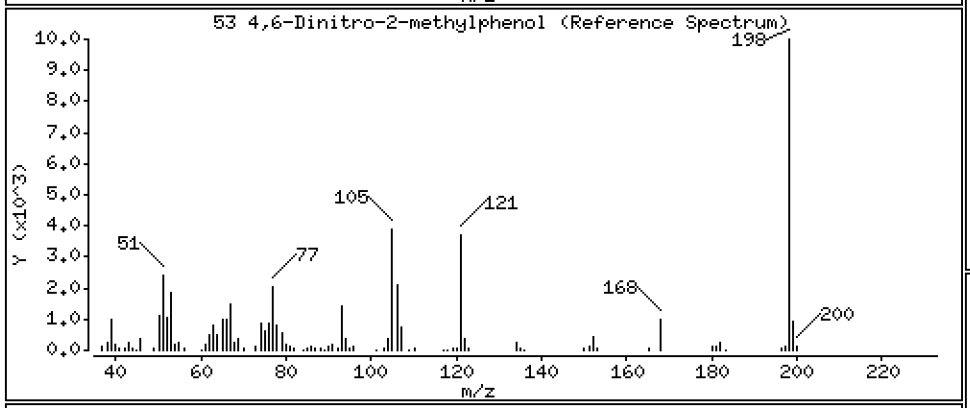
Concentration: 3.646 ug/mL

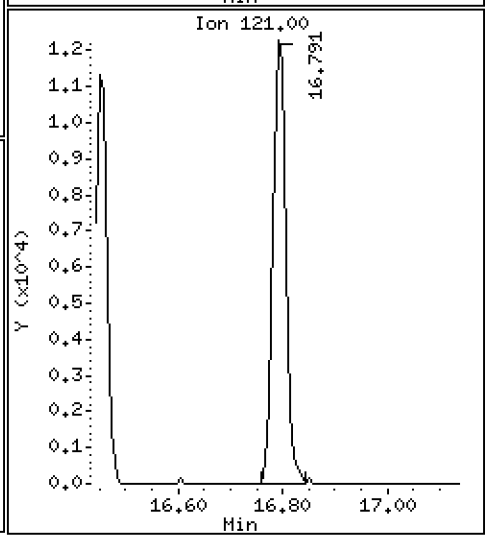


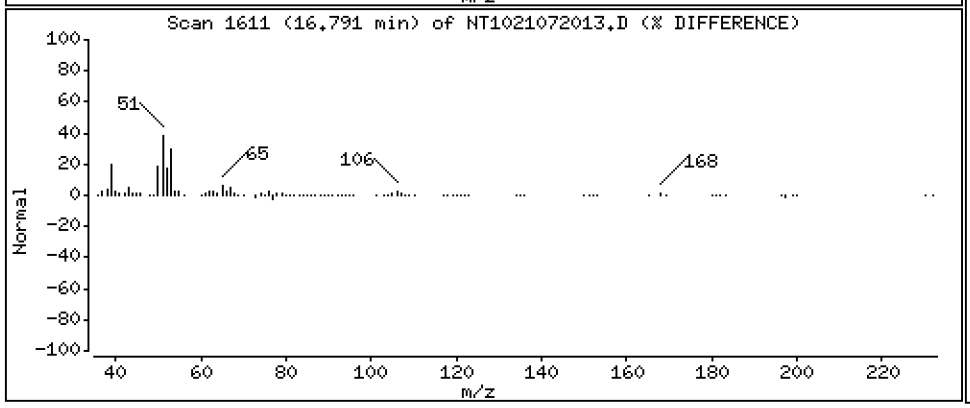












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

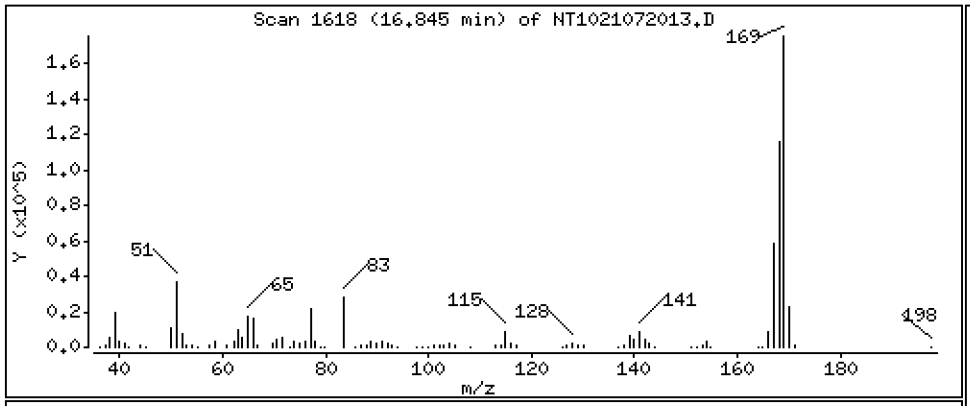
Operator: VTS

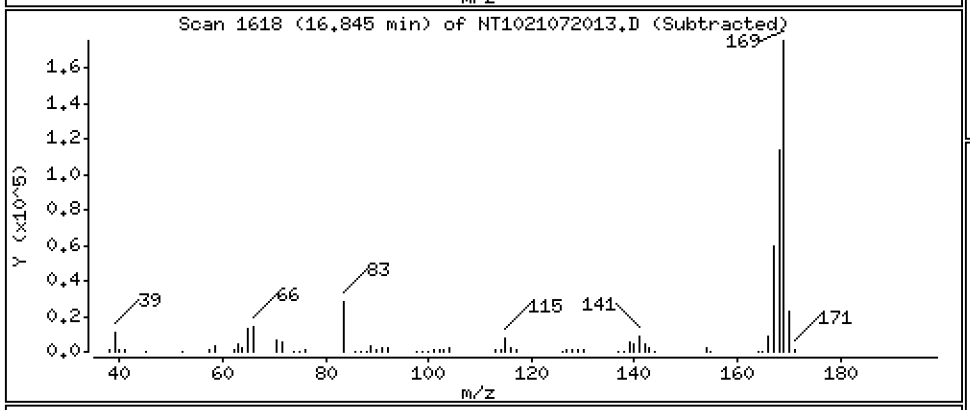
Column phase: ZB-5msi

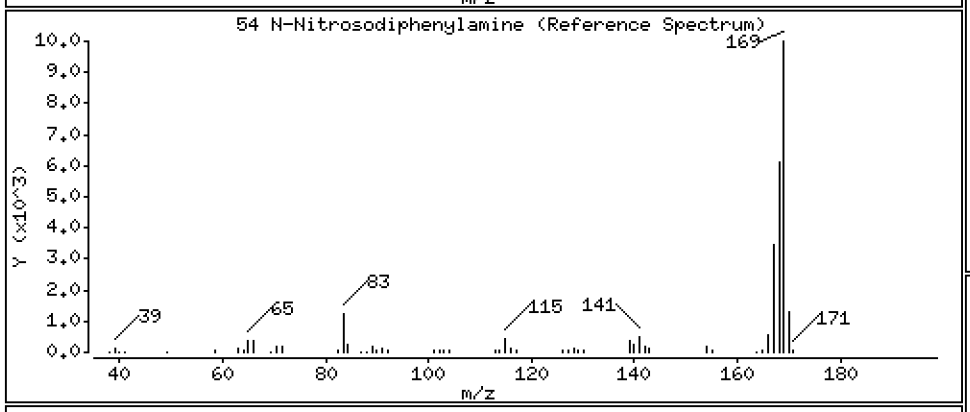
Column diameter: 0.25

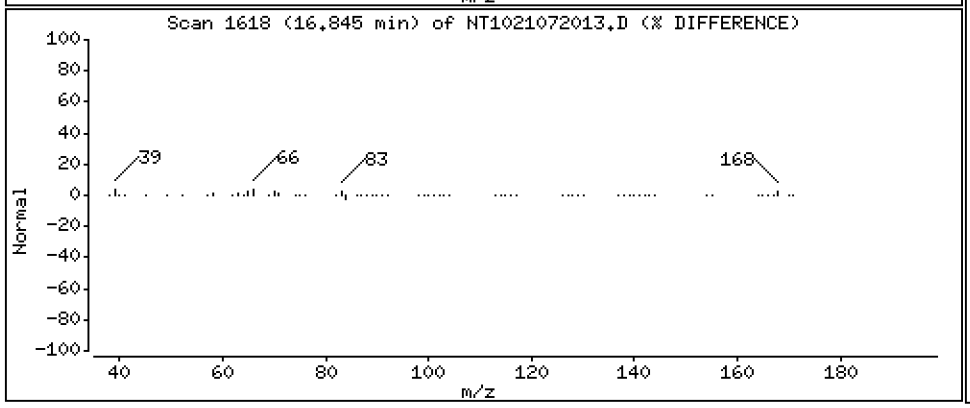
54 N-Nitrosodiphenylamine

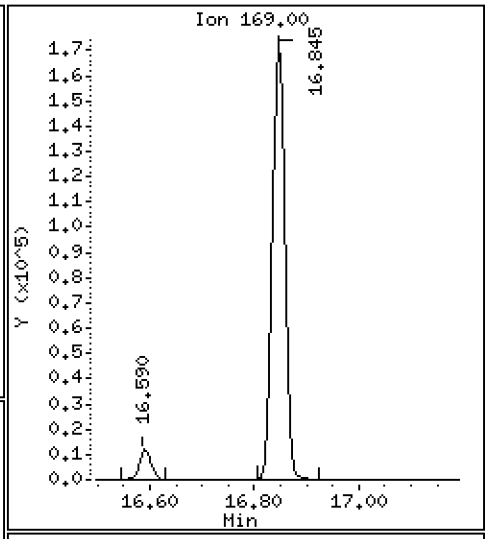
Concentration: 4.546 ug/mL

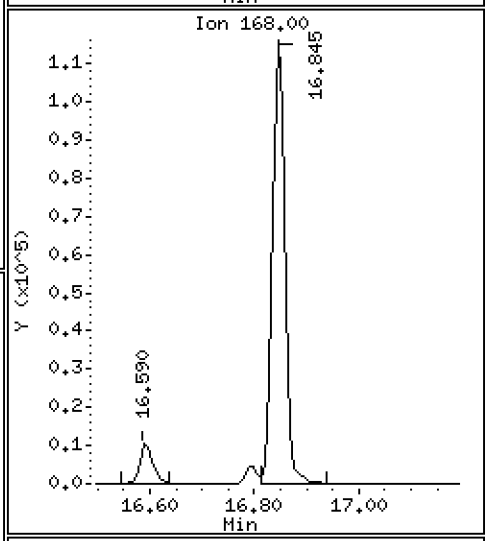


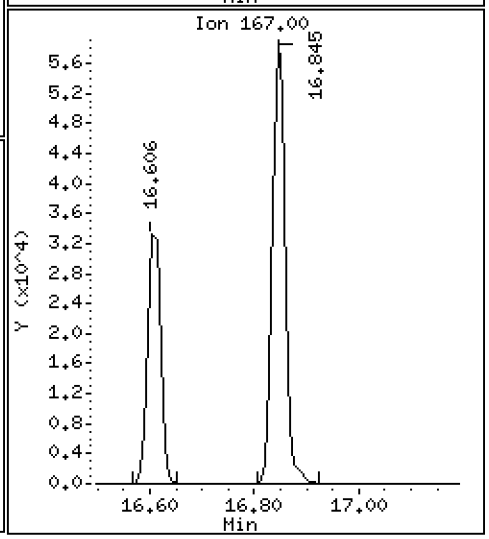












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

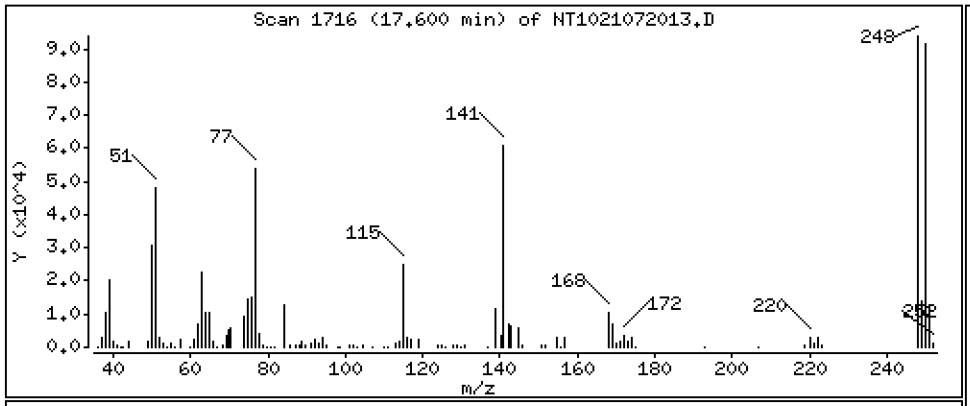
Operator: VTS

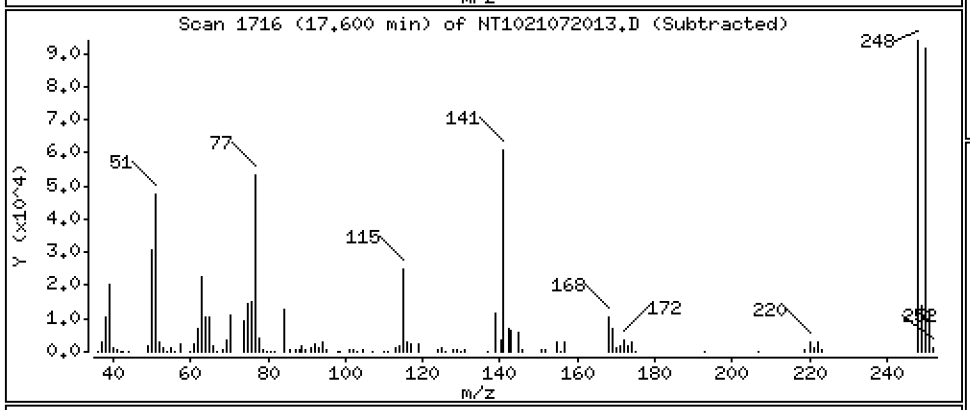
Column phase: ZB-5msi

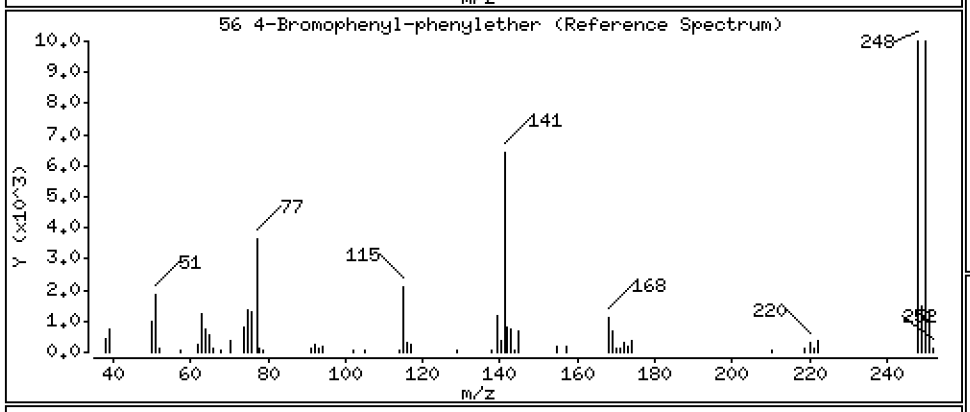
Column diameter: 0.25

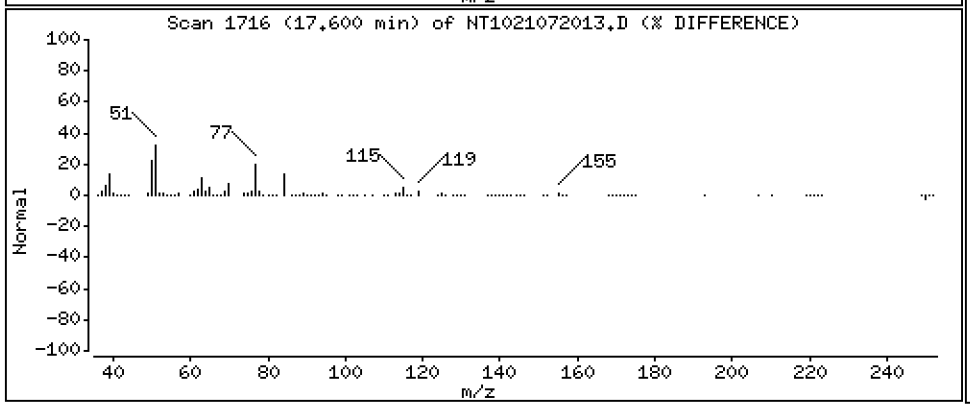
56 4-Bromophenyl-phenylether

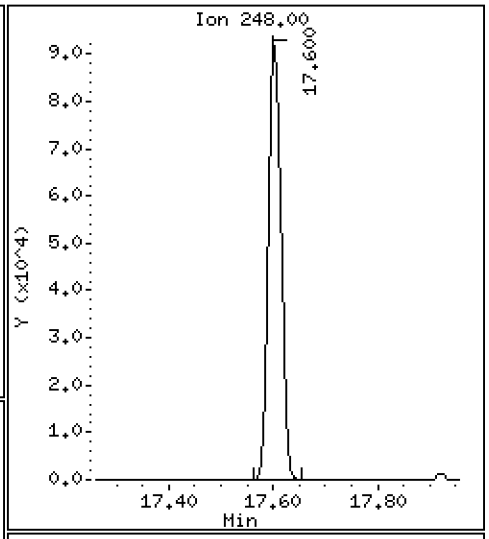
Concentration: 4.934 ug/mL

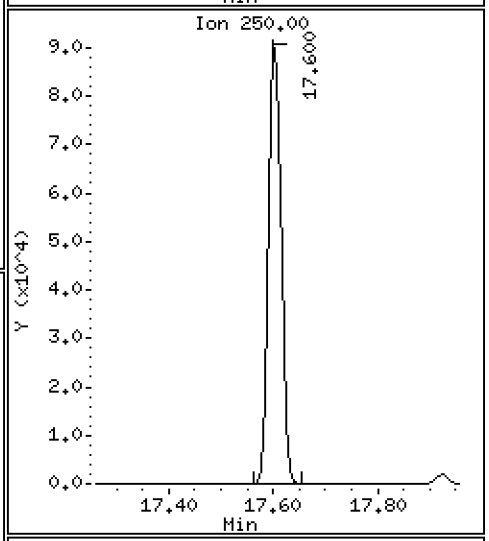


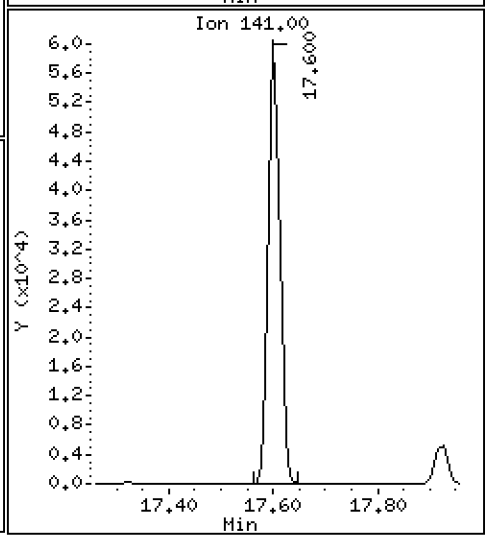












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

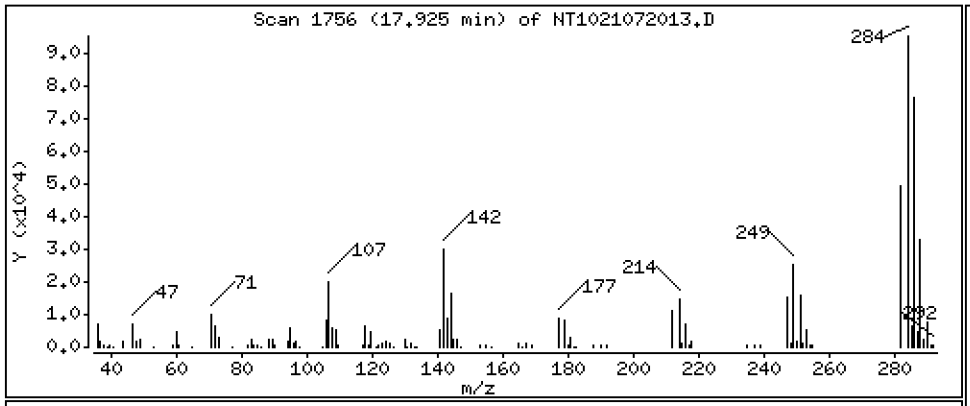
Operator: VTS

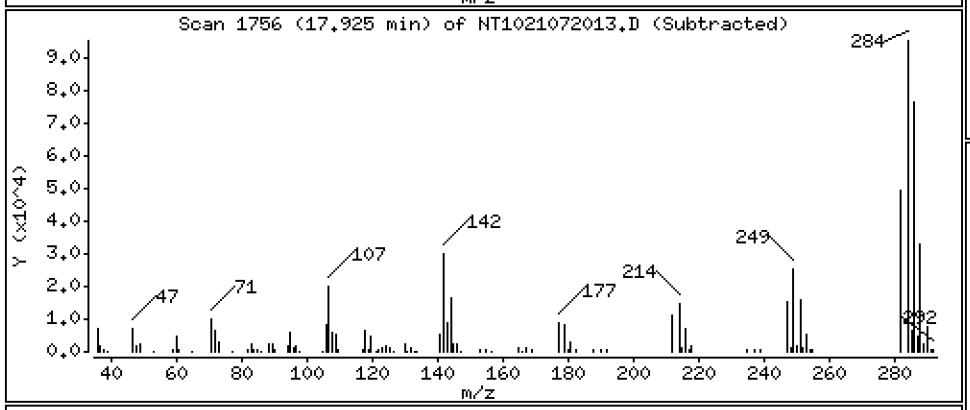
Column phase: ZB-5msi

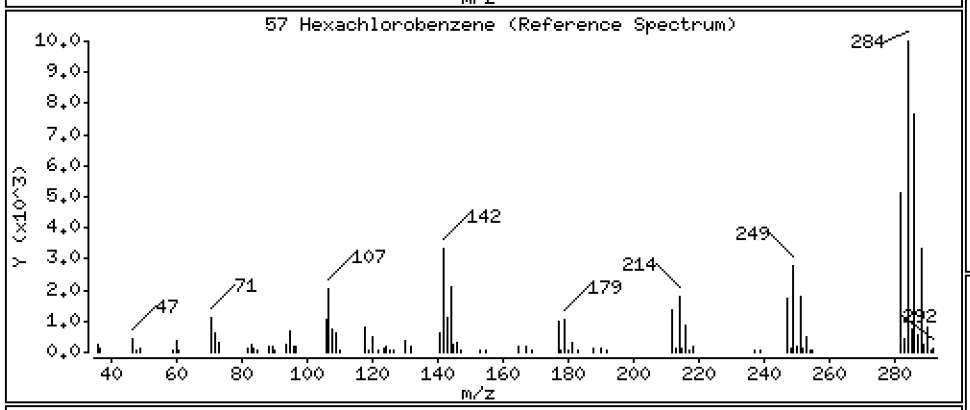
Column diameter: 0.25

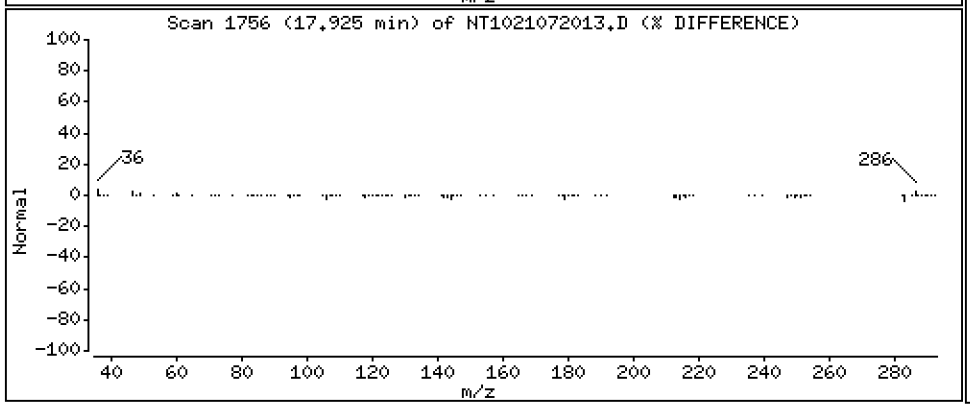
57 Hexachlorobenzene

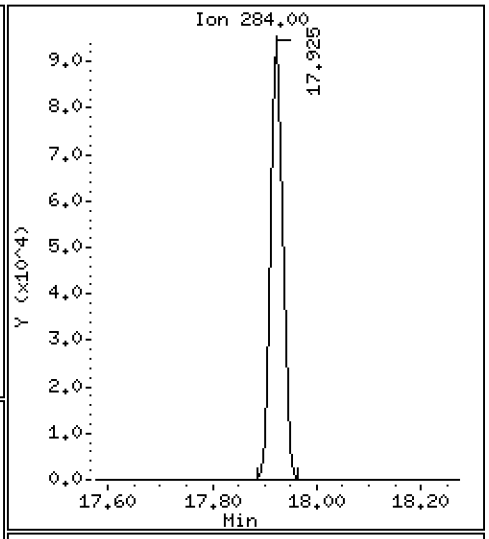
Concentration: 4.773 ug/mL

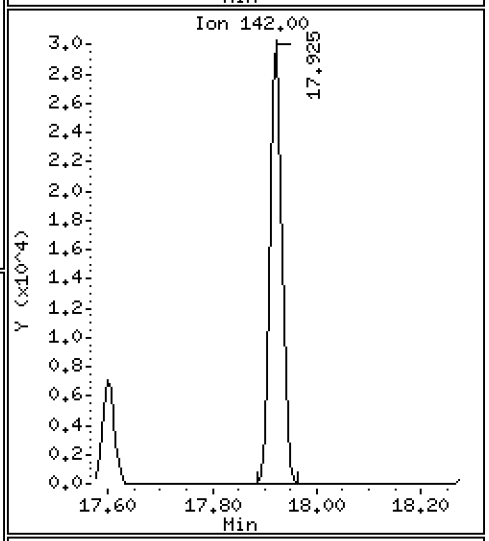


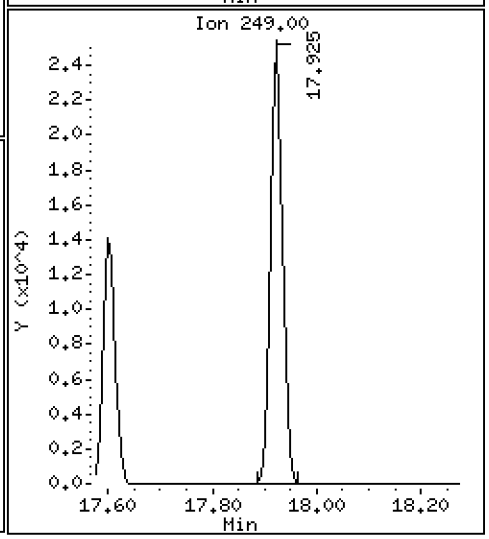












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

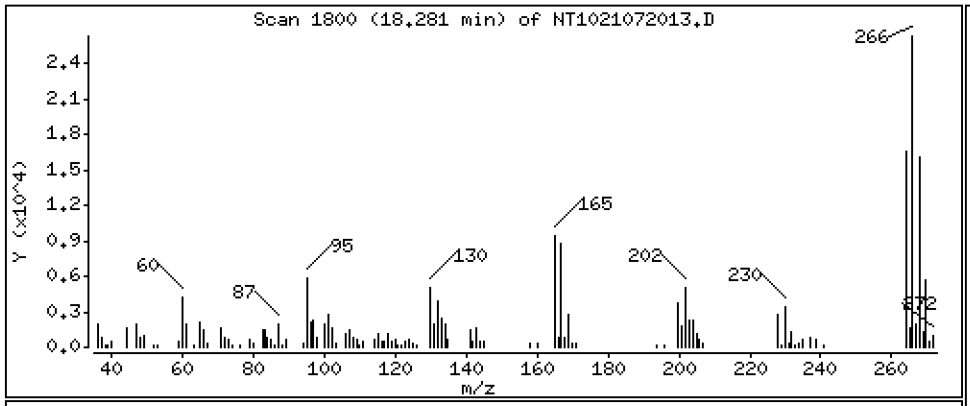
Operator: VTS

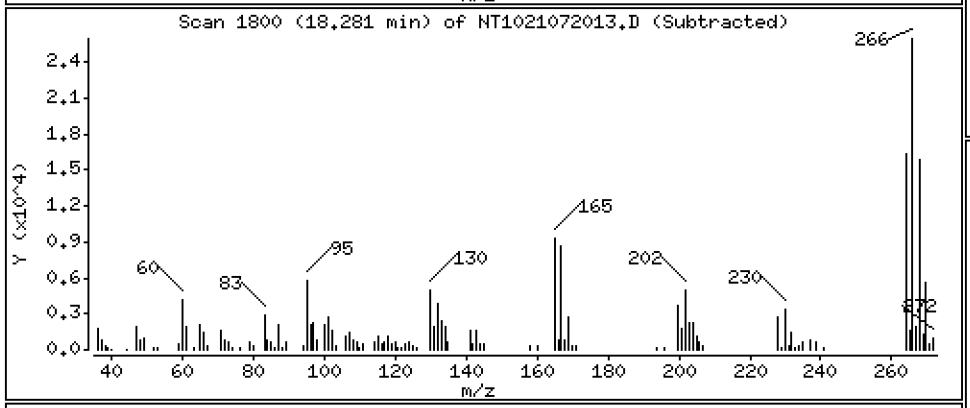
Column phase: ZB-5msi

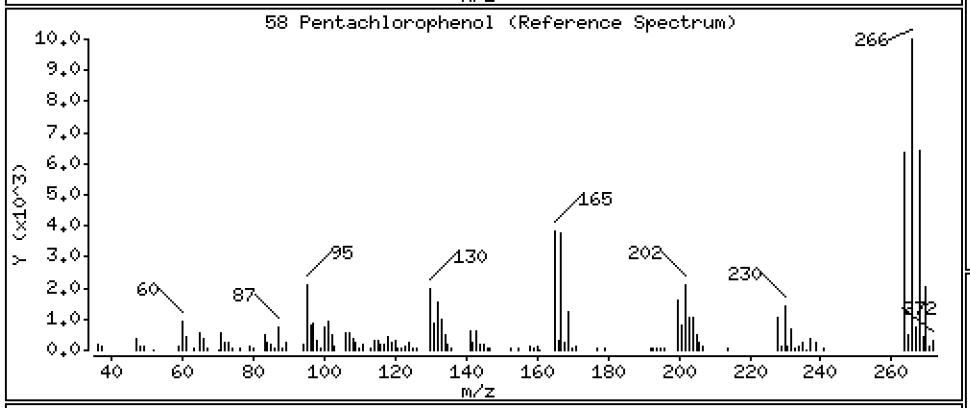
Column diameter: 0.25

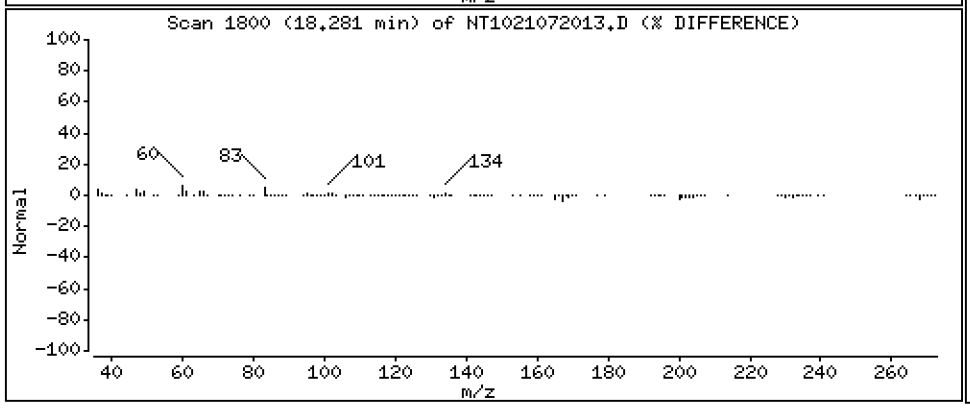
58 Pentachlorophenol

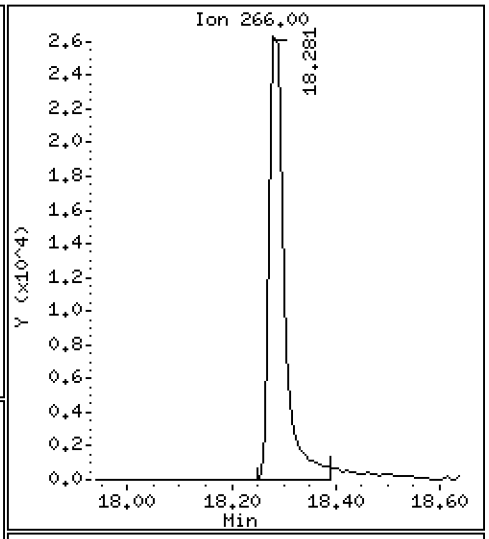
Concentration: 3.987 ug/mL

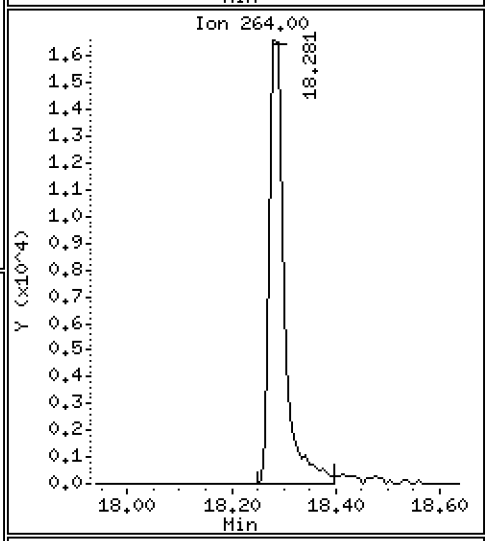


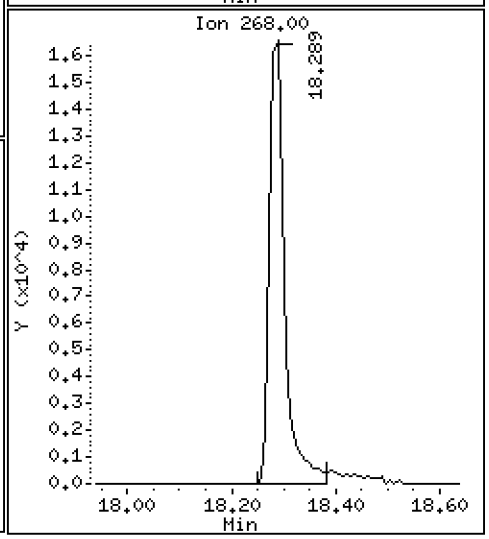












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

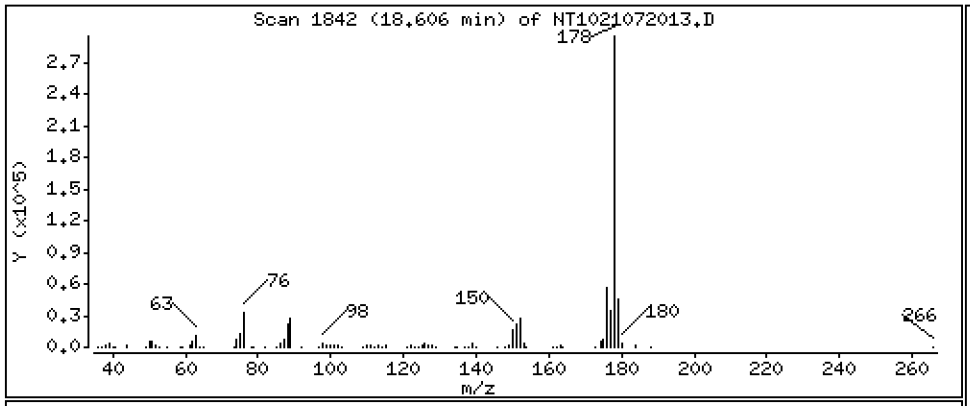
Operator: VTS

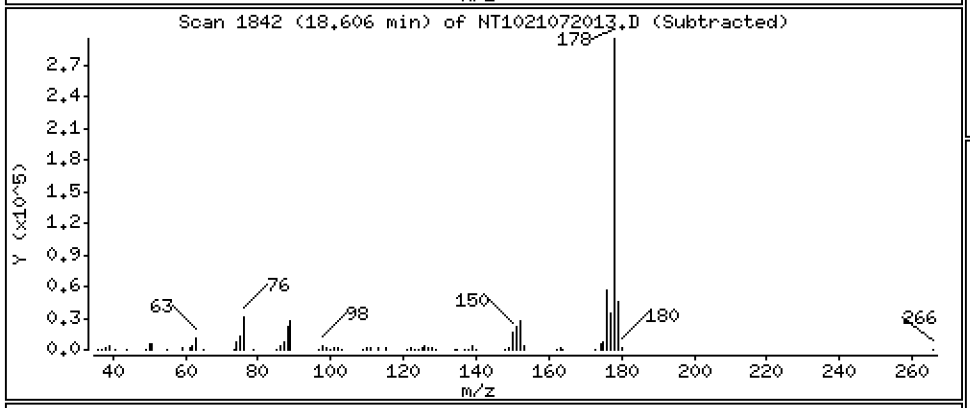
Column phase: ZB-5msi

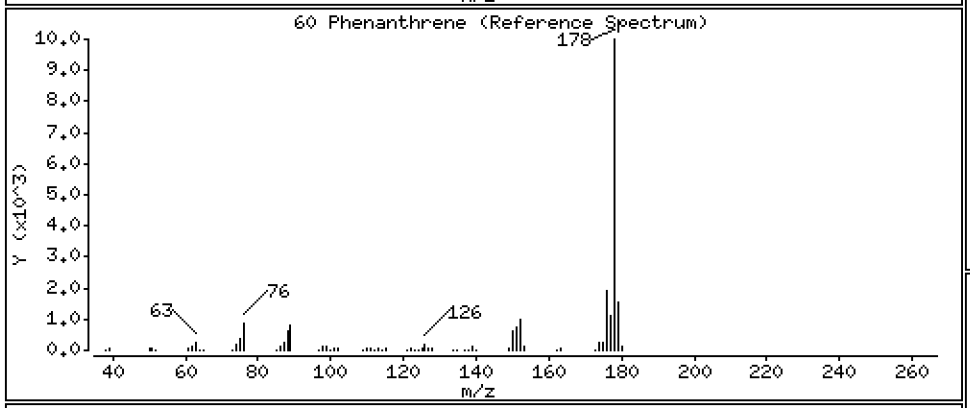
Column diameter: 0.25

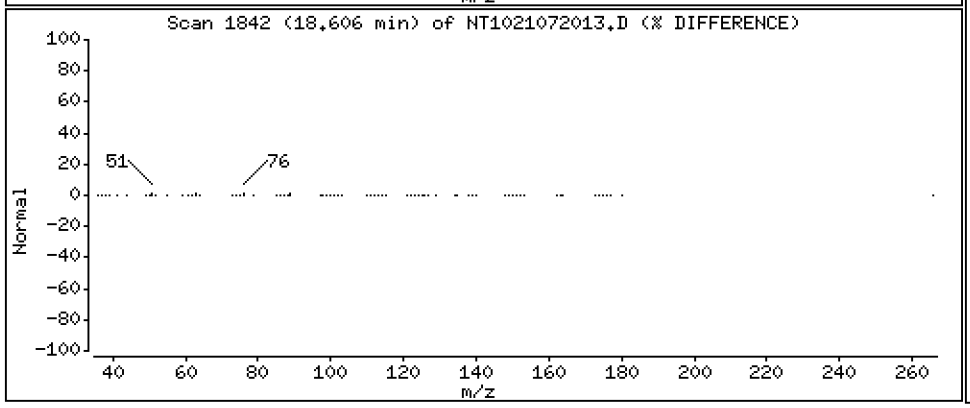
60 Phenanthrene

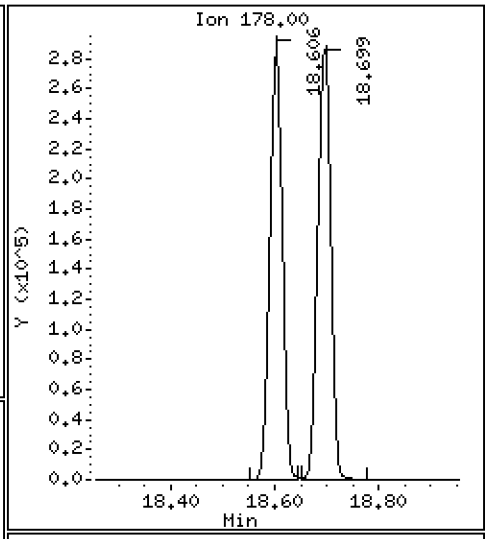
Concentration: 5.038 ug/mL

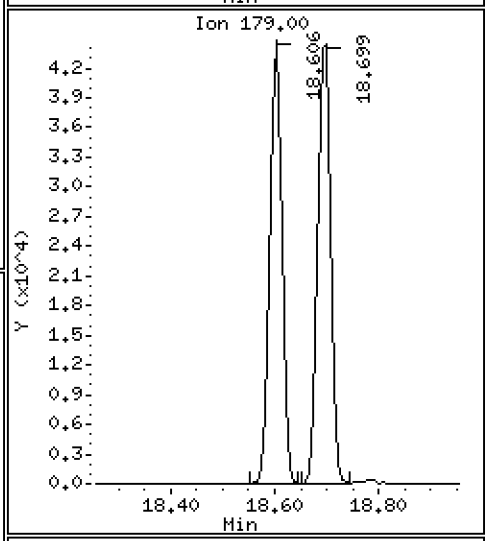


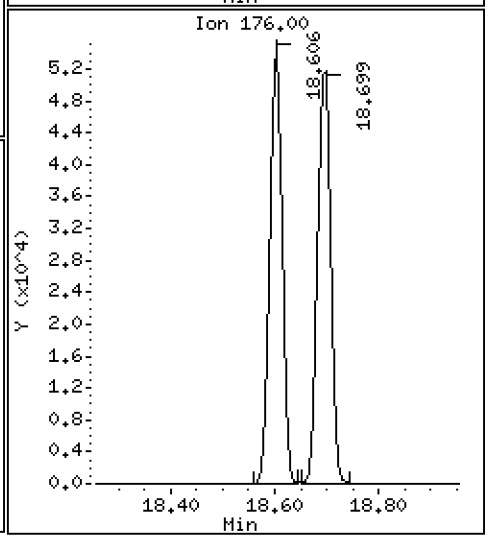












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

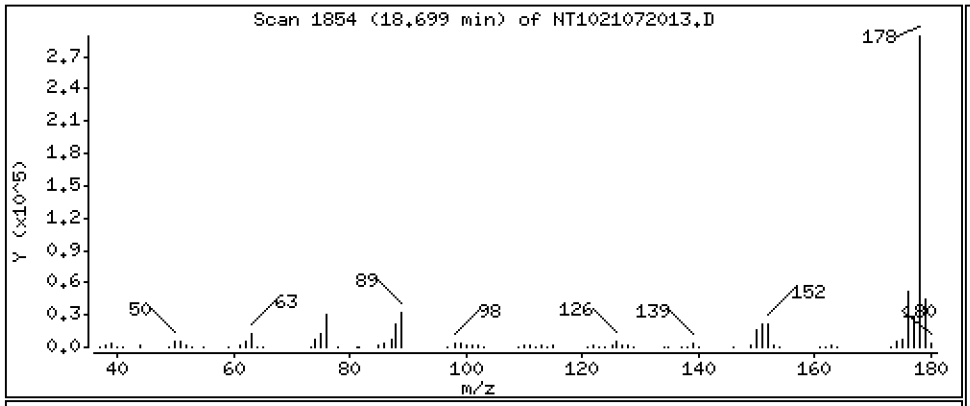
Operator: VTS

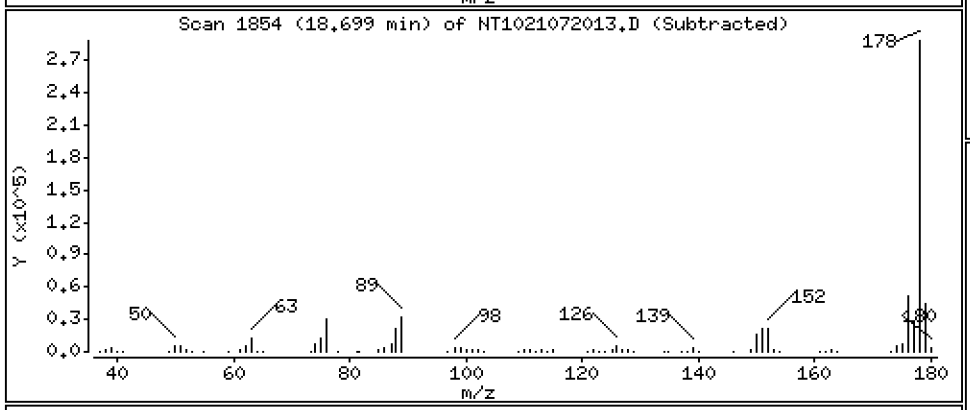
Column phase: ZB-5msi

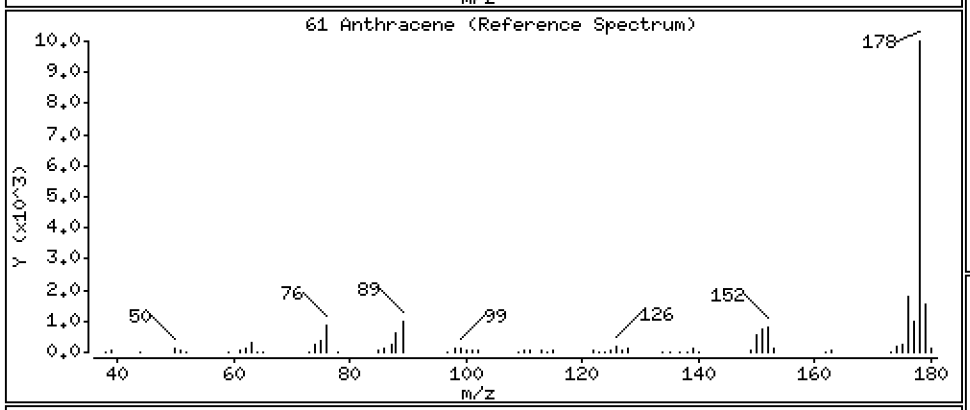
Column diameter: 0.25

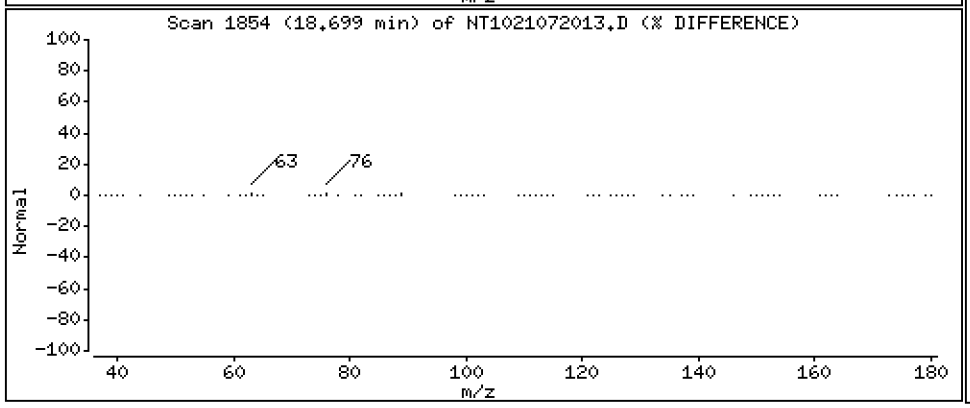
61 Anthracene

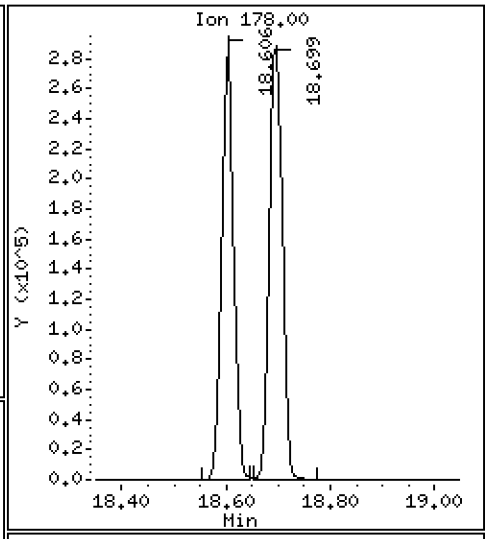
Concentration: 5.020 ug/mL

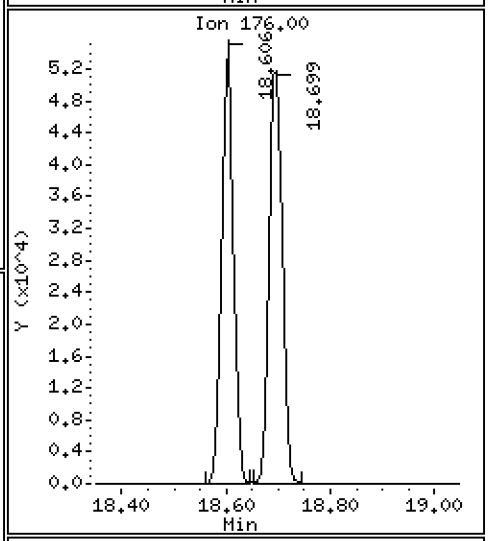


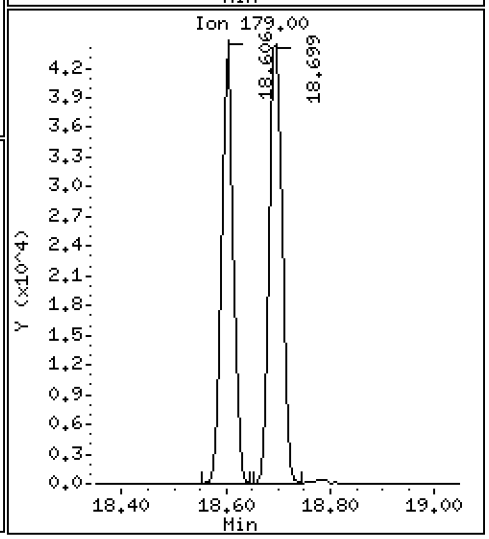












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

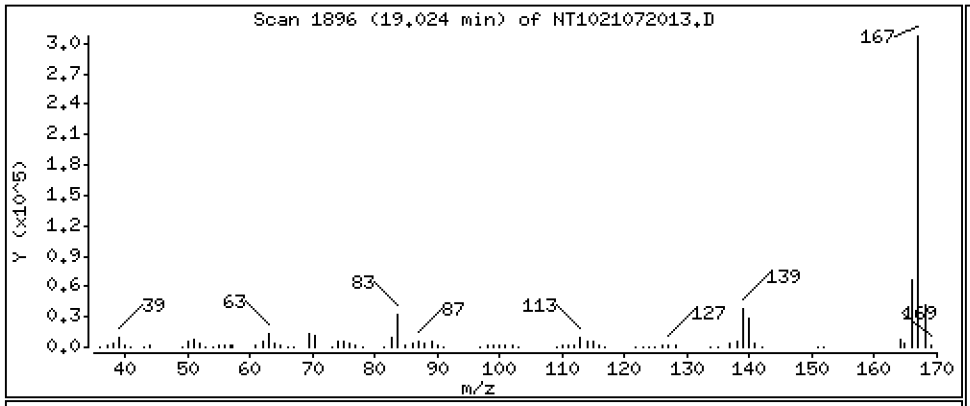
Operator: VTS

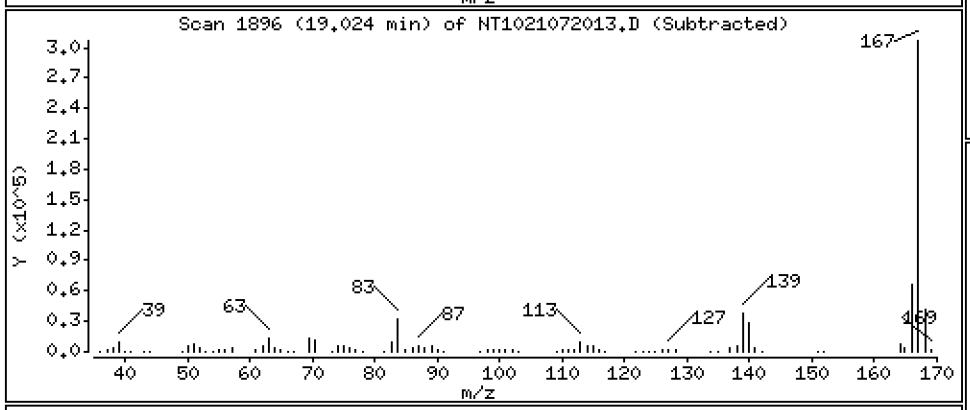
Column phase: ZB-5msi

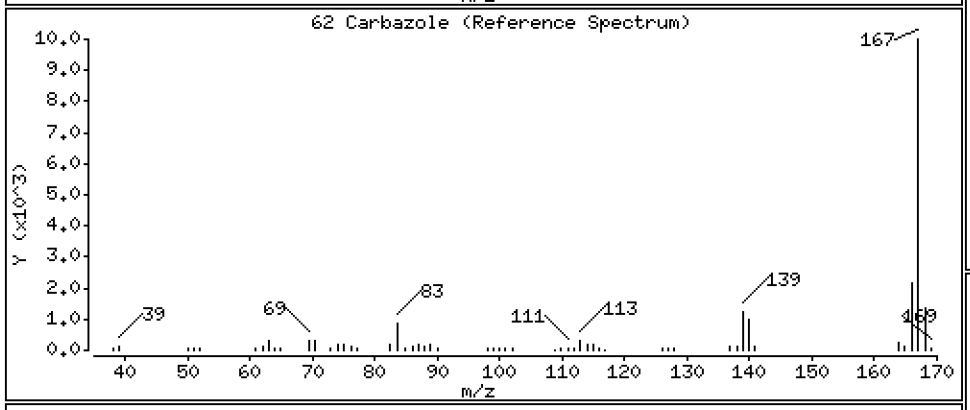
Column diameter: 0.25

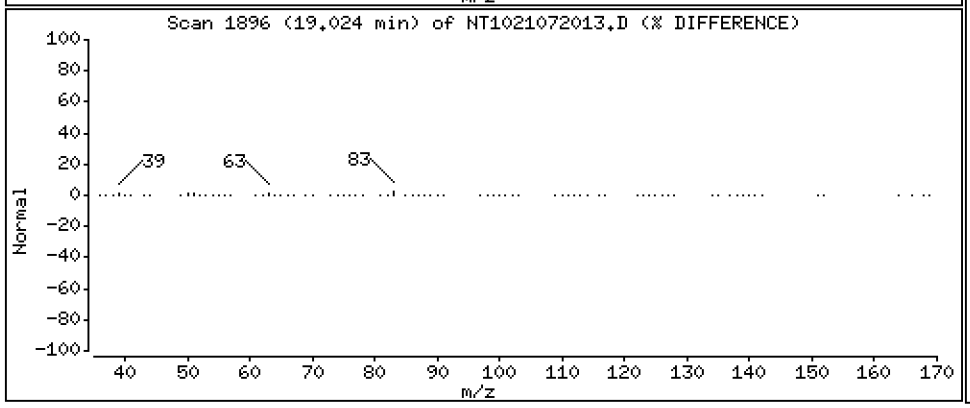
62 Carbazole

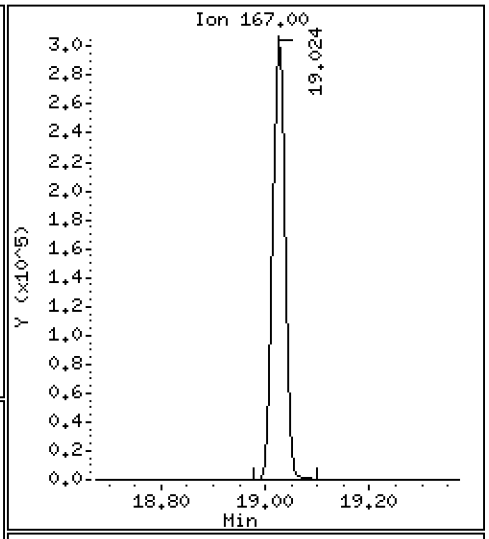
Concentration: 5.033 ug/mL

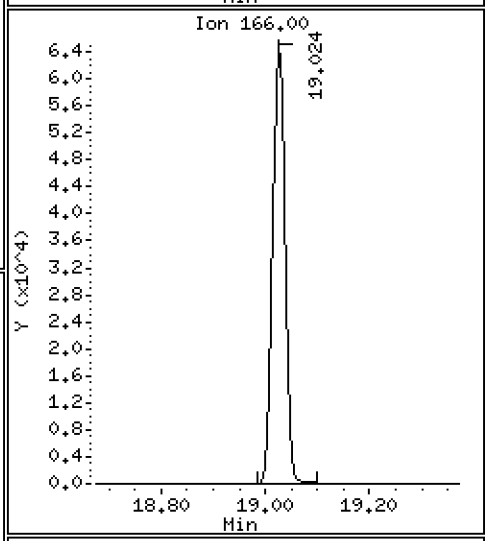


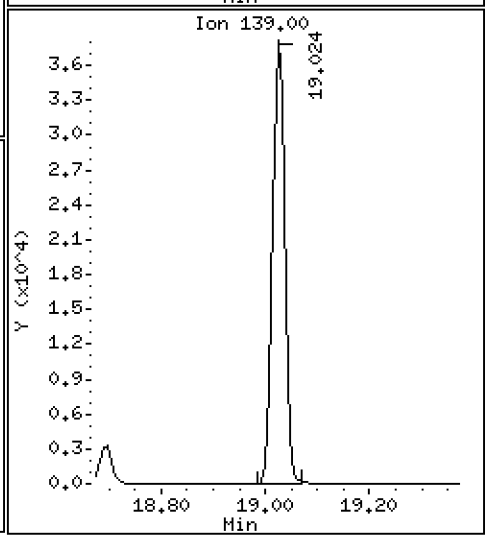












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

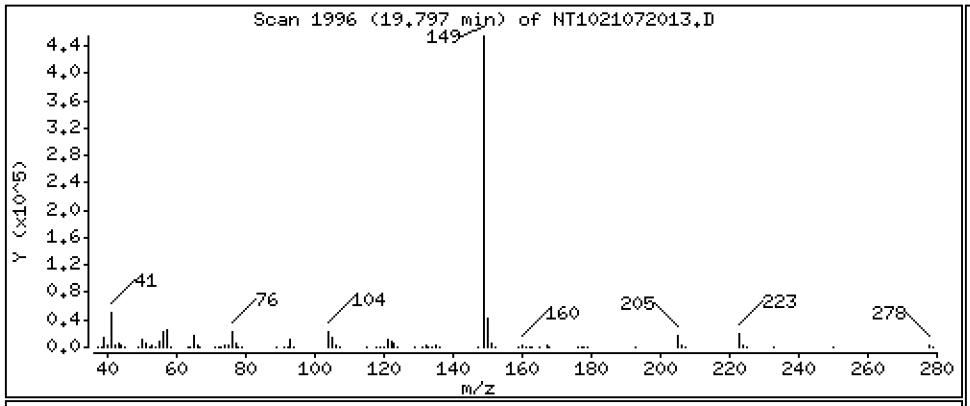
Operator: VTS

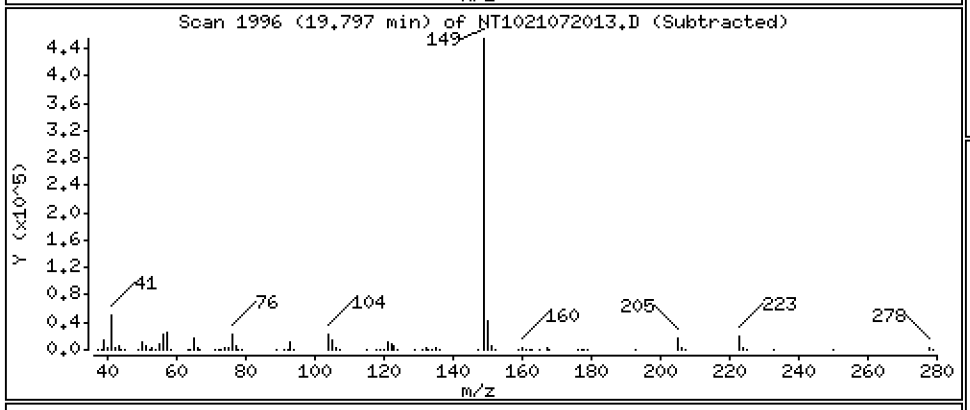
Column phase: ZB-5msi

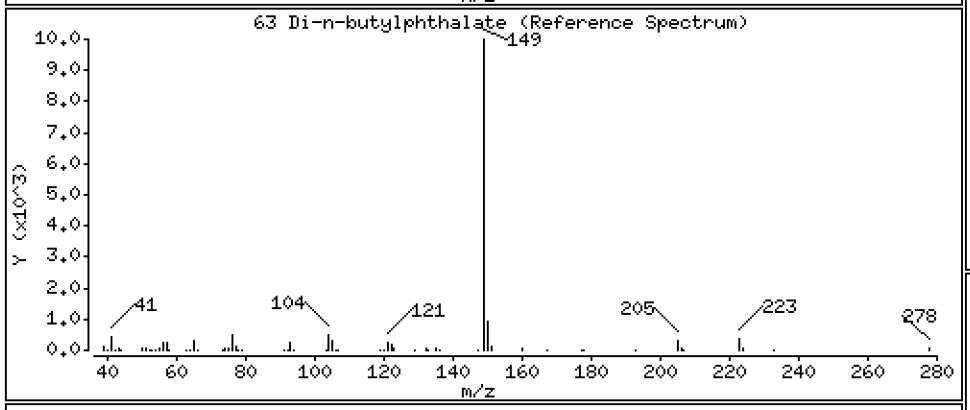
Column diameter: 0.25

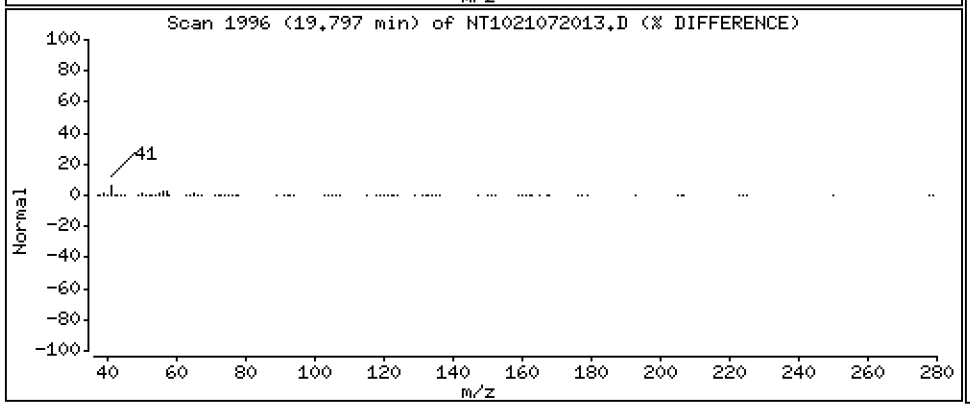
63 Di-n-butylphthalate

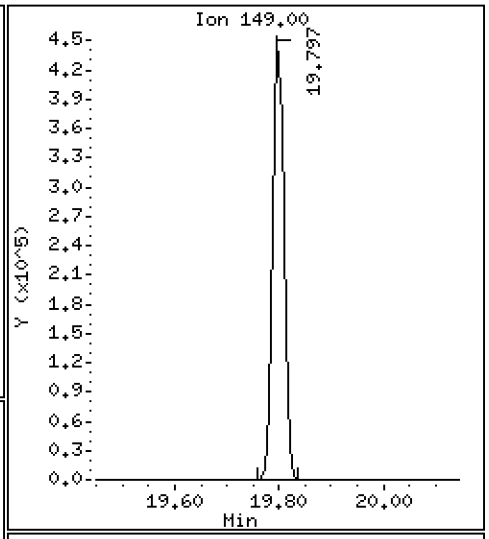
Concentration: 4.276 ug/mL

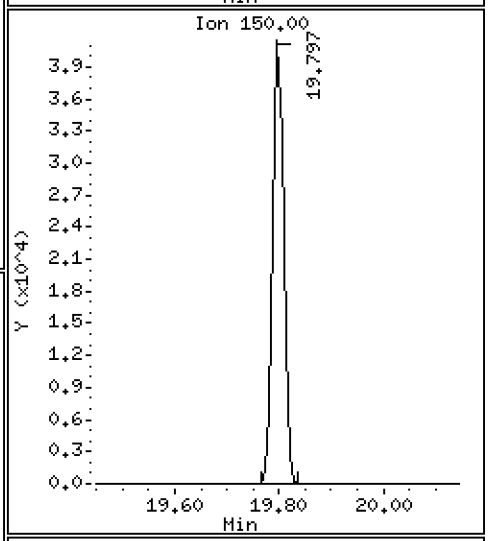


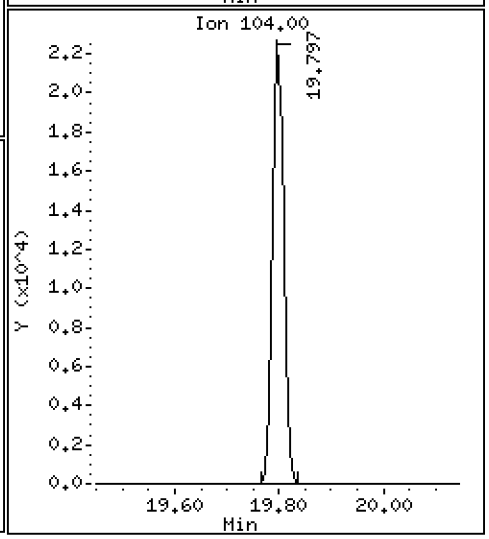












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

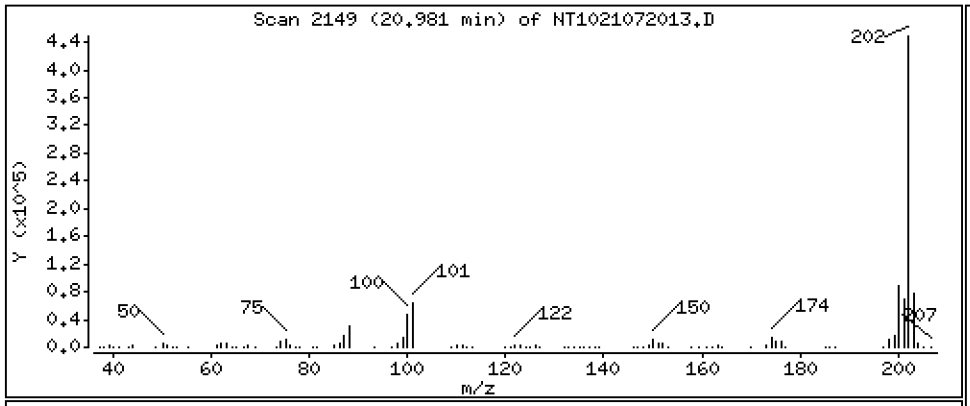
Operator: VTS

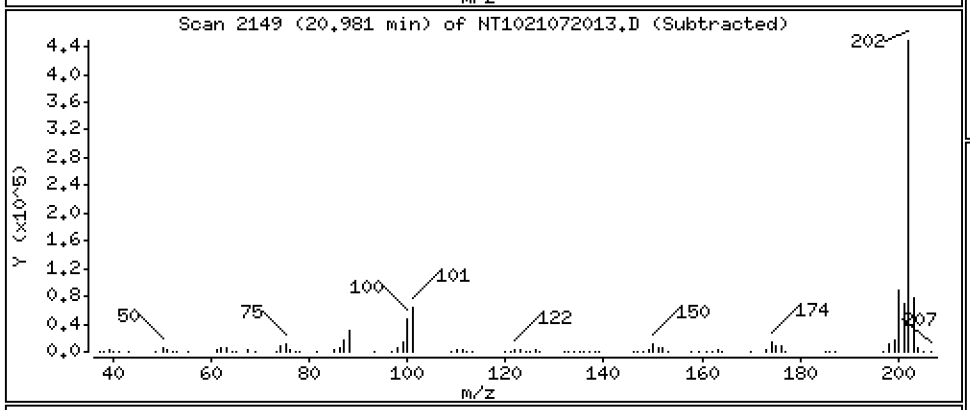
Column phase: ZB-5msi

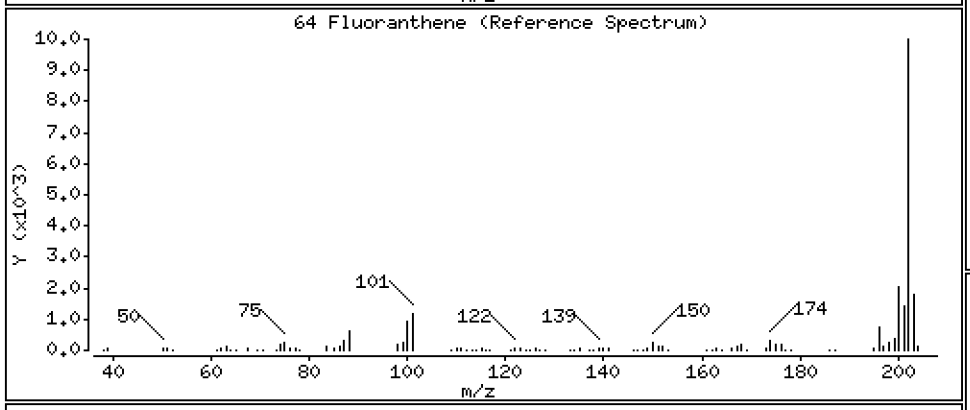
Column diameter: 0.25

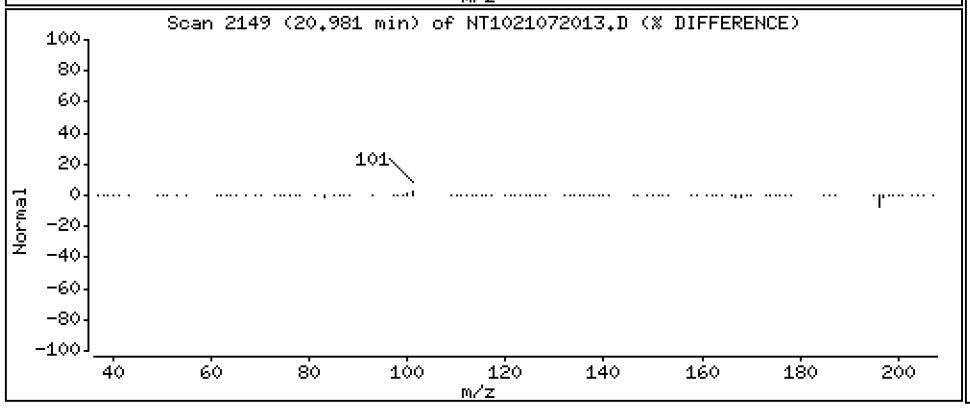
64 Fluoranthene

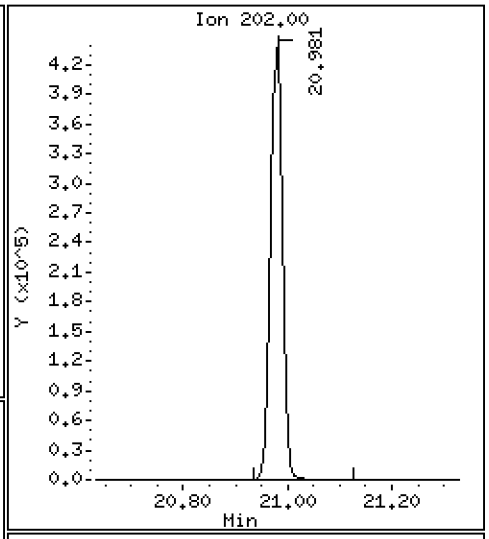
Concentration: 4.950 ug/mL

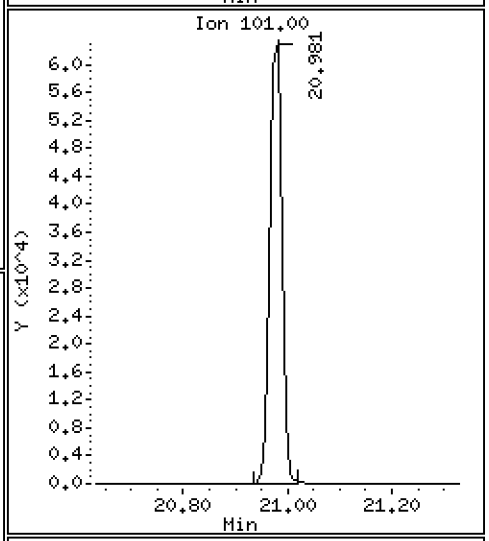


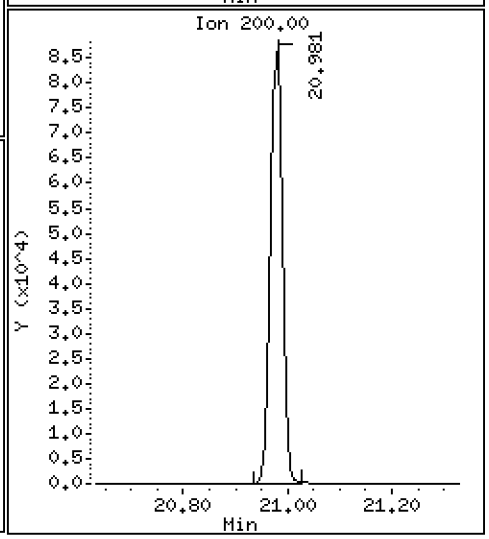












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

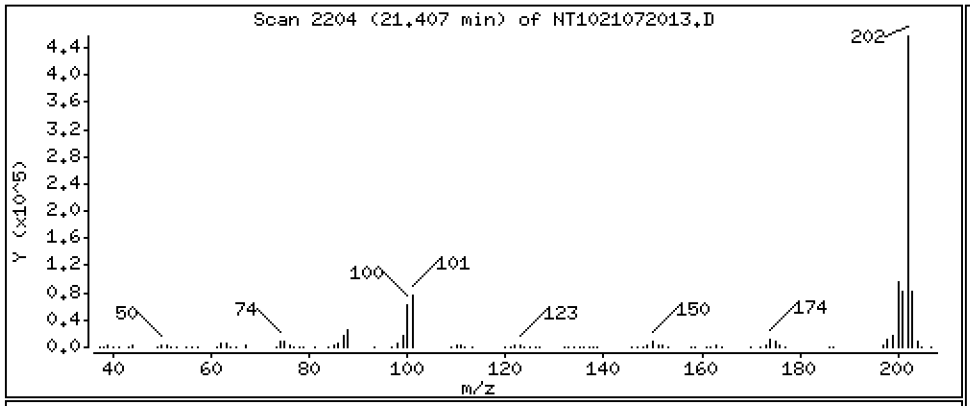
Operator: VTS

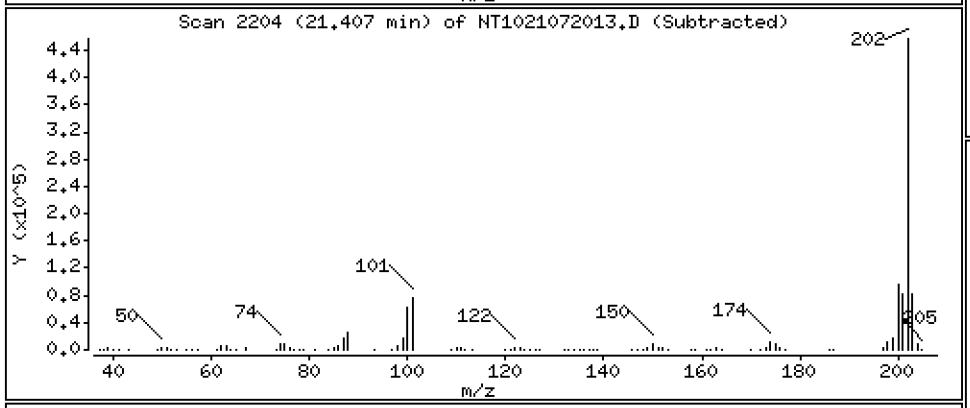
Column phase: ZB-5msi

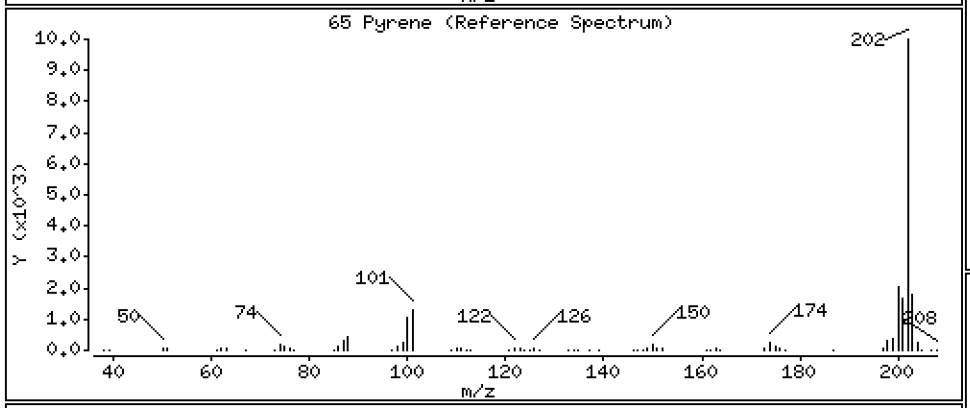
Column diameter: 0.25

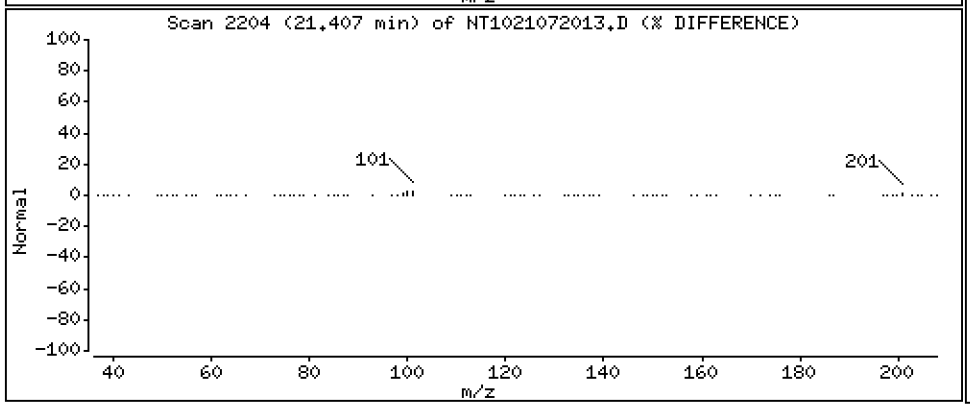
65 Pyrene

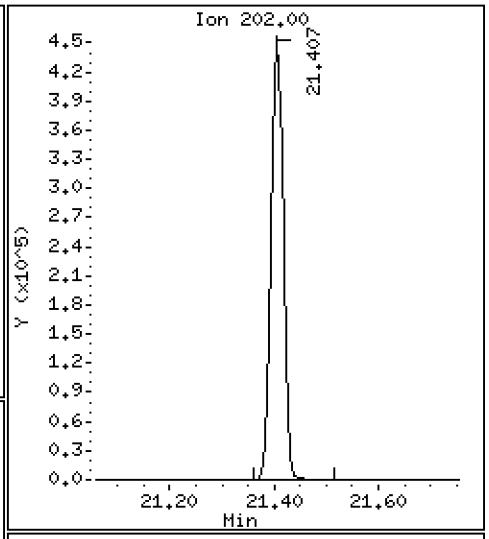
Concentration: 5.254 ug/mL

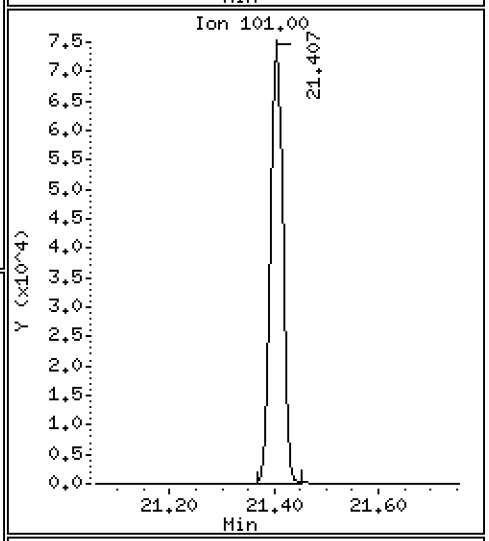


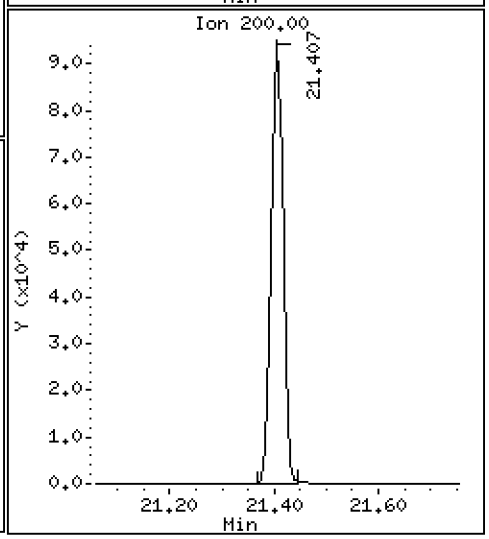












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

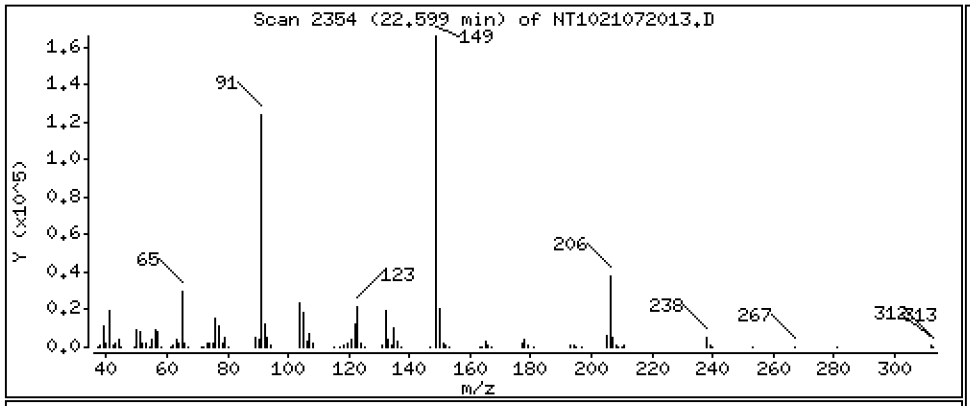
Operator: VTS

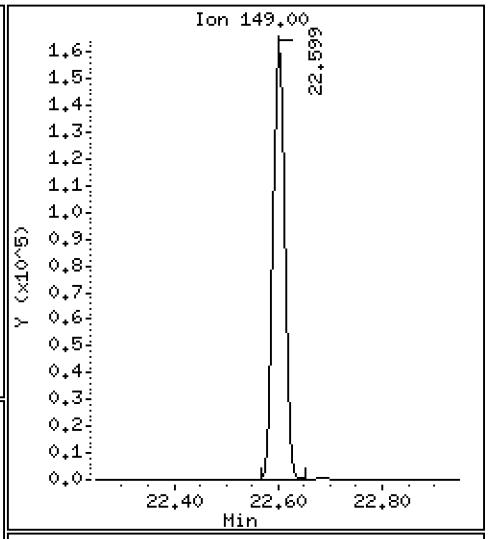
Column phase: ZB-5msi

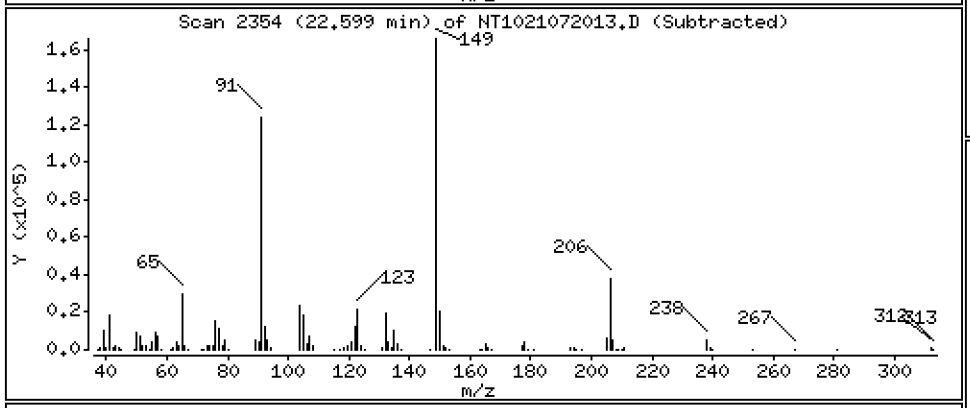
Column diameter: 0.25

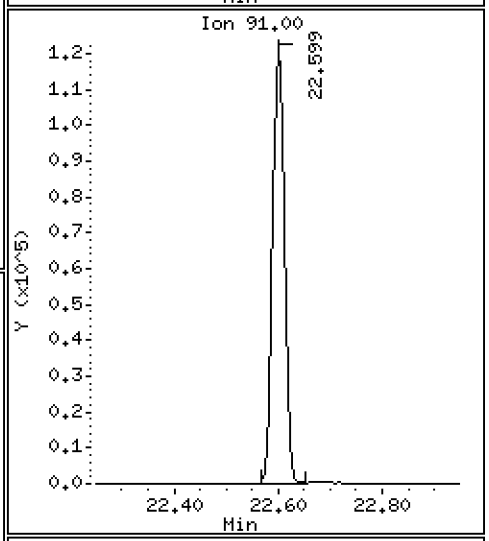
67 Butylbenzylphthalate

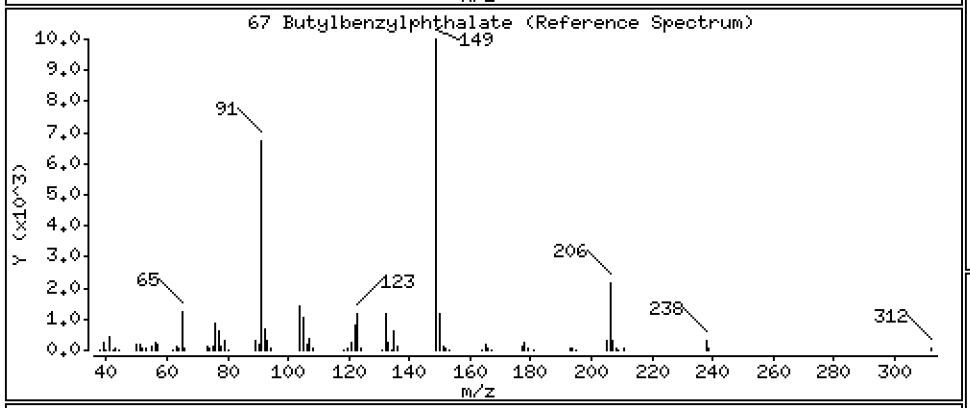
Concentration: 4.974 ug/mL

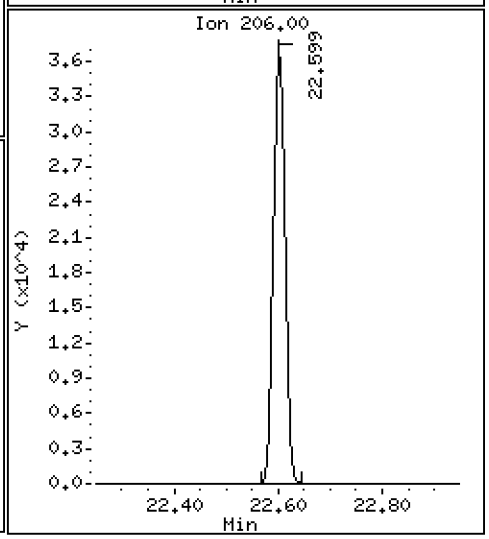


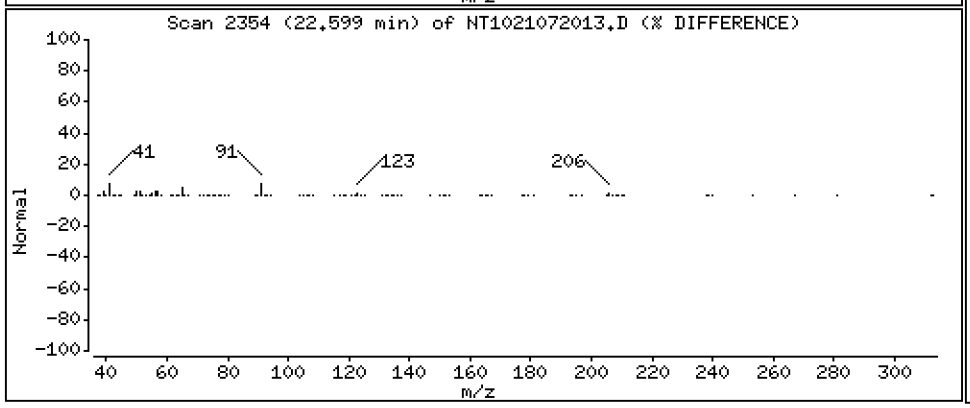












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

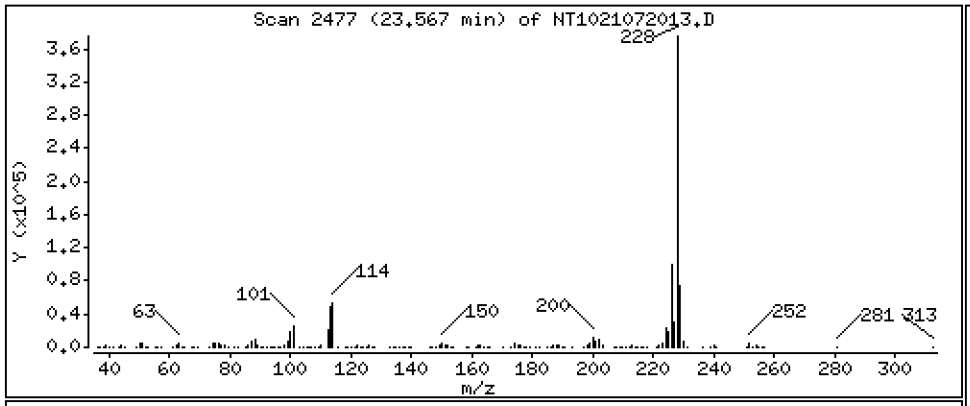
Operator: VTS

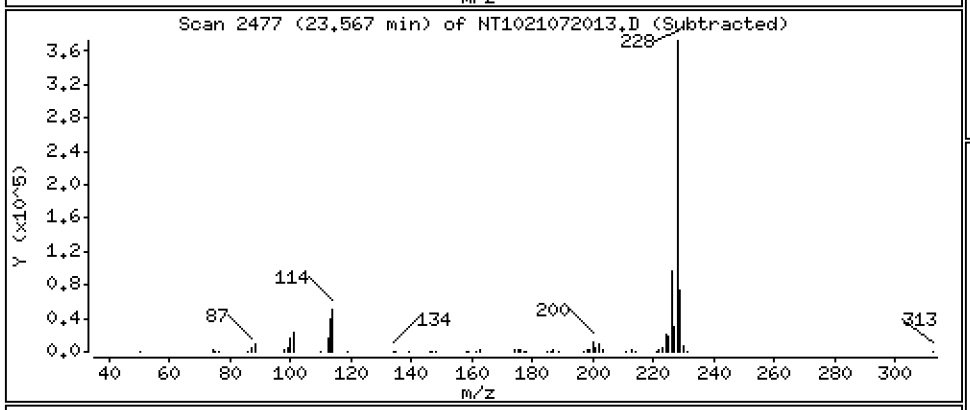
Column phase: ZB-5msi

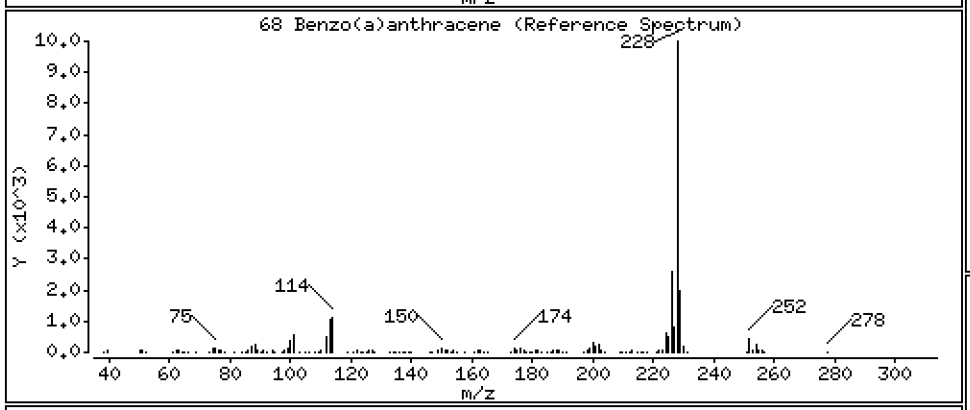
Column diameter: 0.25

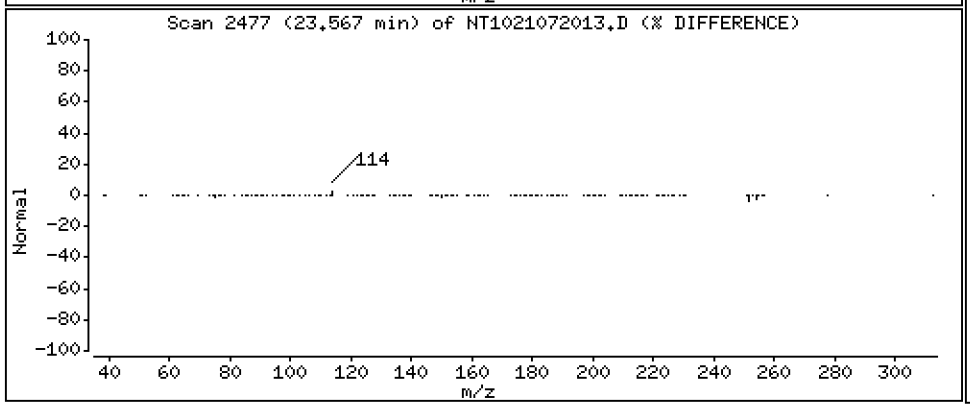
68 Benzo(a)anthracene

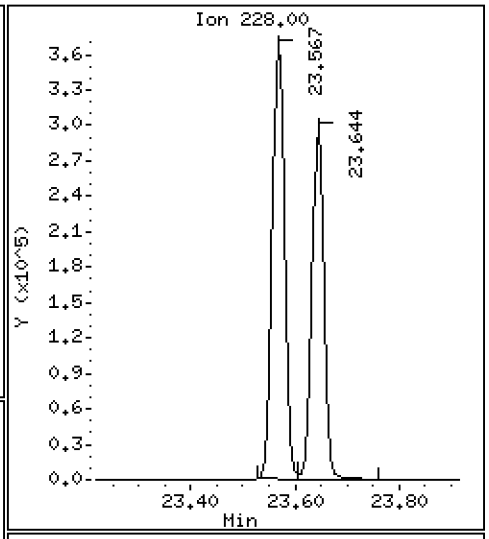
Concentration: 4.800 ug/mL

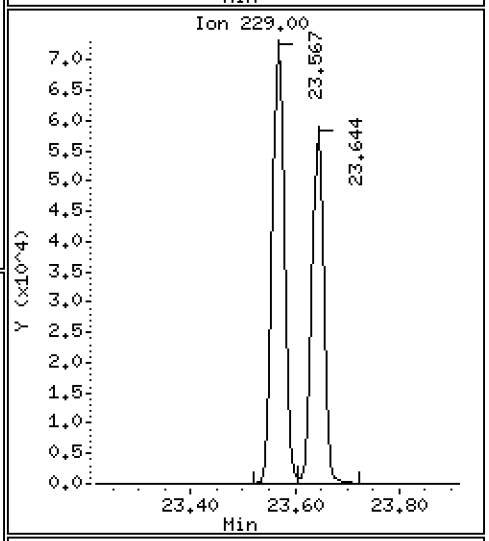


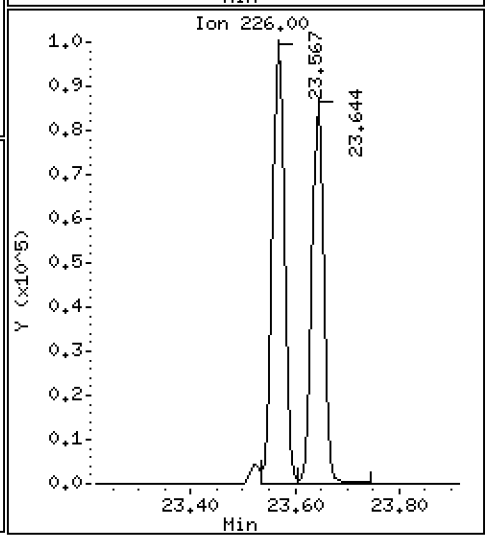












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

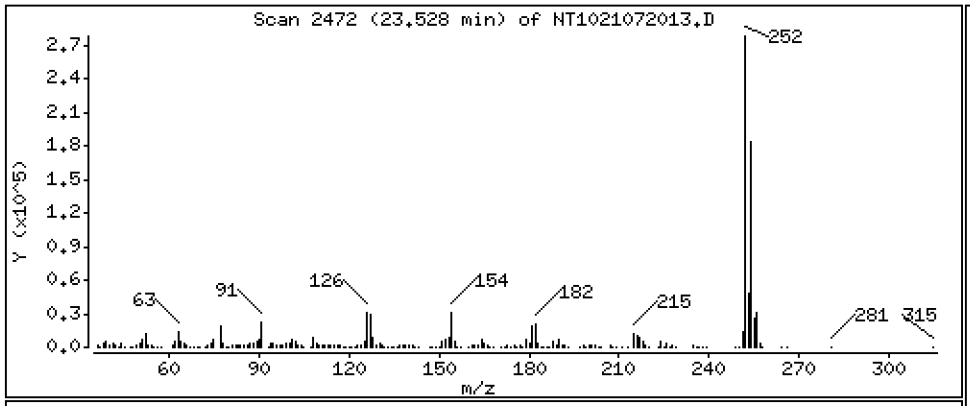
Operator: VTS

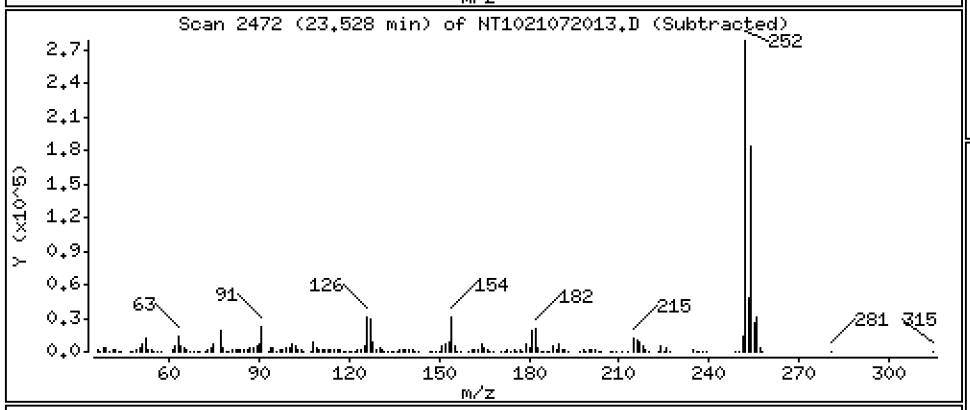
Column phase: ZB-5msi

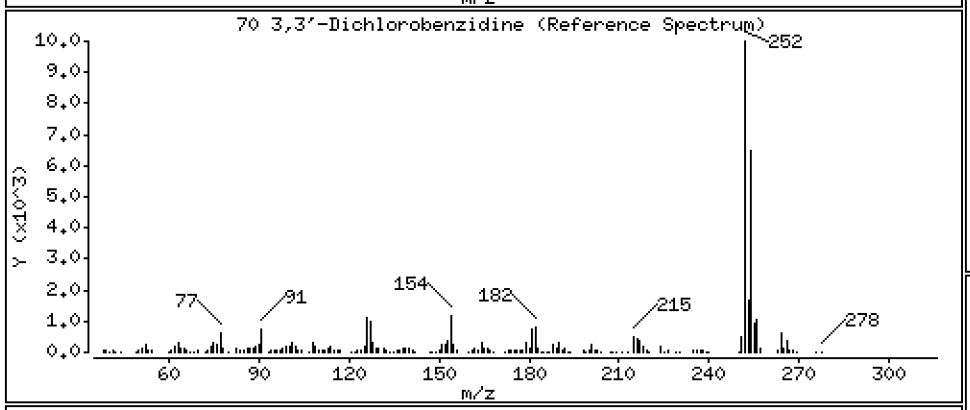
Column diameter: 0.25

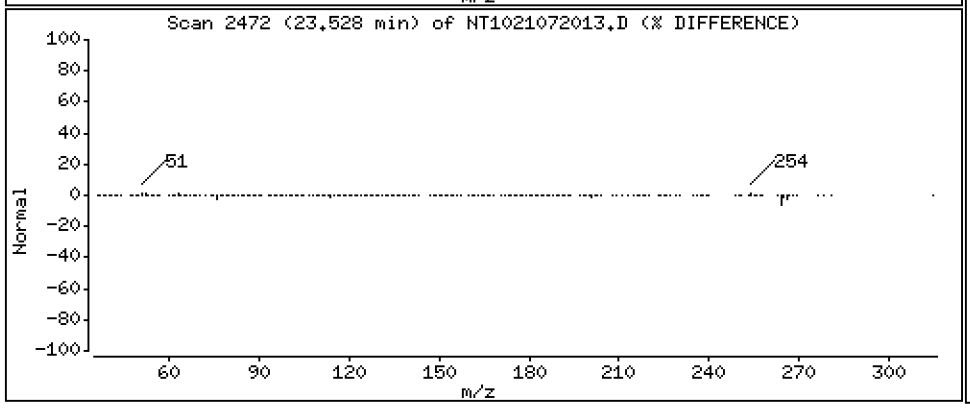
70 3,3'-Dichlorobenzidine

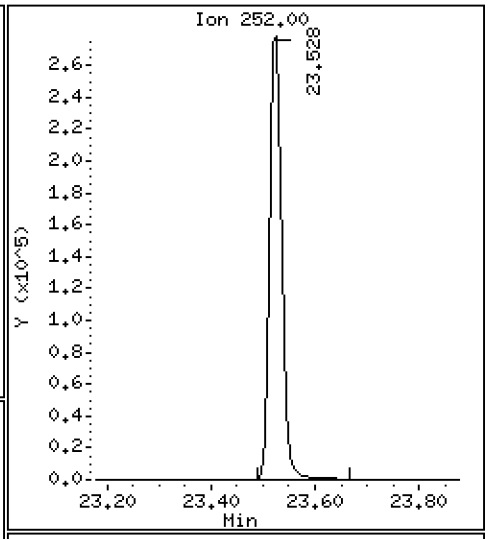
Concentration: 9.013 ug/mL

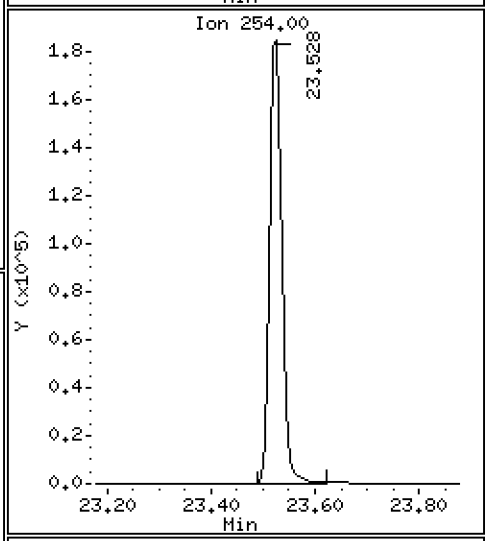


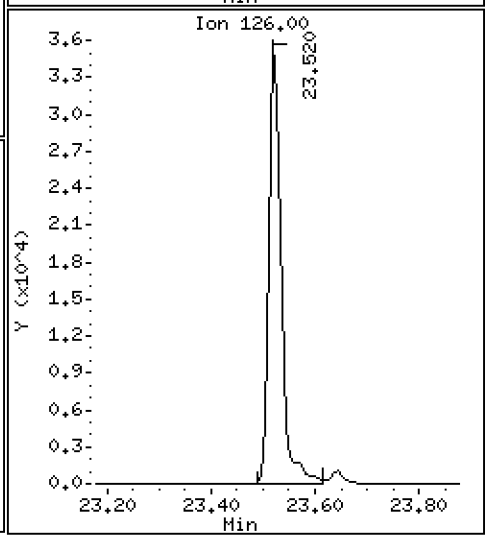












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

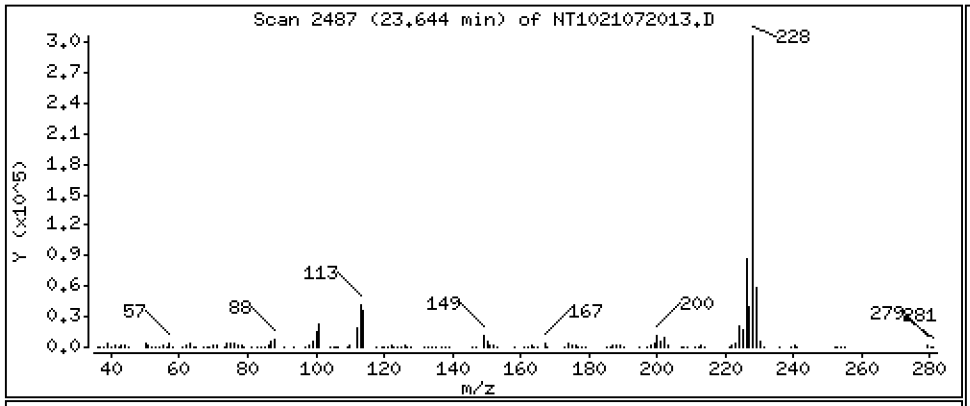
Operator: VTS

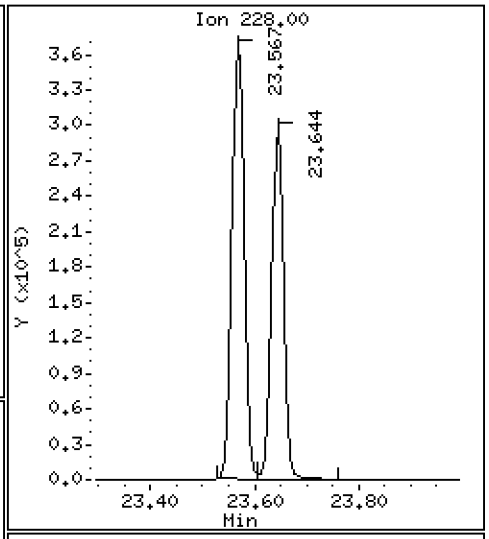
Column phase: ZB-5msi

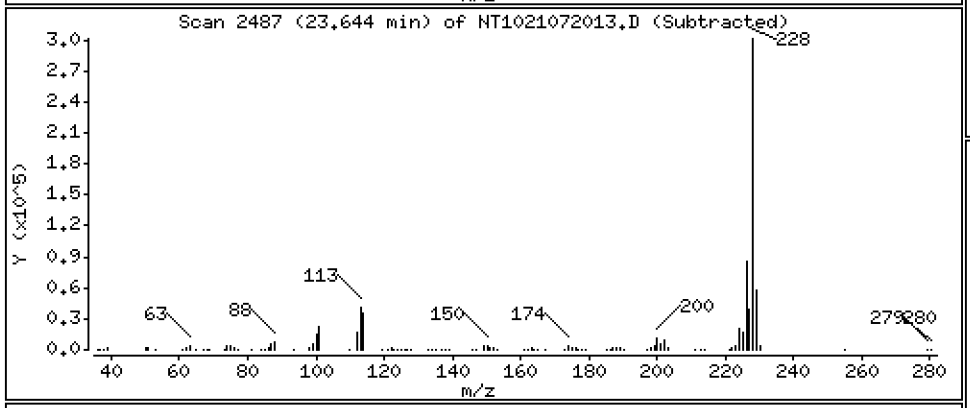
Column diameter: 0.25

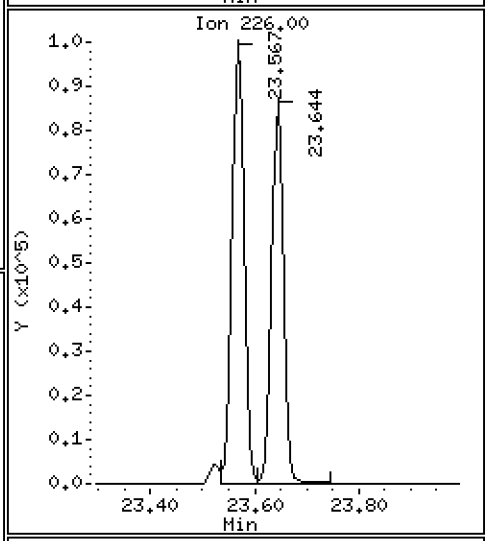
71 Chrysene

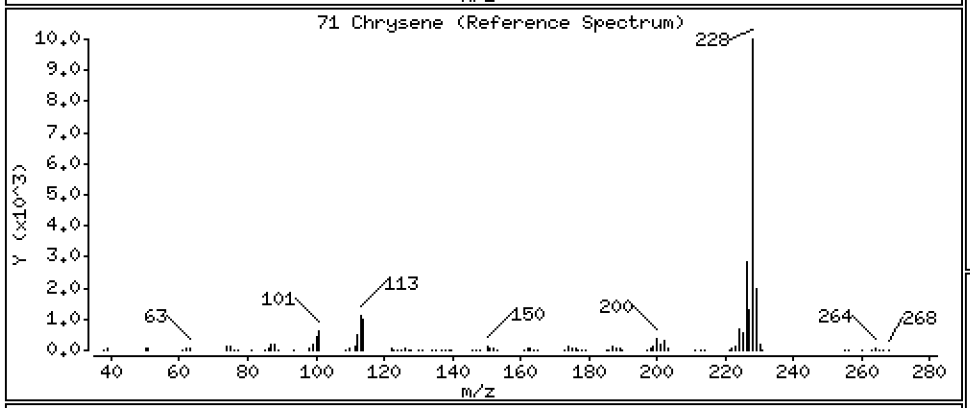
Concentration: 4.859 ug/mL

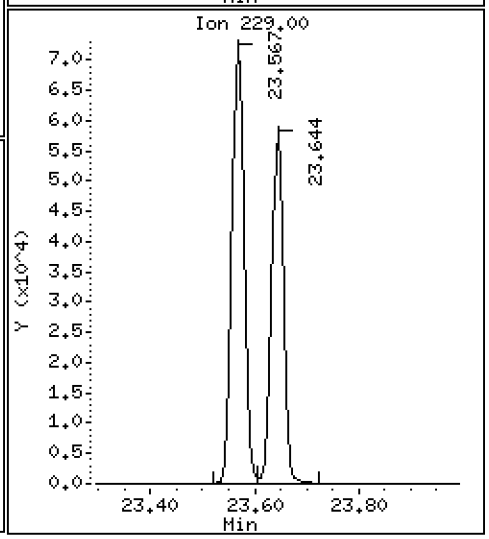


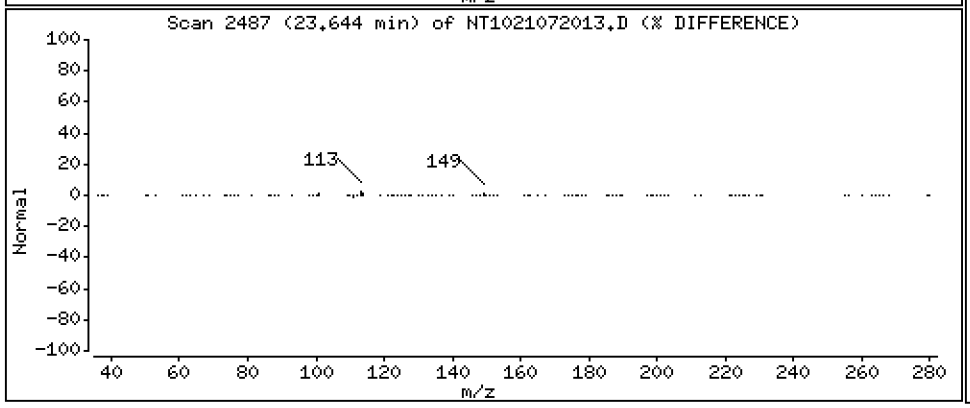












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

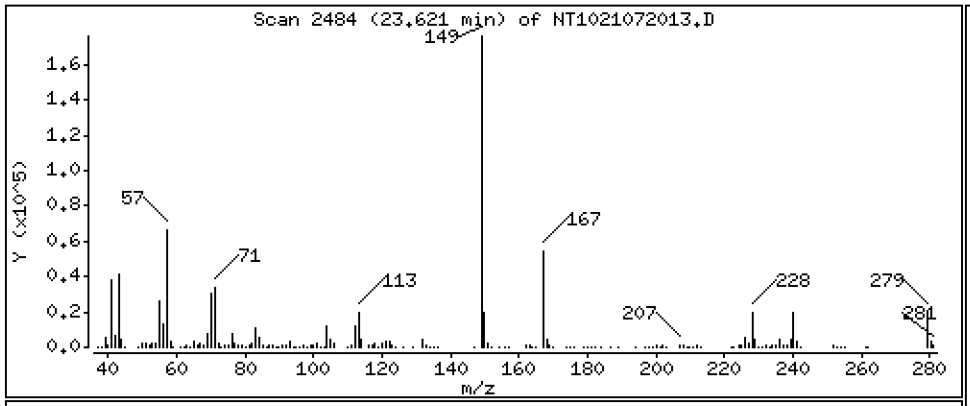
Operator: VTS

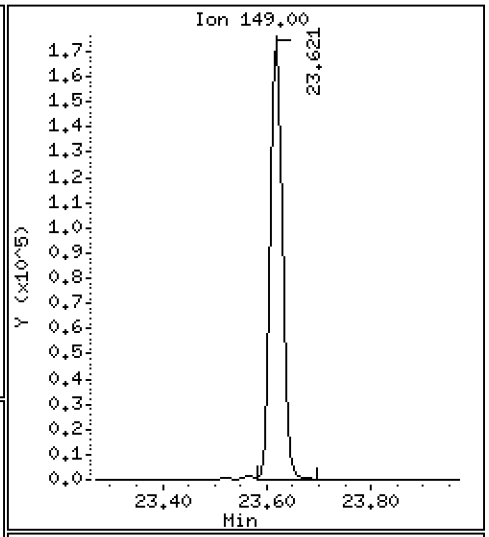
Column phase: ZB-5msi

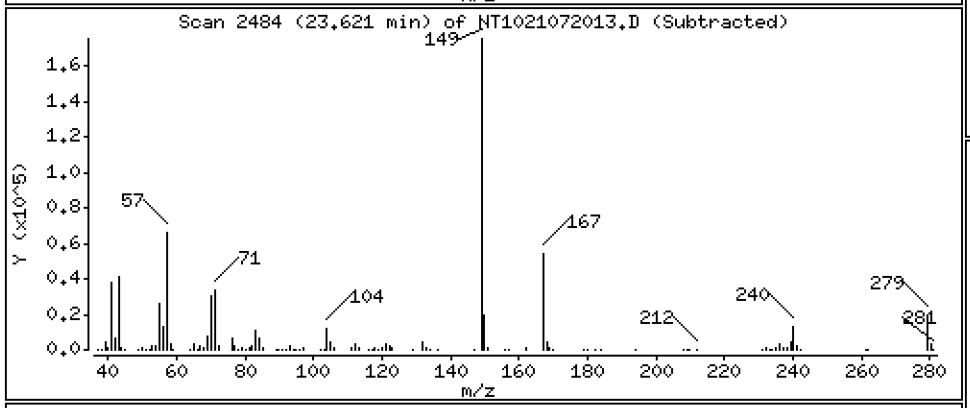
Column diameter: 0.25

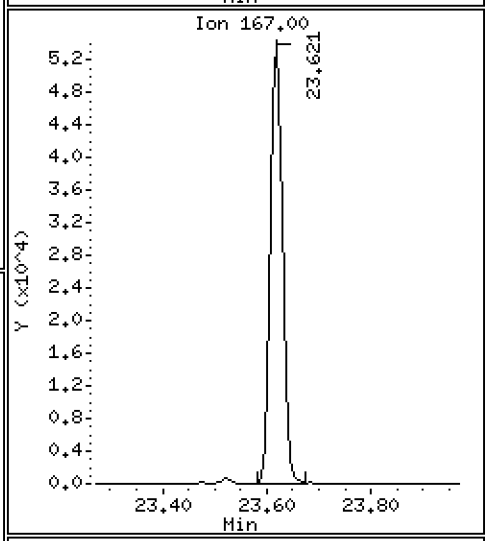
72 bis(2-Ethylhexyl)phthalate

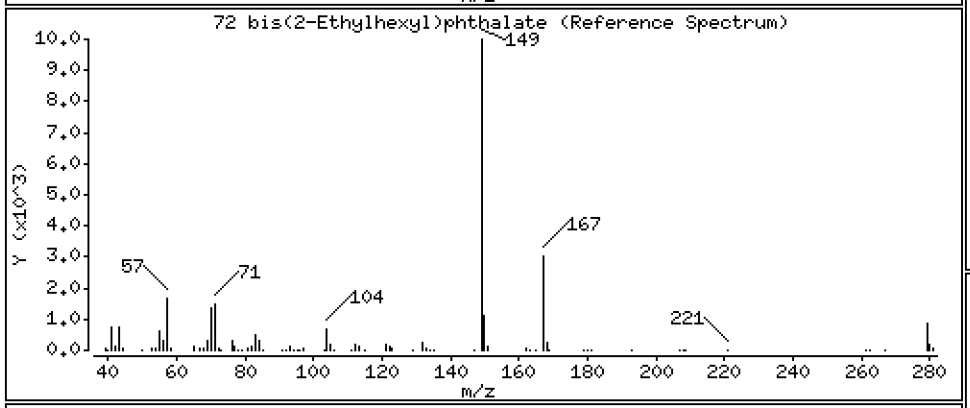
Concentration: 5.117 ug/mL

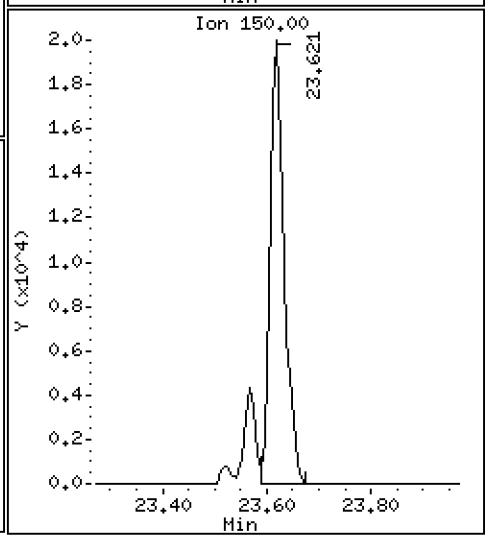


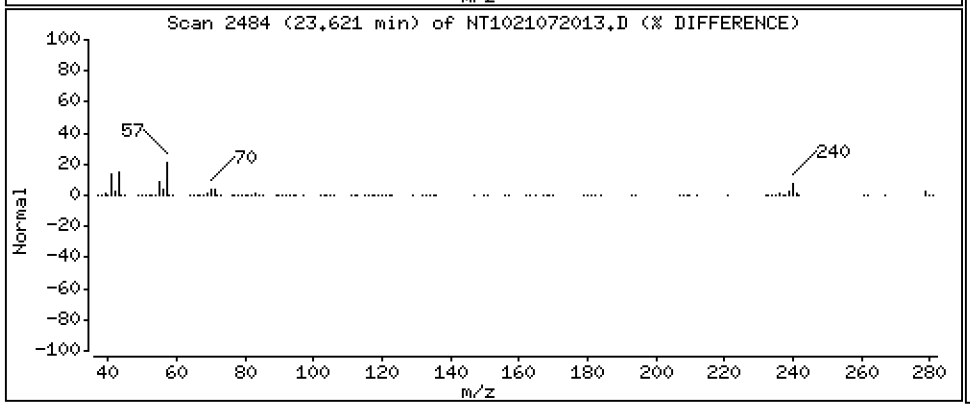












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

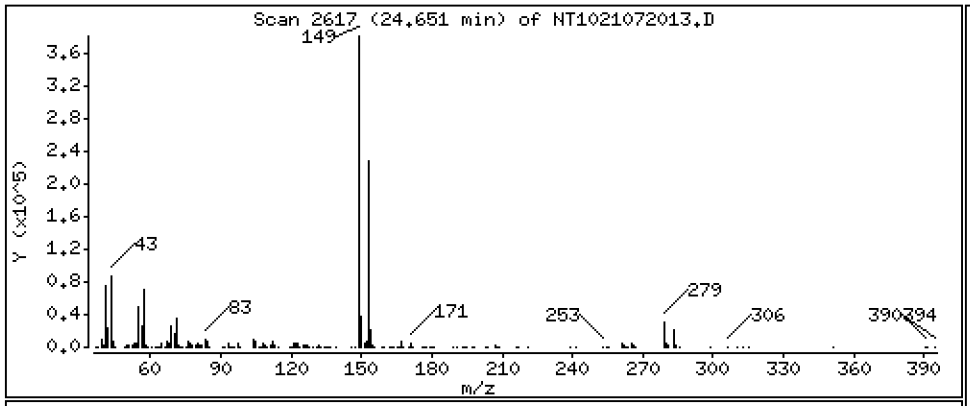
Operator: VTS

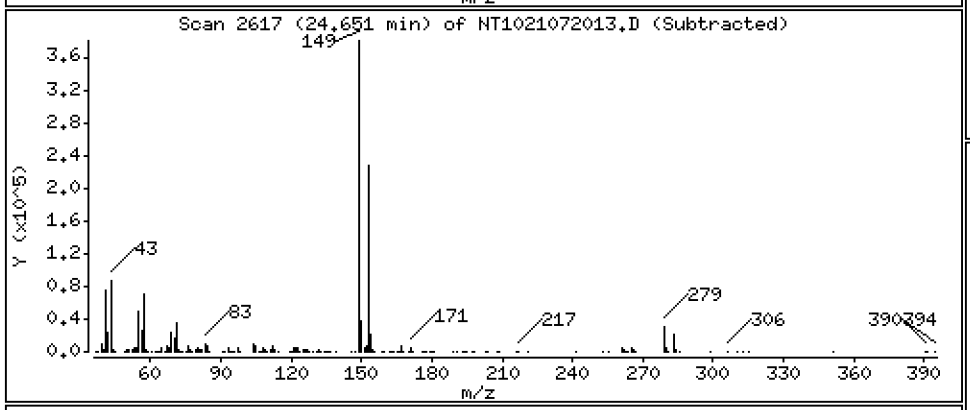
Column phase: ZB-5msi

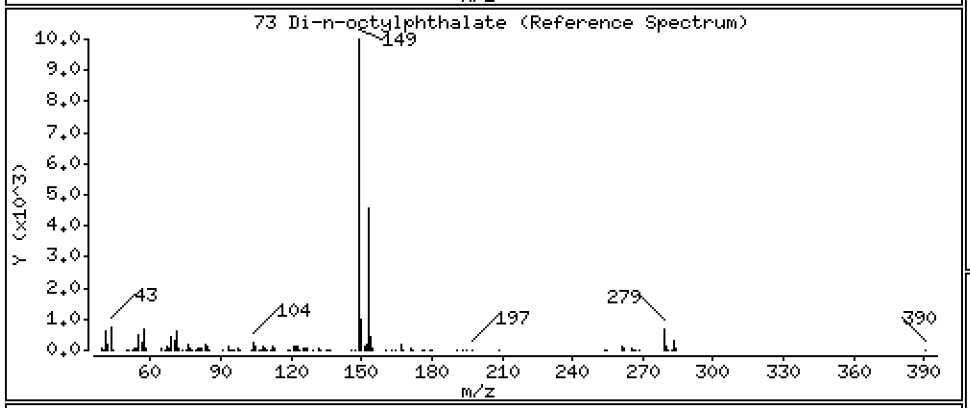
Column diameter: 0.25

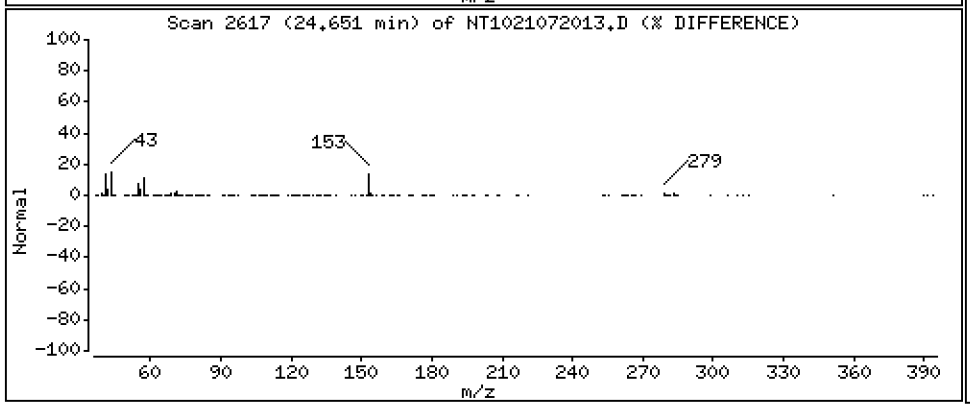
73 Di-n-octylphthalate

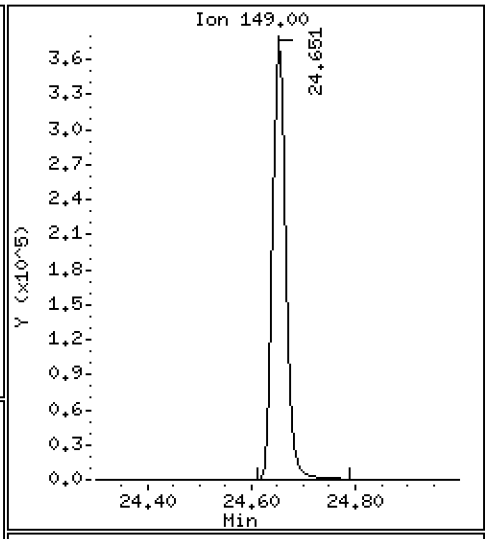
Concentration: 4.741 ug/mL

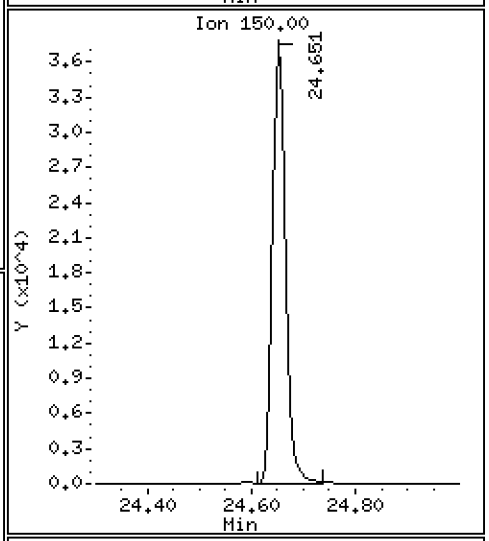


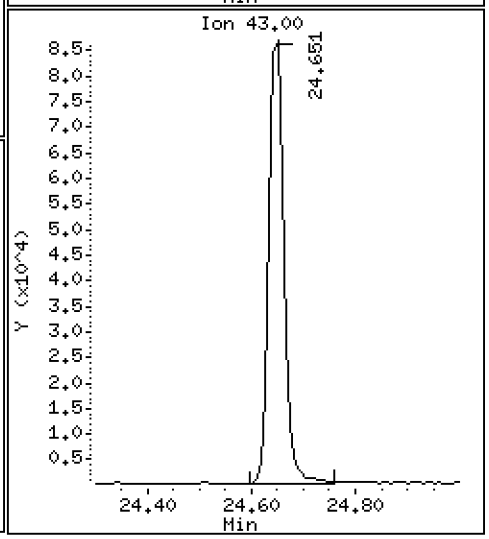












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

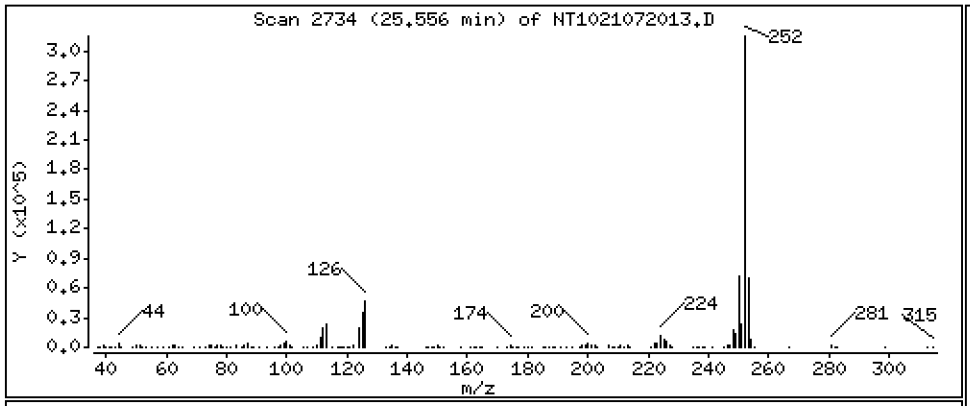
Operator: VTS

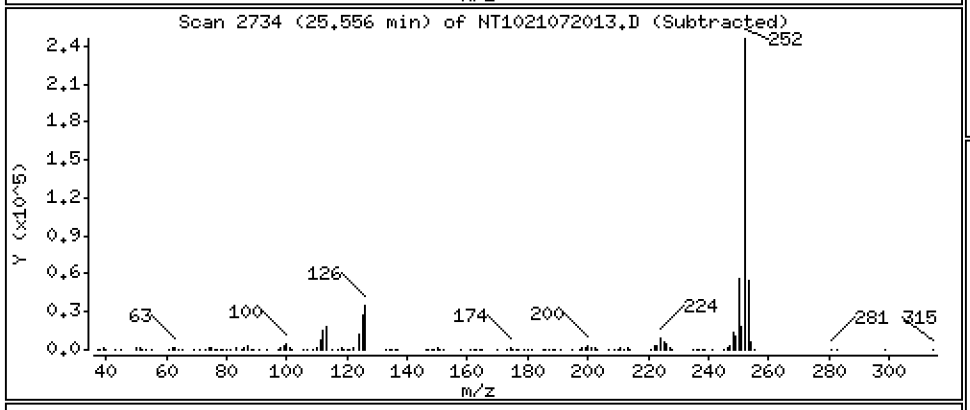
Column phase: ZB-5msi

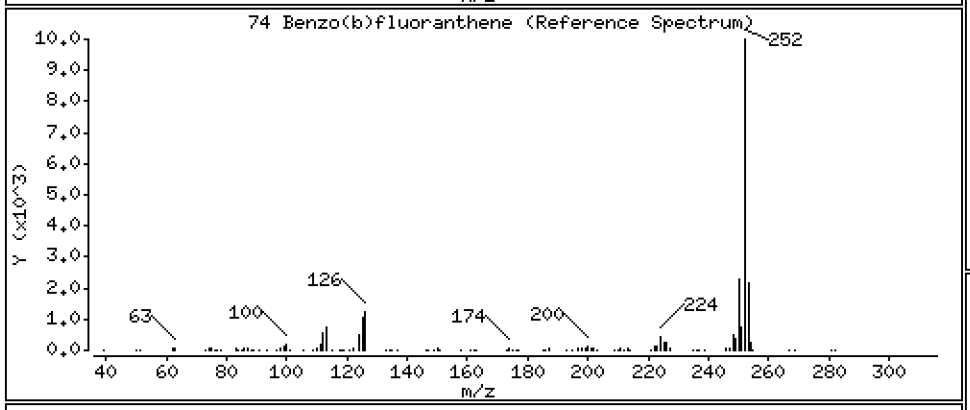
Column diameter: 0.25

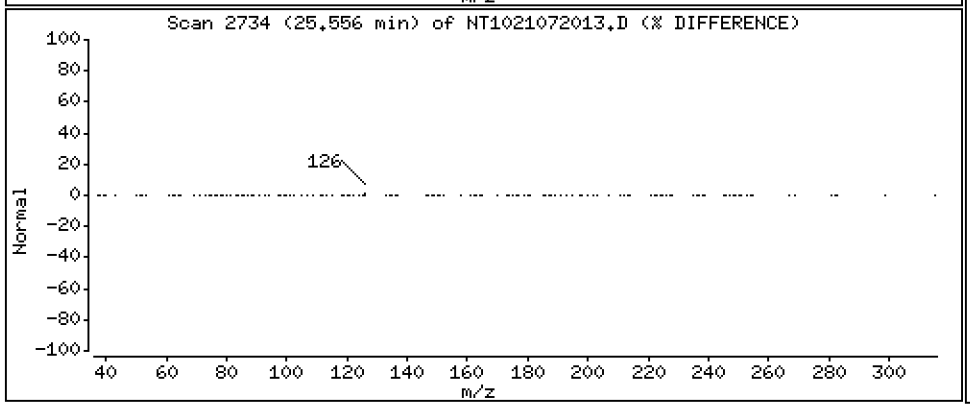
74 Benzo(b)fluoranthene

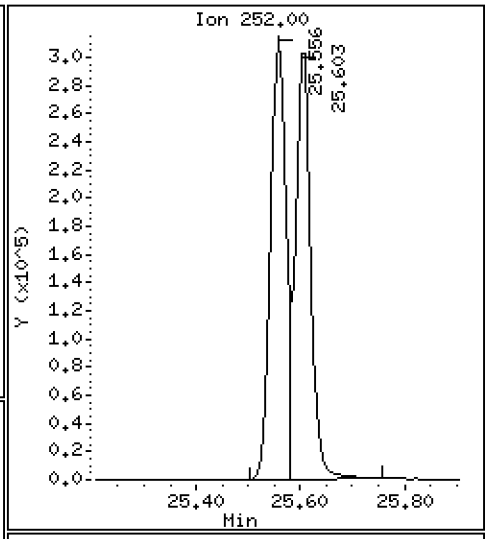
Concentration: 4.778 ug/mL

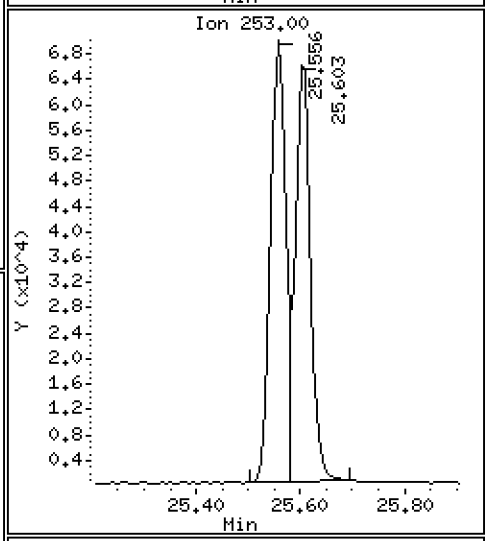


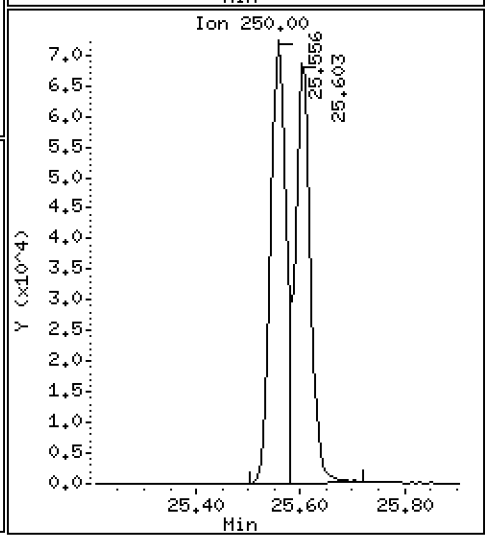












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

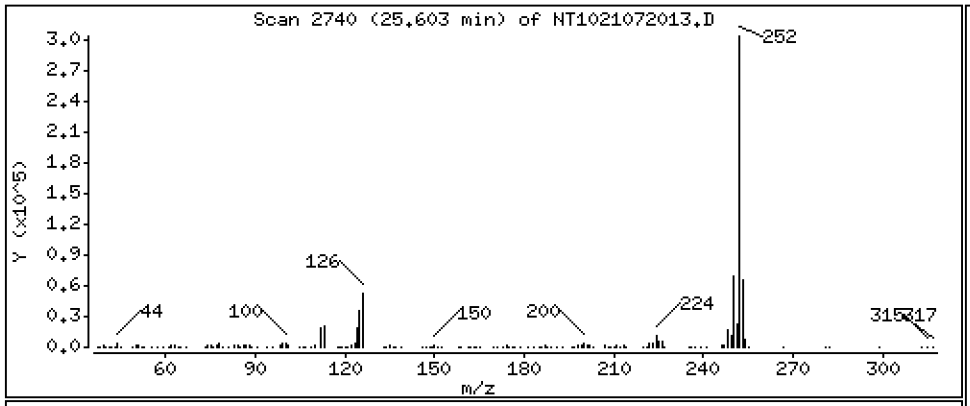
Operator: VTS

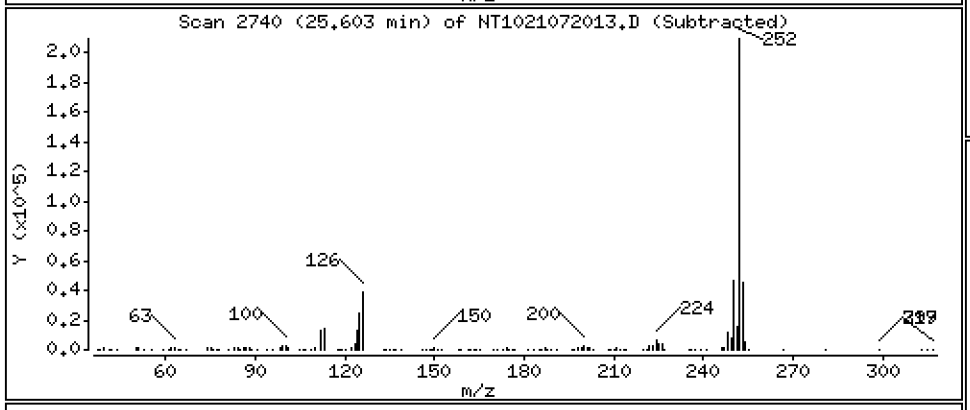
Column phase: ZB-5msi

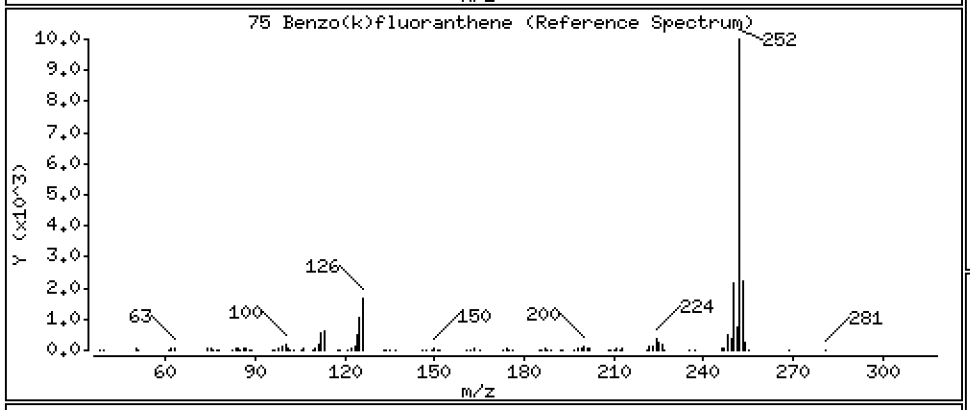
Column diameter: 0.25

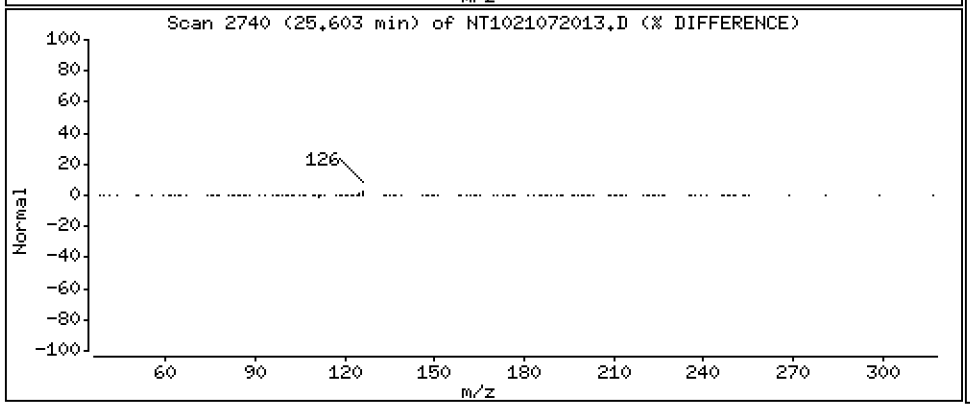
75 Benzo(k)fluoranthene

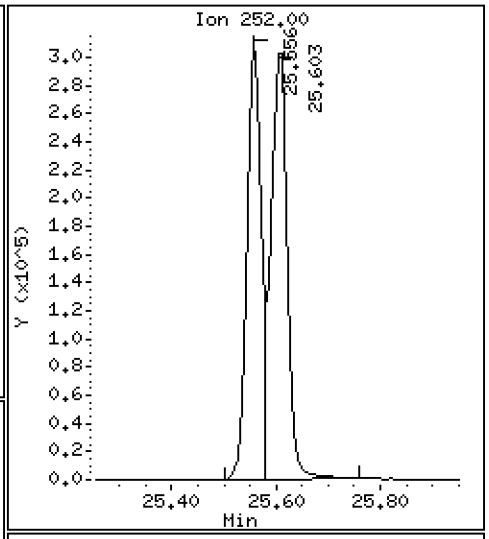
Concentration: 5.137 ug/mL

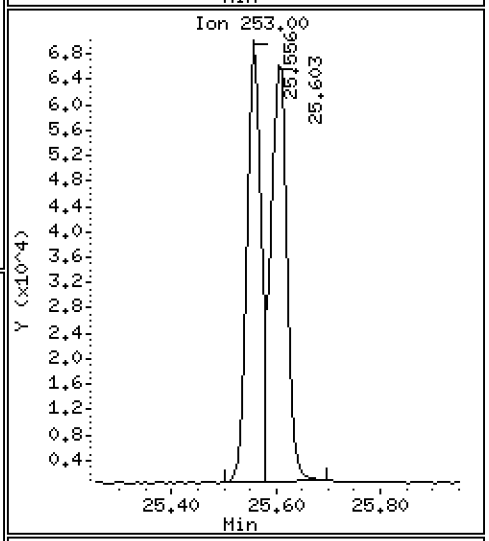


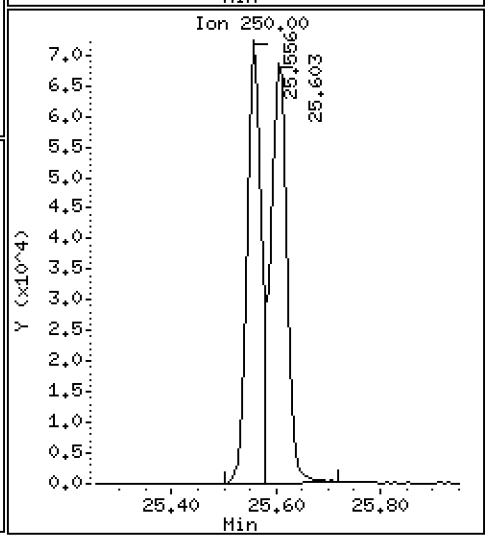












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

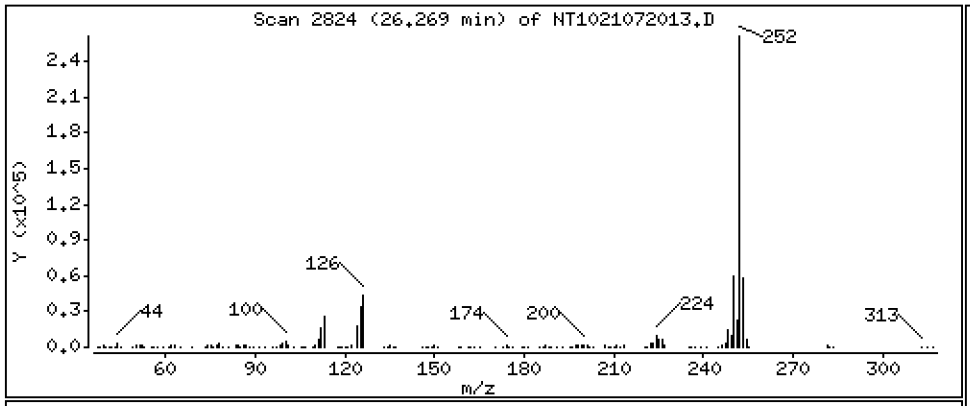
Operator: VTS

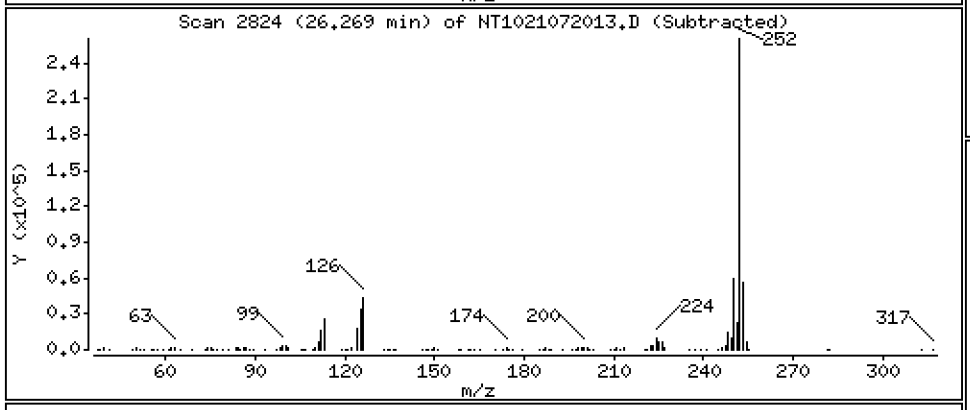
Column phase: ZB-5msi

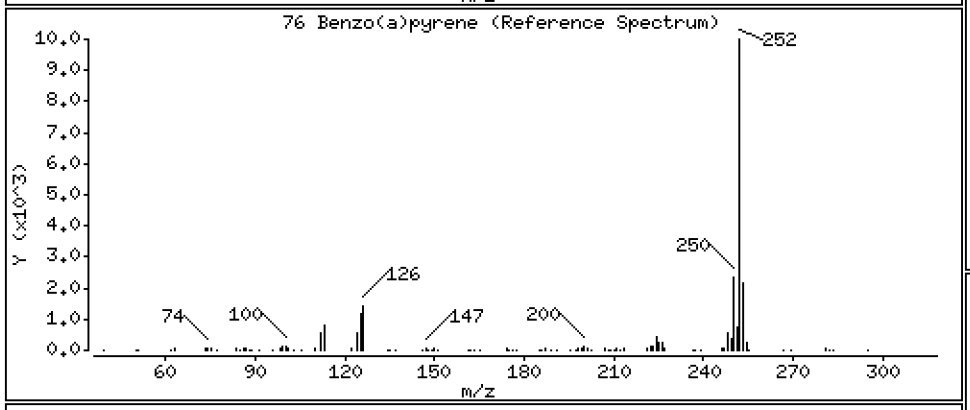
Column diameter: 0.25

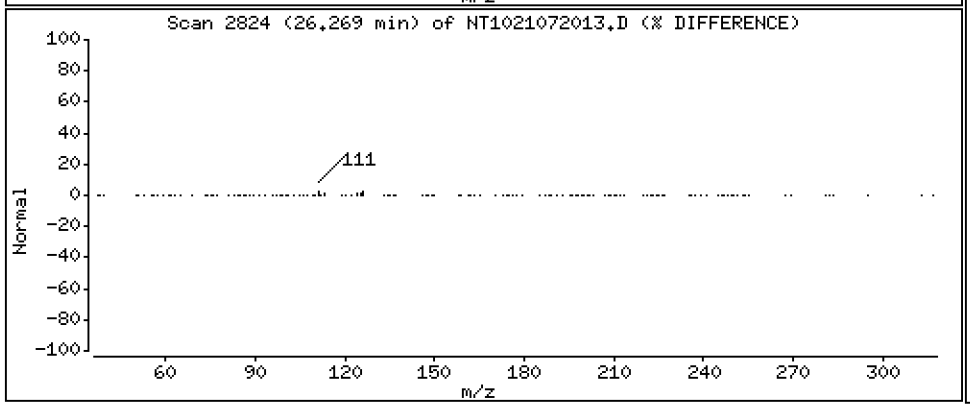
76 Benzo(a)pyrene

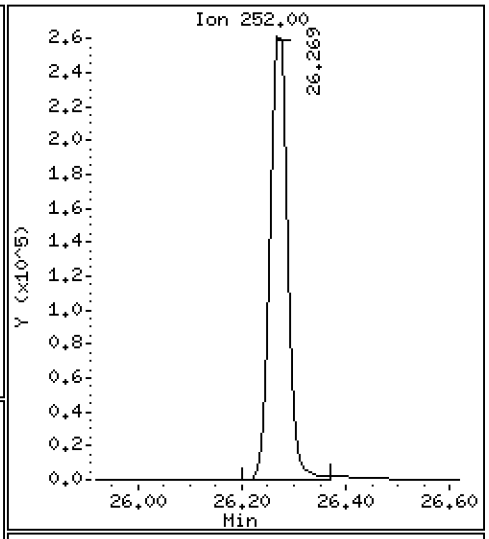
Concentration: 4.977 ug/mL

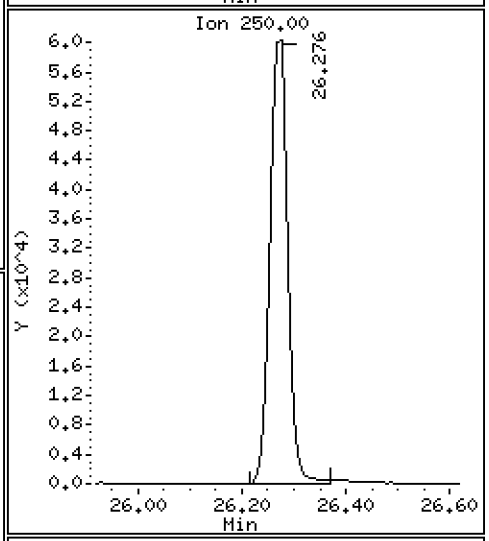


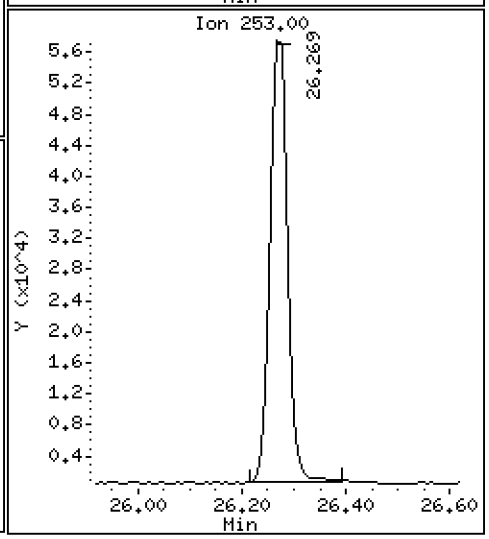












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

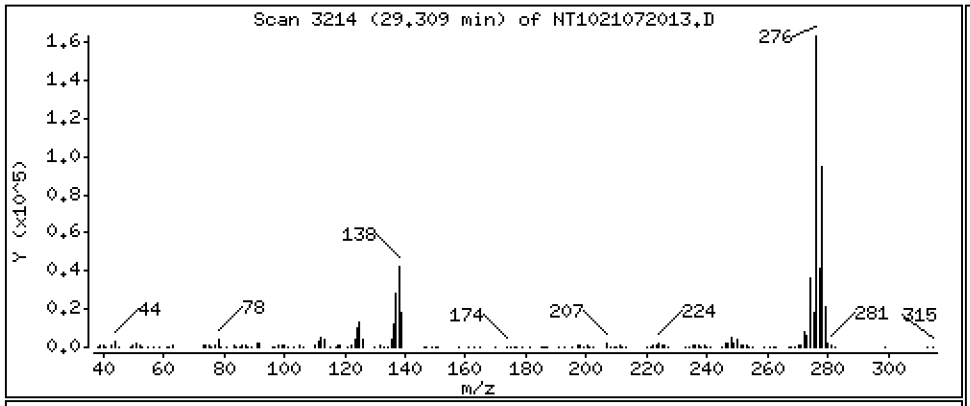
Operator: VTS

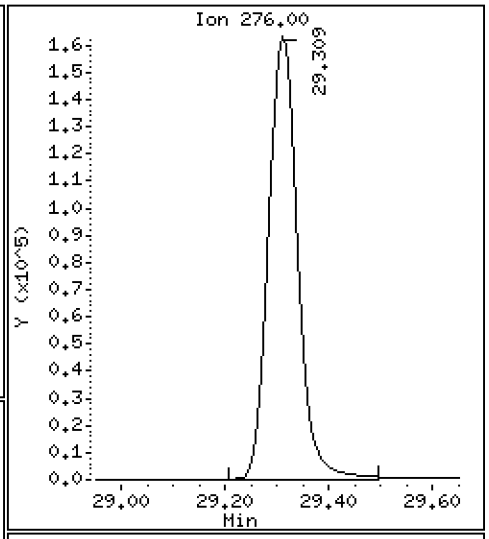
Column phase: ZB-5msi

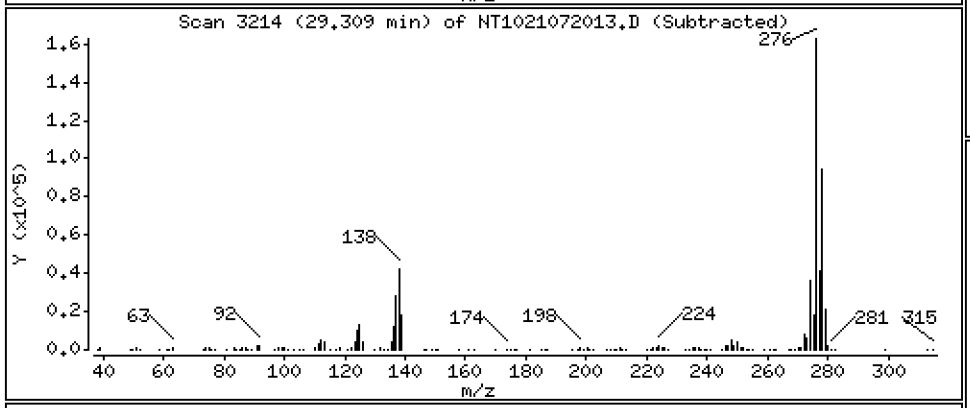
Column diameter: 0.25

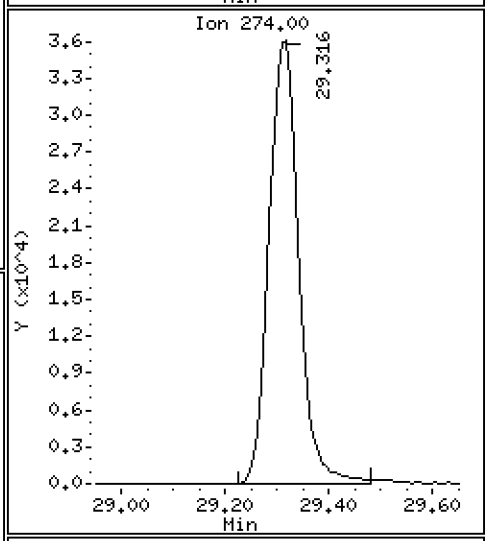
78 Indeno(1,2,3-cd)pyrene

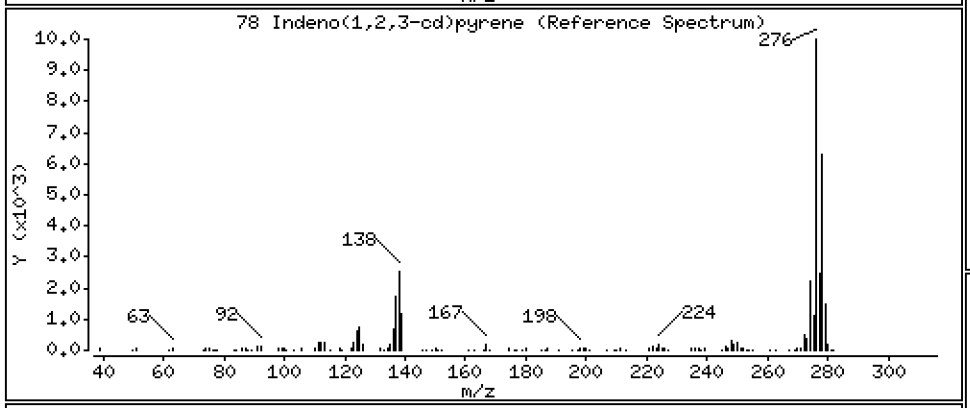
Concentration: 4.743 ug/mL

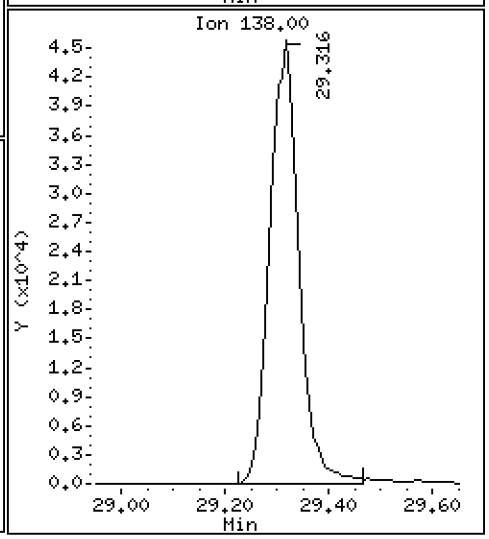


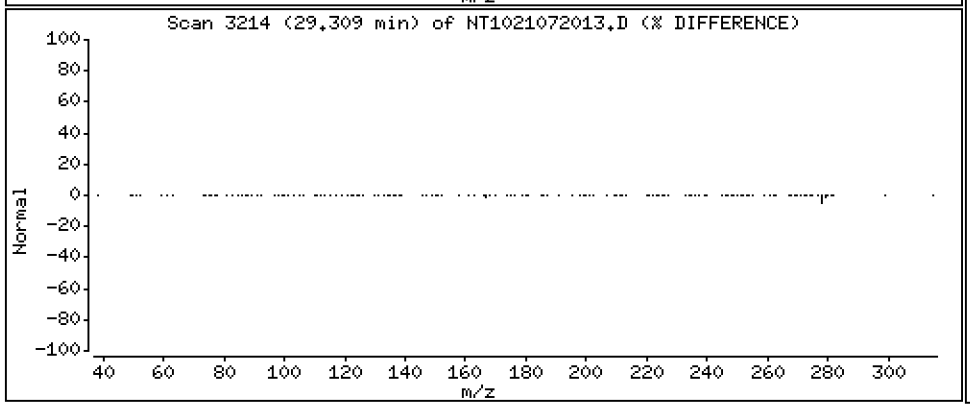












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

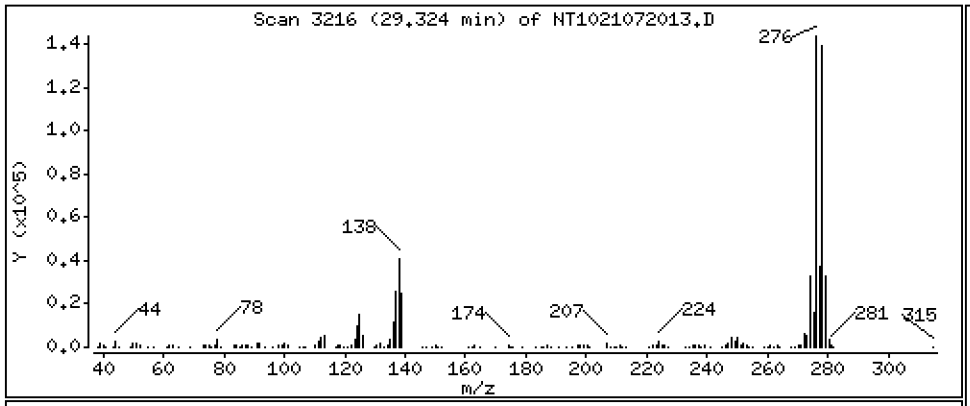
Operator: VTS

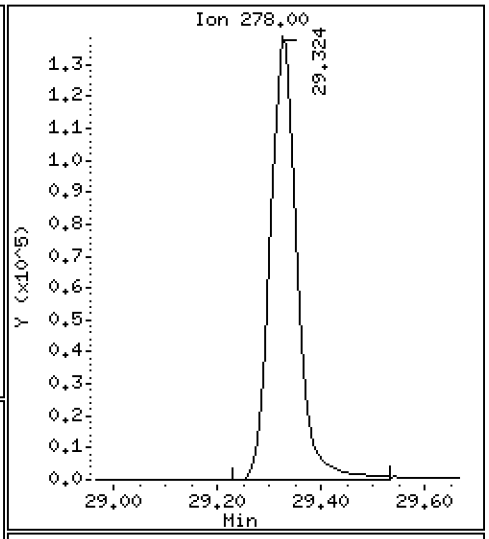
Column phase: ZB-5msi

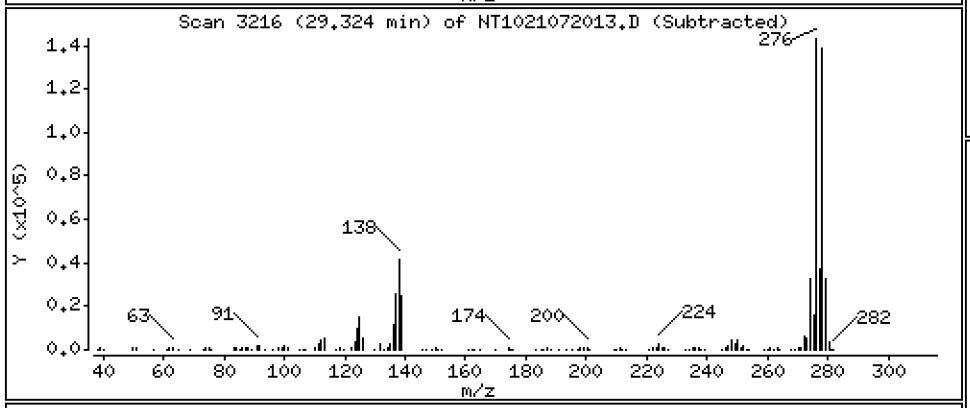
Column diameter: 0.25

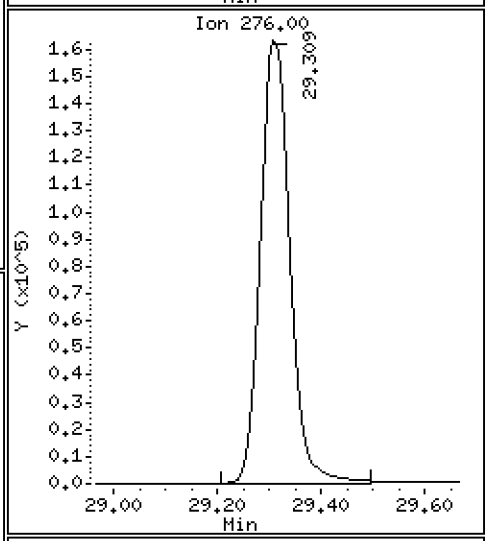
79 Dibenzo(a,h)anthracene

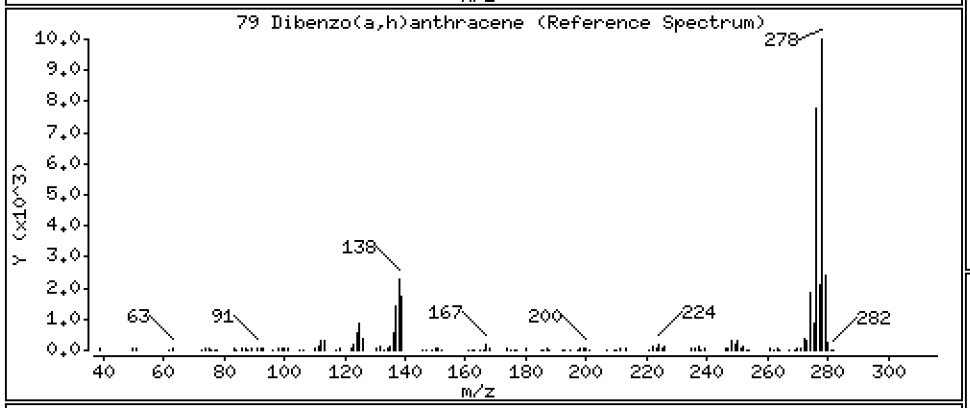
Concentration: 4.703 ug/mL

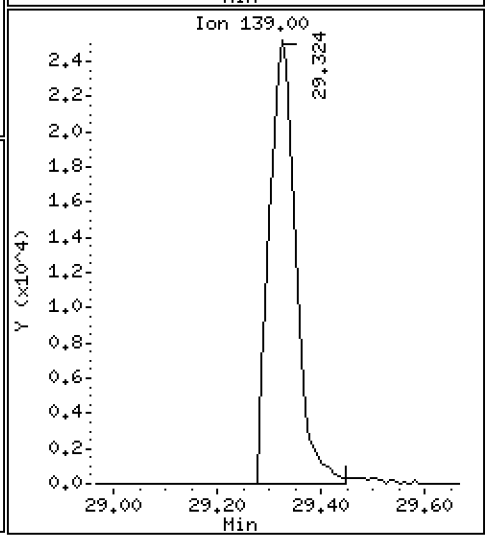


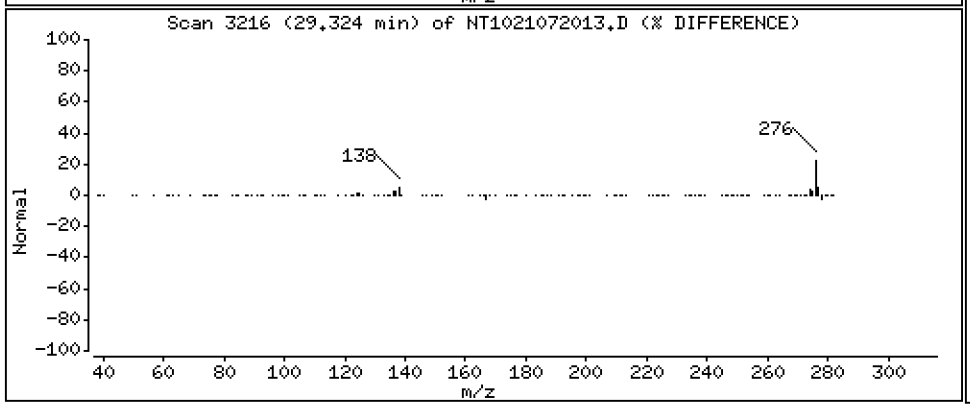












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

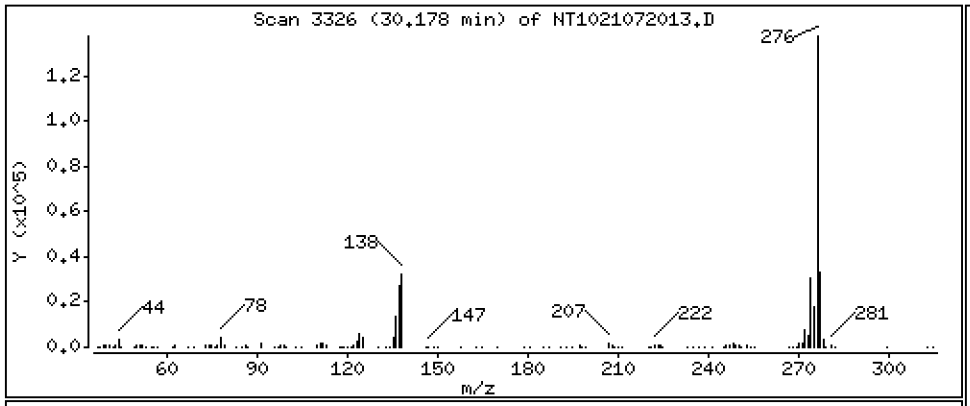
Operator: VTS

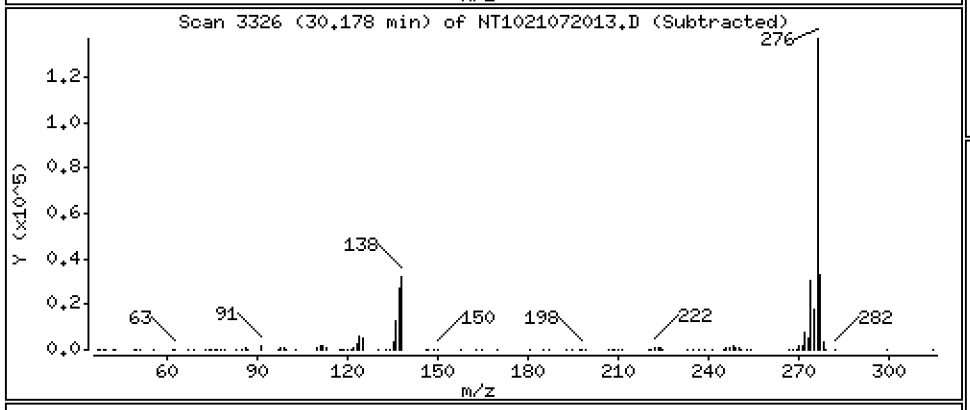
Column phase: ZB-5msi

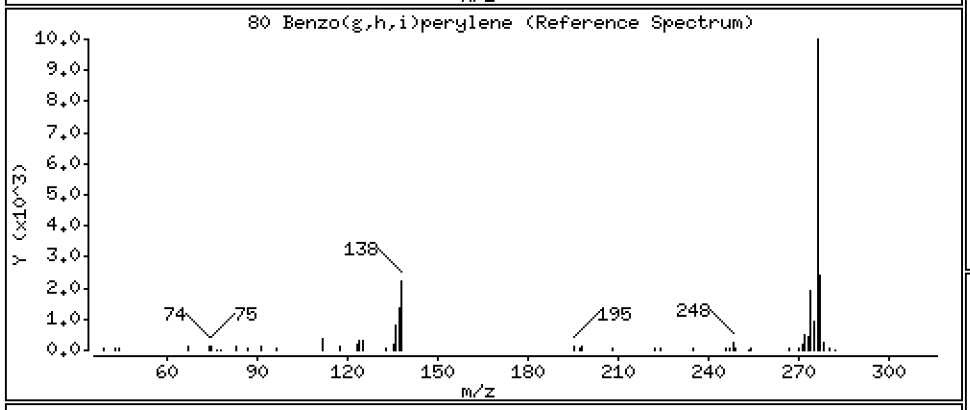
Column diameter: 0.25

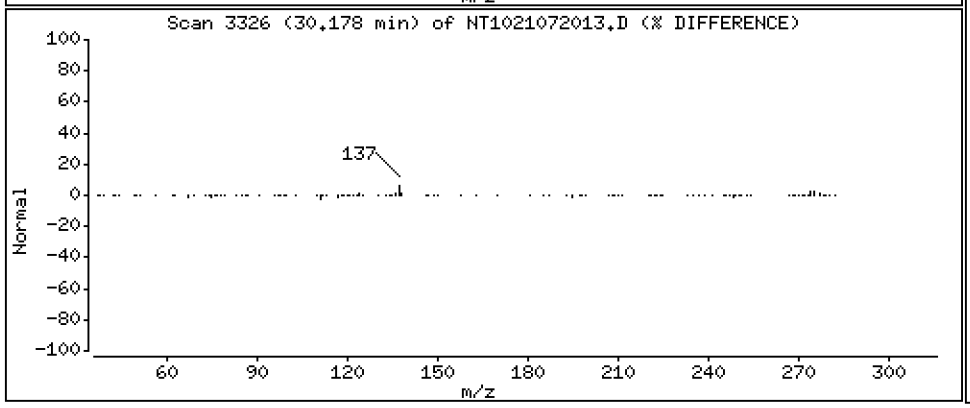
80 Benzo(g,h,i)perylene

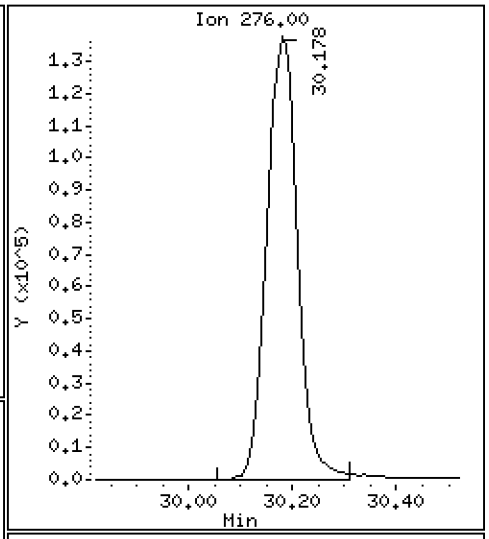
Concentration: 4.714 ug/mL

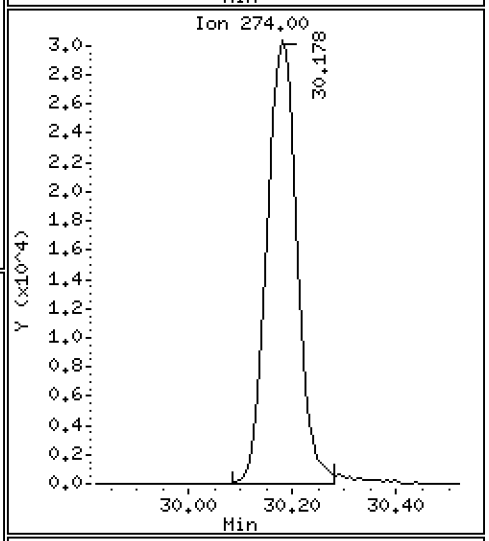


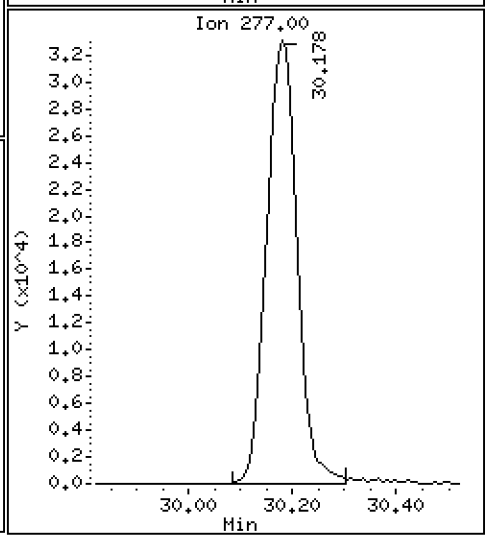












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Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

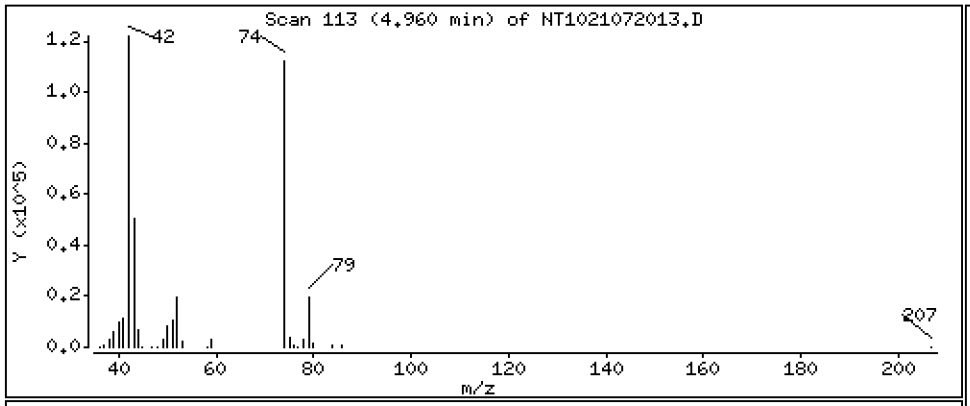
Operator: VTS

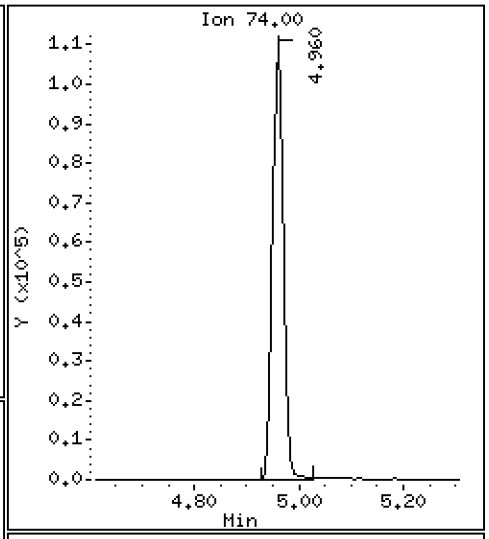
Column phase: ZB-5msi

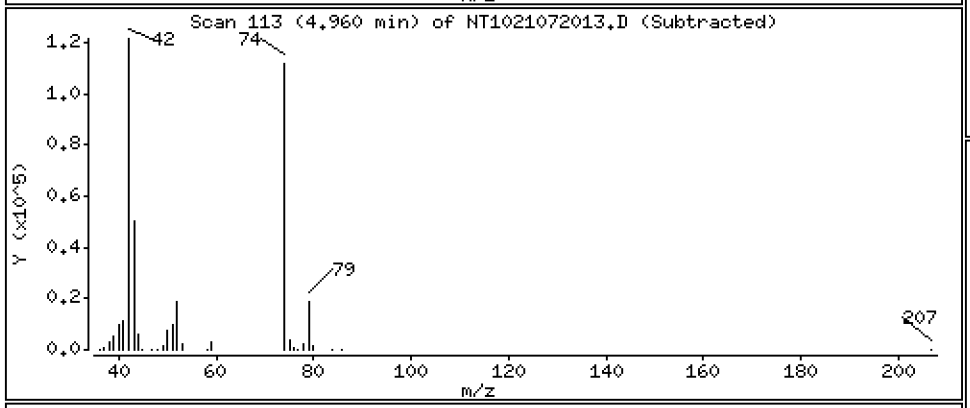
Column diameter: 0.25

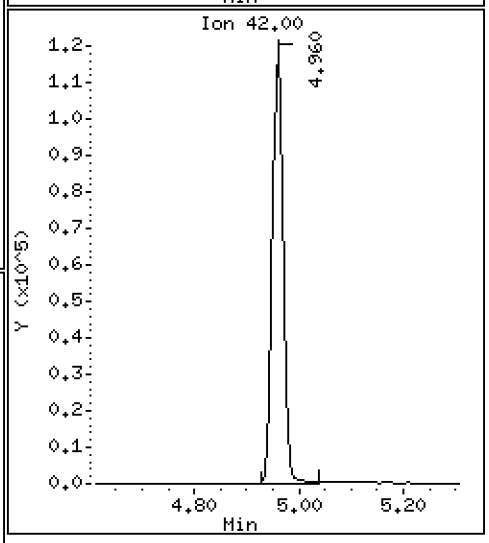
90 N-Nitrosodimethylamine

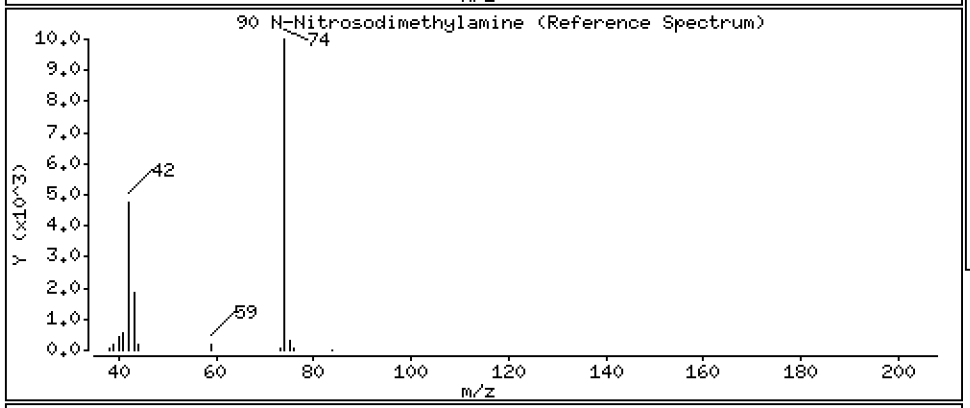
Concentration: 5.630 ug/mL

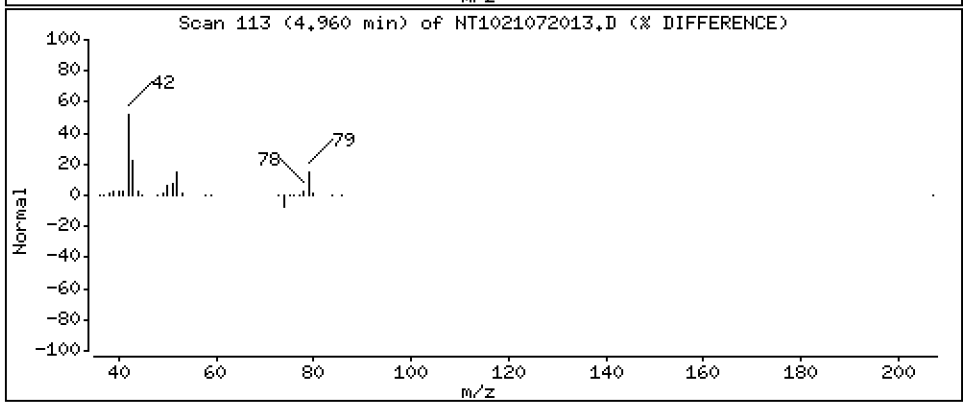












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

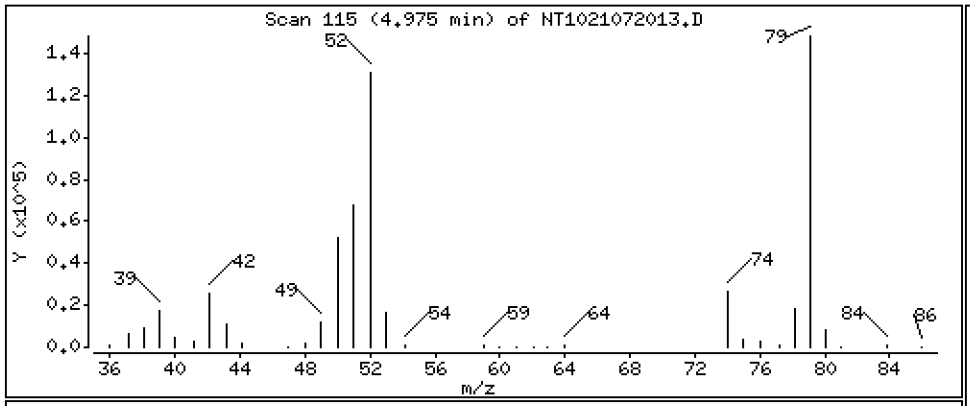
Operator: VTS

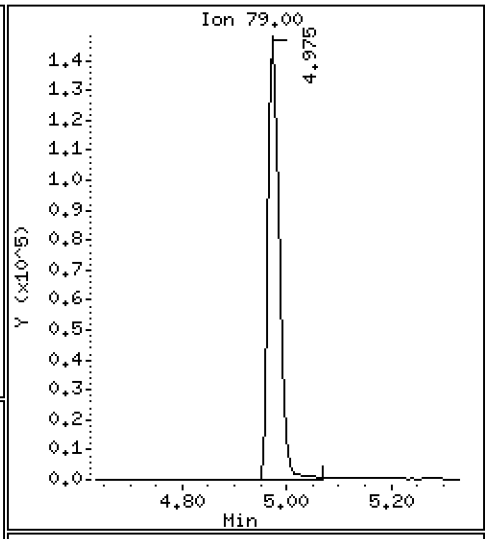
Column phase: ZB-5msi

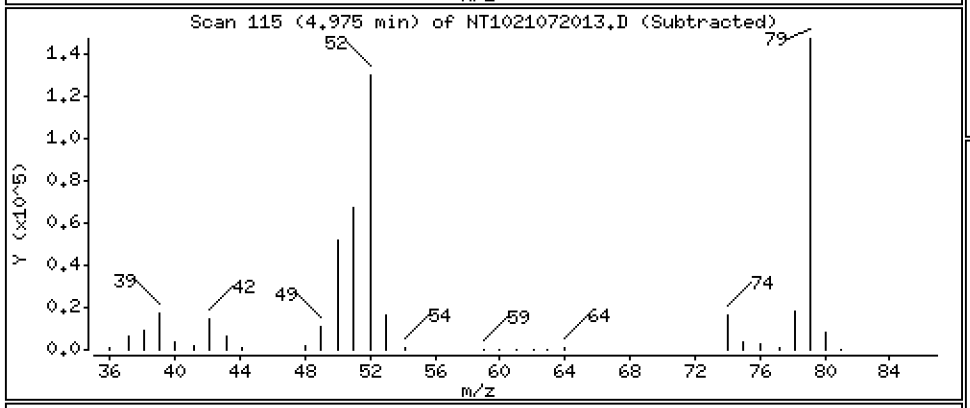
Column diameter: 0.25

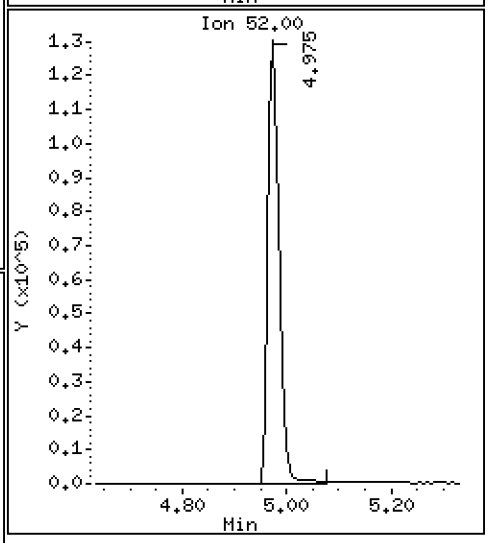
103 Pyridine

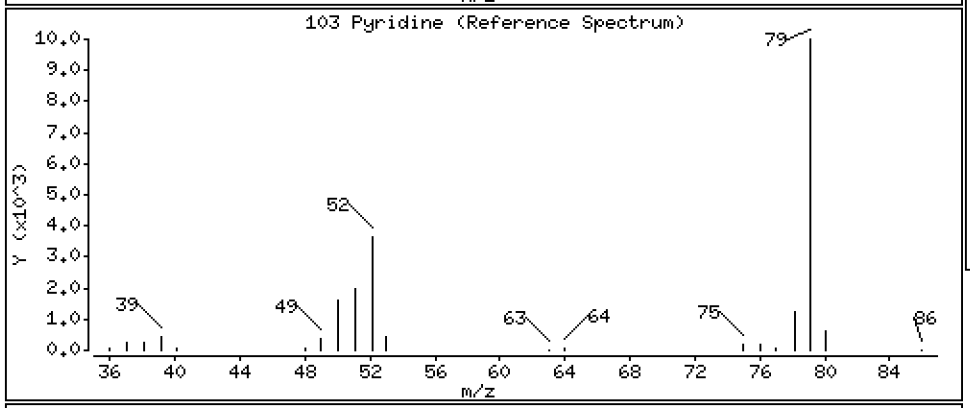
Concentration: 5.038 ug/mL

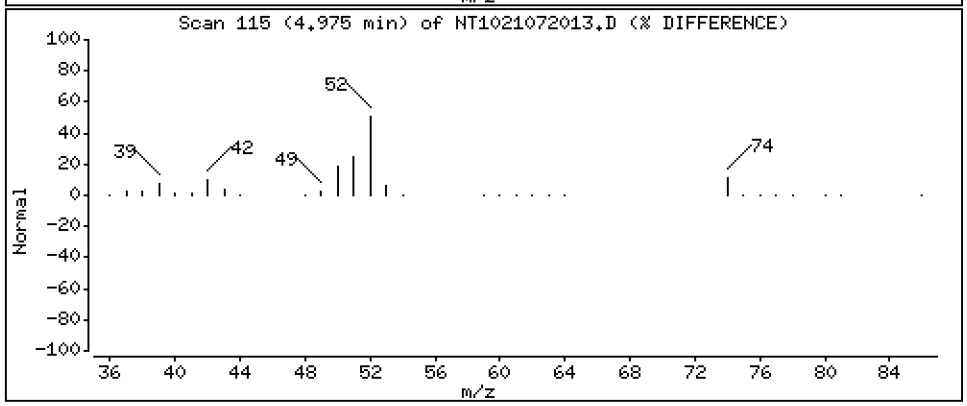












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

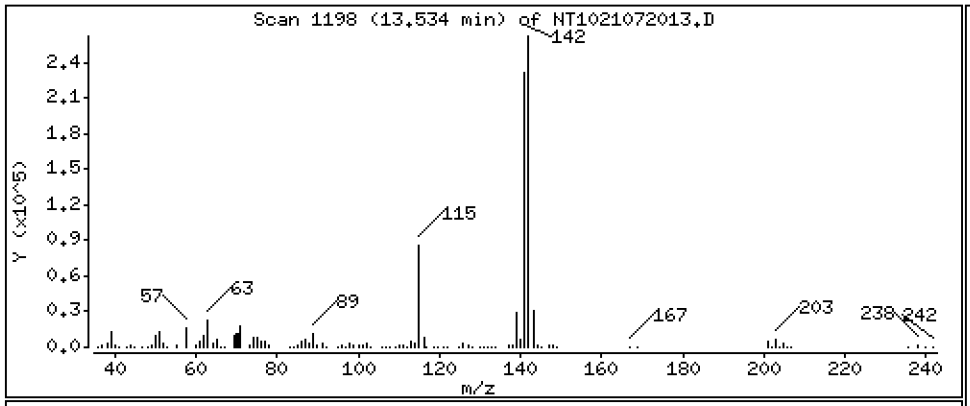
Operator: VTS

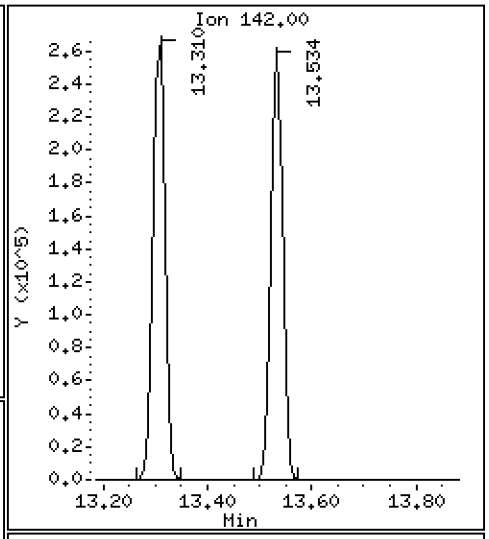
Column phase: ZB-5msi

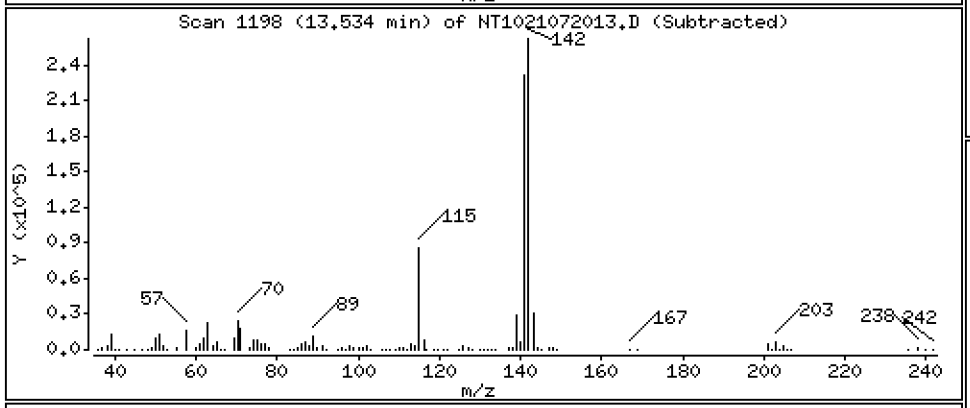
Column diameter: 0.25

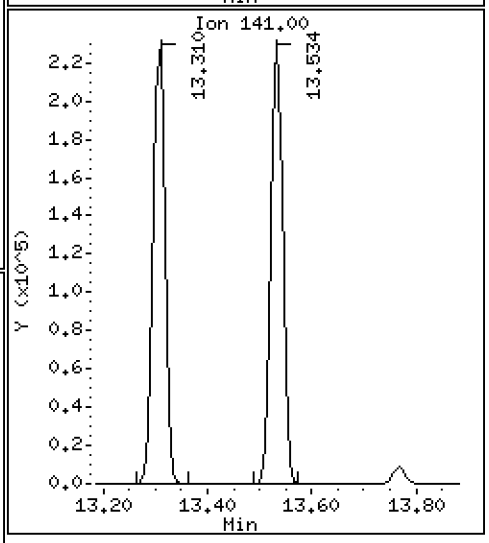
105 1-methylnaphthalene

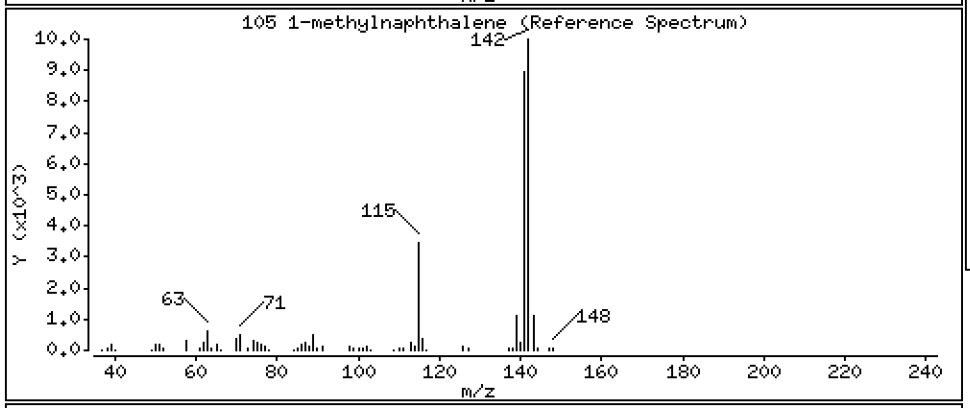
Concentration: 4.923 ug/mL

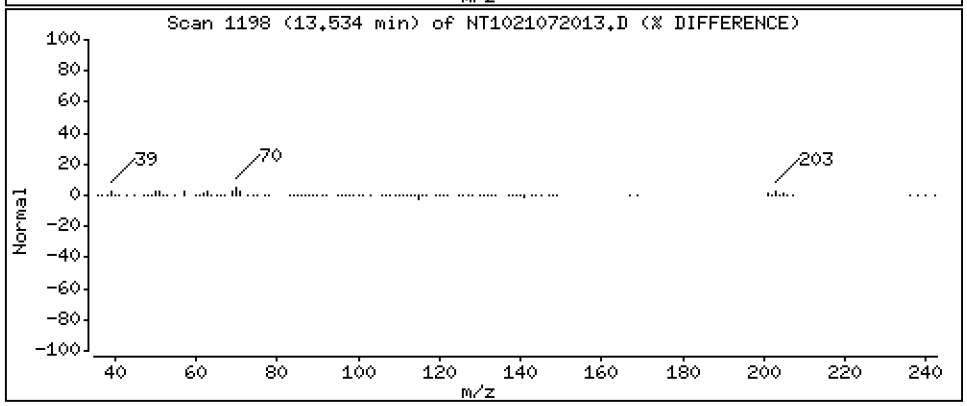












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

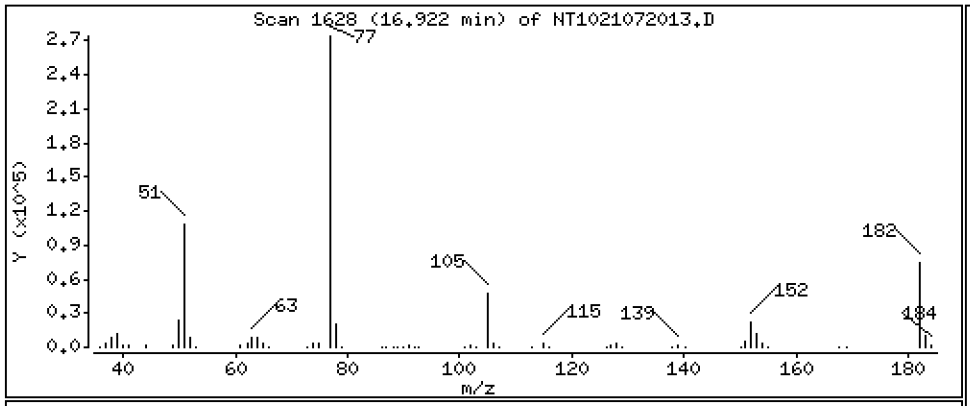
Operator: VTS

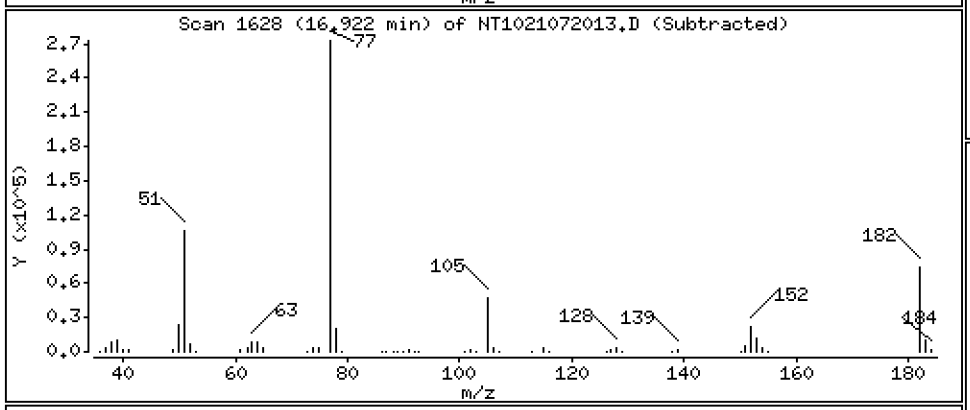
Column phase: ZB-5msi

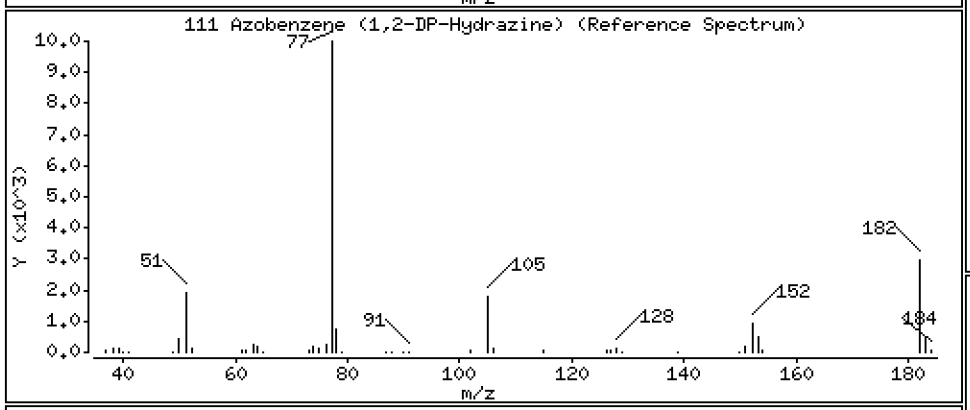
Column diameter: 0.25

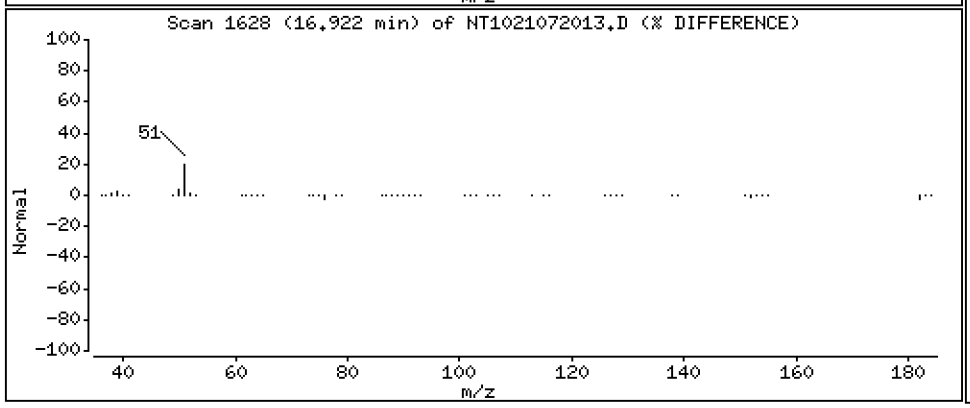
111 Azobenzene (1,2-DP-Hydrazine)

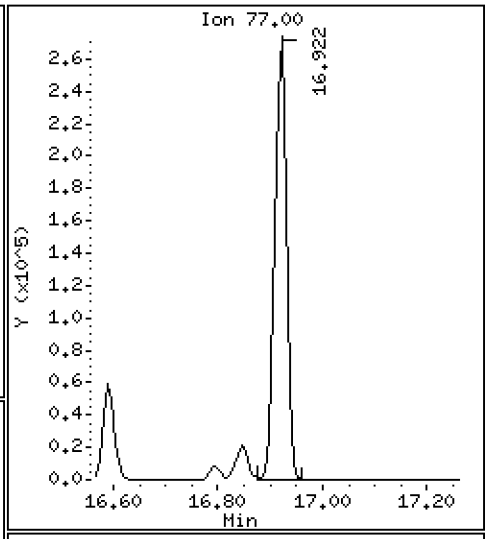
Concentration: 4.749 ug/mL

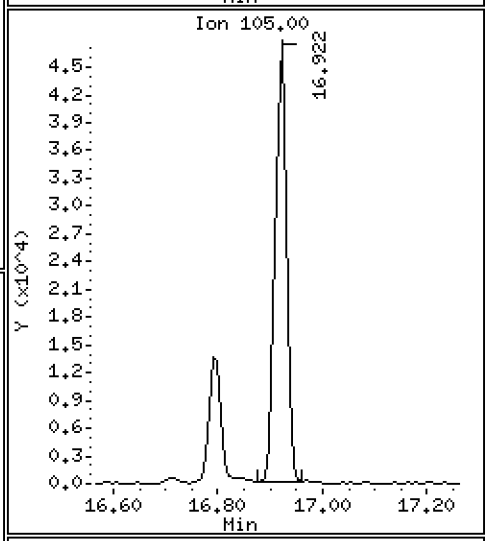


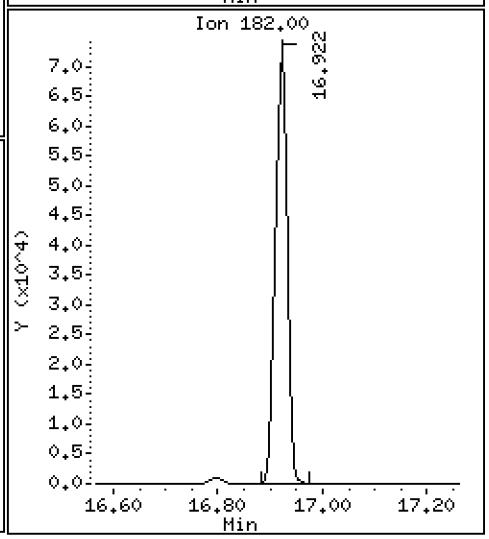












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

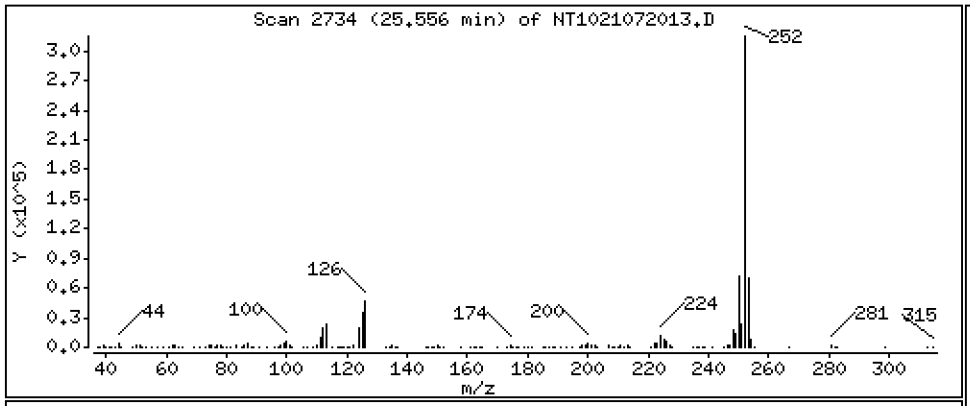
Operator: VTS

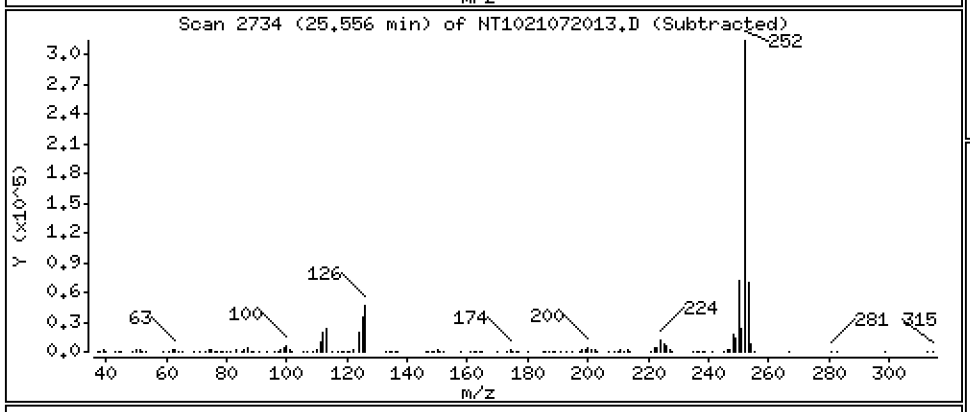
Column phase: ZB-5msi

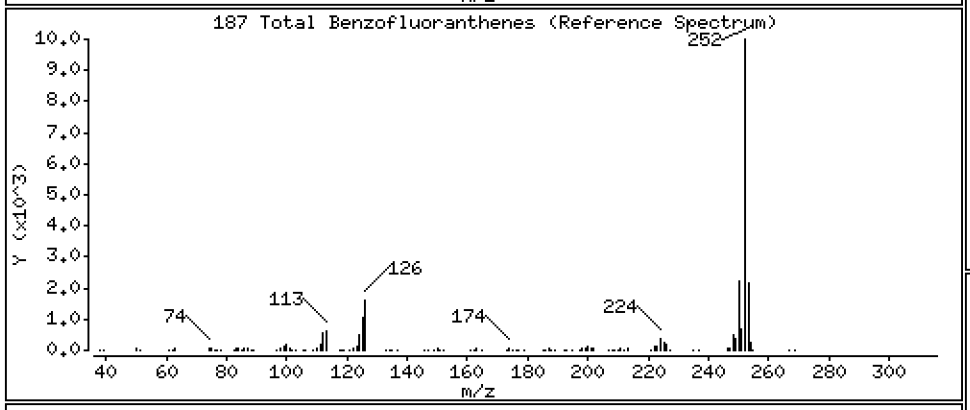
Column diameter: 0.25

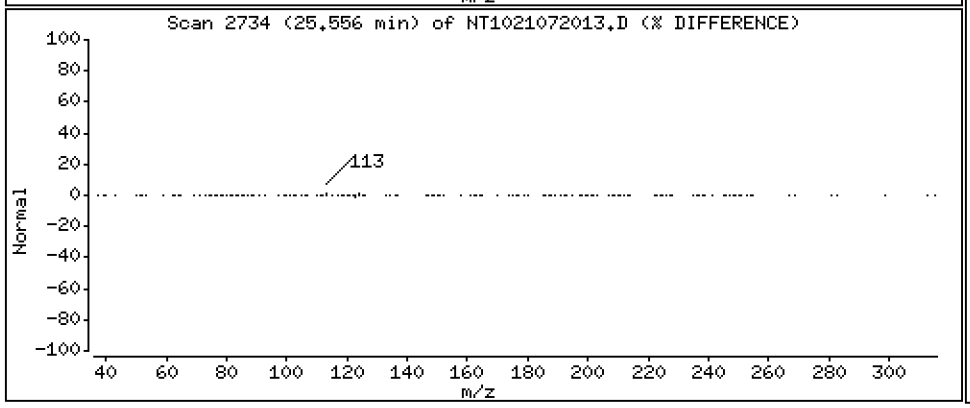
187 Total Benzofluoranthenes

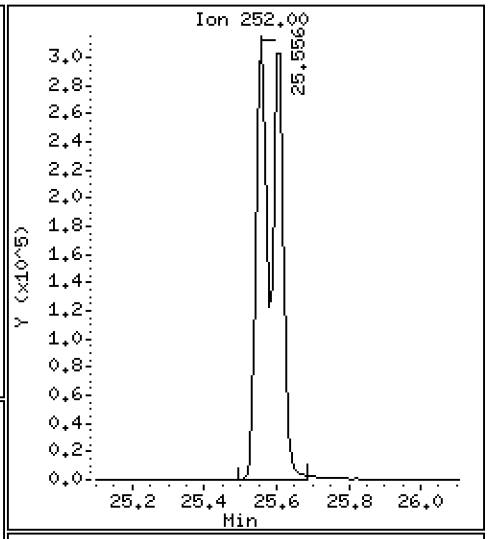
Concentration: 9.829 ug/mL

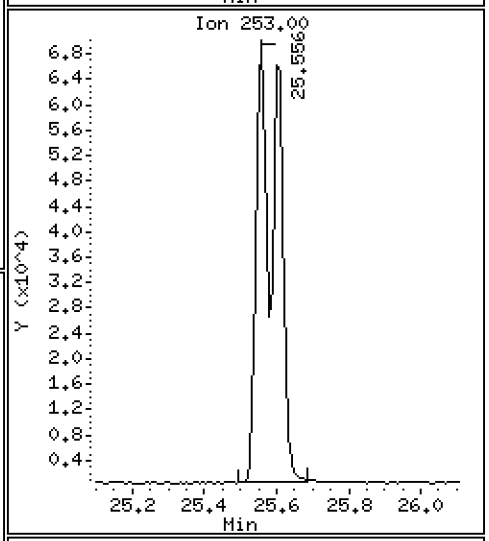


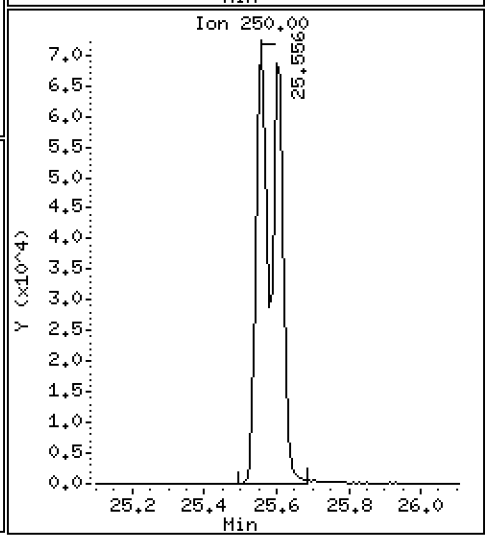












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

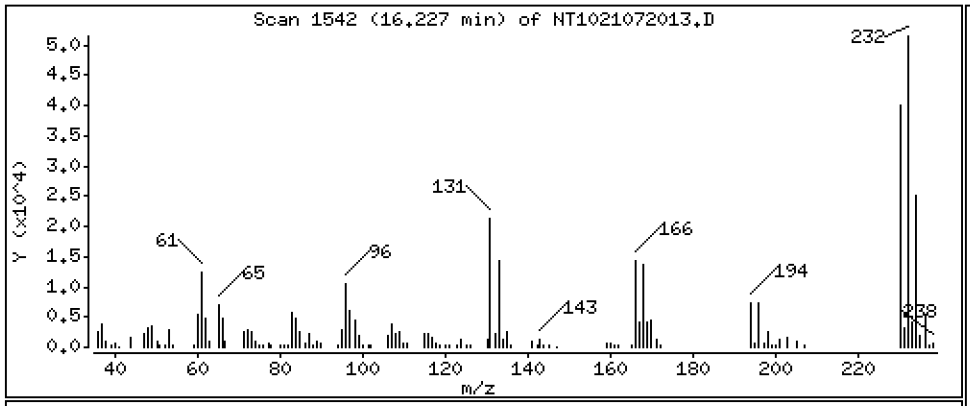
Operator: VTS

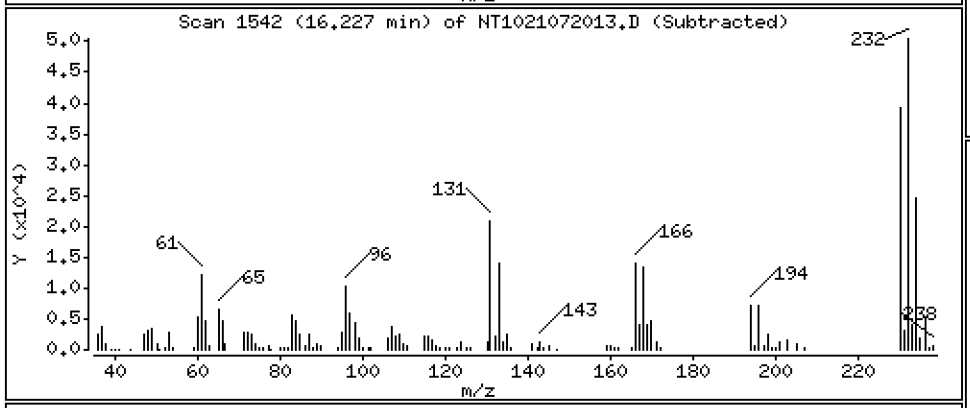
Column phase: ZB-5msi

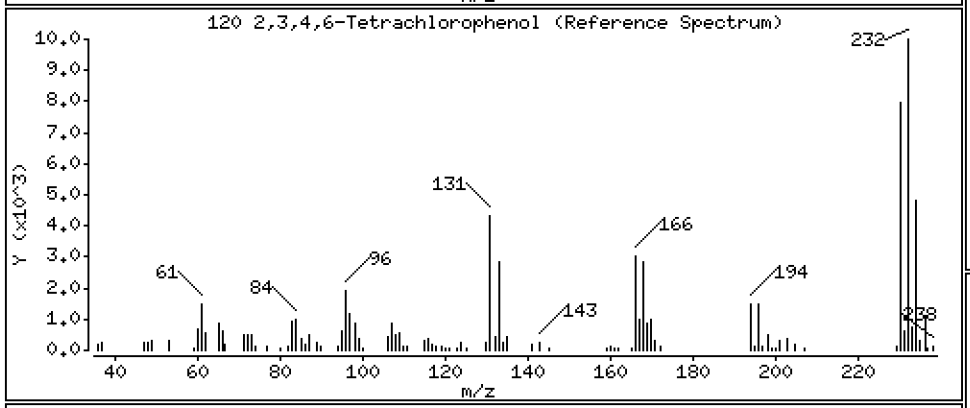
Column diameter: 0.25

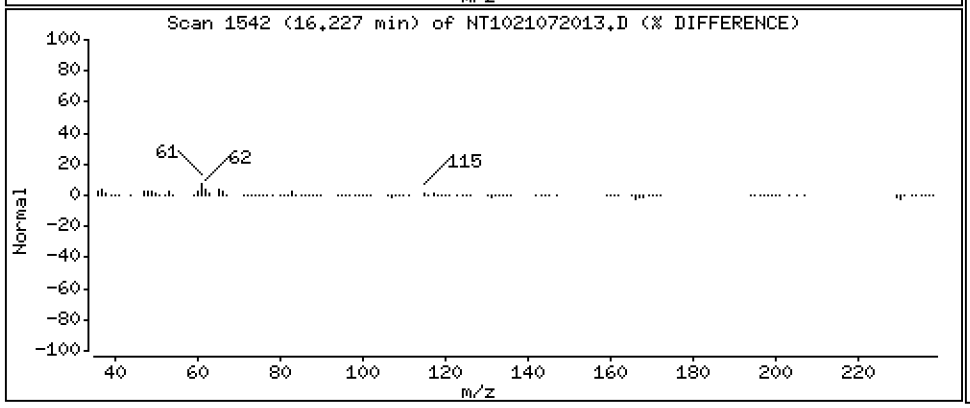
120 2,3,4,6-Tetrachlorophenol

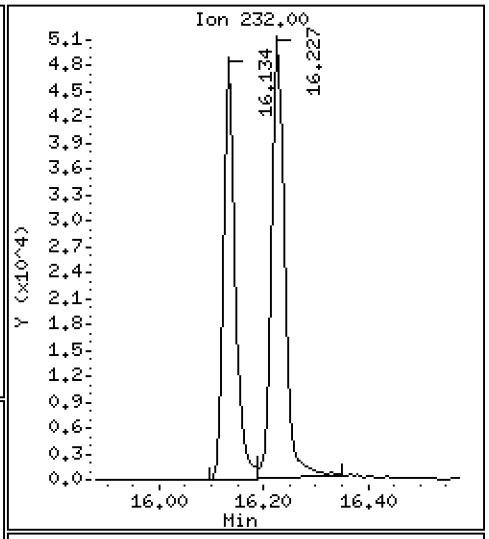
Concentration: 4.472 ug/mL

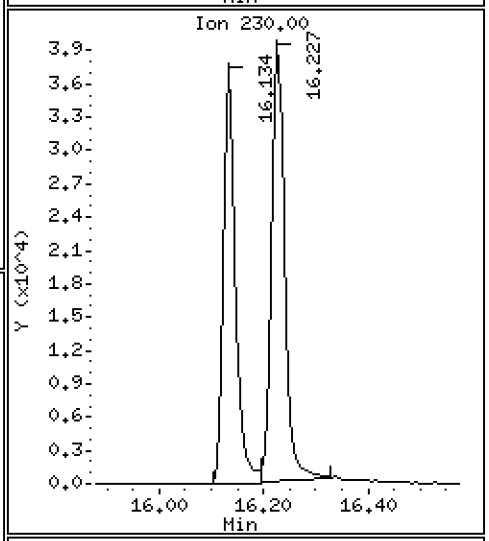


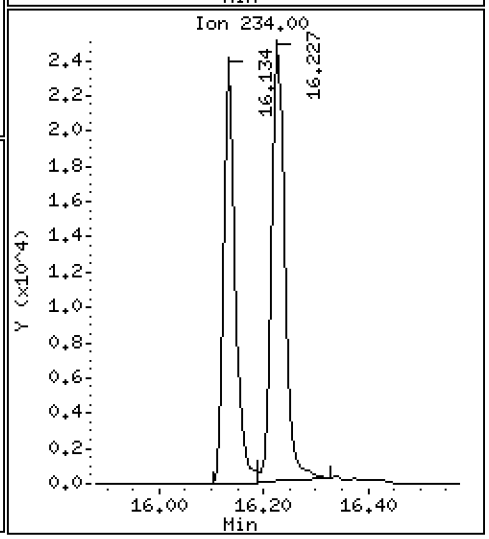












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D
Lab Smp Id: SJG0249-SCV1
Inj Date : 20-JUL-2021 19:24
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-SCV1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 11
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$ 1	2-Fluorophenol	112	Compound Not Detected.					
$ 2	Phenol-d5	99	Compound Not Detected.					
3	Phenol	94	8.729	8.729	(0.932)	245742	4.92176	4.922
$ 5	2-Chlorophenol-d4	132	Compound Not Detected.					
4	Bis(2-Chloroethyl)ether	93	8.907	8.907	(0.950)	200306	5.02286	5.023
6	2-Chlorophenol	128	9.030	9.030	(0.964)	188022	4.97506	4.975
7	1,3-Dichlorobenzene	146	9.301	9.301	(0.993)	207447	4.99685	4.997
* 8	1,4-Dichlorobenzene-d4	152	9.371	9.371	(1.000)	97788	4.00000	
9	1,4-Dichlorobenzene	146	9.402	9.402	(1.003)	177164	4.99810	4.998
$ 10	1,2-Dichlorobenzene-d4	152	Compound Not Detected.					
12	1,2-Dichlorobenzene	146	9.759	9.759	(1.041)	177797	4.74192	4.742
11	Benzyl alcohol	108	9.635	9.635	(1.028)	105562	4.51591	4.516
14	2,2'-oxybis(1-Chloropropane)	121	9.937	9.930	(1.060)	58233	4.04836	4.048
13	2-Methylphenol	108	9.852	9.852	(1.051)	136656	4.39716	4.397
17	Hexachloroethane	117	10.349	10.349	(1.104)	74881	4.91448	4.914
16	N-Nitroso-di-n-propylamine	70	10.194	10.194	(1.088)	127139	4.74213	4.742
15	4-Methylphenol	108	10.124	10.116	(1.080)	155634	4.66654	4.667
$ 18	Nitrobenzene-d5	82	Compound Not Detected.					
19	Nitrobenzene	77	10.512	10.512	(0.886)	196910	4.74090	4.741
20	Isophorone	82	10.946	10.946	(0.922)	387996	4.95012	4.950
21	2-Nitrophenol	139	11.140	11.140	(0.938)	98881	4.51420	4.514
22	2,4-Dimethylphenol	107	11.174	11.165	(0.941)	142239	4.36525	4.365
23	Bis(2-Chloroethoxy)methane	93	11.378	11.378	(0.958)	203559	5.00327	5.003
24	Benzoic acid	105	11.318	11.293	(0.953)	116014	6.35582	6.356
25	2,4-Dichlorophenol	162	11.581	11.581	(0.976)	134290	4.97384	4.974
26	1,2,4-Trichlorobenzene	180	11.778	11.778	(0.992)	150244	4.92195	4.922
* 27	Naphthalene-d8	136	11.871	11.863	(1.000)	342760	4.00000	
28	Naphthalene	128	11.909	11.909	(1.003)	452705	4.99058	4.991
29	4-Chloroaniline	127	12.040	12.040	(1.014)	187038	4.14081	4.141
30	Hexachlorobutadiene	225	12.257	12.257	(1.033)	82774	4.96649	4.966
31	4-Chloro-3-methylphenol	107	12.984	12.984	(1.094)	149957	4.65209	4.652
32	2-Methylnaphthalene	142	13.309	13.309	(1.121)	401309	4.78154	4.782
33	Hexachlorocyclopentadiene	237	13.766	13.766	(0.888)	115119	5.67132	5.671

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	13.929	13.929	(0.899)	99659	4.71321	4.713
	35 2,4,5-Trichlorophenol	196	13.998	13.998	(0.903)	106355	4.72059	4.721
$	36 2-Fluorobiphenyl	172	Compound Not Detected.					
	37 2-Chloronaphthalene	162	14.308	14.308	(0.923)	375518	5.08547	5.085
	38 2-Nitroaniline	65	14.571	14.571	(0.940)	134149	4.84759	4.848
	39 Dimethylphthalate	163	14.997	14.997	(0.968)	332569	4.65636	4.656
	40 Acenaphthylene	152	15.190	15.182	(0.980)	508864	4.84561	4.846
	41 2,6-Dinitrotoluene	165	15.144	15.144	(0.977)	80529	4.97282	4.973
*	42 Acenaphthene-d10	164	15.500	15.500	(1.000)	192459	4.00000	
	43 3-Nitroaniline	138	15.430	15.430	(0.996)	91440	4.55733	4.557
	44 Acenaphthene	153	15.569	15.561	(1.004)	292165	4.79203	4.792
	45 2,4-Dinitrophenol	184	15.646	15.647	(1.009)	17760	1.92814	1.928
	46 Dibenzofuran	168	15.894	15.894	(1.025)	455534	4.83261	4.833
	47 4-Nitrophenol	109	15.731	15.732	(1.015)	31544	4.08873	4.089
	48 2,4-Dinitrotoluene	165	15.956	15.956	(1.029)	106632	4.92932	4.929
	50 Diethylphthalate	149	16.450	16.451	(1.061)	311333	4.59754	4.598
	49 Fluorene	166	16.613	16.605	(1.072)	409103	4.47668	4.477
	51 4-Chlorophenyl-phenylether	204	16.590	16.590	(1.070)	244020	4.59359	4.594
	52 4-Nitroaniline	138	16.705	16.705	(1.078)	86292	4.04827	4.048
	53 4,6-Dinitro-2-methylphenol	198	16.790	16.791	(0.905)	55674	3.64558	3.646
	54 N-Nitrosodiphenylamine	169	16.844	16.844	(0.908)	271104	4.54648	4.546
$	55 2,4,6-Tribromophenol	330	Compound Not Detected.					
	56 4-Bromophenyl-phenylether	248	17.600	17.608	(0.949)	149720	4.93404	4.934
	57 Hexachlorobenzene	284	17.924	17.924	(0.966)	152202	4.77276	4.773
	58 Pentachlorophenol	266	18.280	18.289	(0.985)	51991	3.98721	3.987
*	59 Phenanthrene-d10	188	18.551	18.551	(1.000)	332308	4.00000	
	60 Phenanthrene	178	18.605	18.605	(1.003)	452776	5.03840	5.038
	61 Anthracene	178	18.698	18.698	(1.008)	482395	5.01984	5.020
	62 Carbazole	167	19.023	19.023	(1.025)	477437	5.03266	5.033
	63 Di-n-butylphthalate	149	19.797	19.797	(1.067)	630478	4.27610	4.276
	64 Fluoranthene	202	20.981	20.981	(0.889)	659364	4.95043	4.950
	65 Pyrene	202	21.406	21.406	(0.907)	771424	5.25414	5.254
$	66 Terphenyl-d14	244	Compound Not Detected.					
	67 Butylbenzylphthalate	149	22.598	22.598	(0.958)	240211	4.97393	4.974
	68 Benzo(a)anthracene	228	23.566	23.566	(0.999)	572518	4.80022	4.800
*	69 Chrysene-d12	240	23.597	23.597	(1.000)	319618	4.00000	
	70 3,3'-Dichlorobenzidine	252	23.528	23.528	(0.997)	431848	9.01302	9.013
	71 Chrysene	228	23.644	23.644	(1.002)	446802	4.85899	4.859
	72 bis(2-Ethylhexyl)phthalate	149	23.620	23.620	(0.959)	268021	5.11675	5.117
*	134 Di-n-octylphthalate-d4	153	24.642	24.642	(1.000)	476118	4.00000	
	73 Di-n-octylphthalate	149	24.650	24.650	(1.000)	632575	4.74070	4.741
	74 Benzo(b)fluoranthene	252	25.556	25.556	(0.968)	629813	4.77806	4.778
	75 Benzo(k)fluoranthene	252	25.602	25.602	(0.970)	670704	5.13679	5.137
	76 Benzo(a)pyrene	252	26.268	26.268	(0.995)	592916	4.97710	4.977
*	77 Perylene-d12	264	26.400	26.400	(1.000)	334503	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	29.308	29.300	(1.110)	639525	4.74333	4.743
	79 Dibenzo(a,h)anthracene	278	29.324	29.316	(1.111)	498001	4.70260	4.703
	80 Benzo(g,h,i)perylene	276	30.178	30.170	(1.143)	567139	4.71378	4.714
	90 N-Nitrosodimethylamine	74	4.959	4.959	(0.529)	148222	5.62990	5.630
	91 Aniline	93	Compound Not Detected.					
	93 Benzidine	184	Compound Not Detected.					
	103 Pyridine	79	4.974	4.982	(0.531)	208649	5.03780	5.038
	105 1-methylnaphthalene	142	13.534	13.534	(1.140)	387646	4.92271	4.923
	111 Azobenzene (1,2-DP-Hydrazine)	77	16.921	16.914	(1.092)	410043	4.74895	4.749

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
187 Total Benzofluoranthenes	252	25.556	25.602	(0.968)	1244090	9.82856	9.829
120 2,3,4,6-Tetrachlorophenol	232	16.226	16.227	(1.047)	92537	4.47241	4.472

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D Page 1
Report Date: 21-Jul-2021 09:25

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072013.D
Lab Smp Id: SJG0249-SCV1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	97788	-7.33
27 Naphthalene-d8	373252	186626	746504	342760	-8.17
42 Acenaphthene-d10	212025	106013	424050	192459	-9.23
59 Phenanthrene-d10	362039	181020	724078	332308	-8.21
69 Chrysene-d12	338032	169016	676064	319618	-5.45
134 Di-n-octylphthala	565512	282756	1131024	476118	-15.81
77 Perylene-d12	375340	187670	750680	334503	-10.88

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.37	-0.09
27 Naphthalene-d8	11.87	11.37	12.37	11.87	-0.00
42 Acenaphthene-d10	15.51	15.01	16.01	15.50	-0.05
59 Phenanthrene-d10	18.56	18.06	19.06	18.55	-0.04
69 Chrysene-d12	23.61	23.11	24.11	23.60	-0.03
134 Di-n-octylphthala	24.64	24.14	25.14	24.64	-0.00
77 Perylene-d12	26.40	25.90	26.90	26.40	-0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072013.D

Lab ID: SJG0249-SCV1
nt10.i, ABN.m, 20-JUL-2021 19:24

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

** FIRST SURROGATE NOT FOUND. ICAL Check not performed **

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
NONE			

RRT check based on Ccal File: NT1021072010.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LOW-CONCENTRATION CALIBRATION VERIFICATION

EPA 8270E

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Calibration: EG00057
Laboratory ID: SJH0174-LCV1
Sequence: SJH0174
Standard ID: J008131

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
Naphthalene	0.50000	0.4	-11.2	50.00
2-Methylnaphthalene	0.50000	0.5	-7.7	50.00
Acenaphthylene	0.50000	0.5	2.9	50.00
Acenaphthene	0.50000	0.4	-14.4	50.00
Fluorene	0.50000	0.5	-7.6	50.00
Phenanthrene	0.50000	0.5	-8.7	50.00
Anthracene	0.50000	0.4	-13.0	50.00
Fluoranthene	0.50000	0.5	-6.6	50.00
Pyrene	0.50000	0.4	-11.8	50.00
Butylbenzylphthalate	0.50000	0.5	0.09	50.00
Benzo(a)anthracene	0.50000	0.5	1.7	50.00
Chrysene	0.50000	0.4	-11.2	50.00
Benzofluoranthenes, Total	1.0000	1.0	-3.7	50.00
Benzo(a)pyrene	0.50000	0.5	-6.8	50.00
Indeno(1,2,3-cd)pyrene	0.50000	0.5	-1.4	50.00
Dibenzo(a,h)anthracene	0.50000	0.5	4.9	50.00
Benzo(g,h,i)perylene	0.50000	0.5	-9.7	50.00
1,2-Dichlorobenzene-d4	0.50000	0.527	5.4	50.00
Nitrobenzene-d5	0.50000	0.506	1.2	50.00
2-Fluorobiphenyl	0.50000	0.529	5.7	50.00
p-Terphenyl-d14	0.50000	0.611	22.1	50.00

* Values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081403.D

Date : 14-AUG-2021 10:30

Client ID:

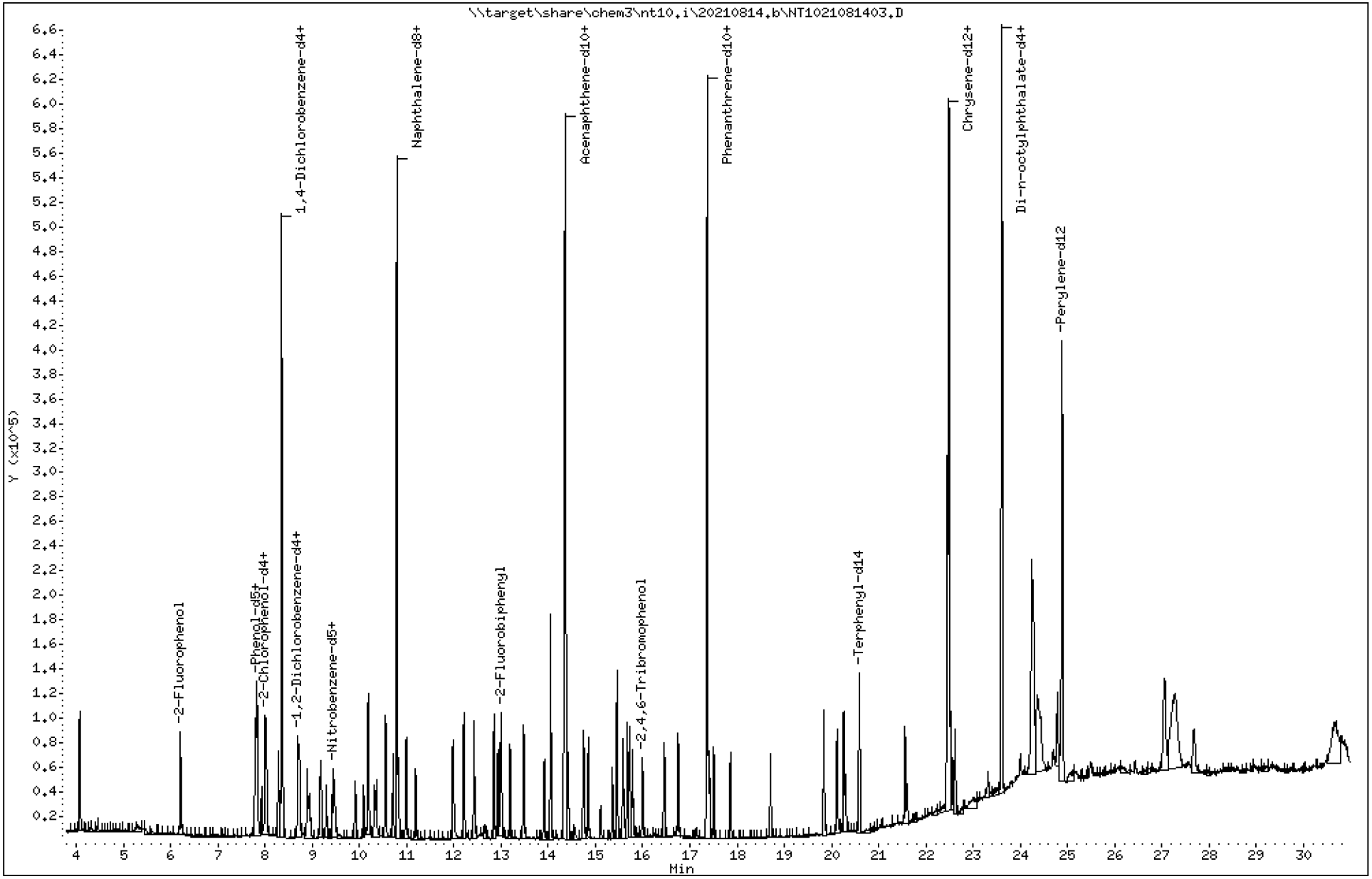
Instrument: nt10.i

Sample Info: SJH0174-LCV1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

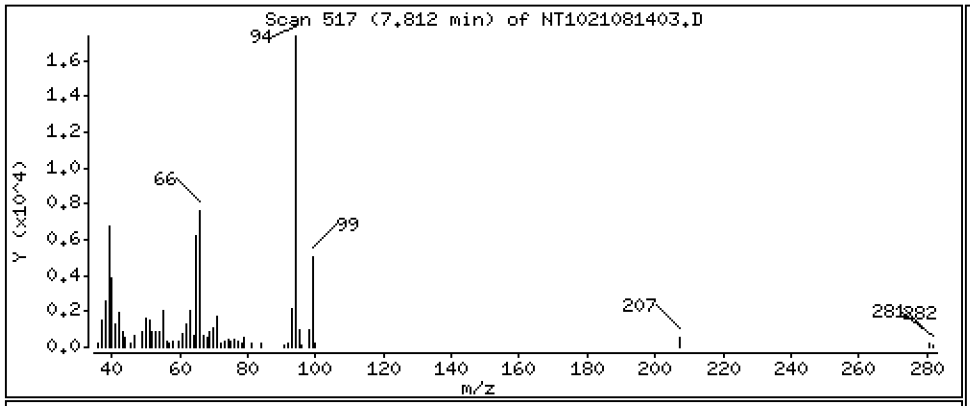
Operator: VTS

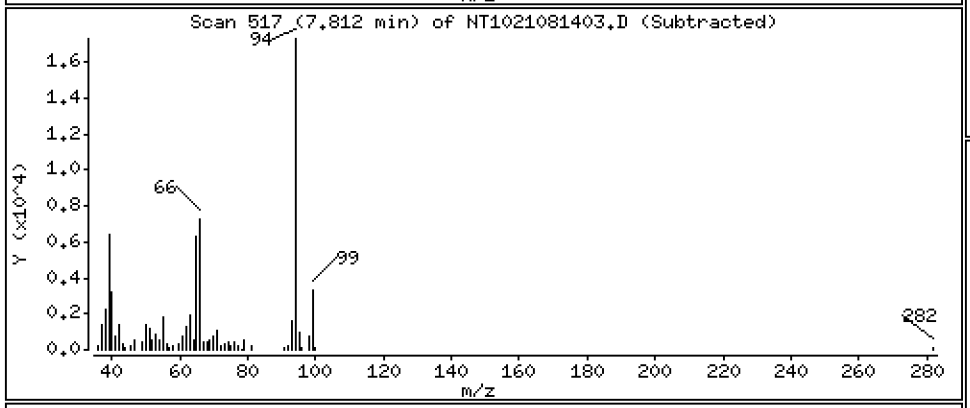
Column phase: ZB-5msi

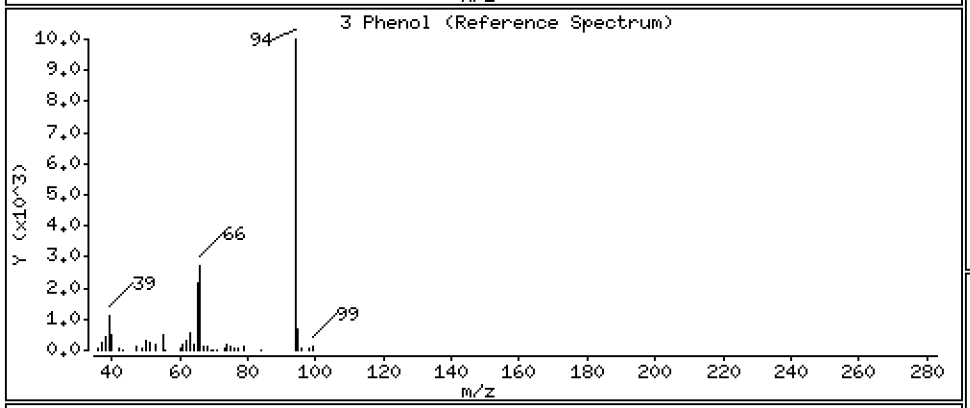
Column diameter: 0.25

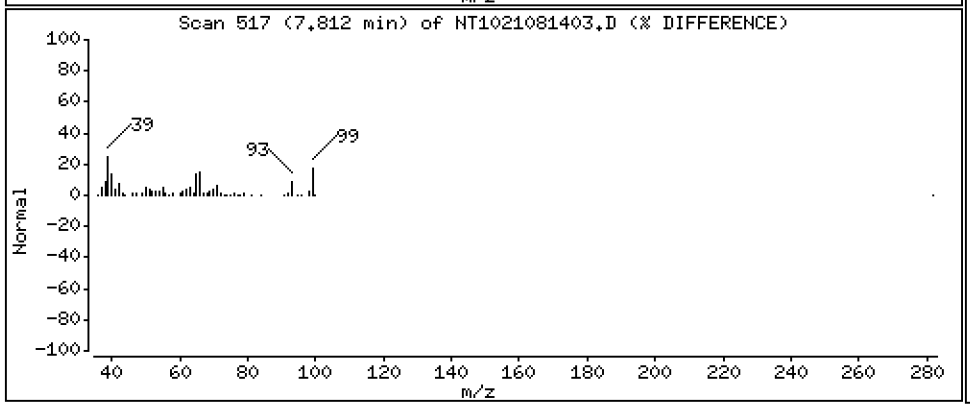
3 Phenol

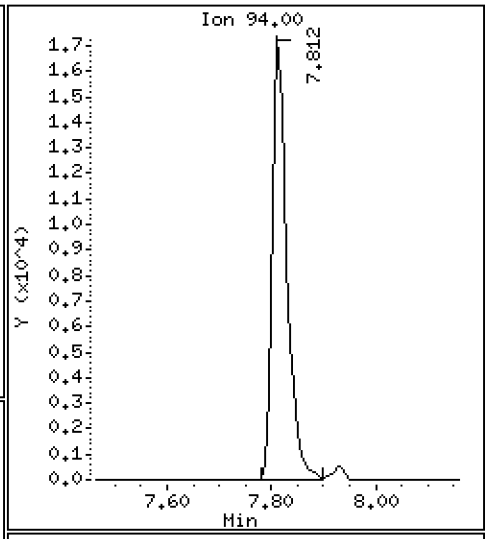
Concentration: 0.5353 ug/mL

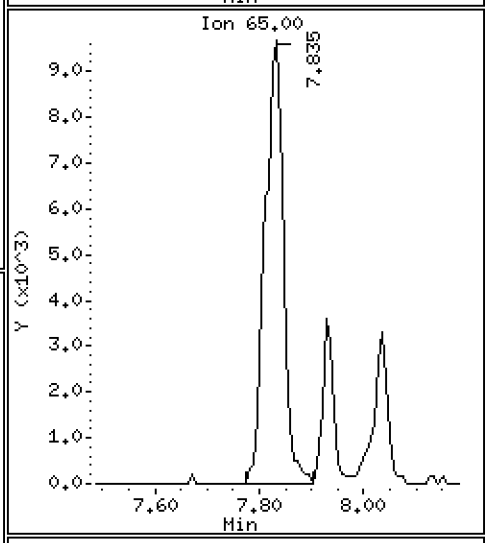


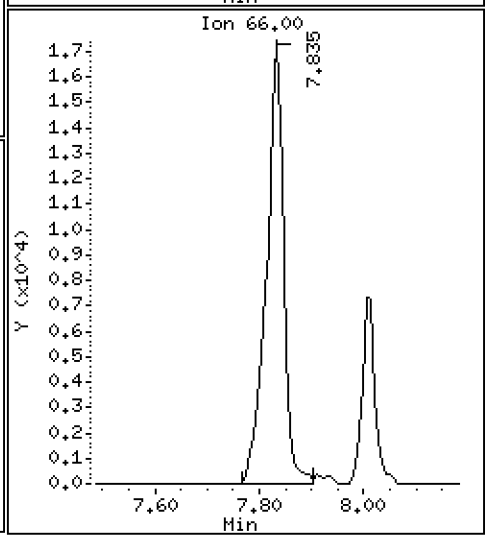












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

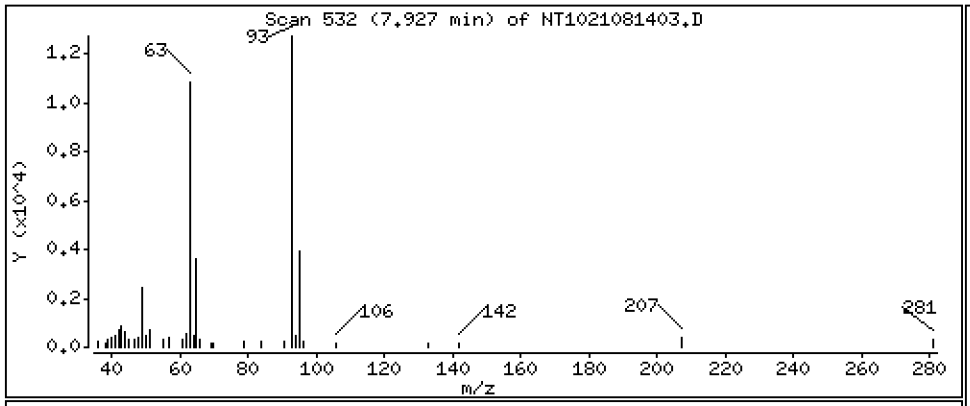
Operator: VTS

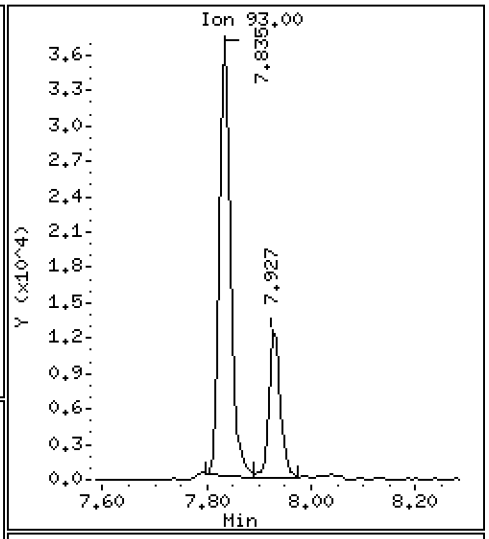
Column phase: ZB-5msi

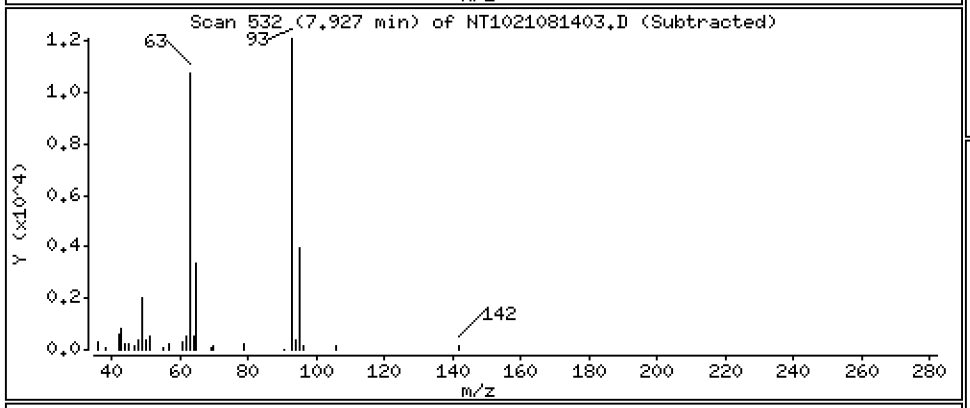
Column diameter: 0.25

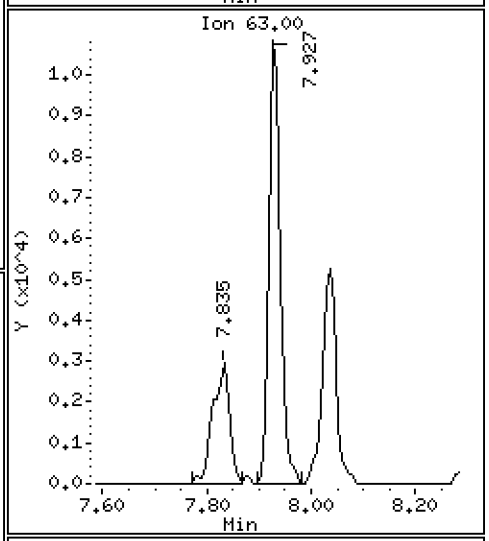
4 Bis(2-Chloroethyl)ether

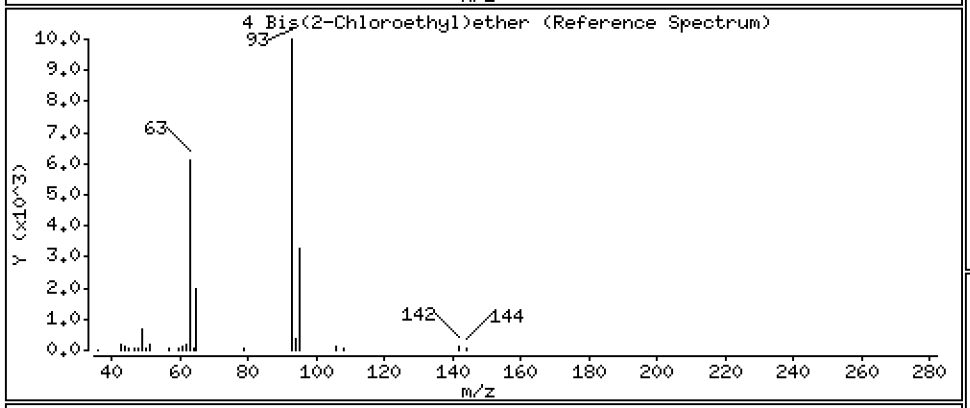
Concentration: 0.3986 ug/mL

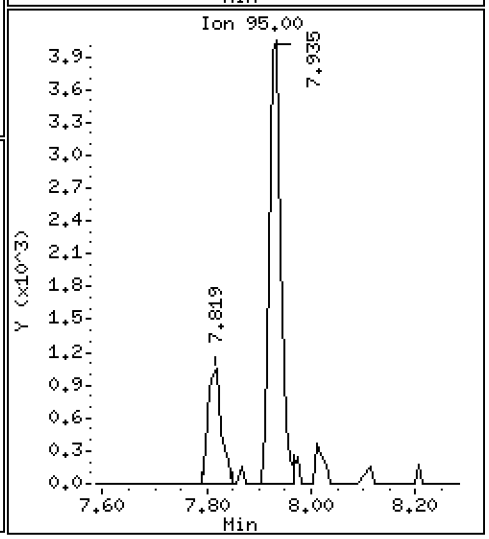


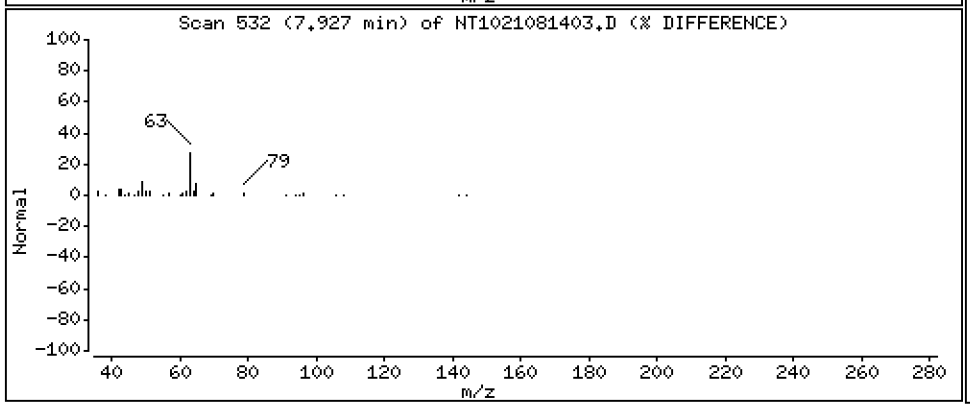












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

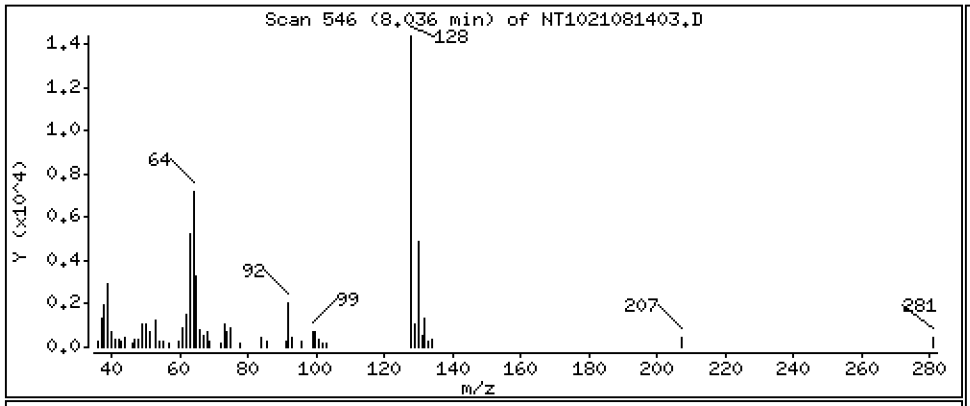
Operator: VTS

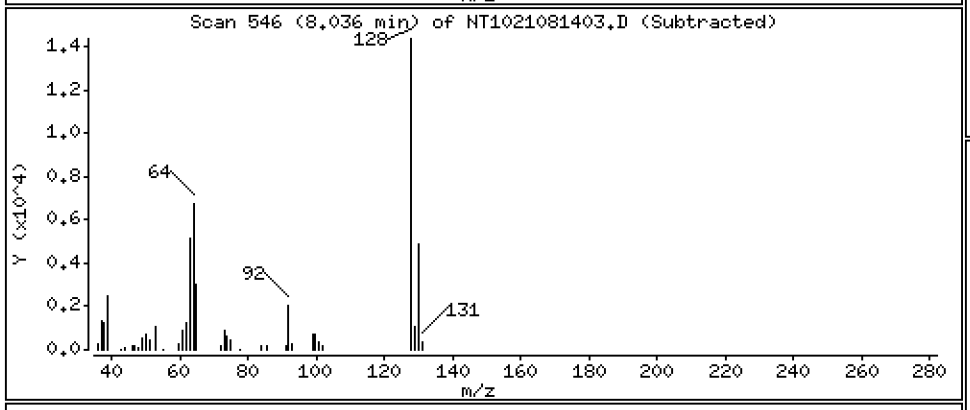
Column phase: ZB-5msi

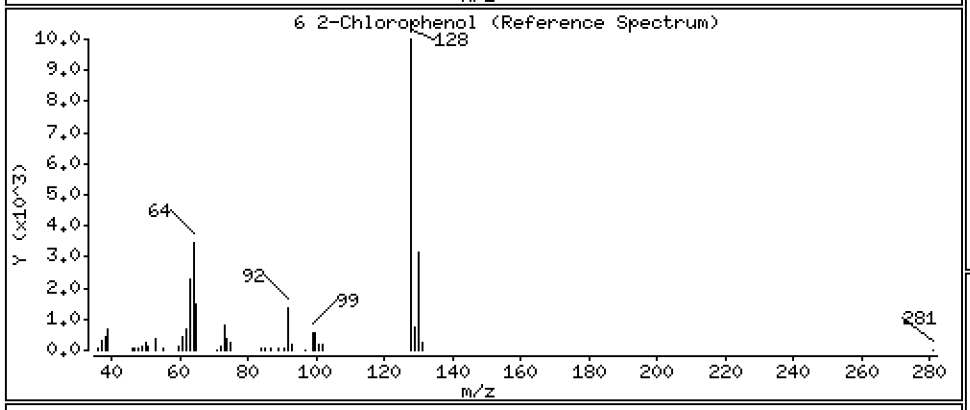
Column diameter: 0.25

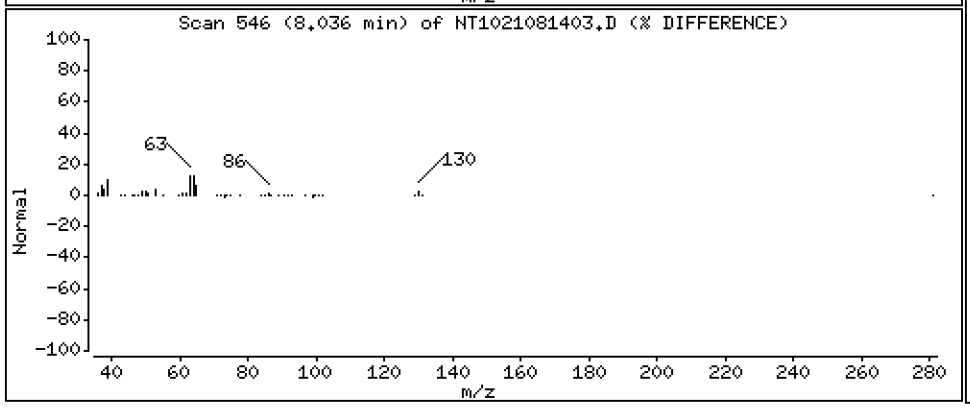
6 2-Chlorophenol

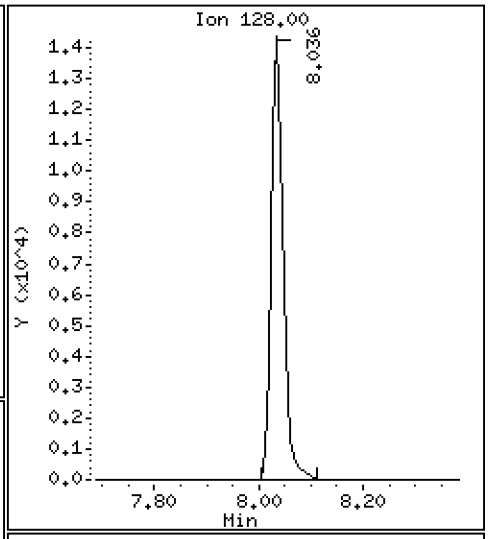
Concentration: 0.5785 ug/mL

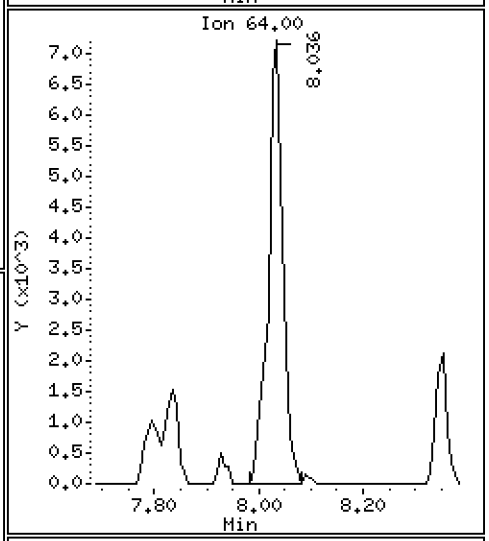


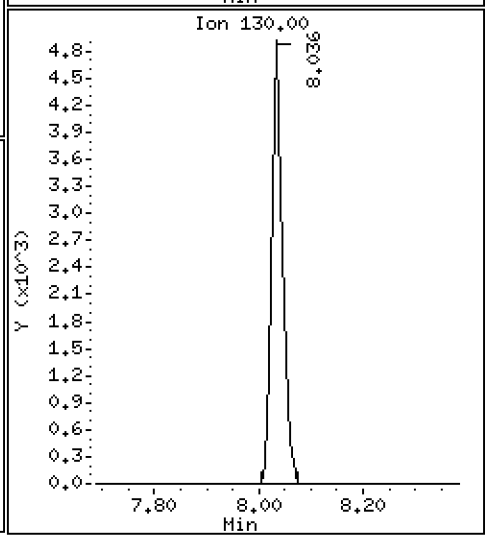












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

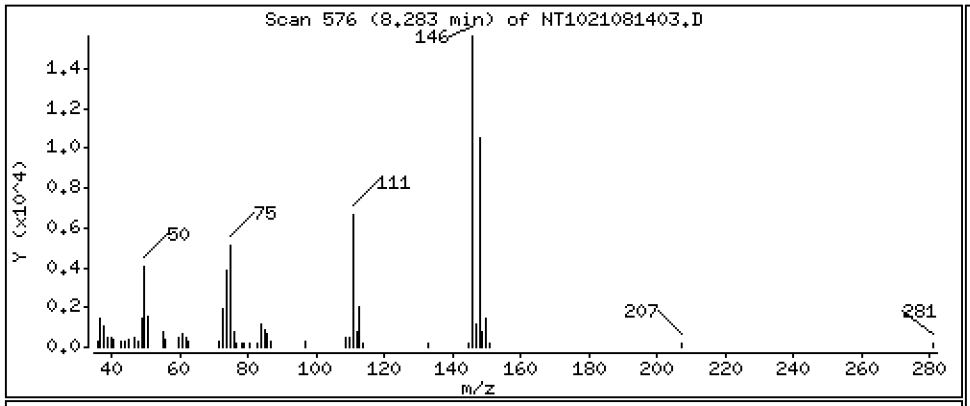
Operator: VTS

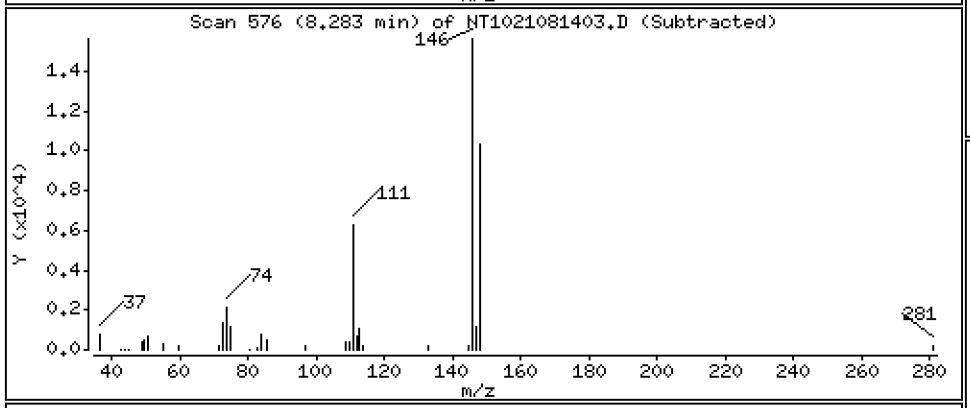
Column phase: ZB-5msi

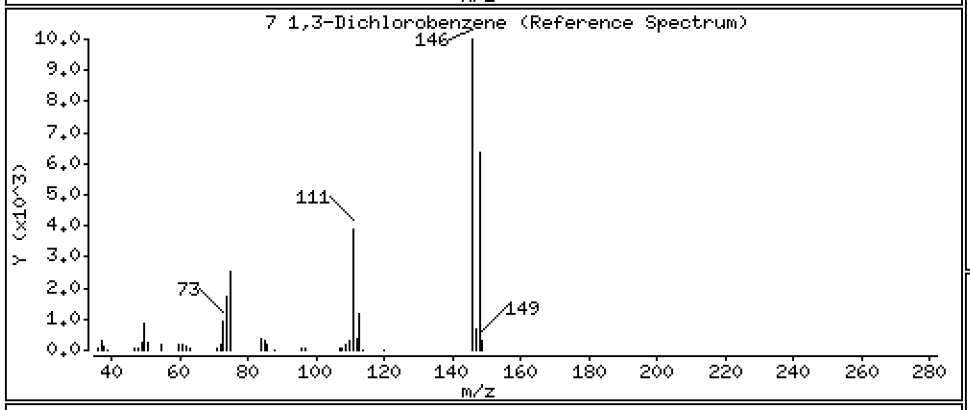
Column diameter: 0.25

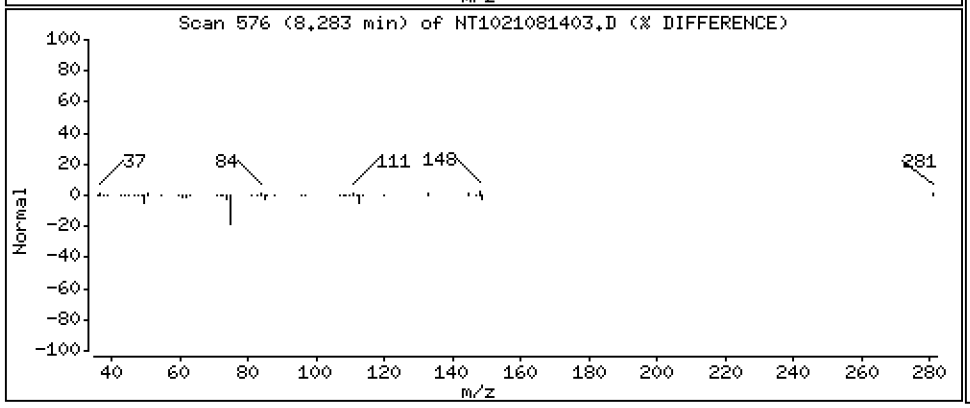
7 1,3-Dichlorobenzene

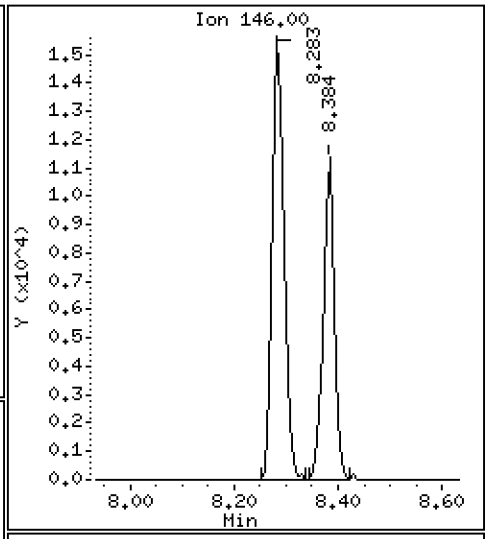
Concentration: 0.4841 ug/mL

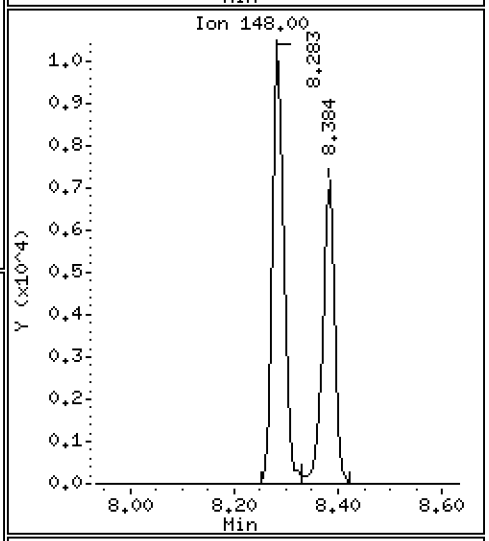


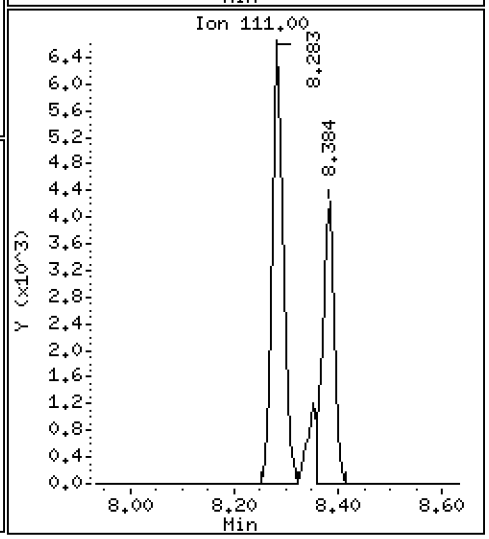












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

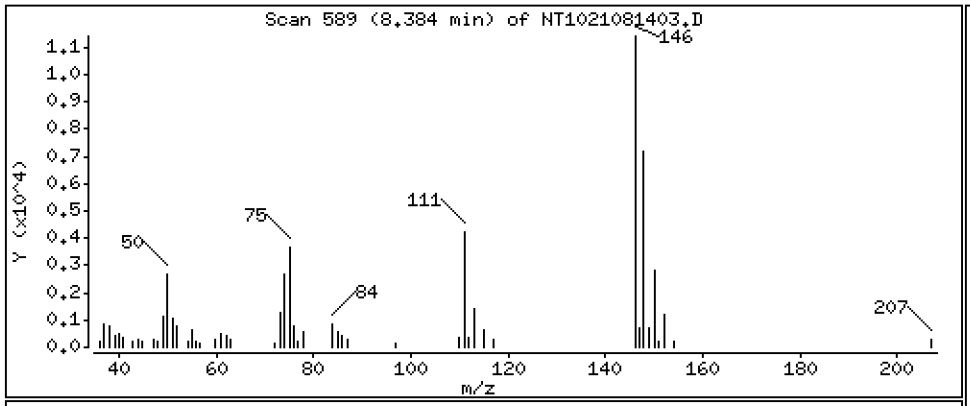
Operator: VTS

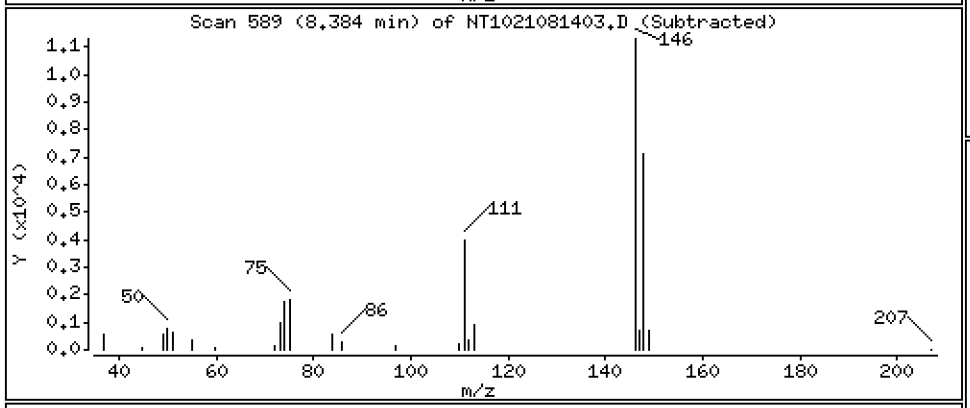
Column phase: ZB-5msi

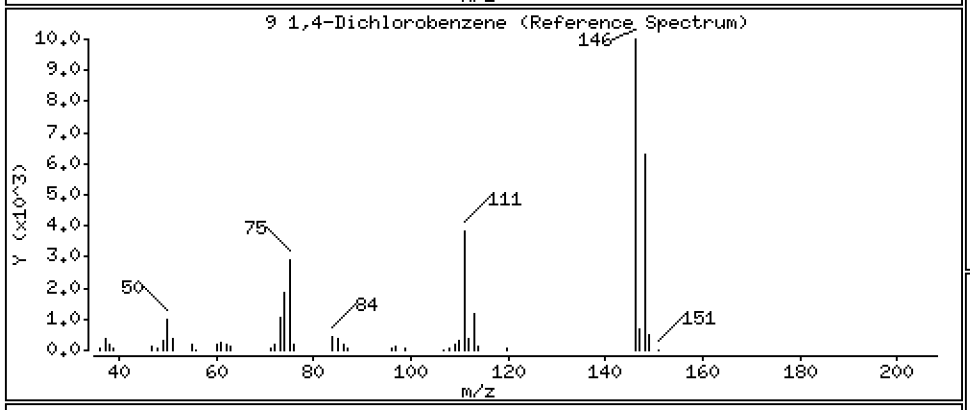
Column diameter: 0.25

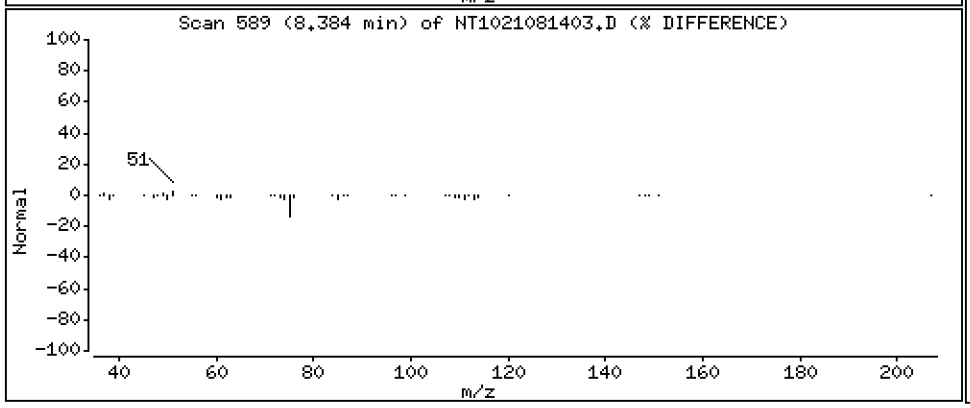
9 1,4-Dichlorobenzene

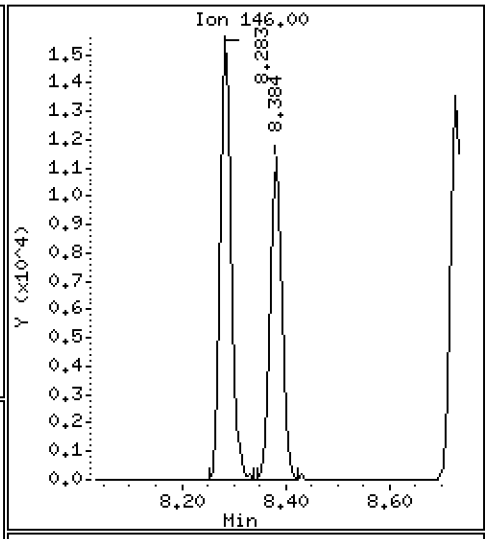
Concentration: 0.3985 ug/mL

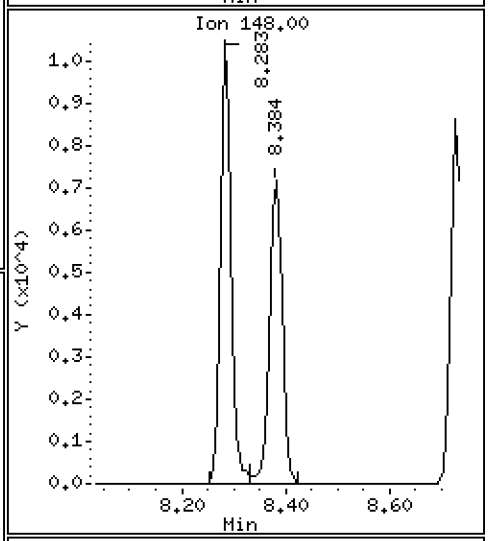


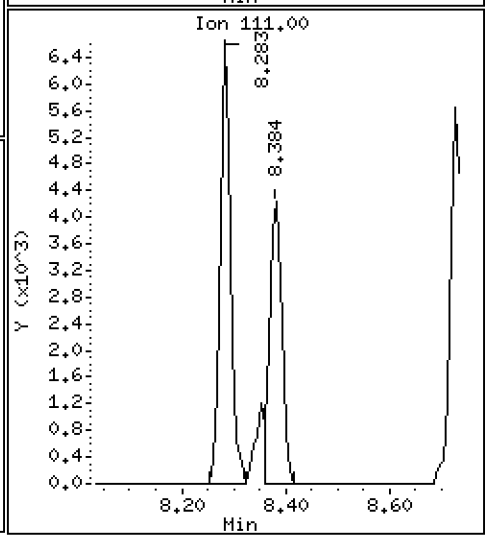












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

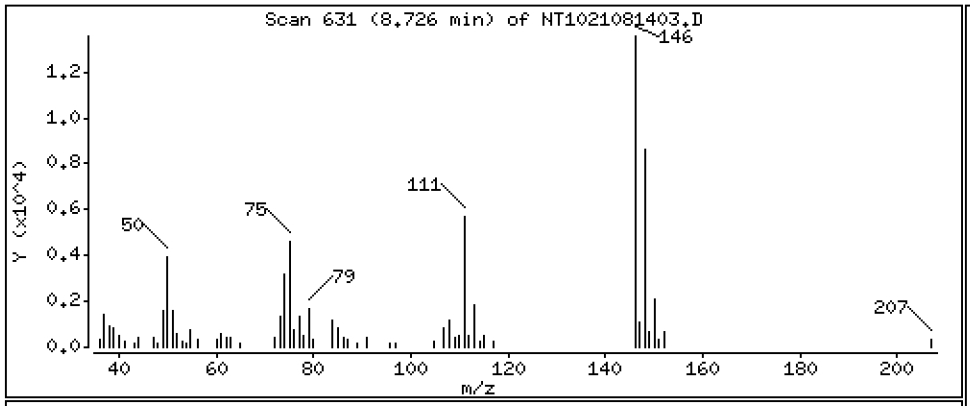
Operator: VTS

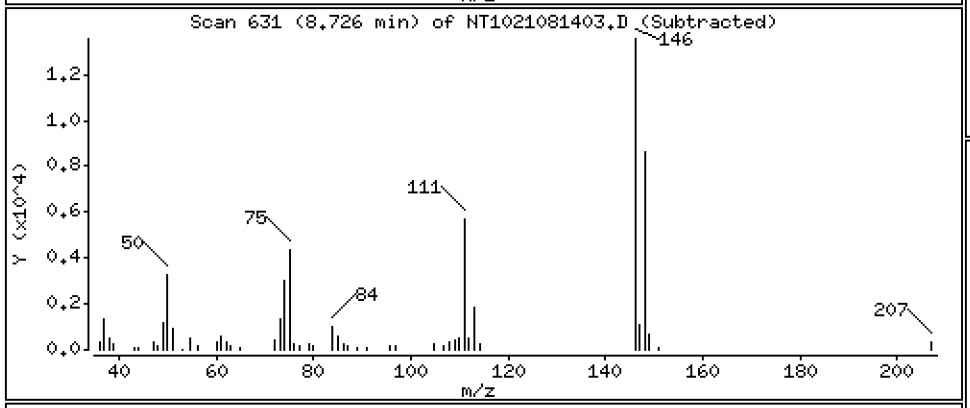
Column phase: ZB-5msi

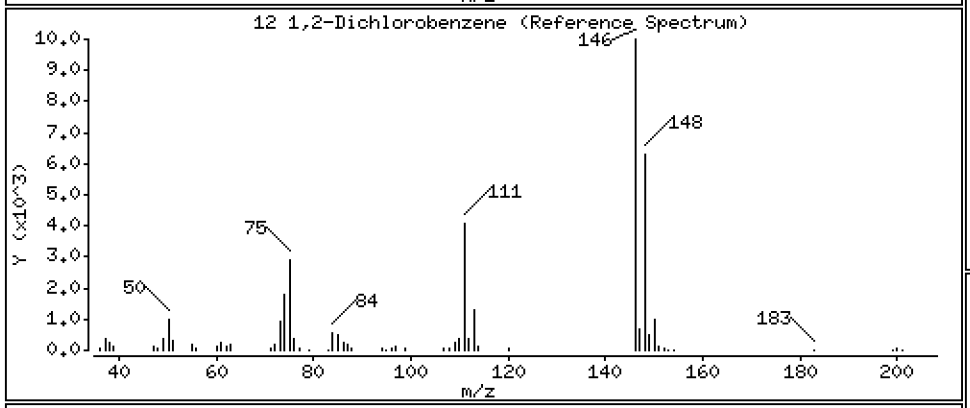
Column diameter: 0.25

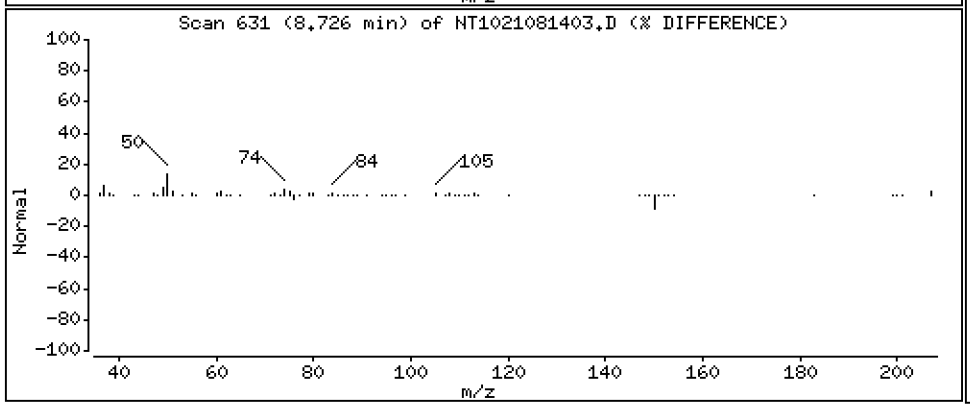
12 1,2-Dichlorobenzene

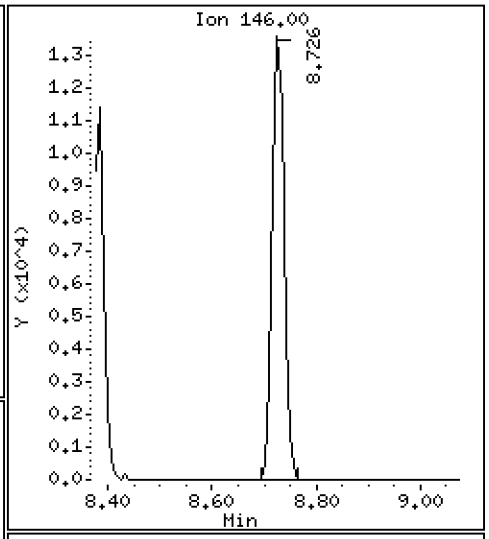
Concentration: 0.4569 ug/mL

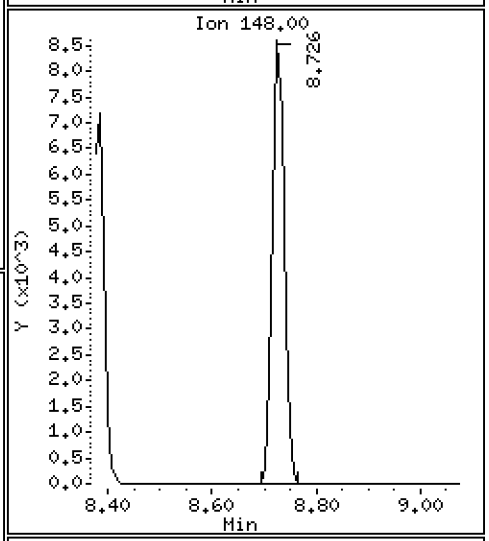


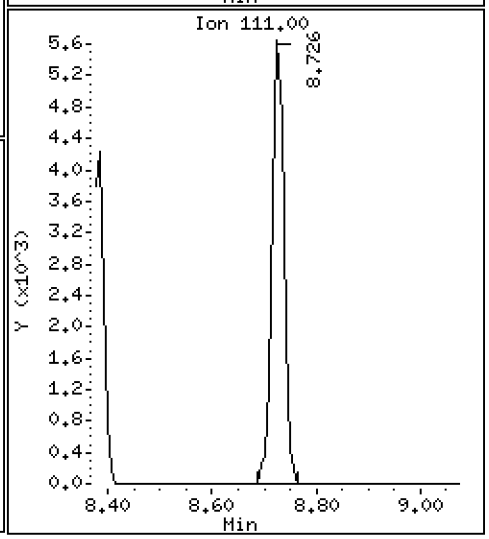












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

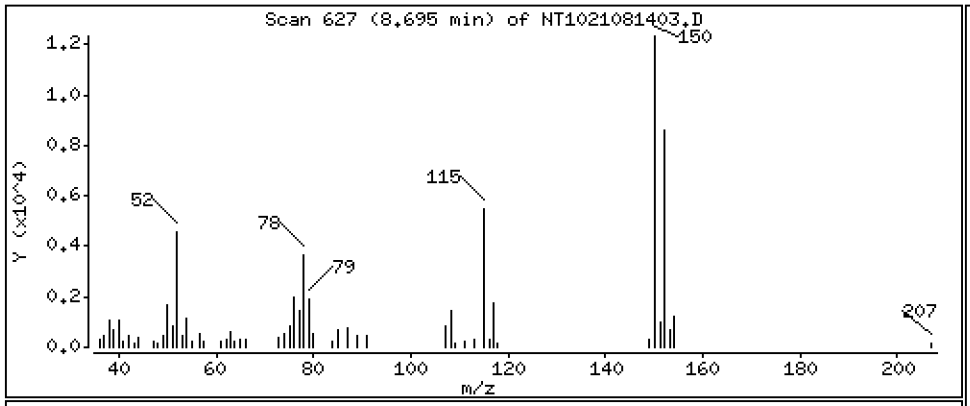
Operator: VTS

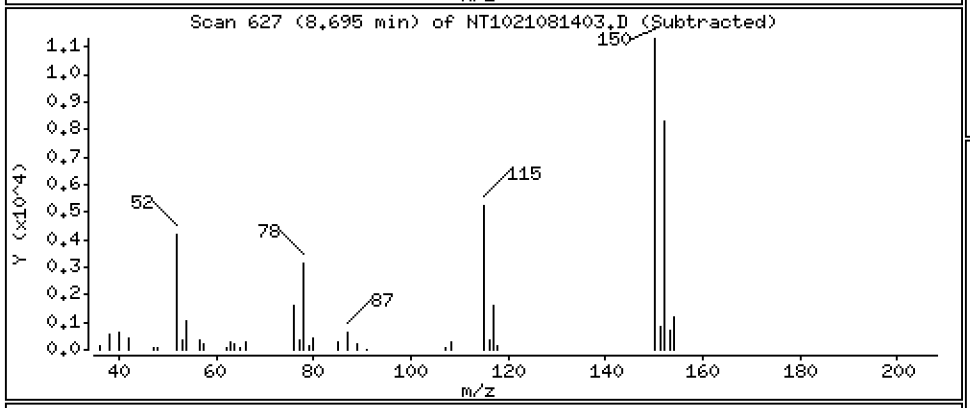
Column phase: ZB-5msi

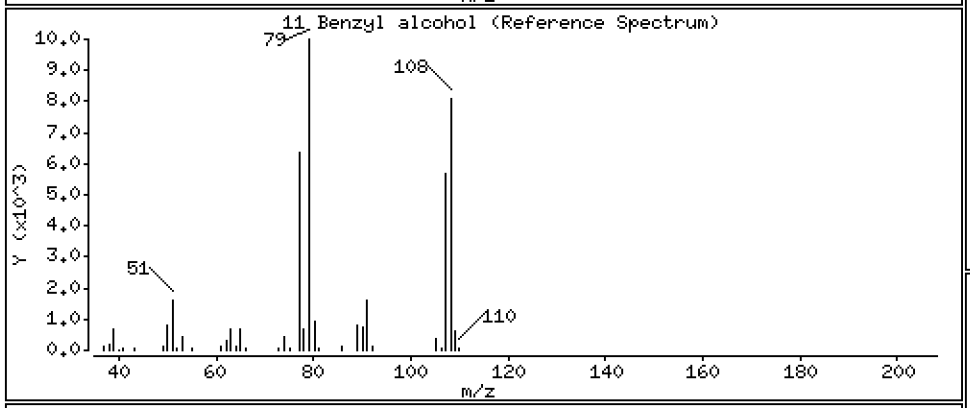
Column diameter: 0.25

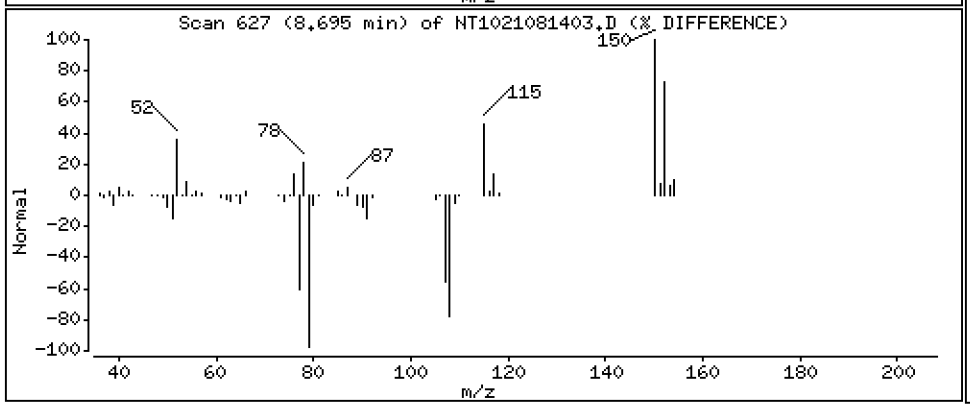
11 Benzyl alcohol

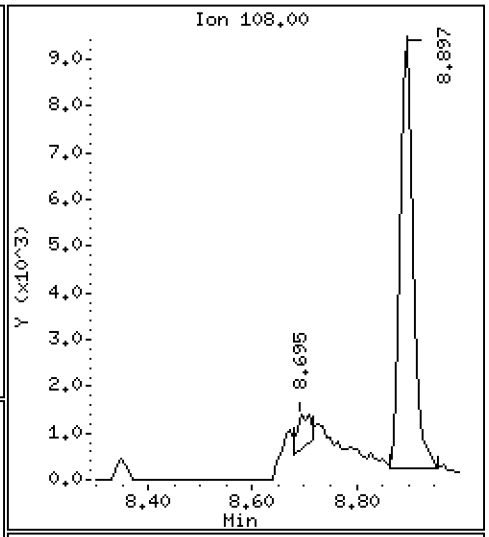
Concentration: 0.04731 ug/mL

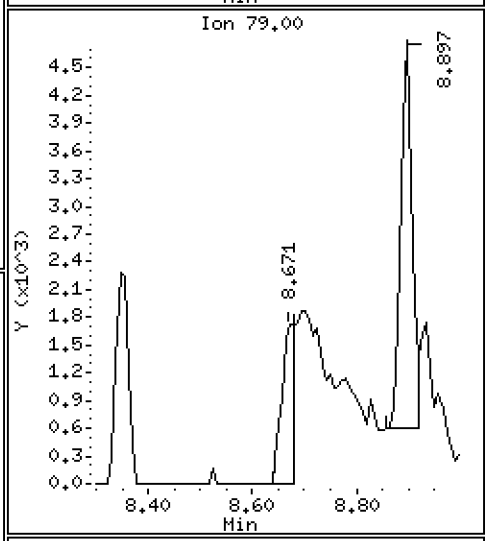


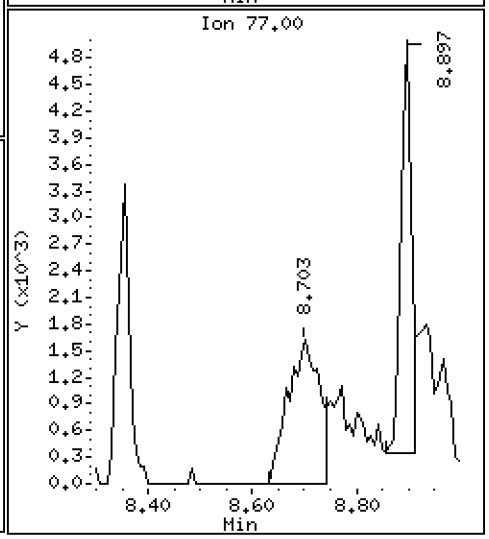












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

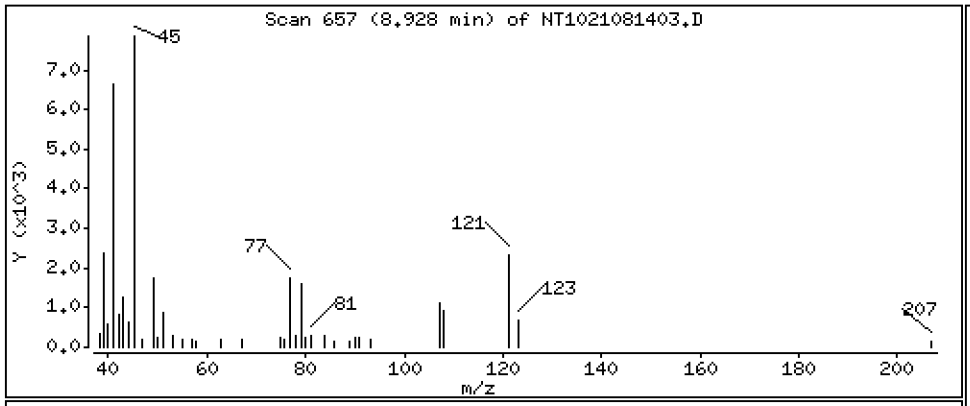
Operator: VTS

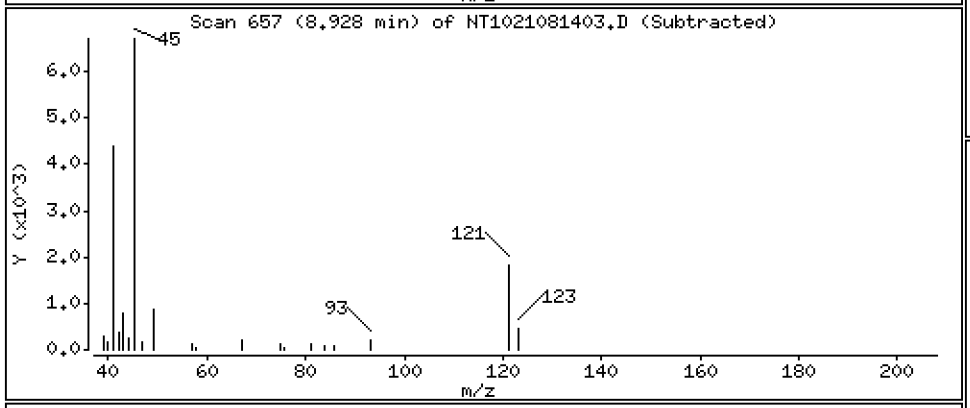
Column phase: ZB-5msi

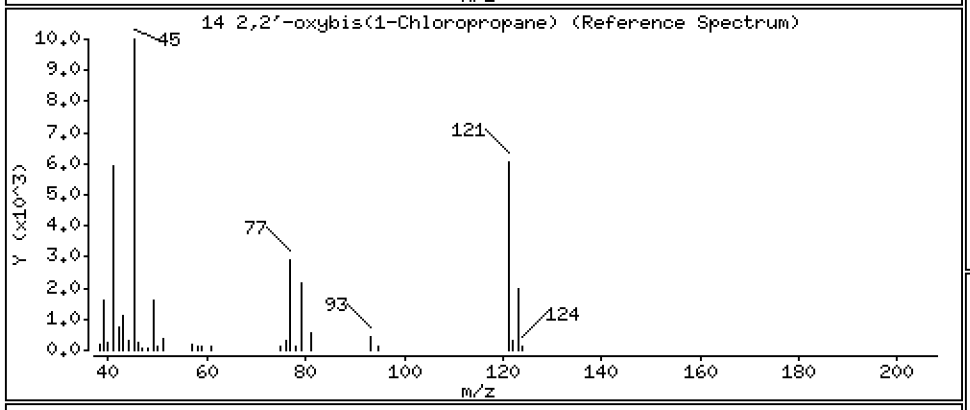
Column diameter: 0.25

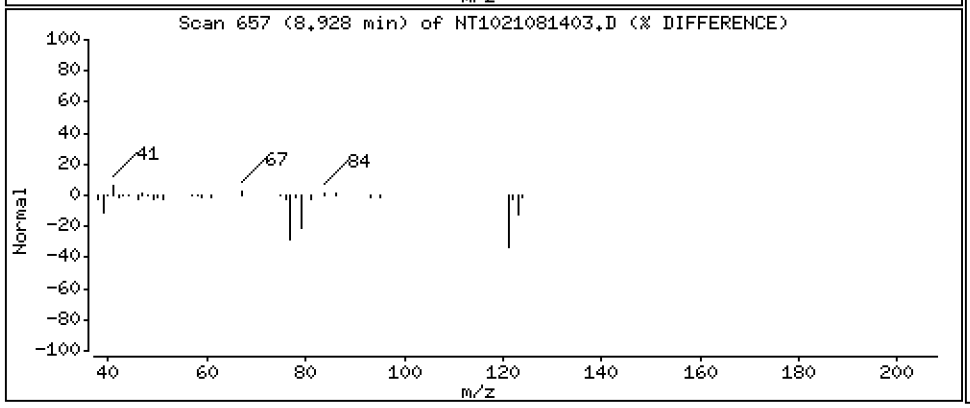
14 2,2'-oxybis(1-Chloropropane)

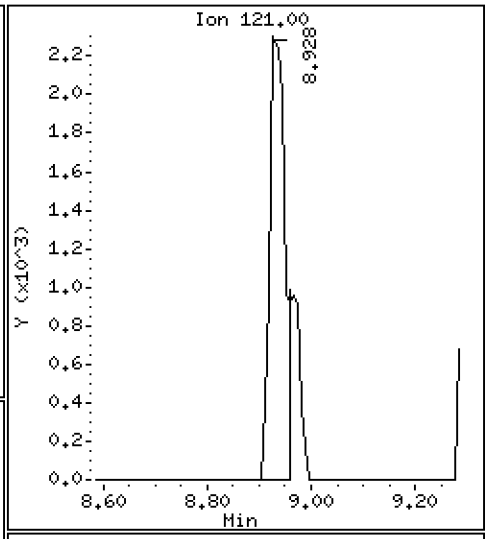
Concentration: 0.2665 ug/mL

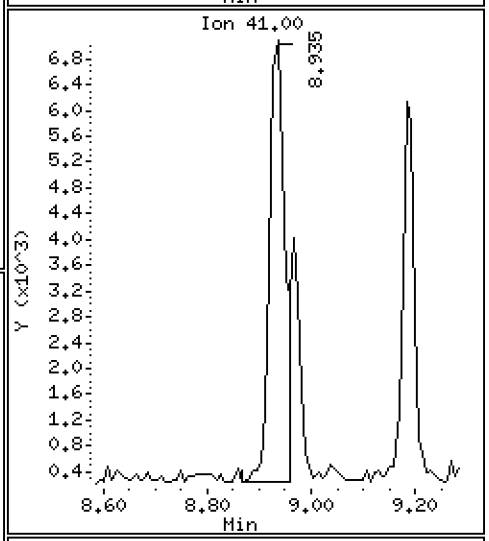


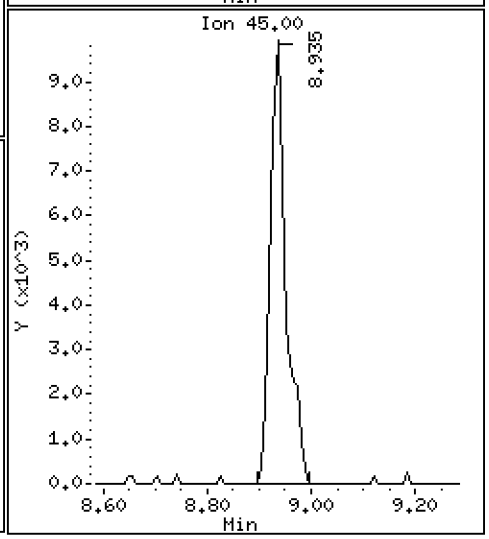












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

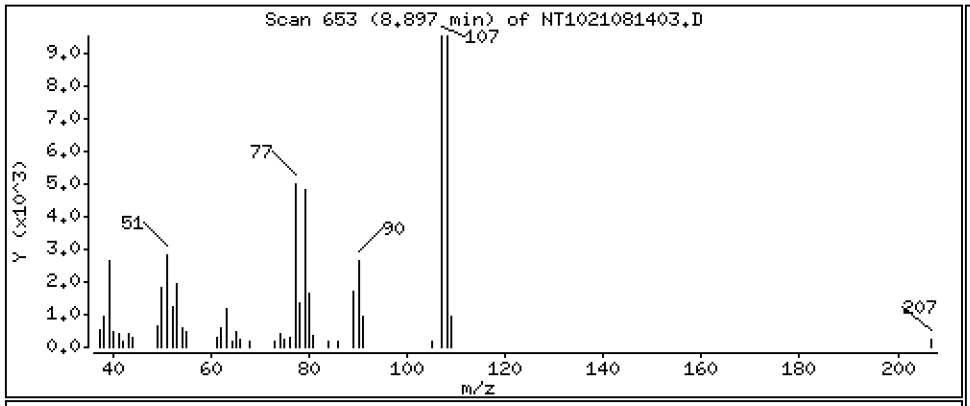
Operator: VTS

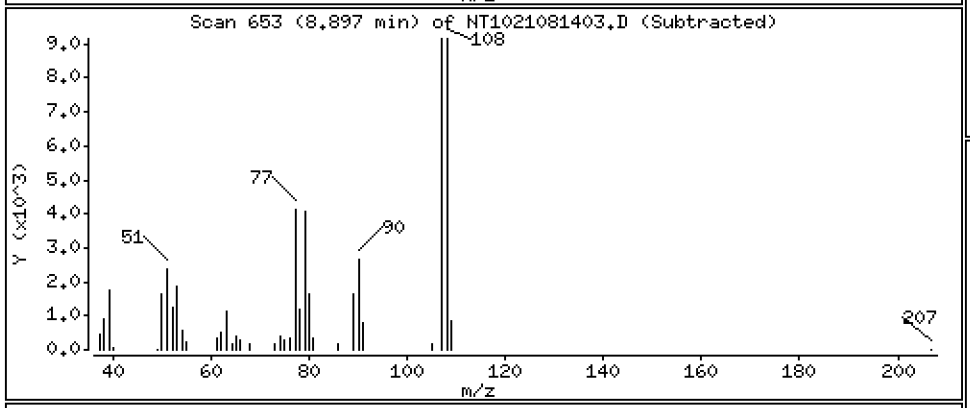
Column phase: ZB-5msi

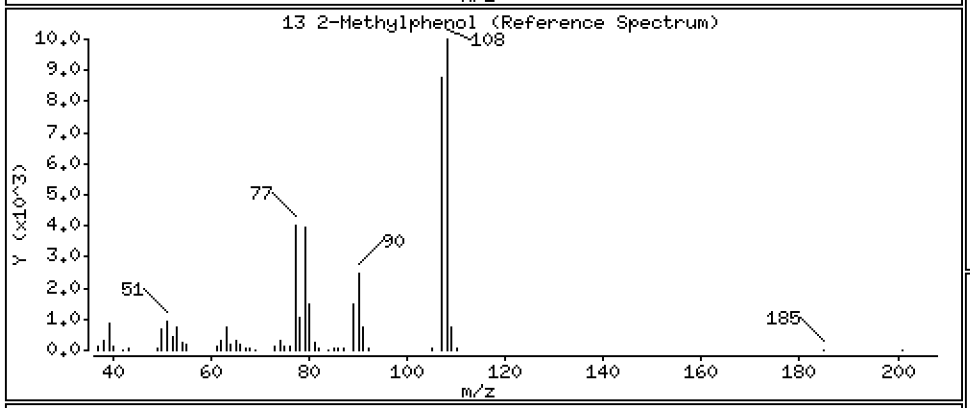
Column diameter: 0.25

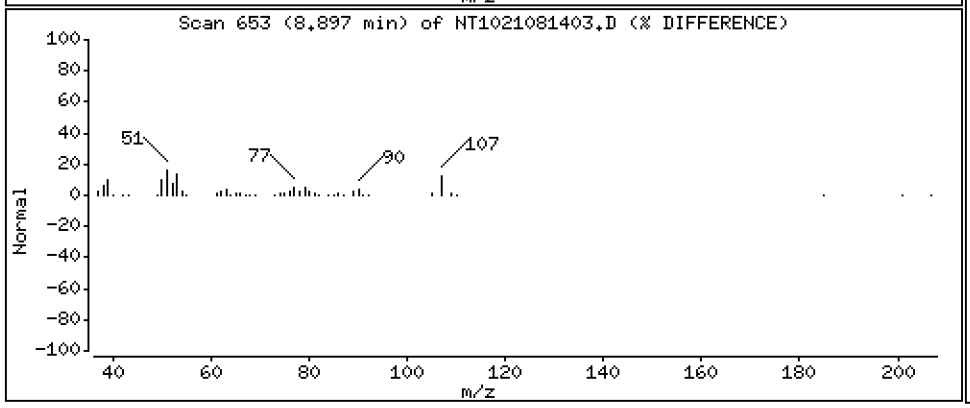
13 2-Methylphenol

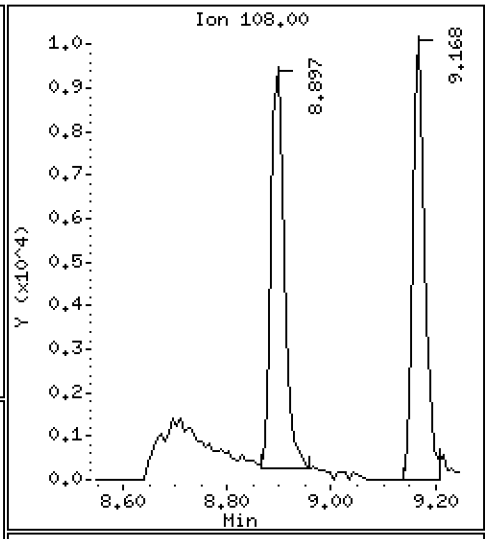
Concentration: 0.4205 ug/mL

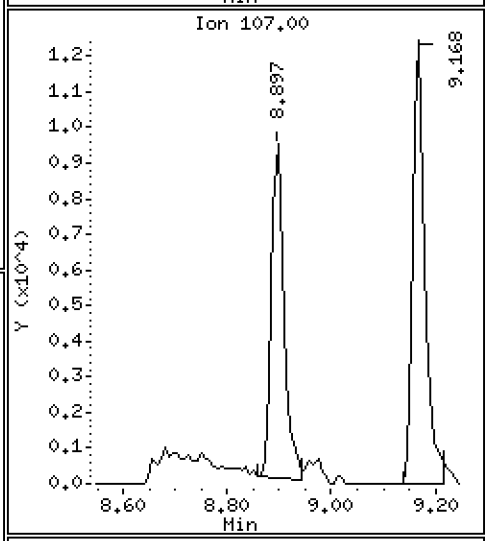


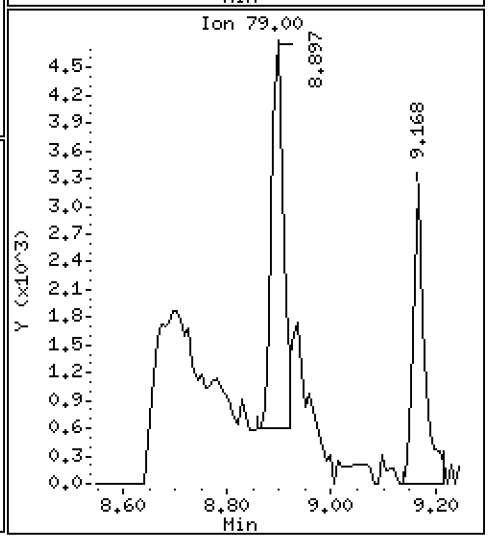












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

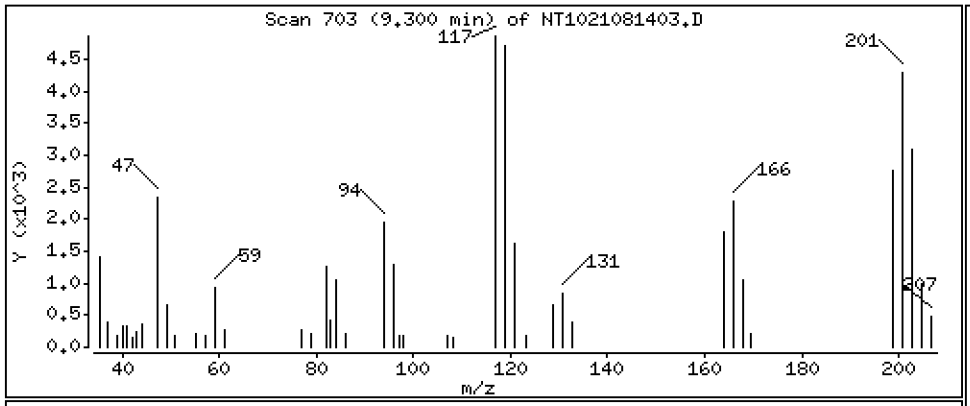
Operator: VTS

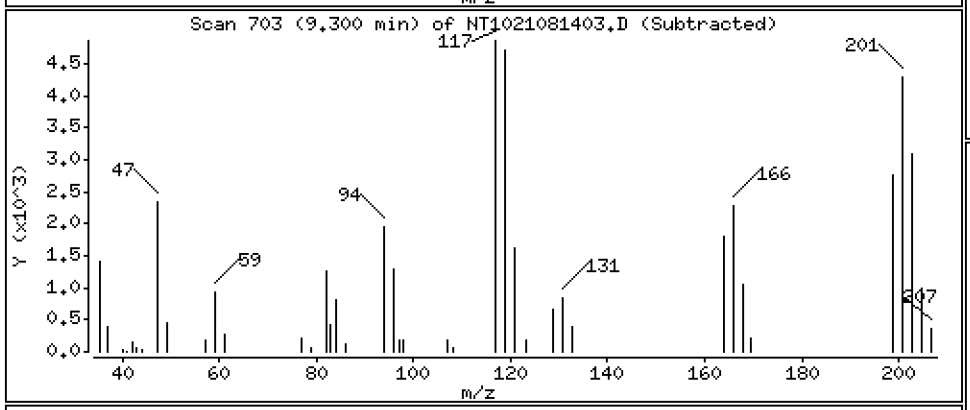
Column phase: ZB-5msi

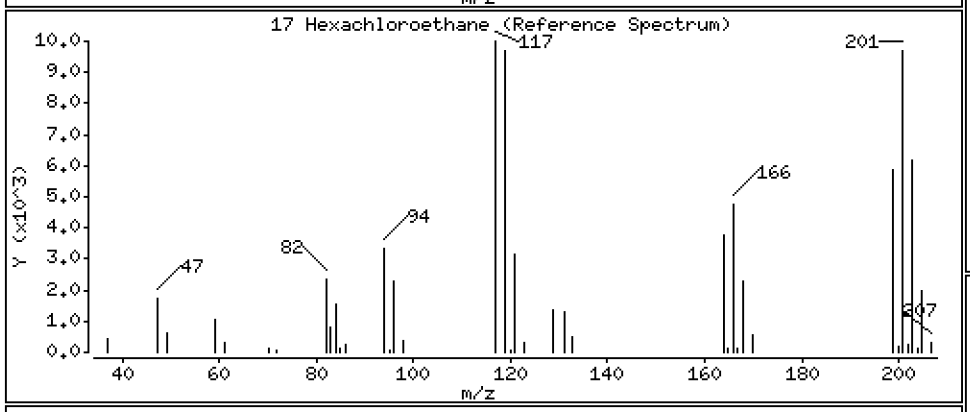
Column diameter: 0.25

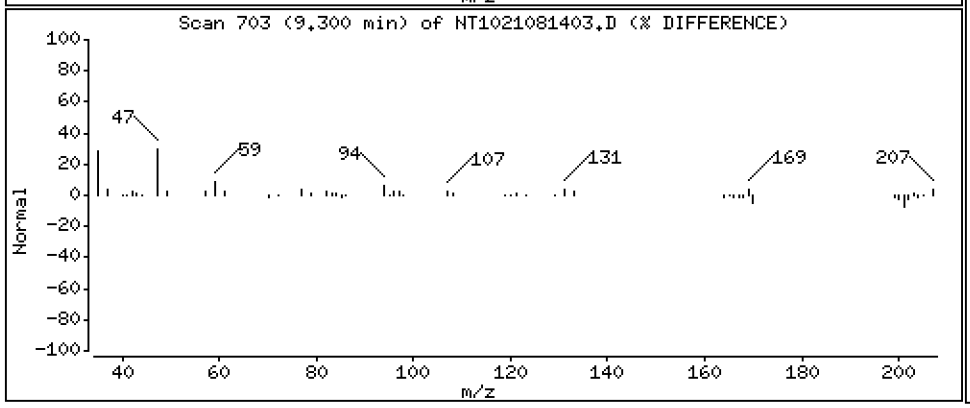
17 Hexachloroethane

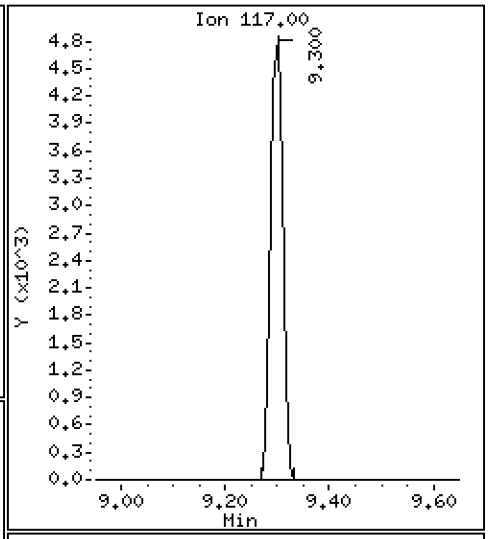
Concentration: 0.4119 ug/mL

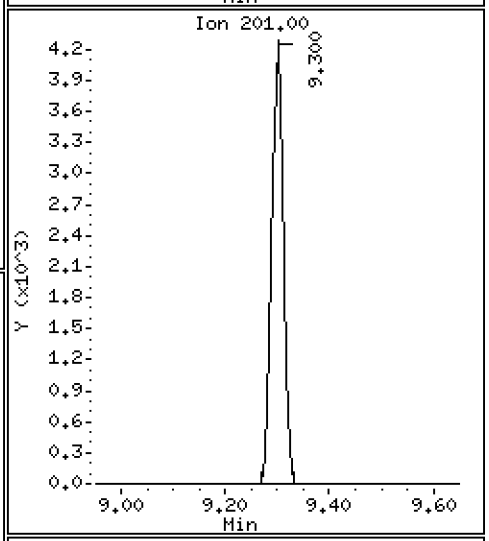


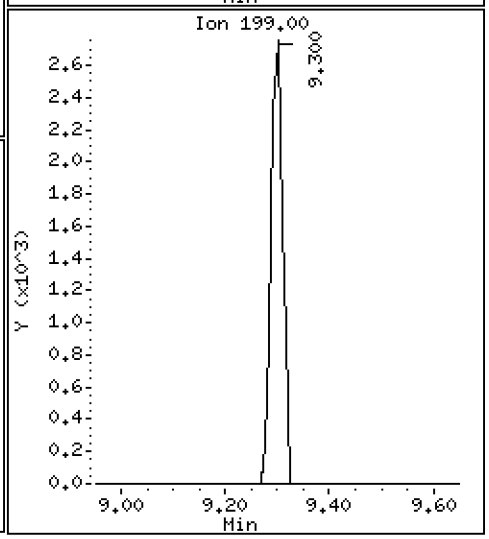












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

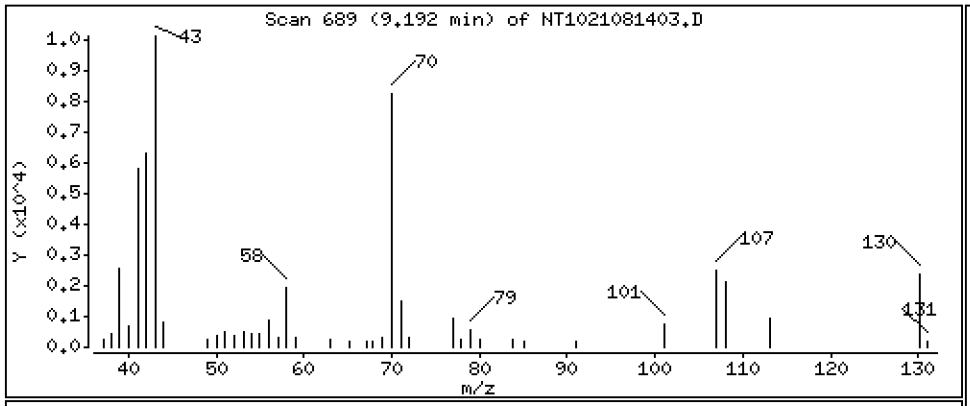
Operator: VTS

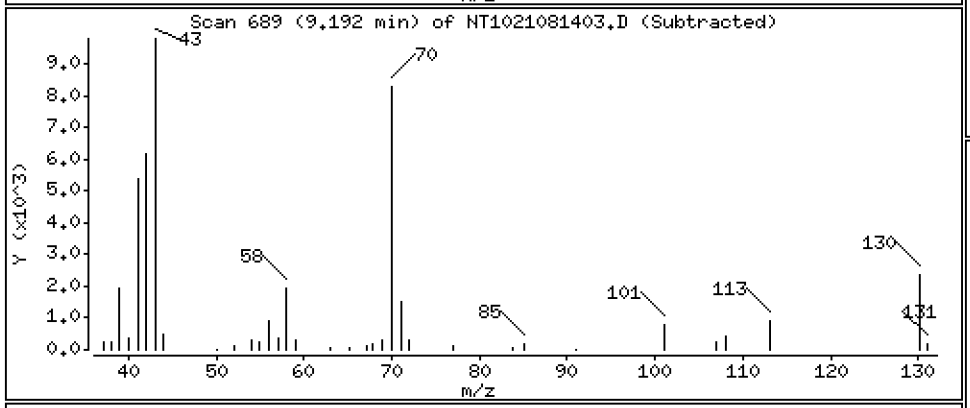
Column phase: ZB-5msi

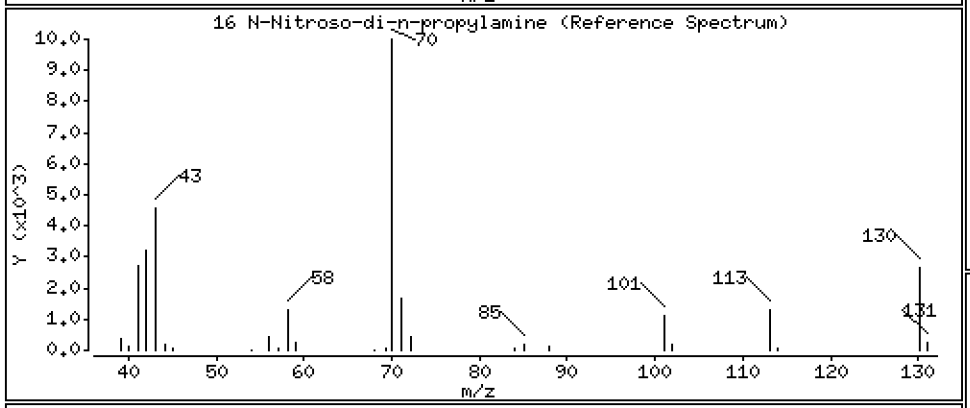
Column diameter: 0.25

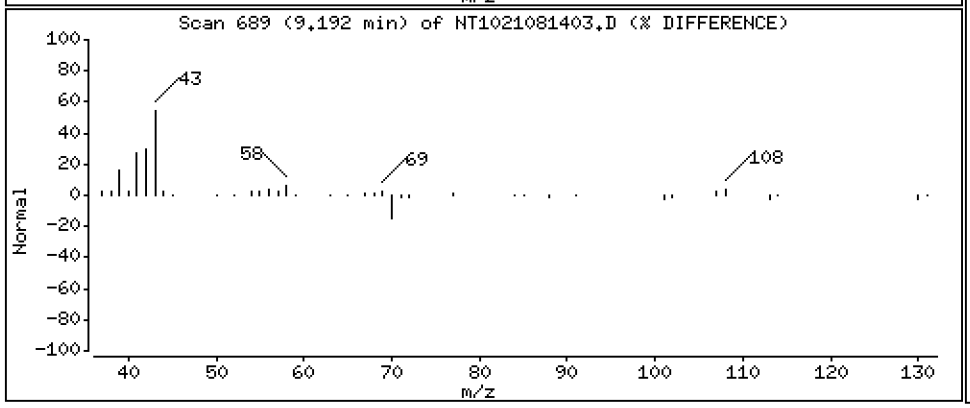
16 N-Nitroso-di-n-propylamine

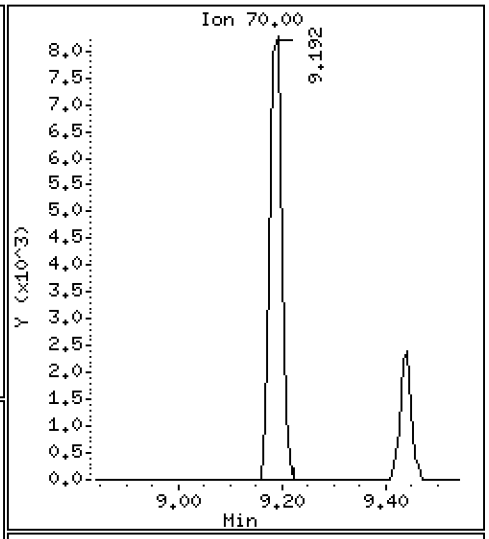
Concentration: 0.3916 ug/mL

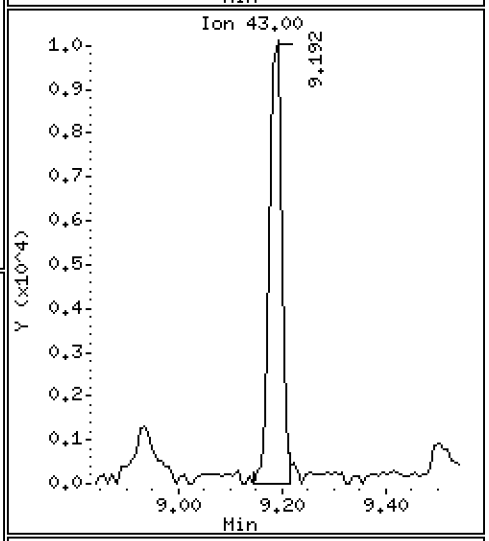


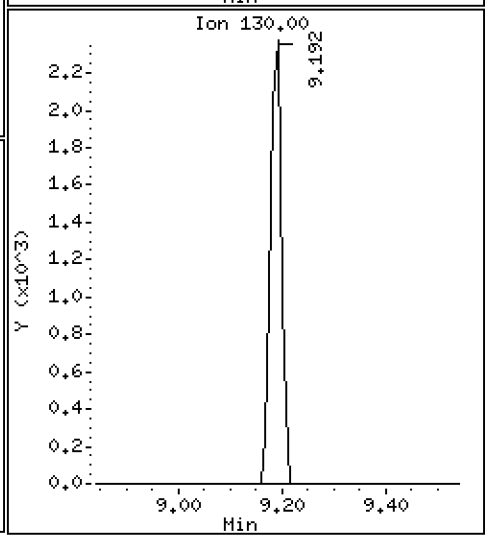












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

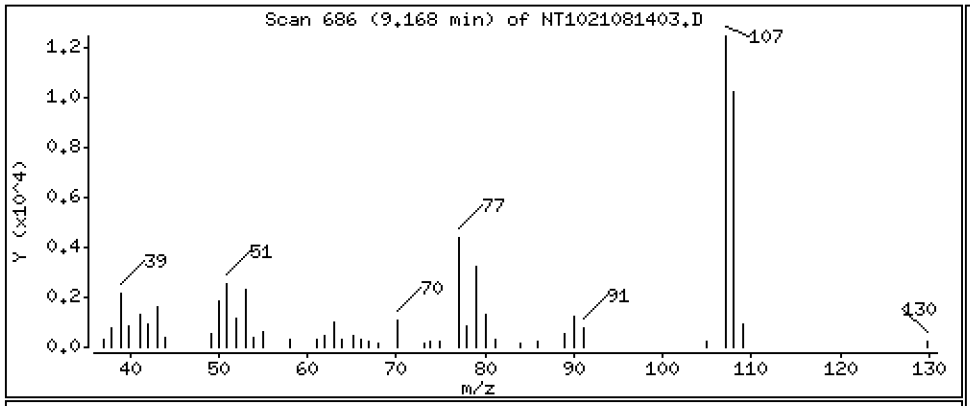
Operator: VTS

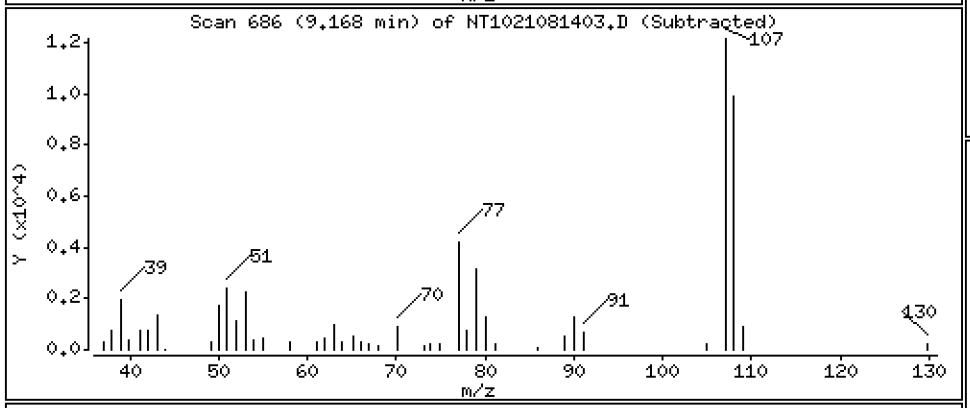
Column phase: ZB-5msi

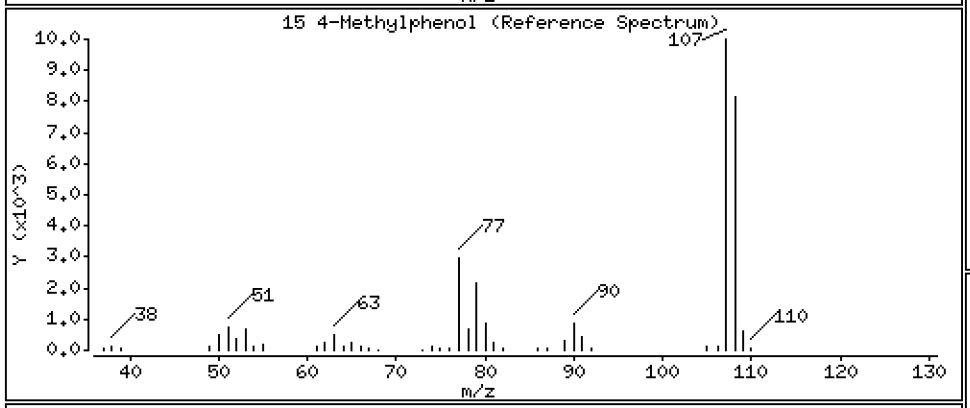
Column diameter: 0.25

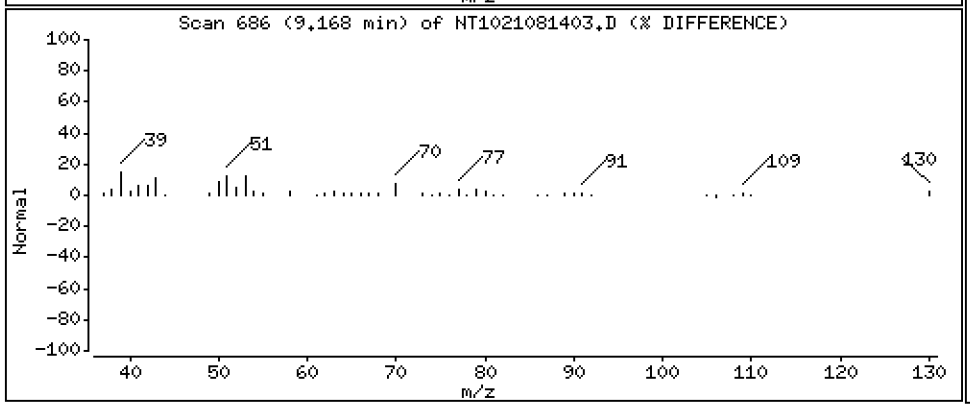
15 4-Methylphenol

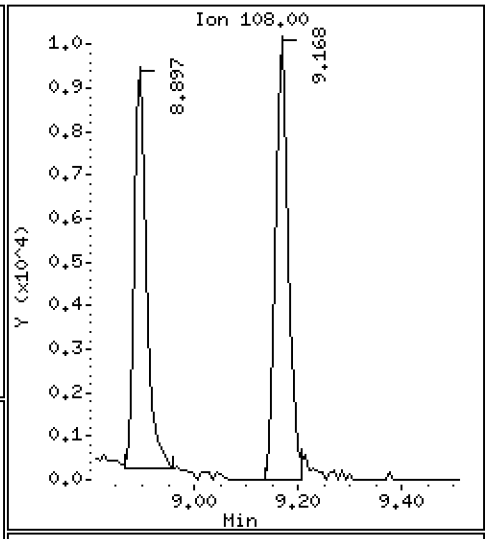
Concentration: 0.4301 ug/mL

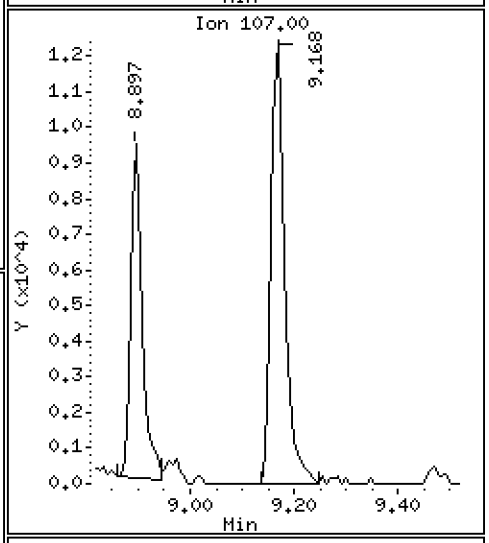


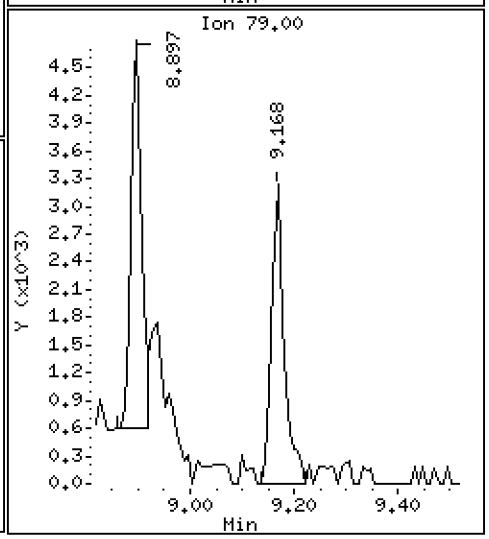












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

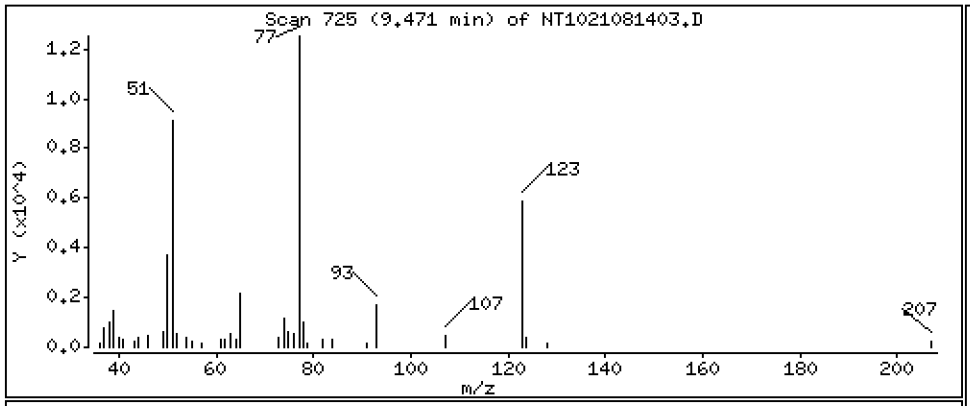
Operator: VTS

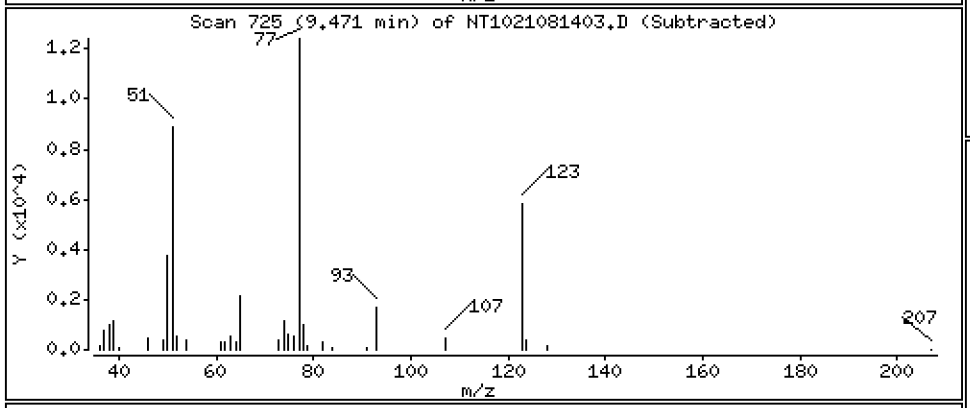
Column phase: ZB-5msi

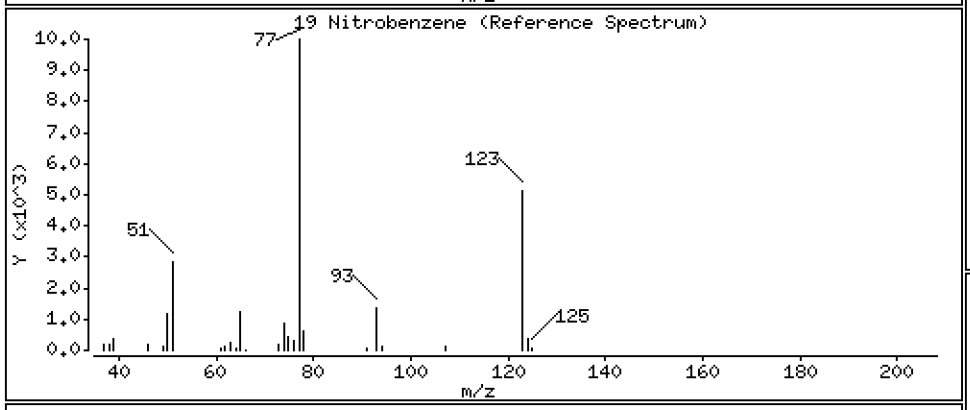
Column diameter: 0.25

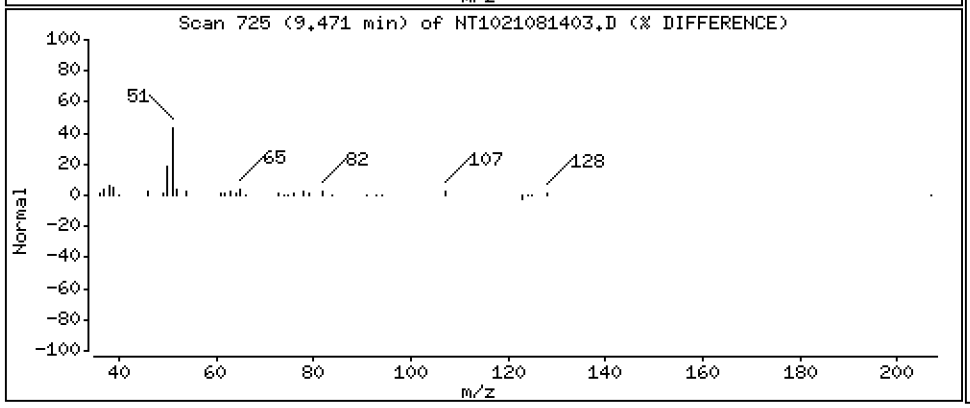
19 Nitrobenzene

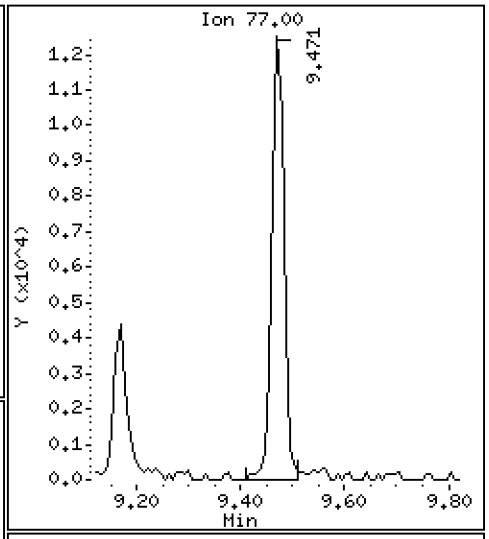
Concentration: 0.4186 ug/mL

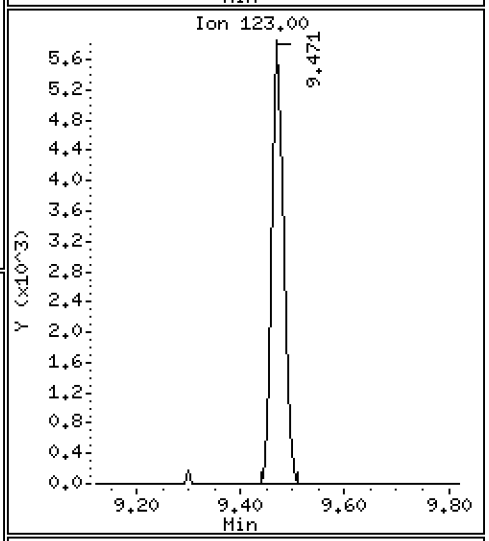


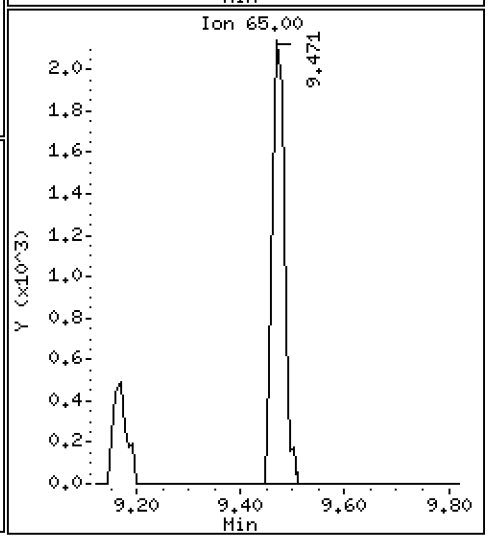












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

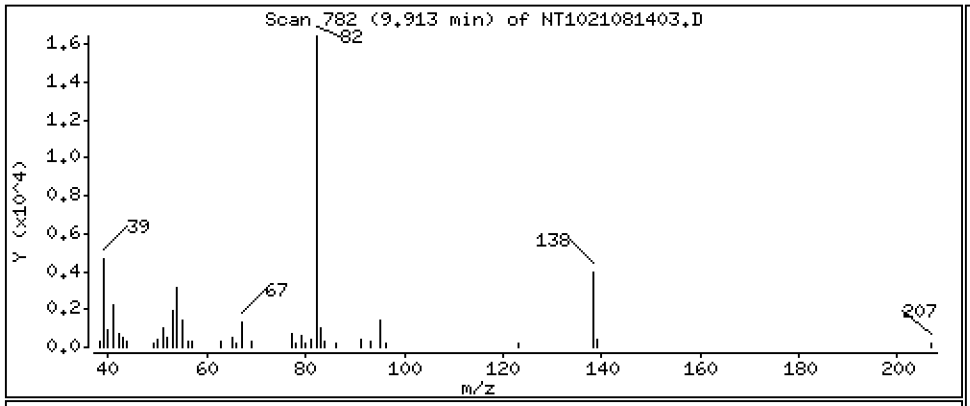
Operator: VTS

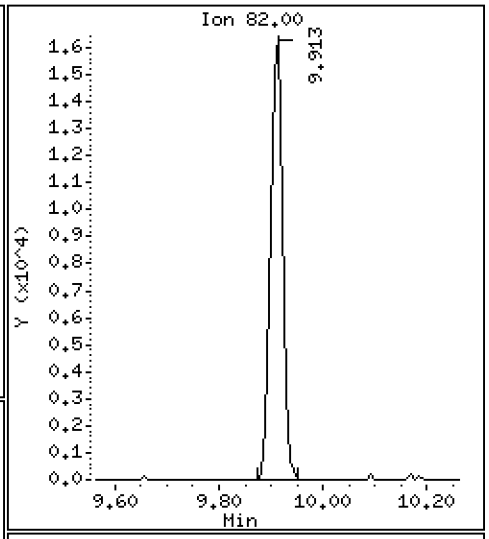
Column phase: ZB-5msi

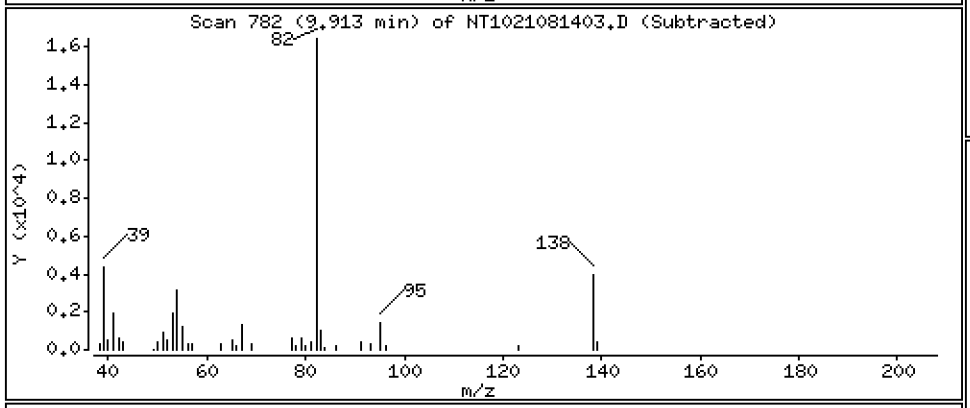
Column diameter: 0.25

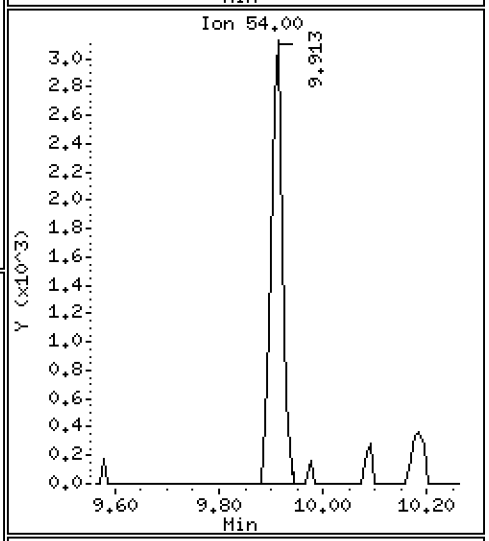
20 Isophorone

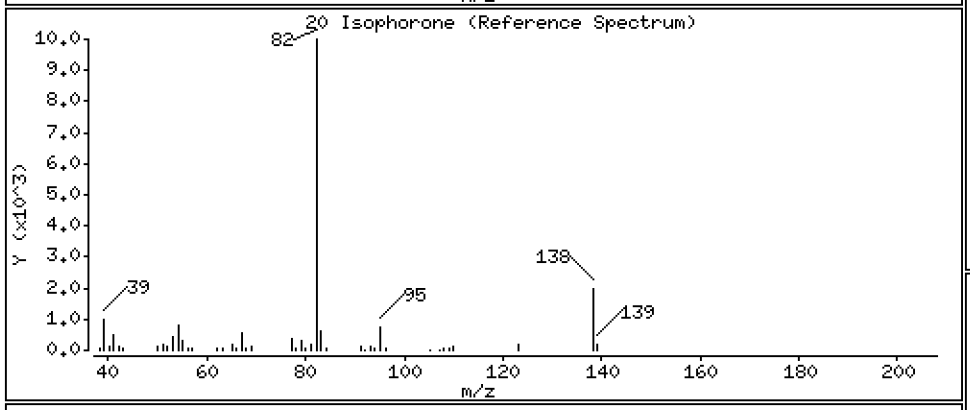
Concentration: 0.2917 ug/mL

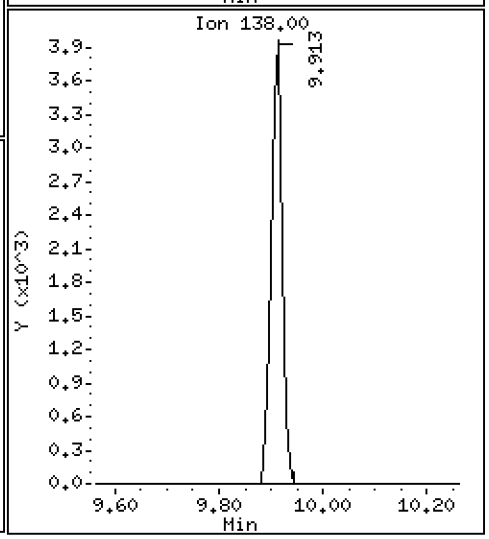


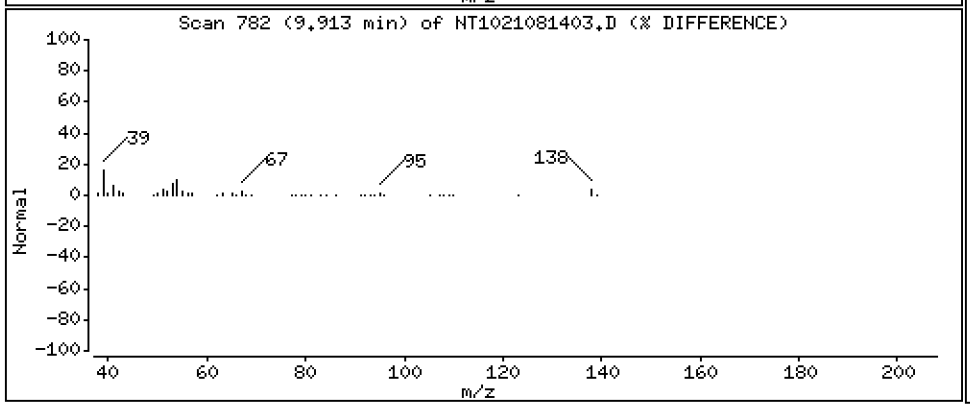












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

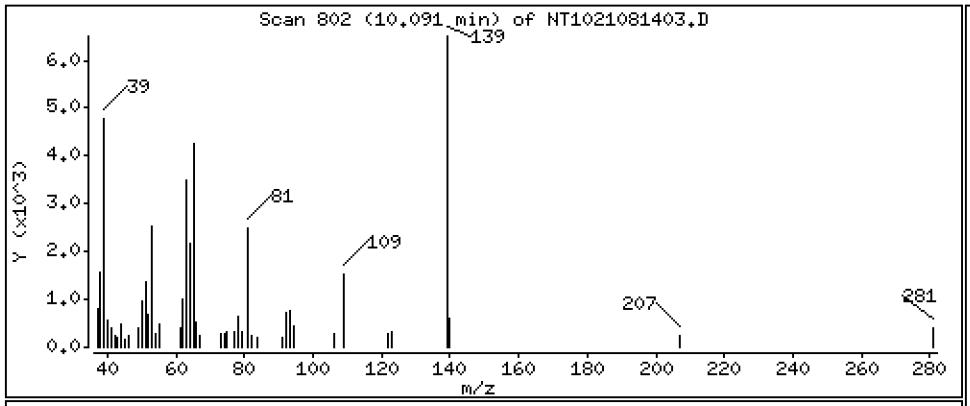
Operator: VTS

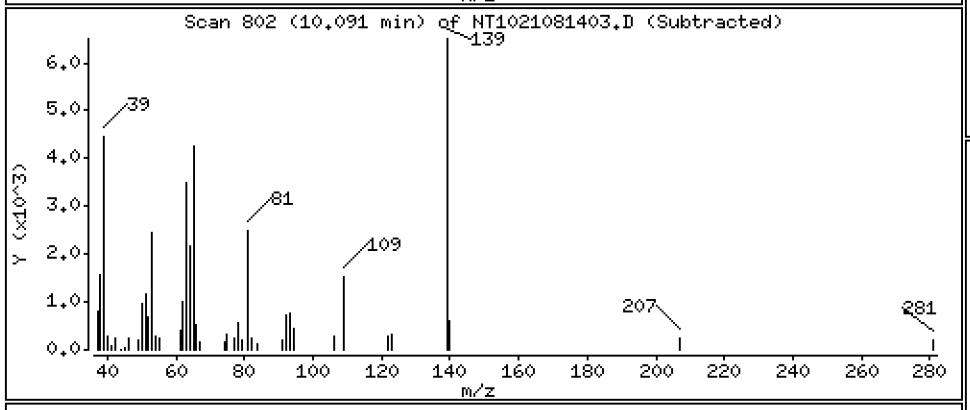
Column phase: ZB-5msi

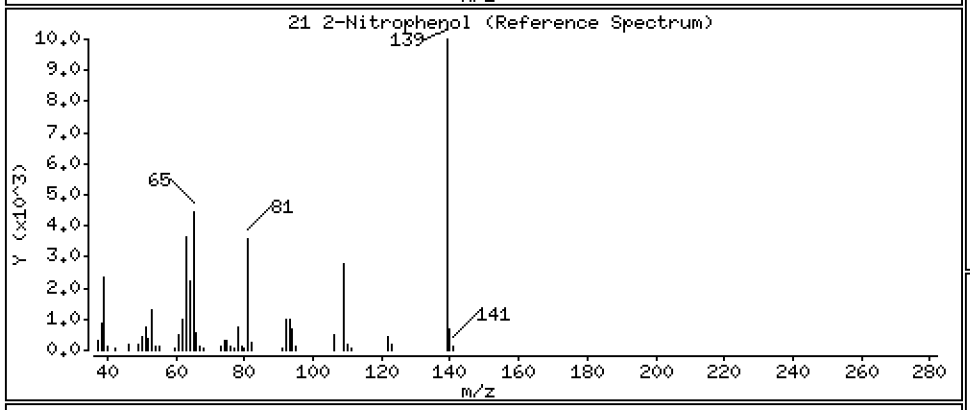
Column diameter: 0.25

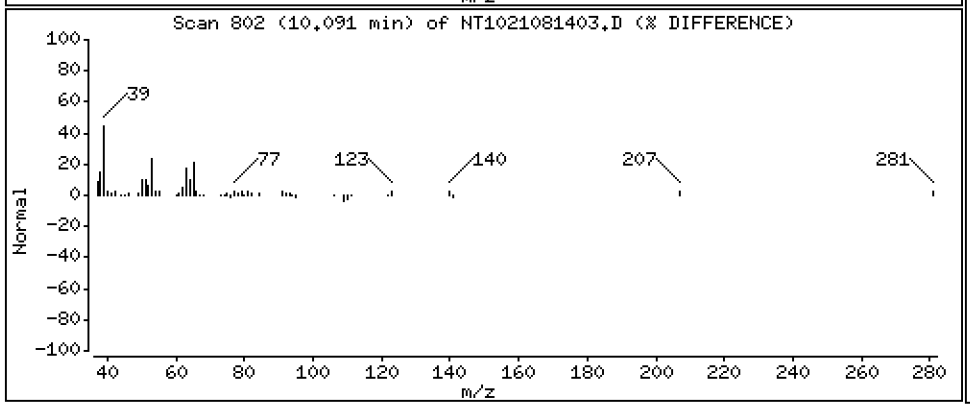
21 2-Nitrophenol

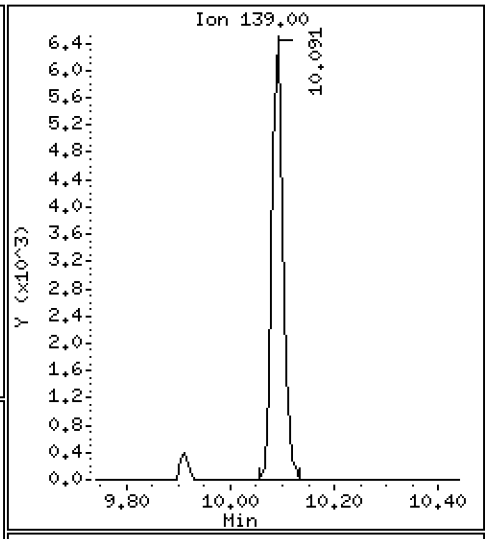
Concentration: 0.3941 ug/mL

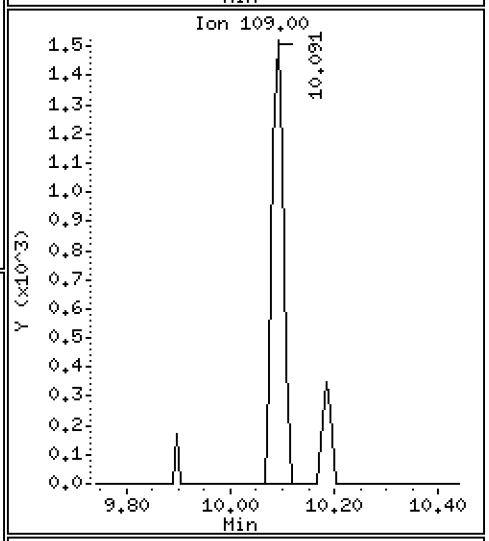


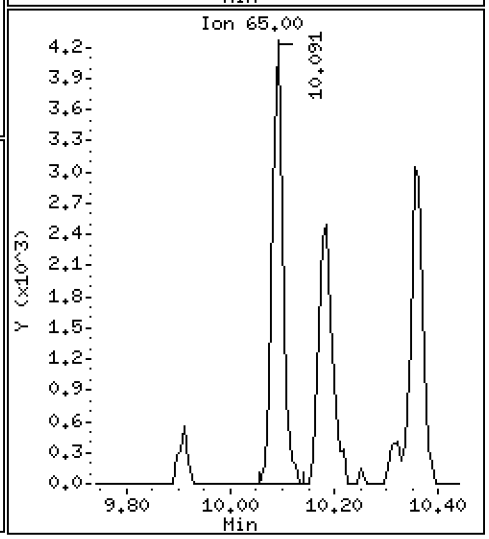












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

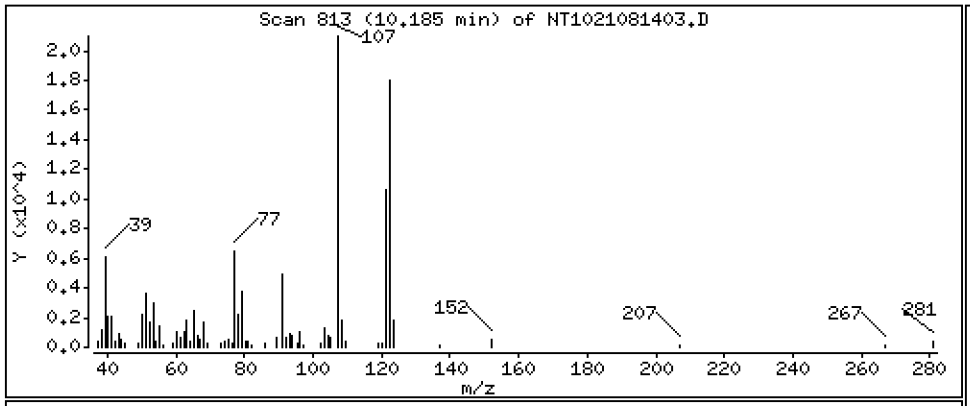
Operator: VTS

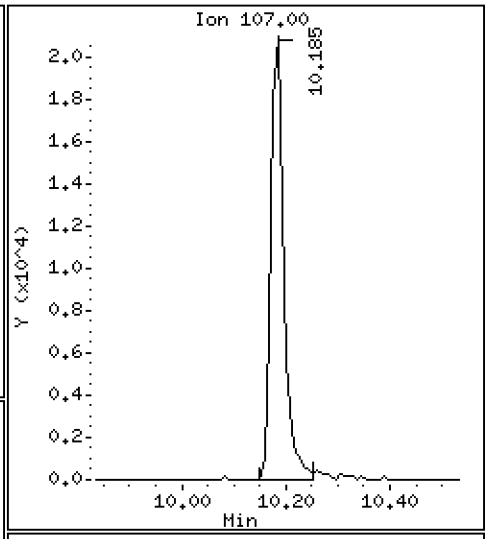
Column phase: ZB-5msi

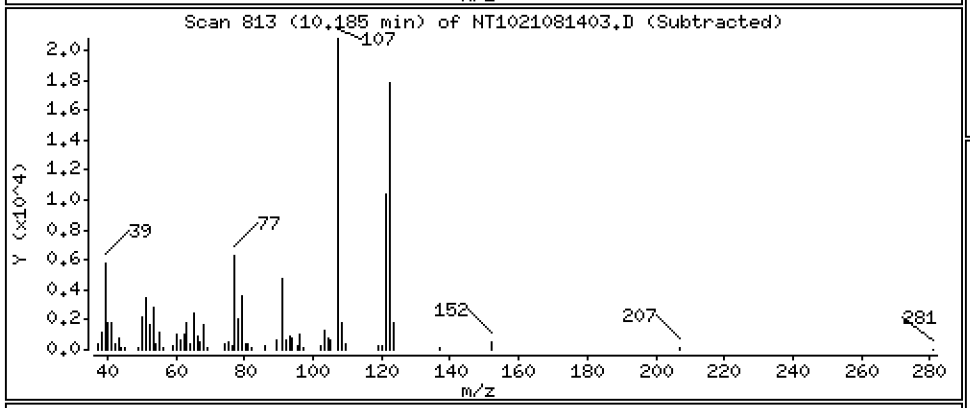
Column diameter: 0.25

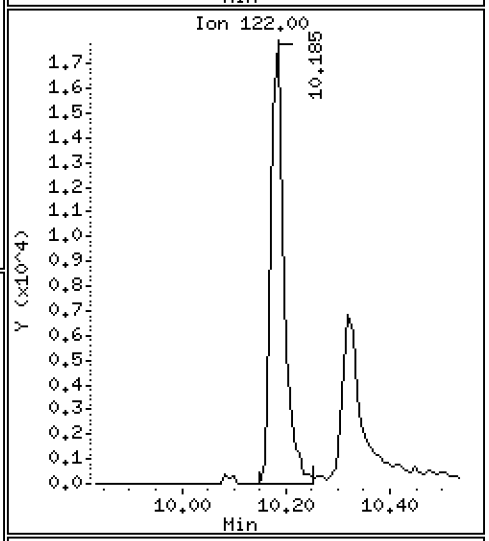
22 2,4-Dimethylphenol

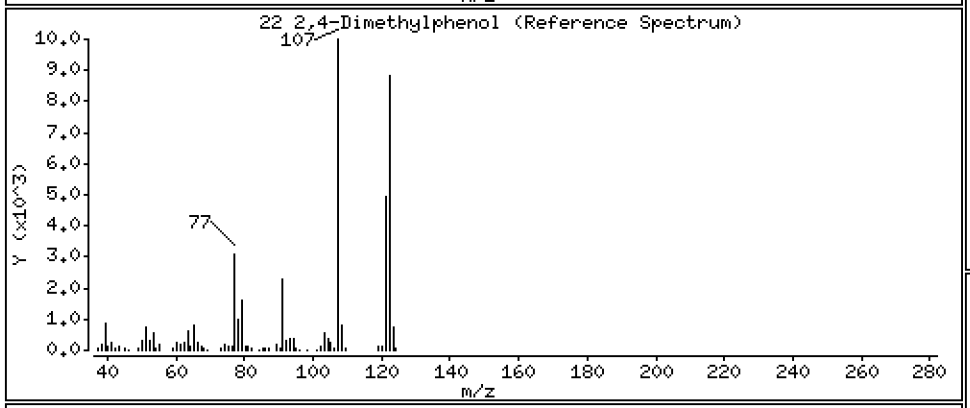
Concentration: 1.000 ug/mL

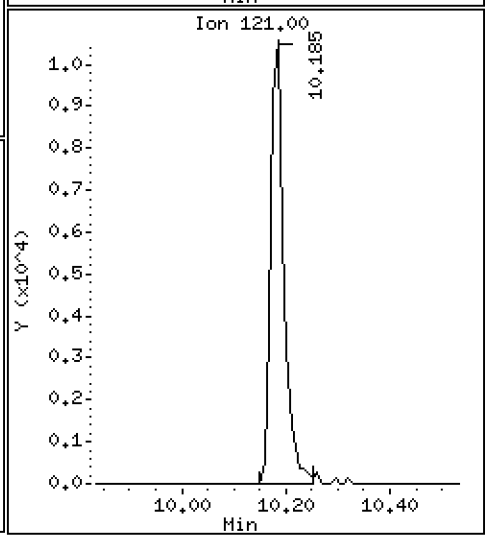


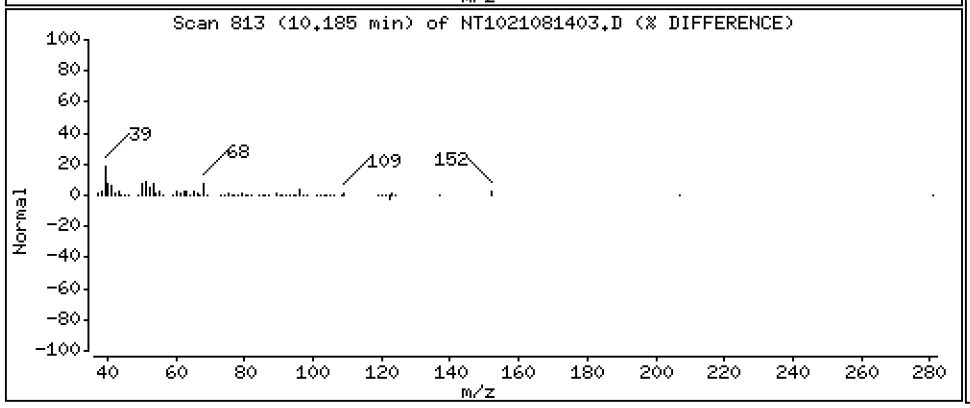












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

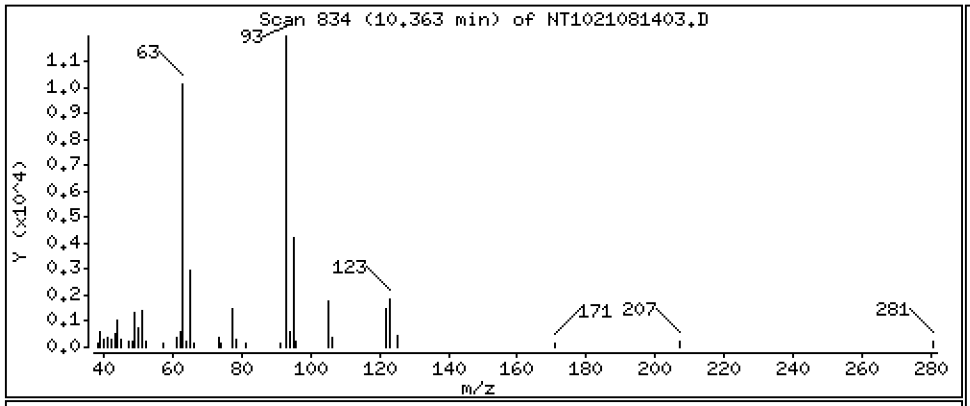
Operator: VTS

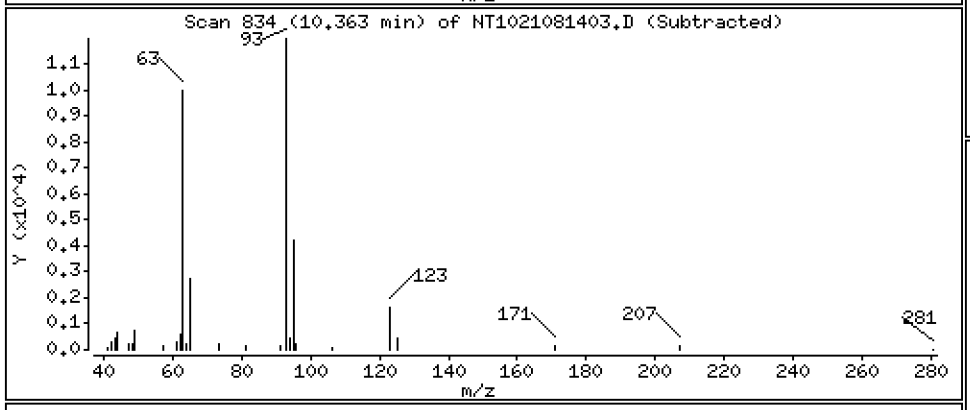
Column phase: ZB-5msi

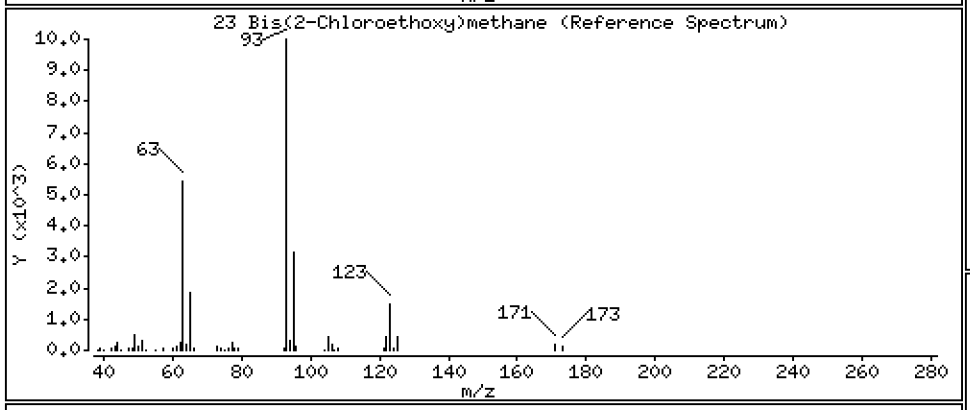
Column diameter: 0.25

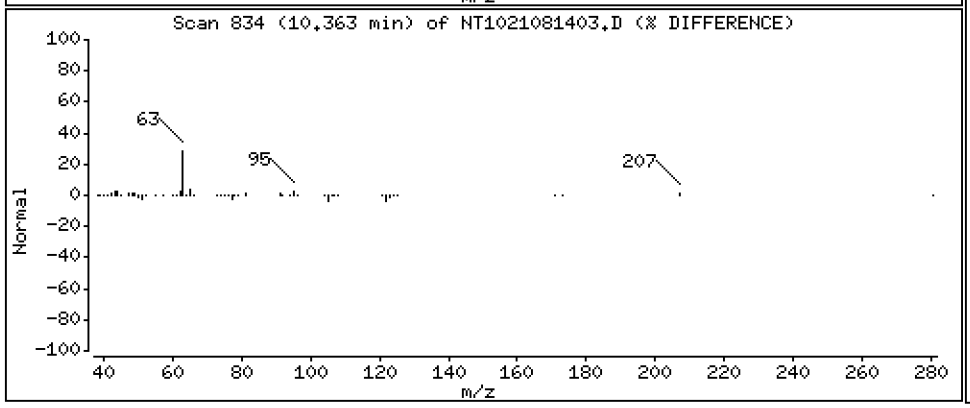
23 Bis(2-Chloroethoxy)methane

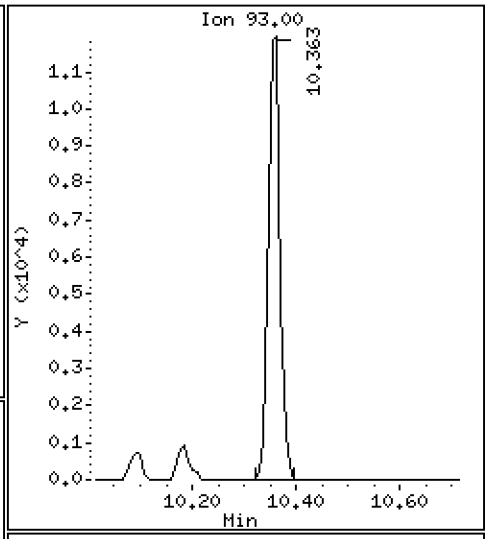
Concentration: 0.4105 ug/mL

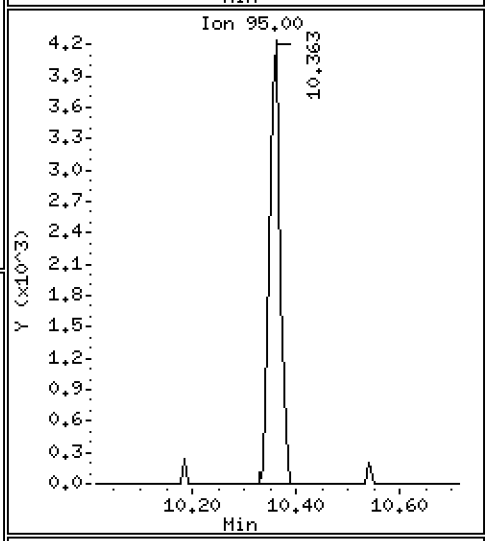


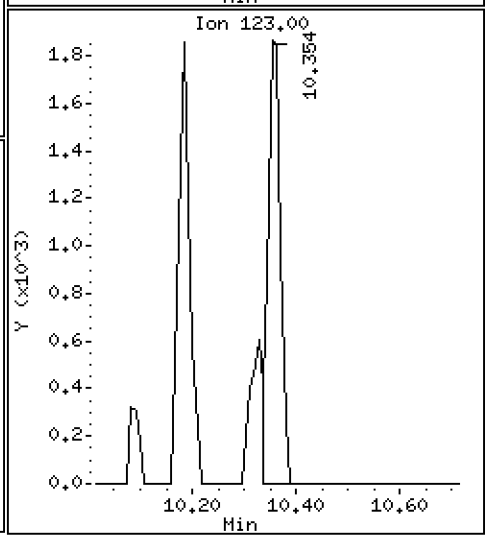












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

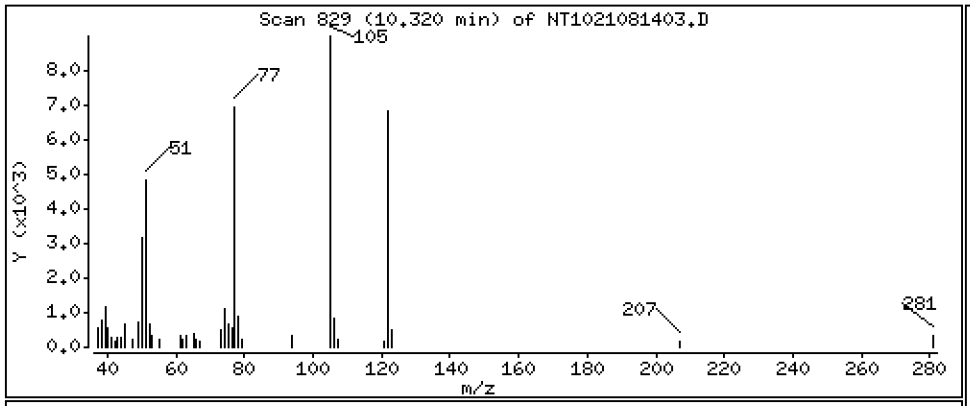
Operator: VTS

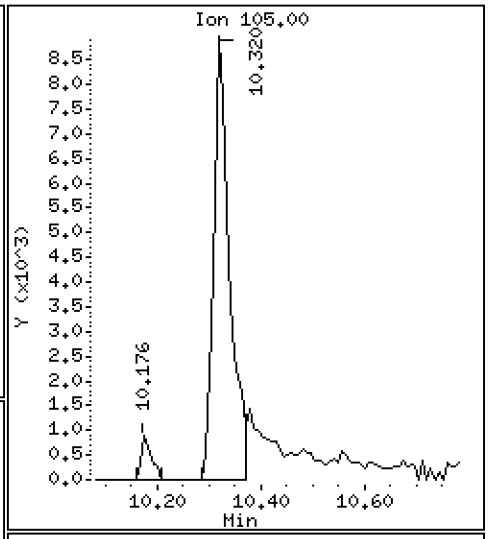
Column phase: ZB-5msi

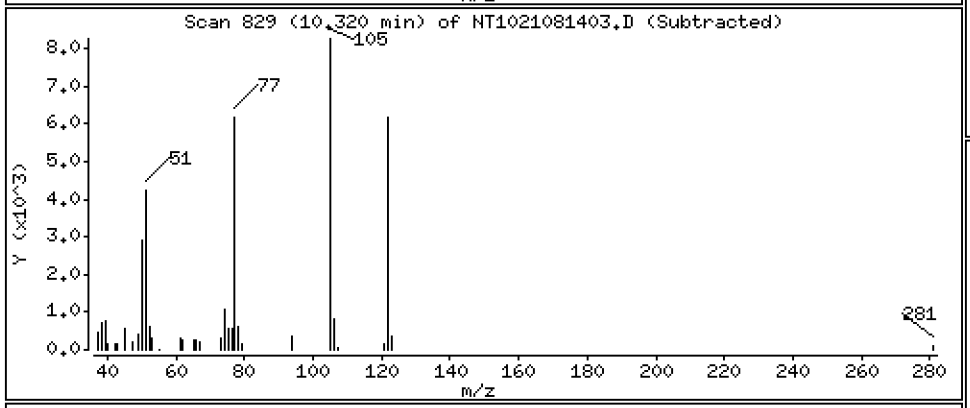
Column diameter: 0.25

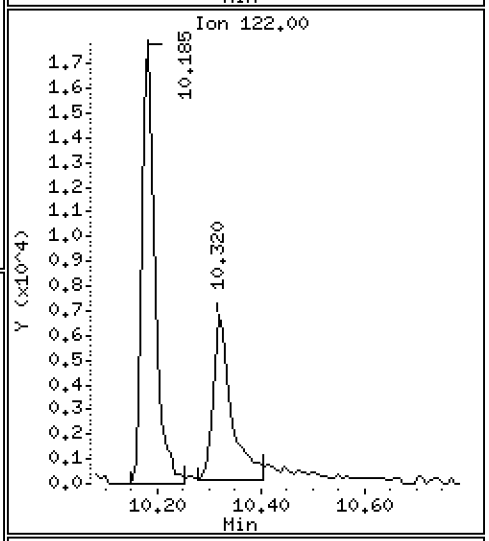
24 Benzoic acid

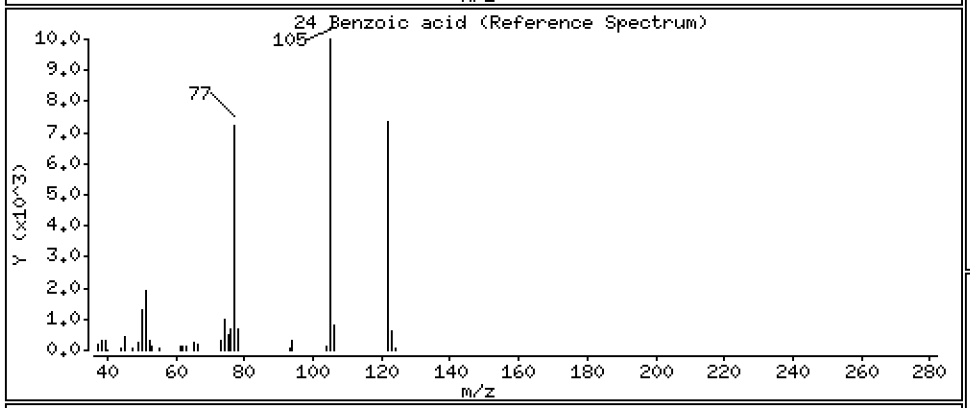
Concentration: 0.9686 ug/mL

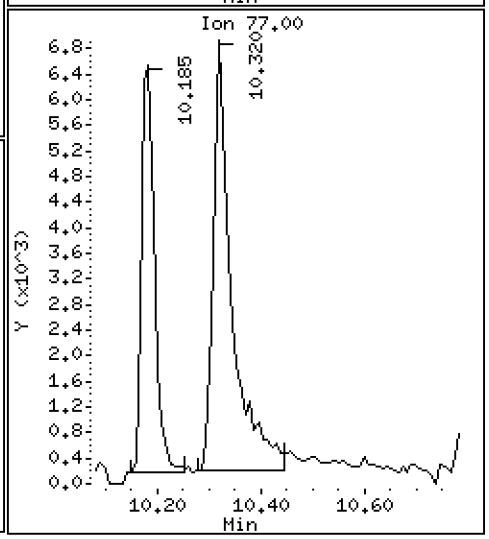


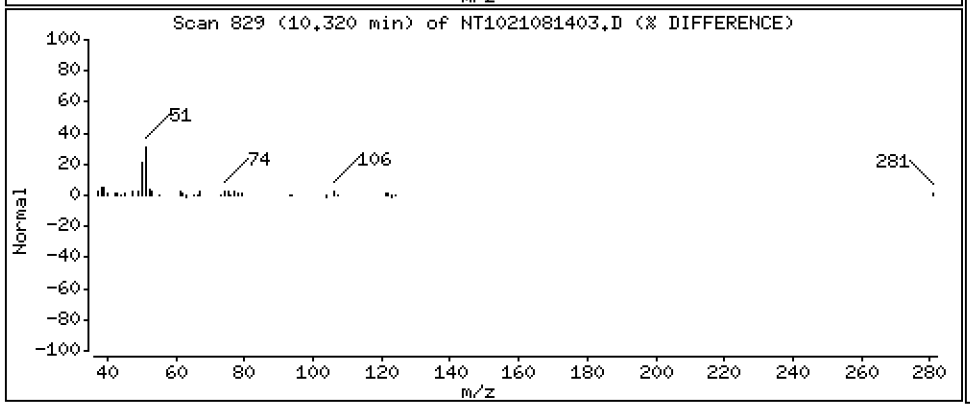












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

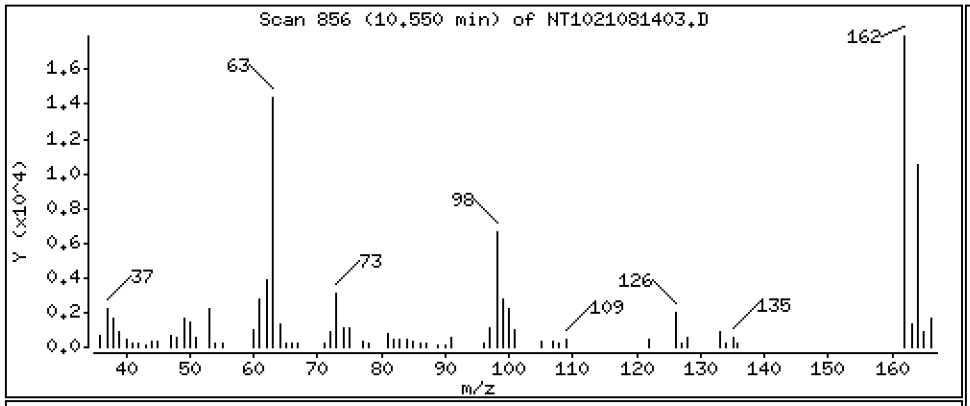
Operator: VTS

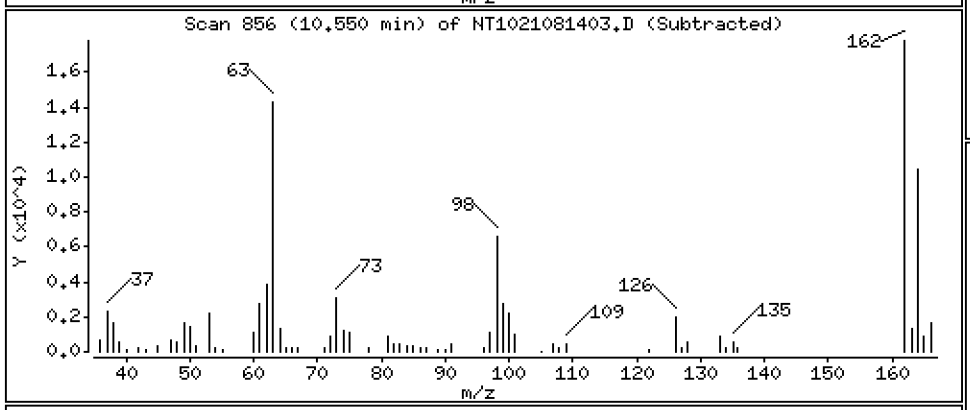
Column phase: ZB-5msi

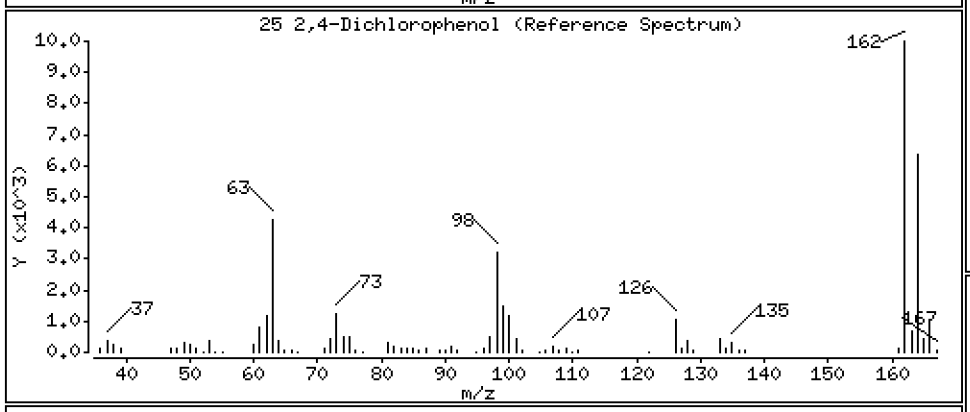
Column diameter: 0.25

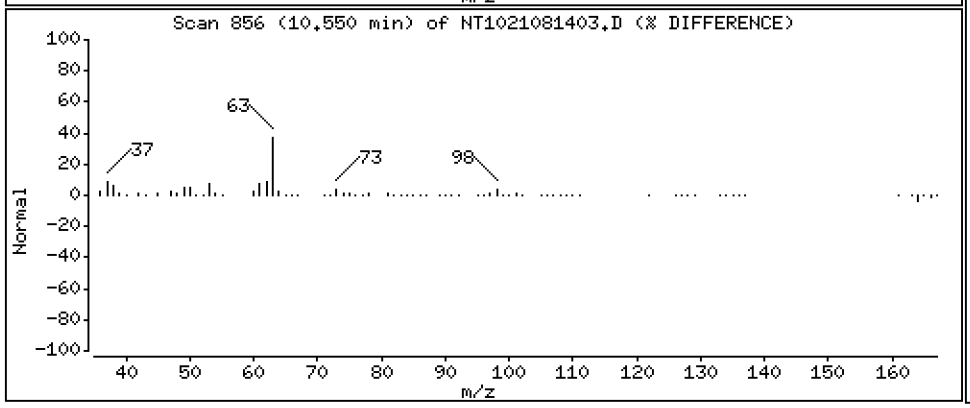
25 2,4-Dichlorophenol

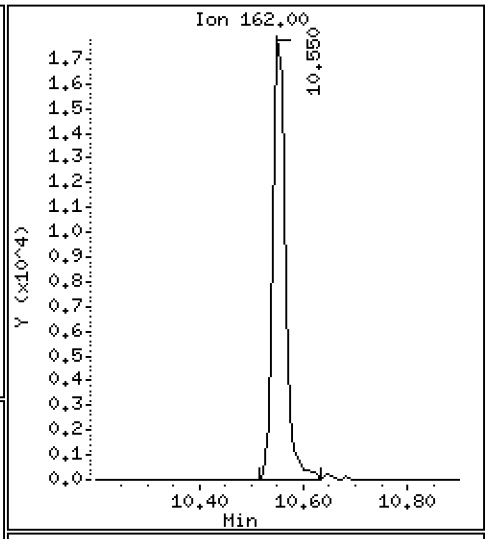
Concentration: 1.010 ug/mL

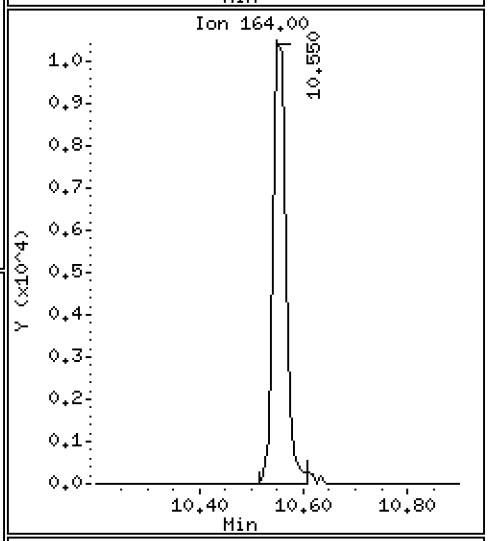


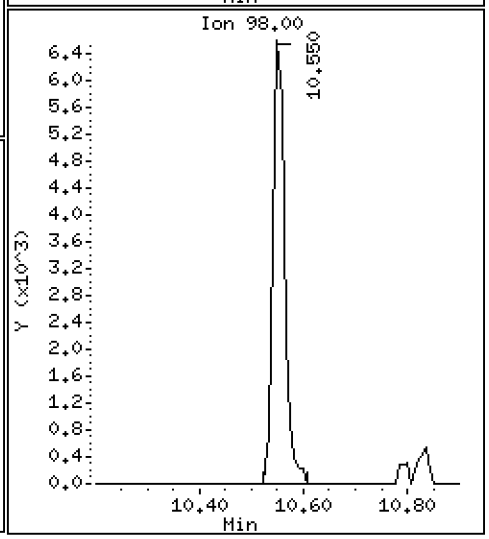












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

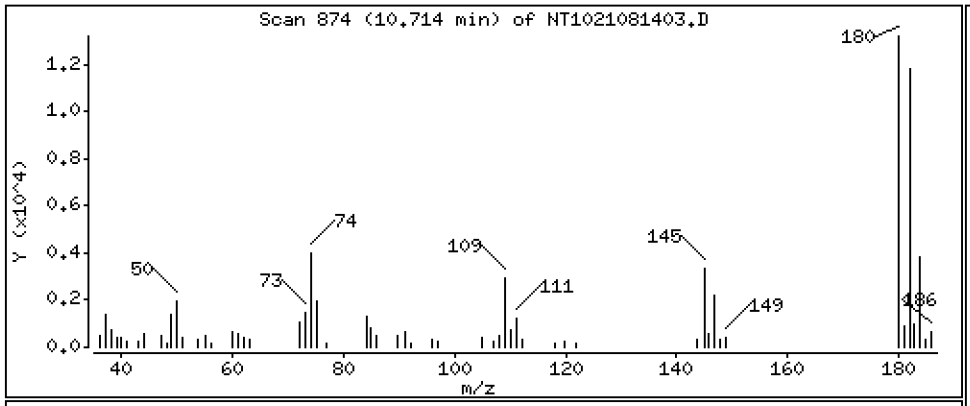
Operator: VTS

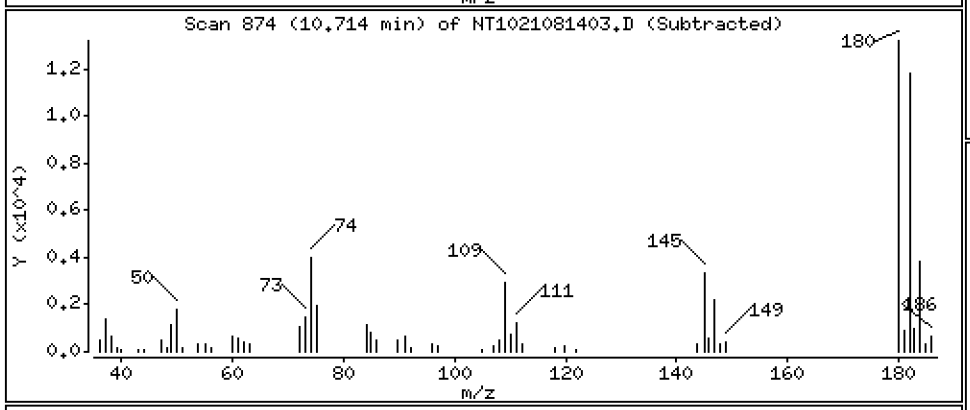
Column phase: ZB-5msi

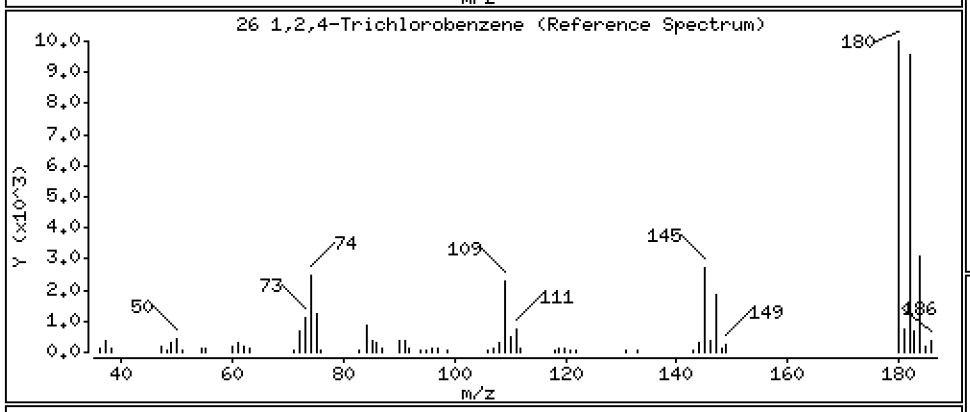
Column diameter: 0.25

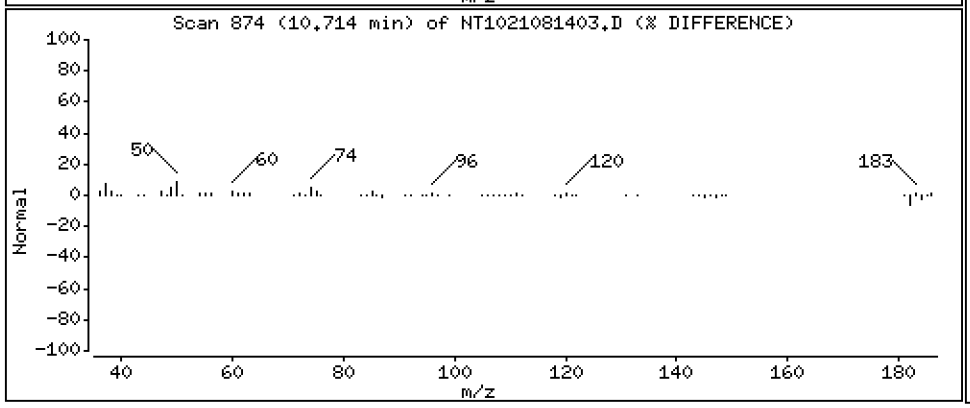
26 1,2,4-Trichlorobenzene

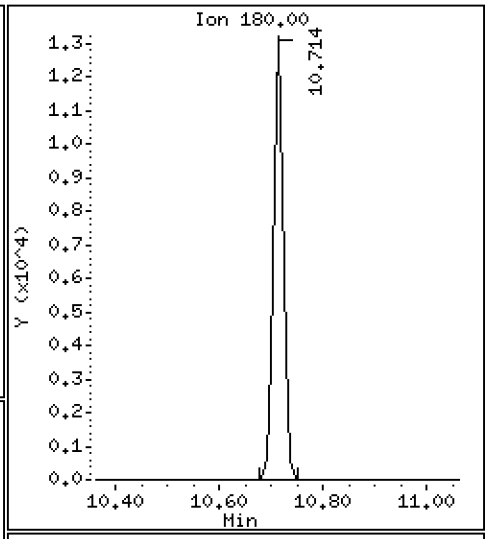
Concentration: 0.5409 ug/mL

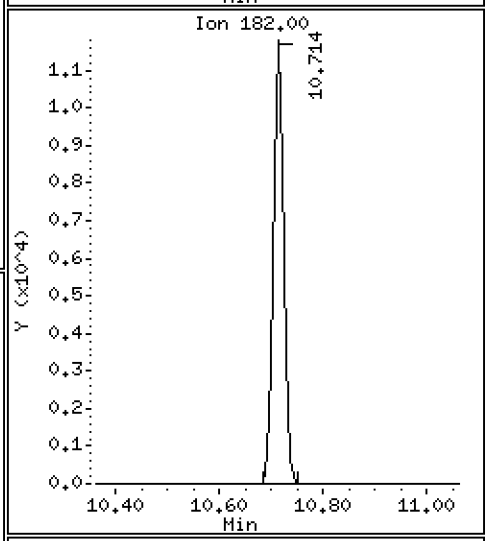


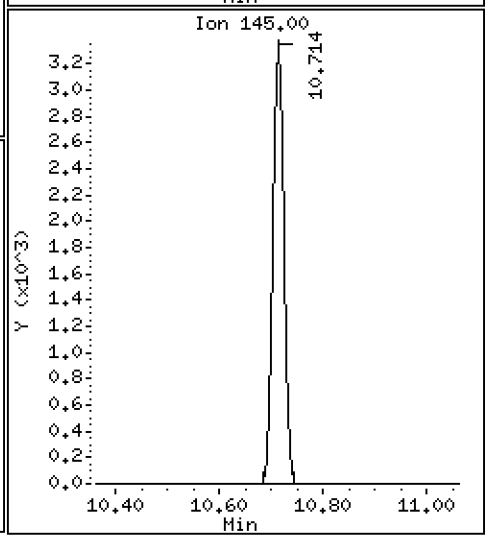












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

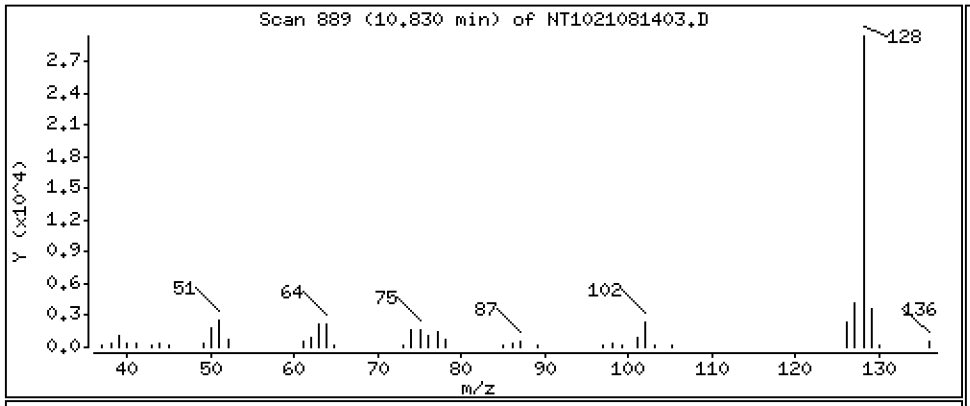
Operator: VTS

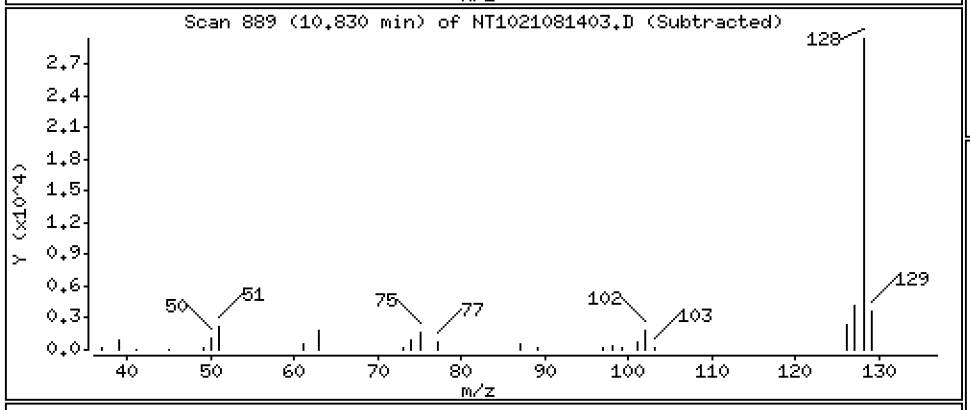
Column phase: ZB-5msi

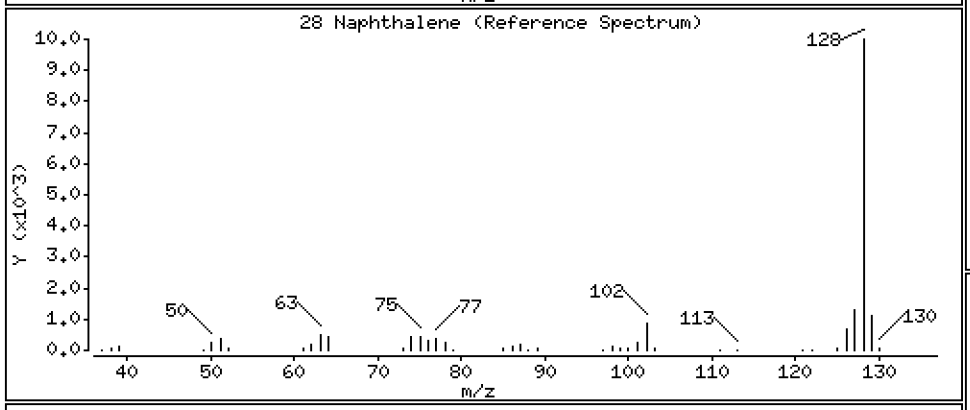
Column diameter: 0.25

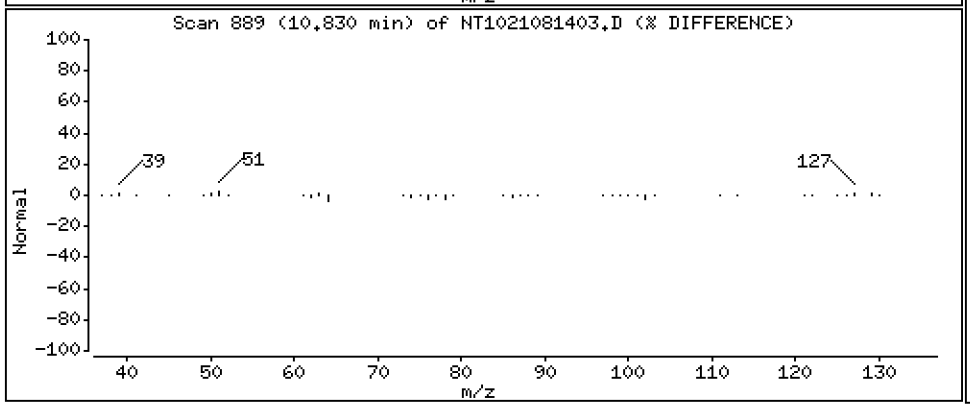
28 Naphthalene

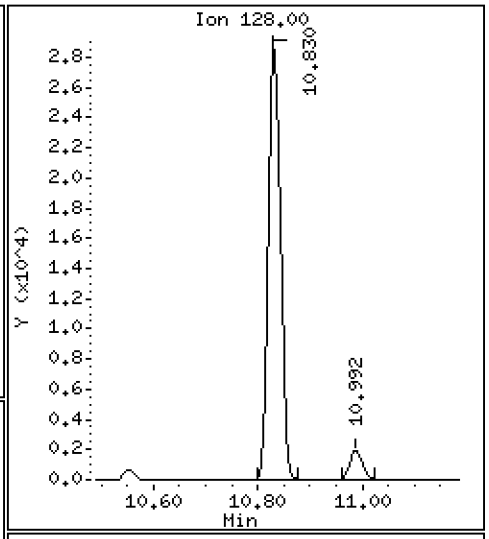
Concentration: 0.4442 ug/mL

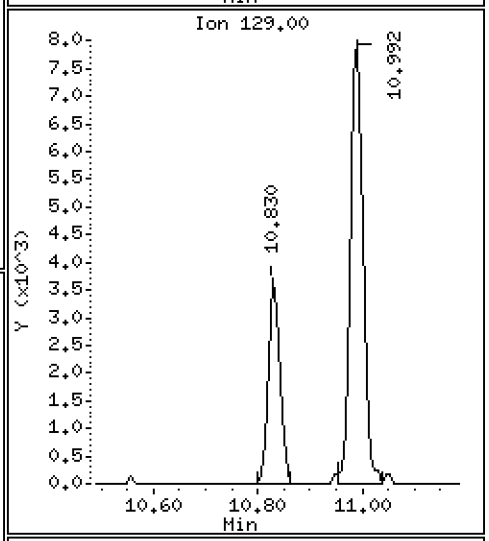


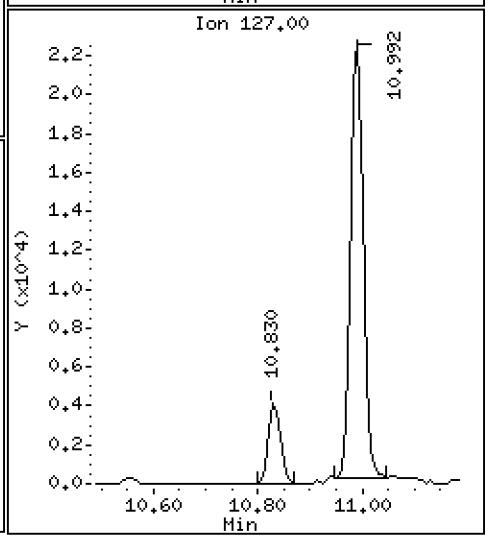












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

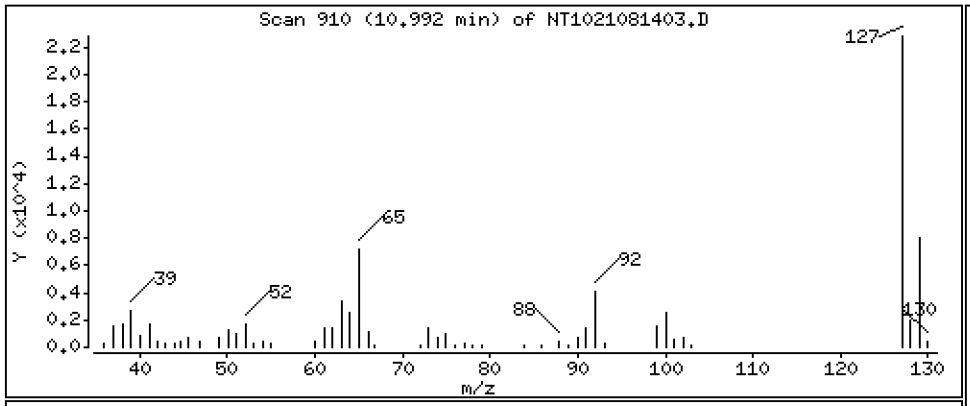
Operator: VTS

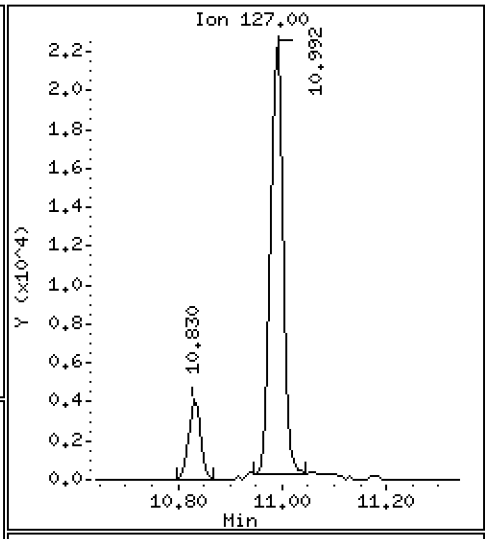
Column phase: ZB-5msi

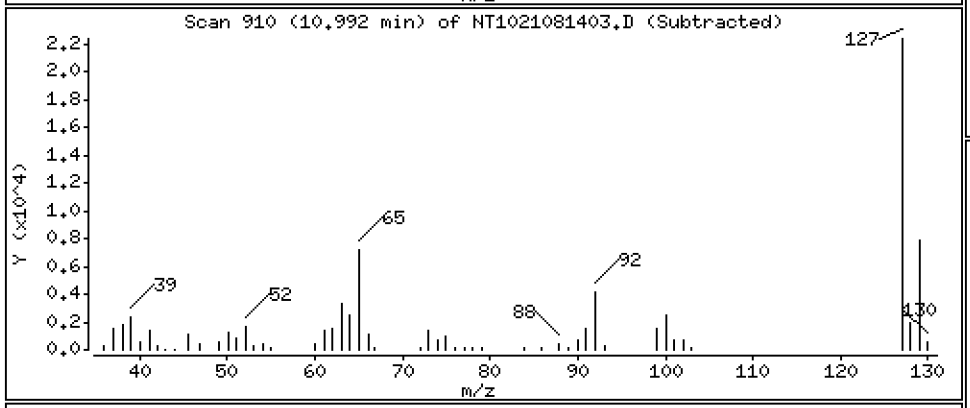
Column diameter: 0.25

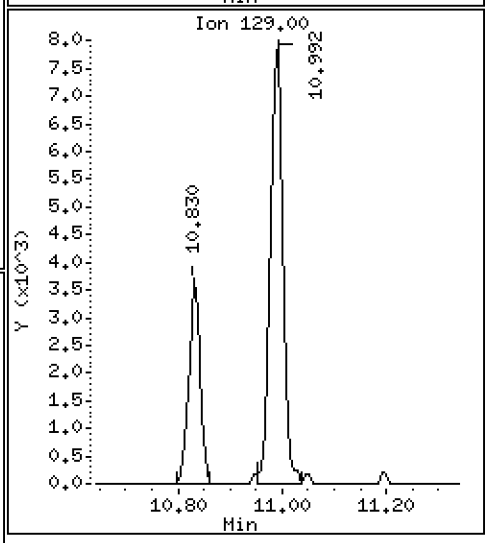
29 4-Chloroaniline

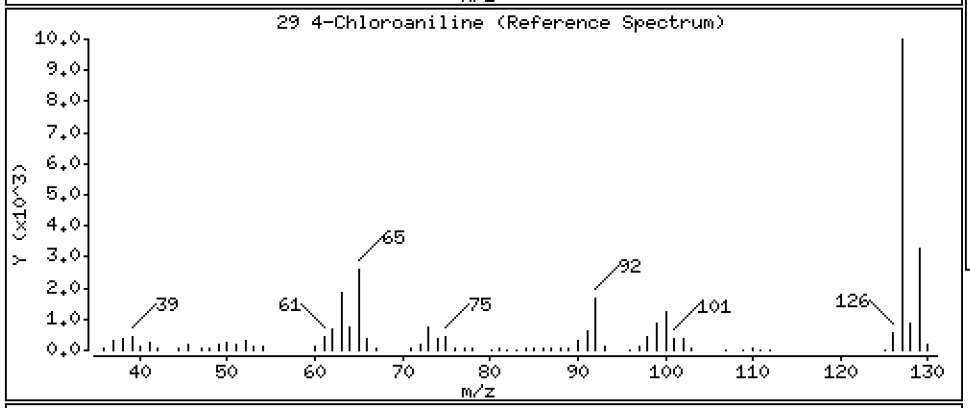
Concentration: 0.7101 ug/mL

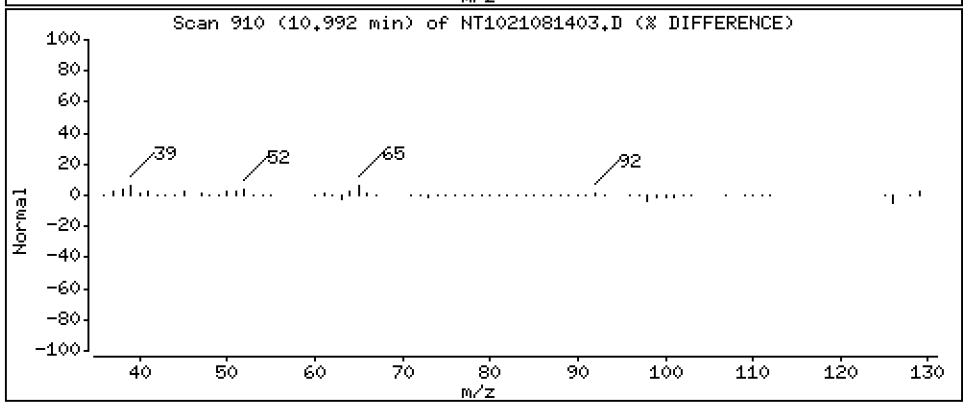












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

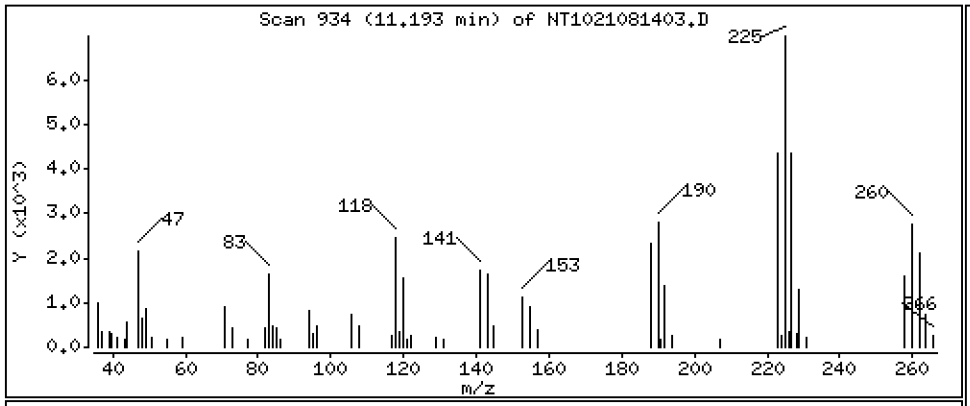
Operator: VTS

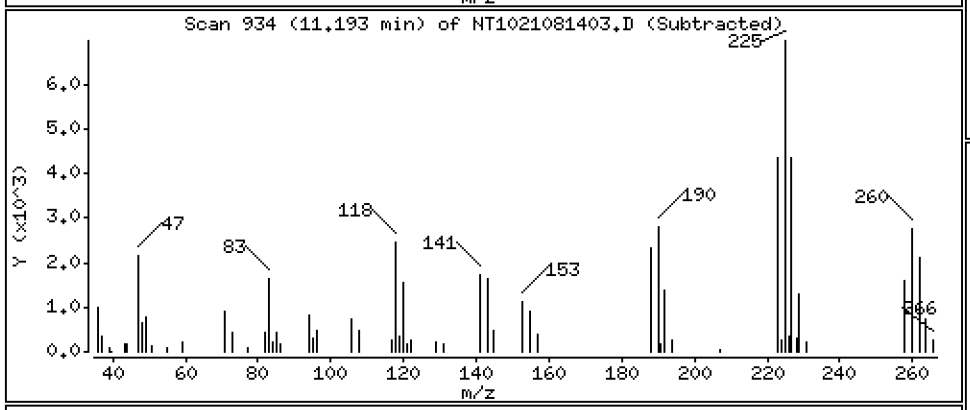
Column phase: ZB-5msi

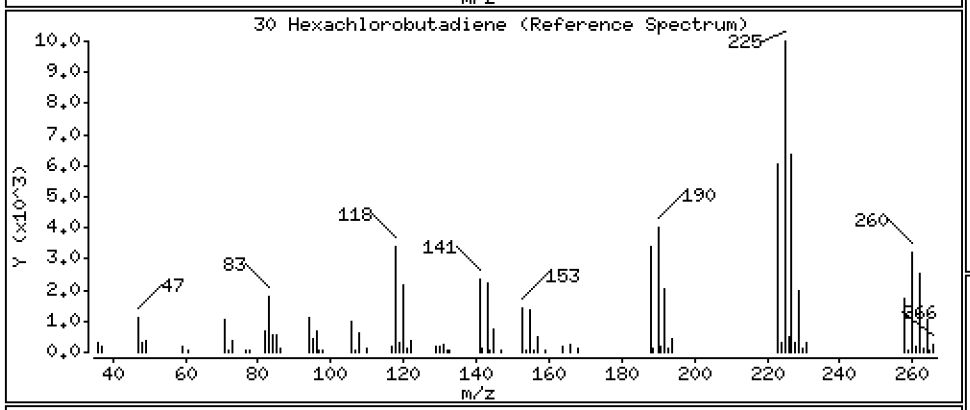
Column diameter: 0.25

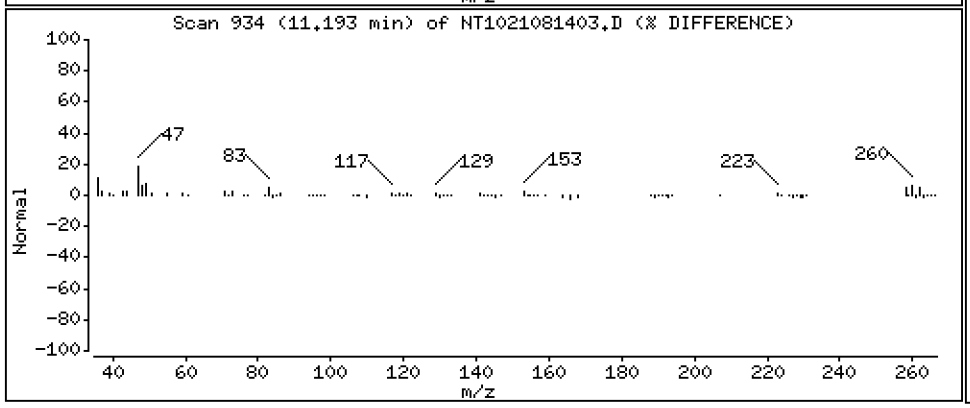
30 Hexachlorobutadiene

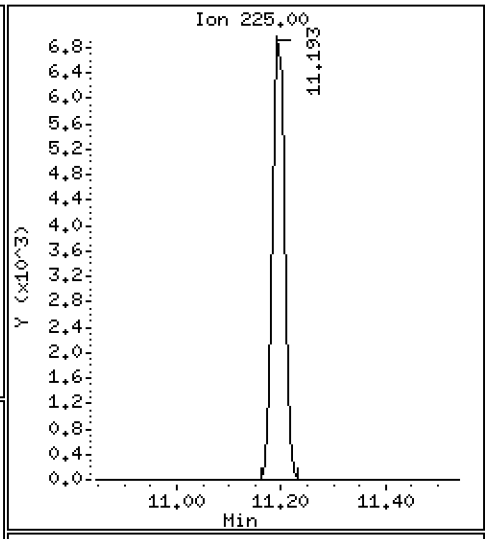
Concentration: 0.5687 ug/mL

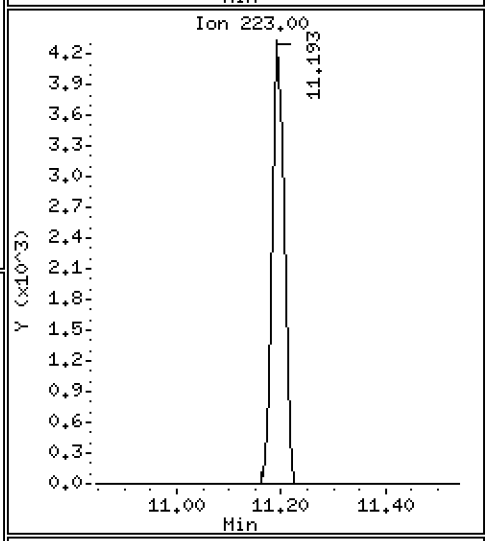


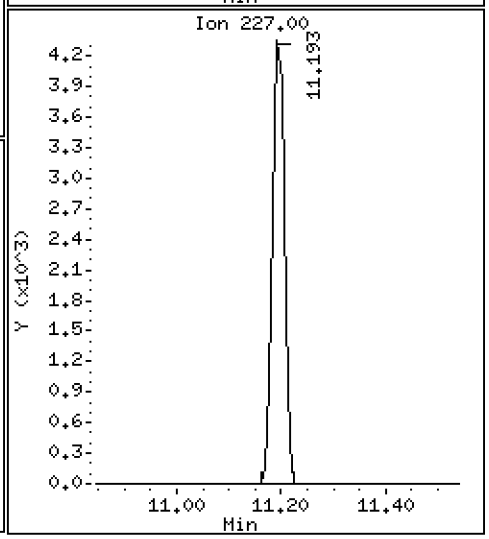












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

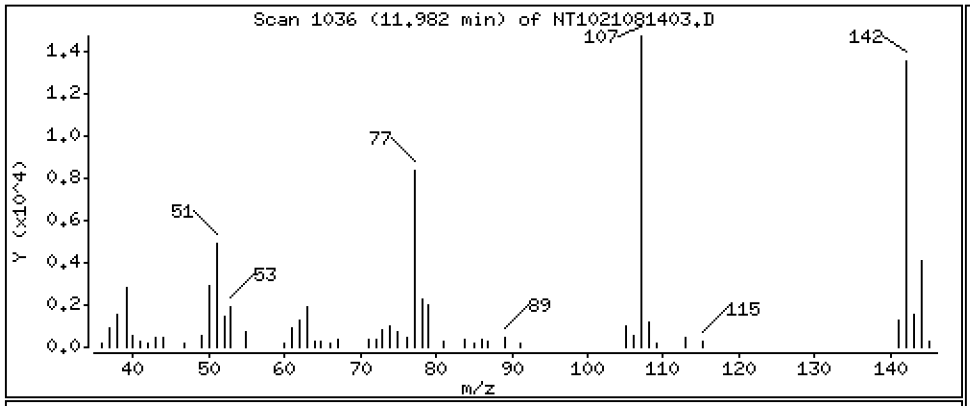
Operator: VTS

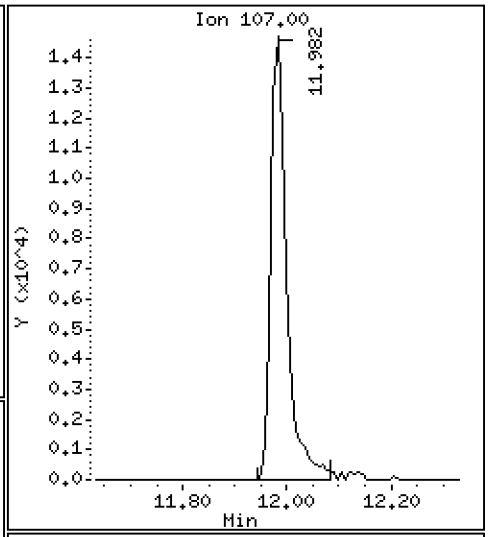
Column phase: ZB-5msi

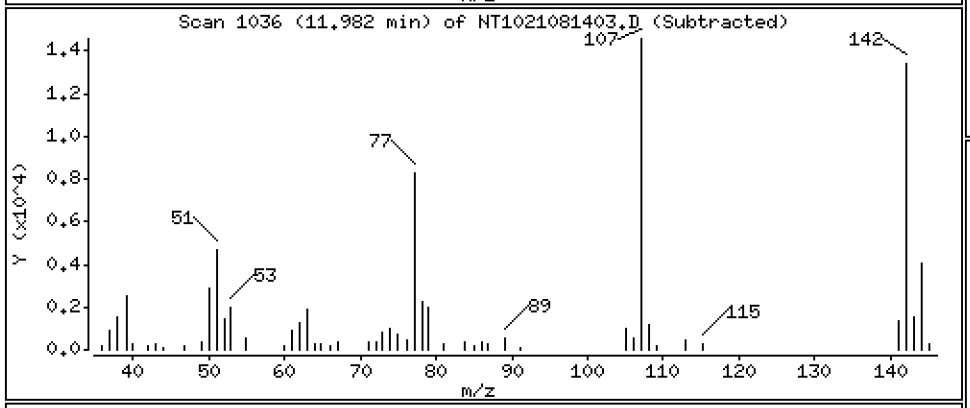
Column diameter: 0.25

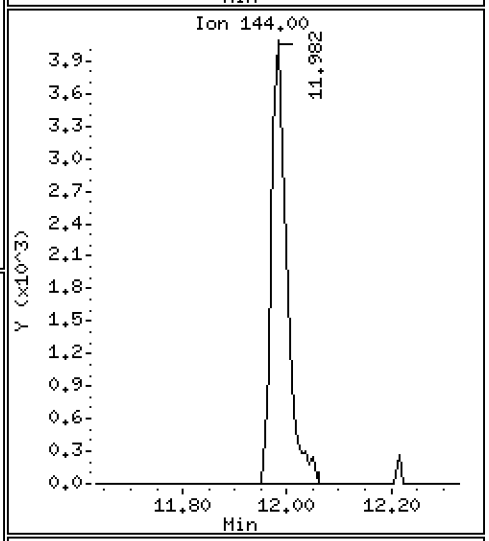
31 4-Chloro-3-methylphenol

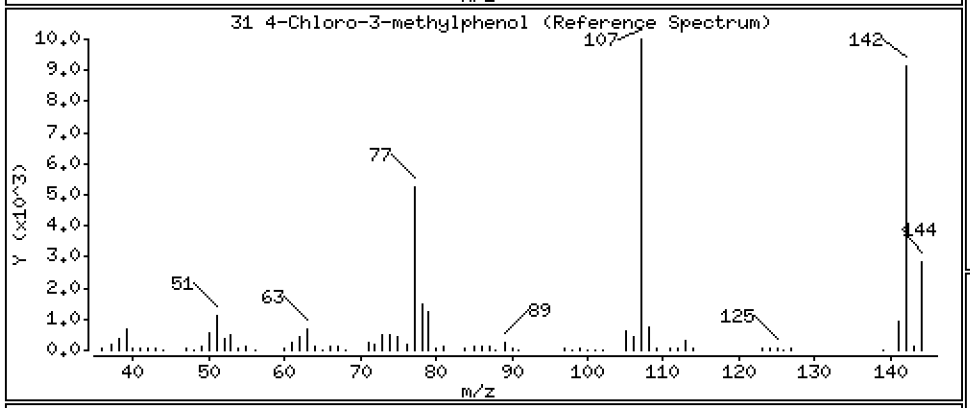
Concentration: 0.8346 ug/mL

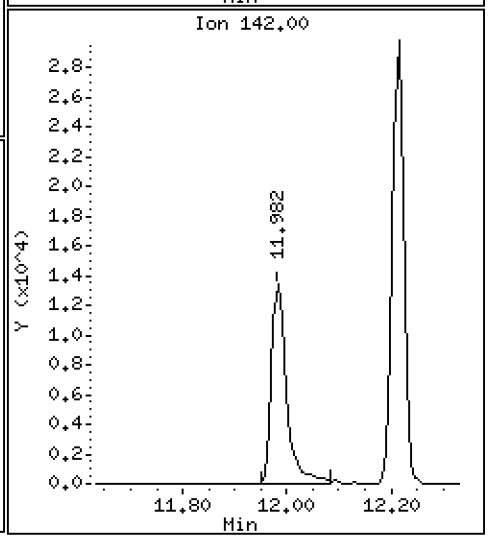


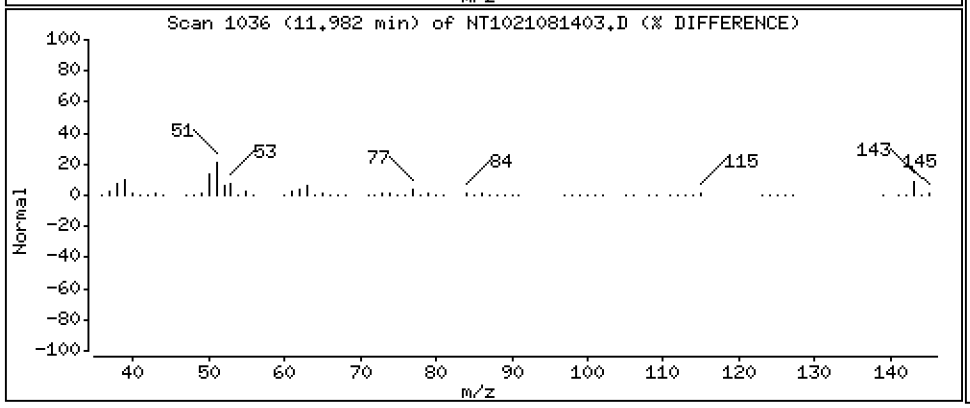












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

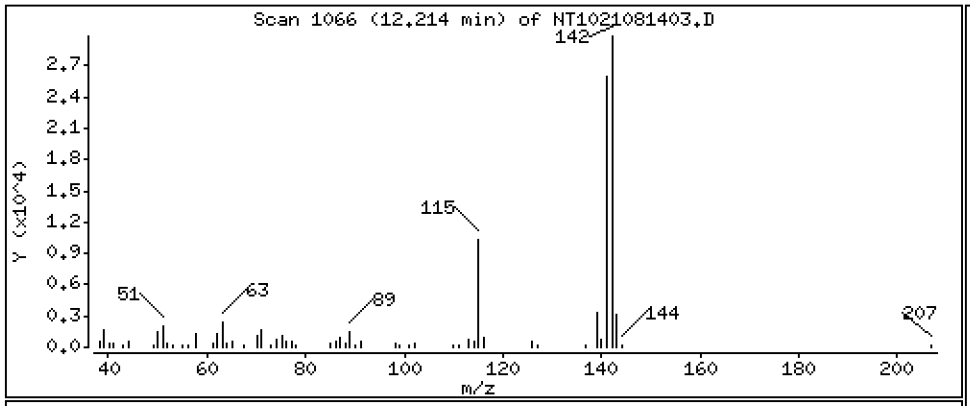
Operator: VTS

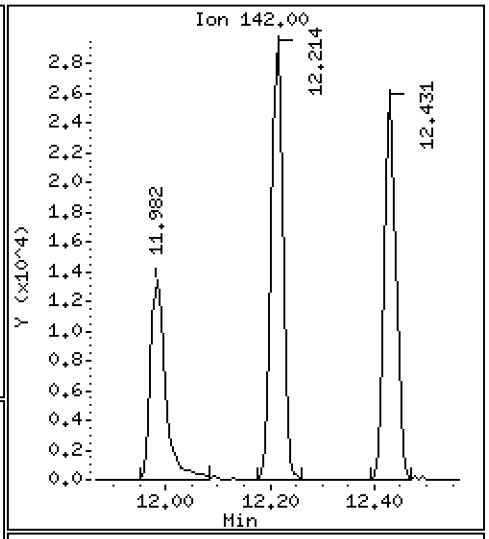
Column phase: ZB-5msi

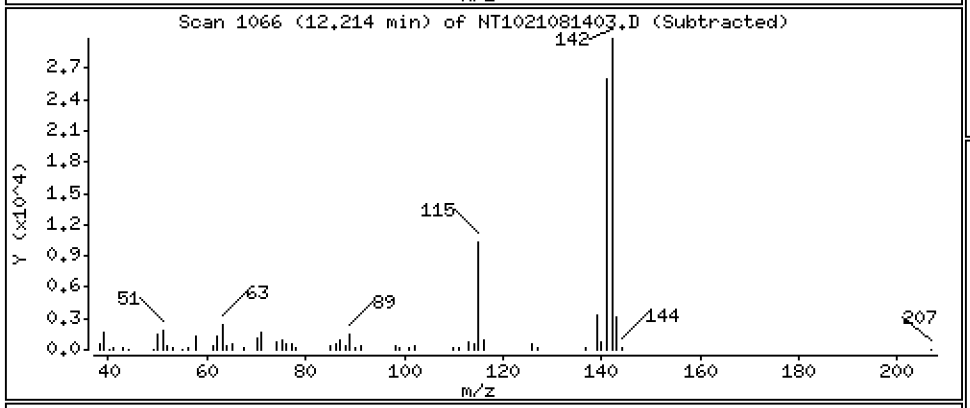
Column diameter: 0.25

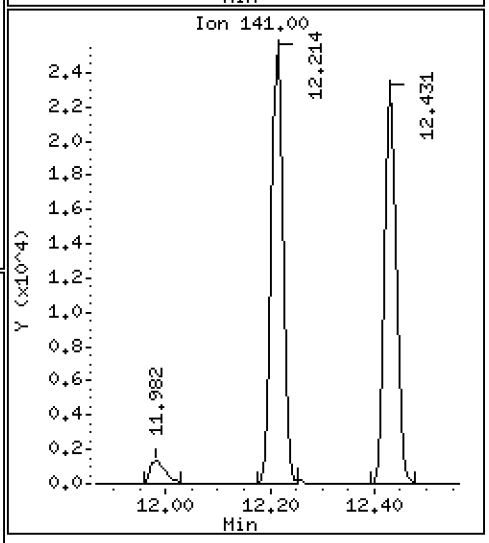
32 2-Methylnaphthalene

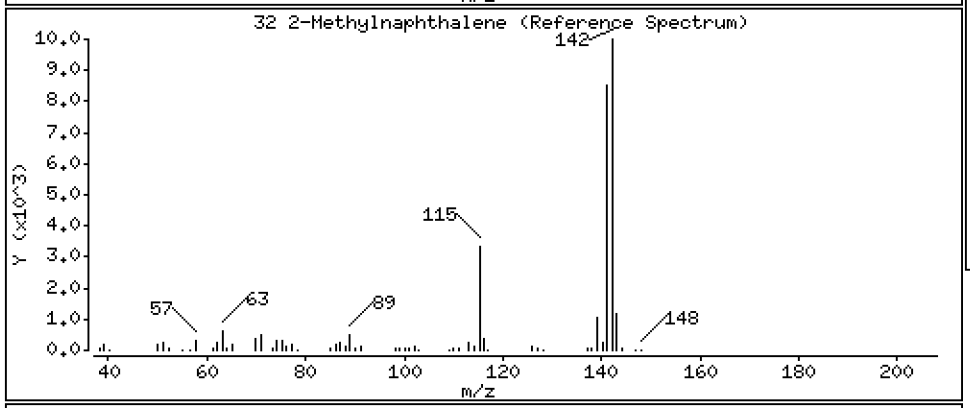
Concentration: 0.4617 ug/mL

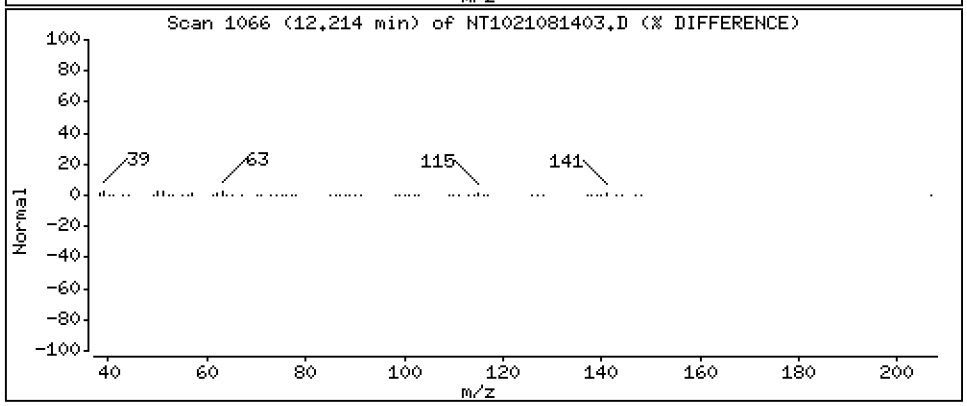












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

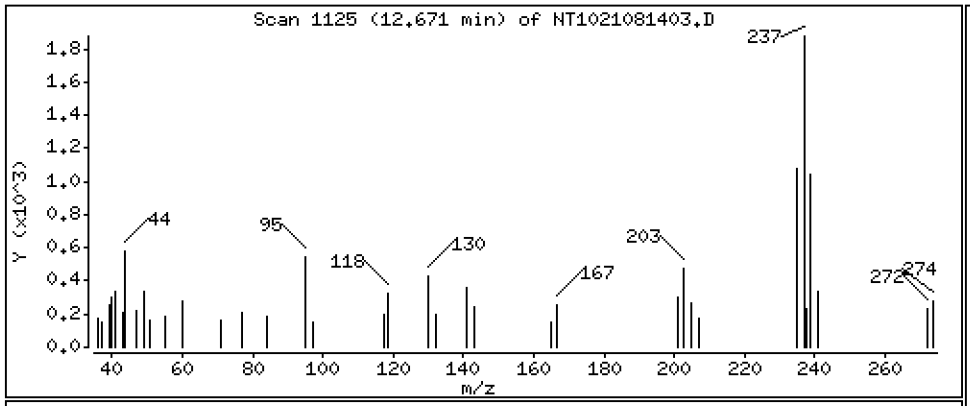
Operator: VTS

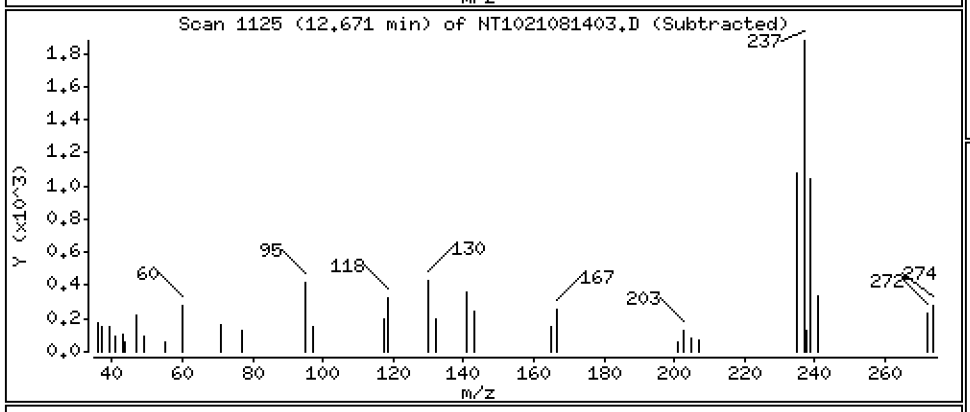
Column phase: ZB-5msi

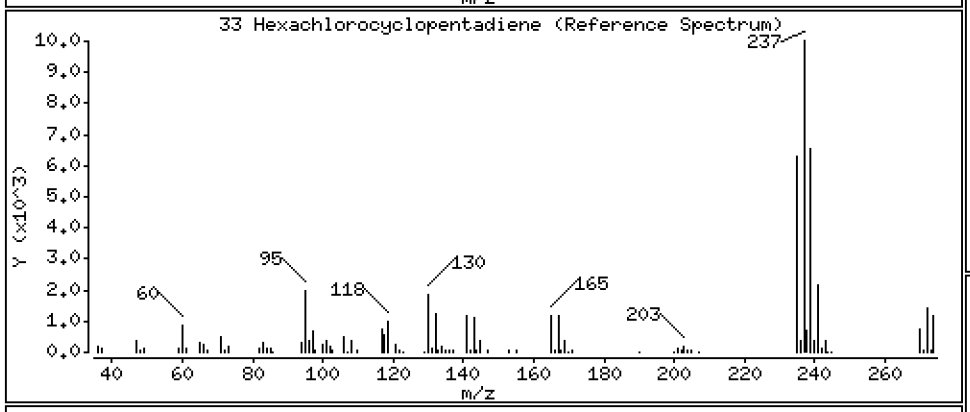
Column diameter: 0.25

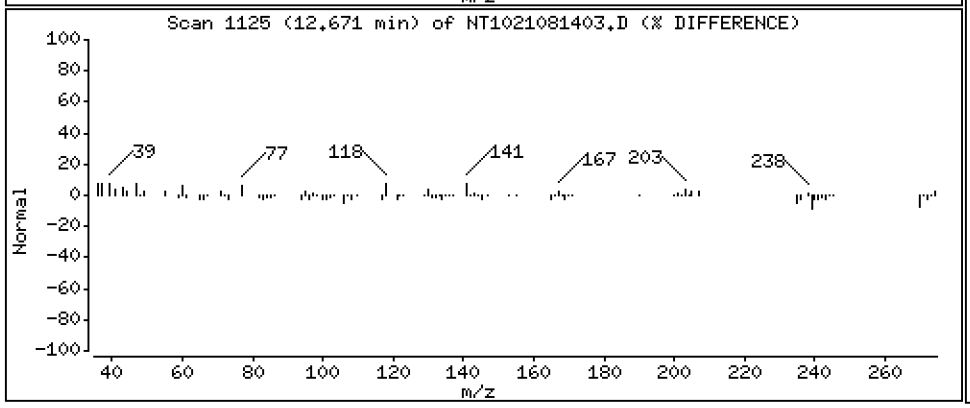
33 Hexachlorocyclopentadiene

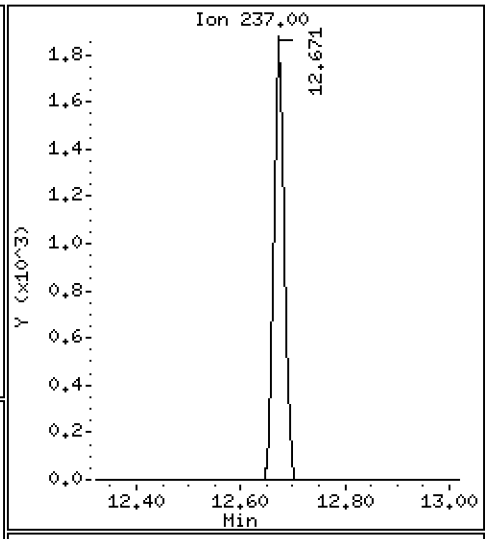
Concentration: 0.1086 ug/mL

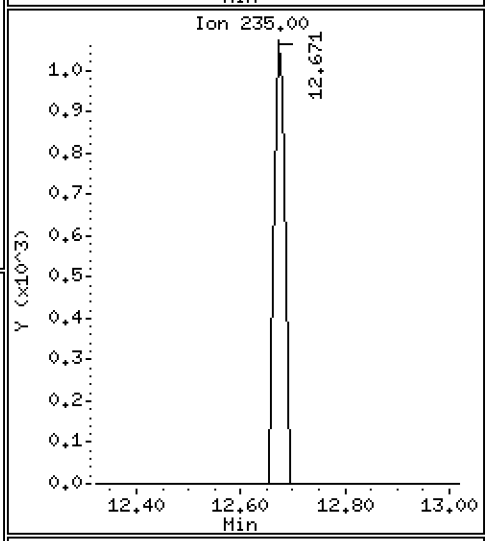


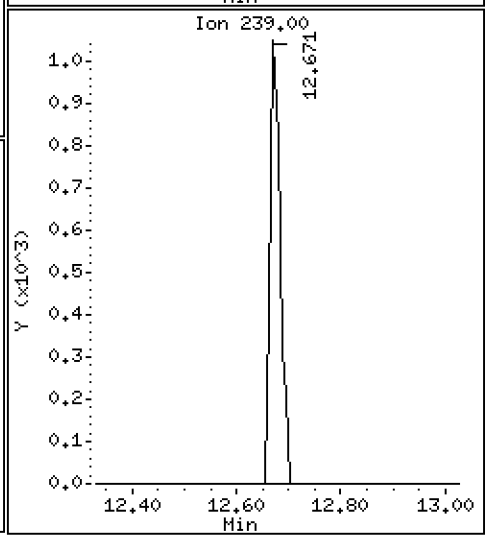












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

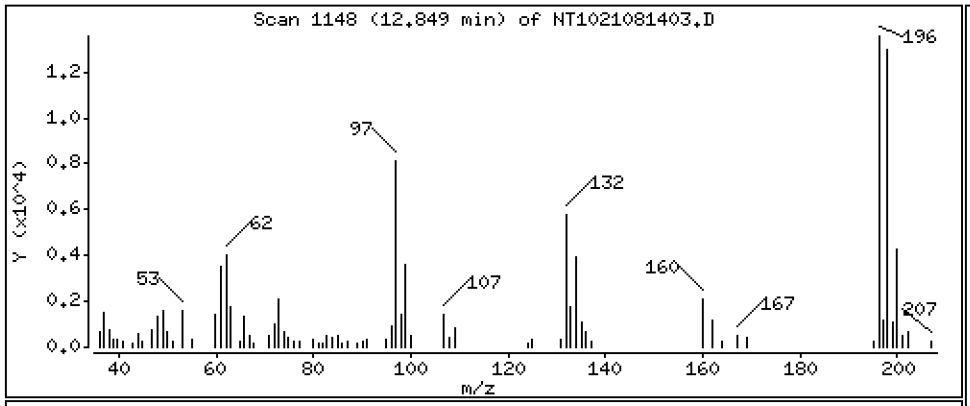
Operator: VTS

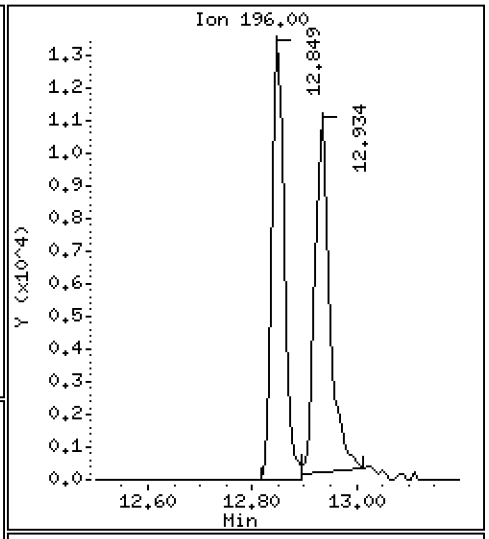
Column phase: ZB-5msi

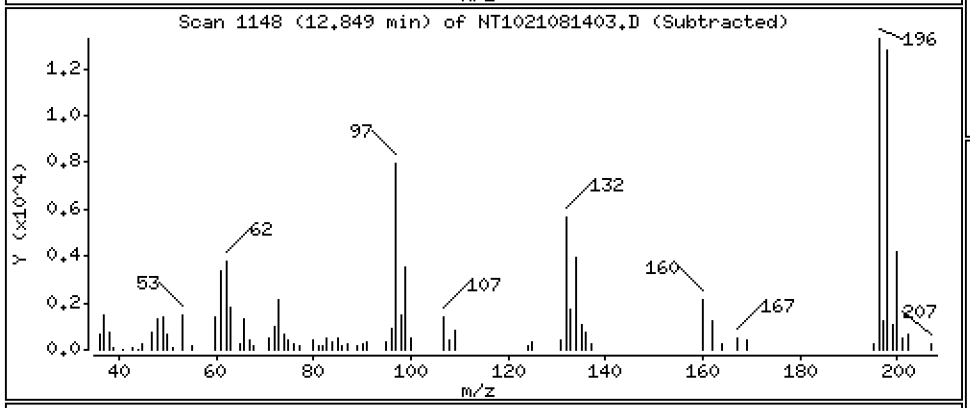
Column diameter: 0.25

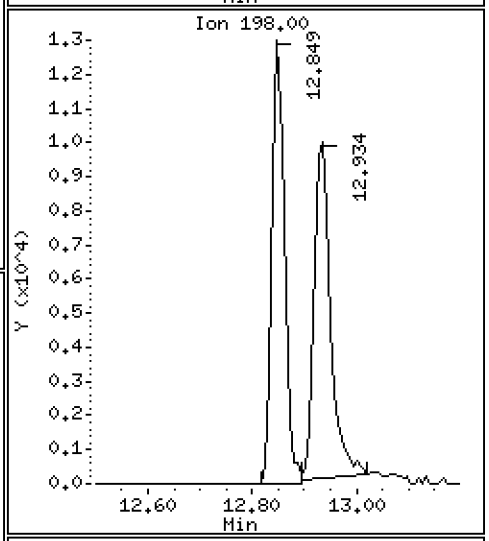
34 2,4,6-Trichlorophenol

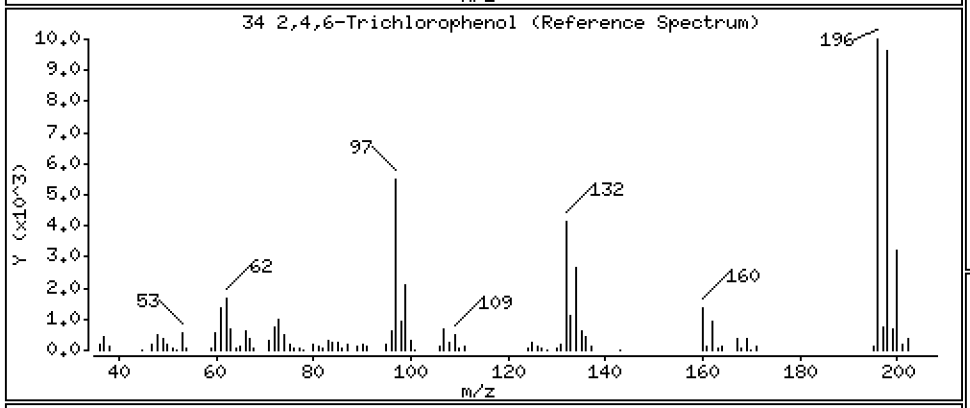
Concentration: 0.9161 ug/mL

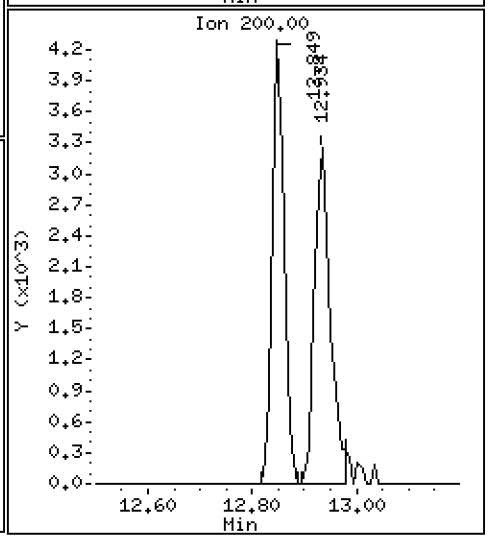


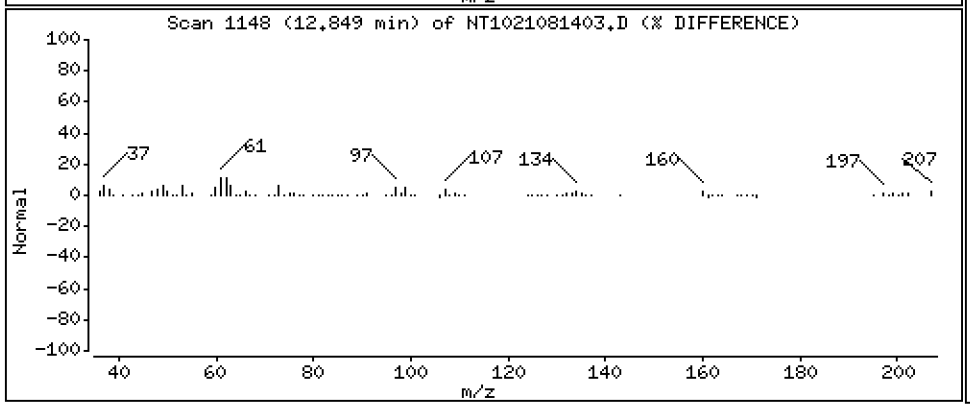












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

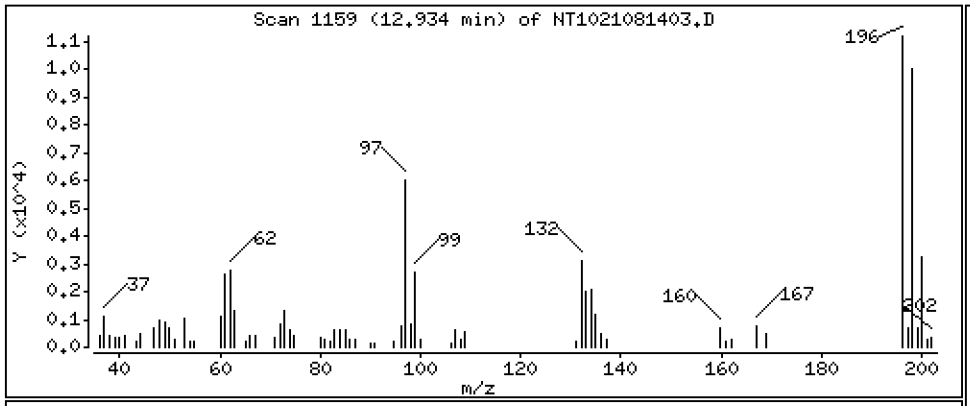
Operator: VTS

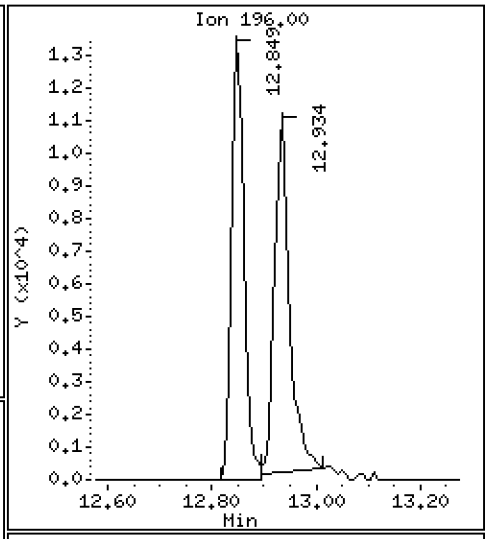
Column phase: ZB-5msi

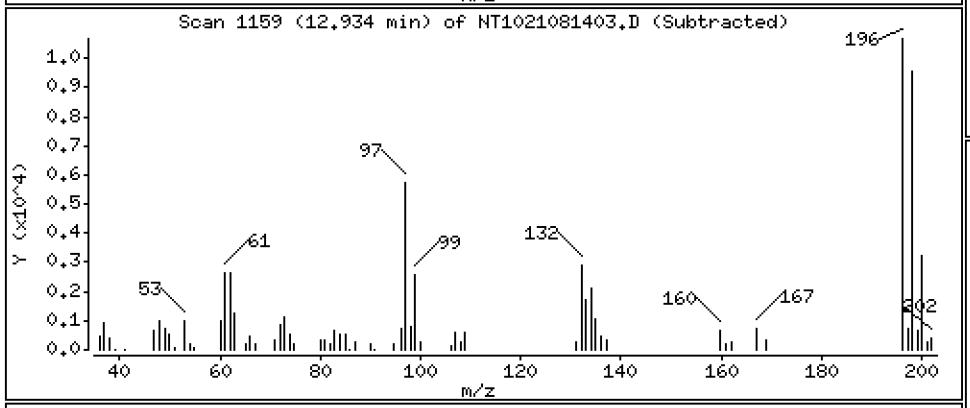
Column diameter: 0.25

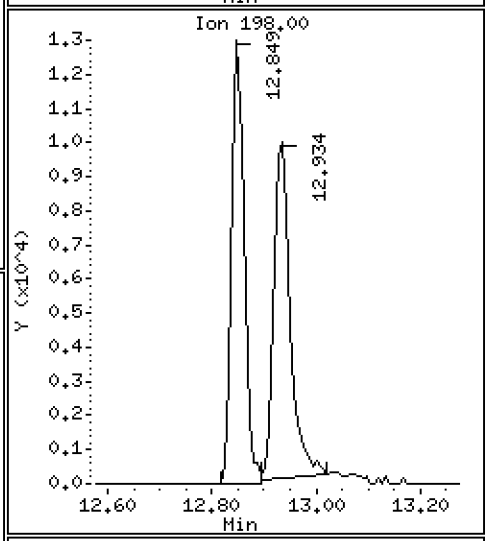
35 2,4,5-Trichlorophenol

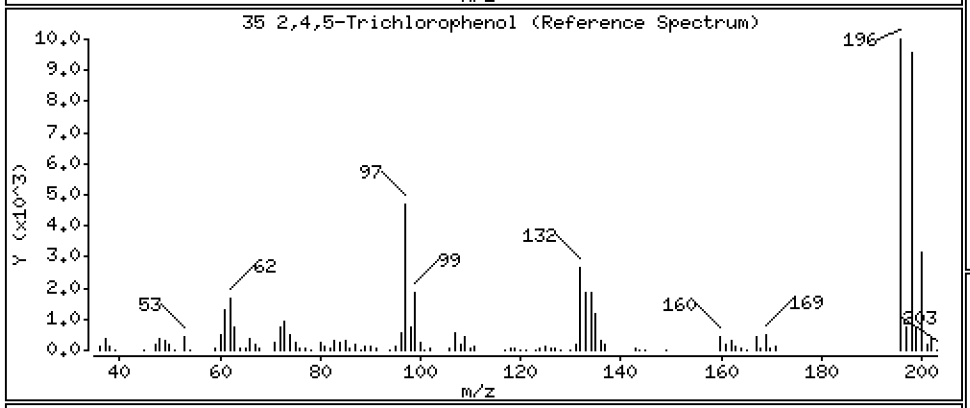
Concentration: 0.8679 ug/mL

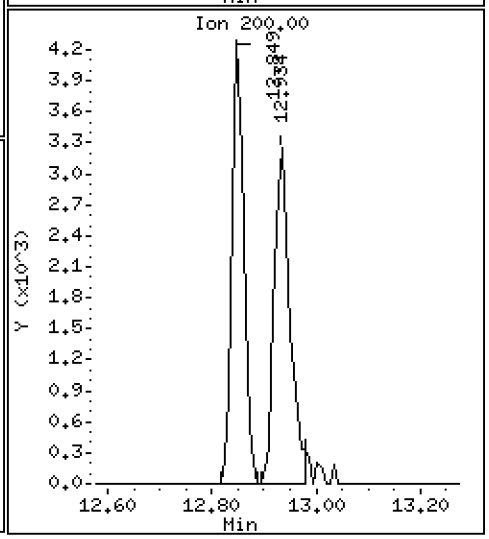


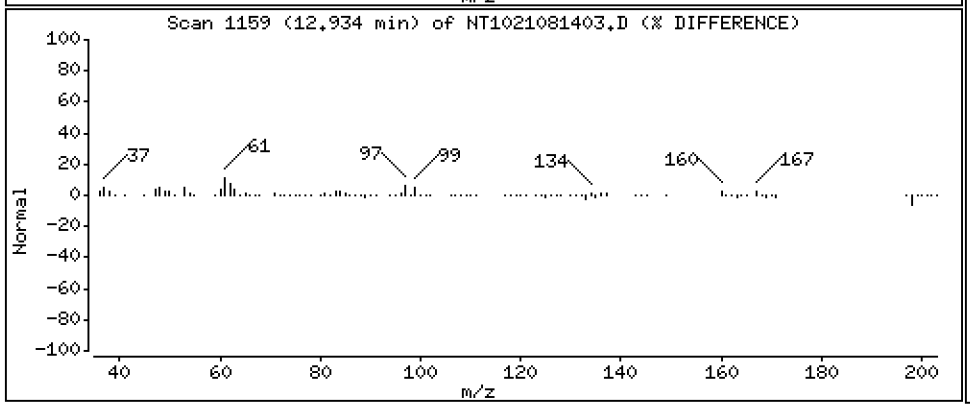












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

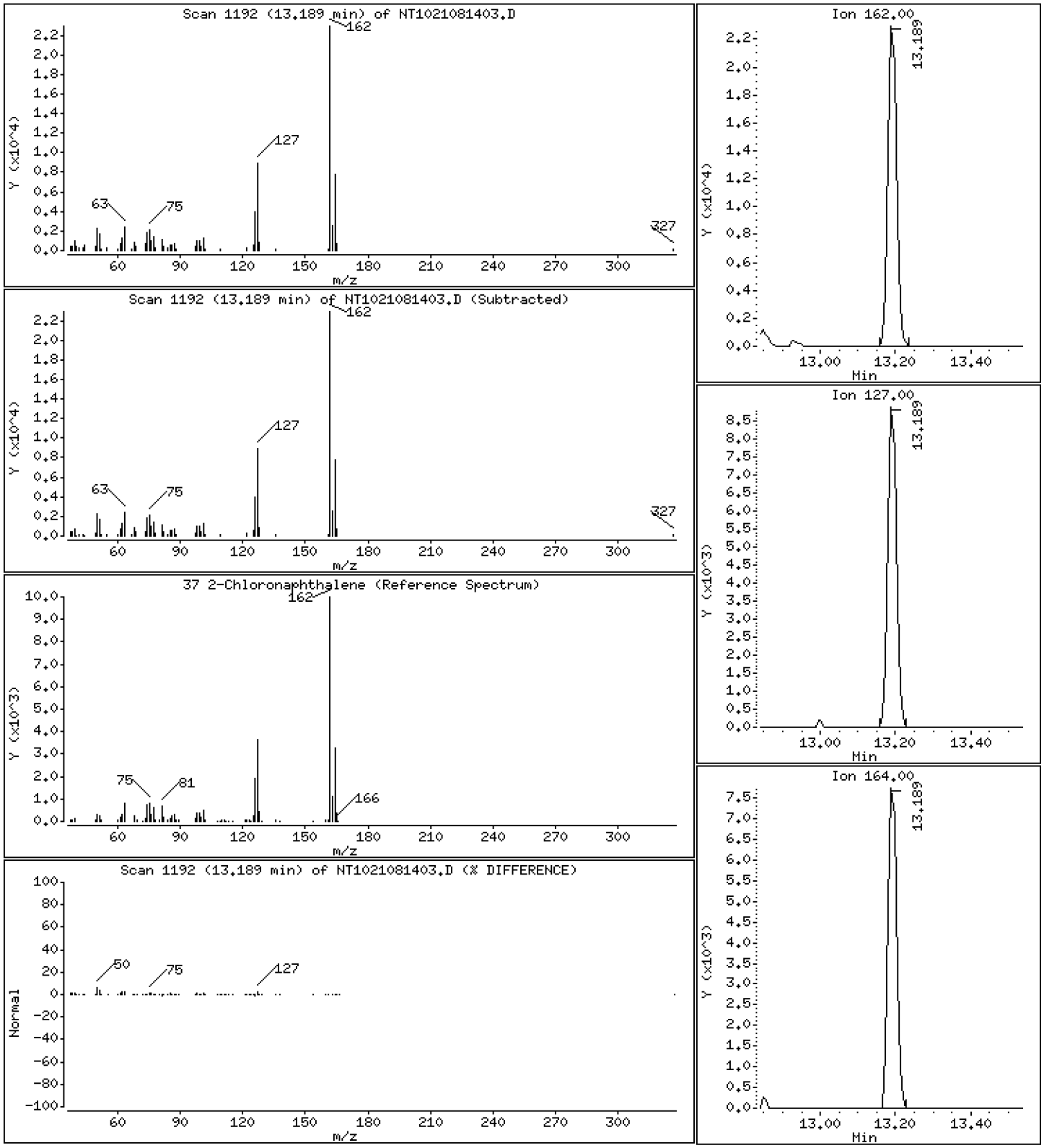
Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25

37 2-Chloronaphthalene

Concentration: 0.4308 ug/mL



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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

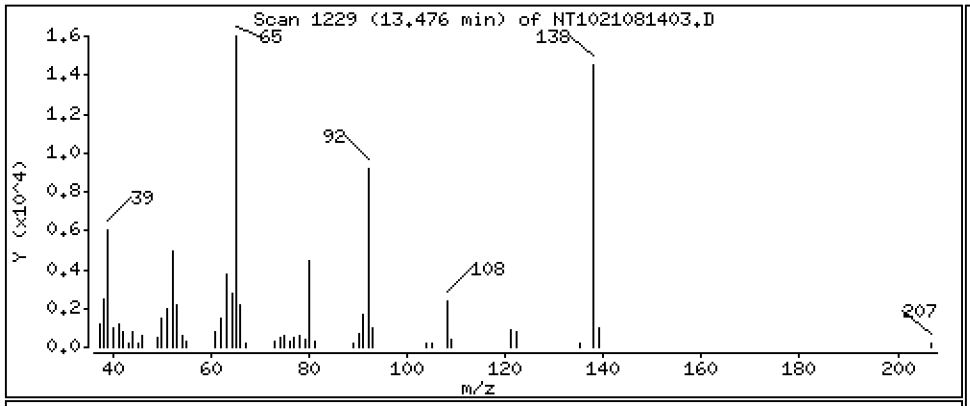
Operator: VTS

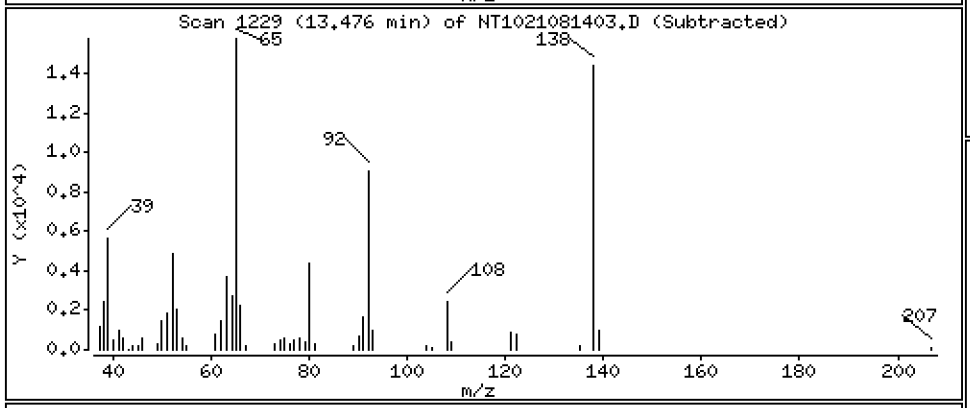
Column phase: ZB-5msi

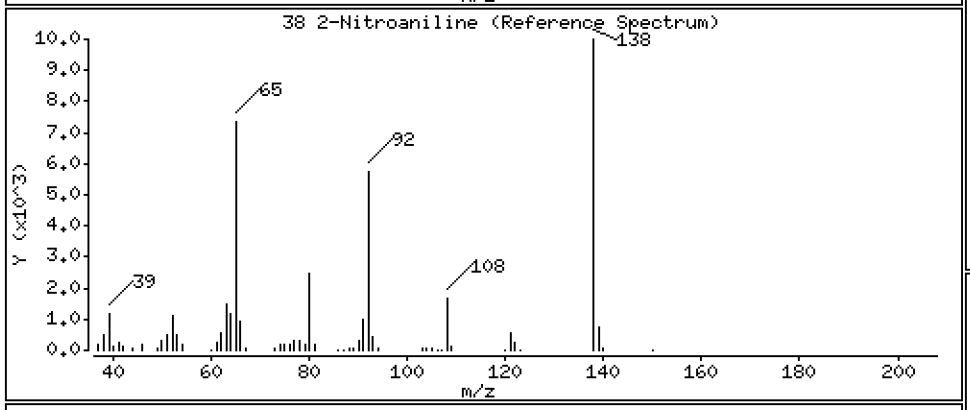
Column diameter: 0.25

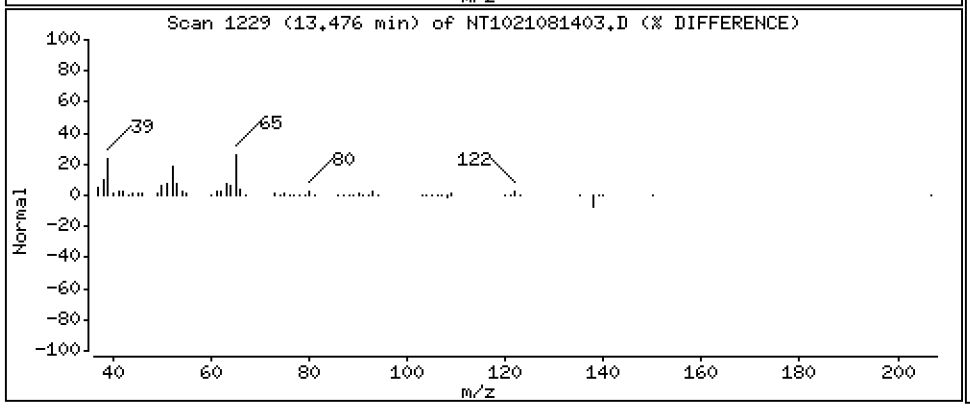
38 2-Nitroaniline

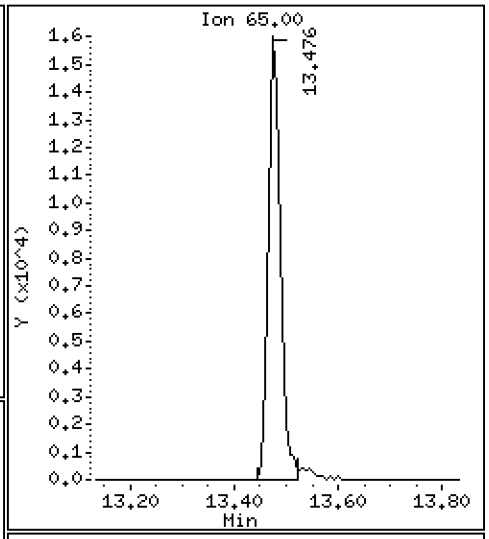
Concentration: 0.8343 ug/mL

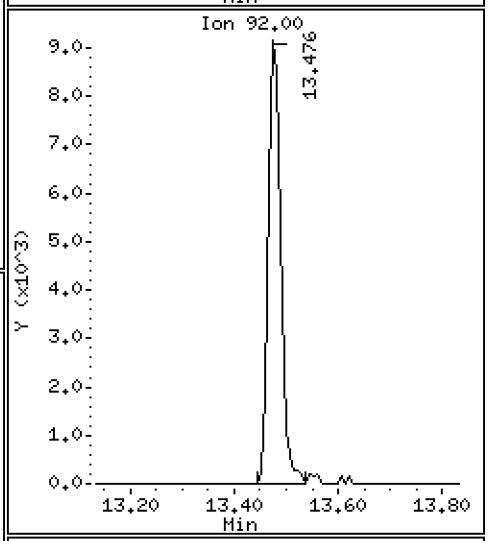


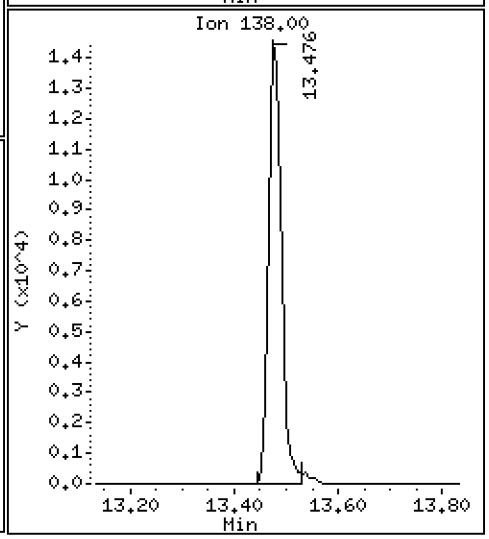












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

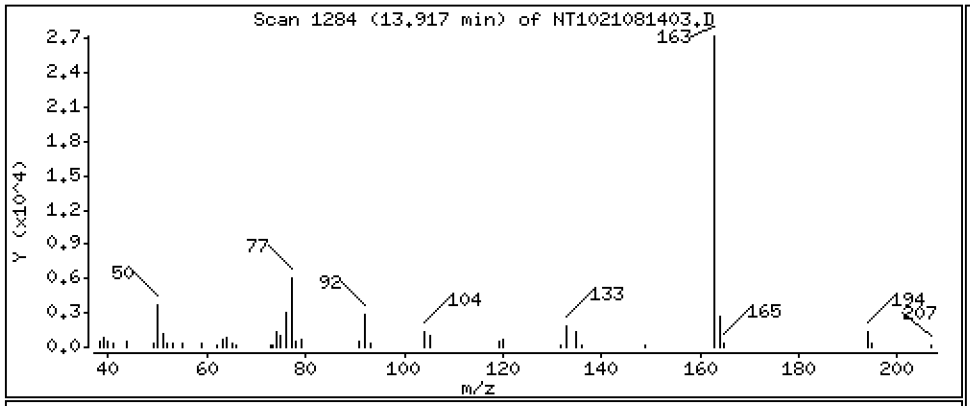
Operator: VTS

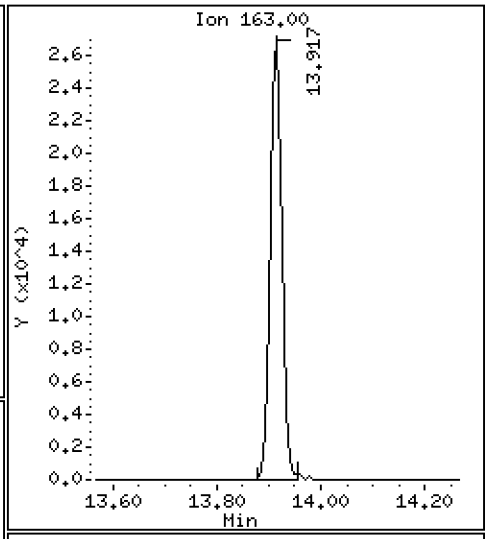
Column phase: ZB-5msi

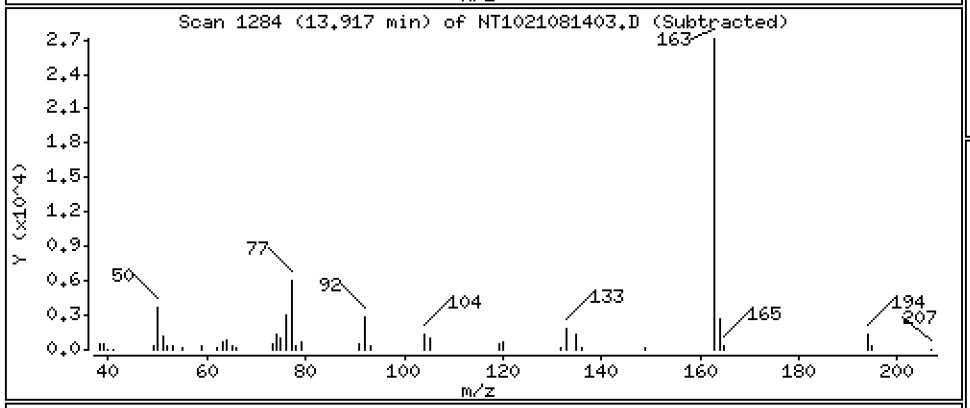
Column diameter: 0.25

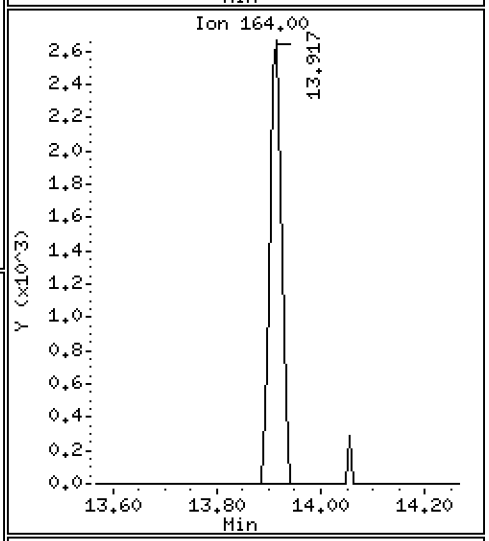
39 Dimethylphthalate

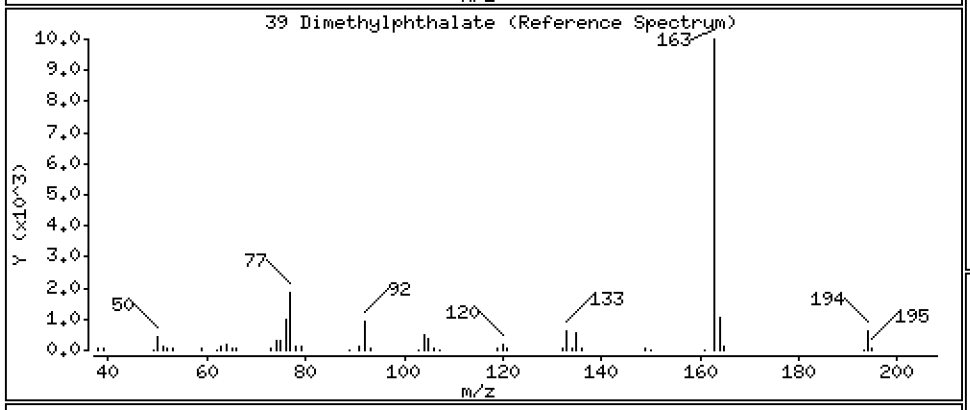
Concentration: 0.5081 ug/mL

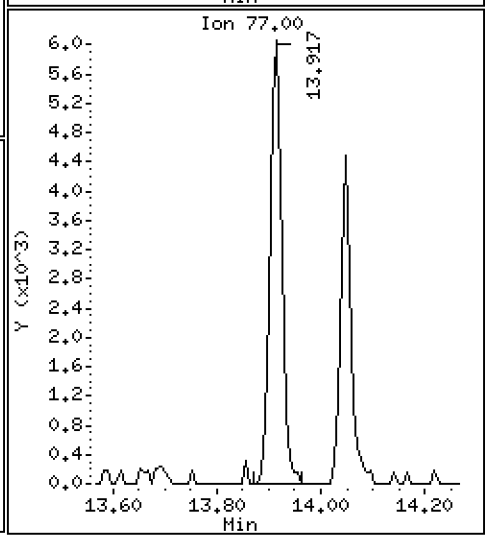


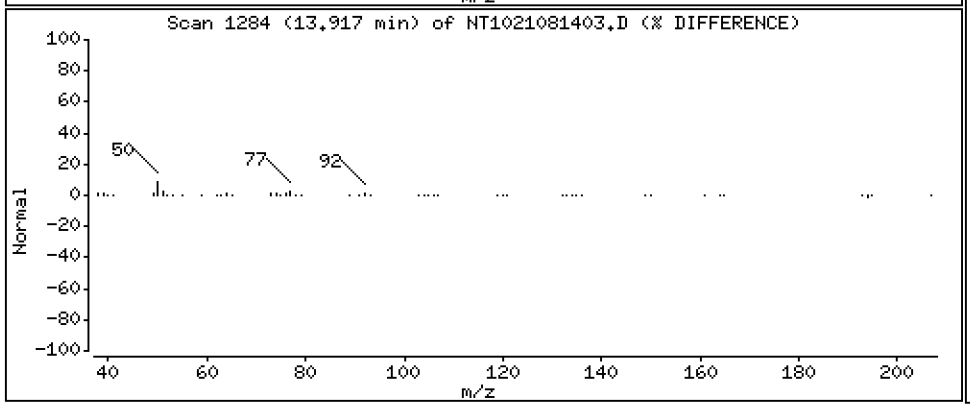












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

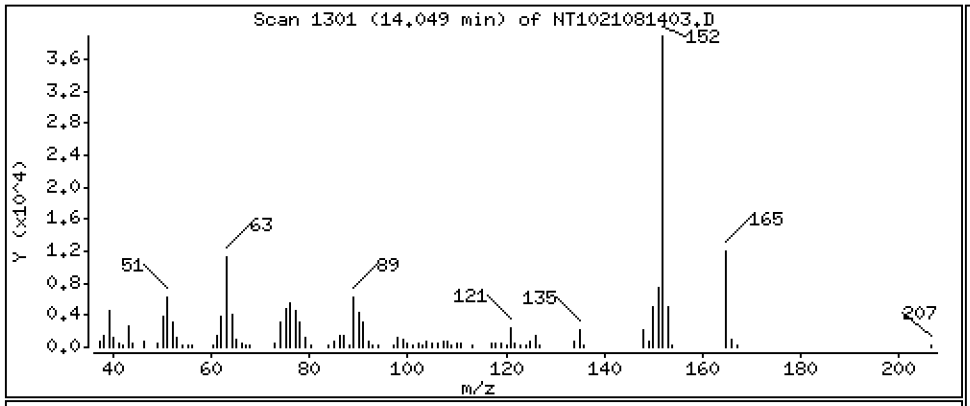
Operator: VTS

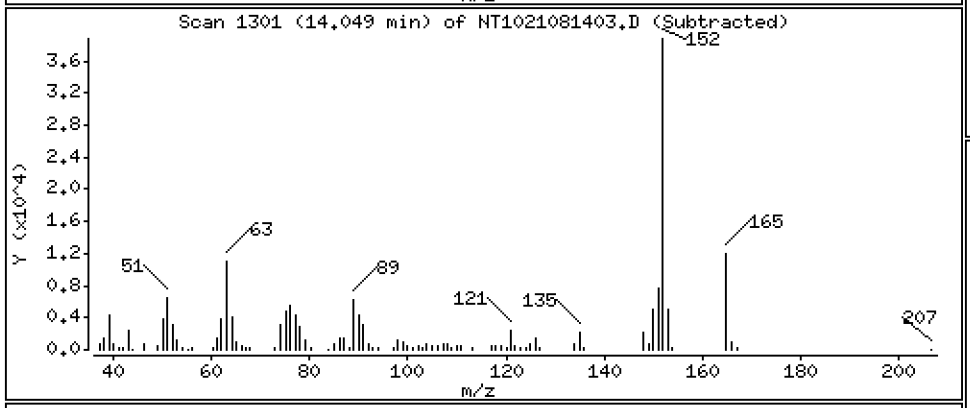
Column phase: ZB-5msi

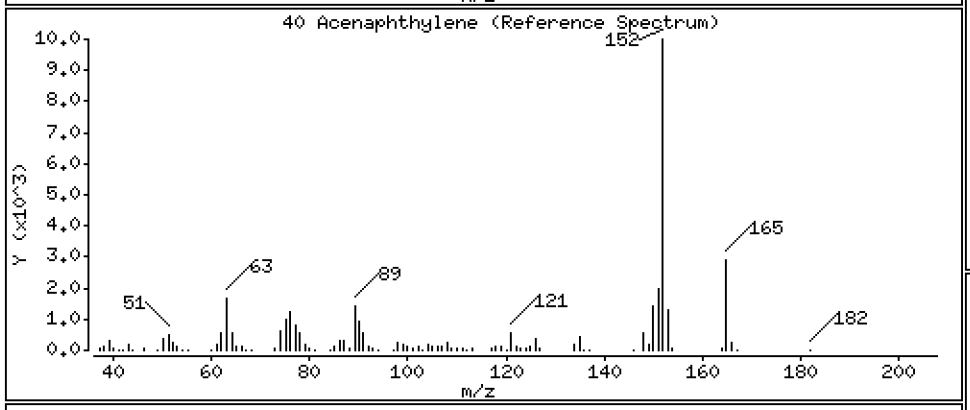
Column diameter: 0.25

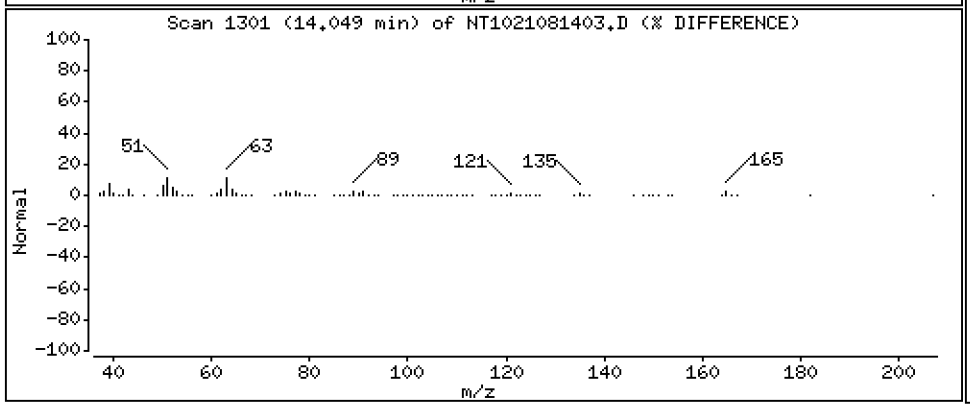
40 Acenaphthylene

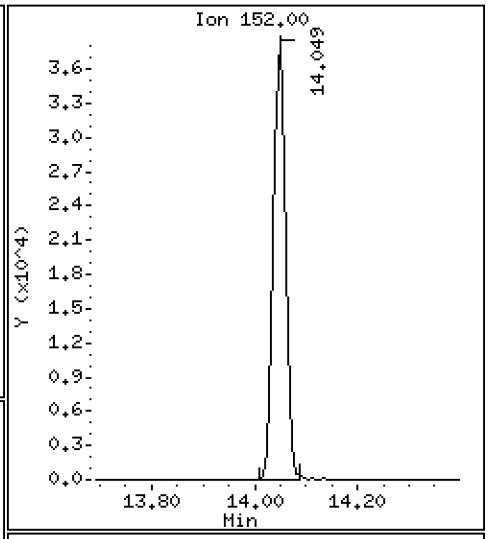
Concentration: 0.5147 ug/mL

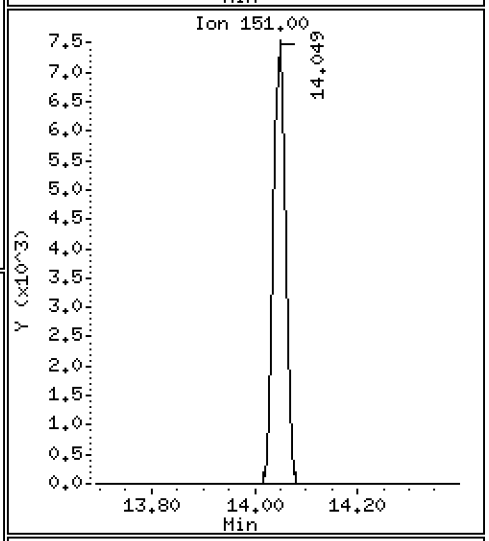


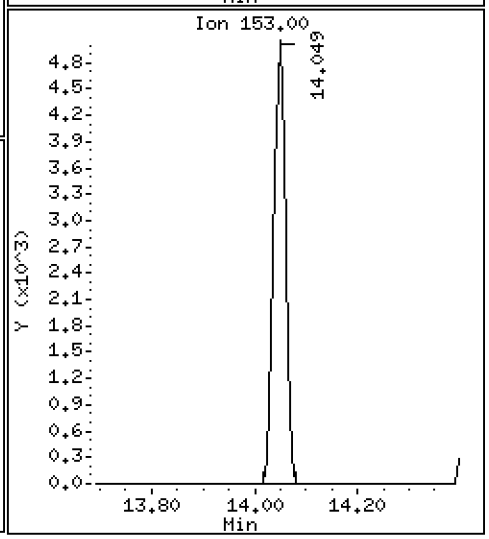












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

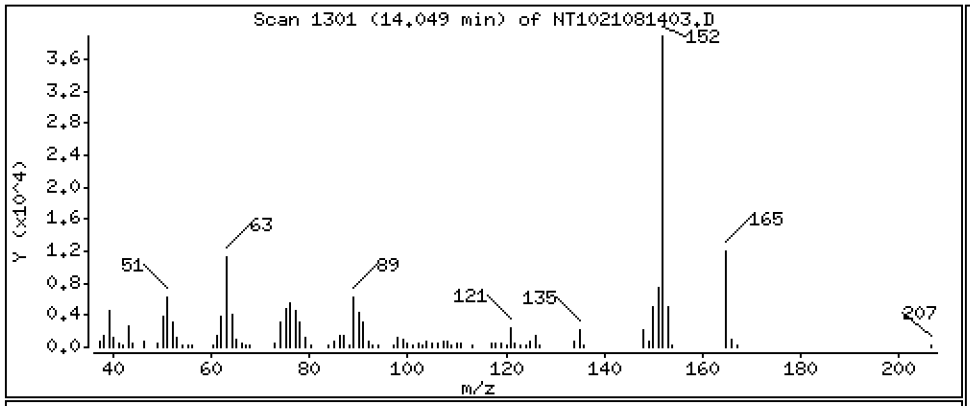
Operator: VTS

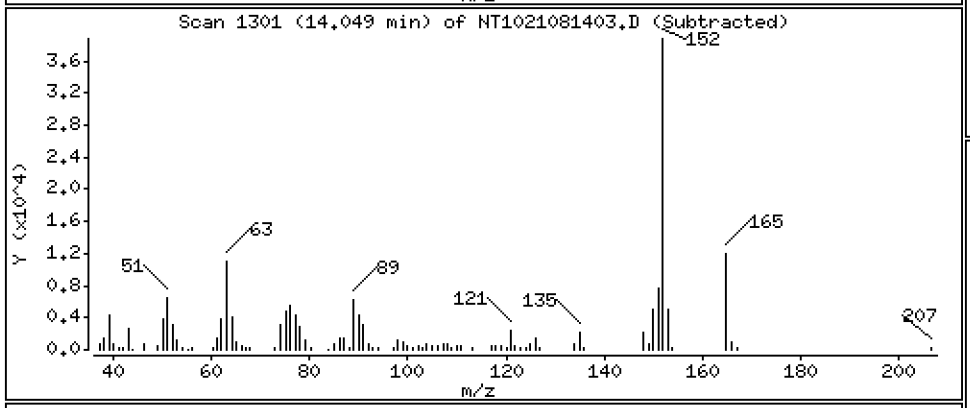
Column phase: ZB-5msi

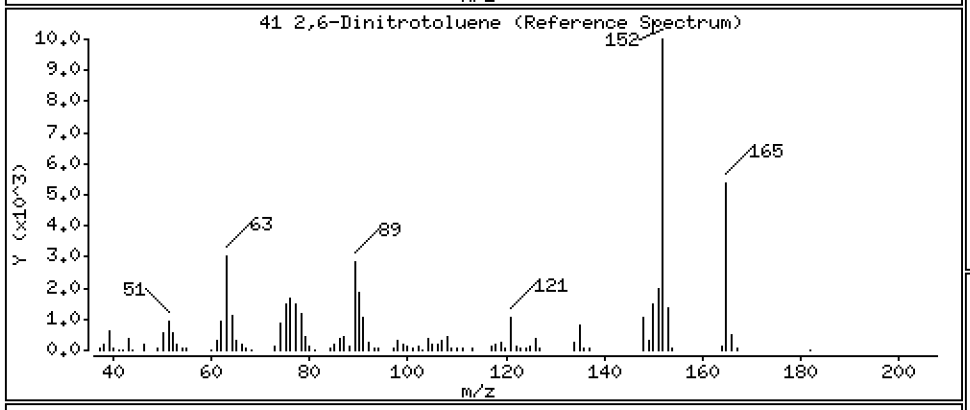
Column diameter: 0.25

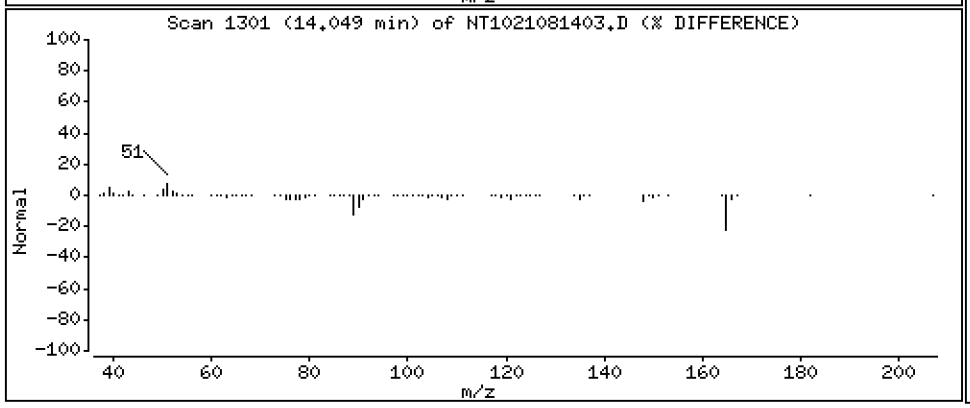
41 2,6-Dinitrotoluene

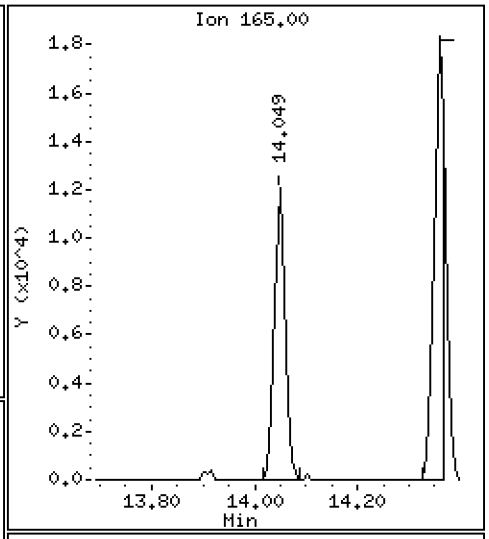
Concentration: 0.9157 ug/mL

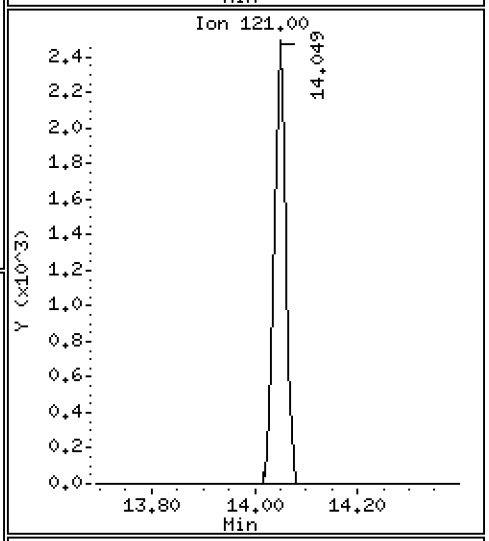


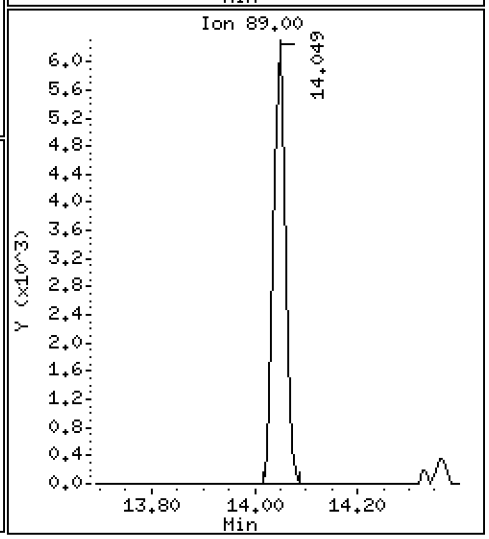












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

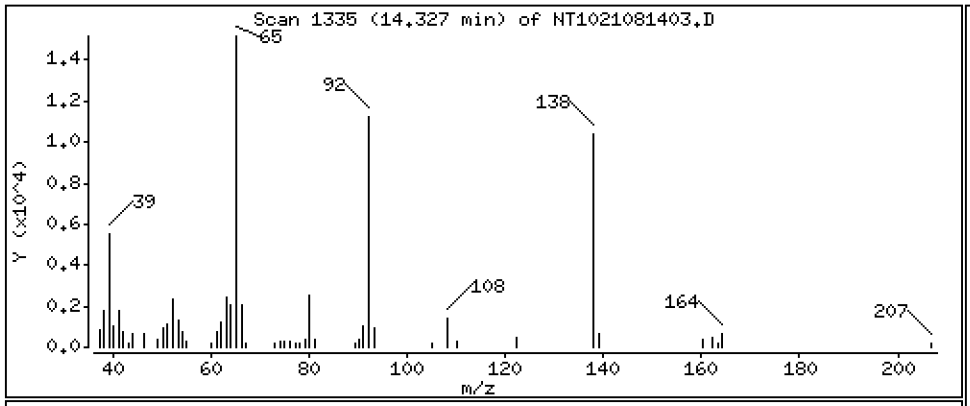
Operator: VTS

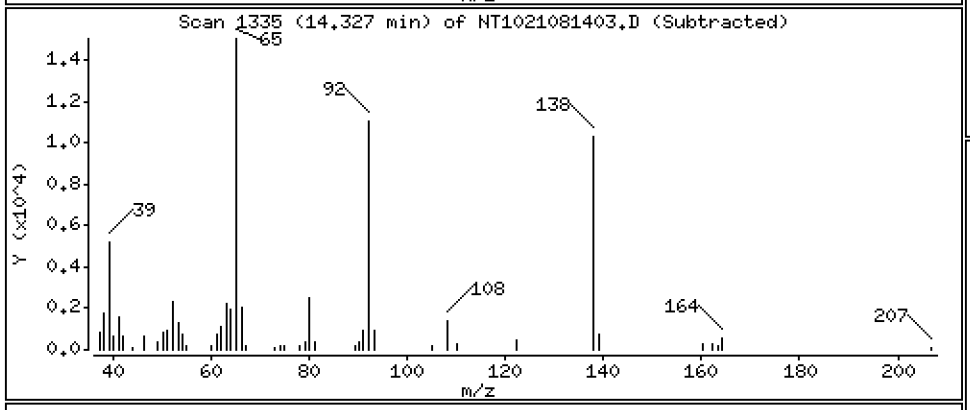
Column phase: ZB-5msi

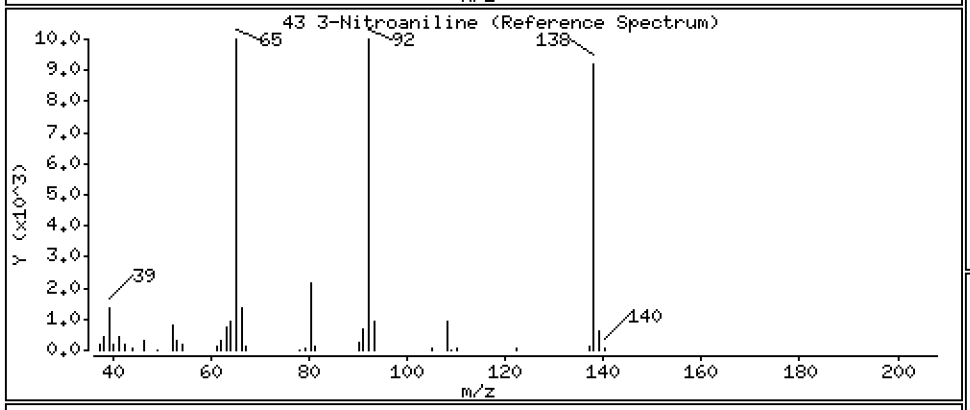
Column diameter: 0.25

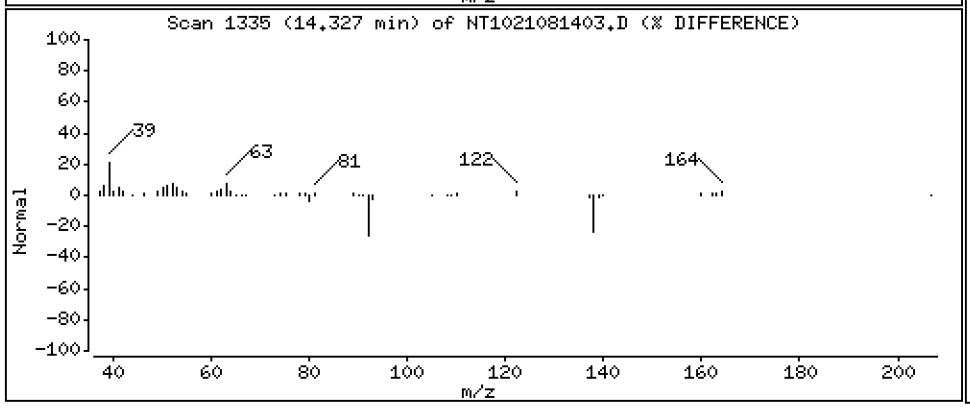
43 3-Nitroaniline

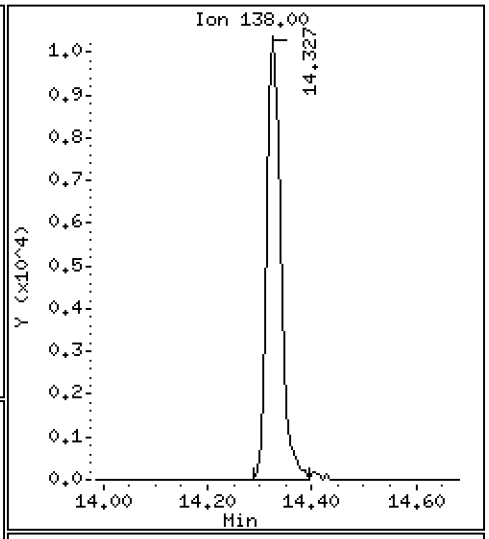
Concentration: 0.8499 ug/mL

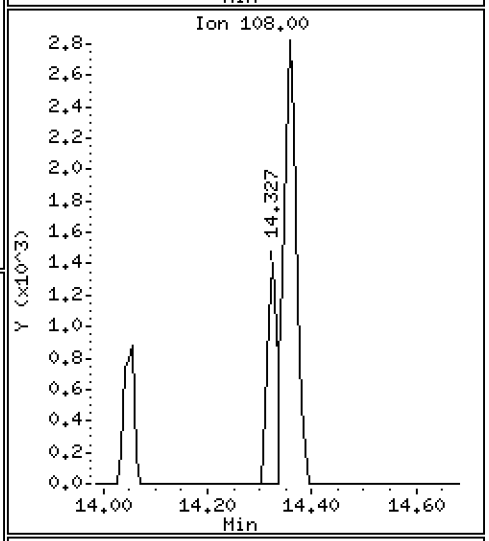


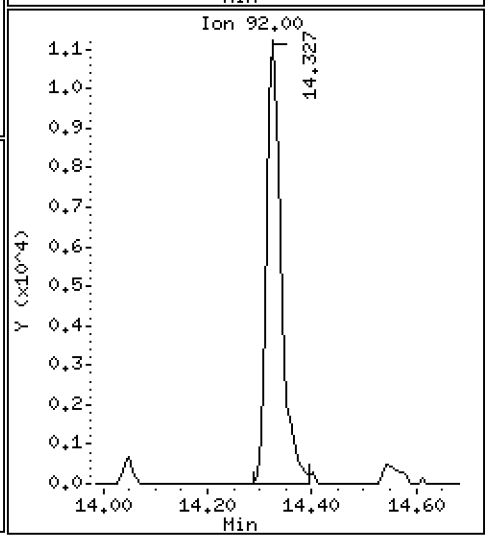












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

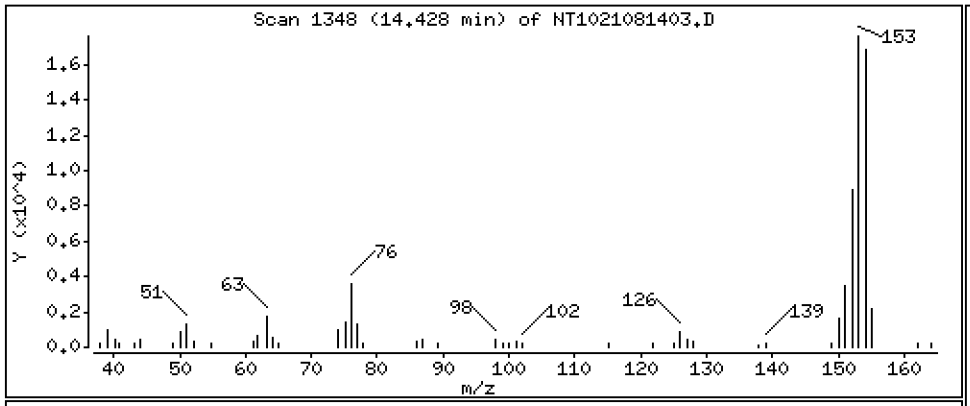
Operator: VTS

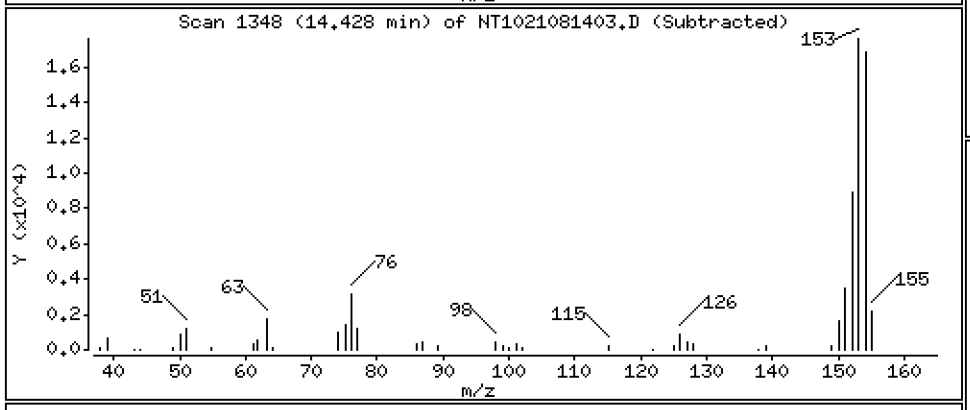
Column phase: ZB-5msi

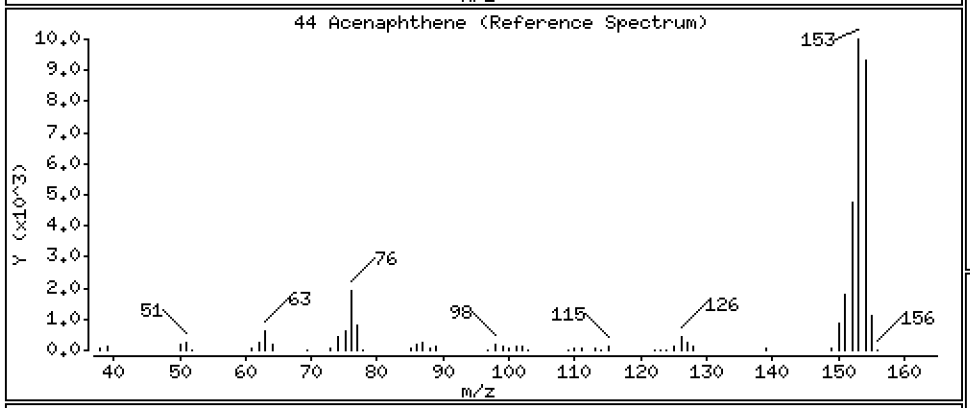
Column diameter: 0.25

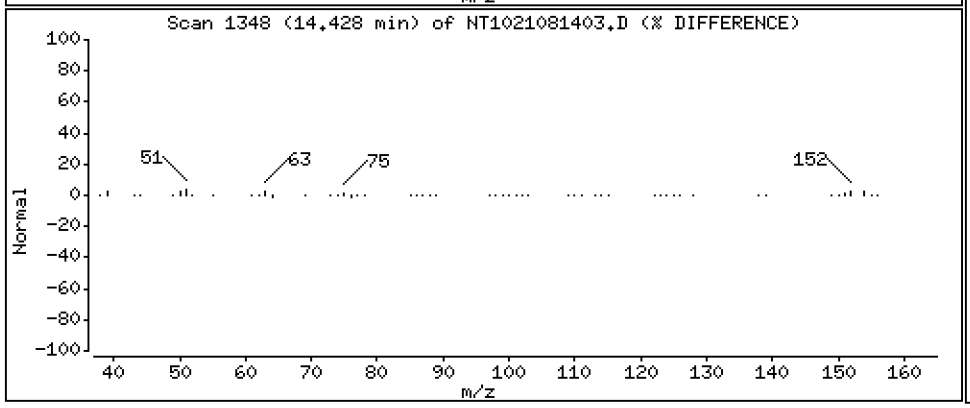
44 Acenaphthene

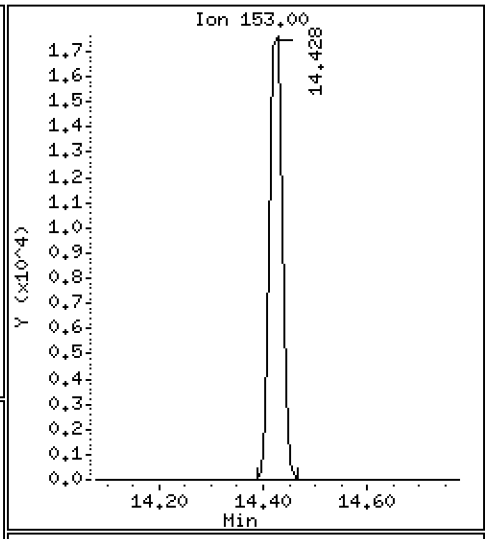
Concentration: 0.4280 ug/mL

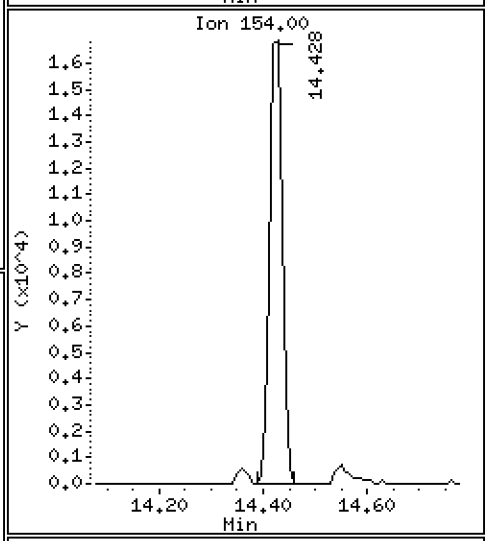


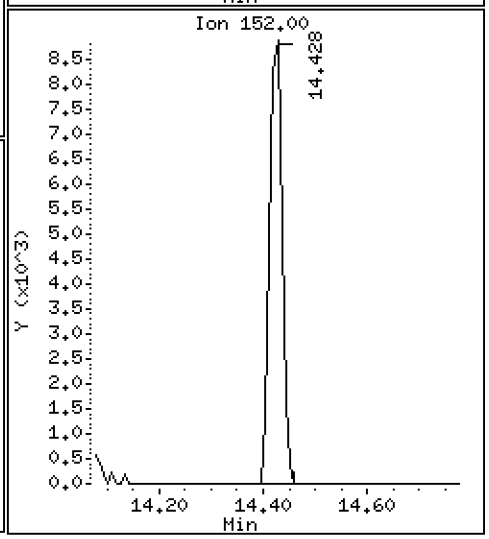












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

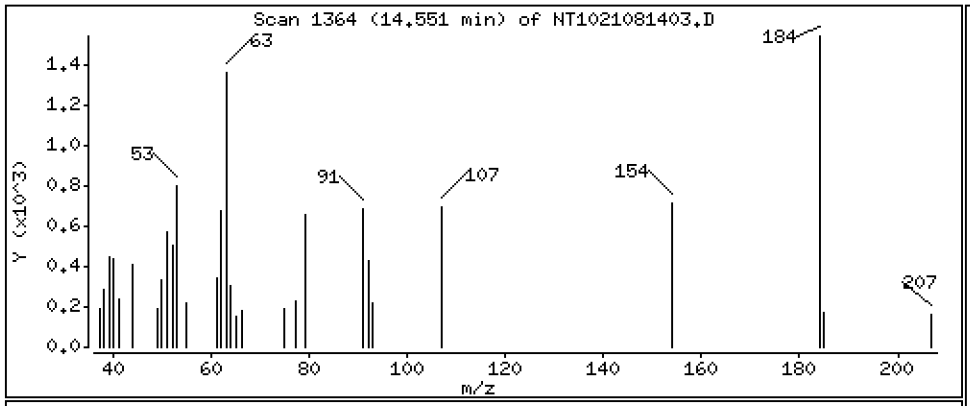
Operator: VTS

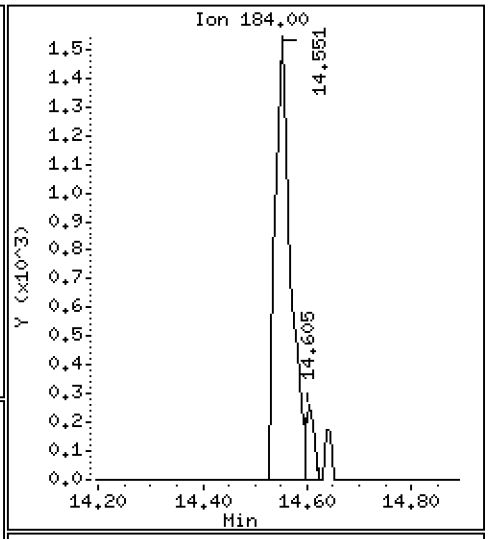
Column phase: ZB-5msi

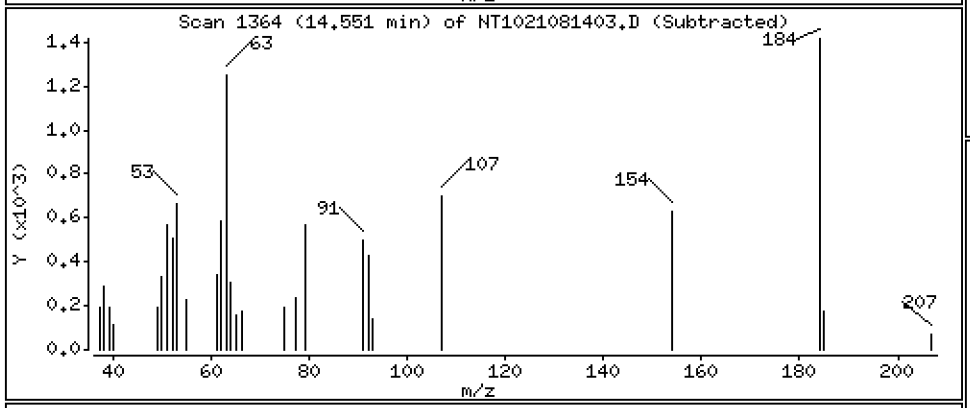
Column diameter: 0.25

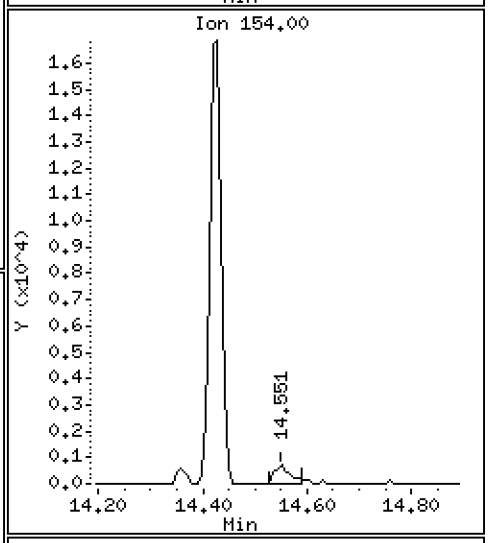
45 2,4-Dinitrophenol

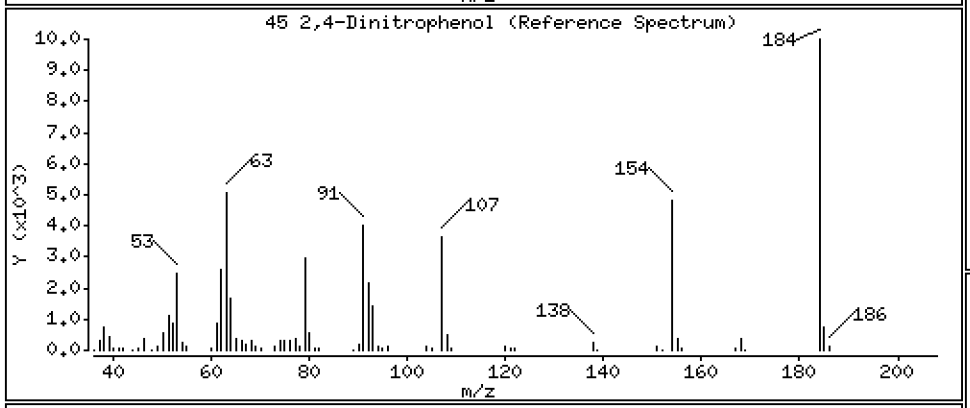
Concentration: 0.3171 ug/mL

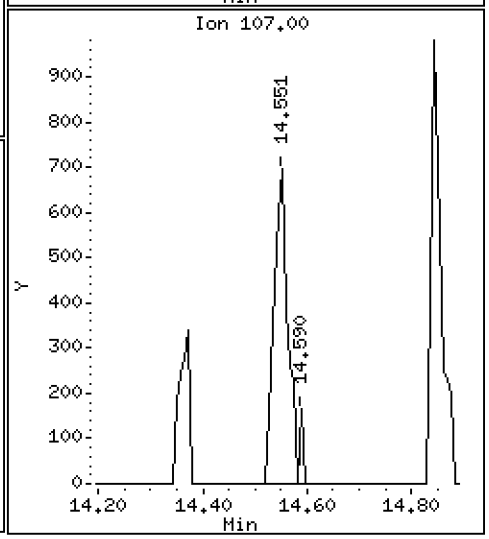


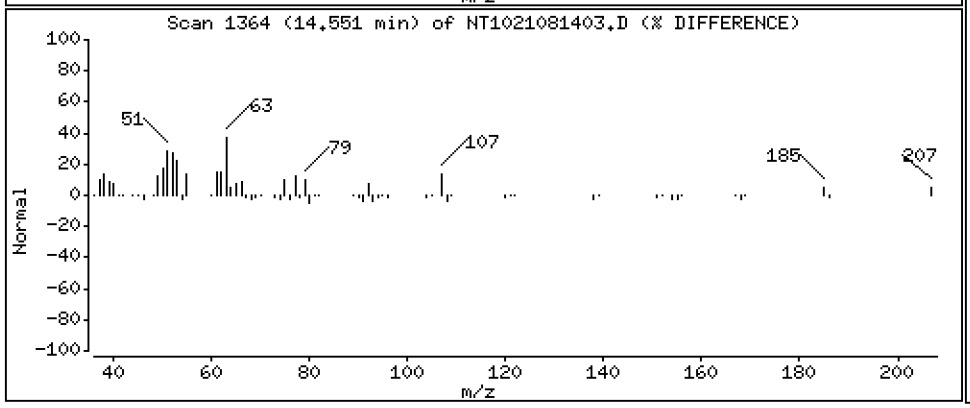












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

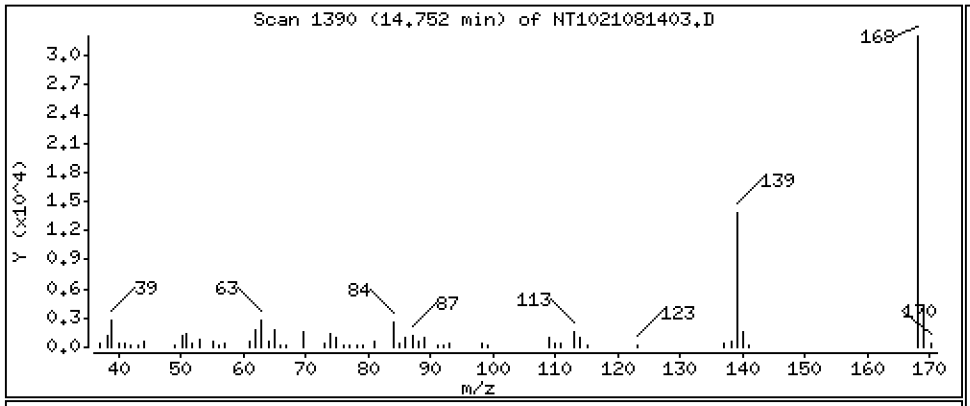
Operator: VTS

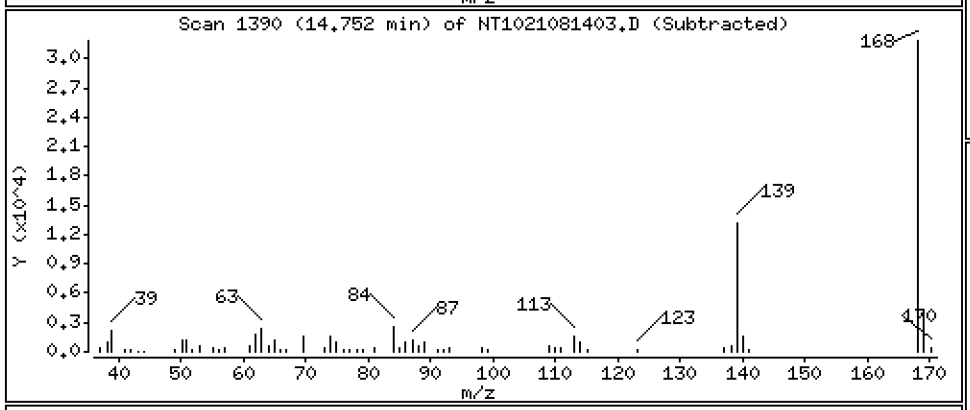
Column phase: ZB-5msi

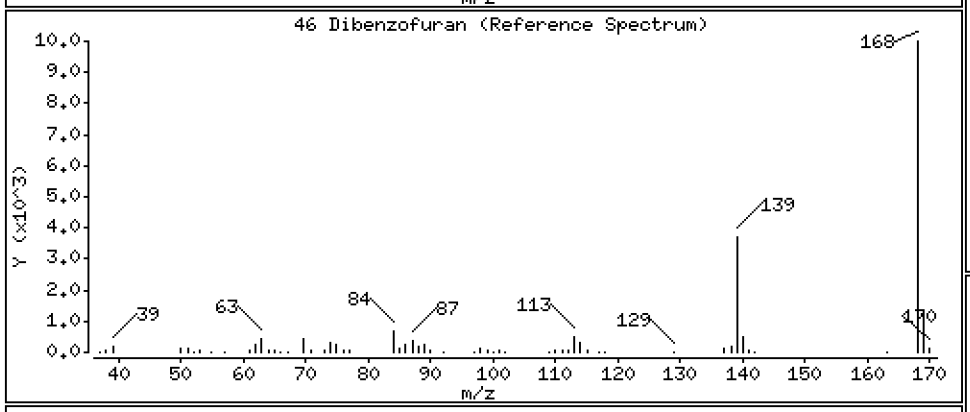
Column diameter: 0.25

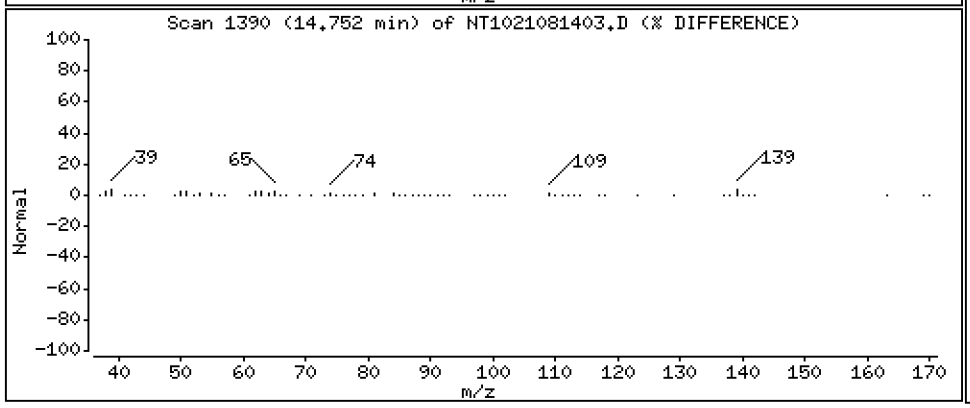
46 Dibenzofuran

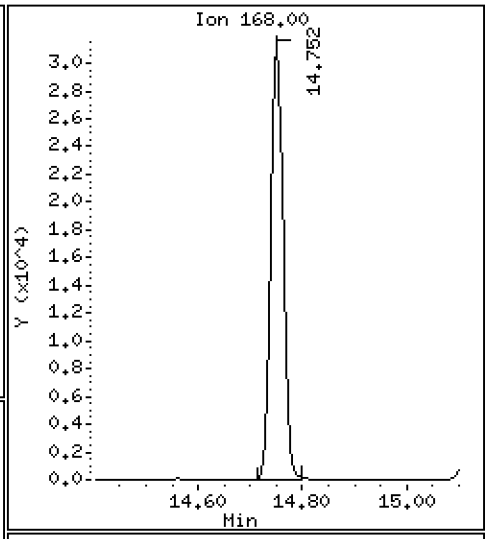
Concentration: 0.4784 ug/mL

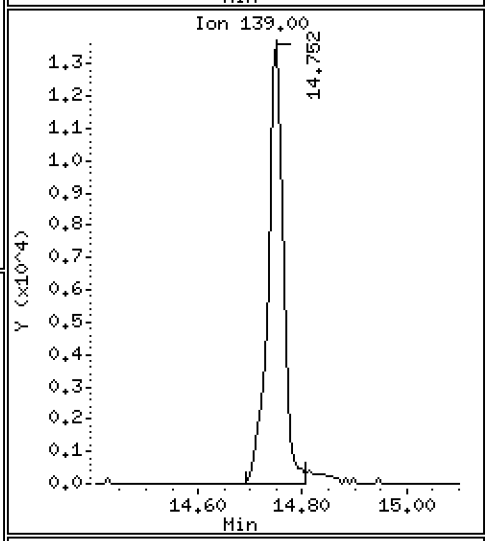


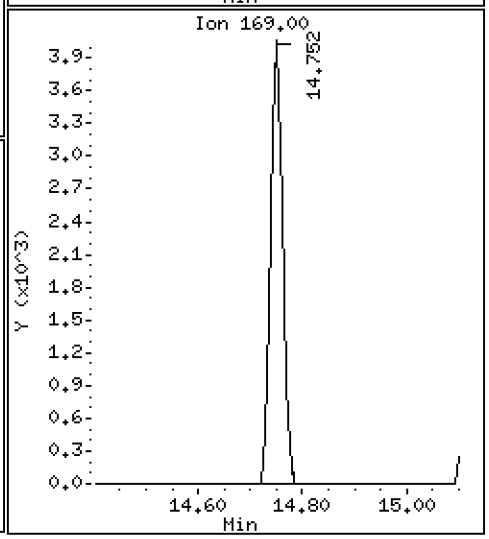












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

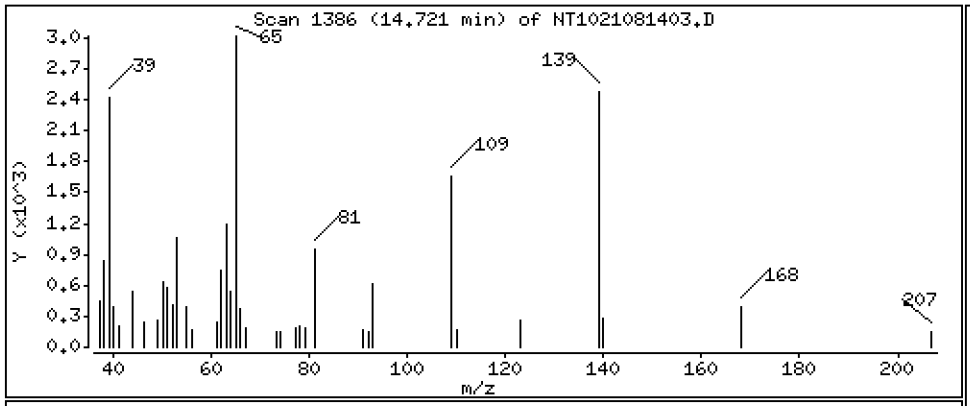
Operator: VTS

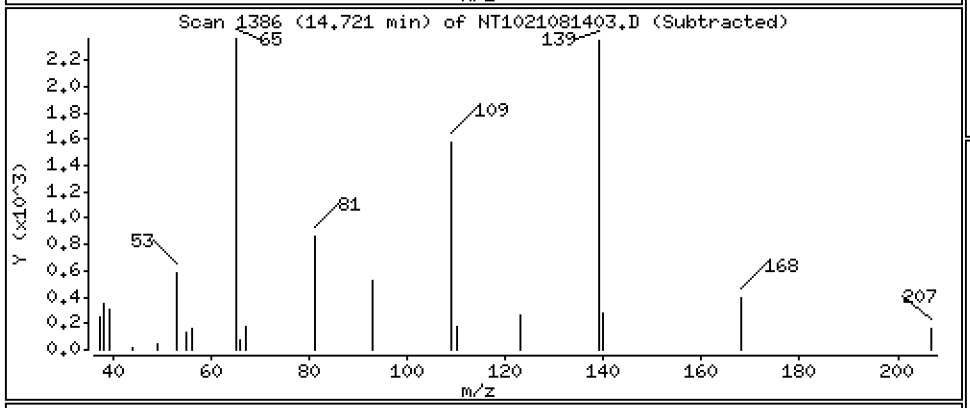
Column phase: ZB-5msi

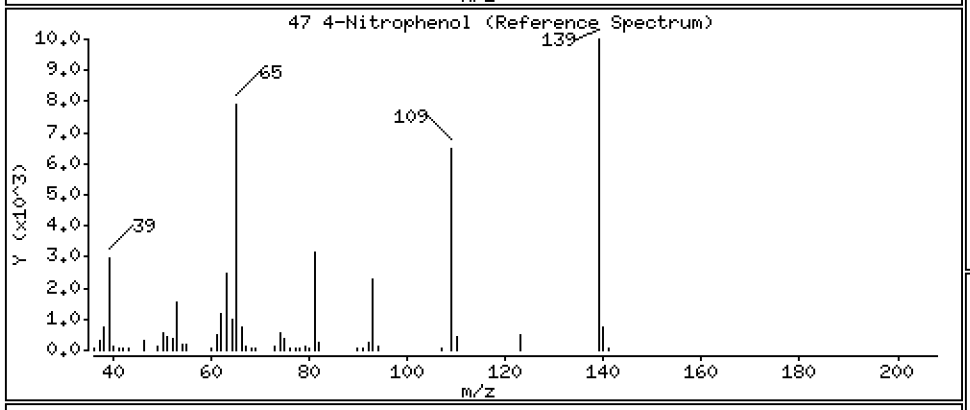
Column diameter: 0.25

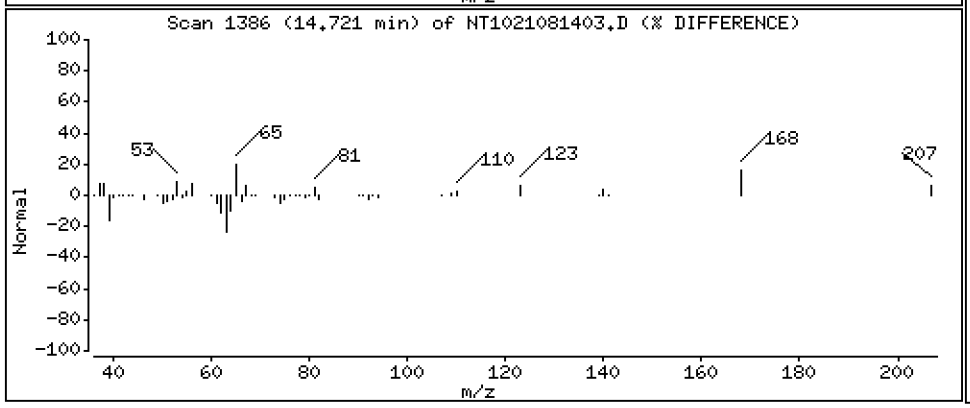
47 4-Nitrophenol

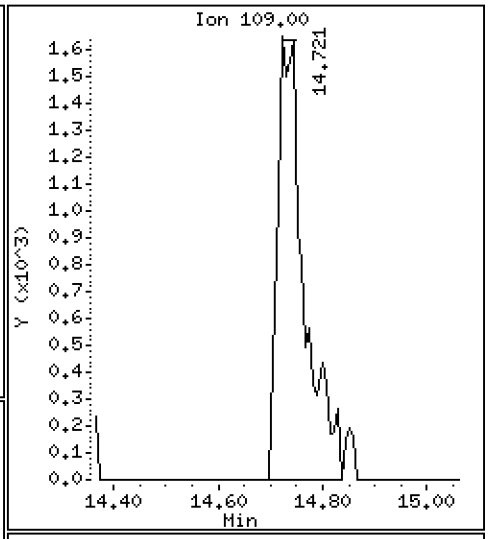
Concentration: 0.7062 ug/mL

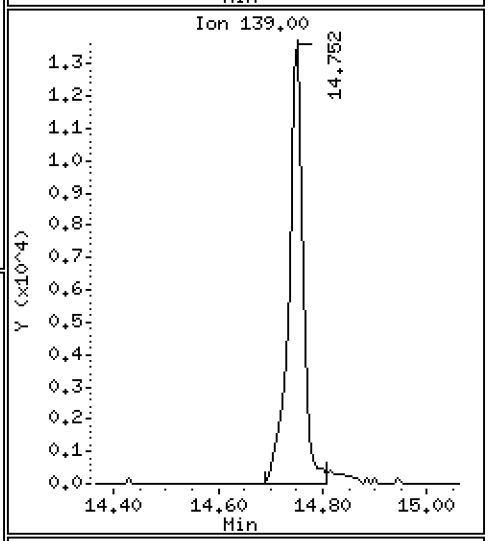


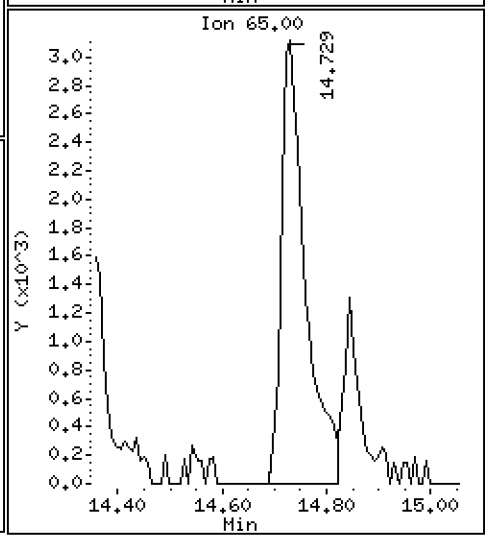












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

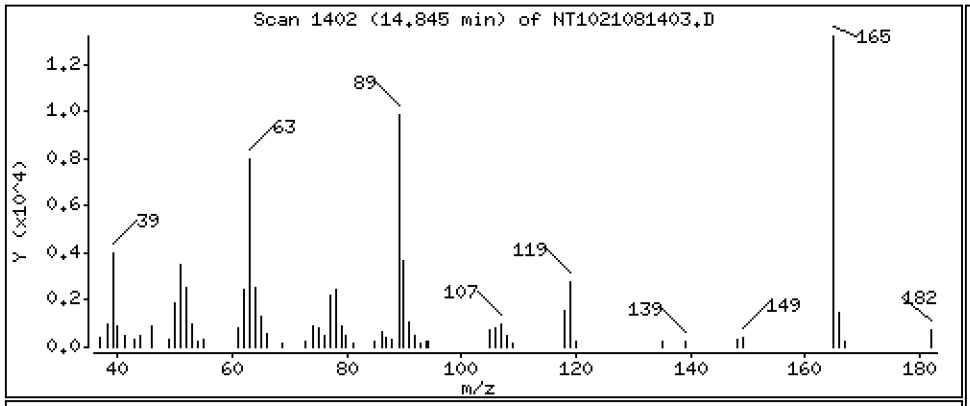
Operator: VTS

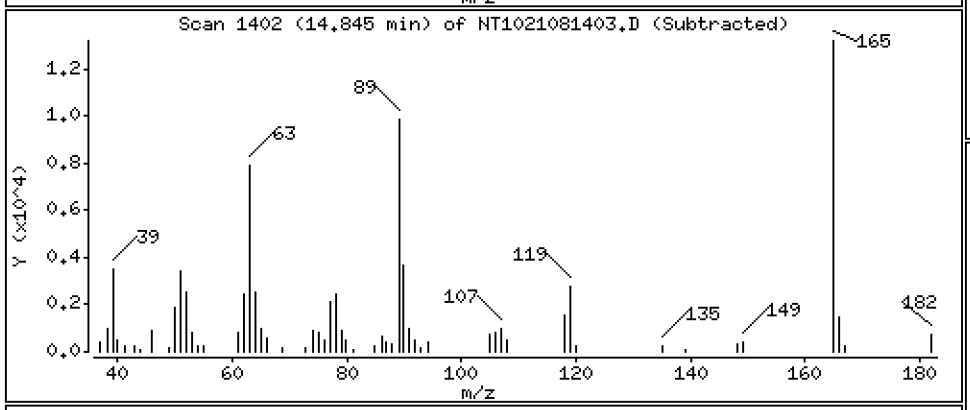
Column phase: ZB-5msi

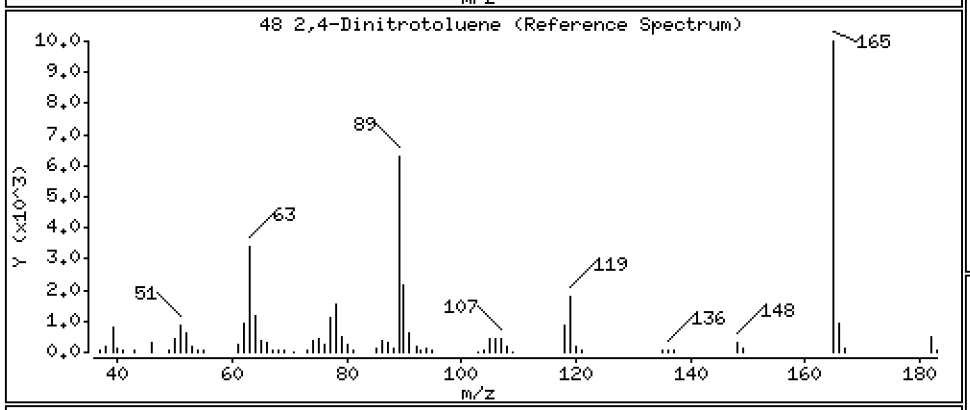
Column diameter: 0.25

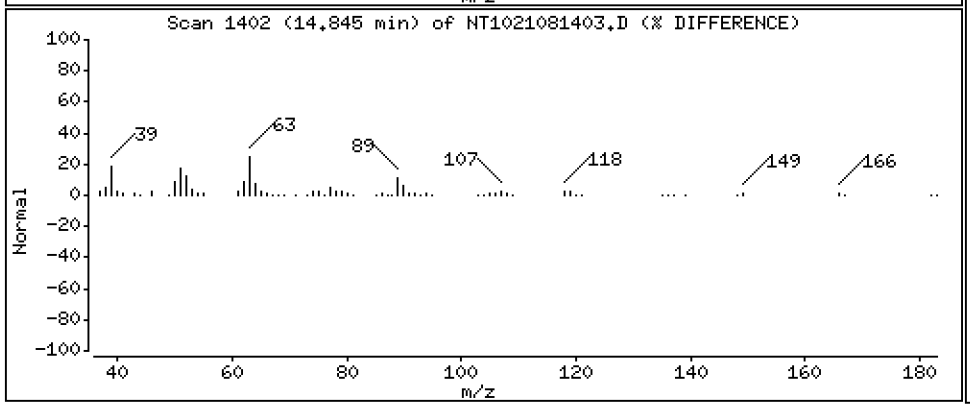
48 2,4-Dinitrotoluene

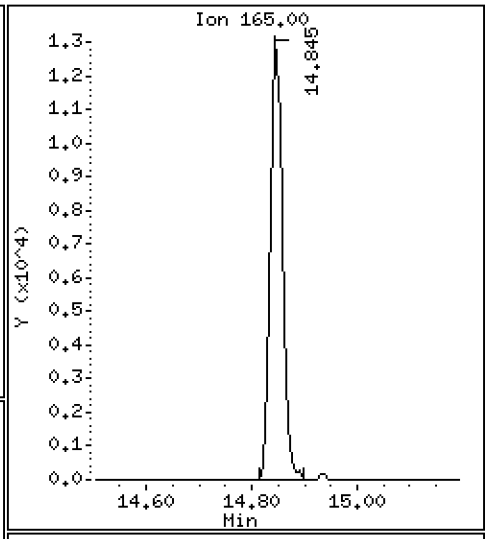
Concentration: 0.8436 ug/mL

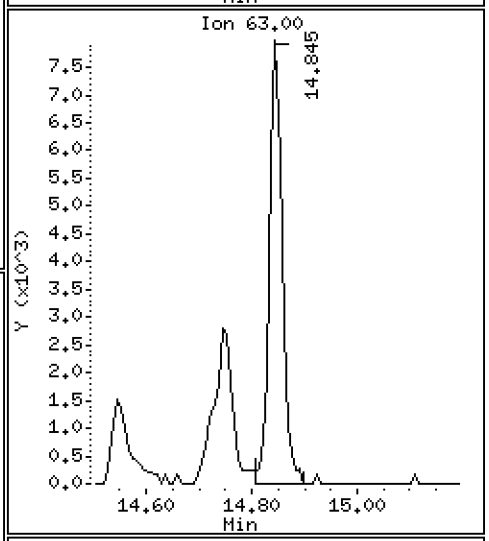


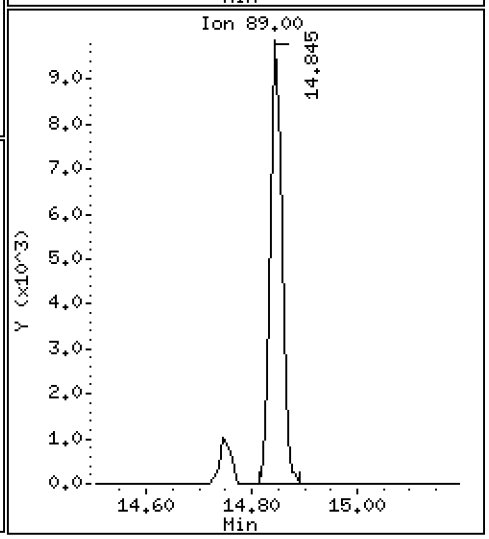












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

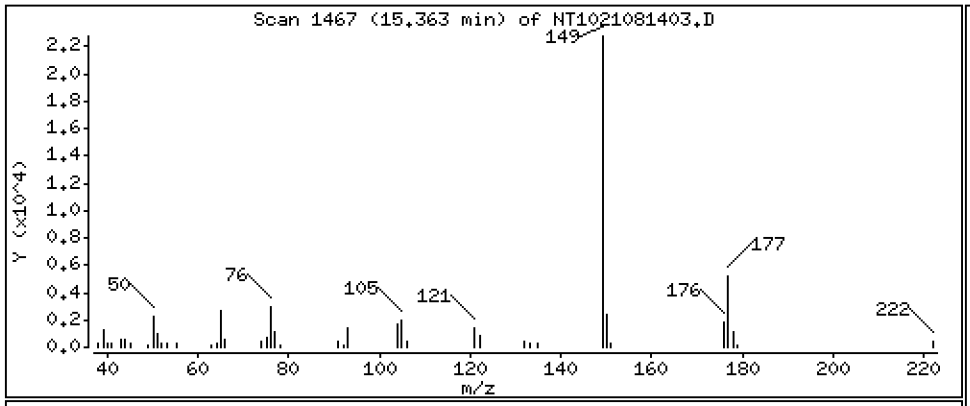
Operator: VTS

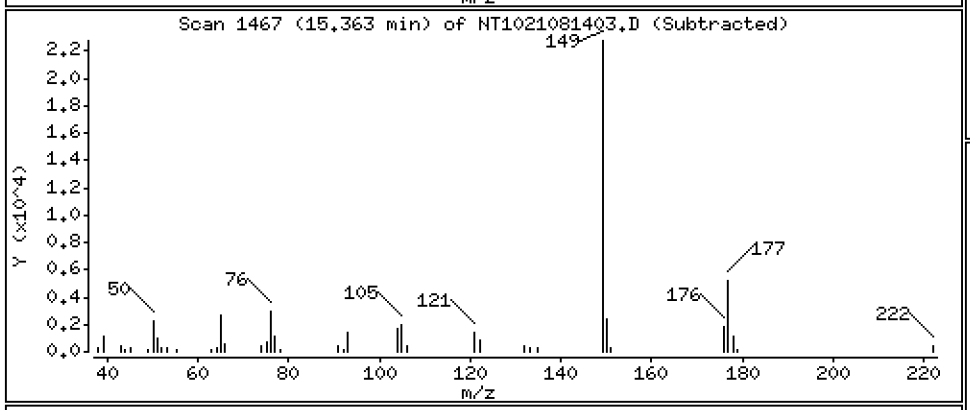
Column phase: ZB-5msi

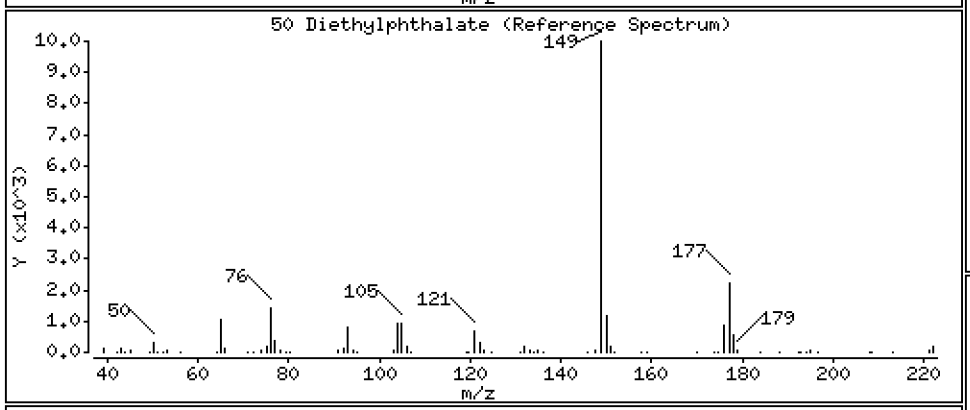
Column diameter: 0.25

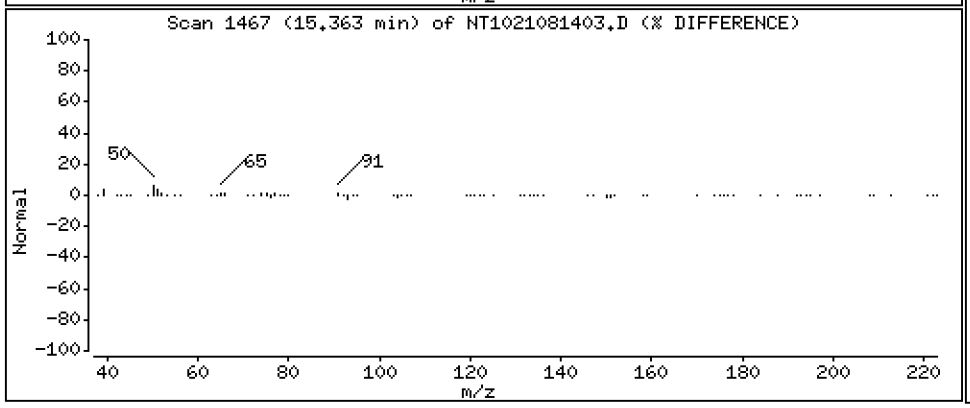
50 Diethylphthalate

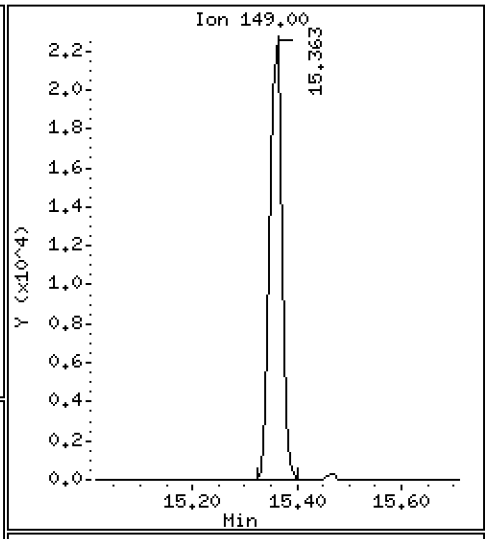
Concentration: 0.4647 ug/mL

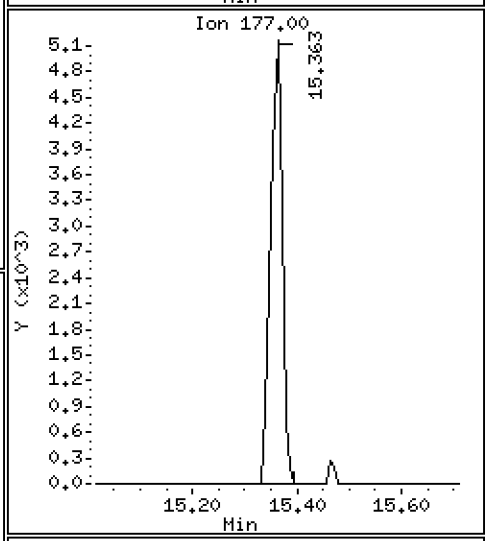


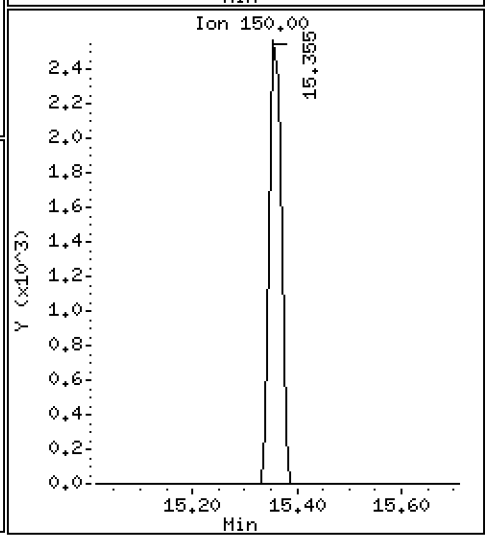












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

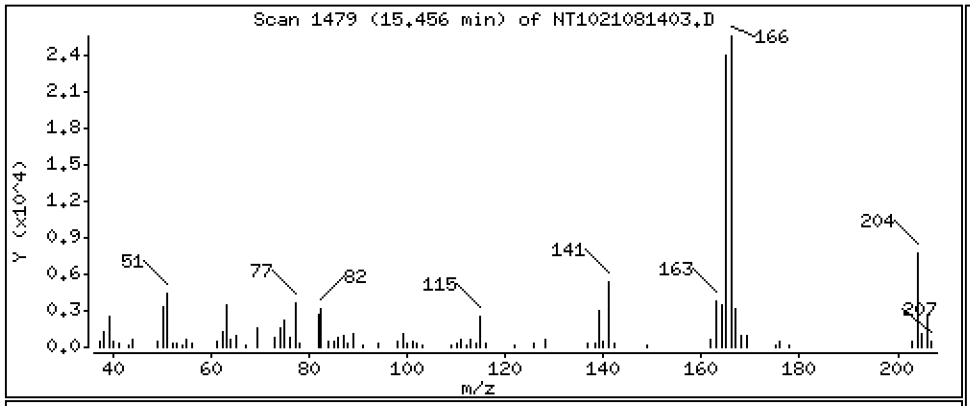
Operator: VTS

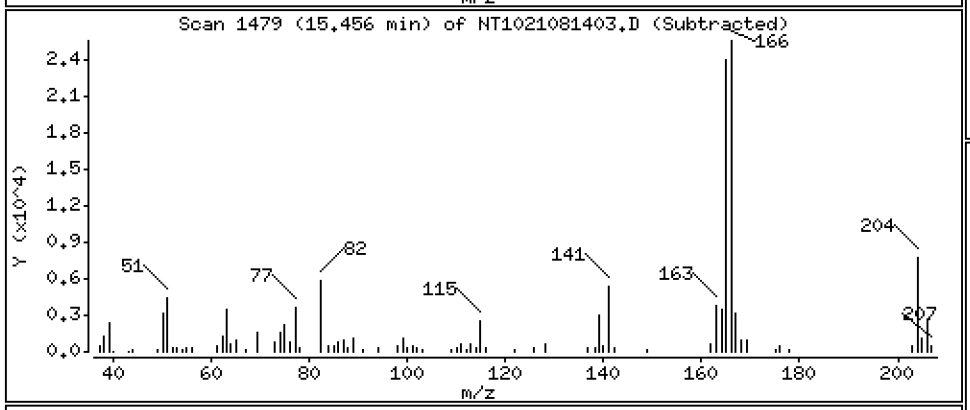
Column phase: ZB-5msi

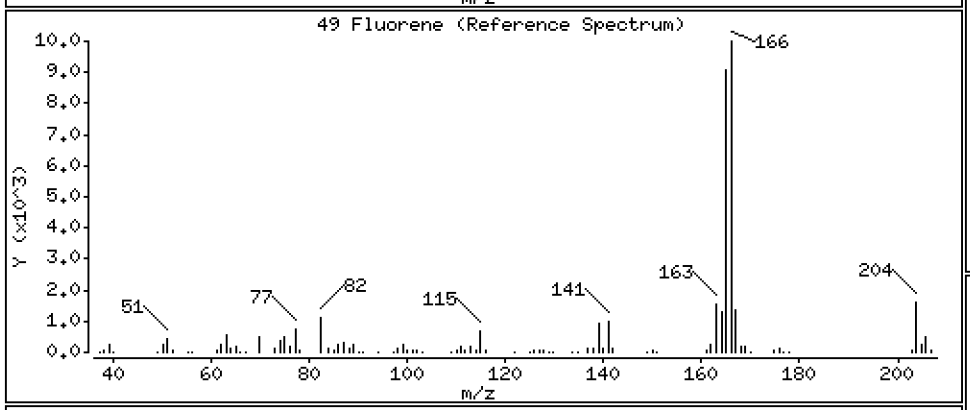
Column diameter: 0.25

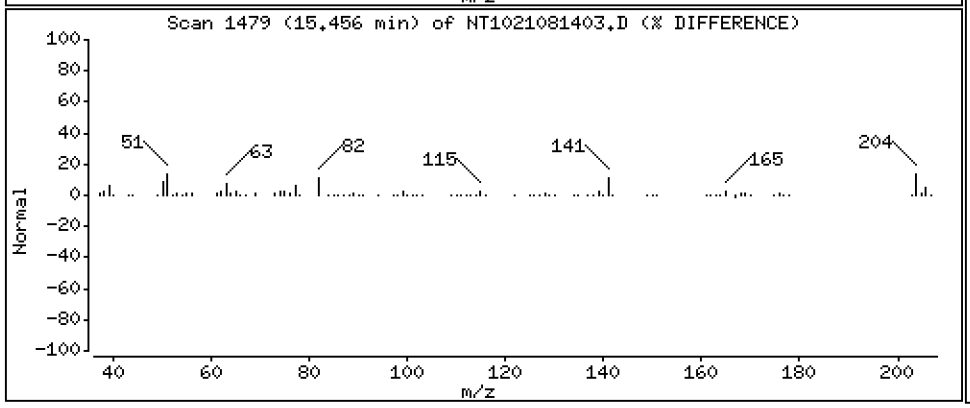
49 Fluorene

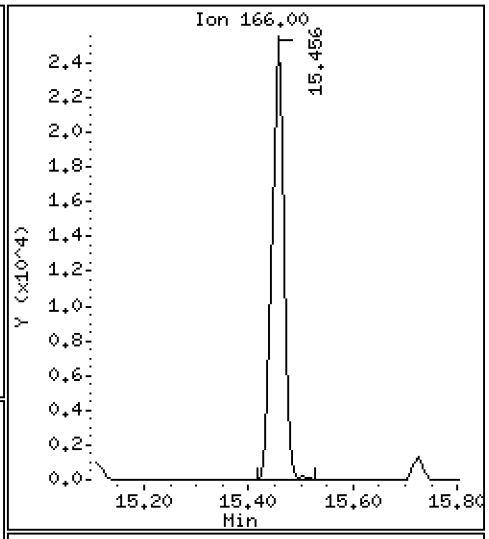
Concentration: 0.4618 ug/mL

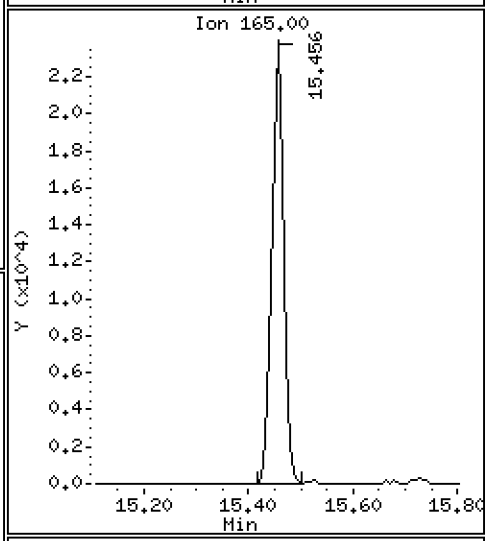


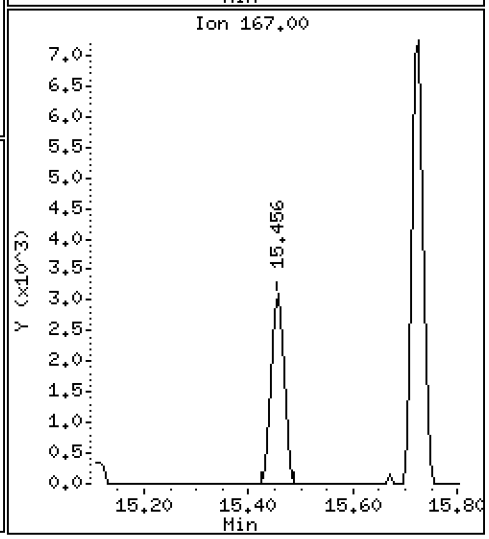












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

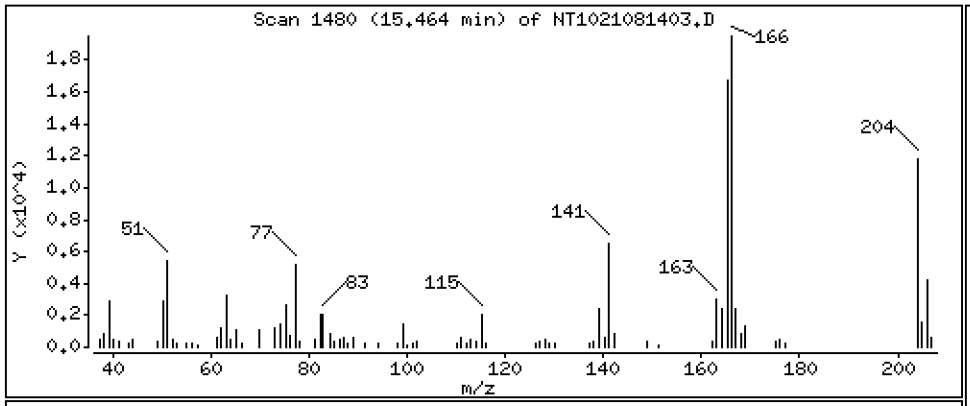
Operator: VTS

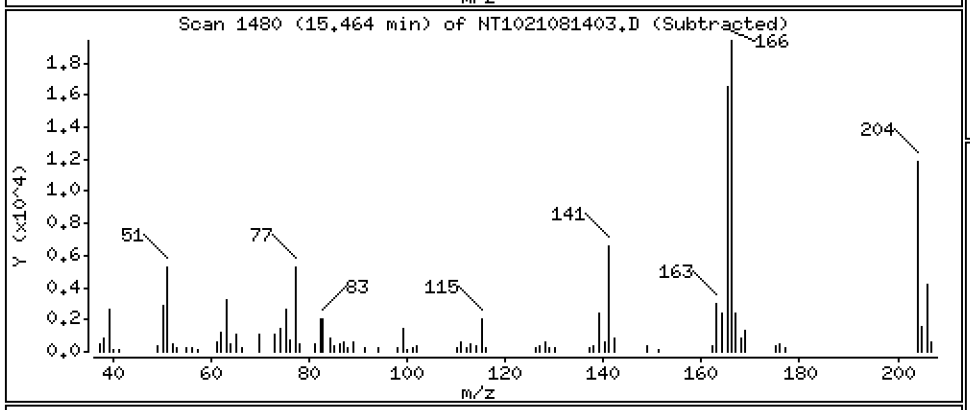
Column phase: ZB-5msi

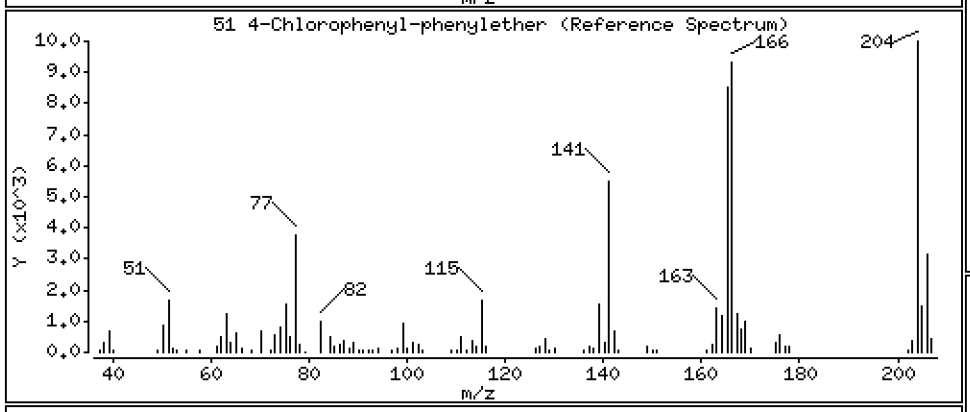
Column diameter: 0.25

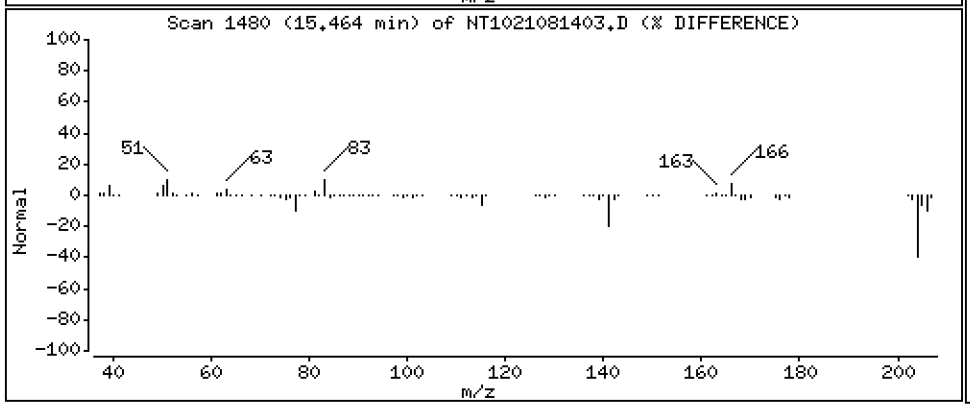
51 4-Chlorophenyl-phenylether

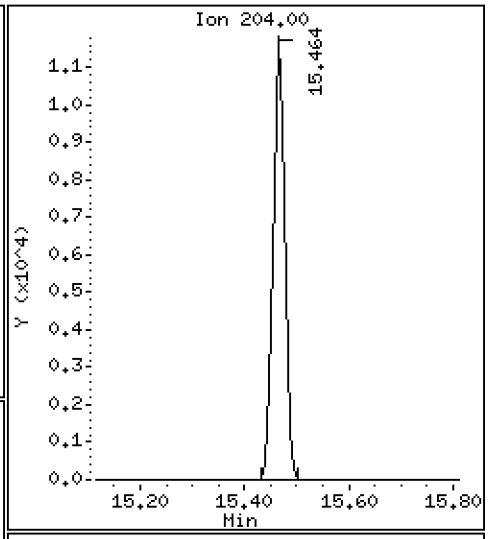
Concentration: 0.3126 ug/mL

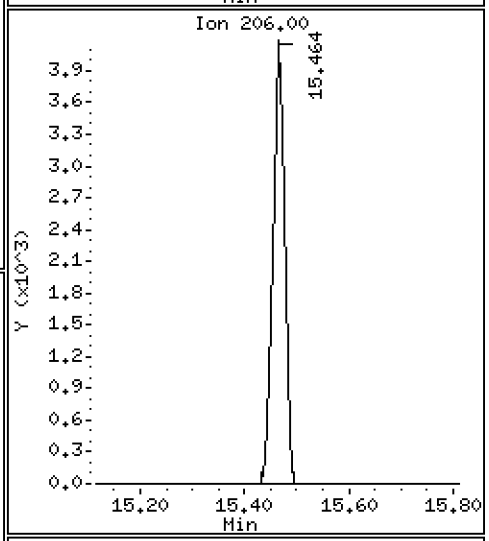


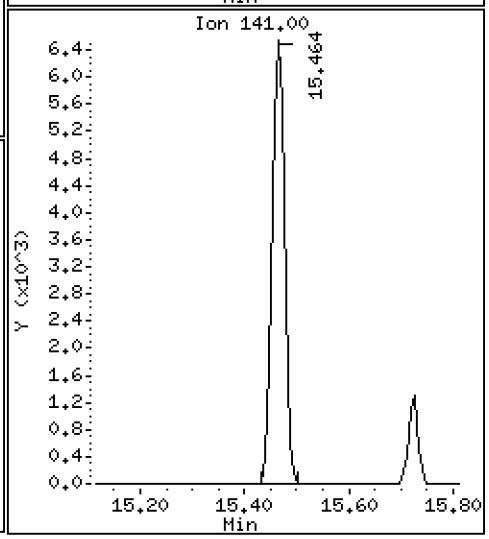












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

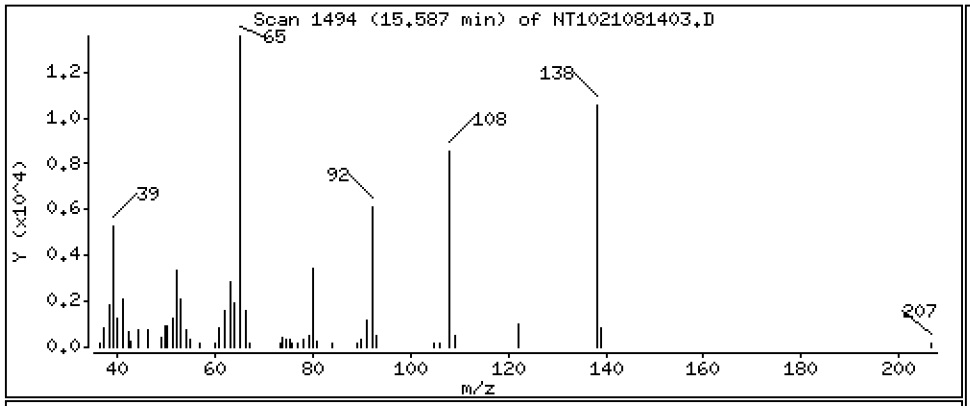
Operator: VTS

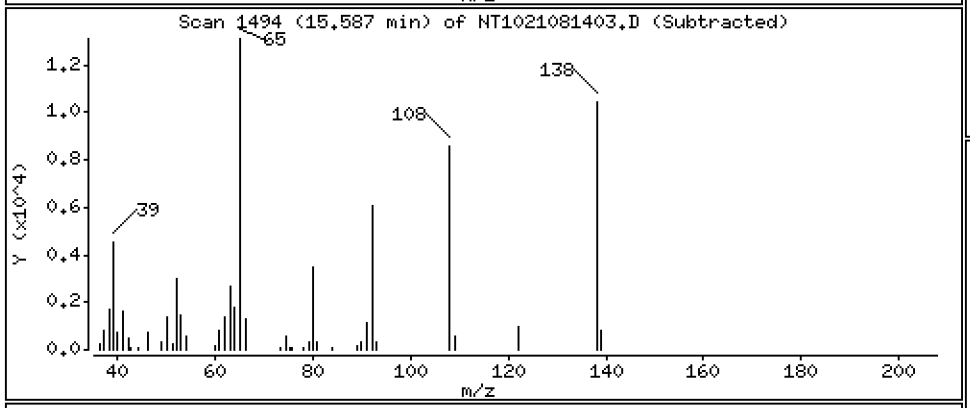
Column phase: ZB-5msi

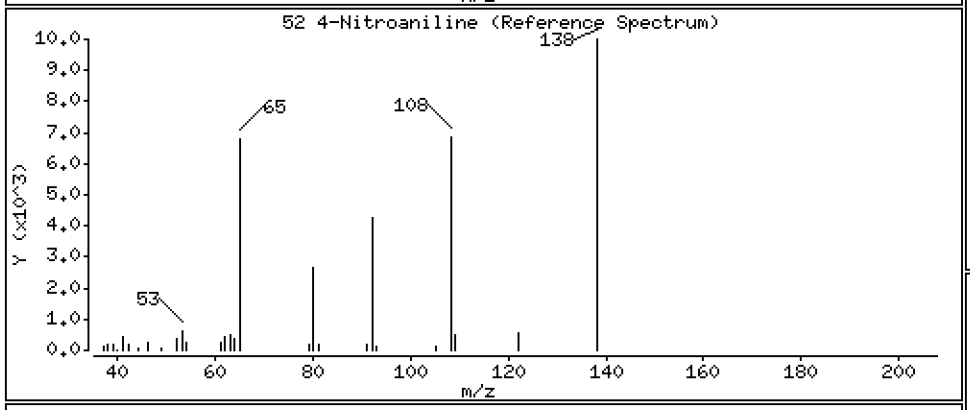
Column diameter: 0.25

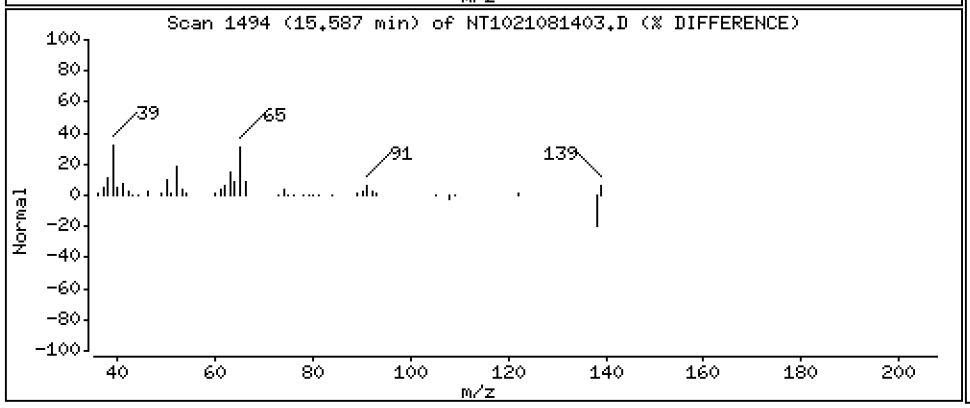
52 4-Nitroaniline

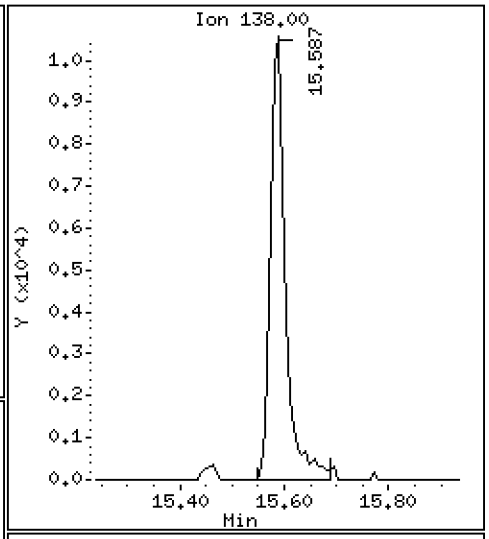
Concentration: 0.8865 ug/mL

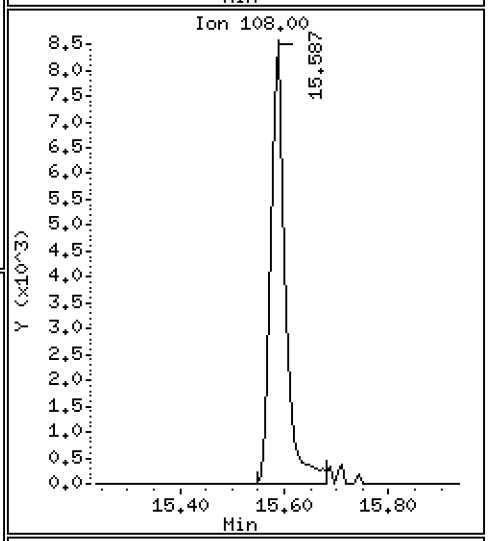


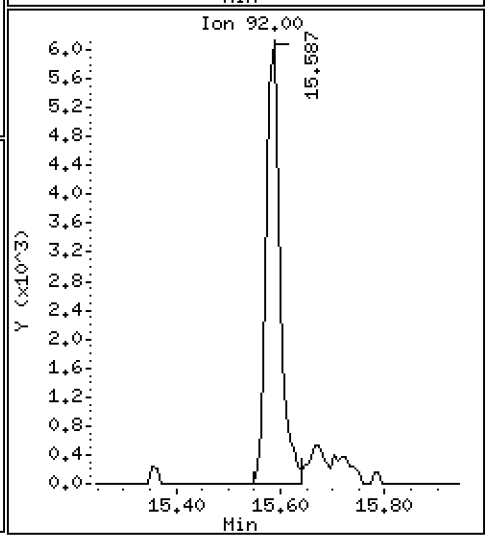












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

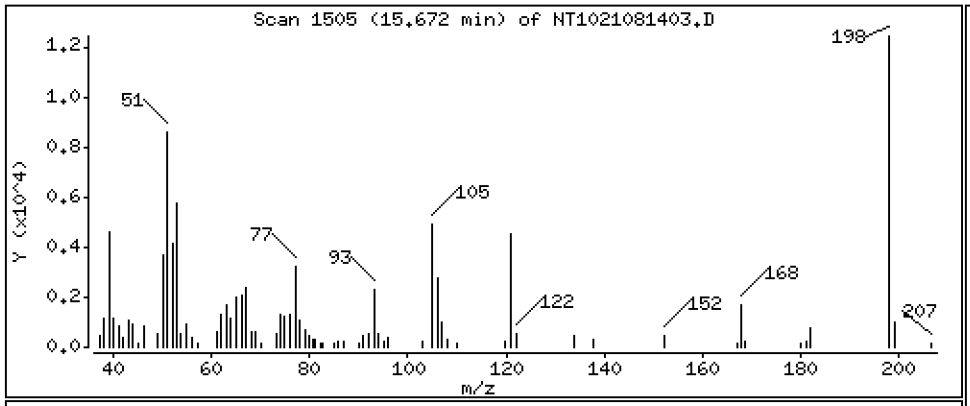
Operator: VTS

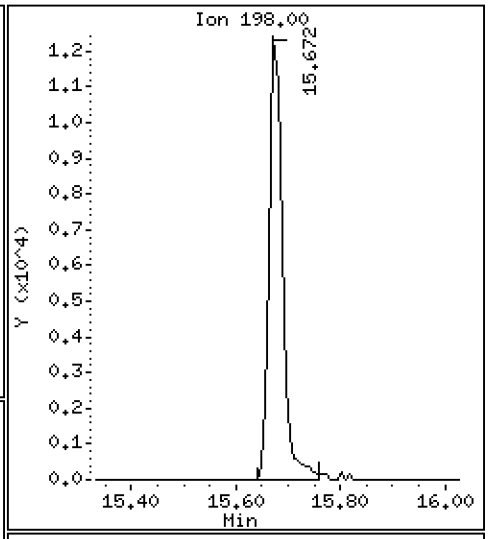
Column phase: ZB-5msi

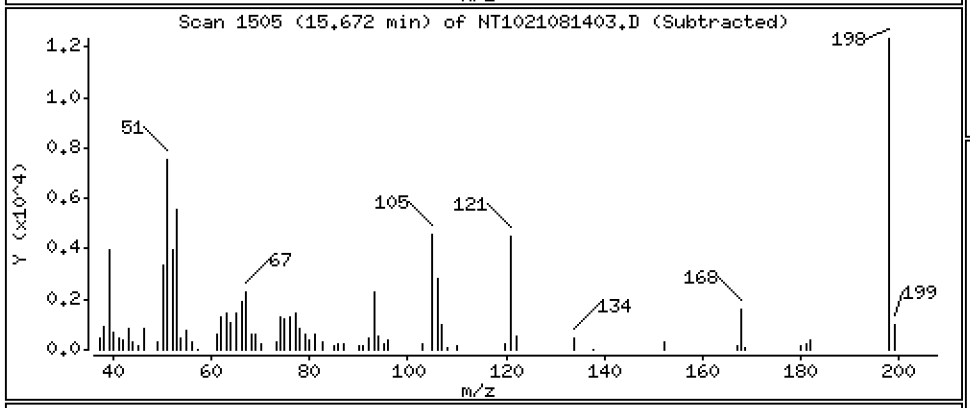
Column diameter: 0.25

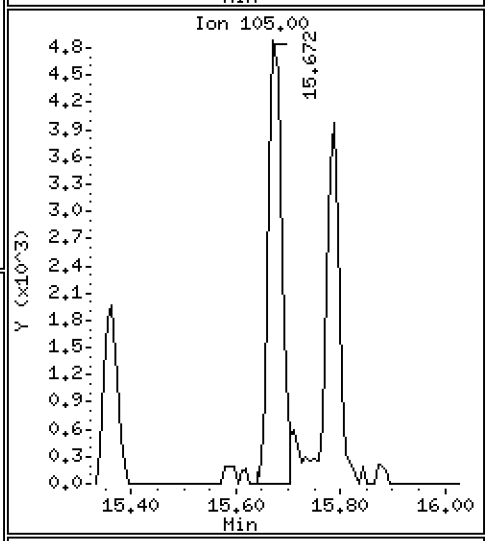
53 4,6-Dinitro-2-methylphenol

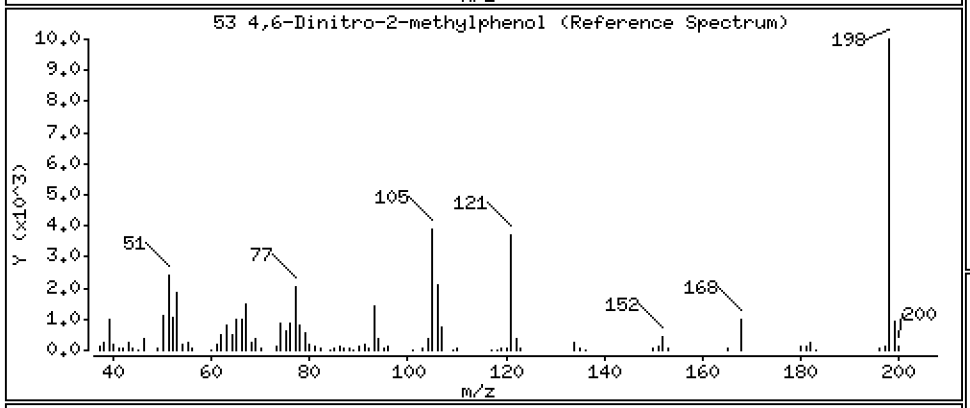
Concentration: 1.187 ug/mL

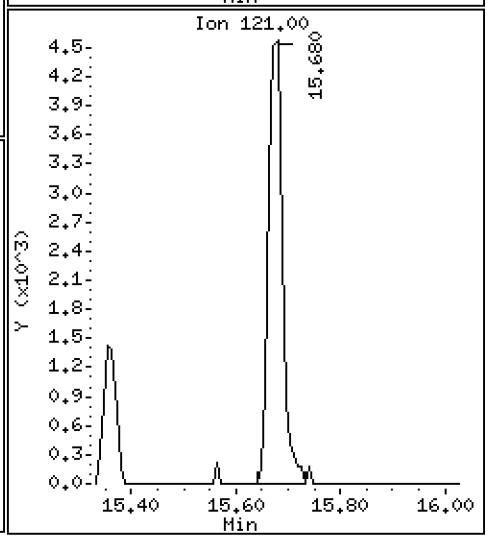


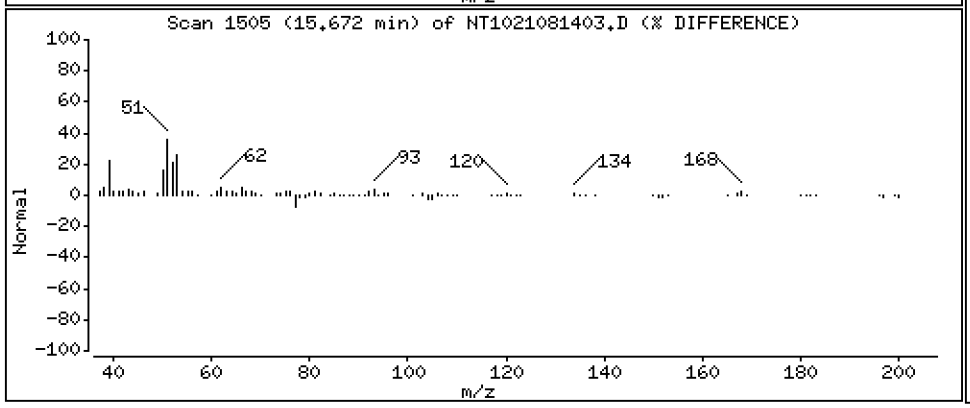












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

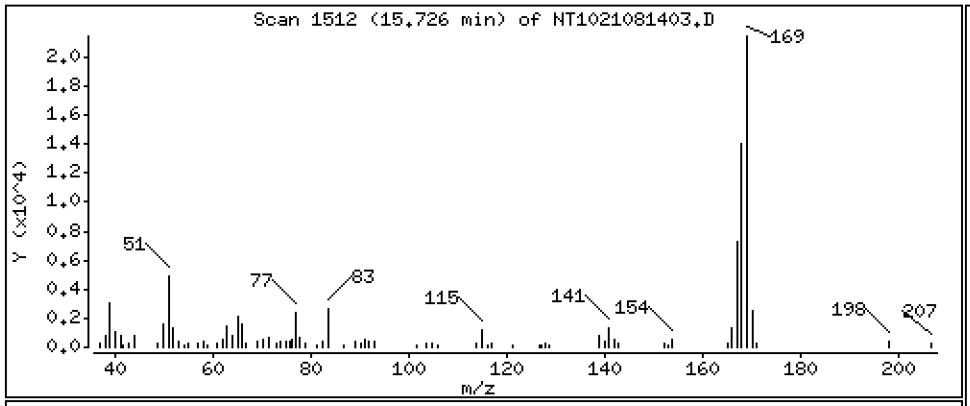
Operator: VTS

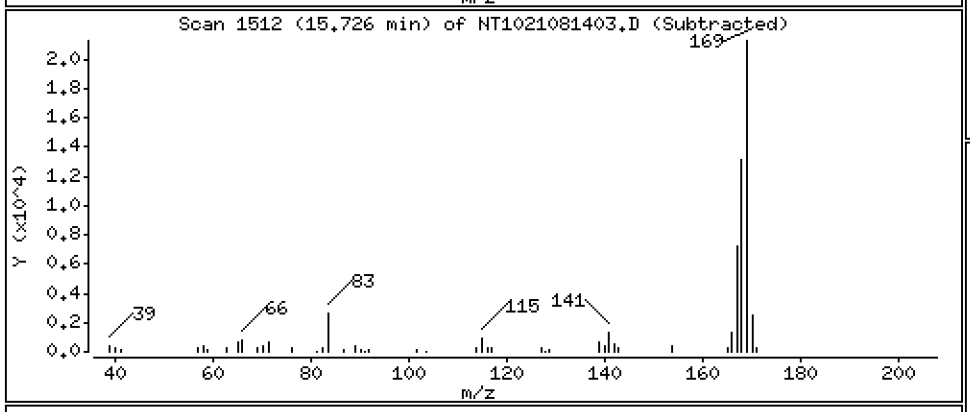
Column phase: ZB-5msi

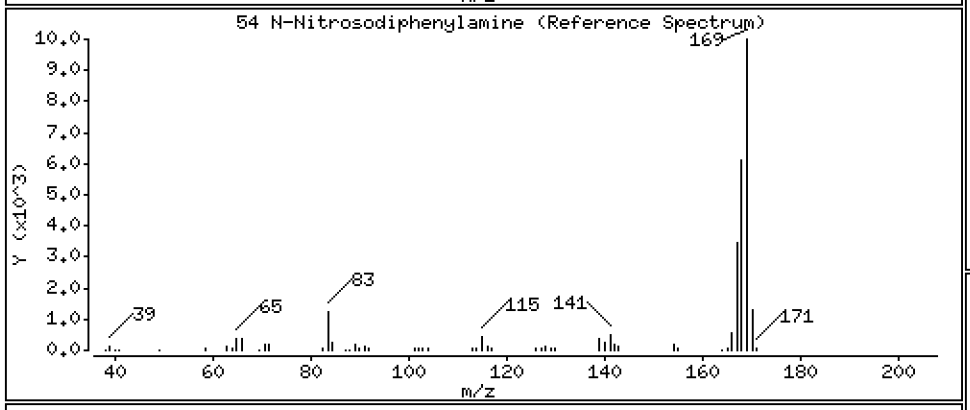
Column diameter: 0.25

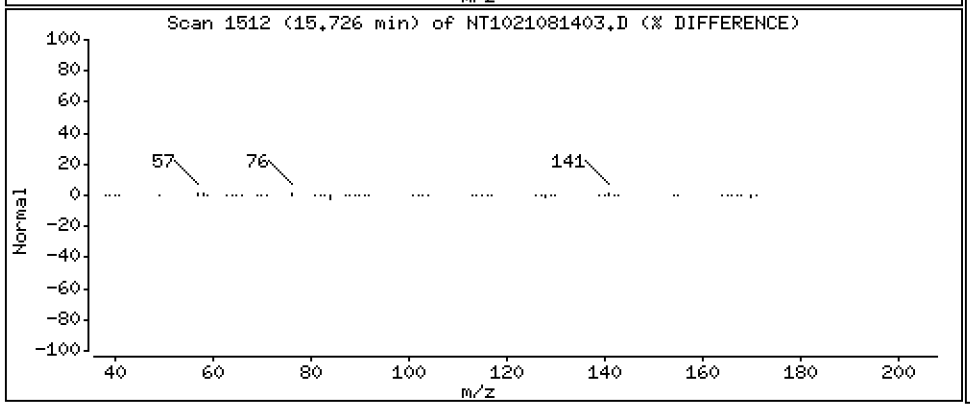
54 N-Nitrosodiphenylamine

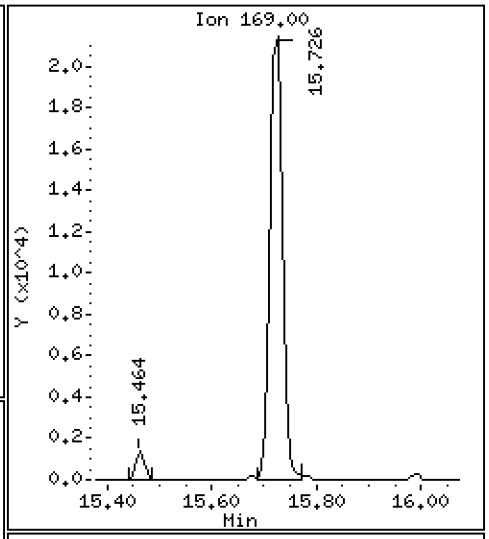
Concentration: 0.4912 ug/mL

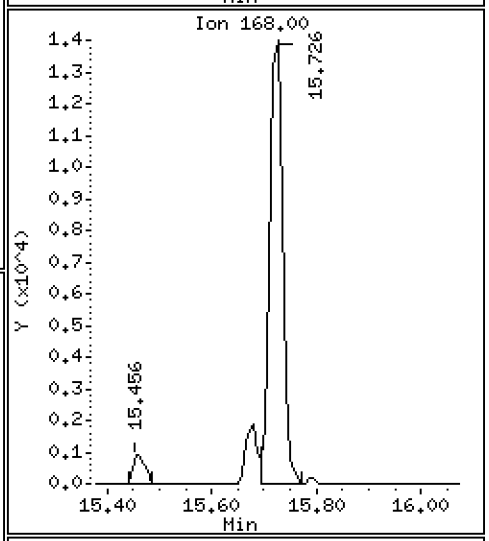


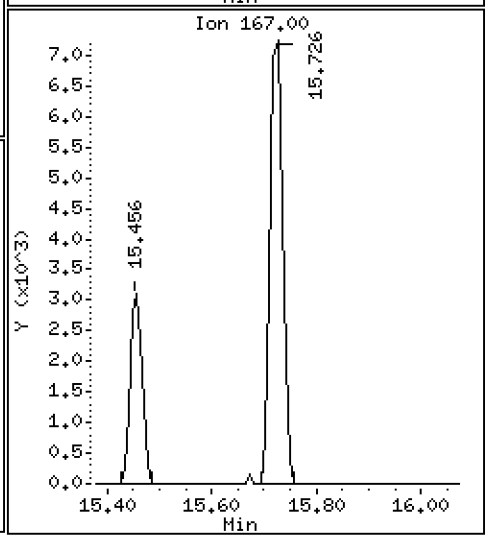












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

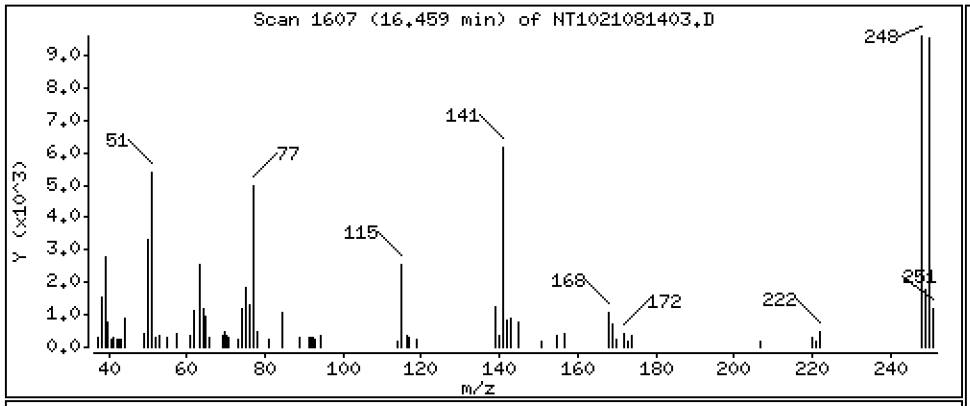
Operator: VTS

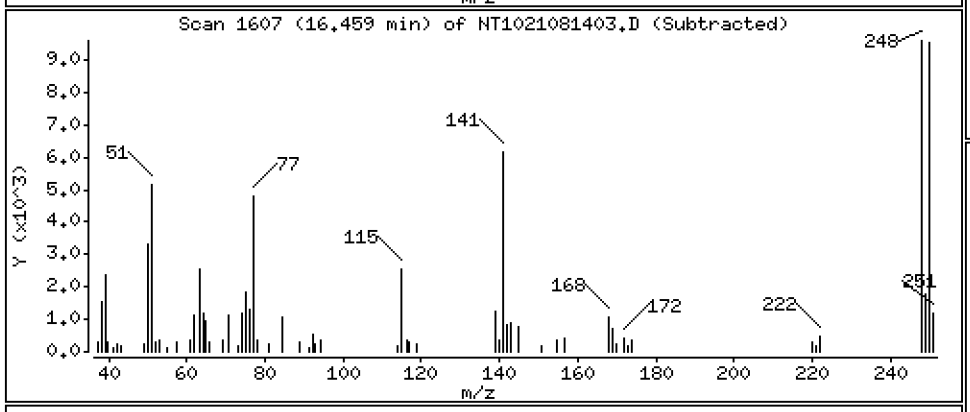
Column phase: ZB-5msi

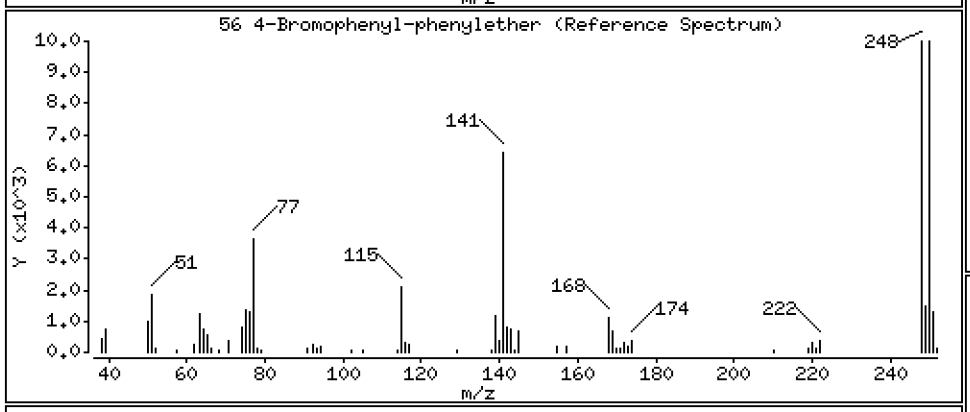
Column diameter: 0.25

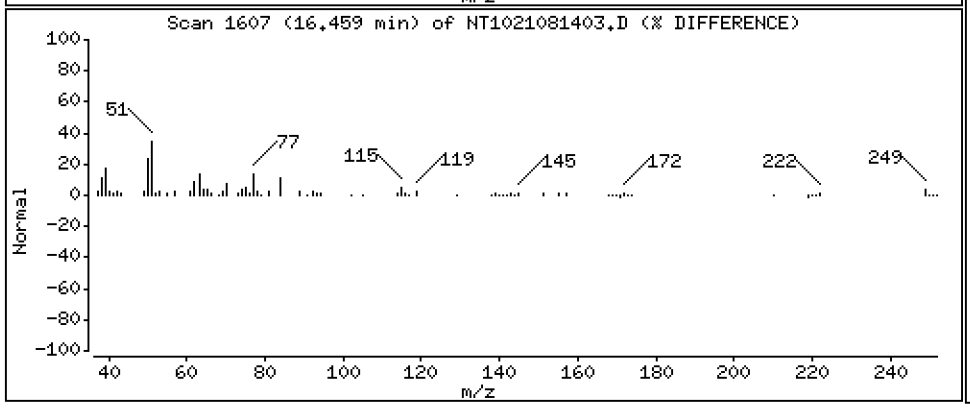
56 4-Bromophenyl-phenylether

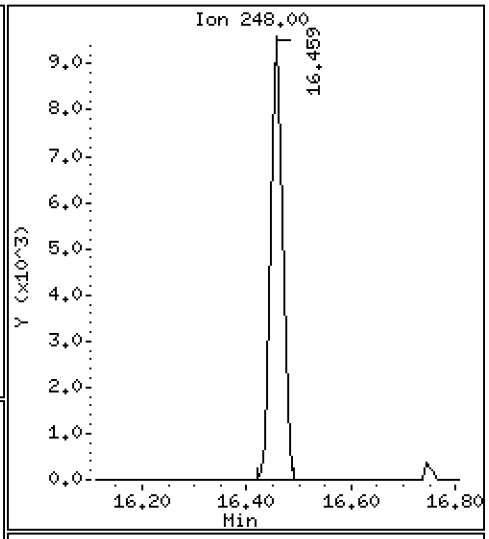
Concentration: 0.4250 ug/mL

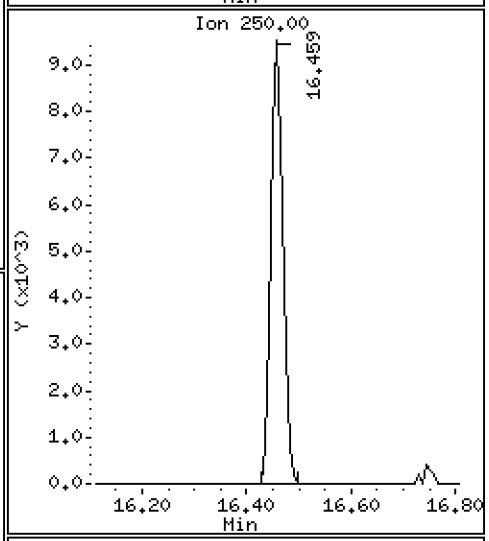


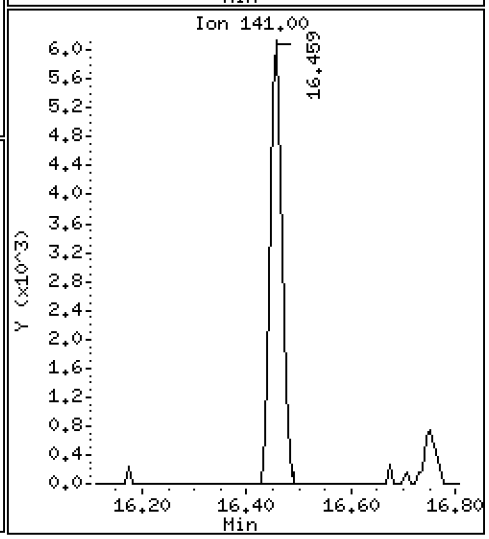












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

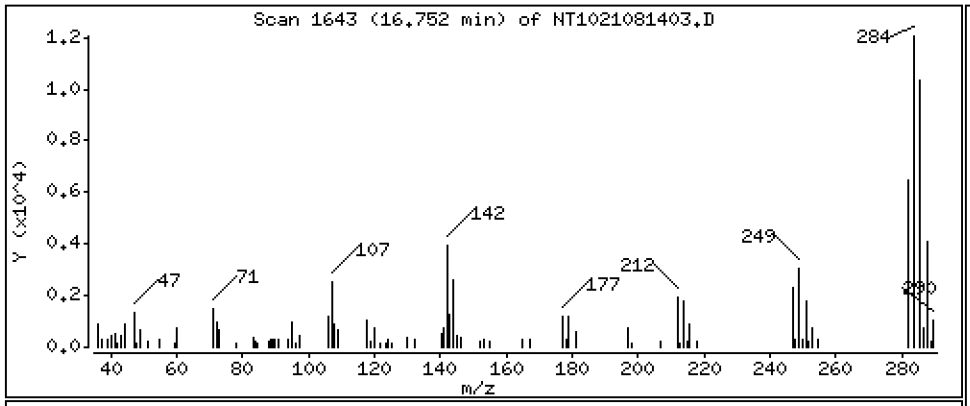
Operator: VTS

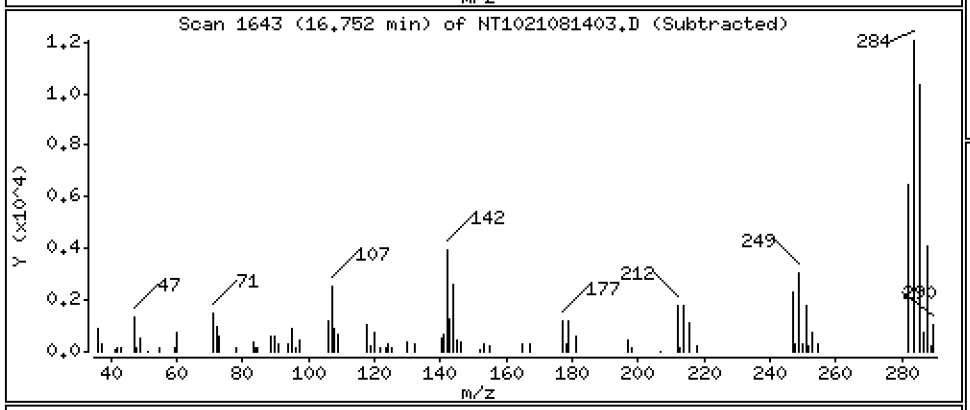
Column phase: ZB-5msi

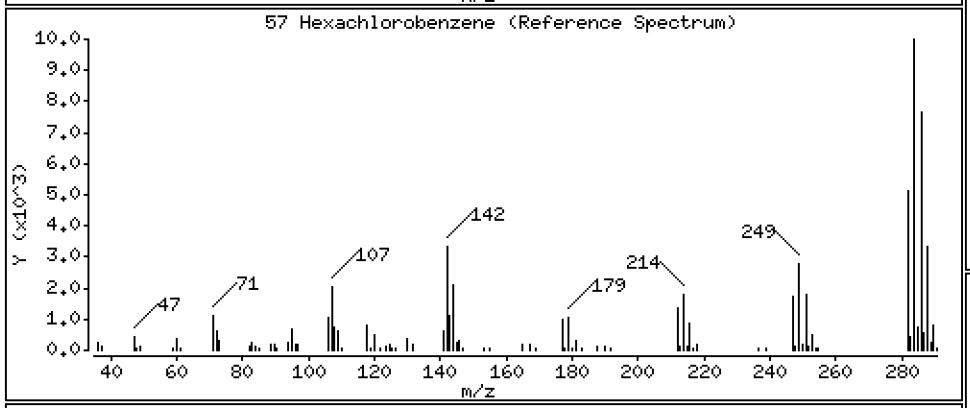
Column diameter: 0.25

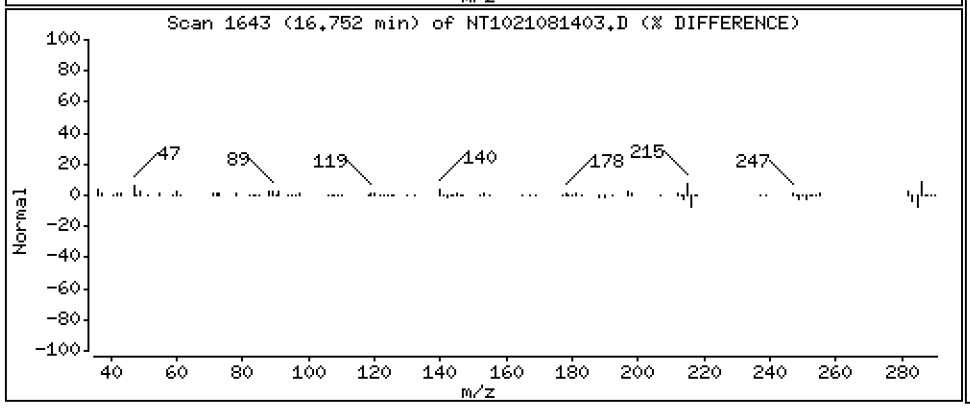
57 Hexachlorobenzene

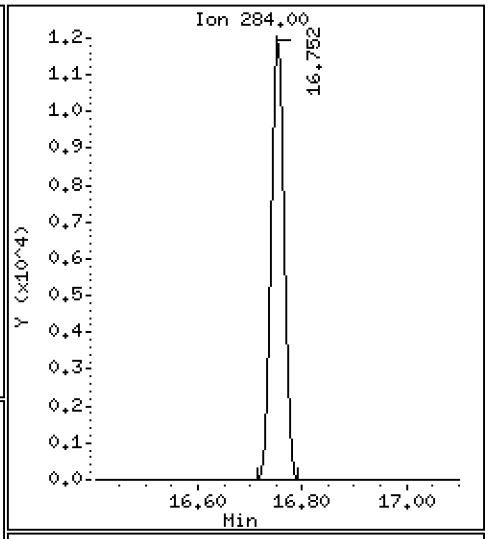
Concentration: 0.5467 ug/mL

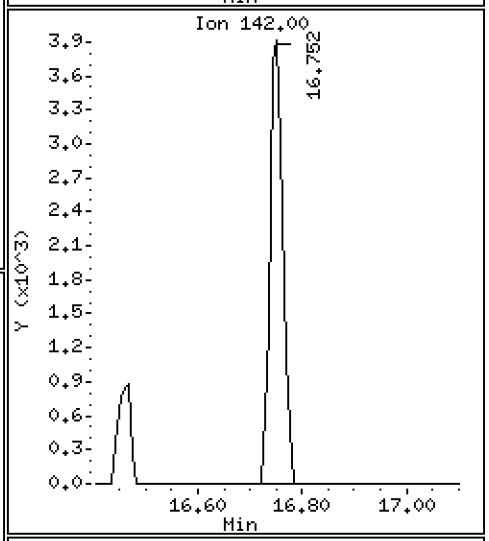


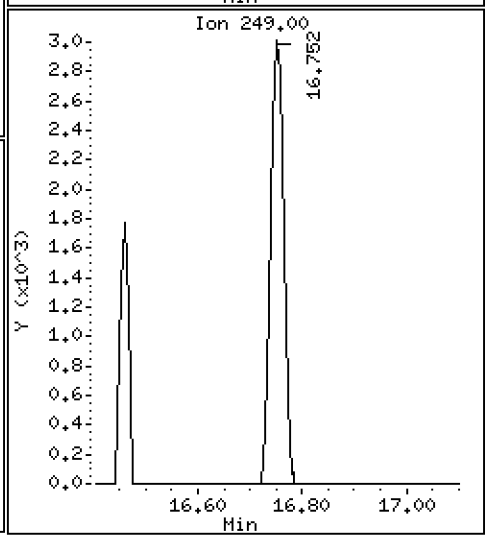












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

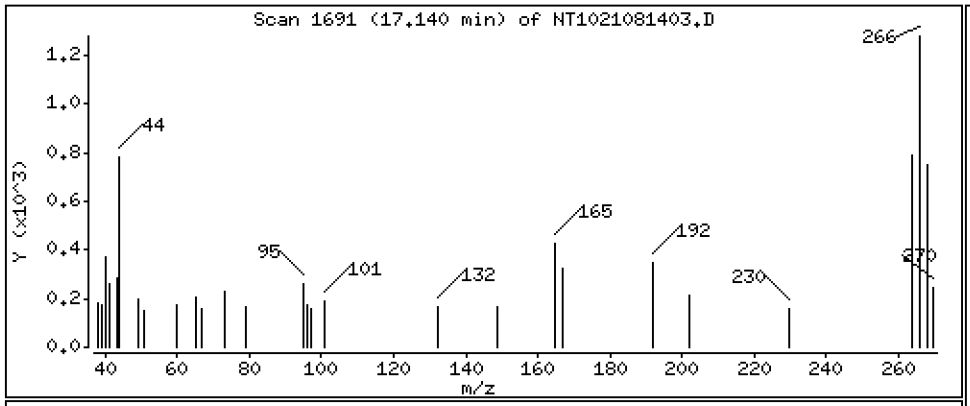
Operator: VTS

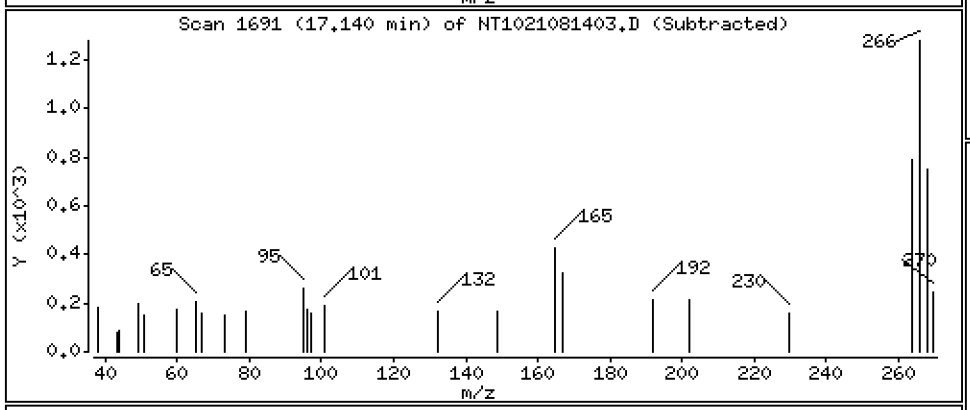
Column phase: ZB-5msi

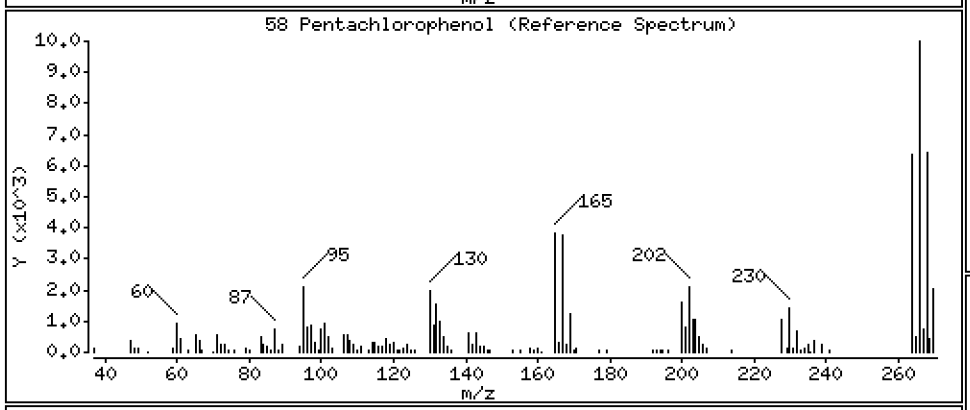
Column diameter: 0.25

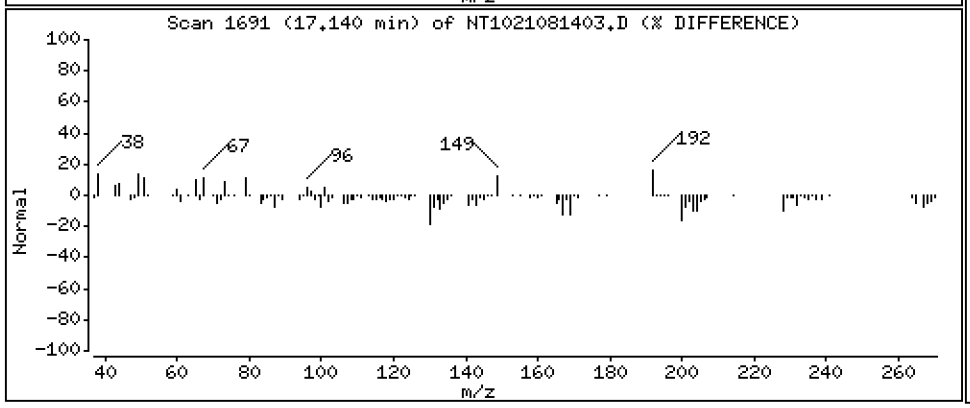
58 Pentachlorophenol

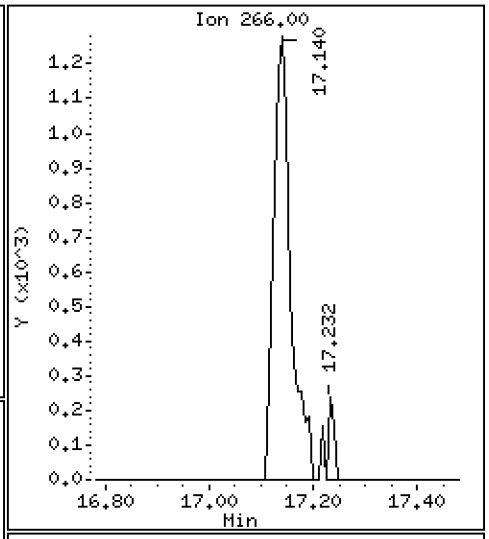
Concentration: 0.1917 ug/mL

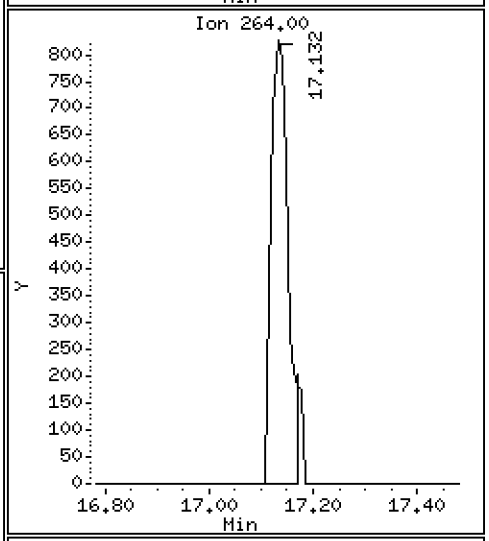


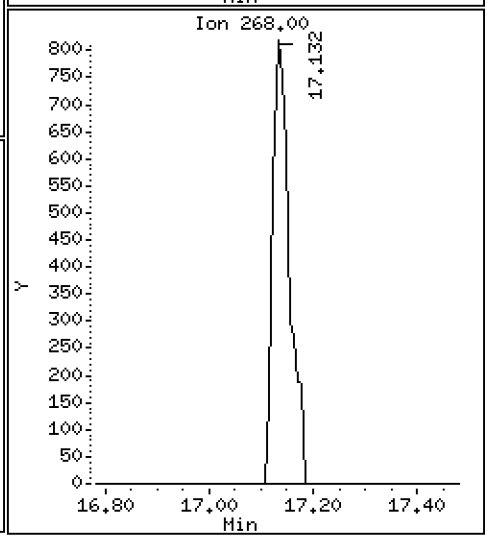












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

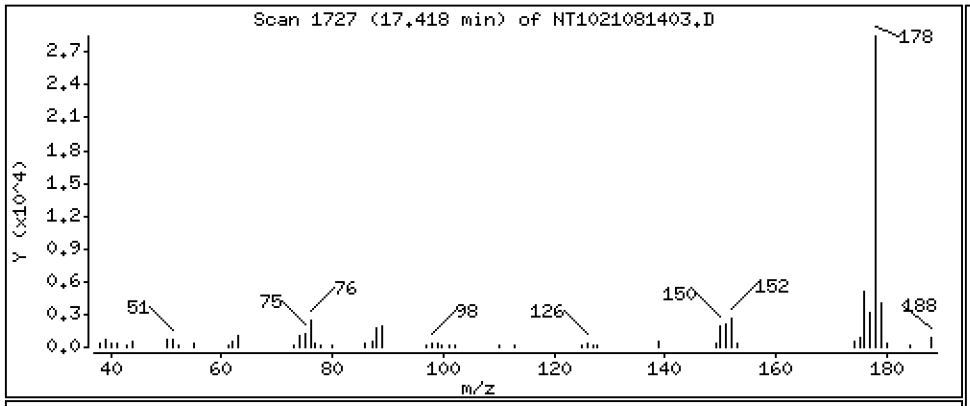
Operator: VTS

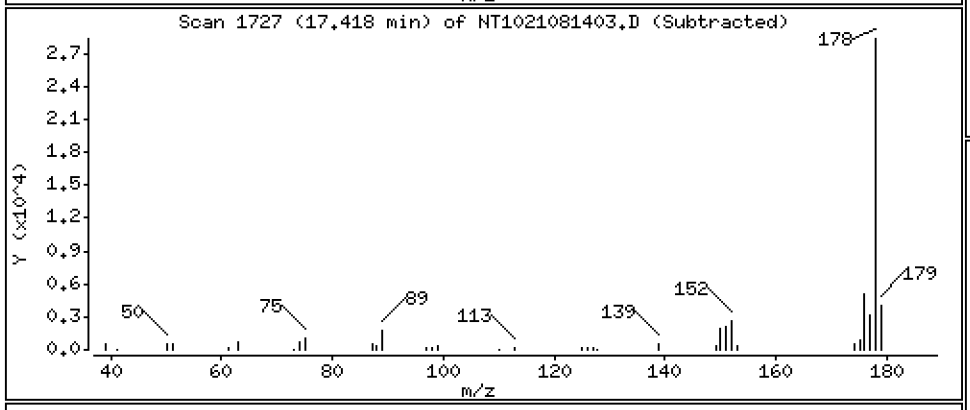
Column phase: ZB-5msi

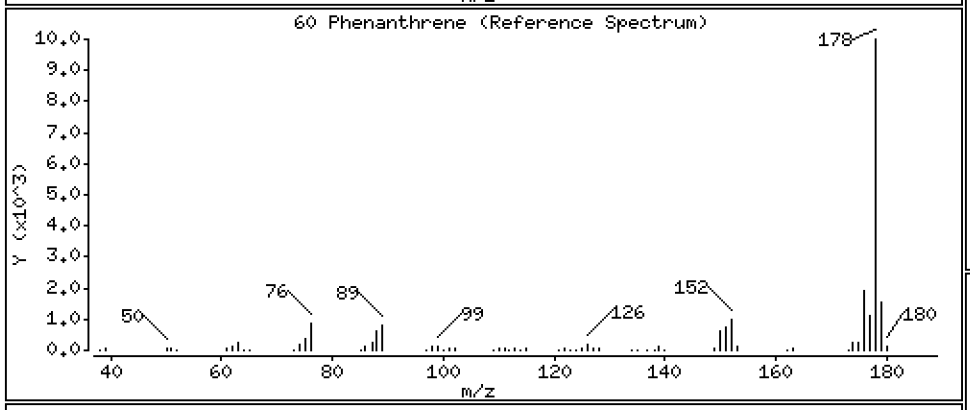
Column diameter: 0.25

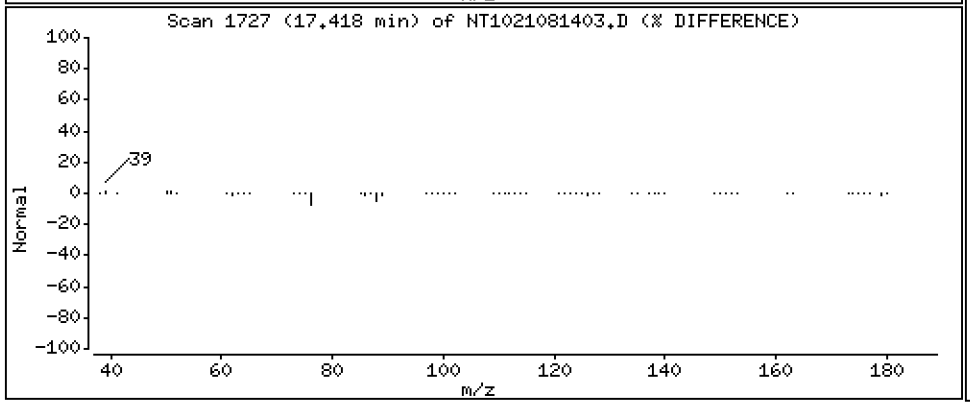
60 Phenanthrene

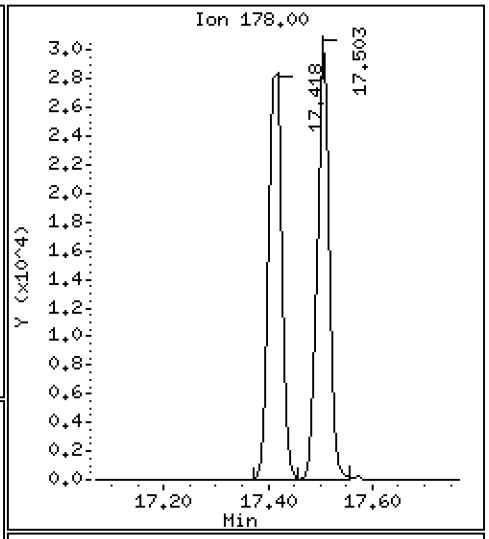
Concentration: 0.4565 ug/mL

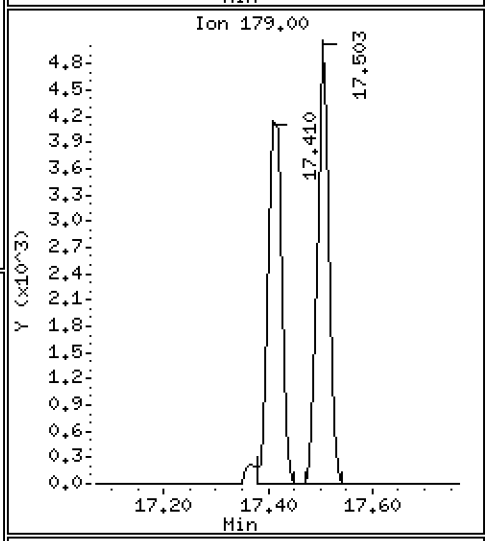


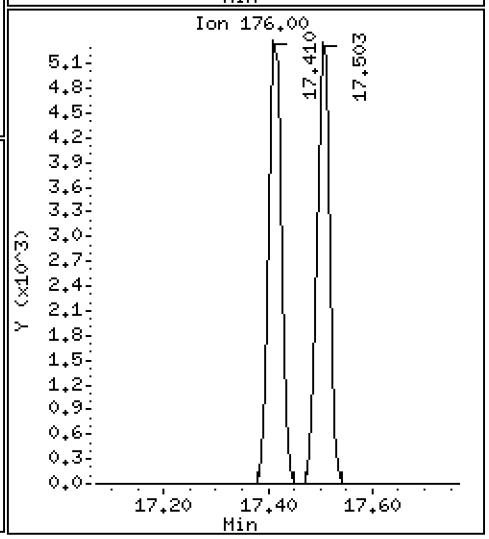












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

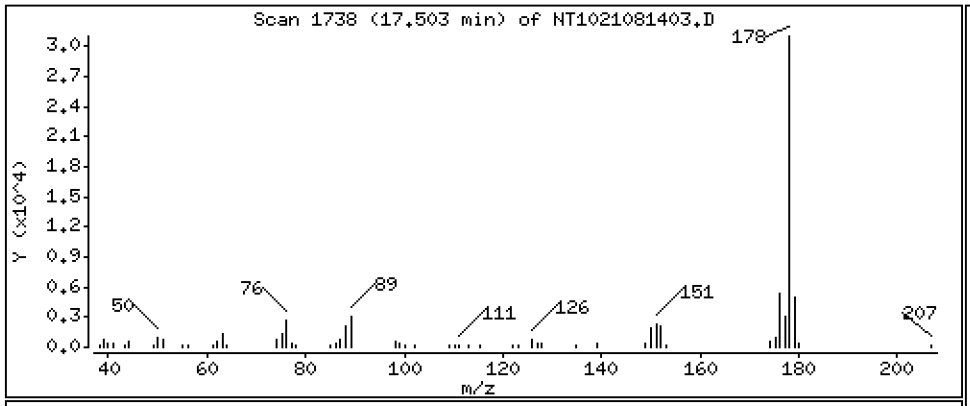
Operator: VTS

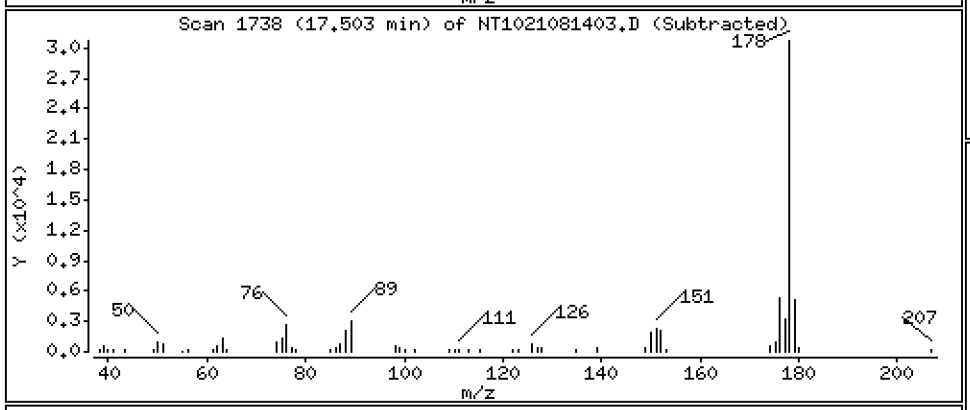
Column phase: ZB-5msi

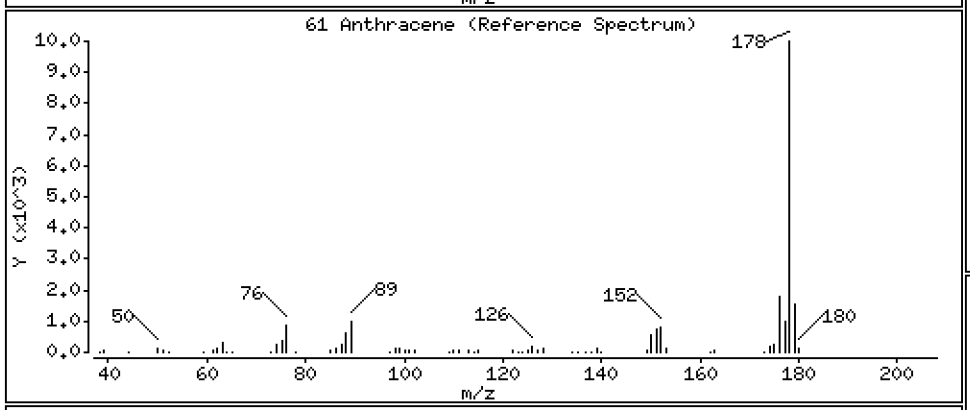
Column diameter: 0.25

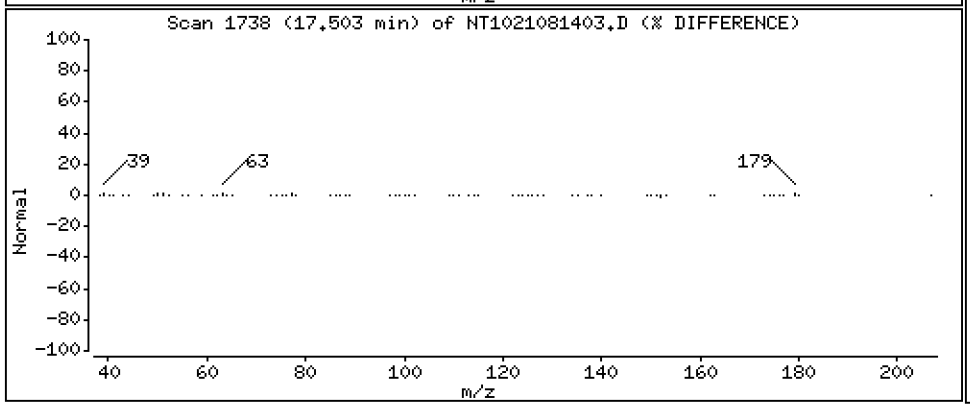
61 Anthracene

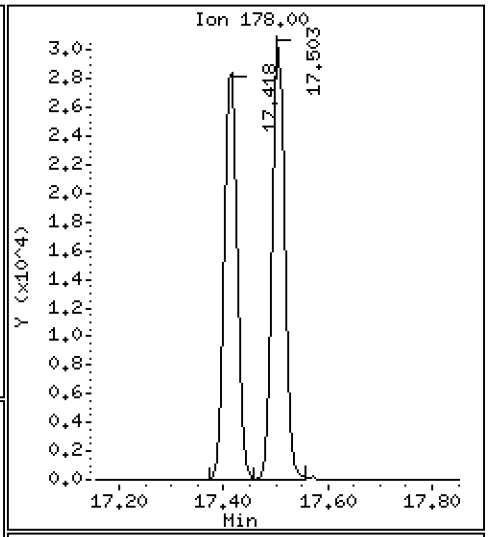
Concentration: 0.4352 ug/mL

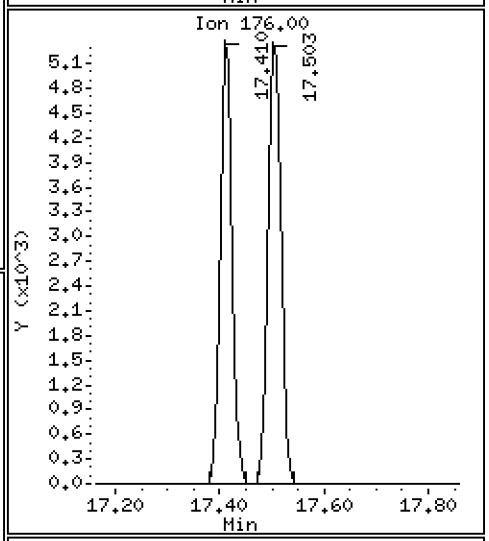


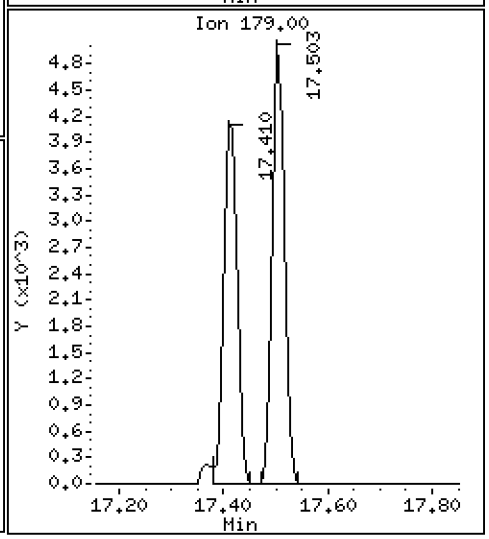












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

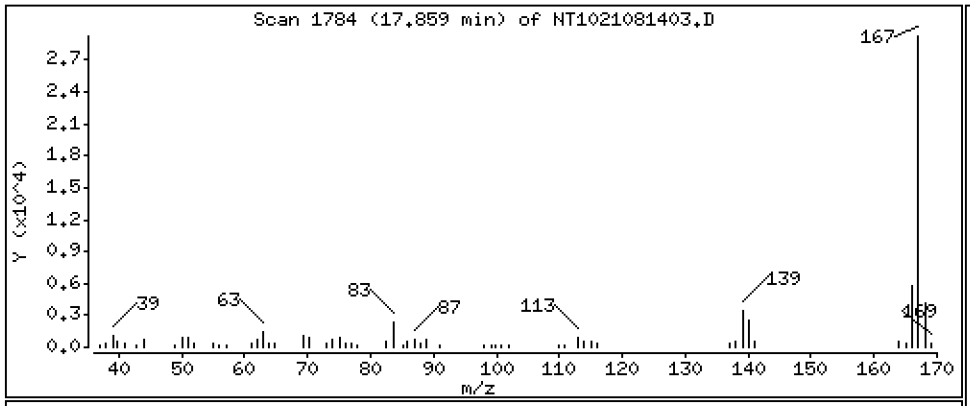
Operator: VTS

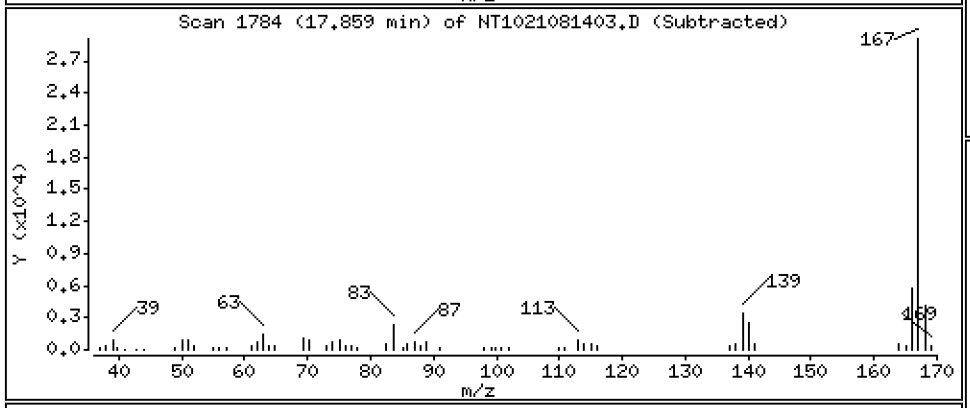
Column phase: ZB-5msi

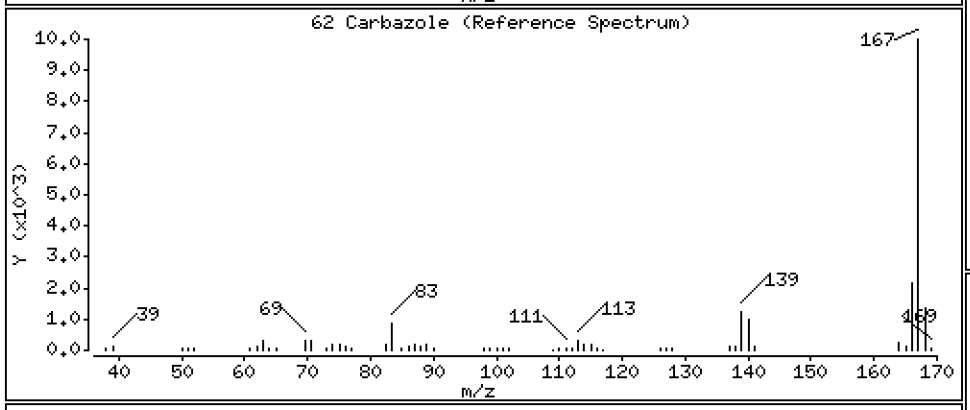
Column diameter: 0.25

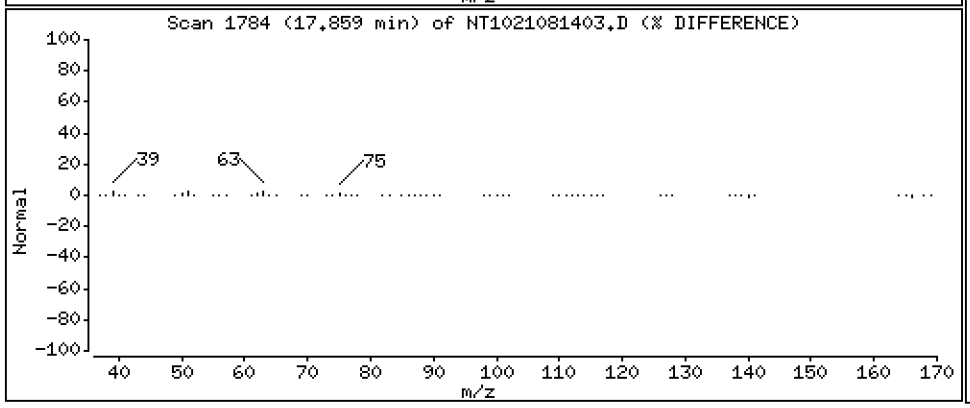
62 Carbazole

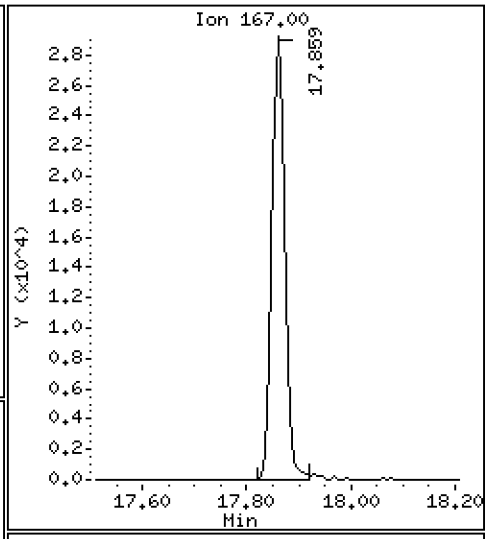
Concentration: 0.4369 ug/mL

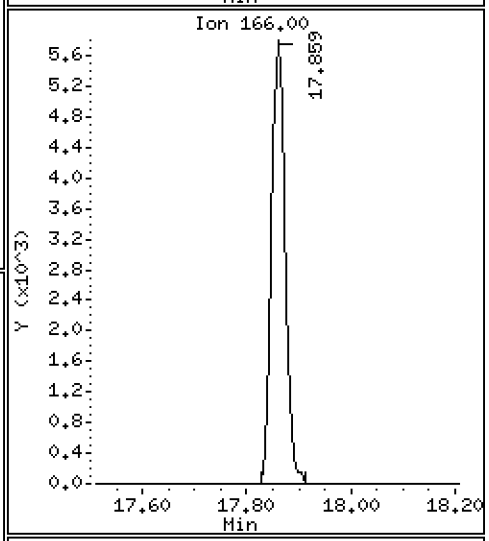


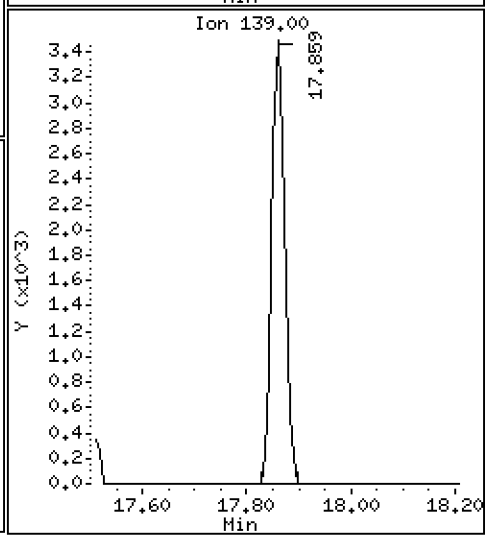












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Date : 14-AUG-2021 10:30

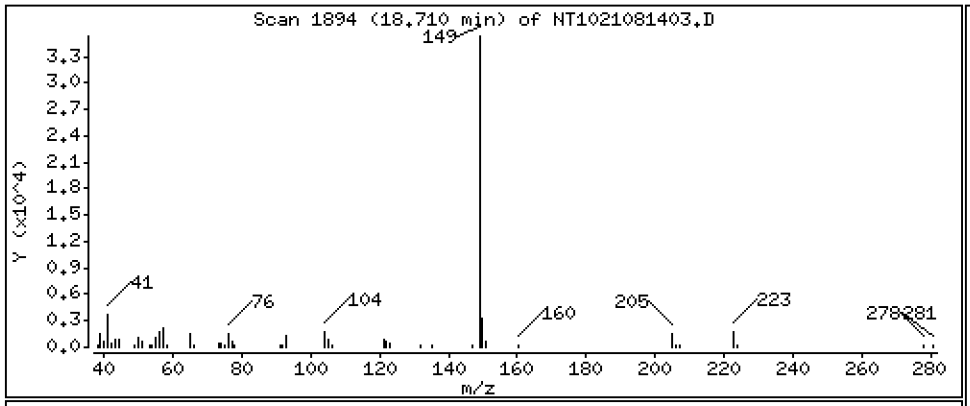
Client ID: Instrument: nt10.i

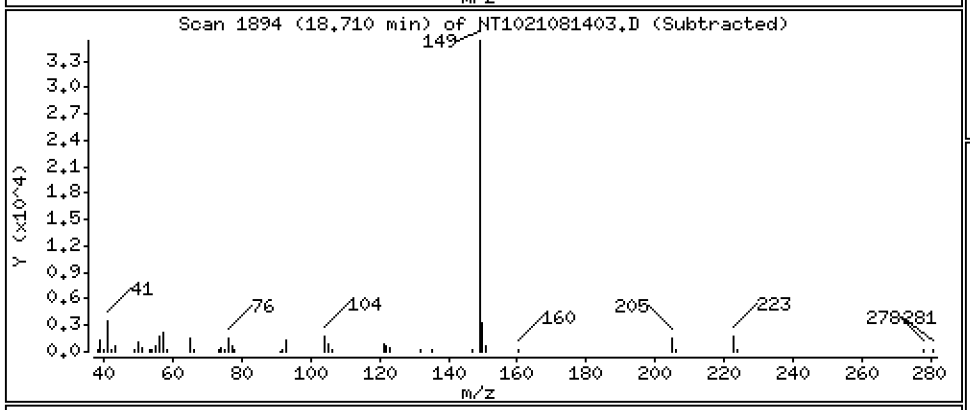
Sample Info: SJH0174-LCV1

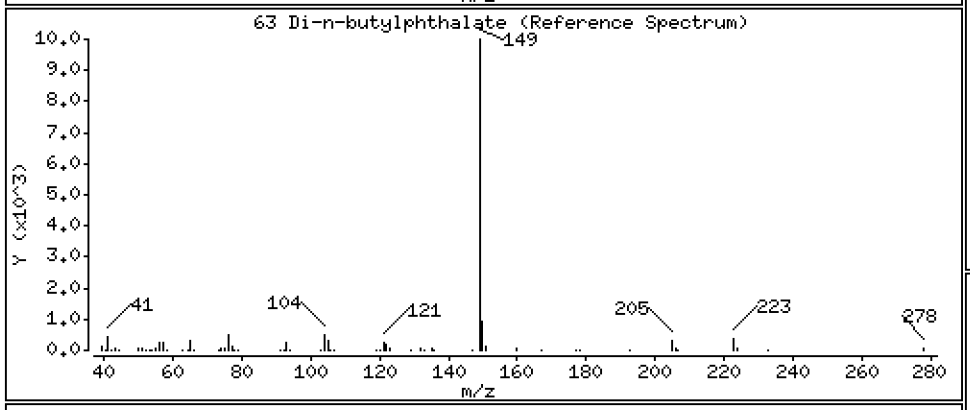
Operator: VTS

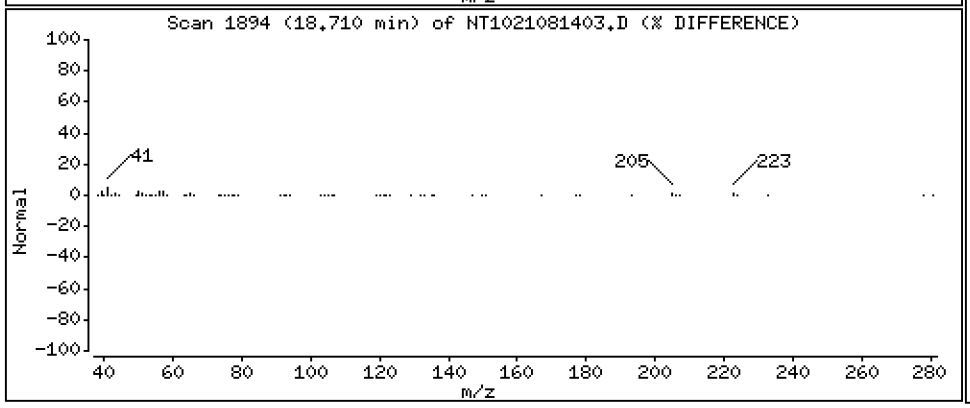
Column phase: ZB-5msi Column diameter: 0.25

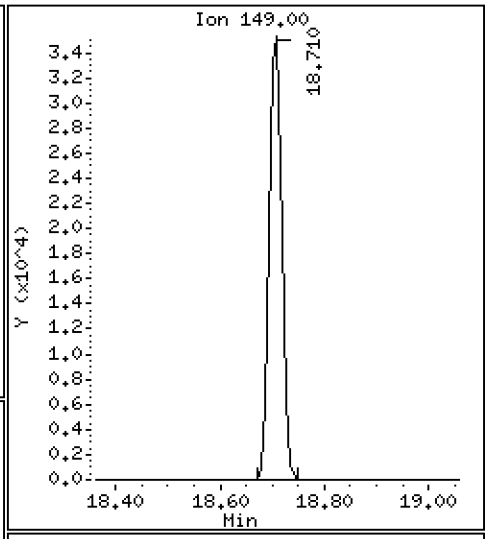
63 Di-n-butylphthalate Concentration: 0.3398 ug/mL

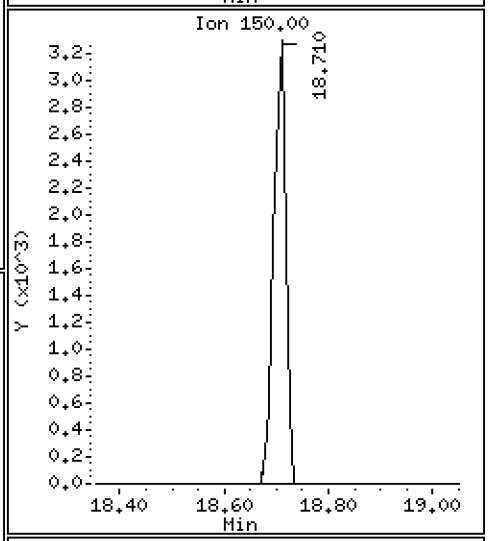


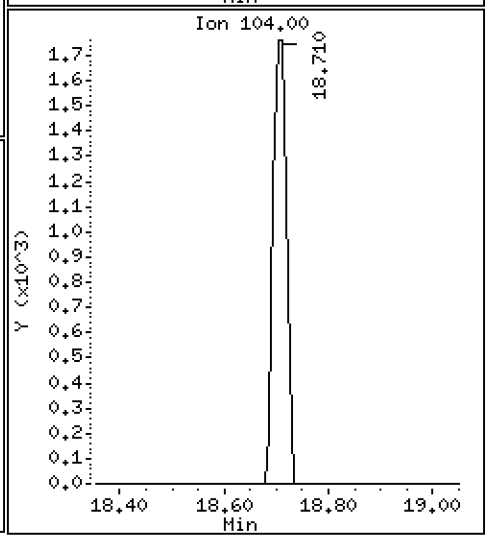












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

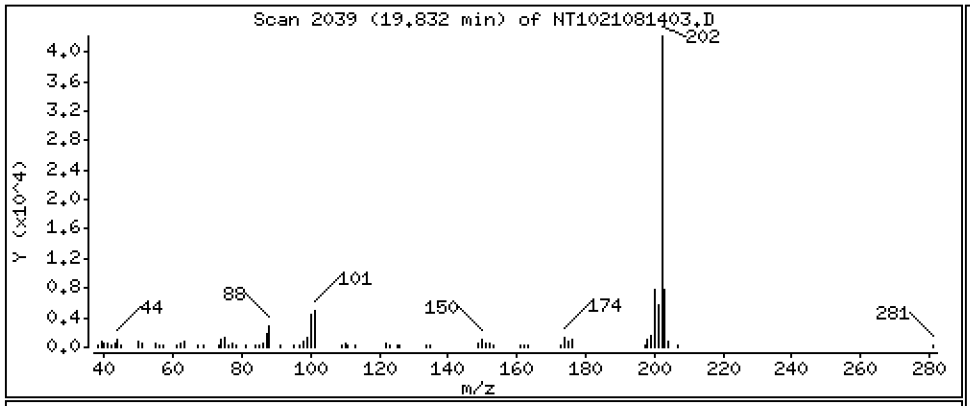
Operator: VTS

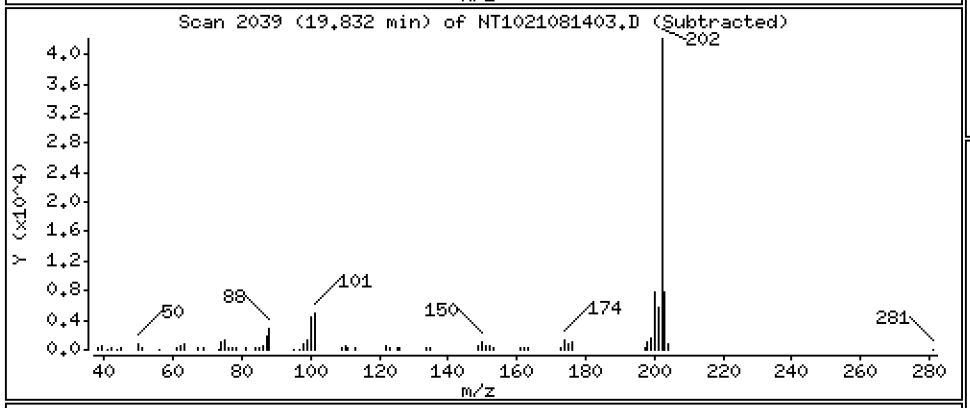
Column phase: ZB-5msi

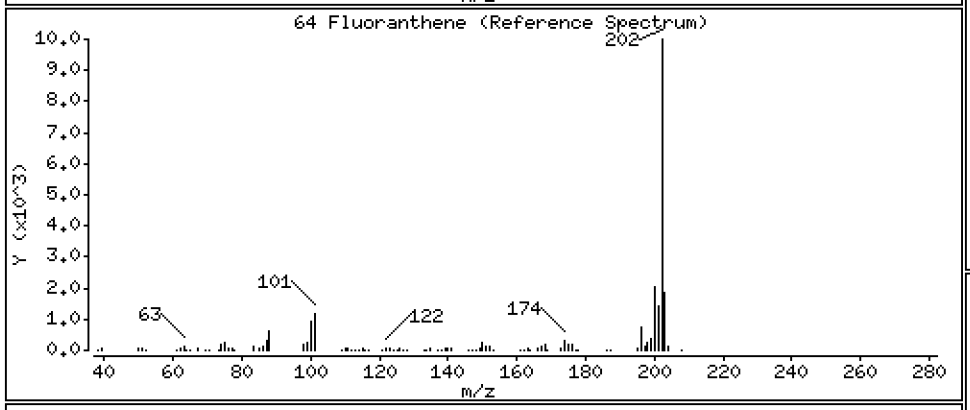
Column diameter: 0.25

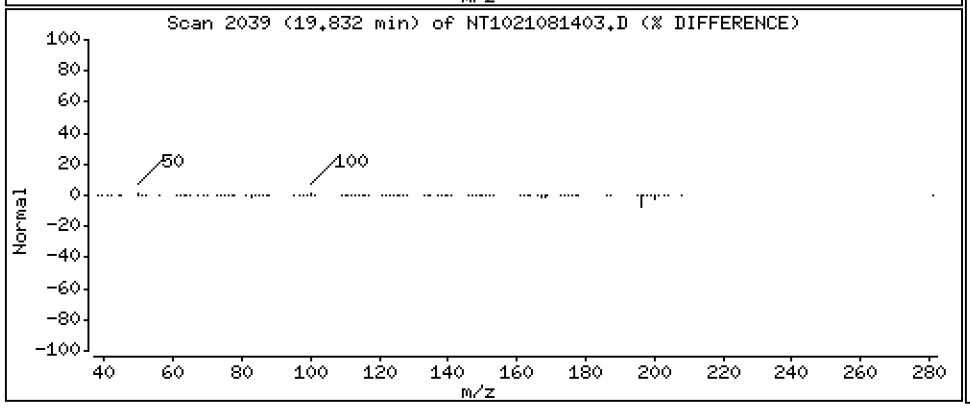
64 Fluoranthene

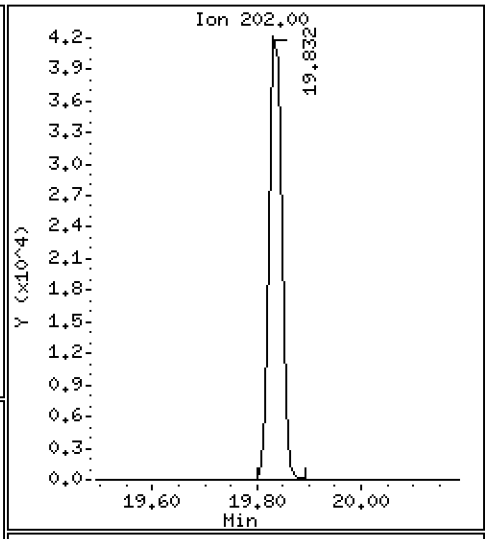
Concentration: 0.4671 ug/mL

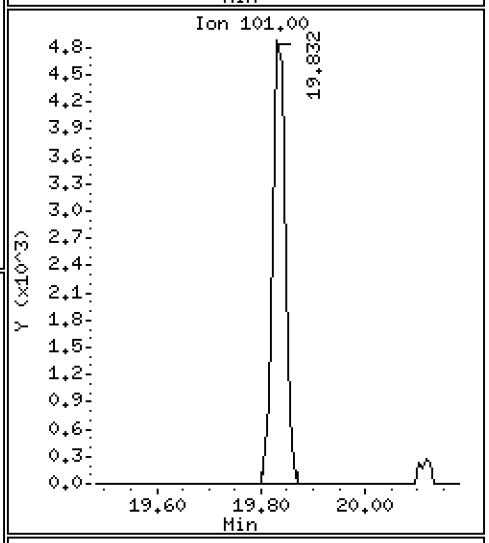


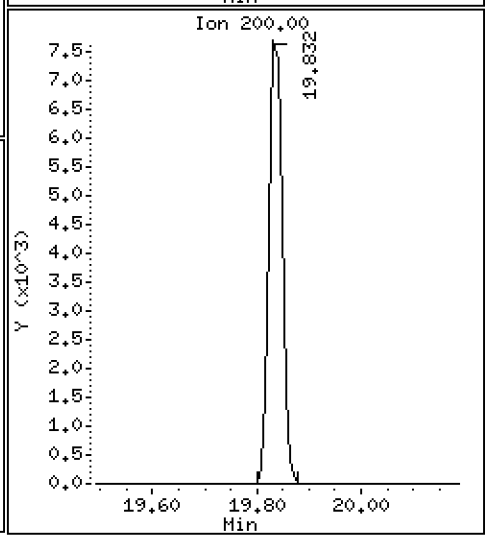












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

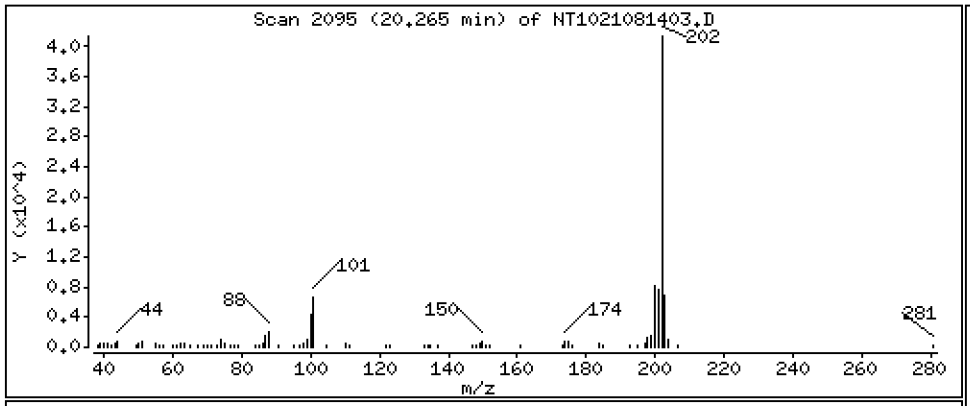
Operator: VTS

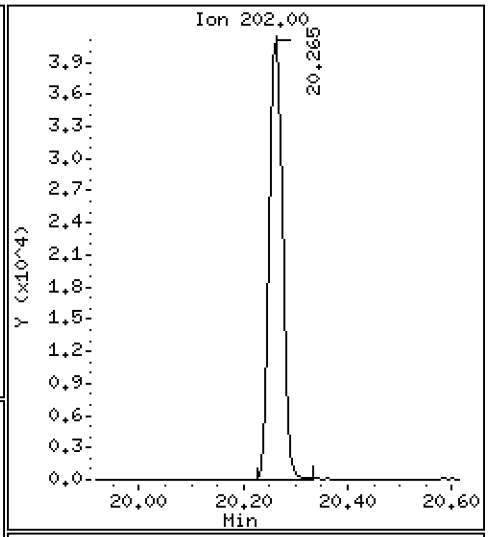
Column phase: ZB-5msi

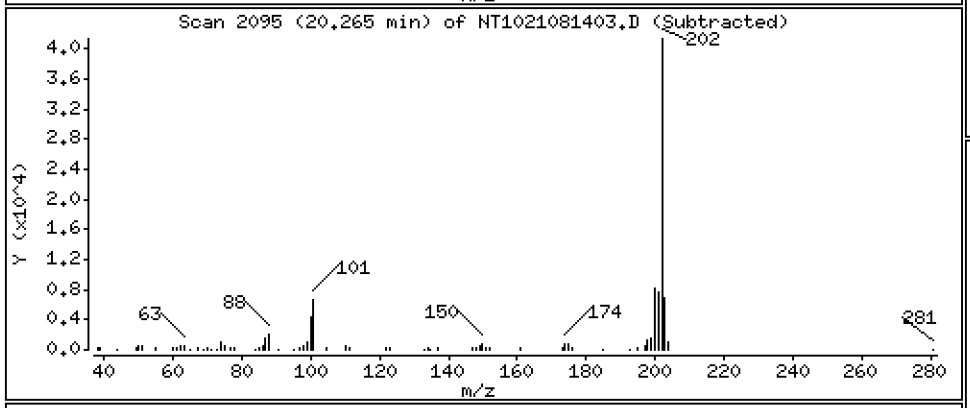
Column diameter: 0.25

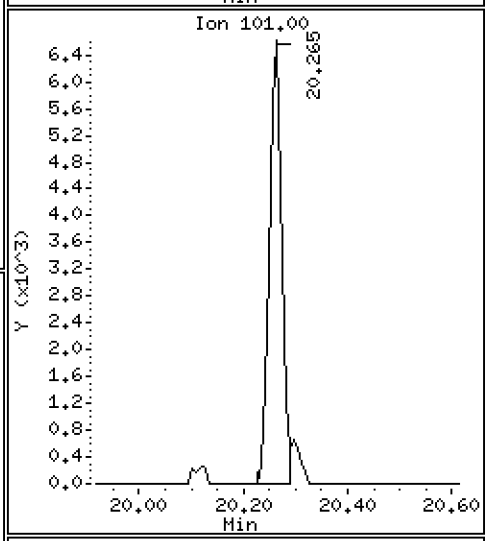
65 Pyrene

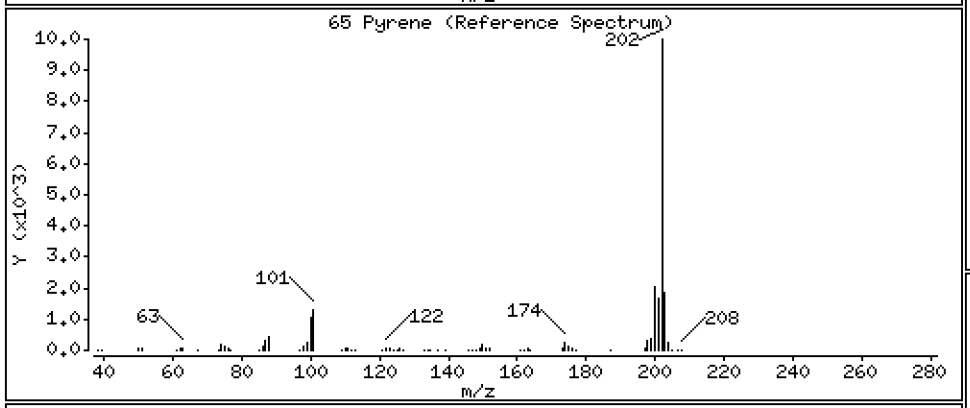
Concentration: 0.4411 ug/mL

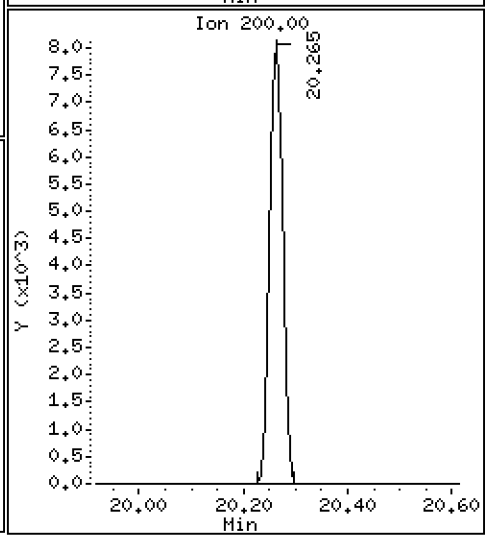


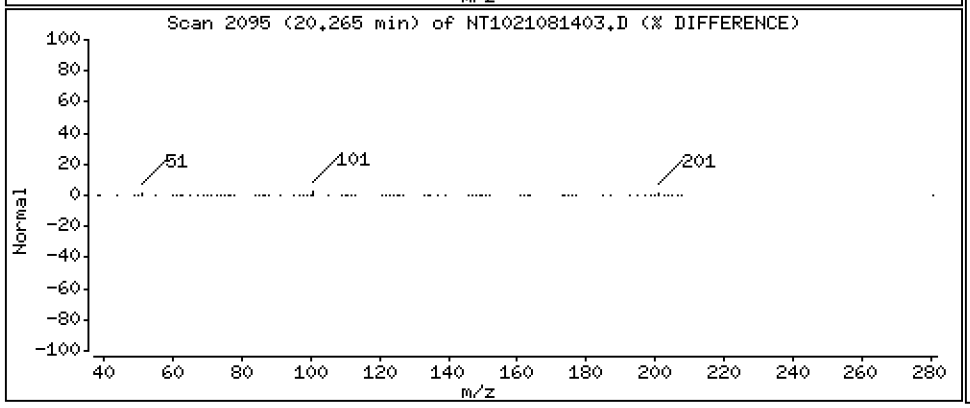












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

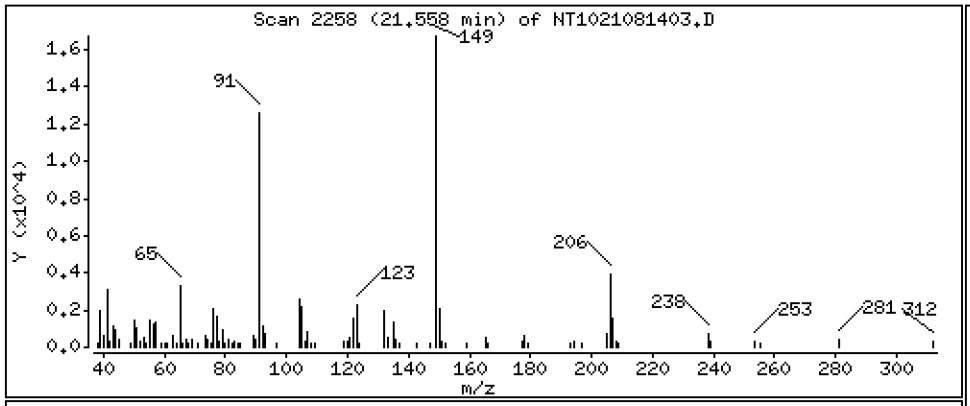
Operator: VTS

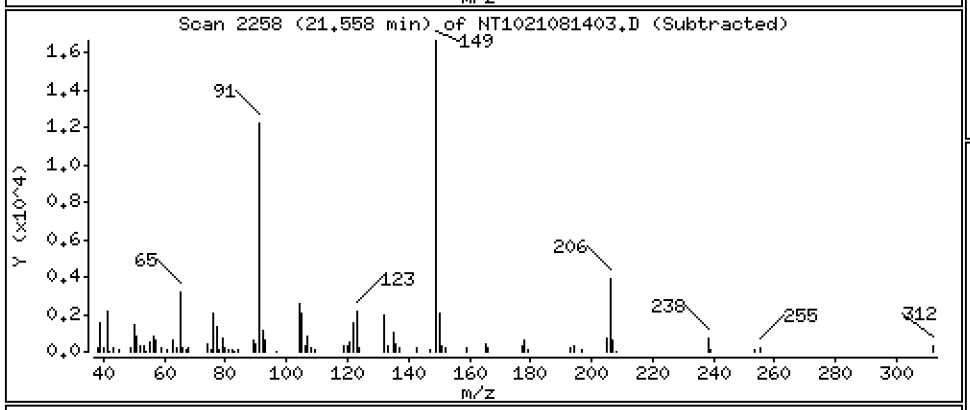
Column phase: ZB-5msi

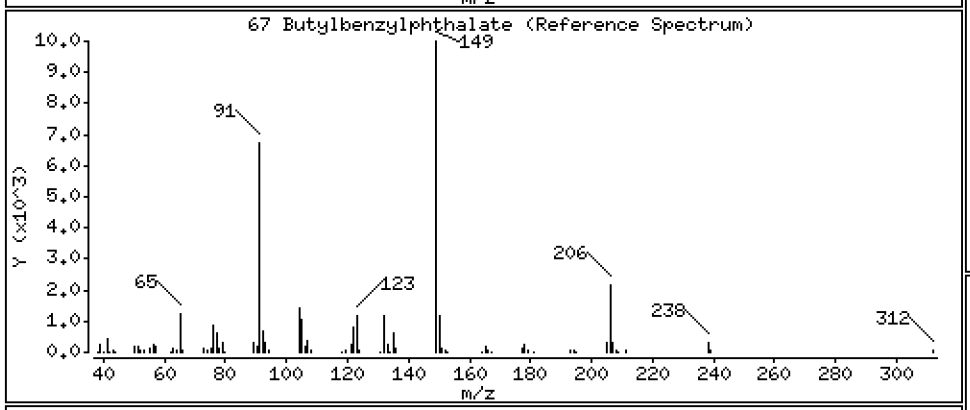
Column diameter: 0.25

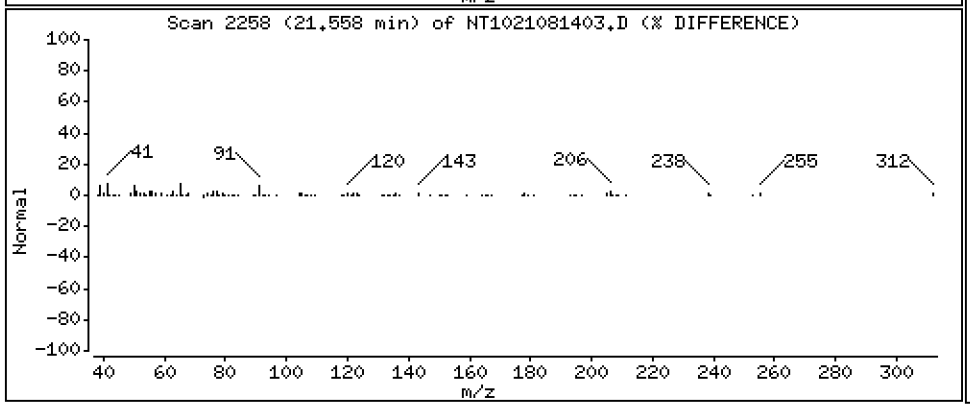
67 Butylbenzylphthalate

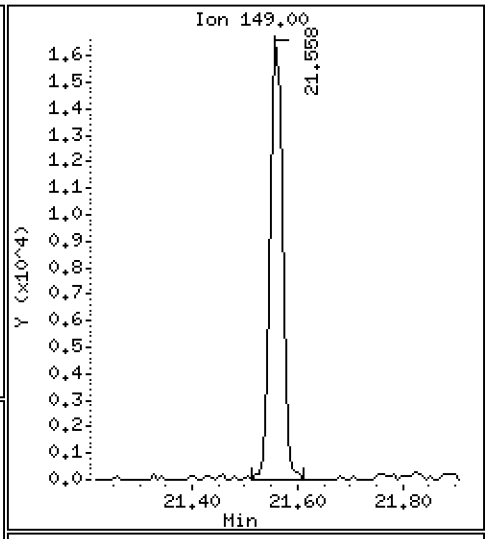
Concentration: 0.5004 ug/mL

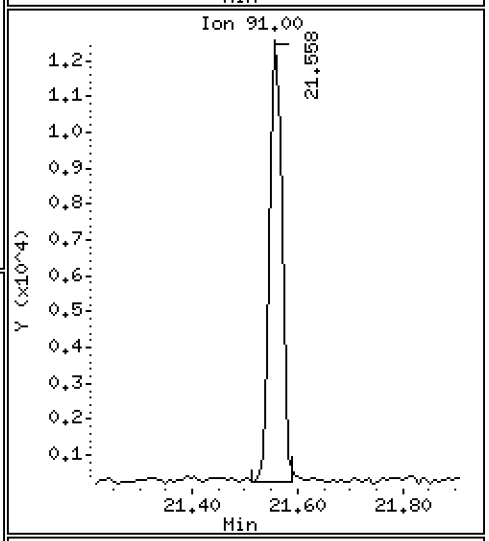


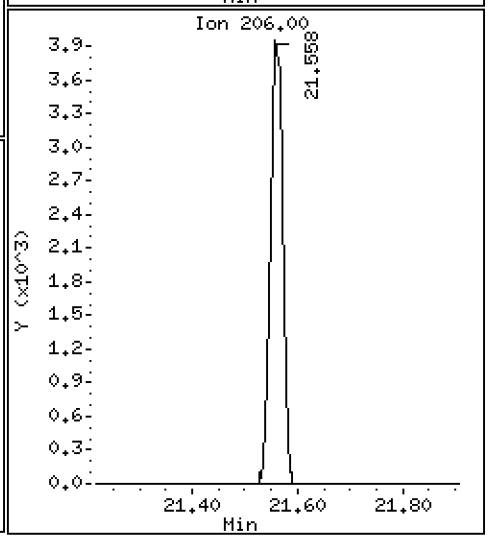












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081403.D

Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

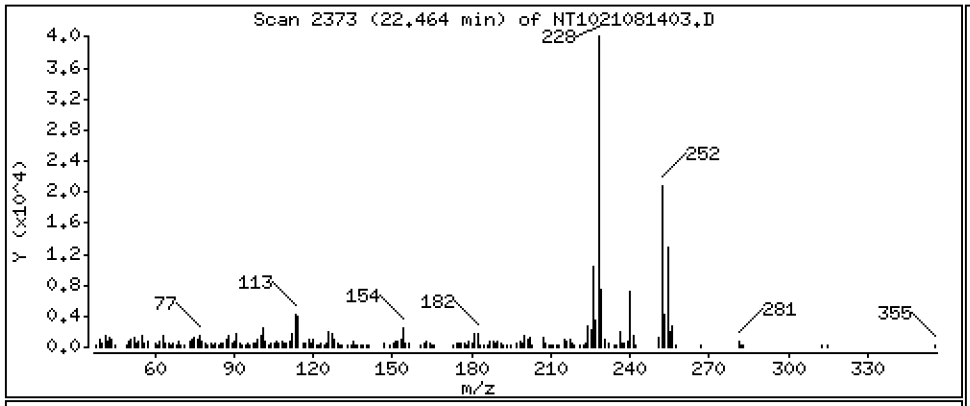
Operator: VTS

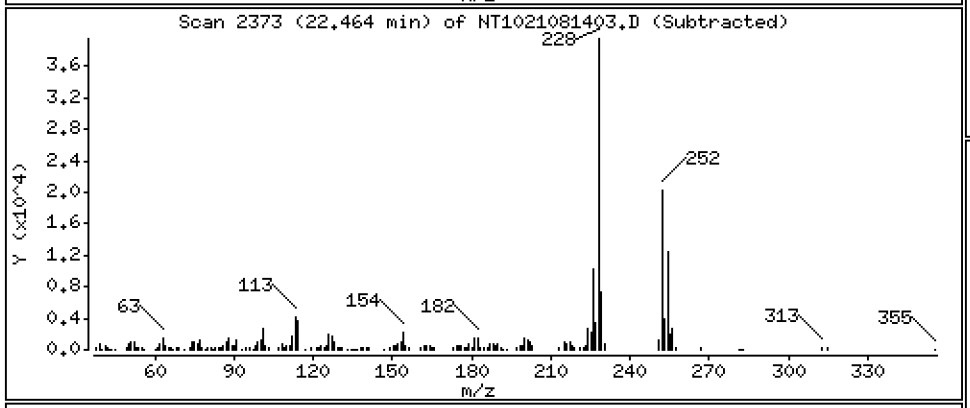
Column phase: ZB-5msi

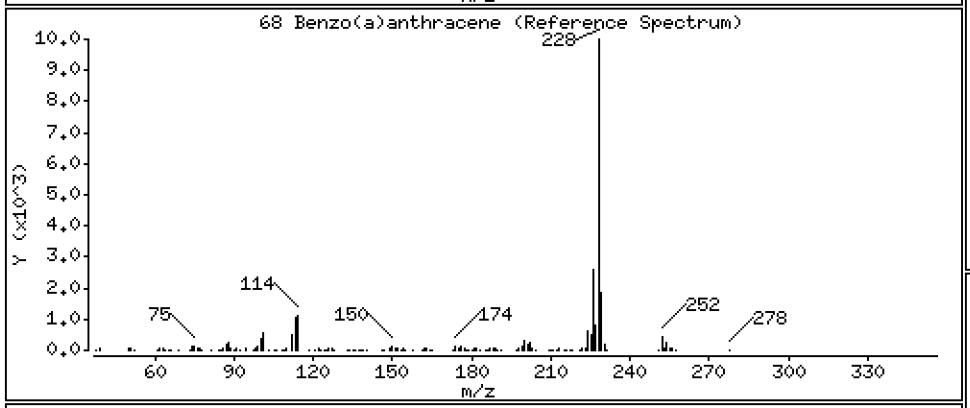
Column diameter: 0.25

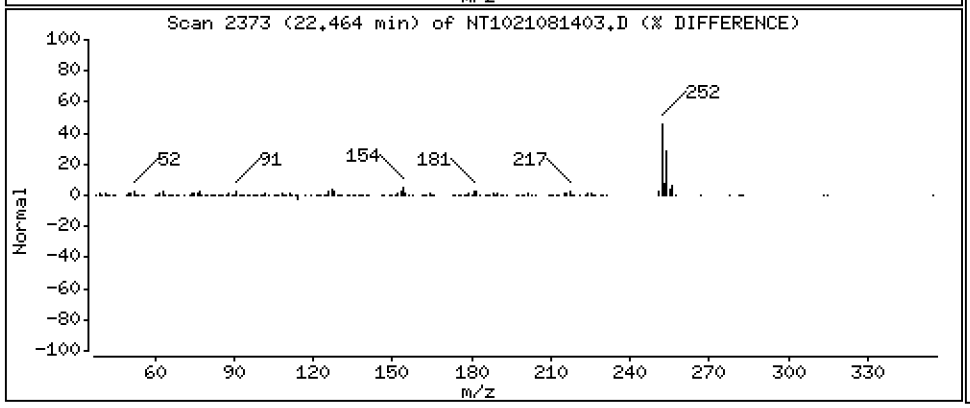
68 Benzo(a)anthracene

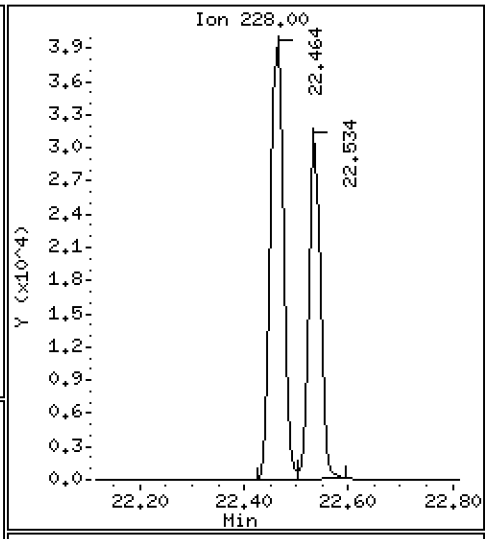
Concentration: 0.5085 ug/mL

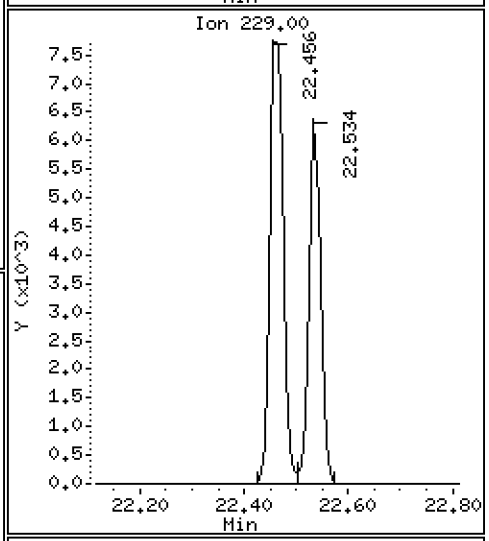


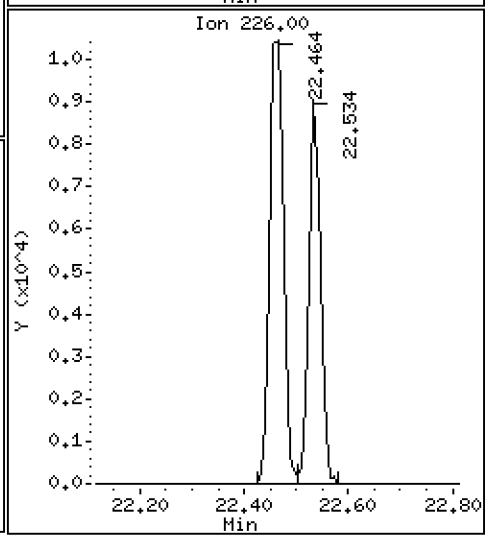












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

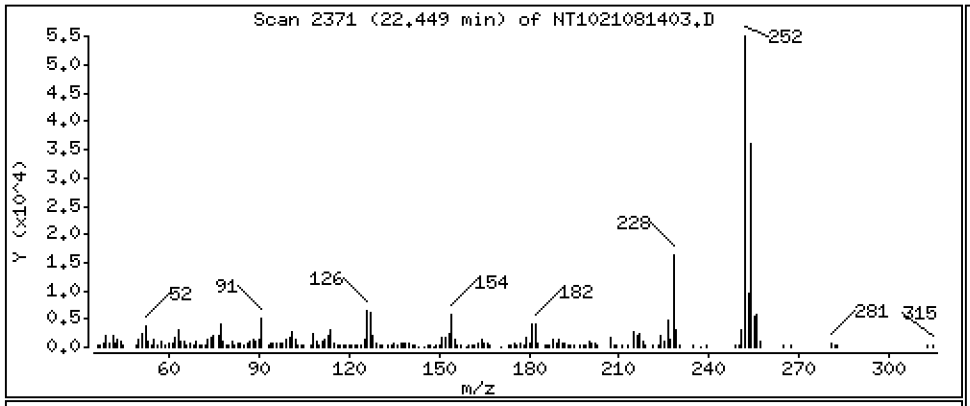
Operator: VTS

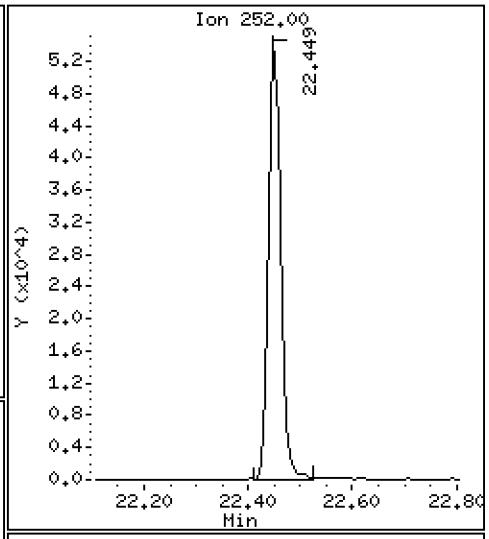
Column phase: ZB-5msi

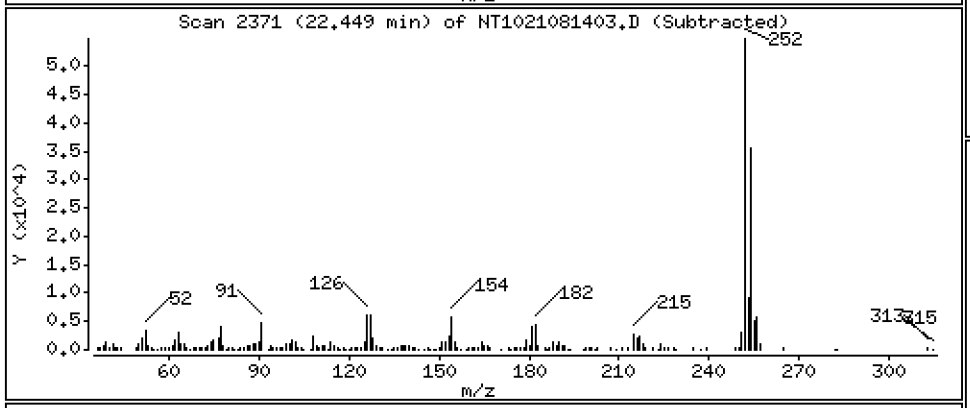
Column diameter: 0.25

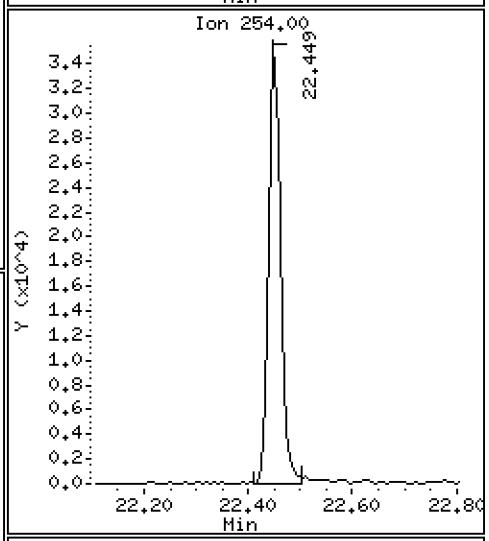
70 3,3'-Dichlorobenzidine

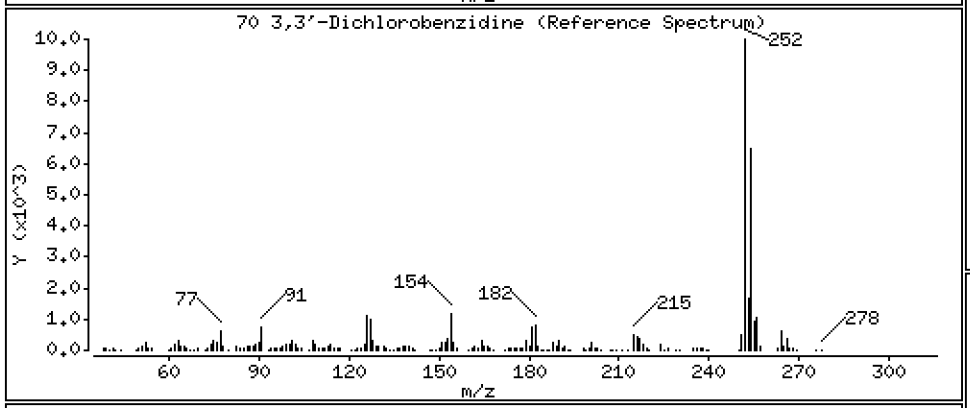
Concentration: 1.611 ug/mL

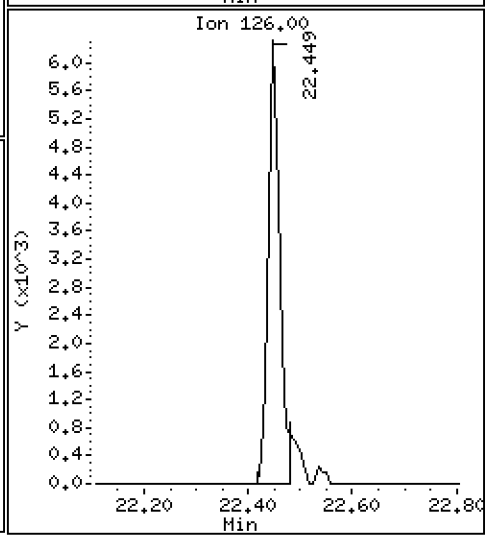


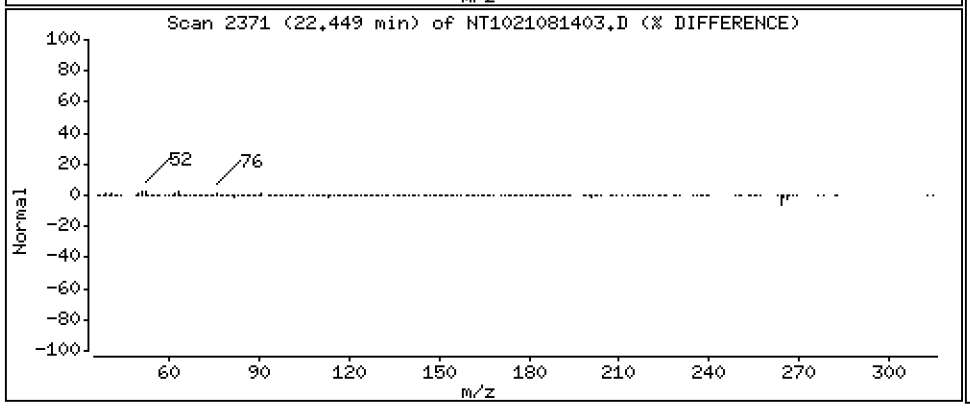












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

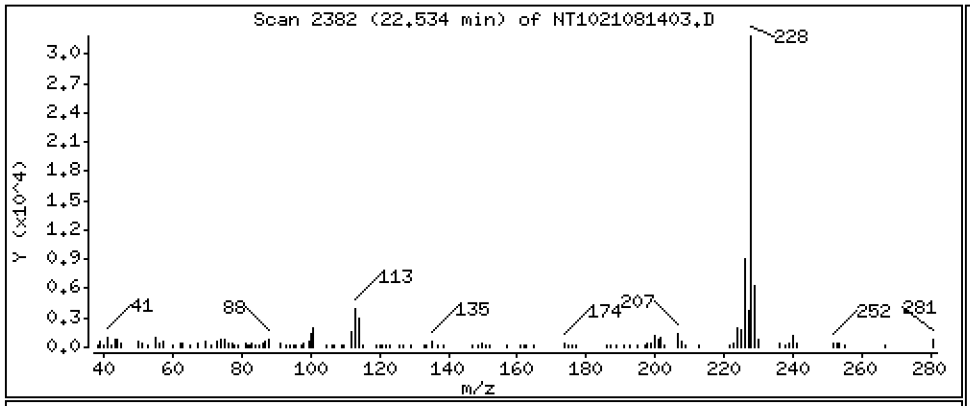
Operator: VTS

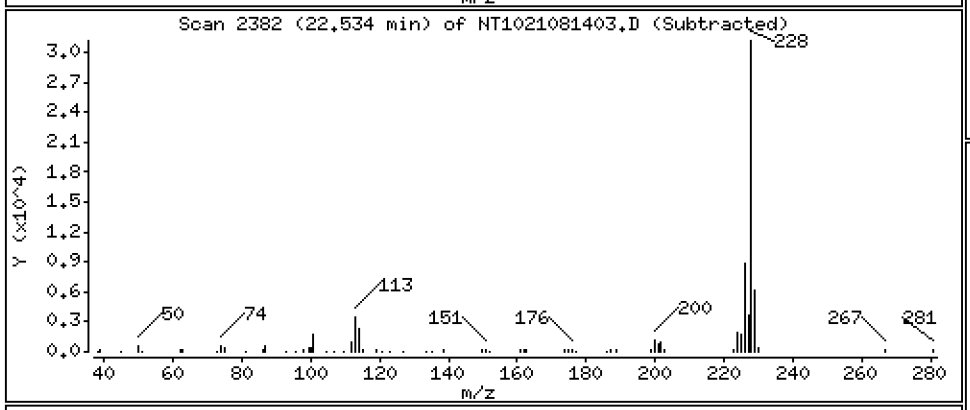
Column phase: ZB-5msi

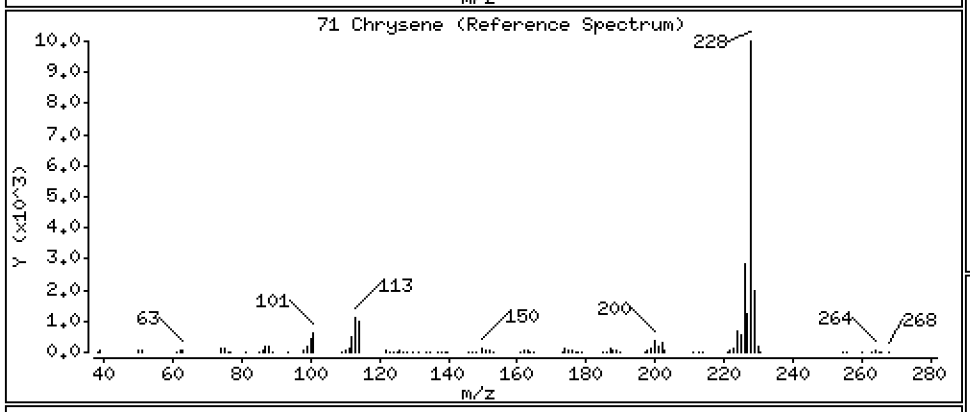
Column diameter: 0.25

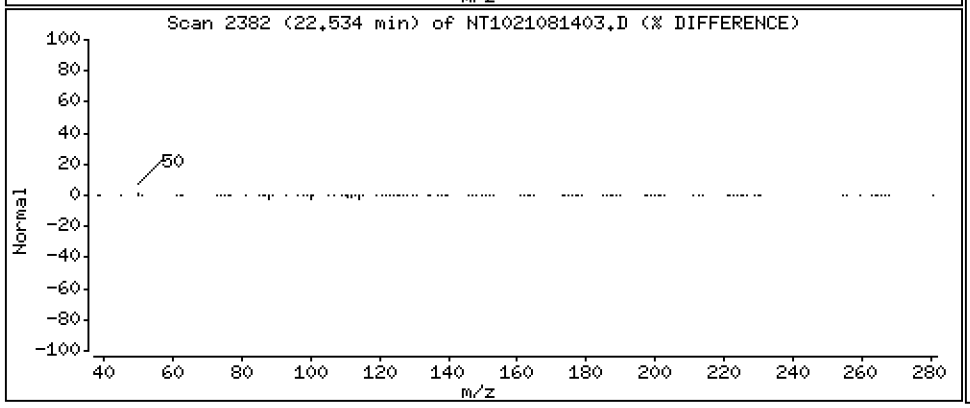
71 Chrysene

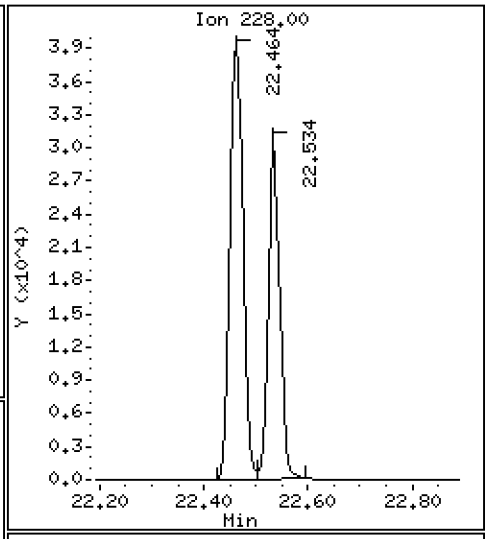
Concentration: 0.4439 ug/mL

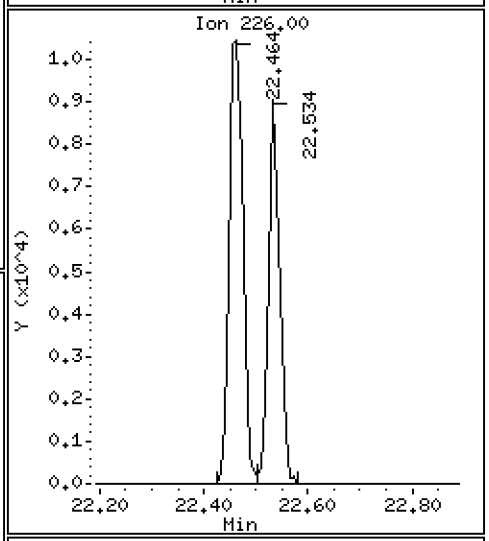


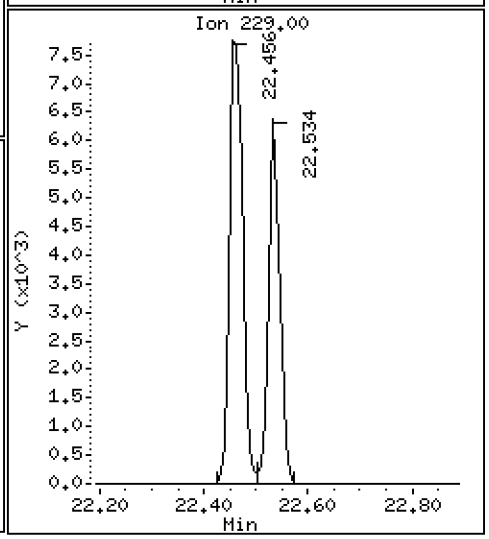












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

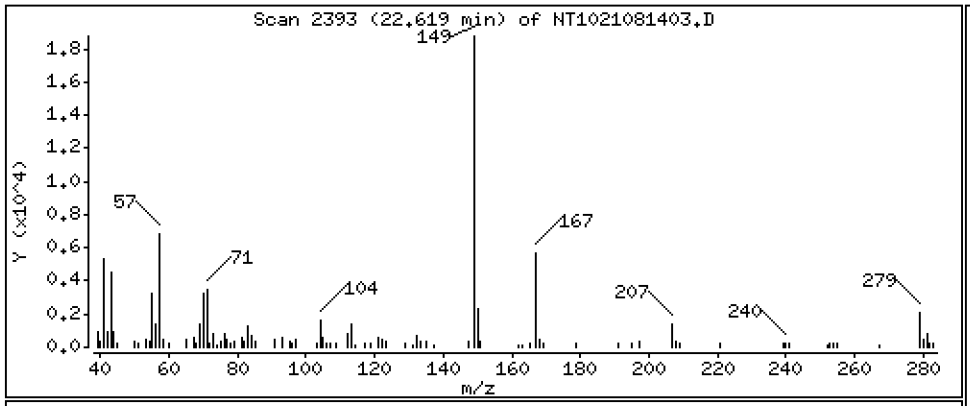
Operator: VTS

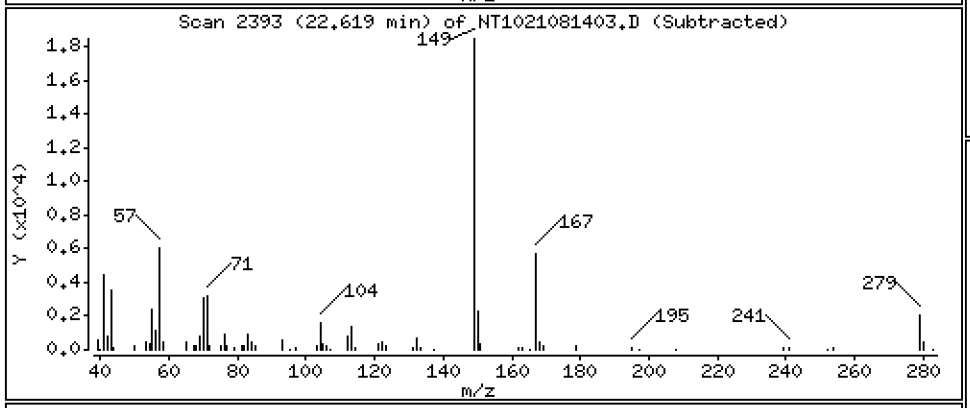
Column phase: ZB-5msi

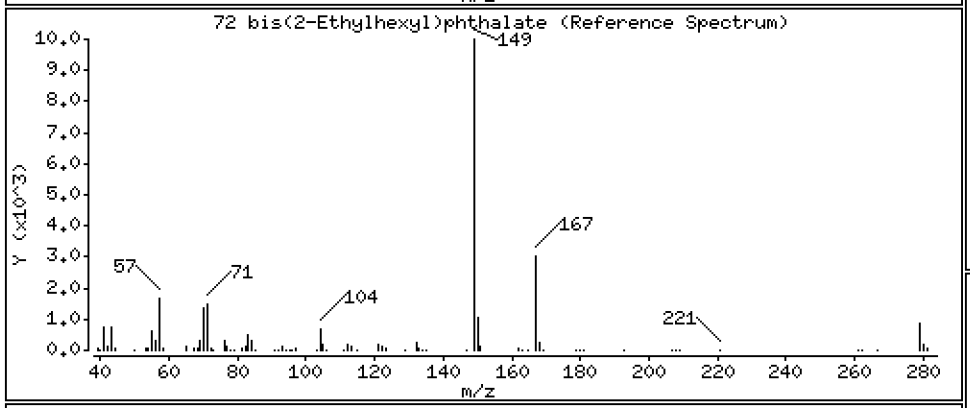
Column diameter: 0.25

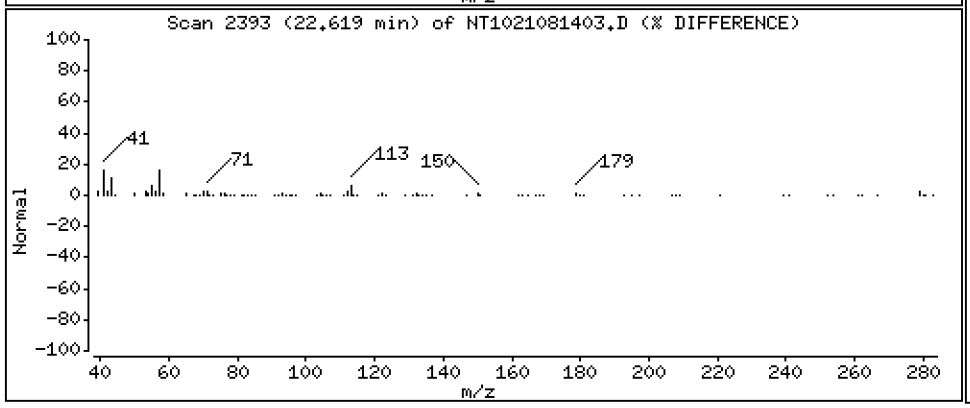
72 bis(2-Ethylhexyl)phthalate

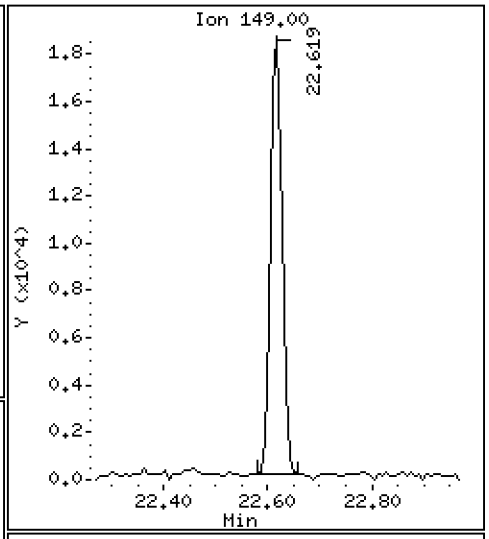
Concentration: 0.6061 ug/mL

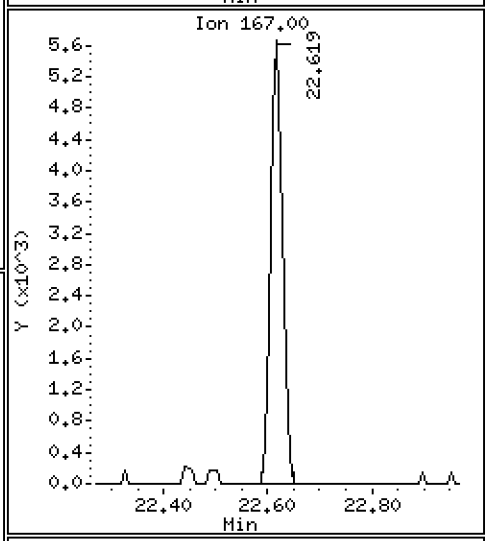


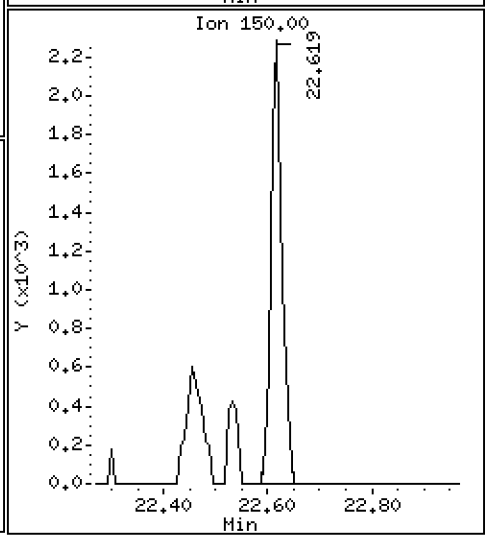












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

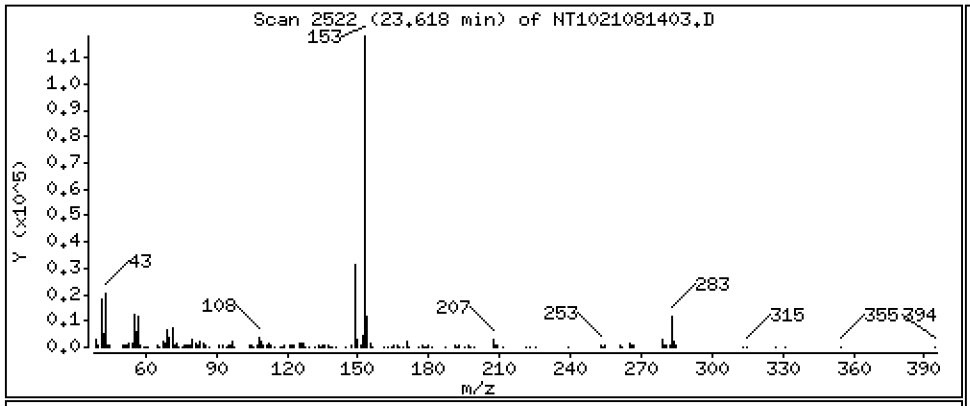
Operator: VTS

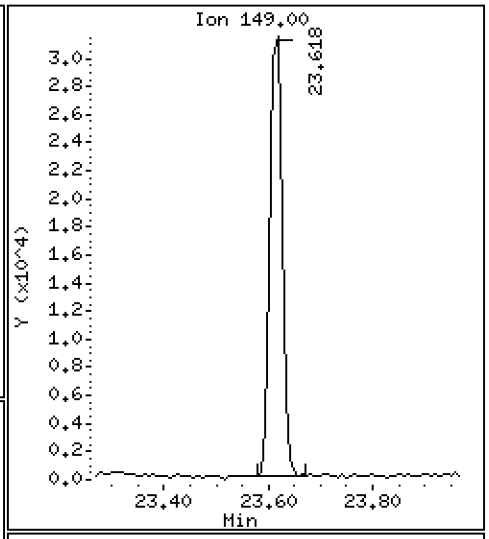
Column phase: ZB-5msi

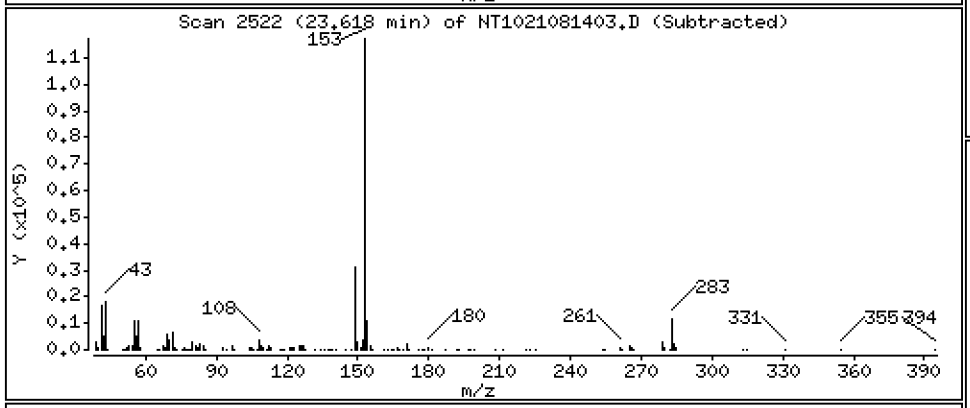
Column diameter: 0.25

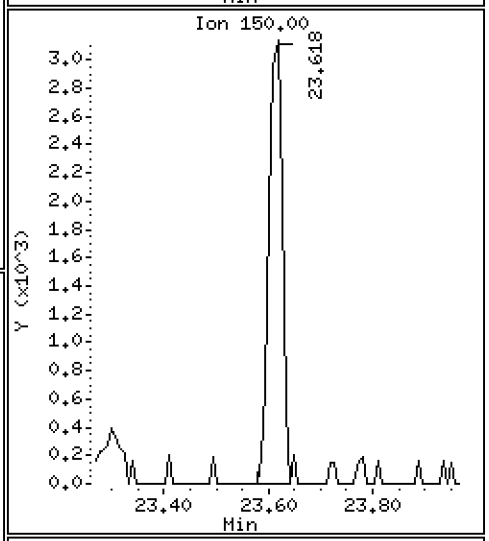
73 Di-n-octylphthalate

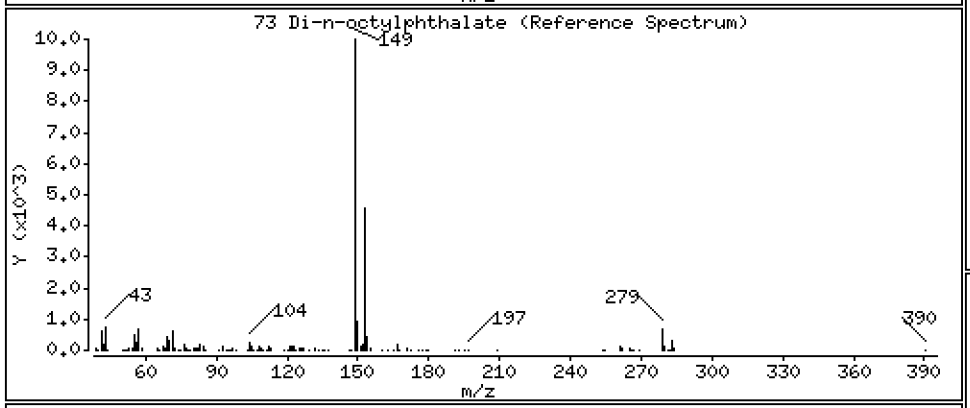
Concentration: 0.4309 ug/mL

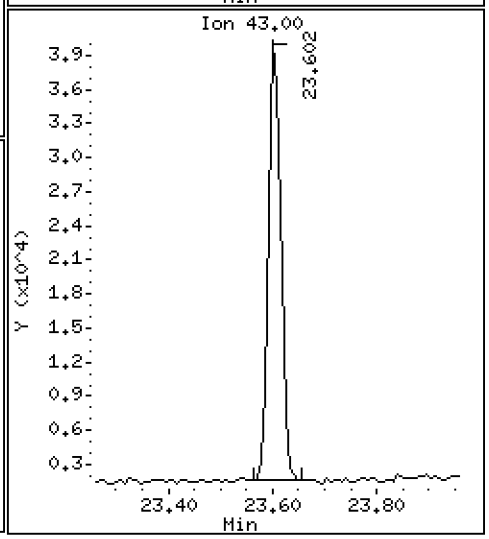


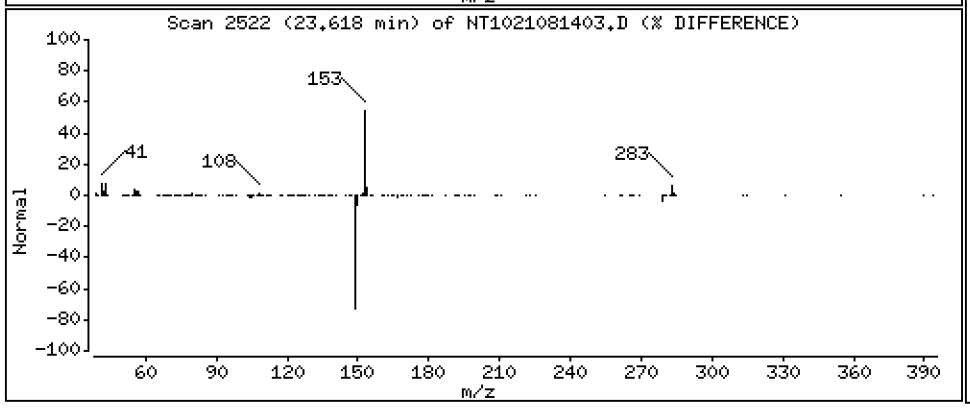












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

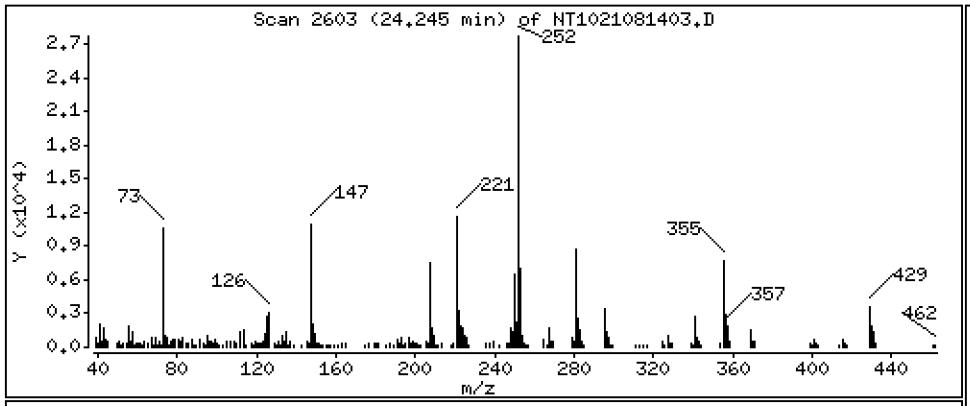
Operator: VTS

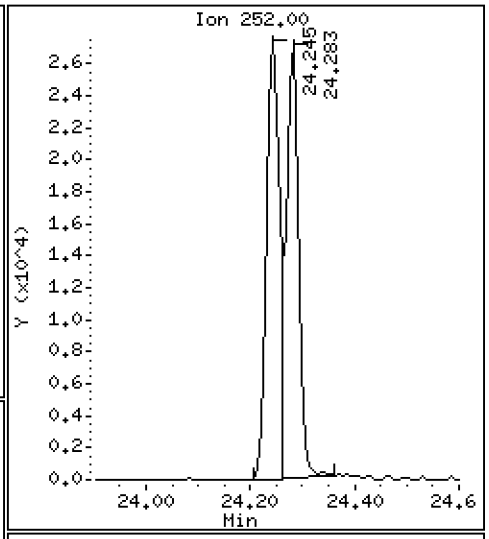
Column phase: ZB-5msi

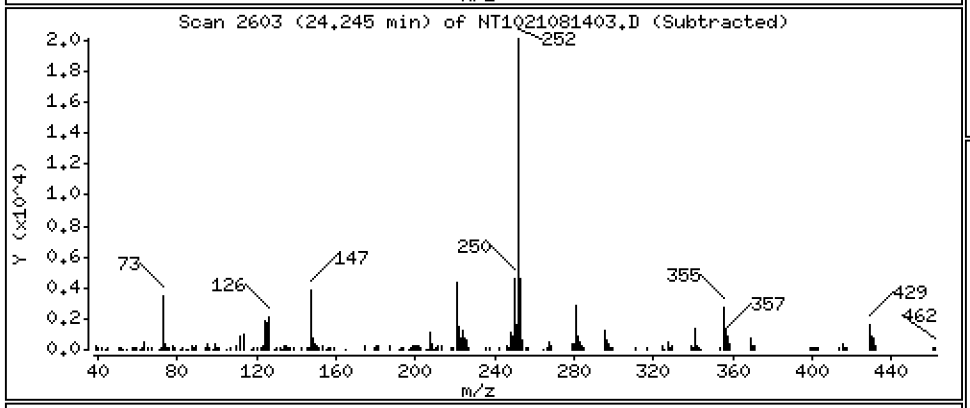
Column diameter: 0.25

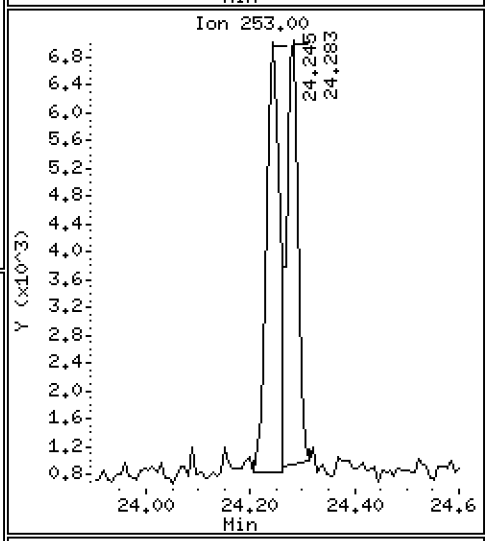
74 Benzo(b)fluoranthene

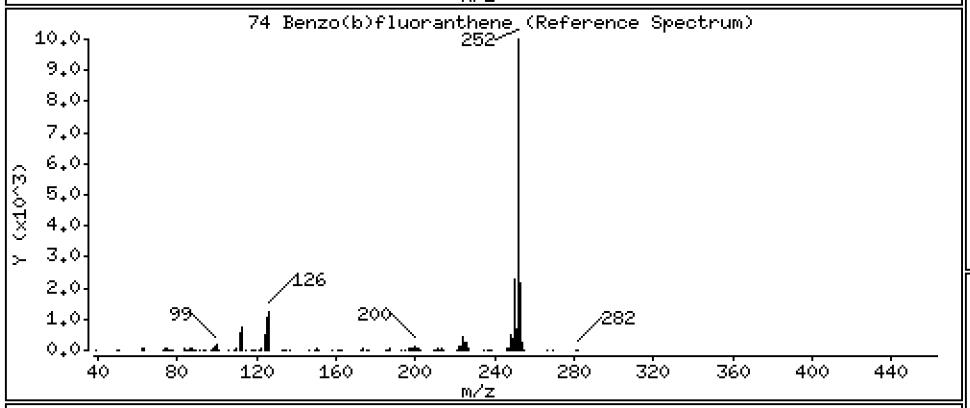
Concentration: 0.4746 ug/mL

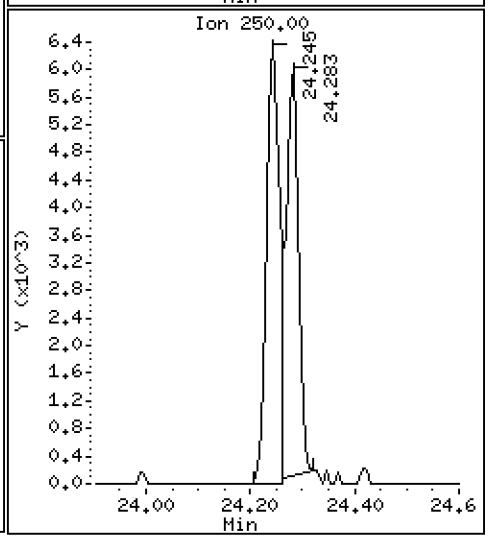


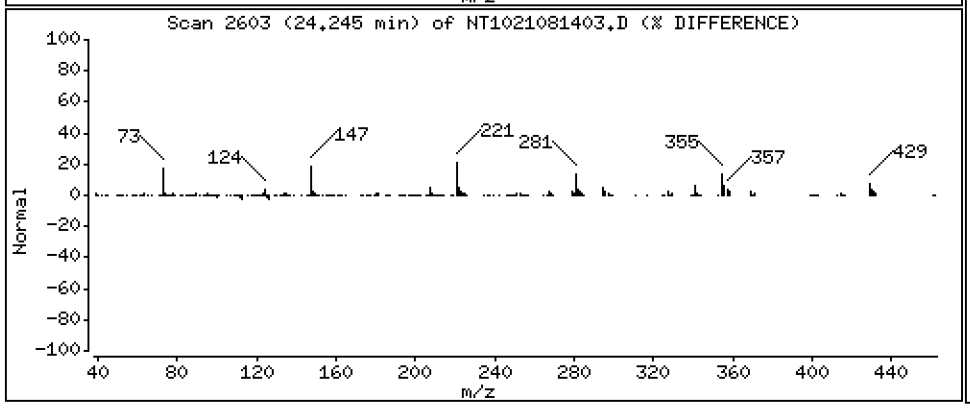












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

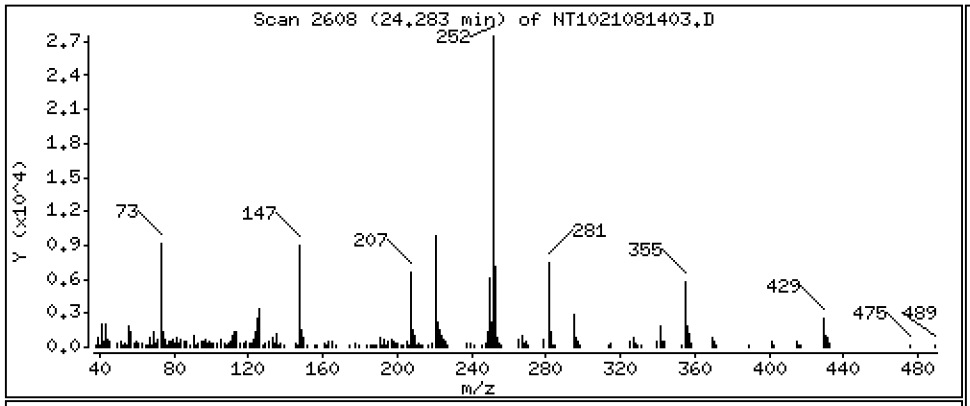
Operator: VTS

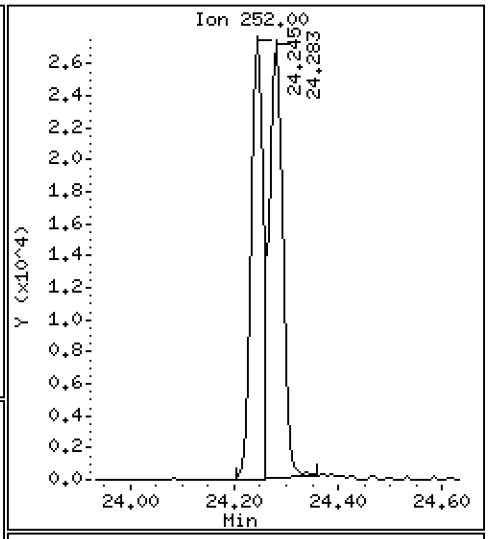
Column phase: ZB-5msi

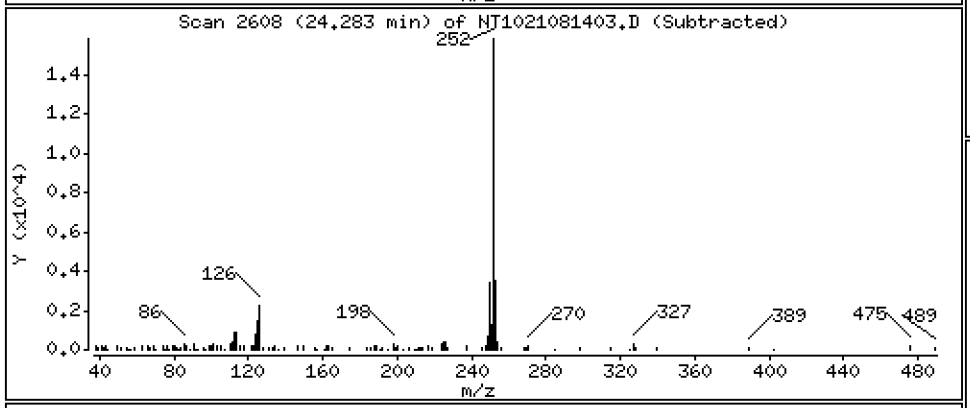
Column diameter: 0.25

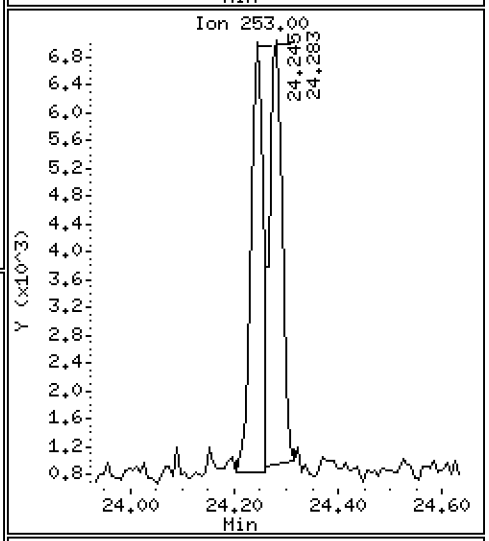
75 Benzo(k)fluoranthene

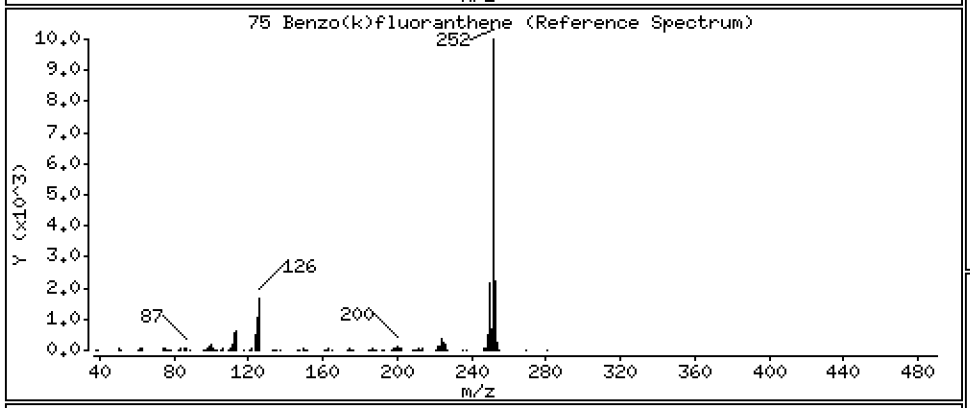
Concentration: 0.5089 ug/mL

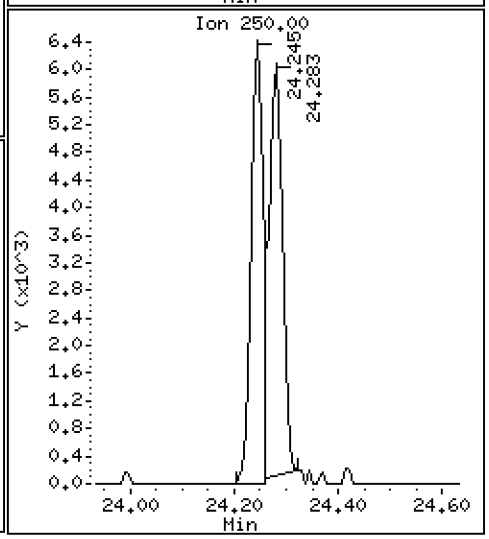


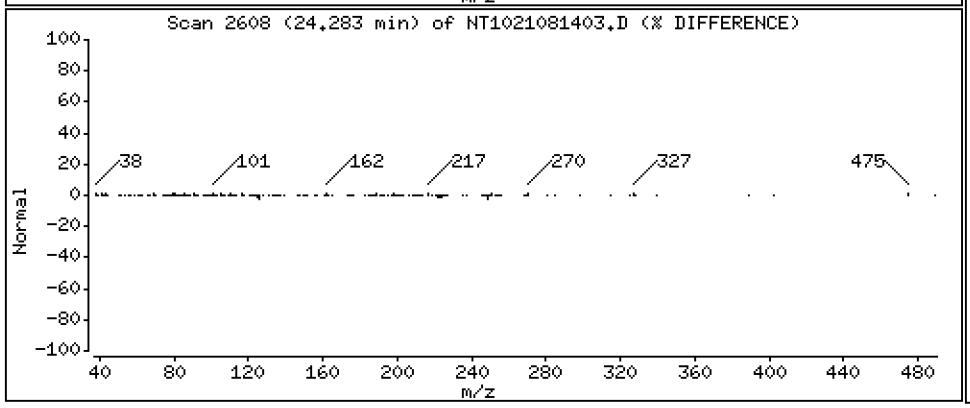












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081403.D

Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

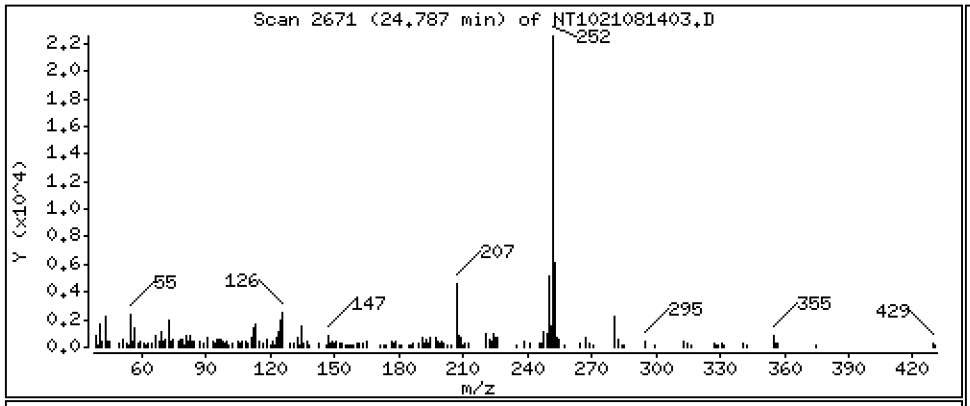
Operator: VTS

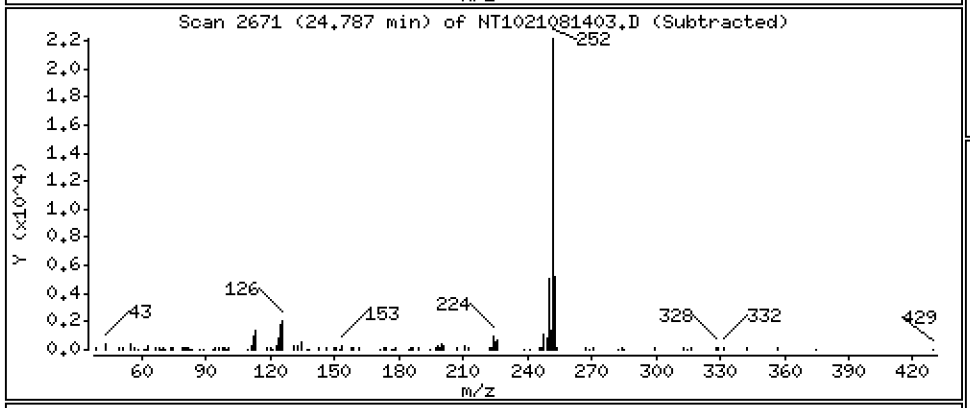
Column phase: ZB-5msi

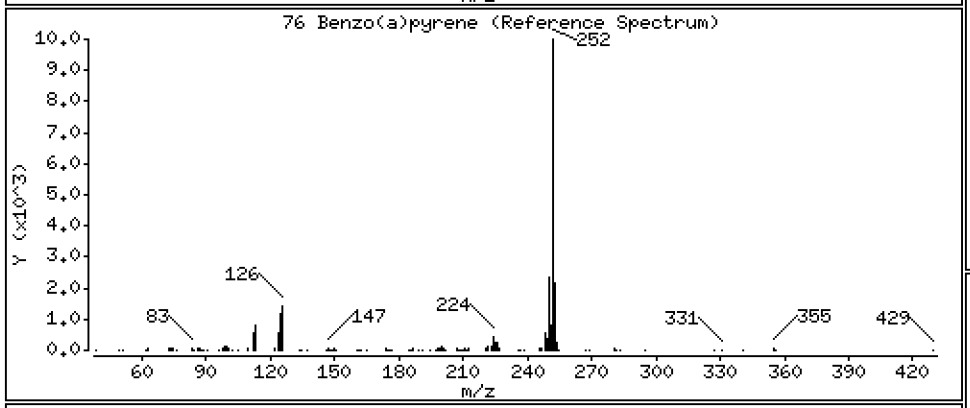
Column diameter: 0.25

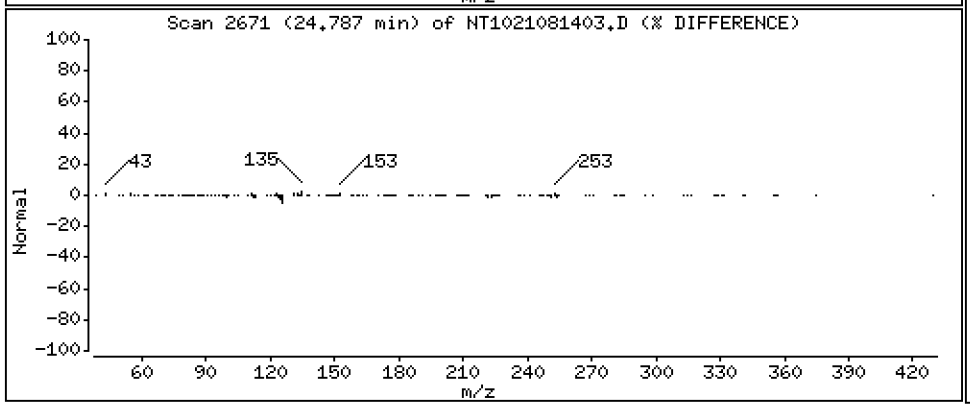
76 Benzo(a)pyrene

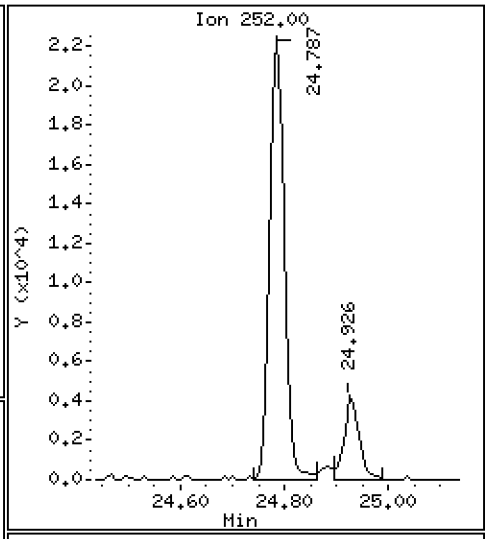
Concentration: 0.4663 ug/mL

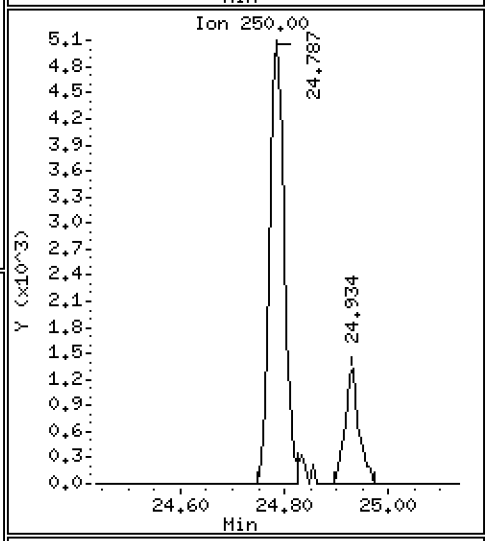


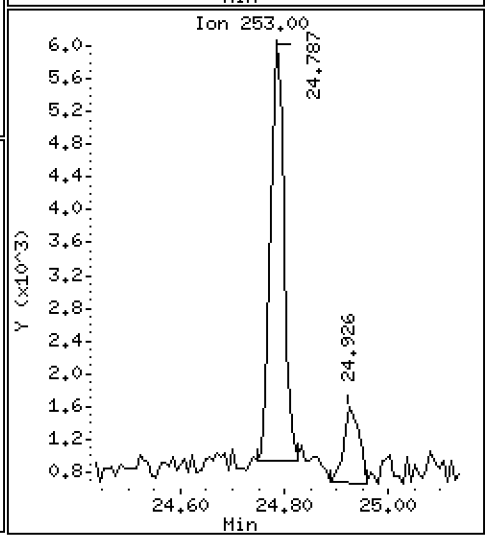












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

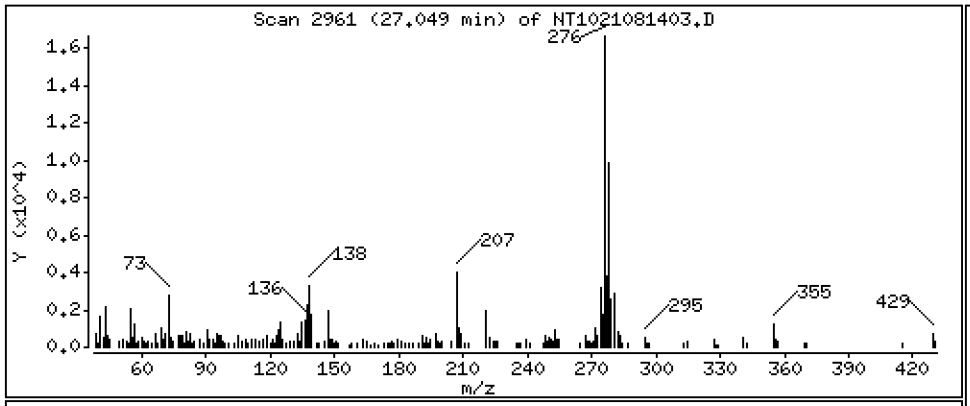
Operator: VTS

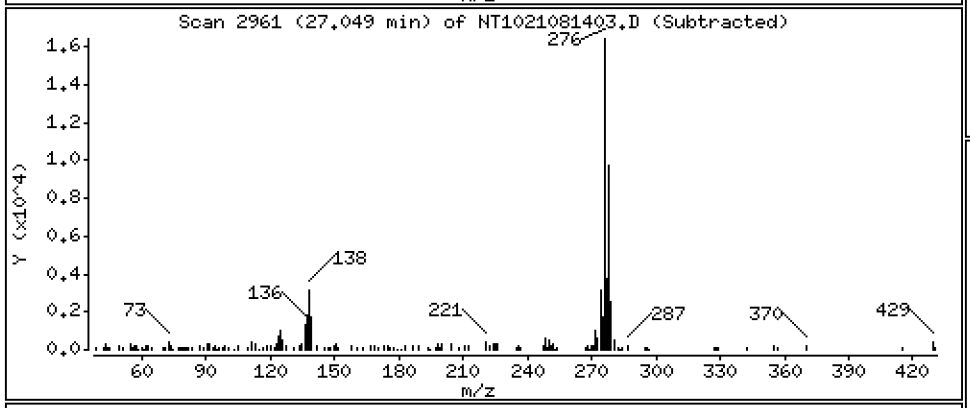
Column phase: ZB-5msi

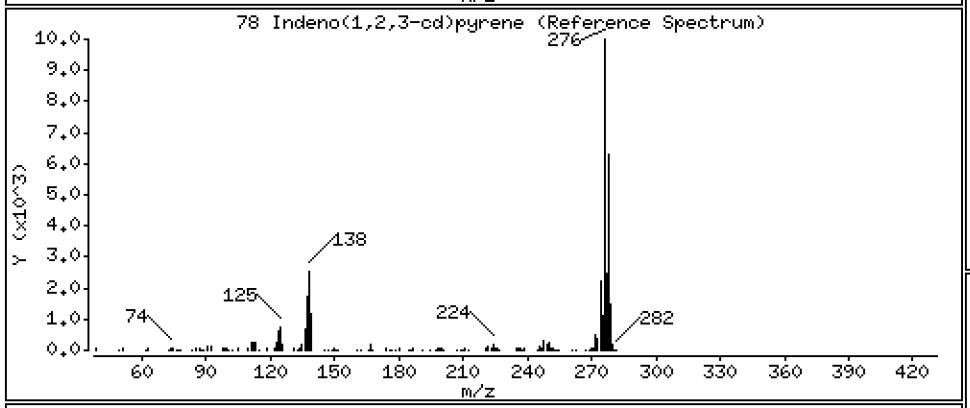
Column diameter: 0.25

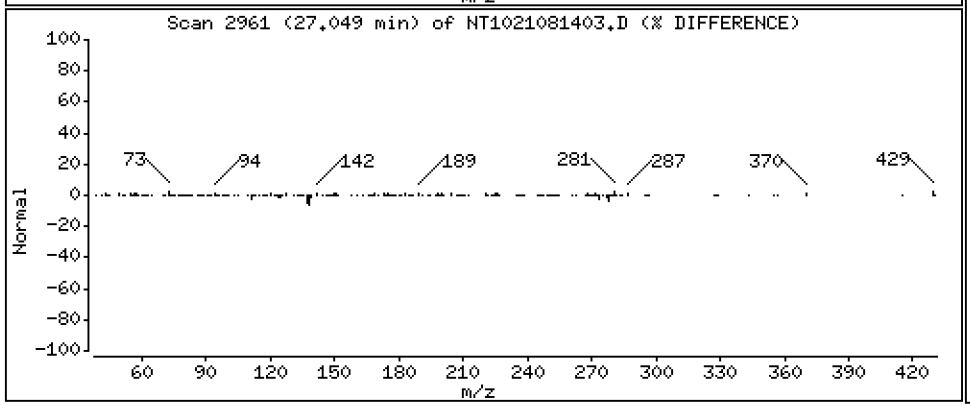
78 Indeno(1,2,3-cd)pyrene

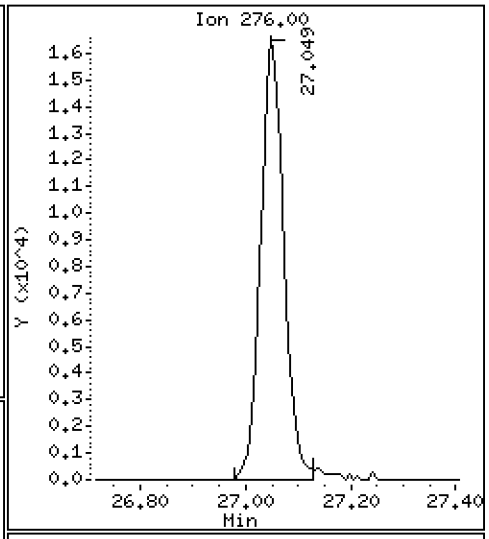
Concentration: 0.4930 ug/mL

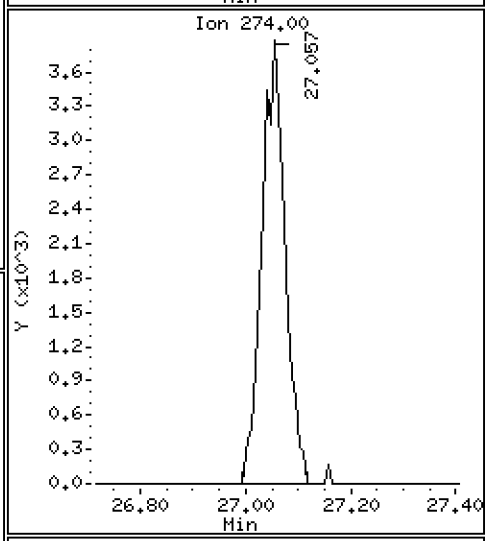


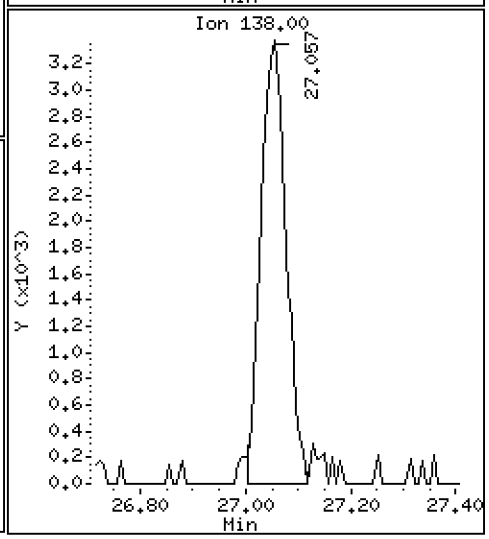












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

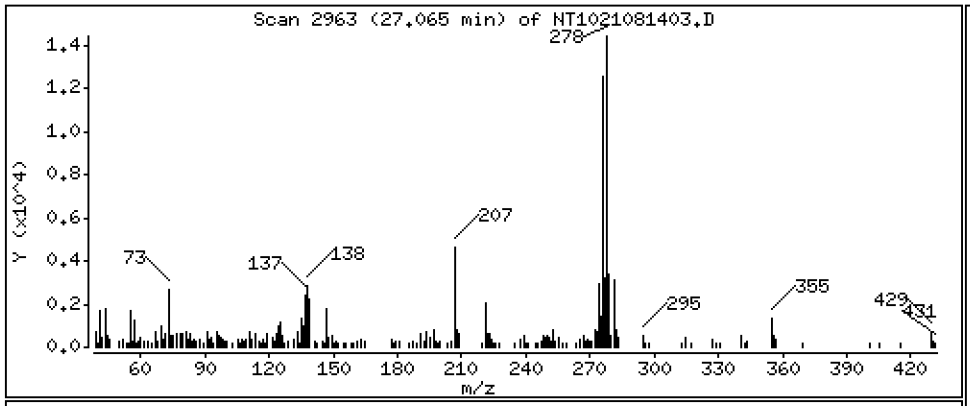
Operator: VTS

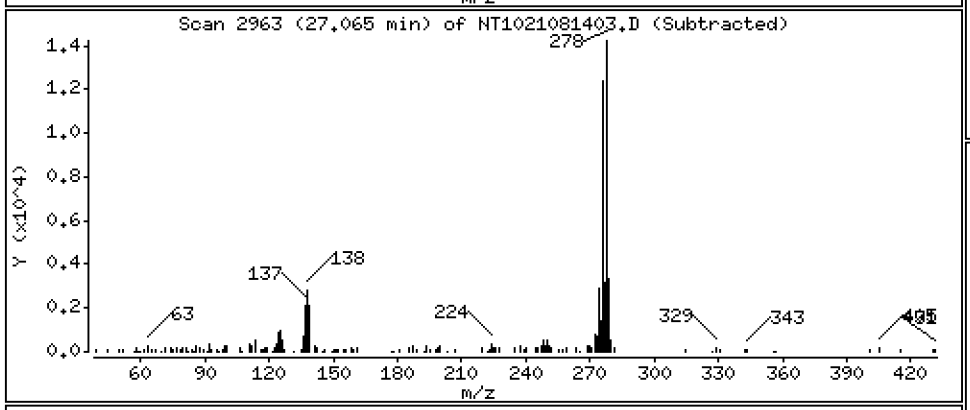
Column phase: ZB-5msi

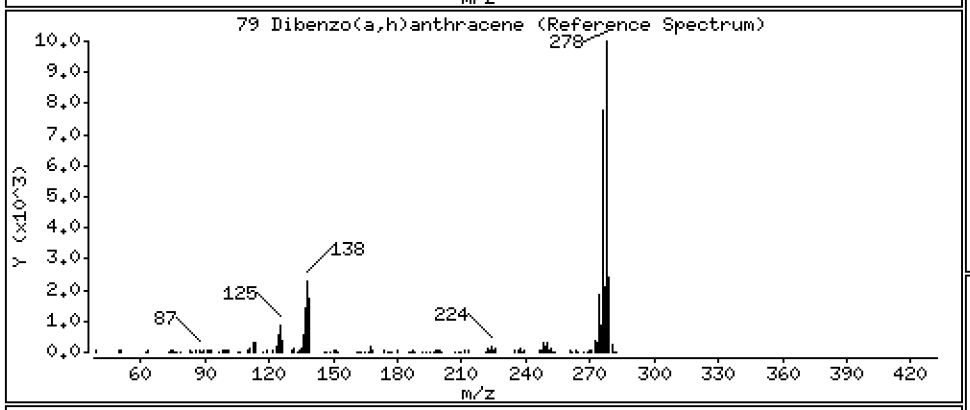
Column diameter: 0.25

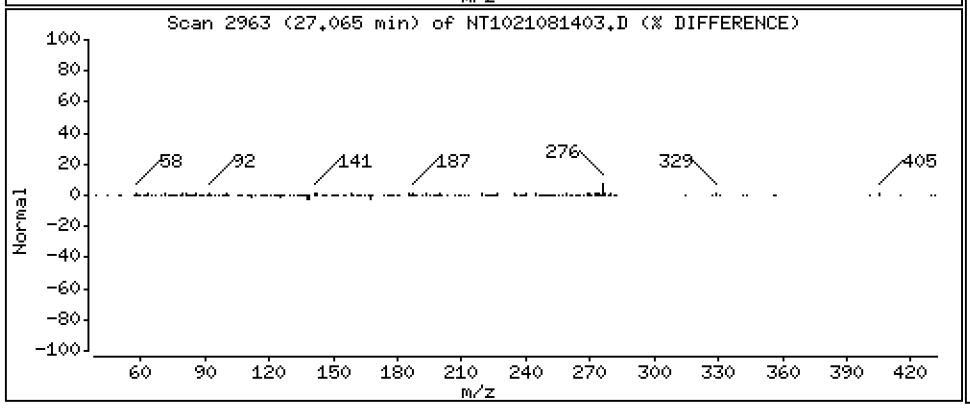
79 Dibenzo(a,h)anthracene

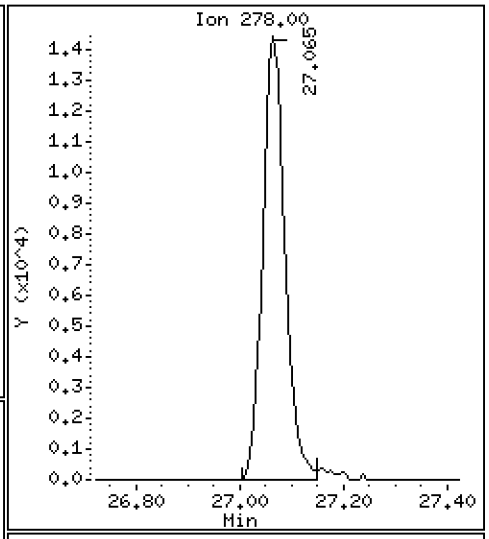
Concentration: 0.5243 ug/mL

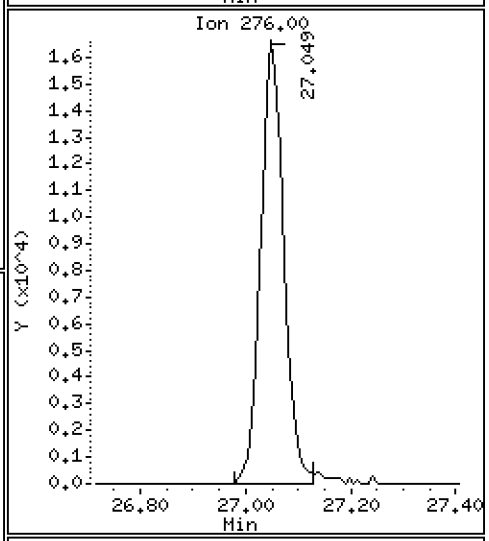


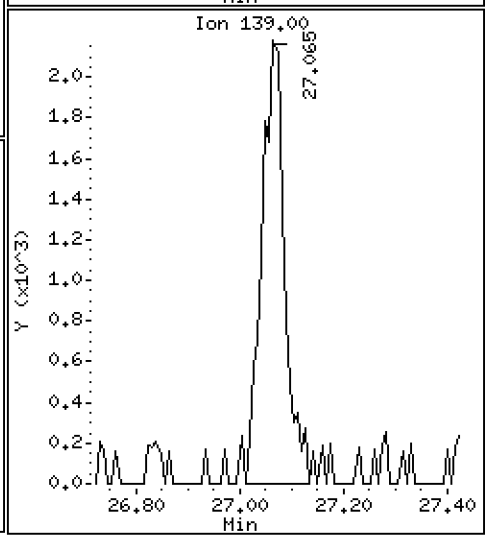












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

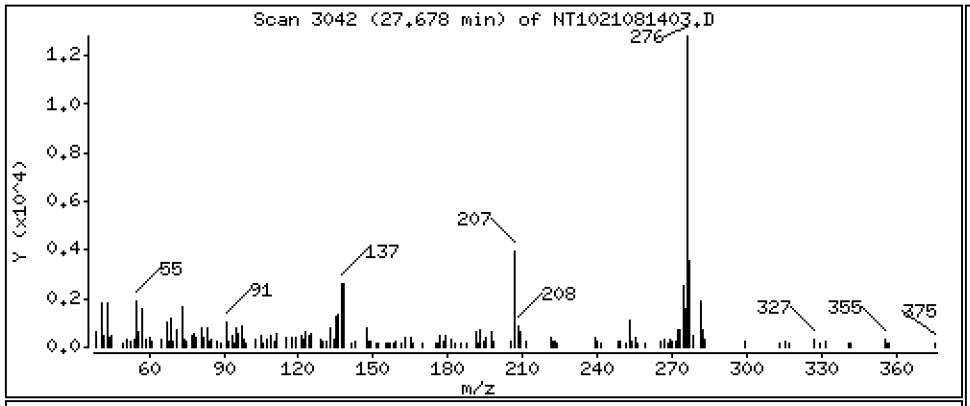
Operator: VTS

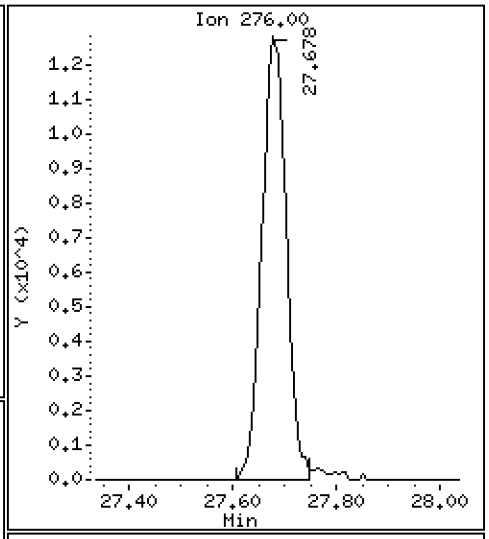
Column phase: ZB-5msi

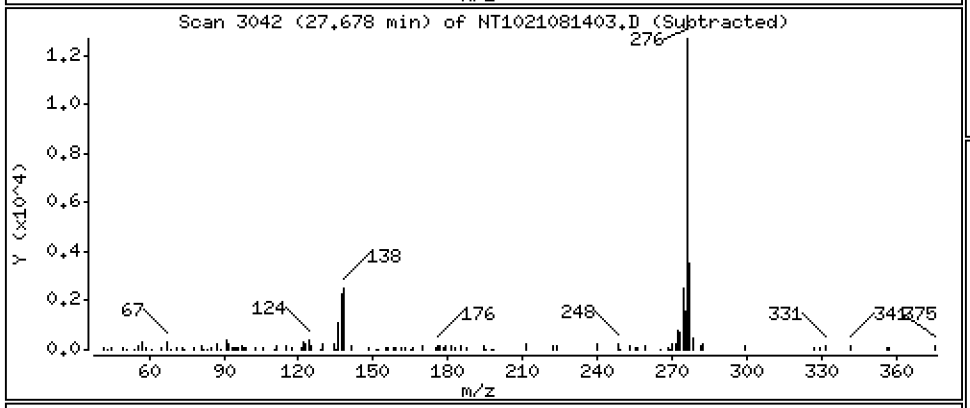
Column diameter: 0.25

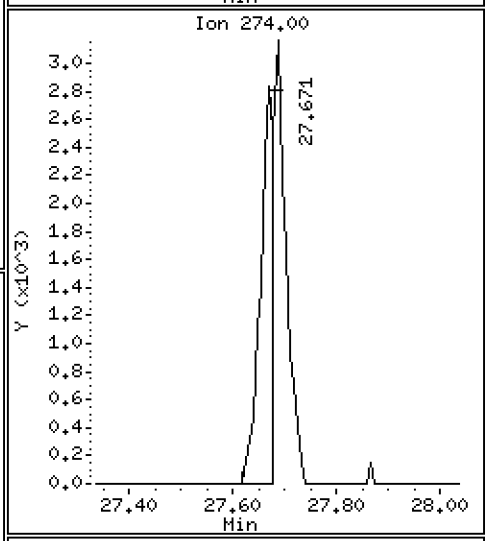
80 Benzo(g,h,i)perylene

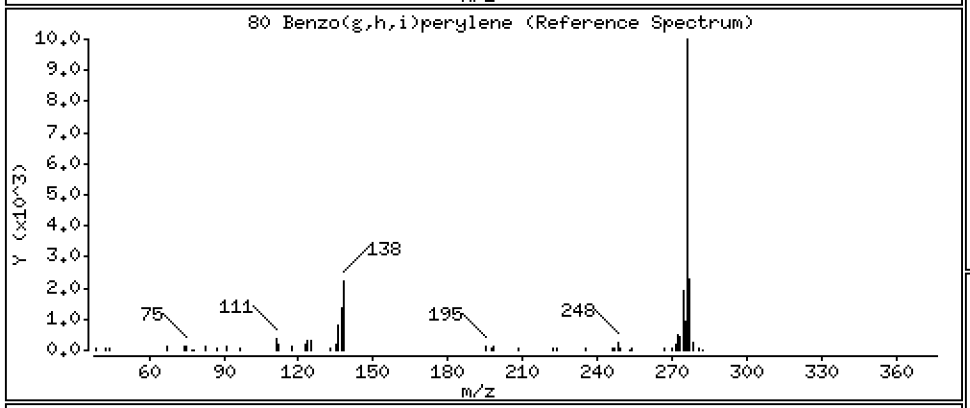
Concentration: 0.4513 ug/mL

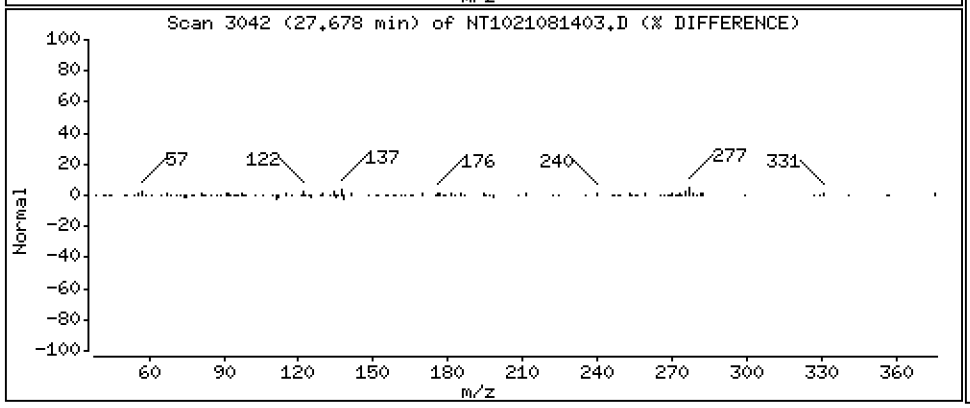


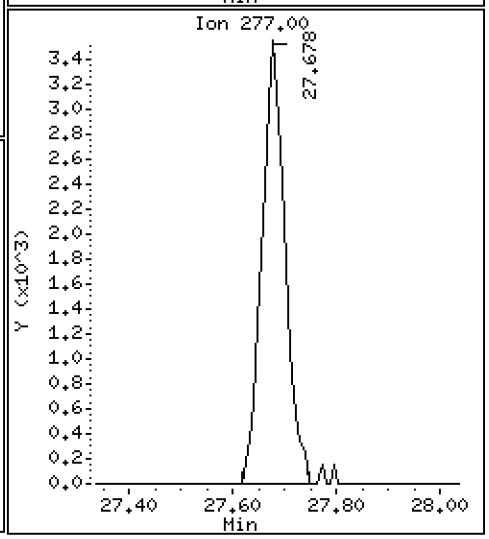












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

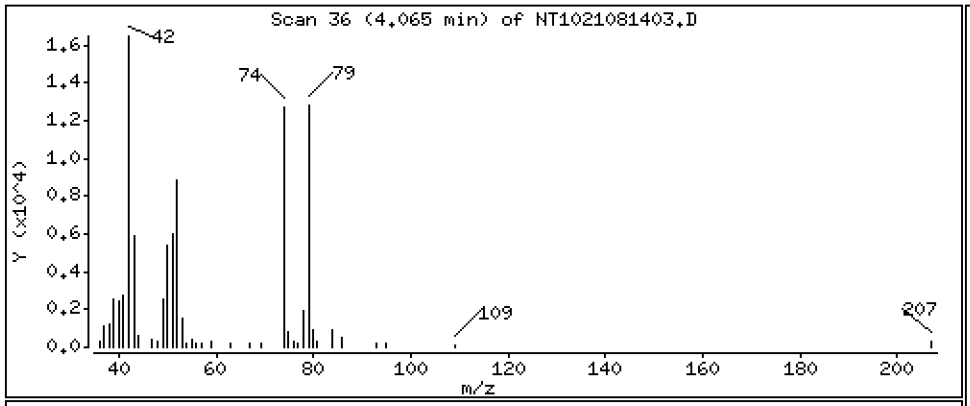
Operator: VTS

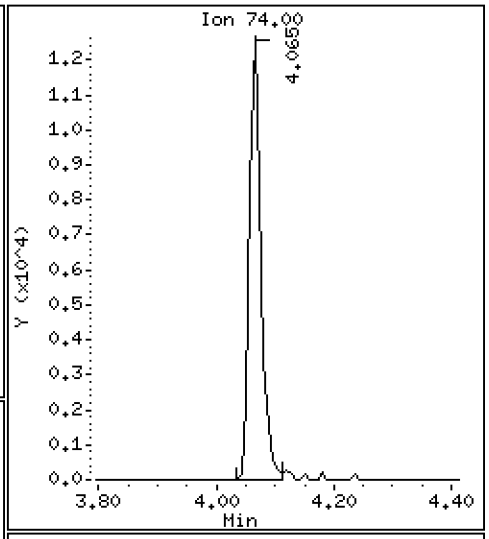
Column phase: ZB-5msi

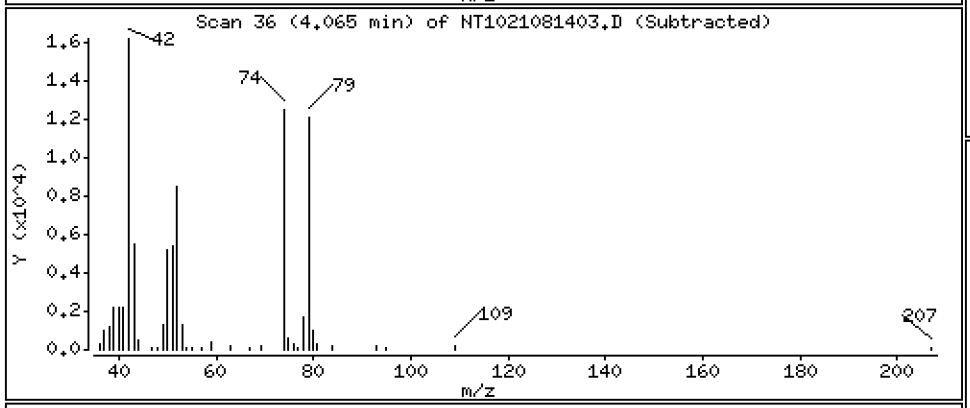
Column diameter: 0.25

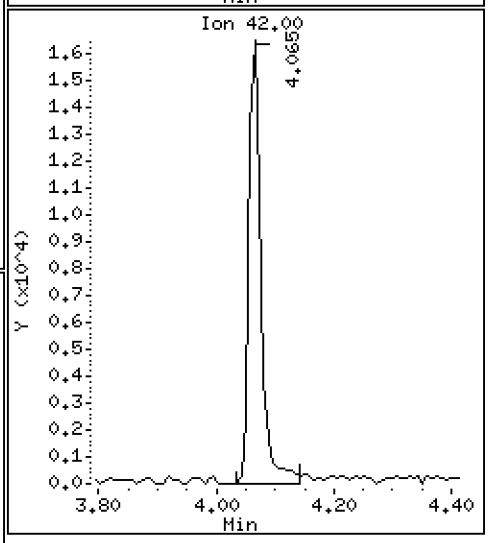
90 N-Nitrosodimethylamine

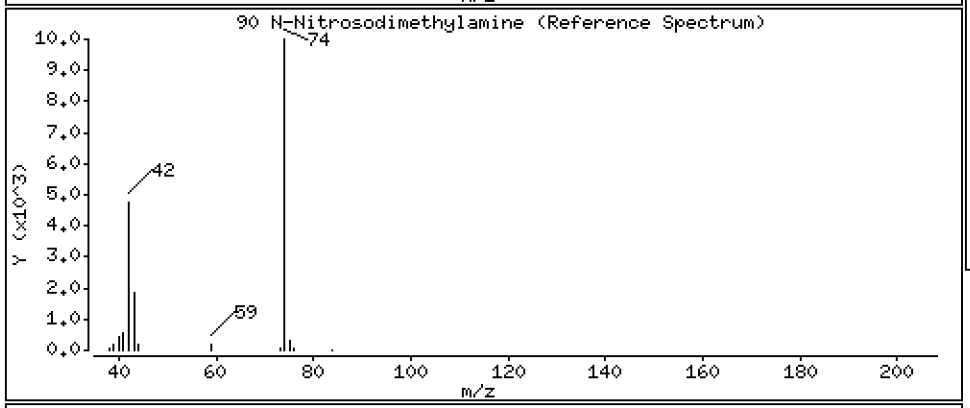
Concentration: 0.5561 ug/mL

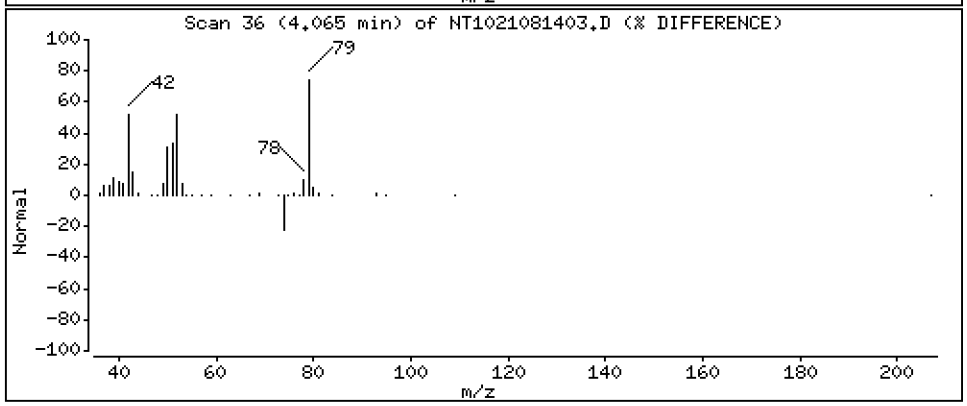












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

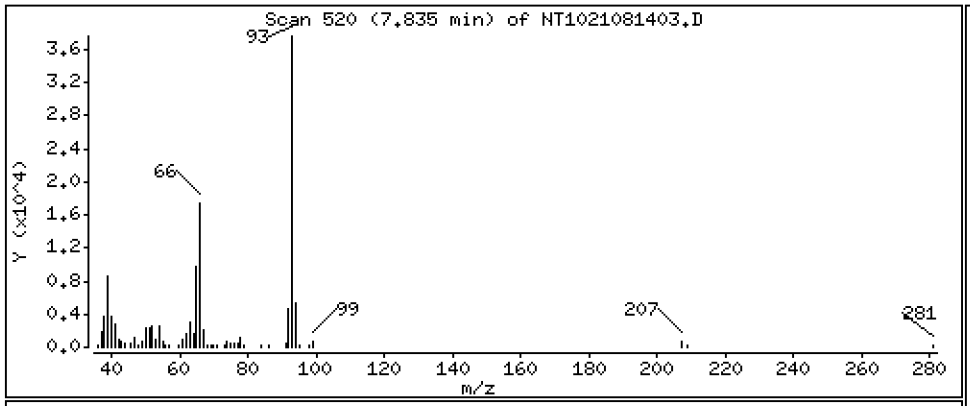
Operator: VTS

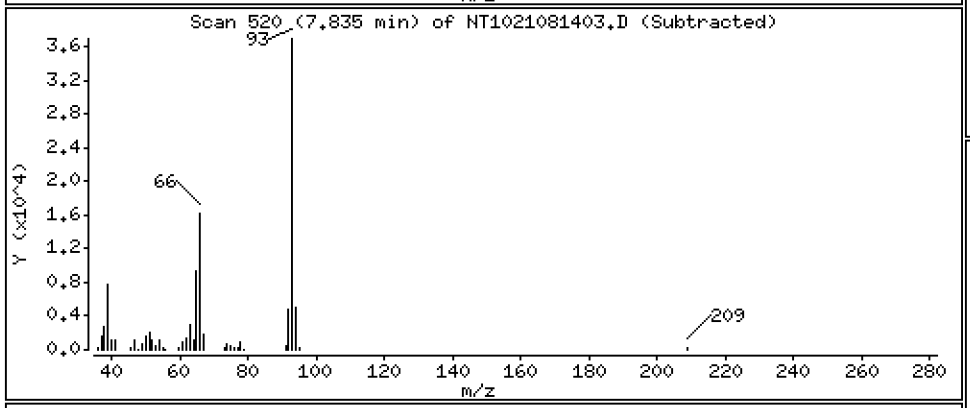
Column phase: ZB-5msi

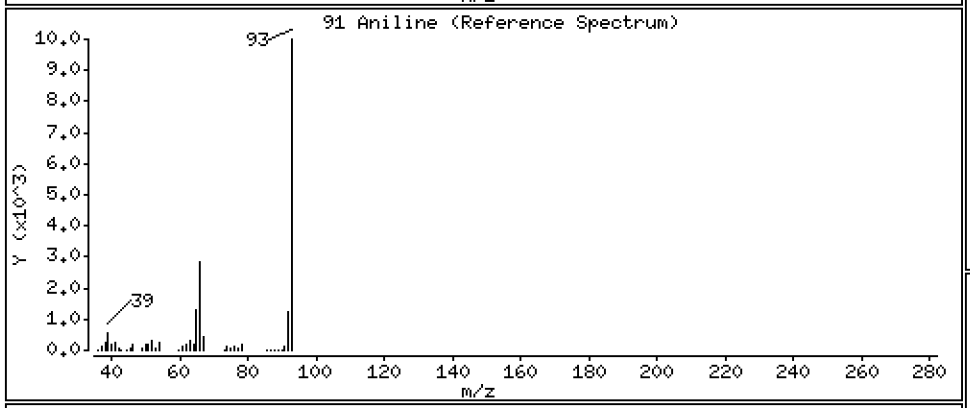
Column diameter: 0.25

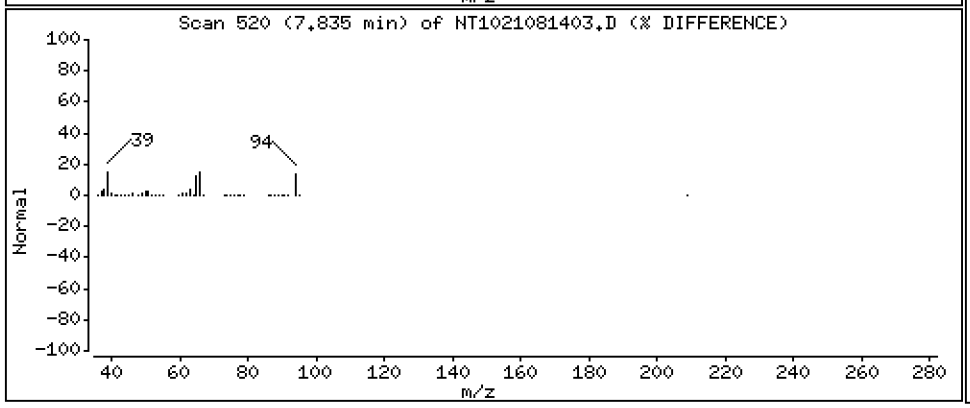
91 Aniline

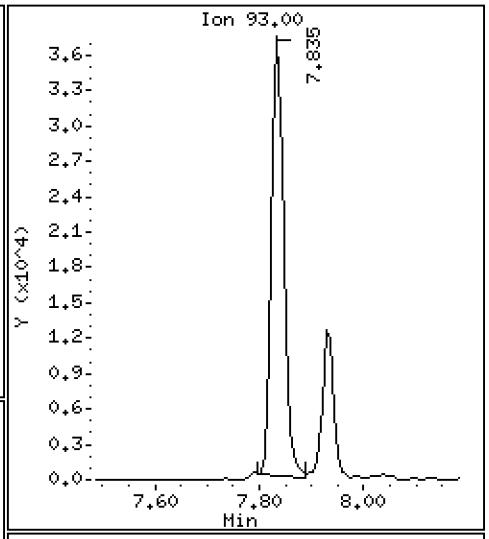
Concentration: 0.9291 ug/mL

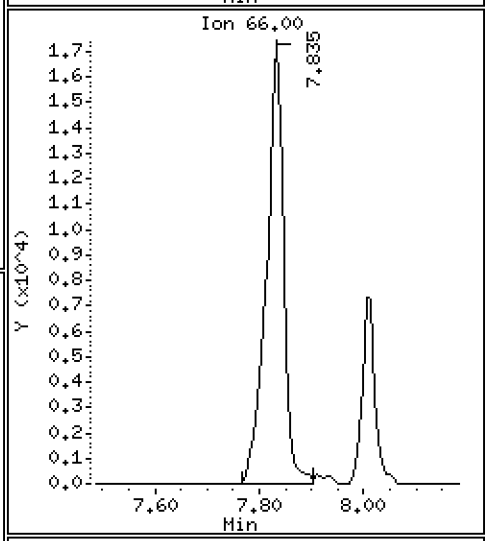


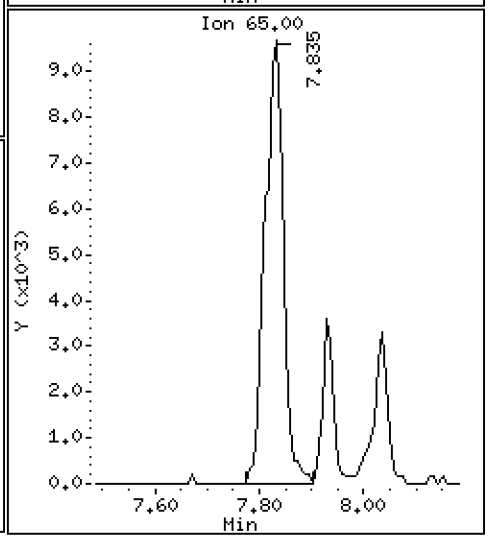












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

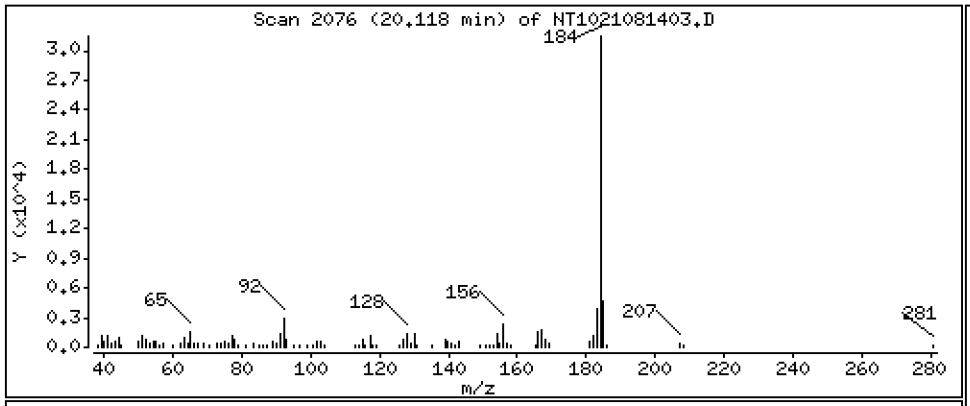
Operator: VTS

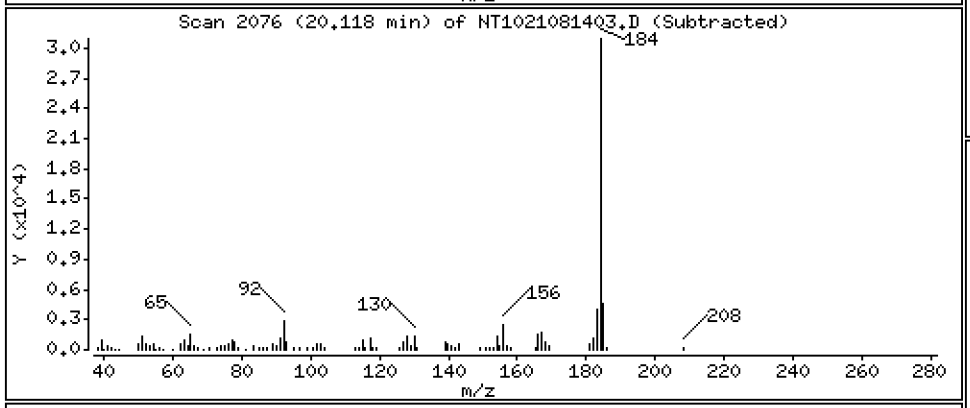
Column phase: ZB-5msi

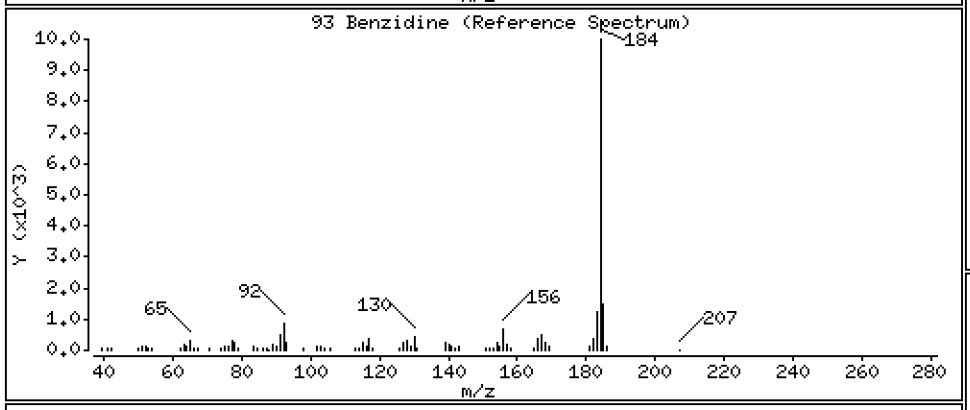
Column diameter: 0.25

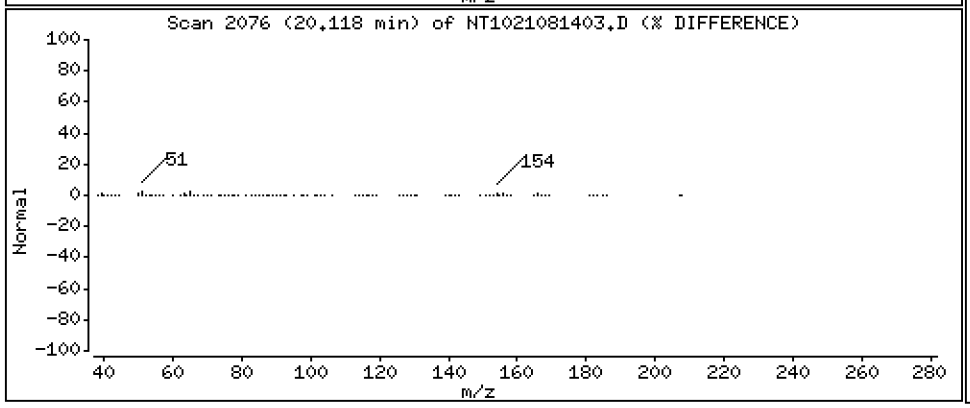
93 Benzidine

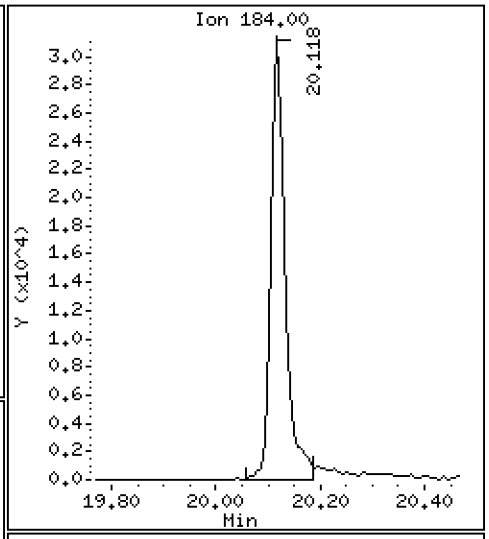
Concentration: 0.8639 ug/mL

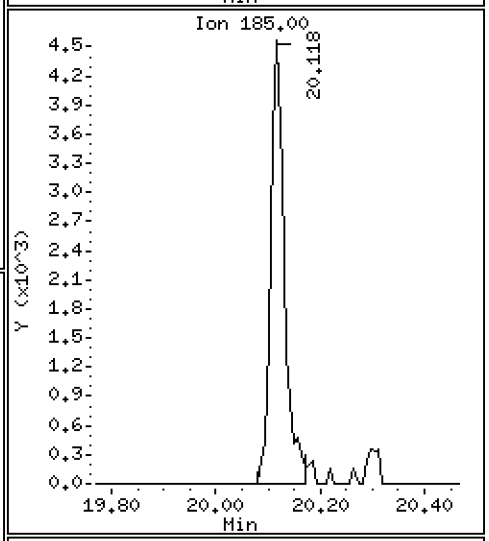


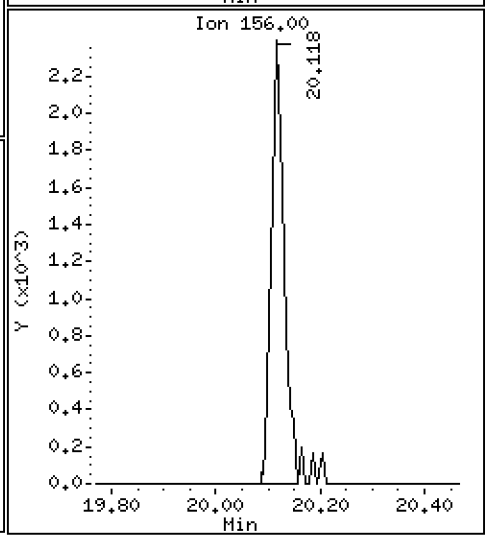












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

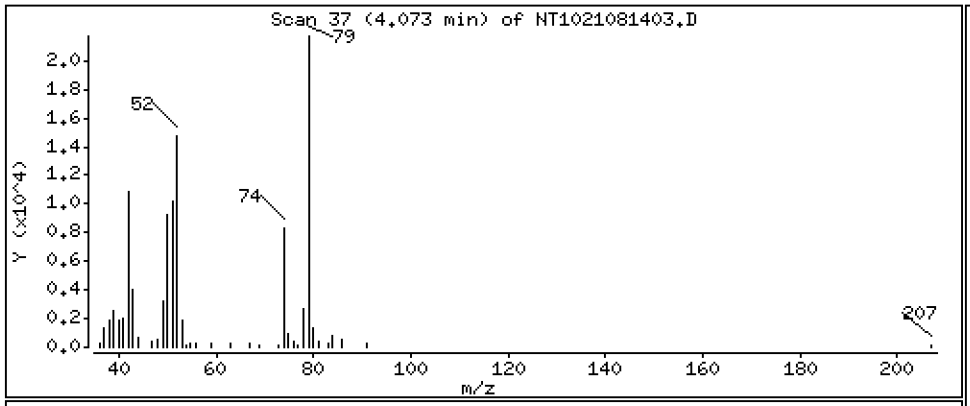
Operator: VTS

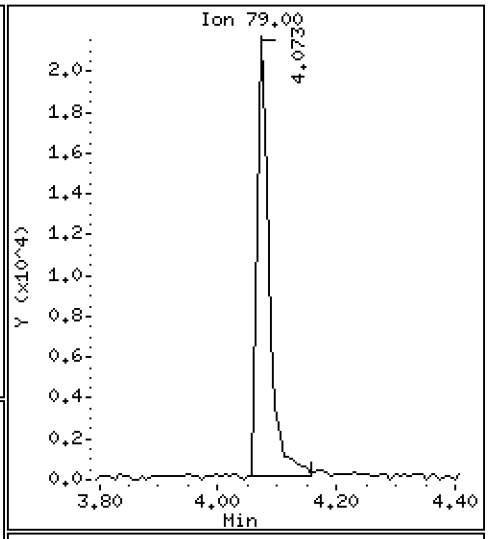
Column phase: ZB-5msi

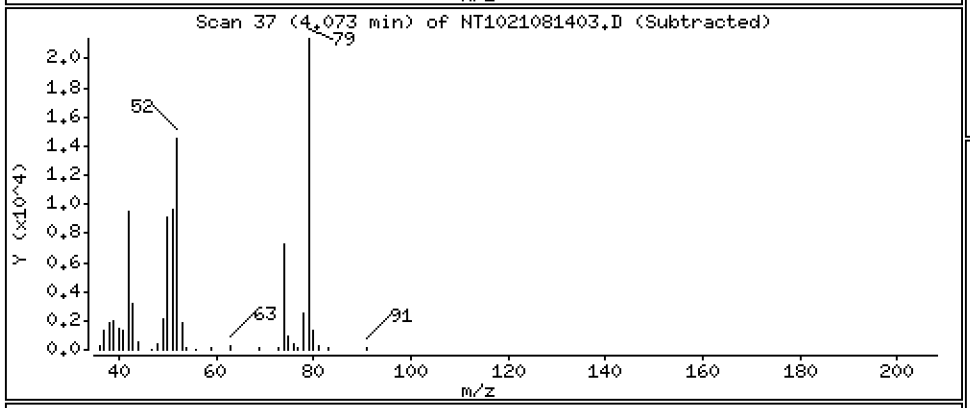
Column diameter: 0.25

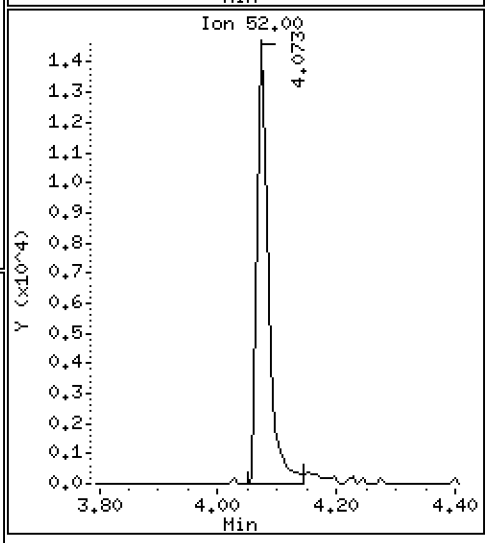
103 Pyridine

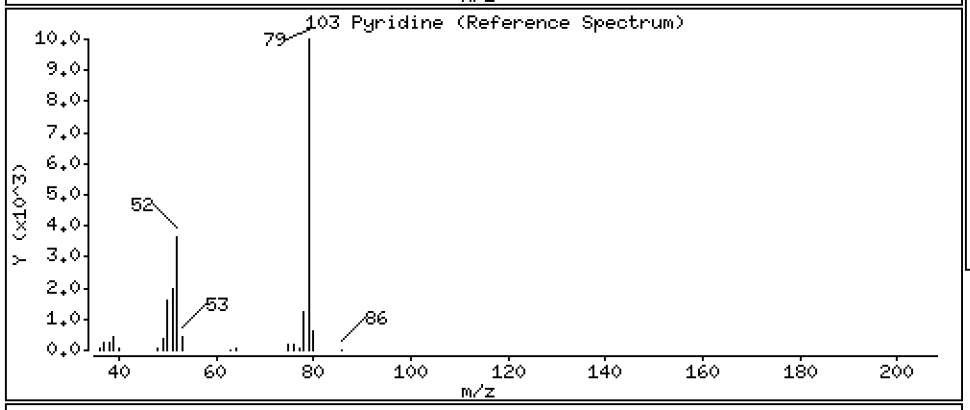
Concentration: 0.6064 ug/mL

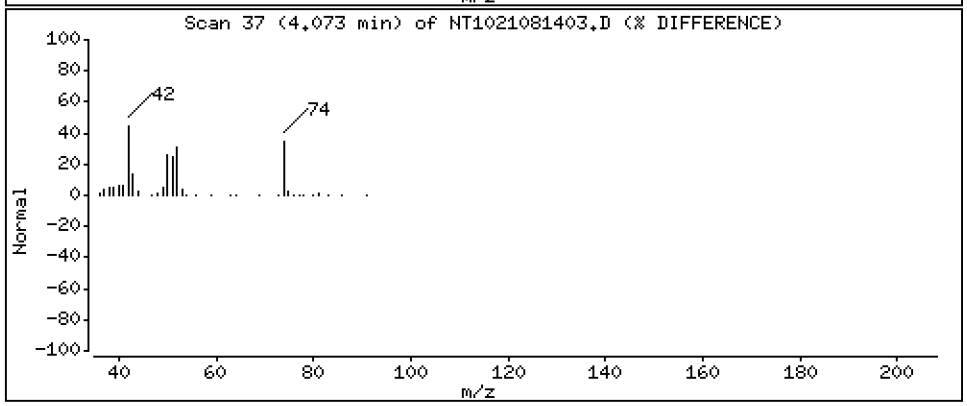












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

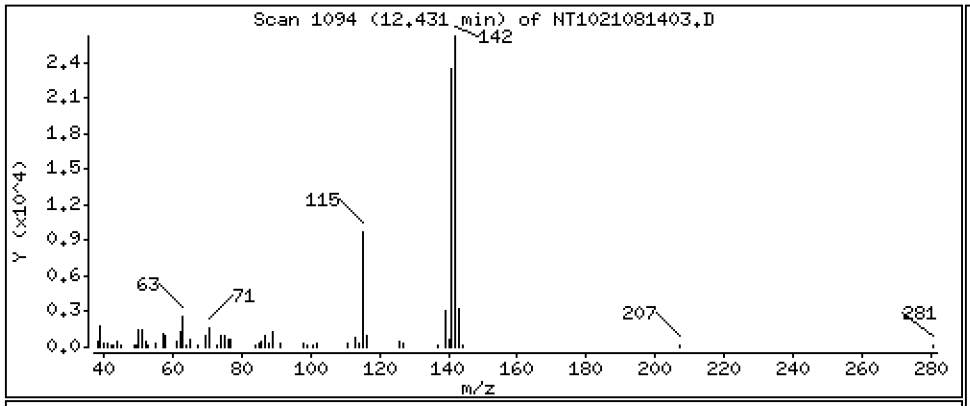
Operator: VTS

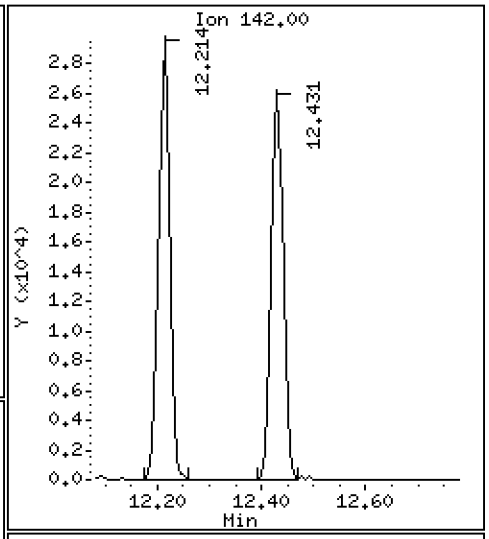
Column phase: ZB-5msi

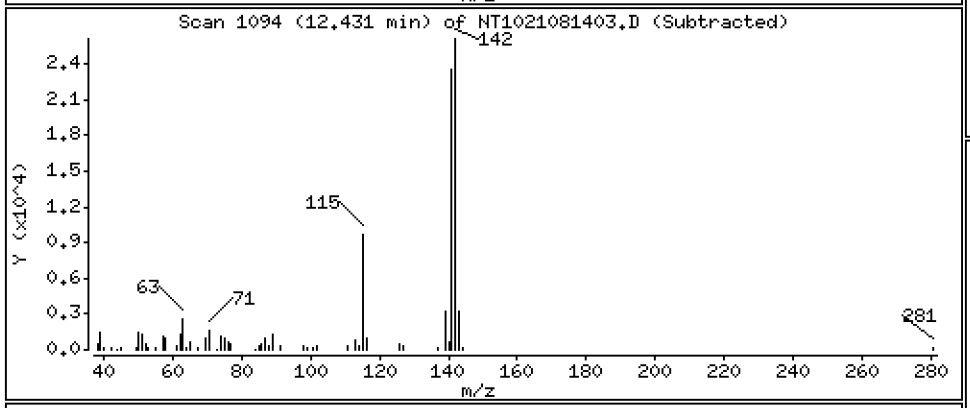
Column diameter: 0.25

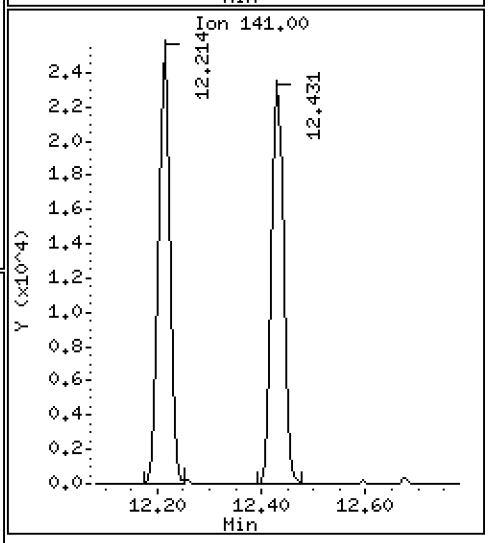
105 1-methylnaphthalene

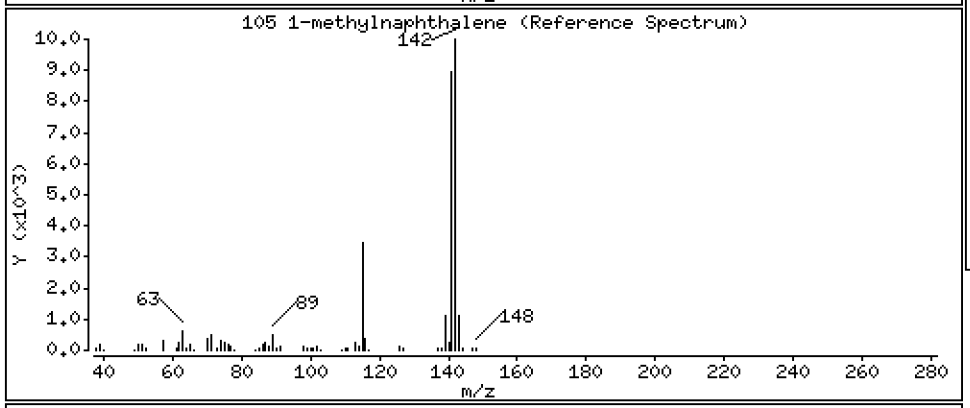
Concentration: 0.4533 ug/mL

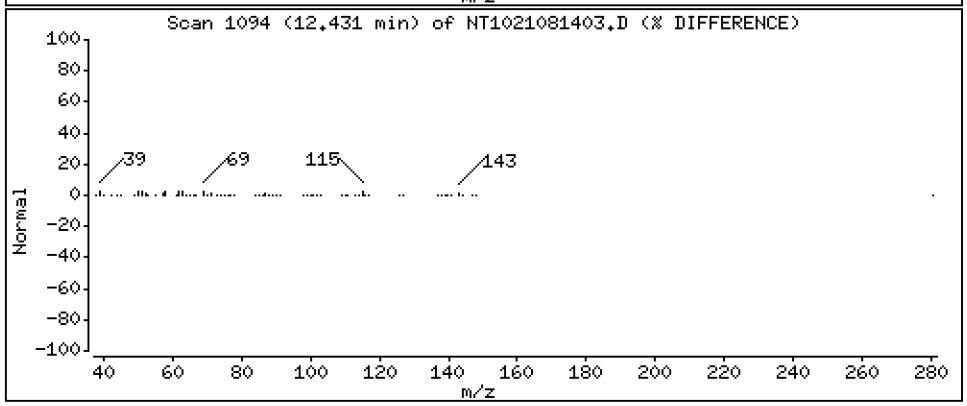












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

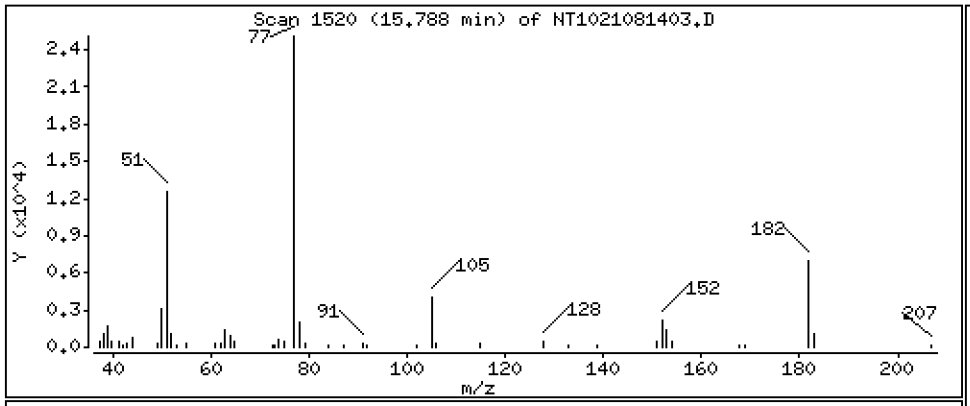
Operator: VTS

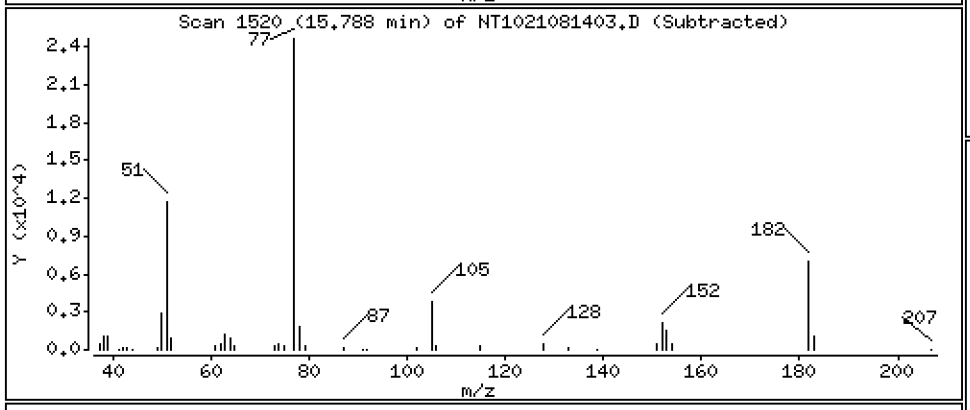
Column phase: ZB-5msi

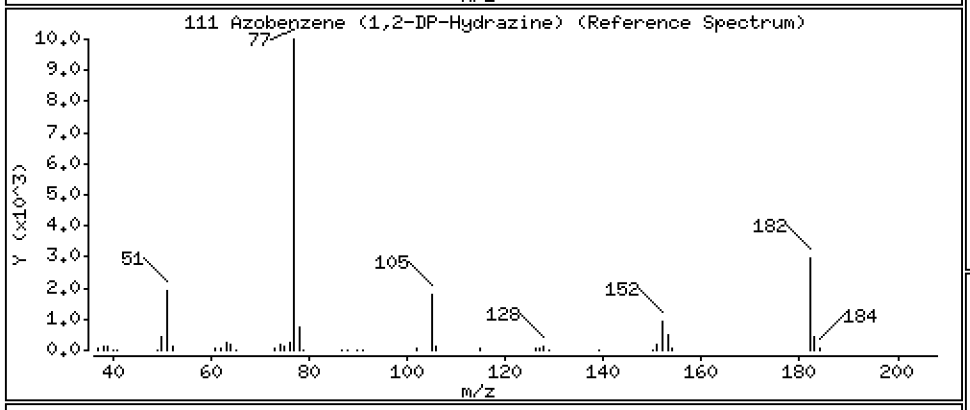
Column diameter: 0.25

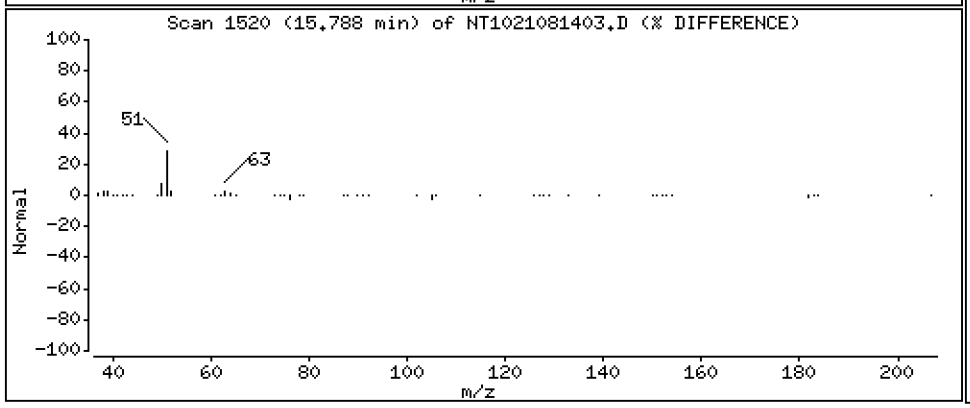
111 Azobenzene (1,2-DP-Hydrazine)

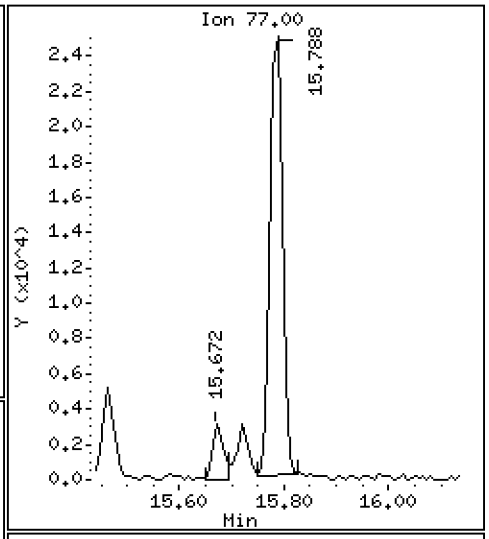
Concentration: 0.4174 ug/mL

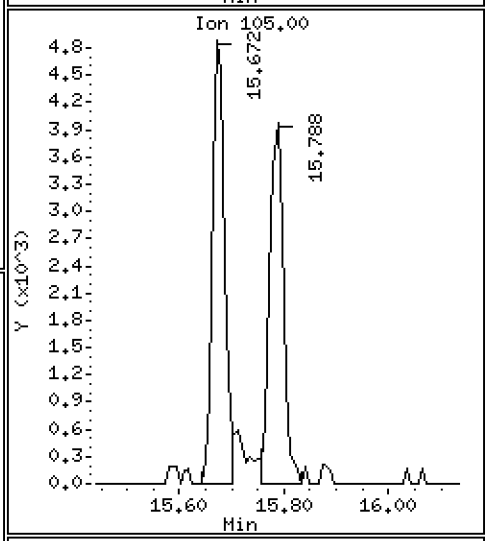


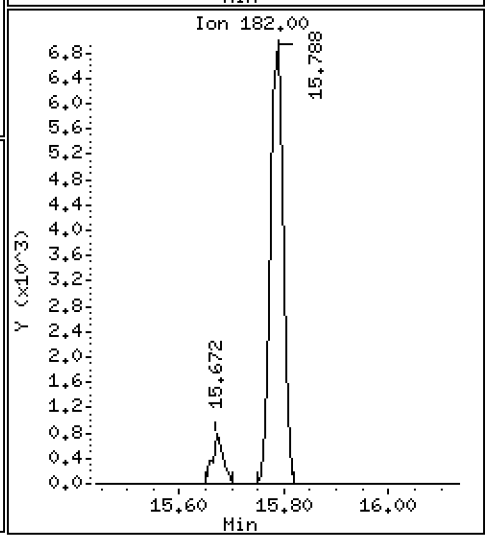












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

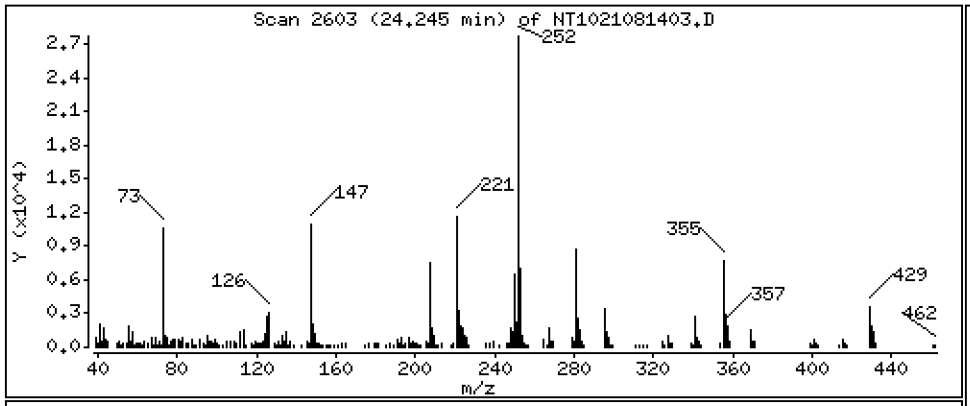
Operator: VTS

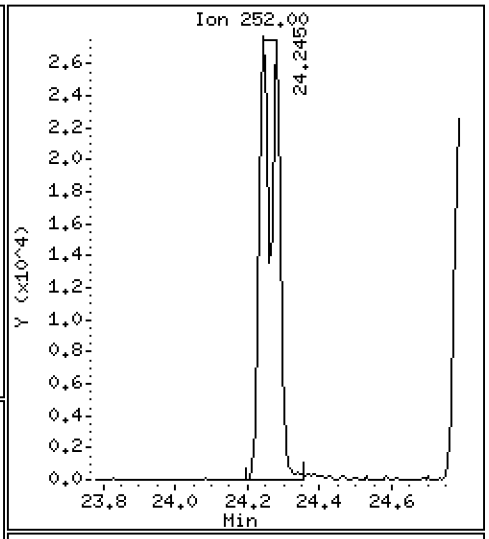
Column phase: ZB-5msi

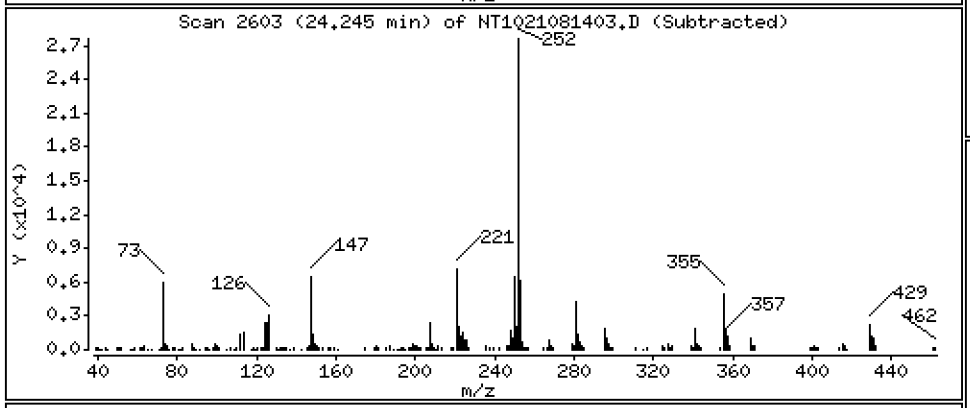
Column diameter: 0.25

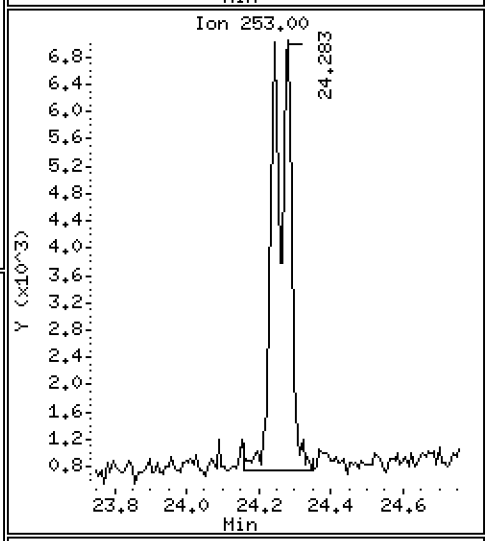
187 Total Benzofluoranthenes

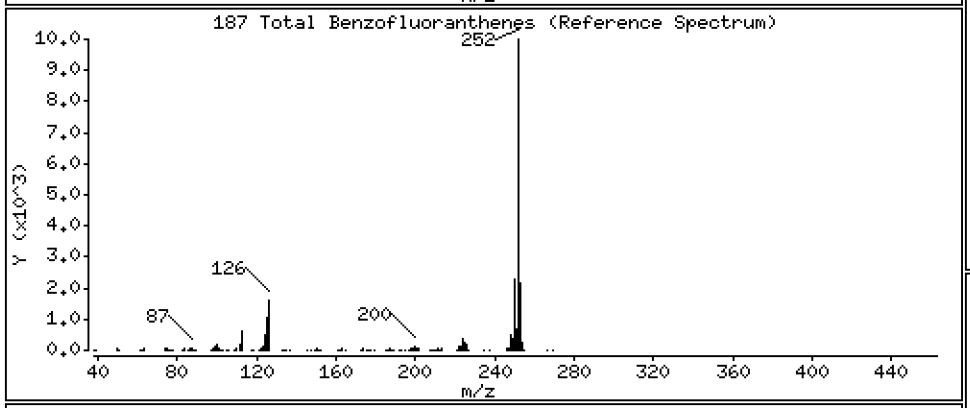
Concentration: 0.9633 ug/mL

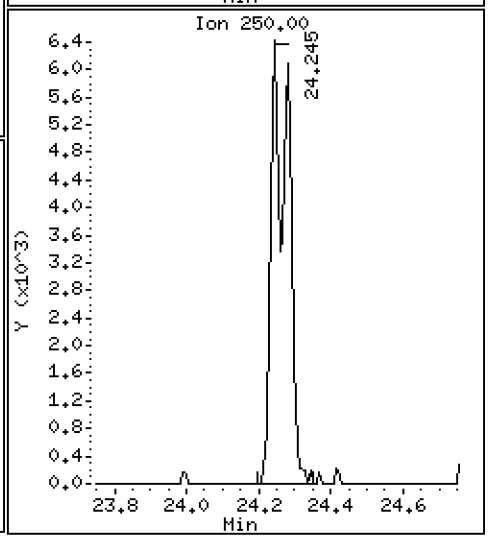


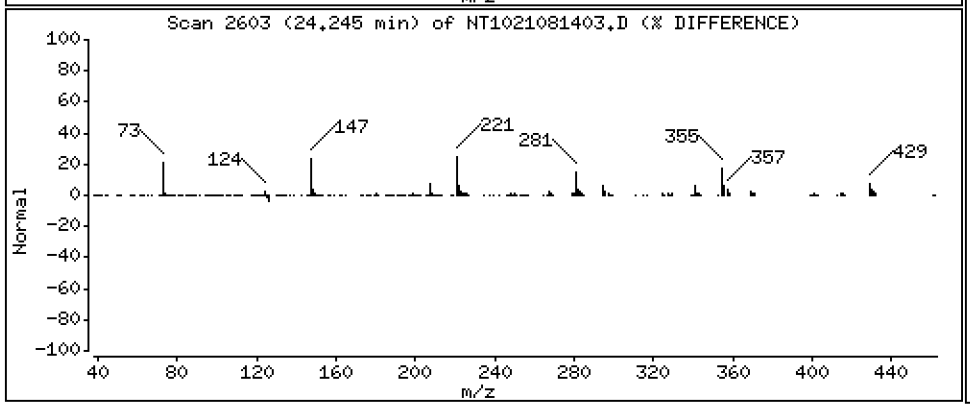












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

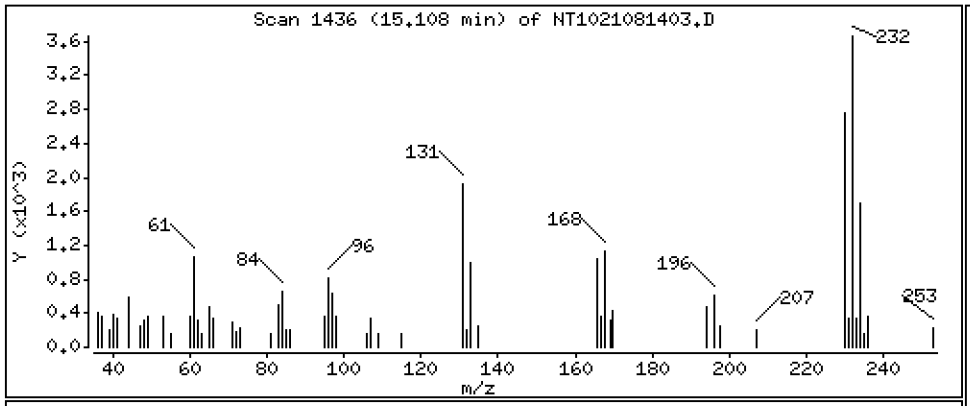
Operator: VTS

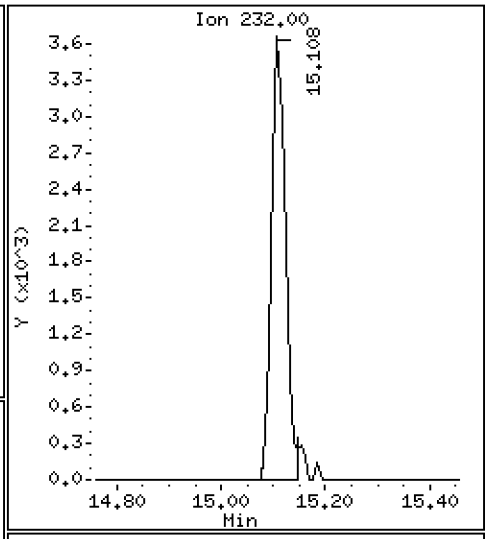
Column phase: ZB-5msi

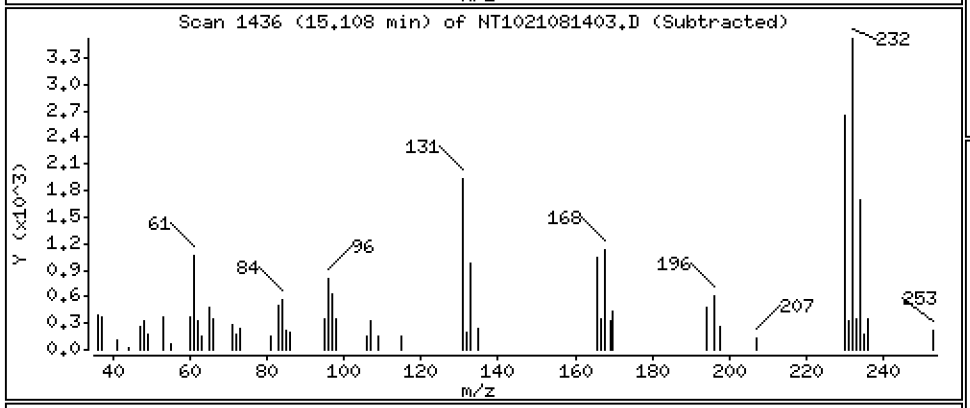
Column diameter: 0.25

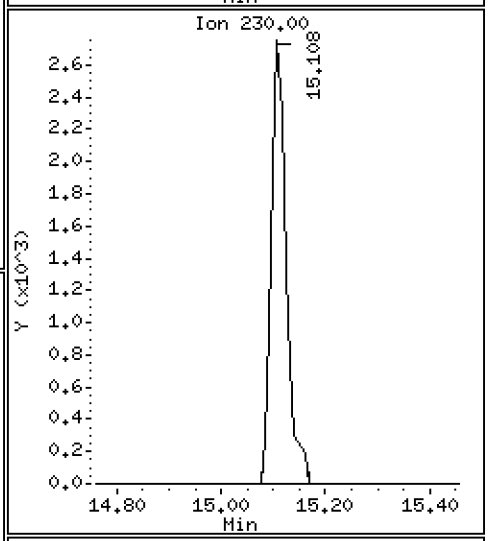
120 2,3,4,6-Tetrachlorophenol

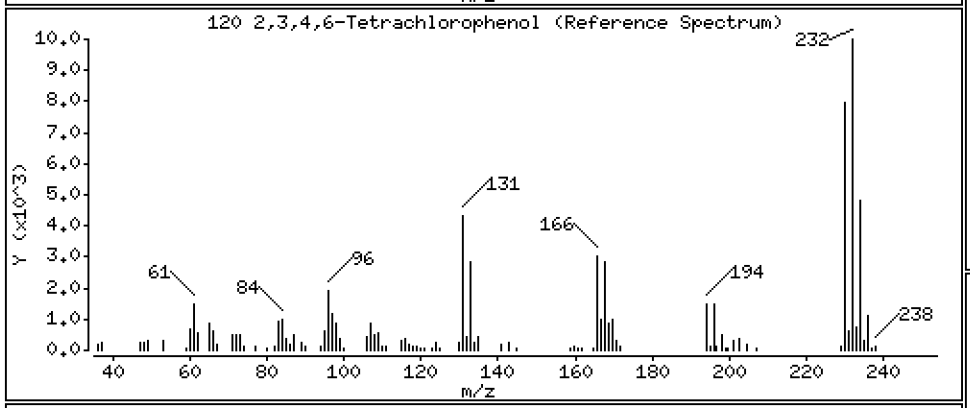
Concentration: 0.2953 ug/mL

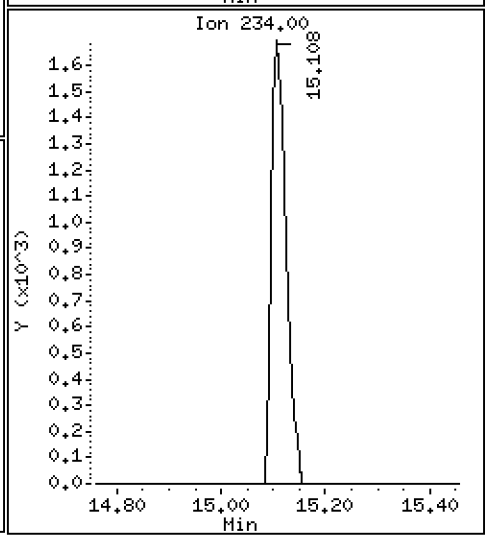


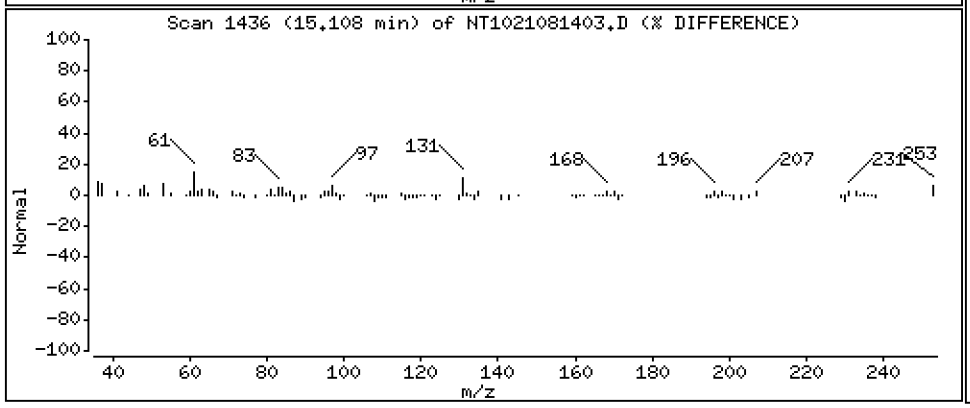












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

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Lab Smp Id: SJH0174-LCV1
Inj Date : 14-AUG-2021 10:30
Operator : VTS Inst ID: nt10.i
Smp Info : SJH0174-LCV1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$ 1 2-Fluorophenol	112	6.211	6.204	(0.744)	33104	0.72238	0.7224
$ 2 Phenol-d5	99	7.788	7.788	(0.932)	43266	0.63609	0.6361
3 Phenol	94	7.811	7.811	(0.935)	31830	0.53535	0.5353
$ 5 2-Chlorophenol-d4	132	8.004	8.004	(0.958)	36444	0.75997	0.7600
4 Bis(2-Chloroethyl)ether	93	7.927	7.935	(0.949)	18927	0.39856	0.3986
6 2-Chlorophenol	128	8.035	8.035	(0.962)	26033	0.57846	0.5785
7 1,3-Dichlorobenzene	146	8.283	8.283	(0.992)	23932	0.48409	0.4841
* 8 1,4-Dichlorobenzene-d4	152	8.353	8.353	(1.000)	116447	4.00000	
9 1,4-Dichlorobenzene	146	8.384	8.384	(1.004)	16822	0.39853	0.3985
$ 10 1,2-Dichlorobenzene-d4	152	8.702	8.702	(1.042)	16250	0.52686	0.5269
12 1,2-Dichlorobenzene	146	8.725	8.726	(1.045)	20402	0.45694	0.4569
11 Benzyl alcohol	108	8.694	8.648	(1.041)	1317	0.04731	0.04731
14 2,2'-oxybis(1-Chloropropane)	121	8.927	8.935	(1.069)	4565	0.26651	0.2665
13 2-Methylphenol	108	8.896	8.896	(1.065)	15562	0.42050	0.4205
17 Hexachloroethane	117	9.300	9.300	(1.113)	7473	0.41187	0.4119
16 N-Nitroso-di-n-propylamine	70	9.191	9.191	(1.100)	12502	0.39159	0.3916
15 4-Methylphenol	108	9.168	9.160	(1.098)	17082	0.43012	0.4301
$ 18 Nitrobenzene-d5	82	9.439	9.440	(0.875)	23722	0.50607	0.5061
19 Nitrobenzene	77	9.470	9.471	(0.878)	19386	0.41860	0.4186
20 Isophorone	82	9.913	9.913	(0.919)	25496	0.29173	0.2917
21 2-Nitrophenol	139	10.091	10.091	(0.935)	9501	0.39410	0.3941
22 2,4-Dimethylphenol	107	10.184	10.184	(0.944)	36345	1.00036	1.000
23 Bis(2-Chloroethoxy)methane	93	10.362	10.363	(0.960)	18624	0.41054	0.4105
24 Benzoic acid	105	10.320	10.430	(0.956)	19519	0.96856	0.9686
25 2,4-Dichlorophenol	162	10.549	10.549	(0.978)	30397	1.00972	1.010
26 1,2,4-Trichlorobenzene	180	10.713	10.714	(0.993)	18410	0.54090	0.5409
* 27 Naphthalene-d8	136	10.791	10.791	(1.000)	382181	4.00000	
28 Naphthalene	128	10.829	10.837	(1.004)	44924	0.44416	0.4442
29 4-Chloroaniline	127	10.991	10.992	(1.019)	35763	0.71009	0.7101
30 Hexachlorobutadiene	225	11.192	11.192	(1.037)	10568	0.56868	0.5687
31 4-Chloro-3-methylphenol	107	11.982	11.982	(1.110)	29996	0.83458	0.8346
32 2-Methylnaphthalene	142	12.214	12.214	(1.132)	43211	0.46175	0.4617
33 Hexachlorocyclopentadiene	237	12.670	12.671	(0.882)	2400	0.10863	0.1086

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	12.848	12.849	(0.895)	21082	0.91606	0.9161
	35 2,4,5-Trichlorophenol	196	12.934	12.926	(0.901)	21283	0.86793	0.8679
$	36 2-Fluorobiphenyl	172	13.003	13.003	(0.906)	50850	0.52862	0.5286
	37 2-Chloronaphthalene	162	13.189	13.189	(0.919)	34626	0.43084	0.4308
	38 2-Nitroaniline	65	13.475	13.483	(0.939)	25128	0.83427	0.8343
	39 Dimethylphthalate	163	13.916	13.917	(0.969)	39499	0.50812	0.5081
	40 Acenaphthylene	152	14.048	14.048	(0.978)	58831	0.51471	0.5147
	41 2,6-Dinitrotoluene	165	14.048	14.048	(0.978)	16140	0.91573	0.9157
*	42 Acenaphthene-d10	164	14.358	14.358	(1.000)	209472	4.00000	
	43 3-Nitroaniline	138	14.327	14.335	(0.998)	18560	0.84989	0.8499
	44 Acenaphthene	153	14.427	14.427	(1.005)	28401	0.42799	0.4280
	45 2,4-Dinitrophenol	184	14.551	14.543	(1.013)	3166	0.31707	0.3171
	46 Dibenzofuran	168	14.752	14.752	(1.027)	49083	0.47841	0.4784
	47 4-Nitrophenol	109	14.721	14.713	(1.025)	5907	0.70619	0.7062(M)
	48 2,4-Dinitrotoluene	165	14.845	14.853	(1.034)	19863	0.84364	0.8436
	50 Diethylphthalate	149	15.363	15.363	(1.070)	34250	0.46470	0.4647
	49 Fluorene	166	15.456	15.456	(1.076)	45935	0.46183	0.4618
	51 4-Chlorophenyl-phenylether	204	15.463	15.463	(1.077)	18076	0.31264	0.3126
	52 4-Nitroaniline	138	15.587	15.587	(1.086)	20566	0.88646	0.8865
	53 4,6-Dinitro-2-methylphenol	198	15.672	15.680	(0.903)	20965	1.18747	1.187
	54 N-Nitrosodiphenylamine	169	15.726	15.726	(0.906)	33963	0.49124	0.4912
$	55 2,4,6-Tribromophenol	330	15.995	15.996	(1.114)	14195	0.81832	0.8183
	56 4-Bromophenyl-phenylether	248	16.458	16.458	(0.948)	14953	0.42501	0.4250
	57 Hexachlorobenzene	284	16.752	16.752	(0.965)	20215	0.54673	0.5467
	58 Pentachlorophenol	266	17.139	17.132	(0.987)	2870	0.19169	0.1917
*	59 Phenanthrene-d10	188	17.363	17.364	(1.000)	385291	4.00000	
	60 Phenanthrene	178	17.418	17.418	(1.003)	47568	0.45654	0.4565
	61 Anthracene	178	17.503	17.503	(1.008)	48485	0.43516	0.4352
	62 Carbazole	167	17.859	17.859	(1.029)	48061	0.43694	0.4369
	63 Di-n-butylphthalate	149	18.710	18.710	(1.078)	56910	0.33977	0.3398
	64 Fluoranthene	202	19.832	19.839	(0.882)	67363	0.46707	0.4671
	65 Pyrene	202	20.265	20.265	(0.901)	70134	0.44115	0.4411
$	66 Terphenyl-d14	244	20.590	20.590	(0.915)	69187	0.61060	0.6106
	67 Butylbenzylphthalate	149	21.558	21.558	(0.958)	26170	0.50045	0.5004
	68 Benzo(a)anthracene	228	22.464	22.464	(0.999)	65674	0.50853	0.5085
*	69 Chrysene-d12	240	22.495	22.495	(1.000)	346086	4.00000	
	70 3,3'-Dichlorobenzidine	252	22.448	22.456	(0.998)	83587	1.61111	1.611
	71 Chrysene	228	22.533	22.541	(1.002)	44203	0.44395	0.4439
	72 bis(2-Ethylhexyl)phthalate	149	22.618	22.619	(0.958)	27012	0.60614	0.6061
*	134 Di-n-octylphthalate-d4	153	23.602	23.610	(1.000)	405063	4.00000	
	73 Di-n-octylphthalate	149	23.617	23.617	(1.001)	48914	0.43088	0.4309
	74 Benzo(b)fluoranthene	252	24.244	24.252	(0.974)	47550	0.47460	0.4746
	75 Benzo(k)fluoranthene	252	24.283	24.283	(0.976)	50500	0.50885	0.5089
	76 Benzo(a)pyrene	252	24.786	24.786	(0.996)	42218	0.46625	0.4663
*	77 Perylene-d12	264	24.879	24.887	(1.000)	254250	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.049	27.057	(1.087)	50520	0.49298	0.4930
	79 Dibenzo(a,h)anthracene	278	27.064	27.072	(1.088)	42199	0.52426	0.5243
	80 Benzo(g,h,i)perylene	276	27.678	27.686	(1.112)	41273	0.45132	0.4513
	90 N-Nitrosodimethylamine	74	4.065	4.065	(0.487)	17433	0.55605	0.5561
	91 Aniline	93	7.834	7.834	(0.938)	57507	0.92911	0.9291
	93 Benzidine	184	20.118	20.118	(0.894)	56981	0.86389	0.8639
	103 Pyridine	79	4.073	4.057	(0.488)	29905	0.60635	0.6064
	105 1-methylnaphthalene	142	12.430	12.431	(1.152)	39802	0.45331	0.4533
	111 Azobenzene (1,2-DP-Hydrazine)	77	15.787	15.788	(1.100)	39222	0.41736	0.4174

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.244	24.283	(0.974)	92680	0.96330	0.9633
120 2,3,4,6-Tetrachlorophenol	232	15.107	15.108	(1.052)	6513	0.29529	0.2953

QC Flag Legend

M - Compound response manually integrated.

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081403.D
Lab Smp Id: SJH0174-LCV1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	116447	36.90
27 Naphthalene-d8	291658	145829	583316	382181	31.04
42 Acenaphthene-d10	163642	81821	327284	209472	28.01
59 Phenanthrene-d10	304099	152050	608198	385291	26.70
69 Chrysene-d12	199453	99727	398906	346086	73.52
134 Di-n-octylphthala	303639	151820	607278	405063	33.40
77 Perylene-d12	200082	100041	400164	254250	27.07

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.35	-0.00
27 Naphthalene-d8	10.79	10.29	11.29	10.79	-0.00
42 Acenaphthene-d10	14.36	13.86	14.86	14.36	-0.00
59 Phenanthrene-d10	17.36	16.86	17.86	17.36	-0.00
69 Chrysene-d12	22.50	22.00	23.00	22.50	-0.00
134 Di-n-octylphthala	23.61	23.11	24.11	23.60	-0.03
77 Perylene-d12	24.89	24.39	25.39	24.88	-0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081403.D

Lab ID: SJH0174-LCV1
nt10.i, ABN.m, 14-AUG-2021 10:30

RT	CO-ELUTION COMPOUNDS
14.049	Acenaphthylene and 2,6-Dinitrotoluene

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
1.041	1.035	0.0056	Benzyl alcohol
0.956	0.967	-0.0102	Benzoic acid

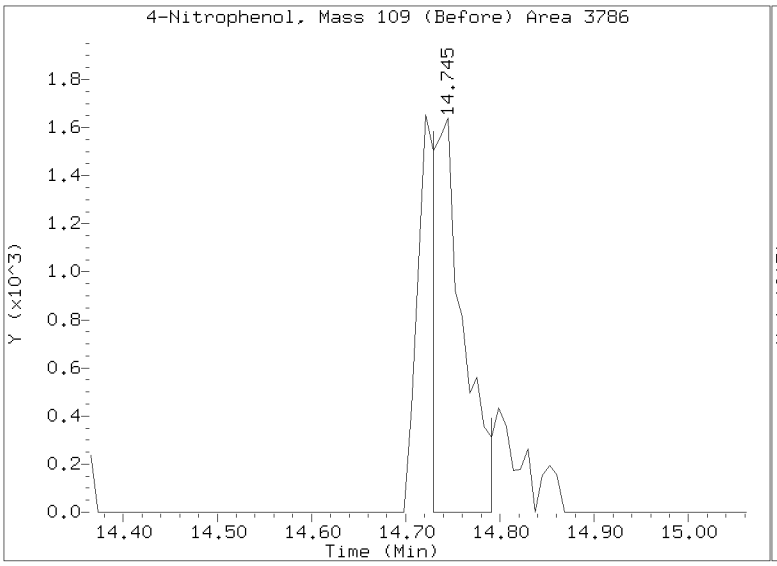
RRT check based on Ccal File: NT1021081402.D

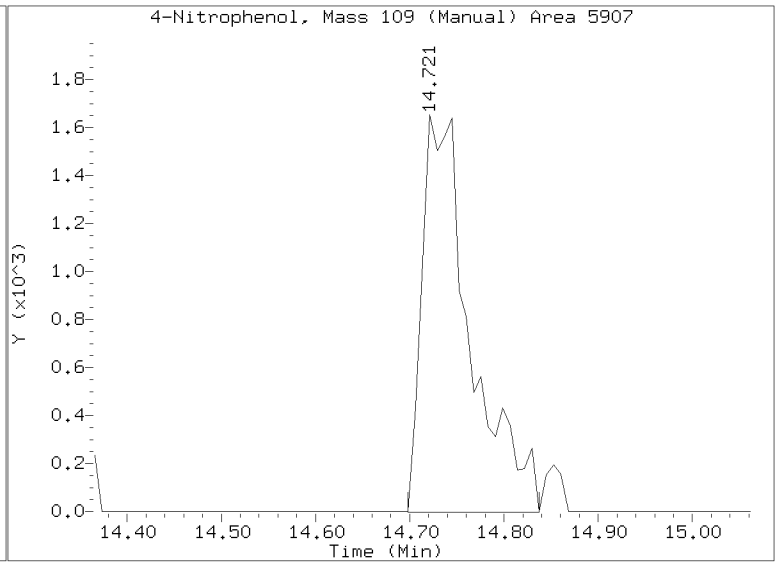
On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Quant Ion Manual Peak Adjustment Report

Datafile: //target/share/chem3/nt10.i/20210814.b/NT1021081403.D
Injection Date: 14-AUG-2021 10:30
Lab ID:SJH0174-LCV1 Client ID:
Report Date: 08/16/2021 09:23





Analytical Resources, Incorporated
Analytical Chemists and Consultants

LOW-CONCENTRATION CALIBRATION VERIFICATION

EPA 8270E

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Calibration: EG00057
Laboratory ID: SJH0174-LCV2
Sequence: SJH0174
Standard ID: J008130

ANALYTE	EXPECTED (ug/mL)	FOUND (ug/mL)	% DRIFT	QC LIMIT
Naphthalene	0.20000	0.2	-13.5	50.00
2-Methylnaphthalene	0.20000	0.2	-20.0	50.00
Acenaphthylene	0.20000	0.2	-3.0	50.00
Acenaphthene	0.20000	0.2	-14.8	50.00
Fluorene	0.20000	0.1	-26.4	50.00
Phenanthrene	0.20000	0.2	-11.7	50.00
Anthracene	0.20000	0.2	-20.0	50.00
Fluoranthene	0.20000	0.2	-15.0	50.00
Pyrene	0.20000	0.2	-21.1	50.00
Butylbenzylphthalate	0.20000	0.2	0.02	50.00
Benzo(a)anthracene	0.20000	0.2	3.6	50.00
Chrysene	0.20000	0.2	-12.4	50.00
Benzofluoranthenes, Total	0.40000	0.4	-4.3	50.00
Benzo(a)pyrene	0.20000	0.2	-4.4	50.00
Indeno(1,2,3-cd)pyrene	0.20000	0.2	-8.6	50.00
Dibenzo(a,h)anthracene	0.20000	0.2	-0.2	50.00
Benzo(g,h,i)perylene	0.20000	0.2	-8.2	50.00
1,2-Dichlorobenzene-d4	0.20000	0.206	2.8	50.00
Nitrobenzene-d5	0.20000	0.178	-11.0	50.00
2-Fluorobiphenyl	0.20000	0.203	1.3	50.00
p-Terphenyl-d14	0.20000	0.243	21.5	50.00

* Values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

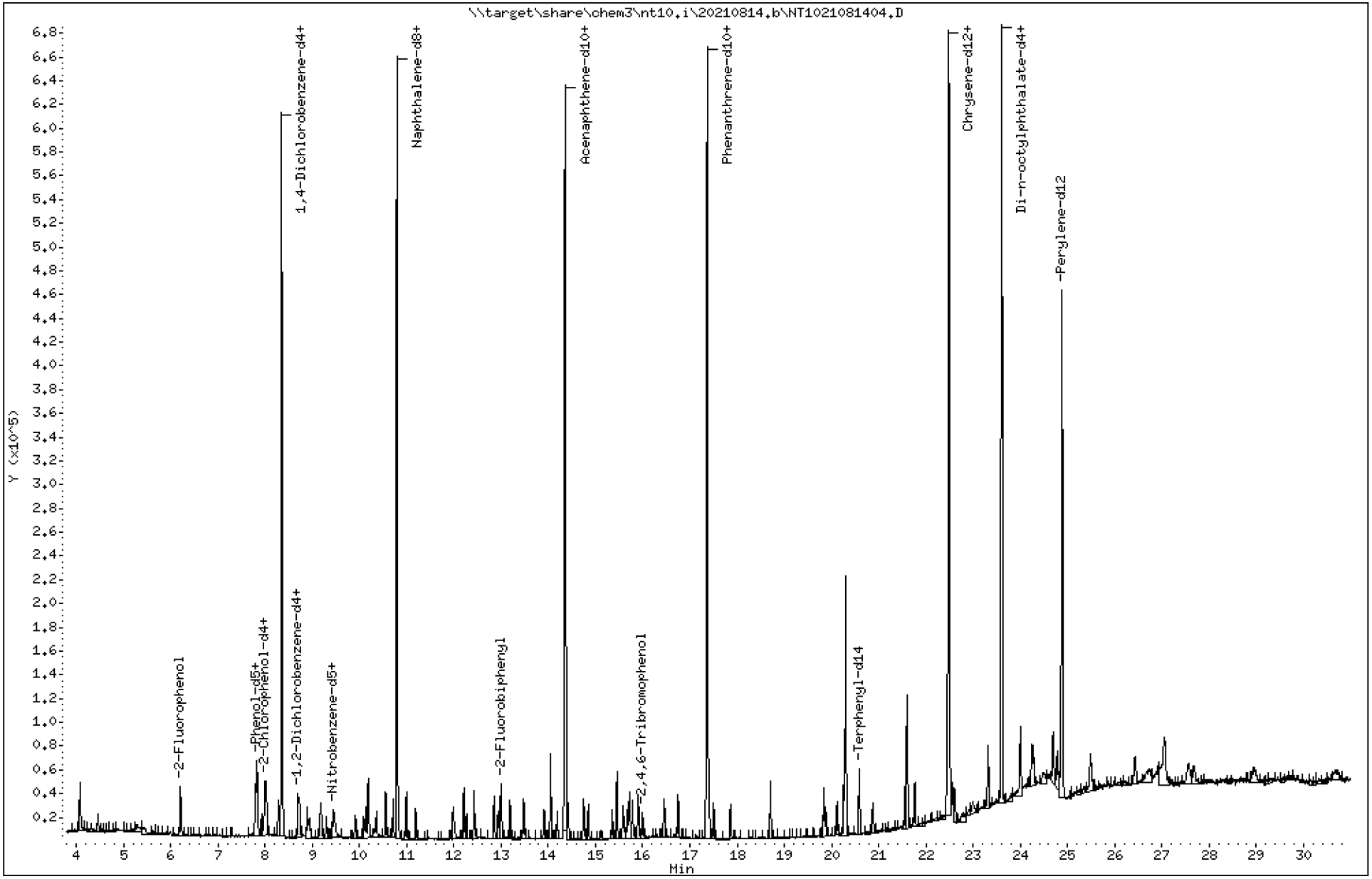
Instrument: nt10.i

Sample Info: SJH0174-LCV2

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

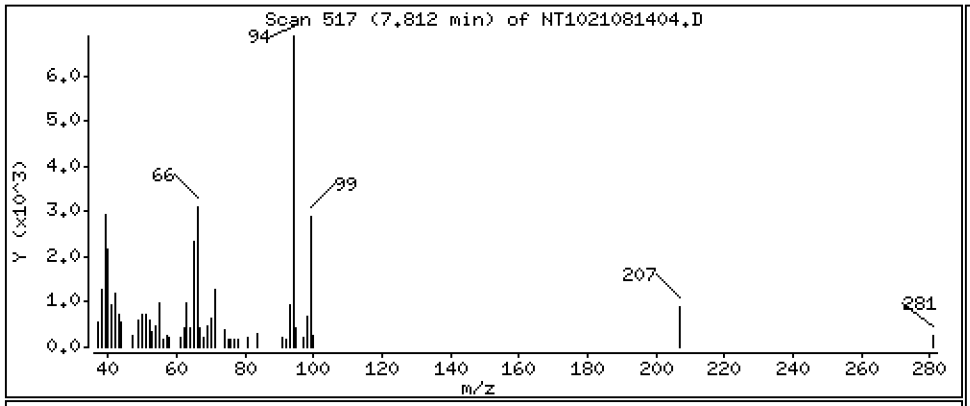
Operator: VTS

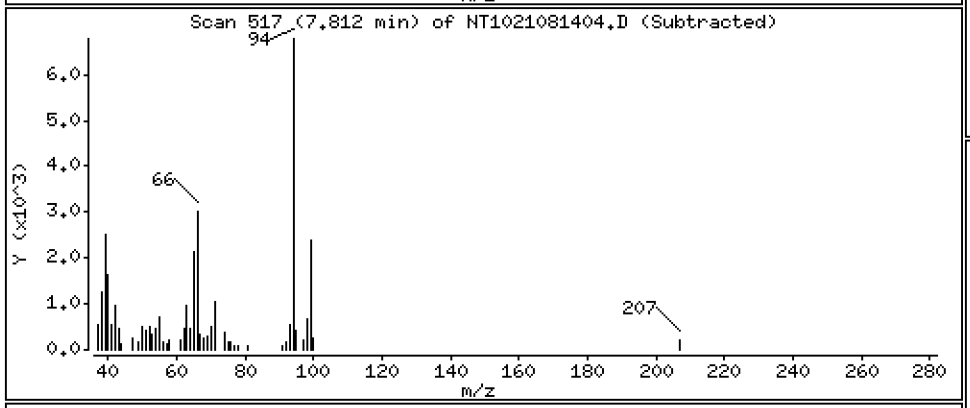
Column phase: ZB-5msi

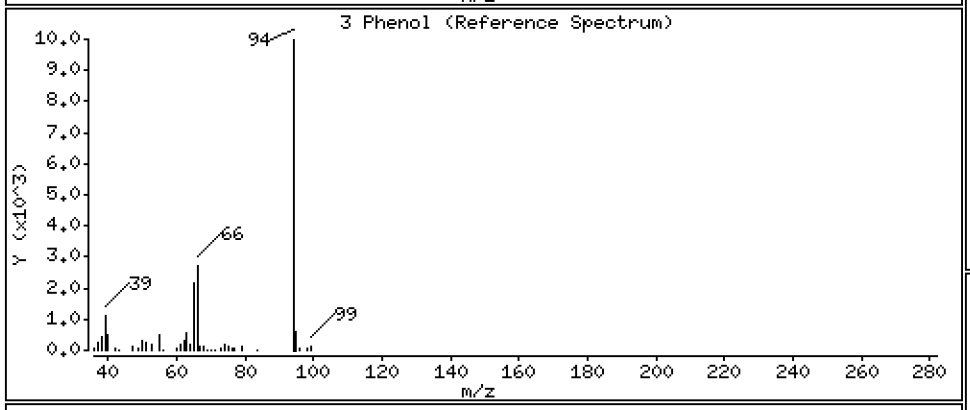
Column diameter: 0.25

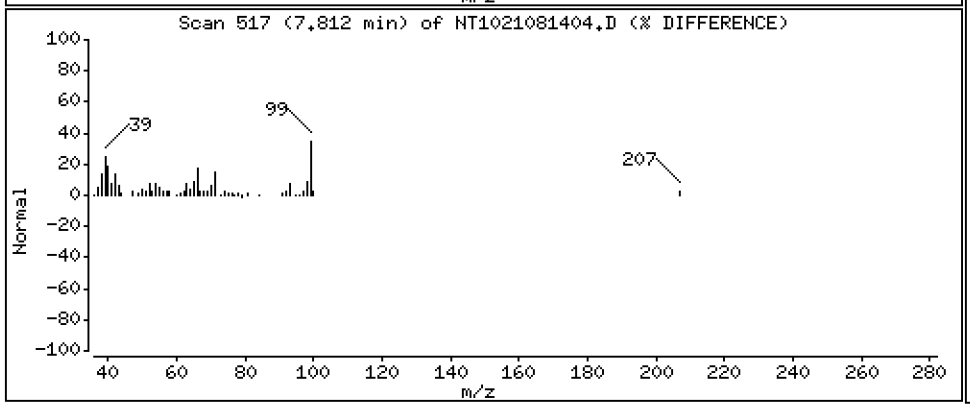
3 Phenol

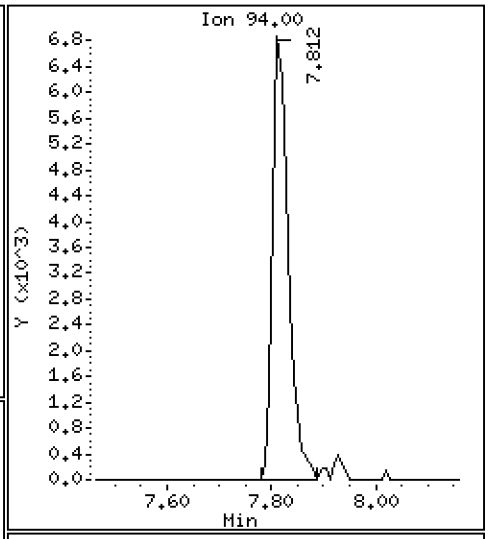
Concentration: 0.2023 ug/mL

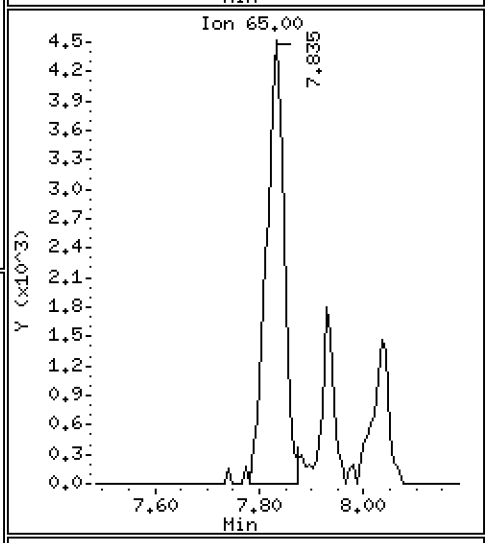


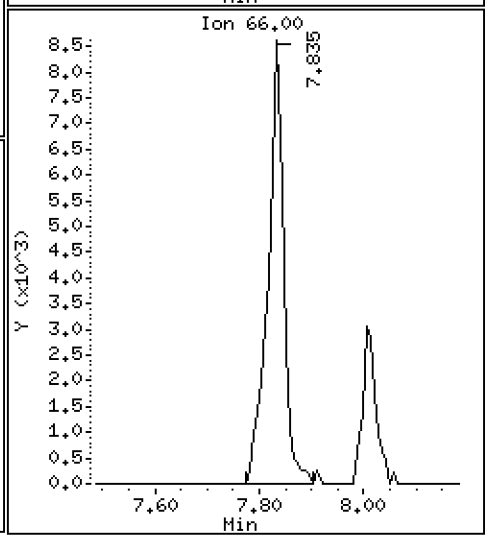












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

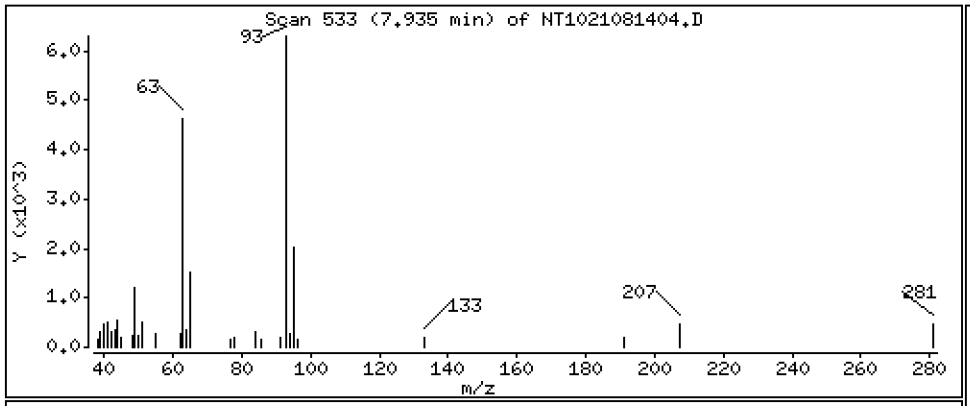
Operator: VTS

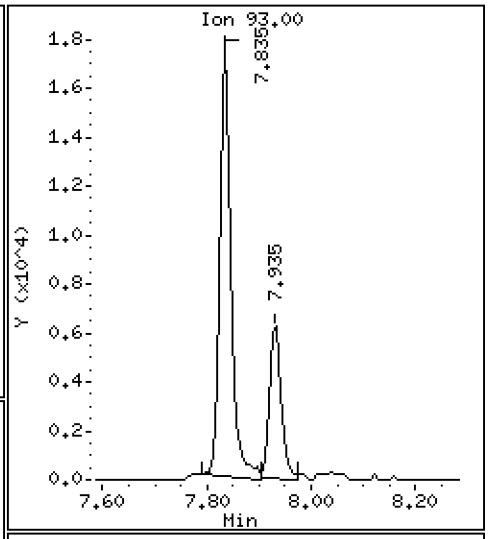
Column phase: ZB-5msi

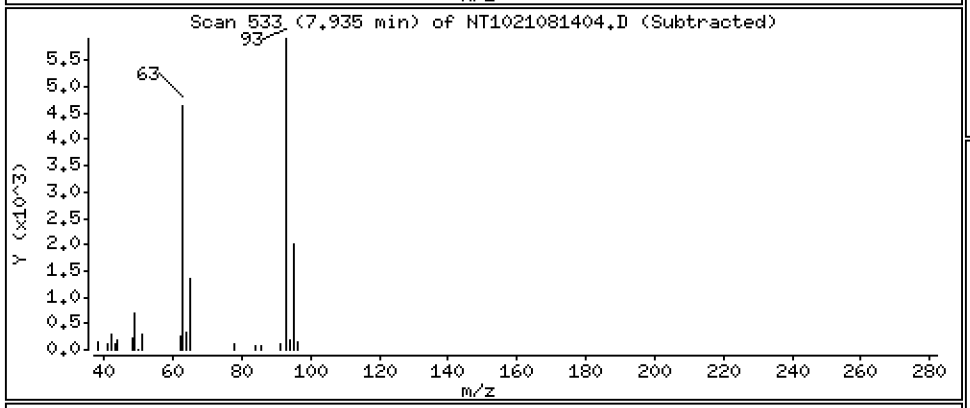
Column diameter: 0.25

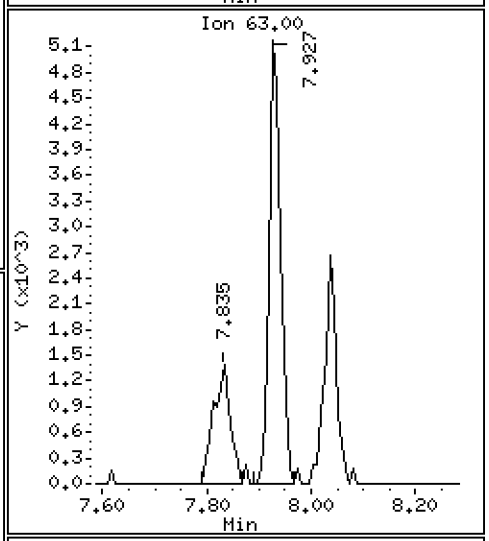
4 Bis(2-Chloroethyl)ether

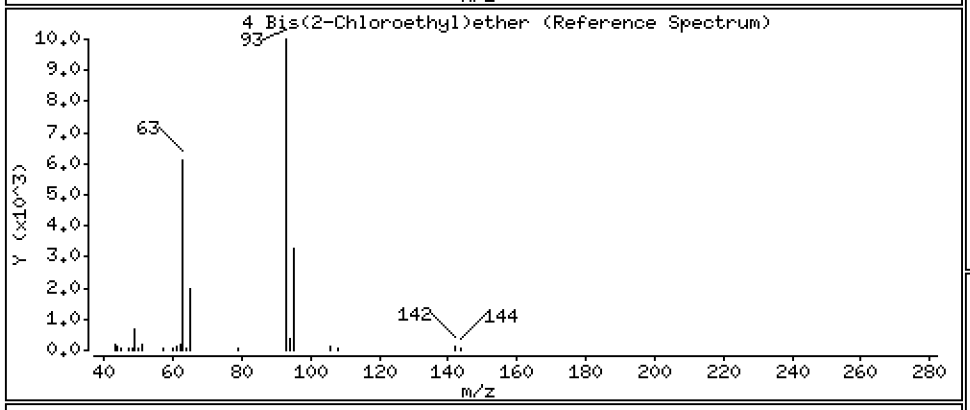
Concentration: 0.1816 ug/mL

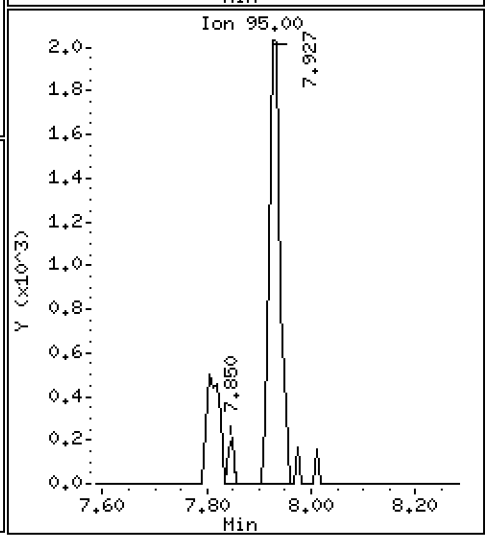


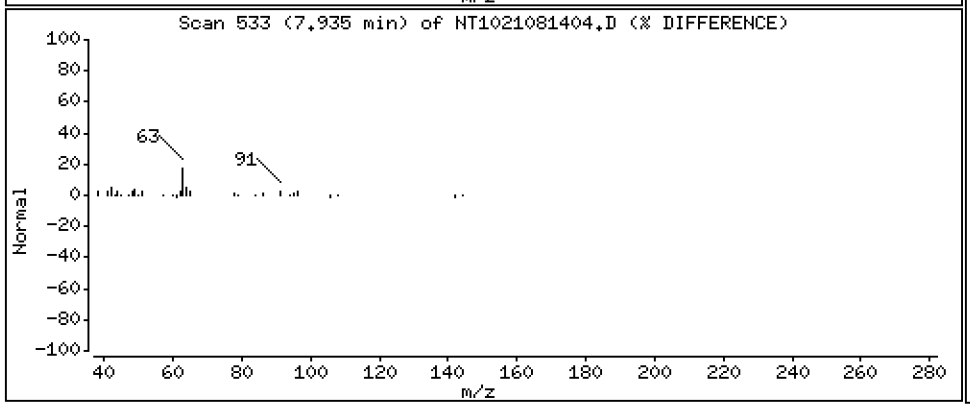












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

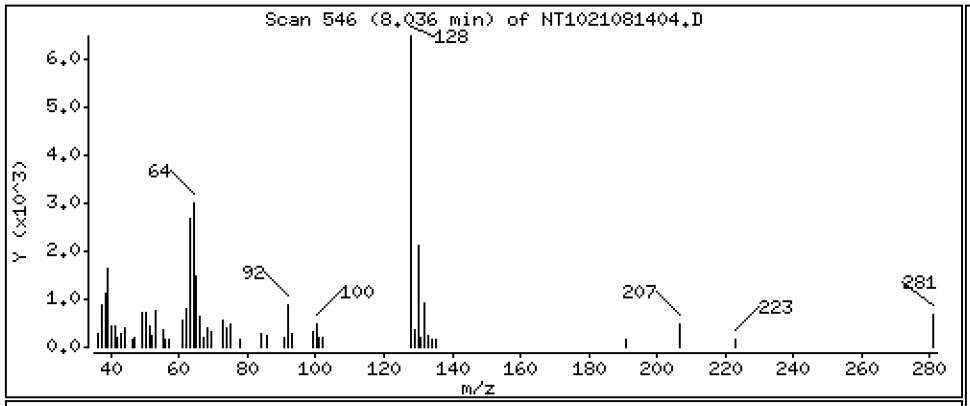
Operator: VTS

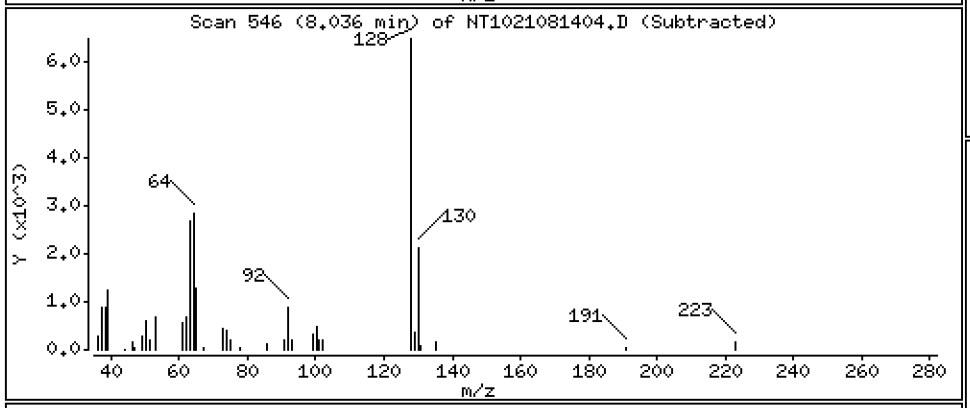
Column phase: ZB-5msi

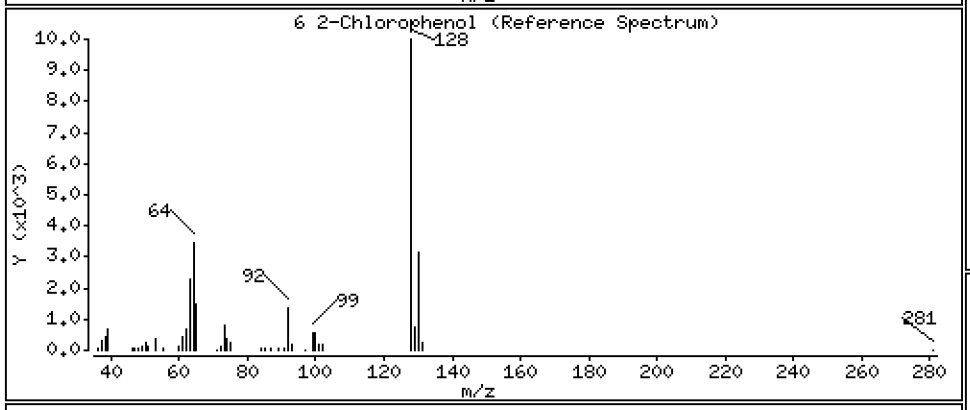
Column diameter: 0.25

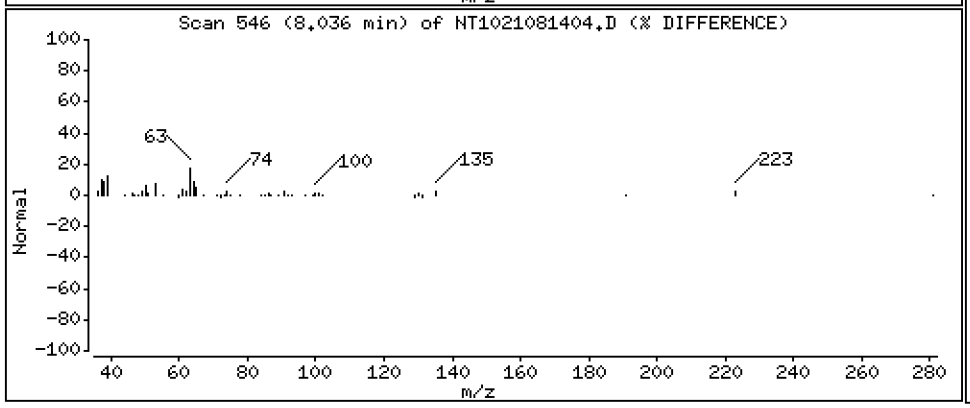
6 2-Chlorophenol

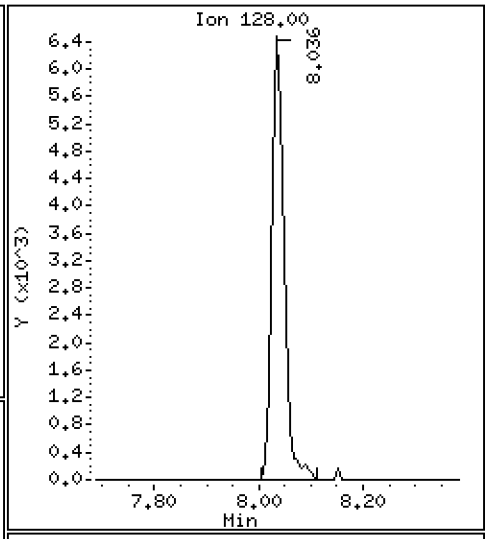
Concentration: 0.2287 ug/mL

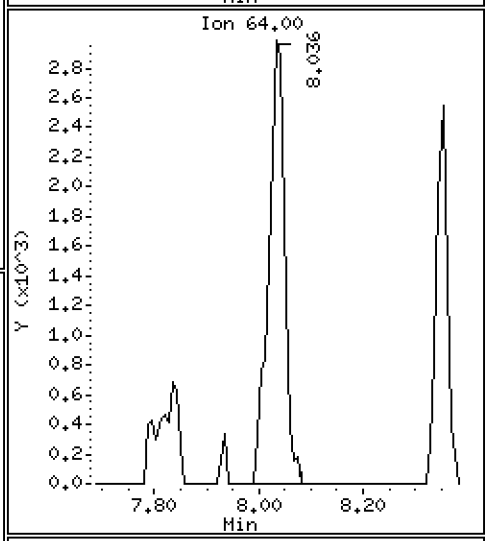


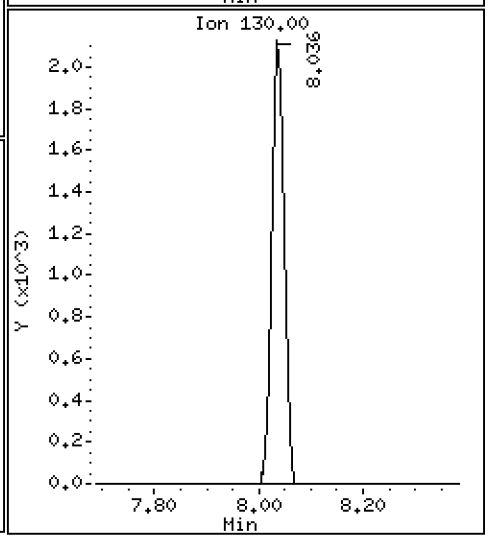












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

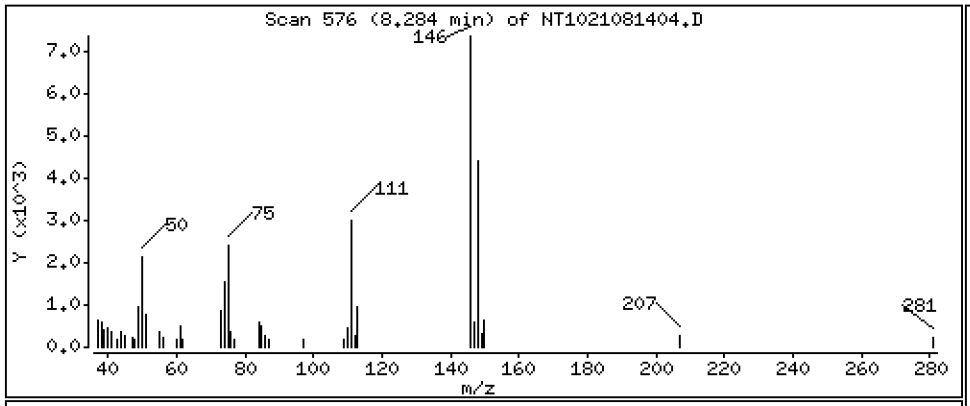
Operator: VTS

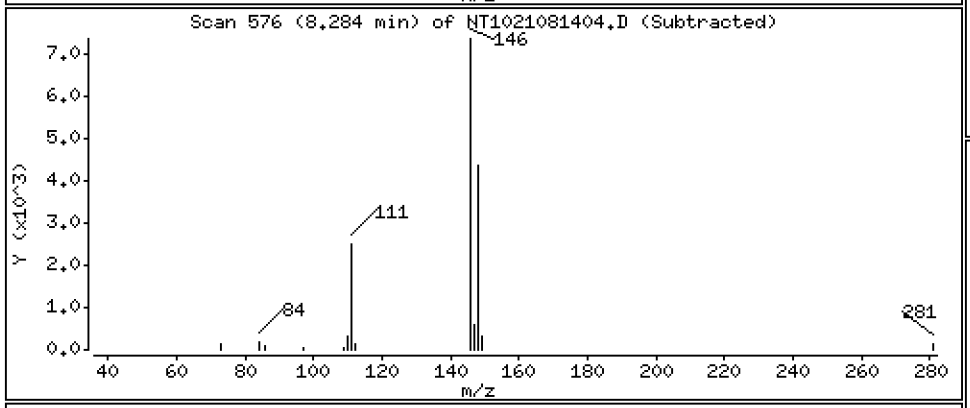
Column phase: ZB-5msi

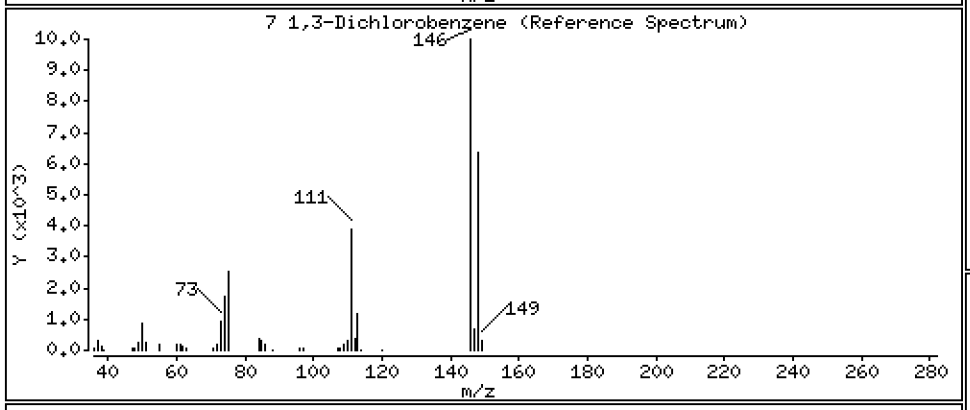
Column diameter: 0.25

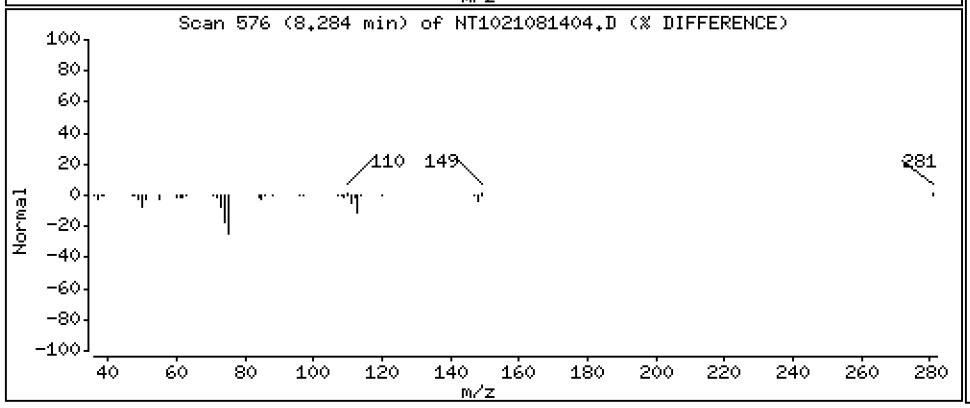
7 1,3-Dichlorobenzene

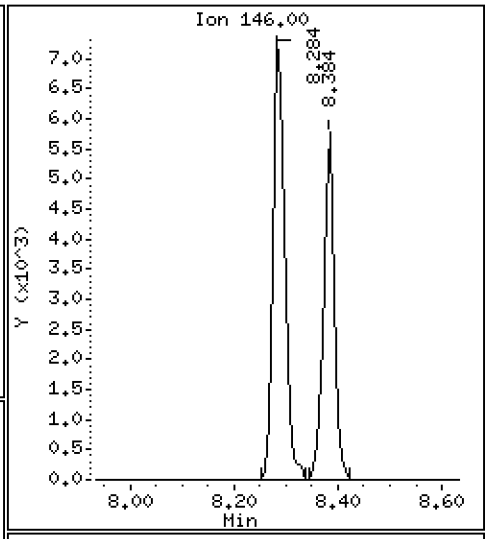
Concentration: 0.1923 ug/mL

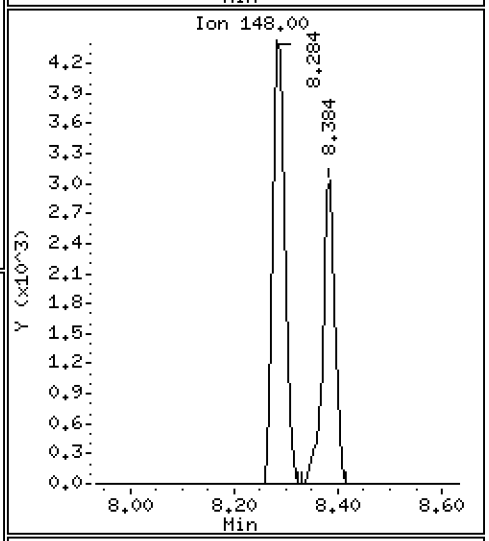


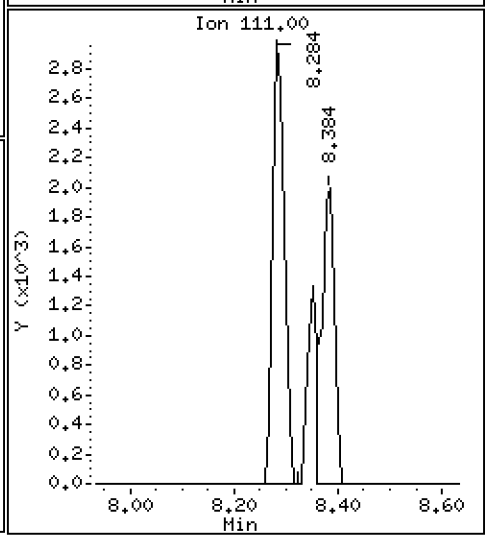












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

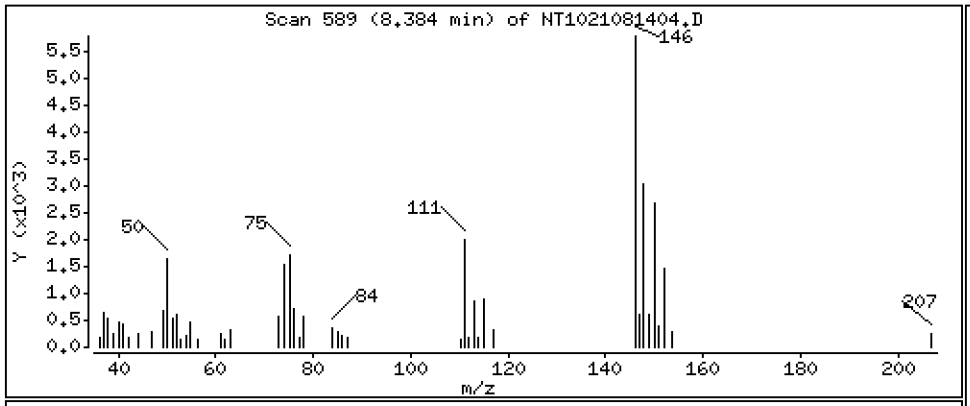
Operator: VTS

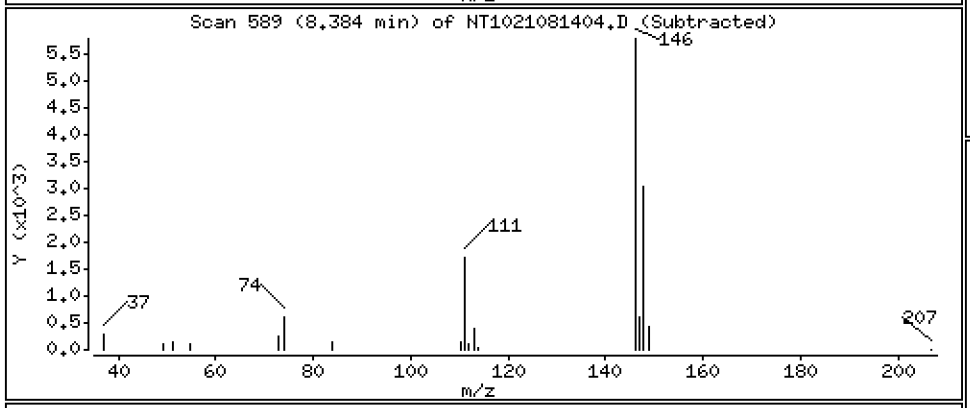
Column phase: ZB-5msi

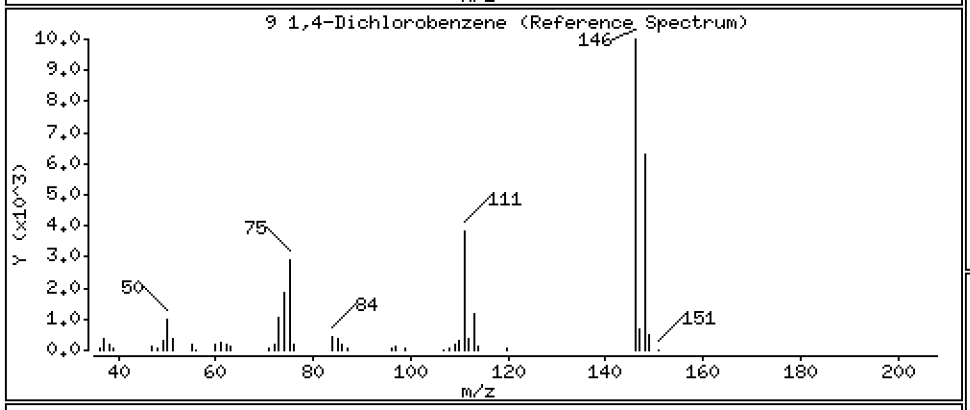
Column diameter: 0.25

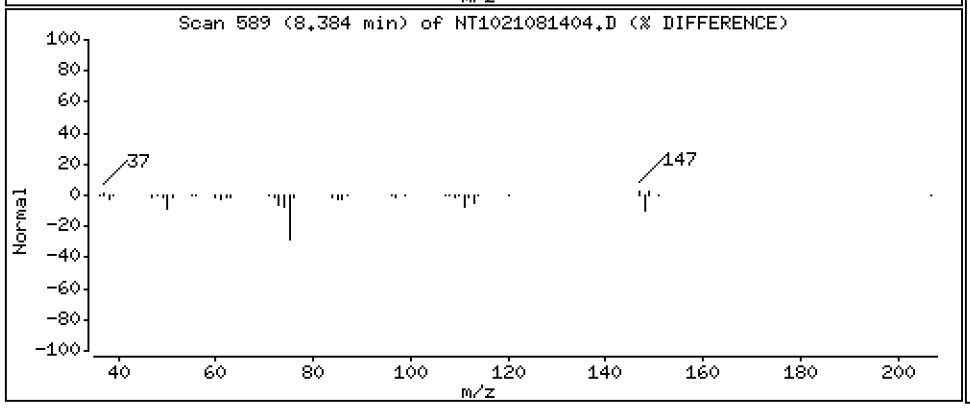
9 1,4-Dichlorobenzene

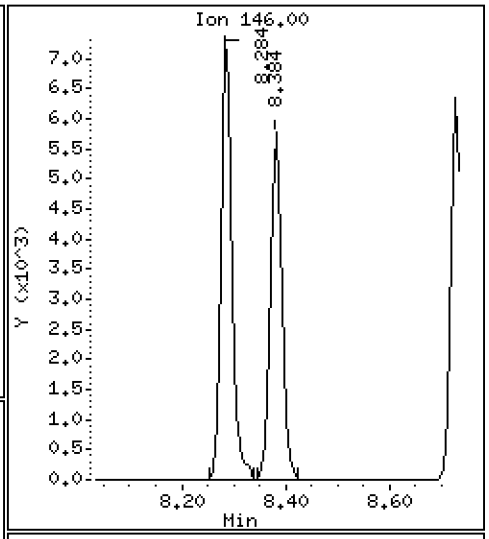
Concentration: 0.1717 ug/mL

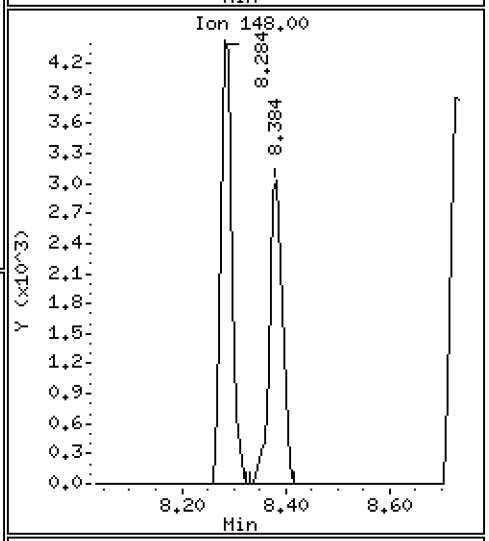


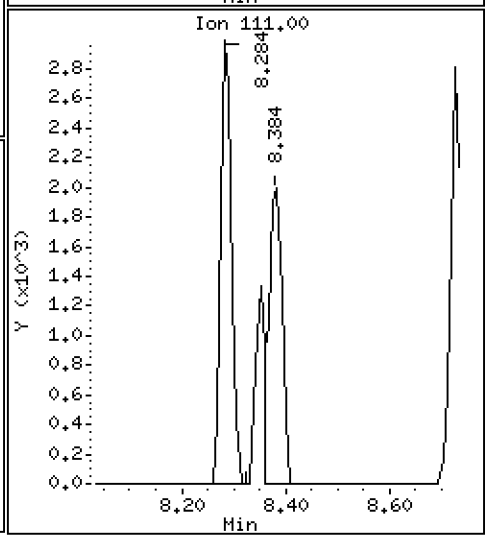












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

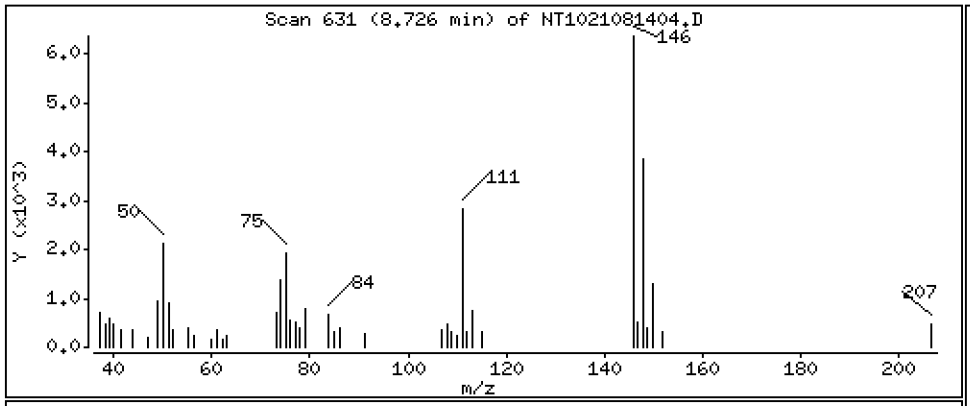
Operator: VTS

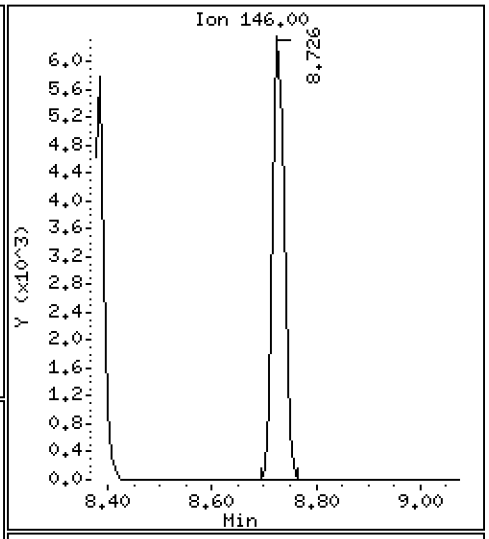
Column phase: ZB-5msi

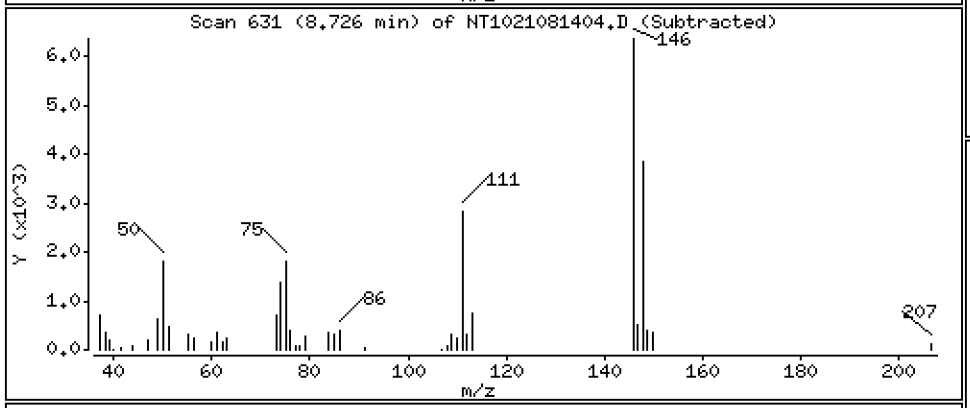
Column diameter: 0.25

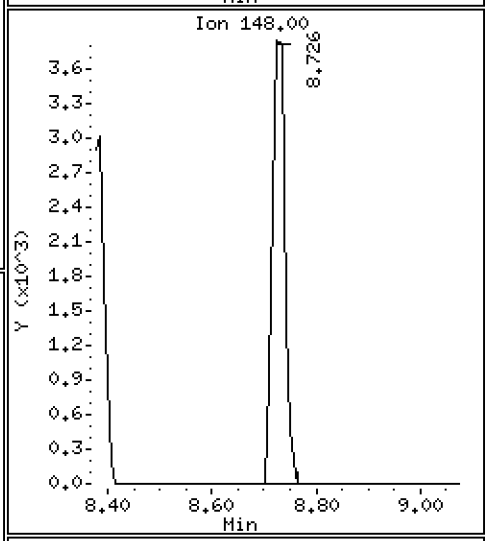
12 1,2-Dichlorobenzene

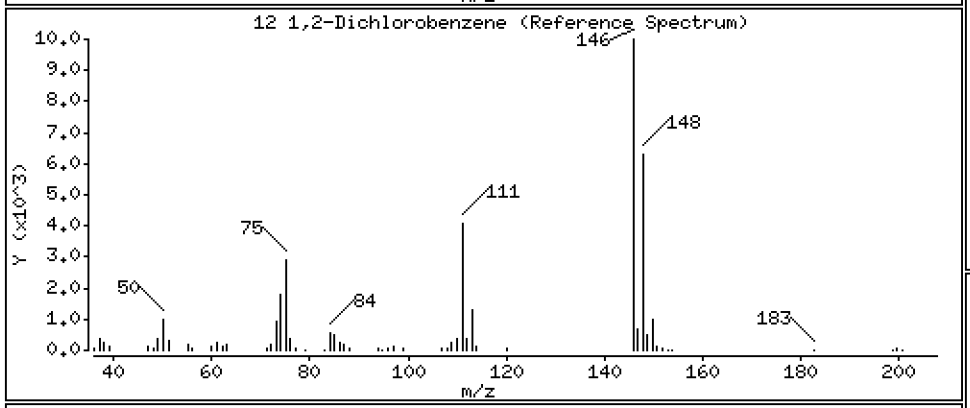
Concentration: 0.1820 ug/mL

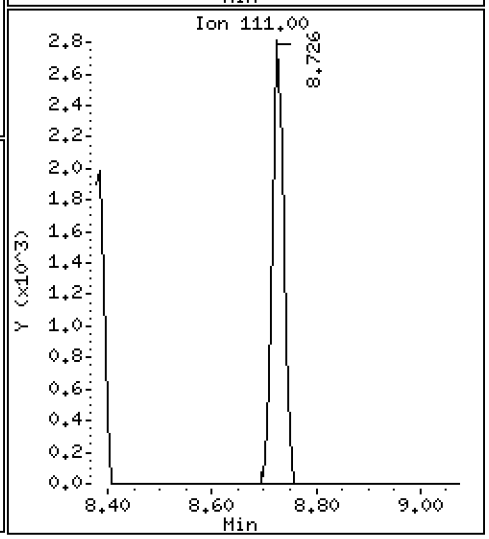


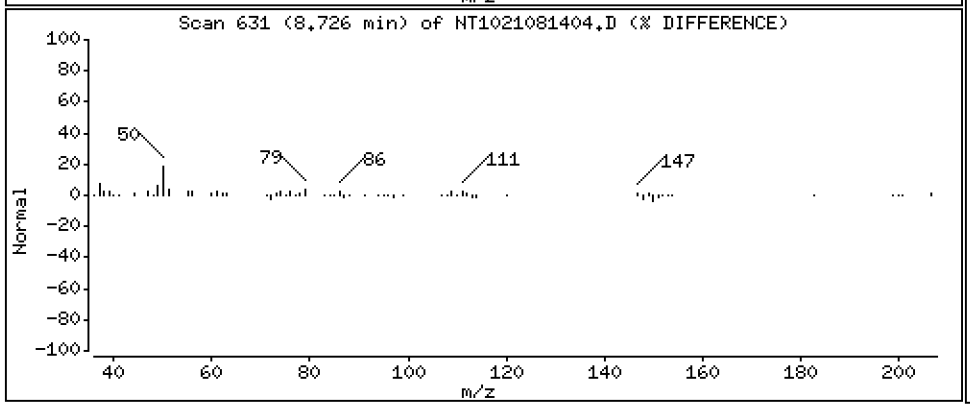












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

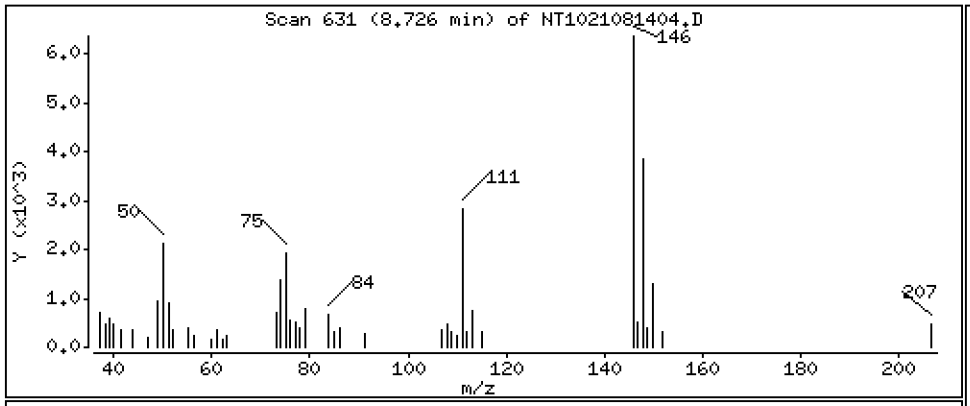
Operator: VTS

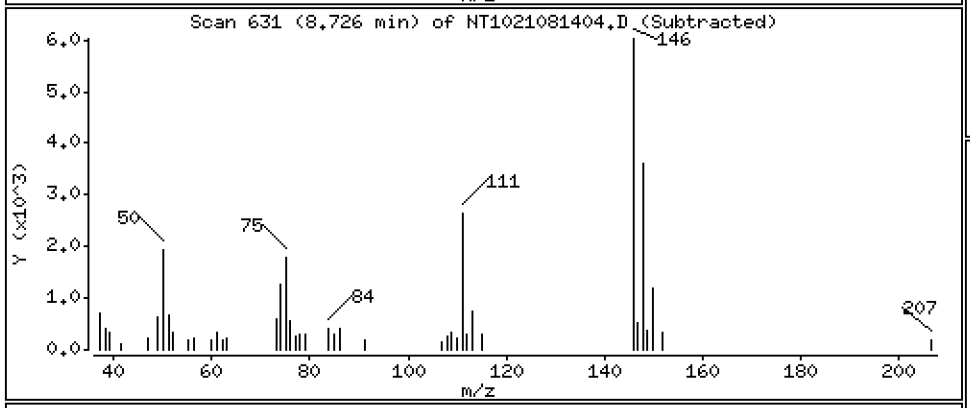
Column phase: ZB-5msi

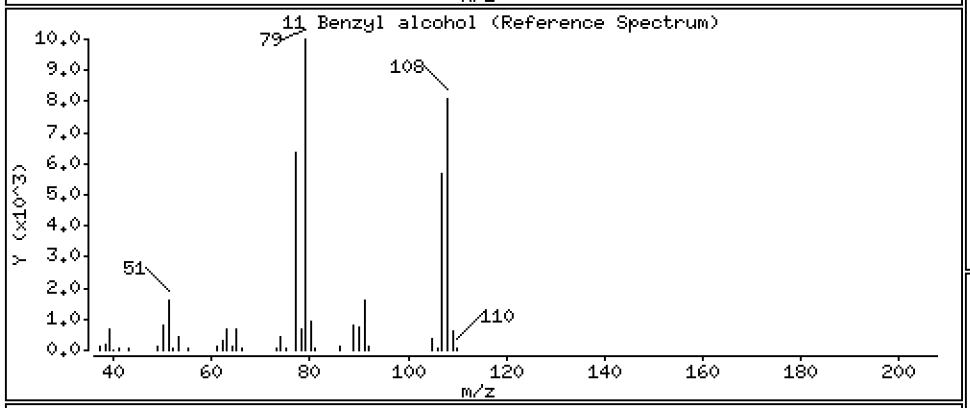
Column diameter: 0.25

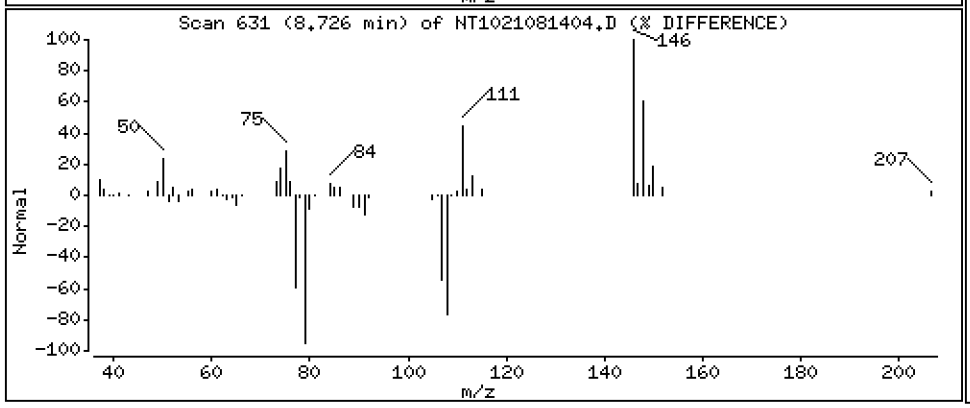
11 Benzyl alcohol

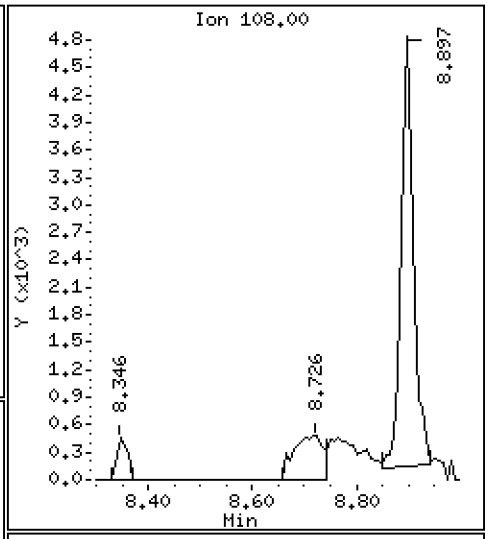
Concentration: 0.06014 ug/mL

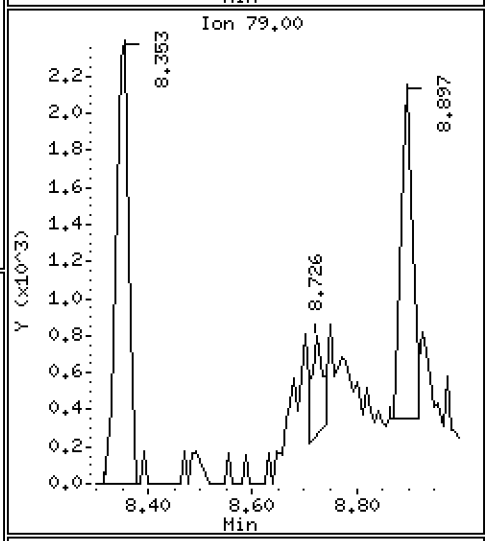


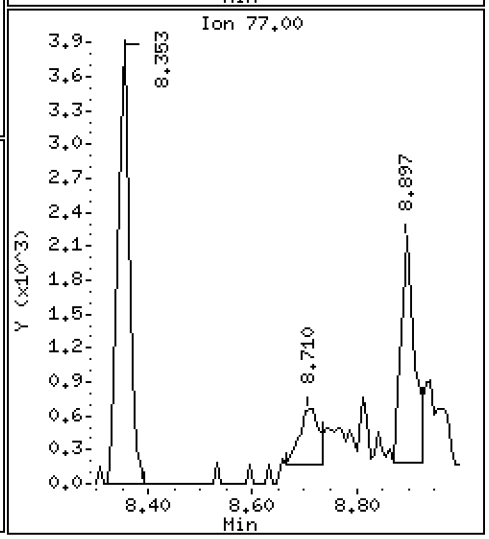












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

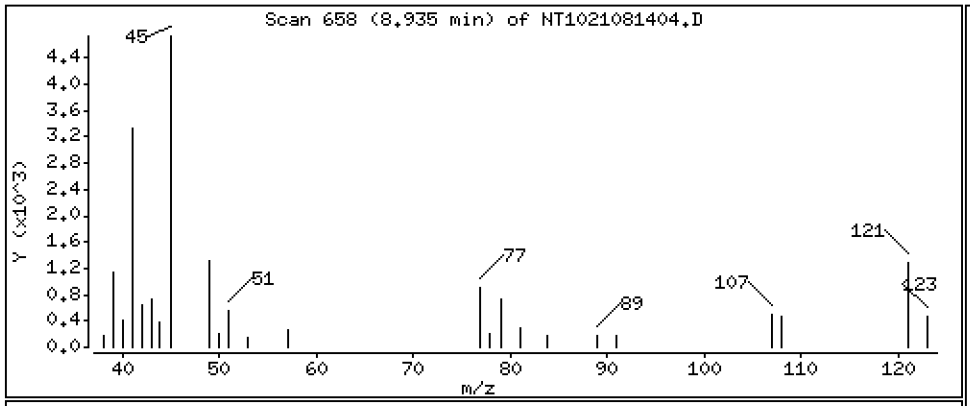
Operator: VTS

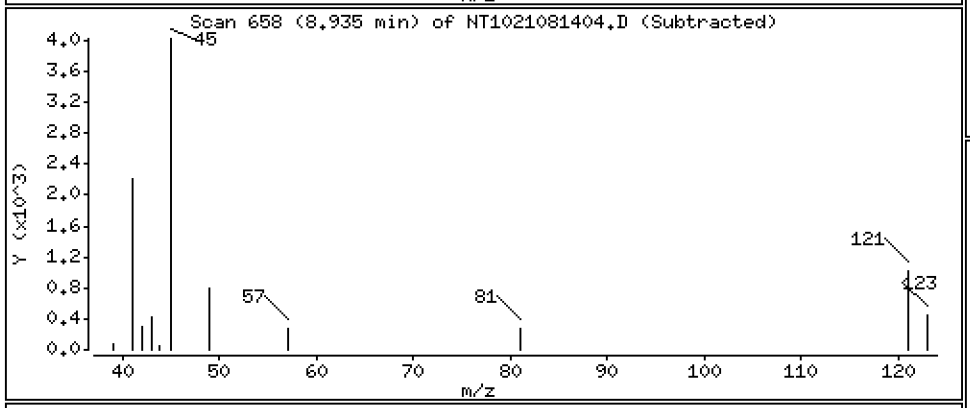
Column phase: ZB-5msi

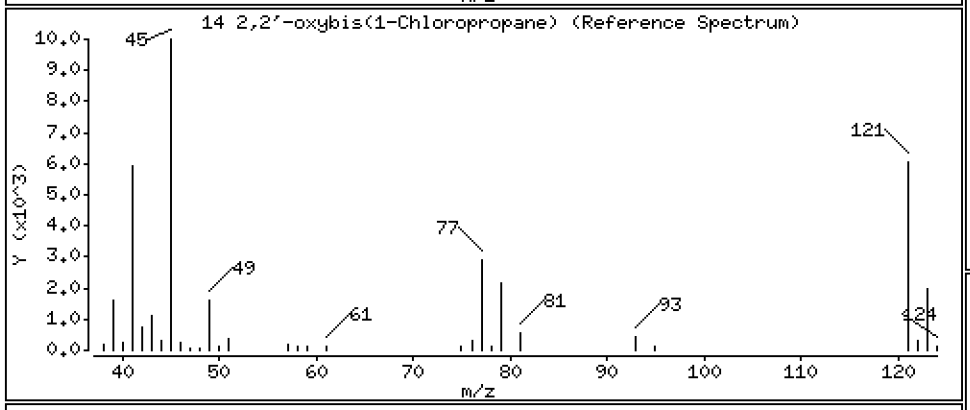
Column diameter: 0.25

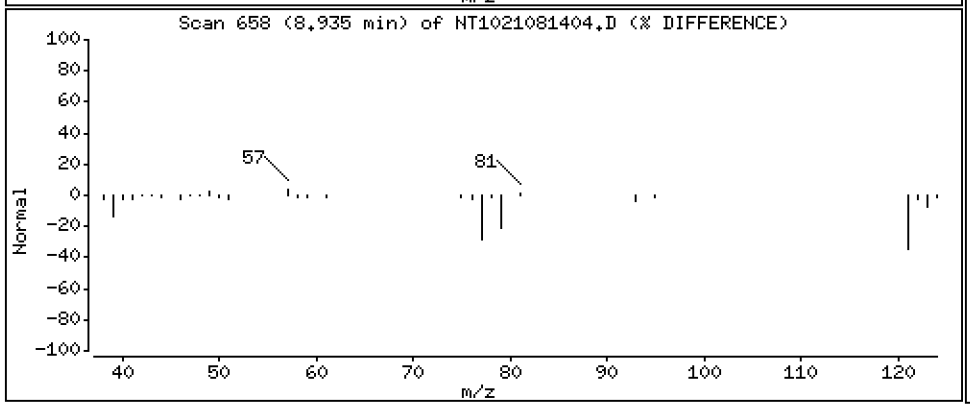
14 2,2'-oxybis(1-Chloropropane)

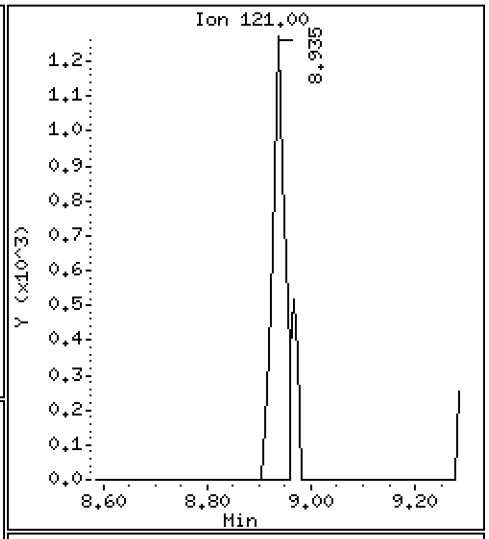
Concentration: 0.1016 ug/mL

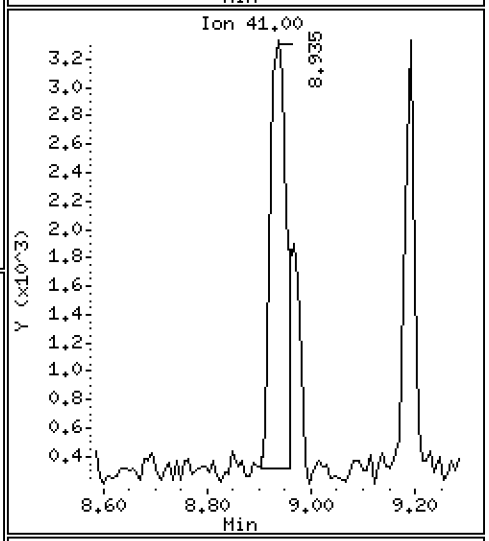


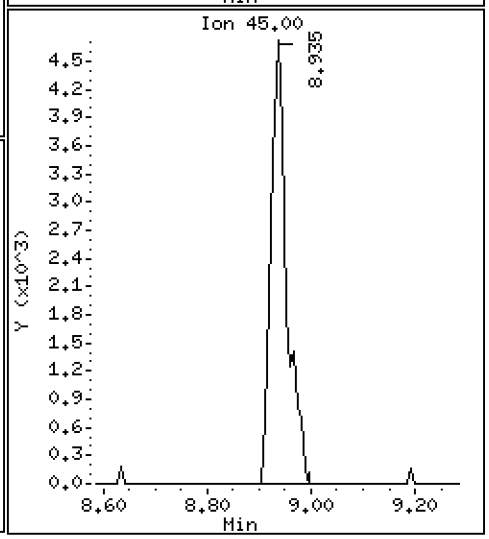












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

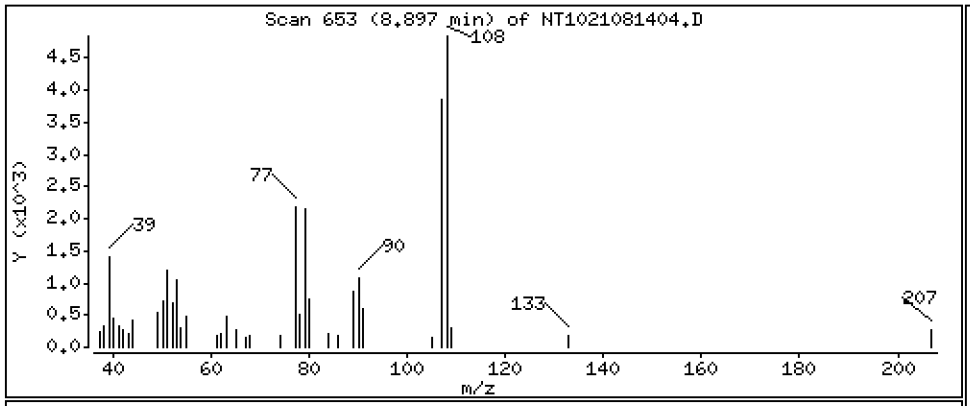
Operator: VTS

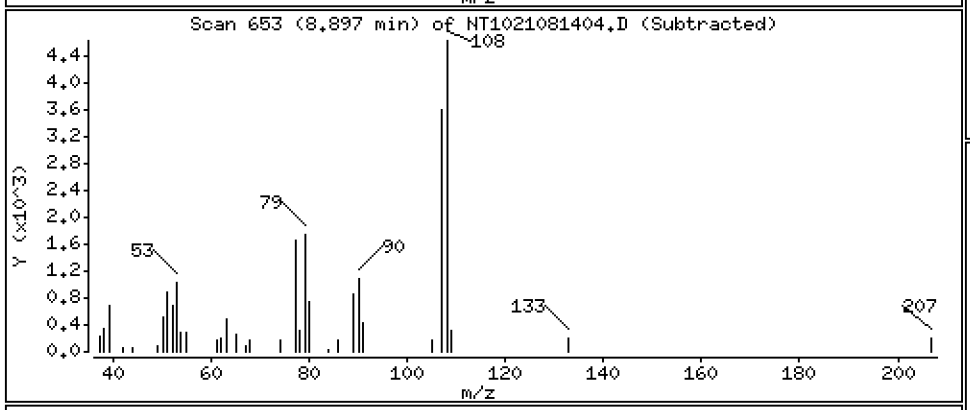
Column phase: ZB-5msi

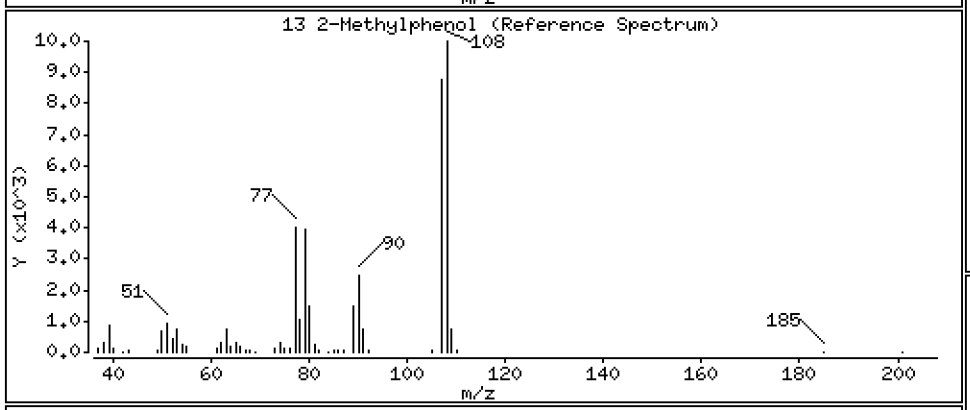
Column diameter: 0.25

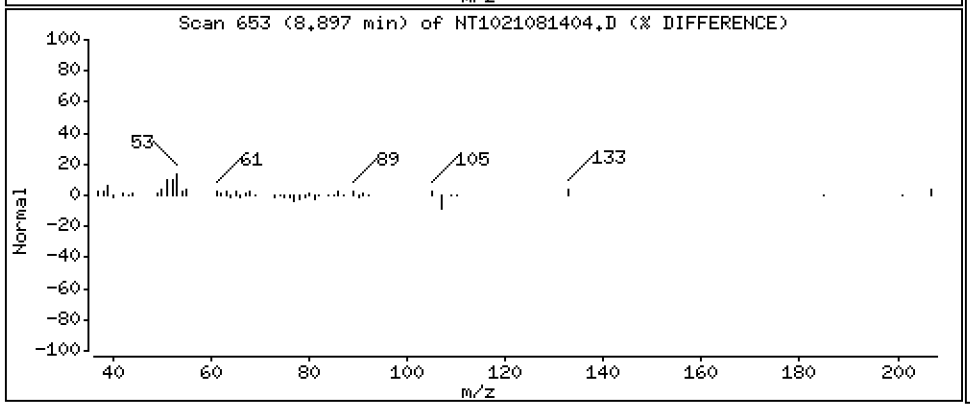
13 2-Methylphenol

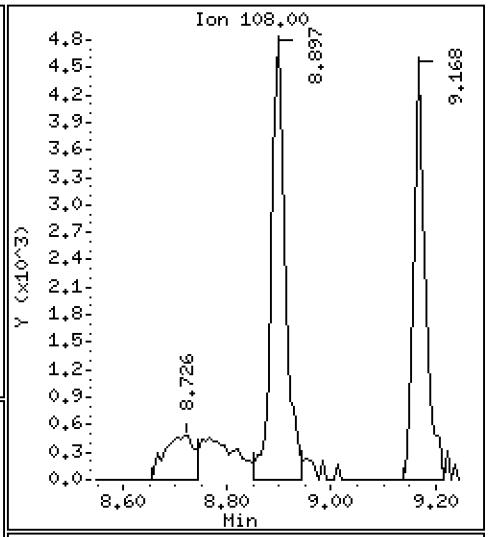
Concentration: 0.2000 ug/mL

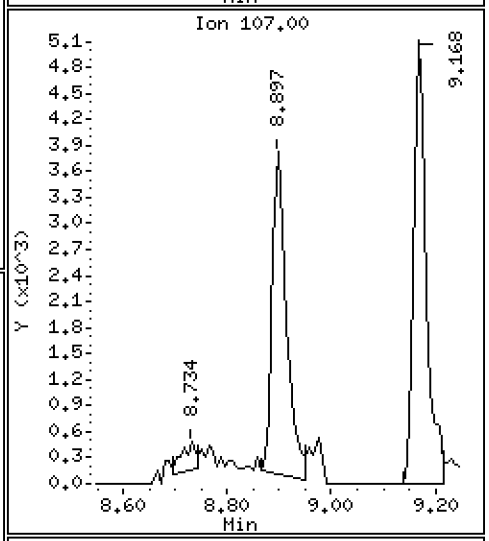


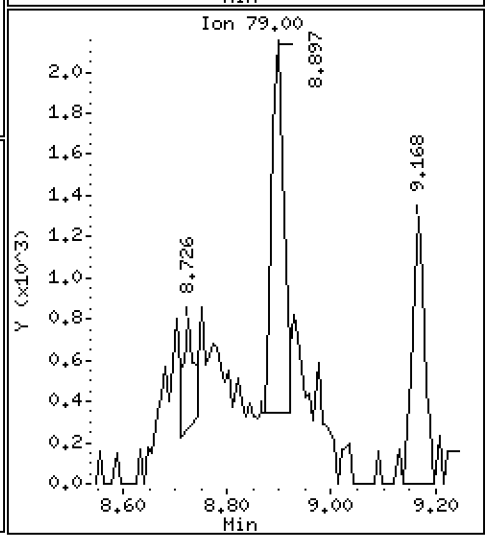












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

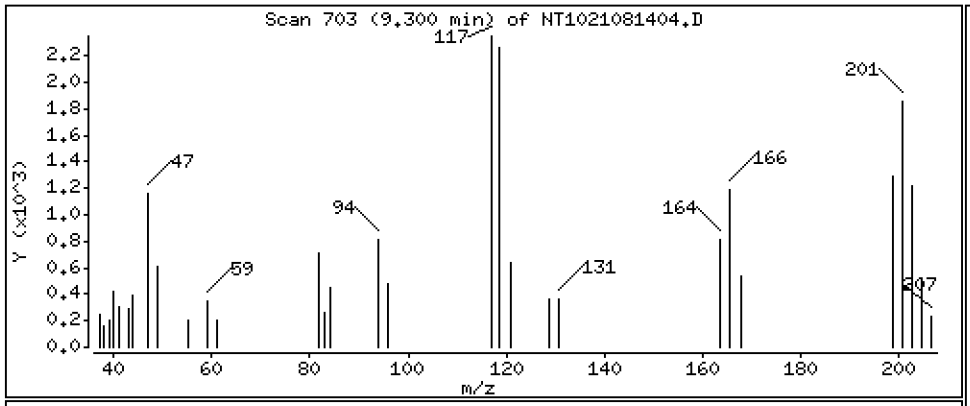
Operator: VTS

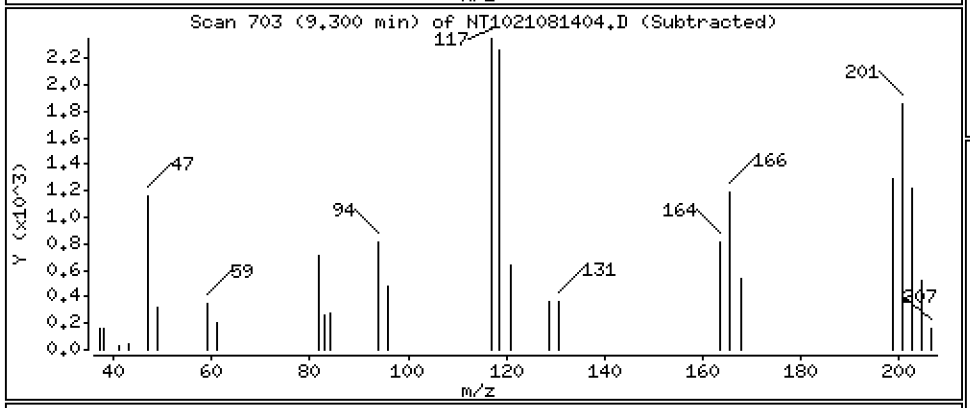
Column phase: ZB-5msi

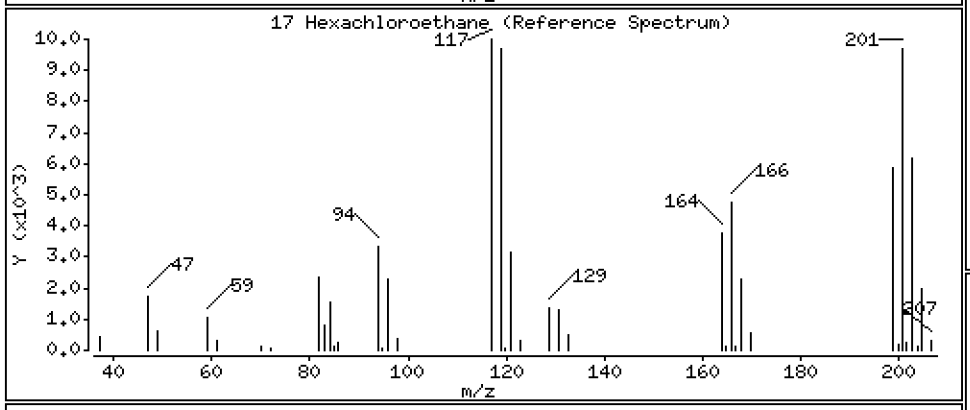
Column diameter: 0.25

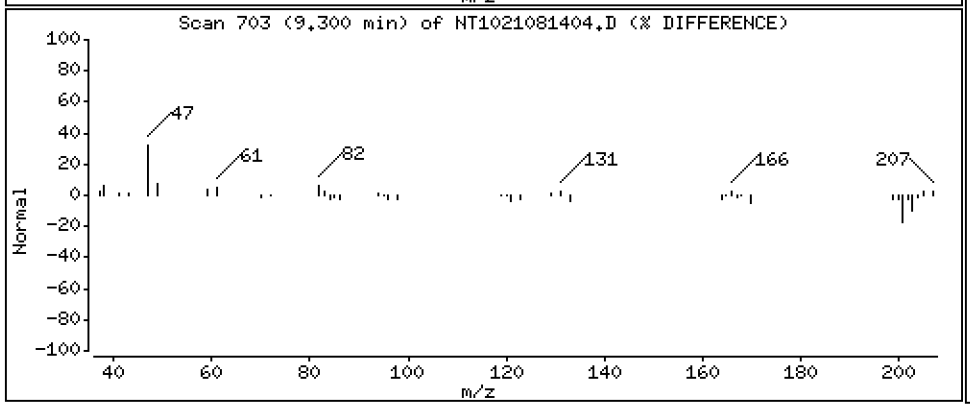
17 Hexachloroethane

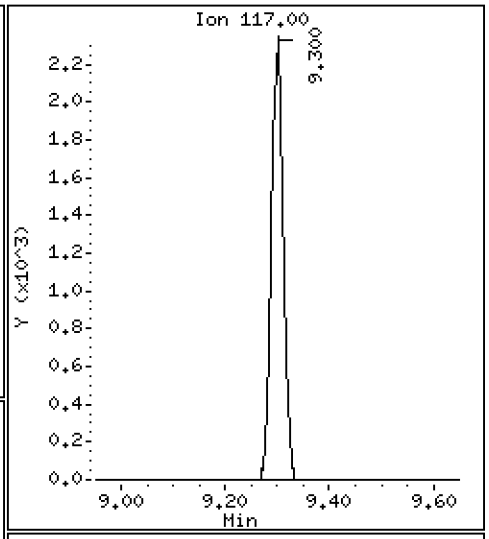
Concentration: 0.1630 ug/mL

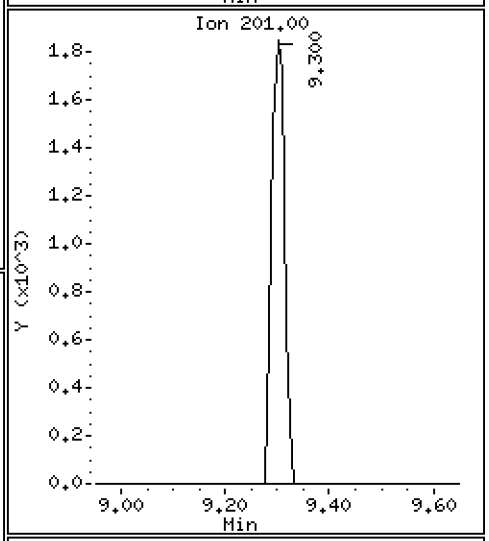


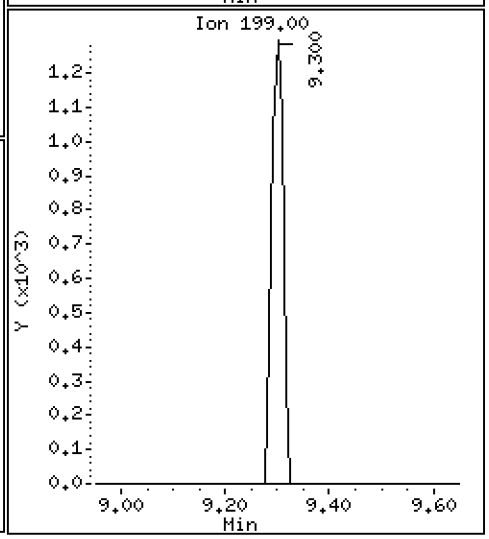












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

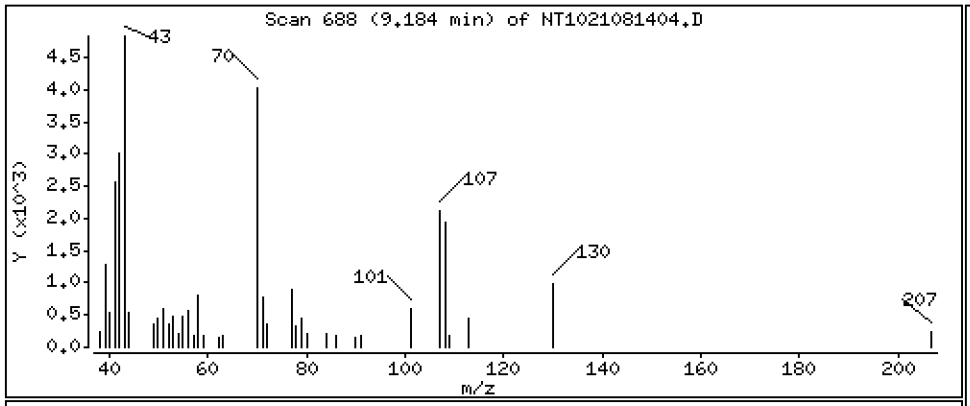
Operator: VTS

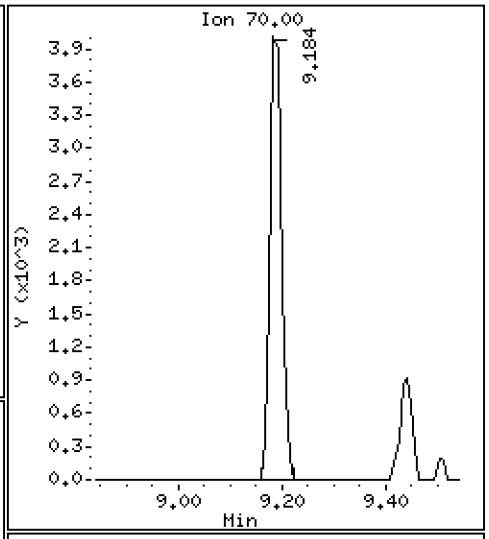
Column phase: ZB-5msi

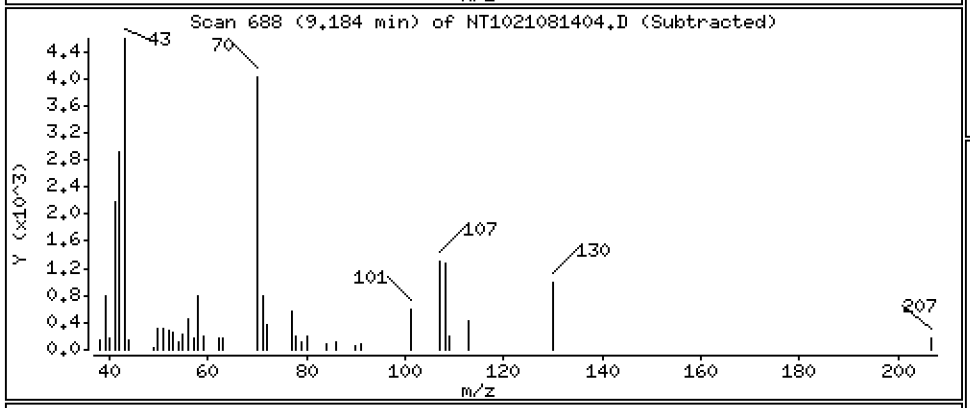
Column diameter: 0.25

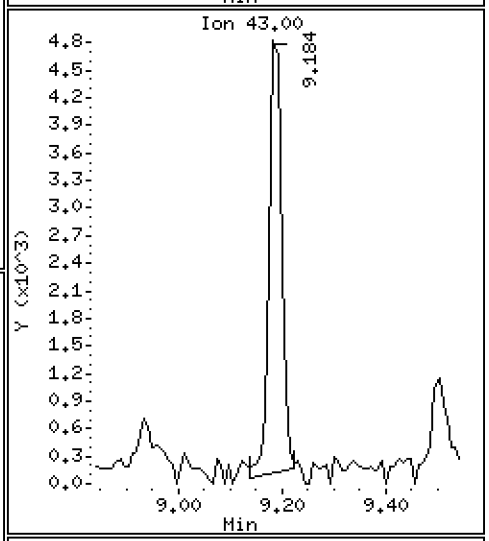
16 N-Nitroso-di-n-propylamine

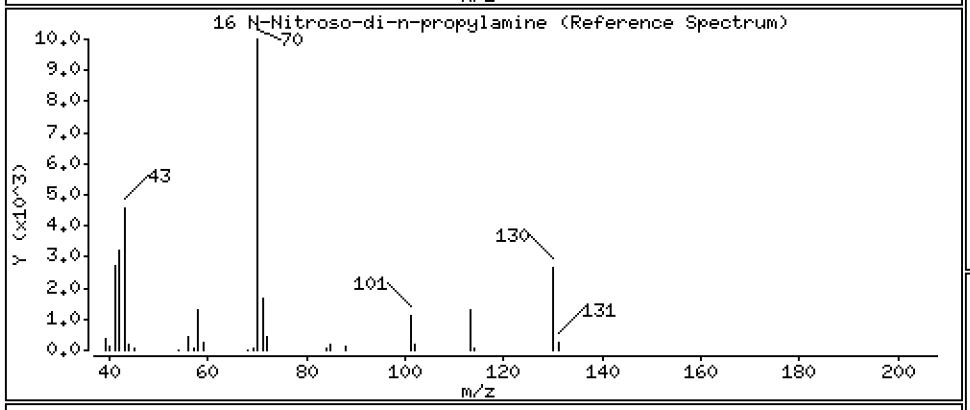
Concentration: 0.1587 ug/mL

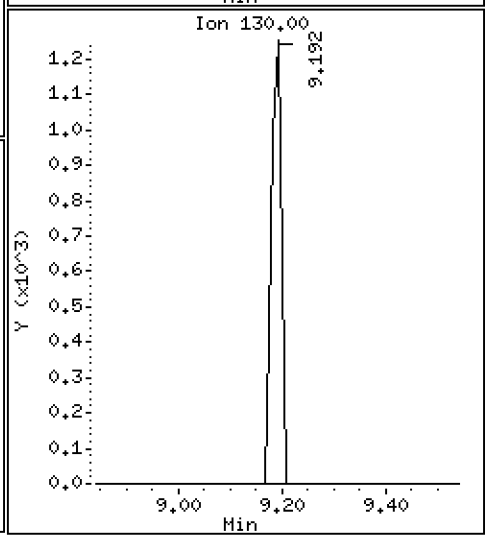


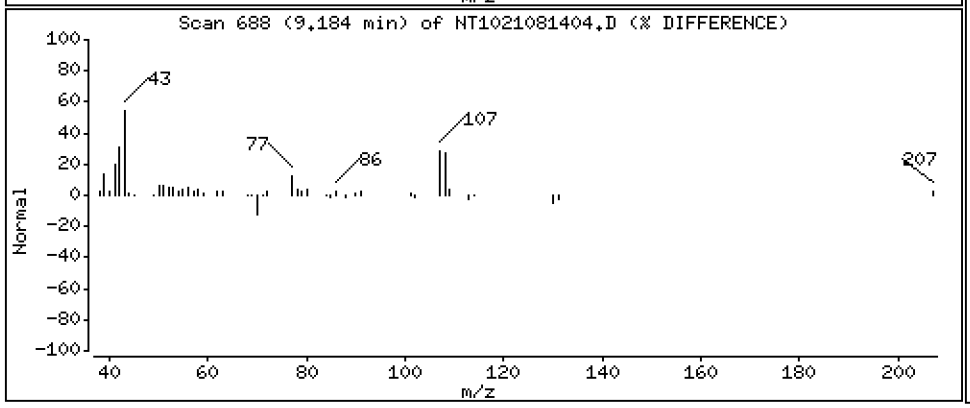












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

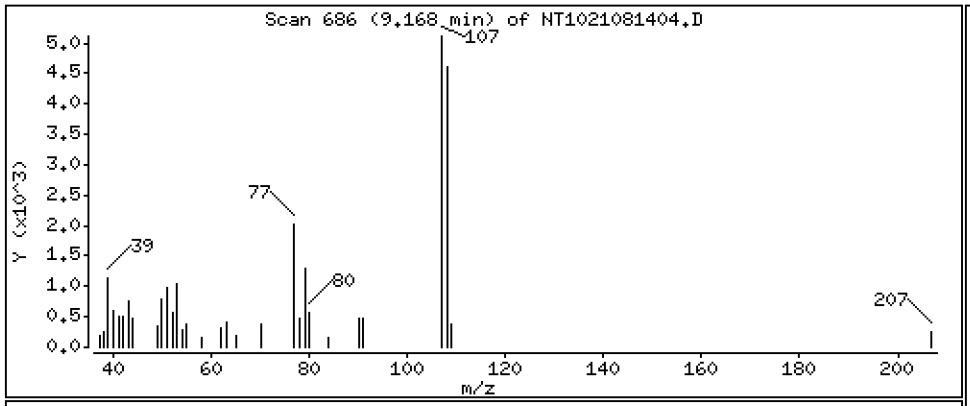
Operator: VTS

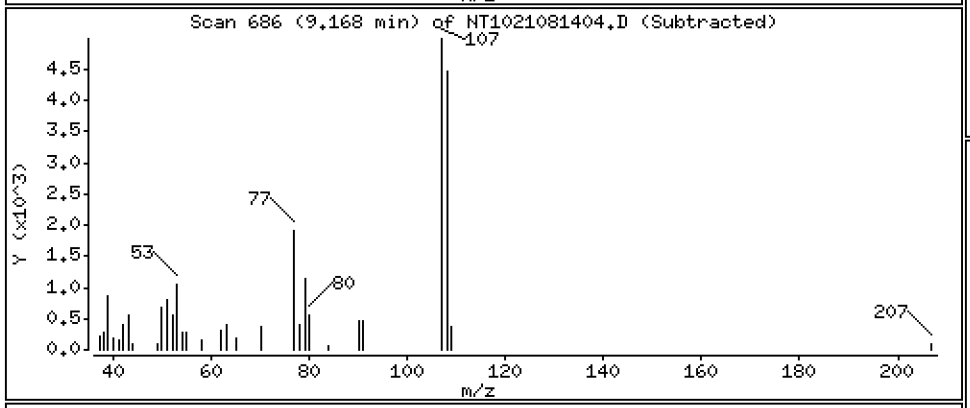
Column phase: ZB-5msi

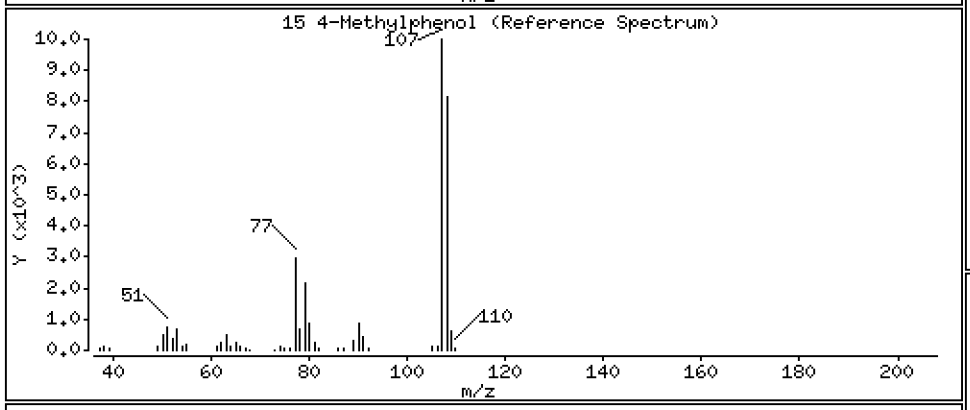
Column diameter: 0.25

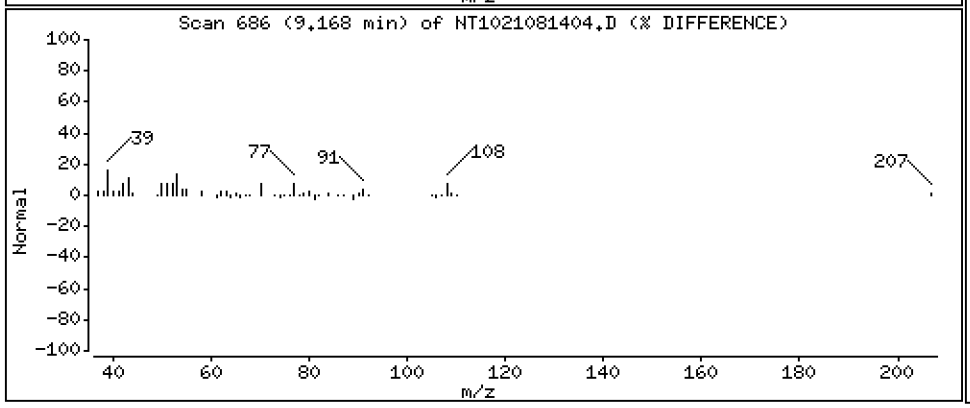
15 4-Methylphenol

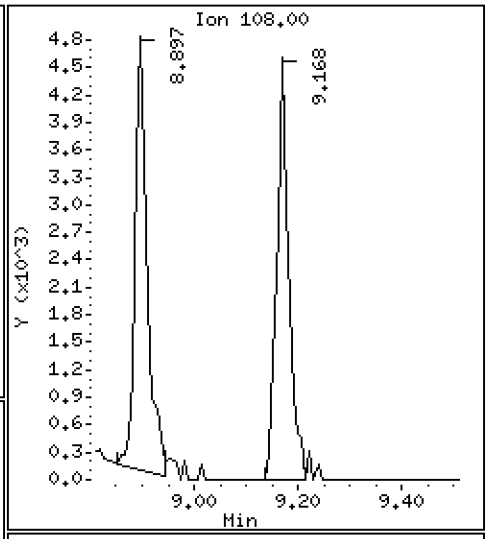
Concentration: 0.1591 ug/mL

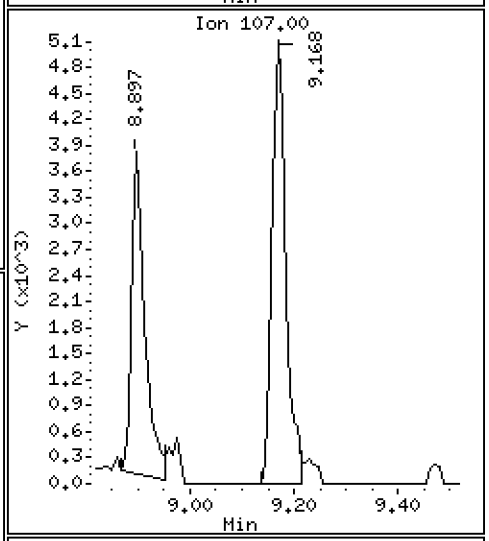


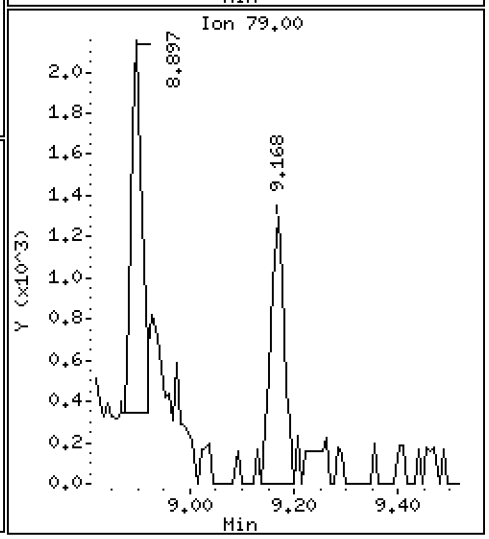












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

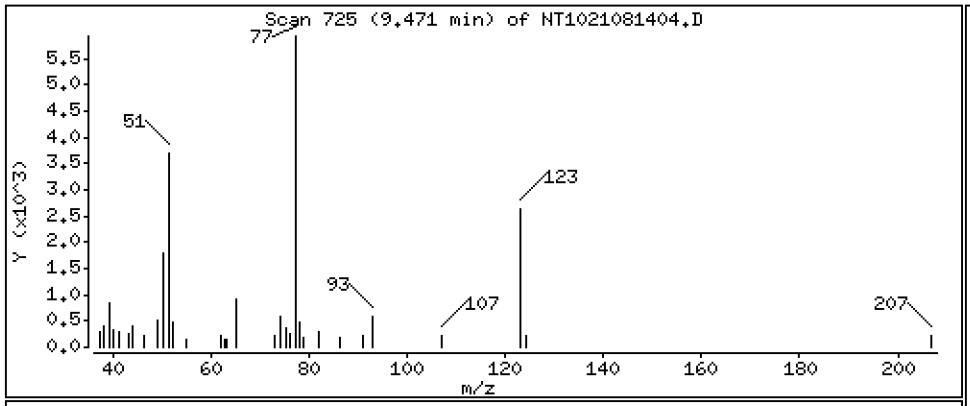
Operator: VTS

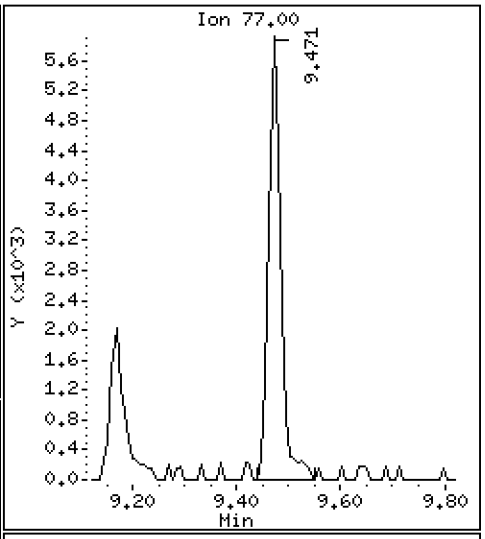
Column phase: ZB-5msi

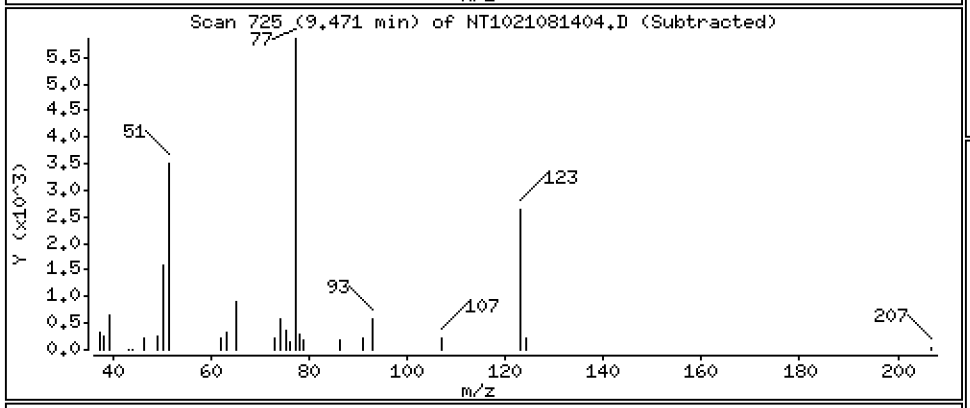
Column diameter: 0.25

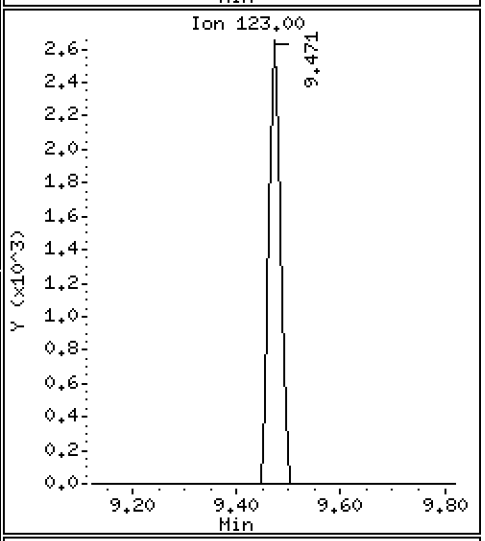
19 Nitrobenzene

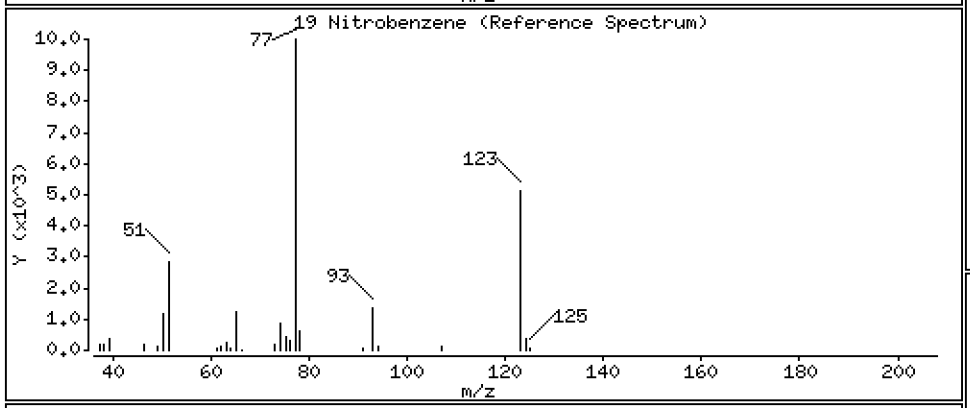
Concentration: 0.1696 ug/mL

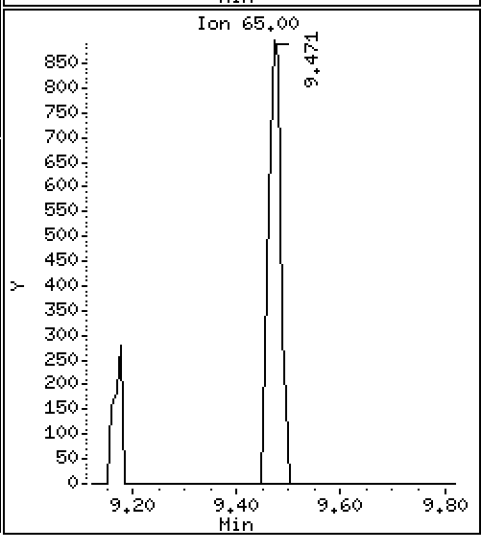


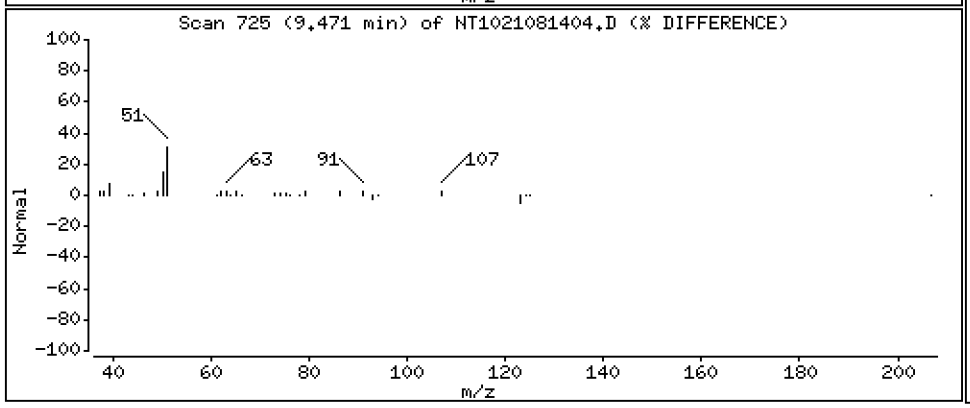












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

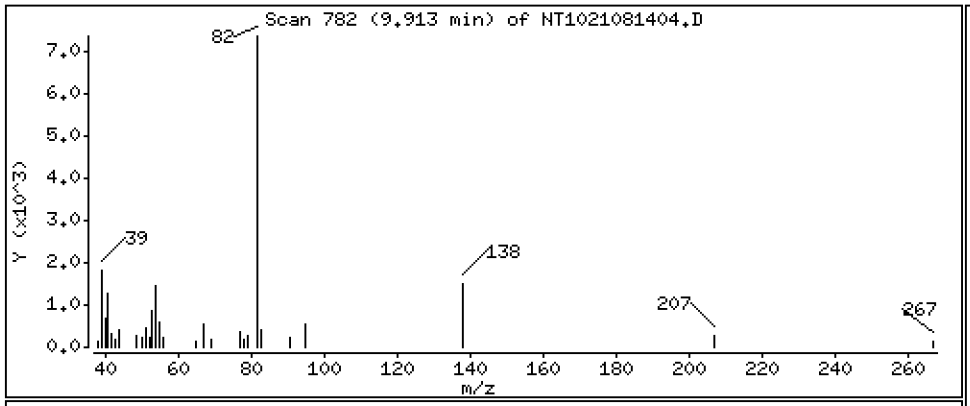
Operator: VTS

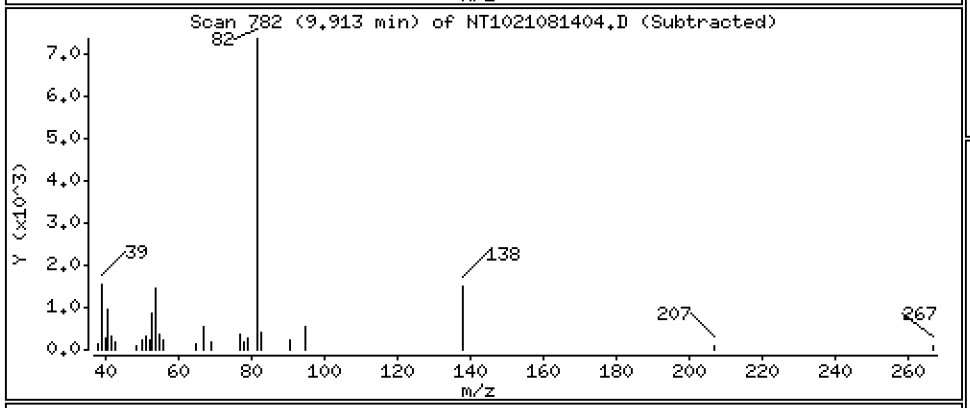
Column phase: ZB-5msi

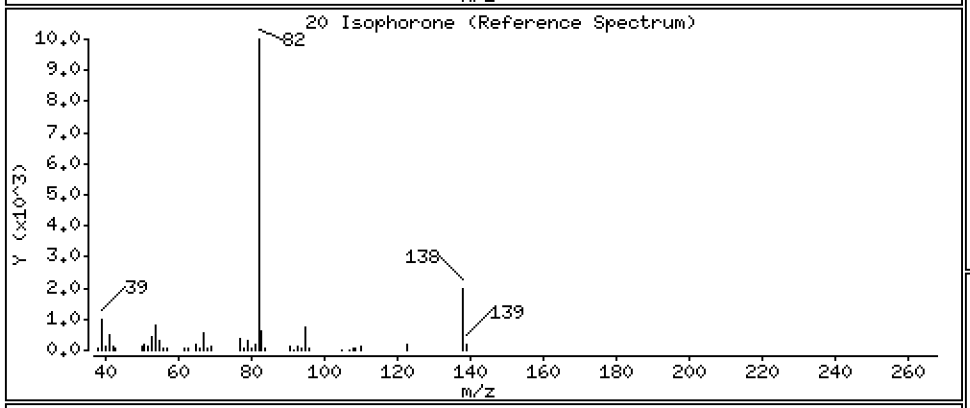
Column diameter: 0.25

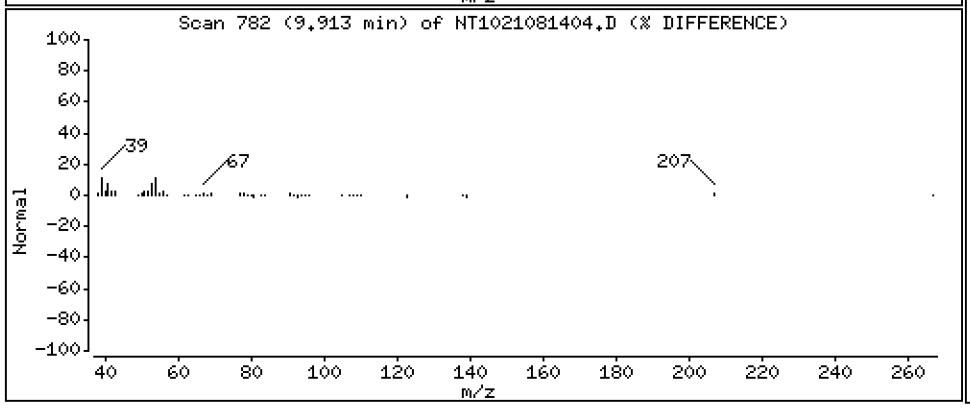
20 Isophorone

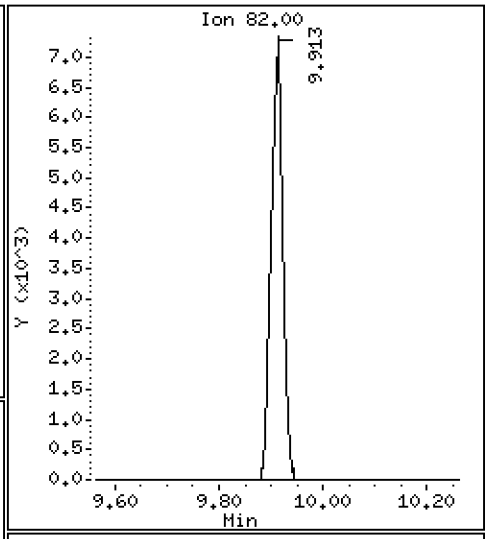
Concentration: 0.1051 ug/mL

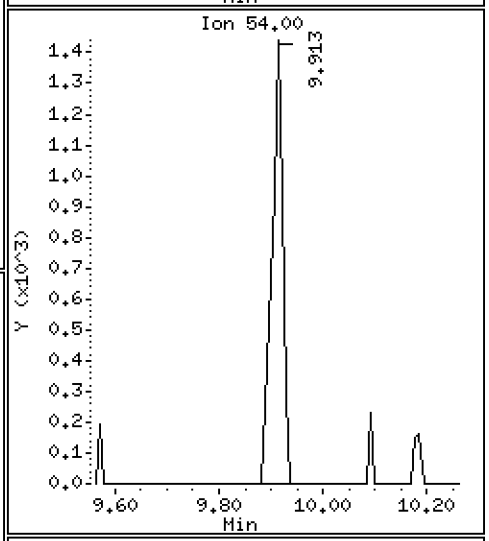


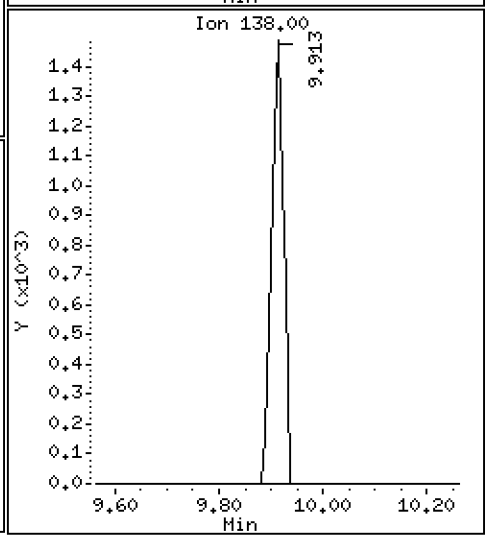












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

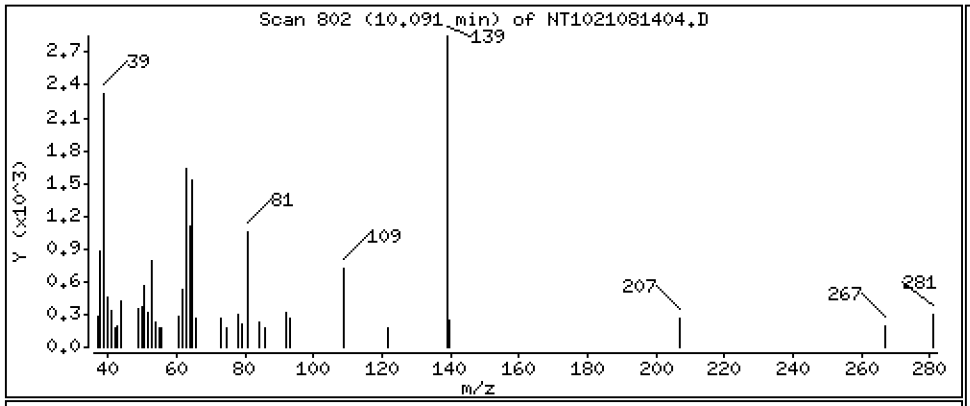
Operator: VTS

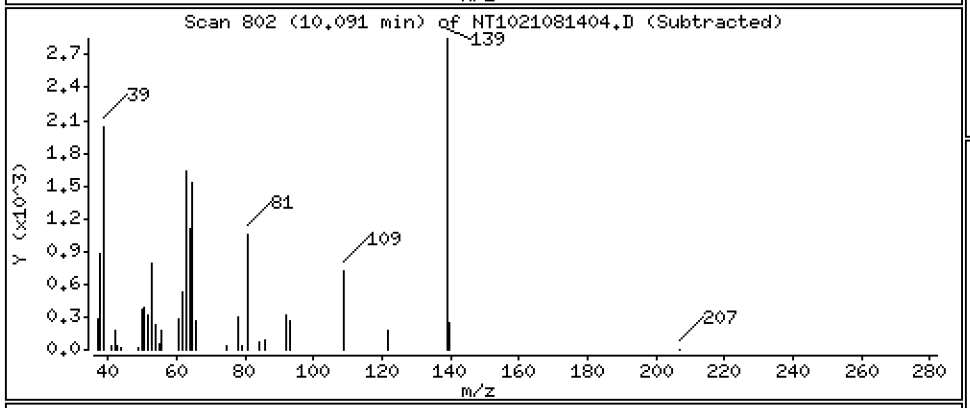
Column phase: ZB-5msi

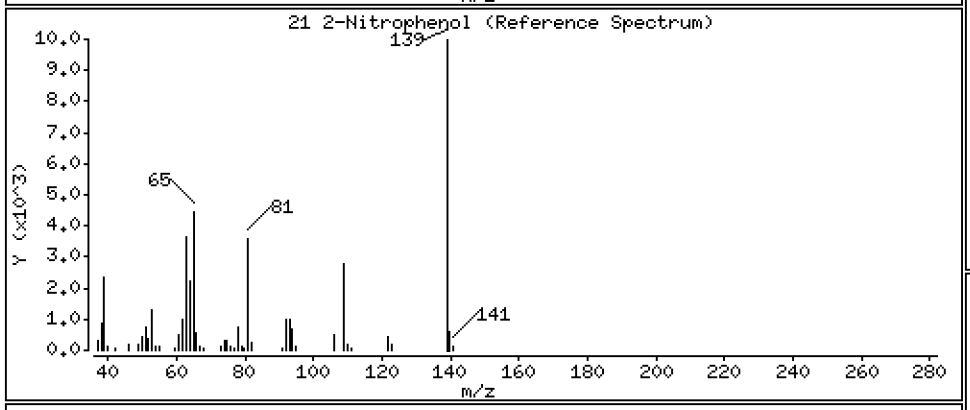
Column diameter: 0.25

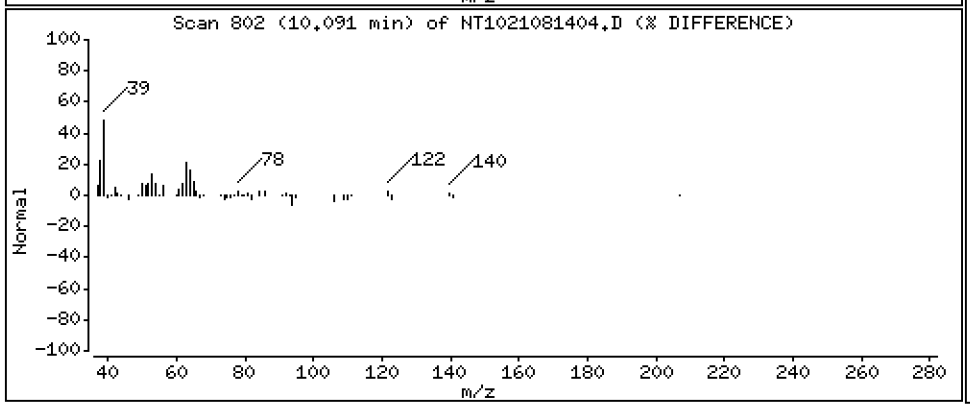
21 2-Nitrophenol

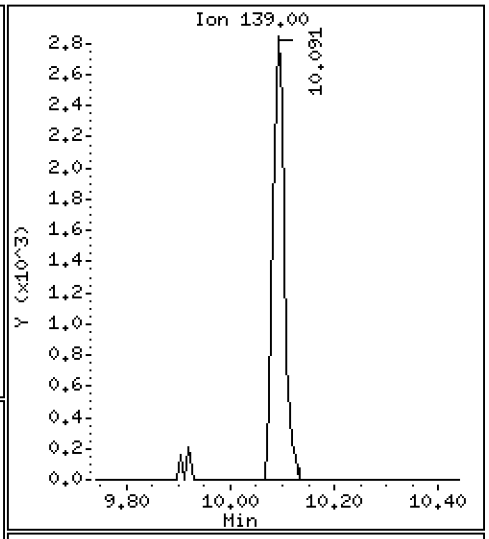
Concentration: 0.1538 ug/mL

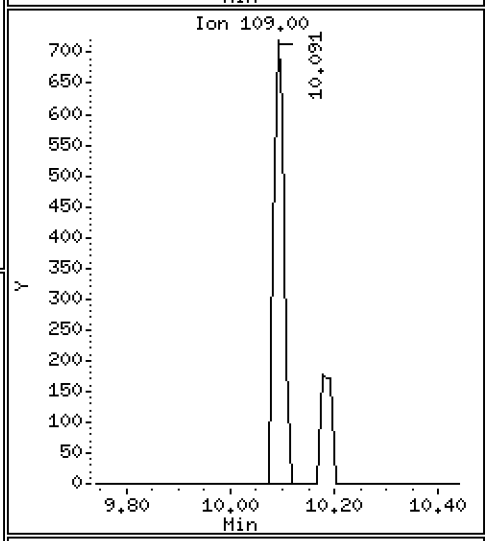


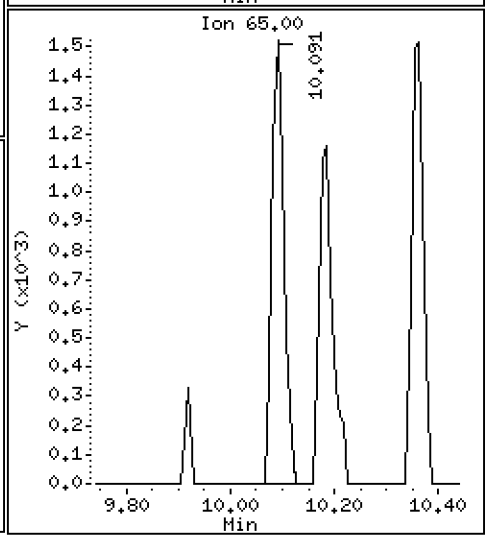












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

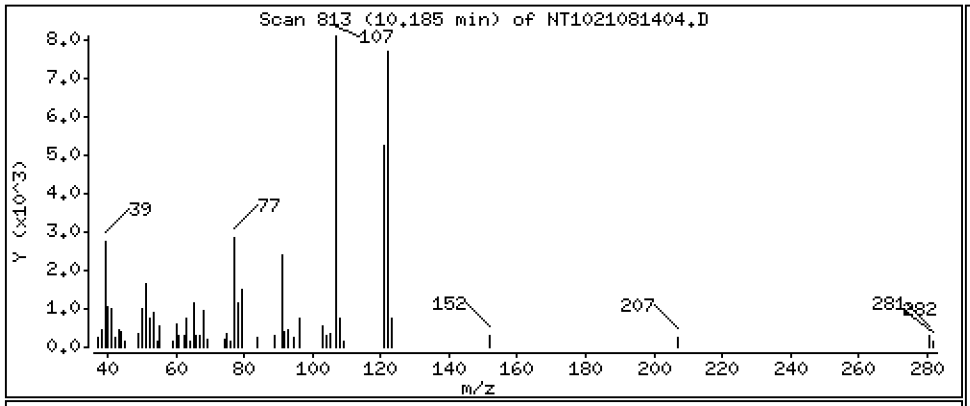
Operator: VTS

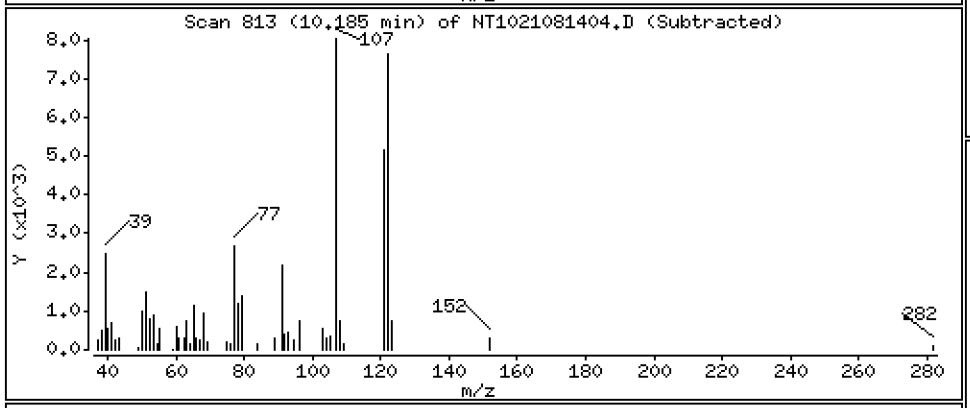
Column phase: ZB-5msi

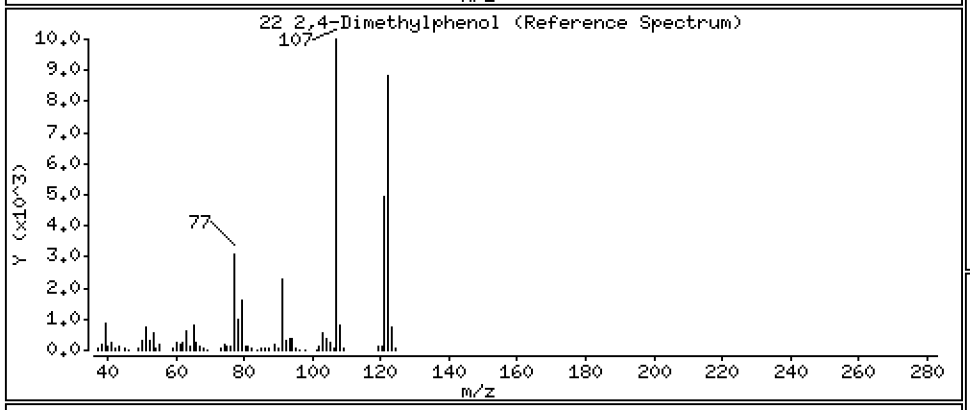
Column diameter: 0.25

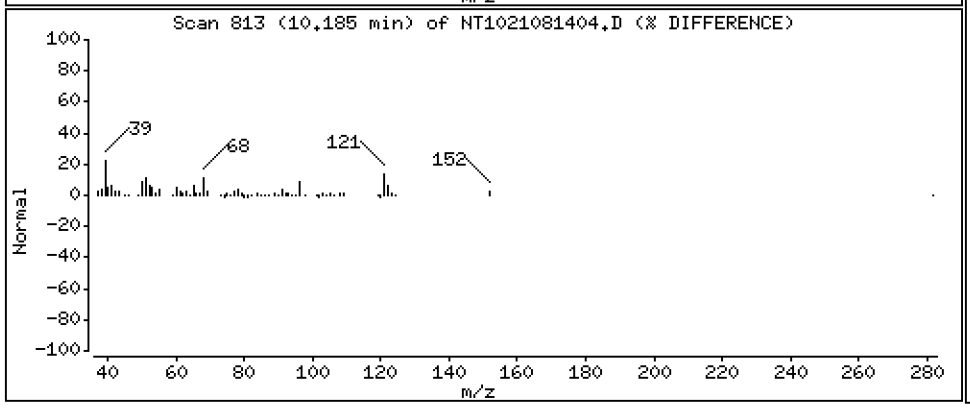
22 2,4-Dimethylphenol

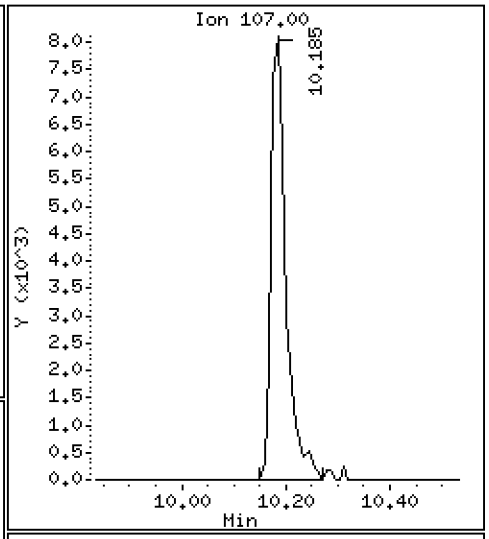
Concentration: 0.3763 ug/mL

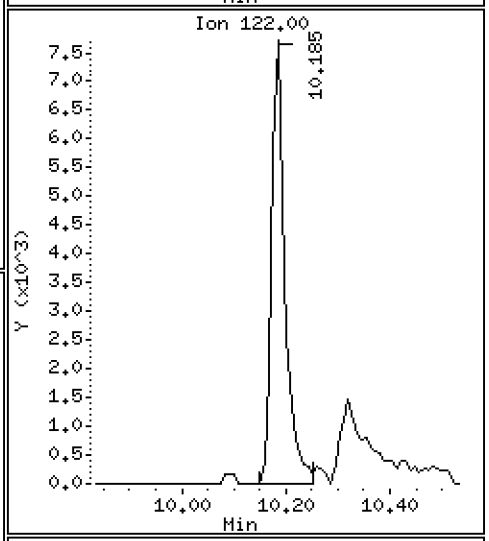


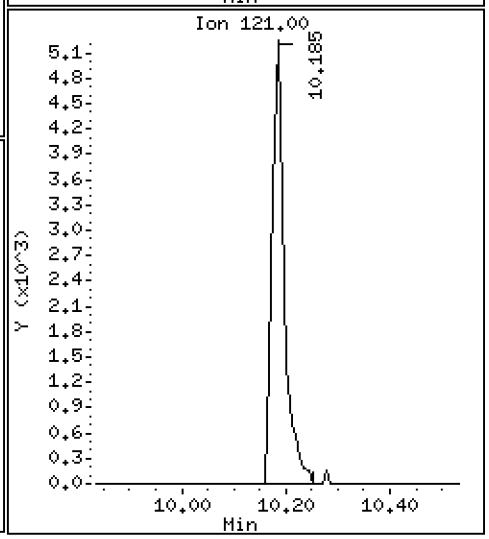












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

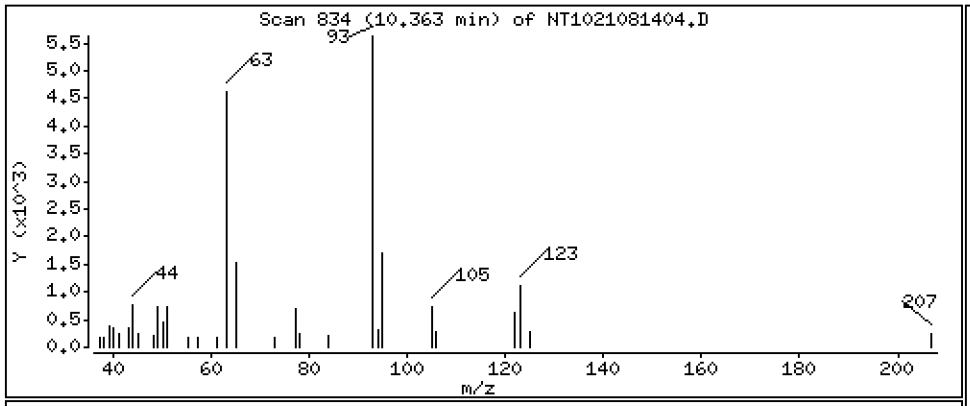
Operator: VTS

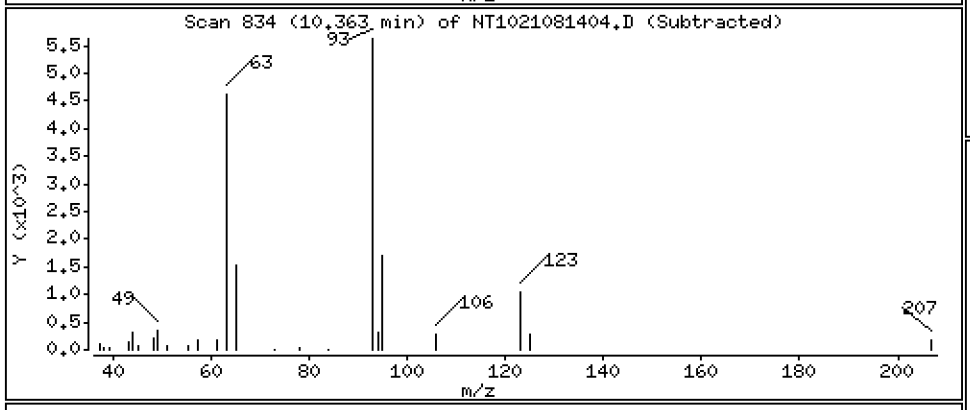
Column phase: ZB-5msi

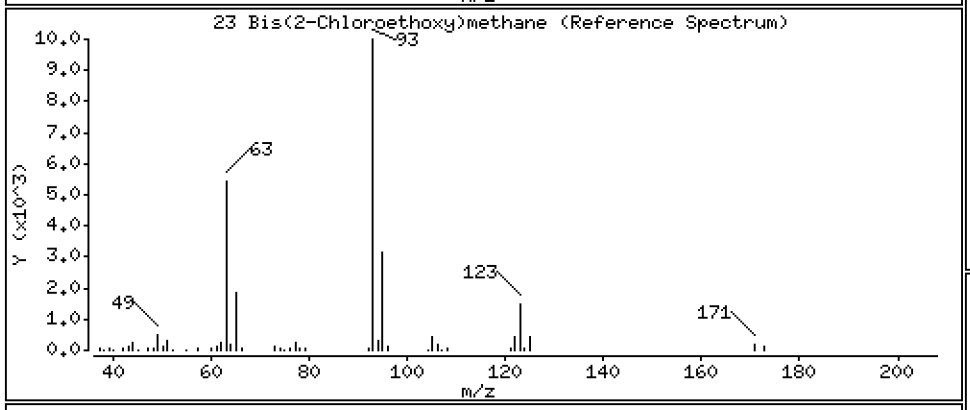
Column diameter: 0.25

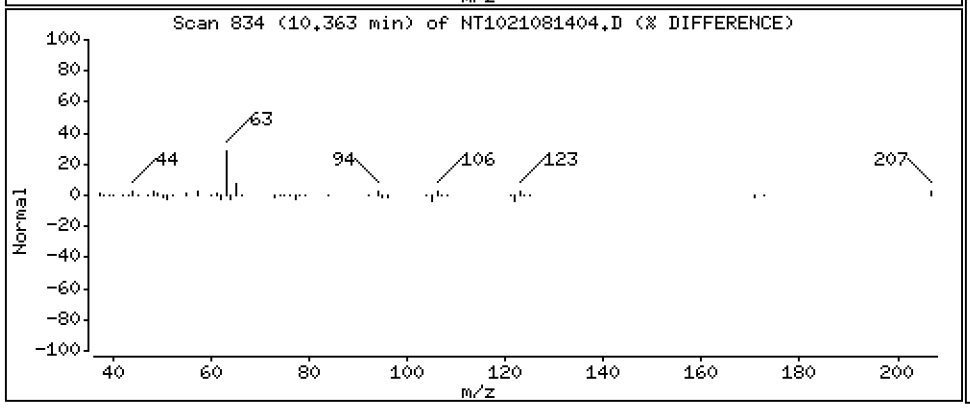
23 Bis(2-Chloroethoxy)methane

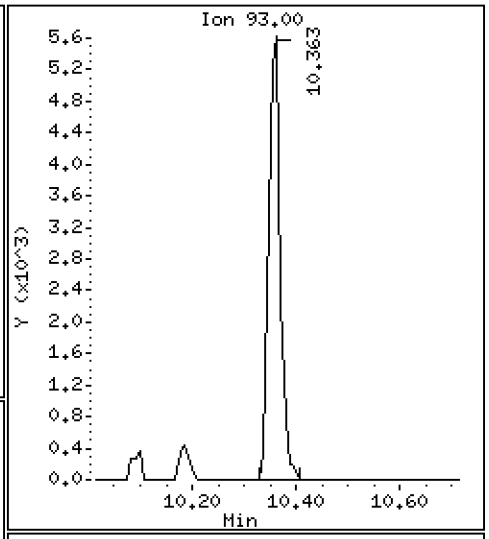
Concentration: 0.1614 ug/mL

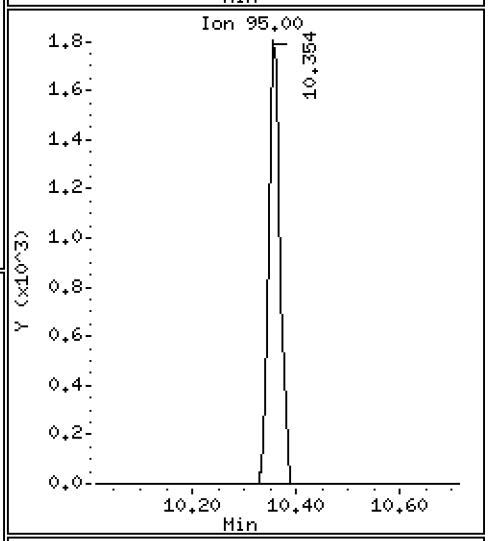


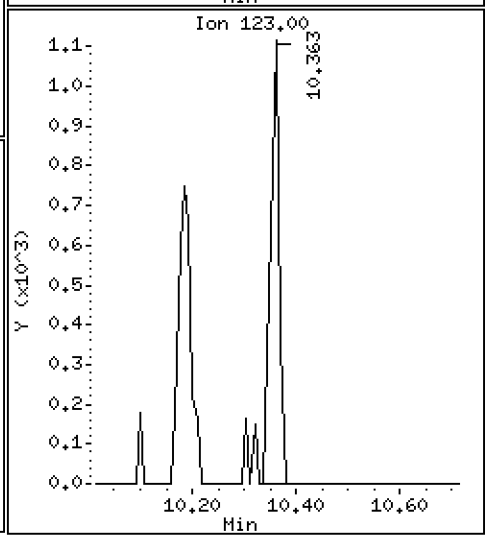












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

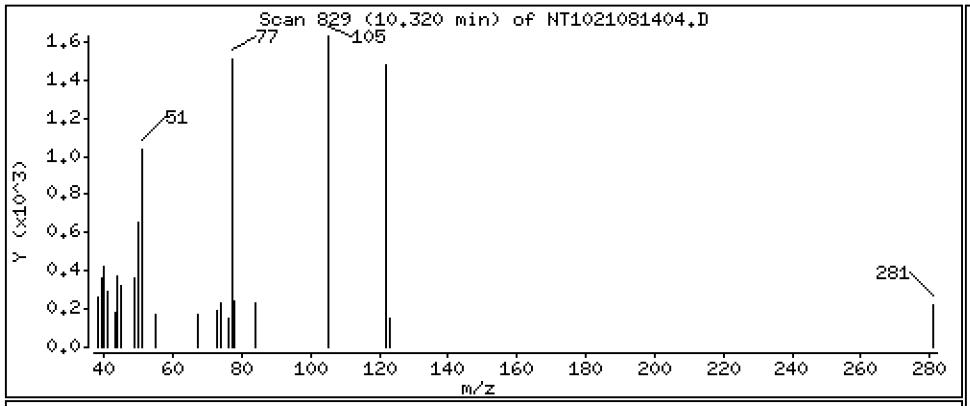
Operator: VTS

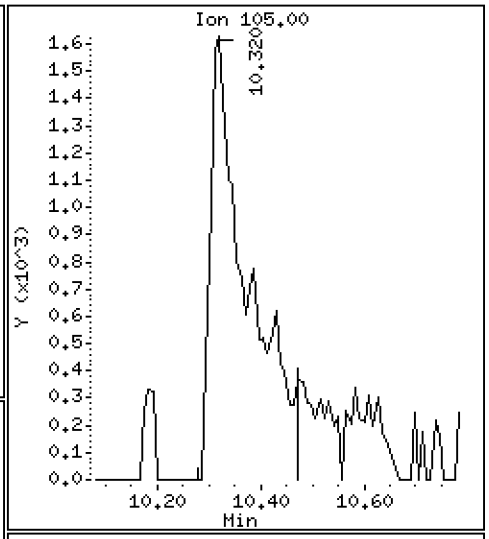
Column phase: ZB-5msi

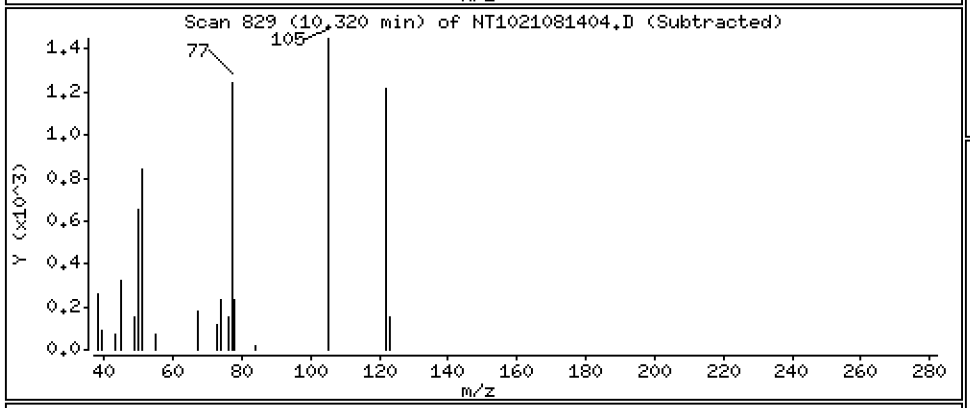
Column diameter: 0.25

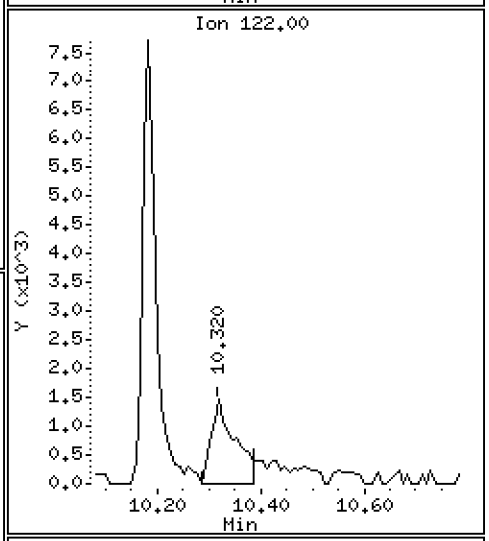
24 Benzoic acid

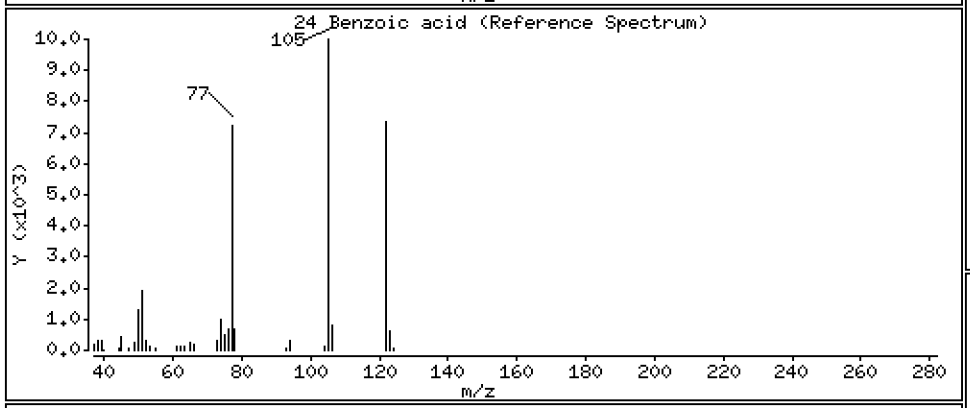
Concentration: 0.3515 ug/mL

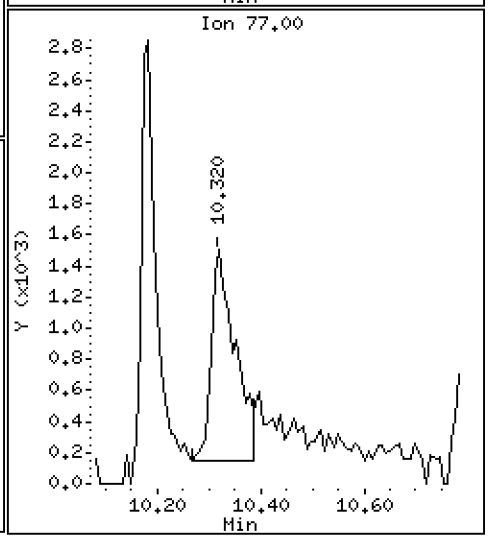


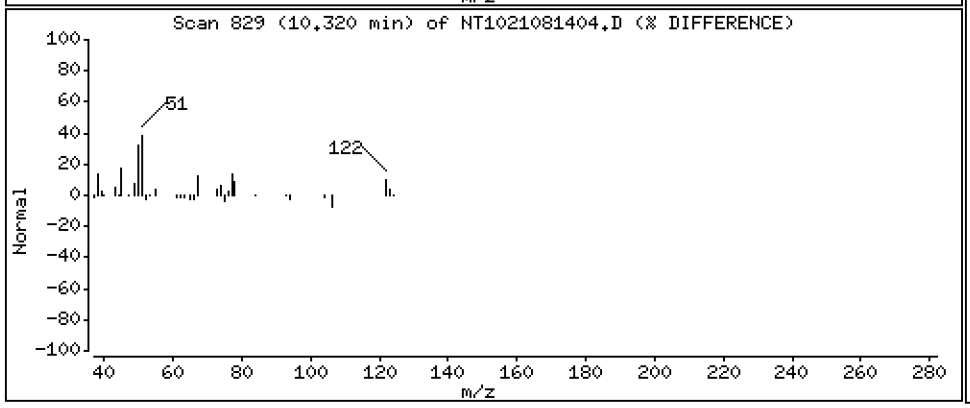












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

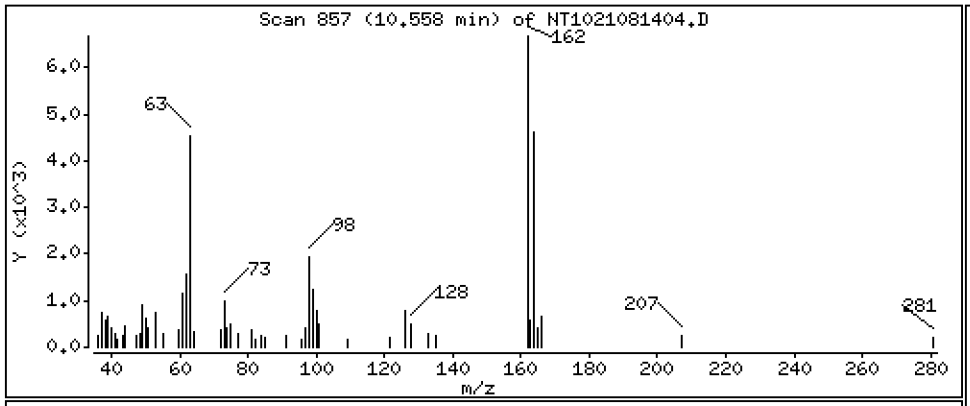
Operator: VTS

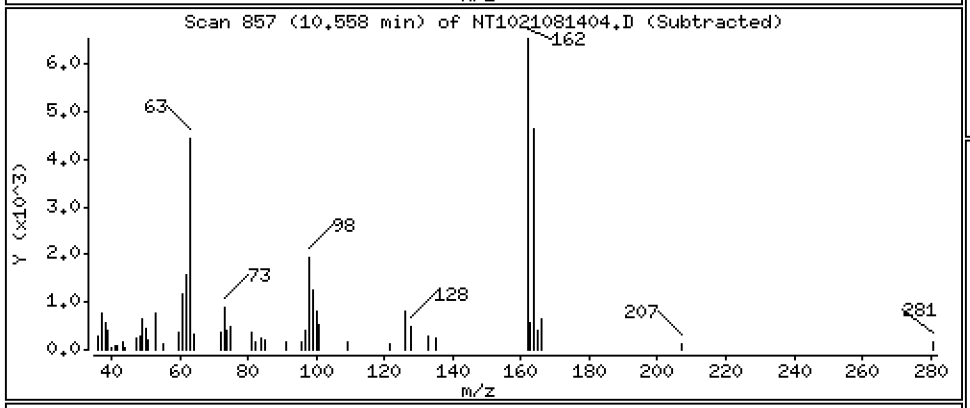
Column phase: ZB-5msi

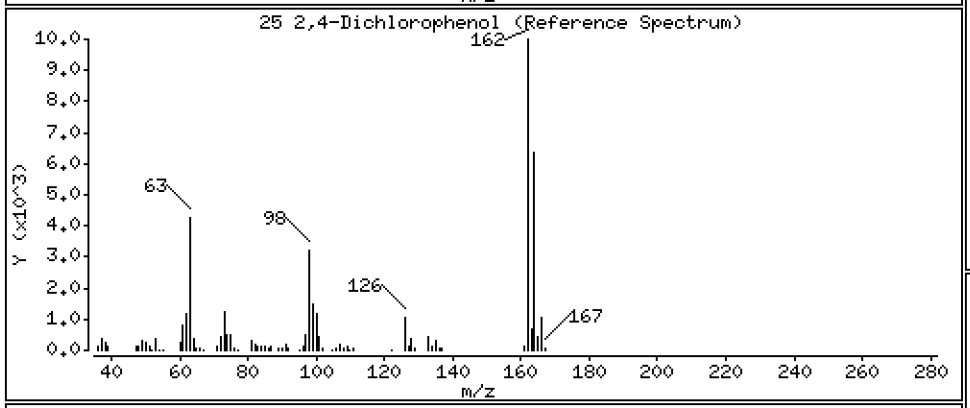
Column diameter: 0.25

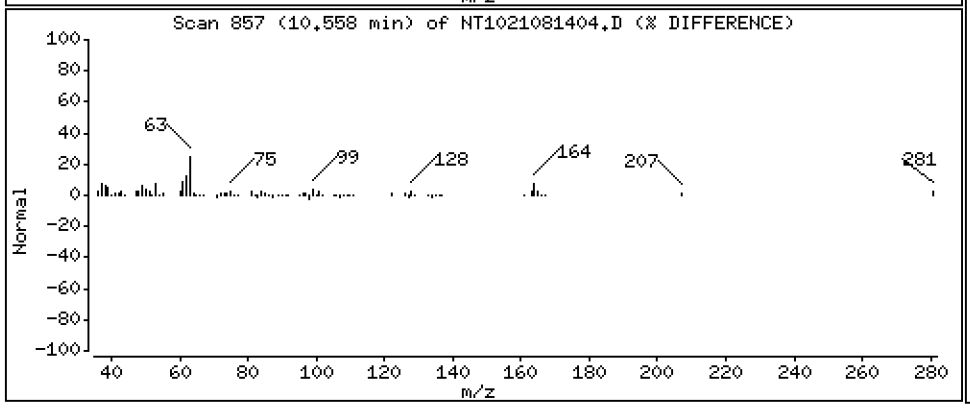
25 2,4-Dichlorophenol

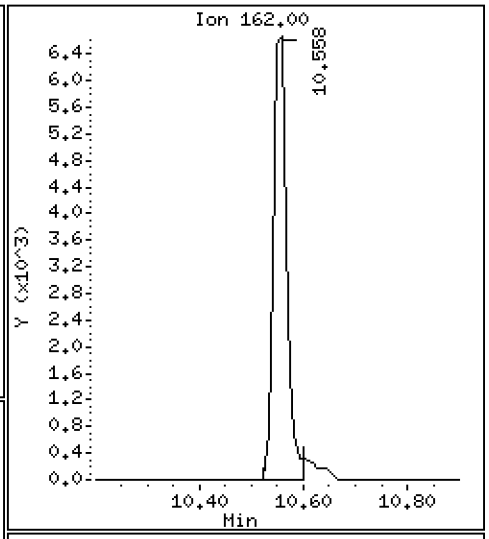
Concentration: 0.3384 ug/mL

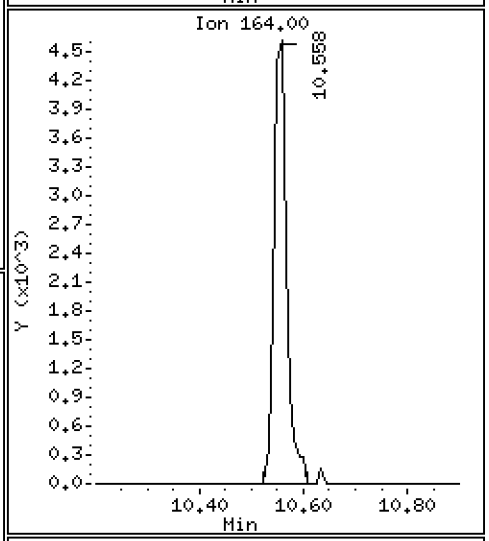


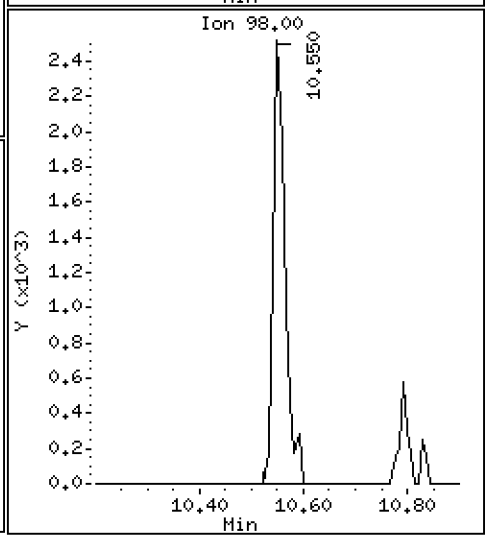












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

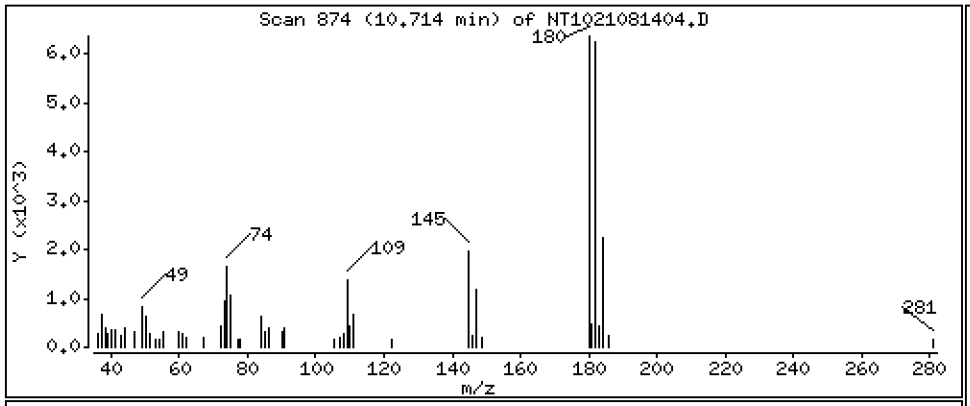
Operator: VTS

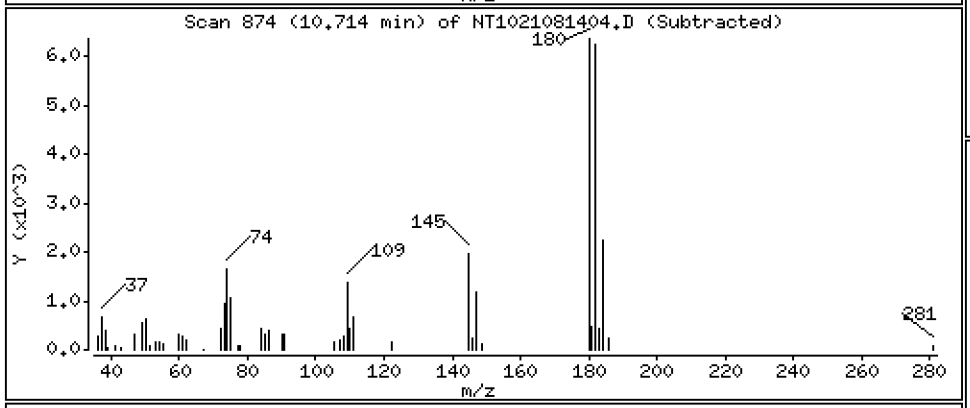
Column phase: ZB-5msi

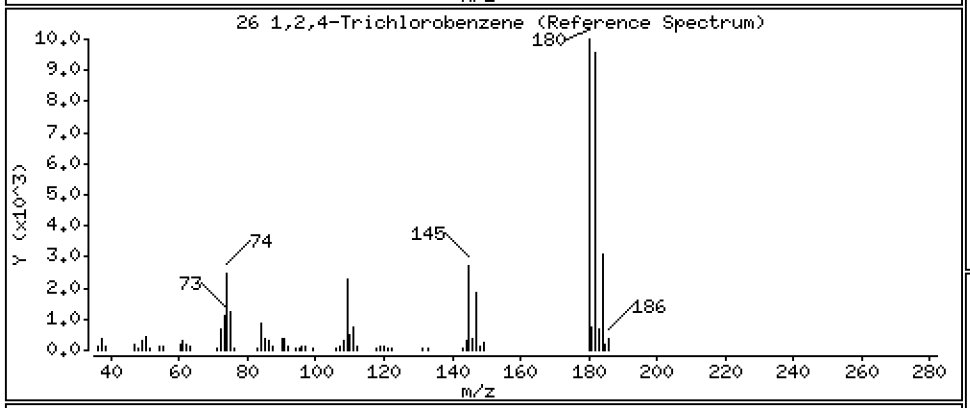
Column diameter: 0.25

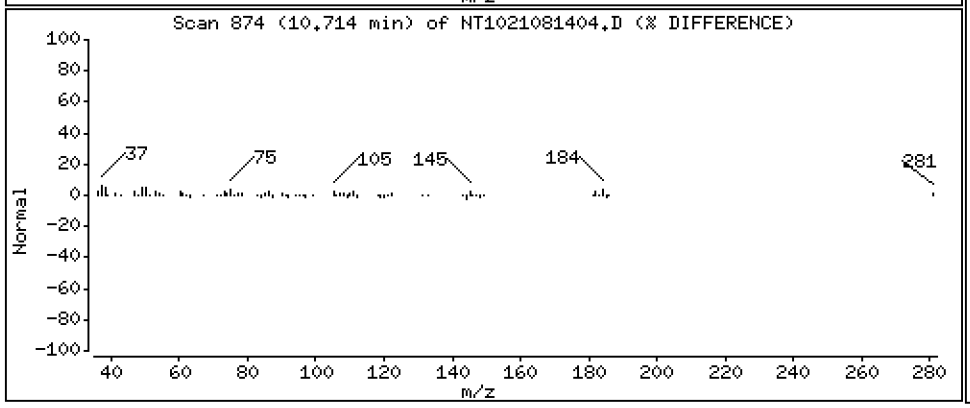
26 1,2,4-Trichlorobenzene

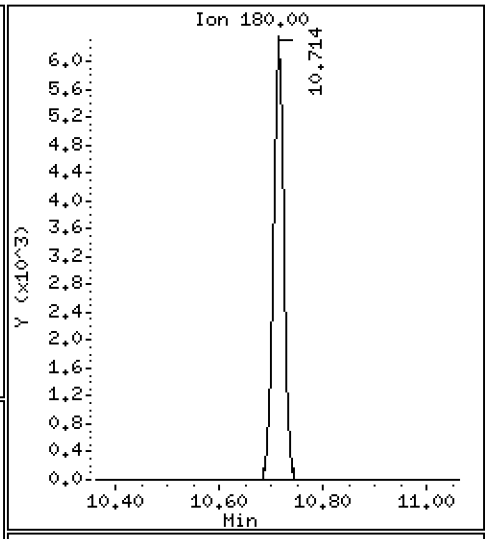
Concentration: 0.2282 ug/mL

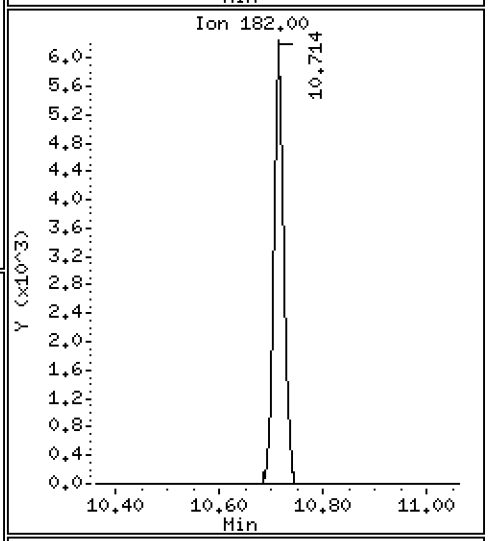


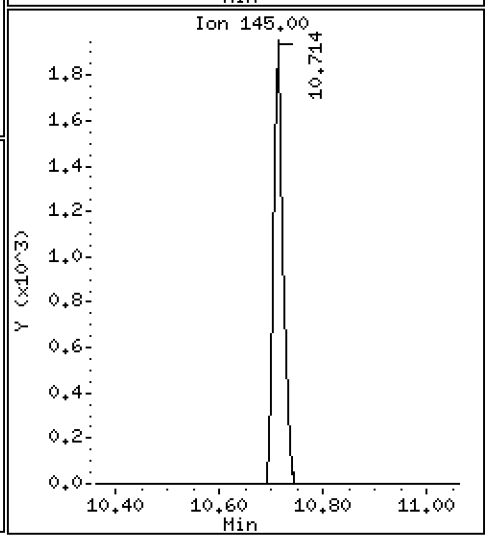












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

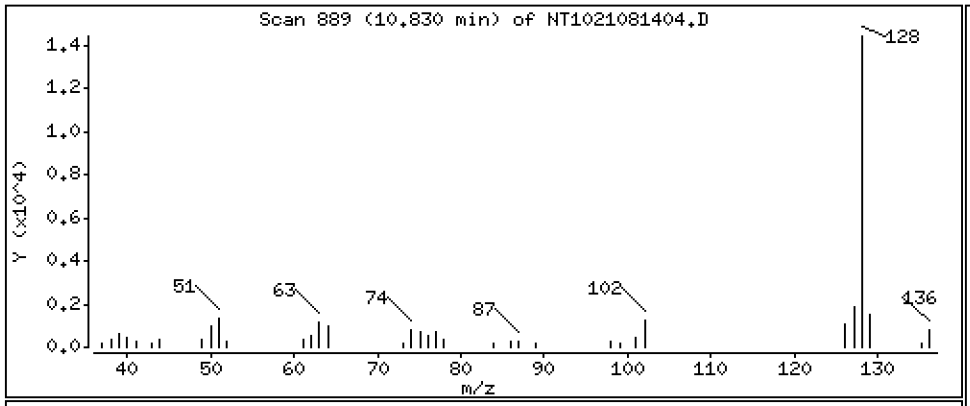
Operator: VTS

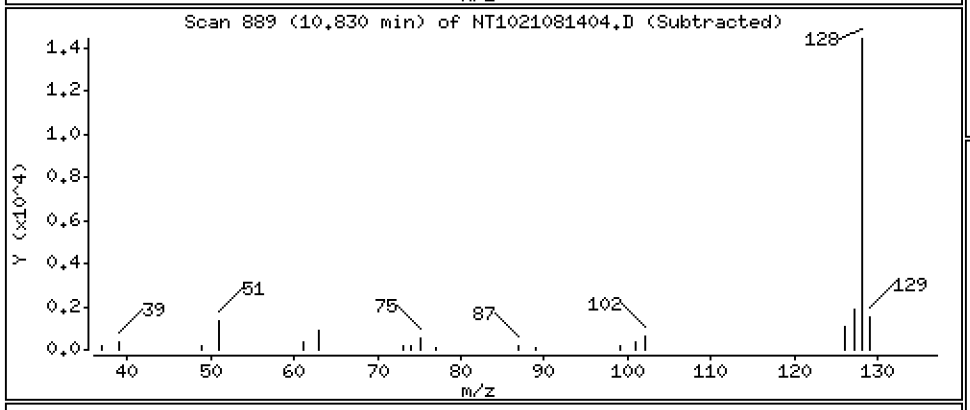
Column phase: ZB-5msi

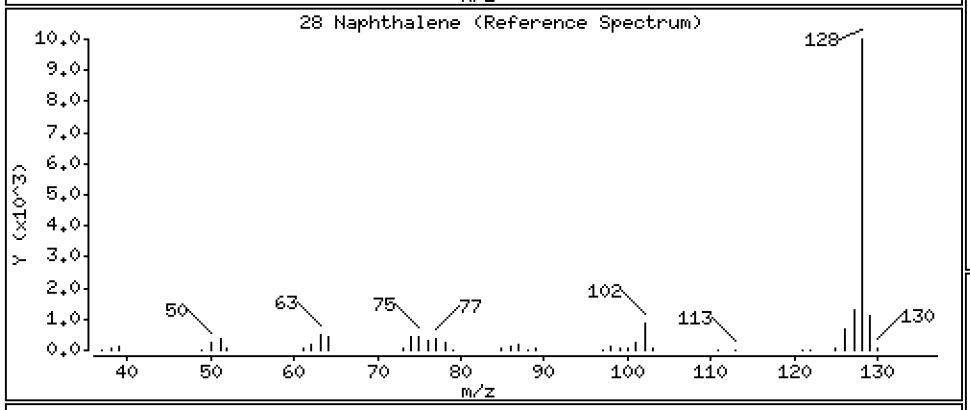
Column diameter: 0.25

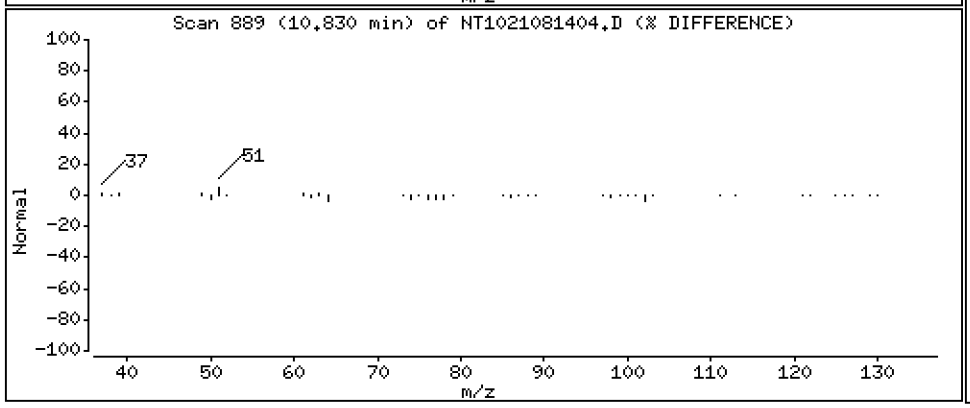
28 Naphthalene

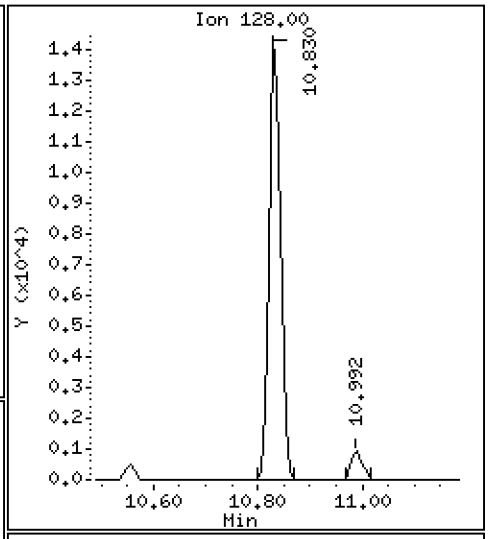
Concentration: 0.1731 ug/mL

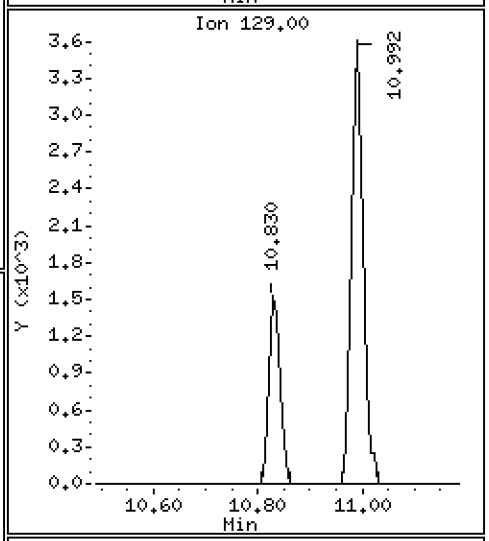


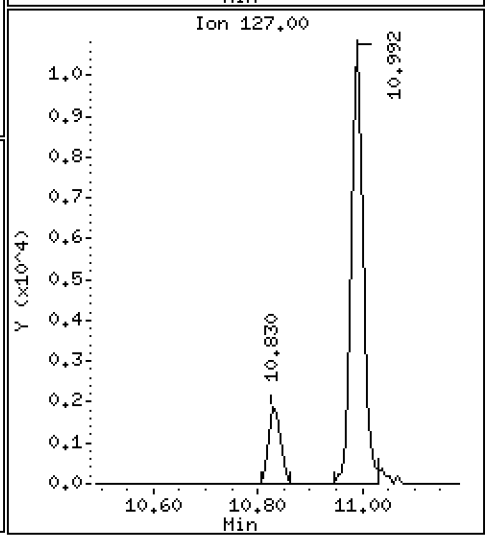












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

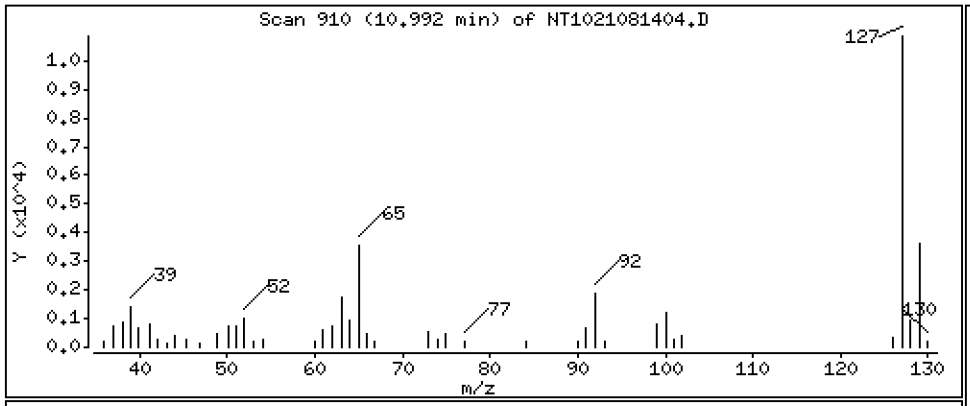
Operator: VTS

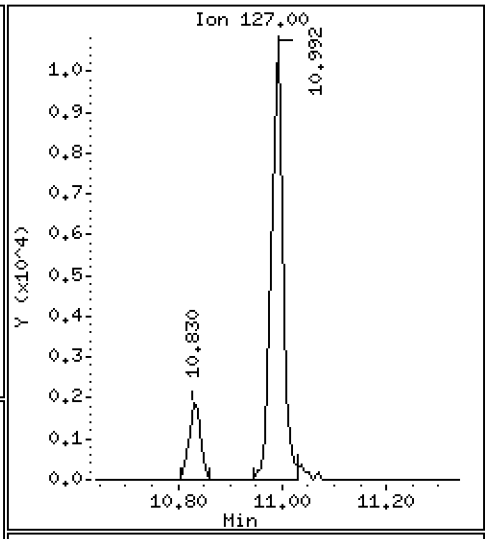
Column phase: ZB-5msi

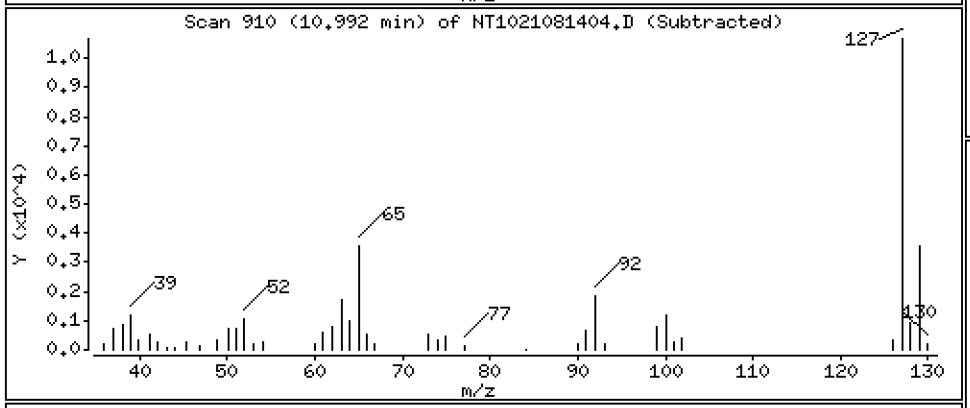
Column diameter: 0.25

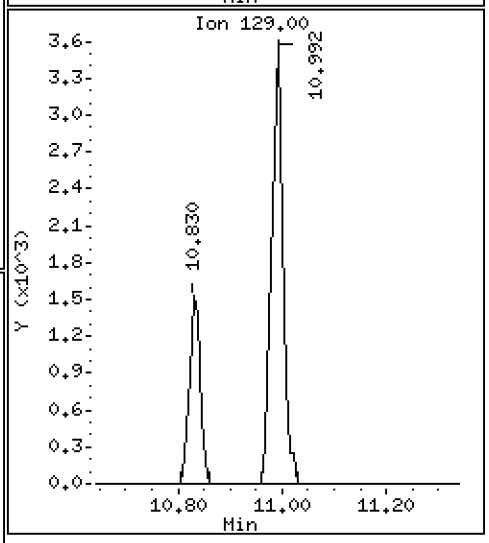
29 4-Chloroaniline

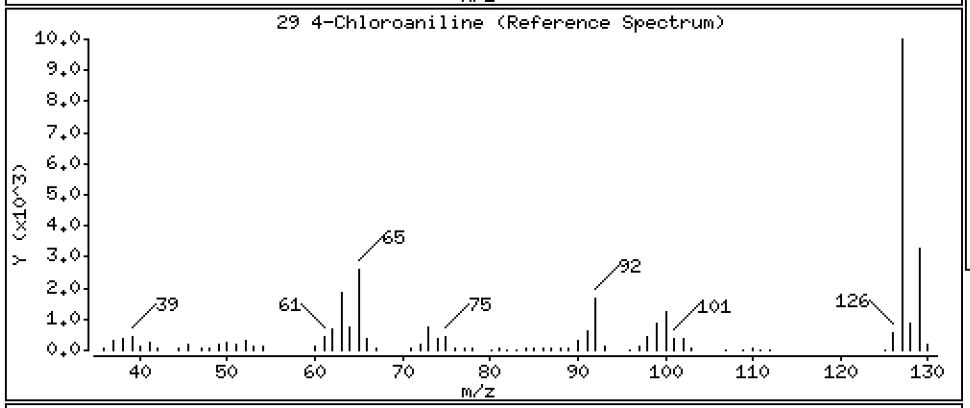
Concentration: 0.2713 ug/mL

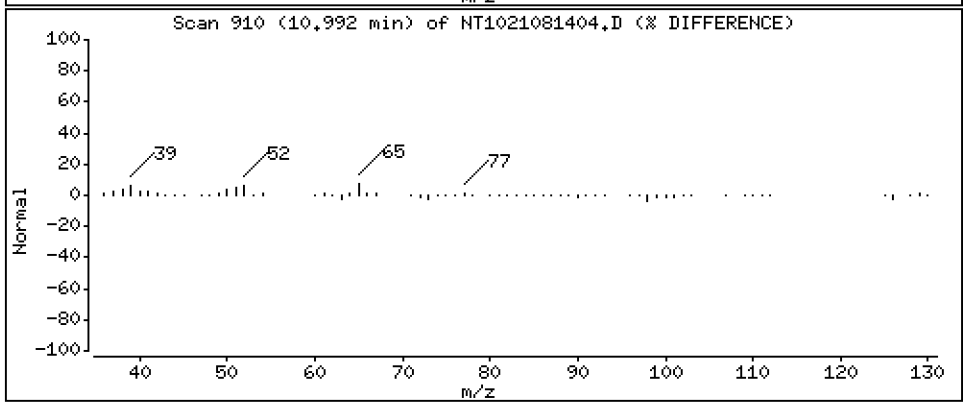












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

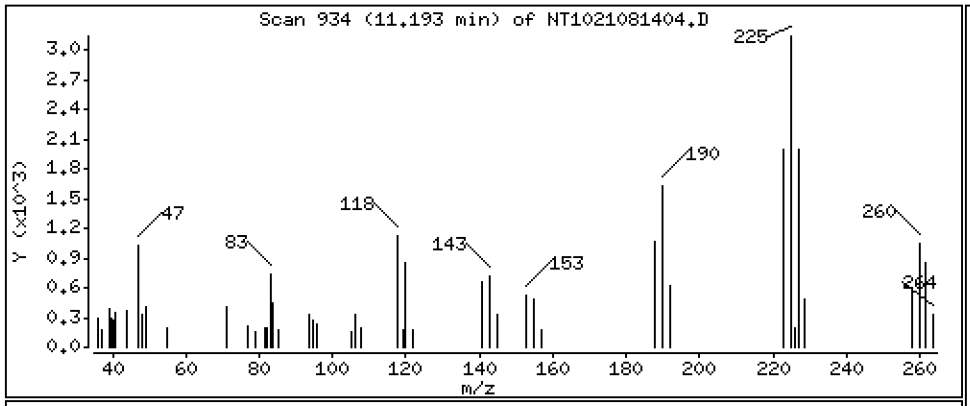
Operator: VTS

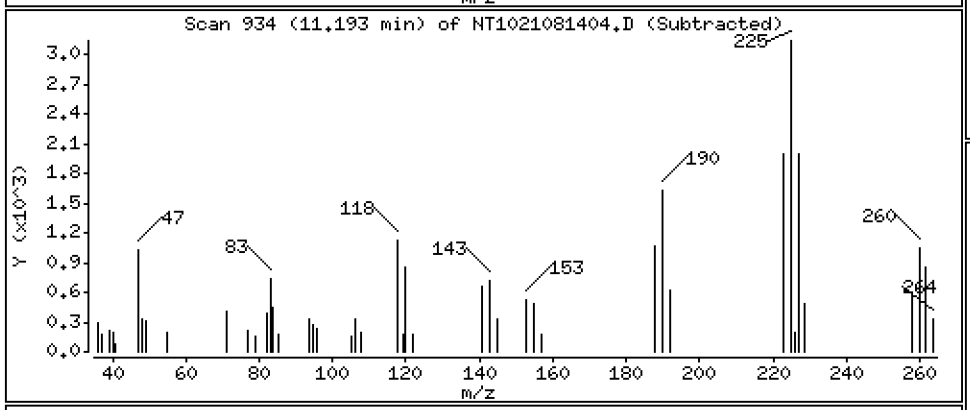
Column phase: ZB-5msi

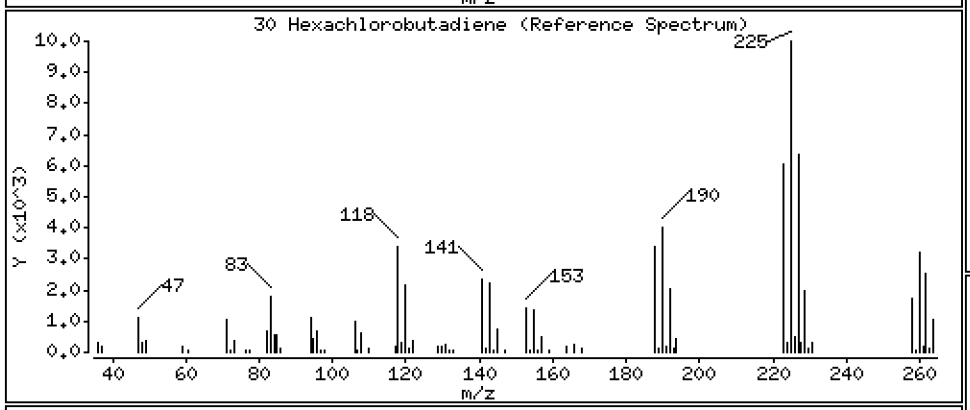
Column diameter: 0.25

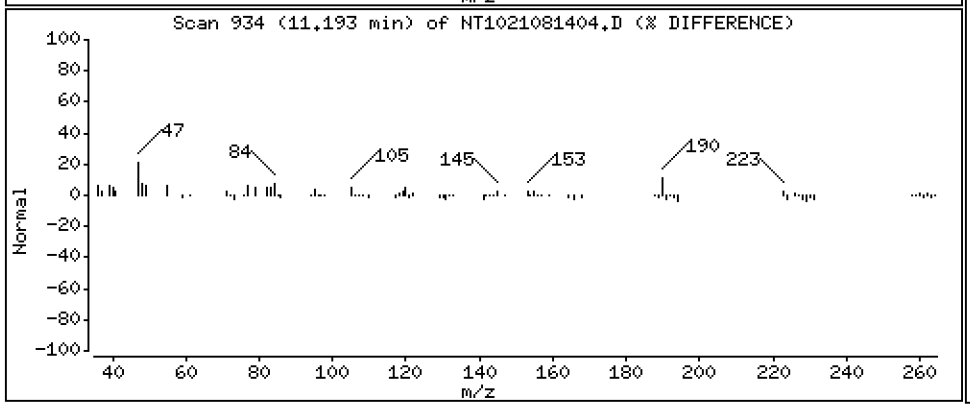
30 Hexachlorobutadiene

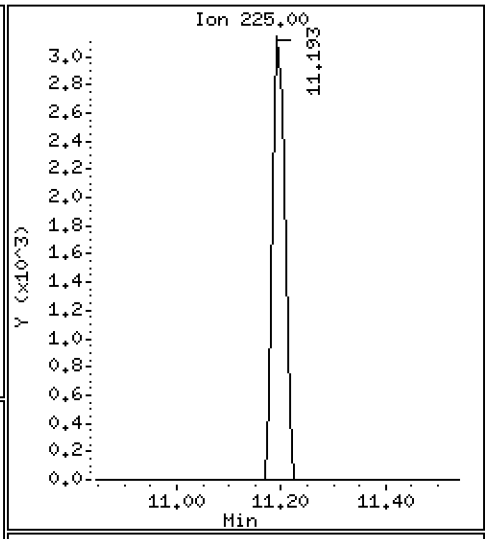
Concentration: 0.2218 ug/mL

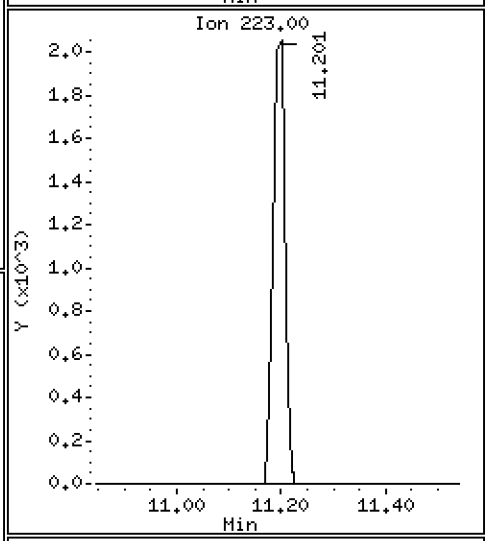


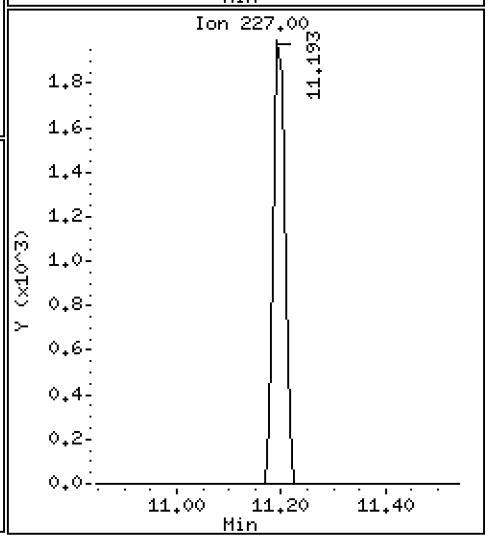












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

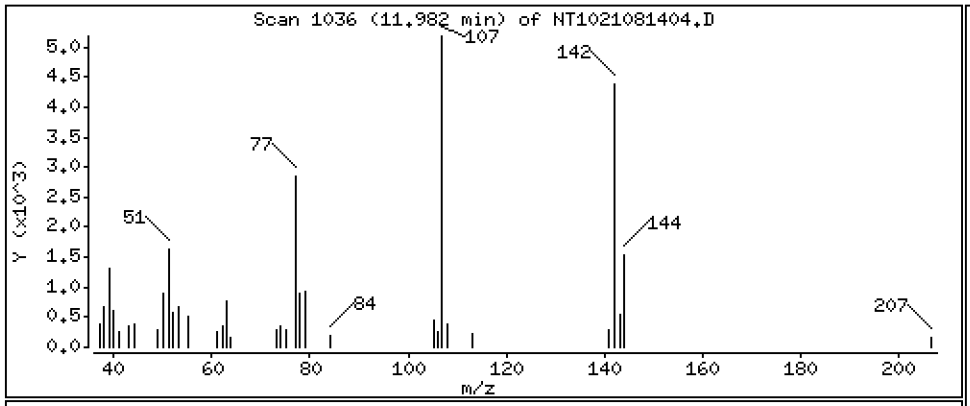
Operator: VTS

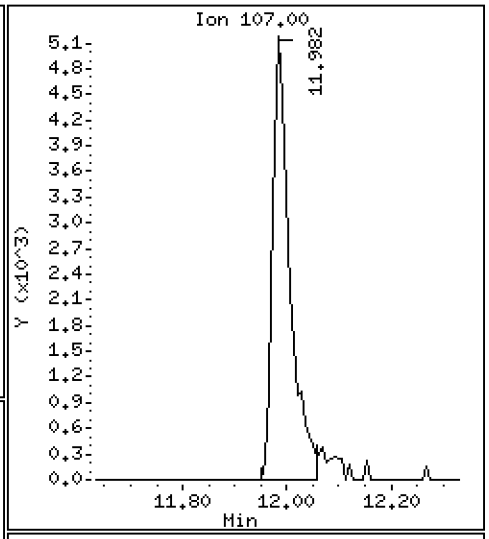
Column phase: ZB-5msi

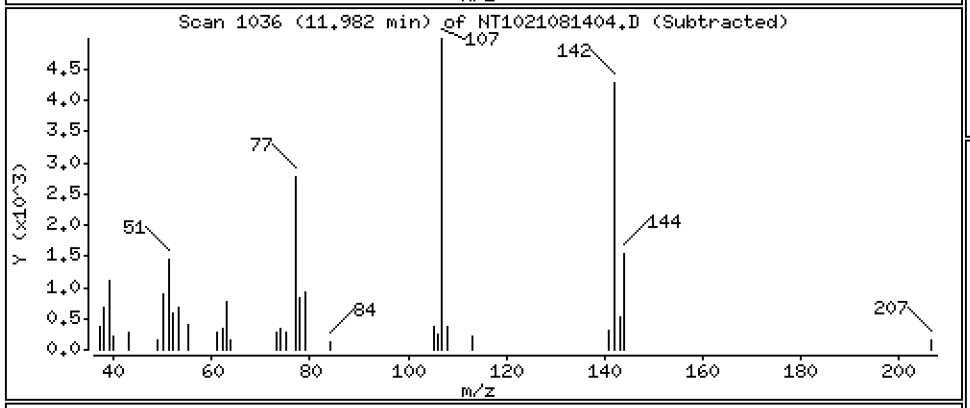
Column diameter: 0.25

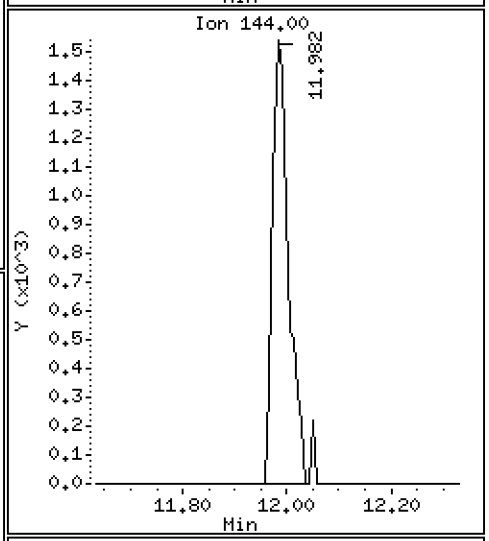
31 4-Chloro-3-methylphenol

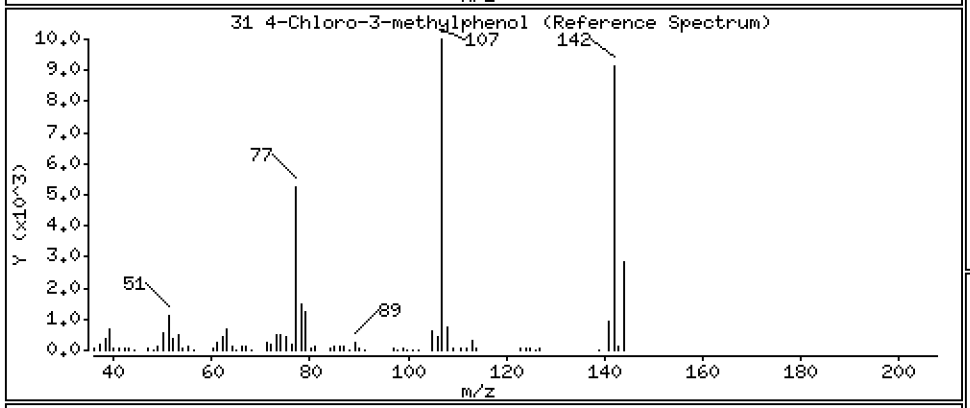
Concentration: 0.2741 ug/mL

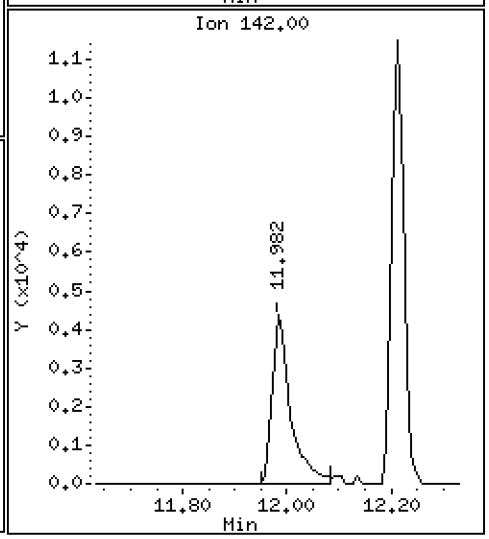


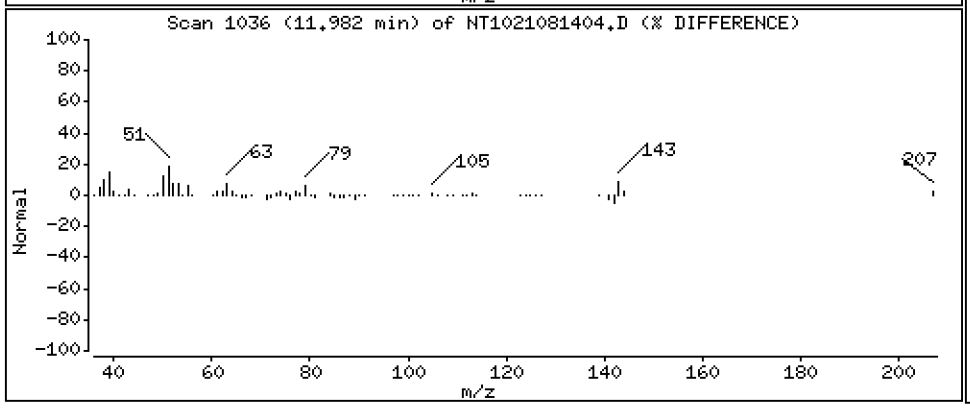












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

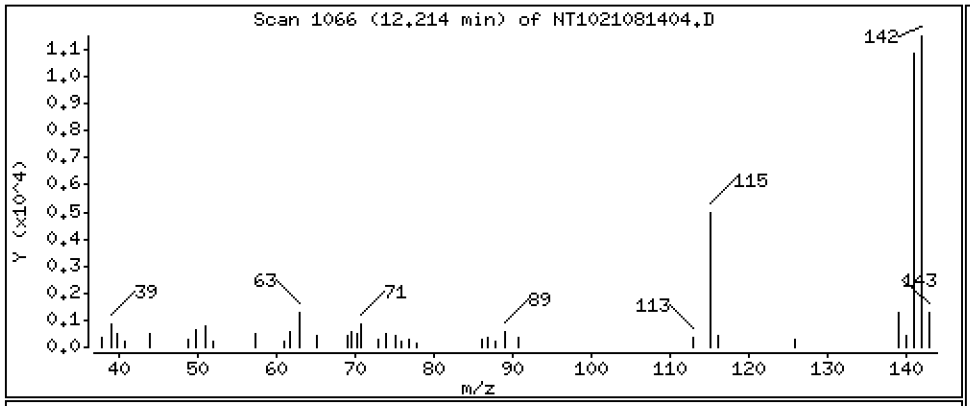
Operator: VTS

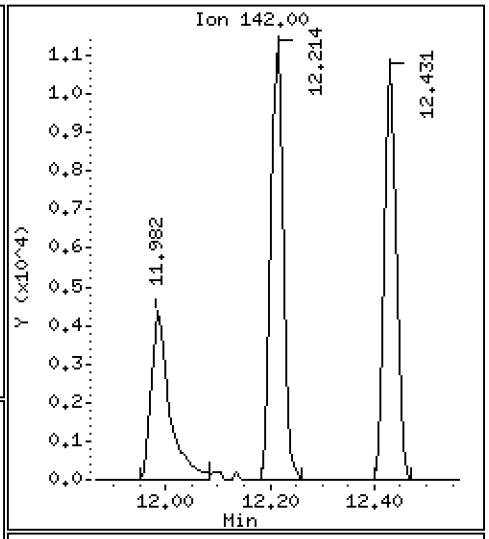
Column phase: ZB-5msi

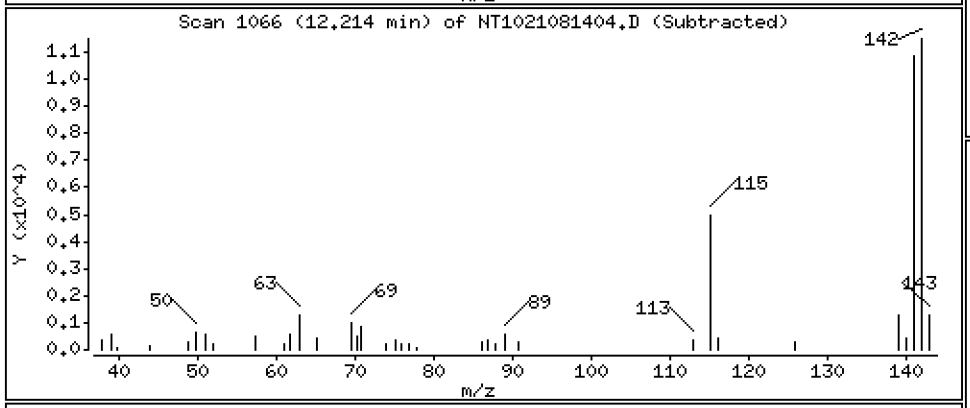
Column diameter: 0.25

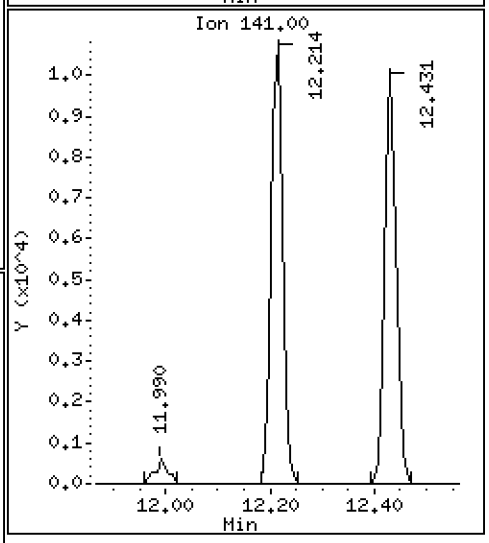
32 2-Methylnaphthalene

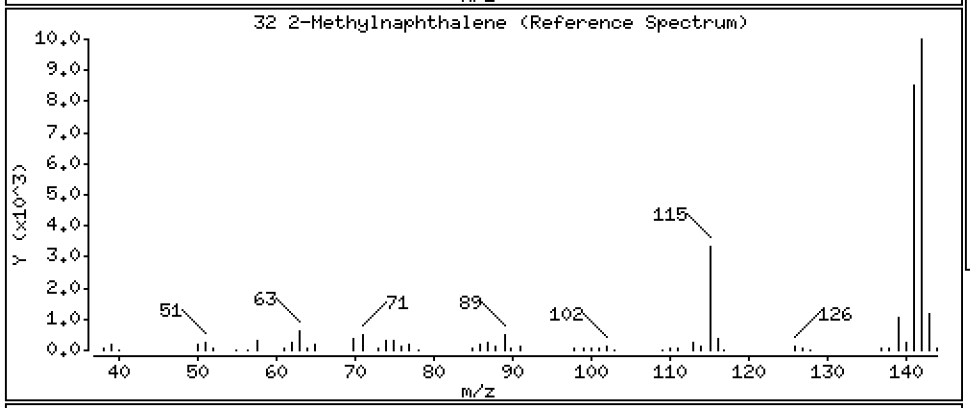
Concentration: 0.1601 ug/mL

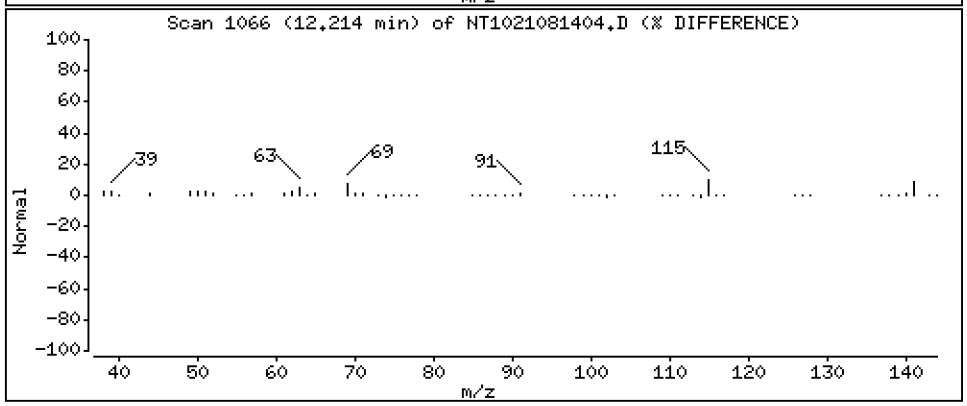












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

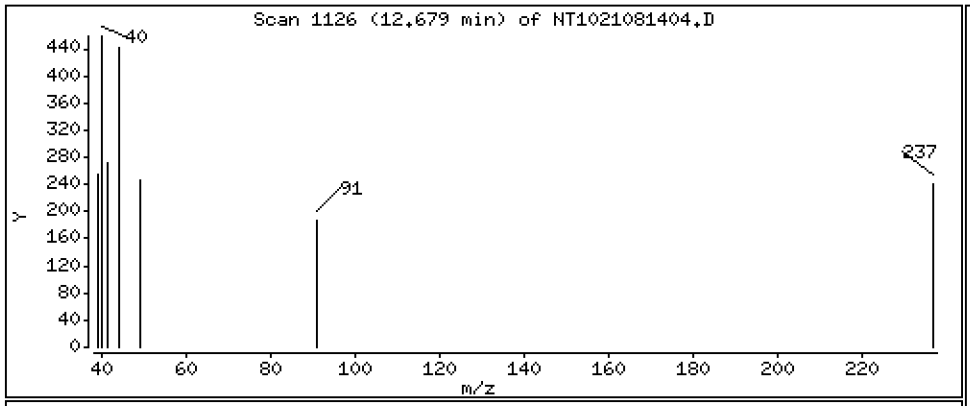
Operator: VTS

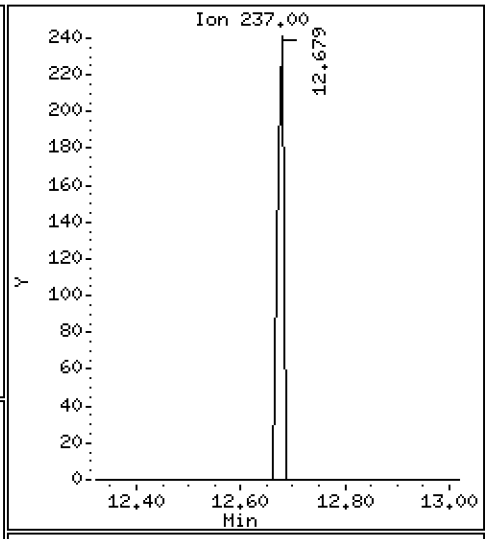
Column phase: ZB-5msi

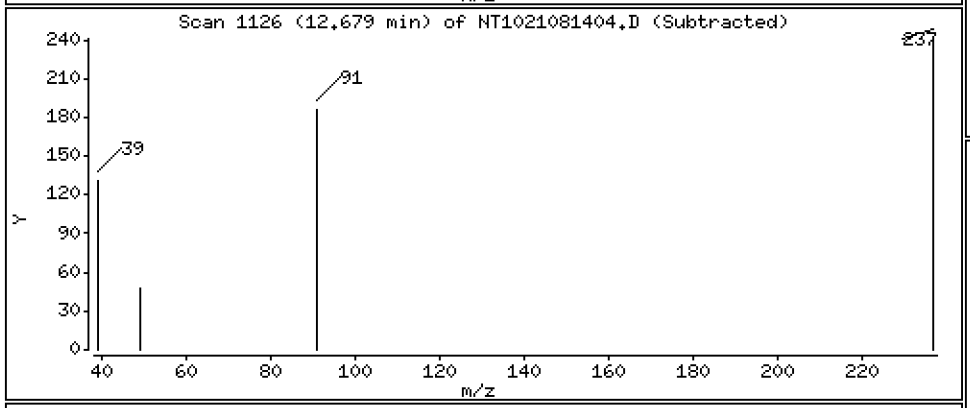
Column diameter: 0.25

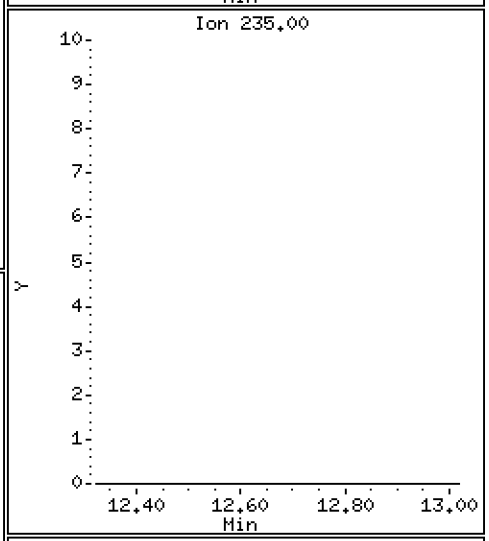
33 Hexachlorocyclopentadiene

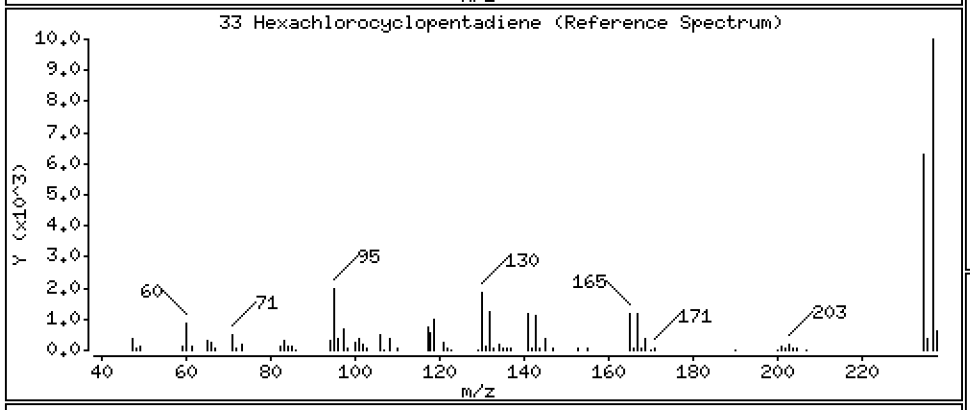
Concentration: 0.007837 ug/mL

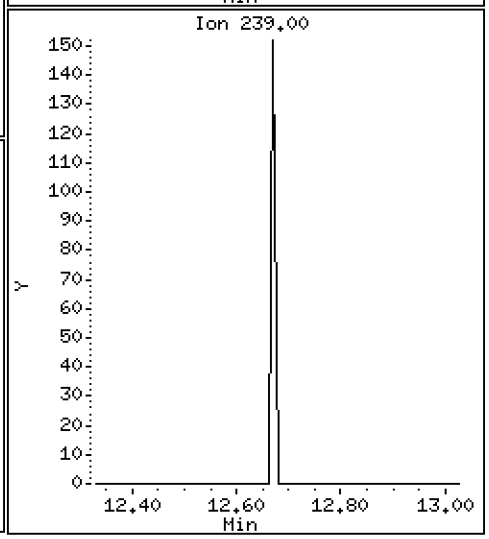


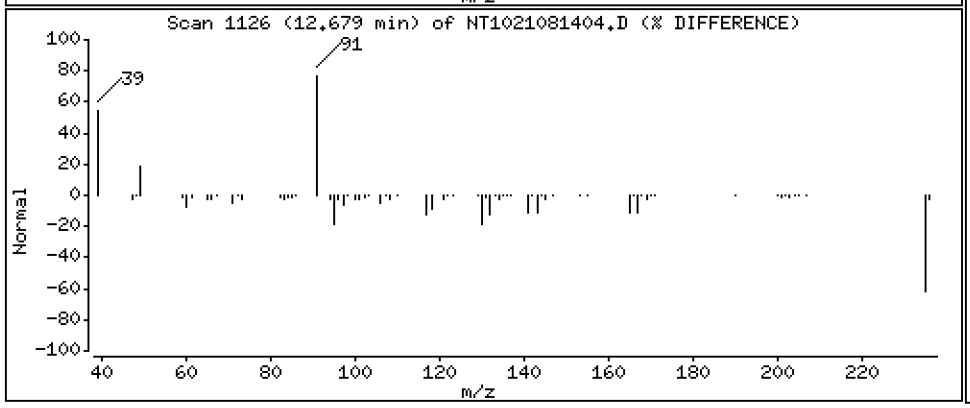












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

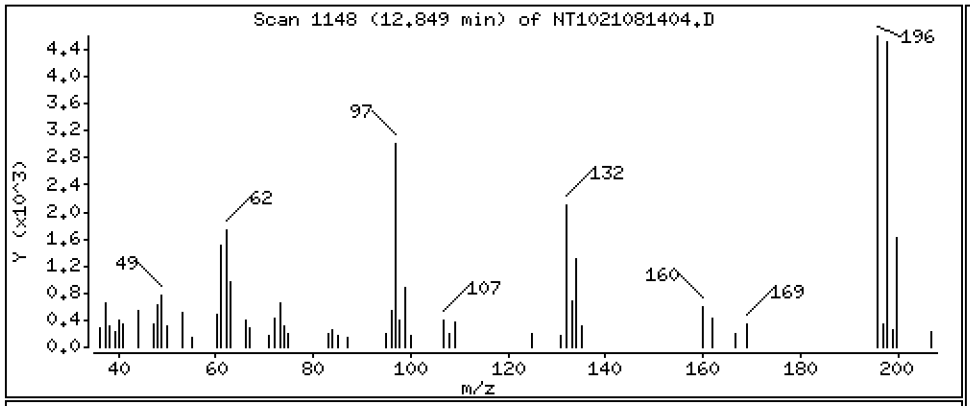
Operator: VTS

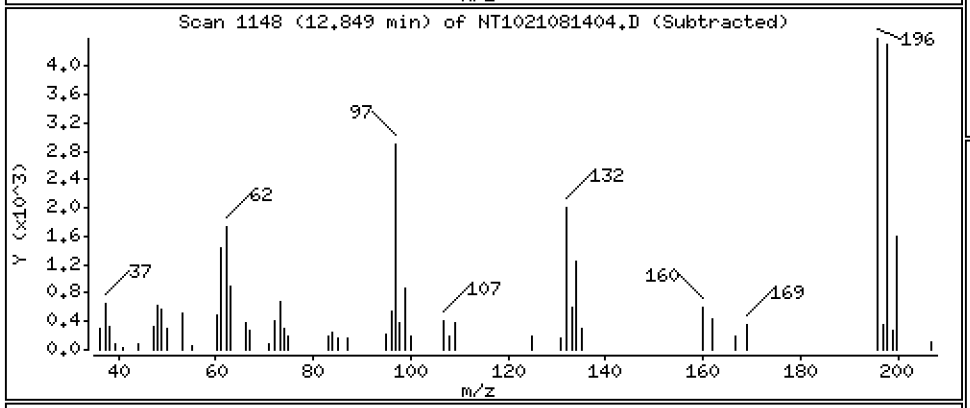
Column phase: ZB-5msi

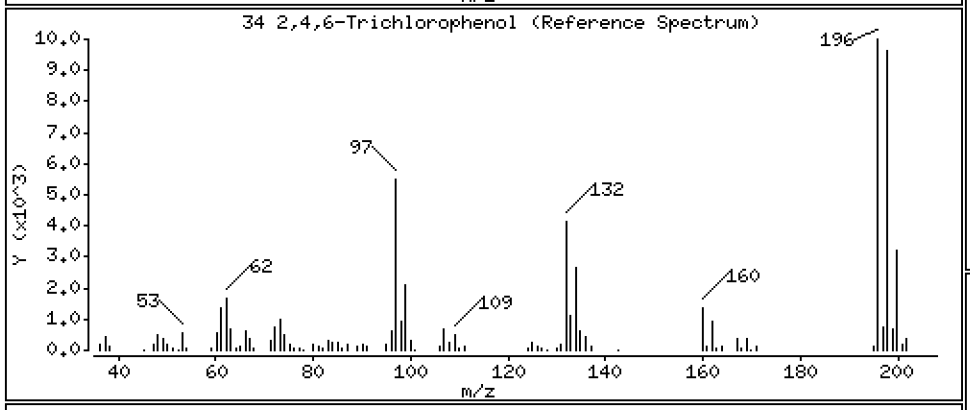
Column diameter: 0.25

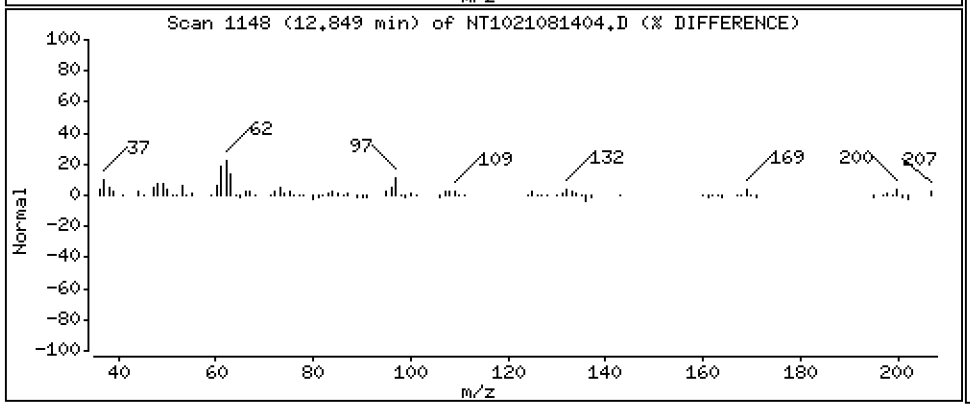
34 2,4,6-Trichlorophenol

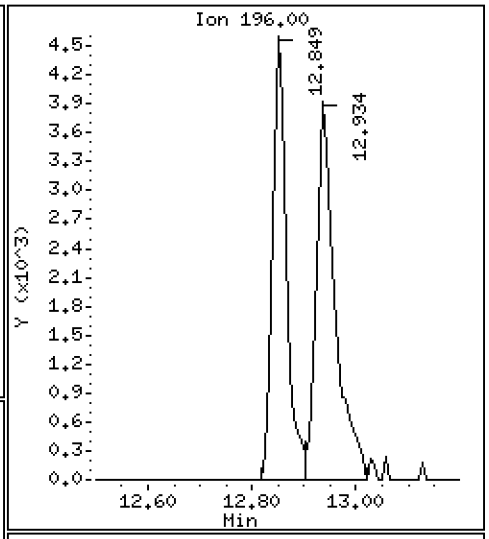
Concentration: 0.3236 ug/mL

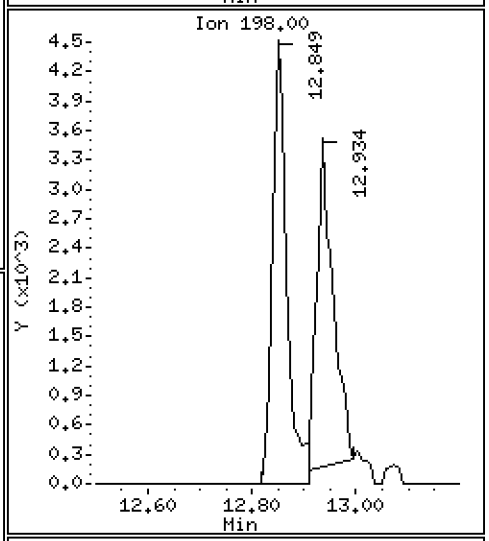


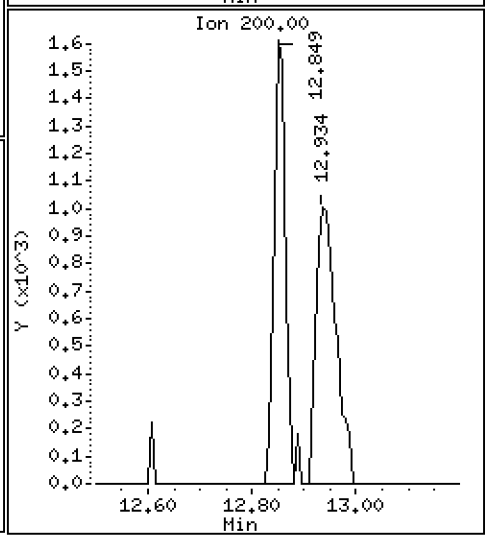












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

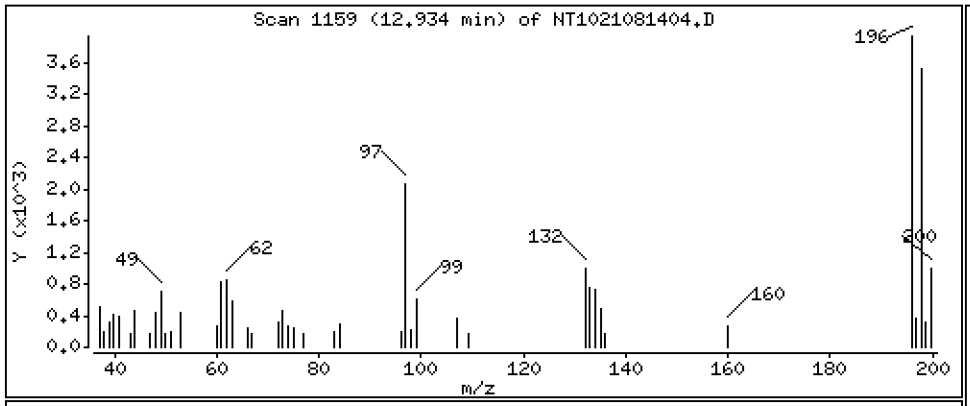
Operator: VTS

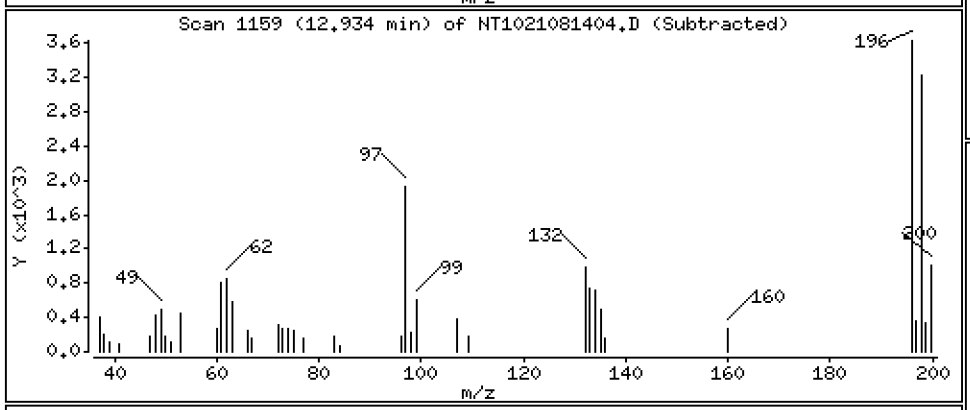
Column phase: ZB-5msi

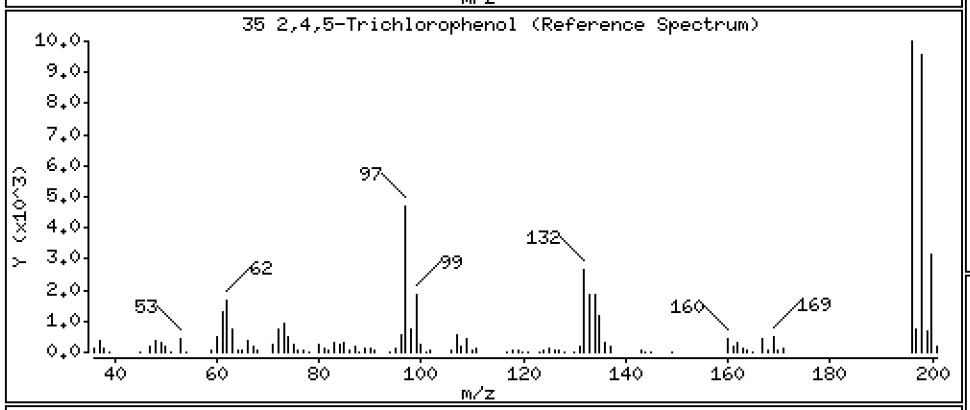
Column diameter: 0.25

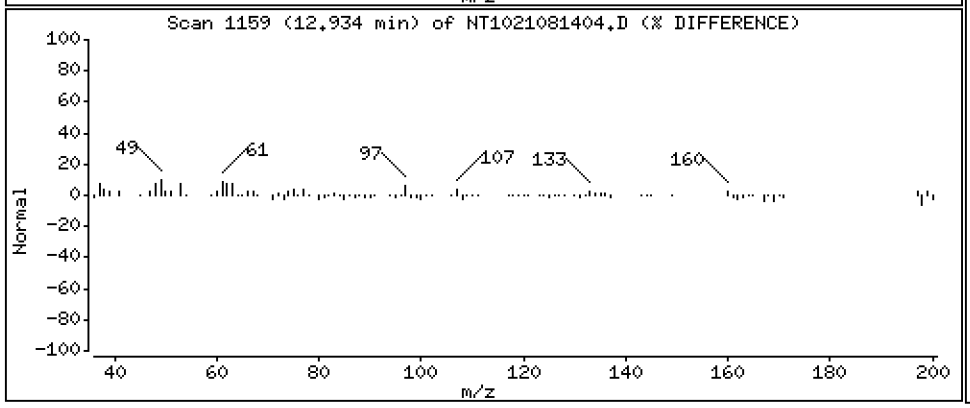
35 2,4,5-Trichlorophenol

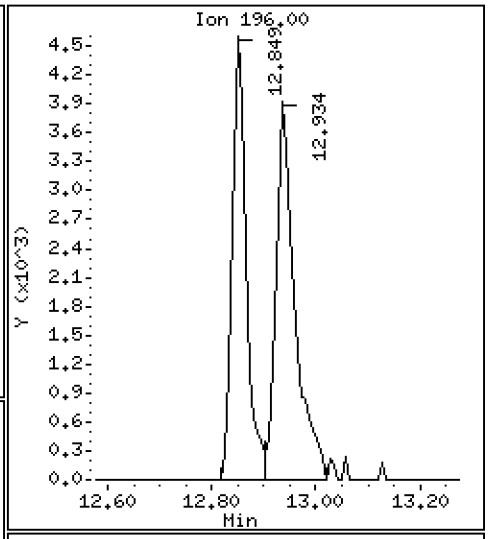
Concentration: 0.3627 ug/mL

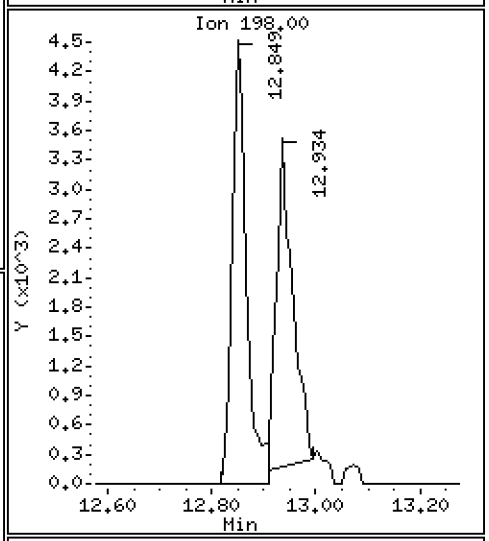


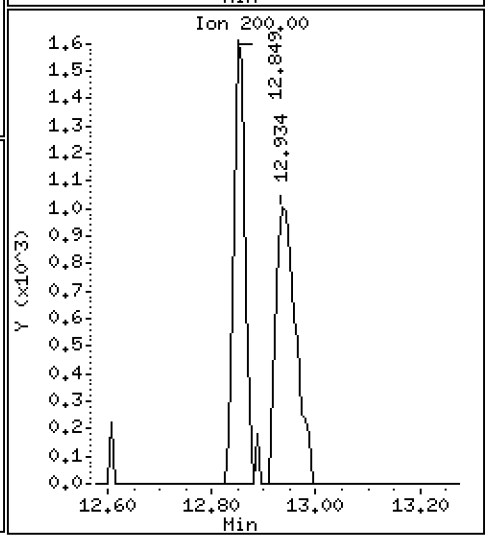












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

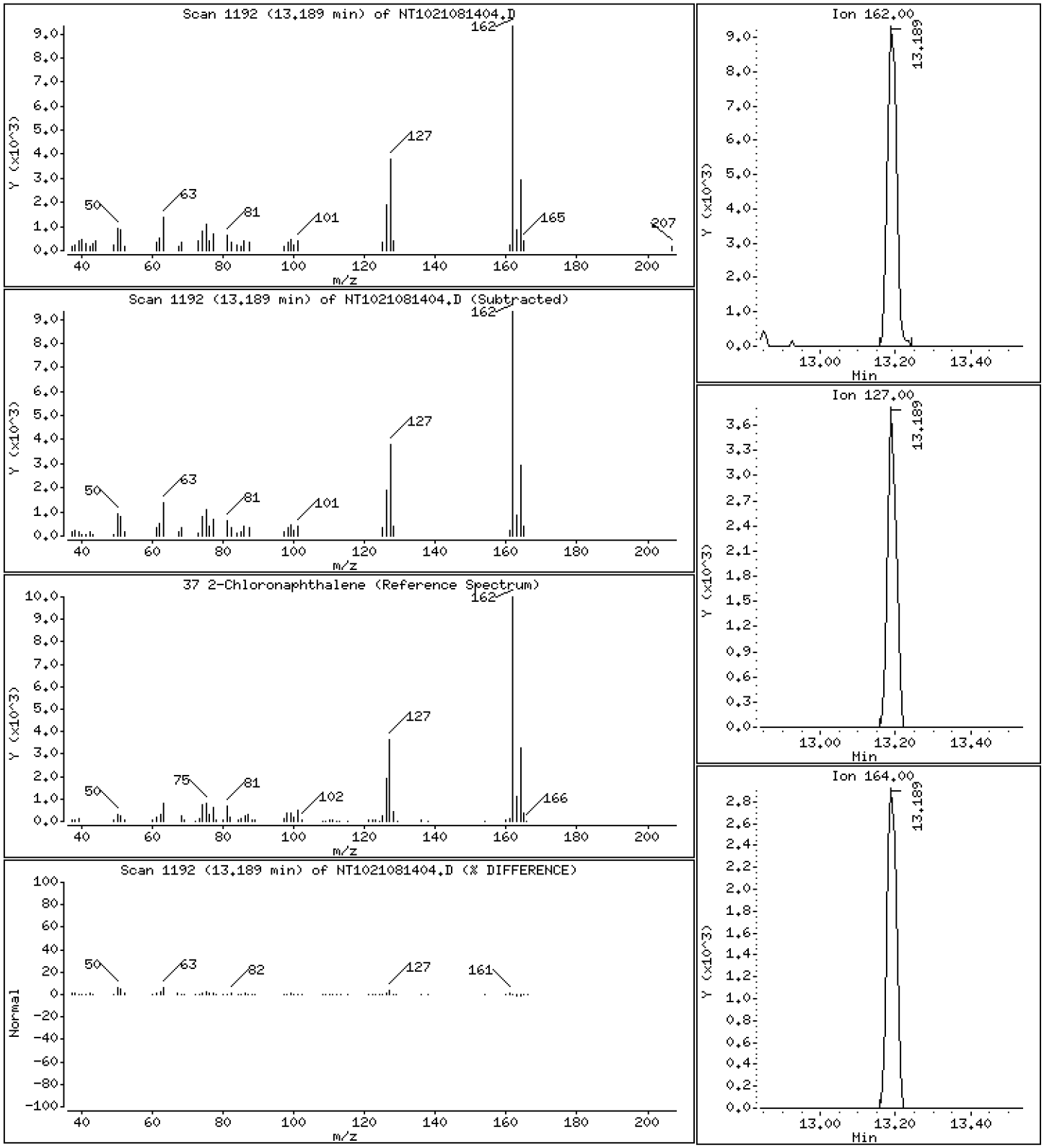
Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25

37 2-Chloronaphthalene

Concentration: 0.1673 ug/mL



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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

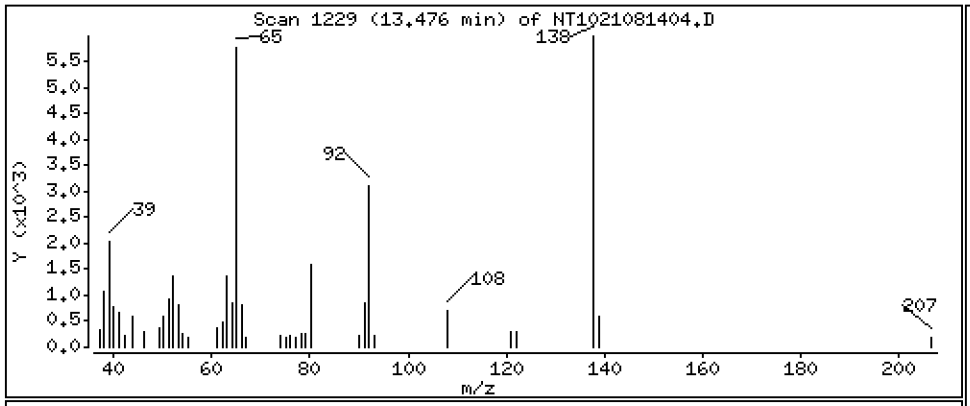
Operator: VTS

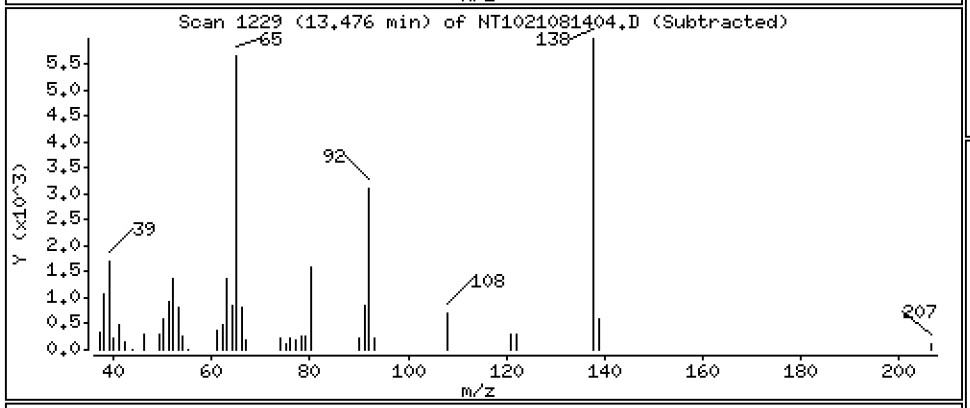
Column phase: ZB-5msi

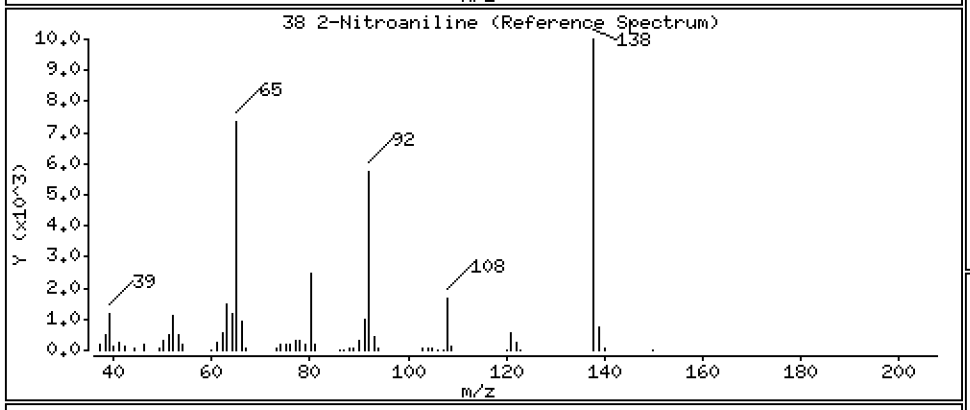
Column diameter: 0.25

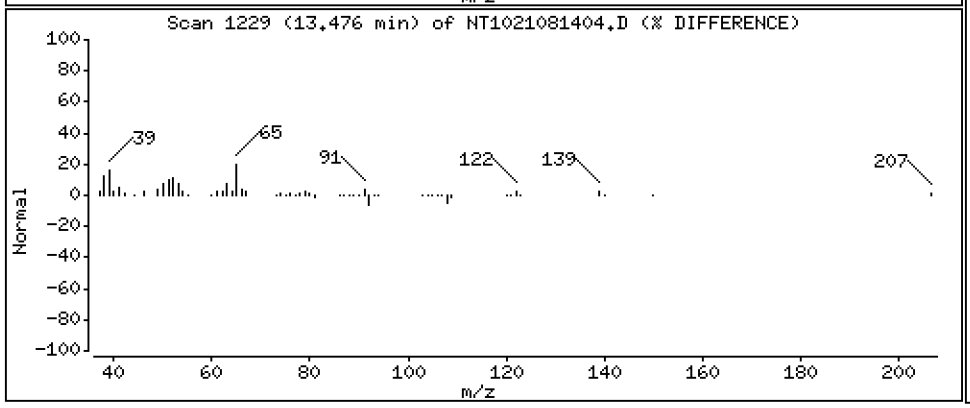
38 2-Nitroaniline

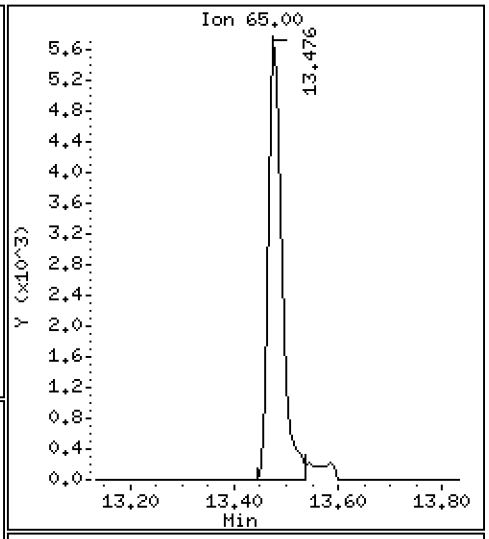
Concentration: 0.3025 ug/mL

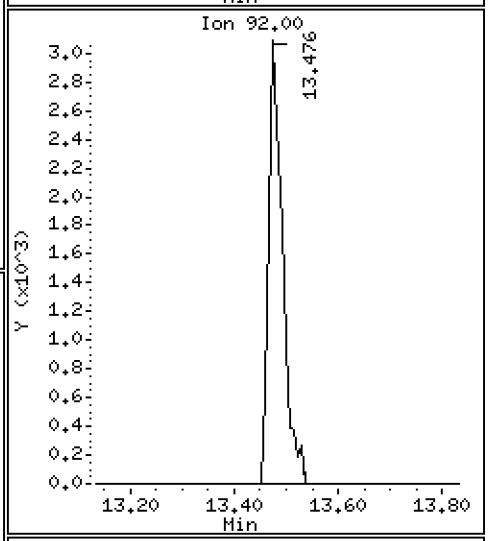


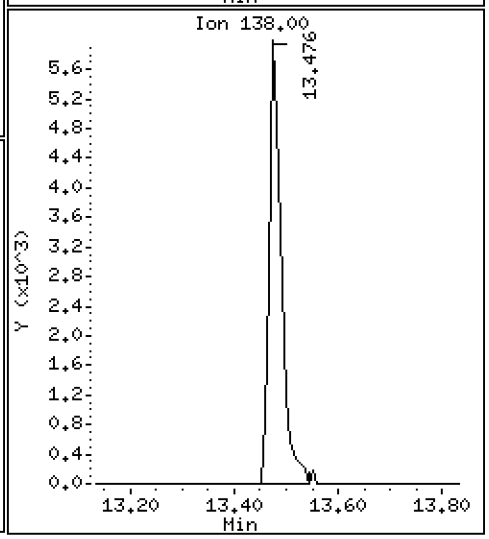












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

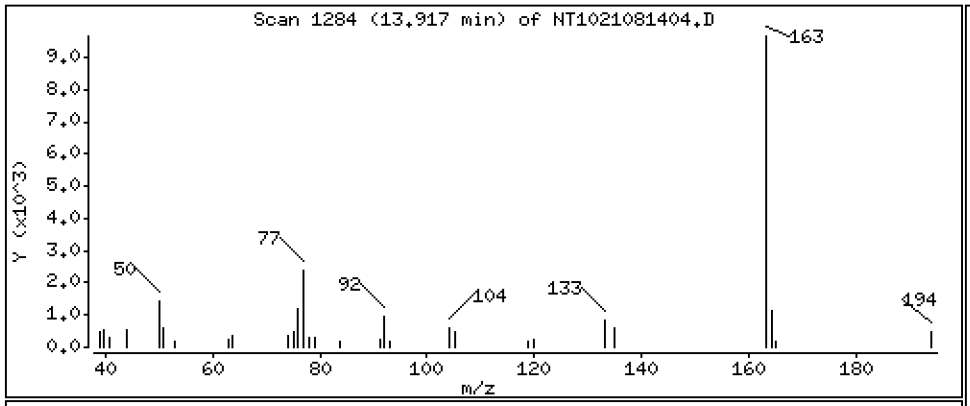
Operator: VTS

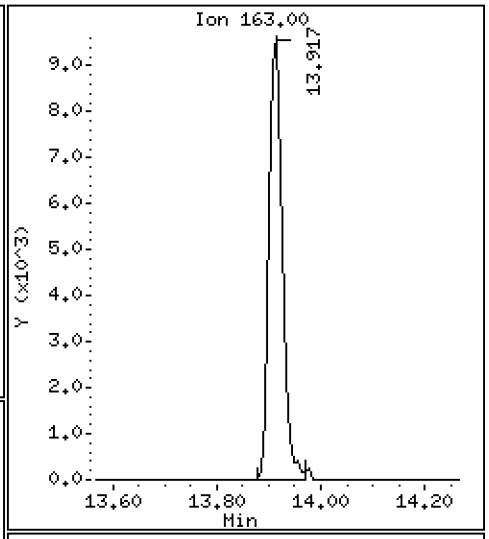
Column phase: ZB-5msi

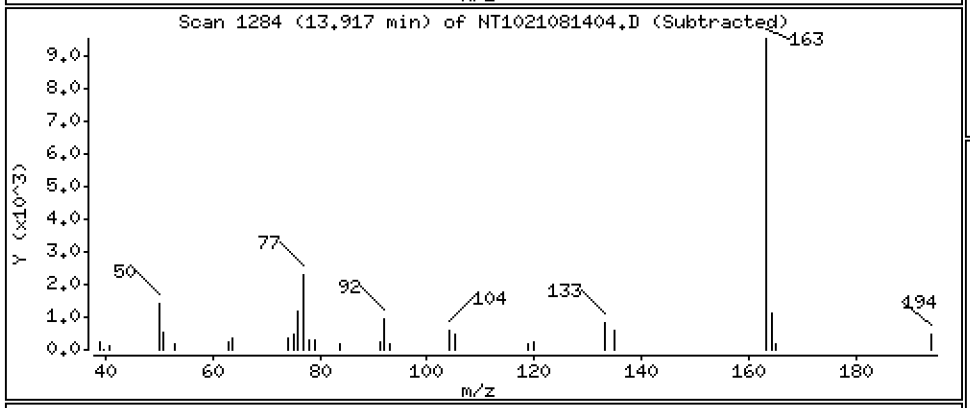
Column diameter: 0.25

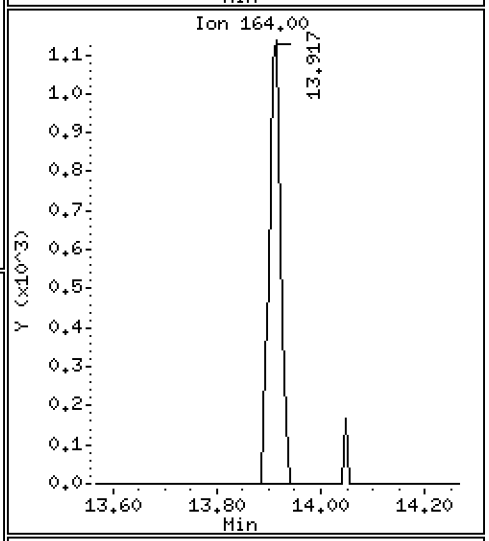
39 Dimethylphthalate

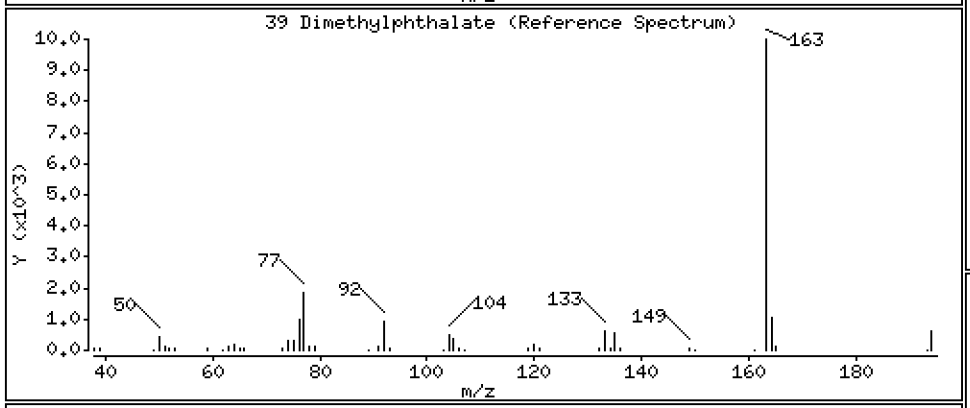
Concentration: 0.1913 ug/mL

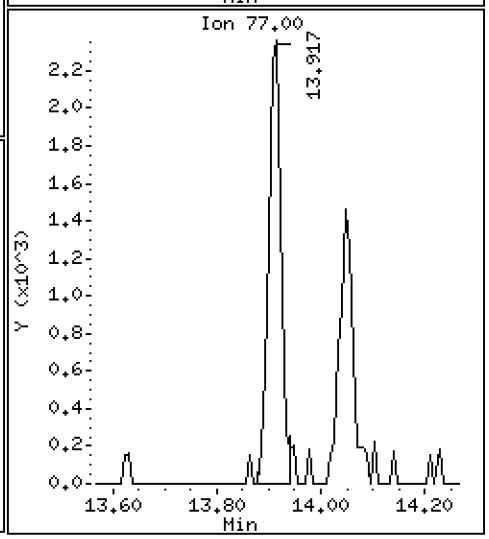


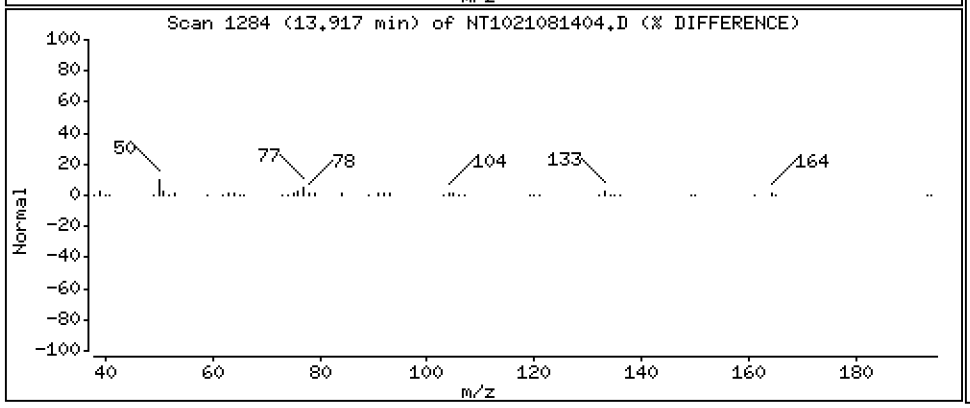












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

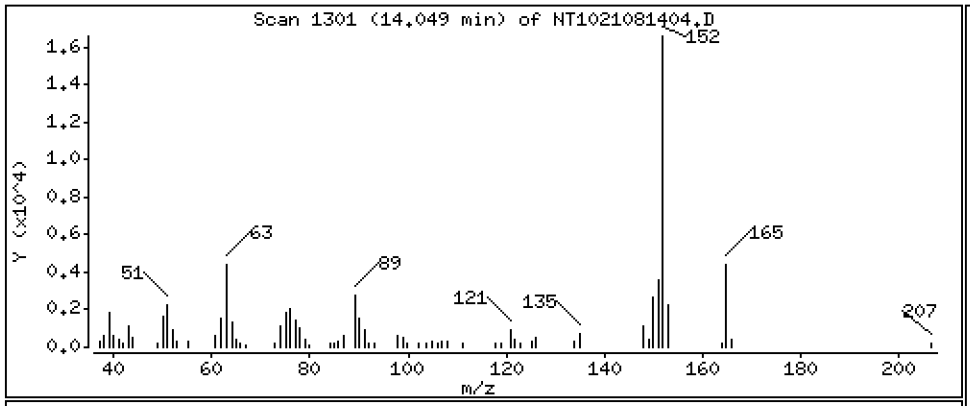
Operator: VTS

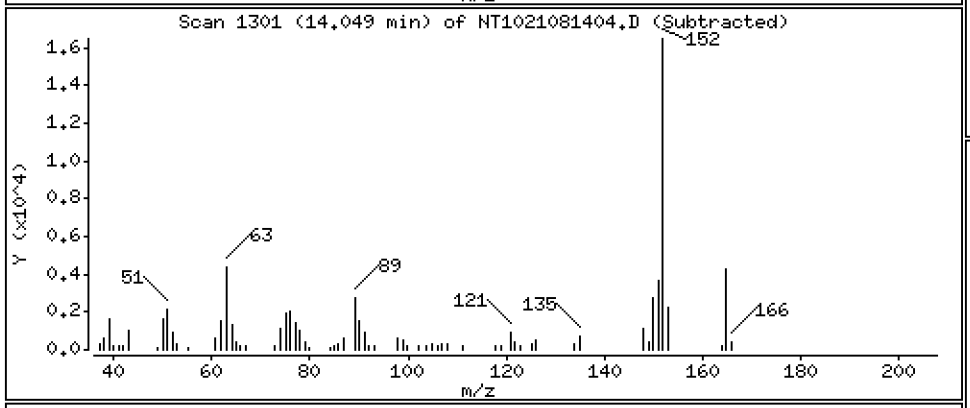
Column phase: ZB-5msi

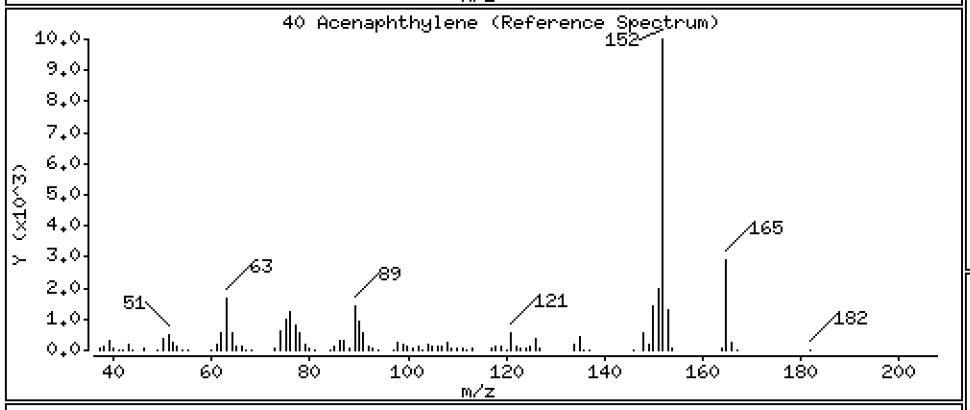
Column diameter: 0.25

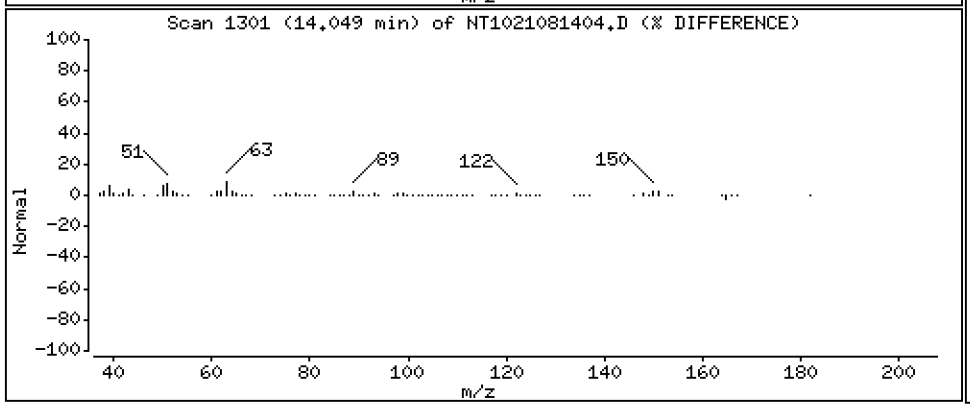
40 Acenaphthylene

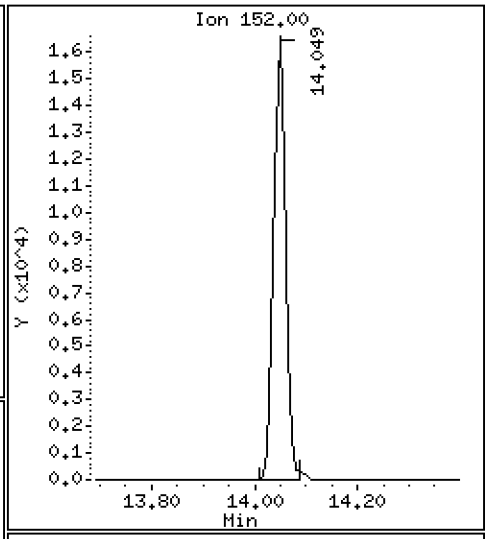
Concentration: 0.1940 ug/mL

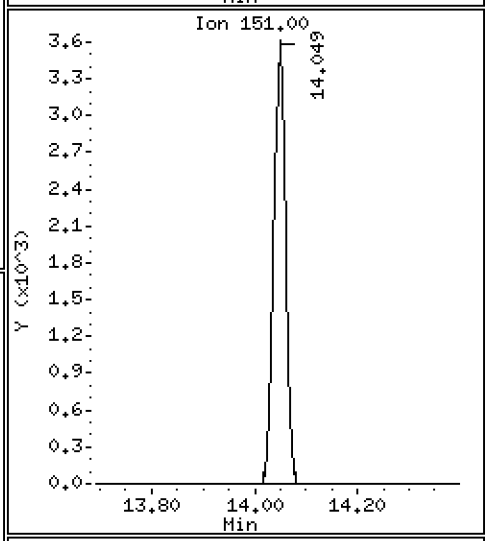


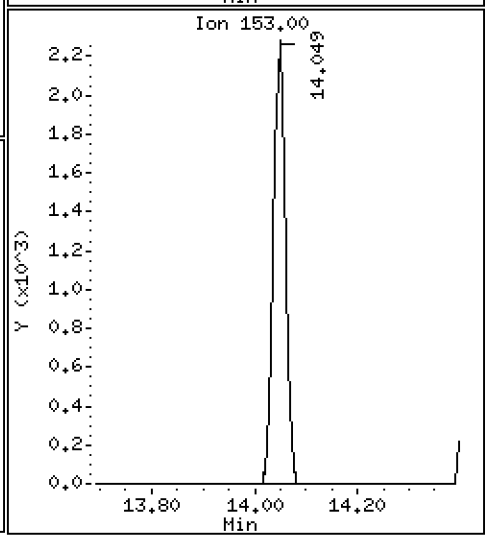












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

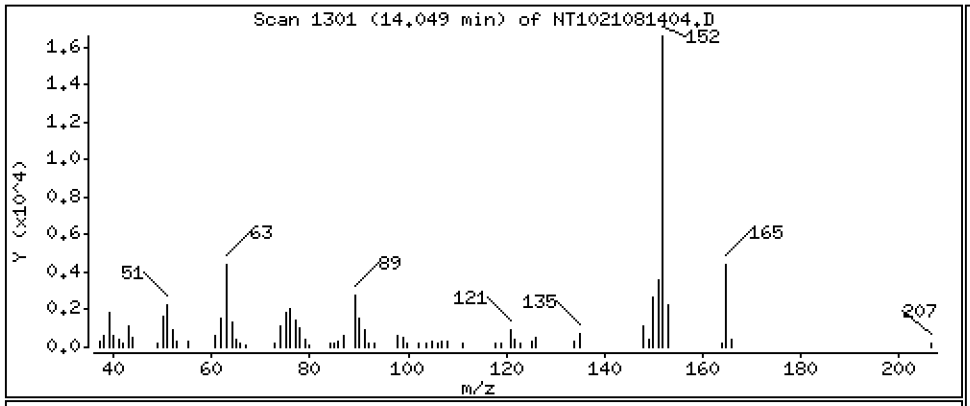
Operator: VTS

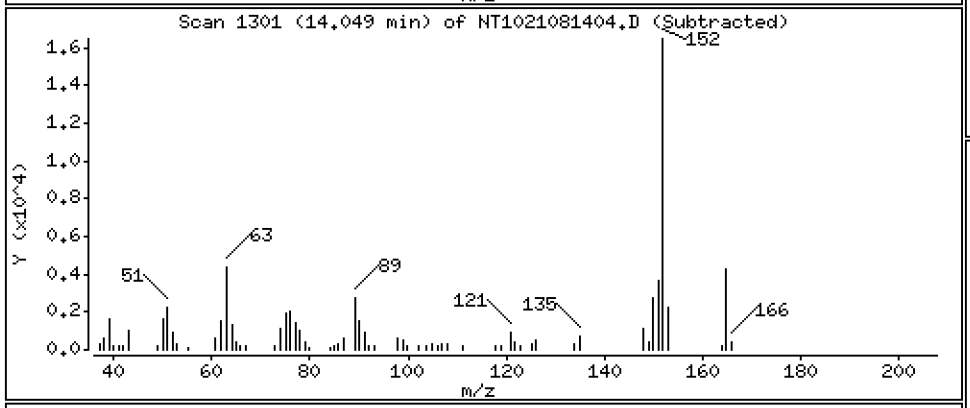
Column phase: ZB-5msi

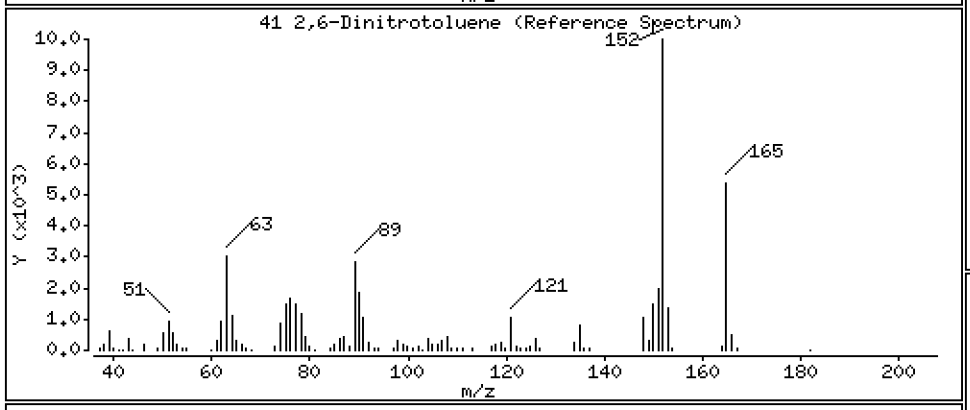
Column diameter: 0.25

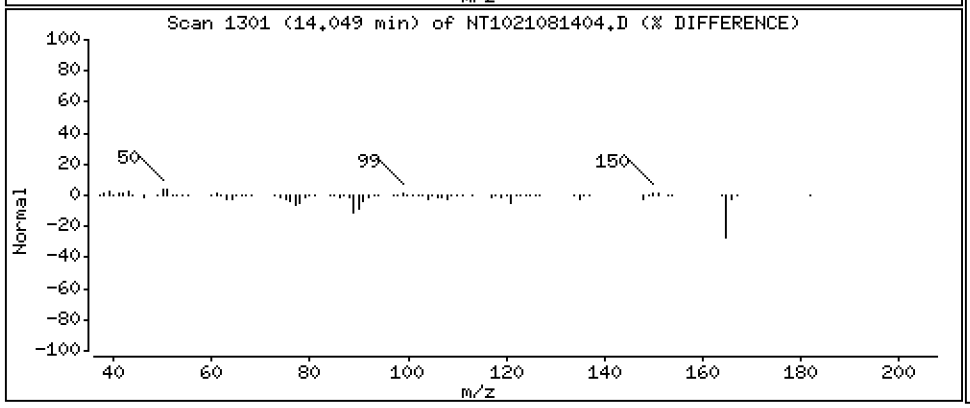
41 2,6-Dinitrotoluene

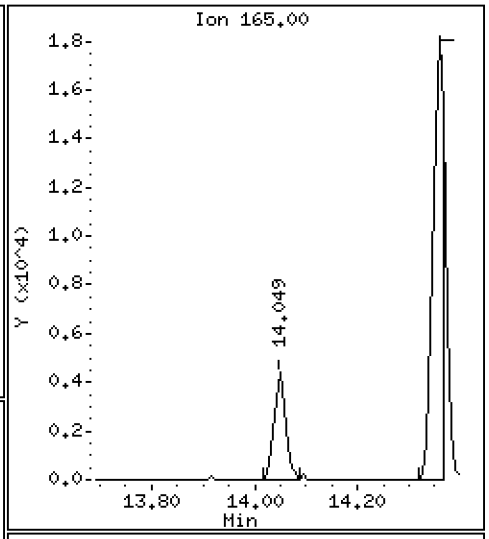
Concentration: 0.3243 ug/mL

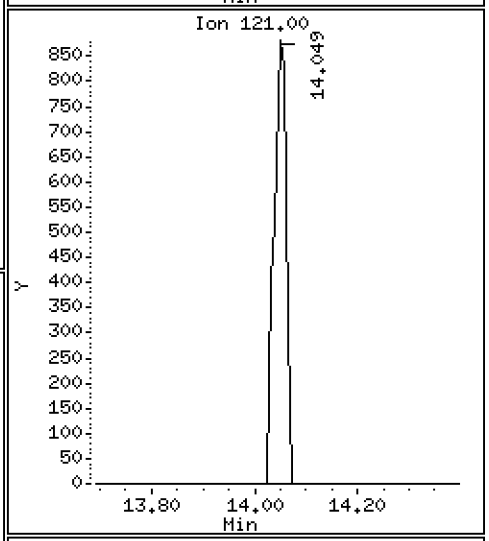


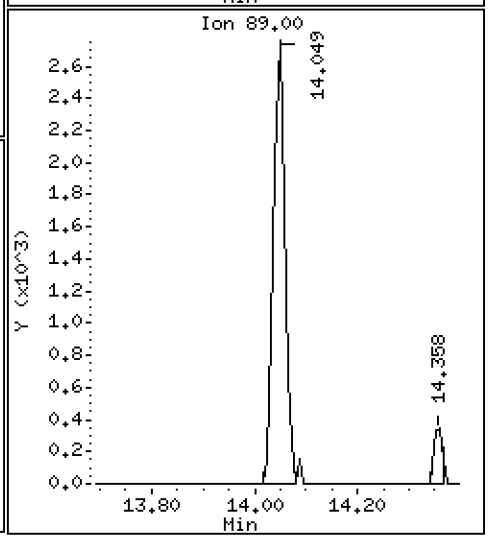












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

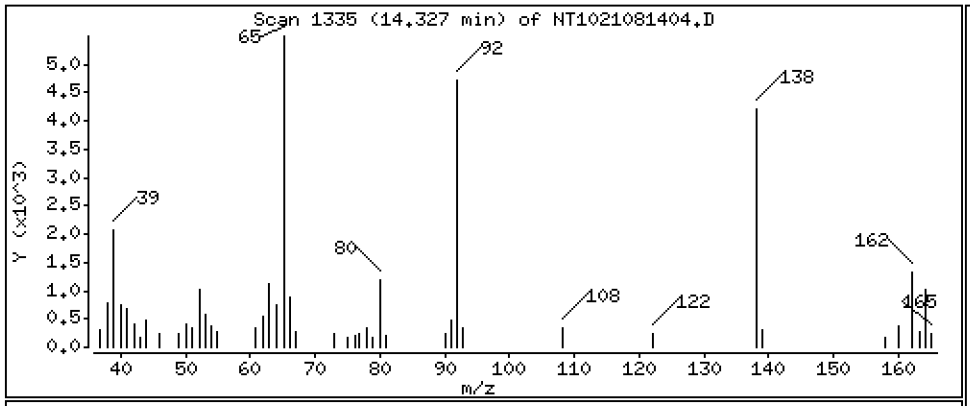
Operator: VTS

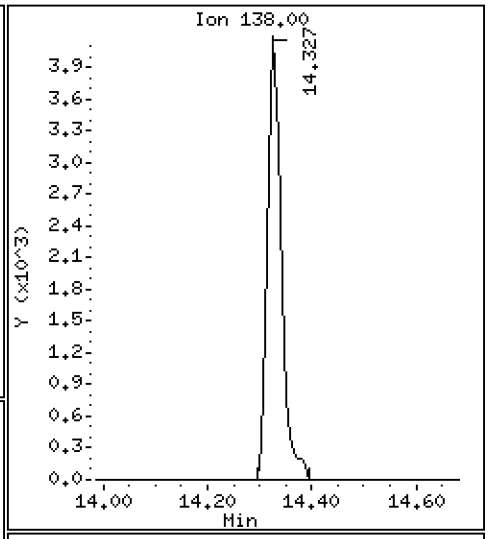
Column phase: ZB-5msi

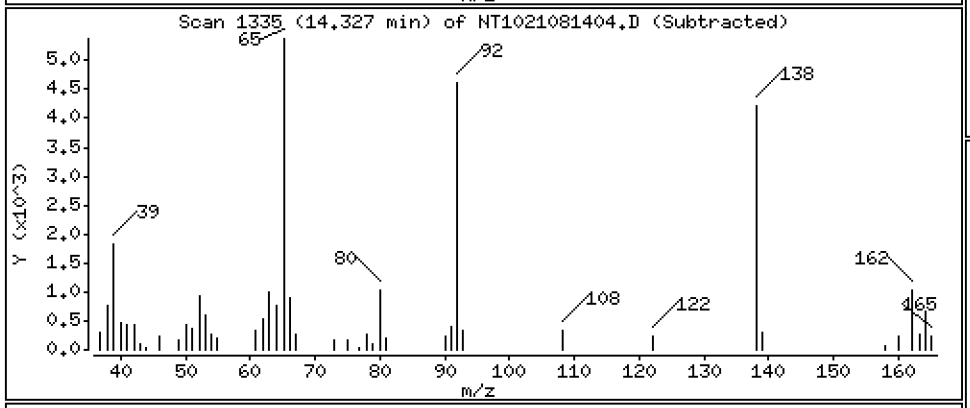
Column diameter: 0.25

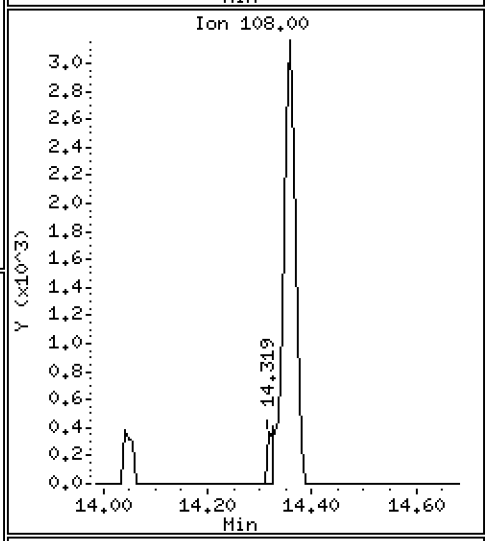
43 3-Nitroaniline

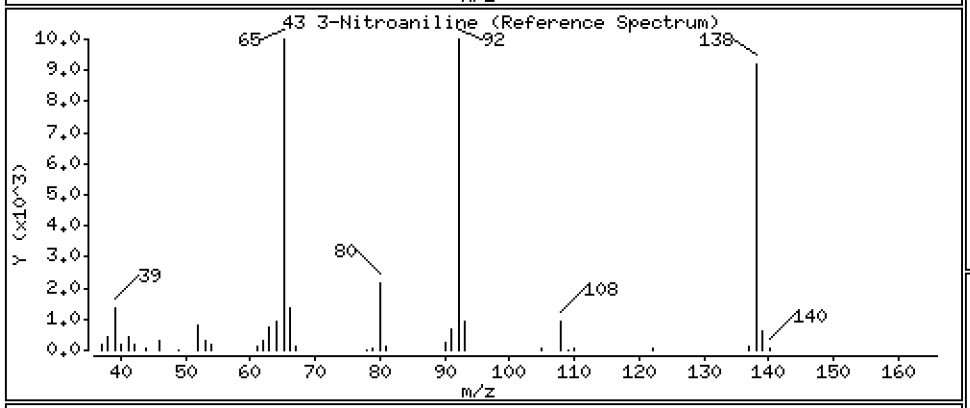
Concentration: 0.3035 ug/mL

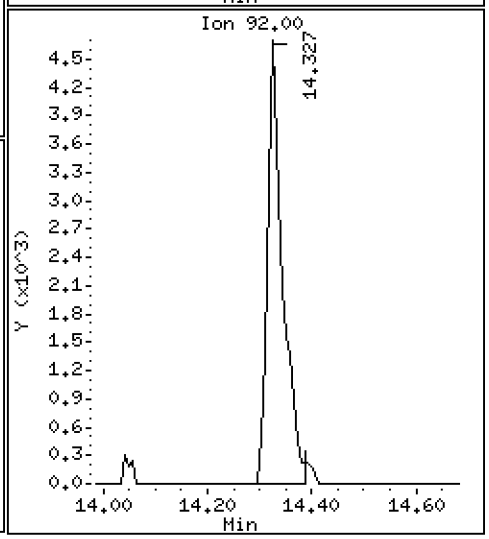


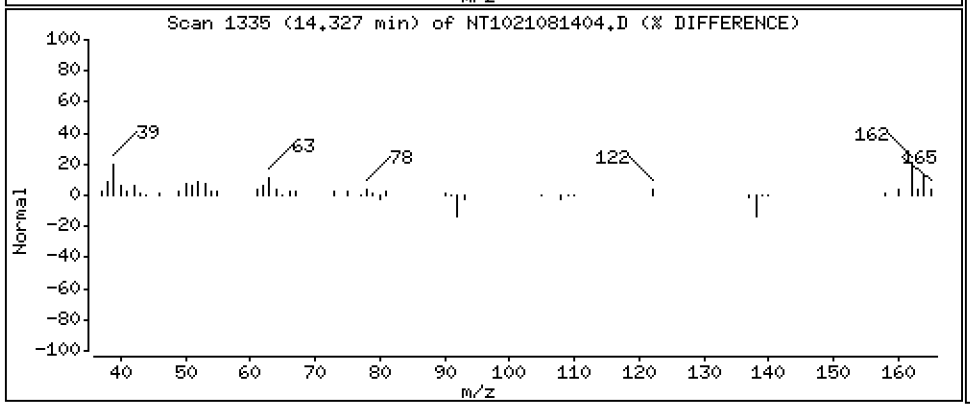












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

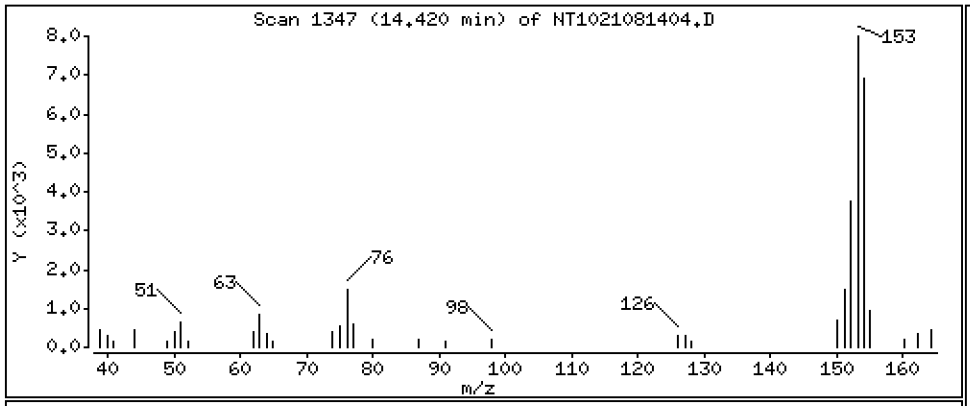
Operator: VTS

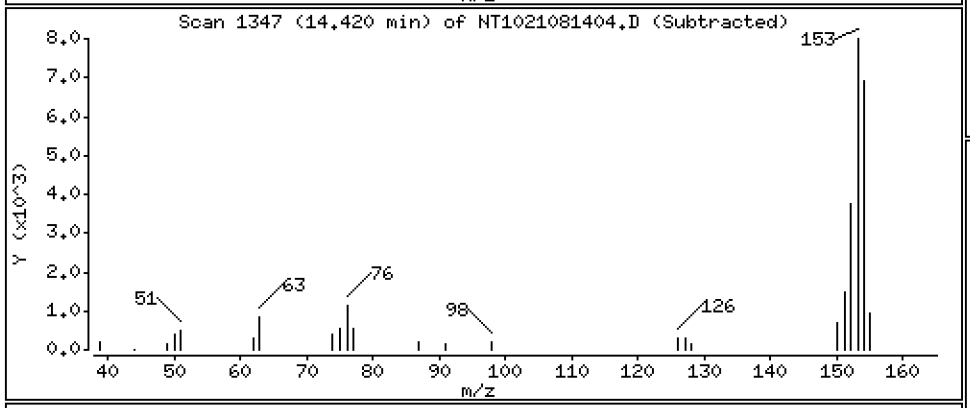
Column phase: ZB-5msi

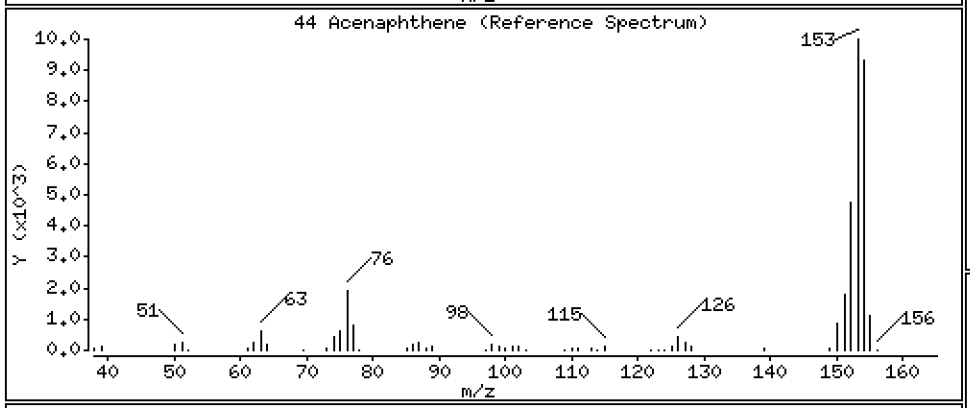
Column diameter: 0.25

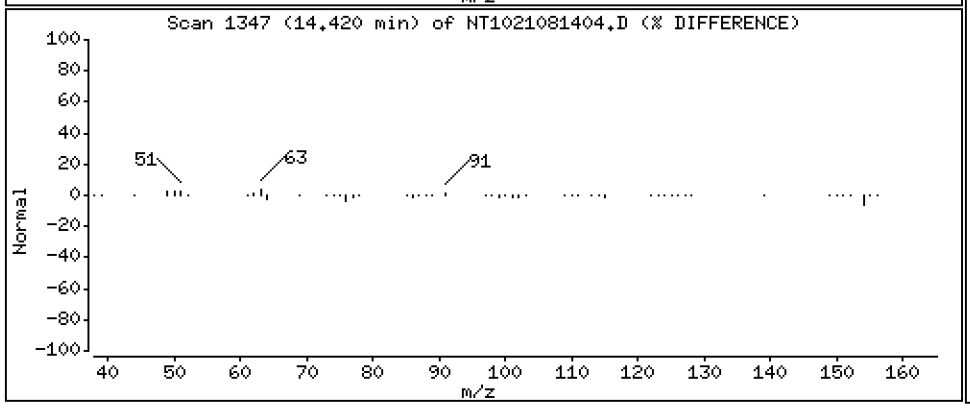
44 Acenaphthene

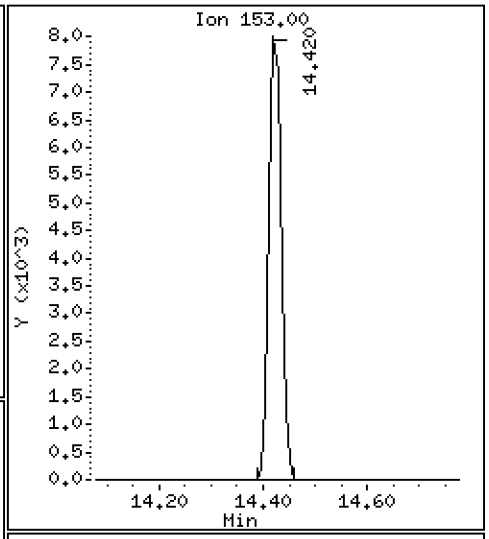
Concentration: 0.1704 ug/mL

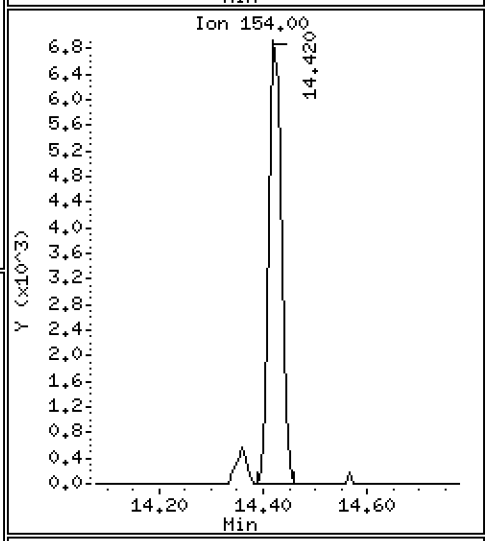


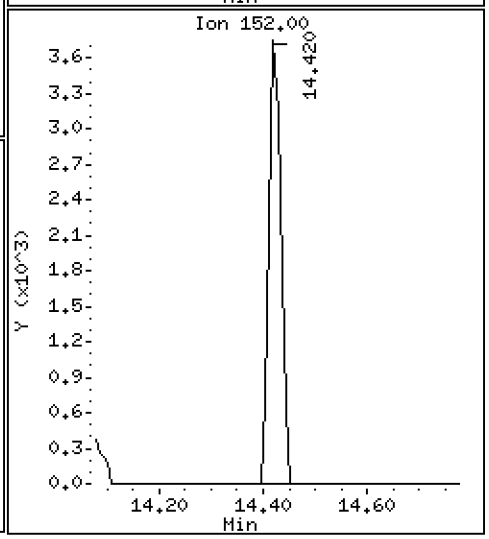












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

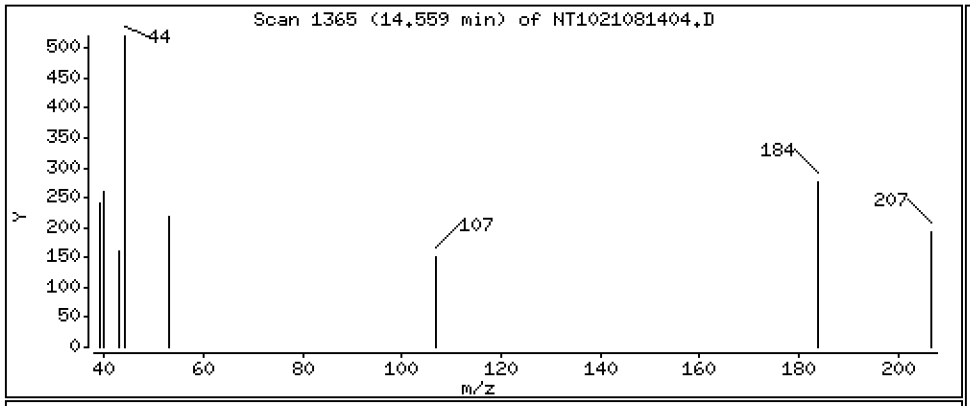
Operator: VTS

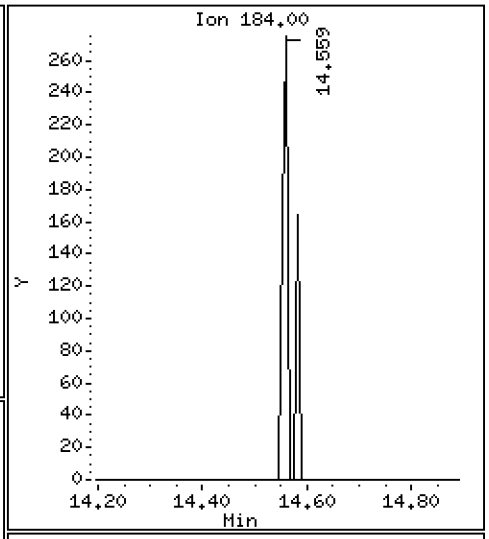
Column phase: ZB-5msi

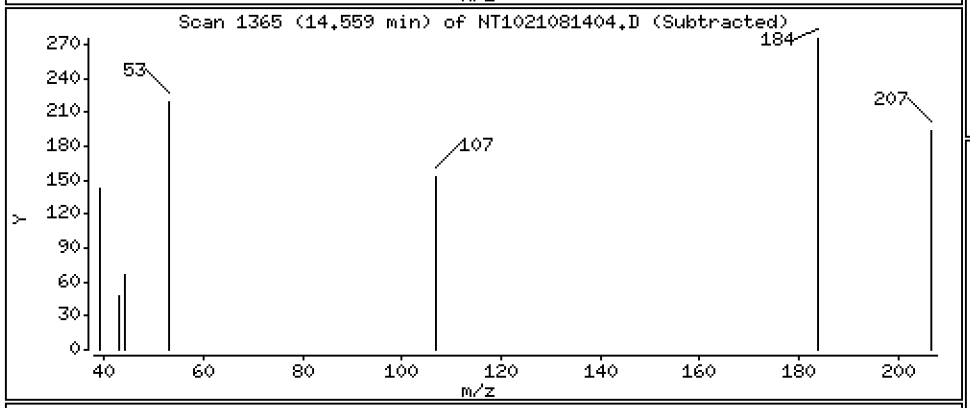
Column diameter: 0.25

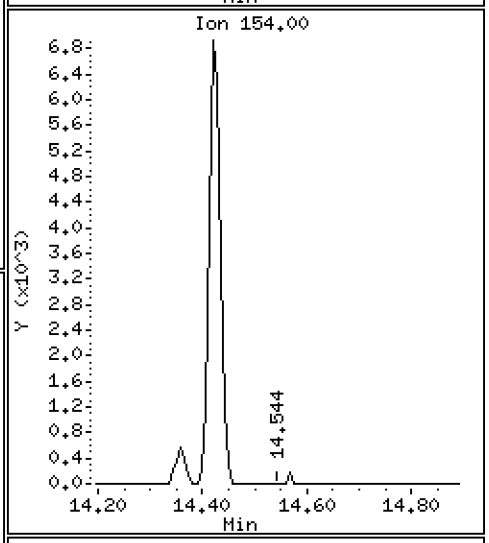
45 2,4-Dinitrophenol

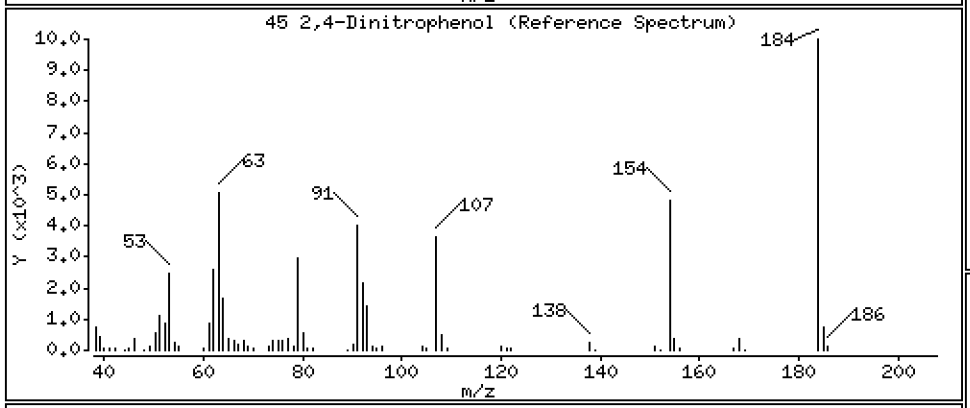
Concentration: 0.02499 ug/mL

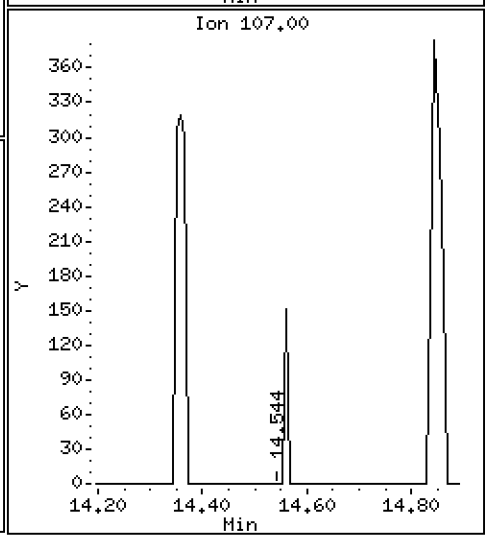


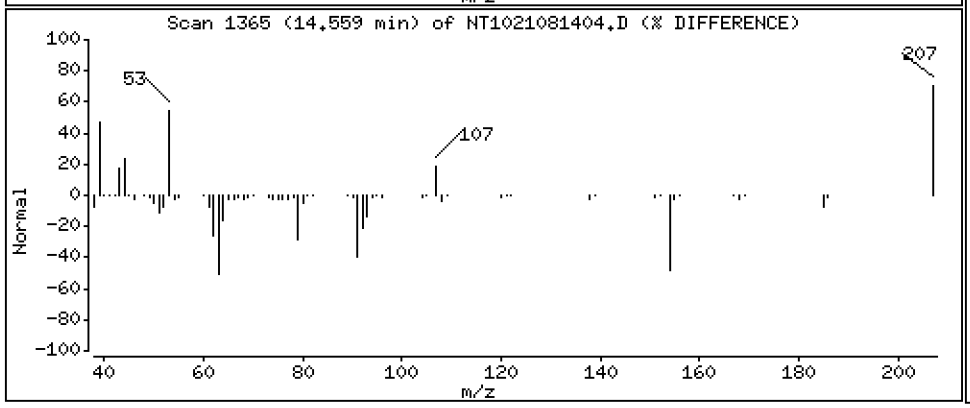












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

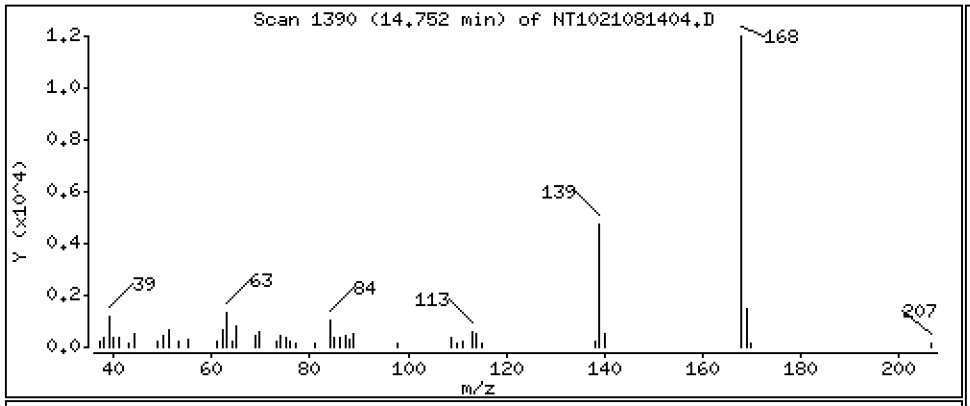
Operator: VTS

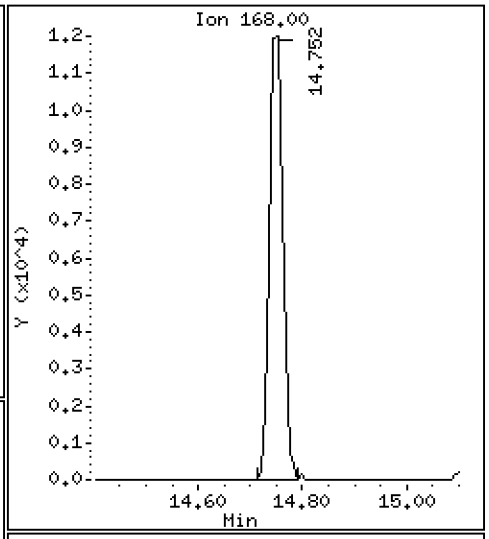
Column phase: ZB-5msi

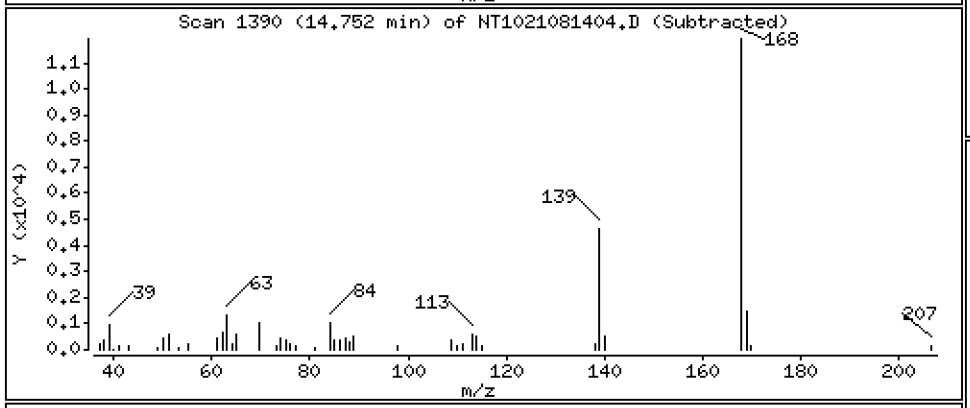
Column diameter: 0.25

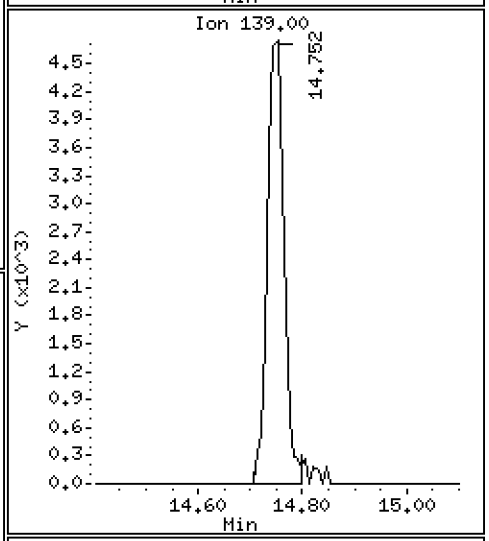
46 Dibenzofuran

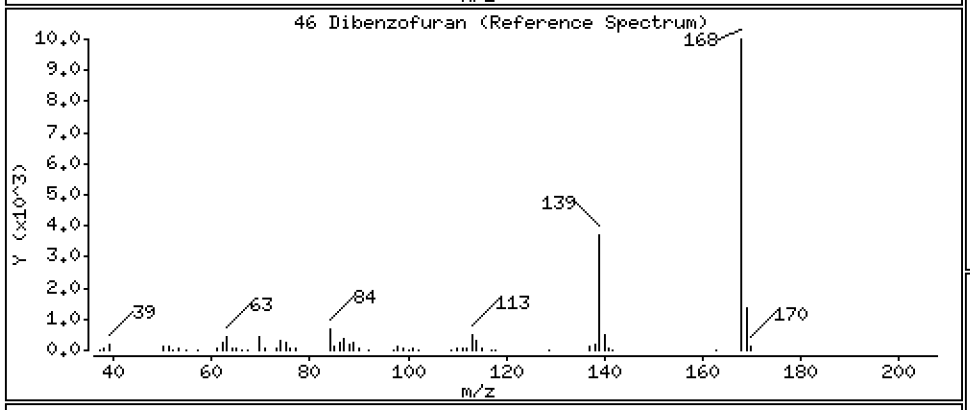
Concentration: 0.1785 ug/mL

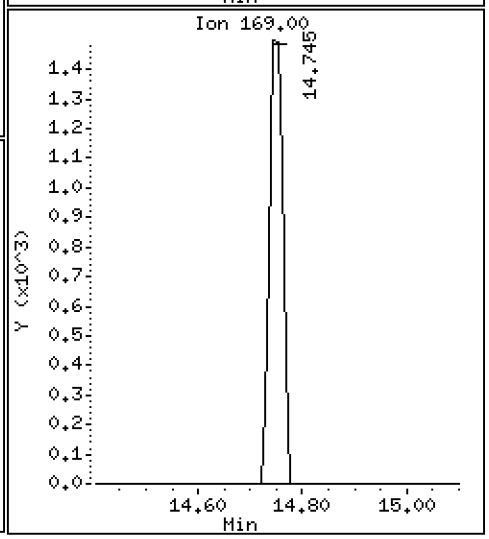


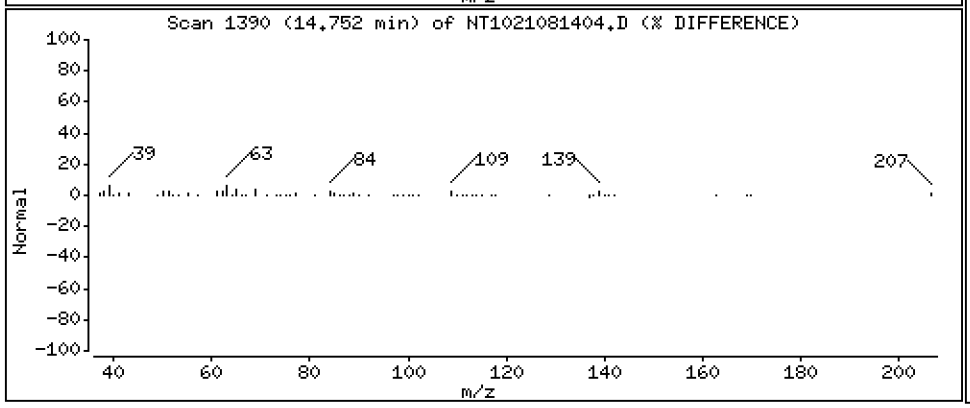












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

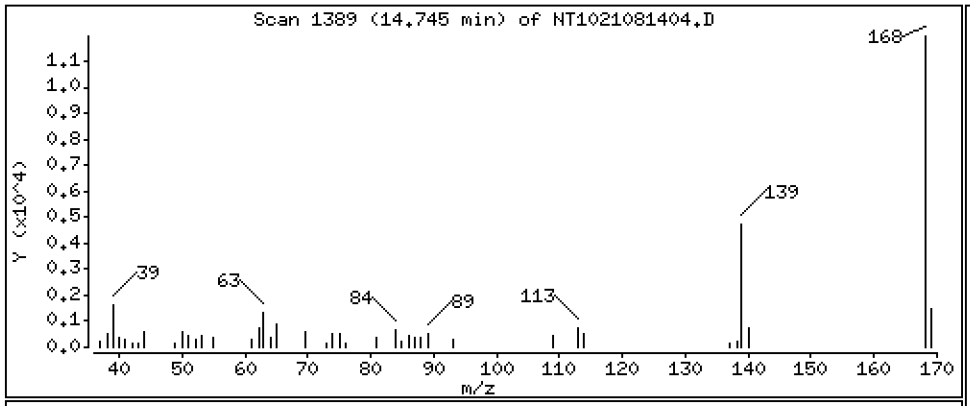
Operator: VTS

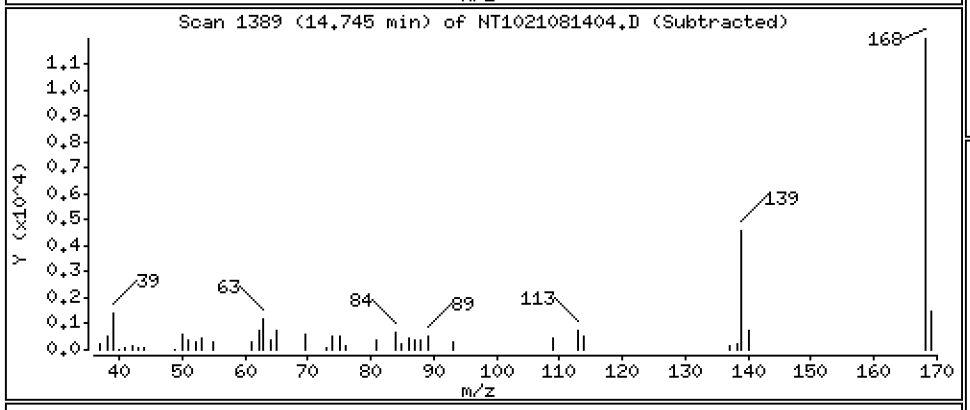
Column phase: ZB-5msi

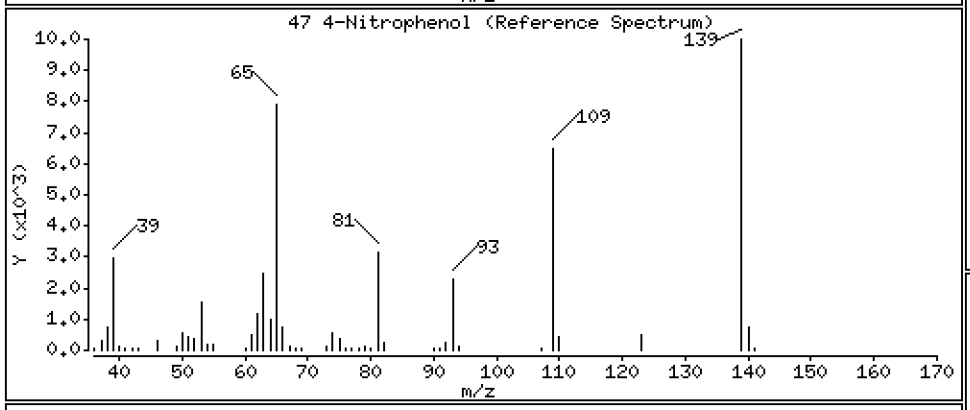
Column diameter: 0.25

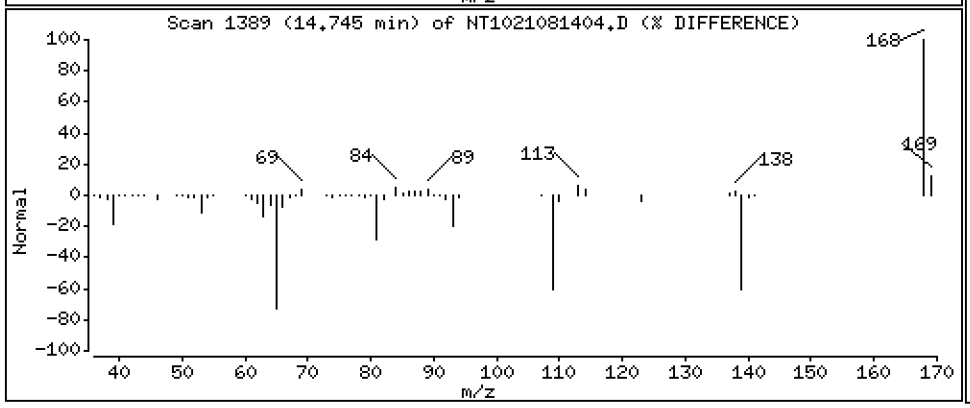
47 4-Nitrophenol

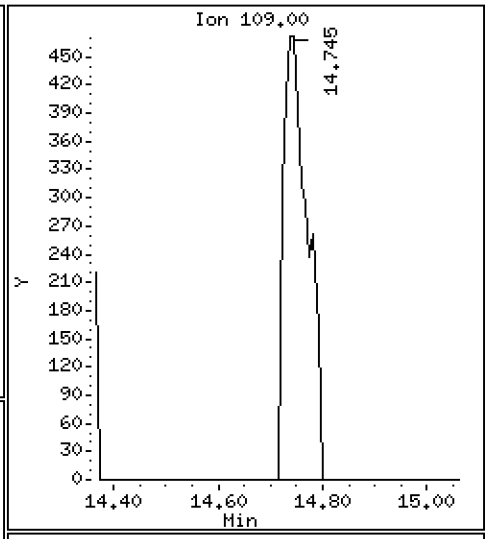
Concentration: 0.1654 ug/mL

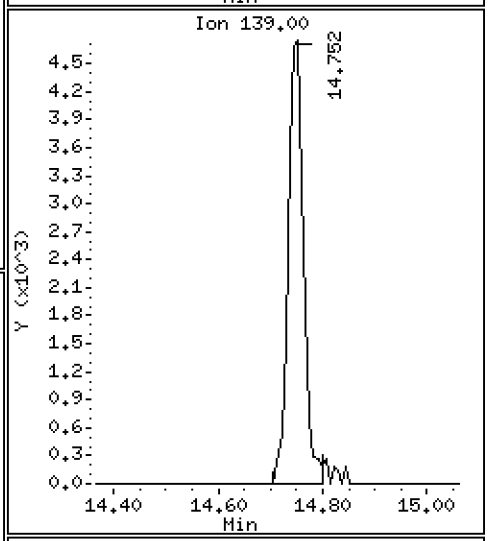


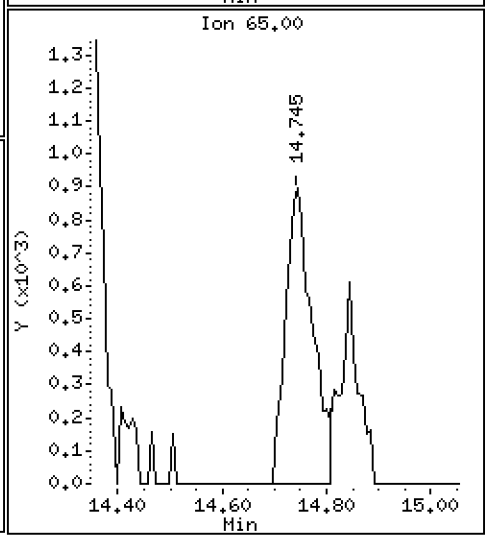












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

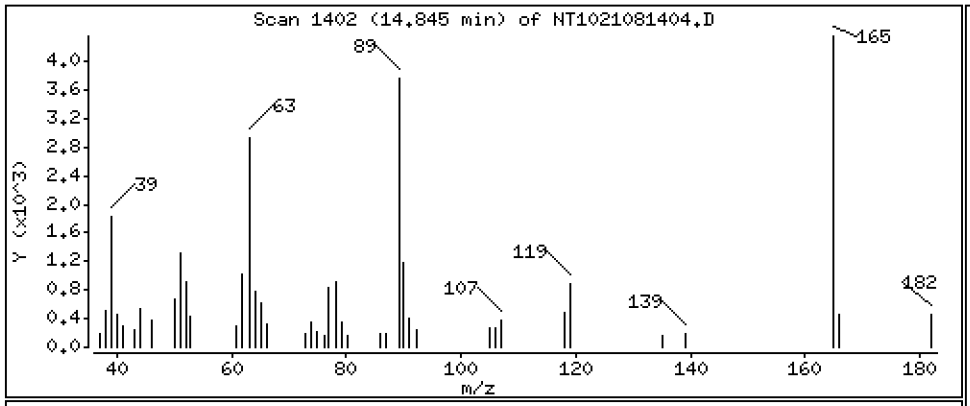
Operator: VTS

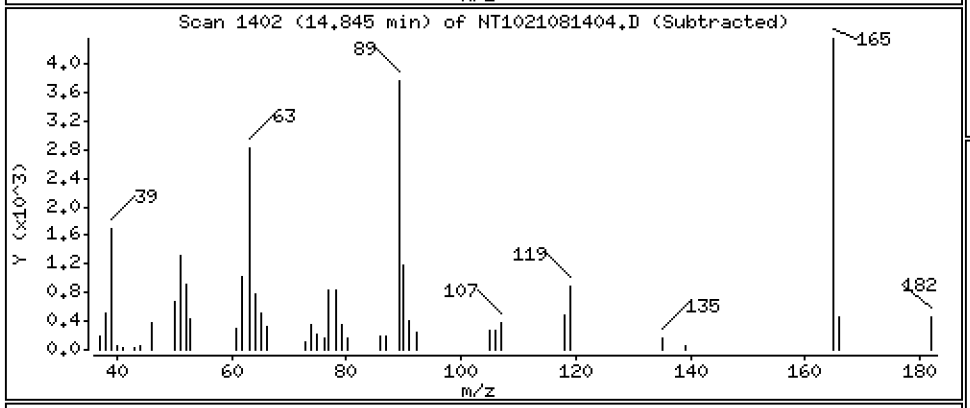
Column phase: ZB-5msi

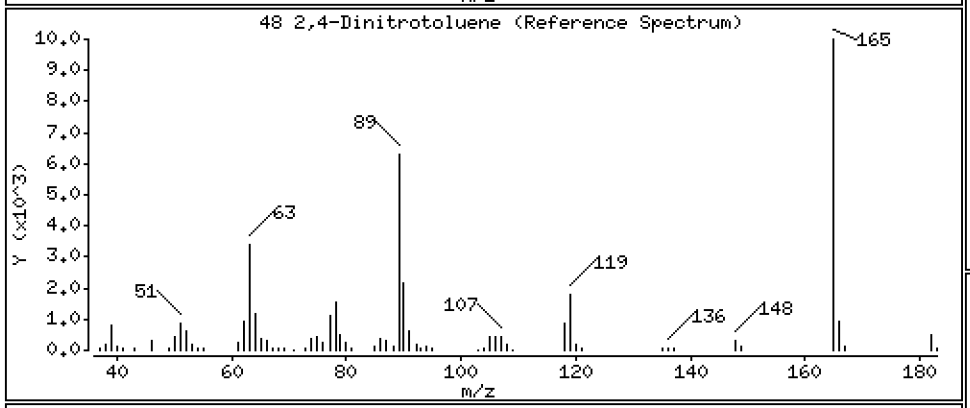
Column diameter: 0.25

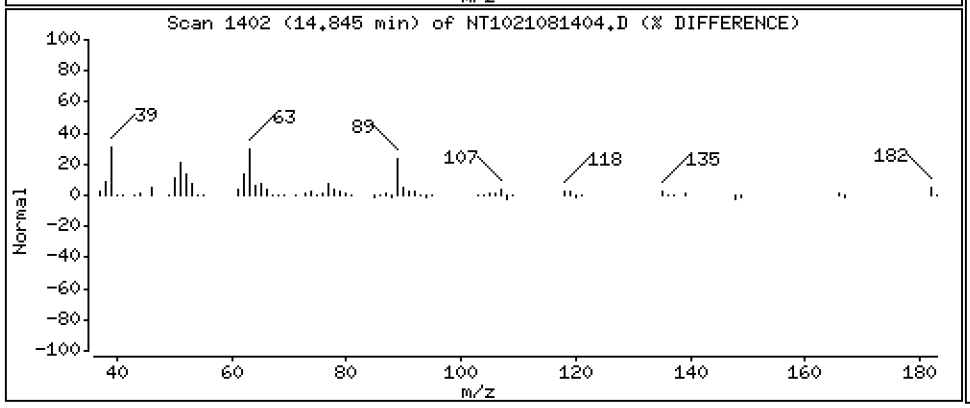
48 2,4-Dinitrotoluene

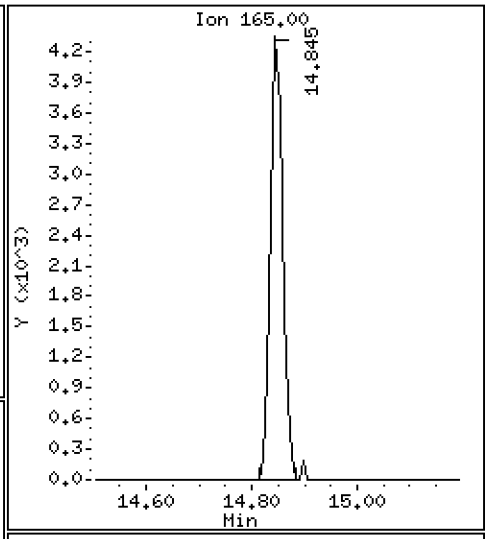
Concentration: 0.2567 ug/mL

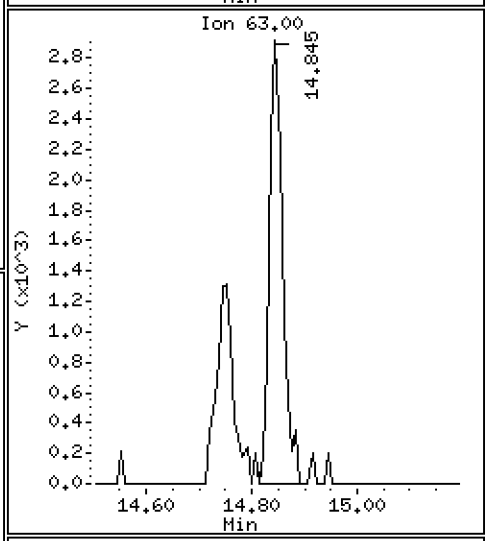


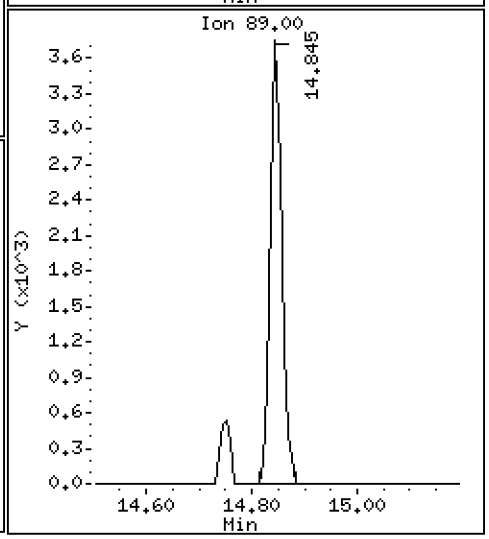












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

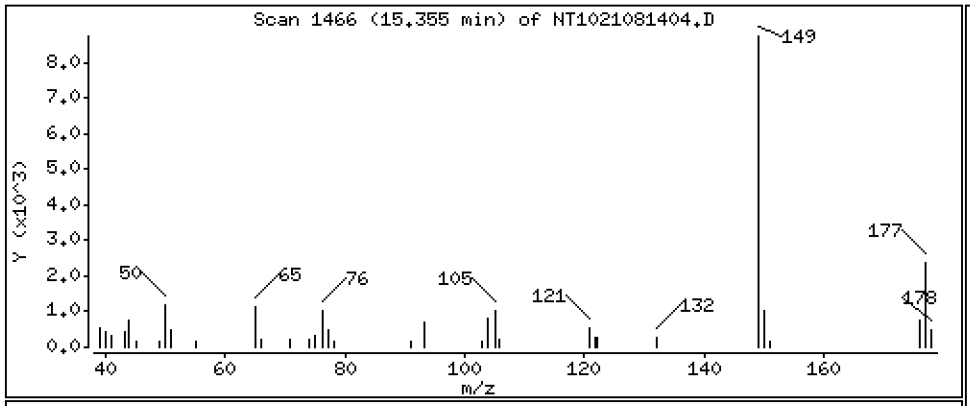
Operator: VTS

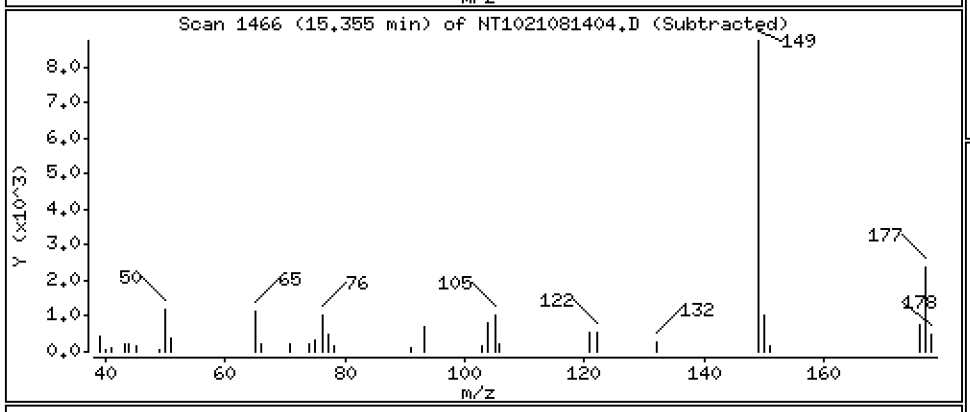
Column phase: ZB-5msi

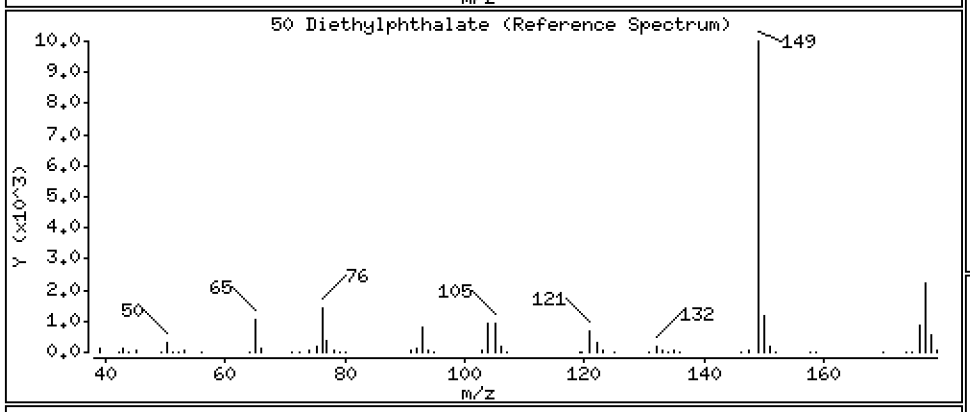
Column diameter: 0.25

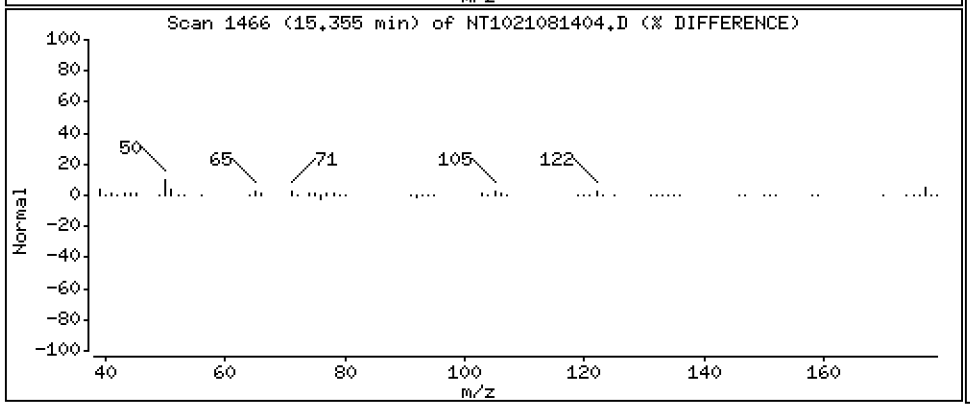
50 Diethylphthalate

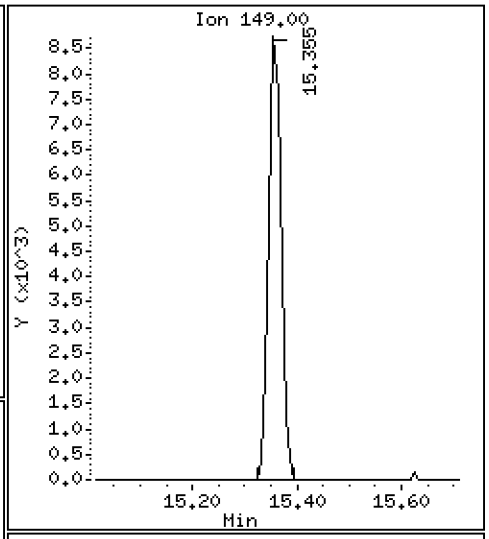
Concentration: 0.1680 ug/mL

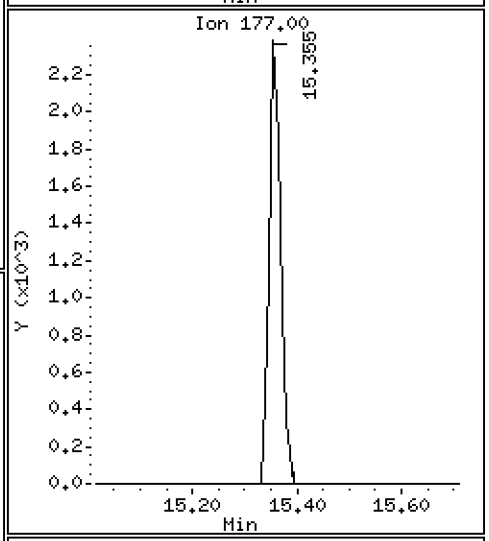


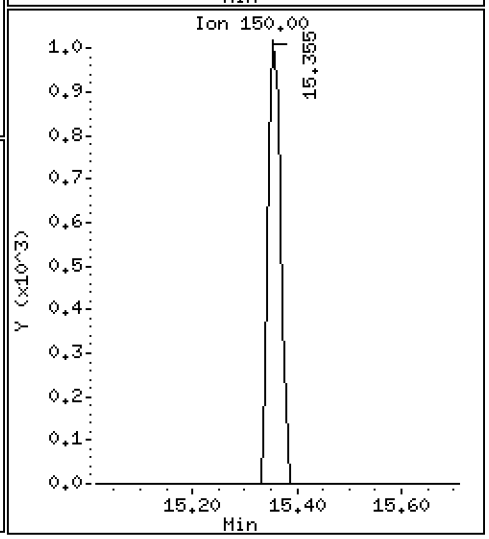












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

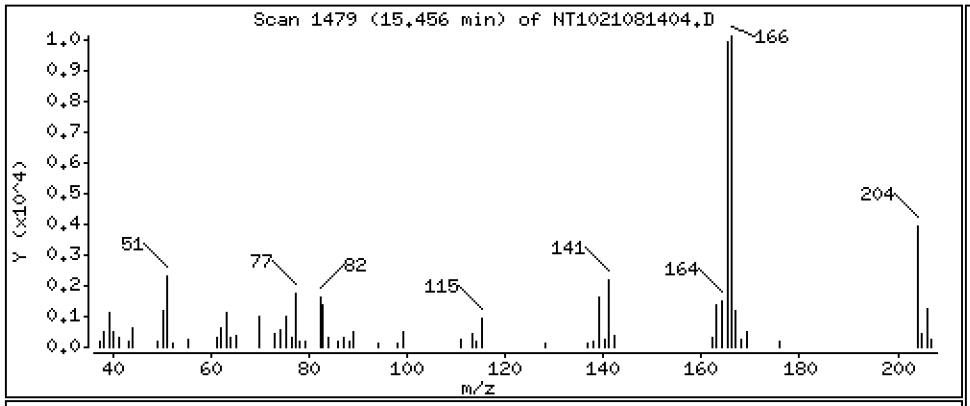
Operator: VTS

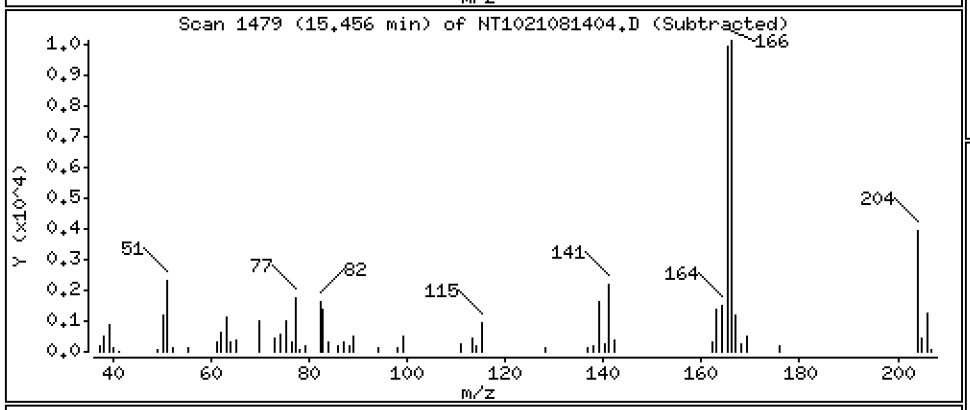
Column phase: ZB-5msi

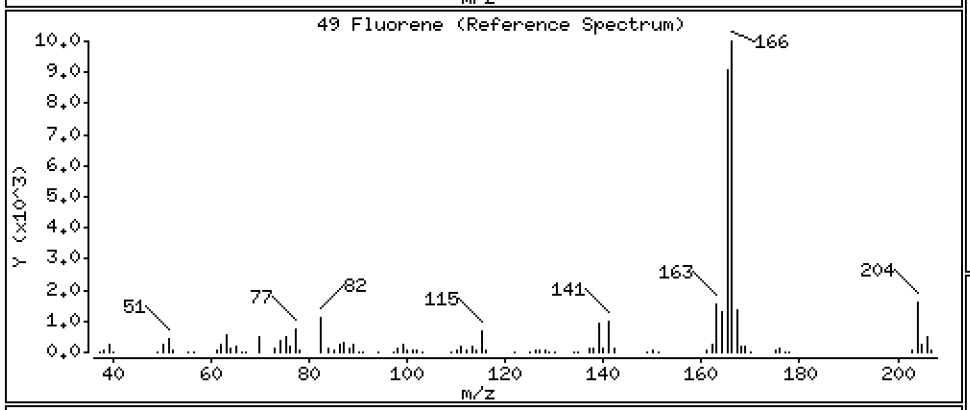
Column diameter: 0.25

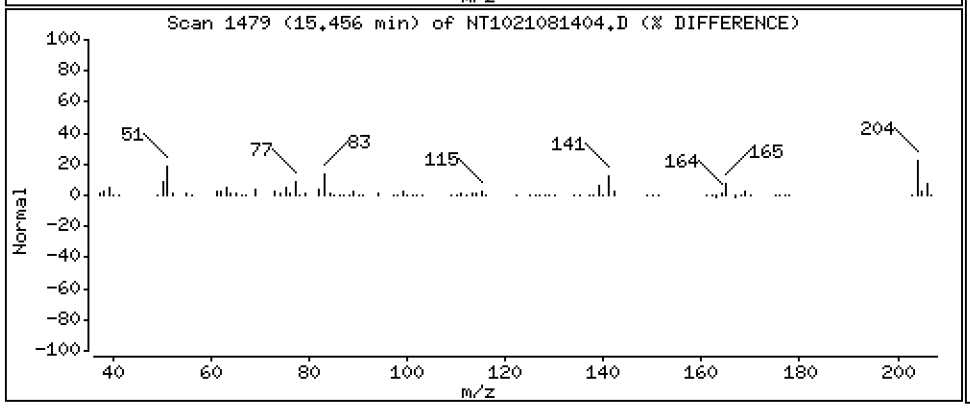
49 Fluorene

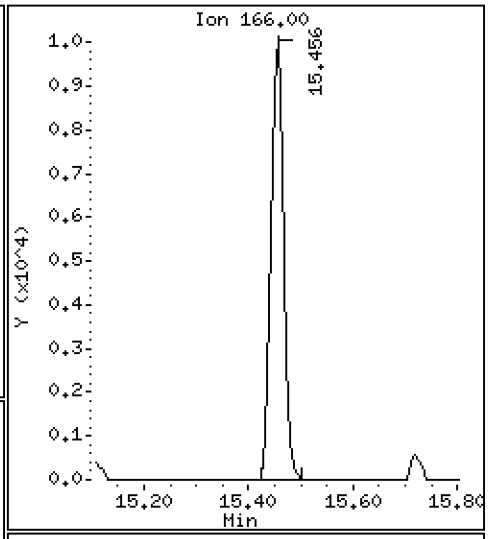
Concentration: 0.1473 ug/mL

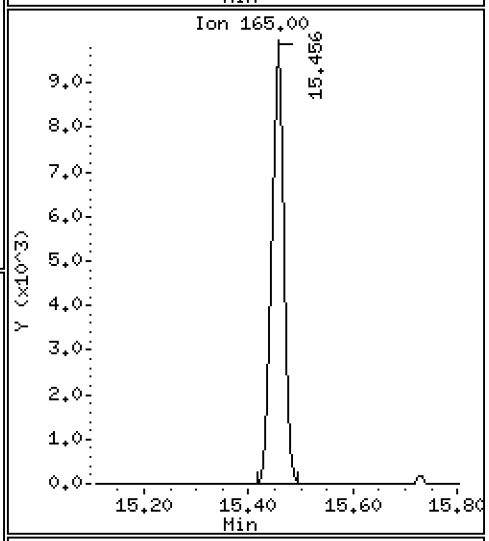


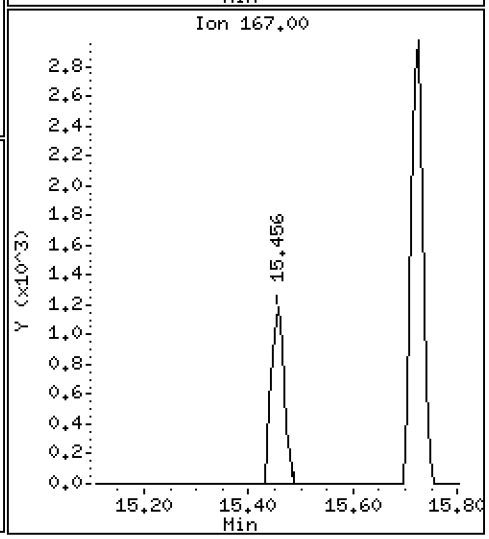












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

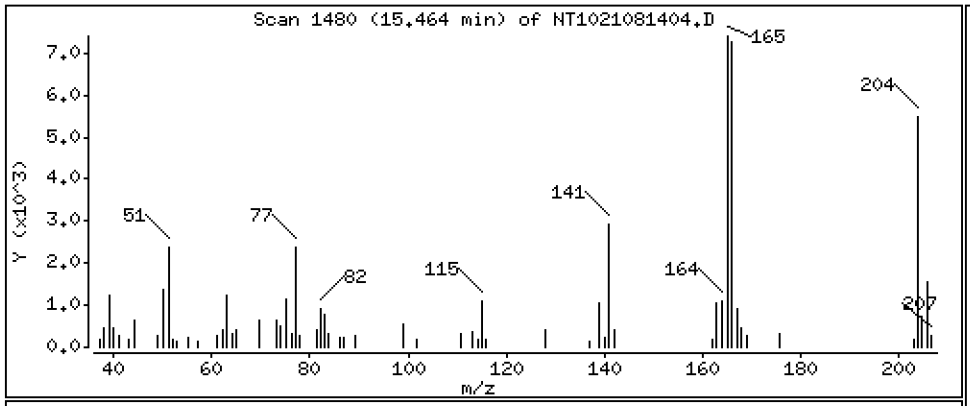
Operator: VTS

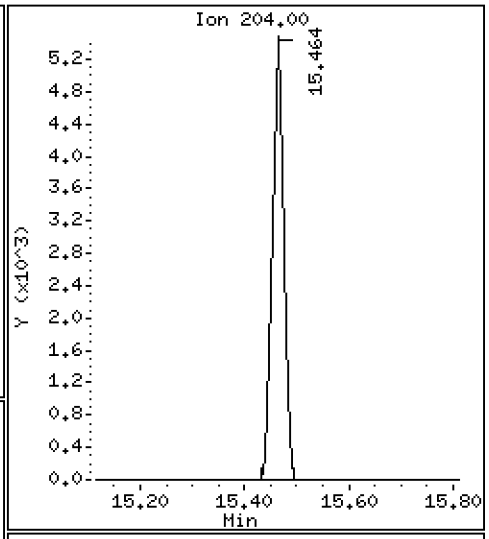
Column phase: ZB-5msi

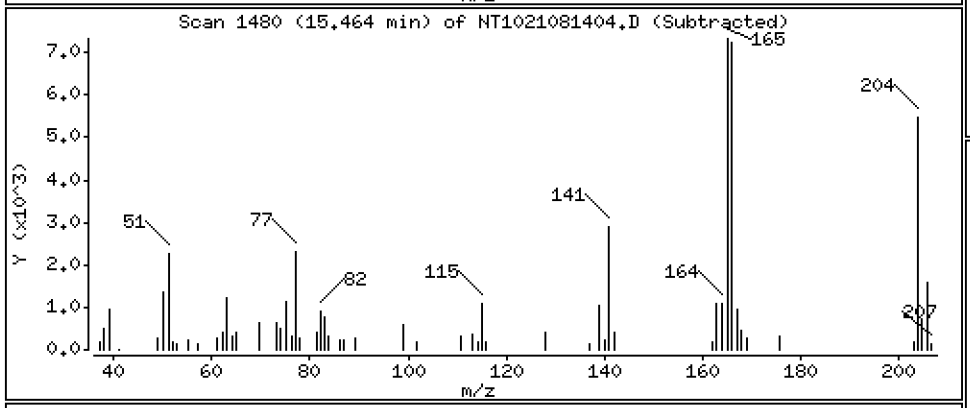
Column diameter: 0.25

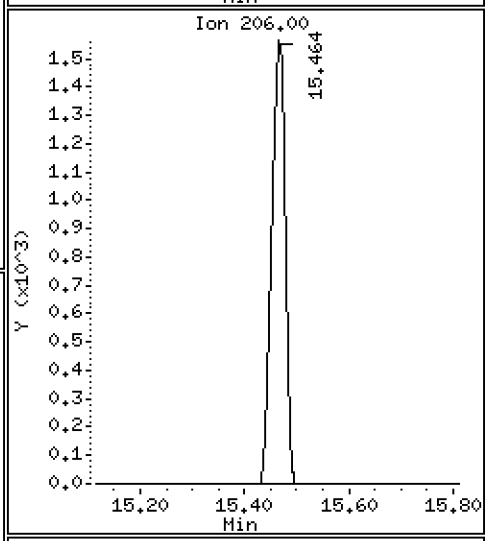
51 4-Chlorophenyl-phenylether

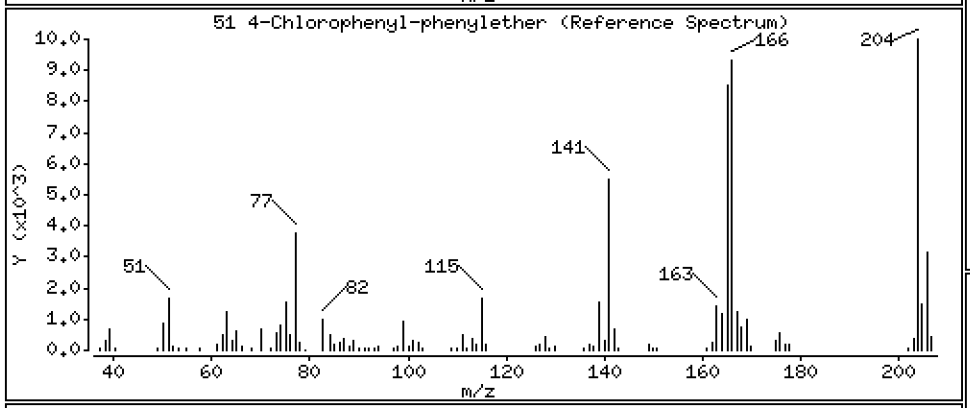
Concentration: 0.1254 ug/mL

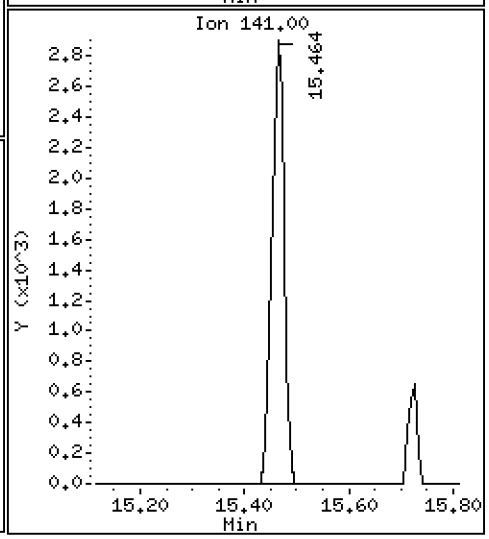


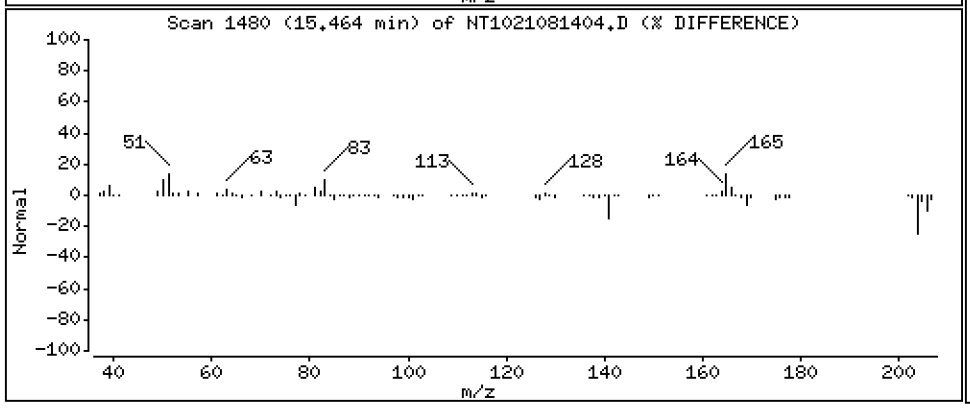












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

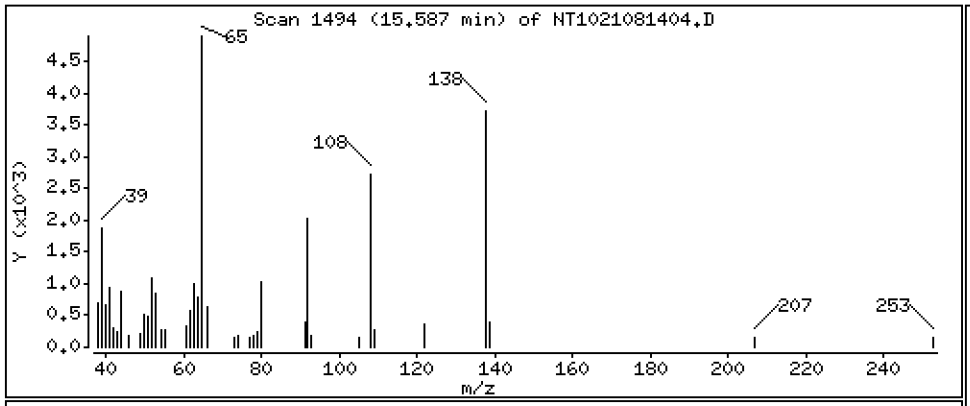
Operator: VTS

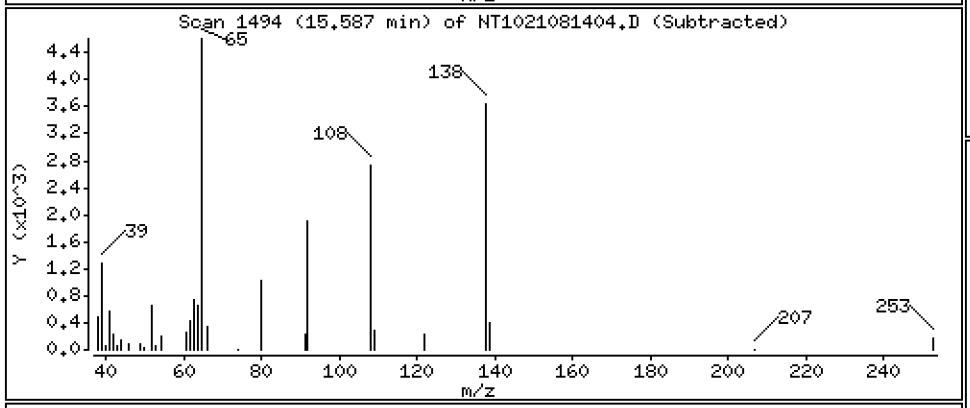
Column phase: ZB-5msi

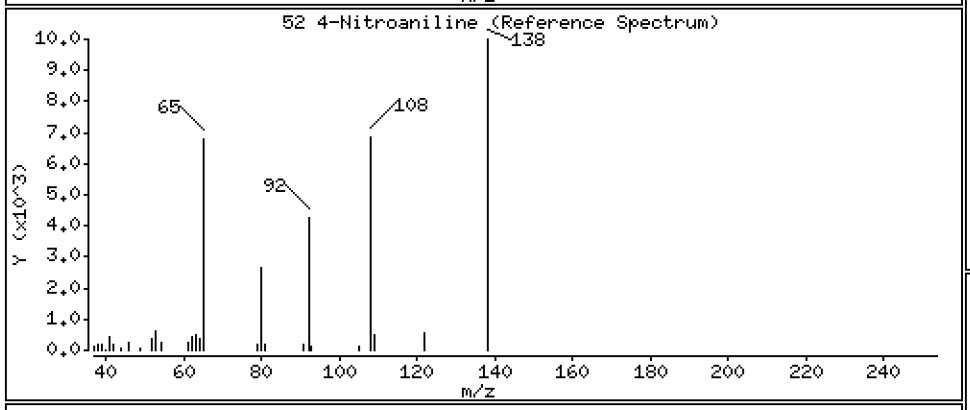
Column diameter: 0.25

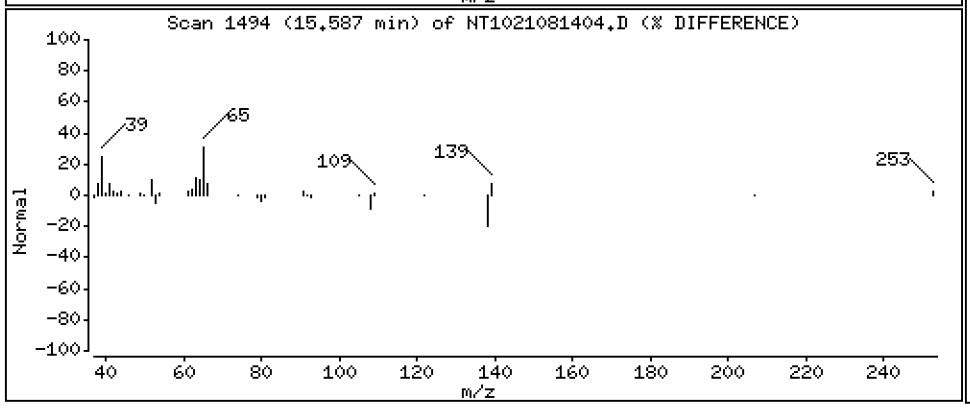
52 4-Nitroaniline

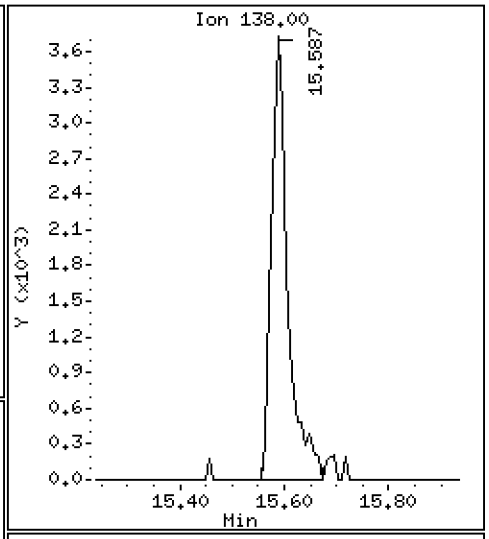
Concentration: 0.3082 ug/mL

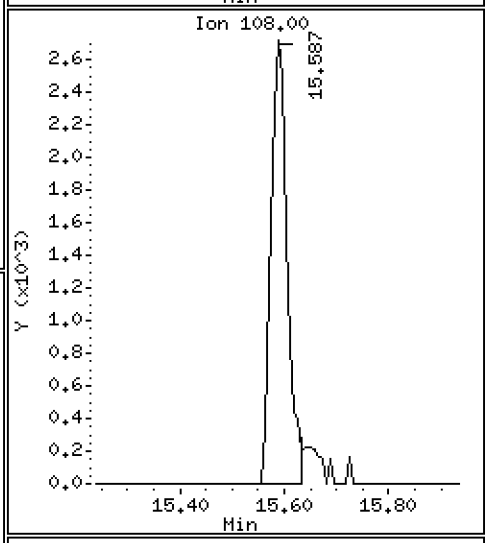


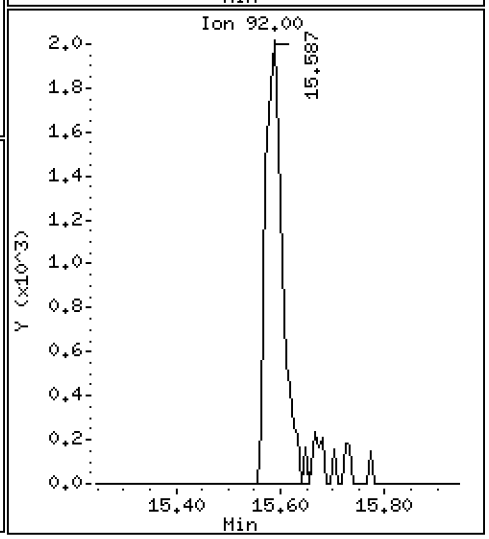












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

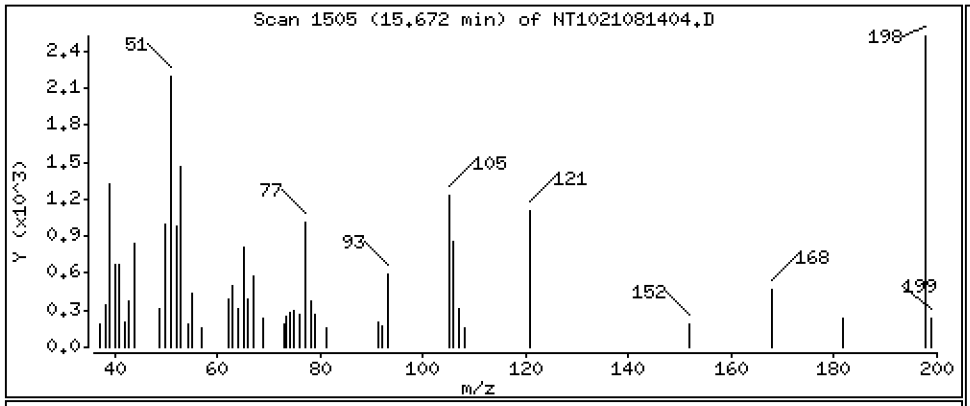
Operator: VTS

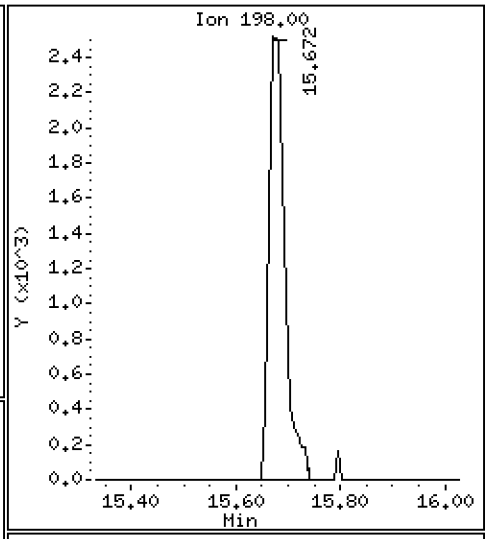
Column phase: ZB-5msi

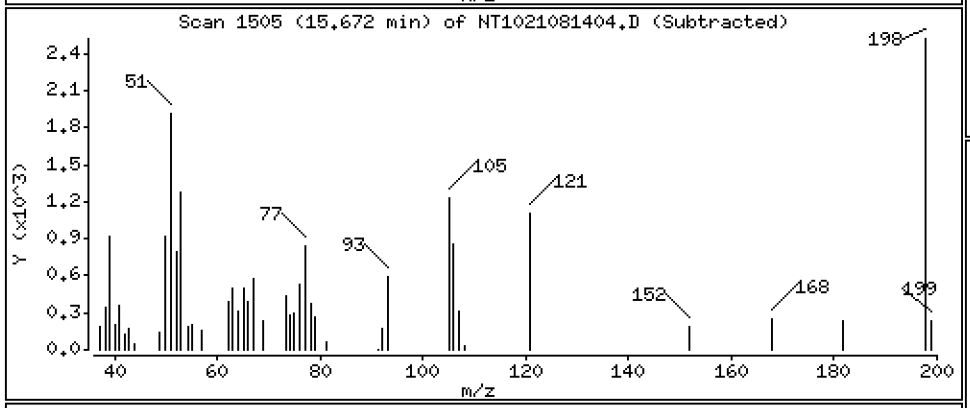
Column diameter: 0.25

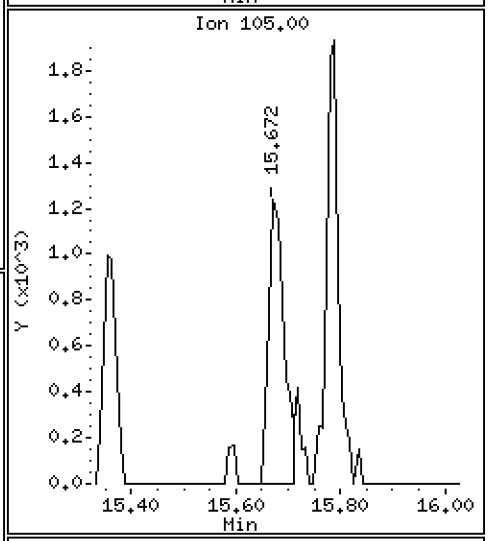
53 4,6-Dinitro-2-methylphenol

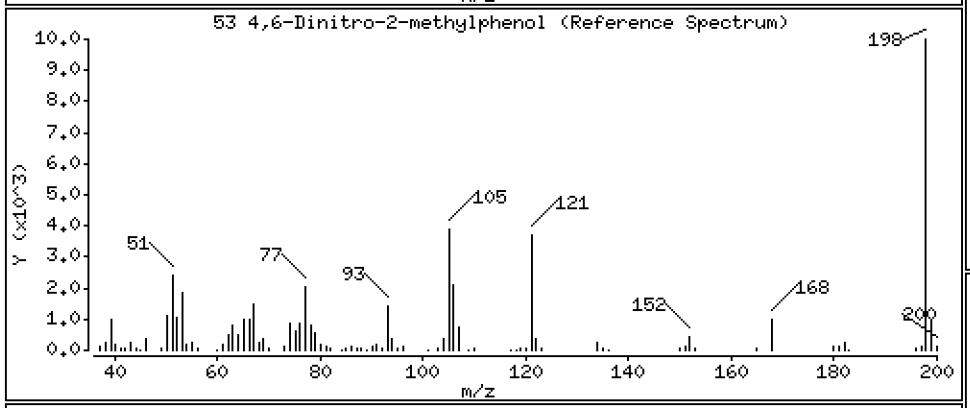
Concentration: 0.2616 ug/mL

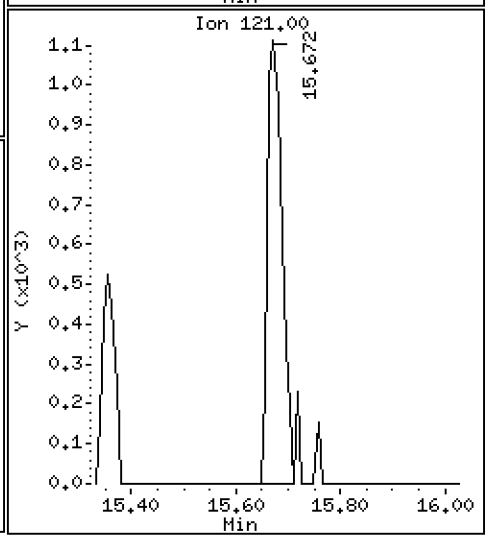


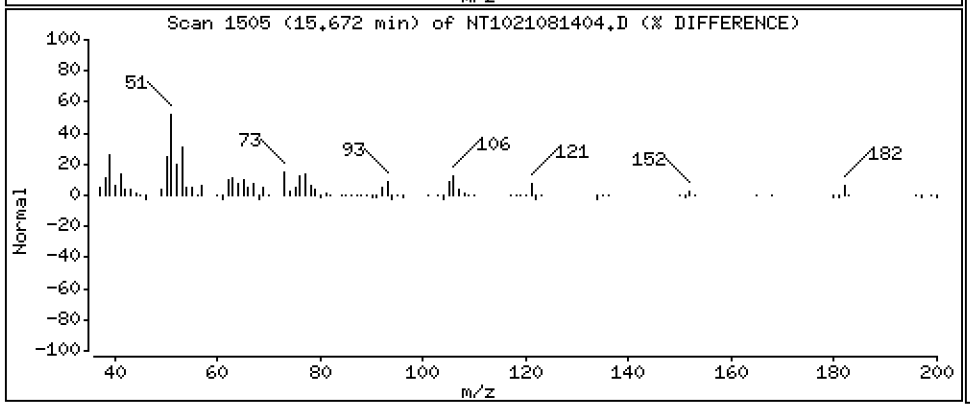












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

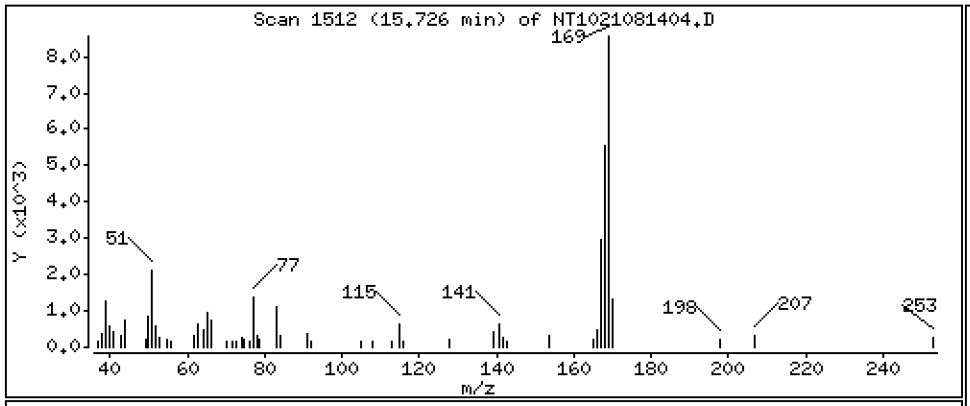
Operator: VTS

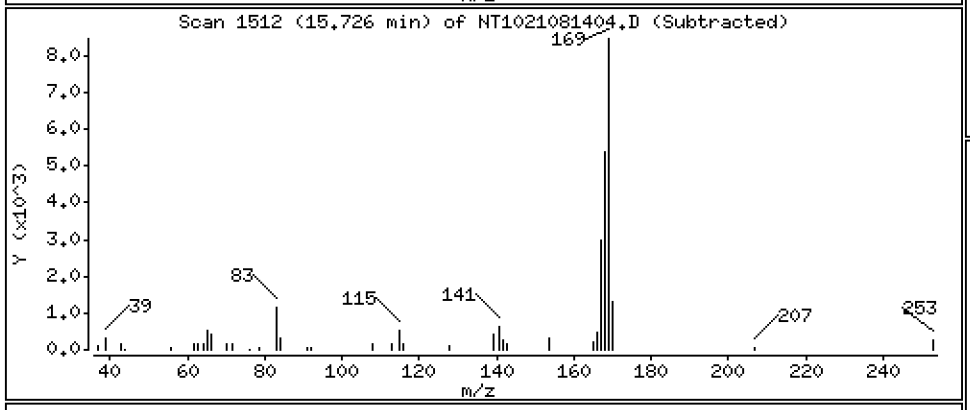
Column phase: ZB-5msi

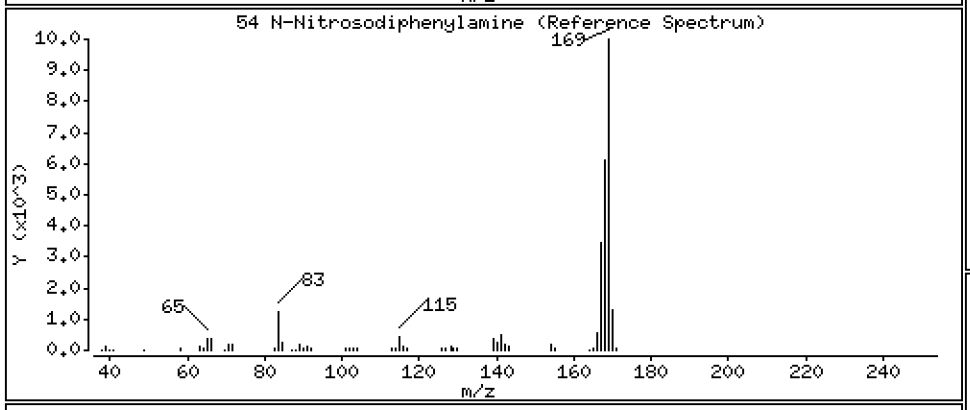
Column diameter: 0.25

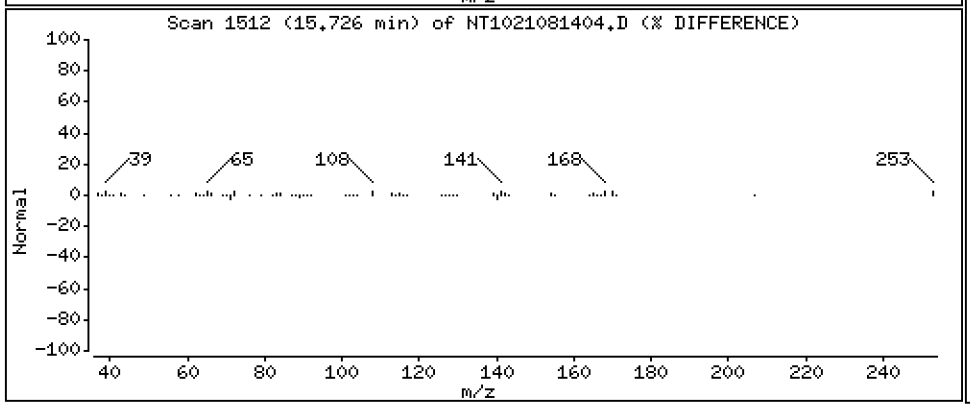
54 N-Nitrosodiphenylamine

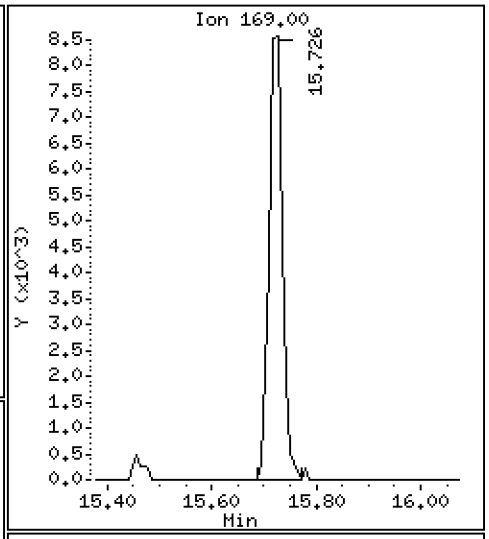
Concentration: 0.1887 ug/mL

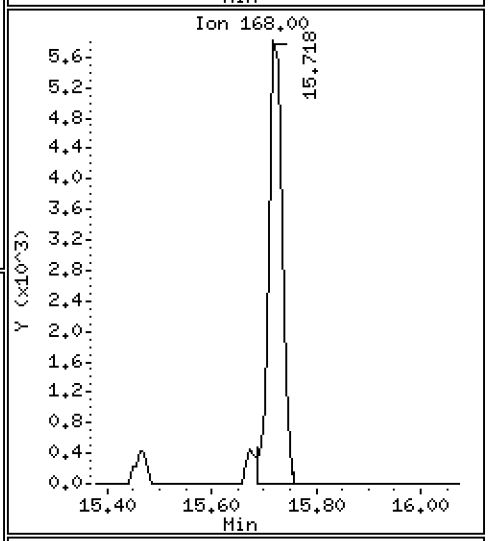


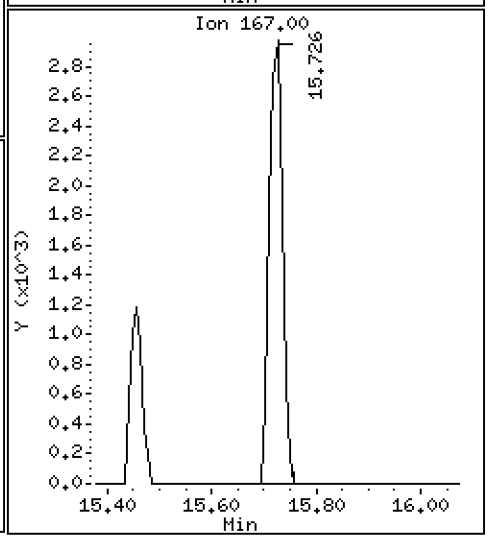












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

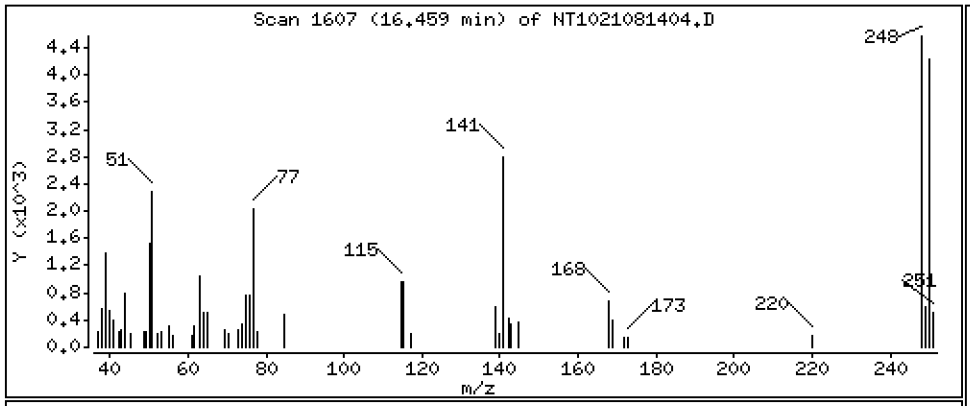
Operator: VTS

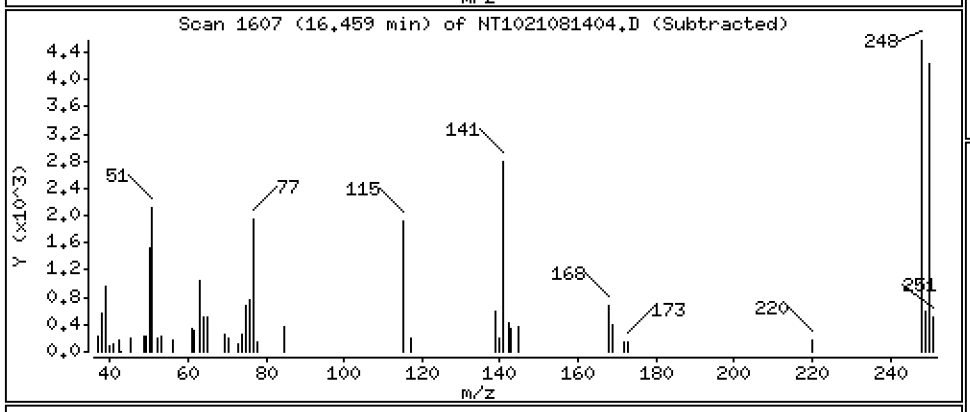
Column phase: ZB-5msi

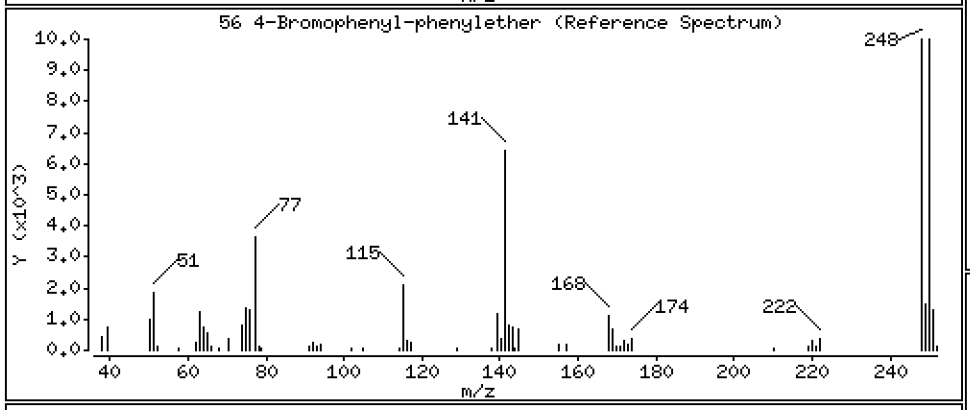
Column diameter: 0.25

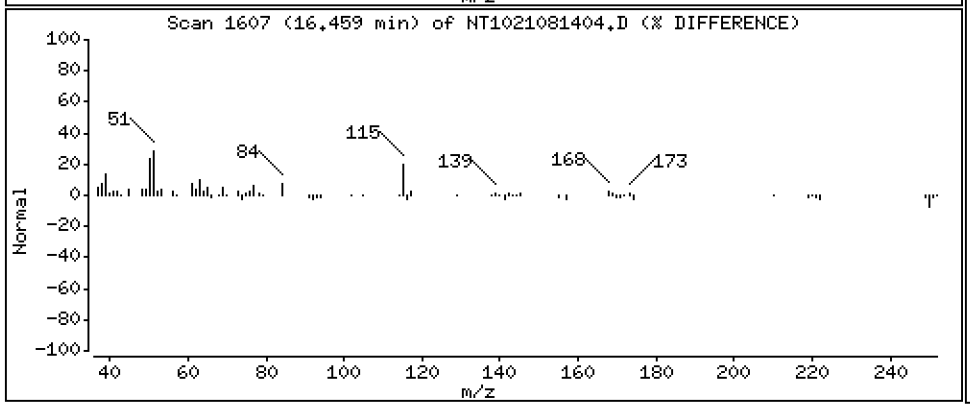
56 4-Bromophenyl-phenylether

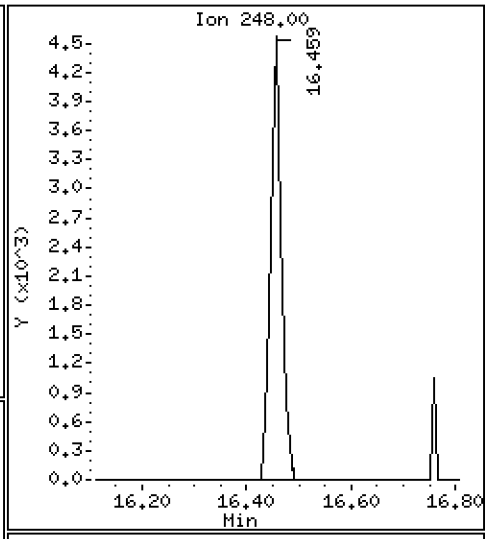
Concentration: 0.1668 ug/mL

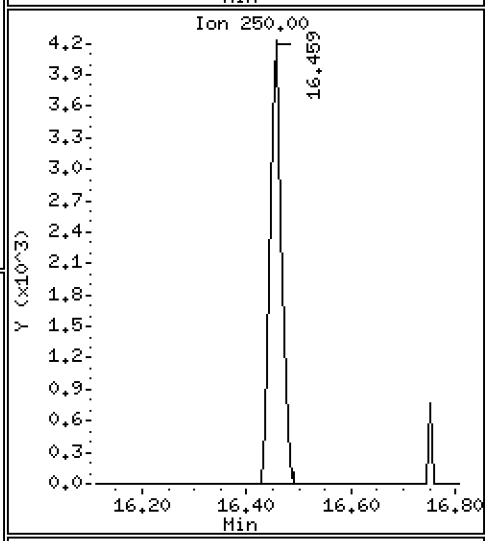


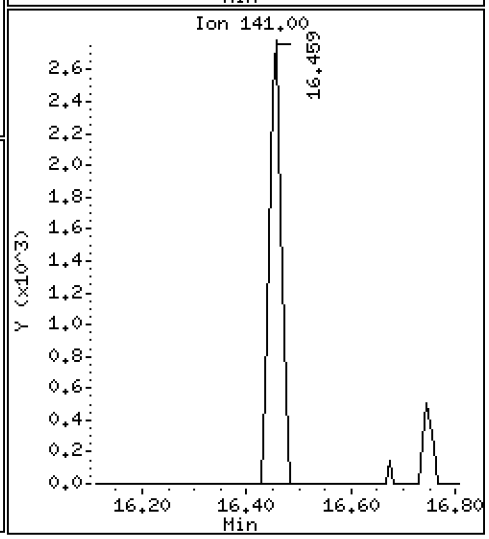












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

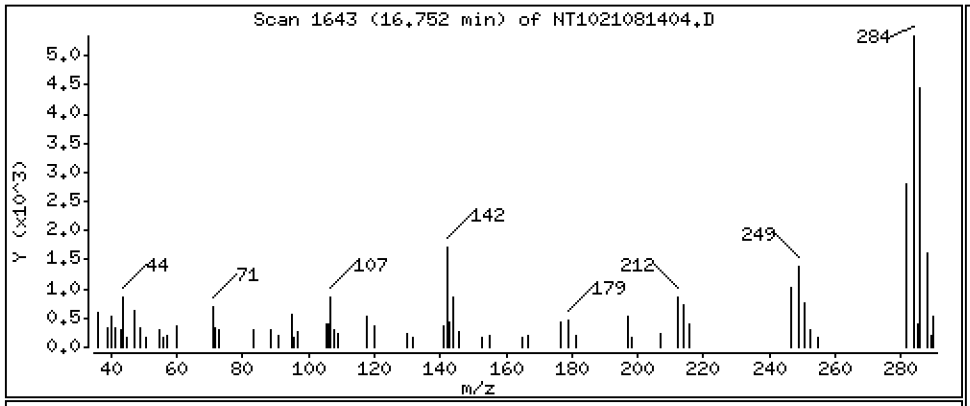
Operator: VTS

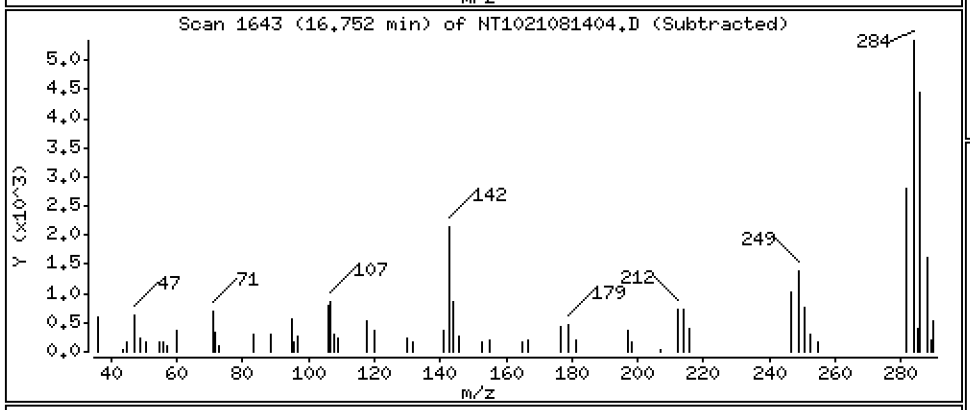
Column phase: ZB-5msi

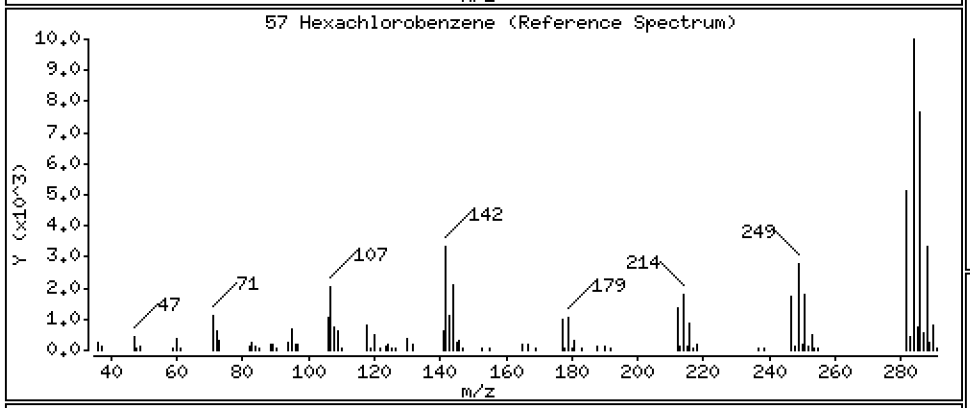
Column diameter: 0.25

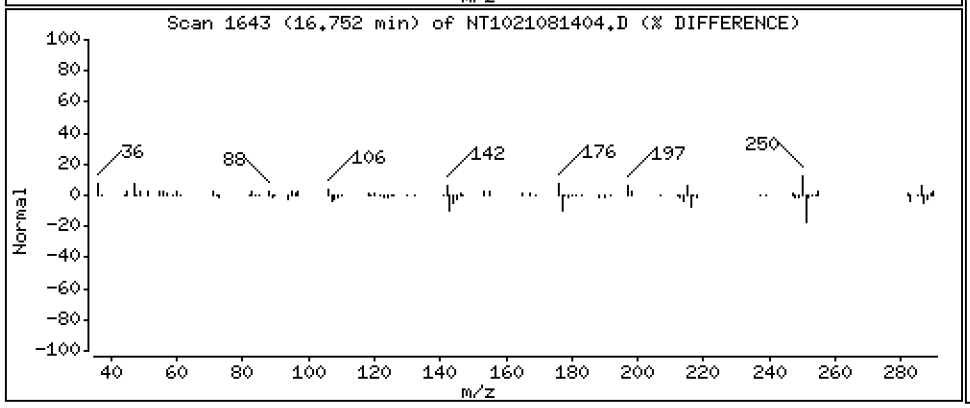
57 Hexachlorobenzene

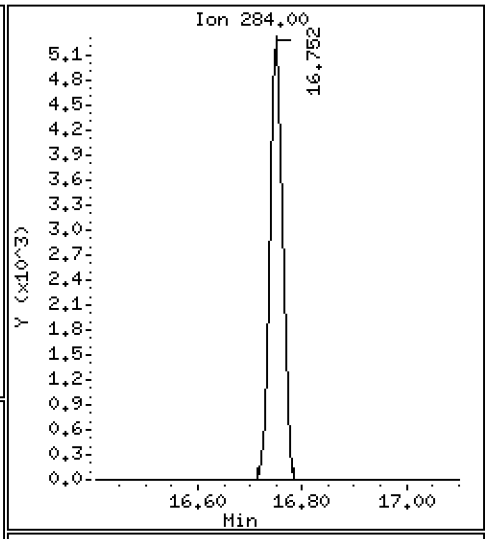
Concentration: 0.2170 ug/mL

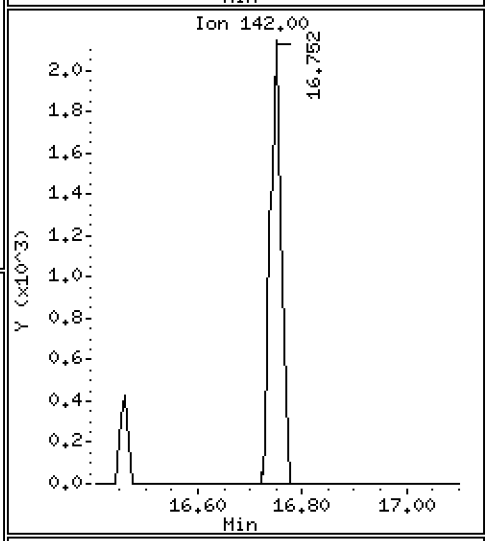


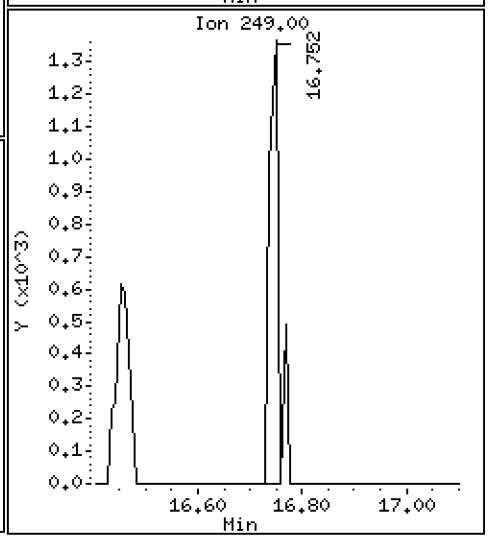












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Date : 14-AUG-2021 11:09

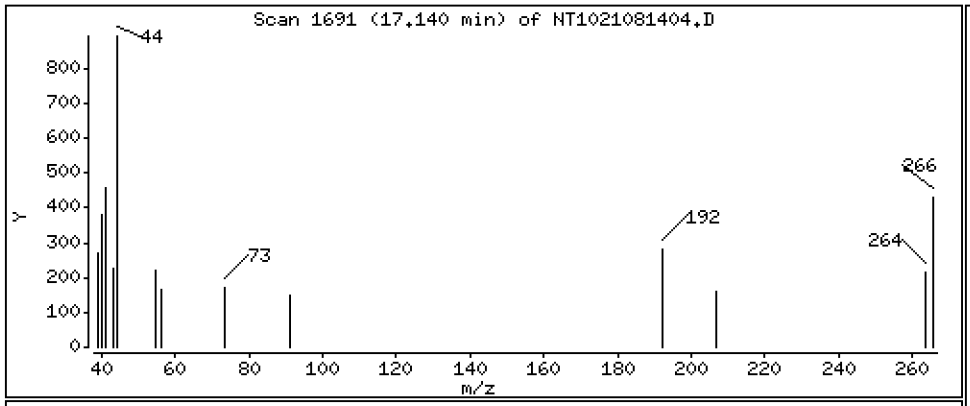
Client ID: Instrument: nt10.i

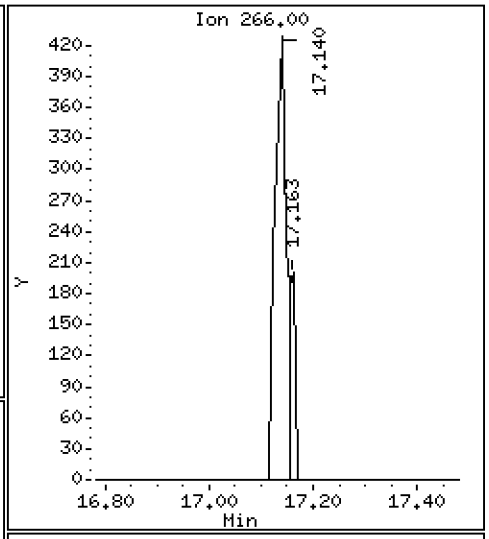
Sample Info: SJH0174-LCV2

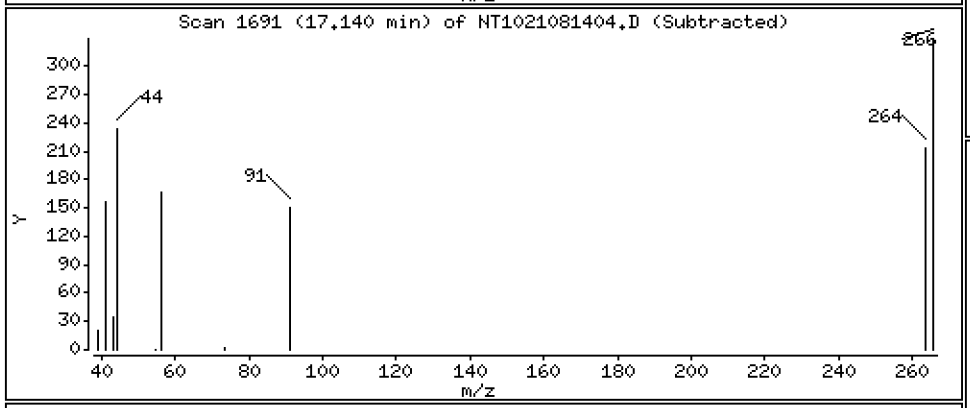
Operator: VTS

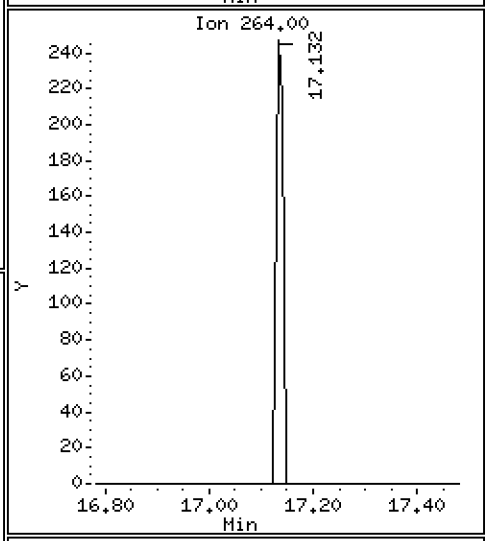
Column phase: ZB-5msi Column diameter: 0.25

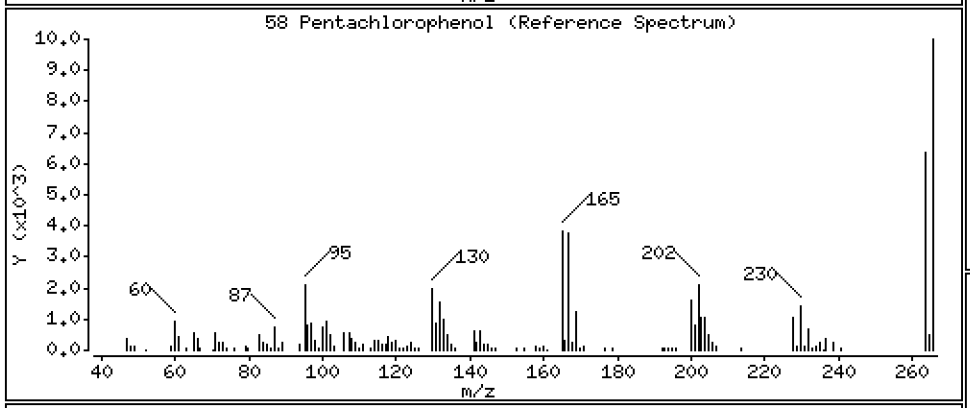
58 Pentachlorophenol Concentration: 0.03946 ug/mL

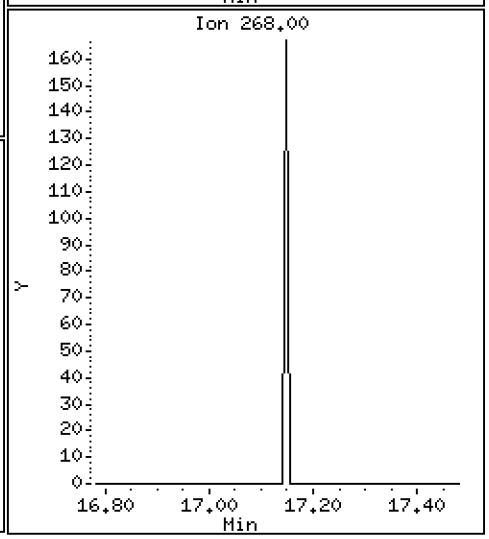


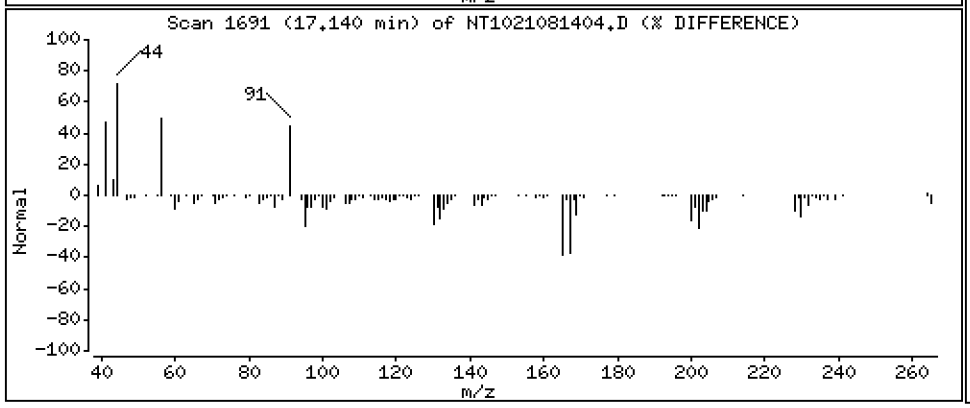












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

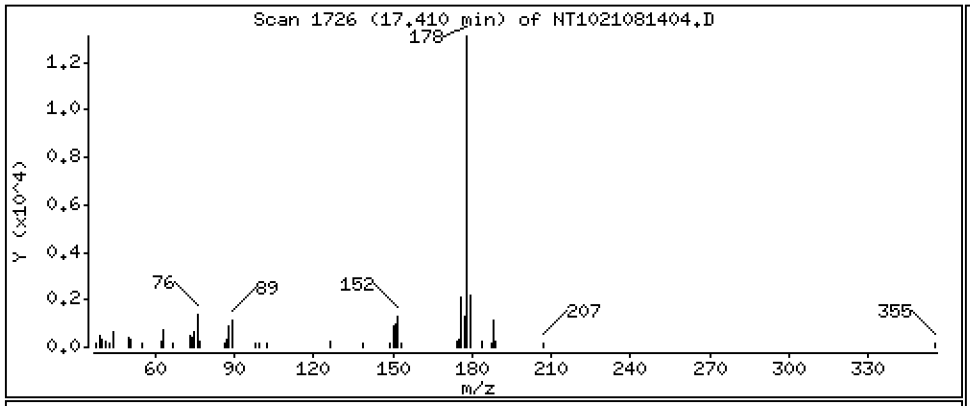
Operator: VTS

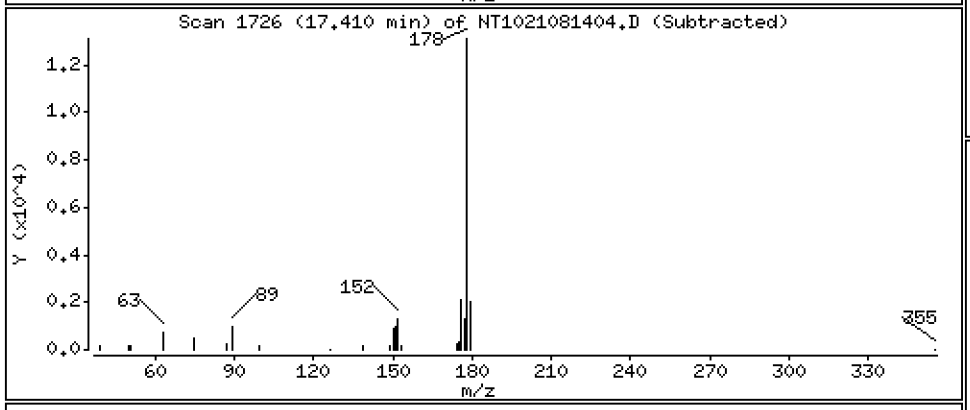
Column phase: ZB-5msi

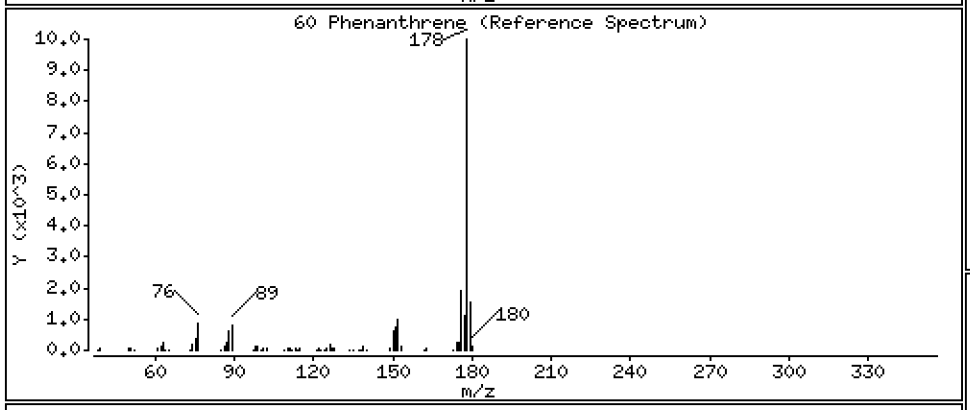
Column diameter: 0.25

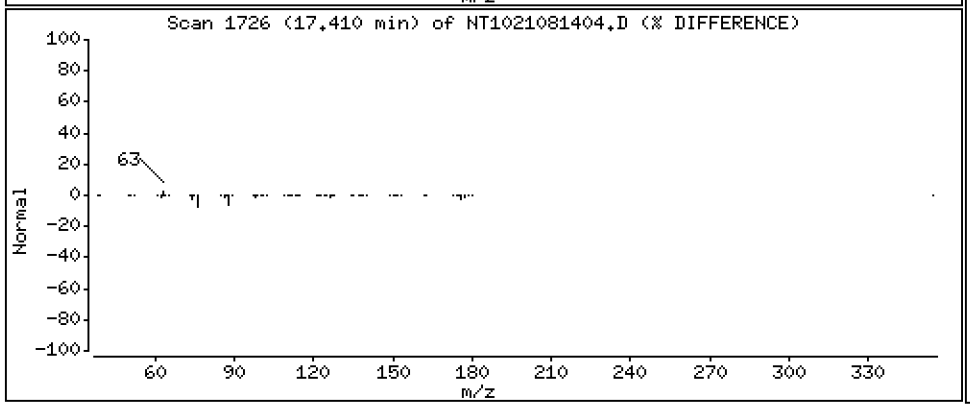
60 Phenanthrene

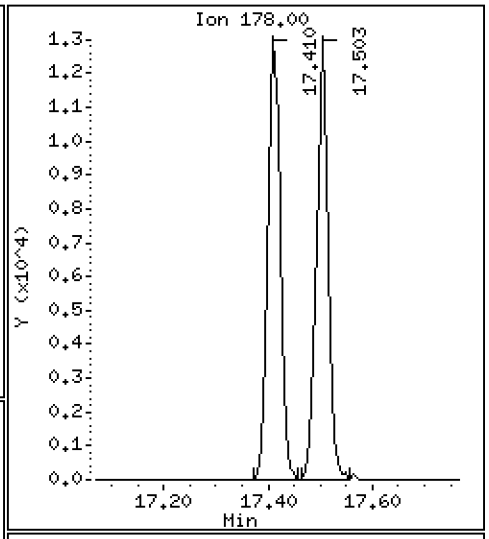
Concentration: 0.1765 ug/mL

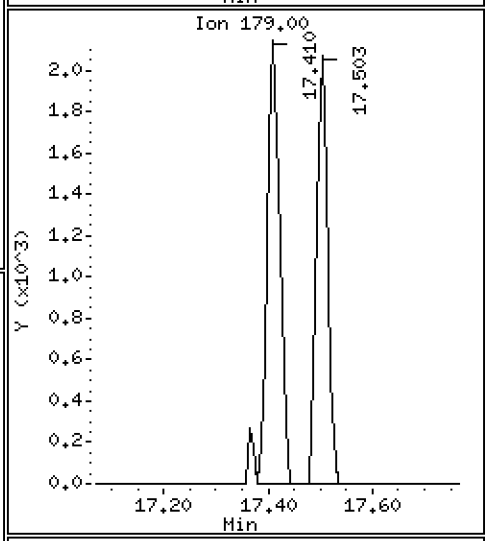


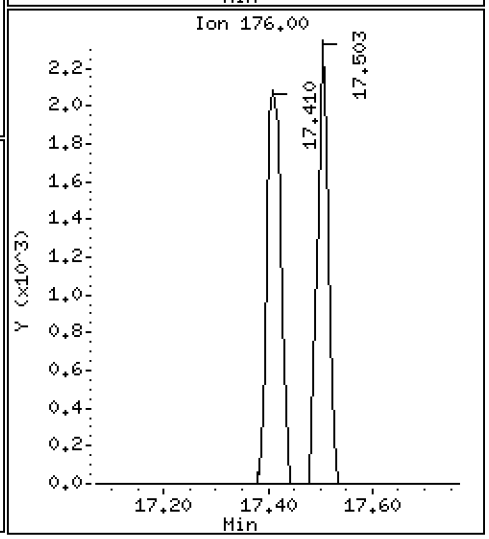












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

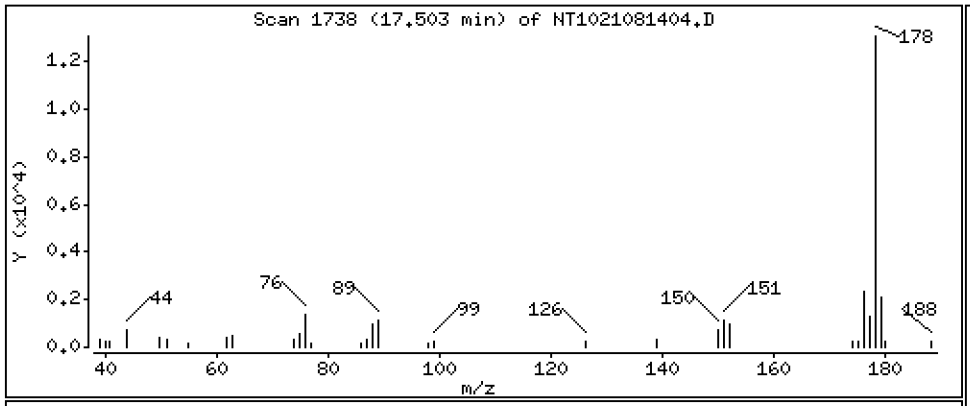
Operator: VTS

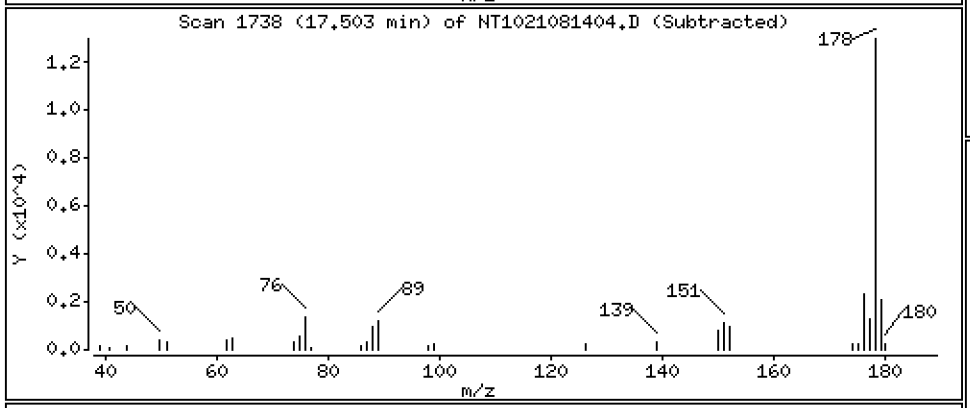
Column phase: ZB-5msi

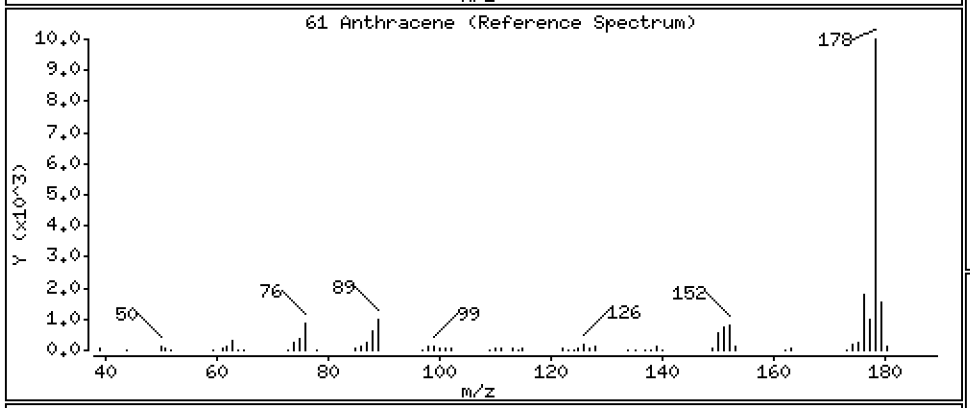
Column diameter: 0.25

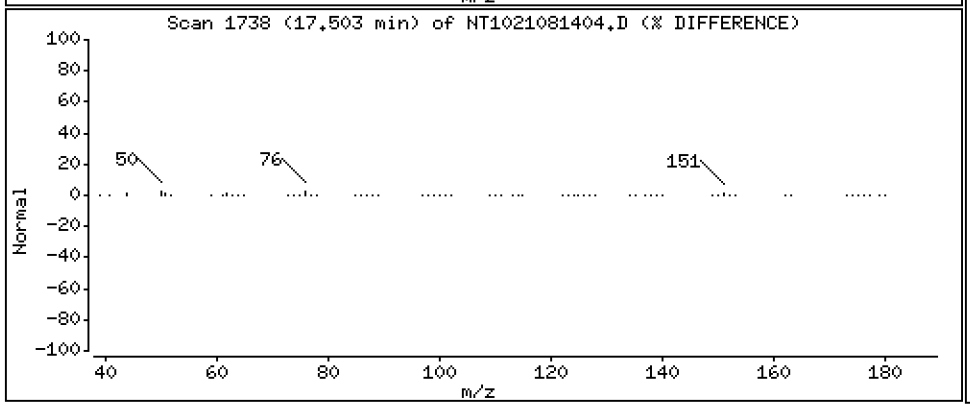
61 Anthracene

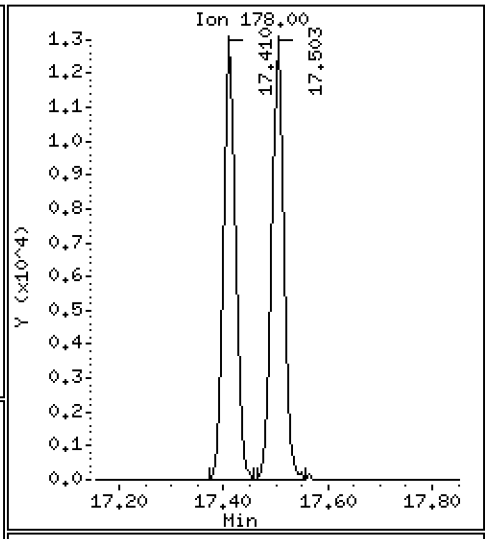
Concentration: 0.1600 ug/mL

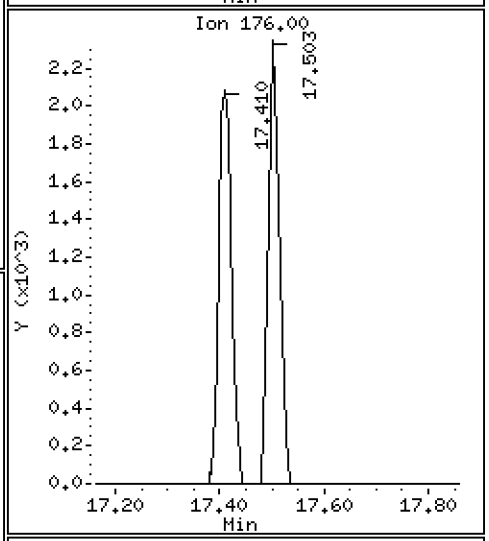


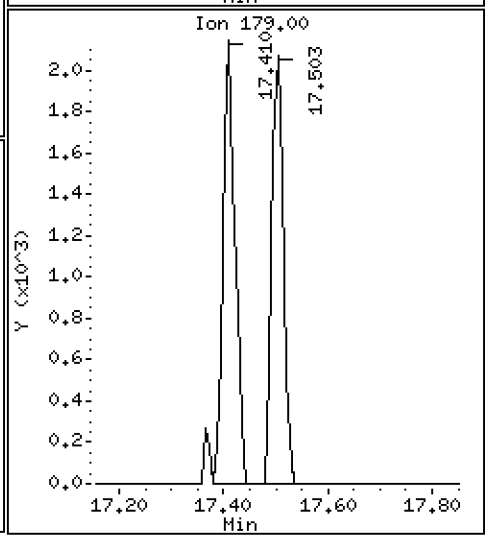












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

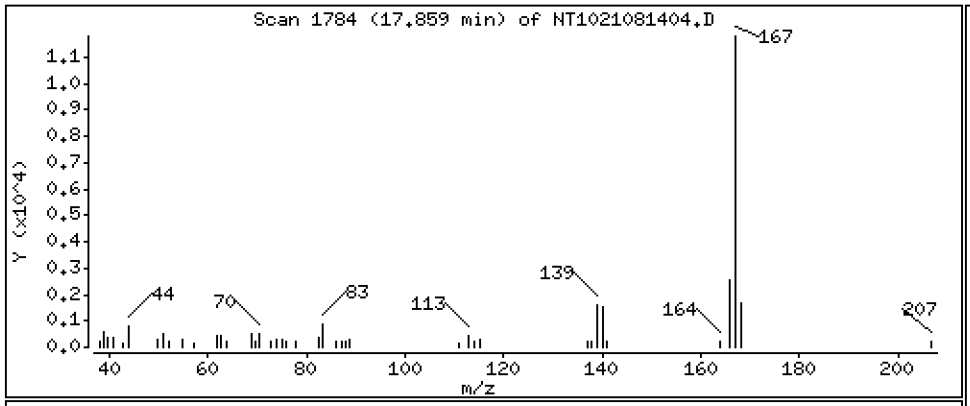
Operator: VTS

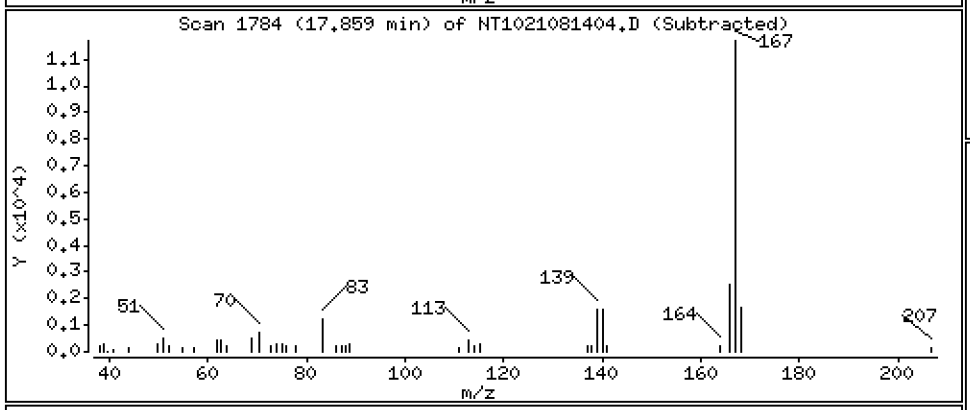
Column phase: ZB-5msi

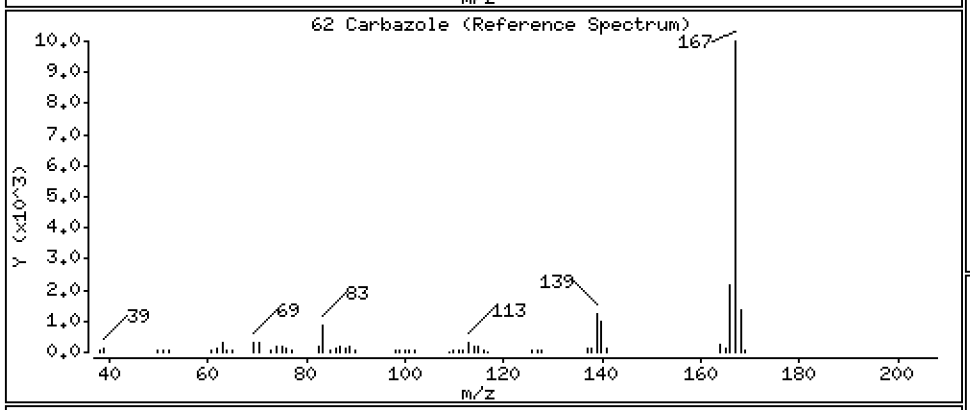
Column diameter: 0.25

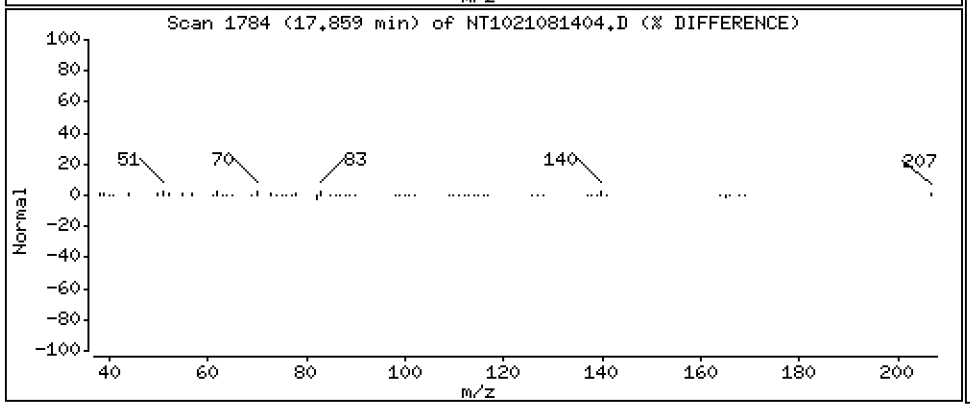
62 Carbazole

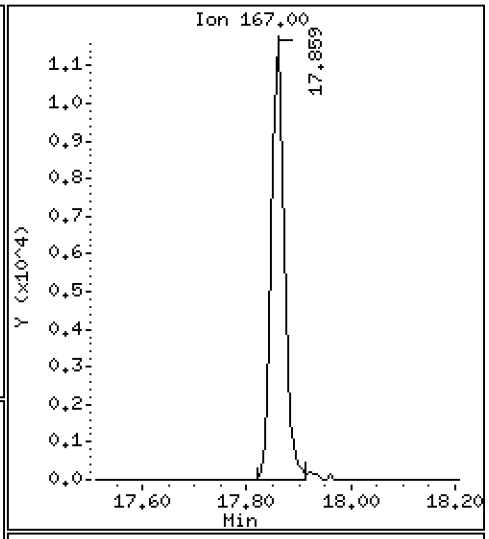
Concentration: 0.1589 ug/mL

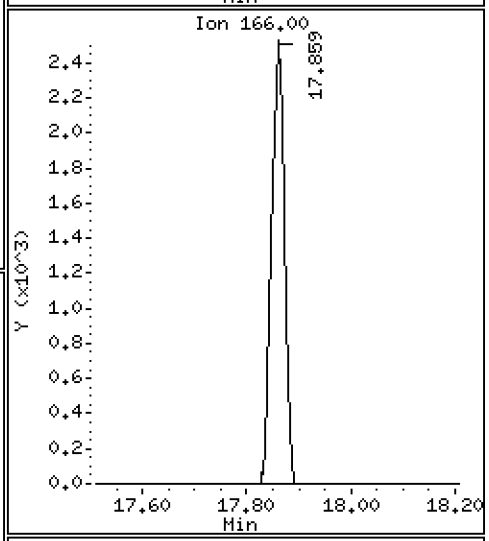


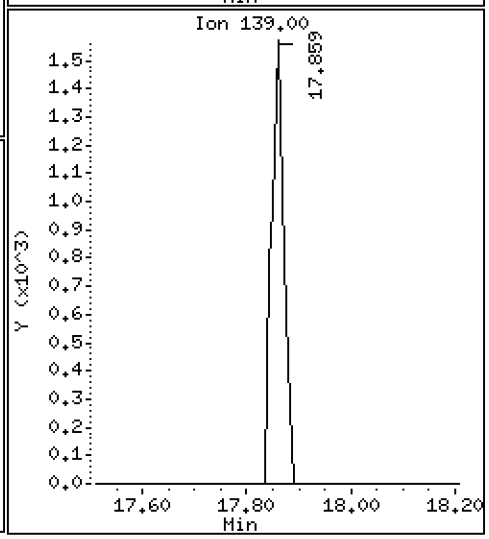












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

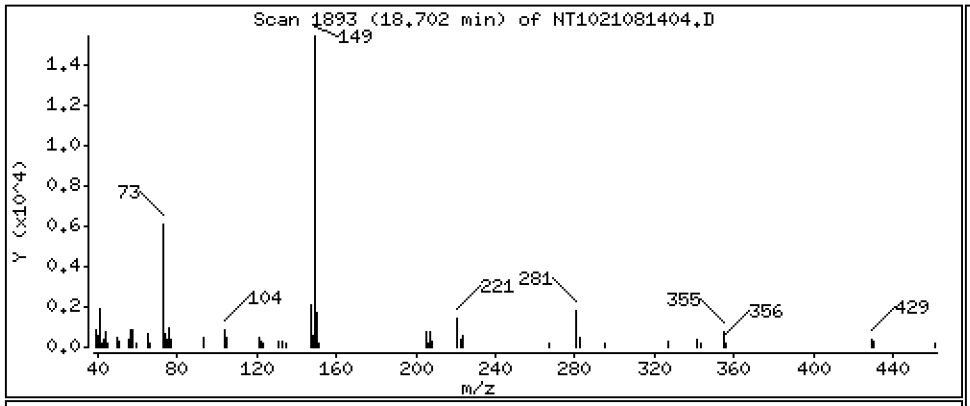
Operator: VTS

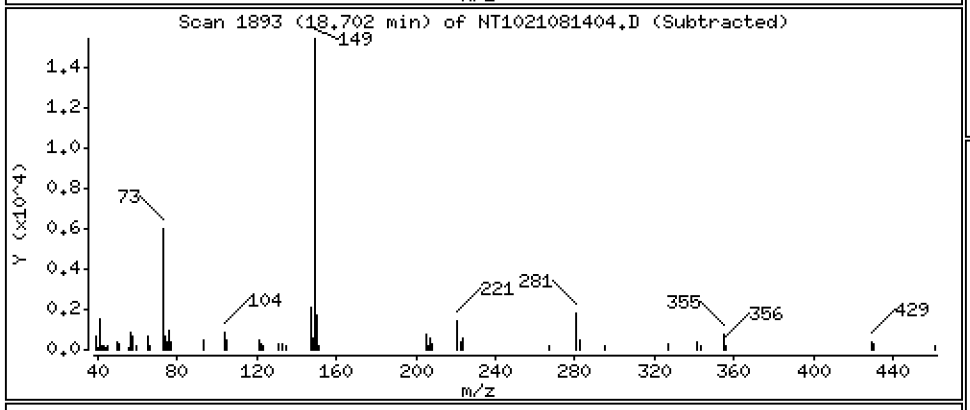
Column phase: ZB-5msi

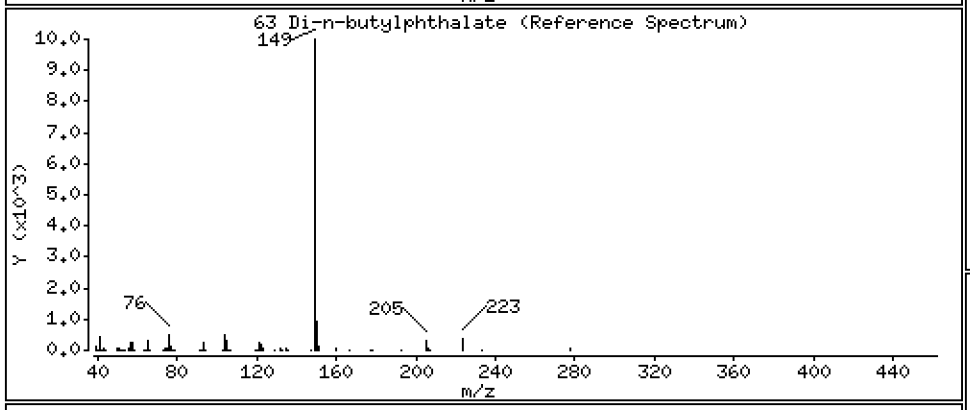
Column diameter: 0.25

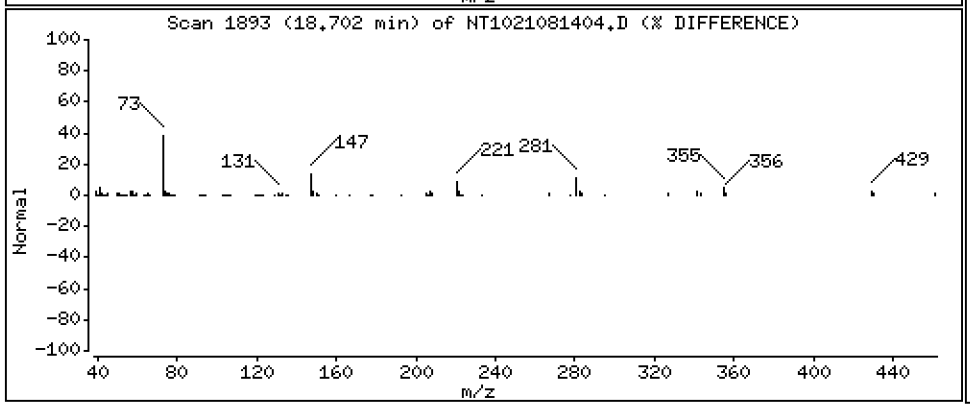
63 Di-n-butylphthalate

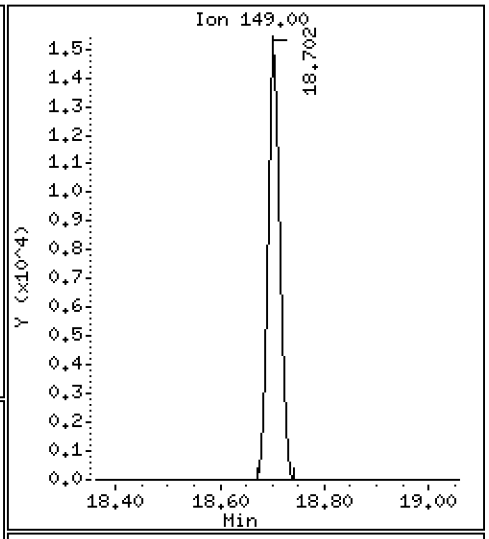
Concentration: 0.1257 ug/mL

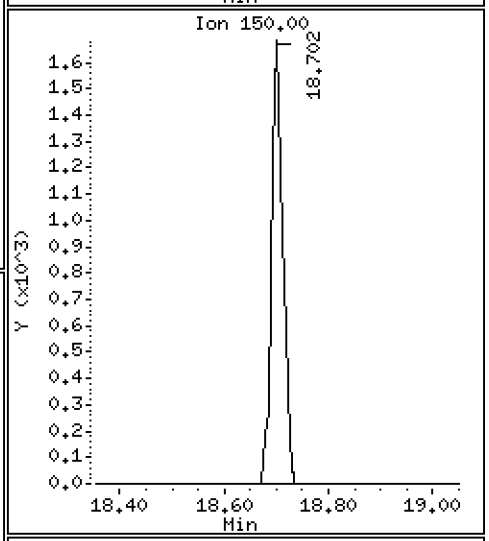


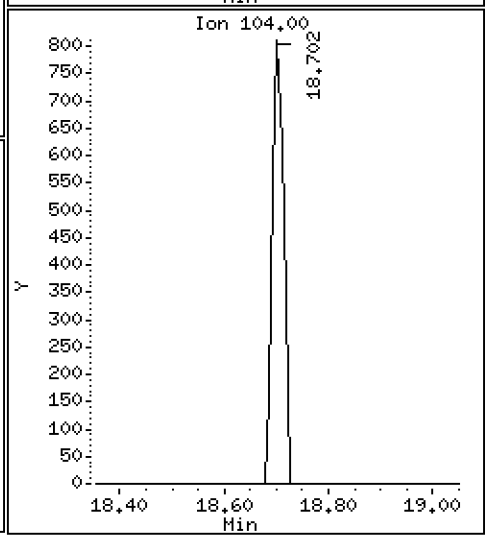












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

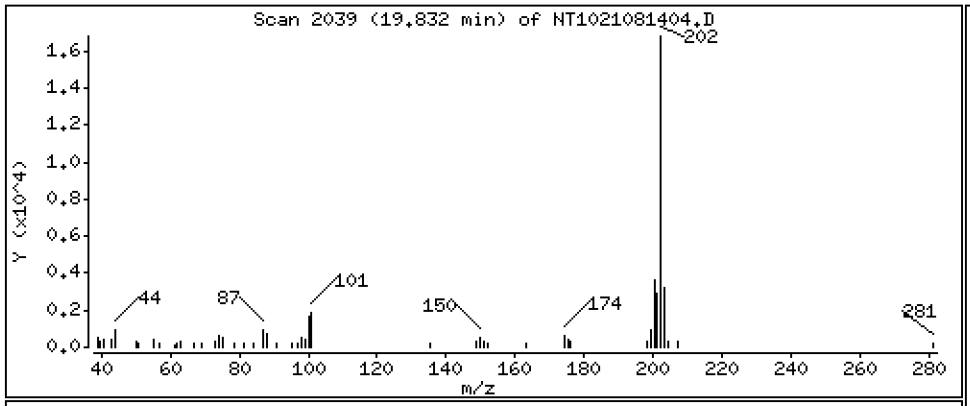
Operator: VTS

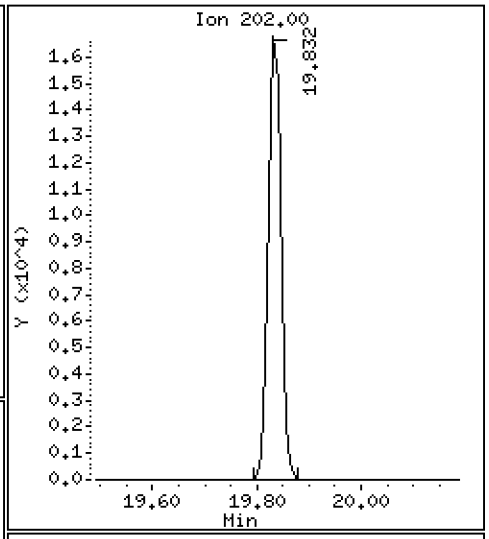
Column phase: ZB-5msi

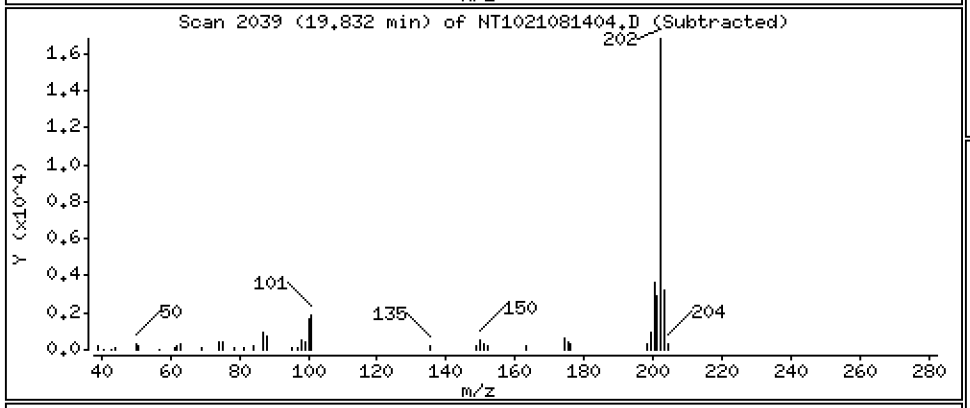
Column diameter: 0.25

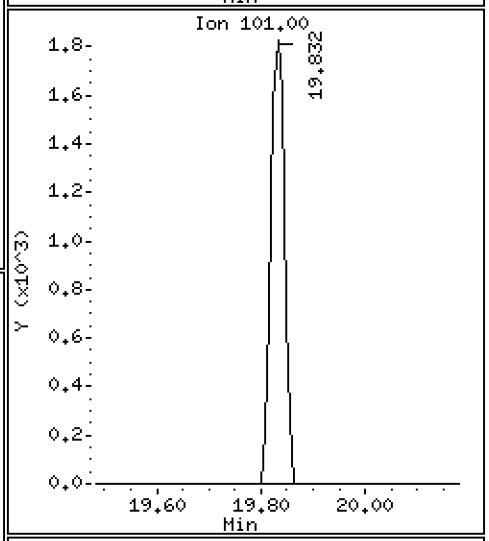
64 Fluoranthene

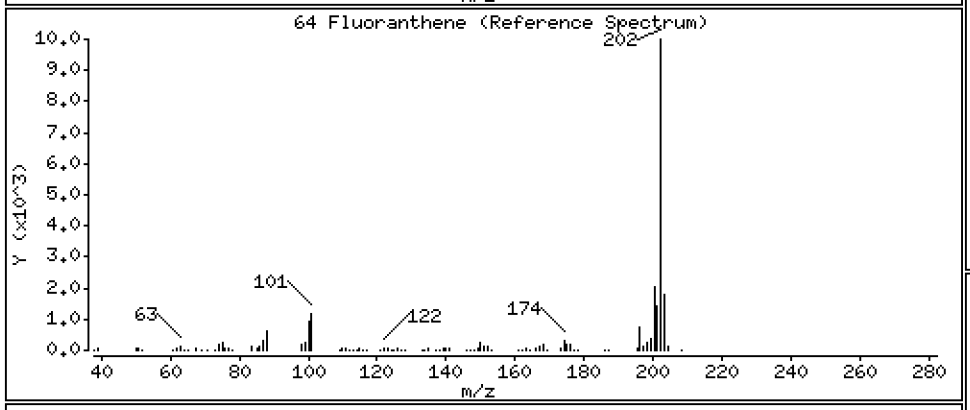
Concentration: 0.1700 ug/mL

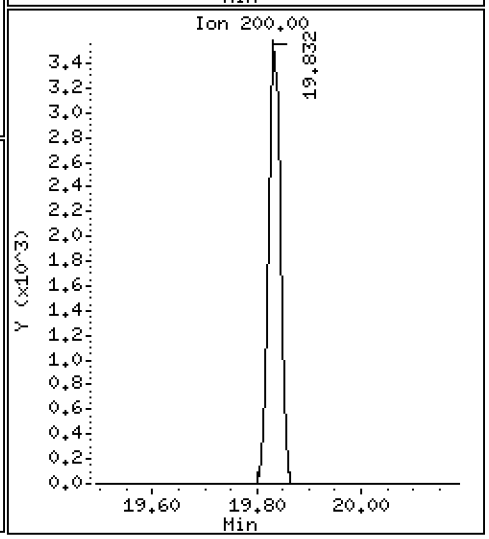


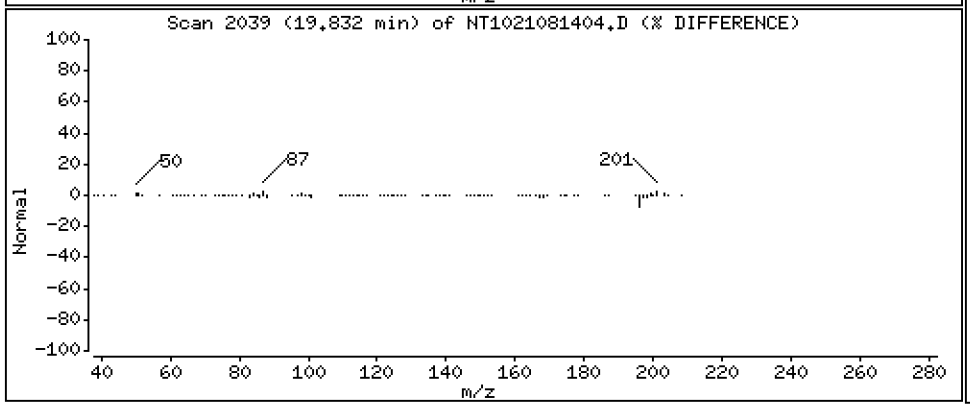












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

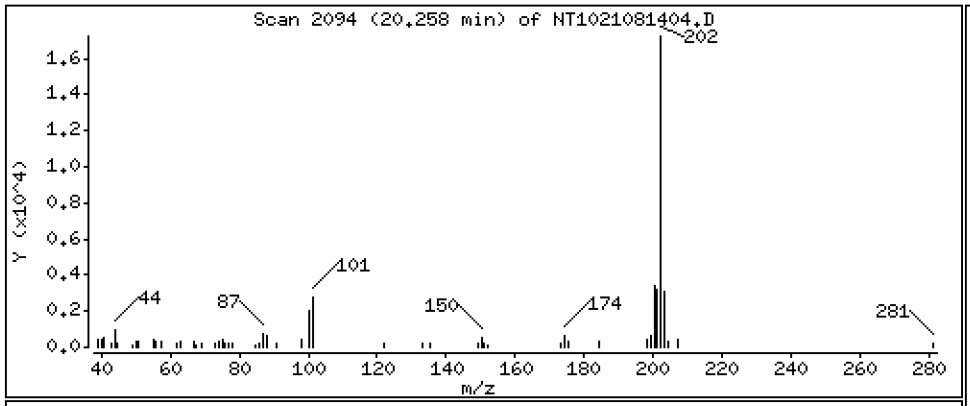
Operator: VTS

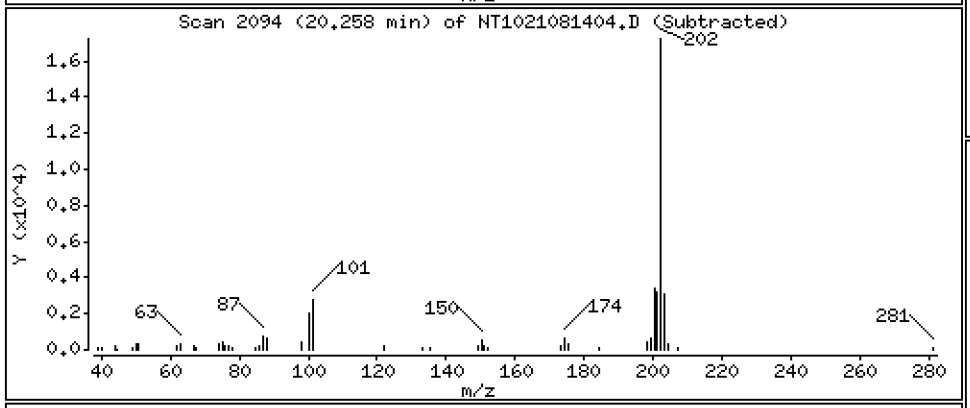
Column phase: ZB-5msi

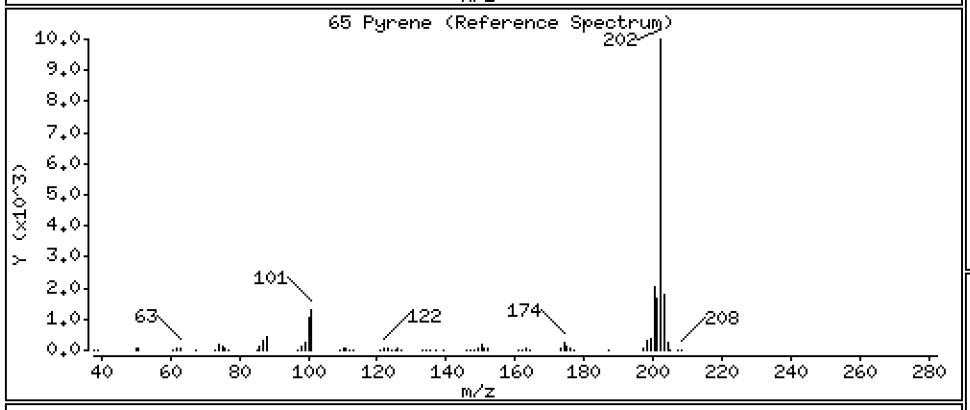
Column diameter: 0.25

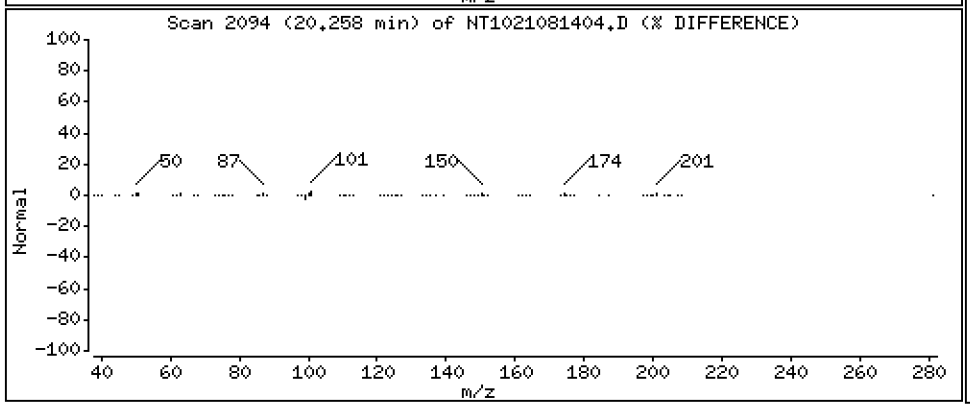
65 Pyrene

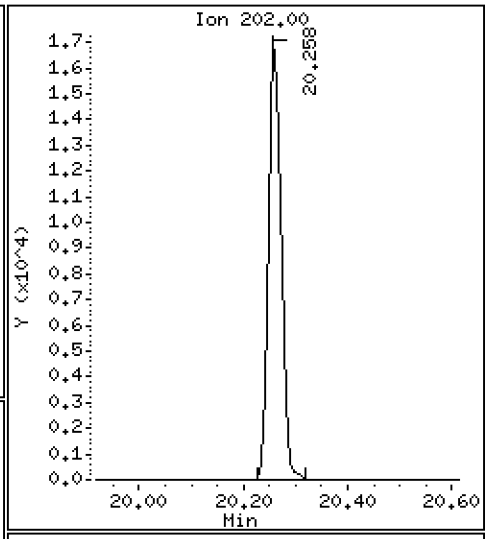
Concentration: 0.1578 ug/mL

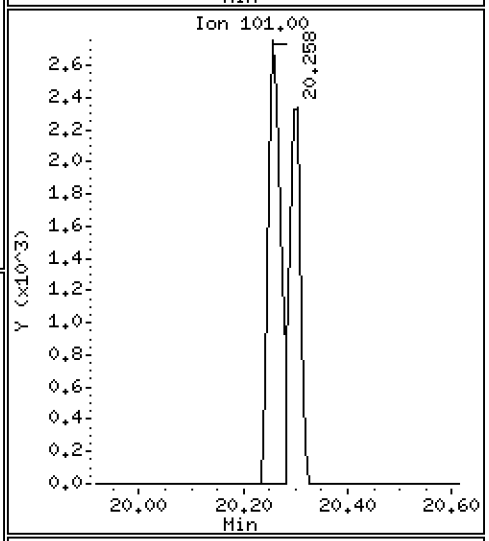


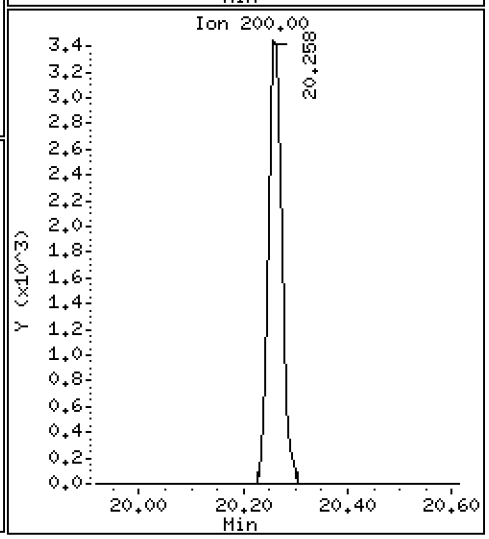












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

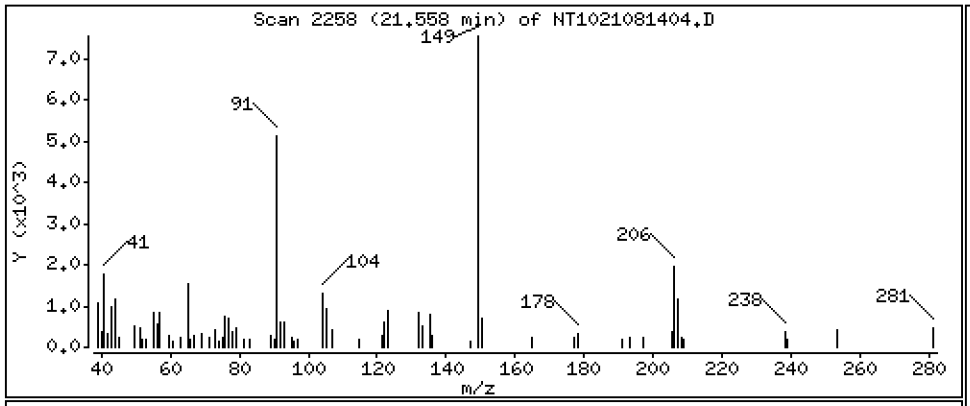
Operator: VTS

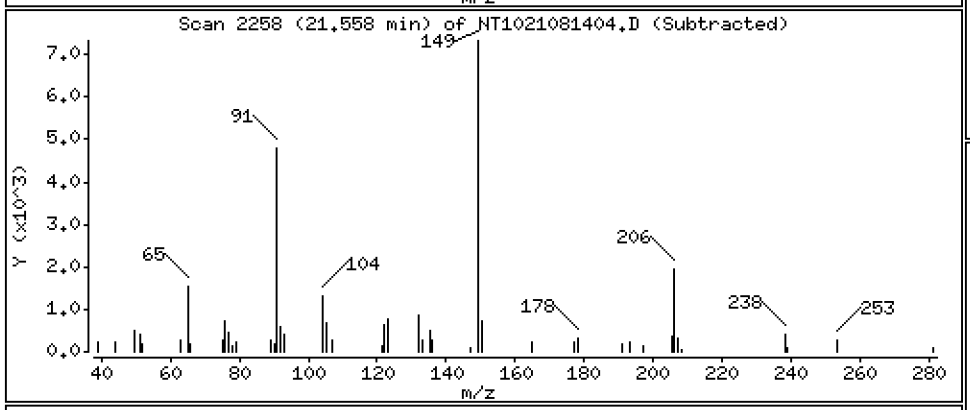
Column phase: ZB-5msi

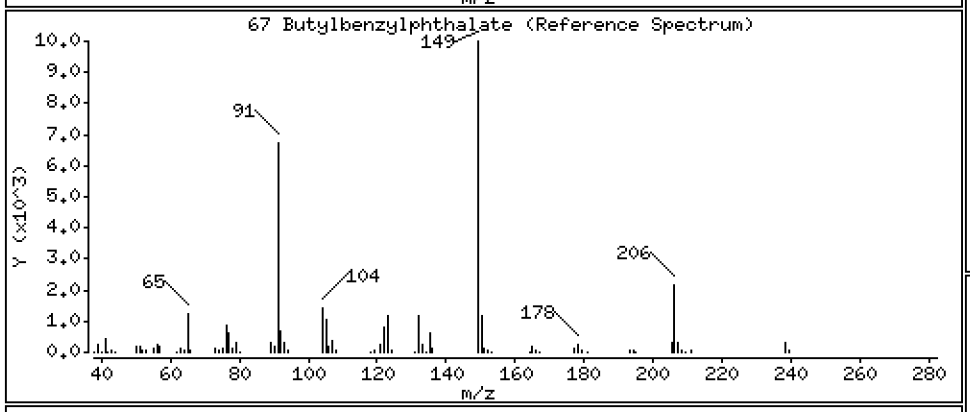
Column diameter: 0.25

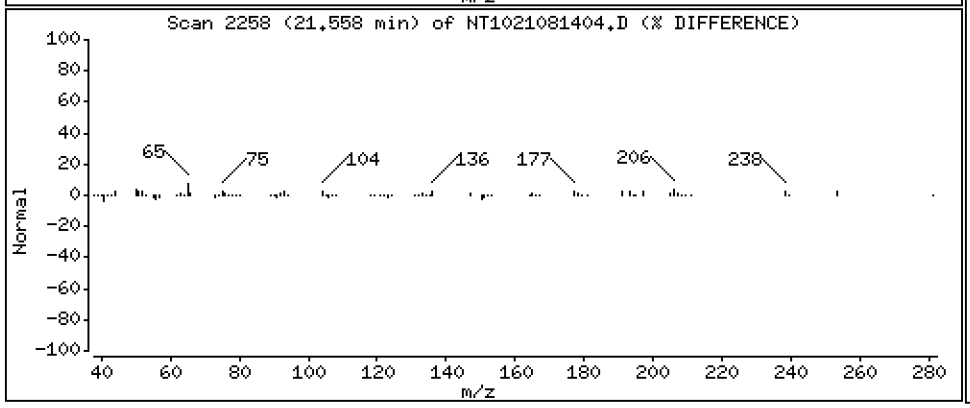
67 Butylbenzylphthalate

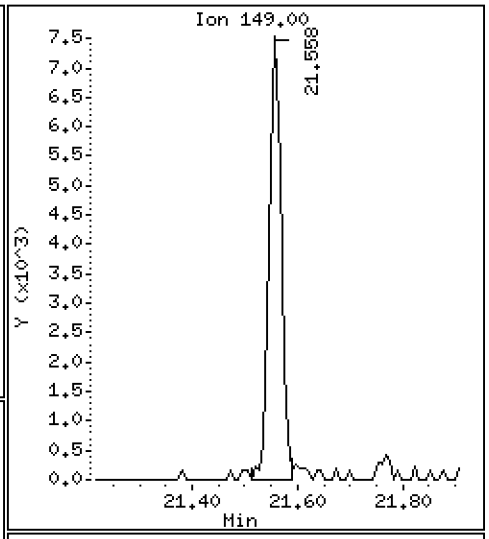
Concentration: 0.2000 ug/mL

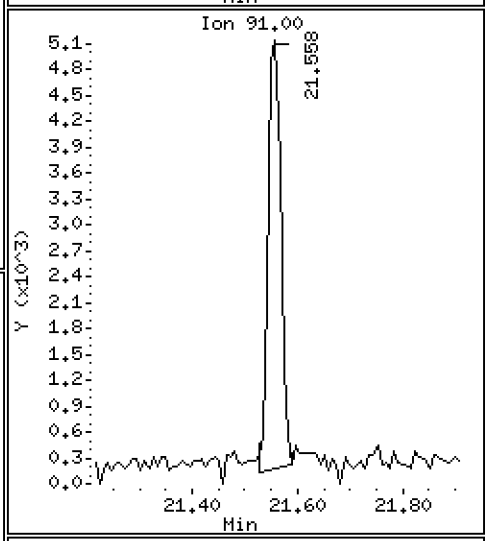


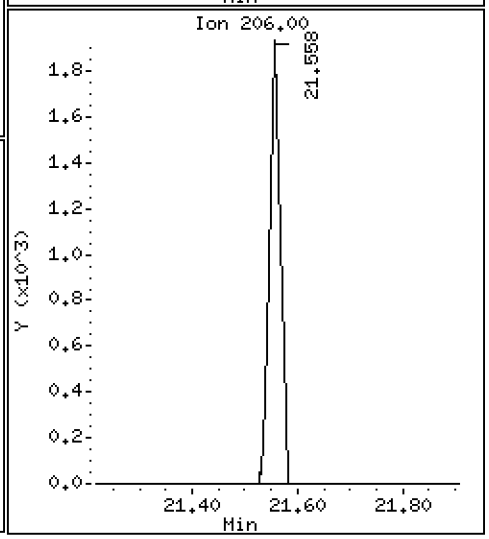












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

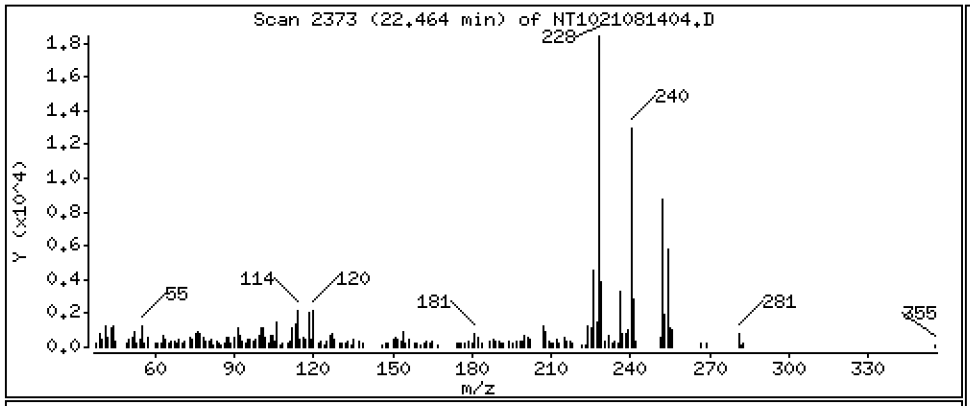
Operator: VTS

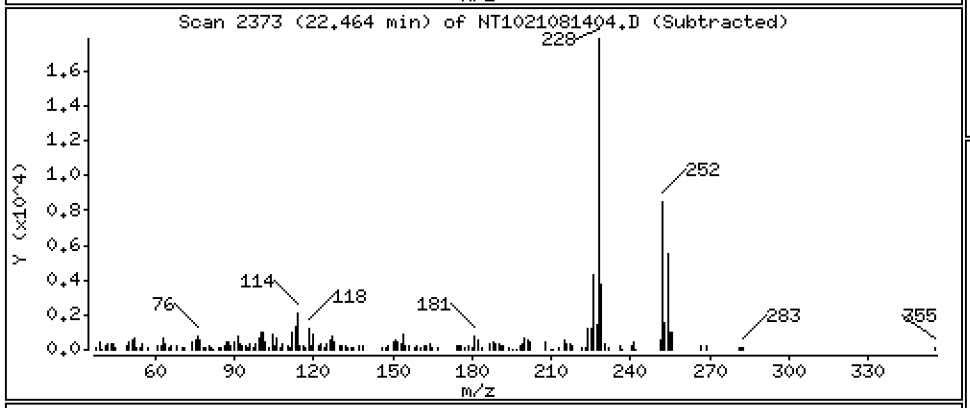
Column phase: ZB-5msi

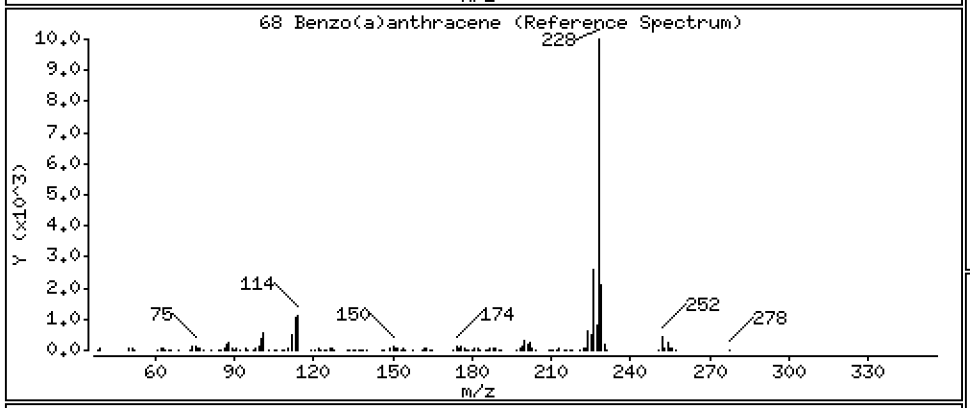
Column diameter: 0.25

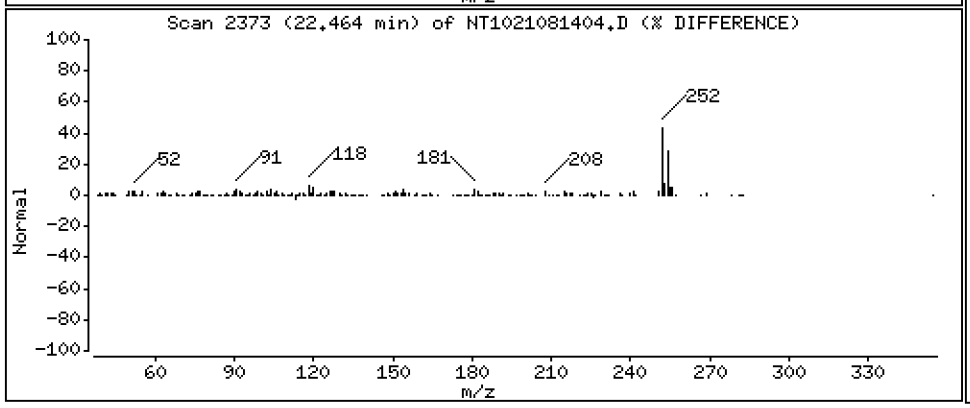
68 Benzo(a)anthracene

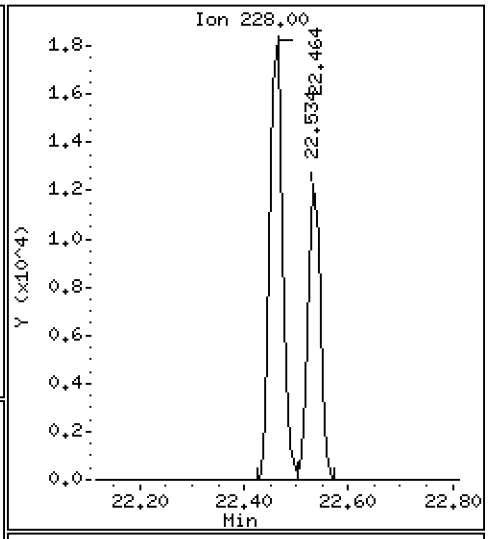
Concentration: 0.2072 ug/mL

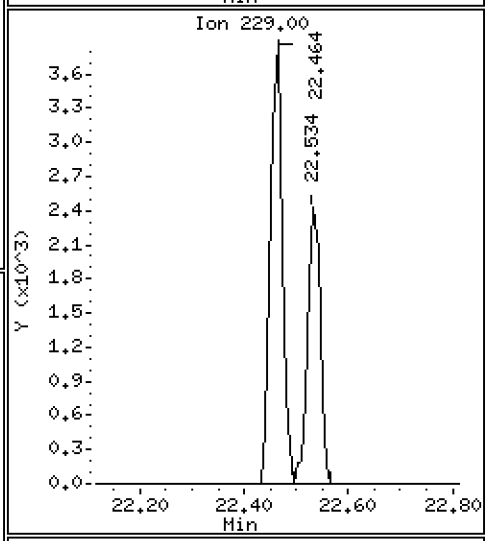


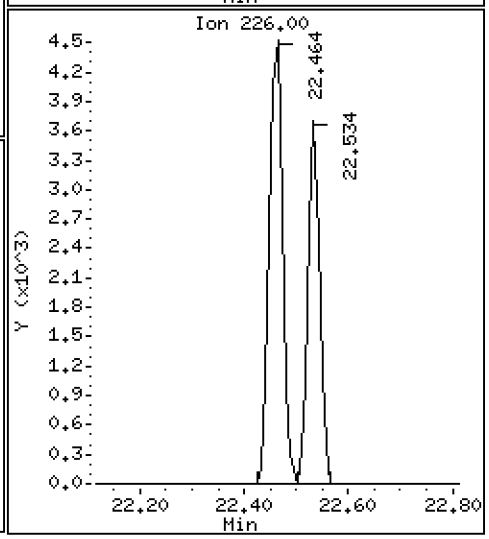












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

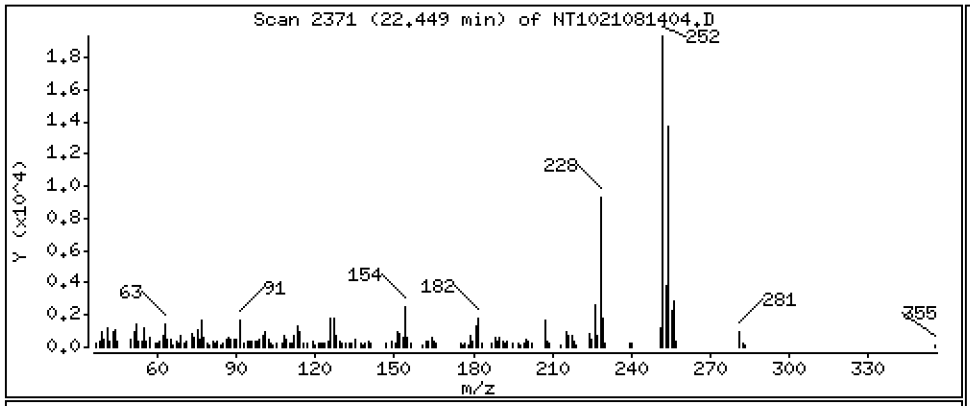
Operator: VTS

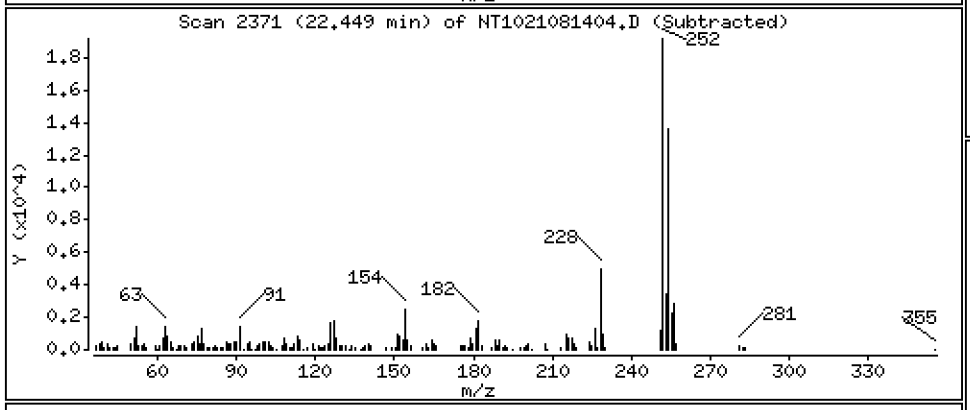
Column phase: ZB-5msi

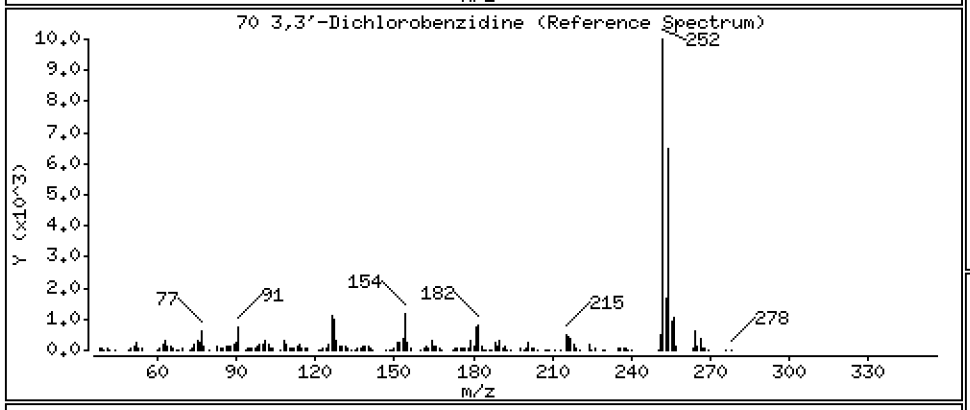
Column diameter: 0.25

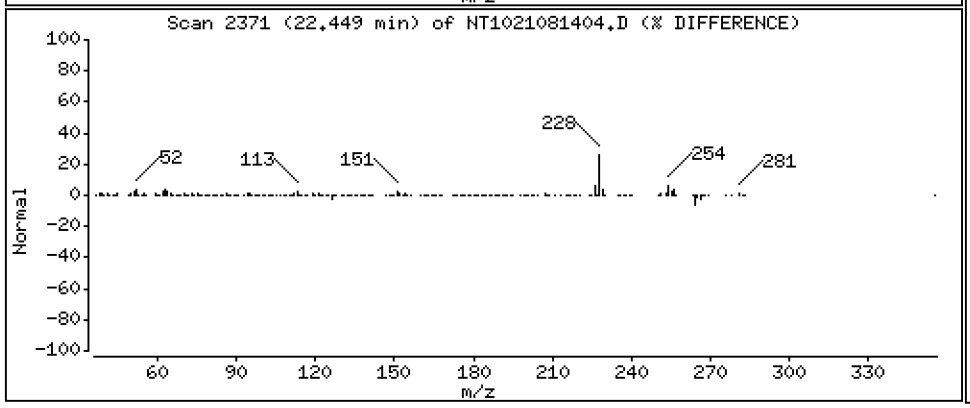
70 3,3'-Dichlorobenzidine

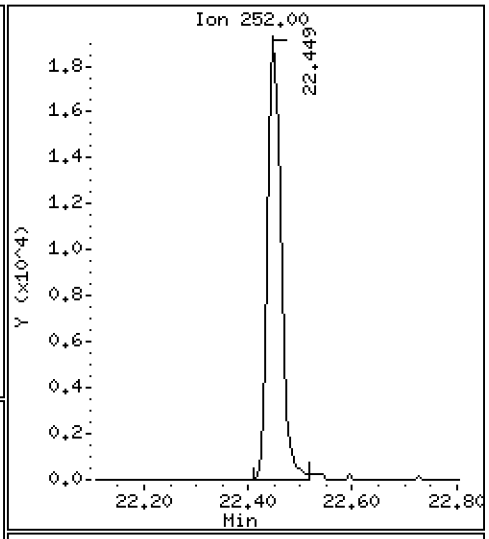
Concentration: 0.5796 ug/mL

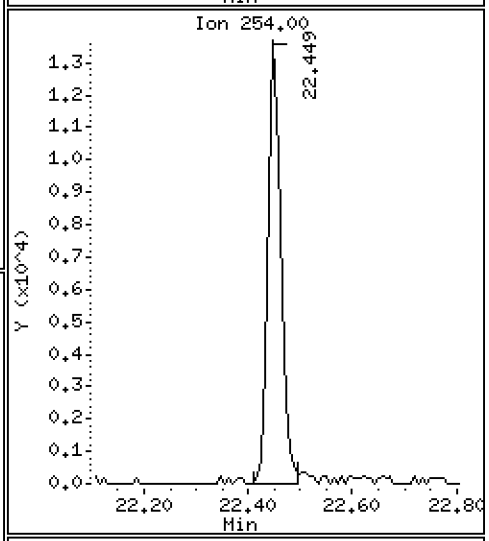


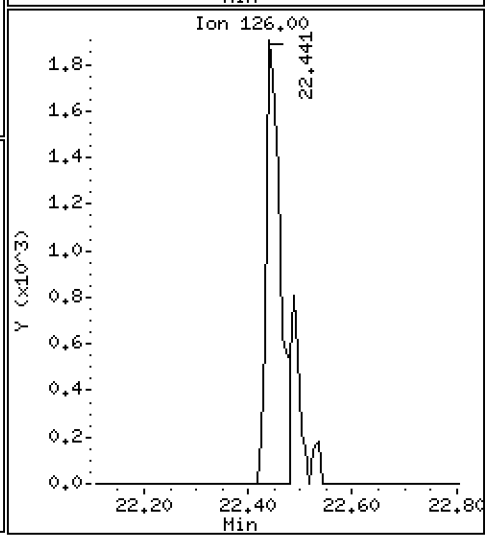












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

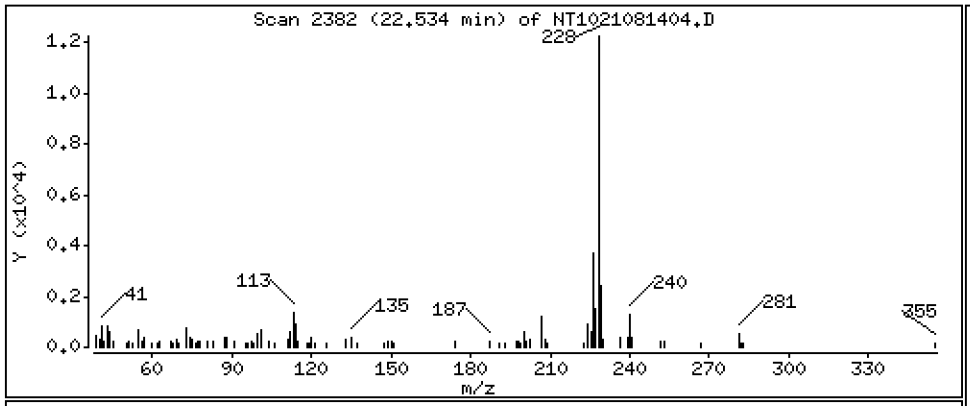
Operator: VTS

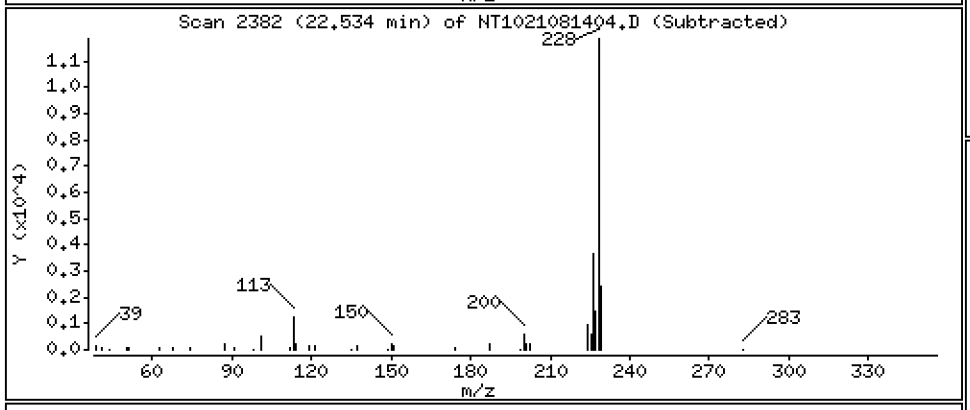
Column phase: ZB-5msi

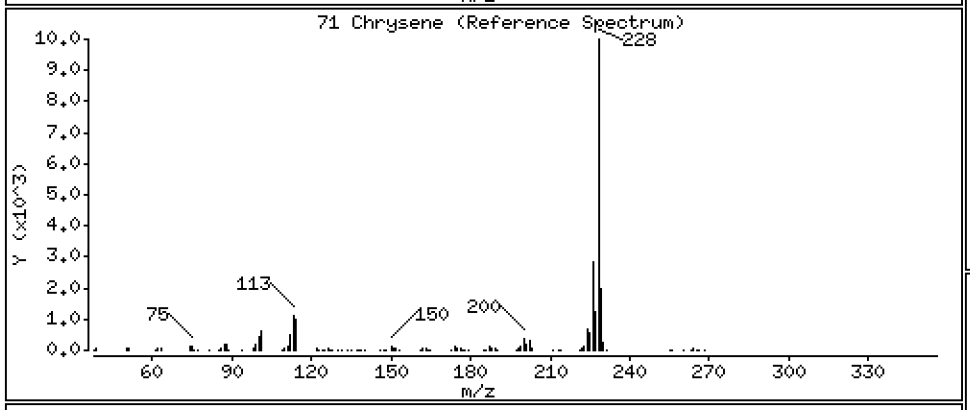
Column diameter: 0.25

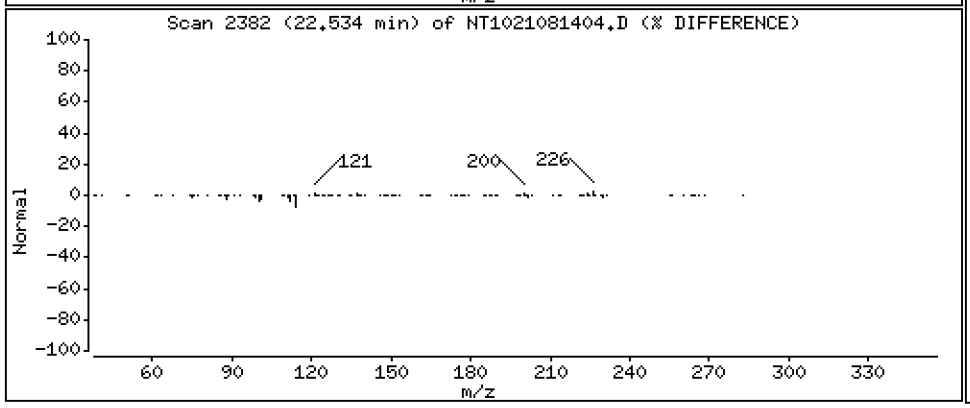
71 Chrysene

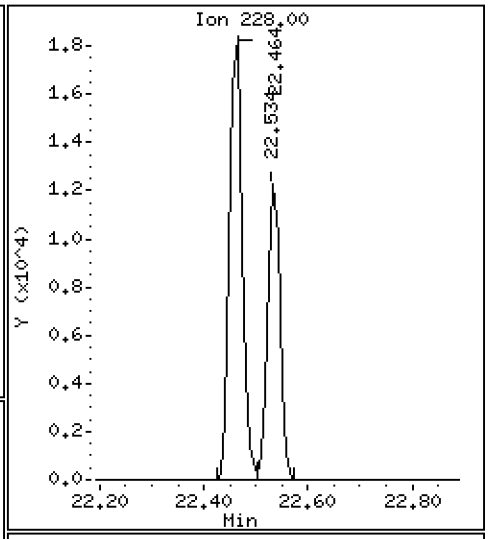
Concentration: 0.1752 ug/mL

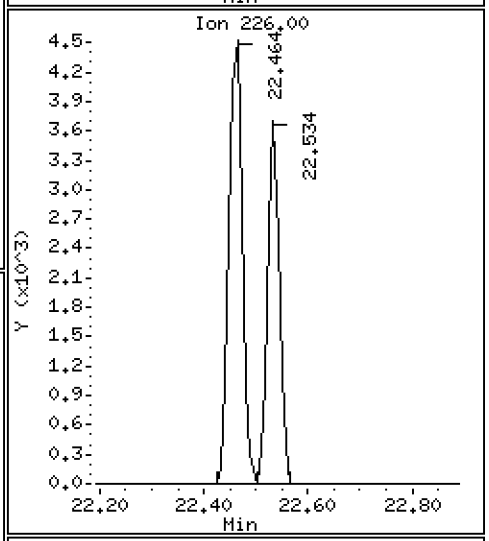


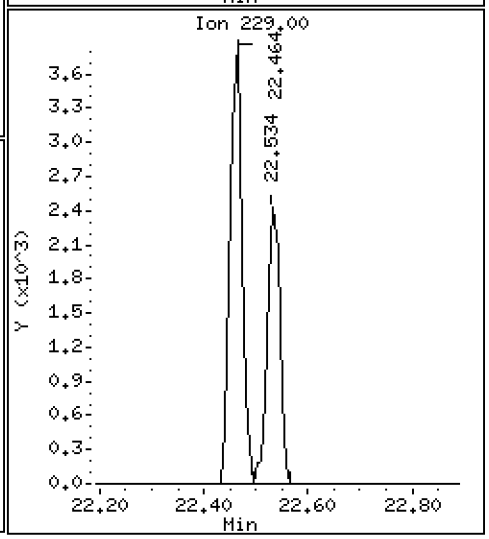












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

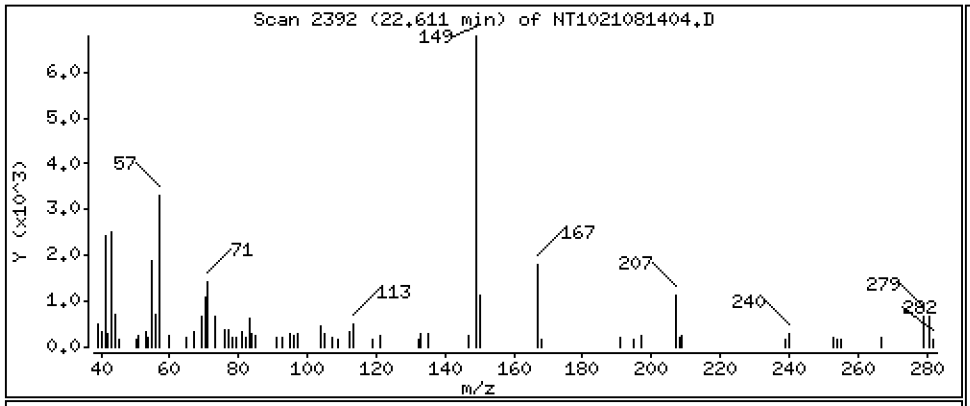
Operator: VTS

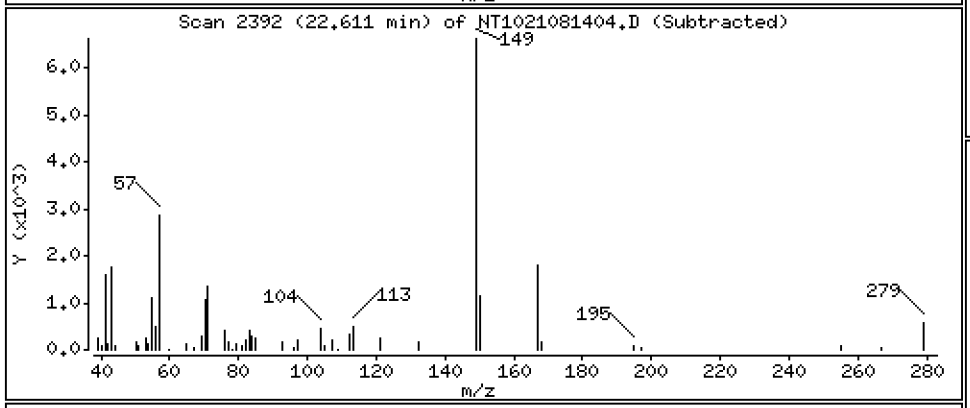
Column phase: ZB-5msi

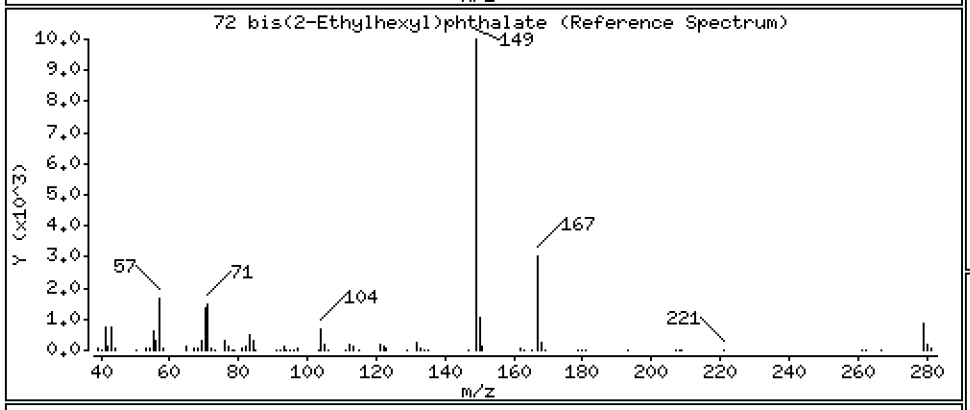
Column diameter: 0.25

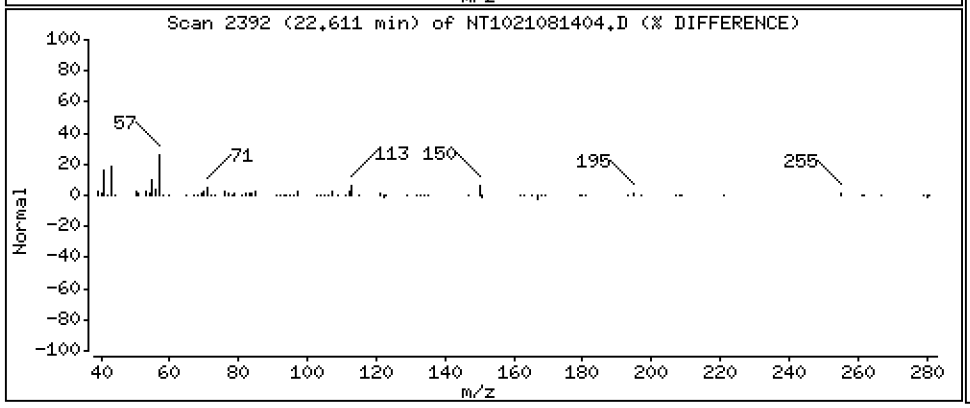
72 bis(2-Ethylhexyl)phthalate

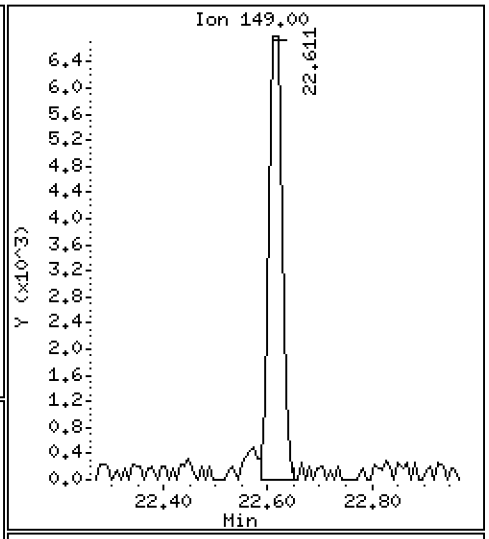
Concentration: 0.2301 ug/mL

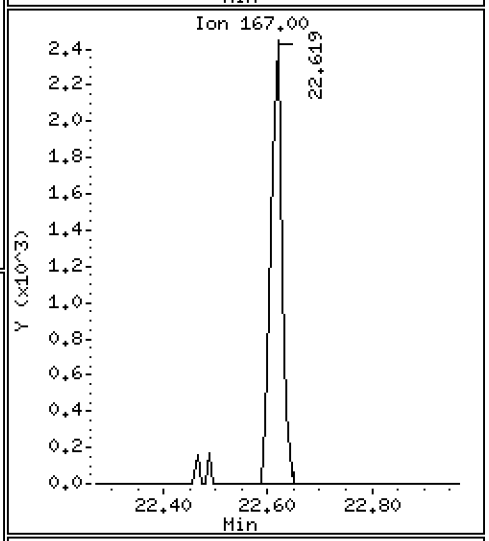


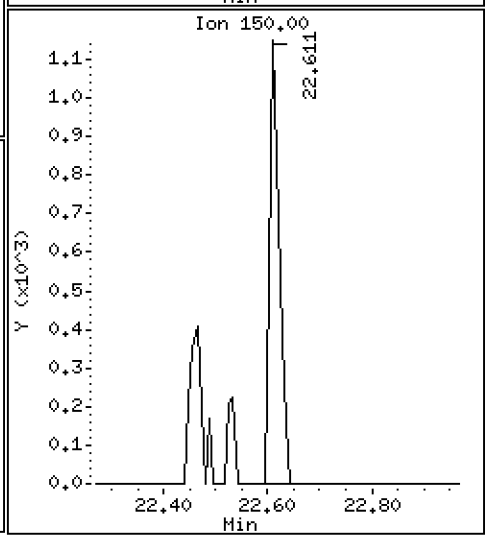












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

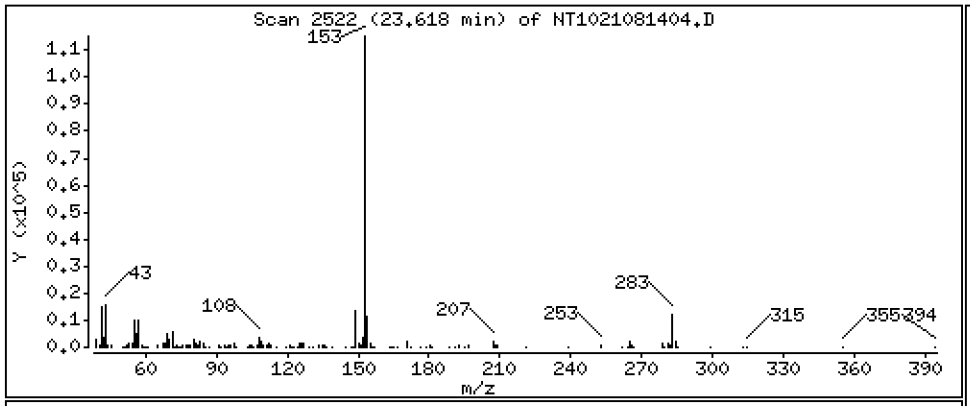
Operator: VTS

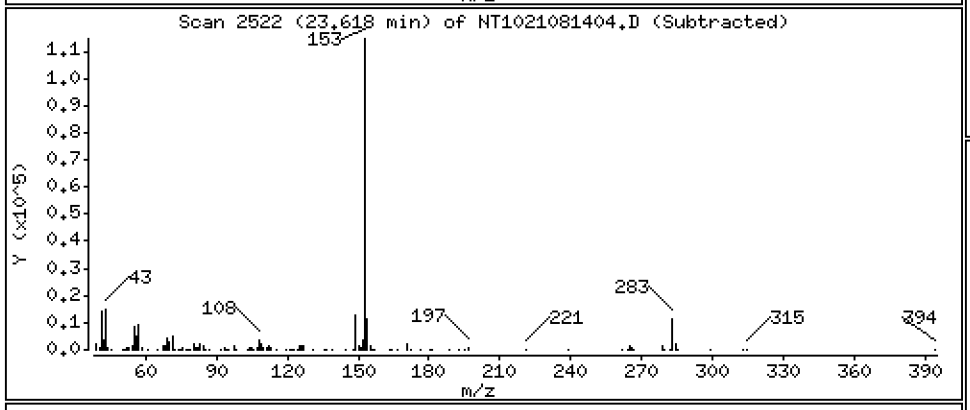
Column phase: ZB-5msi

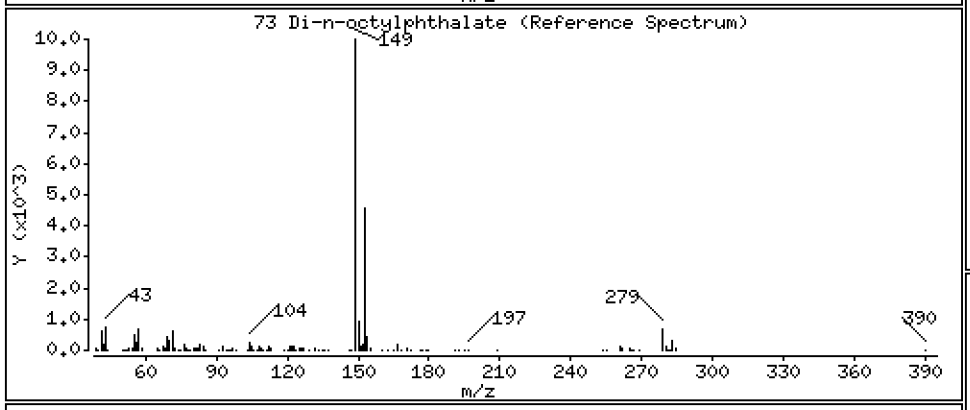
Column diameter: 0.25

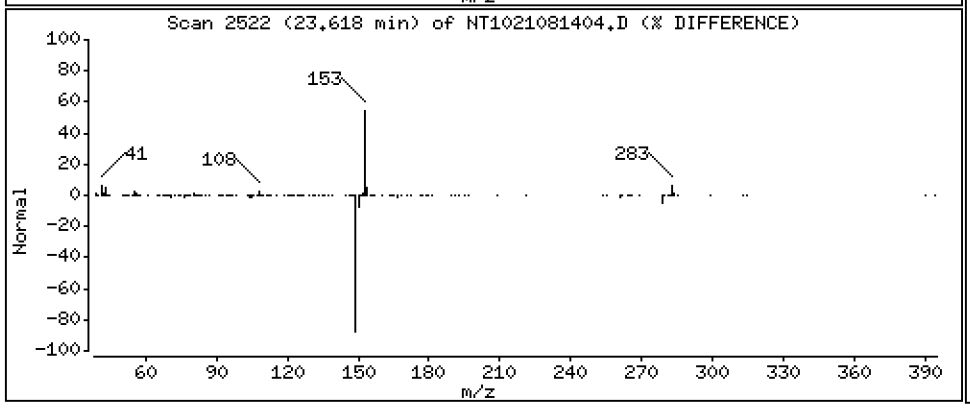
73 Di-n-octylphthalate

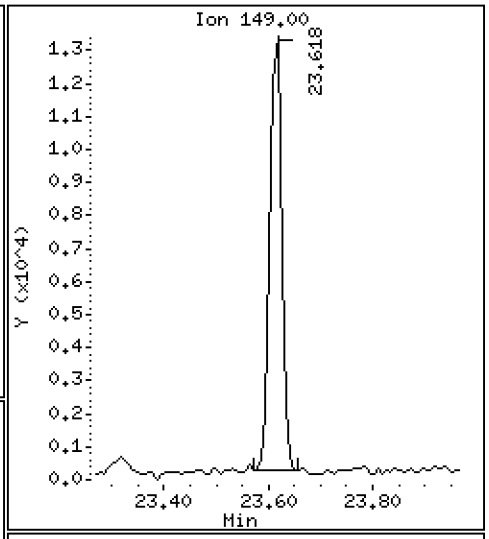
Concentration: 0.1544 ug/mL

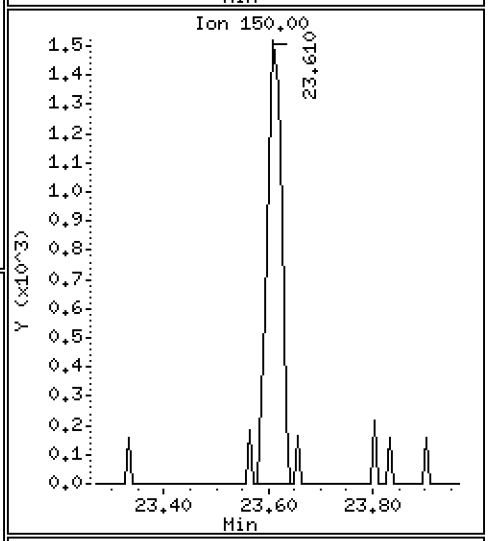


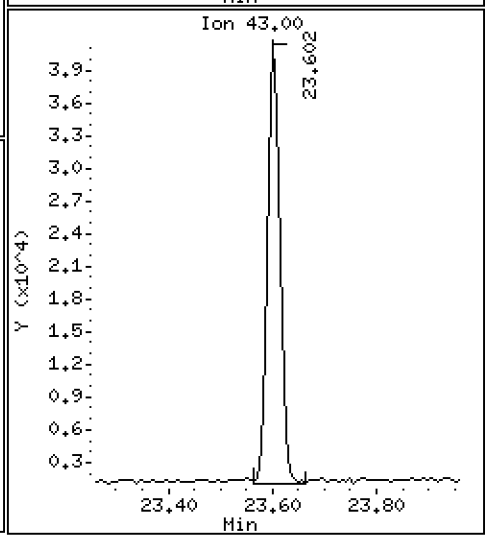












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

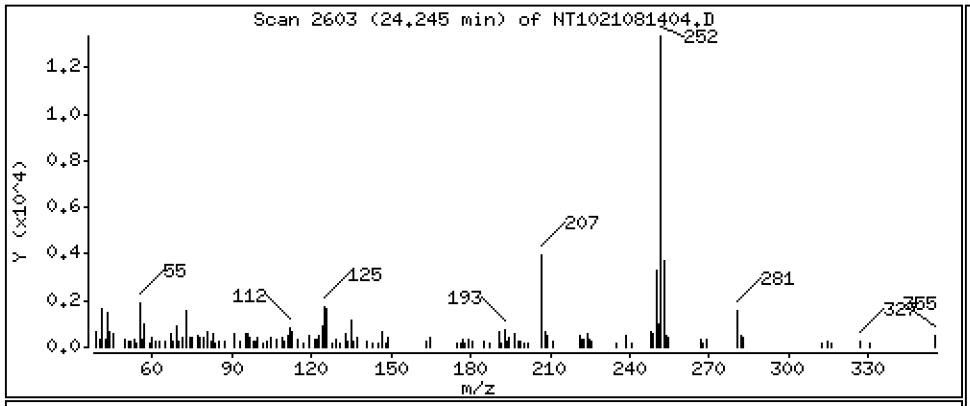
Operator: VTS

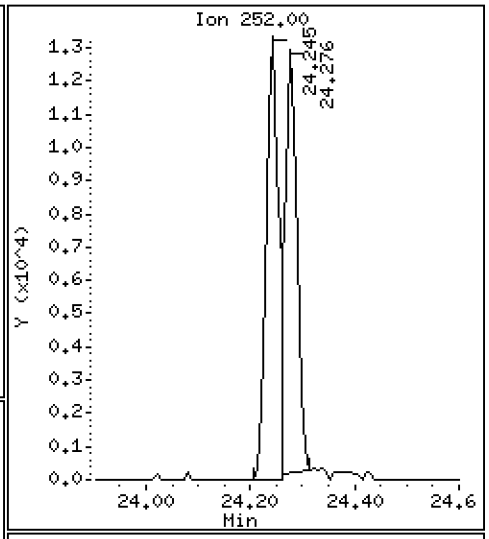
Column phase: ZB-5msi

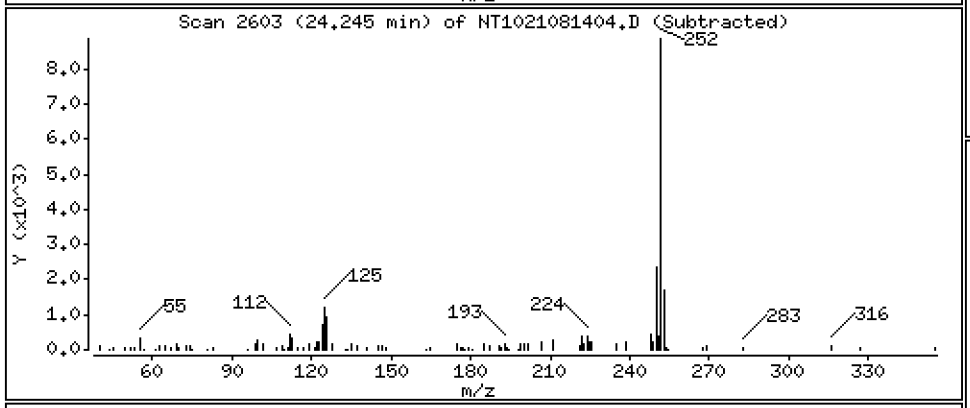
Column diameter: 0.25

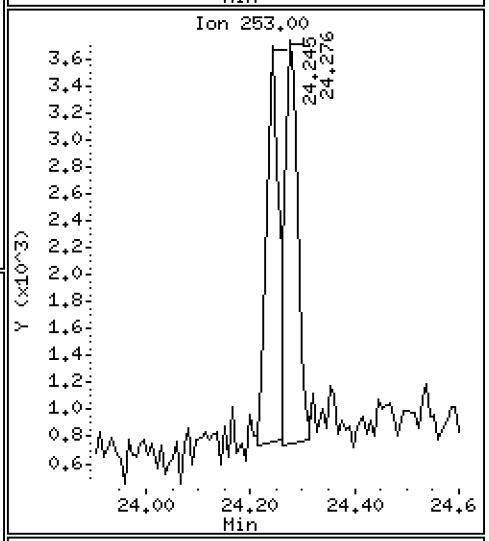
74 Benzo(b)fluoranthene

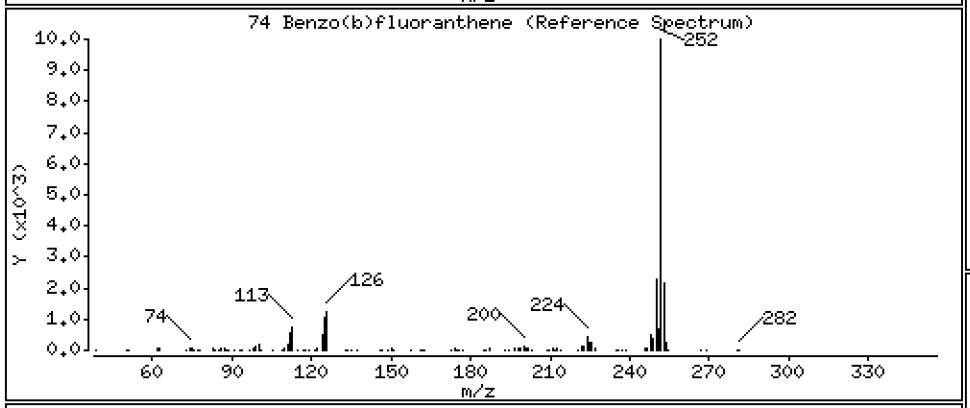
Concentration: 0.1911 ug/mL

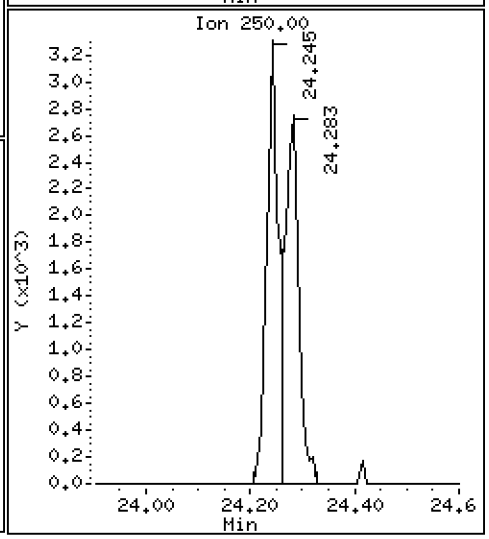


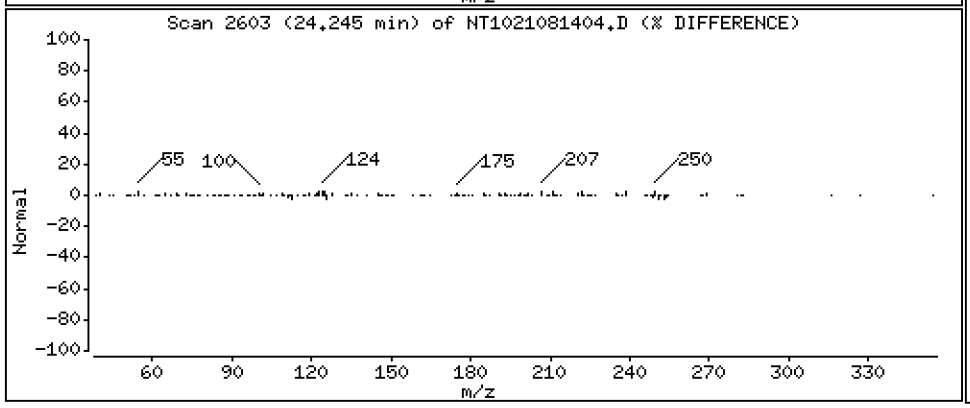












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

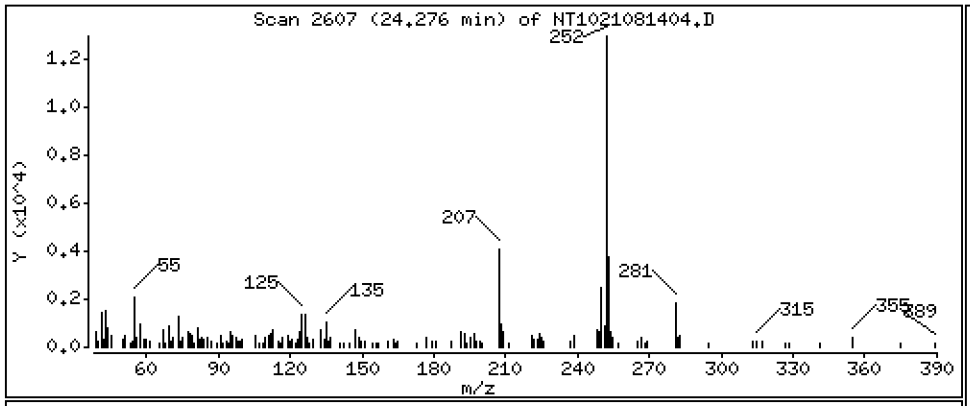
Operator: VTS

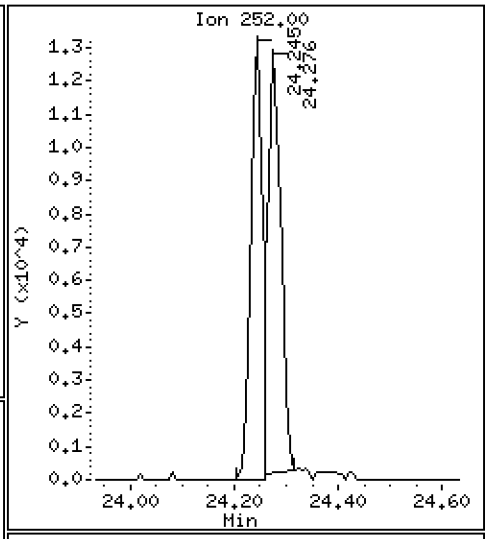
Column phase: ZB-5msi

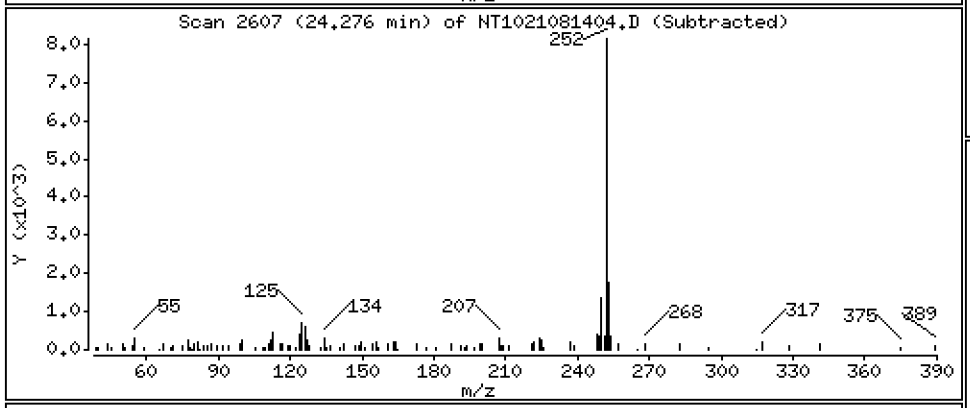
Column diameter: 0.25

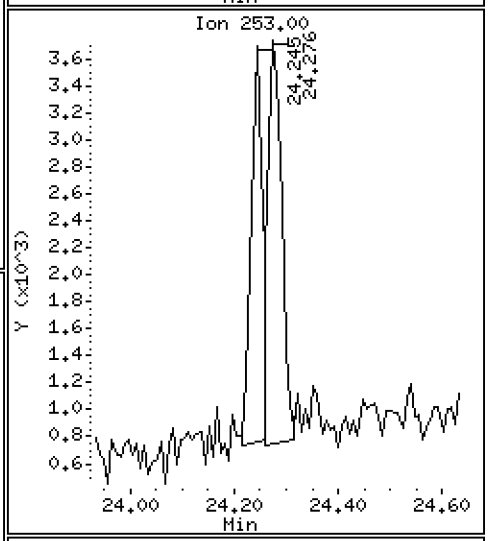
75 Benzo(k)fluoranthene

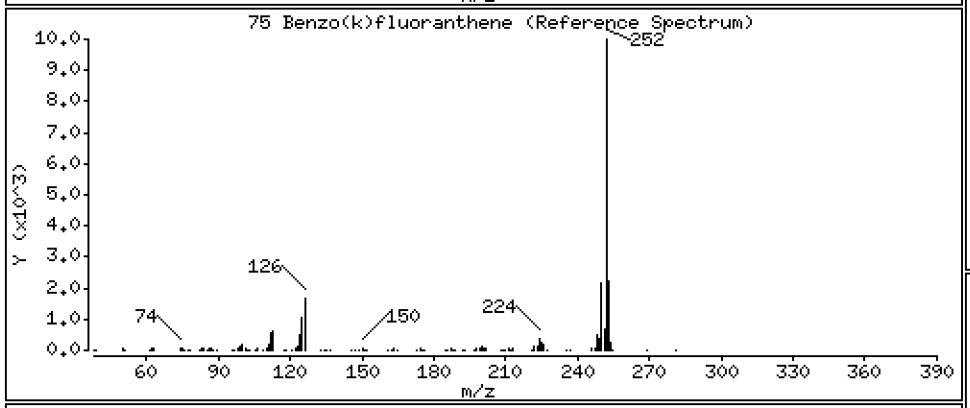
Concentration: 0.1925 ug/mL

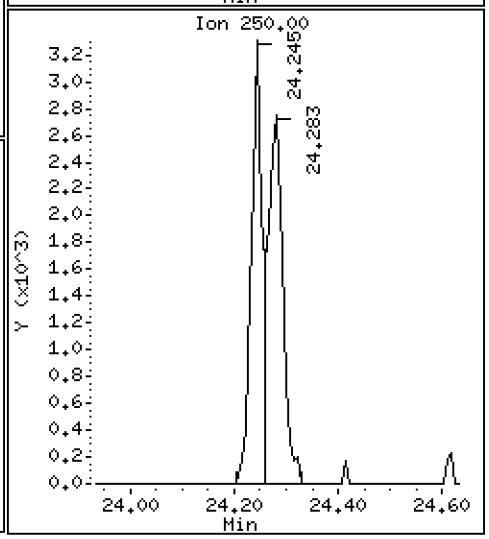


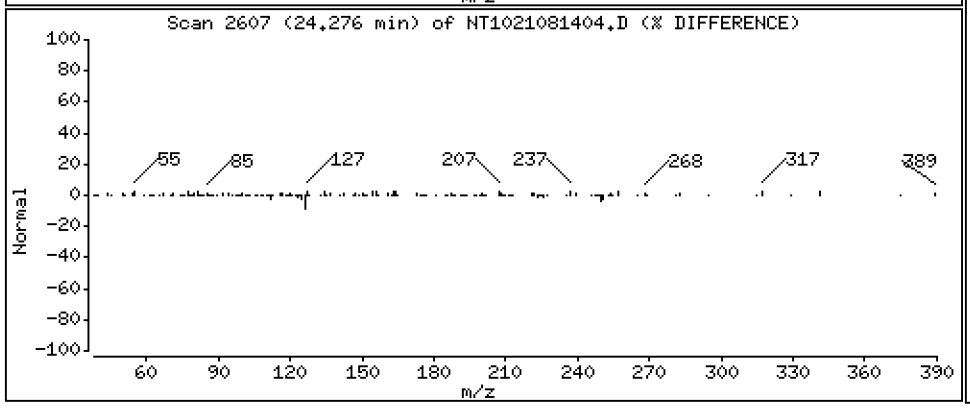












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

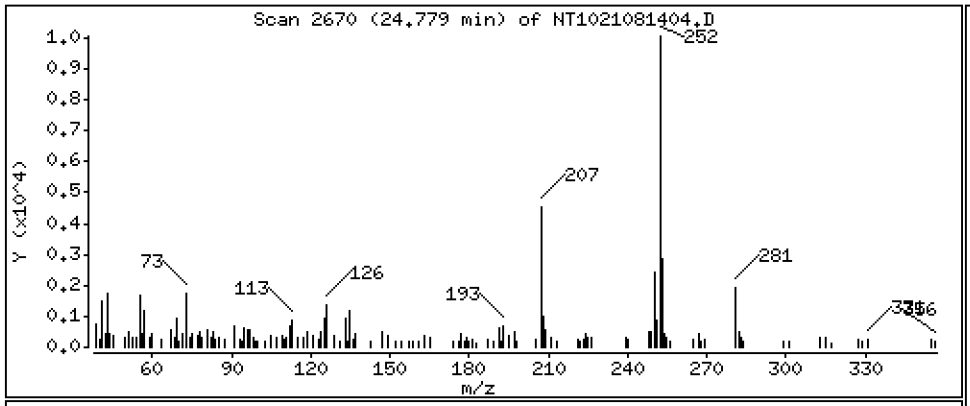
Operator: VTS

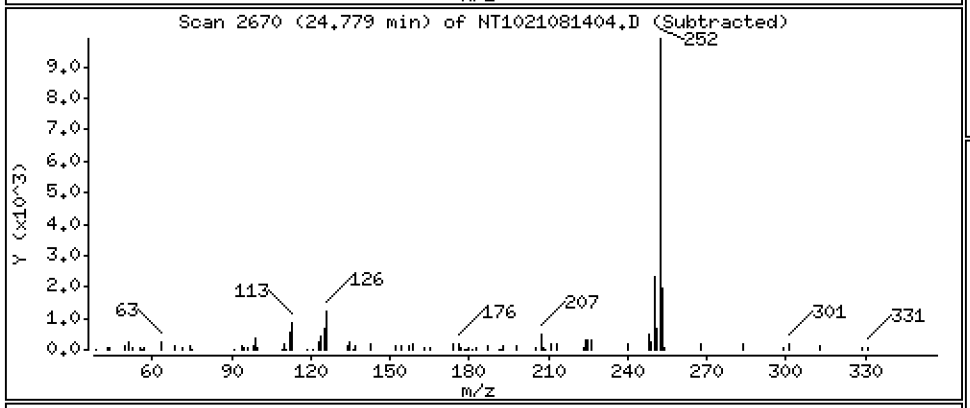
Column phase: ZB-5msi

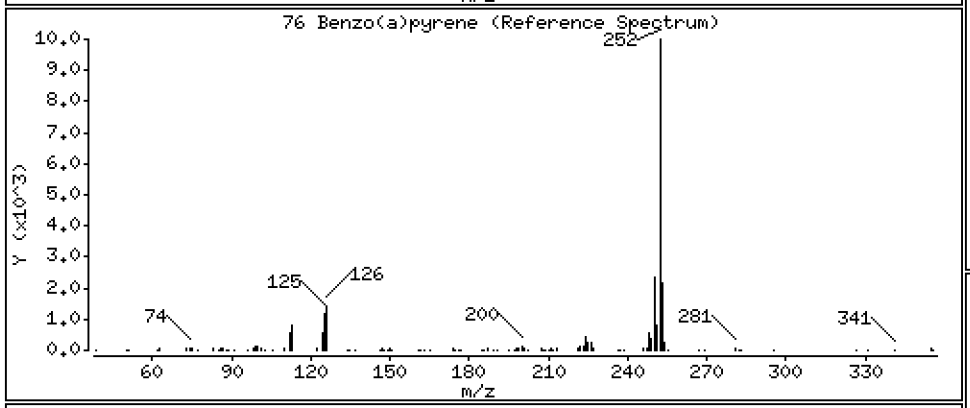
Column diameter: 0.25

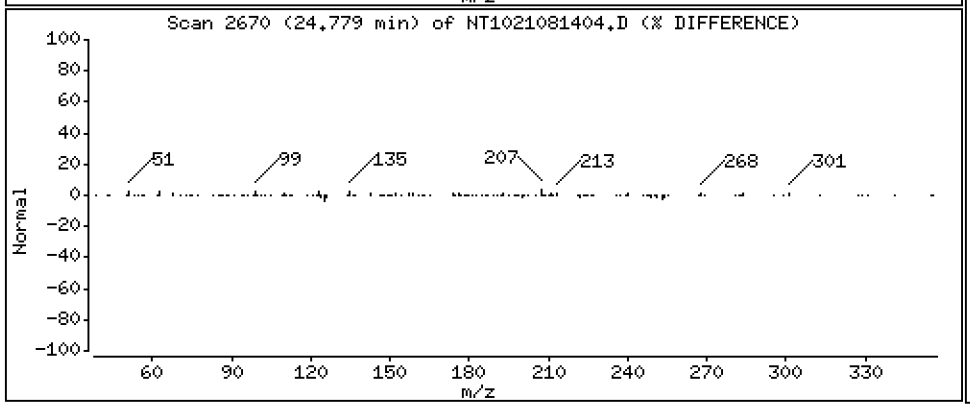
76 Benzo(a)pyrene

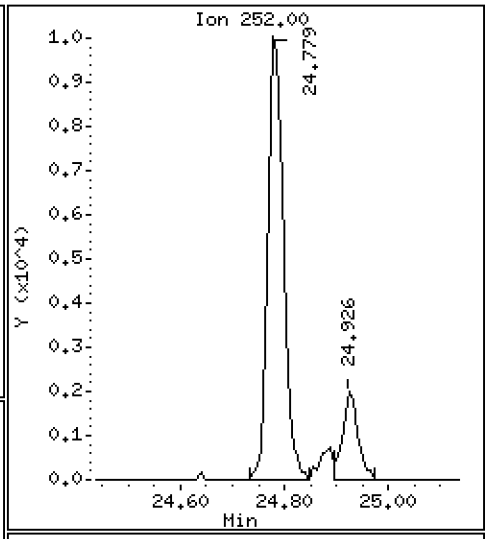
Concentration: 0.1912 ug/mL

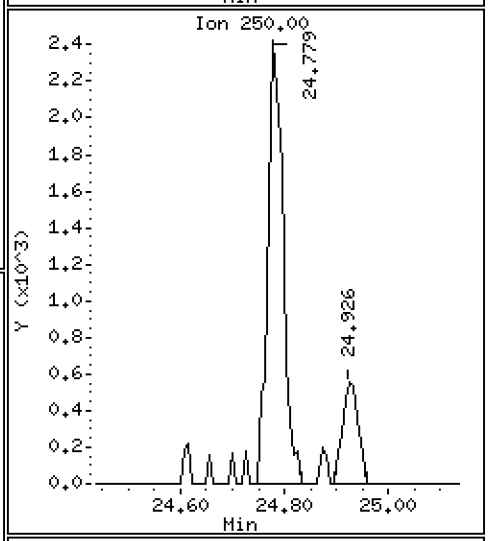


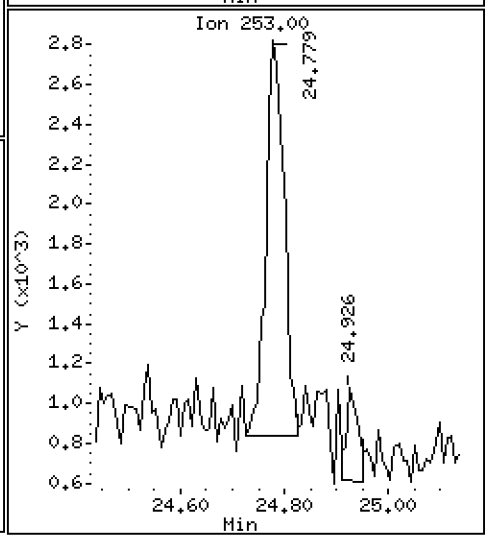












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

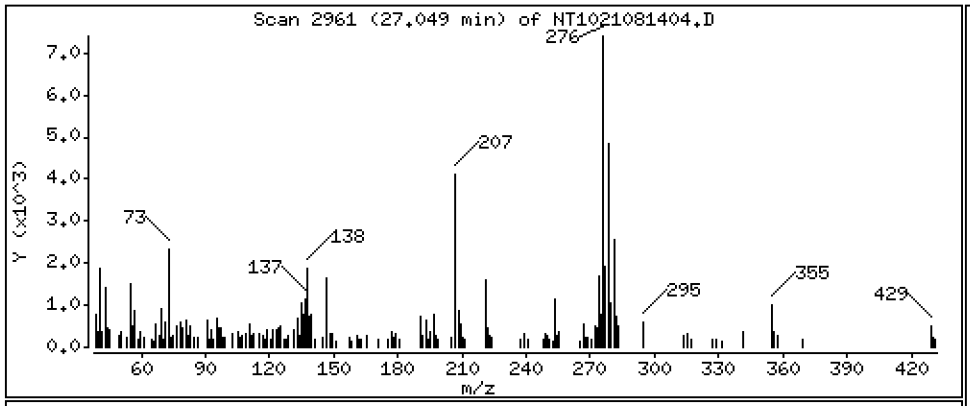
Operator: VTS

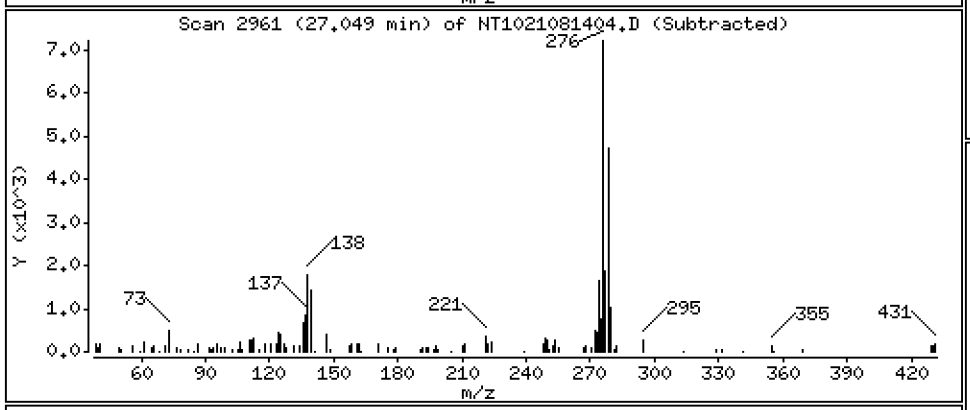
Column phase: ZB-5msi

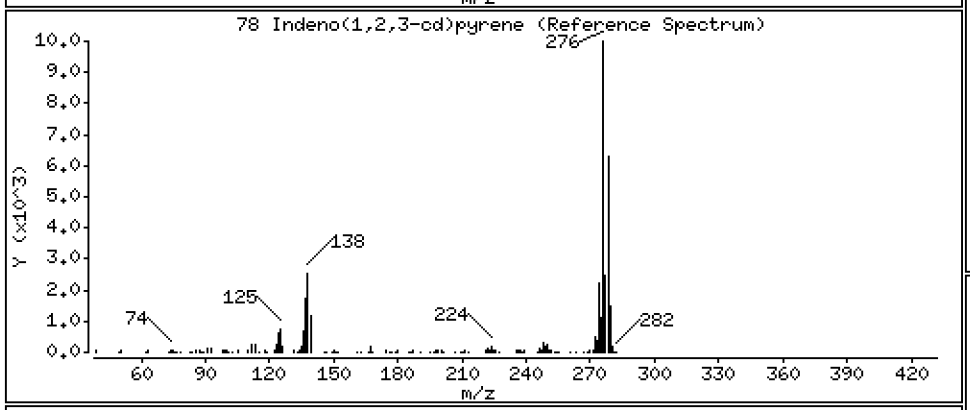
Column diameter: 0.25

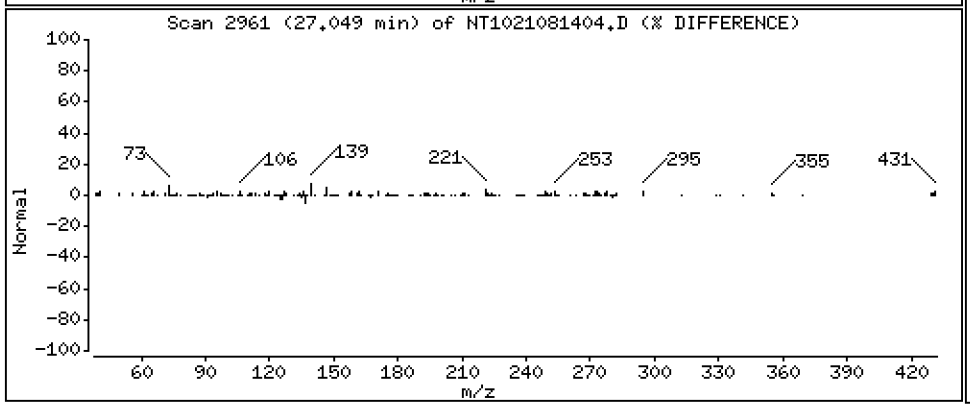
78 Indeno(1,2,3-cd)pyrene

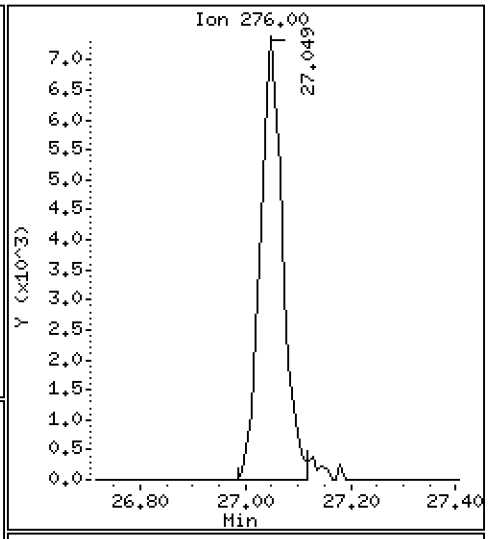
Concentration: 0.1829 ug/mL

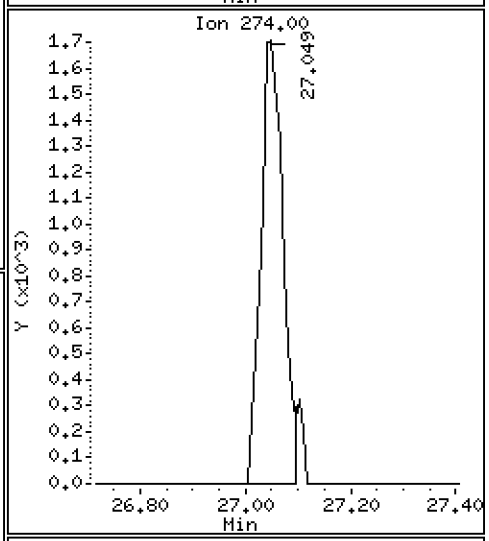


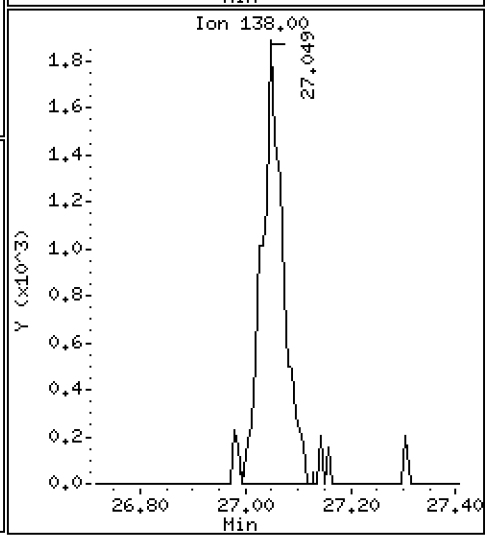












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

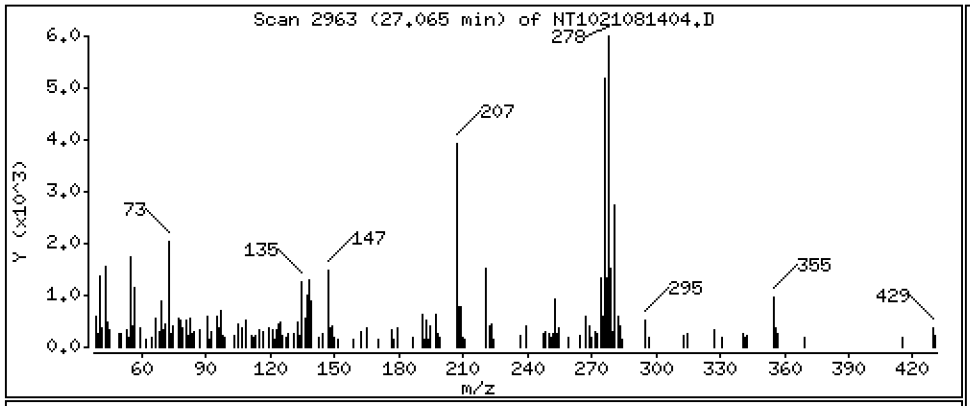
Operator: VTS

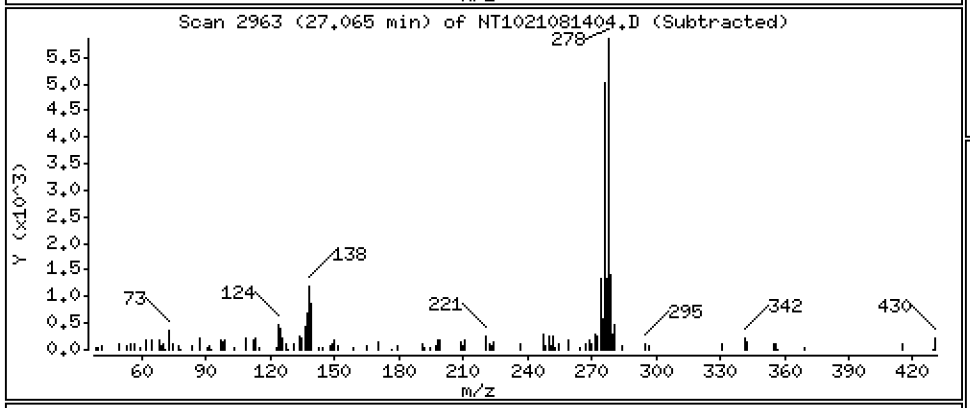
Column phase: ZB-5msi

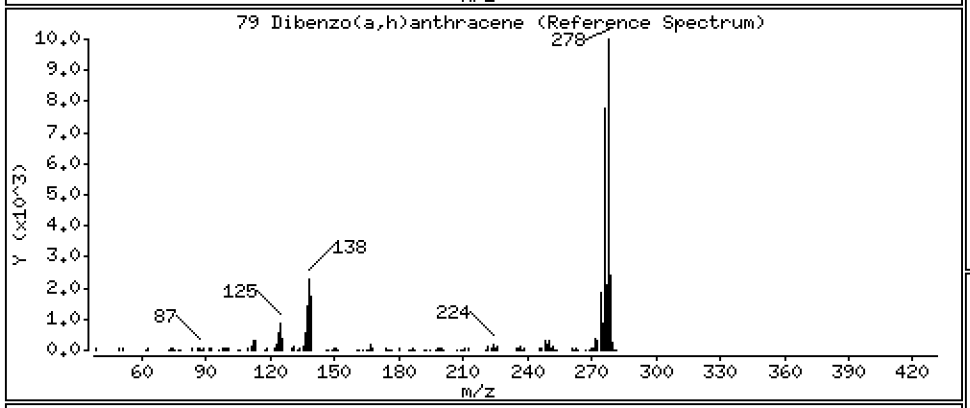
Column diameter: 0.25

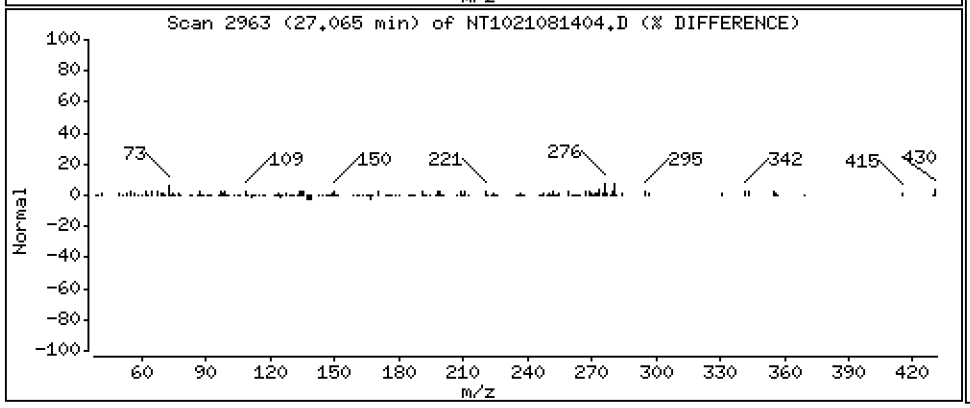
79 Dibenzo(a,h)anthracene

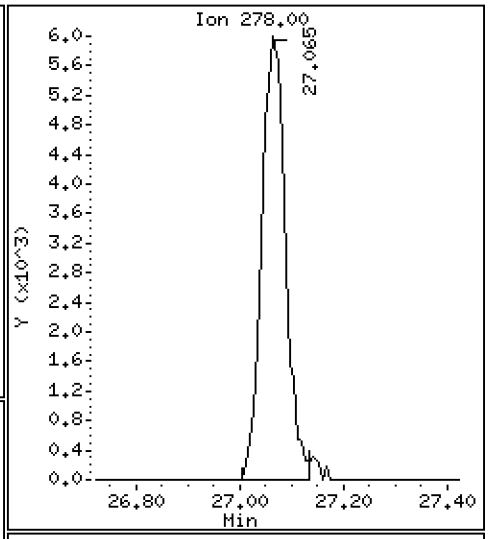
Concentration: 0.1995 ug/mL

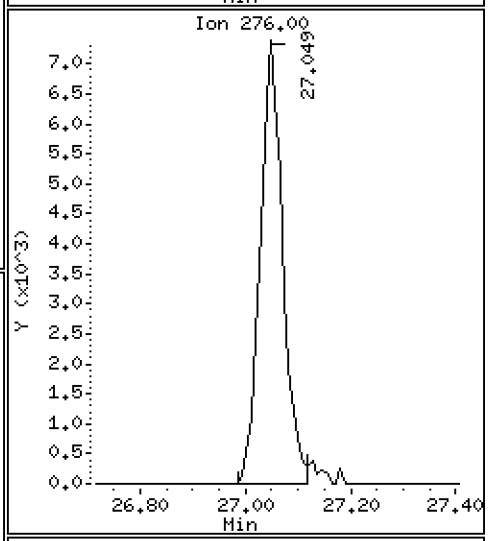


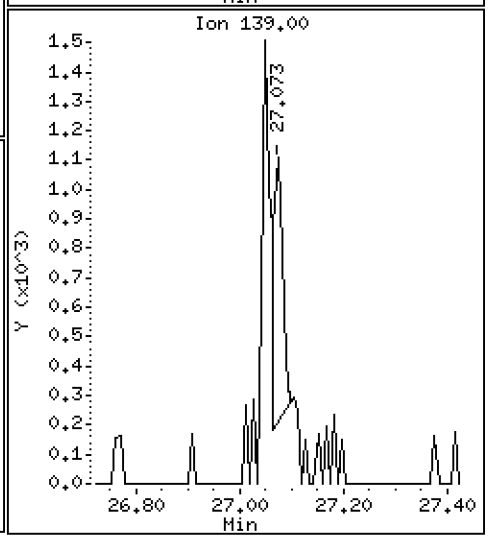












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

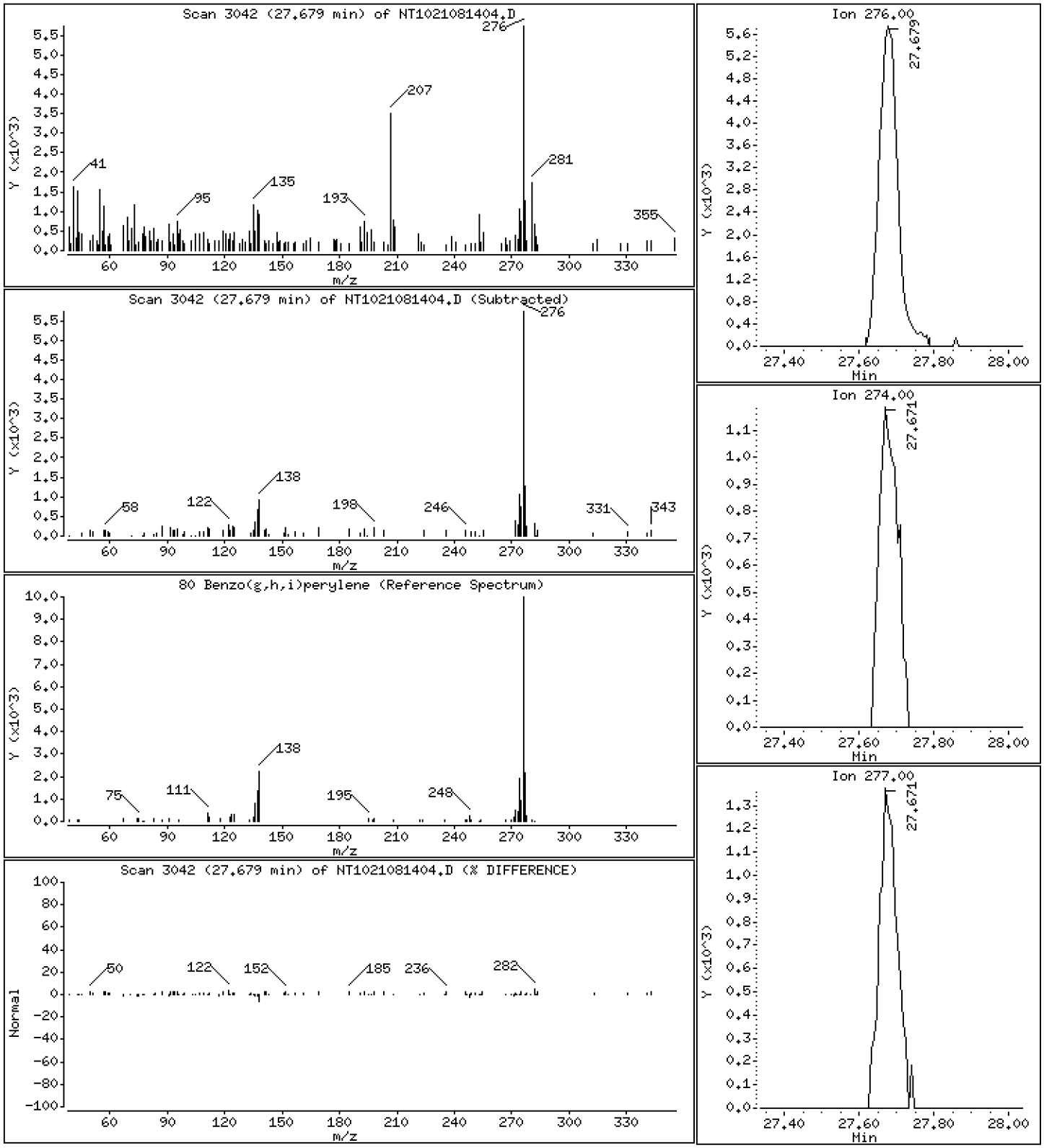
Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25

80 Benzo(g,h,i)perylene

Concentration: 0.1837 ug/mL



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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

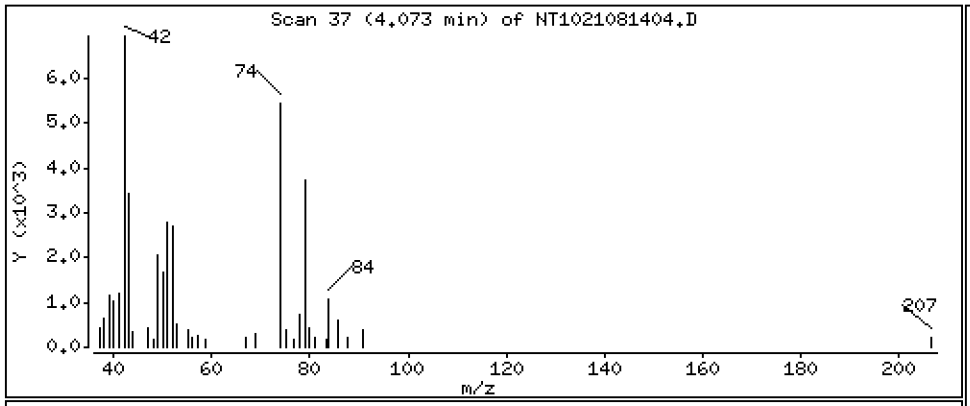
Operator: VTS

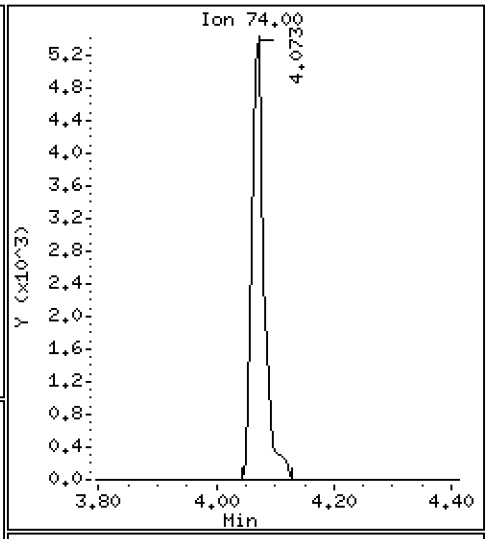
Column phase: ZB-5msi

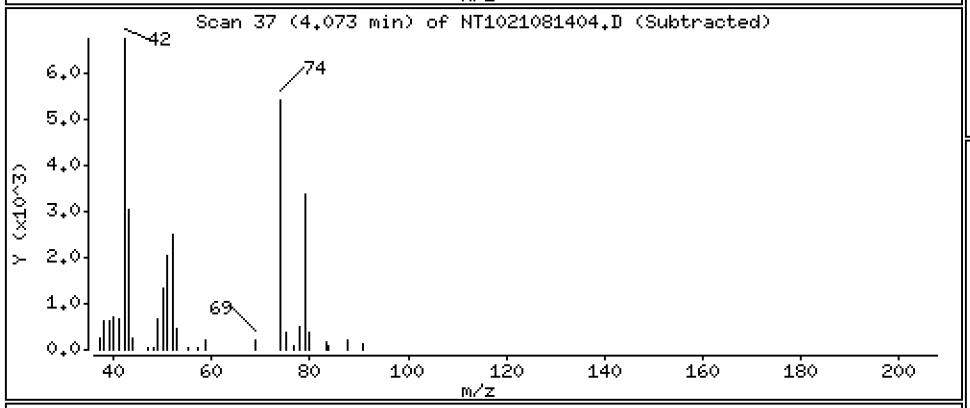
Column diameter: 0.25

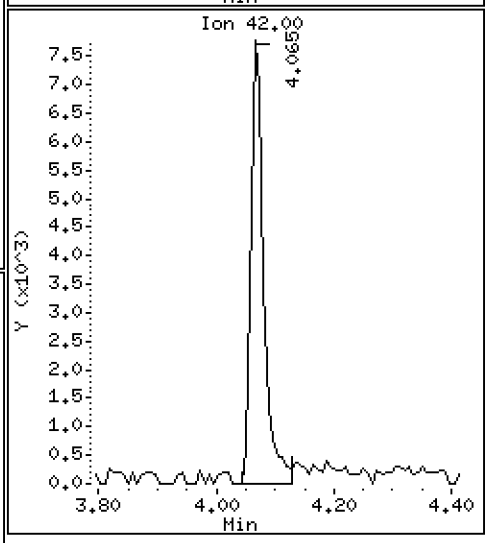
90 N-Nitrosodimethylamine

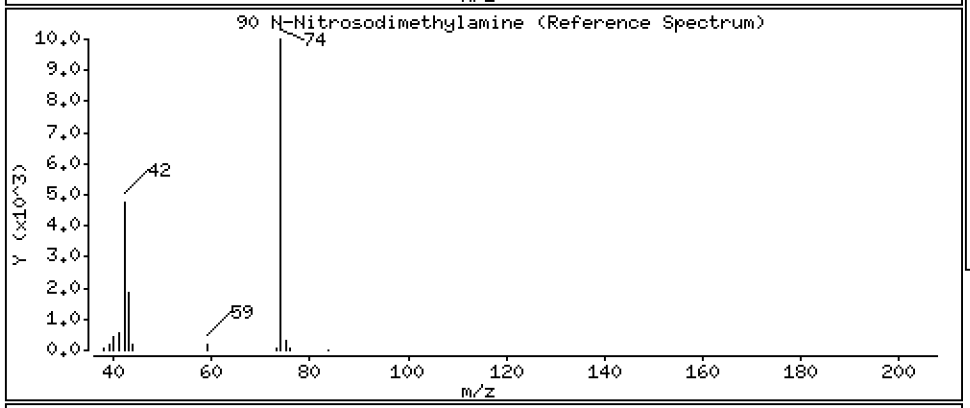
Concentration: 0.2230 ug/mL

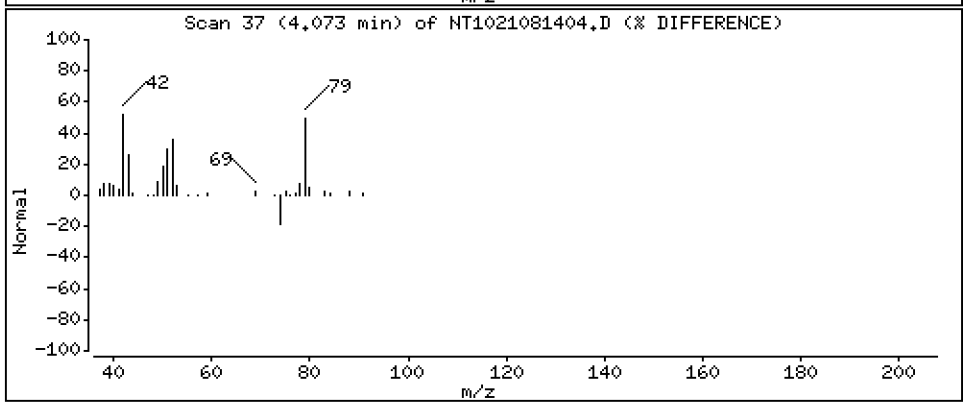












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

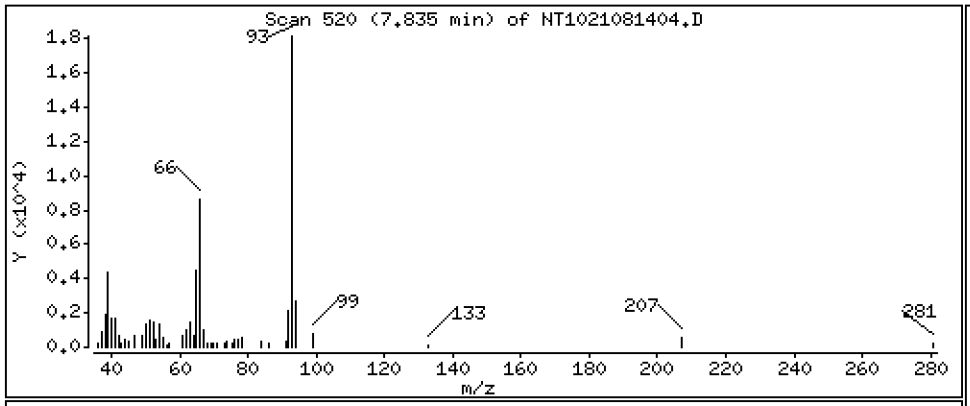
Operator: VTS

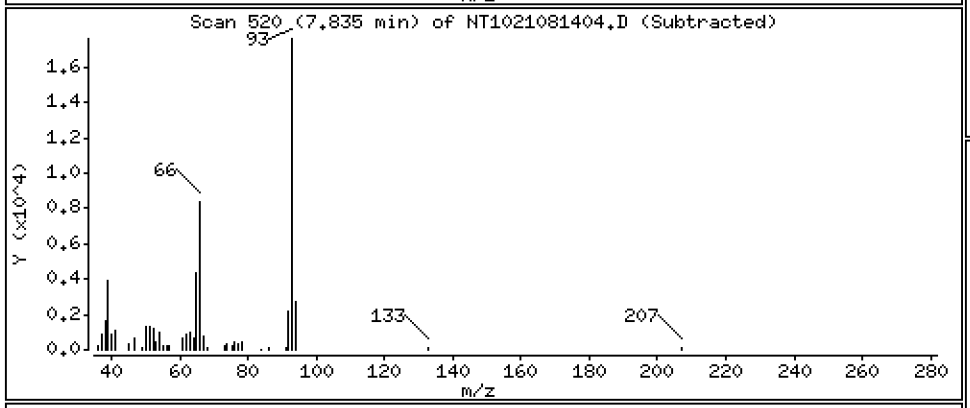
Column phase: ZB-5msi

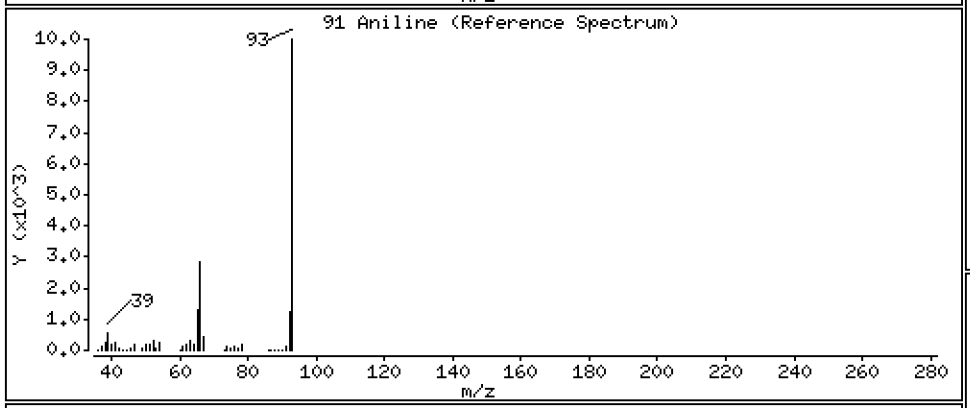
Column diameter: 0.25

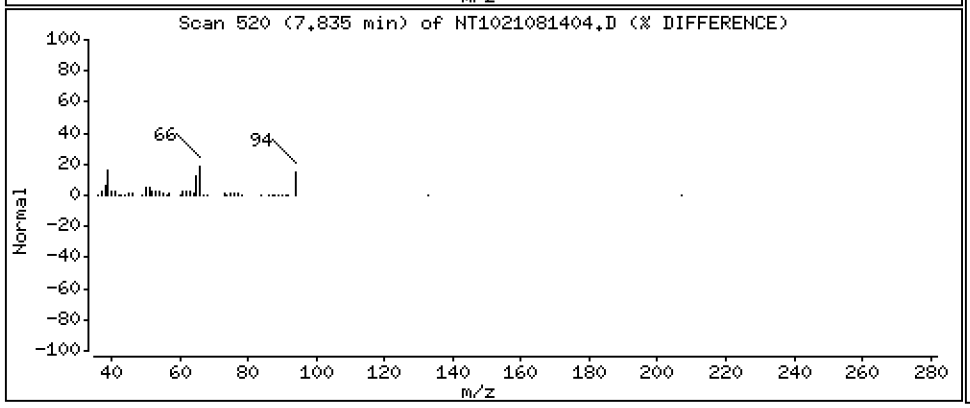
91 Aniline

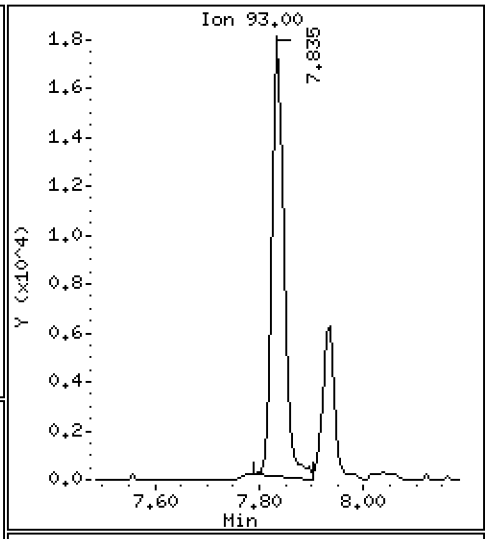
Concentration: 0.3796 ug/mL

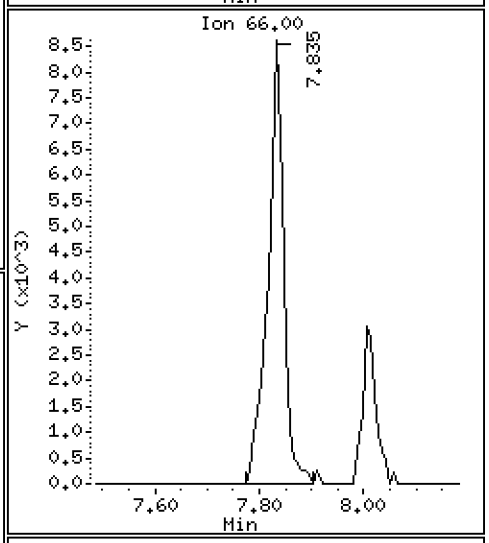


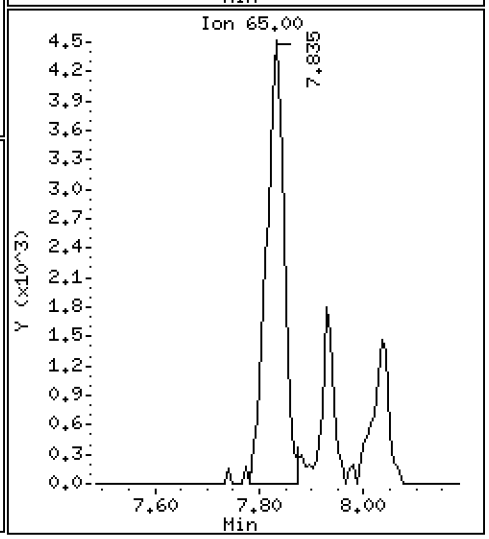












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

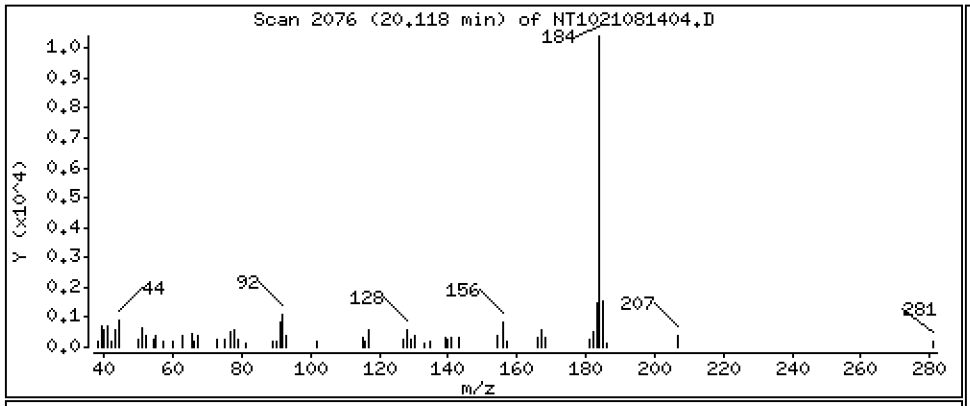
Operator: VTS

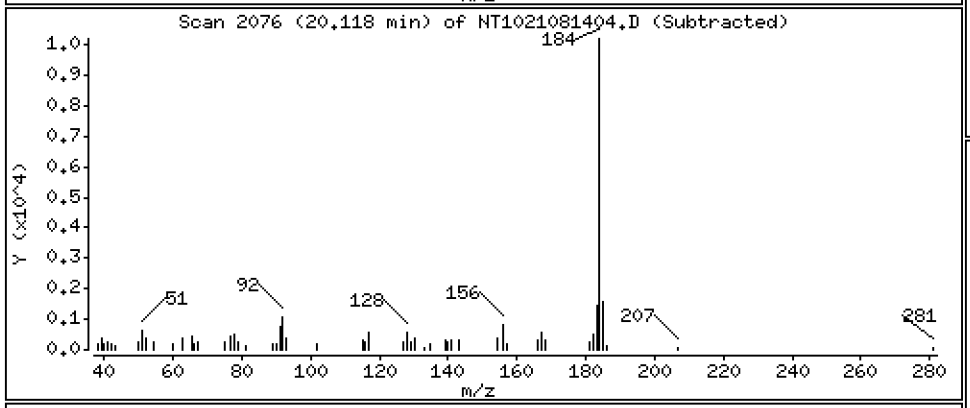
Column phase: ZB-5msi

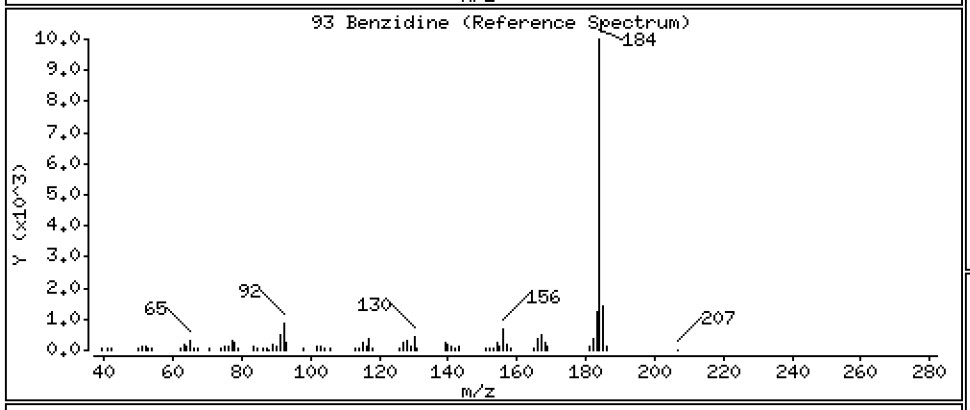
Column diameter: 0.25

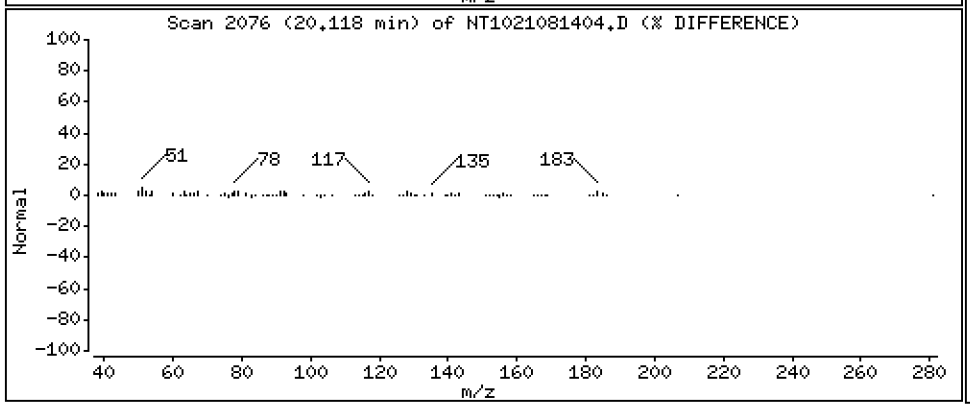
93 Benzidine

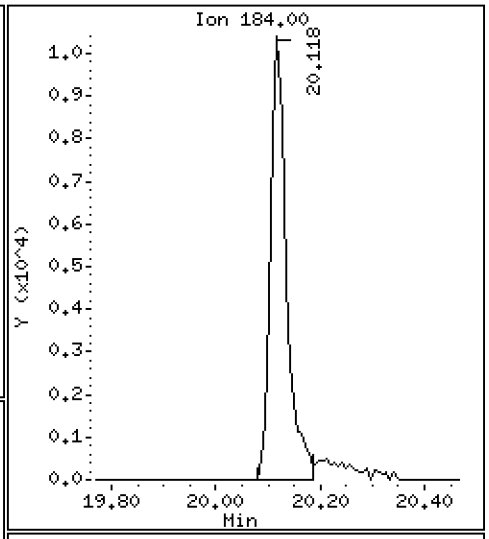
Concentration: 0.2950 ug/mL

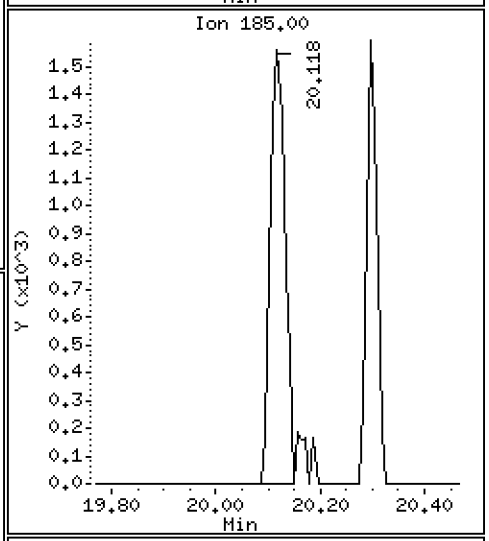


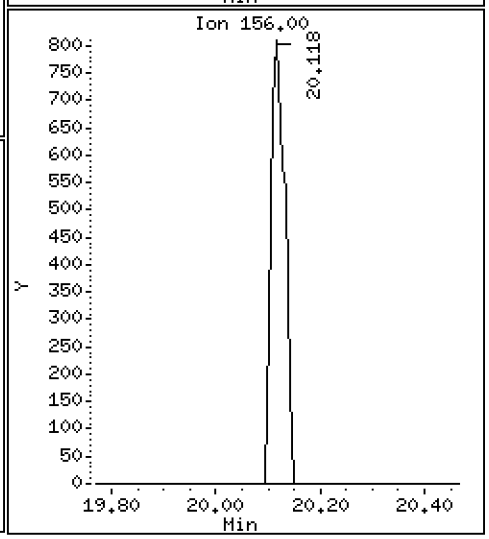












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

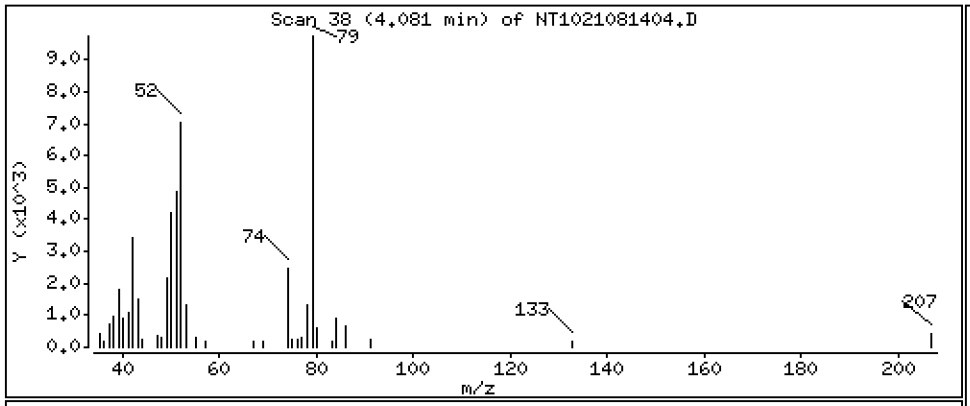
Operator: VTS

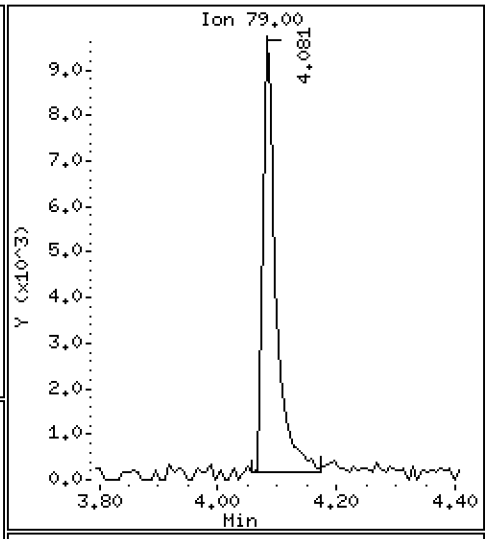
Column phase: ZB-5msi

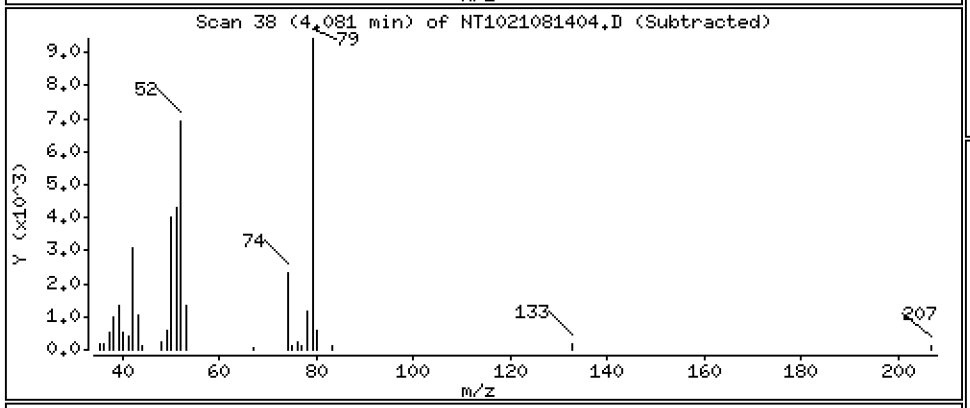
Column diameter: 0.25

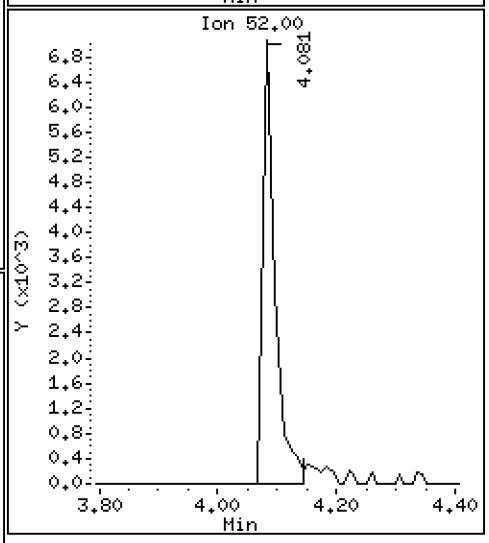
103 Pyridine

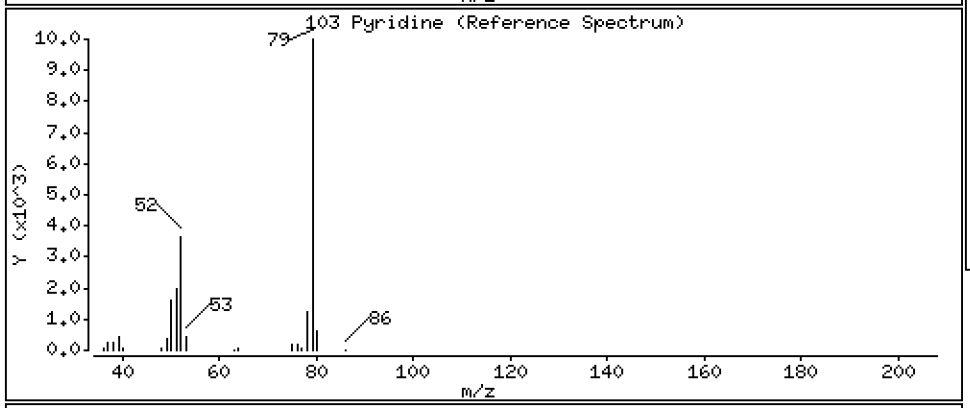
Concentration: 0.2605 ug/mL

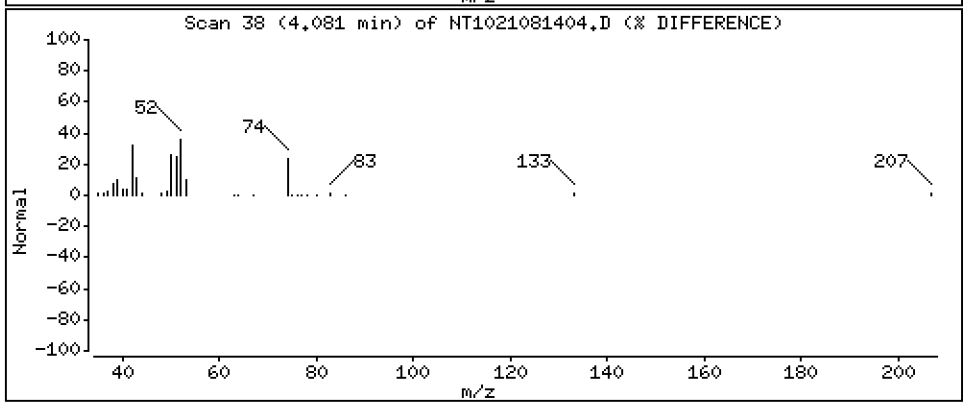












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

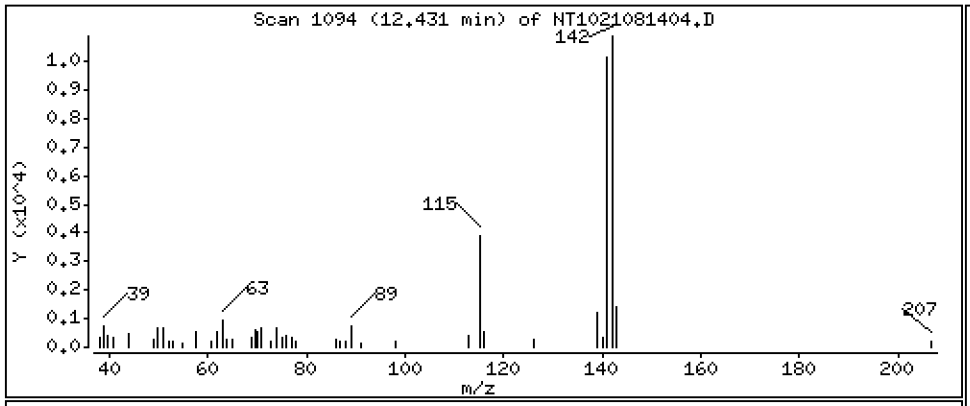
Operator: VTS

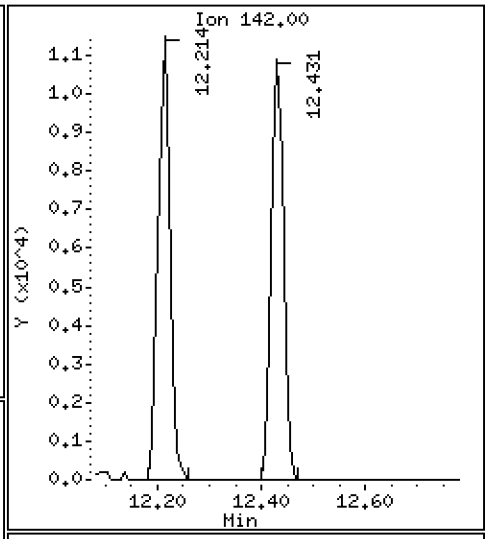
Column phase: ZB-5msi

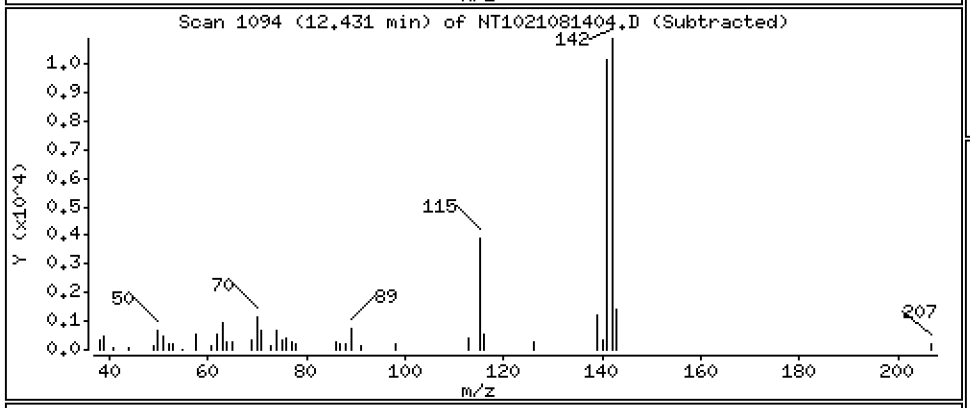
Column diameter: 0.25

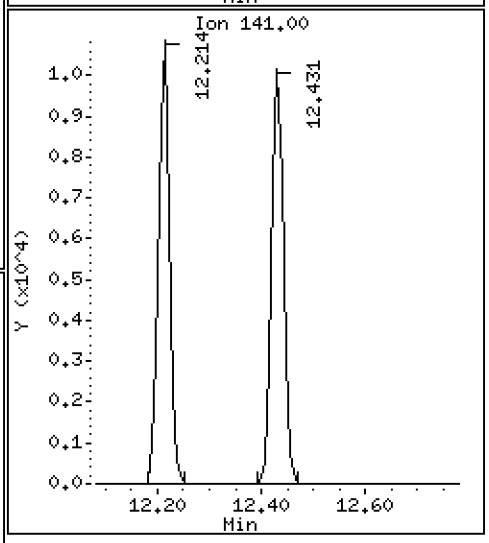
105 1-methylnaphthalene

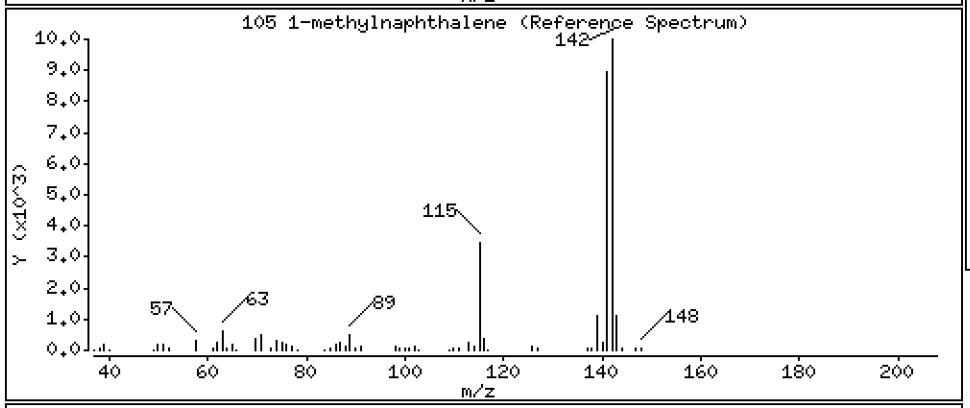
Concentration: 0.1621 ug/mL

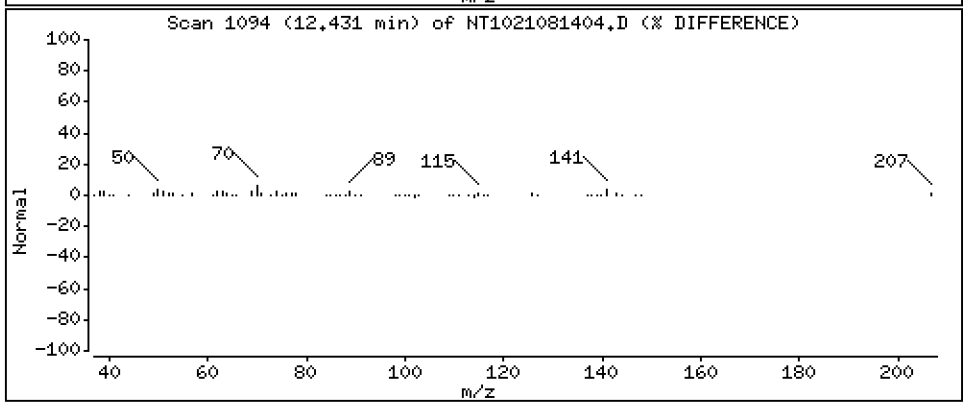












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

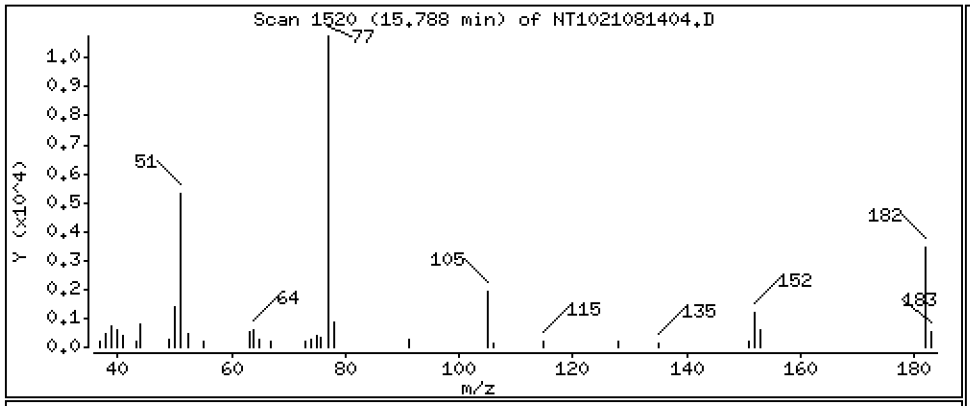
Operator: VTS

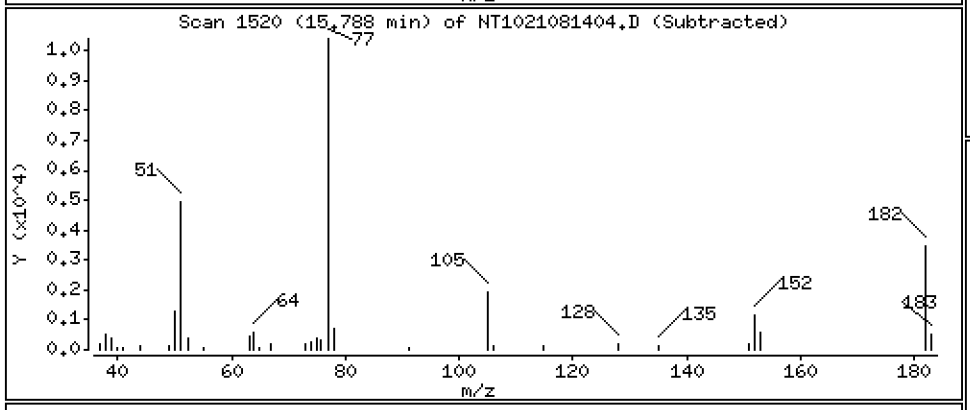
Column phase: ZB-5msi

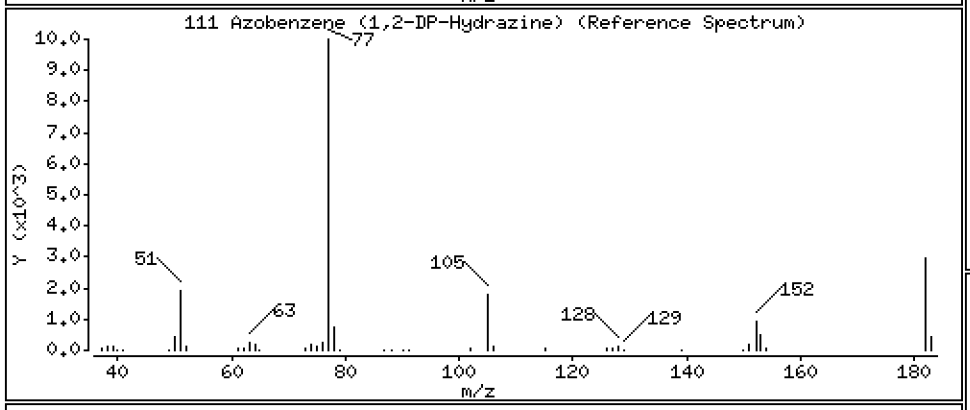
Column diameter: 0.25

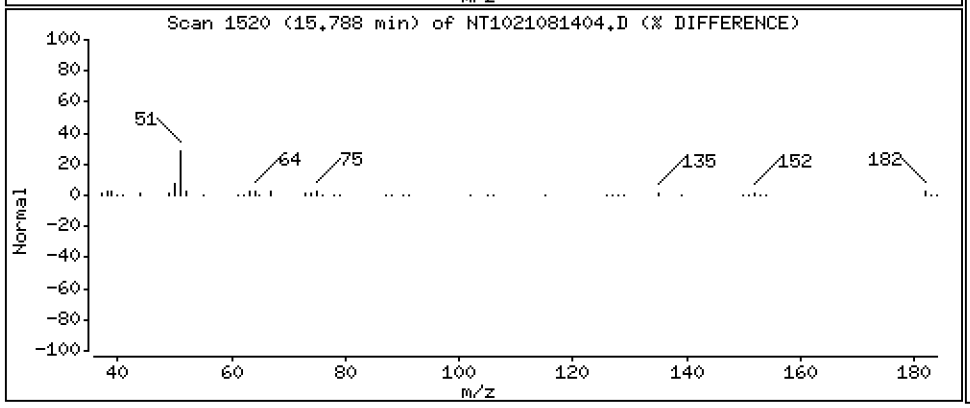
111 Azobenzene (1,2-DP-Hydrazine)

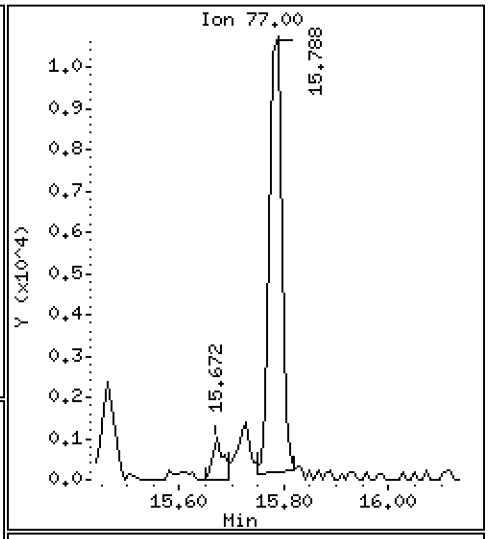
Concentration: 0.1568 ug/mL

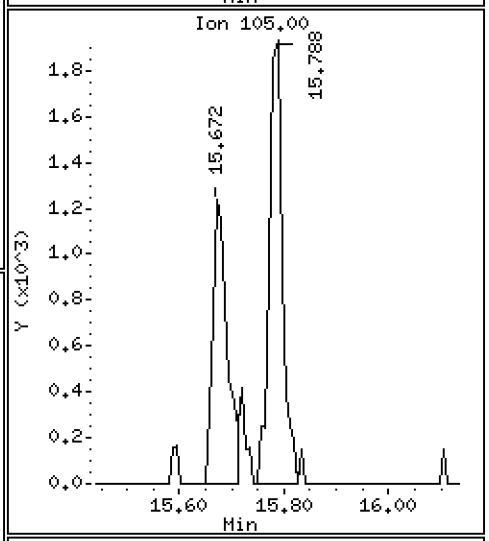


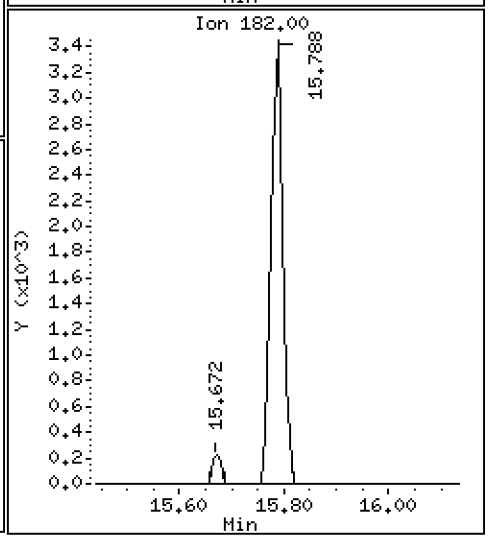












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

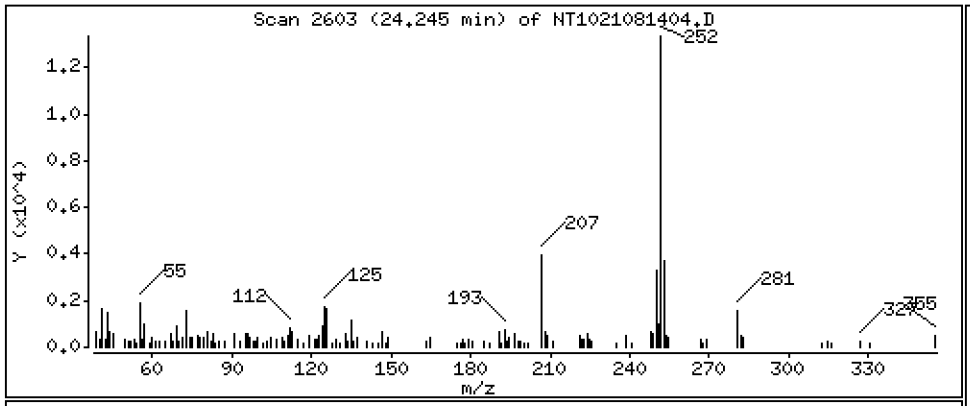
Operator: VTS

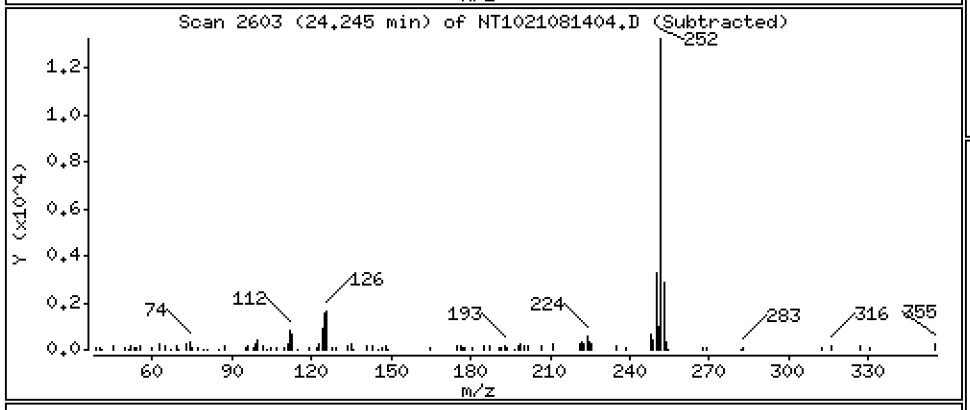
Column phase: ZB-5msi

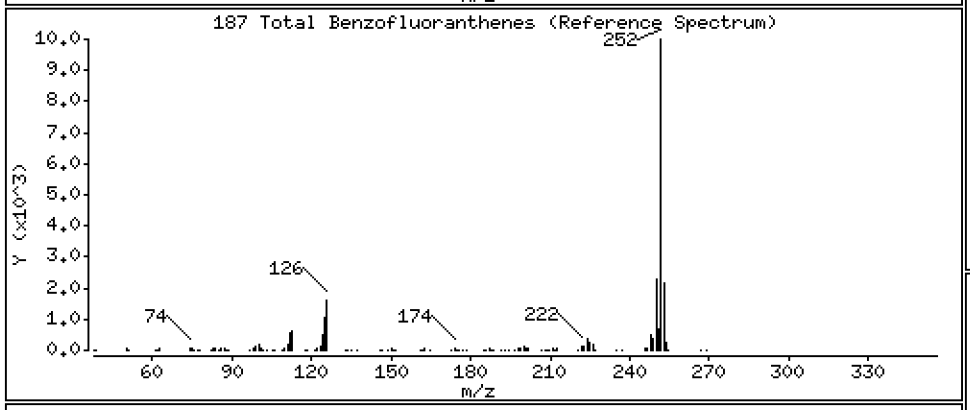
Column diameter: 0.25

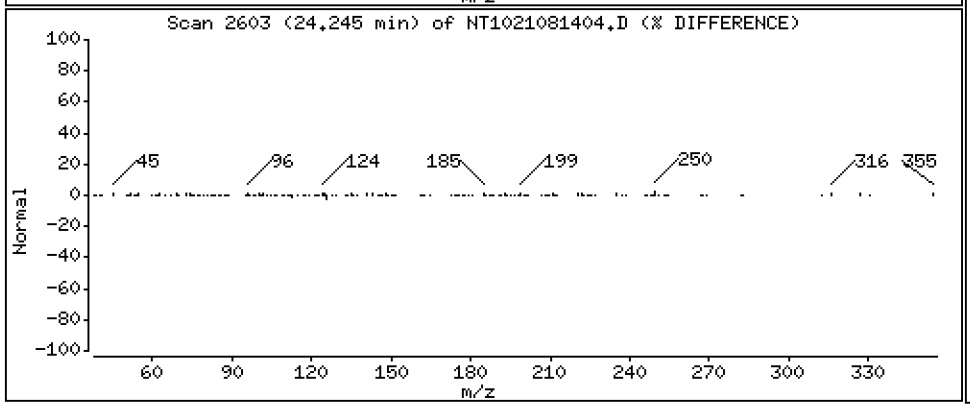
187 Total Benzofluoranthenes

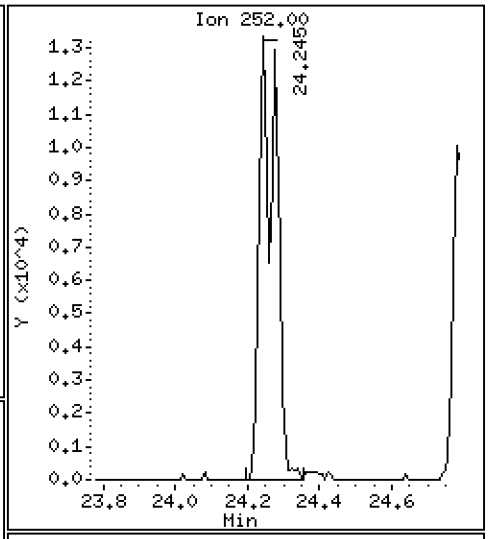
Concentration: 0.3829 ug/mL

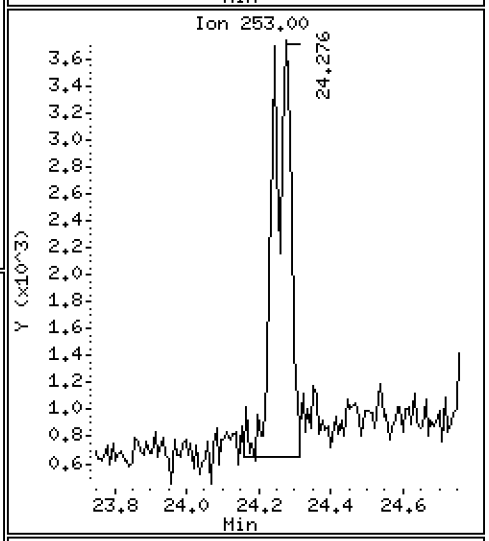


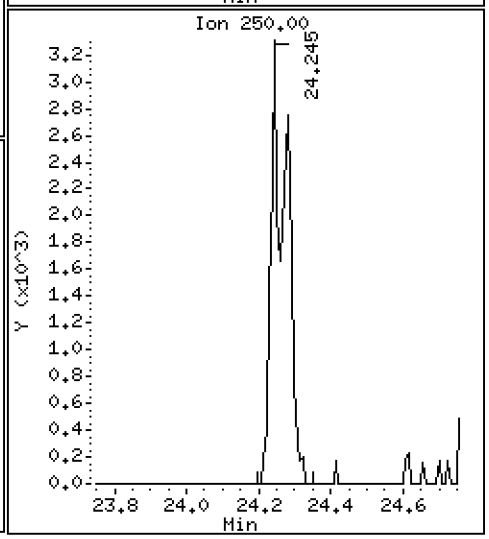












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

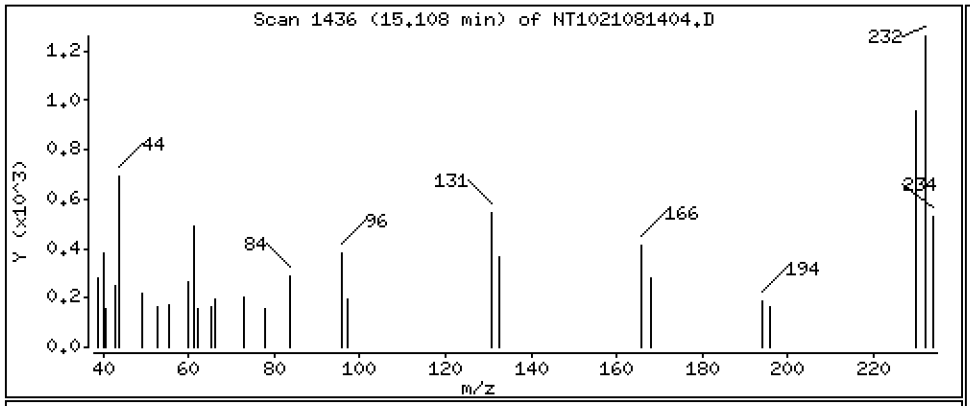
Operator: VTS

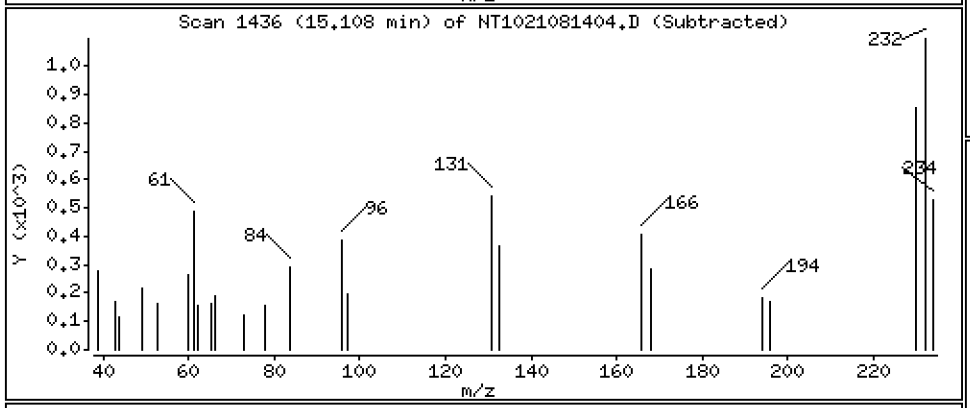
Column phase: ZB-5msi

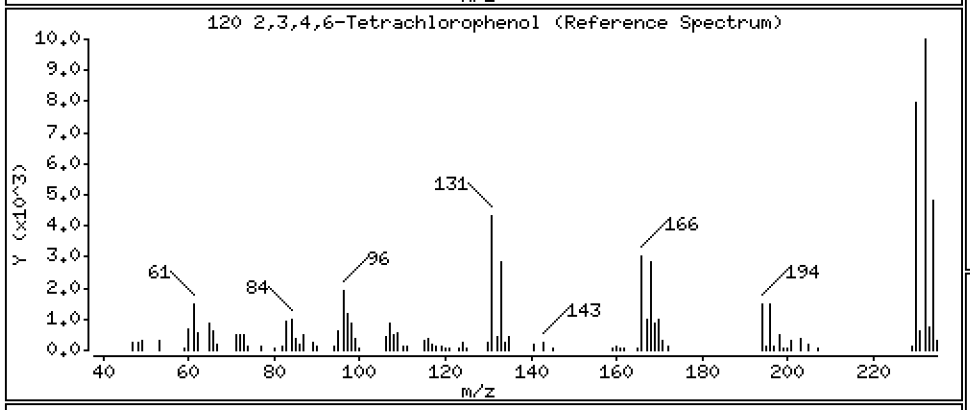
Column diameter: 0.25

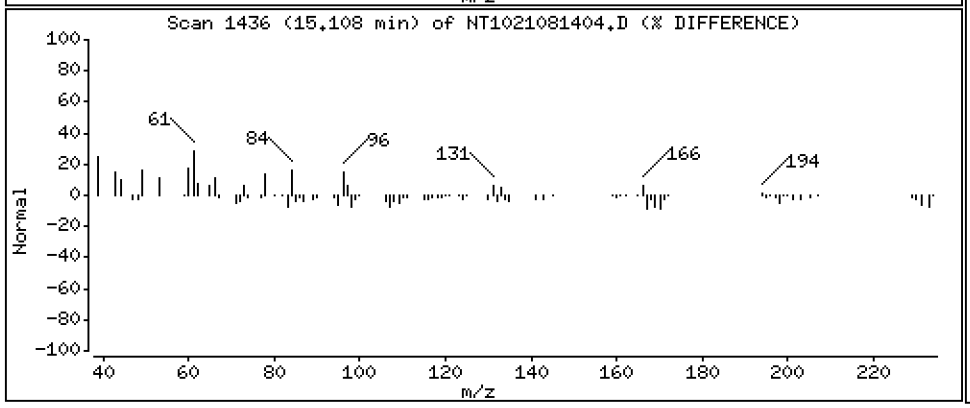
120 2,3,4,6-Tetrachlorophenol

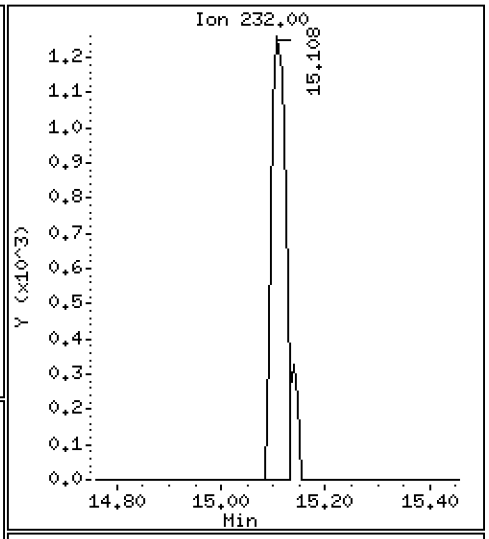
Concentration: 0.09274 ug/mL

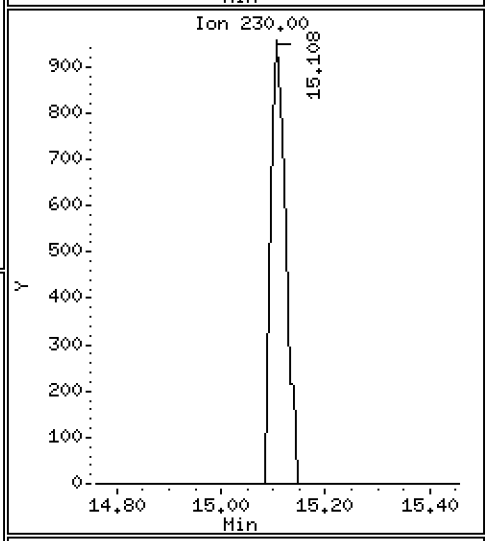


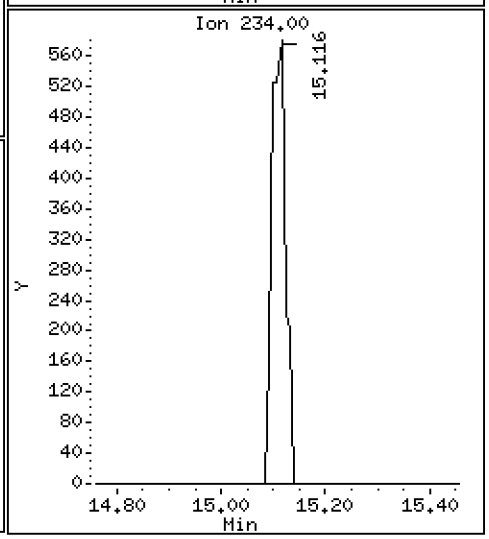












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

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Inj Date : 14-AUG-2021 11:09
Operator : VTS Inst ID: nt10.i
Smp Info : SJH0174-LCV2
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$	1 2-Fluorophenol	112	6.211	6.204	(0.744)	14993	0.28218	0.2822
$	2 Phenol-d5	99	7.796	7.788	(0.933)	19481	0.24703	0.2470
	3 Phenol	94	7.811	7.811	(0.935)	13949	0.20235	0.2023
$	5 2-Chlorophenol-d4	132	8.004	8.004	(0.958)	16481	0.29642	0.2964
	4 Bis(2-Chloroethyl)ether	93	7.935	7.935	(0.950)	9997	0.18157	0.1816
	6 2-Chlorophenol	128	8.035	8.035	(0.962)	11932	0.22868	0.2287
	7 1,3-Dichlorobenzene	146	8.283	8.283	(0.992)	11020	0.19226	0.1923
*	8 1,4-Dichlorobenzene-d4	152	8.353	8.353	(1.000)	135011	4.00000	
	9 1,4-Dichlorobenzene	146	8.384	8.384	(1.004)	8402	0.17168	0.1717
$	10 1,2-Dichlorobenzene-d4	152	8.702	8.702	(1.042)	7355	0.20568	0.2057
	12 1,2-Dichlorobenzene	146	8.725	8.726	(1.045)	9420	0.18197	0.1820
	11 Benzyl alcohol	108	8.725	8.648	(1.045)	1941	0.06014	0.06014
	14 2,2'-oxybis(1-Chloropropane)	121	8.935	8.935	(1.070)	2018	0.10161	0.1016
	13 2-Methylphenol	108	8.896	8.896	(1.065)	8580	0.19996	0.2000
	17 Hexachloroethane	117	9.300	9.300	(1.113)	3428	0.16295	0.1630
	16 N-Nitroso-di-n-propylamine	70	9.183	9.191	(1.099)	5873	0.15866	0.1587
	15 4-Methylphenol	108	9.168	9.160	(1.098)	7324	0.15906	0.1591
$	18 Nitrobenzene-d5	82	9.439	9.440	(0.875)	9866	0.17806	0.1781
	19 Nitrobenzene	77	9.471	9.471	(0.878)	9283	0.16957	0.1696
	20 Isophorone	82	9.913	9.913	(0.919)	10854	0.10506	0.1051
	21 2-Nitrophenol	139	10.091	10.091	(0.935)	4379	0.15378	0.1538
	22 2,4-Dimethylphenol	107	10.184	10.184	(0.944)	16161	0.37630	0.3763
	23 Bis(2-Chloroethoxy)methane	93	10.362	10.363	(0.960)	8653	0.16136	0.1614
	24 Benzoic acid	105	10.320	10.430	(0.956)	8364	0.35149	0.3515(M)
	25 2,4-Dichlorophenol	162	10.558	10.549	(0.978)	12041	0.33837	0.3384
	26 1,2,4-Trichlorobenzene	180	10.713	10.714	(0.993)	9181	0.22819	0.2282
*	27 Naphthalene-d8	136	10.791	10.791	(1.000)	451767	4.00000	
	28 Naphthalene	128	10.829	10.837	(1.004)	20696	0.17310	0.1731
	29 4-Chloroaniline	127	10.991	10.992	(1.019)	16149	0.27125	0.2713
	30 Hexachlorobutadiene	225	11.192	11.192	(1.037)	4872	0.22179	0.2218
	31 4-Chloro-3-methylphenol	107	11.982	11.982	(1.110)	11647	0.27414	0.2741
	32 2-Methylnaphthalene	142	12.214	12.214	(1.132)	17710	0.16010	0.1601
	33 Hexachlorocyclopentadiene	237	12.678	12.671	(0.883)	193	0.00784	0.007837

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	12.848	12.849	(0.895)	8302	0.32362	0.3236
	35 2,4,5-Trichlorophenol	196	12.934	12.926	(0.901)	9915	0.36273	0.3627
$	36 2-Fluorobiphenyl	172	12.995	13.003	(0.905)	21716	0.20252	0.2025
	37 2-Chloronaphthalene	162	13.189	13.189	(0.919)	14988	0.16730	0.1673
	38 2-Nitroaniline	65	13.475	13.483	(0.939)	10157	0.30252	0.3025
	39 Dimethylphthalate	163	13.916	13.917	(0.969)	16575	0.19128	0.1913
	40 Acenaphthylene	152	14.048	14.048	(0.978)	24716	0.19399	0.1940
	41 2,6-Dinitrotoluene	165	14.048	14.048	(0.978)	6372	0.32433	0.3243
*	42 Acenaphthene-d10	164	14.358	14.358	(1.000)	233498	4.00000	
	43 3-Nitroaniline	138	14.327	14.335	(0.998)	7387	0.30346	0.3035
	44 Acenaphthene	153	14.419	14.427	(1.004)	12606	0.17042	0.1704
	45 2,4-Dinitrophenol	184	14.559	14.543	(1.014)	278	0.02499	0.02499(M)
	46 Dibenzofuran	168	14.752	14.752	(1.027)	20418	0.17854	0.1785
	47 4-Nitrophenol	109	14.744	14.713	(1.027)	1541	0.16537	0.1654
	48 2,4-Dinitrotoluene	165	14.845	14.853	(1.034)	6737	0.25670	0.2567
	50 Diethylphthalate	149	15.355	15.363	(1.069)	13804	0.16802	0.1680
	49 Fluorene	166	15.456	15.456	(1.076)	16331	0.14730	0.1473
	51 4-Chlorophenyl-phenylether	204	15.463	15.463	(1.077)	8080	0.12537	0.1254
	52 4-Nitroaniline	138	15.587	15.587	(1.086)	7970	0.30819	0.3082
	53 4,6-Dinitro-2-methylphenol	198	15.672	15.680	(0.903)	5102	0.26162	0.2616
	54 N-Nitrosodiphenylamine	169	15.726	15.726	(0.906)	14430	0.18875	0.1887
$	55 2,4,6-Tribromophenol	330	15.996	15.996	(1.114)	4912	0.25420	0.2542
	56 4-Bromophenyl-phenylether	248	16.458	16.458	(0.948)	6491	0.16684	0.1668
	57 Hexachlorobenzene	284	16.752	16.752	(0.965)	8871	0.21697	0.2170
	58 Pentachlorophenol	266	17.139	17.132	(0.987)	653	0.03946	0.03946
*	59 Phenanthrene-d10	188	17.363	17.364	(1.000)	426054	4.00000	
	60 Phenanthrene	178	17.410	17.418	(1.003)	20337	0.17651	0.1765
	61 Anthracene	178	17.503	17.503	(1.008)	19711	0.15998	0.1600
	62 Carbazole	167	17.859	17.859	(1.029)	19323	0.15887	0.1589
	63 Di-n-butylphthalate	149	18.702	18.710	(1.077)	23260	0.12572	0.1257
	64 Fluoranthene	202	19.832	19.839	(0.882)	27009	0.17000	0.1700
	65 Pyrene	202	20.257	20.265	(0.901)	27634	0.15779	0.1578
$	66 Terphenyl-d14	244	20.590	20.590	(0.916)	30337	0.24304	0.2430
	67 Butylbenzylphthalate	149	21.558	21.558	(0.959)	11523	0.20003	0.2000
	68 Benzo(a)anthracene	228	22.464	22.464	(0.999)	29476	0.20719	0.2072
*	69 Chrysene-d12	240	22.487	22.495	(1.000)	381248	4.00000	
	70 3,3'-Dichlorobenzidine	252	22.448	22.456	(0.998)	33126	0.57960	0.5796
	71 Chrysene	228	22.533	22.541	(1.002)	19214	0.17518	0.1752
	72 bis(2-Ethylhexyl)phthalate	149	22.611	22.619	(0.958)	11469	0.23012	0.2301
*	134 Di-n-octylphthalate-d4	153	23.602	23.610	(1.000)	453021	4.00000	
	73 Di-n-octylphthalate	149	23.617	23.617	(1.001)	19605	0.15442	0.1544
	74 Benzo(b)fluoranthene	252	24.244	24.252	(0.974)	22455	0.19109	0.1911
	75 Benzo(k)fluoranthene	252	24.275	24.283	(0.976)	22405	0.19248	0.1925
	76 Benzo(a)pyrene	252	24.779	24.786	(0.996)	20311	0.19125	0.1912
*	77 Perylene-d12	264	24.879	24.887	(1.000)	298204	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.049	27.057	(1.087)	21979	0.18286	0.1829
	79 Dibenzo(a,h)anthracene	278	27.064	27.072	(1.088)	18837	0.19953	0.1995
	80 Benzo(g,h,i)perylene	276	27.678	27.686	(1.112)	19704	0.18370	0.1837
	90 N-Nitrosodimethylamine	74	4.073	4.065	(0.488)	8106	0.22300	0.2230
	91 Aniline	93	7.834	7.834	(0.938)	27240	0.37959	0.3796
	93 Benzidine	184	20.118	20.118	(0.895)	21438	0.29505	0.2950
	103 Pyridine	79	4.080	4.057	(0.489)	14898	0.26054	0.2605
	105 1-methylnaphthalene	142	12.431	12.431	(1.152)	16828	0.16214	0.1621
	111 Azobenzene (1,2-DP-Hydrazine)	77	15.787	15.788	(1.100)	16422	0.15677	0.1568

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.244	24.283	(0.974)	43202	0.38285	0.3829
120 2,3,4,6-Tetrachlorophenol	232	15.107	15.108	(1.052)	2278	0.09274	0.09274

QC Flag Legend

M - Compound response manually integrated.

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081404.D
Lab Smp Id: SJH0174-LCV2
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	135011	58.73
27 Naphthalene-d8	291658	145829	583316	451767	54.90
42 Acenaphthene-d10	163642	81821	327284	233498	42.69
59 Phenanthrene-d10	304099	152050	608198	426054	40.10
69 Chrysene-d12	199453	99727	398906	381248	91.15
134 Di-n-octylphthala	303639	151820	607278	453021	49.20
77 Perylene-d12	200082	100041	400164	298204	49.04

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.35	-0.00
27 Naphthalene-d8	10.79	10.29	11.29	10.79	-0.00
42 Acenaphthene-d10	14.36	13.86	14.86	14.36	-0.00
59 Phenanthrene-d10	17.36	16.86	17.86	17.36	-0.00
69 Chrysene-d12	22.50	22.00	23.00	22.49	-0.04
134 Di-n-octylphthala	23.61	23.11	24.11	23.60	-0.03
77 Perylene-d12	24.89	24.39	25.39	24.88	-0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081404.D

Lab ID: SJH0174-LCV2
nt10.i, ABN.m, 14-AUG-2021 11:09

RT	CO-ELUTION COMPOUNDS
8.726	1,2-Dichlorobenzene and Benzyl alcohol
14.049	Acenaphthylene and 2,6-Dinitrotoluene

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
1.045	1.035	0.0093	Benzyl alcohol
0.956	0.967	-0.0102	Benzoic acid

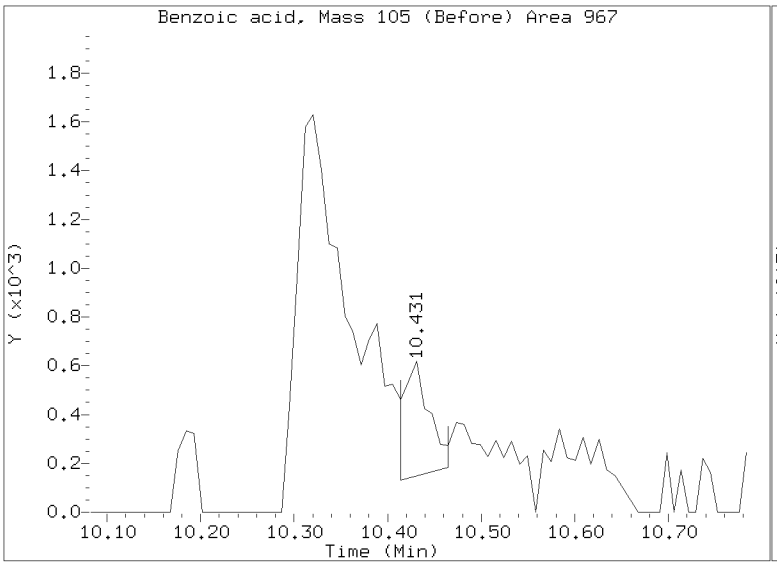
RRT check based on Ccal File: NT1021081402.D

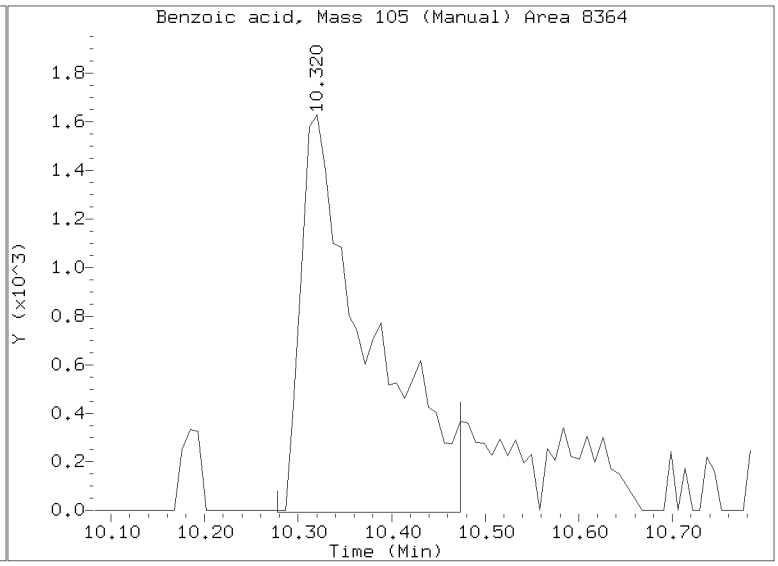
On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

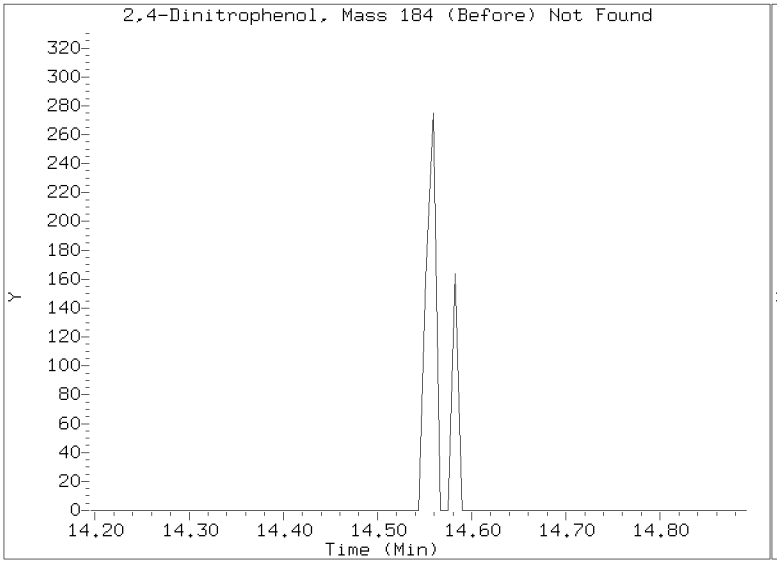
* Only compounds listed in the work order have been verified by the analyst *

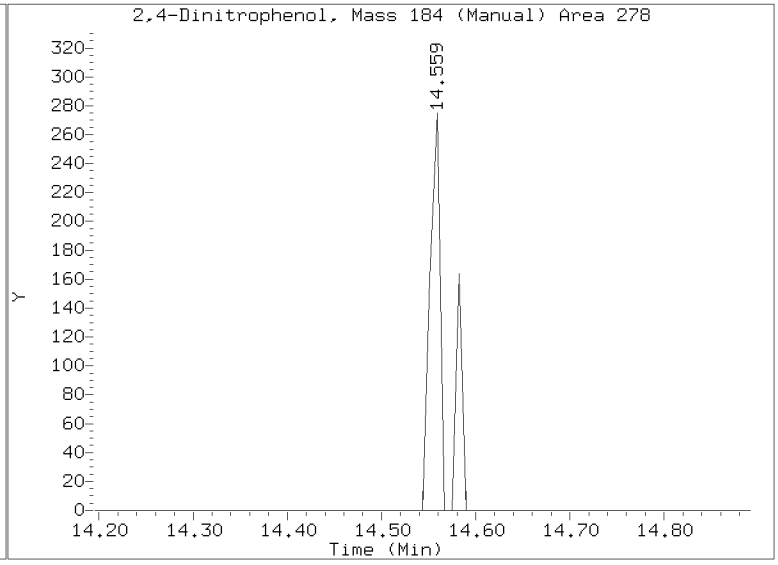
Quant Ion Manual Peak Adjustment Report

Datafile: //target/share/chem3/nt10.i/20210814.b/NT1021081404.D
Injection Date: 14-AUG-2021 11:09
Lab ID:SJH0174-LCV2 Client ID:
Report Date: 08/16/2021 09:23









Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION CHECK

EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	NT10	Calibration:	EG00057
Lab File ID:	NT1021081402.D	Calibration Date:	07/20/2021
Sequence:	SJH0174	Injection Date:	08/14/21
Lab Sample ID:	SJH0174-ICV1	Injection Time:	09:51
Sequence Name:	Initial Cal Check		

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Naphthalene	A	5.0000	4.9	1.0586070	1.0285910		-2.8	+/-20
2-Methylnaphthalene	A	5.0000	5.2	0.9794463	1.0191060		4.0	+/-20
Acenaphthylene	A	5.0000	5.0	2.1826050	2.1962630		0.6	+/-20
Acenaphthene	A	5.0000	4.7	1.2671560	1.1898170		-6.1	+/-20
Fluorene	A	5.0000	3.9	1.8993190	1.4830370		-21.9	+/-20 *
Phenanthrene	A	5.0000	3.5	1.0817070	0.7659848		-29.2	+/-20 *
Anthracene	A	5.0000	3.9	1.1567290	0.8978313		-22.4	+/-20 *
Fluoranthene	A	5.0000	6.3	1.6669060	2.1059680		26.3	+/-20 *
Pyrene	A	5.0000	4.9	1.8374700	1.8022170		-1.9	+/-20
Butylbenzylphthalate	A	5.0000	5.0	0.6043970	0.6056244		0.2	+/-20
Benzo(a)anthracene	A	5.0000	5.1	1.4926470	1.5289540		2.4	+/-20
Chrysene	A	5.0000	5.1	1.1507940	1.1798710		2.5	+/-20
Benzofluoranthenes, Total	A	10.000	9.1	1.5136370	1.3815120		-8.7	+/-20
Benzo(a)pyrene	A	5.0000	4.3	1.4245480	1.2296840		-13.7	+/-20
Indeno(1,2,3-cd)pyrene	A	5.0000	4.8	1.6122550	1.5581490		-3.4	+/-20
Dibenzo(a,h)anthracene	A	5.0000	4.8	1.2663450	1.2229510		-3.4	+/-20
Benzo(g,h,i)perylene	A	5.0000	4.4	1.4387340	1.2558610		-12.7	+/-20
1,2-Dichlorobenzene-d4	A	5.0000	5.12	1.0594750	1.0856590		2.5	+/-20
Nitrobenzene-d5	A	5.0000	5.22	0.4906029	0.5119229		4.3	+/-20
2-Fluorobiphenyl	A	5.0000	5.58	1.8368740	2.0493860		11.6	+/-20
p-Terphenyl-d14	A	5.0000	5.36	1.3096240	1.4033940		7.2	+/-20
Phenanthrene-d10	A	4.0000	4.0	92191.4600	1.0000		0.0	
Chrysene-d12	A	4.0000	4.0	86314.3600	1.0000		0.0	
Di-n-Octylphthalate-d4	A	4.0000	4.0	134660.0000	1.0000		0.0	
Perylene-d12	A	4.0000	4.0	90813.6400	1.0000		0.0	

* Values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081402.D

Date : 14-AUG-2021 09:51

Client ID:

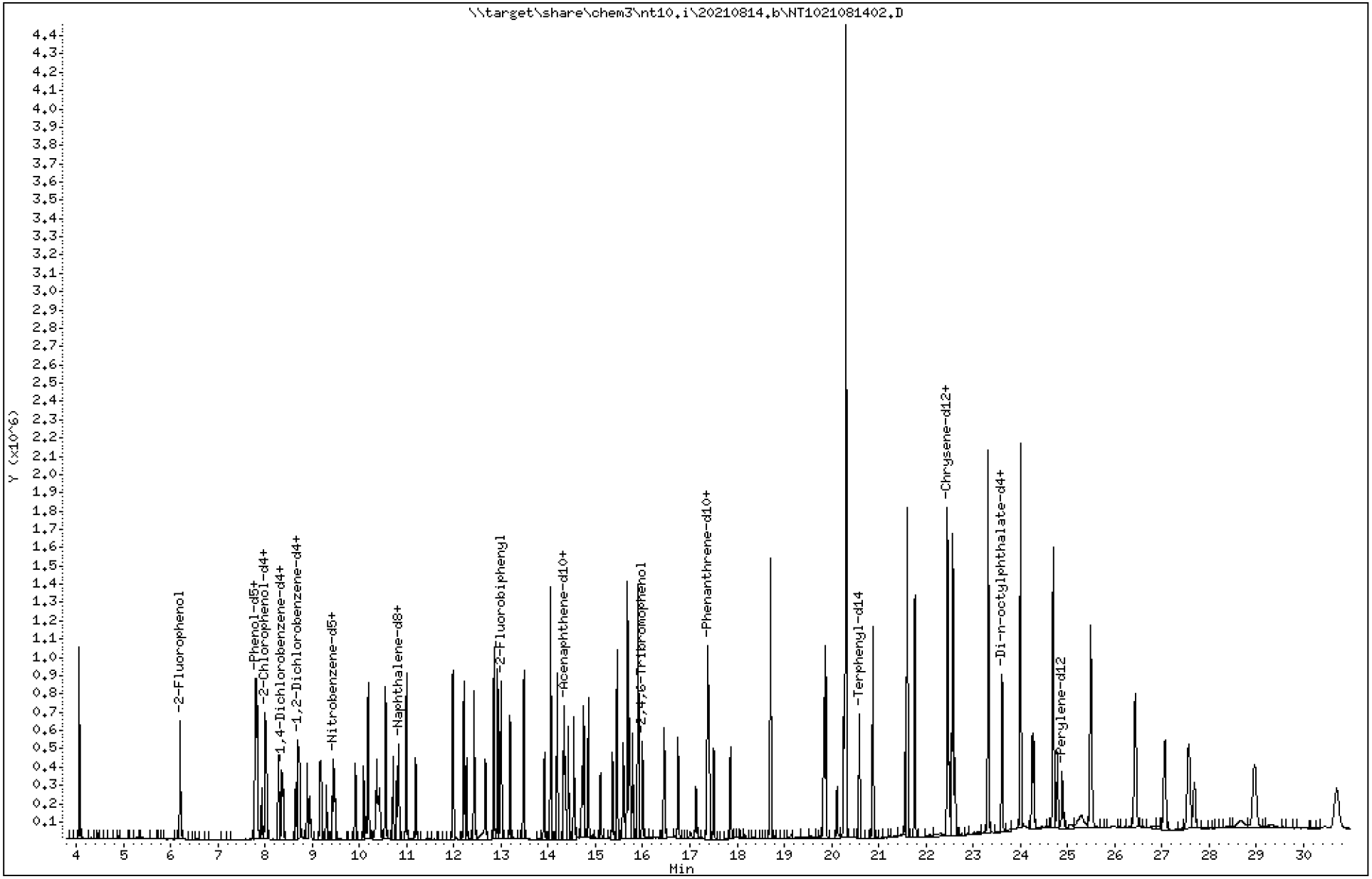
Instrument: nt10.i

Sample Info: SJH0174-ICV1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210814.b\NT1021081402.D
Lab Smp Id: SJH0174-ICV1
Inj Date : 14-AUG-2021 09:51
Operator : VTS Inst ID: nt10.i
Smp Info : SJH0174-ICV1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 2 Continuing Calibration Sample
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
$ 1 2-Fluorophenol	112	6.204	6.204	(0.743)	256039	7.50000	7.649
$ 2 Phenol-d5	99	7.788	7.788	(0.932)	379557	7.50000	7.639
3 Phenol	94	7.811	7.811	(0.935)	228088	5.00000	5.252
$ 5 2-Chlorophenol-d4	132	8.004	8.004	(0.958)	293658	7.50000	8.383
4 Bis(2-Chloroethyl)ether	93	7.935	7.935	(0.950)	134884	5.00000	3.889
6 2-Chlorophenol	128	8.035	8.035	(0.962)	172390	5.00000	5.244
7 1,3-Dichlorobenzene	146	8.283	8.283	(0.992)	165619	5.00000	4.586
* 8 1,4-Dichlorobenzene-d4	152	8.353	8.353	(1.000)	85058	4.00000	
9 1,4-Dichlorobenzene	146	8.384	8.384	(1.004)	134314	5.00000	4.356
$ 10 1,2-Dichlorobenzene-d4	152	8.702	8.702	(1.042)	115430	5.00000	5.124
12 1,2-Dichlorobenzene	146	8.726	8.726	(1.045)	148109	5.00000	4.541
11 Benzyl alcohol	108	8.648	8.648	(1.035)	93397	5.00000	4.593
14 2,2'-oxybis(1-Chloropropane)	121	8.935	8.935	(1.070)	41172	5.00000	3.291(M)
13 2-Methylphenol	108	8.896	8.896	(1.065)	121226	5.00000	4.484
17 Hexachloroethane	117	9.300	9.300	(1.113)	55428	5.00000	4.182
16 N-Nitroso-di-n-propylamine	70	9.191	9.191	(1.100)	92331	5.00000	3.959
15 4-Methylphenol	108	9.160	9.160	(1.097)	135922	5.00000	4.685
$ 18 Nitrobenzene-d5	82	9.440	9.440	(0.875)	186633	5.00000	5.217
19 Nitrobenzene	77	9.471	9.471	(0.878)	155585	5.00000	4.402
20 Isophorone	82	9.913	9.913	(0.919)	234762	5.00000	3.520
21 2-Nitrophenol	139	10.091	10.091	(0.935)	94388	5.00000	5.055
22 2,4-Dimethylphenol	107	10.184	10.184	(0.944)	234514	10.0000	8.458
23 Bis(2-Chloroethoxy)methane	93	10.363	10.363	(0.960)	135498	5.00000	3.914
24 Benzoic acid	105	10.430	10.430	(0.967)	293334	20.0000	18.45
25 2,4-Dichlorophenol	162	10.549	10.549	(0.978)	231885	10.0000	10.09
26 1,2,4-Trichlorobenzene	180	10.714	10.714	(0.993)	126727	5.00000	4.879
* 27 Naphthalene-d8	136	10.791	10.791	(1.000)	291658	4.00000	
28 Naphthalene	128	10.837	10.837	(1.004)	374996	5.00000	4.858
29 4-Chloroaniline	127	10.992	10.992	(1.019)	350415	10.0000	9.117
30 Hexachlorobutadiene	225	11.192	11.192	(1.037)	80508	5.00000	5.677
31 4-Chloro-3-methylphenol	107	11.982	11.982	(1.110)	285021	10.0000	10.39
32 2-Methylnaphthalene	142	12.214	12.214	(1.132)	371538	5.00000	5.202
33 Hexachlorocyclopentadiene	237	12.671	12.671	(0.882)	105291	10.0000	6.101

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
	34 2,4,6-Trichlorophenol	196	12.849	12.849	(0.895)	209797	10.0000	11.67
	35 2,4,5-Trichlorophenol	196	12.926	12.926	(0.900)	223058	10.0000	11.64
$	36 2-Fluorobiphenyl	172	13.003	13.003	(0.906)	419207	5.00000	5.578
	37 2-Chloronaphthalene	162	13.189	13.189	(0.919)	301470	5.00000	4.802
	38 2-Nitroaniline	65	13.483	13.483	(0.939)	249062	10.0000	10.58
	39 Dimethylphthalate	163	13.917	13.917	(0.969)	296594	5.00000	4.884
	40 Acenaphthylene	152	14.048	14.048	(0.978)	449251	5.00000	5.031
	41 2,6-Dinitrotoluene	165	14.048	14.048	(0.978)	138680	10.0000	10.07
*	42 Acenaphthene-d10	164	14.358	14.358	(1.000)	163642	4.00000	
	43 3-Nitroaniline	138	14.335	14.335	(0.998)	155713	10.0000	9.127
	44 Acenaphthene	153	14.427	14.427	(1.005)	243380	5.00000	4.695
	45 2,4-Dinitrophenol	184	14.543	14.543	(1.013)	138725	20.0000	17.02
	46 Dibenzofuran	168	14.752	14.752	(1.027)	426928	5.00000	5.327
	47 4-Nitrophenol	109	14.713	14.713	(1.025)	75163	10.0000	11.36
	48 2,4-Dinitrotoluene	165	14.853	14.853	(1.034)	206492	10.0000	11.23
	50 Diethylphthalate	149	15.363	15.363	(1.070)	288918	5.00000	5.018
	49 Fluorene	166	15.456	15.456	(1.076)	303359	5.00000	3.904
	51 4-Chlorophenyl-phenylether	204	15.463	15.463	(1.077)	138647	5.00000	3.070
	52 4-Nitroaniline	138	15.587	15.587	(1.086)	182625	10.0000	10.08
	53 4,6-Dinitro-2-methylphenol	198	15.680	15.680	(0.903)	287861	20.0000	20.18
	54 N-Nitrosodiphenylamine	169	15.726	15.726	(0.906)	237967	5.00000	4.361
$	55 2,4,6-Tribromophenol	330	15.996	15.996	(1.114)	110876	7.50000	8.113
	56 4-Bromophenyl-phenylether	248	16.458	16.458	(0.948)	124818	5.00000	4.495
	57 Hexachlorobenzene	284	16.752	16.752	(0.965)	132805	5.00000	4.551
	58 Pentachlorophenol	266	17.132	17.132	(0.987)	65222	10.0000	5.445
*	59 Phenanthrene-d10	188	17.364	17.364	(1.000)	304099	4.00000	
	60 Phenanthrene	178	17.418	17.418	(1.003)	291169	5.00000	3.541
	61 Anthracene	178	17.503	17.503	(1.008)	341287	5.00000	3.881
	62 Carbazole	167	17.859	17.859	(1.029)	350123	5.00000	4.033
	63 Di-n-butylphthalate	149	18.710	18.710	(1.078)	474094	5.00000	3.528
	64 Fluoranthene	202	19.839	19.839	(0.882)	525052	5.00000	6.317
	65 Pyrene	202	20.265	20.265	(0.901)	449322	5.00000	4.904
$	66 Terphenyl-d14	244	20.590	20.590	(0.915)	349889	5.00000	5.358
	67 Butylbenzylphthalate	149	21.558	21.558	(0.958)	150992	5.00000	5.010
	68 Benzo(a)anthracene	228	22.464	22.464	(0.999)	381193	5.00000	5.122
*	69 Chrysene-d12	240	22.495	22.495	(1.000)	199453	4.00000	
	70 3,3'-Dichlorobenzidine	252	22.456	22.456	(0.998)	473964	15.0000	15.85
	71 Chrysene	228	22.541	22.541	(1.002)	294161	5.00000	5.126
	72 bis(2-Ethylhexyl)phthalate	149	22.619	22.619	(0.958)	173932	5.00000	5.207
*	134 Di-n-octylphthalate-d4	153	23.610	23.610	(1.000)	303639	4.00000	
	73 Di-n-octylphthalate	149	23.617	23.617	(1.000)	362280	5.00000	4.257
	74 Benzo(b)fluoranthene	252	24.252	24.252	(0.974)	378890	5.00000	4.806
	75 Benzo(k)fluoranthene	252	24.283	24.283	(0.976)	355613	5.00000	4.553(H)
	76 Benzo(a)pyrene	252	24.786	24.786	(0.996)	307547	5.00000	4.316
*	77 Perylene-d12	264	24.887	24.887	(1.000)	200082	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.057	27.057	(1.087)	389697	5.00000	4.832
	79 Dibenzo(a,h)anthracene	278	27.072	27.072	(1.088)	305863	5.00000	4.829
	80 Benzo(g,h,i)perylene	276	27.686	27.686	(1.112)	314094	5.00000	4.364
	90 N-Nitrosodimethylamine	74	4.065	4.065	(0.487)	151209	10.0000	6.603
	91 Aniline	93	7.834	7.834	(0.938)	415194	10.0000	9.184
	93 Benzidine	184	20.118	20.118	(0.894)	184372	10.0000	4.850
	103 Pyridine	79	4.057	4.057	(0.486)	264269	5.00000	7.336
	105 1-methylnaphthalene	142	12.431	12.431	(1.152)	335919	5.00000	5.013
	111 Azobenzene (1,2-DP-Hydrazine)	77	15.788	15.788	(1.100)	307571	5.00000	4.189

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	AMOUNTS CAL-AMT (ug/mL)	AMOUNTS ON-COL (ug/mL)
187 Total Benzofluoranthenes	252	24.283	24.283	(0.976)	691039	10.0000	9.127
120 2,3,4,6-Tetrachlorophenol	232	15.108	15.108	(1.052)	88286	5.00000	5.005

QC Flag Legend

M - Compound response manually integrated.
H - Operator selected an alternate compound hit.

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081402.D
Lab Smp Id: SJH0174-ICV1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 08:43
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	85058	0.00
27 Naphthalene-d8	291658	145829	583316	291658	0.00
42 Acenaphthene-d10	163642	81821	327284	163642	0.00
59 Phenanthrene-d10	304099	152050	608198	304099	0.00
69 Chrysene-d12	199453	99727	398906	199453	0.00
134 Di-n-octylphthala	303639	151820	607278	303639	0.00
77 Perylene-d12	200082	100041	400164	200082	0.00

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.35	0.00
27 Naphthalene-d8	10.79	10.29	11.29	10.79	0.00
42 Acenaphthene-d10	14.36	13.86	14.86	14.36	0.00
59 Phenanthrene-d10	17.36	16.86	17.86	17.36	0.00
69 Chrysene-d12	22.50	22.00	23.00	22.50	0.00
134 Di-n-octylphthala	23.61	23.11	24.11	23.61	0.00
77 Perylene-d12	24.89	24.39	25.39	24.89	0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081402.D

Lab ID: SJH0174-ICV1
nt10.i, ABN.m, 14-AUG-2021 09:51

RT	CO-ELUTION COMPOUNDS
14.049	Acenaphthylene and 2,6-Dinitrotoluene

Quant Method: ICAL

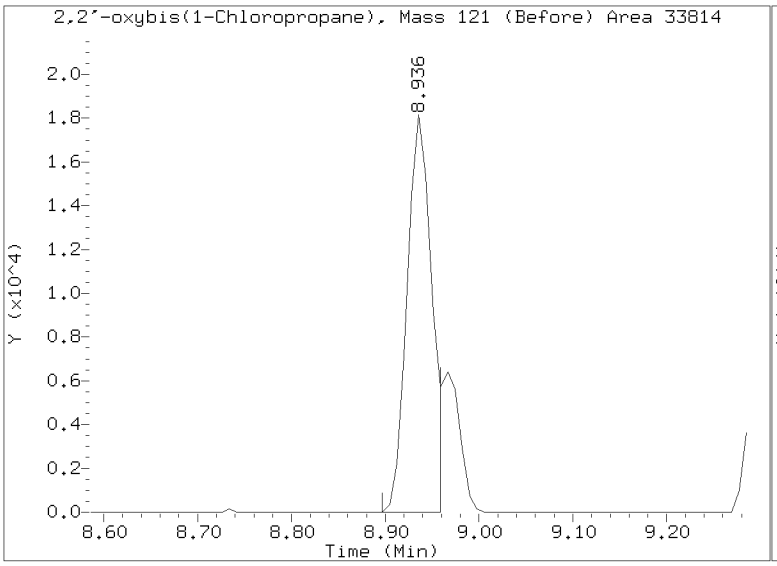
No RRT check. Ccal file.

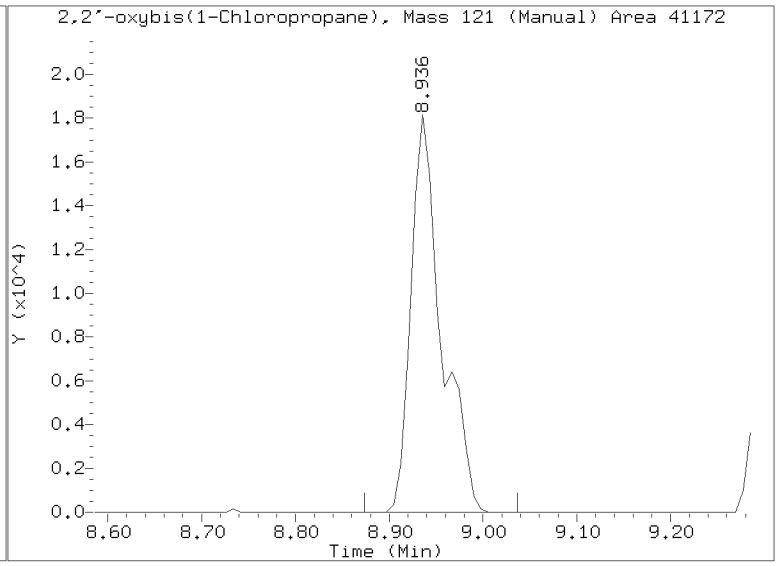
On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Quant Ion Manual Peak Adjustment Report

Datafile: //target/share/chem3/nt10.i/20210814.b/NT1021081402.D
Injection Date: 14-AUG-2021 09:51
Lab ID:SJH0174-ICV1 Client ID:
Report Date: 08/16/2021 09:23





Q-FLAG SUMMARY FOR DATABATCH - \\target\share\chem3\nt10.i\20210814.b

Instrument: nt10.i Date: 14-AUG-2021 Method: ABN.m

INITIAL CAL: 20-JUL-2021

Compound	%RSD or R^2
NO Q-FLAGS	

ICV CAL: NT1021081402.D 14-AUG-2021 09:51

Compound	%D
Bis(2-Chloroethyl)ether	-22.23
2,2'-oxybis(1-Chloropropane)	-34.19
N-Nitroso-di-n-propylamine	-20.81
Isophorone	-29.60
Bis(2-Chloroethoxy)methane	-21.72
Hexachlorocyclopentadiene	-38.99
Fluorene	-21.92
4-Chlorophenyl-phenylether	-38.61
Pentachlorophenol	-45.5
Phenanthrene	-29.19
Anthracene	-22.38
Di-n-butylphthalate	-29.4
Fluoranthene	26.34
N-Nitrosodimethylamine	-33.97
Benzidine	-51.50
Pyridine	46.71

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	NT10	Calibration:	EG00057
Lab File ID:	NT1021072019.D	Calibration Date:	07/20/2021
Sequence:	SJG0249	Injection Date:	07/20/21
Lab Sample ID:	SJG0249-CCV1	Injection Time:	23:13
Sequence Name:	Calibration Check		

		CONC. (ug/mL)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Naphthalene	A	5.0000	5.1	1.0586070	1.0891260		2.9	+/-50
2-Methylnaphthalene	A	5.0000	5.3	0.9794463	1.0408340		6.3	+/-50
Acenaphthylene	A	5.0000	4.9	2.1826050	2.1501870		-1.5	+/-50
Acenaphthene	A	5.0000	5.2	1.2671560	1.3167590		3.9	+/-50
Fluorene	A	5.0000	4.7	1.8993190	1.8007880		-5.2	+/-50
Phenanthrene	A	5.0000	5.1	1.0817070	1.1095640		2.6	+/-50
Anthracene	A	5.0000	5.4	1.1567290	1.2436760		7.5	+/-50
Fluoranthene	A	5.0000	5.4	1.6669060	1.8023320		8.1	+/-50
Pyrene	A	5.0000	5.1	1.8374700	1.8851320		2.6	+/-50
Butylbenzylphthalate	A	5.0000	5.8	0.6043970	0.7040668		16.5	+/-50
Benzo(a)anthracene	A	5.0000	4.9	1.4926470	1.4735870		-1.3	+/-50
Chrysene	A	5.0000	5.3	1.1507940	1.2113750		5.3	+/-50
Benzofluoranthenes, Total	A	10.000	9.8	1.5136370	1.4773560		-2.4	+/-50
Benzo(a)pyrene	A	5.0000	5.1	1.4245480	1.4472970		1.6	+/-50
Indeno(1,2,3-cd)pyrene	A	5.0000	4.6	1.6122550	1.4870930		-7.8	+/-50
Dibenzo(a,h)anthracene	A	5.0000	4.7	1.2663450	1.1845850		-6.5	+/-50
Benzo(g,h,i)perylene	A	5.0000	4.7	1.4387340	1.3647610		-5.1	+/-50
1,2-Dichlorobenzene-d4	A	5.0000	5.13	1.0594750	1.0864030		2.5	+/-50
Nitrobenzene-d5	A	5.0000	5.37	0.4906029	0.5266220		7.3	+/-50
2-Fluorobiphenyl	A	5.0000	5.12	1.8368740	1.8800180		2.3	+/-50
p-Terphenyl-d14	A	5.0000	4.99	1.3096240	1.3071320		-0.2	+/-50

* Values outside of QC limits

* Values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

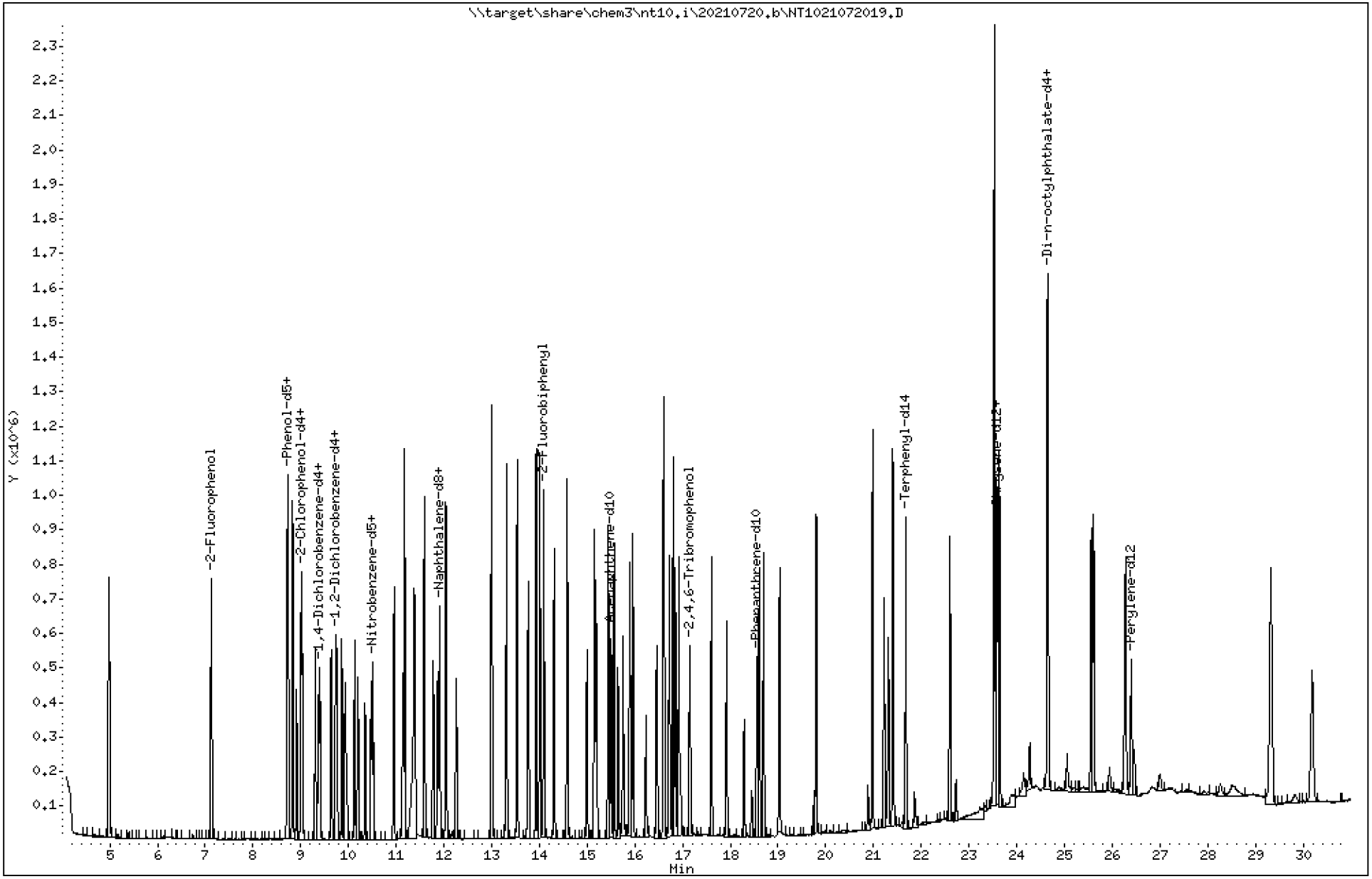
Instrument: nt10.i

Sample Info: SJG0249-CCV1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

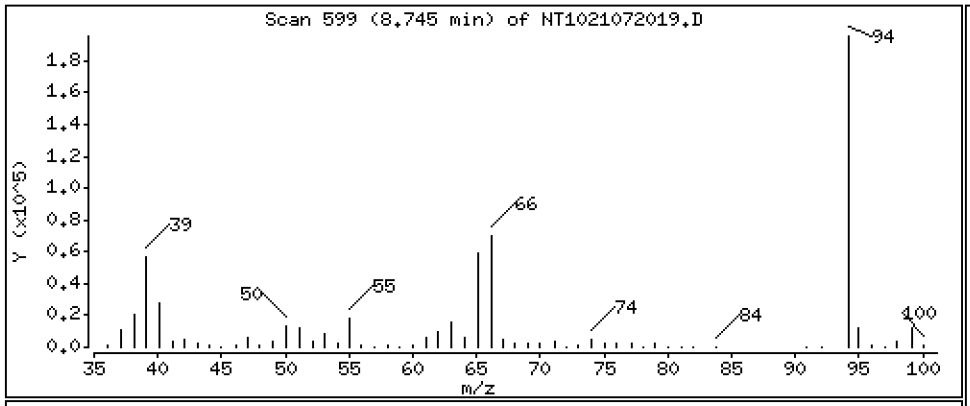
Operator: VTS

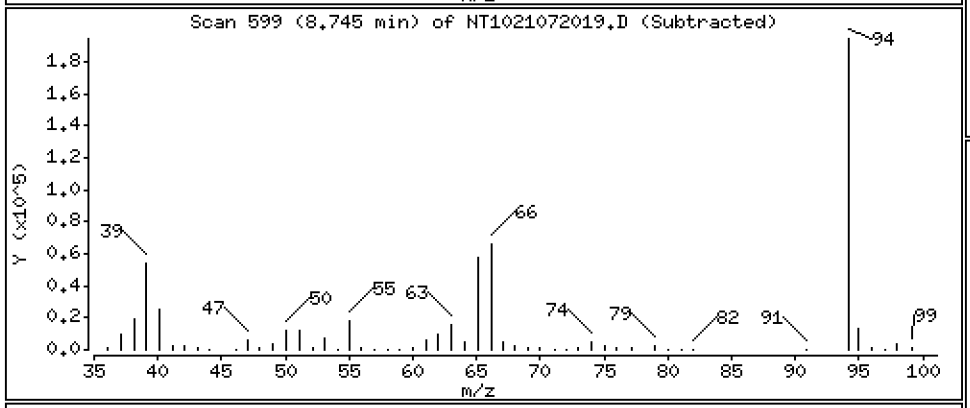
Column phase: ZB-5msi

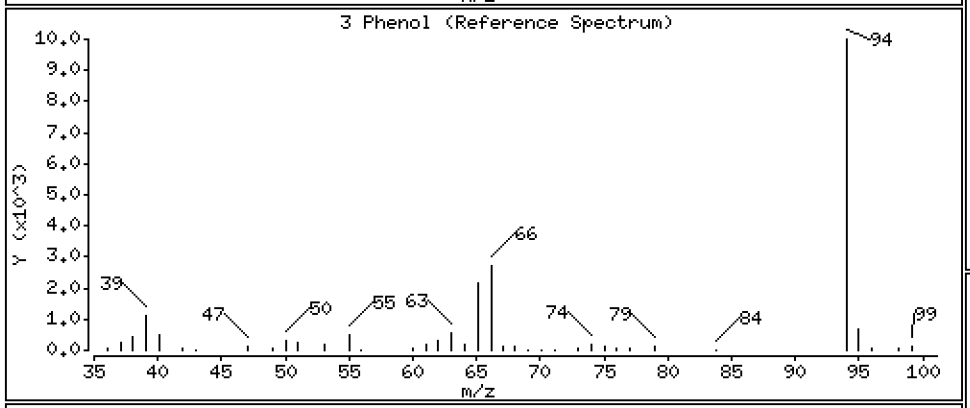
Column diameter: 0.25

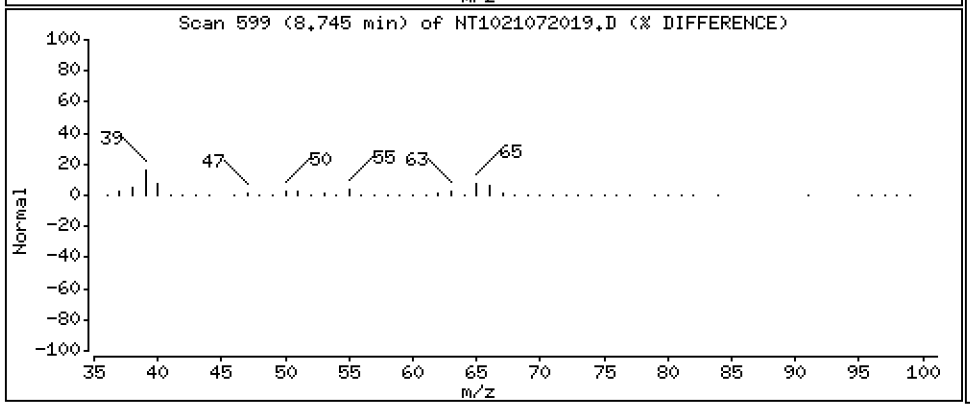
3 Phenol

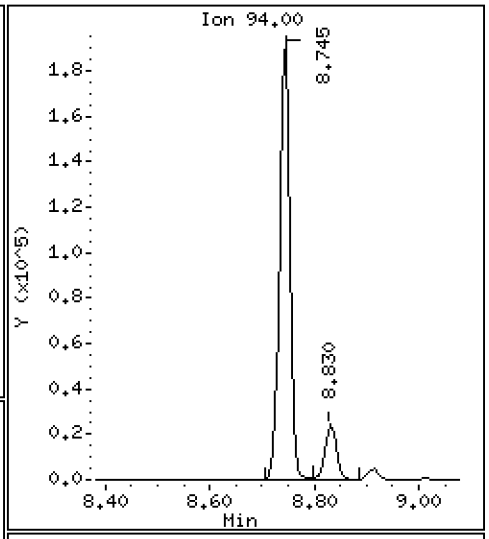
Concentration: 5.319 ug/mL

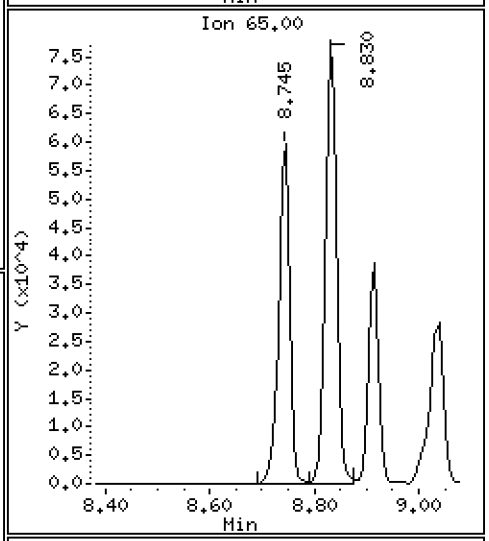


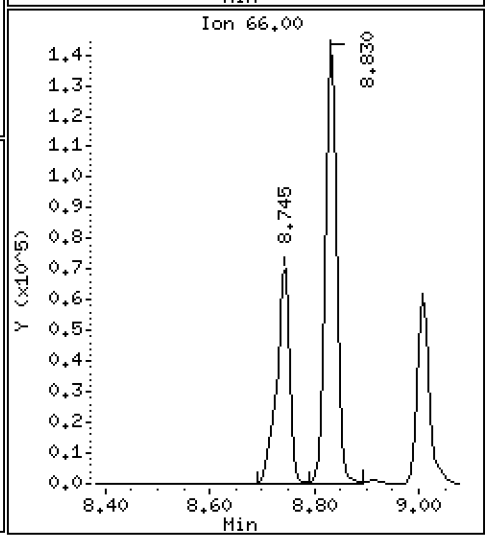












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

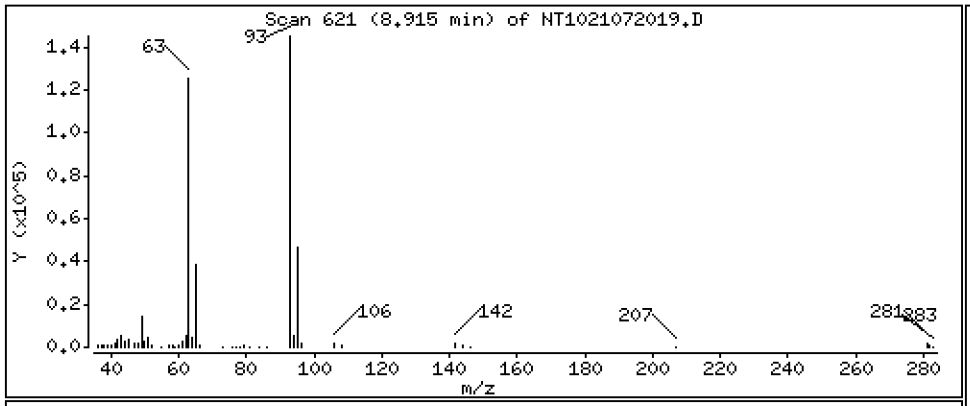
Operator: VTS

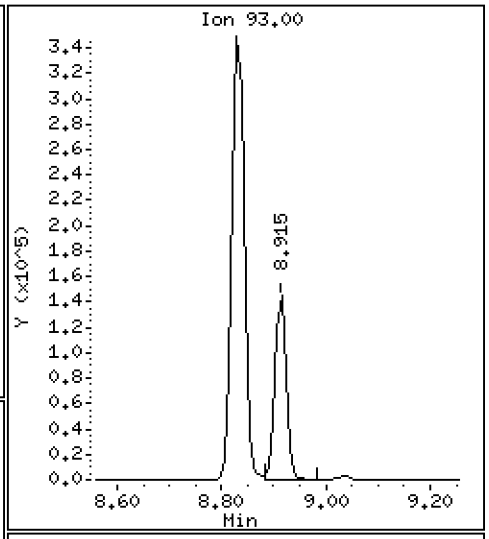
Column phase: ZB-5msi

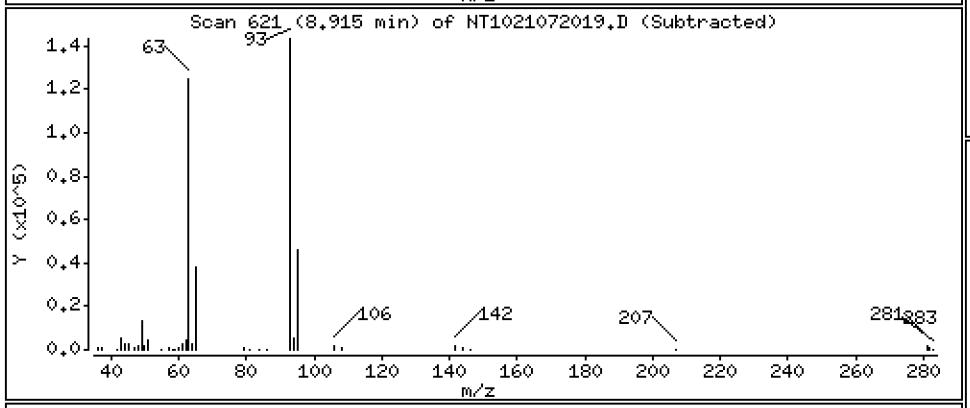
Column diameter: 0.25

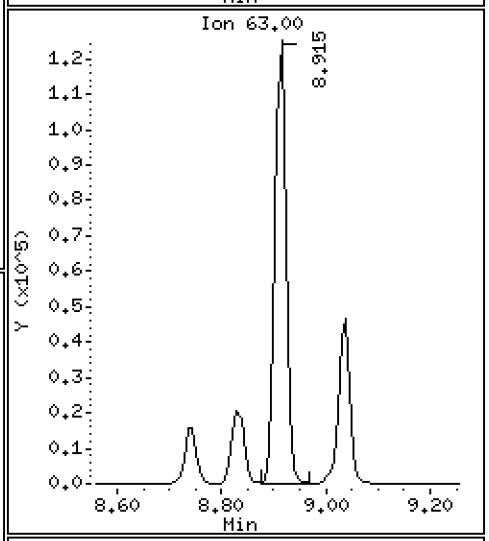
4 Bis(2-Chloroethyl)ether

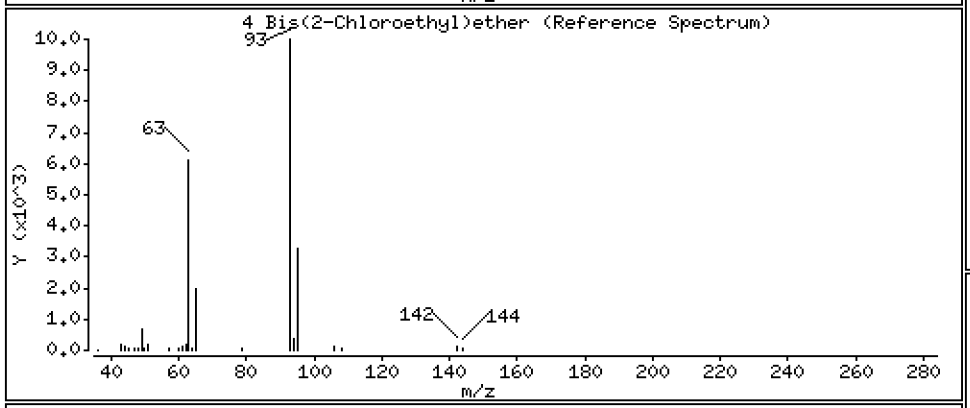
Concentration: 5.018 ug/mL

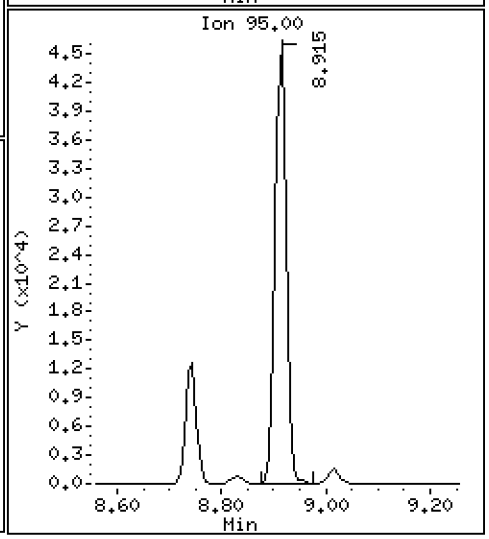


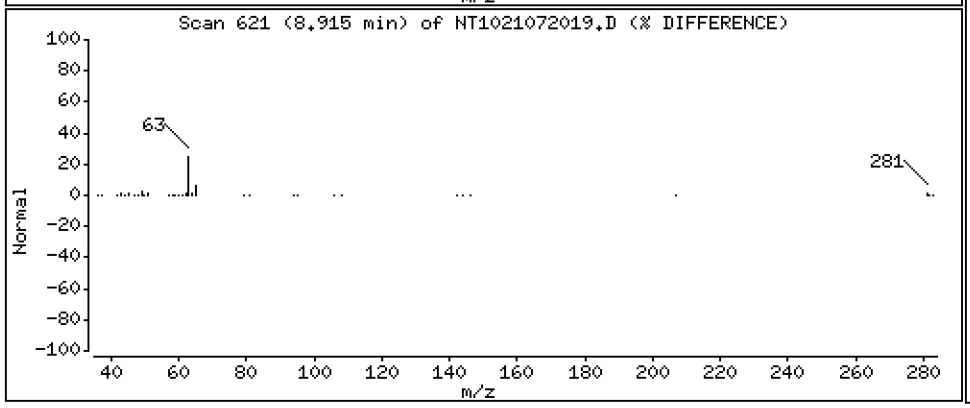












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

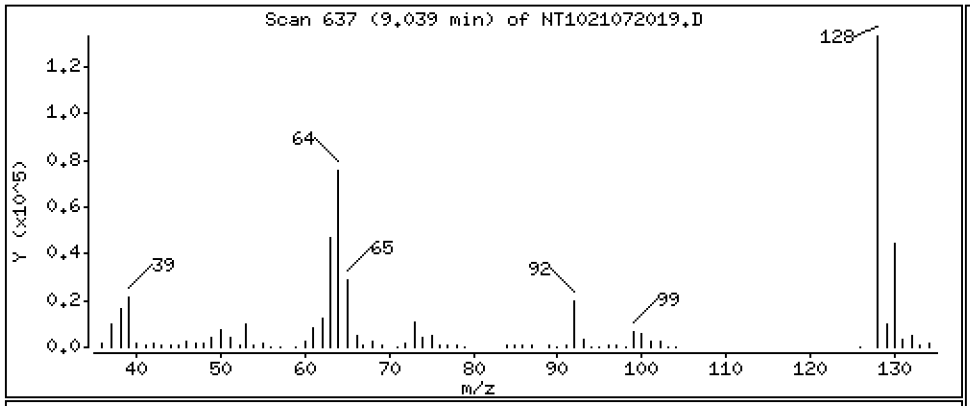
Operator: VTS

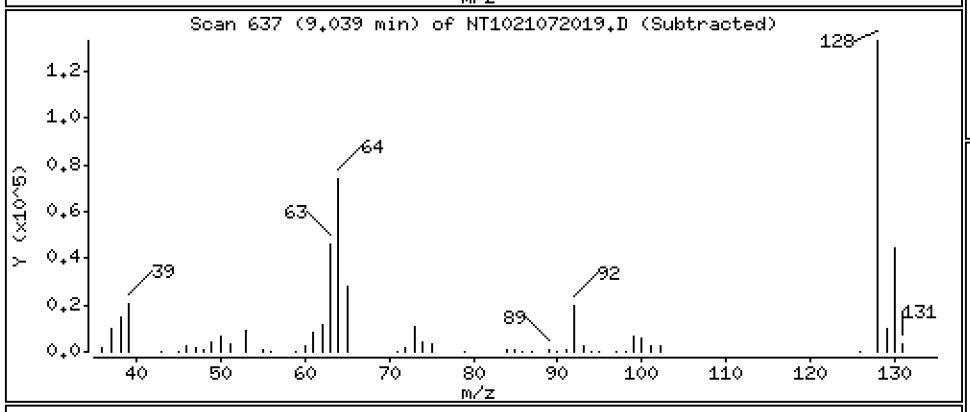
Column phase: ZB-5msi

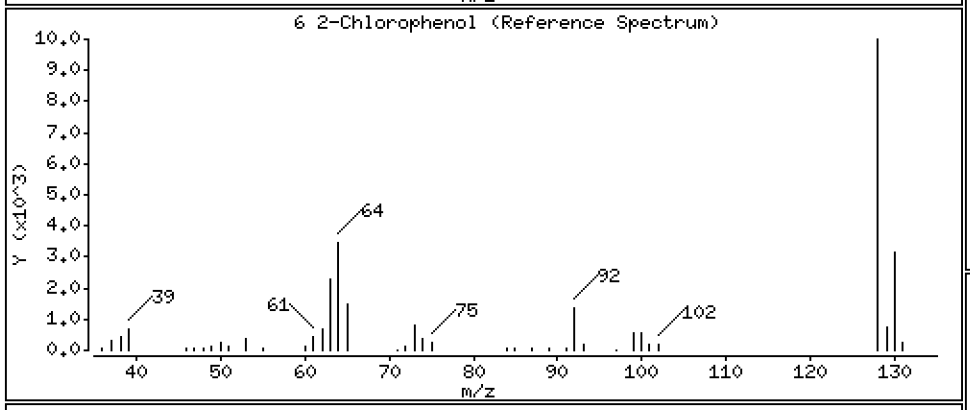
Column diameter: 0.25

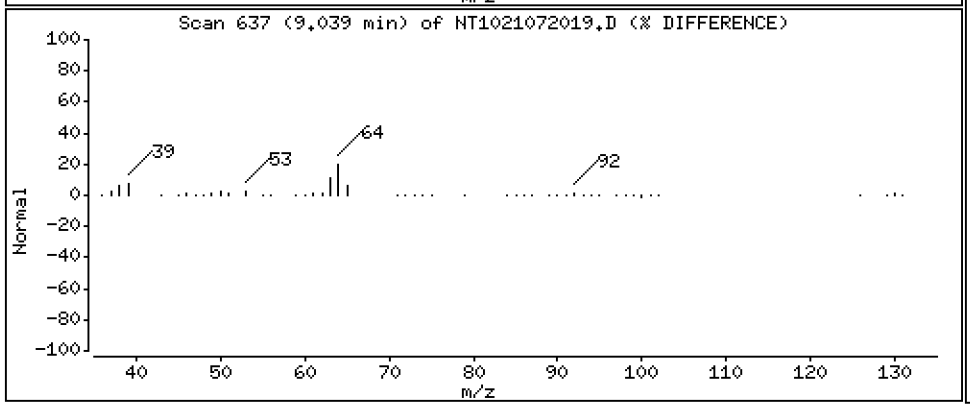
6 2-Chlorophenol

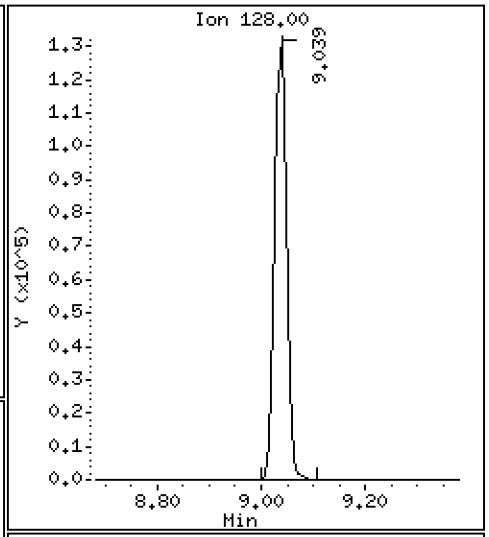
Concentration: 5.166 ug/mL

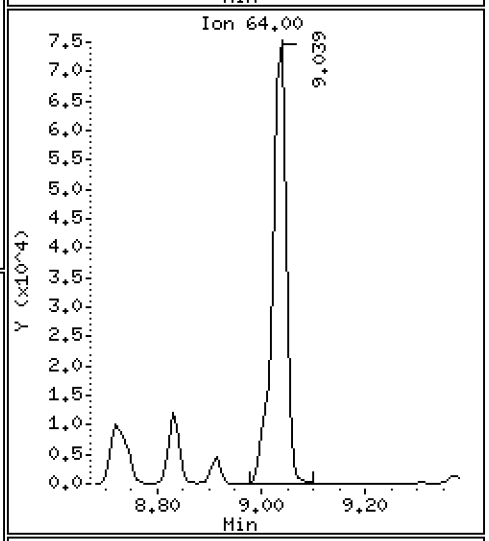


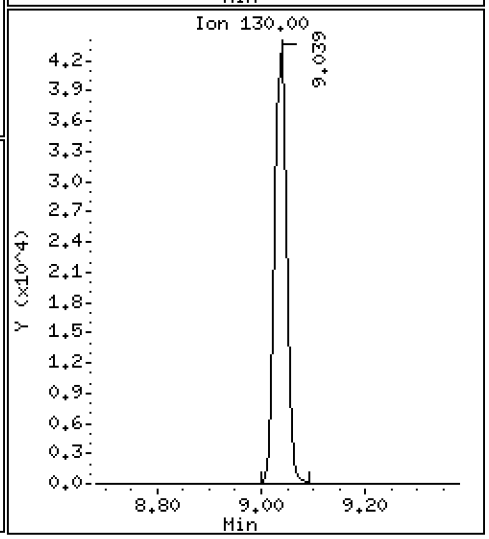












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

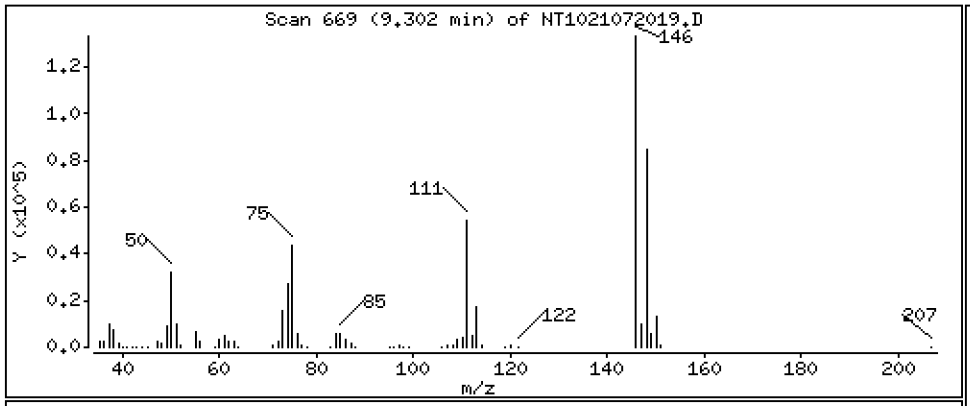
Operator: VTS

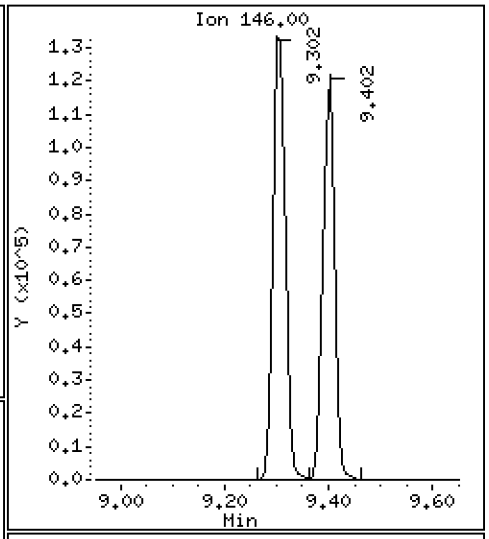
Column phase: ZB-5msi

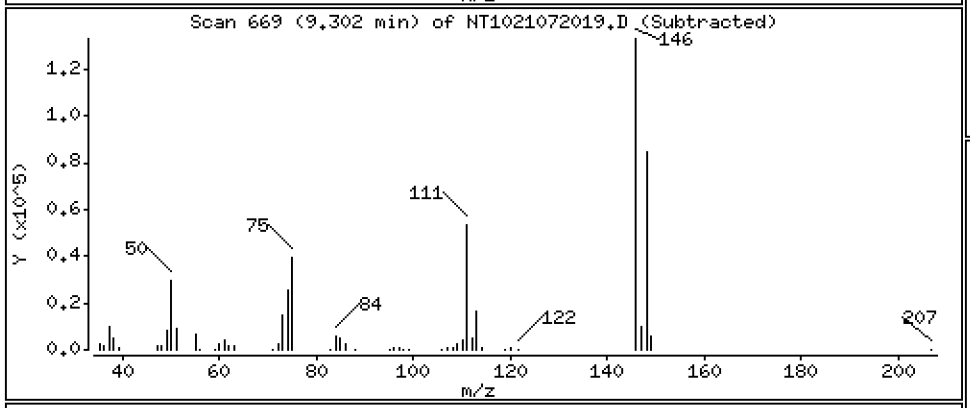
Column diameter: 0.25

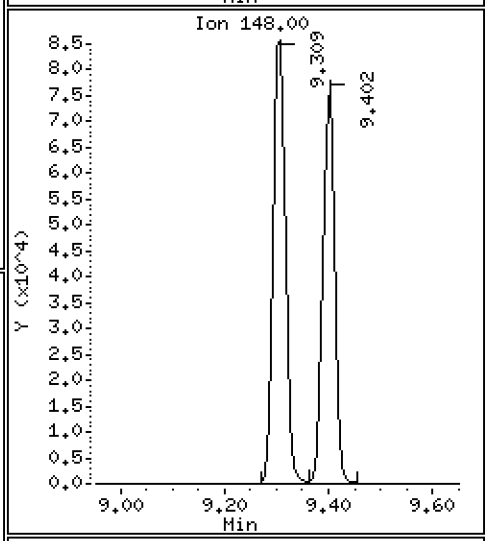
7 1,3-Dichlorobenzene

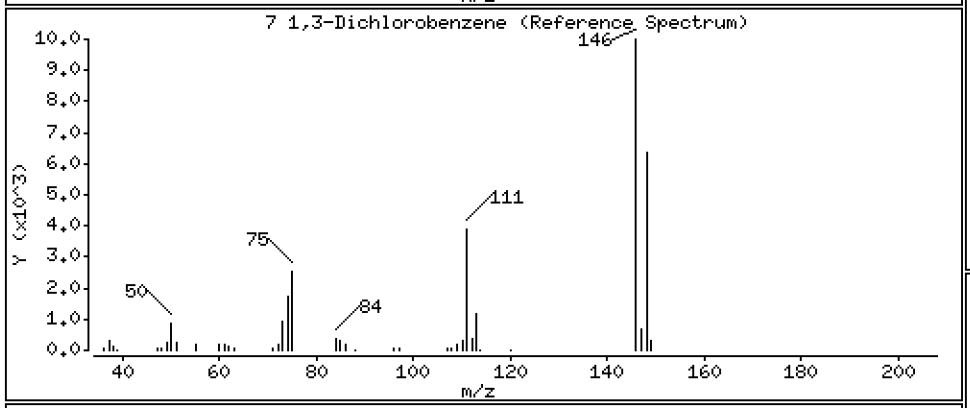
Concentration: 5.022 ug/mL

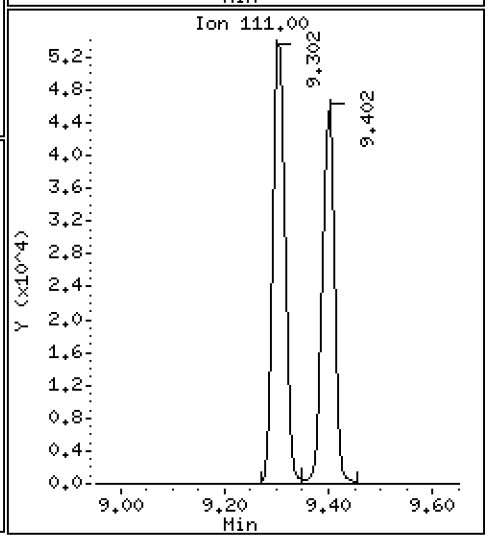


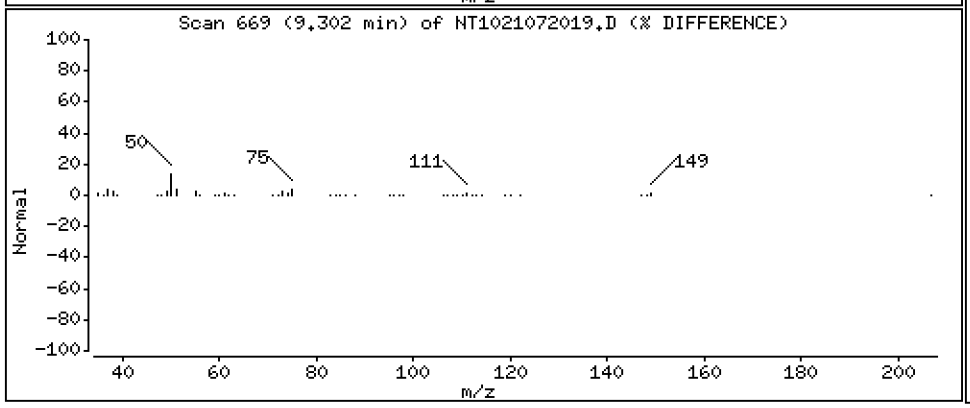












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

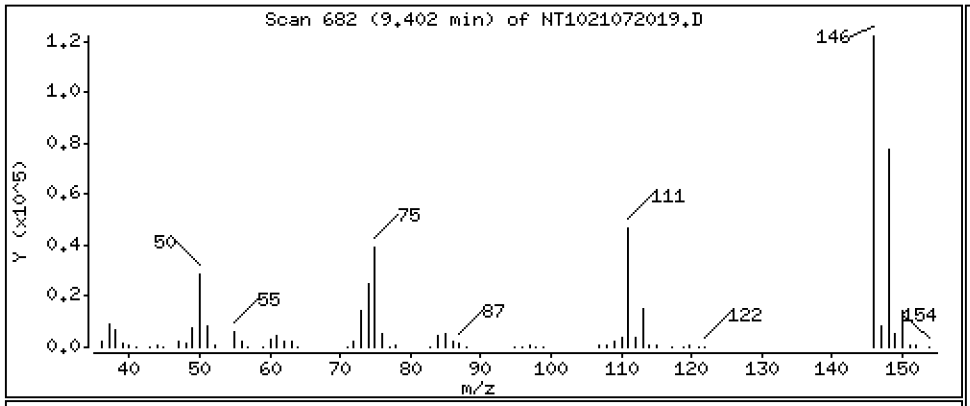
Operator: VTS

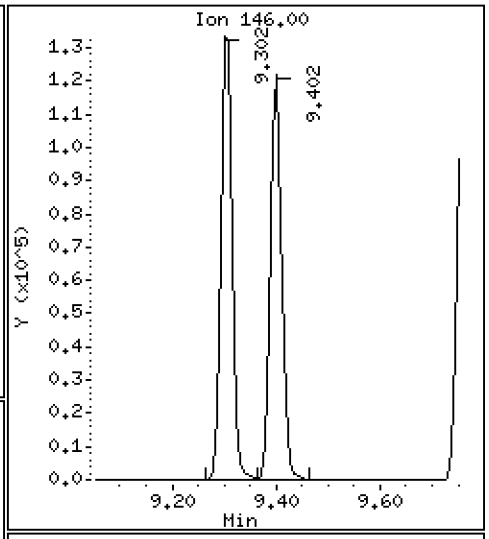
Column phase: ZB-5msi

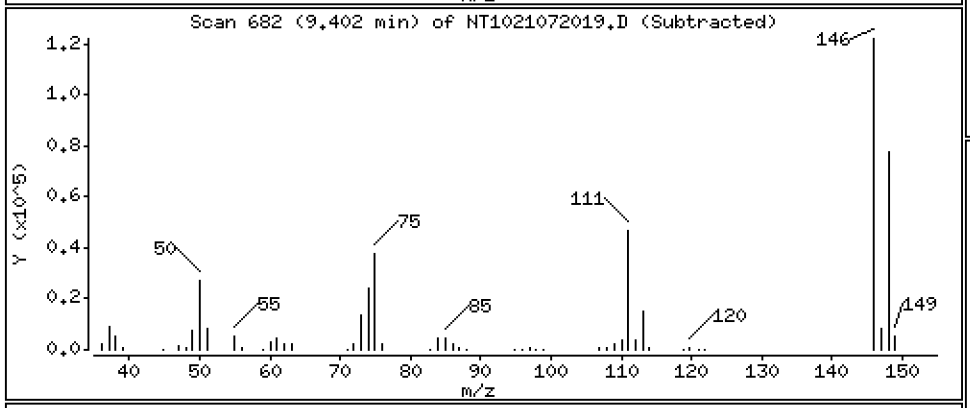
Column diameter: 0.25

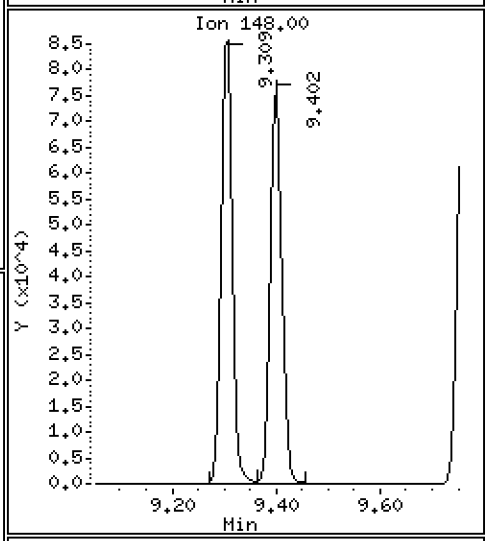
9 1,4-Dichlorobenzene

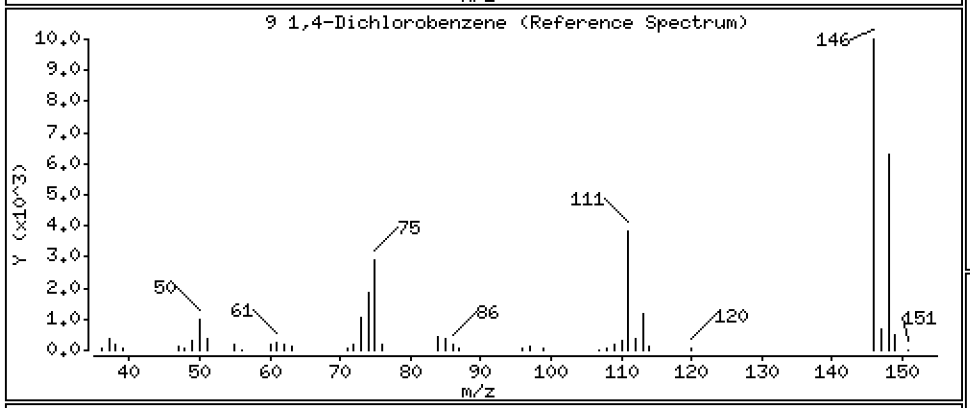
Concentration: 5.083 ug/mL

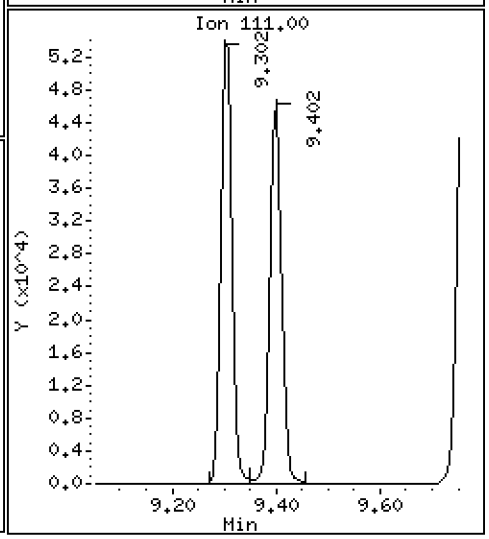


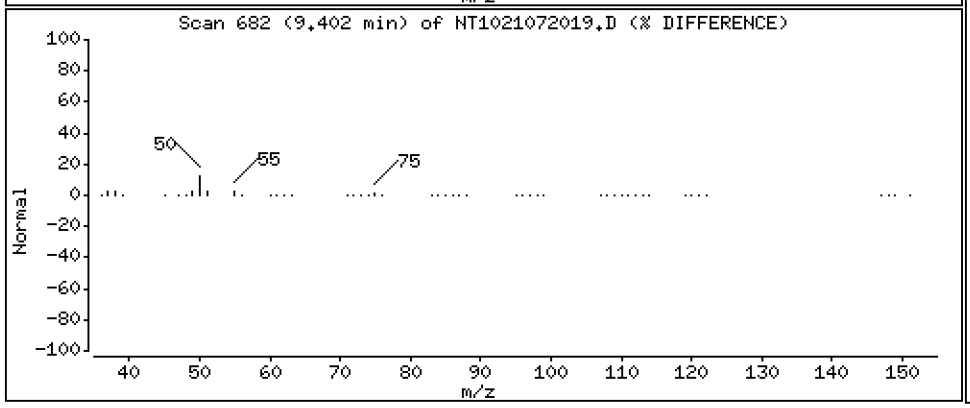












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

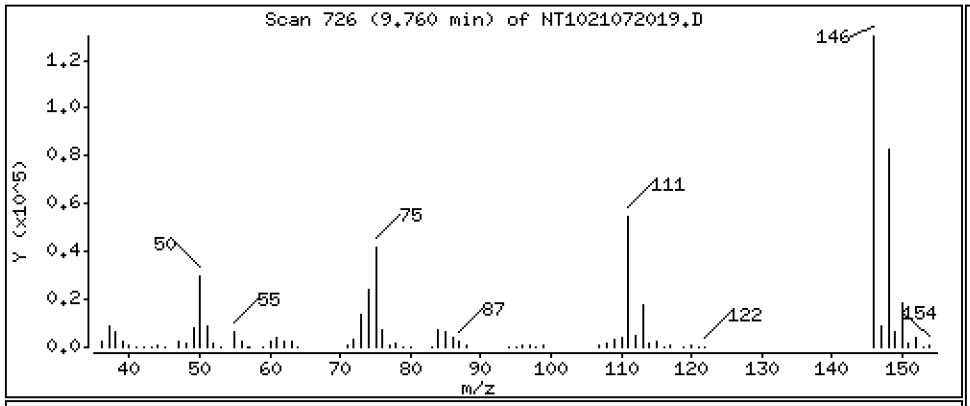
Operator: VTS

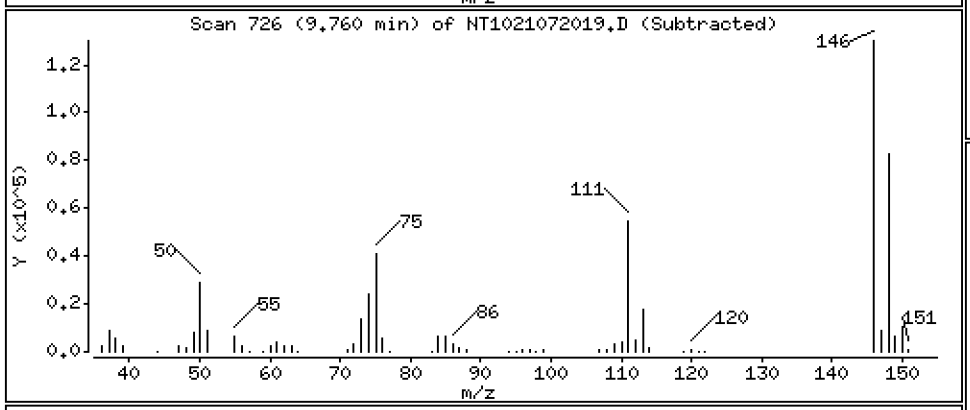
Column phase: ZB-5msi

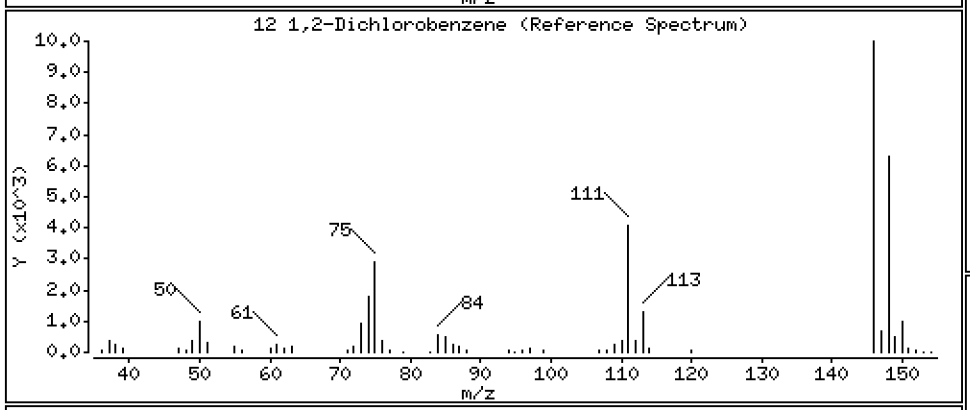
Column diameter: 0.25

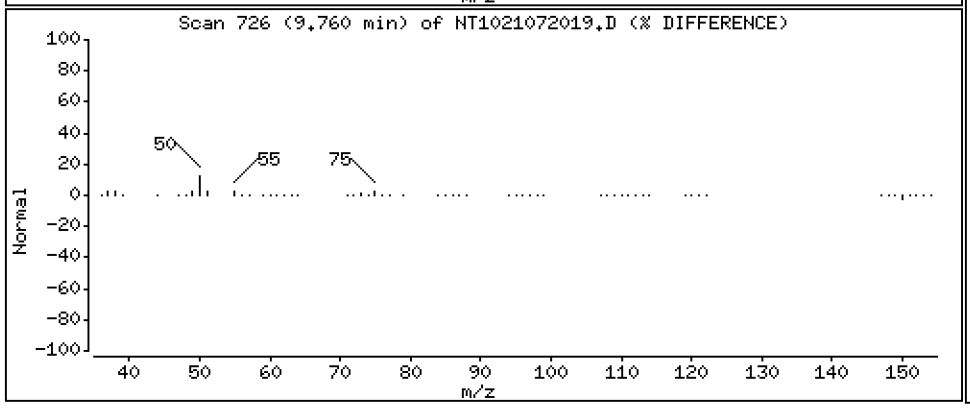
12 1,2-Dichlorobenzene

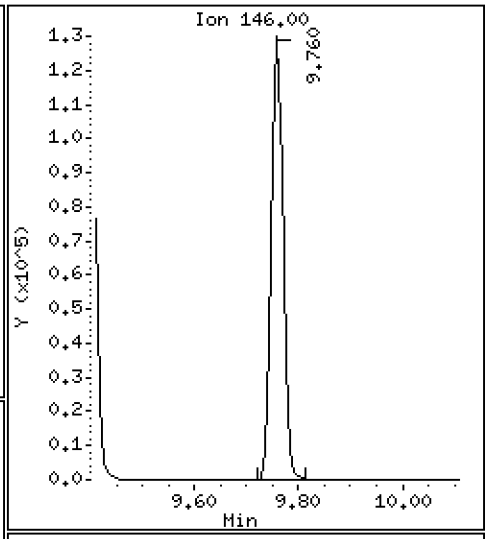
Concentration: 5.071 ug/mL

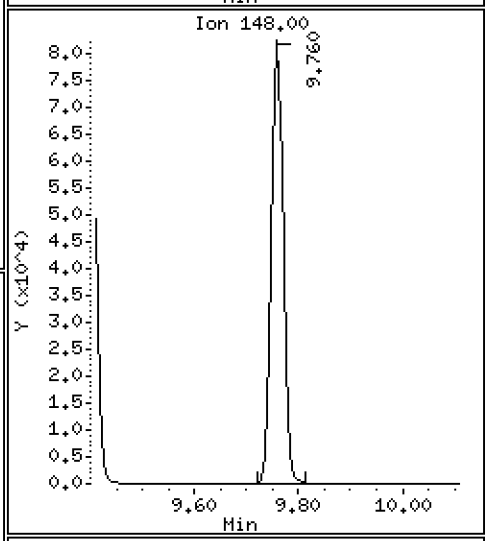


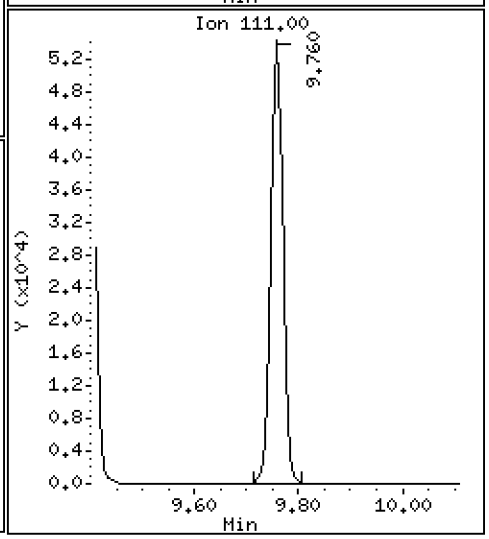












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

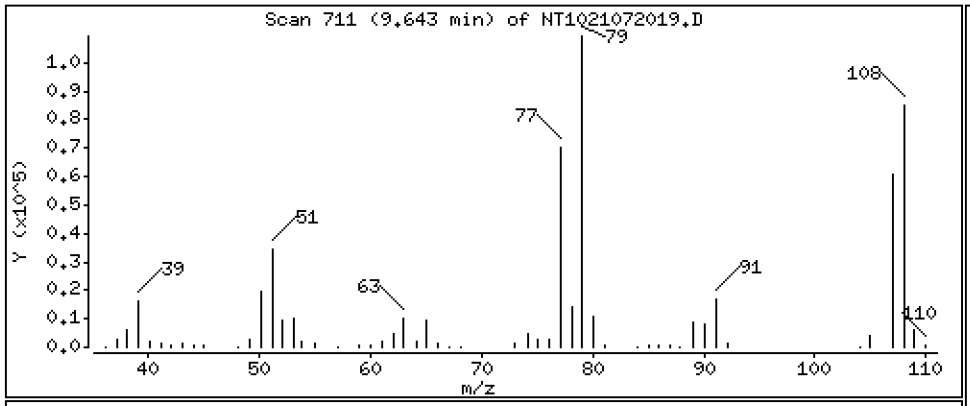
Operator: VTS

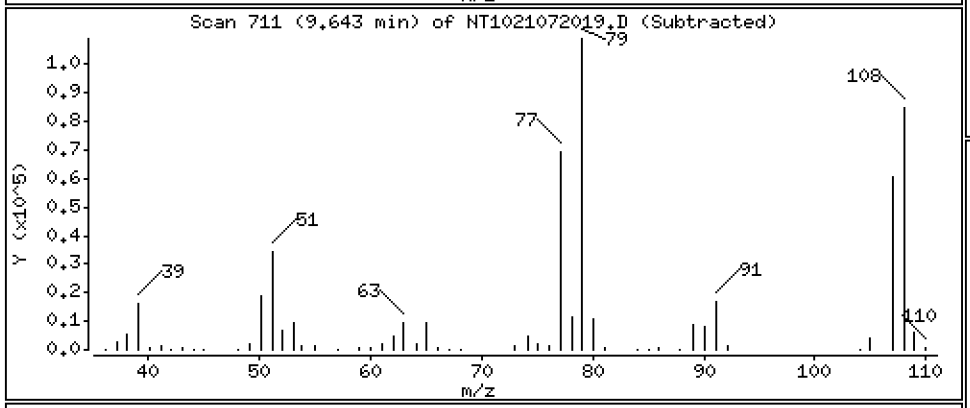
Column phase: ZB-5msi

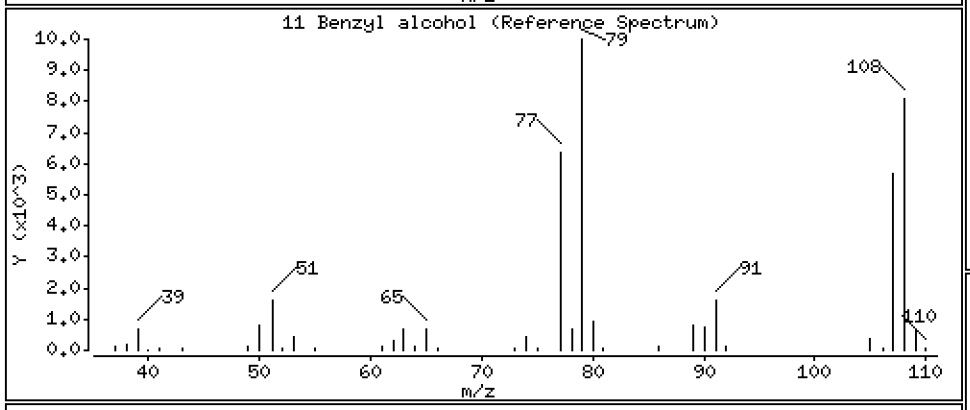
Column diameter: 0.25

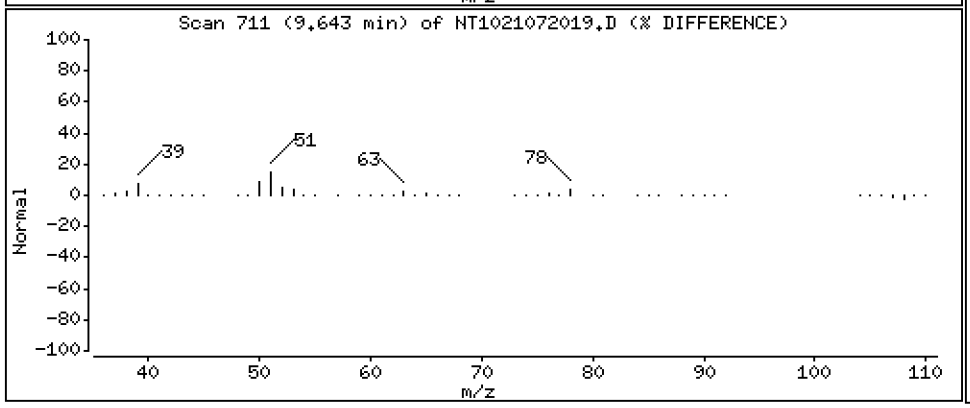
11 Benzyl alcohol

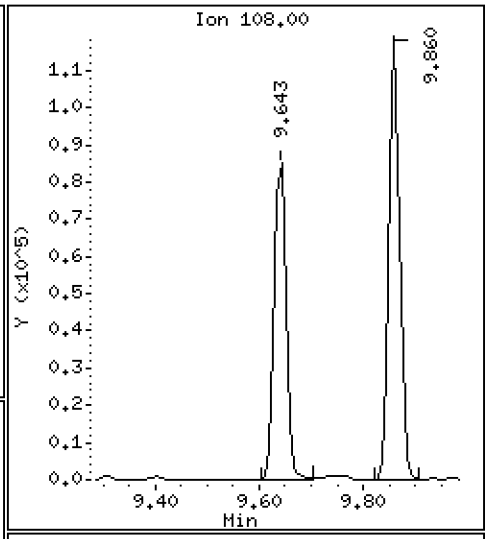
Concentration: 5.468 ug/mL

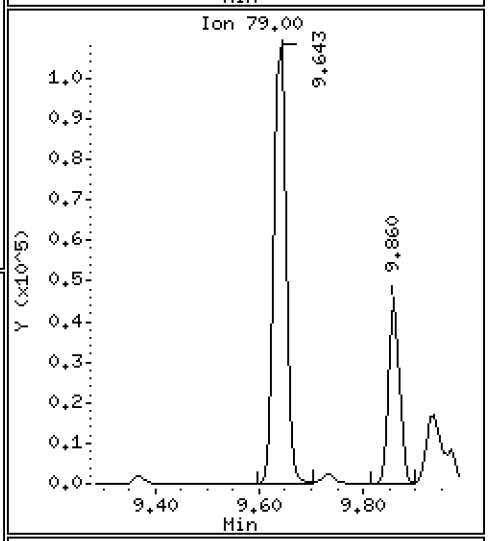


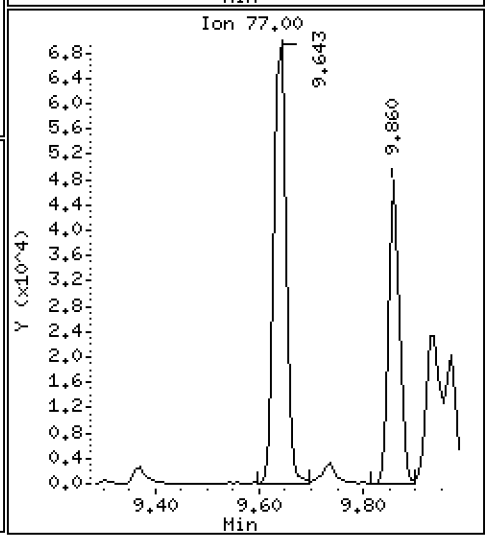












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

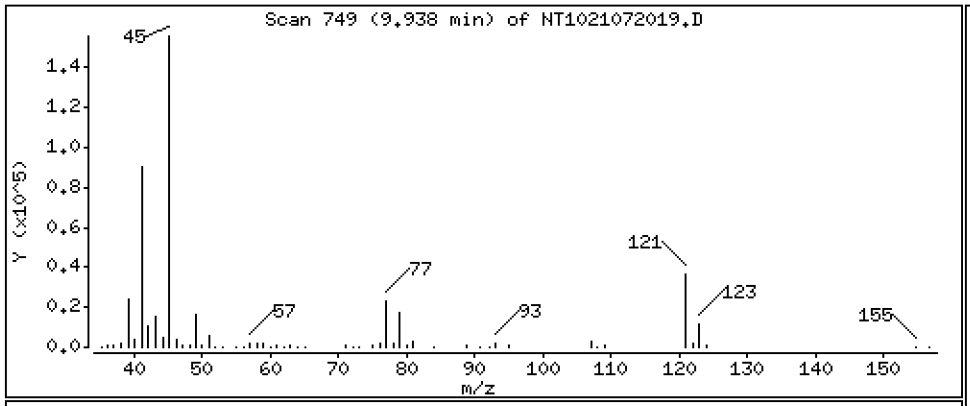
Operator: VTS

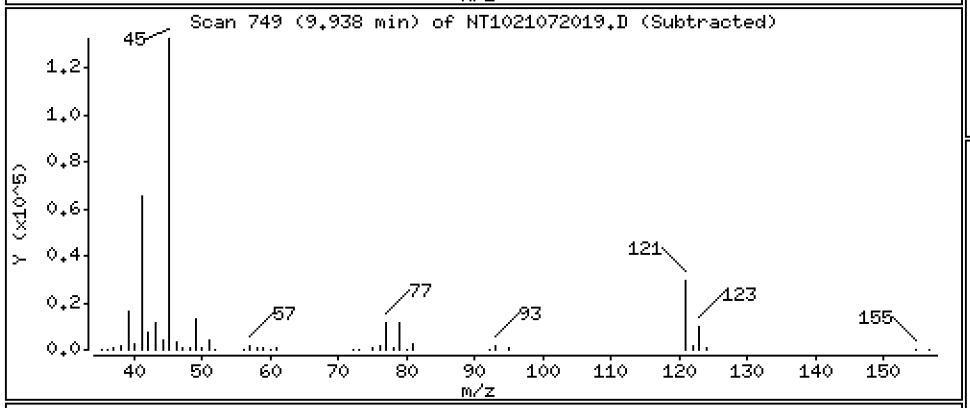
Column phase: ZB-5msi

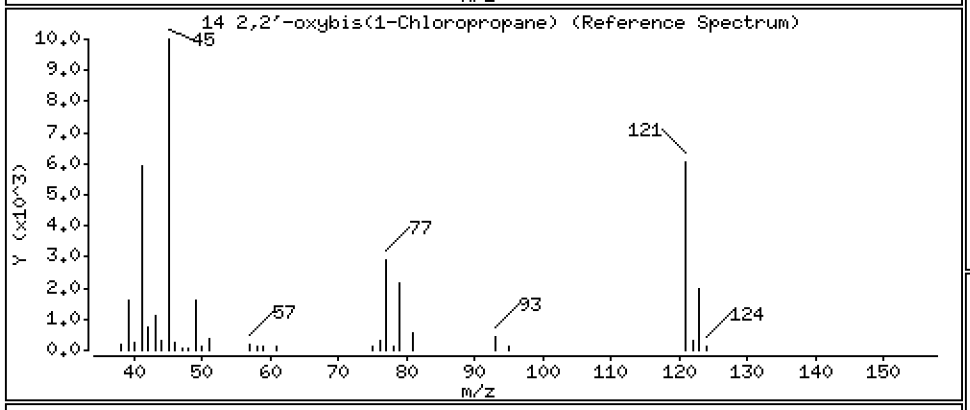
Column diameter: 0.25

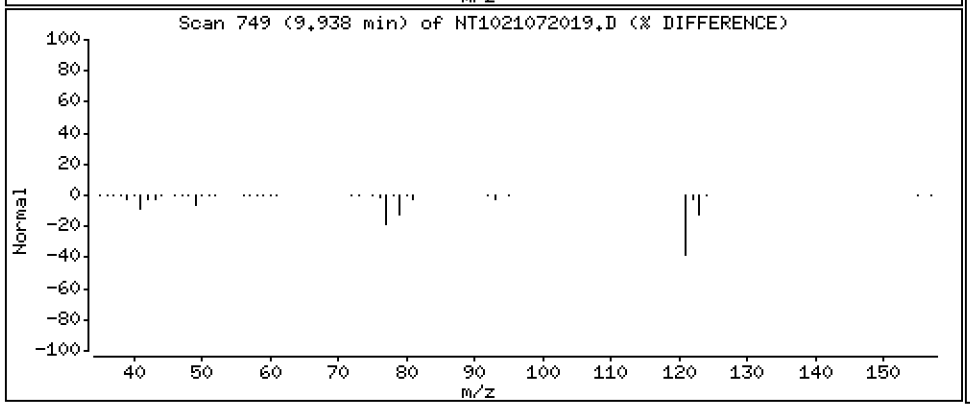
14 2,2'-oxybis(1-Chloropropane)

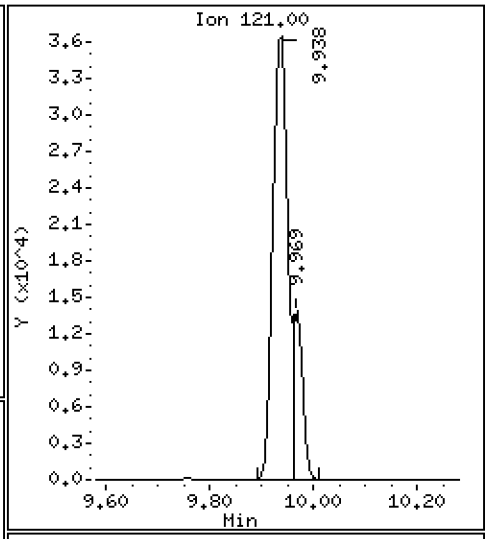
Concentration: 5.035 ug/mL

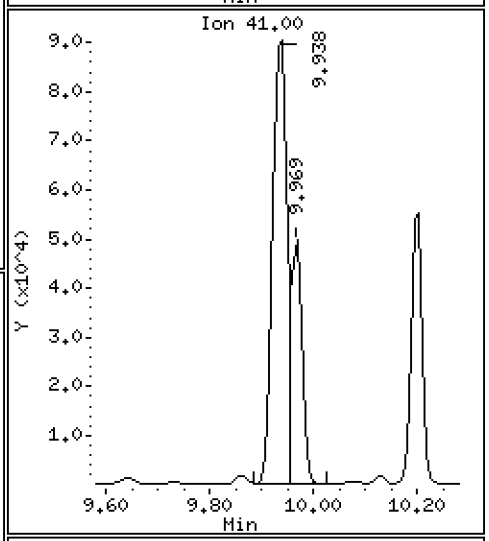


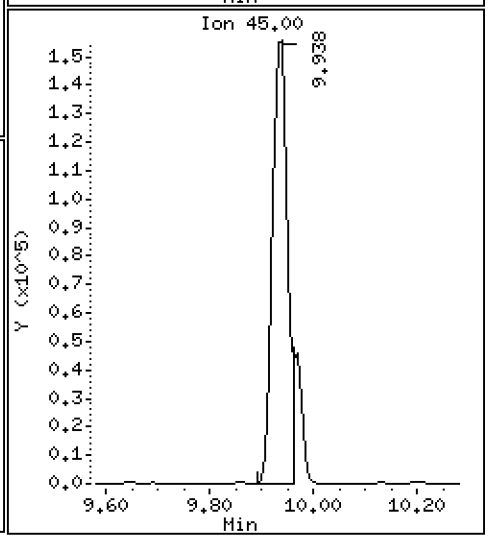












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

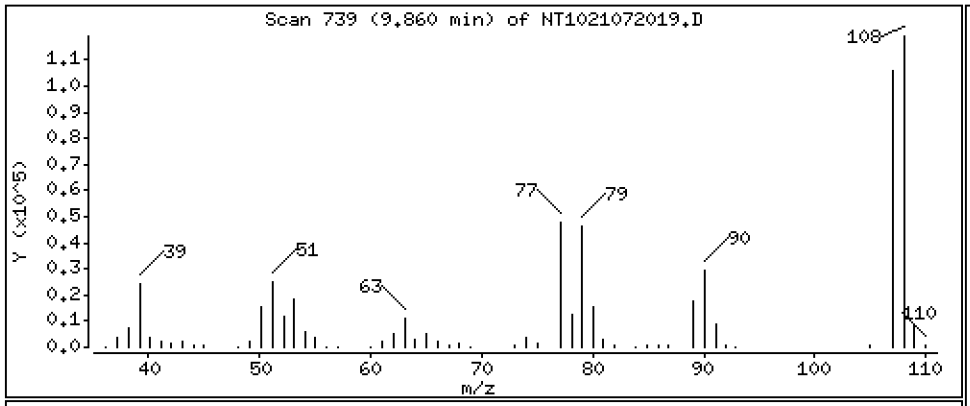
Operator: VTS

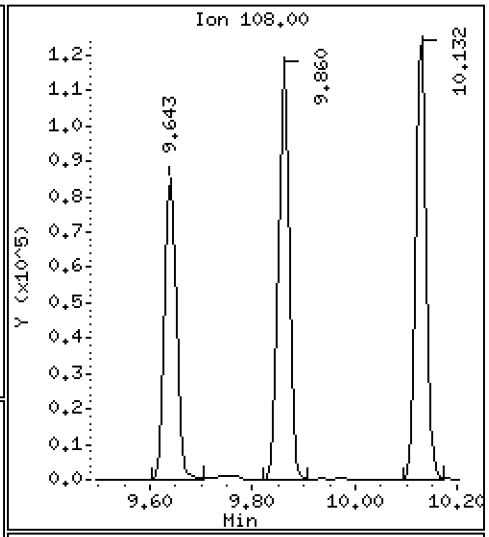
Column phase: ZB-5msi

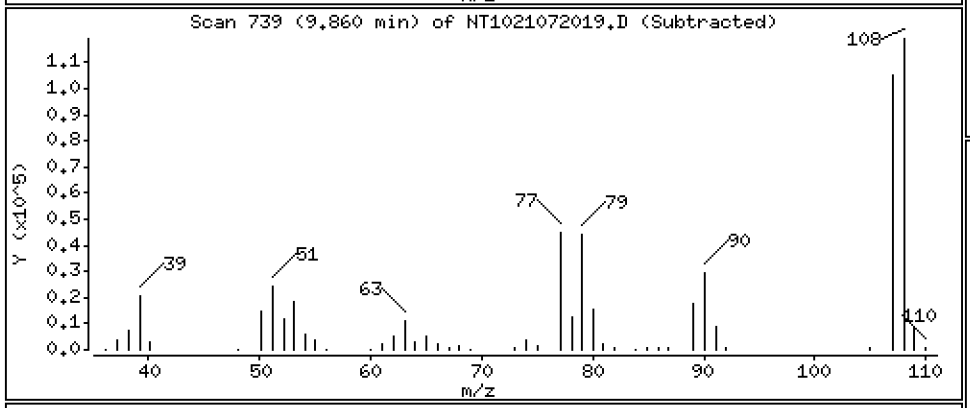
Column diameter: 0.25

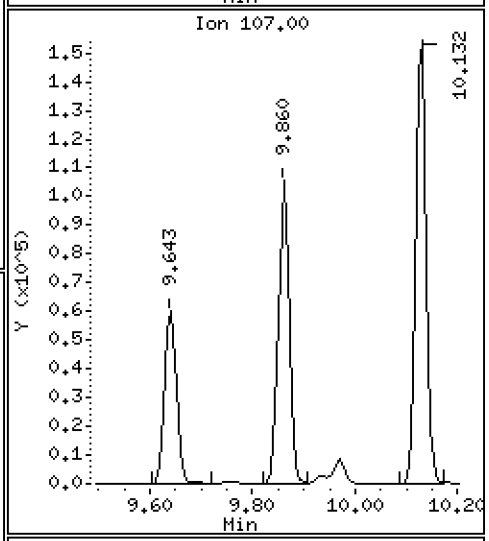
13 2-Methylphenol

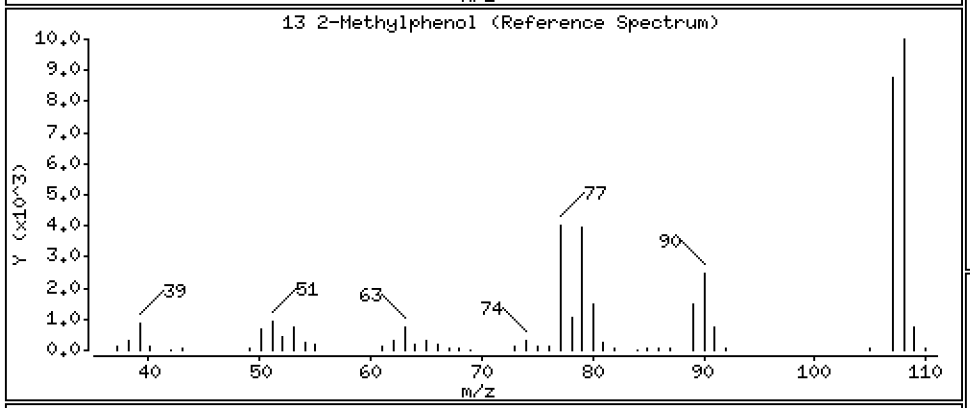
Concentration: 5.329 ug/mL

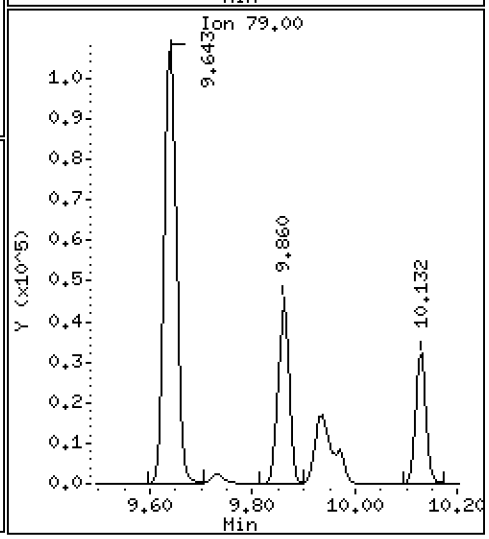


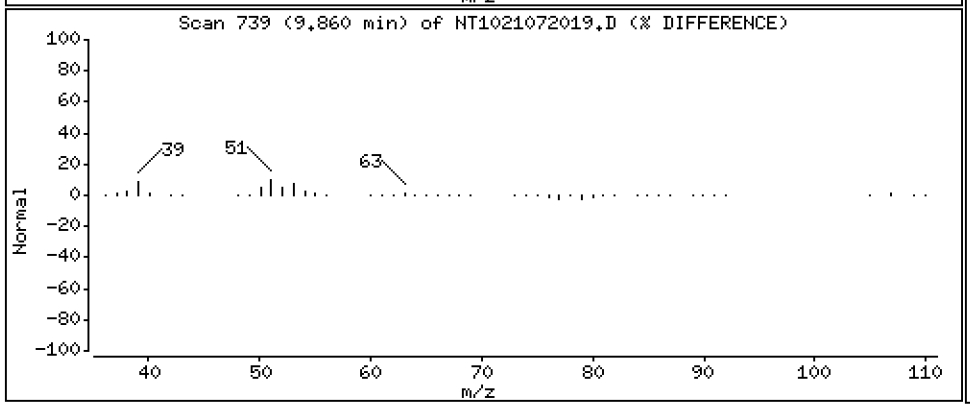












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

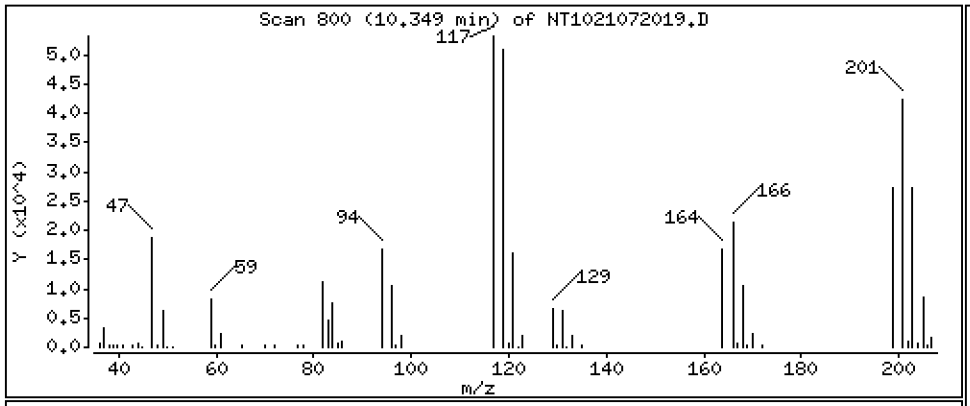
Operator: VTS

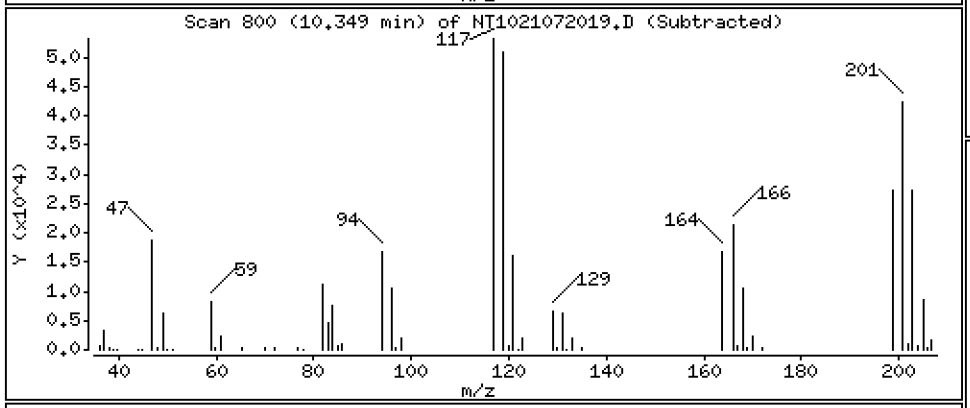
Column phase: ZB-5msi

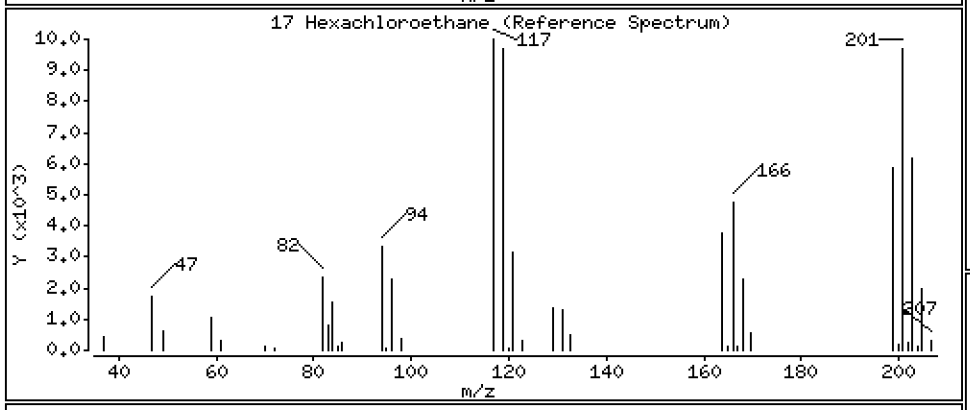
Column diameter: 0.25

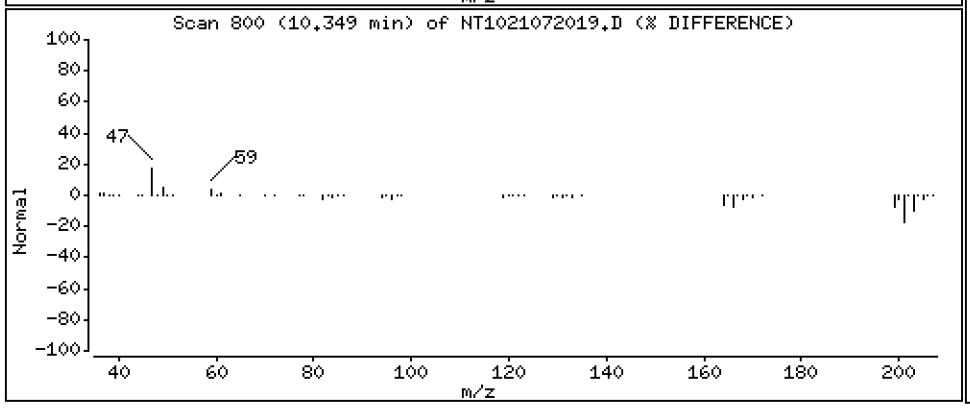
17 Hexachloroethane

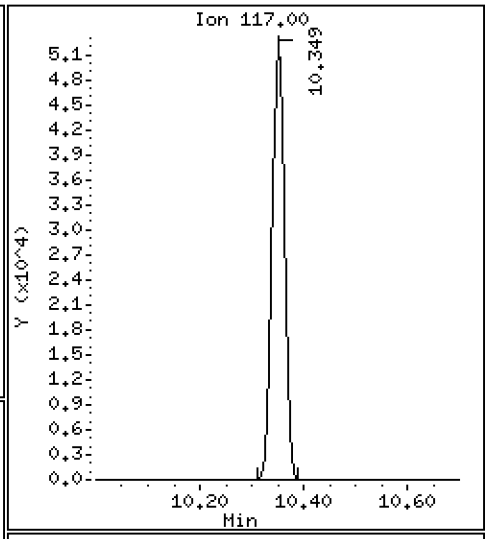
Concentration: 5.324 ug/mL

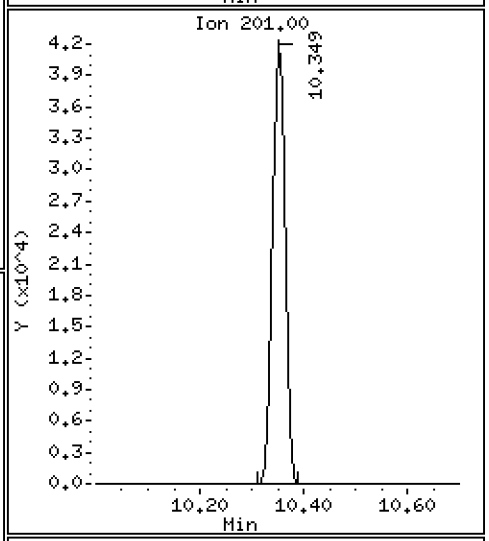


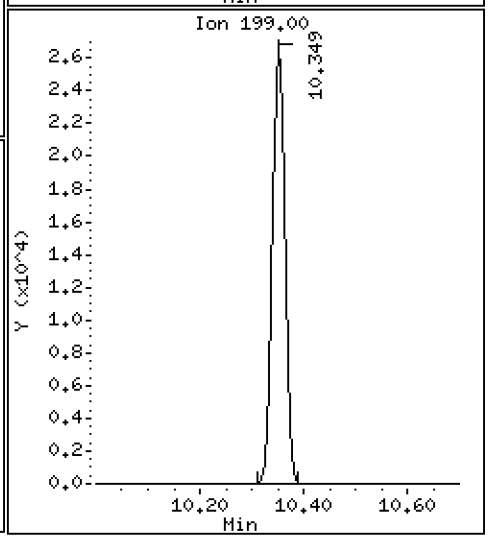












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

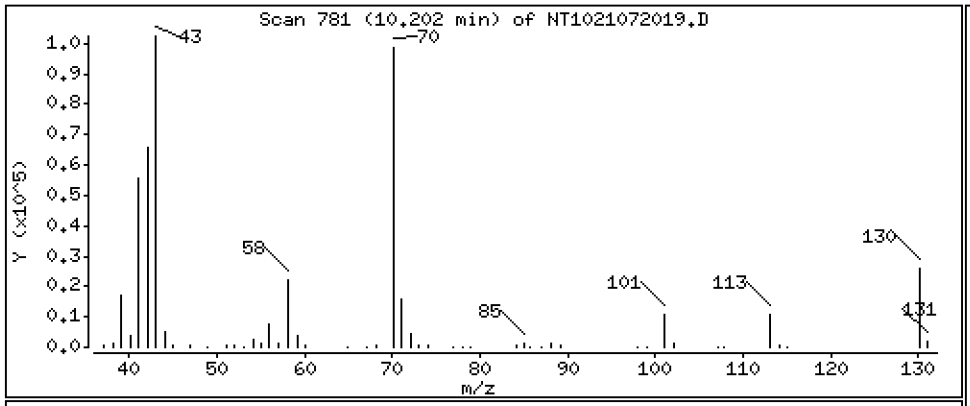
Operator: VTS

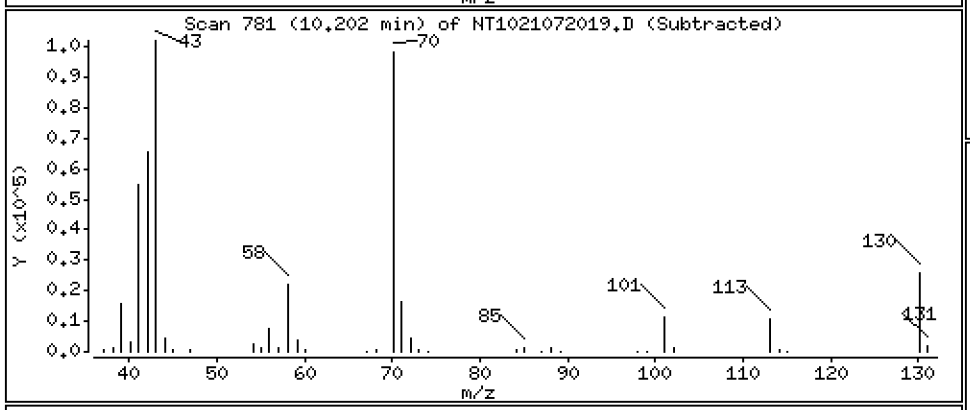
Column phase: ZB-5msi

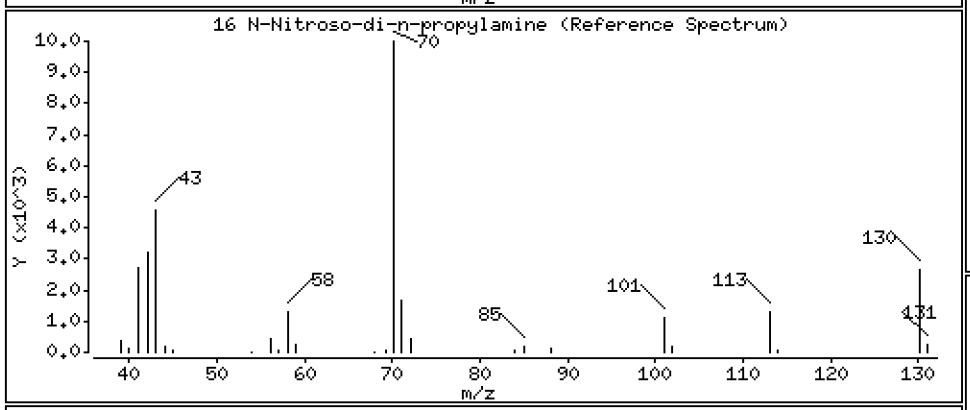
Column diameter: 0.25

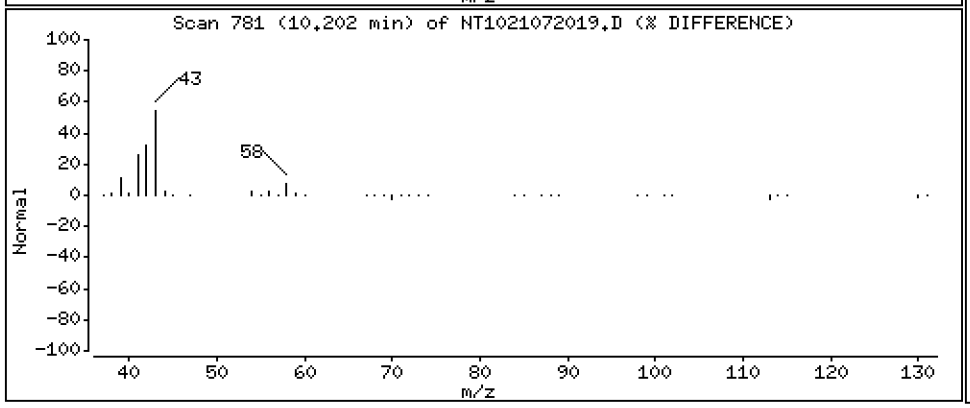
16 N-Nitroso-di-n-propylamine

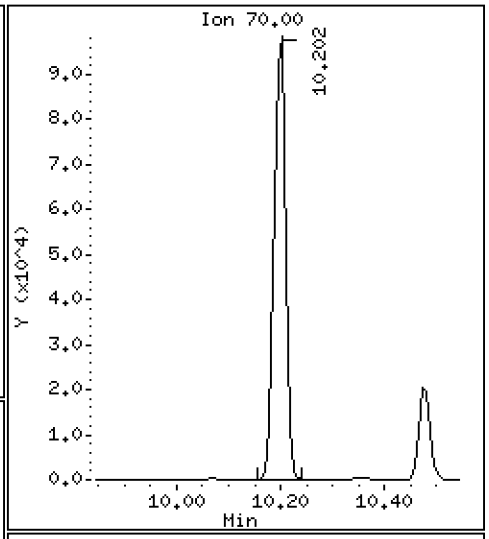
Concentration: 5.329 ug/mL

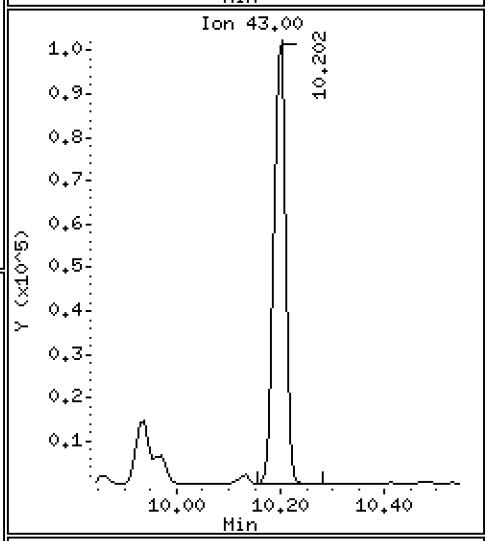


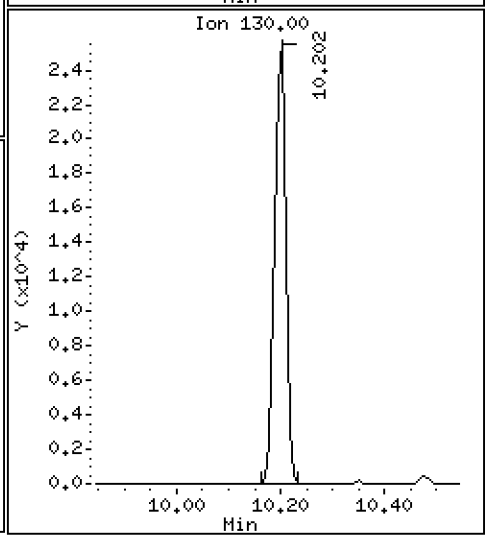












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

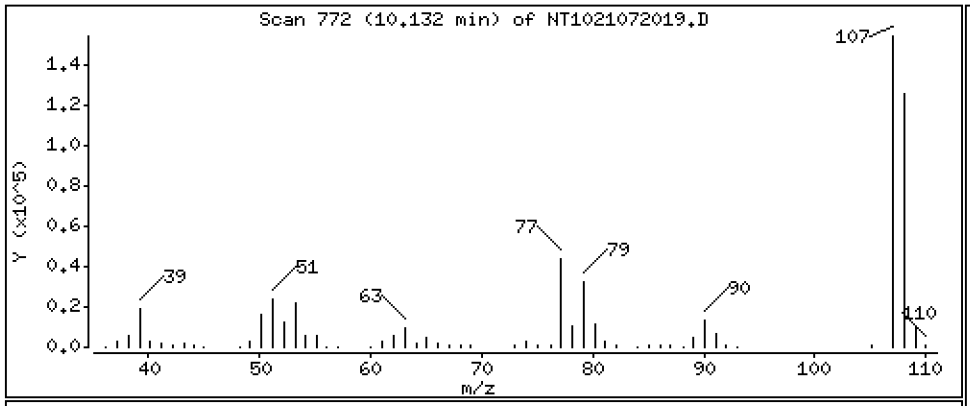
Operator: VTS

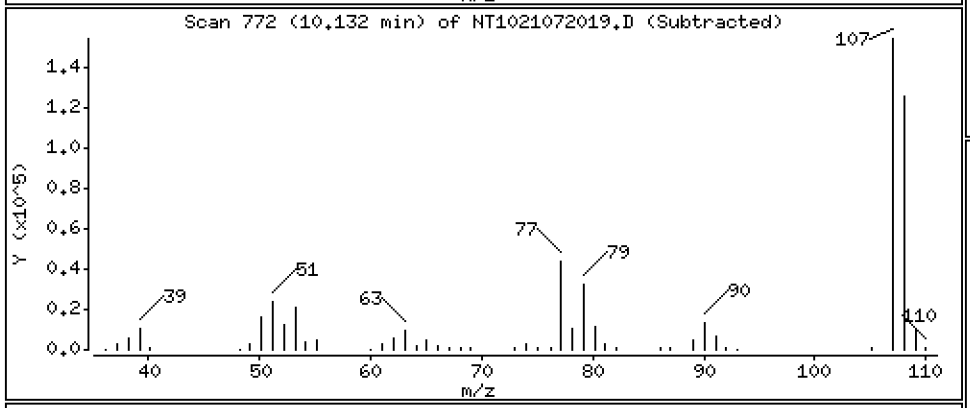
Column phase: ZB-5msi

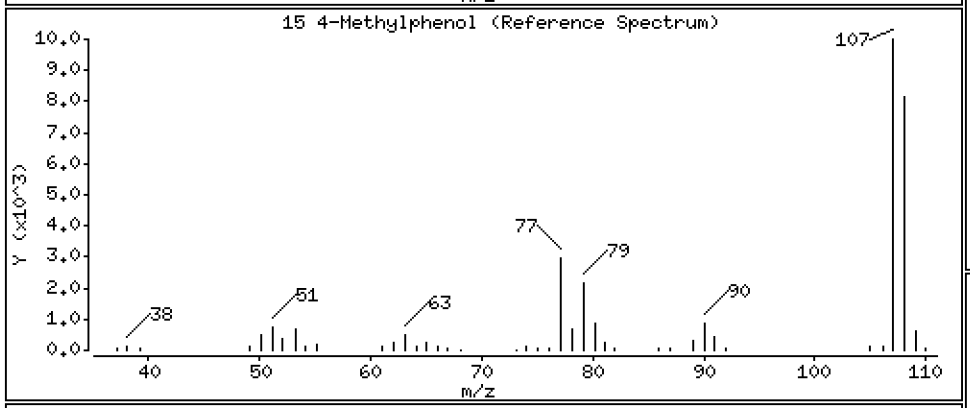
Column diameter: 0.25

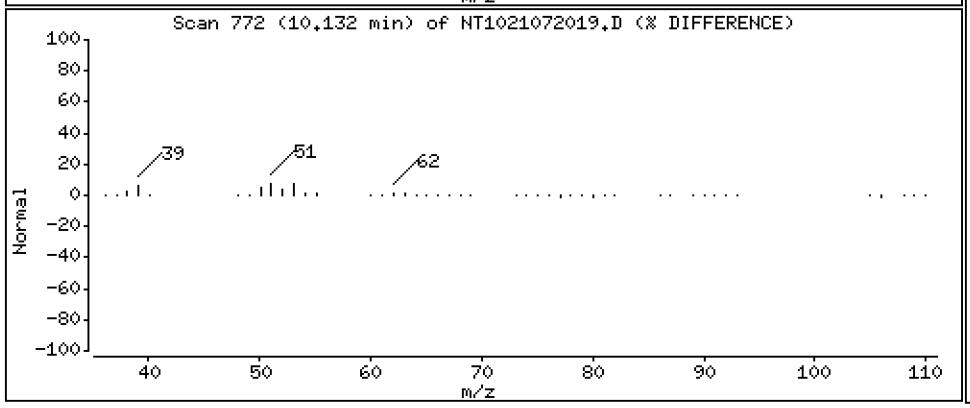
15 4-Methylphenol

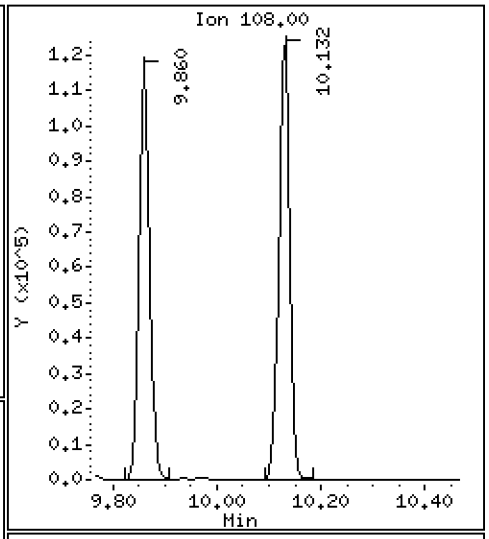
Concentration: 5.349 ug/mL

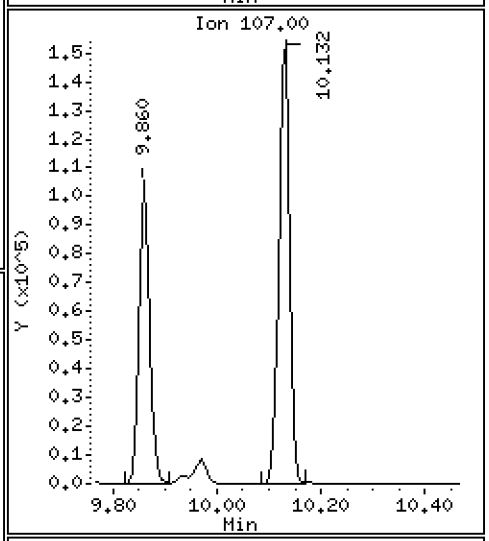


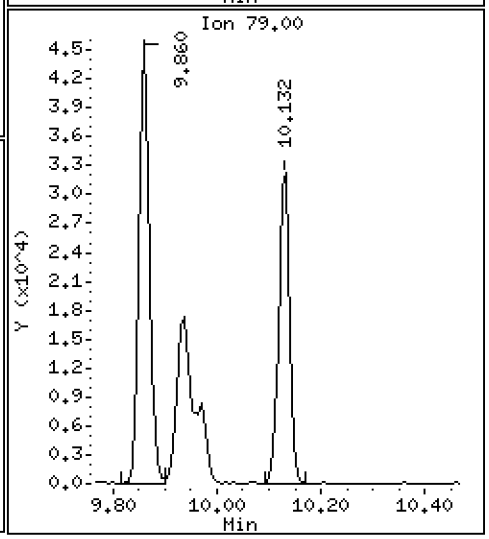












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

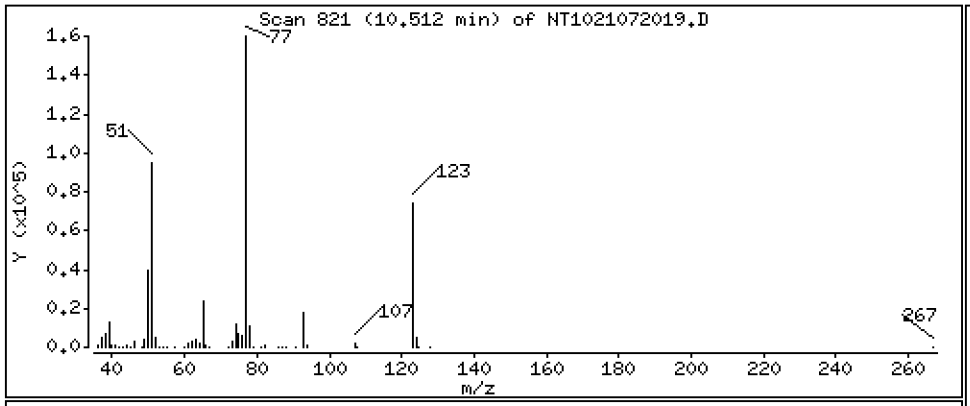
Operator: VTS

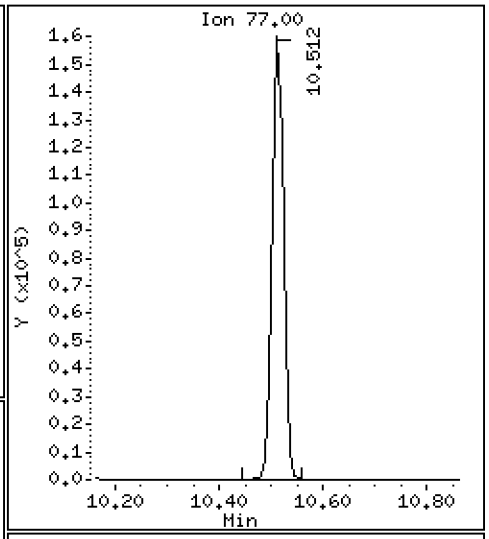
Column phase: ZB-5msi

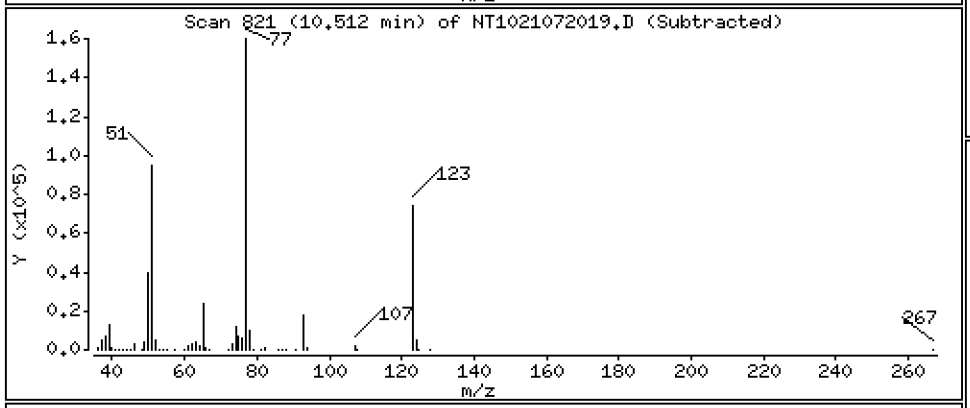
Column diameter: 0.25

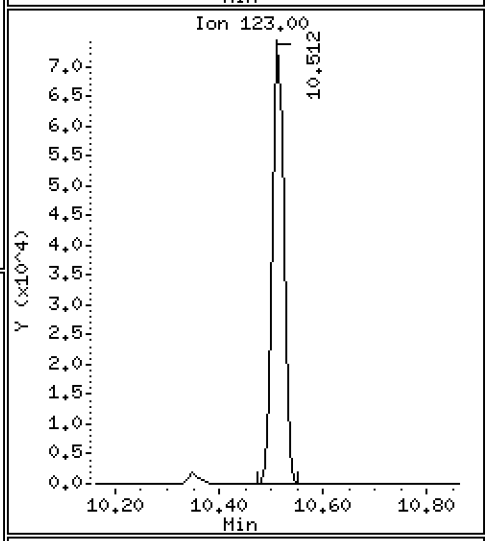
19 Nitrobenzene

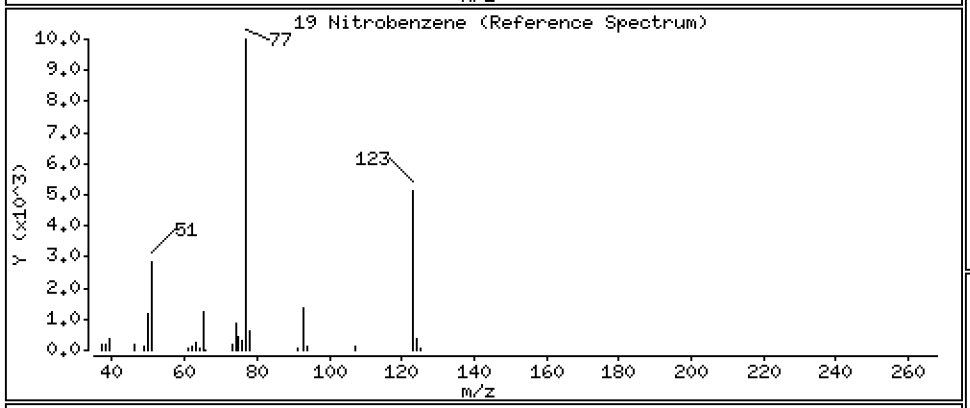
Concentration: 5.353 ug/mL

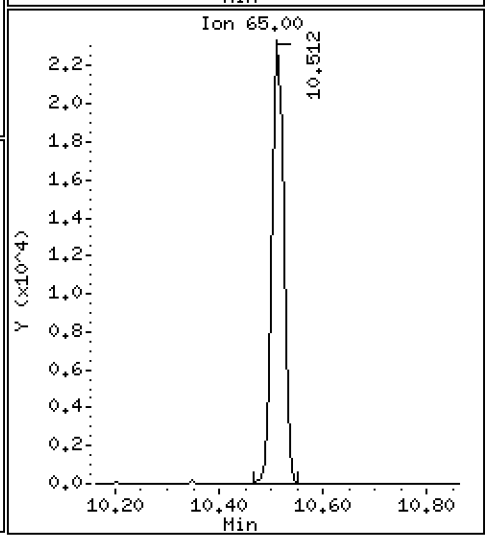


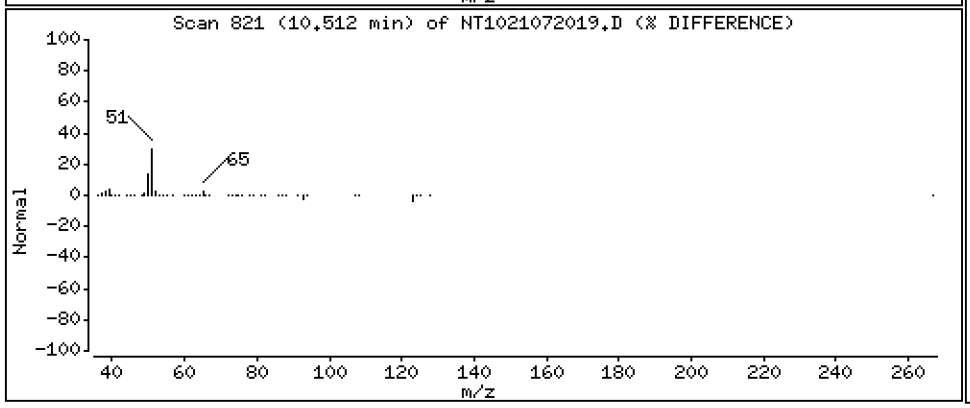












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

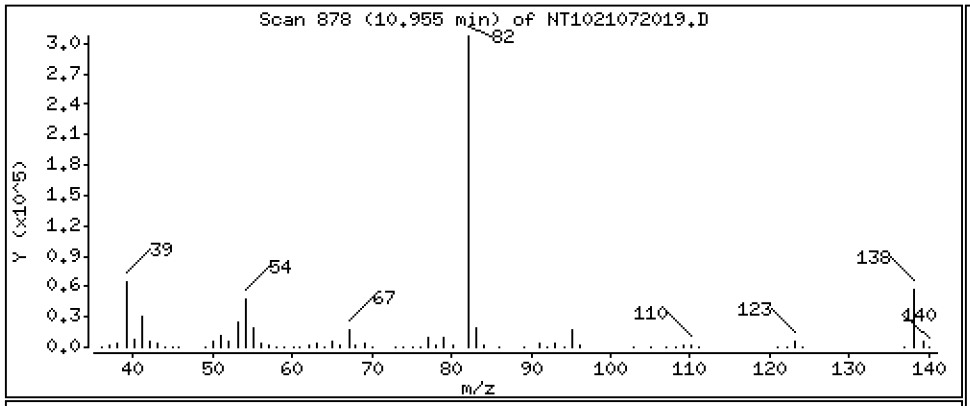
Operator: VTS

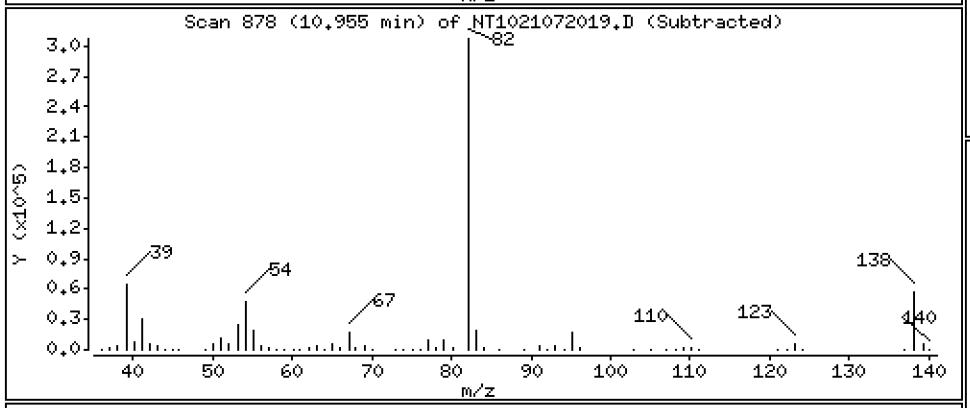
Column phase: ZB-5msi

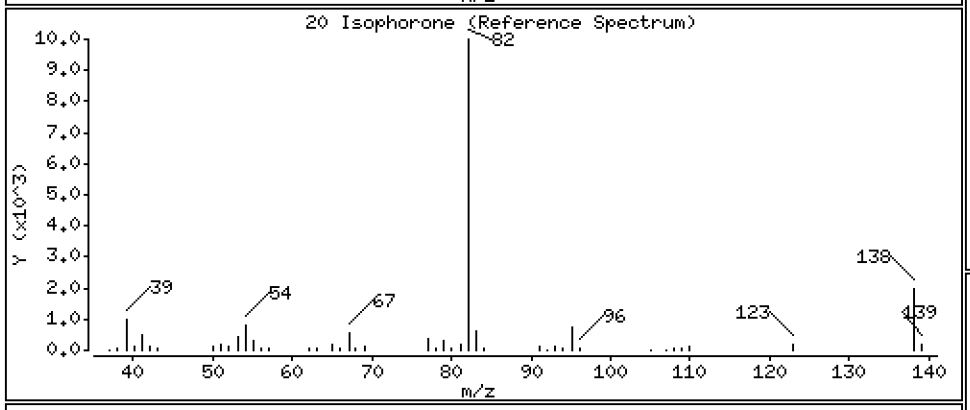
Column diameter: 0.25

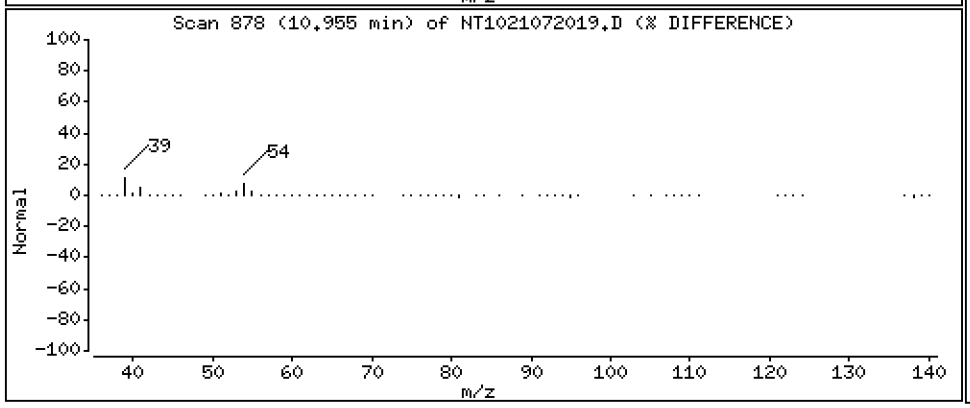
20 Isophorone

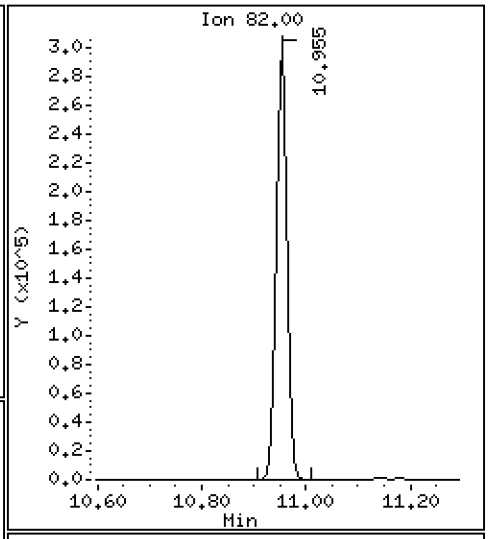
Concentration: 5.595 ug/mL

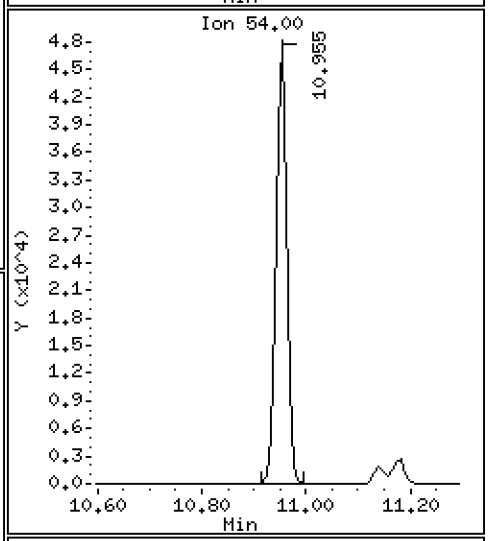


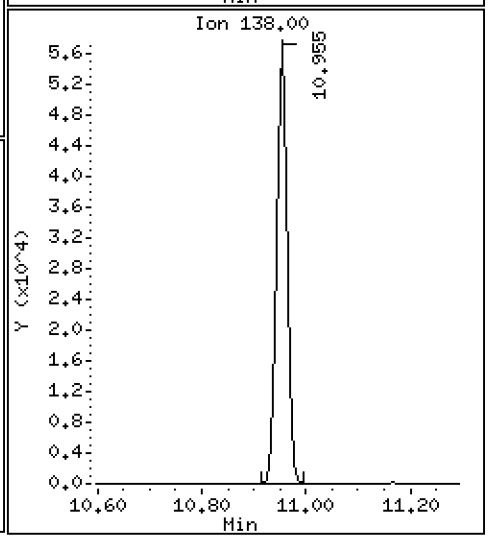












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

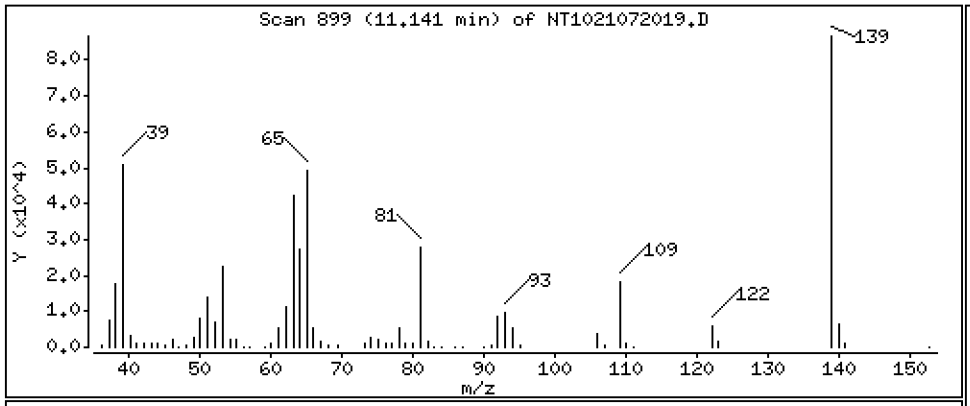
Operator: VTS

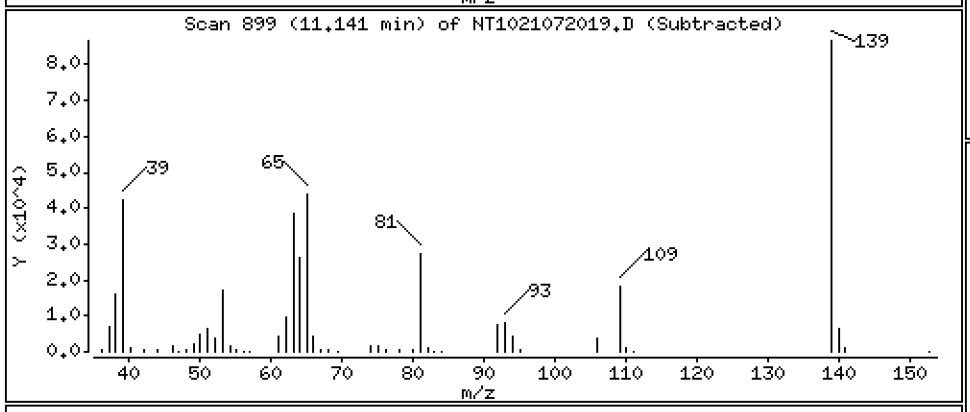
Column phase: ZB-5msi

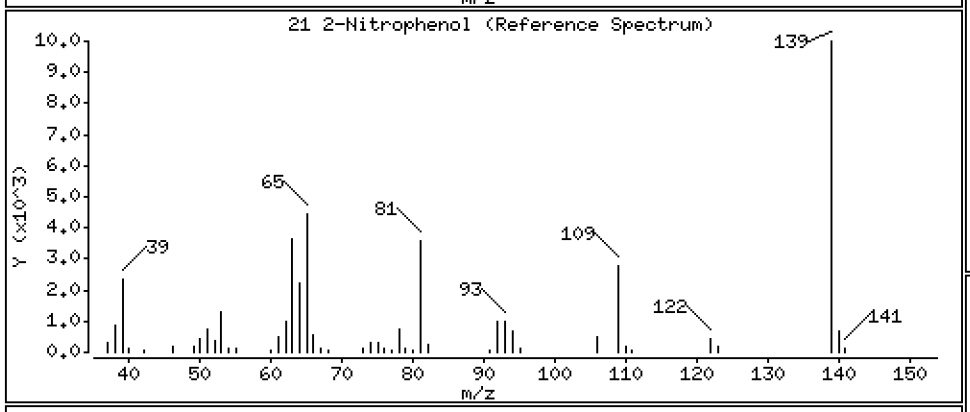
Column diameter: 0.25

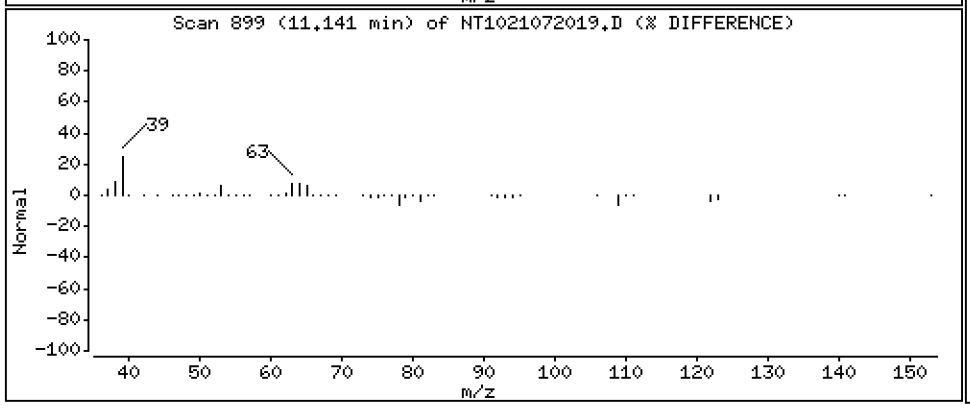
21 2-Nitrophenol

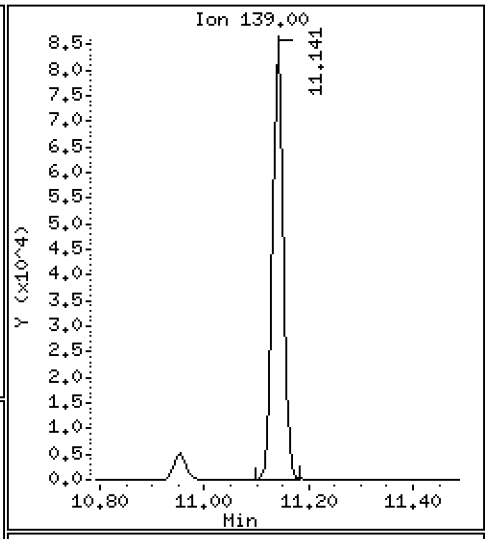
Concentration: 5.312 ug/mL

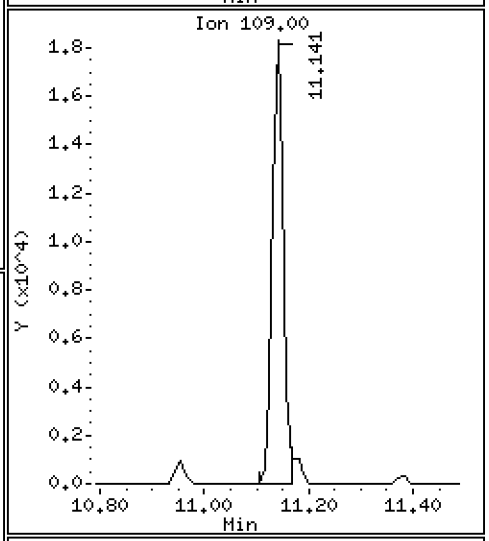


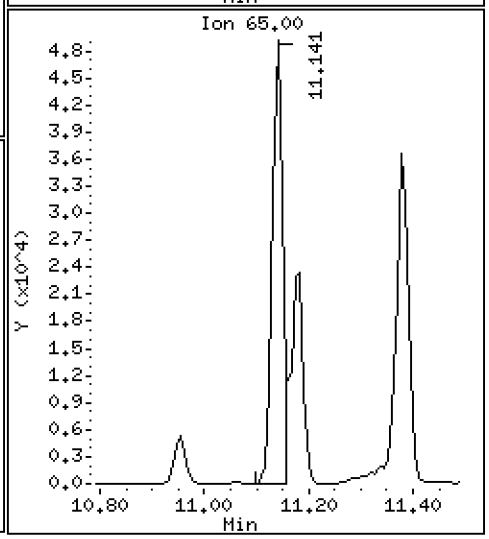












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

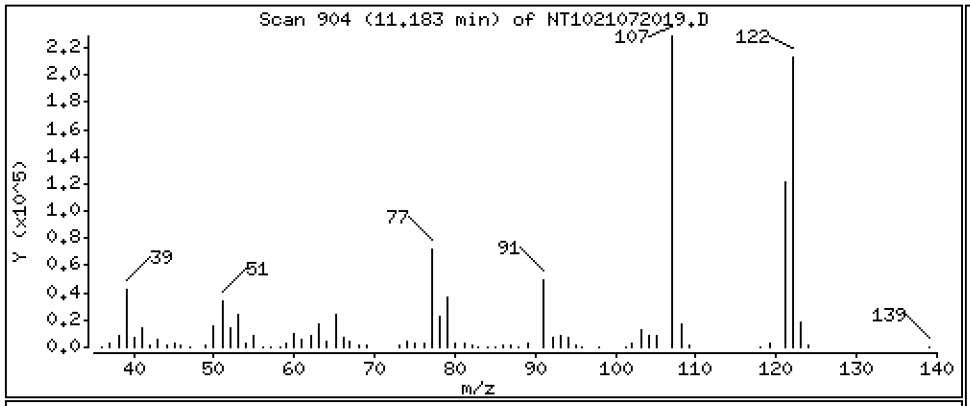
Operator: VTS

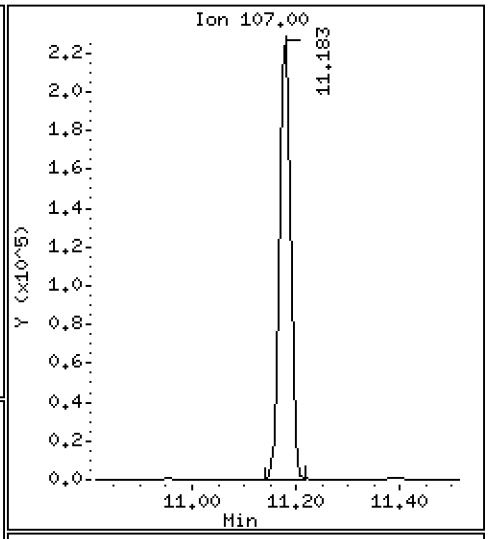
Column phase: ZB-5msi

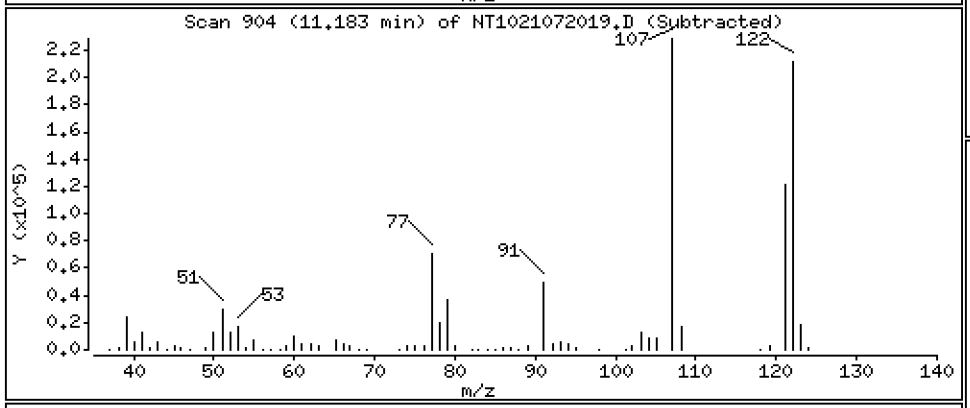
Column diameter: 0.25

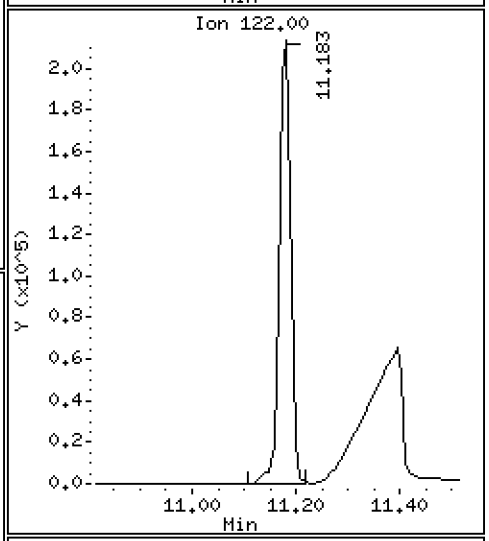
22 2,4-Dimethylphenol

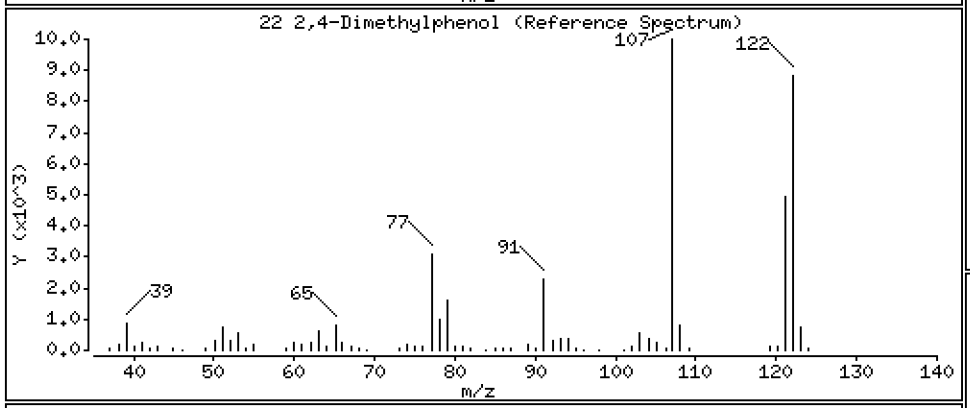
Concentration: 10.23 ug/mL

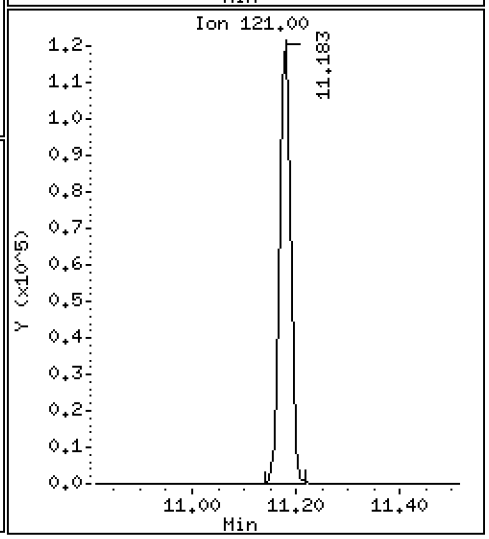


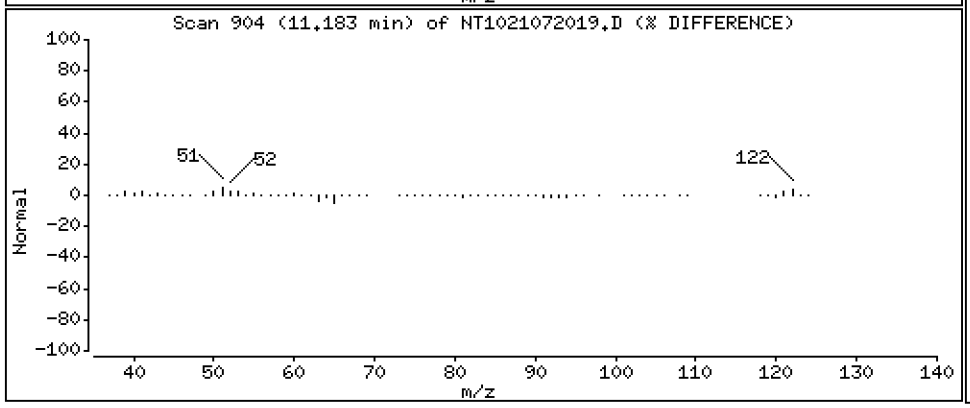












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

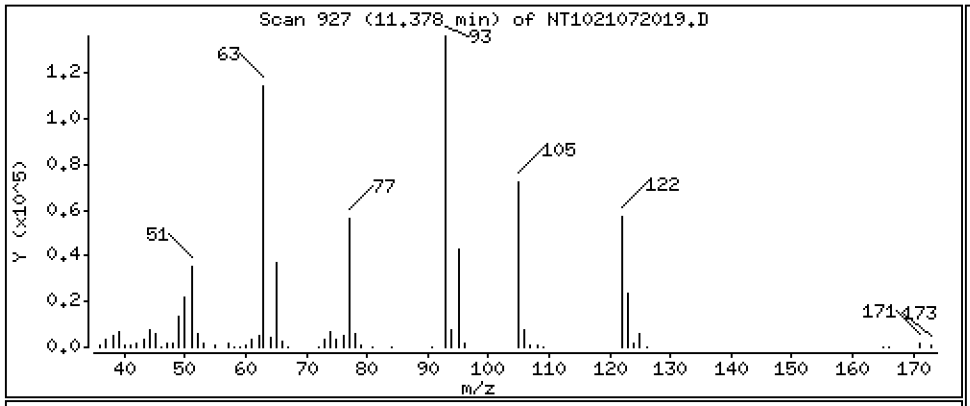
Operator: VTS

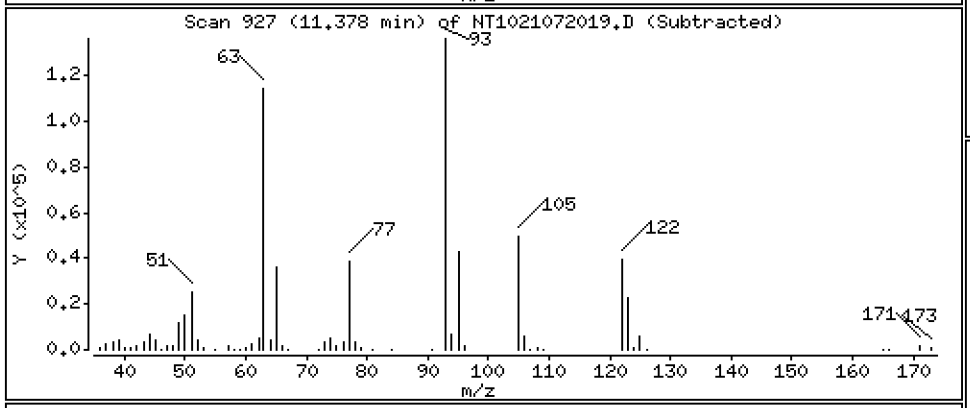
Column phase: ZB-5msi

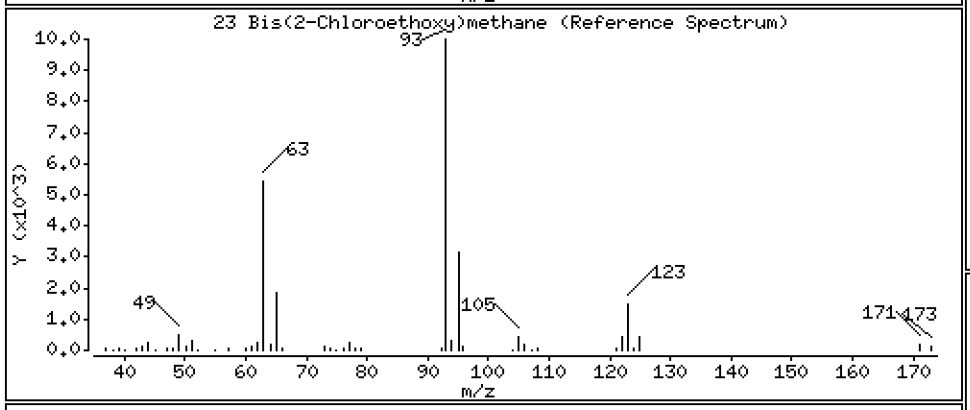
Column diameter: 0.25

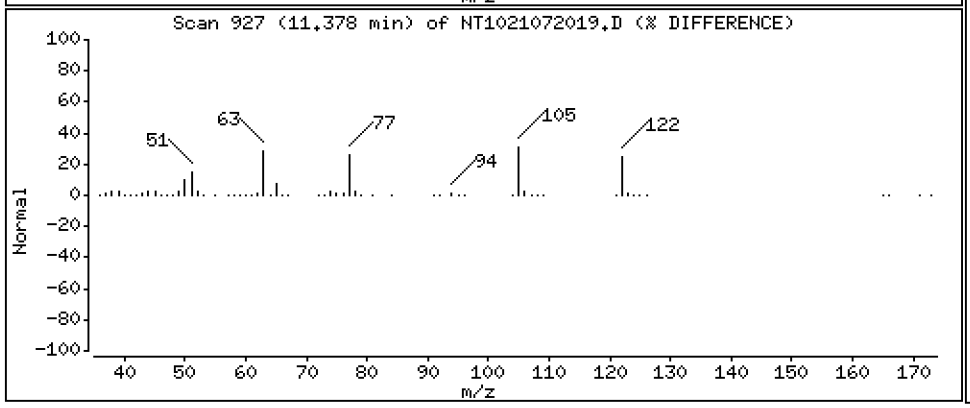
23 Bis(2-Chloroethoxy)methane

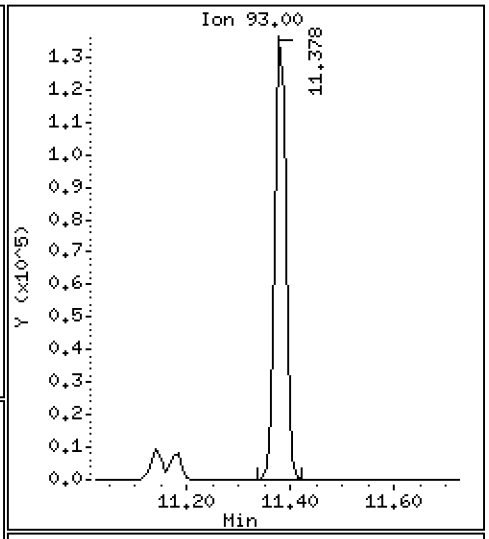
Concentration: 4.807 ug/mL

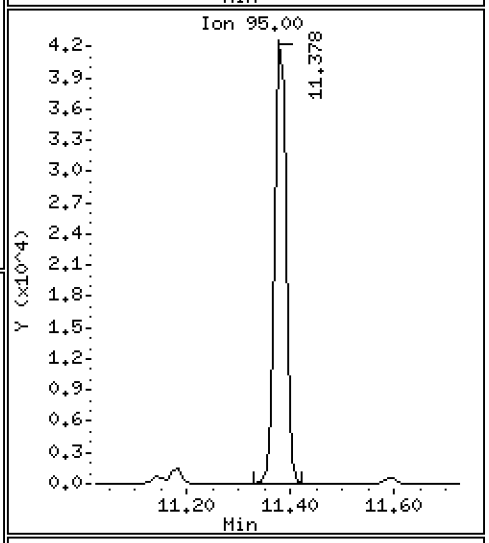


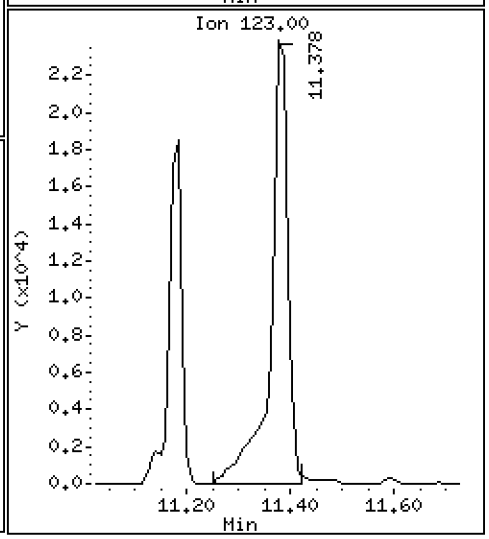












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

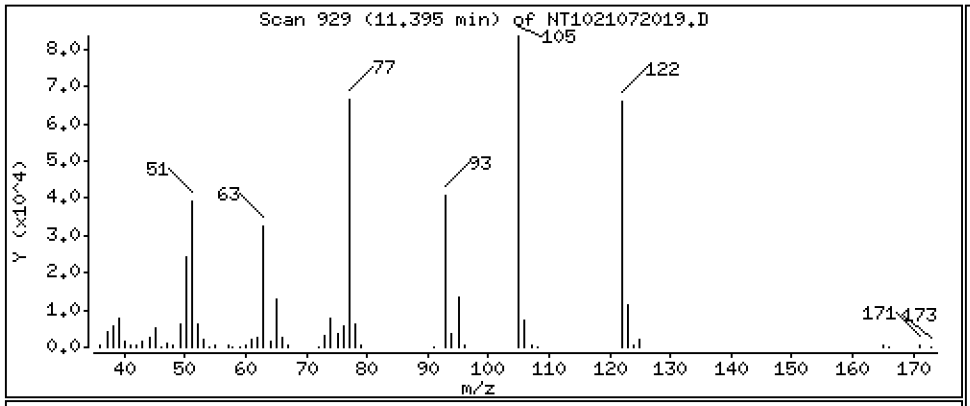
Operator: VTS

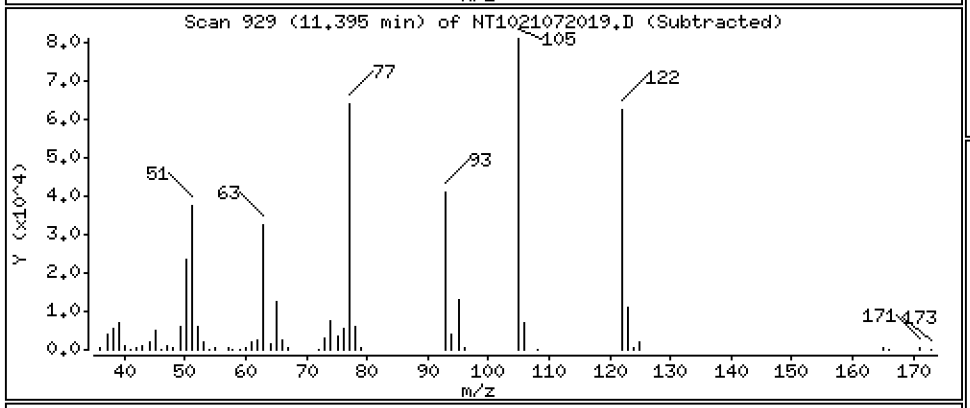
Column phase: ZB-5msi

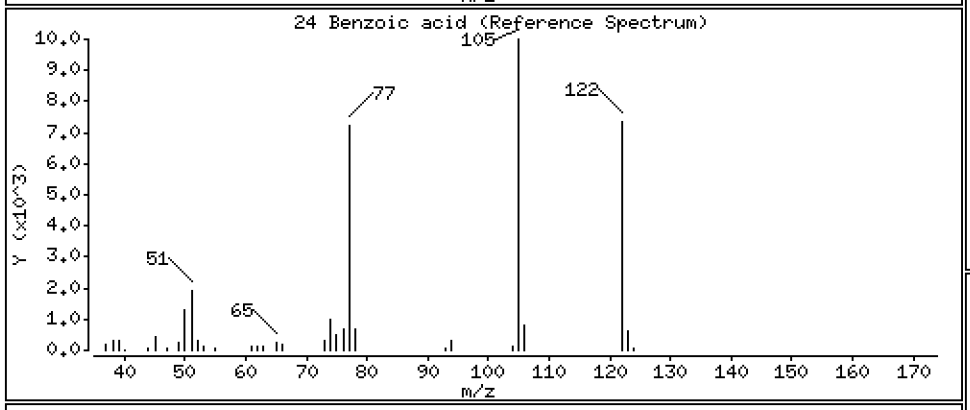
Column diameter: 0.25

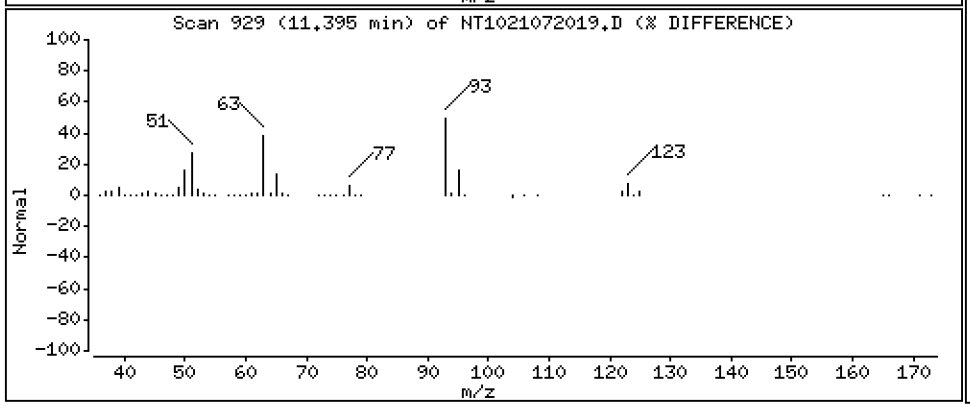
24 Benzoic acid

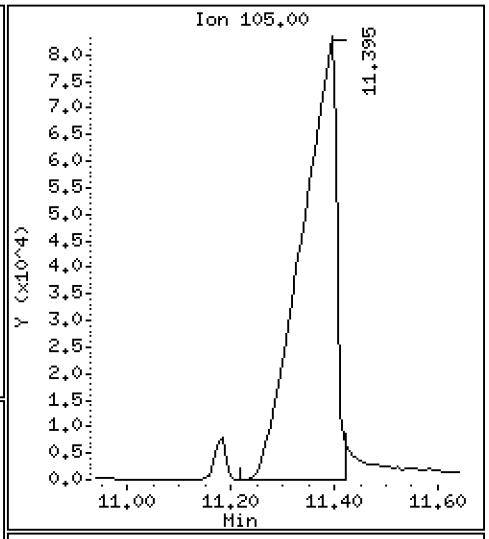
Concentration: 20.34 ug/mL

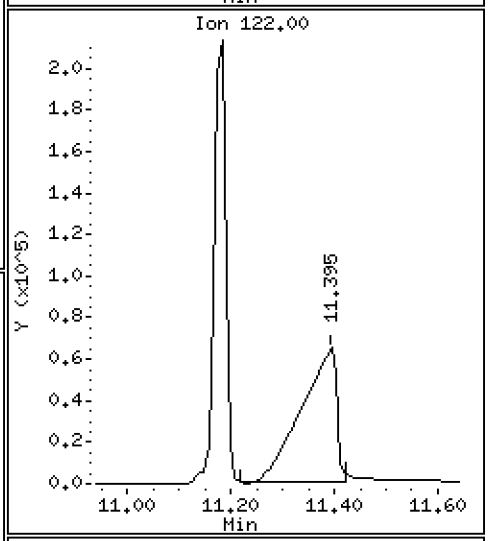


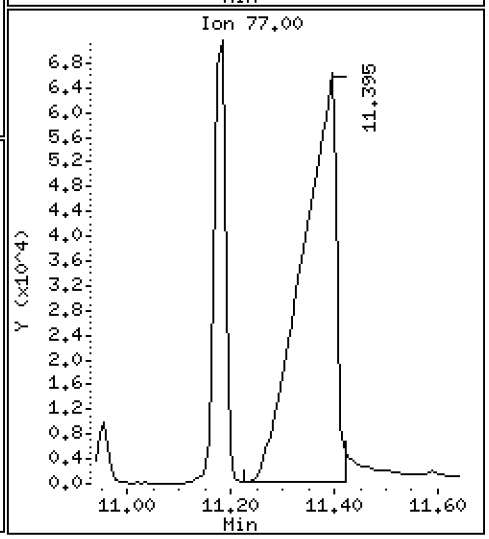












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

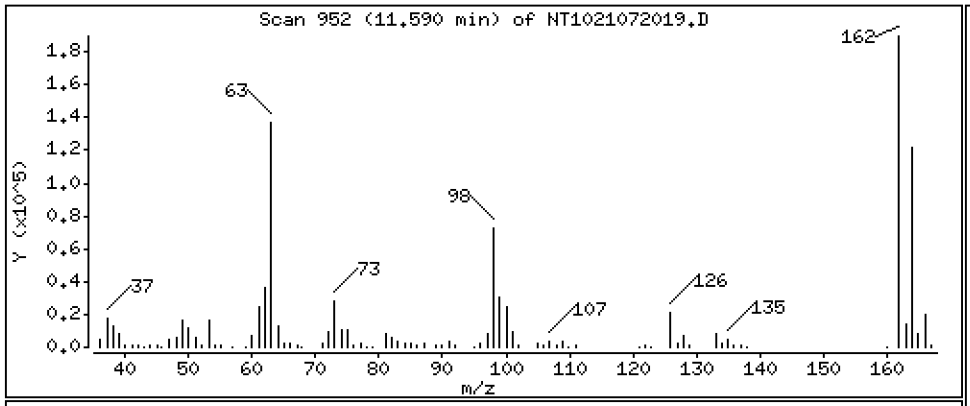
Operator: VTS

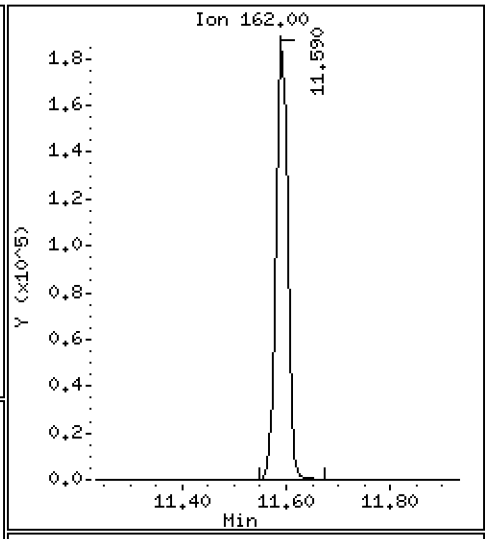
Column phase: ZB-5msi

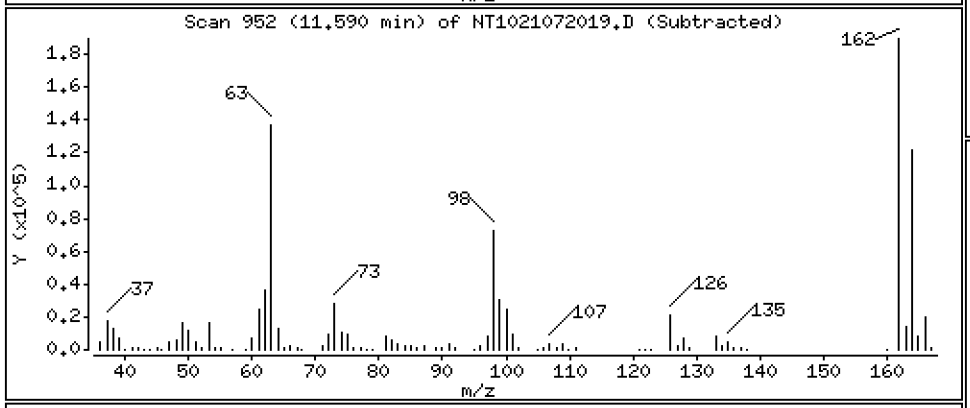
Column diameter: 0.25

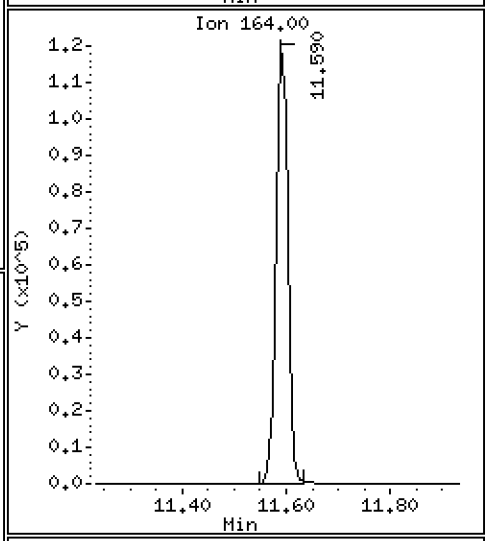
25 2,4-Dichlorophenol

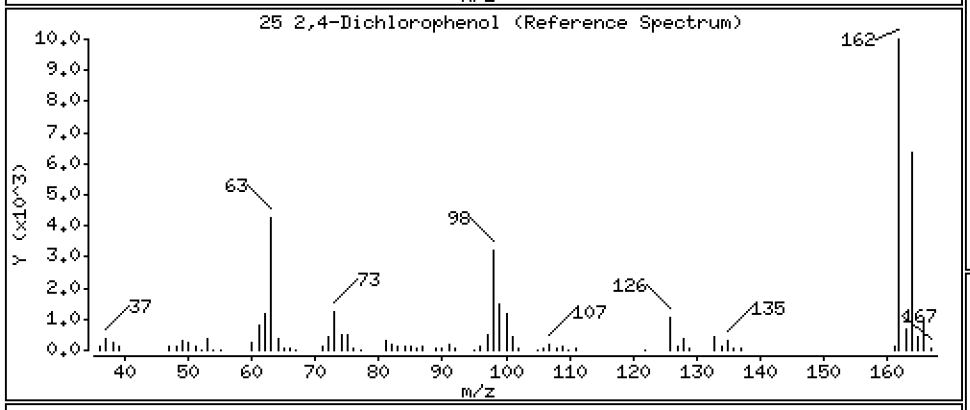
Concentration: 10.38 ug/mL

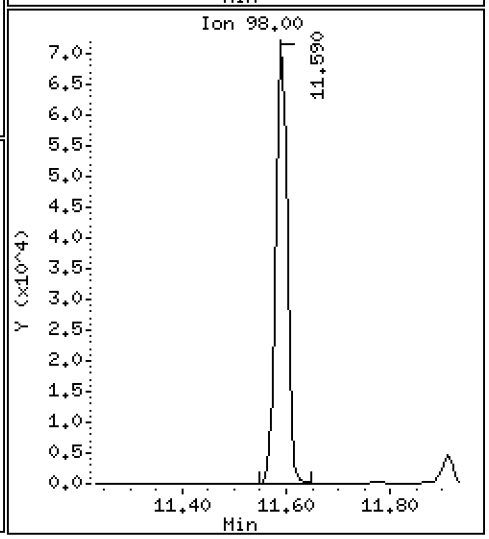


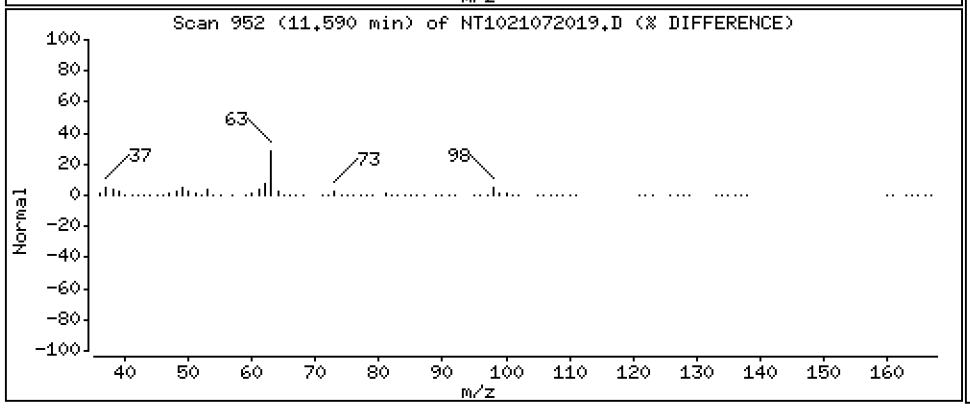












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

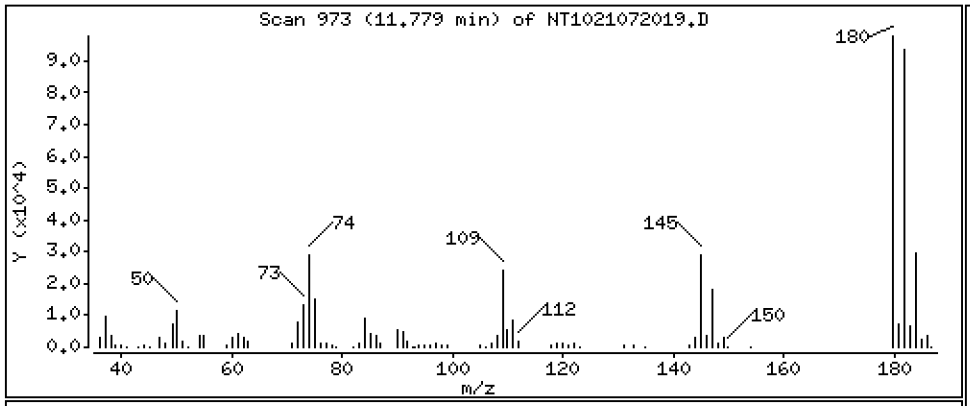
Operator: VTS

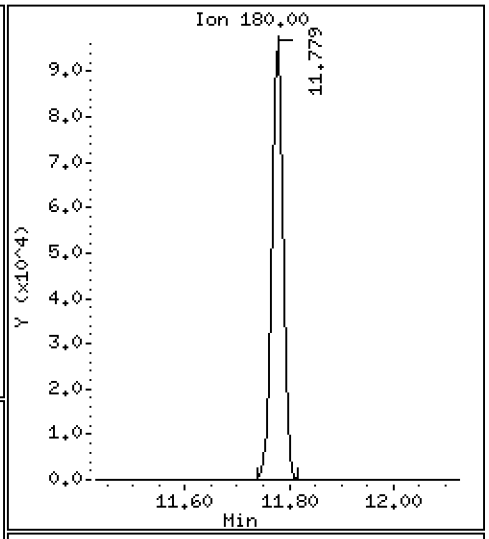
Column phase: ZB-5msi

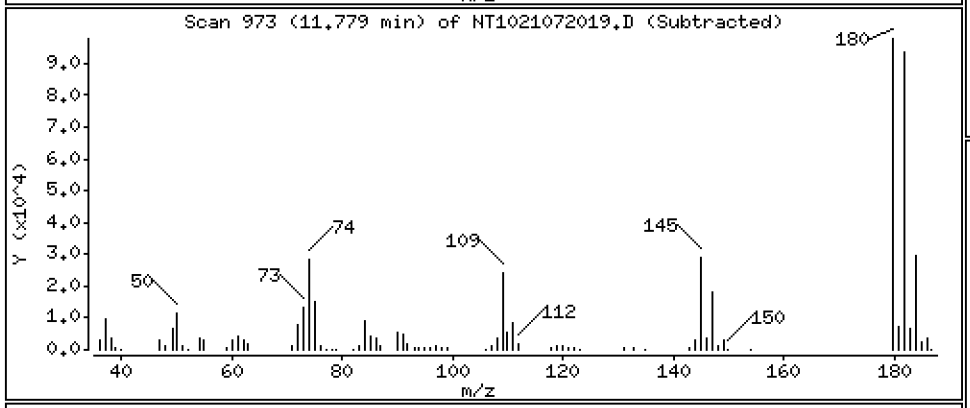
Column diameter: 0.25

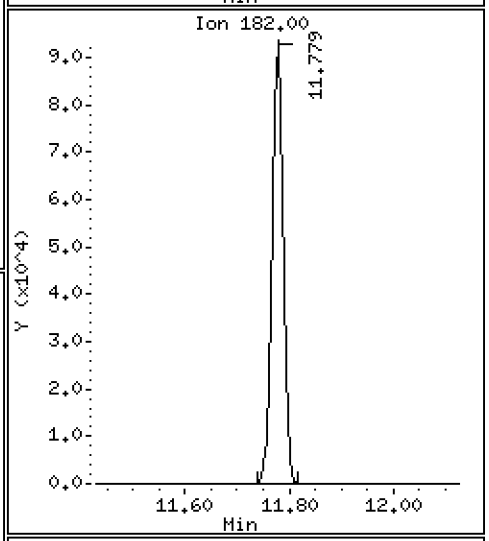
26 1,2,4-Trichlorobenzene

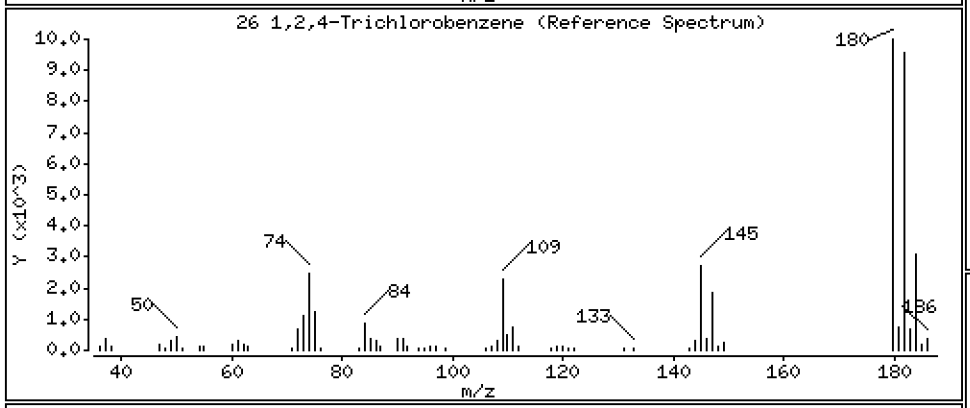
Concentration: 4.803 ug/mL

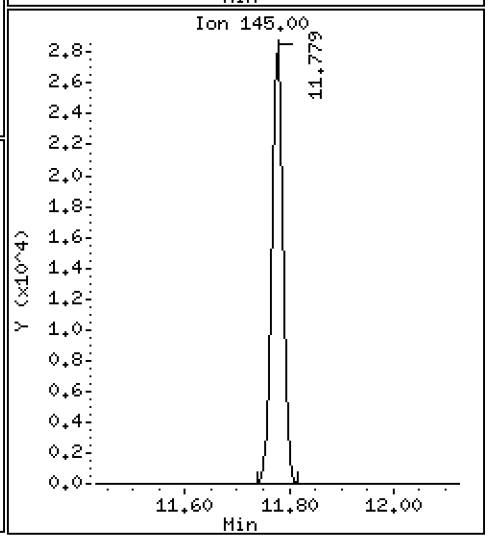


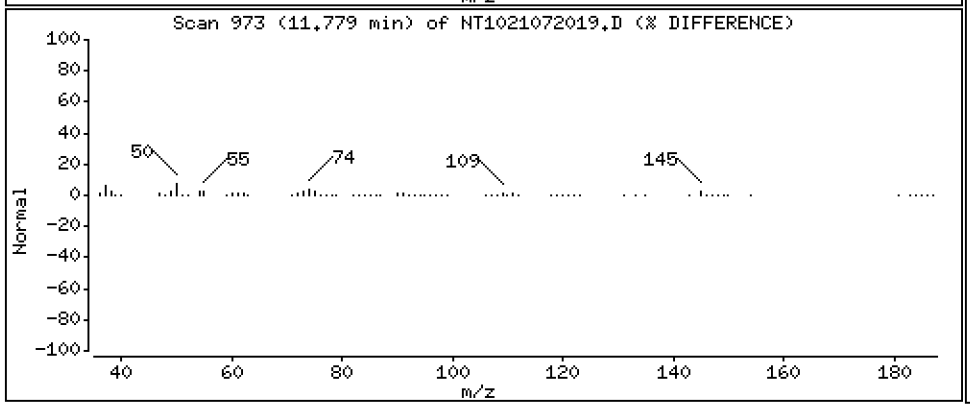












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

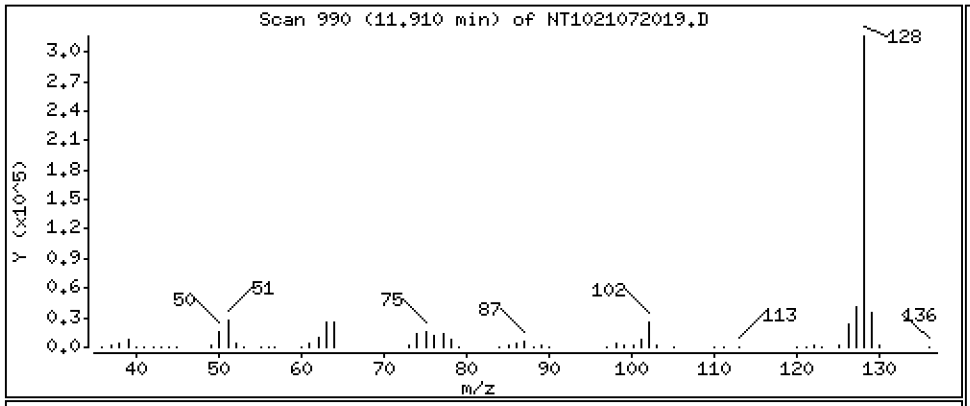
Operator: VTS

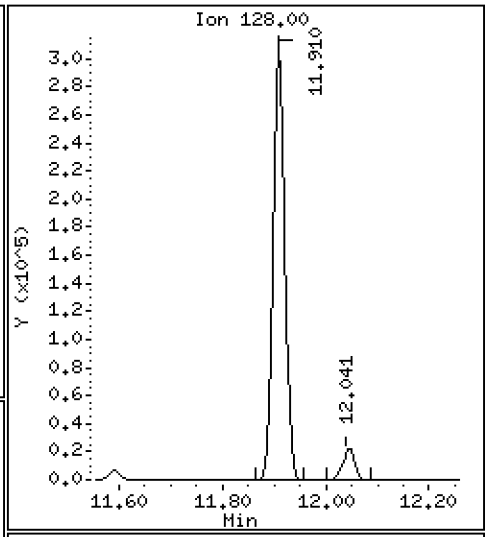
Column phase: ZB-5msi

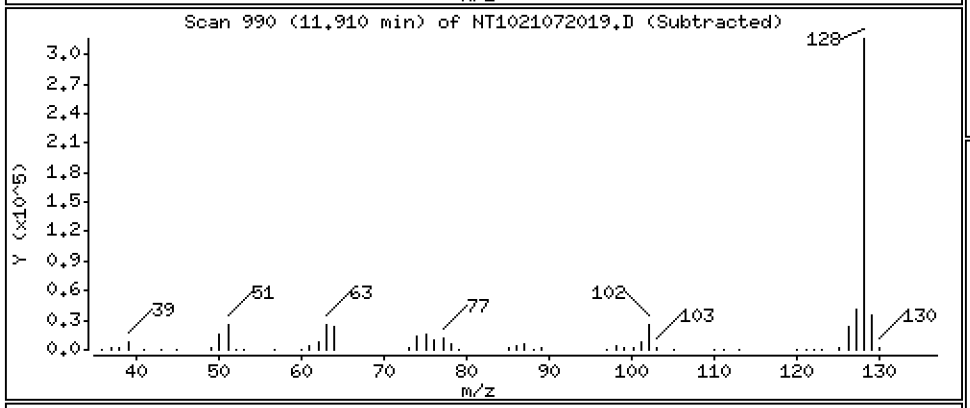
Column diameter: 0.25

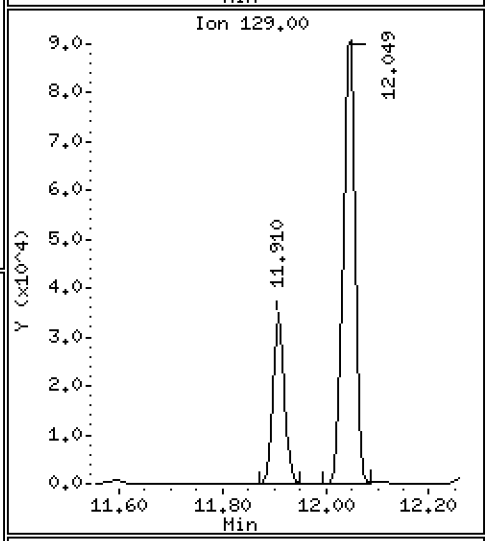
28 Naphthalene

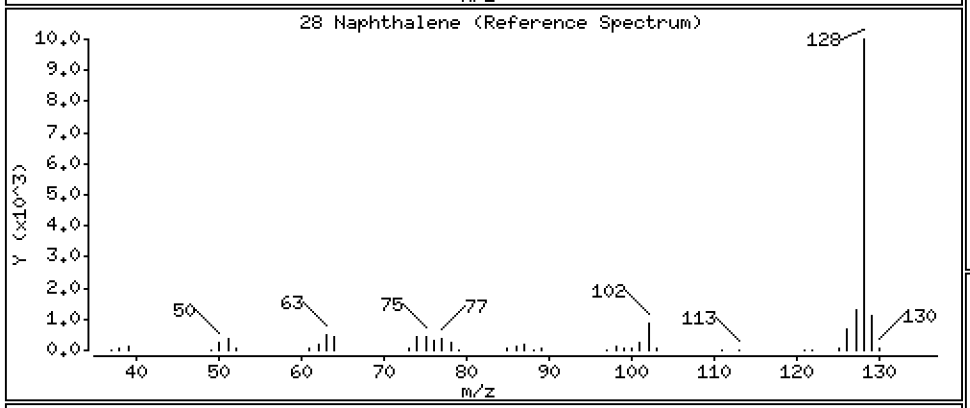
Concentration: 5.144 ug/mL

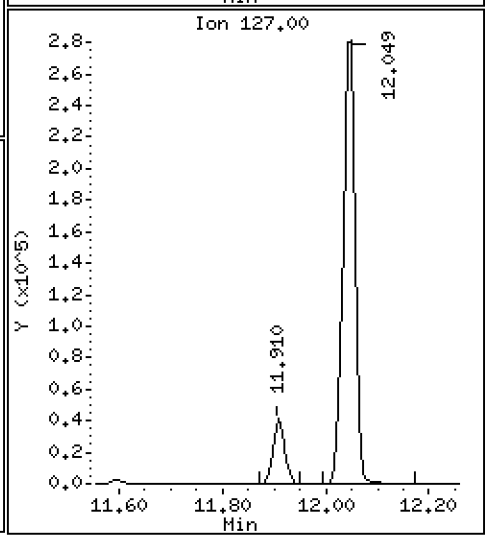


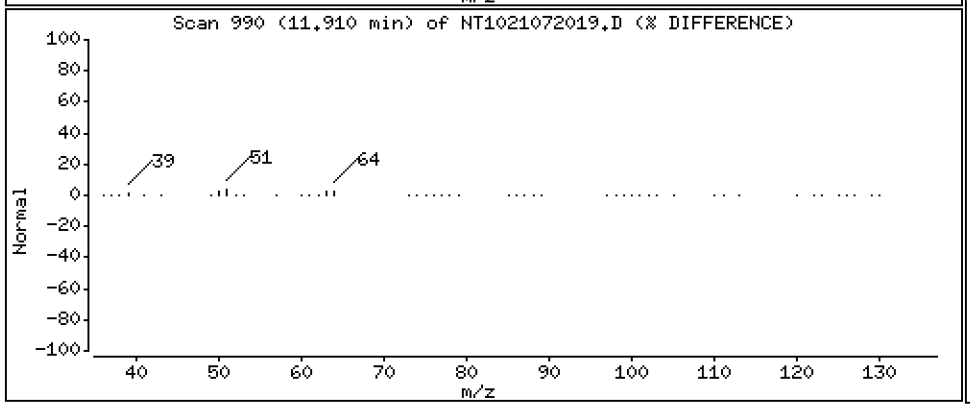












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

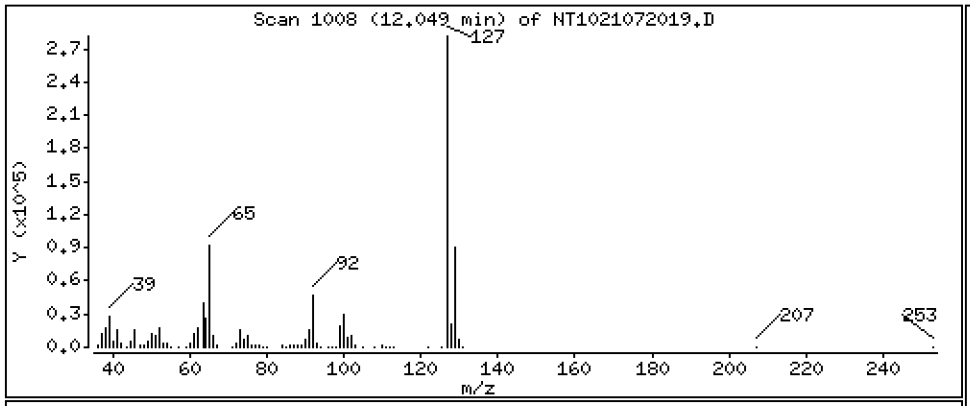
Operator: VTS

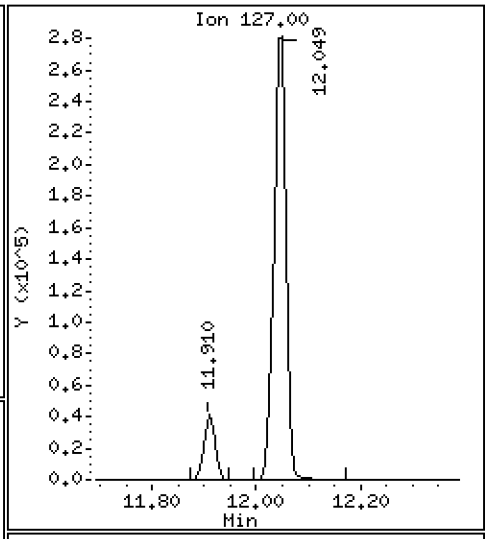
Column phase: ZB-5msi

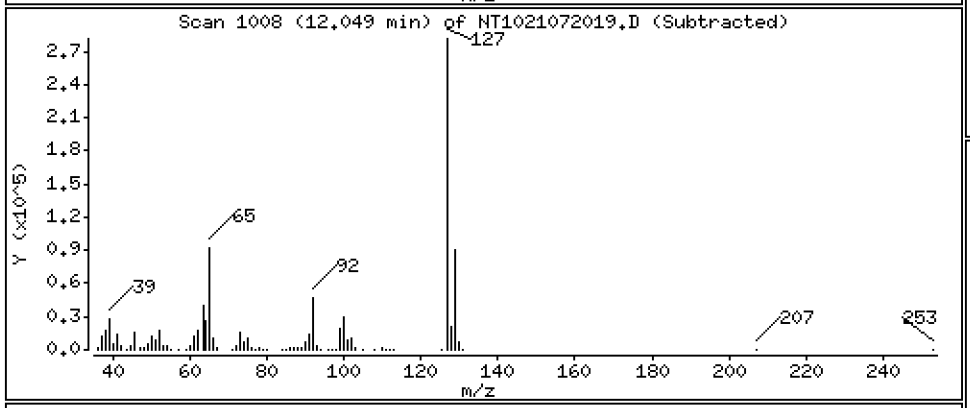
Column diameter: 0.25

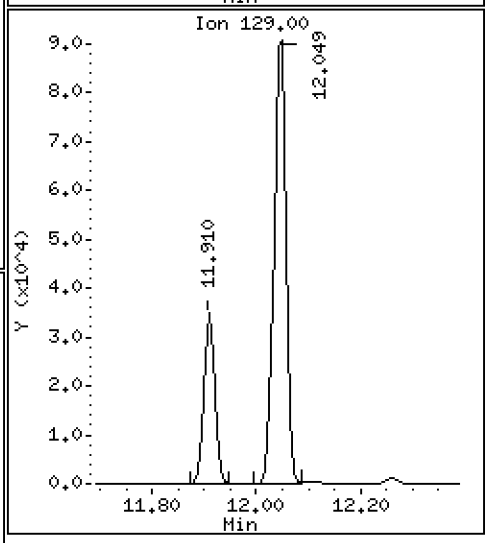
29 4-Chloroaniline

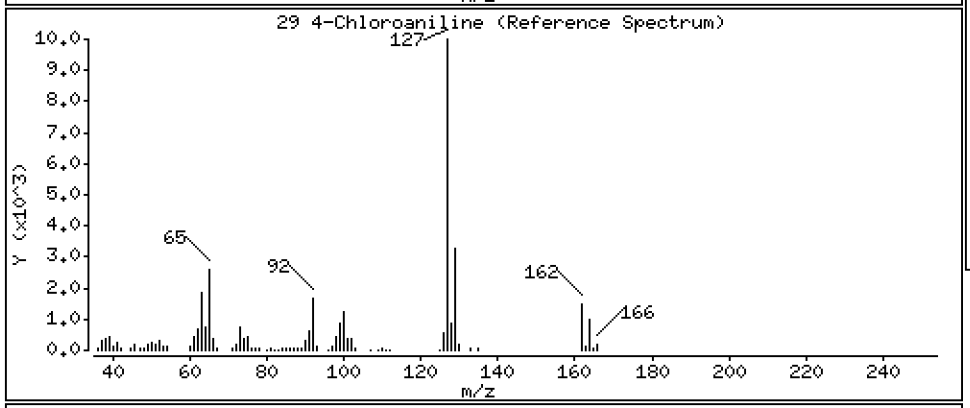
Concentration: 10.70 ug/mL

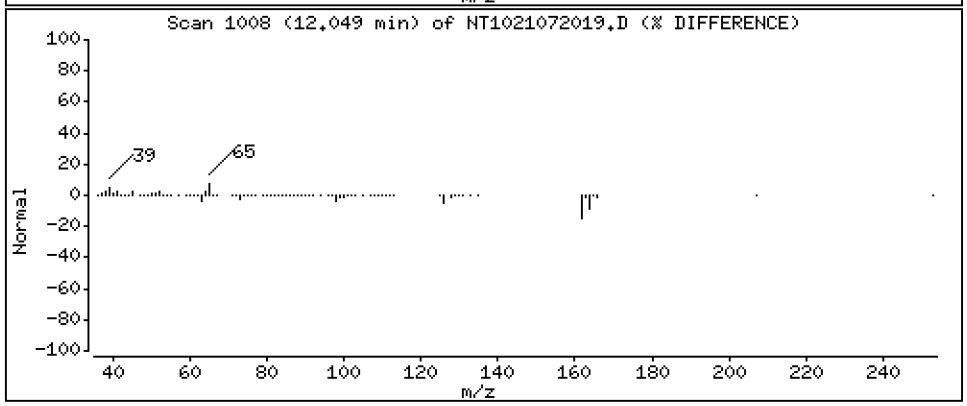












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

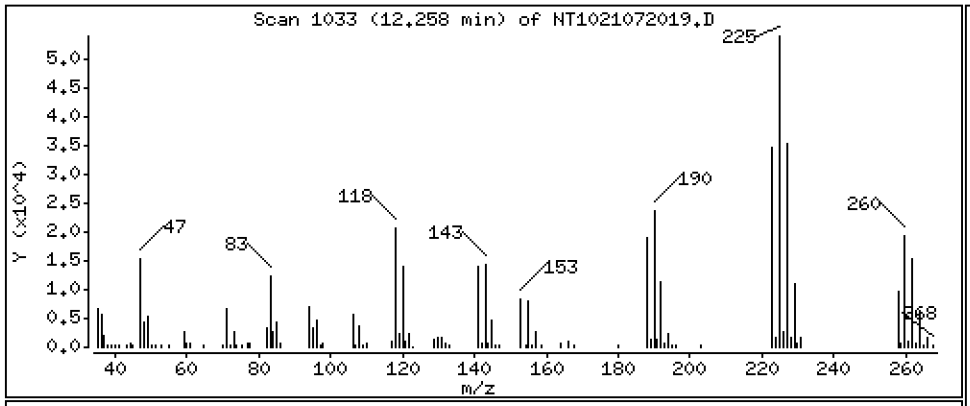
Operator: VTS

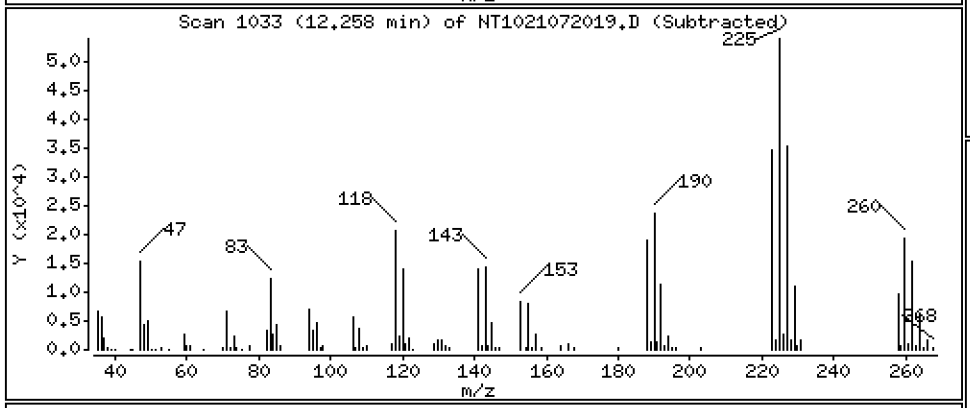
Column phase: ZB-5msi

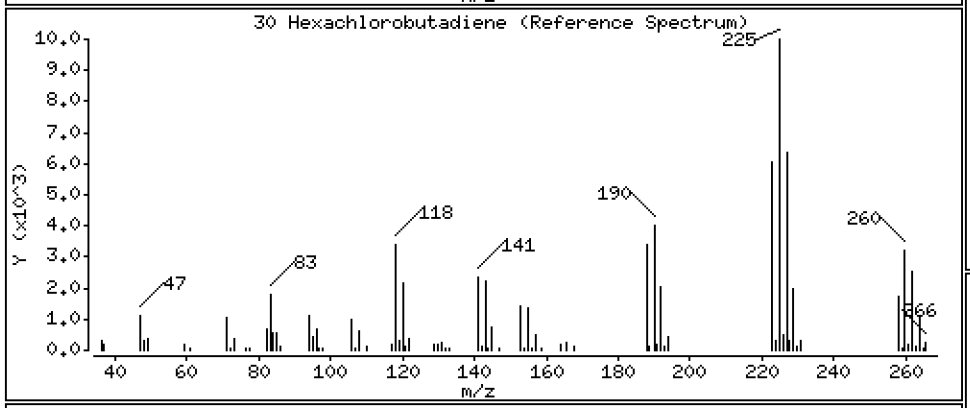
Column diameter: 0.25

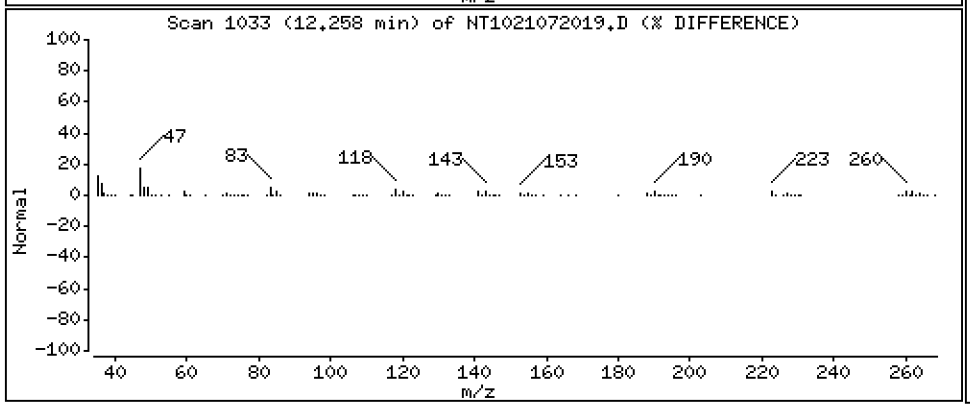
30 Hexachlorobutadiene

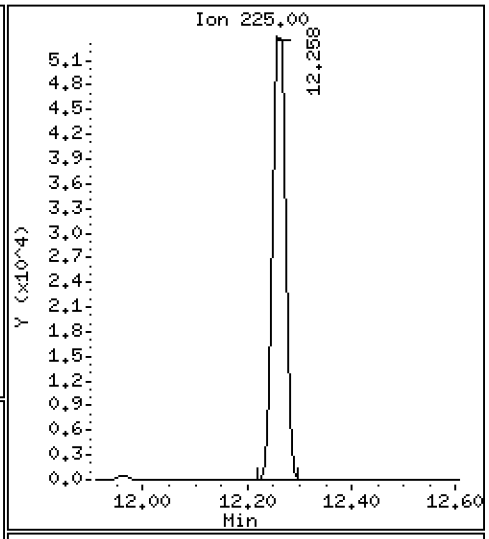
Concentration: 5.093 ug/mL

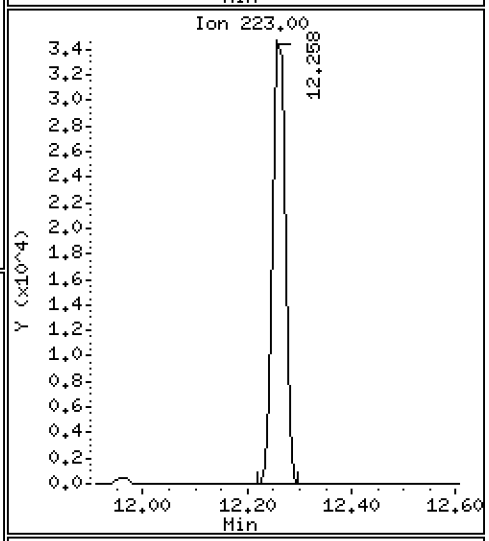


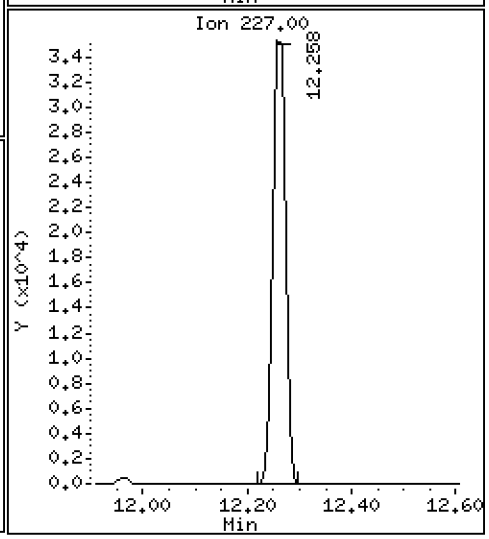












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

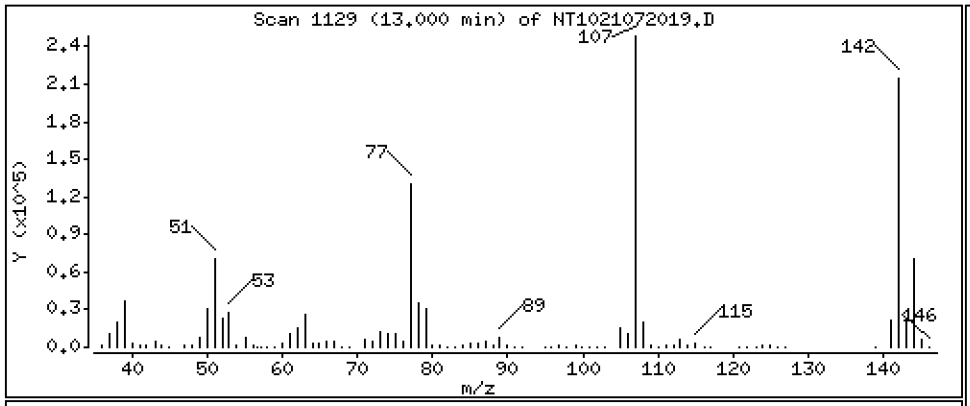
Operator: VTS

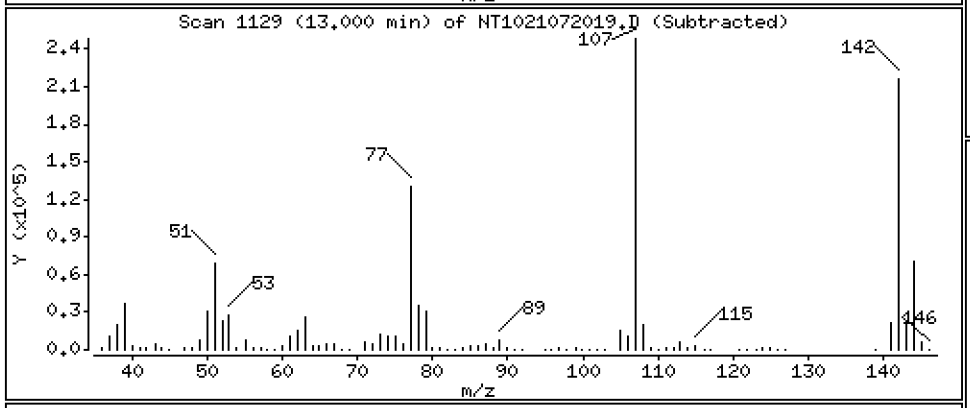
Column phase: ZB-5msi

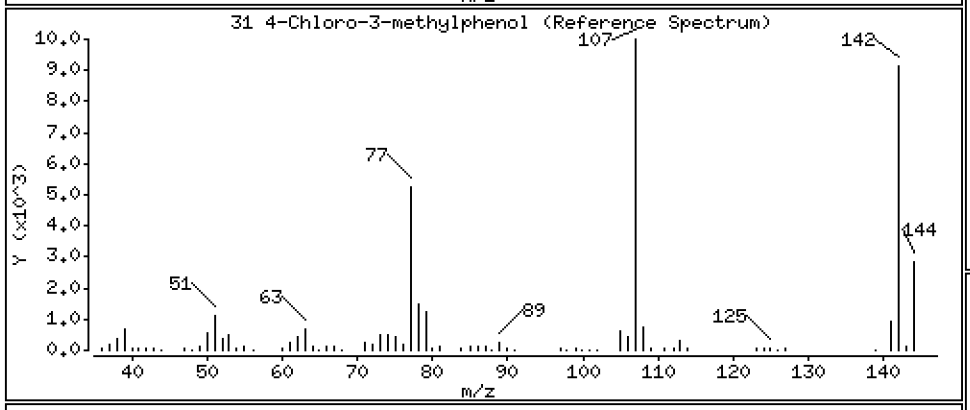
Column diameter: 0.25

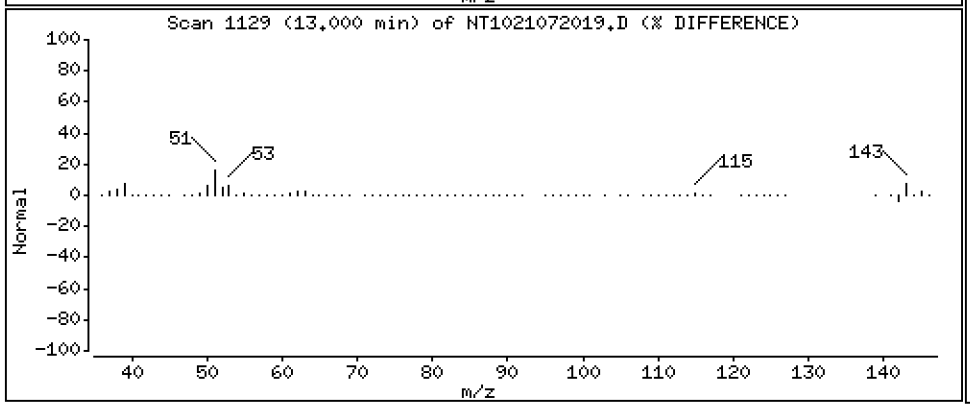
31 4-Chloro-3-methylphenol

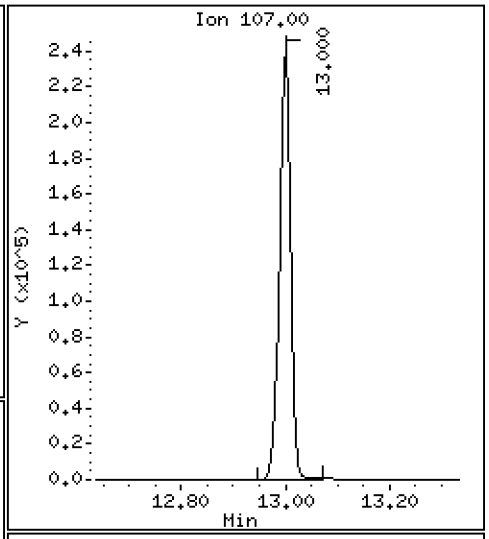
Concentration: 10.84 ug/mL

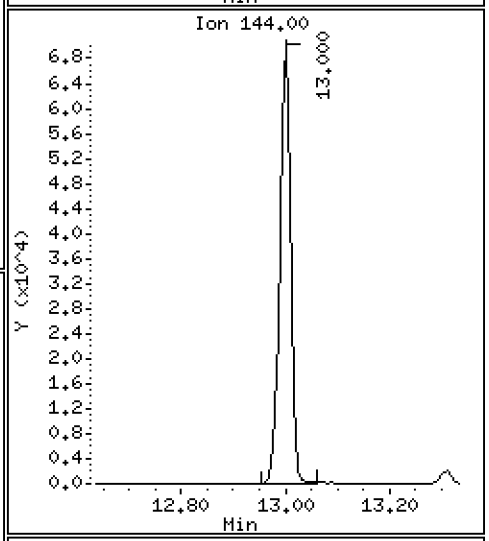


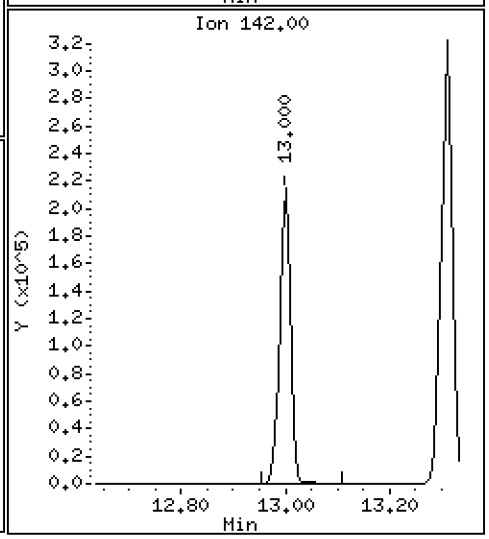












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

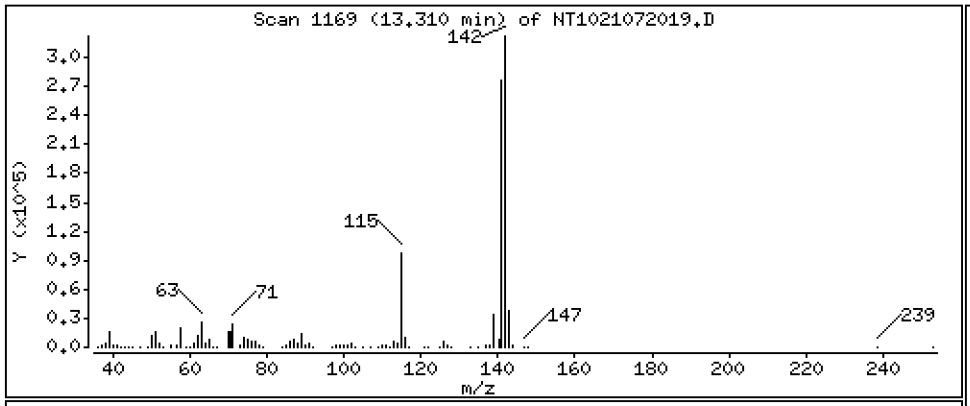
Operator: VTS

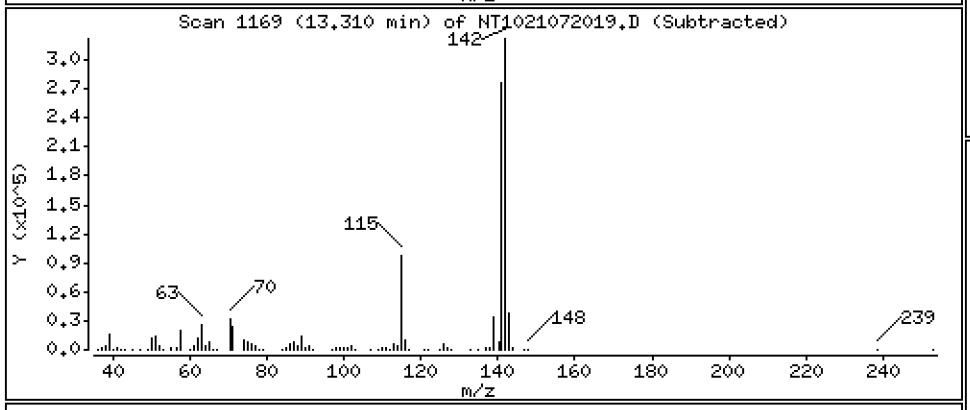
Column phase: ZB-5msi

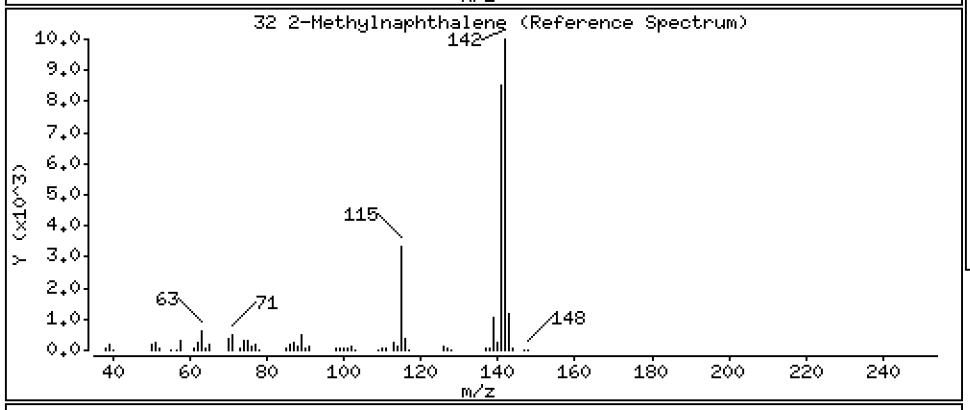
Column diameter: 0.25

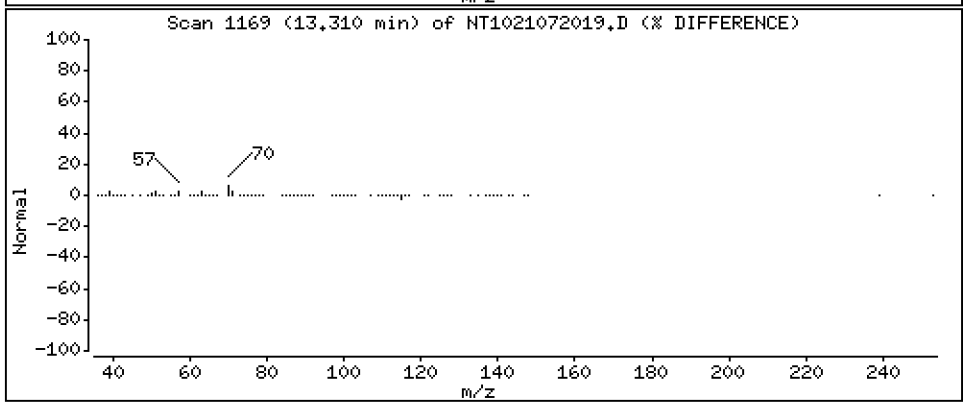
32 2-Methylnaphthalene

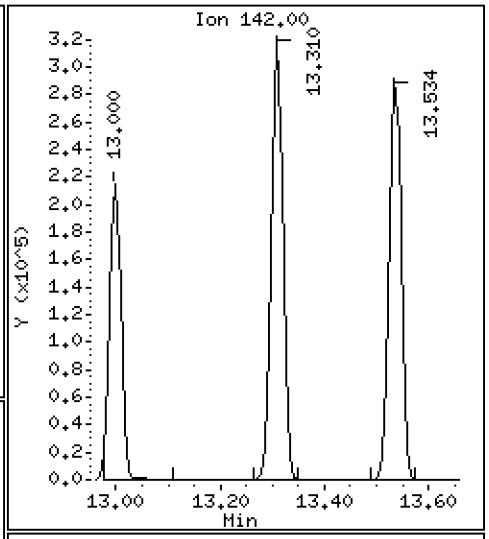
Concentration: 5.313 ug/mL

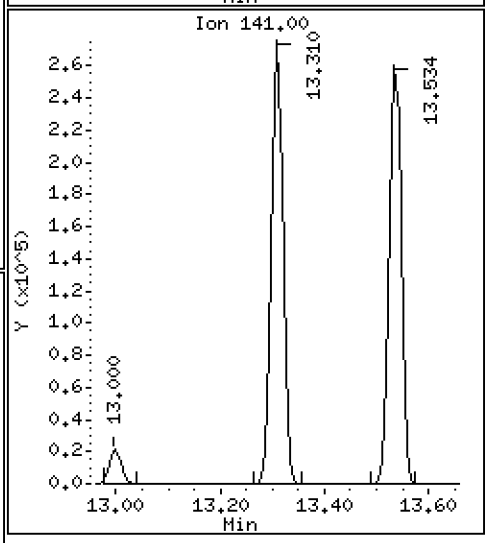












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Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

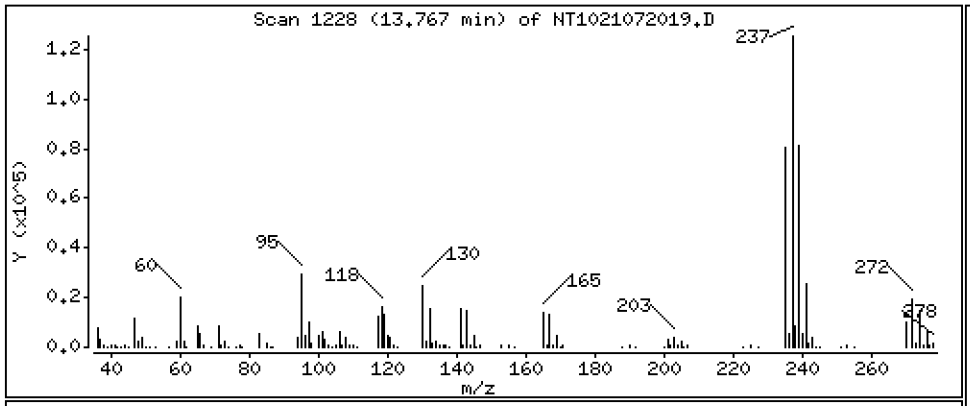
Operator: VTS

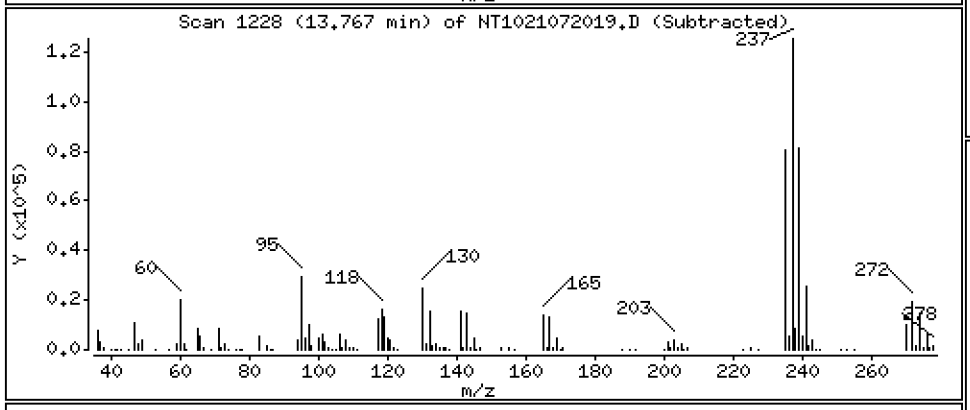
Column phase: ZB-5msi

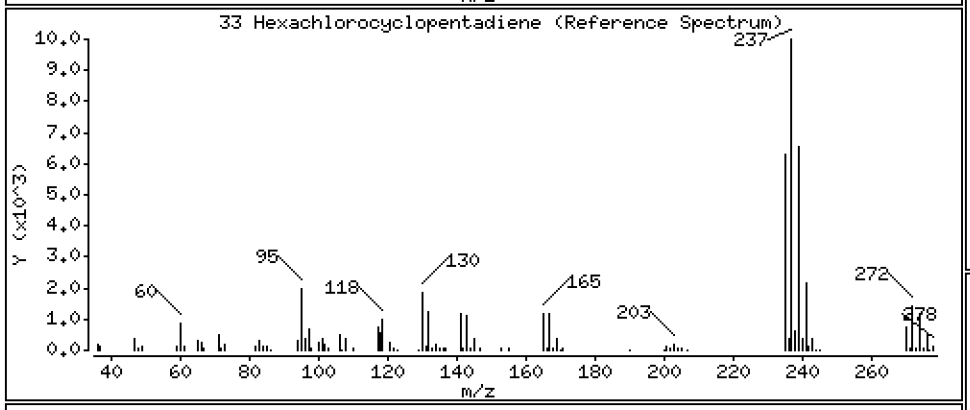
Column diameter: 0.25

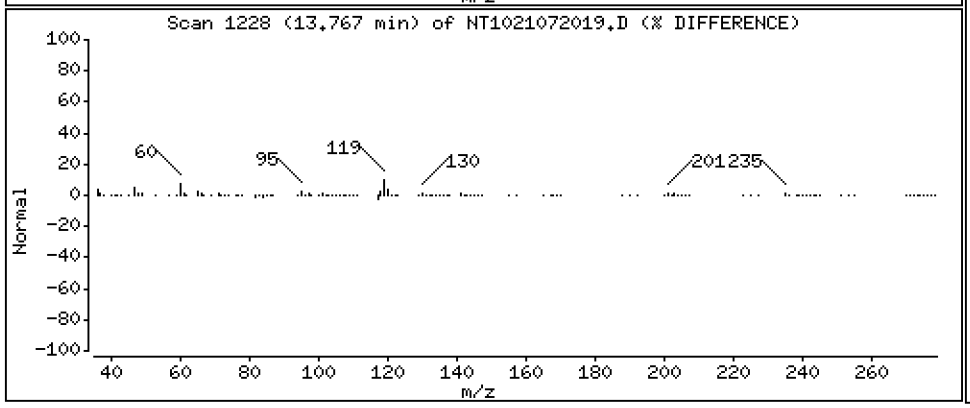
33 Hexachlorocyclopentadiene

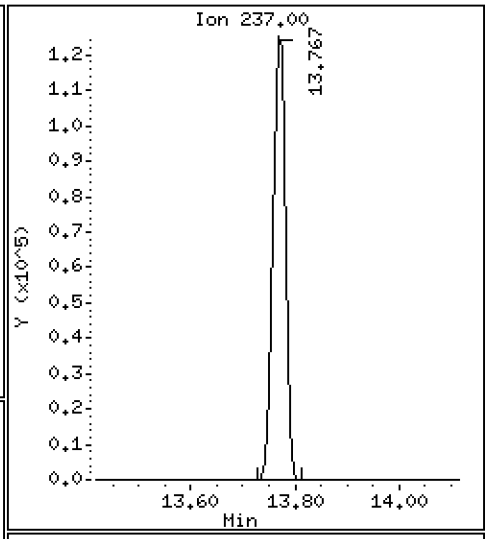
Concentration: 9.283 ug/mL

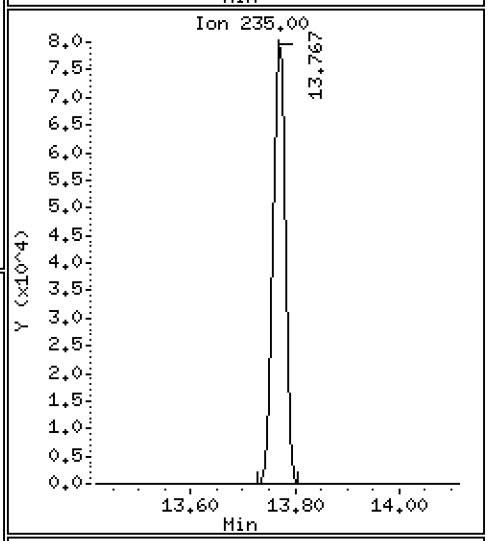


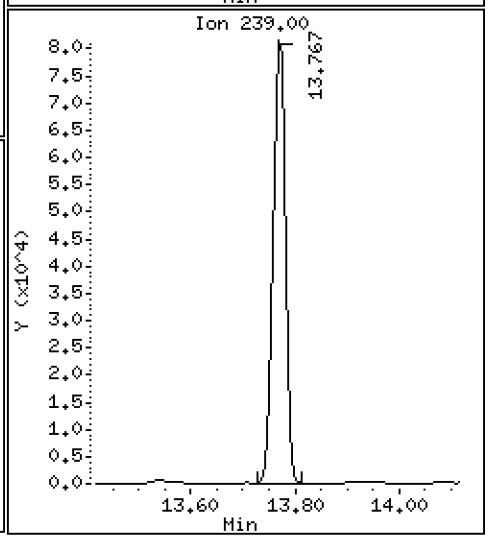












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

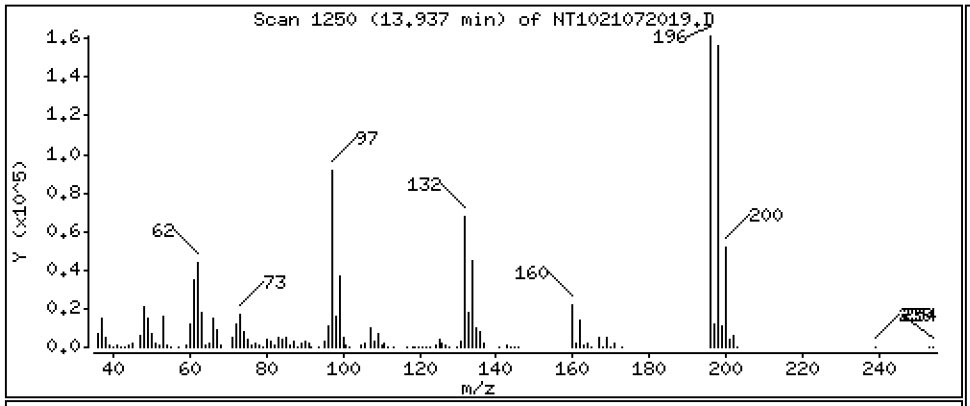
Operator: VTS

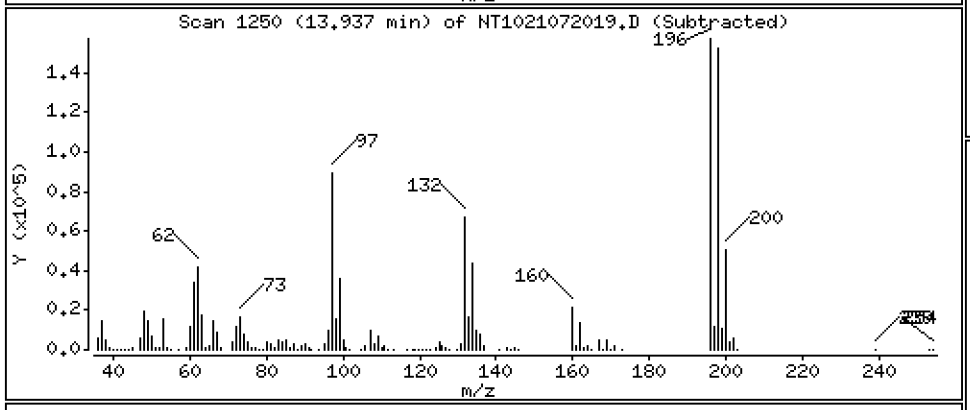
Column phase: ZB-5msi

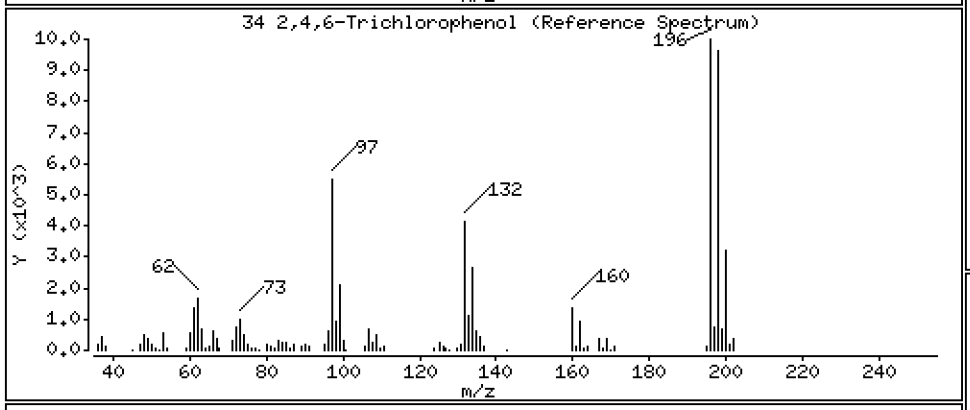
Column diameter: 0.25

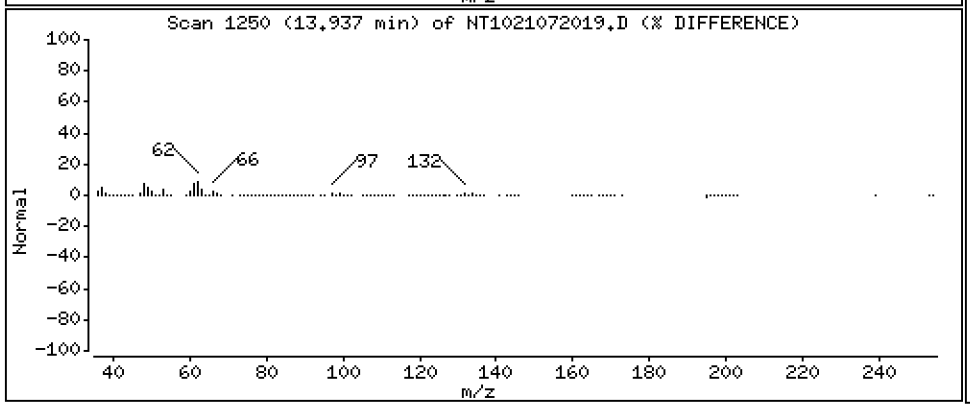
34 2,4,6-Trichlorophenol

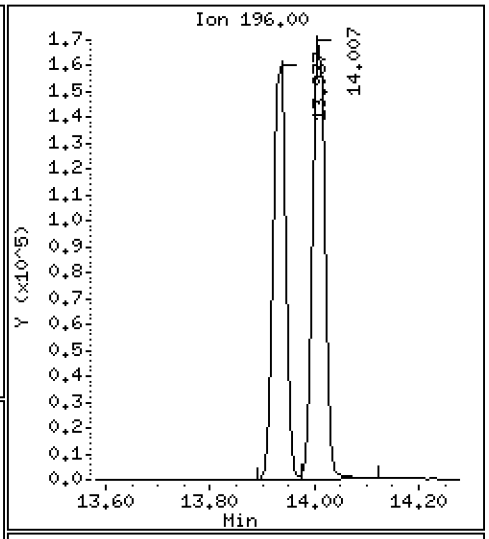
Concentration: 11.22 ug/mL

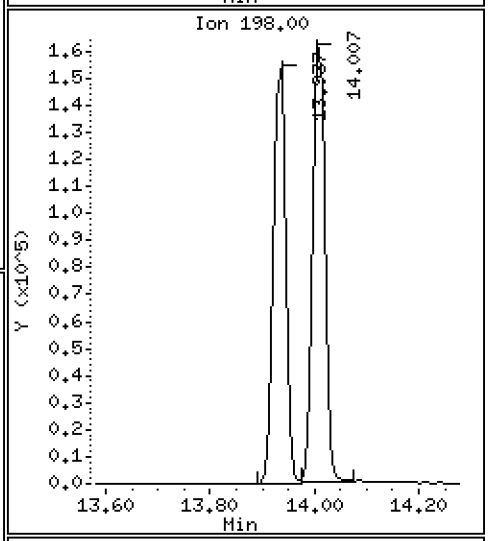


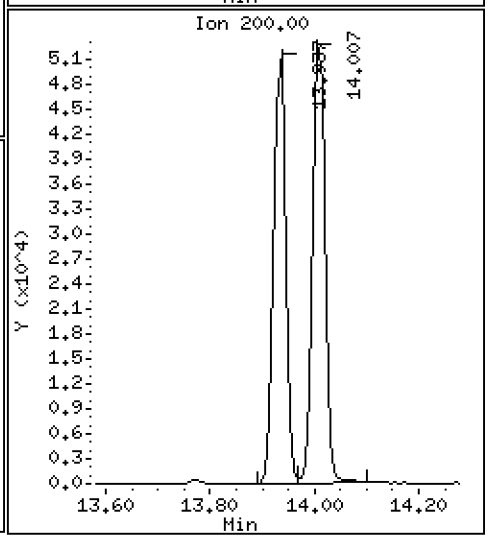












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

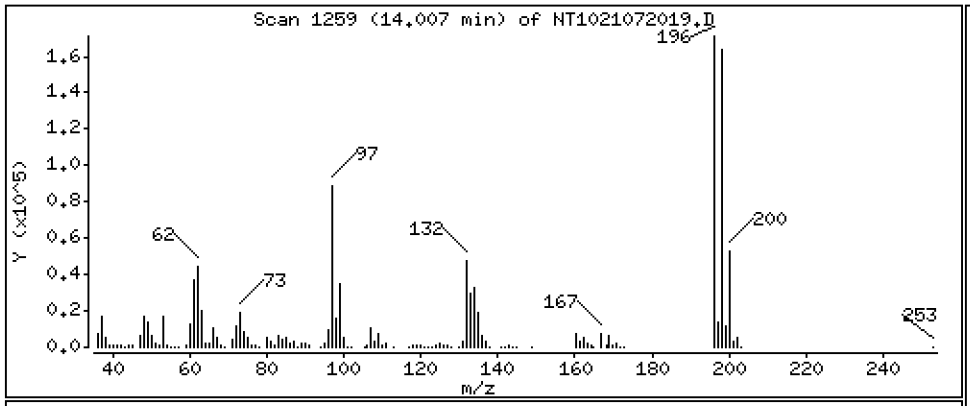
Operator: VTS

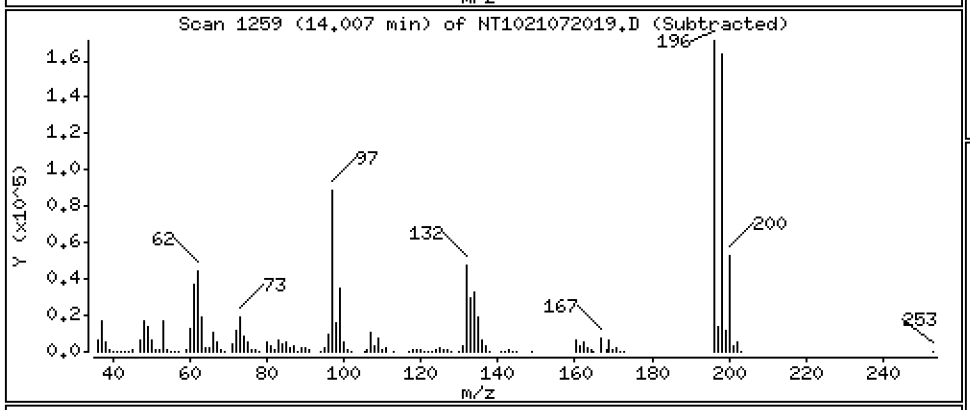
Column phase: ZB-5msi

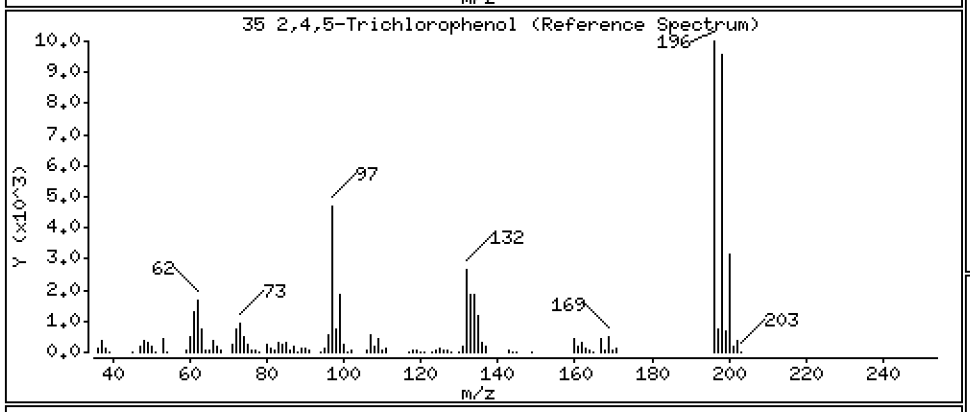
Column diameter: 0.25

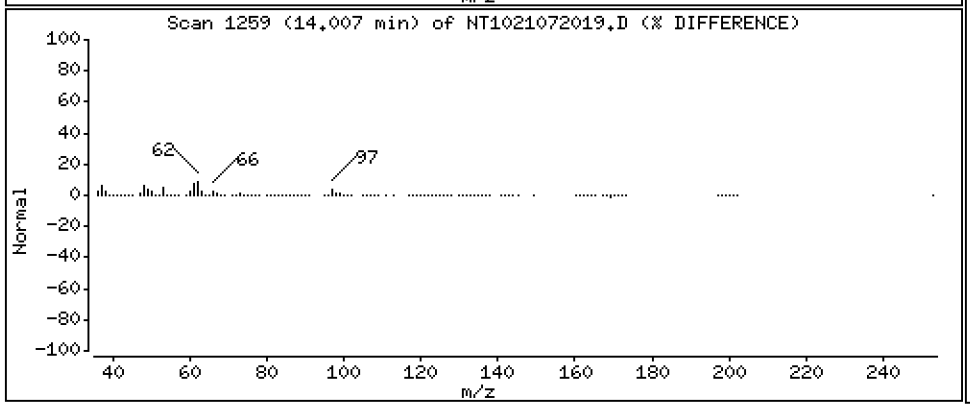
35 2,4,5-Trichlorophenol

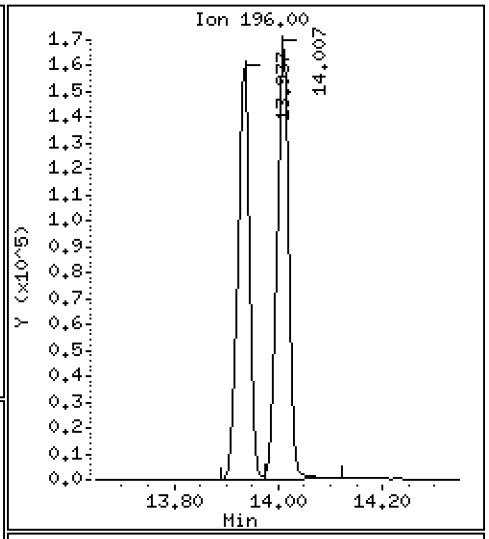
Concentration: 11.04 ug/mL

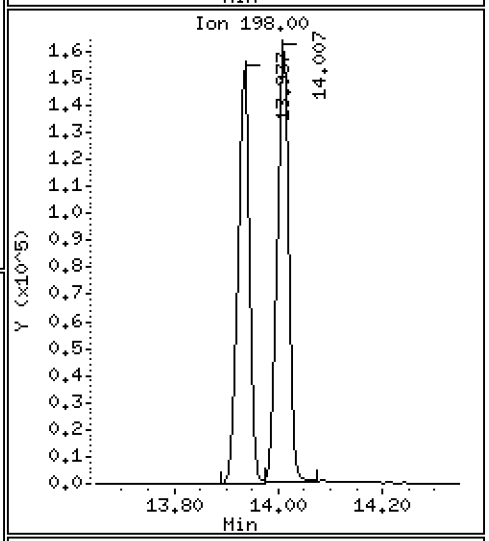


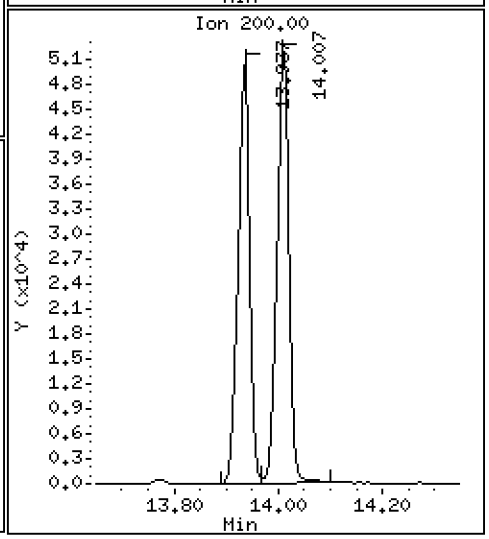












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

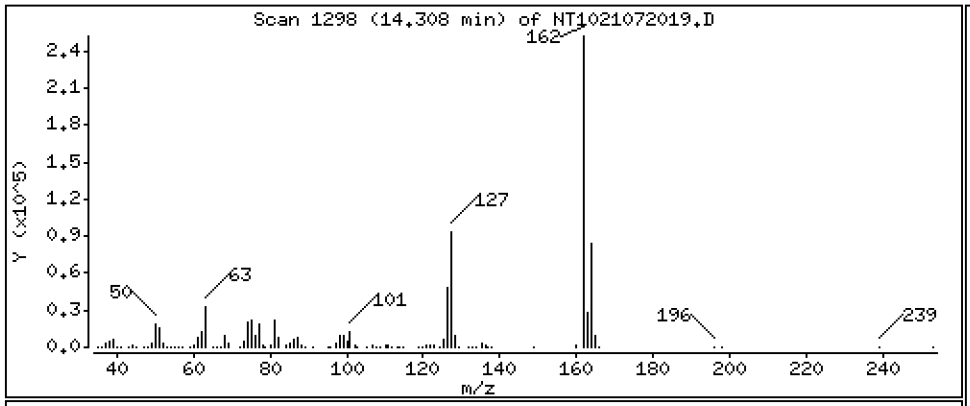
Operator: VTS

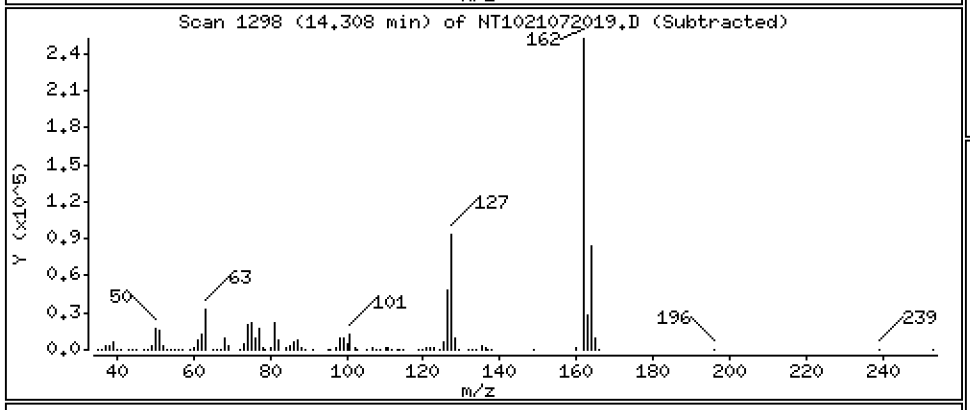
Column phase: ZB-5msi

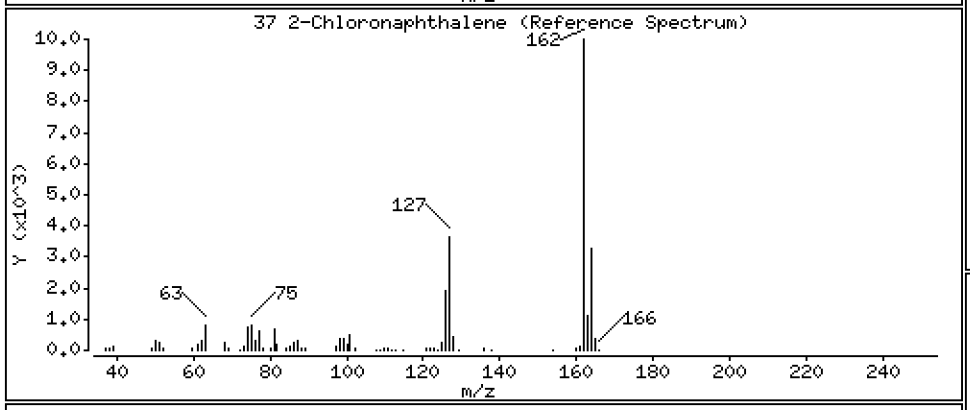
Column diameter: 0.25

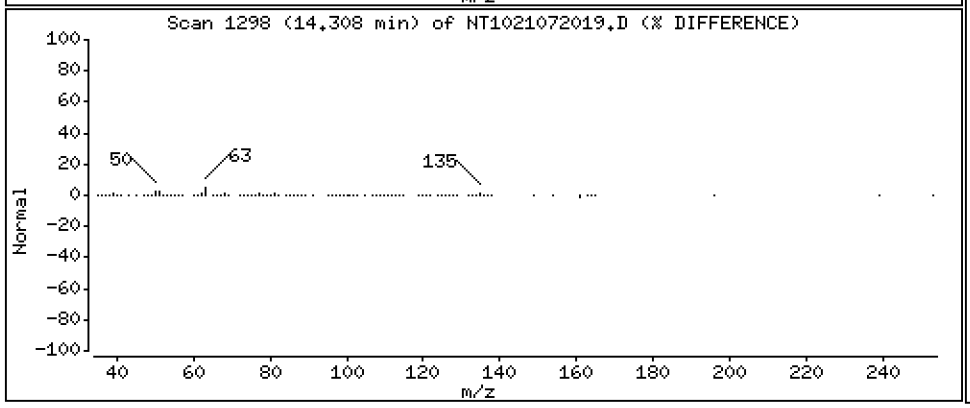
37 2-Chloronaphthalene

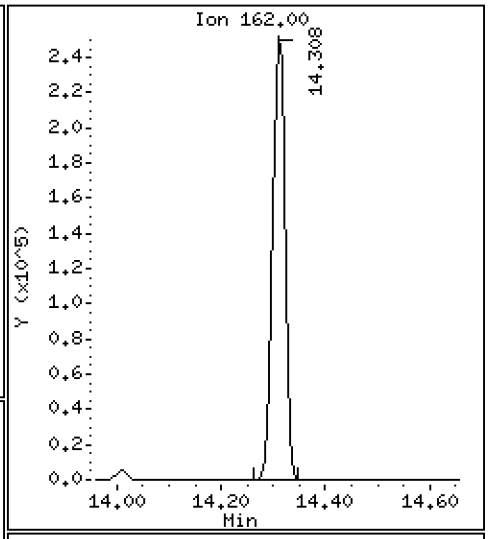
Concentration: 5.077 ug/mL

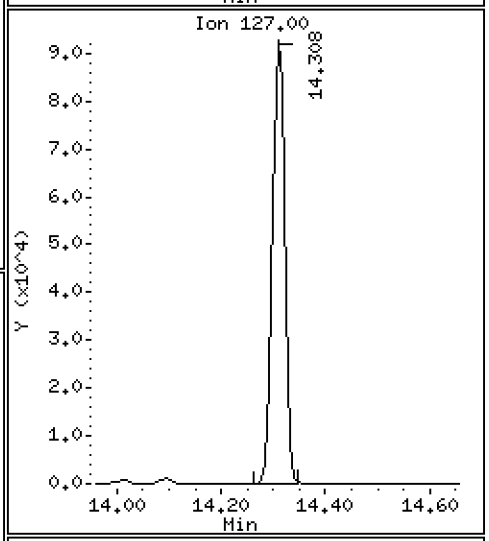


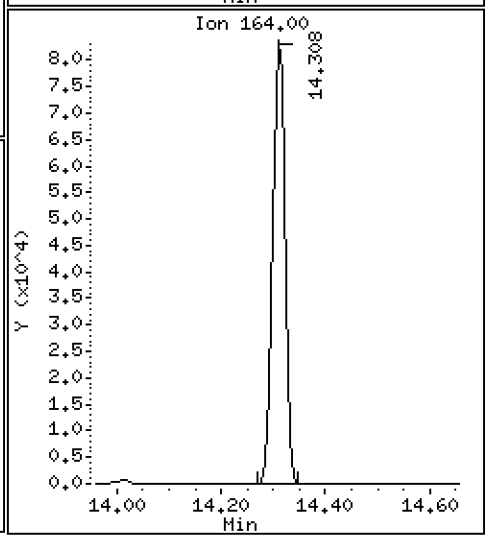












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

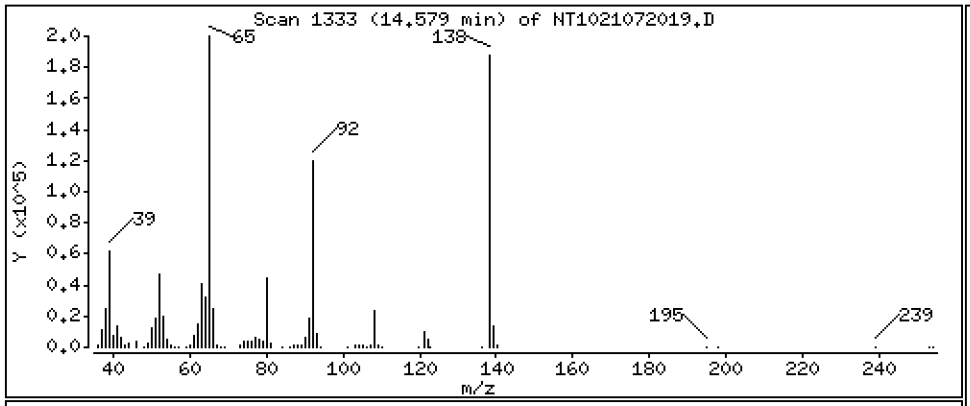
Operator: VTS

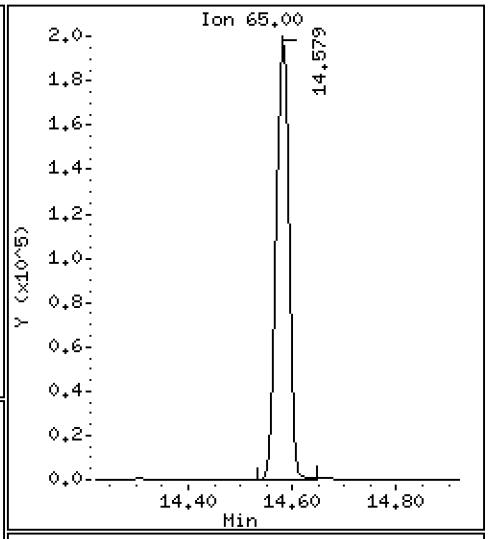
Column phase: ZB-5msi

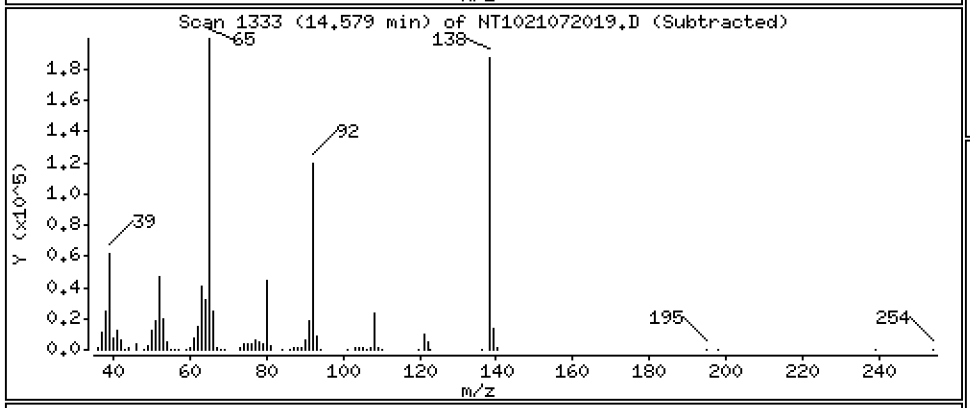
Column diameter: 0.25

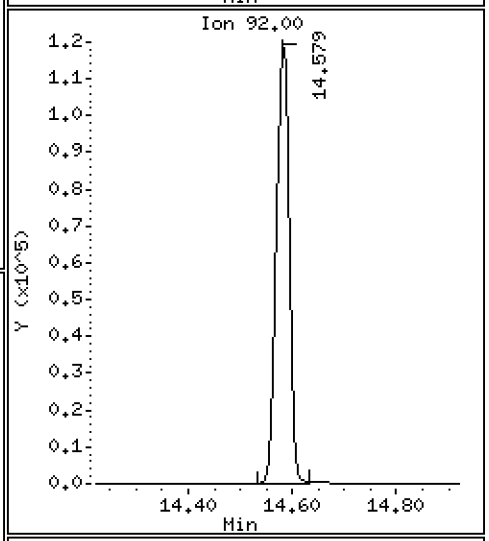
38 2-Nitroaniline

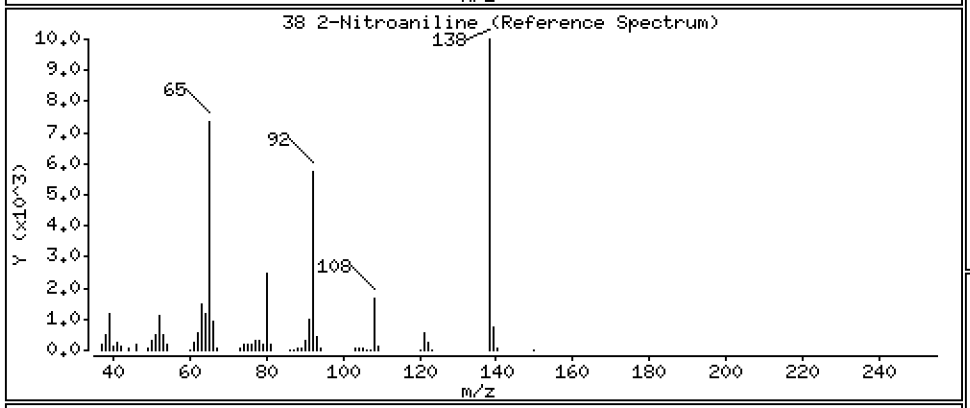
Concentration: 11.04 ug/mL

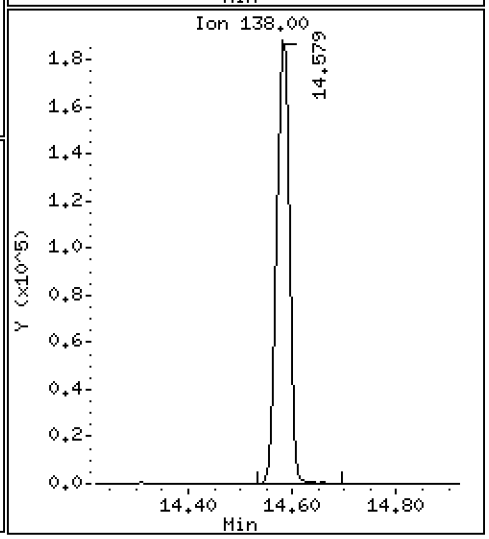


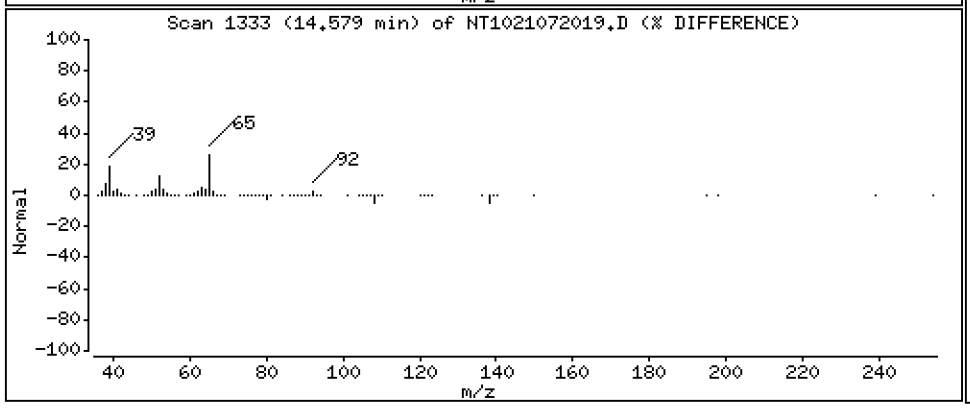












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

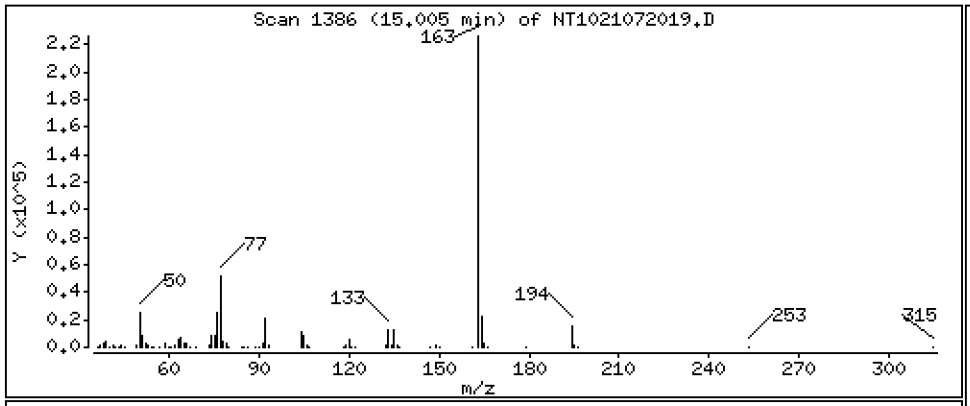
Operator: VTS

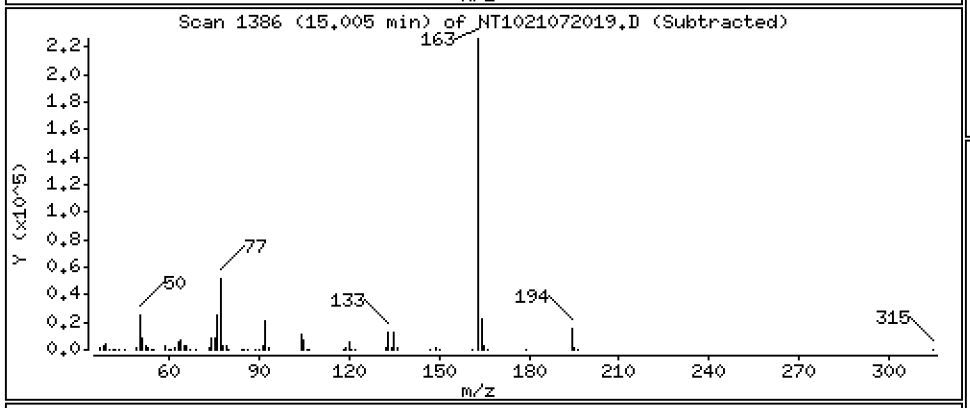
Column phase: ZB-5msi

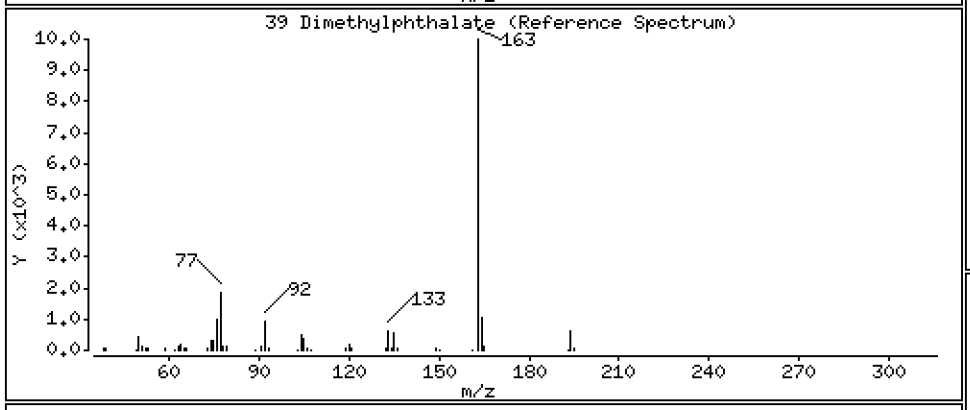
Column diameter: 0.25

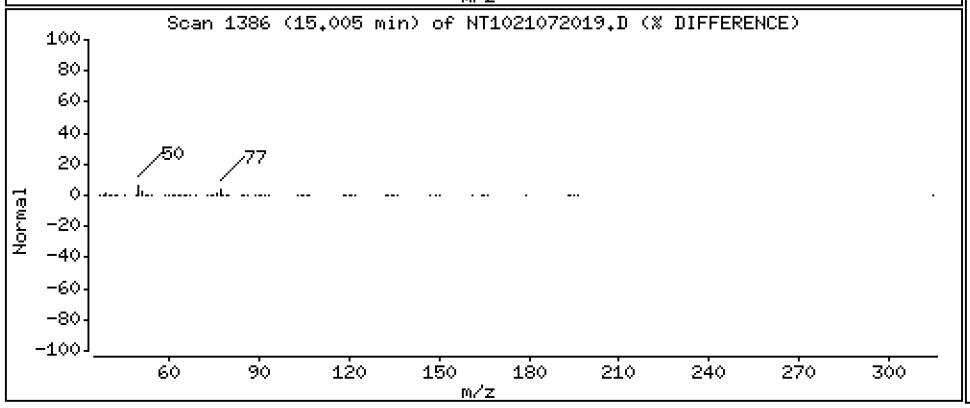
39 Dimethylphthalate

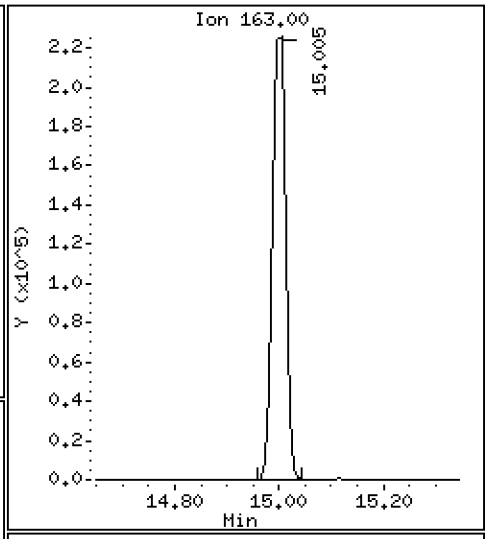
Concentration: 4.939 ug/mL

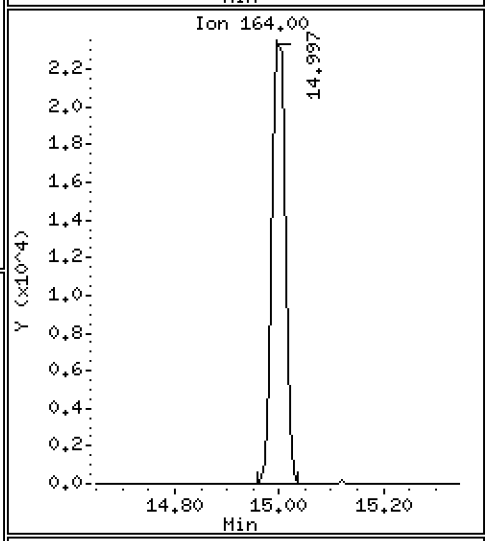


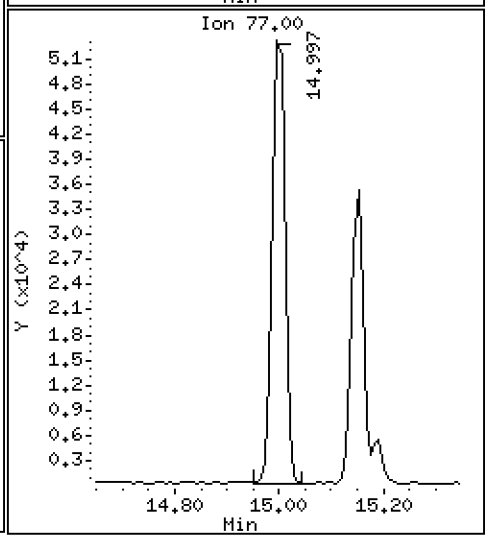












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

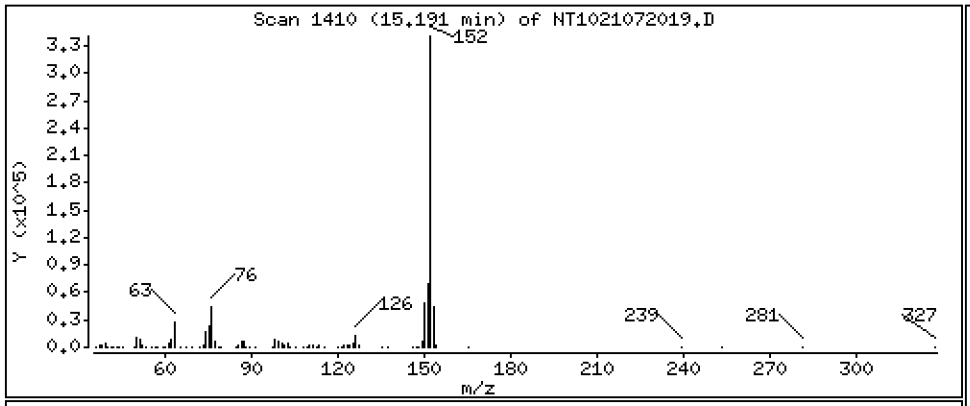
Operator: VTS

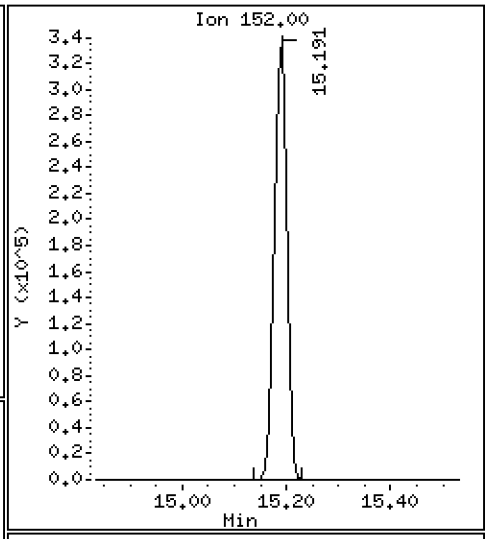
Column phase: ZB-5msi

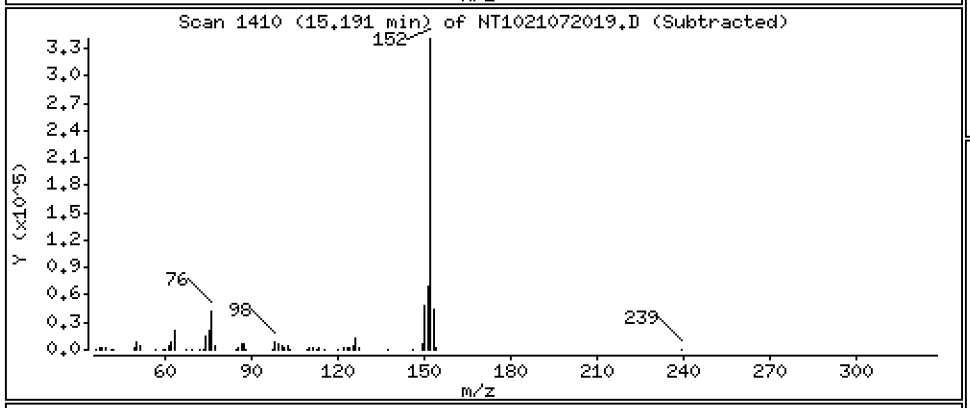
Column diameter: 0.25

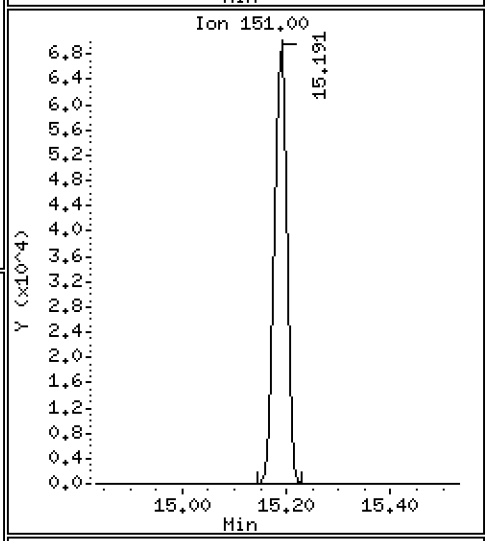
40 Acenaphthylene

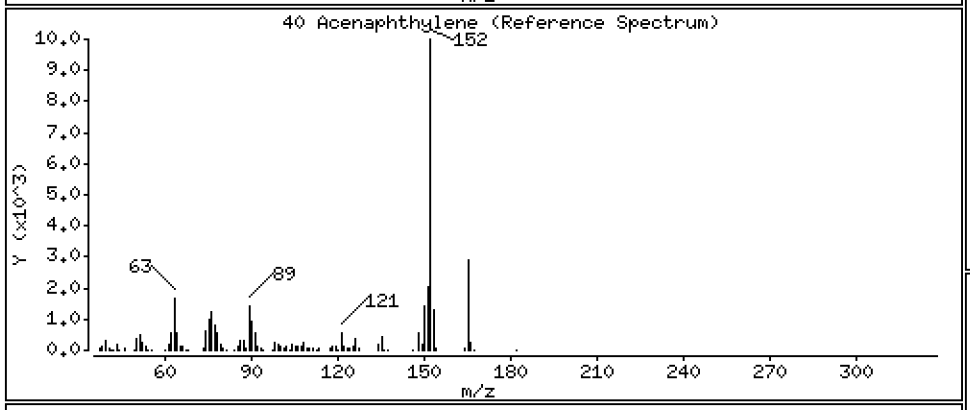
Concentration: 4.926 ug/mL

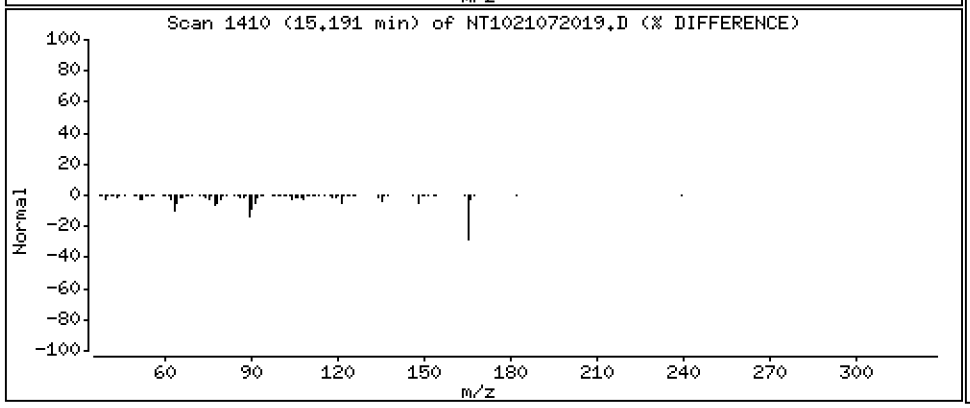


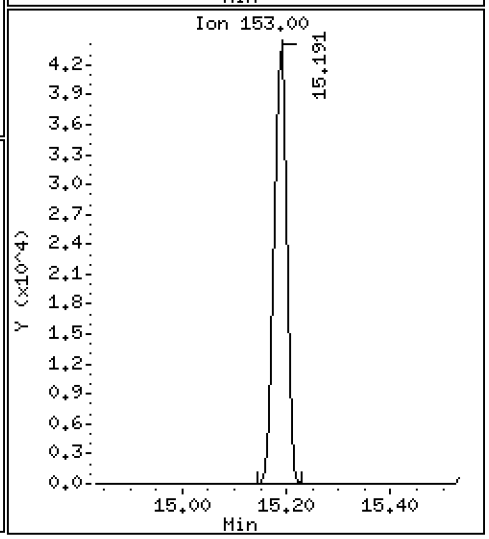












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

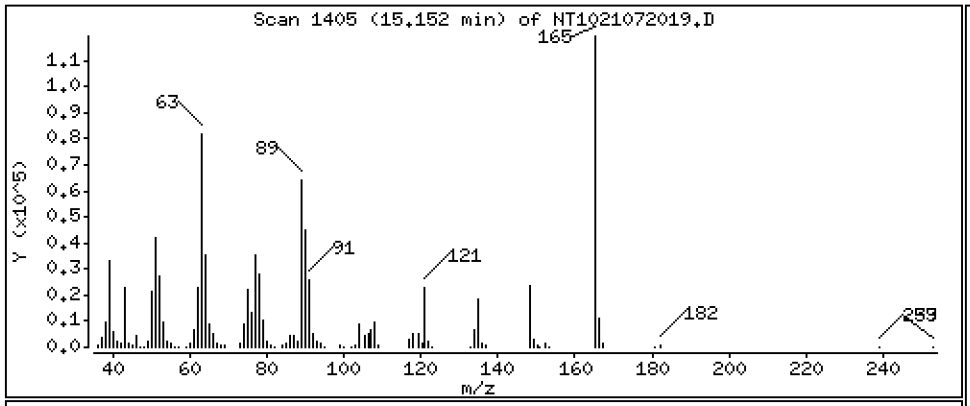
Operator: VTS

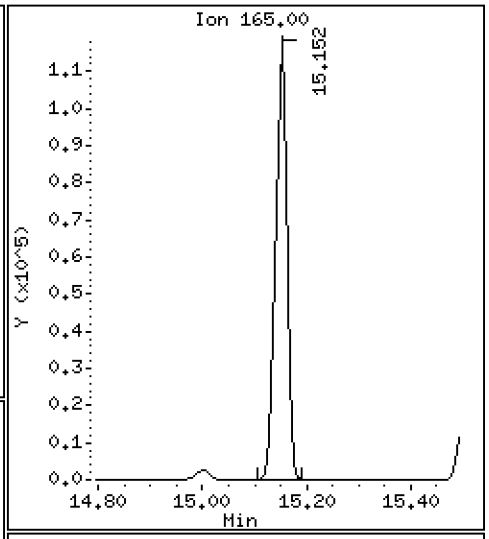
Column phase: ZB-5msi

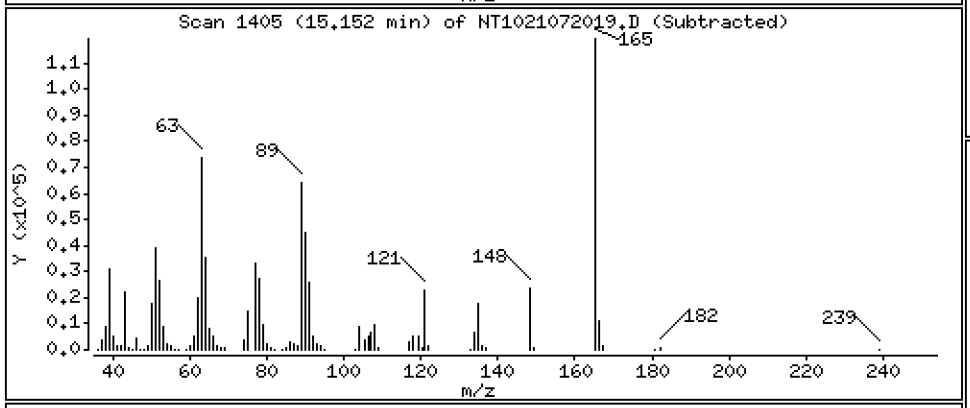
Column diameter: 0.25

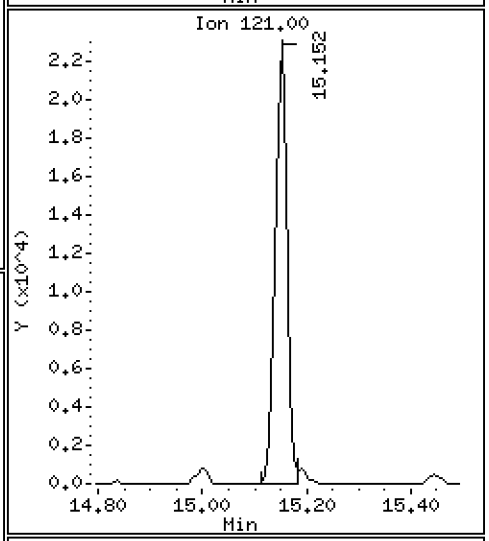
41 2,6-Dinitrotoluene

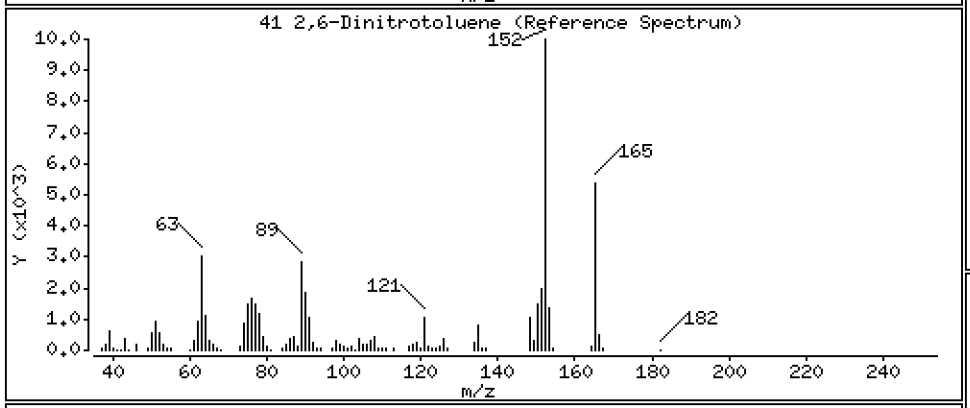
Concentration: 10.20 ug/mL

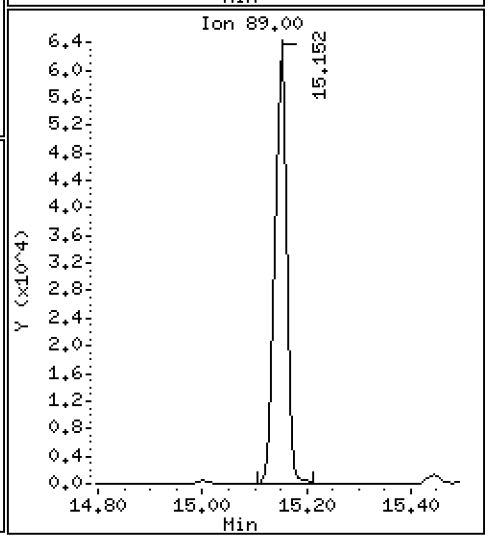


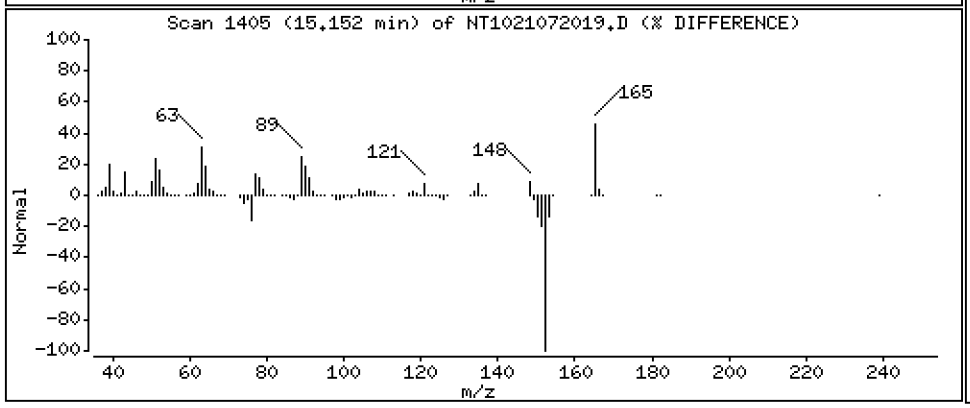












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

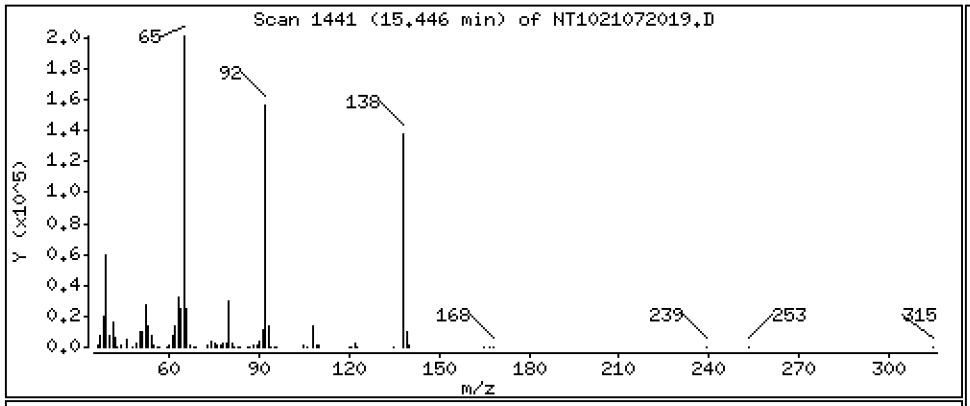
Operator: VTS

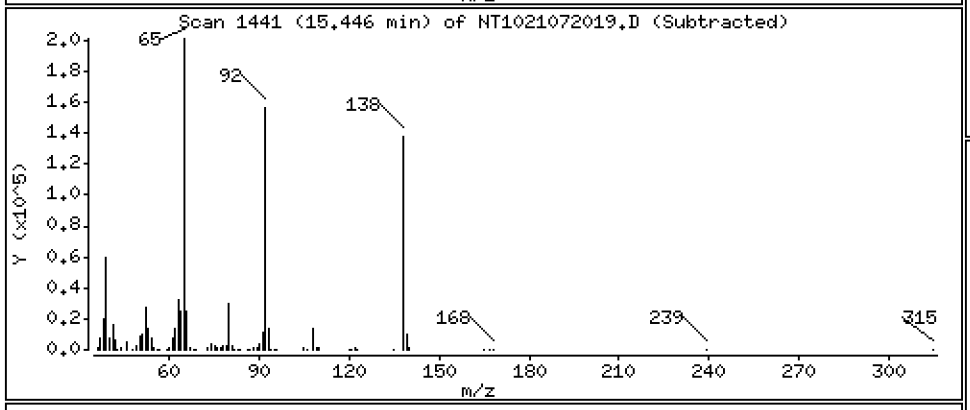
Column phase: ZB-5msi

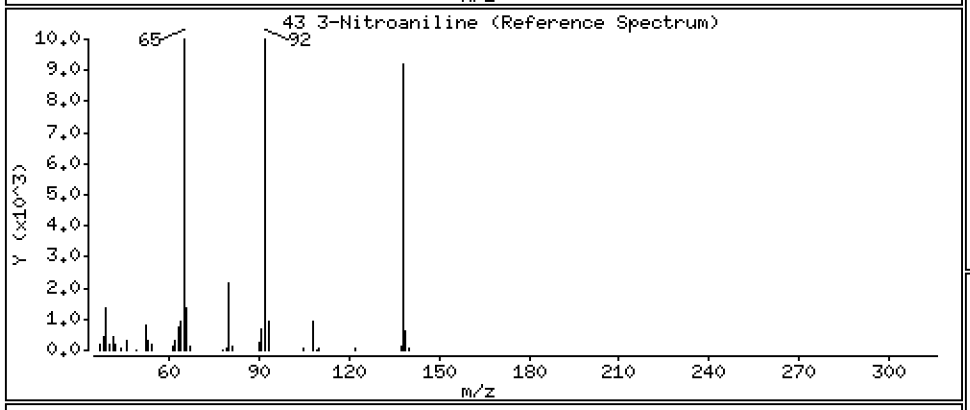
Column diameter: 0.25

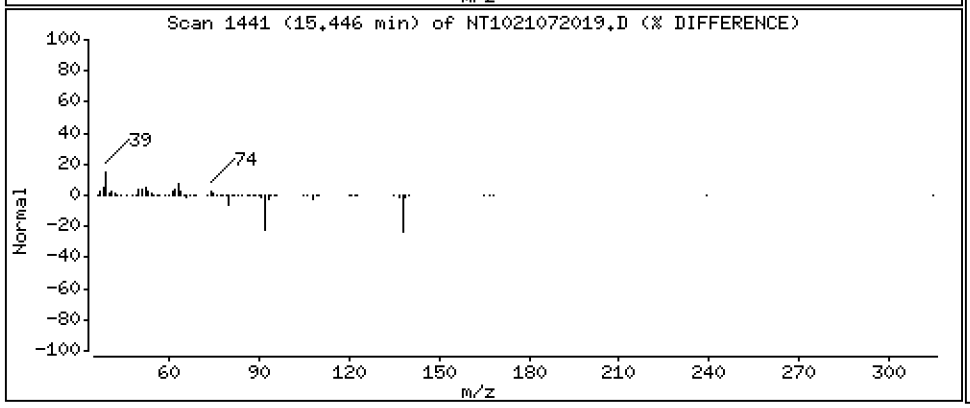
43 3-Nitroaniline

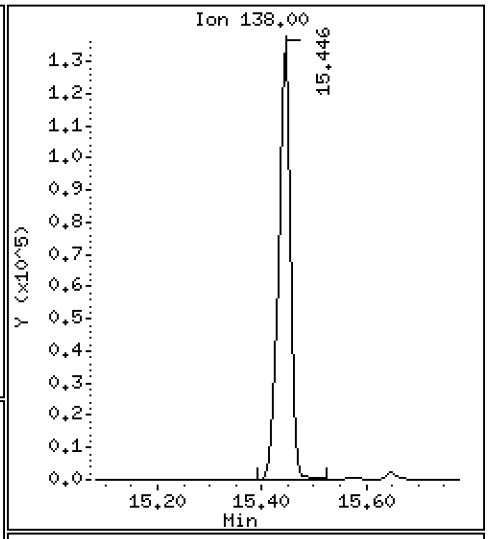
Concentration: 10.17 ug/mL

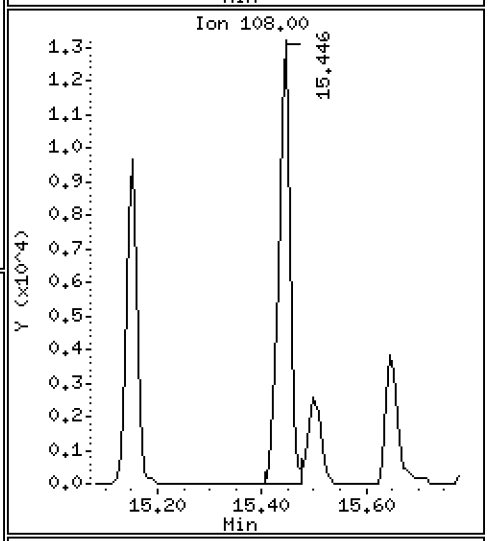


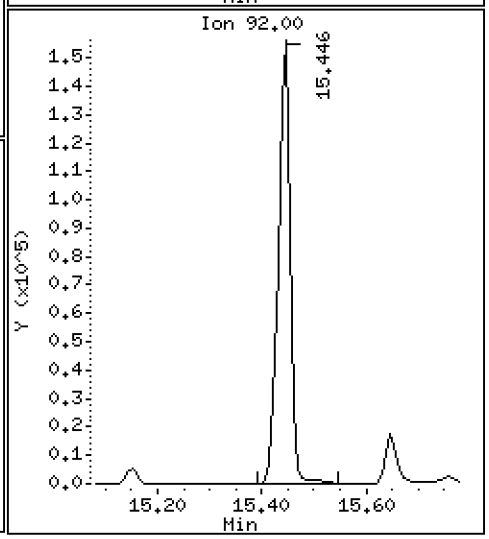












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

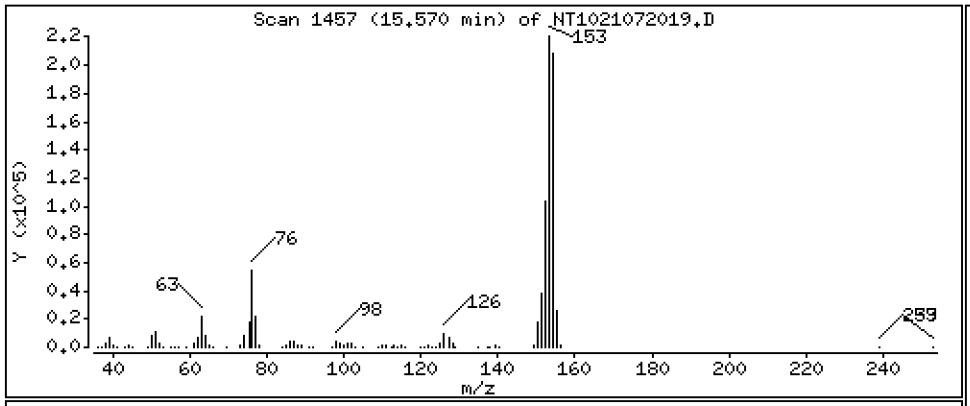
Operator: VTS

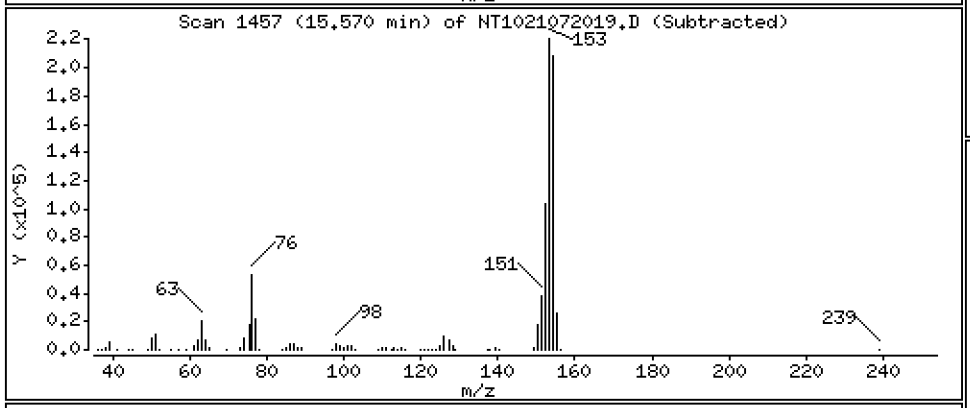
Column phase: ZB-5msi

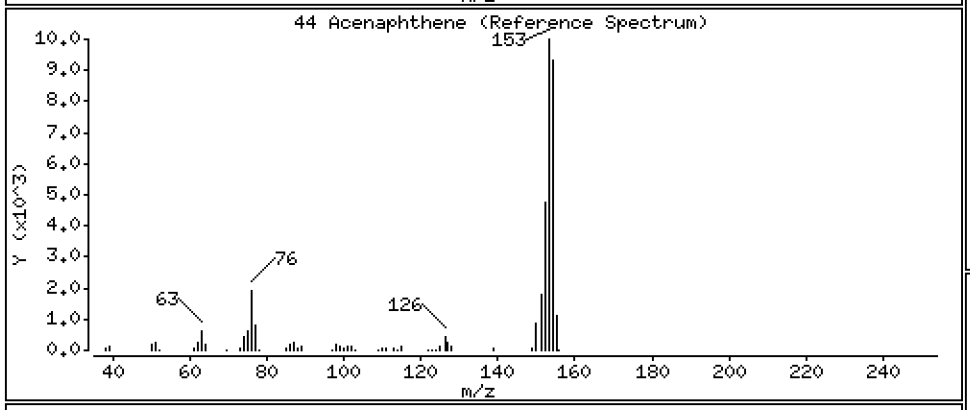
Column diameter: 0.25

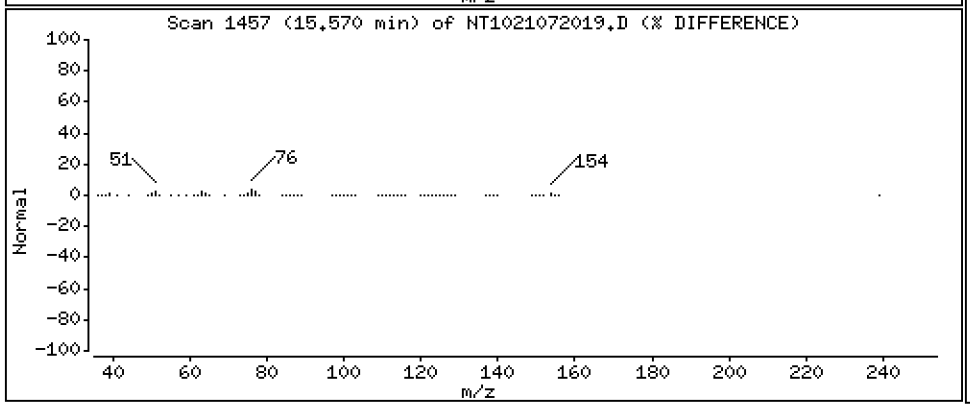
44 Acenaphthene

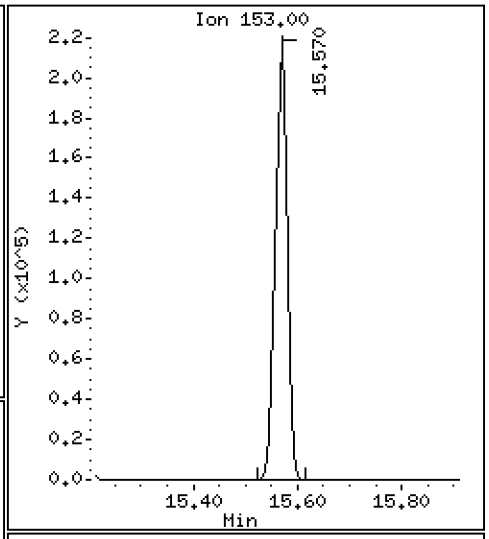
Concentration: 5.196 ug/mL

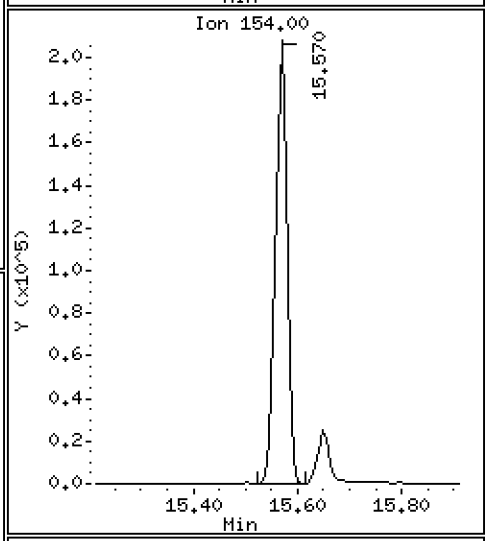


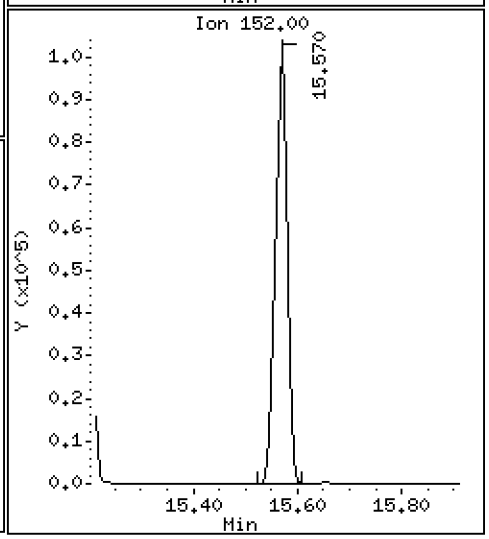












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

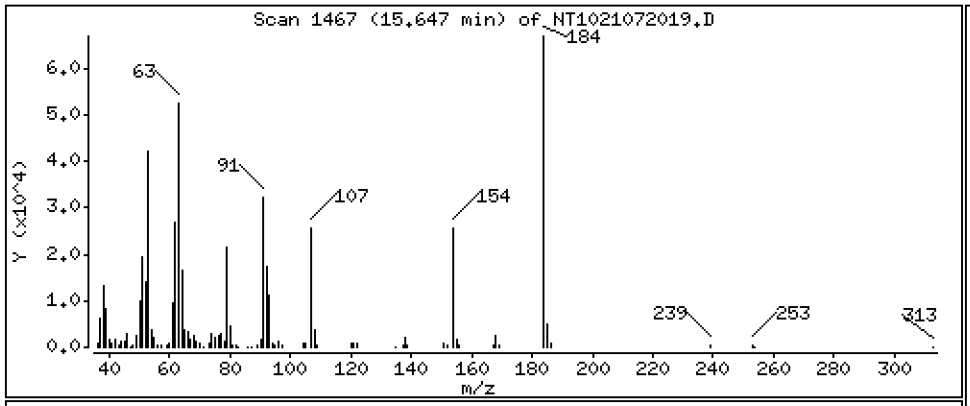
Operator: VTS

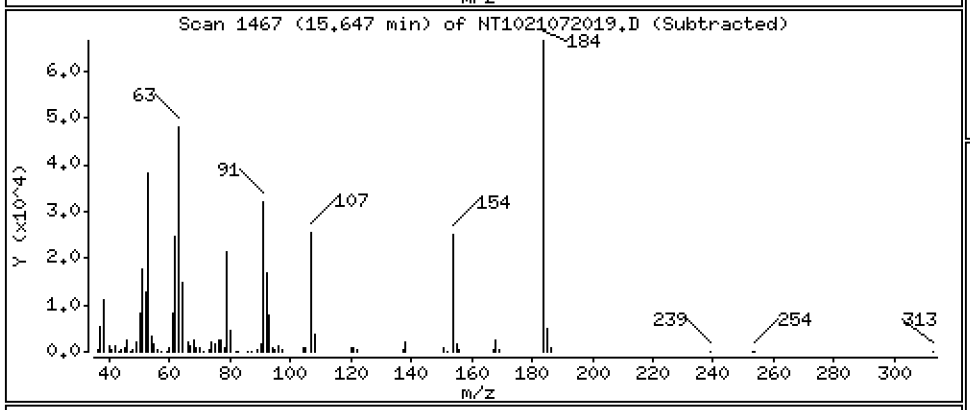
Column phase: ZB-5msi

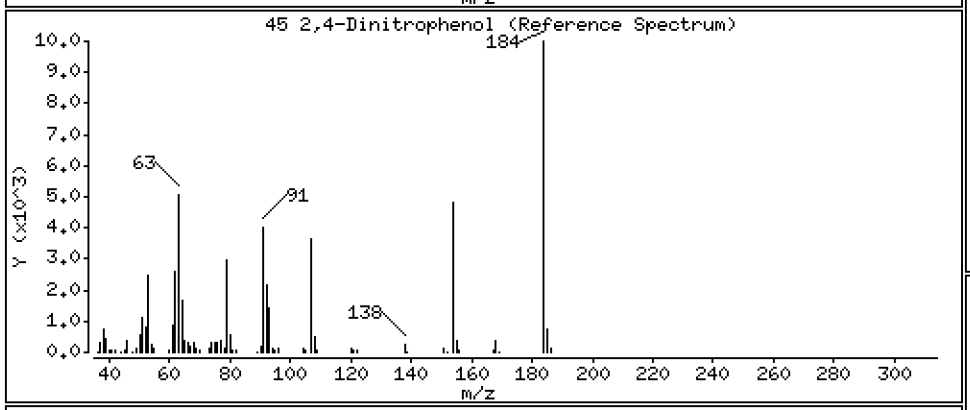
Column diameter: 0.25

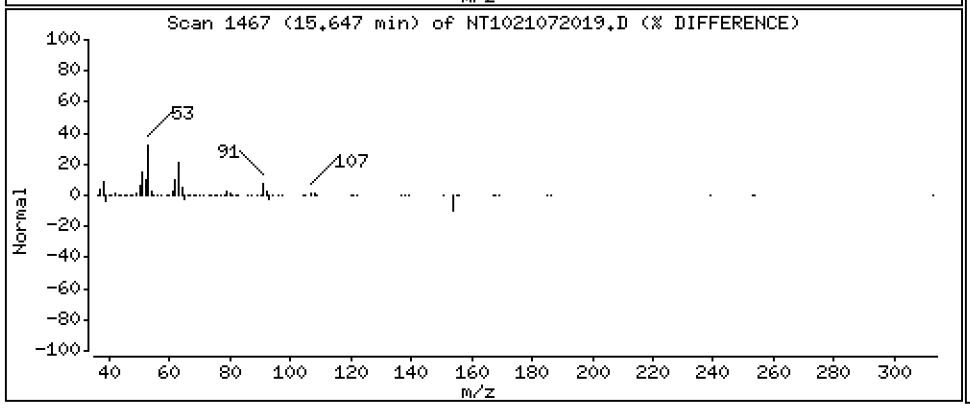
45 2,4-Dinitrophenol

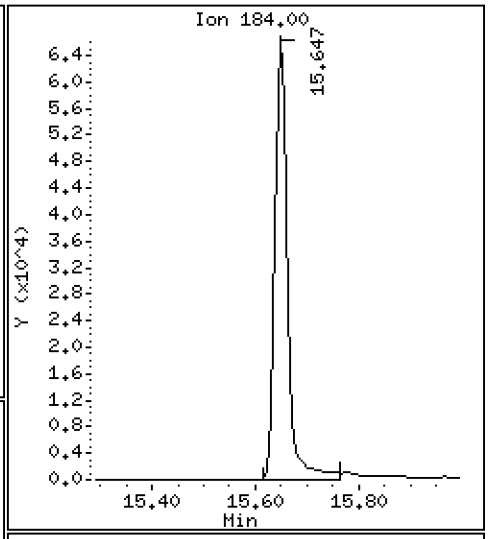
Concentration: 10.67 ug/mL

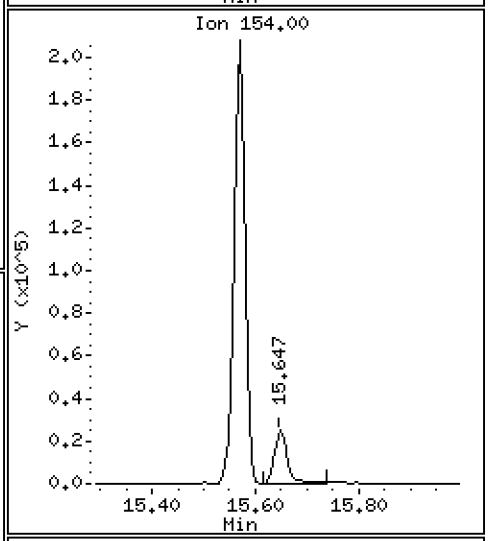


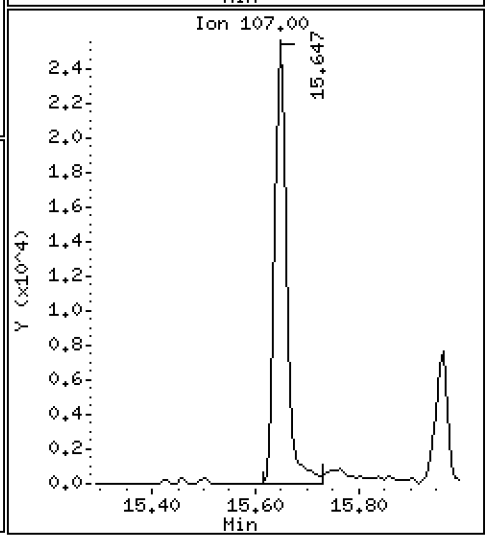












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

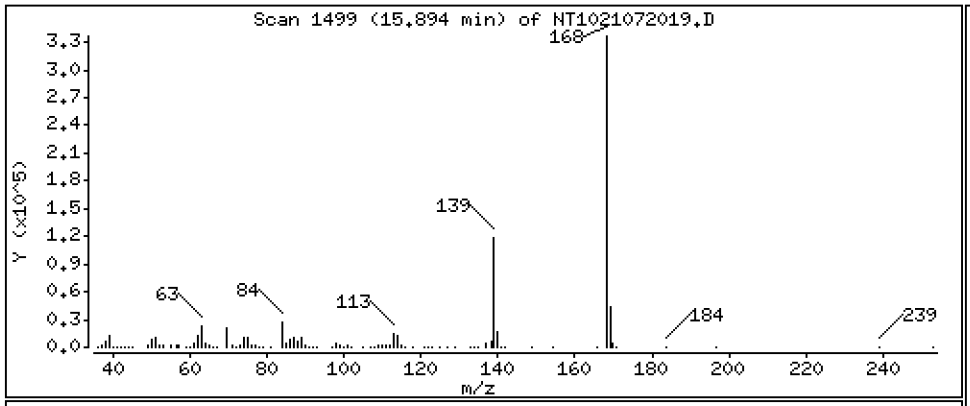
Operator: VTS

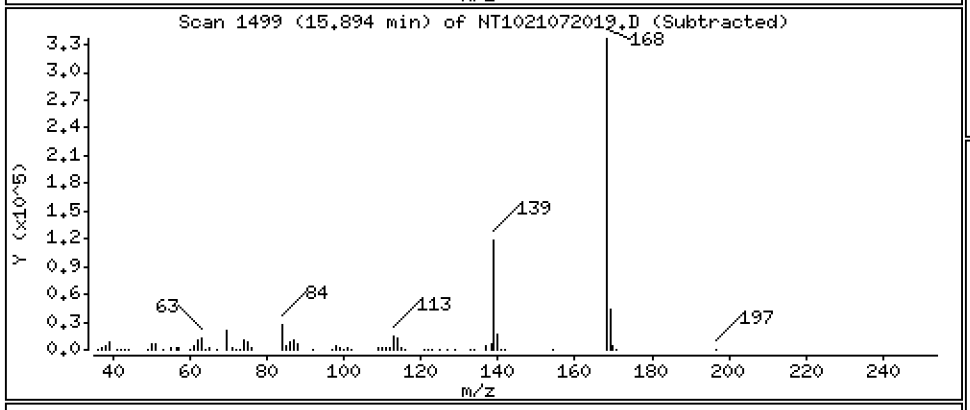
Column phase: ZB-5msi

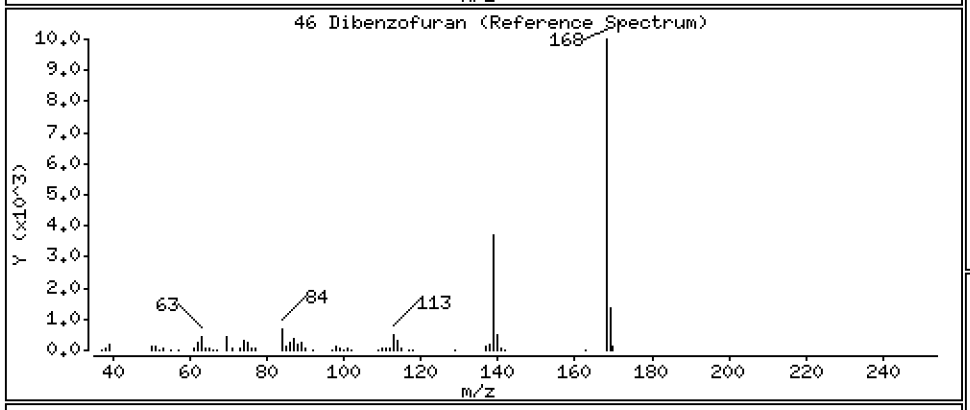
Column diameter: 0.25

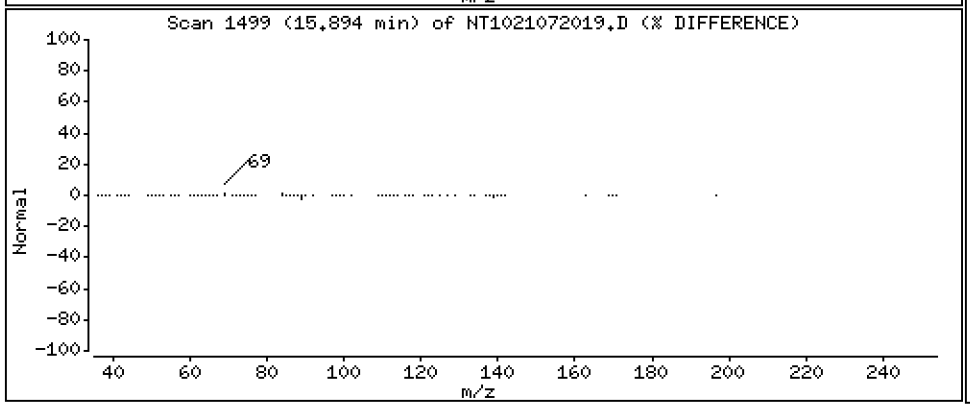
46 Dibenzofuran

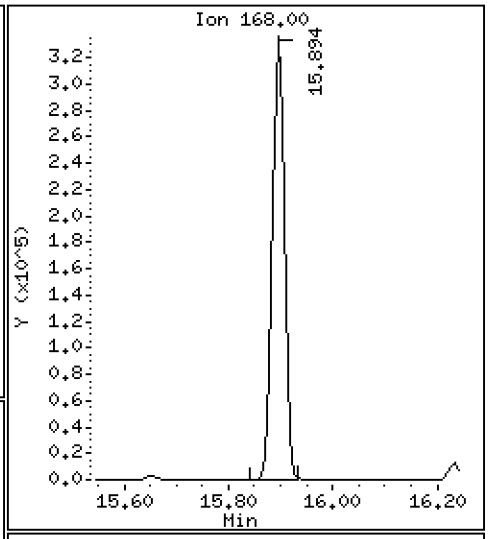
Concentration: 5.149 ug/mL

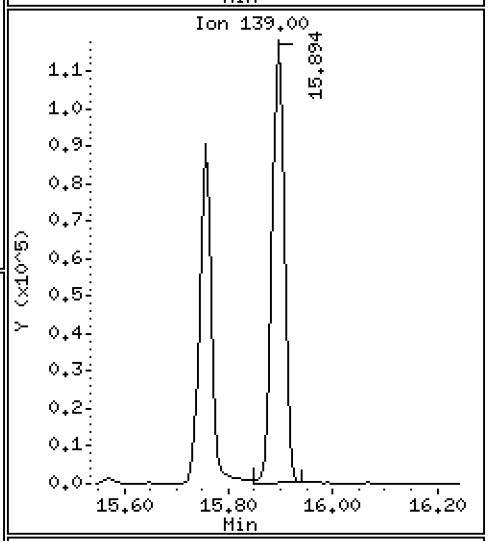


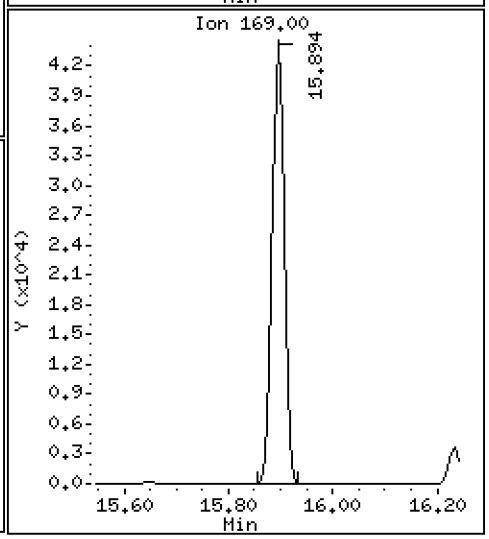












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

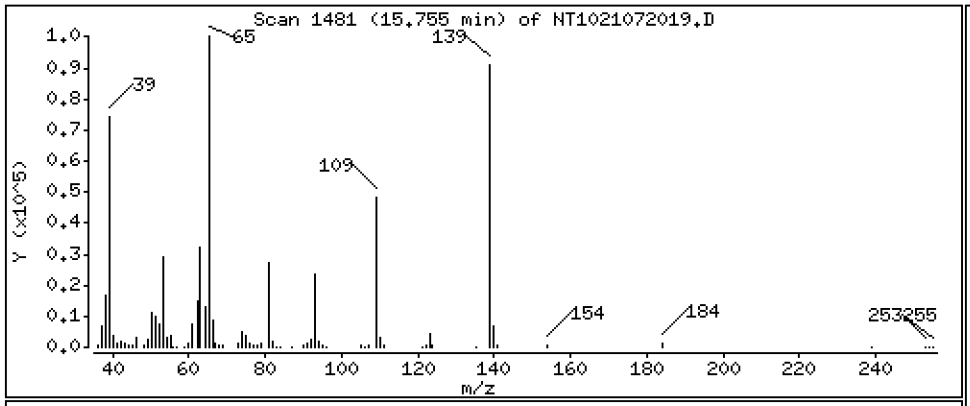
Operator: VTS

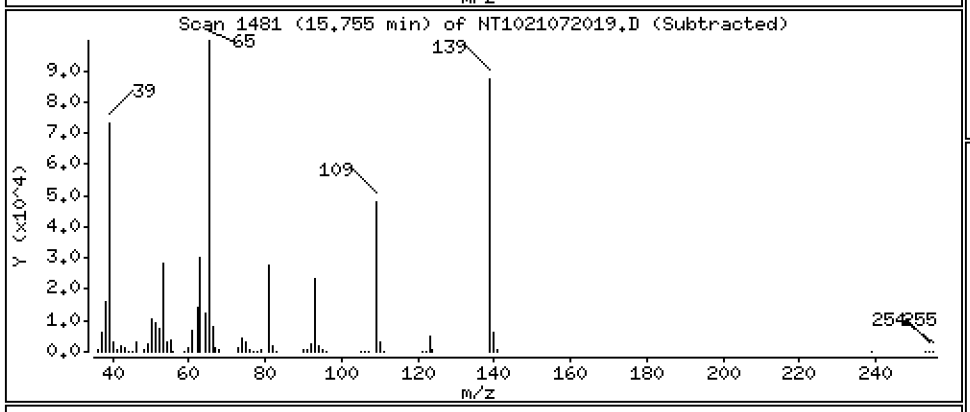
Column phase: ZB-5msi

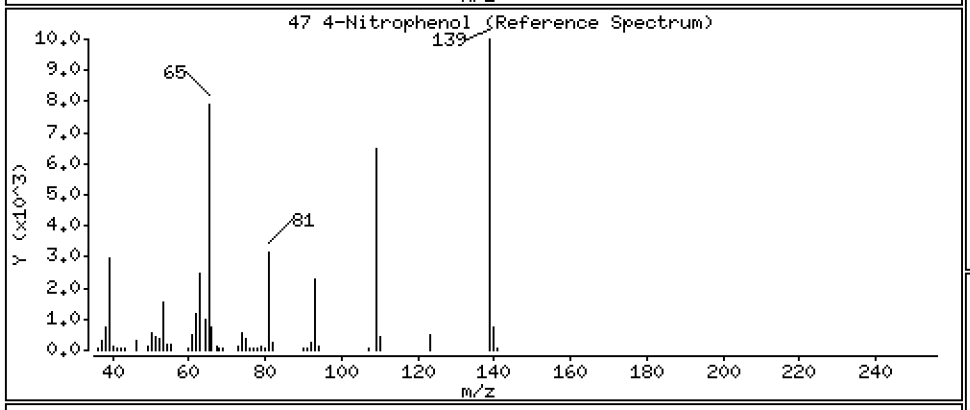
Column diameter: 0.25

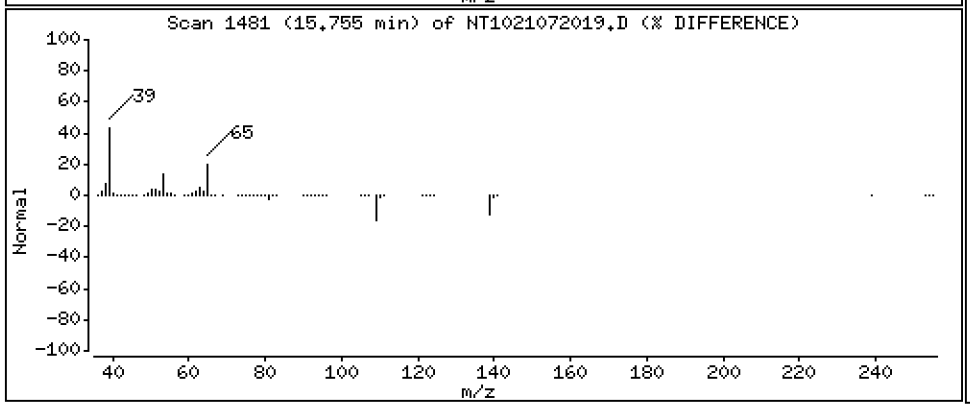
47 4-Nitrophenol

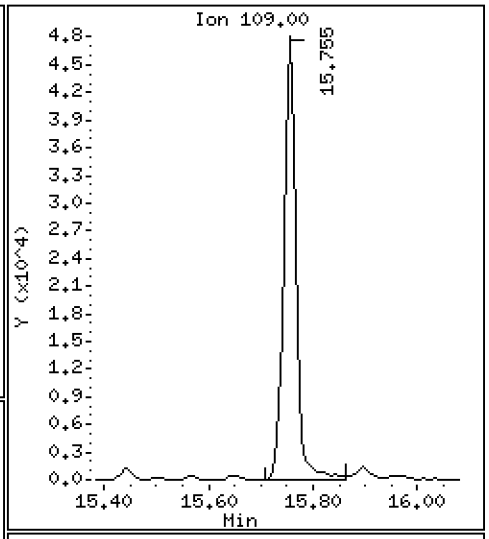
Concentration: 9.729 ug/mL

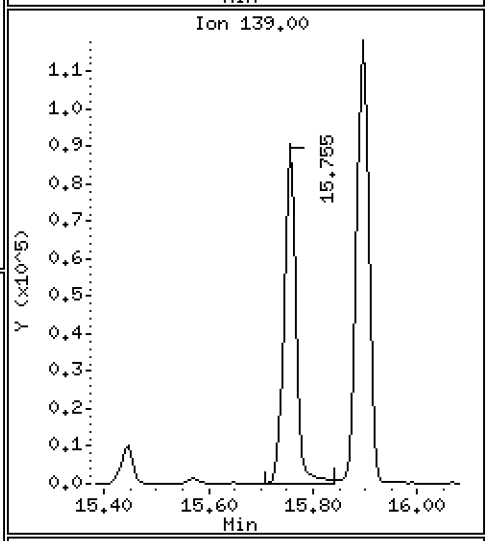


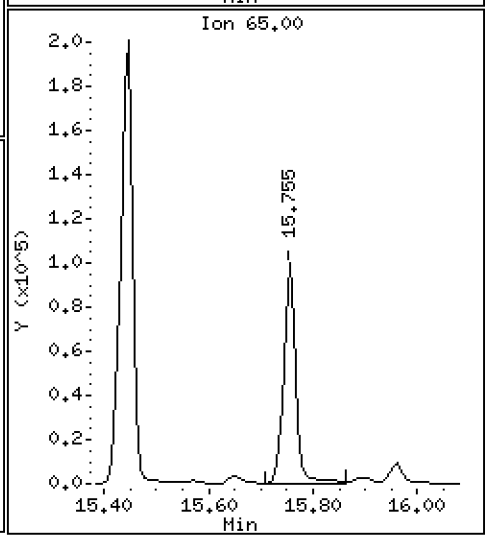












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

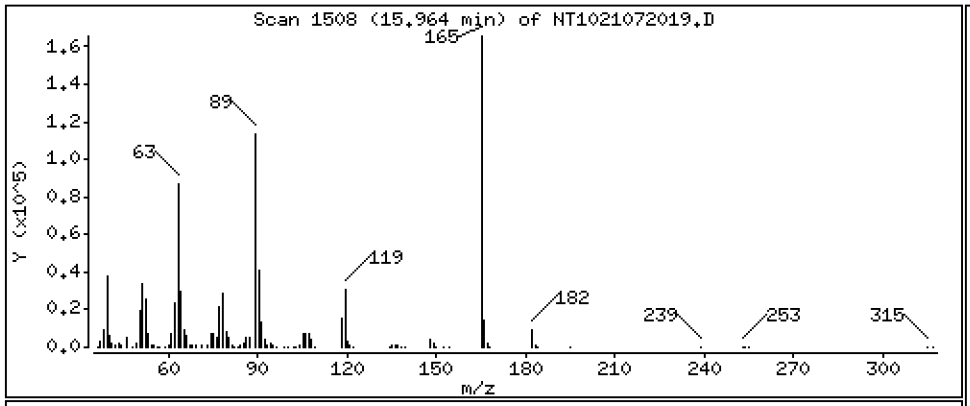
Operator: VTS

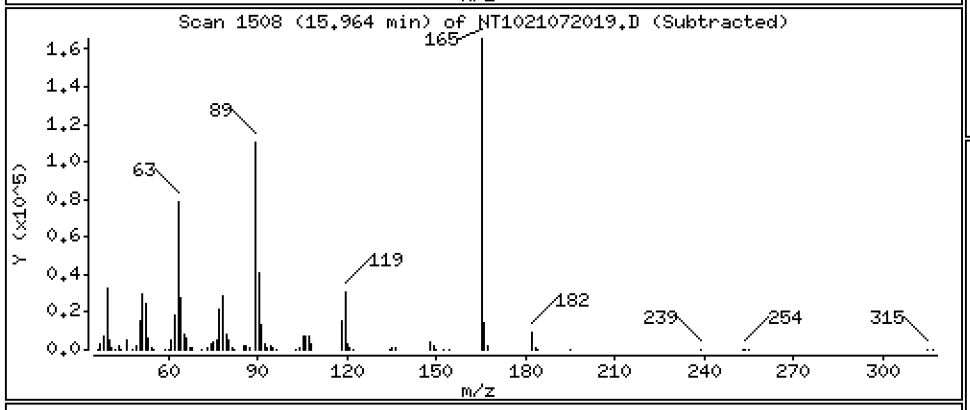
Column phase: ZB-5msi

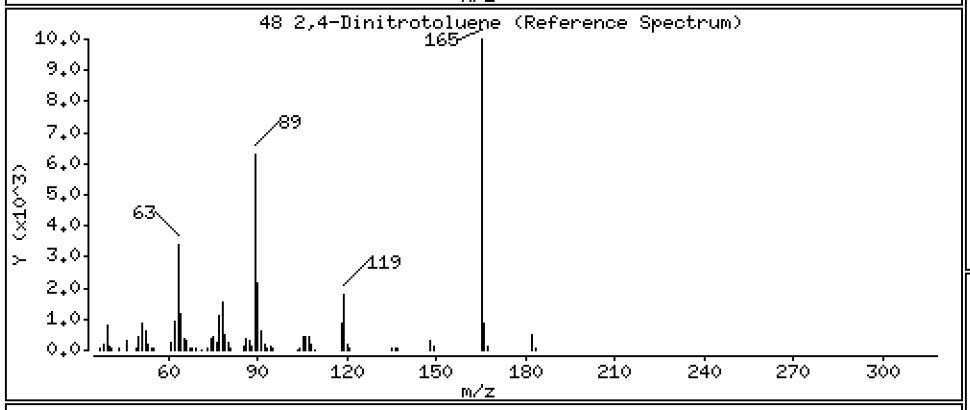
Column diameter: 0.25

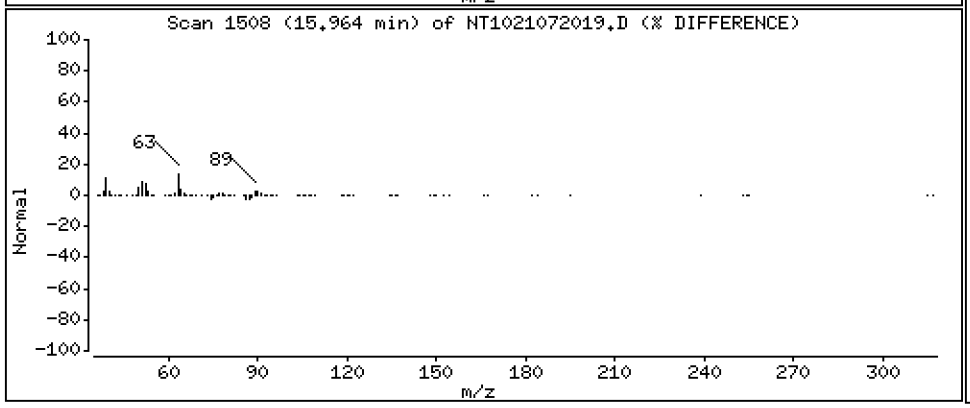
48 2,4-Dinitrotoluene

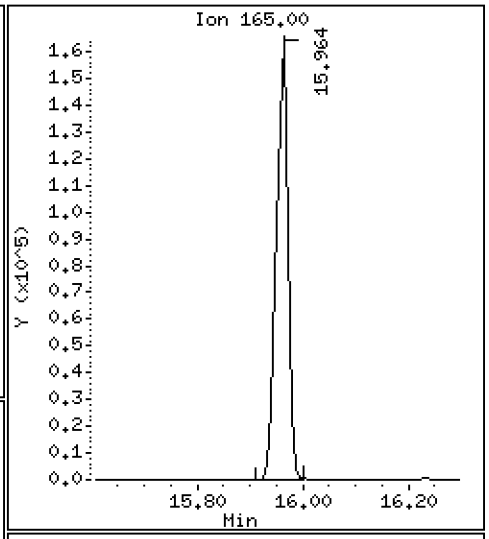
Concentration: 10.73 ug/mL

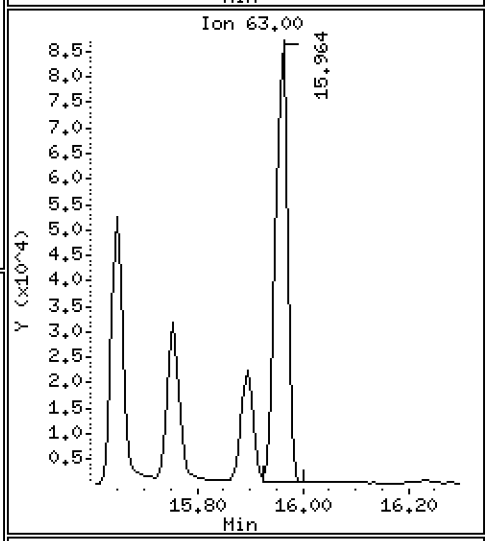


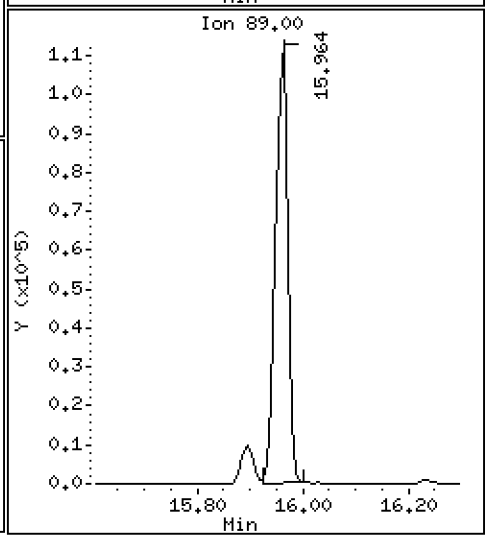












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

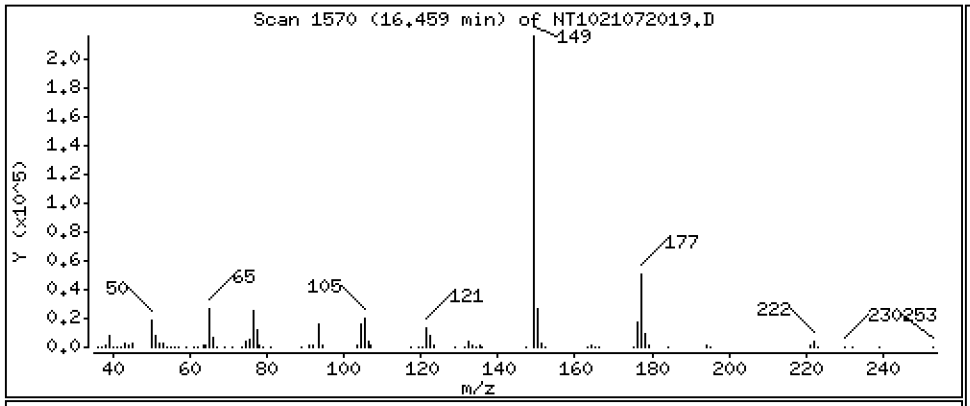
Operator: VTS

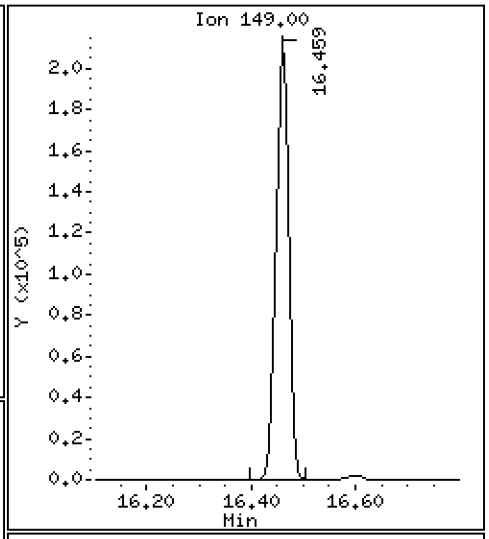
Column phase: ZB-5msi

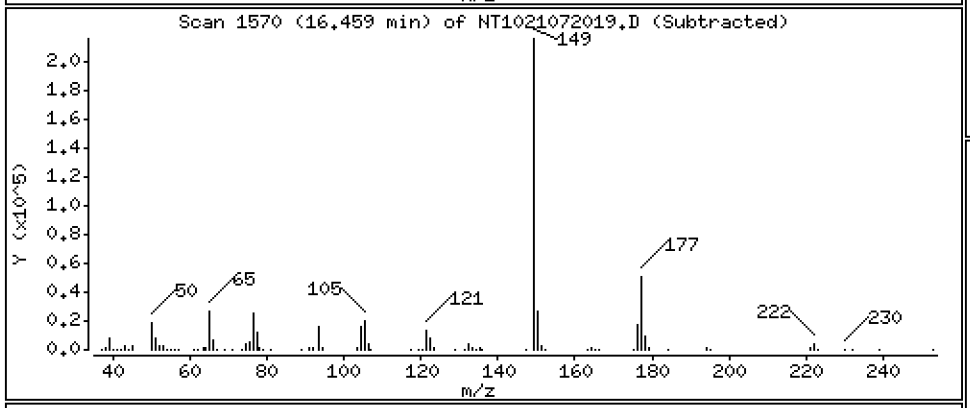
Column diameter: 0.25

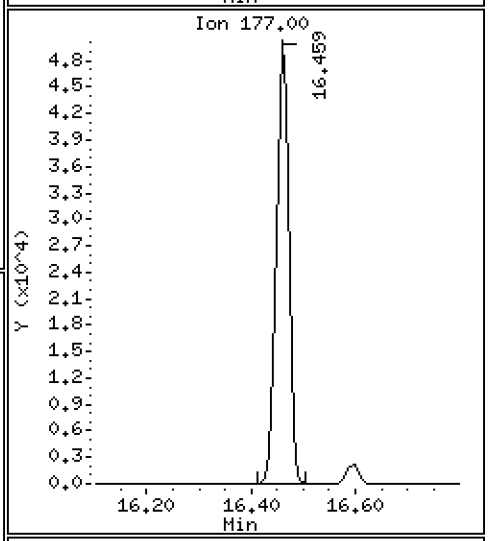
50 Diethylphthalate

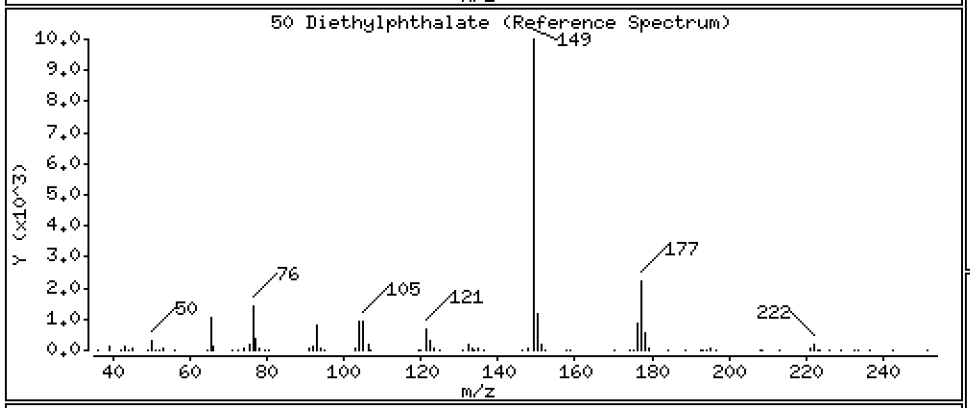
Concentration: 4.973 ug/mL

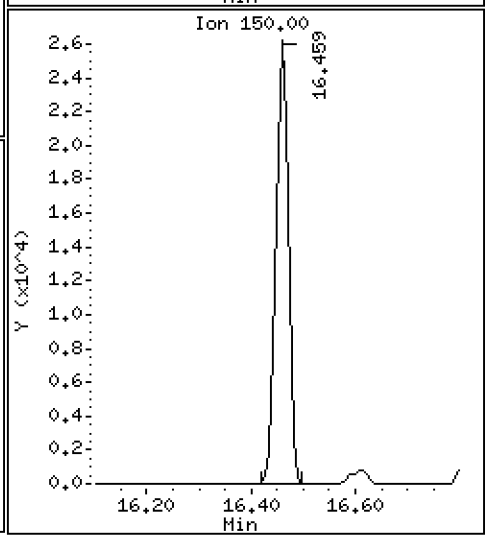


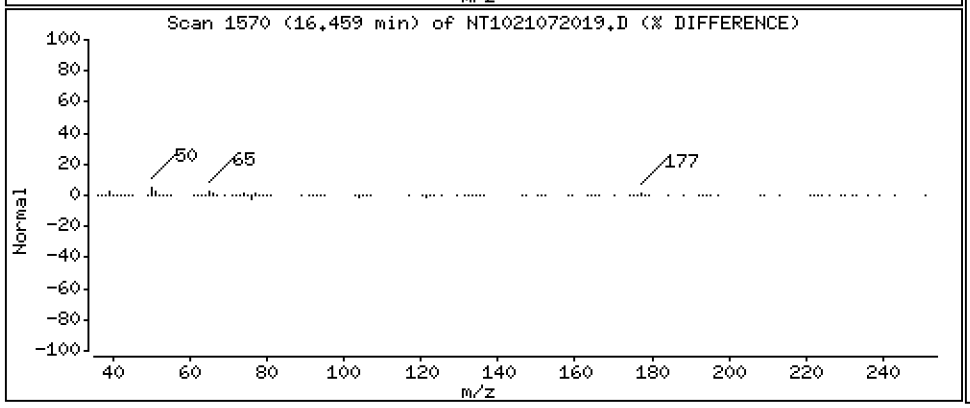












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

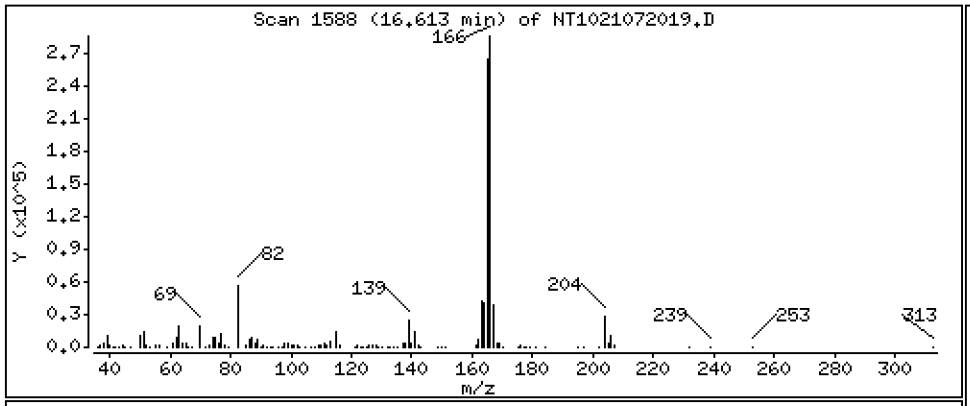
Operator: VTS

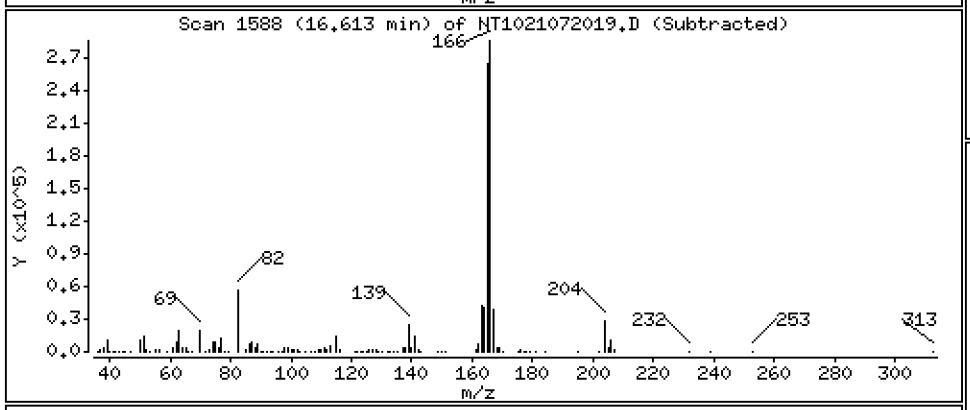
Column phase: ZB-5msi

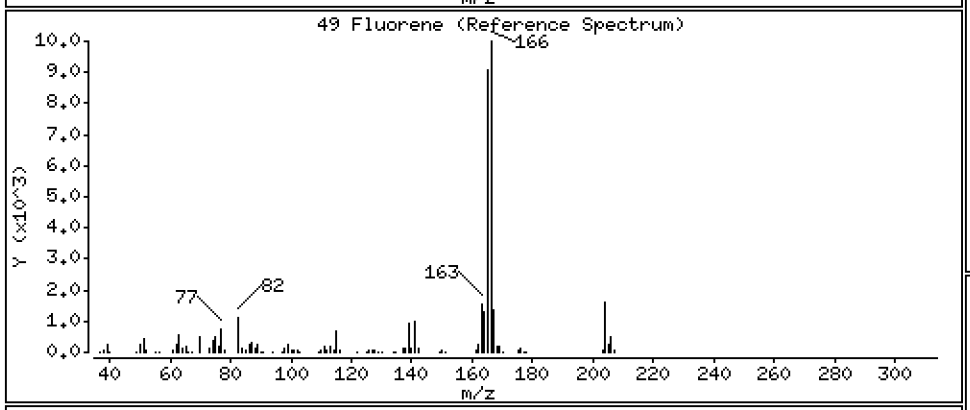
Column diameter: 0.25

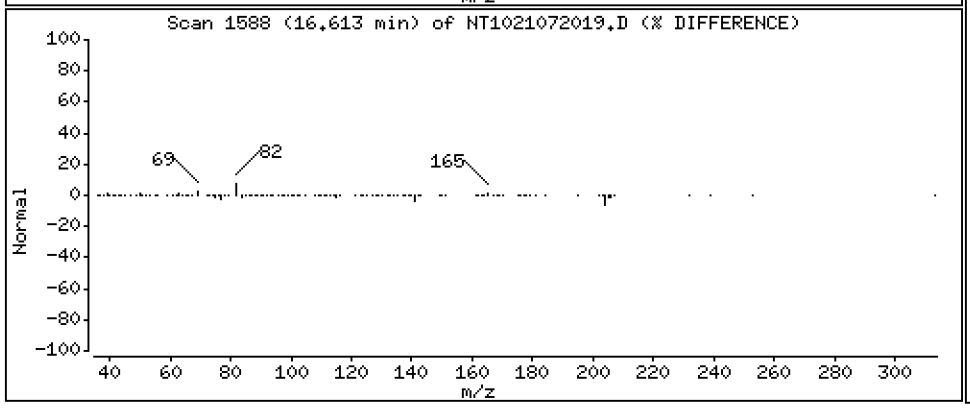
49 Fluorene

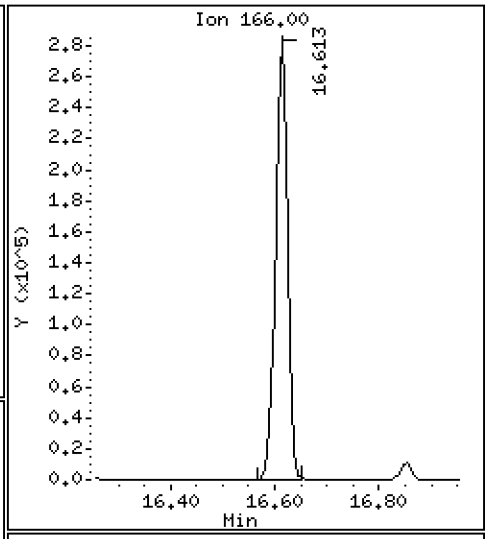
Concentration: 4.741 ug/mL

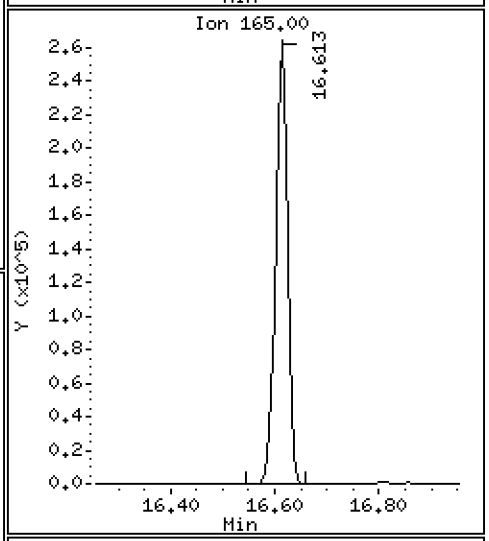


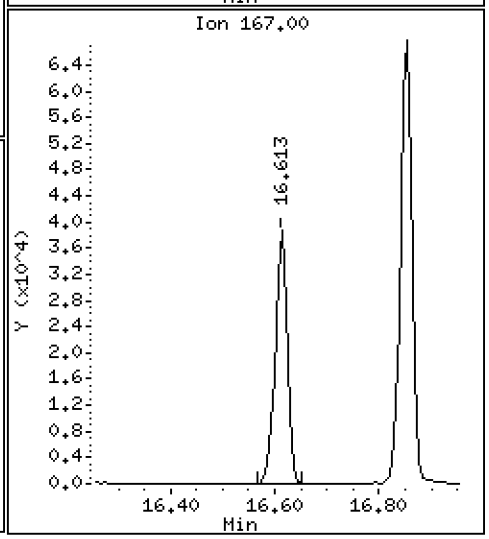












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

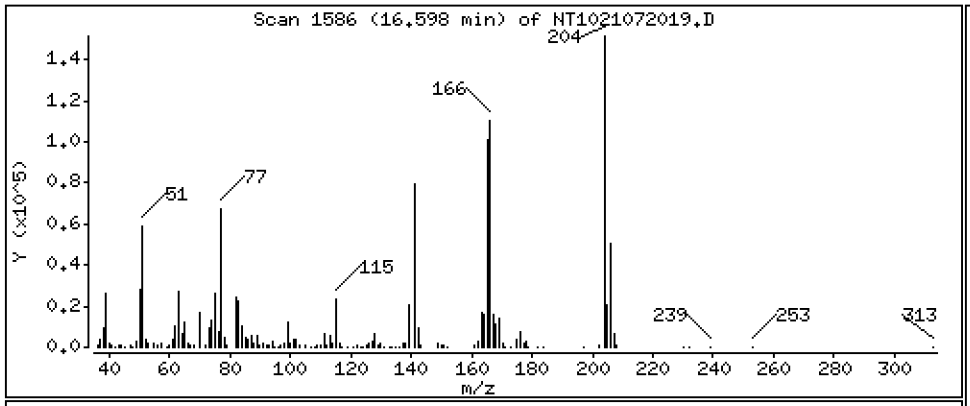
Operator: VTS

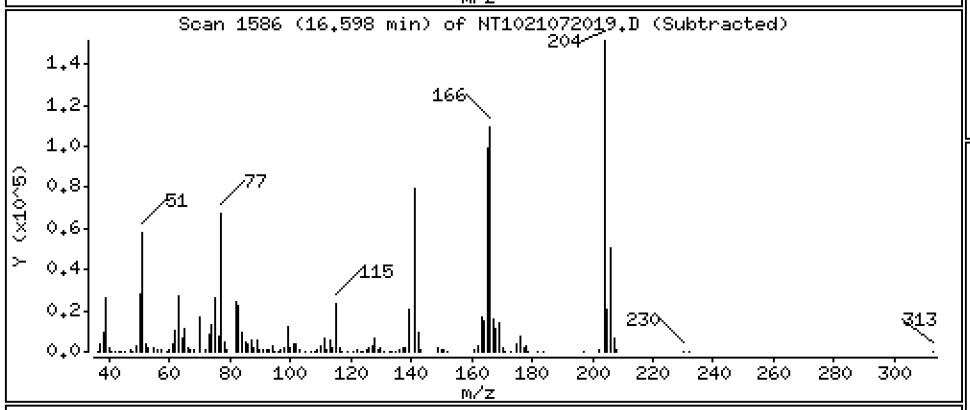
Column phase: ZB-5msi

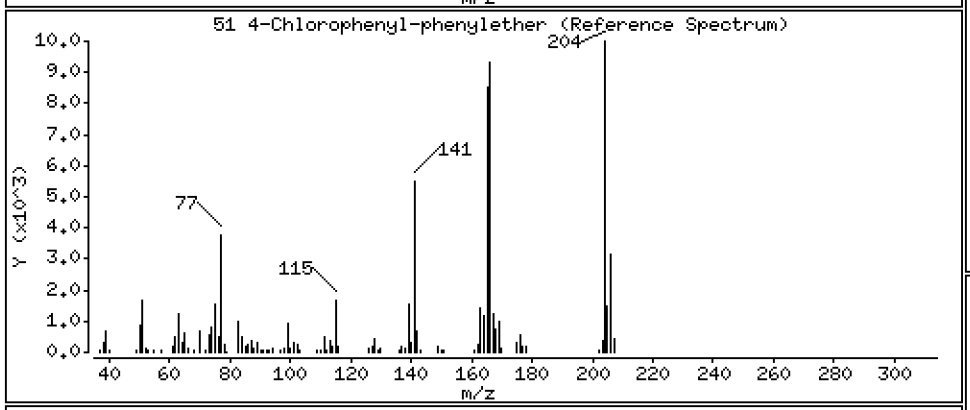
Column diameter: 0.25

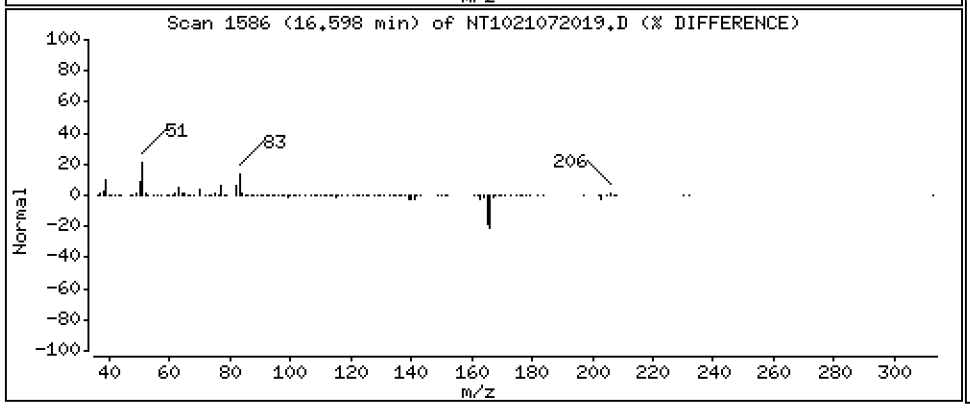
51 4-Chlorophenyl-phenylether

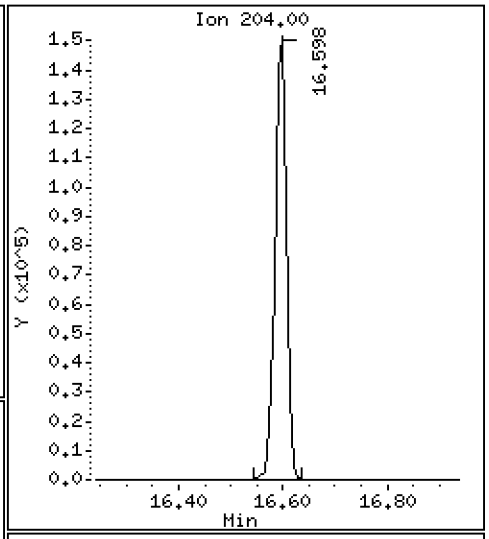
Concentration: 4.972 ug/mL

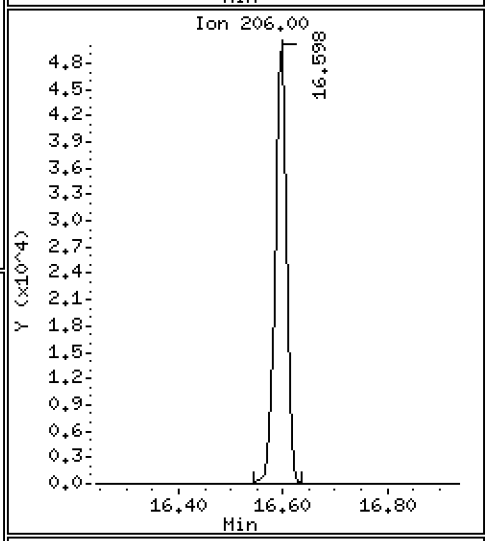


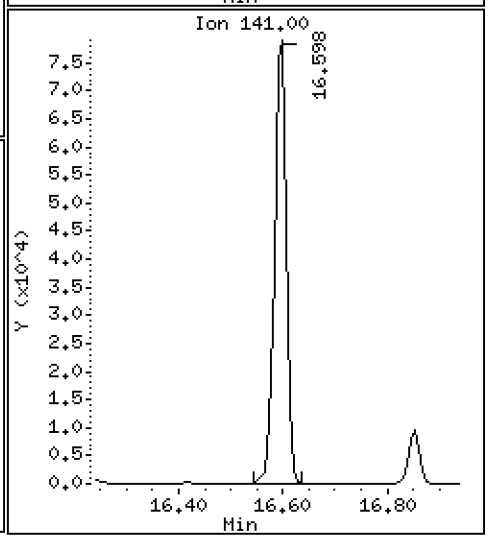












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

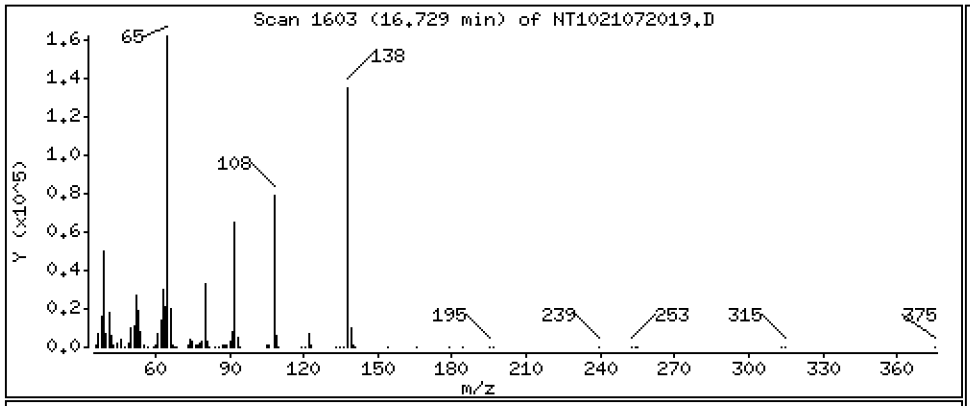
Operator: VTS

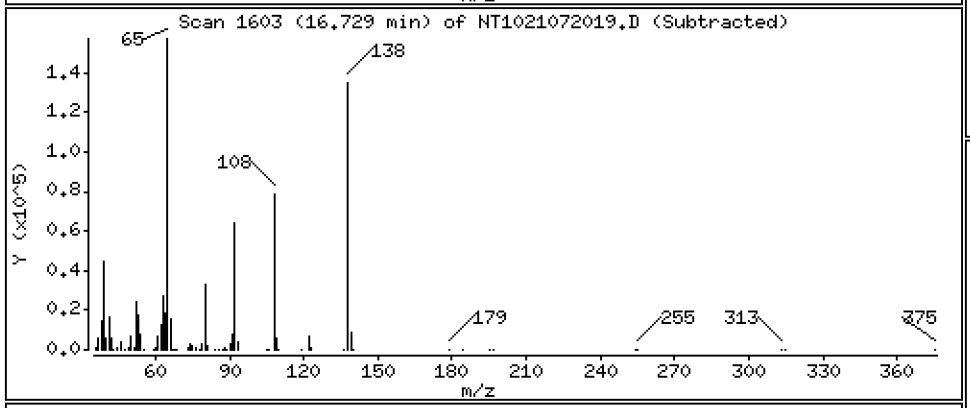
Column phase: ZB-5msi

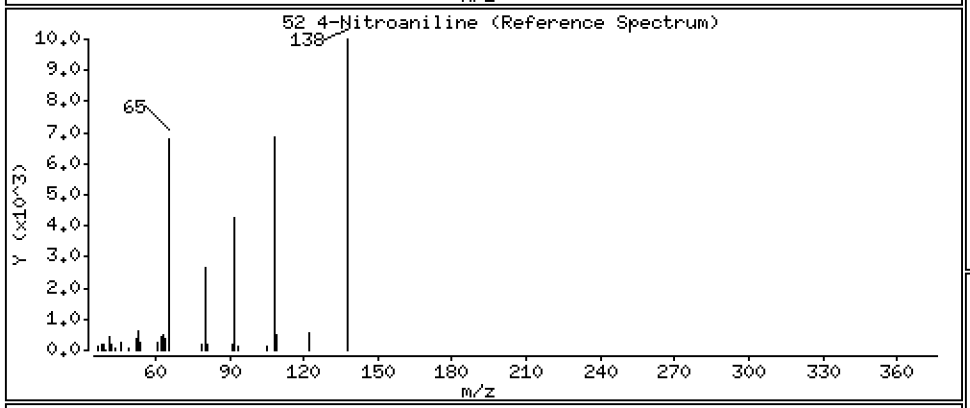
Column diameter: 0.25

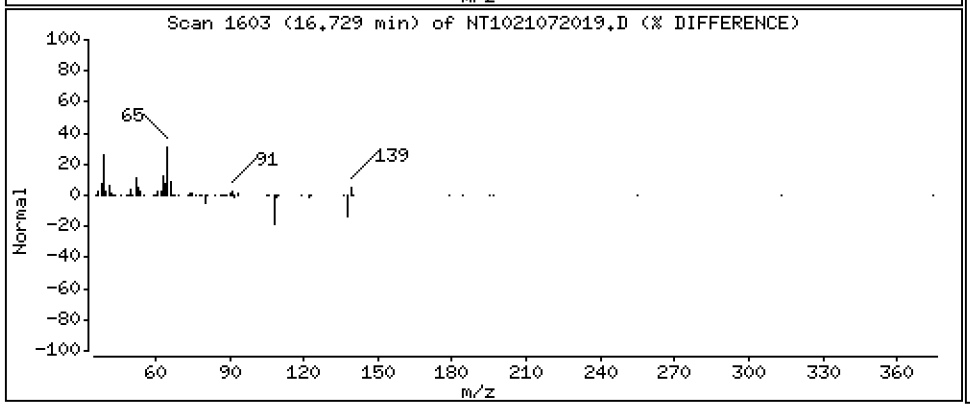
52 4-Nitroaniline

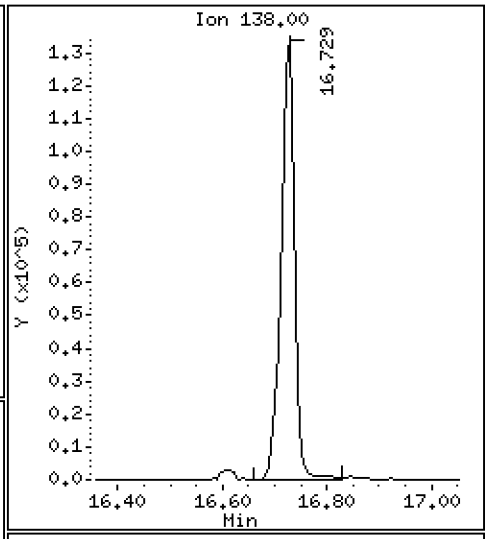
Concentration: 10.90 ug/mL

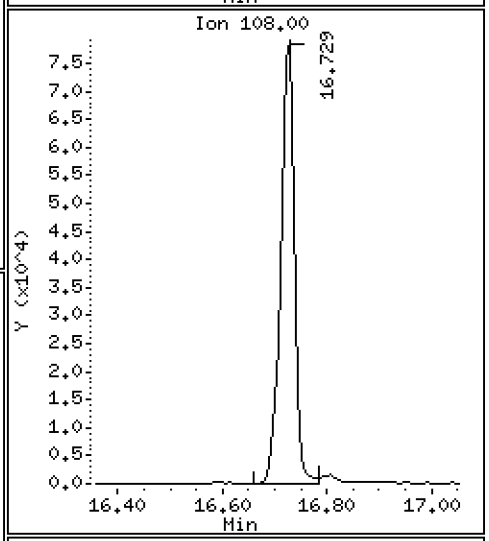


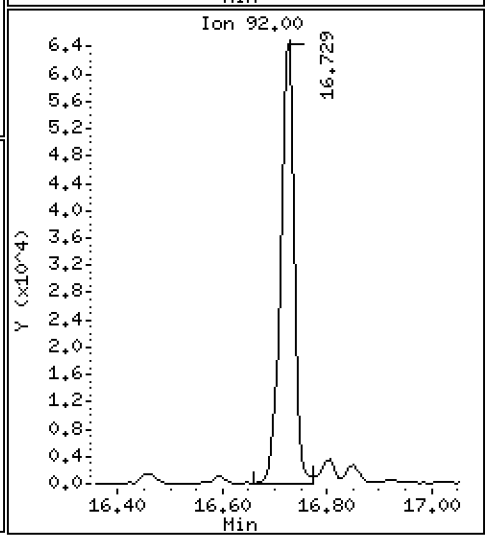












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

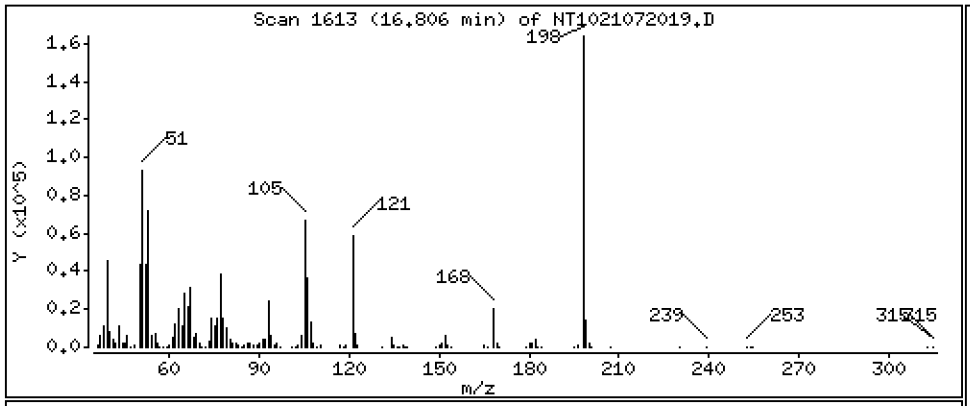
Operator: VTS

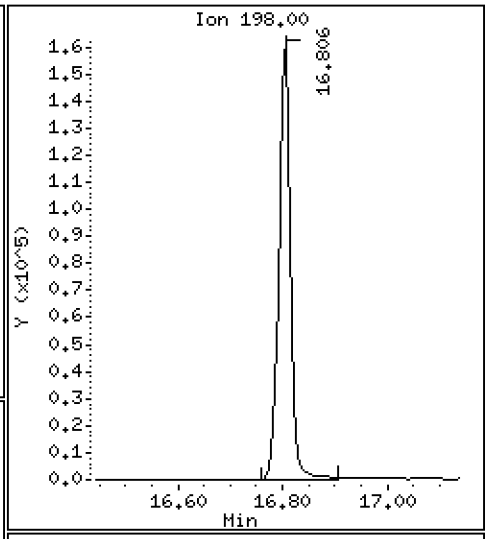
Column phase: ZB-5msi

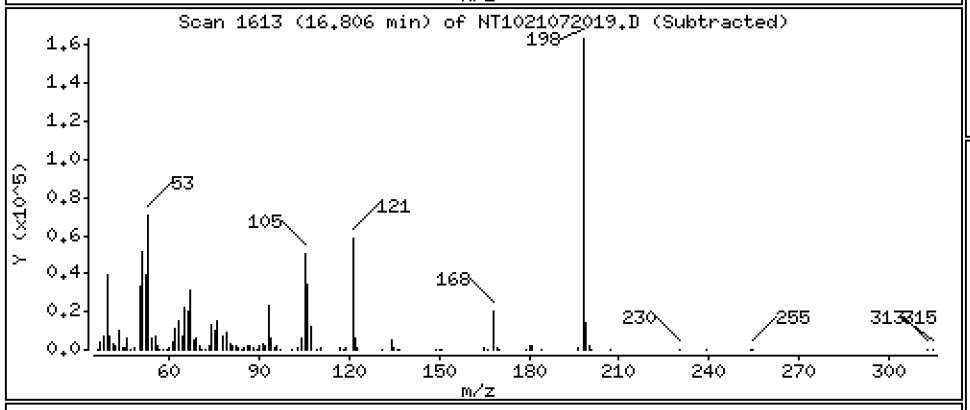
Column diameter: 0.25

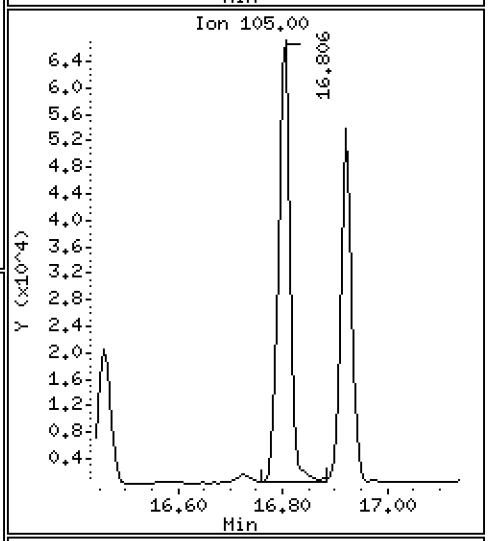
53 4,6-Dinitro-2-methylphenol

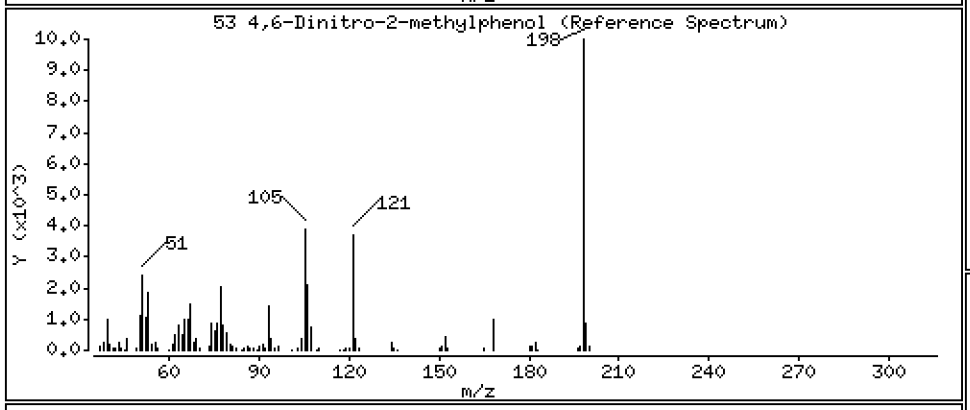
Concentration: 15.44 ug/mL

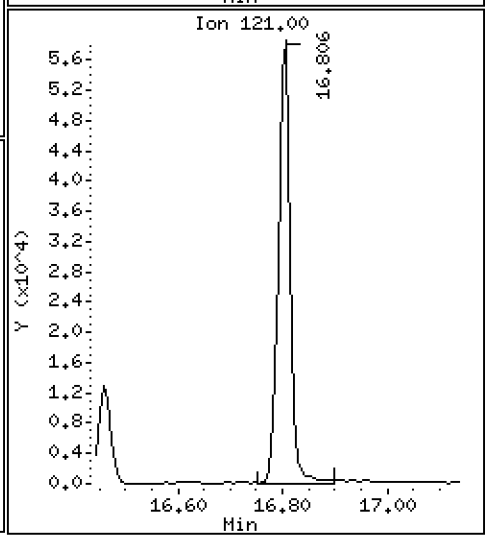


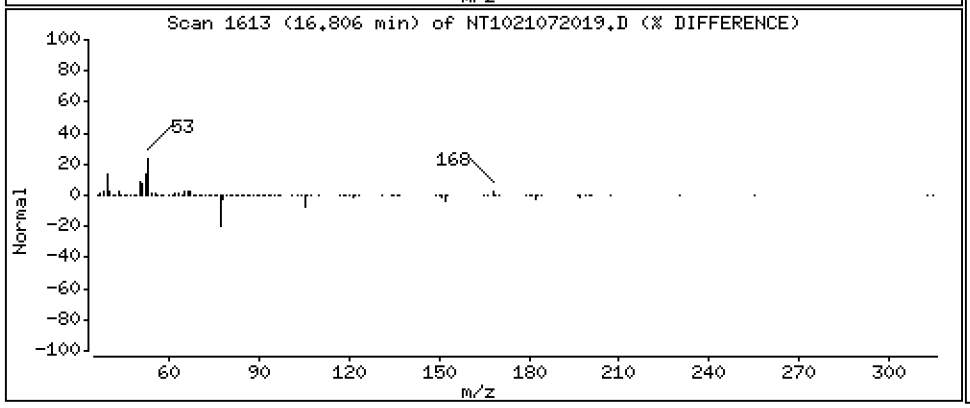












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

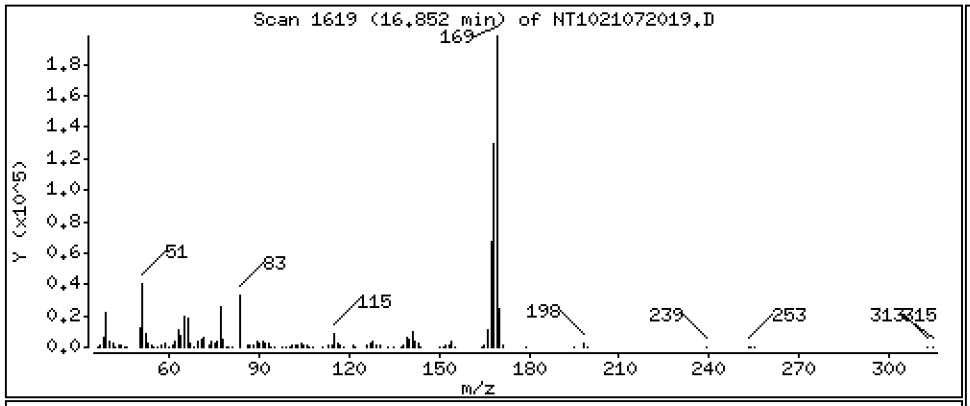
Operator: VTS

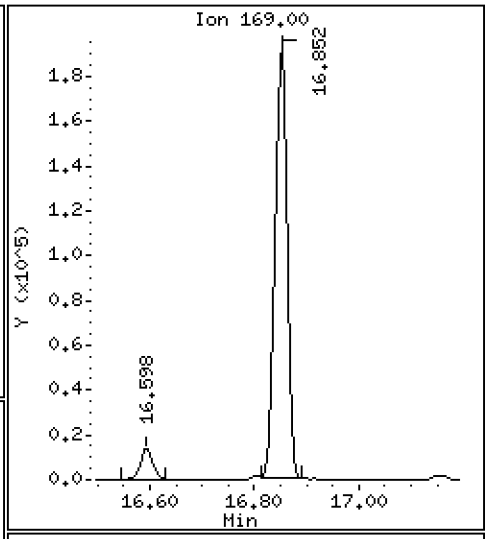
Column phase: ZB-5msi

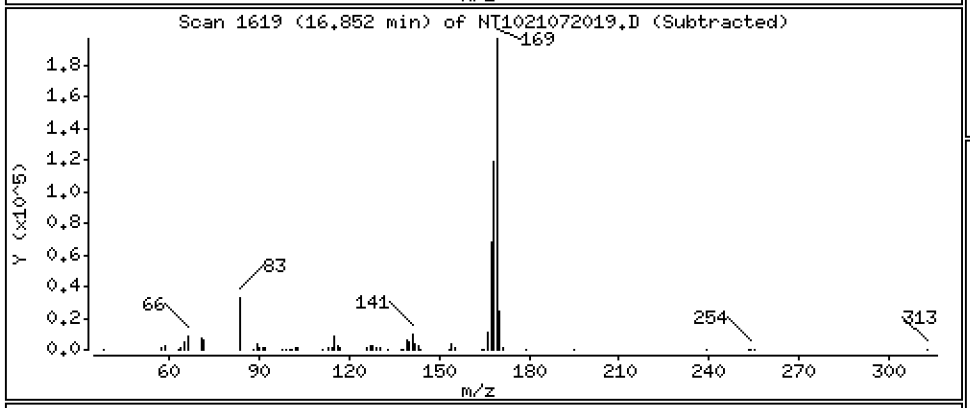
Column diameter: 0.25

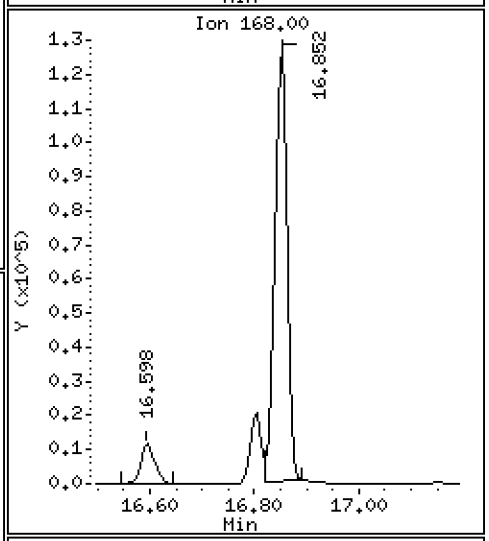
54 N-Nitrosodiphenylamine

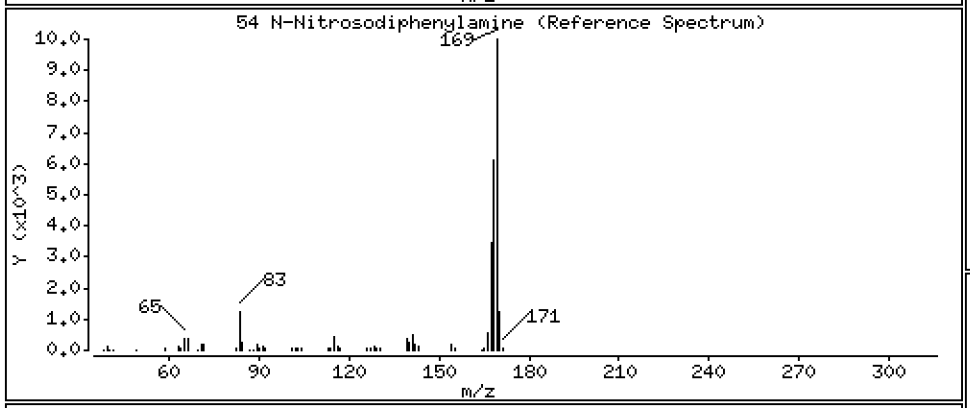
Concentration: 4.803 ug/mL

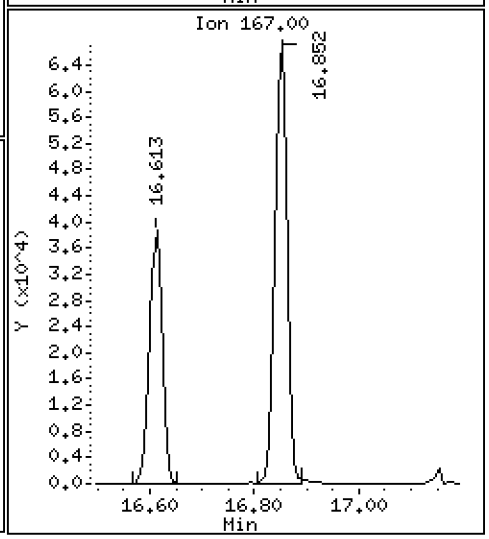


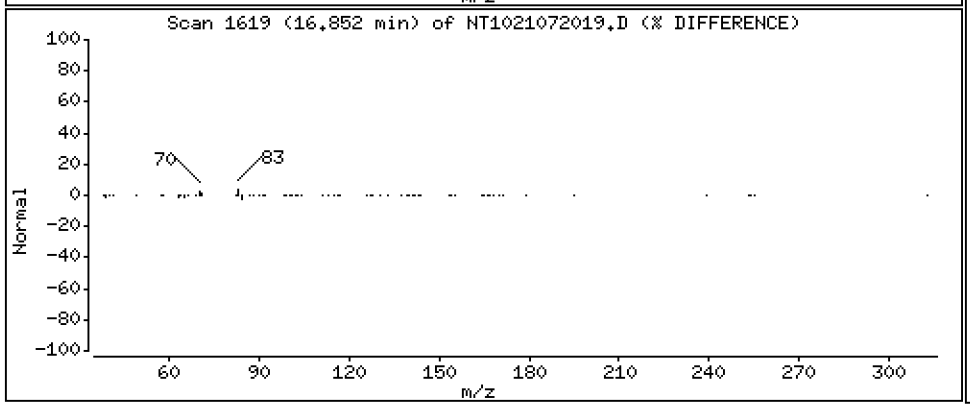












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

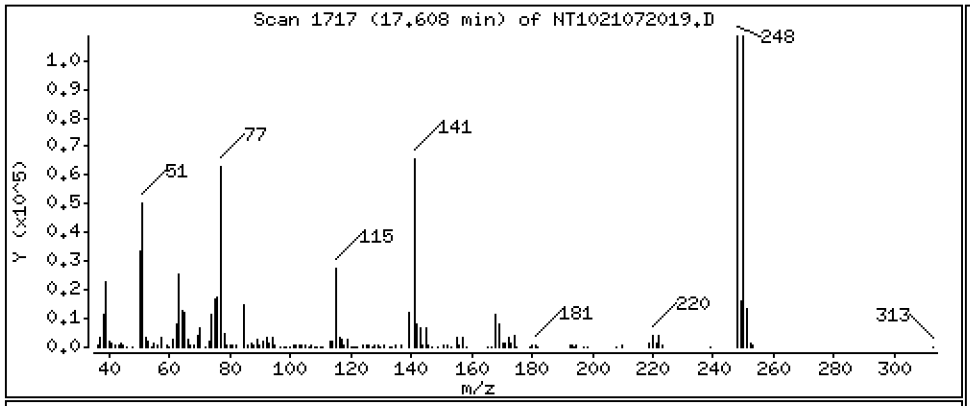
Operator: VTS

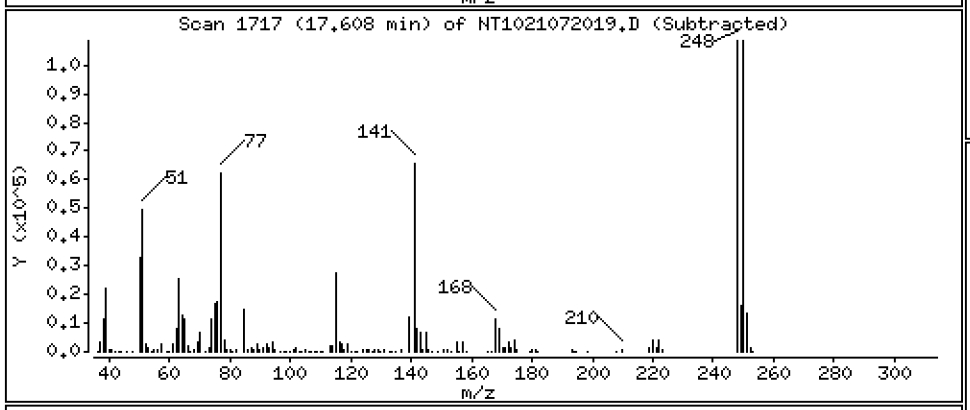
Column phase: ZB-5msi

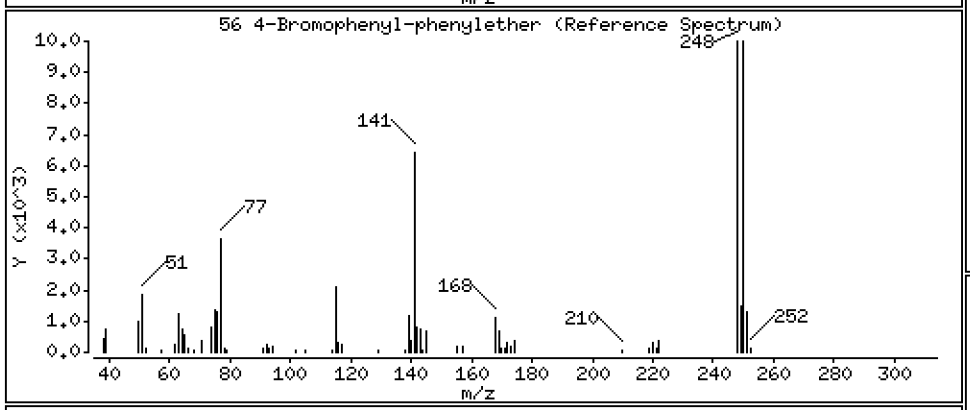
Column diameter: 0.25

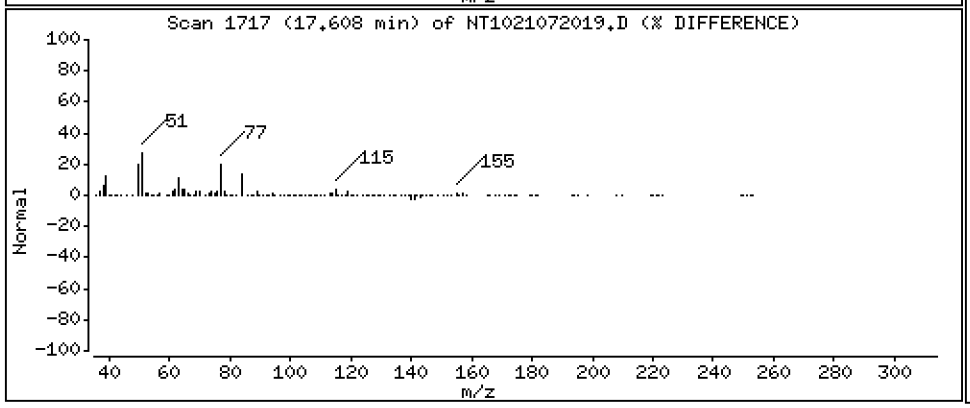
56 4-Bromophenyl-phenylether

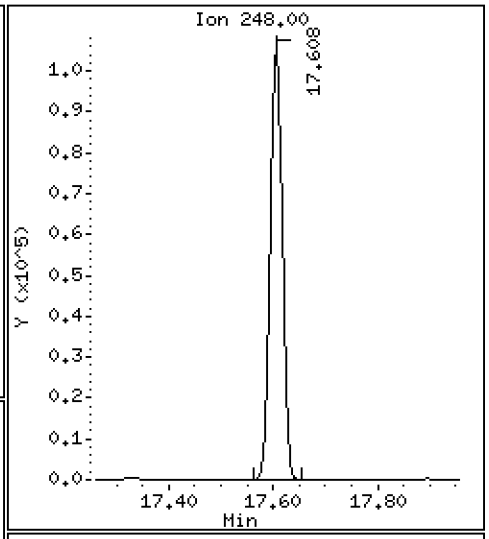
Concentration: 5.065 ug/mL

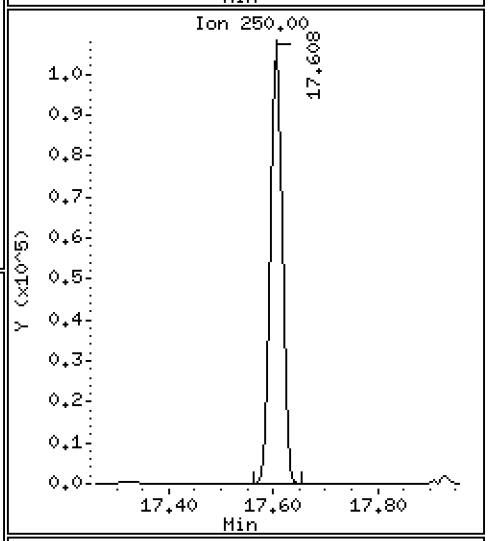


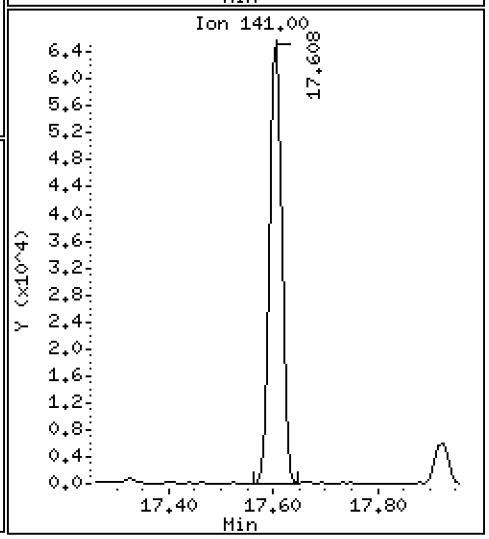












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

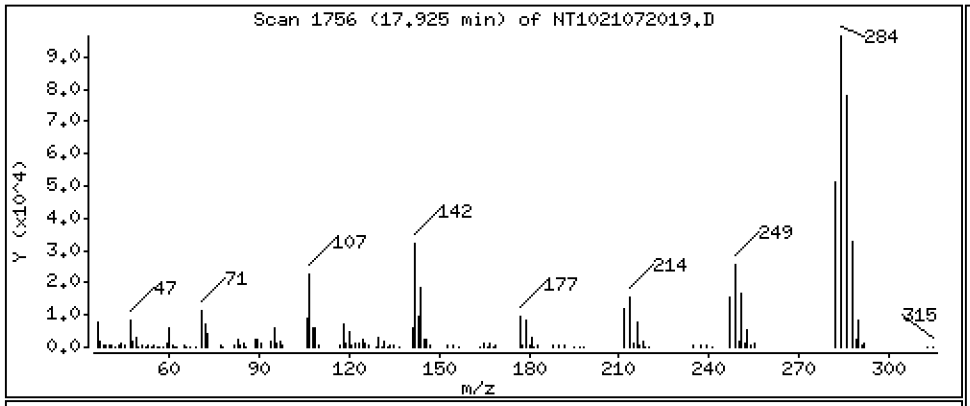
Operator: VTS

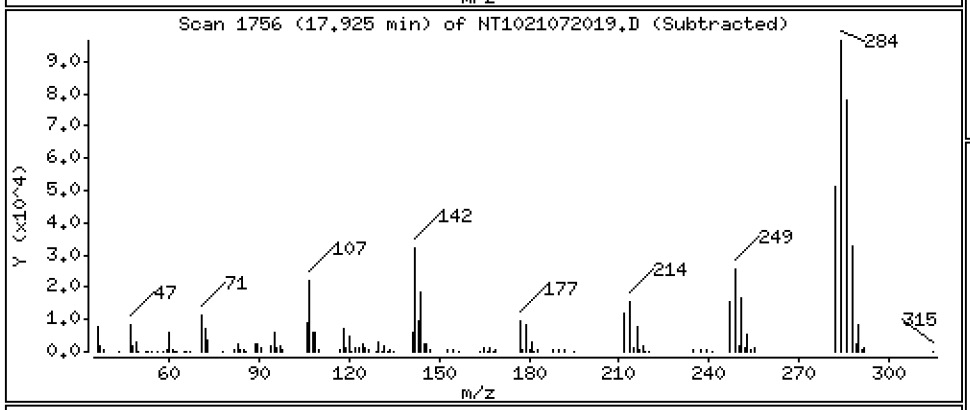
Column phase: ZB-5msi

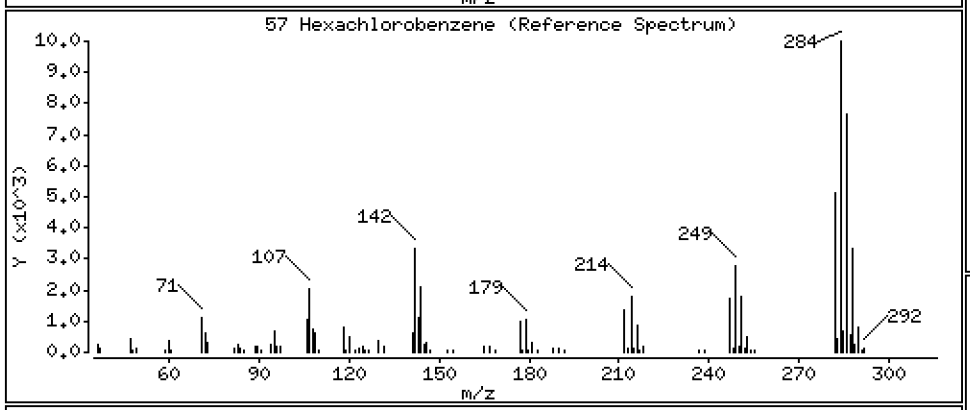
Column diameter: 0.25

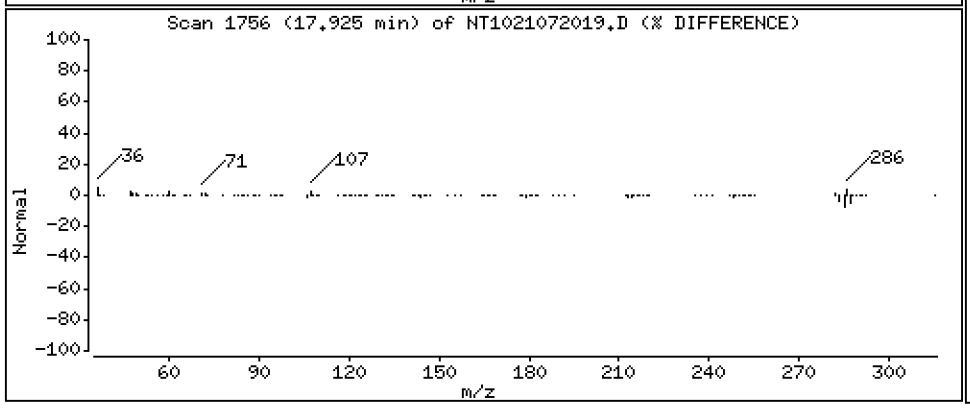
57 Hexachlorobenzene

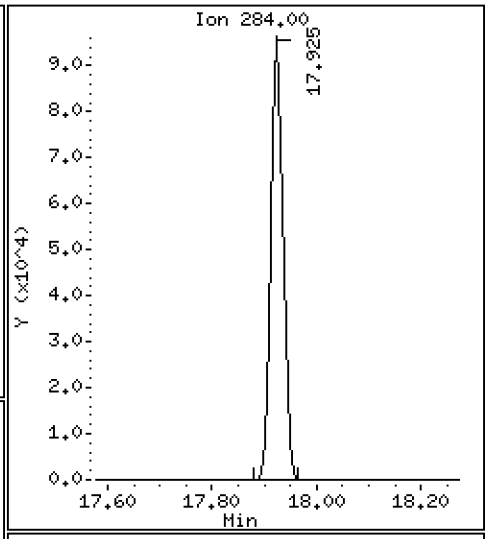
Concentration: 4.566 ug/mL

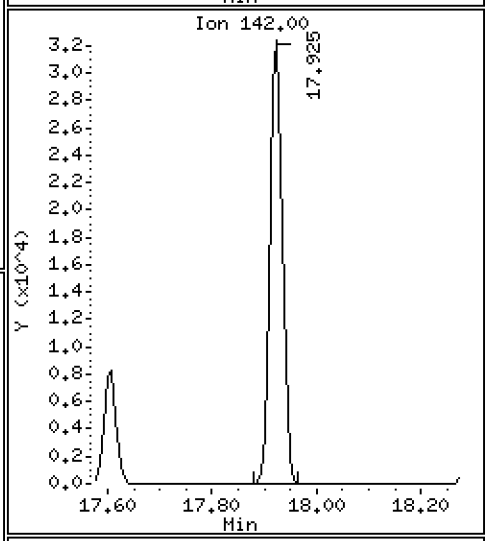


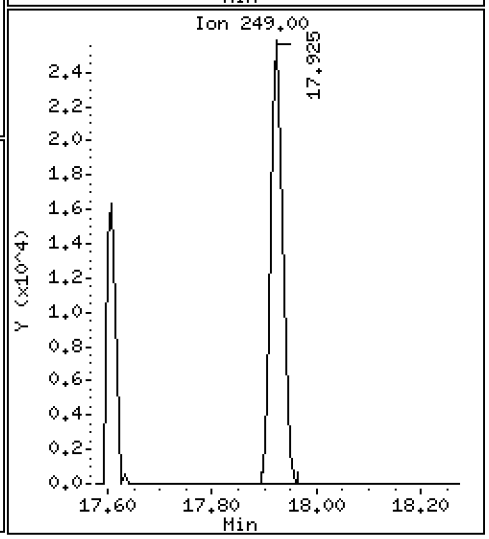












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

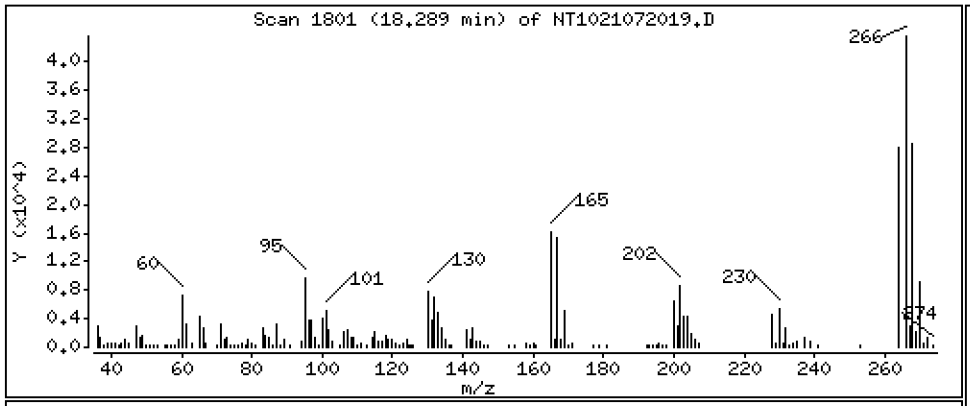
Operator: VTS

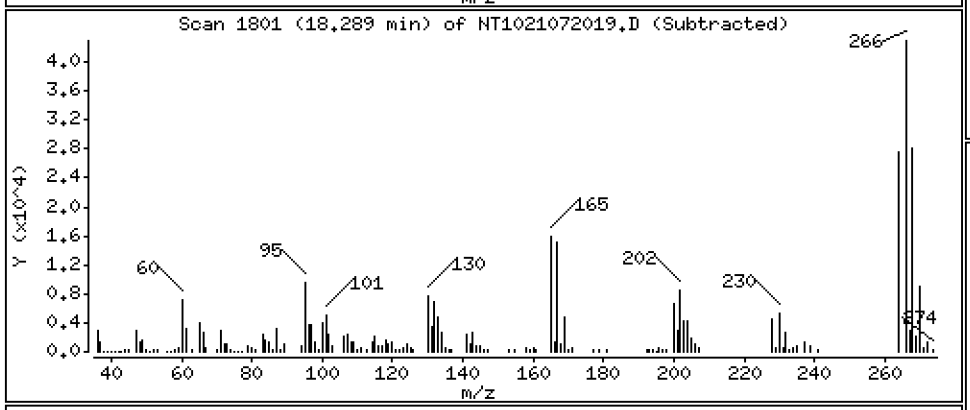
Column phase: ZB-5msi

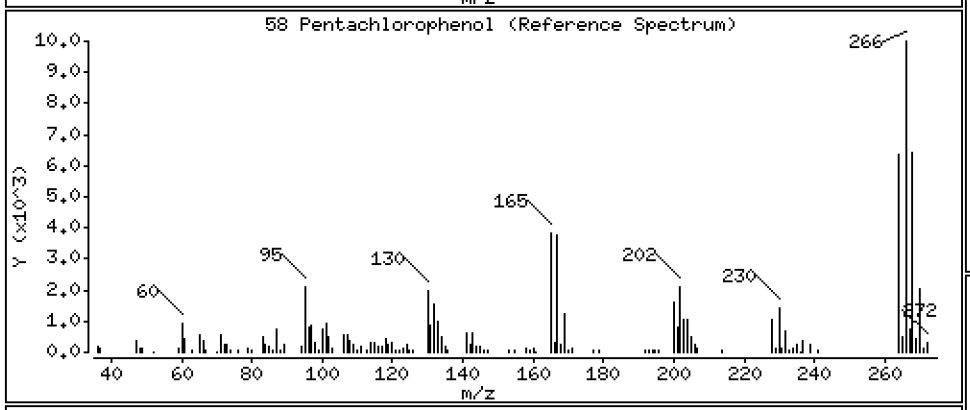
Column diameter: 0.25

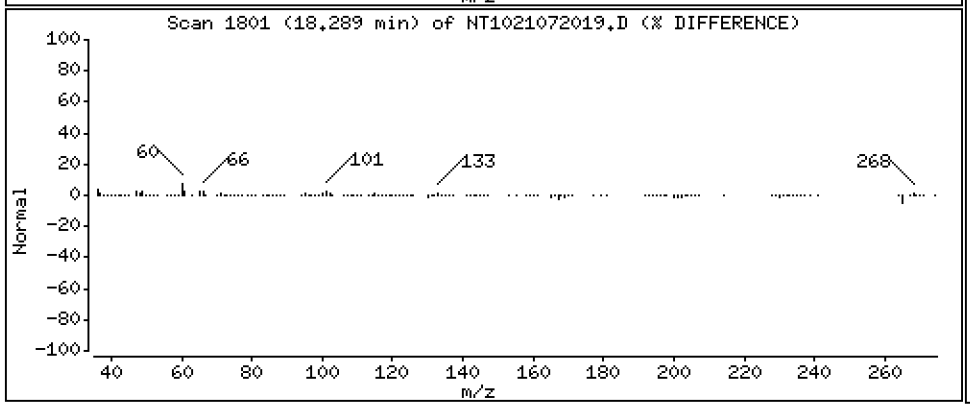
58 Pentachlorophenol

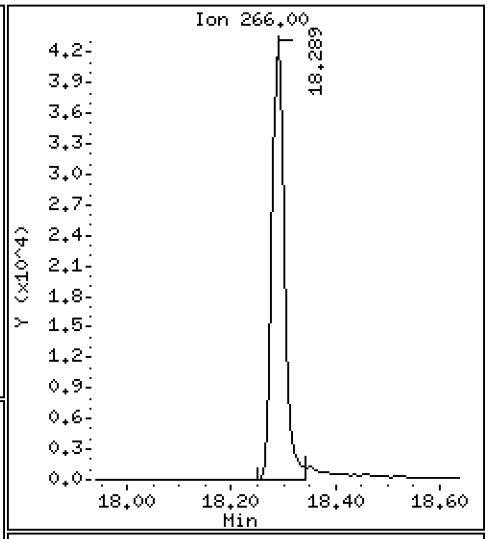
Concentration: 4.978 ug/mL

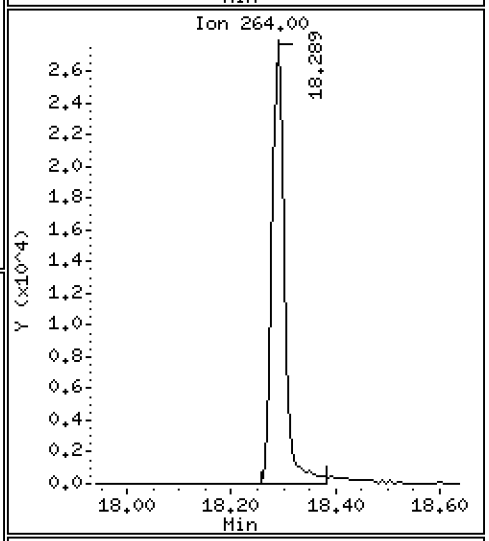


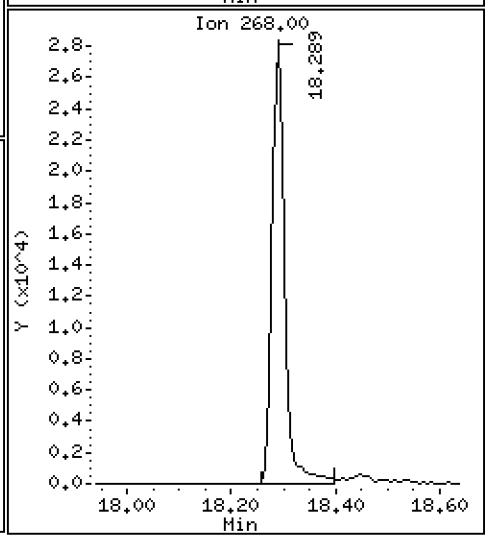












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

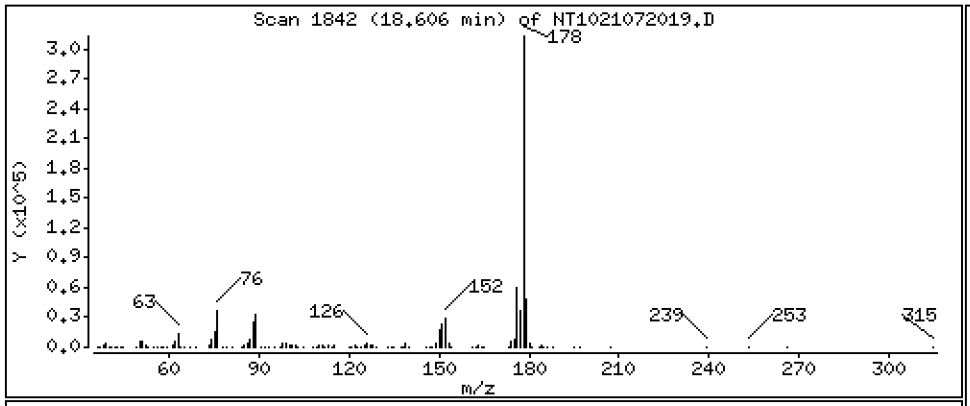
Operator: VTS

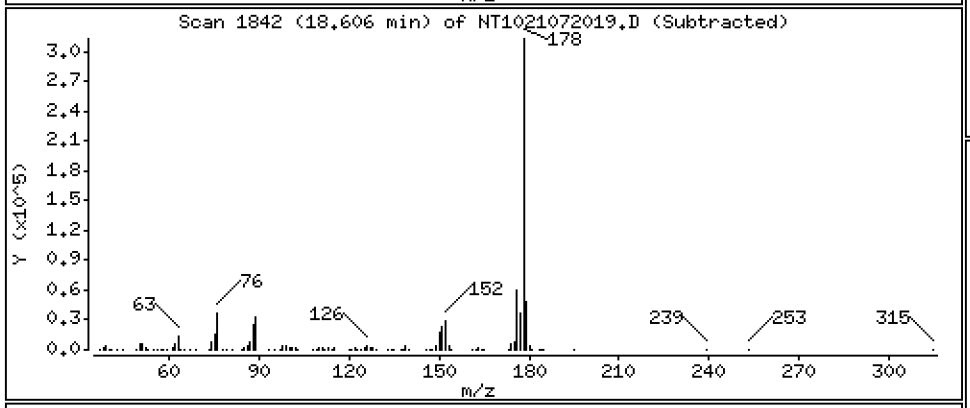
Column phase: ZB-5msi

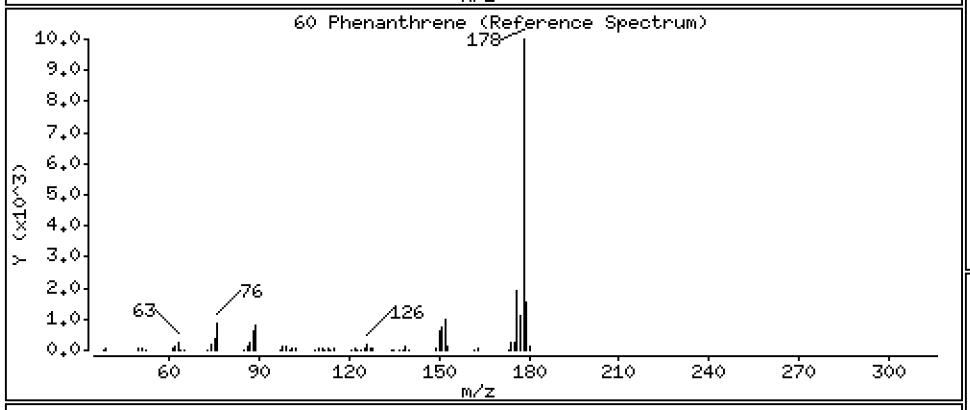
Column diameter: 0.25

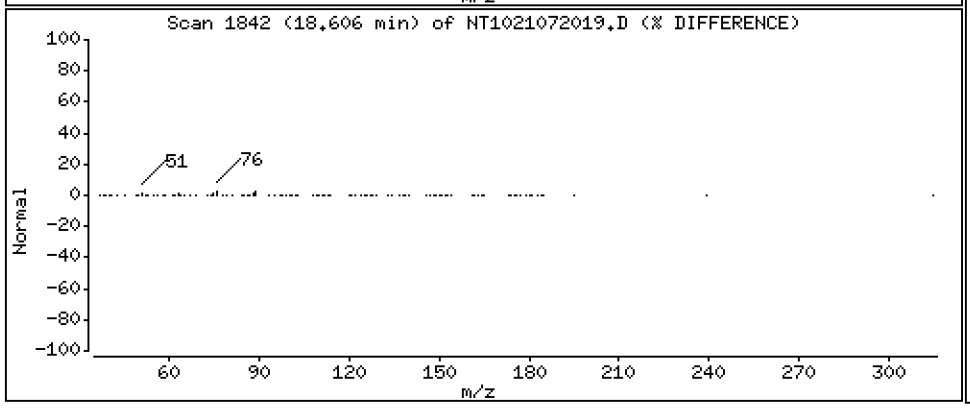
60 Phenanthrene

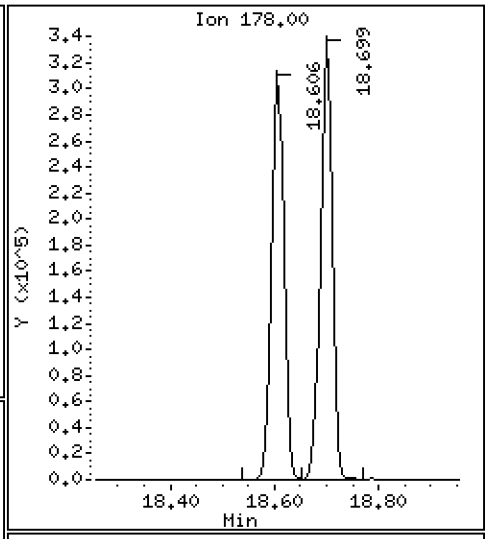
Concentration: 5.129 ug/mL

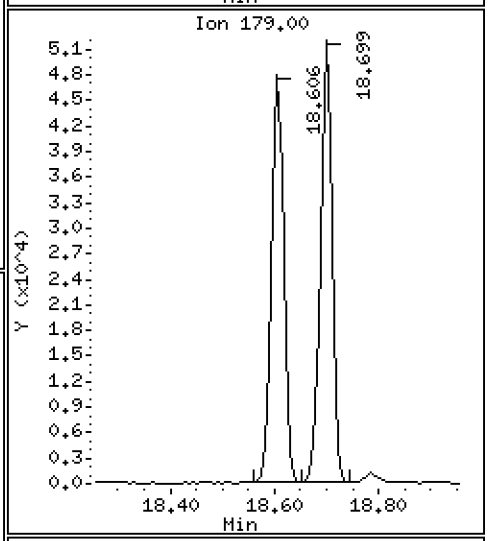


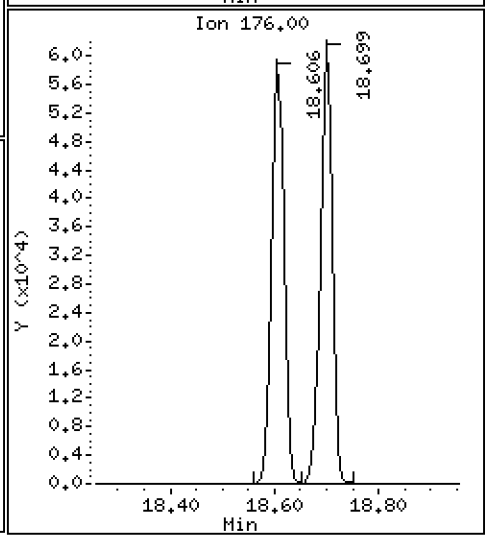












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

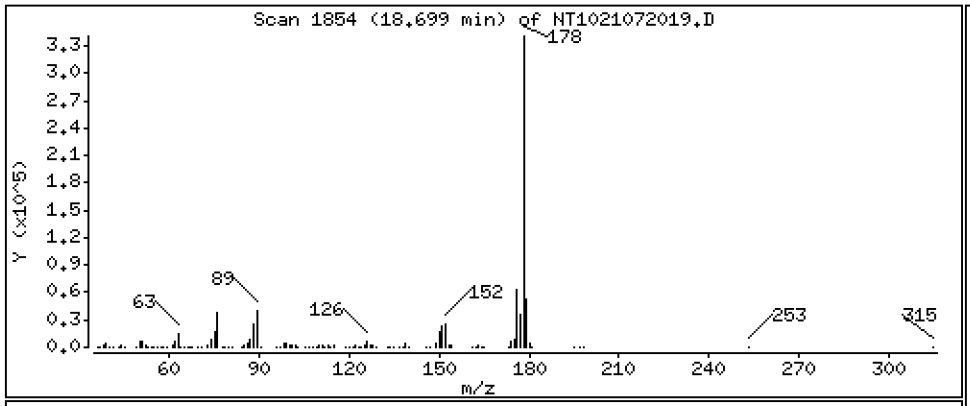
Operator: VTS

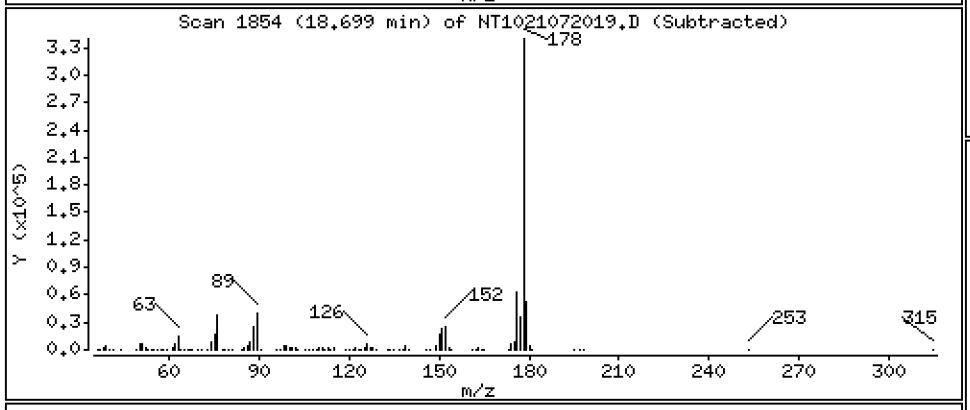
Column phase: ZB-5msi

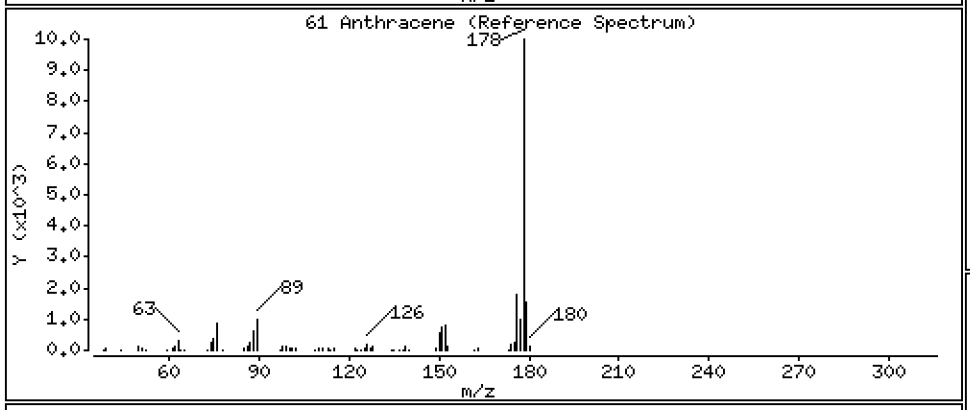
Column diameter: 0.25

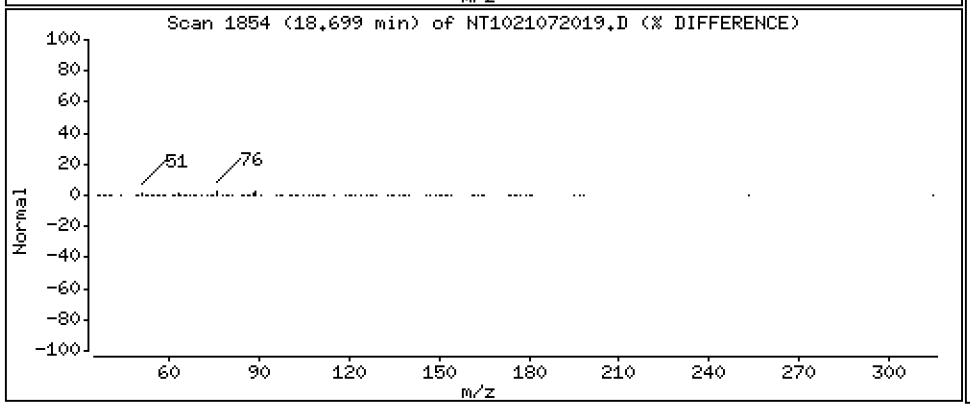
61 Anthracene

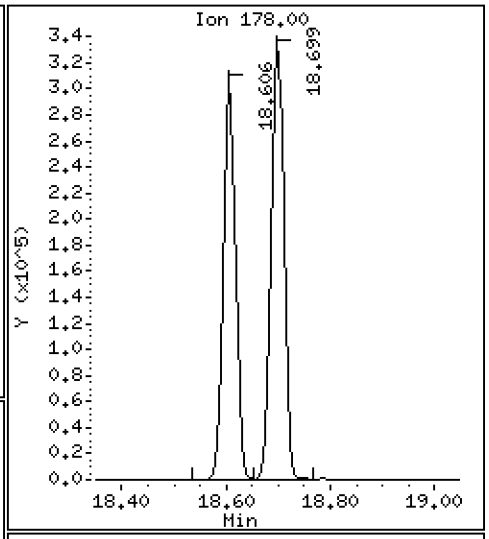
Concentration: 5.376 ug/mL

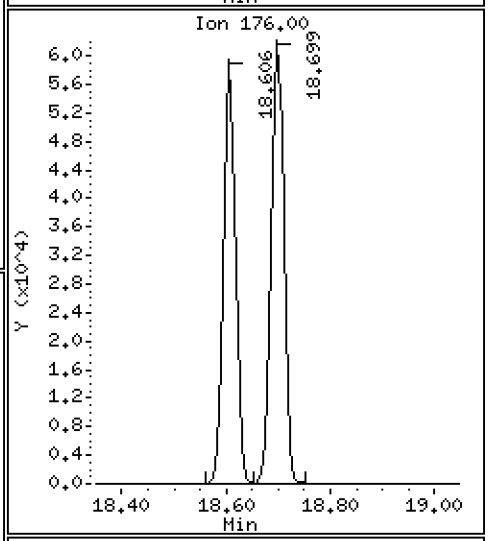


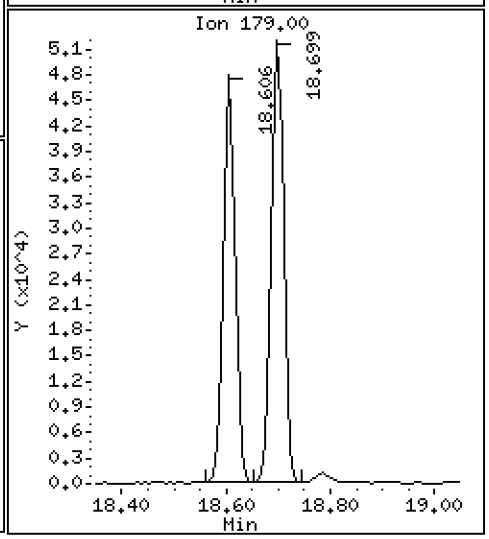












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

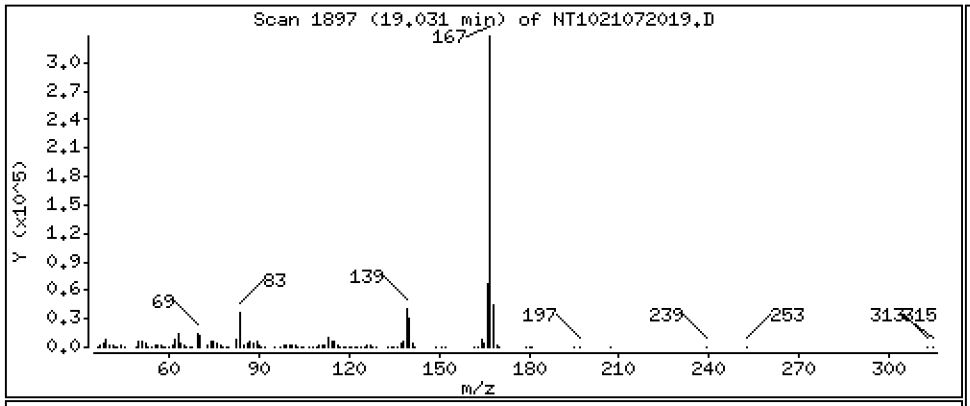
Operator: VTS

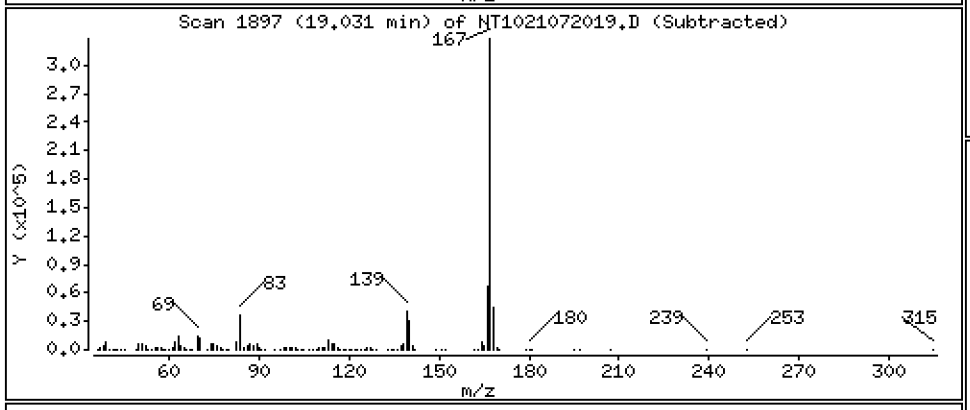
Column phase: ZB-5msi

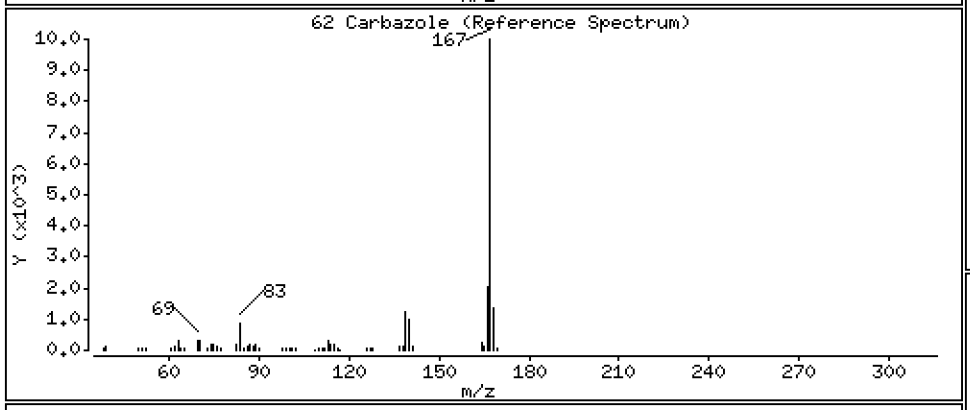
Column diameter: 0.25

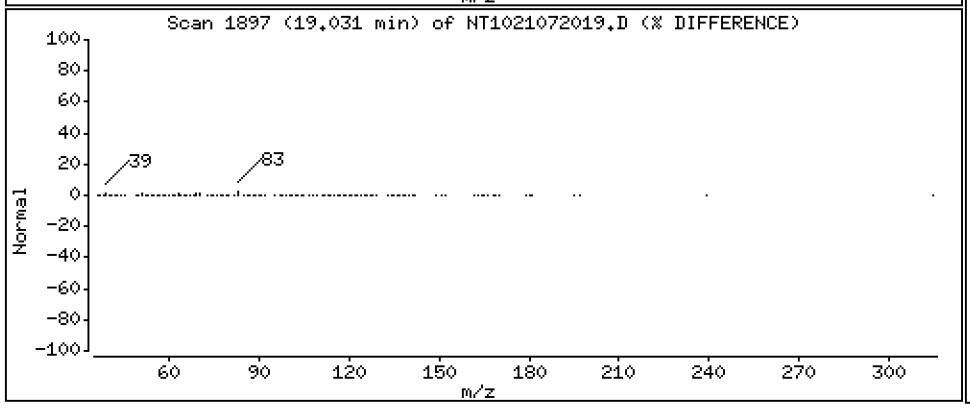
62 Carbazole

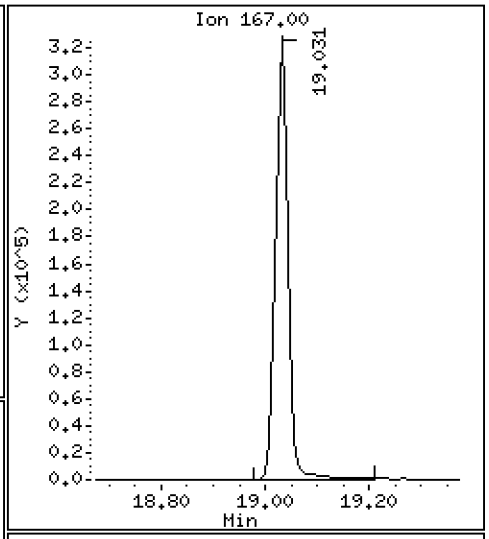
Concentration: 5.370 ug/mL

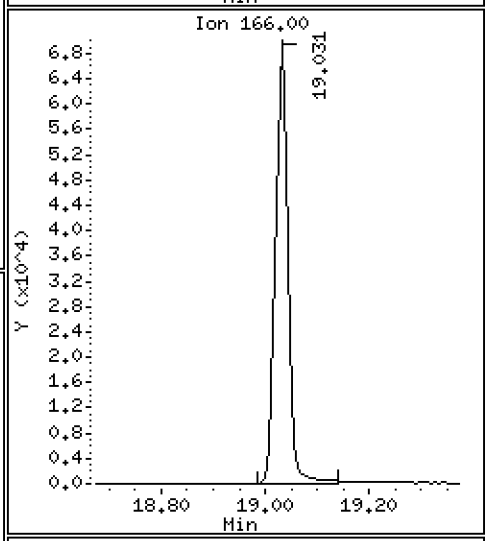


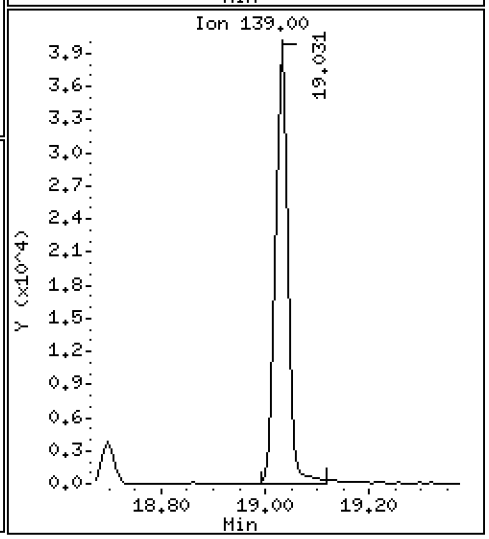












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

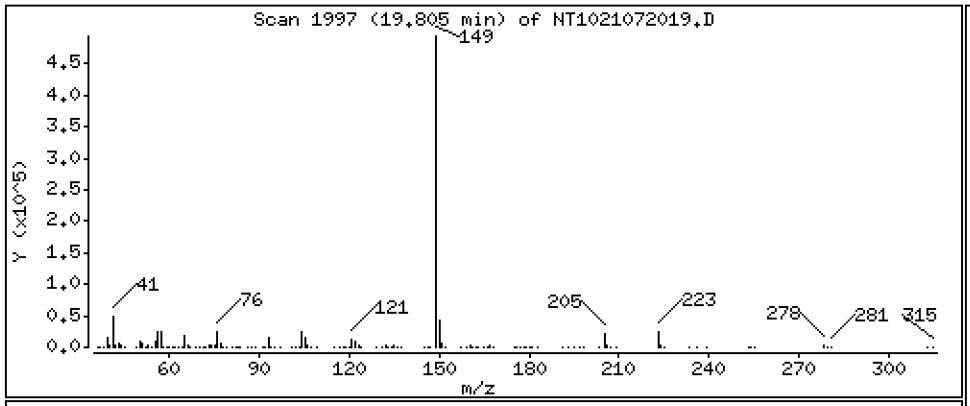
Operator: VTS

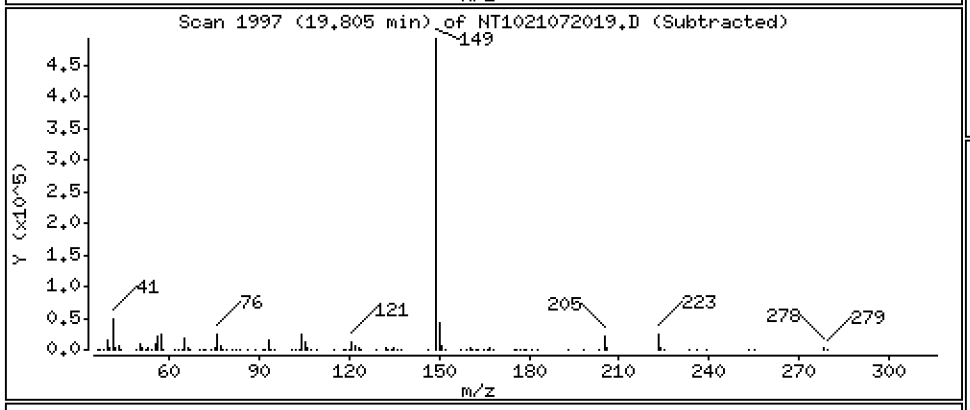
Column phase: ZB-5msi

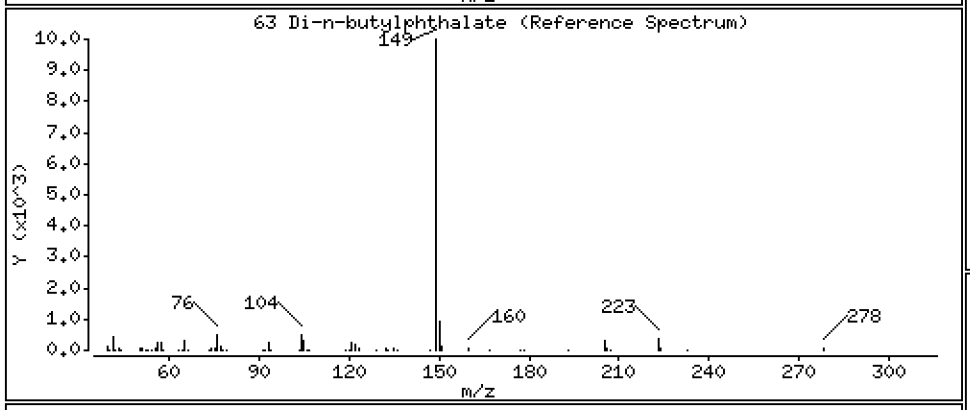
Column diameter: 0.25

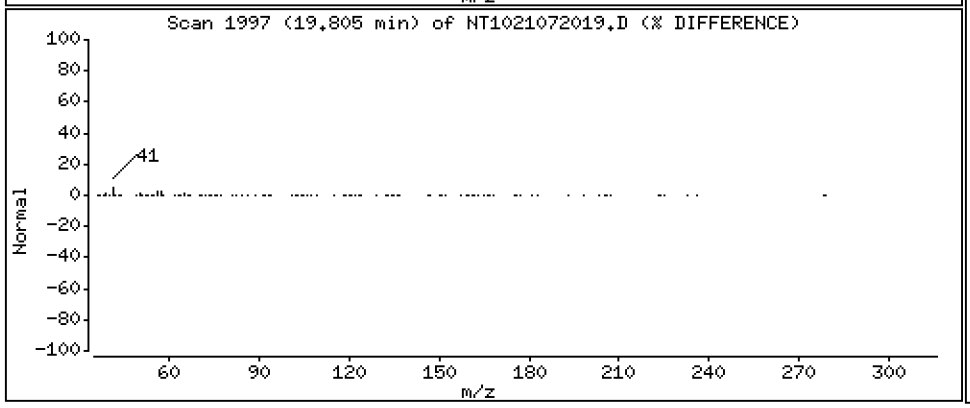
63 Di-n-butylphthalate

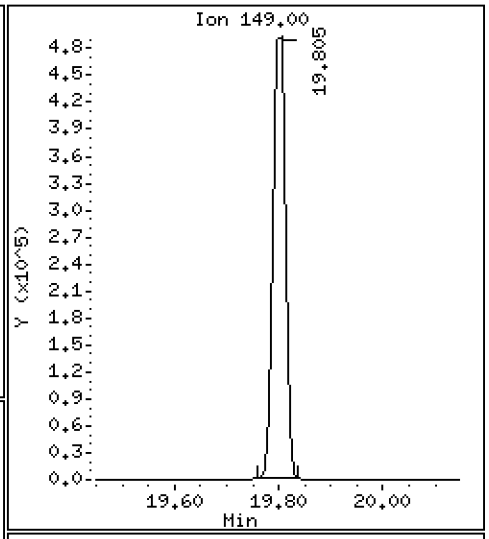
Concentration: 4.899 ug/mL

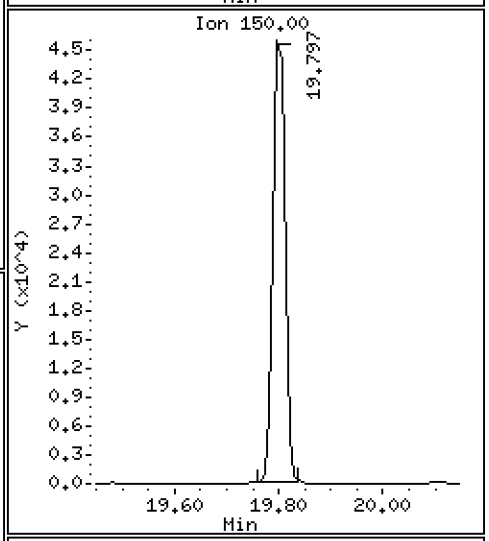


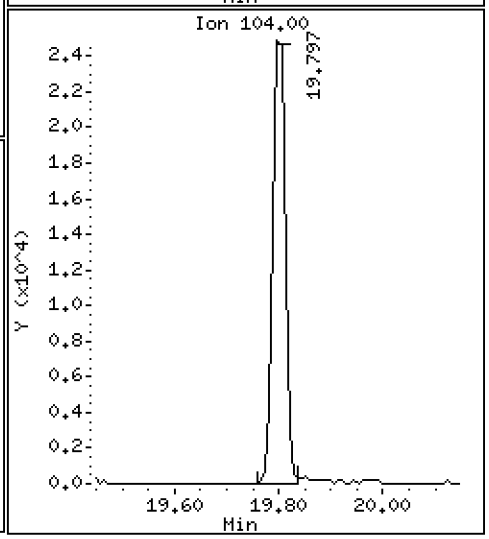












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

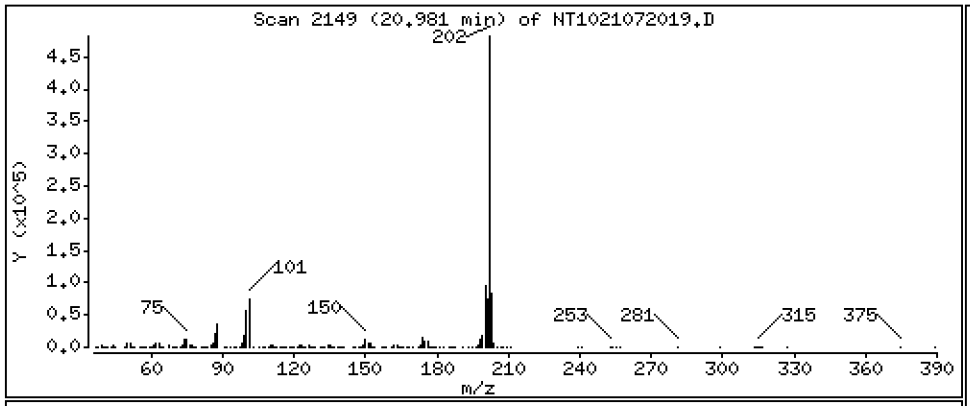
Operator: VTS

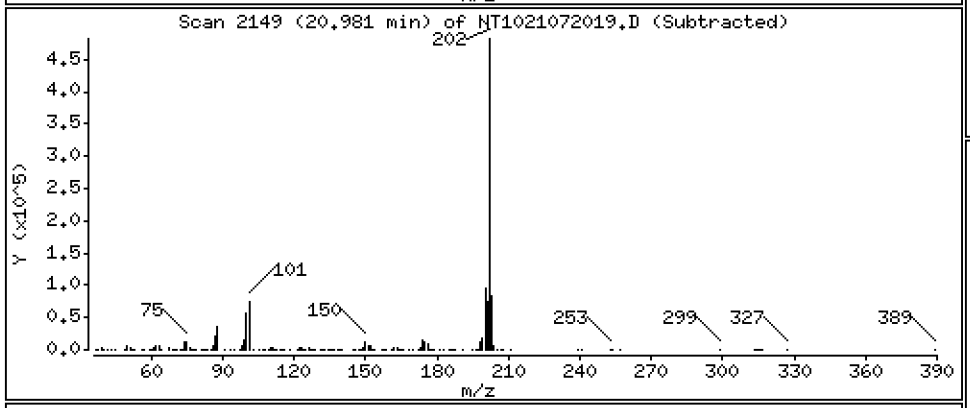
Column phase: ZB-5msi

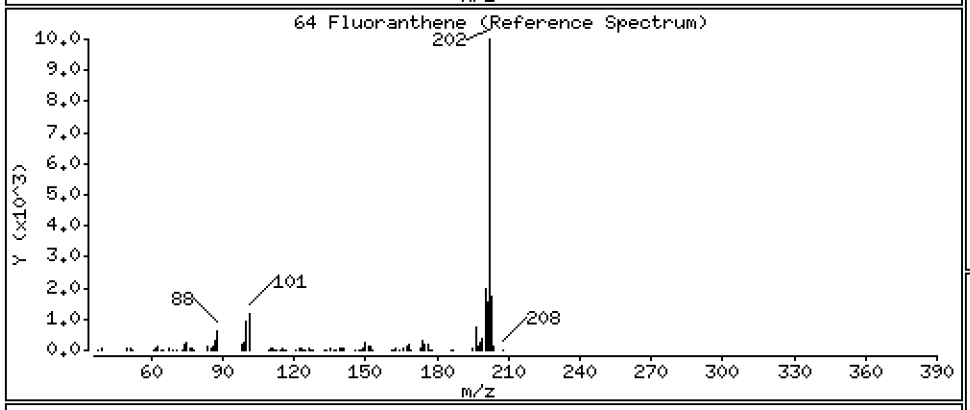
Column diameter: 0.25

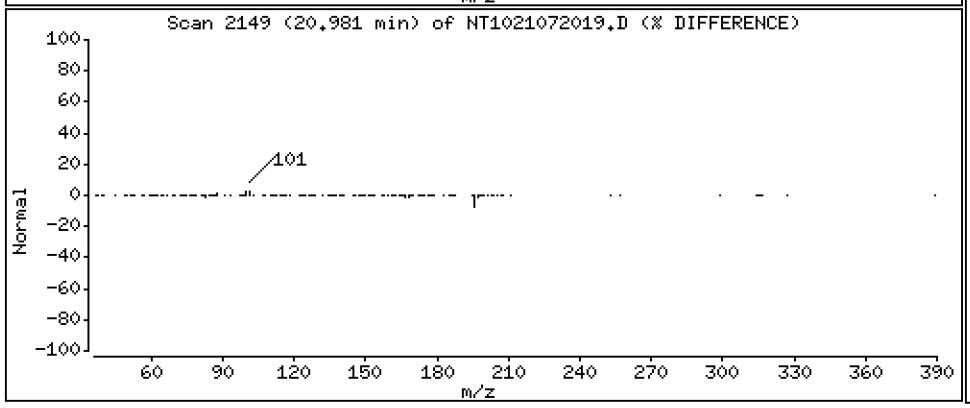
64 Fluoranthene

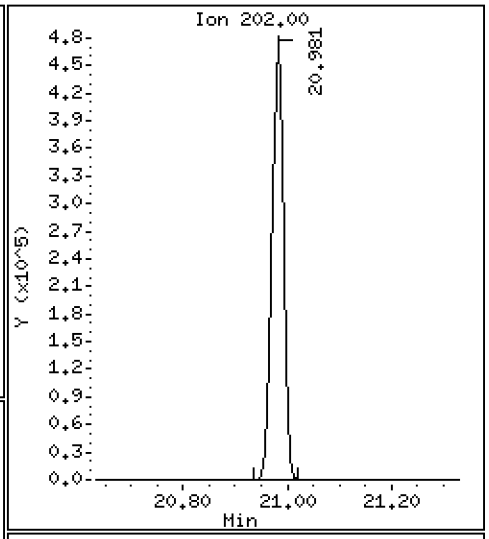
Concentration: 5.406 ug/mL

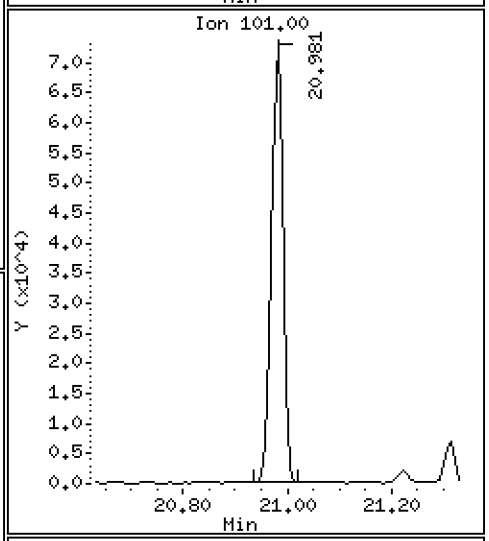


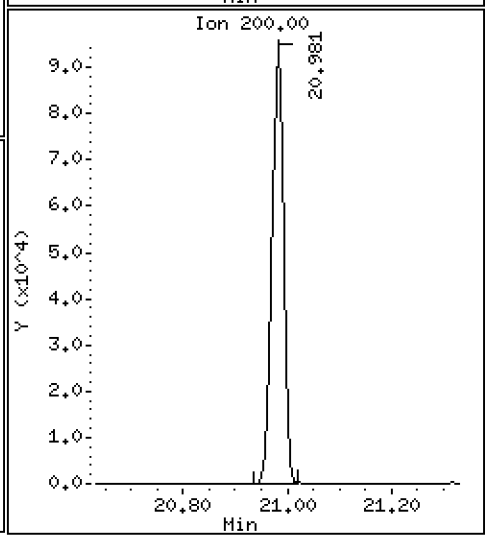












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

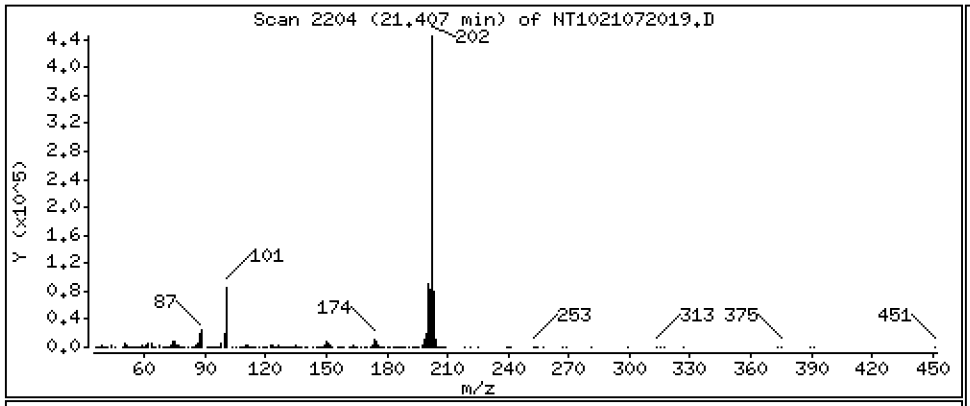
Operator: VTS

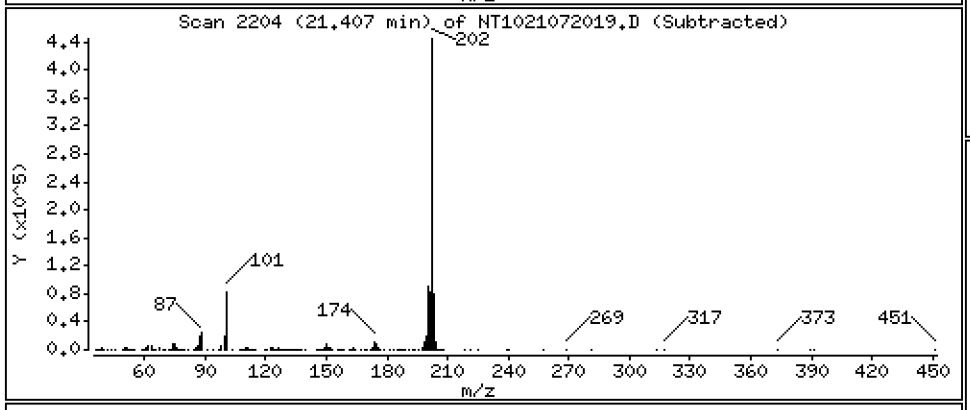
Column phase: ZB-5msi

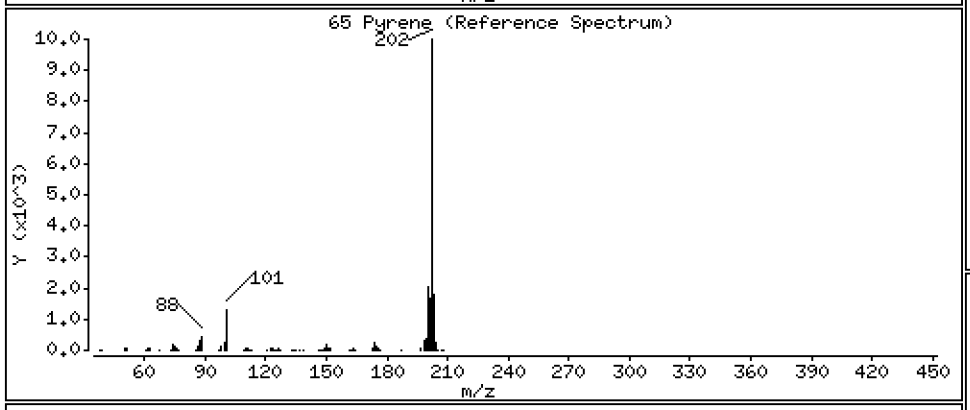
Column diameter: 0.25

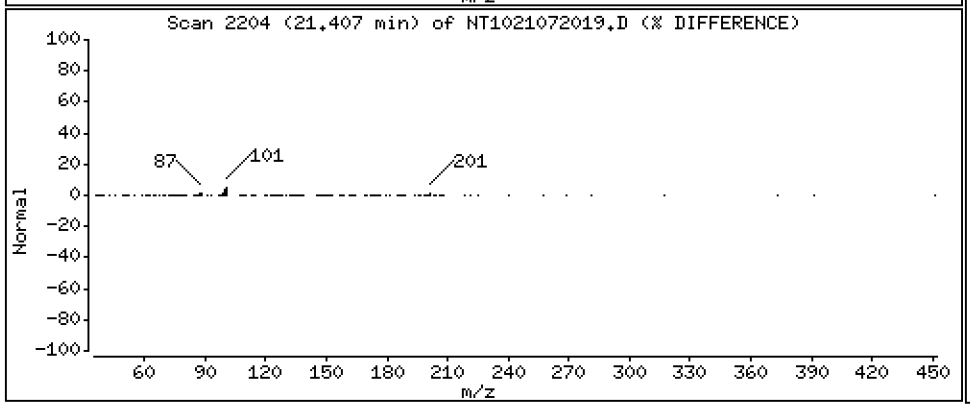
65 Pyrene

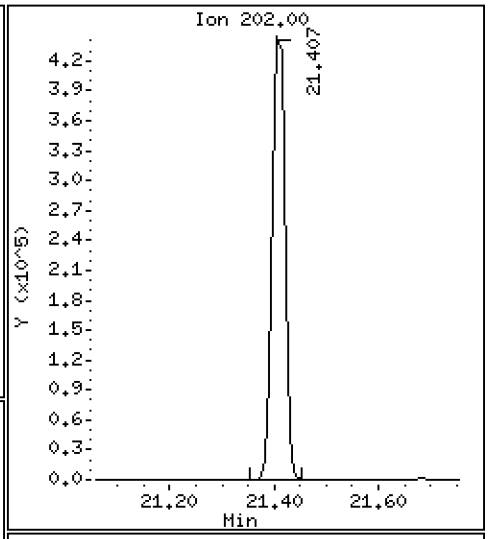
Concentration: 5.130 ug/mL

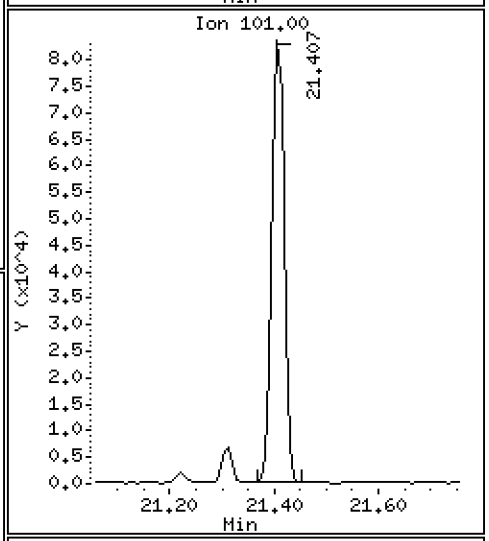


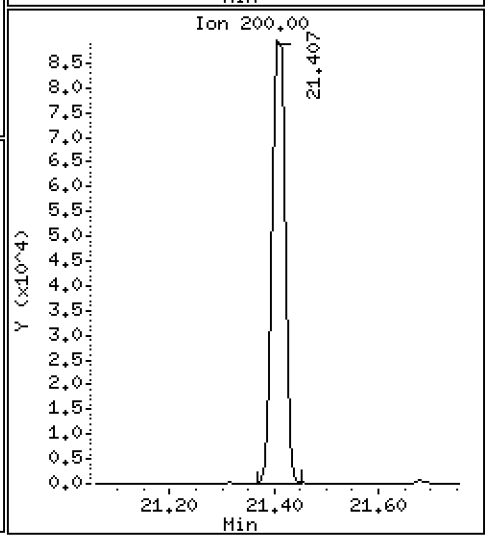












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

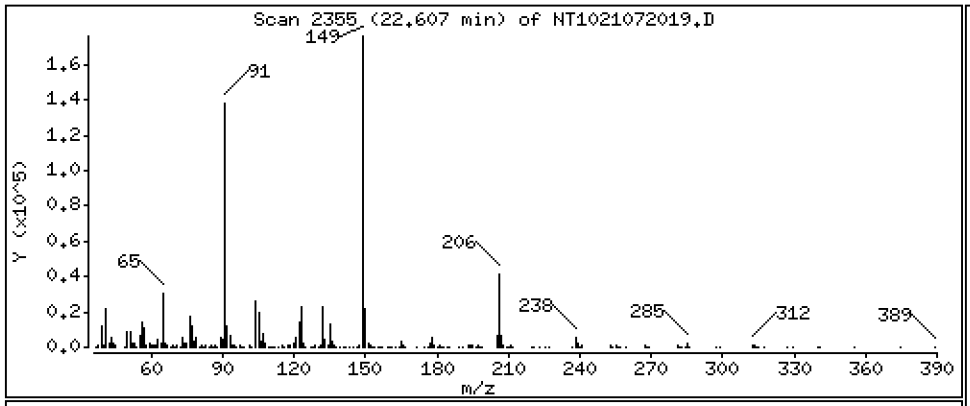
Operator: VTS

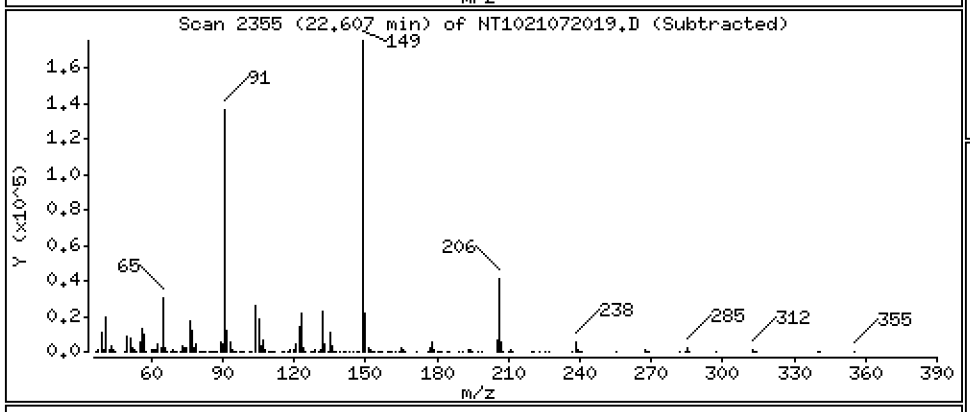
Column phase: ZB-5msi

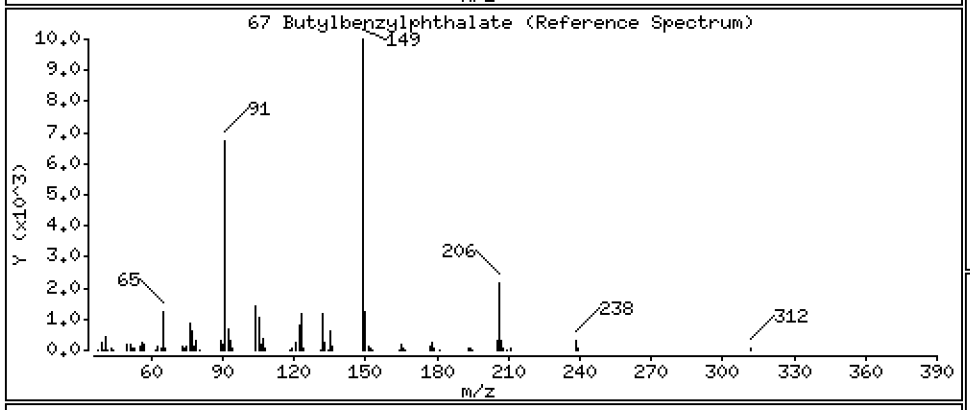
Column diameter: 0.25

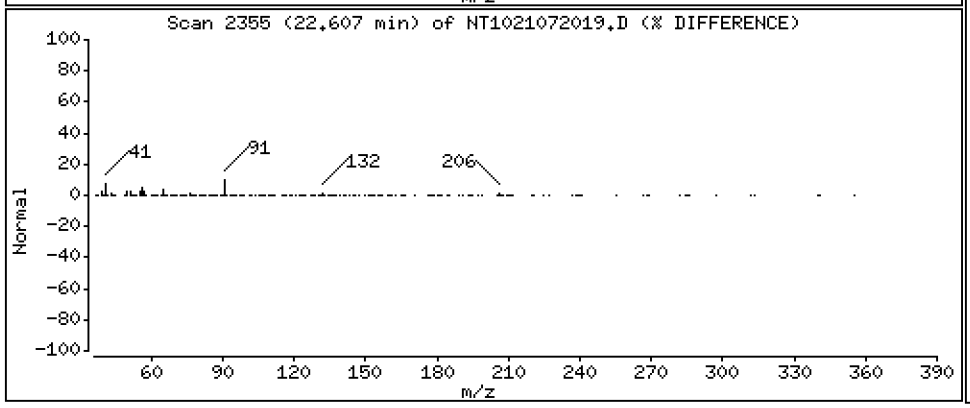
67 Butylbenzylphthalate

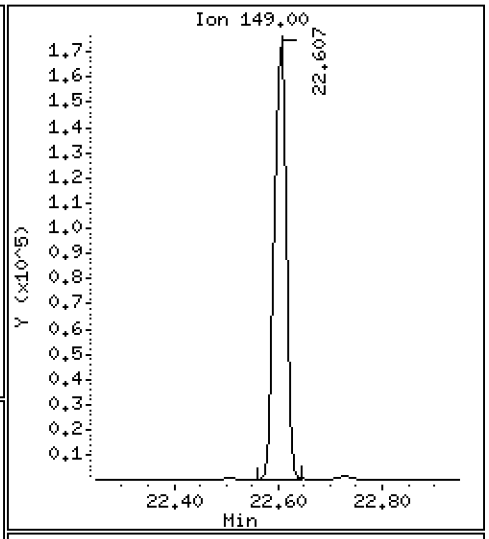
Concentration: 5.825 ug/mL

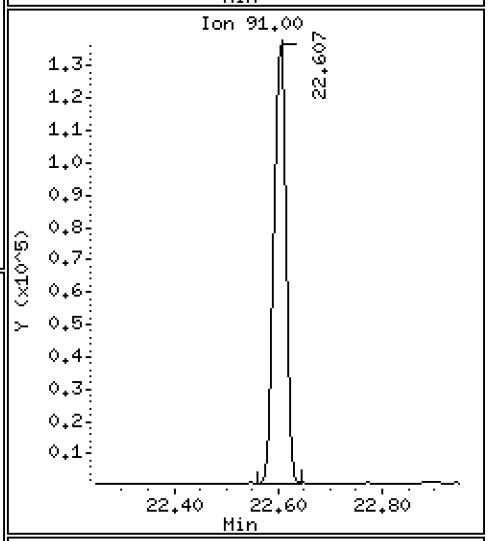


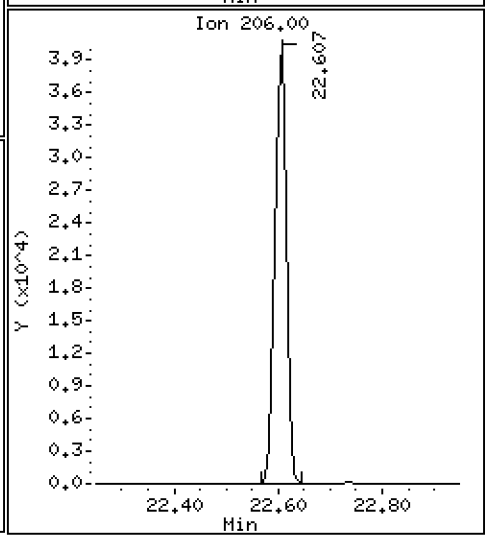












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

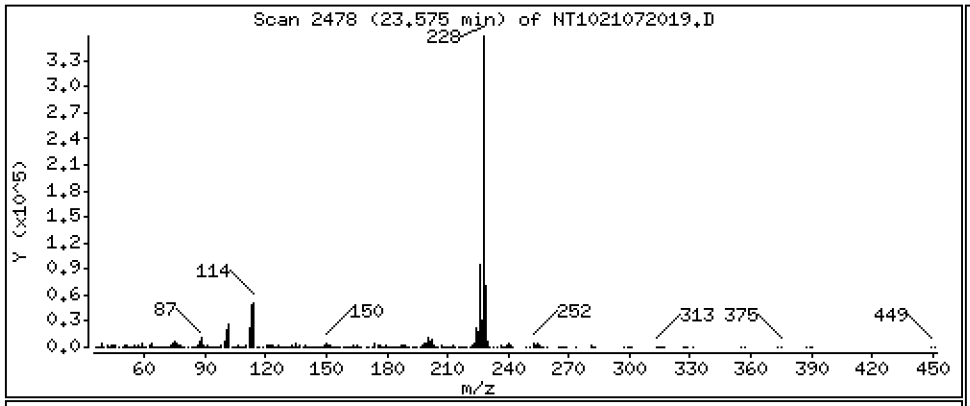
Operator: VTS

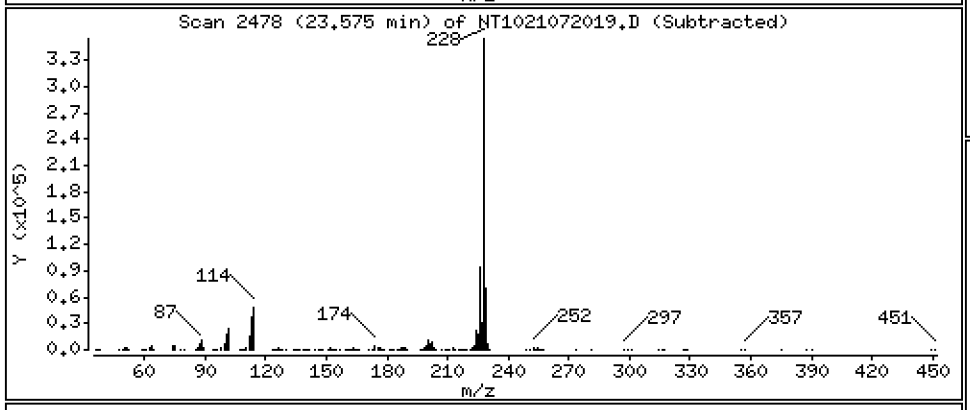
Column phase: ZB-5msi

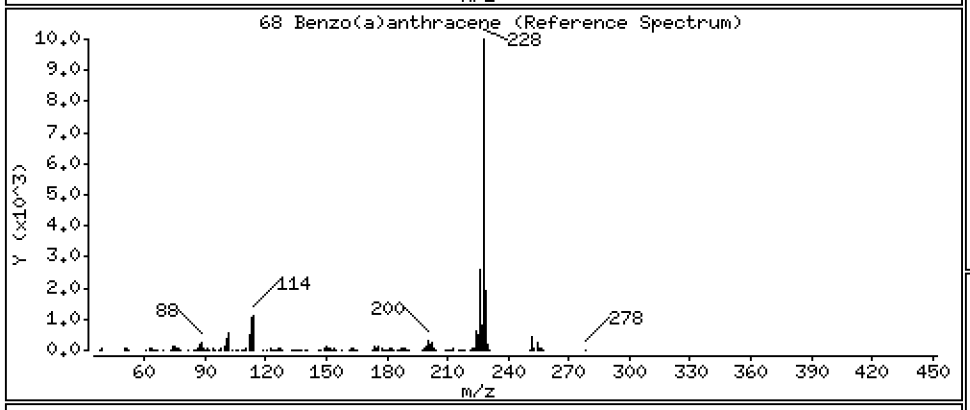
Column diameter: 0.25

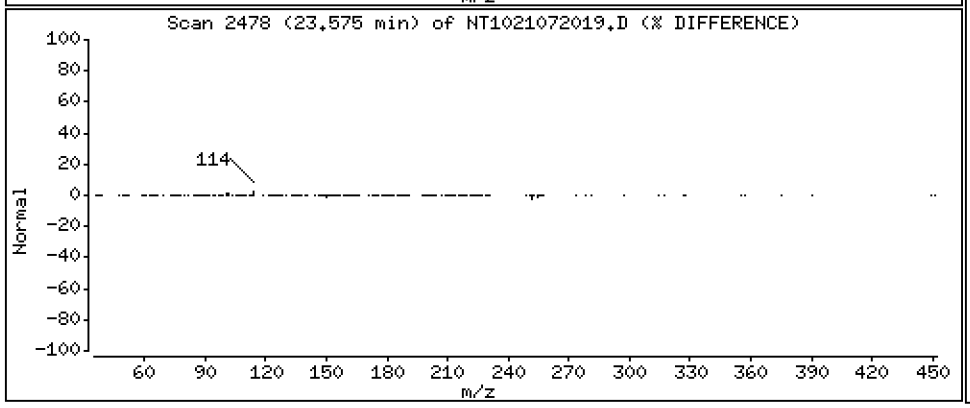
68 Benzo(a)anthracene

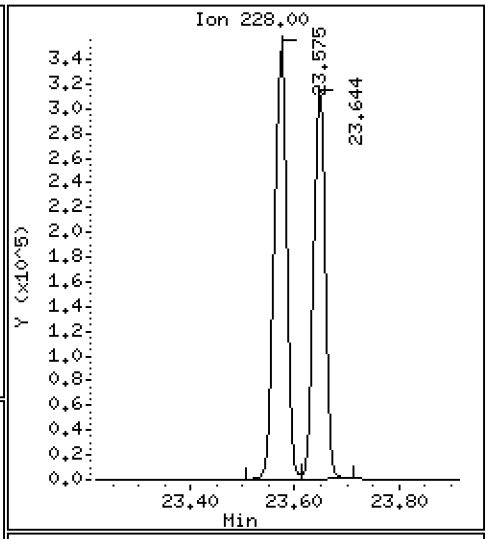
Concentration: 4.936 ug/mL

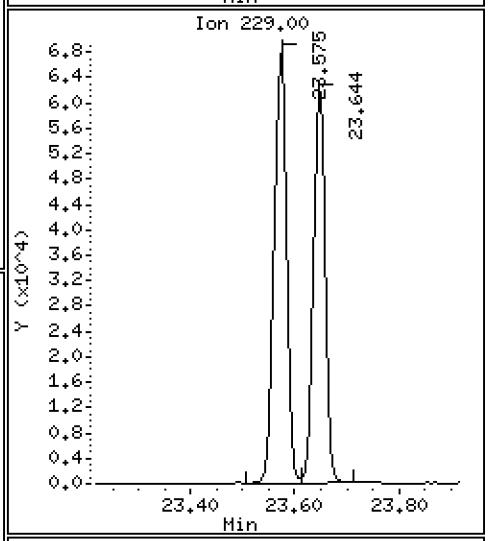


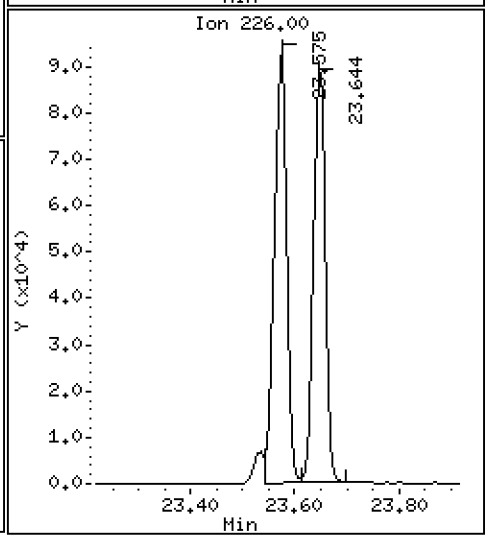












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

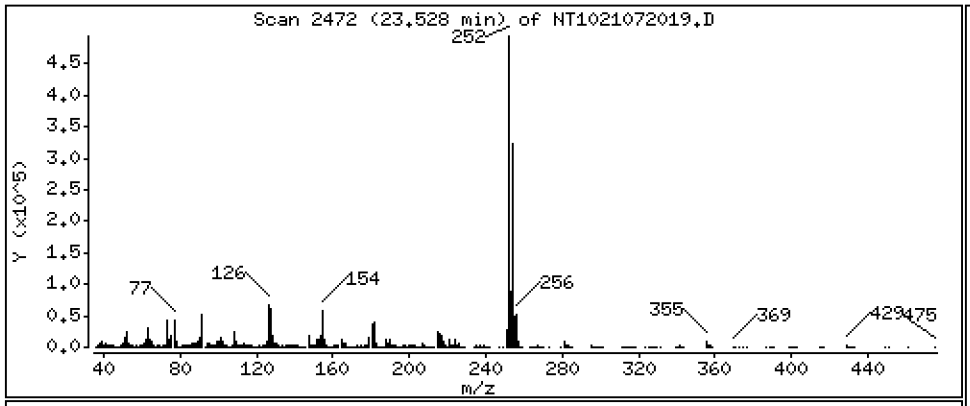
Operator: VTS

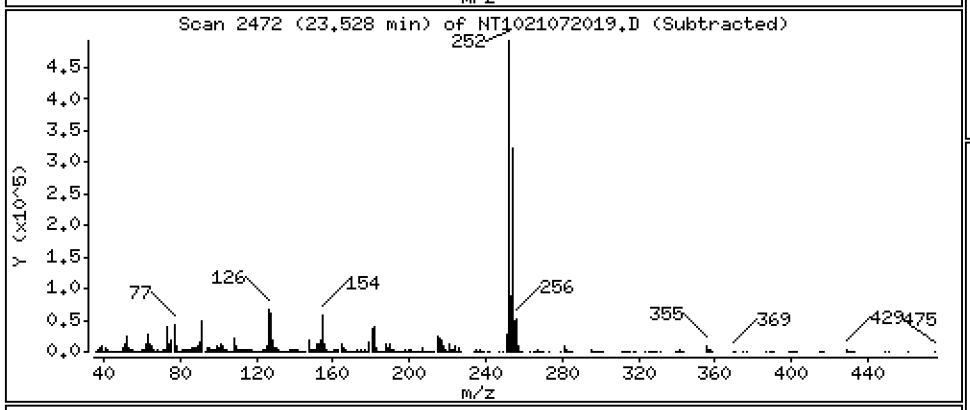
Column phase: ZB-5msi

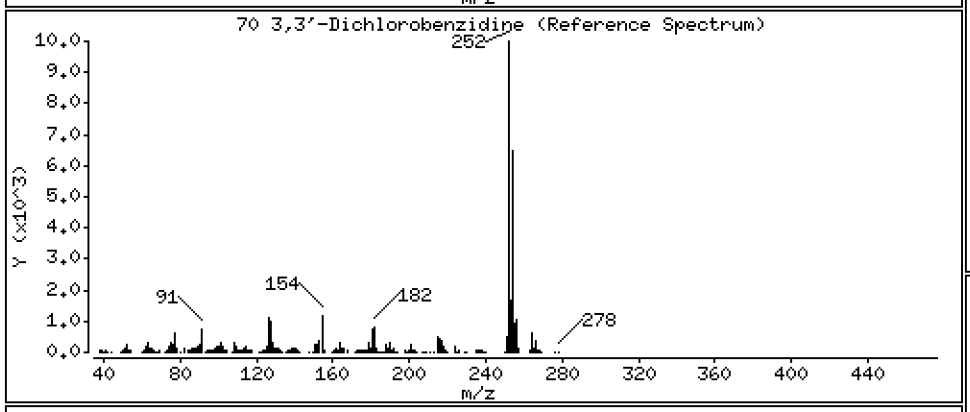
Column diameter: 0.25

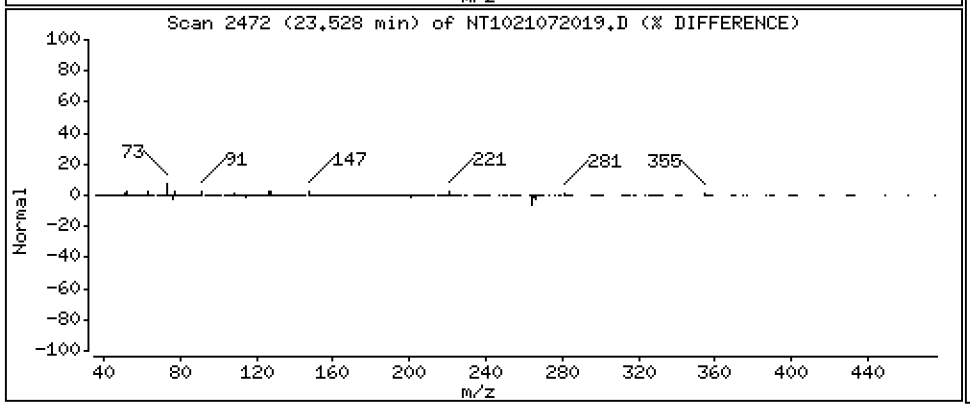
70 3,3'-Dichlorobenzidine

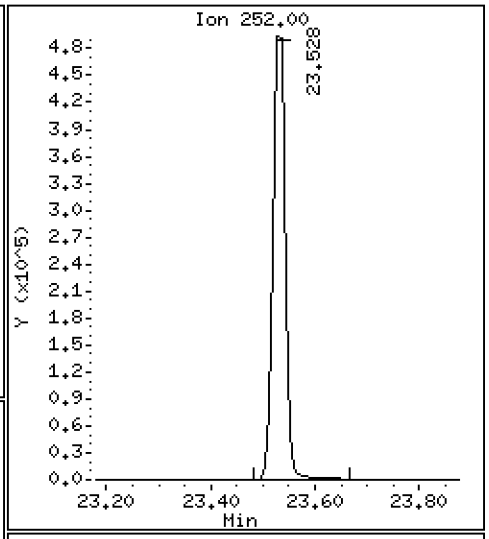
Concentration: 16.57 ug/mL

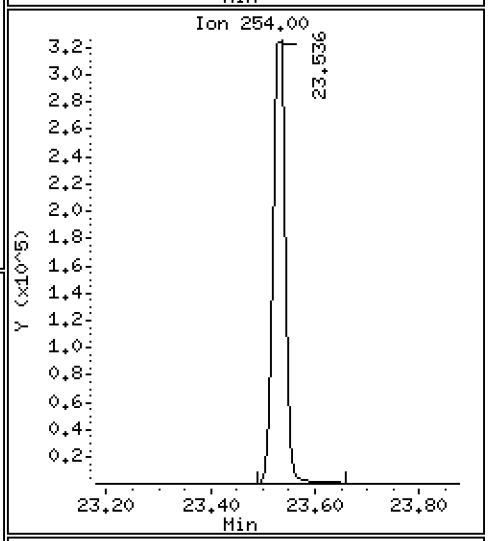


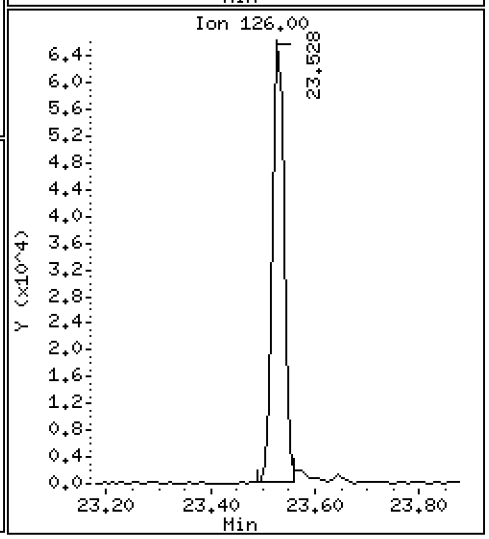












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

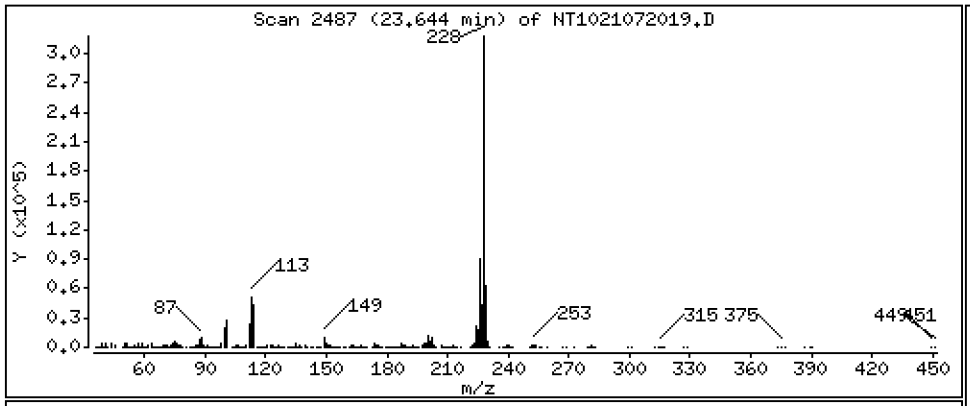
Operator: VTS

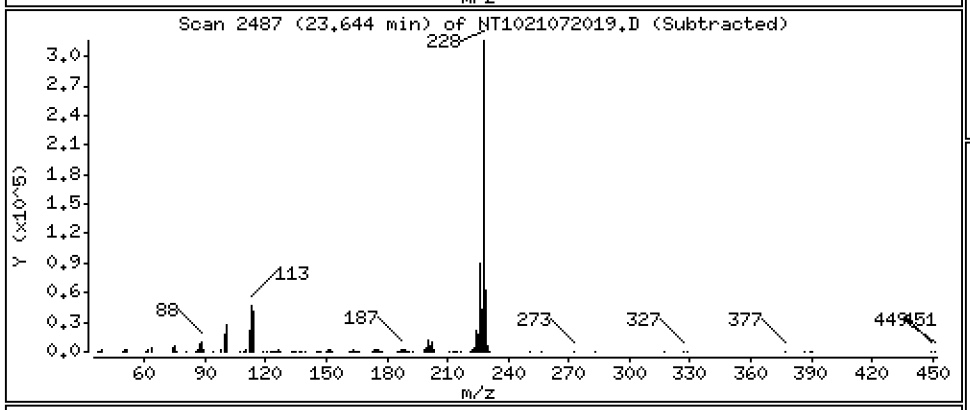
Column phase: ZB-5msi

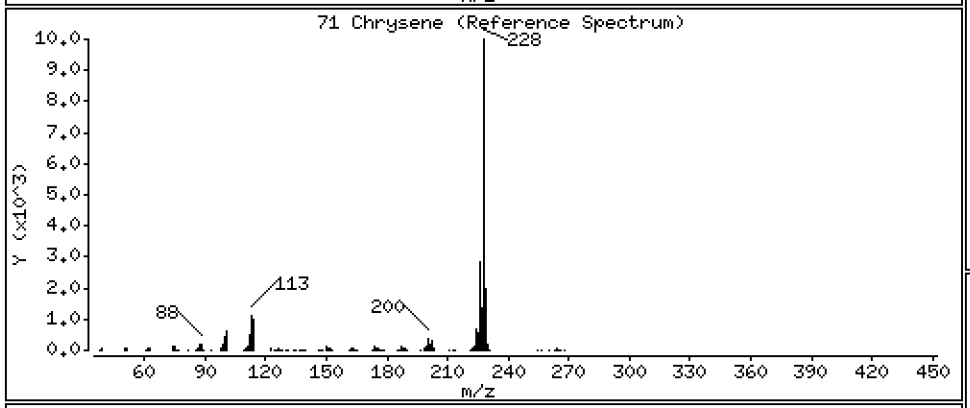
Column diameter: 0.25

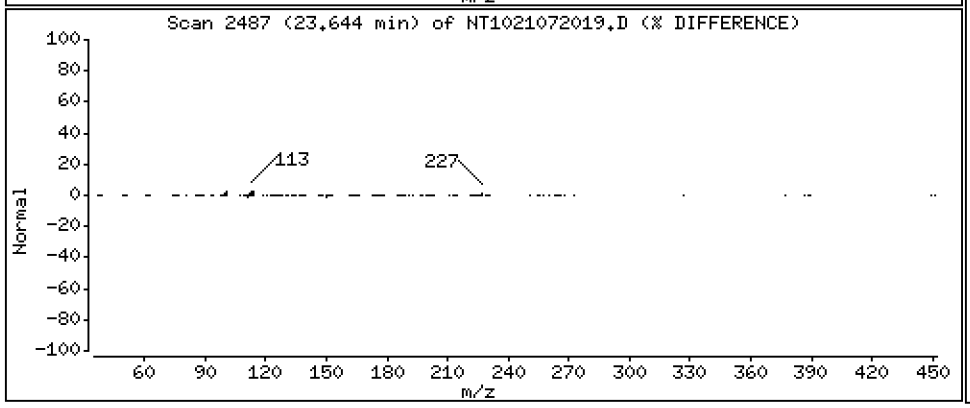
71 Chrysene

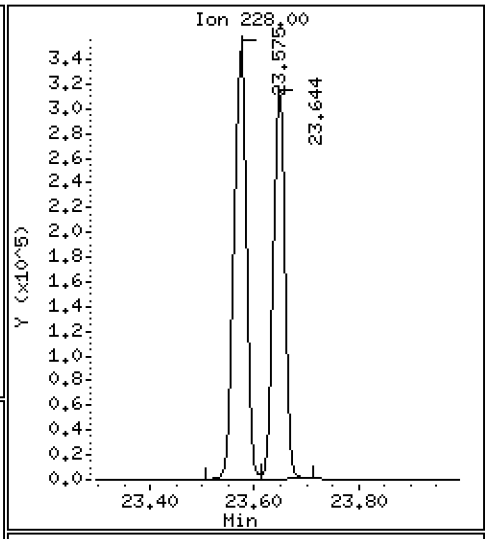
Concentration: 5.263 ug/mL

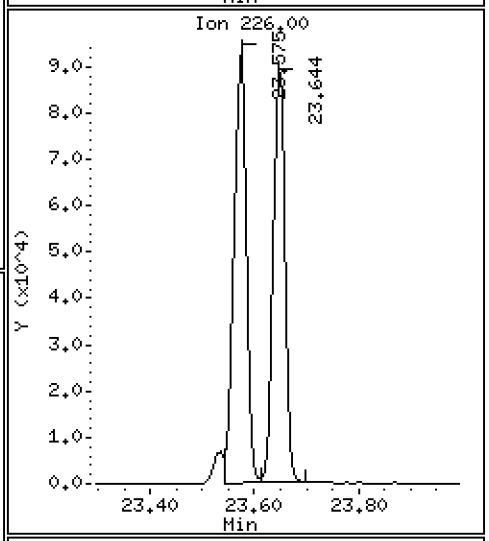


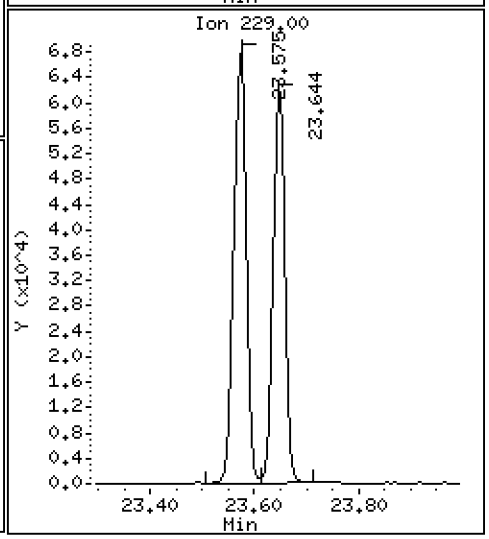












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

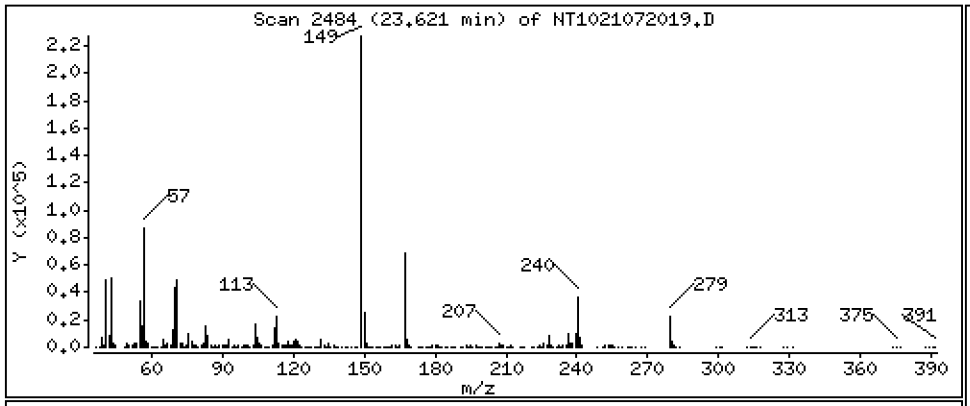
Operator: VTS

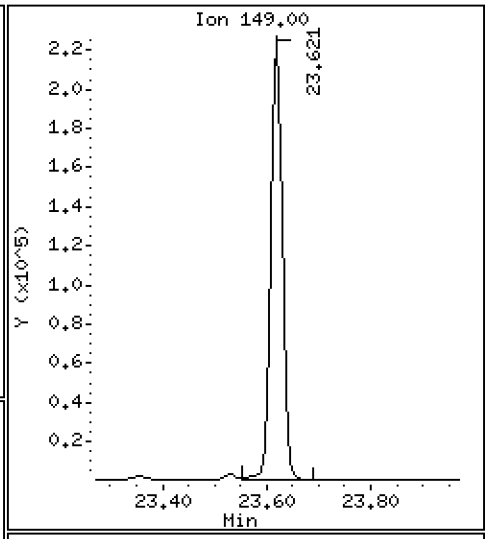
Column phase: ZB-5msi

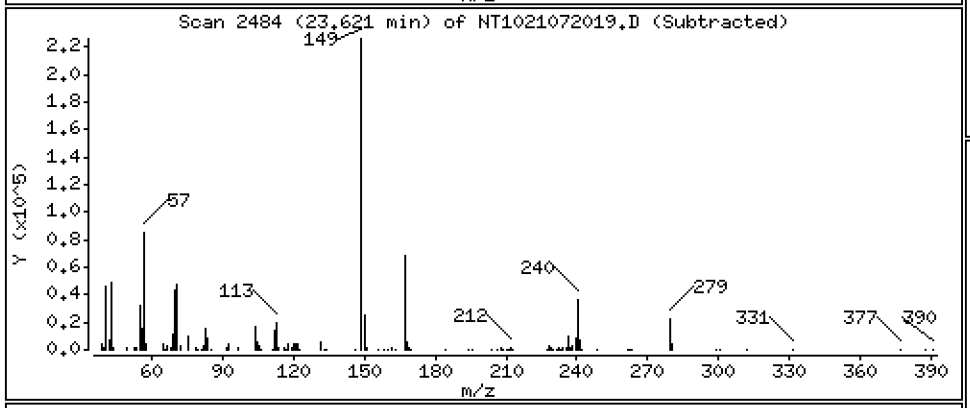
Column diameter: 0.25

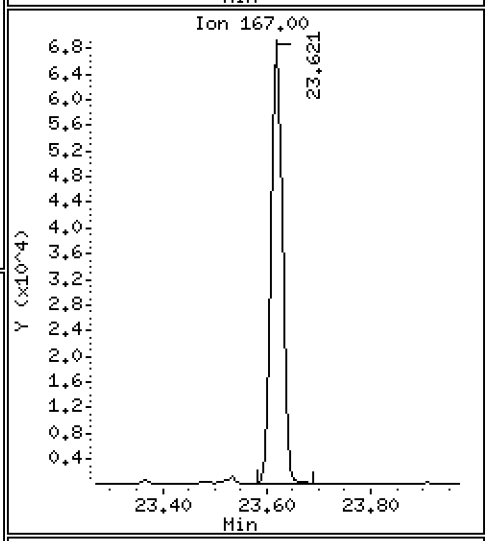
72 bis(2-Ethylhexyl)phthalate

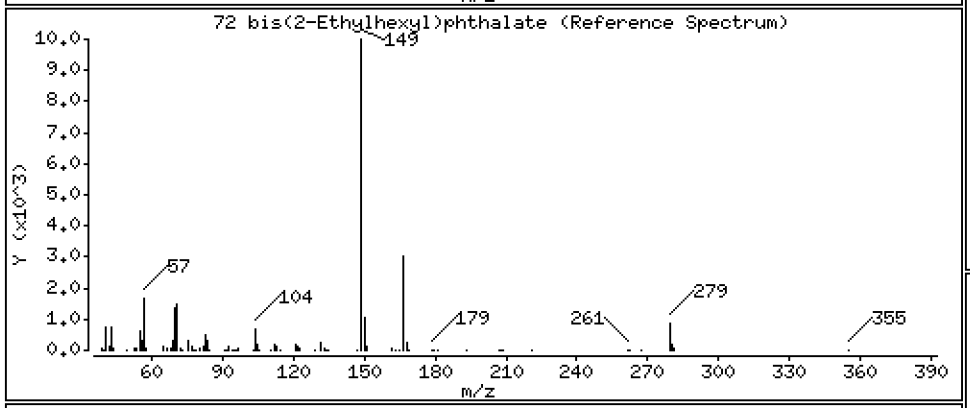
Concentration: 5.542 ug/mL

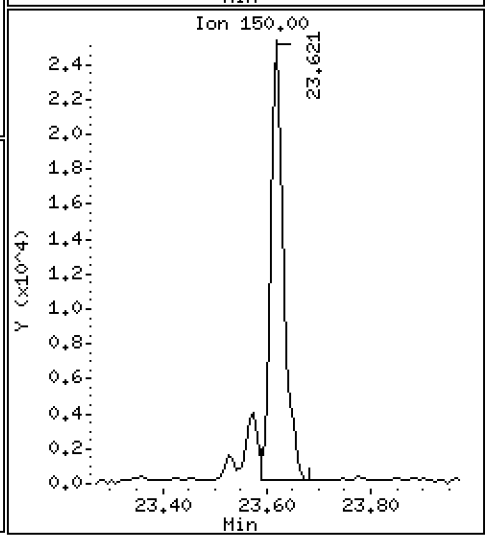


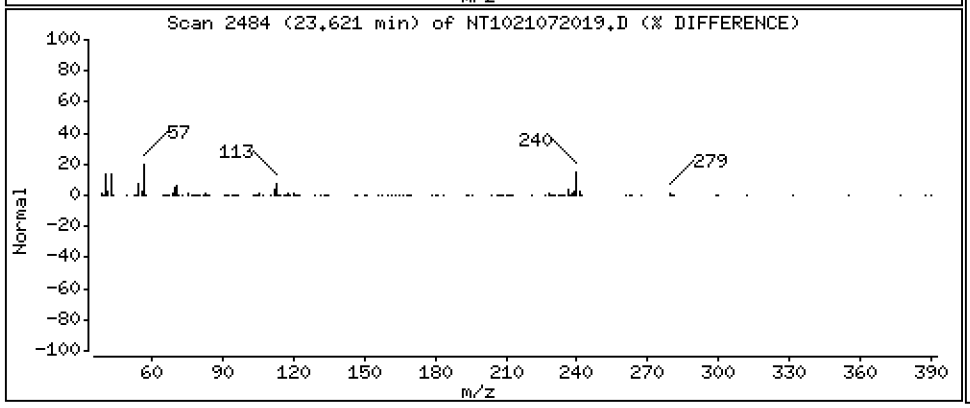












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

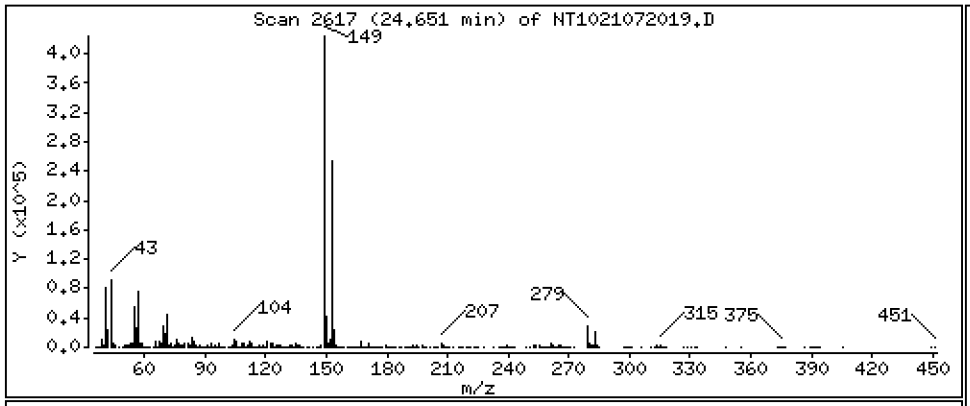
Operator: VTS

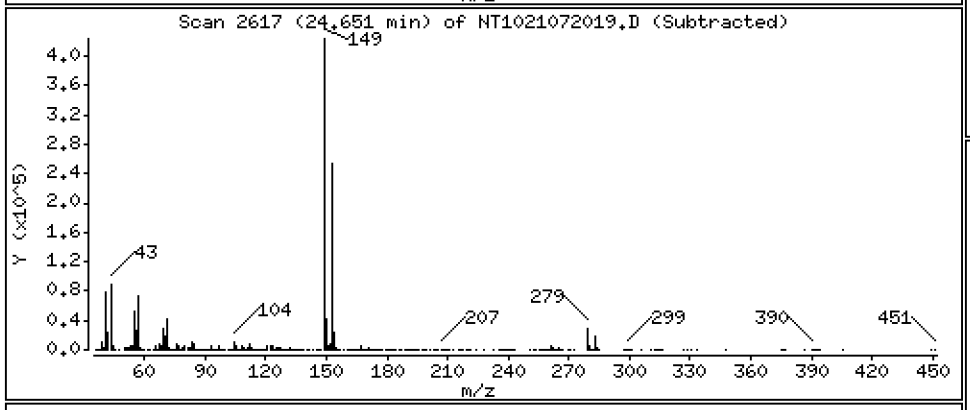
Column phase: ZB-5msi

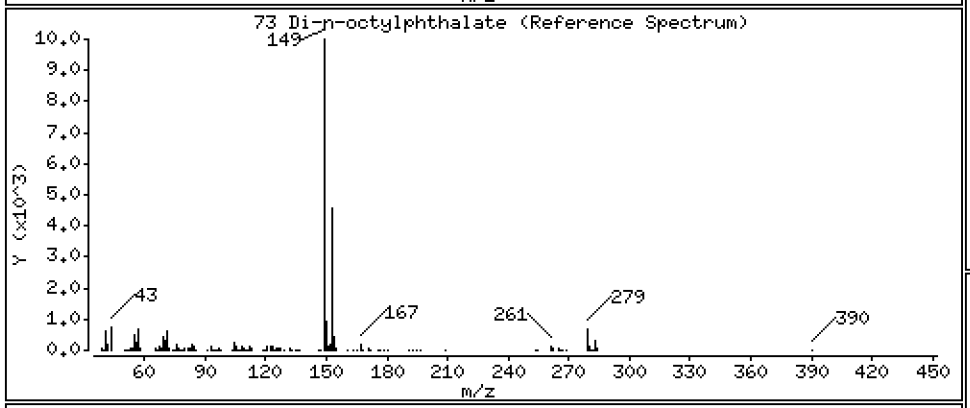
Column diameter: 0.25

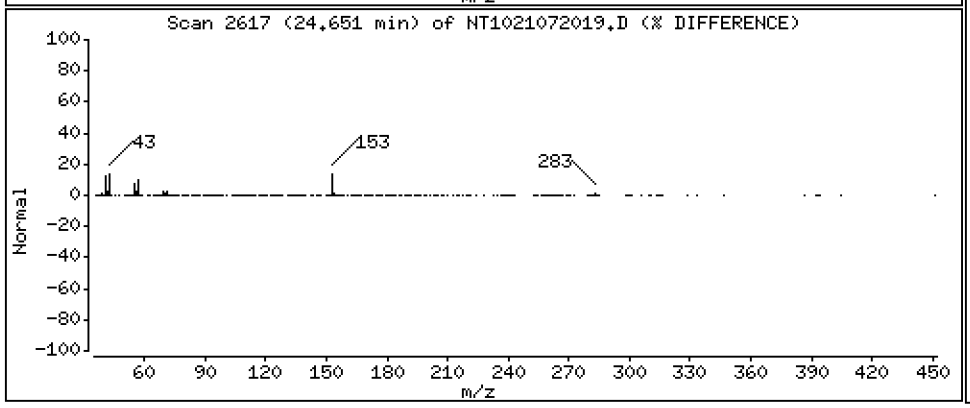
73 Di-n-octylphthalate

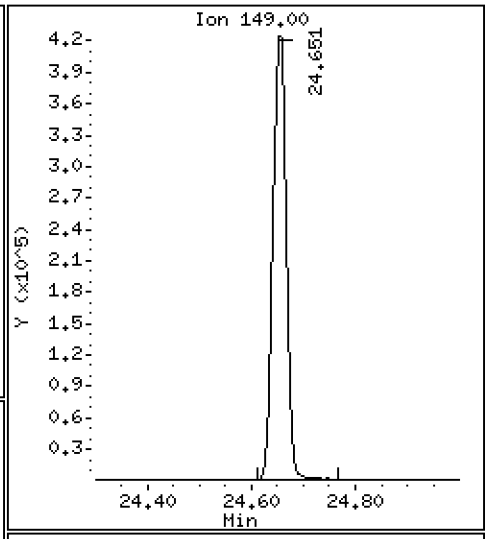
Concentration: 4.825 ug/mL

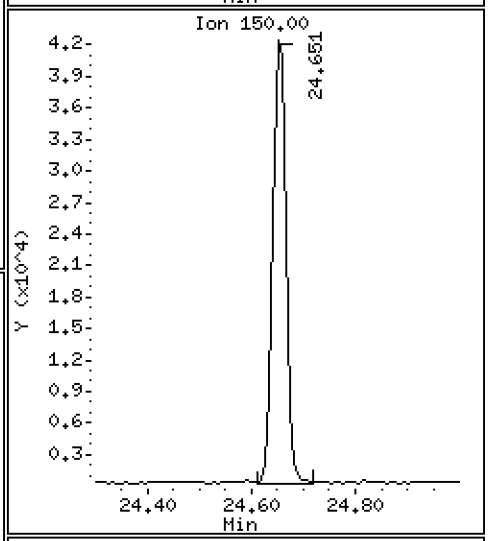


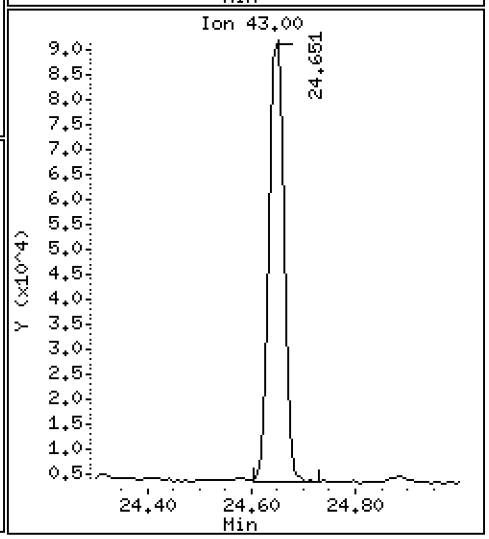












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

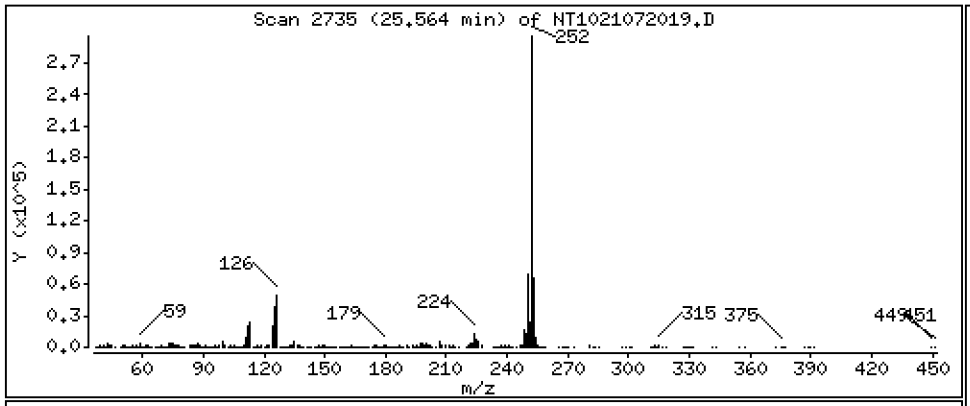
Operator: VTS

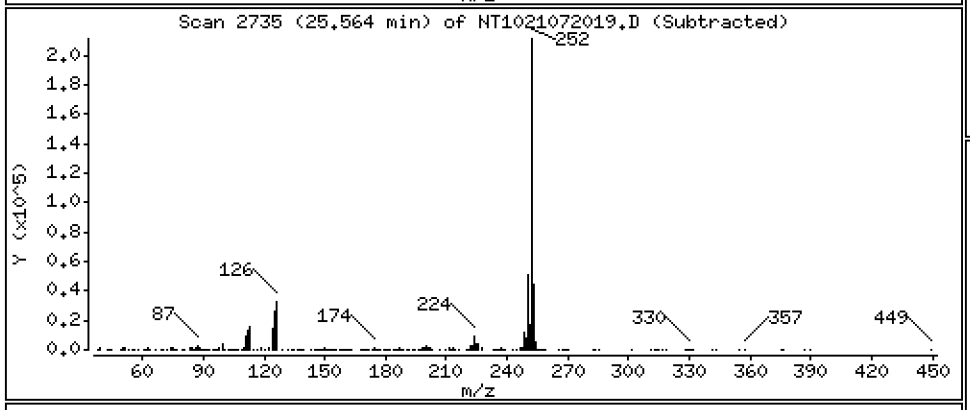
Column phase: ZB-5msi

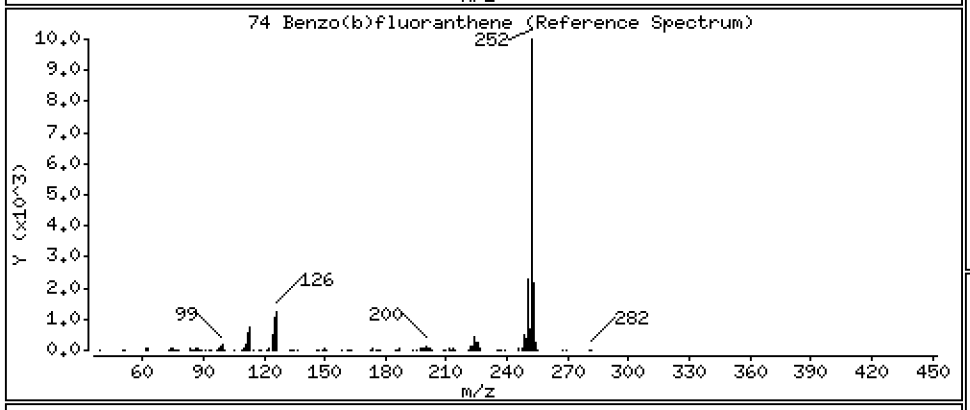
Column diameter: 0.25

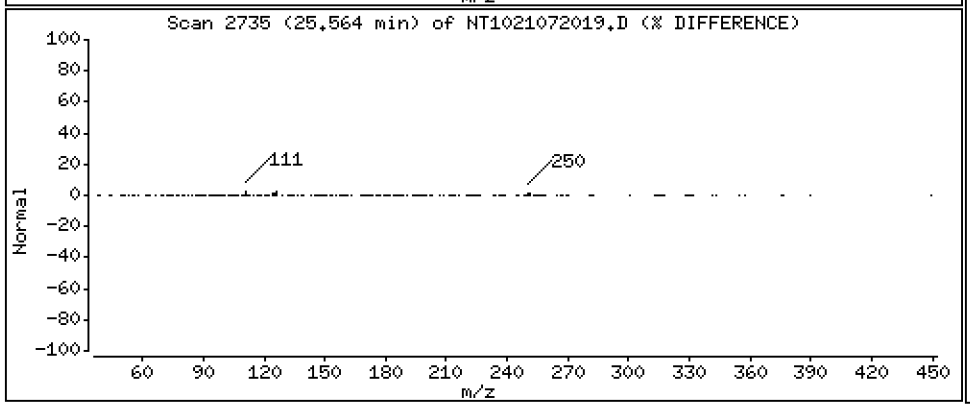
74 Benzo(b)fluoranthene

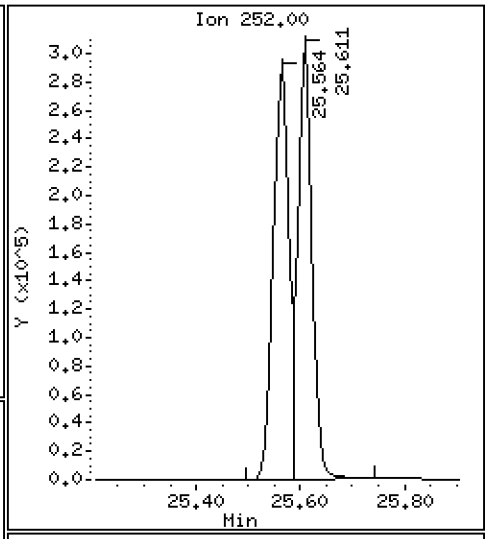
Concentration: 4.945 ug/mL

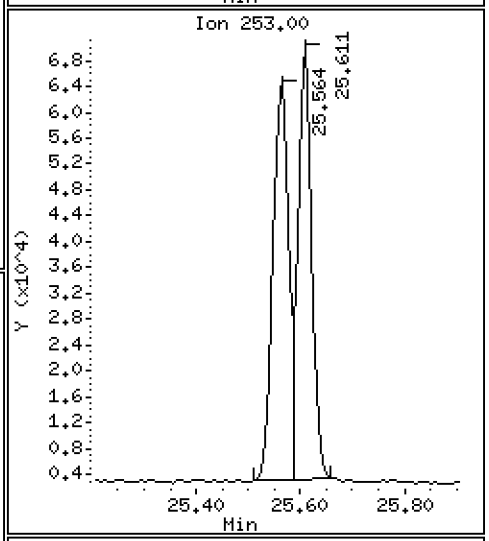


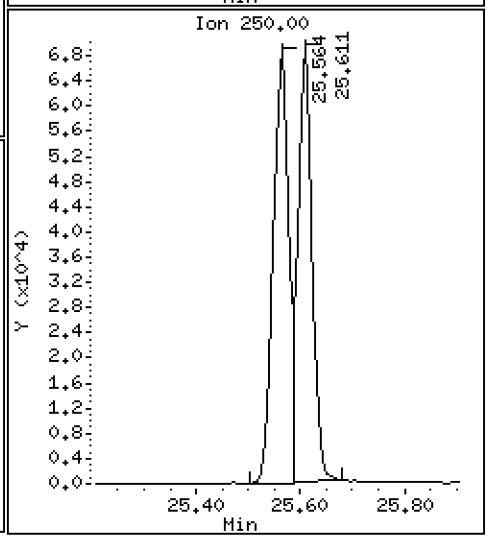












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

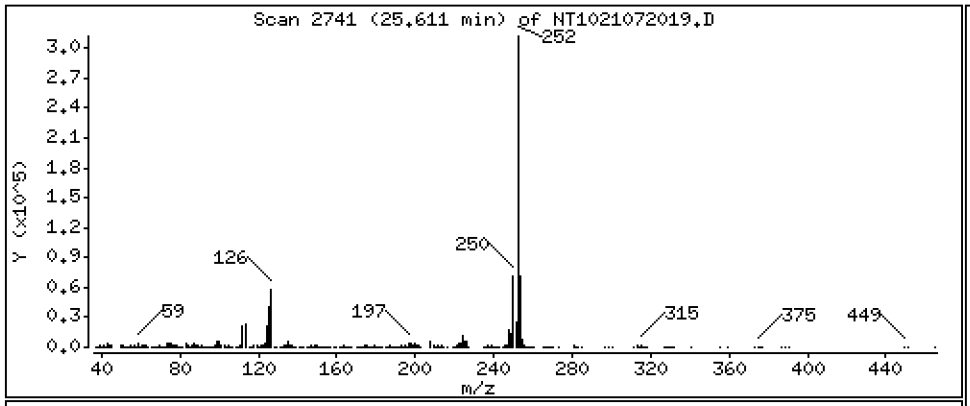
Operator: VTS

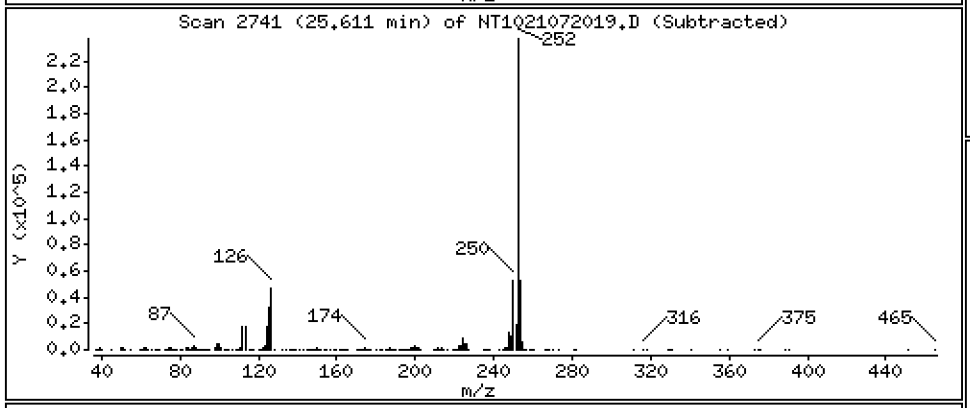
Column phase: ZB-5msi

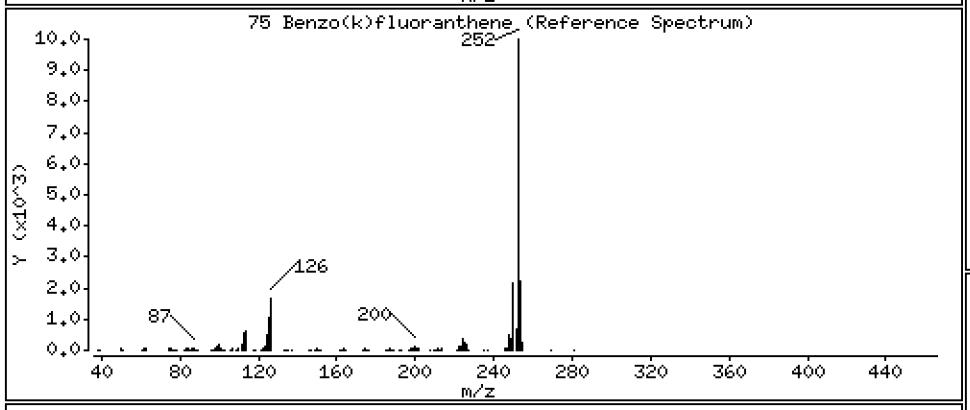
Column diameter: 0.25

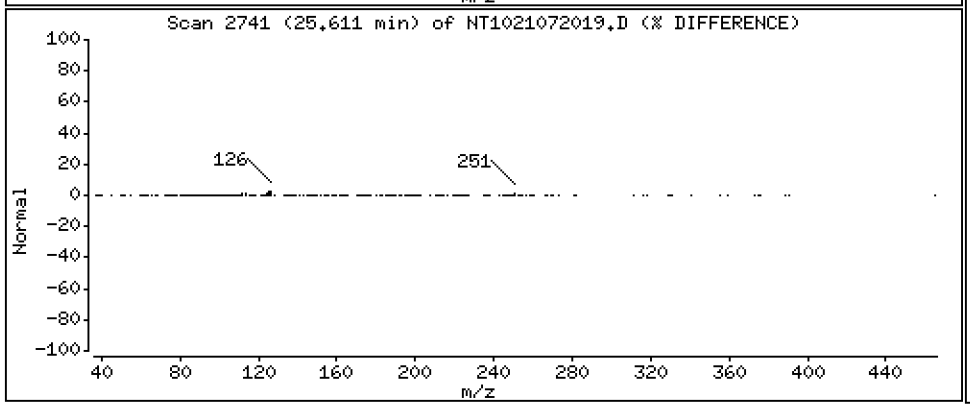
75 Benzo(k)fluoranthene

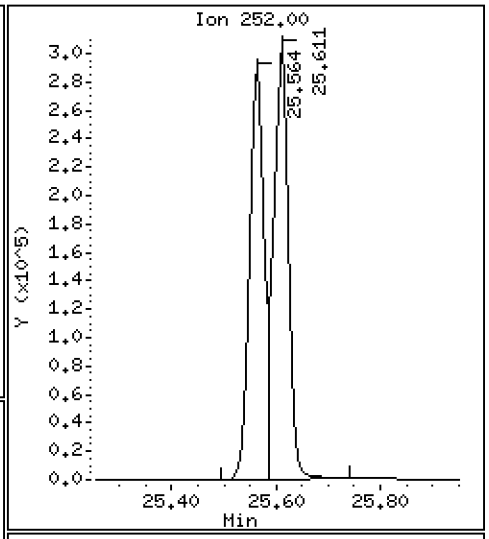
Concentration: 4.884 ug/mL

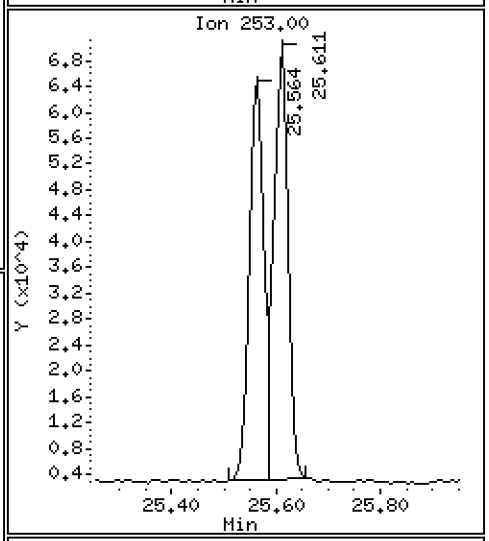


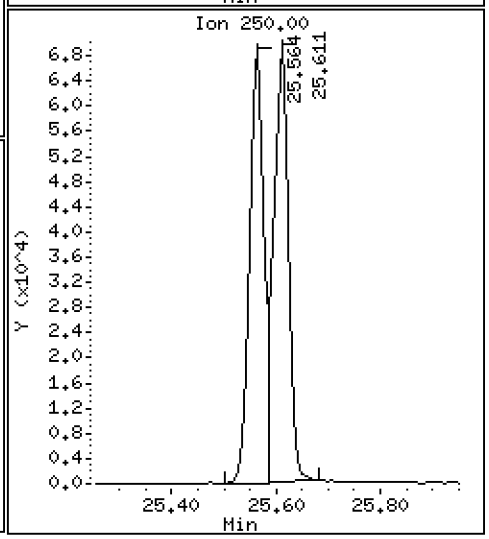












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

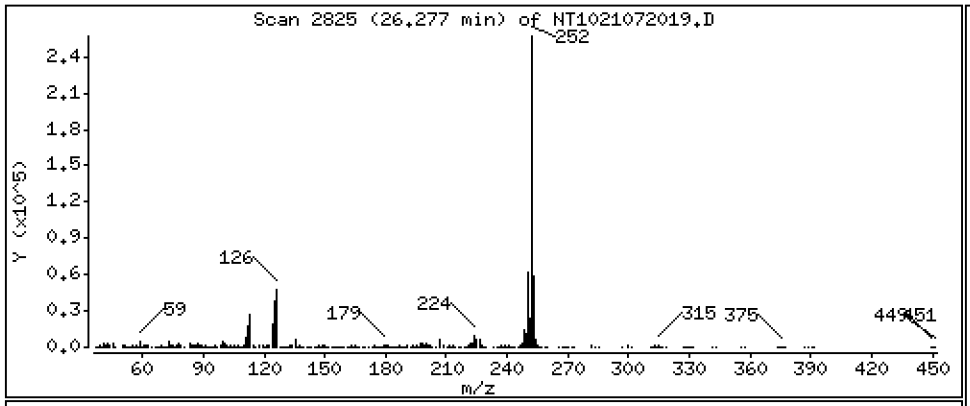
Operator: VTS

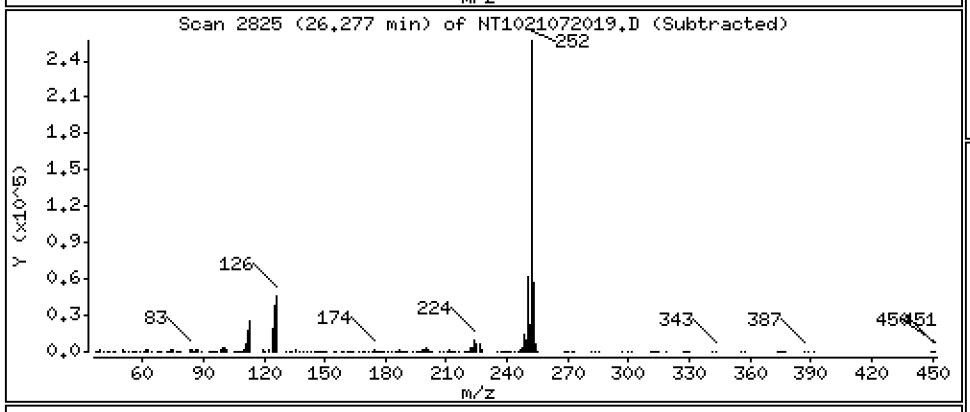
Column phase: ZB-5msi

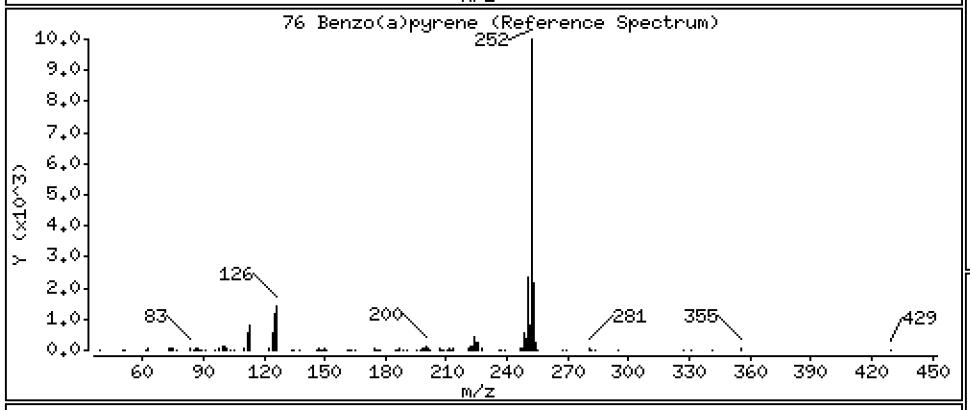
Column diameter: 0.25

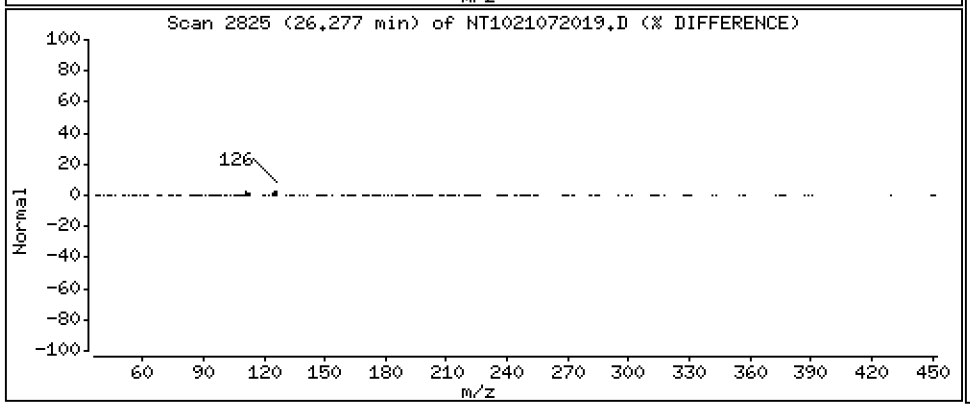
76 Benzo(a)pyrene

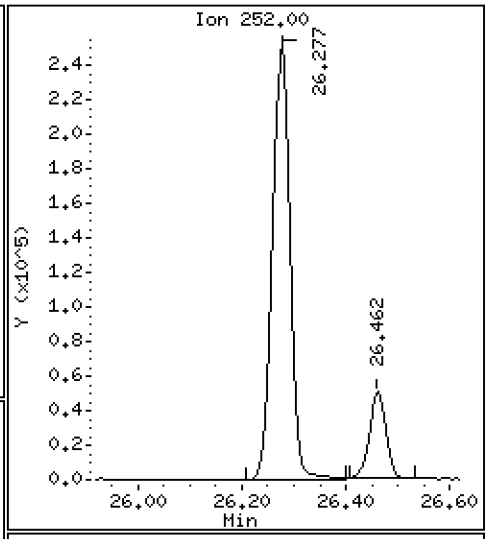
Concentration: 5.080 ug/mL

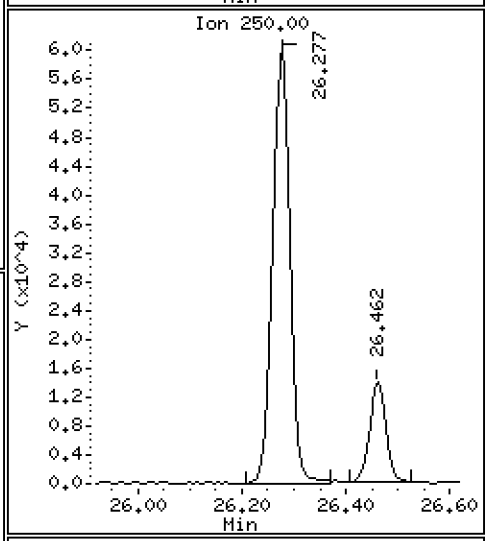


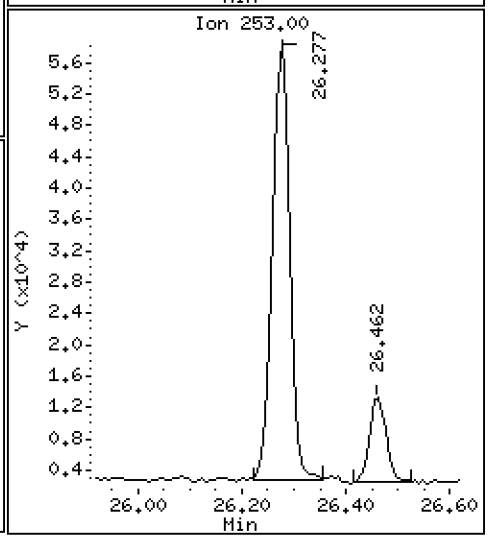












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

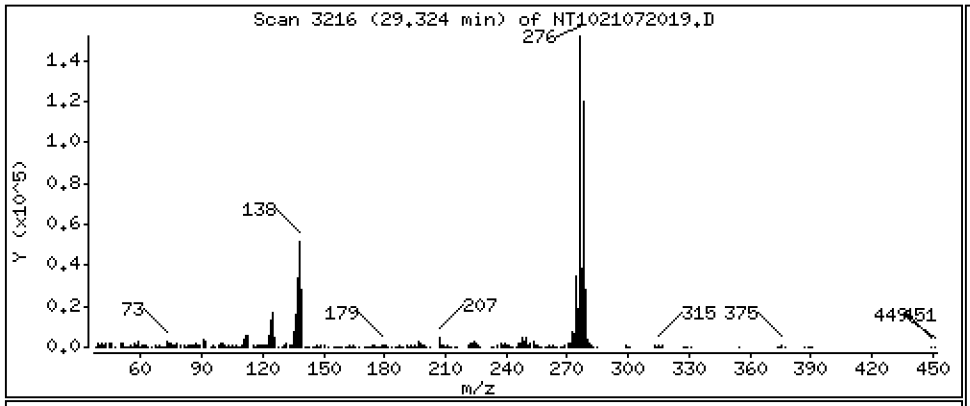
Operator: VTS

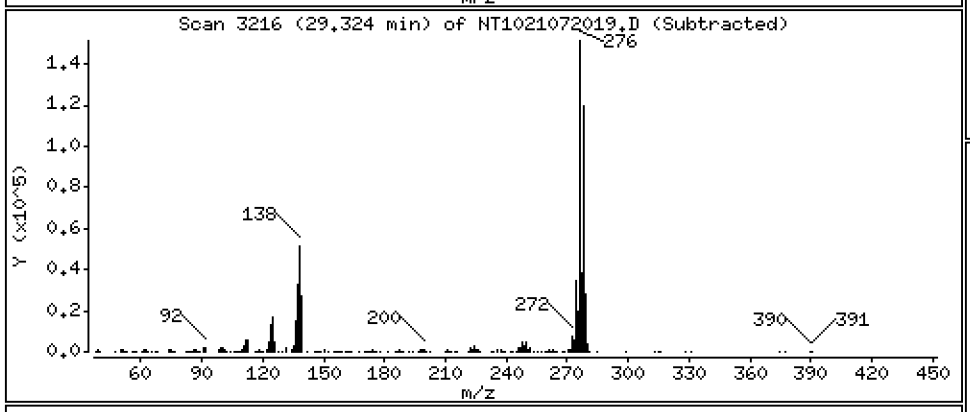
Column phase: ZB-5msi

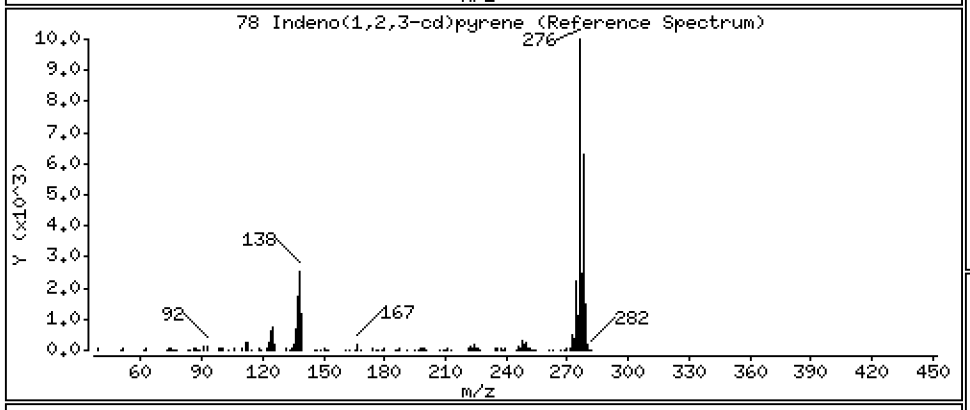
Column diameter: 0.25

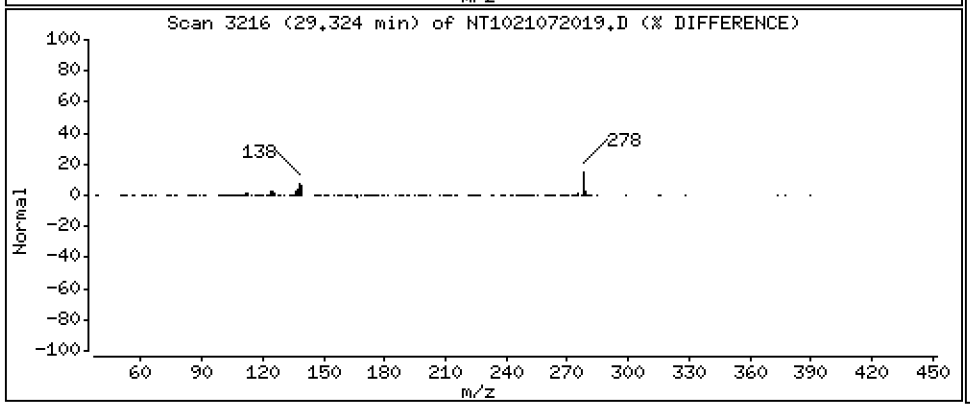
78 Indeno(1,2,3-cd)pyrene

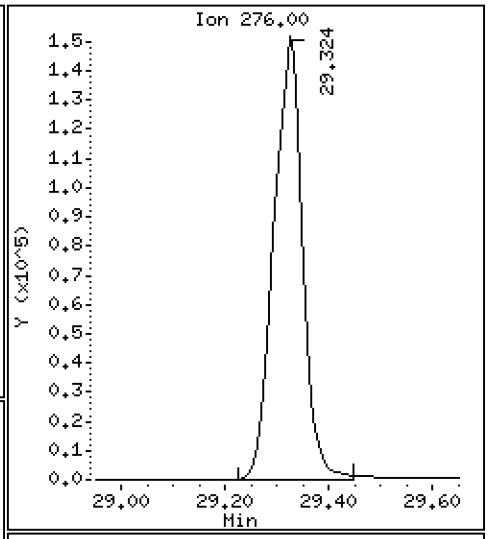
Concentration: 4.612 ug/mL

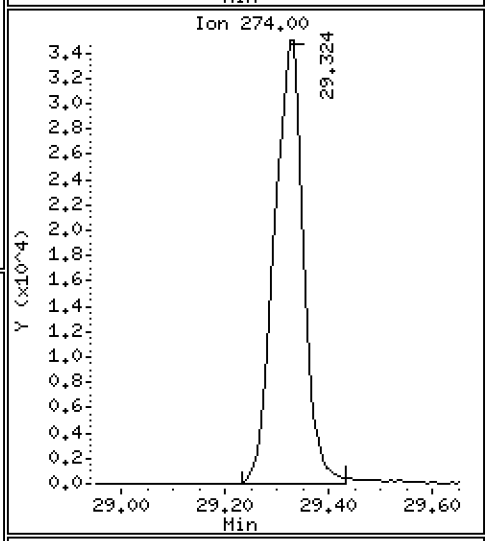


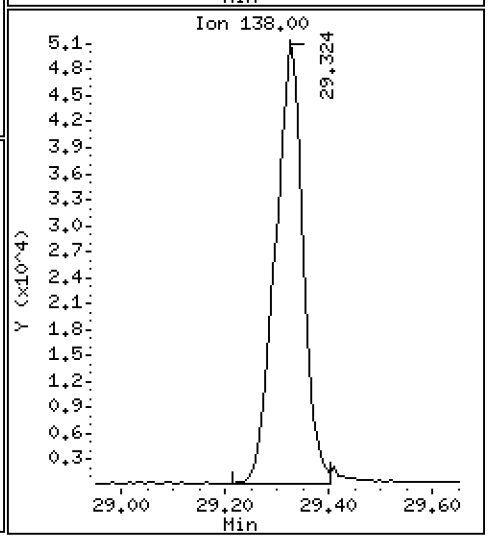












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

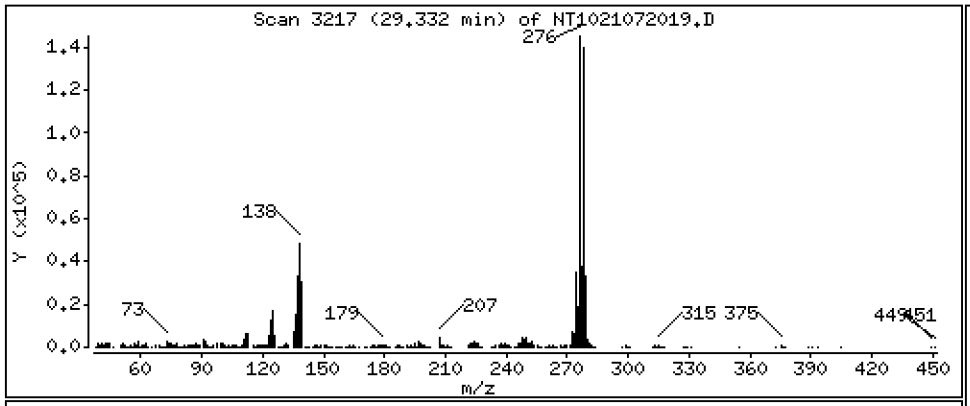
Operator: VTS

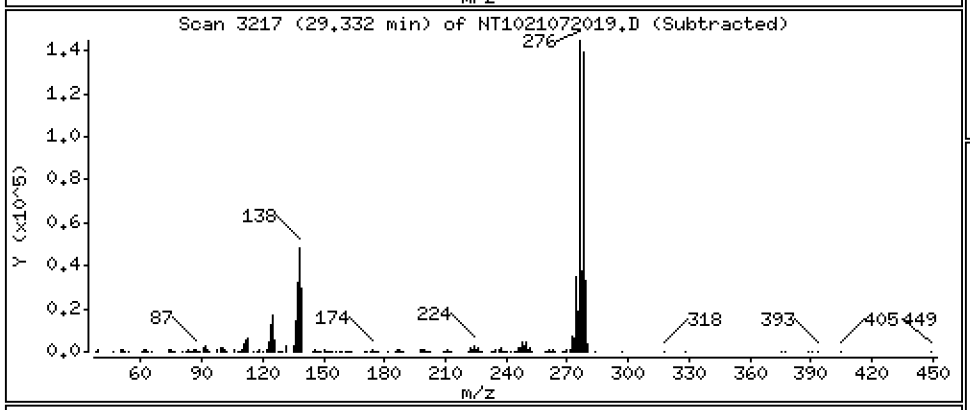
Column phase: ZB-5msi

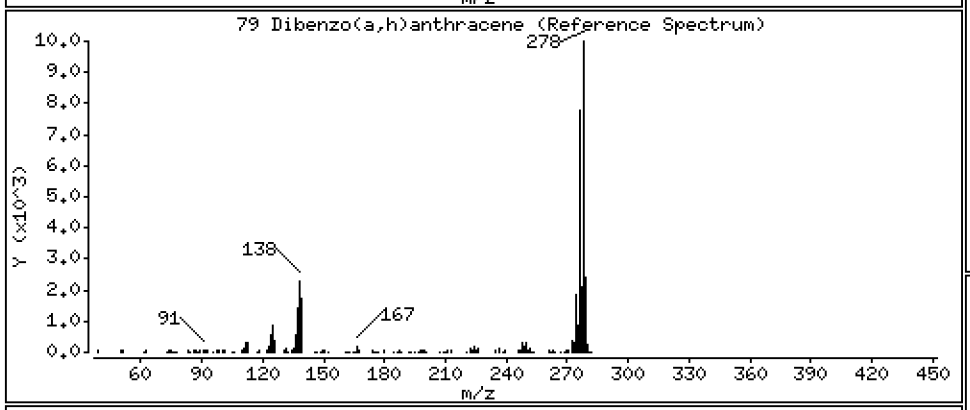
Column diameter: 0.25

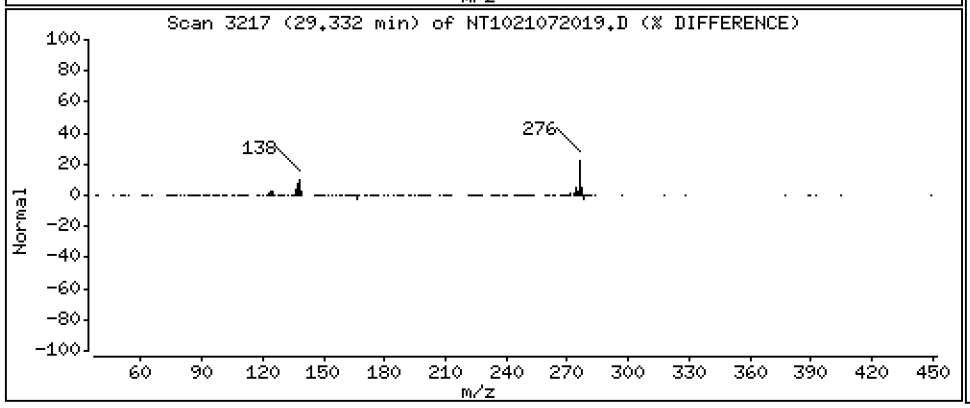
79 Dibenzo(a,h)anthracene

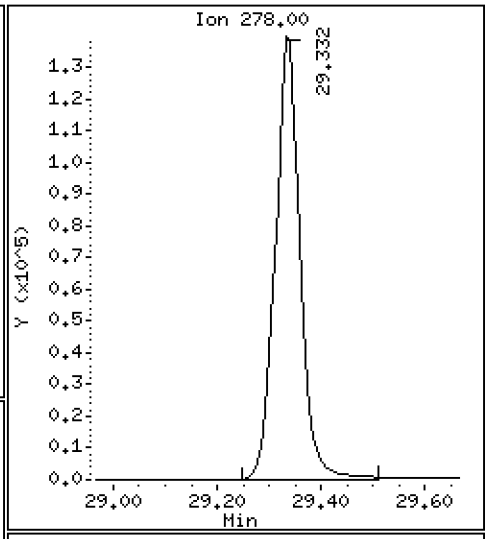
Concentration: 4.677 ug/mL

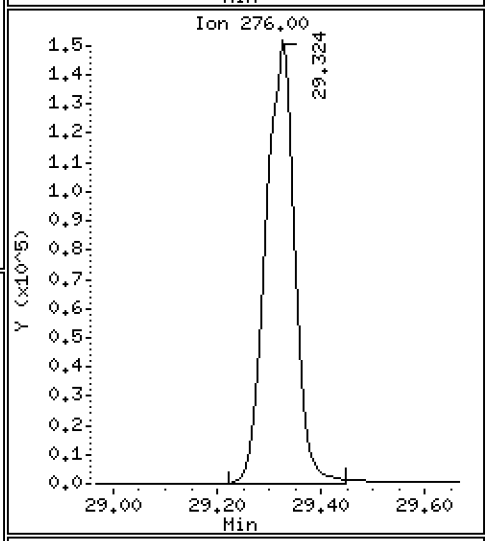


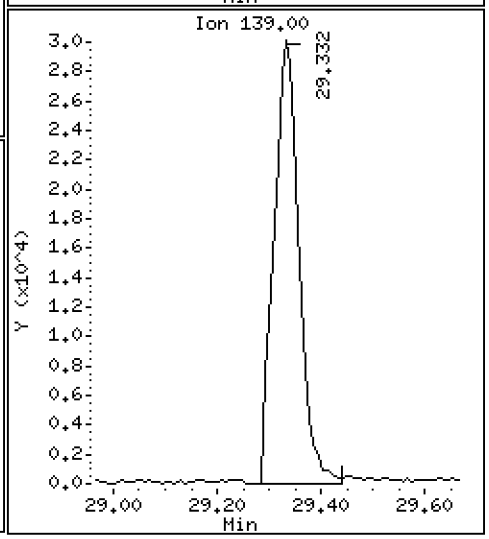












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

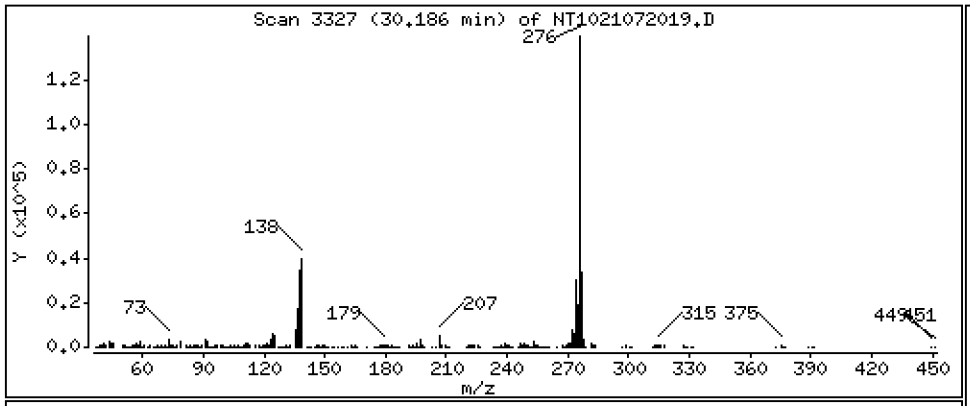
Operator: VTS

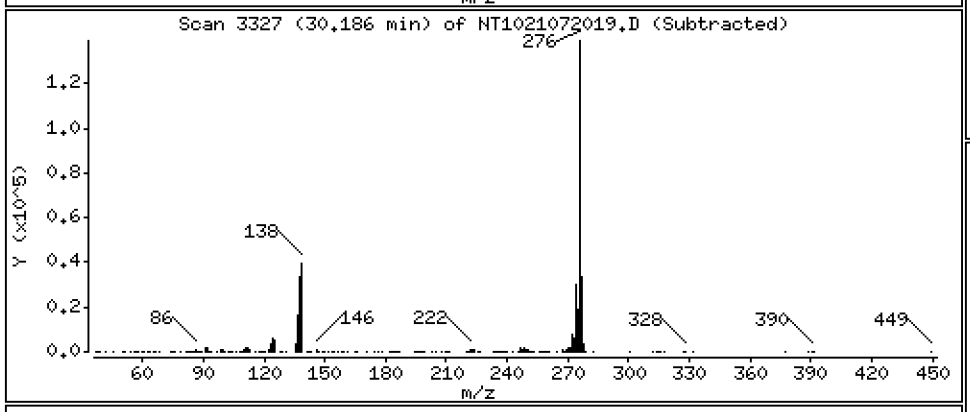
Column phase: ZB-5msi

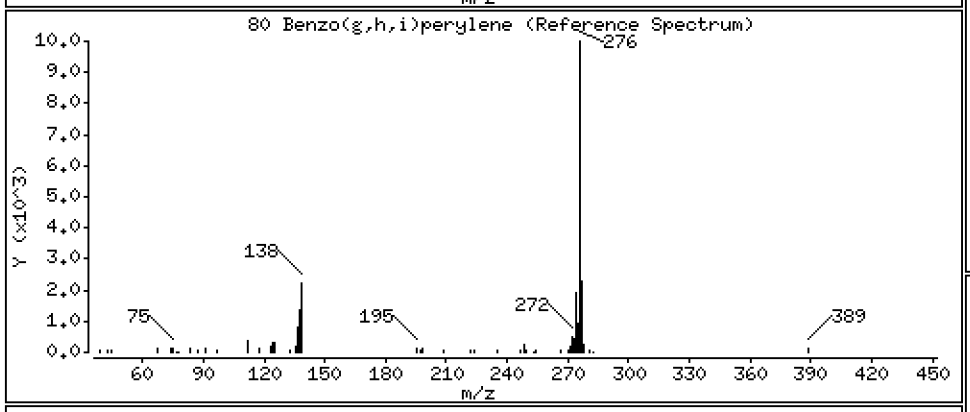
Column diameter: 0.25

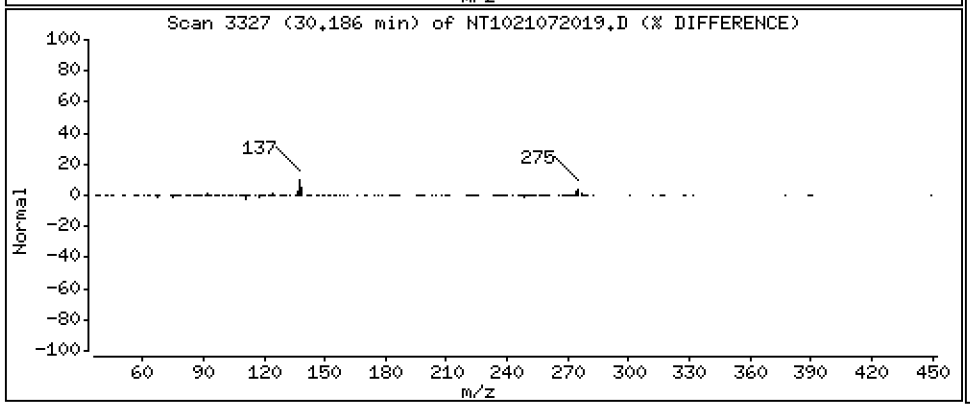
80 Benzo(g,h,i)perylene

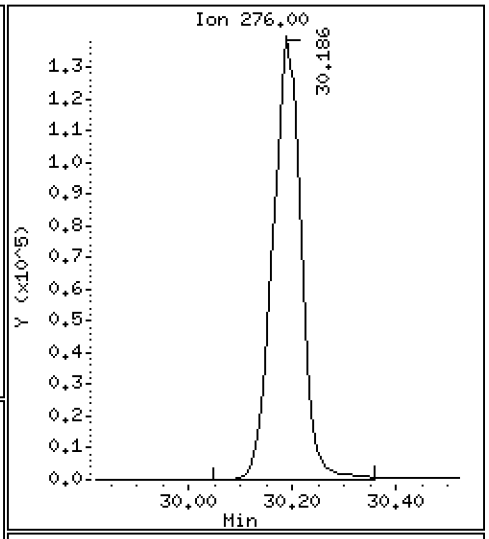
Concentration: 4.743 ug/mL

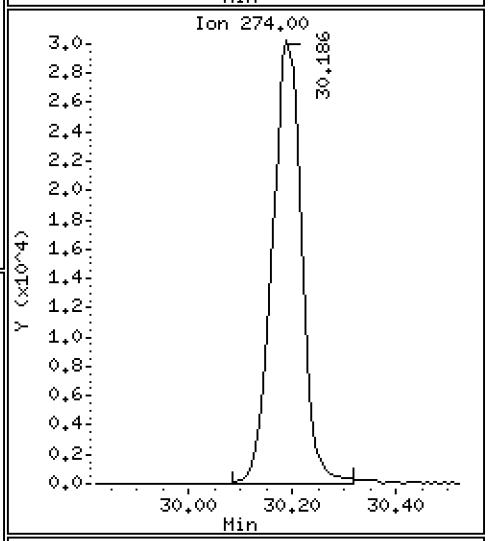


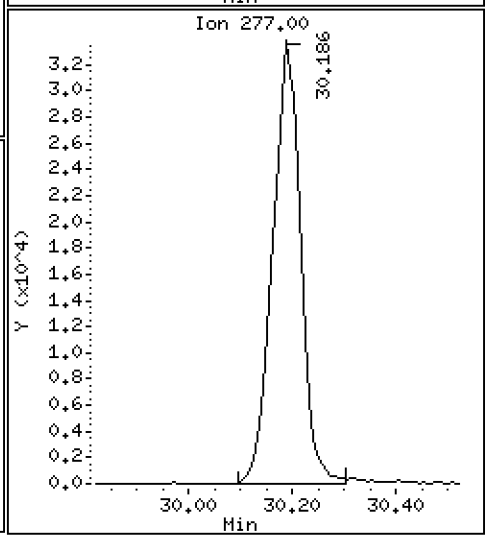












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

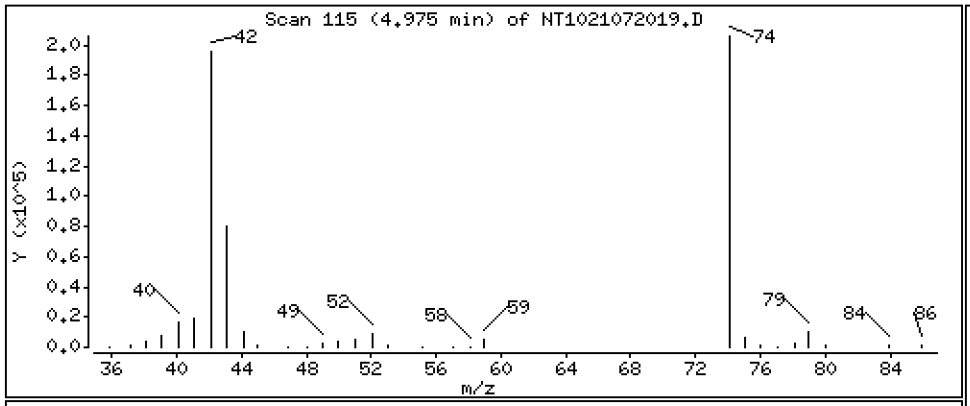
Operator: VTS

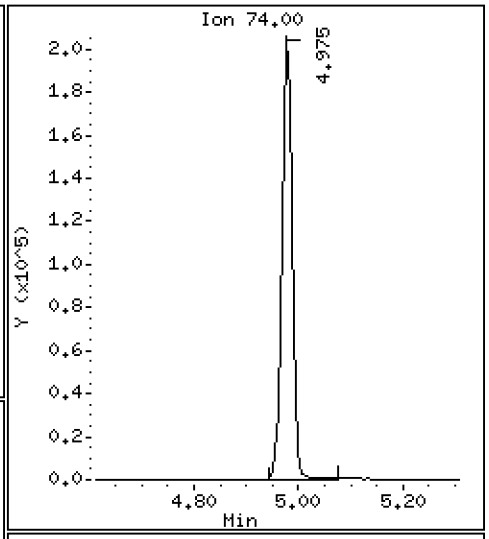
Column phase: ZB-5msi

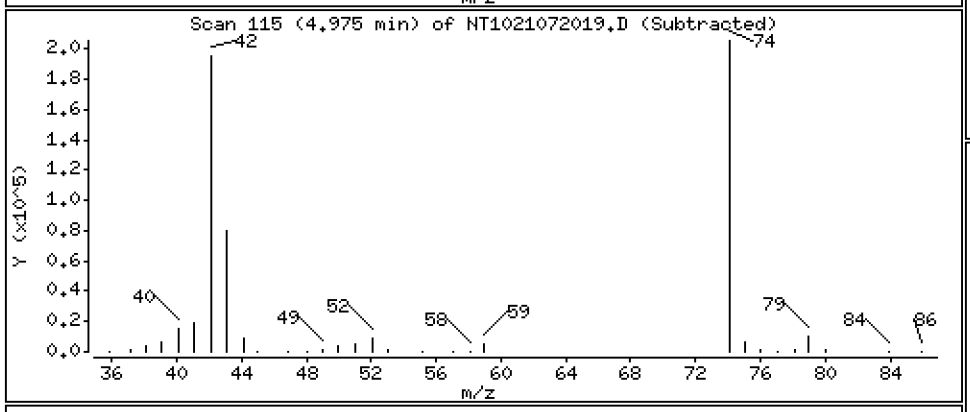
Column diameter: 0.25

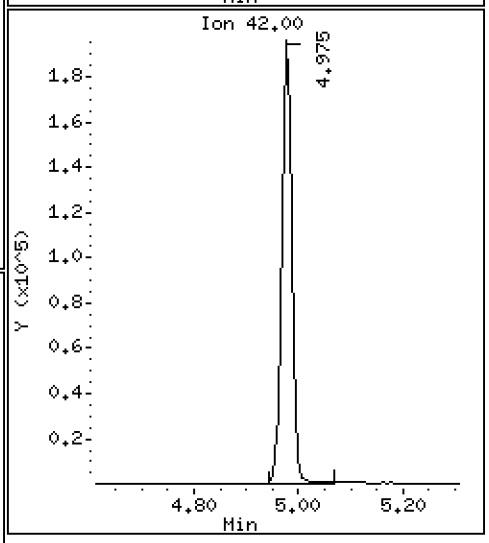
90 N-Nitrosodimethylamine

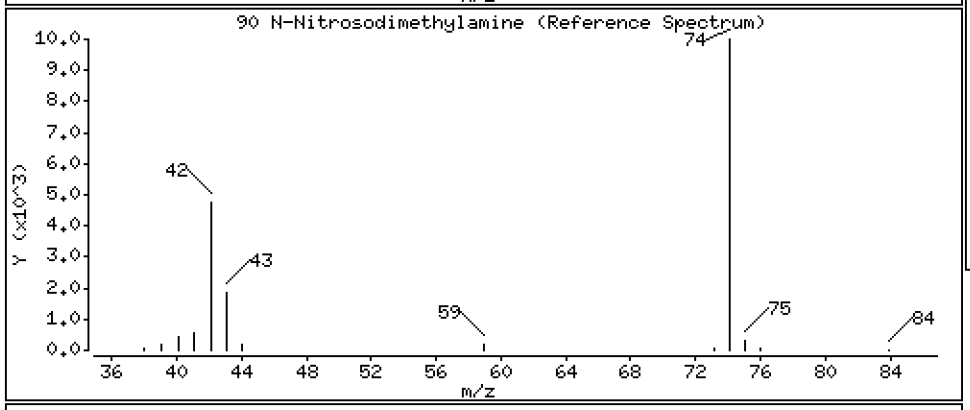
Concentration: 10.93 ug/mL

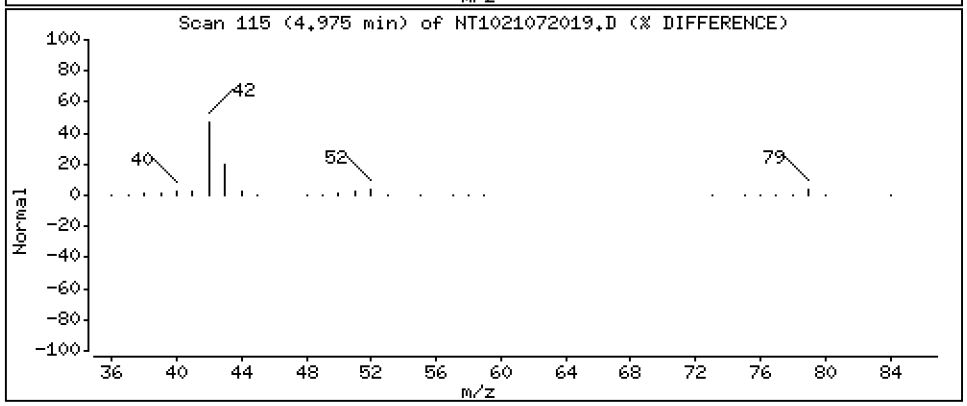












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

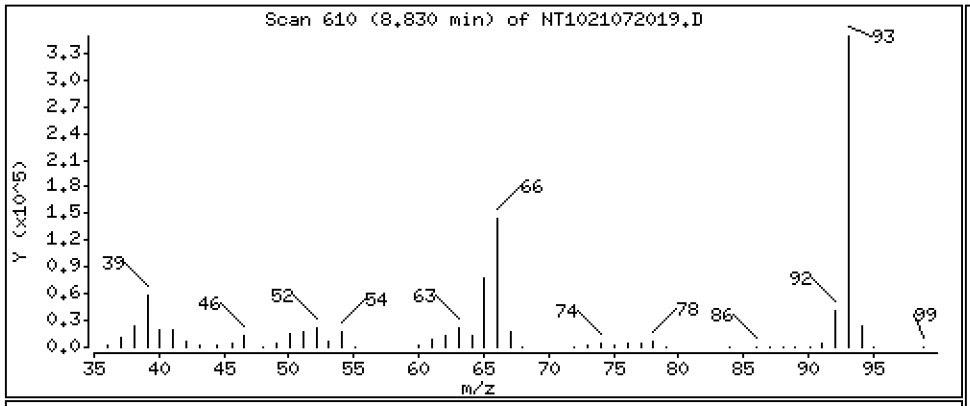
Operator: VTS

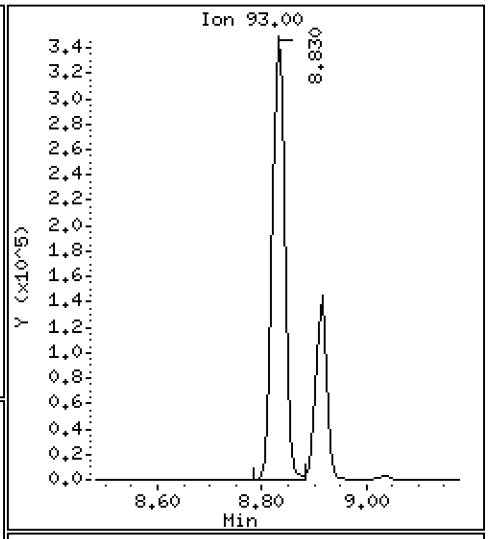
Column phase: ZB-5msi

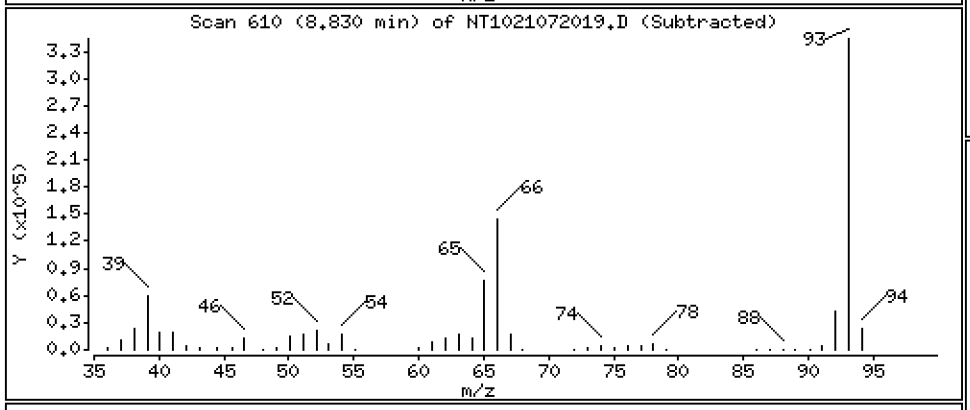
Column diameter: 0.25

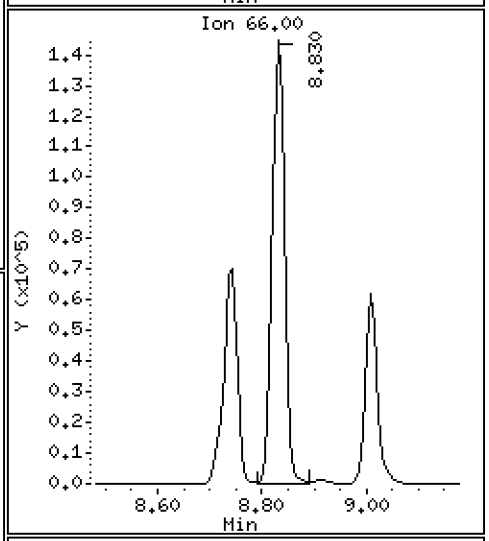
91 Aniline

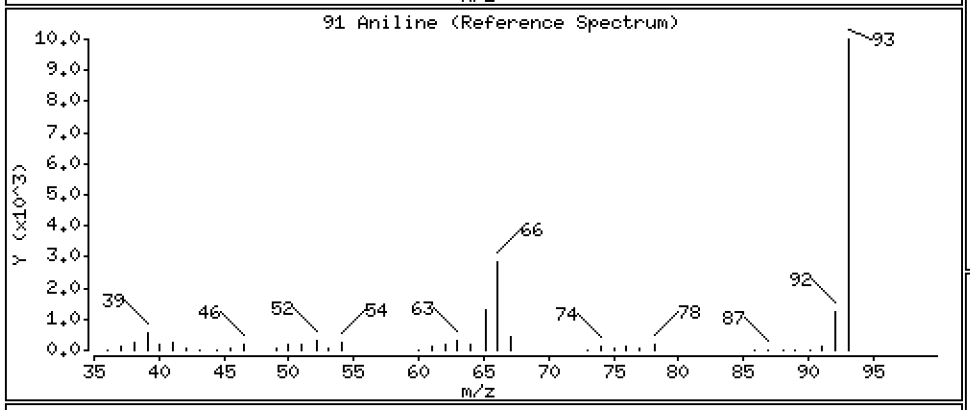
Concentration: 10.48 ug/mL

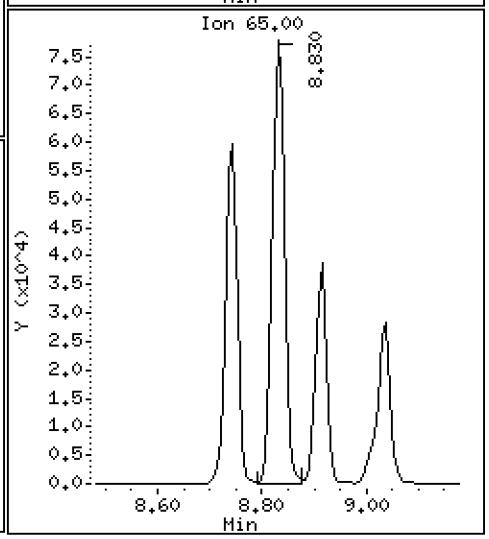


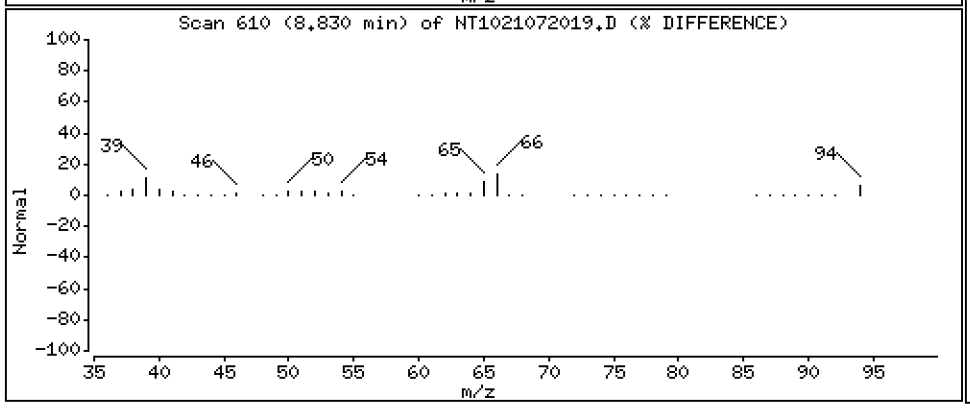












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

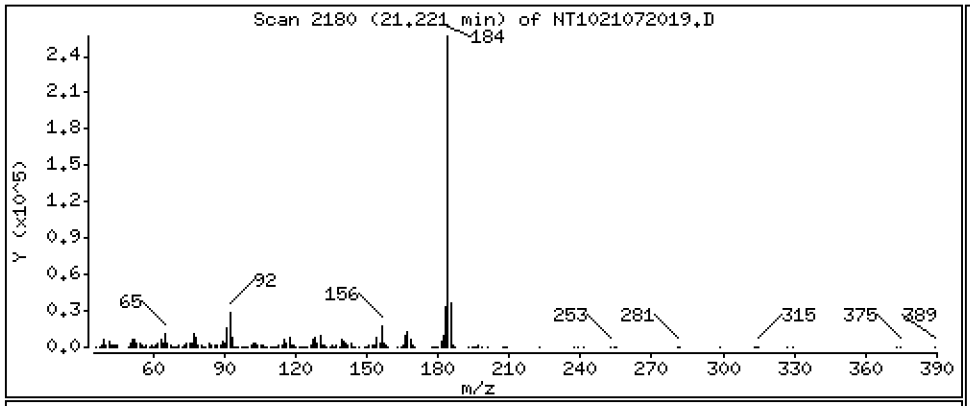
Operator: VTS

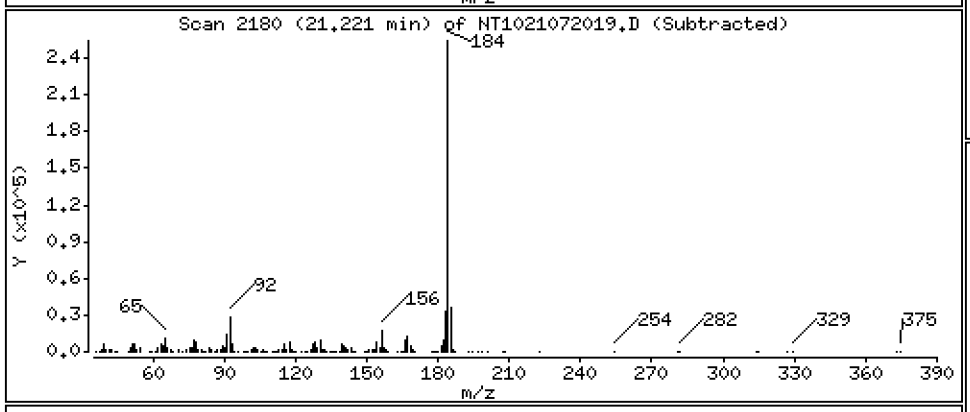
Column phase: ZB-5msi

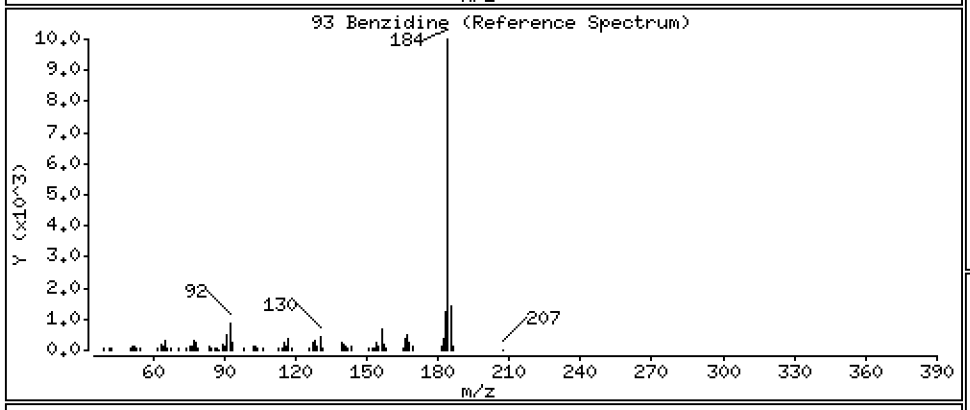
Column diameter: 0.25

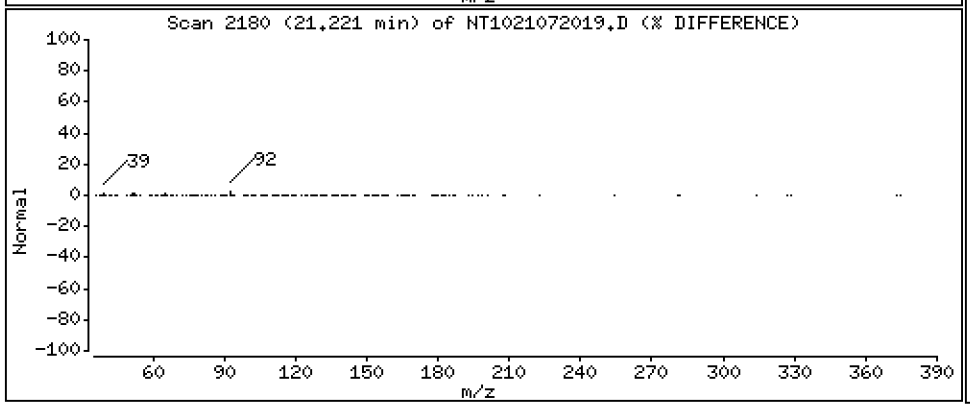
93 Benzidine

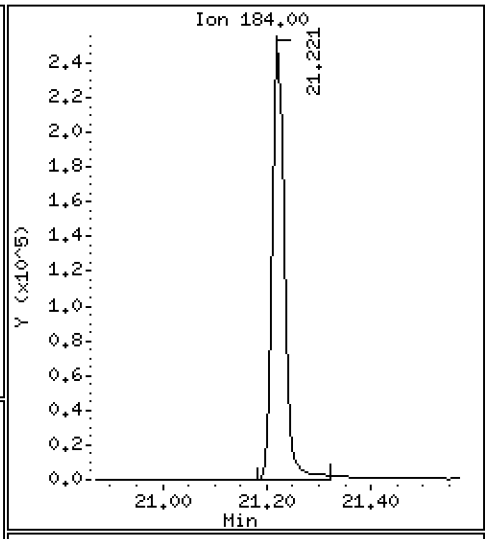
Concentration: 6.655 ug/mL

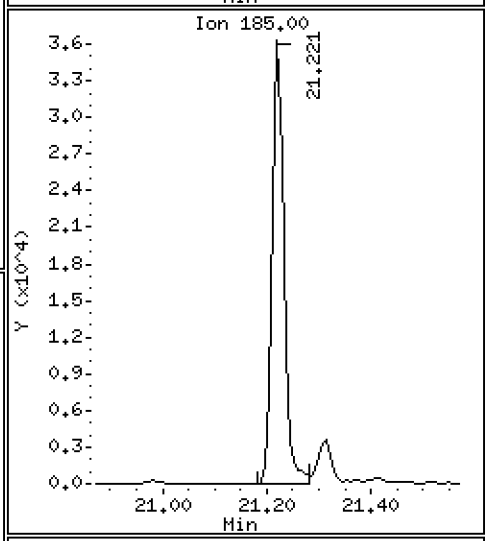


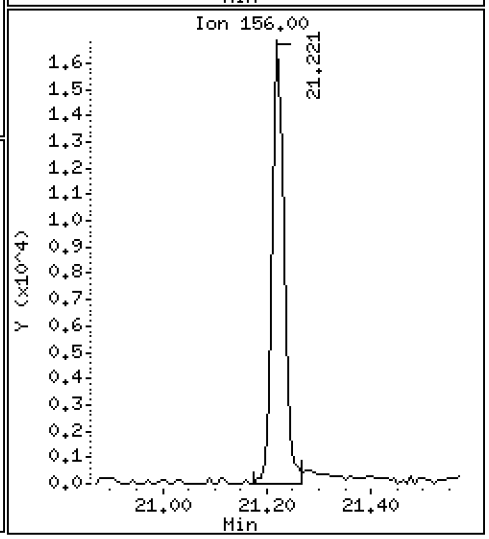












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

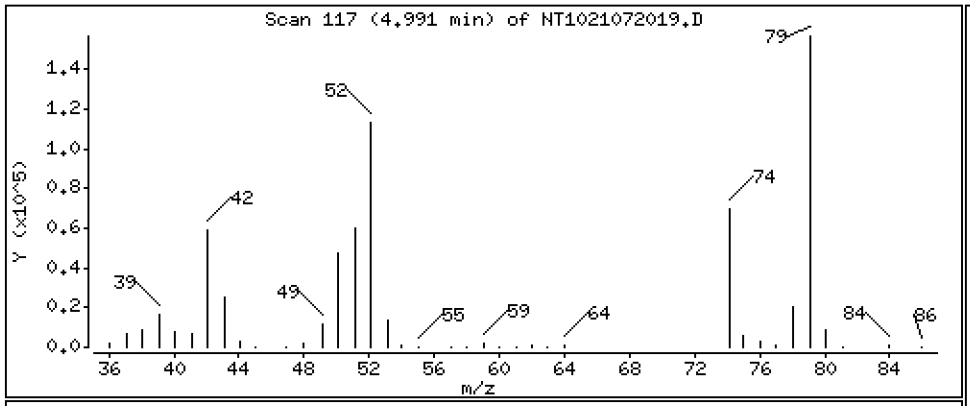
Operator: VTS

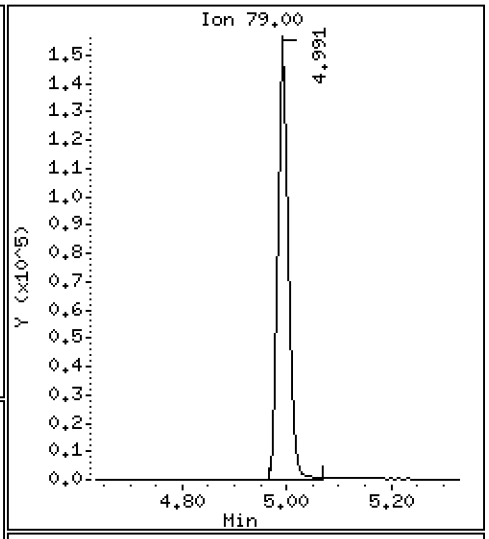
Column phase: ZB-5msi

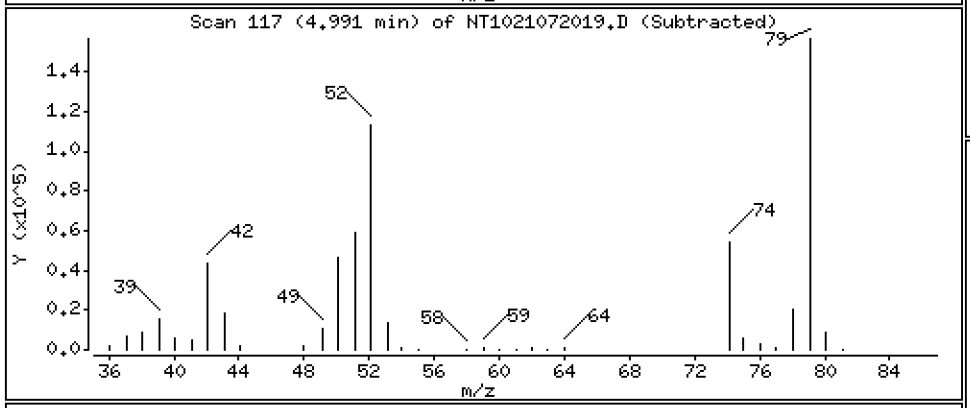
Column diameter: 0.25

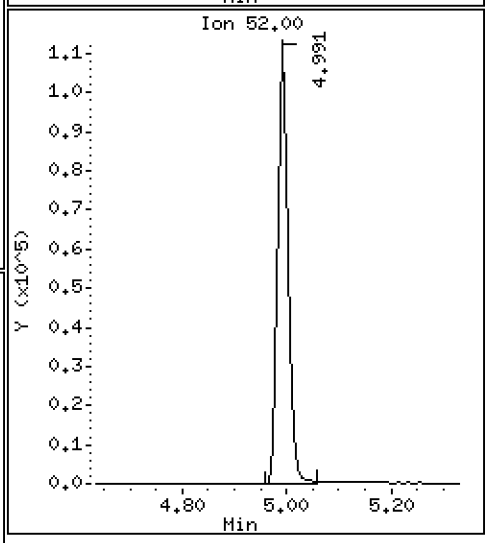
103 Pyridine

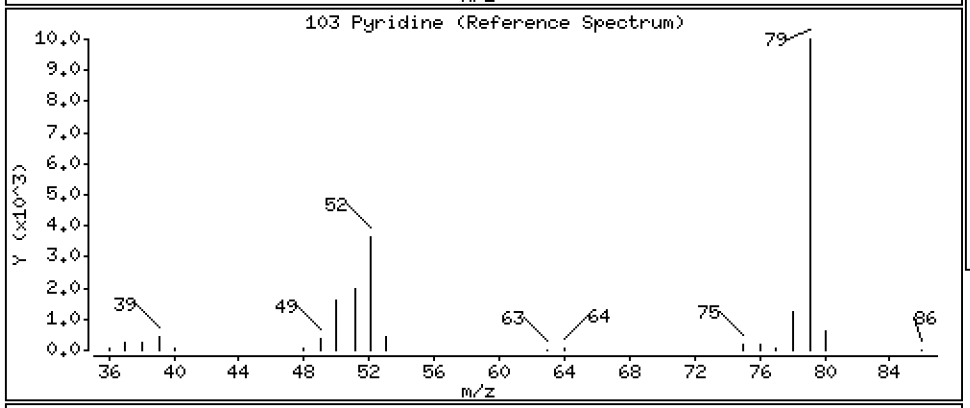
Concentration: 5.071 ug/mL

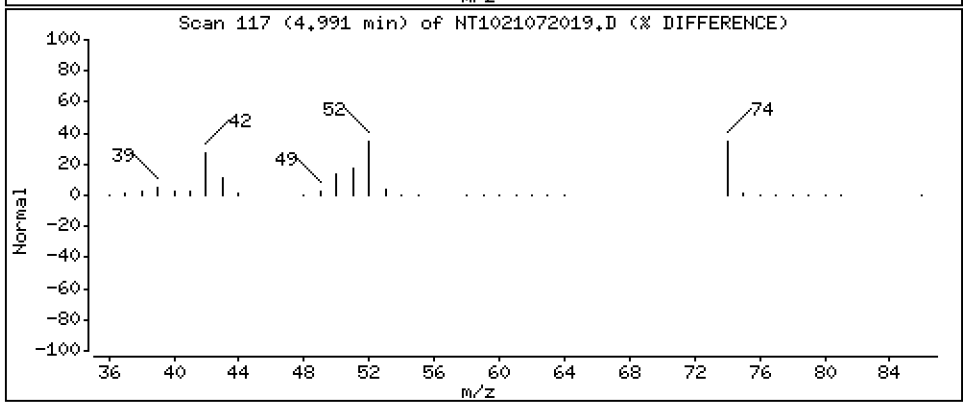












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

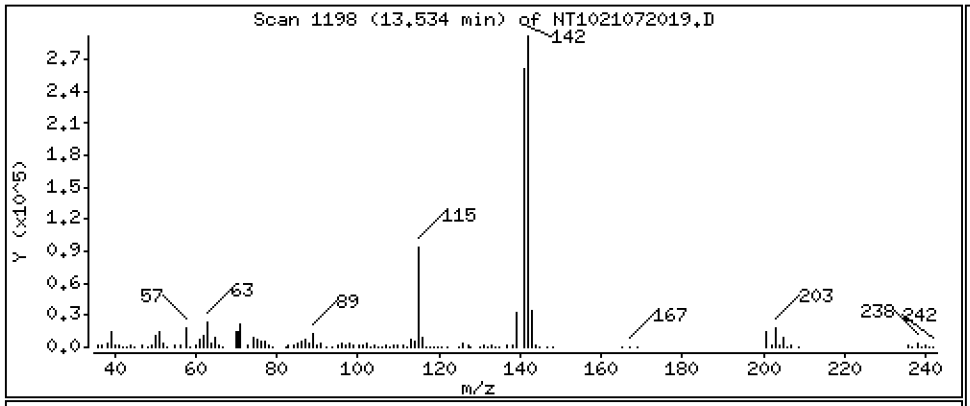
Operator: VTS

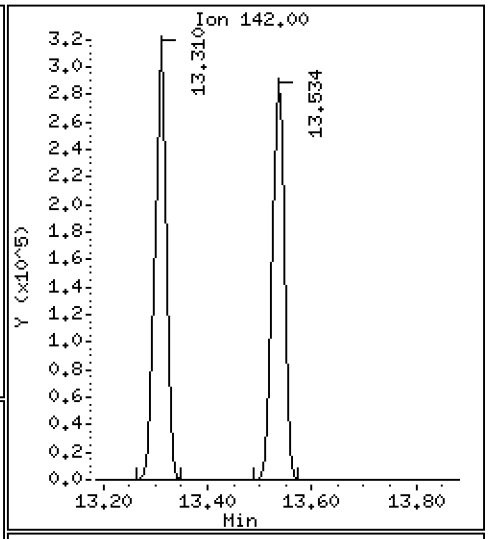
Column phase: ZB-5msi

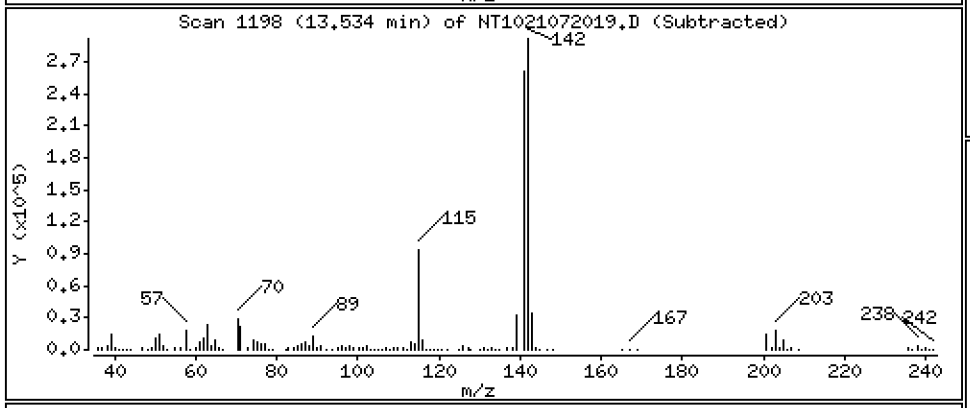
Column diameter: 0.25

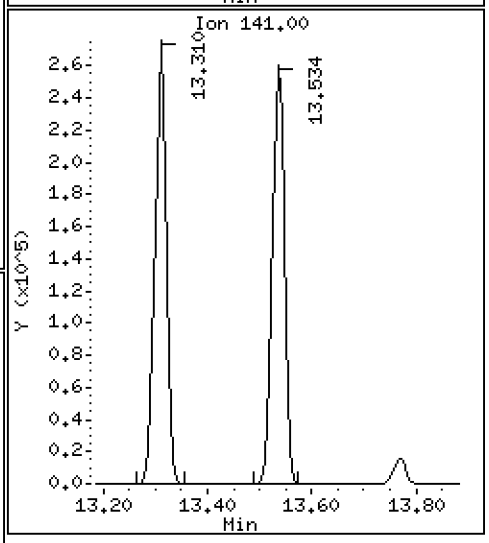
105 1-methylnaphthalene

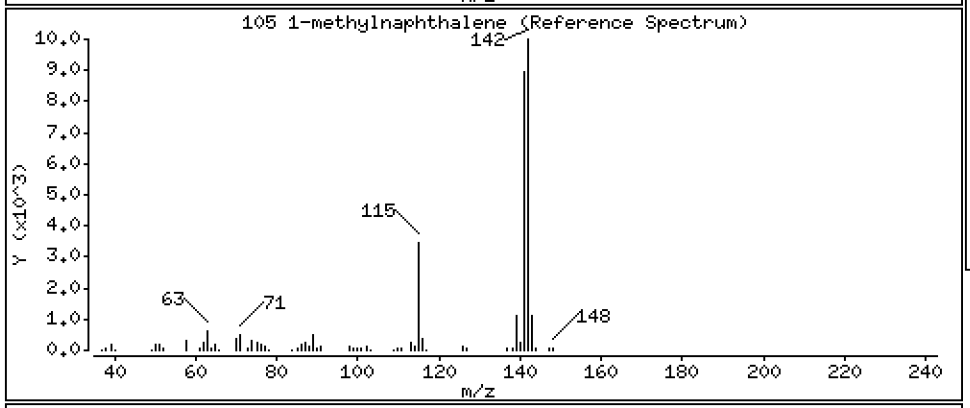
Concentration: 5.424 ug/mL

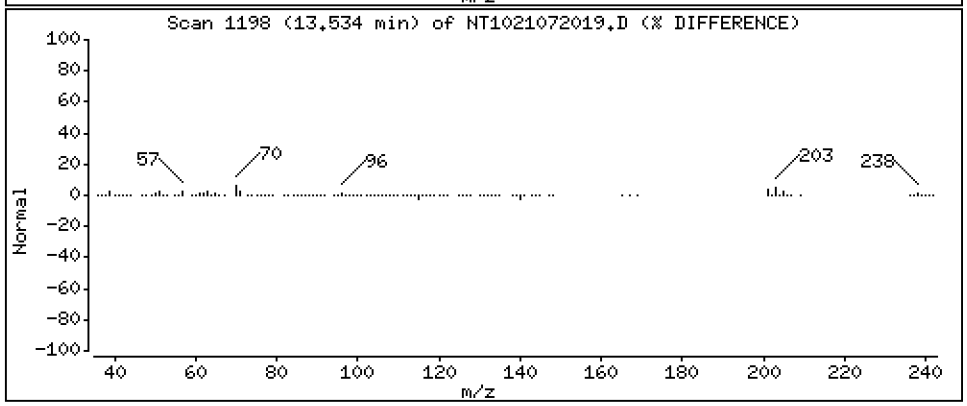












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Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

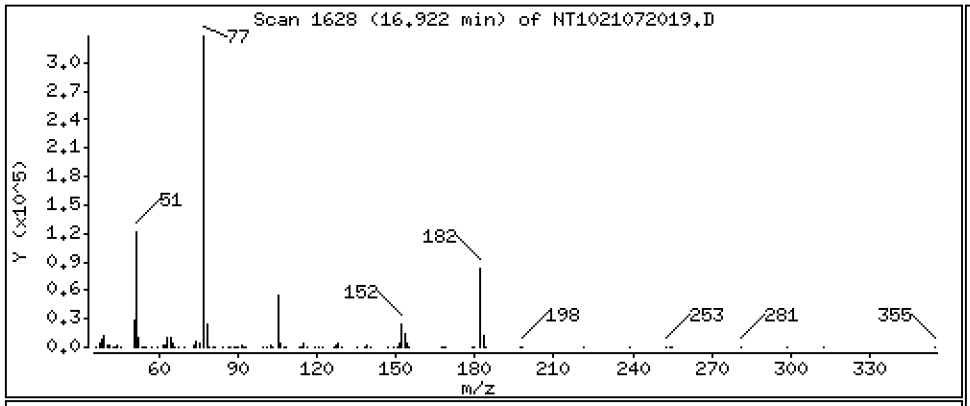
Operator: VTS

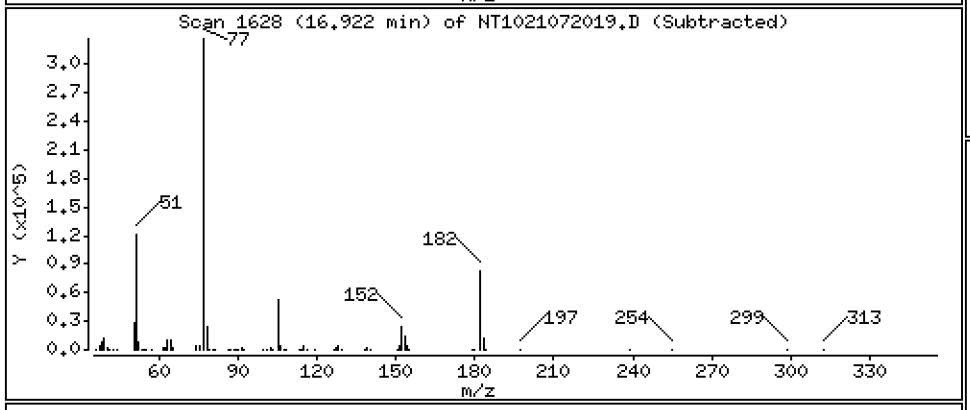
Column phase: ZB-5msi

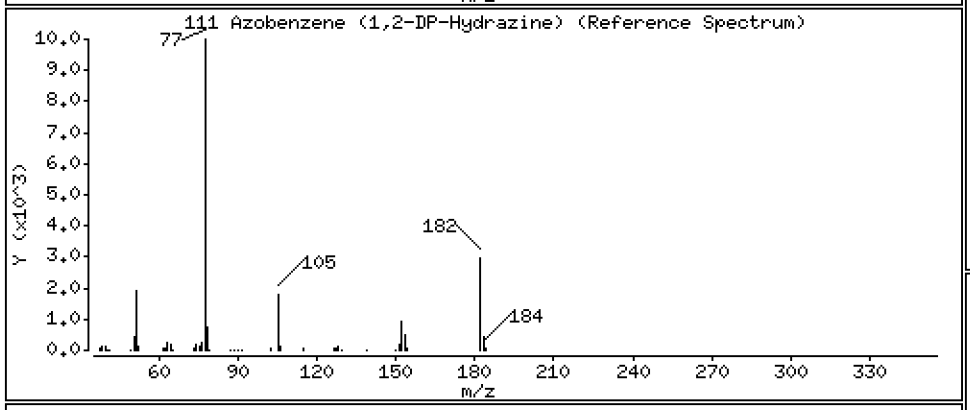
Column diameter: 0.25

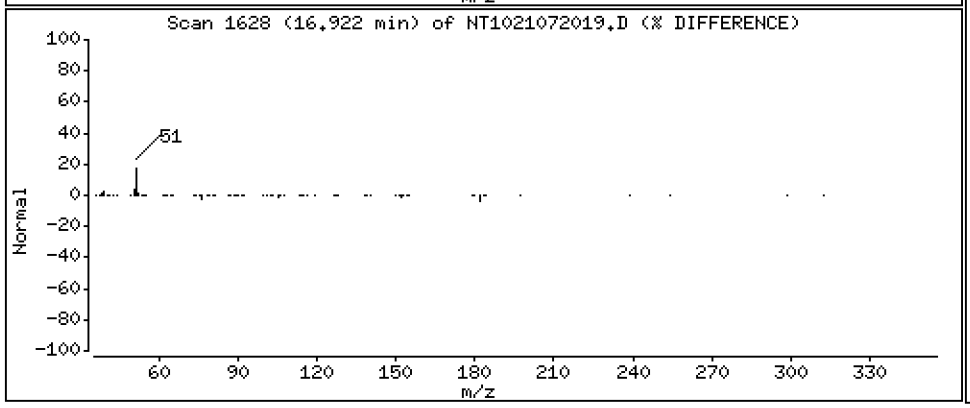
111 Azobenzene (1,2-DP-Hydrazine)

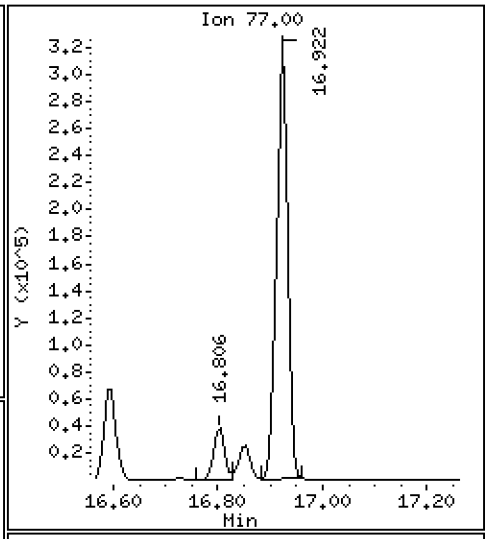
Concentration: 5.107 ug/mL

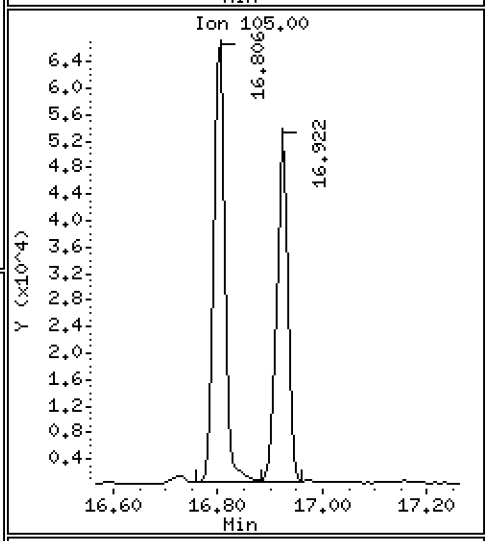


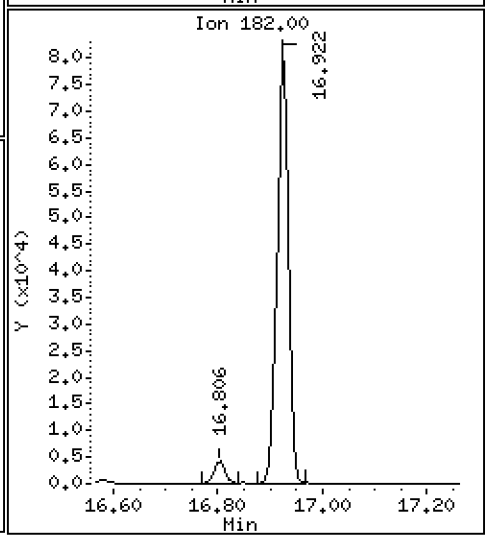












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

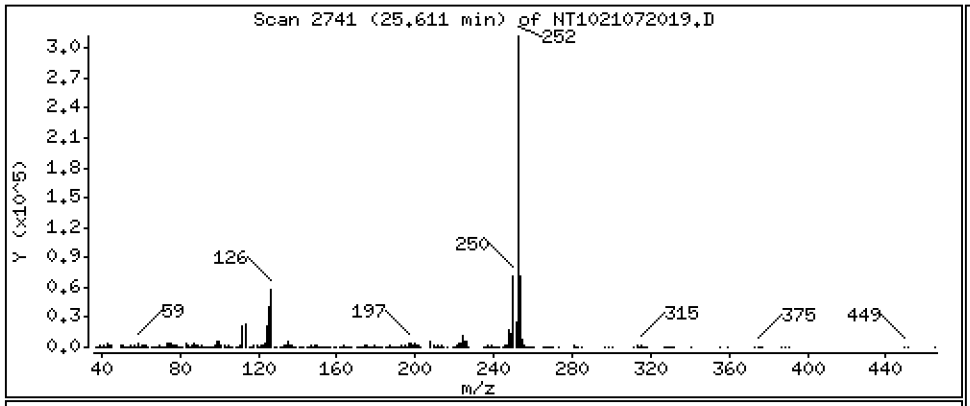
Operator: VTS

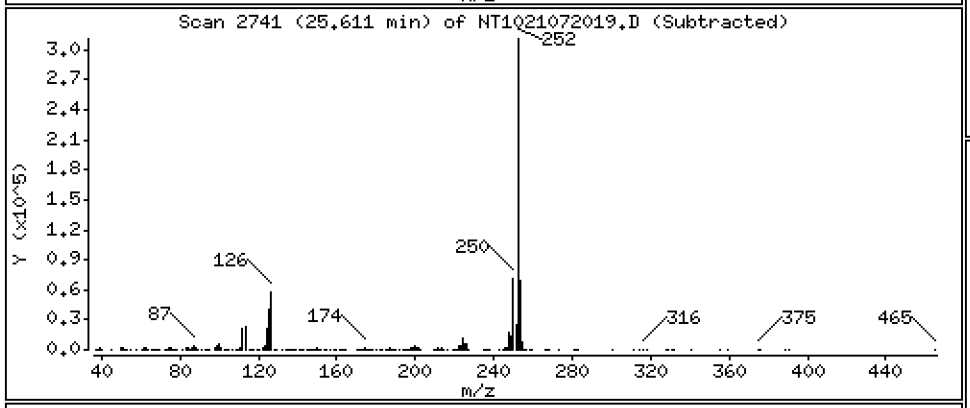
Column phase: ZB-5msi

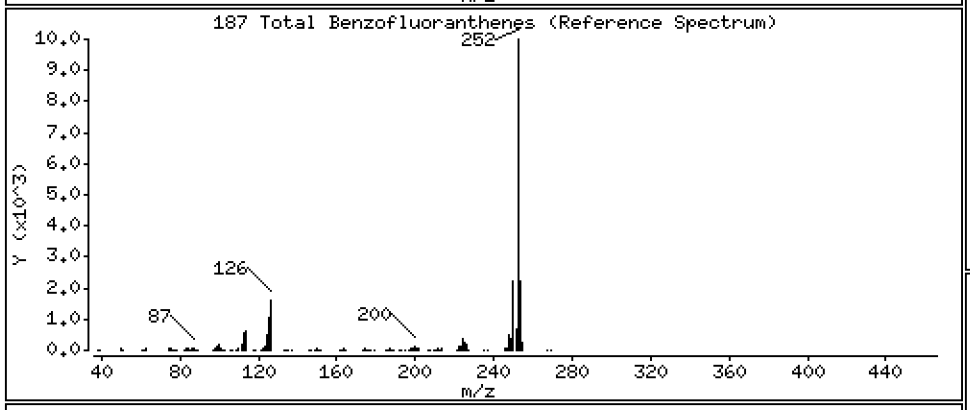
Column diameter: 0.25

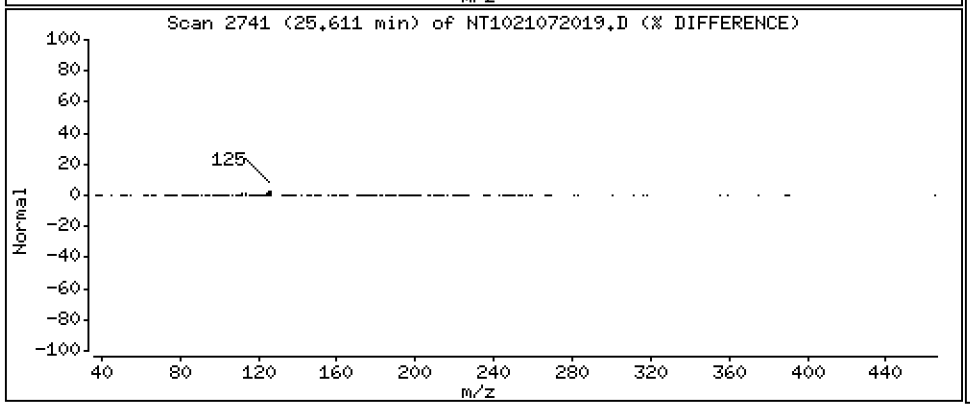
187 Total Benzofluoranthenes

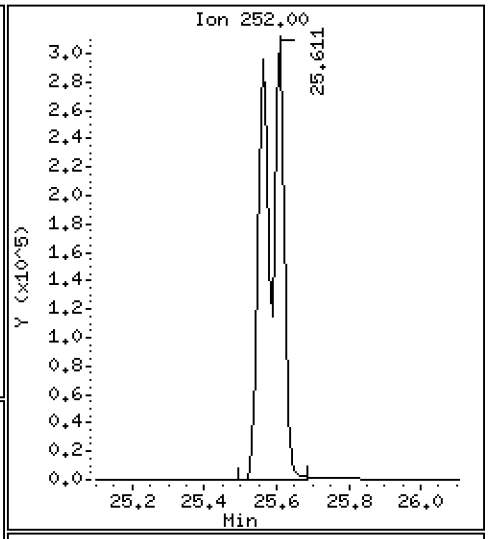
Concentration: 9.760 ug/mL

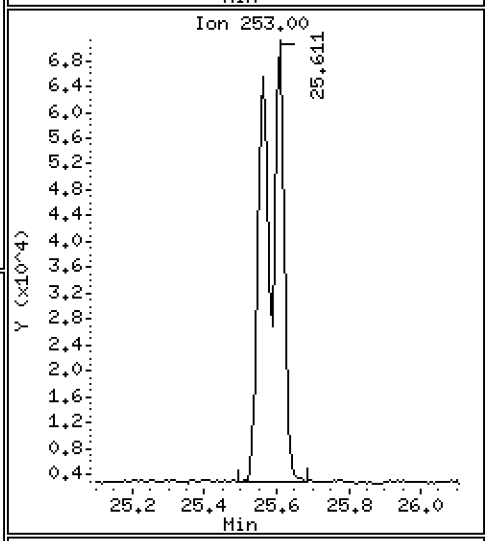


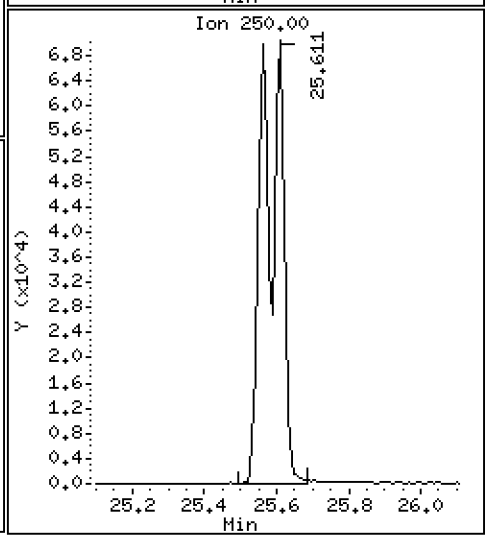












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D

Date : 20-JUL-2021 23:13

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-CCV1

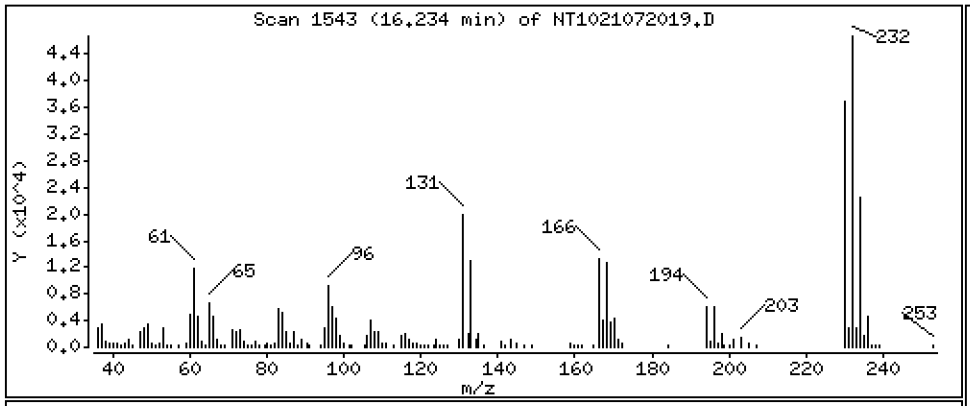
Operator: VTS

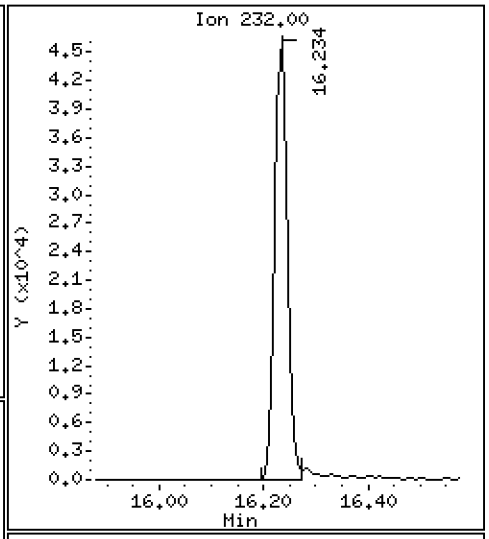
Column phase: ZB-5msi

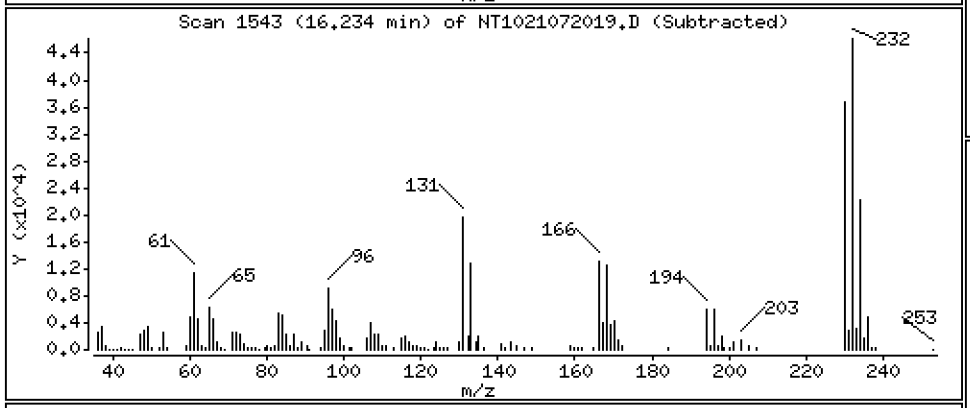
Column diameter: 0.25

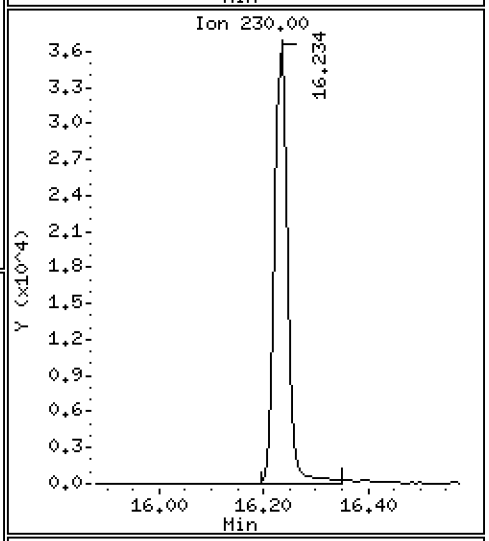
120 2,3,4,6-Tetrachlorophenol

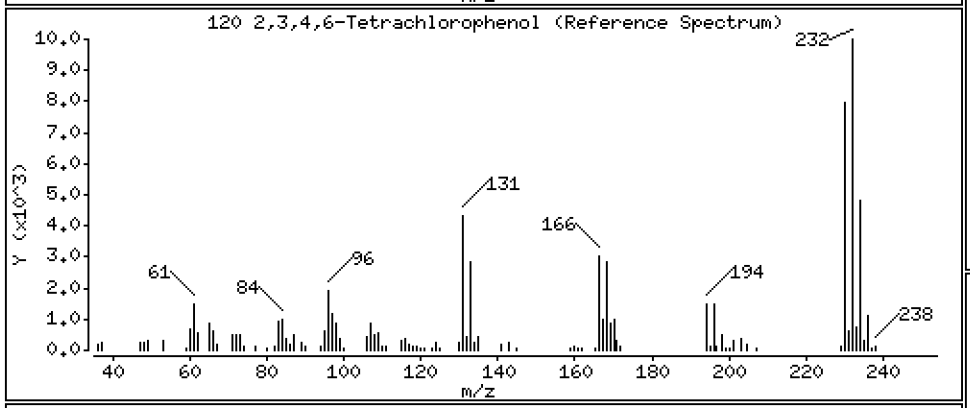
Concentration: 3.410 ug/mL

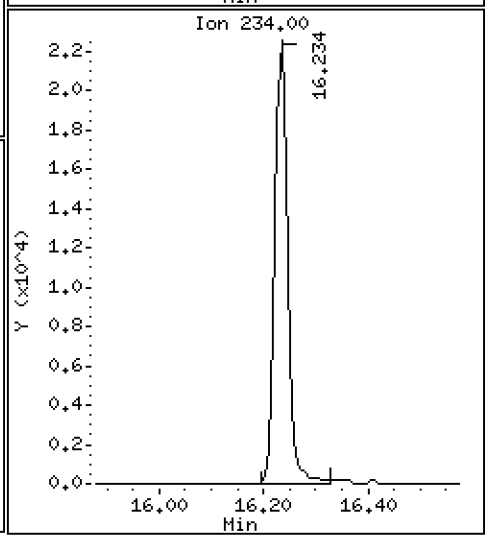


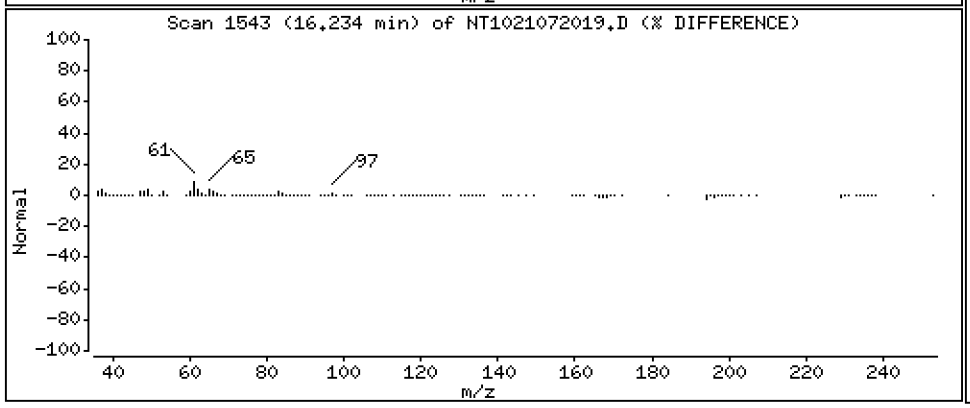












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D
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Inj Date : 20-JUL-2021 23:13
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-CCV1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$	1 2-Fluorophenol	112	7.130	7.122	(0.761)	302386	7.75289	7.753
$	2 Phenol-d5	99	8.722	8.706	(0.931)	478243	8.26115	8.261
	3 Phenol	94	8.745	8.729	(0.933)	269173	5.31924	5.319
$	5 2-Chlorophenol-d4	132	9.007	8.999	(0.961)	314436	7.70409	7.704
	4 Bis(2-Chloroethyl)ether	93	8.915	8.907	(0.951)	202813	5.01799	5.018
	6 2-Chlorophenol	128	9.038	9.030	(0.964)	197888	5.16637	5.166
	7 1,3-Dichlorobenzene	146	9.301	9.301	(0.993)	211318	5.02230	5.022
*	8 1,4-Dichlorobenzene-d4	152	9.371	9.371	(1.000)	99108	4.00000	
	9 1,4-Dichlorobenzene	146	9.402	9.402	(1.003)	182623	5.08349	5.083
$	10 1,2-Dichlorobenzene-d4	152	9.736	9.736	(1.039)	134589	5.12708	5.127
	12 1,2-Dichlorobenzene	146	9.759	9.759	(1.041)	192702	5.07099	5.071
	11 Benzyl alcohol	108	9.643	9.635	(1.029)	129541	5.46791	5.468
	14 2,2'-oxybis(1-Chloropropane)	121	9.938	9.930	(1.060)	73404	5.03508	5.035
	13 2-Methylphenol	108	9.860	9.852	(1.052)	167845	5.32880	5.329
	17 Hexachloroethane	117	10.349	10.349	(1.104)	82211	5.32369	5.324
	16 N-Nitroso-di-n-propylamine	70	10.202	10.194	(1.089)	144790	5.32857	5.329
	15 4-Methylphenol	108	10.132	10.116	(1.081)	180788	5.34856	5.349
$	18 Nitrobenzene-d5	82	10.473	10.473	(0.882)	233911	5.36709	5.367
	19 Nitrobenzene	77	10.512	10.512	(0.886)	230511	5.35344	5.353
	20 Isophorone	82	10.954	10.946	(0.923)	454607	5.59465	5.595
	21 2-Nitrophenol	139	11.140	11.140	(0.938)	120933	5.31179	5.312
	22 2,4-Dimethylphenol	107	11.182	11.165	(0.942)	345503	10.2280	10.23
	23 Bis(2-Chloroethoxy)methane	93	11.378	11.378	(0.958)	202738	4.80671	4.807
	24 Benzoic acid	105	11.395	11.293	(0.960)	395557	20.3448	20.34
	25 2,4-Dichlorophenol	162	11.590	11.581	(0.976)	290616	10.3828	10.38
	26 1,2,4-Trichlorobenzene	180	11.778	11.778	(0.992)	151983	4.80267	4.803
*	27 Naphthalene-d8	136	11.871	11.863	(1.000)	355338	4.00000	
	28 Naphthalene	128	11.909	11.909	(1.003)	483760	5.14415	5.144
	29 4-Chloroaniline	127	12.048	12.040	(1.015)	501278	10.7049	10.70
	30 Hexachlorobutadiene	225	12.257	12.257	(1.033)	88004	5.09338	5.093
	31 4-Chloro-3-methylphenol	107	13.000	12.984	(1.095)	362396	10.8446	10.84
	32 2-Methylnaphthalene	142	13.310	13.309	(1.121)	462310	5.31338	5.313
	33 Hexachlorocyclopentadiene	237	13.766	13.766	(0.888)	199273	9.28279	9.283

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	13.936	13.929	(0.899)	250840	11.2173	11.22
	35 2,4,5-Trichlorophenol	196	14.006	13.998	(0.904)	263084	11.0414	11.04
$	36 2-Fluorobiphenyl	172	14.091	14.091	(0.909)	478319	5.11744	5.117
	37 2-Chloronaphthalene	162	14.308	14.308	(0.923)	396444	5.07662	5.077
	38 2-Nitroaniline	65	14.579	14.571	(0.941)	323079	11.0393	11.04
	39 Dimethylphthalate	163	15.004	14.997	(0.968)	373063	4.93901	4.939
	40 Acenaphthylene	152	15.190	15.182	(0.980)	547056	4.92574	4.926
	41 2,6-Dinitrotoluene	165	15.152	15.144	(0.978)	174683	10.1998	10.20
*	42 Acenaphthene-d10	164	15.500	15.500	(1.000)	203538	4.00000	
	43 3-Nitroaniline	138	15.446	15.430	(0.997)	215720	10.1662	10.17
	44 Acenaphthene	153	15.569	15.561	(1.004)	335013	5.19572	5.196
	45 2,4-Dinitrophenol	184	15.647	15.647	(1.009)	106348	10.6737	10.67
	46 Dibenzofuran	168	15.894	15.894	(1.025)	513287	5.14889	5.149
	47 4-Nitrophenol	109	15.755	15.732	(1.016)	79902	9.72942	9.729
	48 2,4-Dinitrotoluene	165	15.963	15.956	(1.030)	245531	10.7324	10.73
	50 Diethylphthalate	149	16.458	16.451	(1.062)	356164	4.97328	4.973
	49 Fluorene	166	16.613	16.605	(1.072)	458161	4.74061	4.741
	51 4-Chlorophenyl-phenylether	204	16.597	16.590	(1.071)	279353	4.97248	4.972
	52 4-Nitroaniline	138	16.729	16.705	(1.079)	245671	10.8980	10.90
	53 4,6-Dinitro-2-methylphenol	198	16.806	16.791	(0.906)	251123	15.4414	15.44
	54 N-Nitrosodiphenylamine	169	16.852	16.844	(0.908)	300624	4.80252	4.803
$	55 2,4,6-Tribromophenol	330	17.153	17.145	(1.107)	105347	6.21111	6.211
	56 4-Bromophenyl-phenylether	248	17.608	17.608	(0.949)	161346	5.06509	5.065
	57 Hexachlorobenzene	284	17.924	17.924	(0.966)	152856	4.56602	4.566
	58 Pentachlorophenol	266	18.288	18.289	(0.985)	68318	4.97806	4.978
*	59 Phenanthrene-d10	188	18.559	18.551	(1.000)	348847	4.00000	
	60 Phenanthrene	178	18.605	18.605	(1.002)	483835	5.12876	5.129
	61 Anthracene	178	18.698	18.698	(1.008)	542316	5.37583	5.376
	62 Carbazole	167	19.031	19.023	(1.025)	534773	5.36978	5.370
	63 Di-n-butylphthalate	149	19.805	19.797	(1.067)	760839	4.89915	4.899
	64 Fluoranthene	202	20.981	20.981	(0.889)	685213	5.40622	5.406
	65 Pyrene	202	21.406	21.406	(0.907)	716692	5.12970	5.130
$	66 Terphenyl-d14	244	21.677	21.677	(0.918)	496947	4.99049	4.990
	67 Butylbenzylphthalate	149	22.606	22.598	(0.958)	267673	5.82454	5.825
	68 Benzo(a)anthracene	228	23.574	23.566	(0.999)	560230	4.93615	4.936
*	69 Chrysene-d12	240	23.605	23.597	(1.000)	304145	4.00000	
	70 3,3'-Dichlorobenzidine	252	23.528	23.528	(0.997)	755643	16.5732	16.57
	71 Chrysene	228	23.644	23.644	(1.002)	460542	5.26321	5.263
	72 bis(2-Ethylhexyl)phthalate	149	23.621	23.620	(0.959)	323110	5.54206	5.542
*	134 Di-n-octylphthalate-d4	153	24.642	24.642	(1.000)	529930	4.00000	
	73 Di-n-octylphthalate	149	24.650	24.650	(1.000)	716639	4.82533	4.825
	74 Benzo(b)fluoranthene	252	25.564	25.556	(0.968)	614939	4.94516	4.945
	75 Benzo(k)fluoranthene	252	25.610	25.602	(0.970)	601566	4.88374	4.884
	76 Benzo(a)pyrene	252	26.276	26.268	(0.995)	570899	5.07985	5.080
*	77 Perylene-d12	264	26.400	26.400	(1.000)	315567	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	29.324	29.300	(1.111)	586597	4.61184	4.612
	79 Dibenzo(a,h)anthracene	278	29.331	29.316	(1.111)	467270	4.67718	4.677
	80 Benzo(g,h,i)perylene	276	30.186	30.170	(1.143)	538342	4.74292	4.743
	90 N-Nitrosodimethylamine	74	4.975	4.959	(0.531)	291704	10.9322	10.93
	91 Aniline	93	8.830	8.830	(0.942)	551852	10.4758	10.48
	93 Benzidine	184	21.220	21.220	(0.899)	385756	6.65497	6.655
	103 Pyridine	79	4.990	4.982	(0.533)	212850	5.07079	5.071
	105 1-methylnaphthalene	142	13.534	13.534	(1.140)	442760	5.42358	5.424
	111 Azobenzene (1,2-DP-Hydrazine)	77	16.921	16.914	(1.092)	466331	5.10688	5.107

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
187 Total Benzofluoranthenes	252	25.610	25.602	(0.970)	1165512	9.76031	9.760
120 2,3,4,6-Tetrachlorophenol	232	16.234	16.227	(1.047)	74210	3.40983	3.410

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072019.D Page 1
Report Date: 21-Jul-2021 09:25

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072019.D
Lab Smp Id: SJG0249-CCV1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	99108	-6.07
27 Naphthalene-d8	373252	186626	746504	355338	-4.80
42 Acenaphthene-d10	212025	106013	424050	203538	-4.00
59 Phenanthrene-d10	362039	181020	724078	348847	-3.64
69 Chrysene-d12	338032	169016	676064	304145	-10.02
134 Di-n-octylphthala	565512	282756	1131024	529930	-6.29
77 Perylene-d12	375340	187670	750680	315567	-15.93

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.37	-0.08
27 Naphthalene-d8	11.87	11.37	12.37	11.87	-0.00
42 Acenaphthene-d10	15.51	15.01	16.01	15.50	-0.05
59 Phenanthrene-d10	18.56	18.06	19.06	18.56	-0.00
69 Chrysene-d12	23.61	23.11	24.11	23.61	-0.00
134 Di-n-octylphthala	24.64	24.14	25.14	24.64	-0.00
77 Perylene-d12	26.40	25.90	26.90	26.40	-0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072019.D

Lab ID: SJG0249-CCV1
nt10.i, ABN.m, 20-JUL-2021 23:13

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
0.960	0.952	0.0080	Benzoic acid

RRT check based on Ccal File: NT1021072010.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE
CONTINUING CALIBRATION CHECK
EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	NT10	Calibration:	EG00057
Lab File ID:	NT1021072013.D	Calibration Date:	07/20/2021
Sequence:	SJG0249	Injection Date:	07/20/21
Lab Sample ID:	SJG0249-SCV1	Injection Time:	19:24
Sequence Name:	SCV 5.0		

		CONC. (ug/mL)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Naphthalene	A	5.0000	5.0	1.0586070	1.0566110		-0.2	+/-20
2-Methylnaphthalene	A	5.0000	4.8	0.9794463	0.9366531		-4.4	+/-20
Acenaphthylene	A	5.0000	4.8	2.1826050	2.1152100		-3.1	+/-20
Acenaphthene	A	5.0000	4.8	1.2671560	1.2144510		-4.2	+/-20
Fluorene	A	5.0000	4.5	1.8993190	1.7005310		-10.5	+/-20
Phenanthrene	A	5.0000	5.0	1.0817070	1.0900150		0.8	+/-20
Anthracene	A	5.0000	5.0	1.1567290	1.1613200		0.4	+/-20
Fluoranthene	A	5.0000	5.0	1.6669060	1.6503800		-1.0	+/-20
Pyrene	A	5.0000	5.3	1.8374700	1.9308650		5.1	+/-20
Butylbenzylphthalate	A	5.0000	5.0	0.6043970	0.6012452		-0.5	+/-20
Benzo(a)anthracene	A	5.0000	4.8	1.4926470	1.4330060		-4.0	+/-20
Chrysene	A	5.0000	4.9	1.1507940	1.1183400		-2.8	+/-20
Benzofluoranthenes, Total	A	10.000	9.8	1.5136370	1.4876880		-1.7	+/-20
Benzo(a)pyrene	A	5.0000	5.0	1.4245480	1.4180230		-0.5	+/-20
Indeno(1,2,3-cd)pyrene	A	5.0000	4.7	1.6122550	1.5294930		-5.1	+/-20
Dibenzo(a,h)anthracene	A	5.0000	4.7	1.2663450	1.1910230		-5.9	+/-20
Benzo(g,h,i)perylene	A	5.0000	4.7	1.4387340	1.3563740		-5.7	+/-20

* Values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

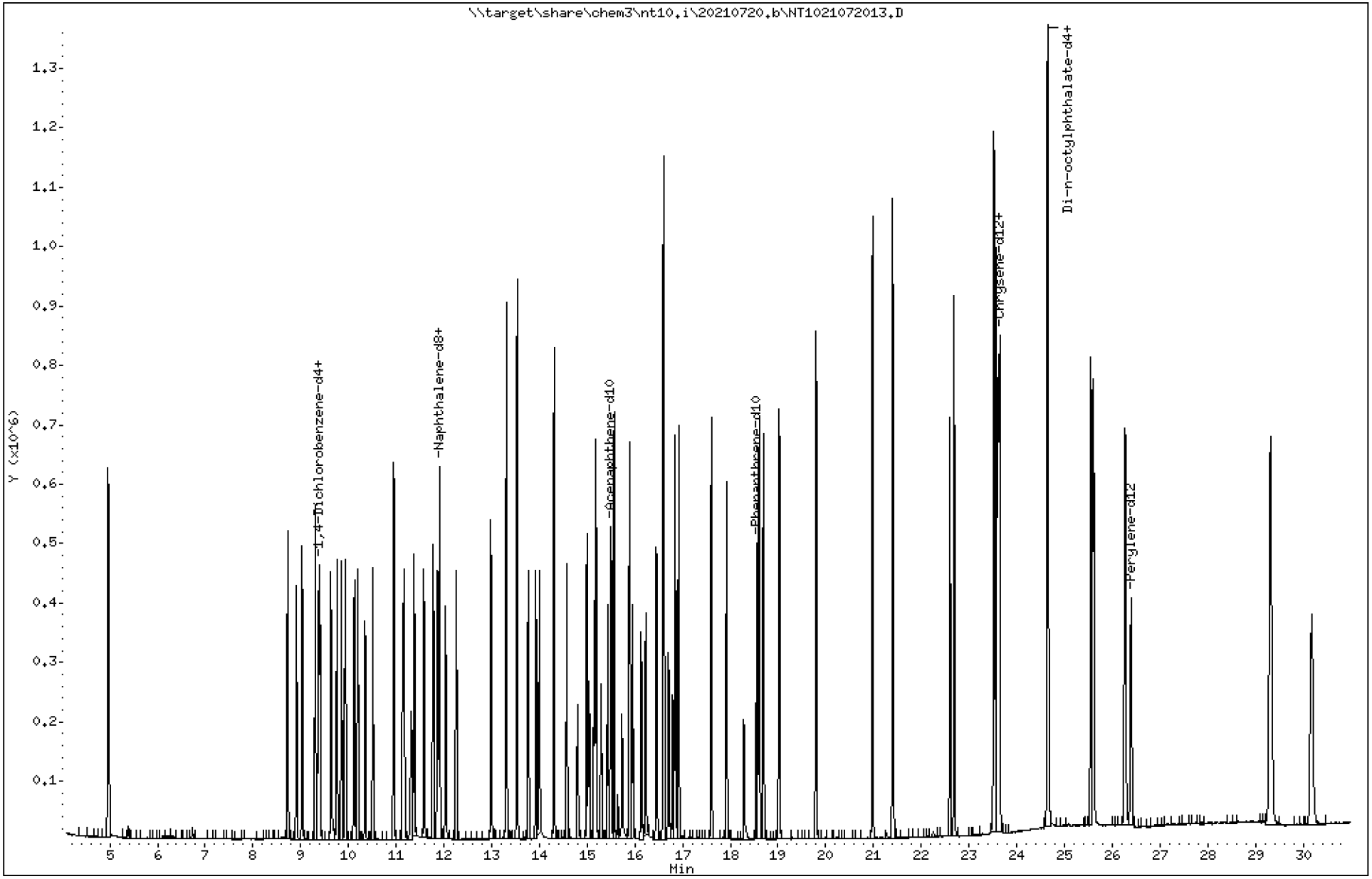
Instrument: nt10.i

Sample Info: SJG0249-SCV1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

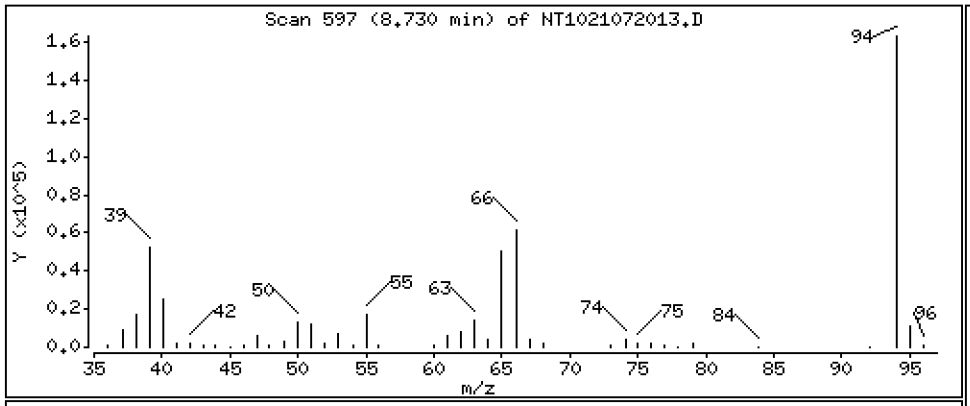
Operator: VTS

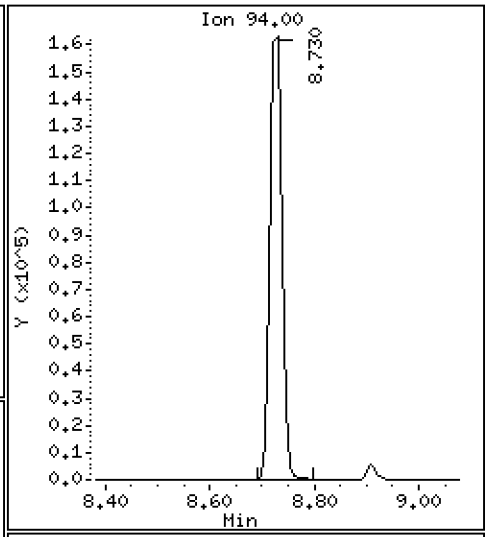
Column phase: ZB-5msi

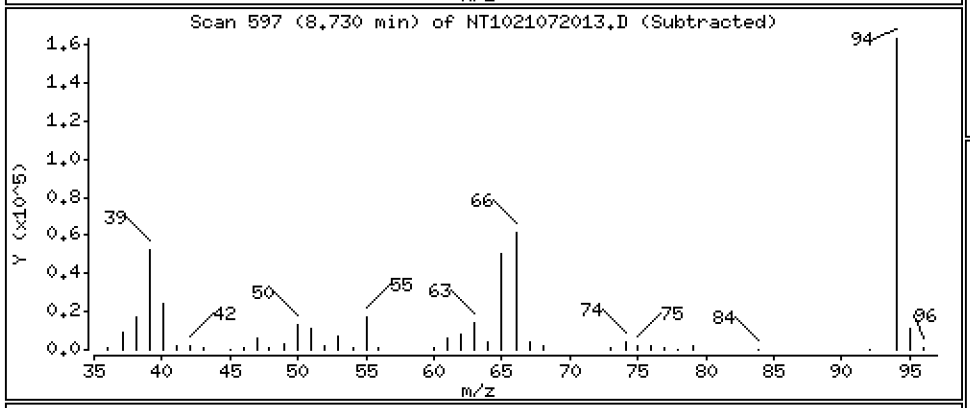
Column diameter: 0.25

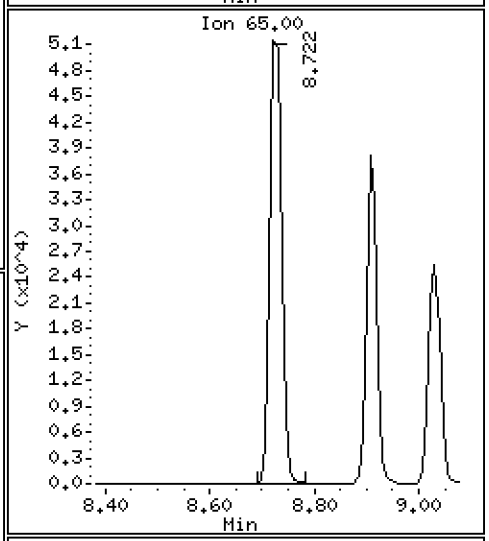
3 Phenol

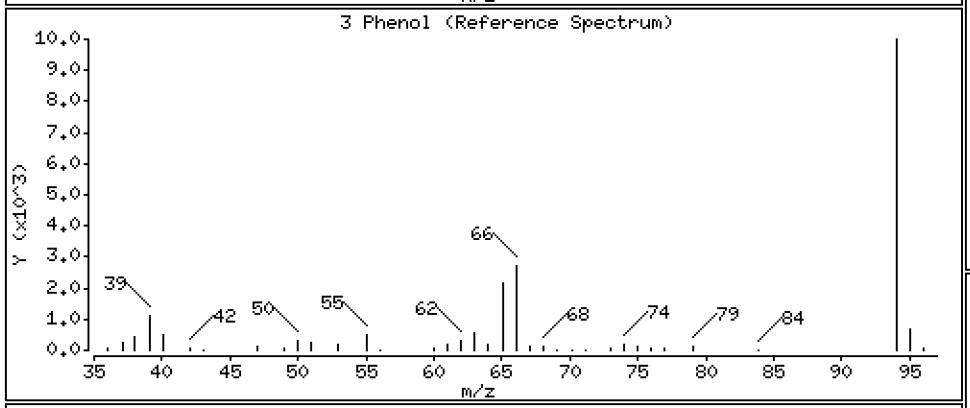
Concentration: 4.922 ug/mL

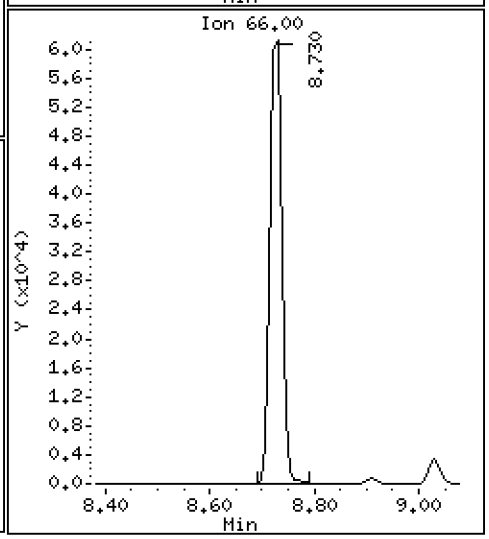


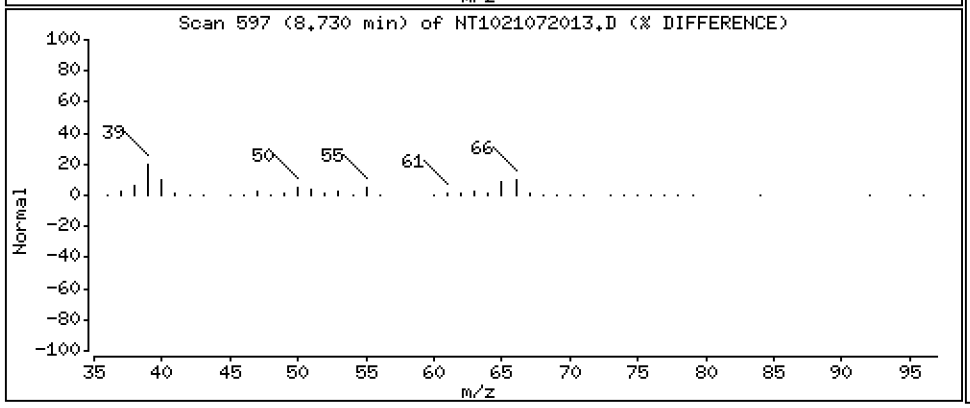












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

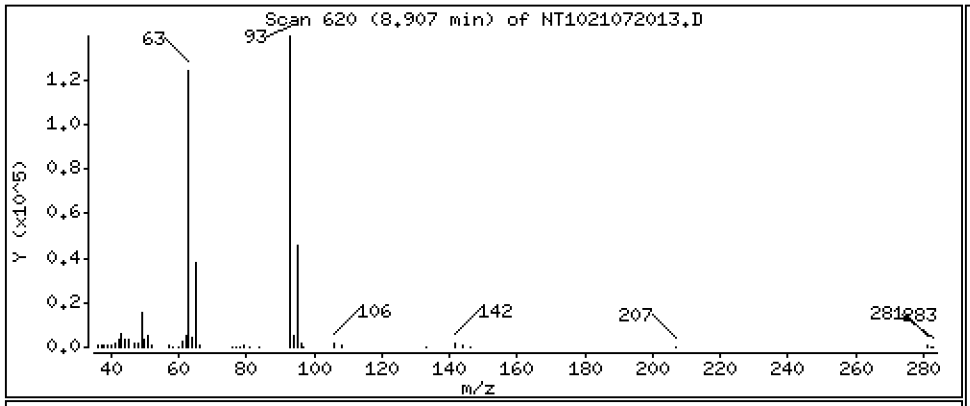
Operator: VTS

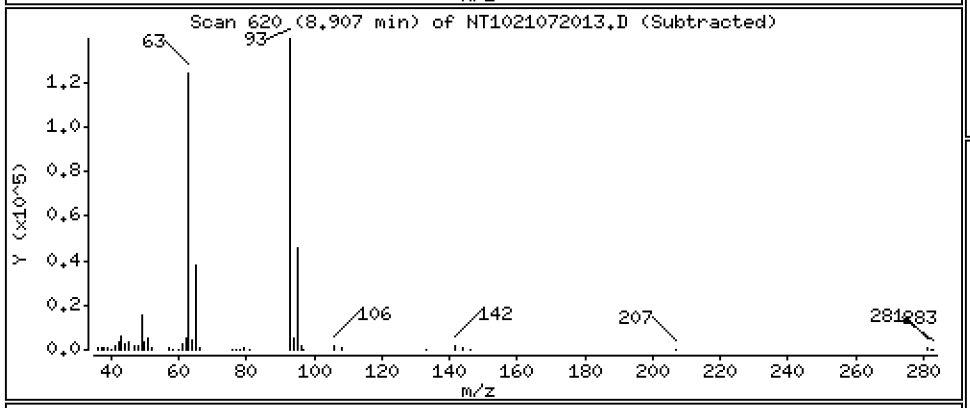
Column phase: ZB-5msi

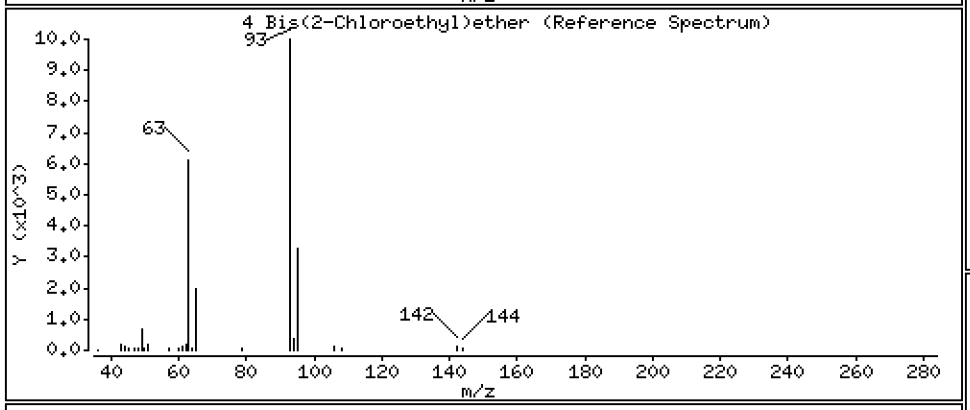
Column diameter: 0.25

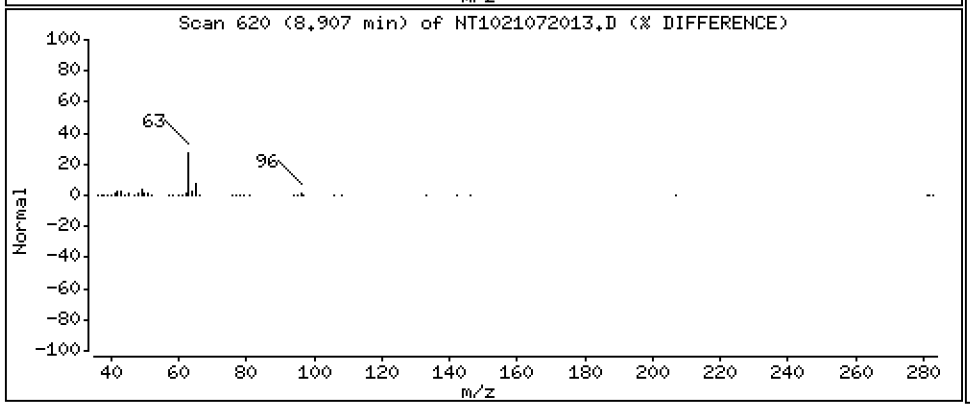
4 Bis(2-Chloroethyl)ether

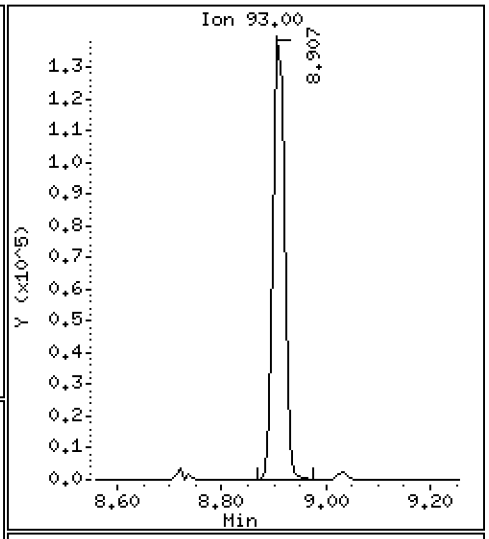
Concentration: 5.023 ug/mL

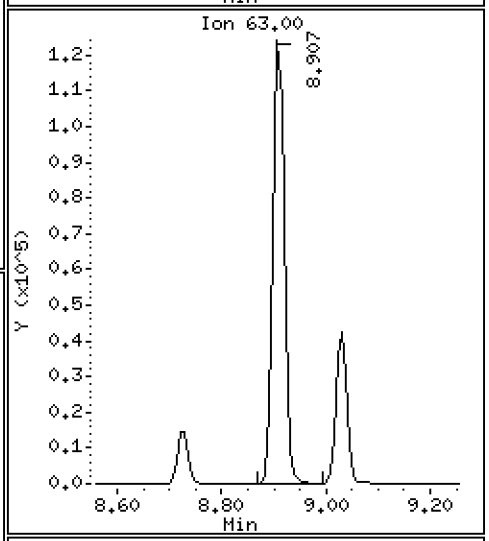


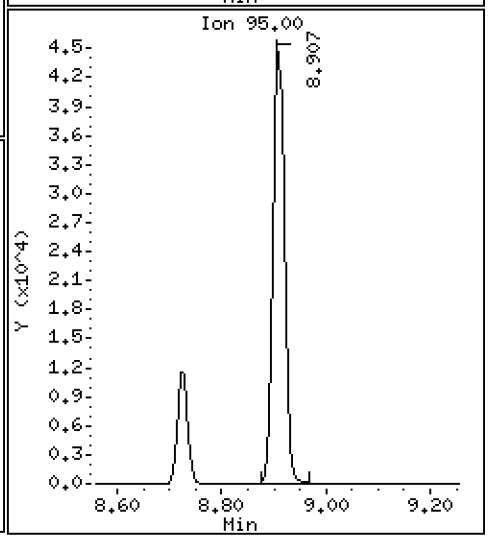












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

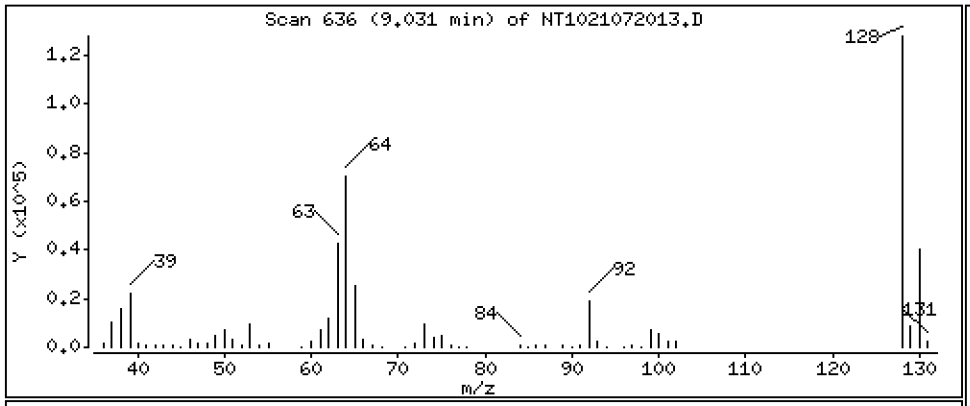
Operator: VTS

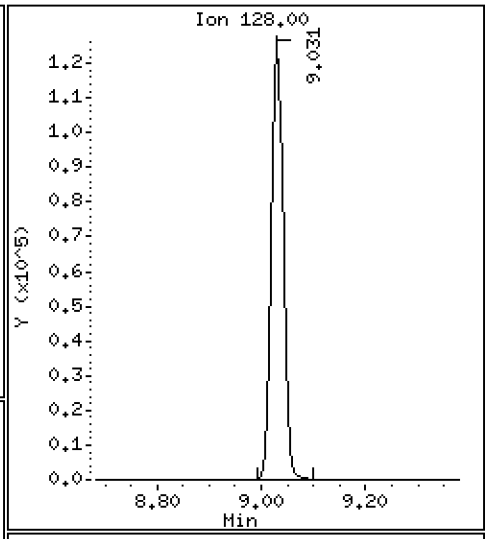
Column phase: ZB-5msi

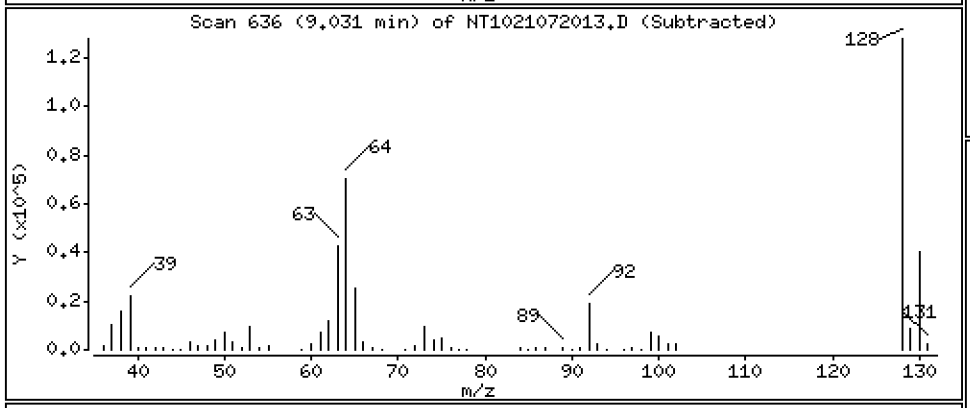
Column diameter: 0.25

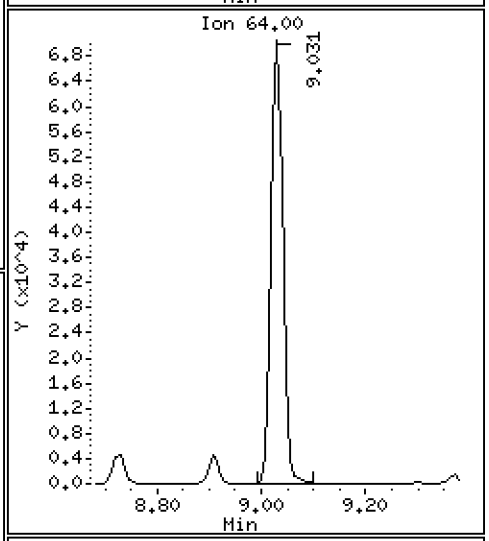
6 2-Chlorophenol

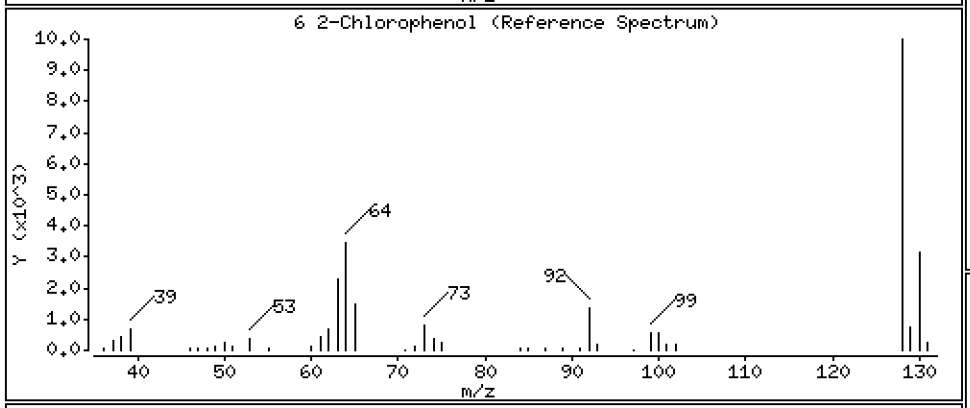
Concentration: 4.975 ug/mL

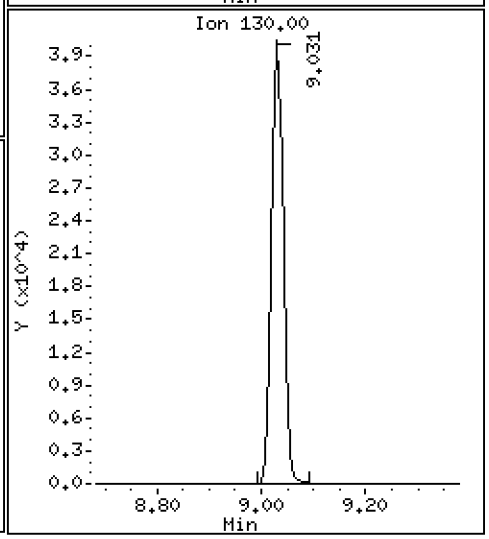


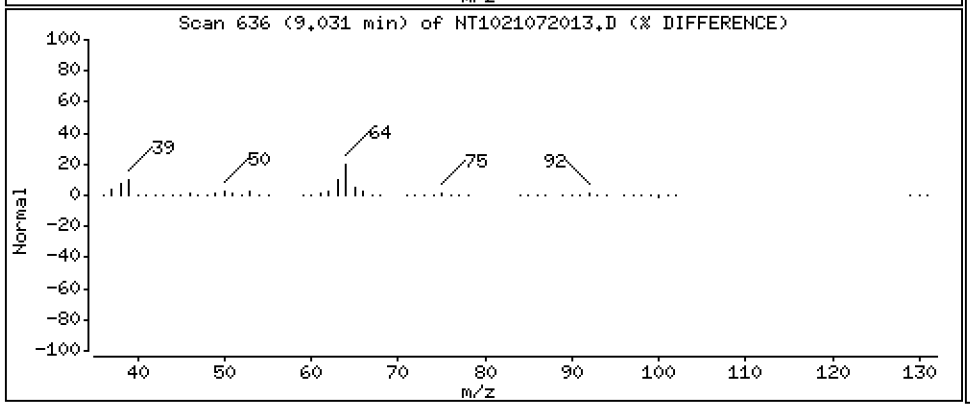












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

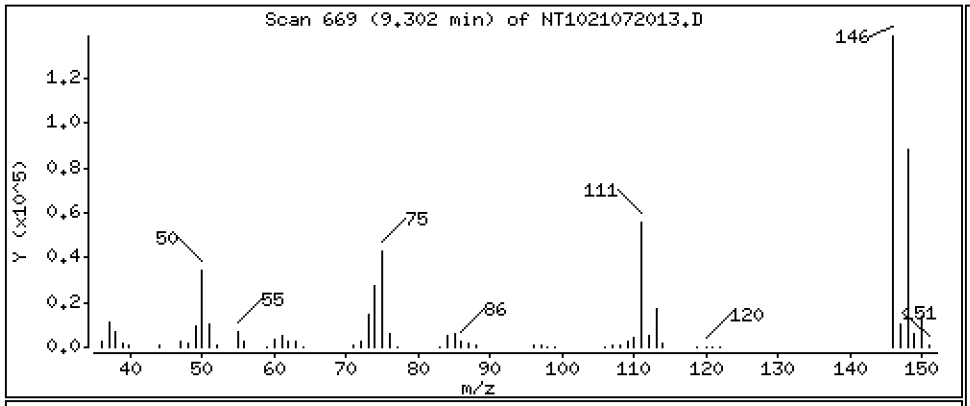
Operator: VTS

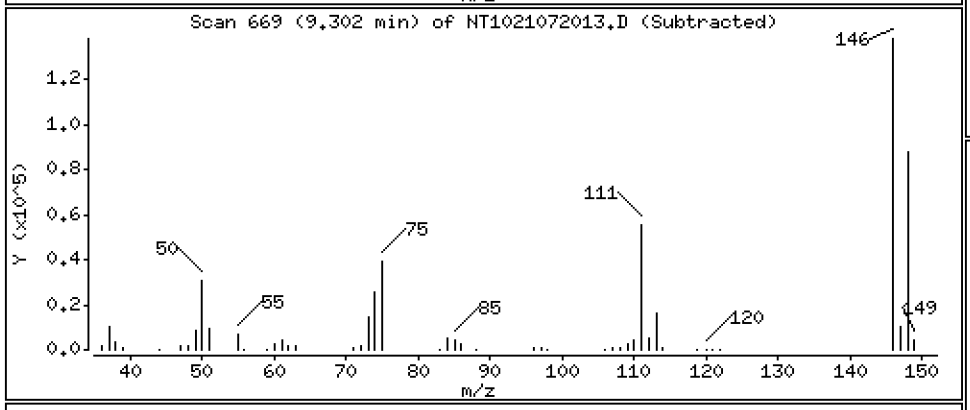
Column phase: ZB-5msi

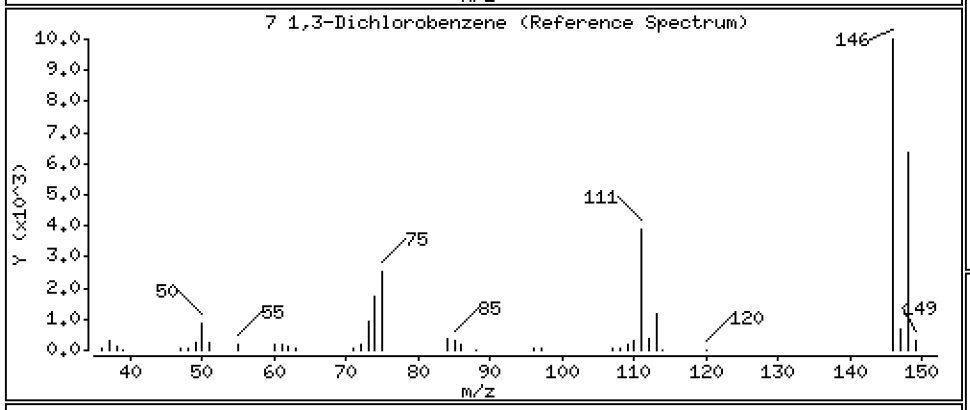
Column diameter: 0.25

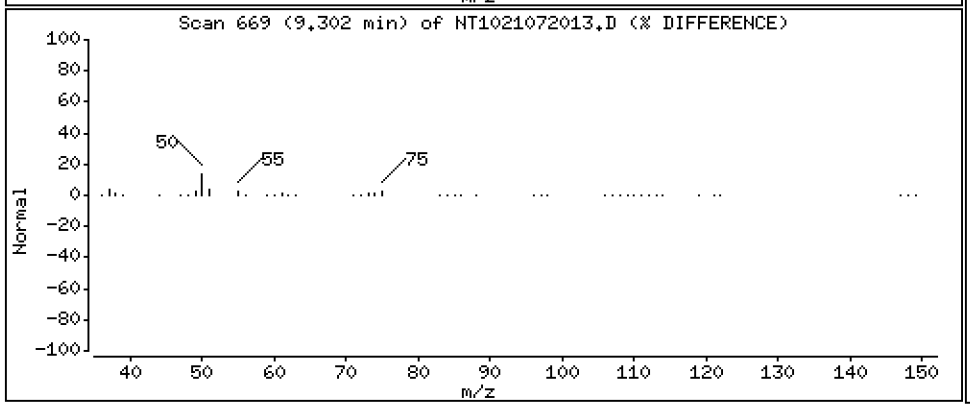
7 1,3-Dichlorobenzene

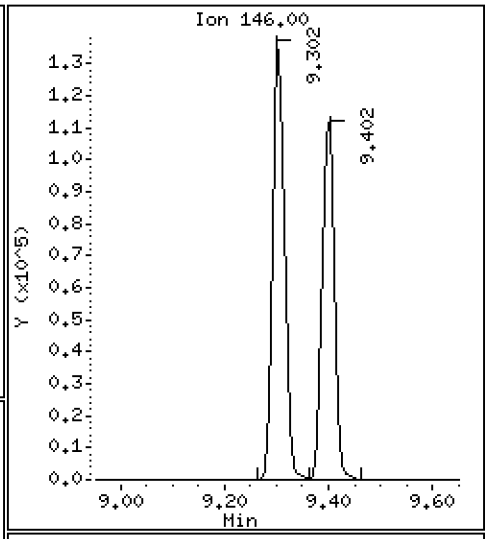
Concentration: 4.997 ug/mL

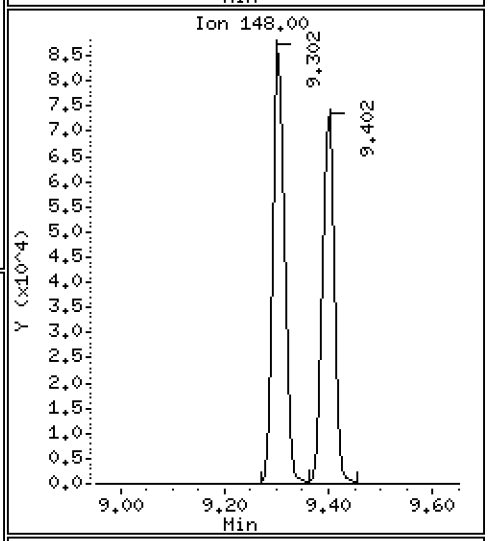


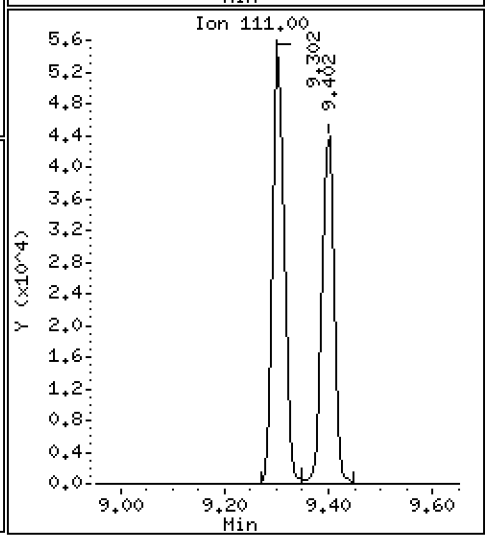












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

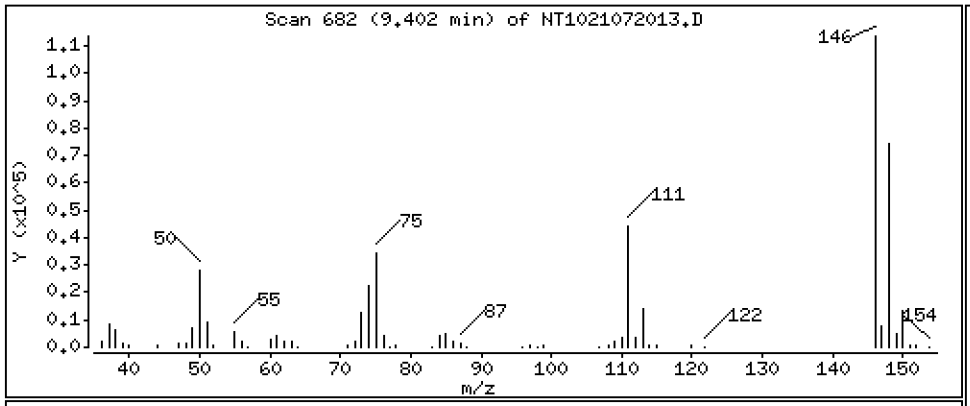
Operator: VTS

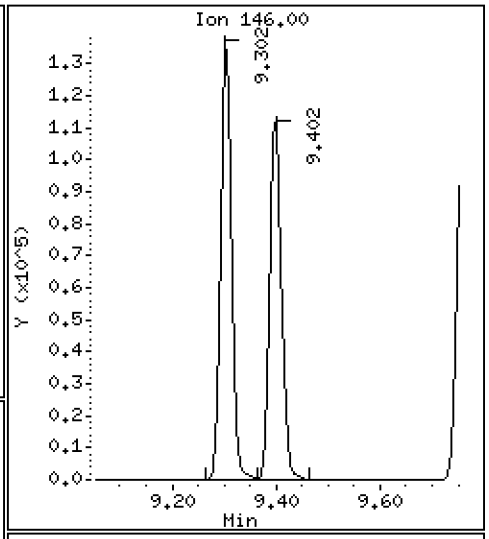
Column phase: ZB-5msi

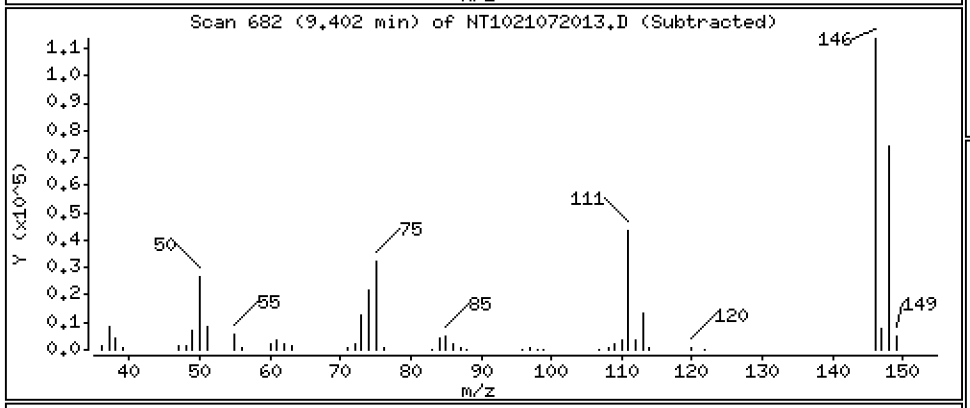
Column diameter: 0.25

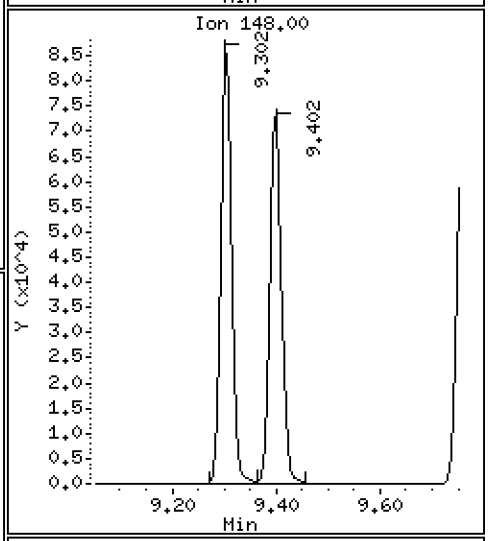
9 1,4-Dichlorobenzene

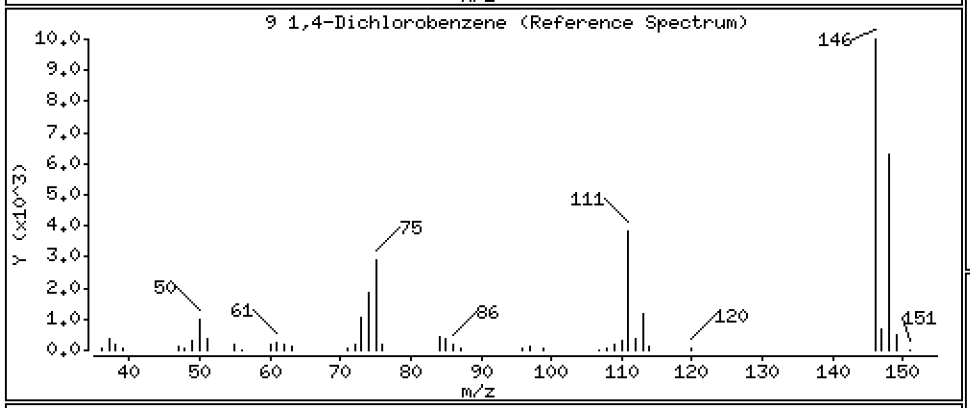
Concentration: 4.998 ug/mL

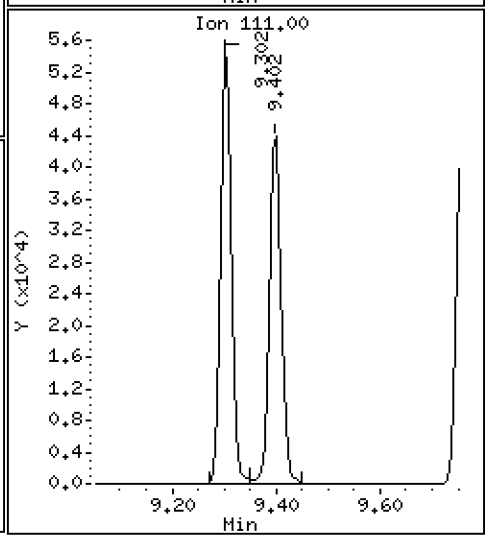


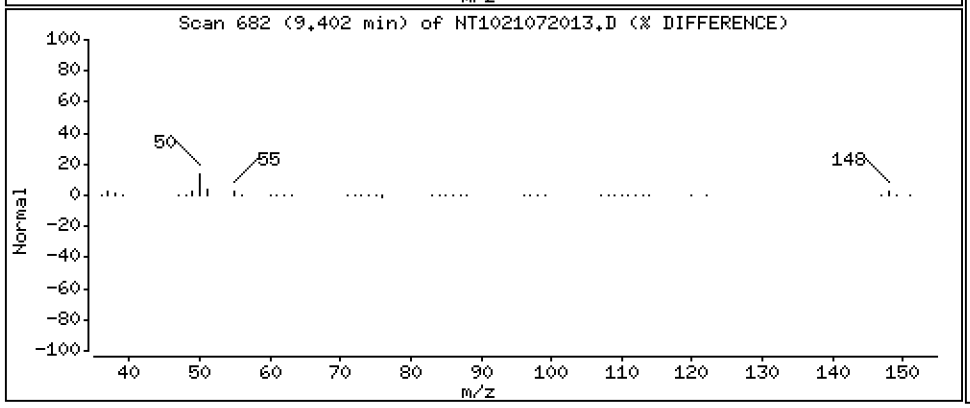












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

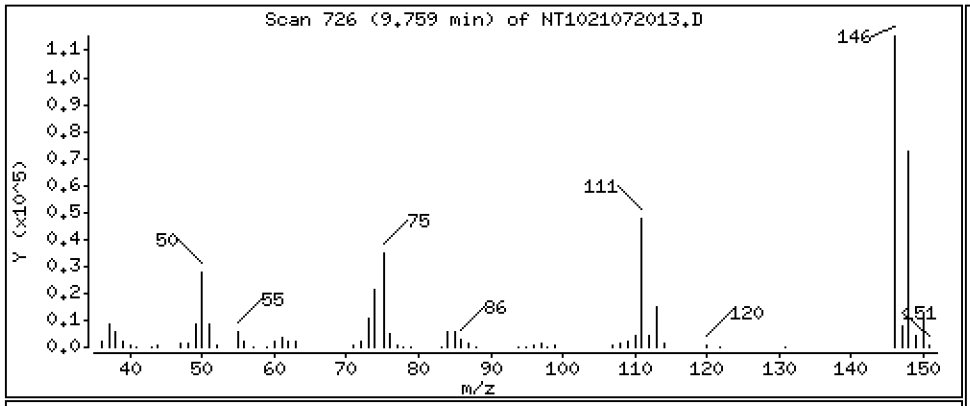
Operator: VTS

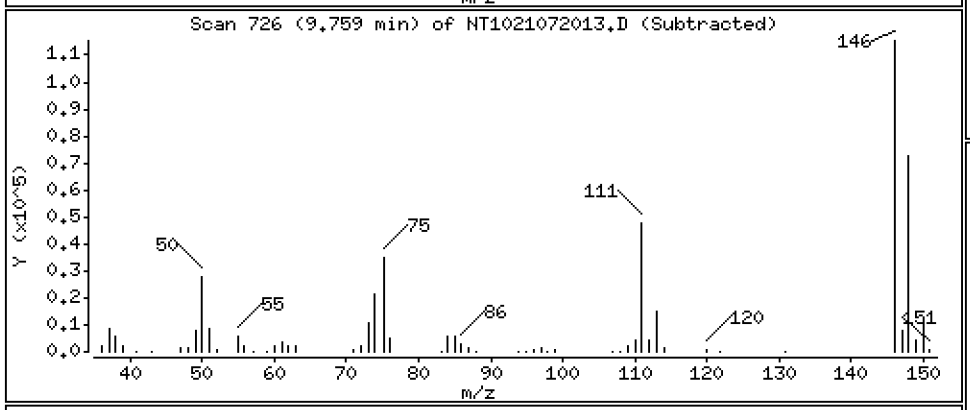
Column phase: ZB-5msi

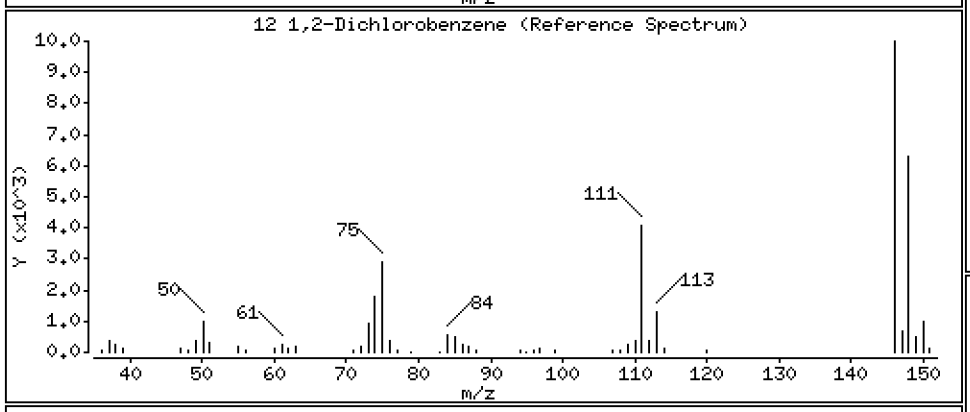
Column diameter: 0.25

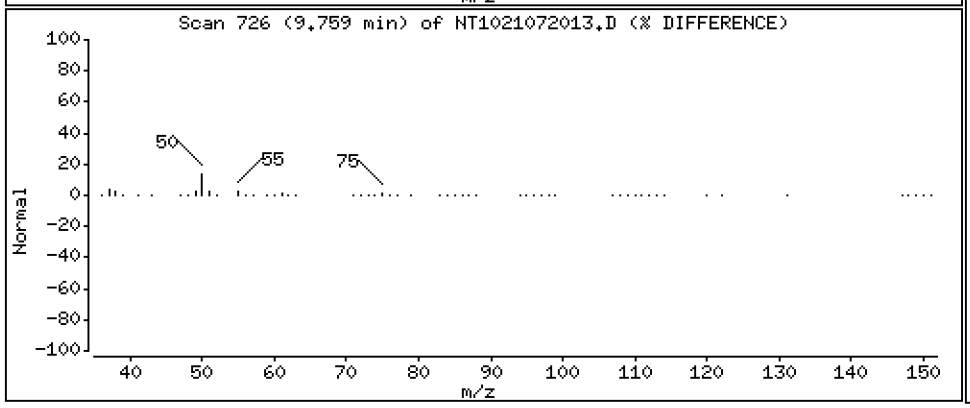
12 1,2-Dichlorobenzene

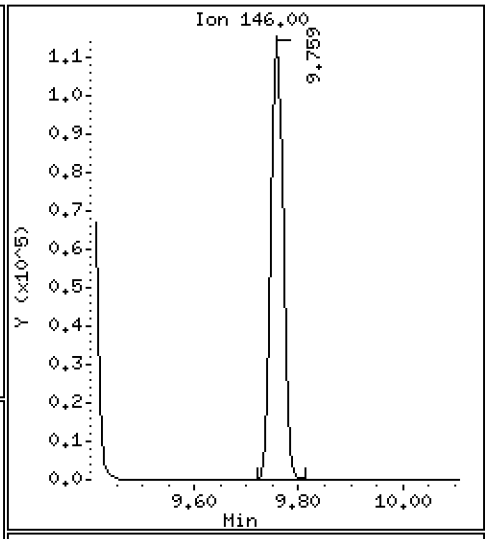
Concentration: 4.742 ug/mL

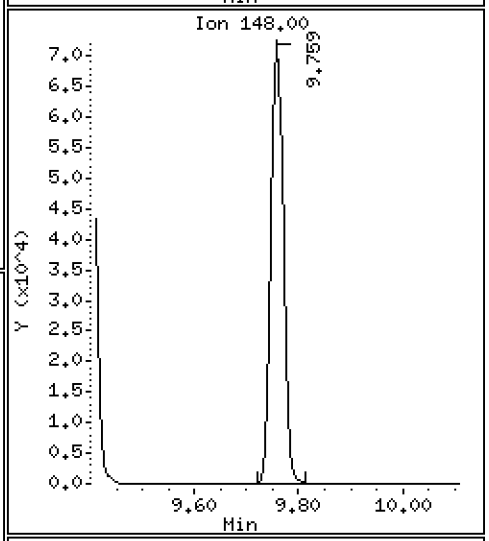


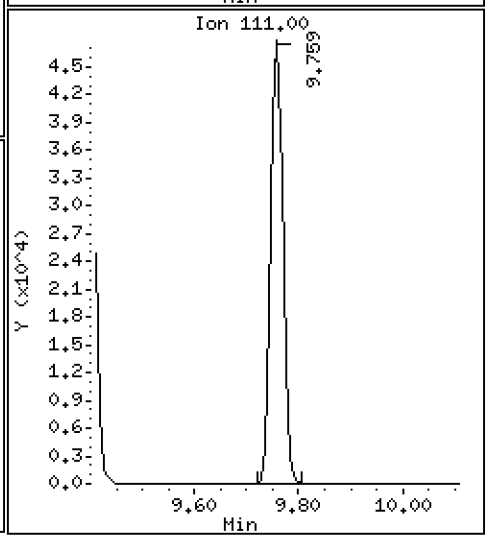












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

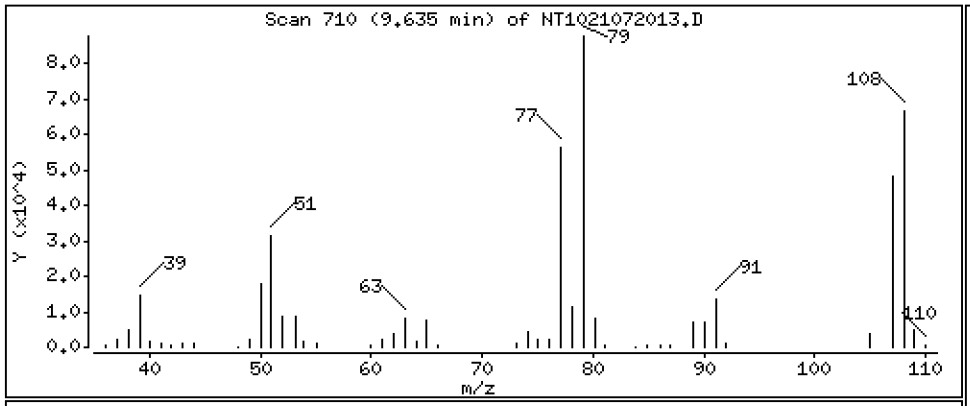
Operator: VTS

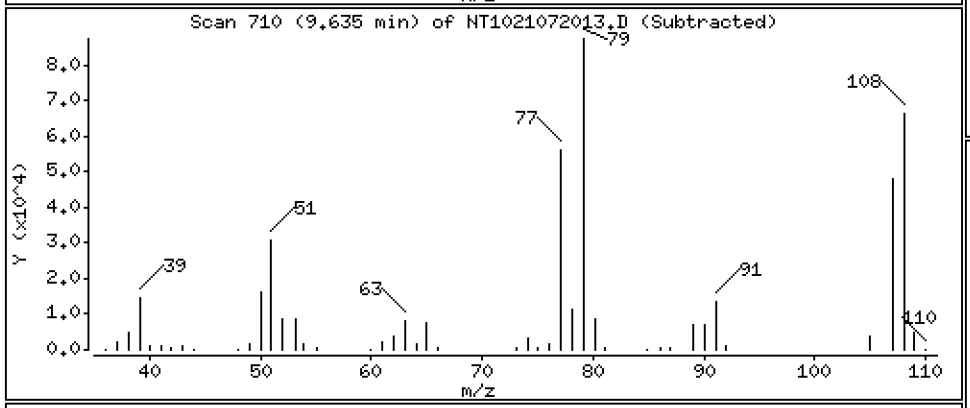
Column phase: ZB-5msi

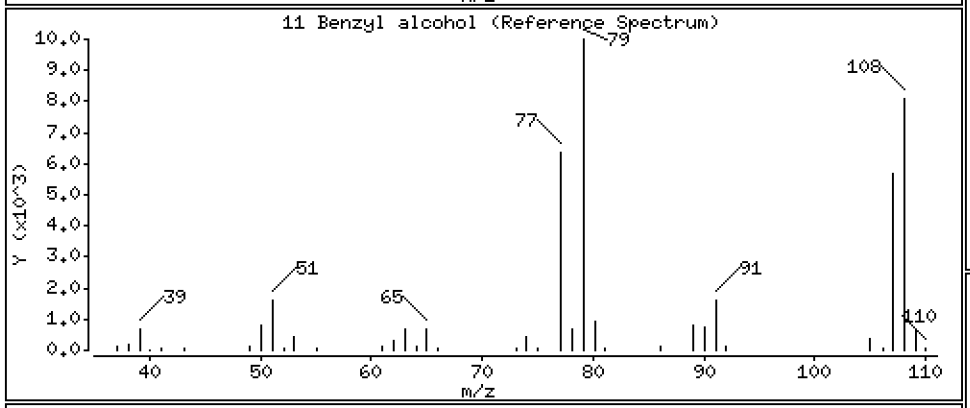
Column diameter: 0.25

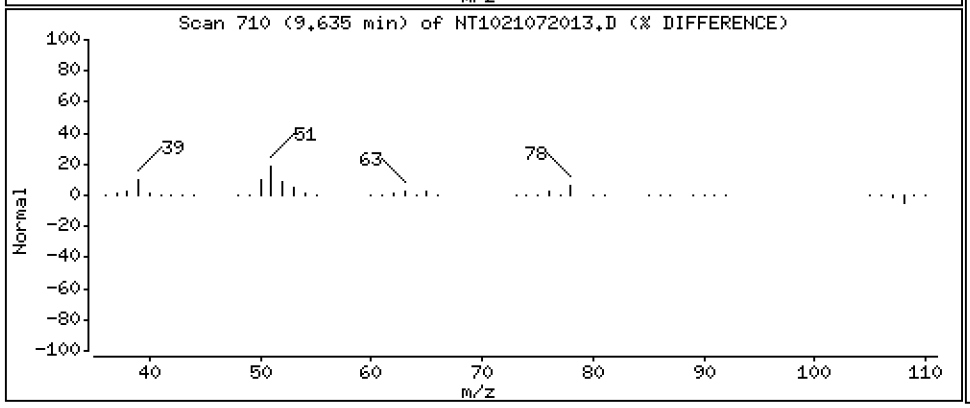
11 Benzyl alcohol

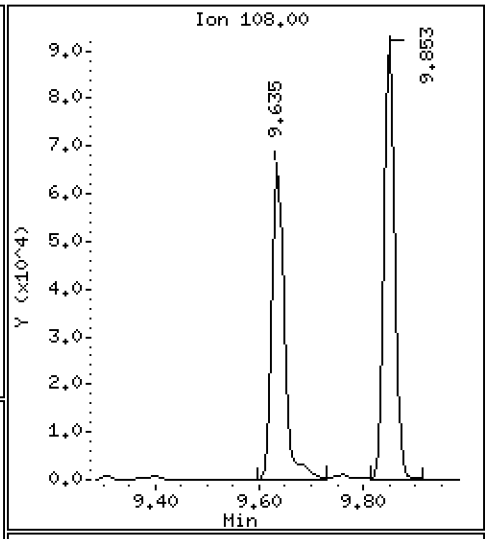
Concentration: 4.516 ug/mL

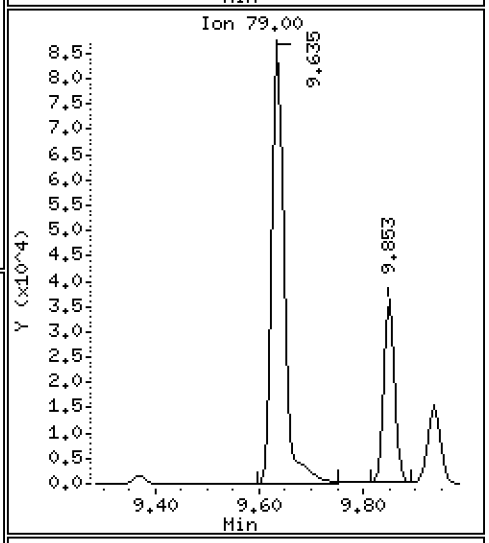


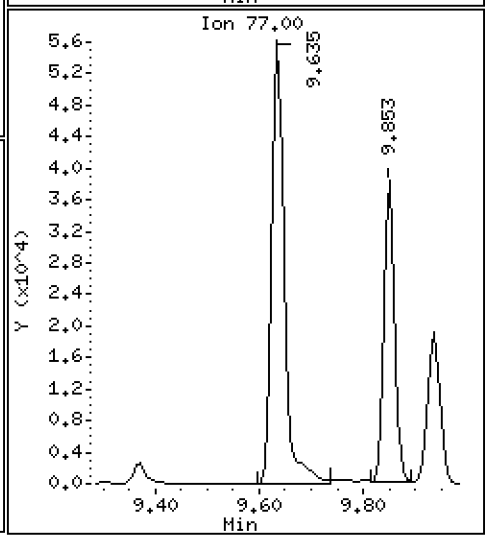












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

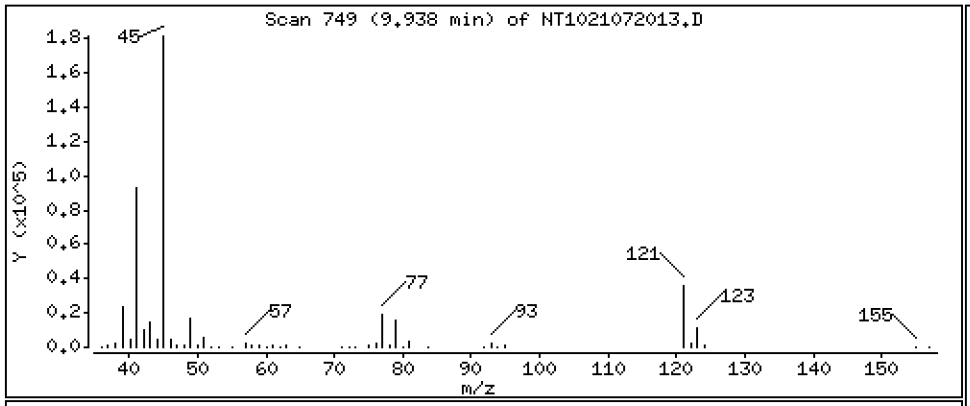
Operator: VTS

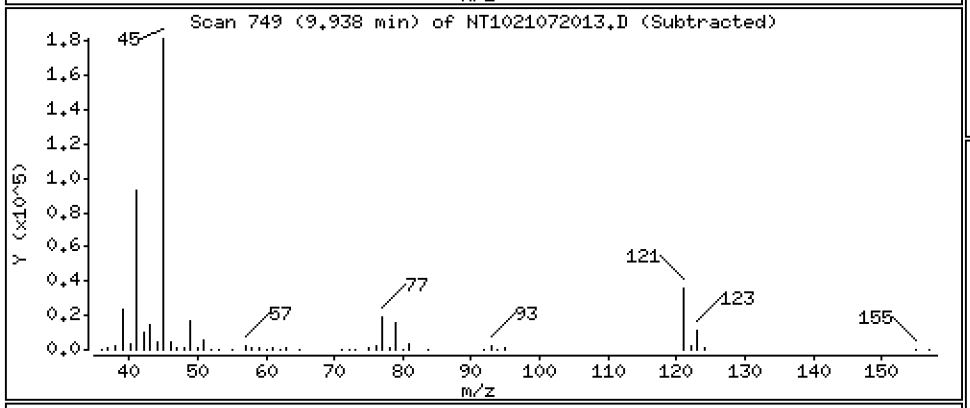
Column phase: ZB-5msi

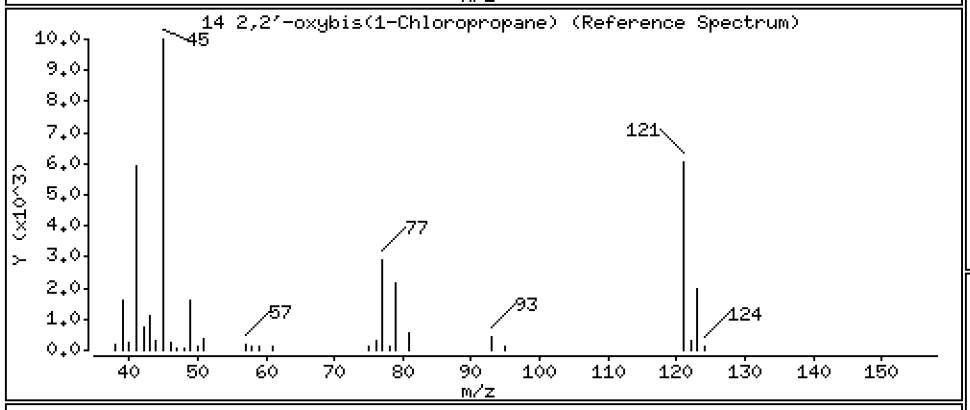
Column diameter: 0.25

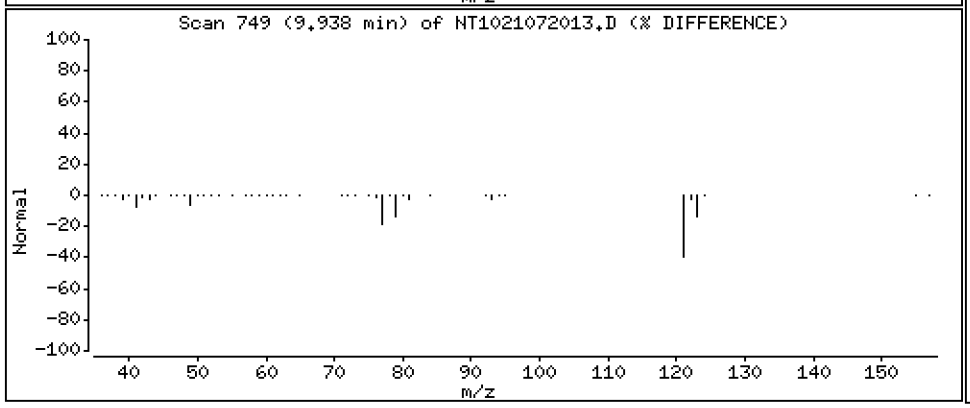
14 2,2'-oxybis(1-Chloropropane)

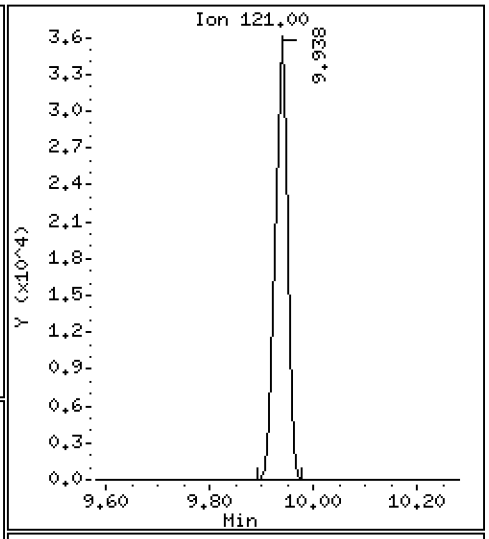
Concentration: 4.048 ug/mL

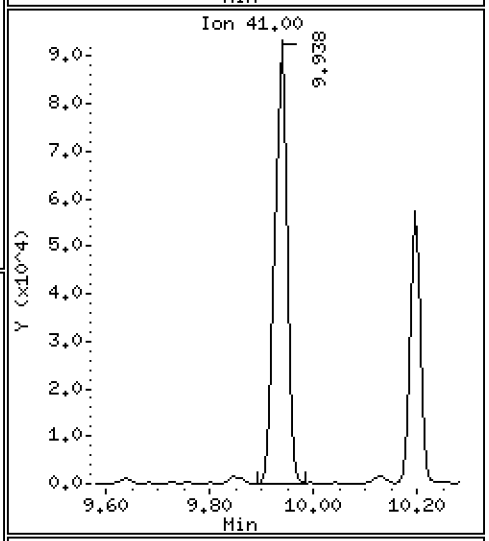


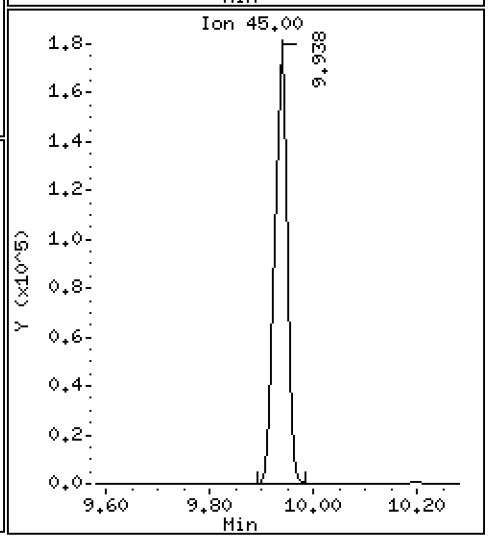












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

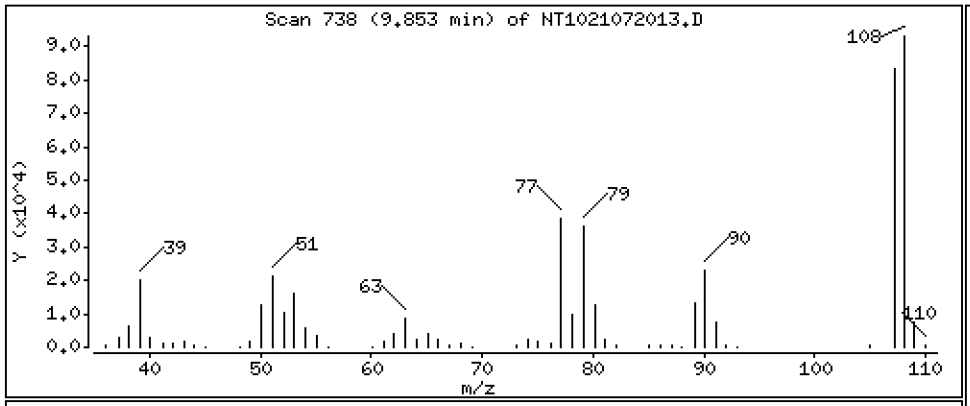
Operator: VTS

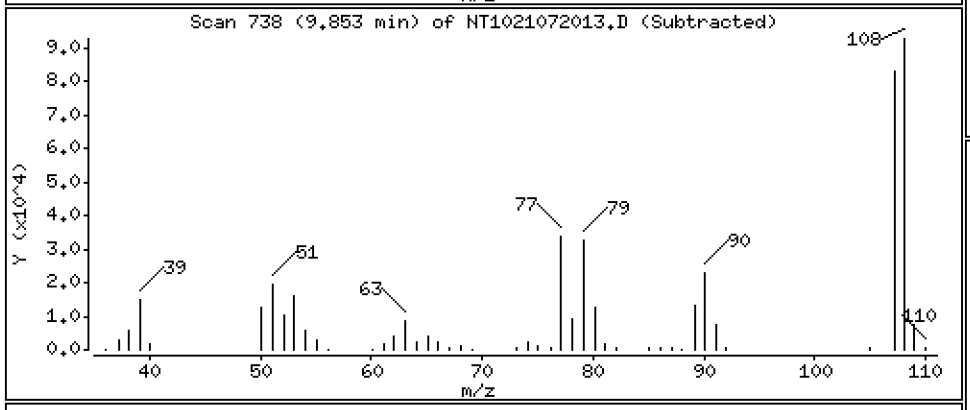
Column phase: ZB-5msi

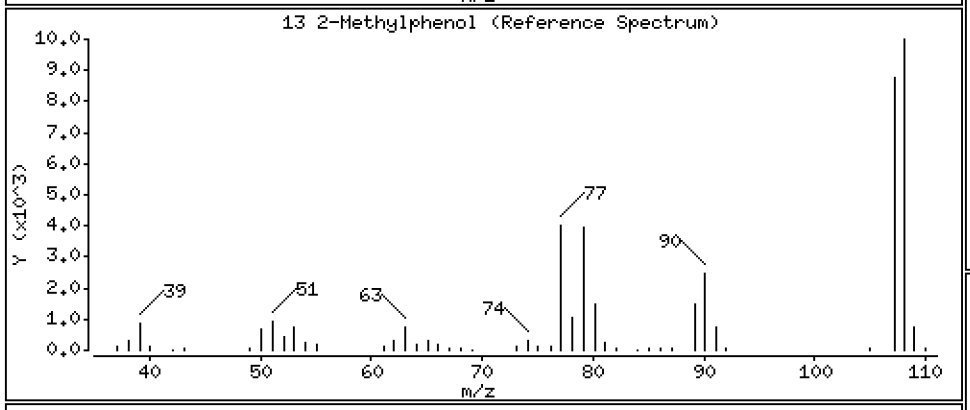
Column diameter: 0.25

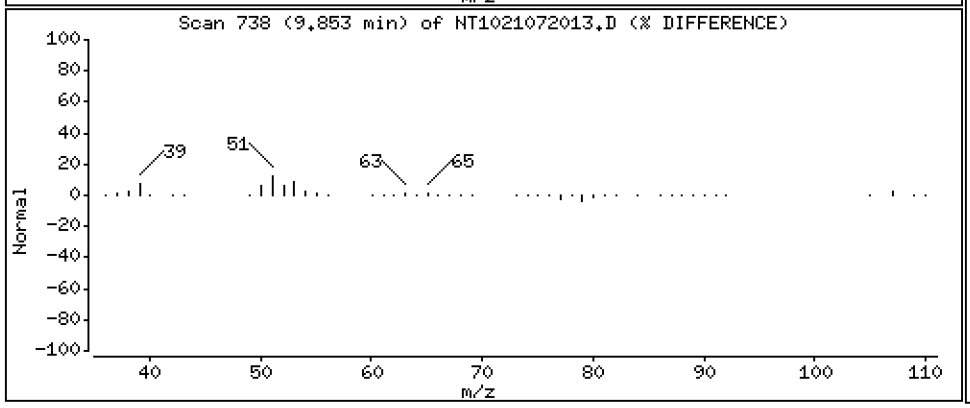
13 2-Methylphenol

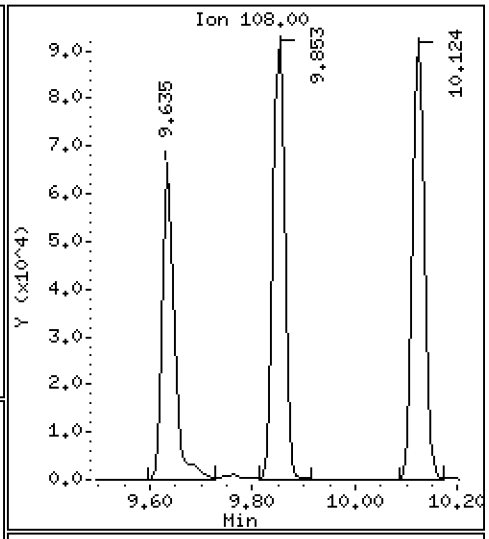
Concentration: 4.397 ug/mL

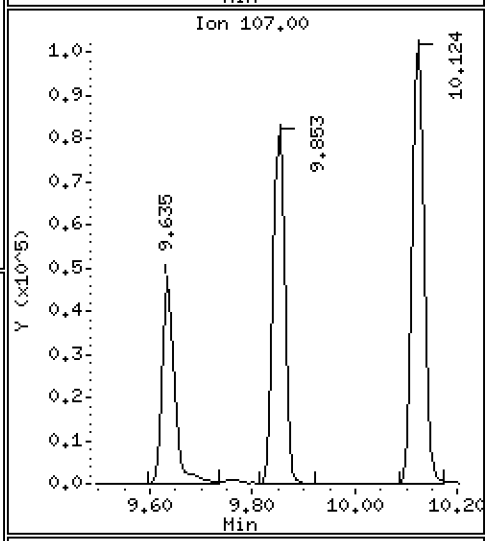


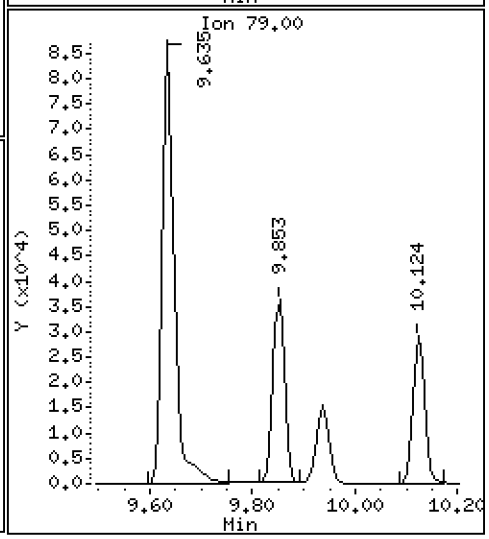












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

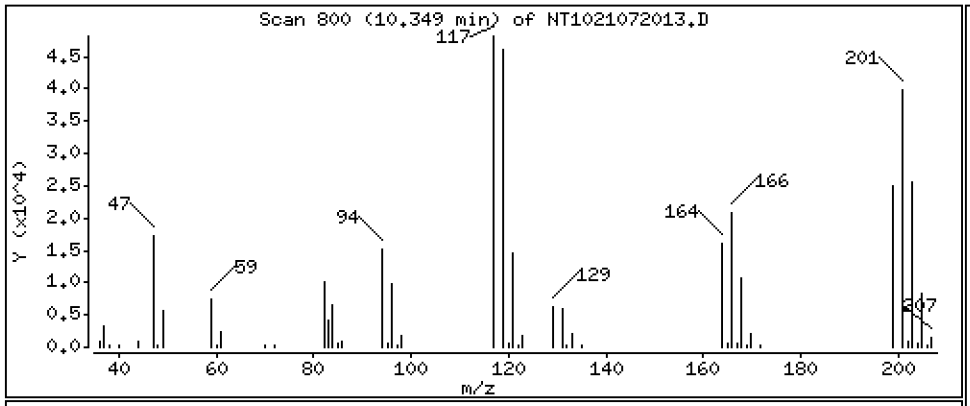
Operator: VTS

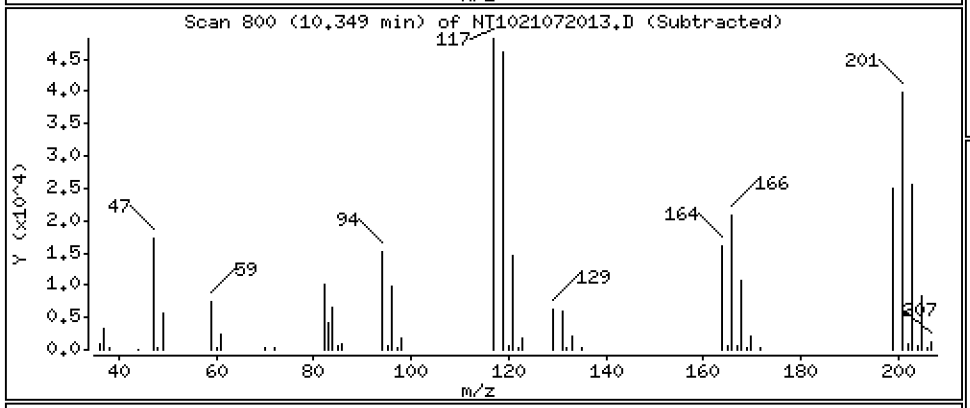
Column phase: ZB-5msi

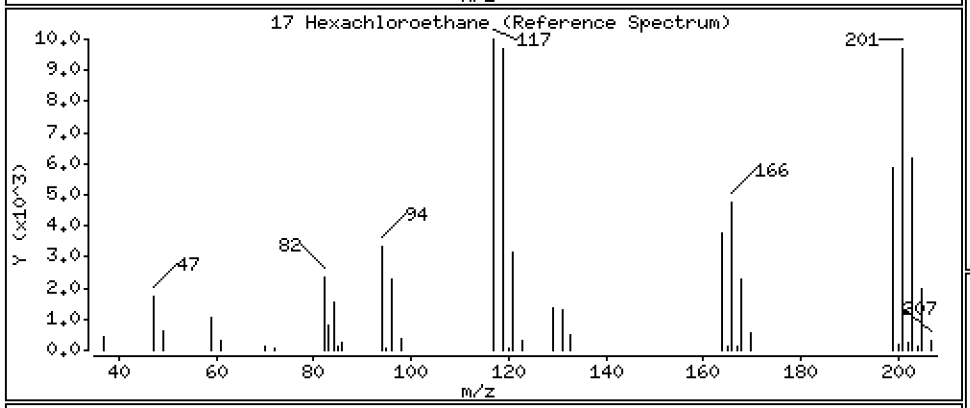
Column diameter: 0.25

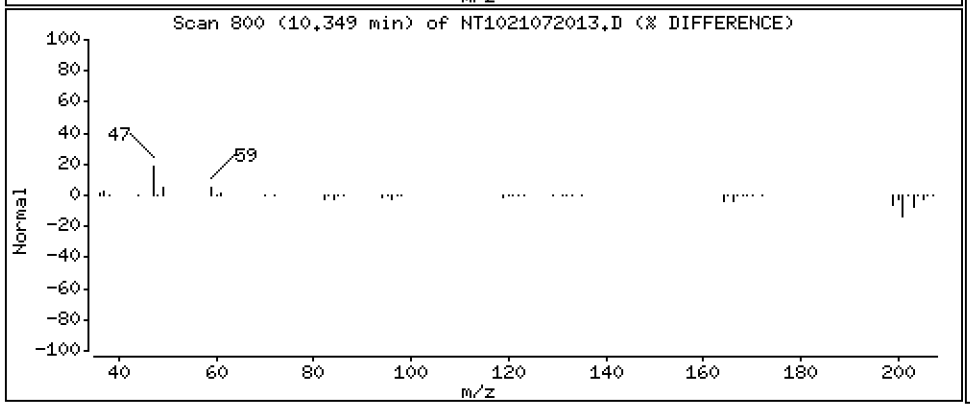
17 Hexachloroethane

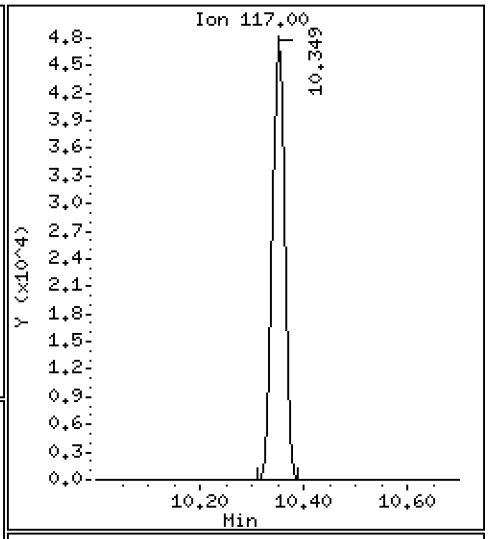
Concentration: 4.914 ug/mL

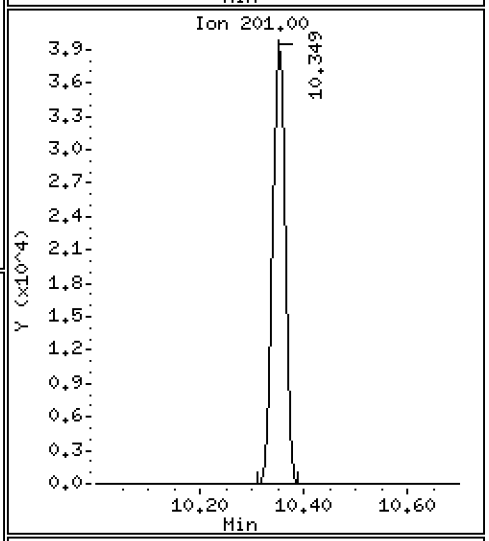


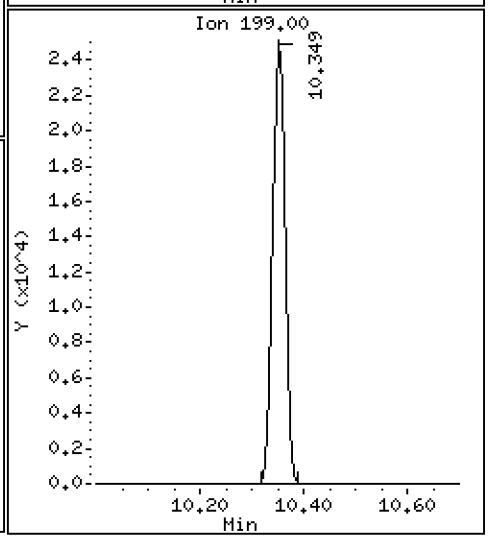












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

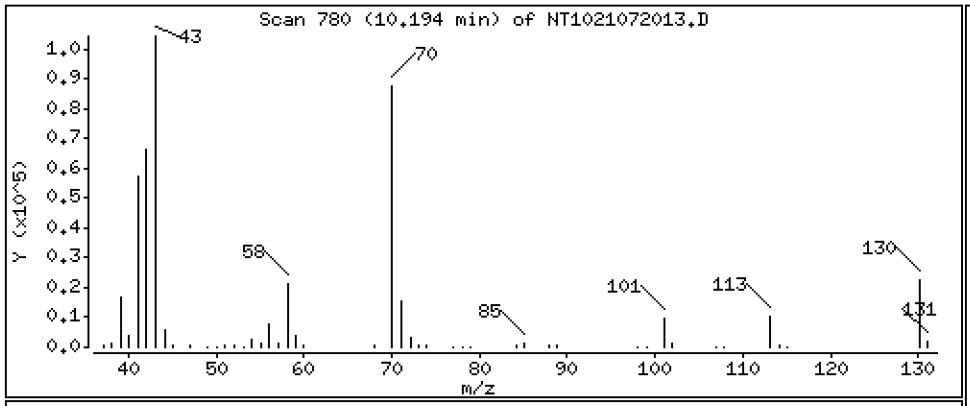
Operator: VTS

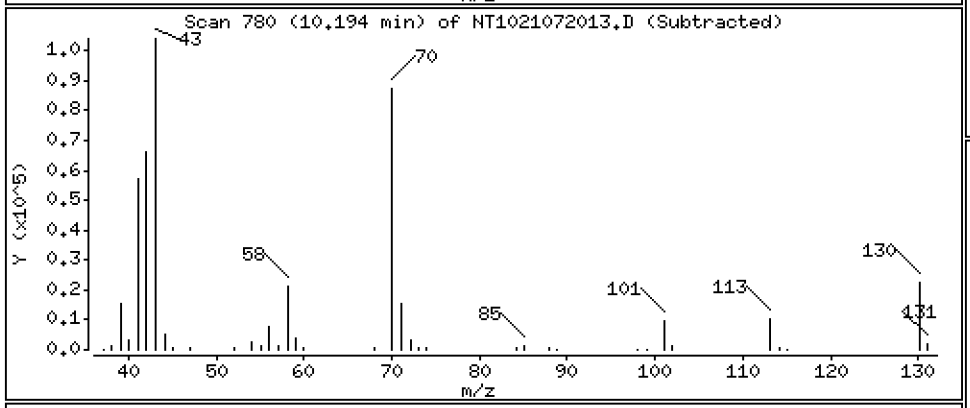
Column phase: ZB-5msi

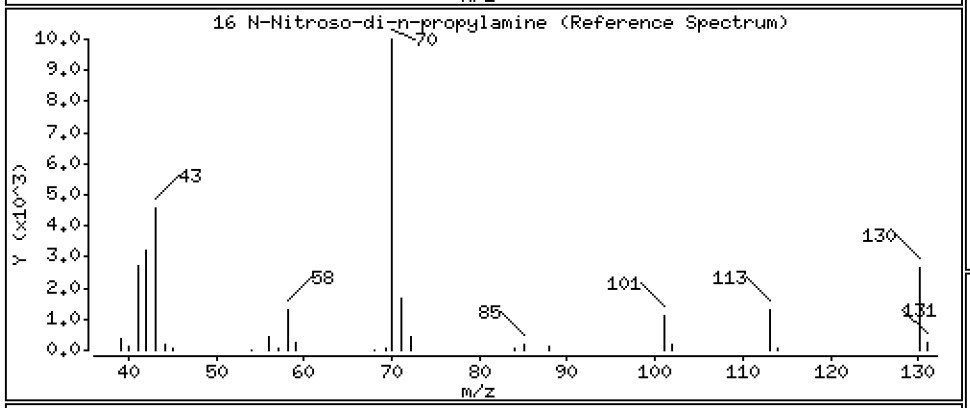
Column diameter: 0.25

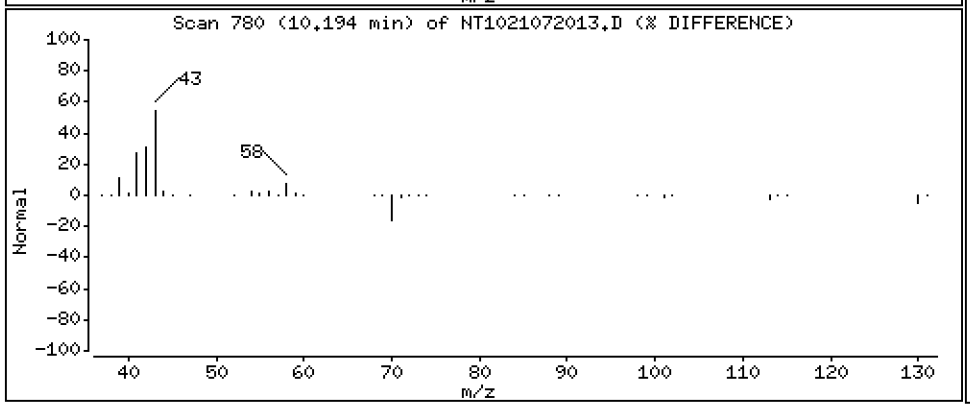
16 N-Nitroso-di-n-propylamine

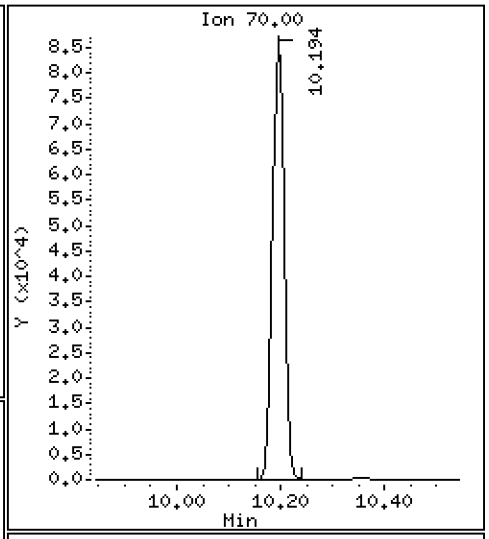
Concentration: 4.742 ug/mL

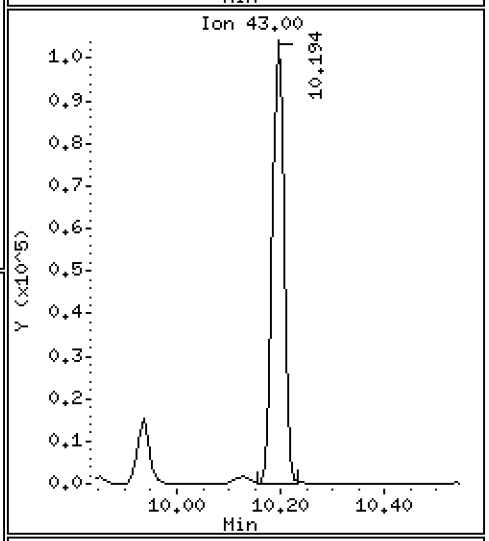


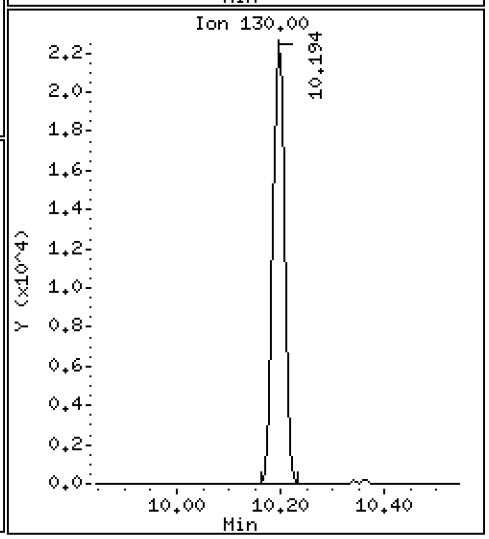












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

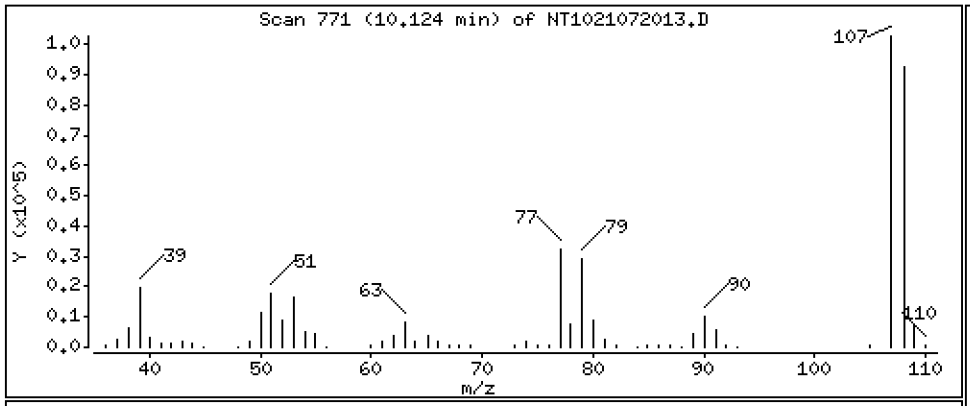
Operator: VTS

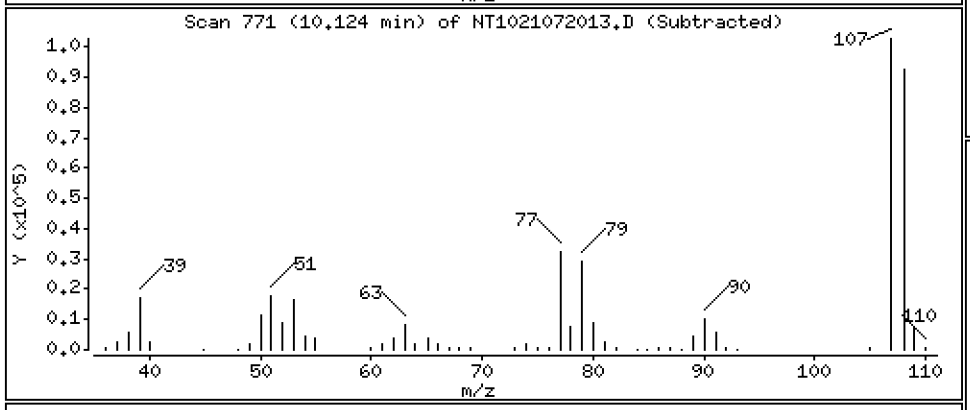
Column phase: ZB-5msi

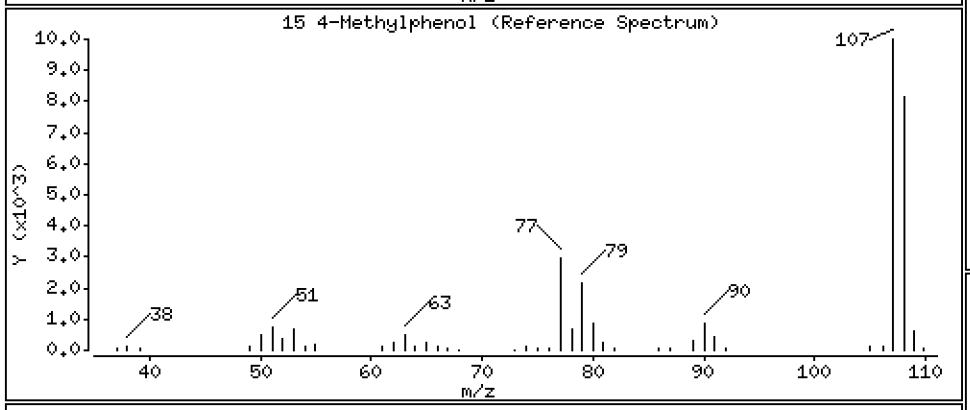
Column diameter: 0.25

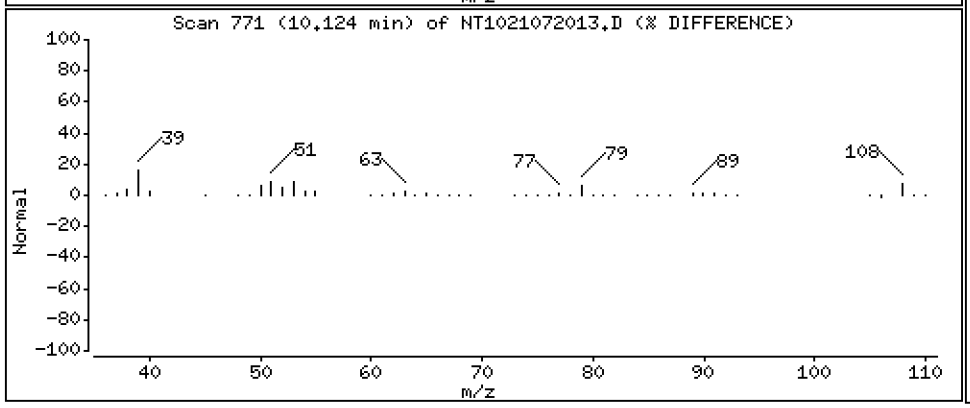
15 4-Methylphenol

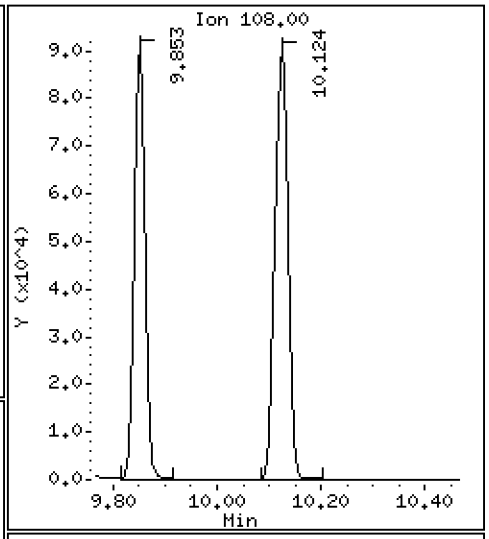
Concentration: 4.667 ug/mL

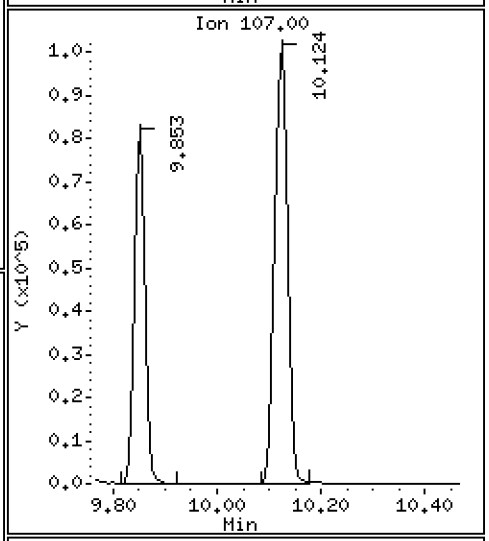


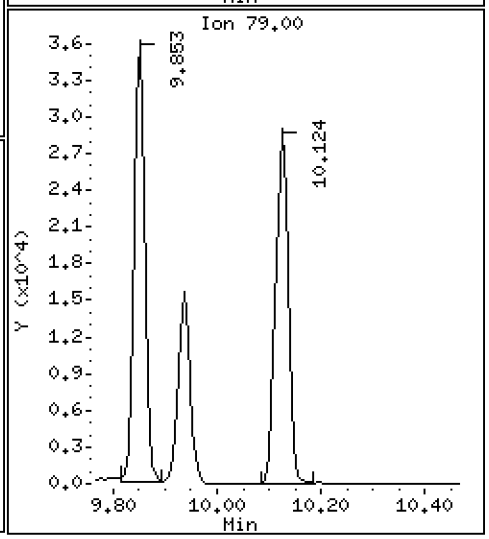












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

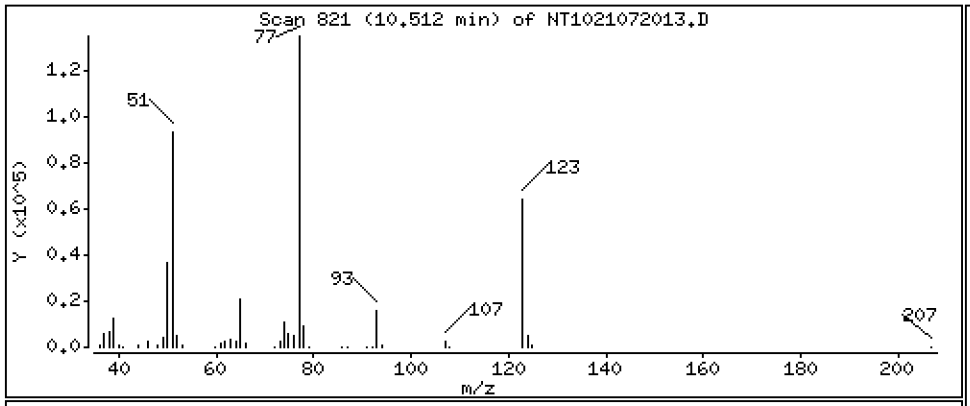
Operator: VTS

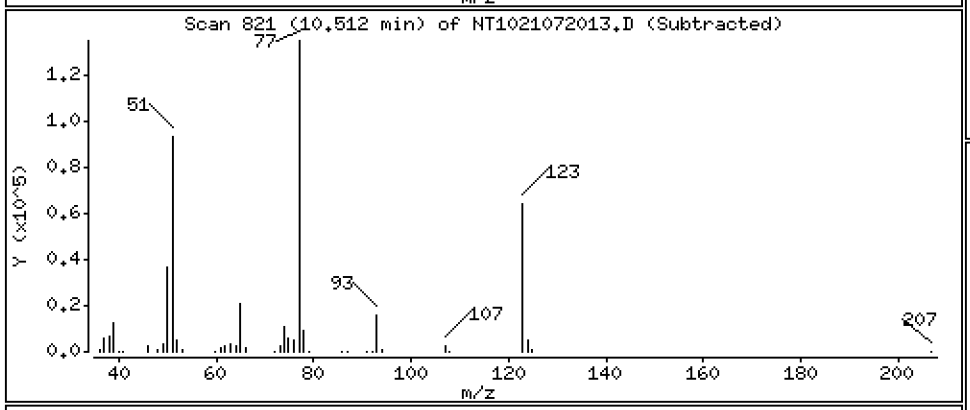
Column phase: ZB-5msi

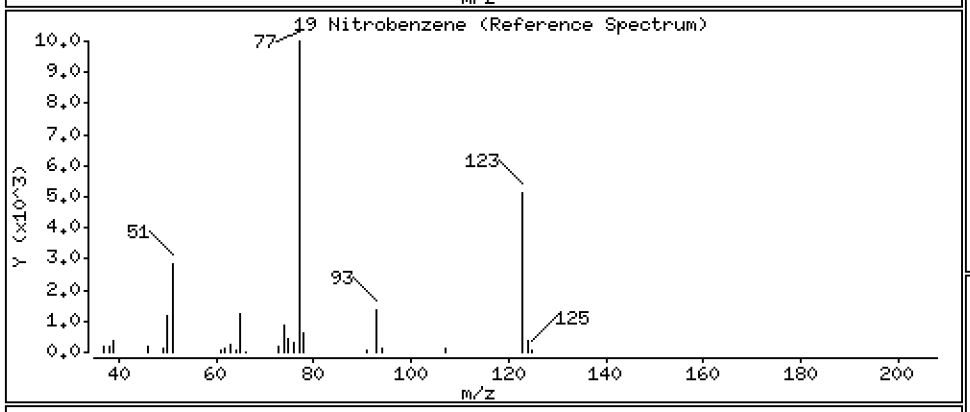
Column diameter: 0.25

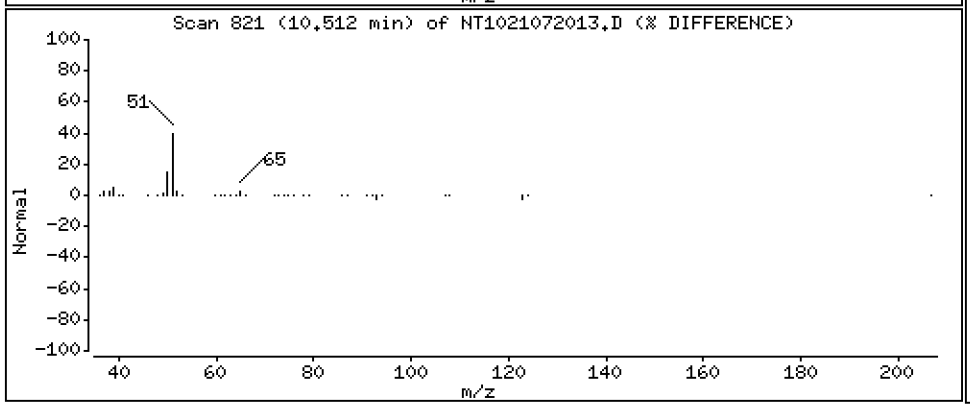
19 Nitrobenzene

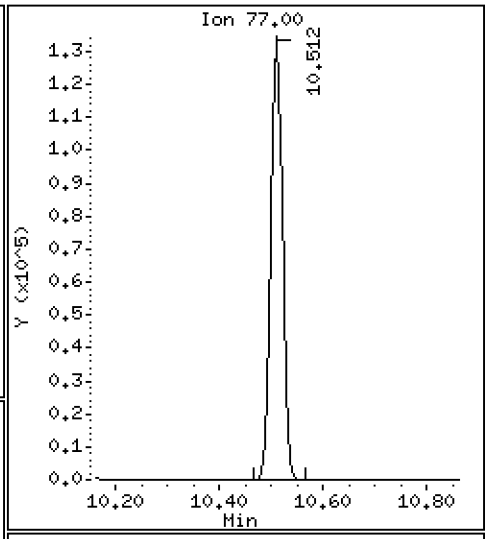
Concentration: 4.741 ug/mL

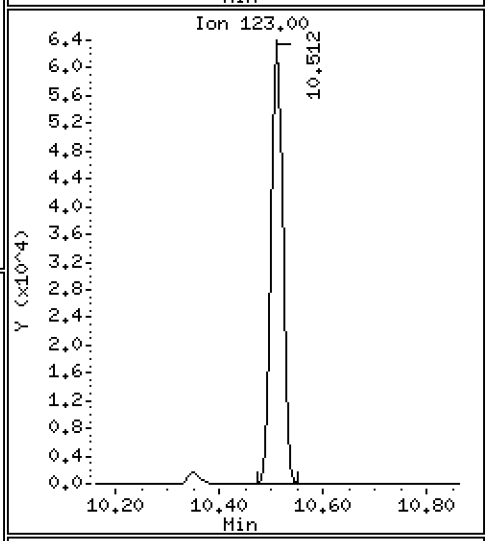


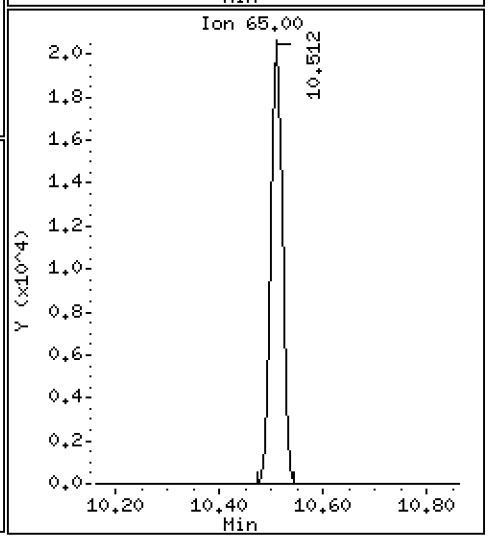












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

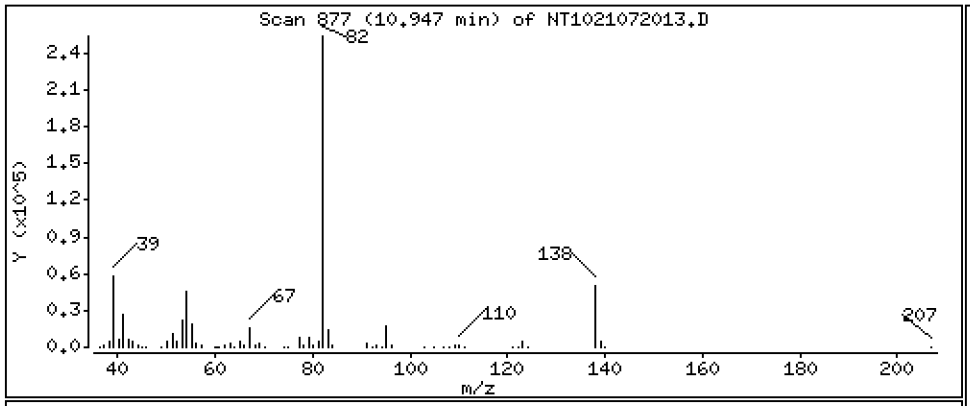
Operator: VTS

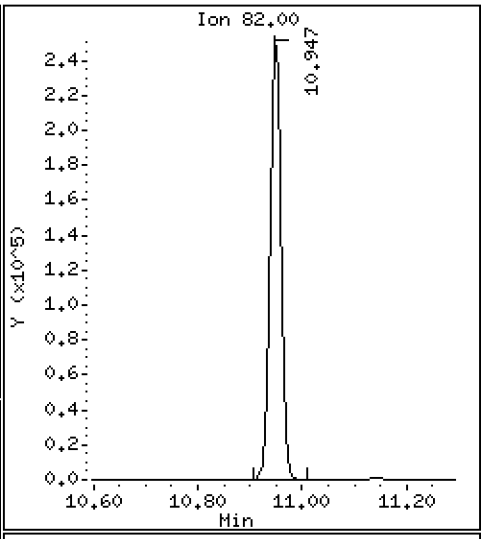
Column phase: ZB-5msi

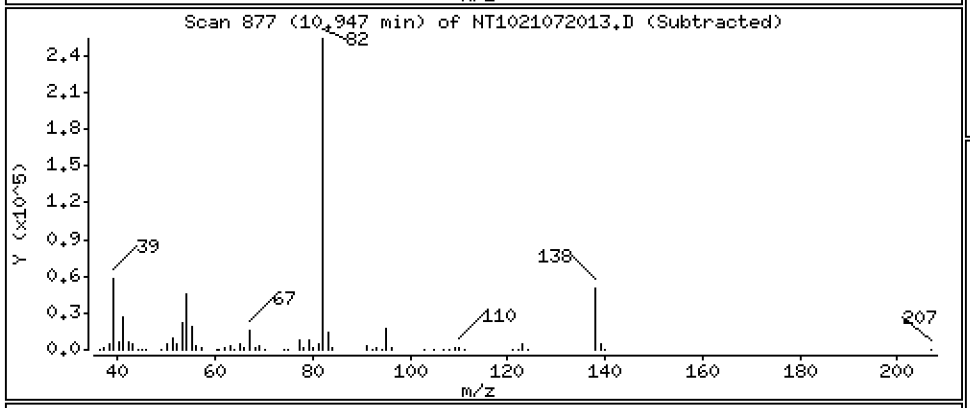
Column diameter: 0.25

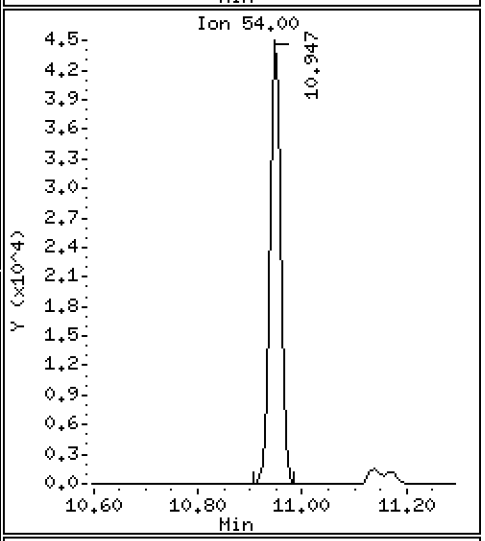
20 Isophorone

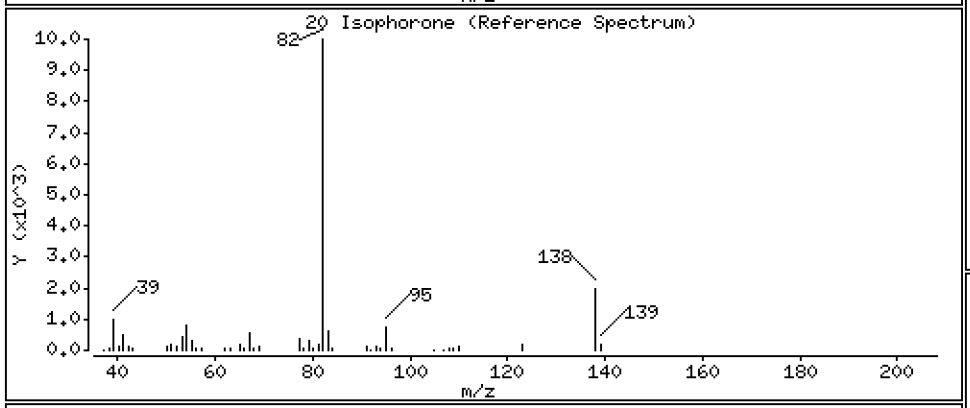
Concentration: 4.950 ug/mL

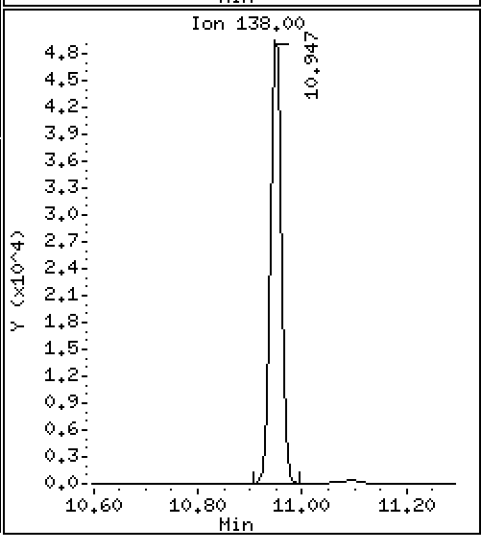


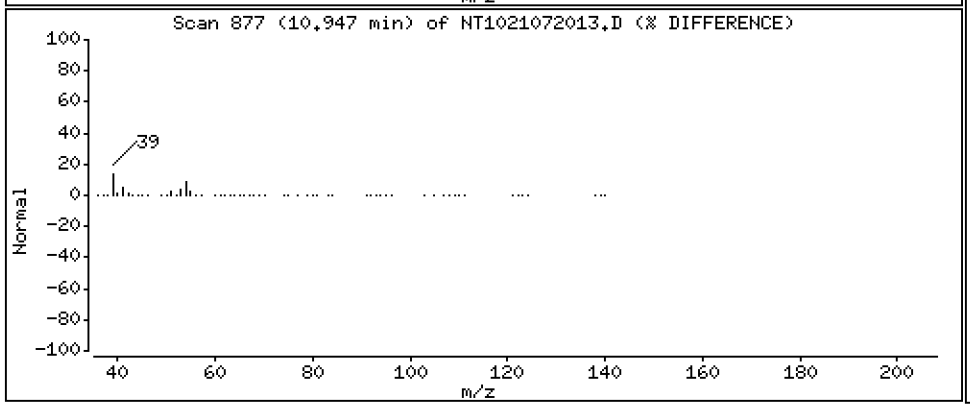












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

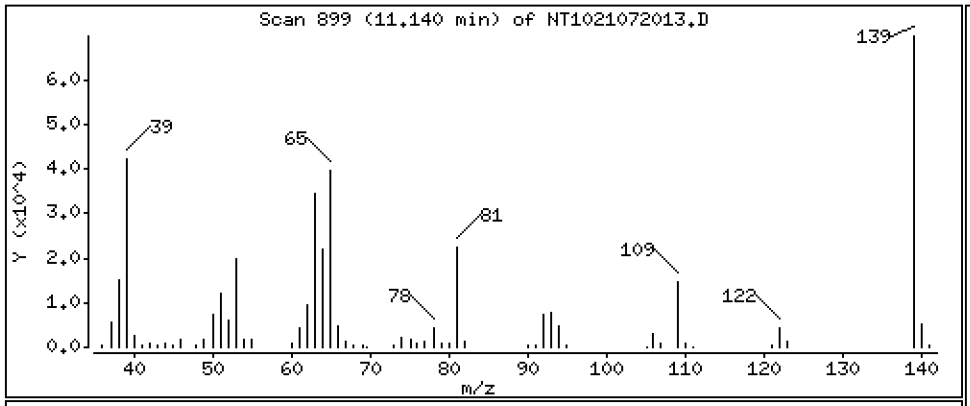
Operator: VTS

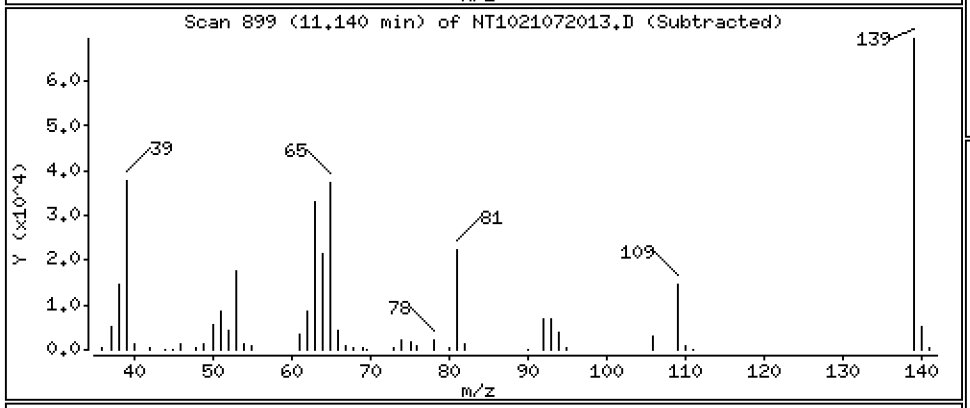
Column phase: ZB-5msi

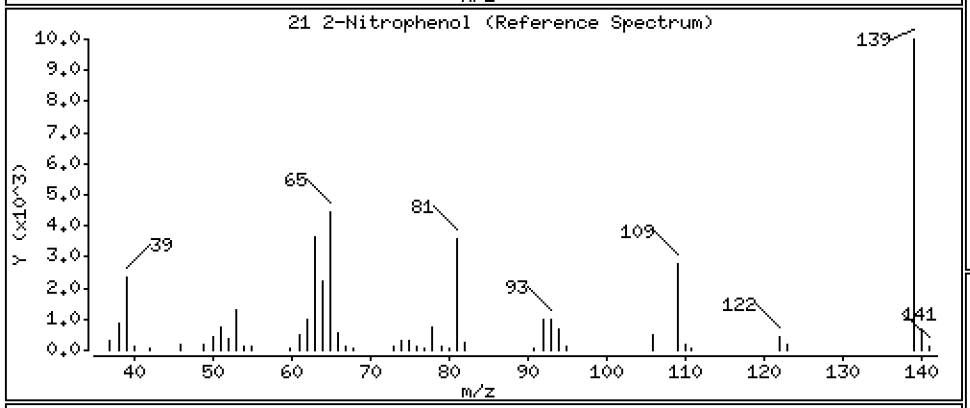
Column diameter: 0.25

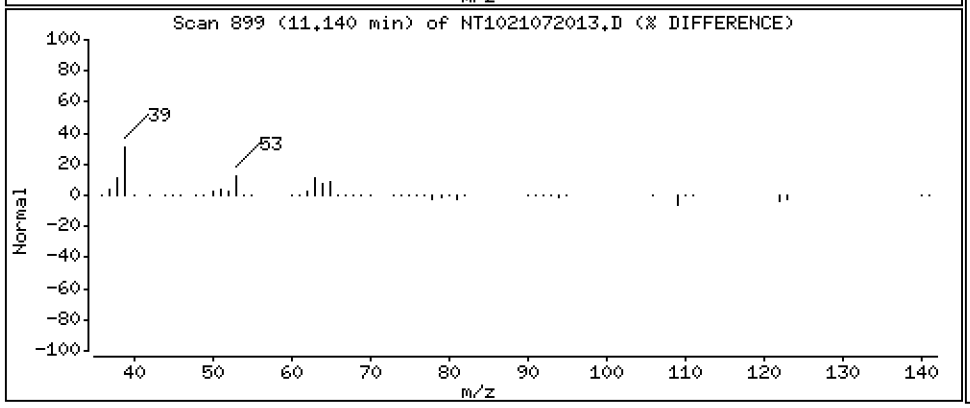
21 2-Nitrophenol

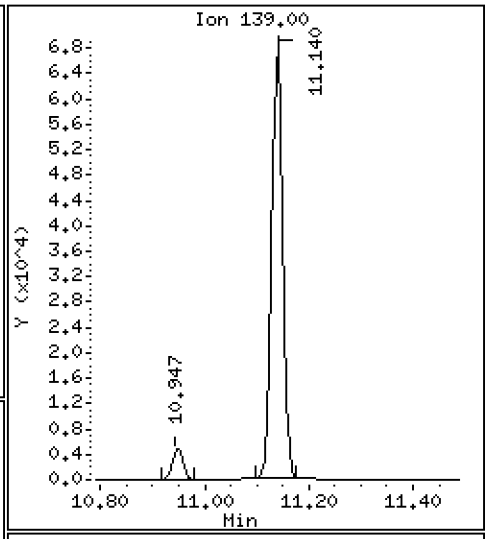
Concentration: 4.514 ug/mL

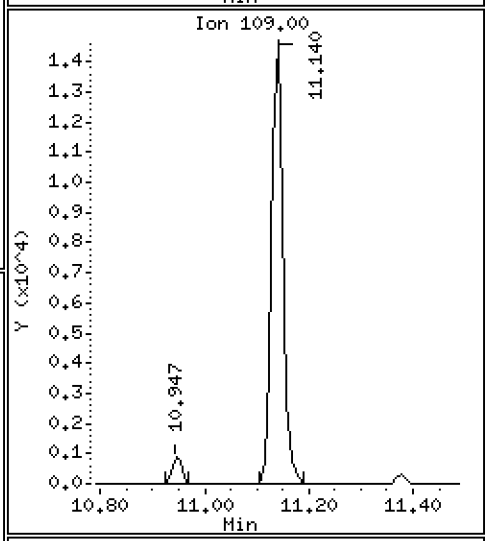


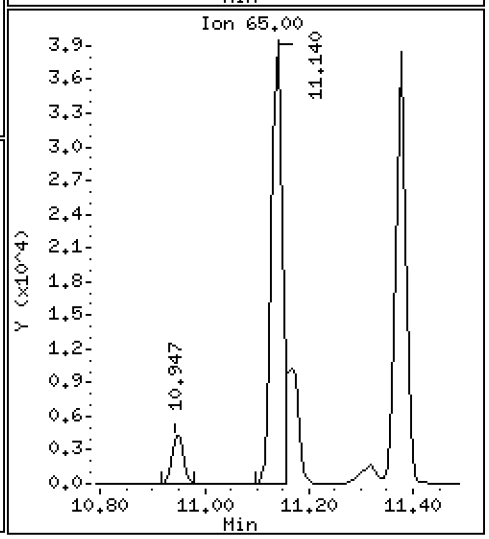












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

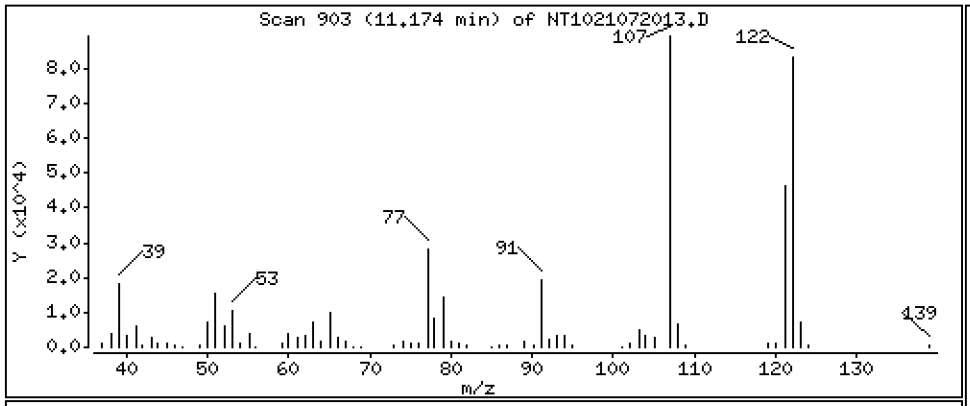
Operator: VTS

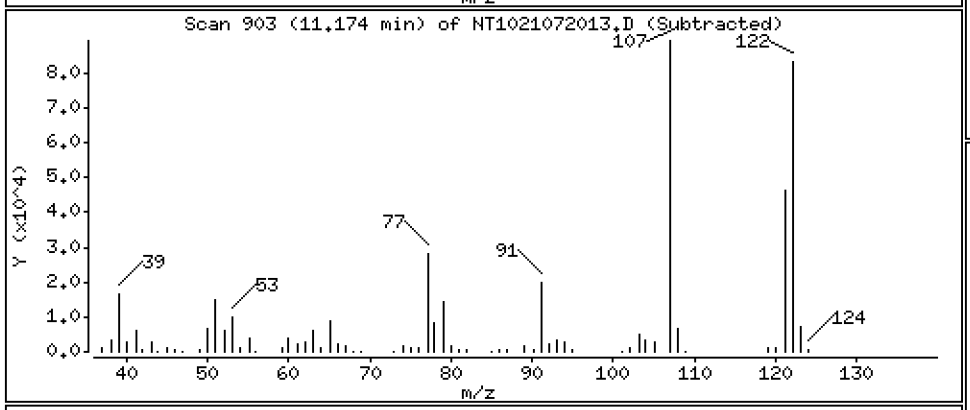
Column phase: ZB-5msi

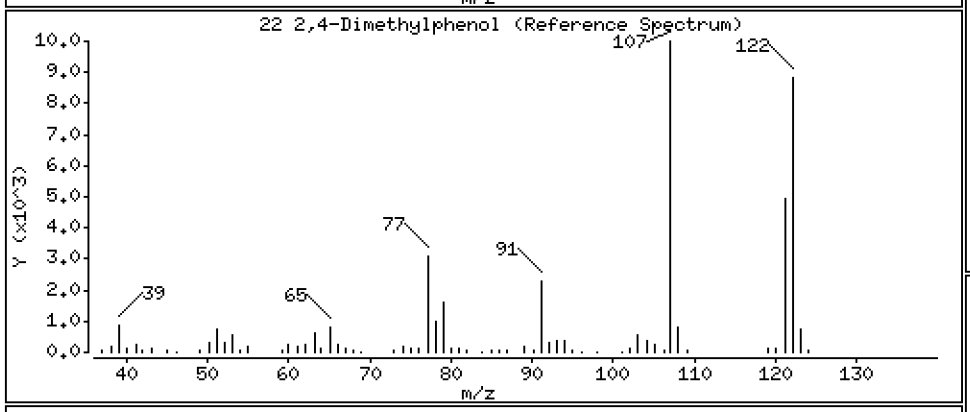
Column diameter: 0.25

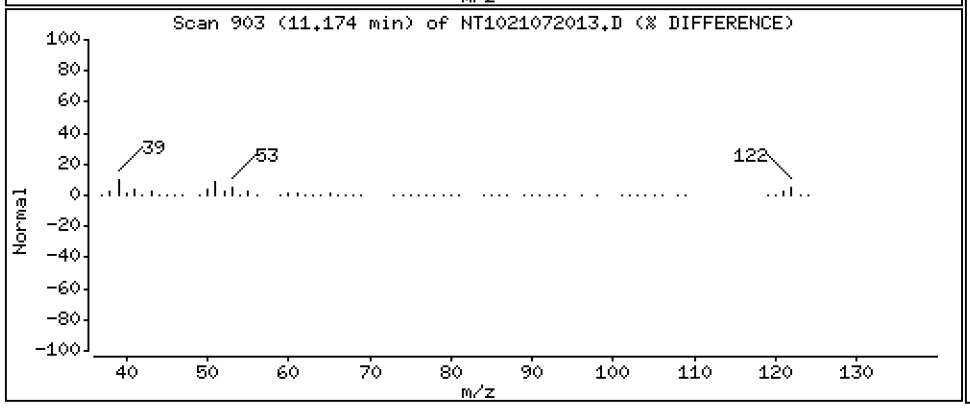
22 2,4-Dimethylphenol

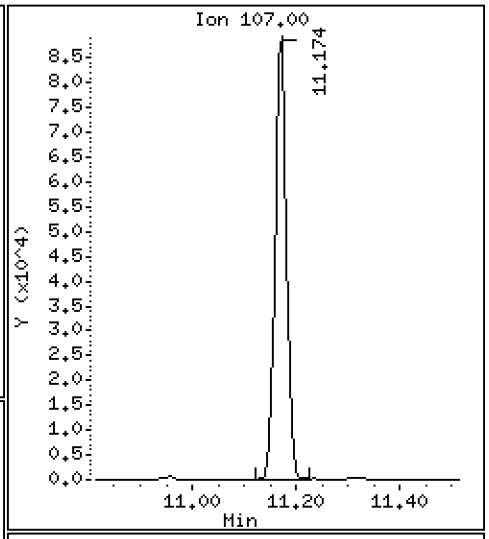
Concentration: 4.365 ug/mL

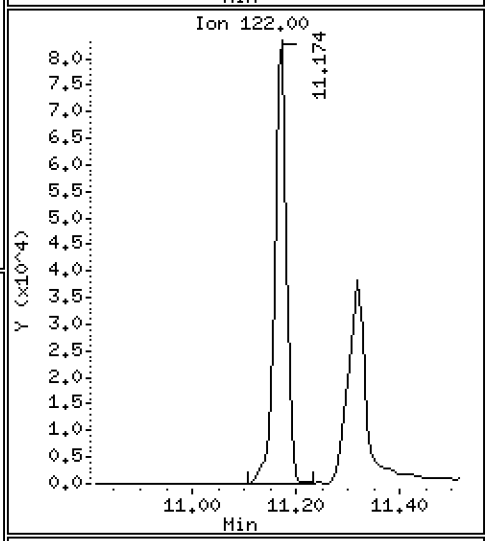


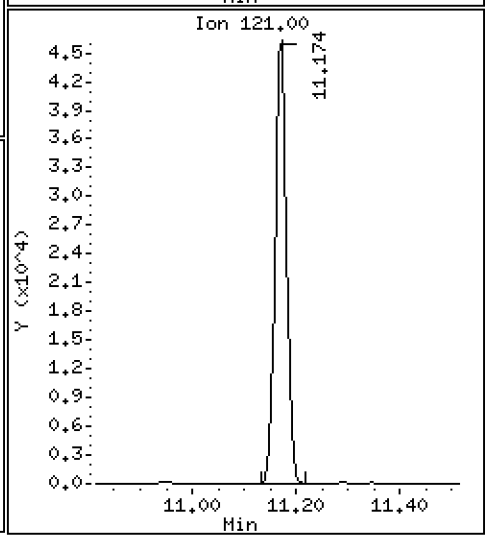












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

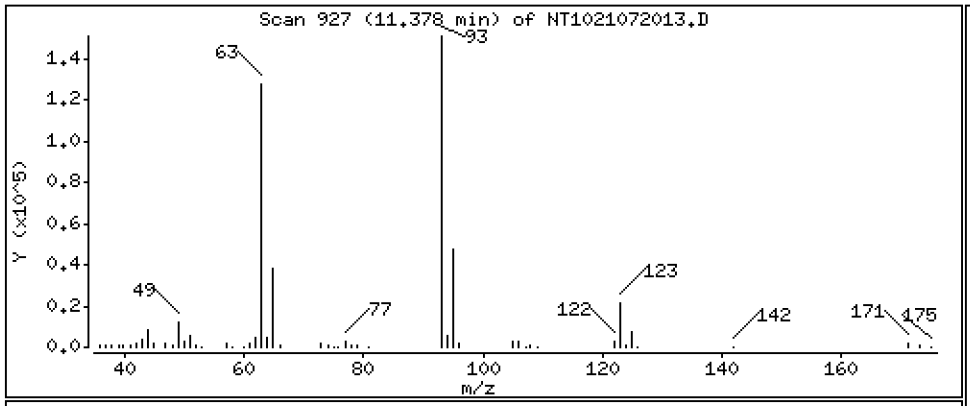
Operator: VTS

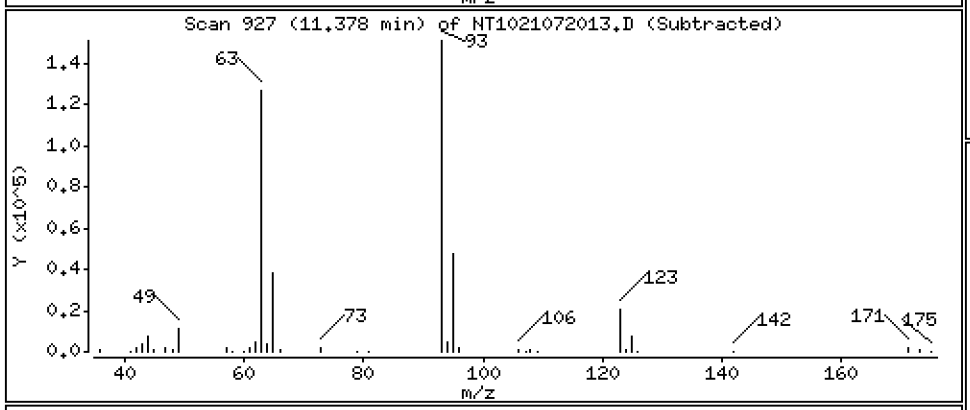
Column phase: ZB-5msi

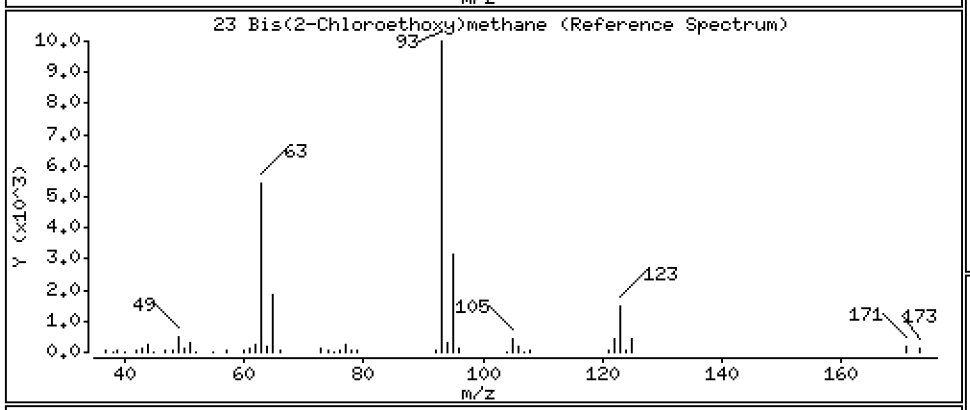
Column diameter: 0.25

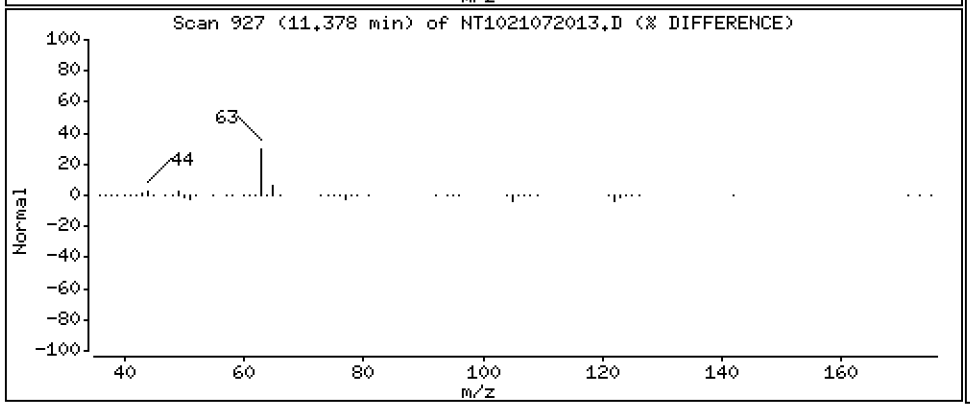
23 Bis(2-Chloroethoxy)methane

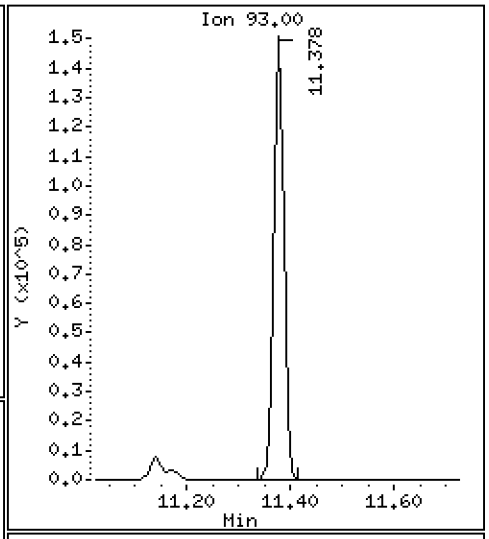
Concentration: 5.003 ug/mL

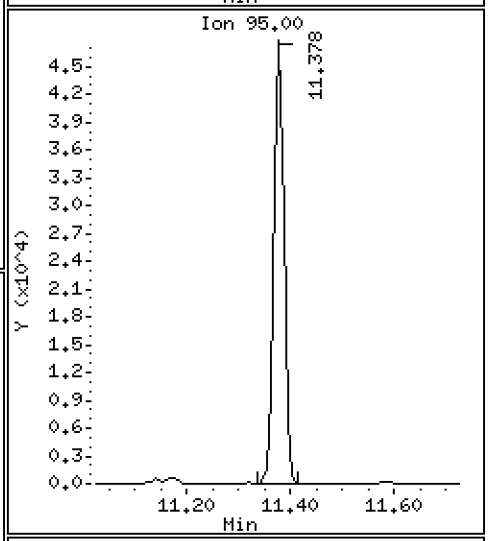


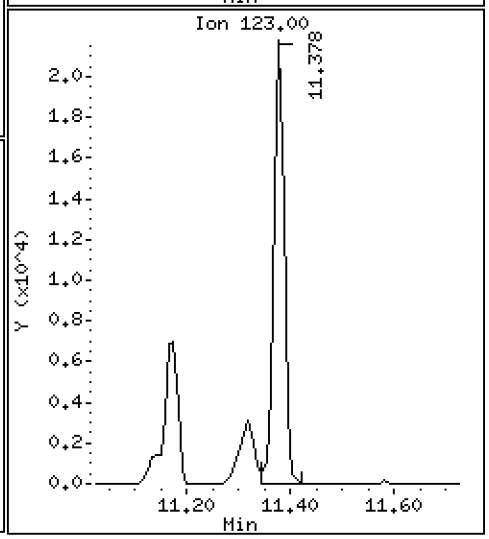












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

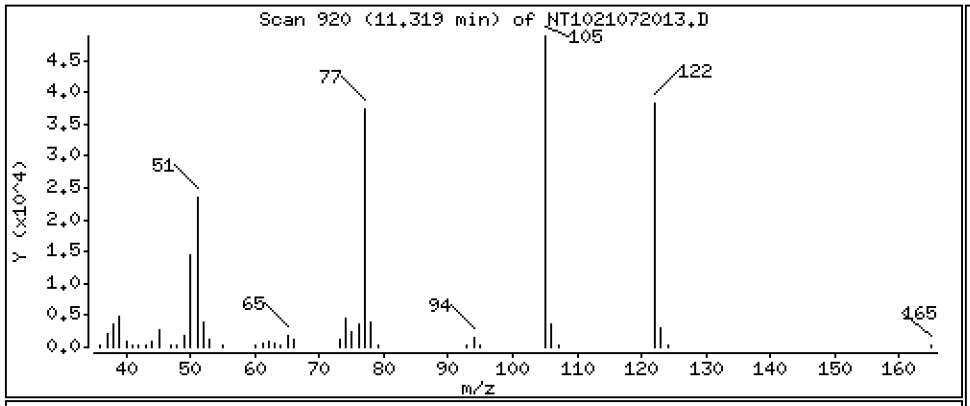
Operator: VTS

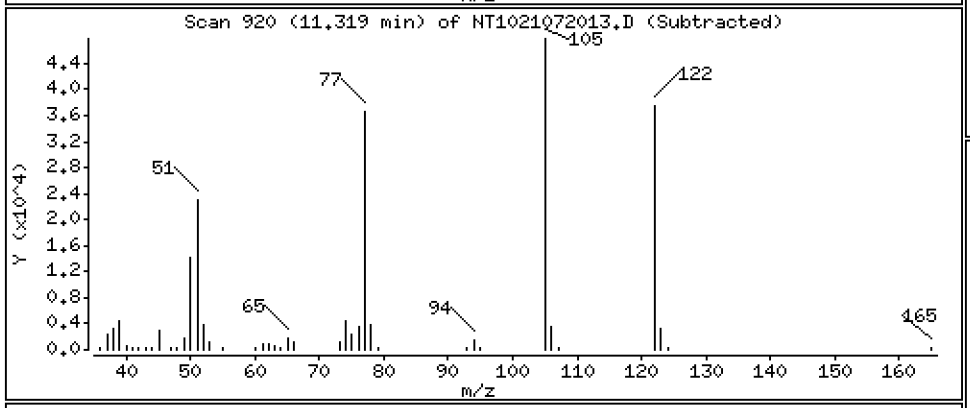
Column phase: ZB-5msi

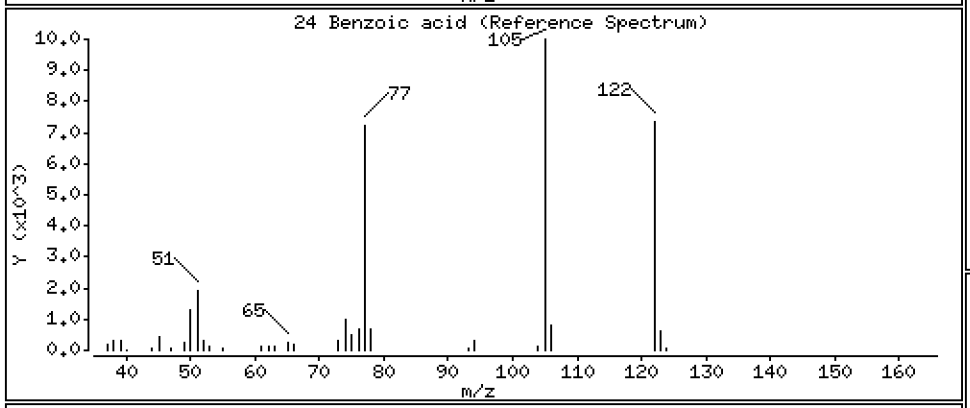
Column diameter: 0.25

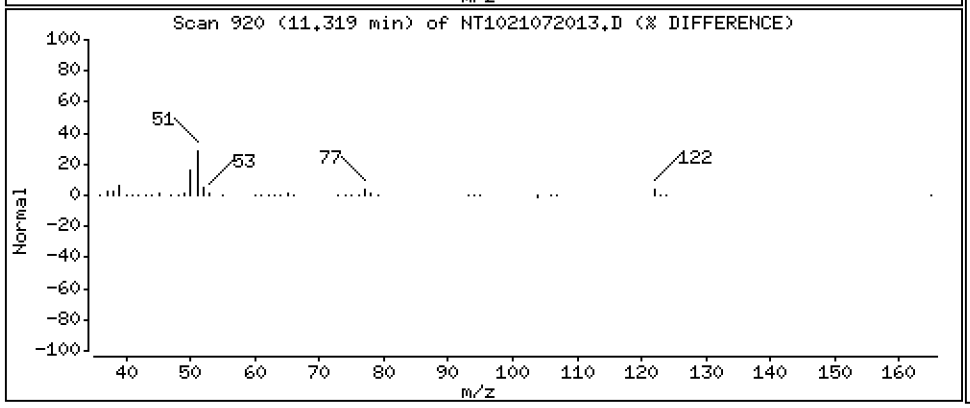
24 Benzoic acid

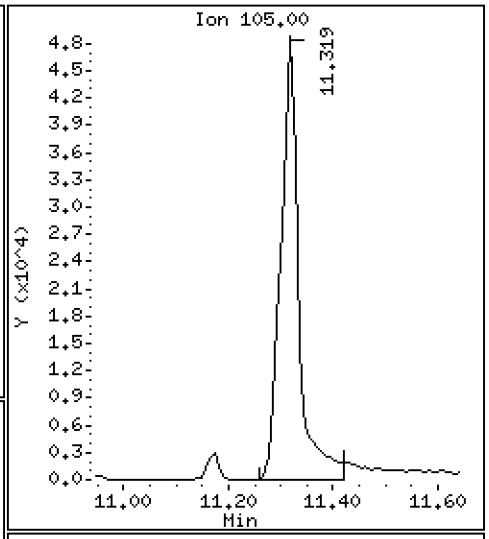
Concentration: 6.356 ug/mL

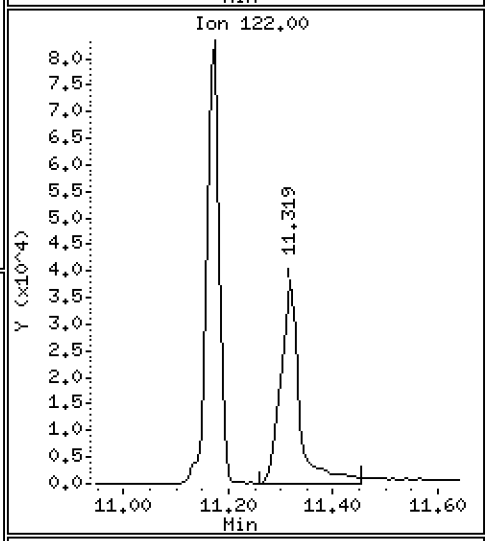


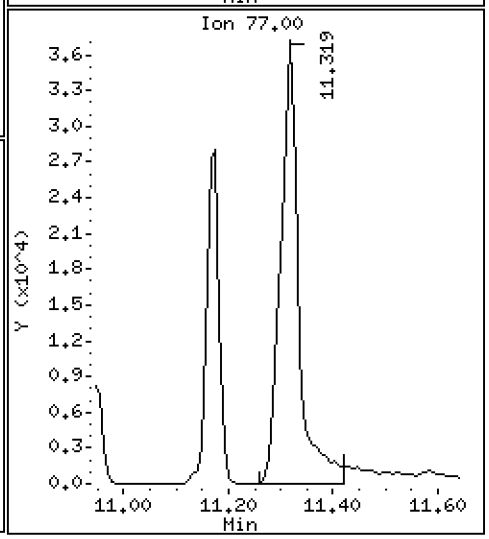












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

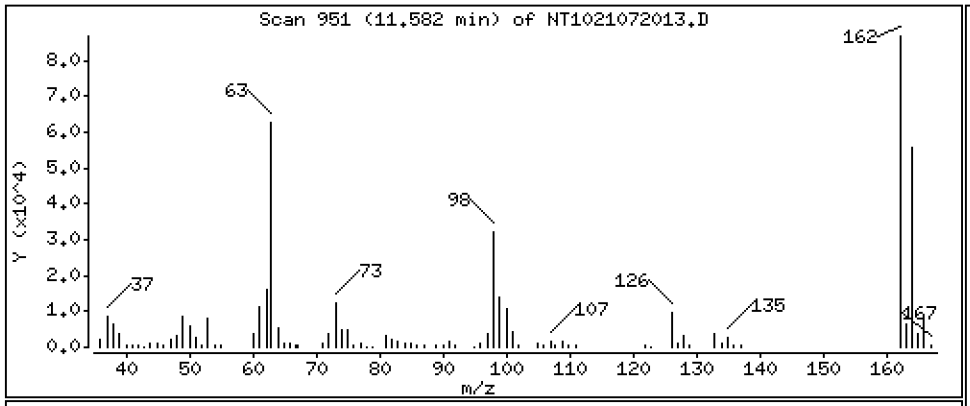
Operator: VTS

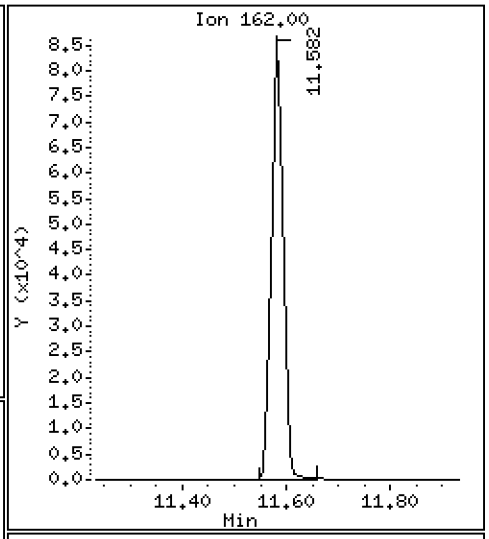
Column phase: ZB-5msi

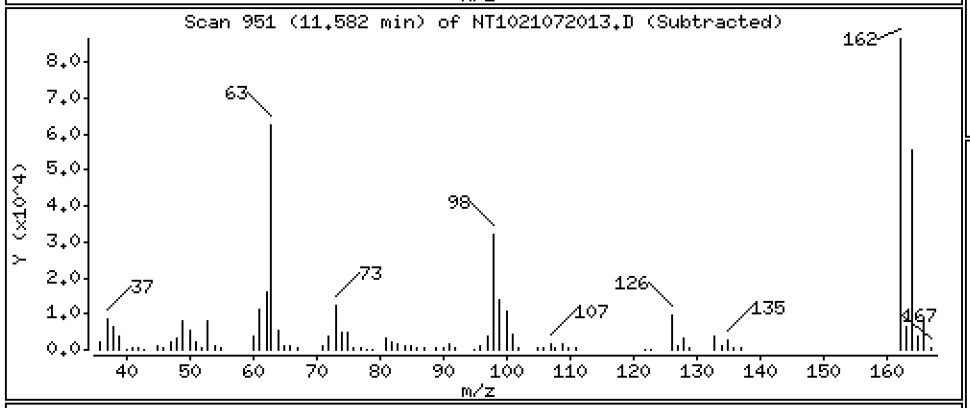
Column diameter: 0.25

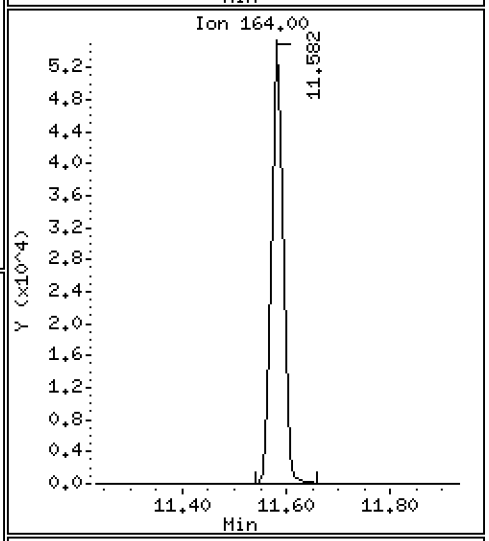
25 2,4-Dichlorophenol

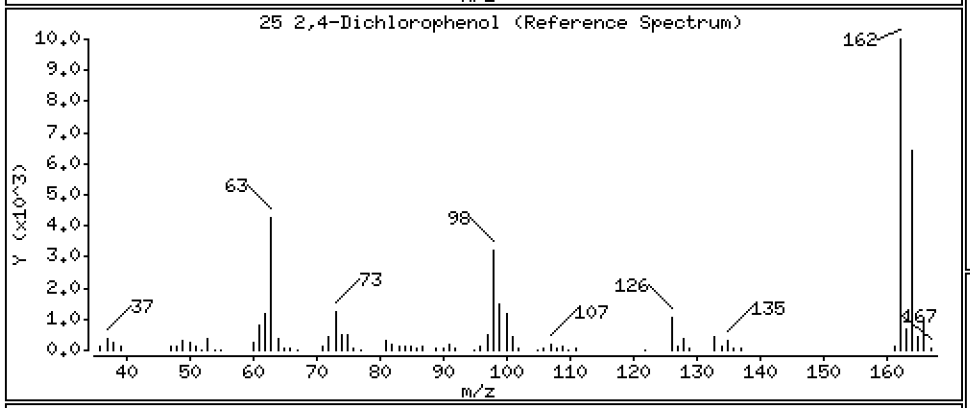
Concentration: 4.974 ug/mL

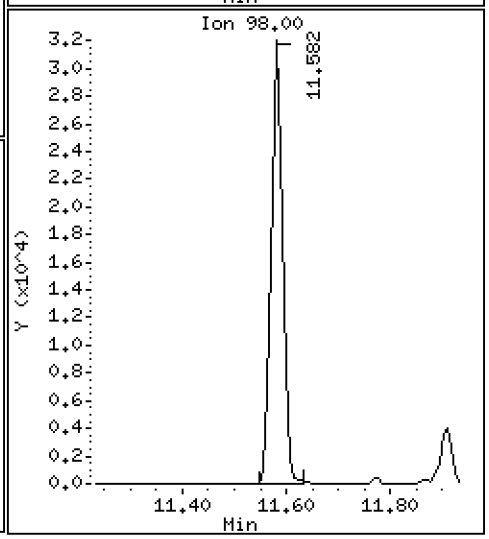


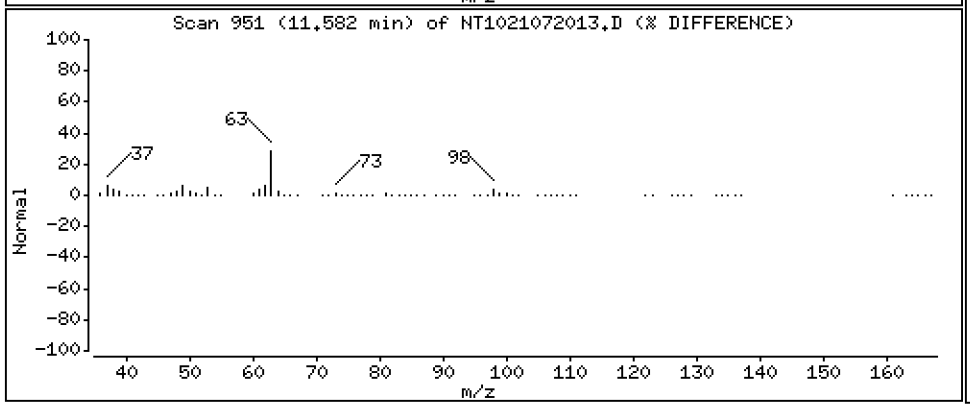












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

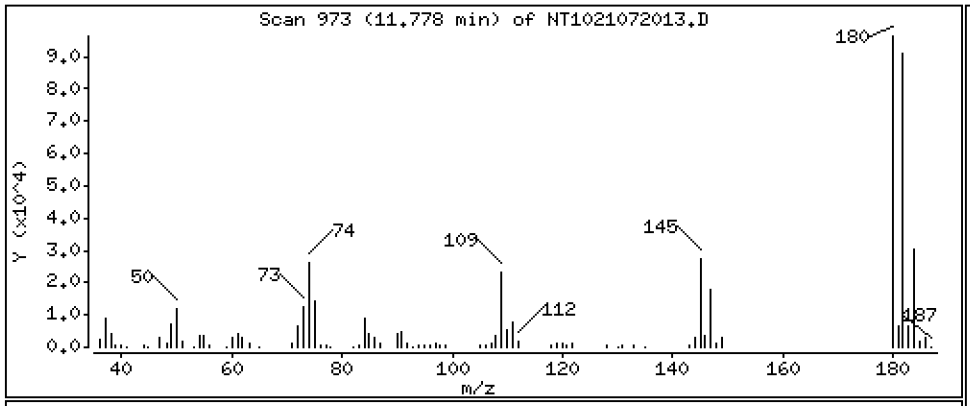
Operator: VTS

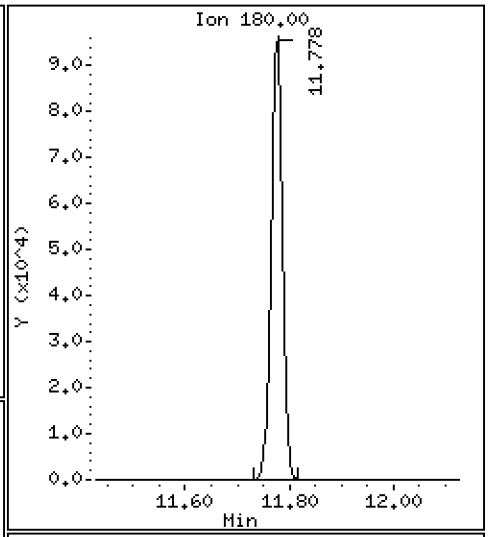
Column phase: ZB-5msi

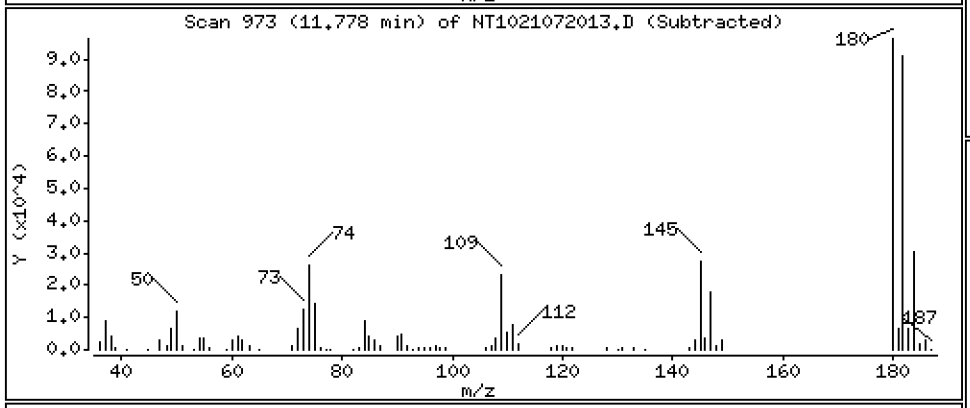
Column diameter: 0.25

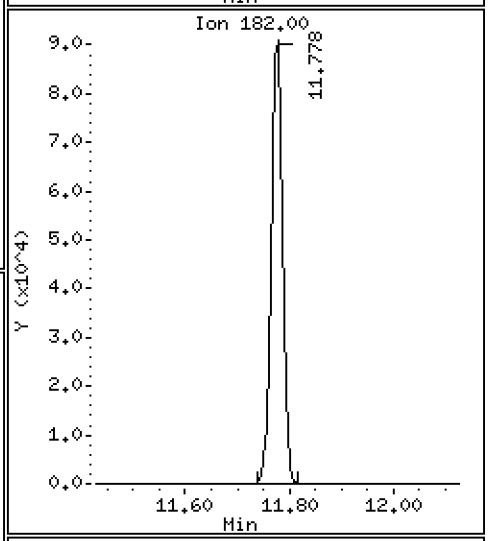
26 1,2,4-Trichlorobenzene

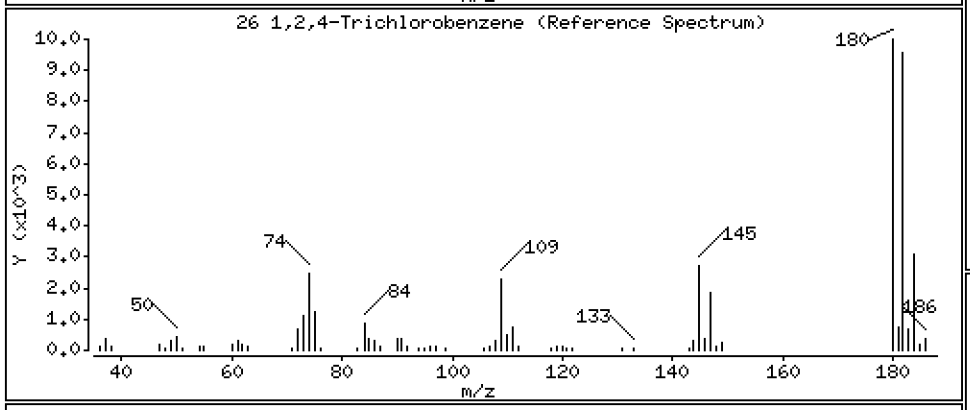
Concentration: 4.922 ug/mL

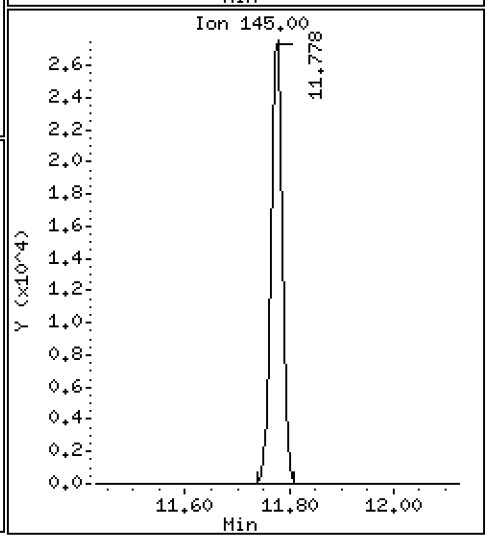


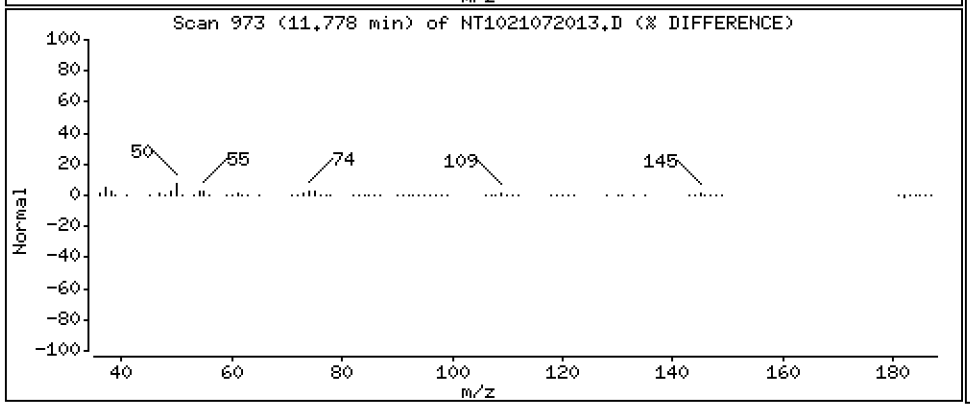












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

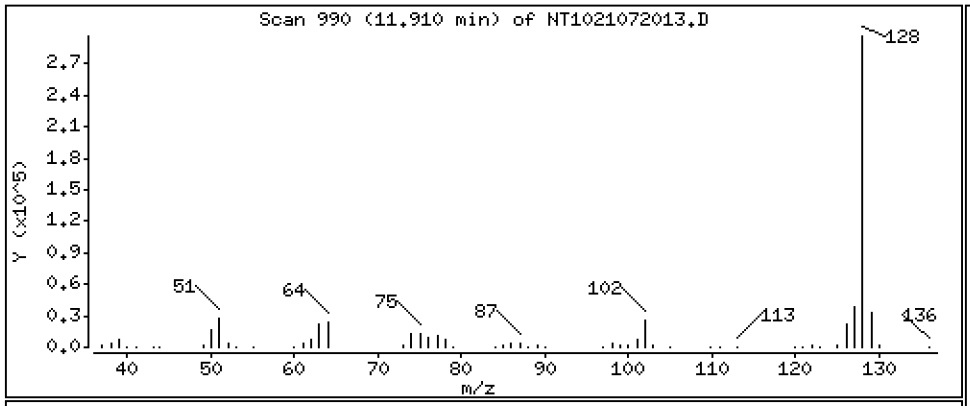
Operator: VTS

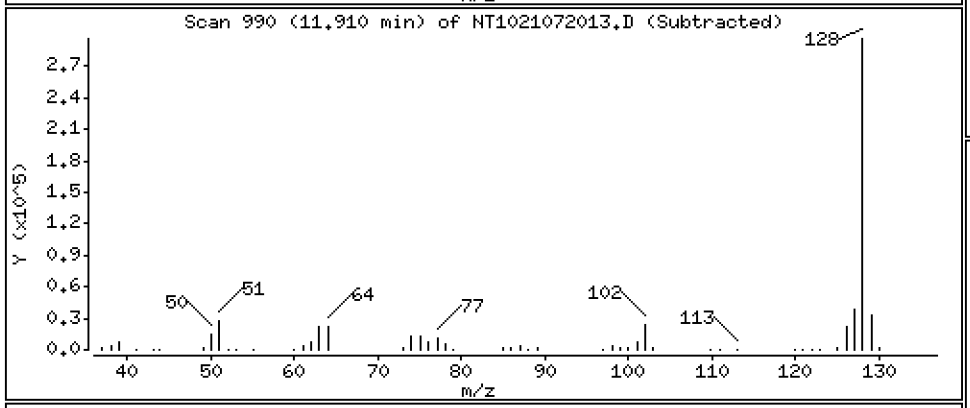
Column phase: ZB-5msi

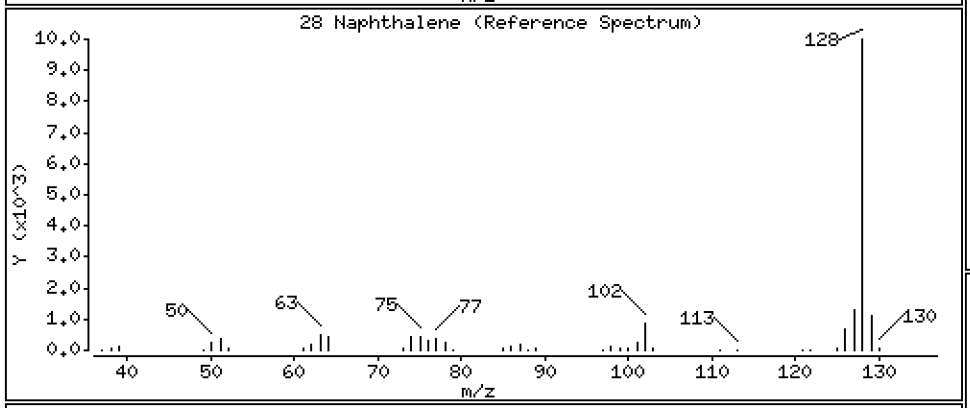
Column diameter: 0.25

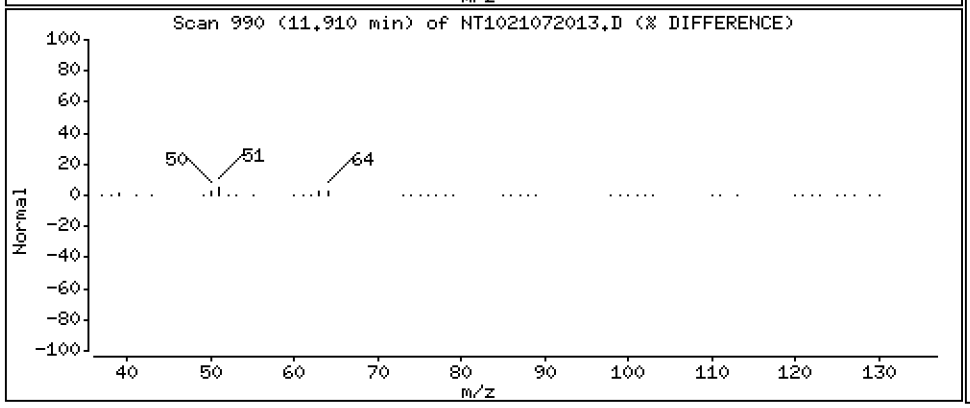
28 Naphthalene

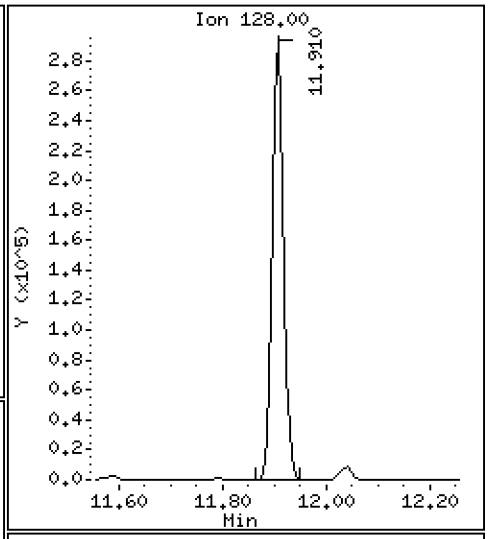
Concentration: 4.991 ug/mL

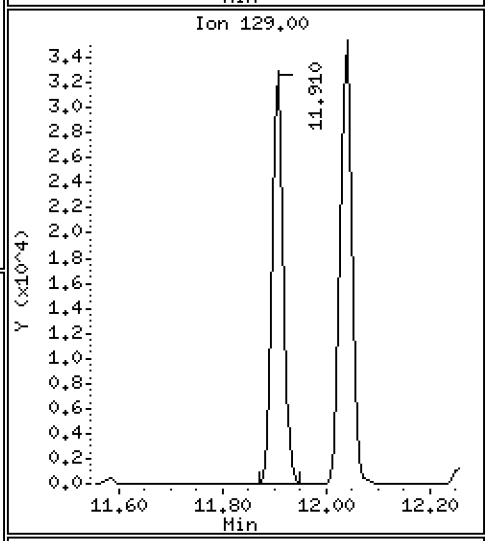


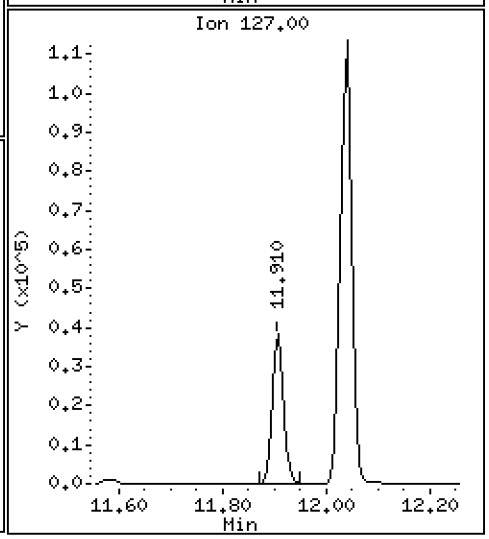












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

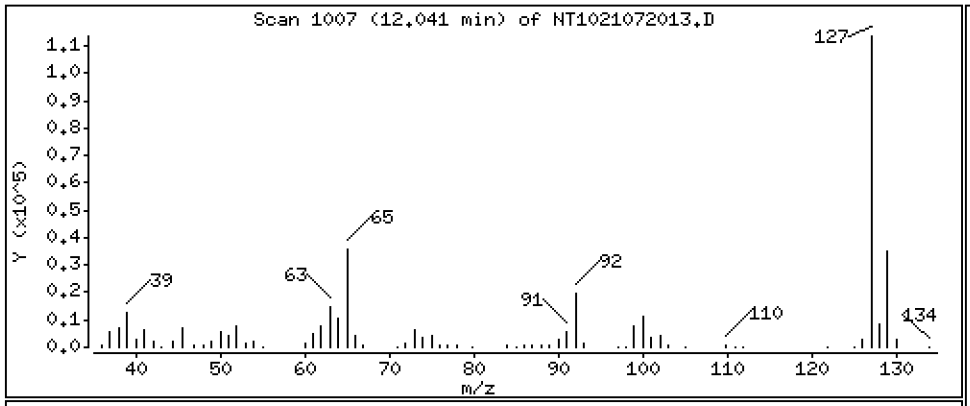
Operator: VTS

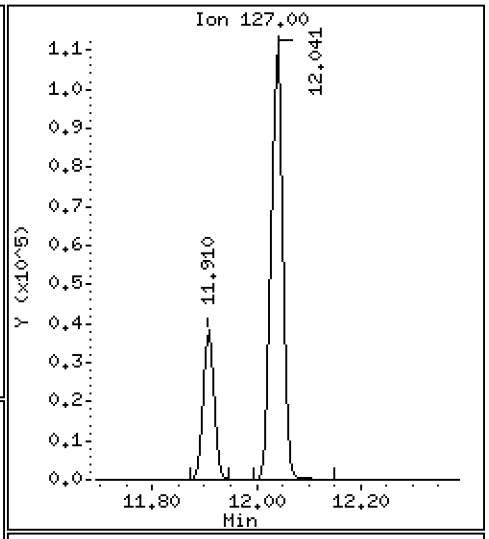
Column phase: ZB-5msi

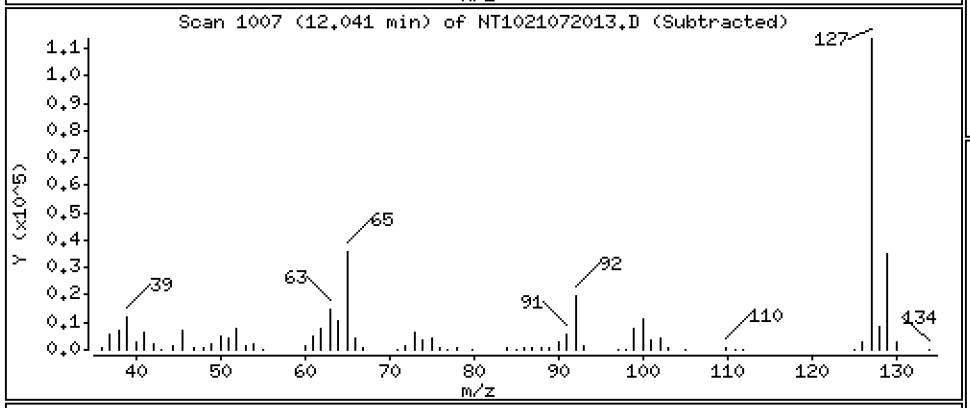
Column diameter: 0.25

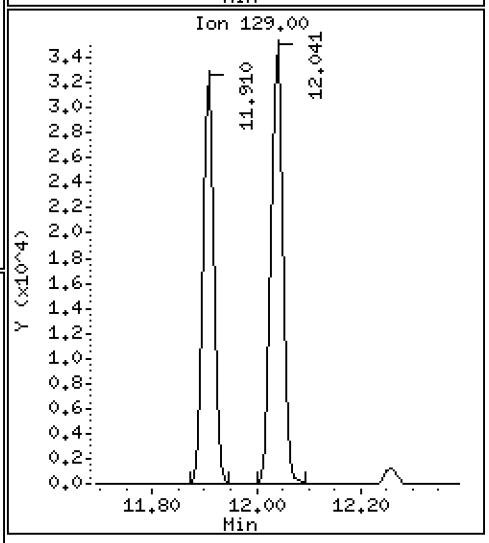
29 4-Chloroaniline

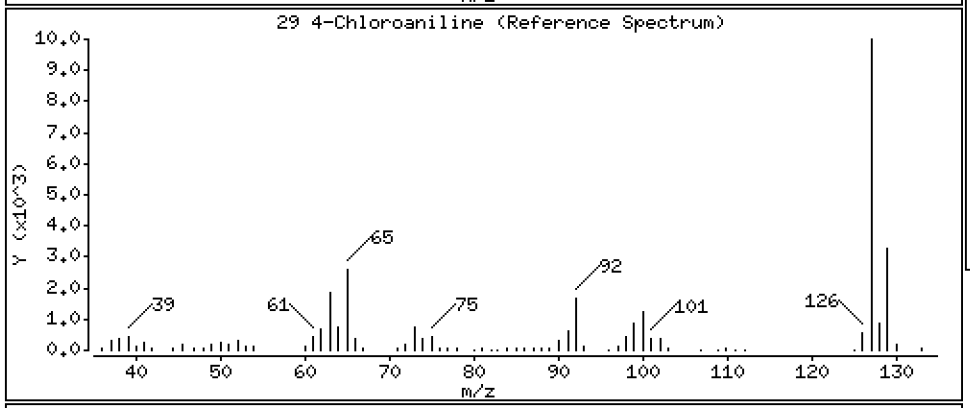
Concentration: 4.141 ug/mL

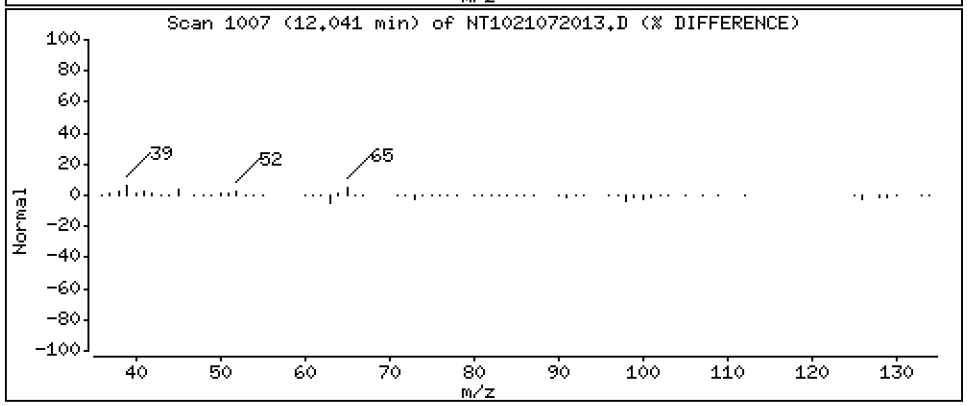












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

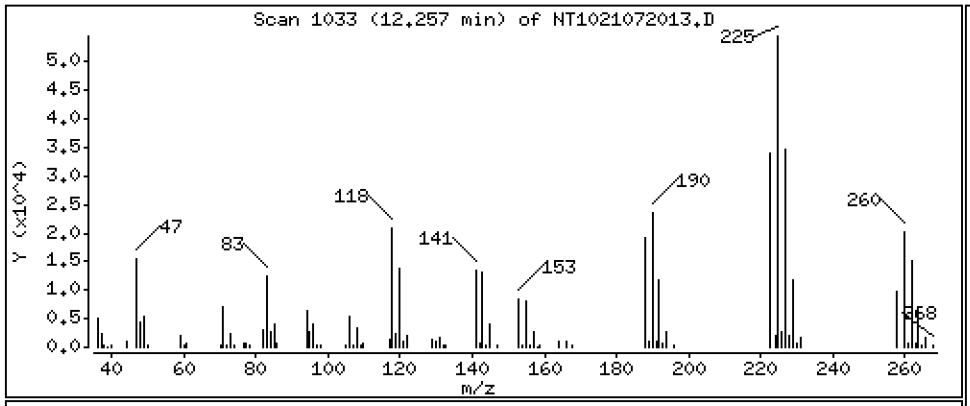
Operator: VTS

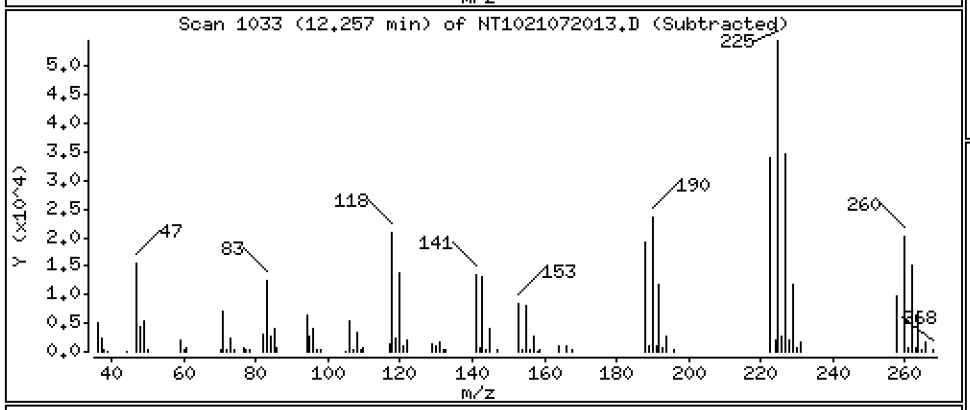
Column phase: ZB-5msi

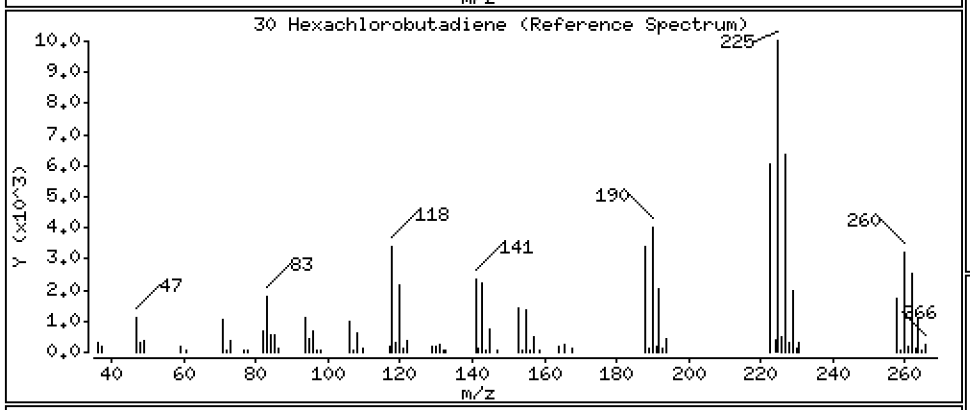
Column diameter: 0.25

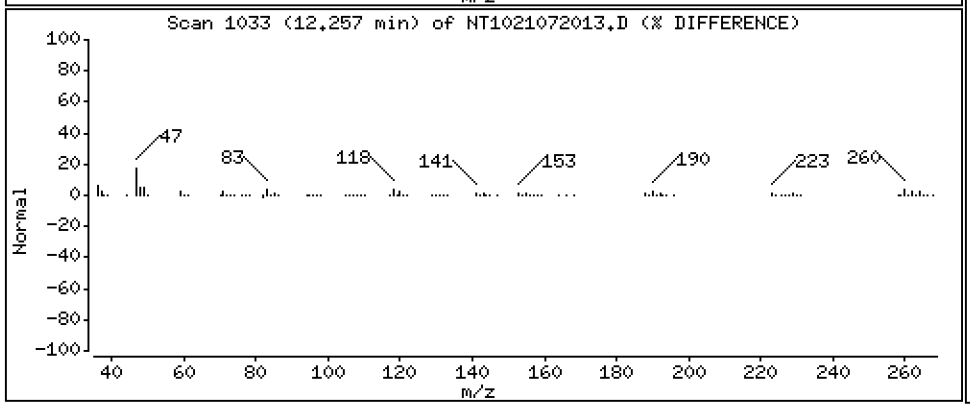
30 Hexachlorobutadiene

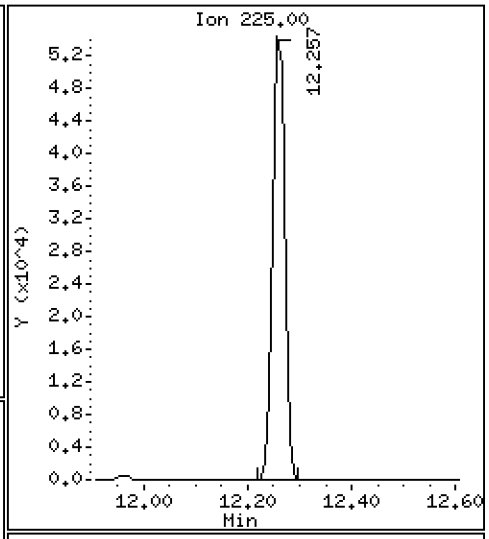
Concentration: 4.966 ug/mL

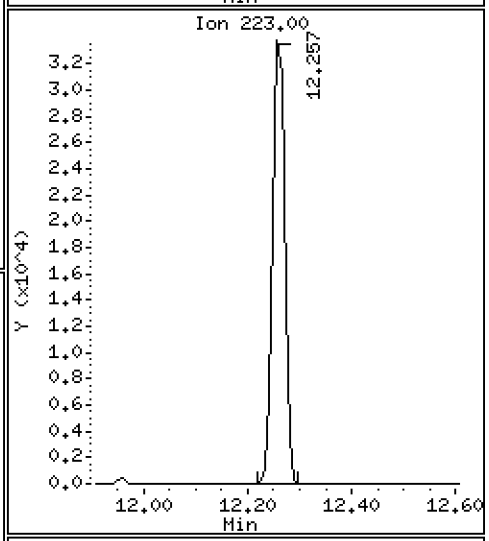


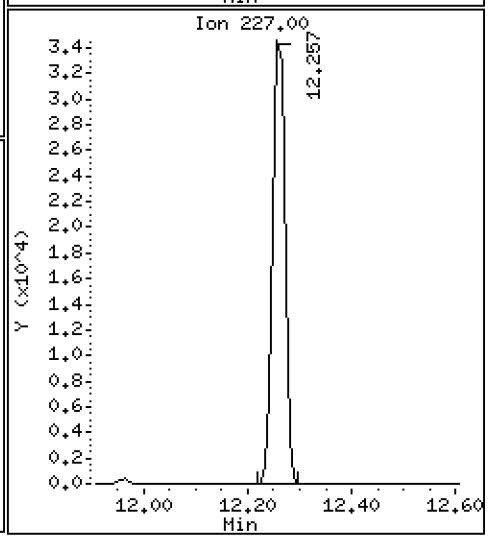












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

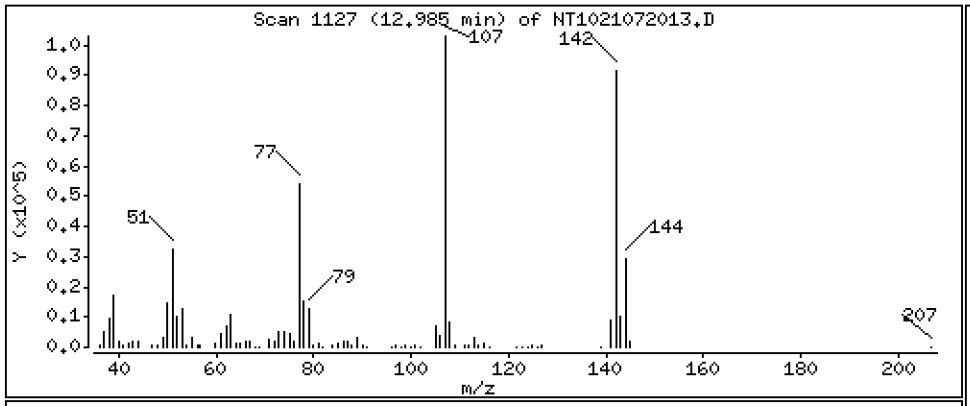
Operator: VTS

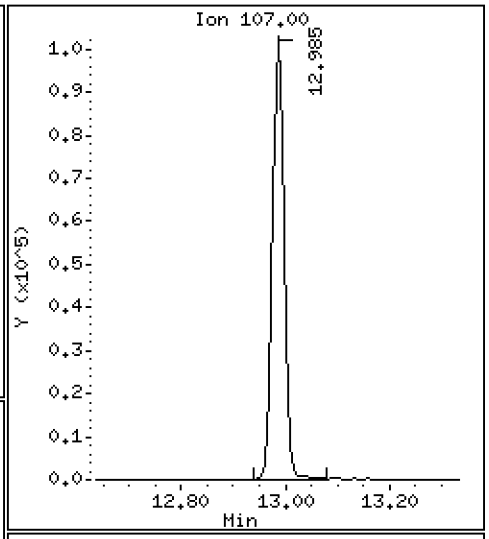
Column phase: ZB-5msi

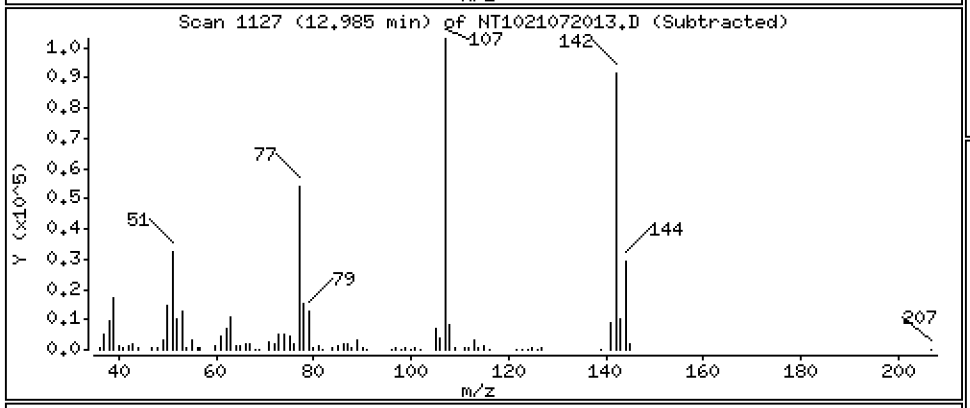
Column diameter: 0.25

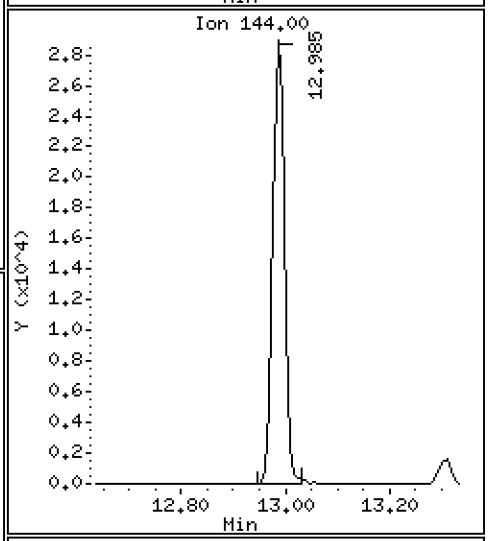
31 4-Chloro-3-methylphenol

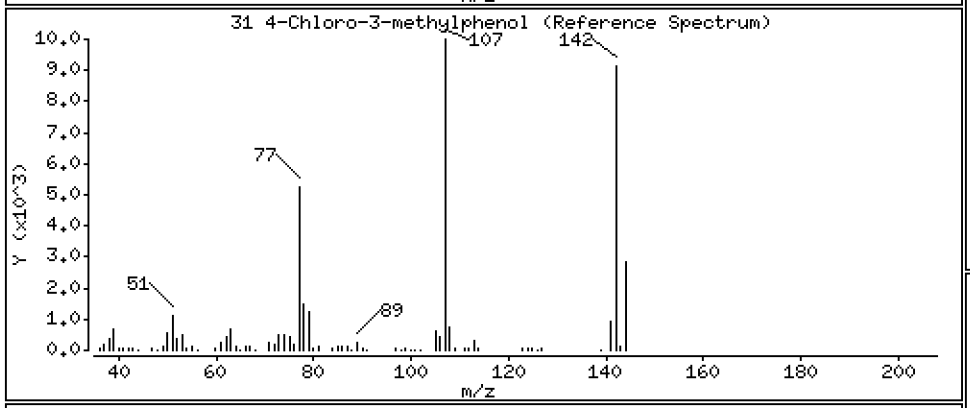
Concentration: 4.652 ug/mL

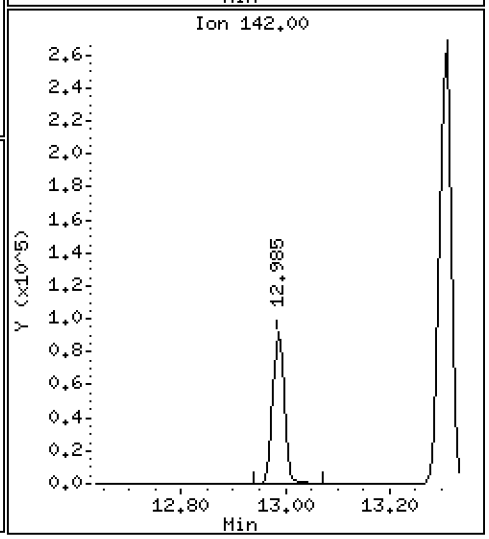


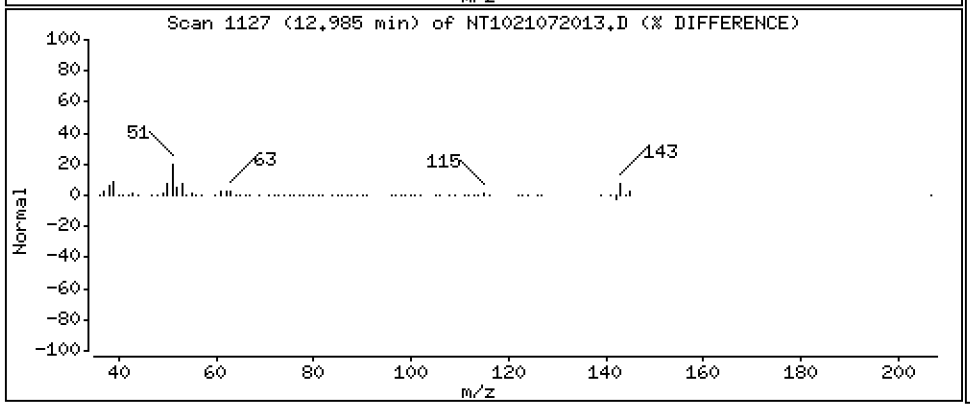












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

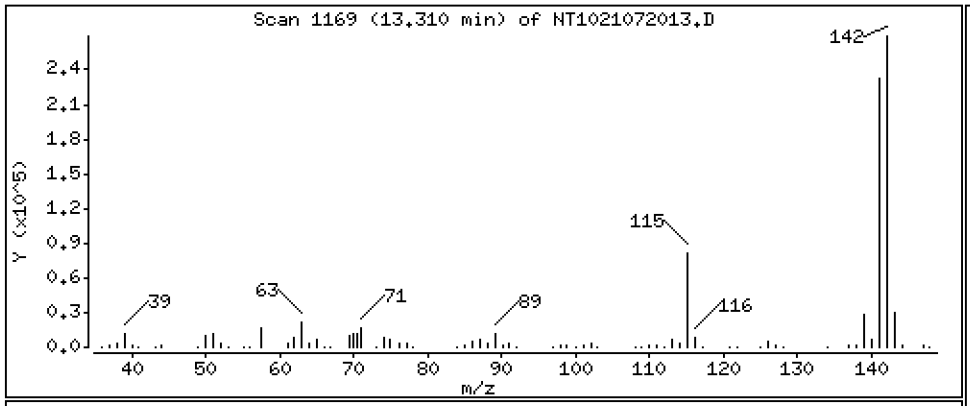
Operator: VTS

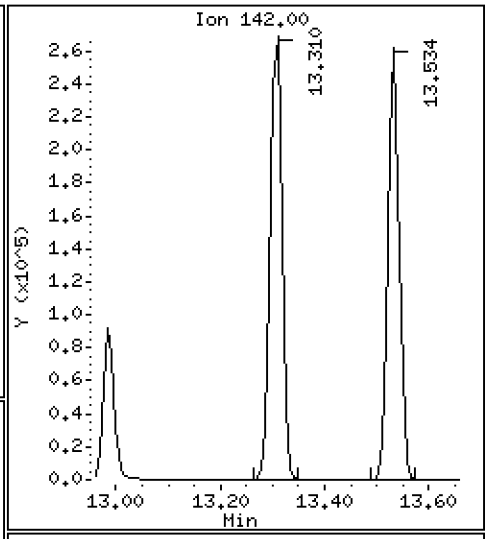
Column phase: ZB-5msi

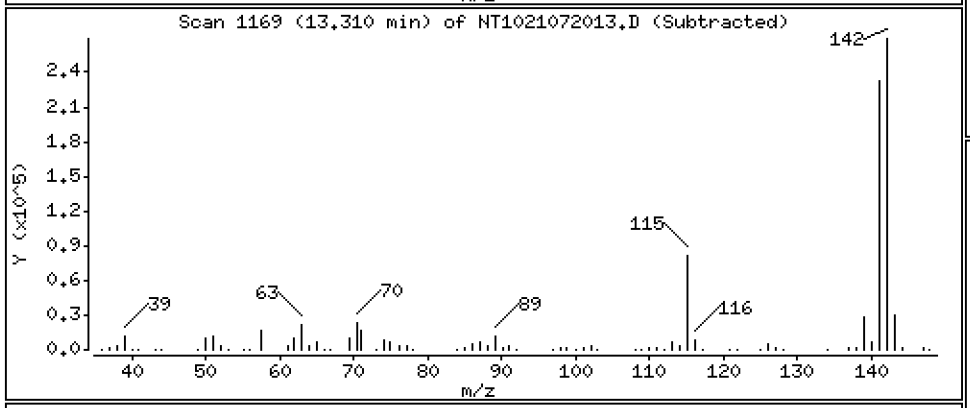
Column diameter: 0.25

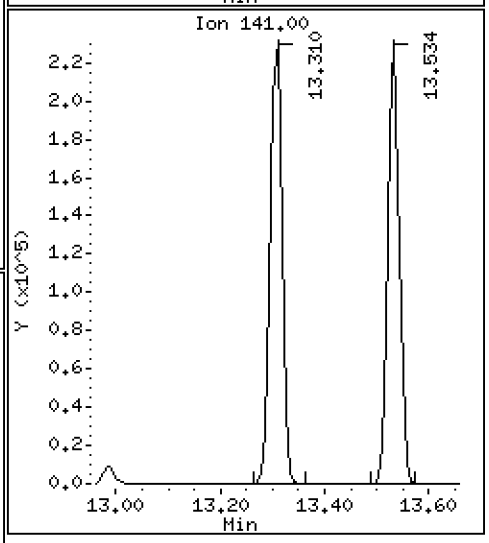
32 2-Methylnaphthalene

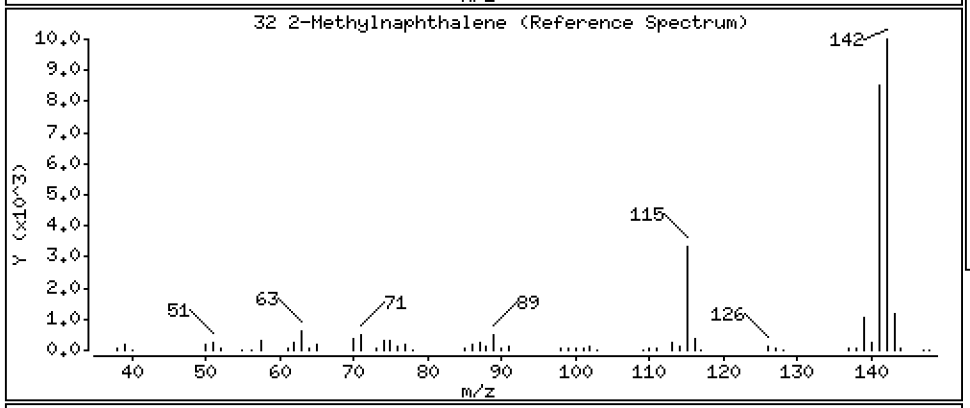
Concentration: 4.782 ug/mL

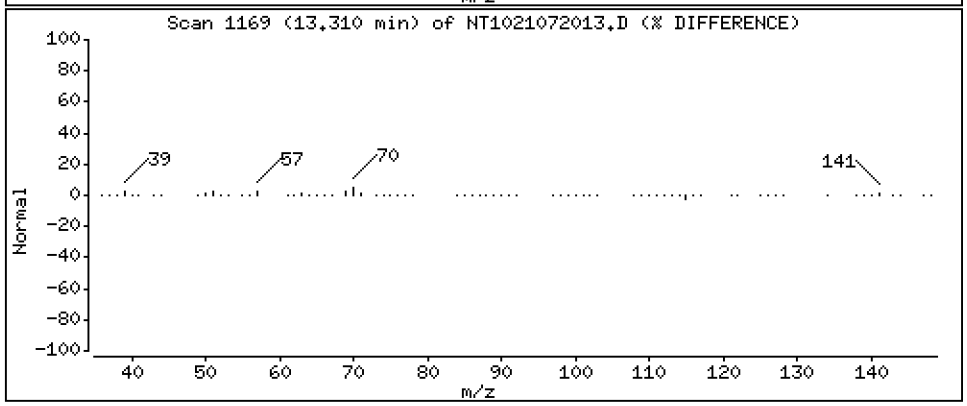












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

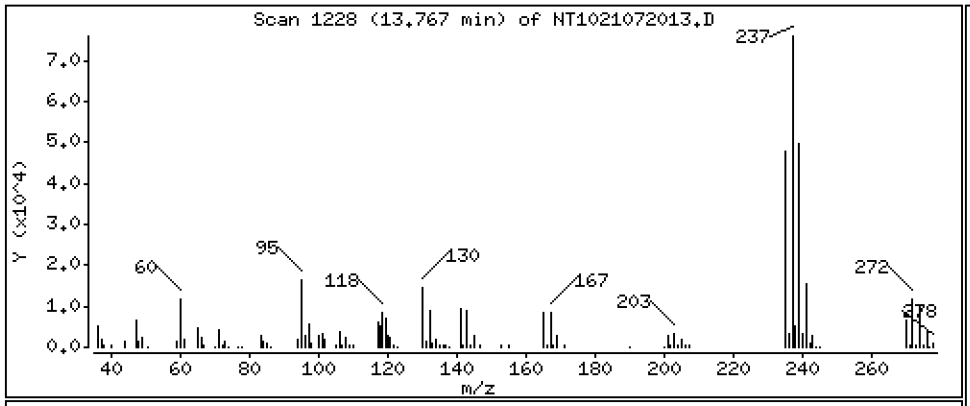
Operator: VTS

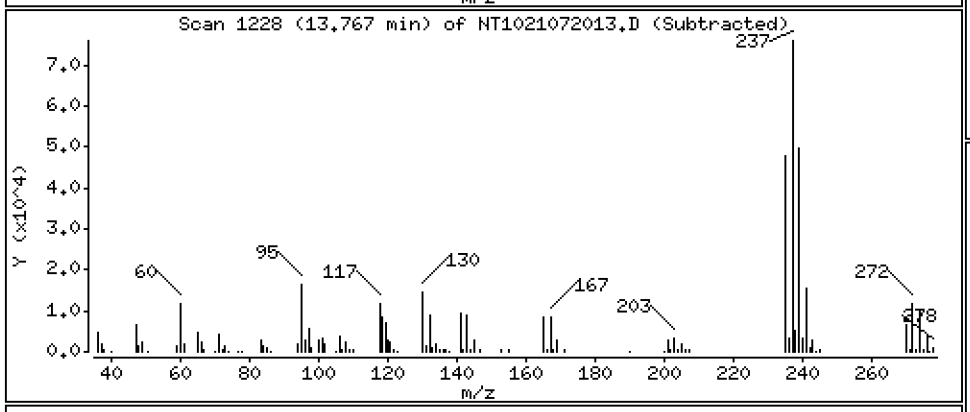
Column phase: ZB-5msi

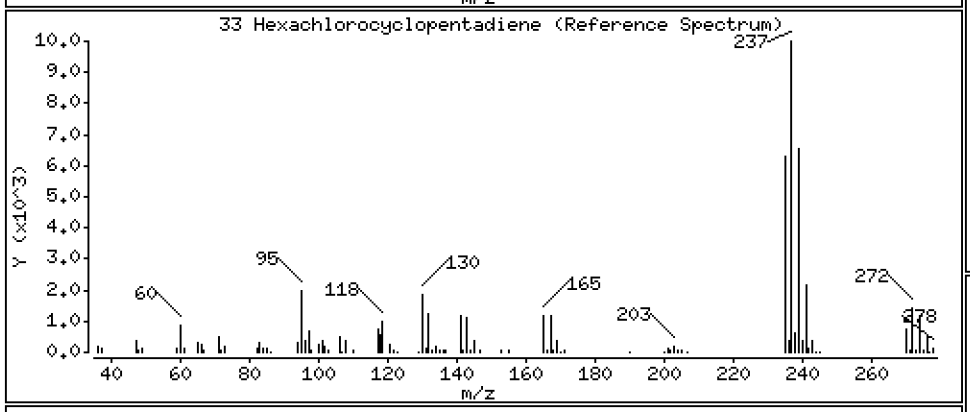
Column diameter: 0.25

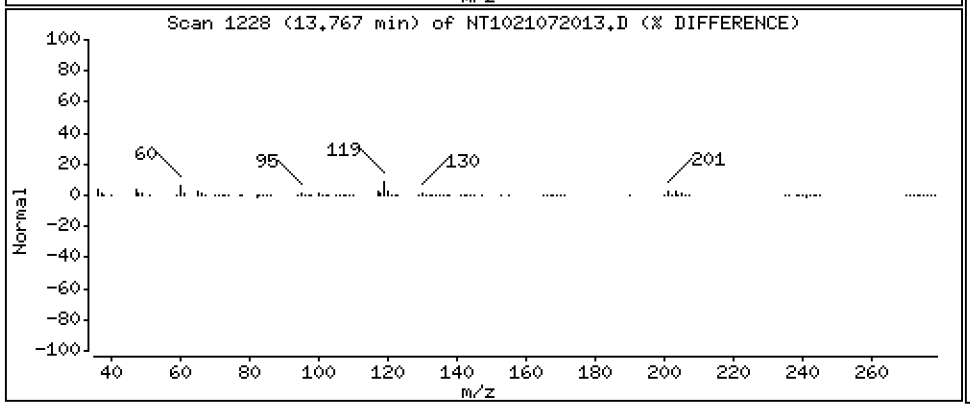
33 Hexachlorocyclopentadiene

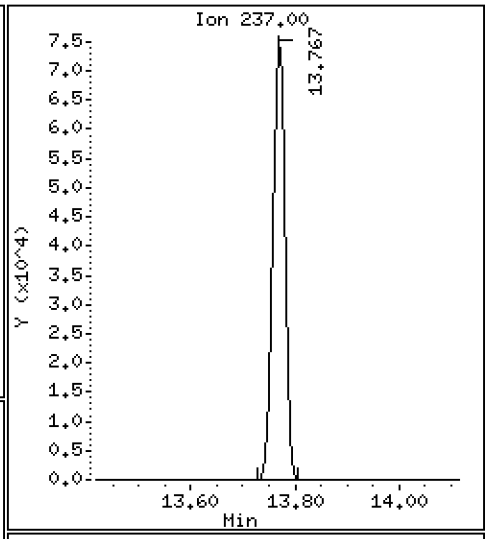
Concentration: 5.671 ug/mL

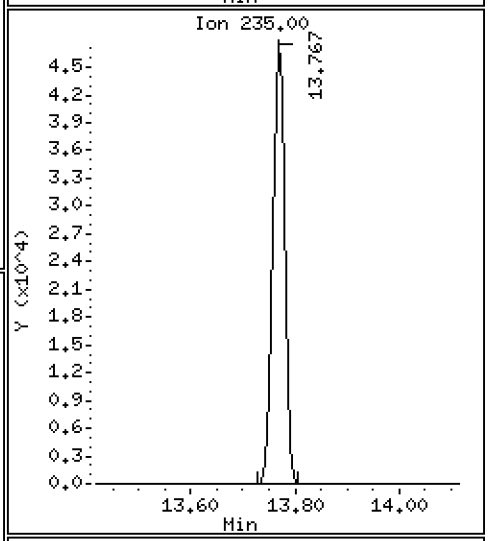


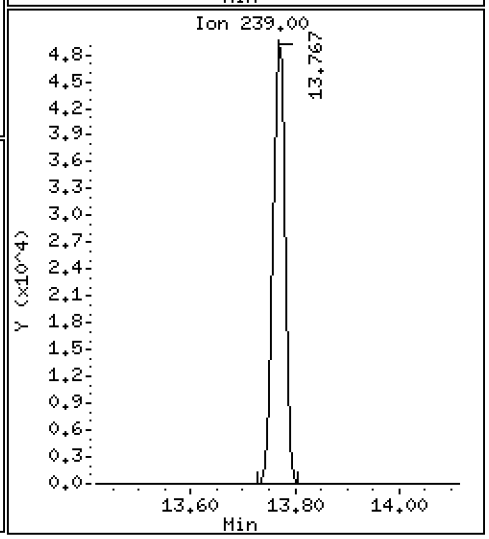












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

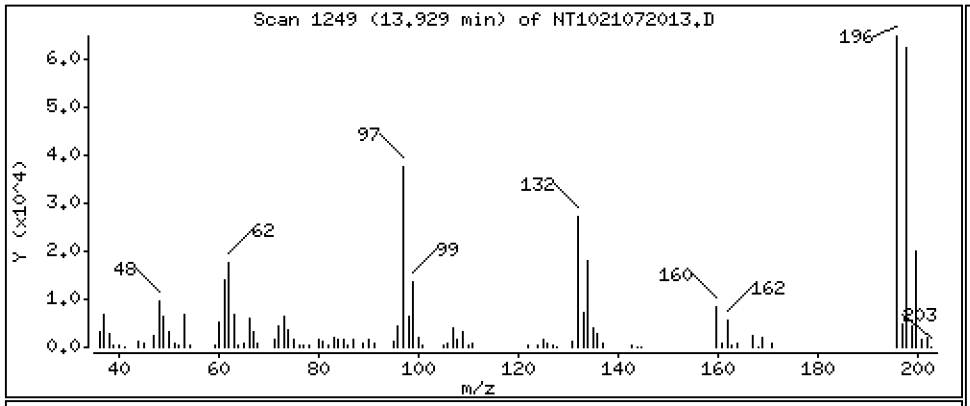
Operator: VTS

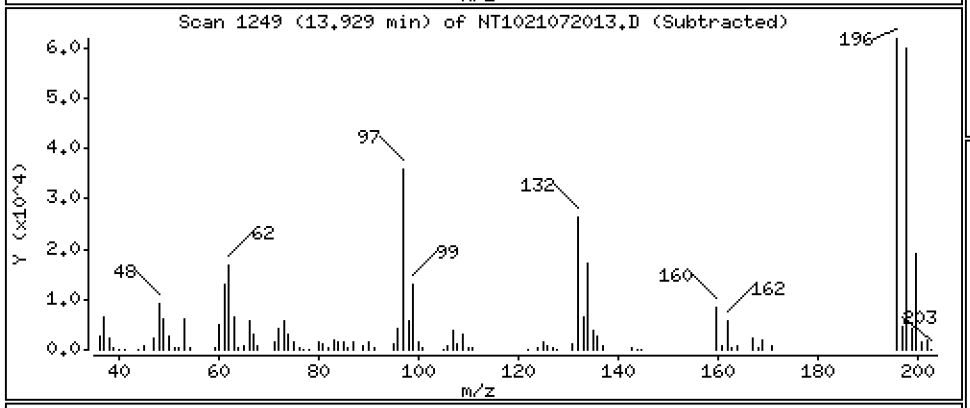
Column phase: ZB-5msi

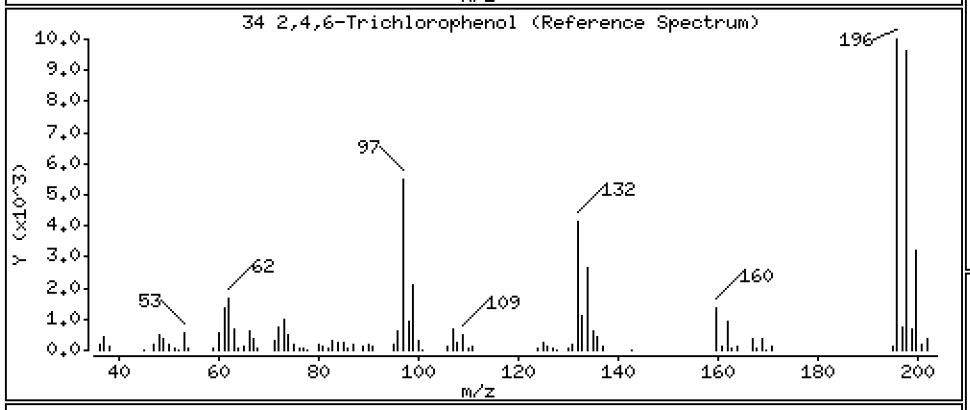
Column diameter: 0.25

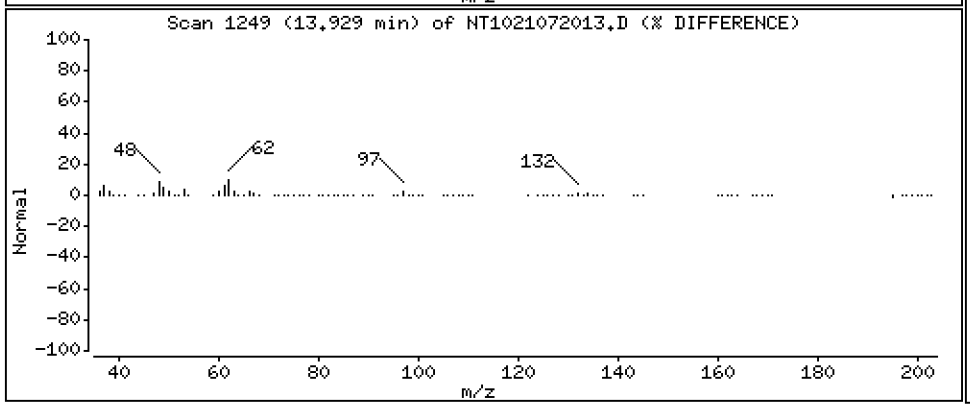
34 2,4,6-Trichlorophenol

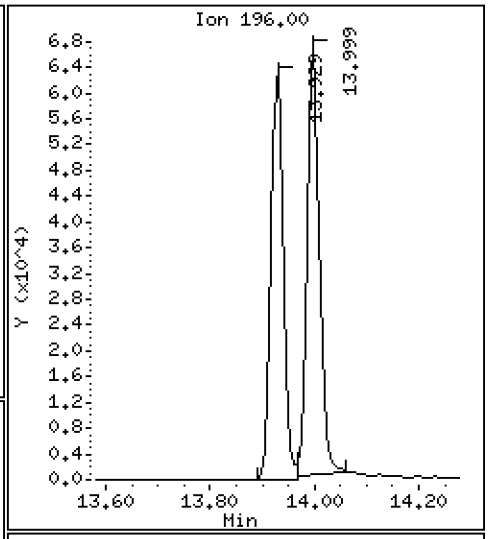
Concentration: 4.713 ug/mL

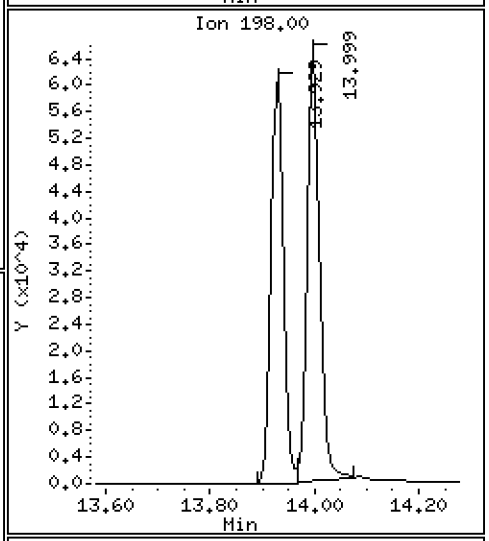


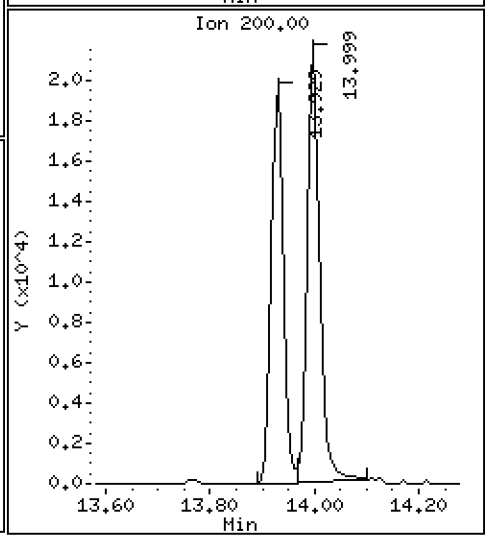












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

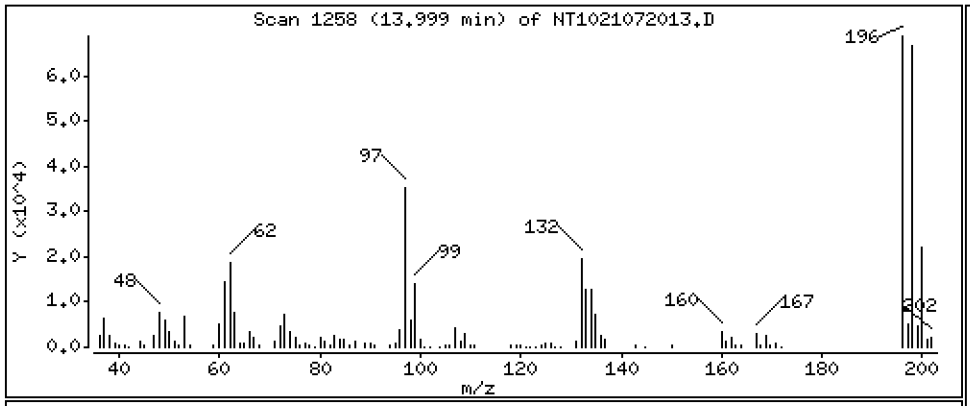
Operator: VTS

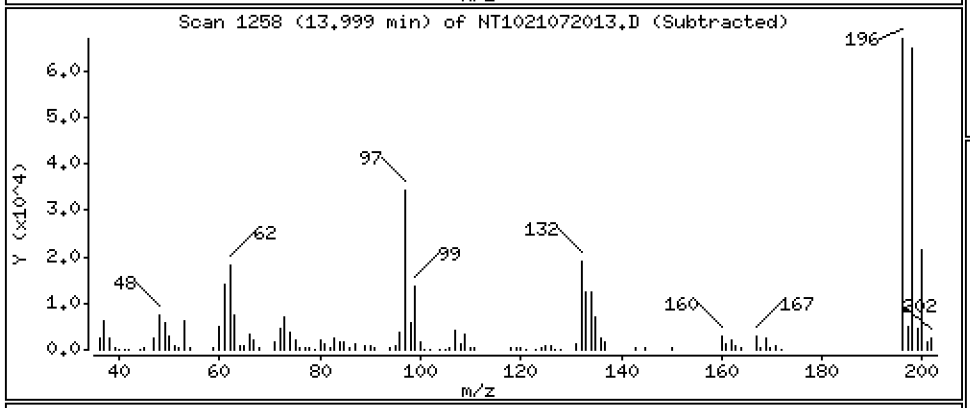
Column phase: ZB-5msi

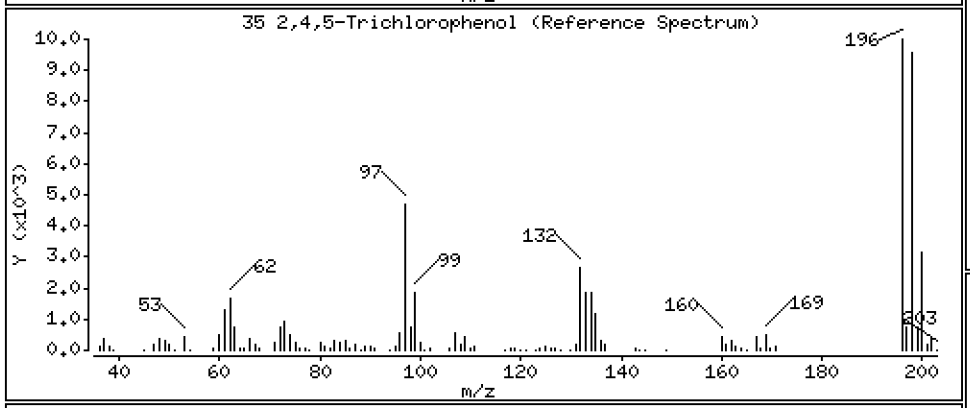
Column diameter: 0.25

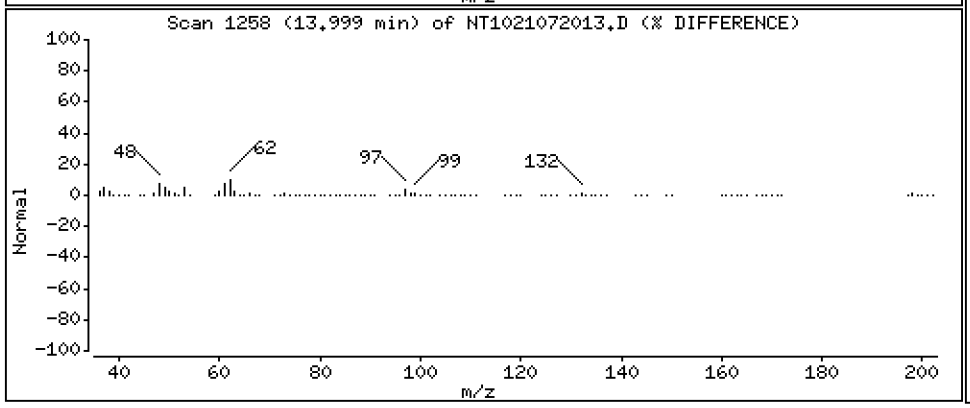
35 2,4,5-Trichlorophenol

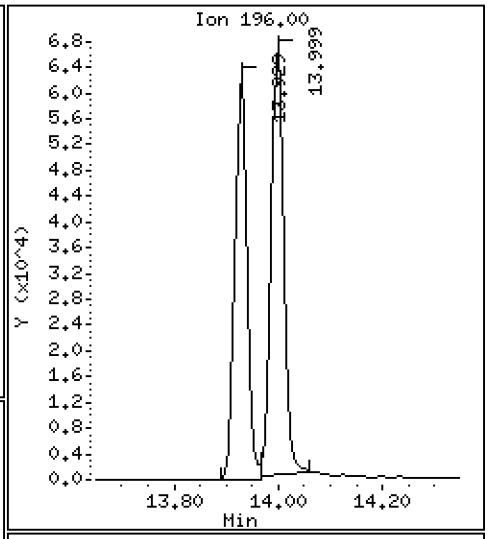
Concentration: 4.721 ug/mL

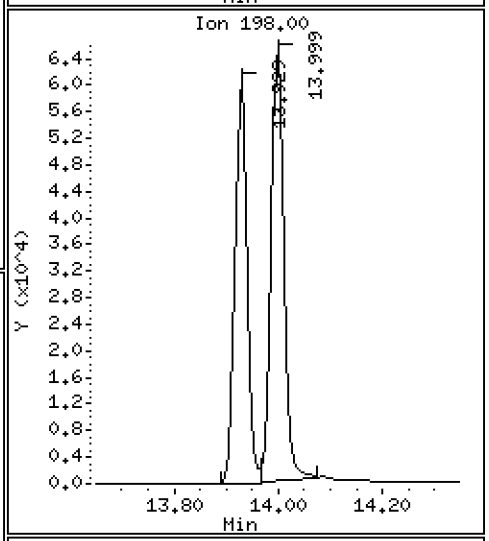


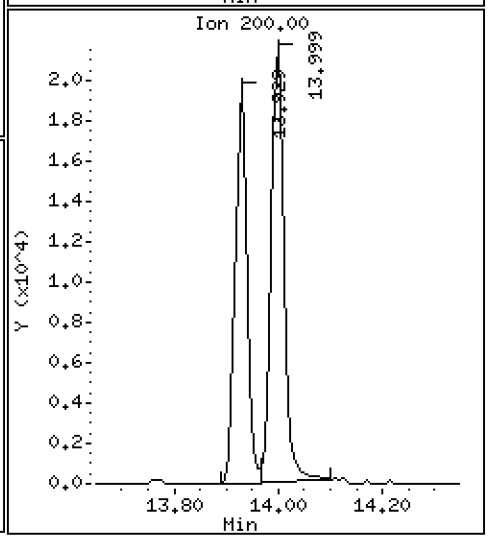












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

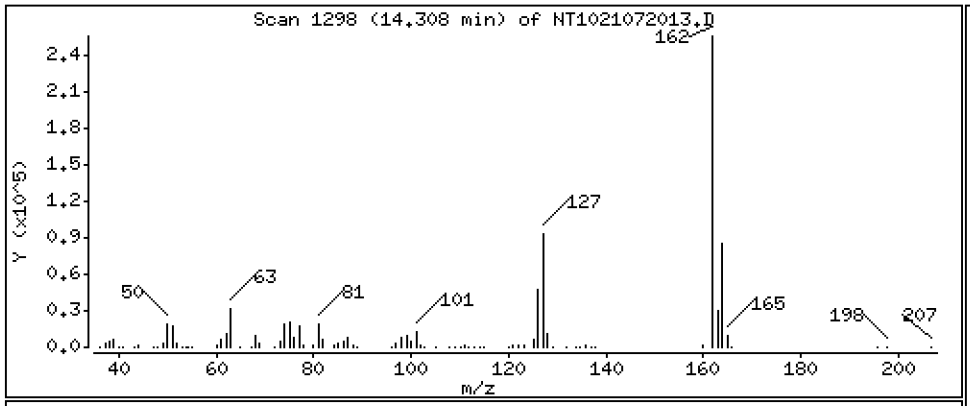
Operator: VTS

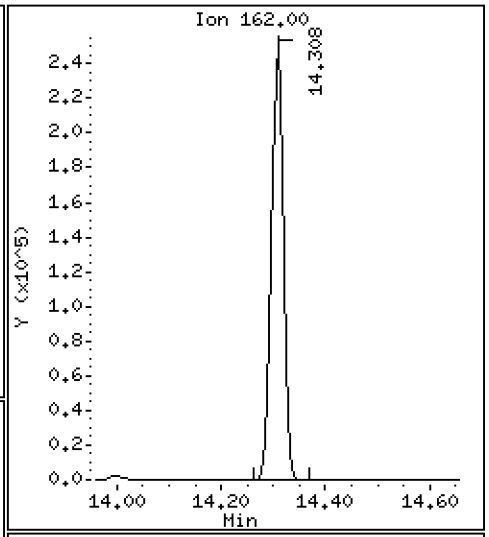
Column phase: ZB-5msi

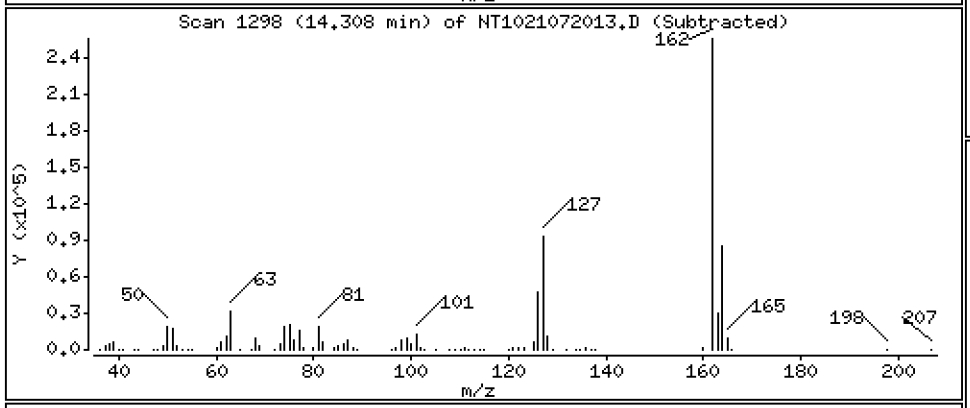
Column diameter: 0.25

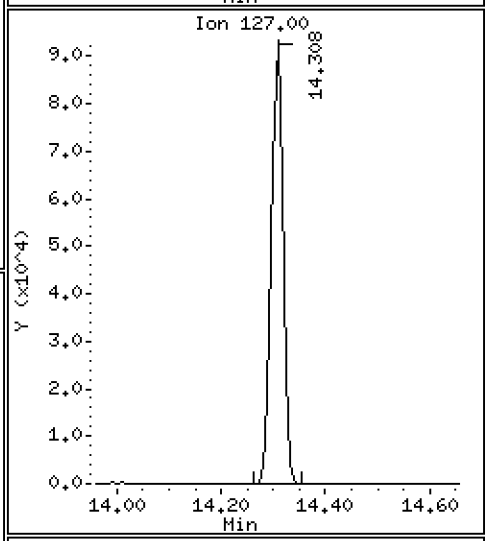
37 2-Chloronaphthalene

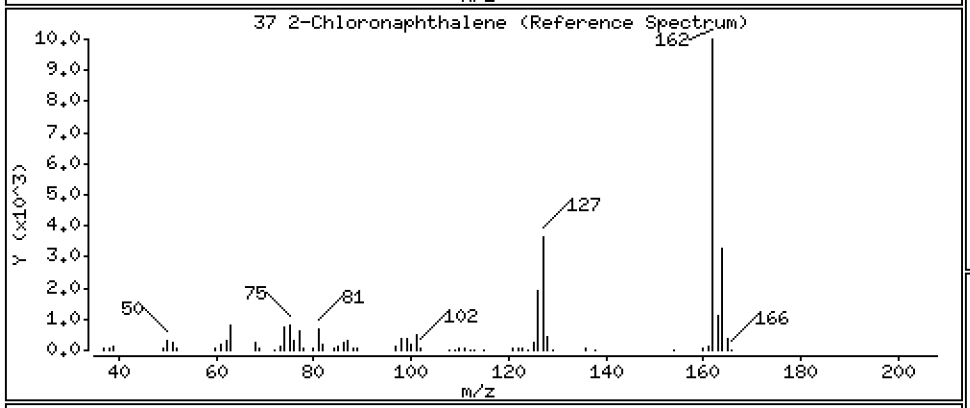
Concentration: 5.085 ug/mL

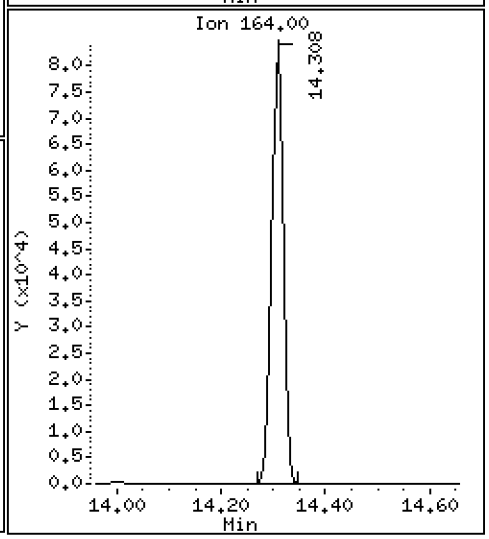


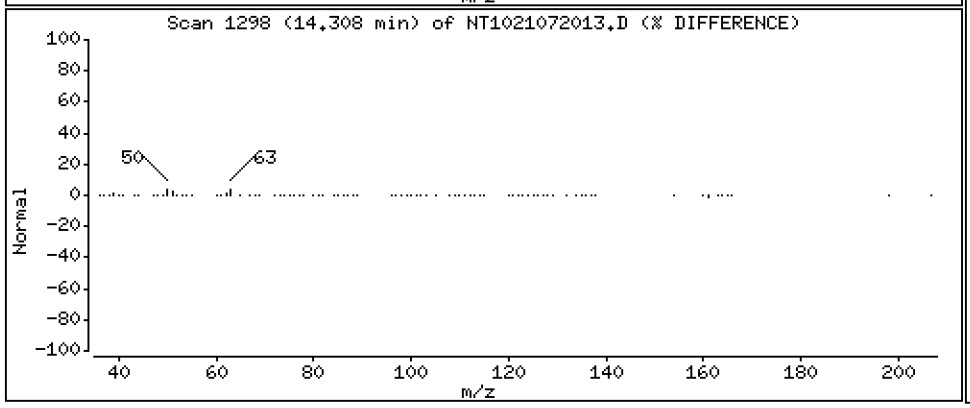












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

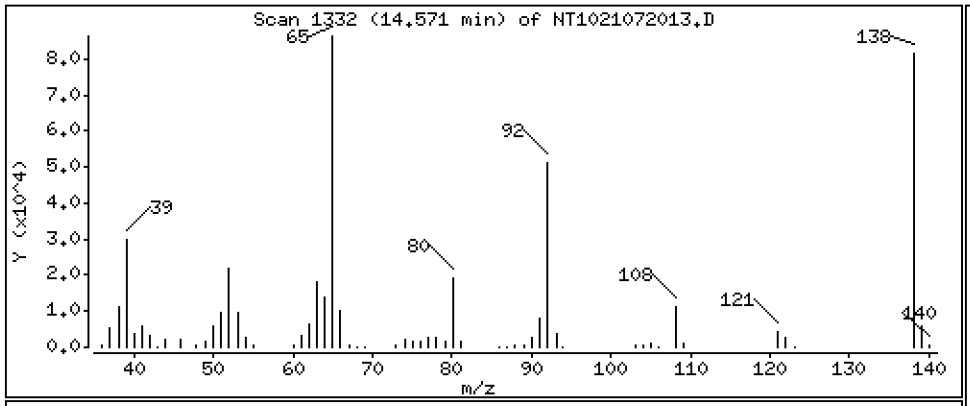
Operator: VTS

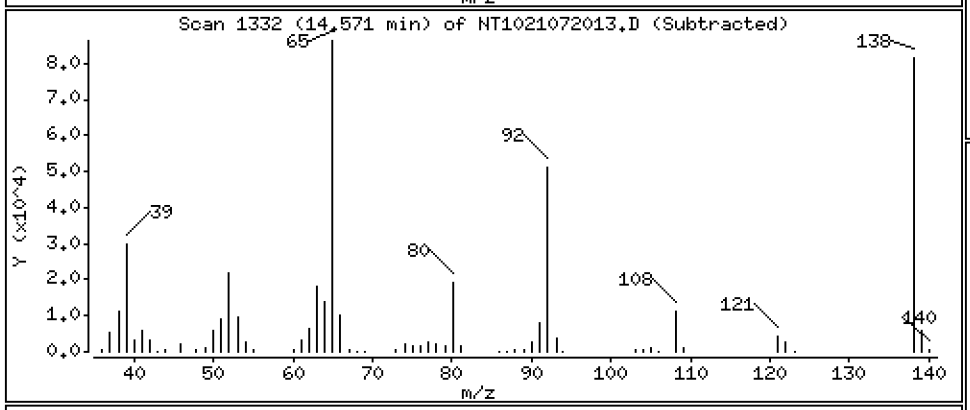
Column phase: ZB-5msi

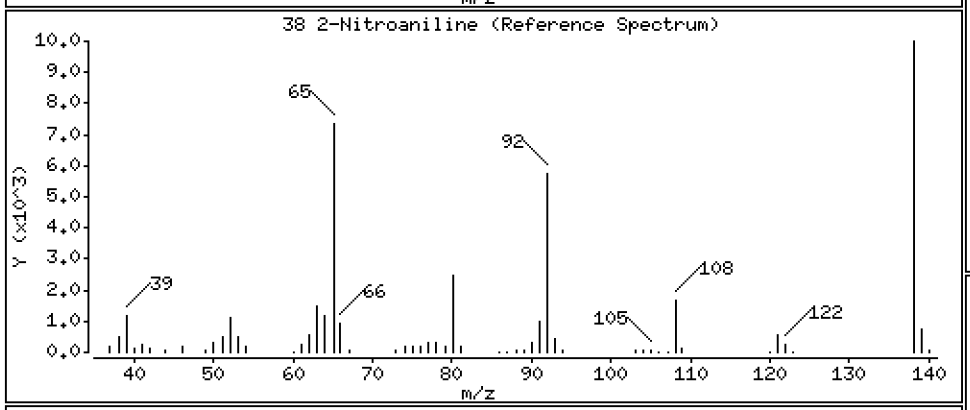
Column diameter: 0.25

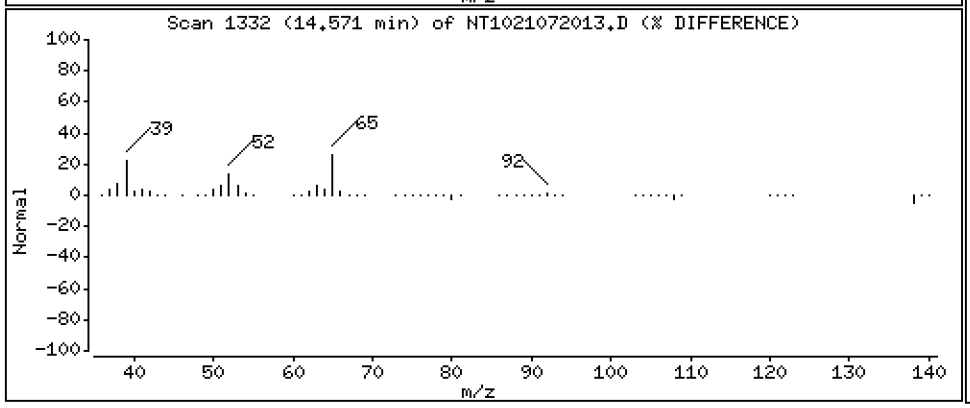
38 2-Nitroaniline

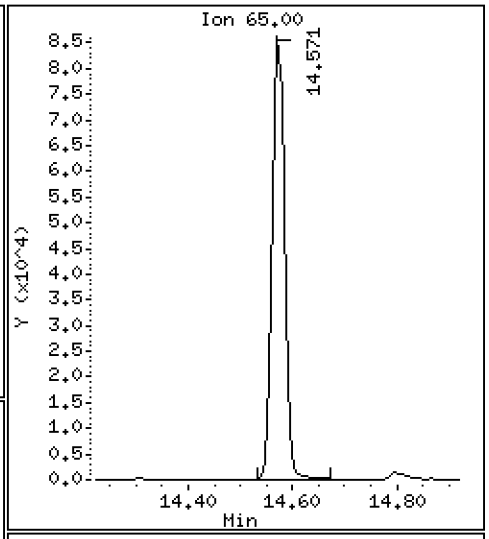
Concentration: 4.848 ug/mL

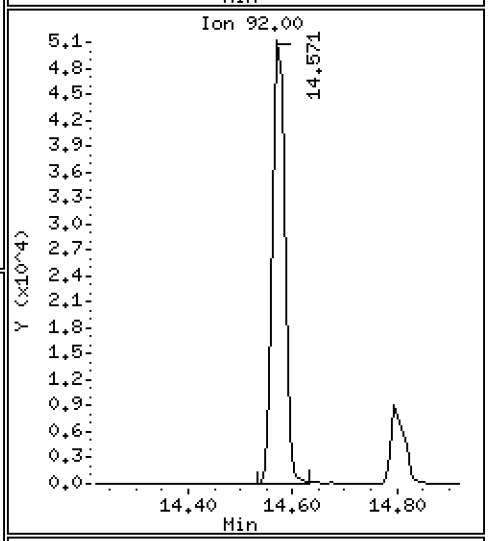


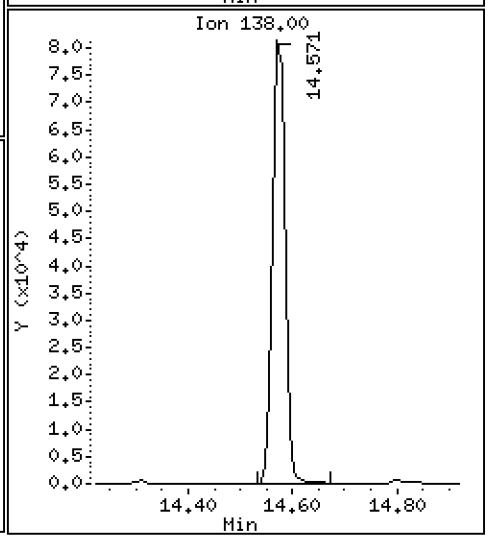












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

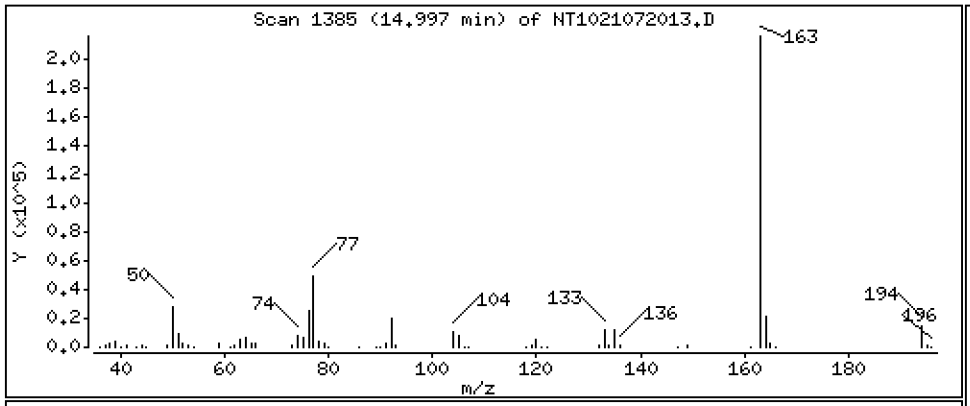
Operator: VTS

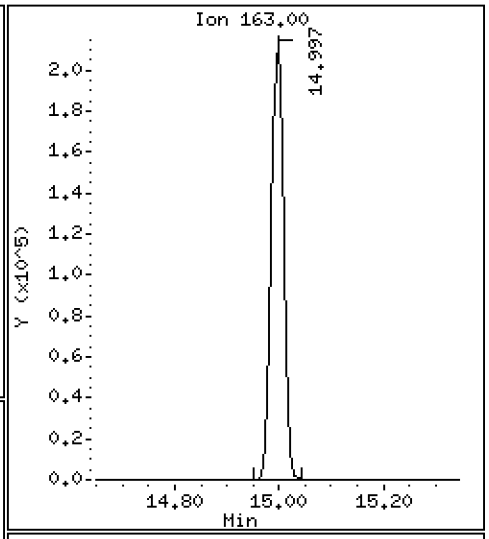
Column phase: ZB-5msi

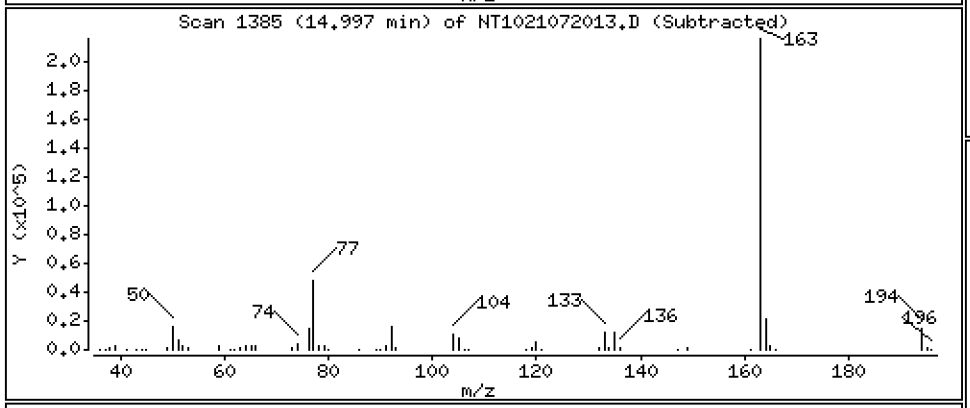
Column diameter: 0.25

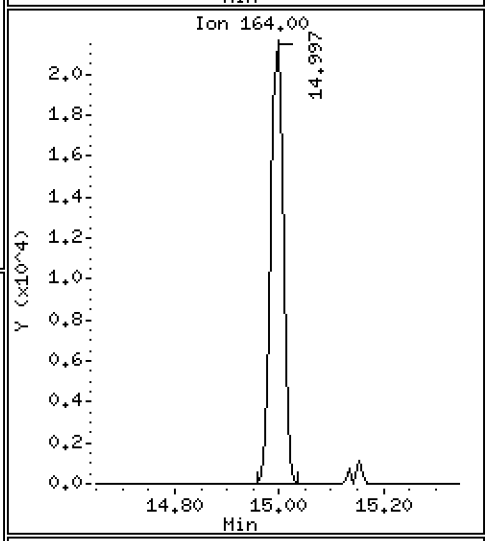
39 Dimethylphthalate

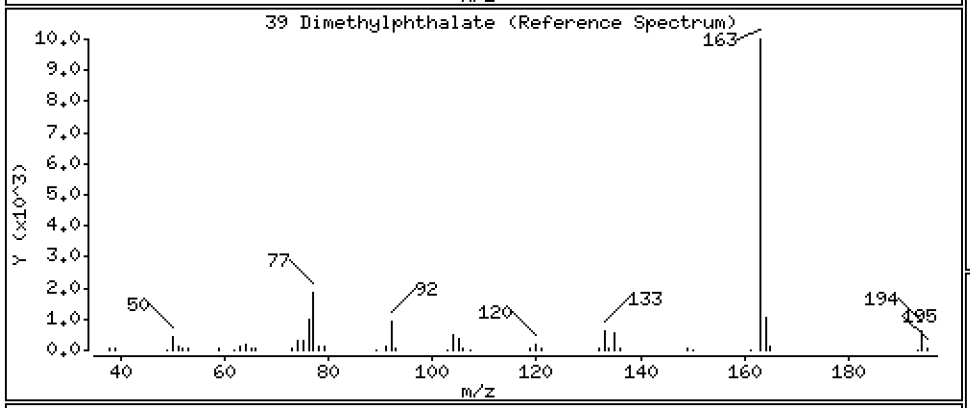
Concentration: 4.656 ug/mL

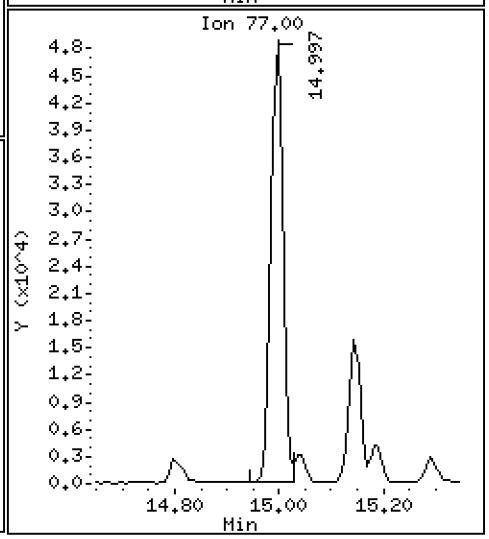


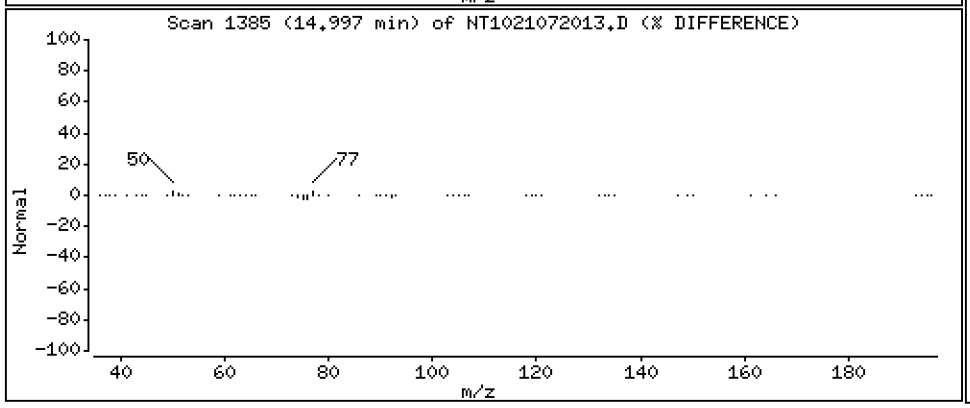












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

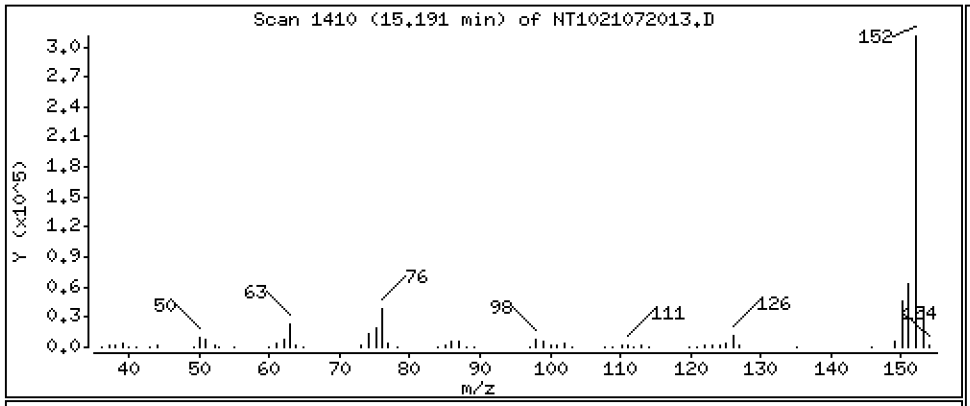
Operator: VTS

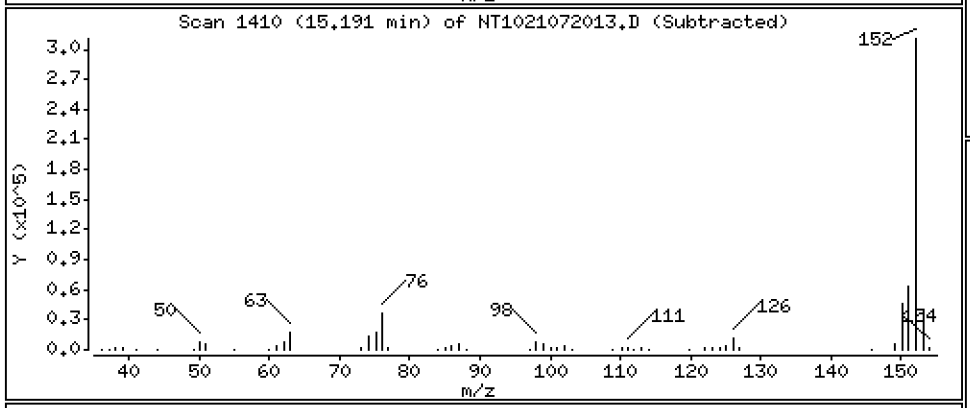
Column phase: ZB-5msi

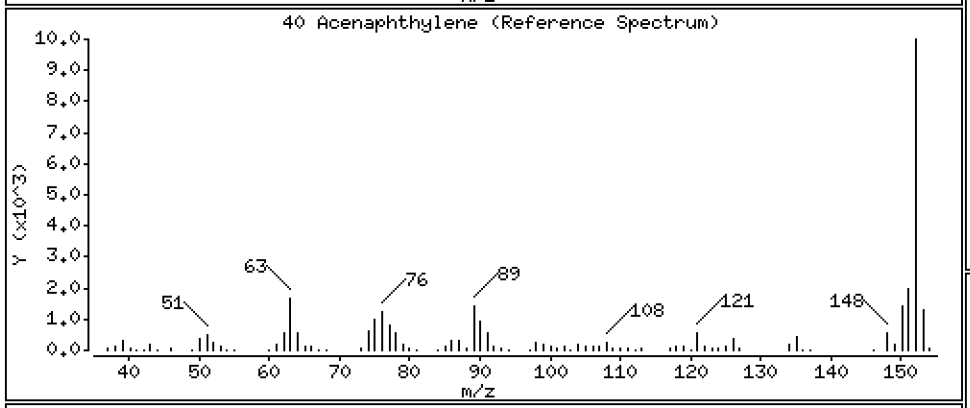
Column diameter: 0.25

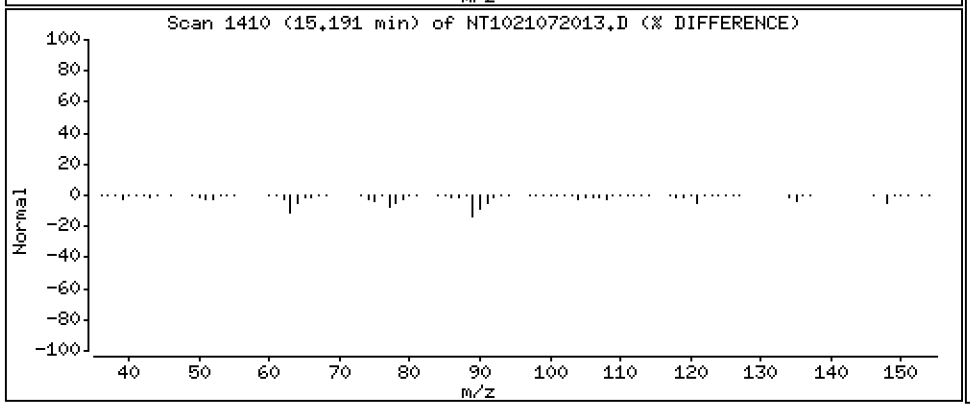
40 Acenaphthylene

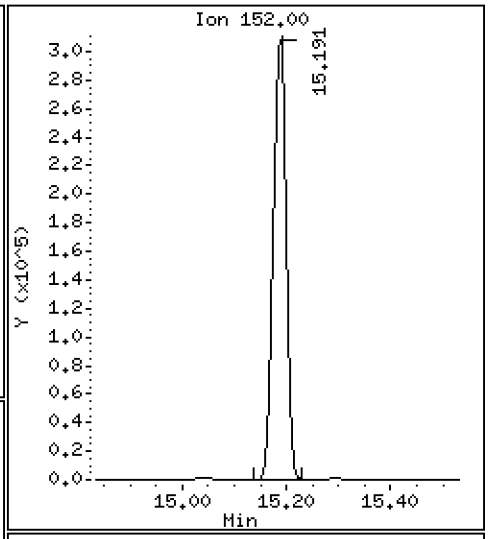
Concentration: 4.846 ug/mL

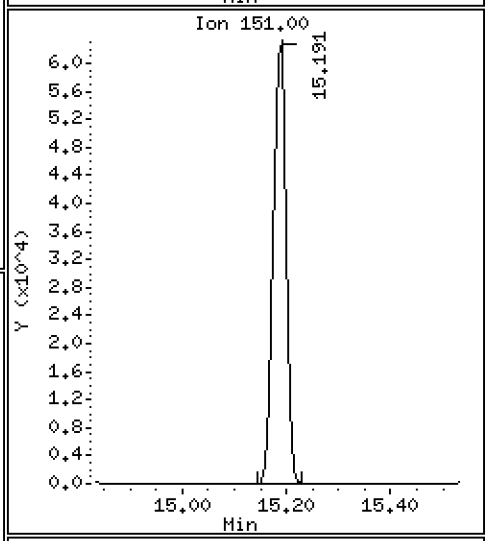


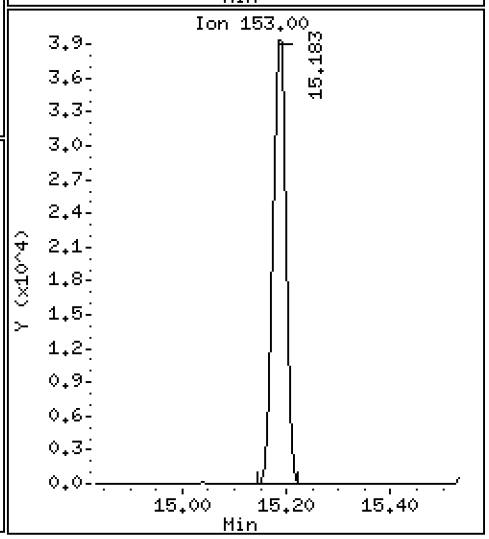












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

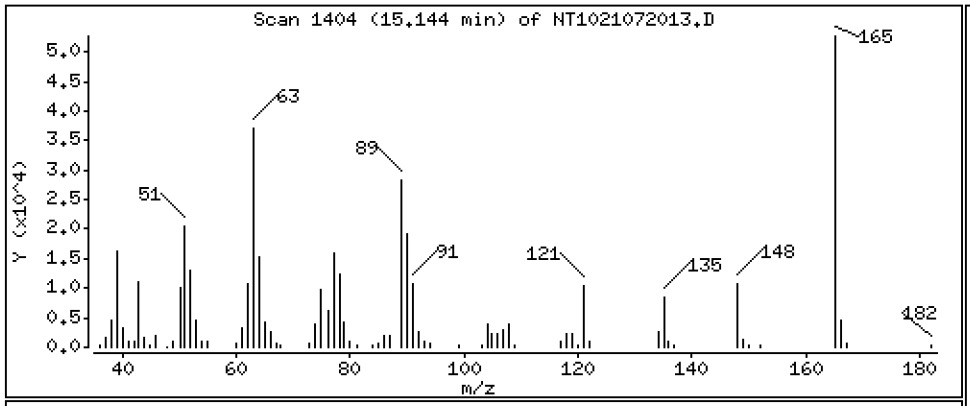
Operator: VTS

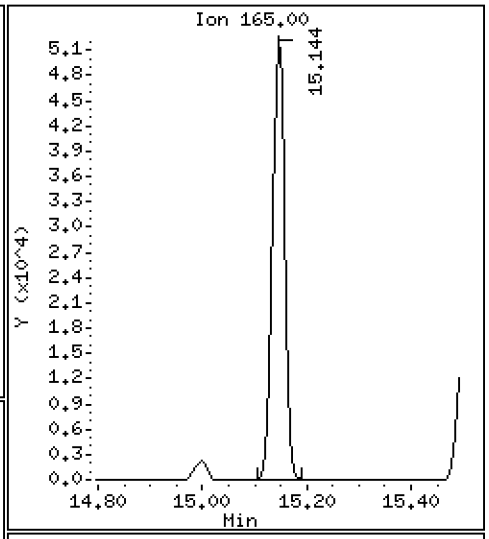
Column phase: ZB-5msi

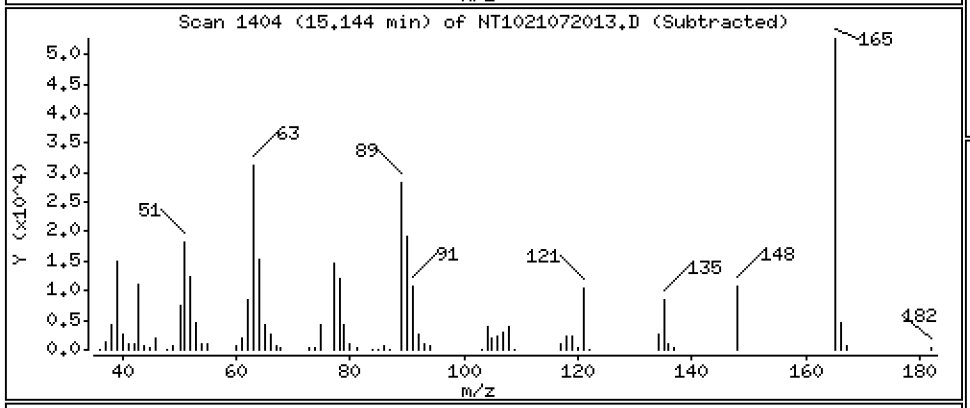
Column diameter: 0.25

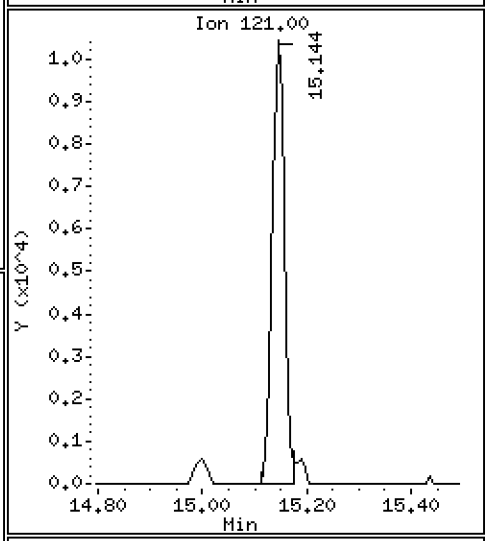
41 2,6-Dinitrotoluene

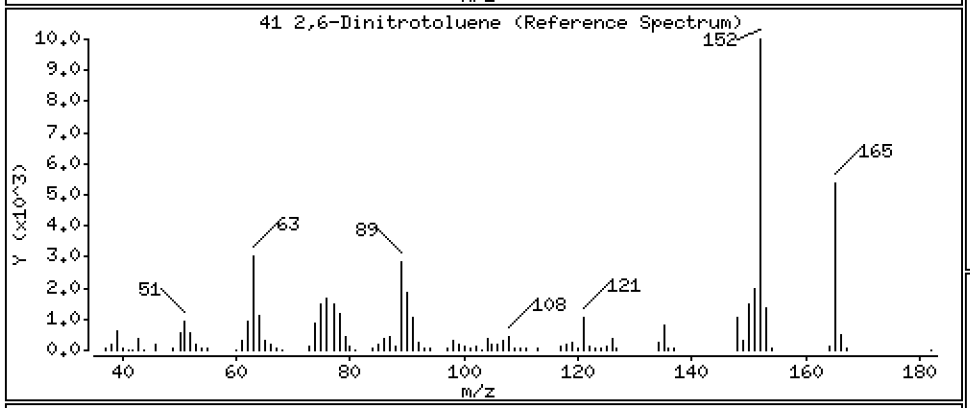
Concentration: 4.973 ug/mL

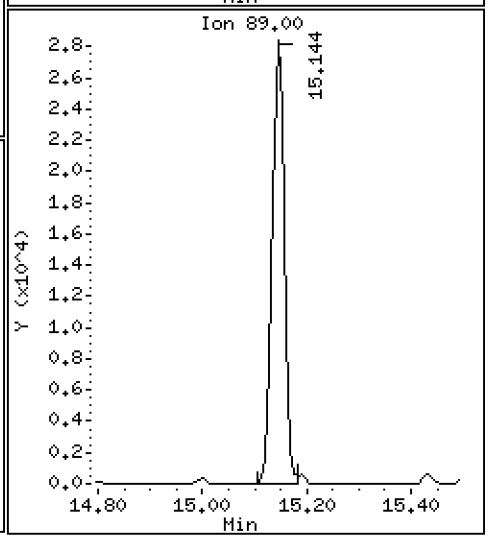


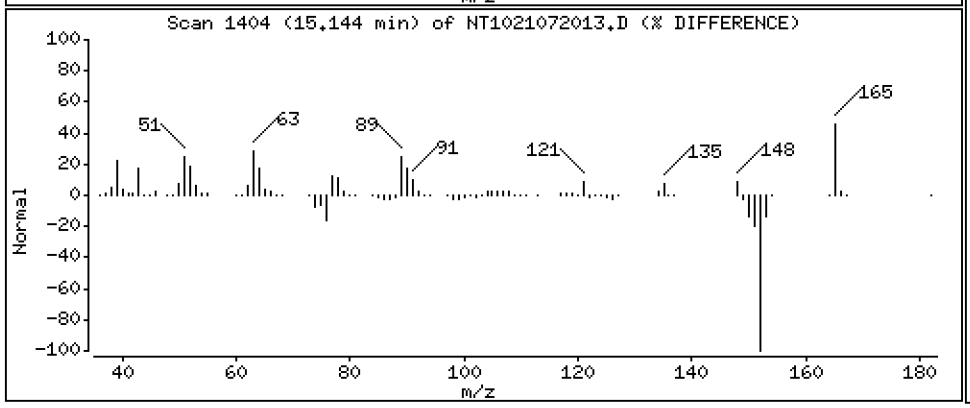












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

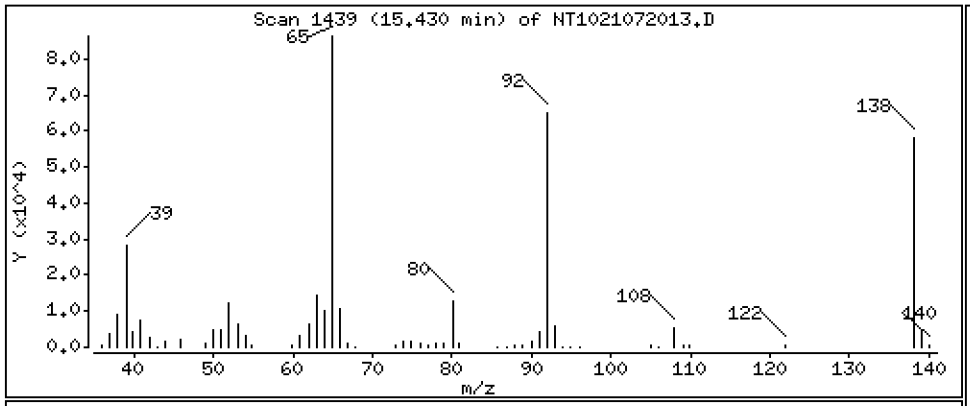
Operator: VTS

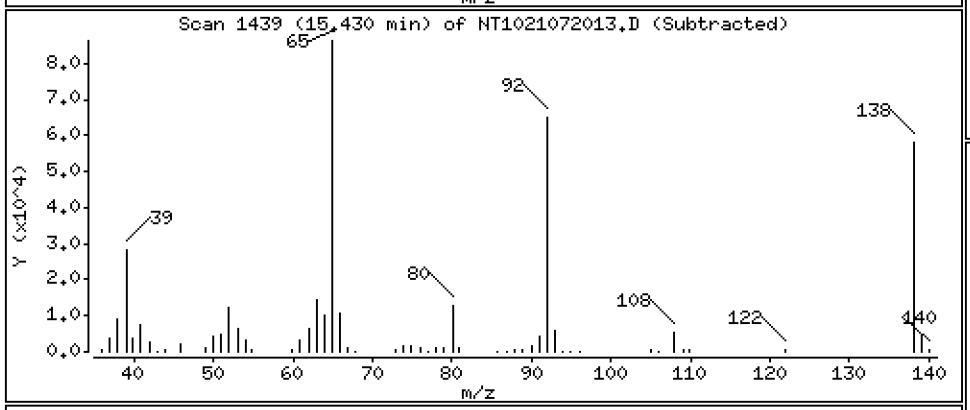
Column phase: ZB-5msi

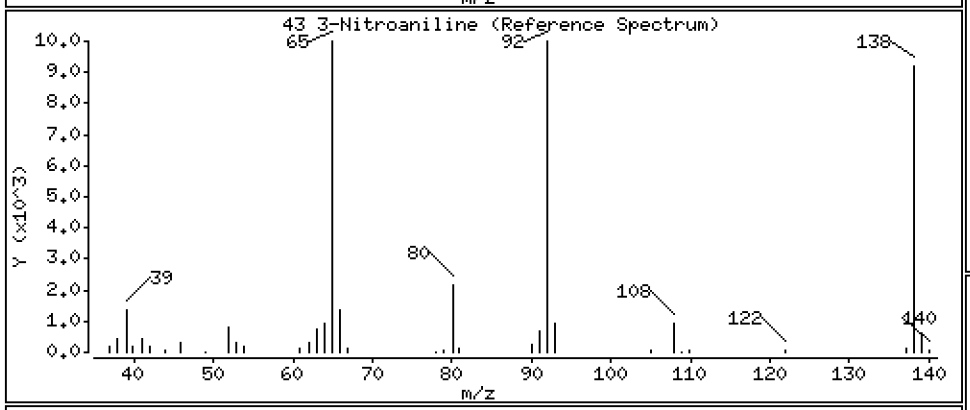
Column diameter: 0.25

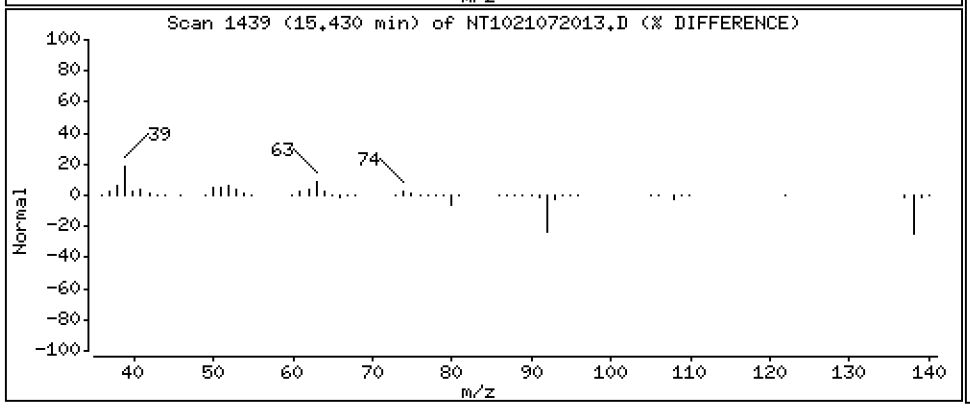
43 3-Nitroaniline

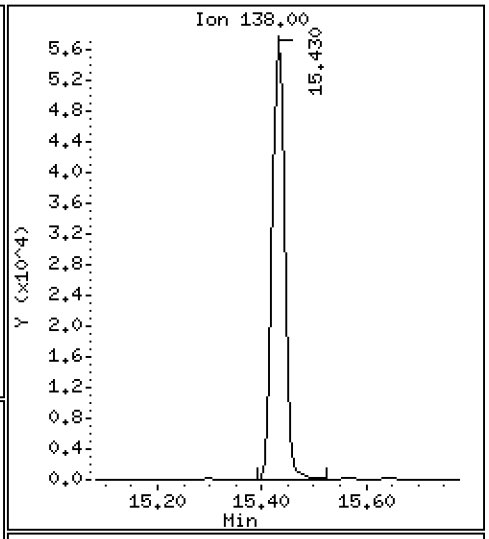
Concentration: 4.557 ug/mL

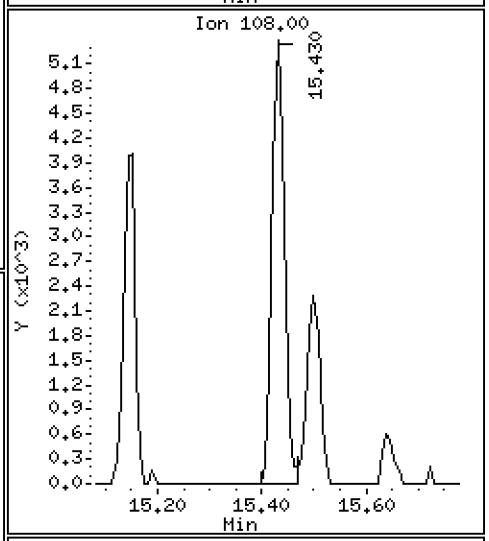


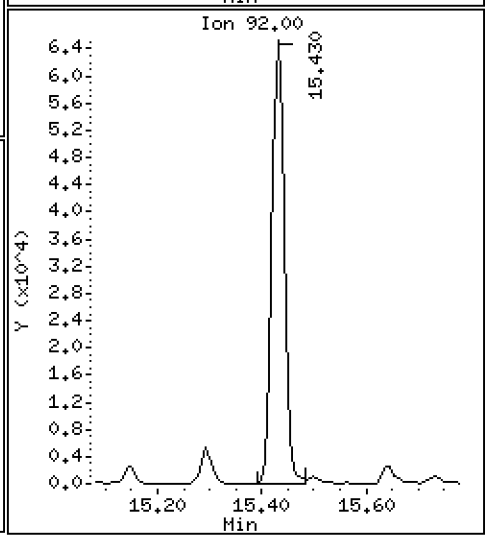












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

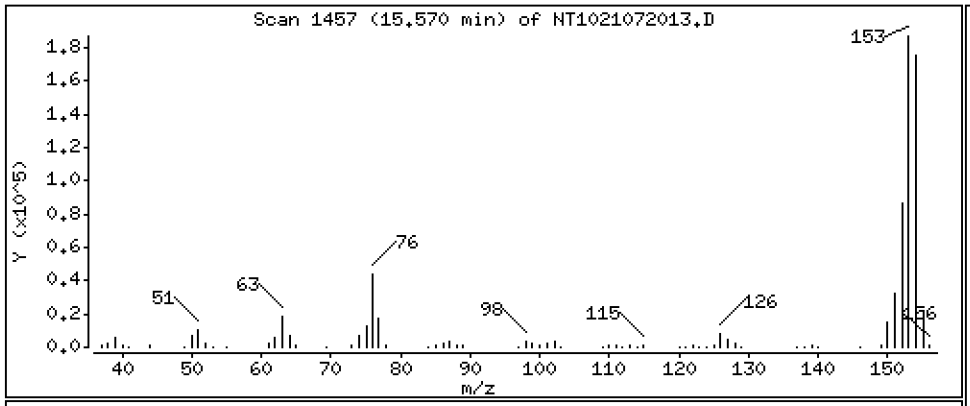
Operator: VTS

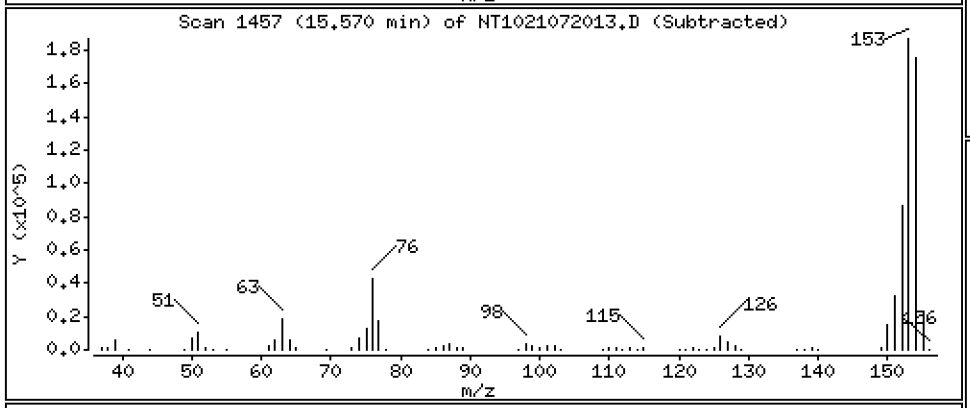
Column phase: ZB-5msi

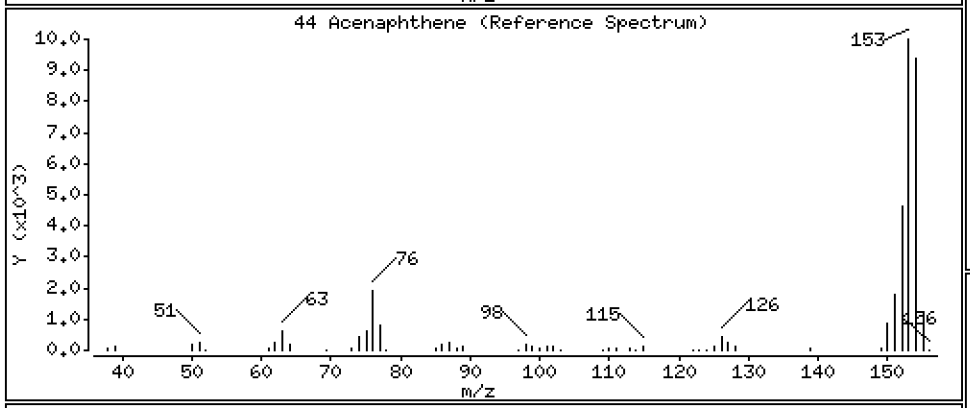
Column diameter: 0.25

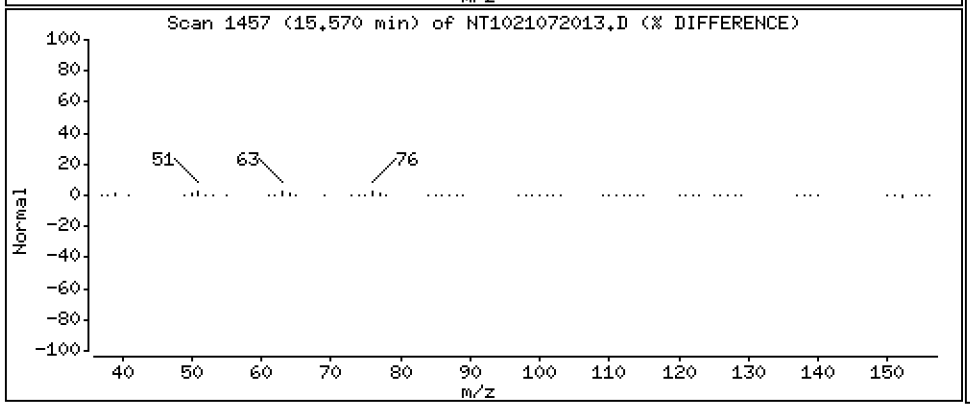
44 Acenaphthene

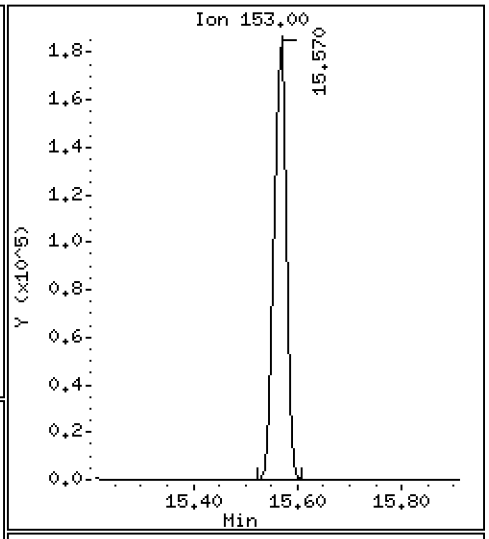
Concentration: 4.792 ug/mL

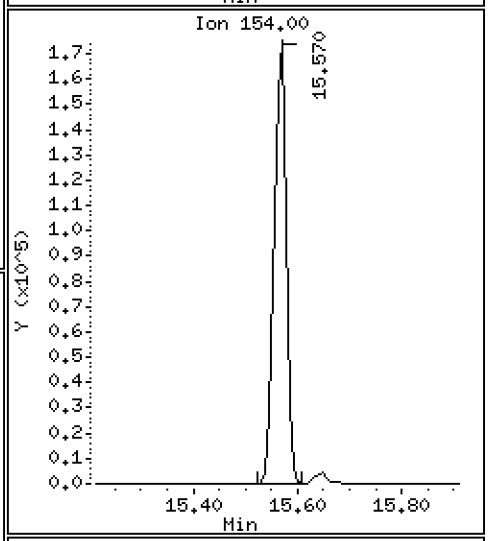


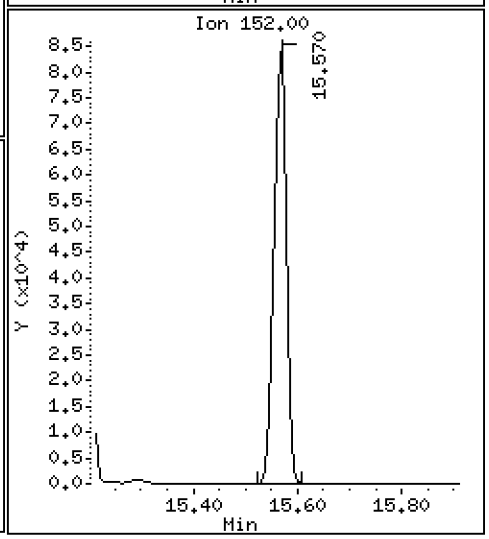












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

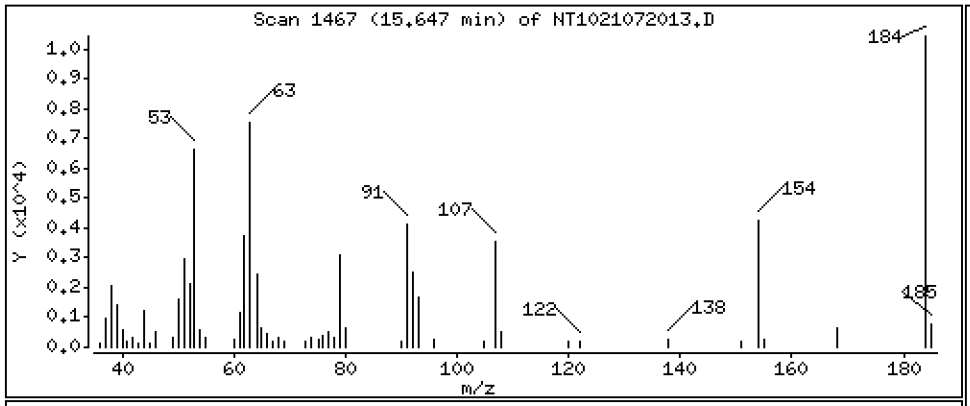
Operator: VTS

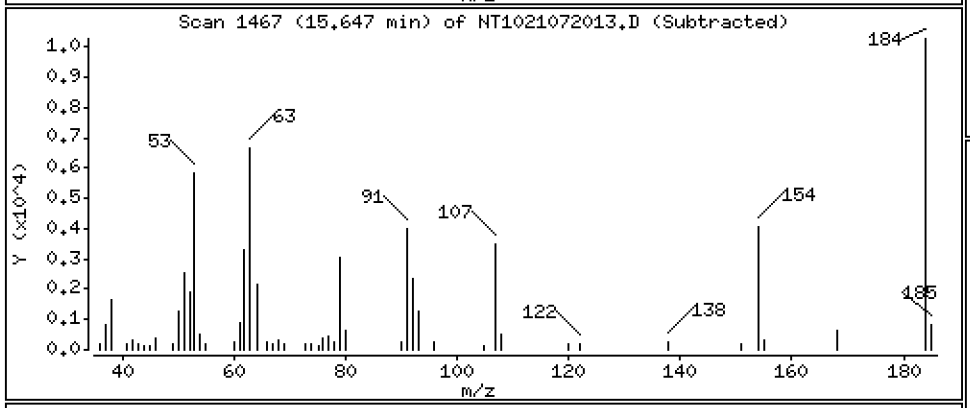
Column phase: ZB-5msi

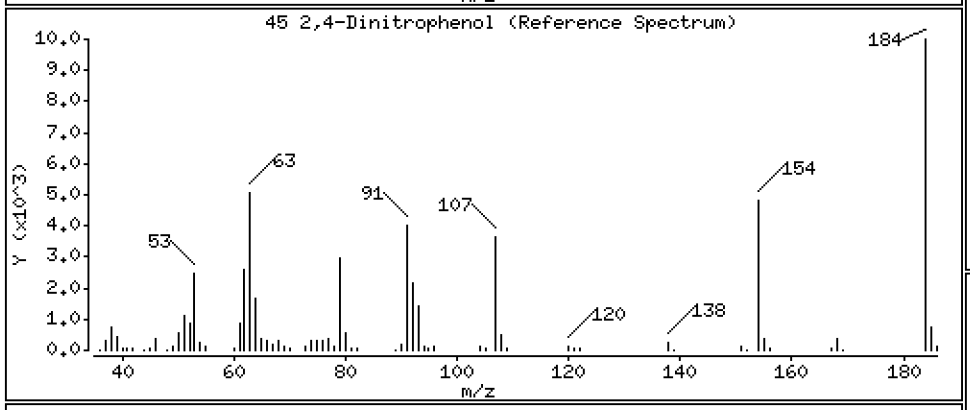
Column diameter: 0.25

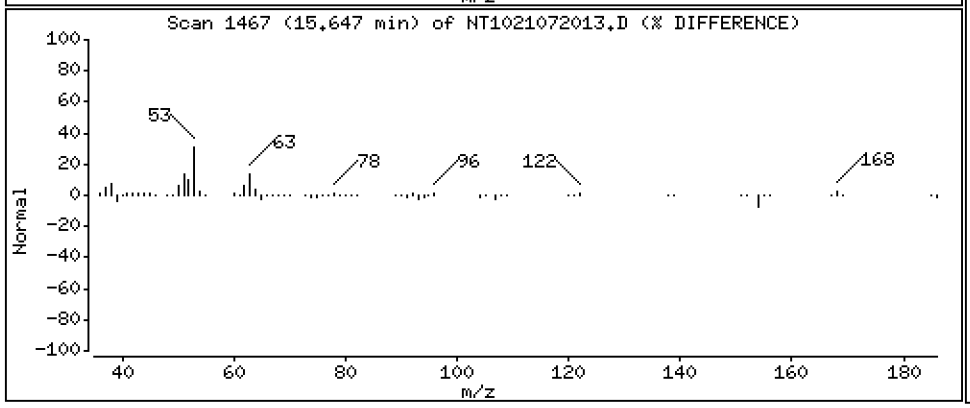
45 2,4-Dinitrophenol

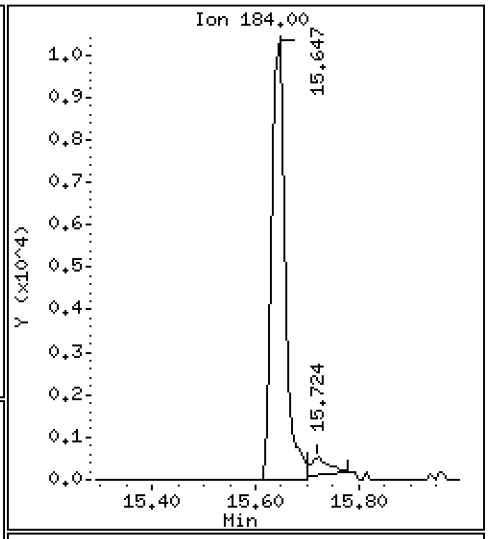
Concentration: 1.928 ug/mL

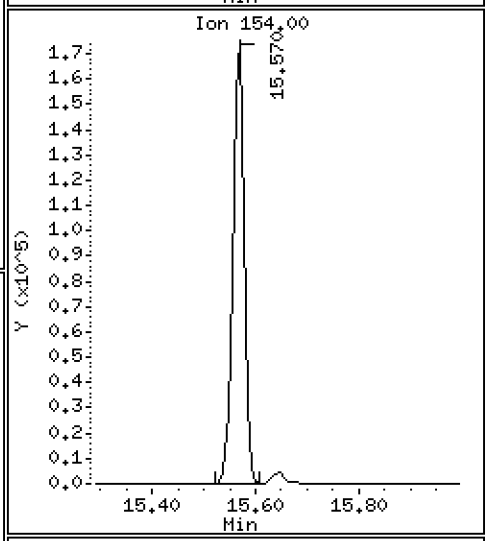


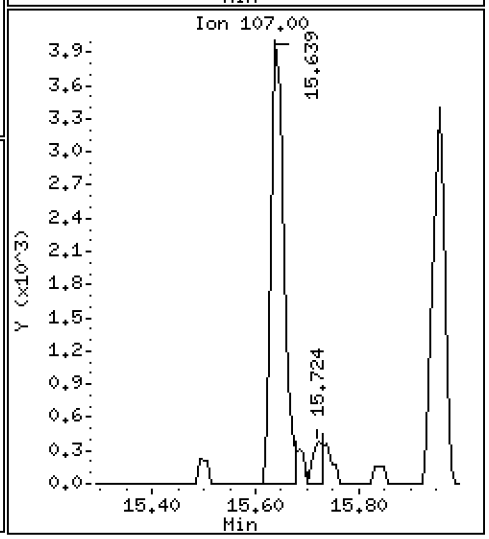












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

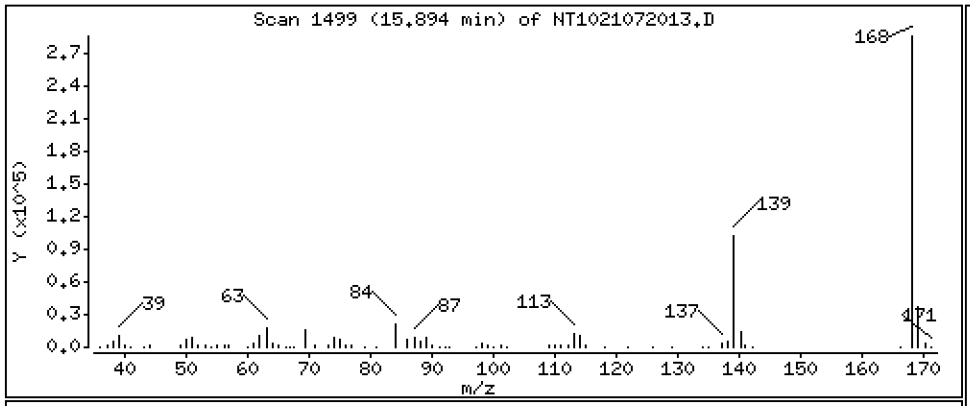
Operator: VTS

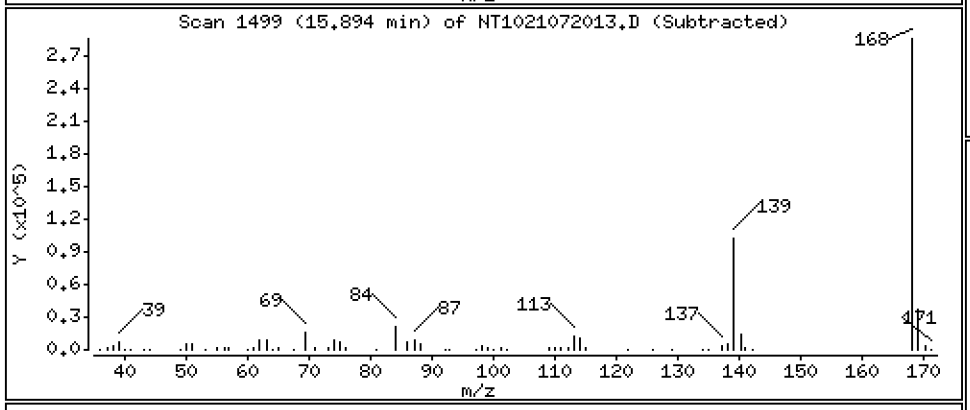
Column phase: ZB-5msi

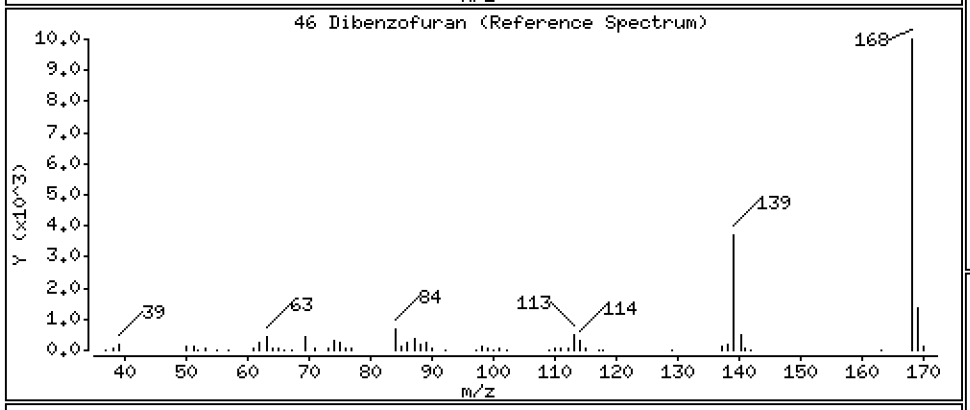
Column diameter: 0.25

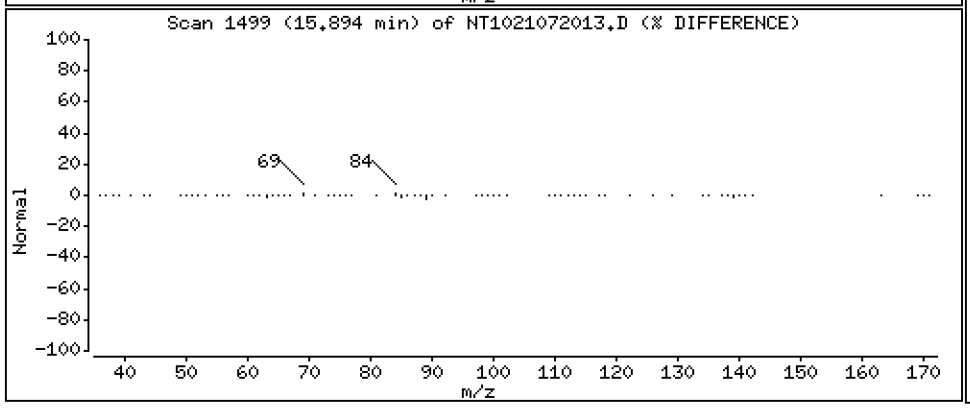
46 Dibenzofuran

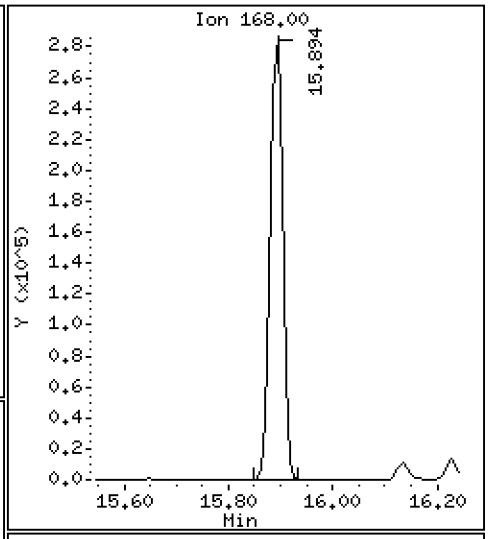
Concentration: 4.833 ug/mL

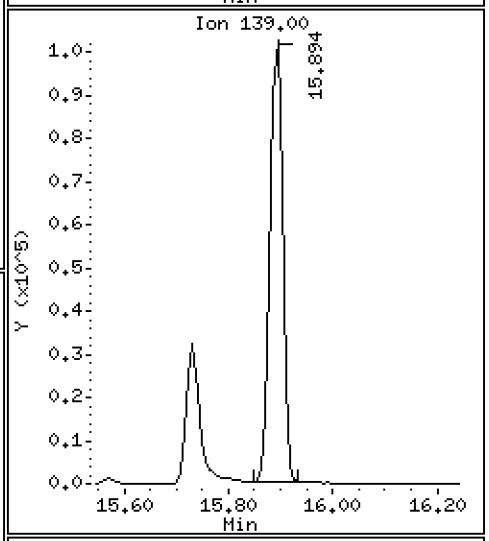


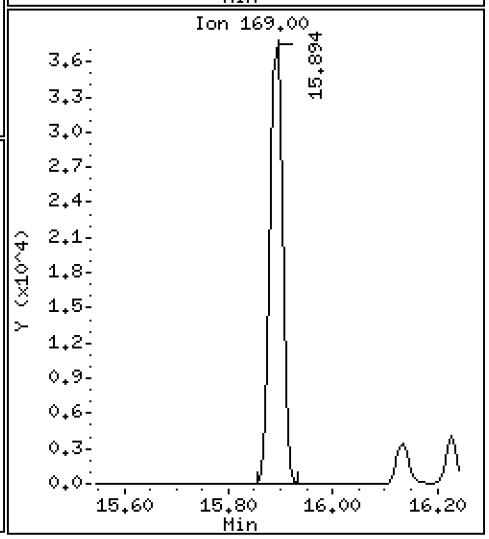












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

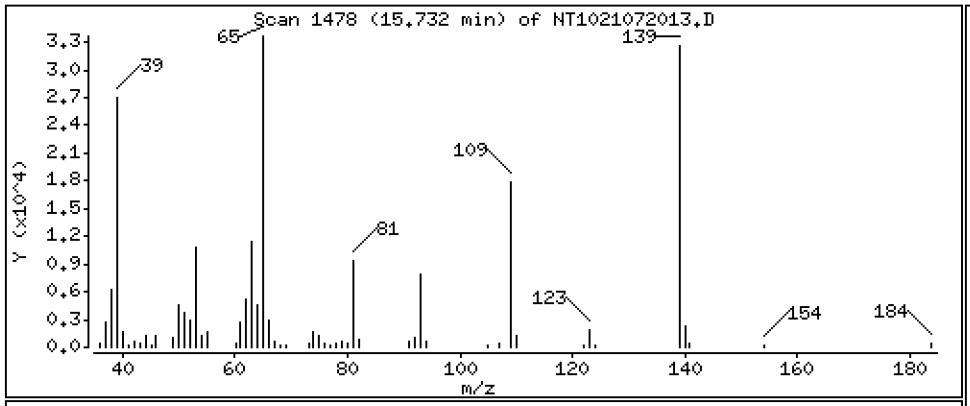
Operator: VTS

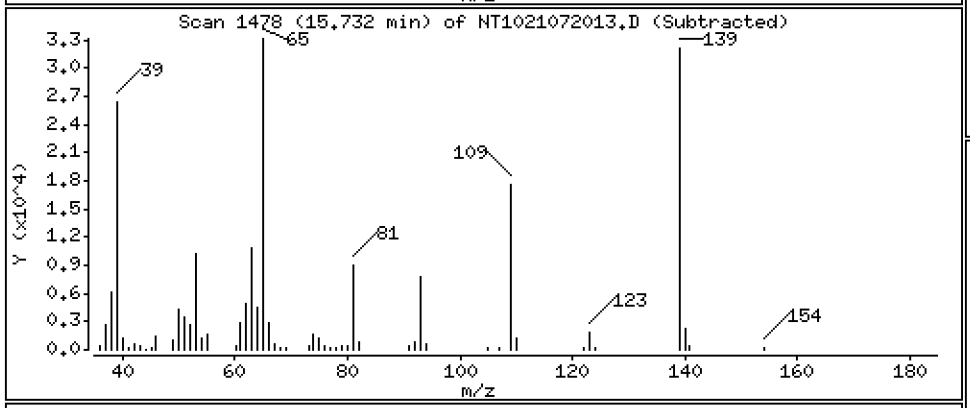
Column phase: ZB-5msi

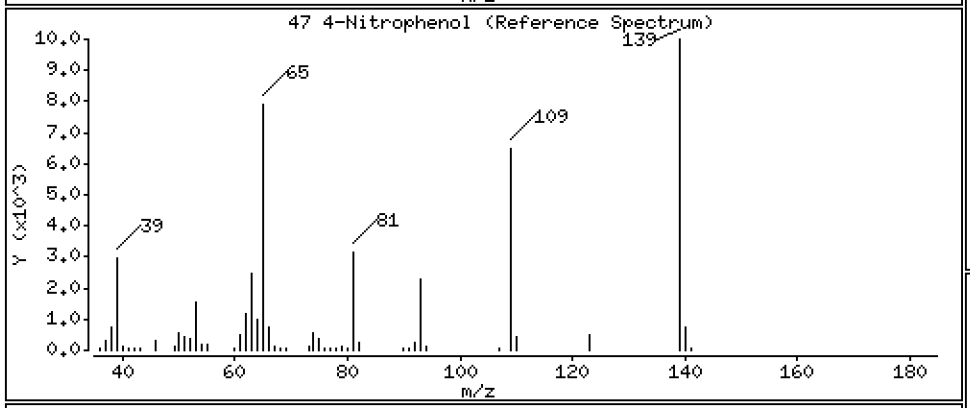
Column diameter: 0.25

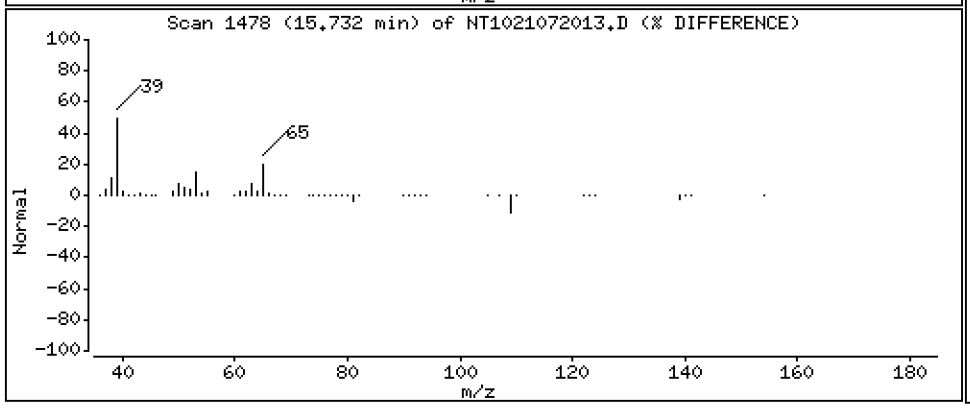
47 4-Nitrophenol

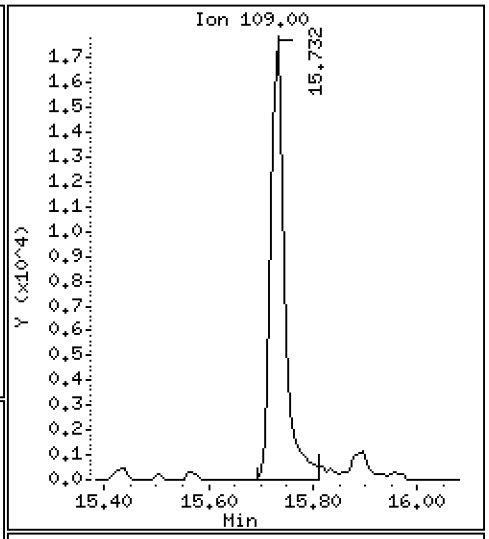
Concentration: 4.089 ug/mL

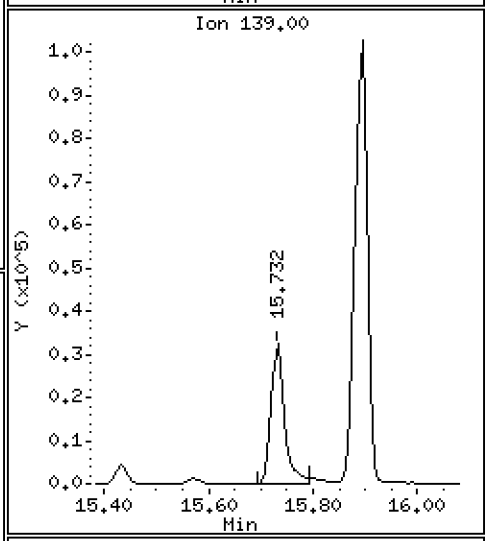


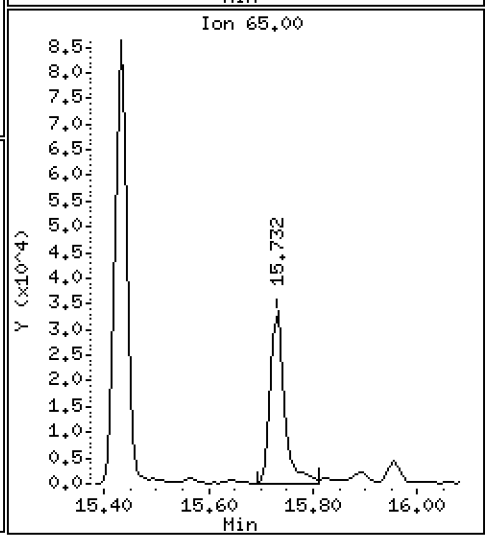












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

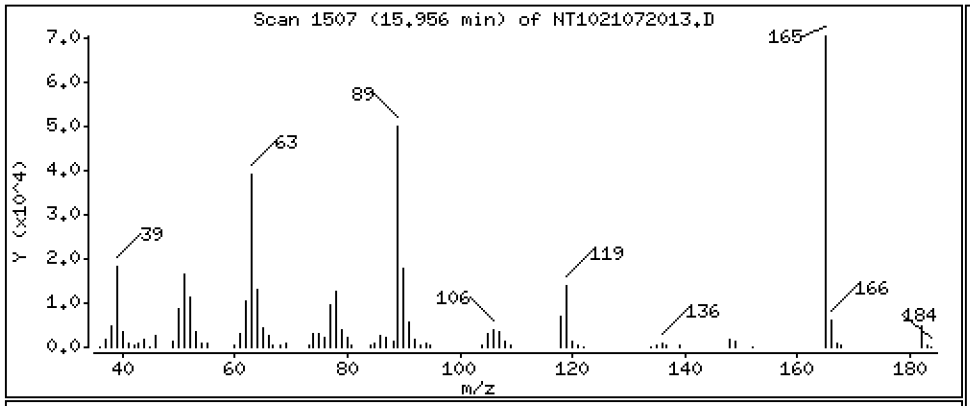
Operator: VTS

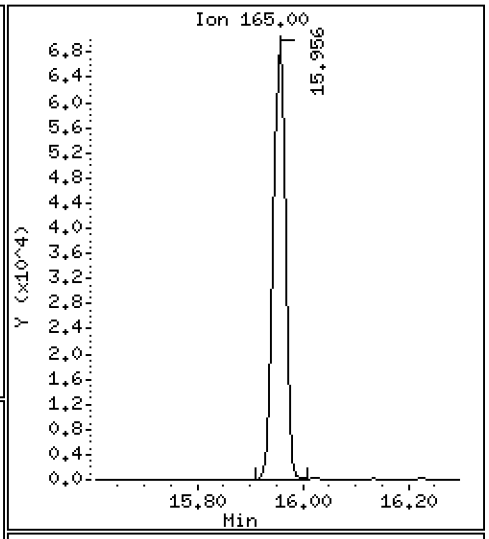
Column phase: ZB-5msi

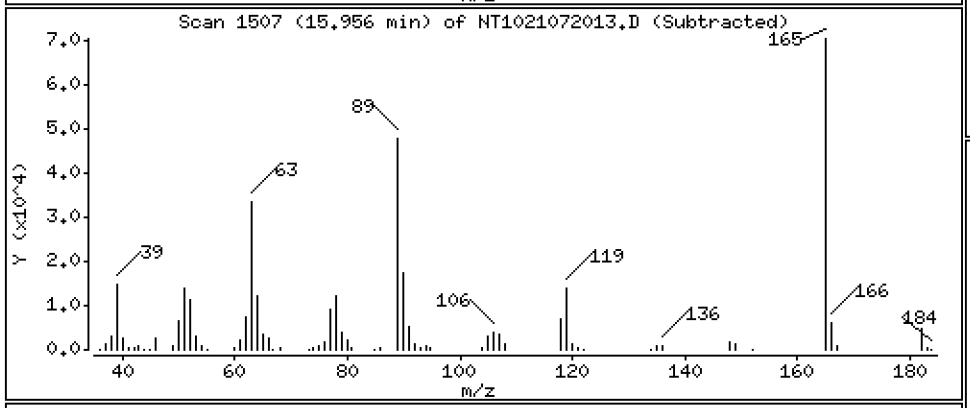
Column diameter: 0.25

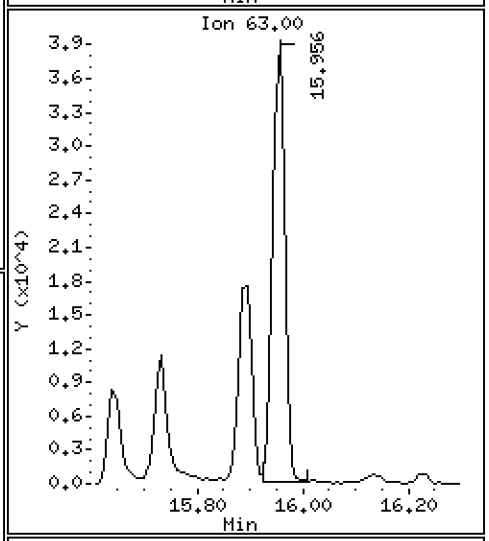
48 2,4-Dinitrotoluene

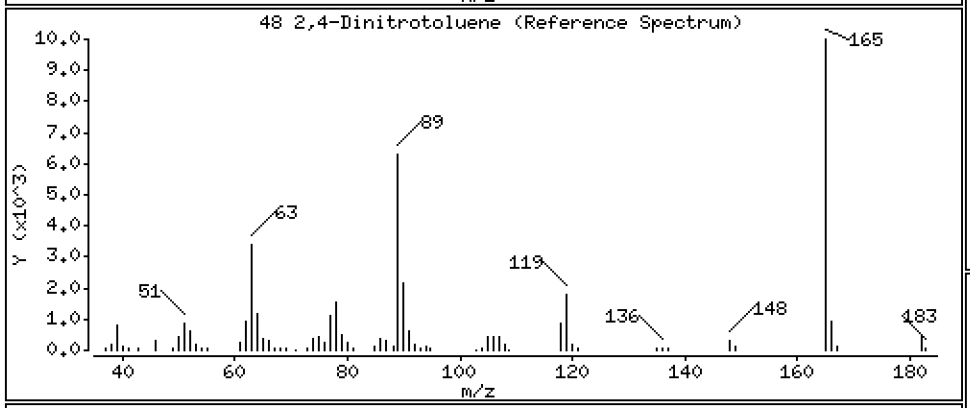
Concentration: 4.929 ug/mL

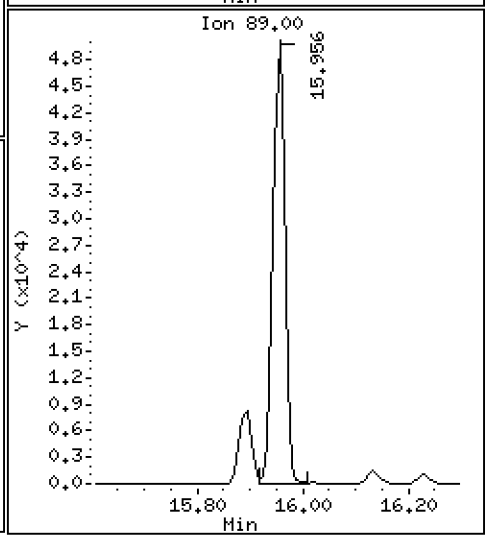


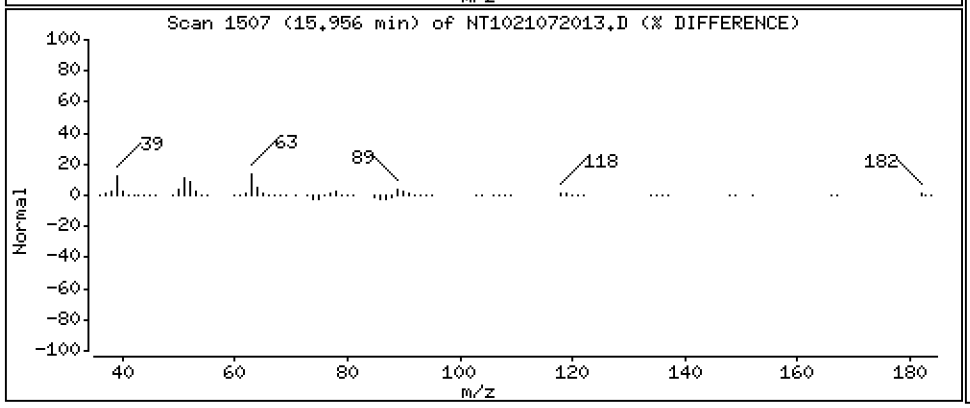












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

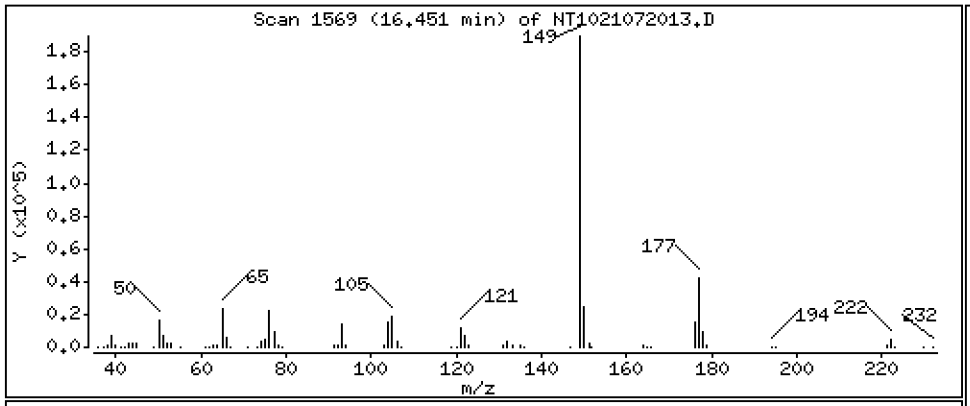
Operator: VTS

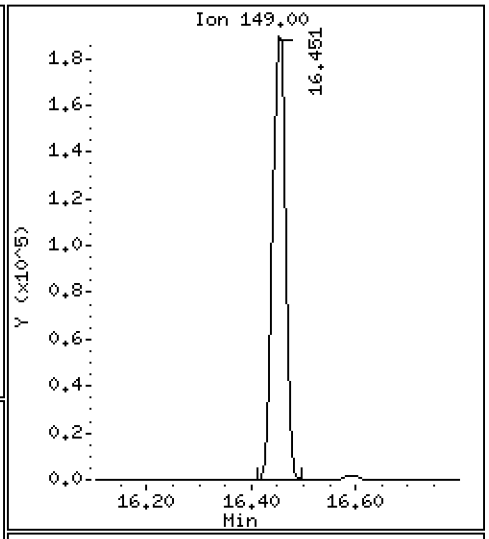
Column phase: ZB-5msi

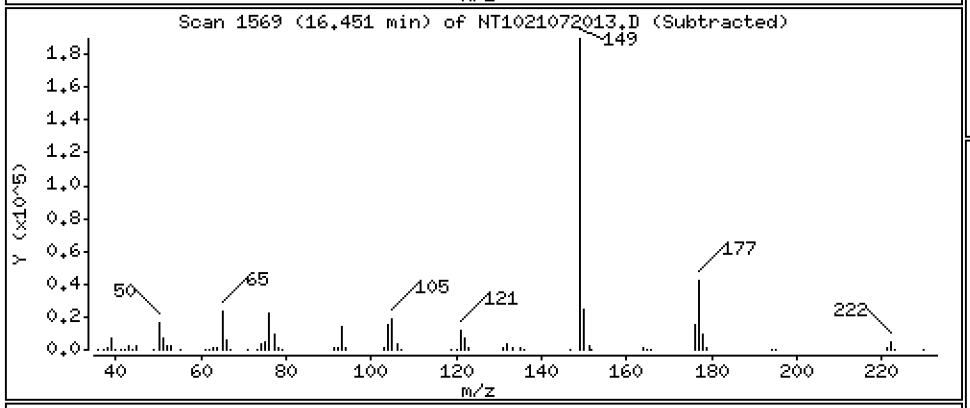
Column diameter: 0.25

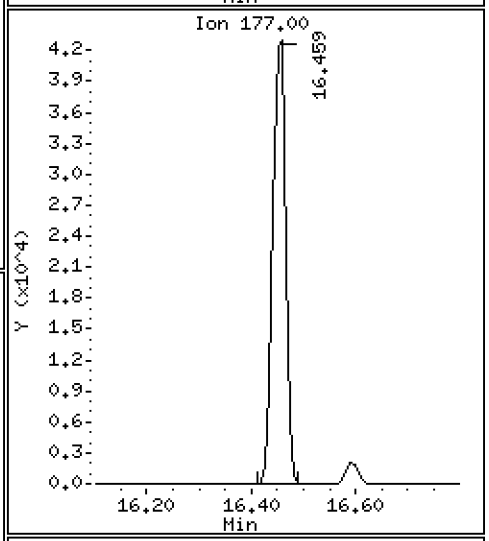
50 Diethylphthalate

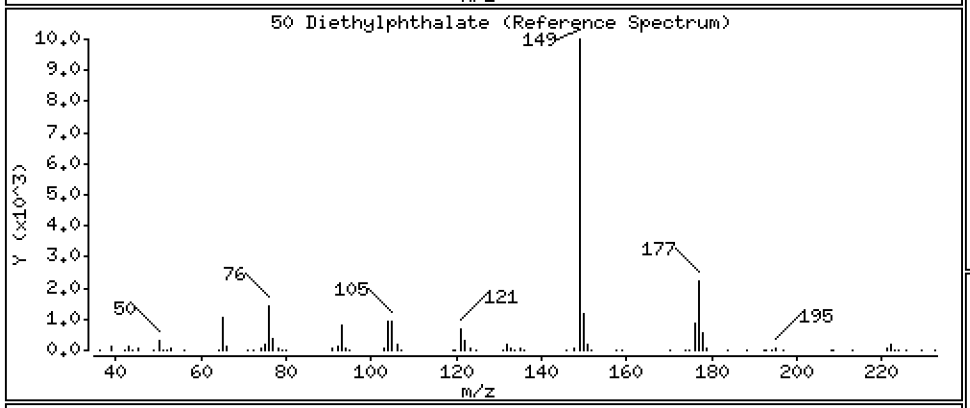
Concentration: 4.598 ug/mL

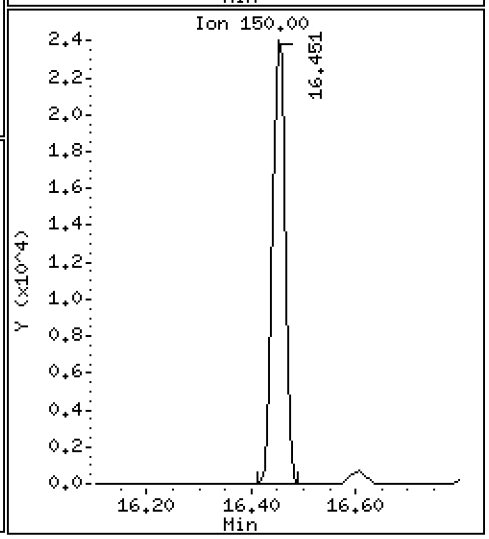


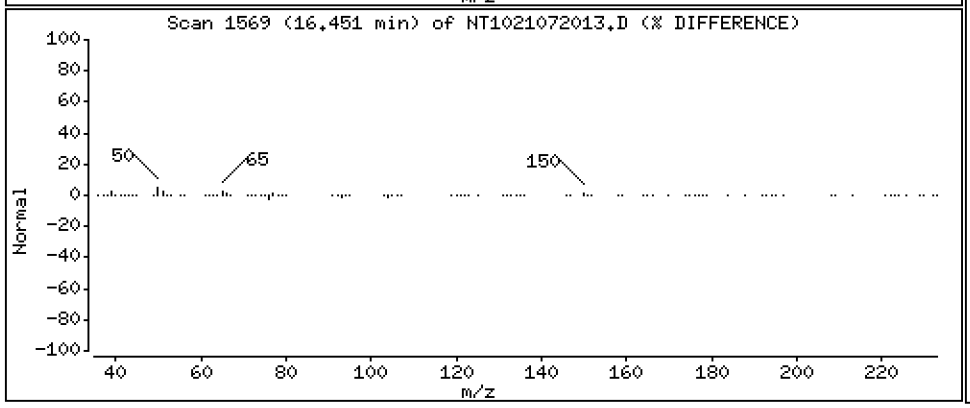












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

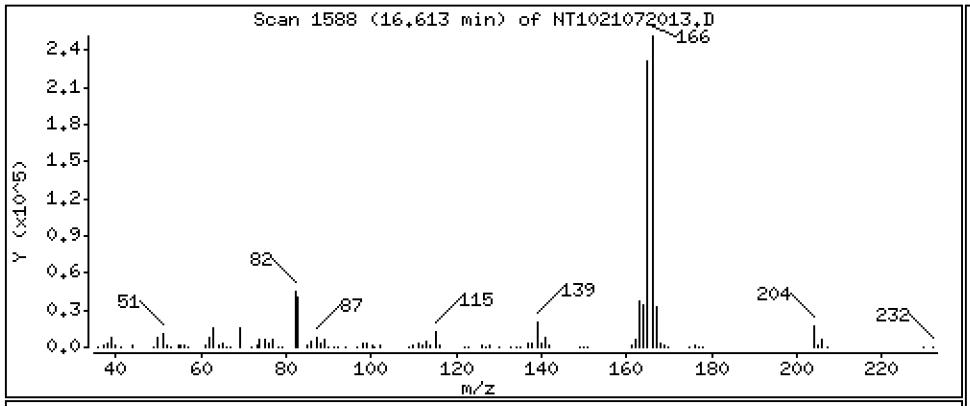
Operator: VTS

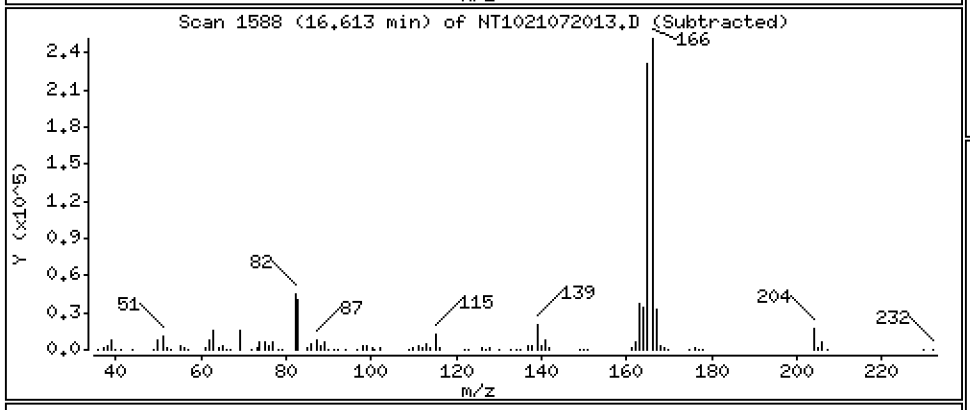
Column phase: ZB-5msi

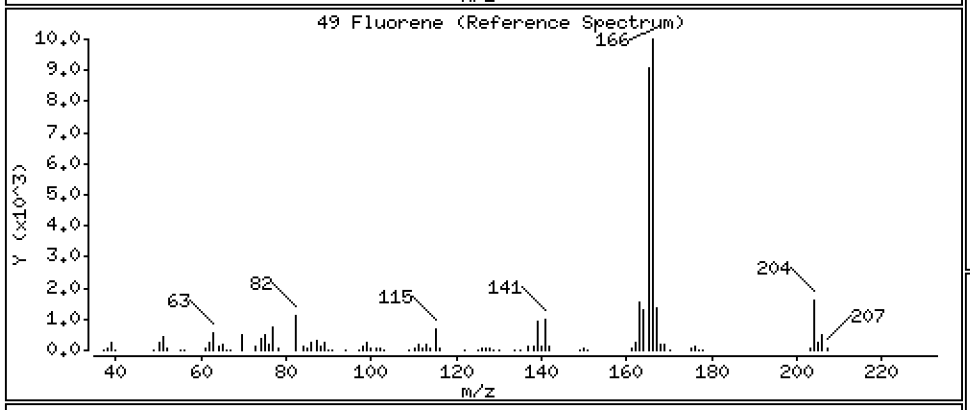
Column diameter: 0.25

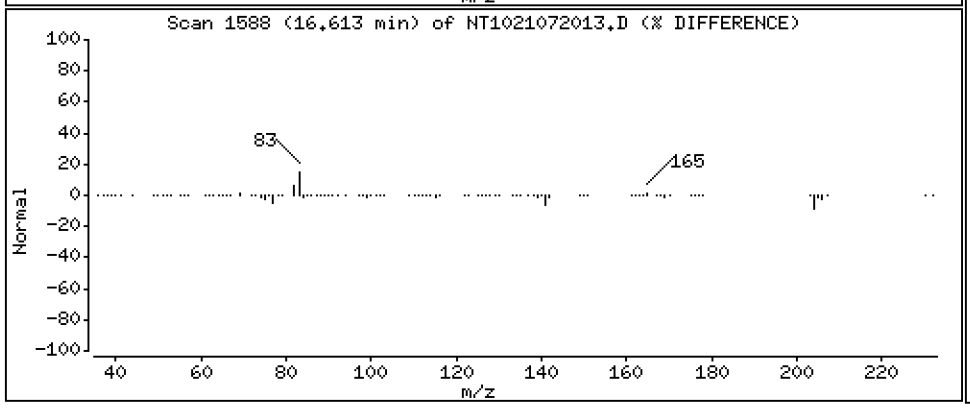
49 Fluorene

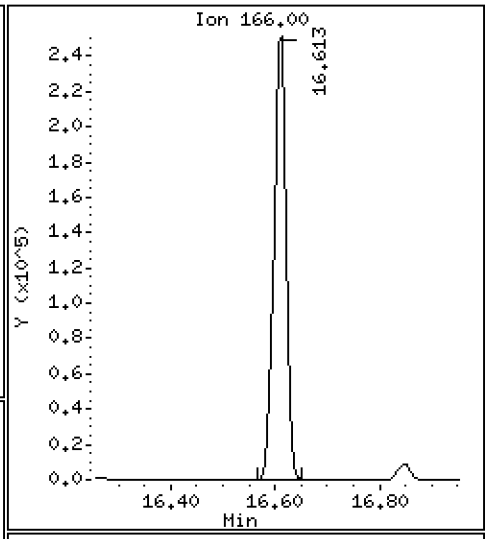
Concentration: 4.477 ug/mL

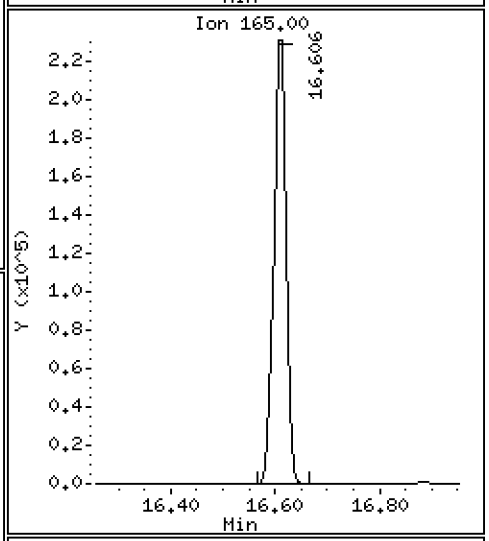


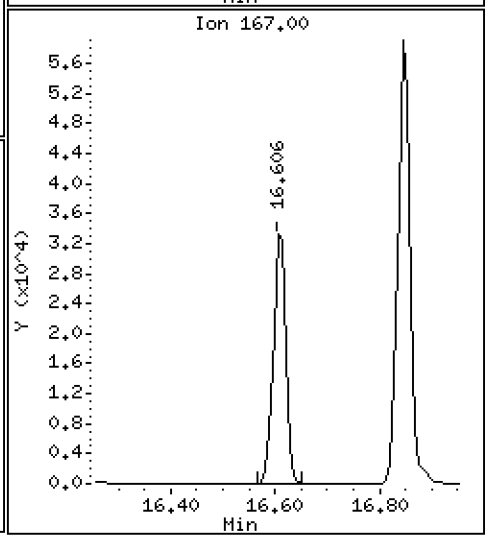












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

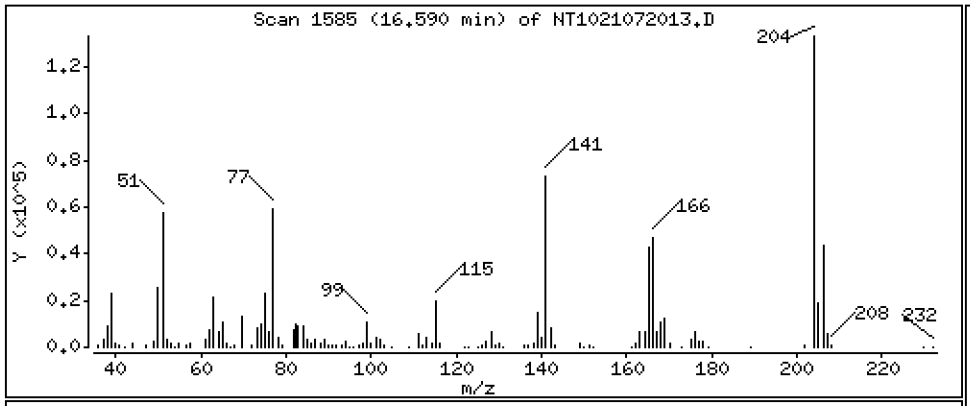
Operator: VTS

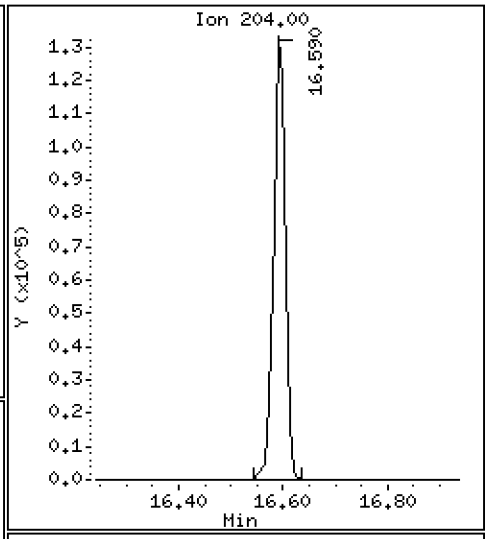
Column phase: ZB-5msi

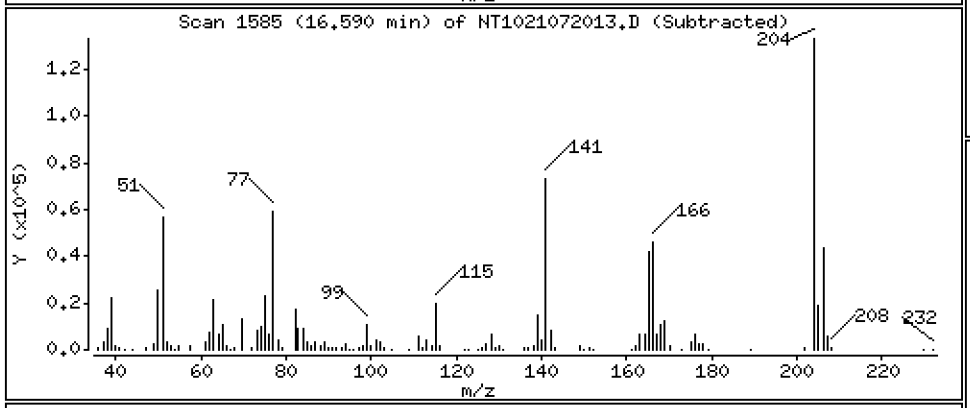
Column diameter: 0.25

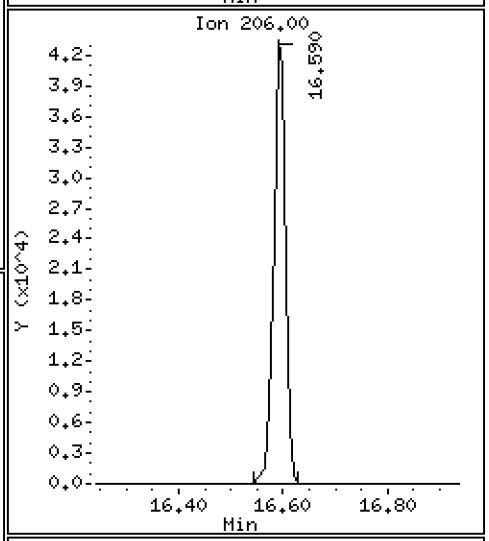
51 4-Chlorophenyl-phenylether

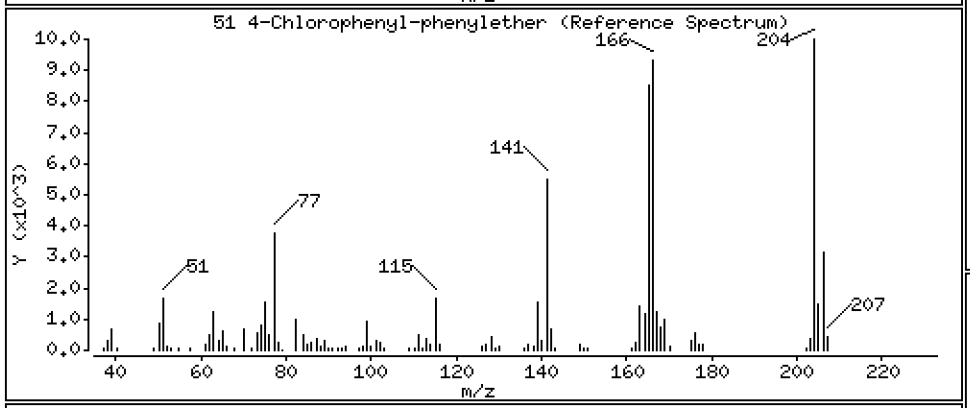
Concentration: 4.594 ug/mL

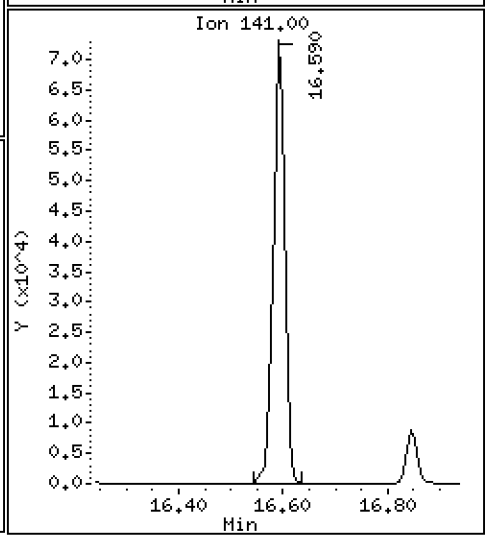


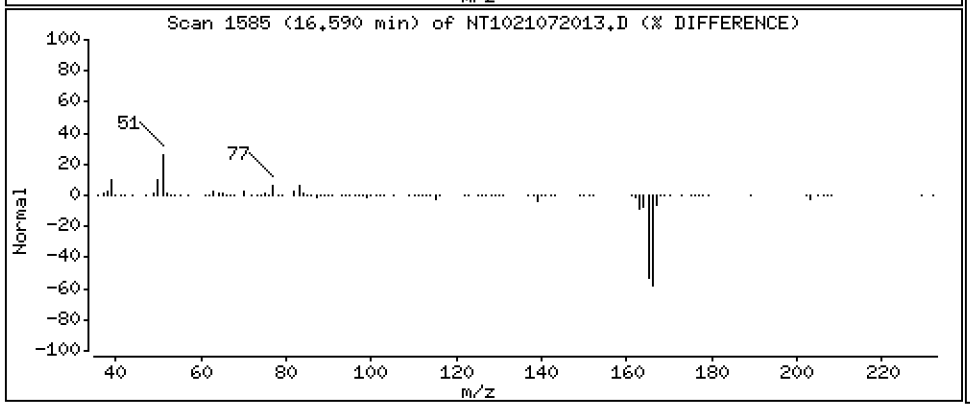












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

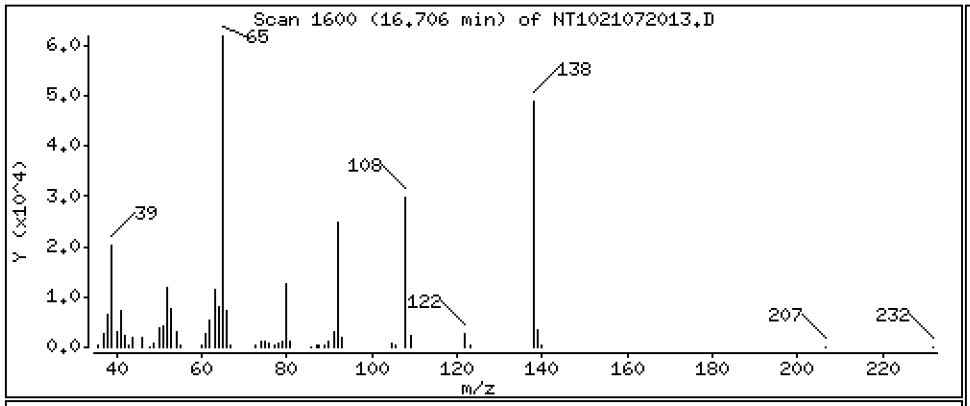
Operator: VTS

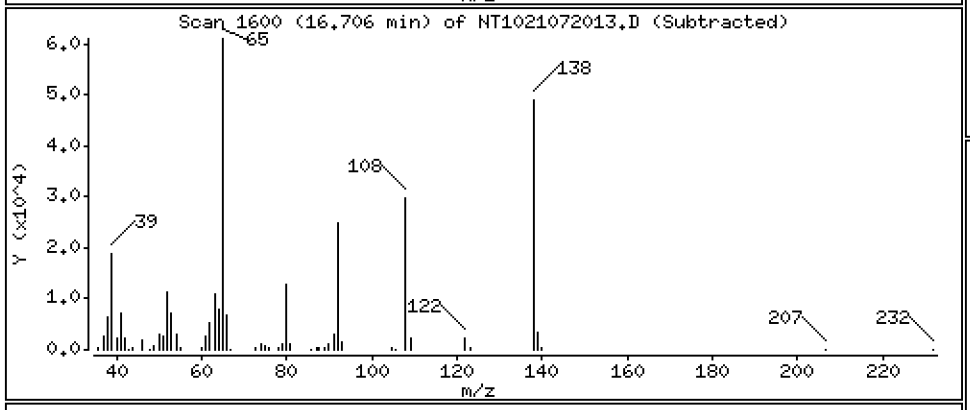
Column phase: ZB-5msi

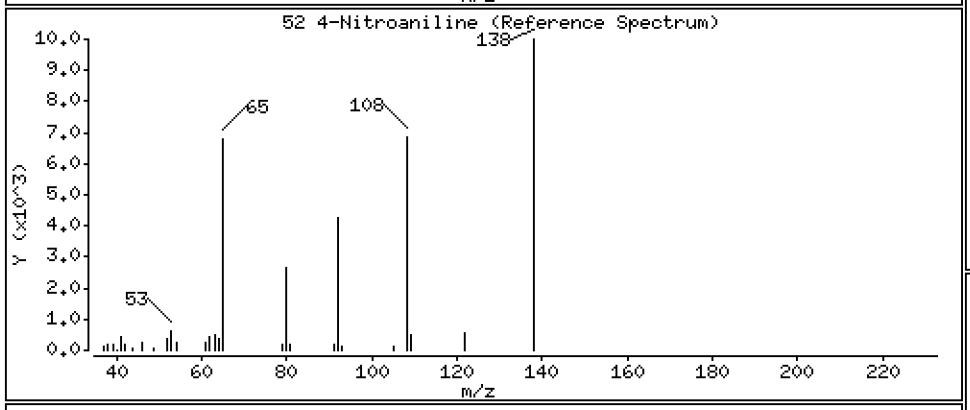
Column diameter: 0.25

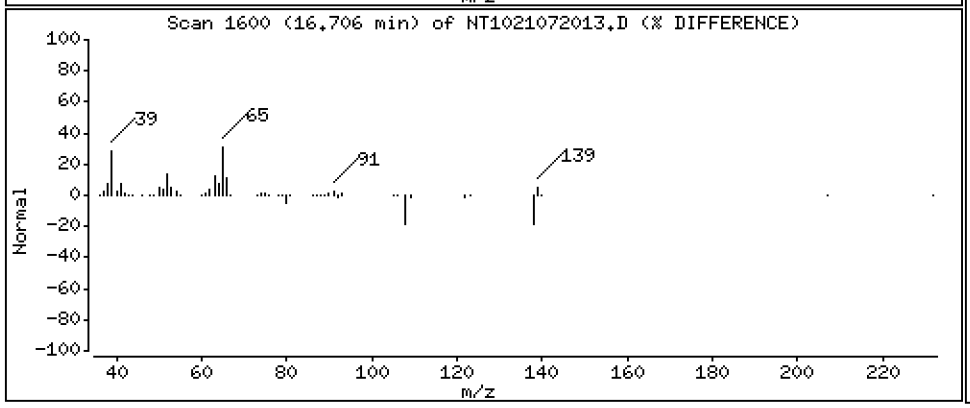
52 4-Nitroaniline

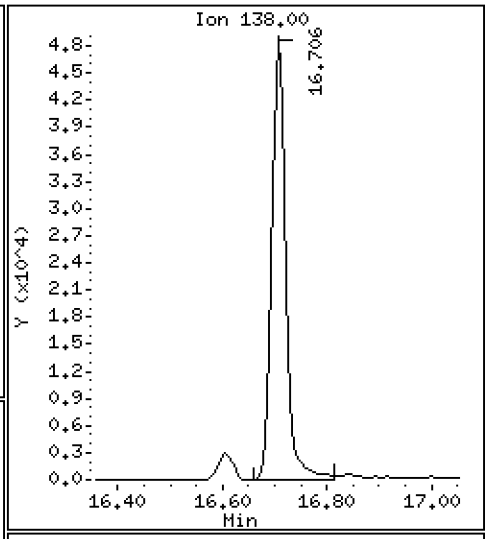
Concentration: 4.048 ug/mL

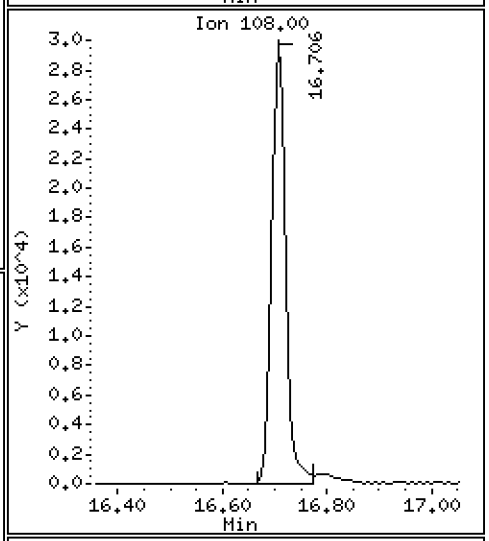


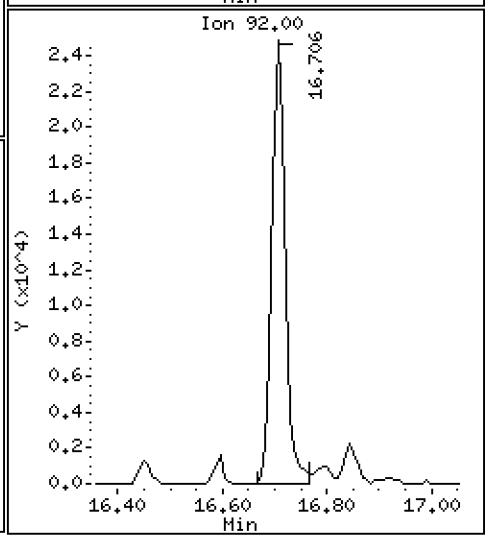












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

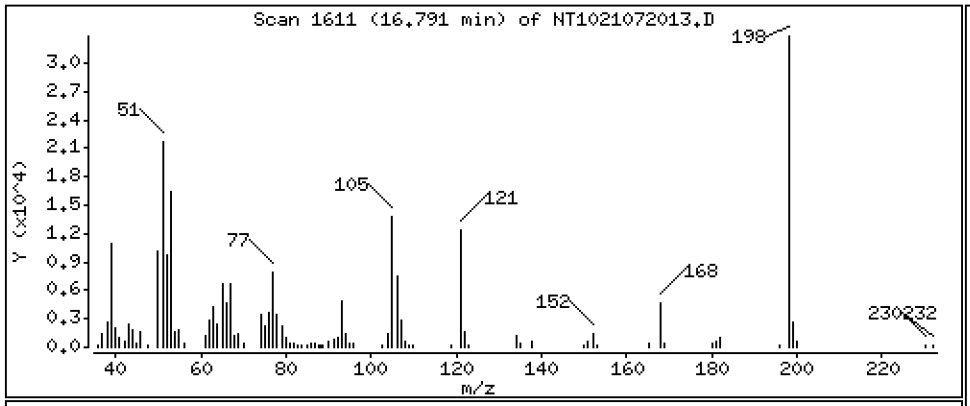
Operator: VTS

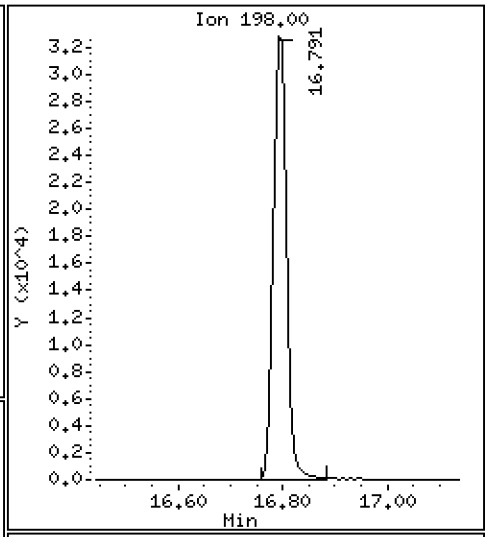
Column phase: ZB-5msi

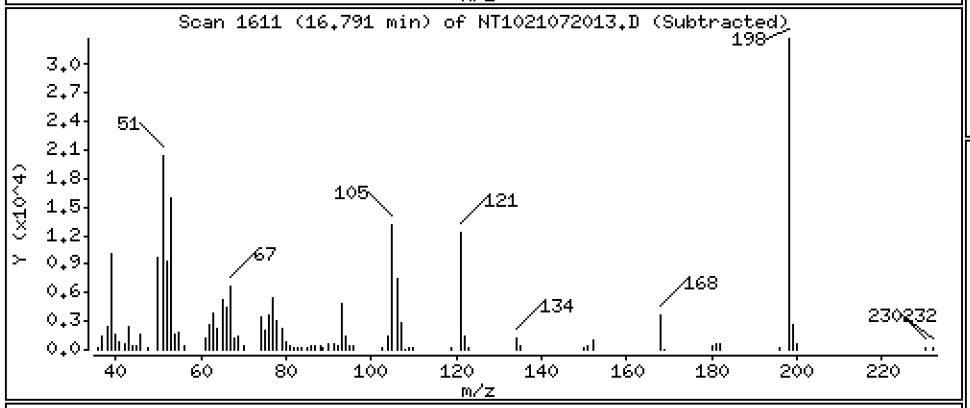
Column diameter: 0.25

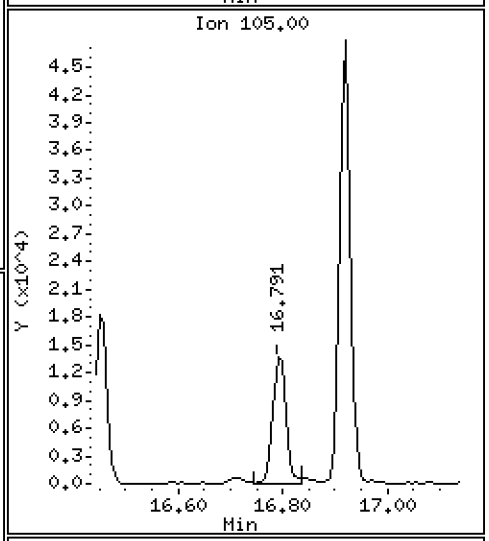
53 4,6-Dinitro-2-methylphenol

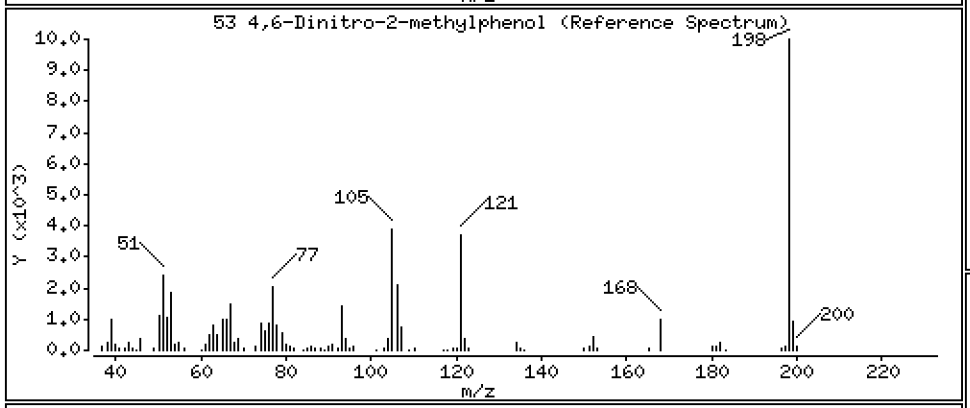
Concentration: 3.646 ug/mL

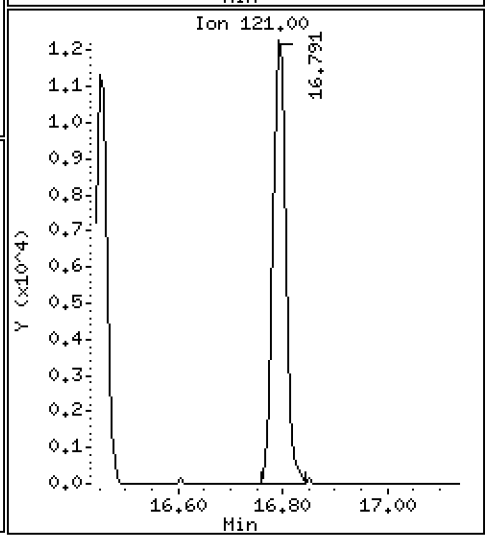


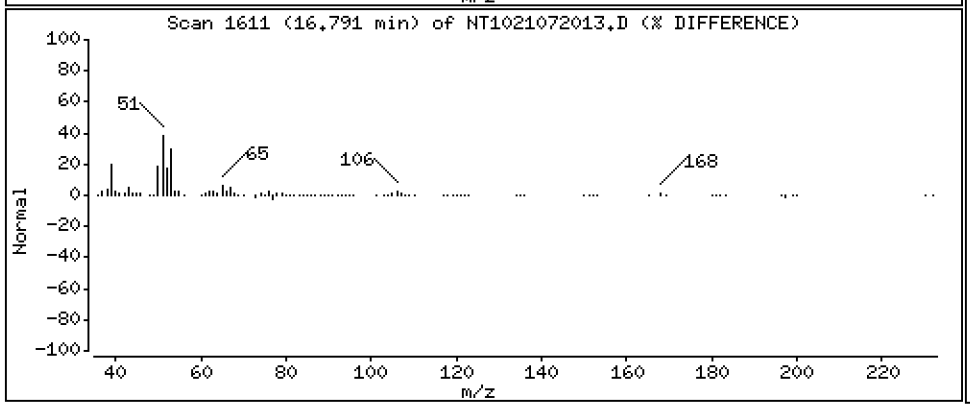












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

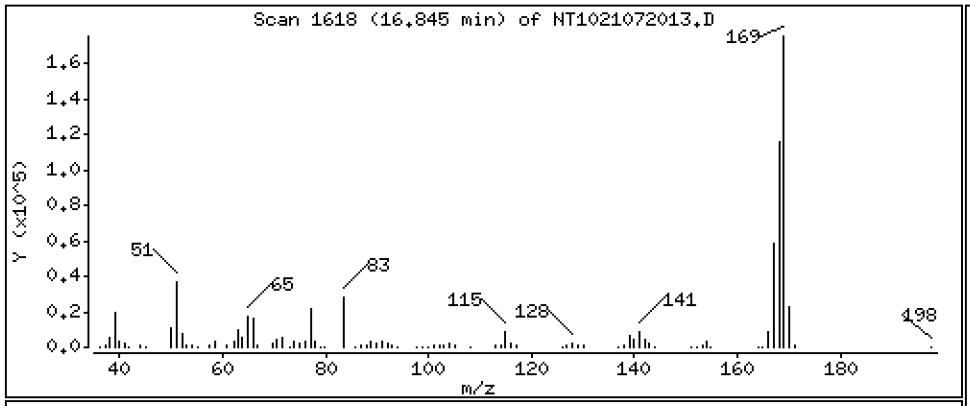
Operator: VTS

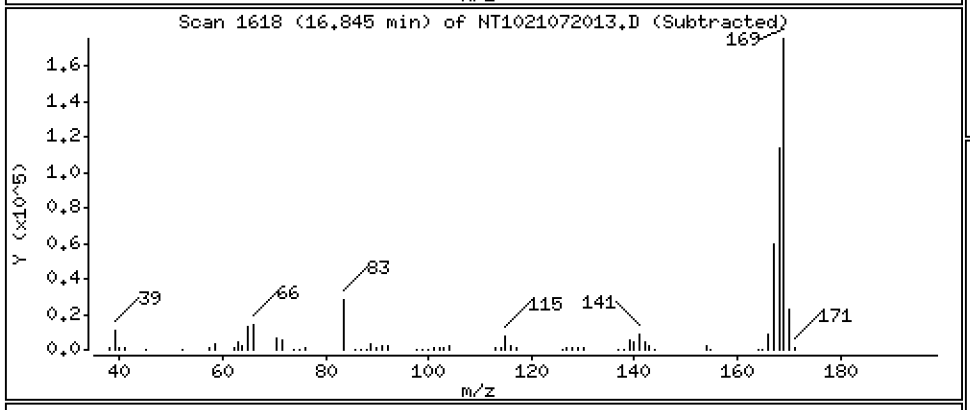
Column phase: ZB-5msi

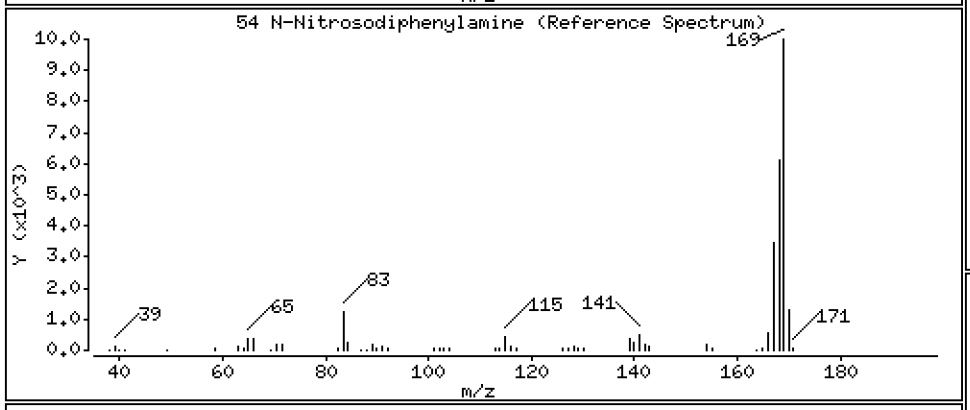
Column diameter: 0.25

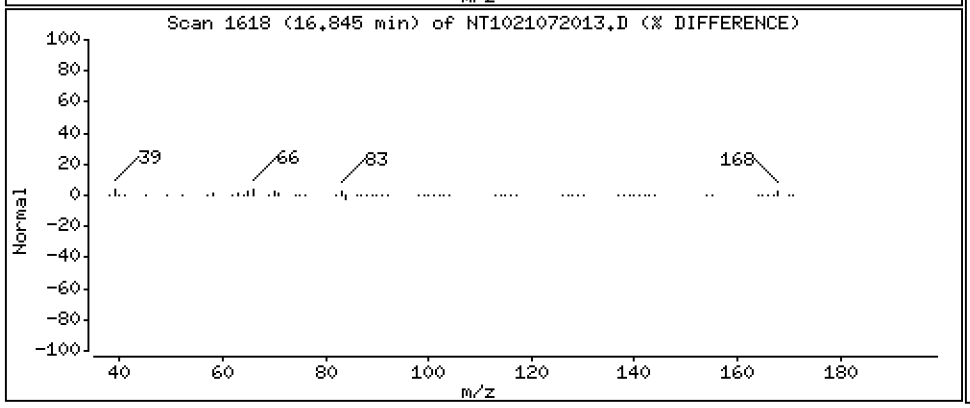
54 N-Nitrosodiphenylamine

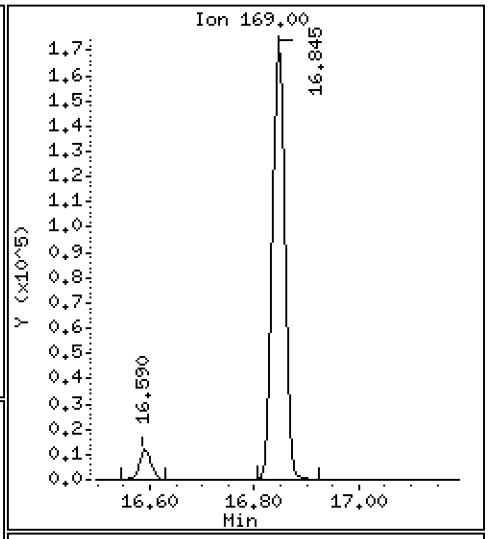
Concentration: 4.546 ug/mL

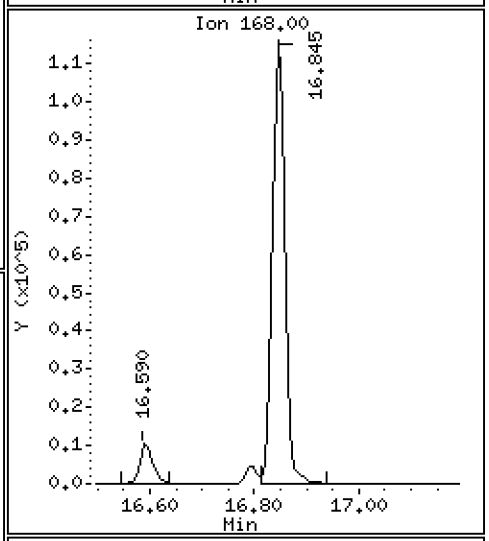


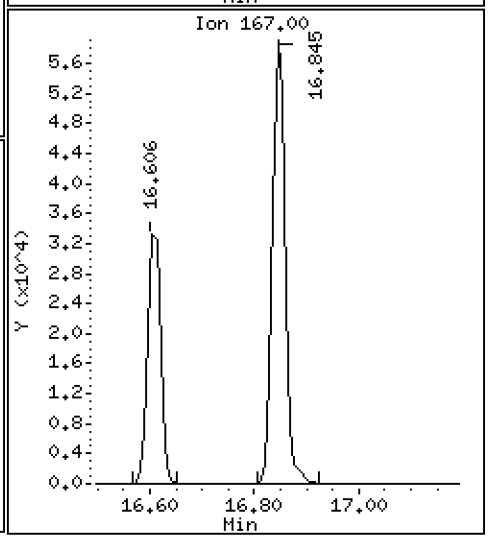












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

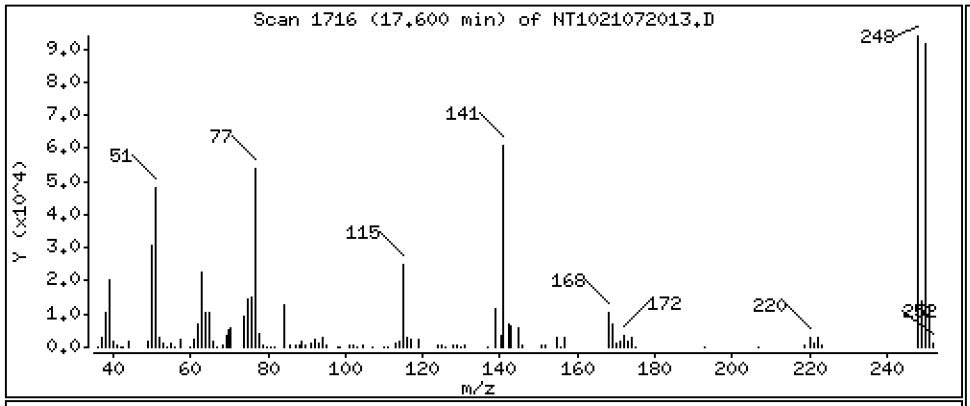
Operator: VTS

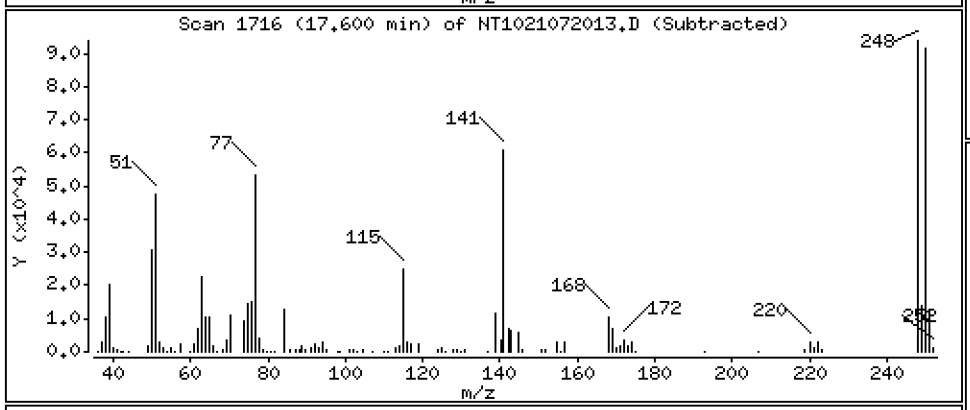
Column phase: ZB-5msi

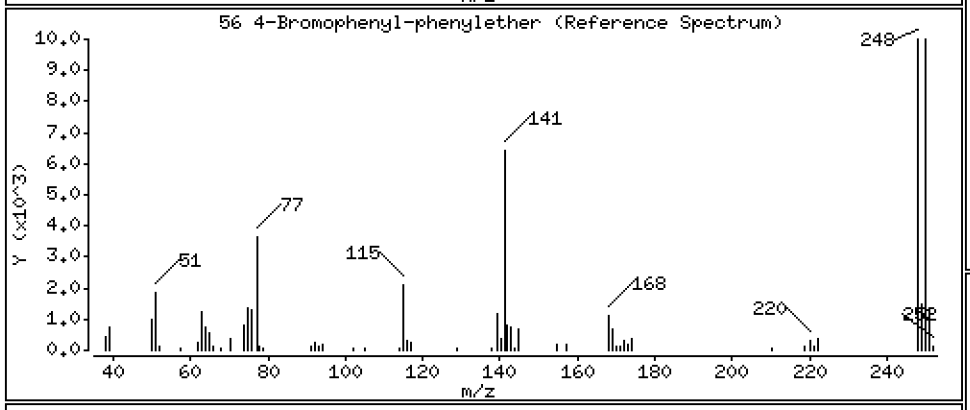
Column diameter: 0.25

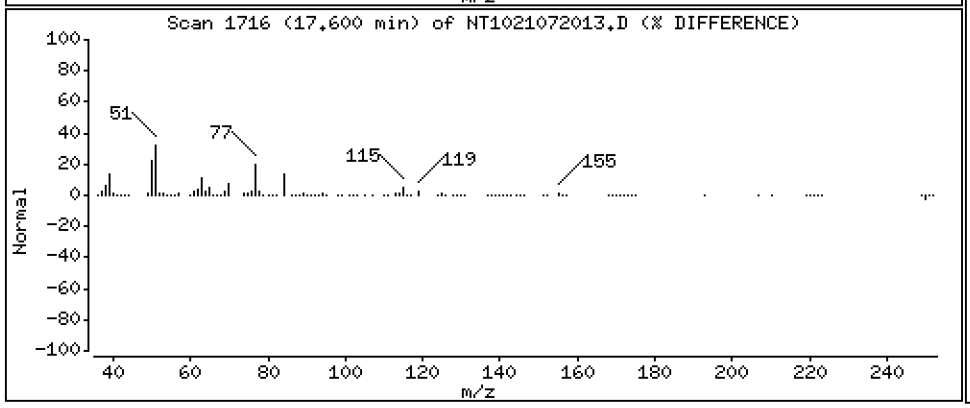
56 4-Bromophenyl-phenylether

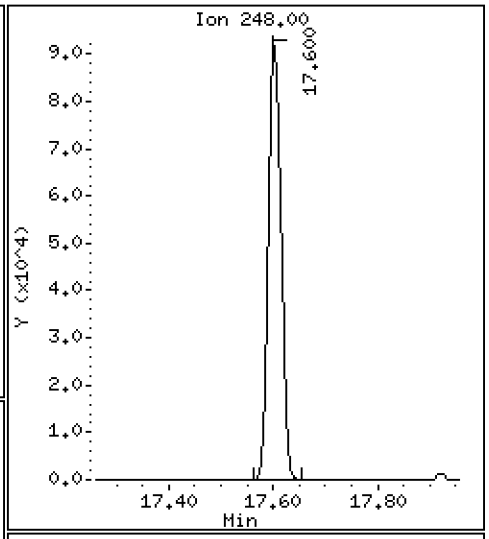
Concentration: 4.934 ug/mL

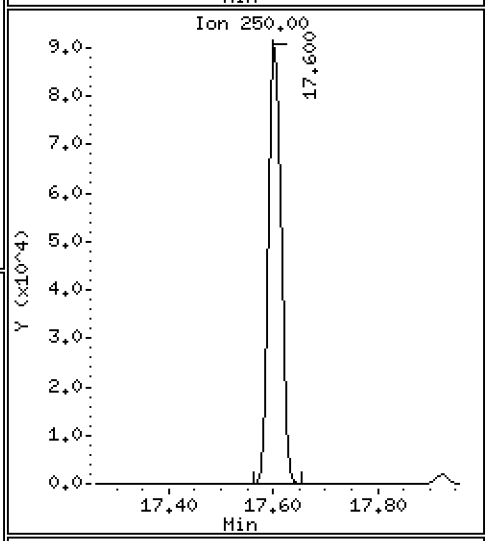


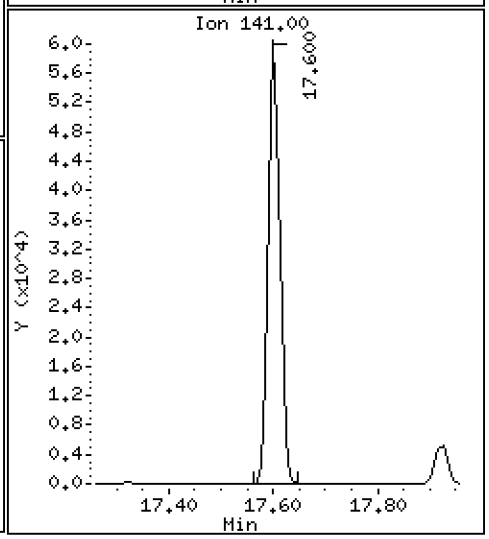












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

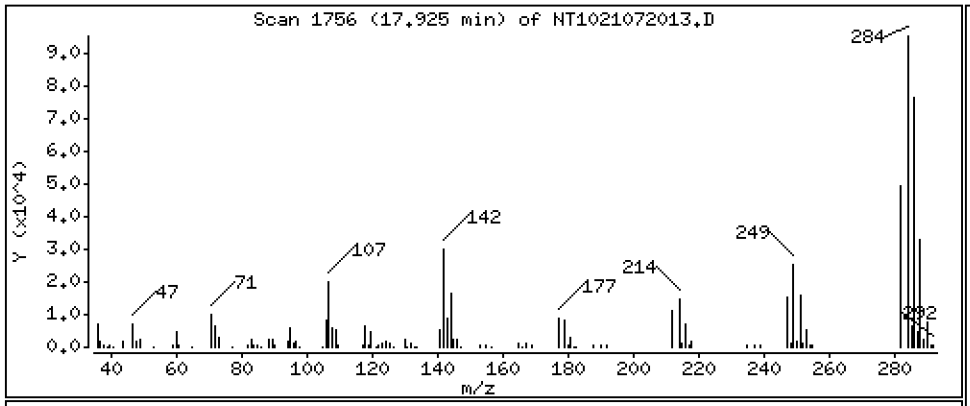
Operator: VTS

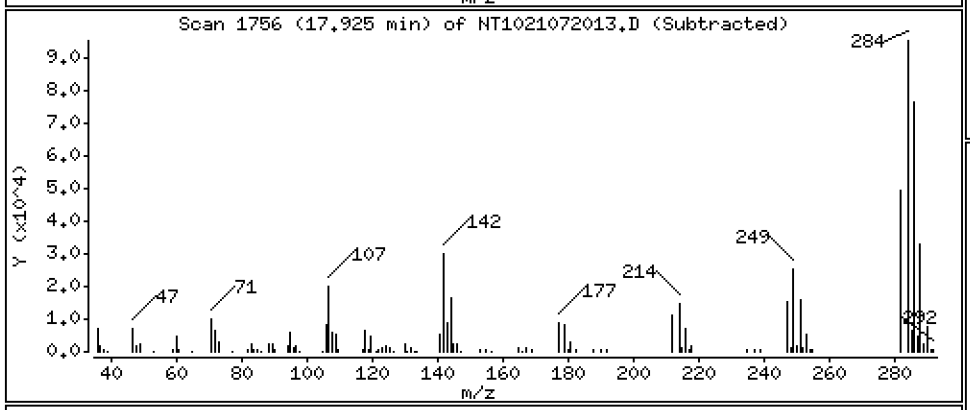
Column phase: ZB-5msi

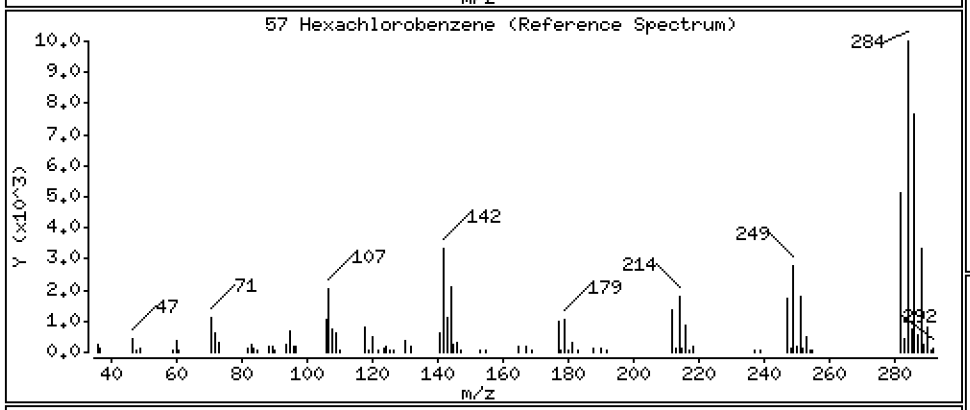
Column diameter: 0.25

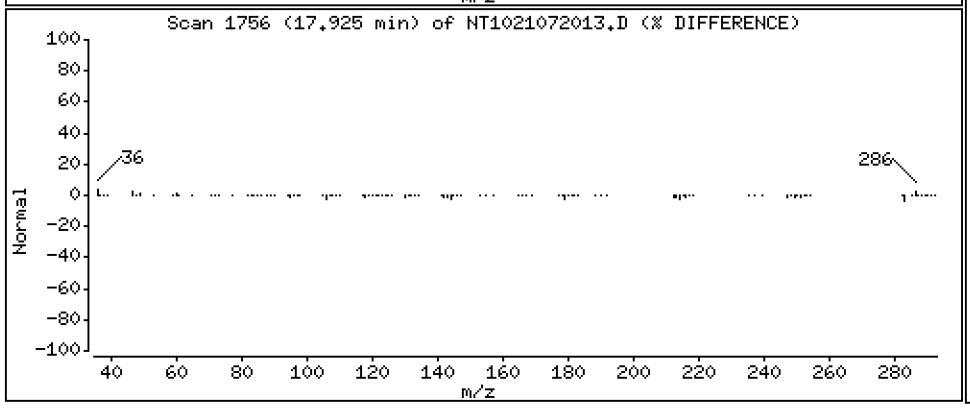
57 Hexachlorobenzene

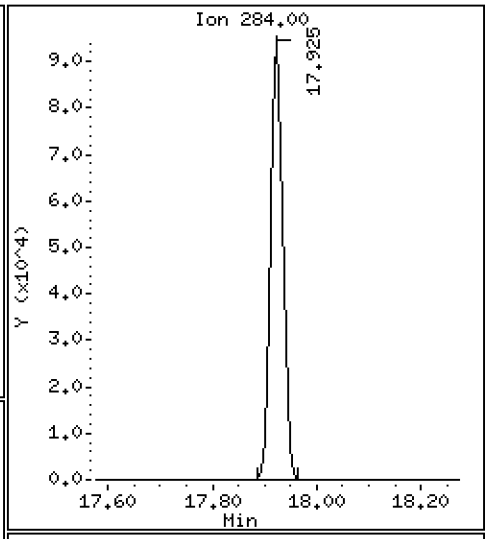
Concentration: 4.773 ug/mL

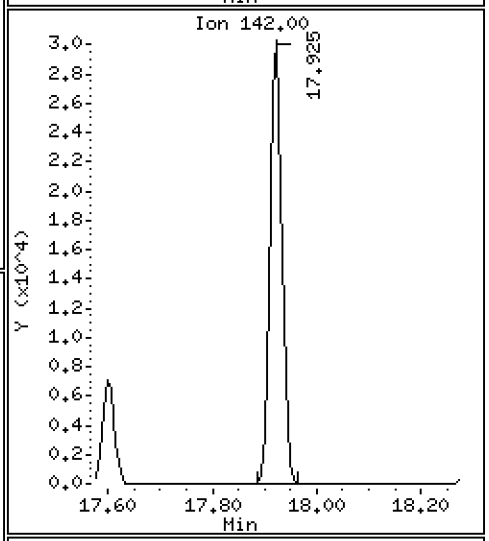


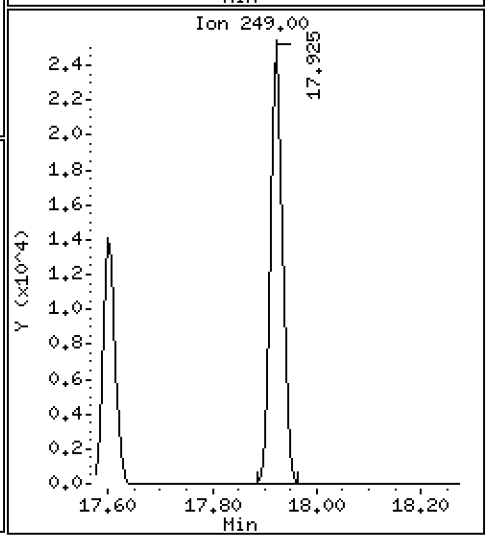












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

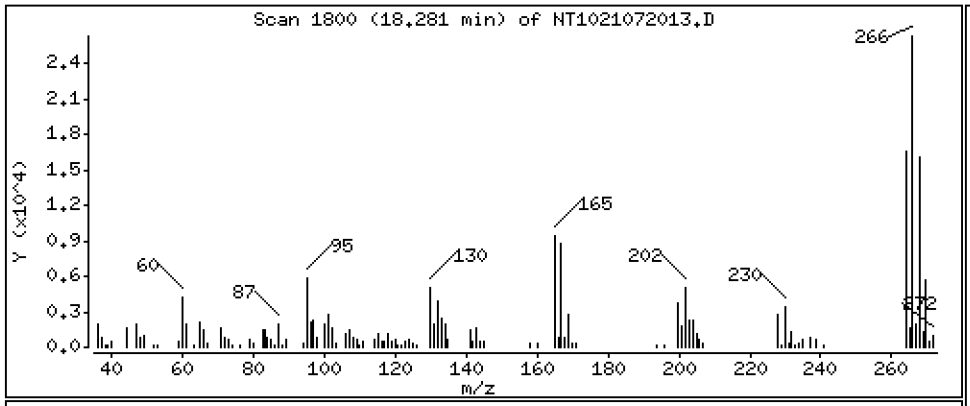
Operator: VTS

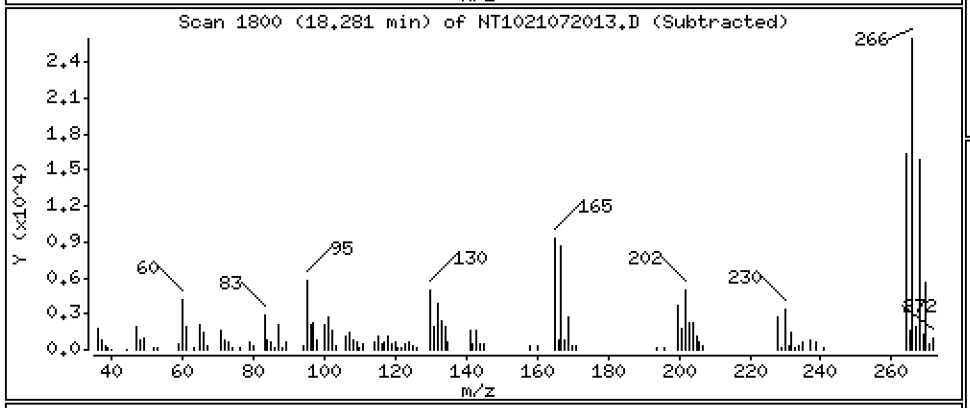
Column phase: ZB-5msi

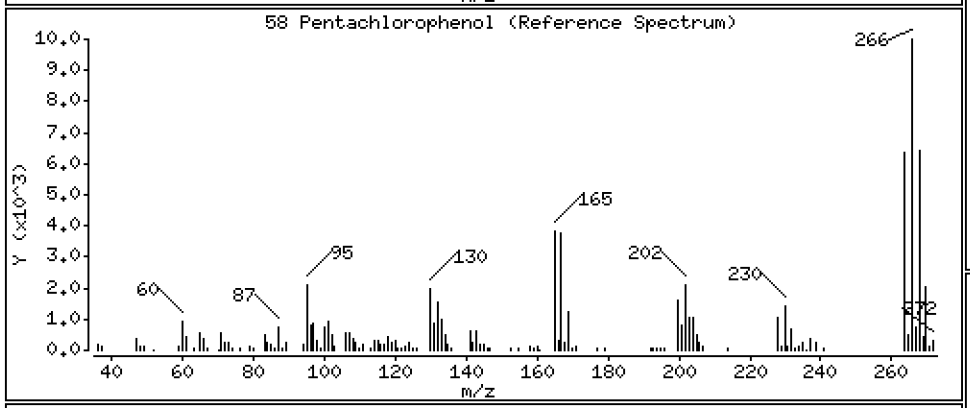
Column diameter: 0.25

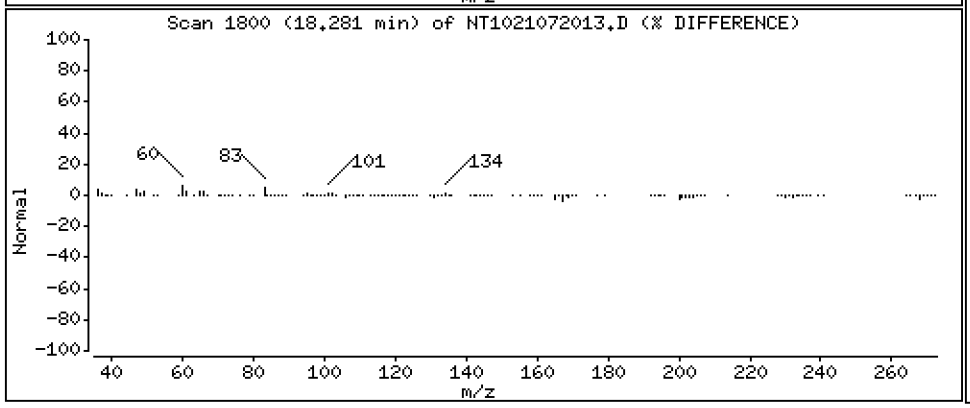
58 Pentachlorophenol

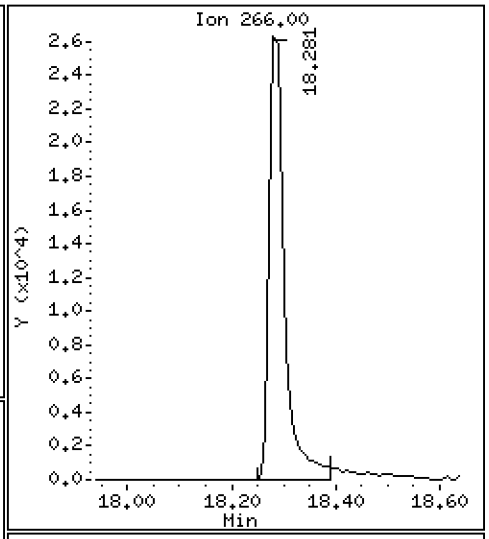
Concentration: 3.987 ug/mL

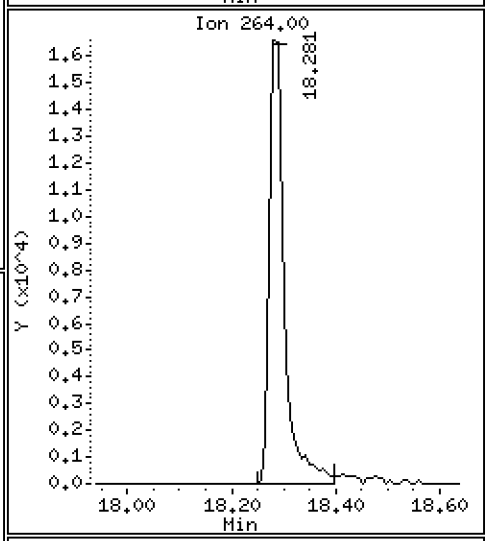


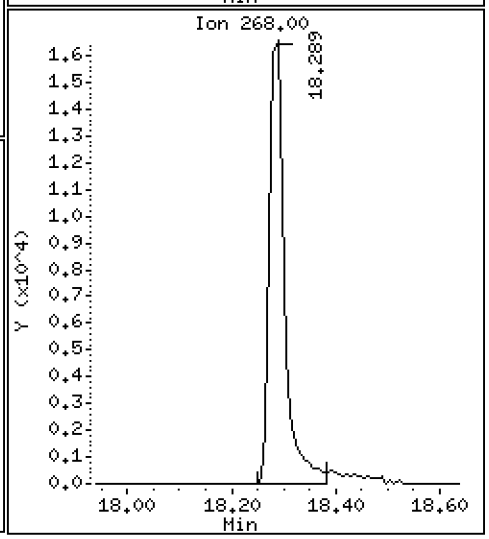












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

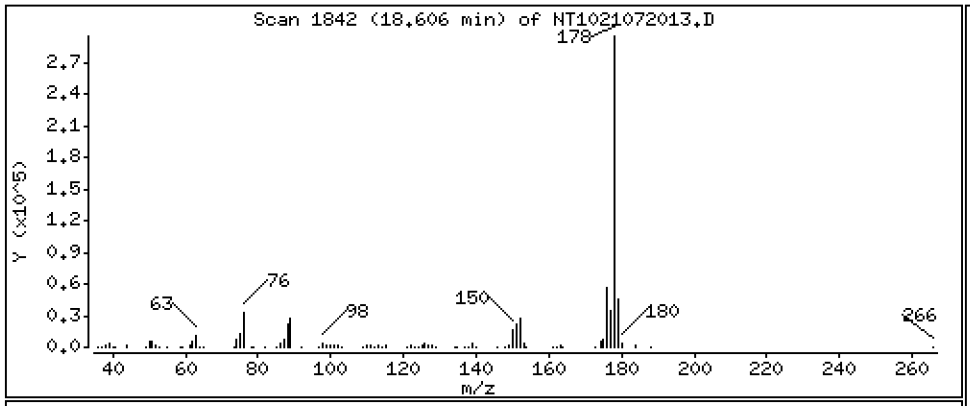
Operator: VTS

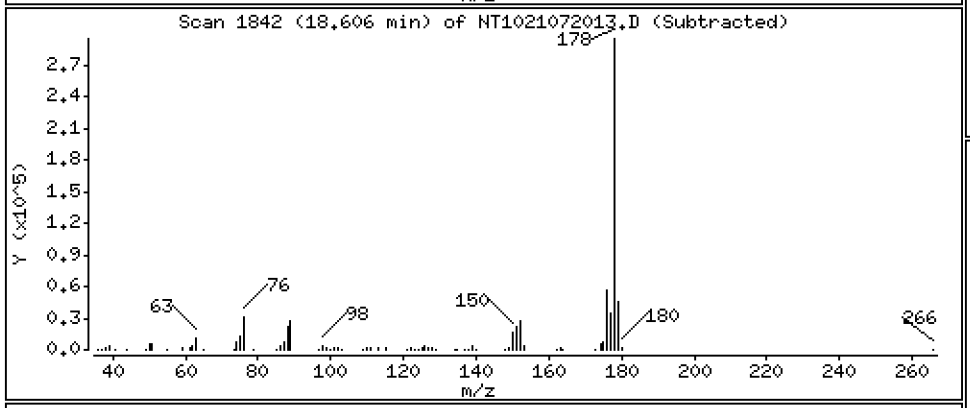
Column phase: ZB-5msi

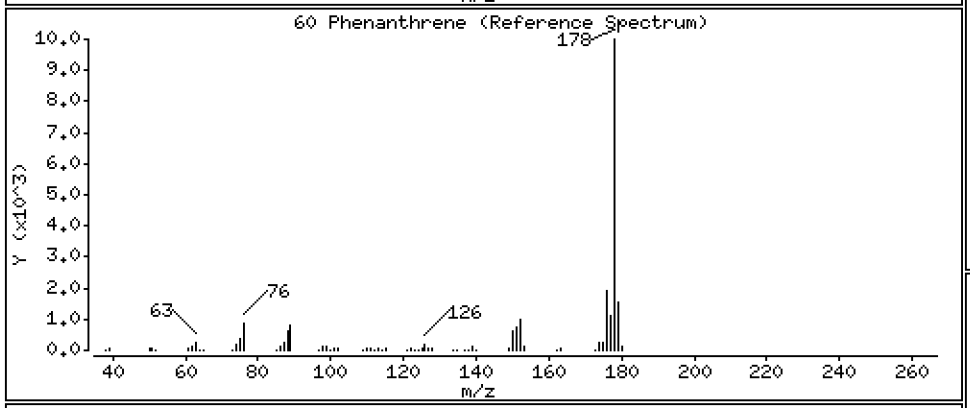
Column diameter: 0.25

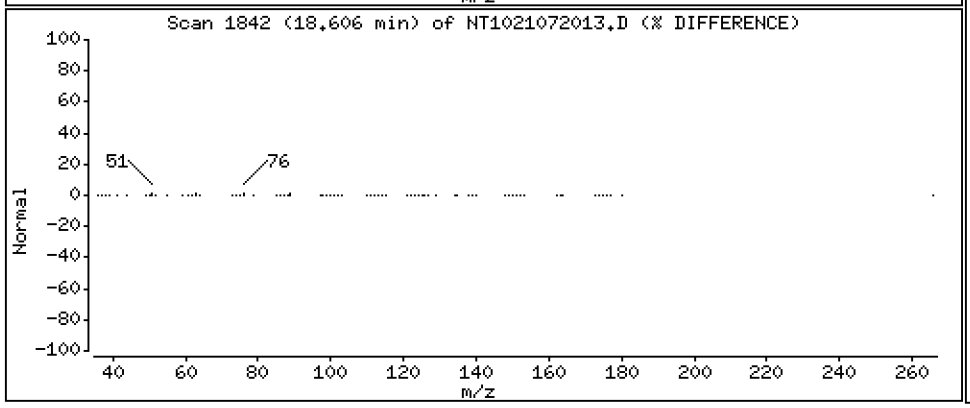
60 Phenanthrene

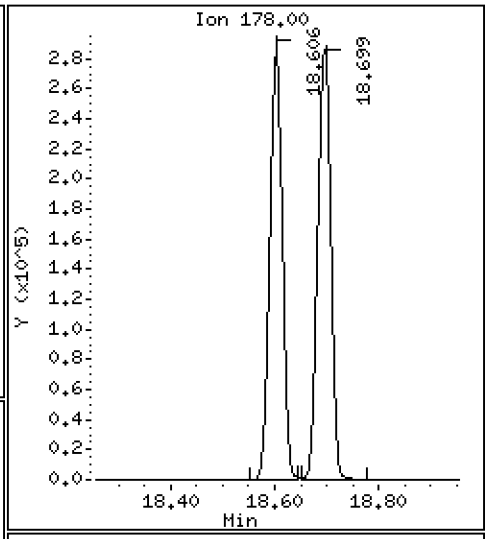
Concentration: 5.038 ug/mL

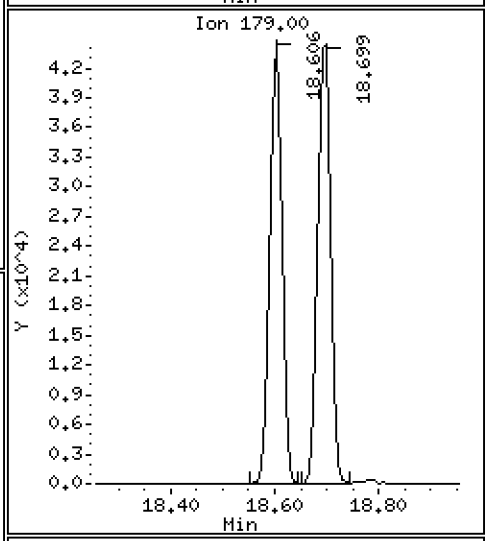


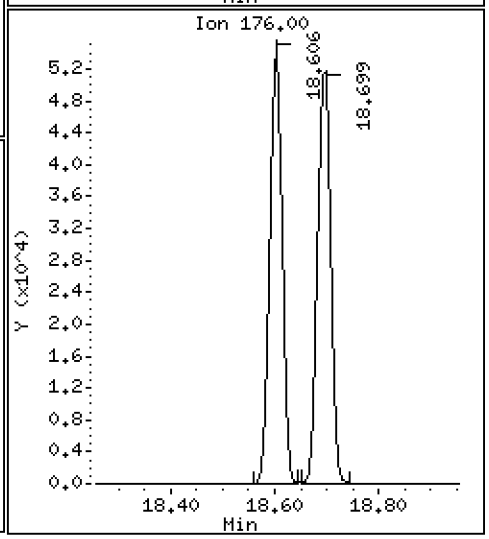












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

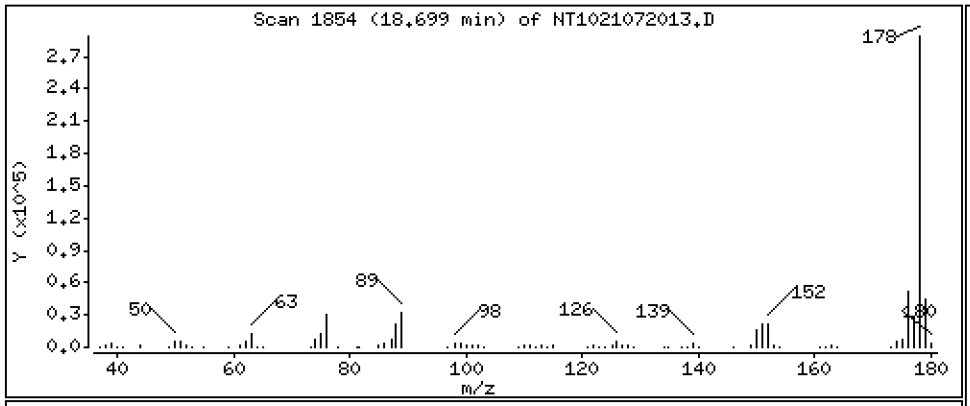
Operator: VTS

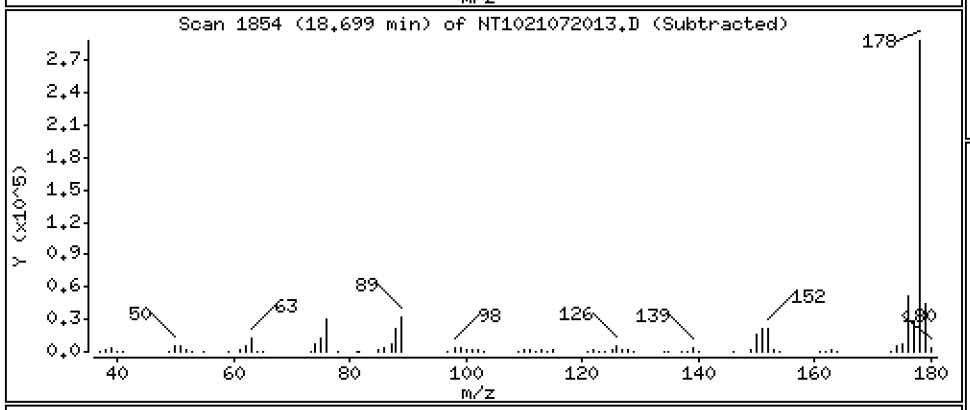
Column phase: ZB-5msi

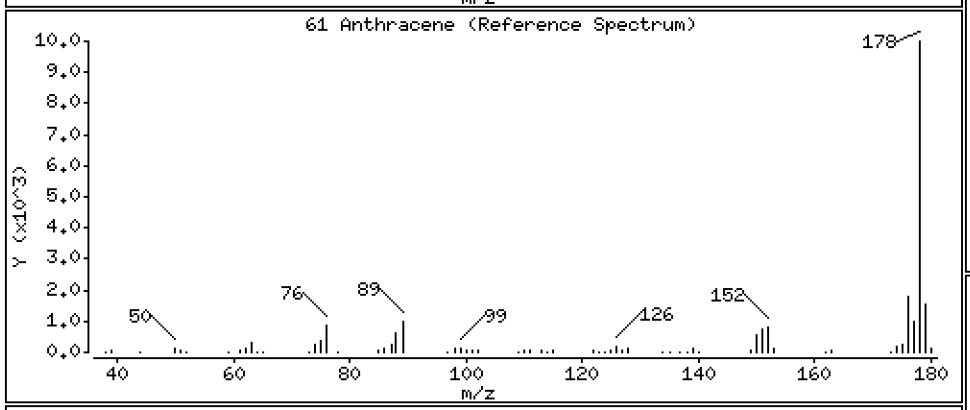
Column diameter: 0.25

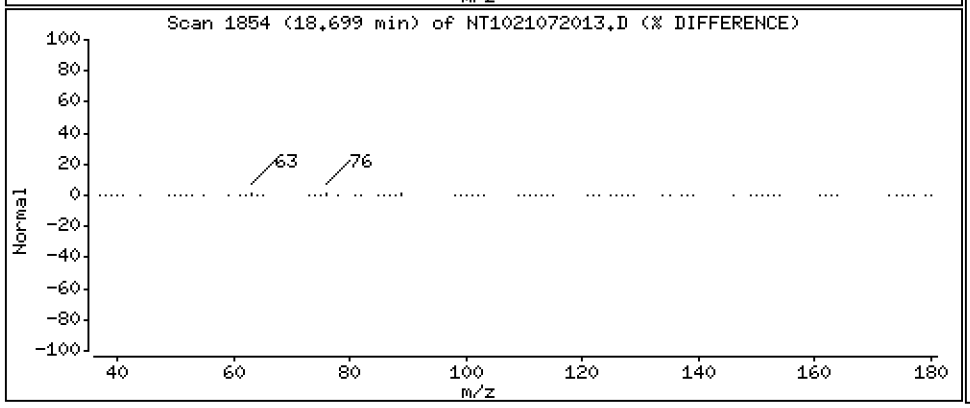
61 Anthracene

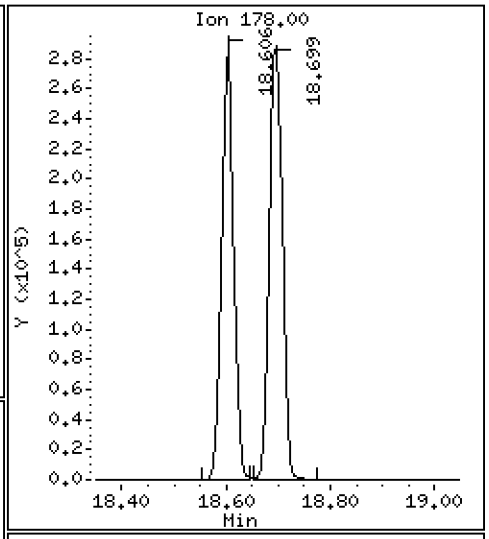
Concentration: 5.020 ug/mL

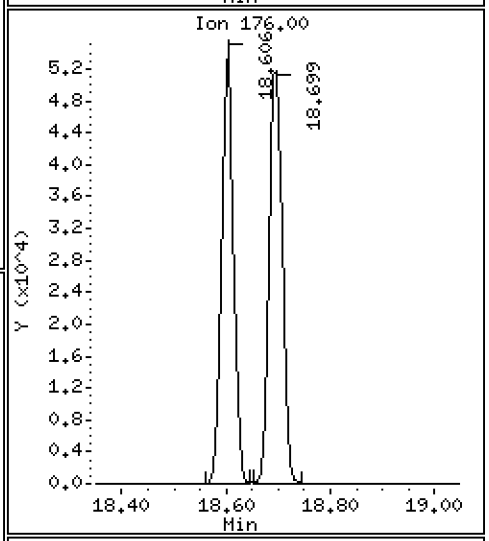


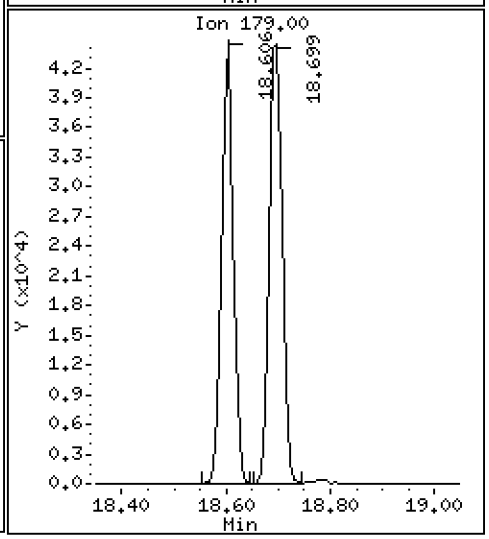












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

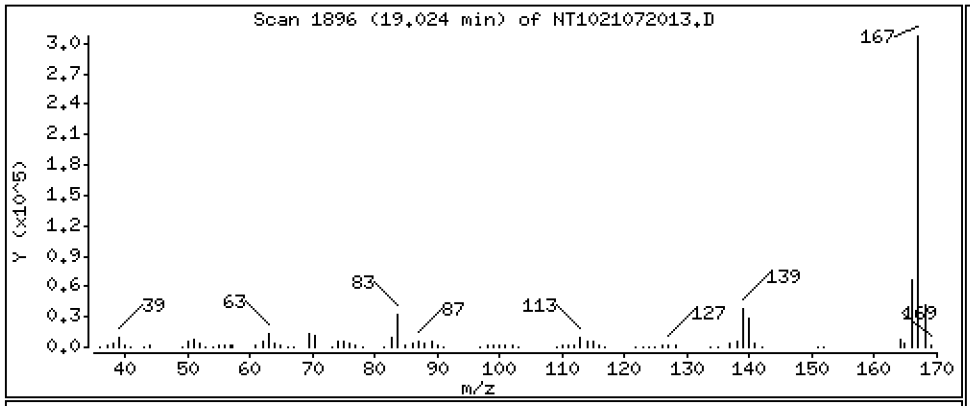
Operator: VTS

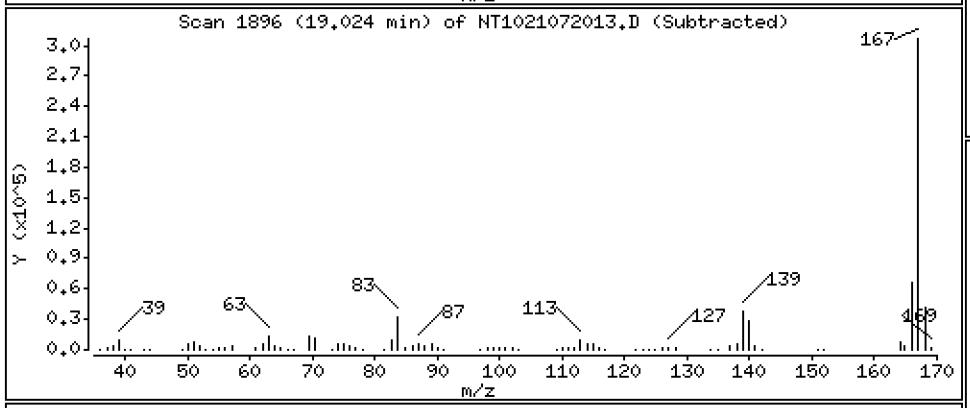
Column phase: ZB-5msi

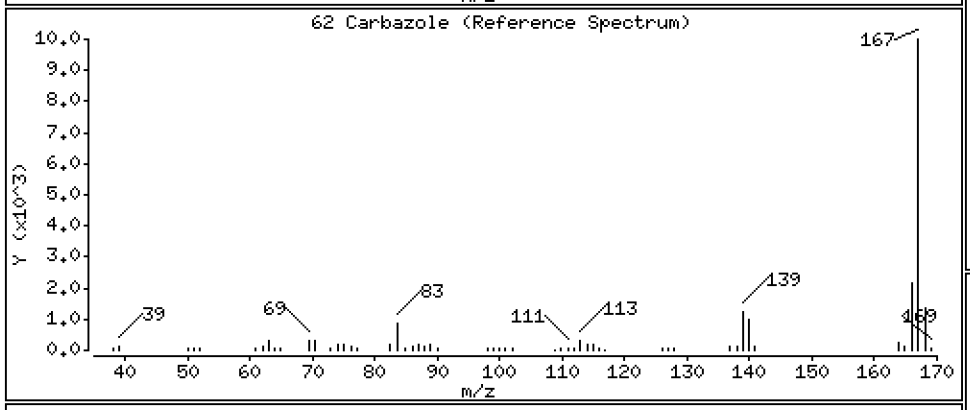
Column diameter: 0.25

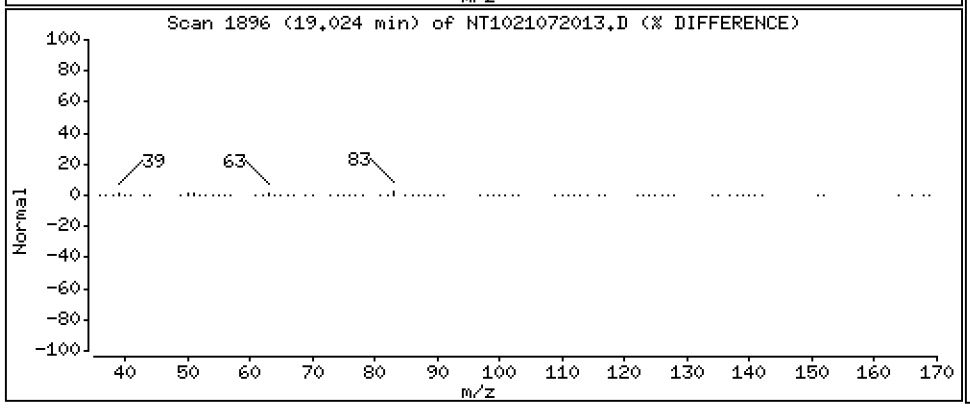
62 Carbazole

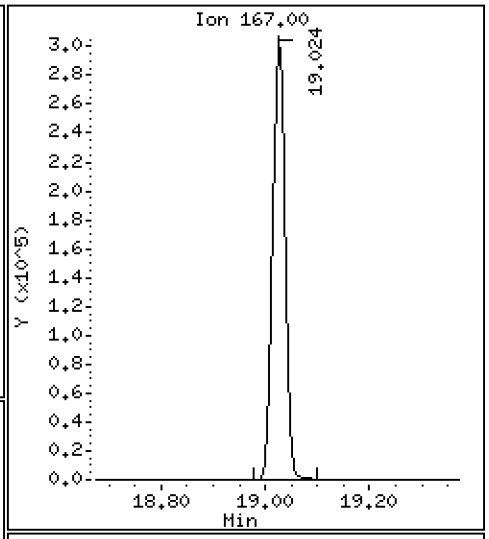
Concentration: 5.033 ug/mL

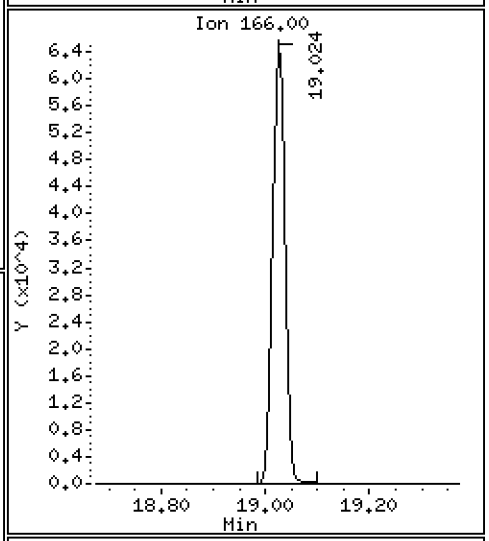


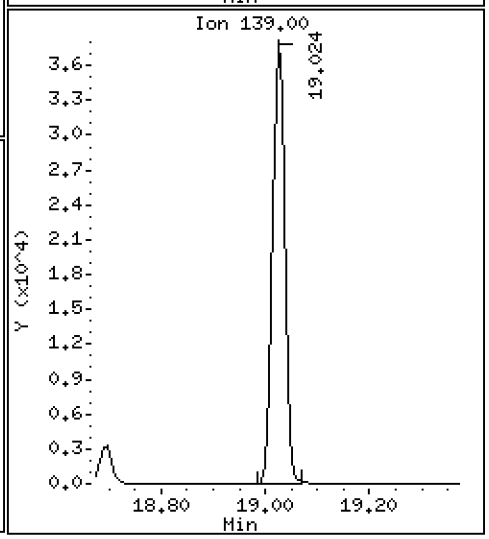












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

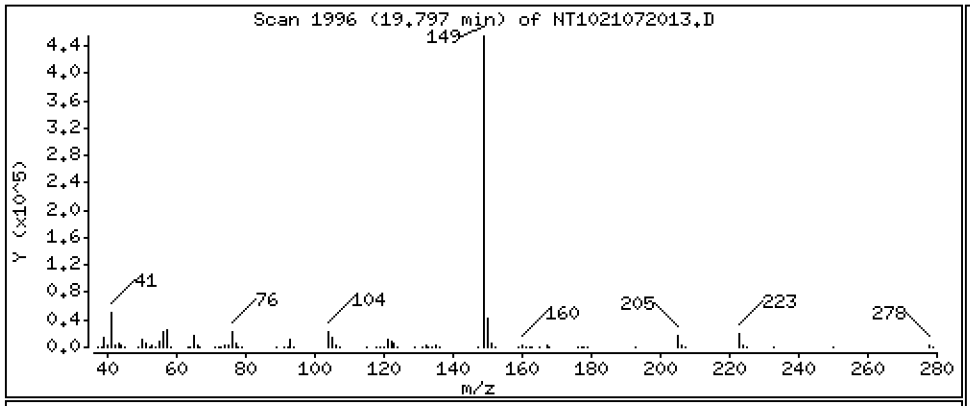
Operator: VTS

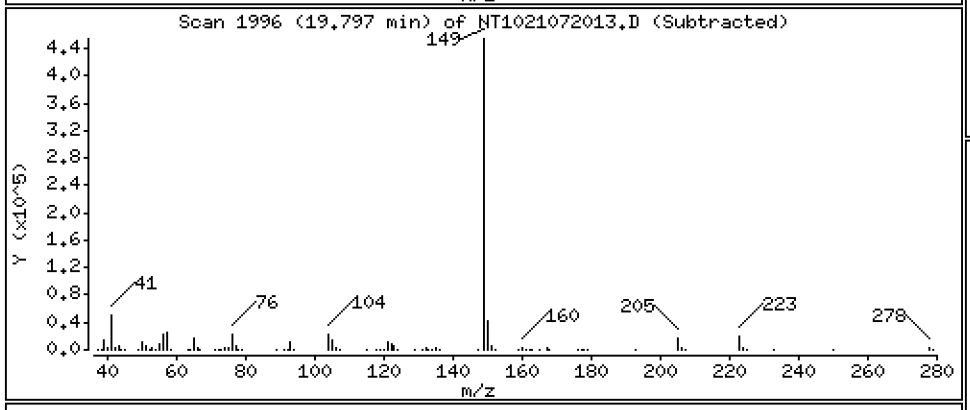
Column phase: ZB-5msi

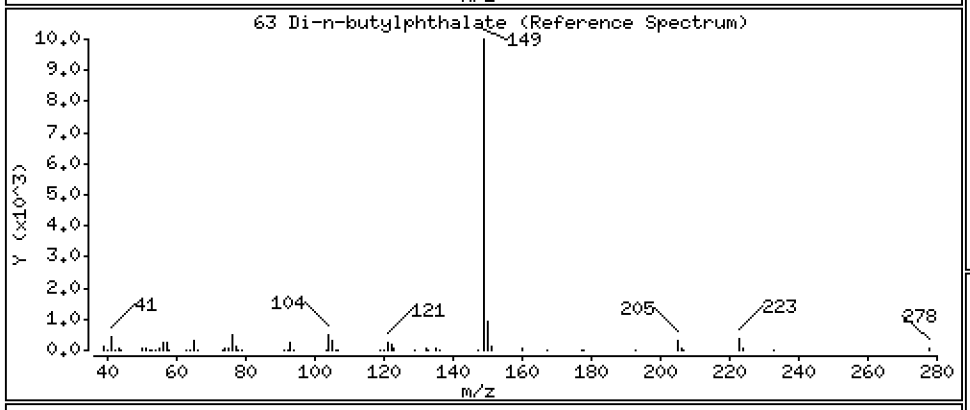
Column diameter: 0.25

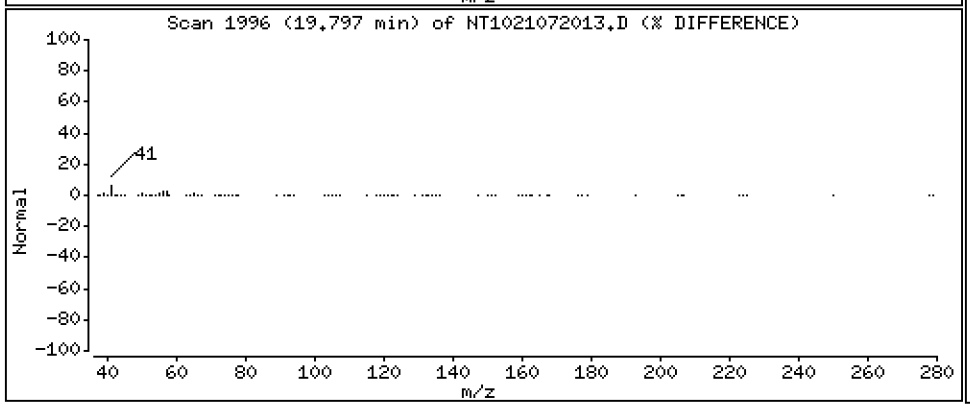
63 Di-n-butylphthalate

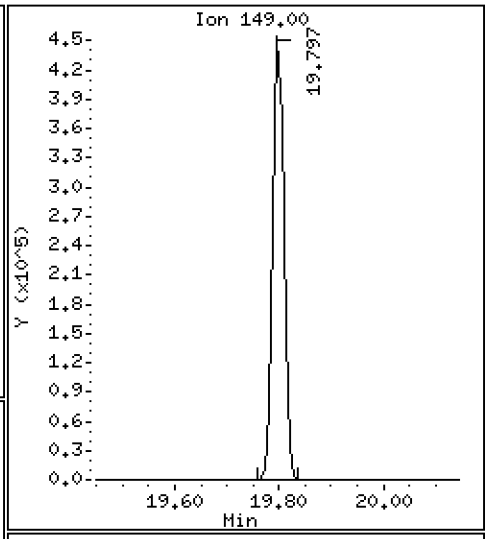
Concentration: 4.276 ug/mL

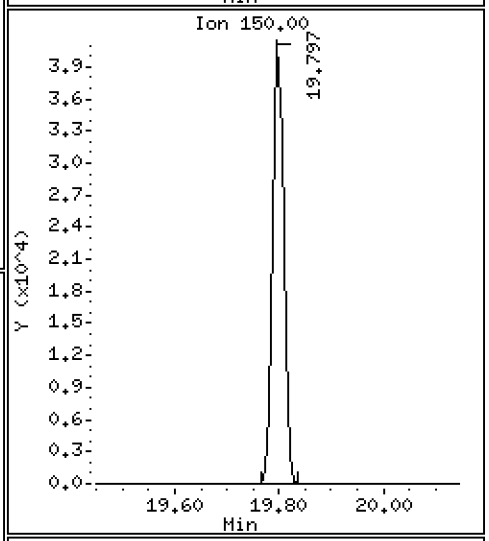


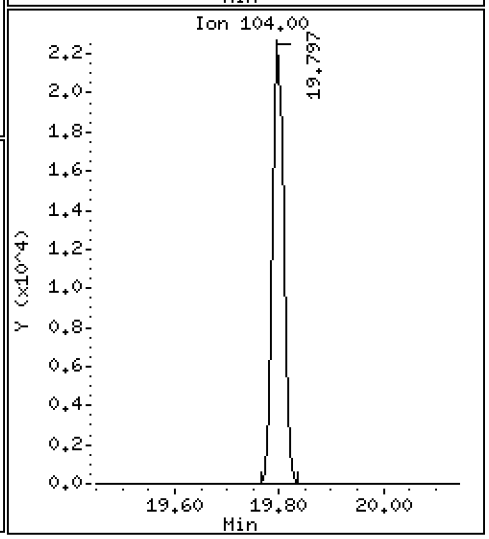












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

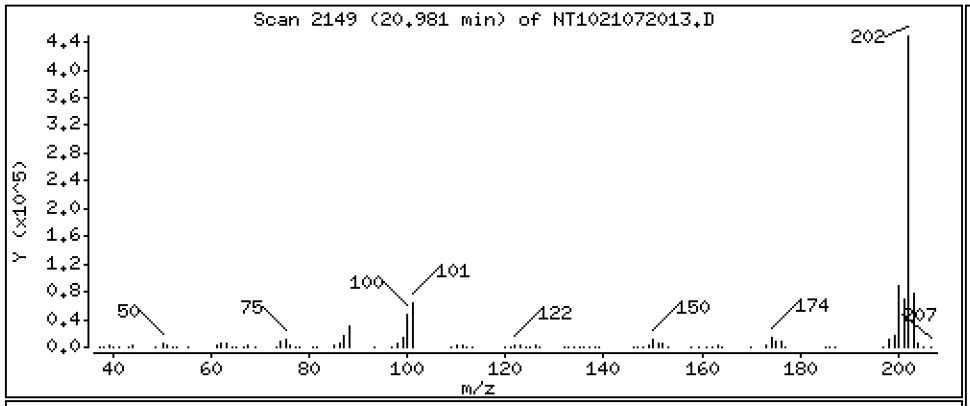
Operator: VTS

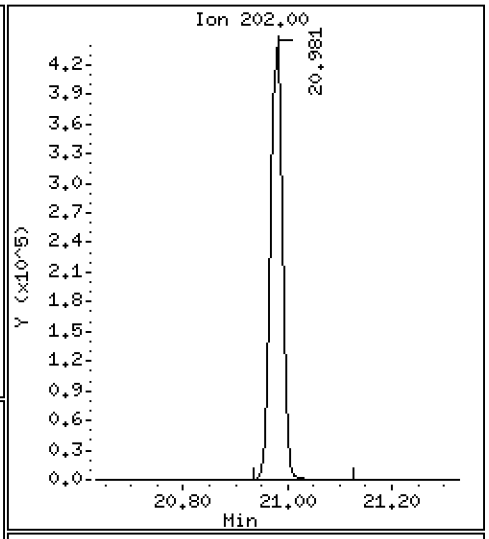
Column phase: ZB-5msi

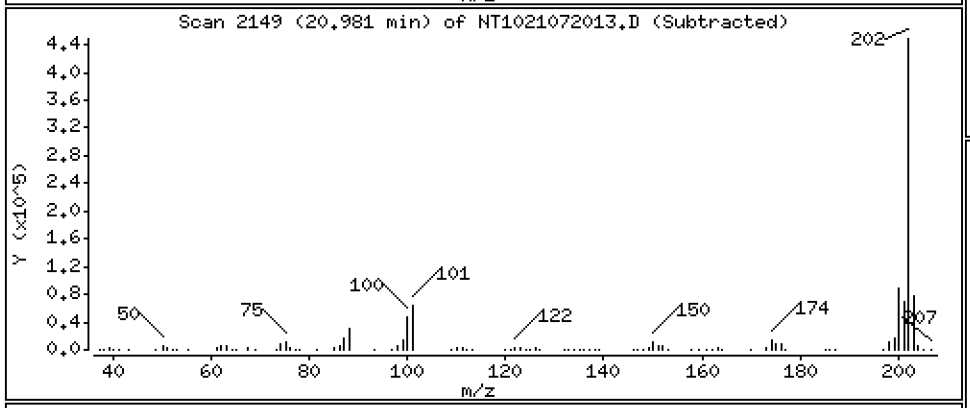
Column diameter: 0.25

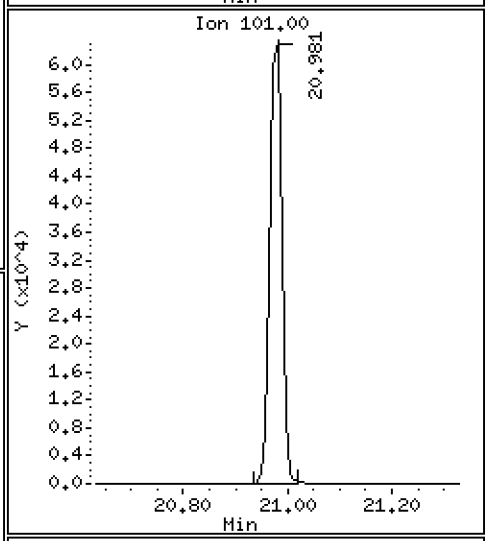
64 Fluoranthene

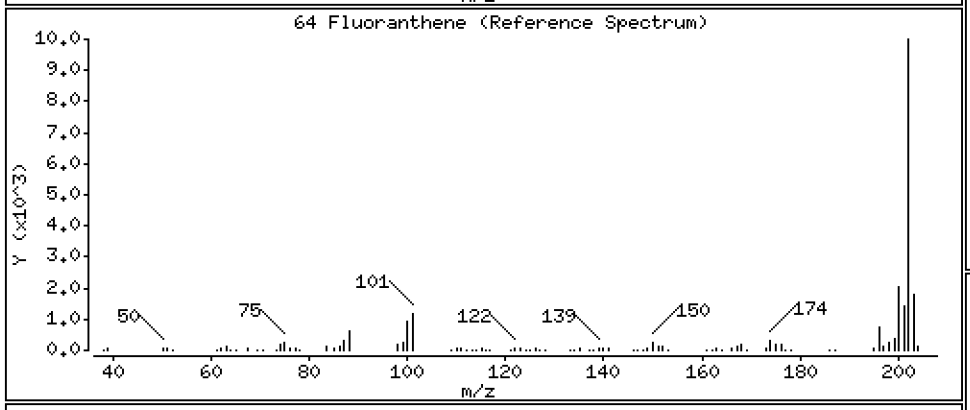
Concentration: 4.950 ug/mL

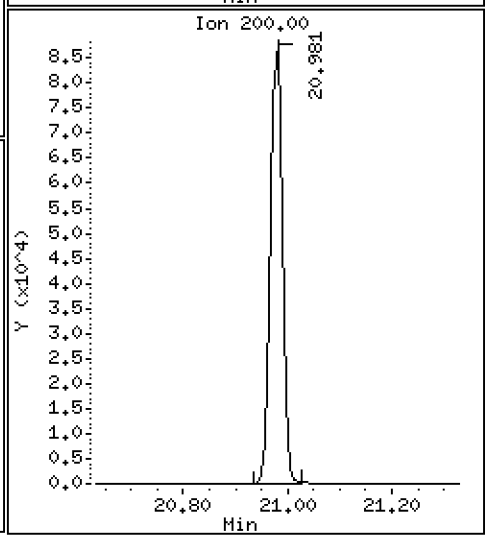


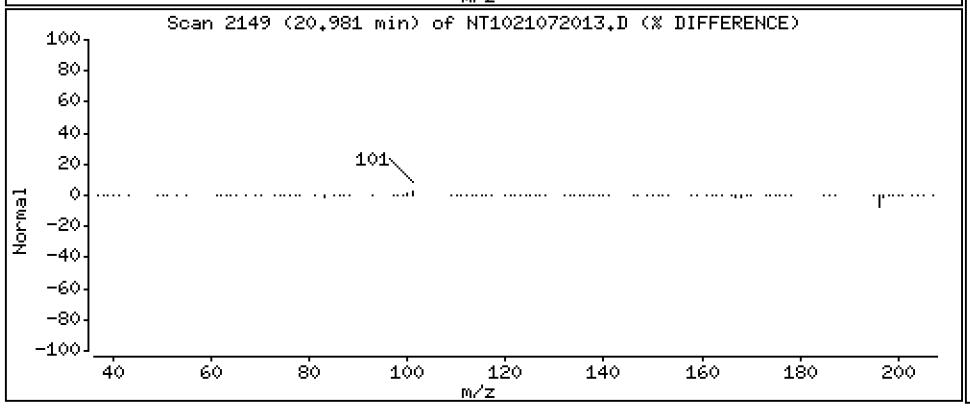












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

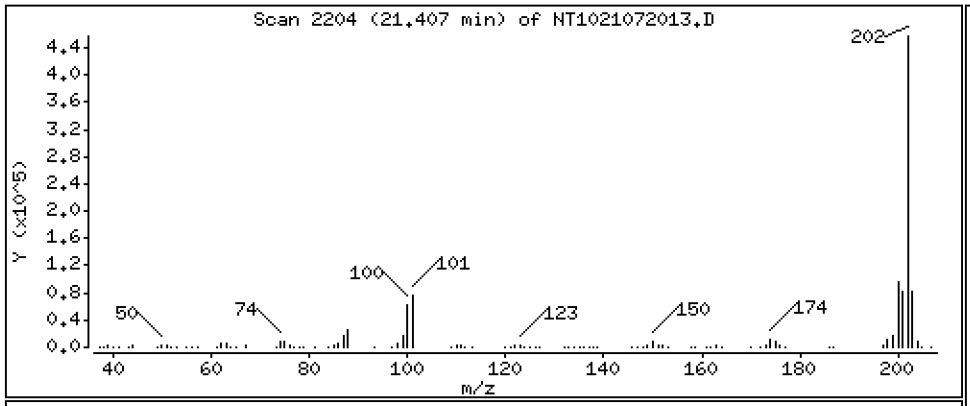
Operator: VTS

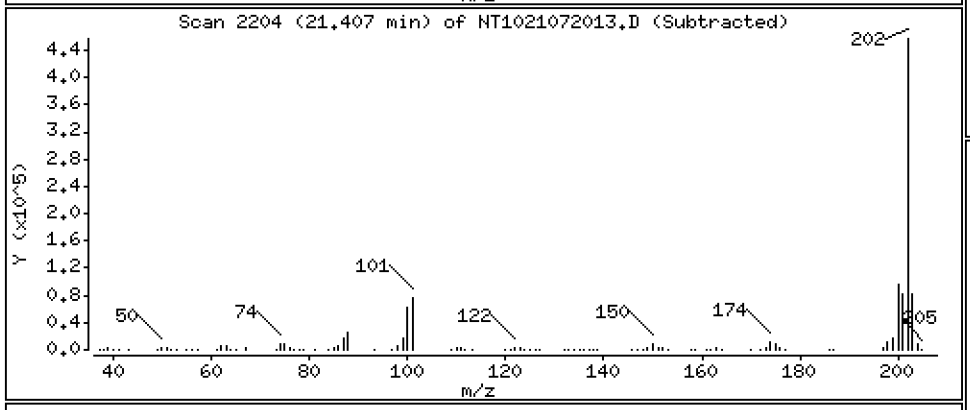
Column phase: ZB-5msi

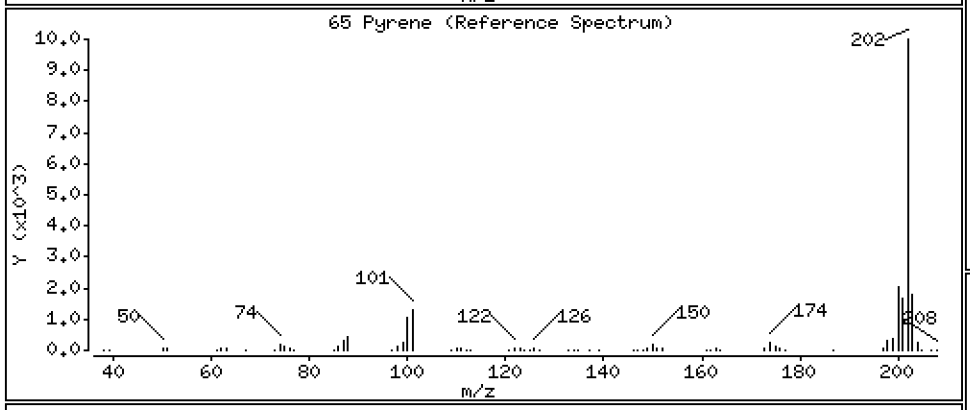
Column diameter: 0.25

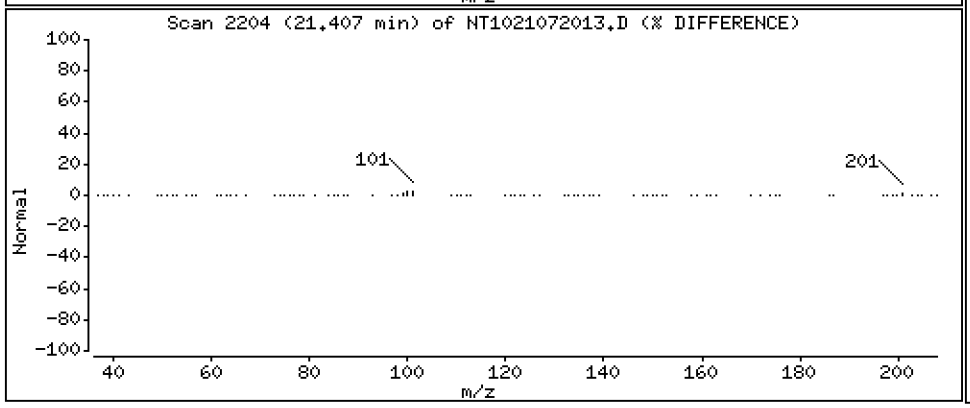
65 Pyrene

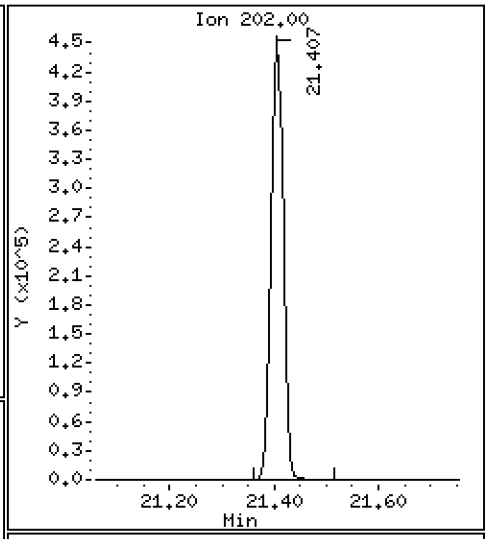
Concentration: 5.254 ug/mL

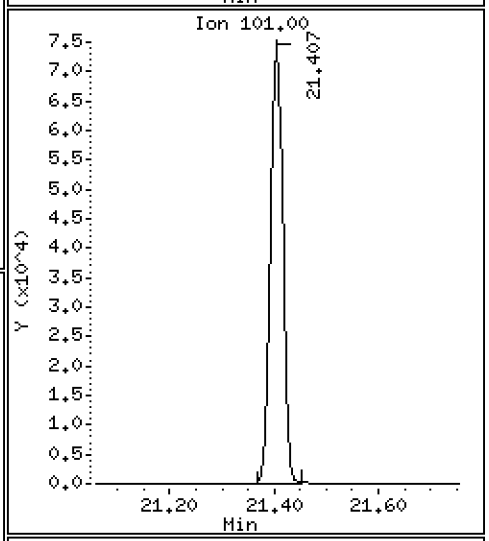


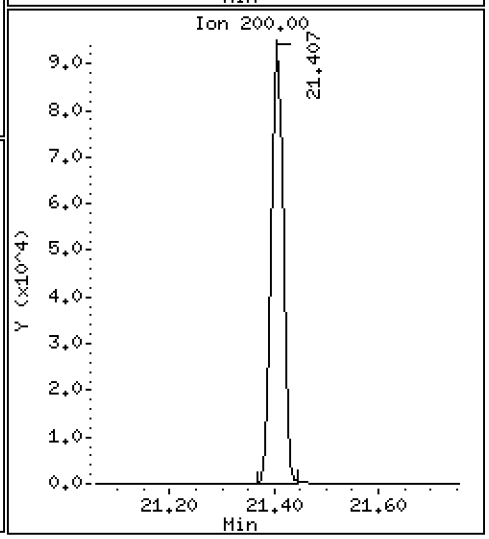












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

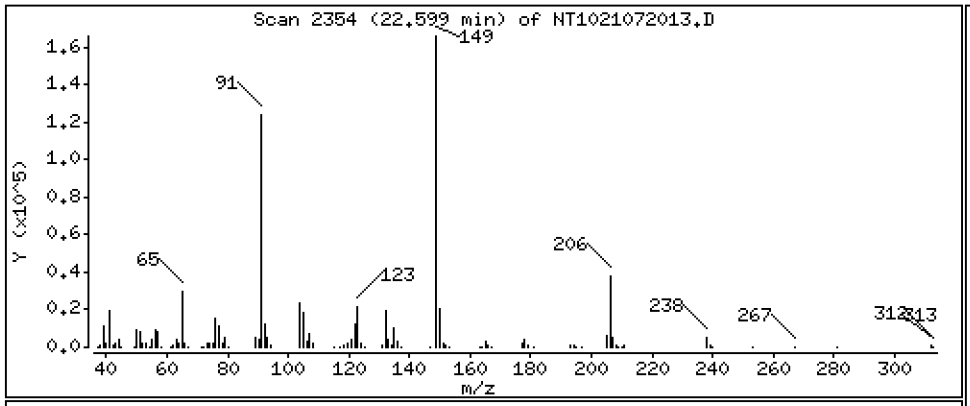
Operator: VTS

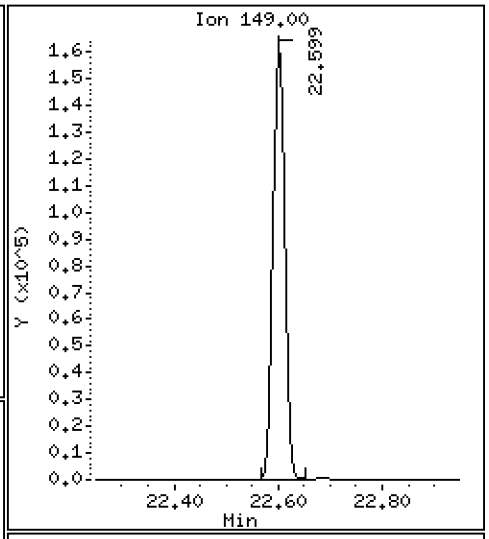
Column phase: ZB-5msi

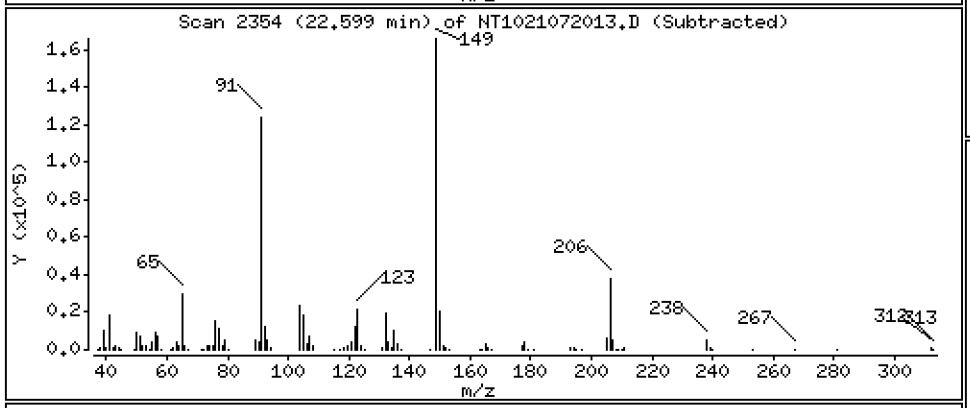
Column diameter: 0.25

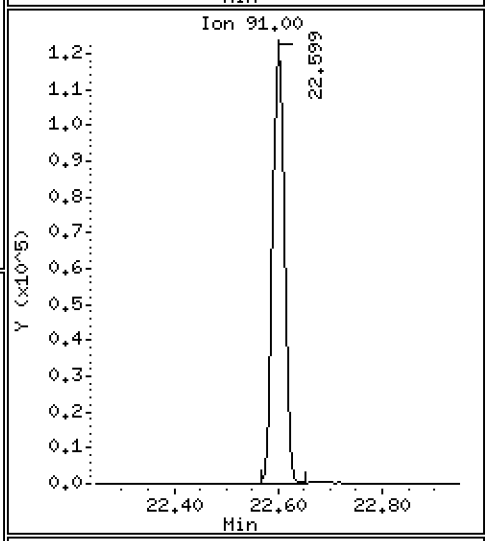
67 Butylbenzylphthalate

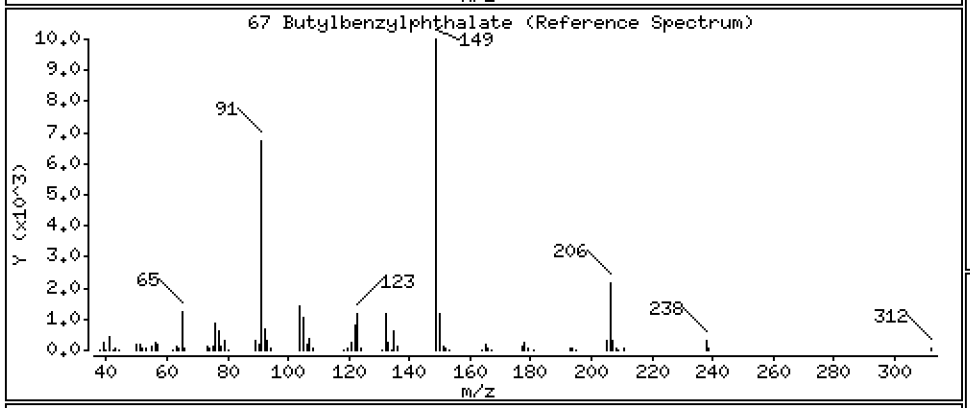
Concentration: 4.974 ug/mL

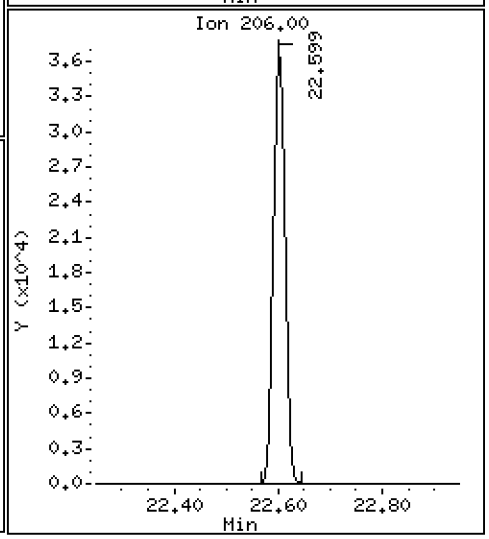


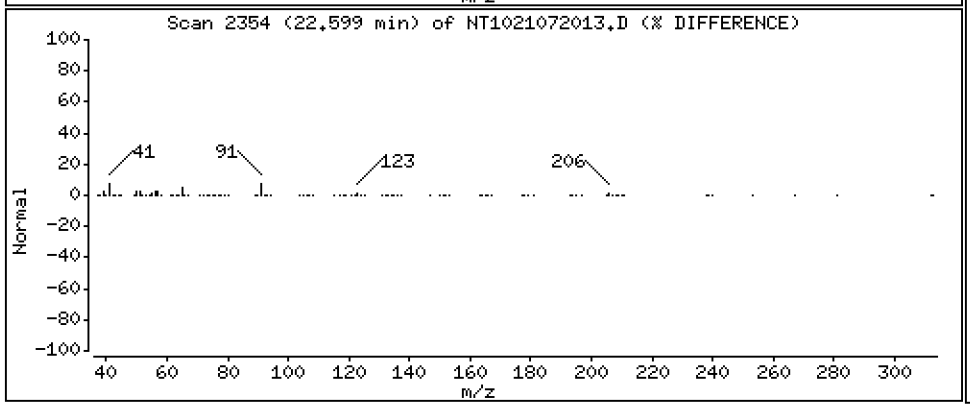












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

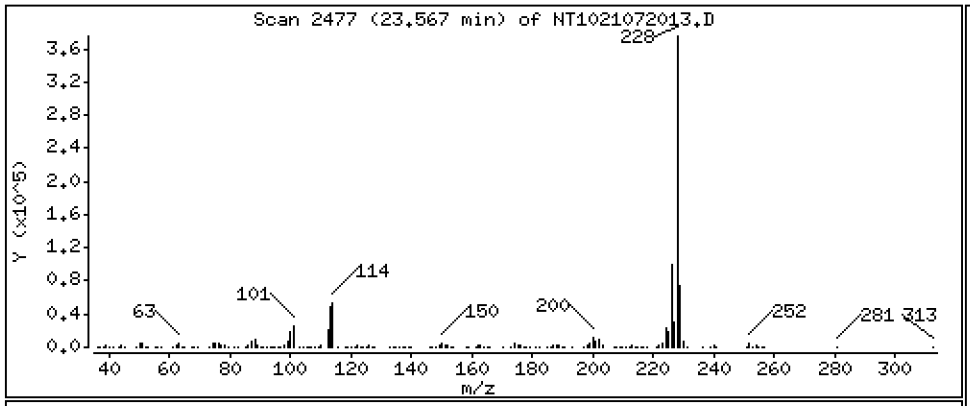
Operator: VTS

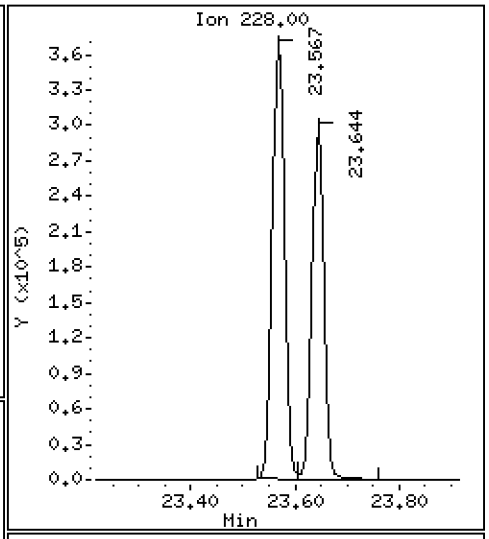
Column phase: ZB-5msi

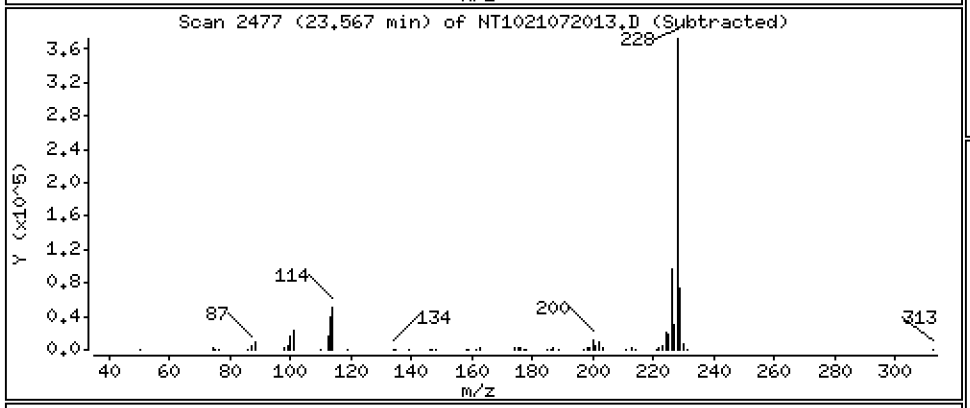
Column diameter: 0.25

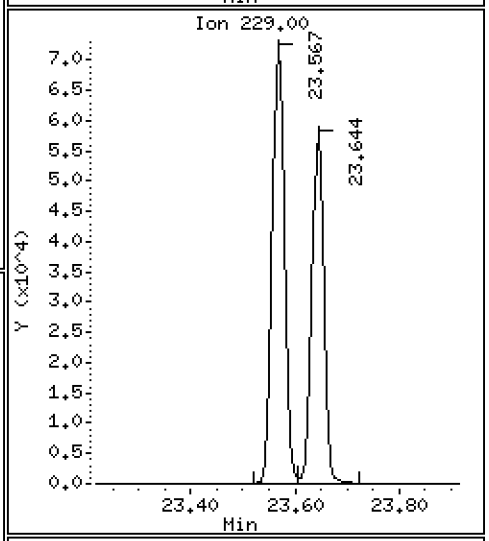
68 Benzo(a)anthracene

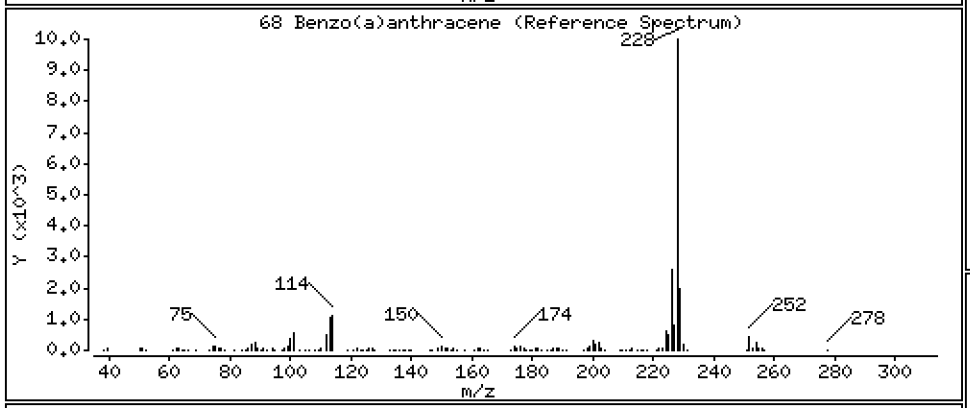
Concentration: 4.800 ug/mL

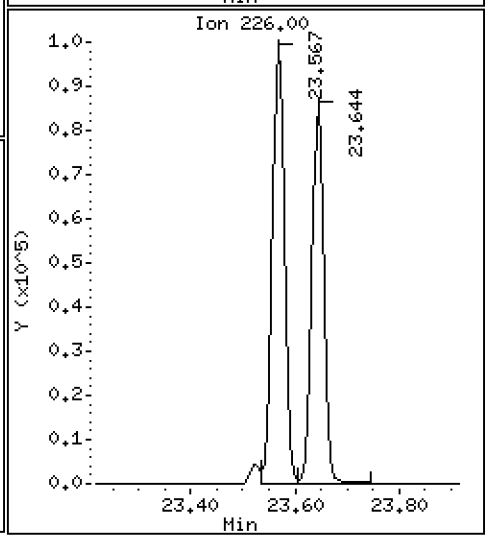


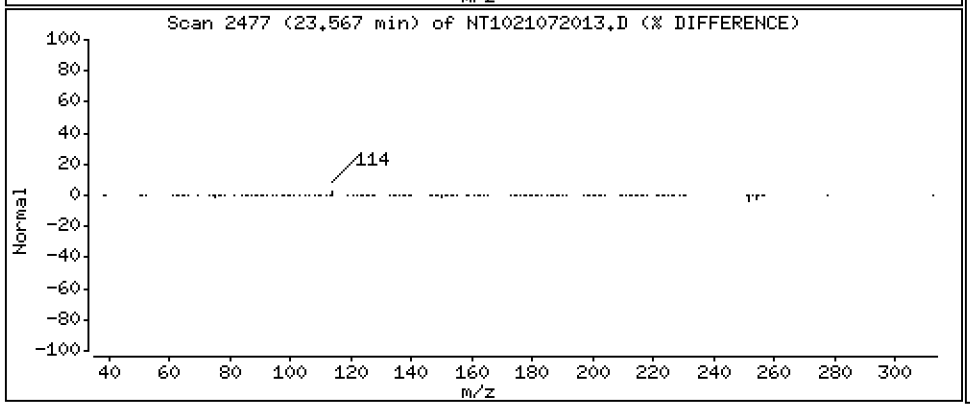












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

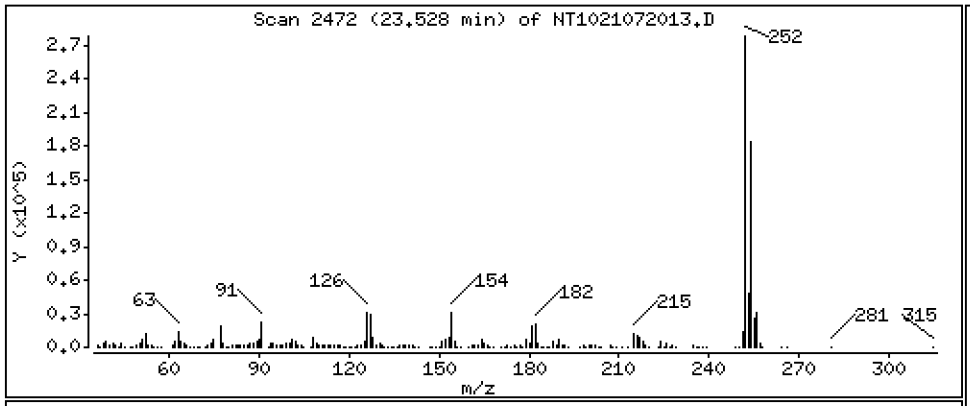
Operator: VTS

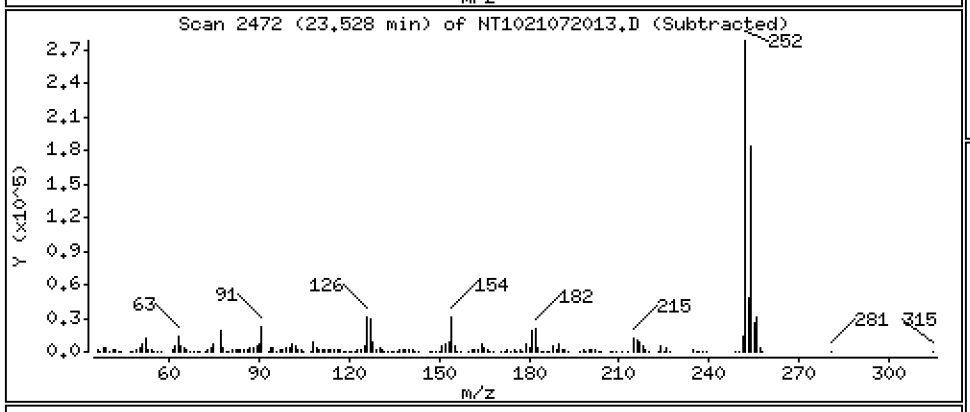
Column phase: ZB-5msi

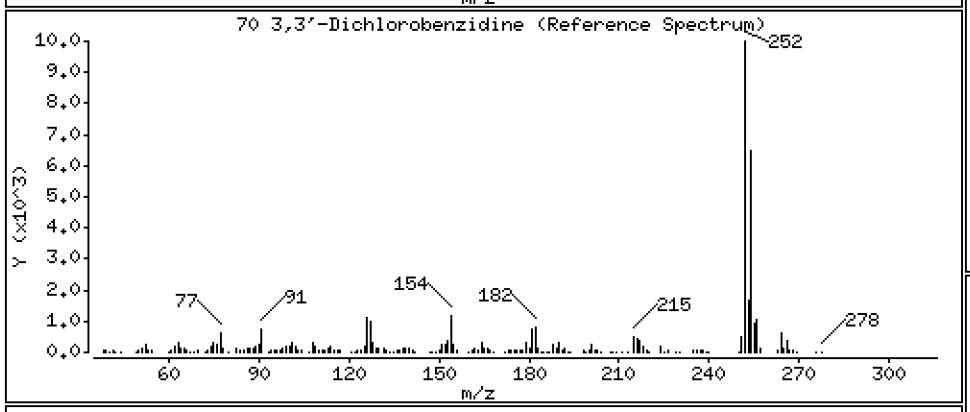
Column diameter: 0.25

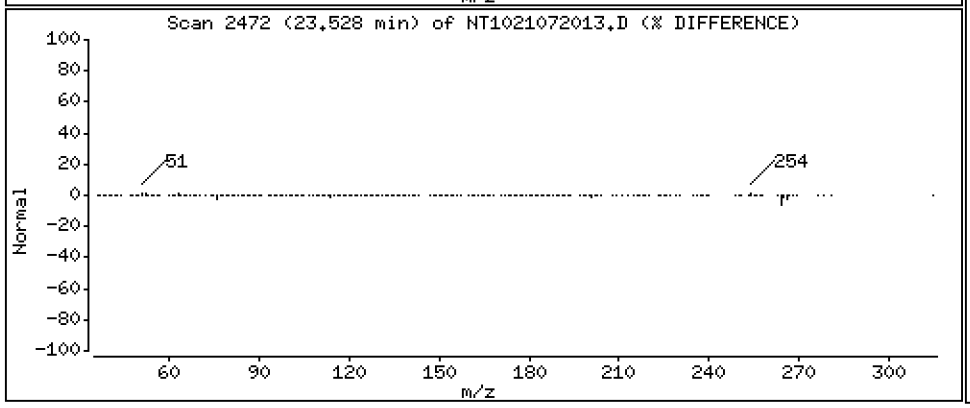
70 3,3'-Dichlorobenzidine

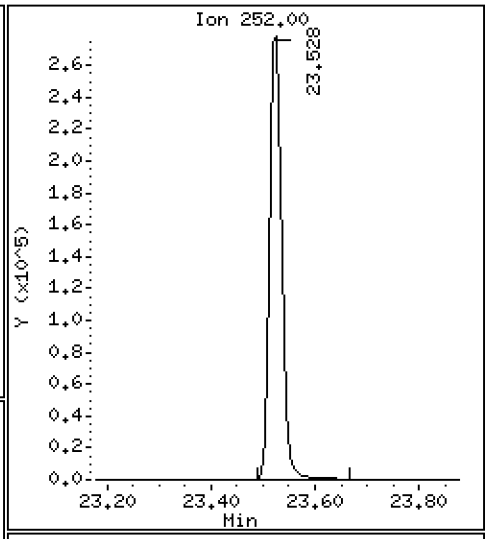
Concentration: 9.013 ug/mL

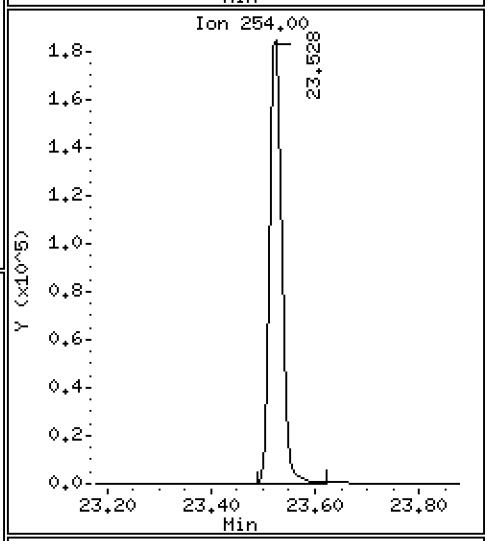


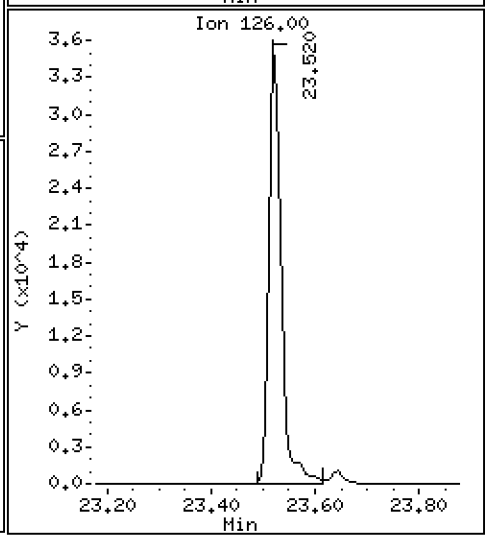












Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D

Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

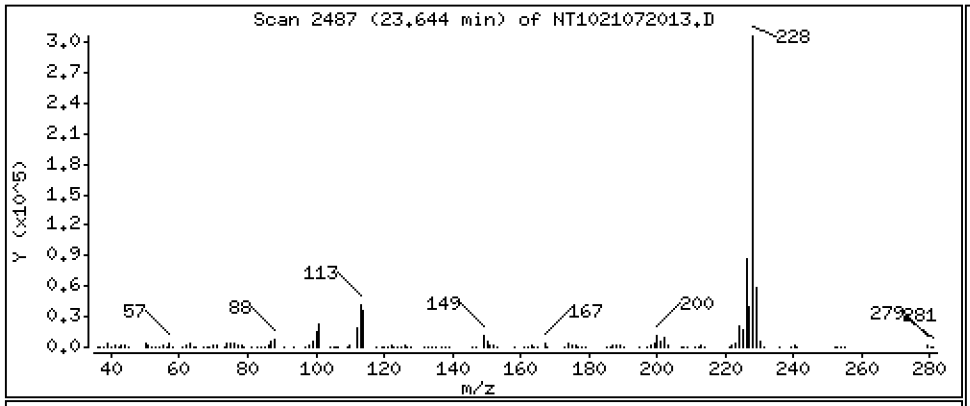
Operator: VTS

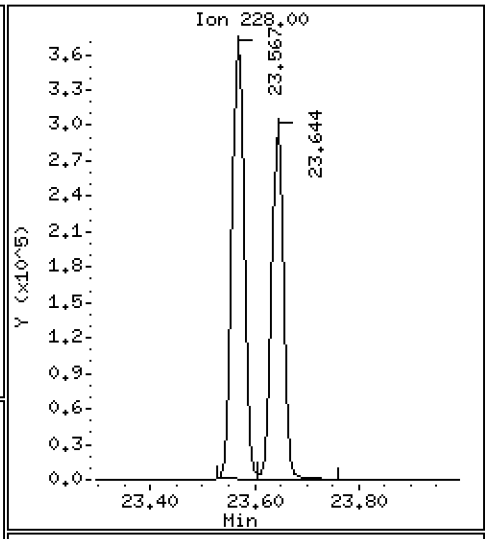
Column phase: ZB-5msi

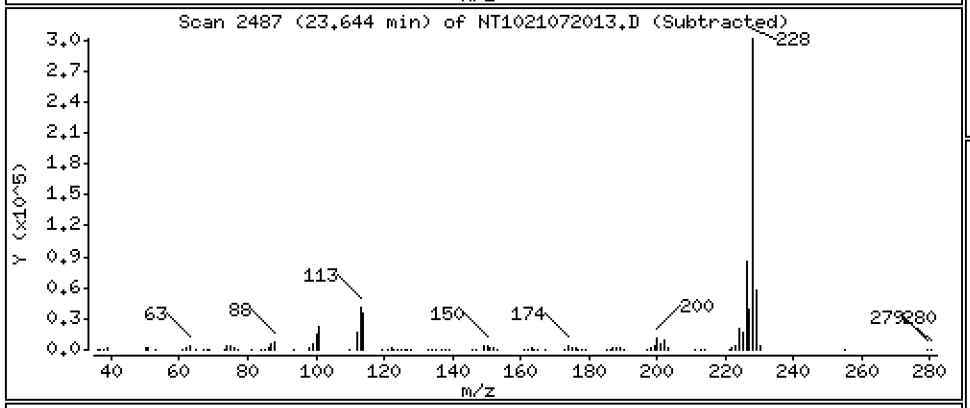
Column diameter: 0.25

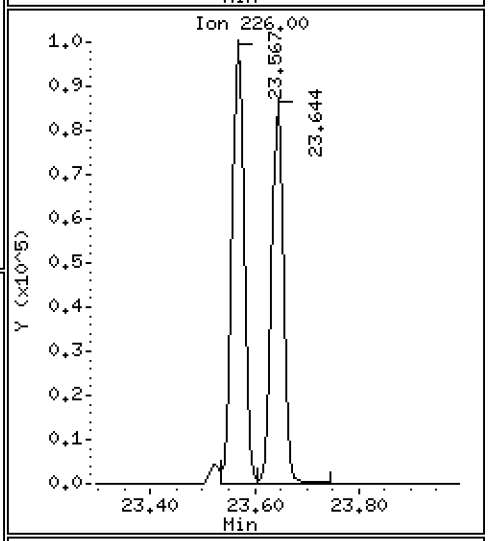
71 Chrysene

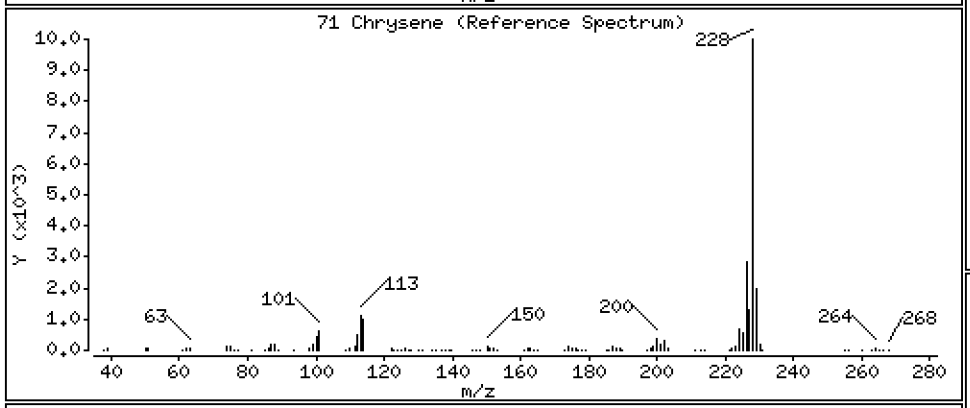
Concentration: 4.859 ug/mL

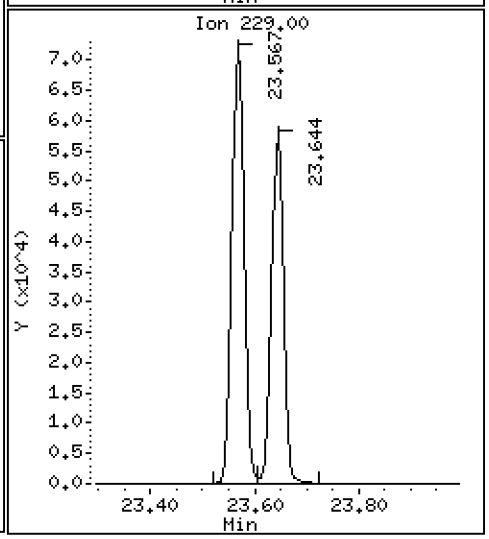


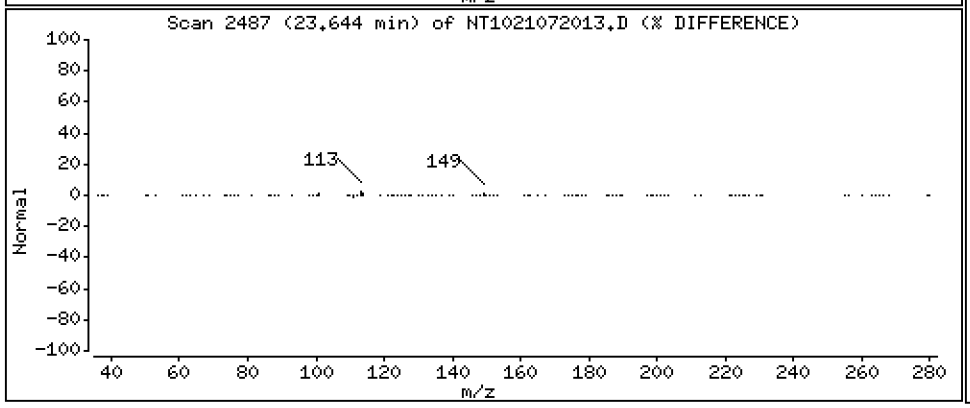












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

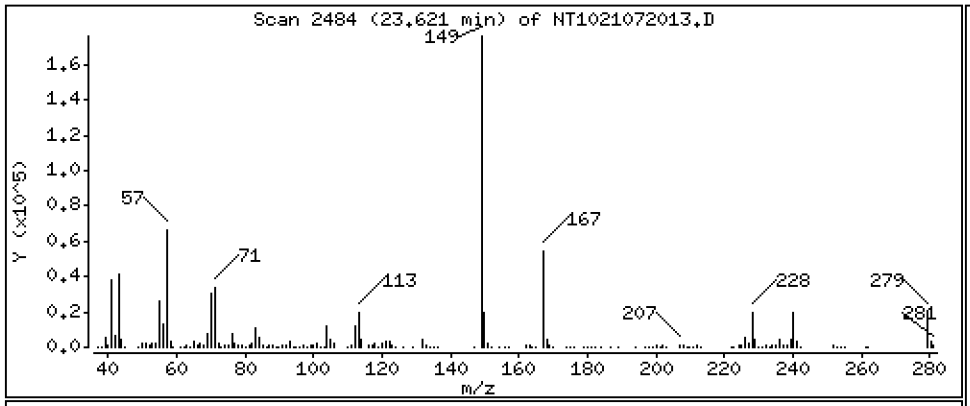
Operator: VTS

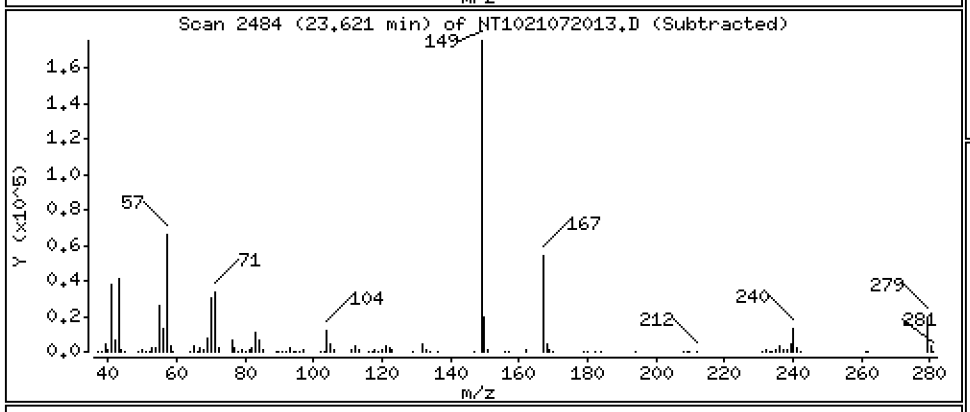
Column phase: ZB-5msi

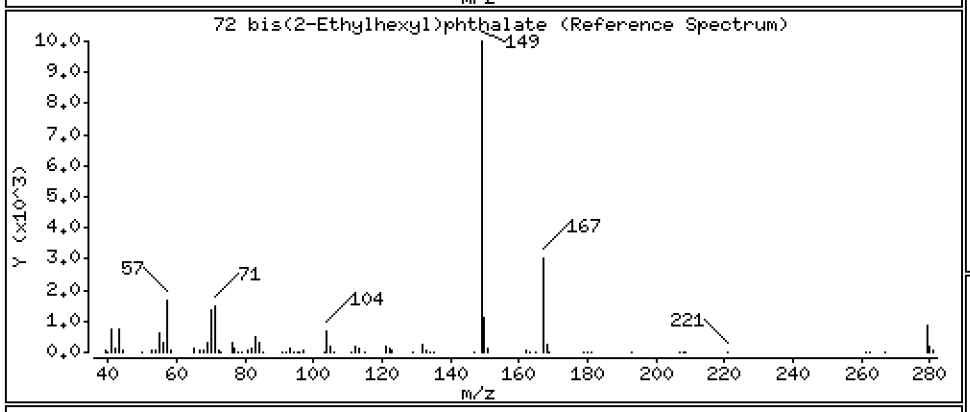
Column diameter: 0.25

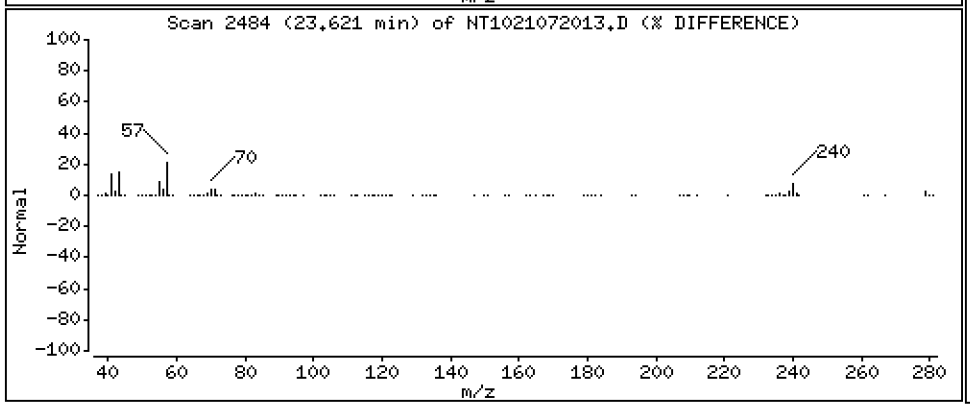
72 bis(2-Ethylhexyl)phthalate

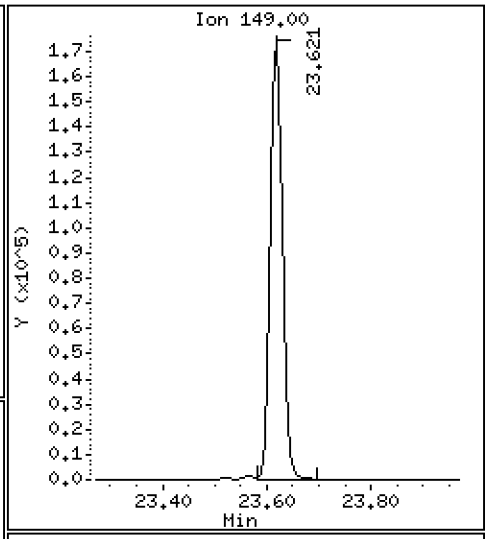
Concentration: 5.117 ug/mL

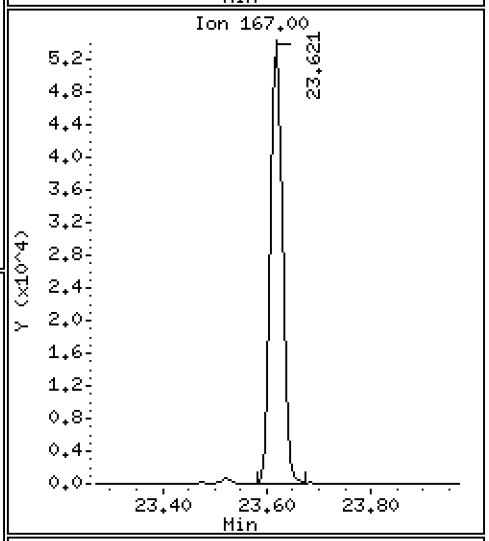


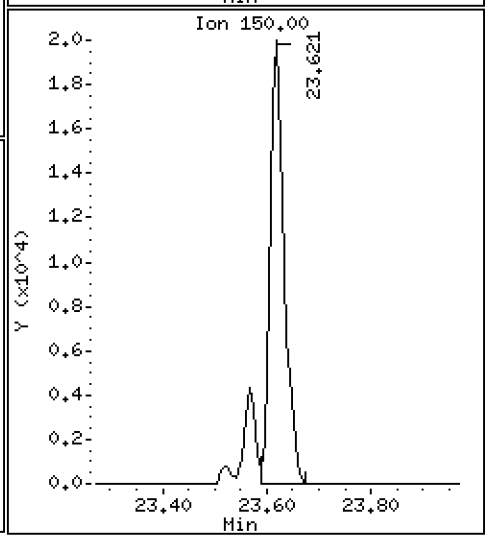












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

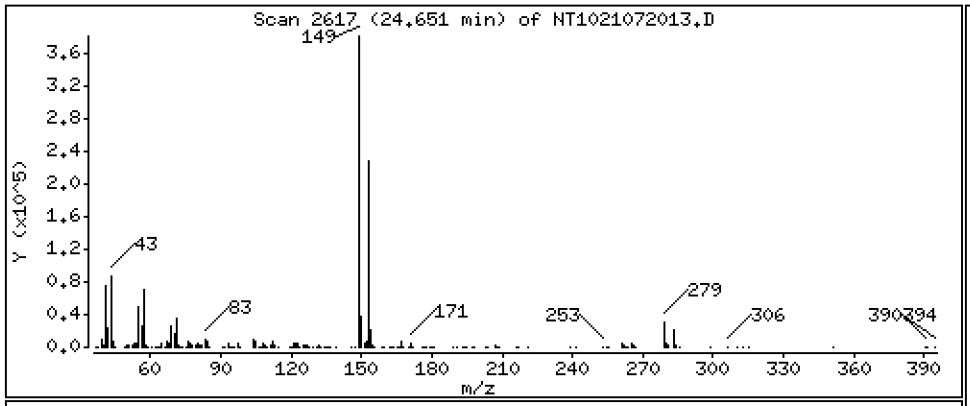
Operator: VTS

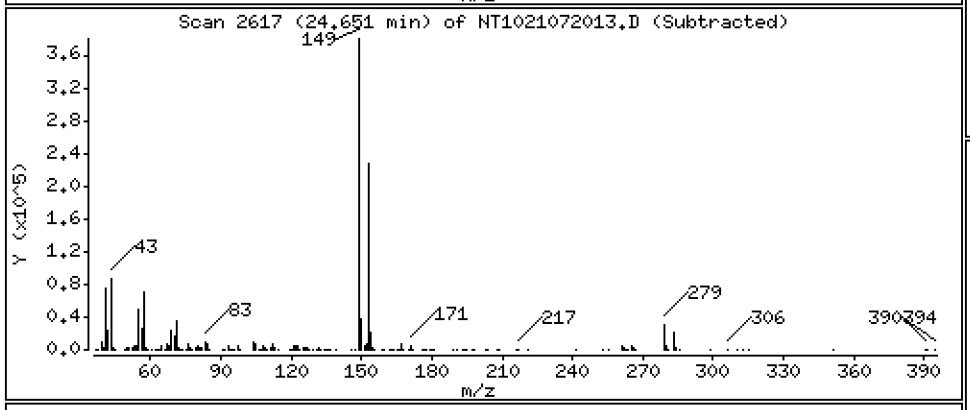
Column phase: ZB-5msi

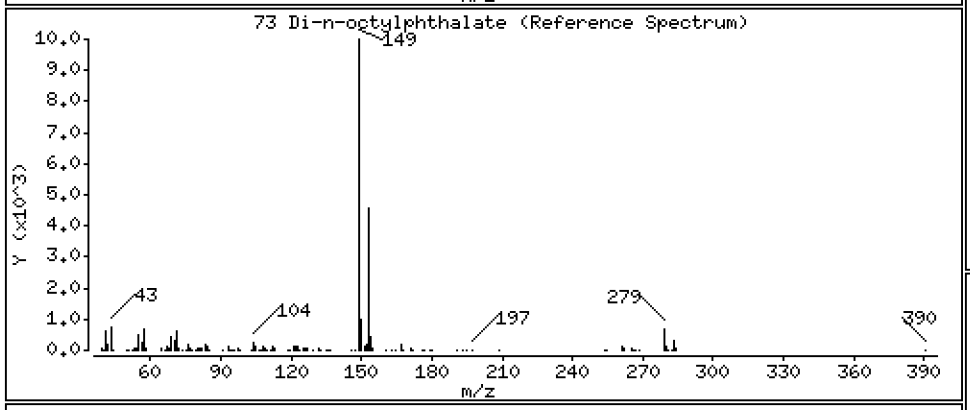
Column diameter: 0.25

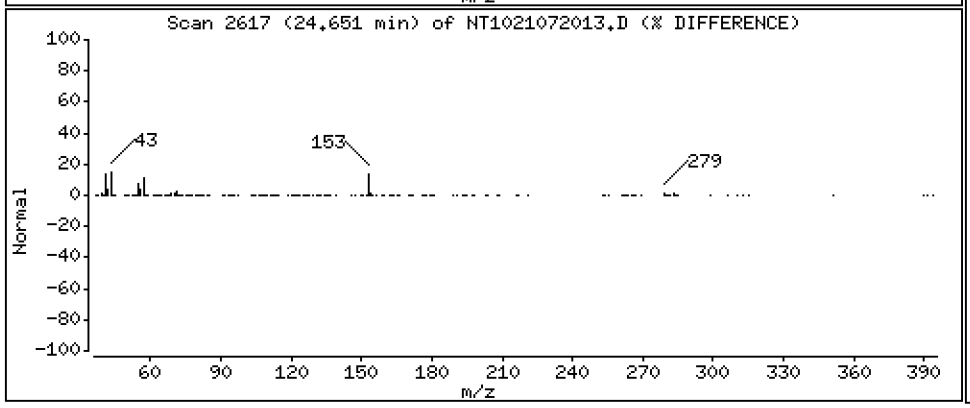
73 Di-n-octylphthalate

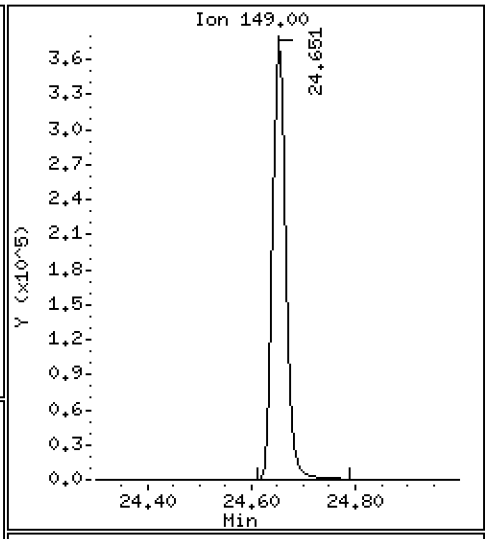
Concentration: 4.741 ug/mL

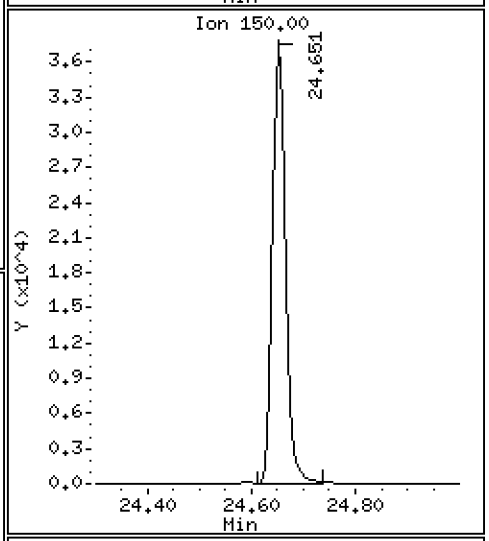


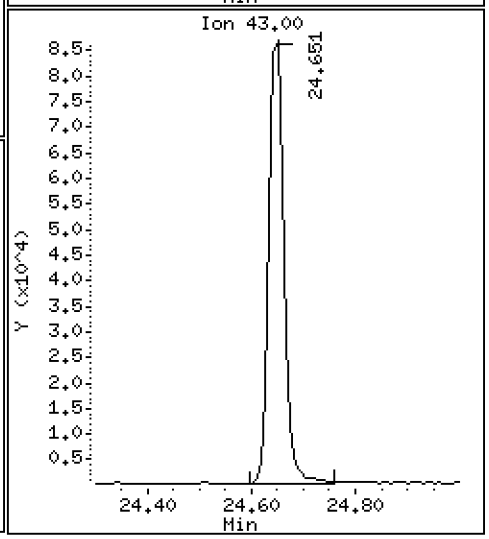












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

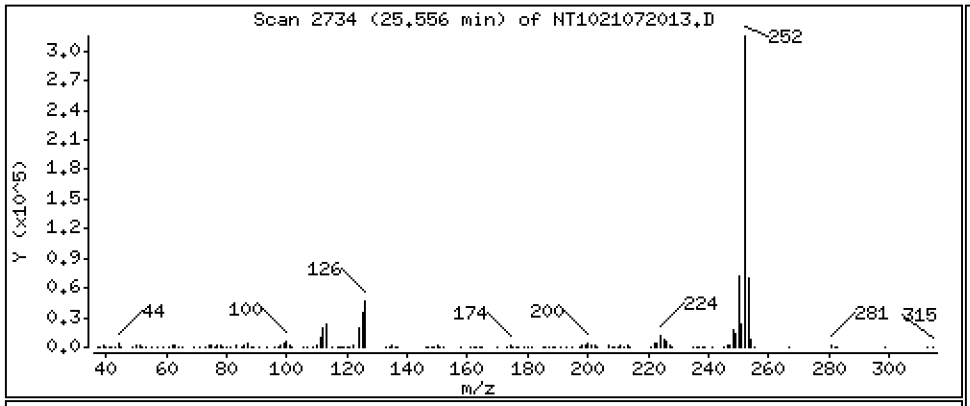
Operator: VTS

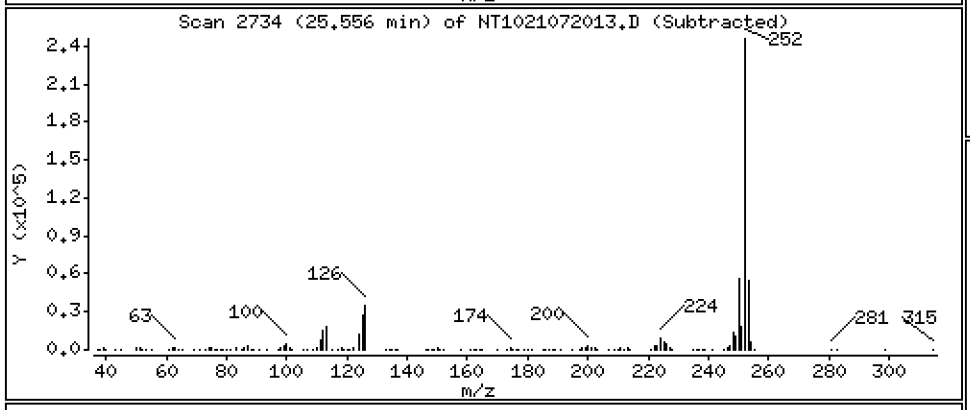
Column phase: ZB-5msi

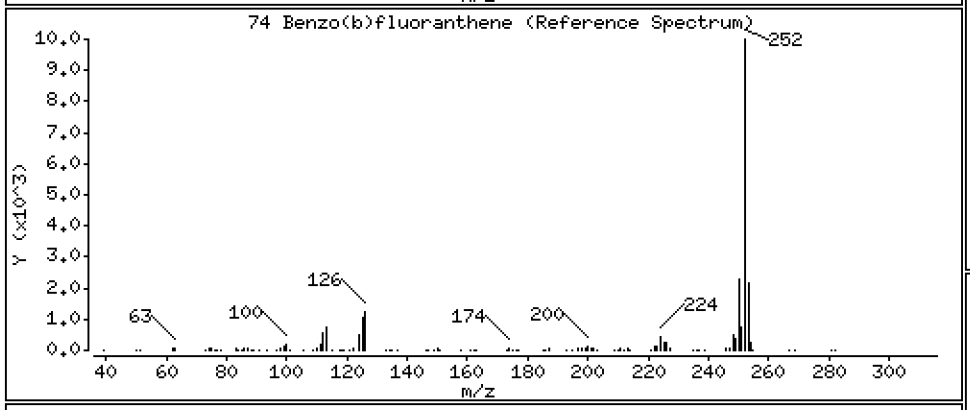
Column diameter: 0.25

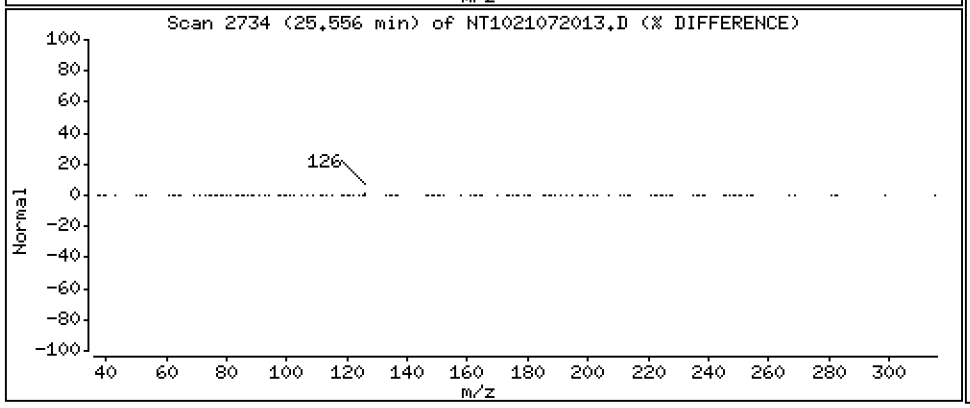
74 Benzo(b)fluoranthene

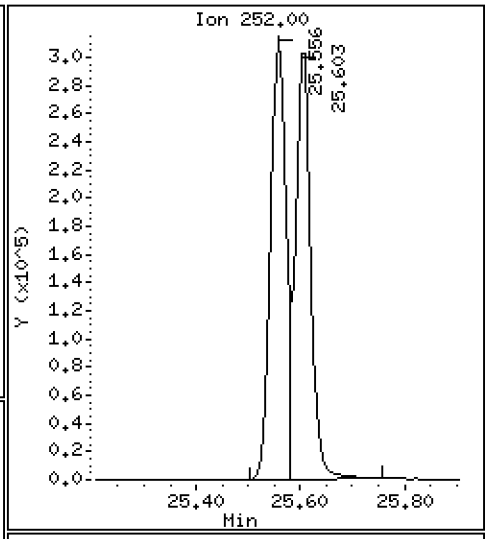
Concentration: 4.778 ug/mL

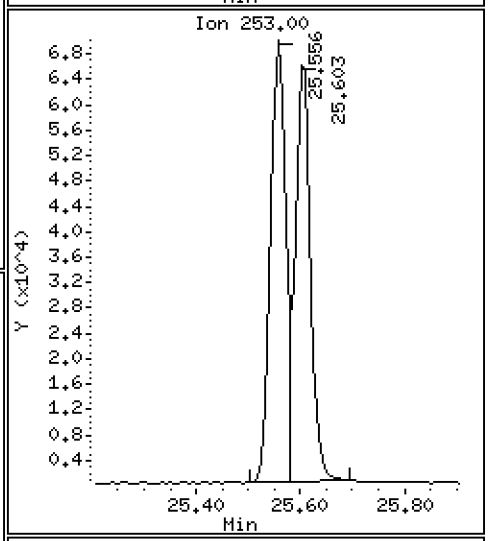


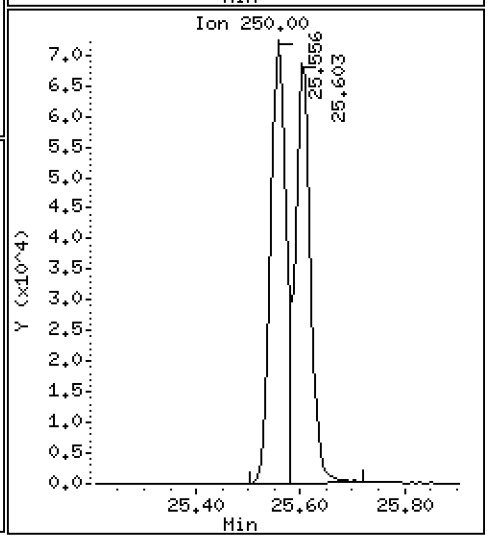












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

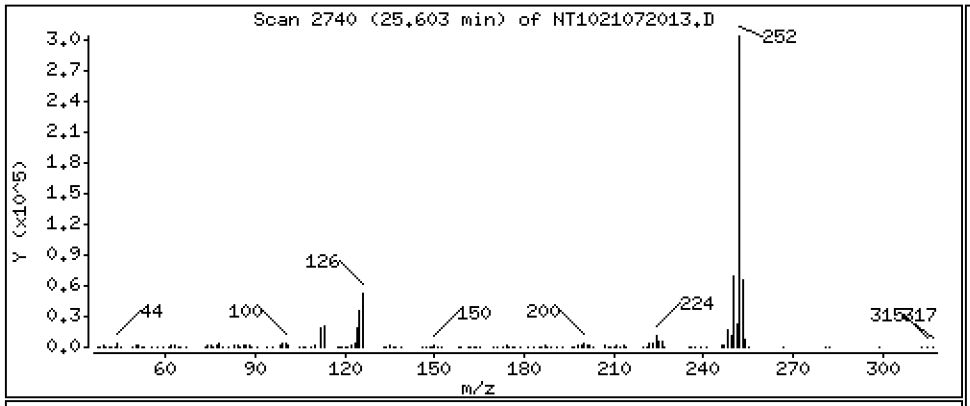
Operator: VTS

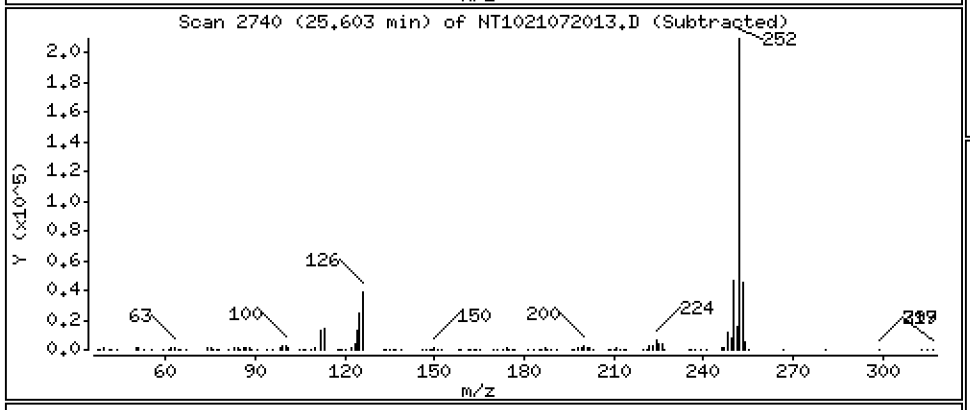
Column phase: ZB-5msi

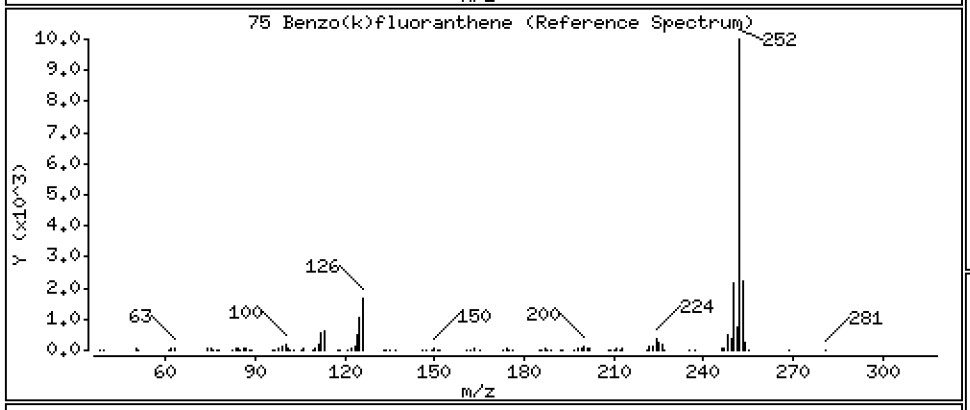
Column diameter: 0.25

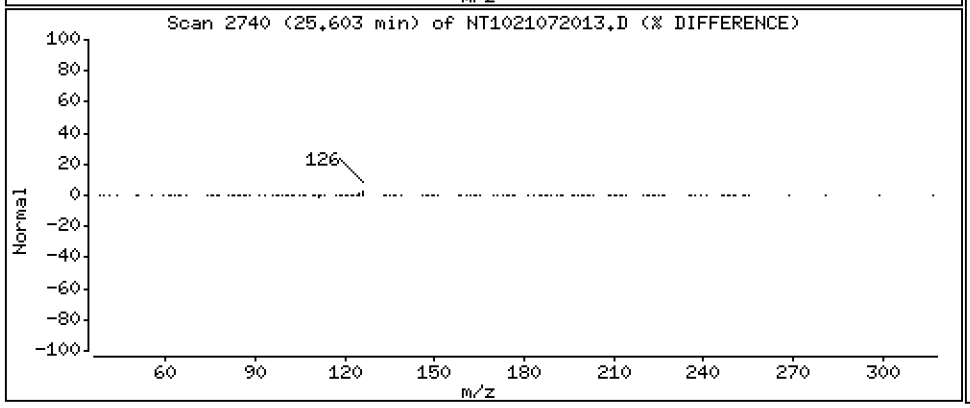
75 Benzo(k)fluoranthene

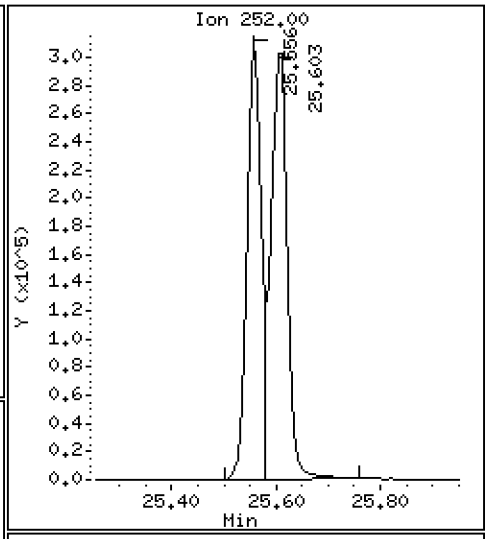
Concentration: 5.137 ug/mL

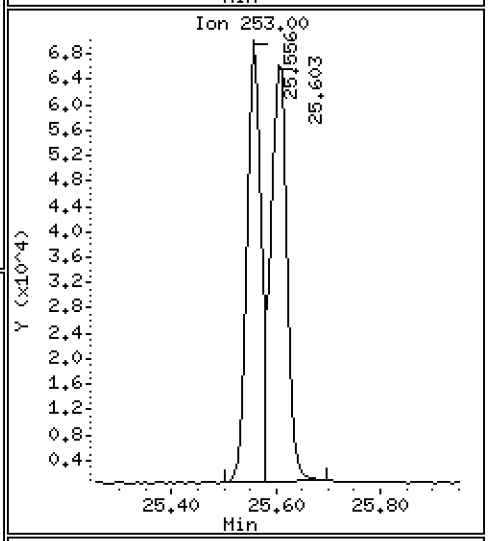


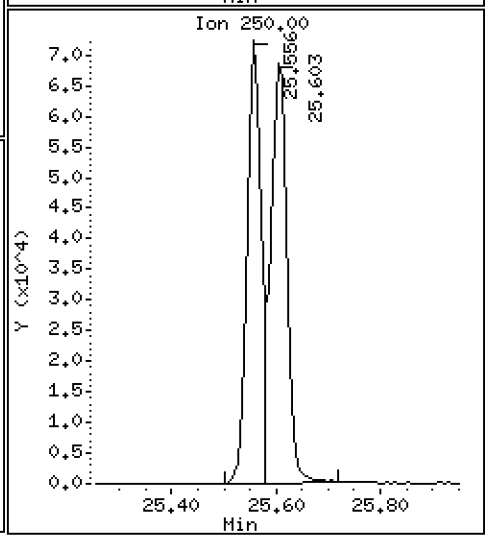












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

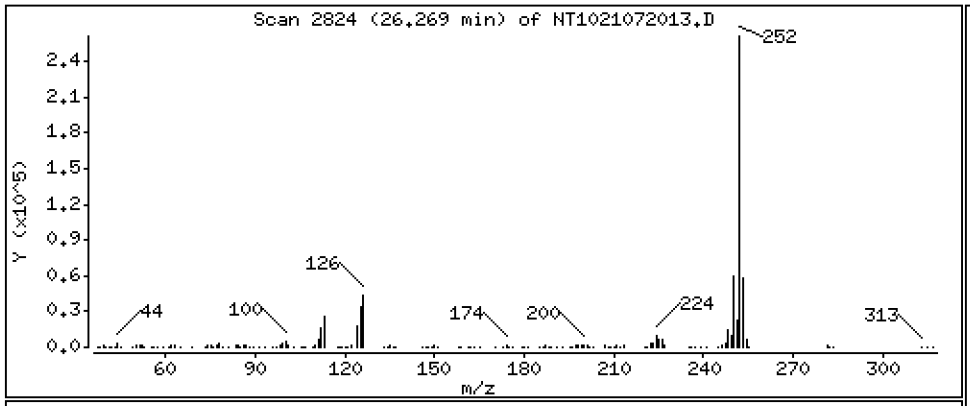
Operator: VTS

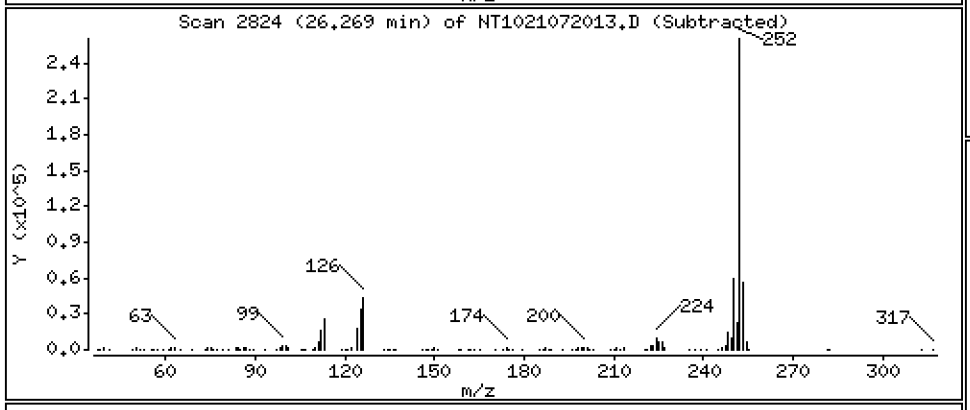
Column phase: ZB-5msi

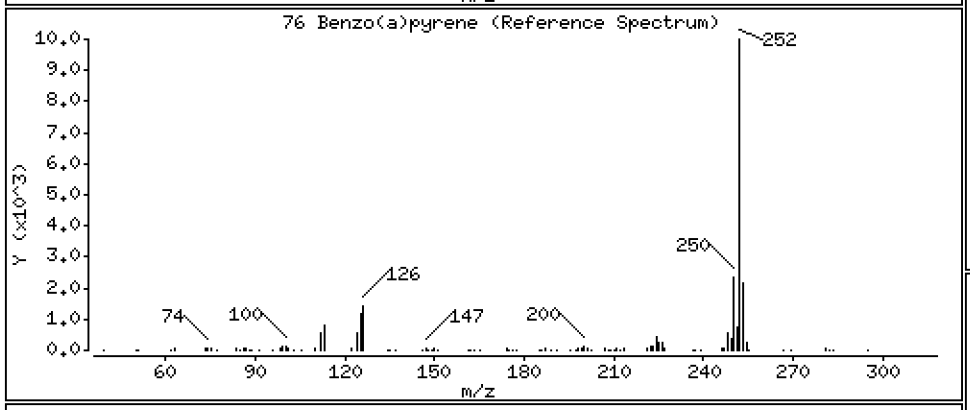
Column diameter: 0.25

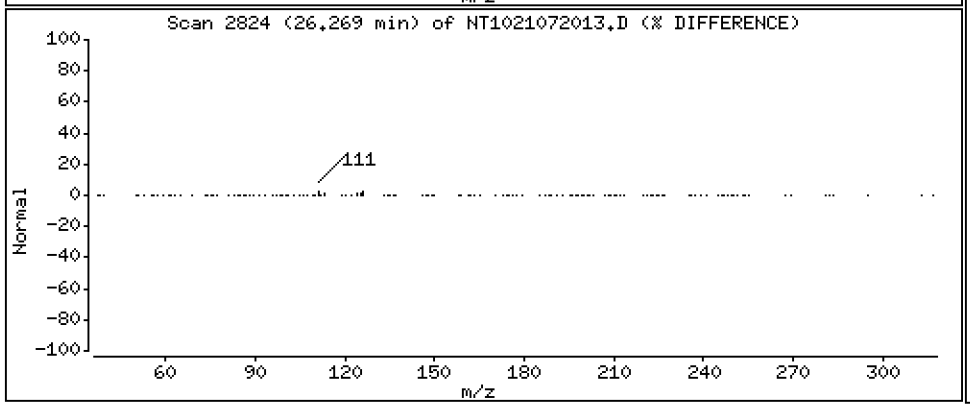
76 Benzo(a)pyrene

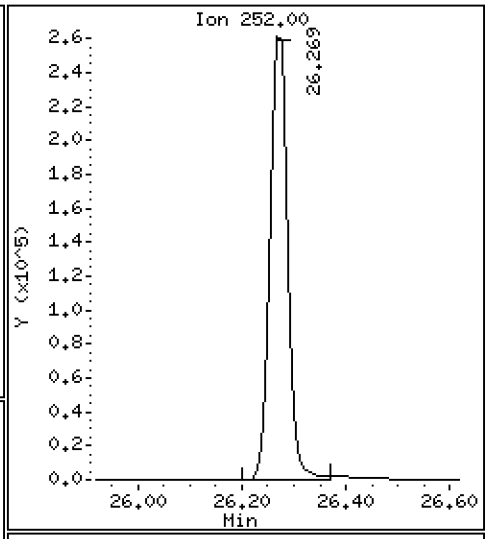
Concentration: 4.977 ug/mL

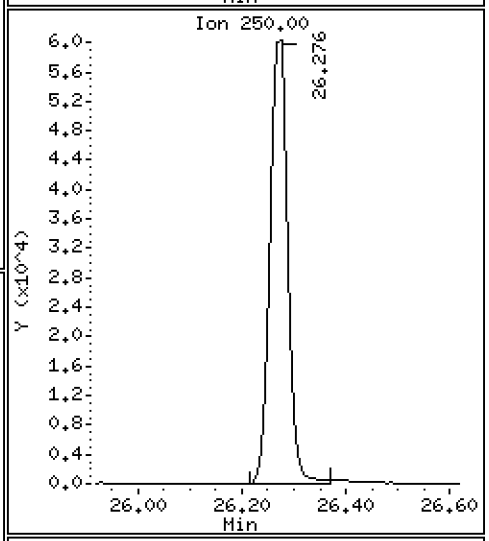


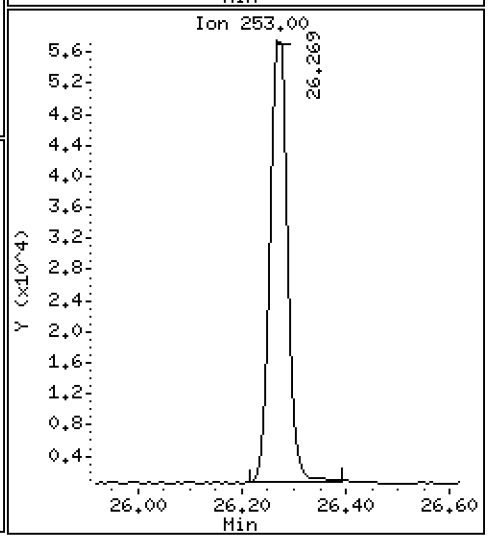












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

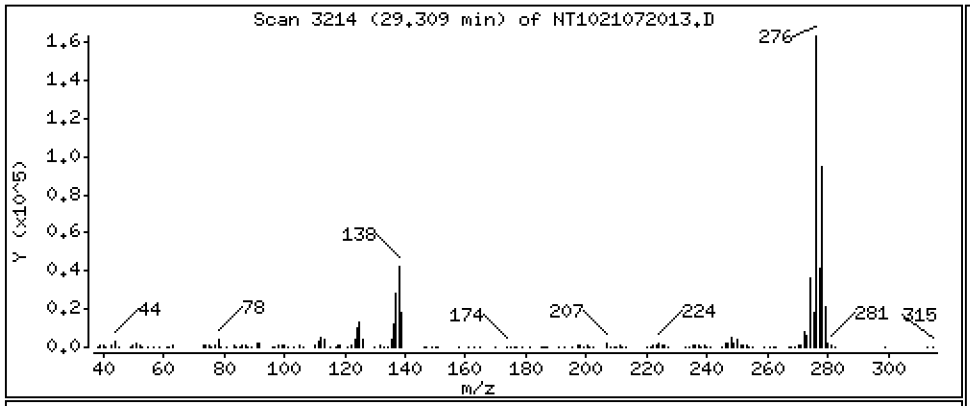
Operator: VTS

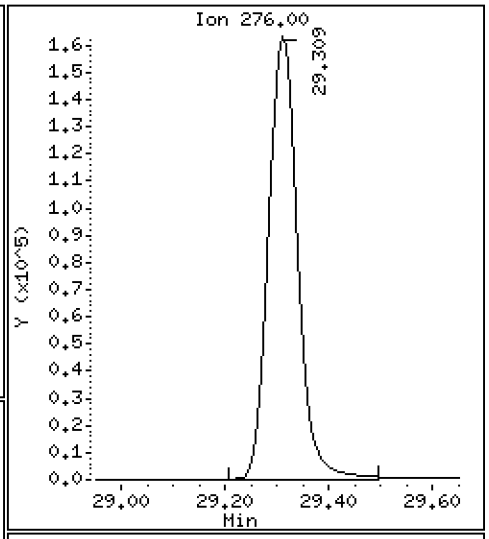
Column phase: ZB-5msi

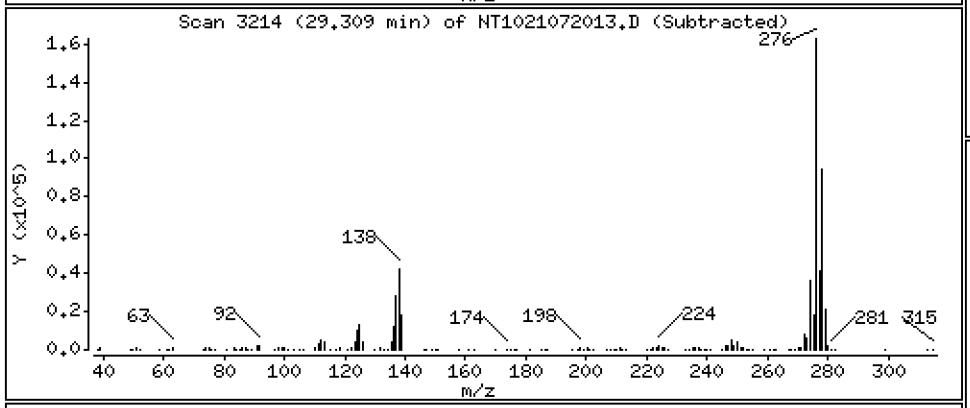
Column diameter: 0.25

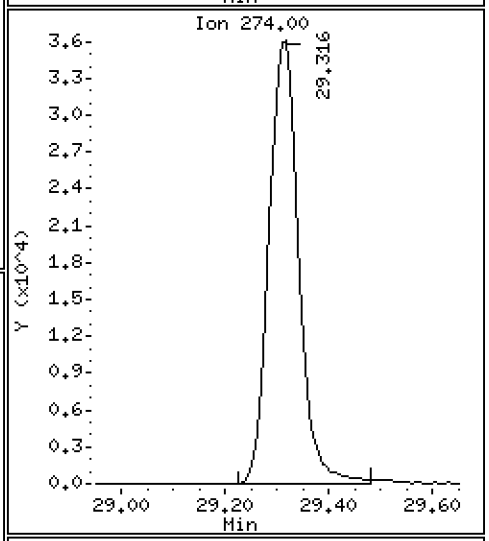
78 Indeno(1,2,3-cd)pyrene

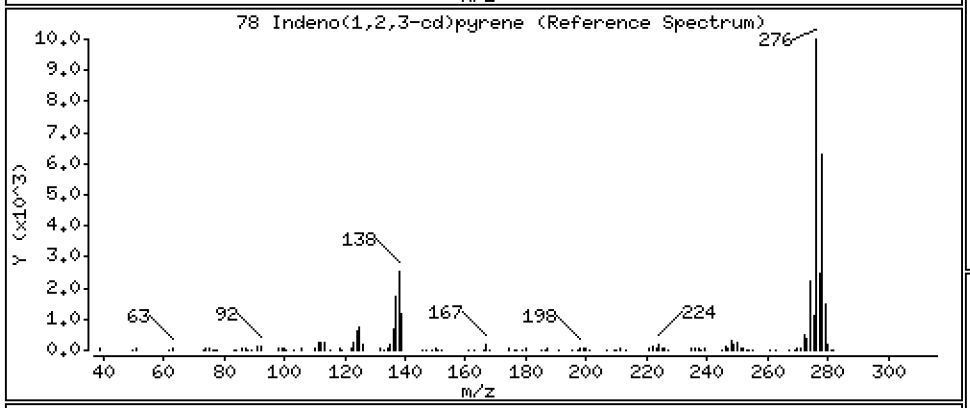
Concentration: 4.743 ug/mL

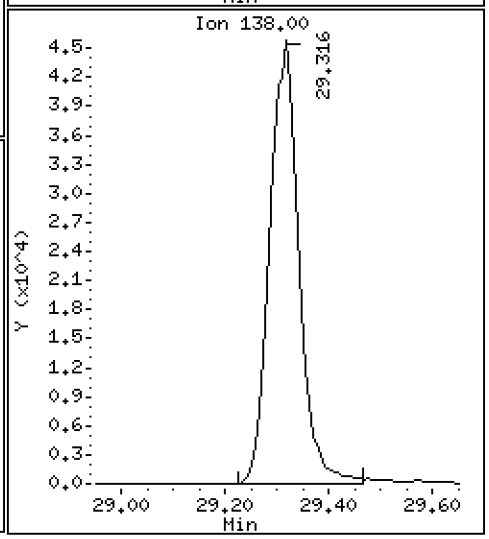


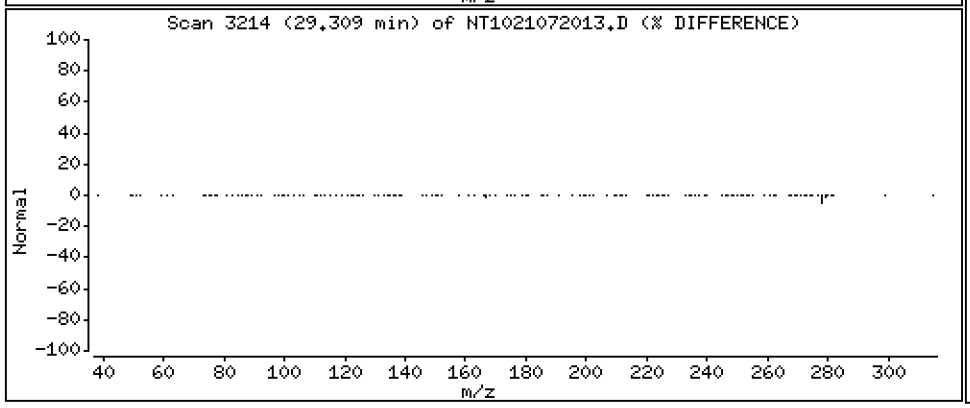












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

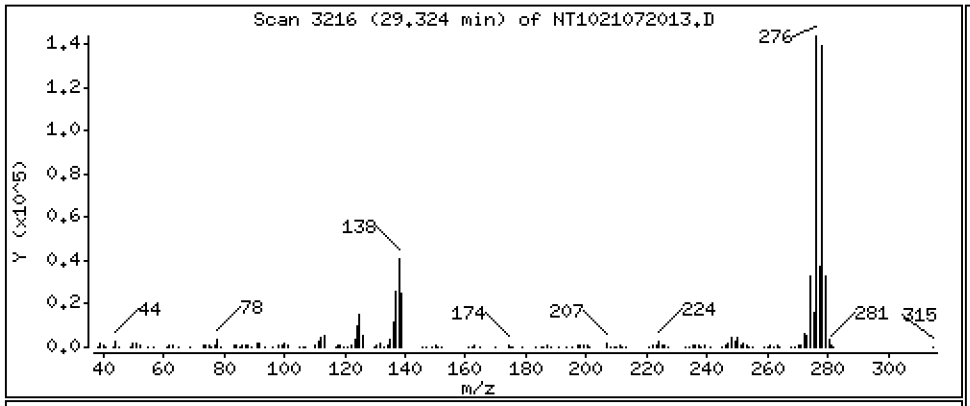
Operator: VTS

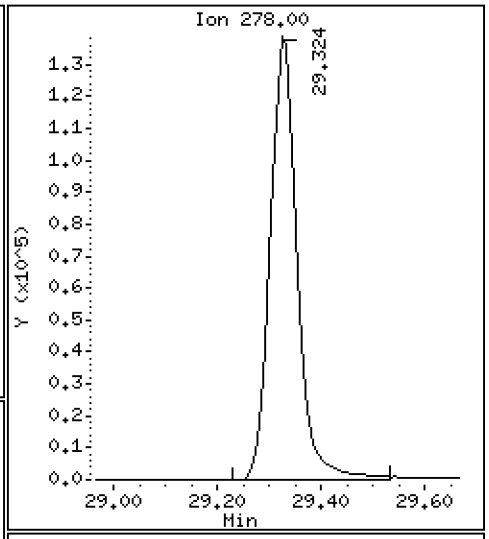
Column phase: ZB-5msi

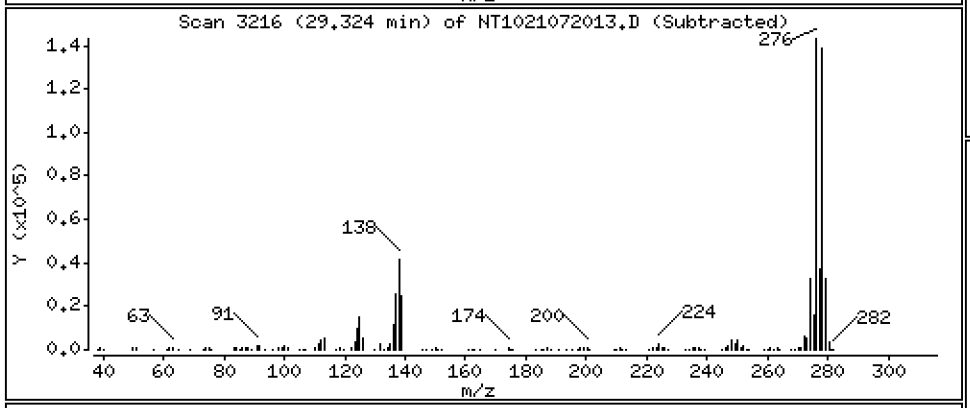
Column diameter: 0.25

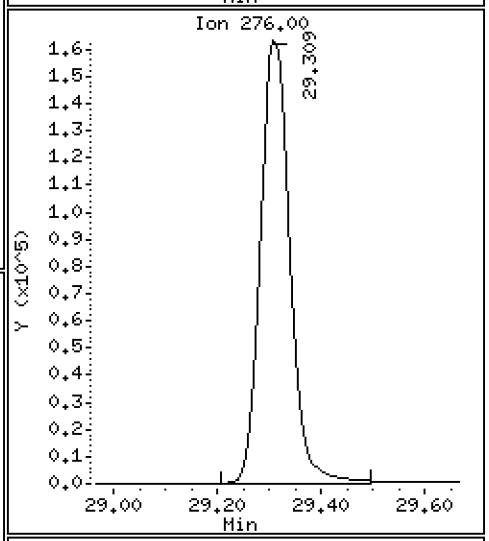
79 Dibenzo(a,h)anthracene

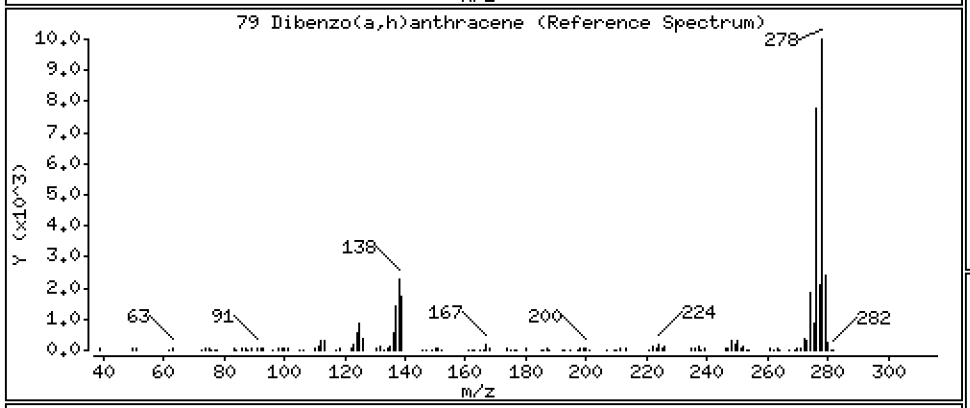
Concentration: 4.703 ug/mL

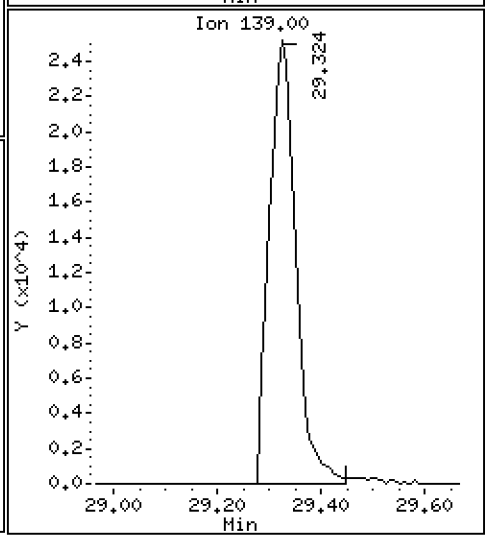


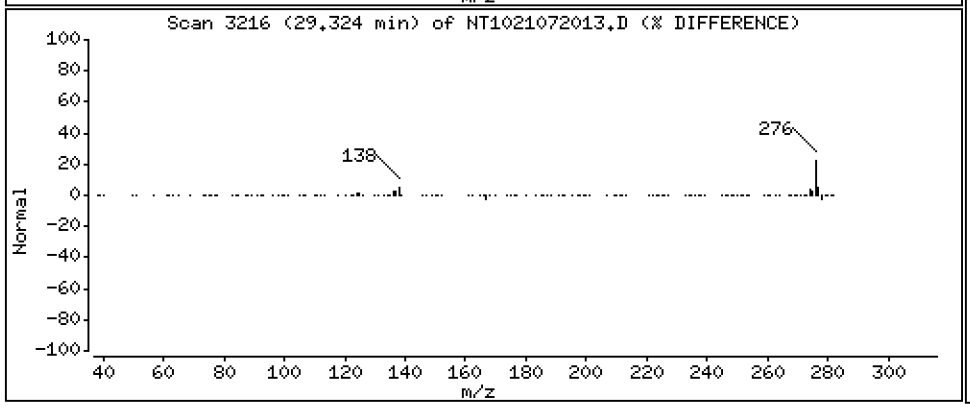












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

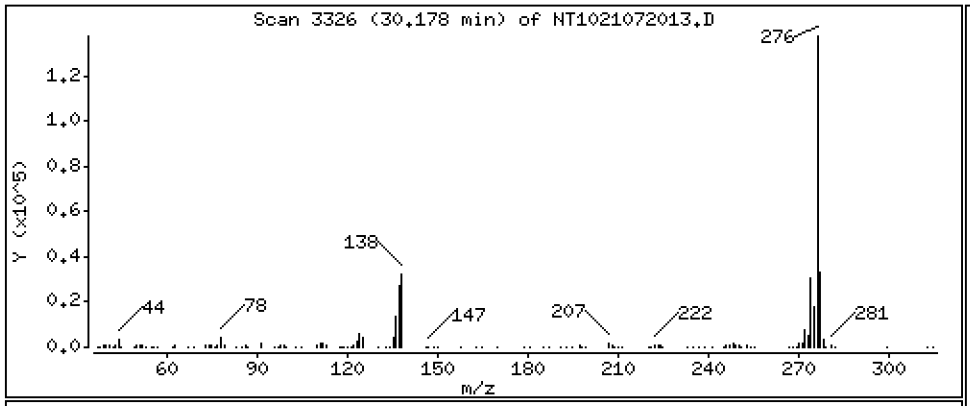
Operator: VTS

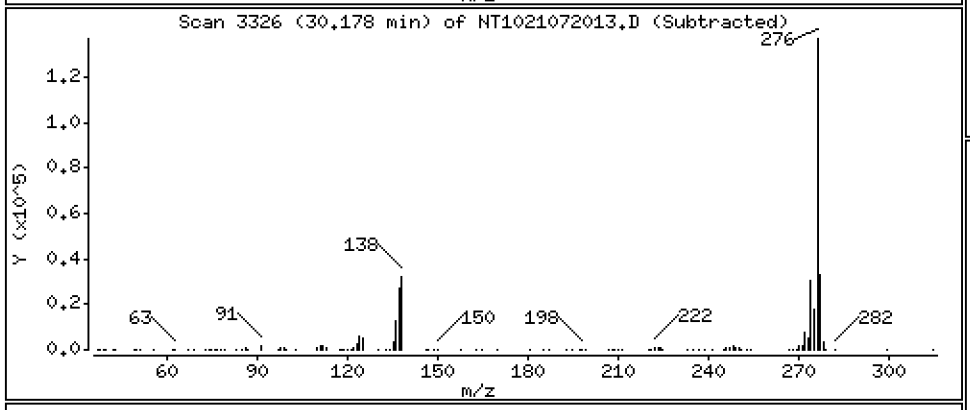
Column phase: ZB-5msi

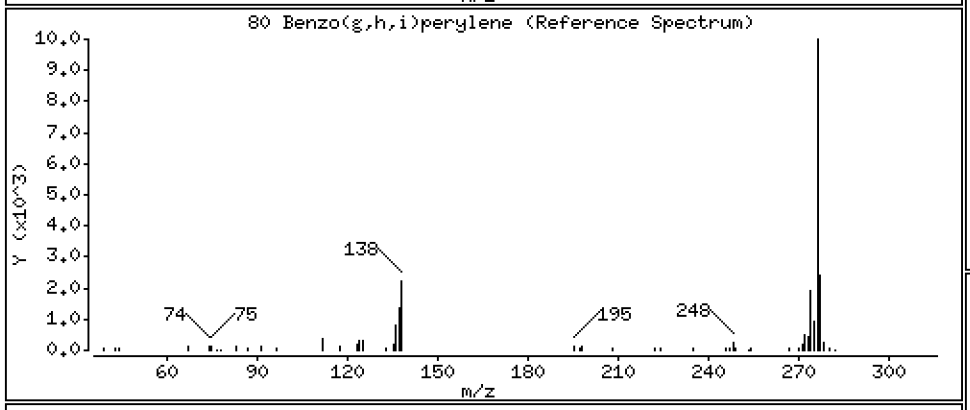
Column diameter: 0.25

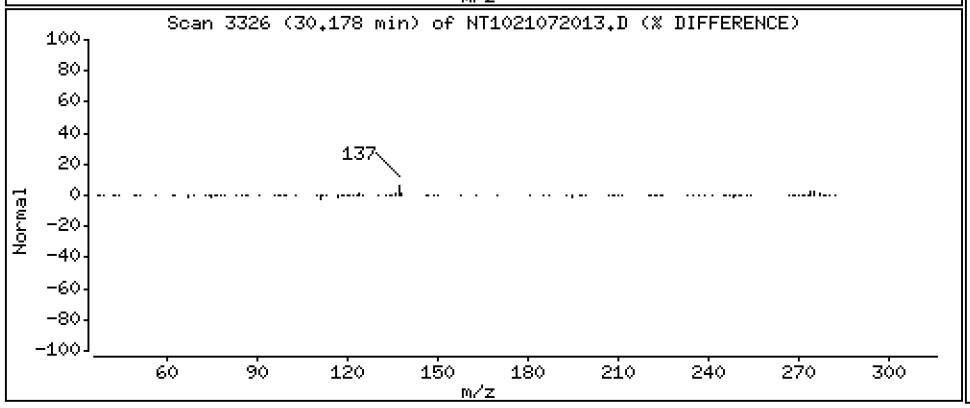
80 Benzo(g,h,i)perylene

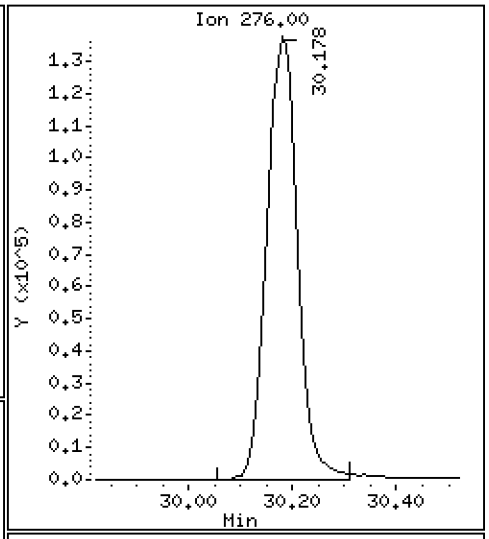
Concentration: 4.714 ug/mL

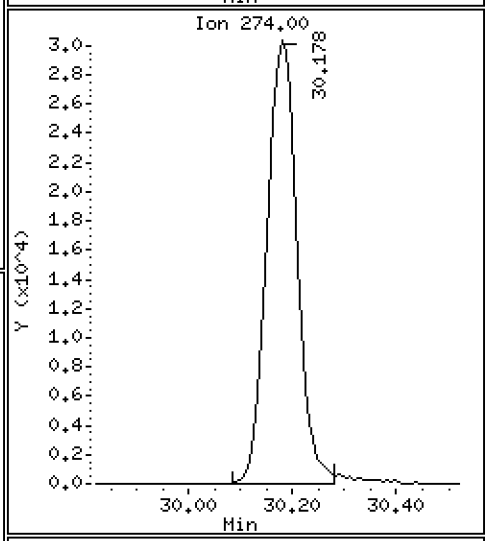


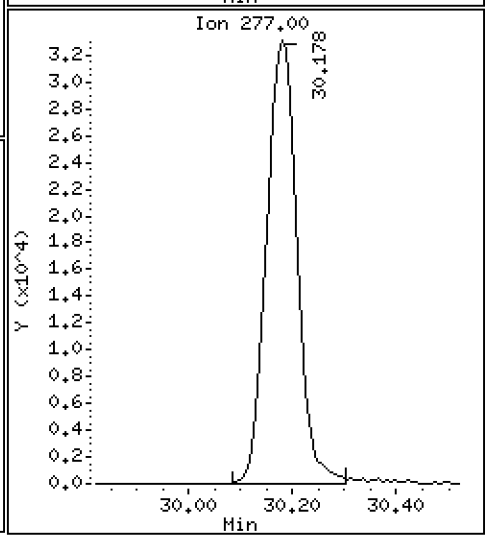












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

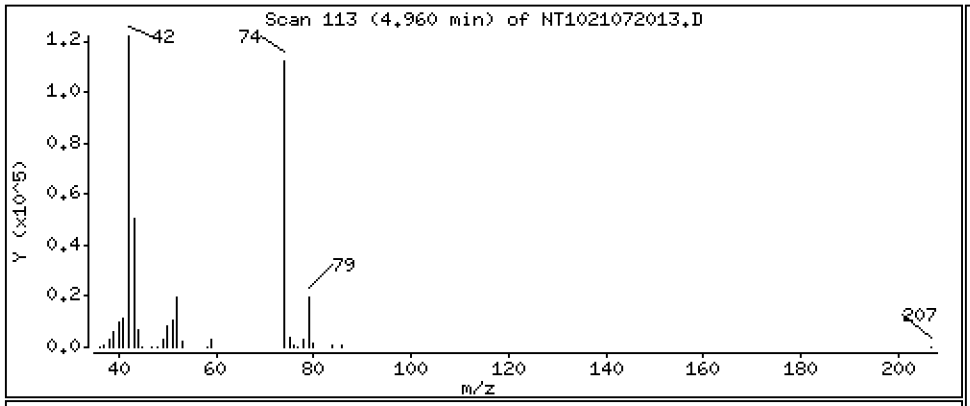
Operator: VTS

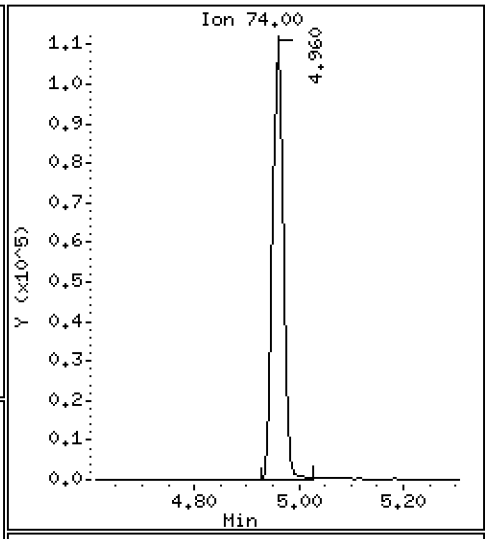
Column phase: ZB-5msi

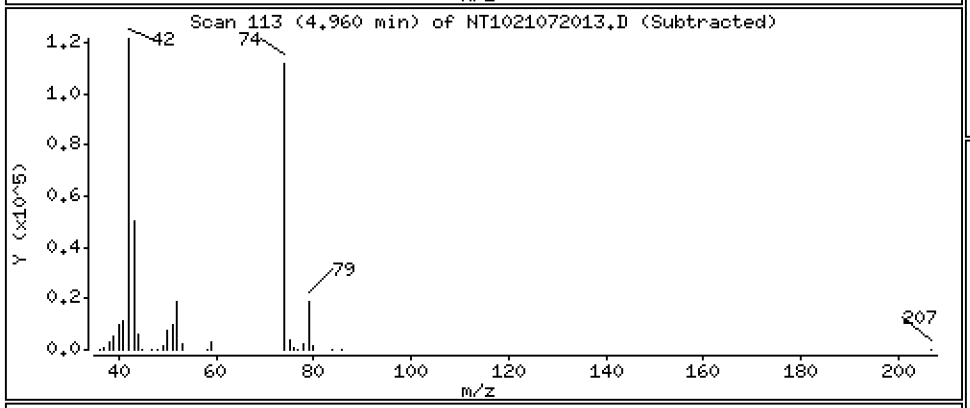
Column diameter: 0.25

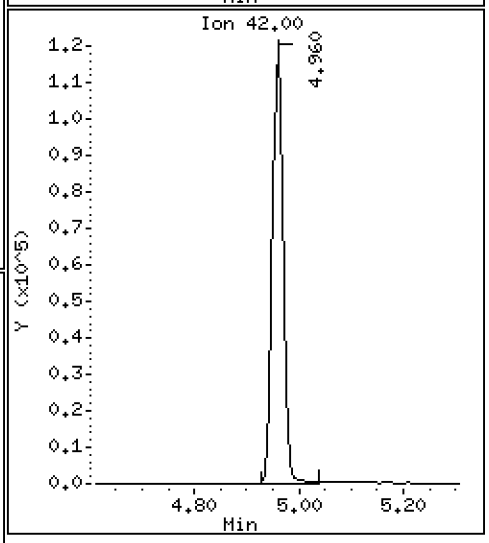
90 N-Nitrosodimethylamine

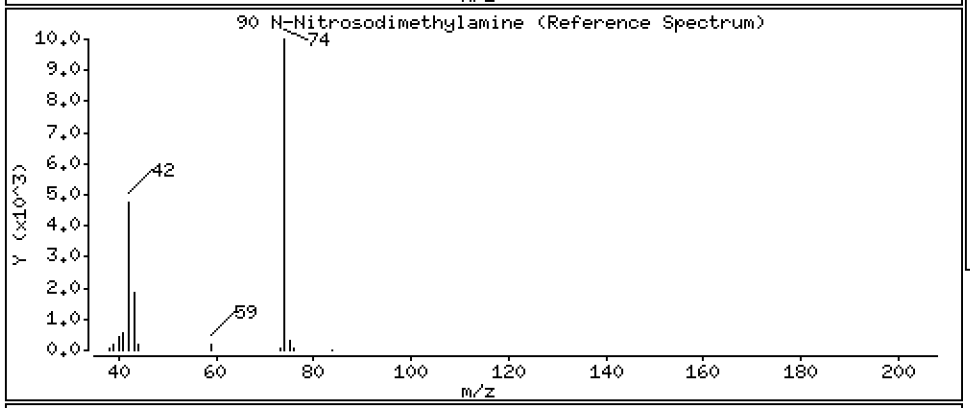
Concentration: 5.630 ug/mL

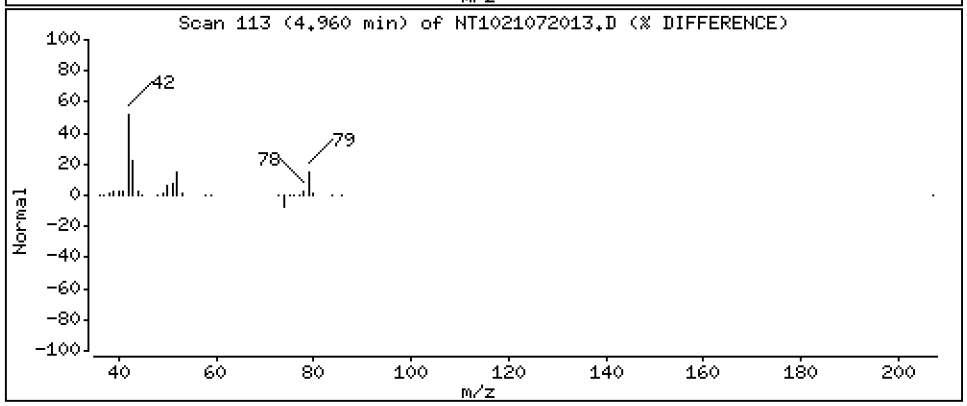












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

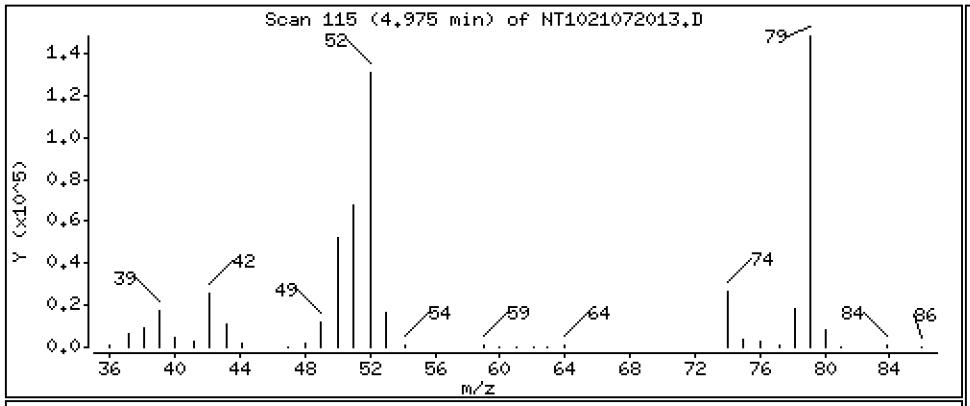
Operator: VTS

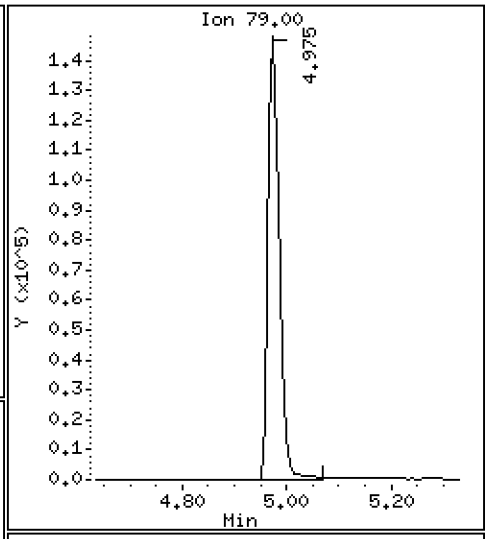
Column phase: ZB-5msi

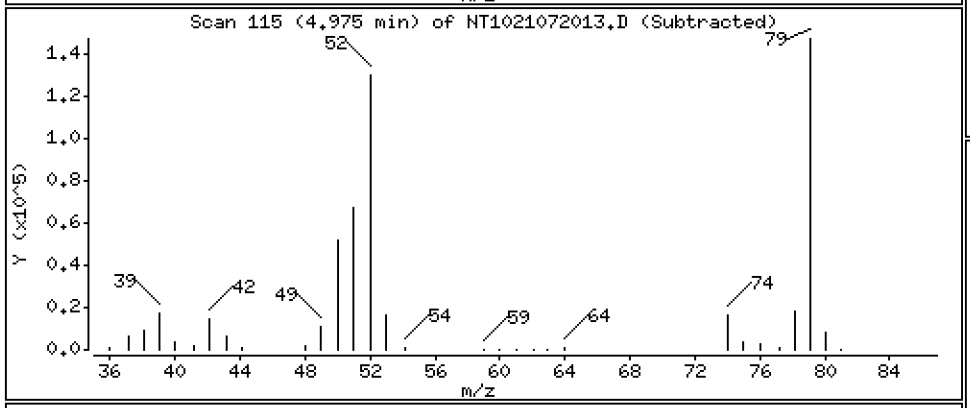
Column diameter: 0.25

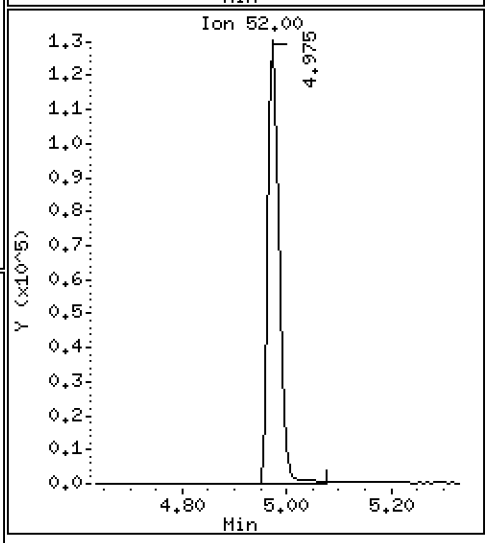
103 Pyridine

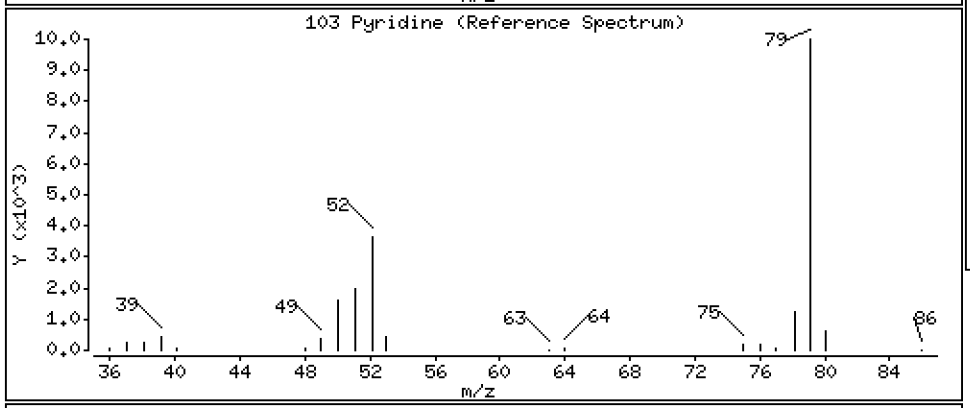
Concentration: 5.038 ug/mL

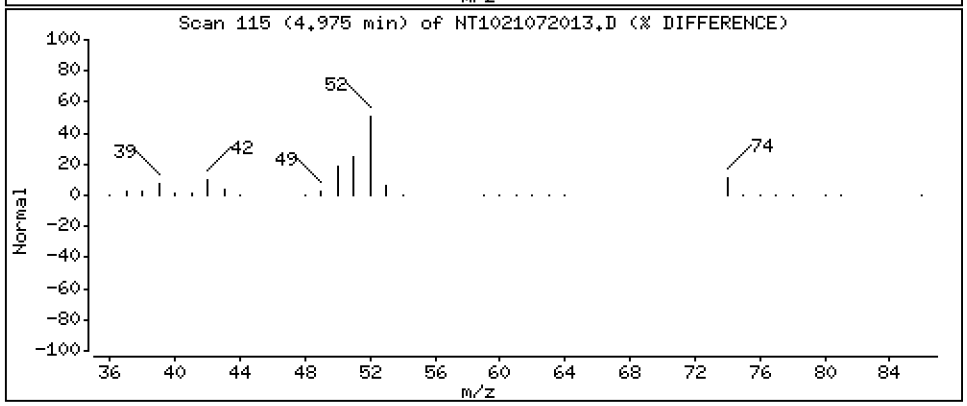












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

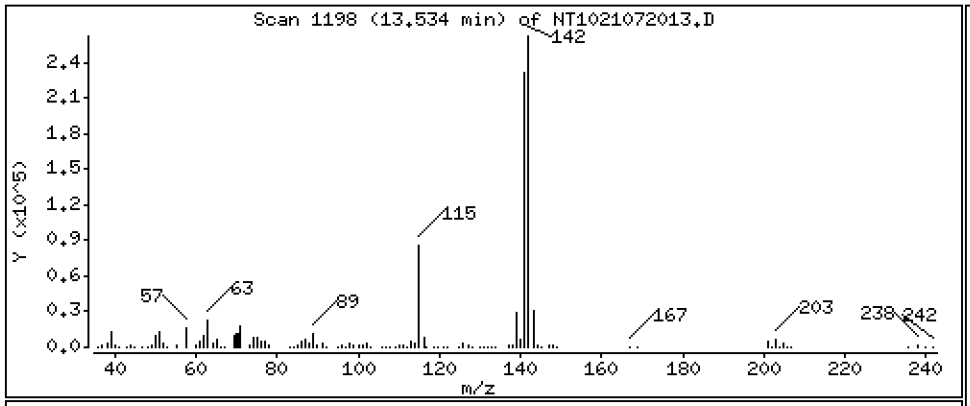
Operator: VTS

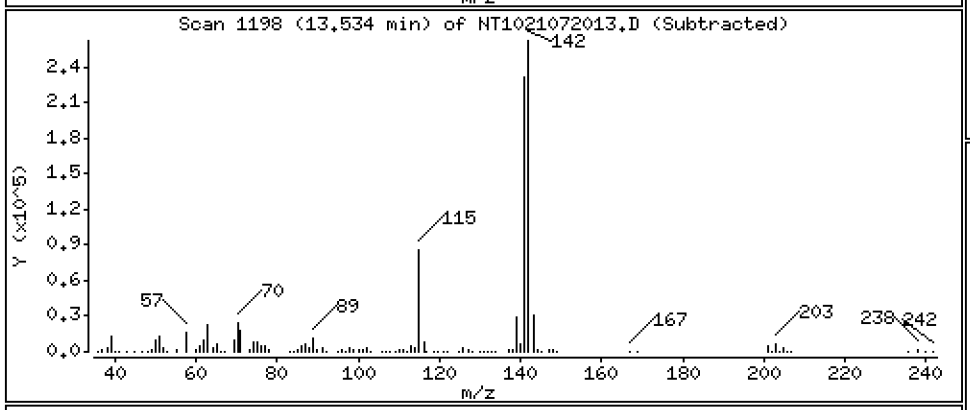
Column phase: ZB-5msi

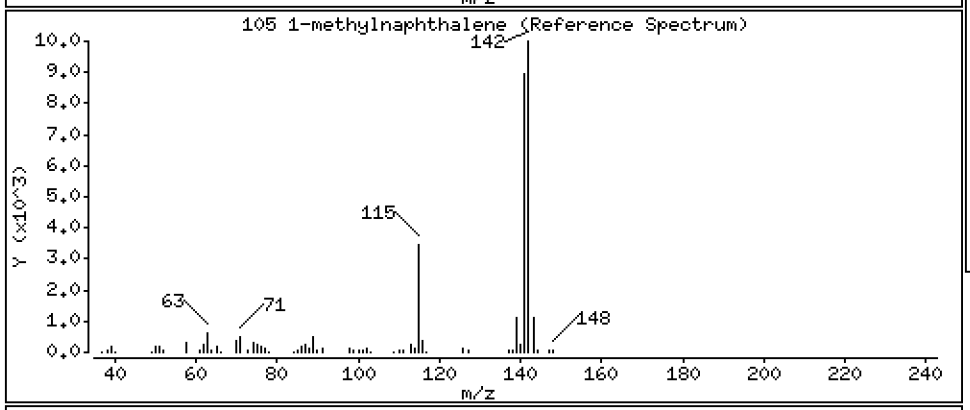
Column diameter: 0.25

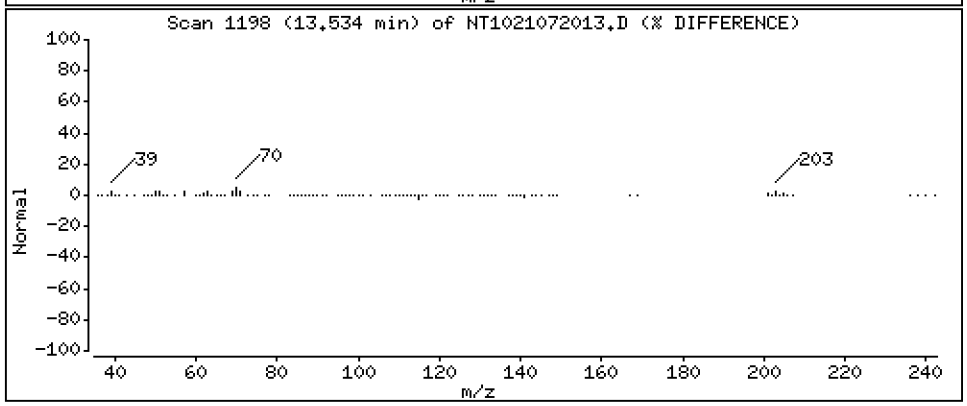
105 1-methylnaphthalene

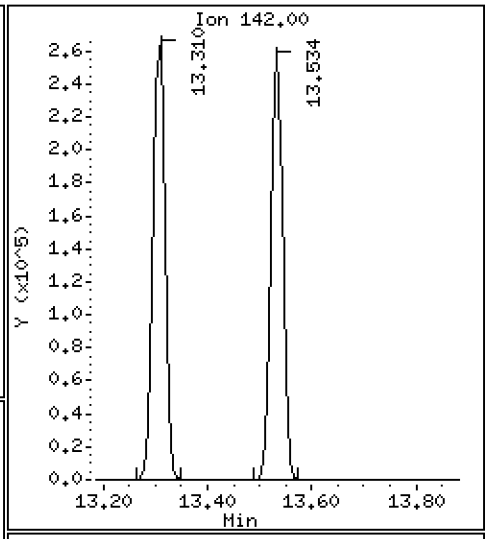
Concentration: 4.923 ug/mL

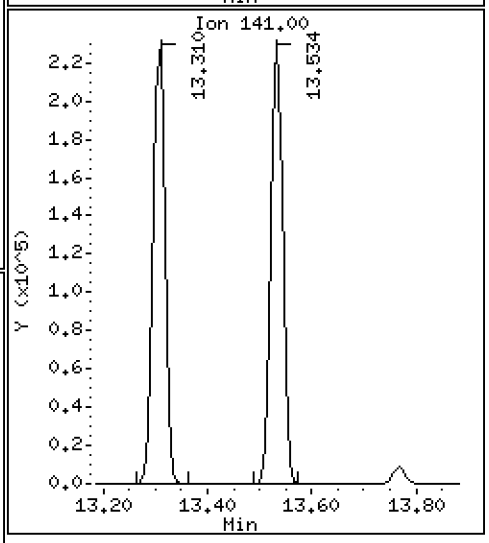












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

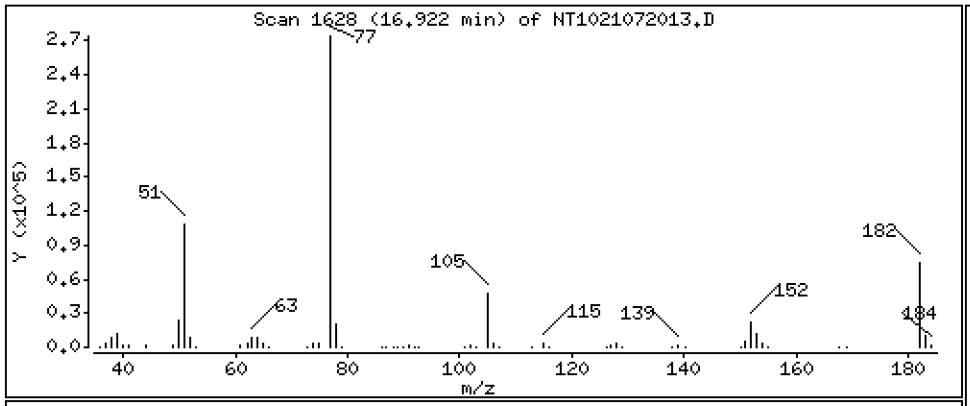
Operator: VTS

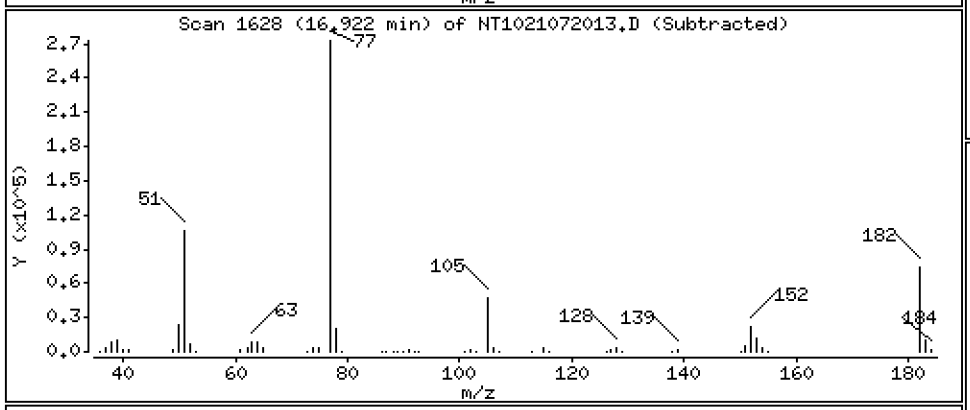
Column phase: ZB-5msi

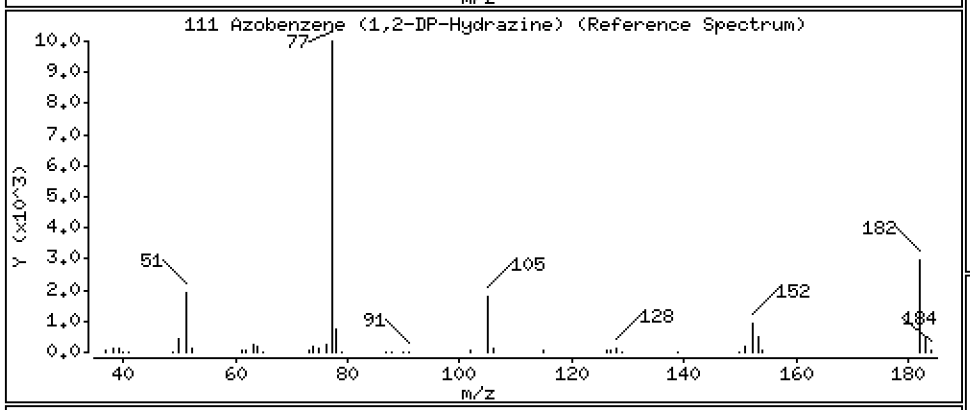
Column diameter: 0.25

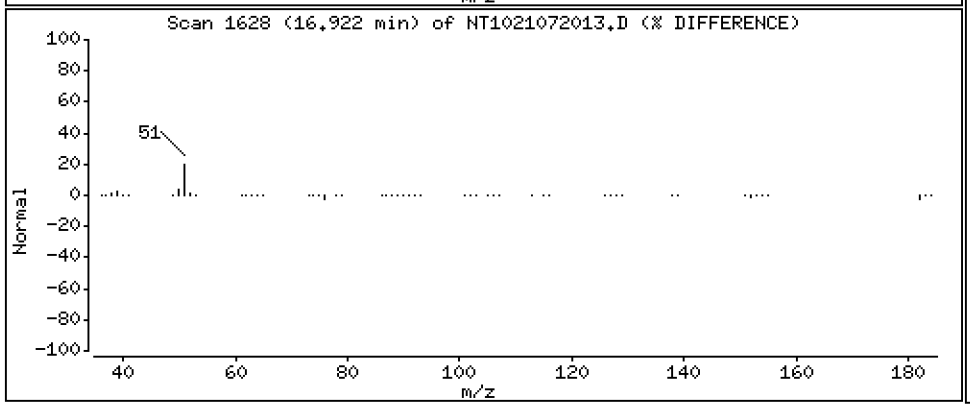
111 Azobenzene (1,2-DP-Hydrazine)

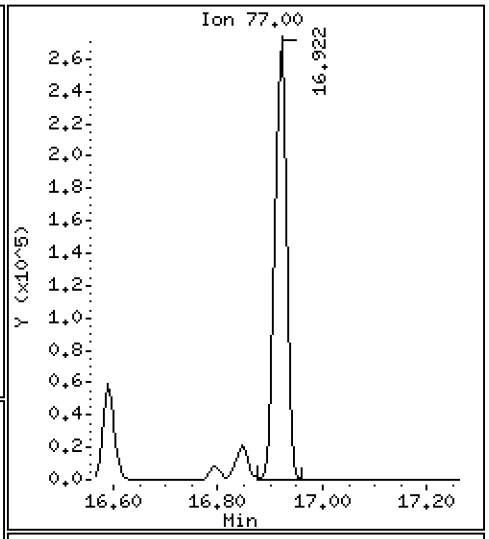
Concentration: 4.749 ug/mL

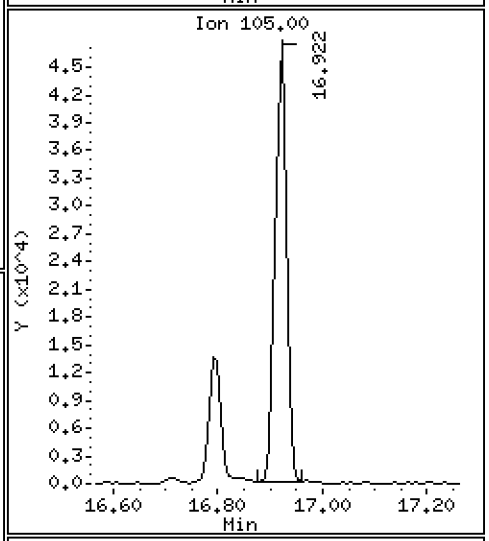


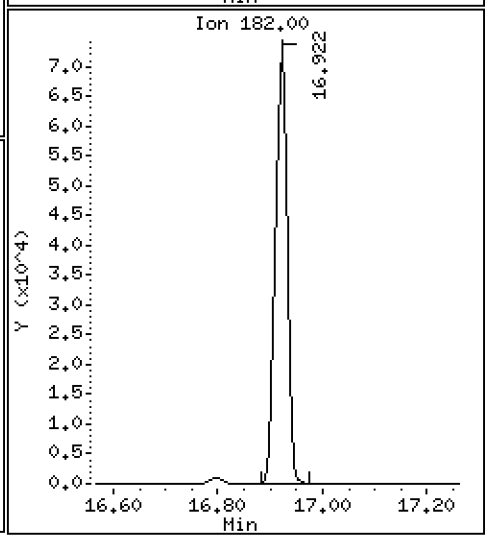












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

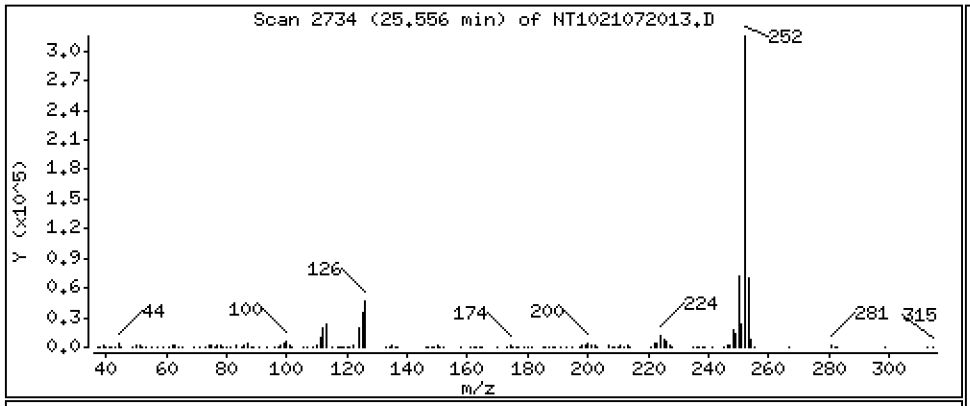
Operator: VTS

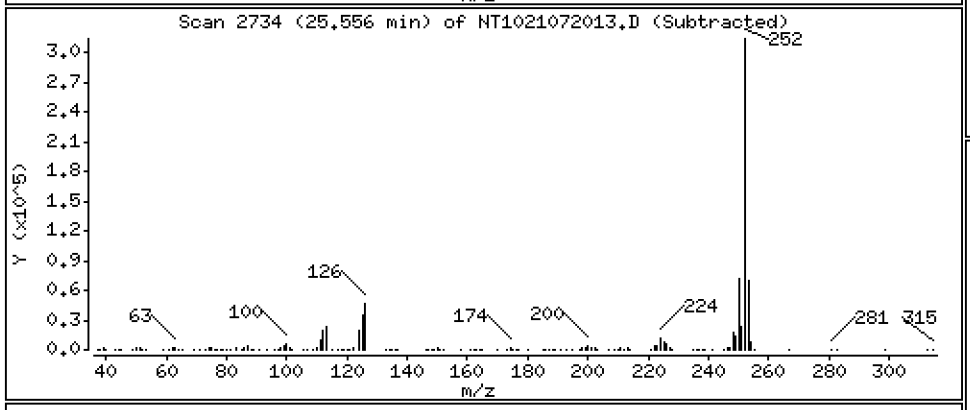
Column phase: ZB-5msi

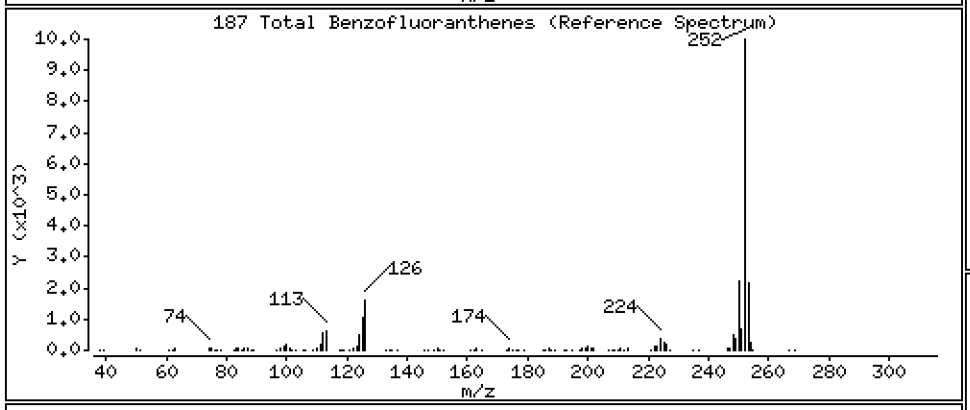
Column diameter: 0.25

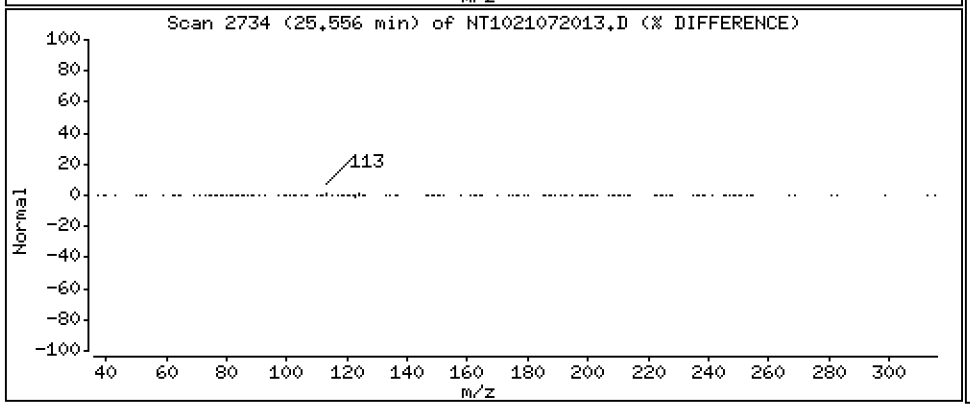
187 Total Benzofluoranthenes

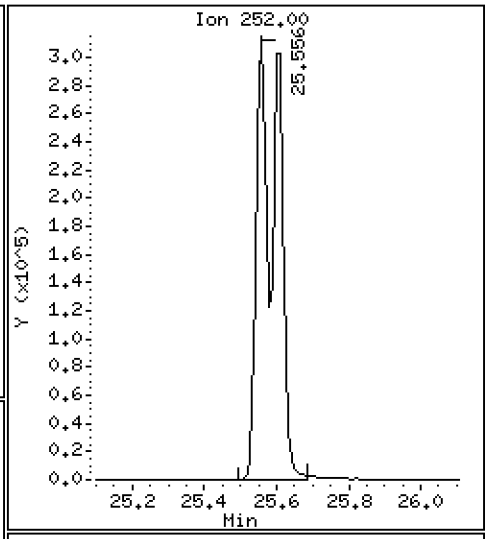
Concentration: 9.829 ug/mL

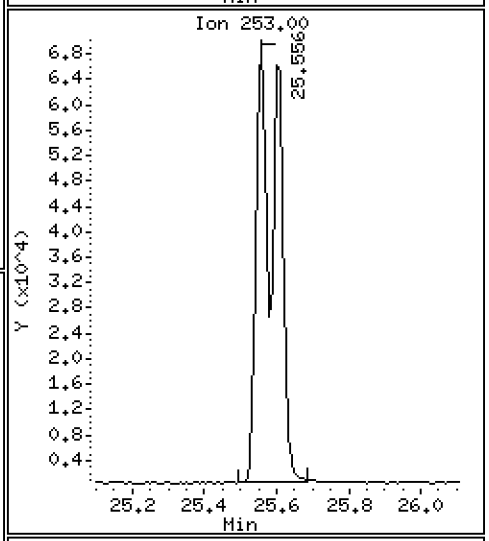


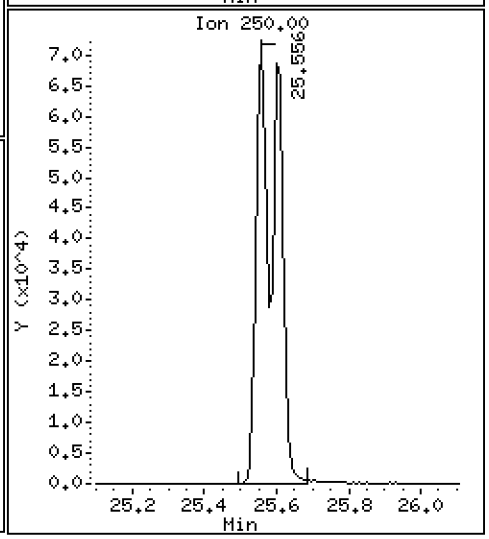












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Date : 20-JUL-2021 19:24

Client ID:

Instrument: nt10.i

Sample Info: SJG0249-SCV1

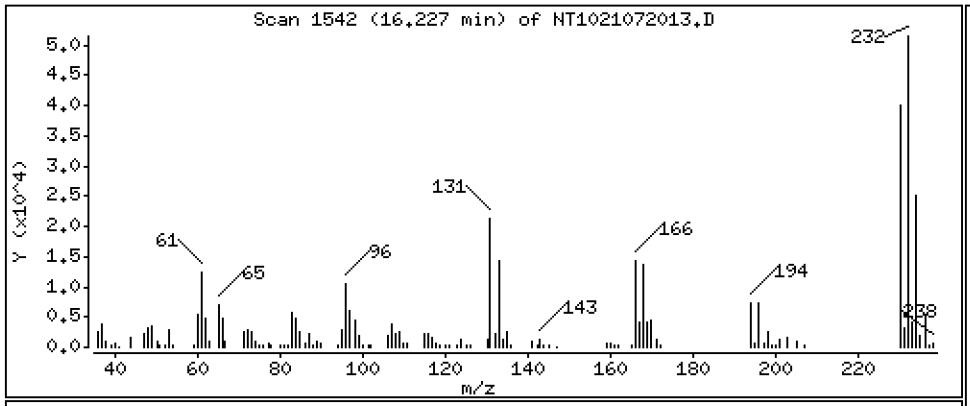
Operator: VTS

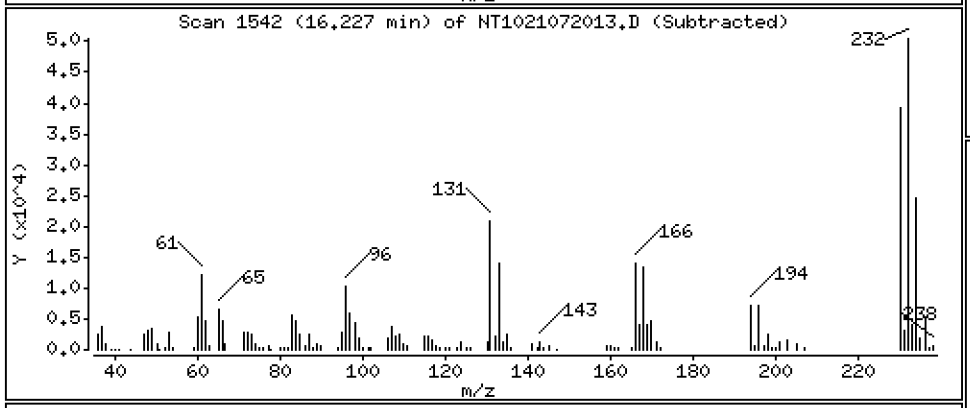
Column phase: ZB-5msi

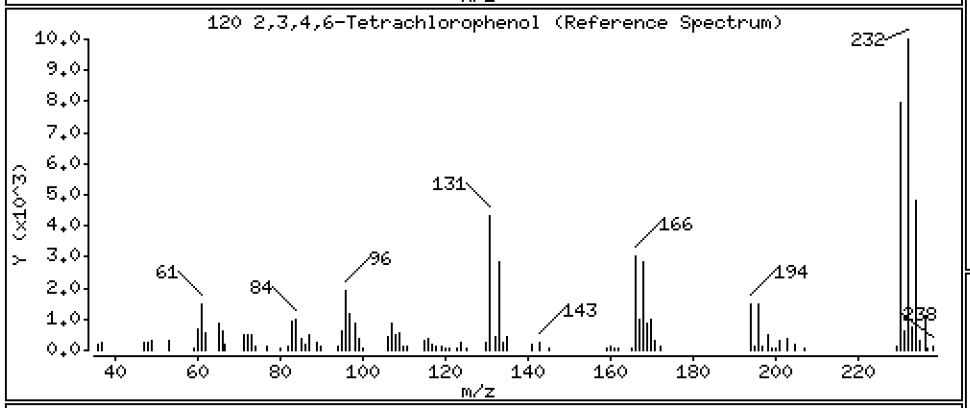
Column diameter: 0.25

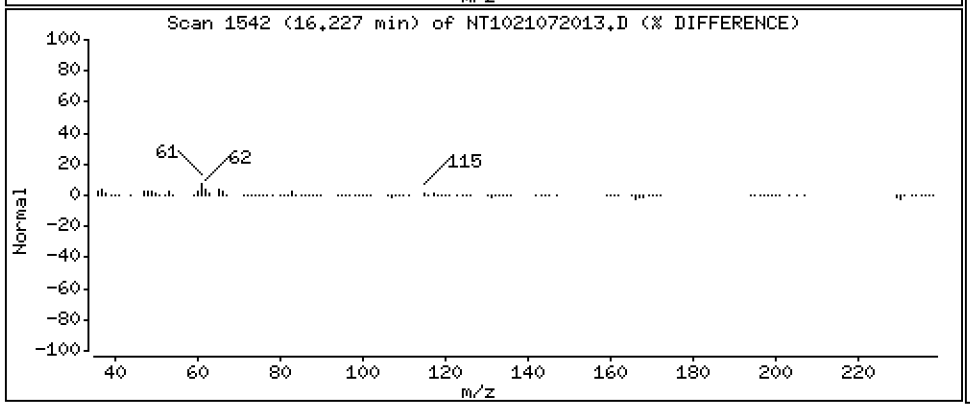
120 2,3,4,6-Tetrachlorophenol

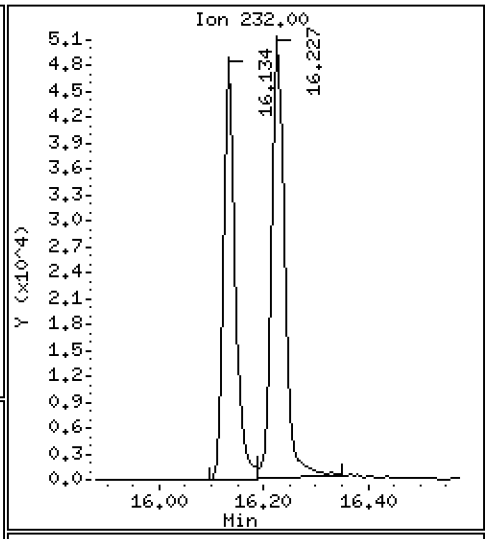
Concentration: 4.472 ug/mL

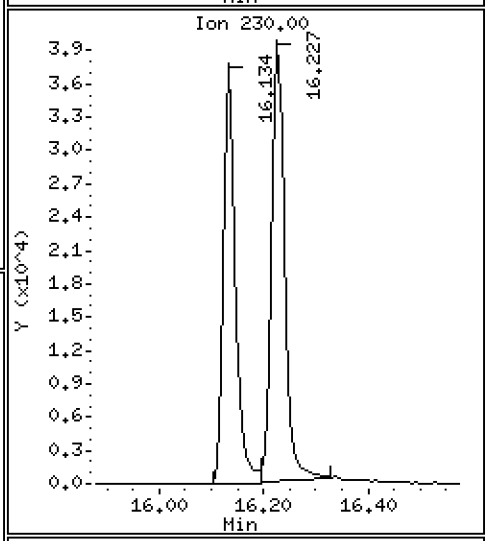


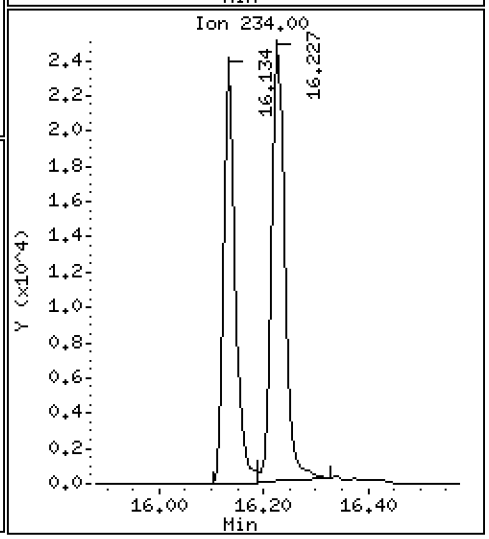












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D
Lab Smp Id: SJG0249-SCV1
Inj Date : 20-JUL-2021 19:24
Operator : VTS Inst ID: nt10.i
Smp Info : SJG0249-SCV1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210720.b\ABN.m
Meth Date : 21-Jul-2021 07:21 van Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 11
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: VANS-202011

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$ 1	2-Fluorophenol	112	Compound Not Detected.					
$ 2	Phenol-d5	99	Compound Not Detected.					
3	Phenol	94	8.729	8.729	(0.932)	245742	4.92176	4.922
$ 5	2-Chlorophenol-d4	132	Compound Not Detected.					
4	Bis(2-Chloroethyl)ether	93	8.907	8.907	(0.950)	200306	5.02286	5.023
6	2-Chlorophenol	128	9.030	9.030	(0.964)	188022	4.97506	4.975
7	1,3-Dichlorobenzene	146	9.301	9.301	(0.993)	207447	4.99685	4.997
* 8	1,4-Dichlorobenzene-d4	152	9.371	9.371	(1.000)	97788	4.00000	
9	1,4-Dichlorobenzene	146	9.402	9.402	(1.003)	177164	4.99810	4.998
$ 10	1,2-Dichlorobenzene-d4	152	Compound Not Detected.					
12	1,2-Dichlorobenzene	146	9.759	9.759	(1.041)	177797	4.74192	4.742
11	Benzyl alcohol	108	9.635	9.635	(1.028)	105562	4.51591	4.516
14	2,2'-oxybis(1-Chloropropane)	121	9.937	9.930	(1.060)	58233	4.04836	4.048
13	2-Methylphenol	108	9.852	9.852	(1.051)	136656	4.39716	4.397
17	Hexachloroethane	117	10.349	10.349	(1.104)	74881	4.91448	4.914
16	N-Nitroso-di-n-propylamine	70	10.194	10.194	(1.088)	127139	4.74213	4.742
15	4-Methylphenol	108	10.124	10.116	(1.080)	155634	4.66654	4.667
$ 18	Nitrobenzene-d5	82	Compound Not Detected.					
19	Nitrobenzene	77	10.512	10.512	(0.886)	196910	4.74090	4.741
20	Isophorone	82	10.946	10.946	(0.922)	387996	4.95012	4.950
21	2-Nitrophenol	139	11.140	11.140	(0.938)	98881	4.51420	4.514
22	2,4-Dimethylphenol	107	11.174	11.165	(0.941)	142239	4.36525	4.365
23	Bis(2-Chloroethoxy)methane	93	11.378	11.378	(0.958)	203559	5.00327	5.003
24	Benzoic acid	105	11.318	11.293	(0.953)	116014	6.35582	6.356
25	2,4-Dichlorophenol	162	11.581	11.581	(0.976)	134290	4.97384	4.974
26	1,2,4-Trichlorobenzene	180	11.778	11.778	(0.992)	150244	4.92195	4.922
* 27	Naphthalene-d8	136	11.871	11.863	(1.000)	342760	4.00000	
28	Naphthalene	128	11.909	11.909	(1.003)	452705	4.99058	4.991
29	4-Chloroaniline	127	12.040	12.040	(1.014)	187038	4.14081	4.141
30	Hexachlorobutadiene	225	12.257	12.257	(1.033)	82774	4.96649	4.966
31	4-Chloro-3-methylphenol	107	12.984	12.984	(1.094)	149957	4.65209	4.652
32	2-Methylnaphthalene	142	13.309	13.309	(1.121)	401309	4.78154	4.782
33	Hexachlorocyclopentadiene	237	13.766	13.766	(0.888)	115119	5.67132	5.671

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	13.929	13.929	(0.899)	99659	4.71321	4.713
	35 2,4,5-Trichlorophenol	196	13.998	13.998	(0.903)	106355	4.72059	4.721
$	36 2-Fluorobiphenyl	172	Compound Not Detected.					
	37 2-Chloronaphthalene	162	14.308	14.308	(0.923)	375518	5.08547	5.085
	38 2-Nitroaniline	65	14.571	14.571	(0.940)	134149	4.84759	4.848
	39 Dimethylphthalate	163	14.997	14.997	(0.968)	332569	4.65636	4.656
	40 Acenaphthylene	152	15.190	15.182	(0.980)	508864	4.84561	4.846
	41 2,6-Dinitrotoluene	165	15.144	15.144	(0.977)	80529	4.97282	4.973
*	42 Acenaphthene-d10	164	15.500	15.500	(1.000)	192459	4.00000	
	43 3-Nitroaniline	138	15.430	15.430	(0.996)	91440	4.55733	4.557
	44 Acenaphthene	153	15.569	15.561	(1.004)	292165	4.79203	4.792
	45 2,4-Dinitrophenol	184	15.646	15.647	(1.009)	17760	1.92814	1.928
	46 Dibenzofuran	168	15.894	15.894	(1.025)	455534	4.83261	4.833
	47 4-Nitrophenol	109	15.731	15.732	(1.015)	31544	4.08873	4.089
	48 2,4-Dinitrotoluene	165	15.956	15.956	(1.029)	106632	4.92932	4.929
	50 Diethylphthalate	149	16.450	16.451	(1.061)	311333	4.59754	4.598
	49 Fluorene	166	16.613	16.605	(1.072)	409103	4.47668	4.477
	51 4-Chlorophenyl-phenylether	204	16.590	16.590	(1.070)	244020	4.59359	4.594
	52 4-Nitroaniline	138	16.705	16.705	(1.078)	86292	4.04827	4.048
	53 4,6-Dinitro-2-methylphenol	198	16.790	16.791	(0.905)	55674	3.64558	3.646
	54 N-Nitrosodiphenylamine	169	16.844	16.844	(0.908)	271104	4.54648	4.546
$	55 2,4,6-Tribromophenol	330	Compound Not Detected.					
	56 4-Bromophenyl-phenylether	248	17.600	17.608	(0.949)	149720	4.93404	4.934
	57 Hexachlorobenzene	284	17.924	17.924	(0.966)	152202	4.77276	4.773
	58 Pentachlorophenol	266	18.280	18.289	(0.985)	51991	3.98721	3.987
*	59 Phenanthrene-d10	188	18.551	18.551	(1.000)	332308	4.00000	
	60 Phenanthrene	178	18.605	18.605	(1.003)	452776	5.03840	5.038
	61 Anthracene	178	18.698	18.698	(1.008)	482395	5.01984	5.020
	62 Carbazole	167	19.023	19.023	(1.025)	477437	5.03266	5.033
	63 Di-n-butylphthalate	149	19.797	19.797	(1.067)	630478	4.27610	4.276
	64 Fluoranthene	202	20.981	20.981	(0.889)	659364	4.95043	4.950
	65 Pyrene	202	21.406	21.406	(0.907)	771424	5.25414	5.254
$	66 Terphenyl-d14	244	Compound Not Detected.					
	67 Butylbenzylphthalate	149	22.598	22.598	(0.958)	240211	4.97393	4.974
	68 Benzo(a)anthracene	228	23.566	23.566	(0.999)	572518	4.80022	4.800
*	69 Chrysene-d12	240	23.597	23.597	(1.000)	319618	4.00000	
	70 3,3'-Dichlorobenzidine	252	23.528	23.528	(0.997)	431848	9.01302	9.013
	71 Chrysene	228	23.644	23.644	(1.002)	446802	4.85899	4.859
	72 bis(2-Ethylhexyl)phthalate	149	23.620	23.620	(0.959)	268021	5.11675	5.117
*	134 Di-n-octylphthalate-d4	153	24.642	24.642	(1.000)	476118	4.00000	
	73 Di-n-octylphthalate	149	24.650	24.650	(1.000)	632575	4.74070	4.741
	74 Benzo(b)fluoranthene	252	25.556	25.556	(0.968)	629813	4.77806	4.778
	75 Benzo(k)fluoranthene	252	25.602	25.602	(0.970)	670704	5.13679	5.137
	76 Benzo(a)pyrene	252	26.268	26.268	(0.995)	592916	4.97710	4.977
*	77 Perylene-d12	264	26.400	26.400	(1.000)	334503	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	29.308	29.300	(1.110)	639525	4.74333	4.743
	79 Dibenzo(a,h)anthracene	278	29.324	29.316	(1.111)	498001	4.70260	4.703
	80 Benzo(g,h,i)perylene	276	30.178	30.170	(1.143)	567139	4.71378	4.714
	90 N-Nitrosodimethylamine	74	4.959	4.959	(0.529)	148222	5.62990	5.630
	91 Aniline	93	Compound Not Detected.					
	93 Benzidine	184	Compound Not Detected.					
	103 Pyridine	79	4.974	4.982	(0.531)	208649	5.03780	5.038
	105 1-methylnaphthalene	142	13.534	13.534	(1.140)	387646	4.92271	4.923
	111 Azobenzene (1,2-DP-Hydrazine)	77	16.921	16.914	(1.092)	410043	4.74895	4.749

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
187 Total Benzofluoranthenes	252	25.556	25.602	(0.968)	1244090	9.82856	9.829
120 2,3,4,6-Tetrachlorophenol	232	16.226	16.227	(1.047)	92537	4.47241	4.472

Data File: \\target\share\chem3\nt10.i\20210720.b\NT1021072013.D Page 1
Report Date: 21-Jul-2021 09:25

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021072013.D
Lab Smp Id: SJG0249-SCV1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210720.b\ABN.m
Misc Info:

Calibration Date: 20-JUL-2021
Calibration Time: 13:41
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	105518	52759	211036	97788	-7.33
27 Naphthalene-d8	373252	186626	746504	342760	-8.17
42 Acenaphthene-d10	212025	106013	424050	192459	-9.23
59 Phenanthrene-d10	362039	181020	724078	332308	-8.21
69 Chrysene-d12	338032	169016	676064	319618	-5.45
134 Di-n-octylphthala	565512	282756	1131024	476118	-15.81
77 Perylene-d12	375340	187670	750680	334503	-10.88

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	9.38	8.88	9.88	9.37	-0.09
27 Naphthalene-d8	11.87	11.37	12.37	11.87	-0.00
42 Acenaphthene-d10	15.51	15.01	16.01	15.50	-0.05
59 Phenanthrene-d10	18.56	18.06	19.06	18.55	-0.04
69 Chrysene-d12	23.61	23.11	24.11	23.60	-0.03
134 Di-n-octylphthala	24.64	24.14	25.14	24.64	-0.00
77 Perylene-d12	26.40	25.90	26.90	26.40	-0.00

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021072013.D

Lab ID: SJG0249-SCV1
nt10.i, ABN.m, 20-JUL-2021 19:24

RT	CO-ELUTION COMPOUNDS
	NO CO-ELUTIONS

** FIRST SURROGATE NOT FOUND. ICAL Check not performed **

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
NONE			

RRT check based on Ccal File: NT1021072010.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	NT10	Calibration:	EG00057
Lab File ID:	NT1021081419.D	Calibration Date:	07/20/2021
Sequence:	SJH0174	Injection Date:	08/14/21
Lab Sample ID:	SJH0174-CCV1	Injection Time:	21:12
Sequence Name:	Calibration Check		

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Naphthalene	A	5.0000	4.9	1.0586070	1.0427320		-1.5	+/-50
2-Methylnaphthalene	A	5.0000	5.3	0.9794463	1.0332870		5.5	+/-50
Acenaphthylene	A	5.0000	5.1	2.1826050	2.2117610		1.3	+/-50
Acenaphthene	A	5.0000	4.7	1.2671560	1.1904060		-6.1	+/-50
Fluorene	A	5.0000	4.5	1.8993190	1.7257250		-9.1	+/-50
Phenanthrene	A	5.0000	3.6	1.0817070	0.7754927		-28.3	+/-50
Anthracene	A	5.0000	3.9	1.1567290	0.9094588		-21.4	+/-50
Fluoranthene	A	5.0000	5.5	1.6669060	1.8308010		9.8	+/-50
Pyrene	A	5.0000	4.4	1.8374700	1.6190990		-11.9	+/-50
Butylbenzylphthalate	A	5.0000	4.8	0.6043970	0.5763699		-4.6	+/-50
Benzo(a)anthracene	A	5.0000	5.0	1.4926470	1.4826720		-0.7	+/-50
Chrysene	A	5.0000	5.3	1.1507940	1.2124940		5.4	+/-50
Benzofluoranthenes, Total	A	10.000	9.6	1.5136370	1.4491350		-4.3	+/-50
Benzo(a)pyrene	A	5.0000	4.4	1.4245480	1.2614650		-11.4	+/-50
Indeno(1,2,3-cd)pyrene	A	5.0000	3.8	1.6122550	1.2113770		-24.9	+/-50
Dibenzo(a,h)anthracene	A	5.0000	4.0	1.2663450	1.0243810		-19.1	+/-50
Benzo(g,h,i)perylene	A	5.0000	2.9	1.4387340	0.8342332		-42.0	+/-50
1,2-Dichlorobenzene-d4	A	5.0000	5.18	1.0594750	1.0978370		3.6	+/-50
Nitrobenzene-d5	A	5.0000	5.39	0.4906029	0.5286899		7.8	+/-50
2-Fluorobiphenyl	A	5.0000	5.54	1.8368740	2.0348830		10.8	+/-50
p-Terphenyl-d14	A	5.0000	4.95	1.3096240	1.2959020		-1.0	+/-50

* Values outside of QC limits

* Values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081419.D

Page 1

Date : 14-AUG-2021 21:12

Client ID:

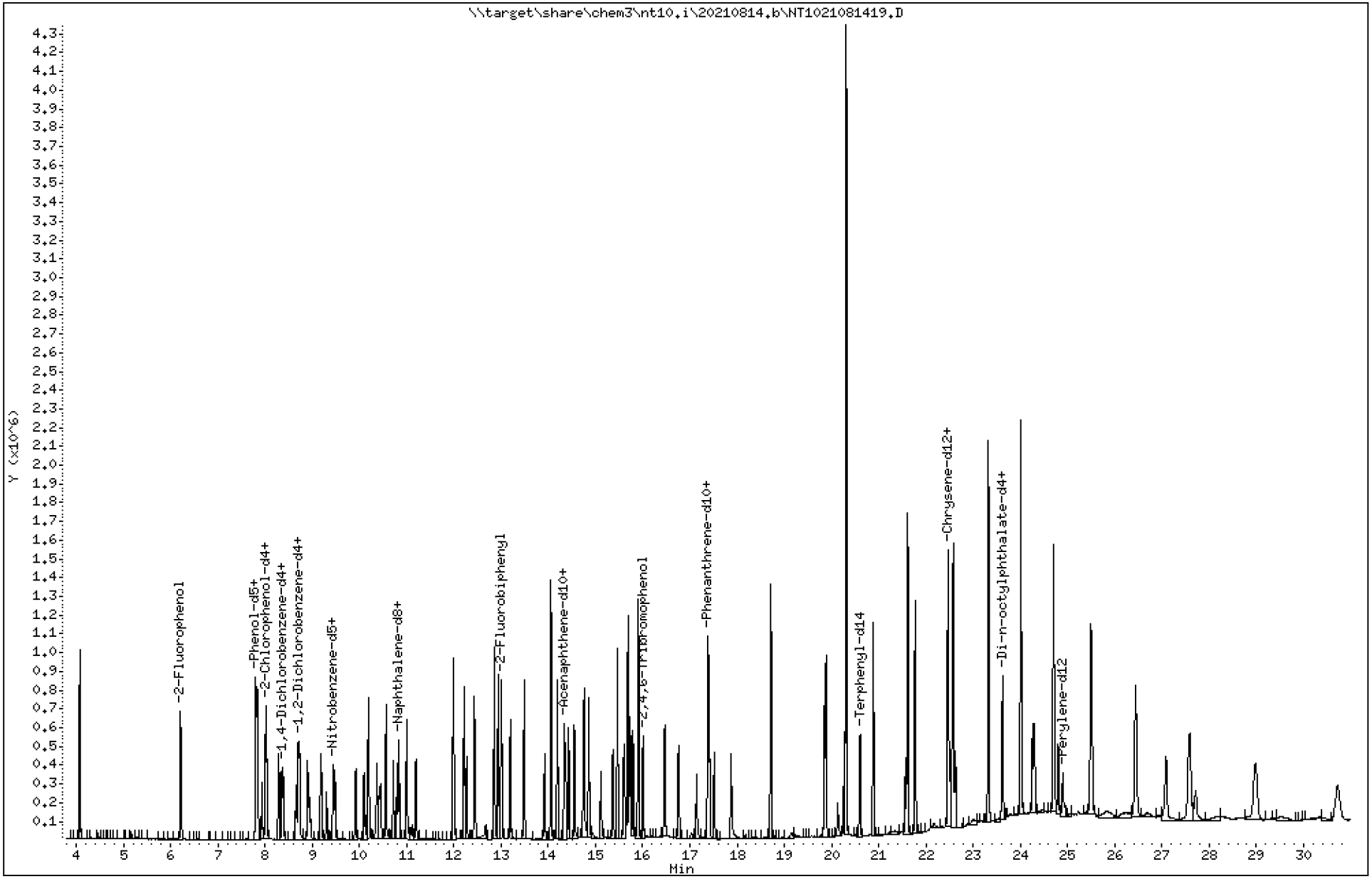
Instrument: nt10.i

Sample Info: SJH0174-CCV1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

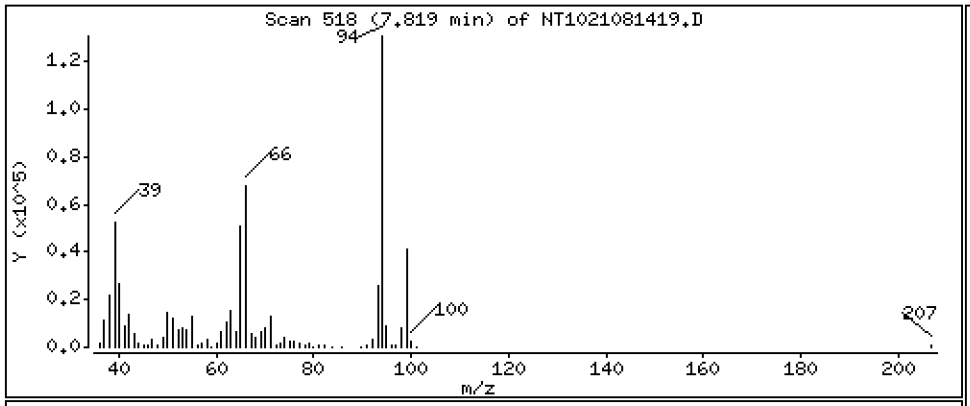
Operator: VTS

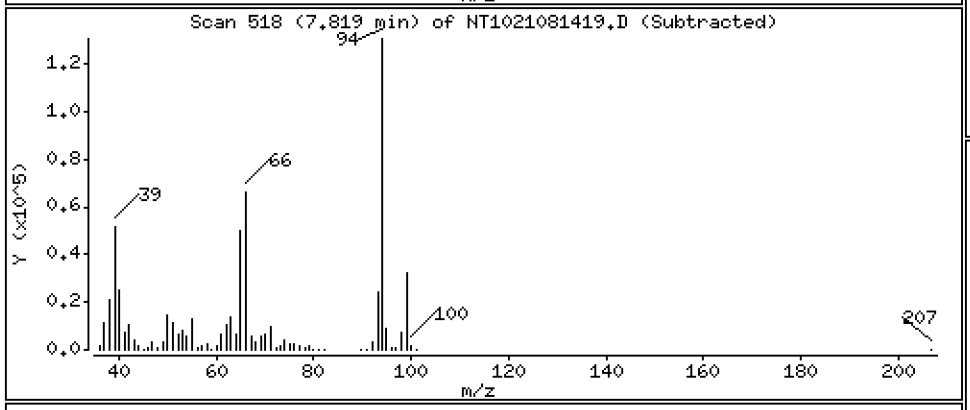
Column phase: ZB-5msi

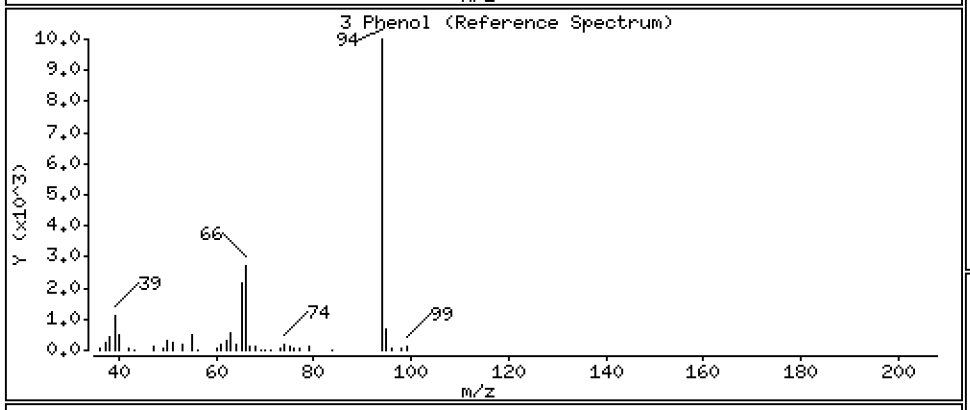
Column diameter: 0.25

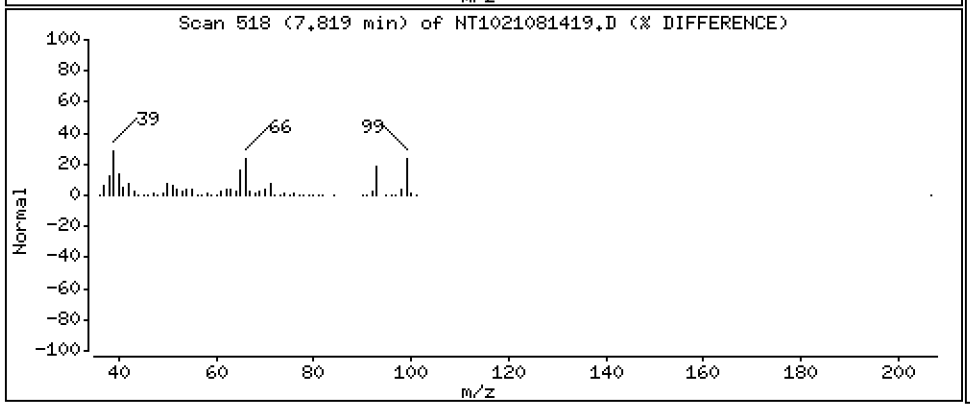
3 Phenol

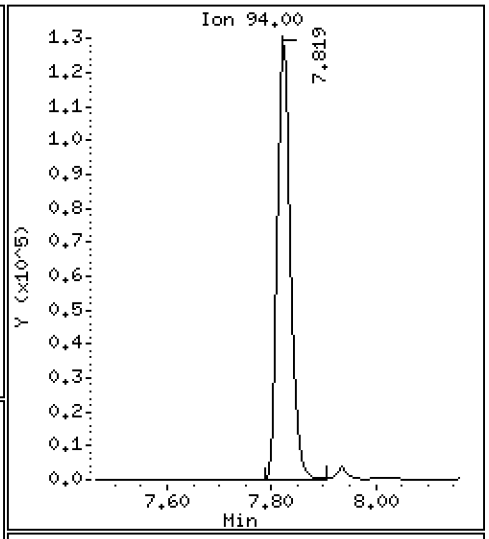
Concentration: 5.161 ug/mL

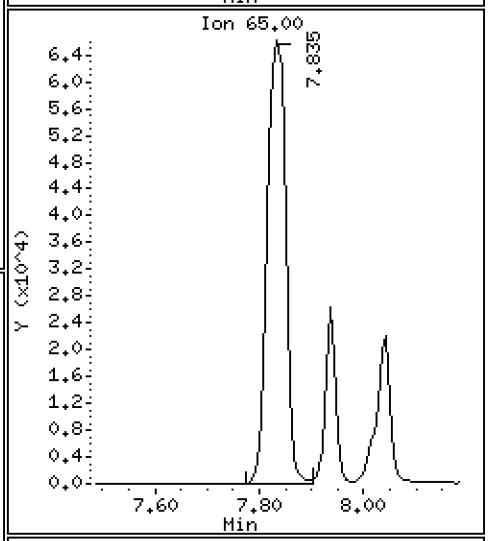


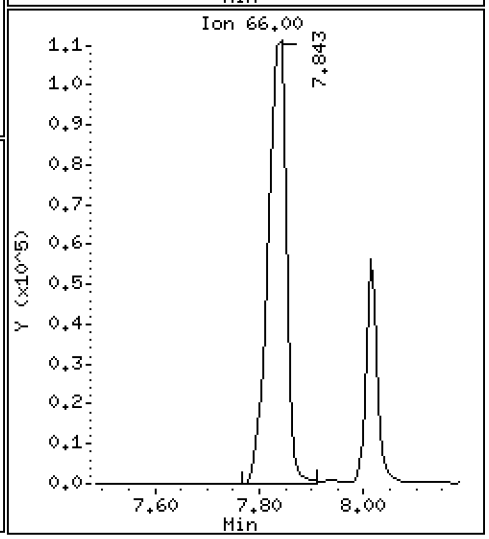












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

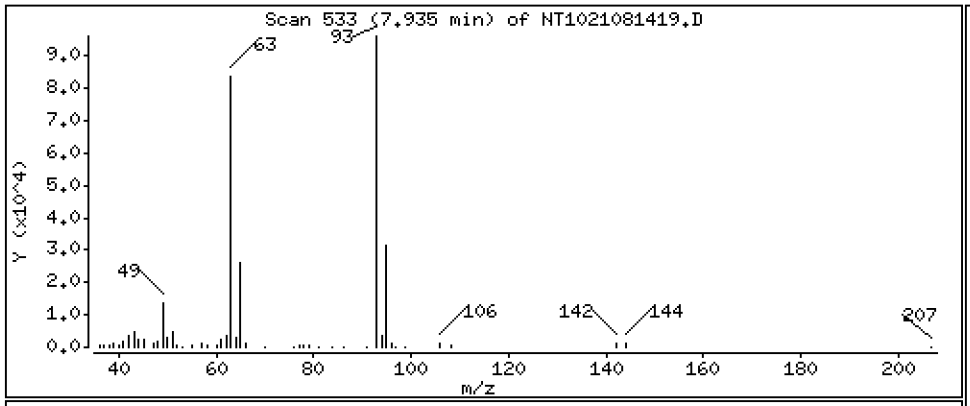
Operator: VTS

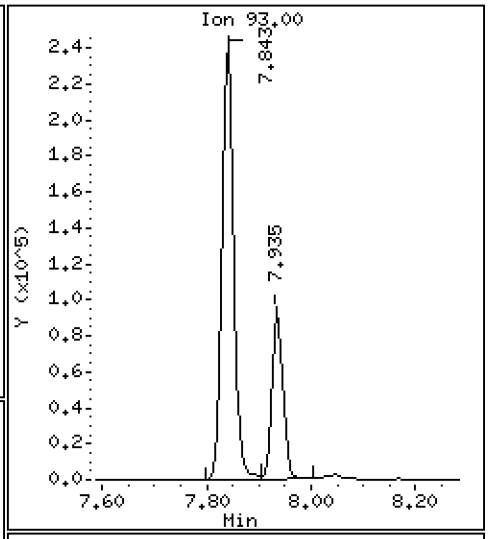
Column phase: ZB-5msi

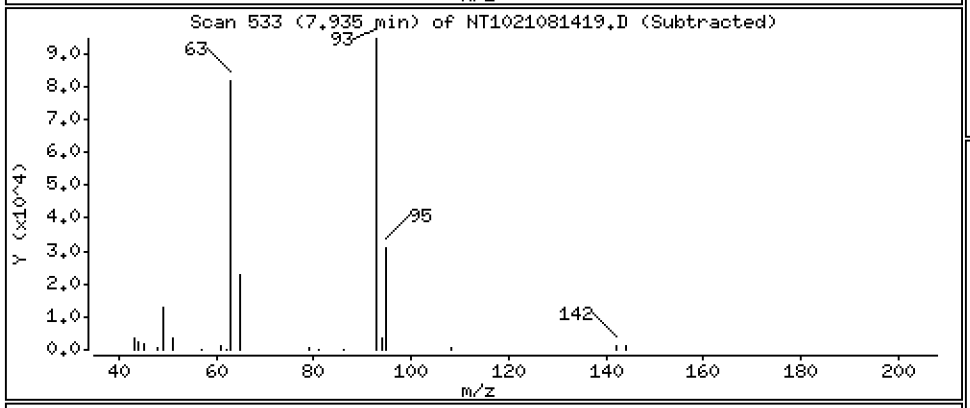
Column diameter: 0.25

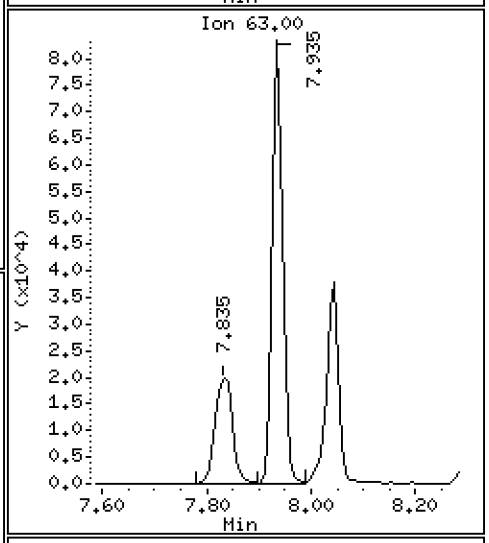
4 Bis(2-Chloroethyl)ether

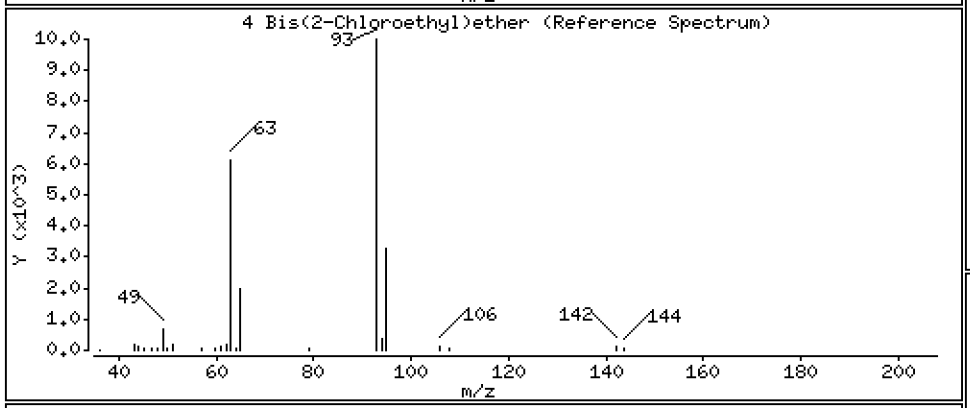
Concentration: 3.965 ug/mL

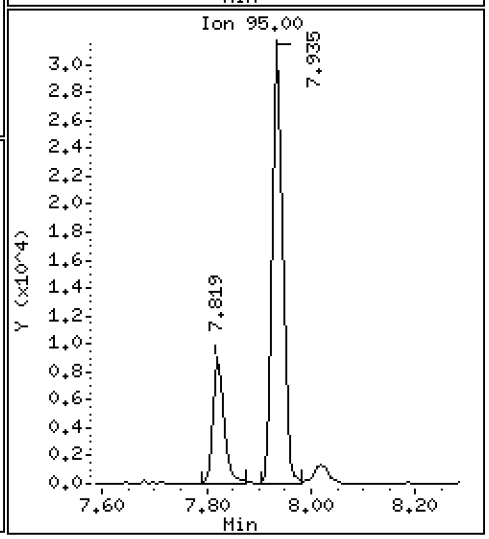


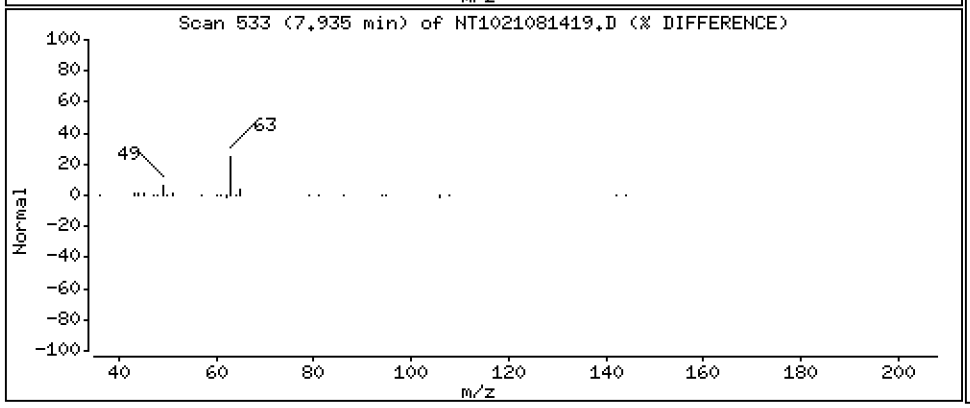












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

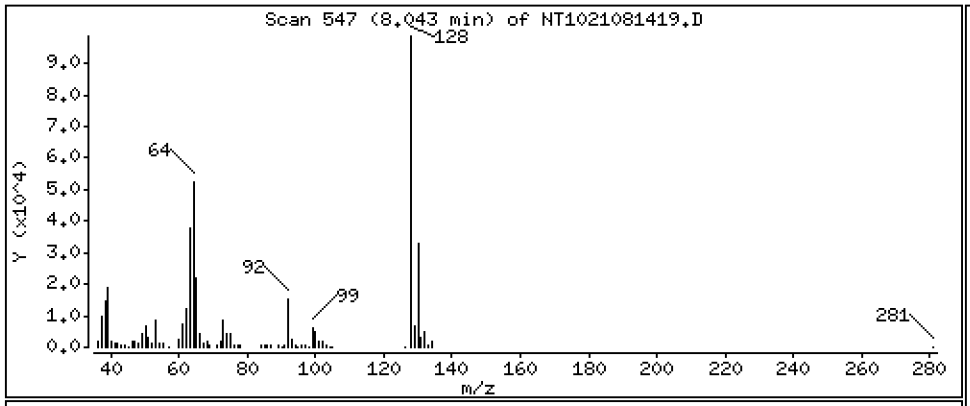
Operator: VTS

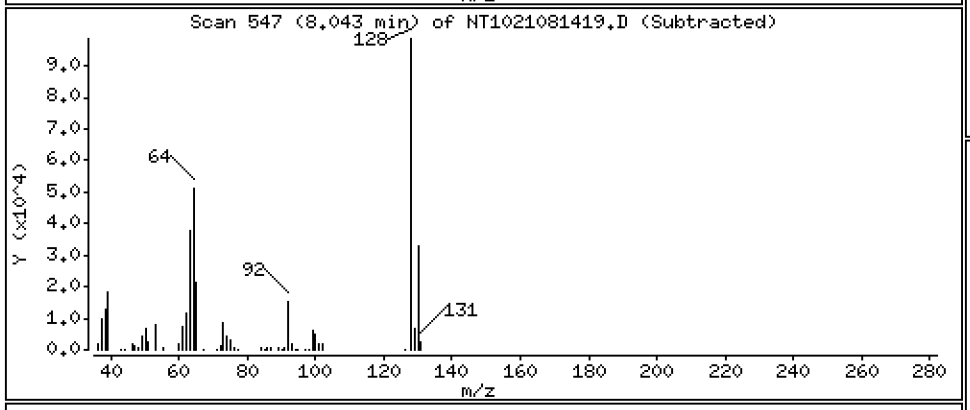
Column phase: ZB-5msi

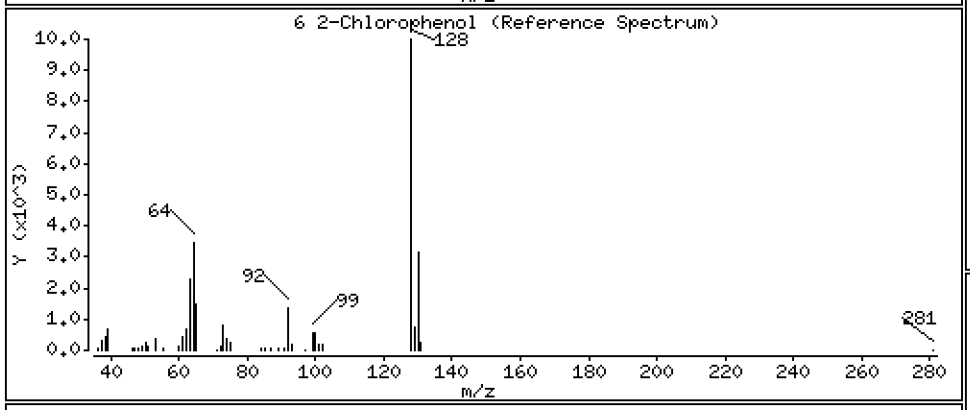
Column diameter: 0.25

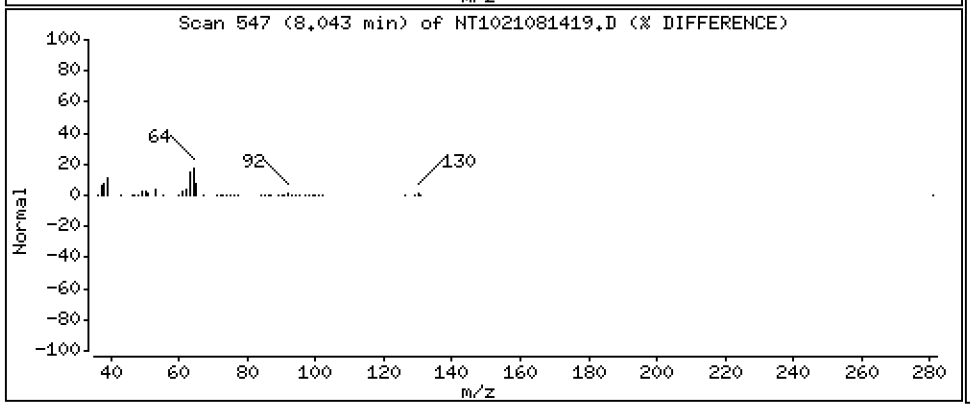
6 2-Chlorophenol

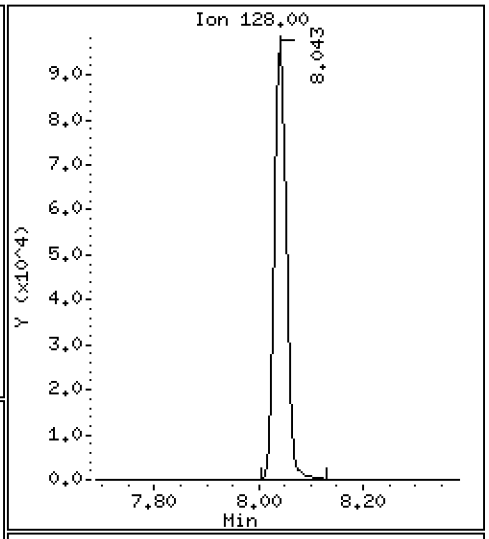
Concentration: 5.319 ug/mL

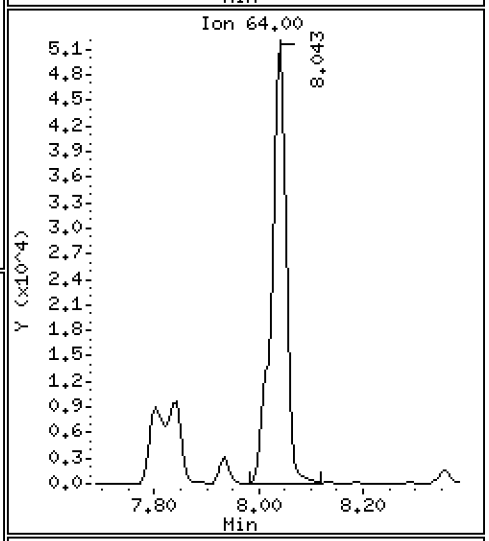


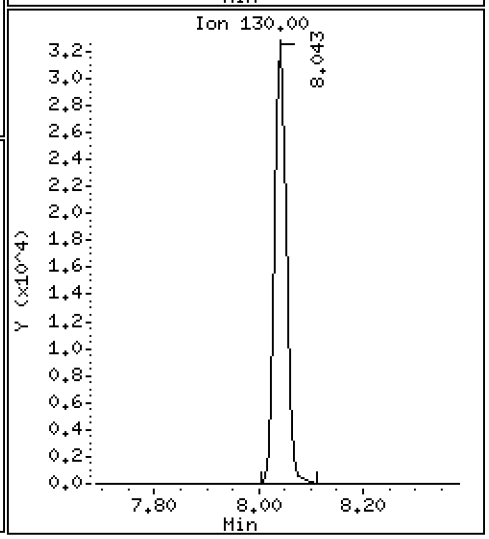












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

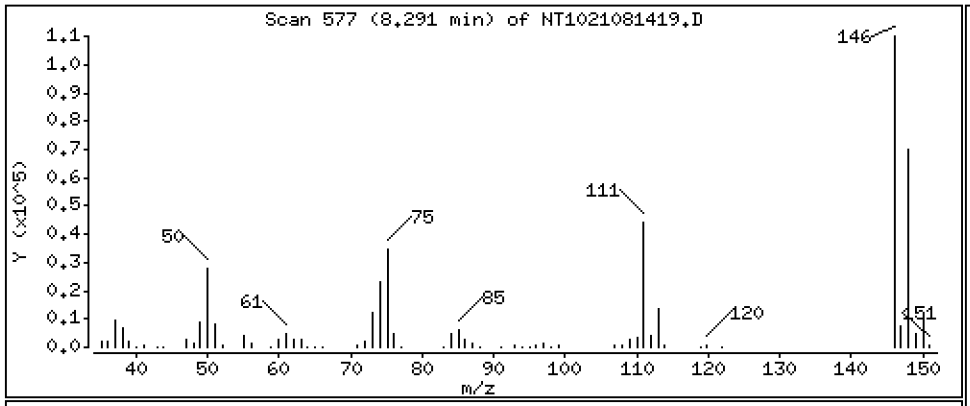
Operator: VTS

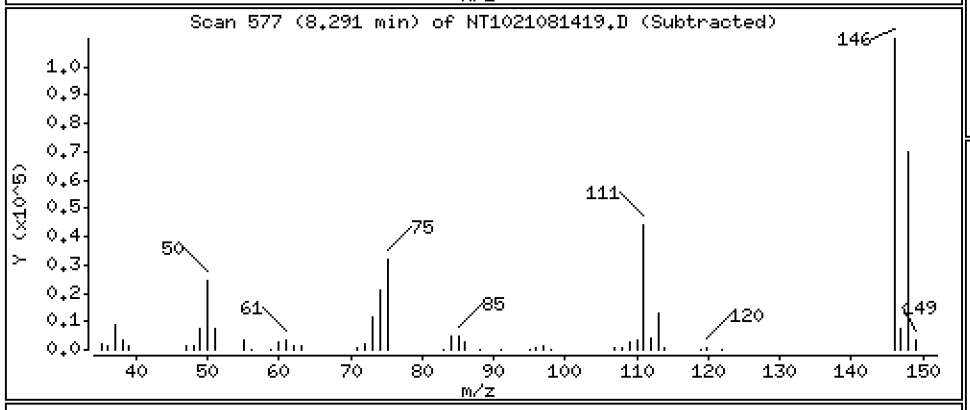
Column phase: ZB-5msi

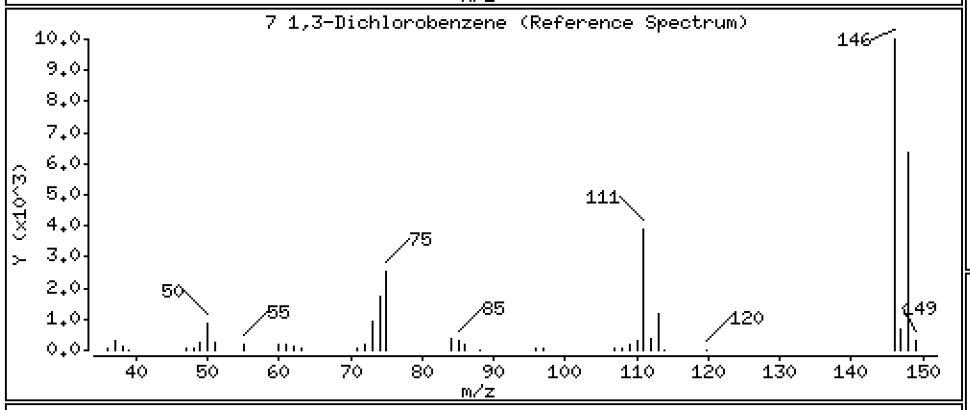
Column diameter: 0.25

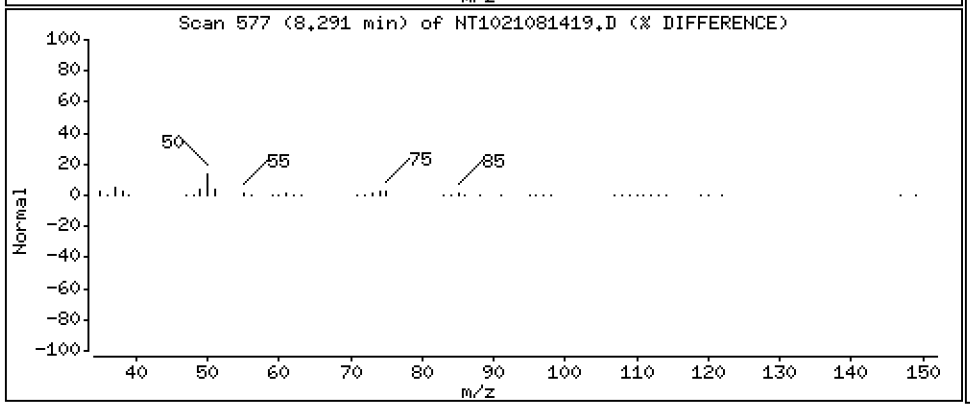
7 1,3-Dichlorobenzene

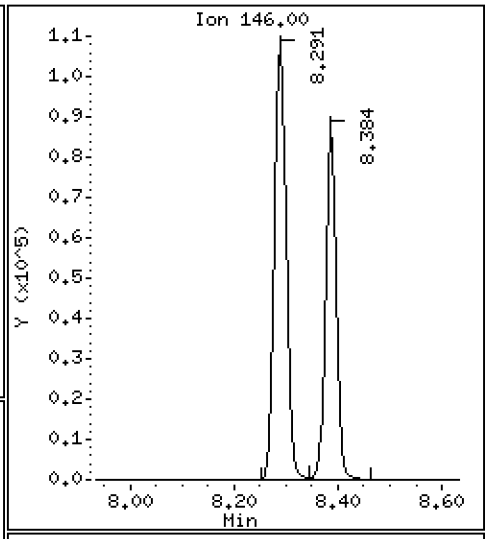
Concentration: 4.654 ug/mL

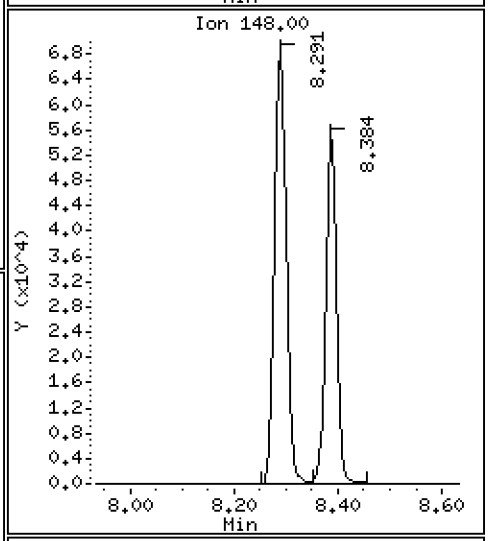


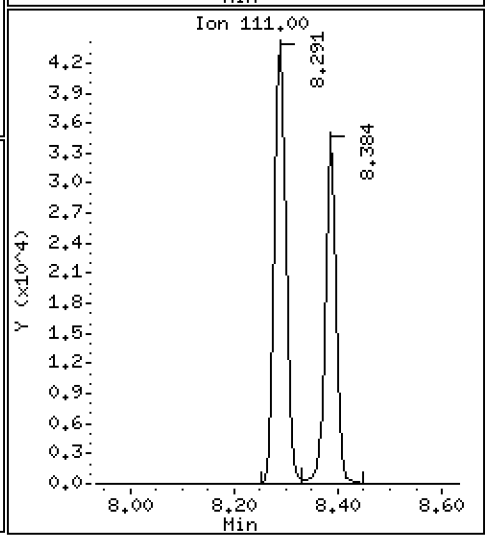












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

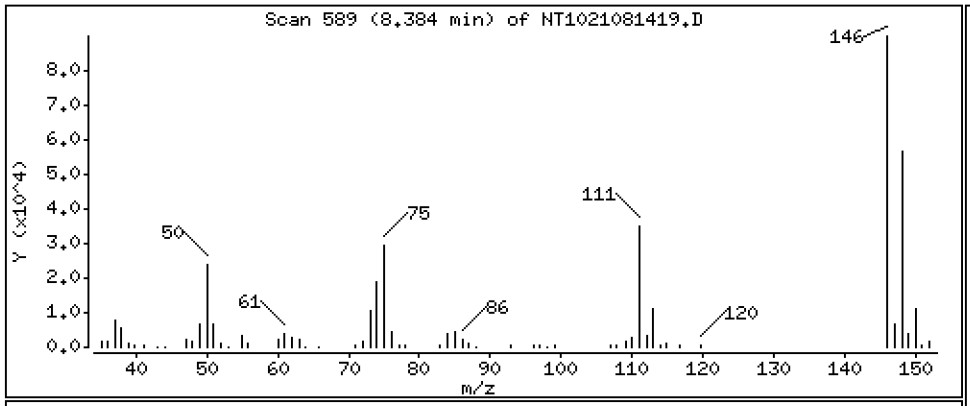
Operator: VTS

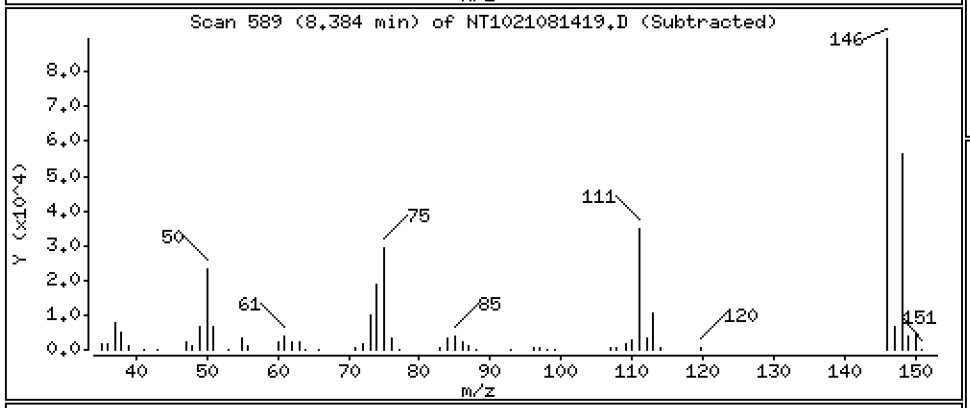
Column phase: ZB-5msi

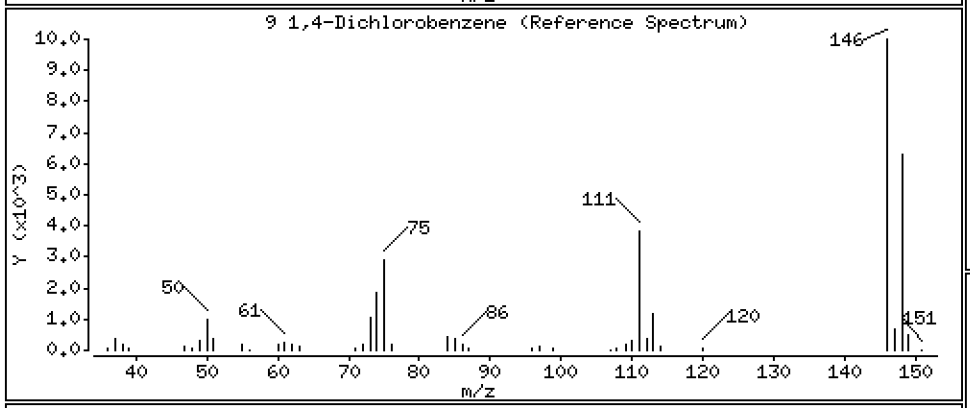
Column diameter: 0.25

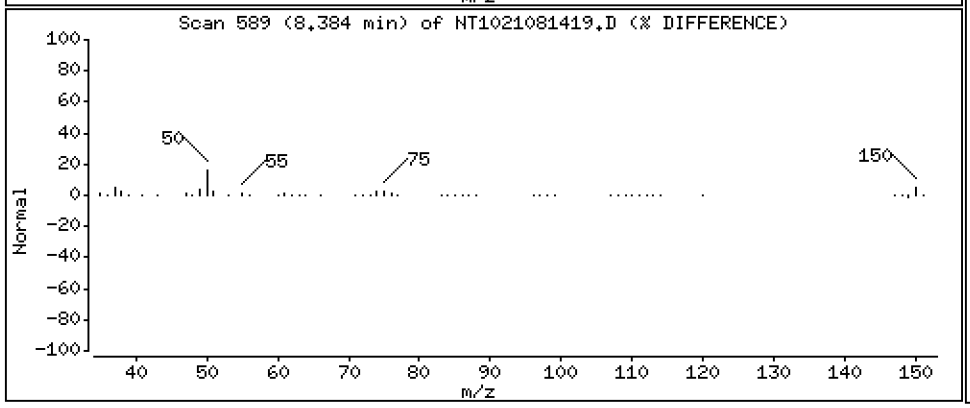
9 1,4-Dichlorobenzene

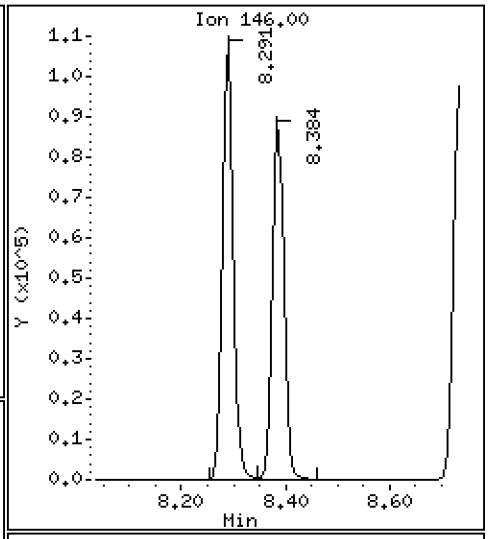
Concentration: 4.327 ug/mL

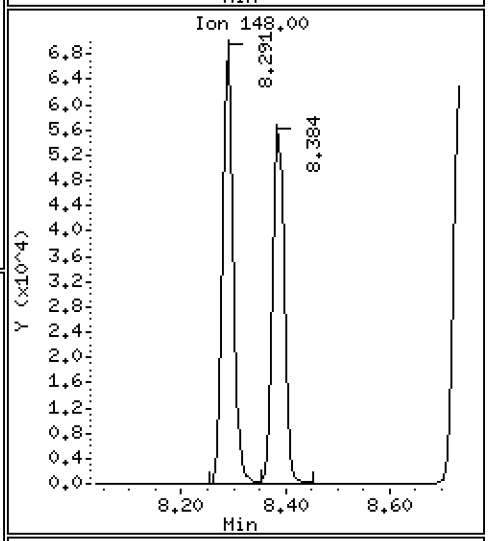


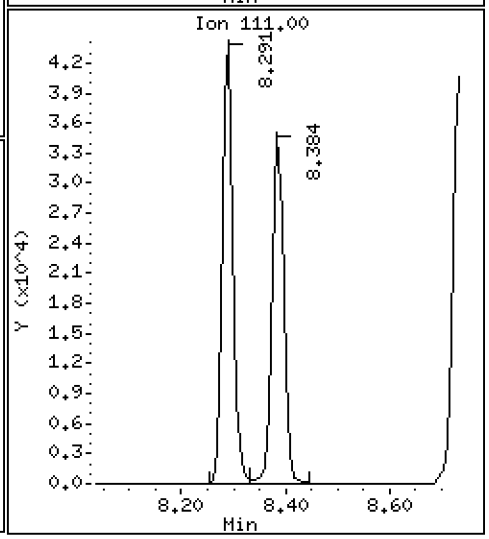












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

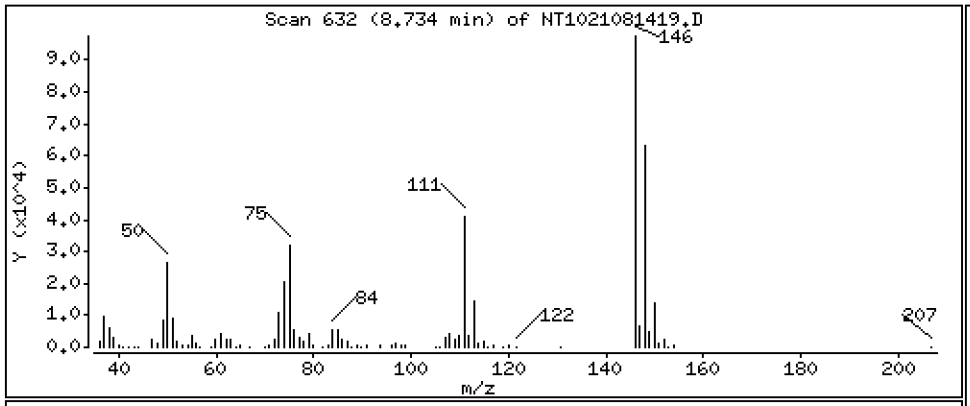
Operator: VTS

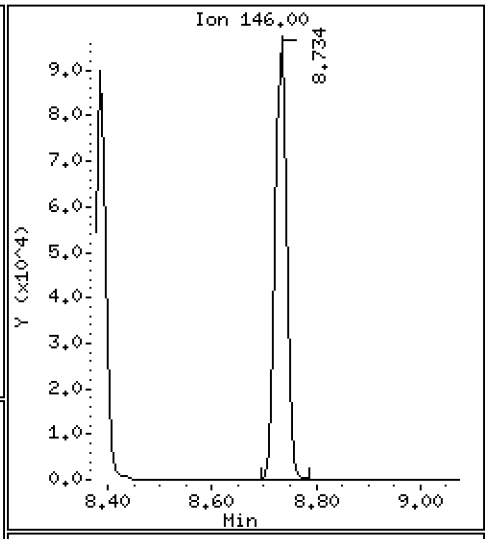
Column phase: ZB-5msi

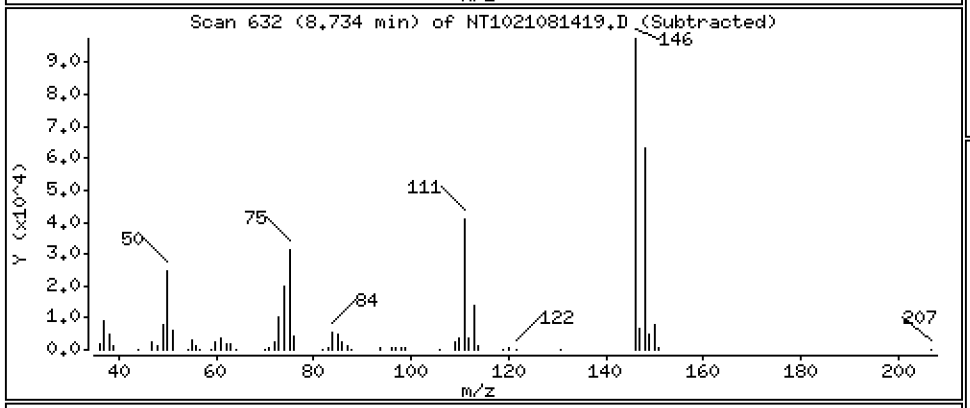
Column diameter: 0.25

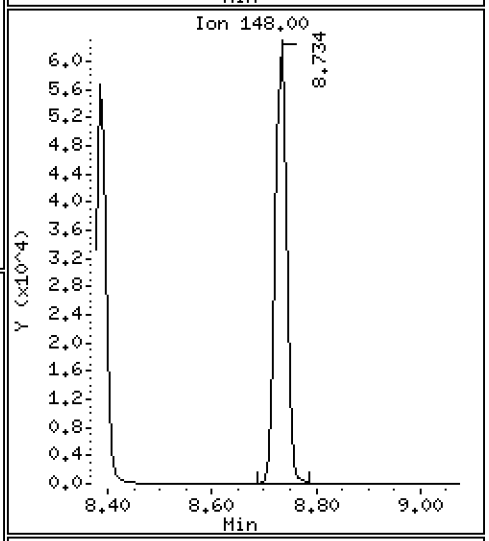
12 1,2-Dichlorobenzene

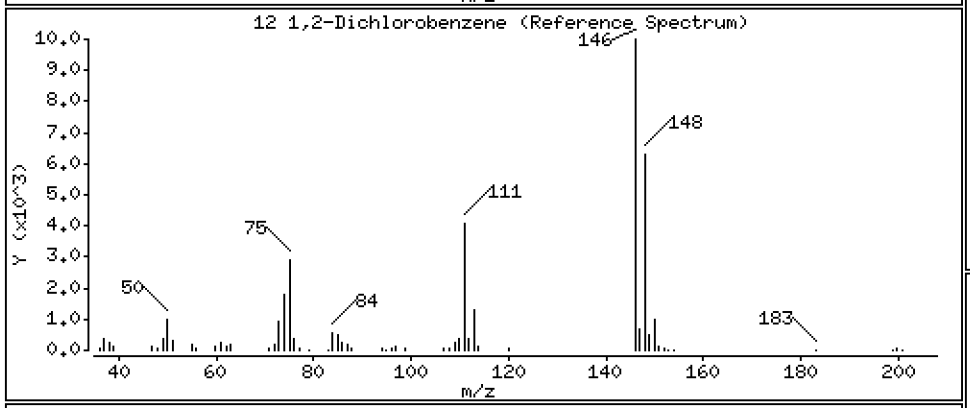
Concentration: 4.455 ug/mL

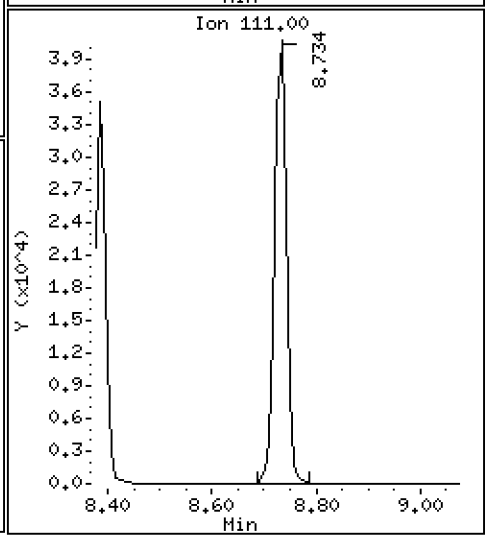


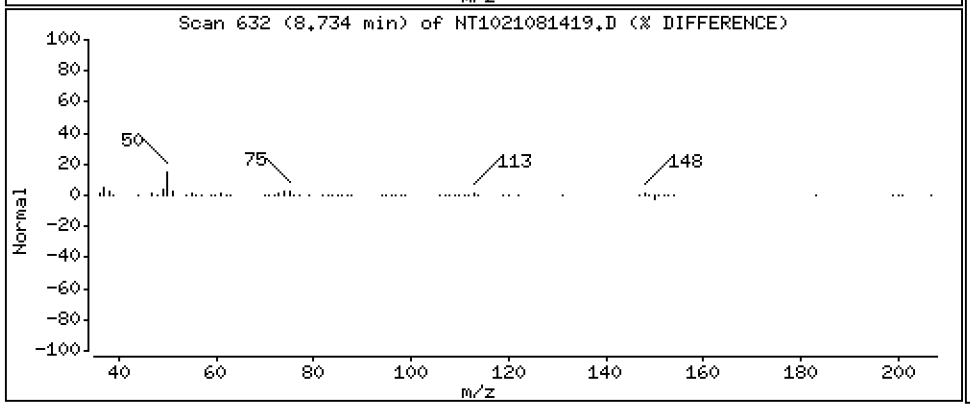












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

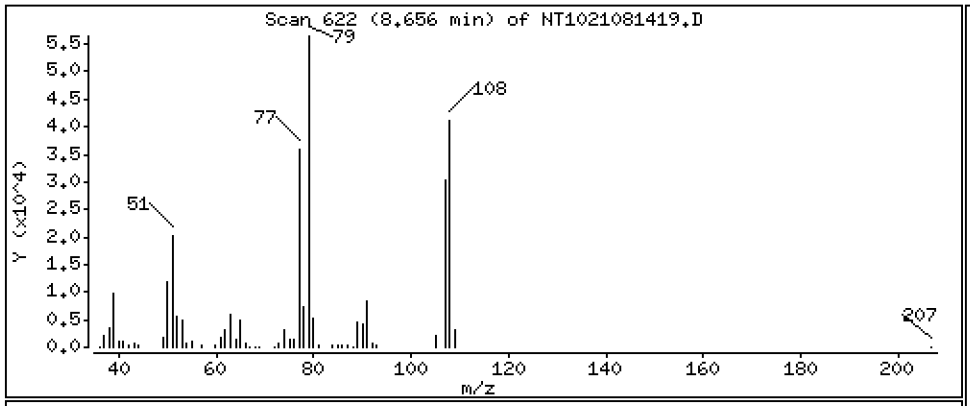
Operator: VTS

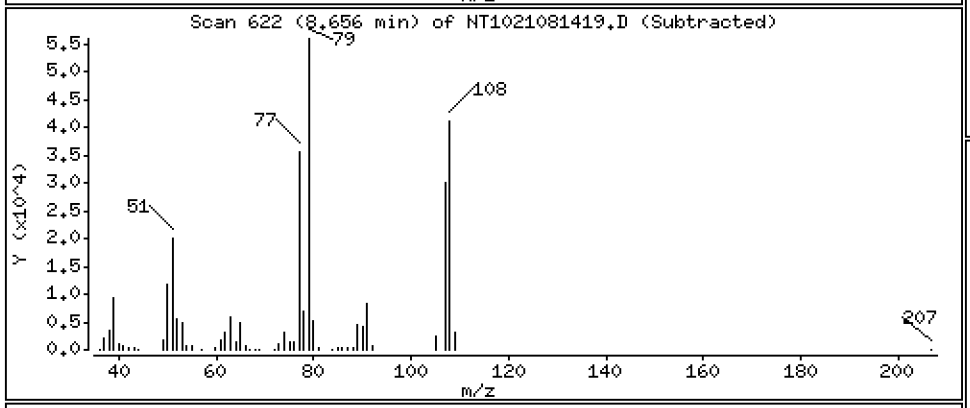
Column phase: ZB-5msi

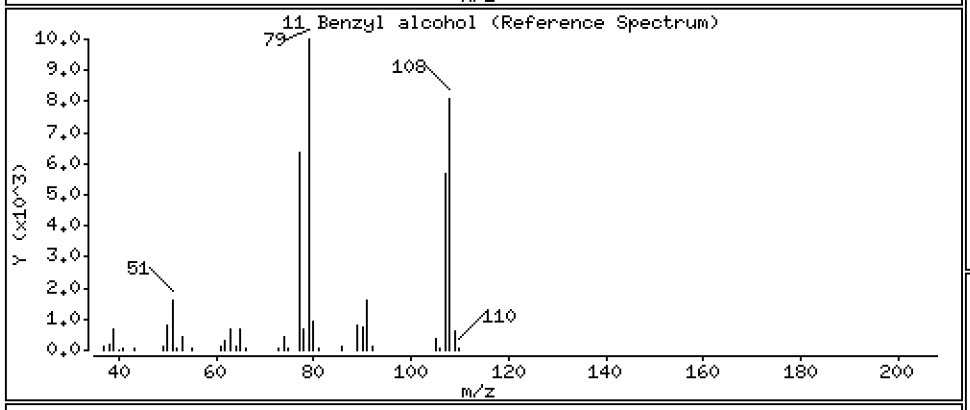
Column diameter: 0.25

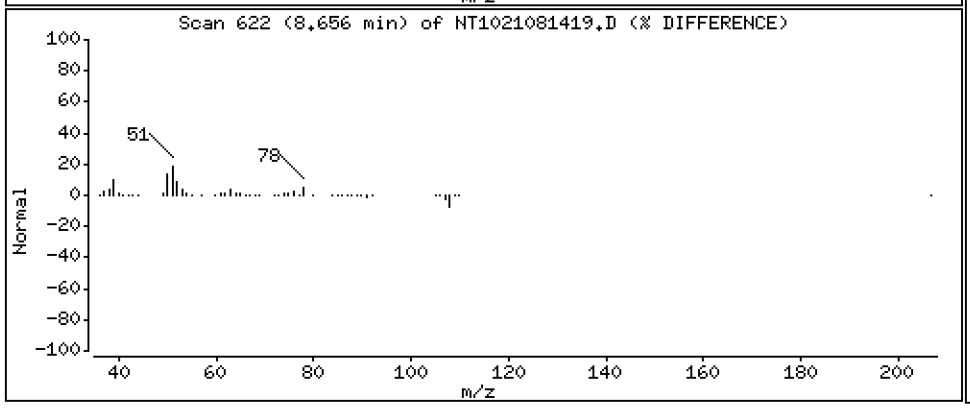
11 Benzyl alcohol

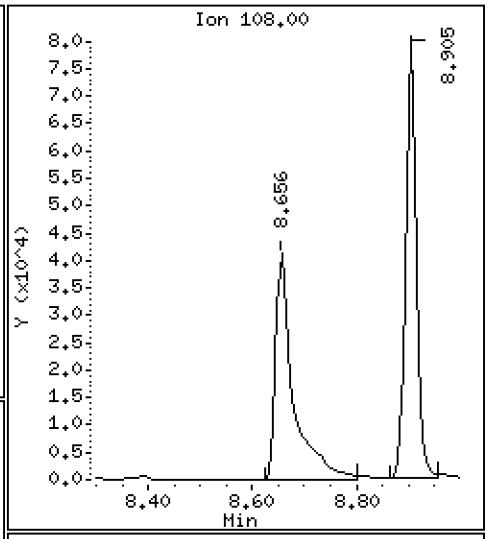
Concentration: 4.874 ug/mL

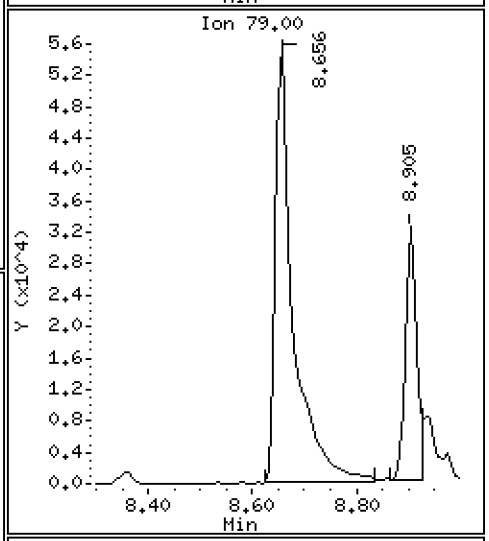


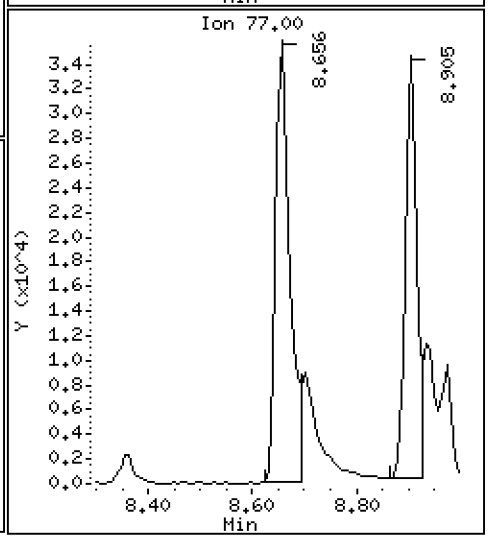












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

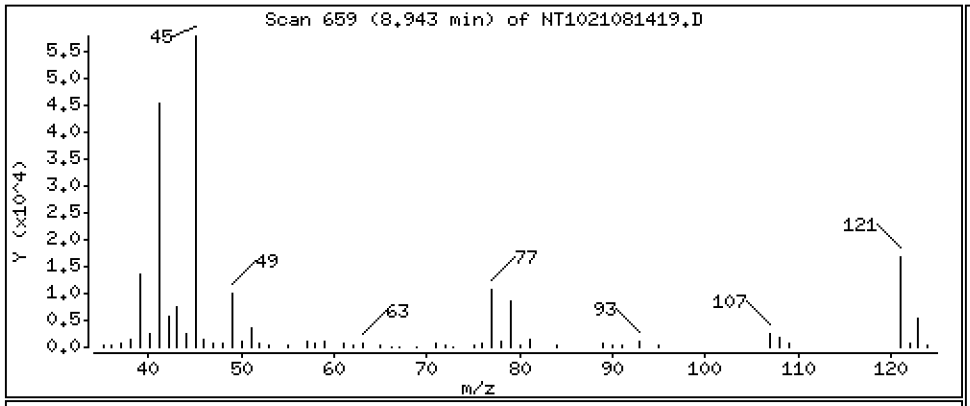
Operator: VTS

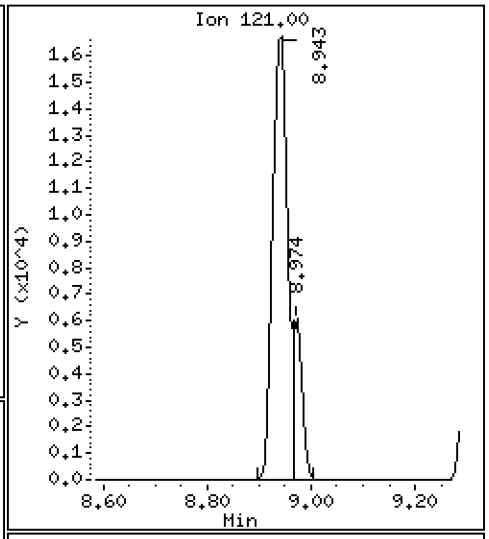
Column phase: ZB-5msi

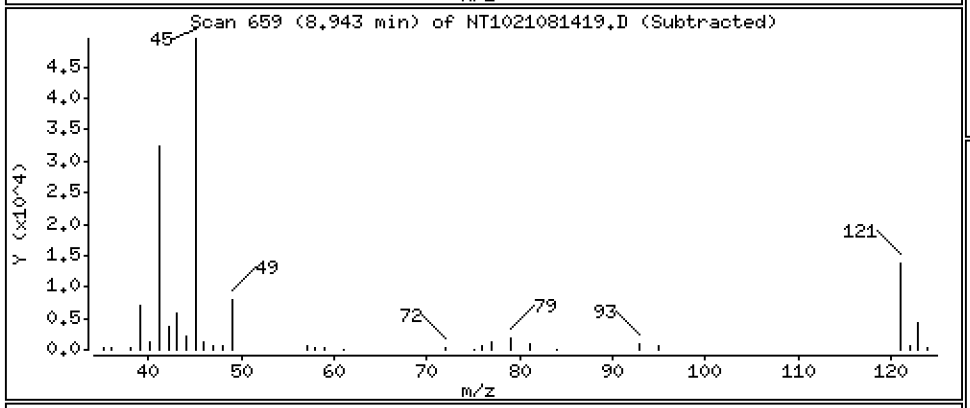
Column diameter: 0.25

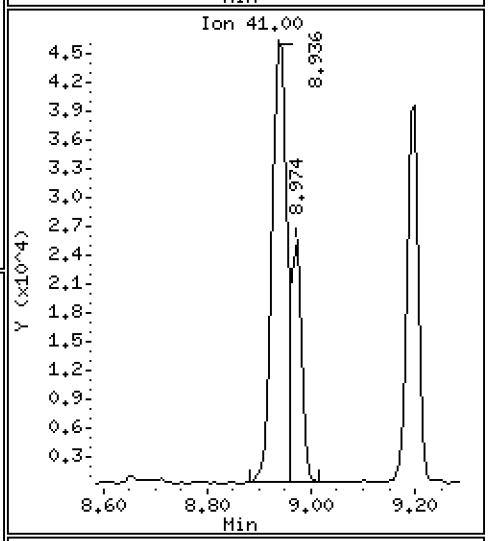
14 2,2'-oxybis(1-Chloropropane)

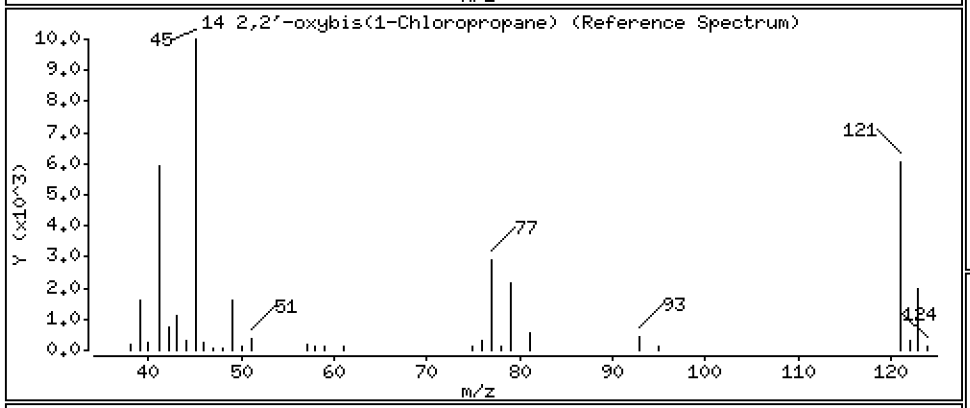
Concentration: 2.807 ug/mL

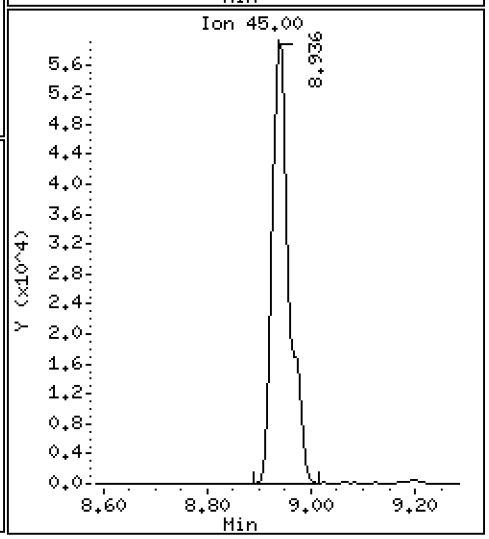


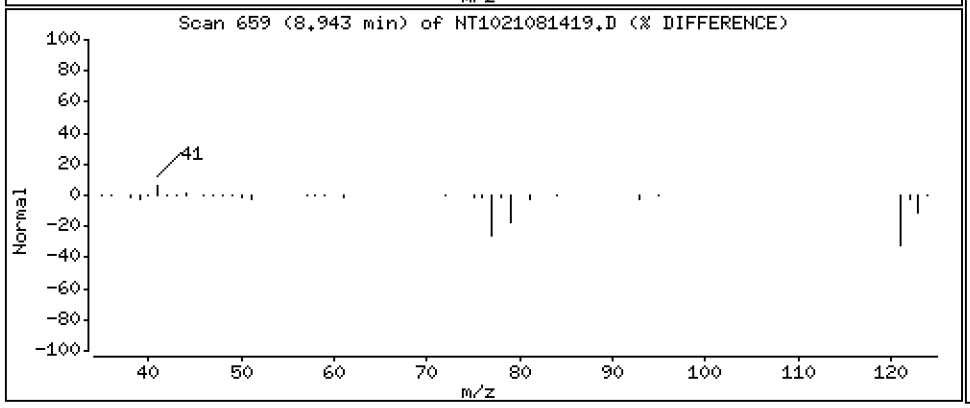












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

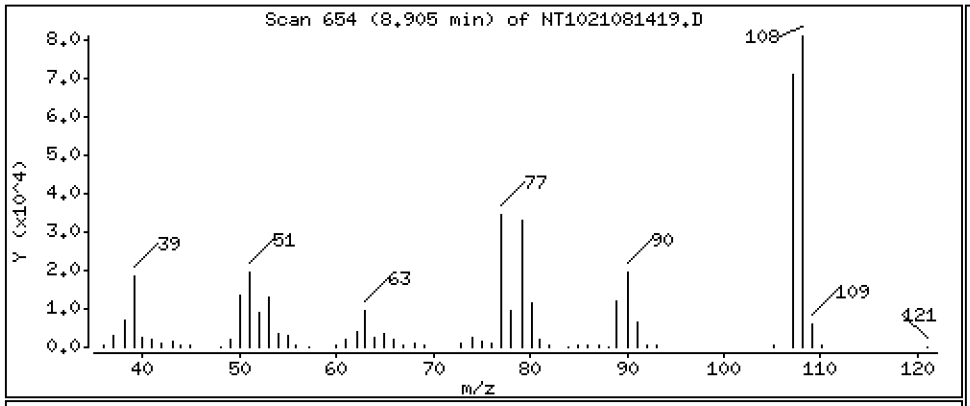
Operator: VTS

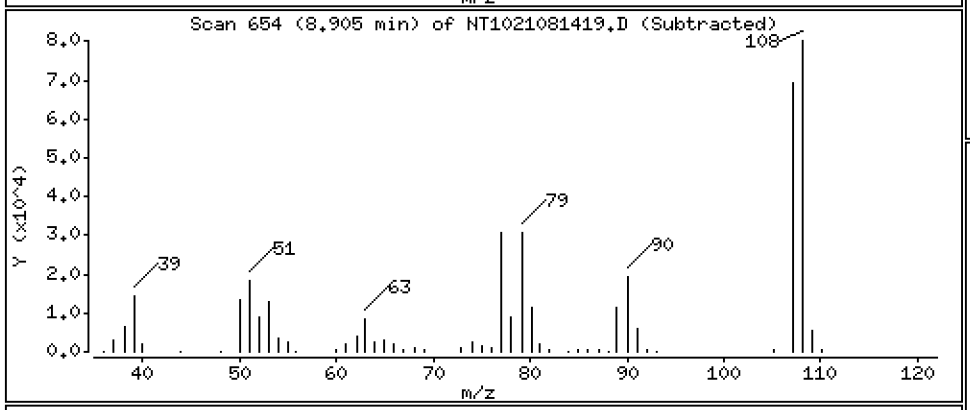
Column phase: ZB-5msi

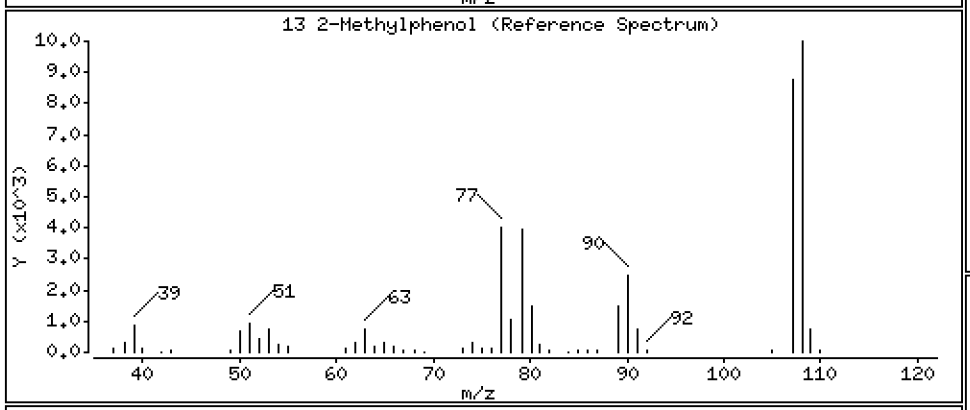
Column diameter: 0.25

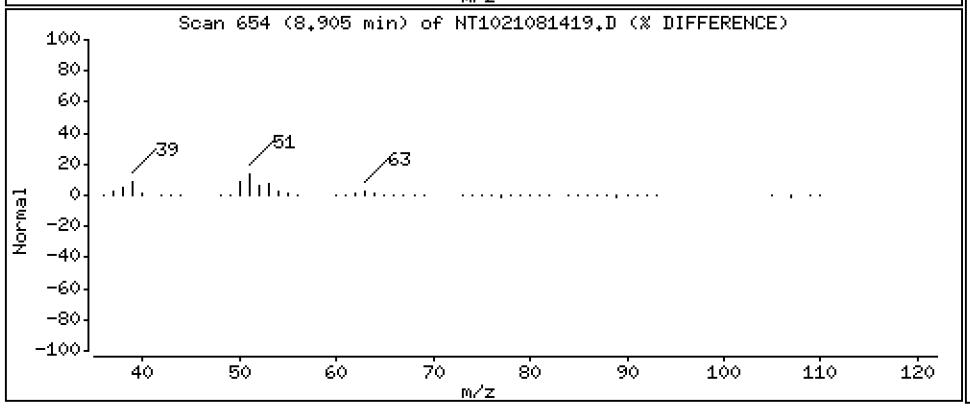
13 2-Methylphenol

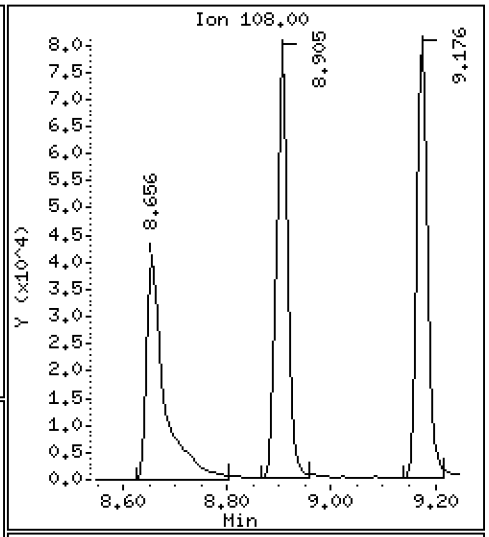
Concentration: 4.448 ug/mL

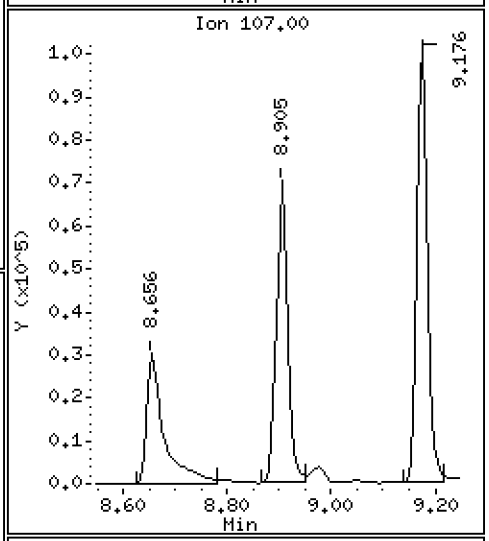


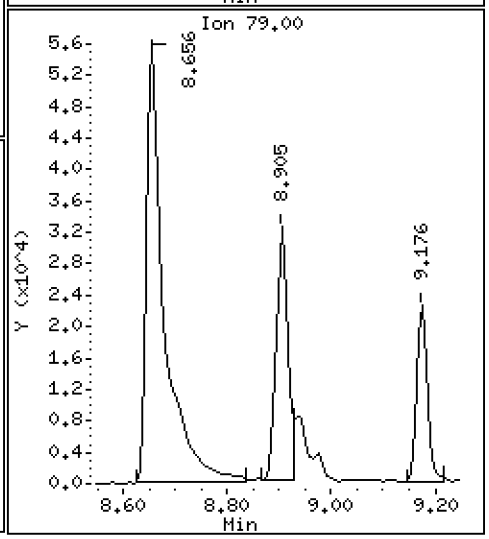












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

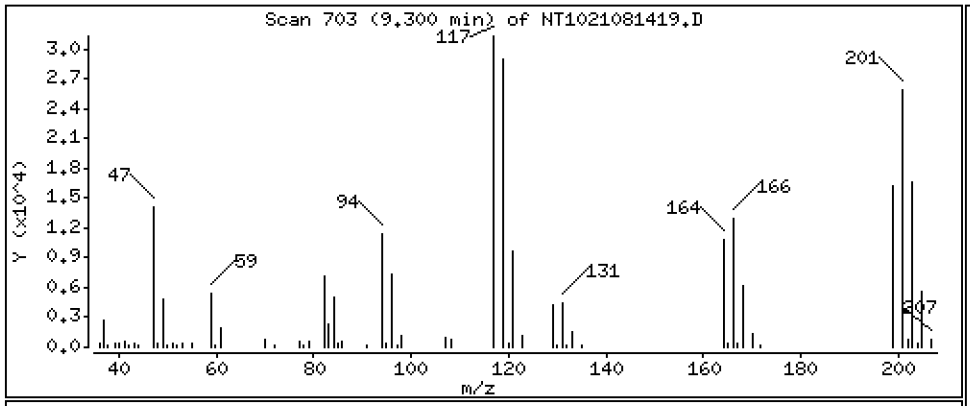
Operator: VTS

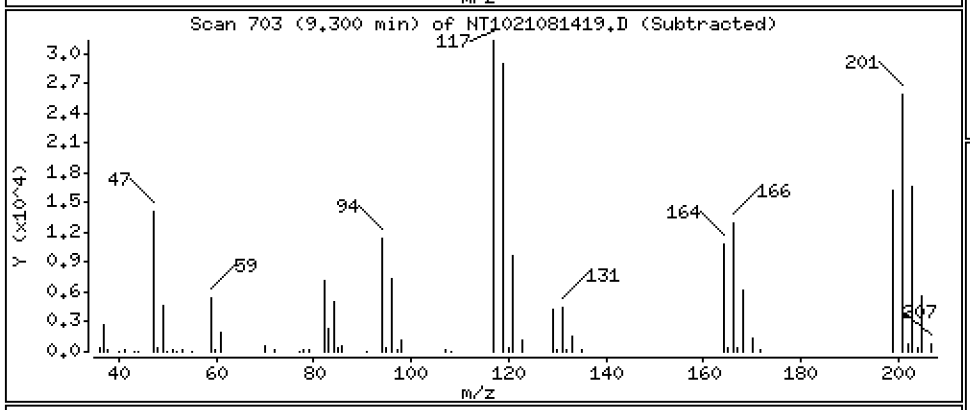
Column phase: ZB-5msi

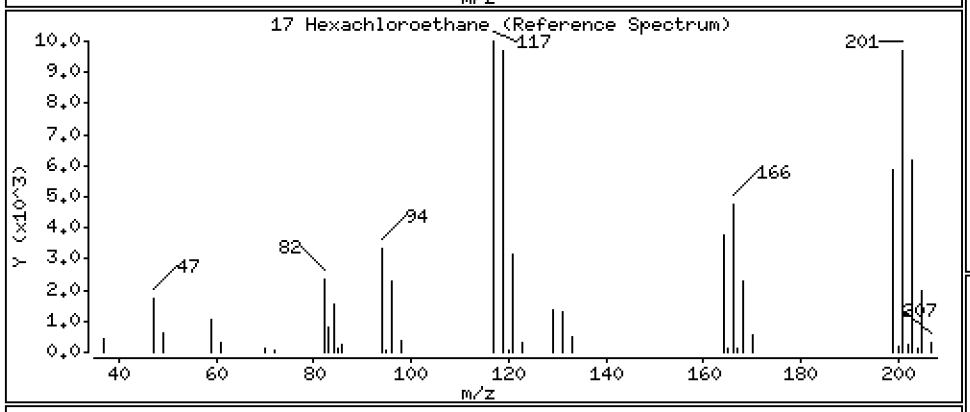
Column diameter: 0.25

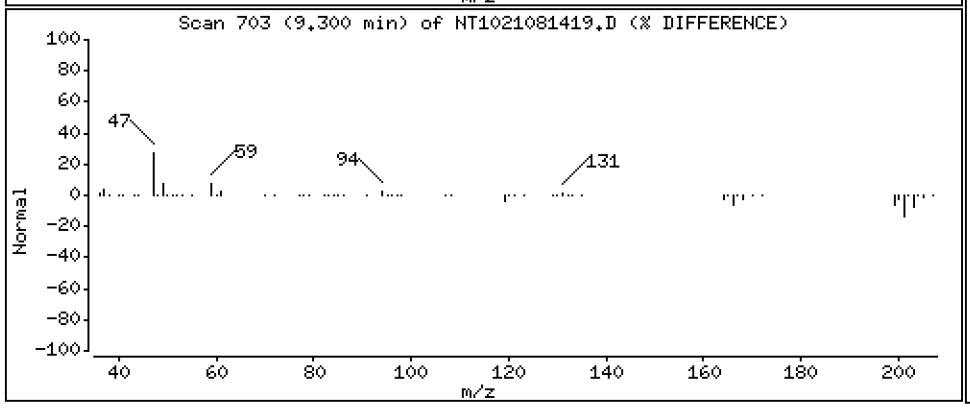
17 Hexachloroethane

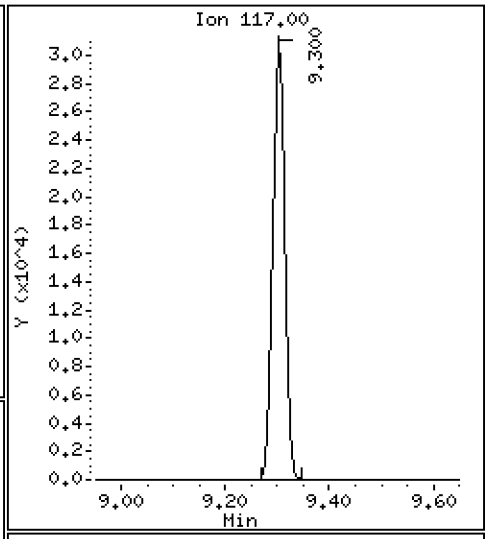
Concentration: 3.651 ug/mL

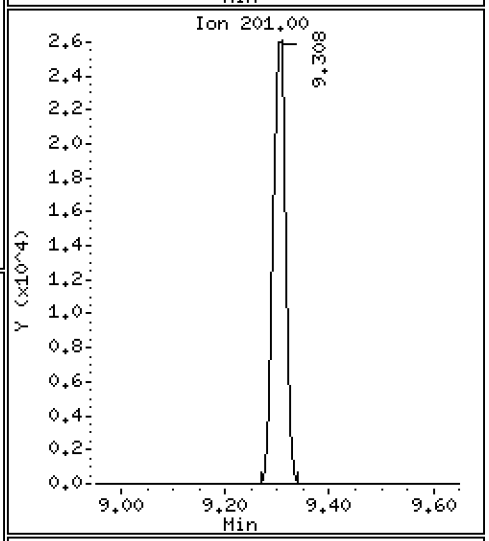


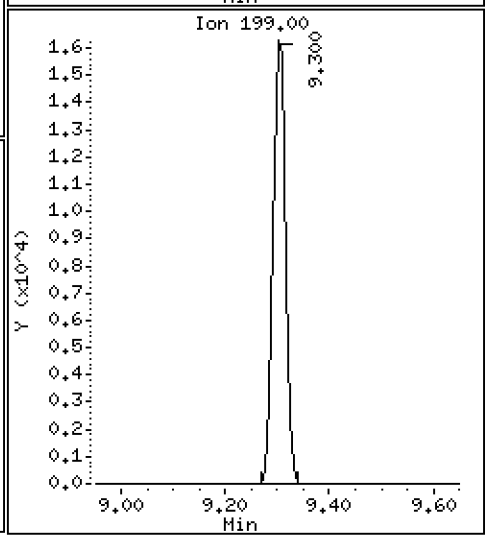












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

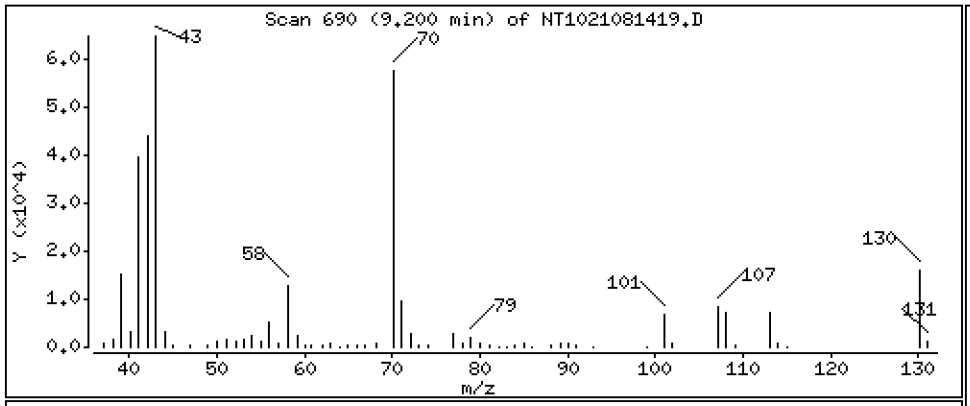
Operator: VTS

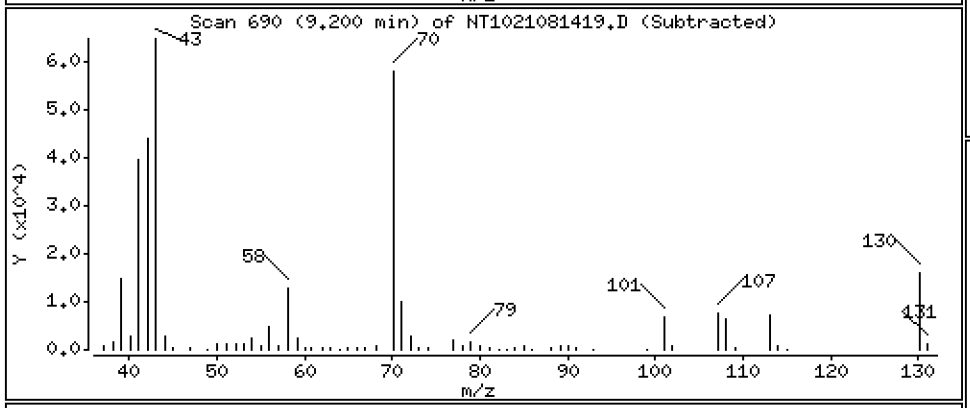
Column phase: ZB-5msi

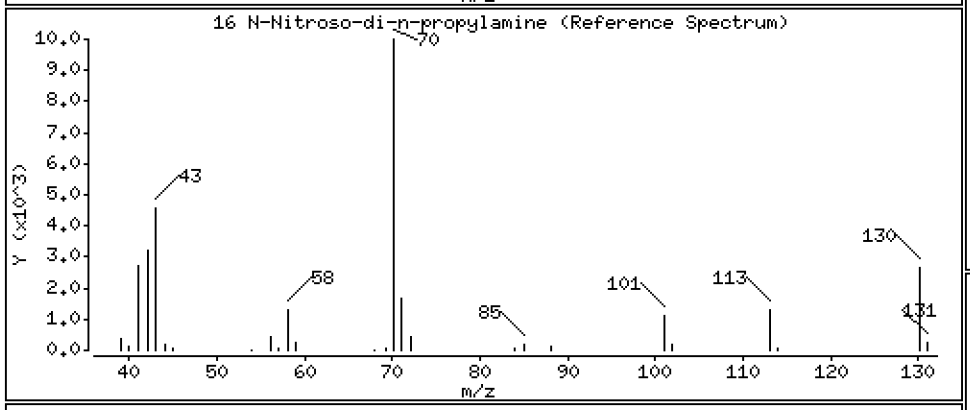
Column diameter: 0.25

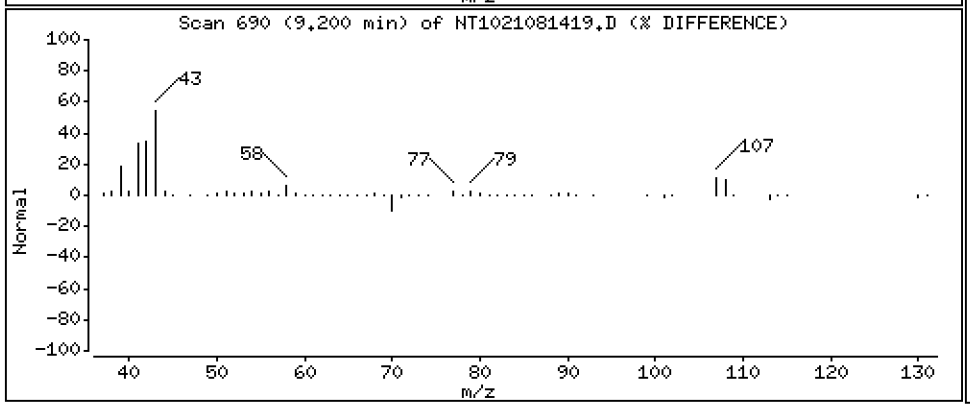
16 N-Nitroso-di-n-propylamine

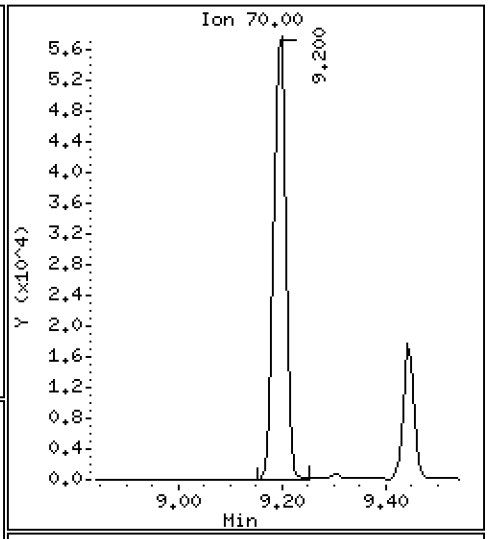
Concentration: 4.021 ug/mL

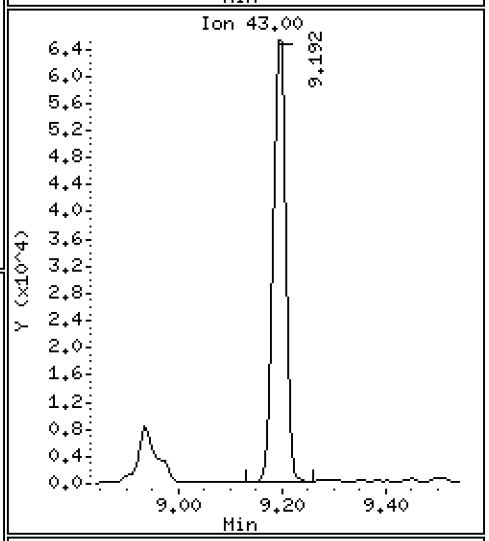


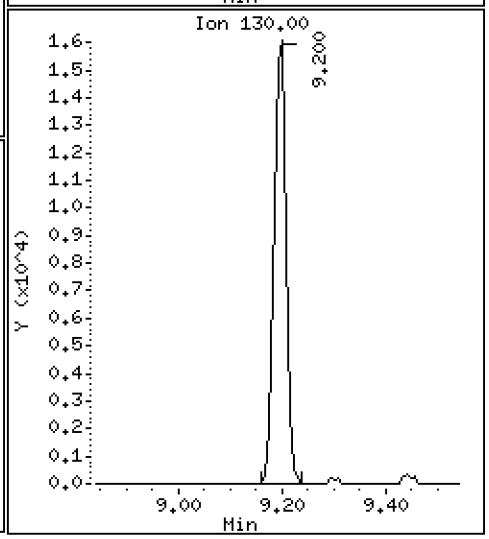












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

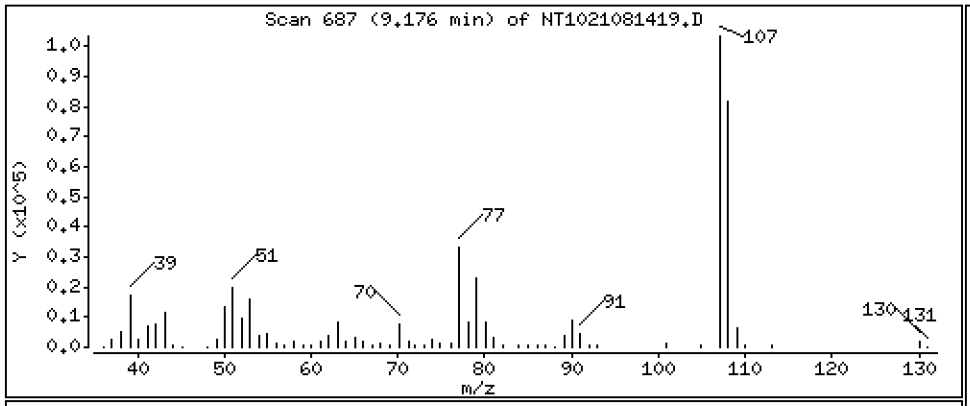
Operator: VTS

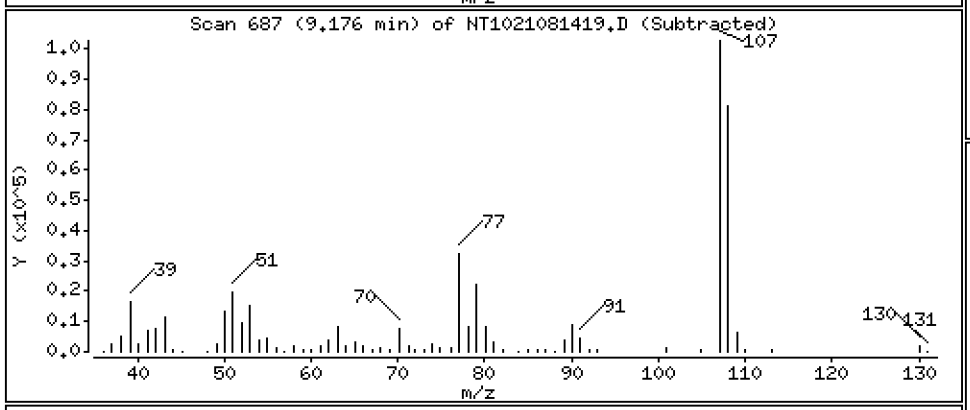
Column phase: ZB-5msi

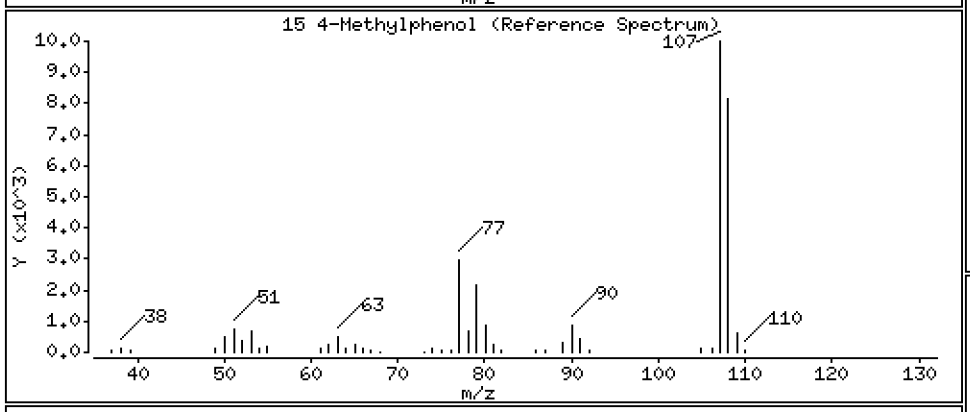
Column diameter: 0.25

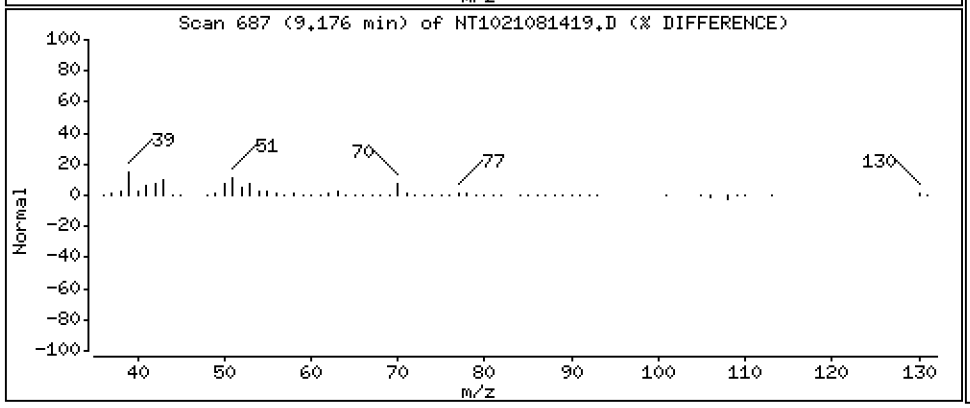
15 4-Methylphenol

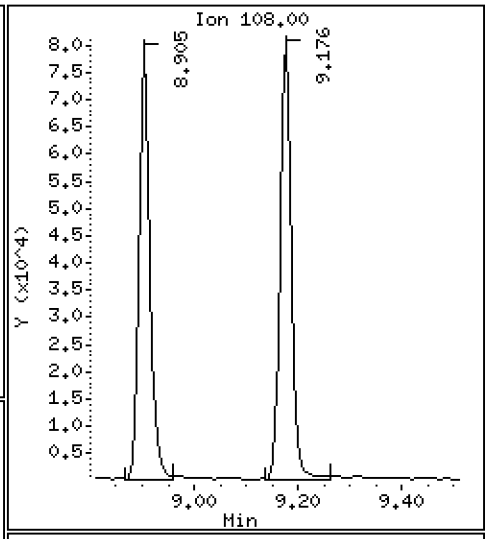
Concentration: 4.471 ug/mL

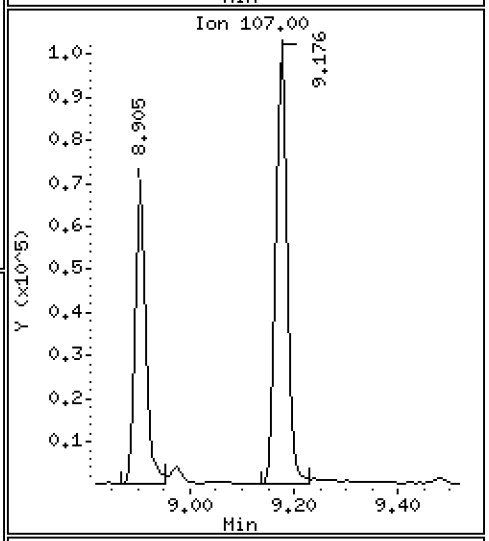


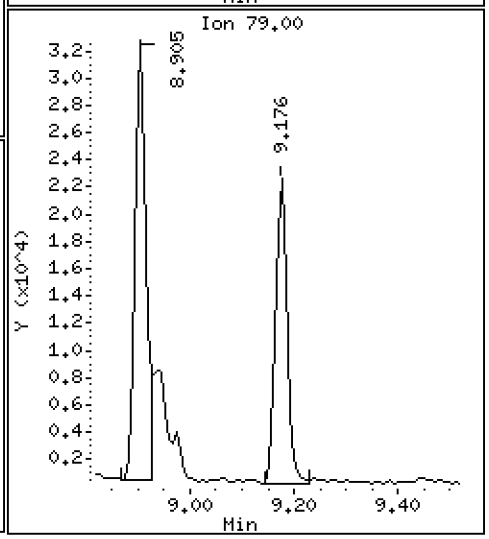












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

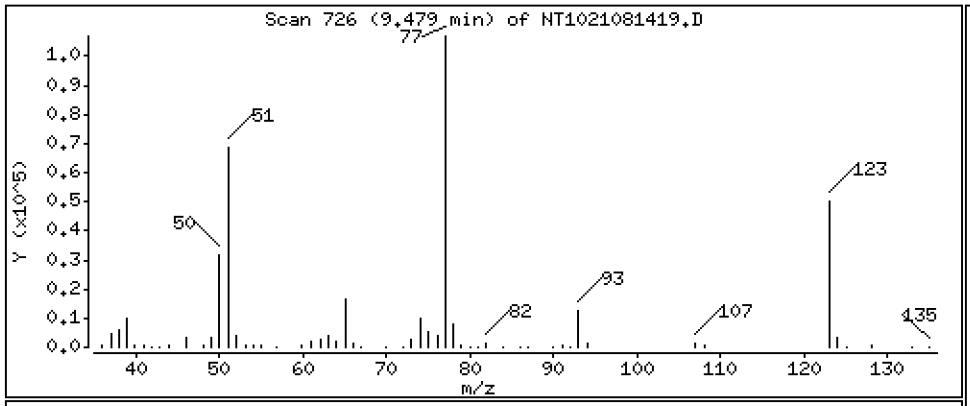
Operator: VTS

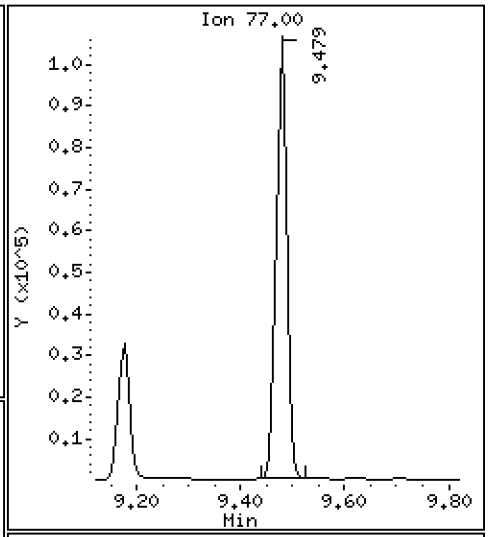
Column phase: ZB-5msi

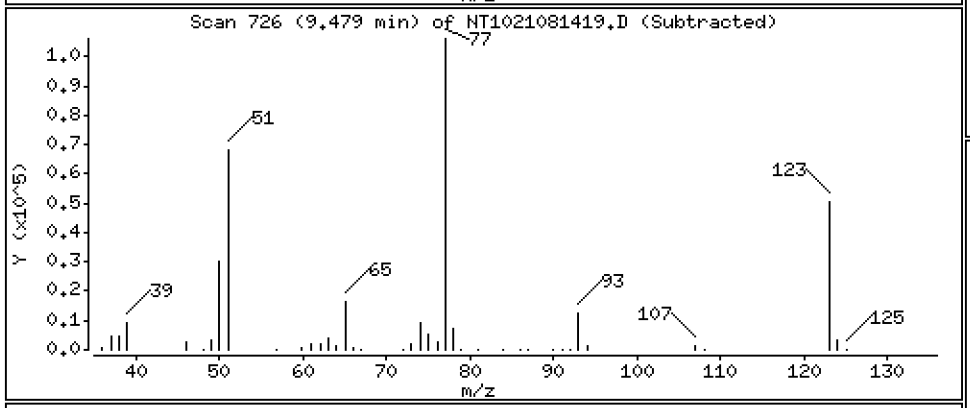
Column diameter: 0.25

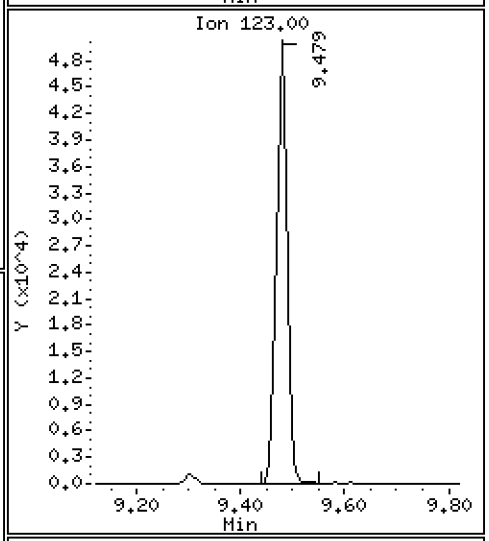
19 Nitrobenzene

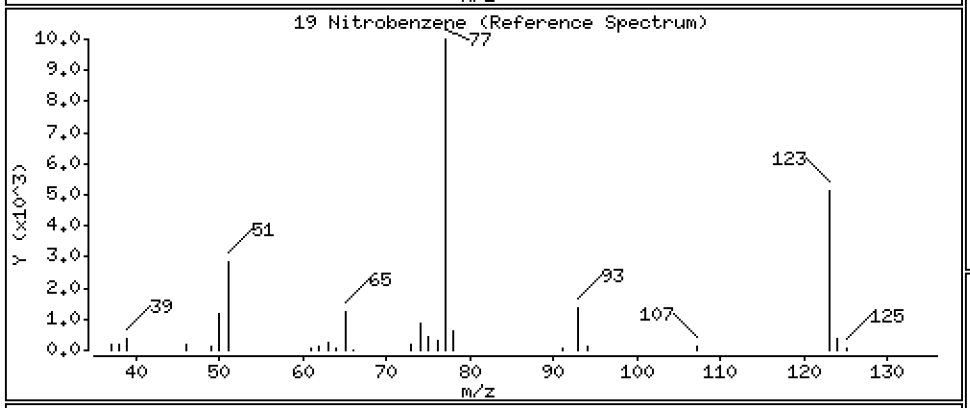
Concentration: 4.428 ug/mL

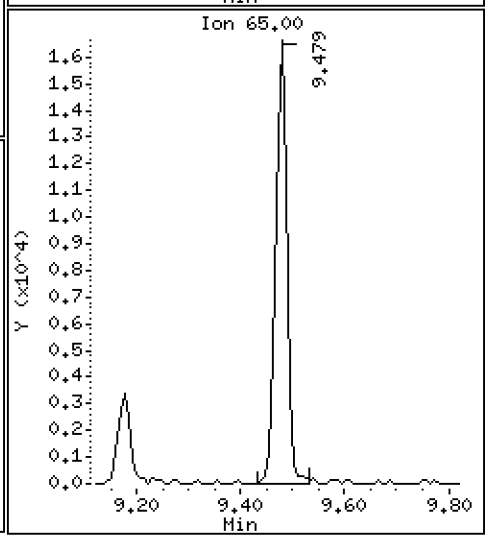


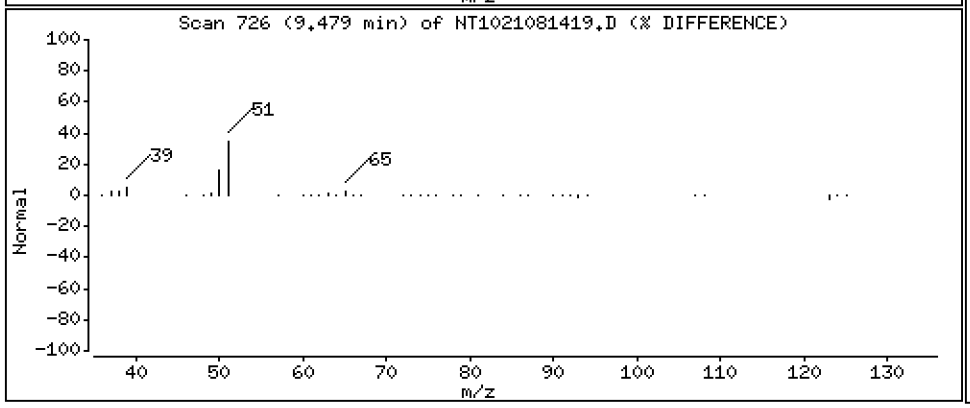












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

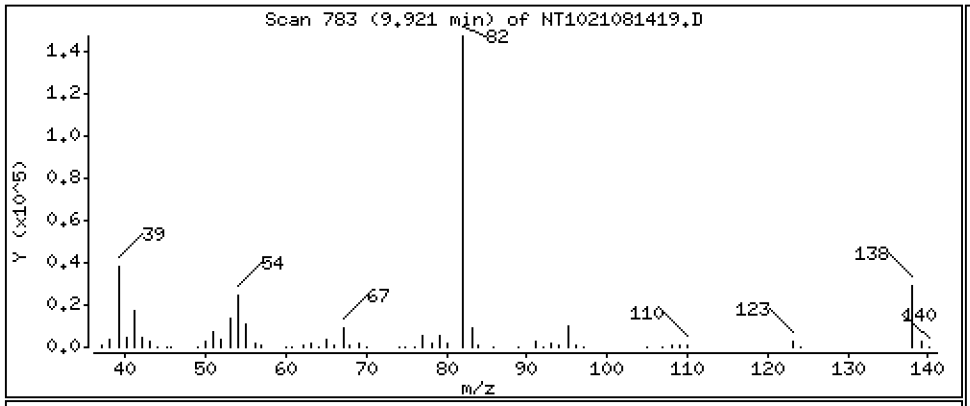
Operator: VTS

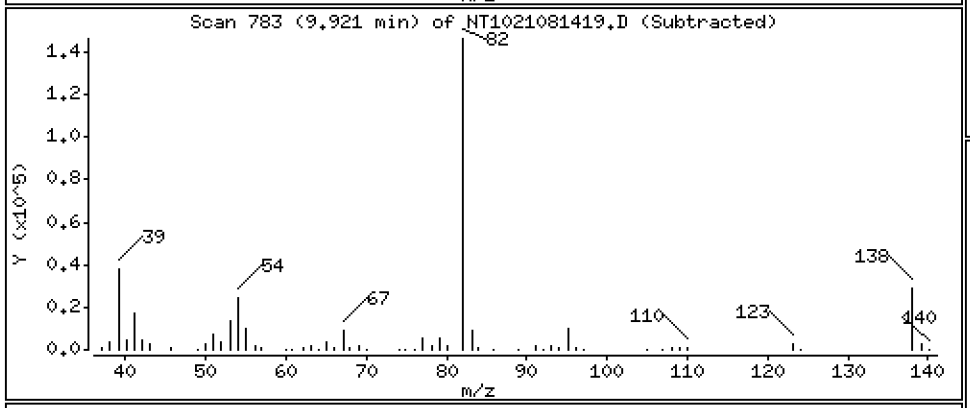
Column phase: ZB-5msi

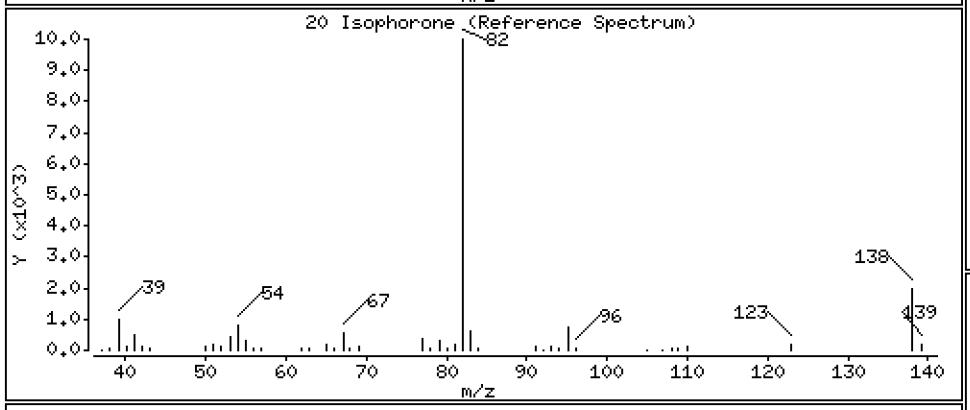
Column diameter: 0.25

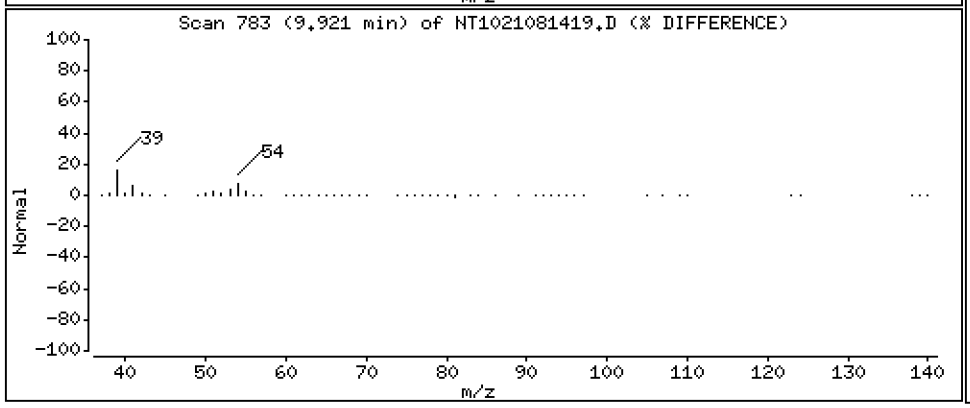
20 Isophorone

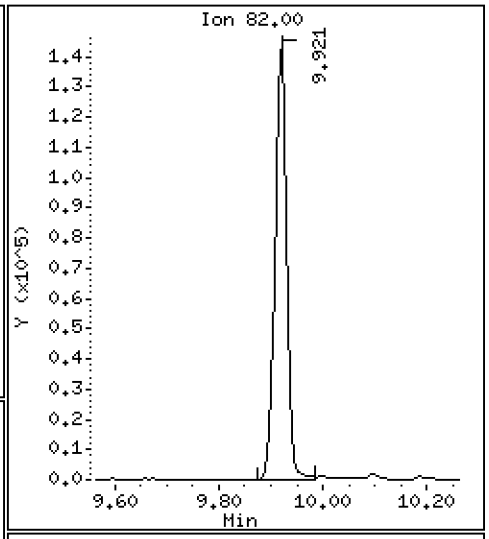
Concentration: 3.610 ug/mL

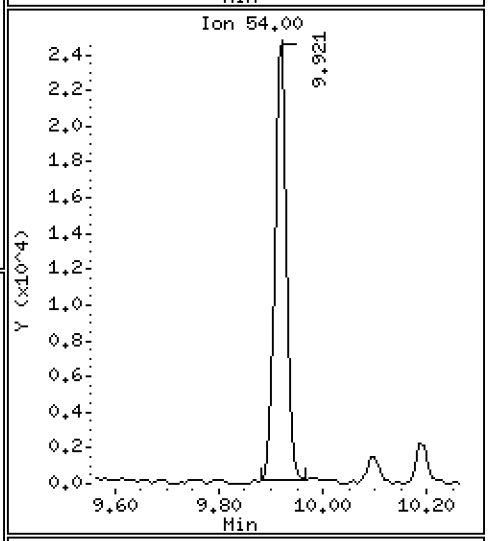


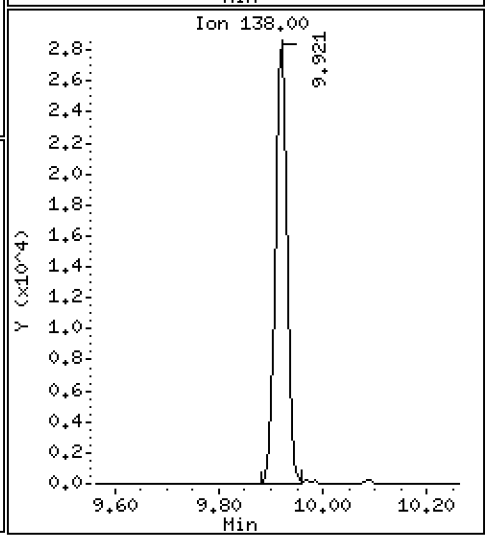












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

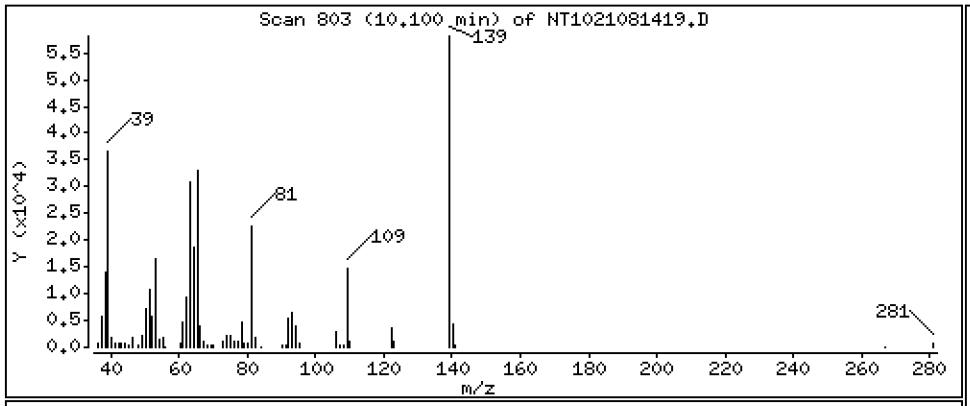
Operator: VTS

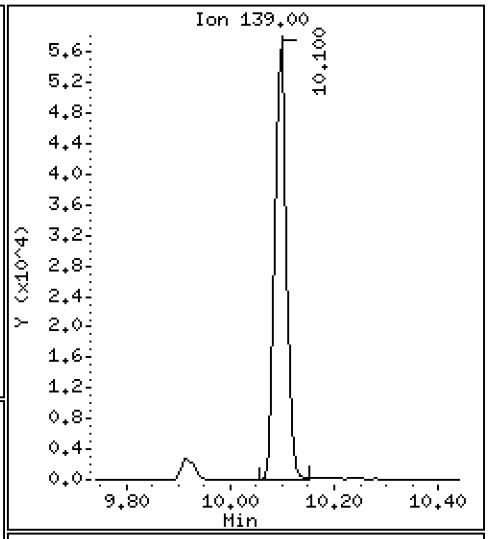
Column phase: ZB-5msi

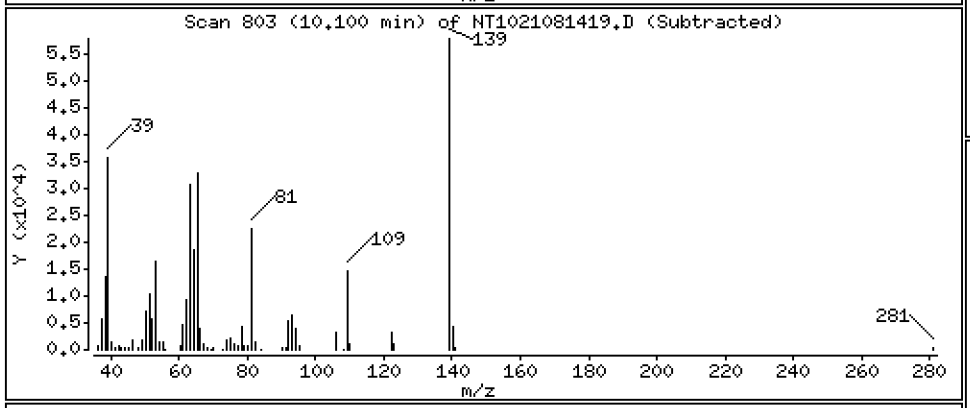
Column diameter: 0.25

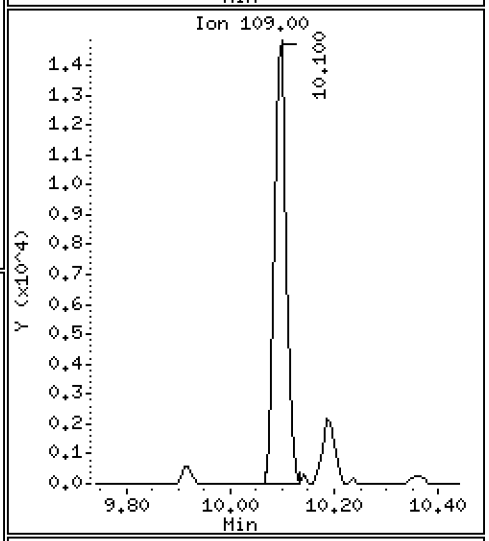
21 2-Nitrophenol

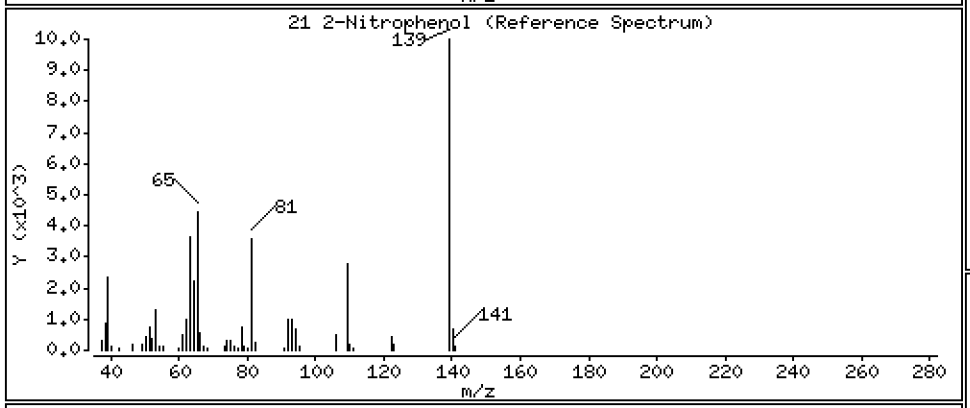
Concentration: 5.050 ug/mL

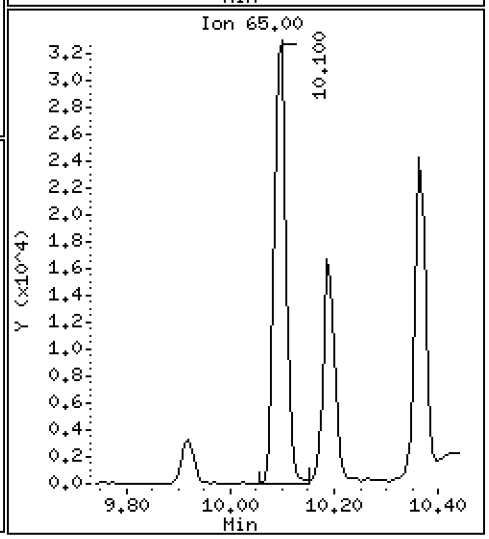


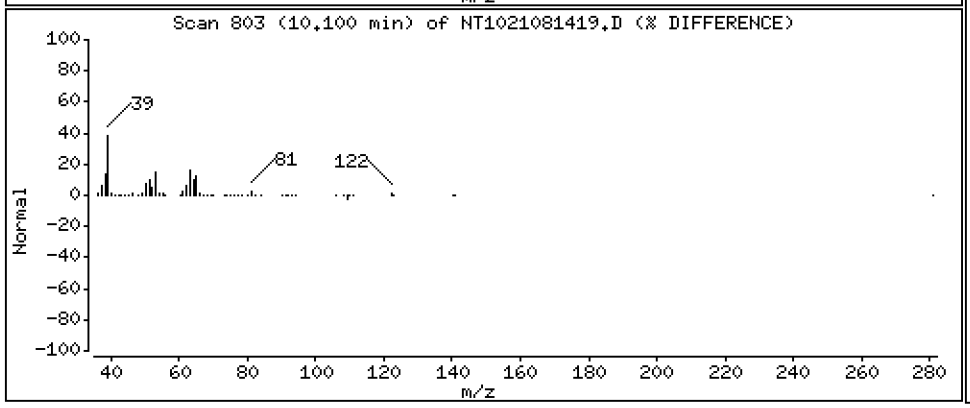












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

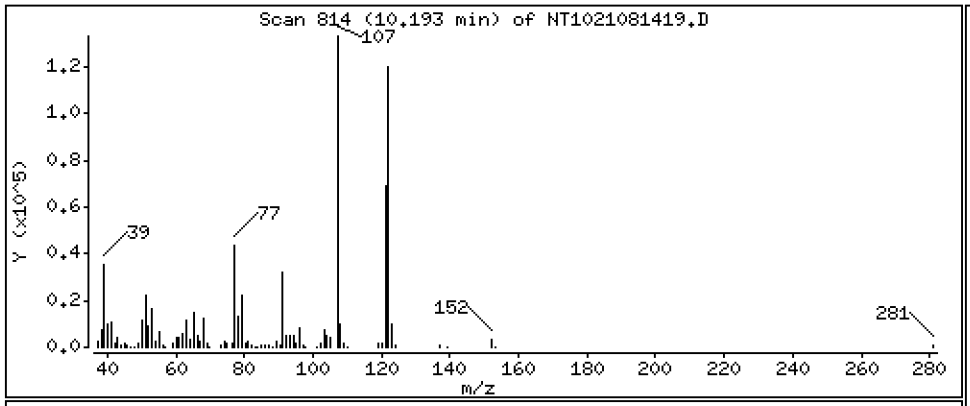
Operator: VTS

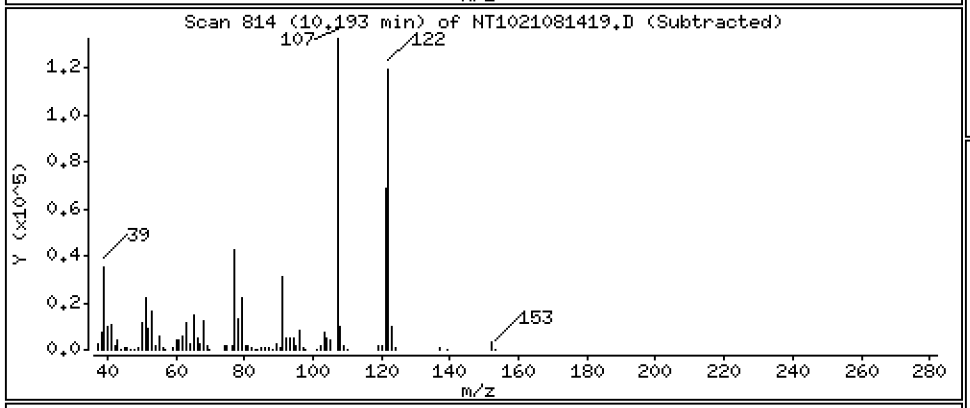
Column phase: ZB-5msi

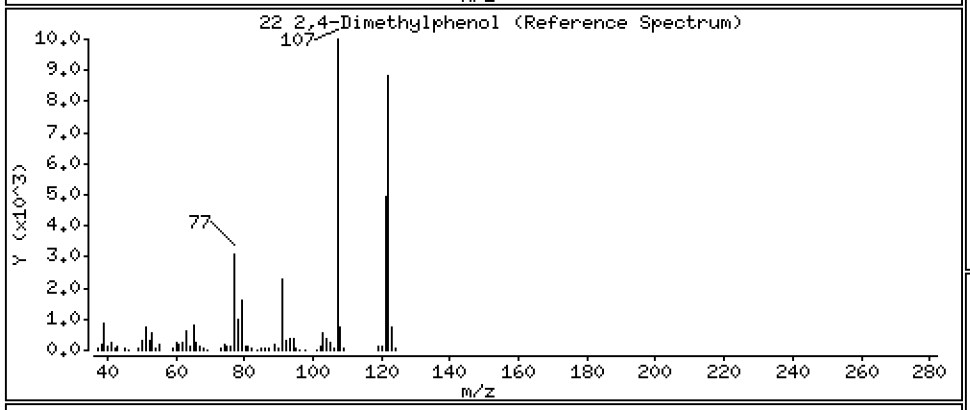
Column diameter: 0.25

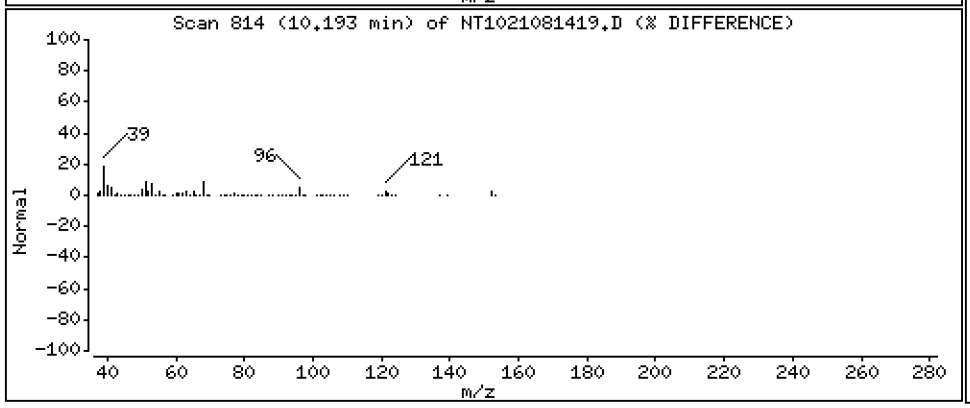
22 2,4-Dimethylphenol

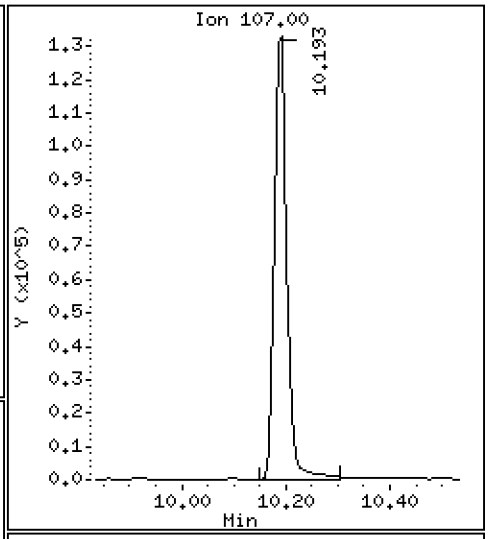
Concentration: 8.416 ug/mL

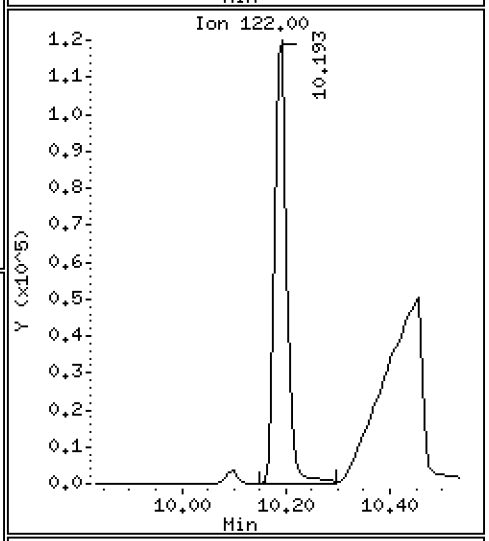


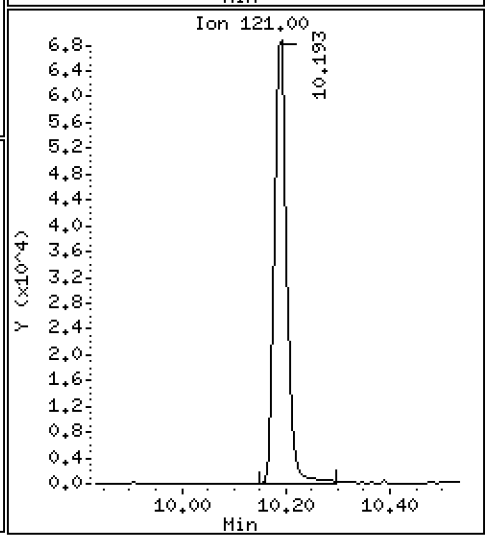












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

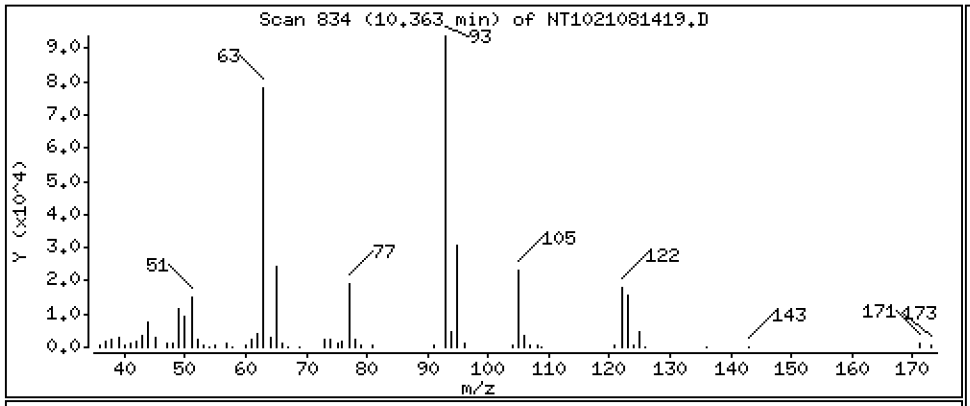
Operator: VTS

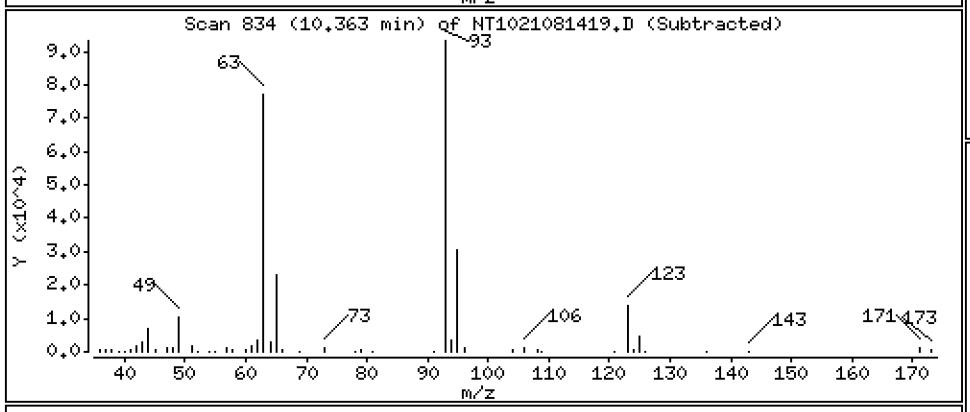
Column phase: ZB-5msi

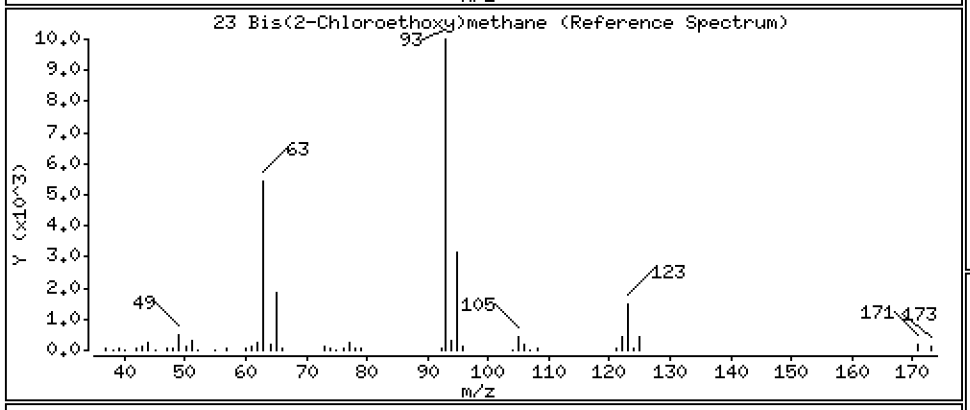
Column diameter: 0.25

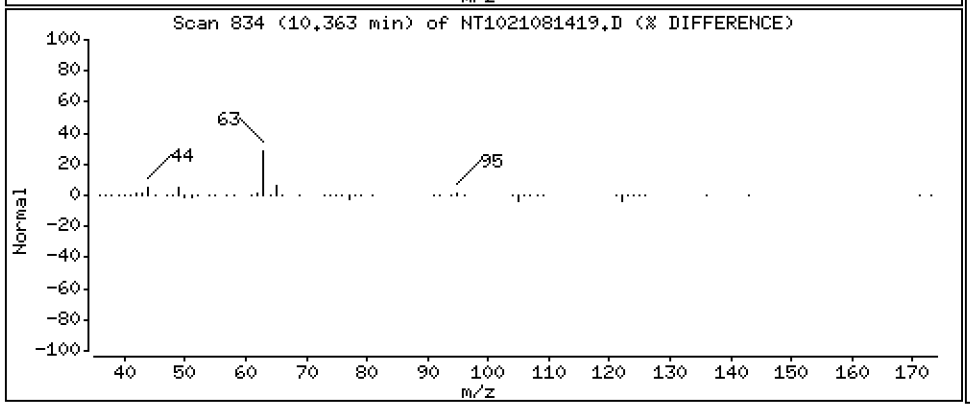
23 Bis(2-Chloroethoxy)methane

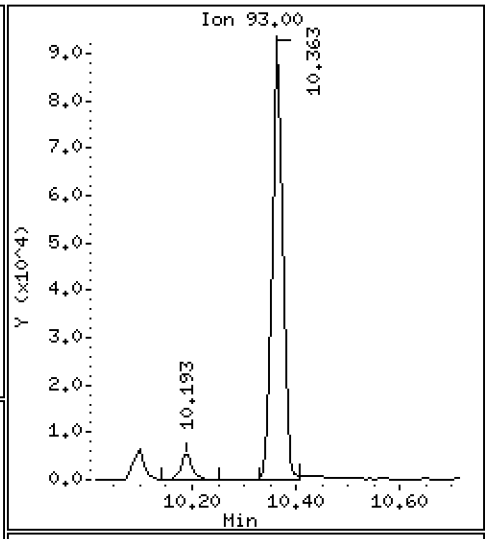
Concentration: 3.991 ug/mL

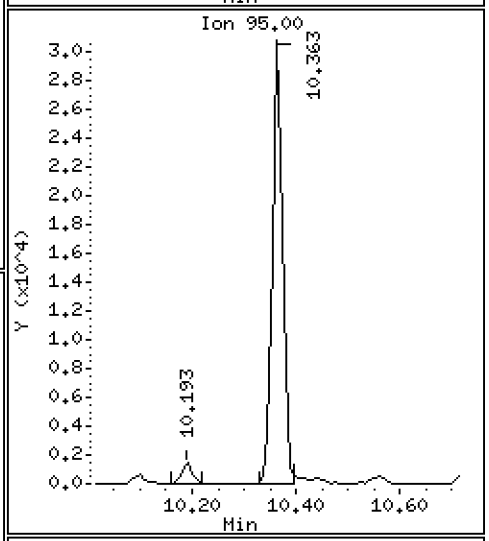


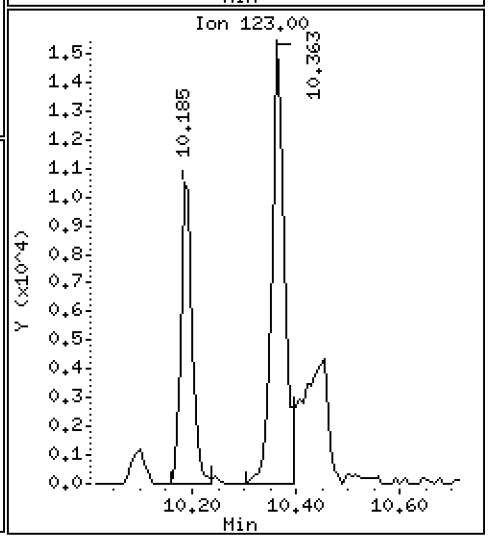












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

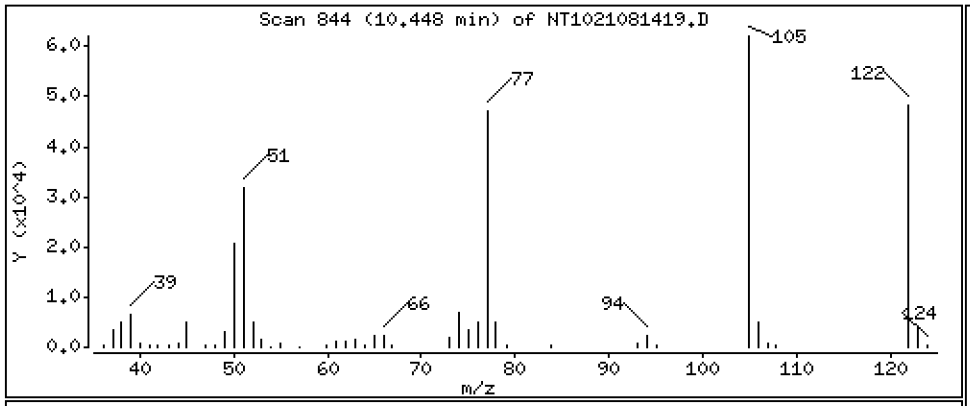
Operator: VTS

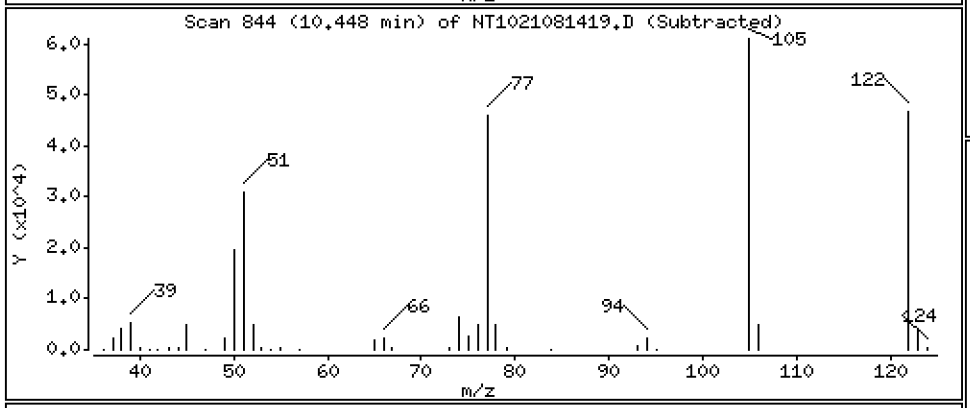
Column phase: ZB-5msi

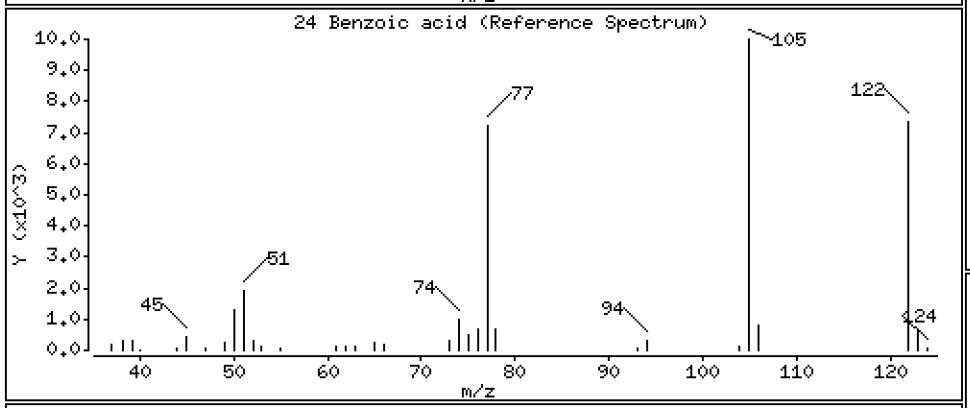
Column diameter: 0.25

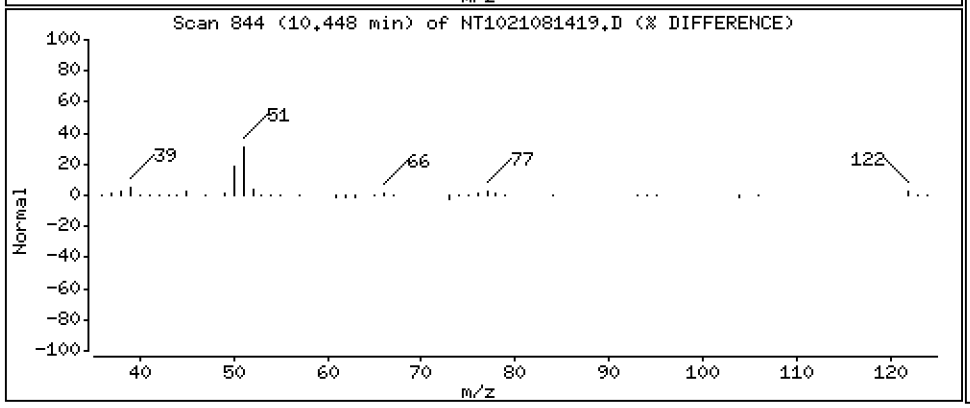
24 Benzoic acid

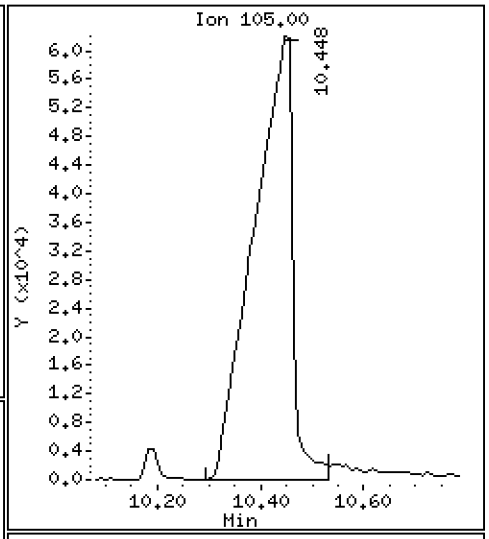
Concentration: 21.64 ug/mL

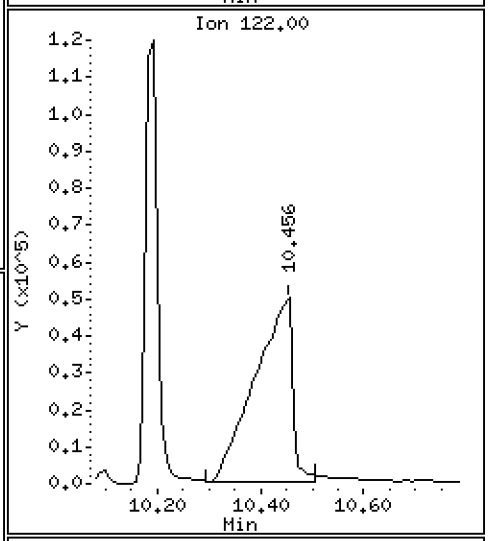


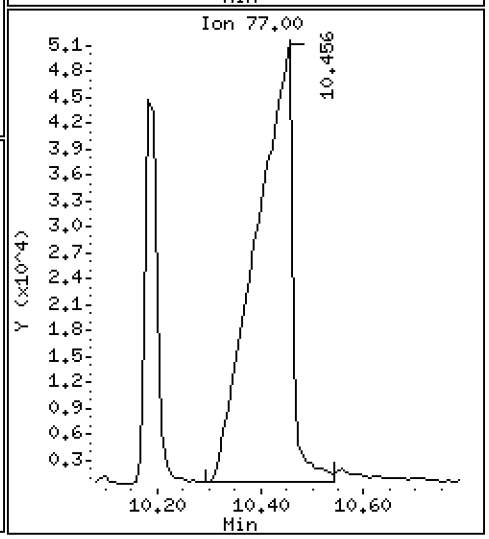












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

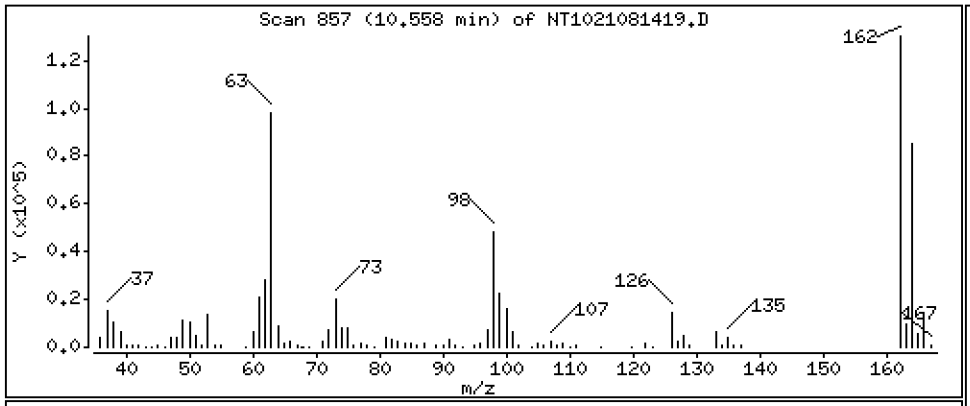
Operator: VTS

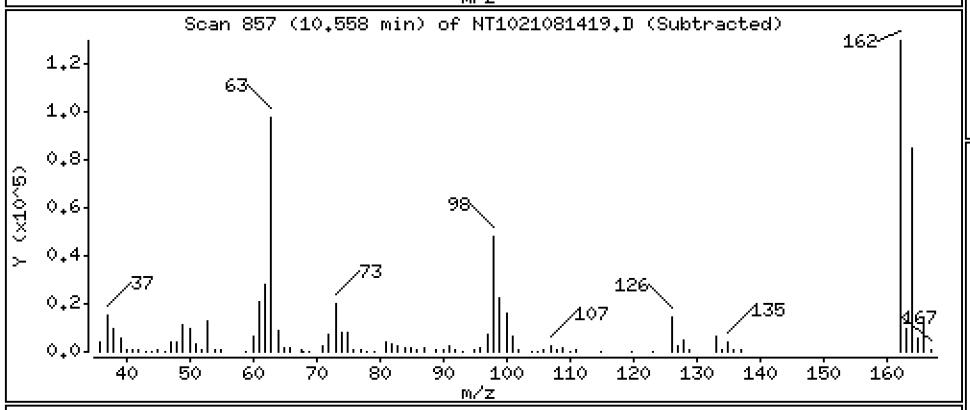
Column phase: ZB-5msi

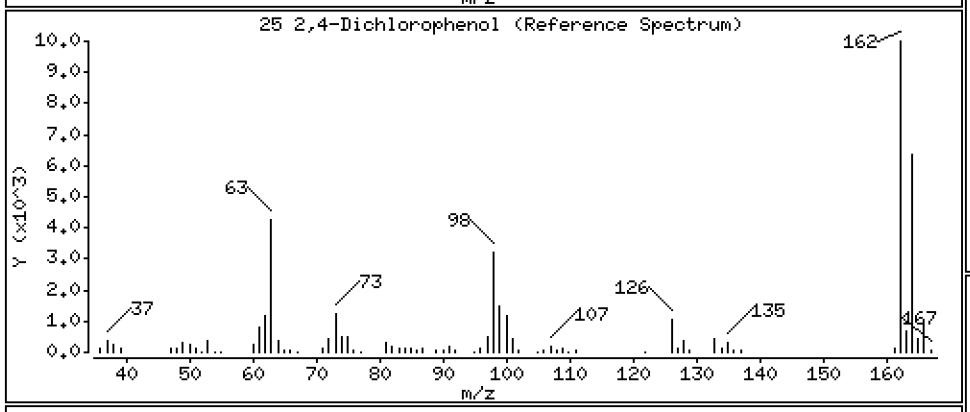
Column diameter: 0.25

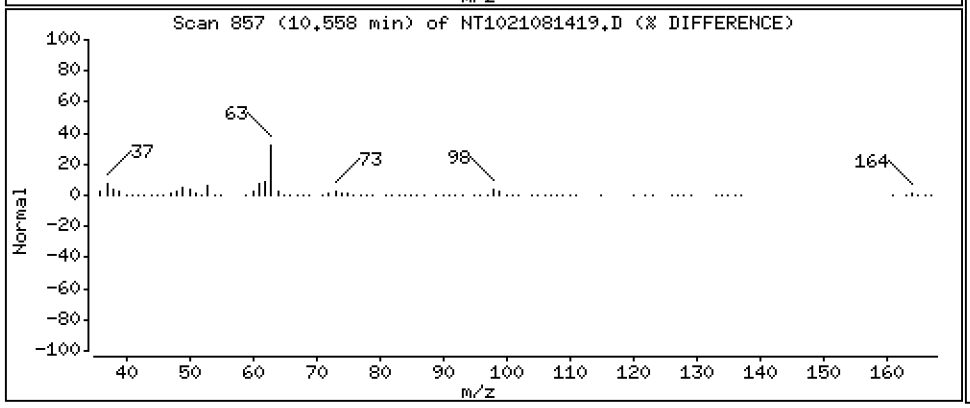
25 2,4-Dichlorophenol

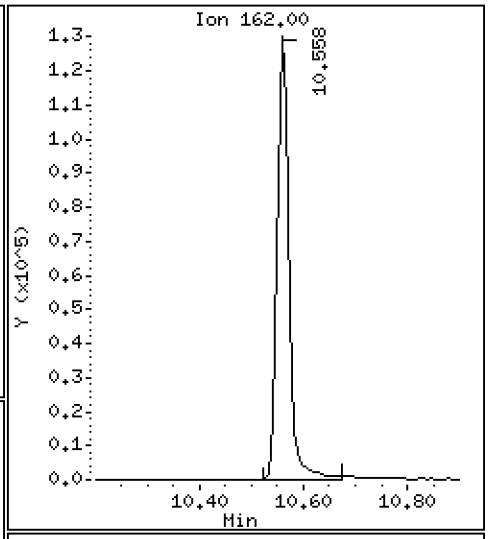
Concentration: 10.79 ug/mL

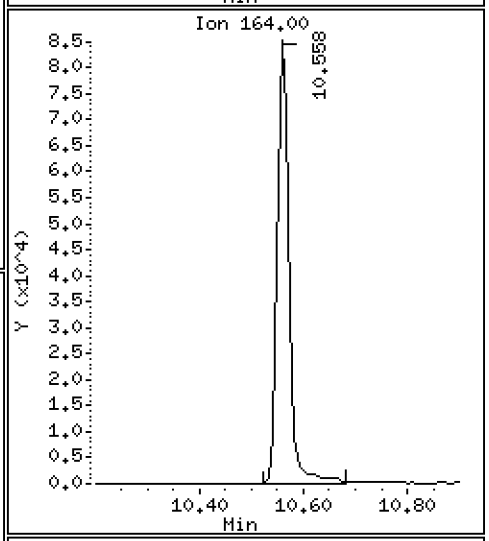


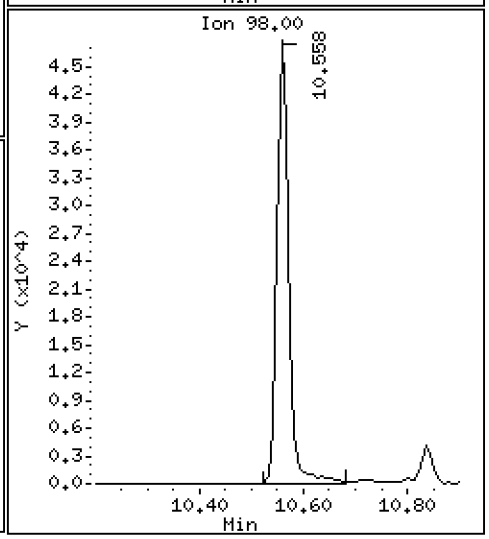












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

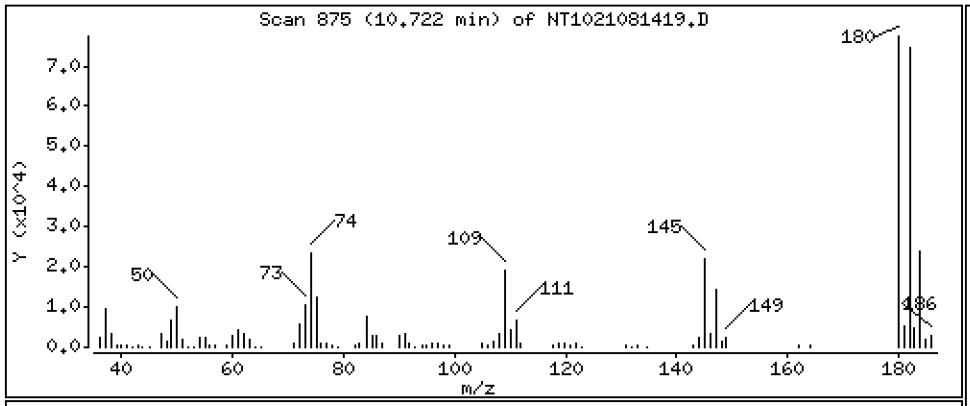
Operator: VTS

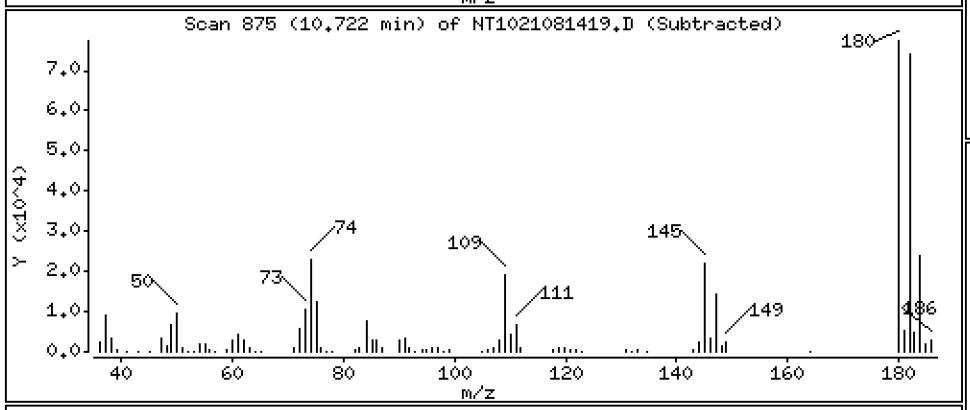
Column phase: ZB-5msi

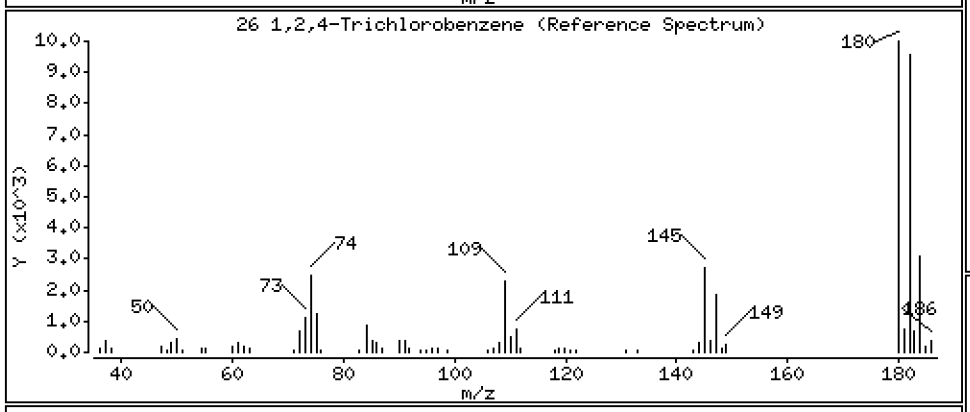
Column diameter: 0.25

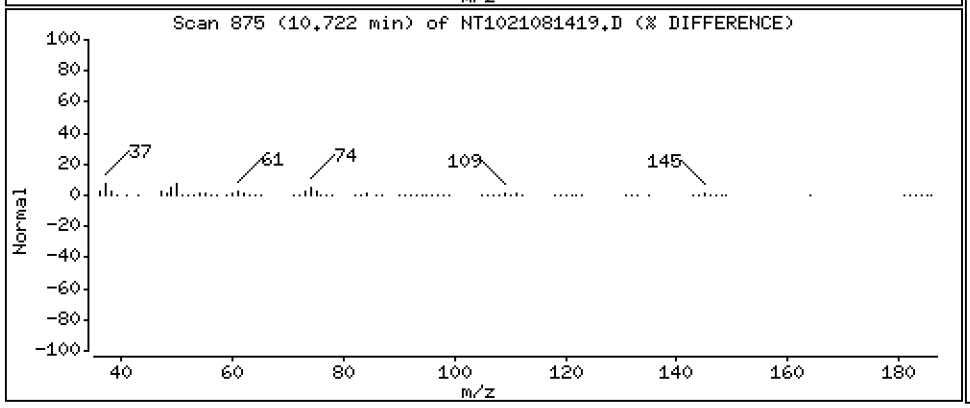
26 1,2,4-Trichlorobenzene

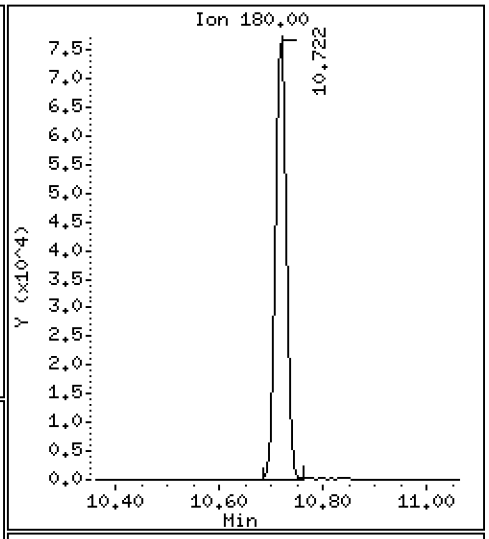
Concentration: 4.869 ug/mL

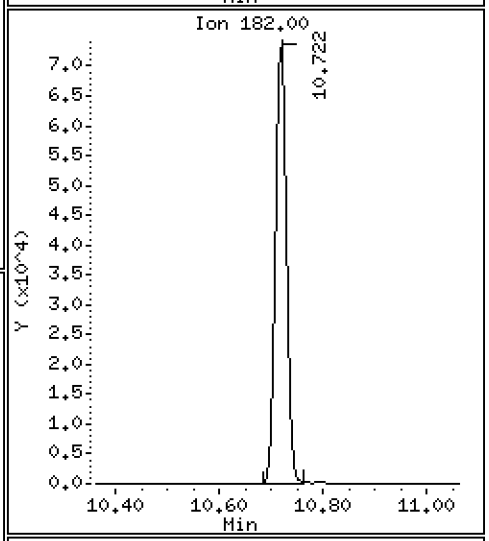


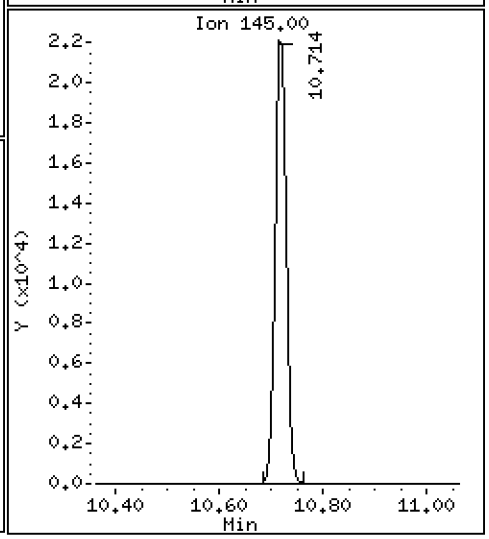












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

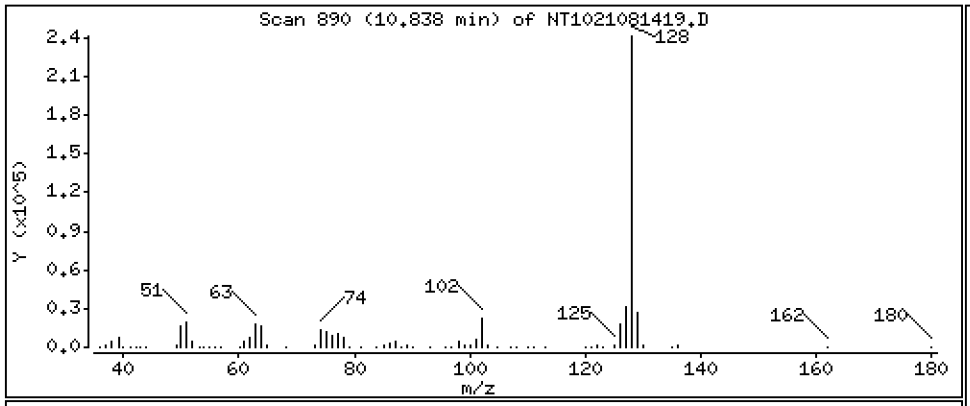
Operator: VTS

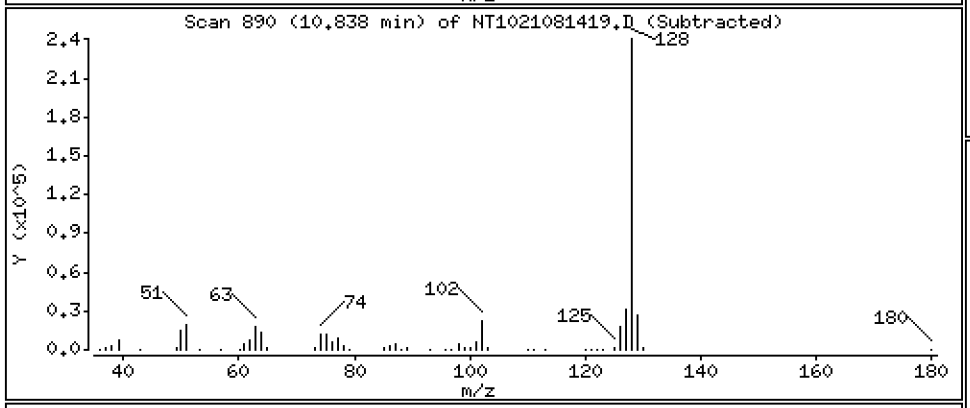
Column phase: ZB-5msi

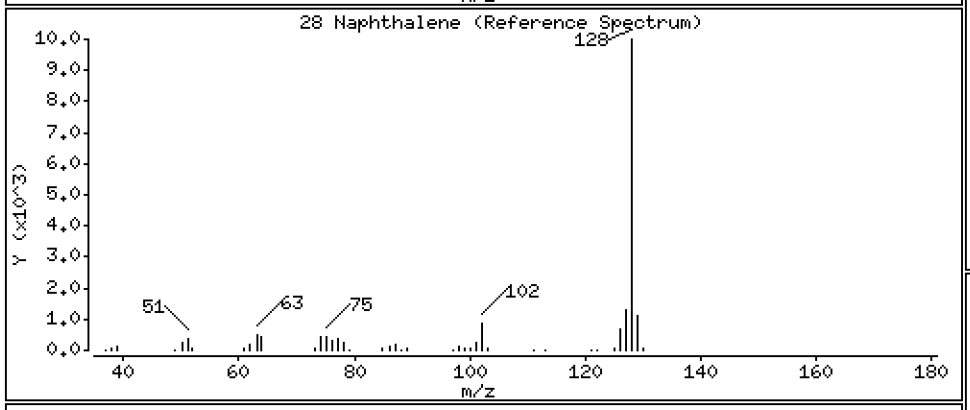
Column diameter: 0.25

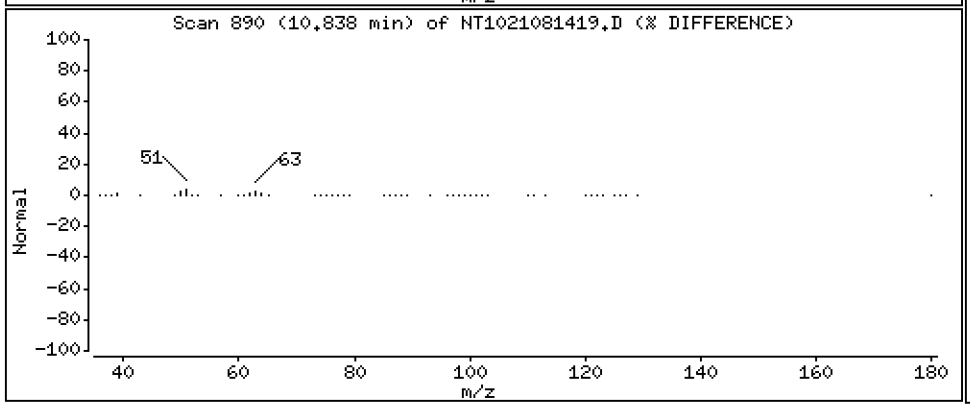
28 Naphthalene

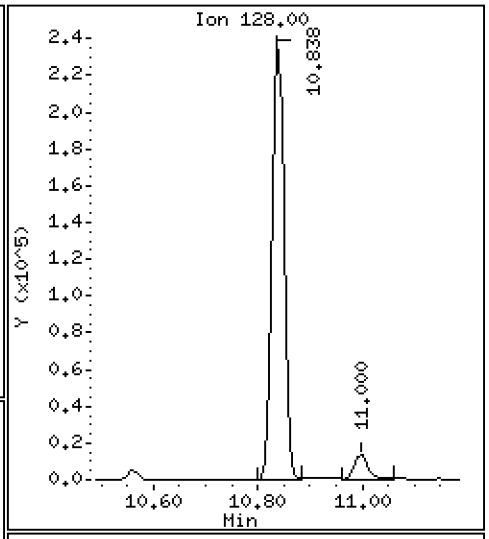
Concentration: 4.925 ug/mL

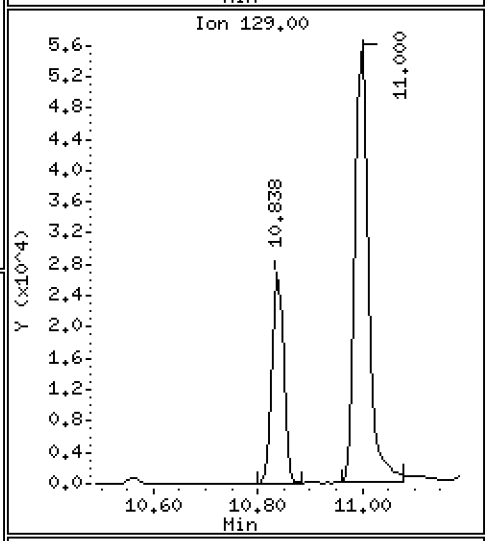


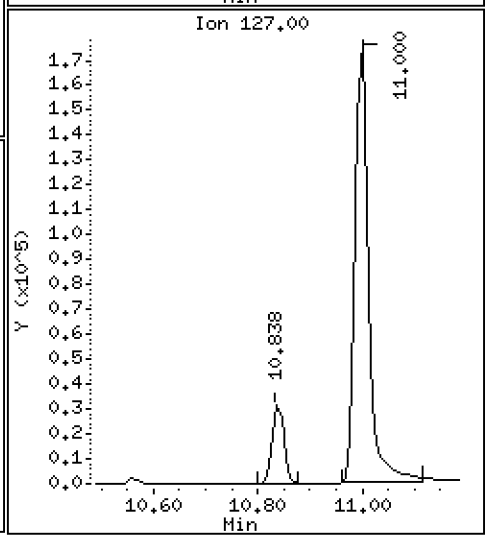












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

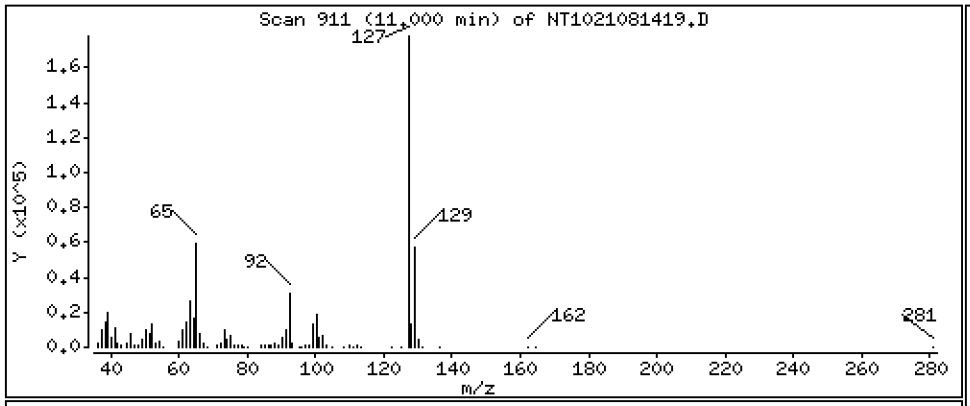
Operator: VTS

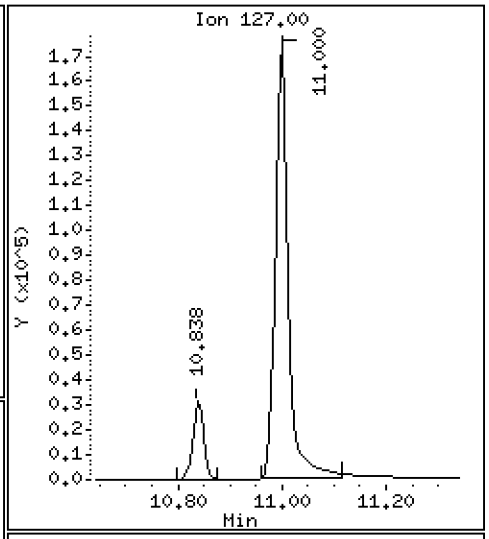
Column phase: ZB-5msi

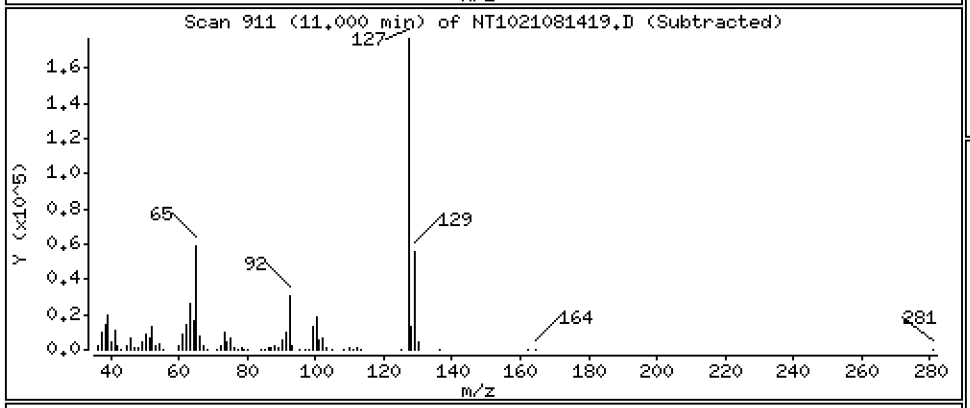
Column diameter: 0.25

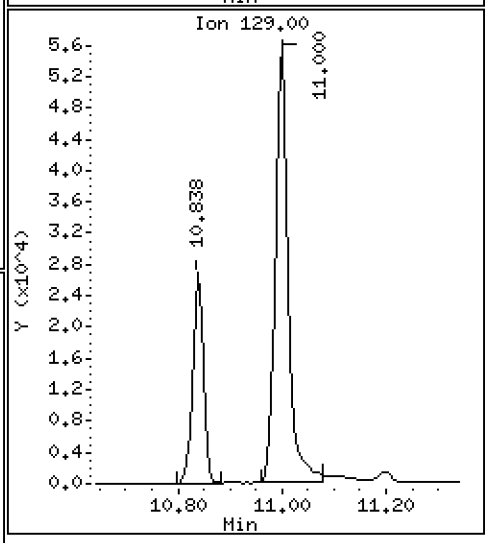
29 4-Chloroaniline

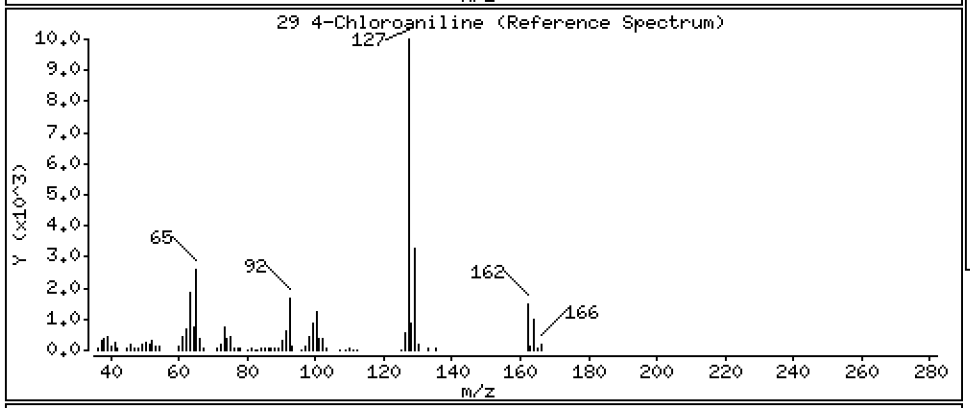
Concentration: 9.287 ug/mL

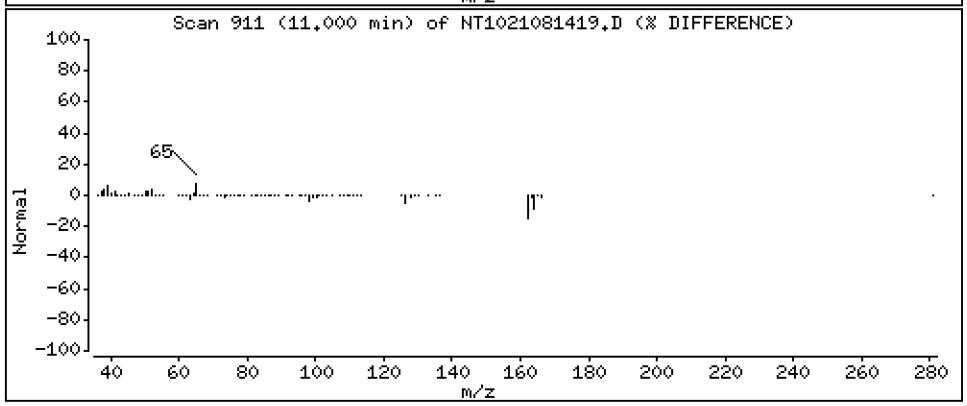












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

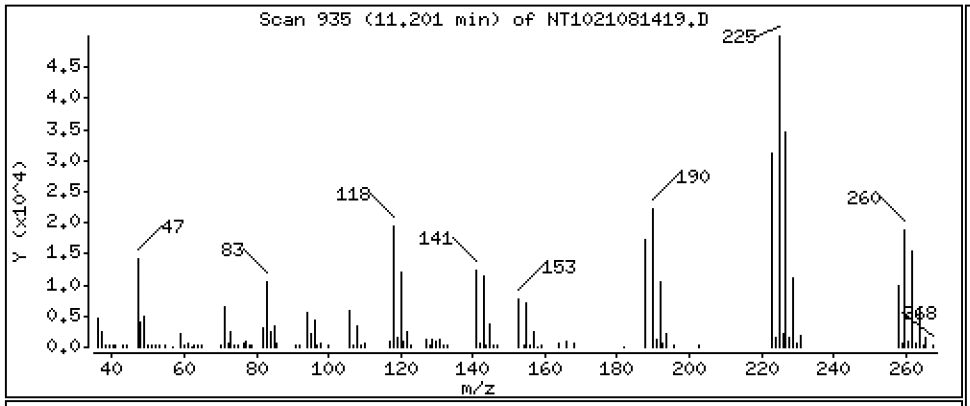
Operator: VTS

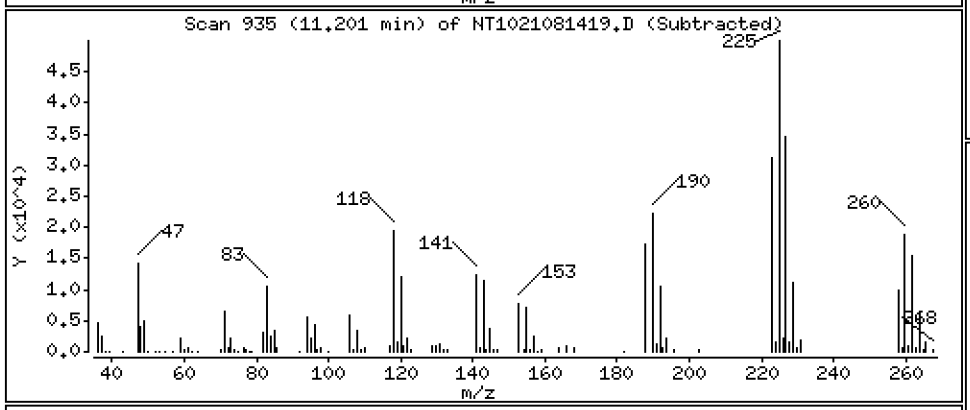
Column phase: ZB-5msi

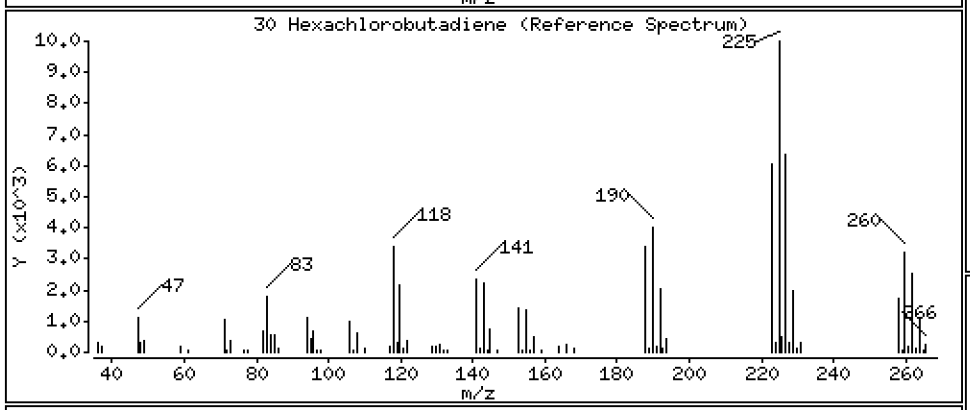
Column diameter: 0.25

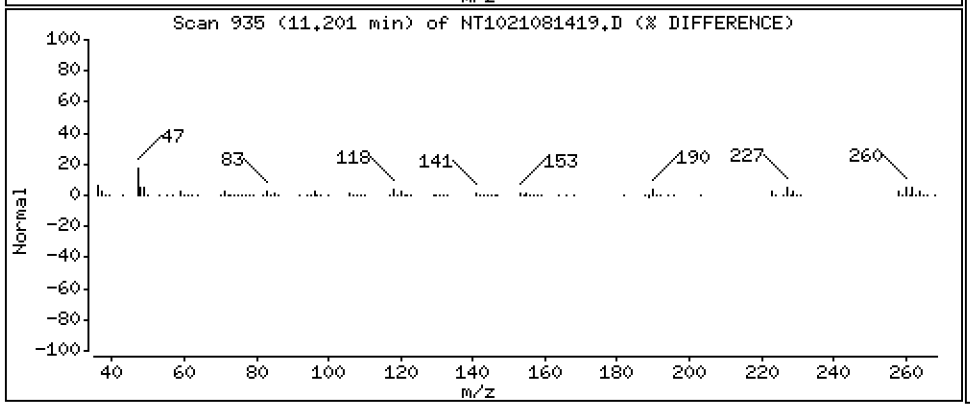
30 Hexachlorobutadiene

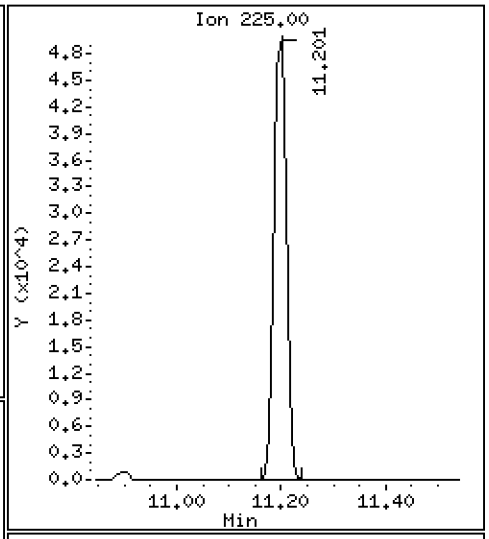
Concentration: 5.851 ug/mL

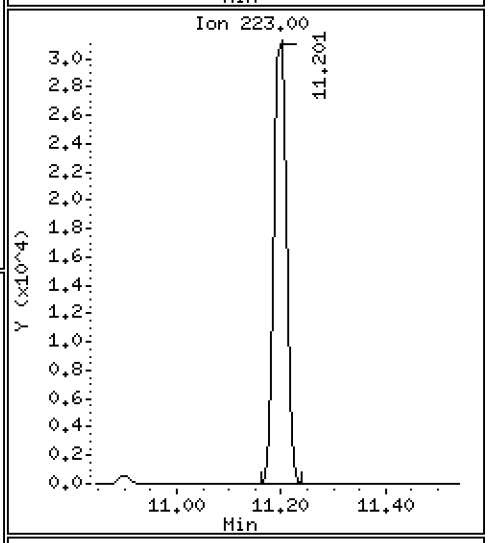


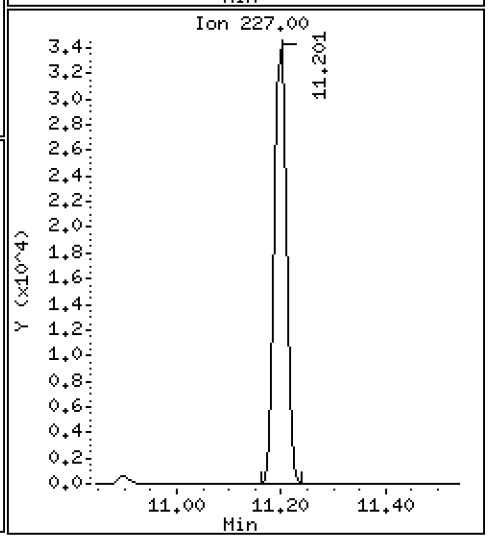












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

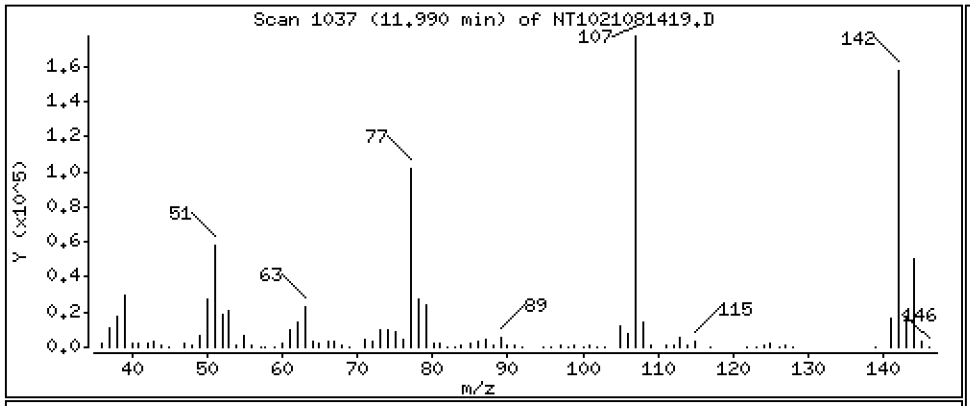
Operator: VTS

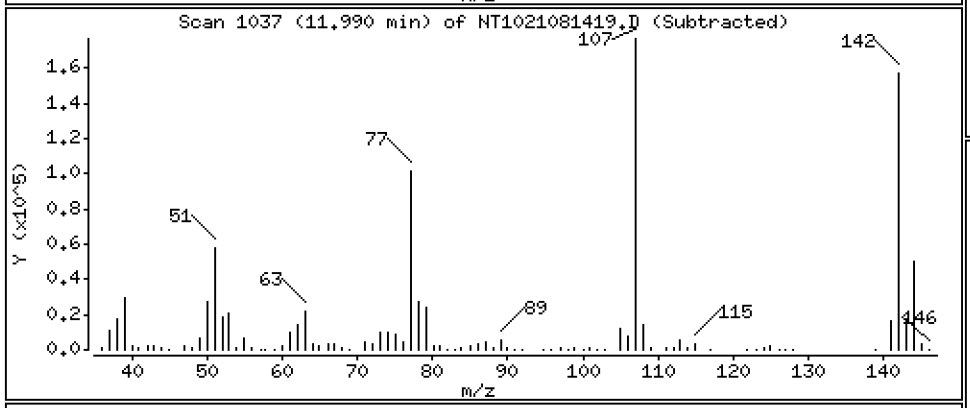
Column phase: ZB-5msi

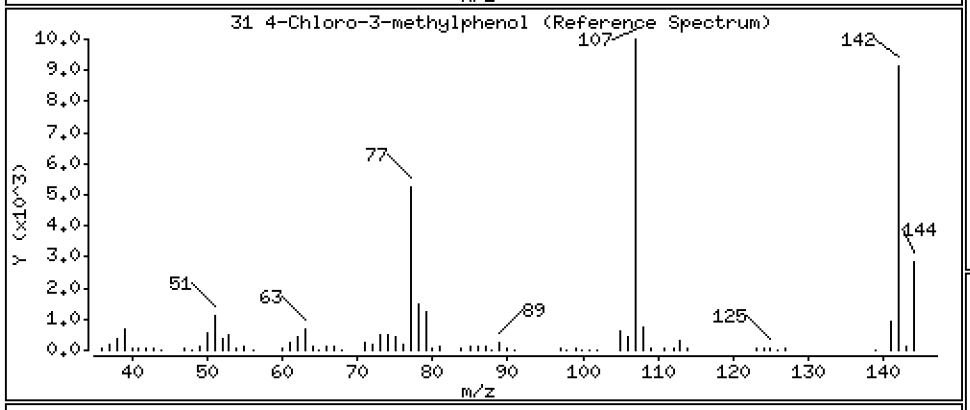
Column diameter: 0.25

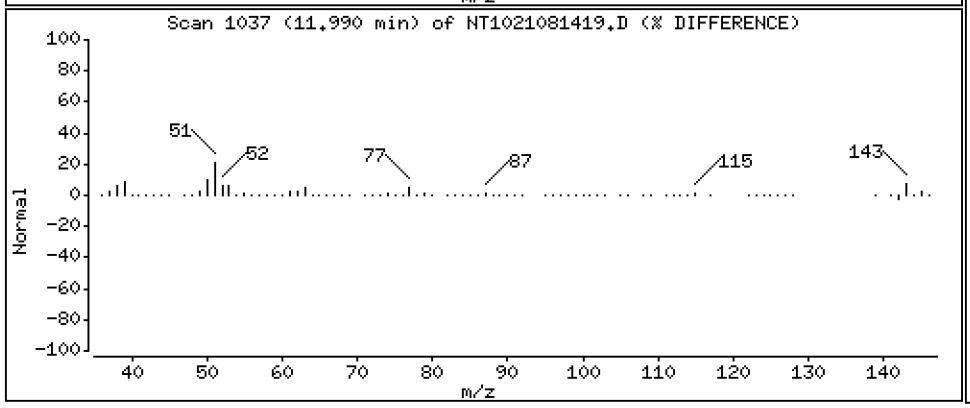
31 4-Chloro-3-methylphenol

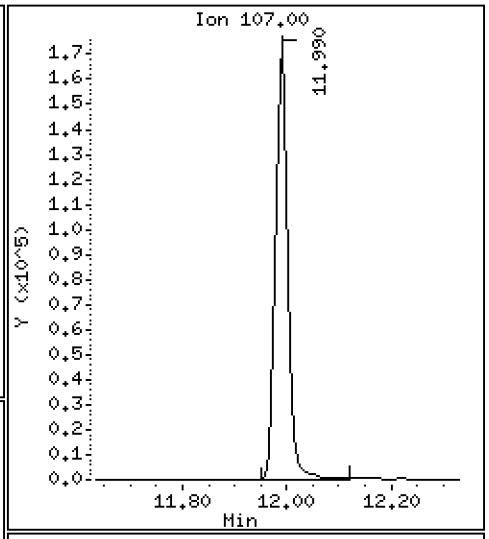
Concentration: 10.65 ug/mL

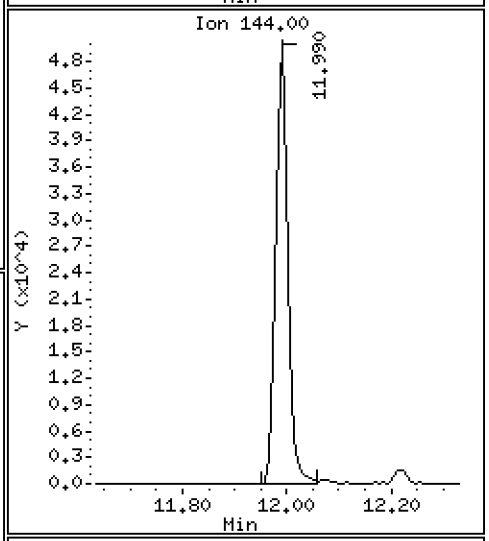


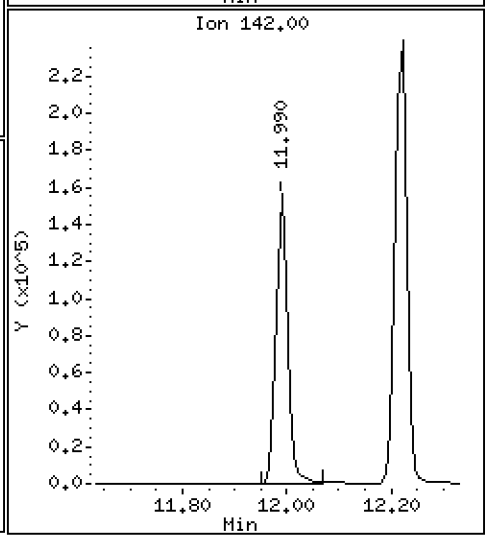












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

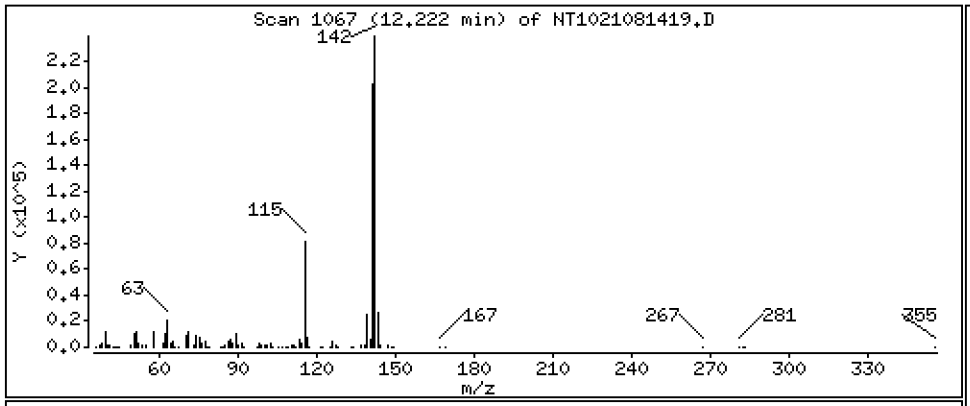
Operator: VTS

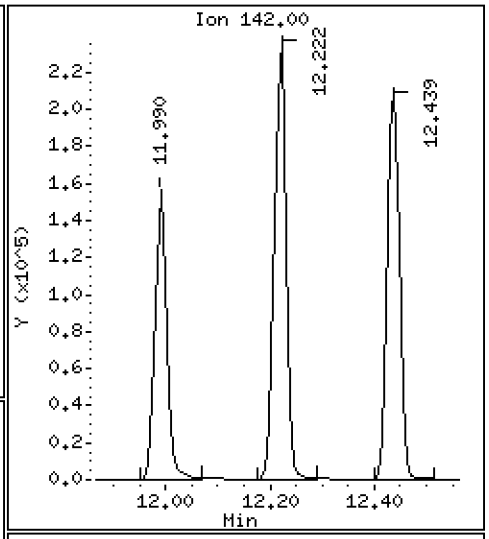
Column phase: ZB-5msi

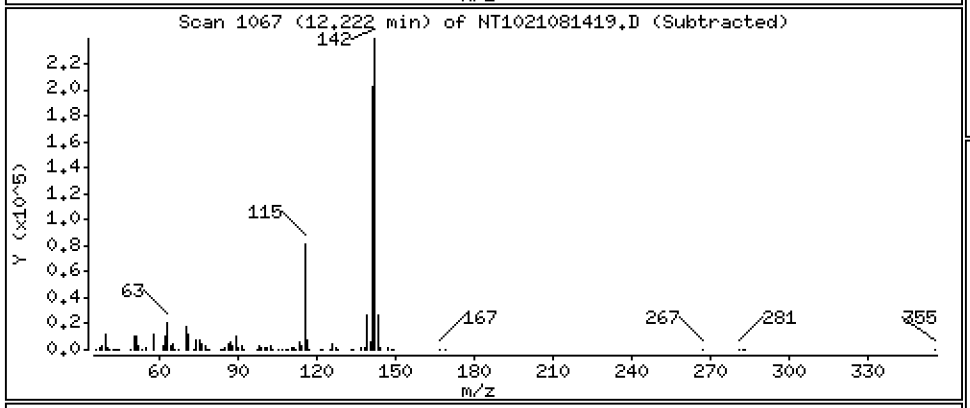
Column diameter: 0.25

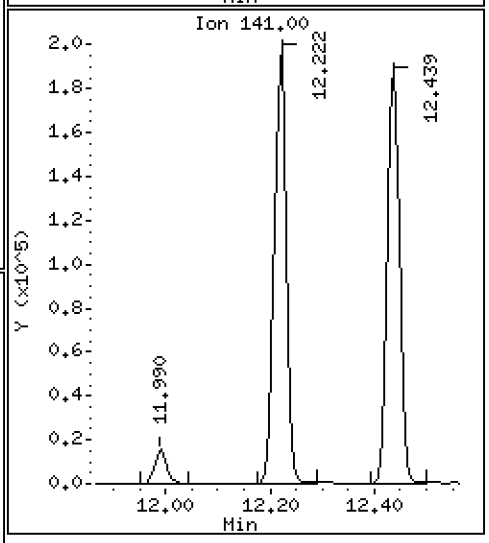
32 2-Methylnaphthalene

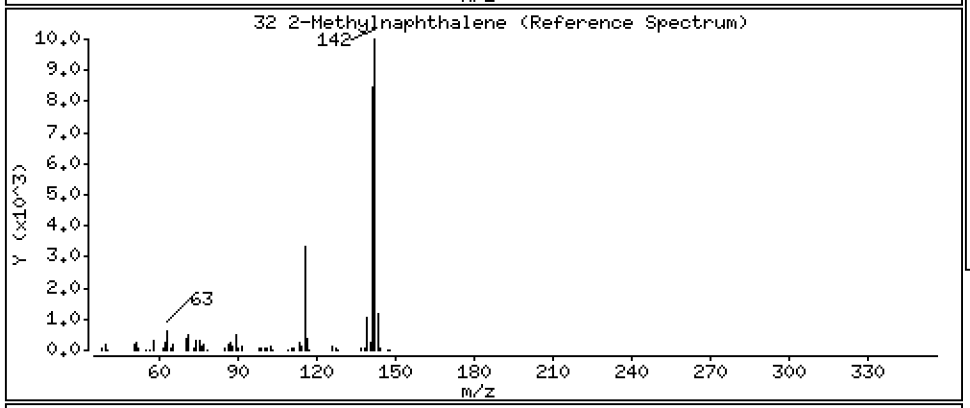
Concentration: 5.275 ug/mL

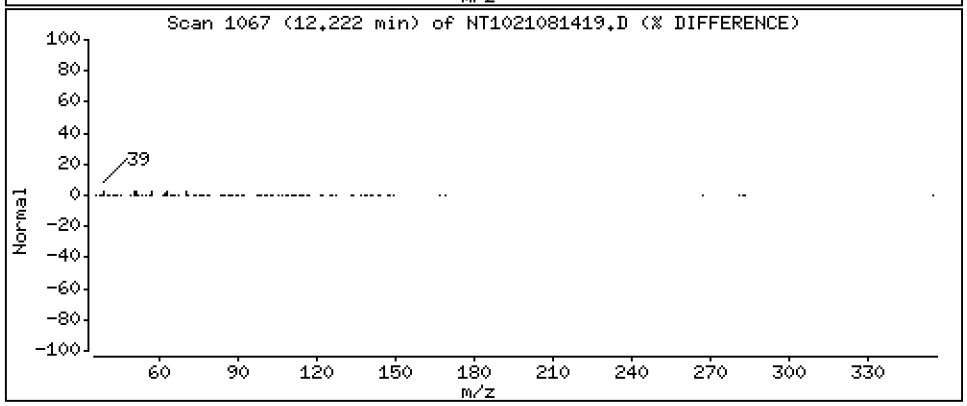












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081419.D

Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

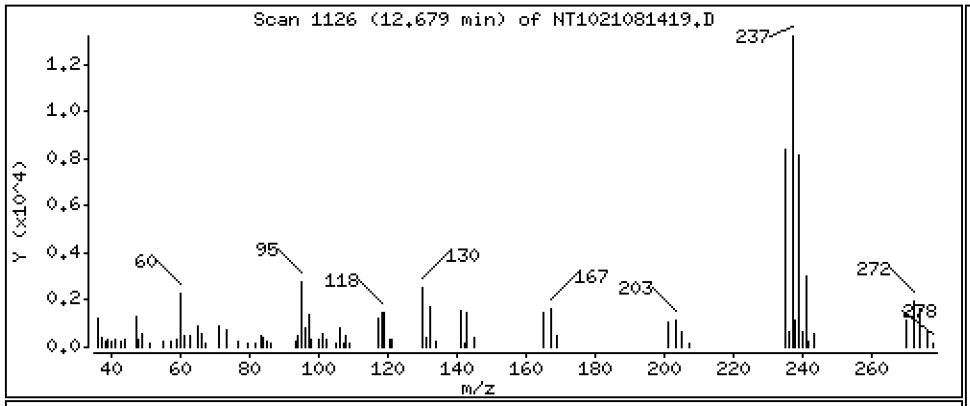
Operator: VTS

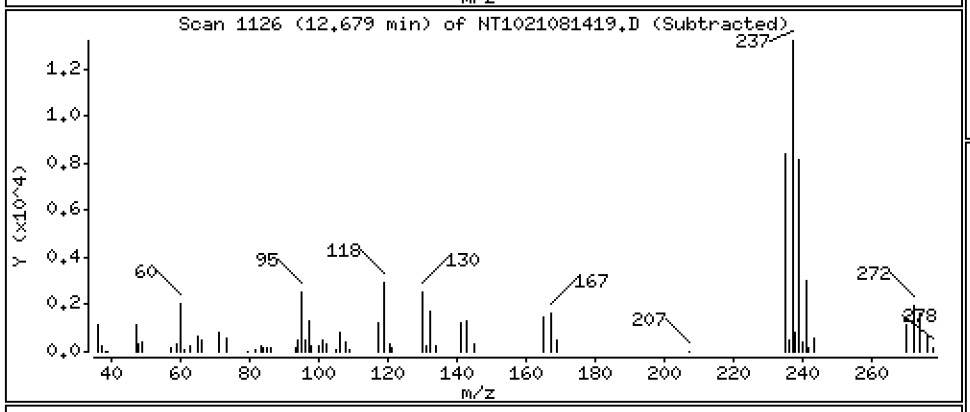
Column phase: ZB-5msi

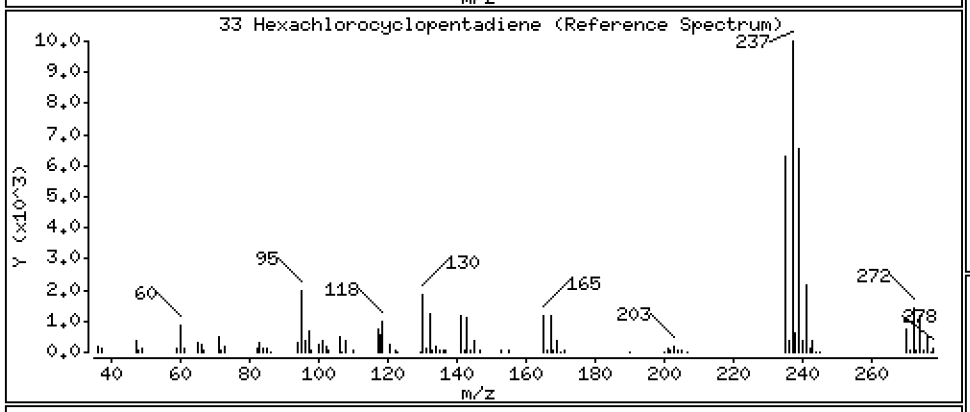
Column diameter: 0.25

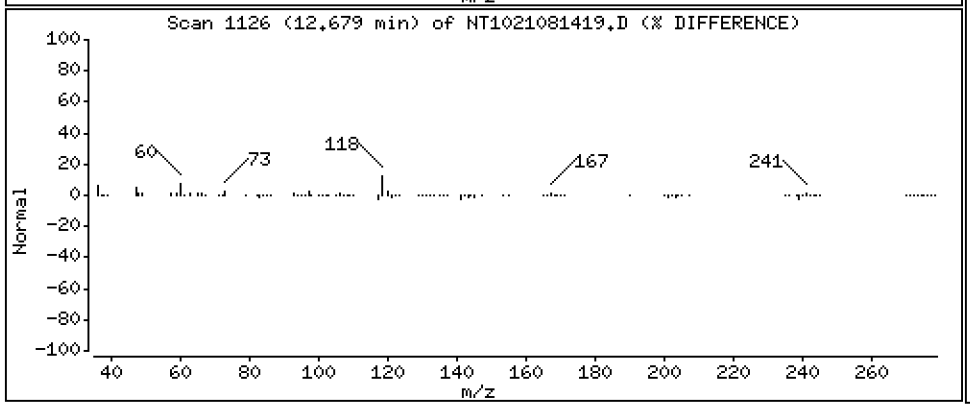
33 Hexachlorocyclopentadiene

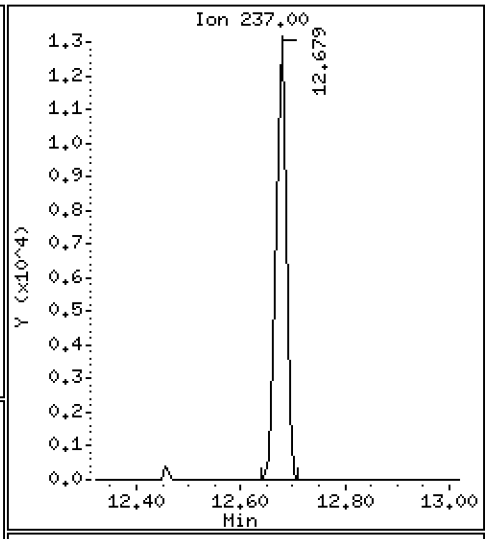
Concentration: 1.054 ug/mL

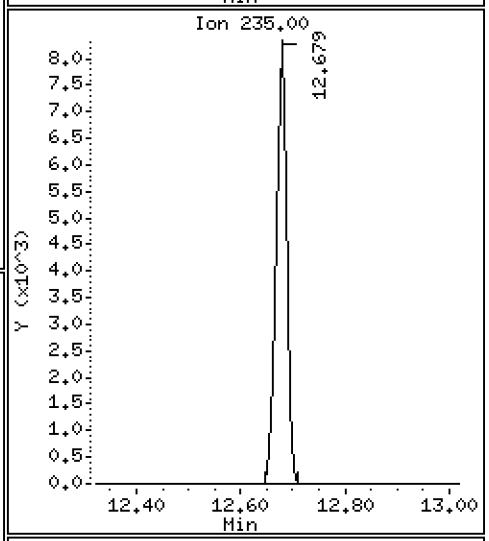


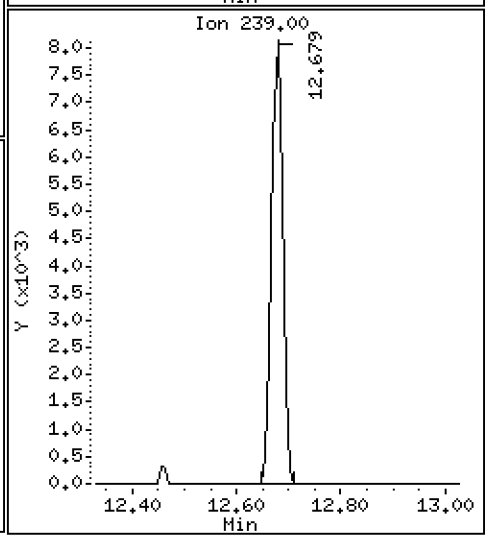












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

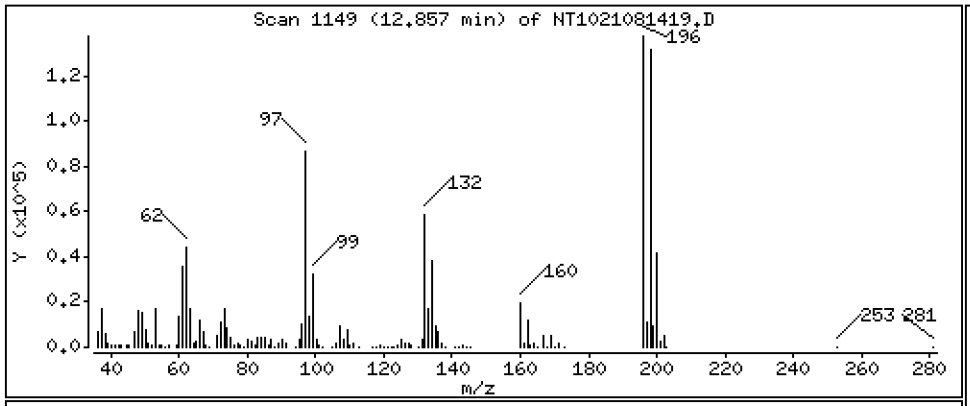
Operator: VTS

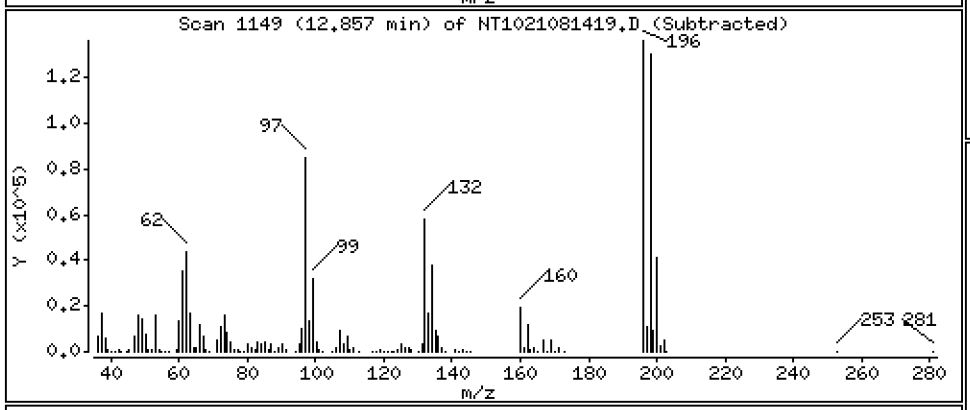
Column phase: ZB-5msi

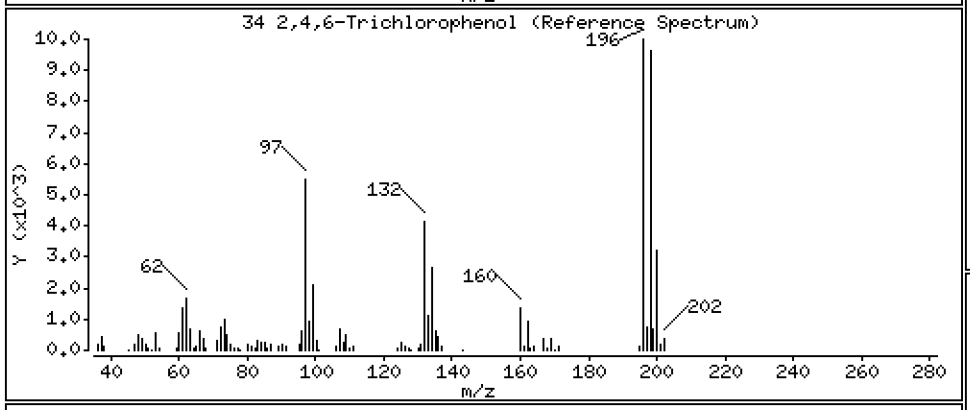
Column diameter: 0.25

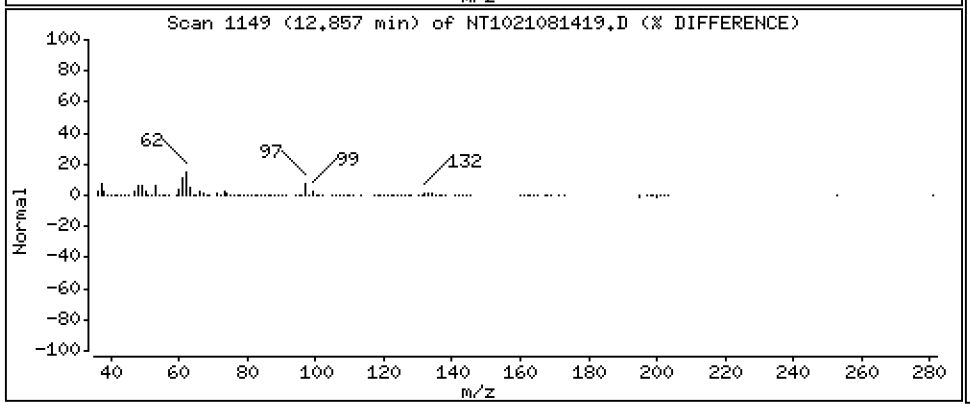
34 2,4,6-Trichlorophenol

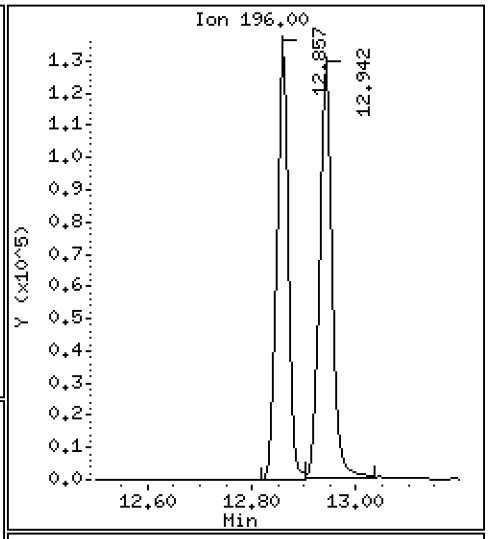
Concentration: 11.74 ug/mL

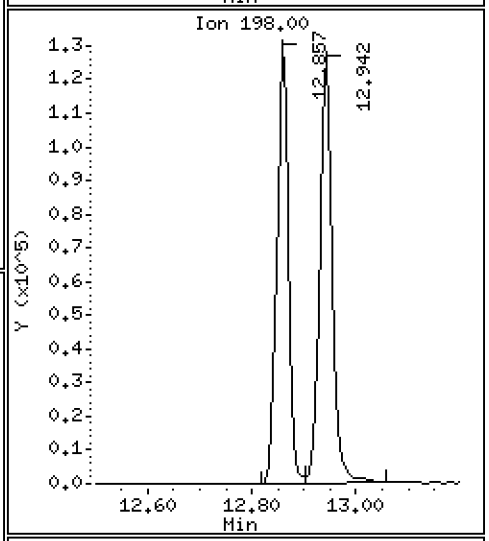


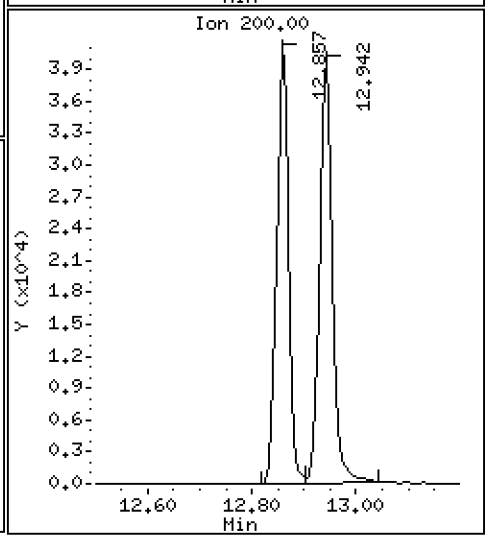












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

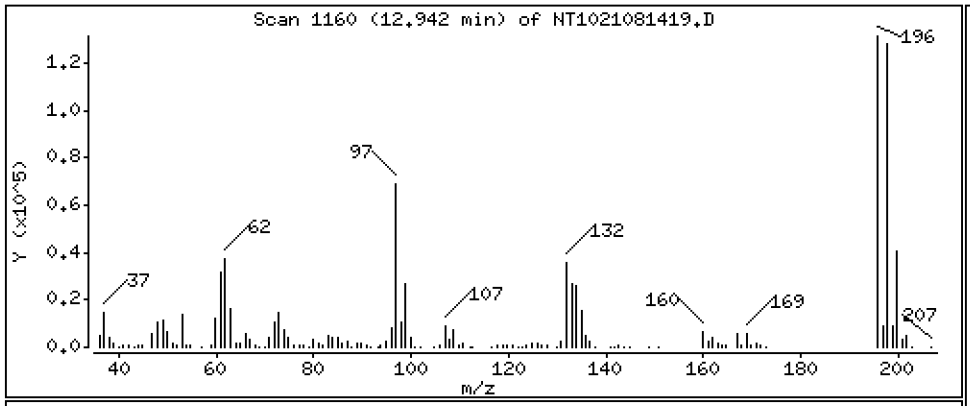
Operator: VTS

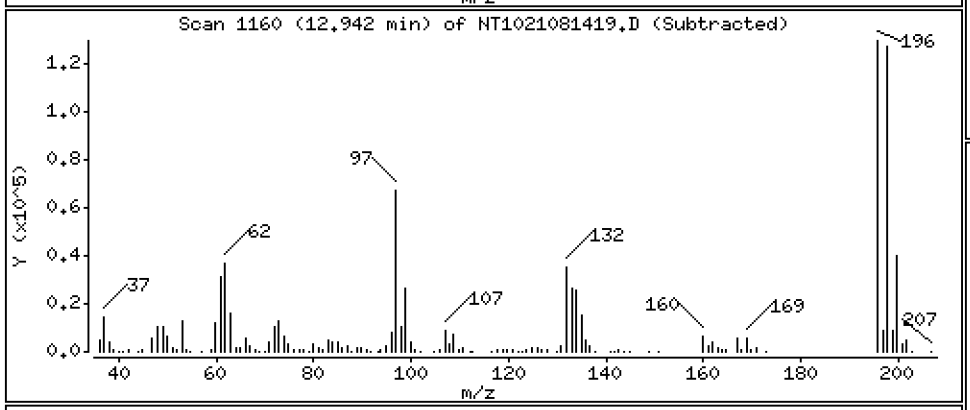
Column phase: ZB-5msi

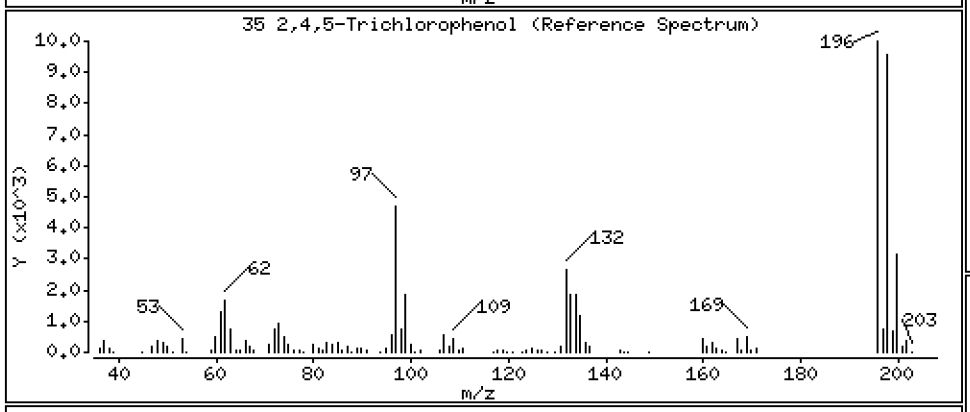
Column diameter: 0.25

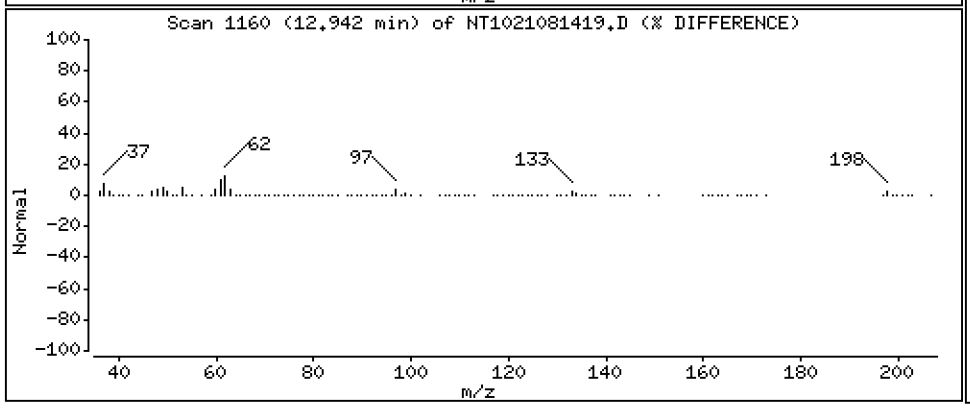
35 2,4,5-Trichlorophenol

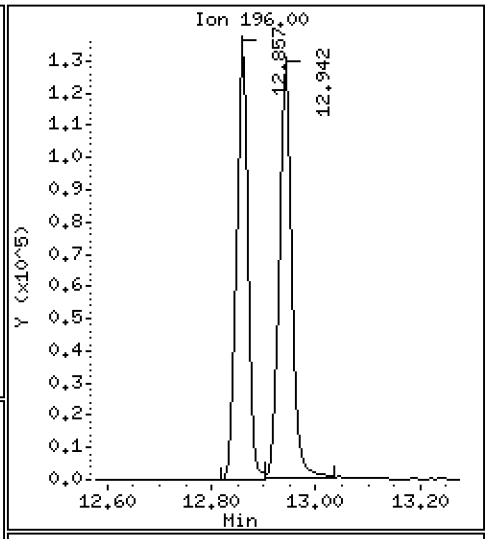
Concentration: 11.83 ug/mL

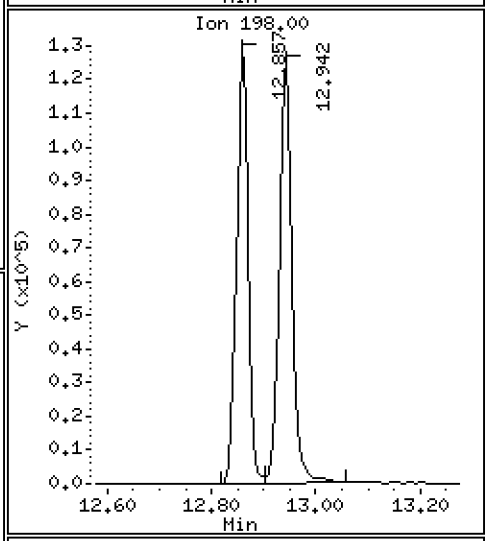


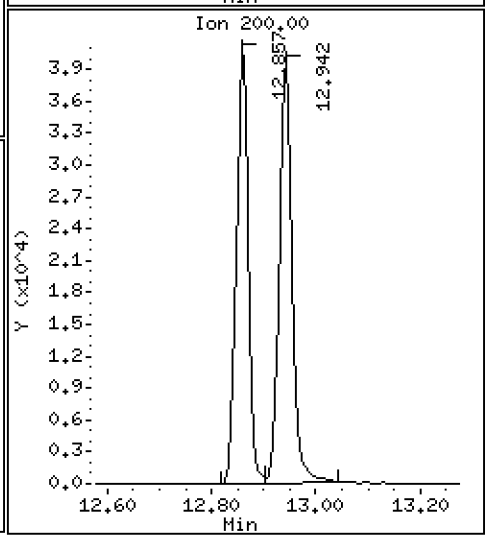












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

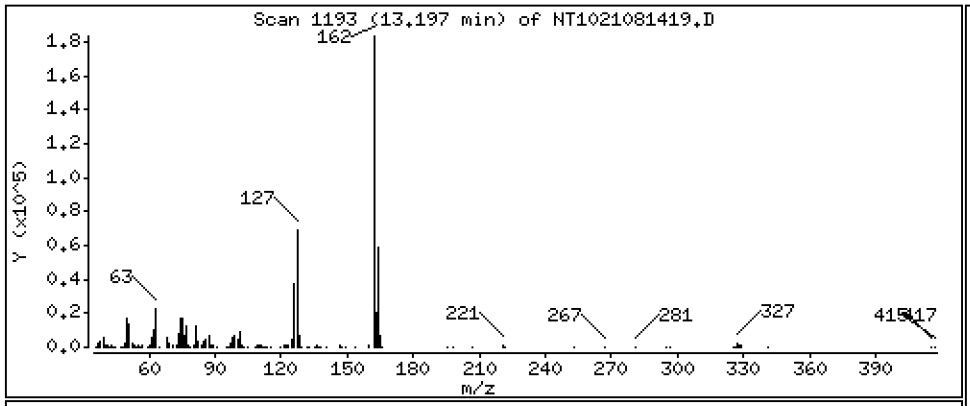
Operator: VTS

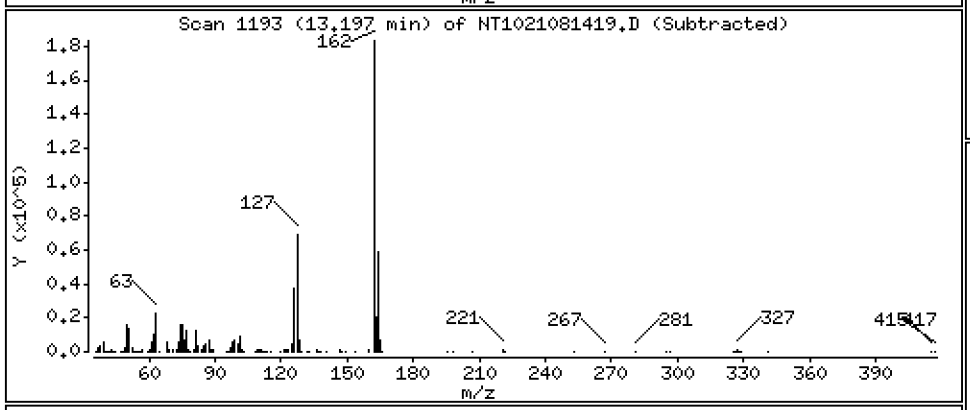
Column phase: ZB-5msi

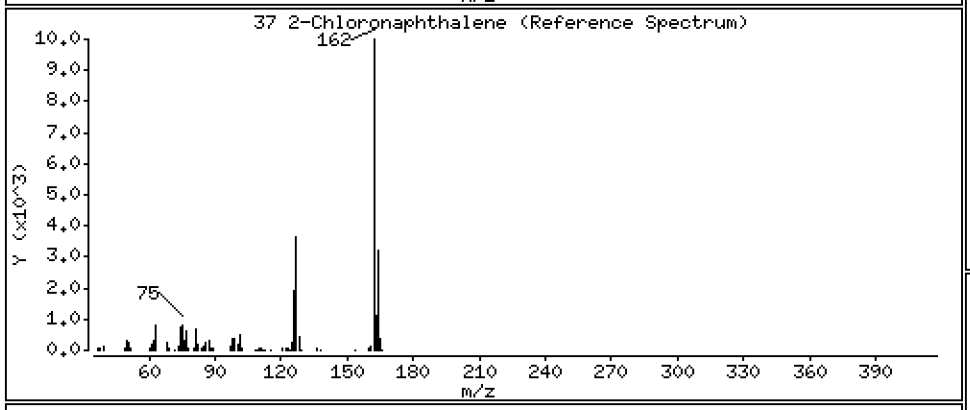
Column diameter: 0.25

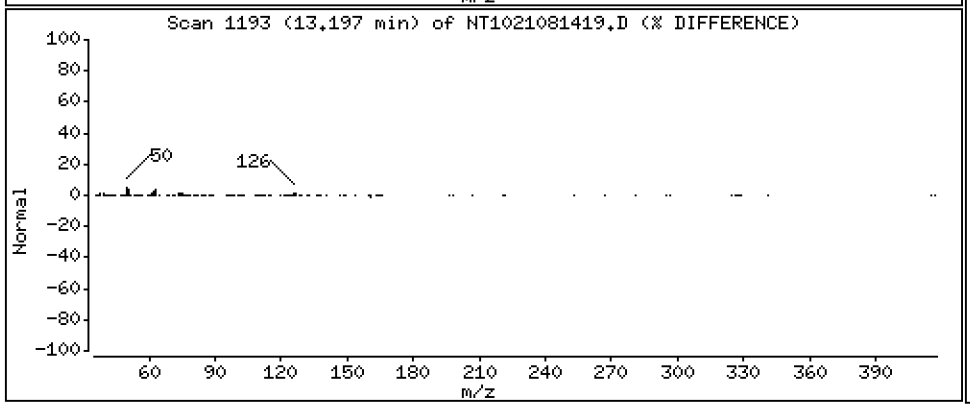
37 2-Chloronaphthalene

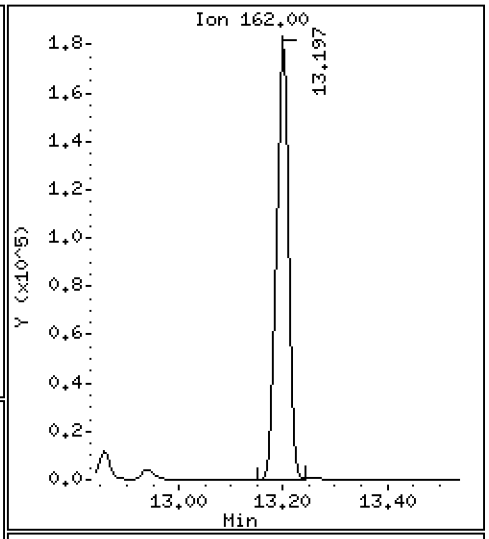
Concentration: 4.743 ug/mL

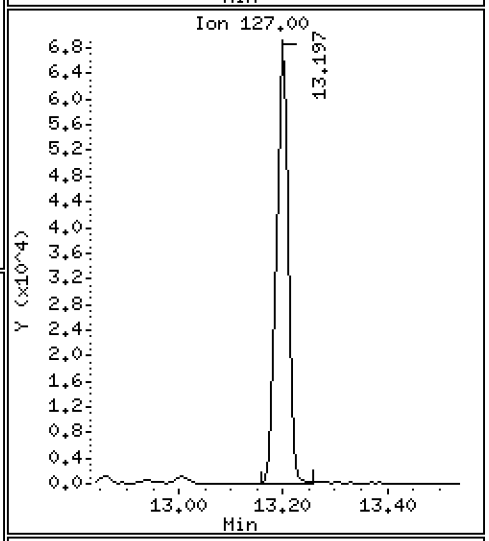


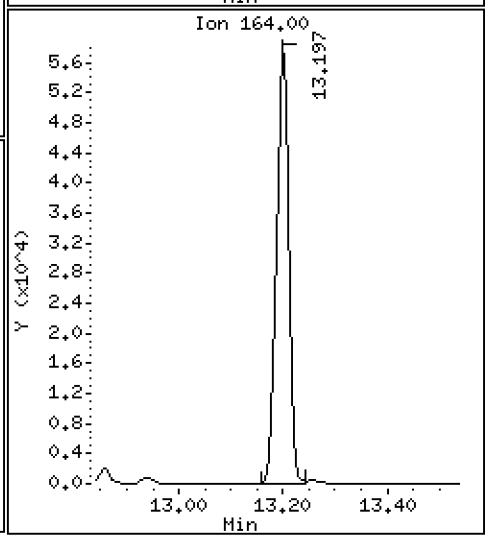












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

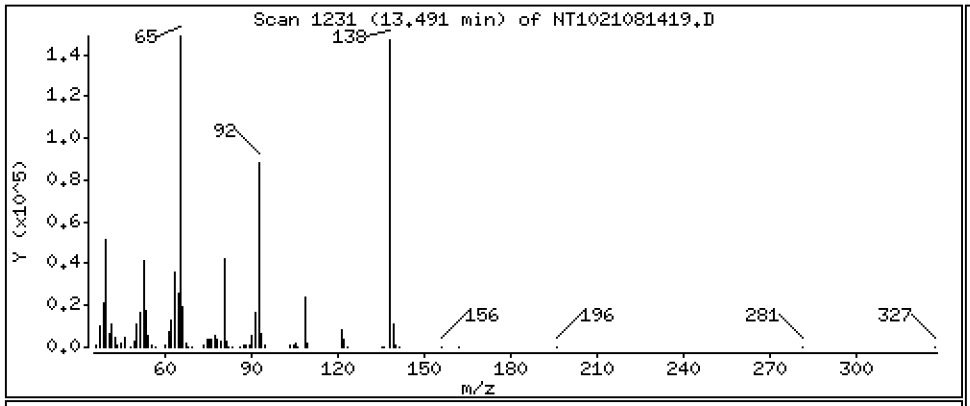
Operator: VTS

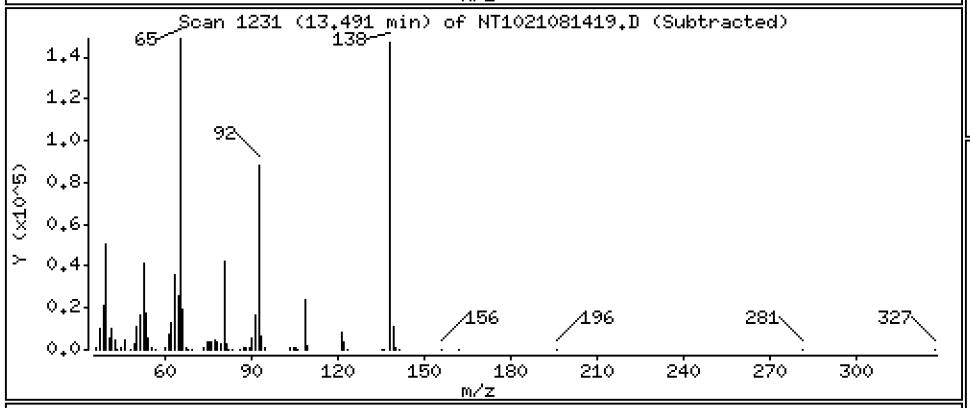
Column phase: ZB-5msi

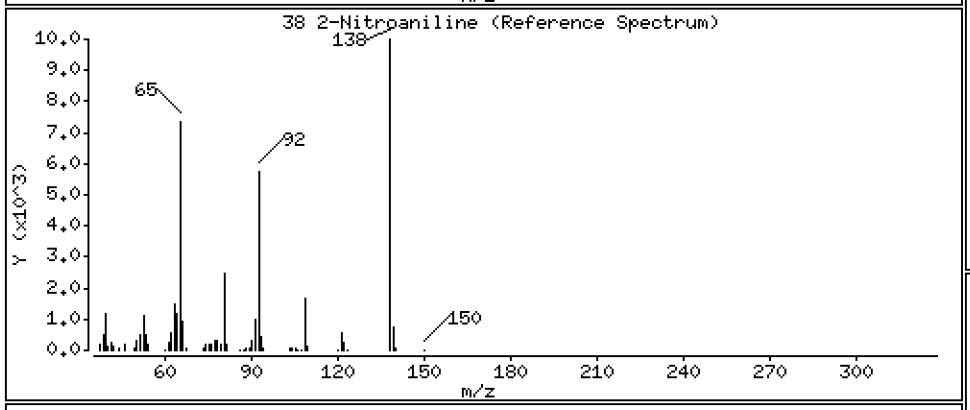
Column diameter: 0.25

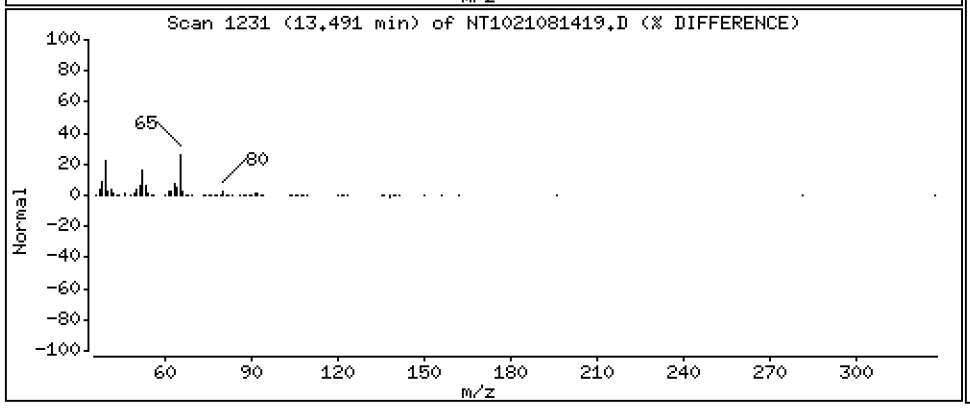
38 2-Nitroaniline

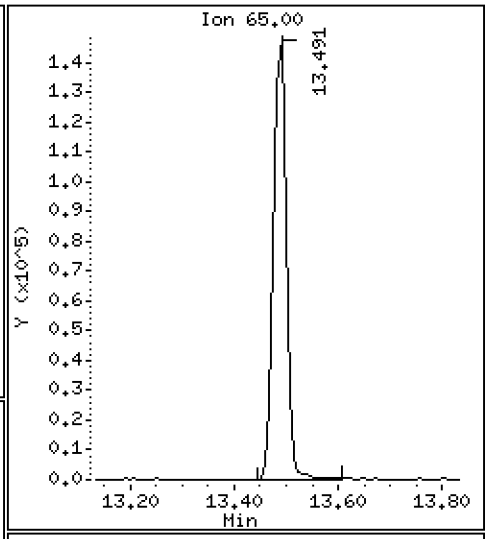
Concentration: 10.49 ug/mL

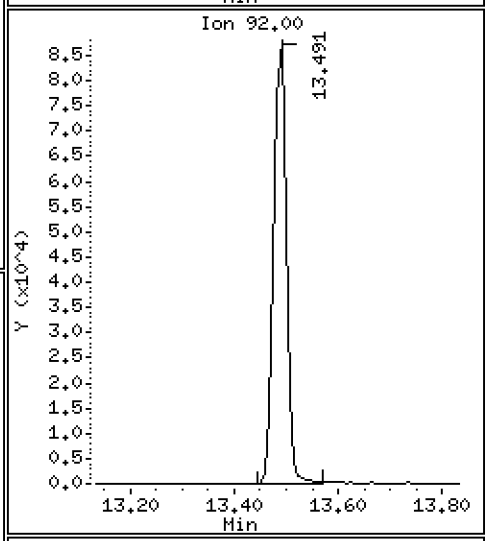


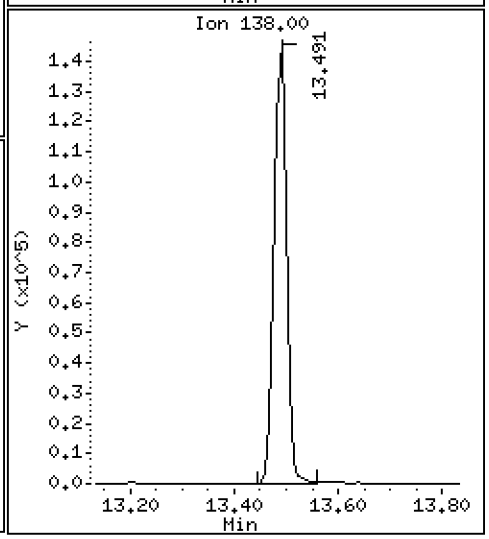












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

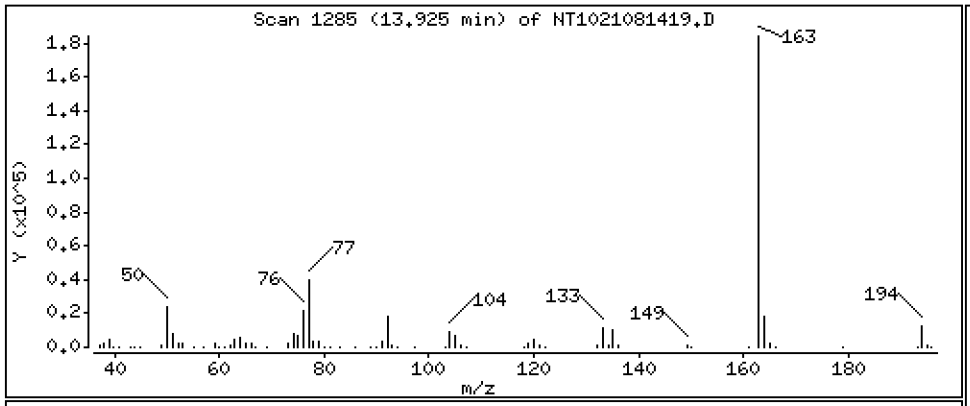
Operator: VTS

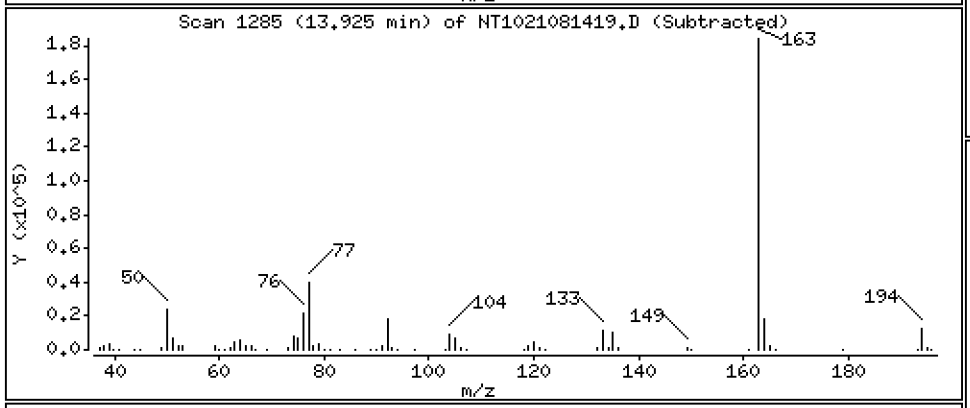
Column phase: ZB-5msi

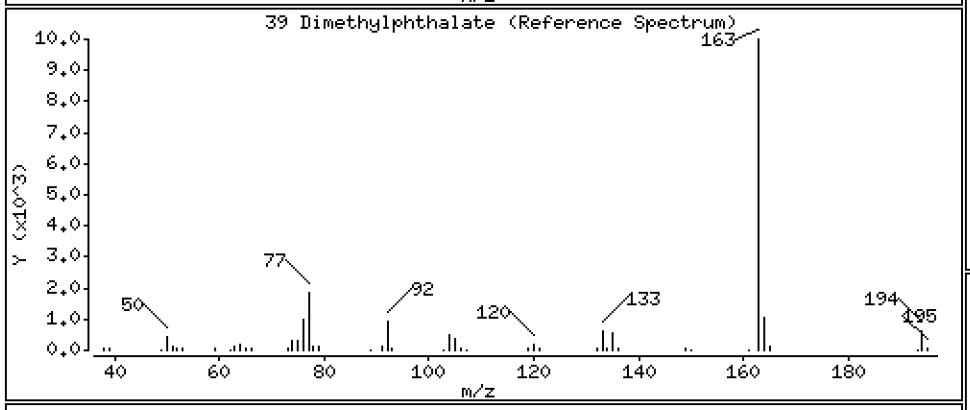
Column diameter: 0.25

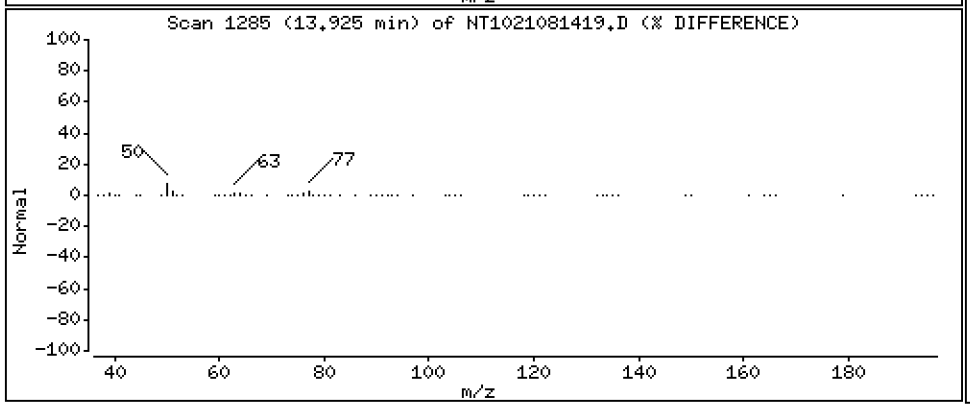
39 Dimethylphthalate

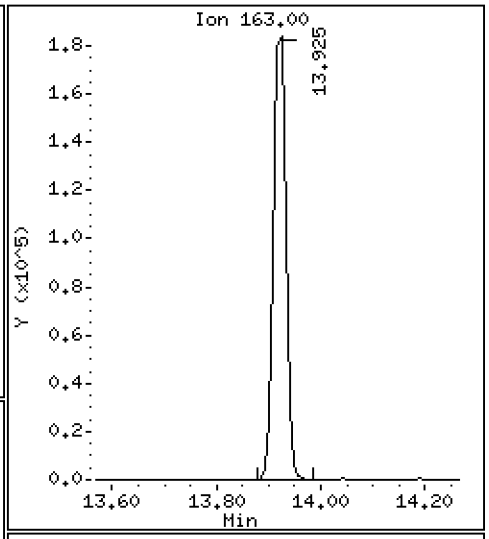
Concentration: 4.954 ug/mL

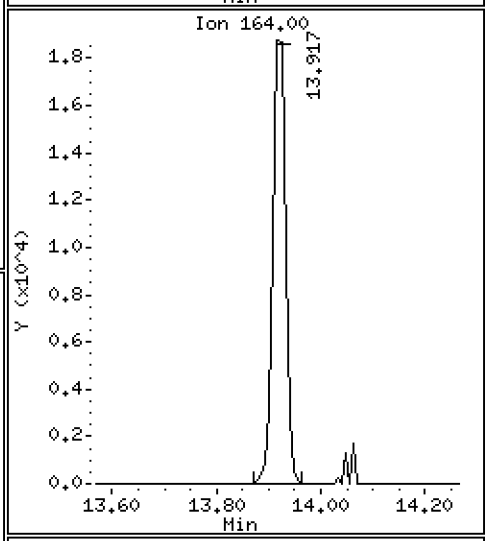


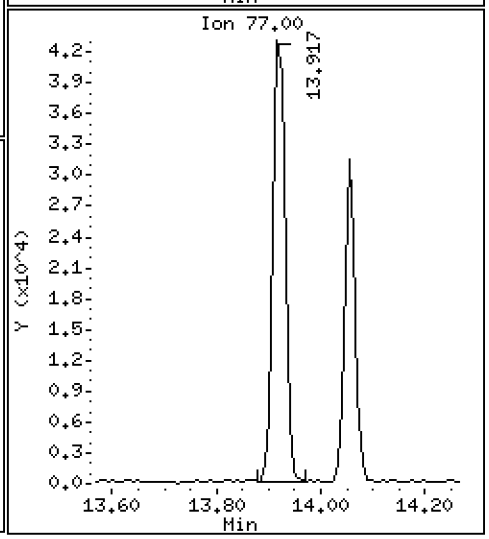












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

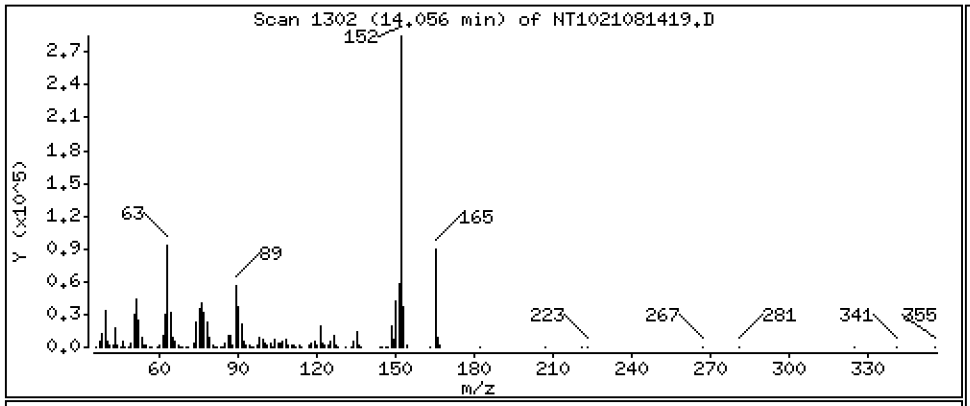
Operator: VTS

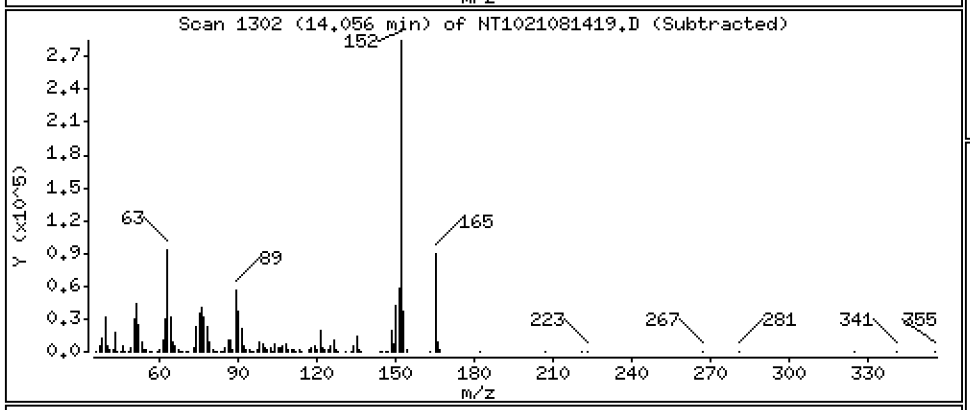
Column phase: ZB-5msi

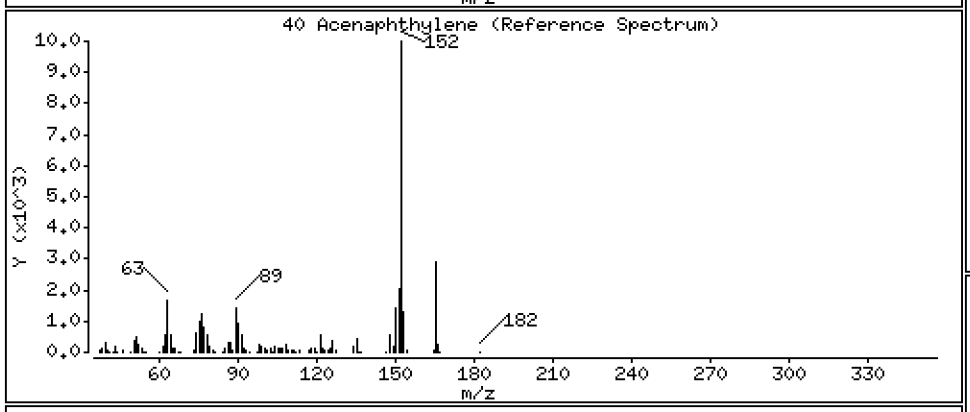
Column diameter: 0.25

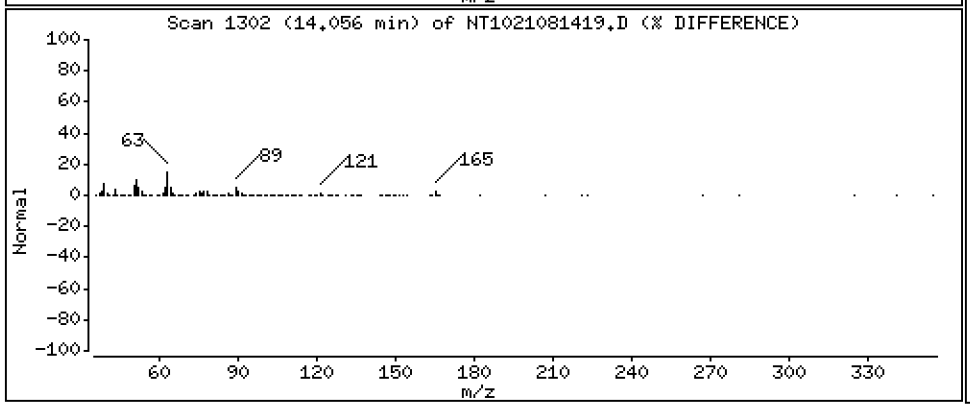
40 Acenaphthylene

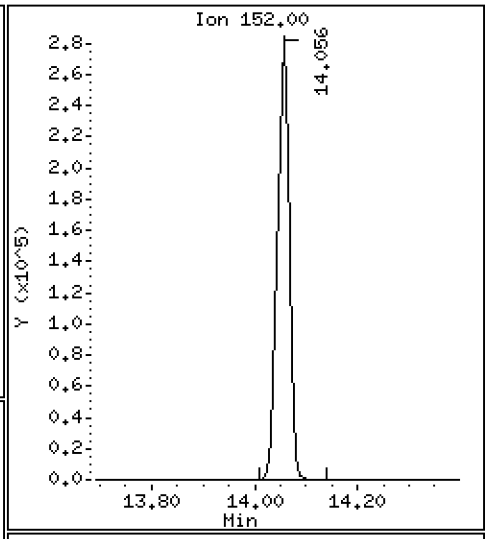
Concentration: 5.067 ug/mL

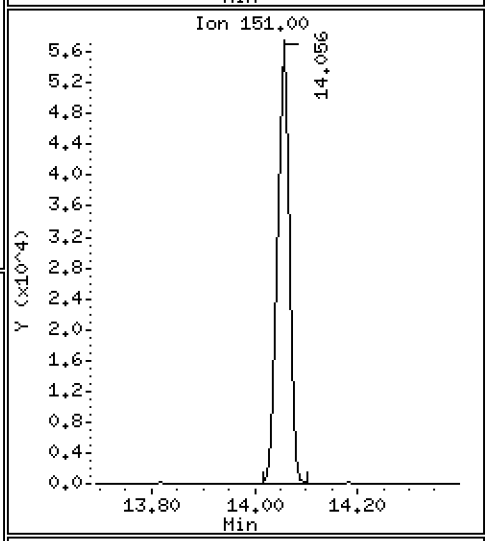


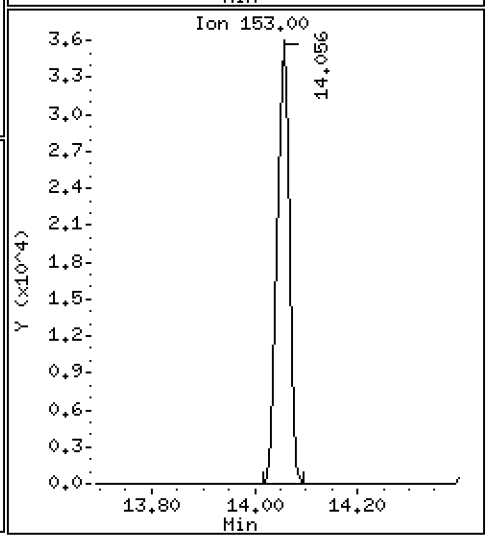












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081419.D

Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

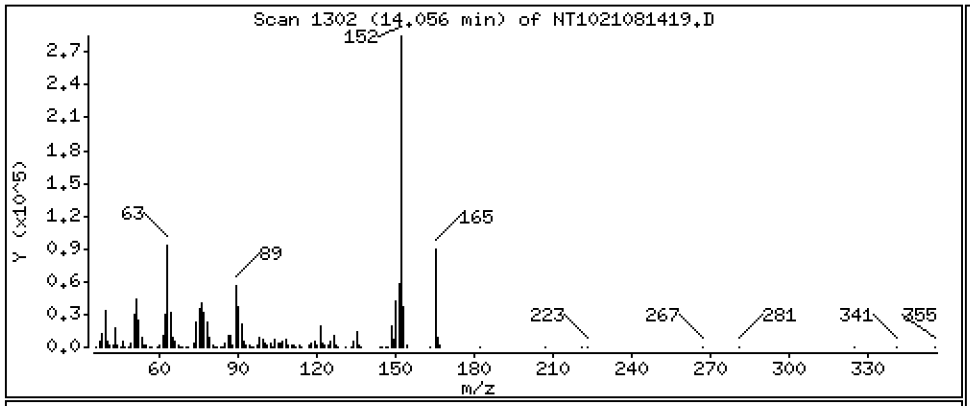
Operator: VTS

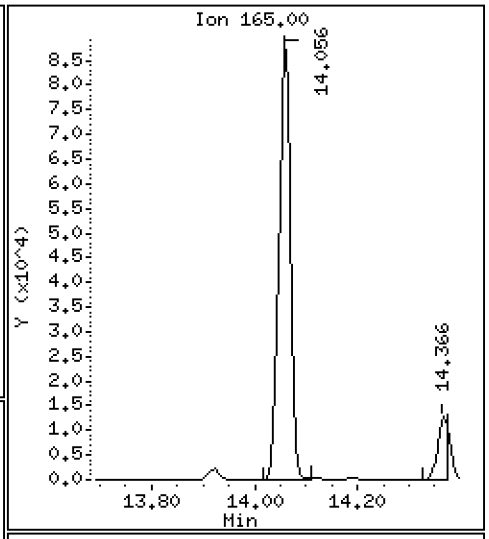
Column phase: ZB-5msi

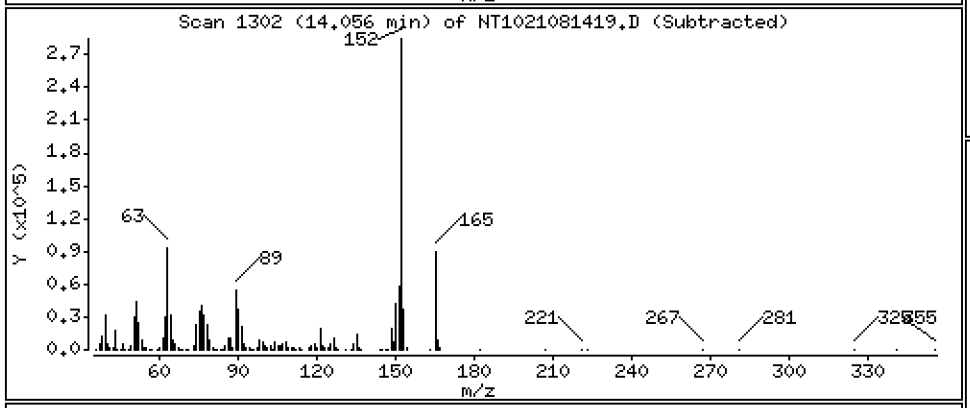
Column diameter: 0.25

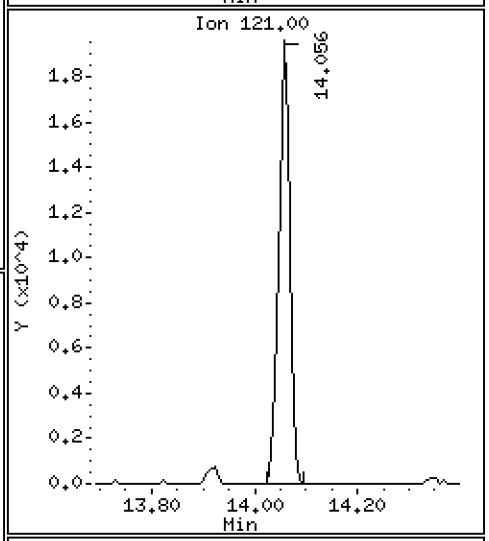
41 2,6-Dinitrotoluene

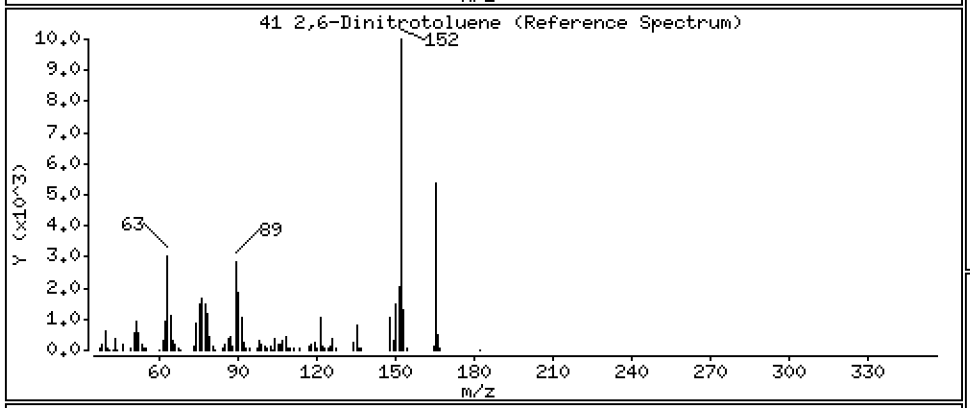
Concentration: 10.07 ug/mL

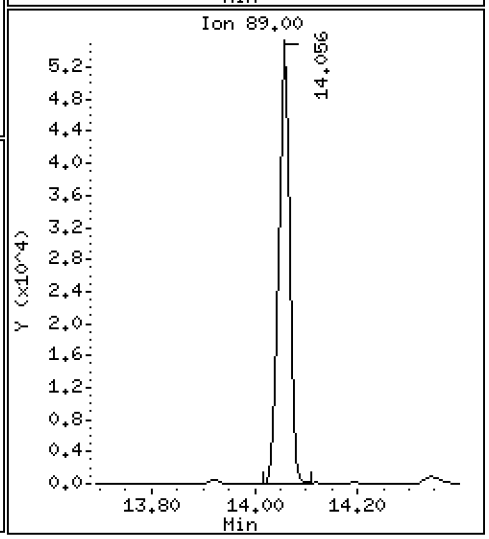


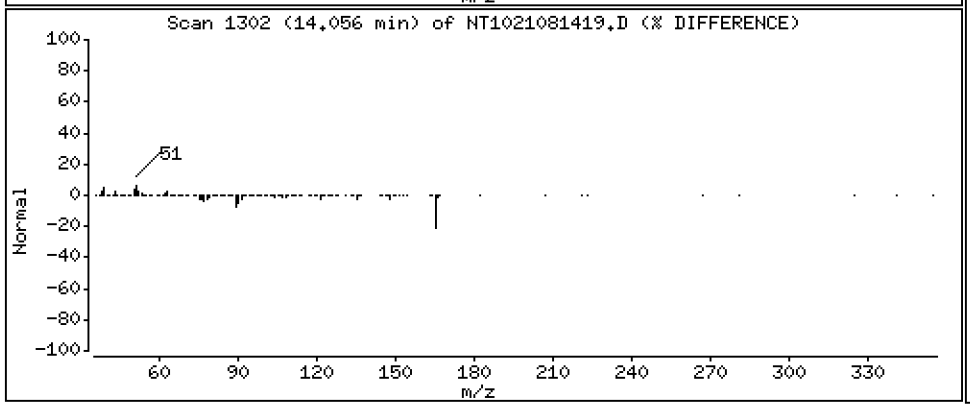












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

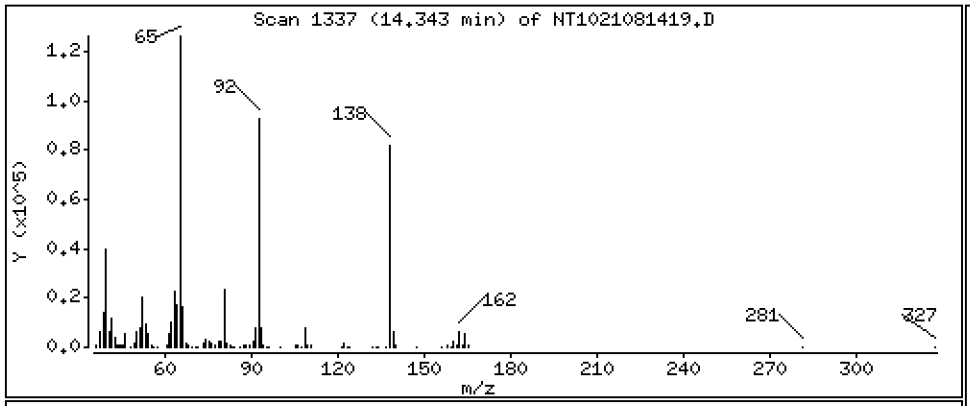
Operator: VTS

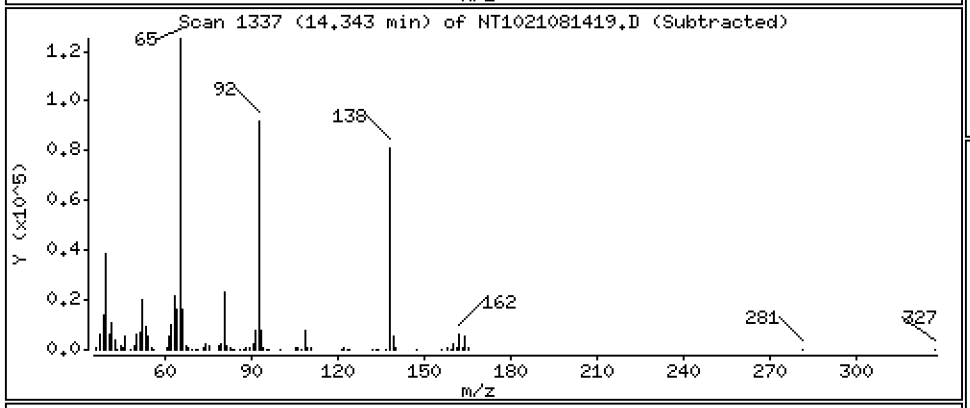
Column phase: ZB-5msi

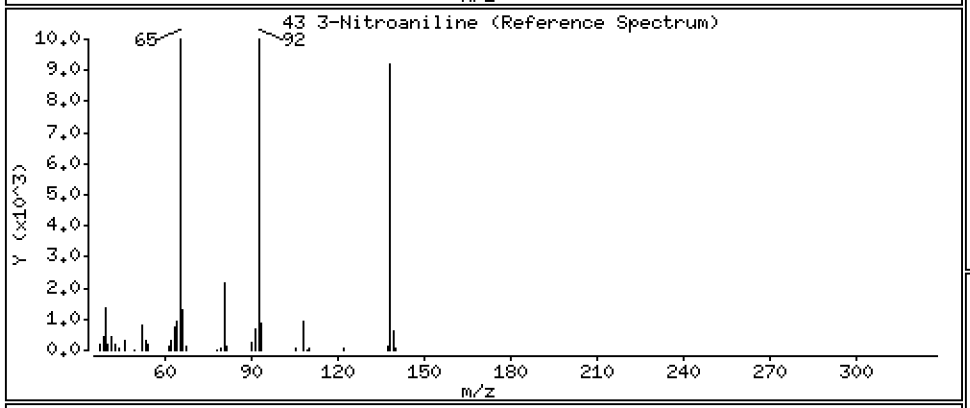
Column diameter: 0.25

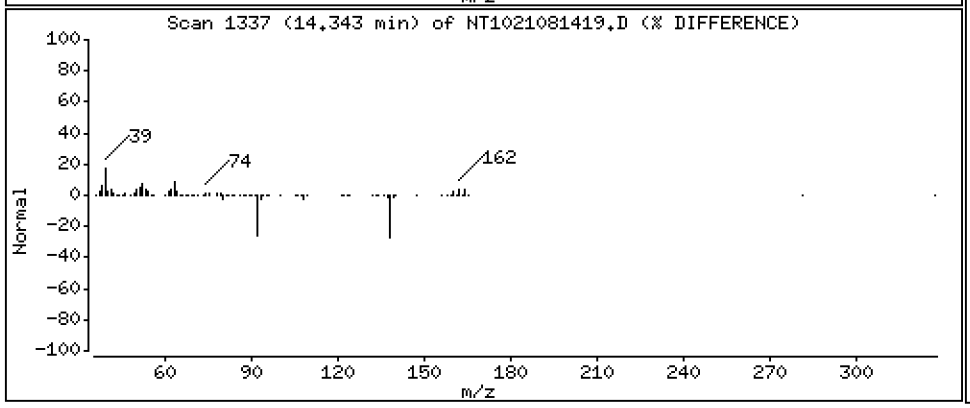
43 3-Nitroaniline

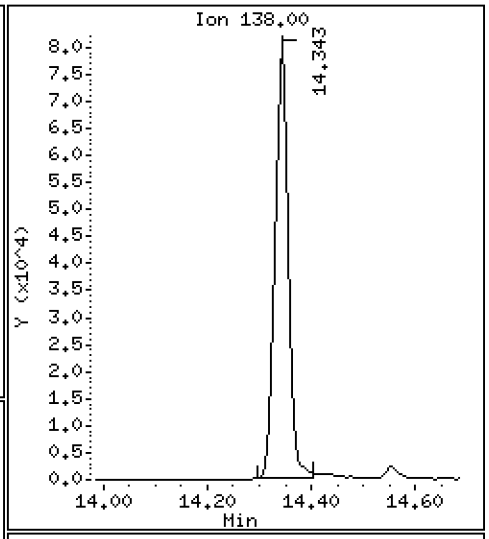
Concentration: 8.349 ug/mL

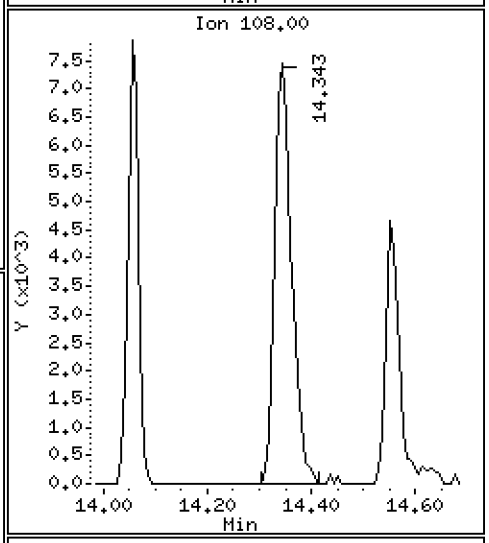


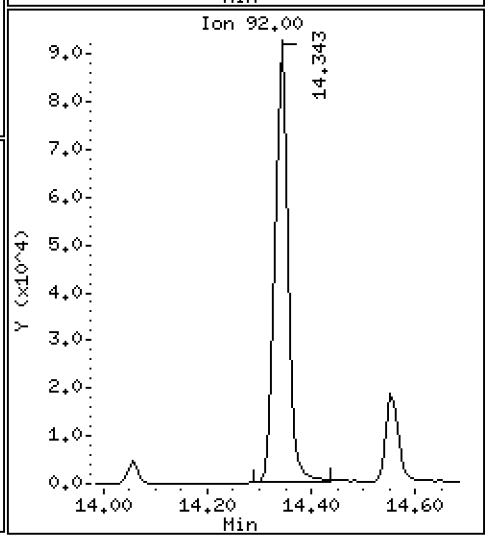












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

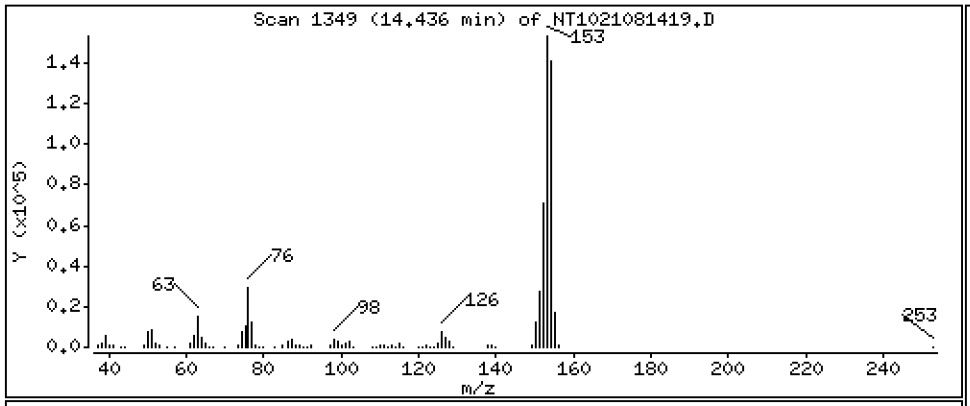
Operator: VTS

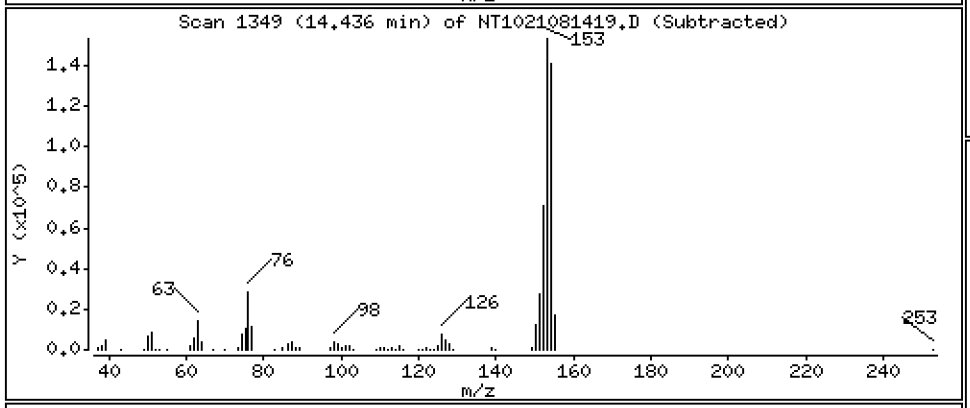
Column phase: ZB-5msi

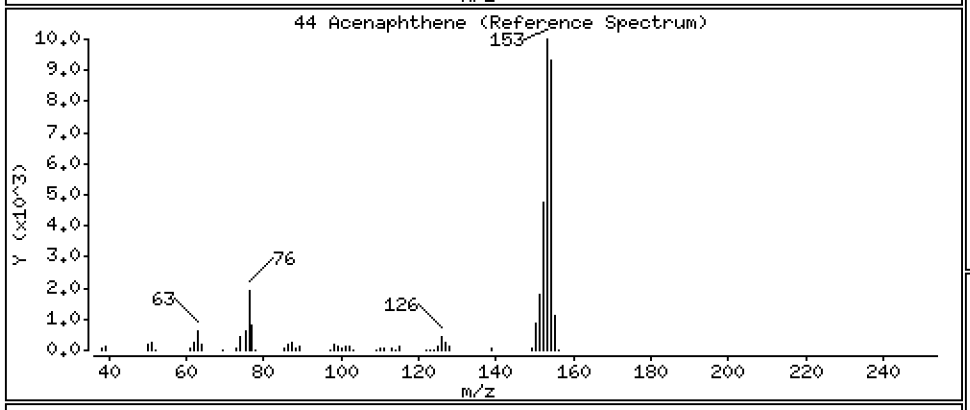
Column diameter: 0.25

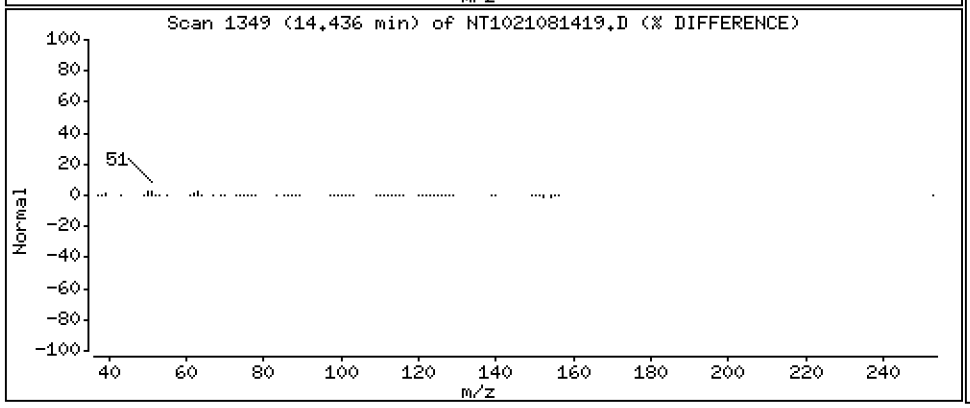
44 Acenaphthene

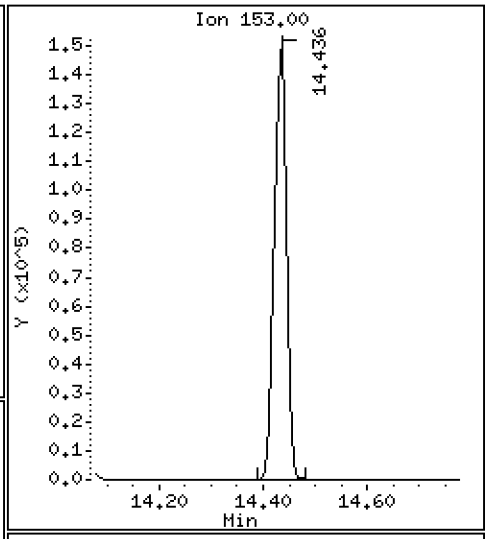
Concentration: 4.697 ug/mL

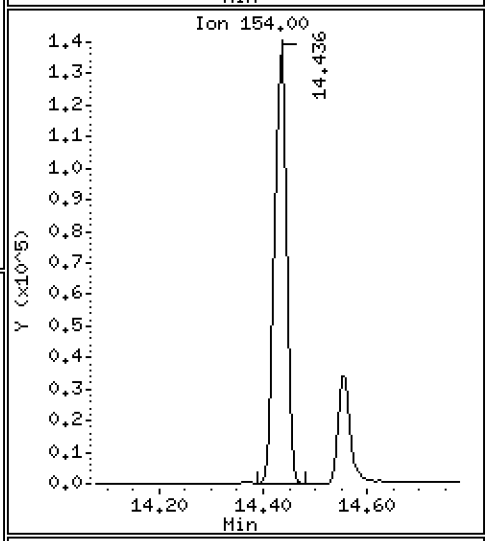


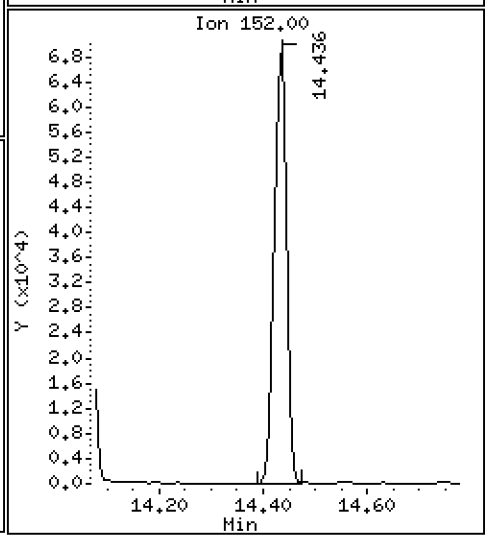












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081419.D

Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

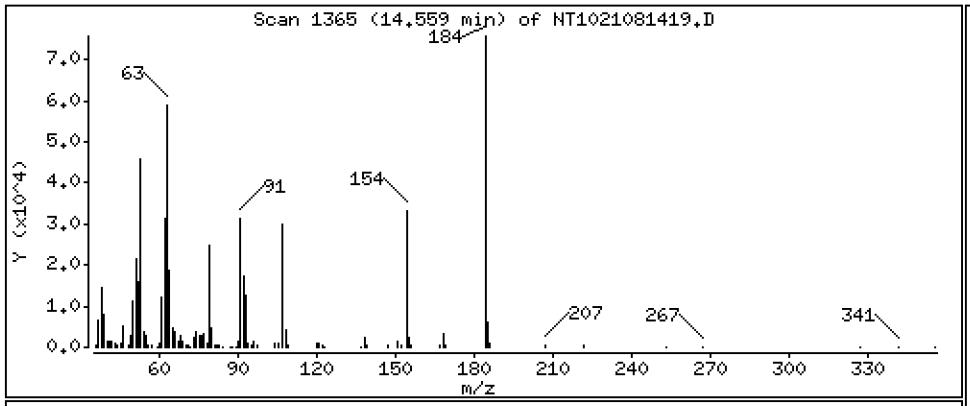
Operator: VTS

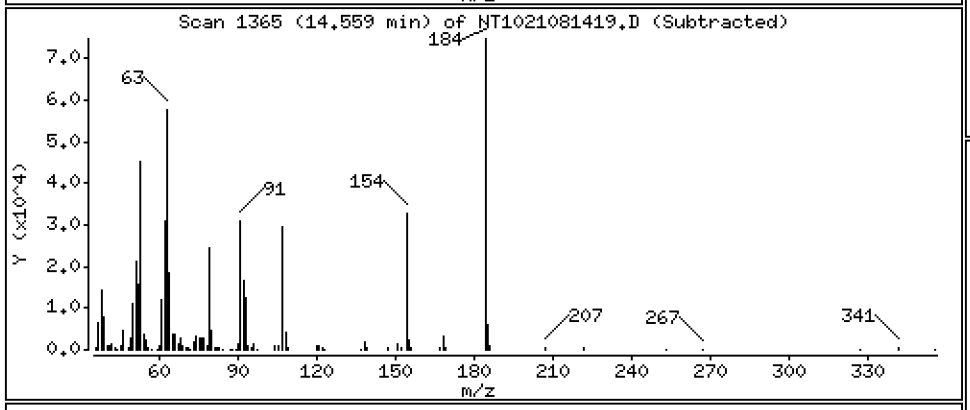
Column phase: ZB-5msi

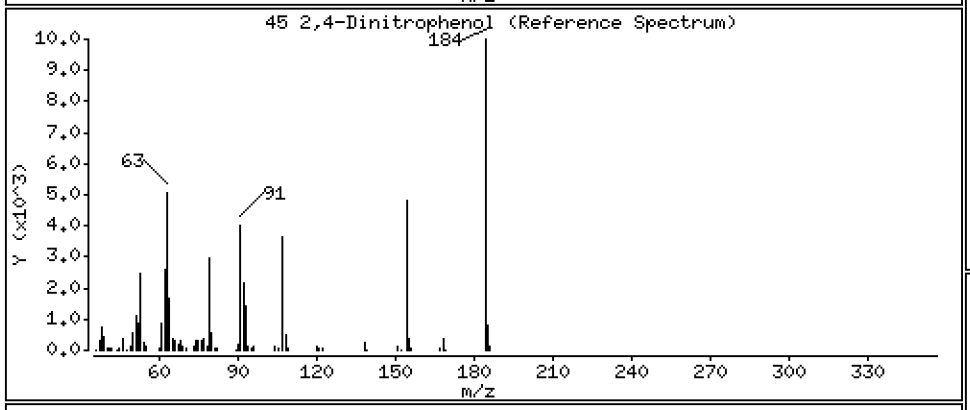
Column diameter: 0.25

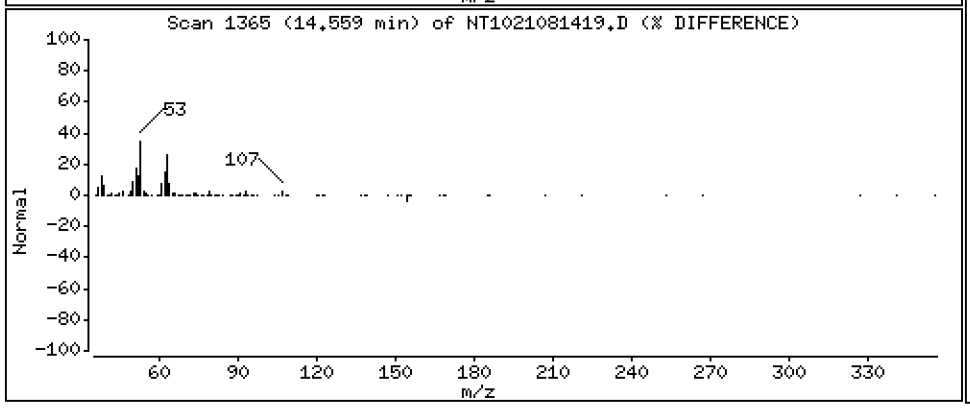
45 2,4-Dinitrophenol

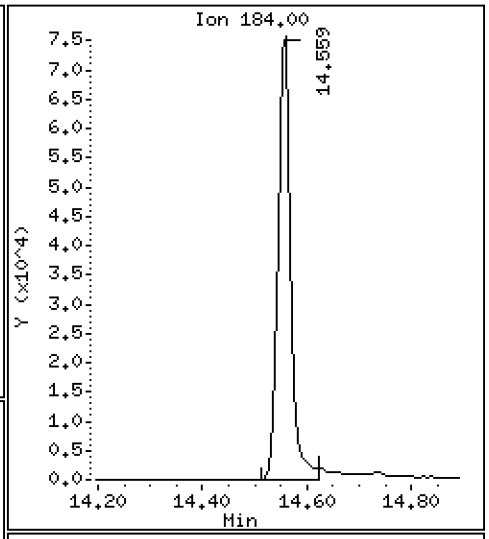
Concentration: 16.38 ug/mL

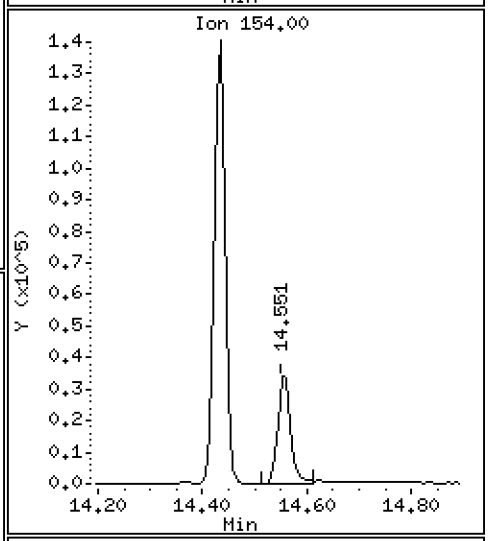


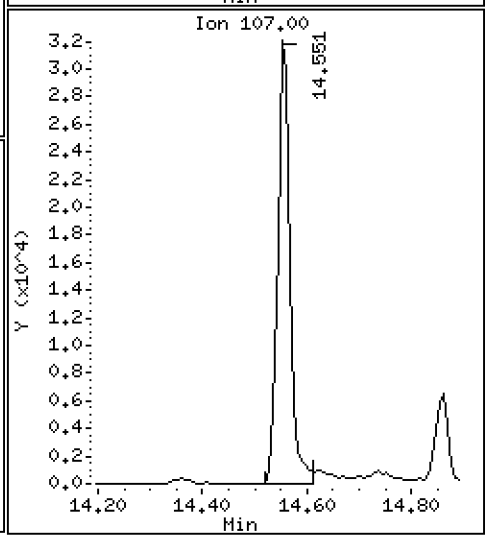












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

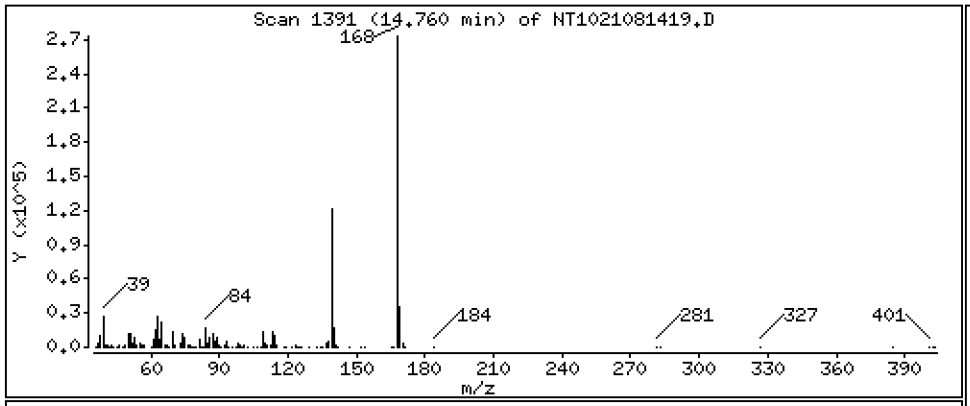
Operator: VTS

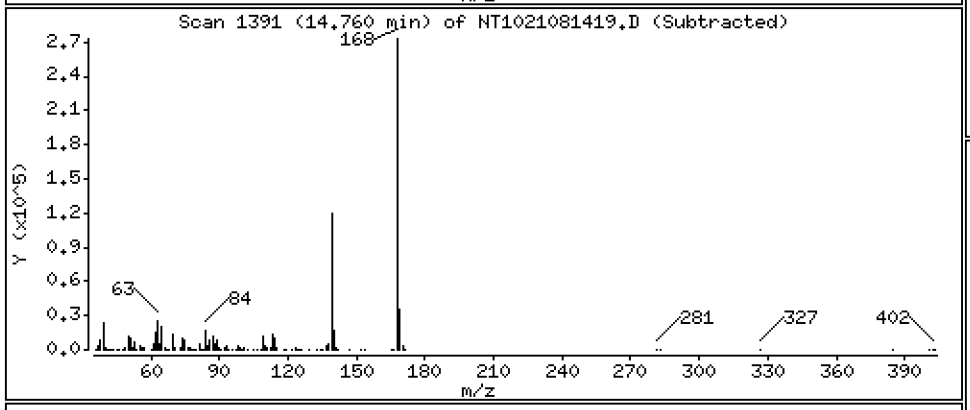
Column phase: ZB-5msi

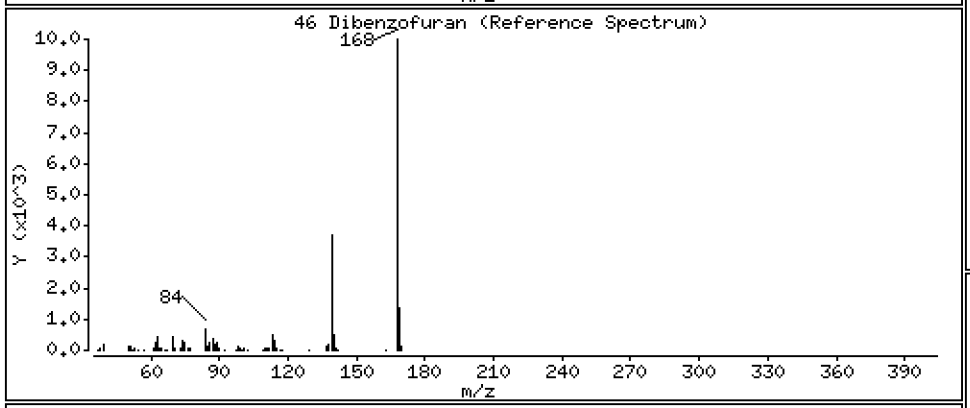
Column diameter: 0.25

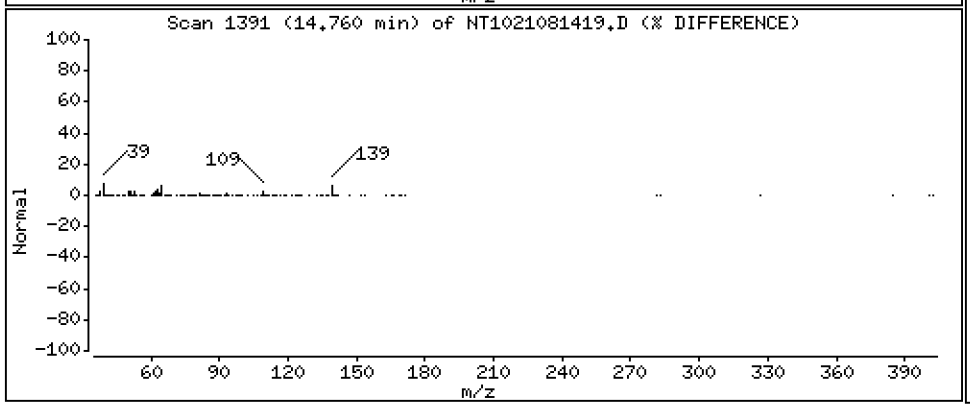
46 Dibenzofuran

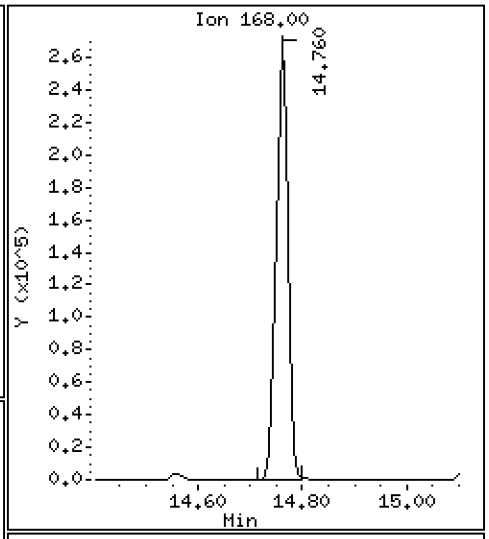
Concentration: 5.315 ug/mL

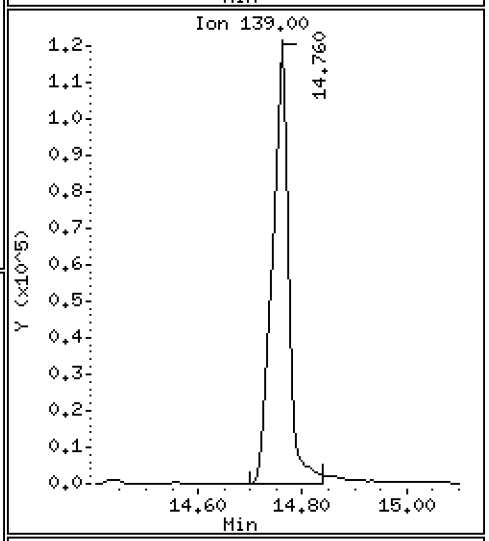


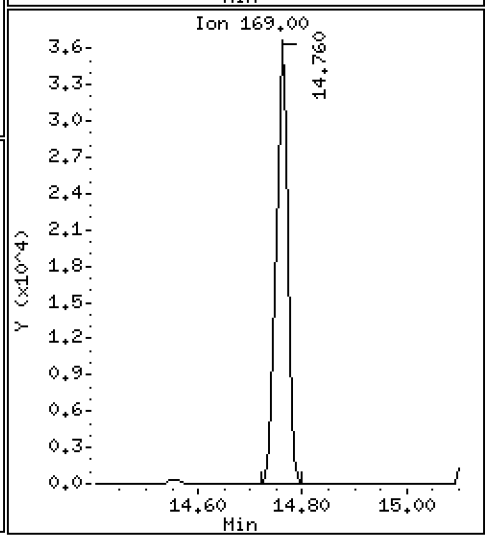












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

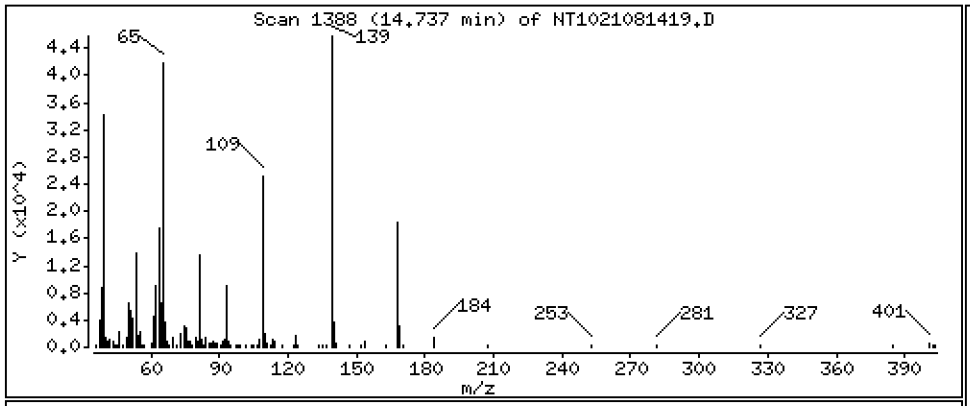
Operator: VTS

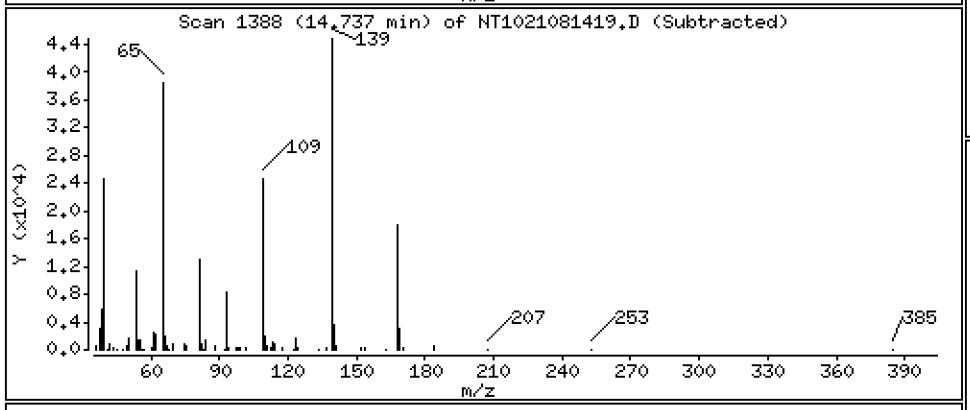
Column phase: ZB-5msi

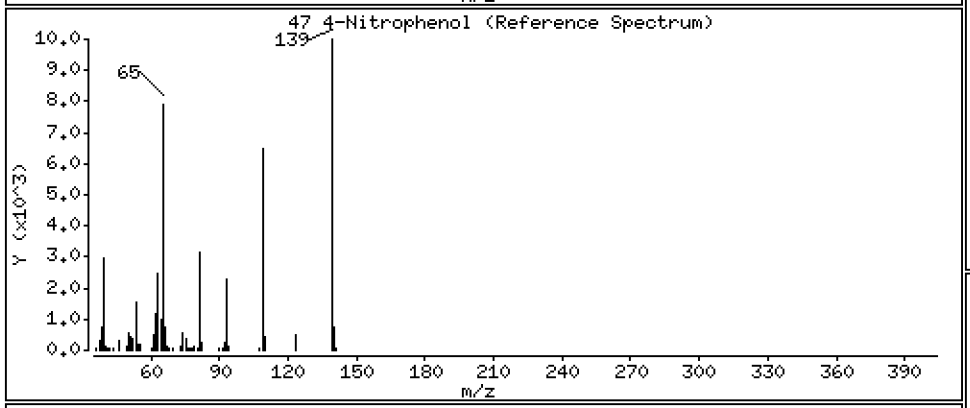
Column diameter: 0.25

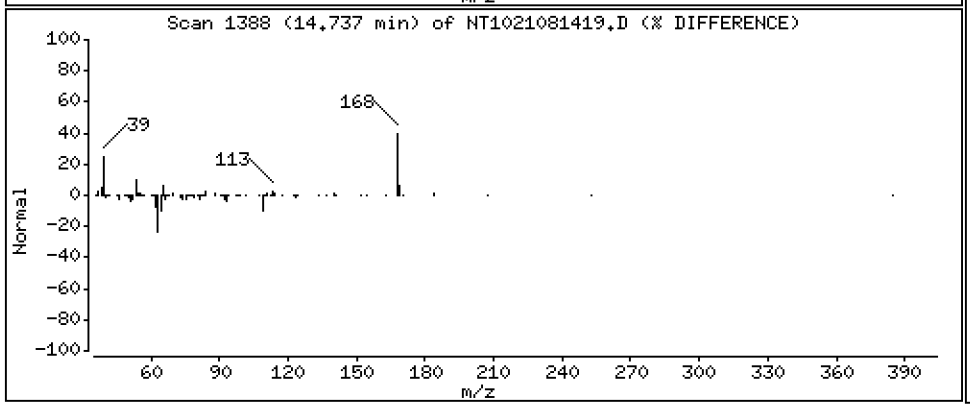
47 4-Nitrophenol

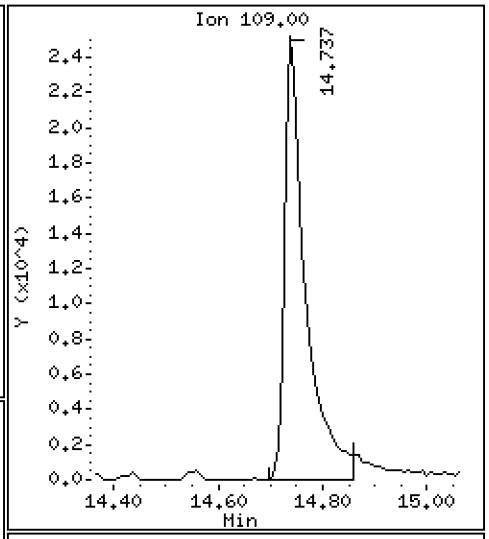
Concentration: 11.36 ug/mL

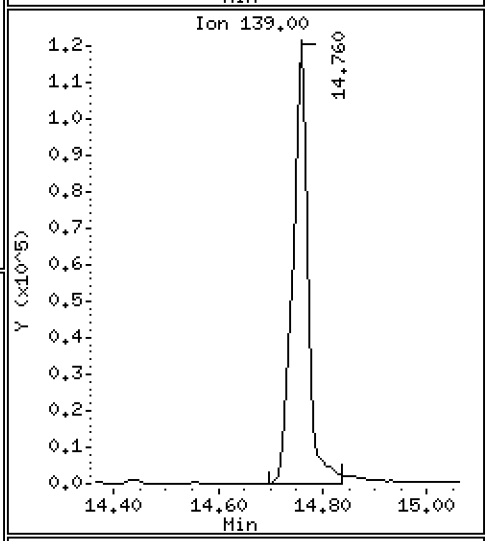


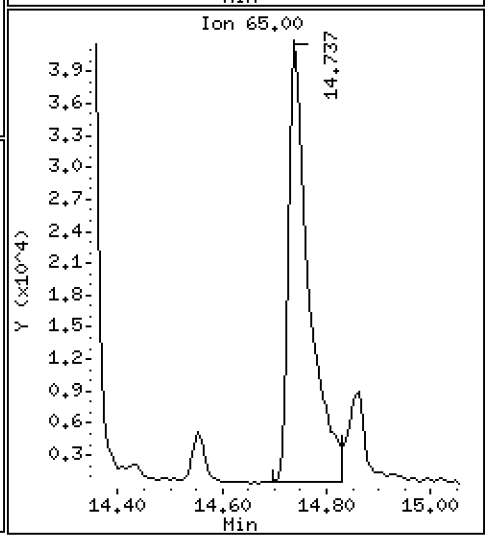












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

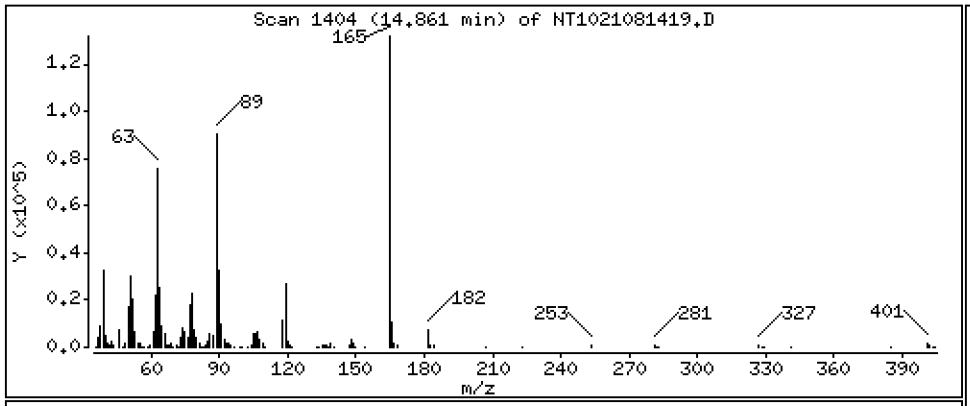
Operator: VTS

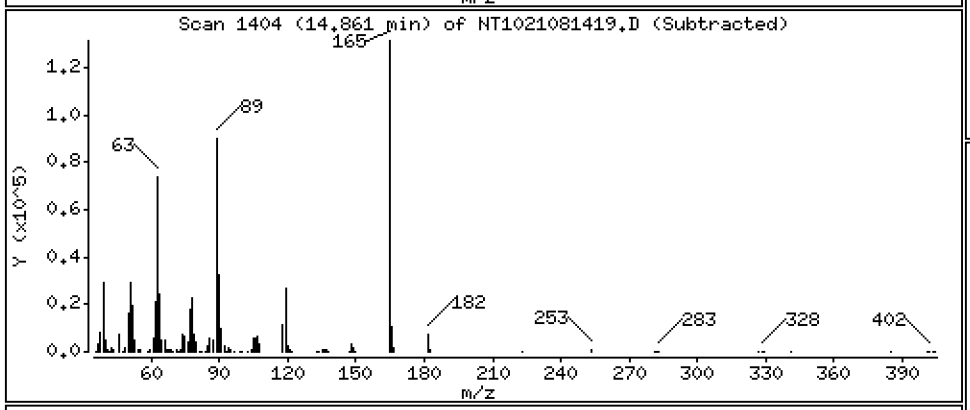
Column phase: ZB-5msi

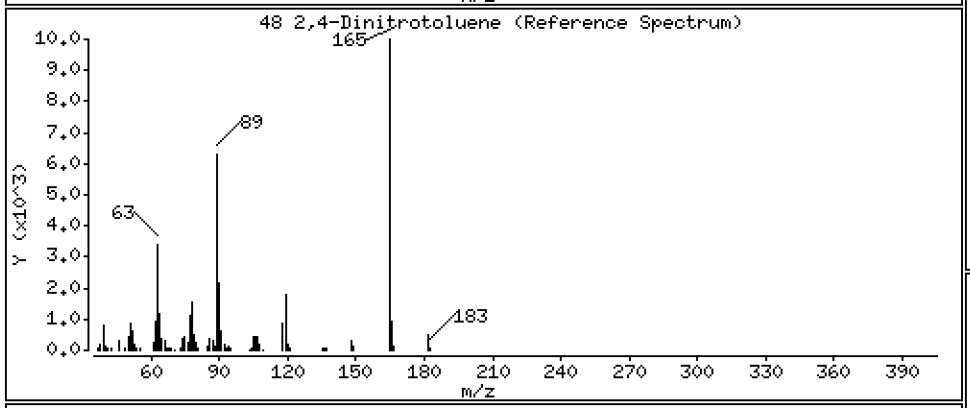
Column diameter: 0.25

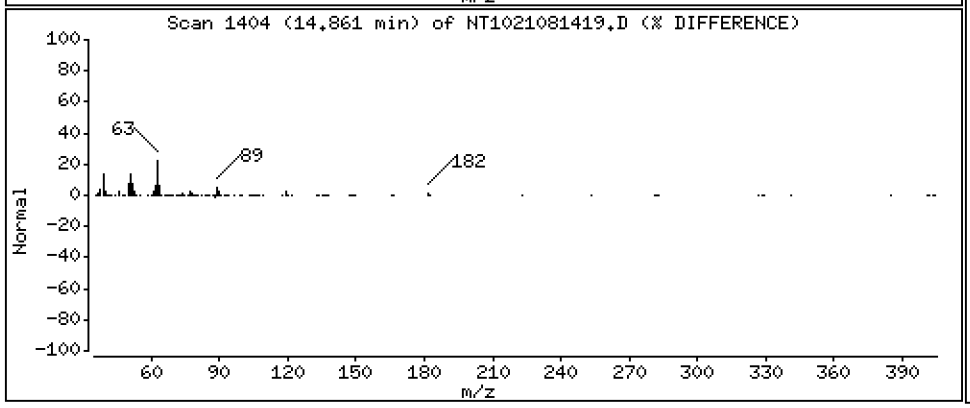
48 2,4-Dinitrotoluene

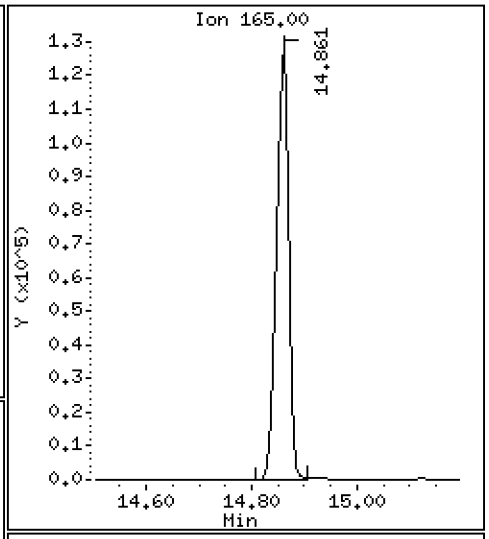
Concentration: 11.27 ug/mL

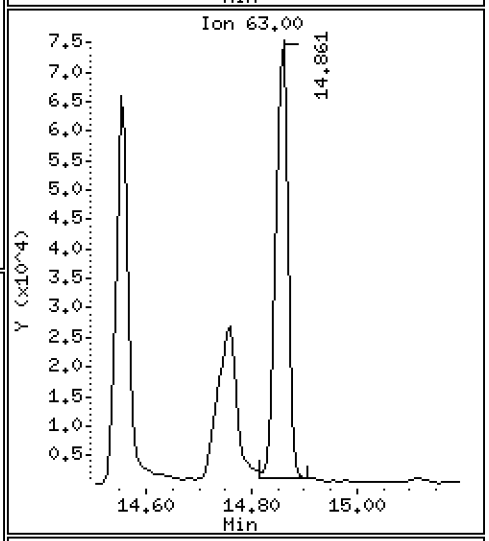


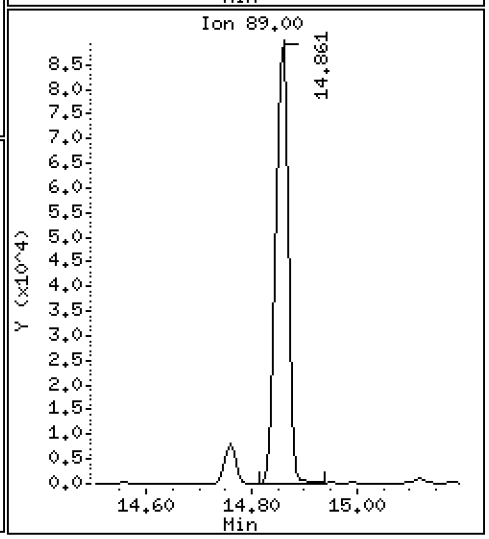












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

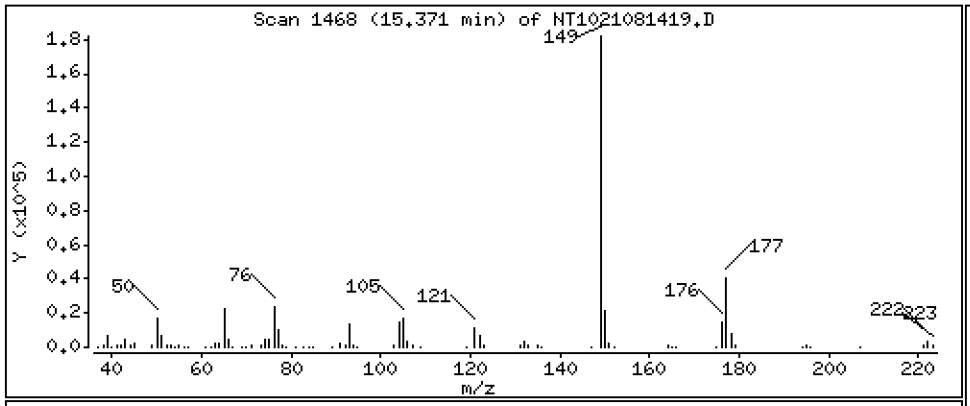
Operator: VTS

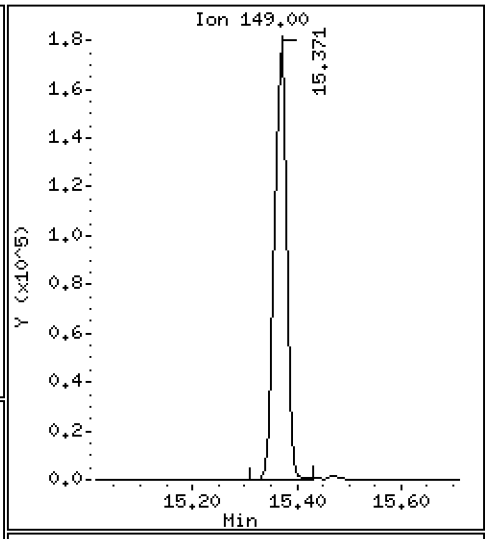
Column phase: ZB-5msi

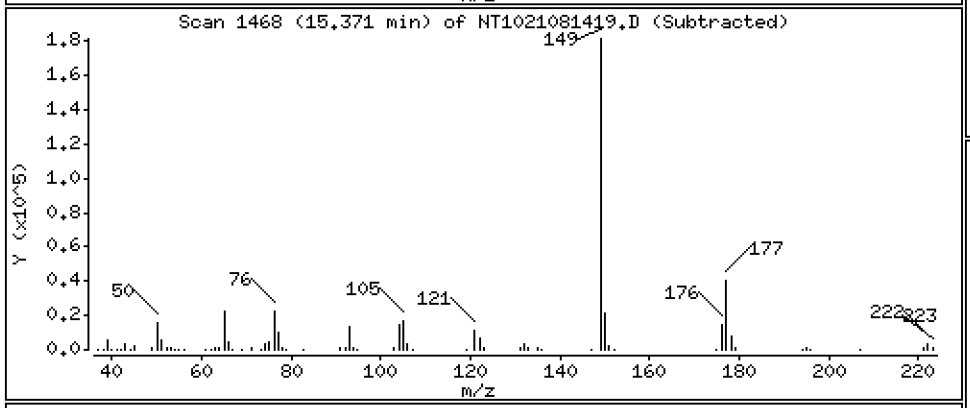
Column diameter: 0.25

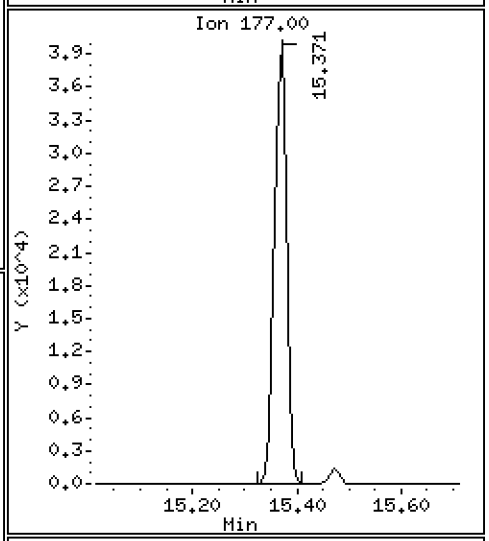
50 Diethylphthalate

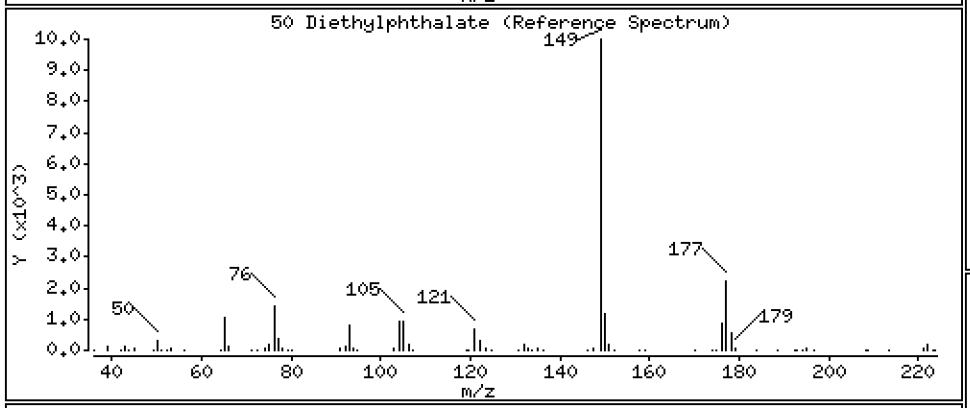
Concentration: 5.034 ug/mL

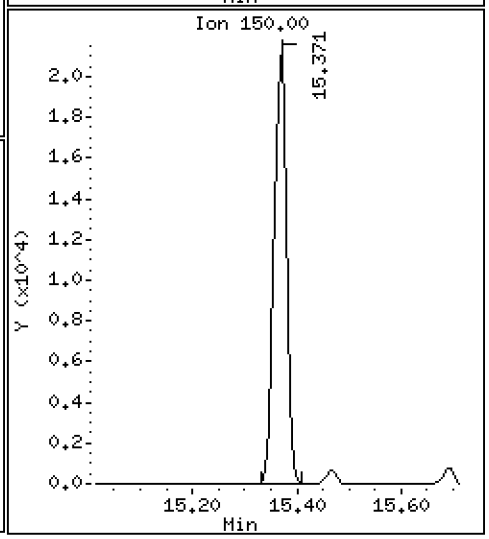


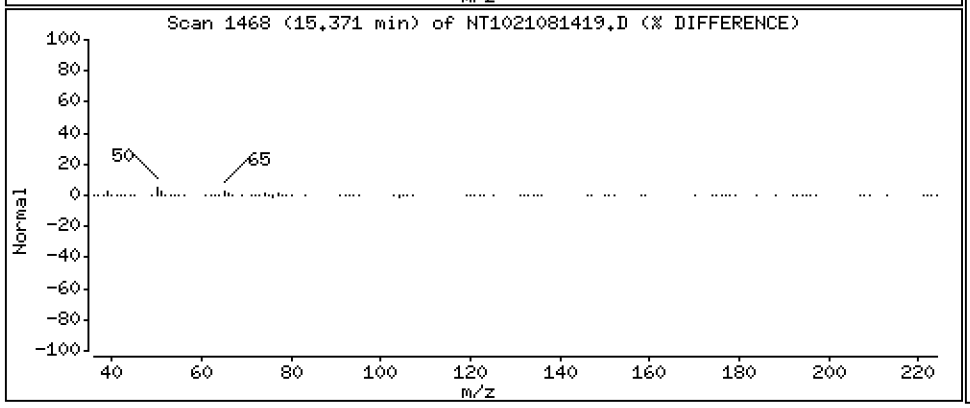












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

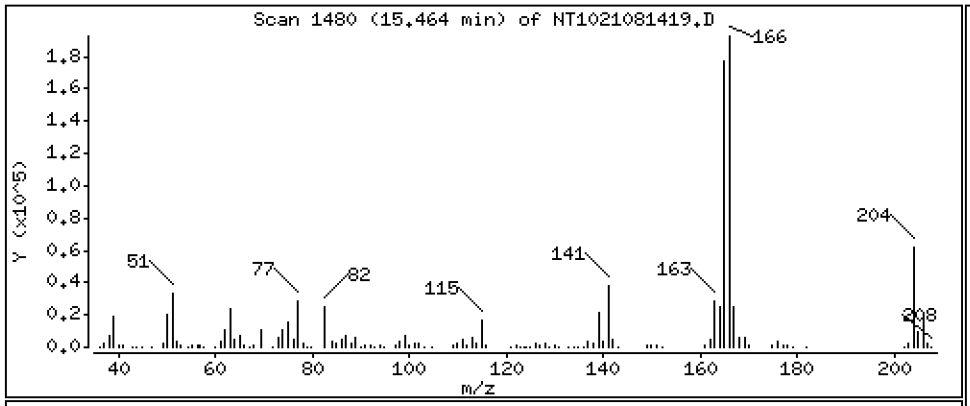
Operator: VTS

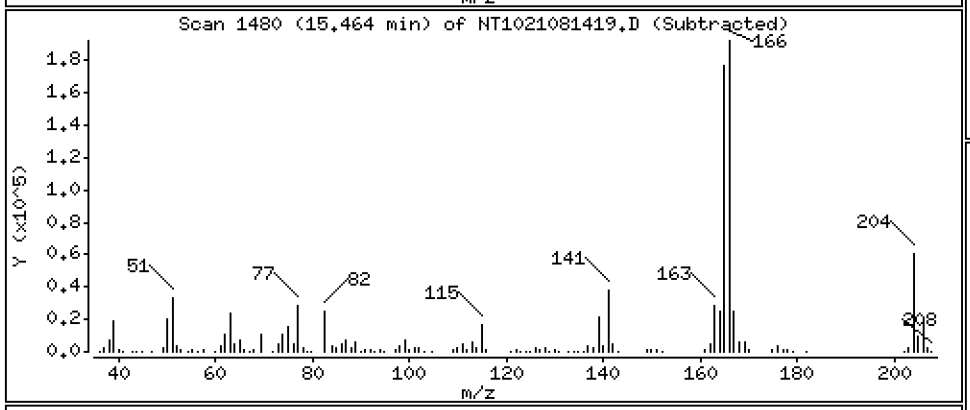
Column phase: ZB-5msi

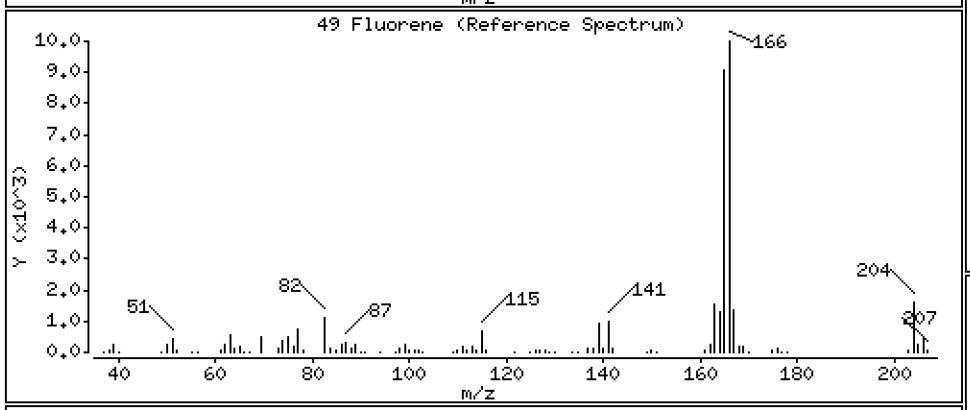
Column diameter: 0.25

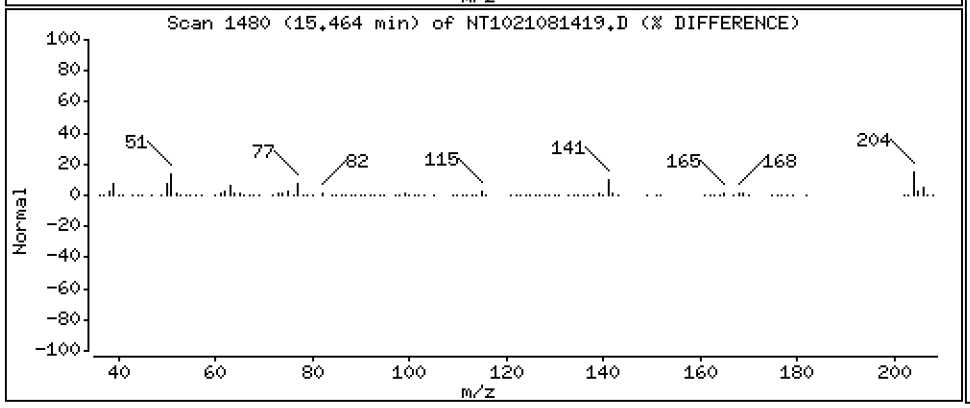
49 Fluorene

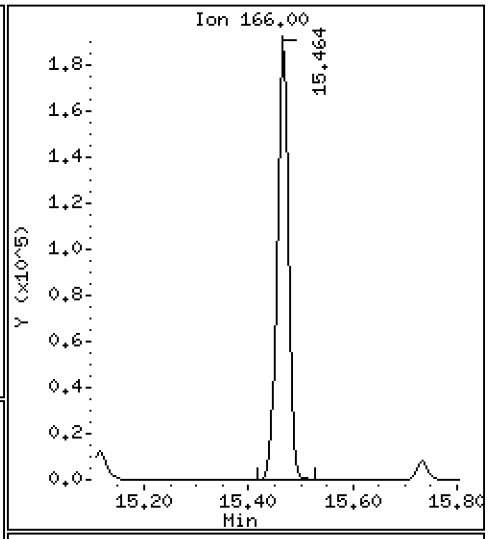
Concentration: 4.543 ug/mL

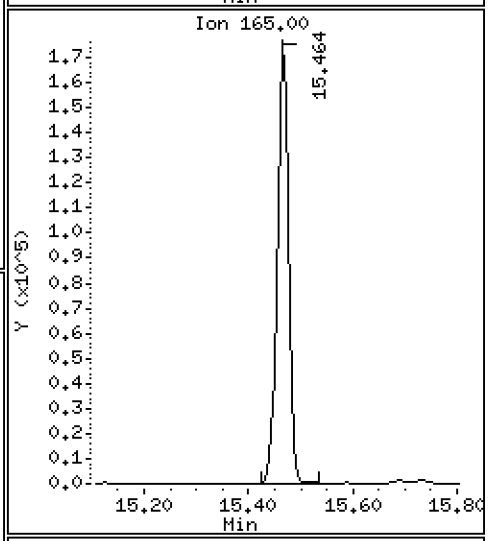


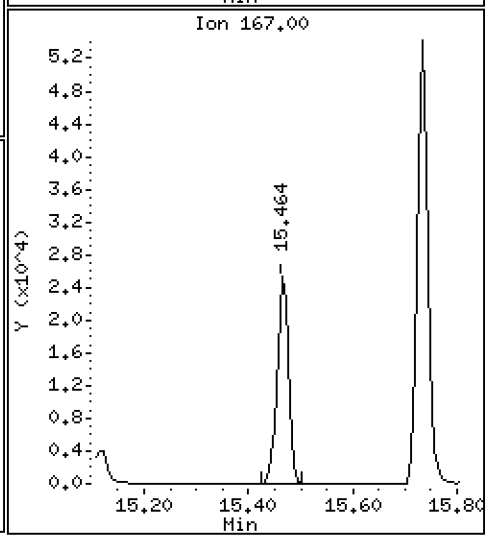












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

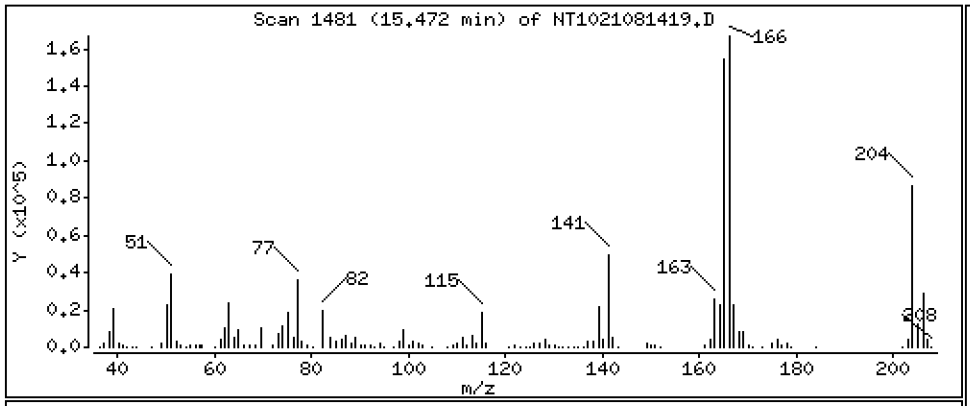
Operator: VTS

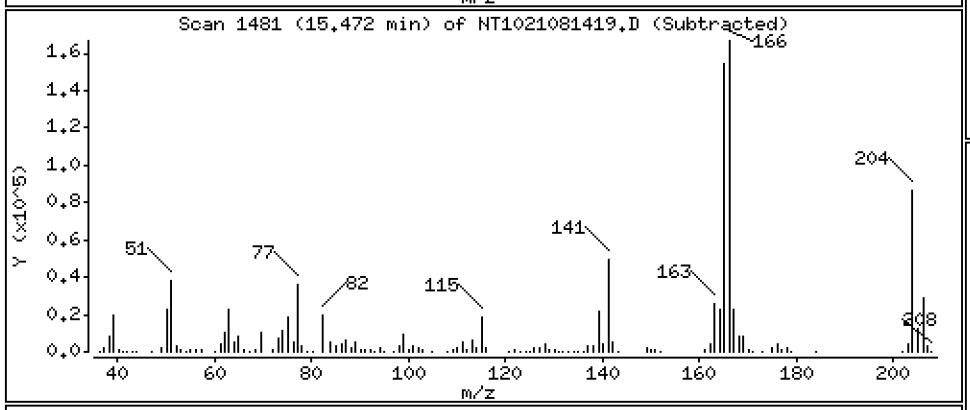
Column phase: ZB-5msi

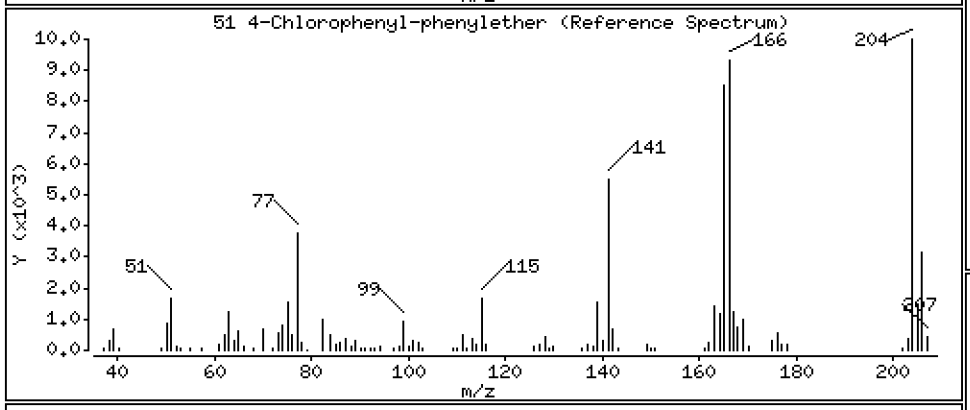
Column diameter: 0.25

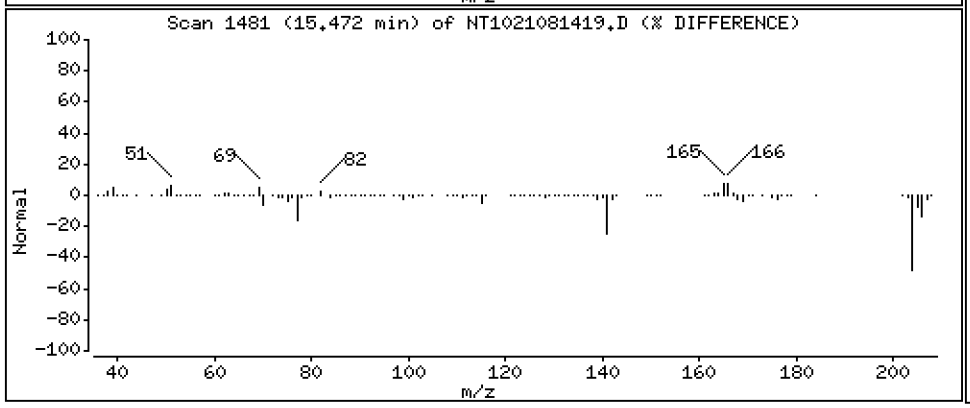
51 4-Chlorophenyl-phenylether

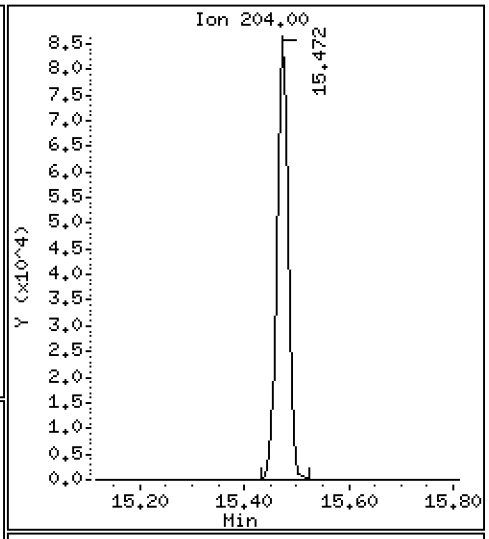
Concentration: 3.654 ug/mL

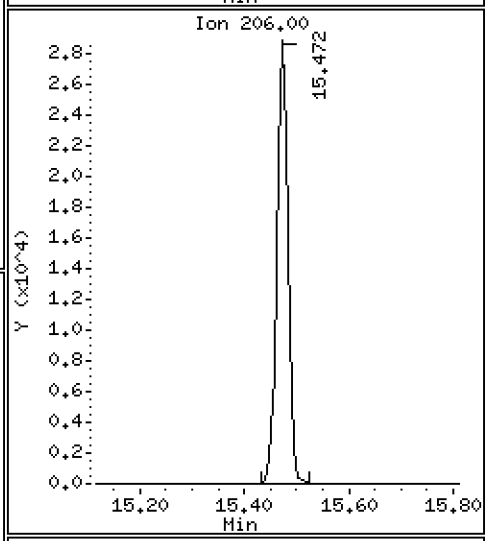


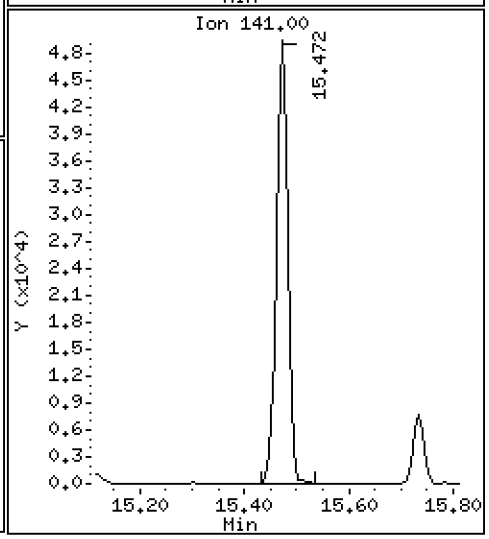












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

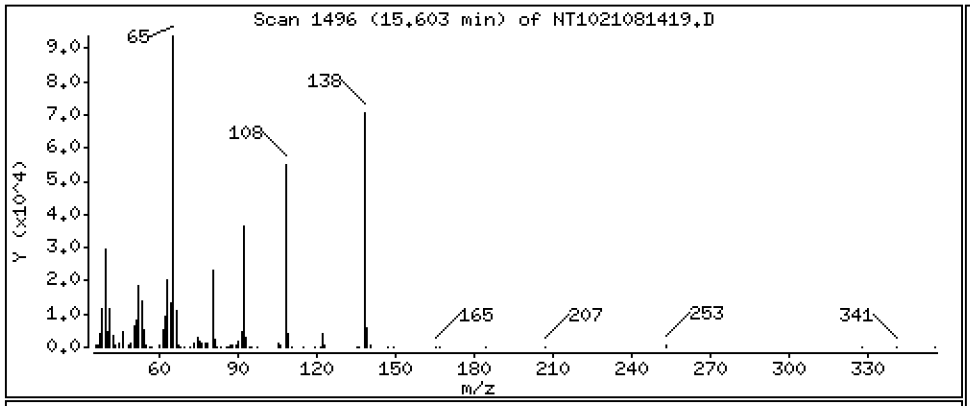
Operator: VTS

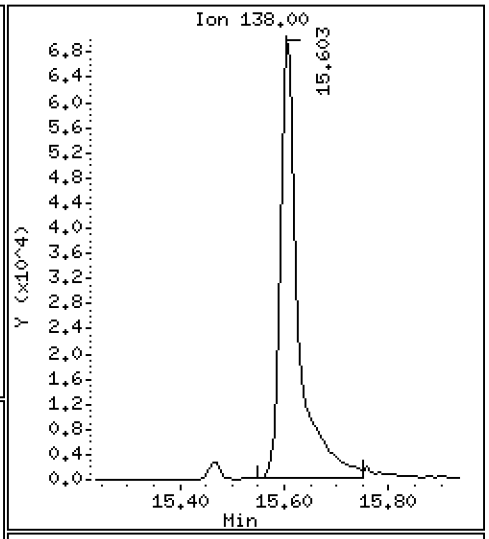
Column phase: ZB-5msi

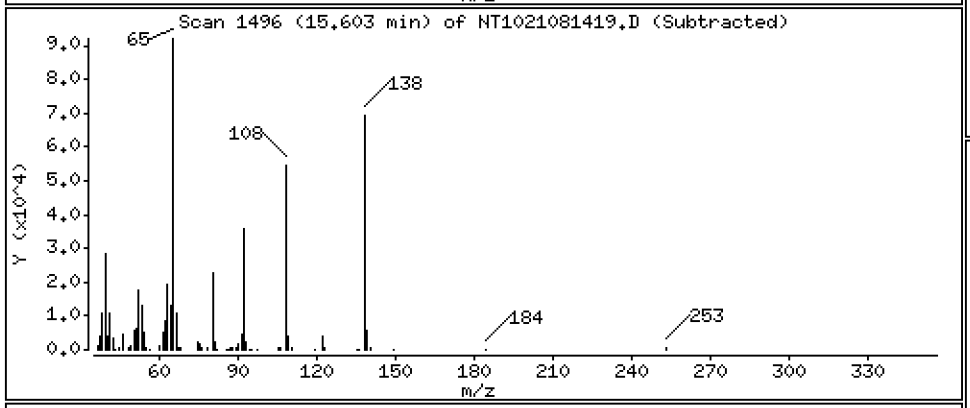
Column diameter: 0.25

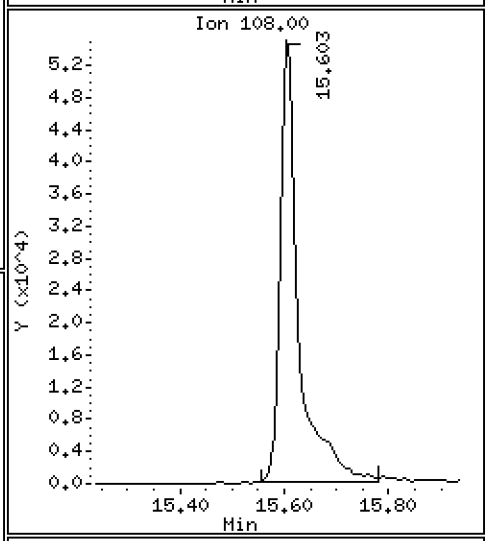
52 4-Nitroaniline

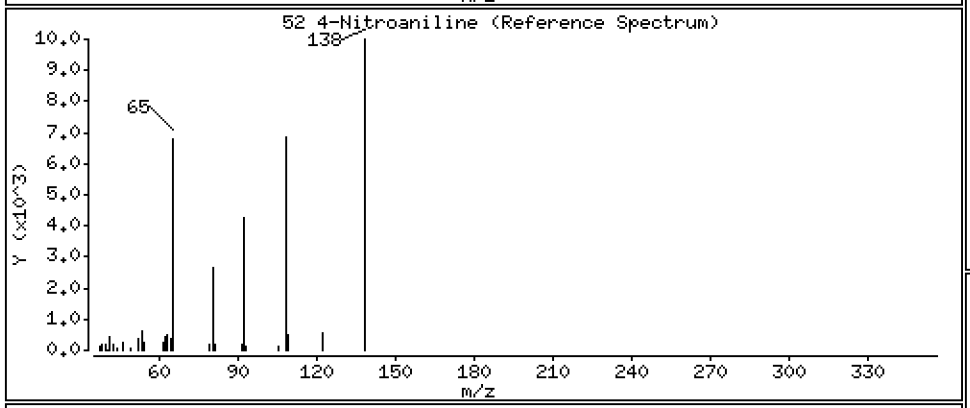
Concentration: 9.892 ug/mL

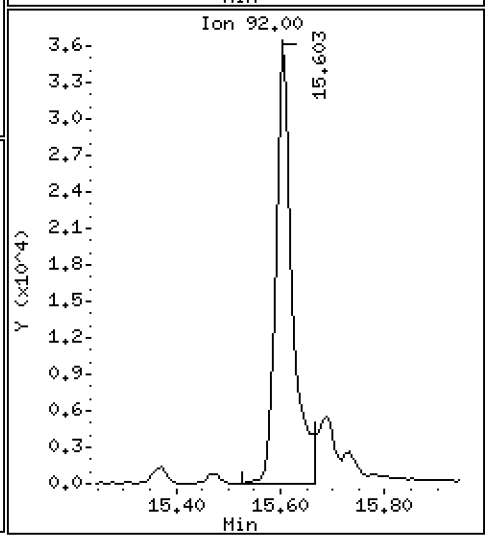


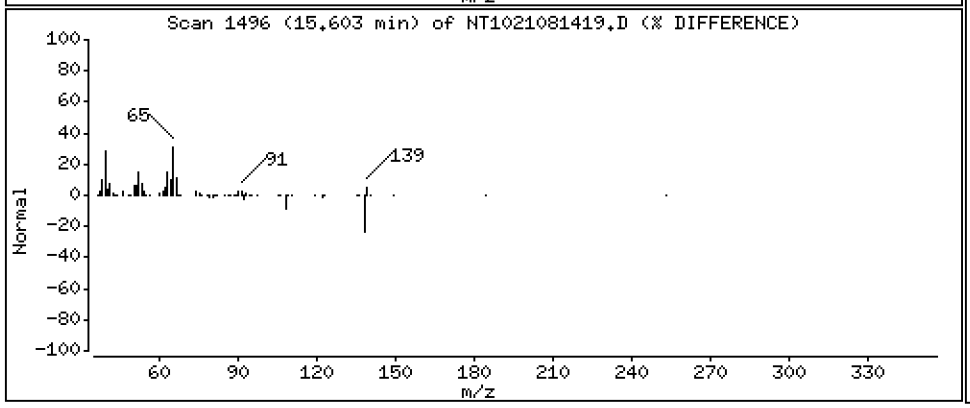












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081419.D

Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

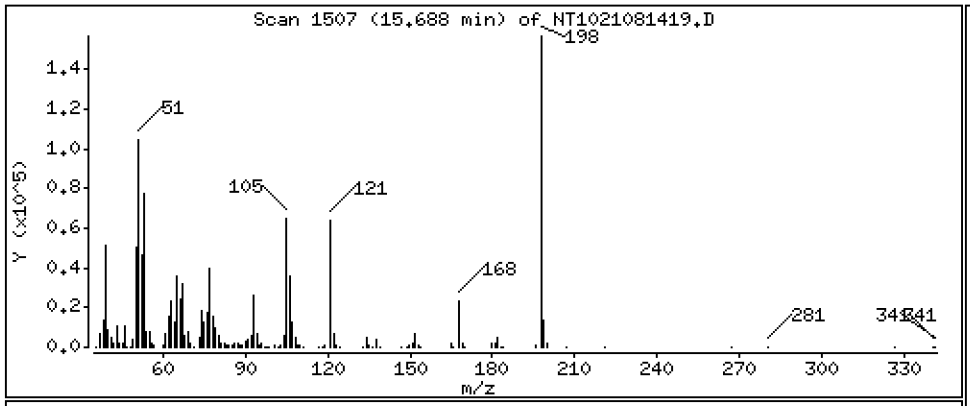
Operator: VTS

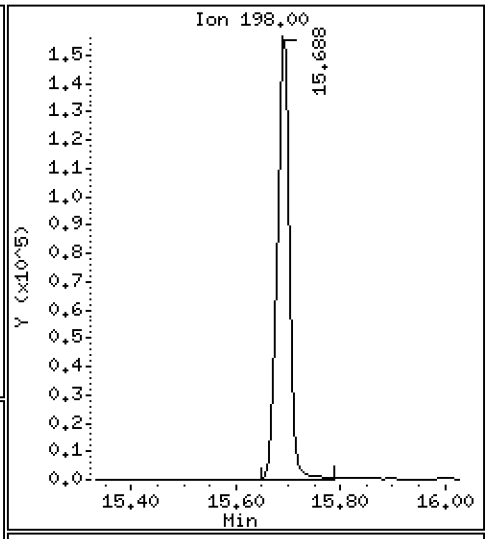
Column phase: ZB-5msi

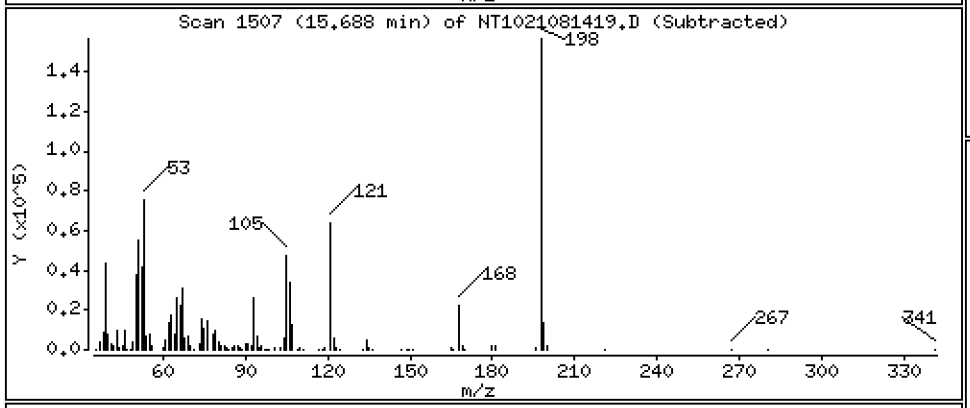
Column diameter: 0.25

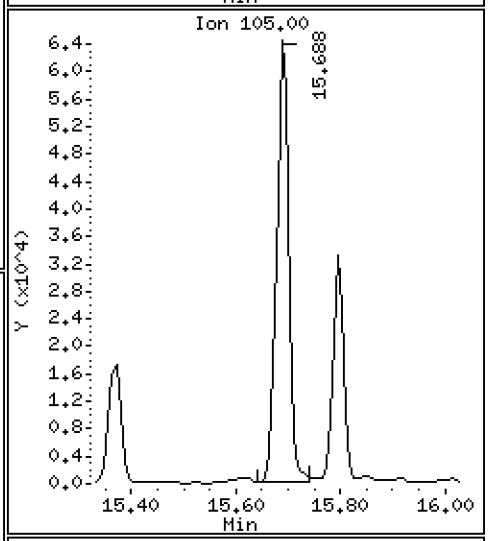
53 4,6-Dinitro-2-methylphenol

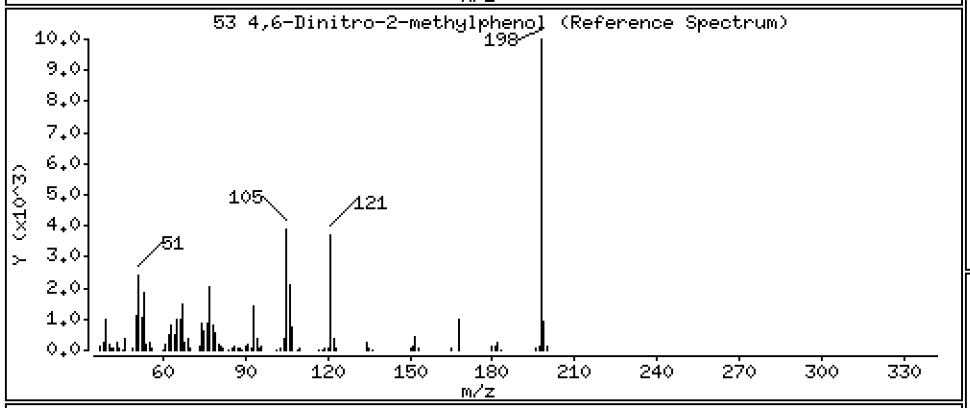
Concentration: 19.78 ug/mL

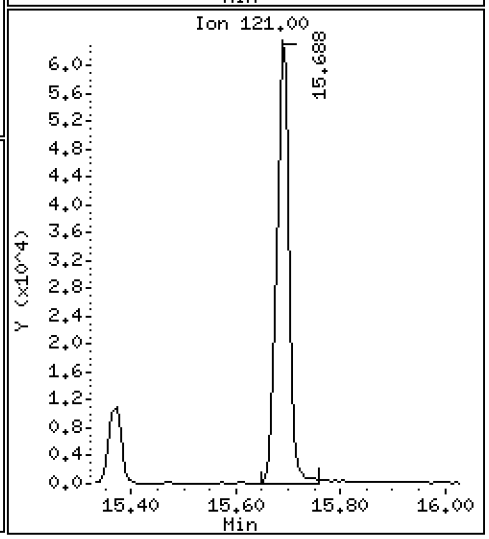


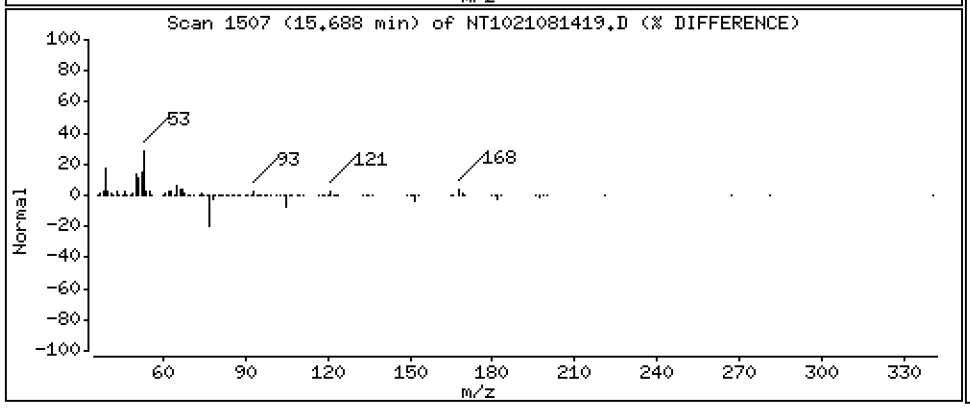












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

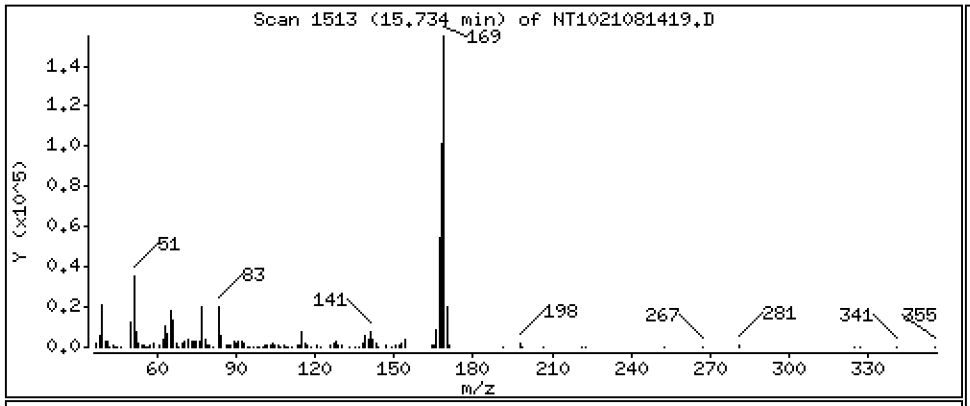
Operator: VTS

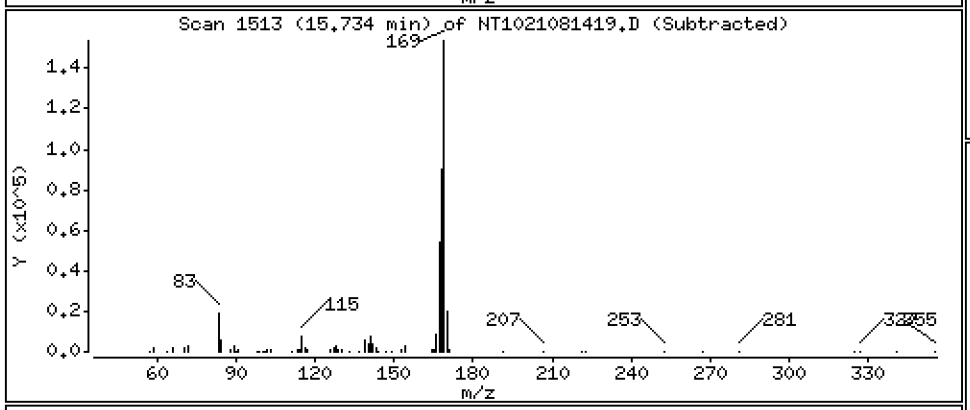
Column phase: ZB-5msi

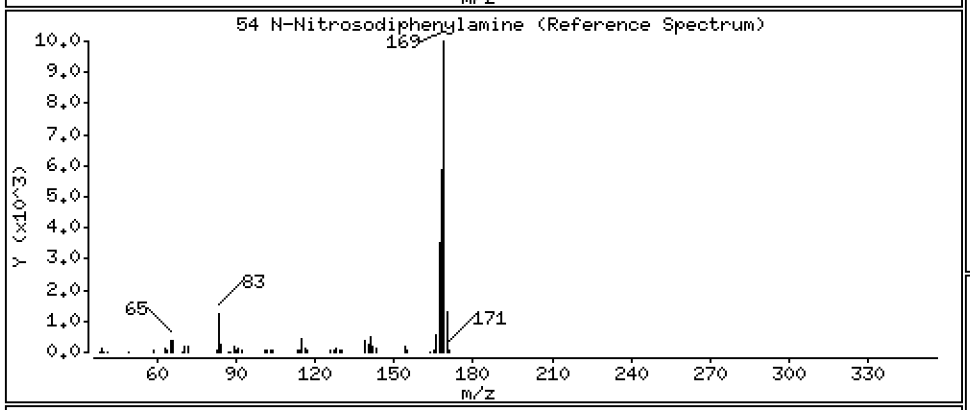
Column diameter: 0.25

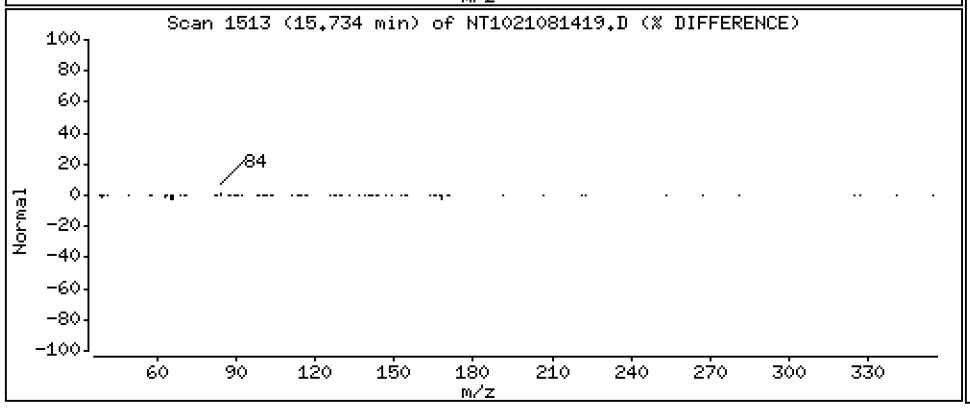
54 N-Nitrosodiphenylamine

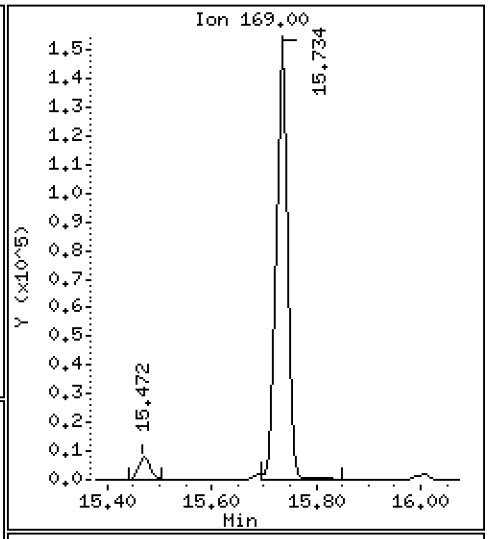
Concentration: 4.541 ug/mL

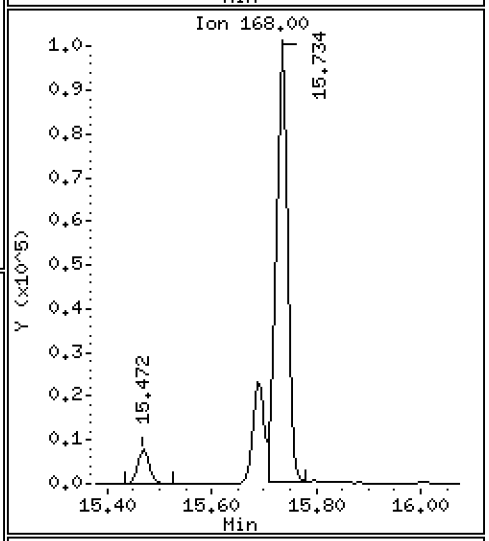


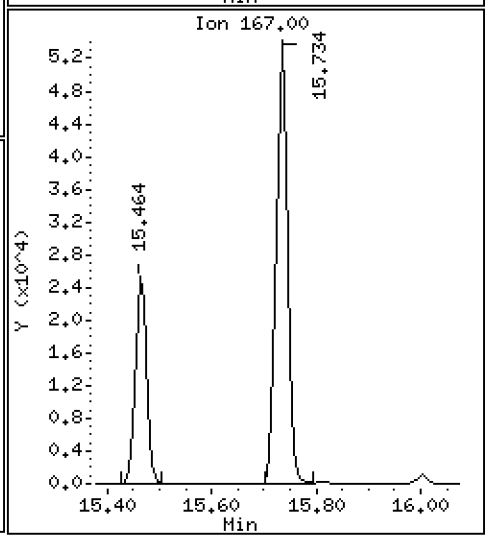












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081419.D

Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

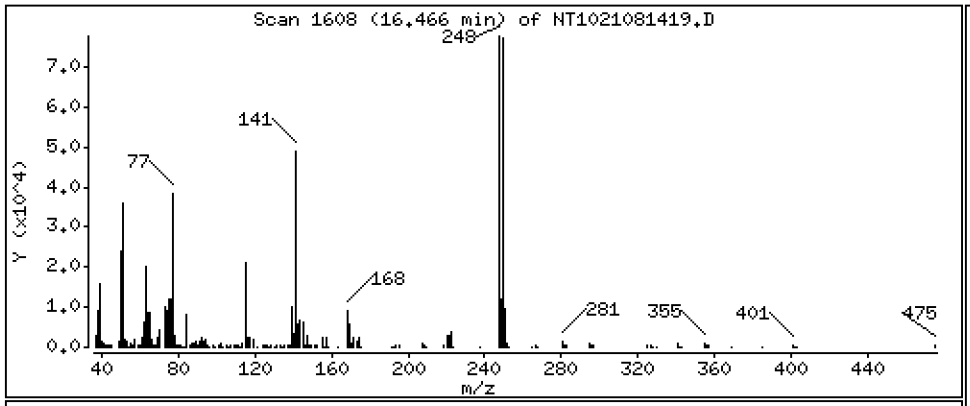
Operator: VTS

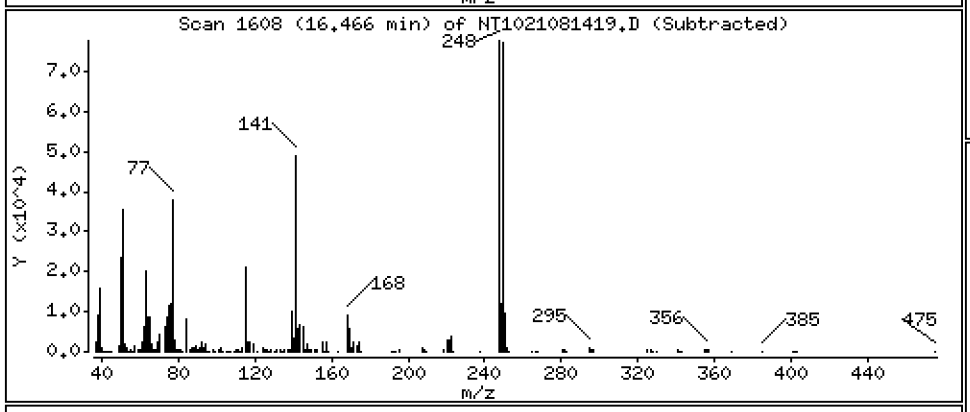
Column phase: ZB-5msi

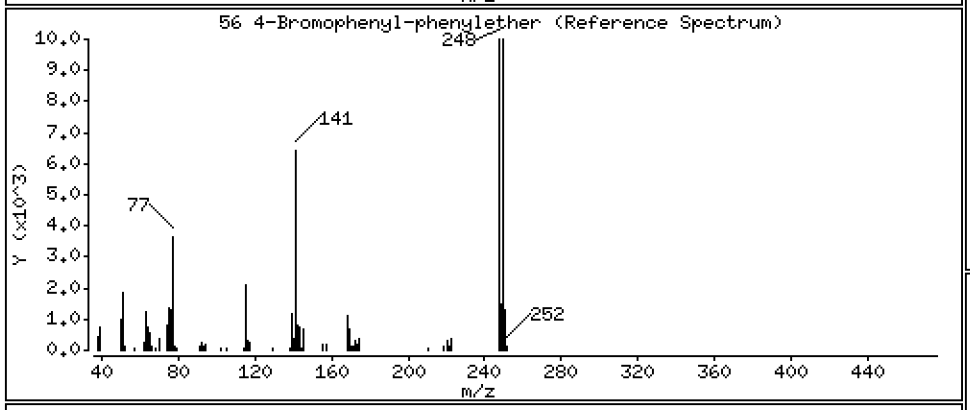
Column diameter: 0.25

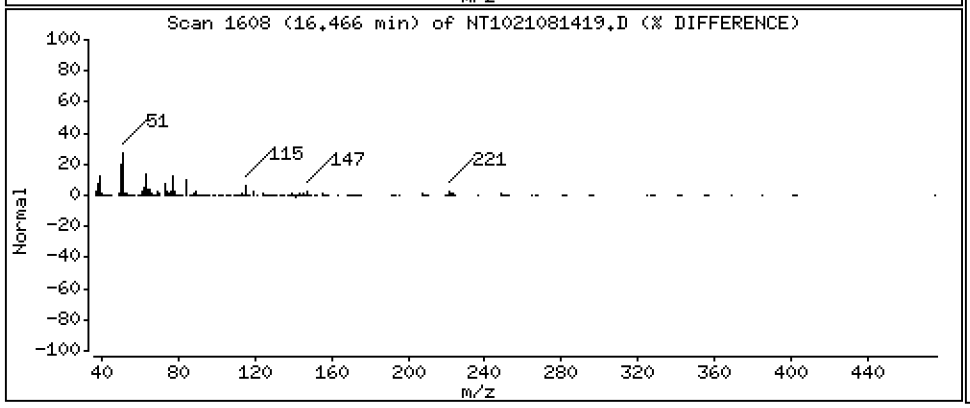
56 4-Bromophenyl-phenylether

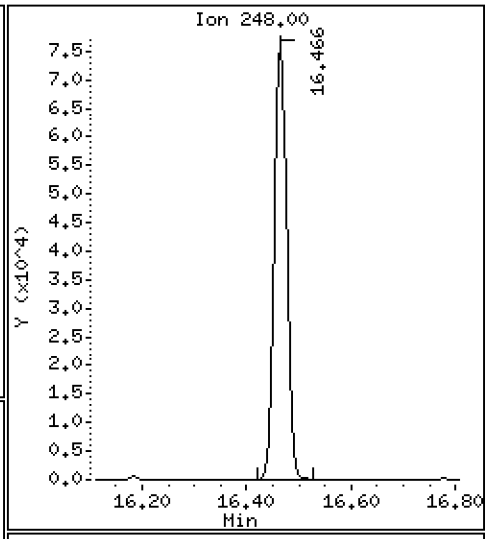
Concentration: 4.758 ug/mL

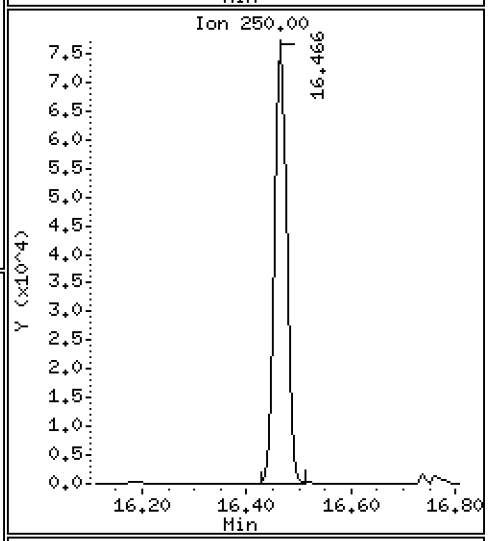


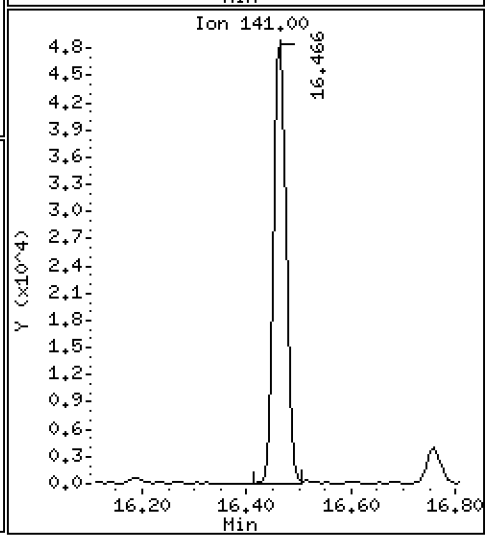












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081419.D

Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

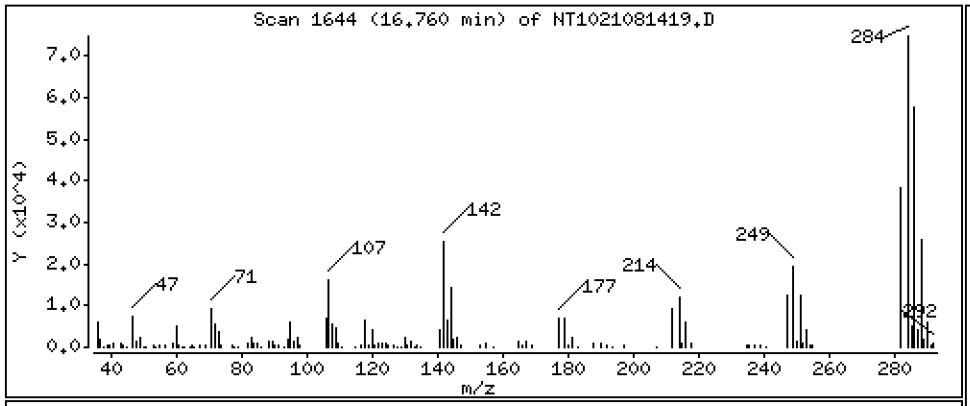
Operator: VTS

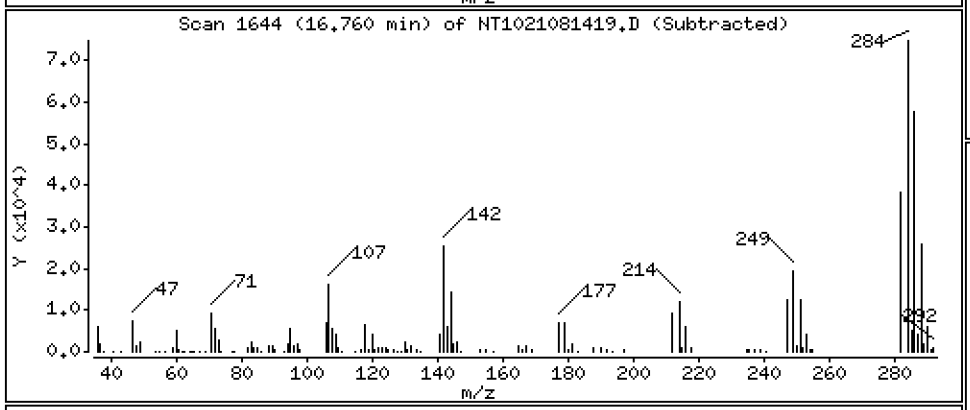
Column phase: ZB-5msi

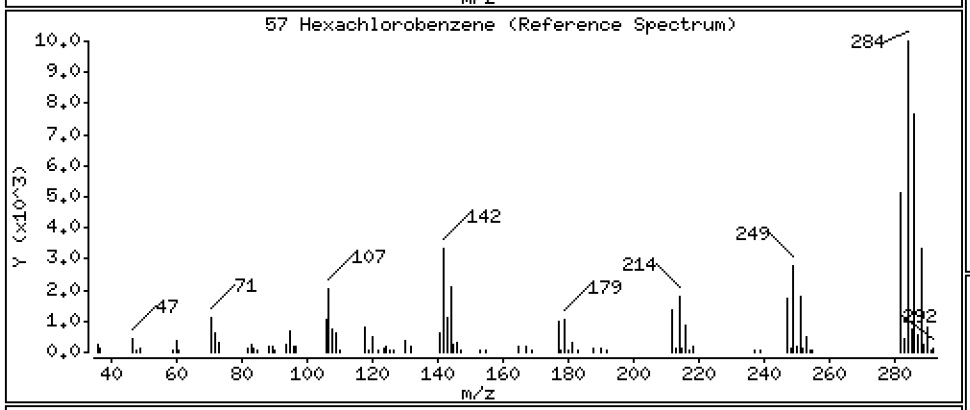
Column diameter: 0.25

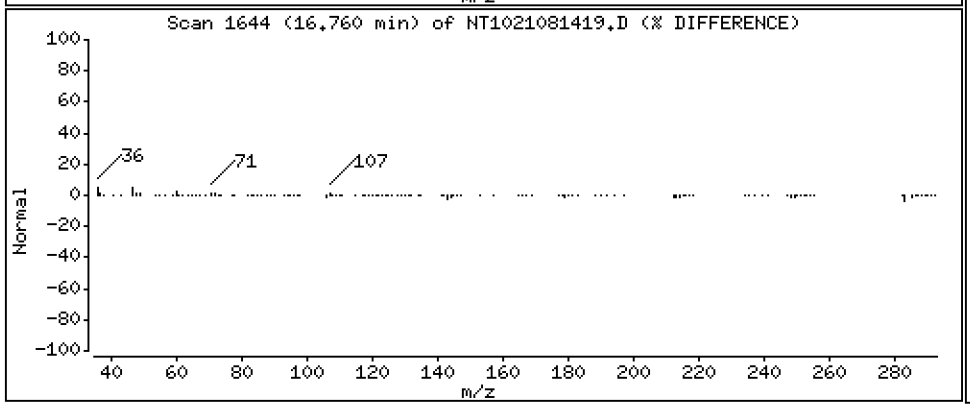
57 Hexachlorobenzene

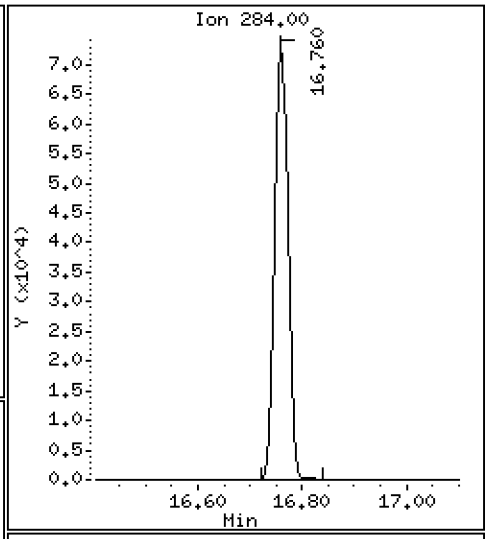
Concentration: 4.719 ug/mL

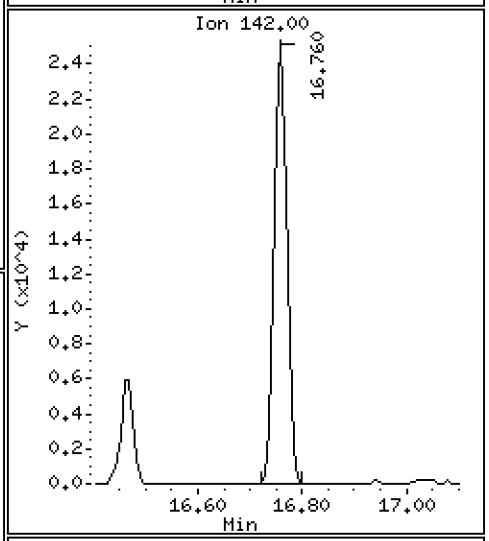


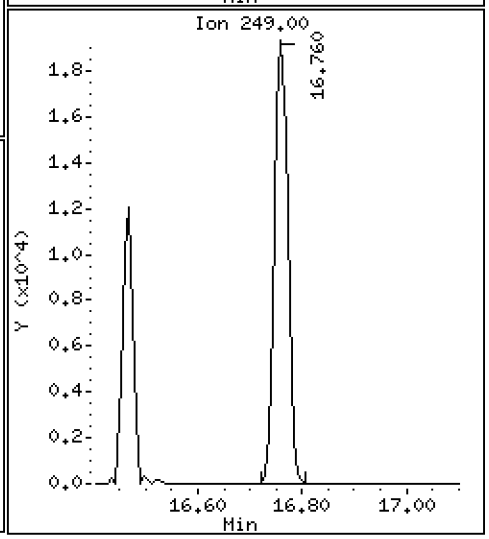












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

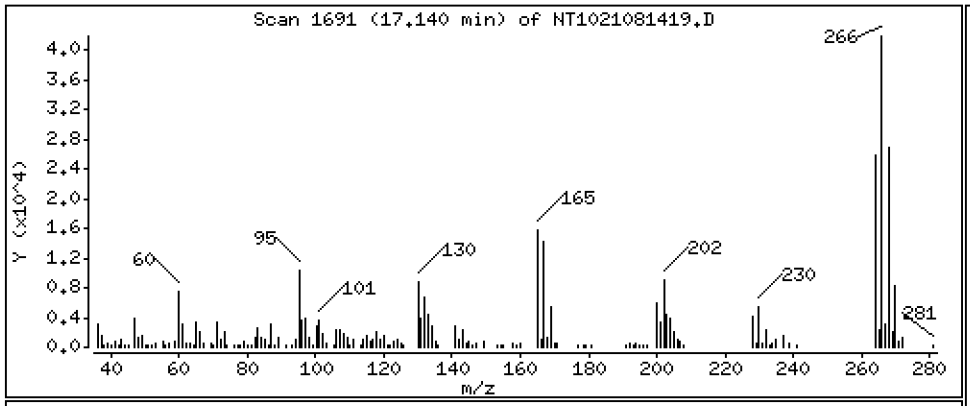
Operator: VTS

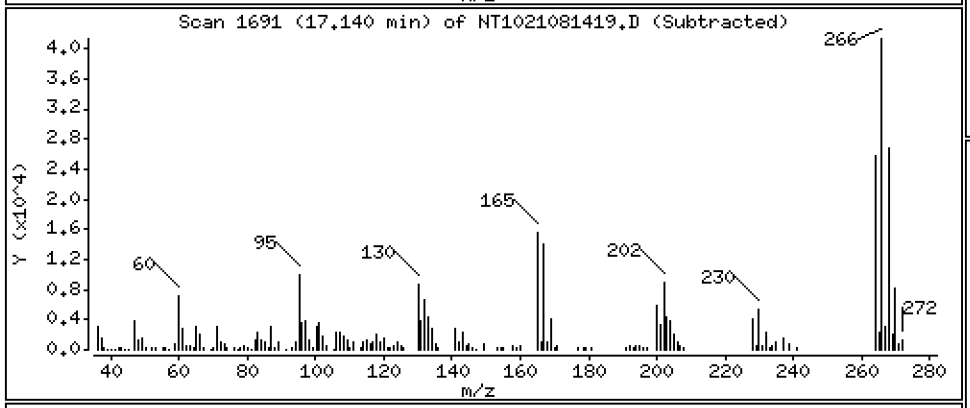
Column phase: ZB-5msi

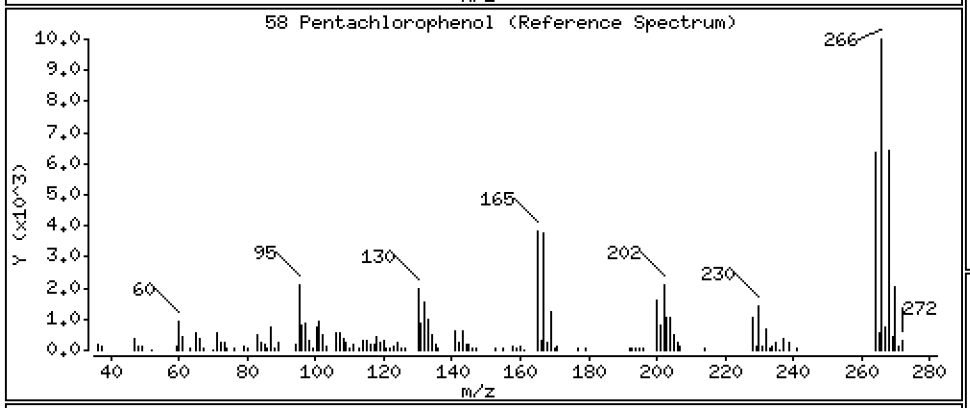
Column diameter: 0.25

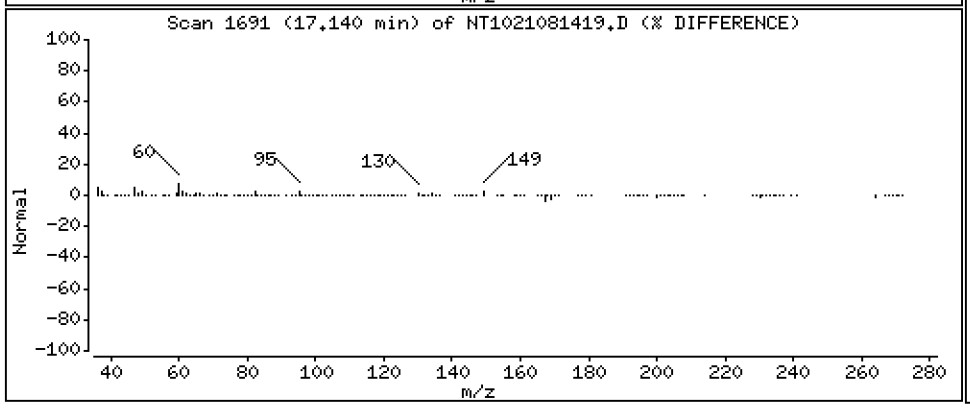
58 Pentachlorophenol

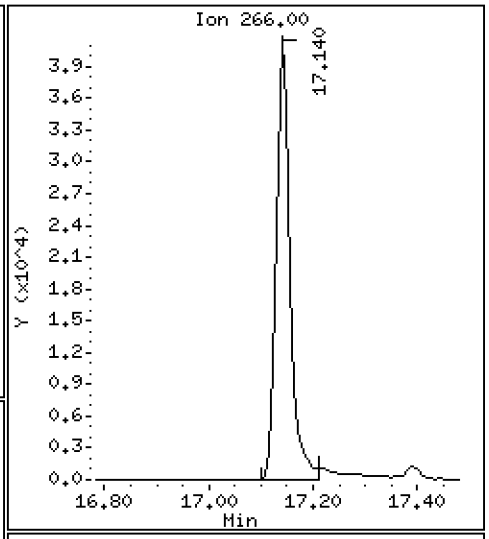
Concentration: 6.930 ug/mL

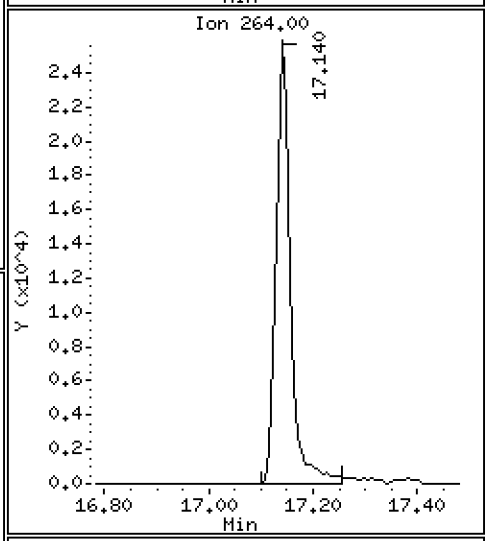


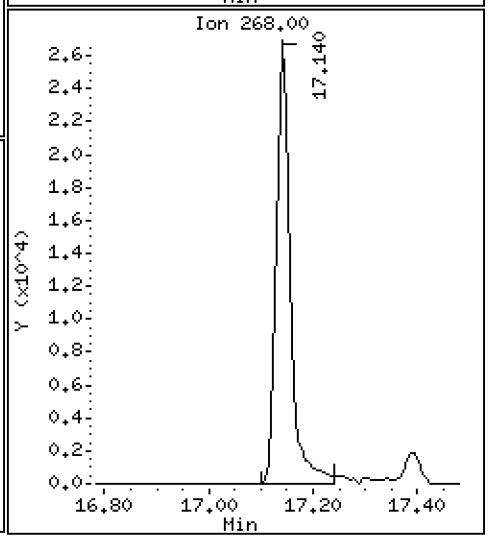












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

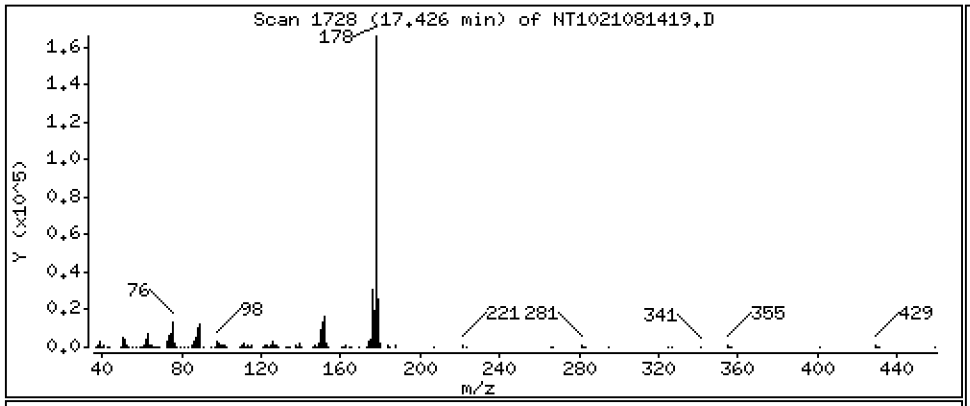
Operator: VTS

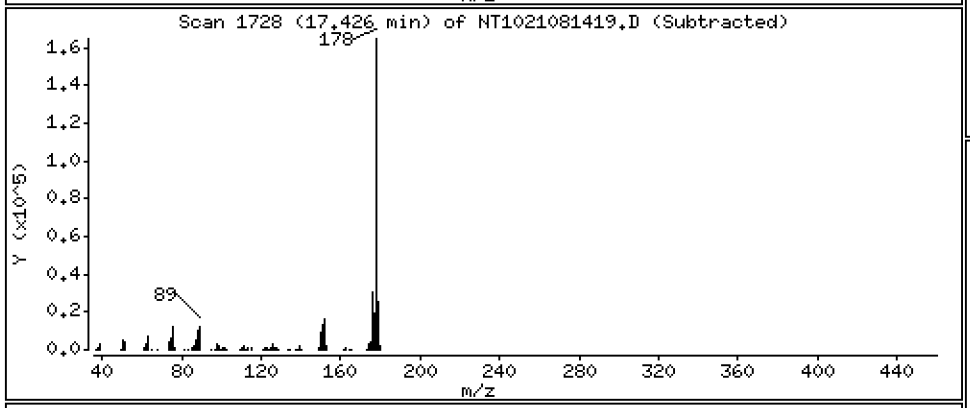
Column phase: ZB-5msi

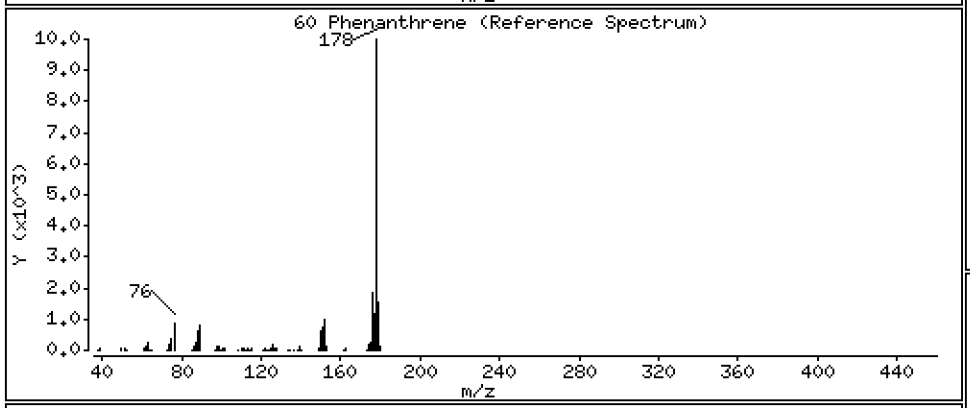
Column diameter: 0.25

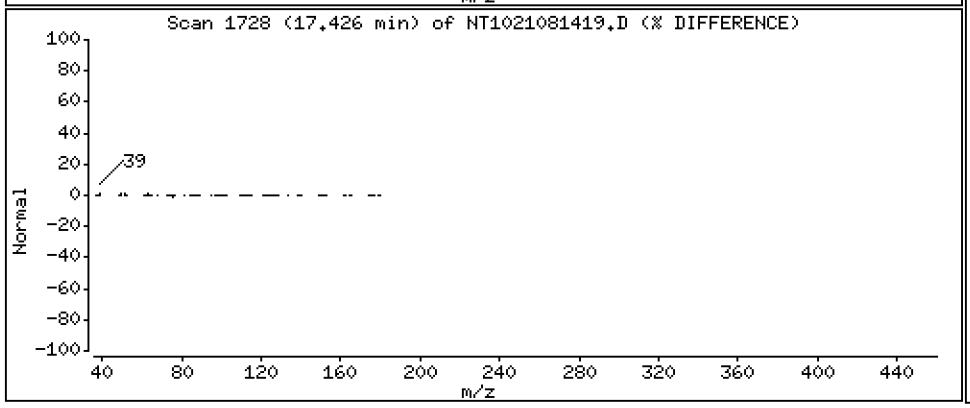
60 Phenanthrene

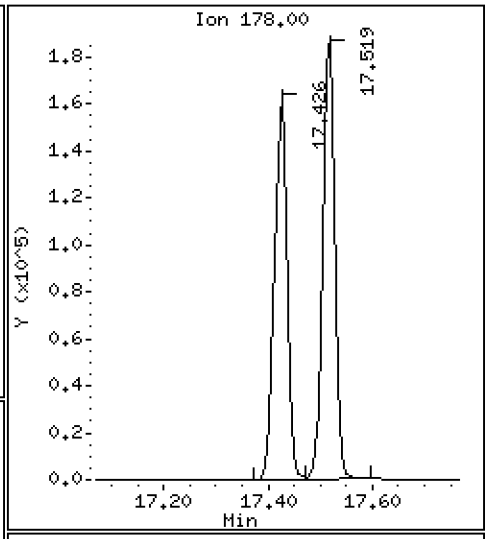
Concentration: 3.585 ug/mL

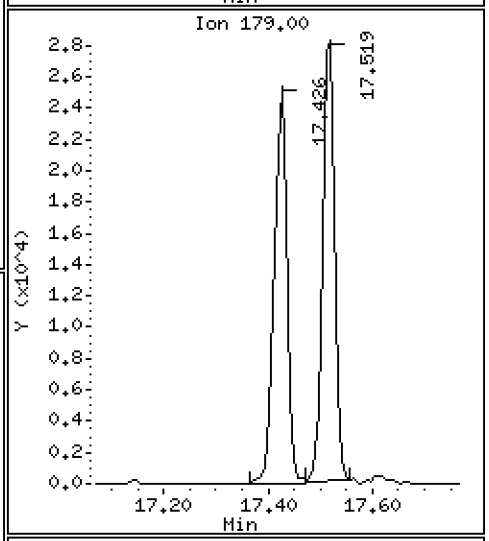


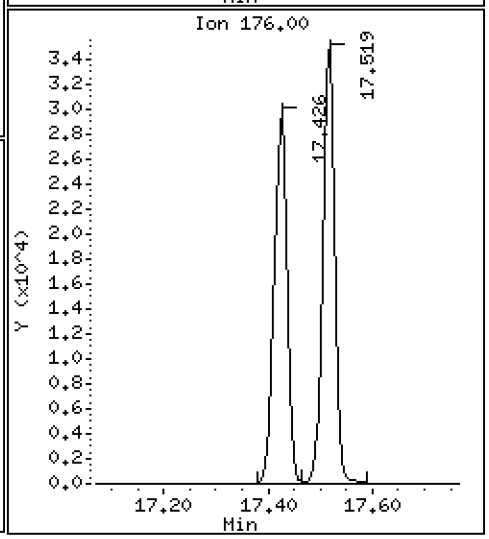












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

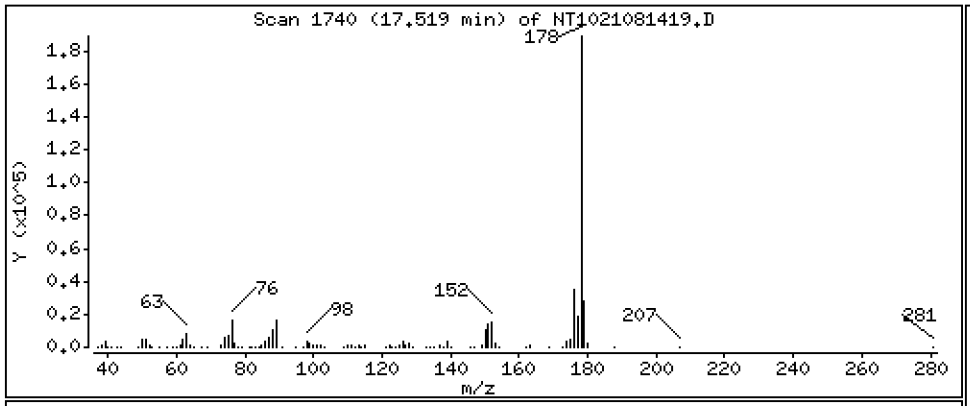
Operator: VTS

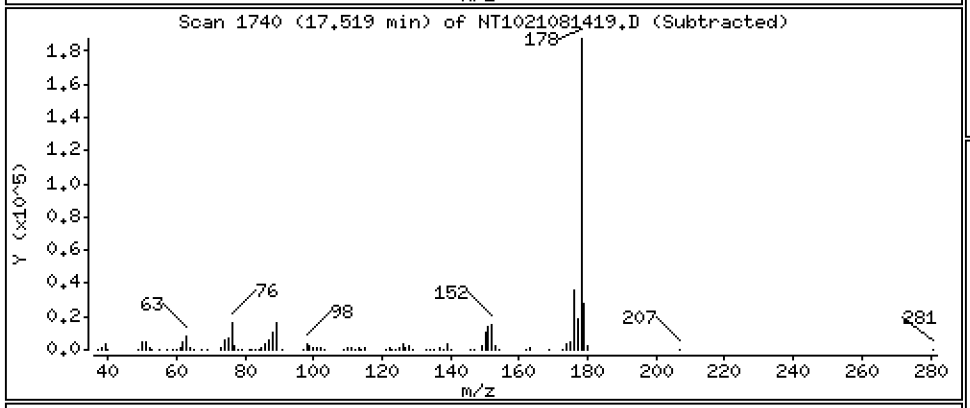
Column phase: ZB-5msi

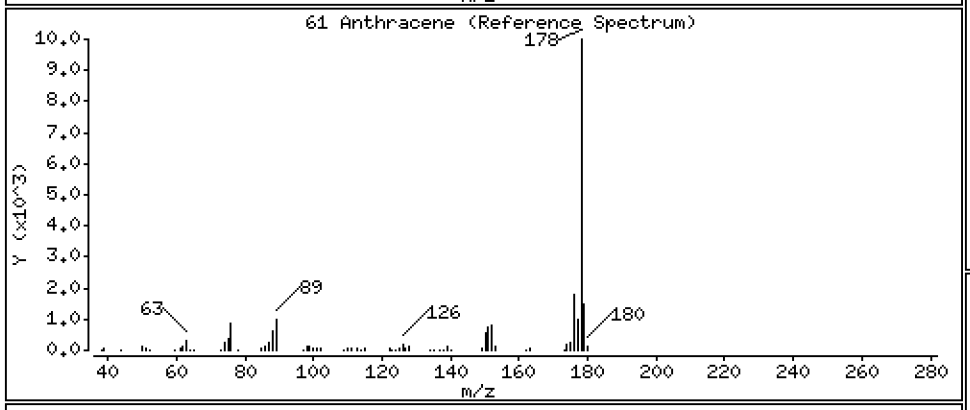
Column diameter: 0.25

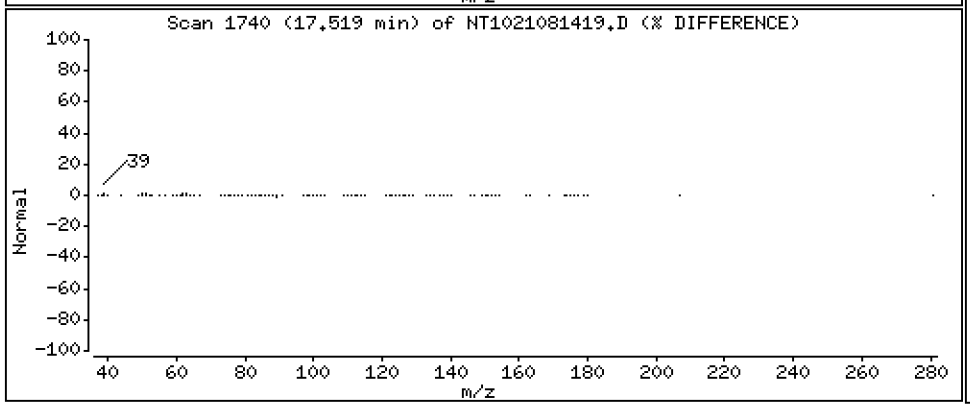
61 Anthracene

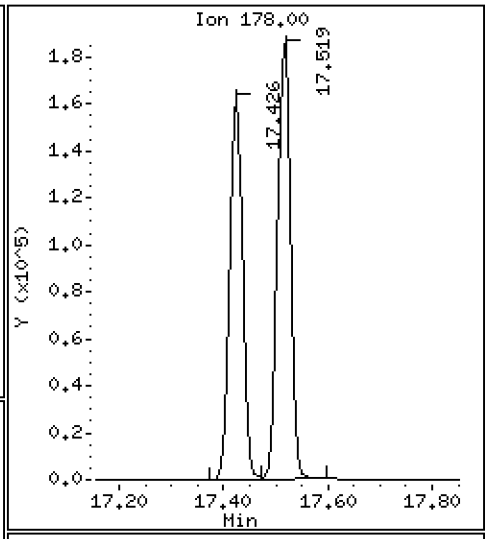
Concentration: 3.931 ug/mL

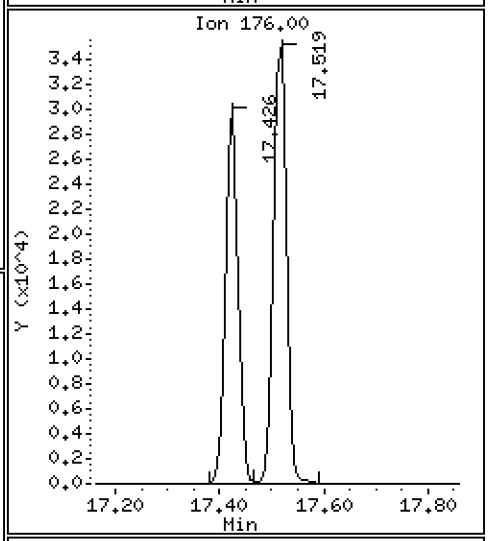


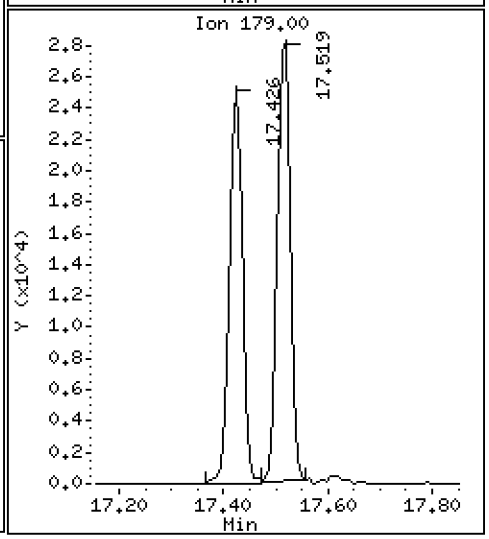












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

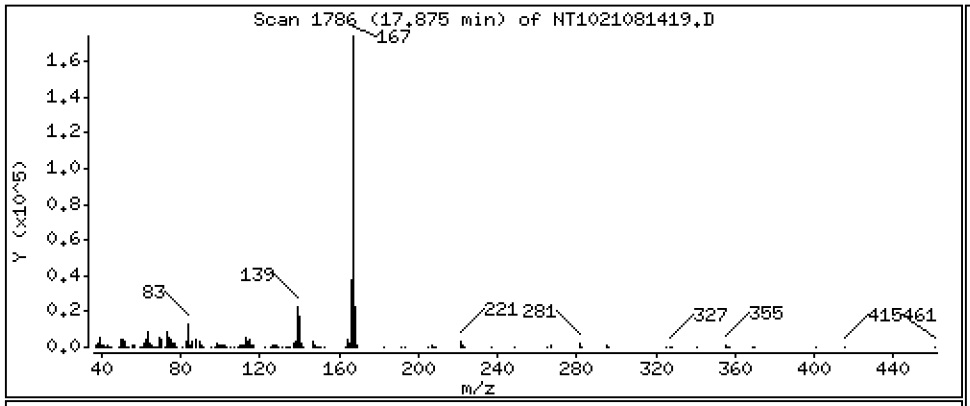
Operator: VTS

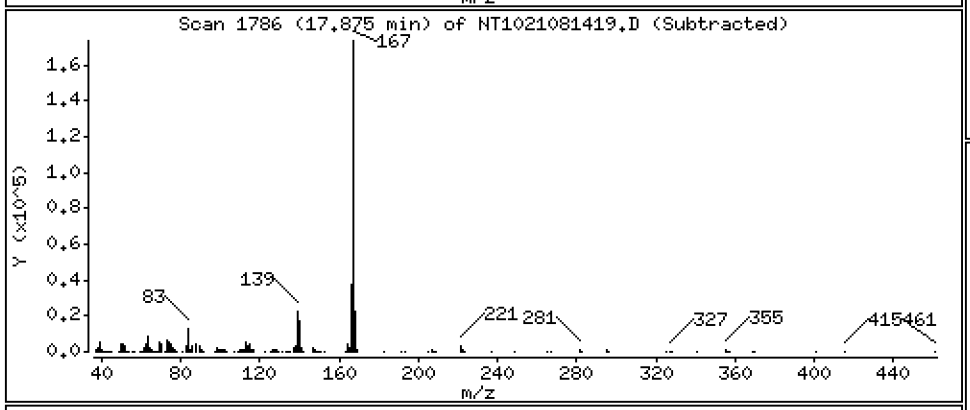
Column phase: ZB-5msi

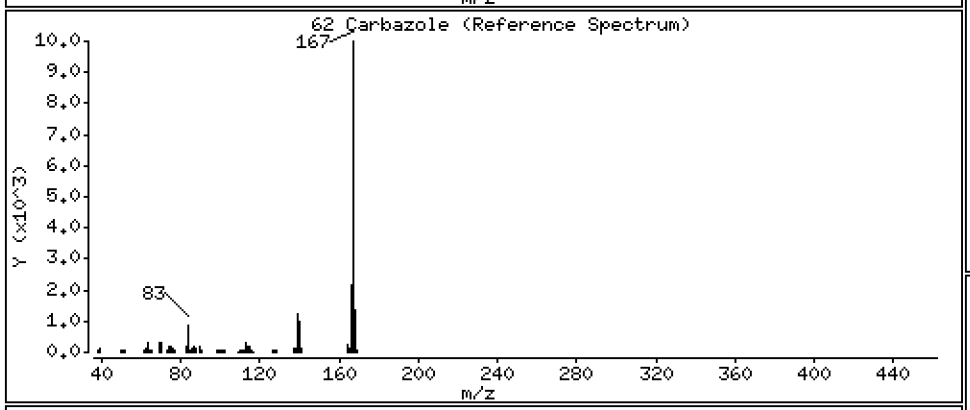
Column diameter: 0.25

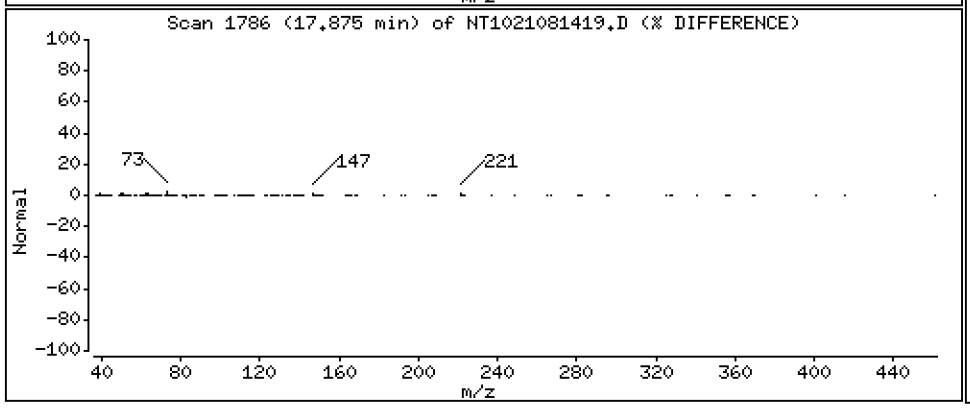
62 Carbazole

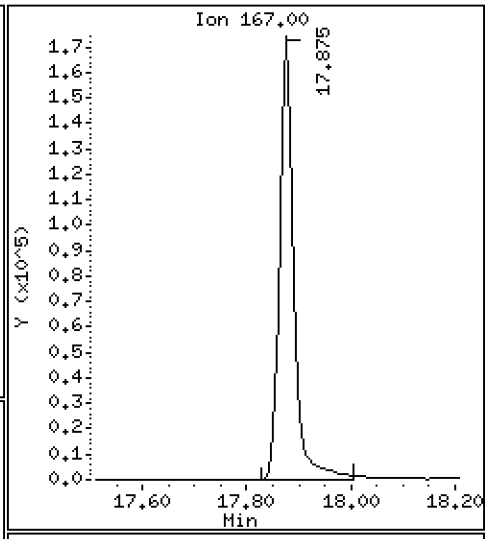
Concentration: 4.275 ug/mL

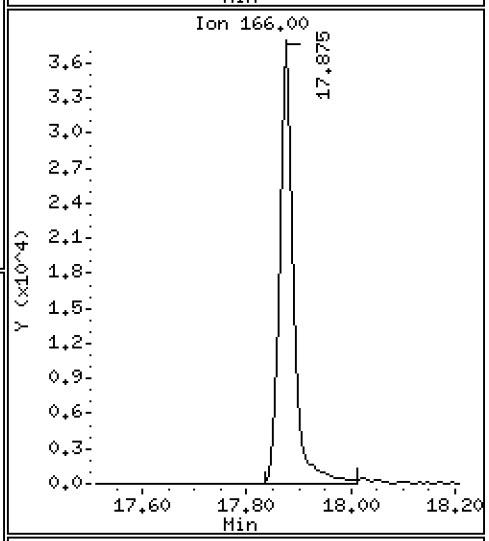


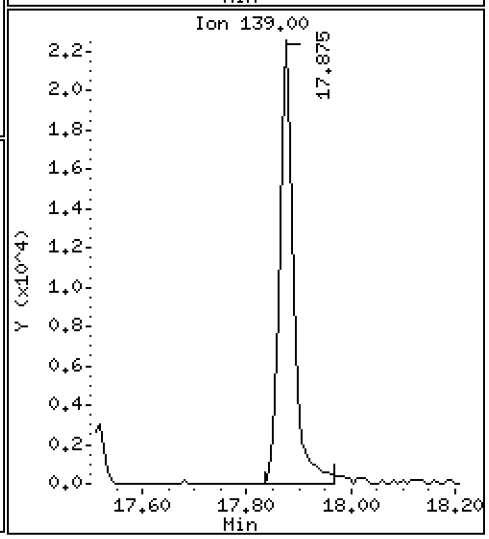












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

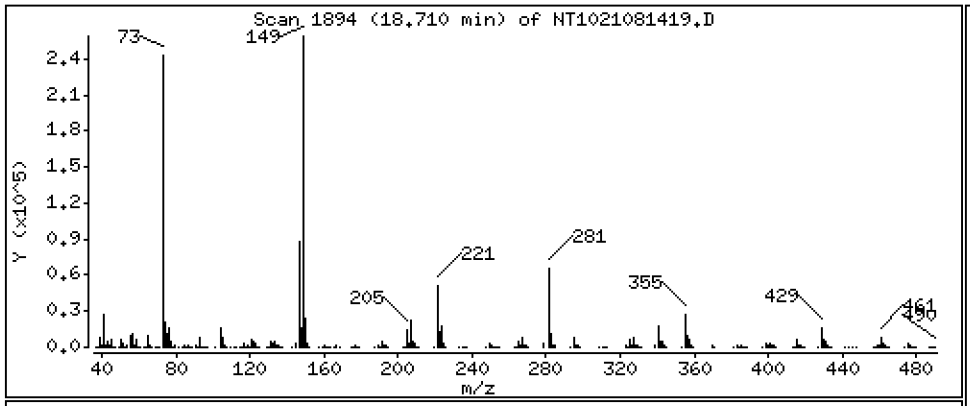
Operator: VTS

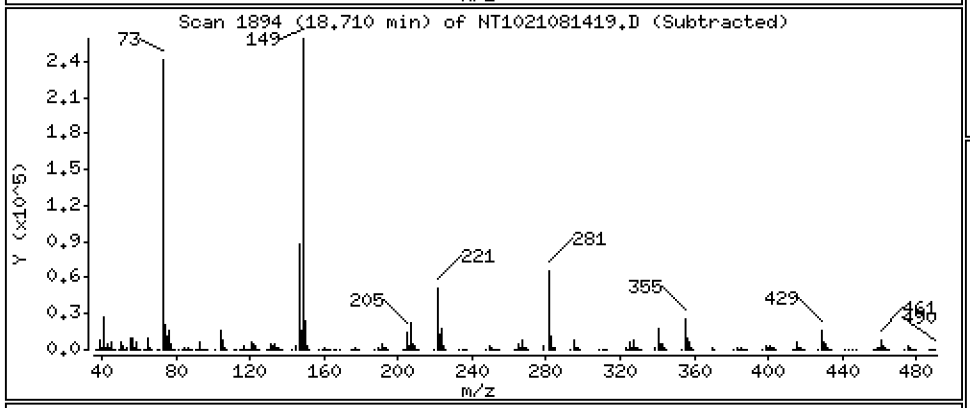
Column phase: ZB-5msi

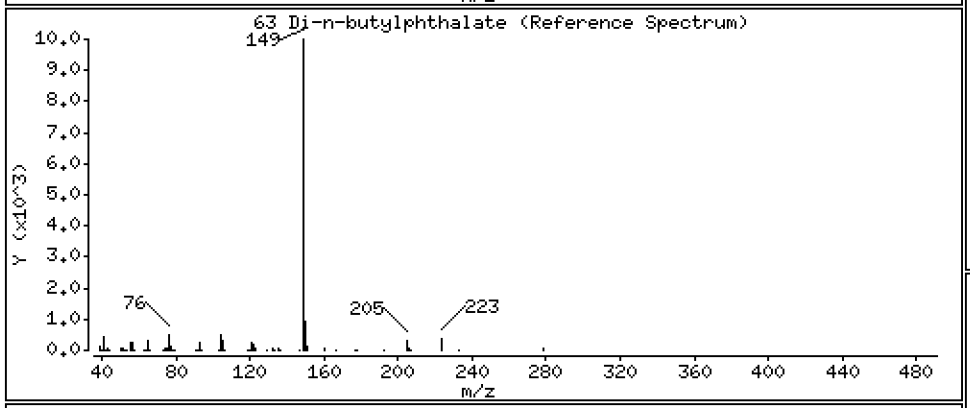
Column diameter: 0.25

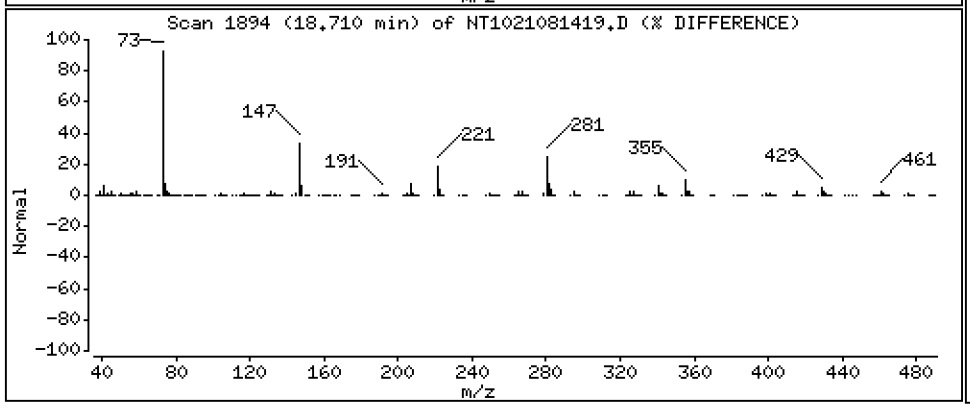
63 Di-n-butylphthalate

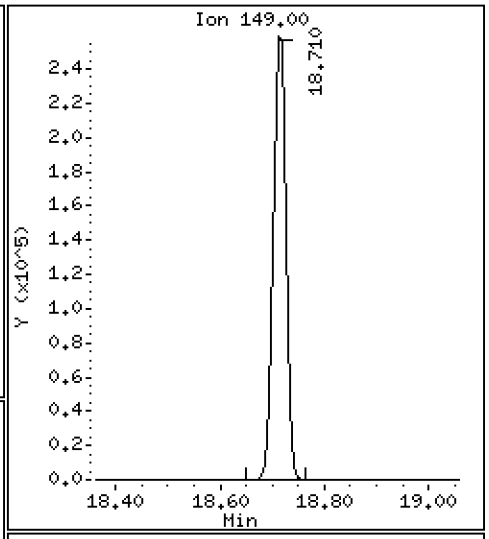
Concentration: 3.464 ug/mL

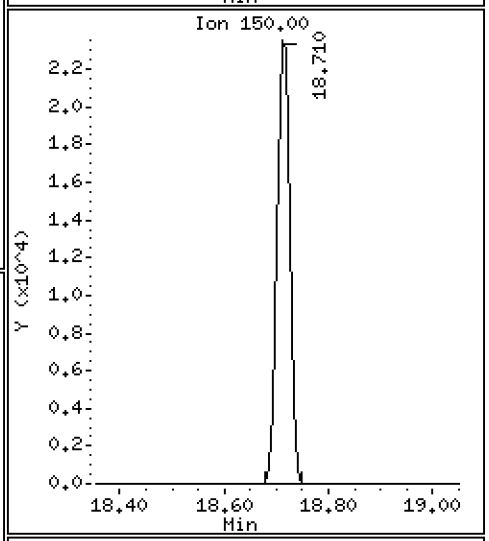


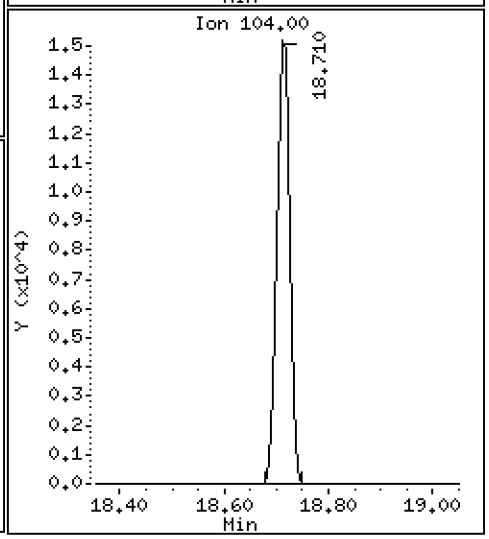












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081419.D

Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

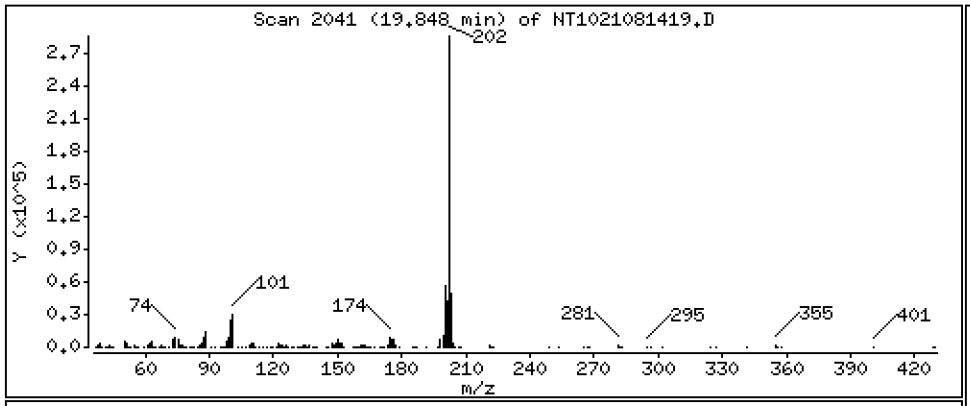
Operator: VTS

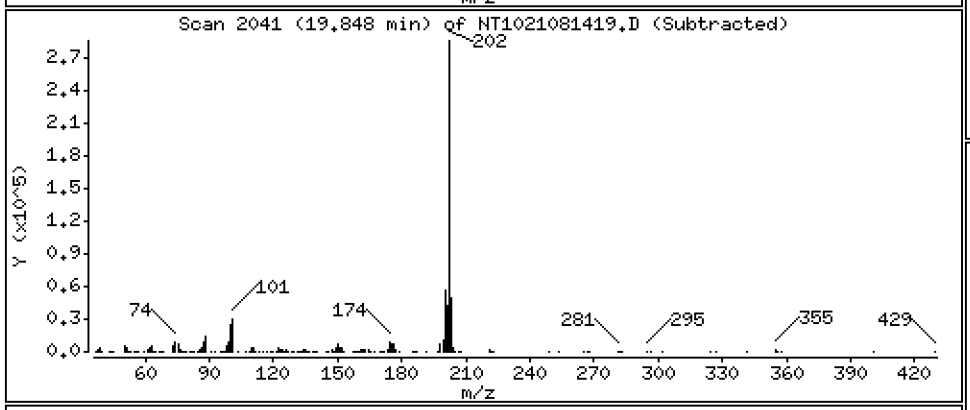
Column phase: ZB-5msi

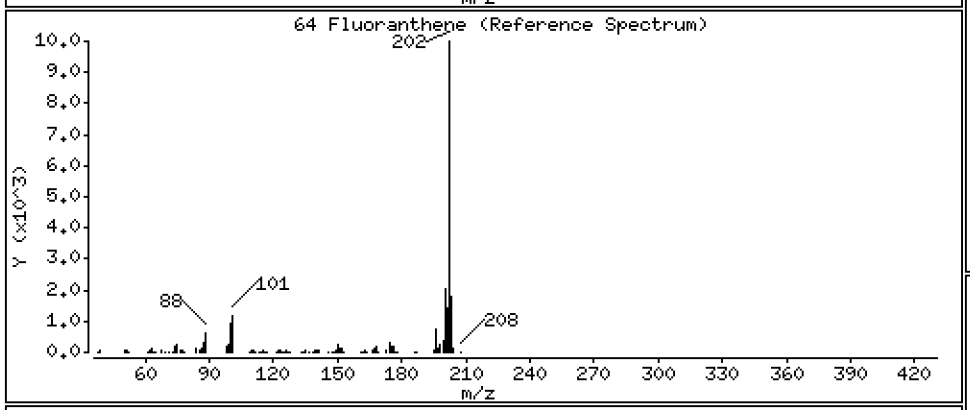
Column diameter: 0.25

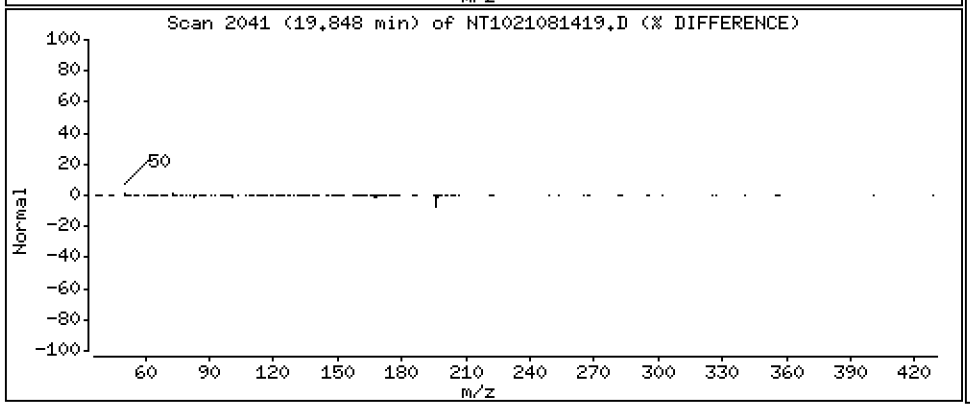
64 Fluoranthene

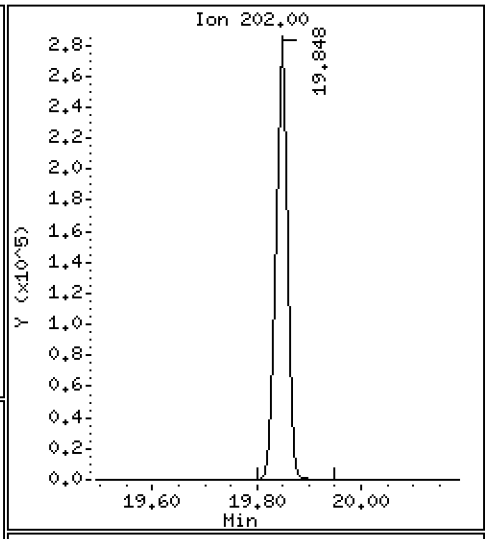
Concentration: 5.492 ug/mL

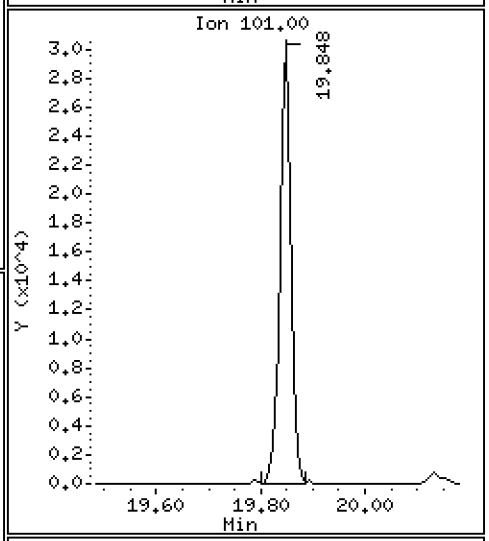


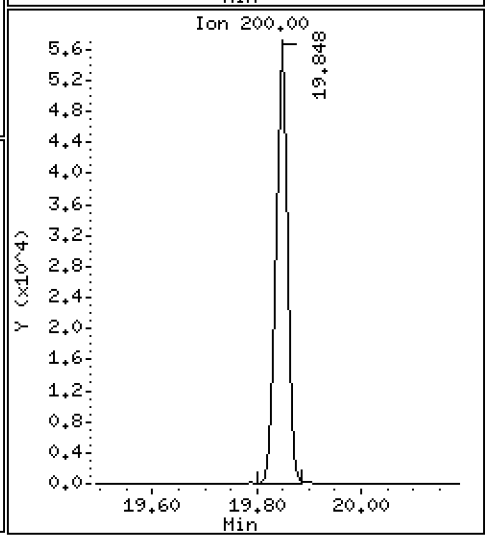












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081419.D

Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

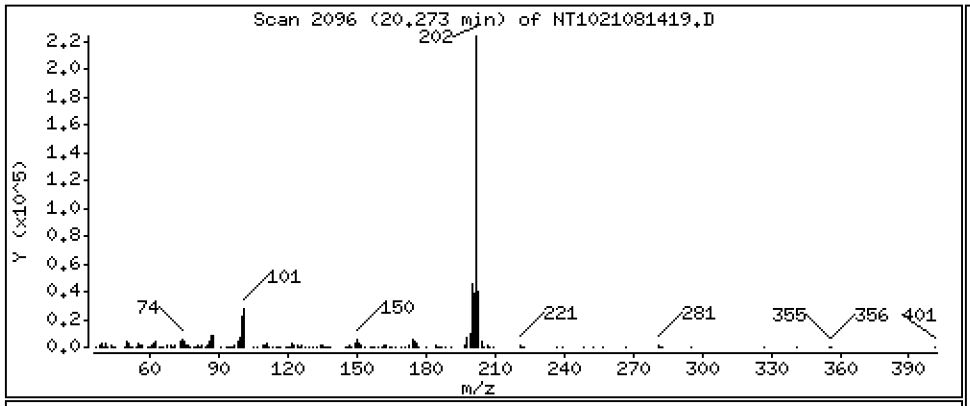
Operator: VTS

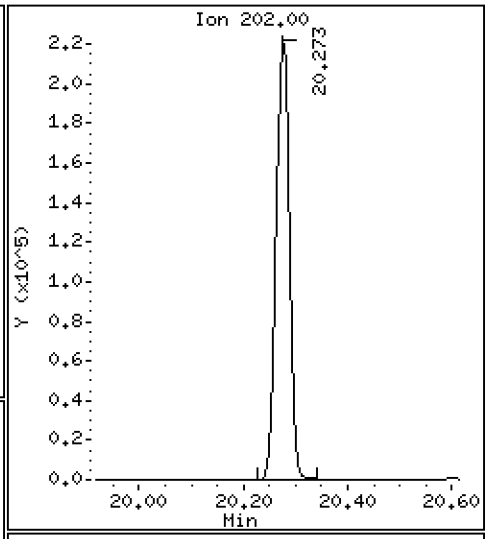
Column phase: ZB-5msi

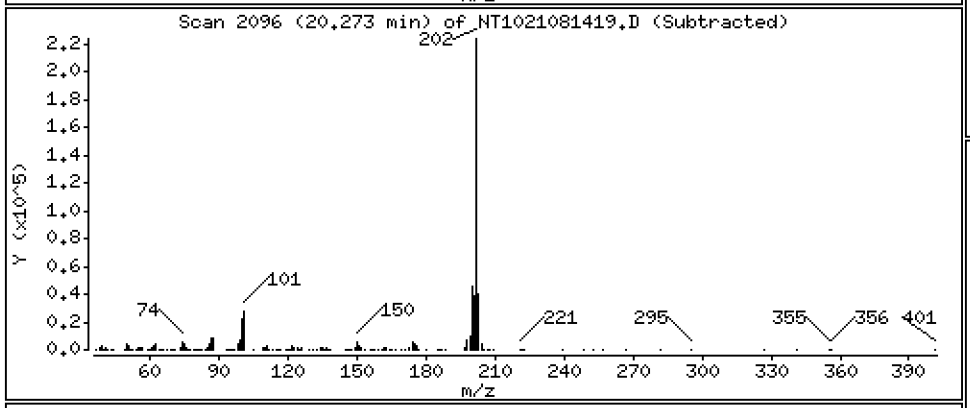
Column diameter: 0.25

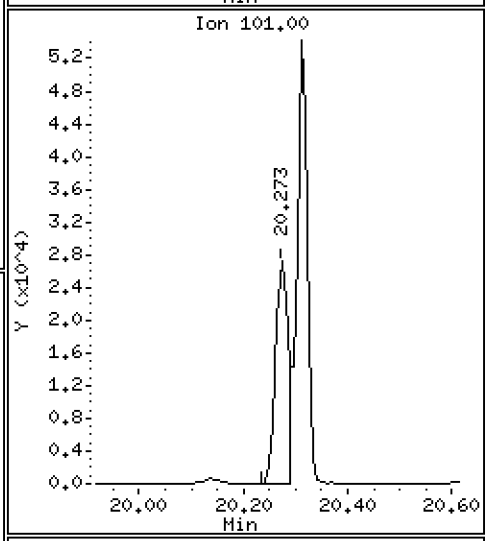
65 Pyrene

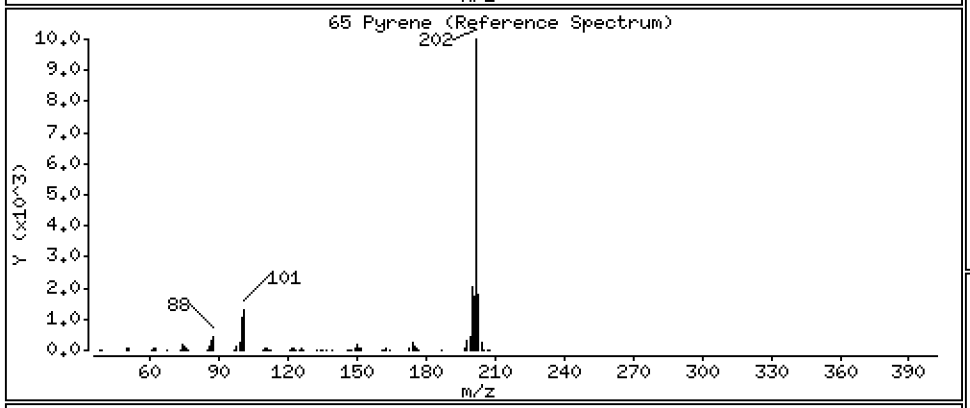
Concentration: 4.406 ug/mL

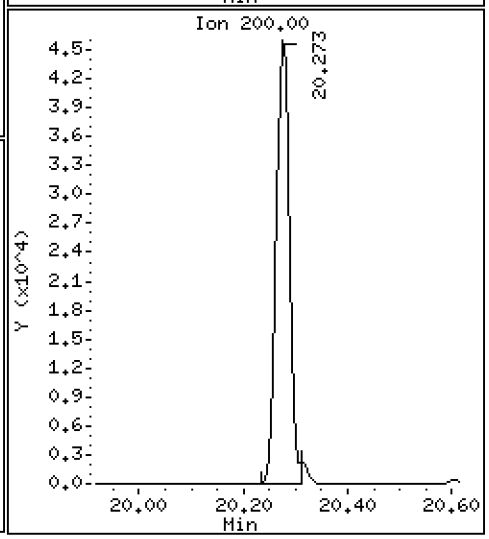


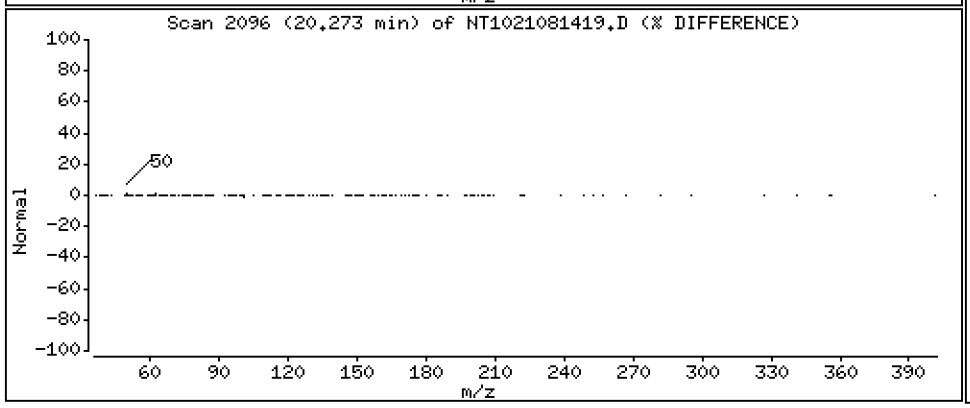












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

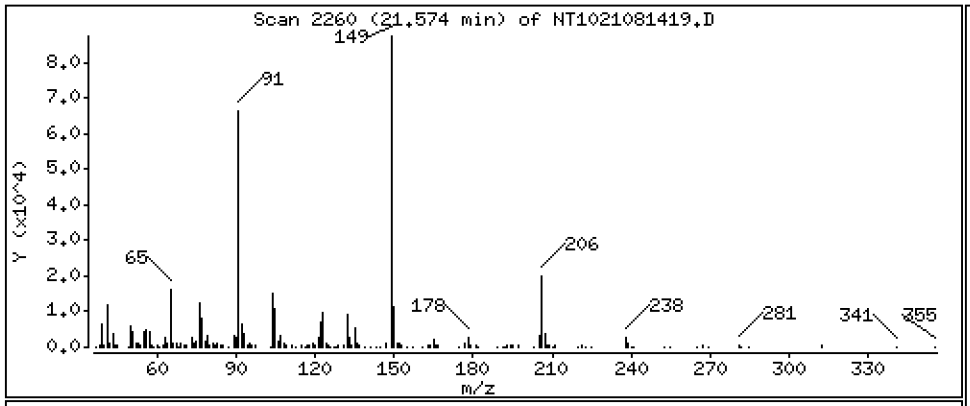
Operator: VTS

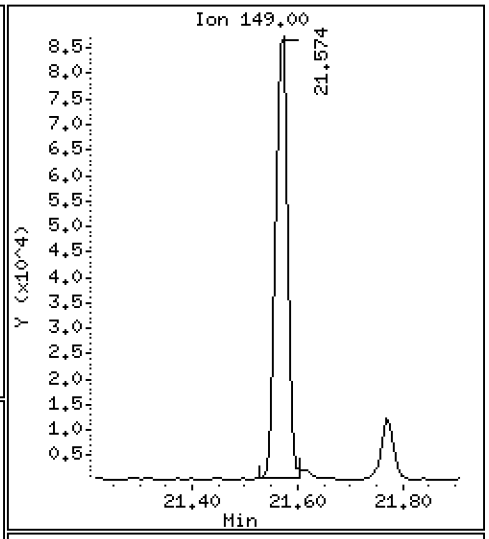
Column phase: ZB-5msi

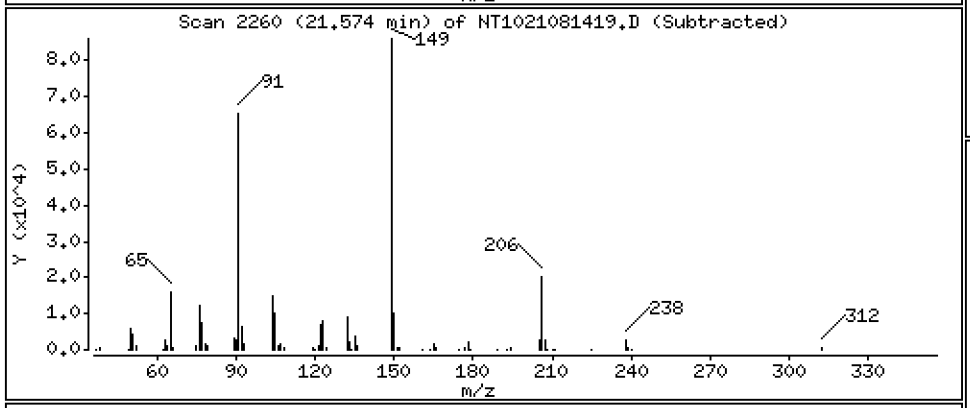
Column diameter: 0.25

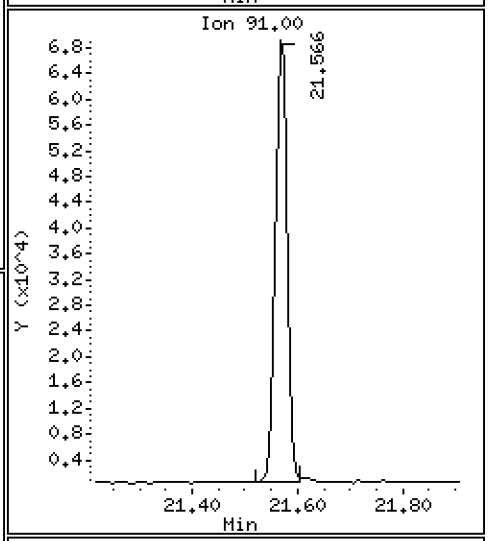
67 Butylbenzylphthalate

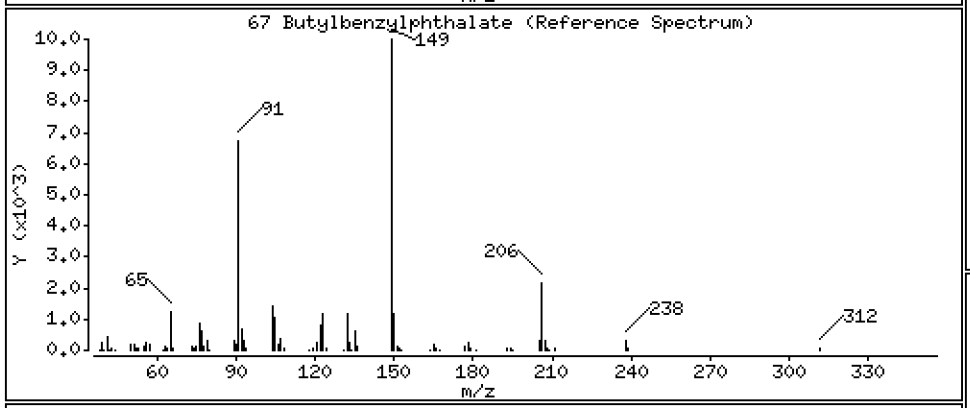
Concentration: 4.768 ug/mL

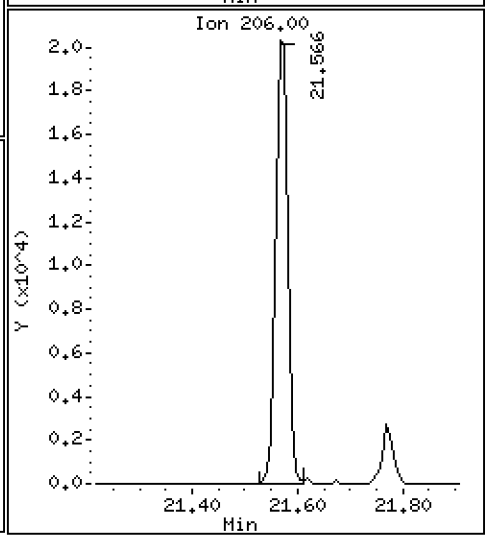


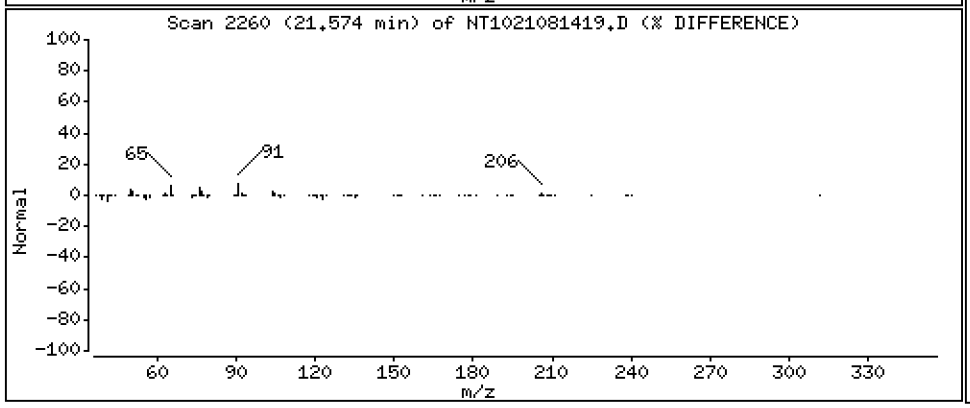












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

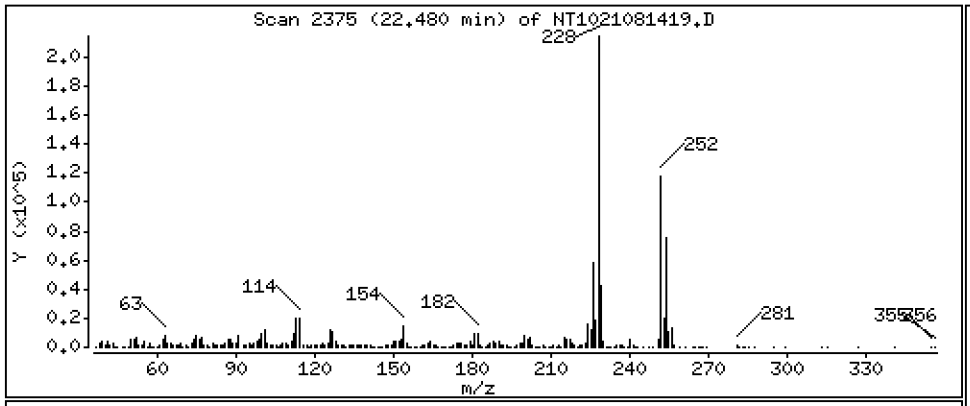
Operator: VTS

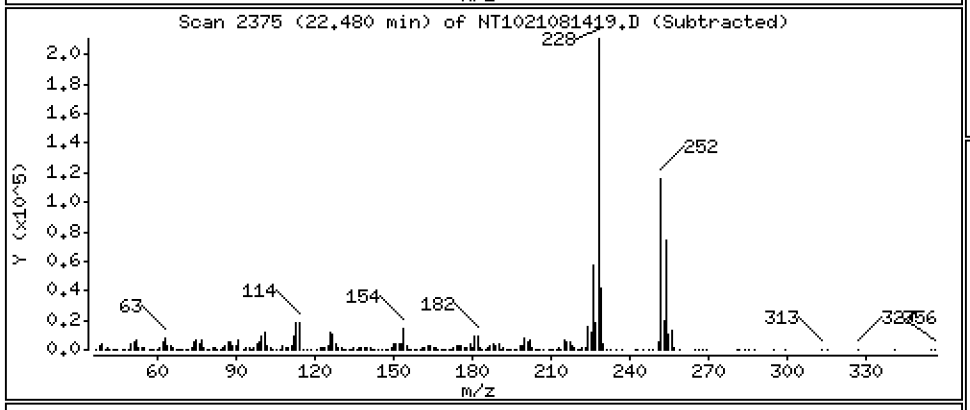
Column phase: ZB-5msi

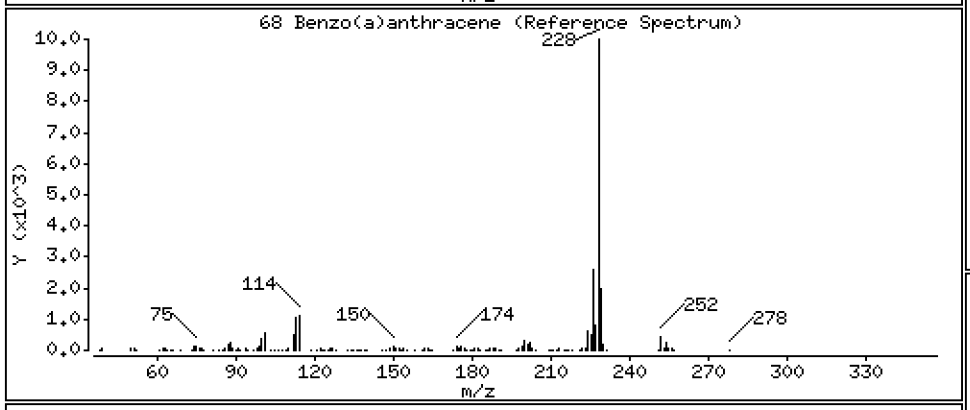
Column diameter: 0.25

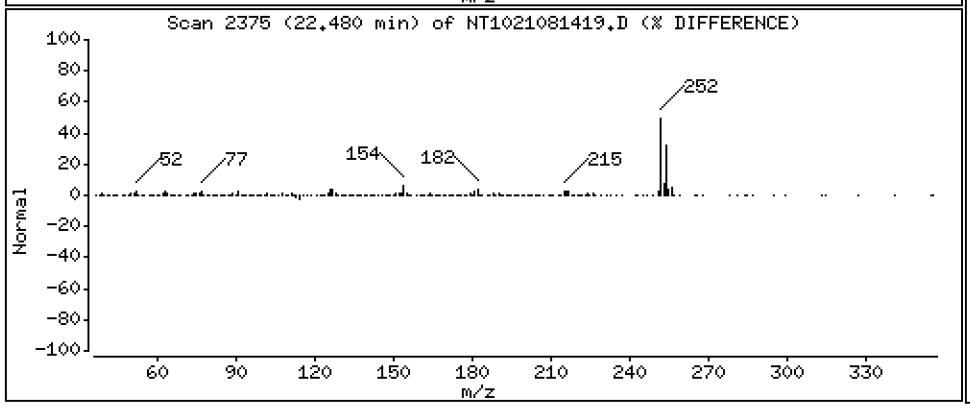
68 Benzo(a)anthracene

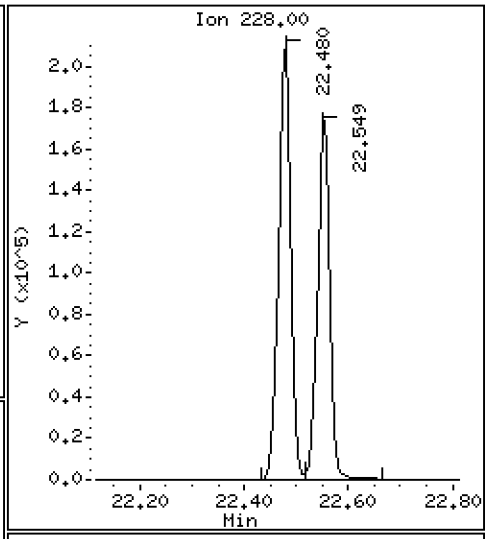
Concentration: 4.967 ug/mL

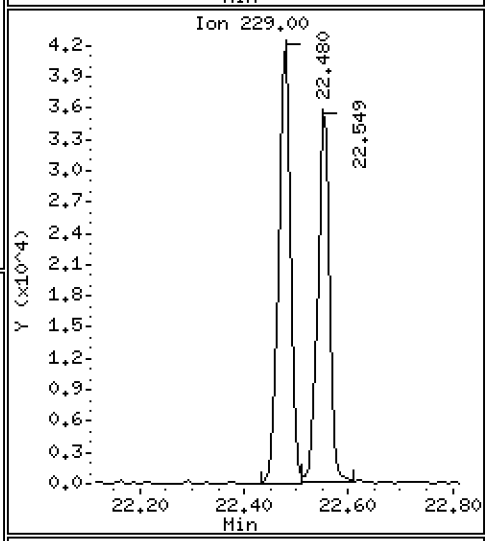


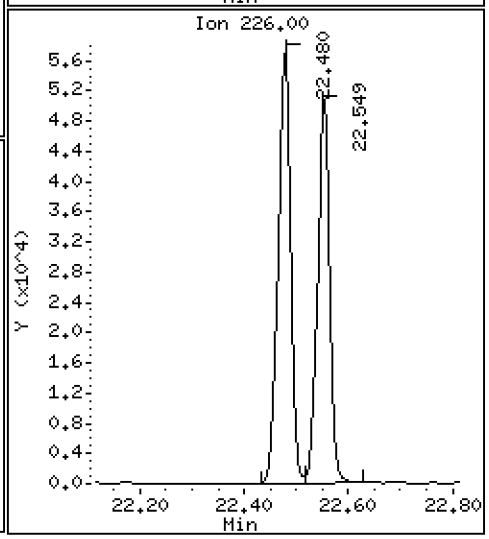












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

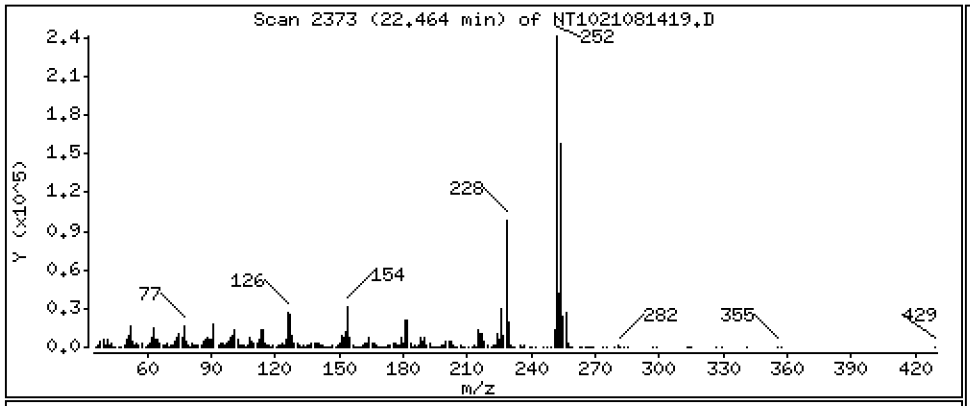
Operator: VTS

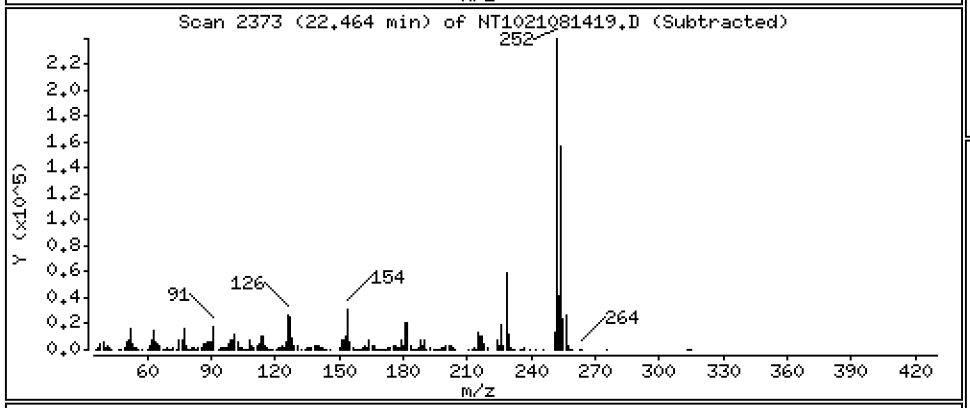
Column phase: ZB-5msi

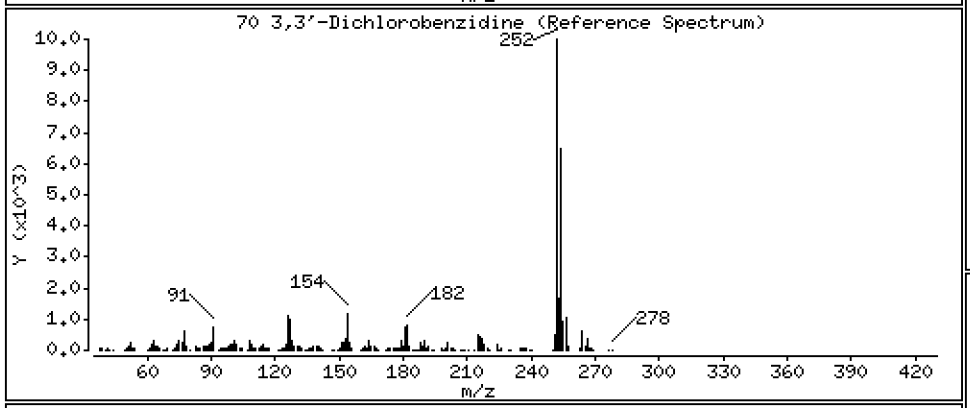
Column diameter: 0.25

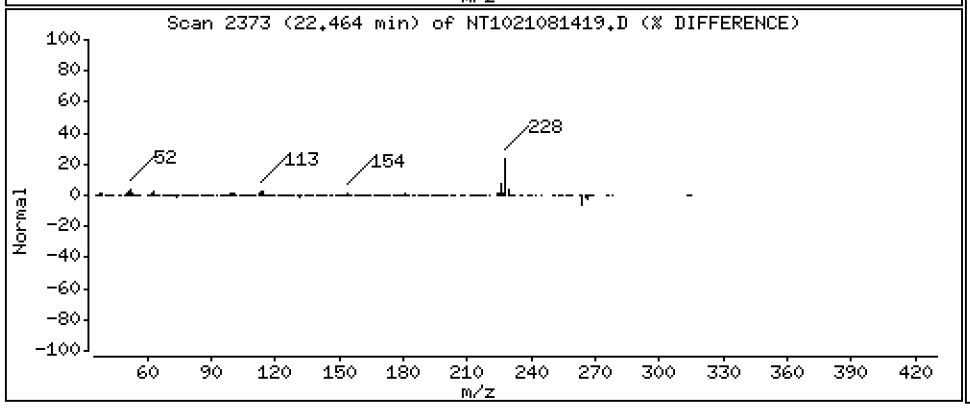
70 3,3'-Dichlorobenzidine

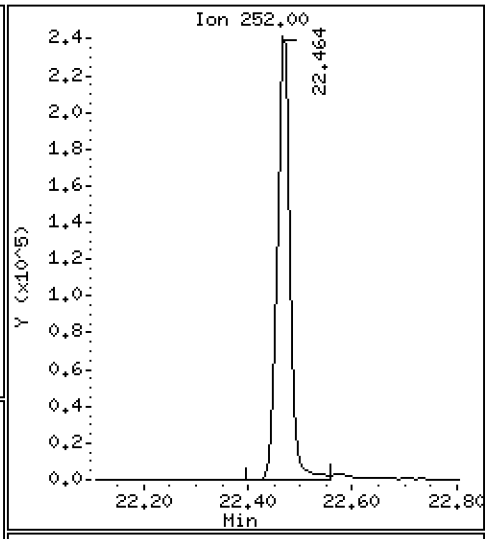
Concentration: 14.84 ug/mL

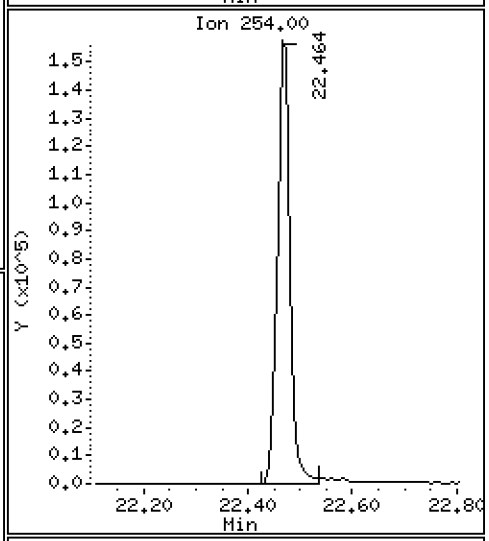


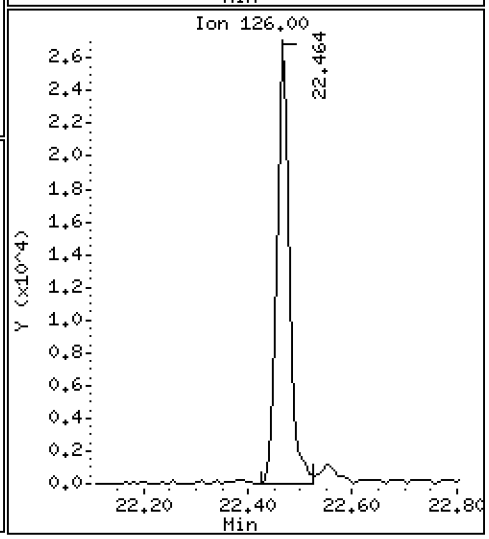












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

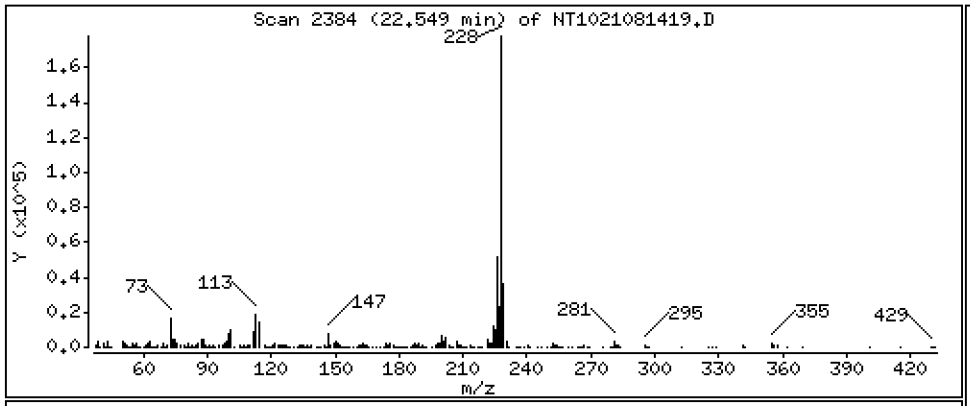
Operator: VTS

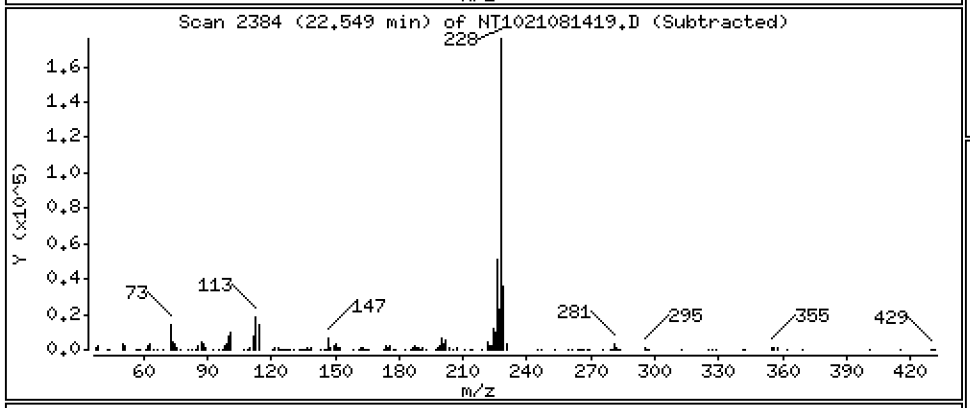
Column phase: ZB-5msi

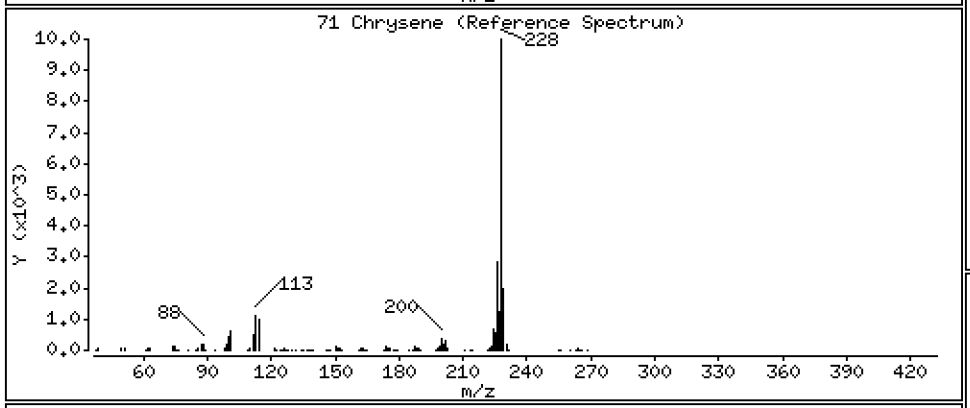
Column diameter: 0.25

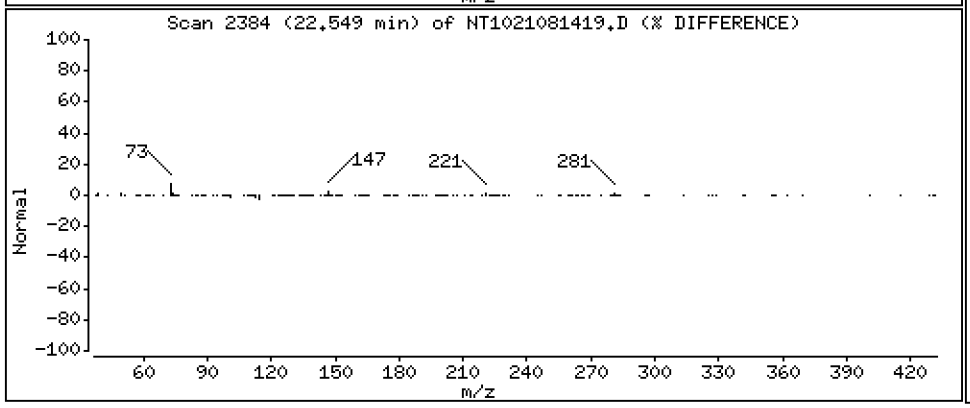
71 Chrysene

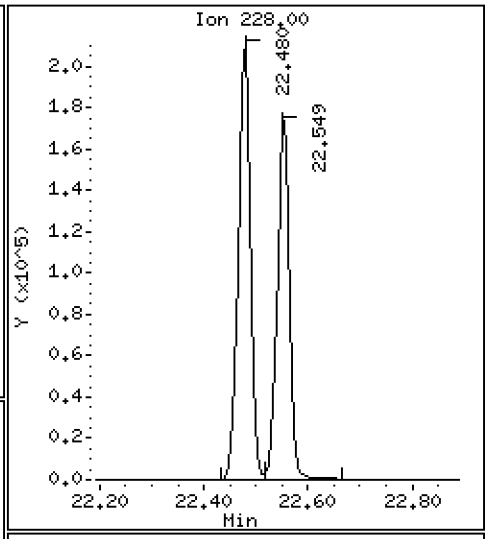
Concentration: 5.268 ug/mL

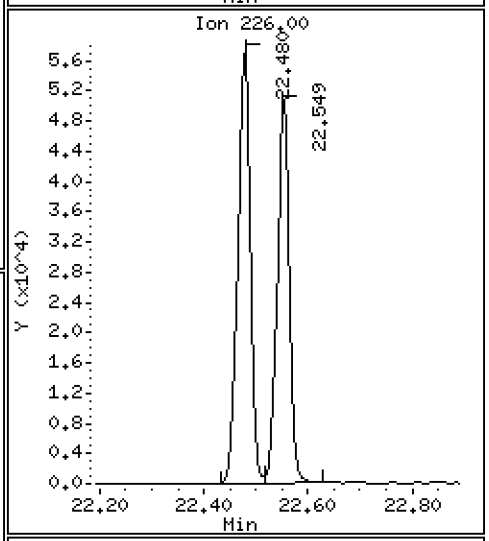


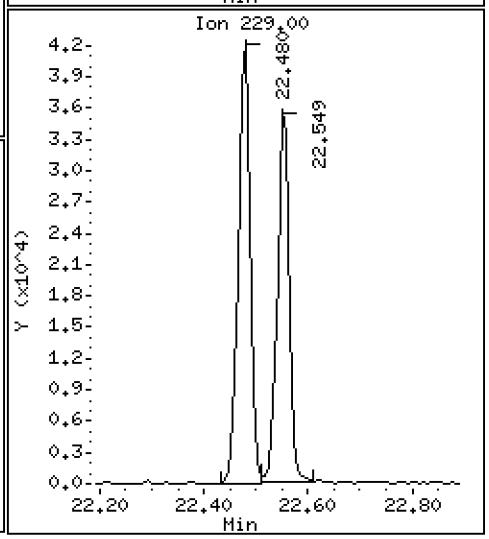












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

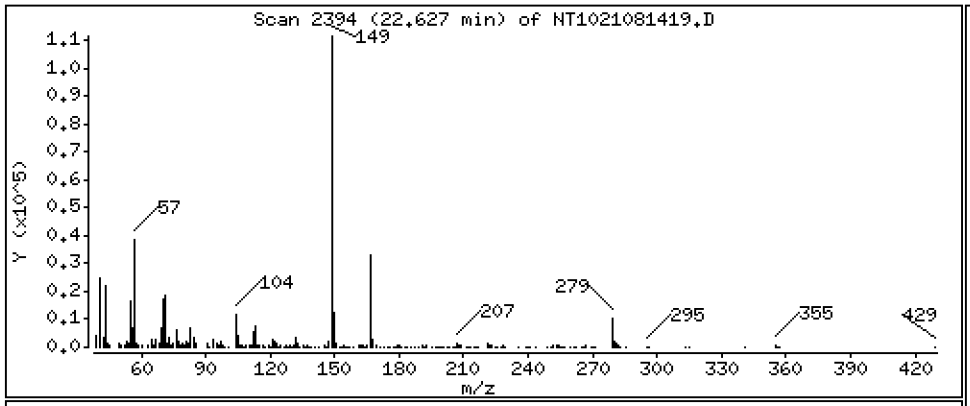
Operator: VTS

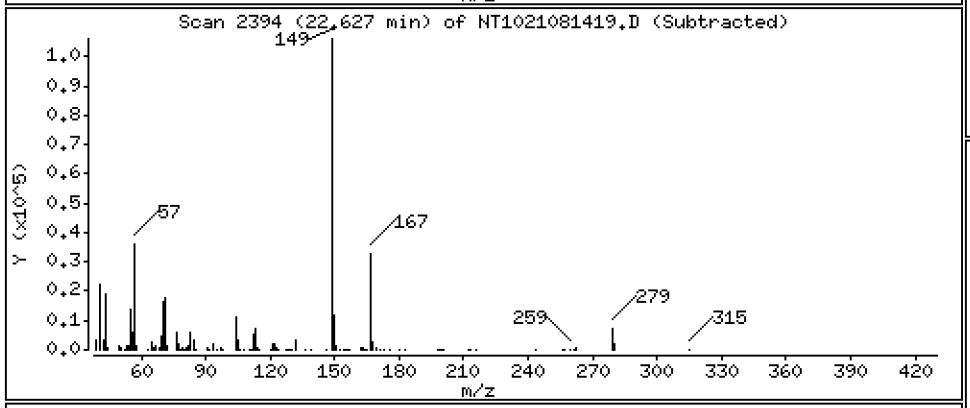
Column phase: ZB-5msi

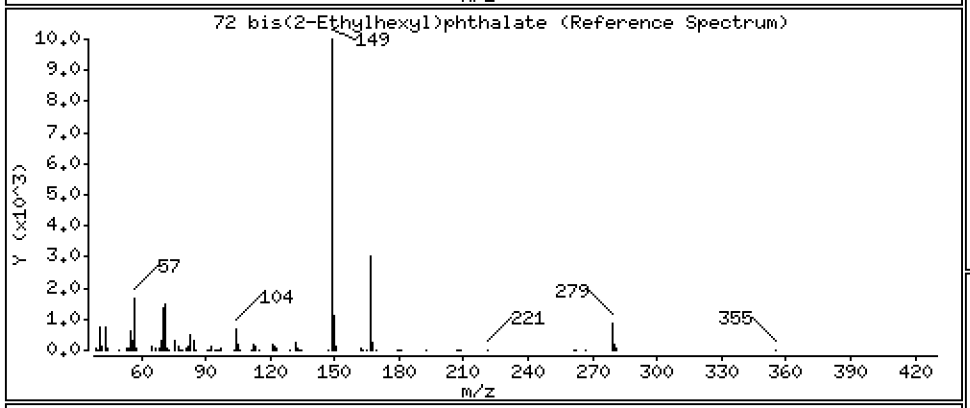
Column diameter: 0.25

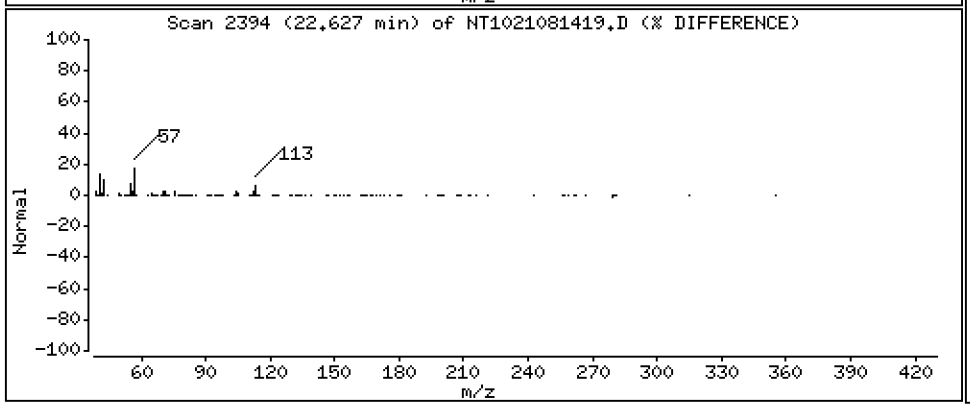
72 bis(2-Ethylhexyl)phthalate

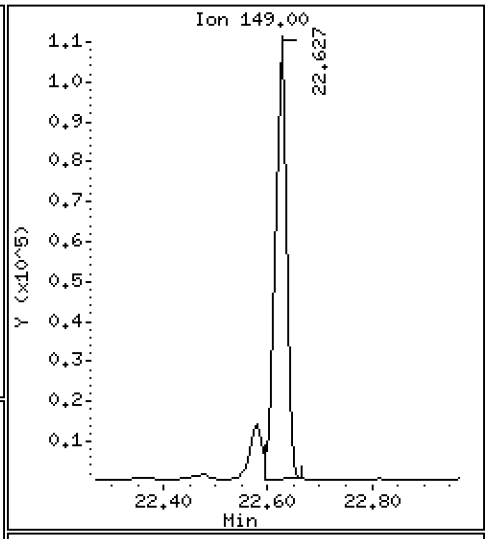
Concentration: 5.170 ug/mL

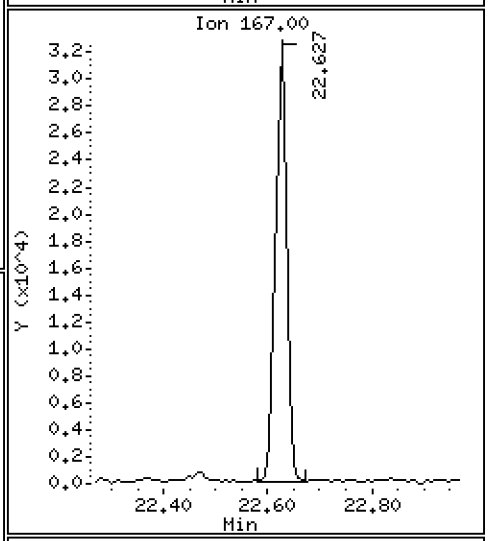


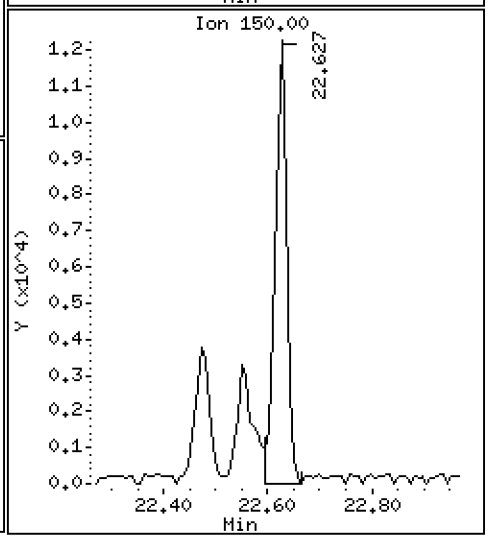












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

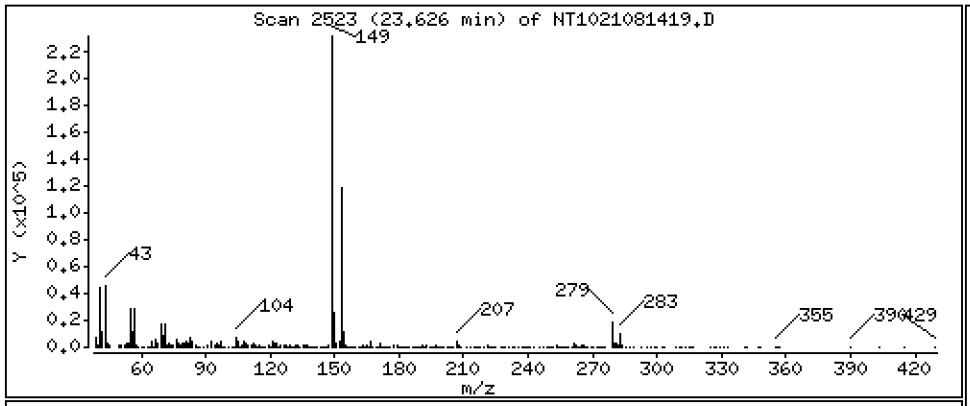
Operator: VTS

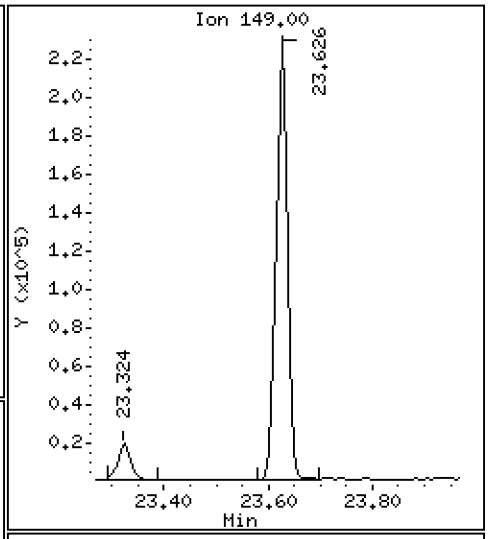
Column phase: ZB-5msi

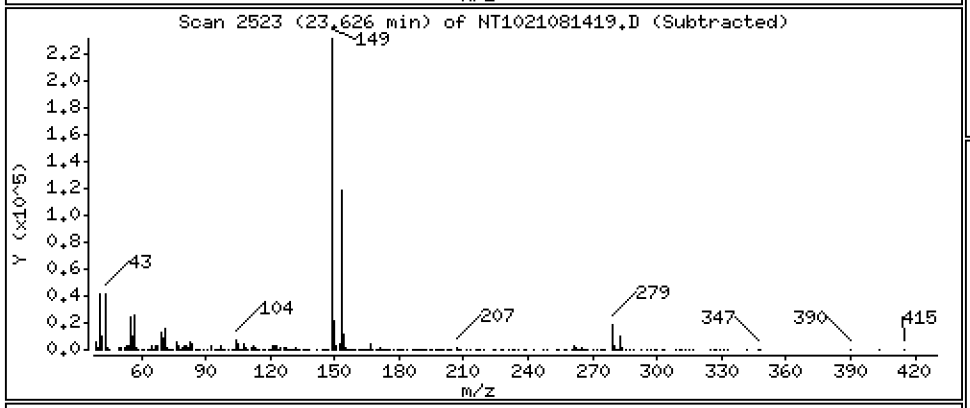
Column diameter: 0.25

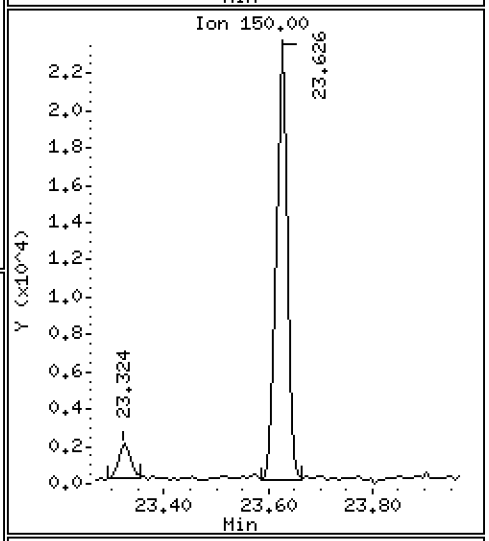
73 Di-n-octylphthalate

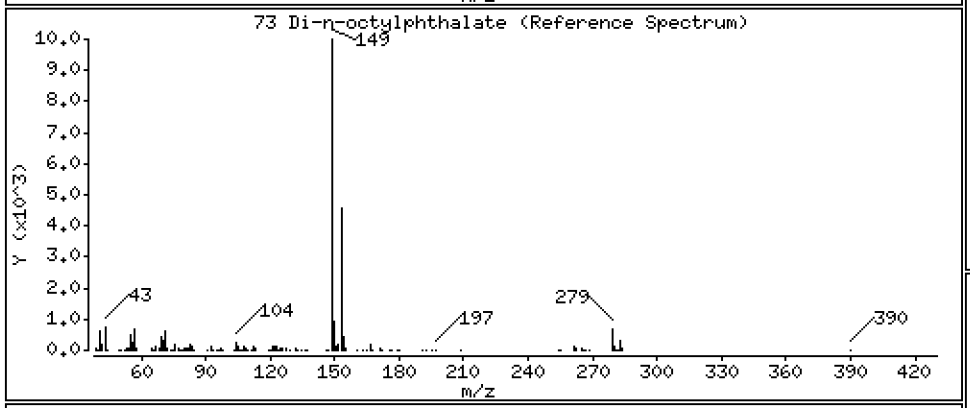
Concentration: 4.299 ug/mL

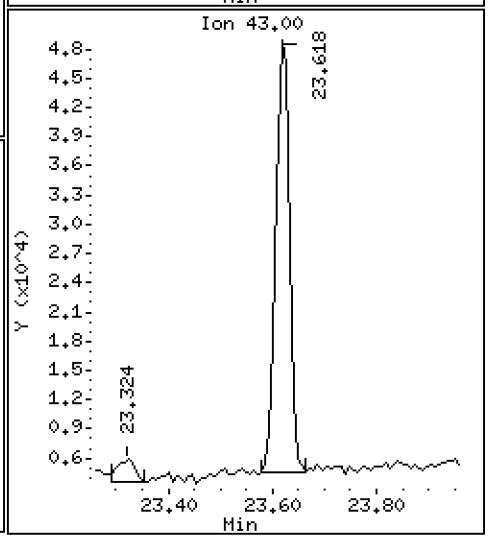


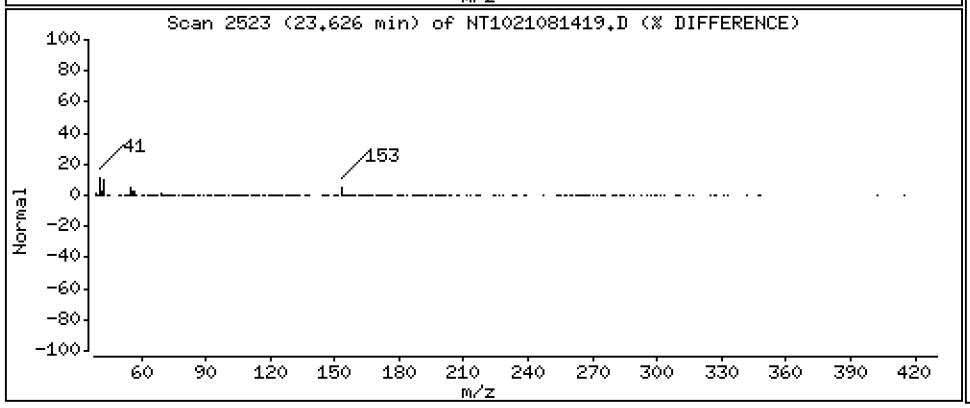












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

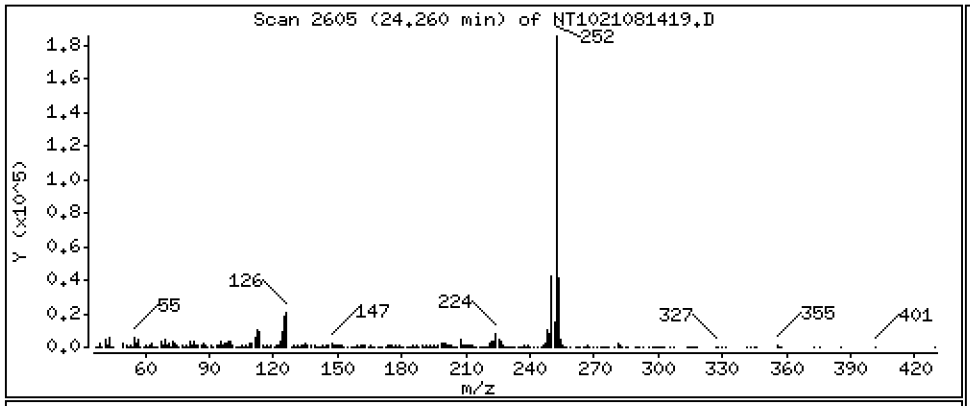
Operator: VTS

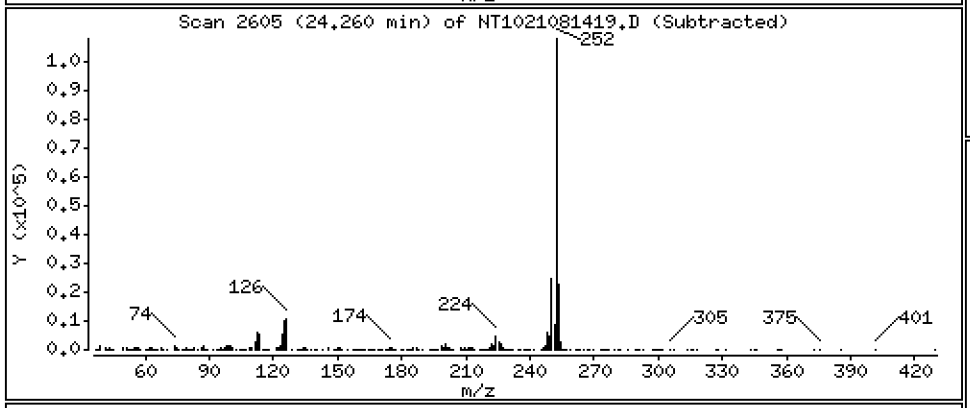
Column phase: ZB-5msi

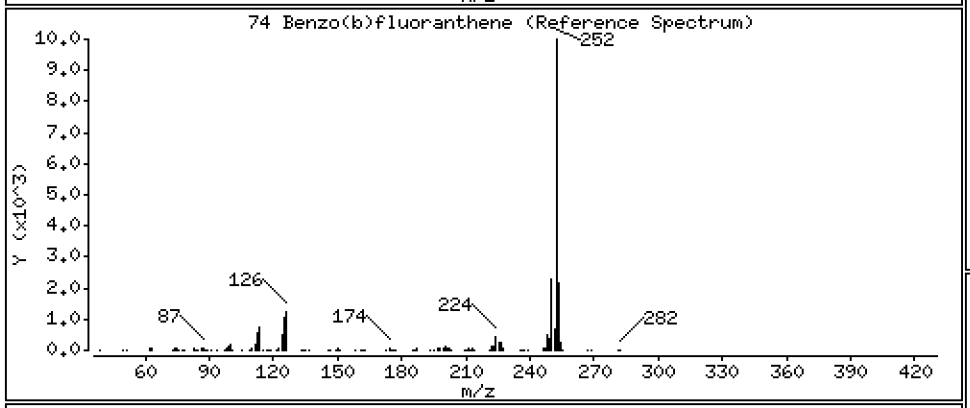
Column diameter: 0.25

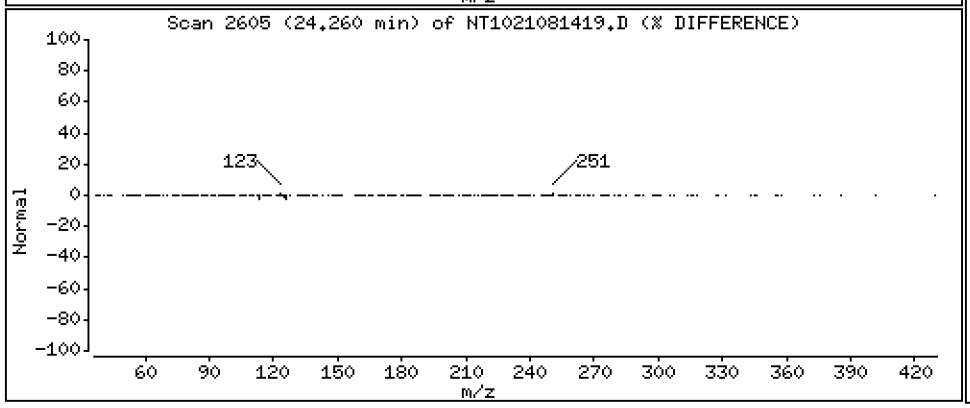
74 Benzo(b)fluoranthene

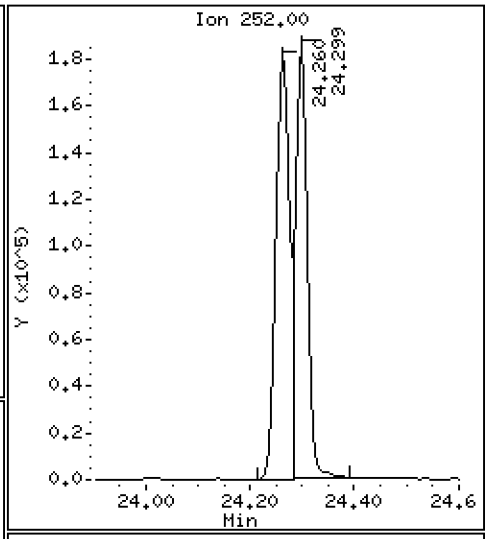
Concentration: 5.079 ug/mL

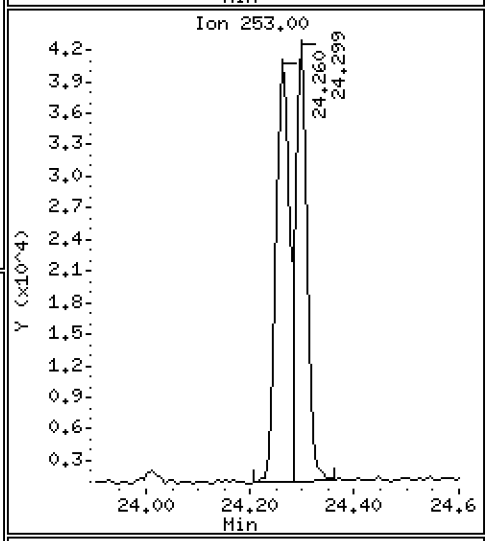


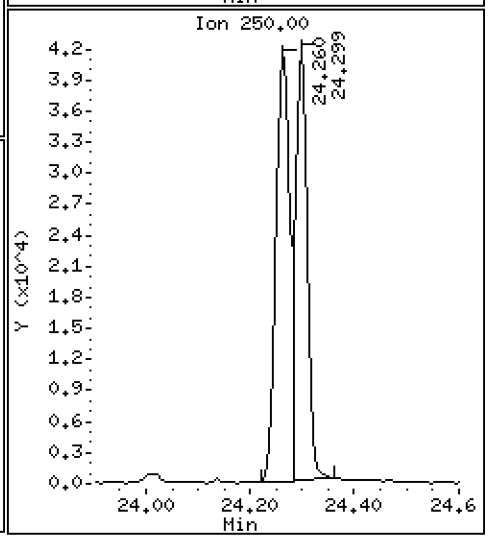












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

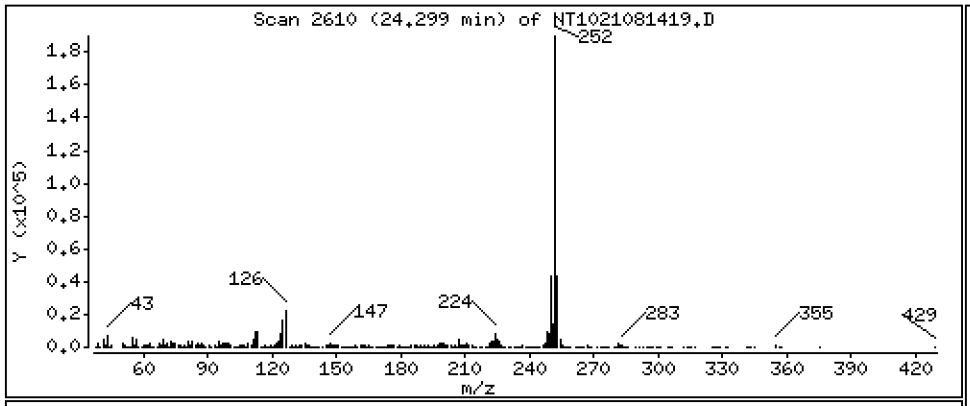
Operator: VTS

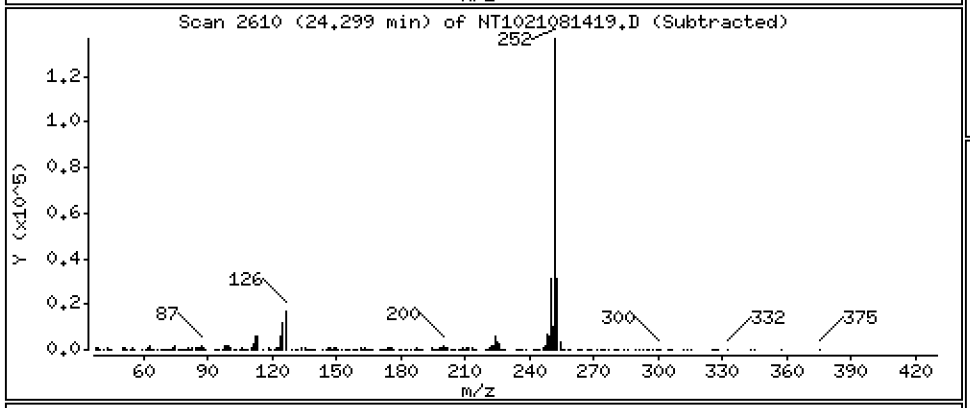
Column phase: ZB-5msi

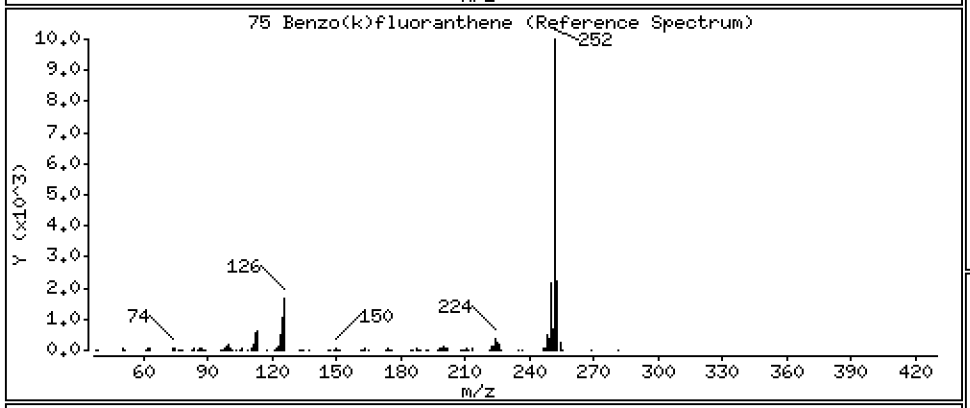
Column diameter: 0.25

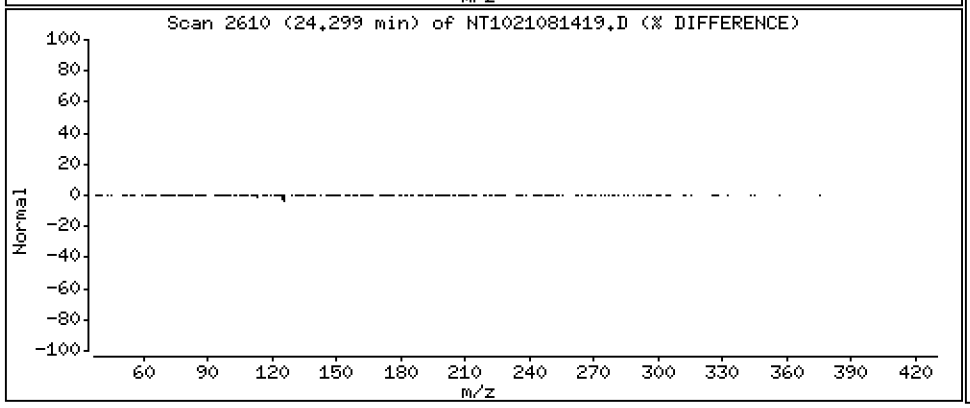
75 Benzo(k)fluoranthene

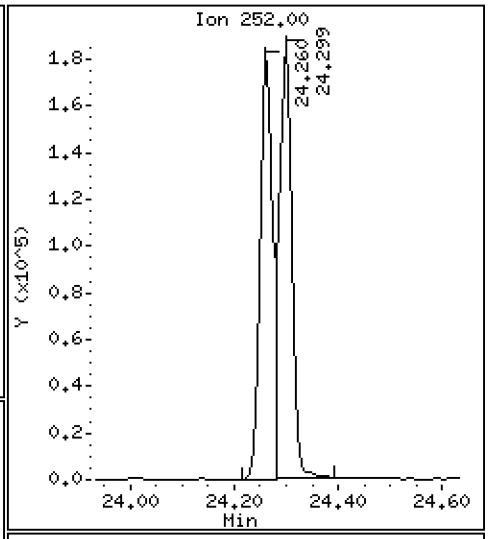
Concentration: 4.752 ug/mL

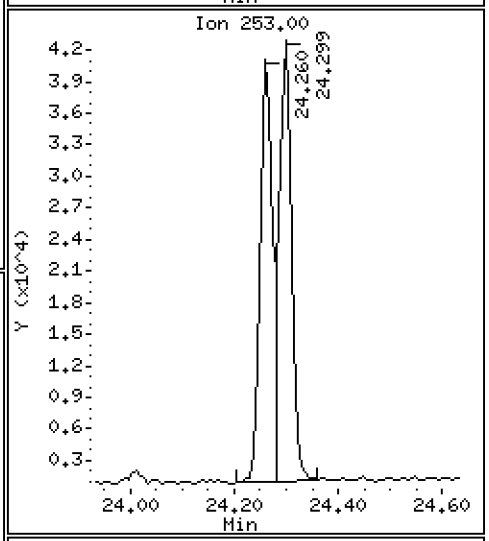


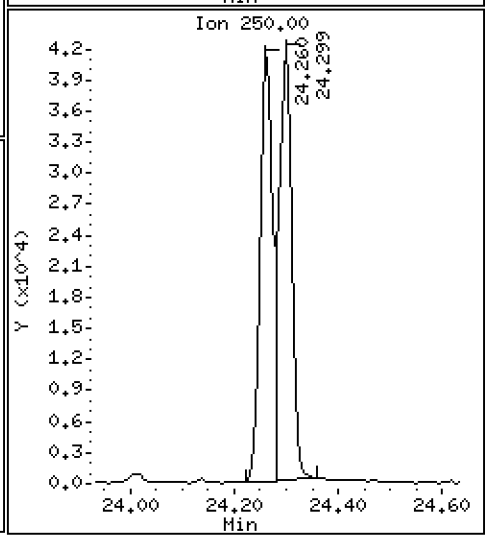












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

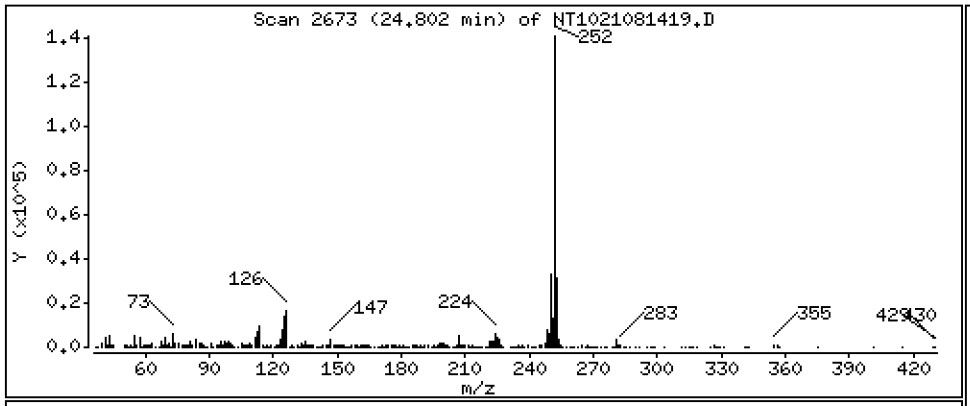
Operator: VTS

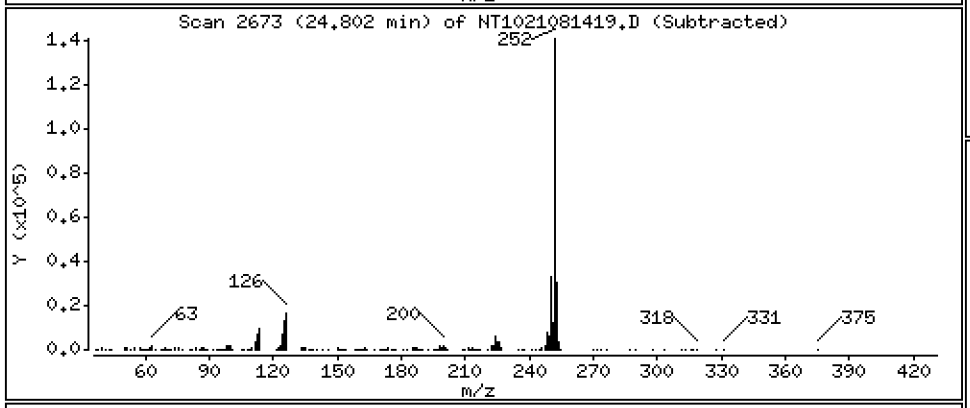
Column phase: ZB-5msi

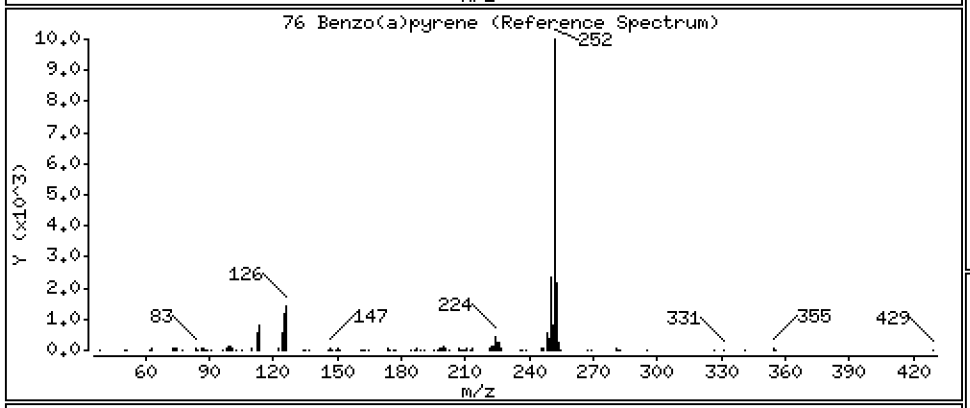
Column diameter: 0.25

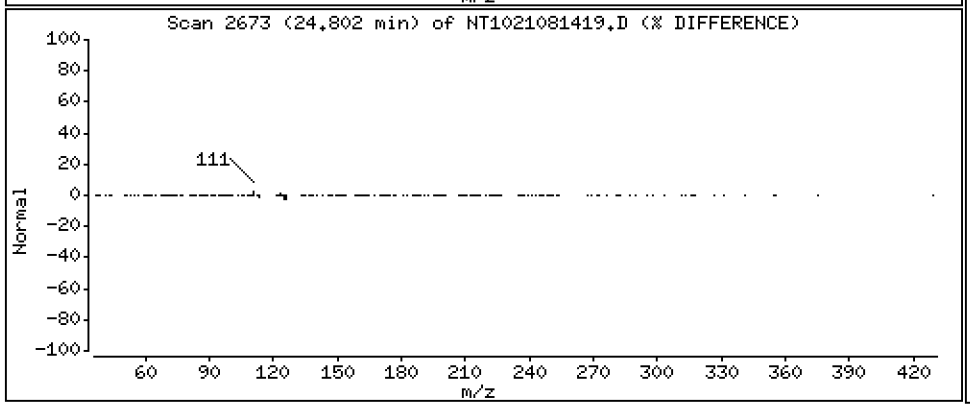
76 Benzo(a)pyrene

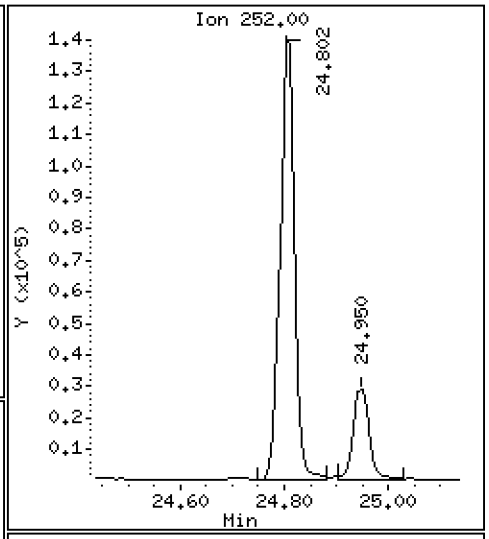
Concentration: 4.428 ug/mL

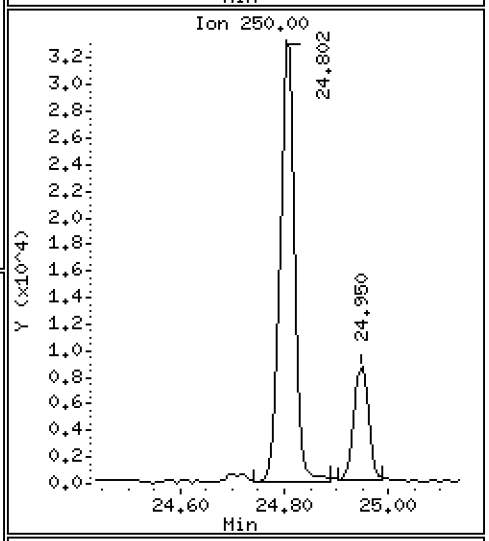


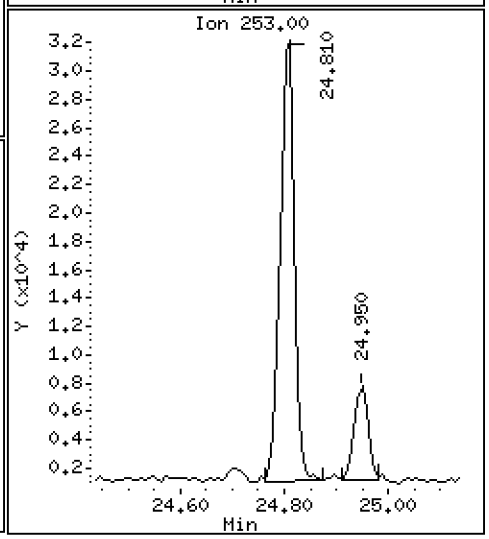












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

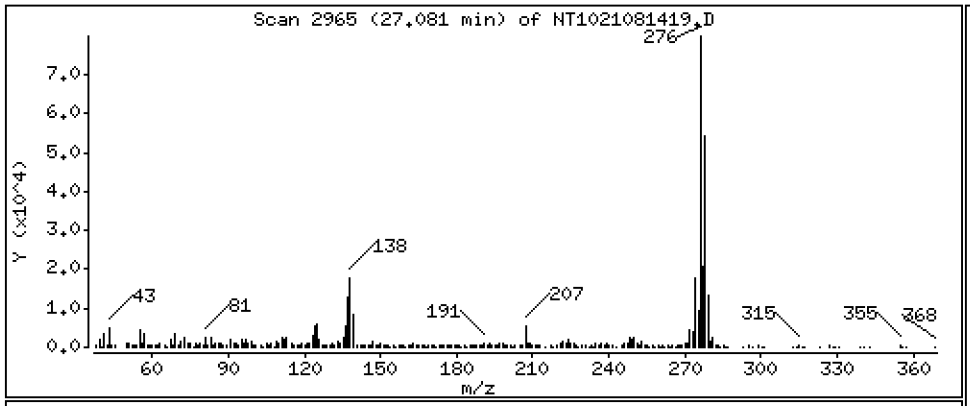
Operator: VTS

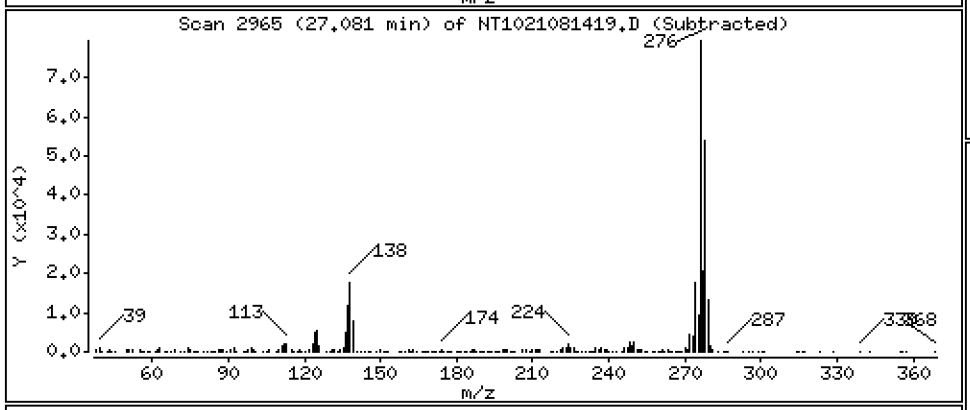
Column phase: ZB-5msi

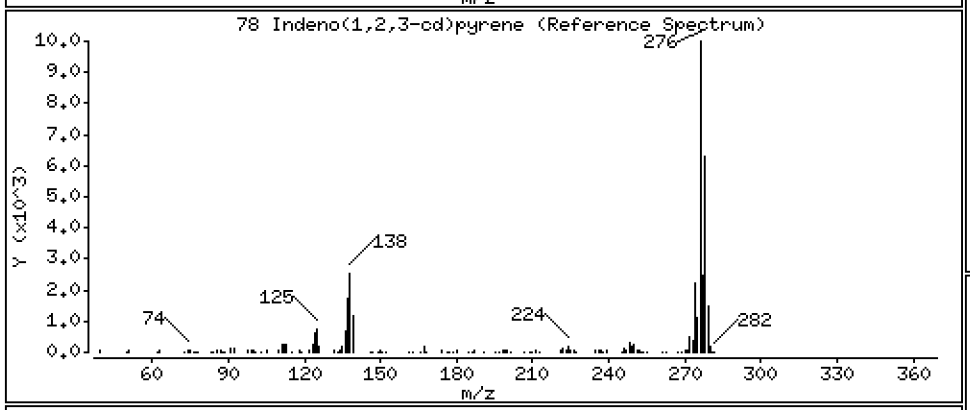
Column diameter: 0.25

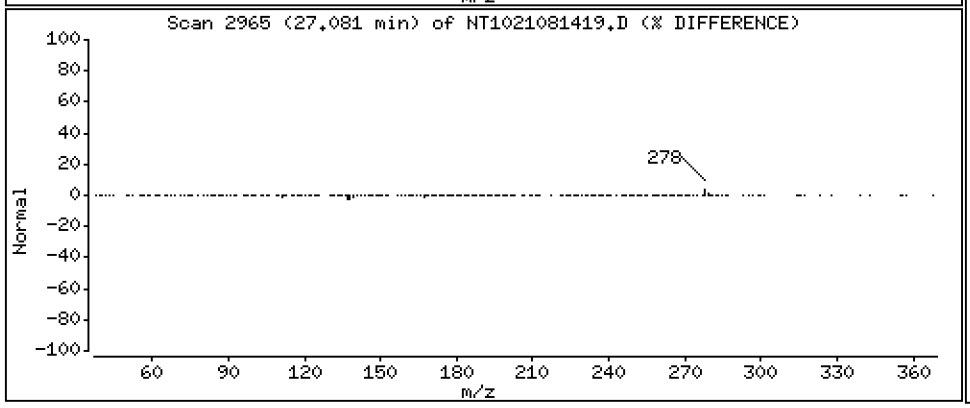
78 Indeno(1,2,3-cd)pyrene

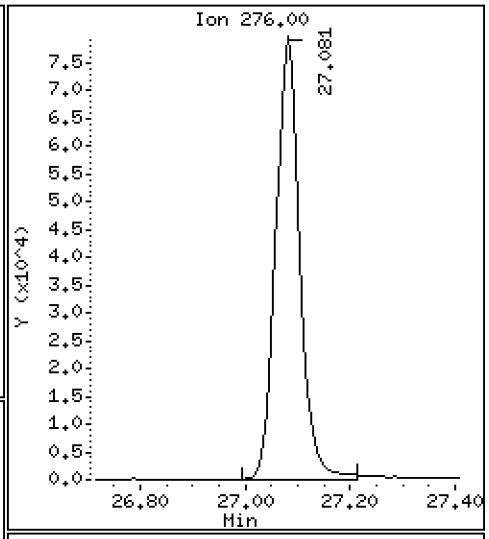
Concentration: 3.757 ug/mL

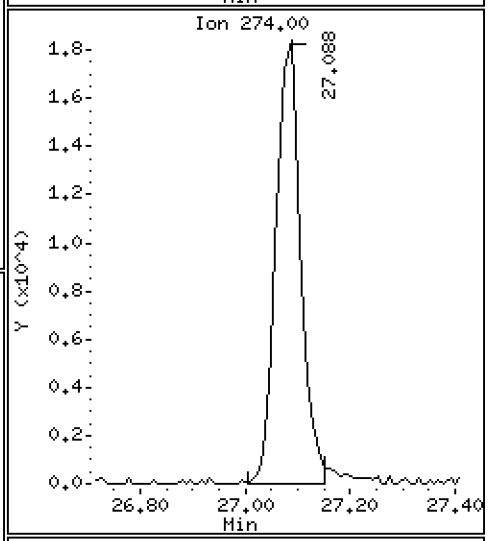


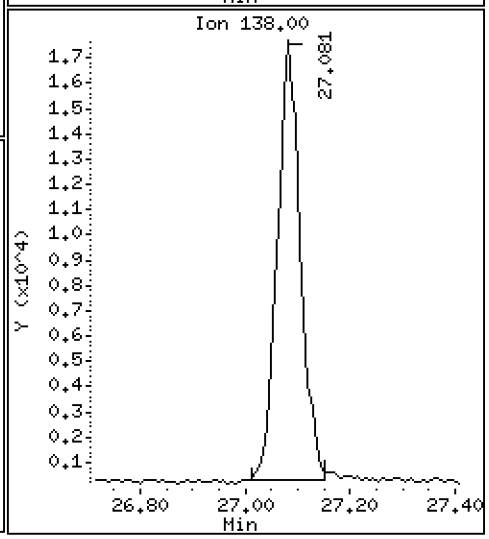












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

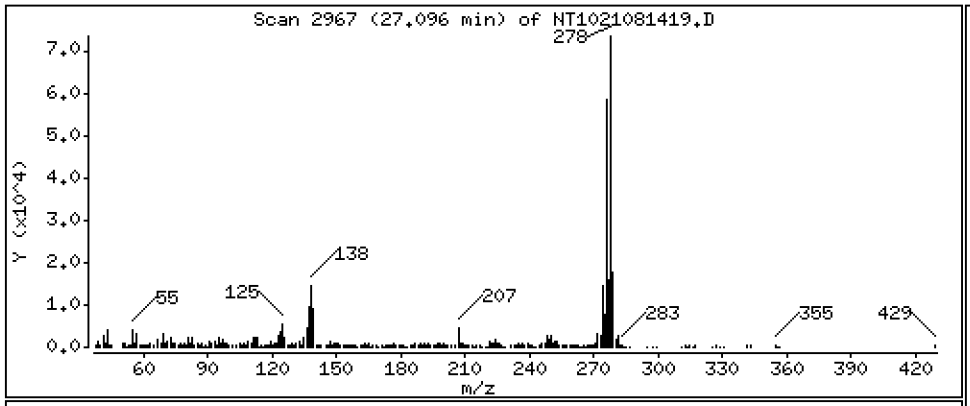
Operator: VTS

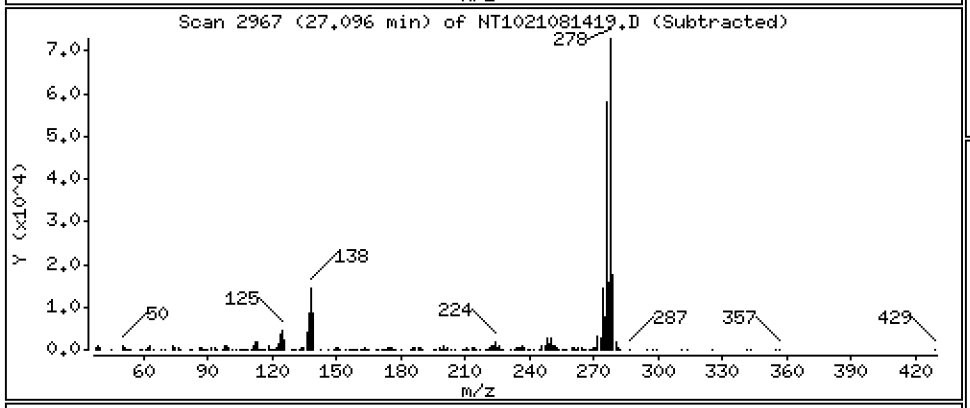
Column phase: ZB-5msi

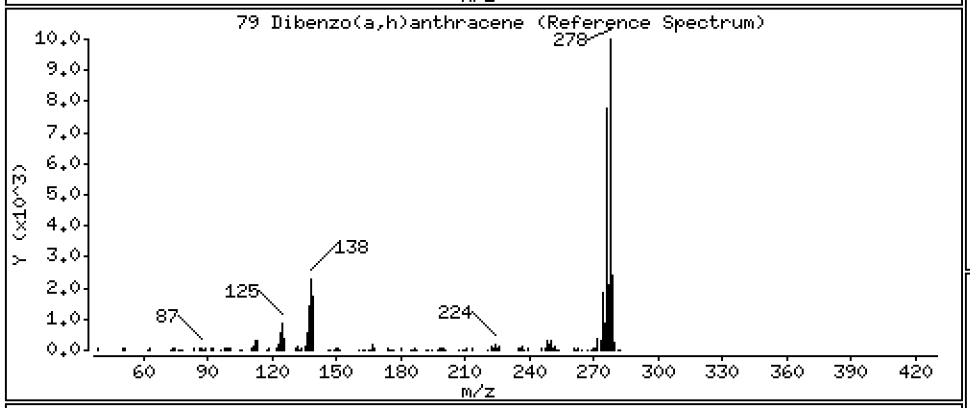
Column diameter: 0.25

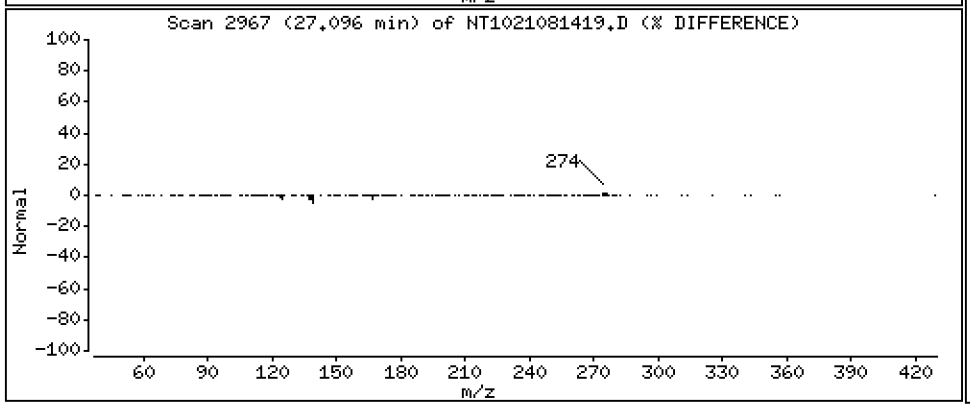
79 Dibenzo(a,h)anthracene

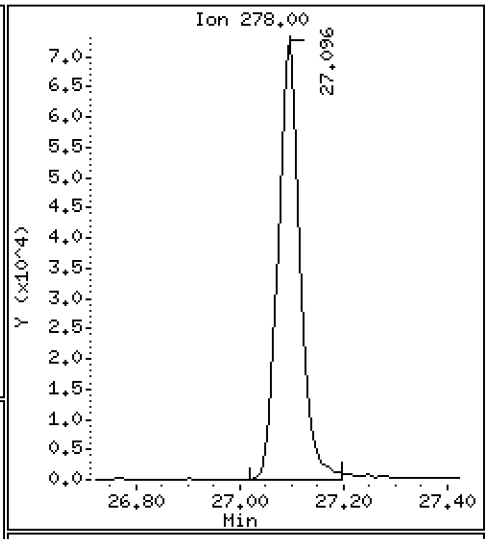
Concentration: 4.045 ug/mL

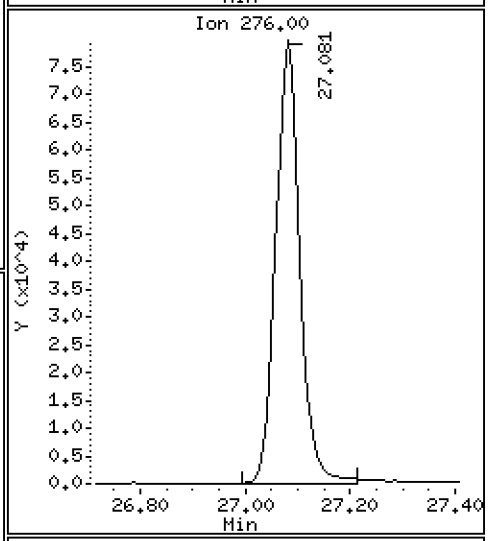


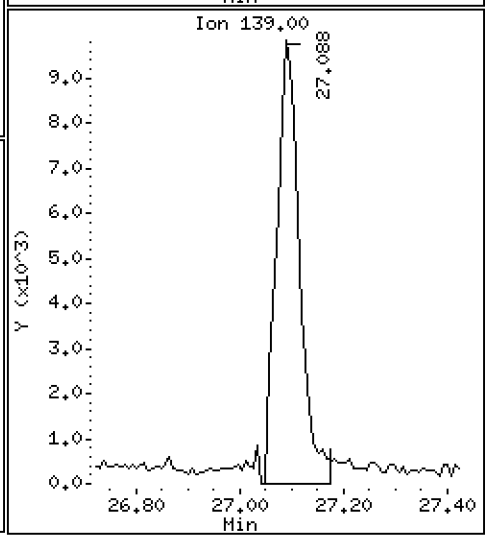












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

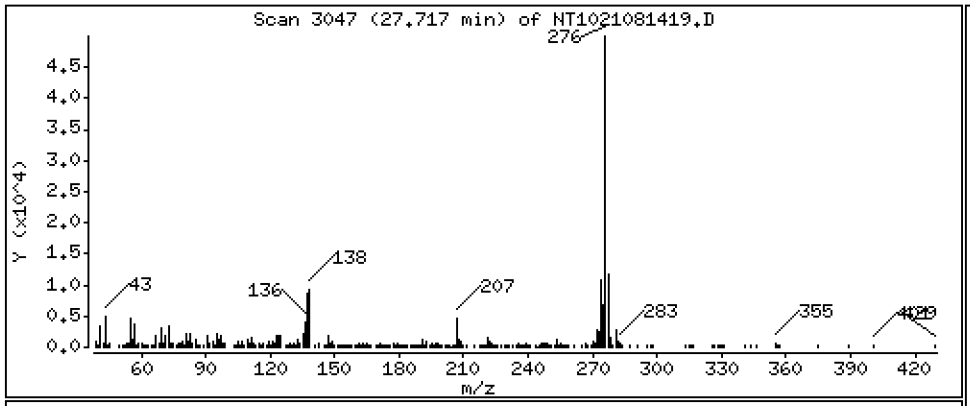
Operator: VTS

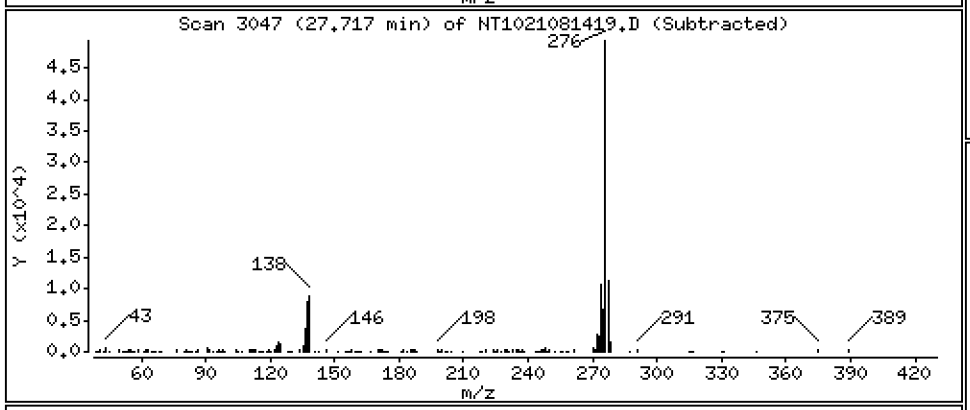
Column phase: ZB-5msi

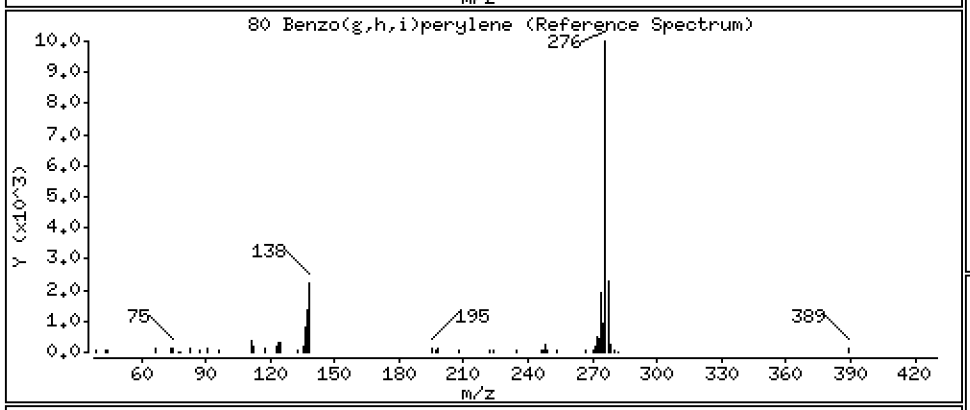
Column diameter: 0.25

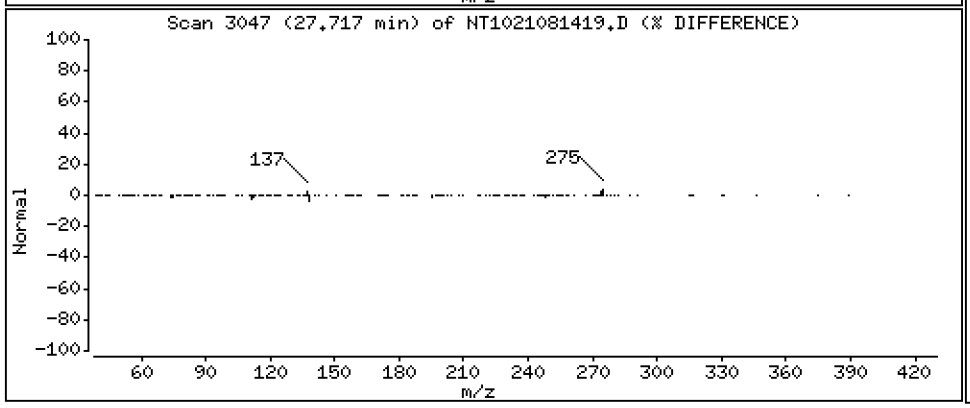
80 Benzo(g,h,i)perylene

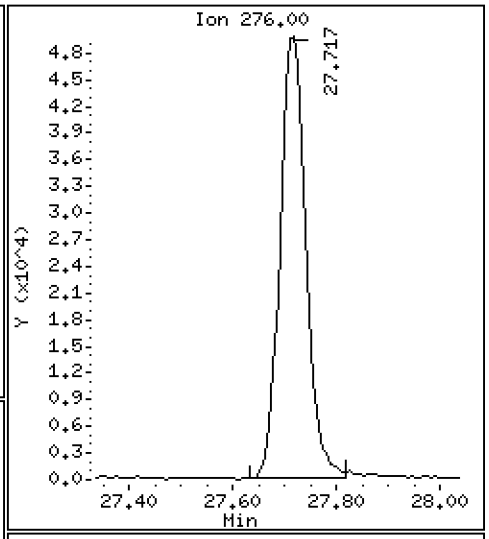
Concentration: 2.899 ug/mL

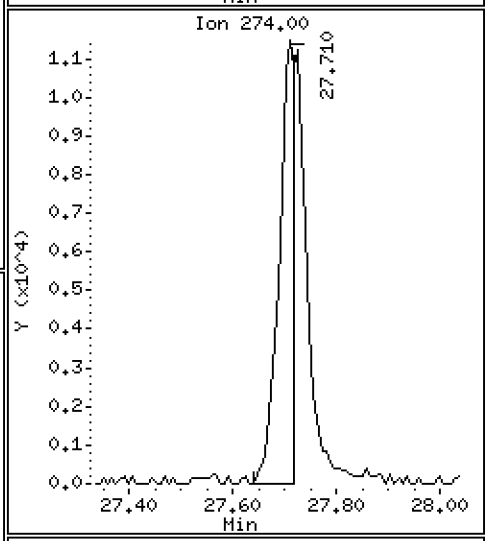


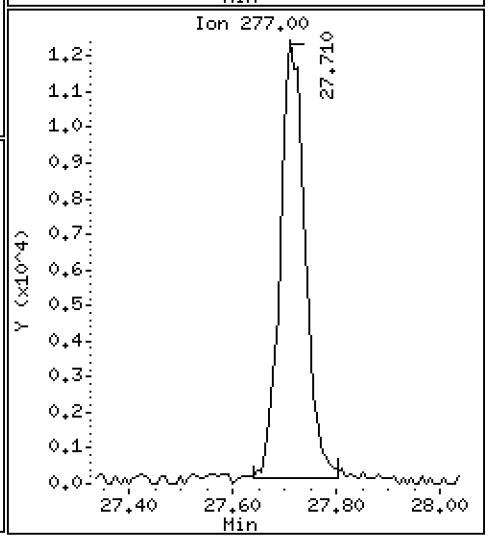












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

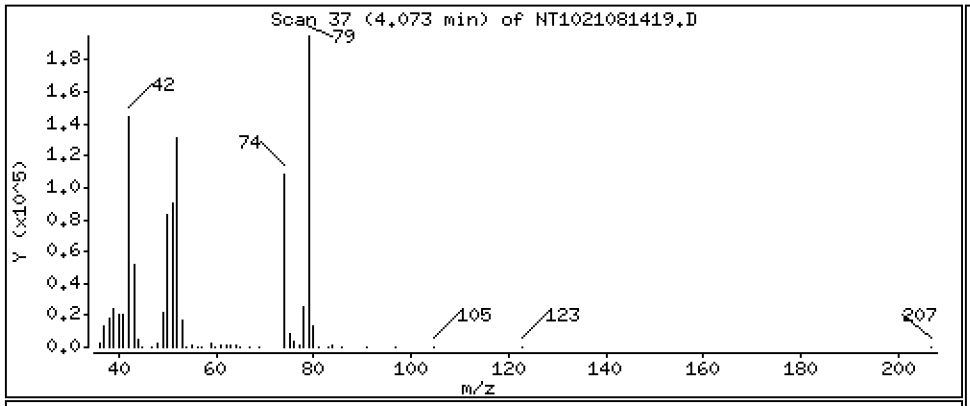
Operator: VTS

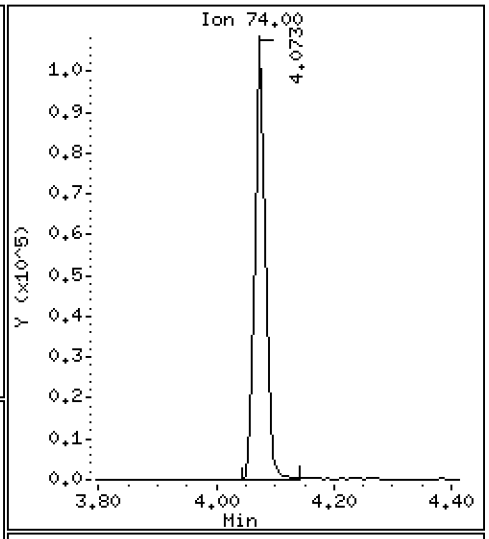
Column phase: ZB-5msi

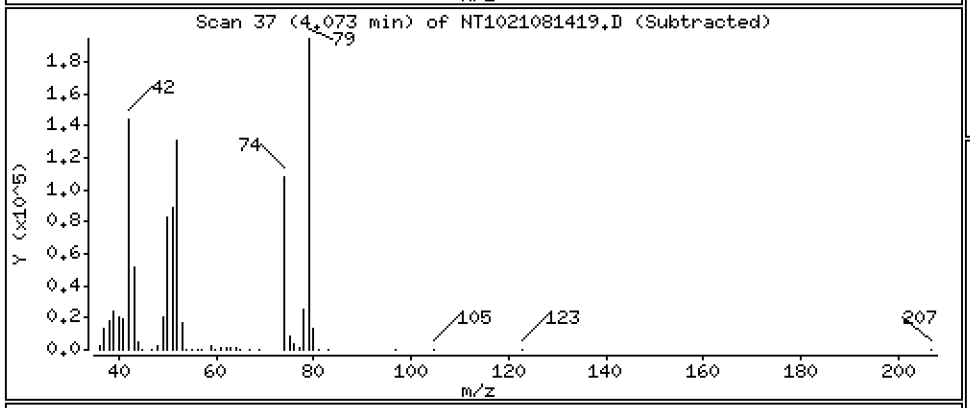
Column diameter: 0.25

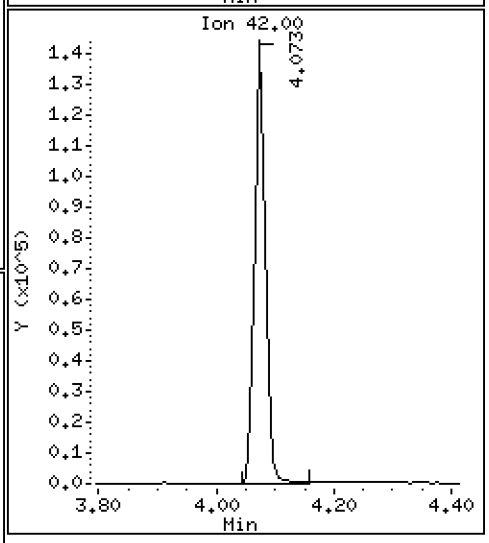
90 N-Nitrosodimethylamine

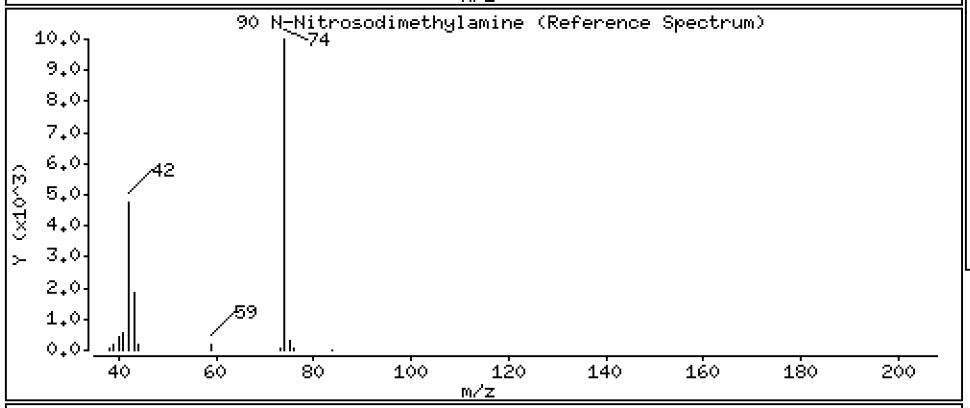
Concentration: 6.225 ug/mL

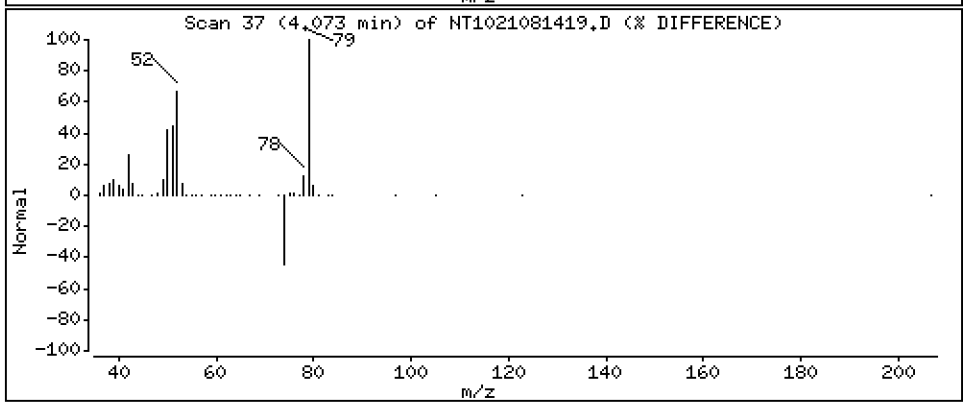












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

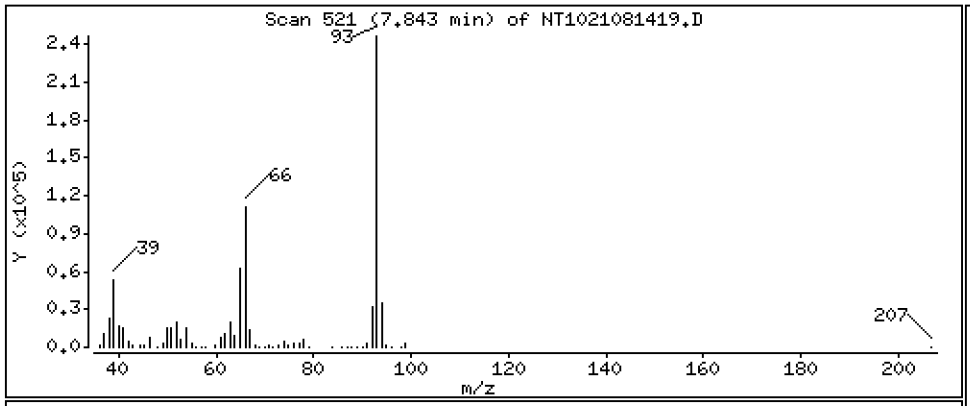
Operator: VTS

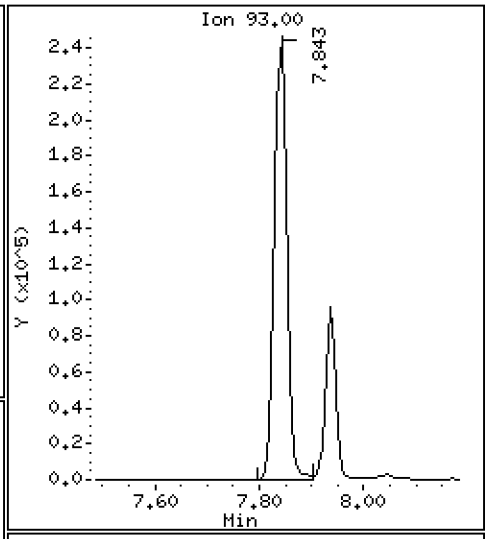
Column phase: ZB-5msi

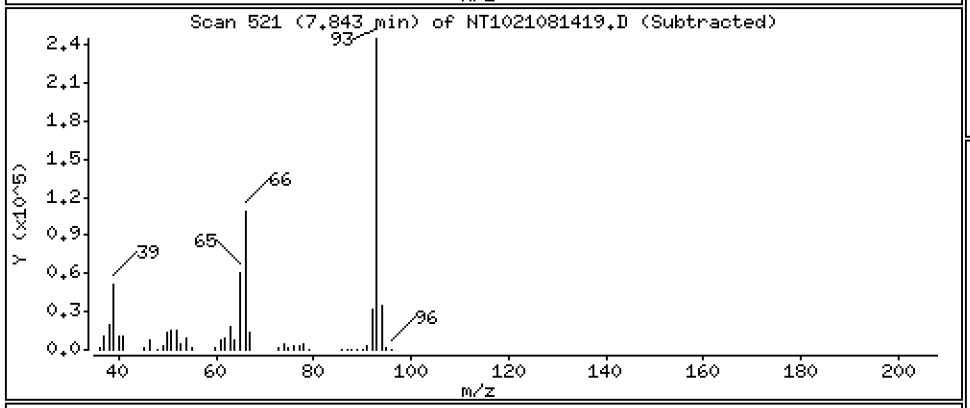
Column diameter: 0.25

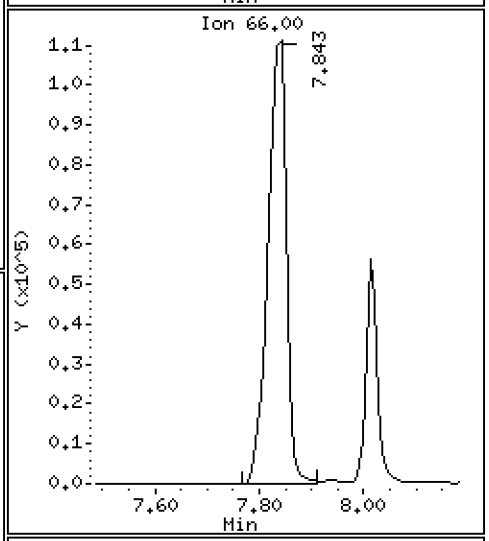
91 Aniline

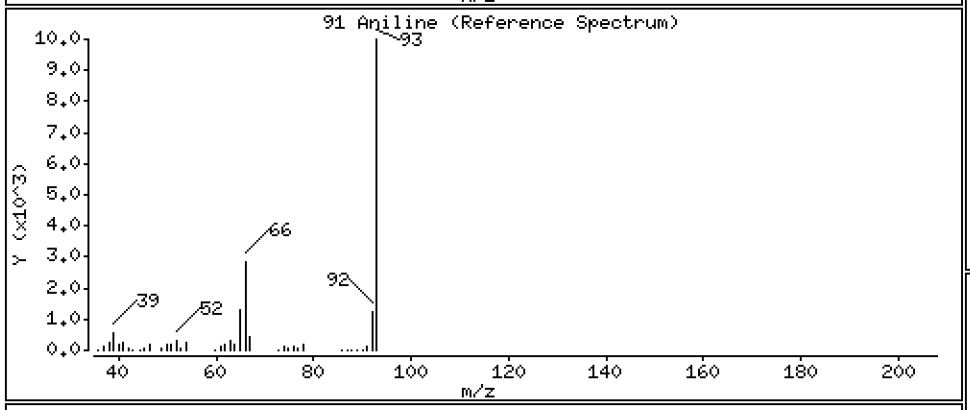
Concentration: 8.941 ug/mL

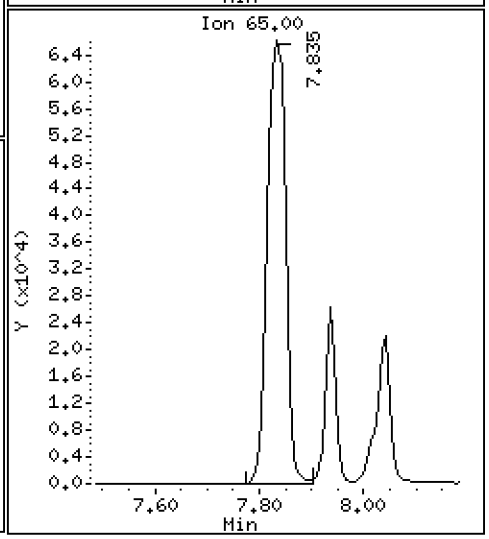


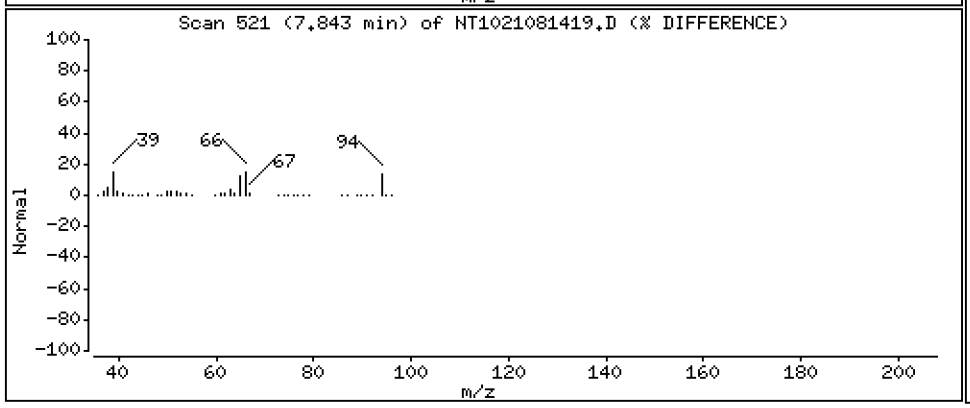












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081419.D

Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

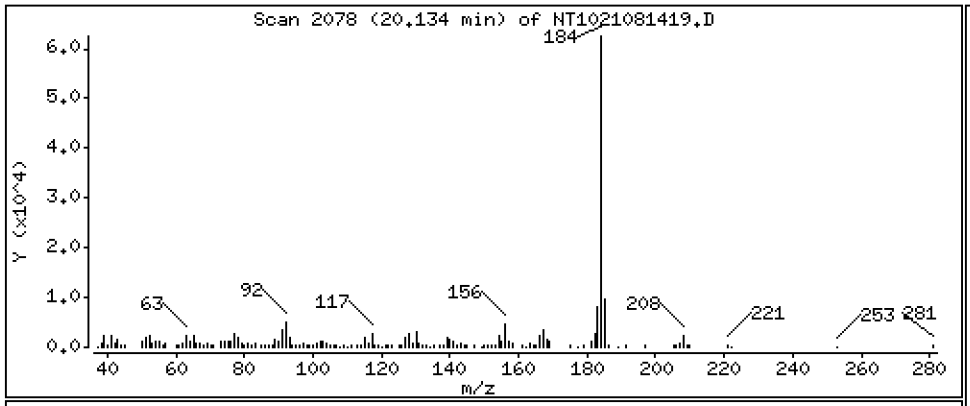
Operator: VTS

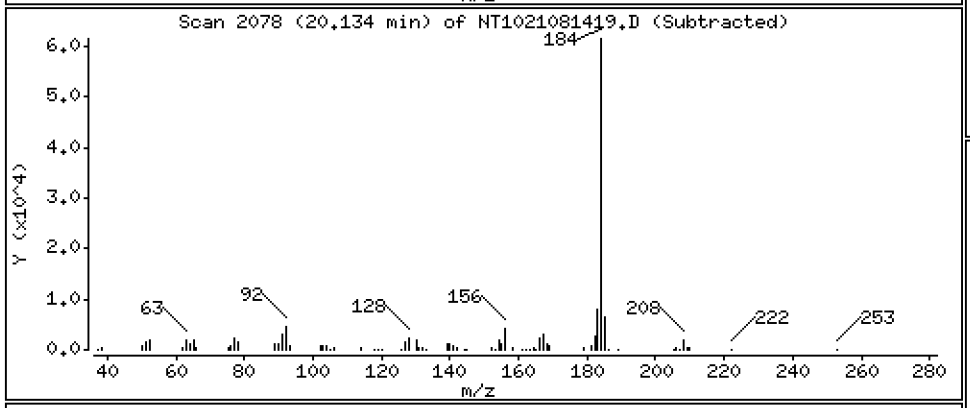
Column phase: ZB-5msi

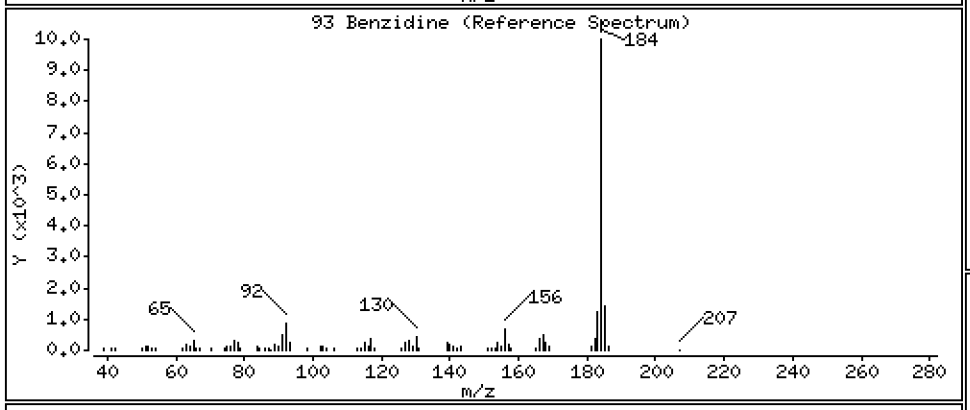
Column diameter: 0.25

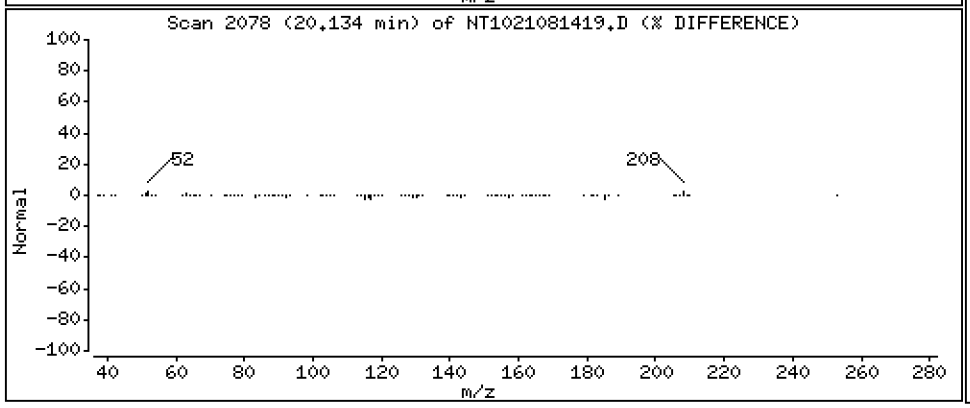
93 Benzidine

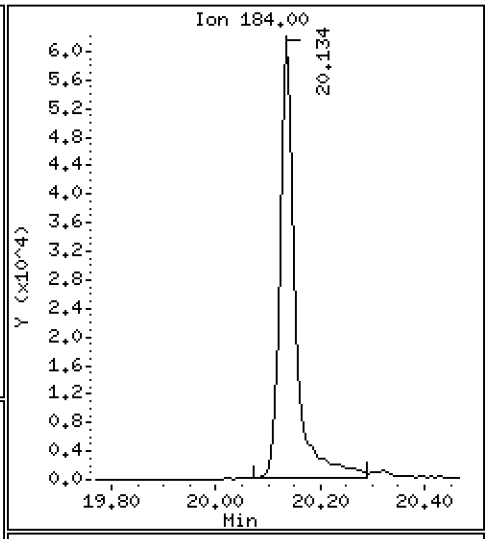
Concentration: 3.660 ug/mL

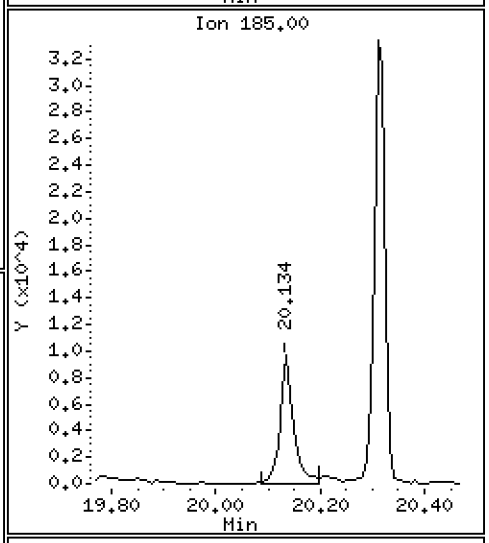


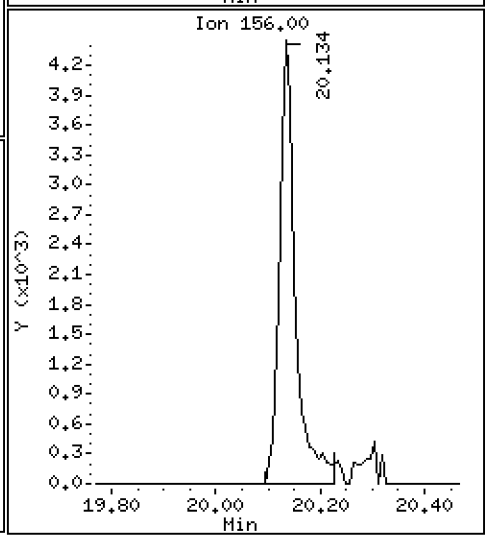












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

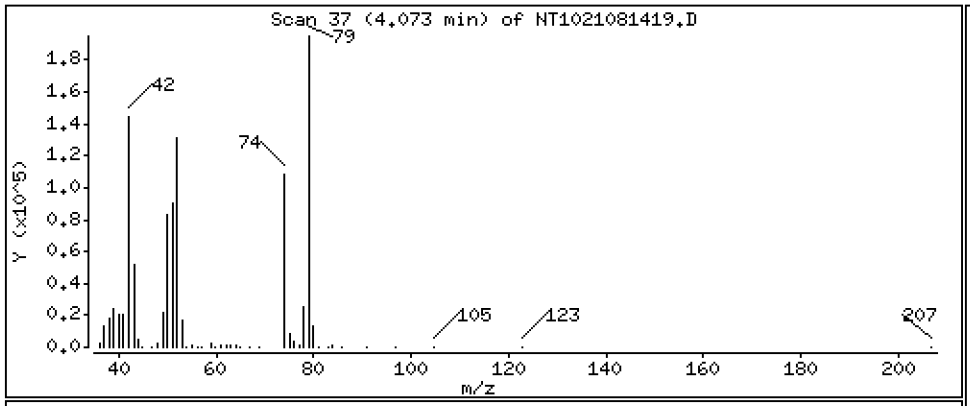
Operator: VTS

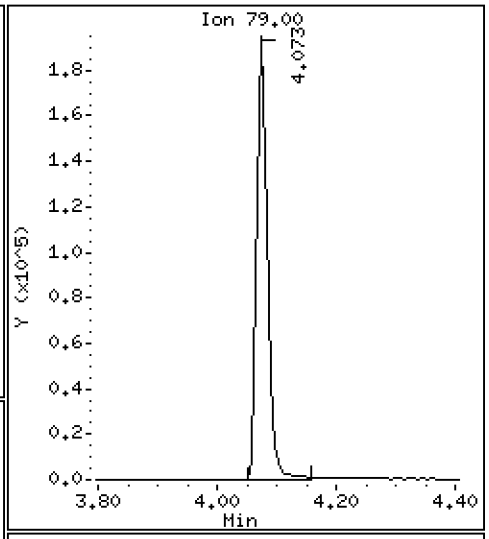
Column phase: ZB-5msi

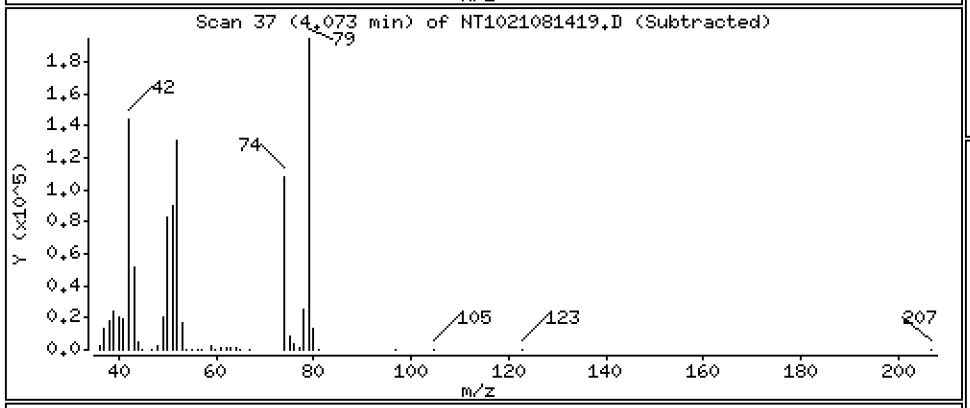
Column diameter: 0.25

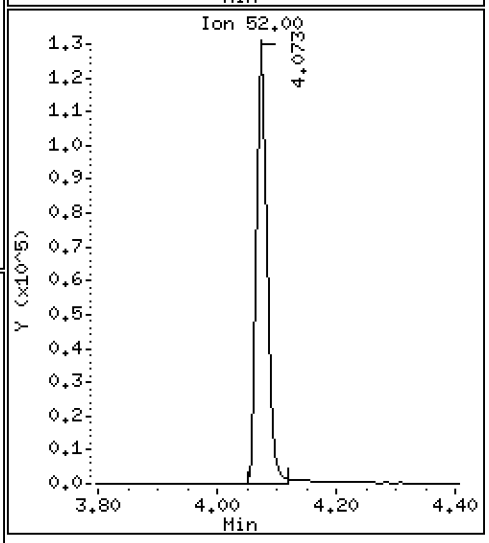
103 Pyridine

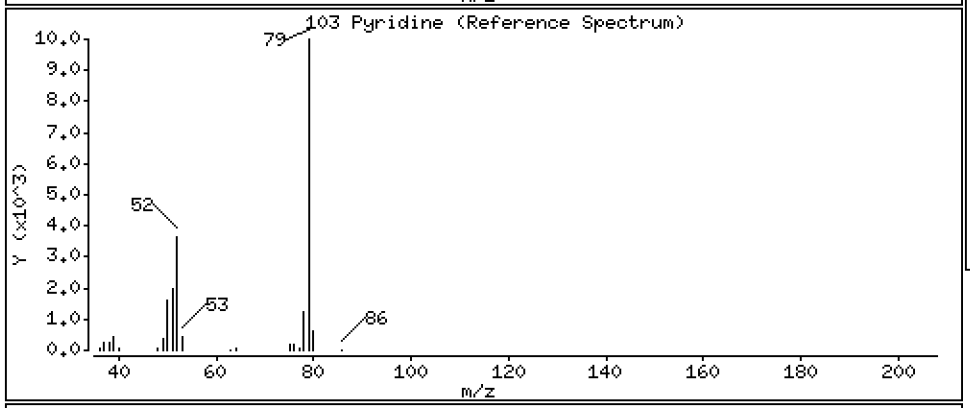
Concentration: 6.932 ug/mL

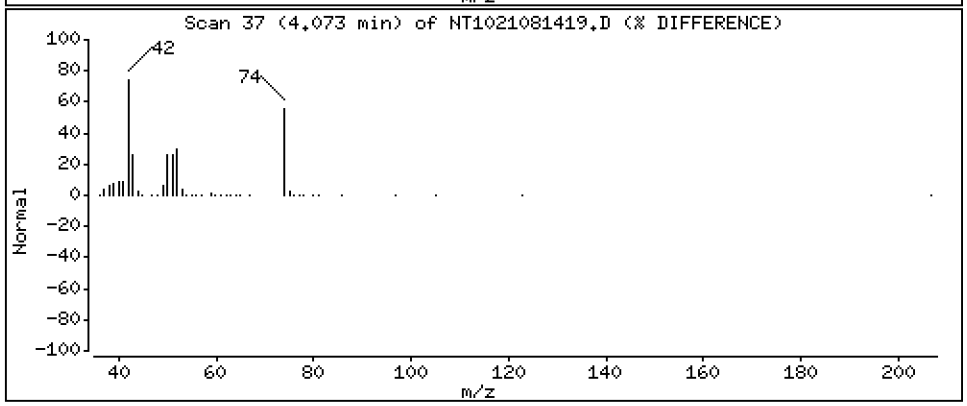












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

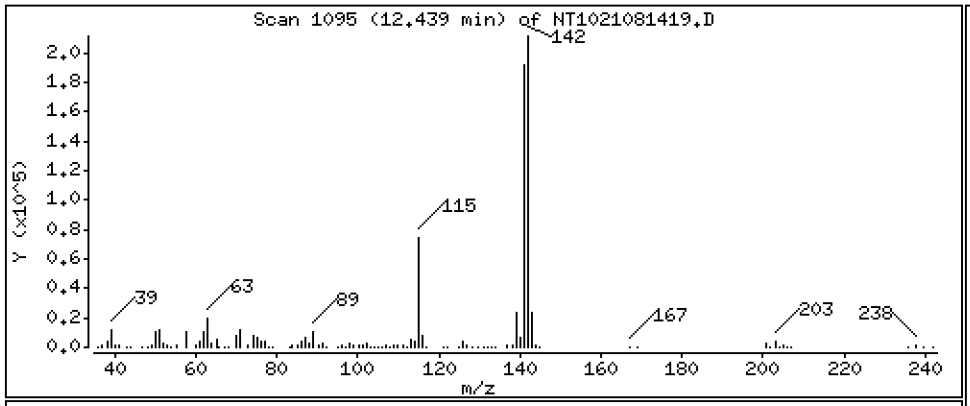
Operator: VTS

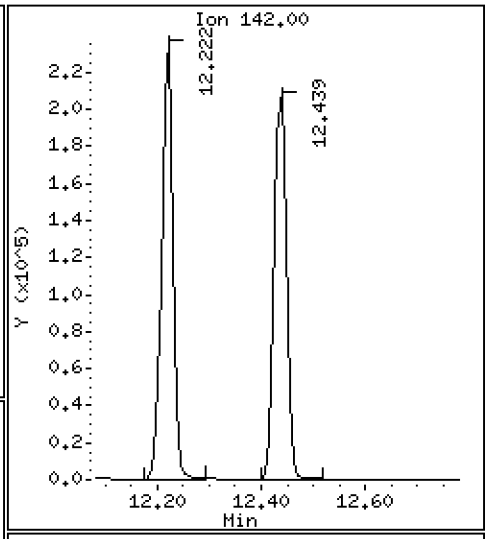
Column phase: ZB-5msi

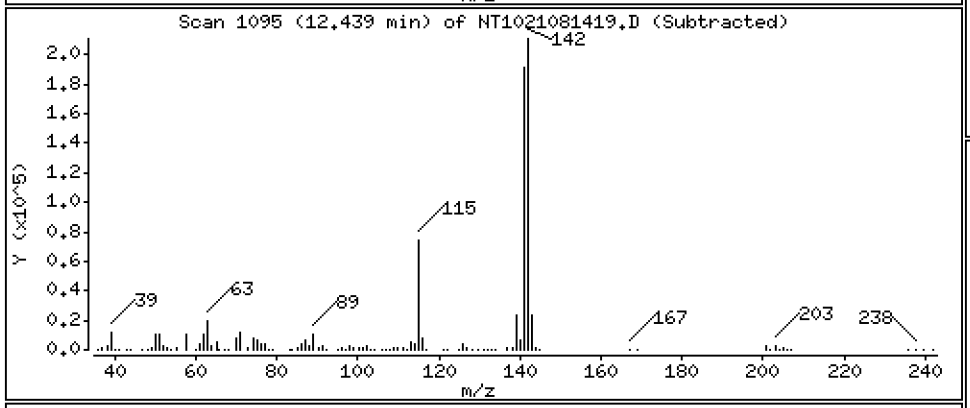
Column diameter: 0.25

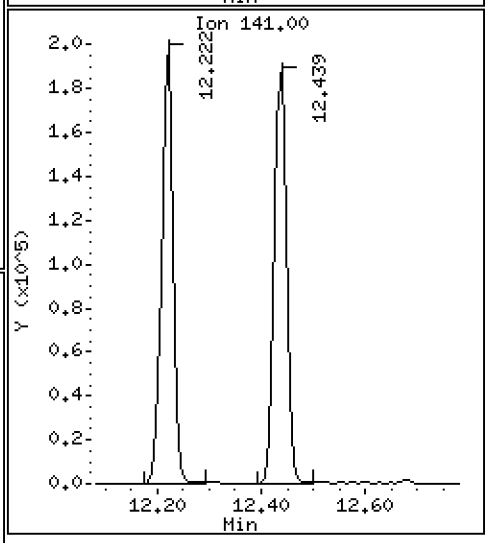
105 1-methylnaphthalene

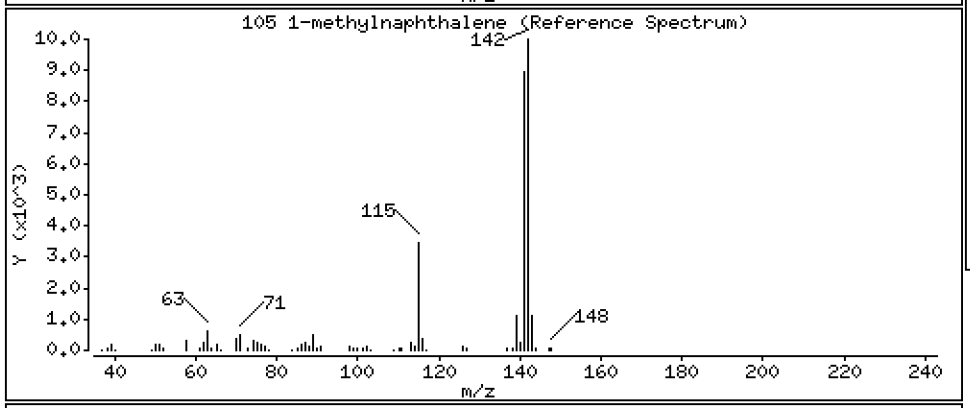
Concentration: 5.144 ug/mL

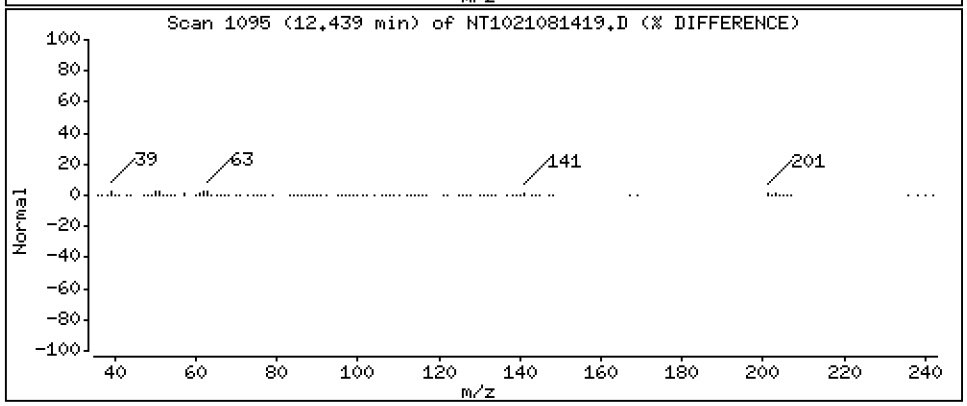












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

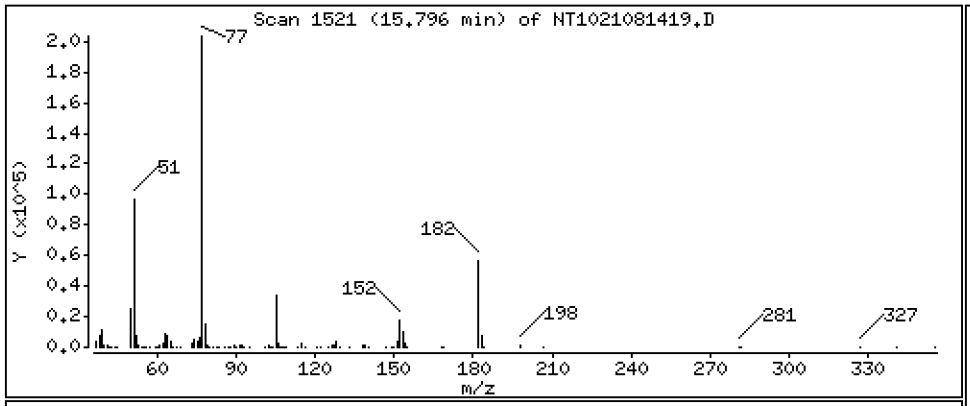
Operator: VTS

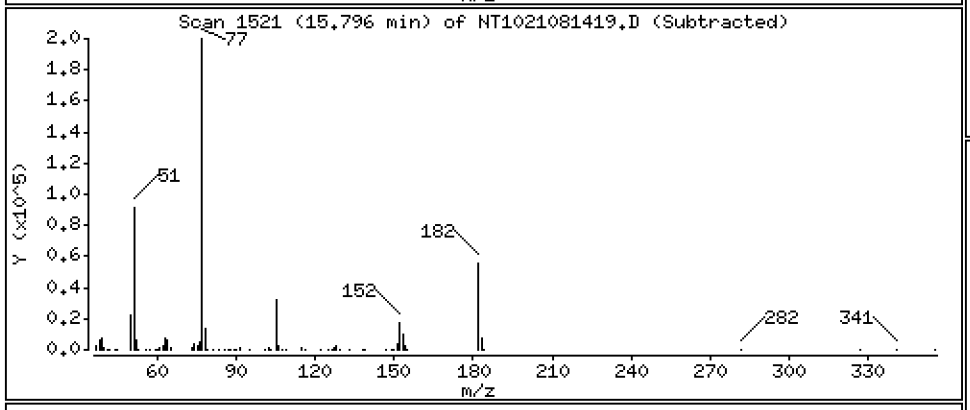
Column phase: ZB-5msi

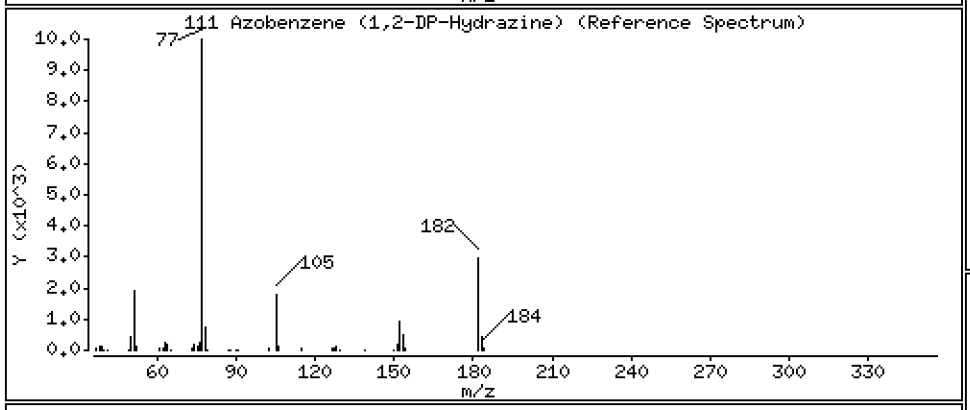
Column diameter: 0.25

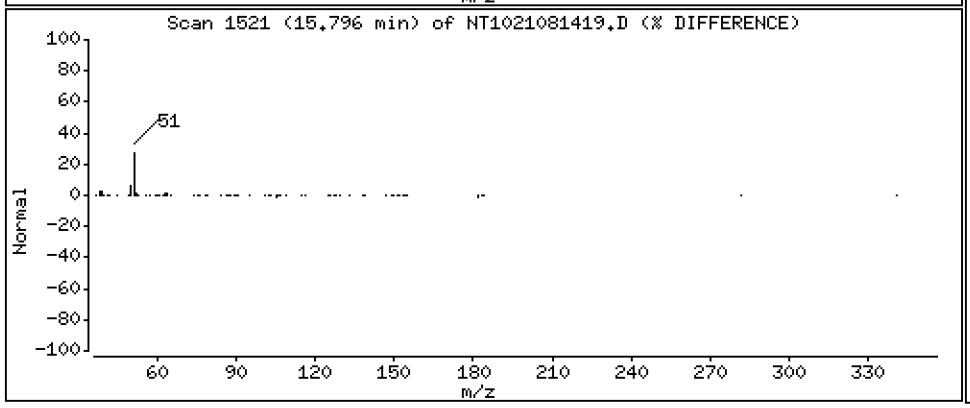
111 Azobenzene (1,2-DP-Hydrazine)

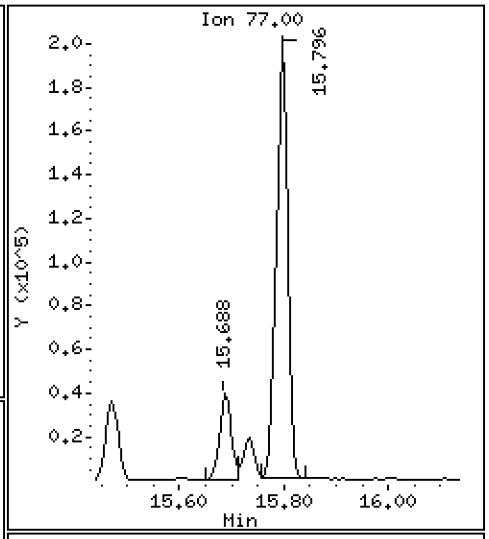
Concentration: 4.168 ug/mL

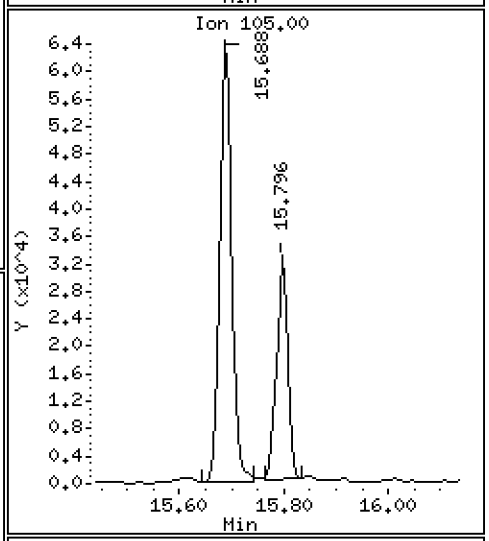


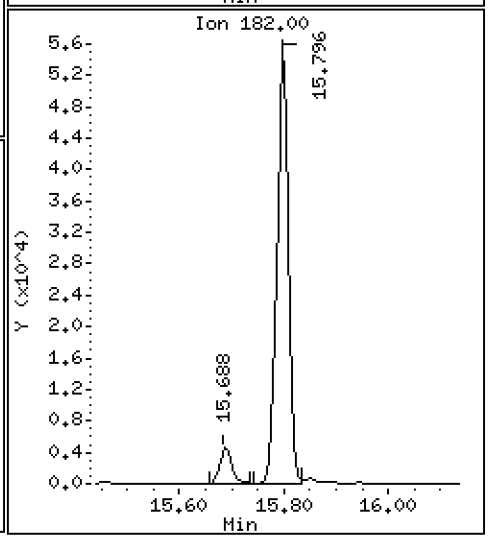












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

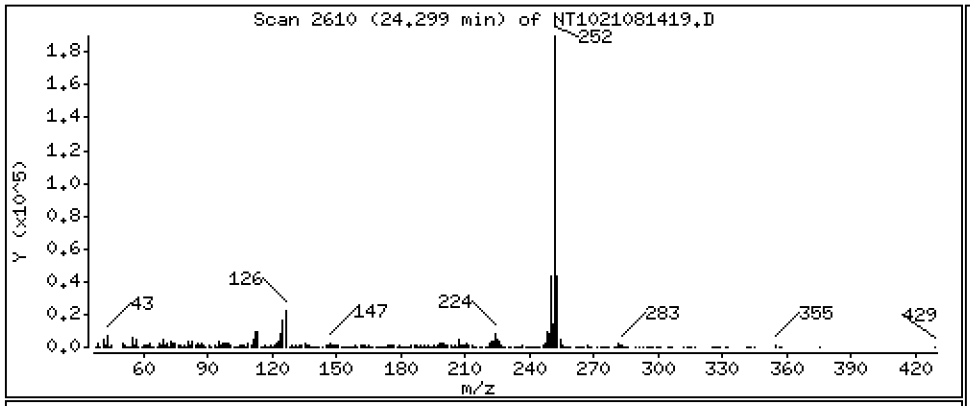
Operator: VTS

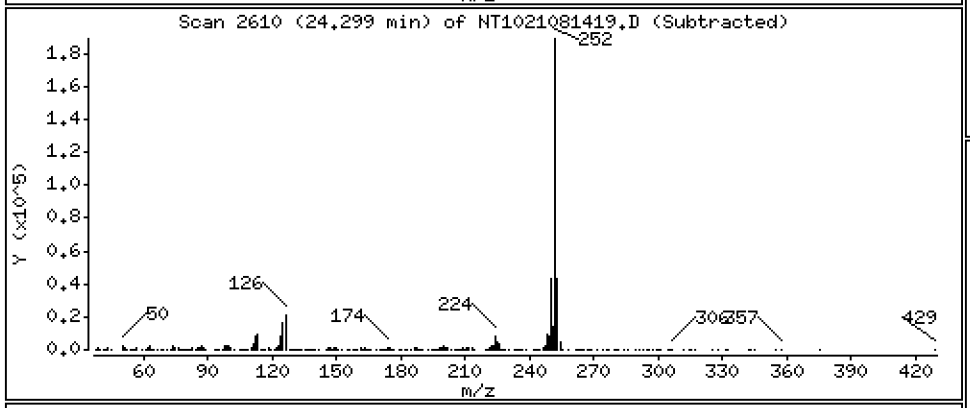
Column phase: ZB-5msi

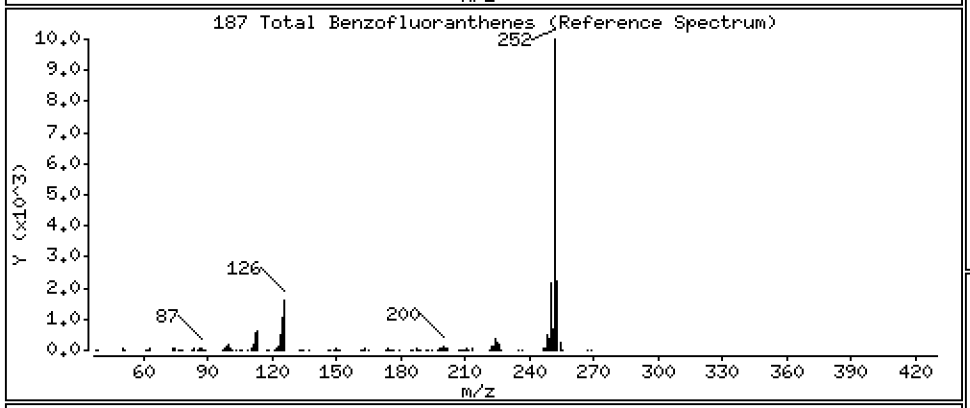
Column diameter: 0.25

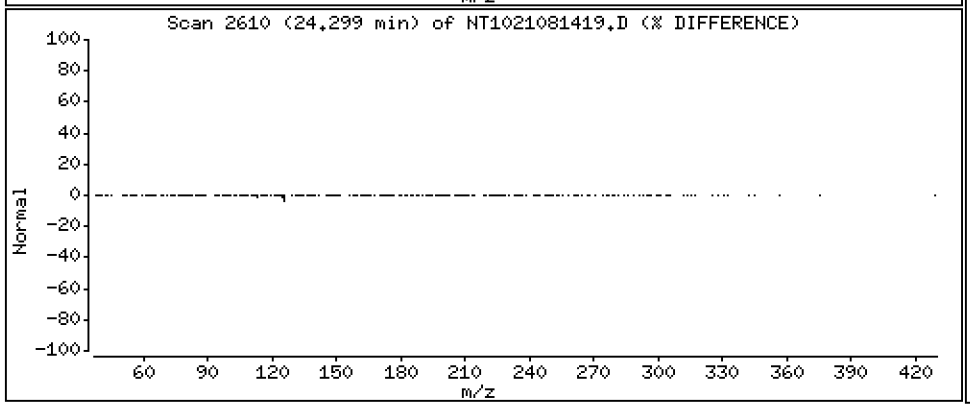
187 Total Benzofluoranthenes

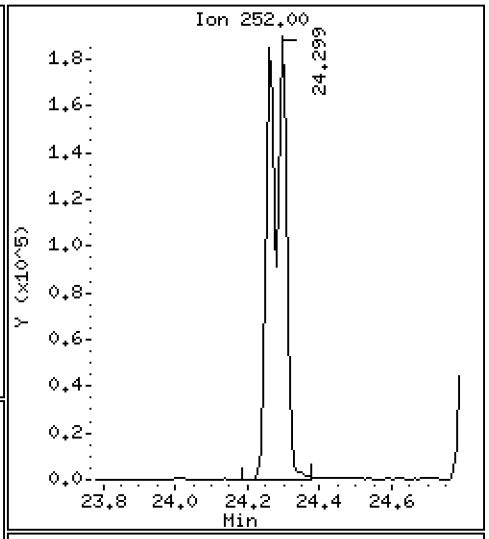
Concentration: 9.574 ug/mL

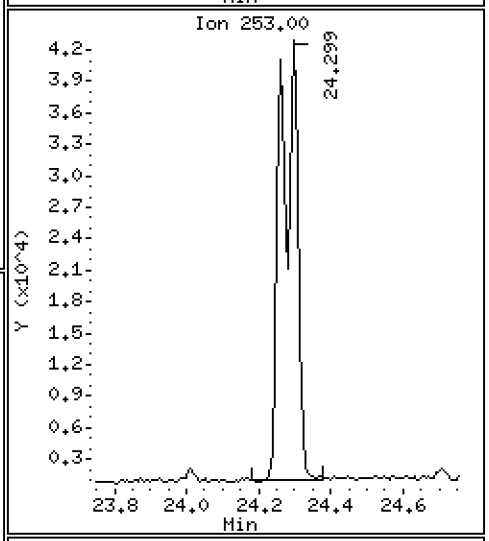


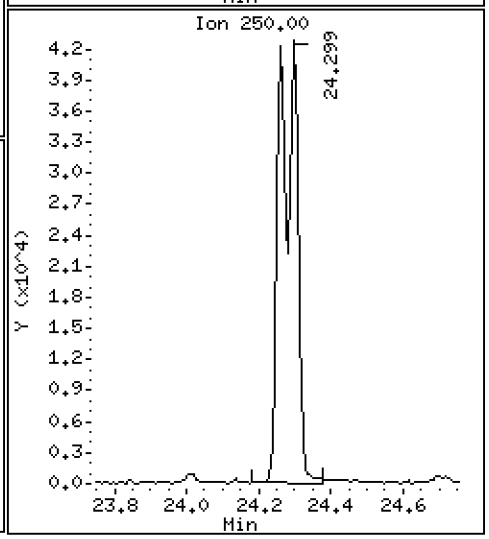












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Date : 14-AUG-2021 21:12

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-CCV1

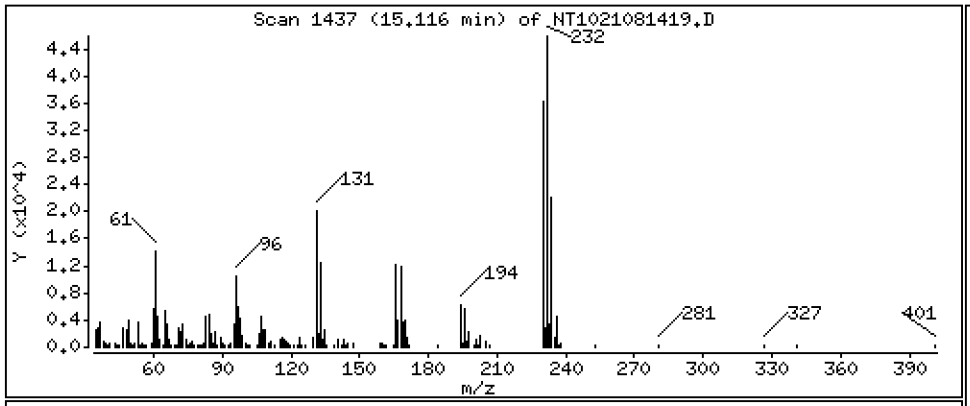
Operator: VTS

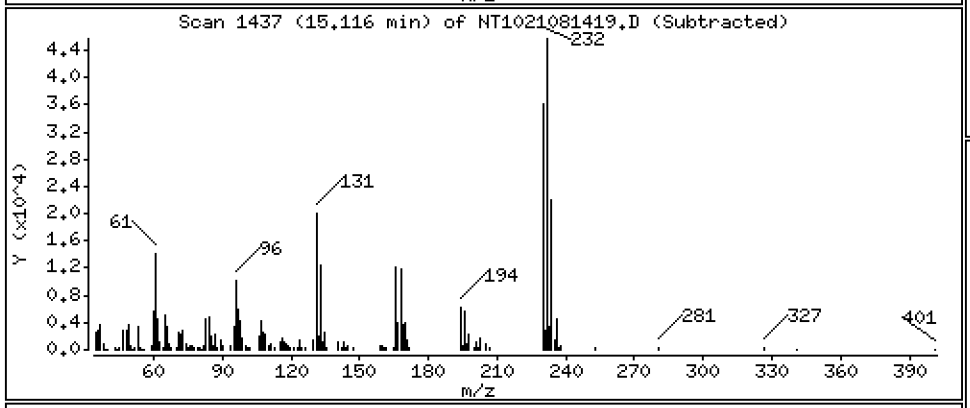
Column phase: ZB-5msi

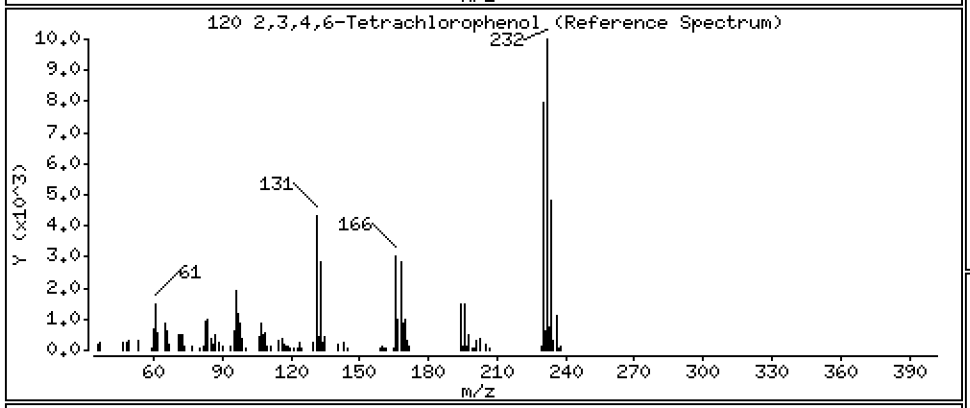
Column diameter: 0.25

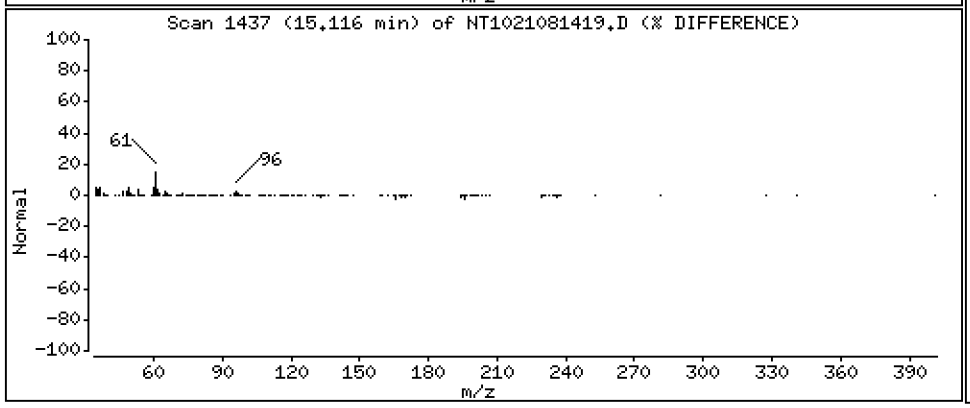
120 2,3,4,6-Tetrachlorophenol

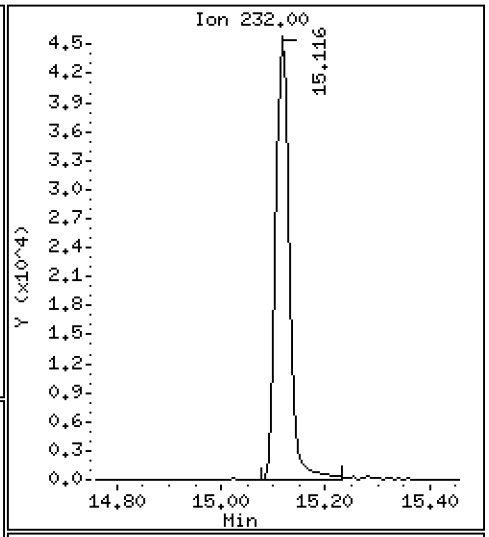
Concentration: 5.166 ug/mL

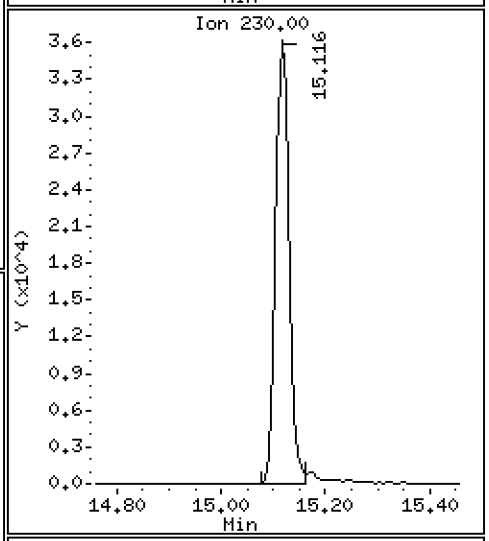


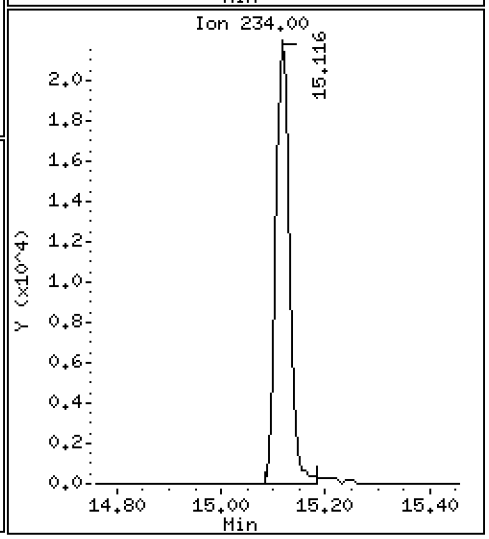












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210814.b\NT1021081419.D
Lab Smp Id: SJH0174-CCV1
Inj Date : 14-AUG-2021 21:12
Operator : VTS Inst ID: nt10.i
Smp Info : SJH0174-CCV1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 2
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$	1 2-Fluorophenol	112	6.212	6.204	(0.744)	247169	7.67046	7.670
$	2 Phenol-d5	99	7.804	7.788	(0.934)	353906	7.39955	7.400
	3 Phenol	94	7.819	7.811	(0.936)	215753	5.16060	5.161
$	5 2-Chlorophenol-d4	132	8.012	8.004	(0.959)	288148	8.54536	8.545
	4 Bis(2-Chloroethyl)ether	93	7.935	7.935	(0.950)	132407	3.96525	3.965
	6 2-Chlorophenol	128	8.043	8.035	(0.963)	168321	5.31900	5.319
	7 1,3-Dichlorobenzene	146	8.291	8.283	(0.993)	161781	4.65393	4.654
*	8 1,4-Dichlorobenzene-d4	152	8.353	8.353	(1.000)	81881	4.00000	
	9 1,4-Dichlorobenzene	146	8.384	8.384	(1.004)	128433	4.32721	4.327
$	10 1,2-Dichlorobenzene-d4	152	8.702	8.702	(1.042)	112365	5.18104	5.181
	12 1,2-Dichlorobenzene	146	8.733	8.726	(1.046)	139875	4.45525	4.455
	11 Benzyl alcohol	108	8.656	8.648	(1.036)	95394	4.87372	4.874
	14 2,2'-oxybis(1-Chloropropane)	121	8.943	8.935	(1.071)	33803	2.80652	2.807
	13 2-Methylphenol	108	8.904	8.896	(1.066)	115743	4.44776	4.448
	17 Hexachloroethane	117	9.300	9.300	(1.113)	46585	3.65136	3.651
	16 N-Nitroso-di-n-propylamine	70	9.199	9.191	(1.101)	90271	4.02111	4.021
	15 4-Methylphenol	108	9.176	9.160	(1.099)	124859	4.47108	4.471
$	18 Nitrobenzene-d5	82	9.440	9.440	(0.874)	181149	5.38817	5.388
	19 Nitrobenzene	77	9.478	9.471	(0.878)	147074	4.42786	4.428
	20 Isophorone	82	9.921	9.913	(0.919)	226286	3.61004	3.610
	21 2-Nitrophenol	139	10.099	10.091	(0.935)	88608	5.04958	5.050
	22 2,4-Dimethylphenol	107	10.193	10.184	(0.944)	219298	8.41571	8.416
	23 Bis(2-Chloroethoxy)methane	93	10.362	10.363	(0.960)	129859	3.99118	3.991
	24 Benzoic acid	105	10.447	10.430	(0.967)	325368	21.6371	21.64
	25 2,4-Dichlorophenol	162	10.558	10.549	(0.978)	233072	10.7945	10.79
	26 1,2,4-Trichlorobenzene	180	10.721	10.714	(0.993)	118853	4.86872	4.869
*	27 Naphthalene-d8	136	10.798	10.791	(1.000)	274110	4.00000	
	28 Naphthalene	128	10.837	10.837	(1.004)	357279	4.92502	4.925
	29 4-Chloroaniline	127	10.999	10.992	(1.019)	335459	9.28667	9.287
	30 Hexachlorobutadiene	225	11.200	11.192	(1.037)	77981	5.85072	5.851
	31 4-Chloro-3-methylphenol	107	11.989	11.982	(1.110)	274493	10.6482	10.65
	32 2-Methylnaphthalene	142	12.222	12.214	(1.132)	354043	5.27485	5.275
	33 Hexachlorocyclopentadiene	237	12.678	12.671	(0.883)	17620	1.05391	1.054

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	12.856	12.849	(0.895)	204469	11.7405	11.74
	35 2,4,5-Trichlorophenol	196	12.941	12.926	(0.901)	219497	11.8284	11.83
$	36 2-Fluorobiphenyl	172	13.003	13.003	(0.905)	403207	5.53898	5.539
	37 2-Chloronaphthalene	162	13.197	13.189	(0.919)	288482	4.74328	4.743
	38 2-Nitroaniline	65	13.491	13.483	(0.939)	239160	10.4927	10.49
	39 Dimethylphthalate	163	13.924	13.917	(0.969)	291431	4.95405	4.954
	40 Acenaphthylene	152	14.056	14.048	(0.978)	438255	5.06679	5.067
	41 2,6-Dinitrotoluene	165	14.056	14.048	(0.978)	134331	10.0713	10.07
*	42 Acenaphthene-d10	164	14.365	14.358	(1.000)	158518	4.00000	
	43 3-Nitroaniline	138	14.342	14.335	(0.998)	137975	8.34900	8.349
	44 Acenaphthene	153	14.435	14.427	(1.005)	235876	4.69716	4.697
	45 2,4-Dinitrophenol	184	14.559	14.543	(1.013)	129137	16.3839	16.38
	46 Dibenzofuran	168	14.760	14.752	(1.027)	412633	5.31477	5.315
	47 4-Nitrophenol	109	14.736	14.713	(1.026)	72796	11.3599	11.36
	48 2,4-Dinitrotoluene	165	14.860	14.853	(1.034)	200815	11.2708	11.27
	50 Diethylphthalate	149	15.371	15.363	(1.070)	280748	5.03358	5.034
	49 Fluorene	166	15.463	15.456	(1.076)	341948	4.54301	4.543
	51 4-Chlorophenyl-phenylether	204	15.471	15.463	(1.077)	159856	3.65355	3.654
	52 4-Nitroaniline	138	15.602	15.587	(1.086)	173677	9.89238	9.892
	53 4,6-Dinitro-2-methylphenol	198	15.687	15.680	(0.903)	254791	19.7813	19.78
	54 N-Nitrosodiphenylamine	169	15.733	15.726	(0.905)	223905	4.54088	4.541
$	55 2,4,6-Tribromophenol	330	16.003	15.996	(1.114)	105208	7.94833	7.948
	56 4-Bromophenyl-phenylether	248	16.466	16.458	(0.947)	119398	4.75836	4.758
	57 Hexachlorobenzene	284	16.760	16.752	(0.964)	124445	4.71915	4.719
	58 Pentachlorophenol	266	17.139	17.132	(0.986)	75300	6.92968	6.930
*	59 Phenanthrene-d10	188	17.379	17.364	(1.000)	274792	4.00000	
	60 Phenanthrene	178	17.425	17.418	(1.003)	266374	3.58458	3.585
	61 Anthracene	178	17.518	17.503	(1.008)	312390	3.93116	3.931
	62 Carbazole	167	17.874	17.859	(1.028)	335390	4.27532	4.275
	63 Di-n-butylphthalate	149	18.710	18.710	(1.077)	420573	3.46441	3.464
	64 Fluoranthene	202	19.847	19.839	(0.882)	424073	5.49161	5.492
	65 Pyrene	202	20.273	20.265	(0.901)	375036	4.40578	4.406
$	66 Terphenyl-d14	244	20.605	20.590	(0.916)	300173	4.94761	4.948
	67 Butylbenzylphthalate	149	21.573	21.558	(0.959)	133506	4.76814	4.768
	68 Benzo(a)anthracene	228	22.479	22.464	(0.999)	343435	4.96659	4.967
*	69 Chrysene-d12	240	22.502	22.495	(1.000)	185306	4.00000	
	70 3,3'-Dichlorobenzidine	252	22.464	22.456	(0.998)	412351	14.8439	14.84
	71 Chrysene	228	22.549	22.541	(1.002)	280853	5.26808	5.268
	72 bis(2-Ethylhexyl)phthalate	149	22.626	22.619	(0.958)	159598	5.17005	5.170
*	134 Di-n-octylphthalate-d4	153	23.617	23.610	(1.000)	280590	4.00000	
	73 Di-n-octylphthalate	149	23.625	23.617	(1.000)	338087	4.29934	4.299
	74 Benzo(b)fluoranthene	252	24.260	24.252	(0.974)	337396	5.07880	5.079
	75 Benzo(k)fluoranthene	252	24.299	24.283	(0.976)	312701	4.75195	4.752
	76 Benzo(a)pyrene	252	24.802	24.786	(0.996)	265830	4.42760	4.428
*	77 Perylene-d12	264	24.903	24.887	(1.000)	168585	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.080	27.057	(1.087)	255275	3.75678	3.757
	79 Dibenzo(a,h)anthracene	278	27.096	27.072	(1.088)	215869	4.04463	4.045
	80 Benzo(g,h,i)perylene	276	27.717	27.686	(1.113)	175799	2.89919	2.899
	90 N-Nitrosodimethylamine	74	4.073	4.065	(0.488)	137237	6.22532	6.225
	91 Aniline	93	7.842	7.834	(0.939)	389128	8.94091	8.941
	93 Benzidine	184	20.133	20.118	(0.895)	129266	3.66024	3.660
	103 Pyridine	79	4.073	4.057	(0.488)	240382	6.93153	6.932
	105 1-methylnaphthalene	142	12.438	12.431	(1.152)	323934	5.14388	5.144
	111 Azobenzene (1,2-DP-Hydrazine)	77	15.795	15.788	(1.100)	296440	4.16836	4.168

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.299	24.283	(0.976)	610756	9.57386	9.574
120 2,3,4,6-Tetrachlorophenol	232	15.115	15.108	(1.052)	88356	5.16614	5.166

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081419.D
Lab Smp Id: SJH0174-CCV1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	81881	-3.74
27 Naphthalene-d8	291658	145829	583316	274110	-6.02
42 Acenaphthene-d10	163642	81821	327284	158518	-3.13
59 Phenanthrene-d10	304099	152050	608198	274792	-9.64
69 Chrysene-d12	199453	99727	398906	185306	-7.09
134 Di-n-octylphthala	303639	151820	607278	280590	-7.59
77 Perylene-d12	200082	100041	400164	168585	-15.74

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.35	-0.00
27 Naphthalene-d8	10.79	10.29	11.29	10.80	0.07
42 Acenaphthene-d10	14.36	13.86	14.86	14.37	0.05
59 Phenanthrene-d10	17.36	16.86	17.86	17.38	0.09
69 Chrysene-d12	22.50	22.00	23.00	22.50	0.03
134 Di-n-octylphthala	23.61	23.11	24.11	23.62	0.03
77 Perylene-d12	24.89	24.39	25.39	24.90	0.06

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081419.D

Lab ID: SJH0174-CCV1
nt10.i, ABN.m, 14-AUG-2021 21:12

RT	CO-ELUTION COMPOUNDS
14.056	Acenaphthylene and 2,6-Dinitrotoluene

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
NONE			

RRT check based on Ccal File: NT1021081402.D

On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LOW-CONCENTRATION CONTINUING CALIBRATION CHECK

EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	NT10	Calibration:	EG00057
Lab File ID:	NT1021081403.D	Calibration Date:	07/20/2021
Sequence:	SJH0174	Injection Date:	08/14/21
Lab Sample ID:	SJH0174-LCV1	Injection Time:	10:30
Sequence Name:	ABN 0.5		

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Naphthalene	A	0.50000	0.4	1.0586070	0.9403712		-11.2	+/-50
2-Methylnaphthalene	A	0.50000	0.5	0.9794463	0.9045138		-7.7	+/-50
Acenaphthylene	A	0.50000	0.5	2.1826050	2.2468300		2.9	+/-50
Acenaphthene	A	0.50000	0.4	1.2671560	1.0846700		-14.4	+/-50
Fluorene	A	0.50000	0.5	1.8993190	1.7543160		-7.6	+/-50
Phenanthrene	A	0.50000	0.5	1.0817070	0.9876794		-8.7	+/-50
Anthracene	A	0.50000	0.4	1.1567290	1.0067200		-13.0	+/-50
Fluoranthene	A	0.50000	0.5	1.6669060	1.5571390		-6.6	+/-50
Pyrene	A	0.50000	0.4	1.8374700	1.6211920		-11.8	+/-50
Butylbenzylphthalate	A	0.50000	0.5	0.6043970	0.6049363		0.09	+/-50
Benzo(a)anthracene	A	0.50000	0.5	1.4926470	1.5180970		1.7	+/-50
Chrysene	A	0.50000	0.4	1.1507940	1.0217810		-11.2	+/-50
Benzofluoranthenes, Total	A	1.0000	1.0	1.5136370	1.4580920		-3.7	+/-50
Benzo(a)pyrene	A	0.50000	0.5	1.4245480	1.3283930		-6.8	+/-50
Indeno(1,2,3-cd)pyrene	A	0.50000	0.5	1.6122550	1.5896170		-1.4	+/-50
Dibenzo(a,h)anthracene	A	0.50000	0.5	1.2663450	1.3277950		4.9	+/-50
Benzo(g,h,i)perylene	A	0.50000	0.5	1.4387340	1.2986590		-9.7	+/-50
1,2-Dichlorobenzene-d4	A	0.50000	0.527	1.0594750	1.1163880		5.4	+/-50
Nitrobenzene-d5	A	0.50000	0.506	0.4906029	0.4965605		1.2	+/-50
2-Fluorobiphenyl	A	0.50000	0.529	1.8368740	1.9420260		5.7	+/-50
p-Terphenyl-d14	A	0.50000	0.611	1.3096240	1.5993020		22.1	+/-50

* Values outside of QC limits

* Values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081403.D

Date : 14-AUG-2021 10:30

Client ID:

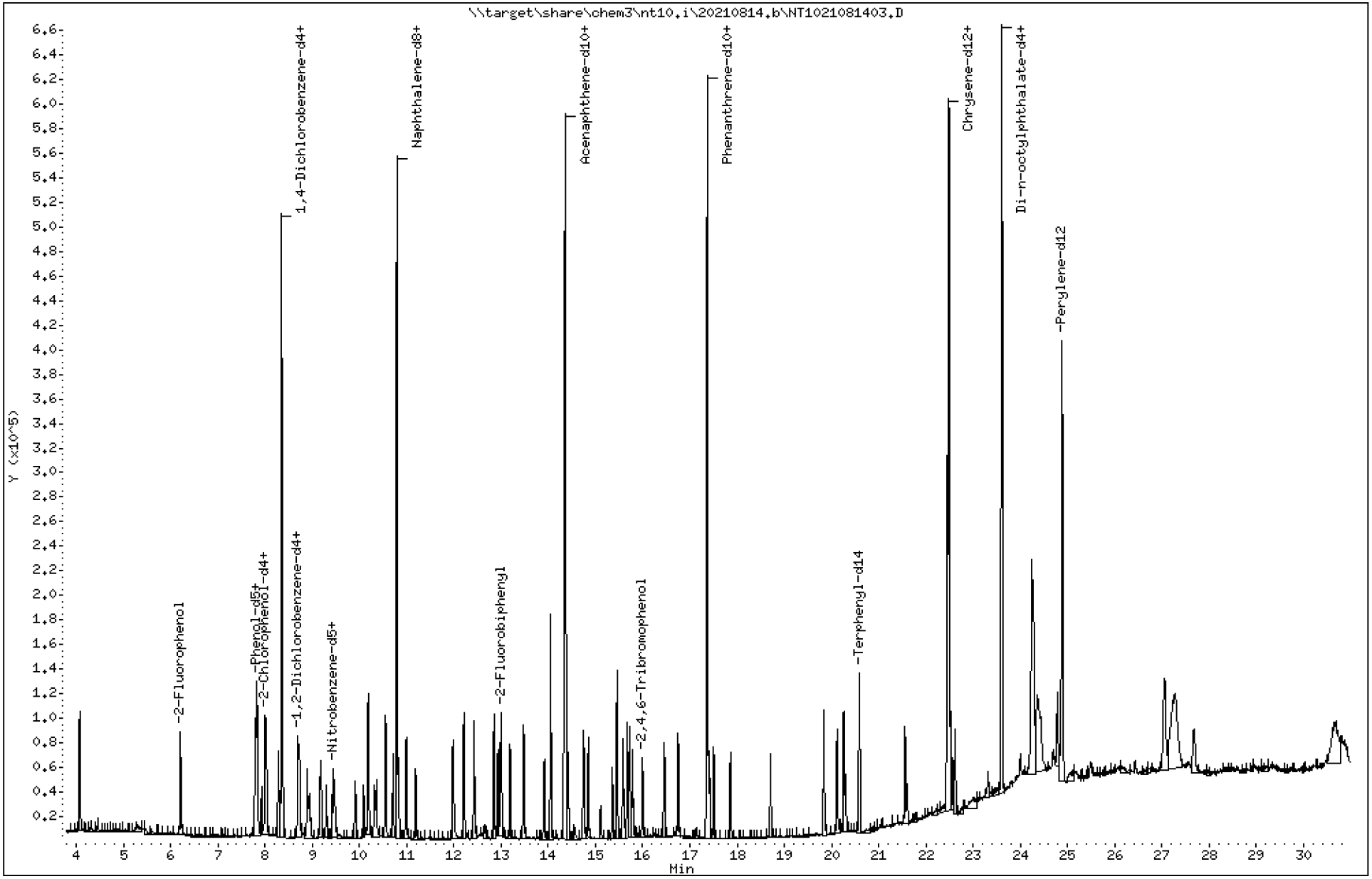
Instrument: nt10.i

Sample Info: SJH0174-LCV1

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

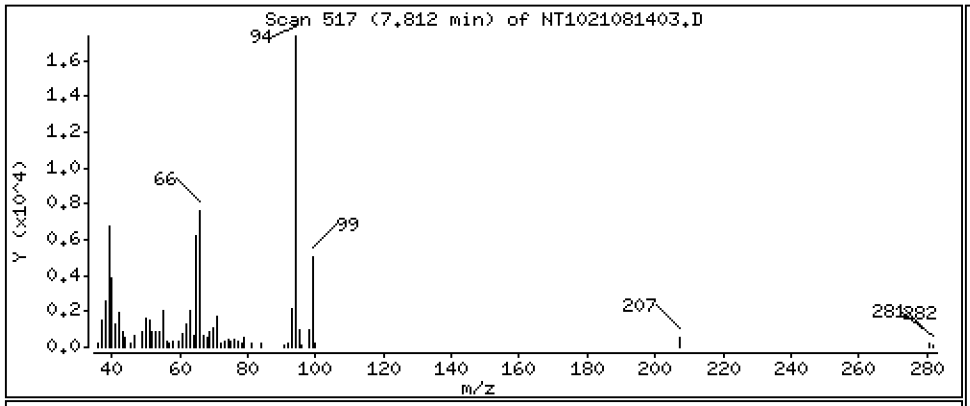
Operator: VTS

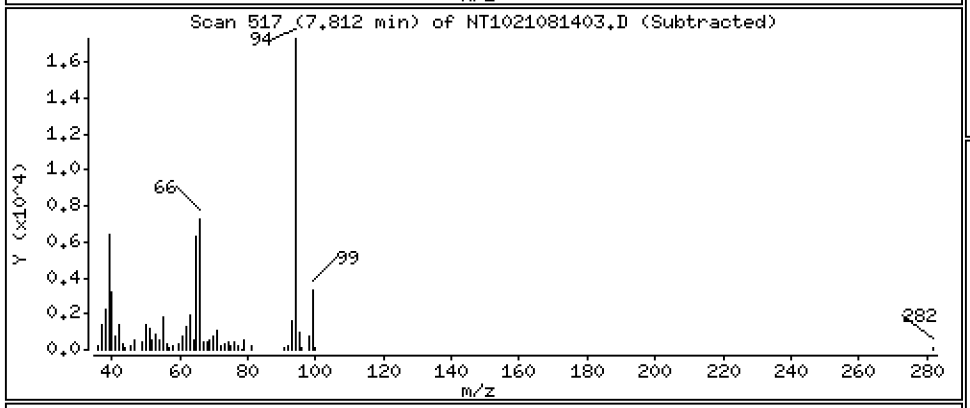
Column phase: ZB-5msi

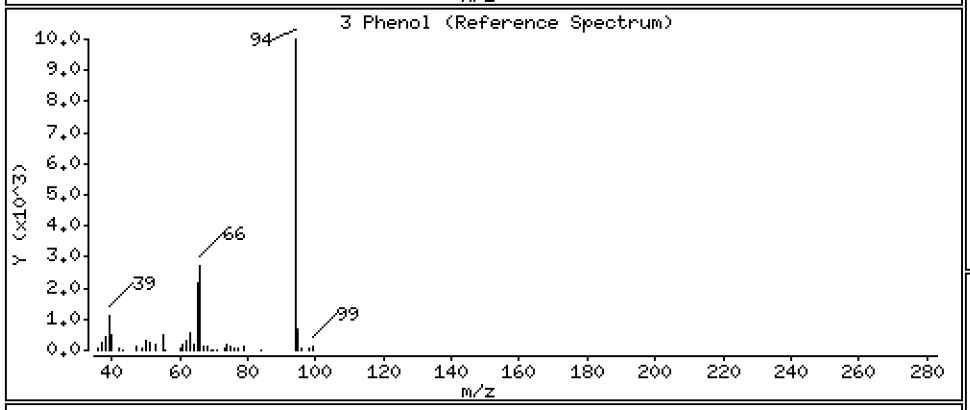
Column diameter: 0.25

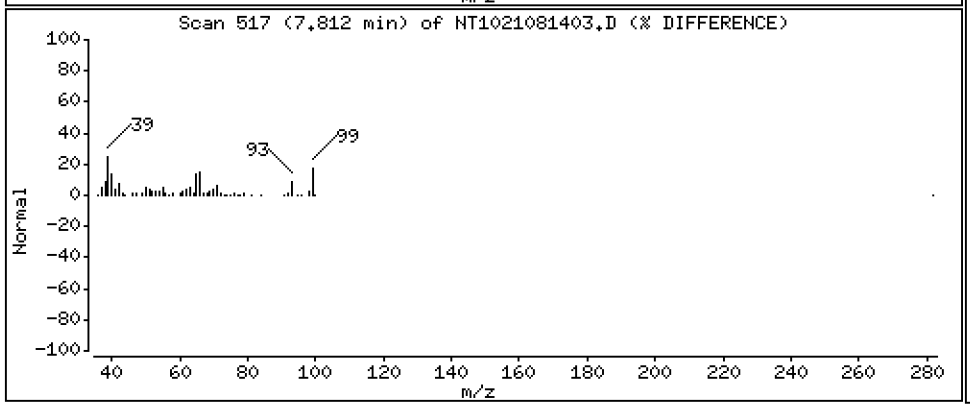
3 Phenol

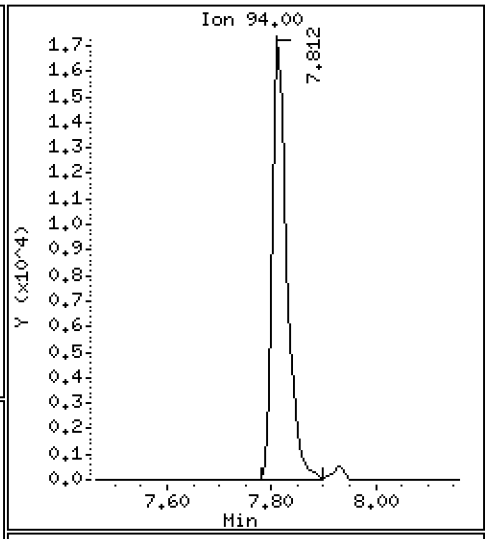
Concentration: 0.5353 ug/mL

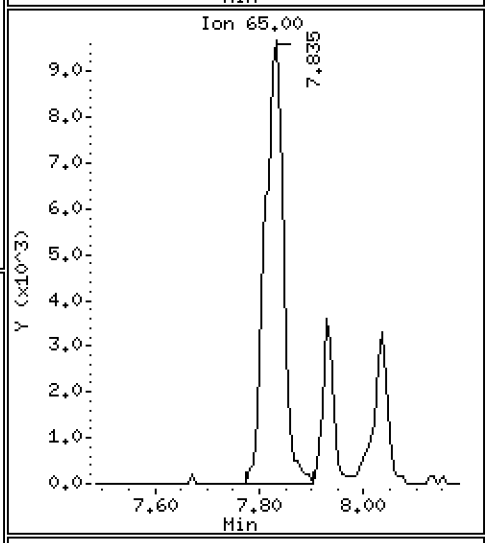


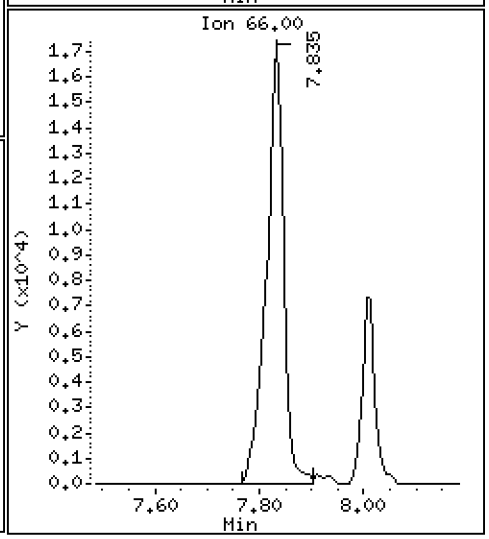












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

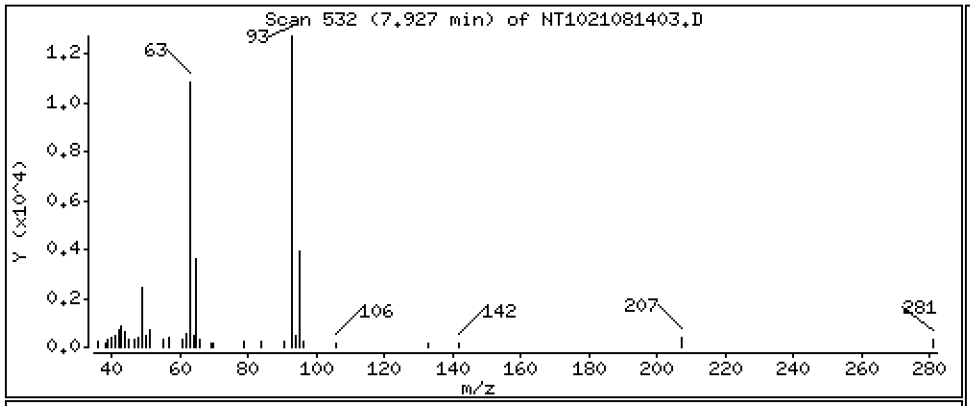
Operator: VTS

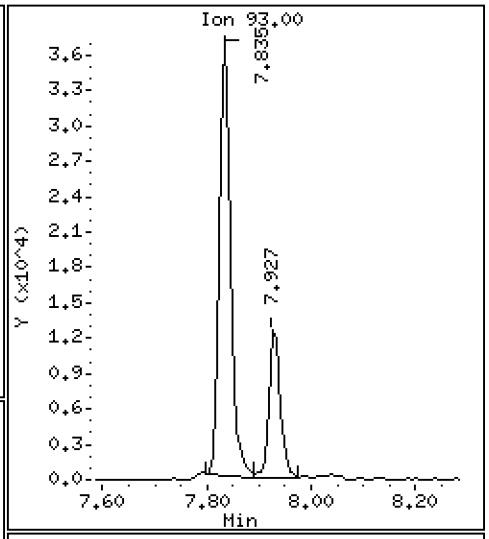
Column phase: ZB-5msi

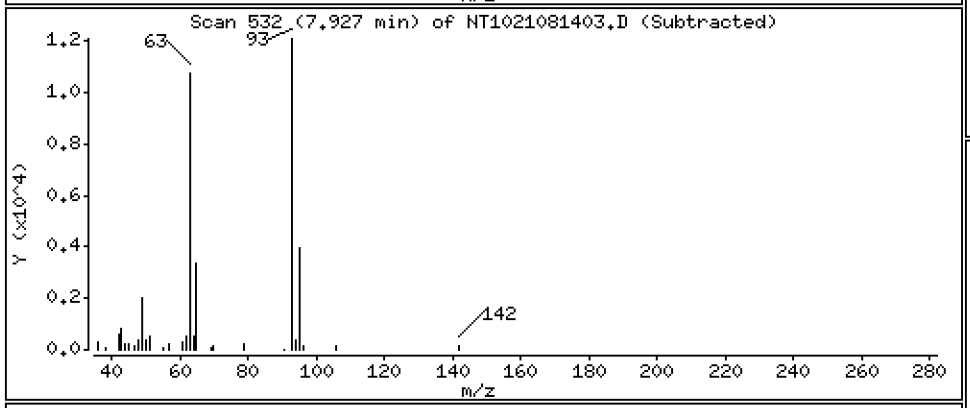
Column diameter: 0.25

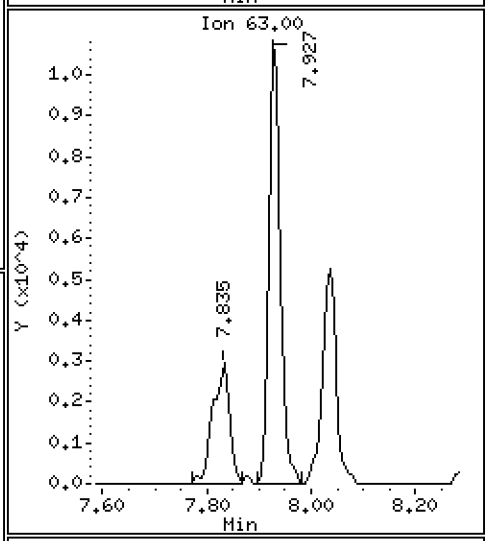
4 Bis(2-Chloroethyl)ether

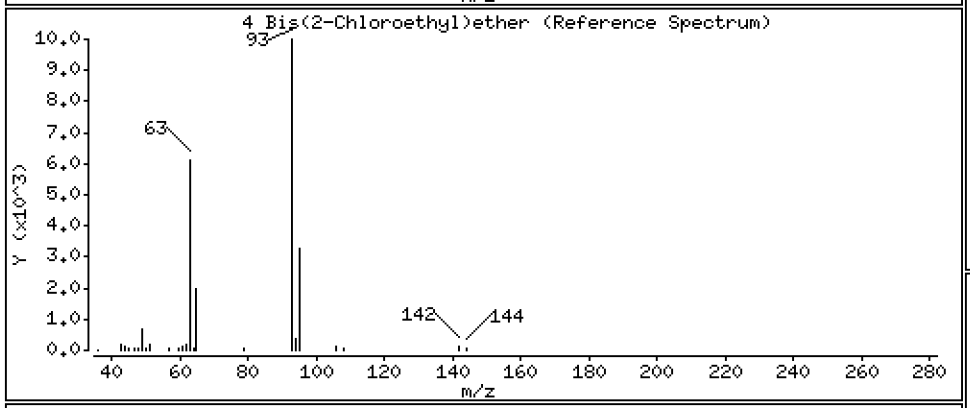
Concentration: 0.3986 ug/mL

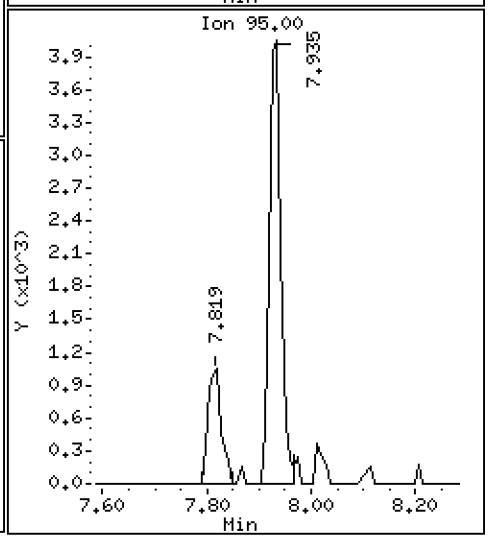


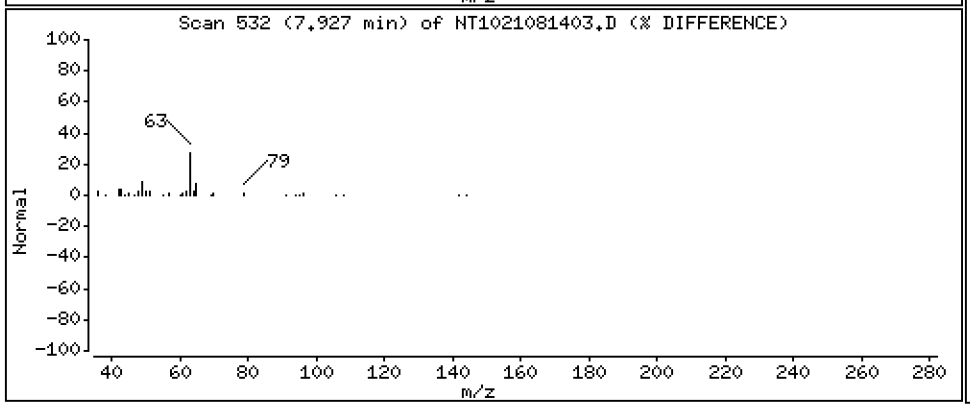












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

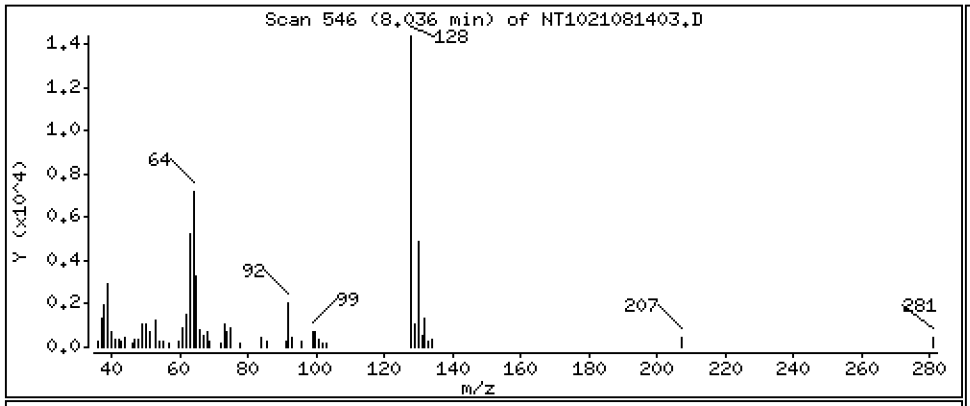
Operator: VTS

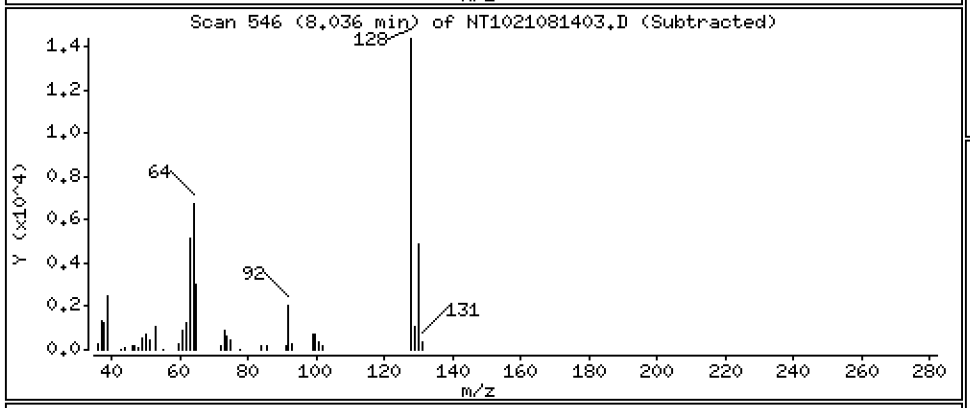
Column phase: ZB-5msi

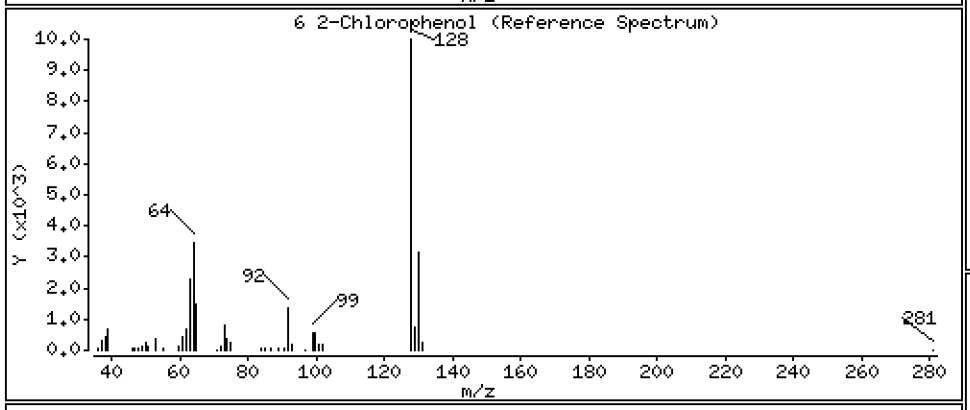
Column diameter: 0.25

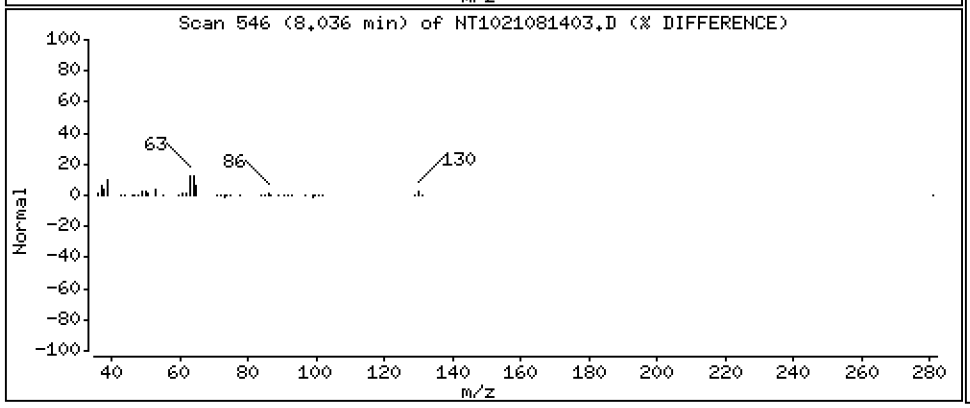
6 2-Chlorophenol

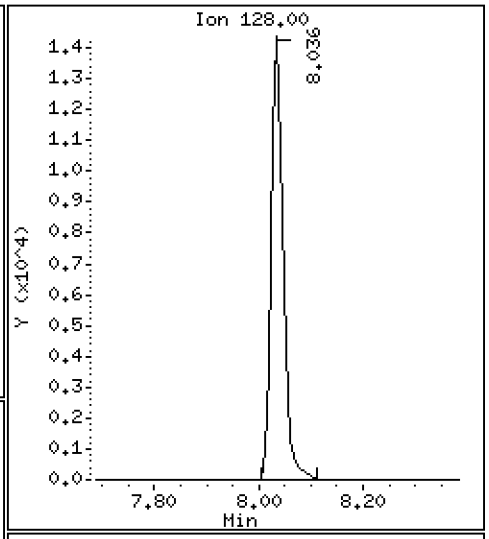
Concentration: 0.5785 ug/mL

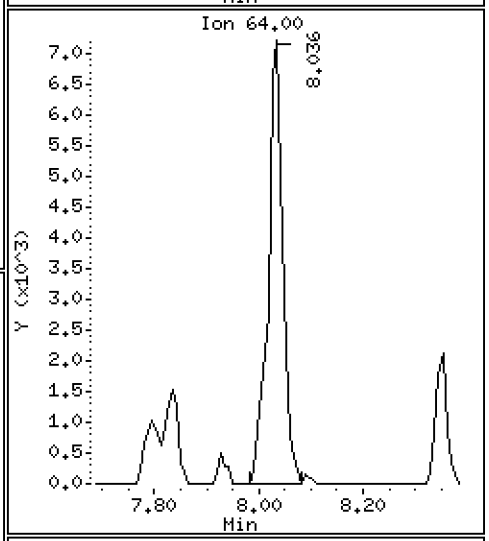


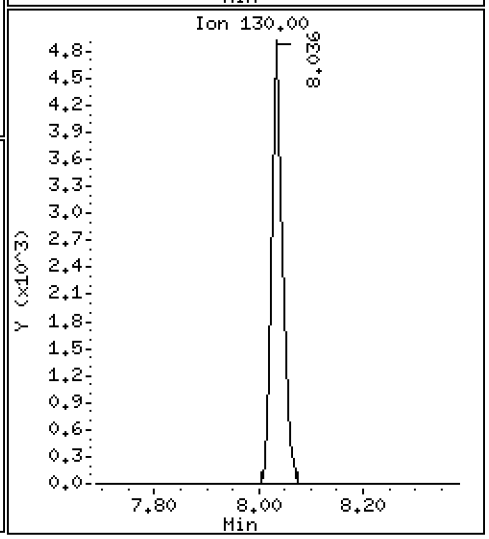












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

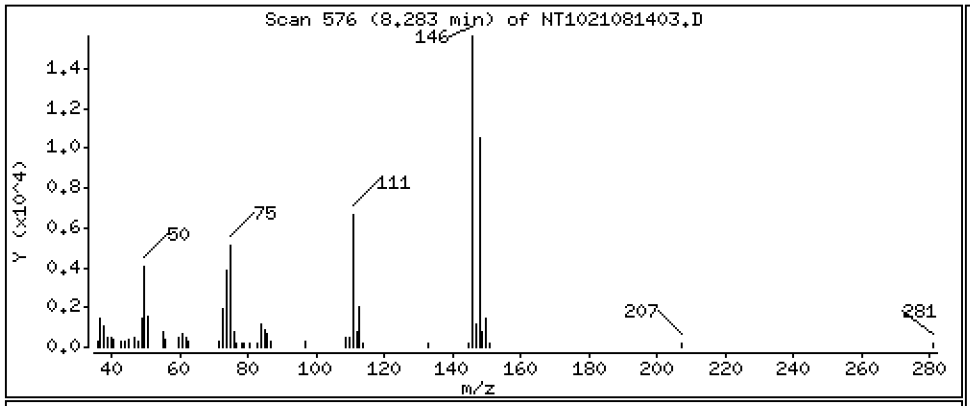
Operator: VTS

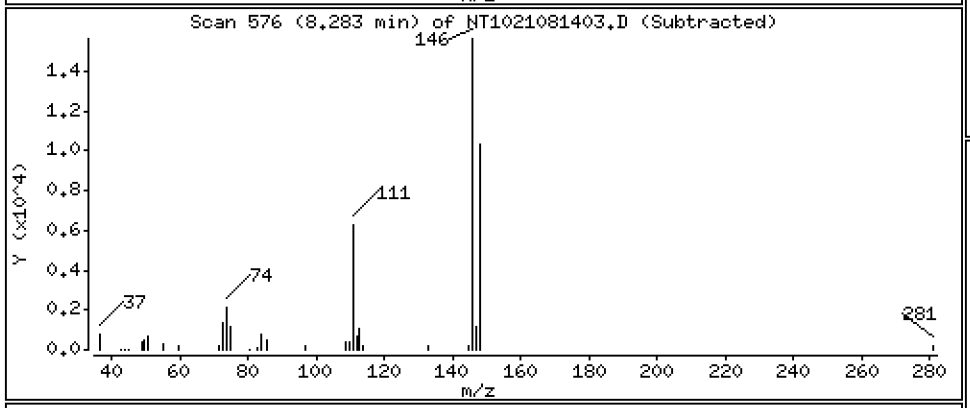
Column phase: ZB-5msi

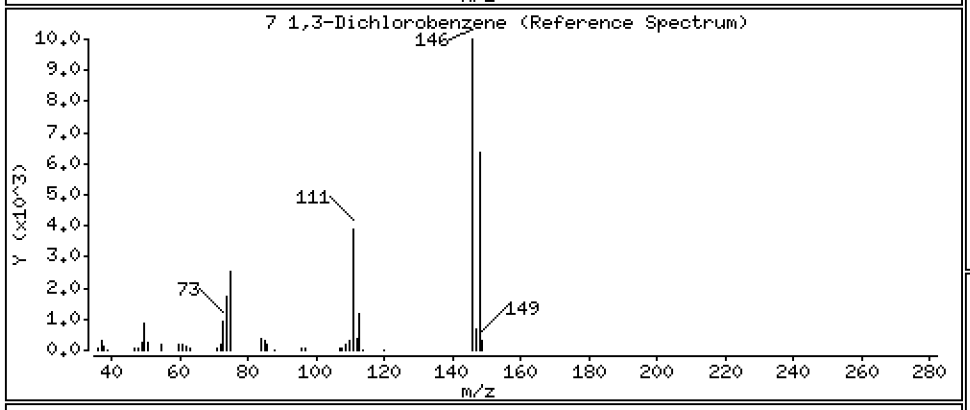
Column diameter: 0.25

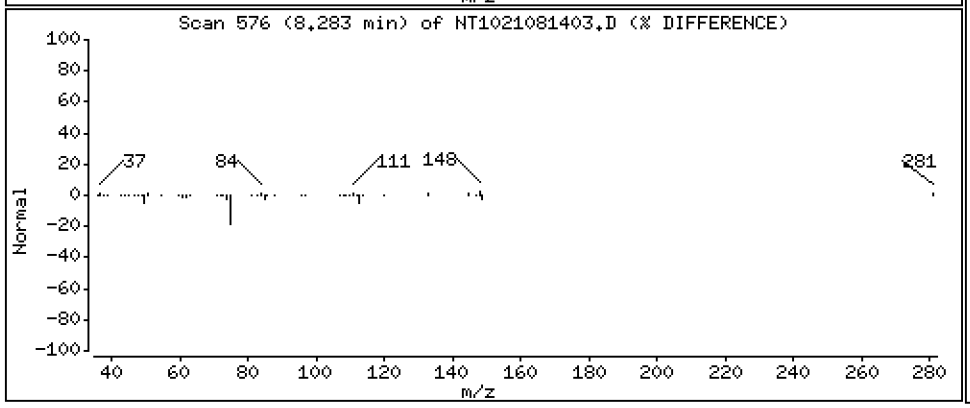
7 1,3-Dichlorobenzene

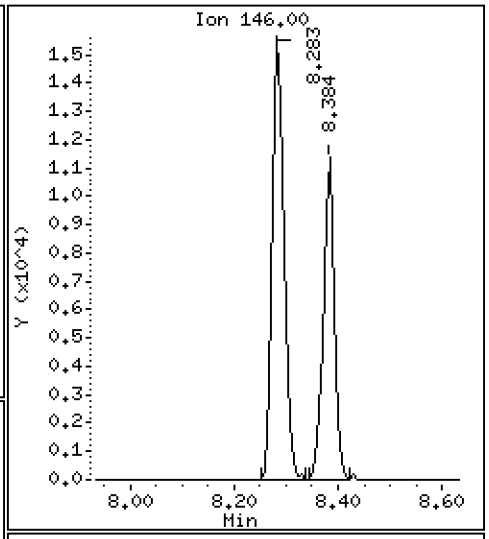
Concentration: 0.4841 ug/mL

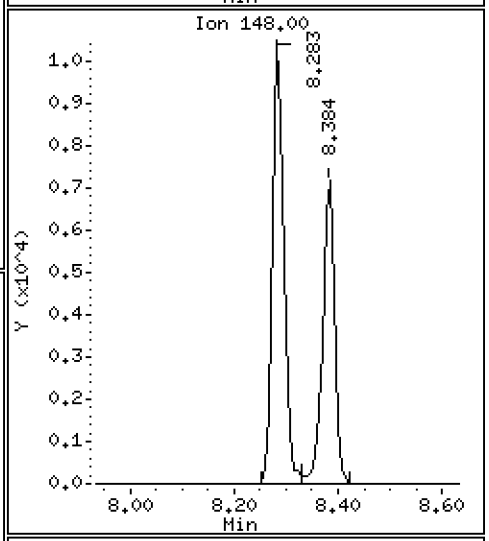


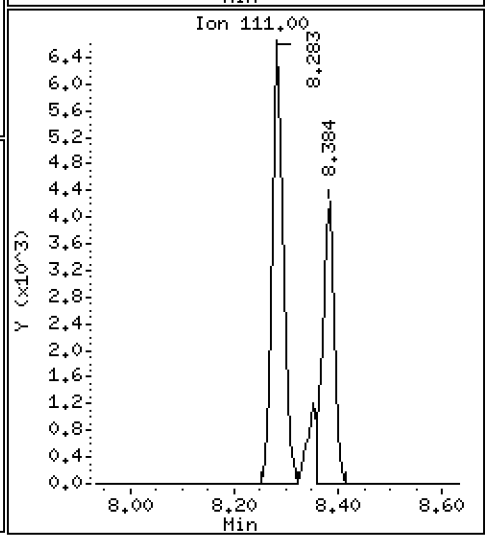












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

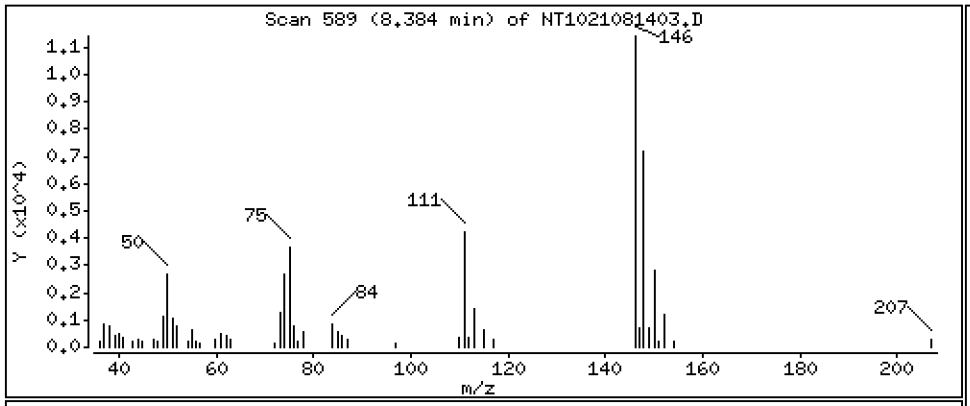
Operator: VTS

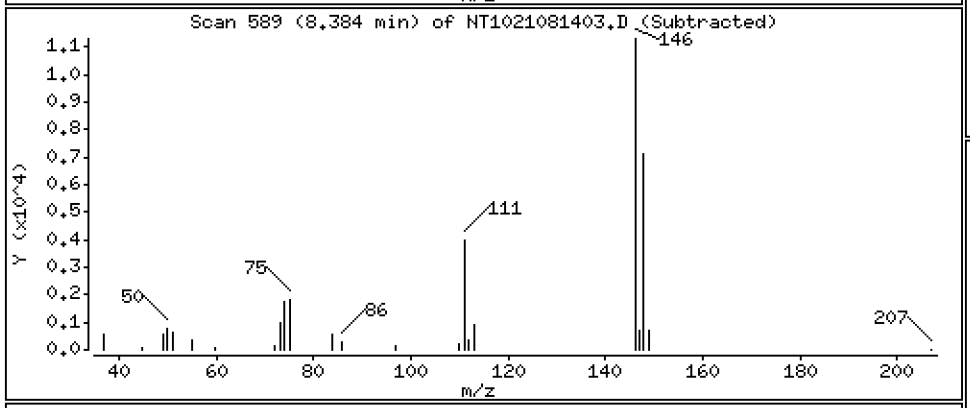
Column phase: ZB-5msi

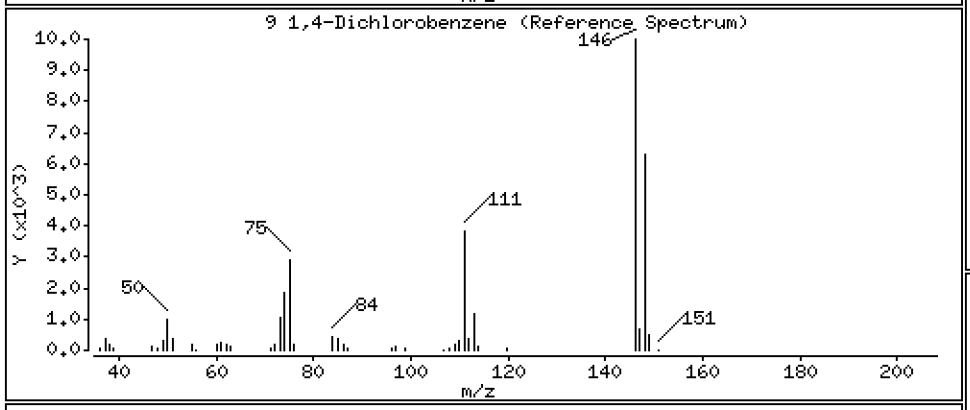
Column diameter: 0.25

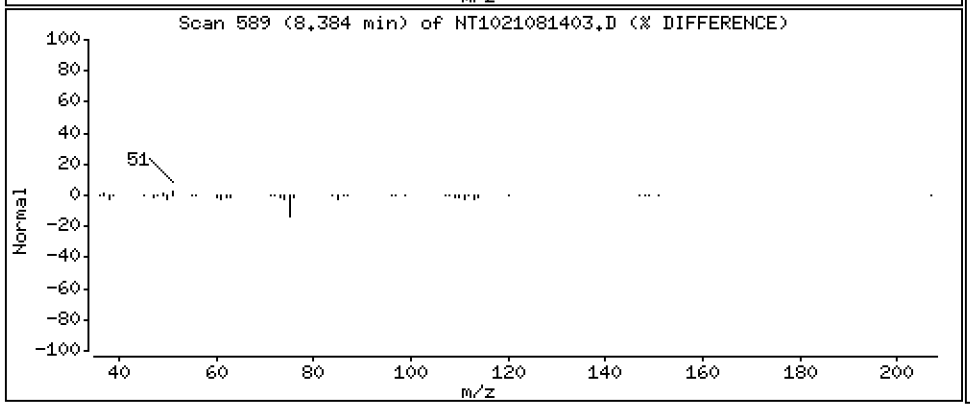
9 1,4-Dichlorobenzene

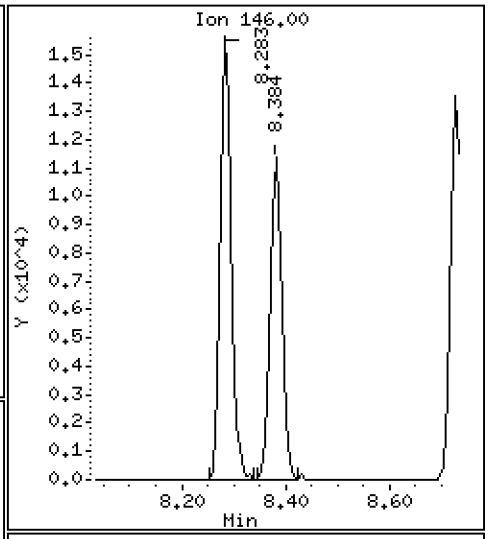
Concentration: 0.3985 ug/mL

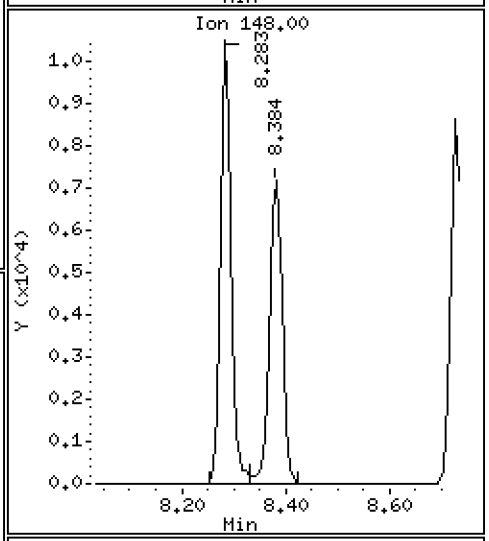


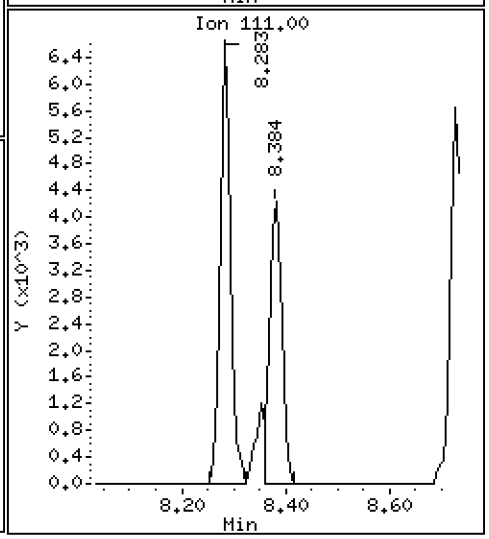












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

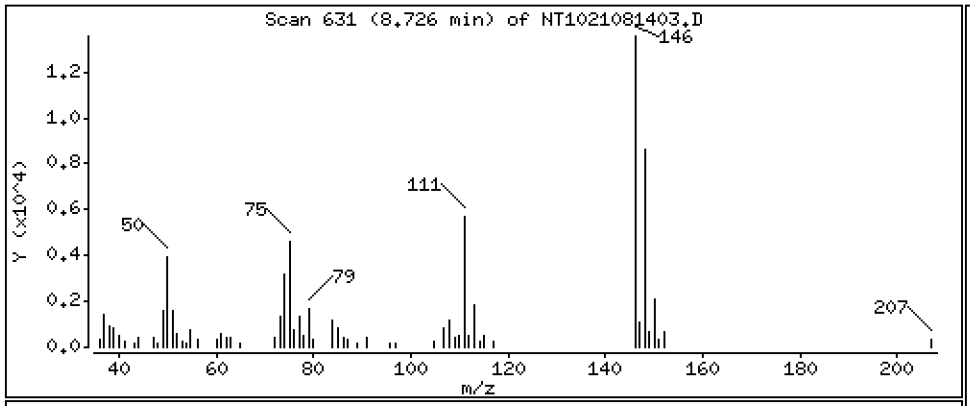
Operator: VTS

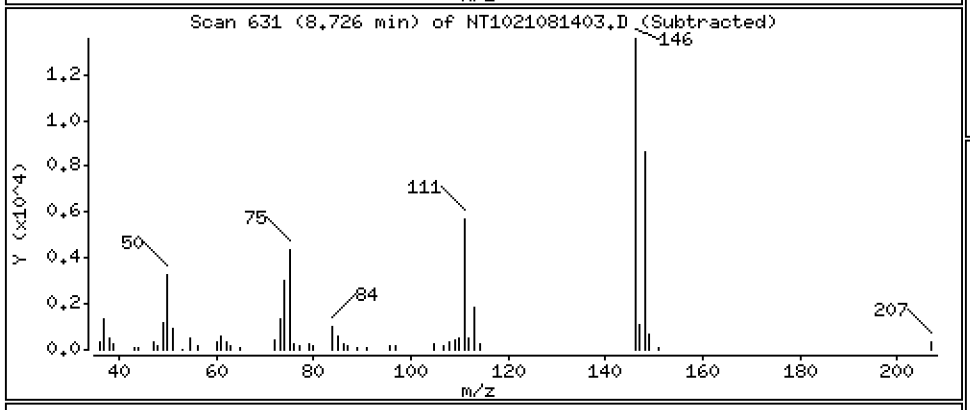
Column phase: ZB-5msi

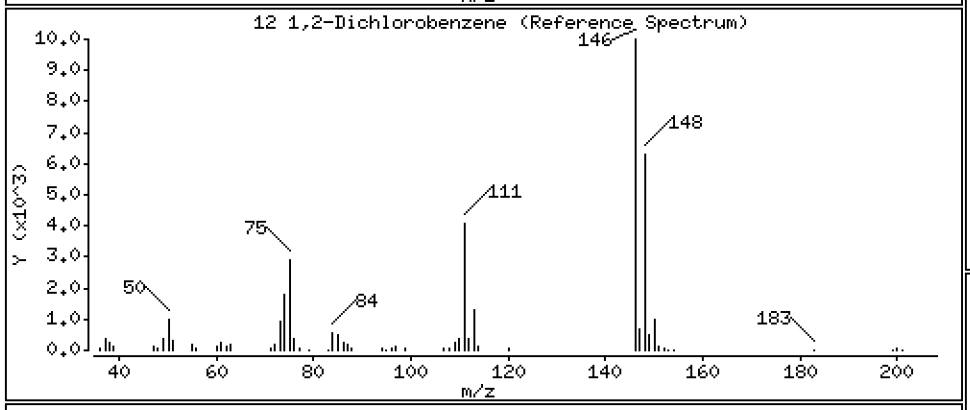
Column diameter: 0.25

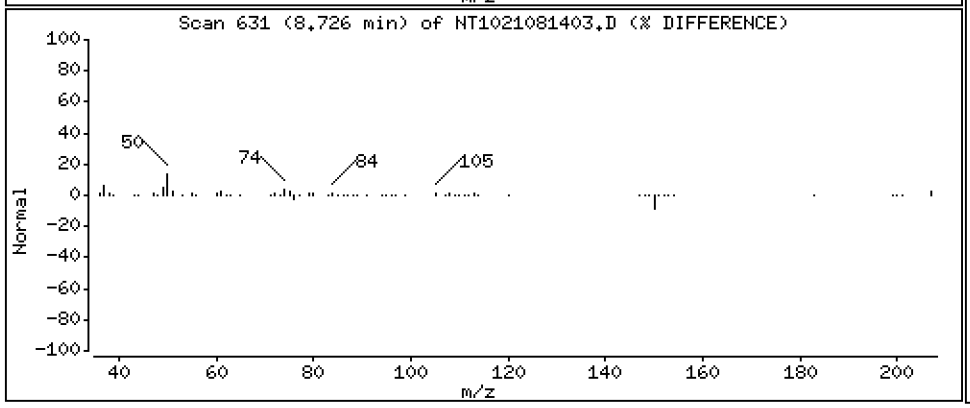
12 1,2-Dichlorobenzene

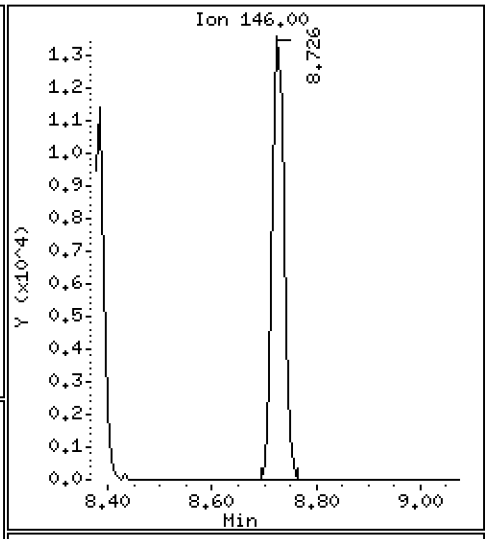
Concentration: 0.4569 ug/mL

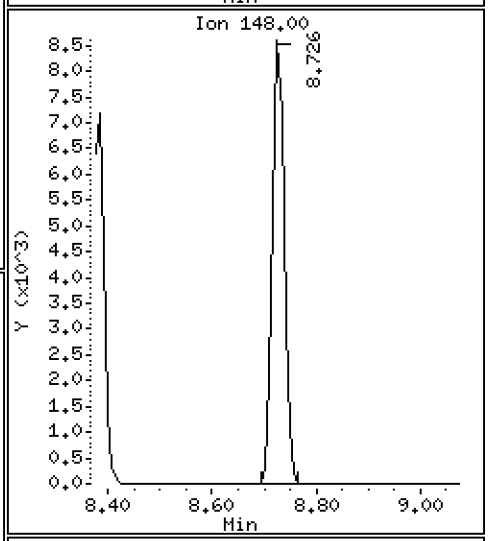


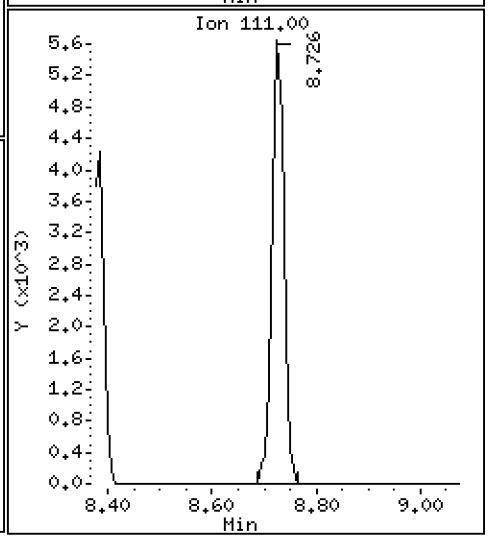












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

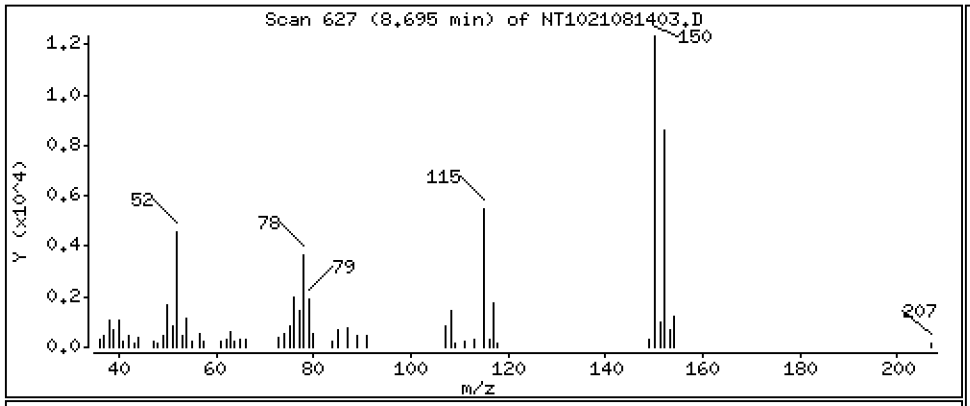
Operator: VTS

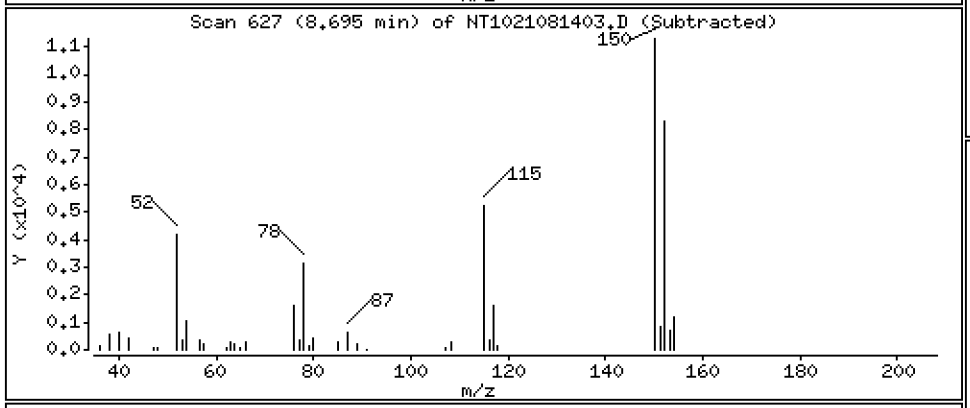
Column phase: ZB-5msi

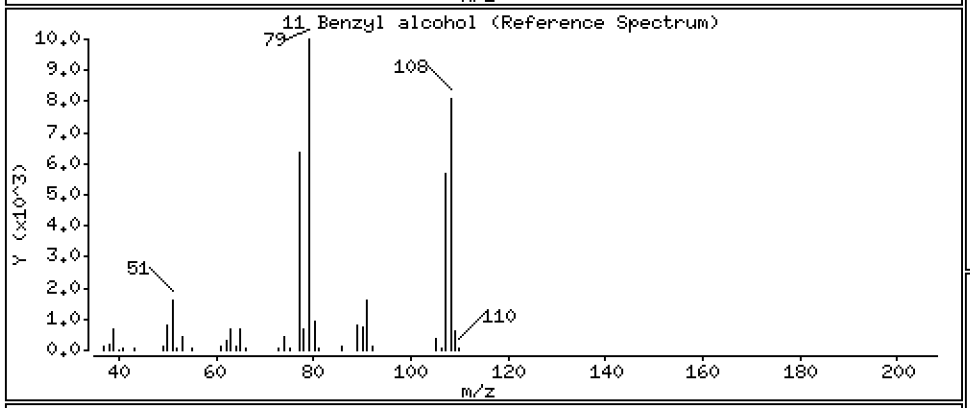
Column diameter: 0.25

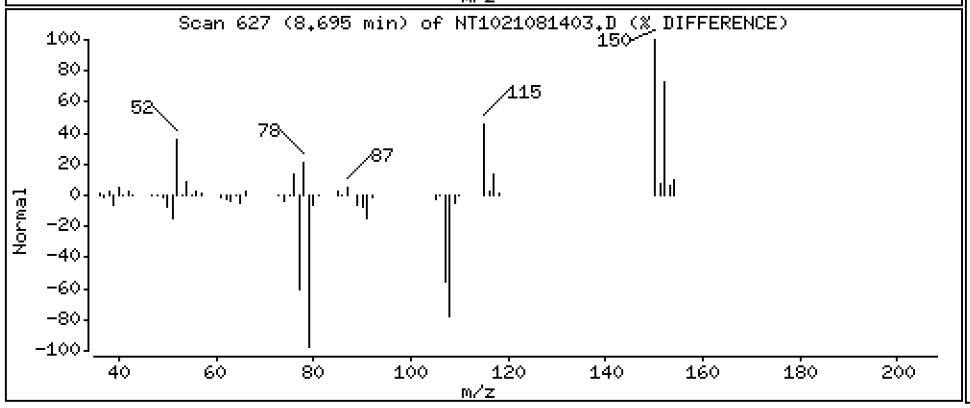
11 Benzyl alcohol

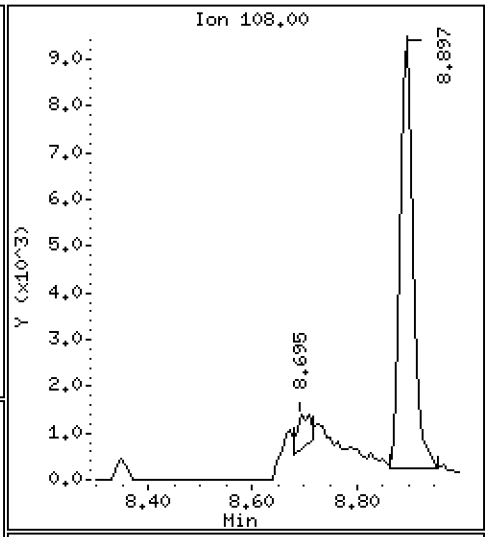
Concentration: 0.04731 ug/mL

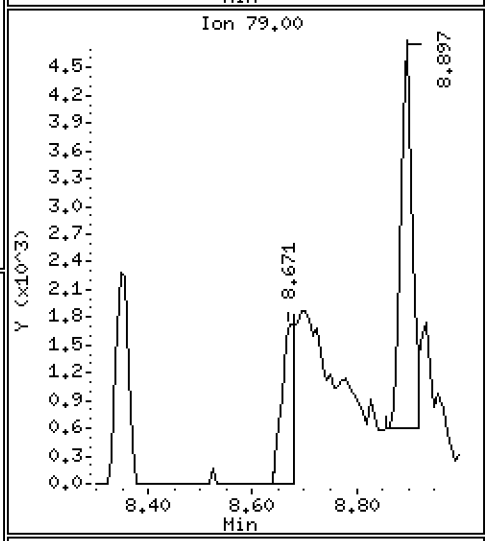


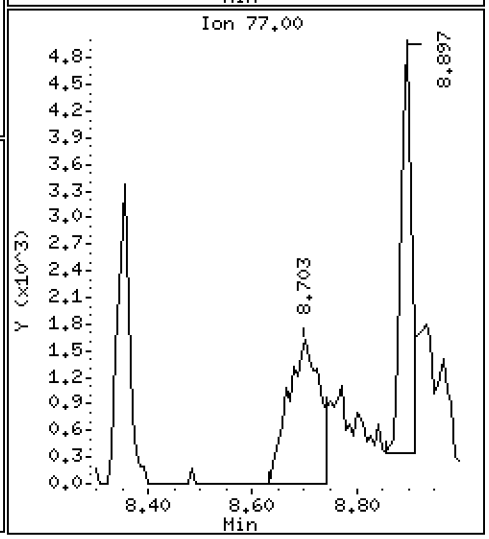












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

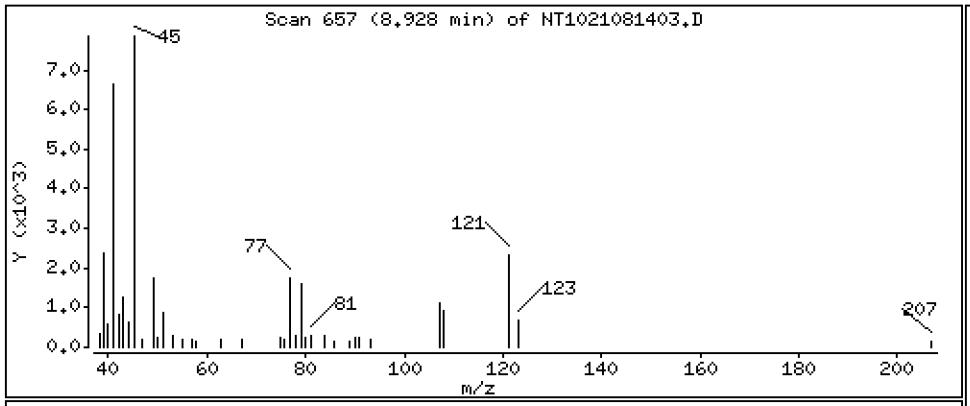
Operator: VTS

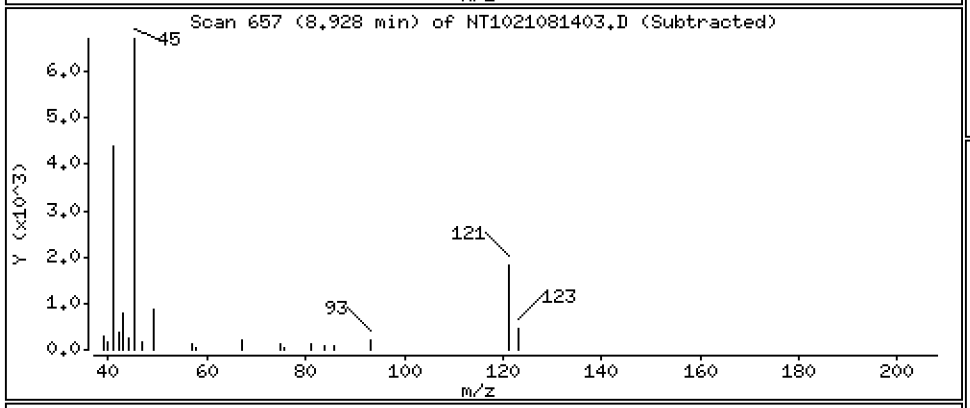
Column phase: ZB-5msi

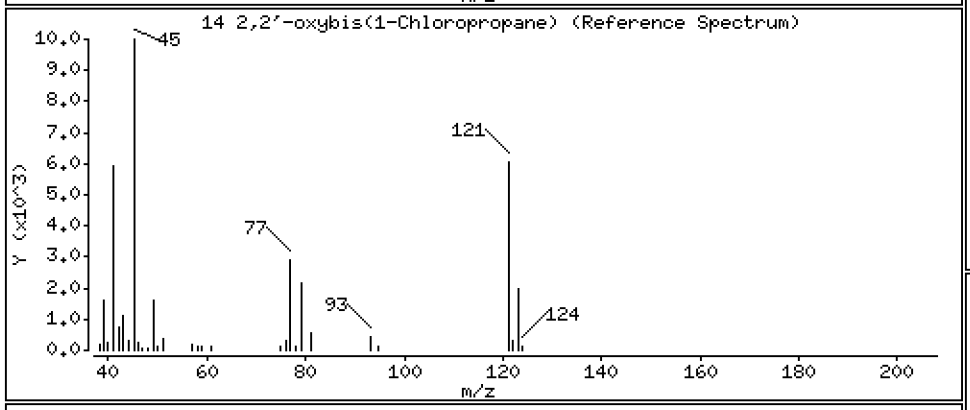
Column diameter: 0.25

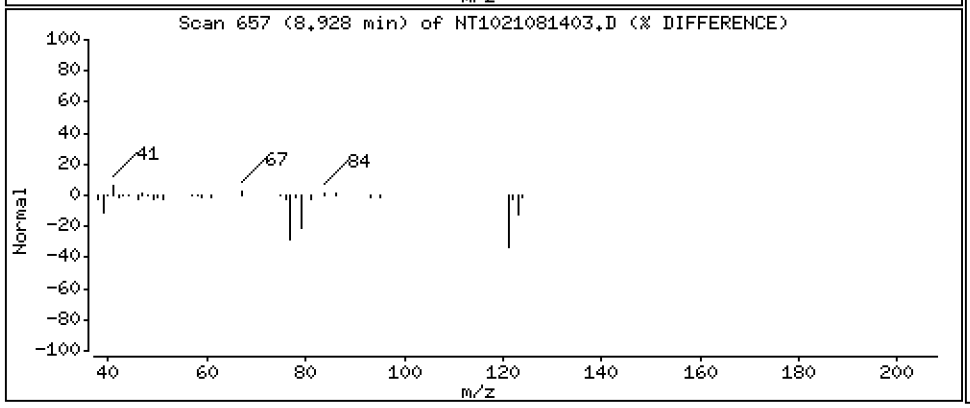
14 2,2'-oxybis(1-Chloropropane)

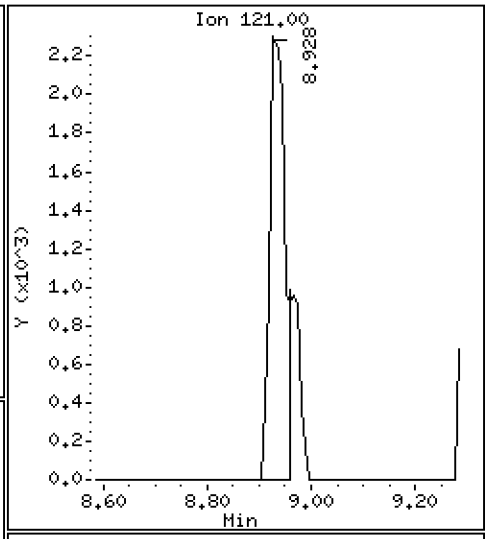
Concentration: 0.2665 ug/mL

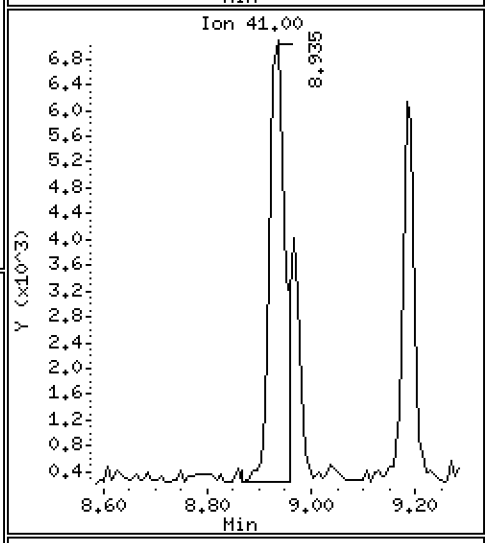


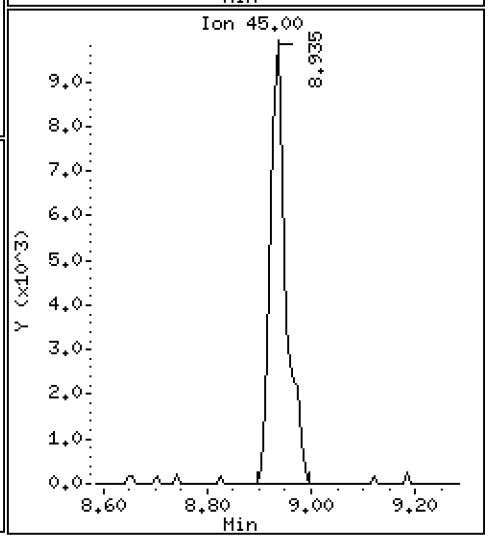












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

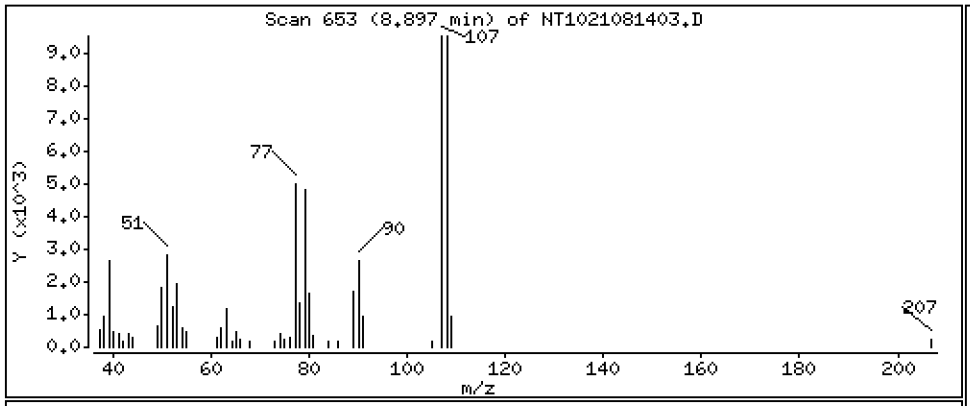
Operator: VTS

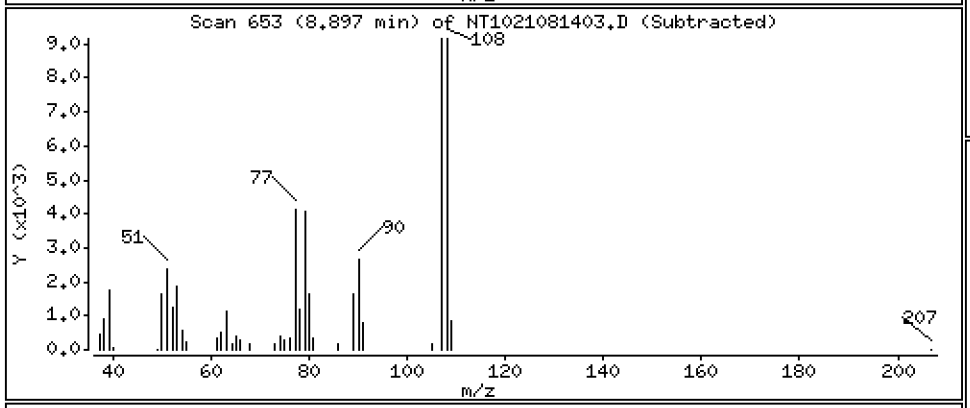
Column phase: ZB-5msi

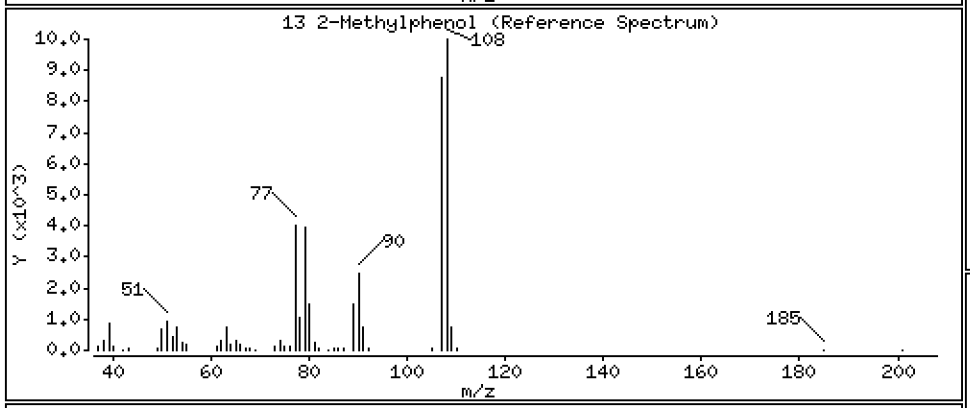
Column diameter: 0.25

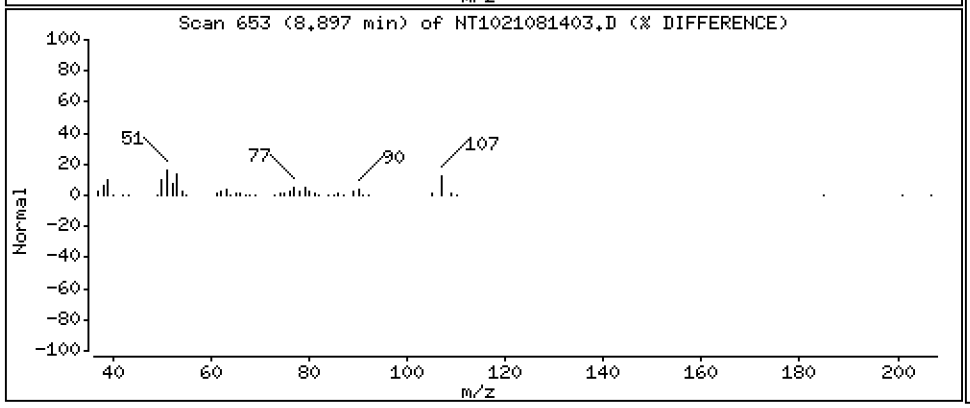
13 2-Methylphenol

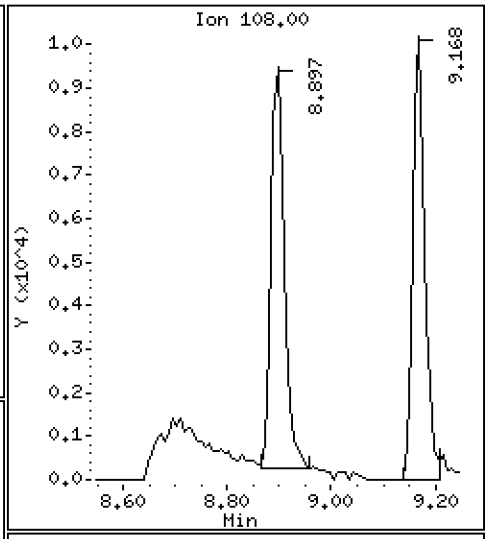
Concentration: 0.4205 ug/mL

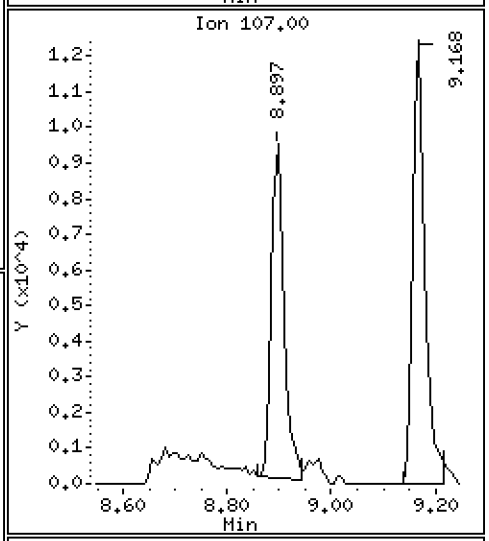


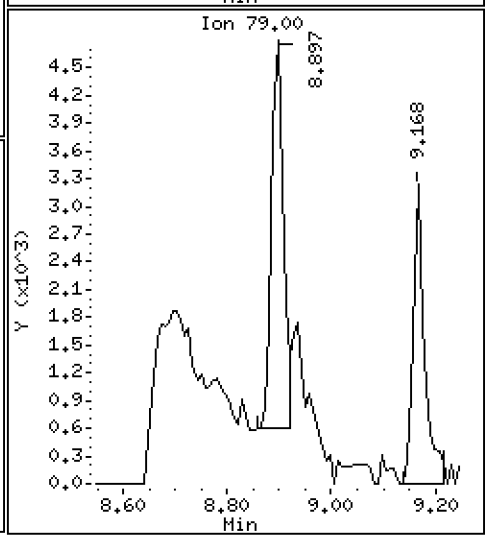












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

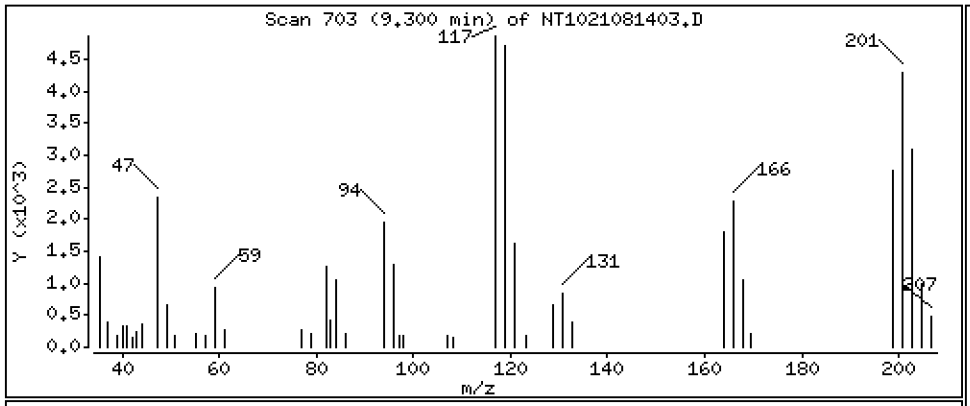
Operator: VTS

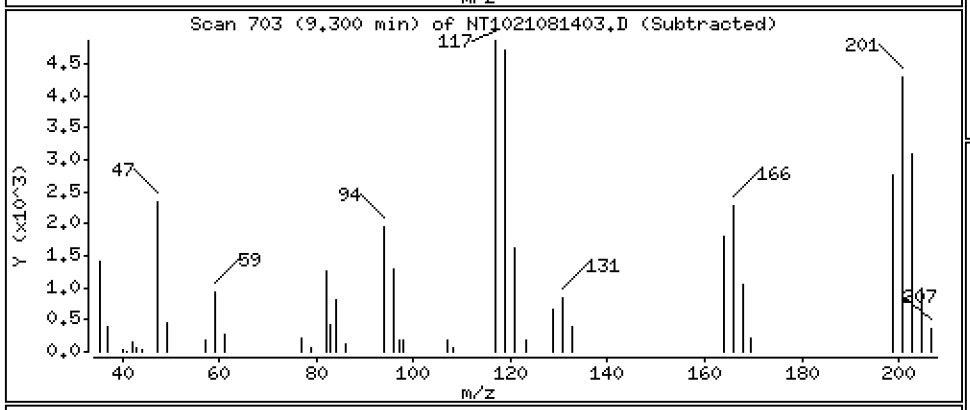
Column phase: ZB-5msi

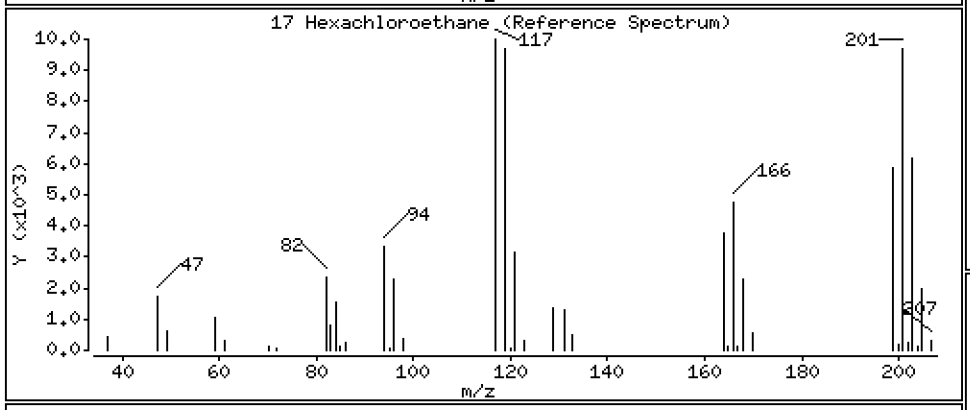
Column diameter: 0.25

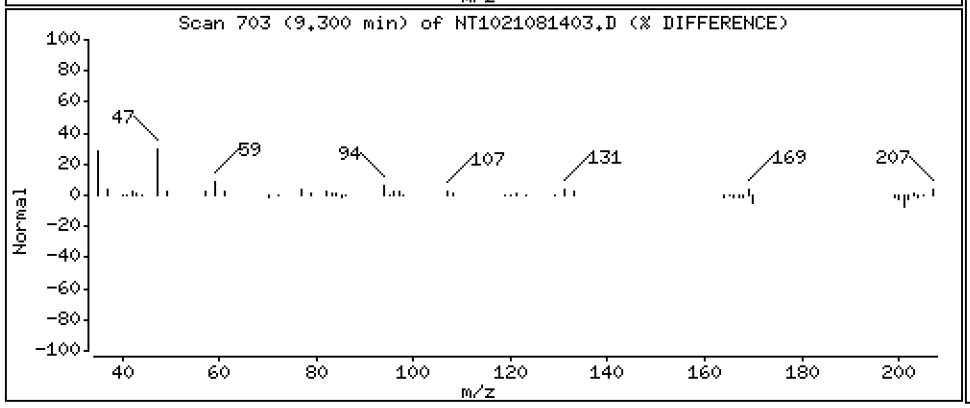
17 Hexachloroethane

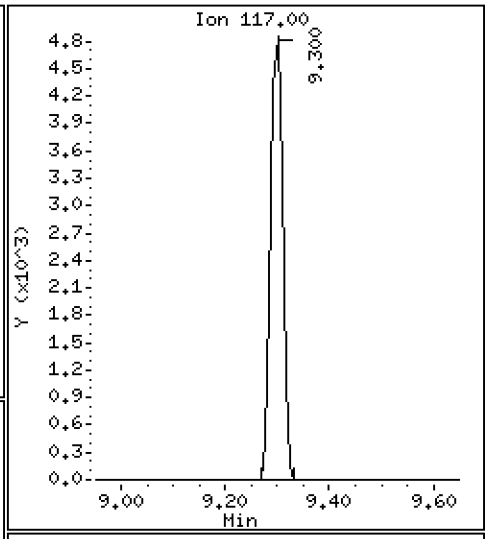
Concentration: 0.4119 ug/mL

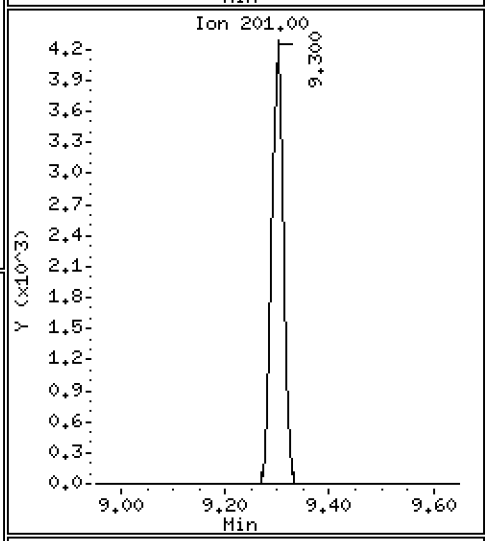


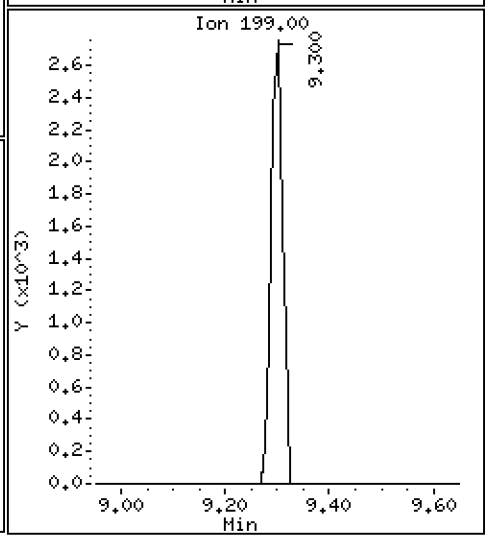












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

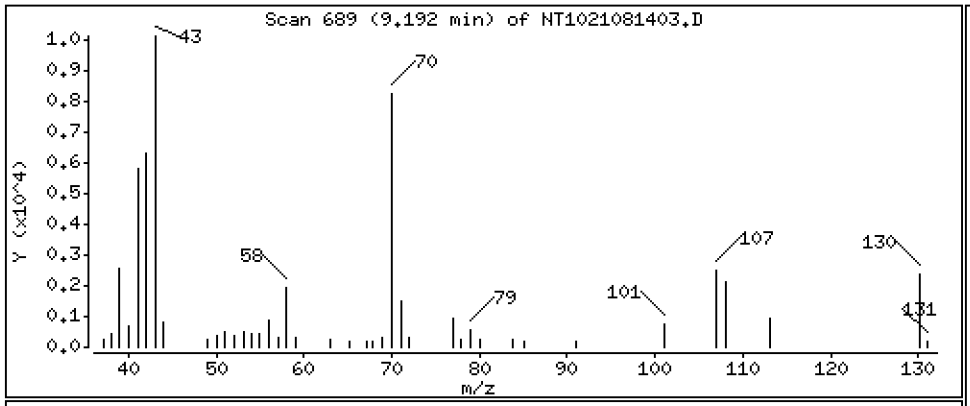
Operator: VTS

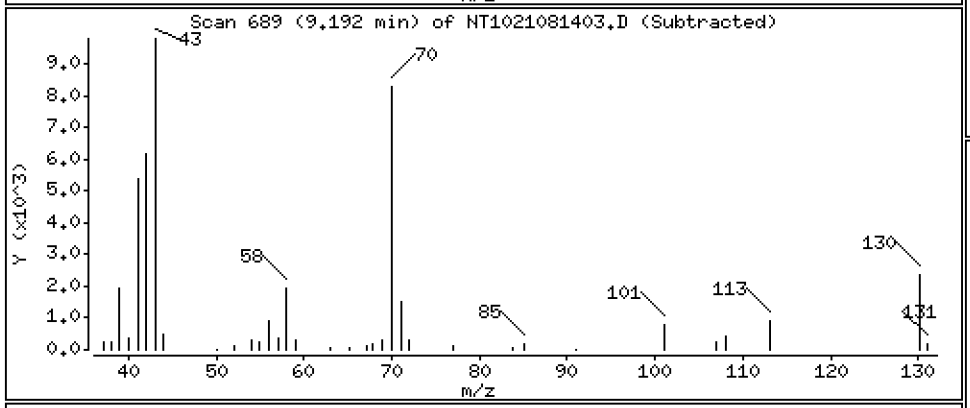
Column phase: ZB-5msi

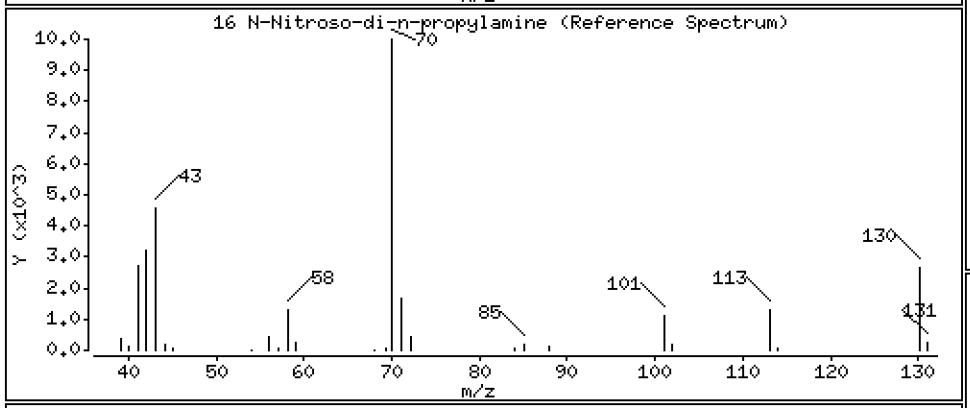
Column diameter: 0.25

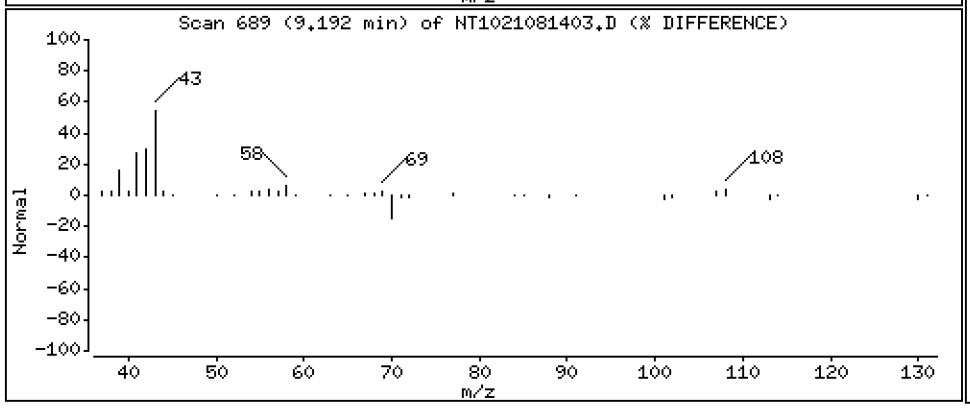
16 N-Nitroso-di-n-propylamine

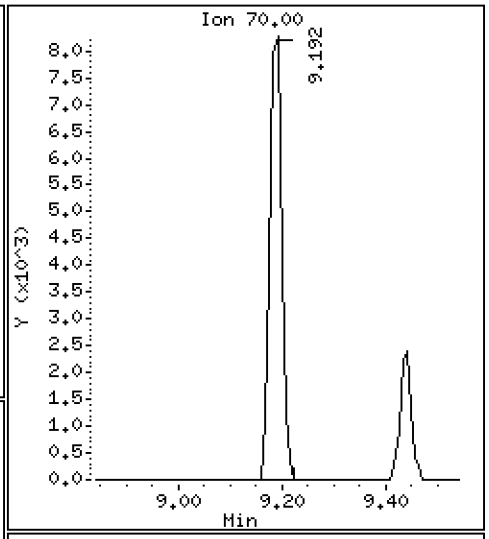
Concentration: 0.3916 ug/mL

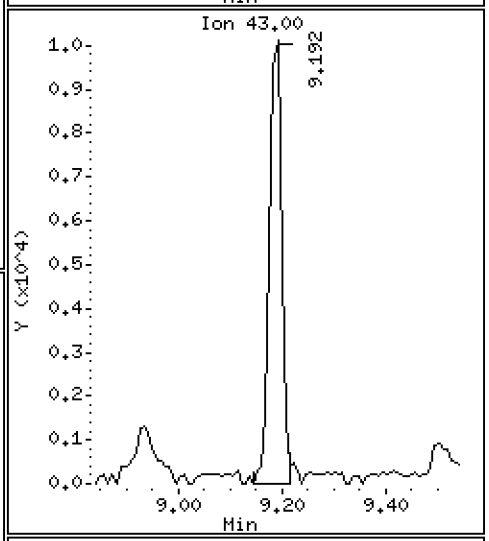


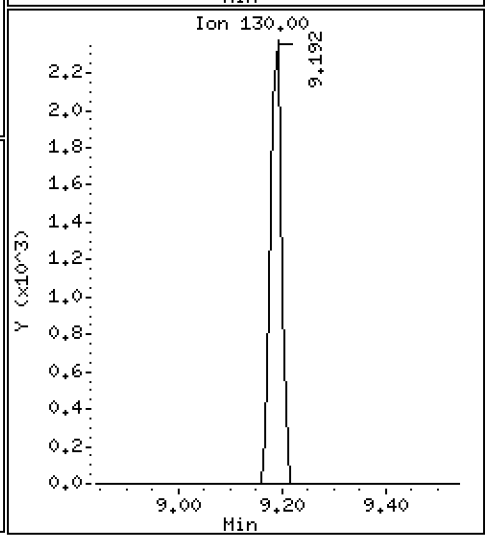












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

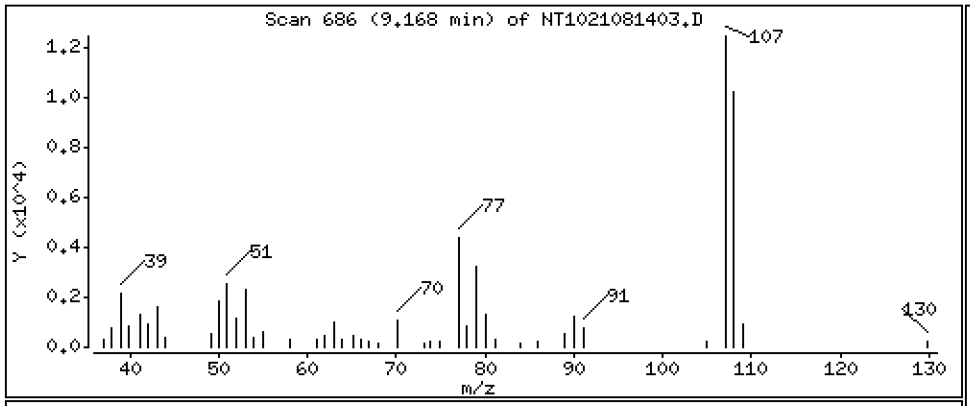
Operator: VTS

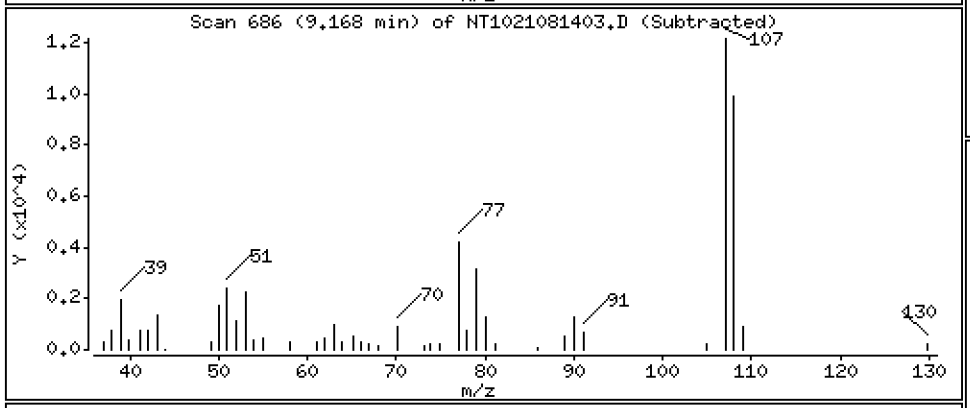
Column phase: ZB-5msi

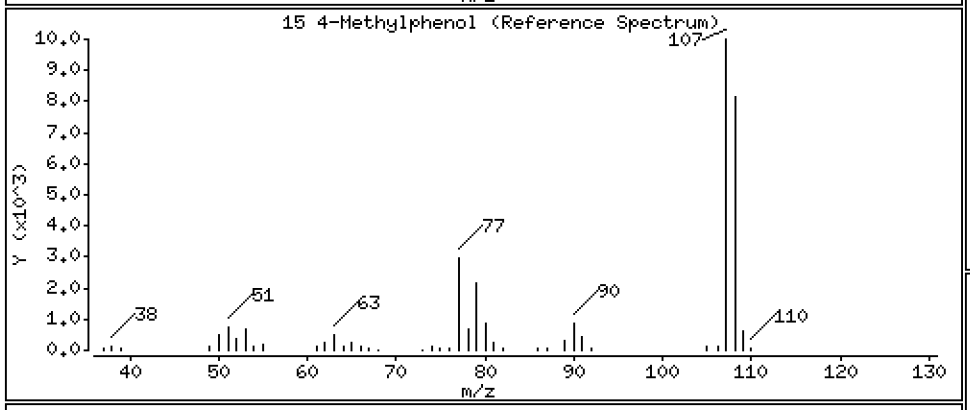
Column diameter: 0.25

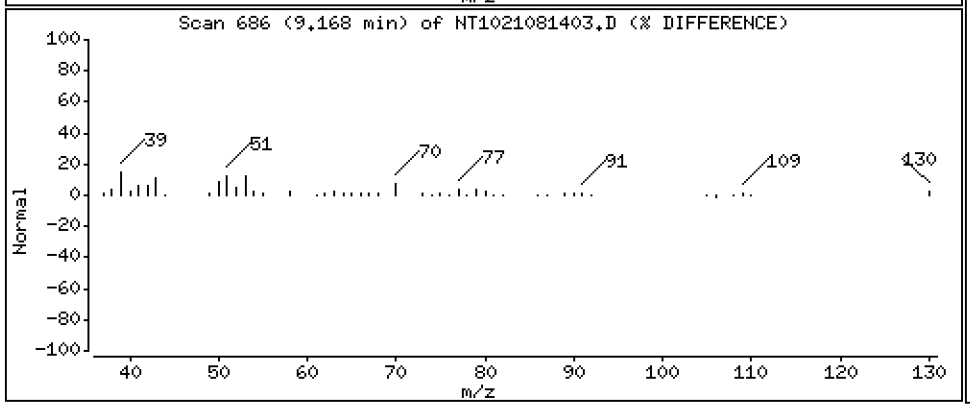
15 4-Methylphenol

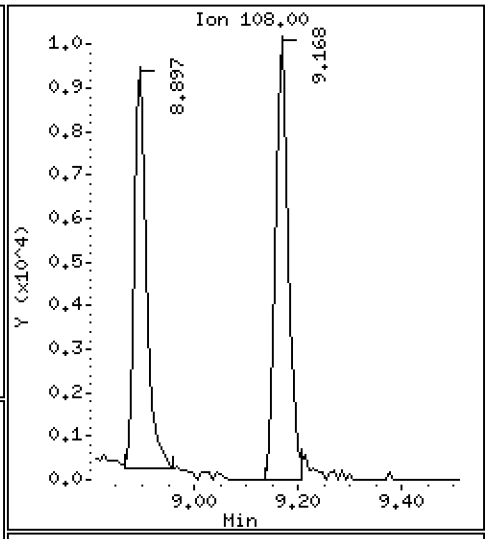
Concentration: 0.4301 ug/mL

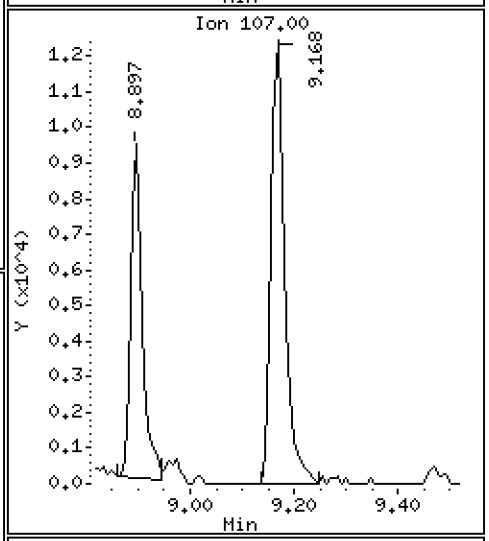


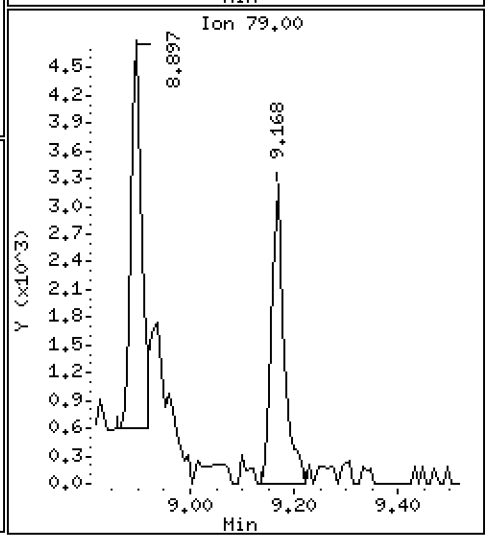












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

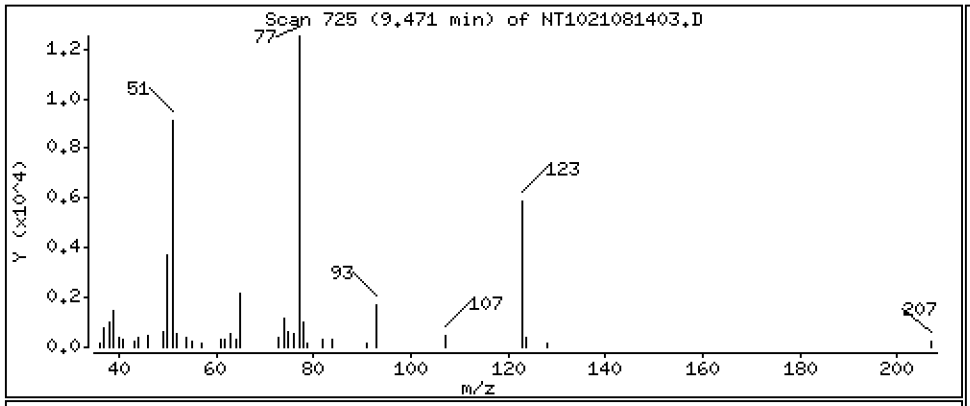
Operator: VTS

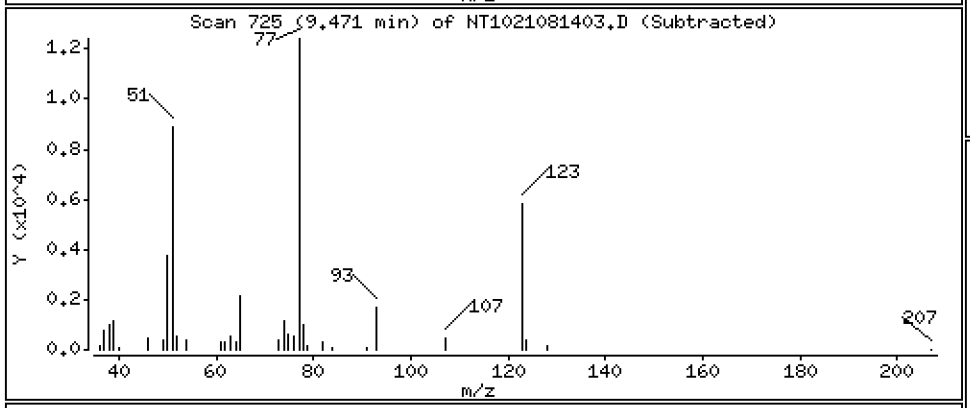
Column phase: ZB-5msi

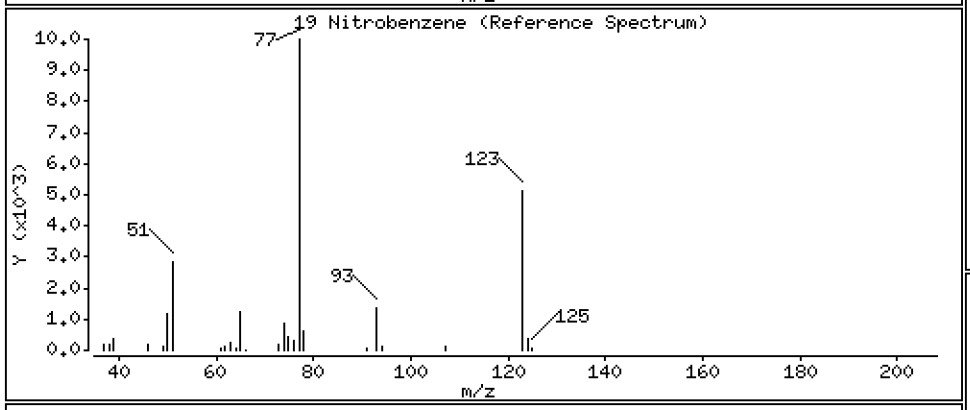
Column diameter: 0.25

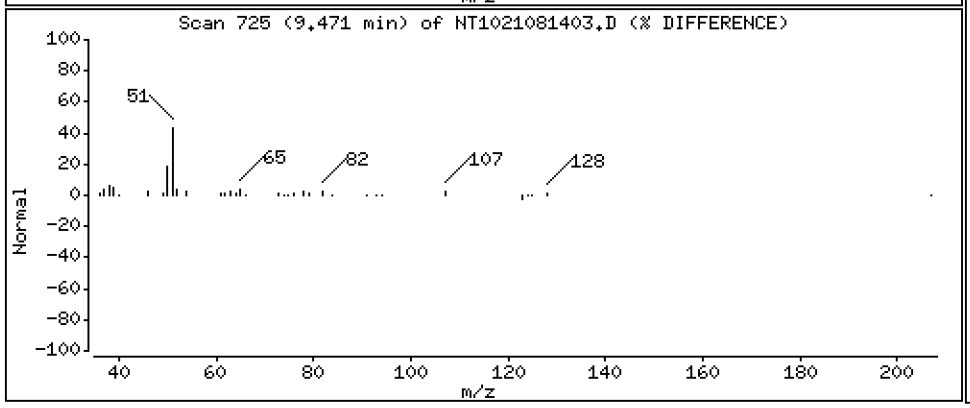
19 Nitrobenzene

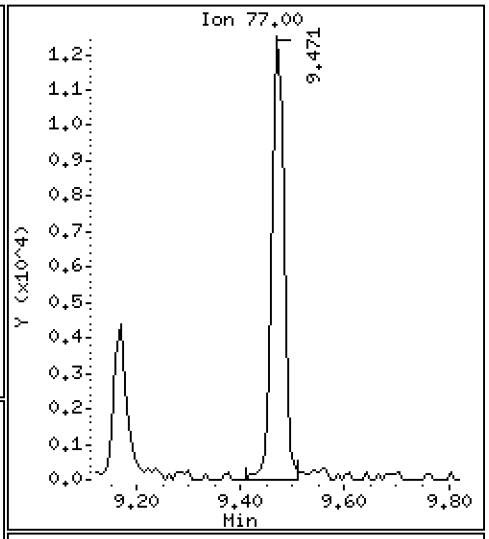
Concentration: 0.4186 ug/mL

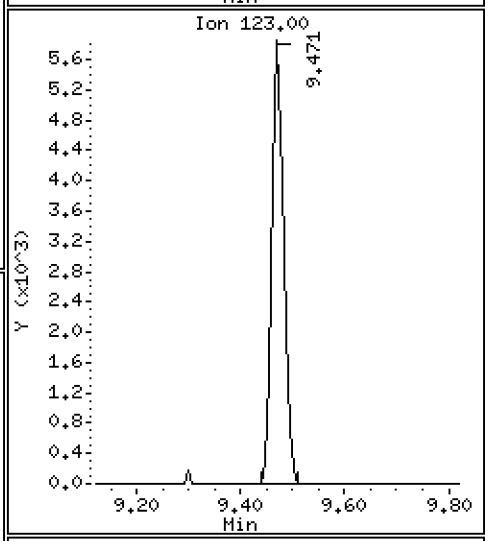


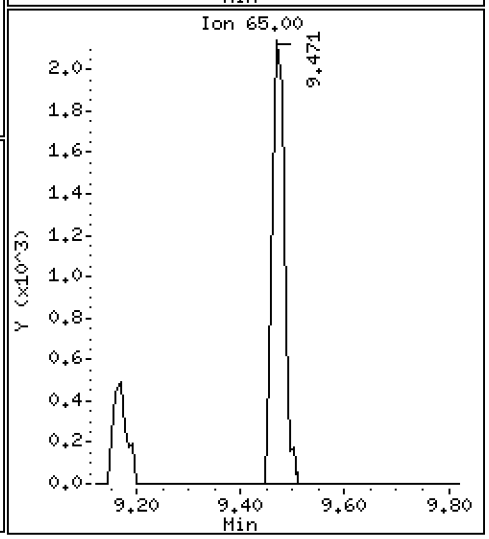












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

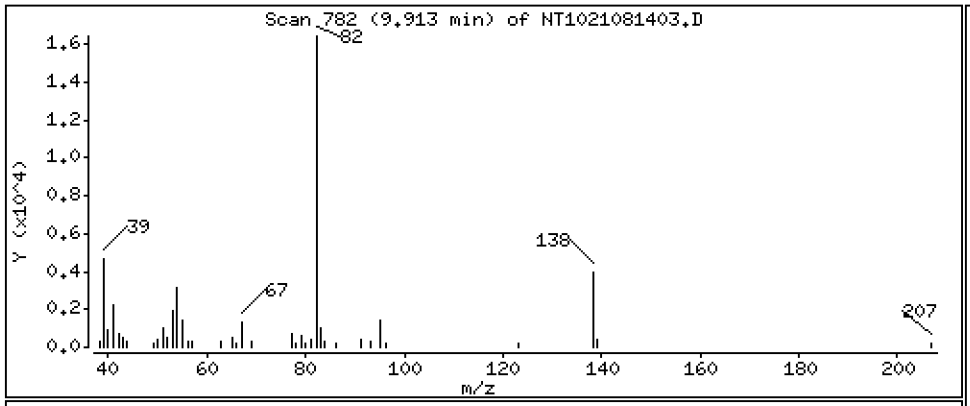
Operator: VTS

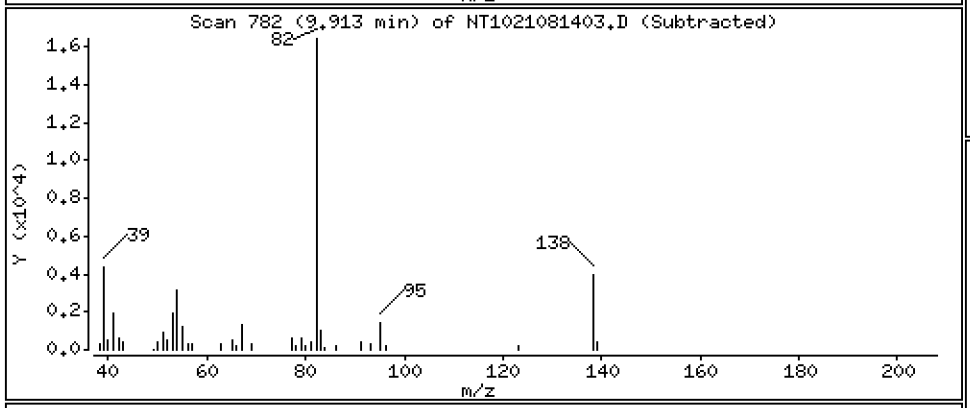
Column phase: ZB-5msi

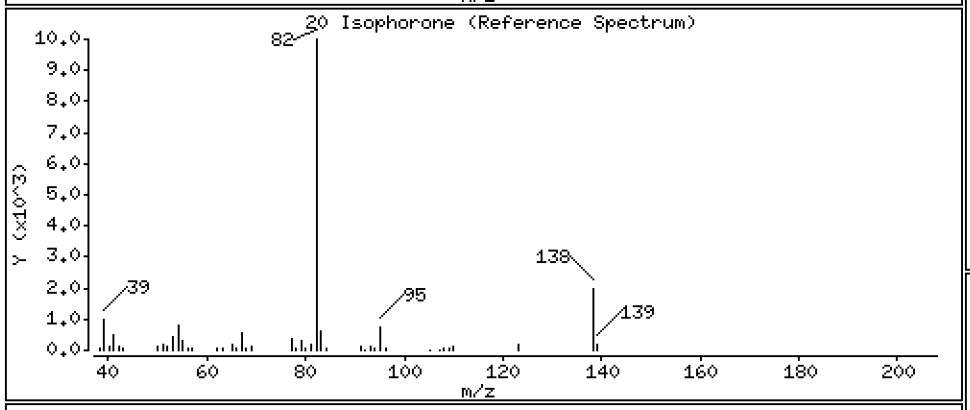
Column diameter: 0.25

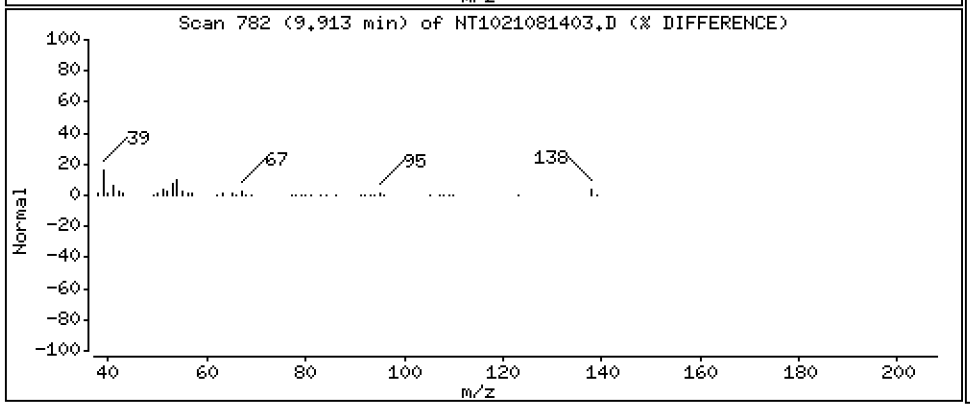
20 Isophorone

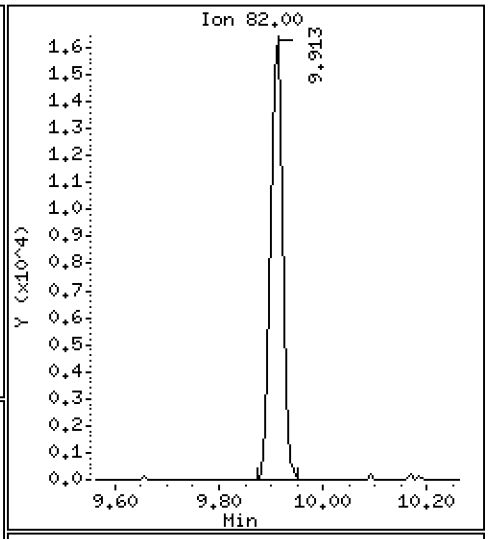
Concentration: 0.2917 ug/mL

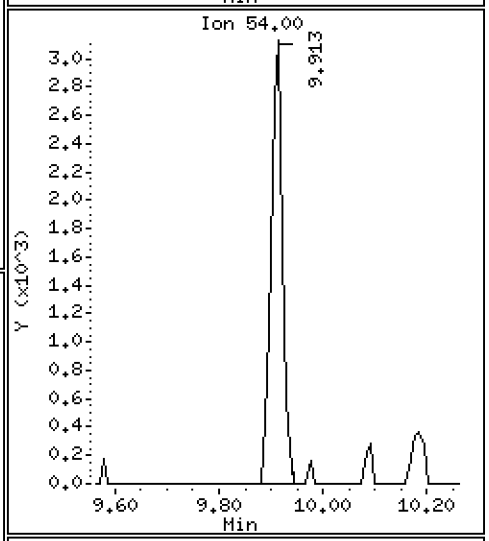


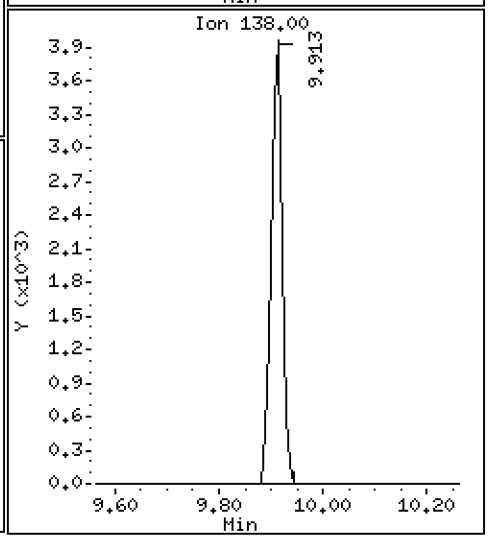












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

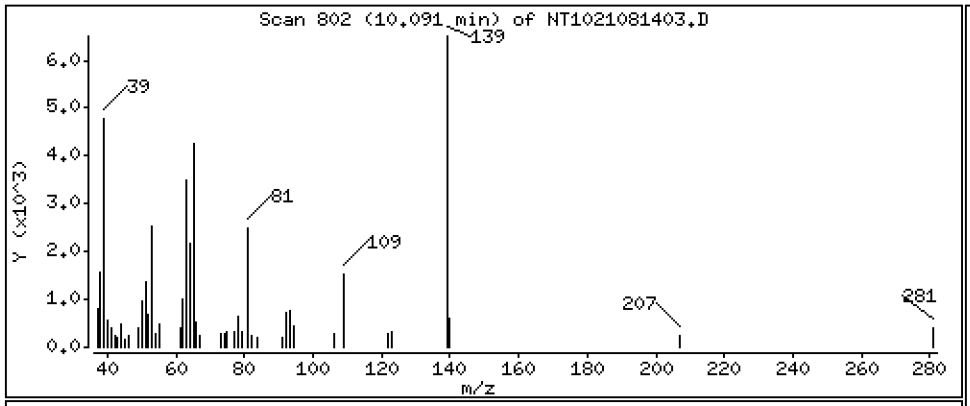
Operator: VTS

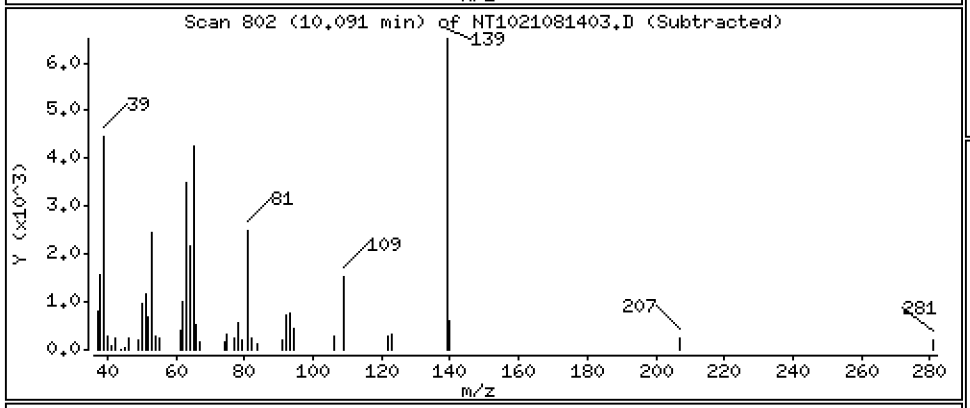
Column phase: ZB-5msi

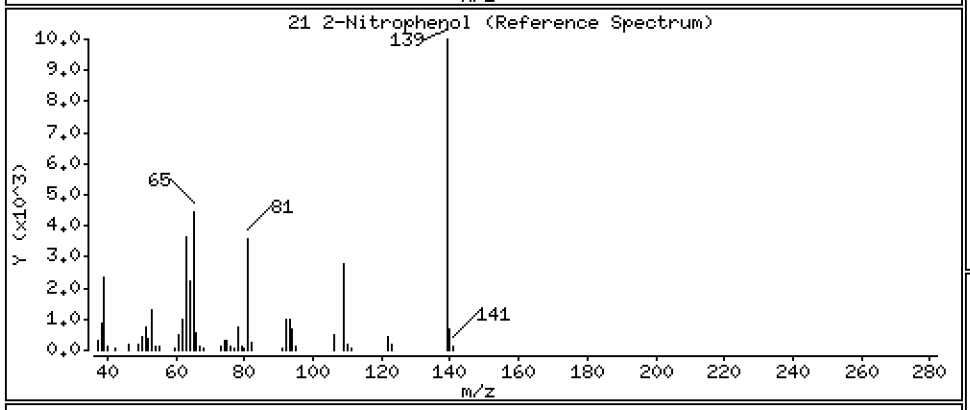
Column diameter: 0.25

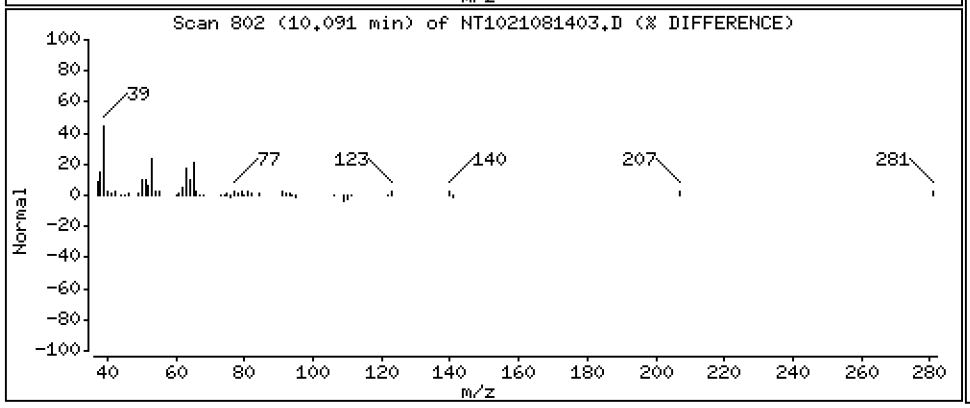
21 2-Nitrophenol

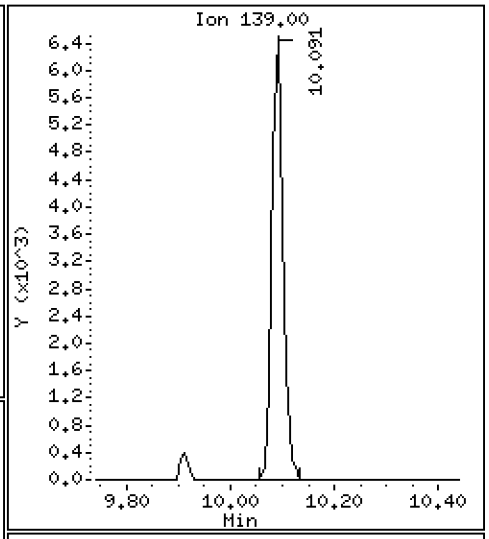
Concentration: 0.3941 ug/mL

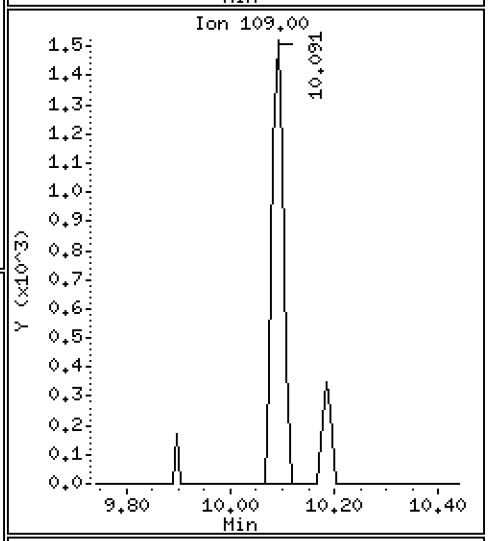


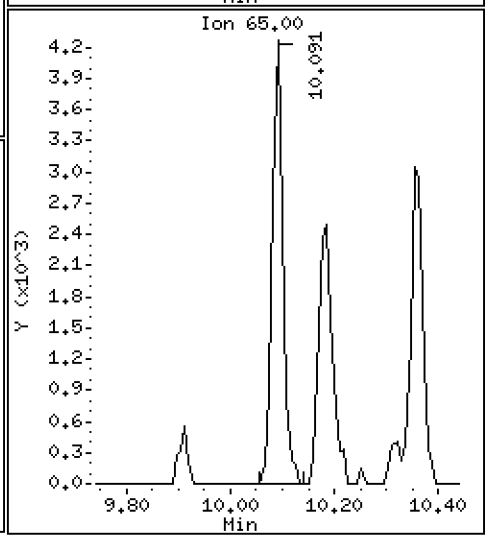












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

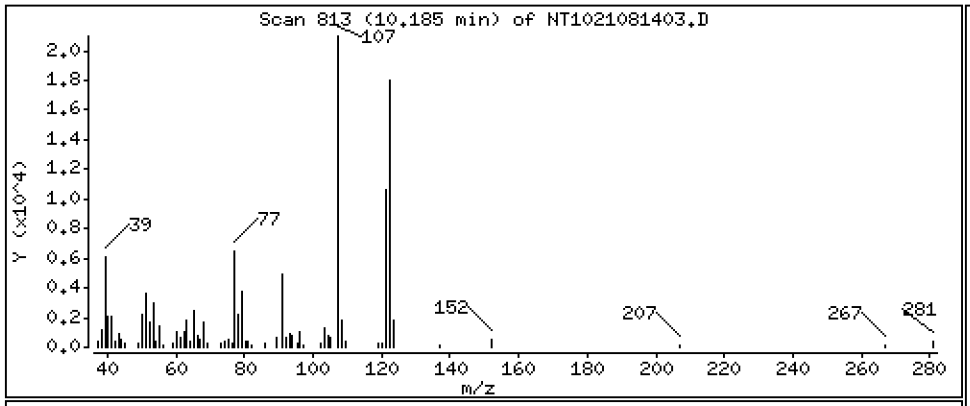
Operator: VTS

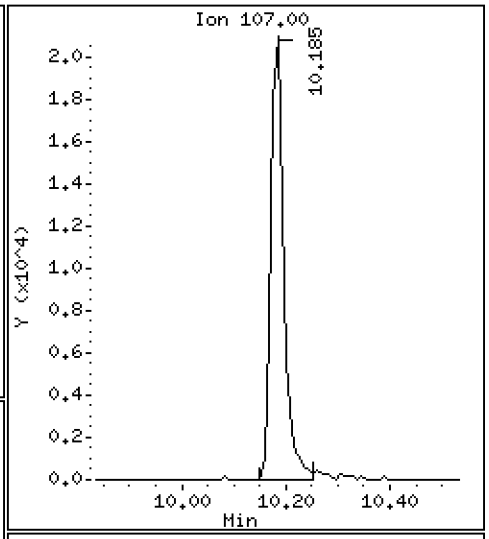
Column phase: ZB-5msi

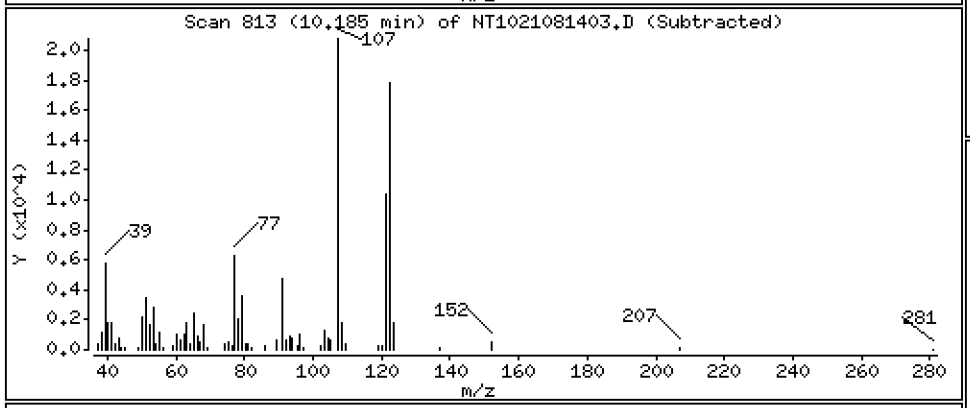
Column diameter: 0.25

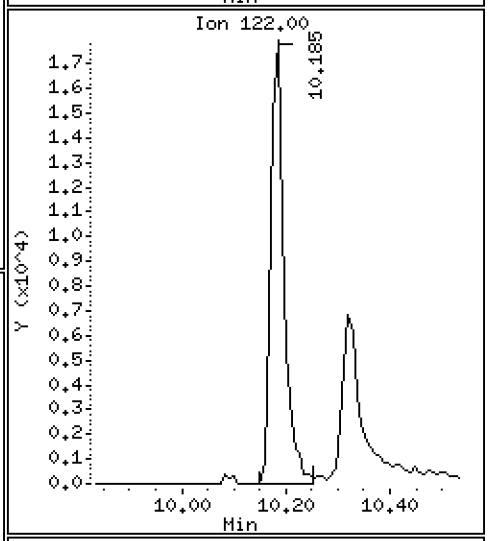
22 2,4-Dimethylphenol

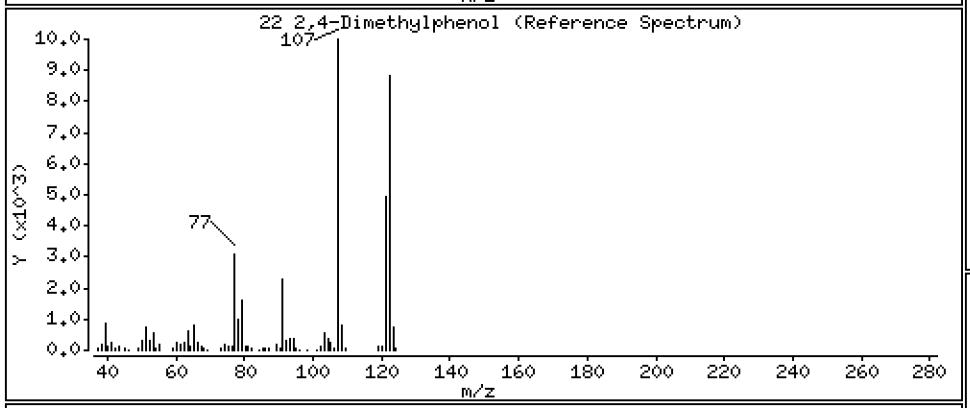
Concentration: 1.000 ug/mL

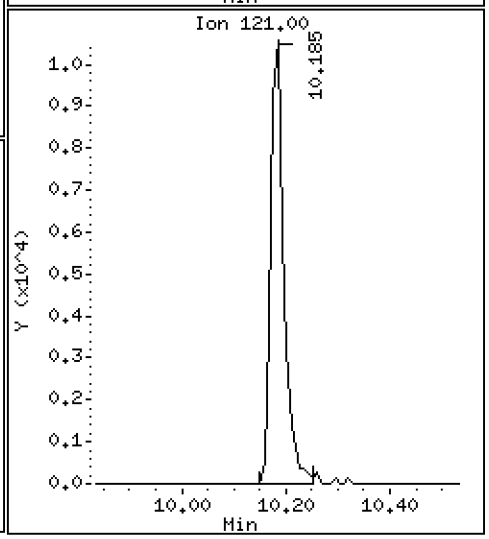


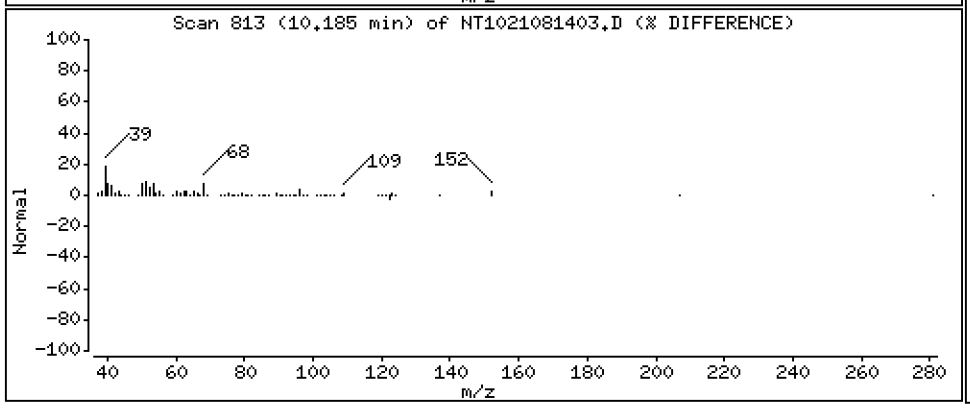












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

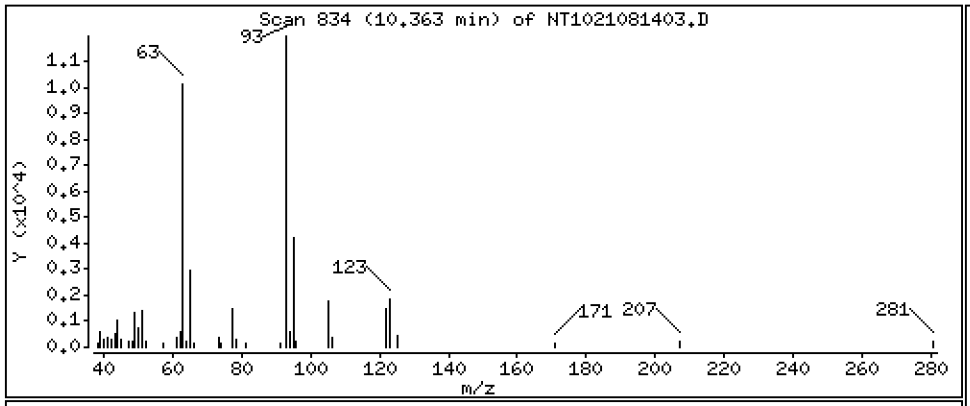
Operator: VTS

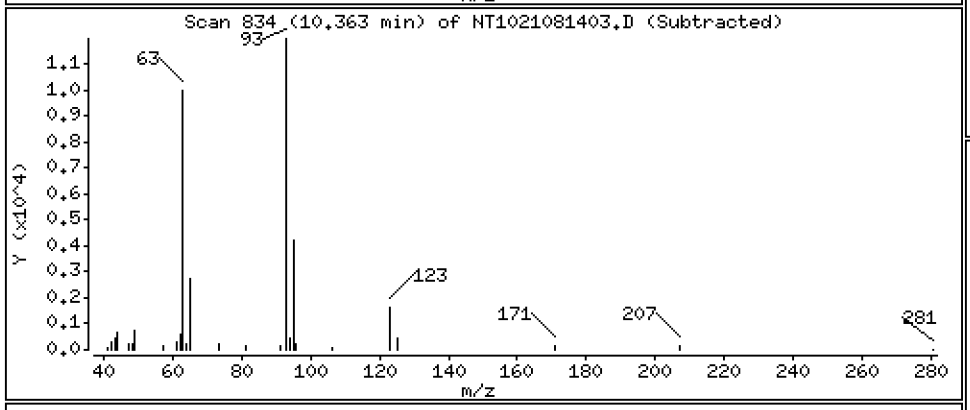
Column phase: ZB-5msi

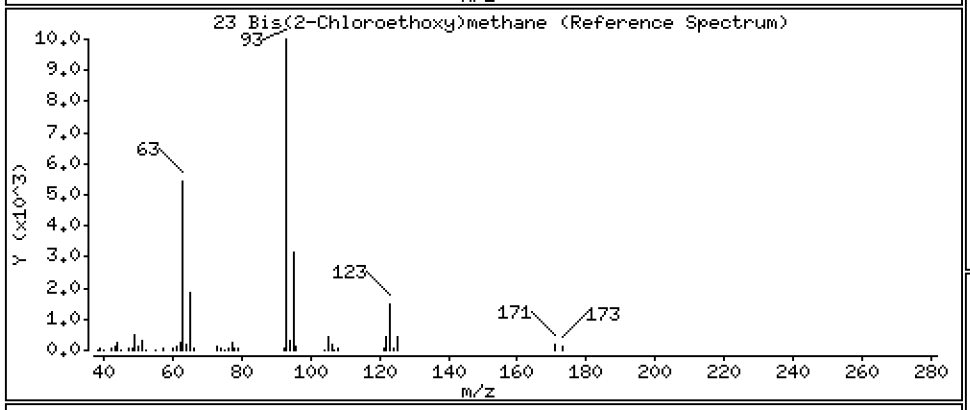
Column diameter: 0.25

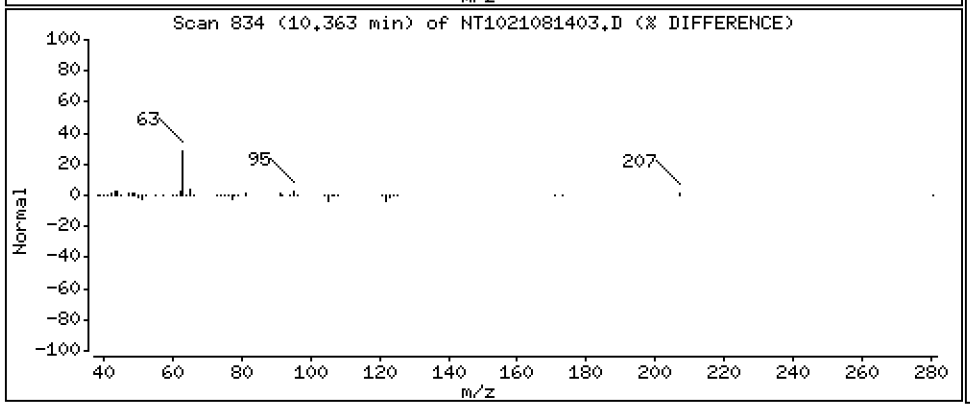
23 Bis(2-Chloroethoxy)methane

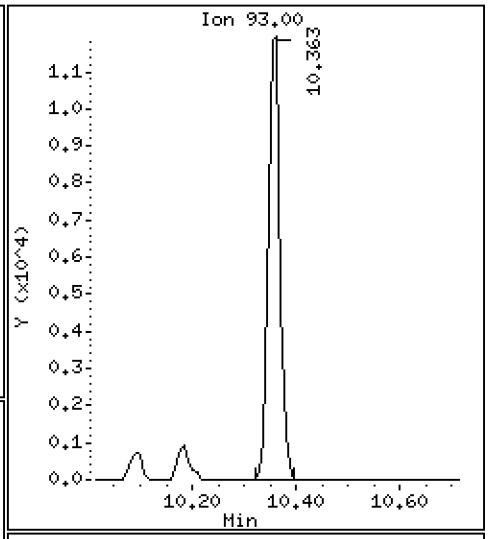
Concentration: 0.4105 ug/mL

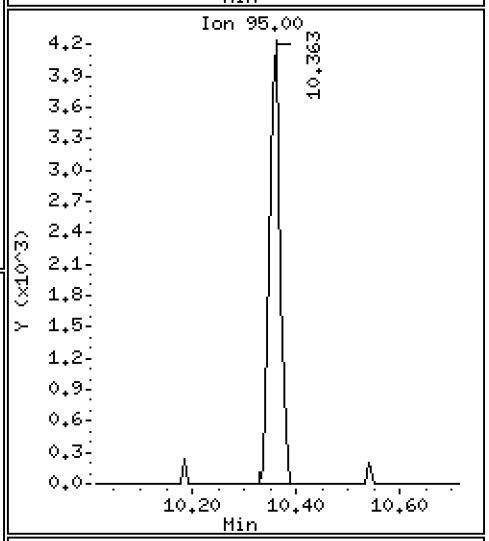


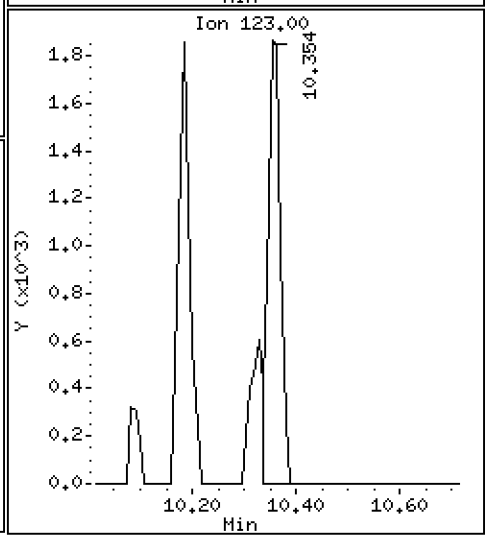












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

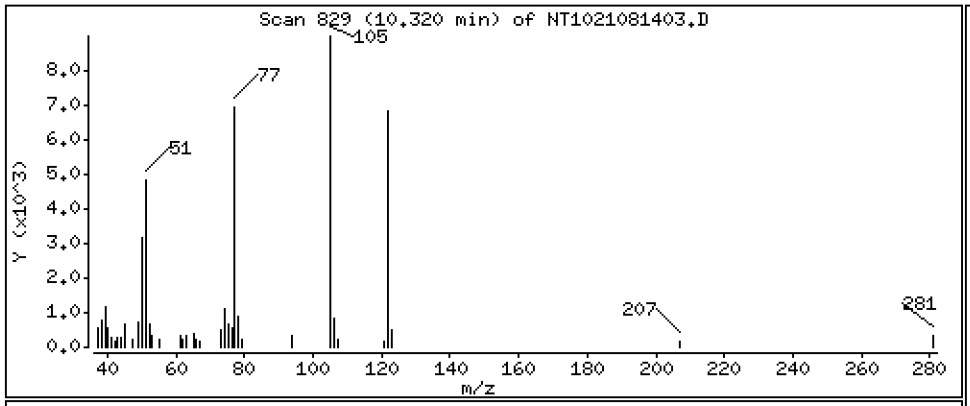
Operator: VTS

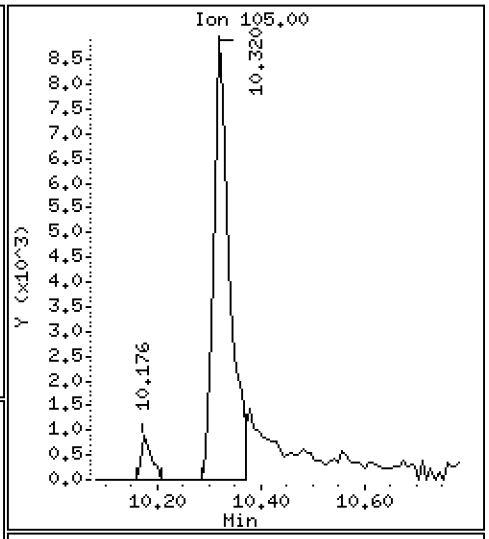
Column phase: ZB-5msi

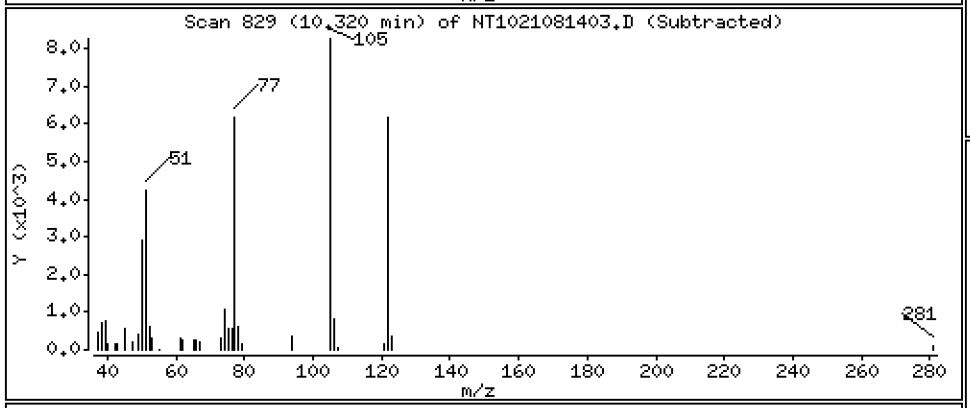
Column diameter: 0.25

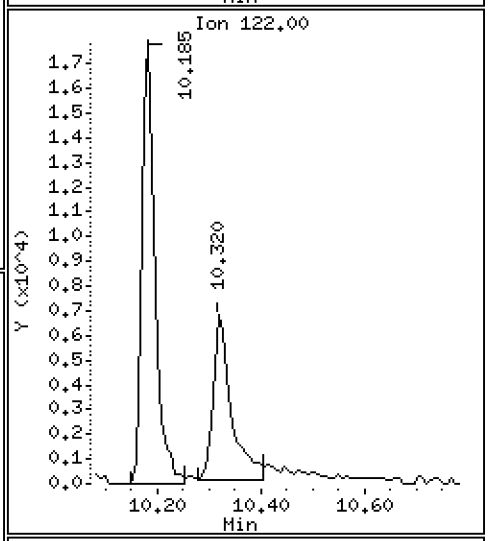
24 Benzoic acid

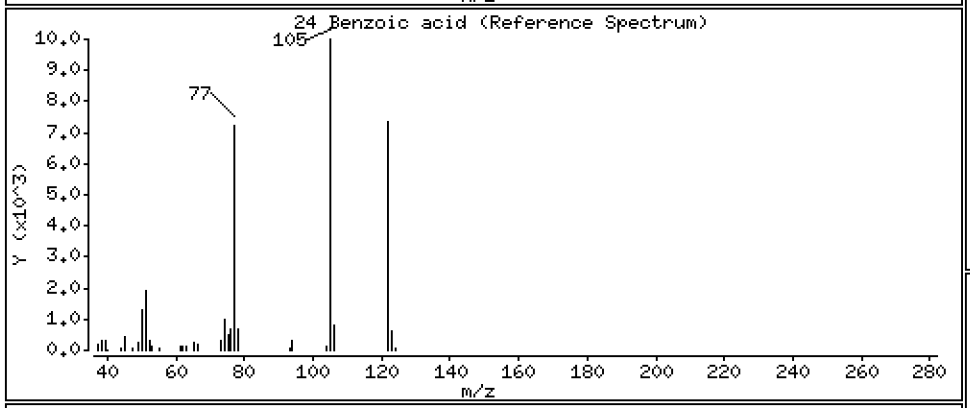
Concentration: 0.9686 ug/mL

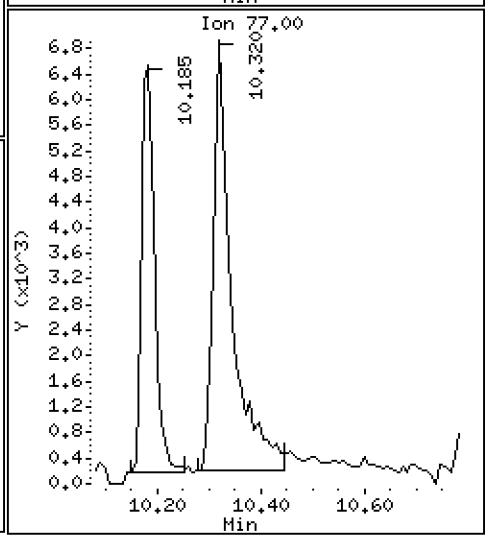


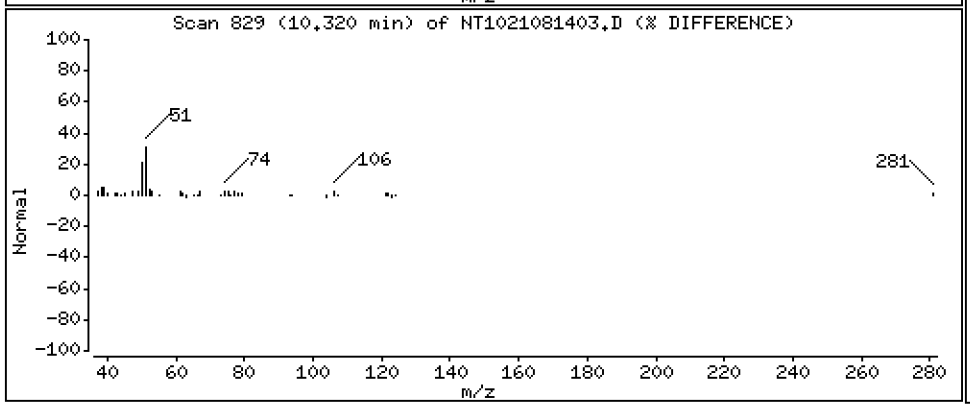












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Date : 14-AUG-2021 10:30

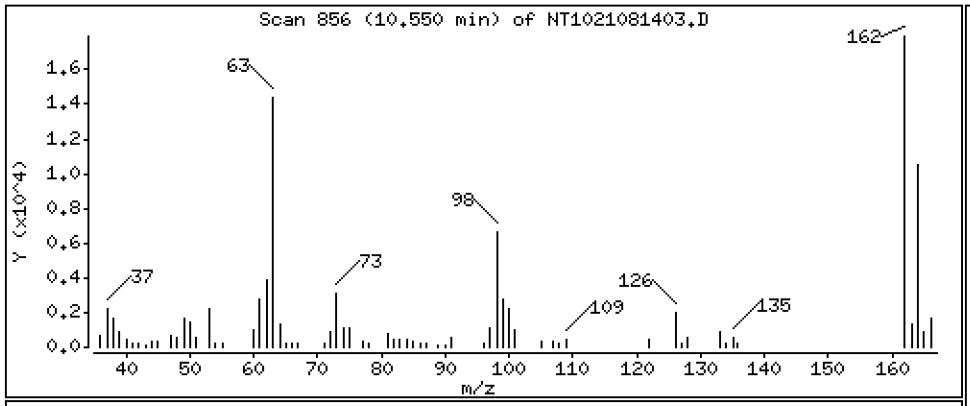
Client ID: Instrument: nt10.i

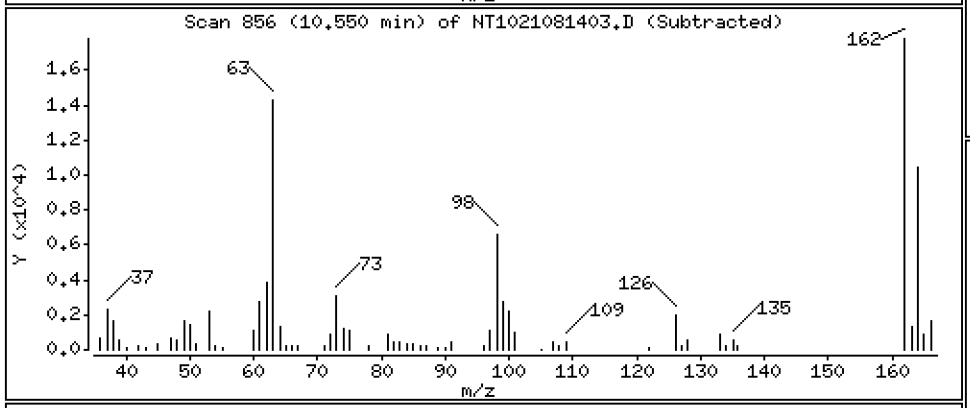
Sample Info: SJH0174-LCV1

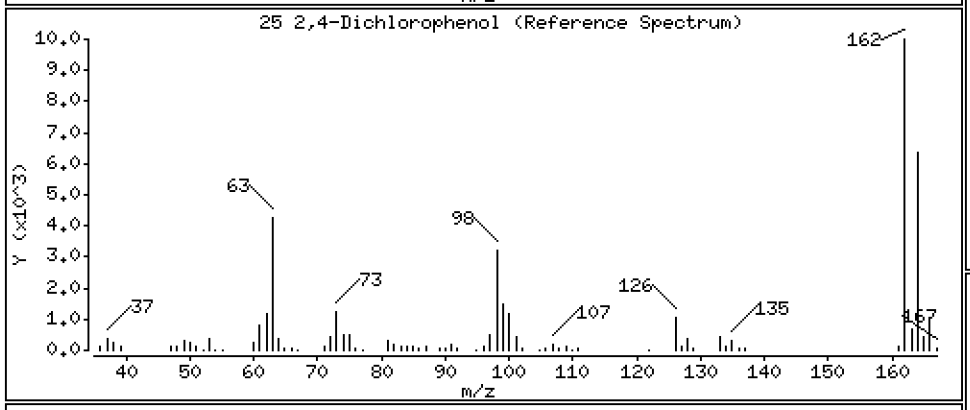
Operator: VTS

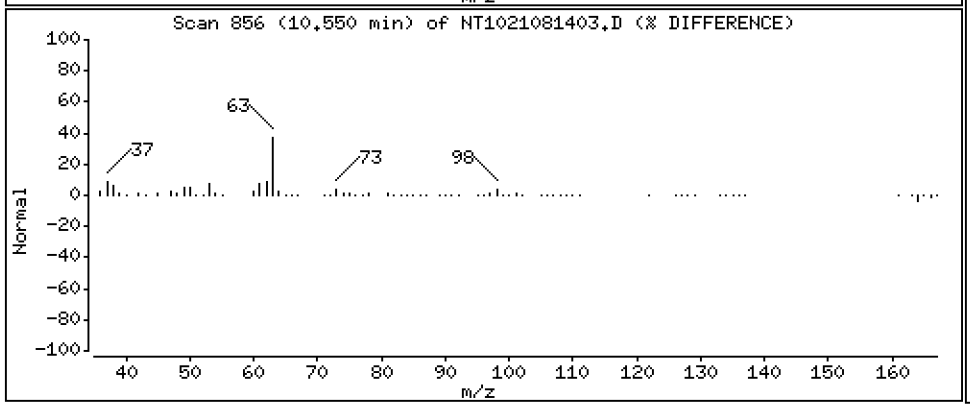
Column phase: ZB-5msi Column diameter: 0.25

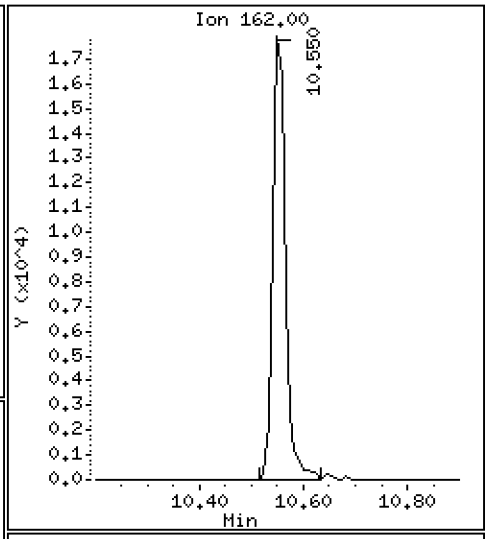
25 2,4-Dichlorophenol Concentration: 1.010 ug/mL

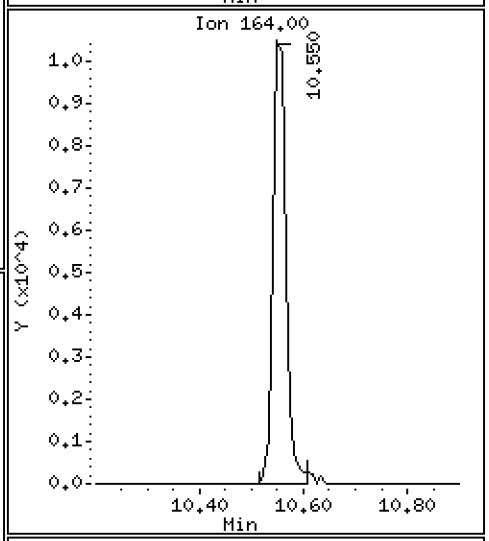


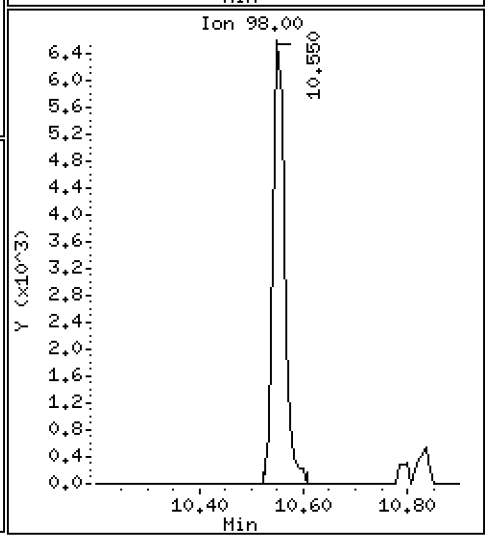












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

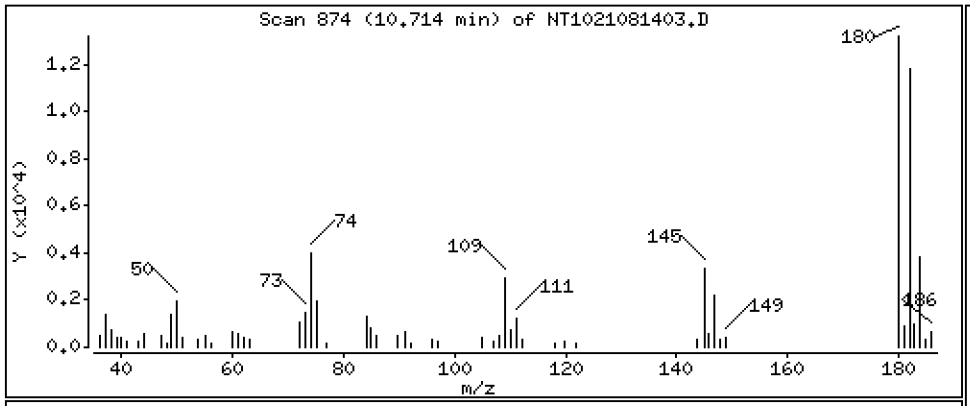
Operator: VTS

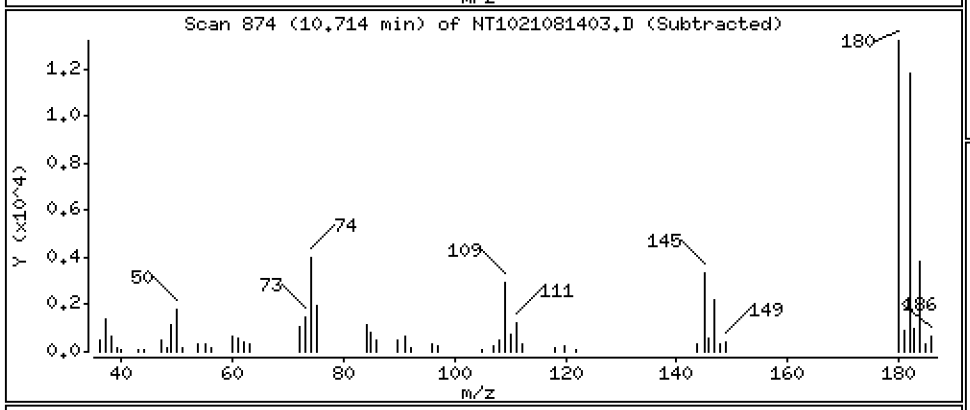
Column phase: ZB-5msi

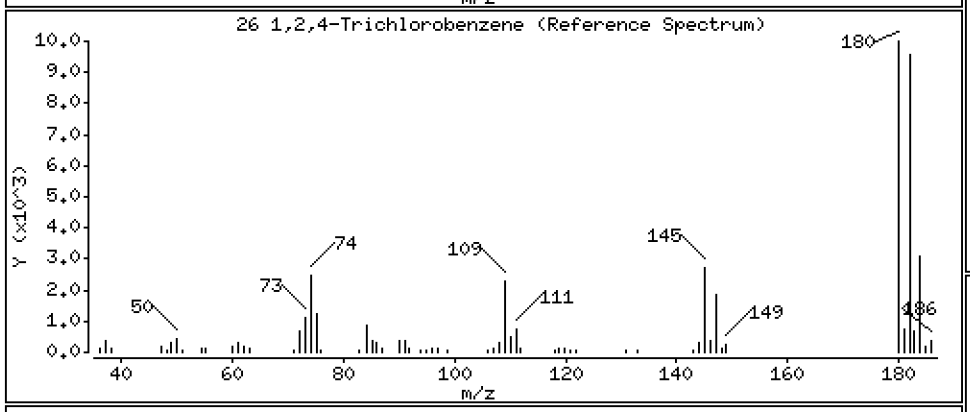
Column diameter: 0.25

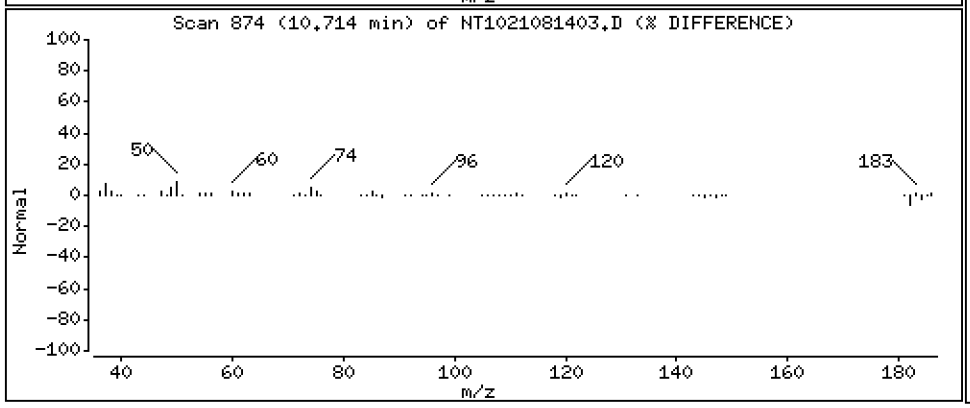
26 1,2,4-Trichlorobenzene

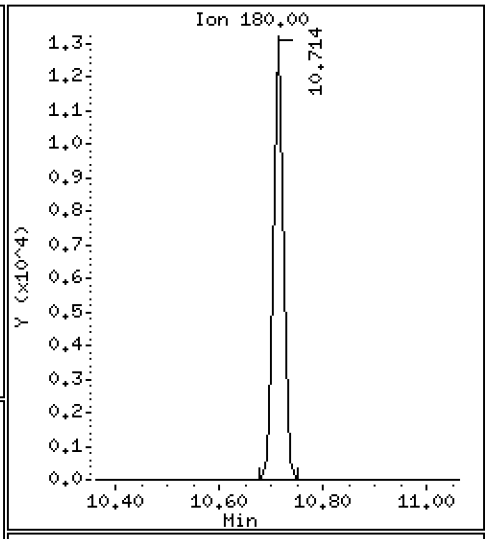
Concentration: 0.5409 ug/mL

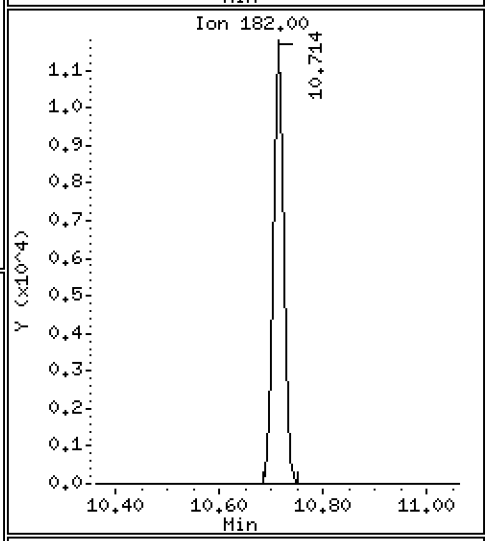


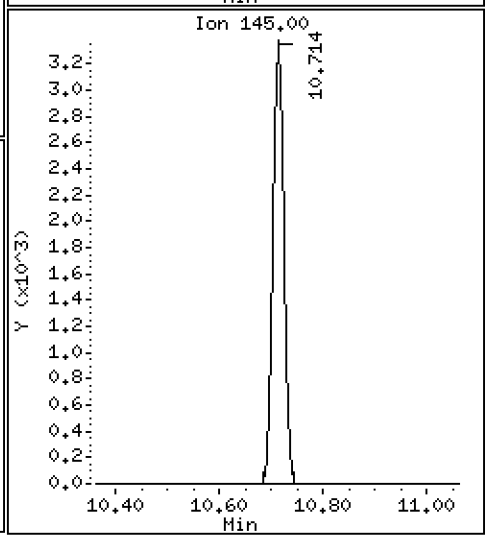












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

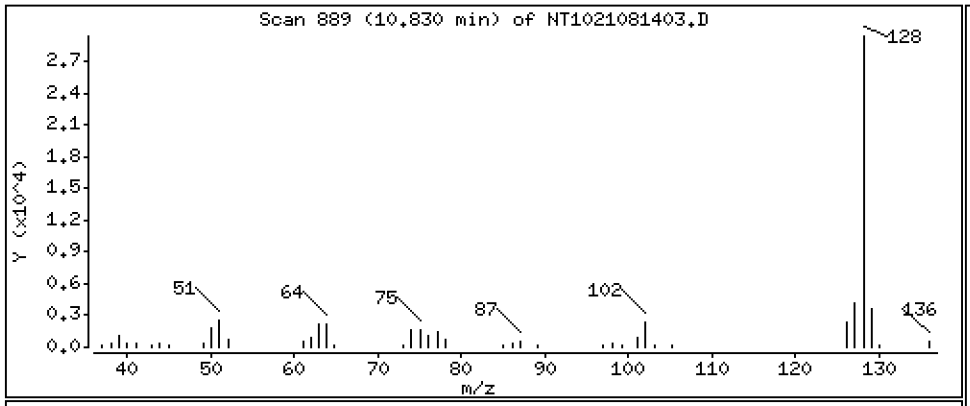
Operator: VTS

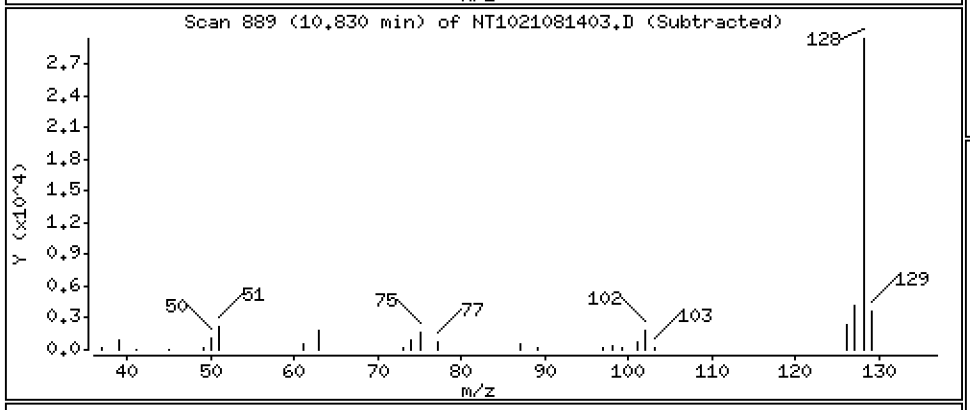
Column phase: ZB-5msi

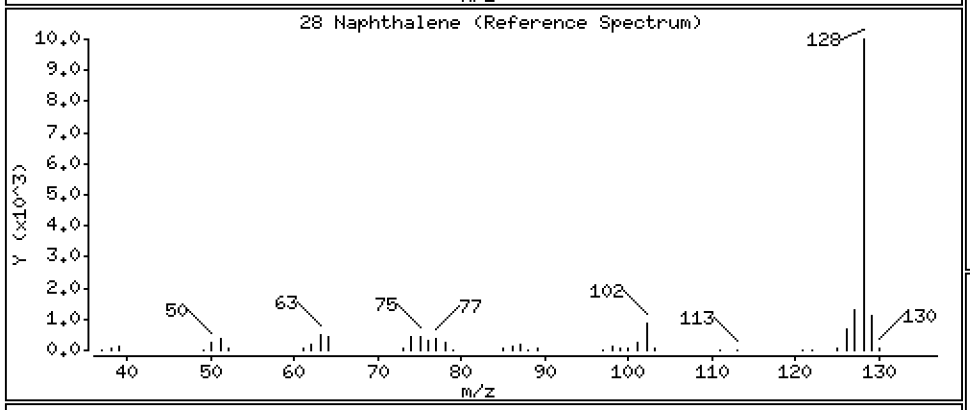
Column diameter: 0.25

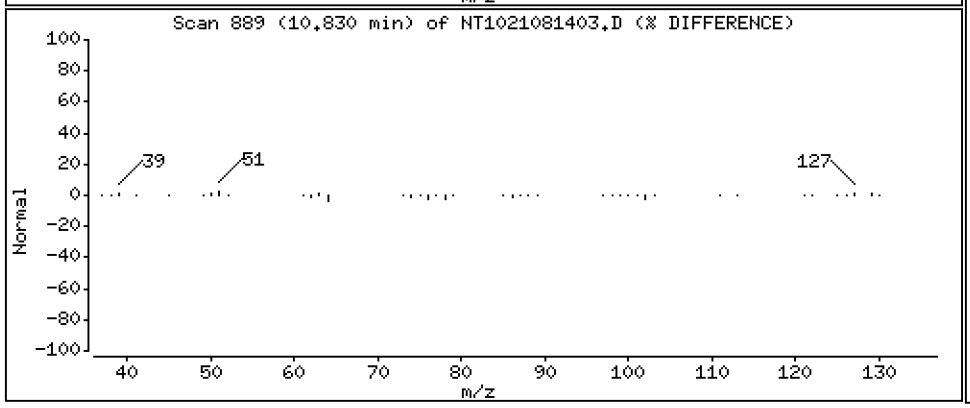
28 Naphthalene

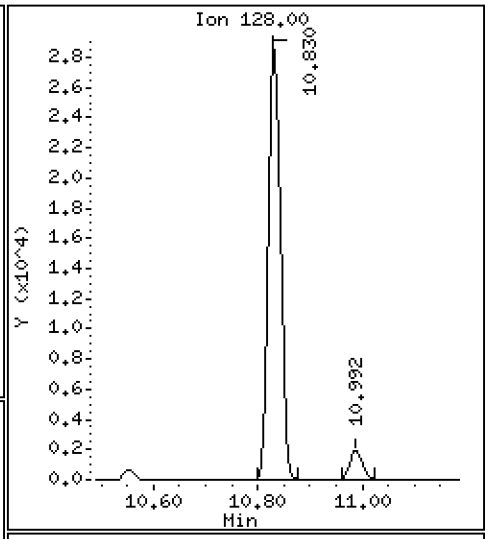
Concentration: 0.4442 ug/mL

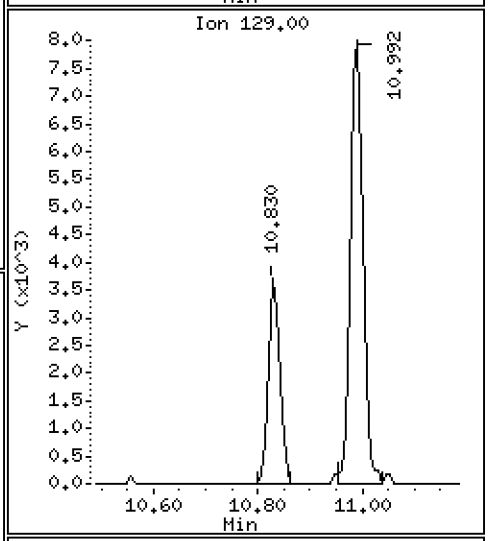


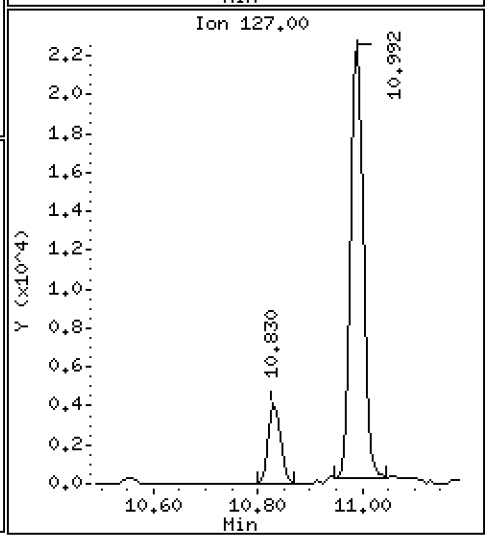












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

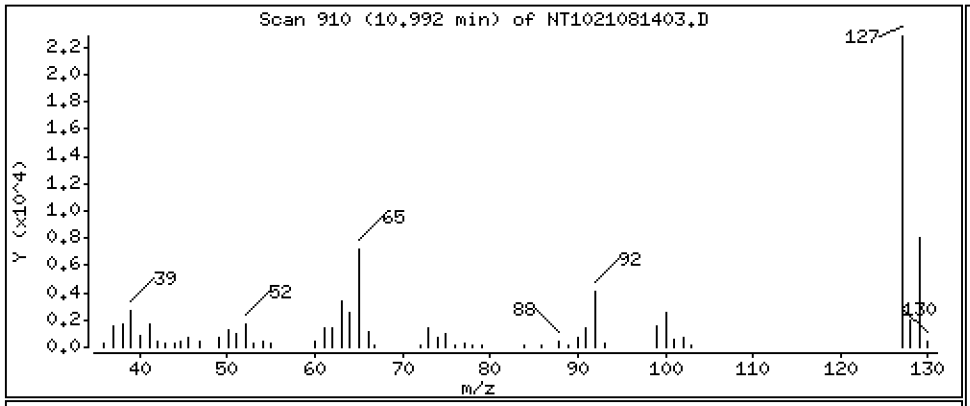
Operator: VTS

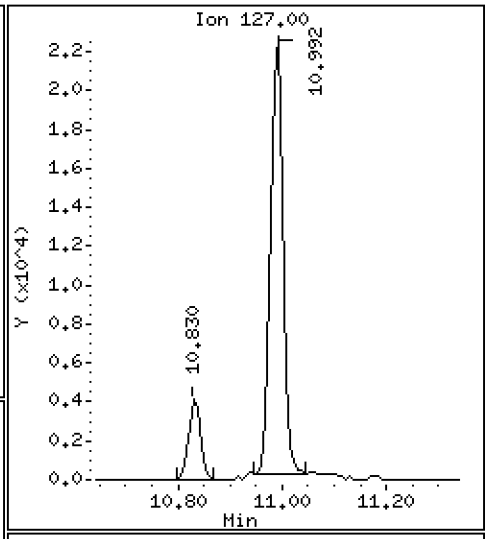
Column phase: ZB-5msi

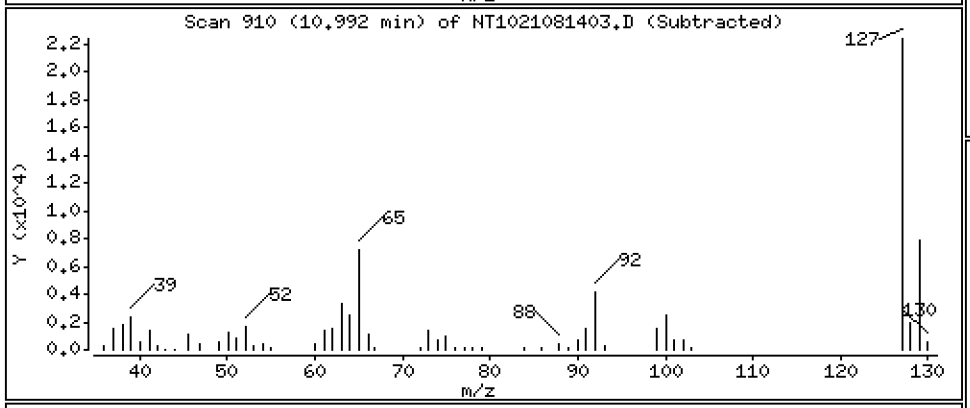
Column diameter: 0.25

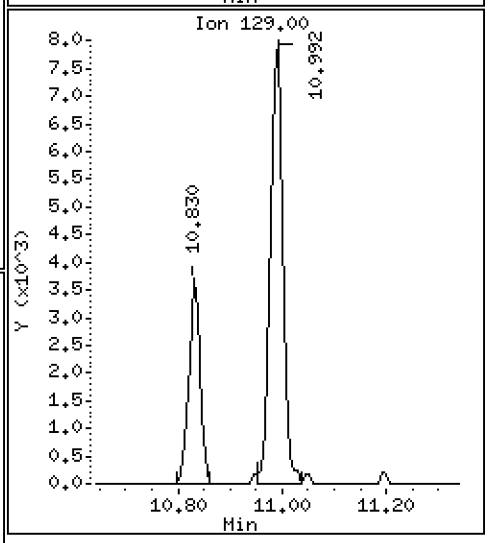
29 4-Chloroaniline

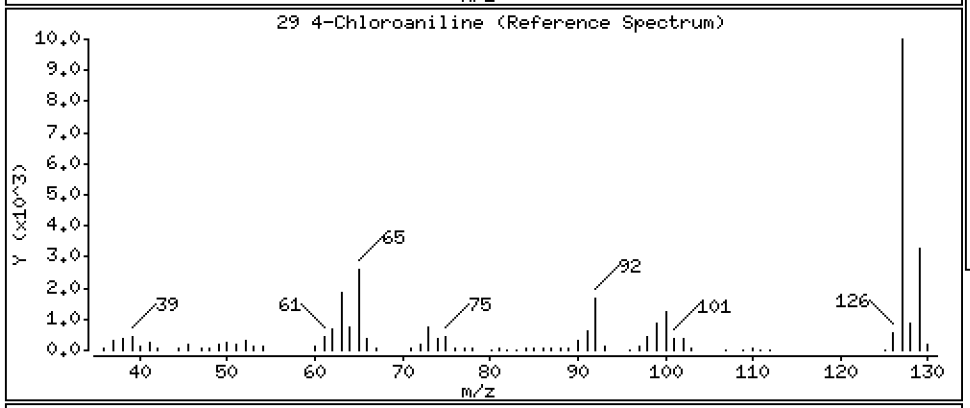
Concentration: 0.7101 ug/mL

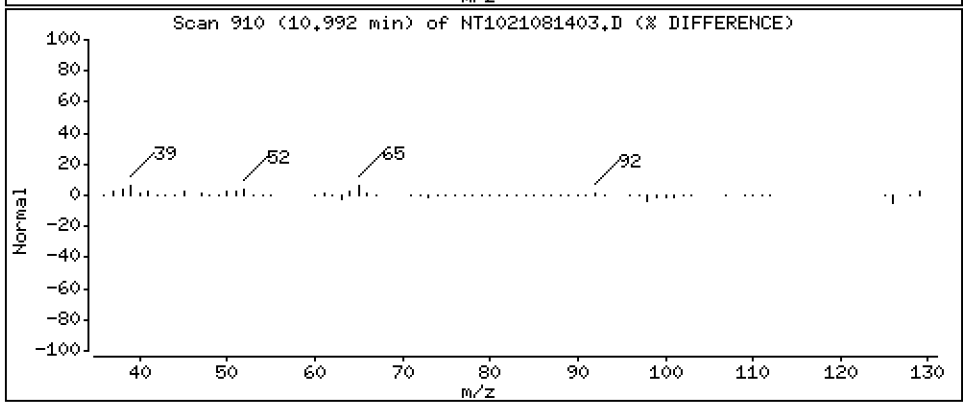












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

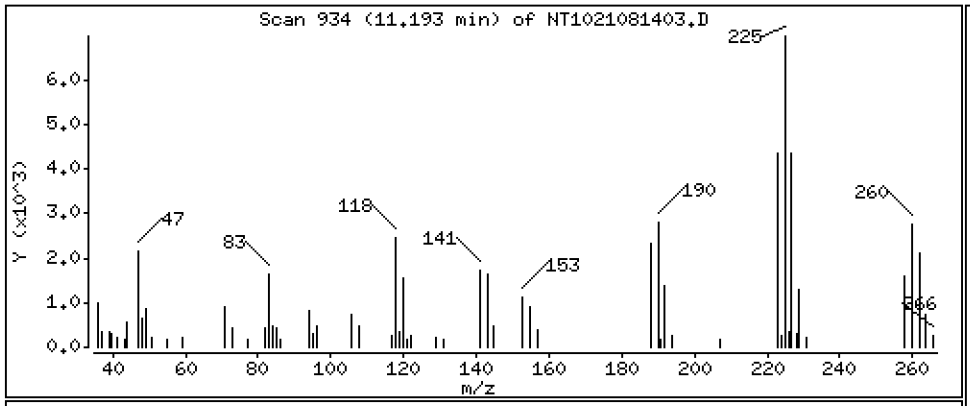
Operator: VTS

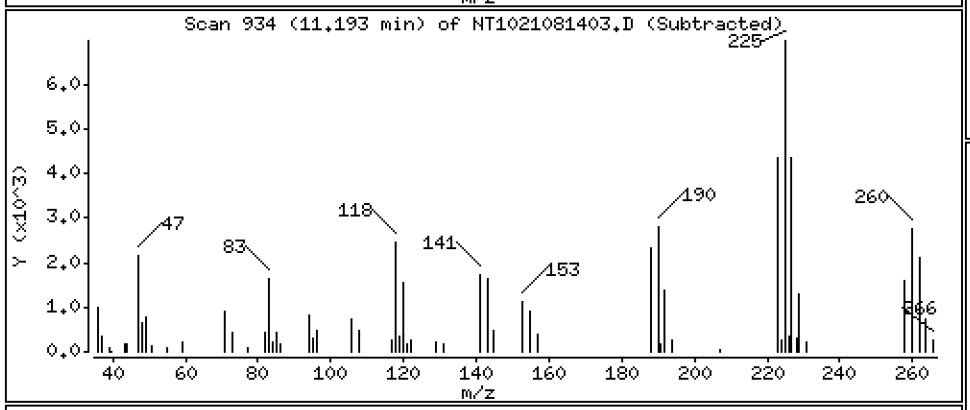
Column phase: ZB-5msi

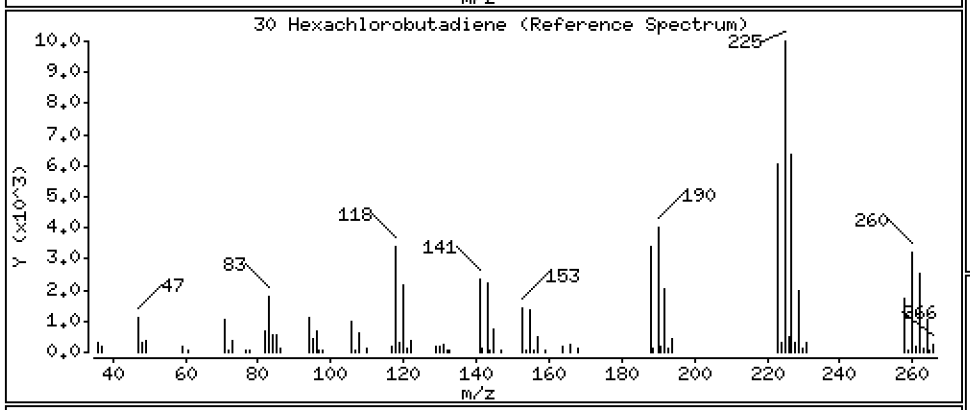
Column diameter: 0.25

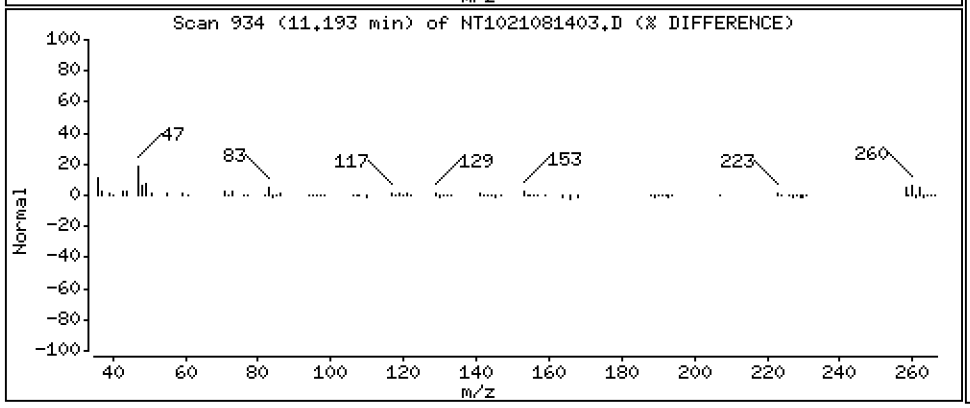
30 Hexachlorobutadiene

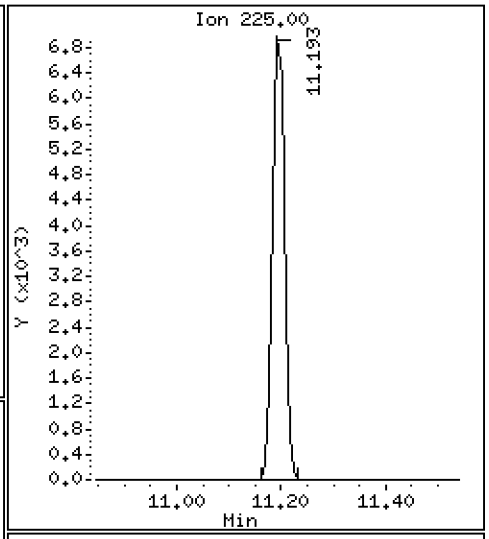
Concentration: 0.5687 ug/mL

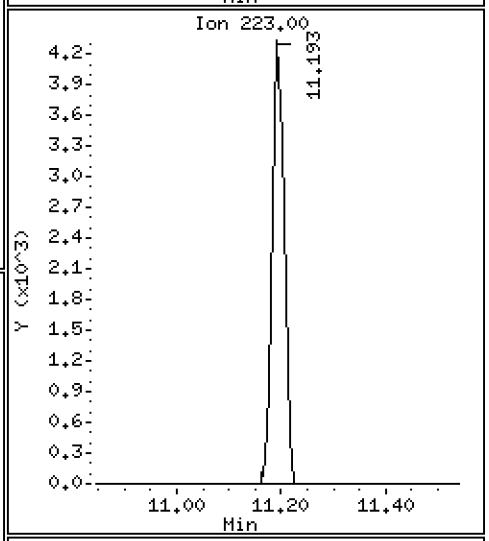


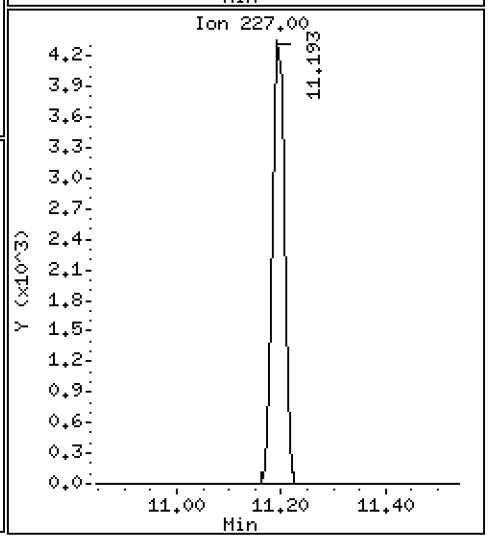












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

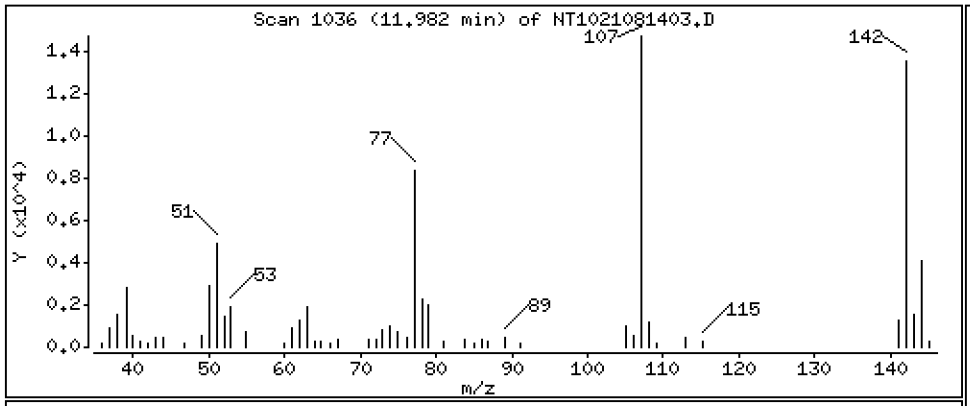
Operator: VTS

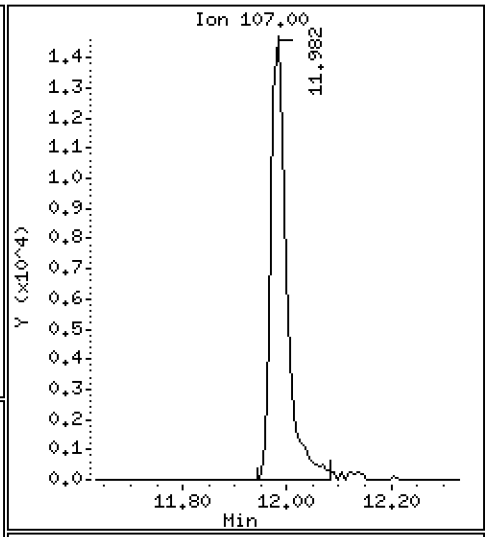
Column phase: ZB-5msi

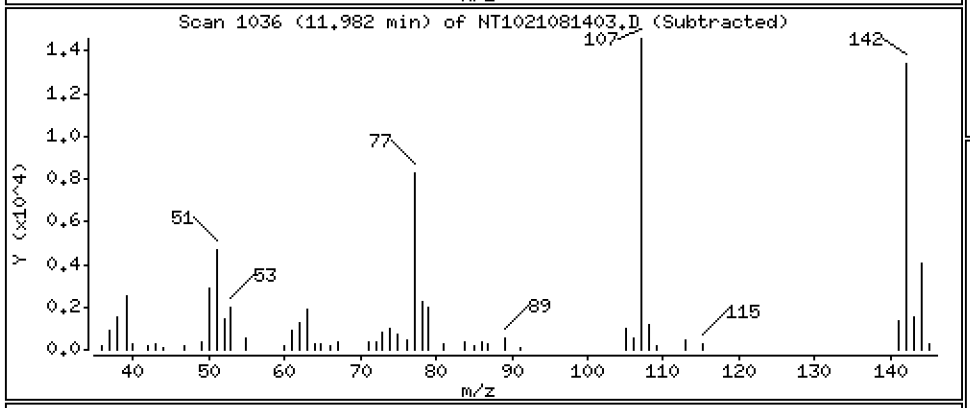
Column diameter: 0.25

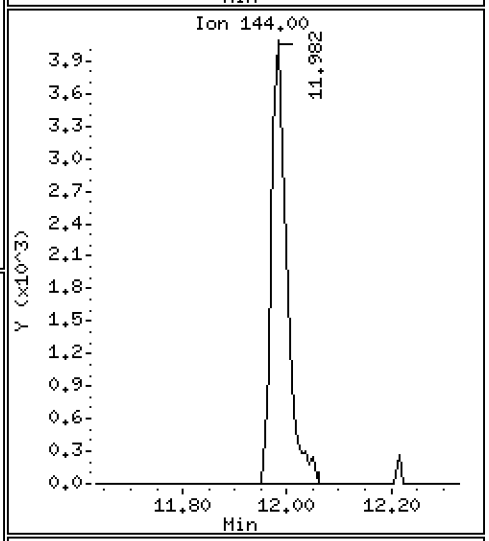
31 4-Chloro-3-methylphenol

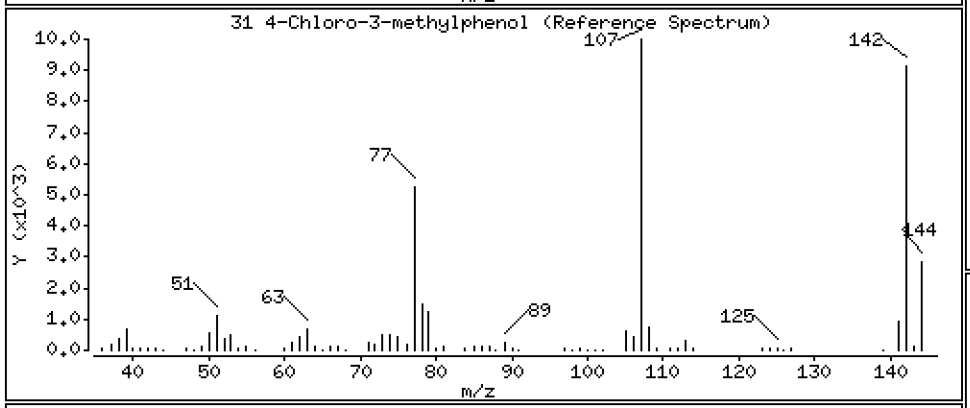
Concentration: 0.8346 ug/mL

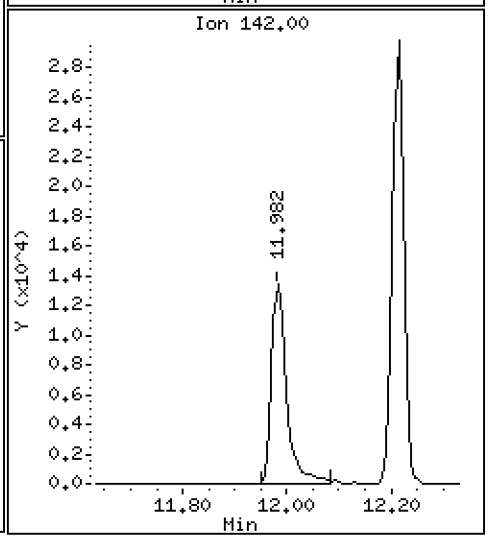


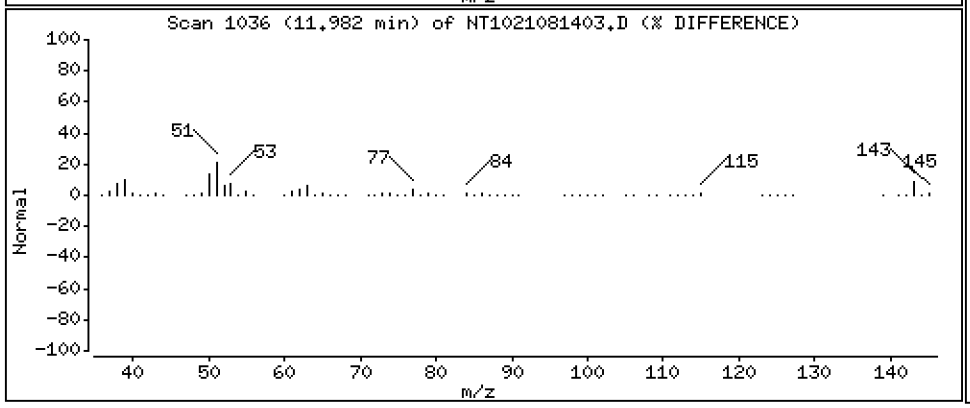












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

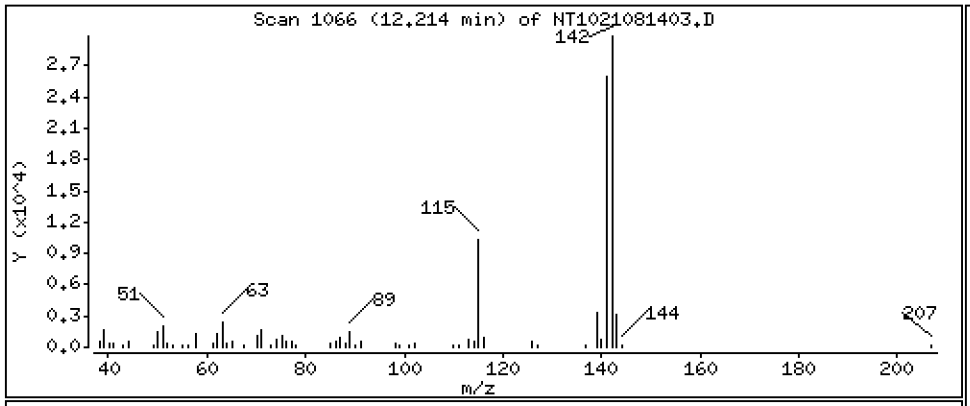
Operator: VTS

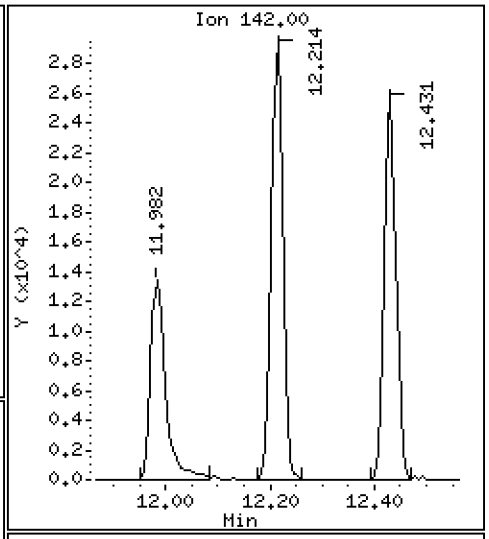
Column phase: ZB-5msi

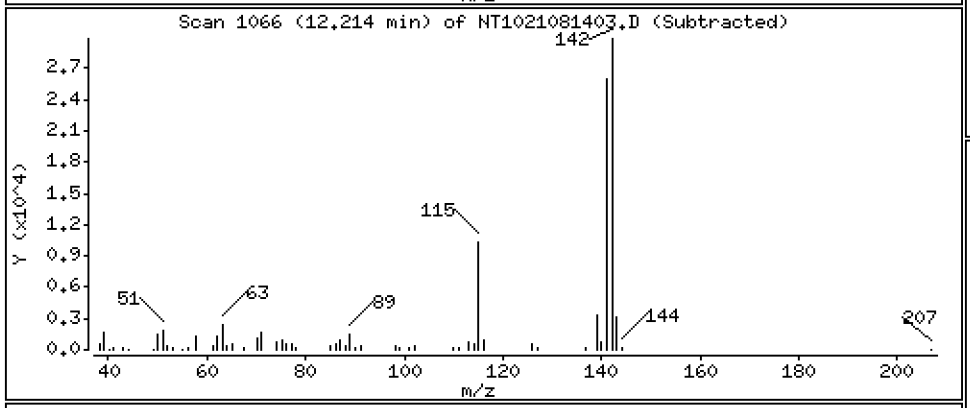
Column diameter: 0.25

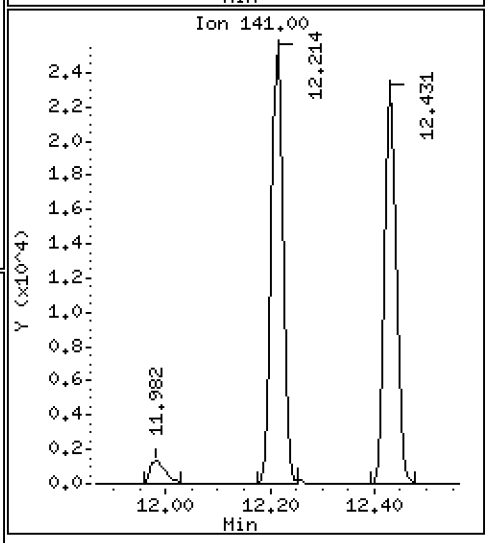
32 2-Methylnaphthalene

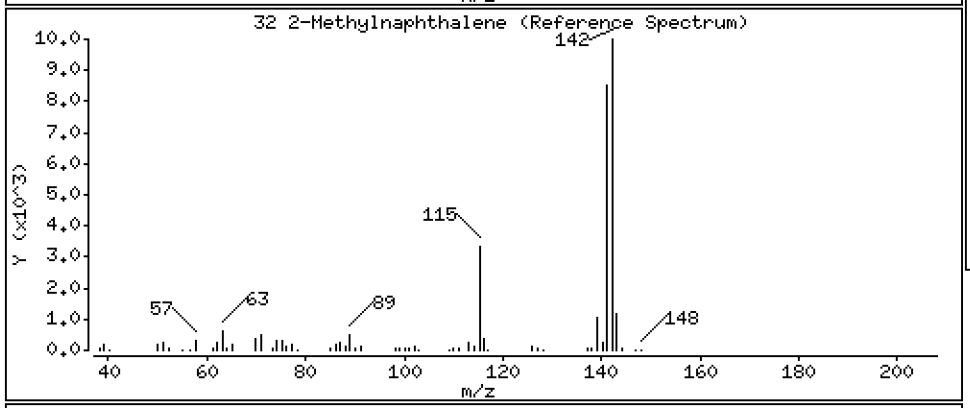
Concentration: 0.4617 ug/mL

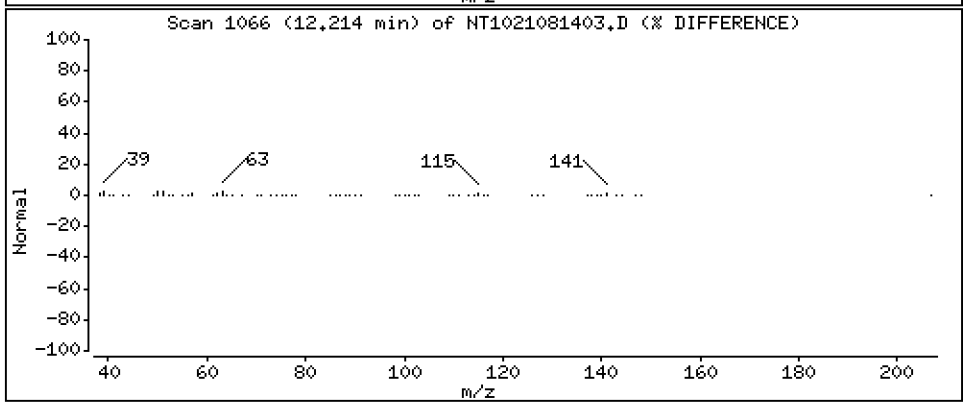












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

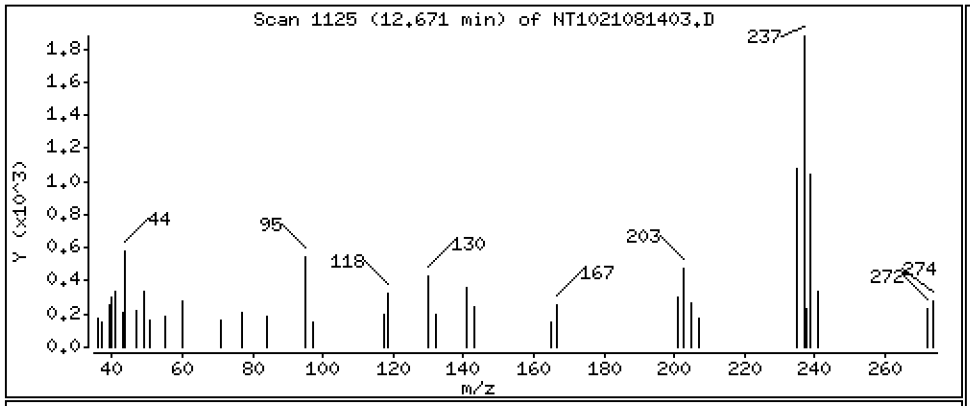
Operator: VTS

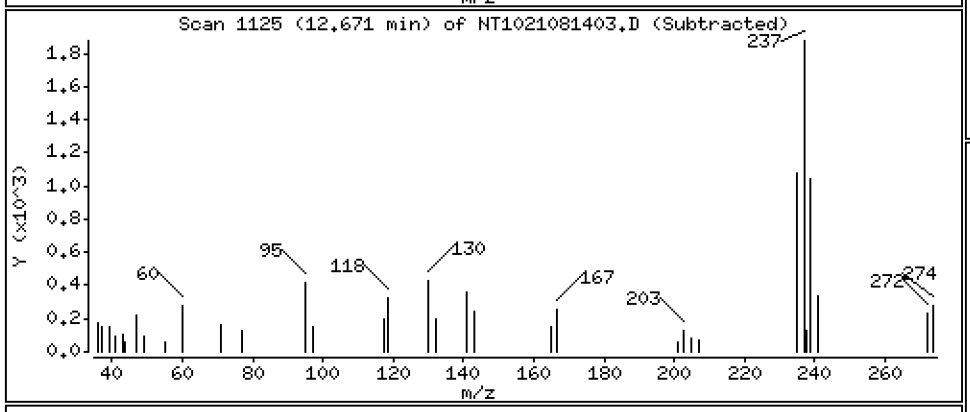
Column phase: ZB-5msi

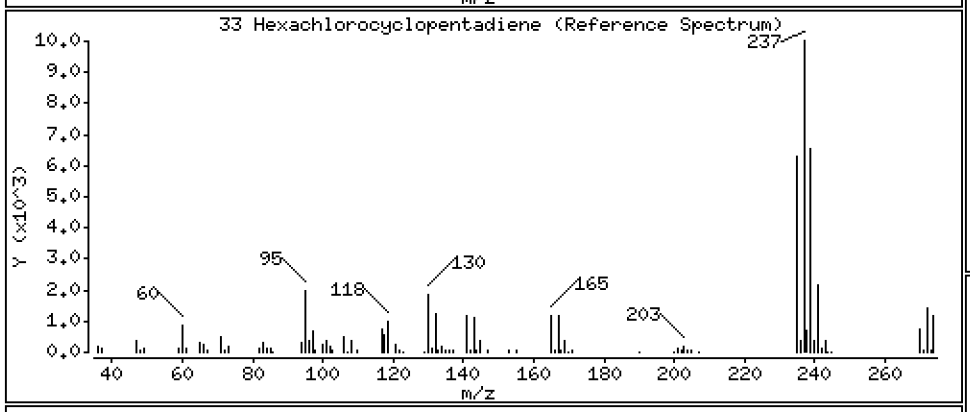
Column diameter: 0.25

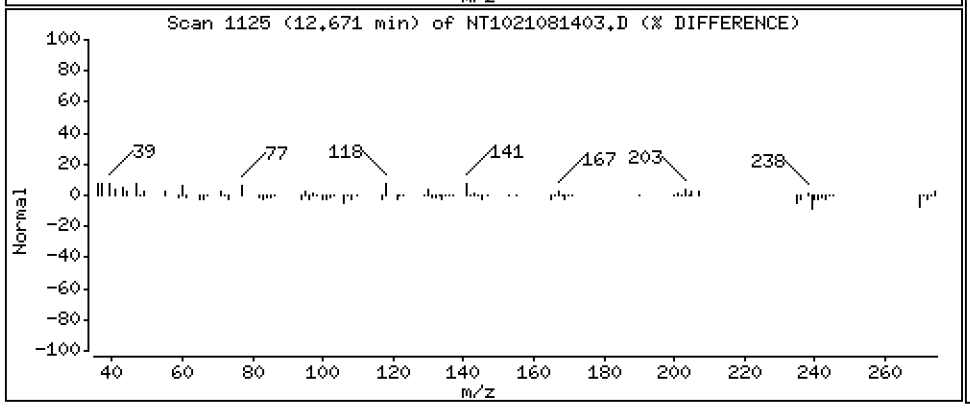
33 Hexachlorocyclopentadiene

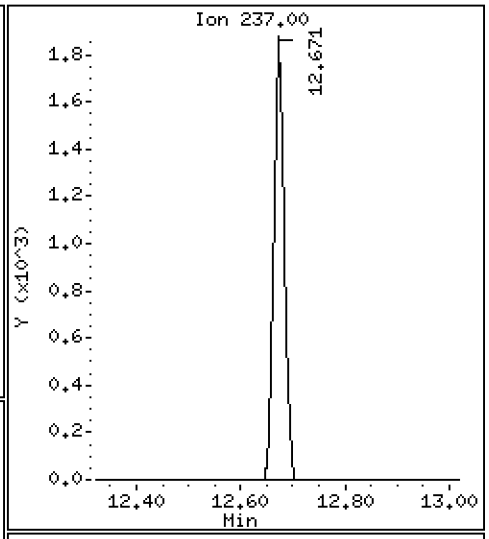
Concentration: 0.1086 ug/mL

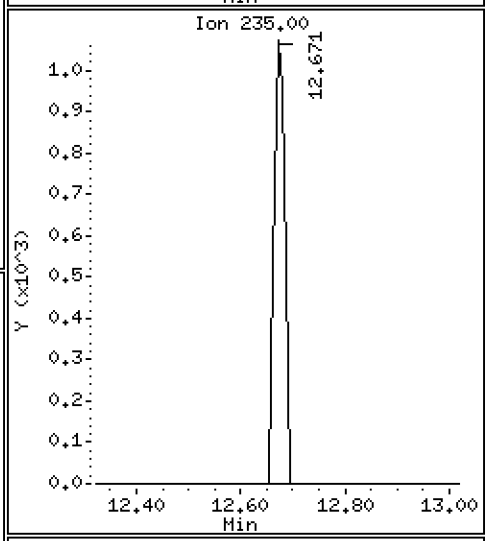


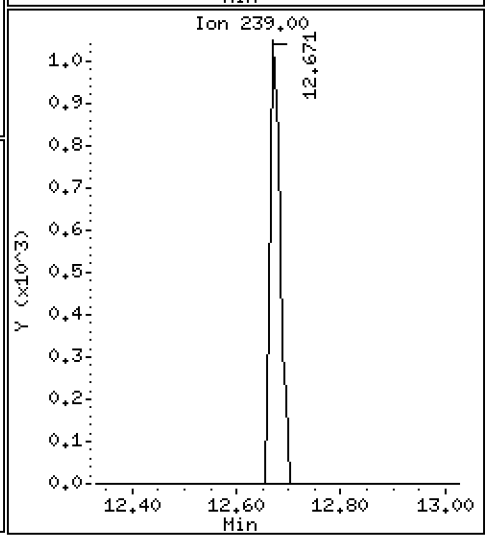












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

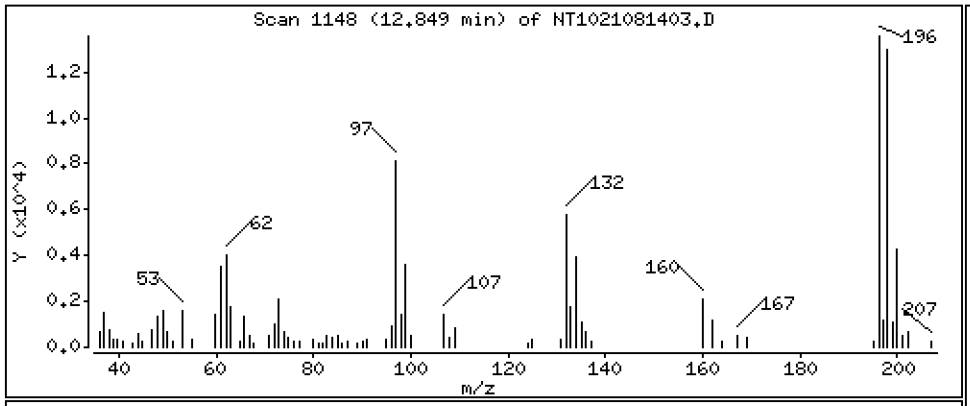
Operator: VTS

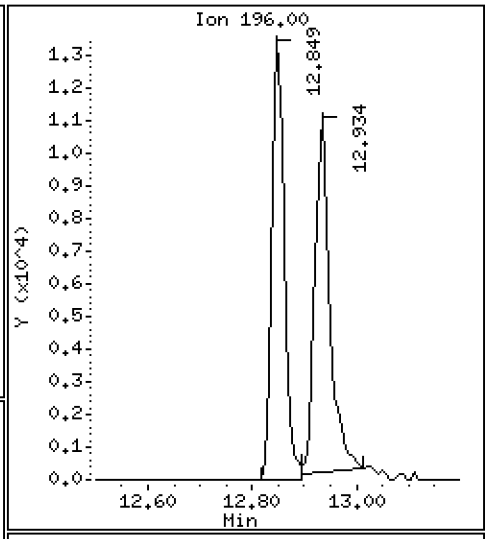
Column phase: ZB-5msi

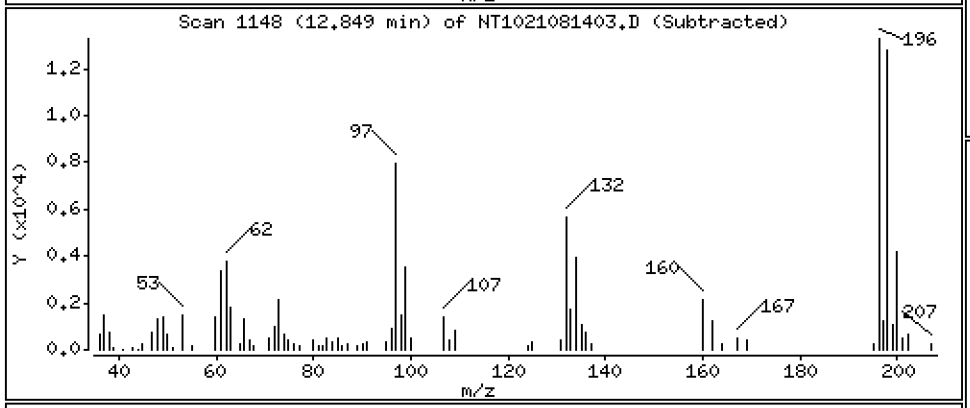
Column diameter: 0.25

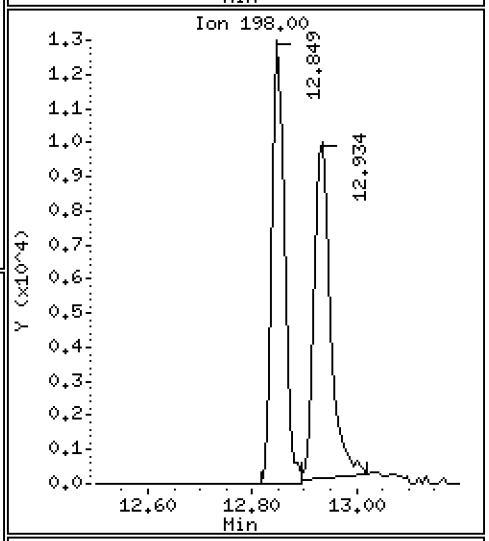
34 2,4,6-Trichlorophenol

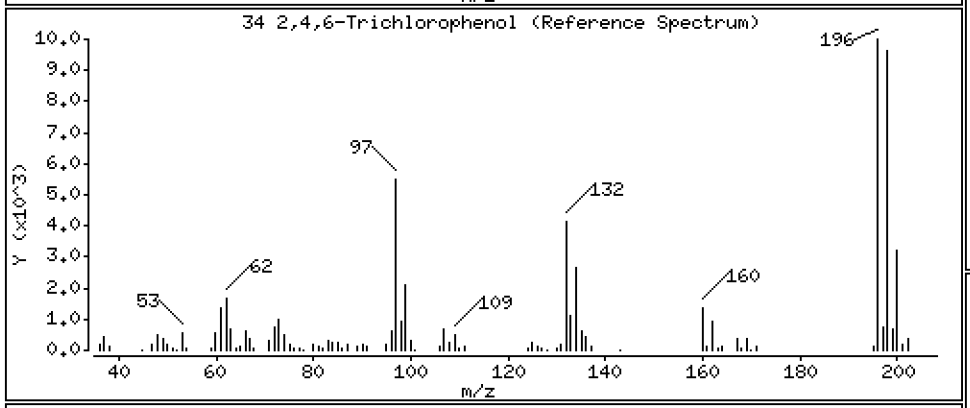
Concentration: 0.9161 ug/mL

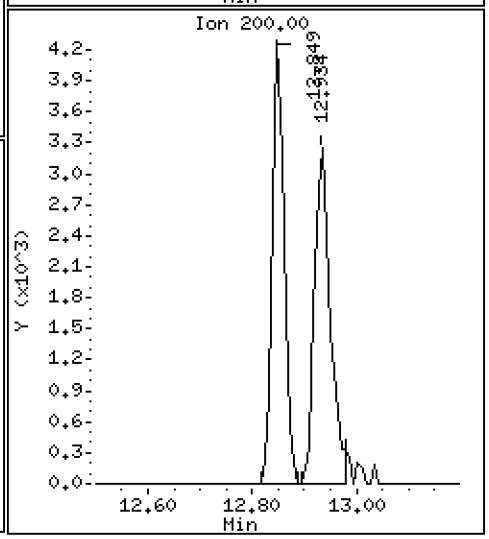


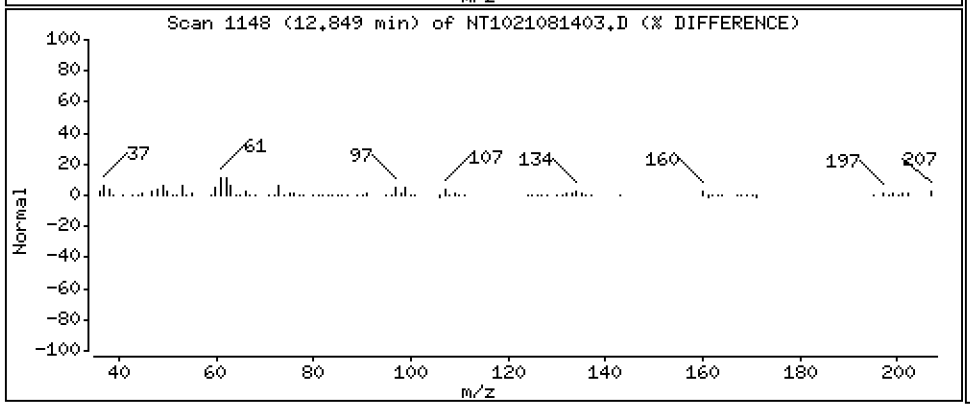












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

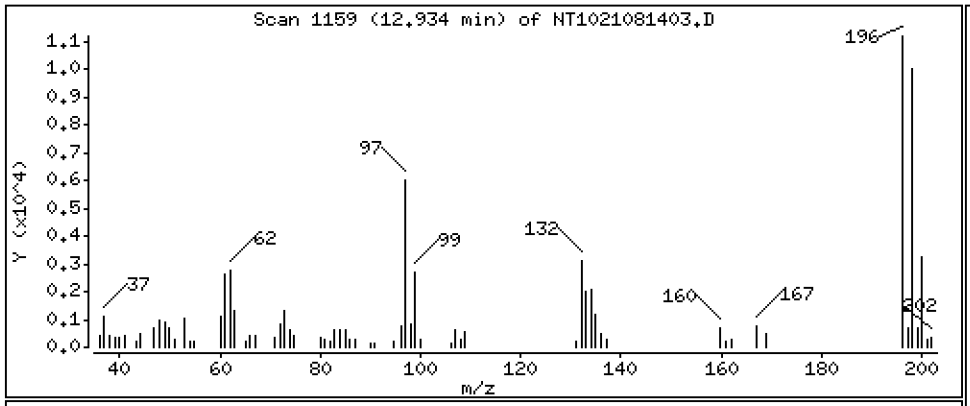
Operator: VTS

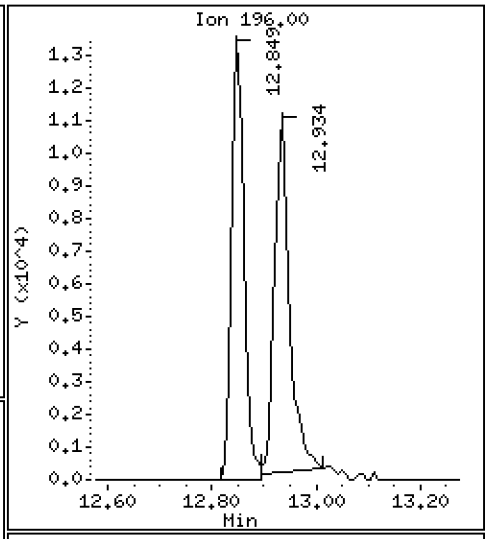
Column phase: ZB-5msi

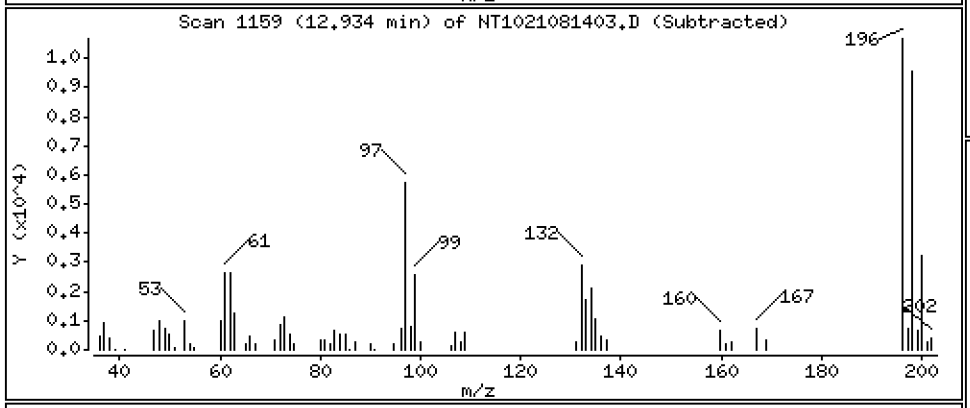
Column diameter: 0.25

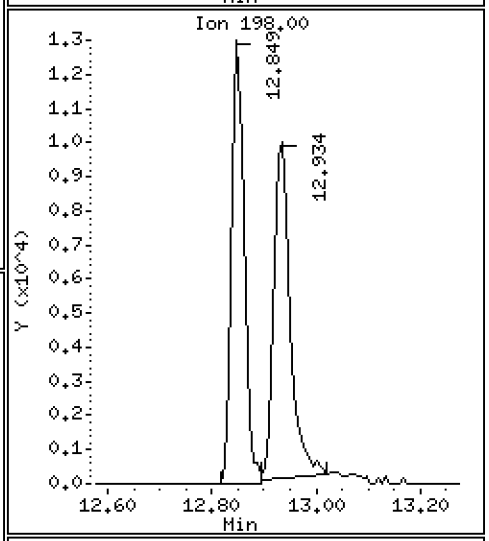
35 2,4,5-Trichlorophenol

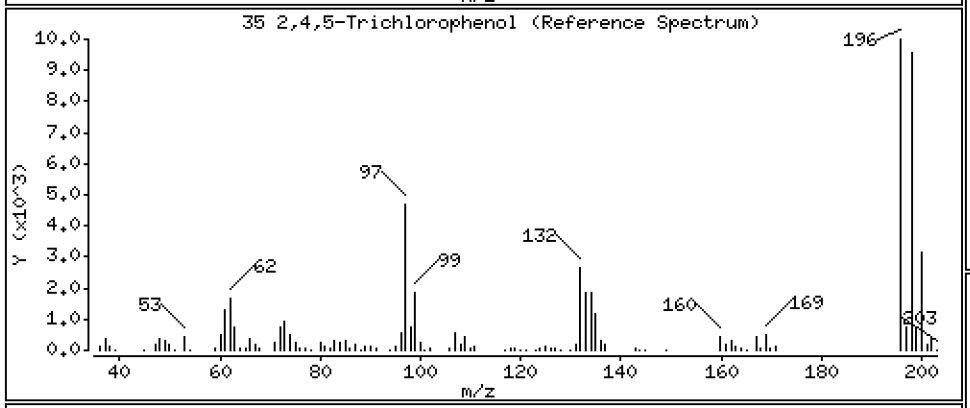
Concentration: 0.8679 ug/mL

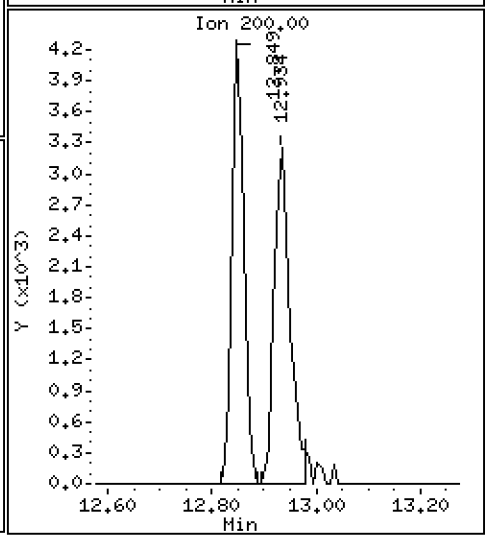


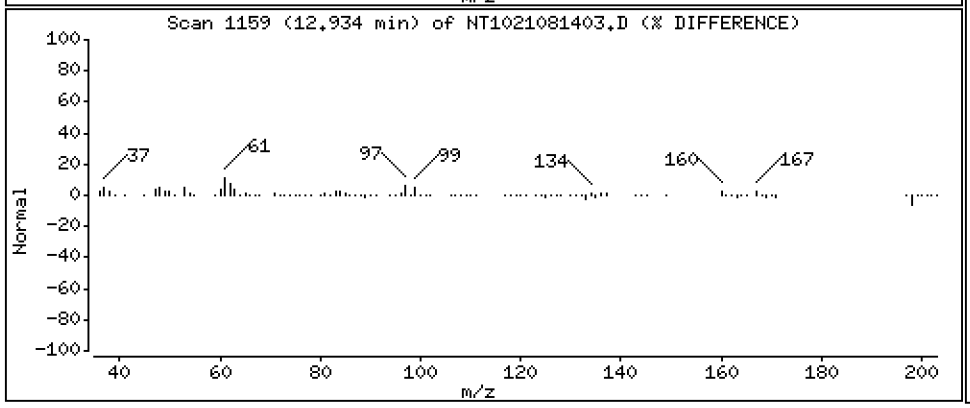












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

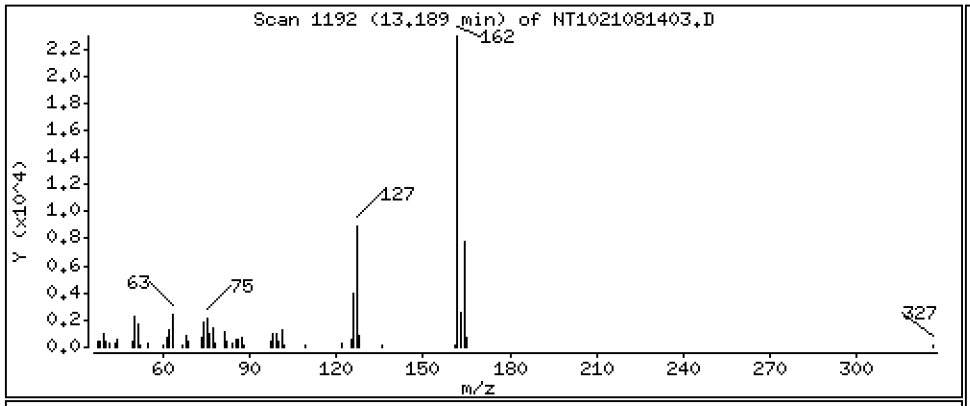
Operator: VTS

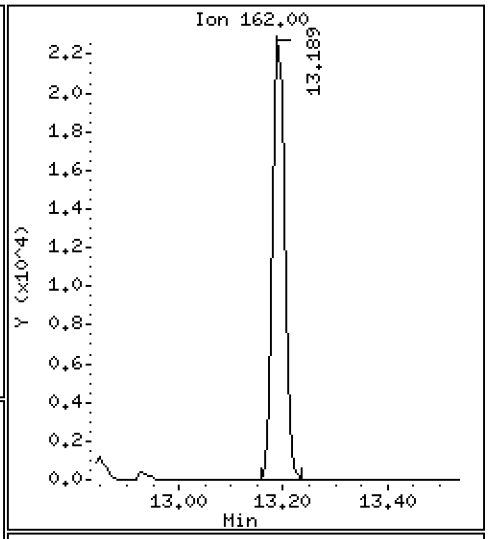
Column phase: ZB-5msi

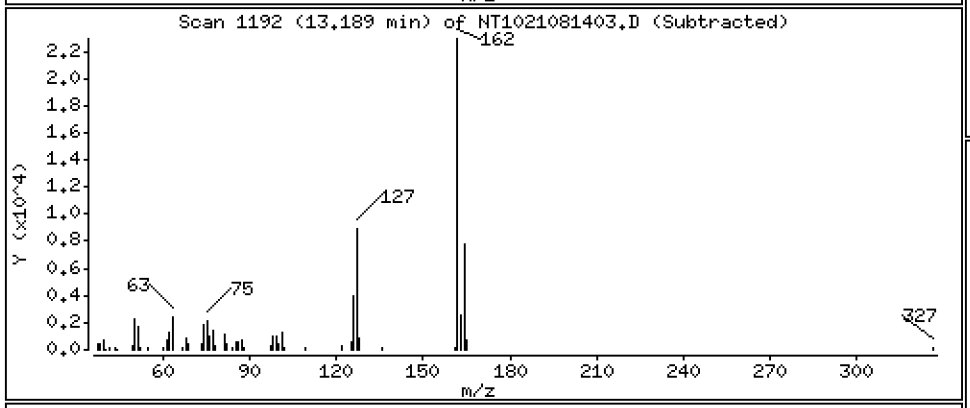
Column diameter: 0.25

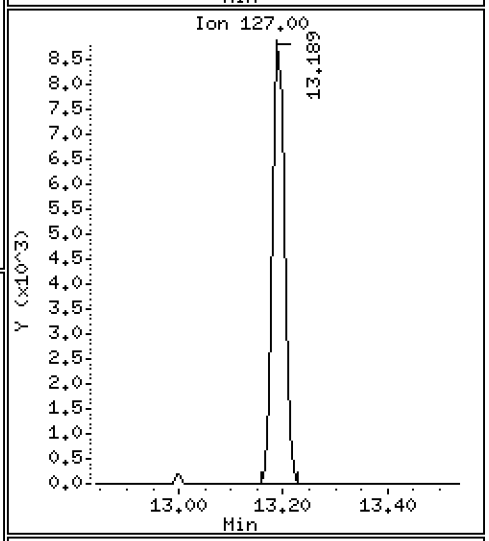
37 2-Chloronaphthalene

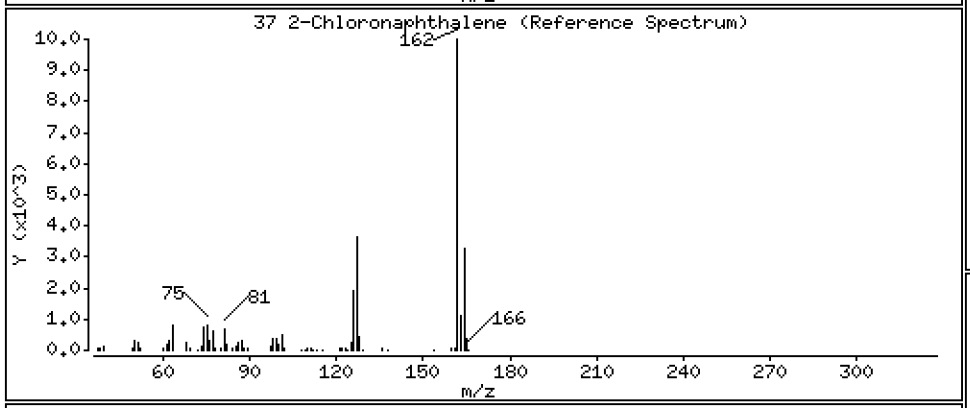
Concentration: 0.4308 ug/mL

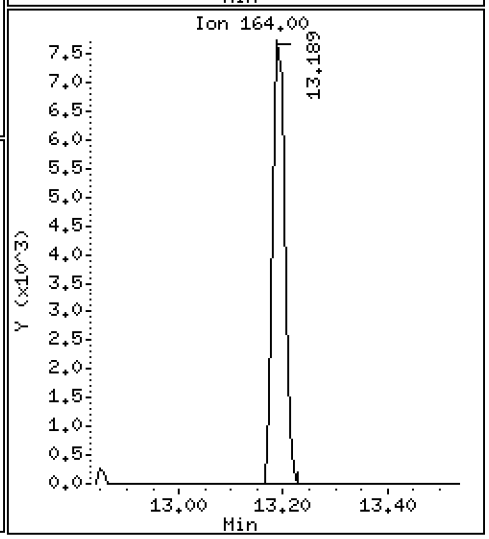


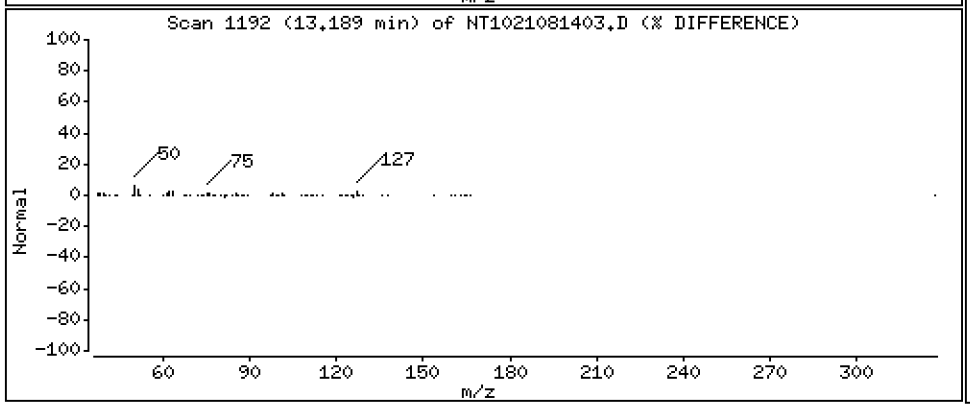












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

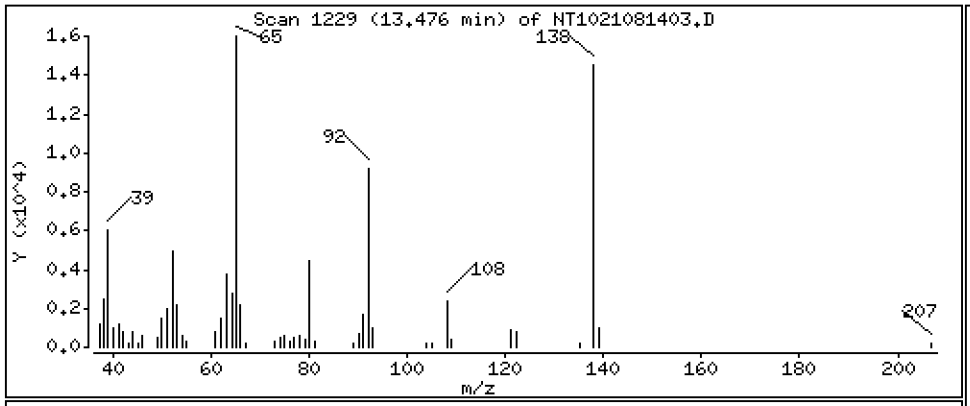
Operator: VTS

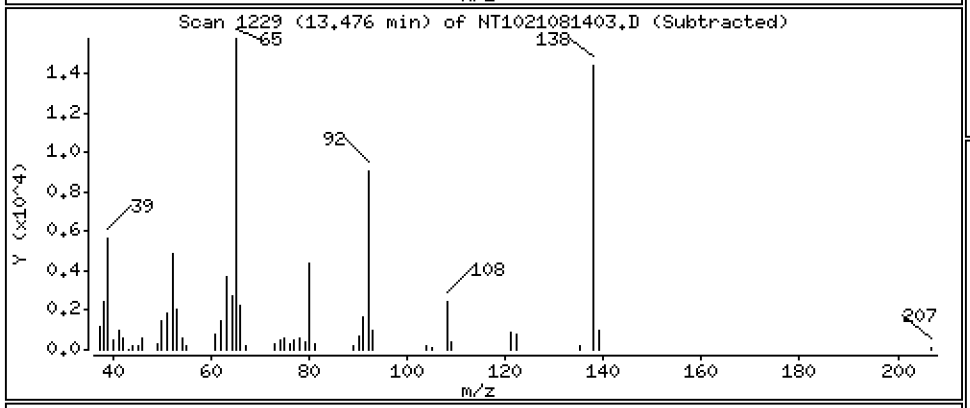
Column phase: ZB-5msi

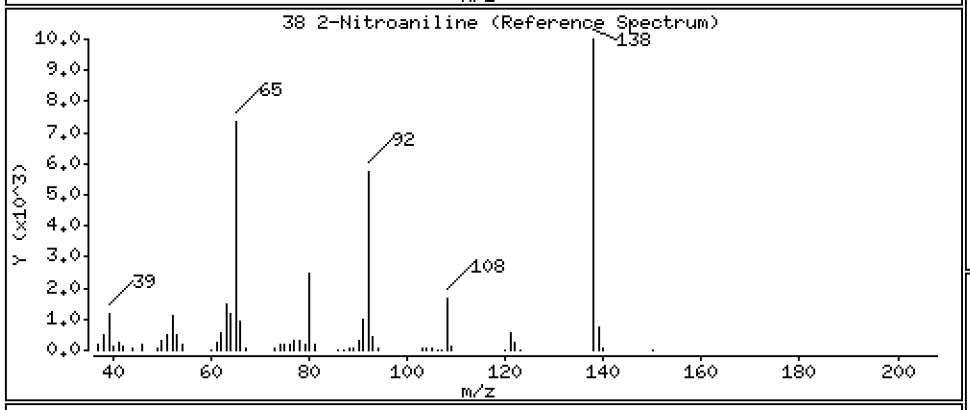
Column diameter: 0.25

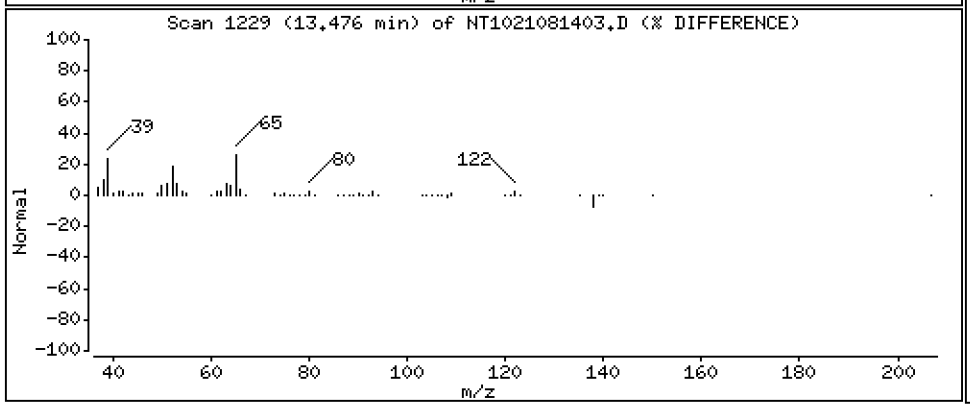
38 2-Nitroaniline

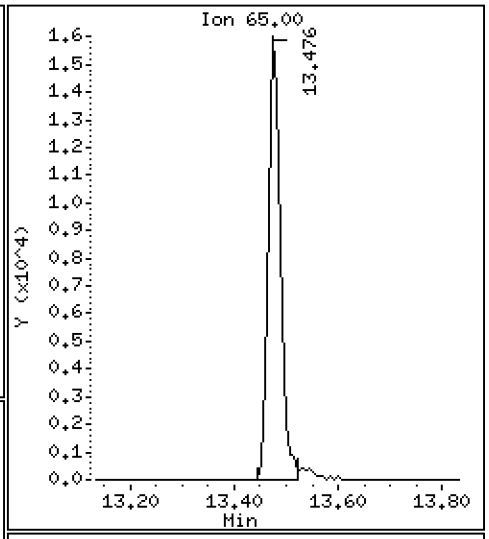
Concentration: 0.8343 ug/mL

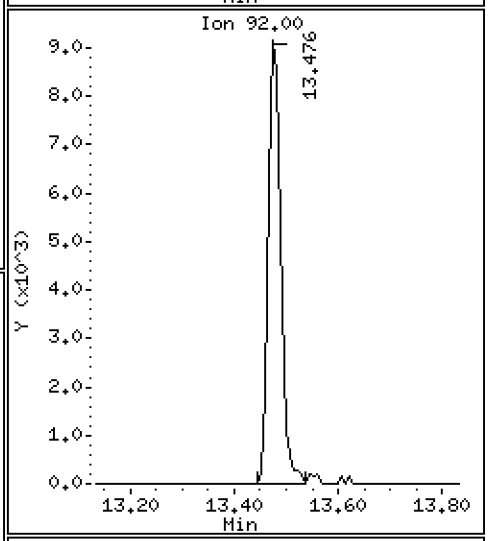


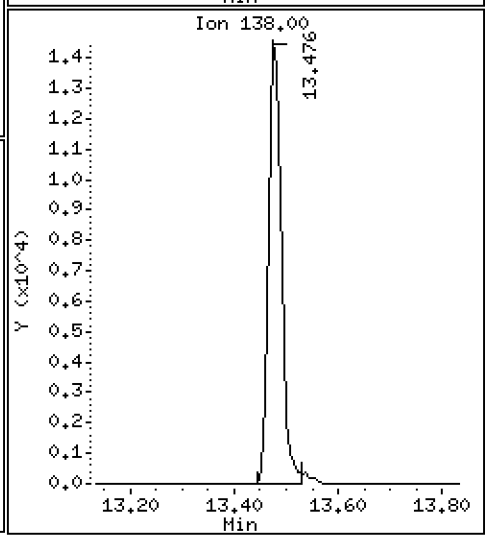












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

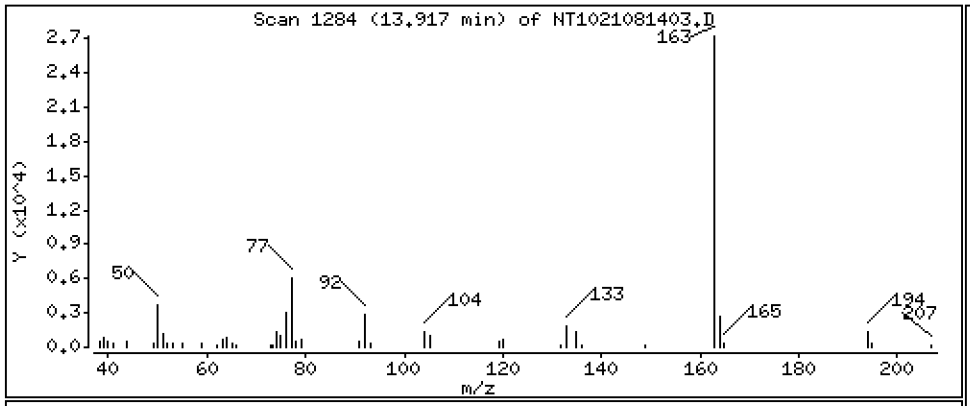
Operator: VTS

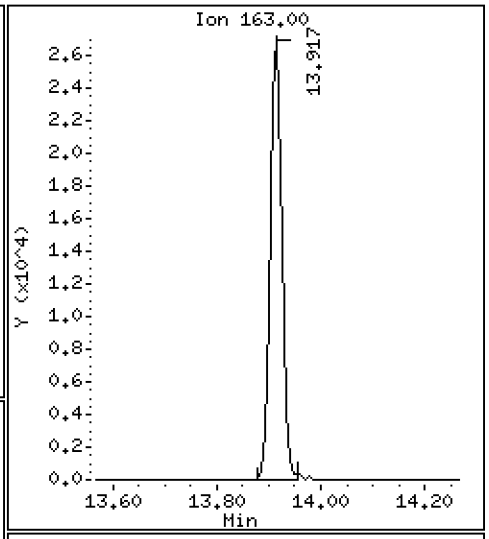
Column phase: ZB-5msi

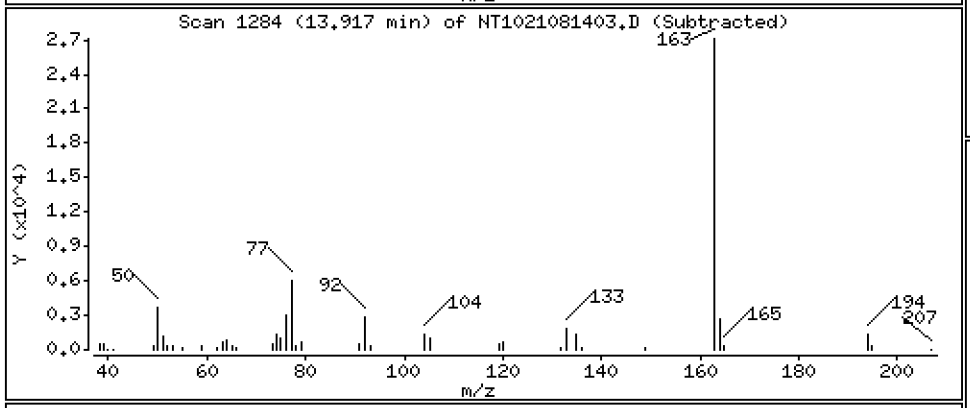
Column diameter: 0.25

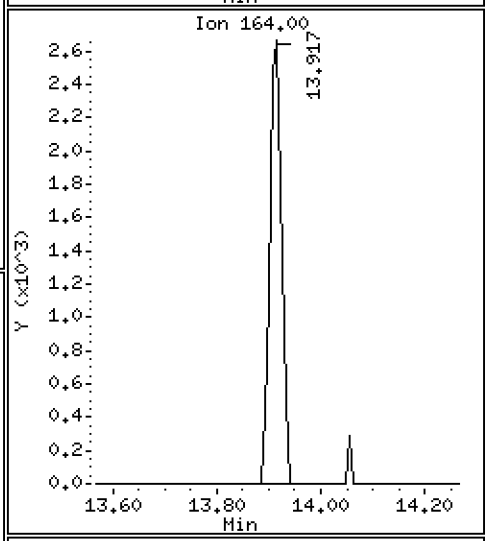
39 Dimethylphthalate

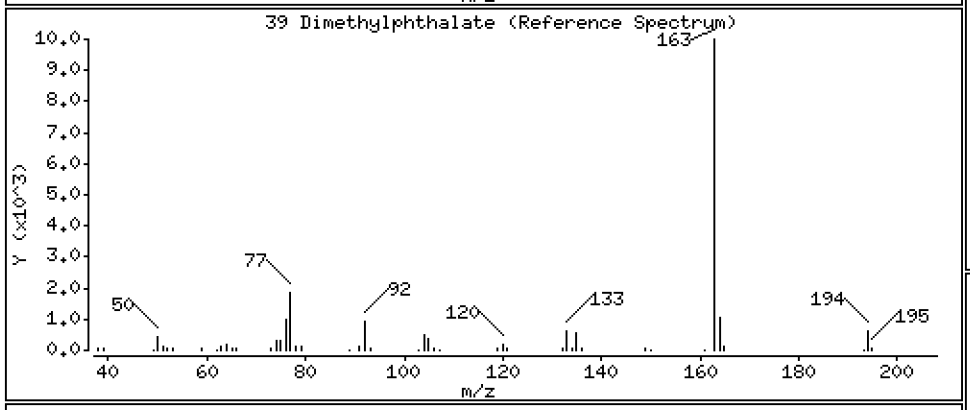
Concentration: 0.5081 ug/mL

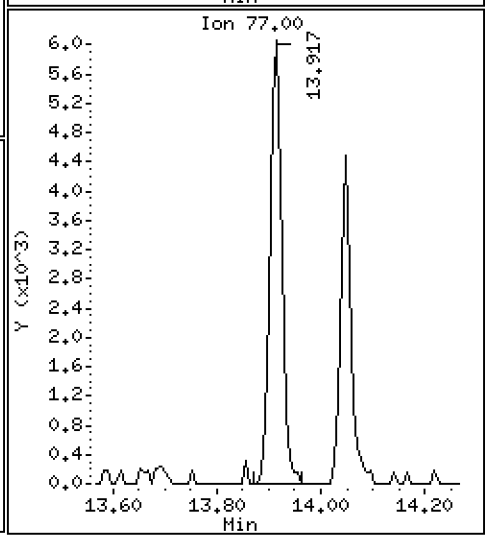


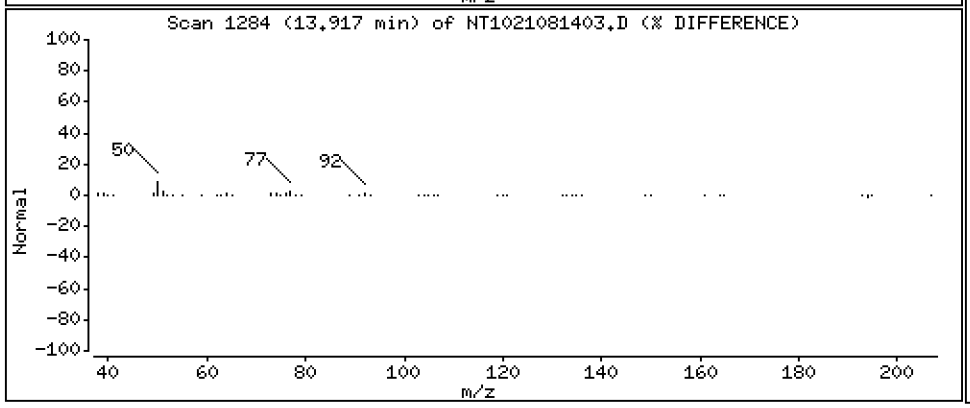












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

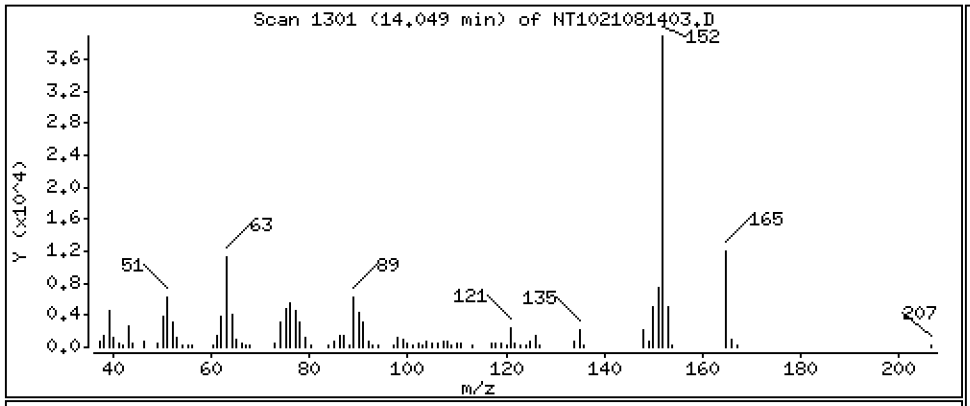
Operator: VTS

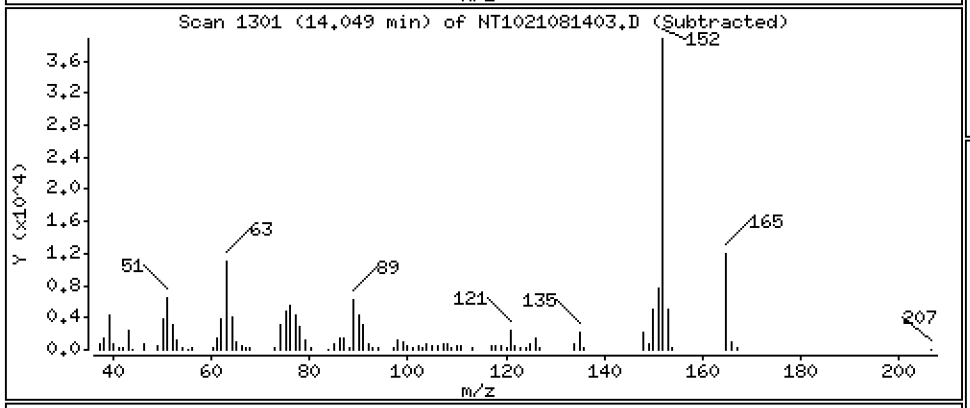
Column phase: ZB-5msi

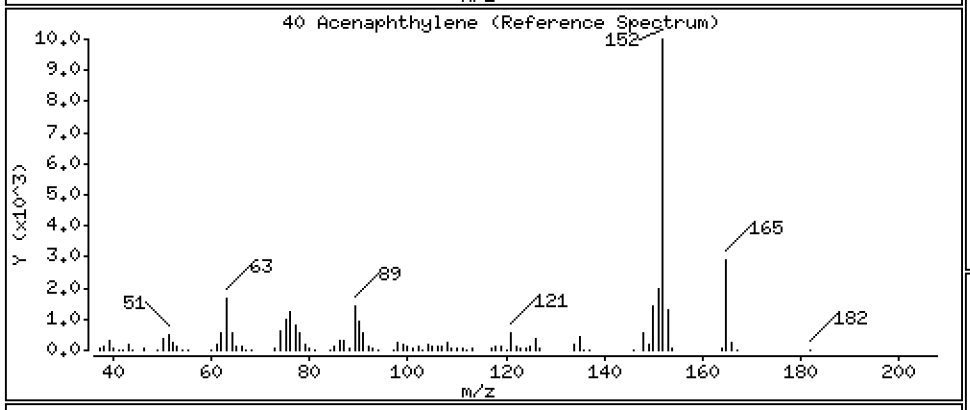
Column diameter: 0.25

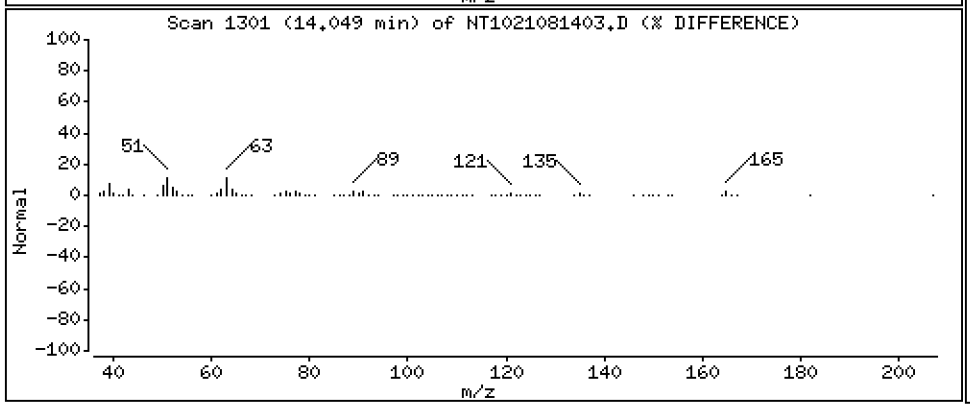
40 Acenaphthylene

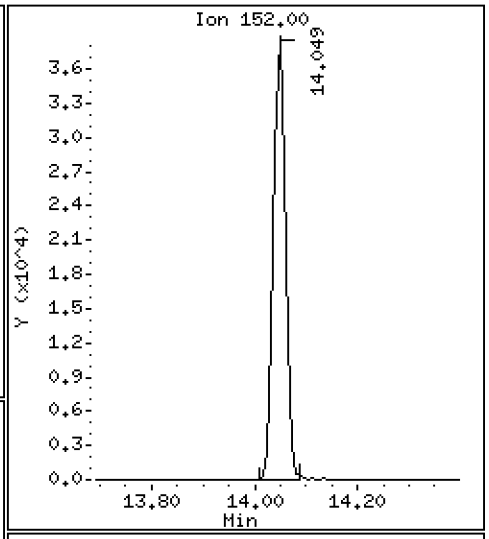
Concentration: 0.5147 ug/mL

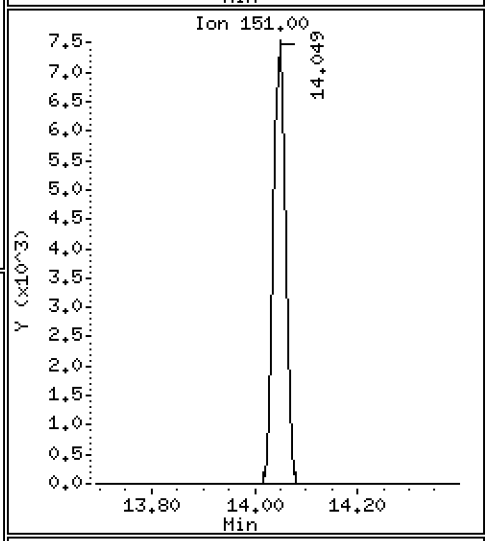


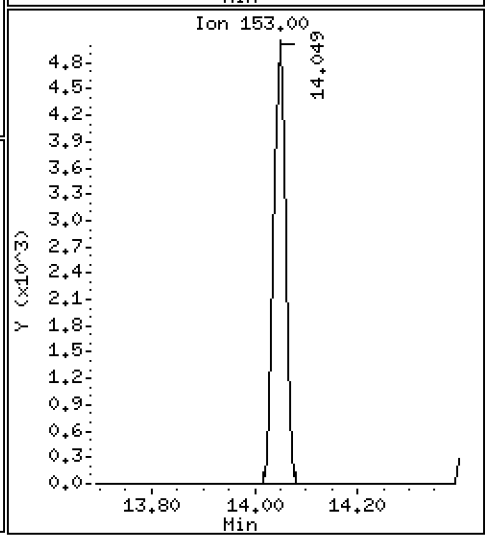












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

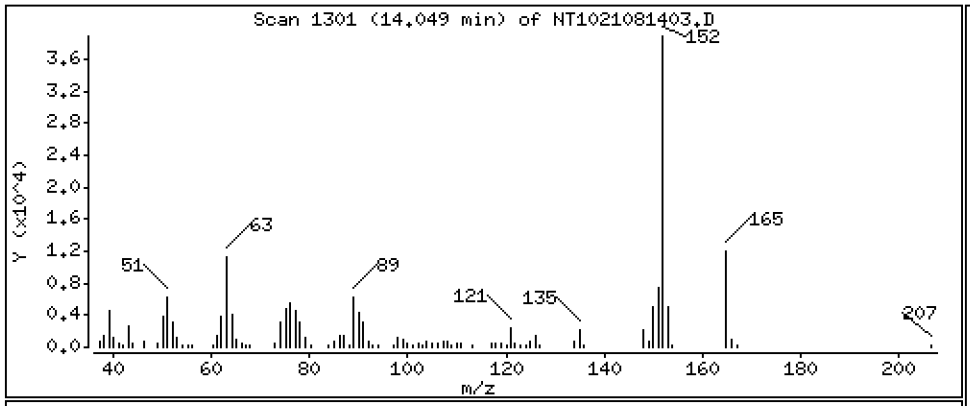
Operator: VTS

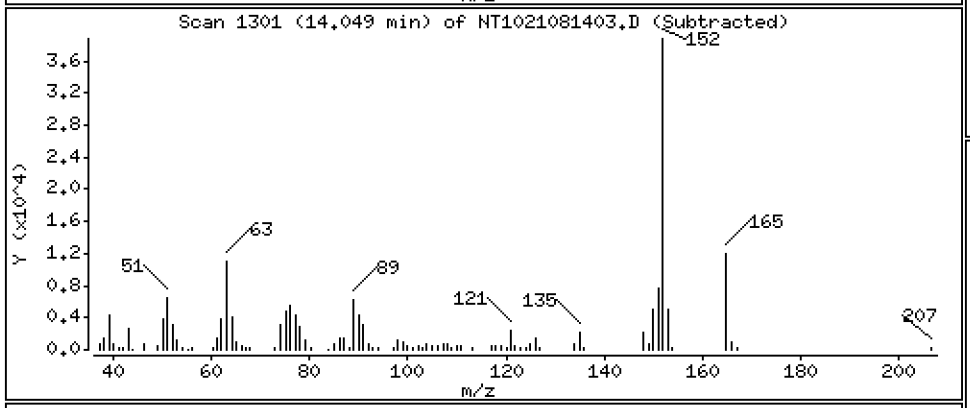
Column phase: ZB-5msi

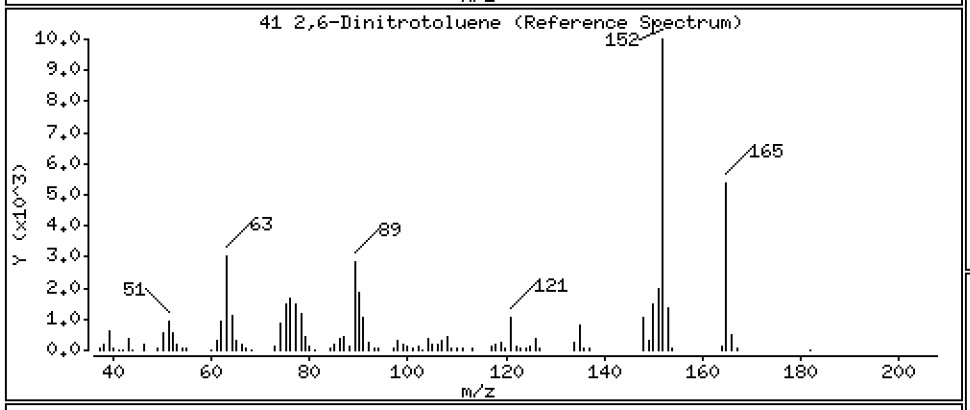
Column diameter: 0.25

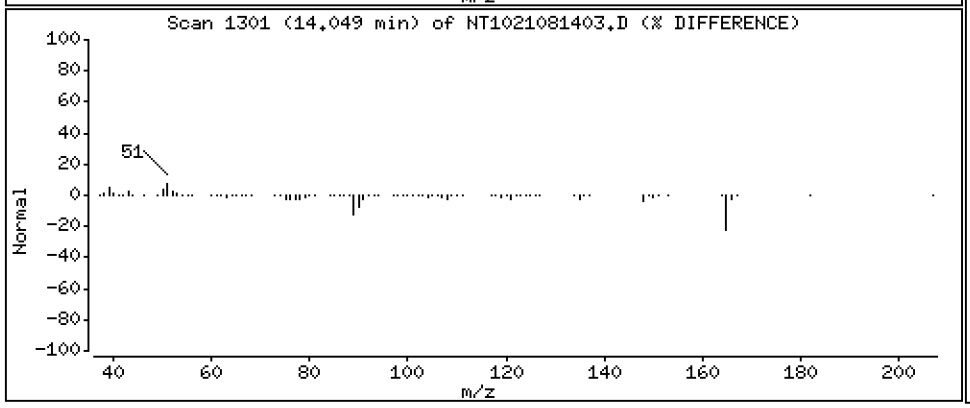
41 2,6-Dinitrotoluene

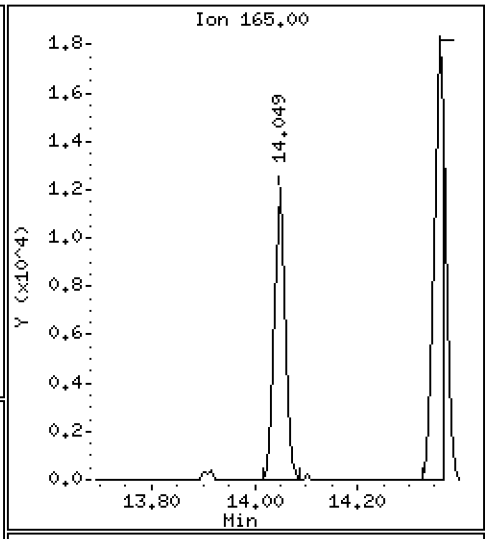
Concentration: 0.9157 ug/mL

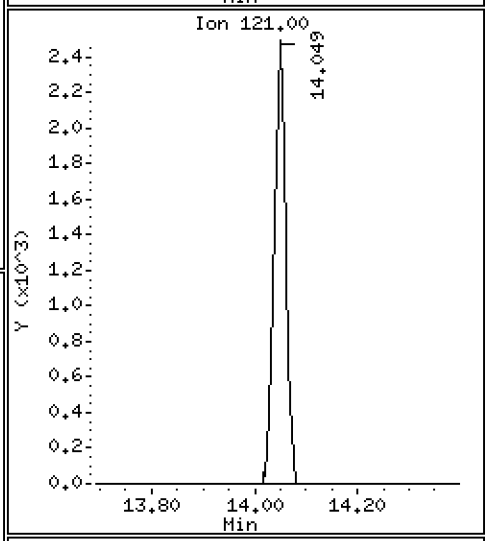


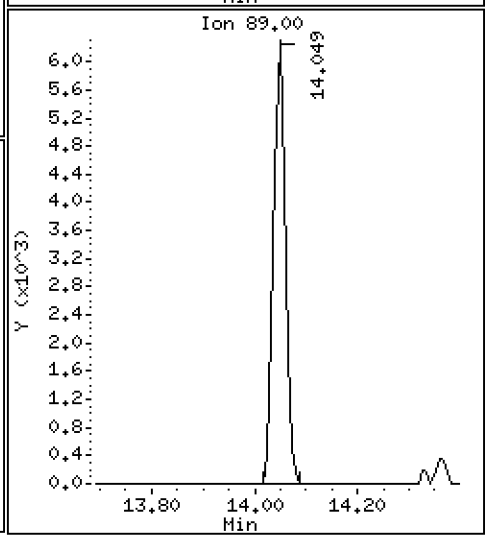












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

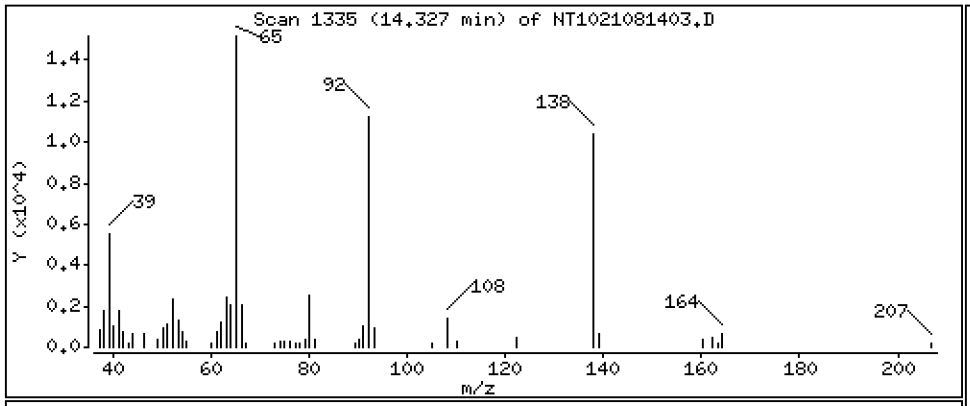
Operator: VTS

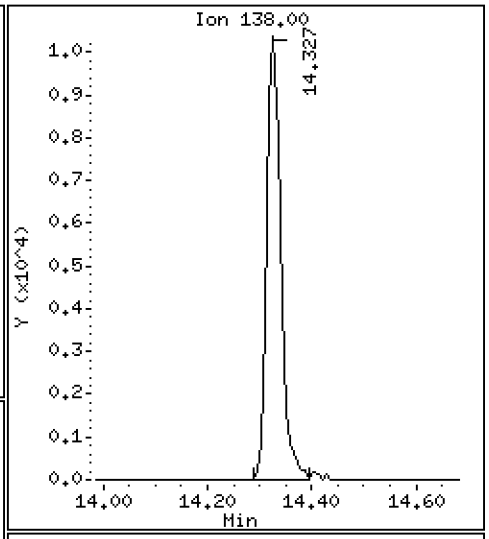
Column phase: ZB-5msi

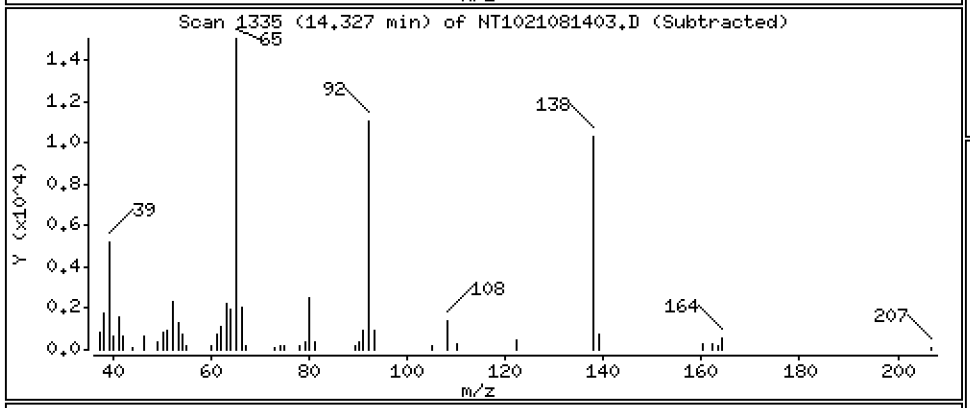
Column diameter: 0.25

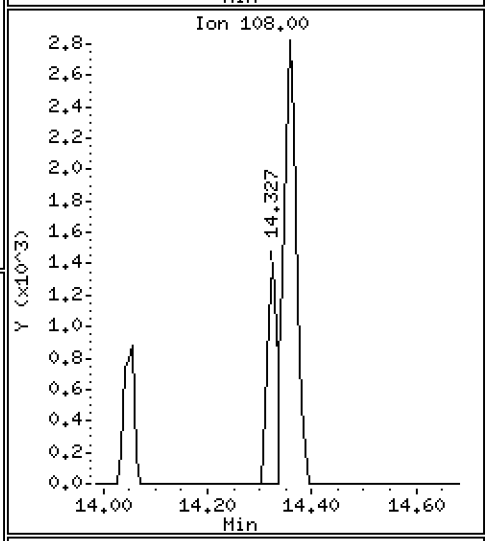
43 3-Nitroaniline

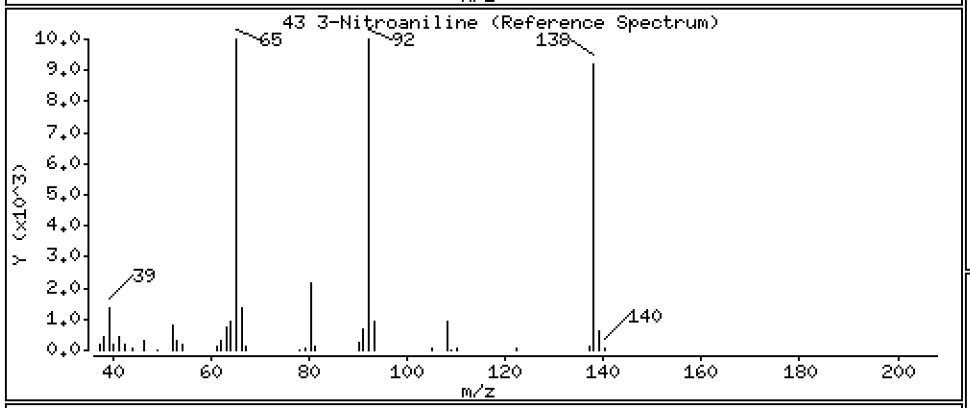
Concentration: 0.8499 ug/mL

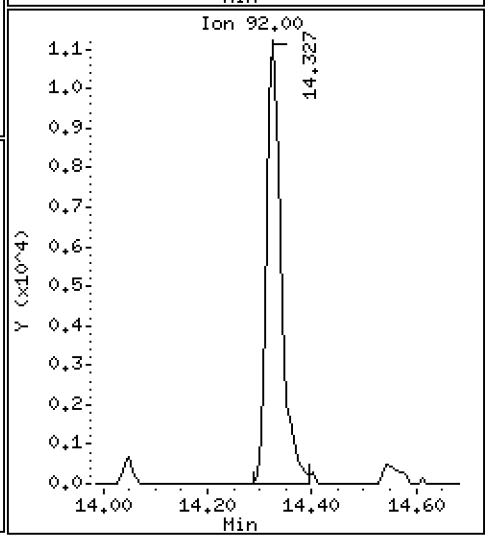


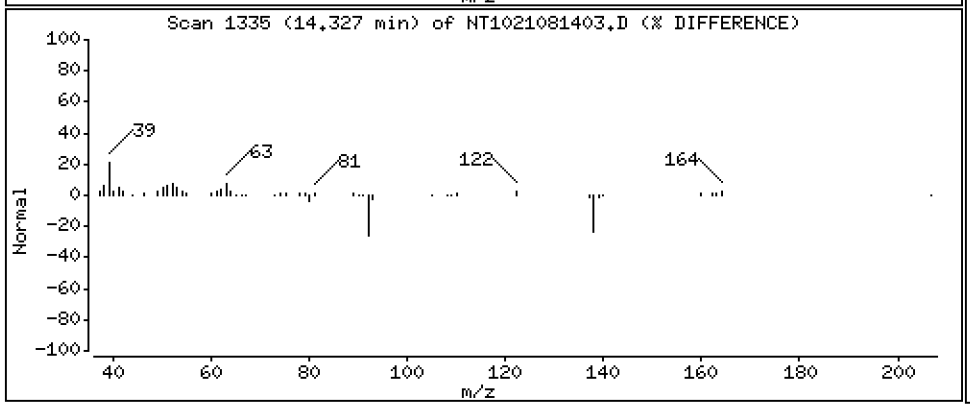












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Date : 14-AUG-2021 10:30

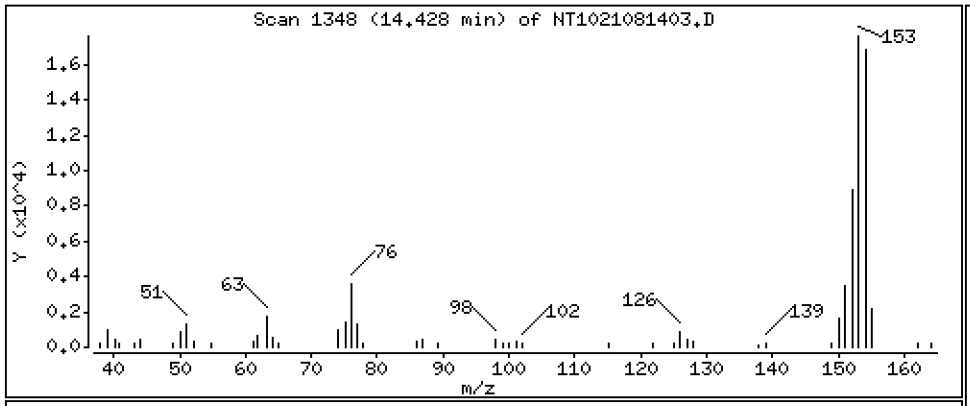
Client ID: Instrument: nt10.i

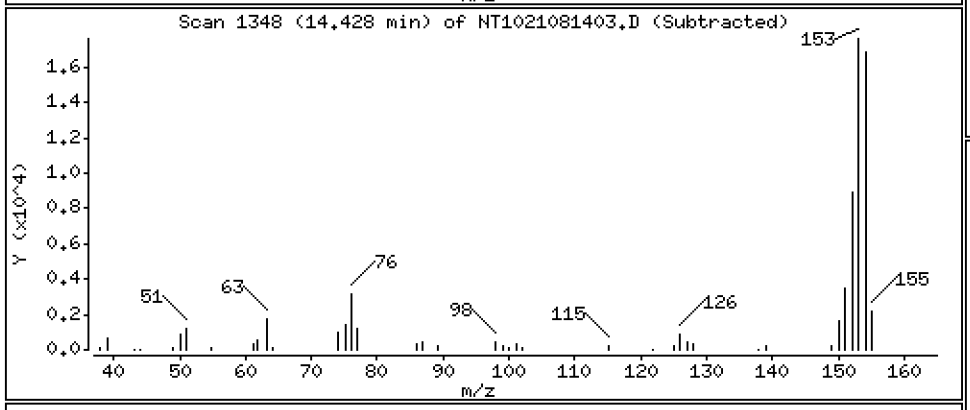
Sample Info: SJH0174-LCV1

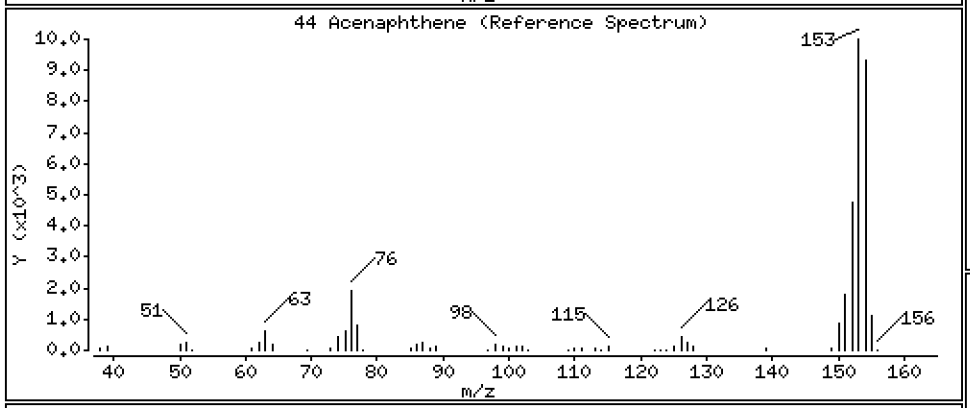
Operator: VTS

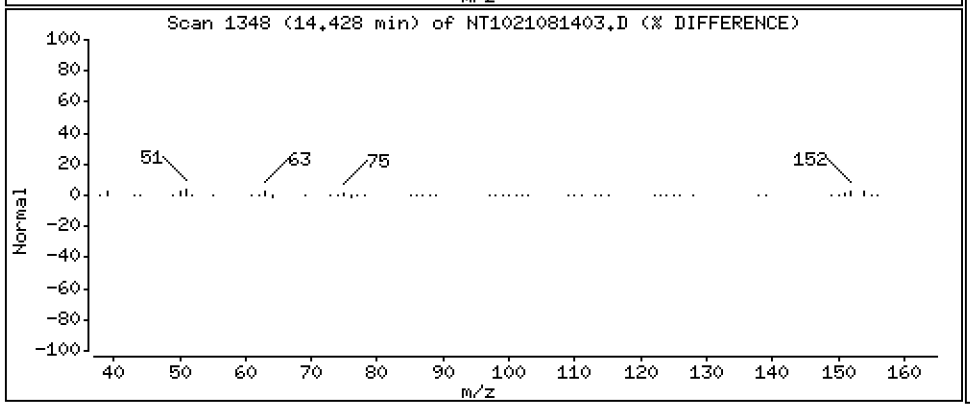
Column phase: ZB-5msi Column diameter: 0.25

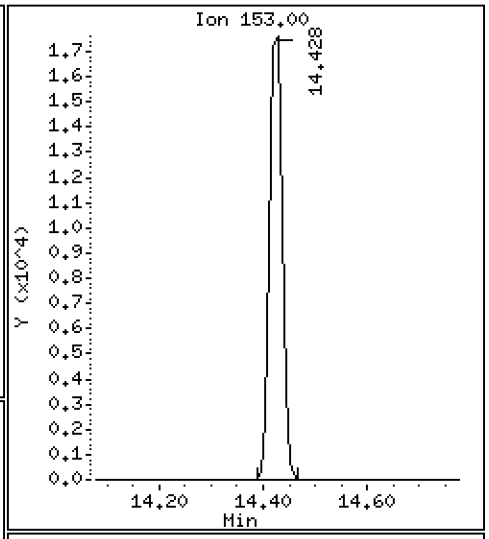
44 Acenaphthene Concentration: 0.4280 ug/mL

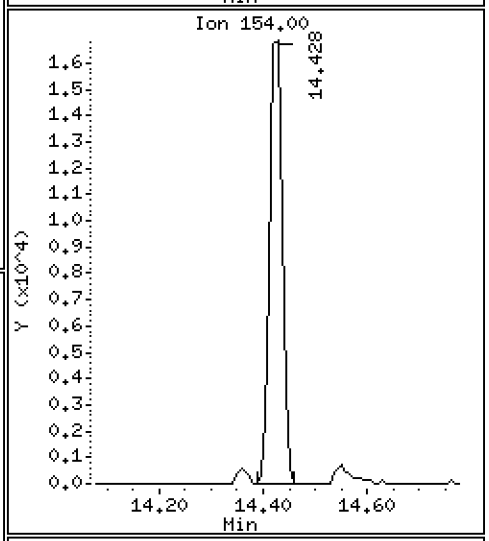


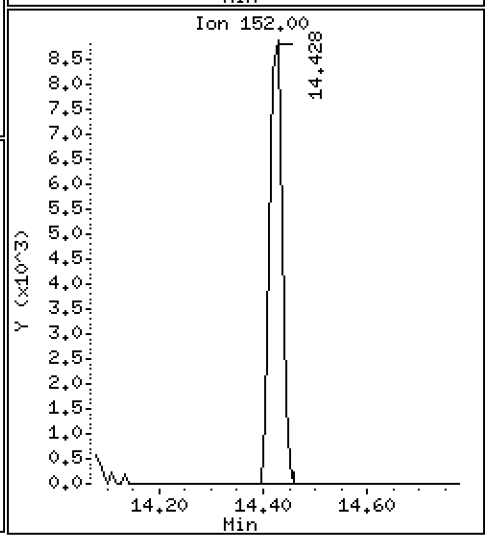












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

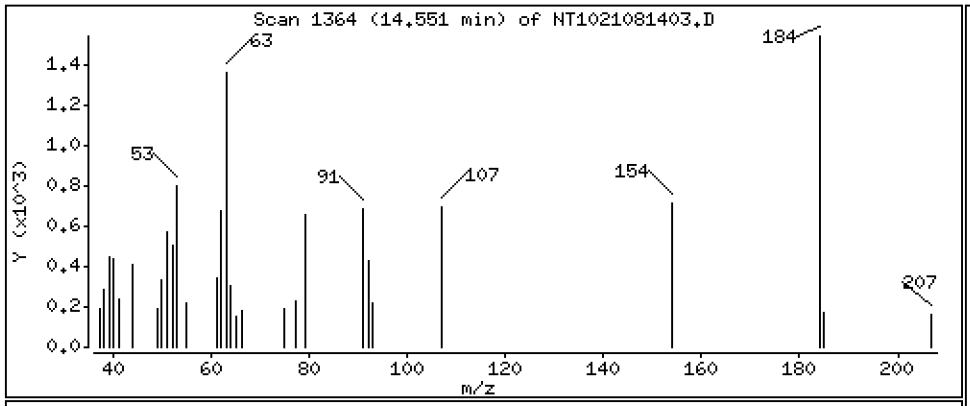
Operator: VTS

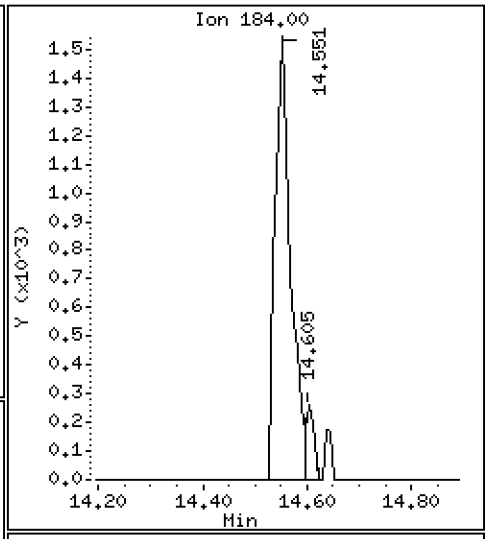
Column phase: ZB-5msi

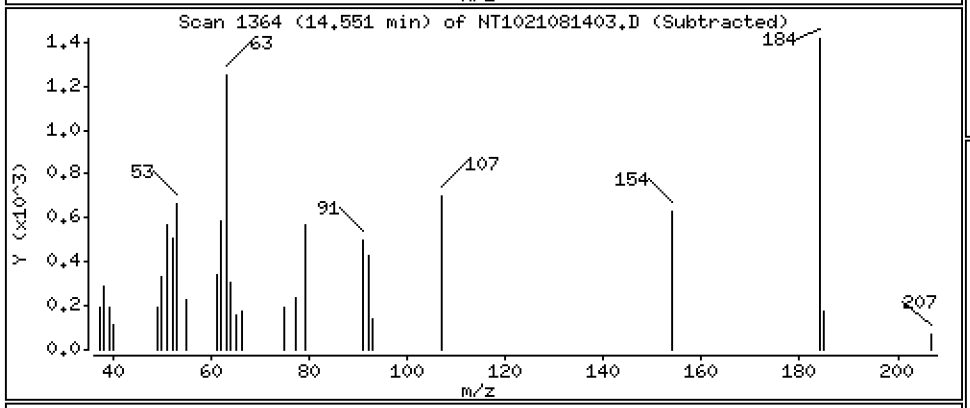
Column diameter: 0.25

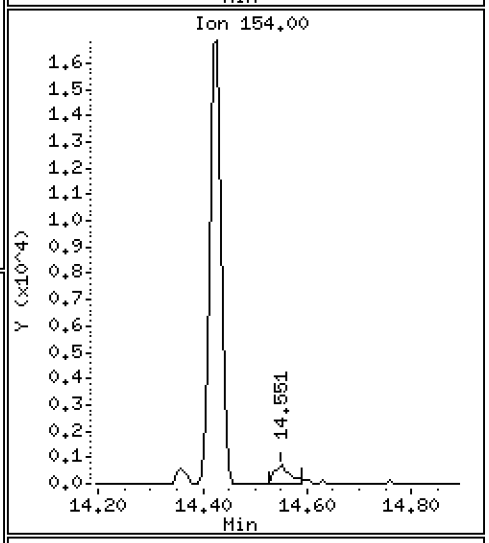
45 2,4-Dinitrophenol

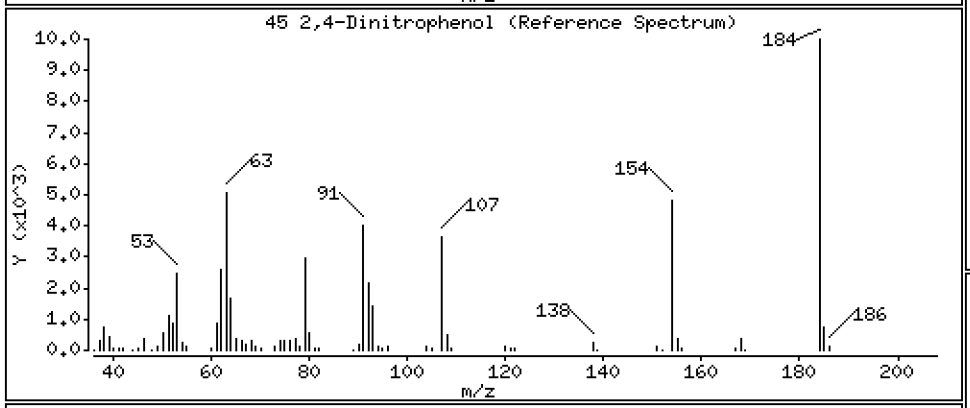
Concentration: 0.3171 ug/mL

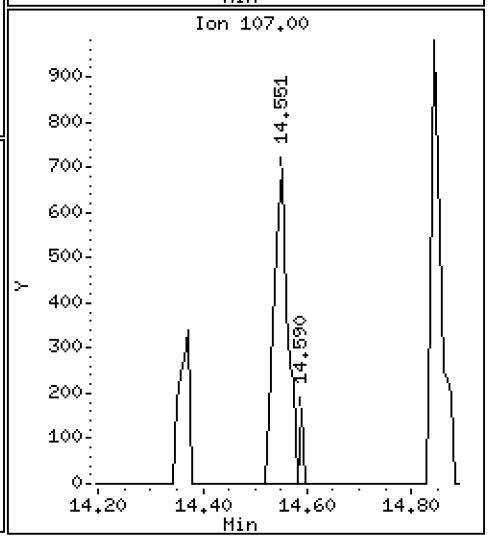


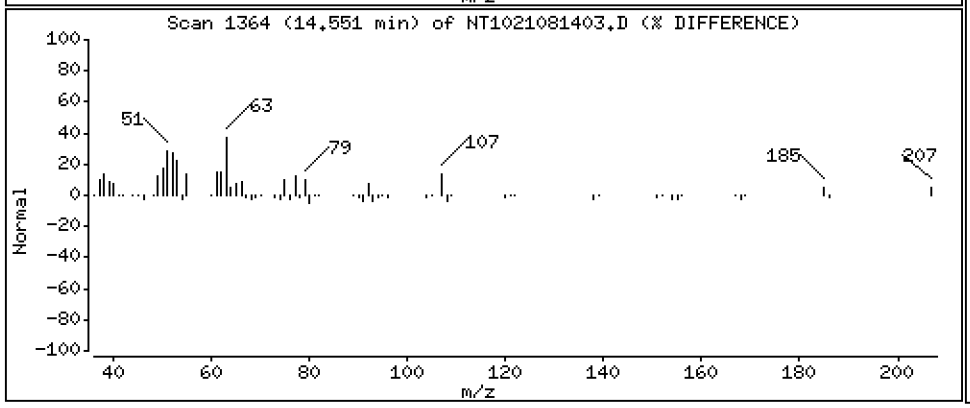












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

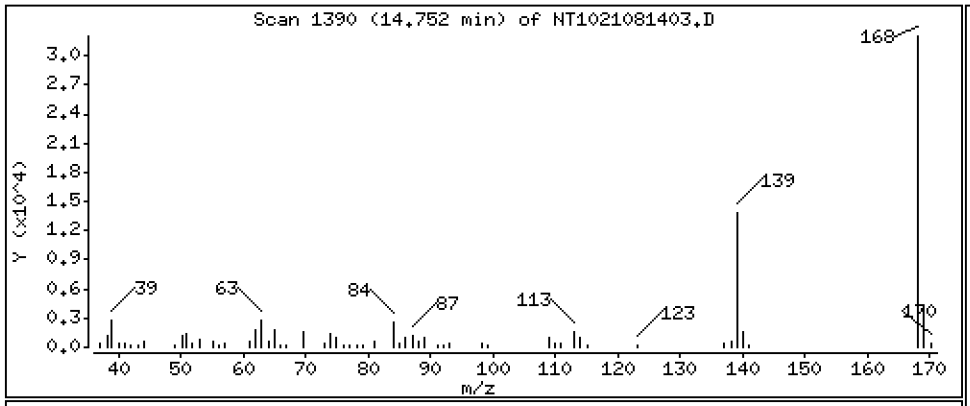
Operator: VTS

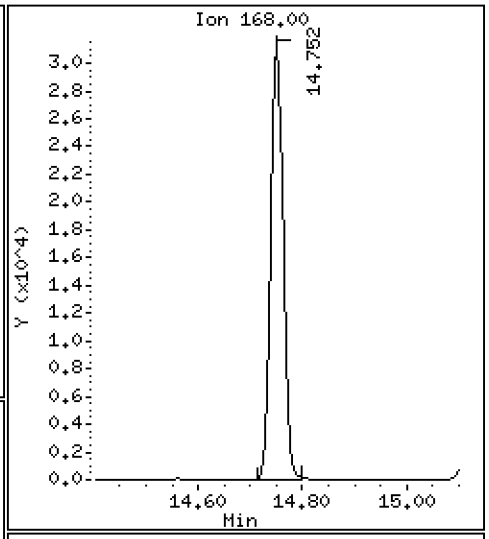
Column phase: ZB-5msi

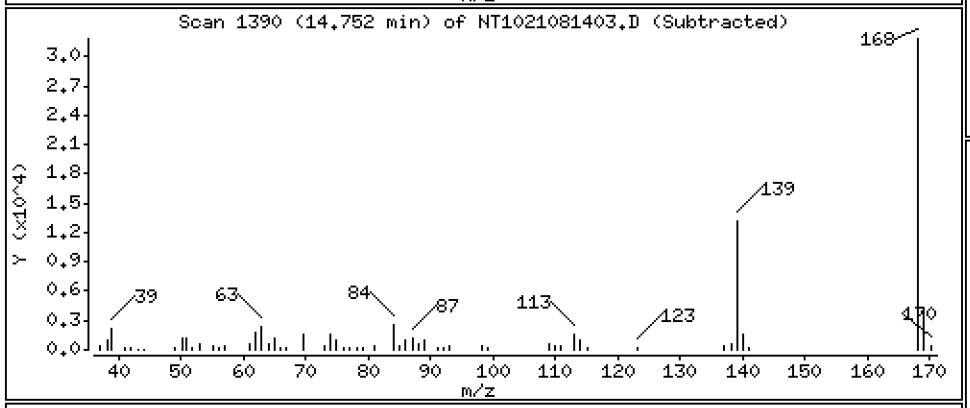
Column diameter: 0.25

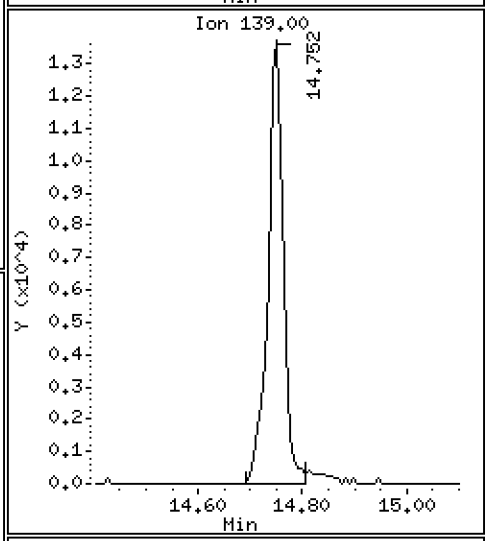
46 Dibenzofuran

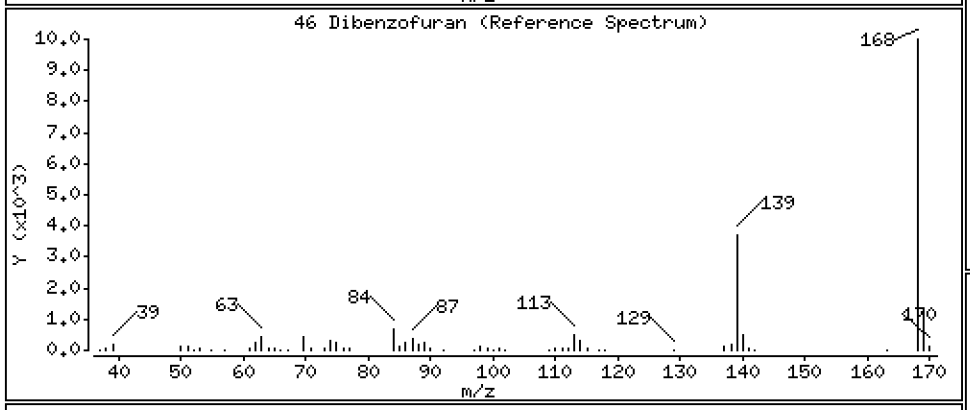
Concentration: 0.4784 ug/mL

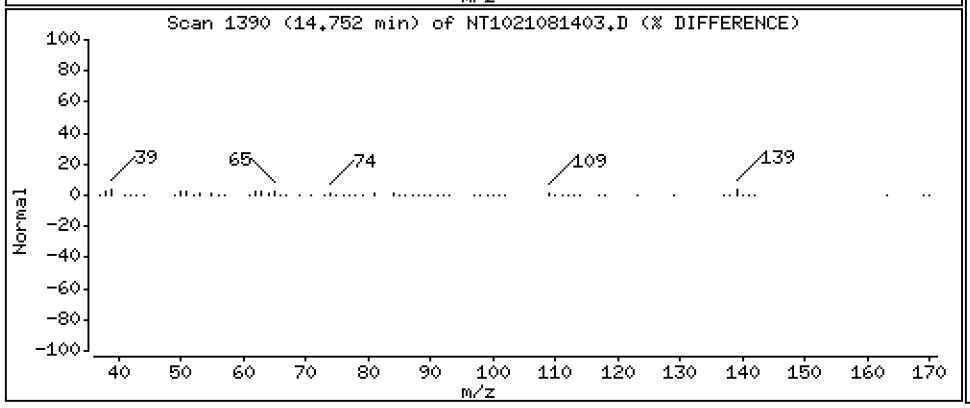


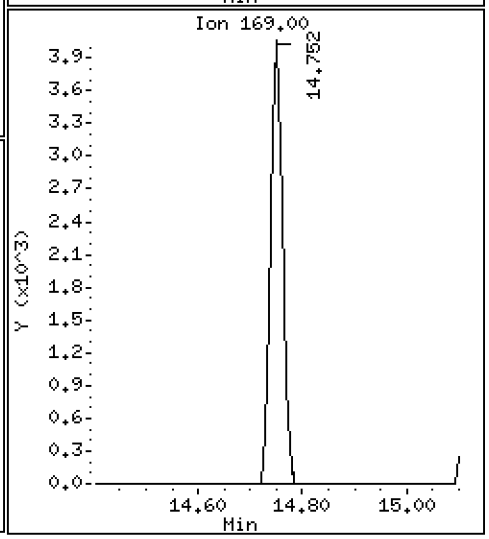












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

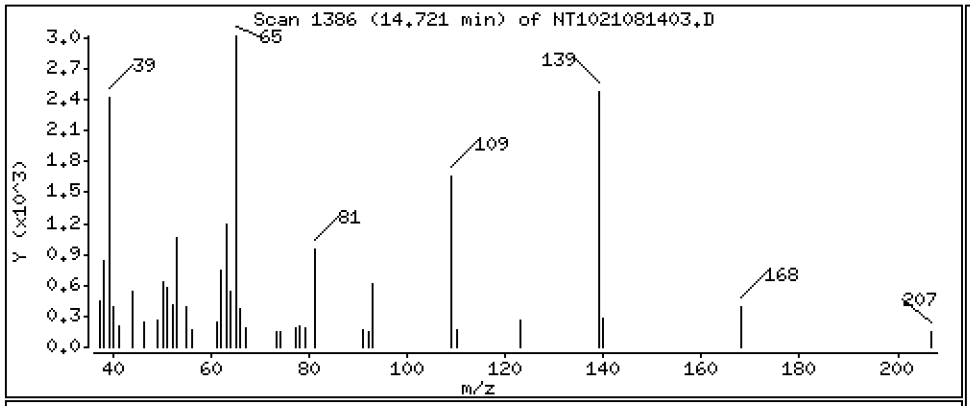
Operator: VTS

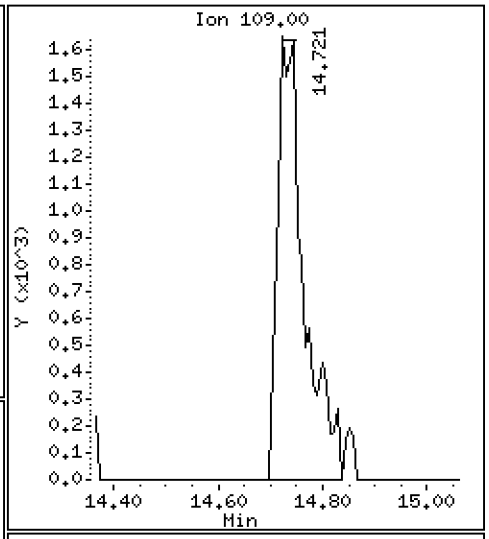
Column phase: ZB-5msi

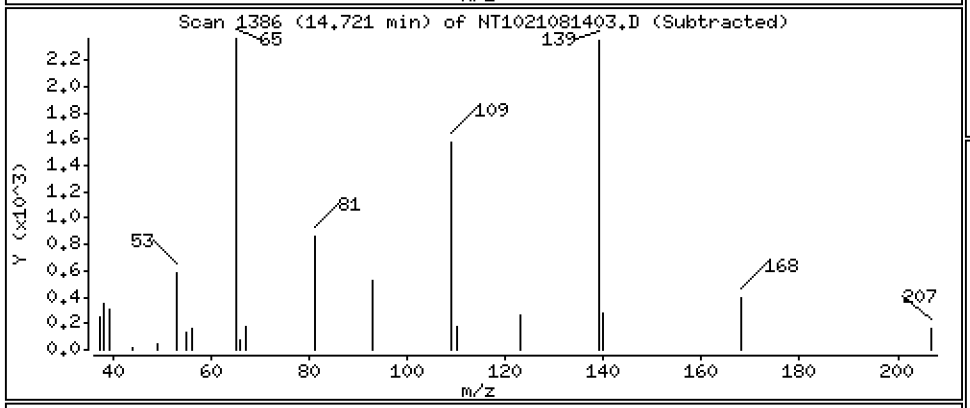
Column diameter: 0.25

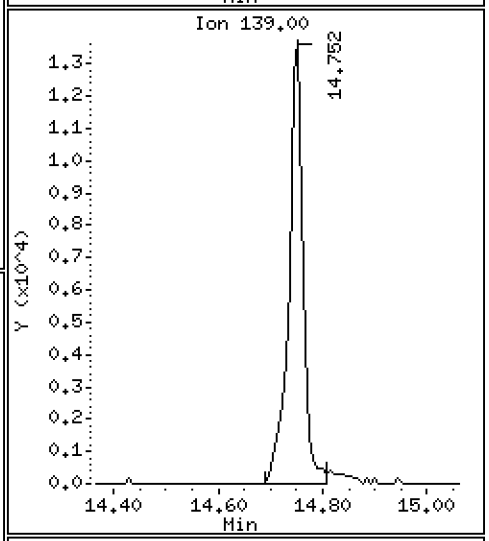
47 4-Nitrophenol

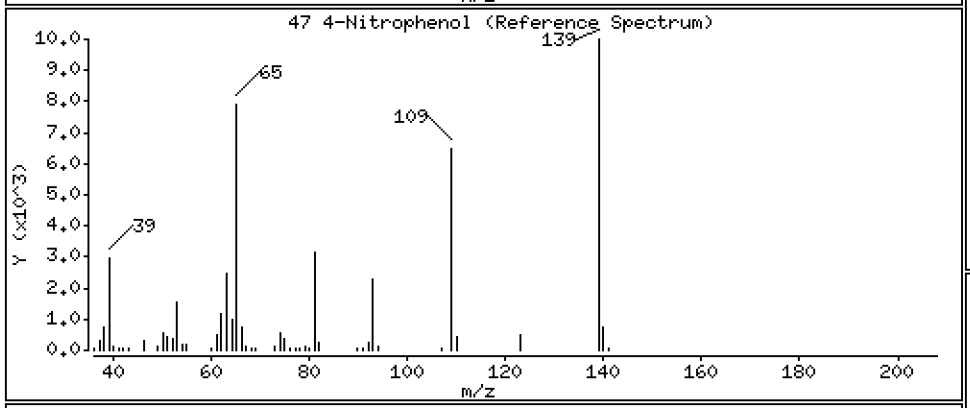
Concentration: 0.7062 ug/mL

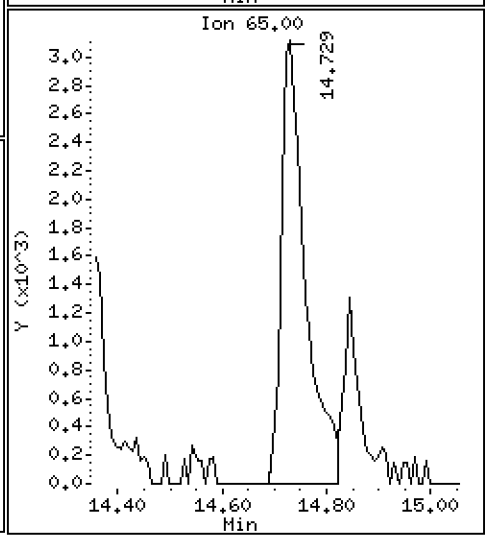


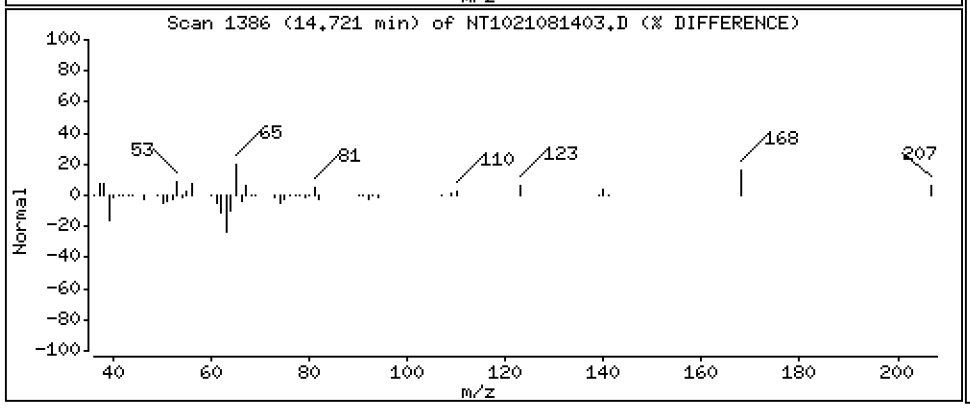












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

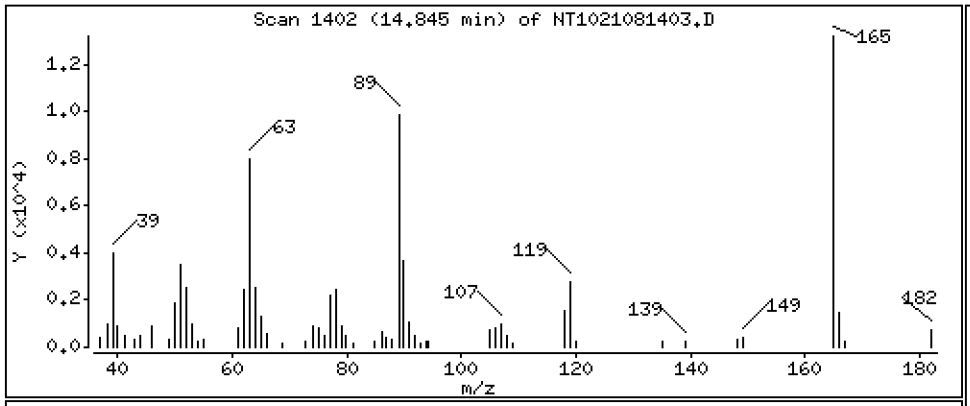
Operator: VTS

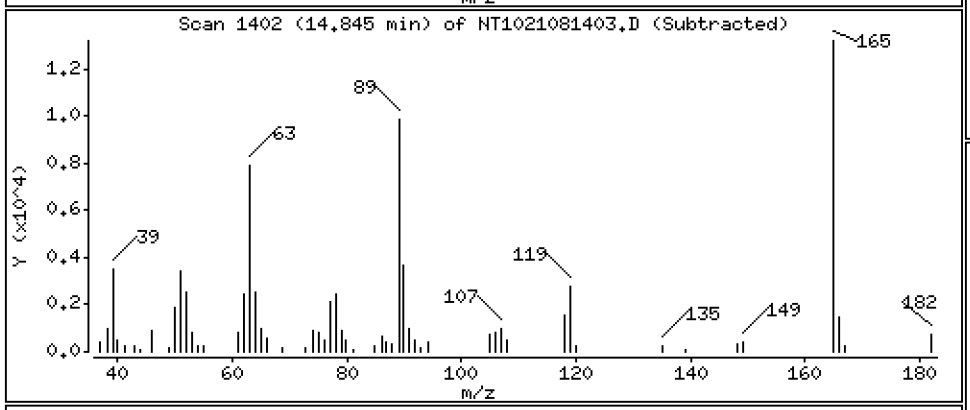
Column phase: ZB-5msi

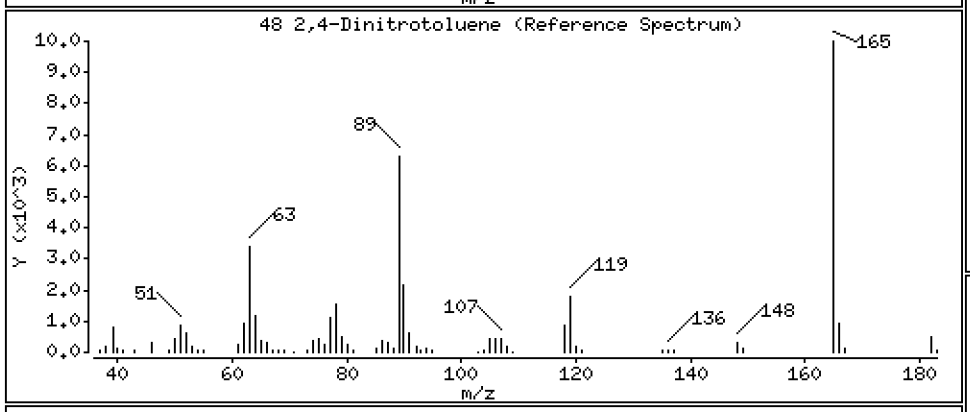
Column diameter: 0.25

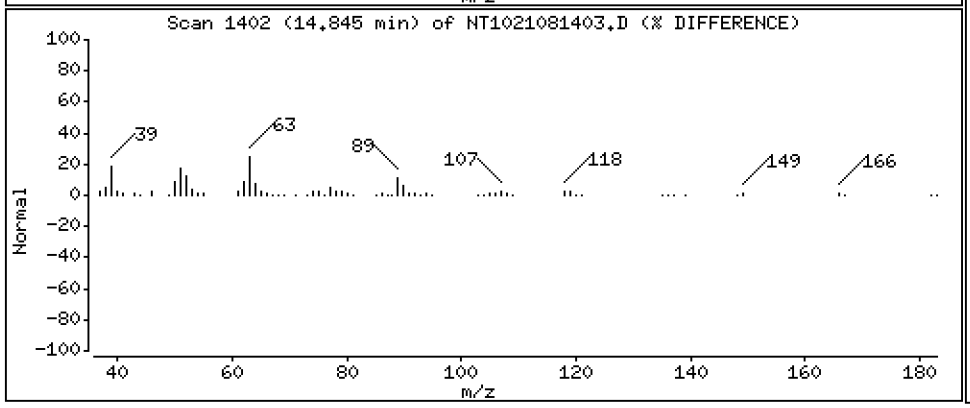
48 2,4-Dinitrotoluene

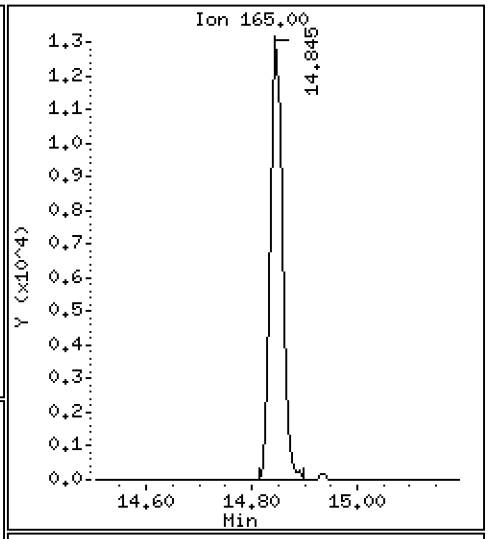
Concentration: 0.8436 ug/mL

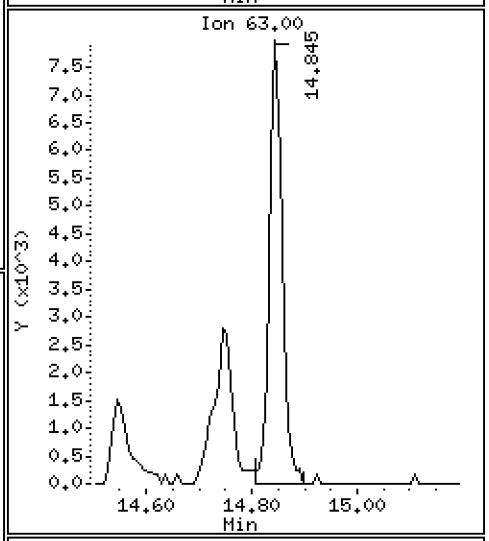


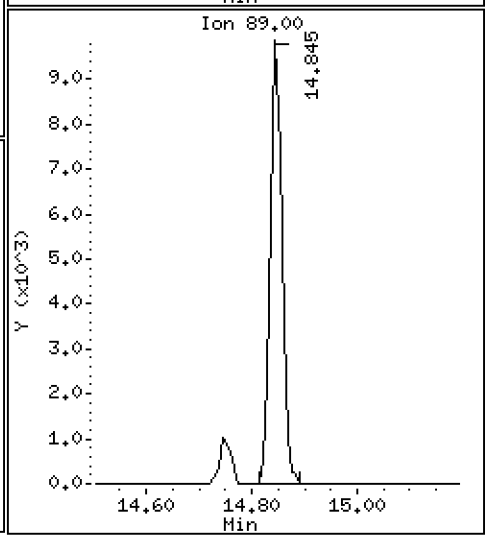












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081403.D

Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

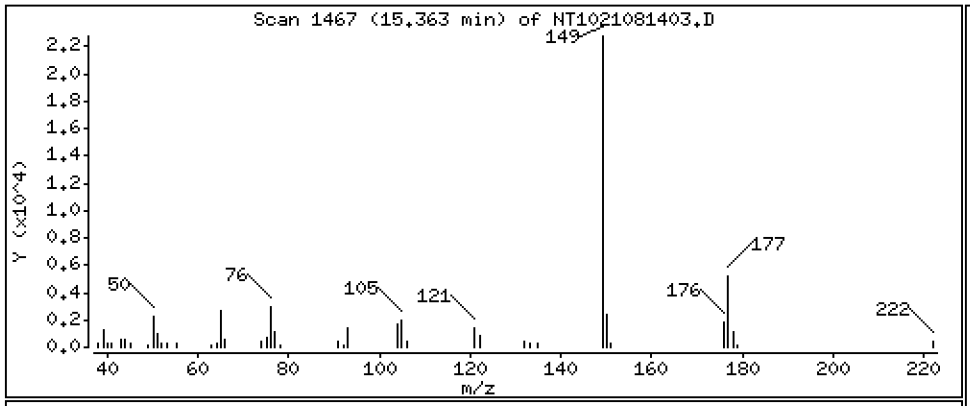
Operator: VTS

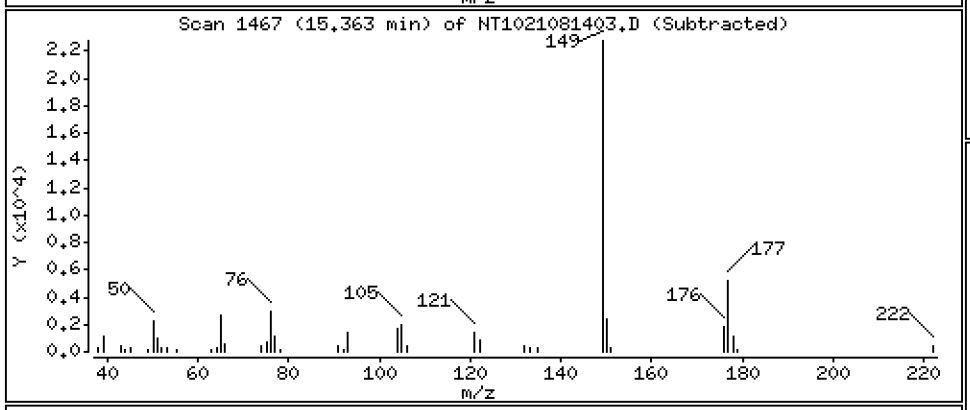
Column phase: ZB-5msi

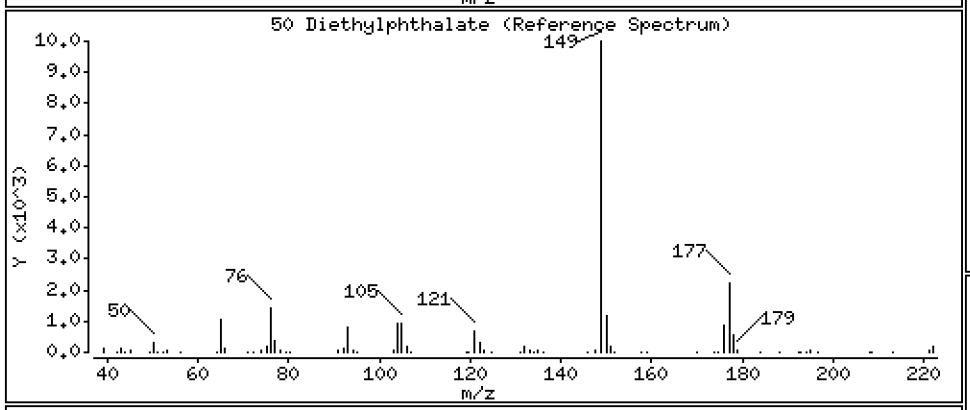
Column diameter: 0.25

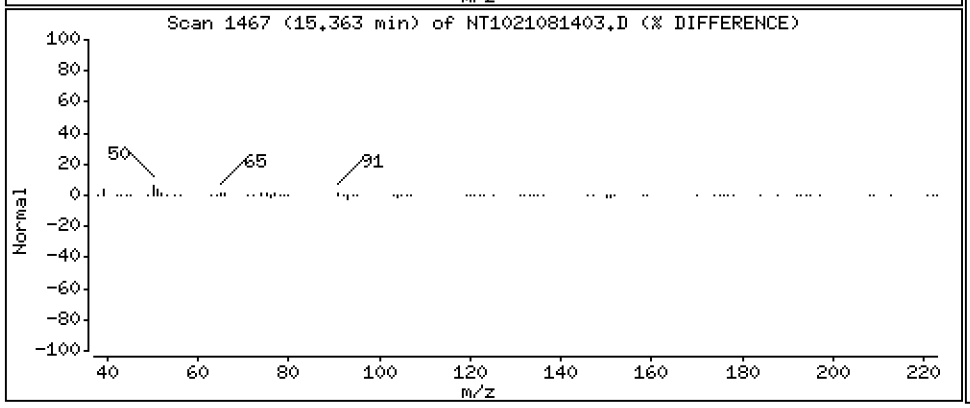
50 Diethylphthalate

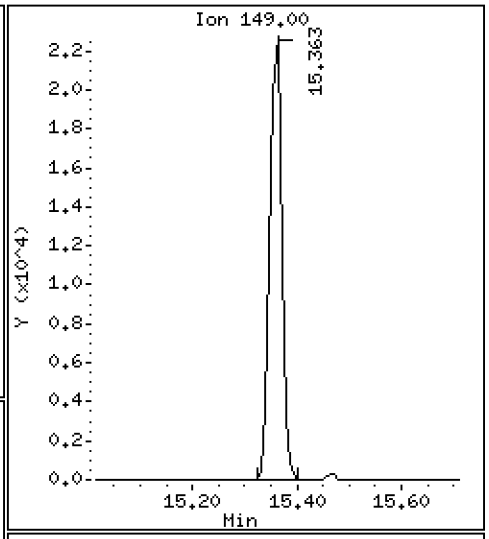
Concentration: 0.4647 ug/mL

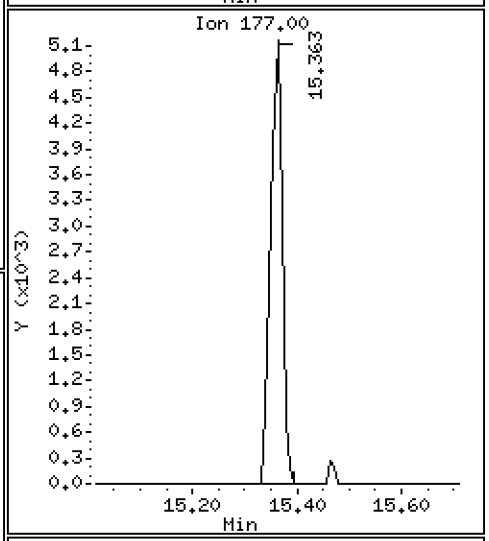


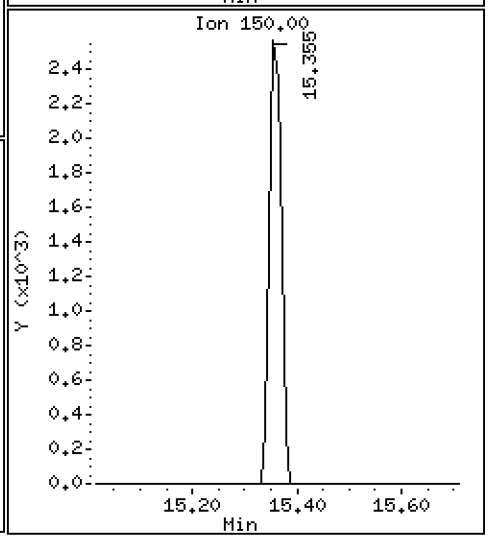












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081403.D

Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

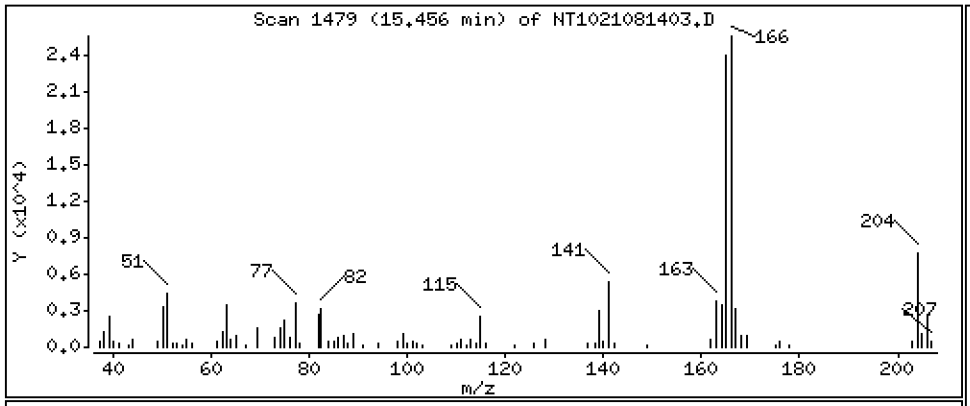
Operator: VTS

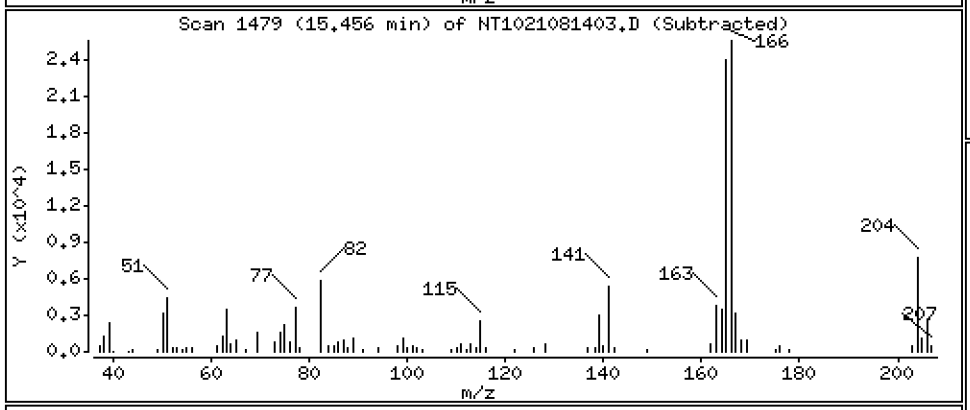
Column phase: ZB-5msi

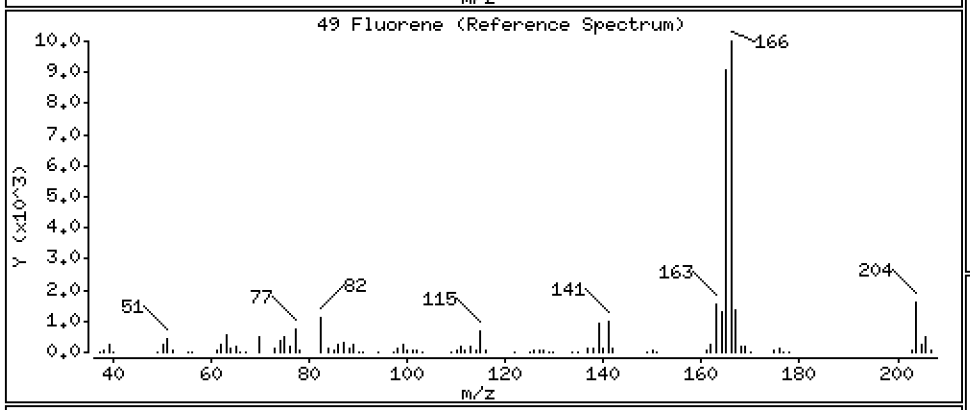
Column diameter: 0.25

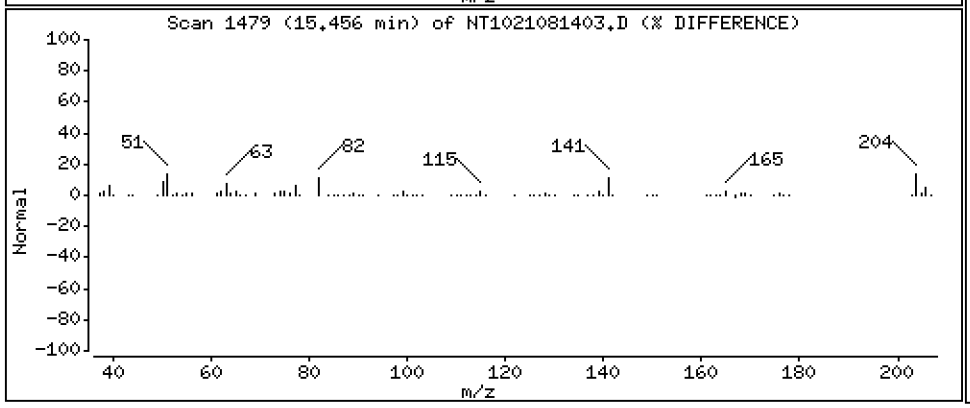
49 Fluorene

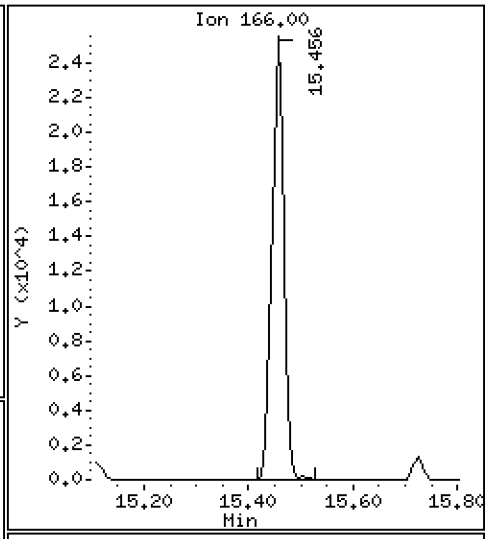
Concentration: 0.4618 ug/mL

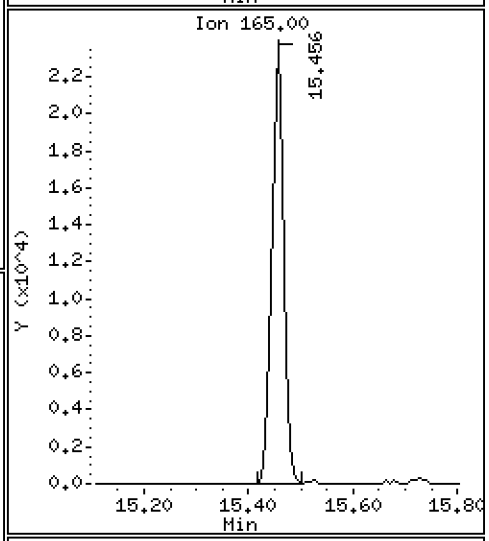


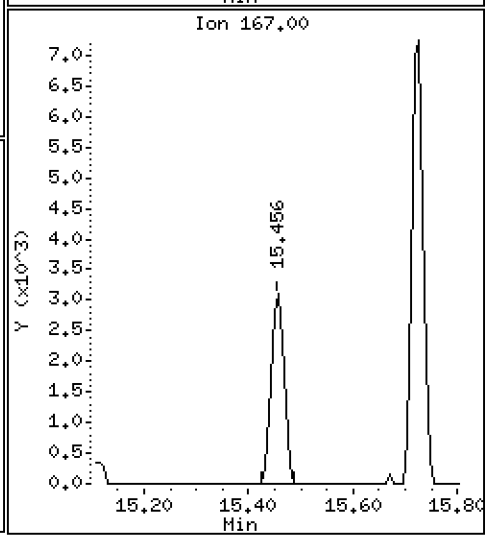












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081403.D

Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

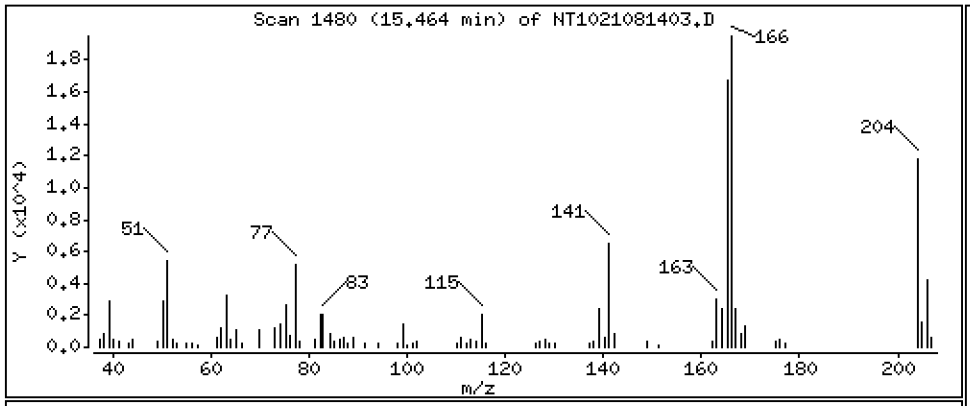
Operator: VTS

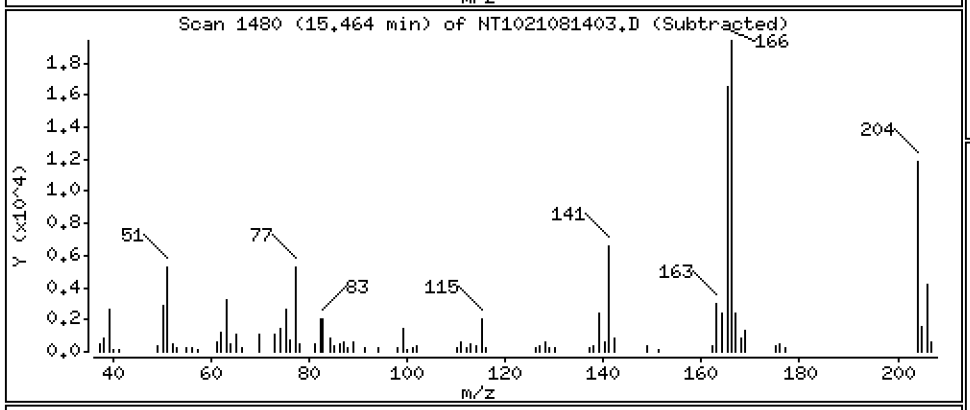
Column phase: ZB-5msi

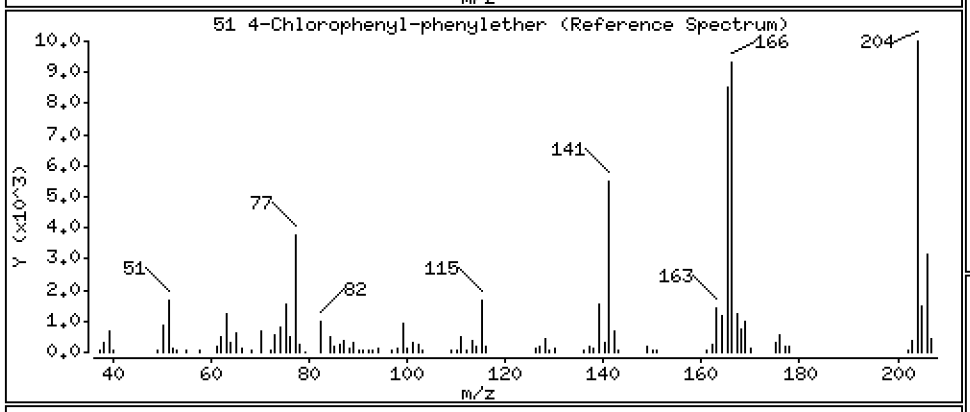
Column diameter: 0.25

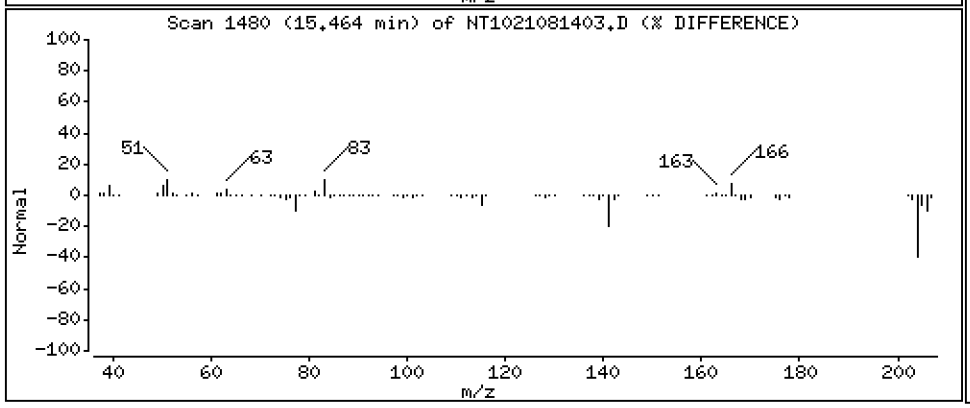
51 4-Chlorophenyl-phenylether

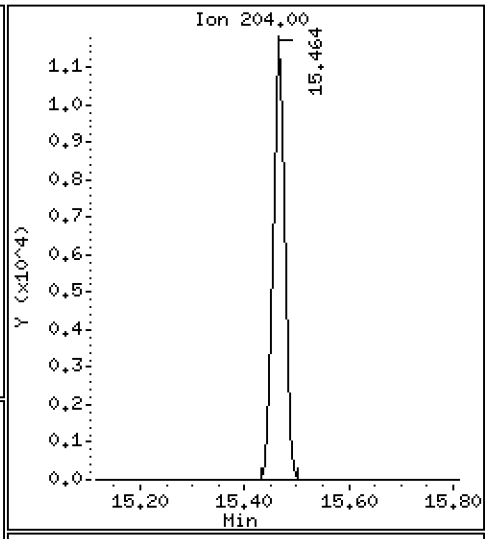
Concentration: 0.3126 ug/mL

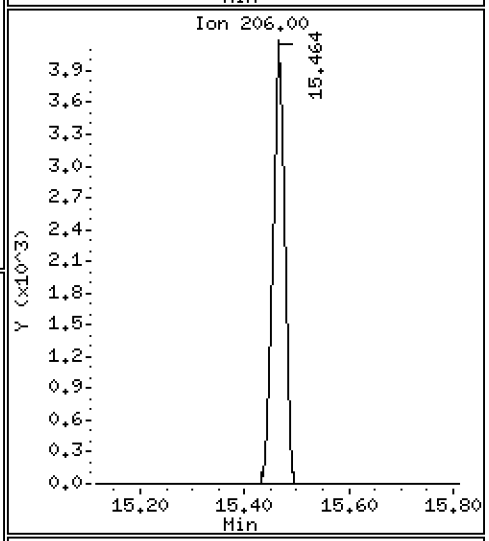


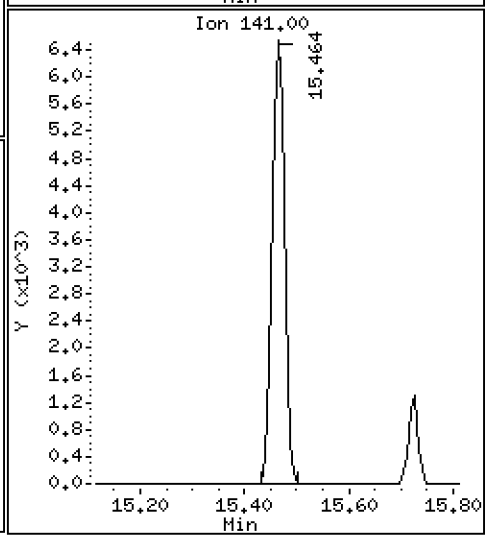












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

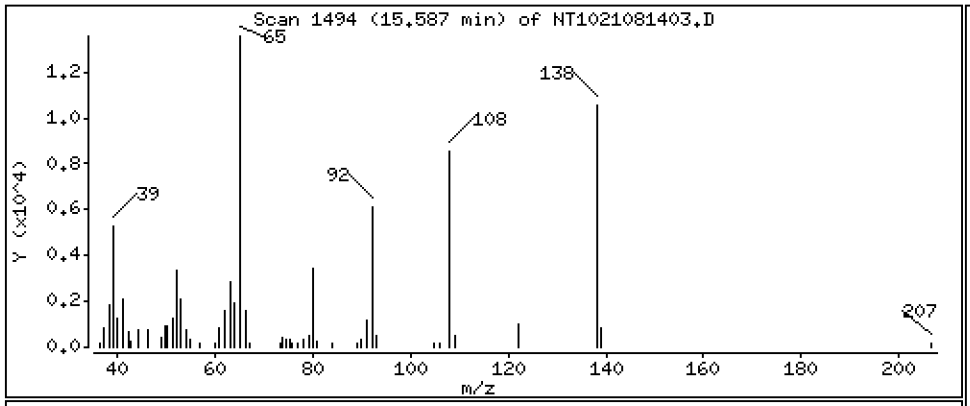
Operator: VTS

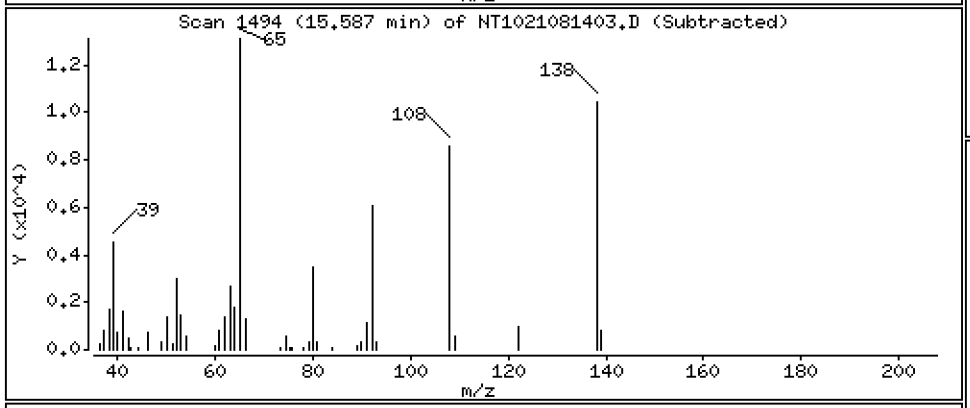
Column phase: ZB-5msi

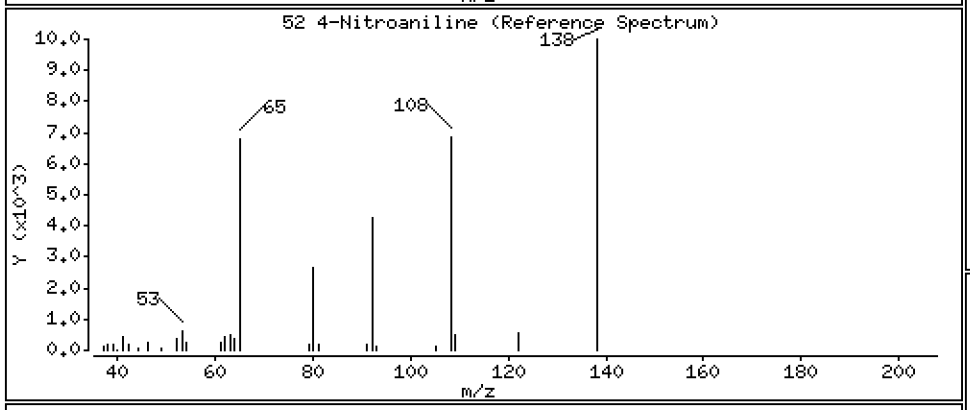
Column diameter: 0.25

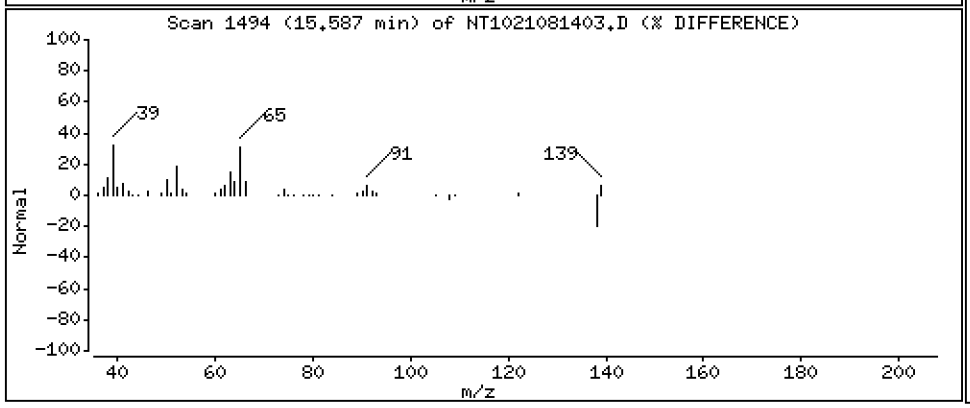
52 4-Nitroaniline

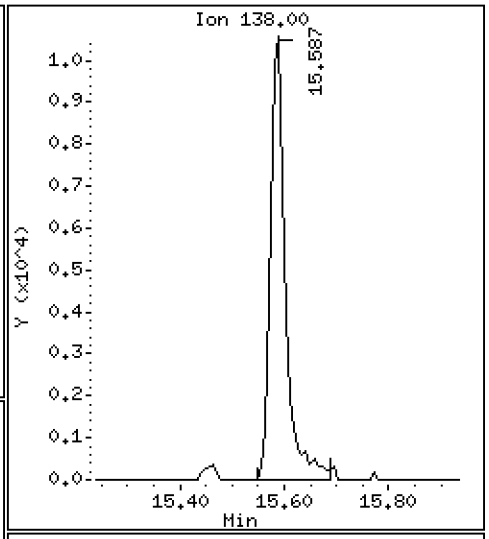
Concentration: 0.8865 ug/mL

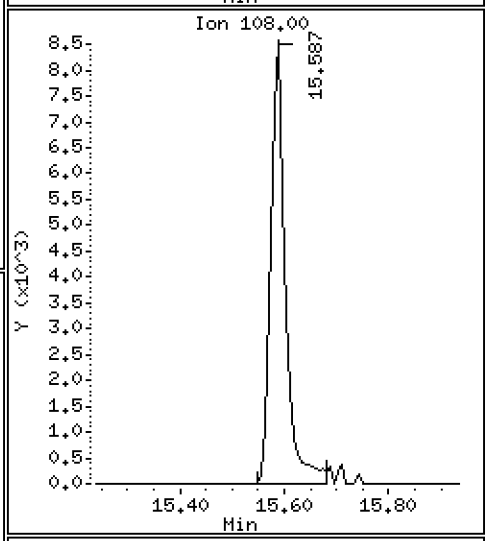


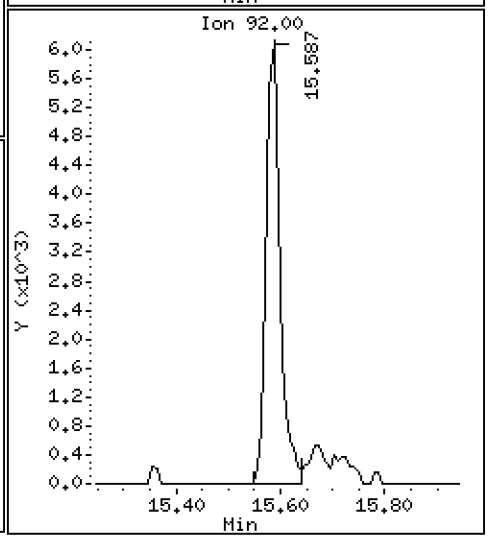












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081403.D

Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

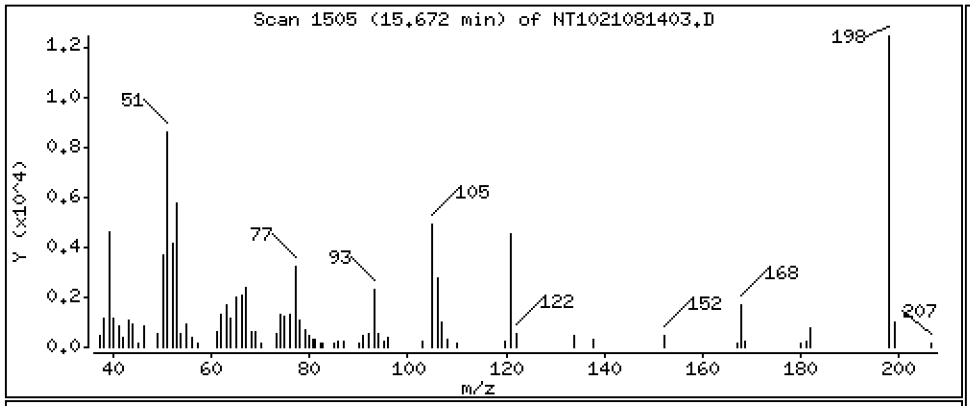
Operator: VTS

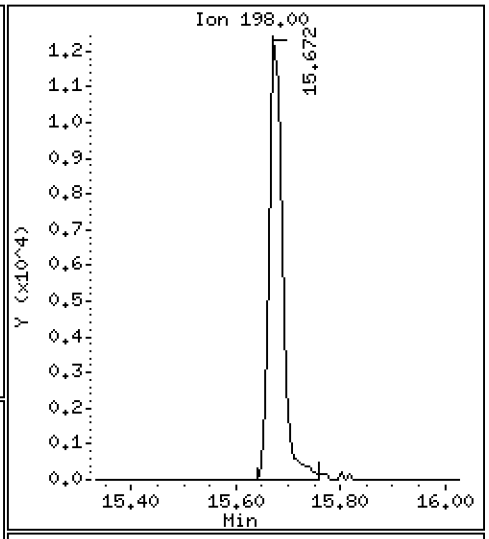
Column phase: ZB-5msi

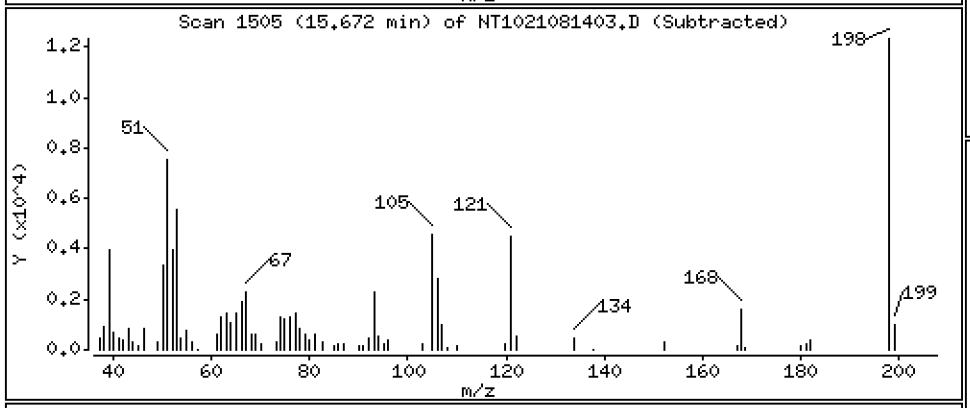
Column diameter: 0.25

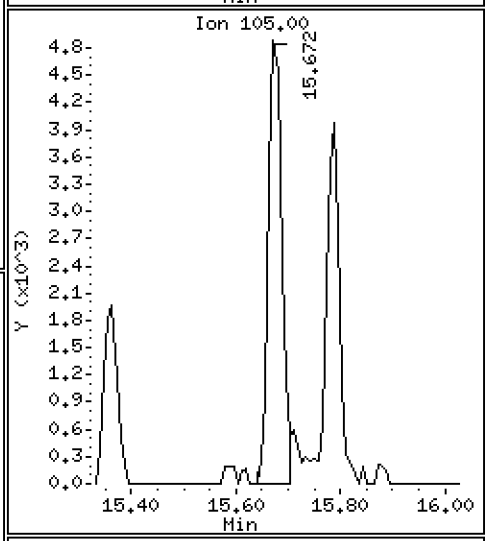
53 4,6-Dinitro-2-methylphenol

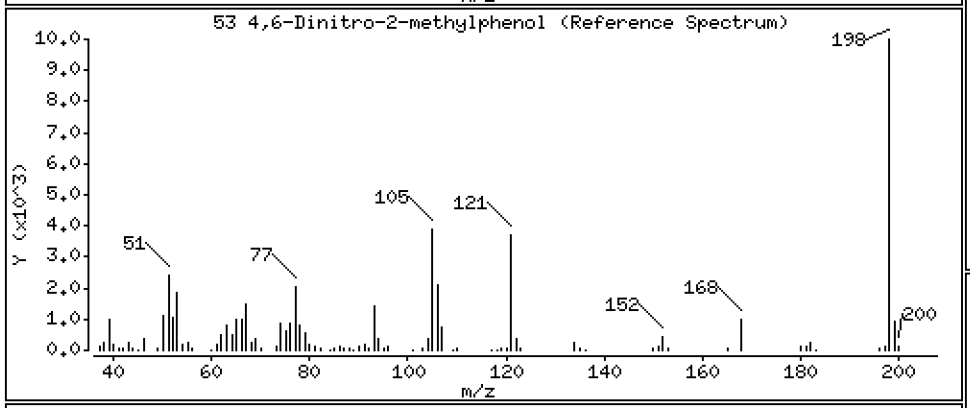
Concentration: 1.187 ug/mL

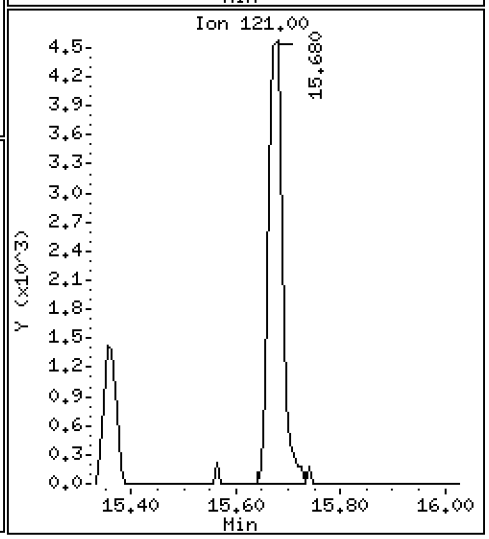


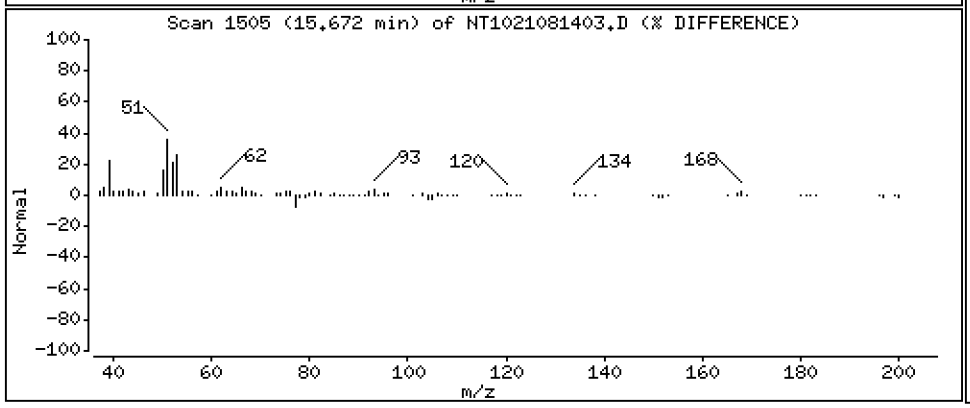












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

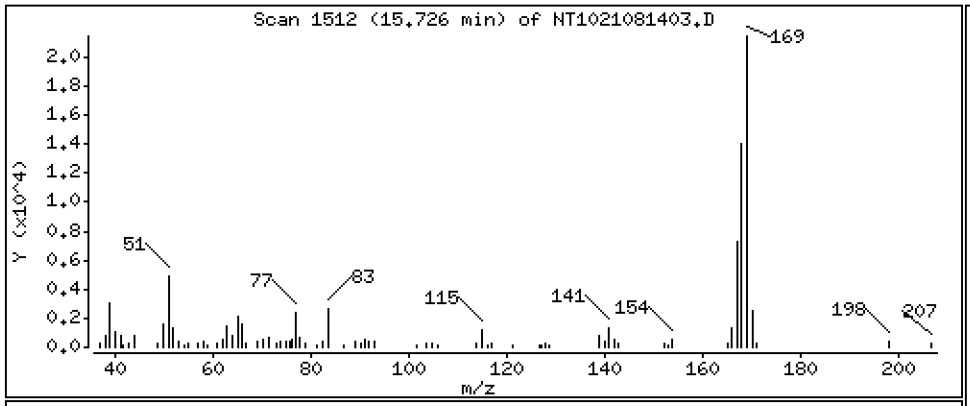
Operator: VTS

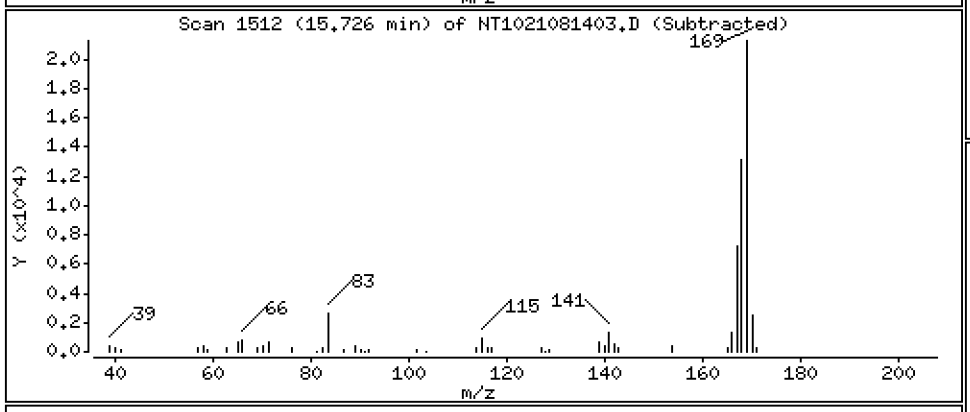
Column phase: ZB-5msi

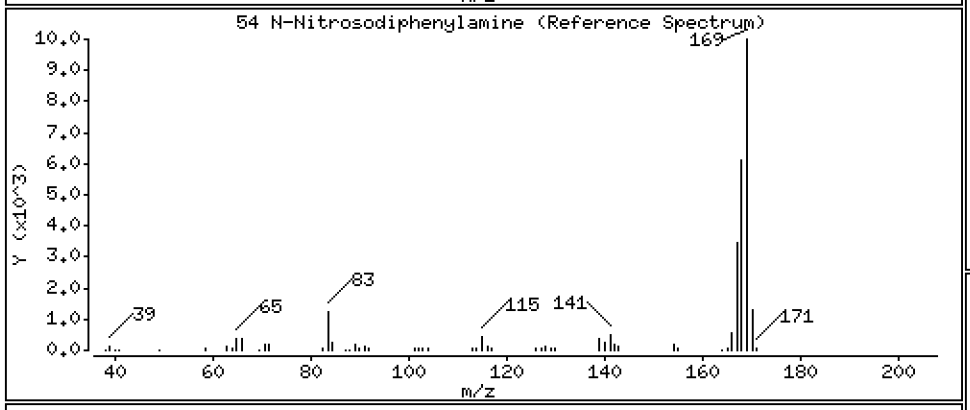
Column diameter: 0.25

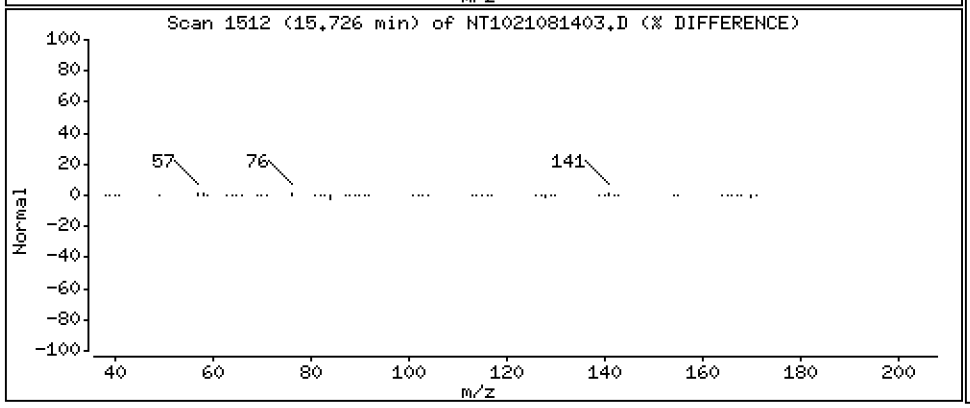
54 N-Nitrosodiphenylamine

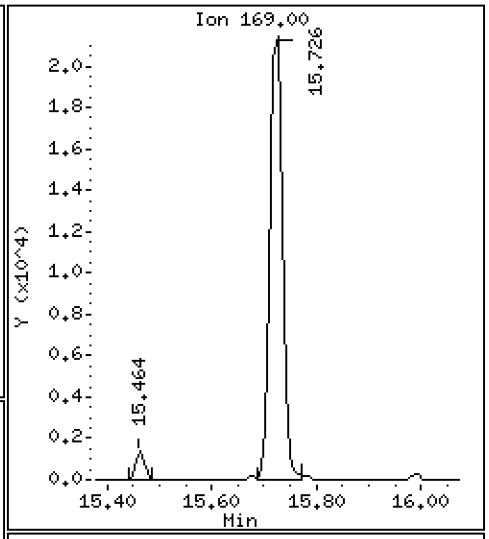
Concentration: 0.4912 ug/mL

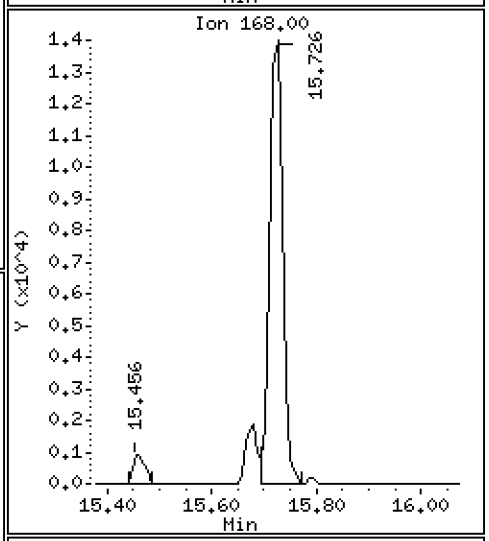


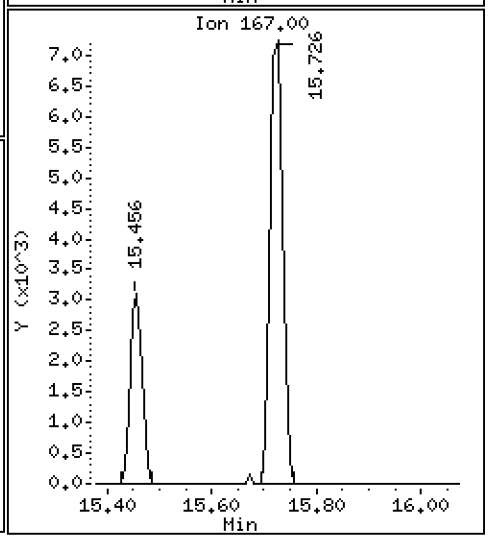












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

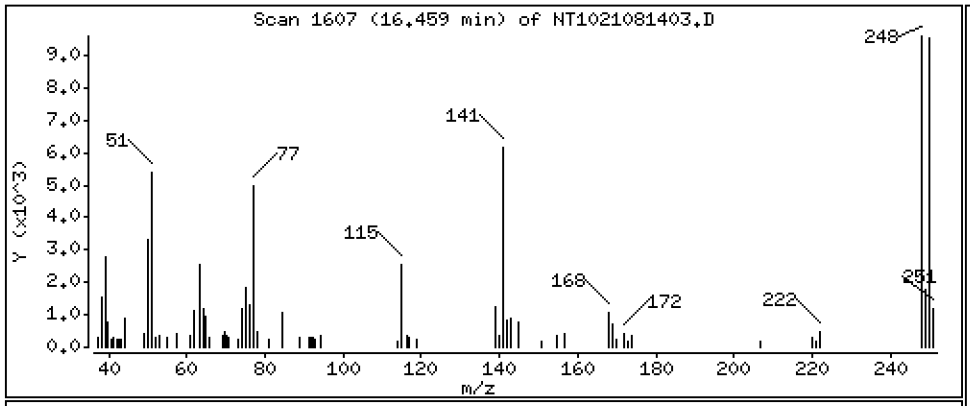
Operator: VTS

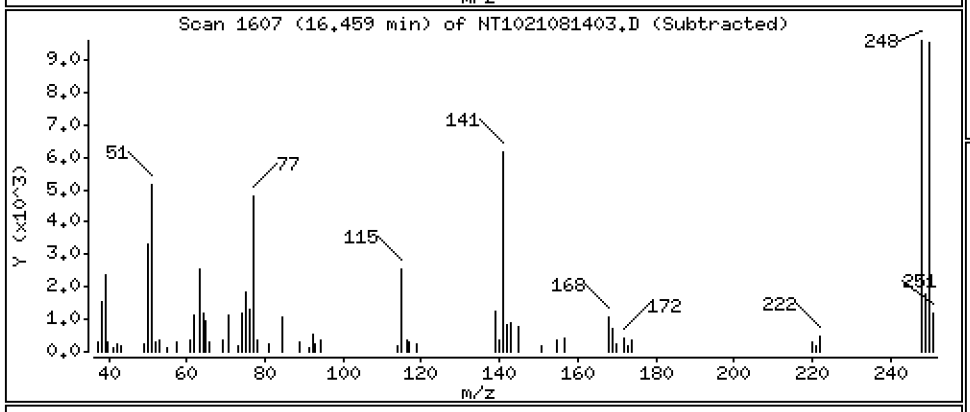
Column phase: ZB-5msi

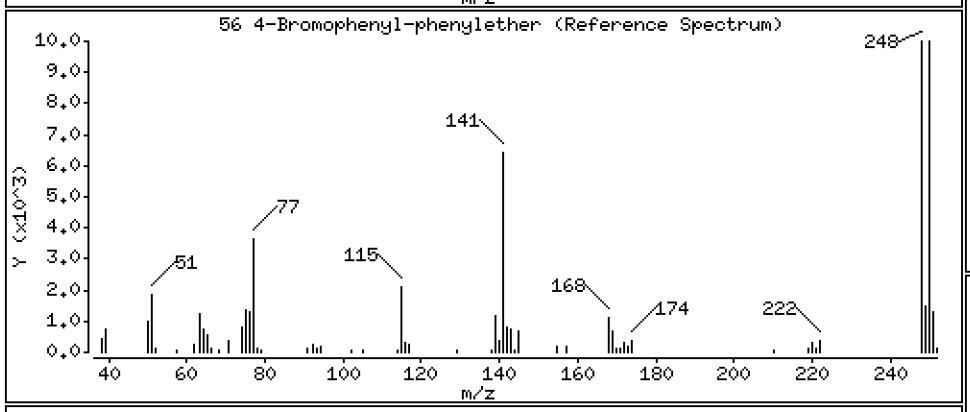
Column diameter: 0.25

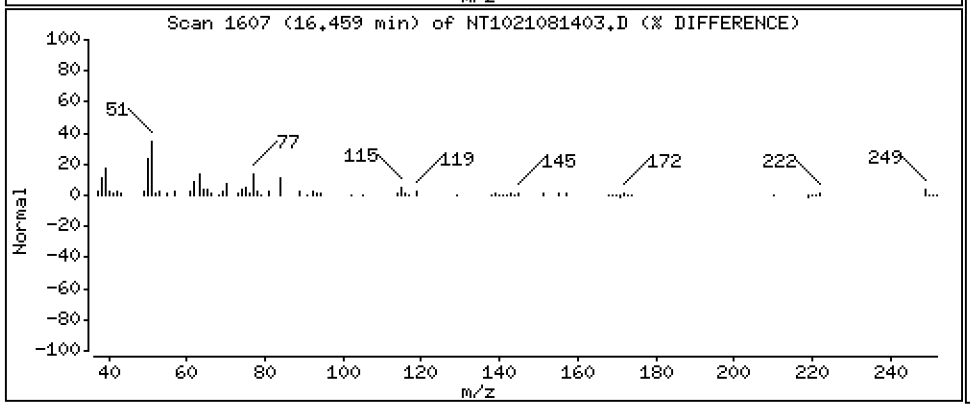
56 4-Bromophenyl-phenylether

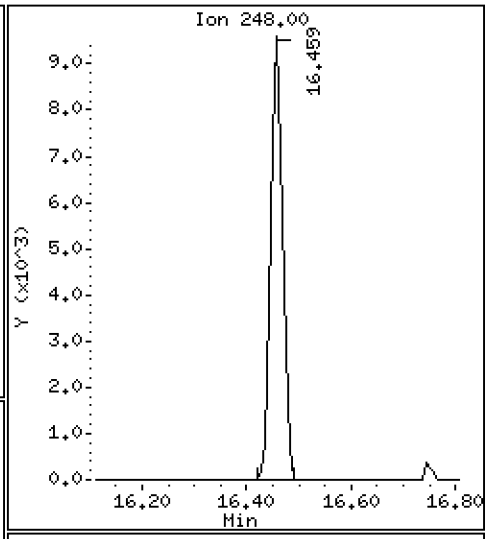
Concentration: 0.4250 ug/mL

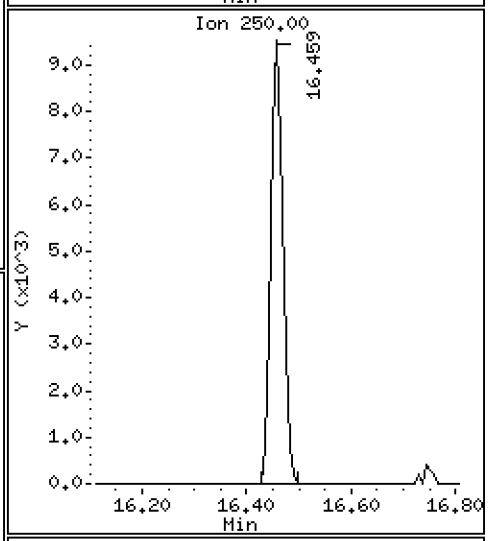


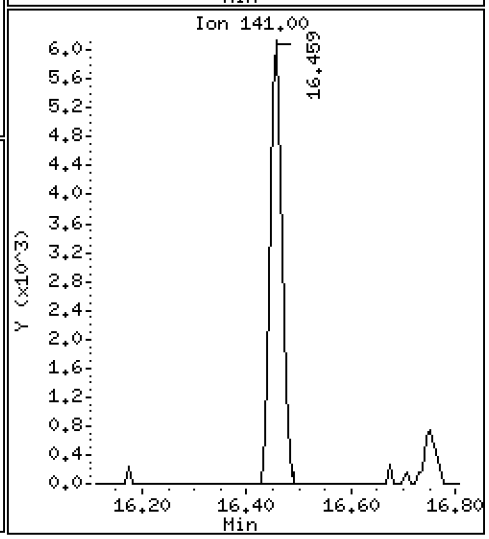












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081403.D

Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

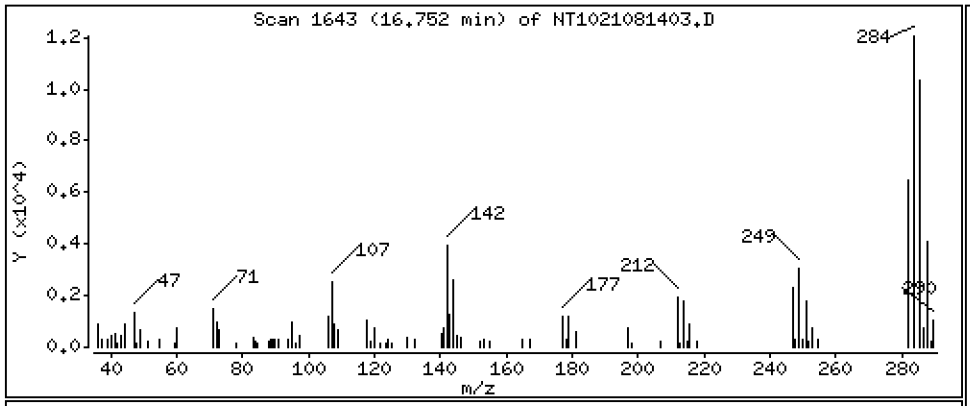
Operator: VTS

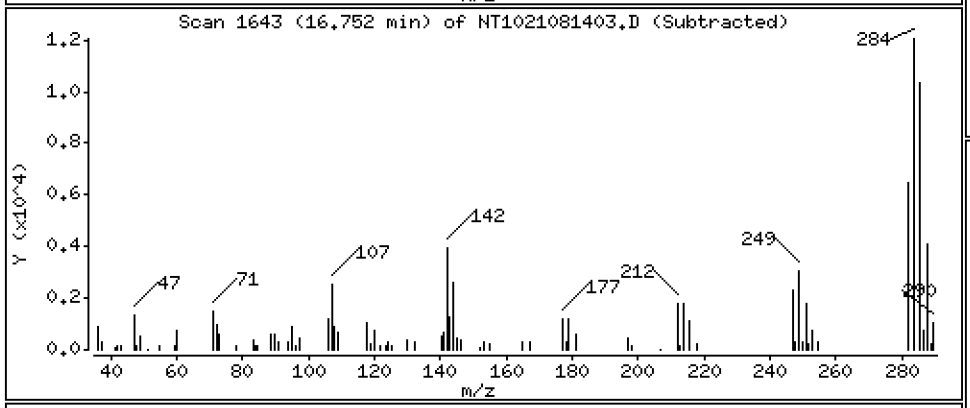
Column phase: ZB-5msi

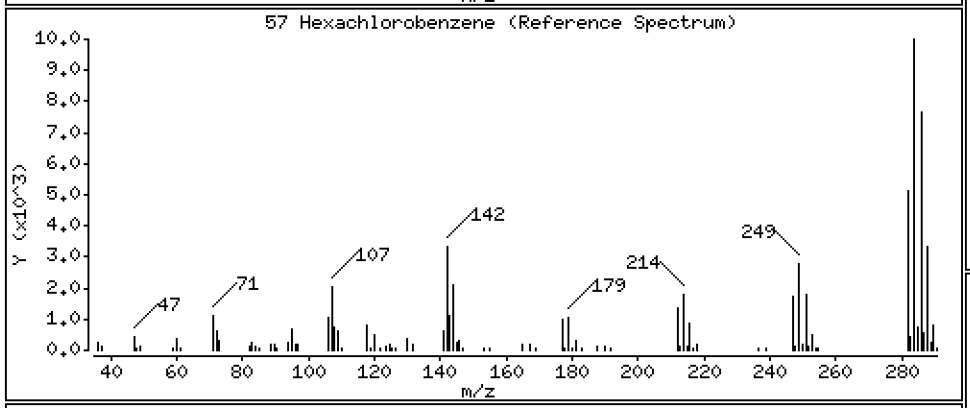
Column diameter: 0.25

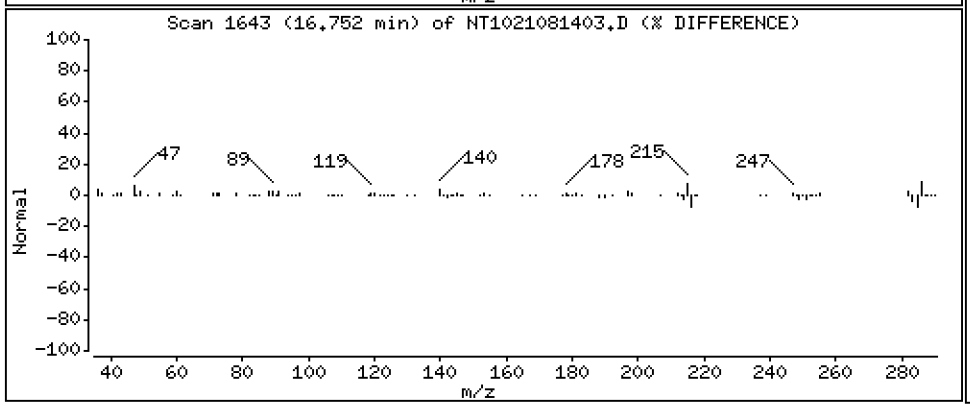
57 Hexachlorobenzene

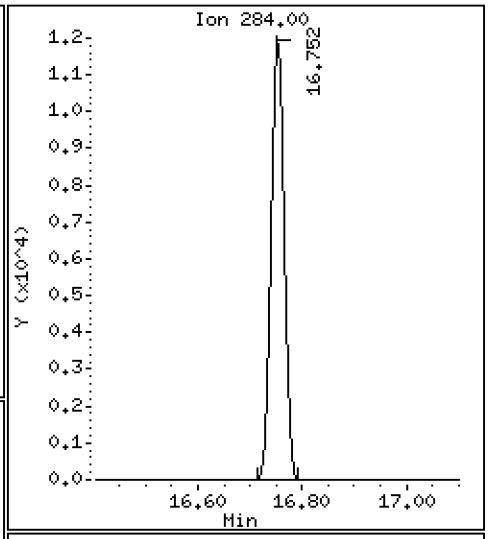
Concentration: 0.5467 ug/mL

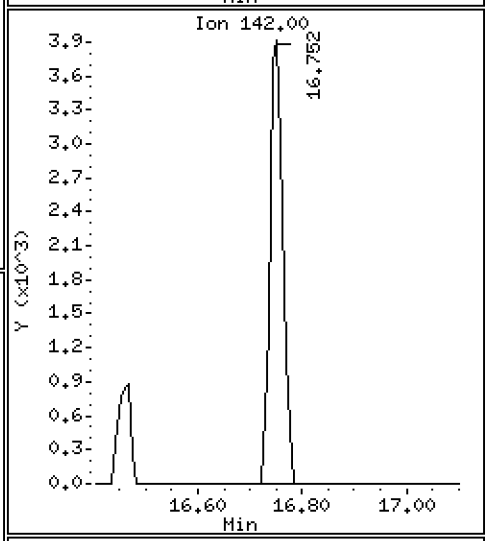


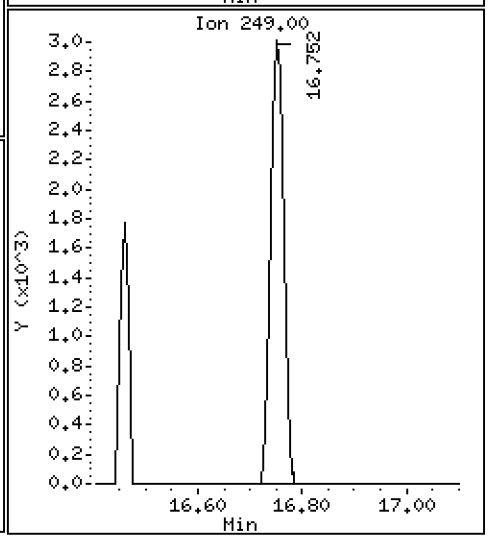












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081403.D

Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

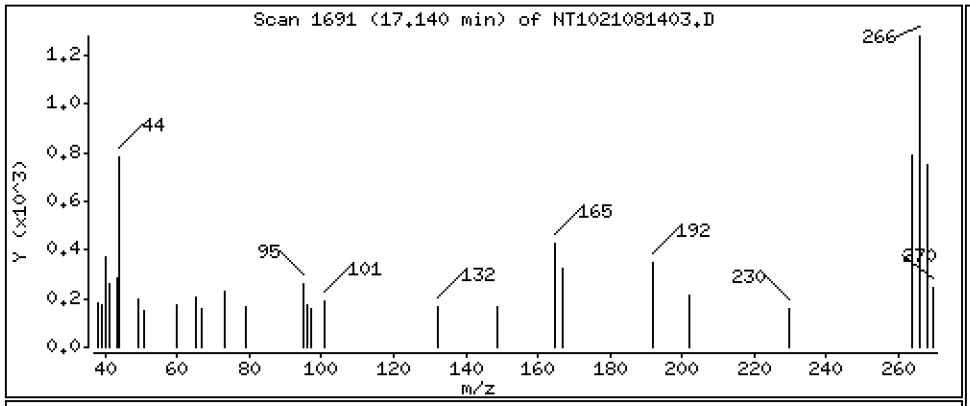
Operator: VTS

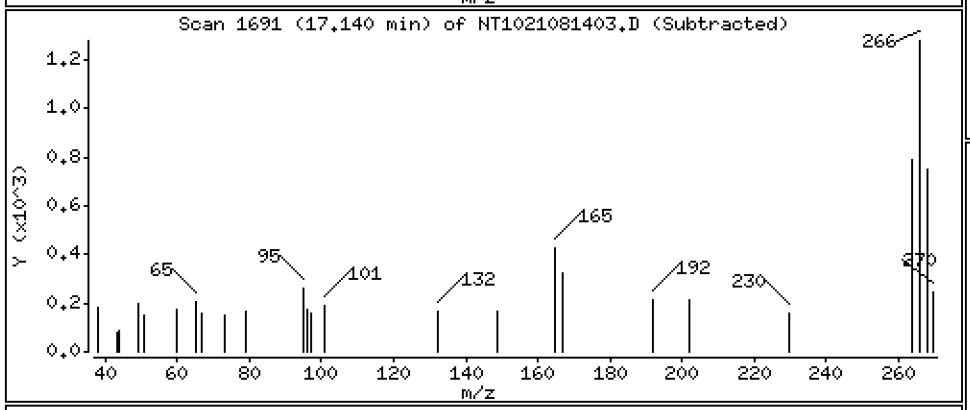
Column phase: ZB-5msi

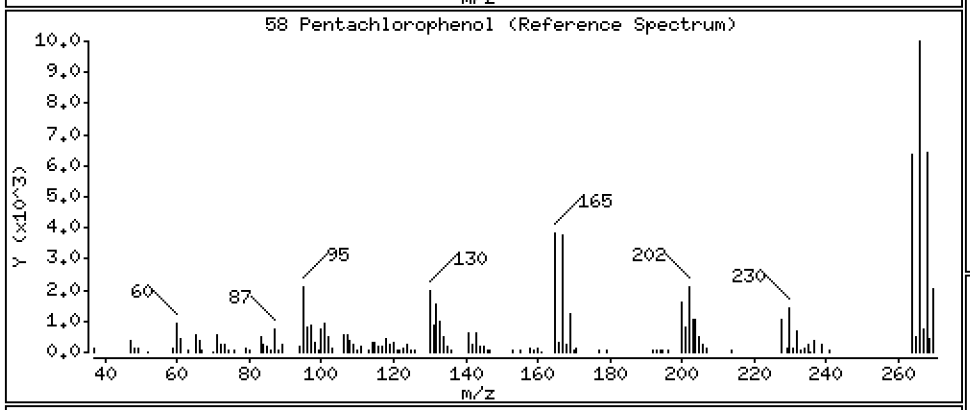
Column diameter: 0.25

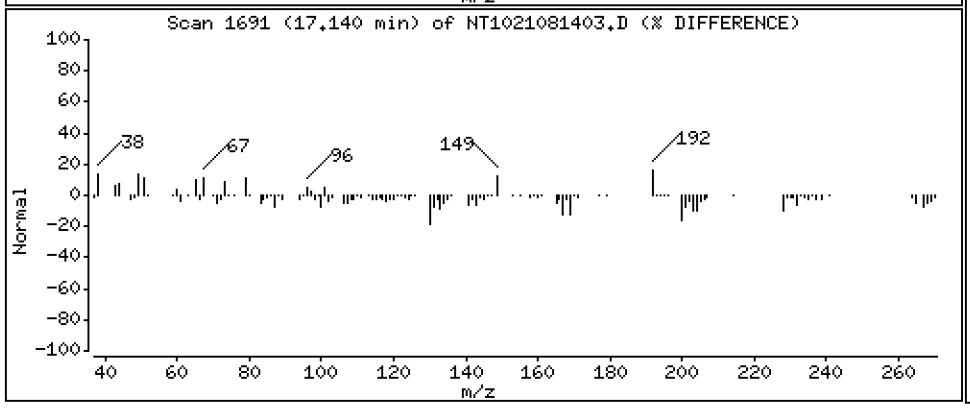
58 Pentachlorophenol

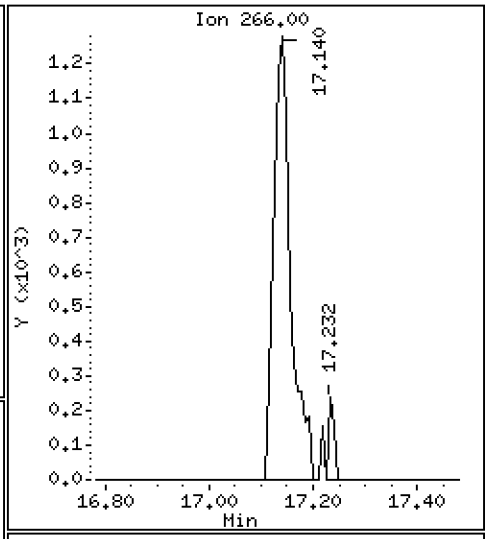
Concentration: 0.1917 ug/mL

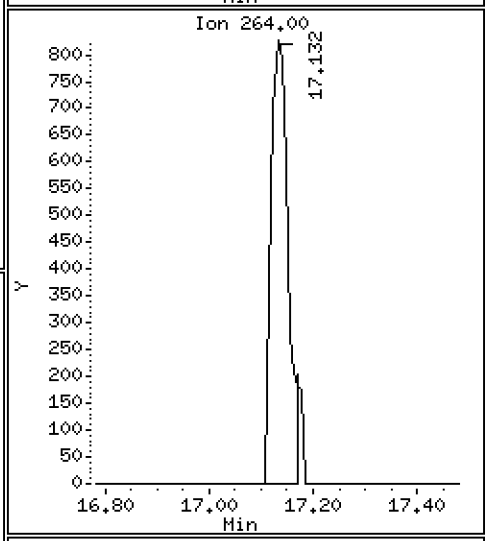


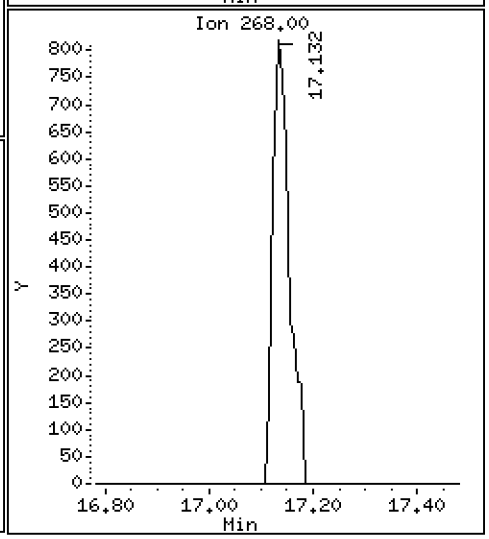












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Date : 14-AUG-2021 10:30

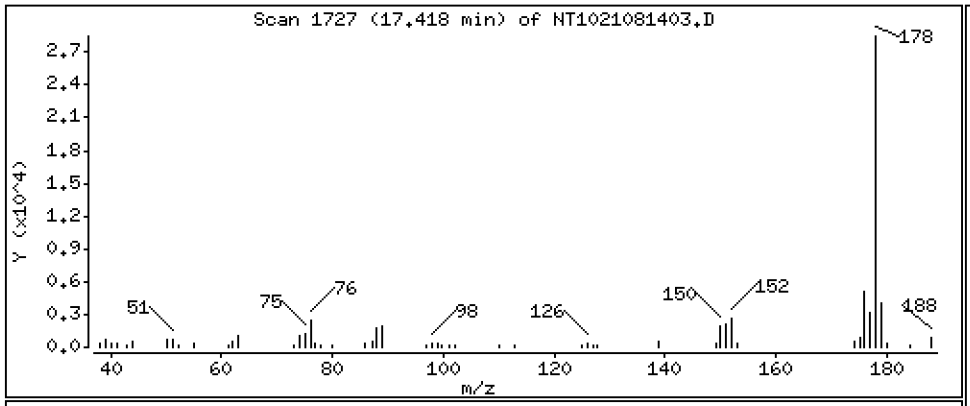
Client ID: Instrument: nt10.i

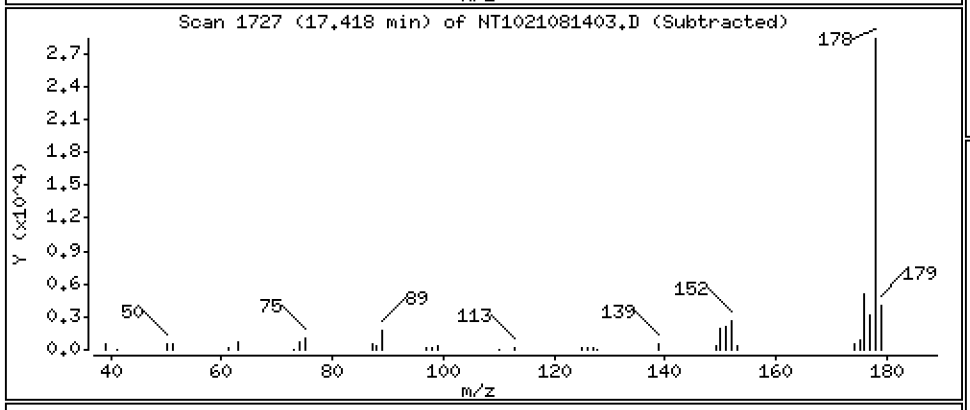
Sample Info: SJH0174-LCV1

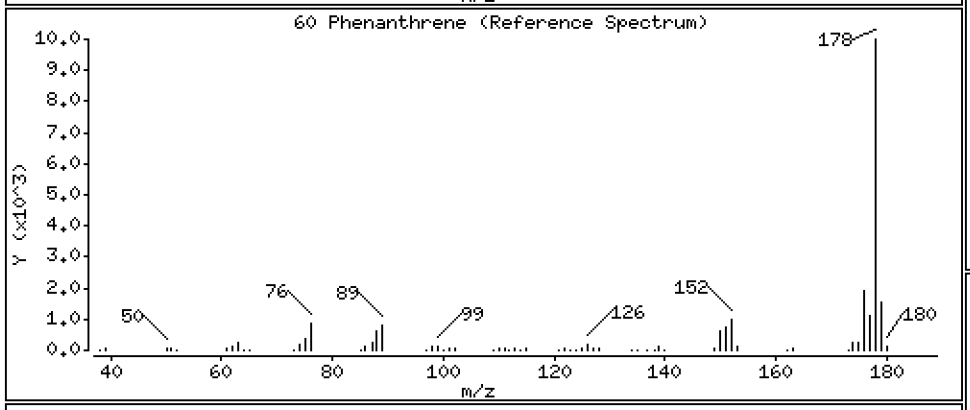
Operator: VTS

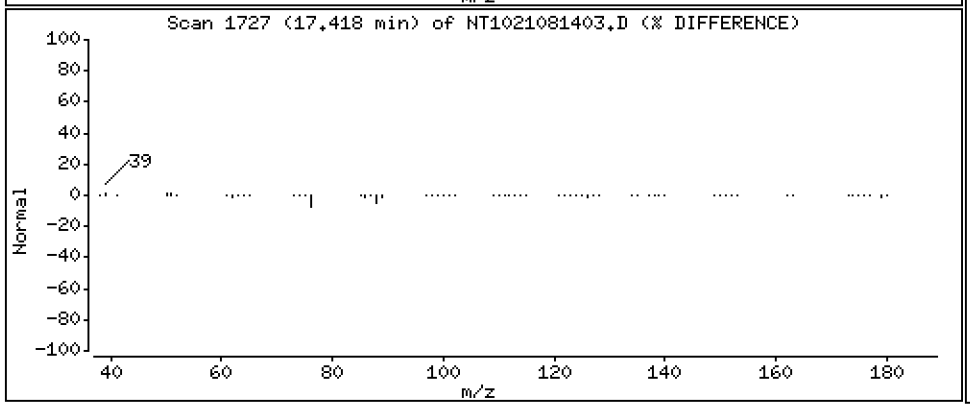
Column phase: ZB-5msi Column diameter: 0.25

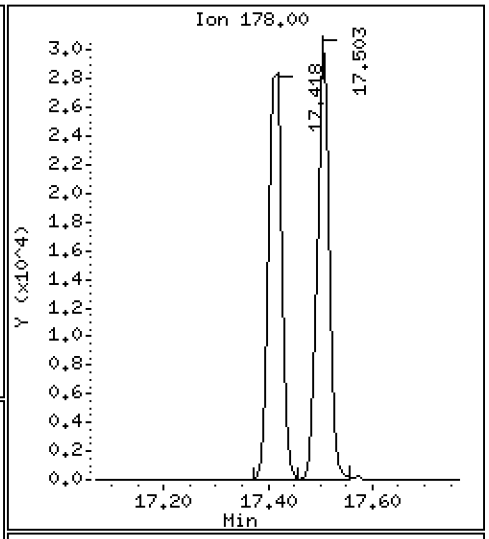
60 Phenanthrene Concentration: 0.4565 ug/mL

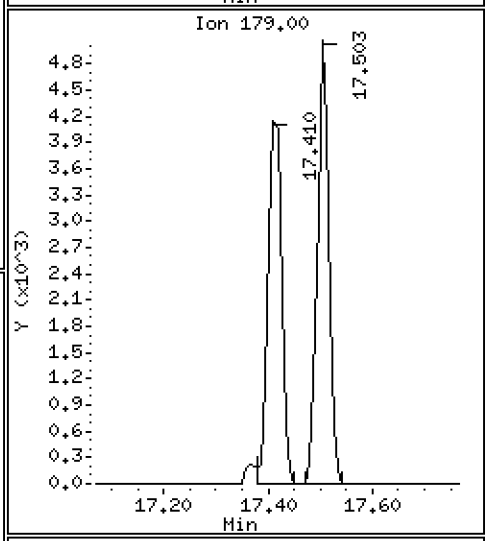


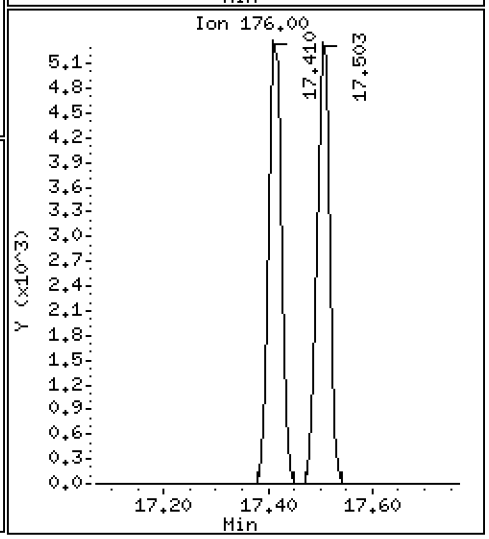












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

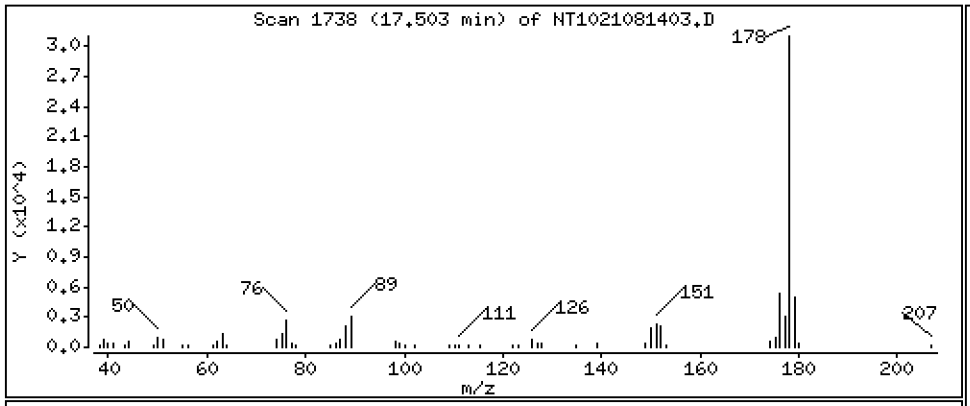
Operator: VTS

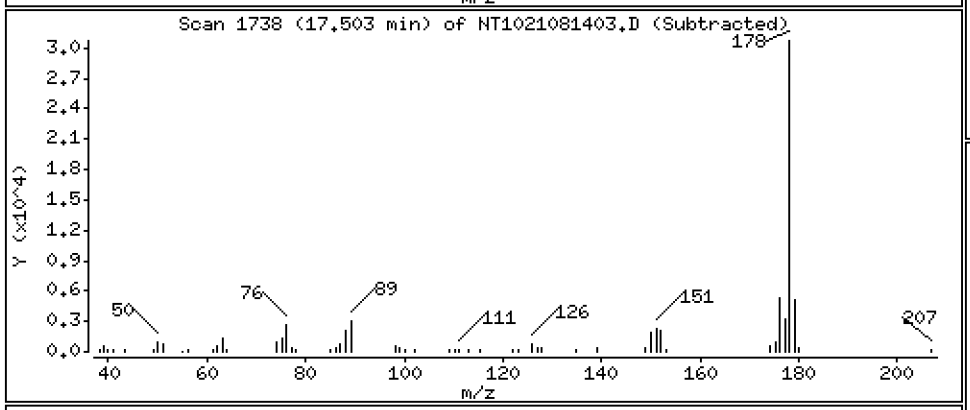
Column phase: ZB-5msi

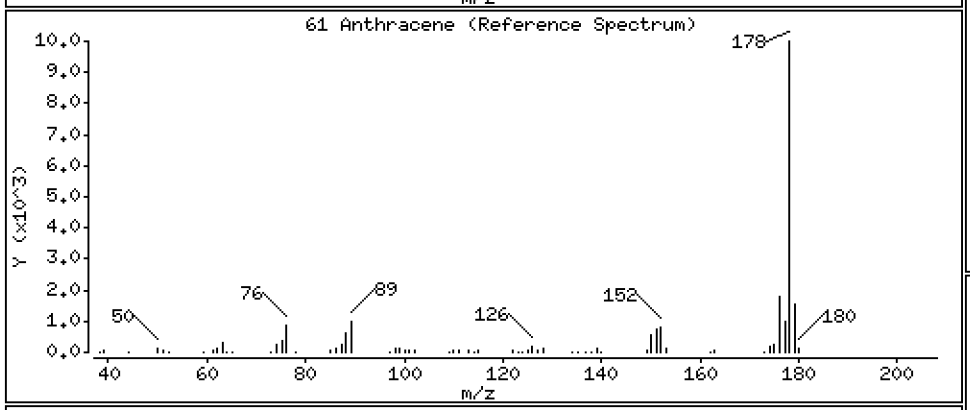
Column diameter: 0.25

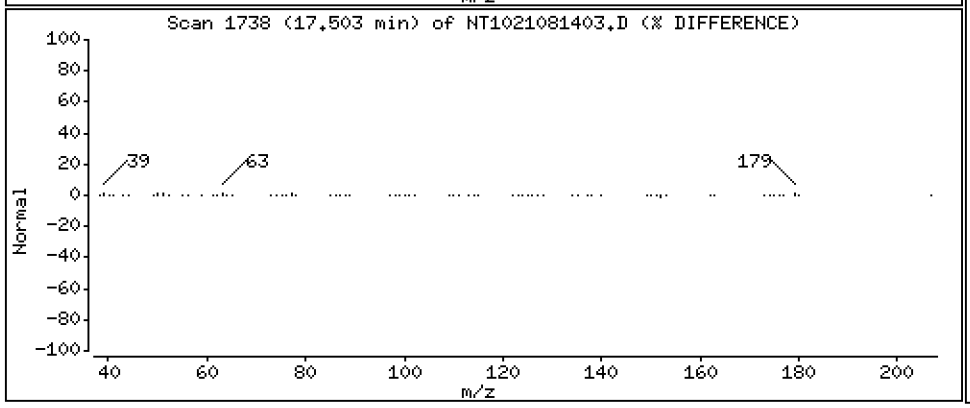
61 Anthracene

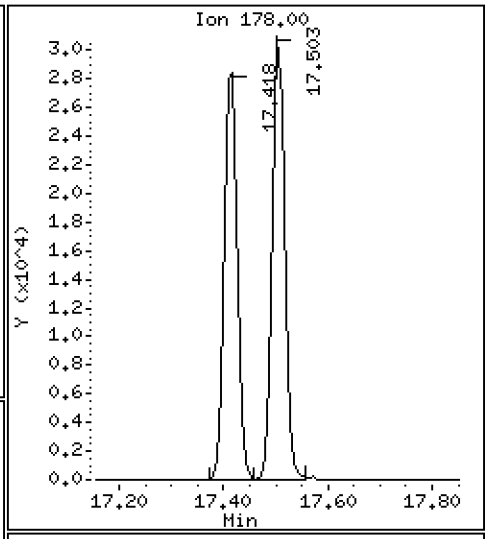
Concentration: 0.4352 ug/mL

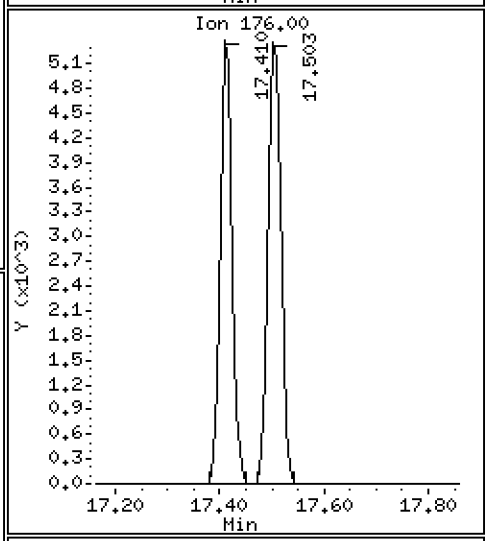


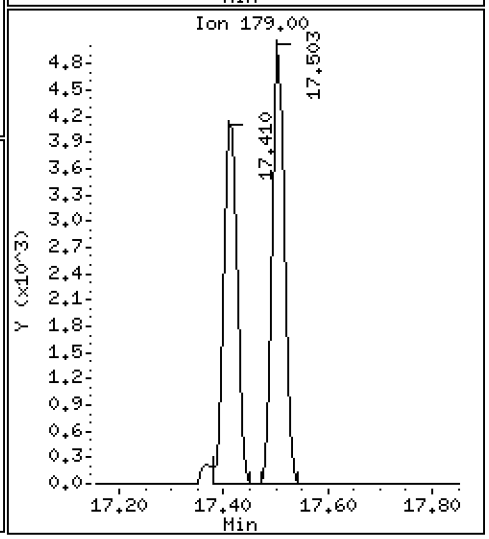












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

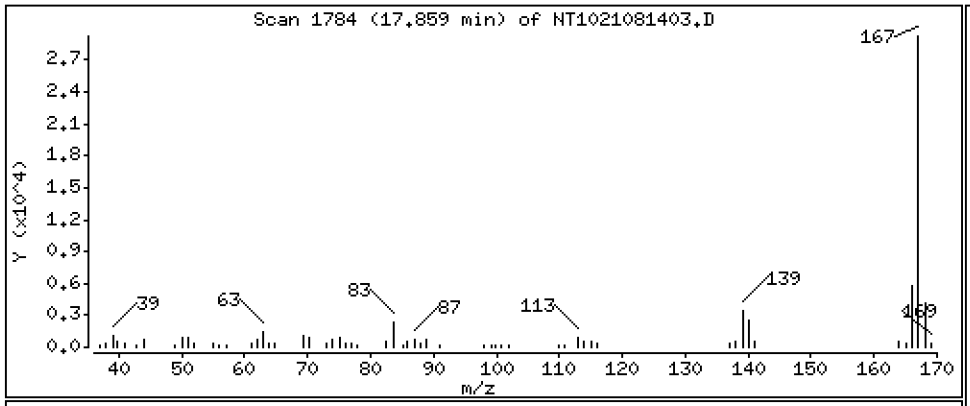
Operator: VTS

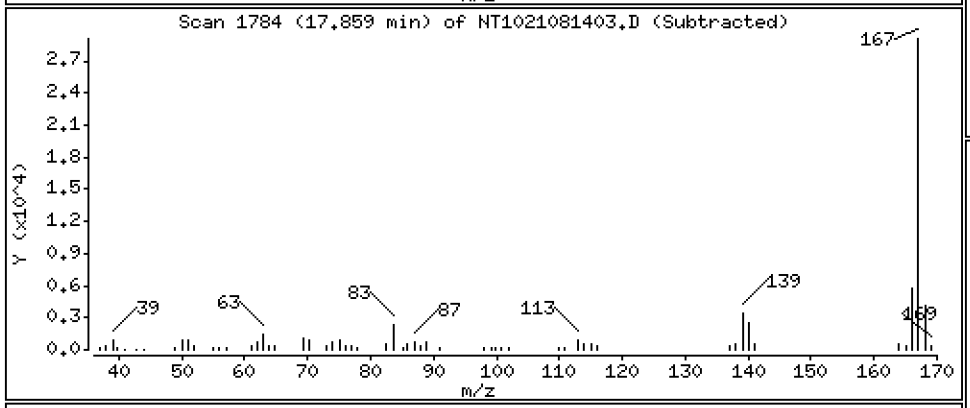
Column phase: ZB-5msi

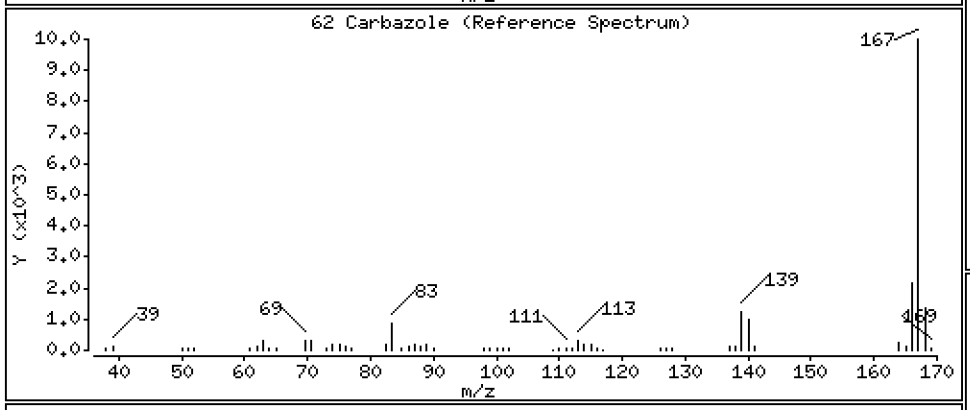
Column diameter: 0.25

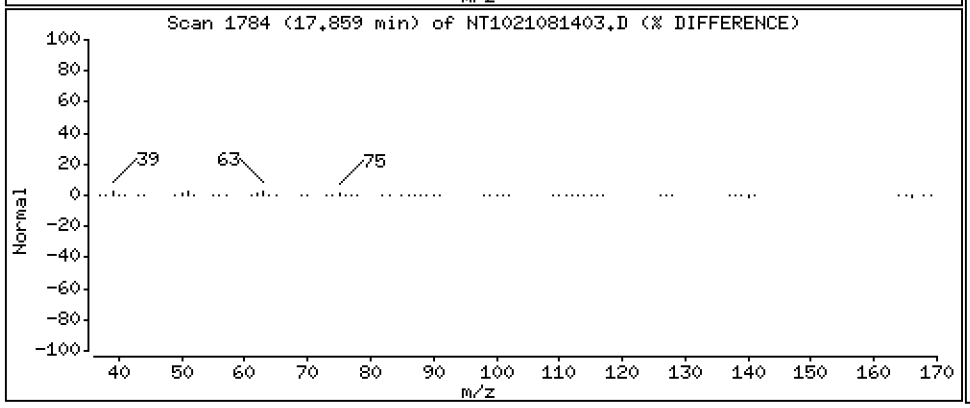
62 Carbazole

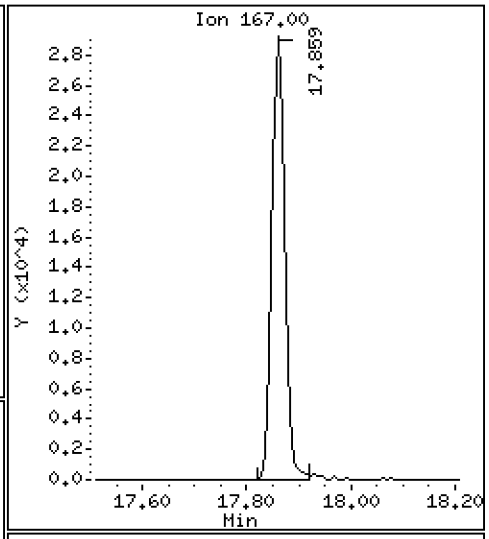
Concentration: 0.4369 ug/mL

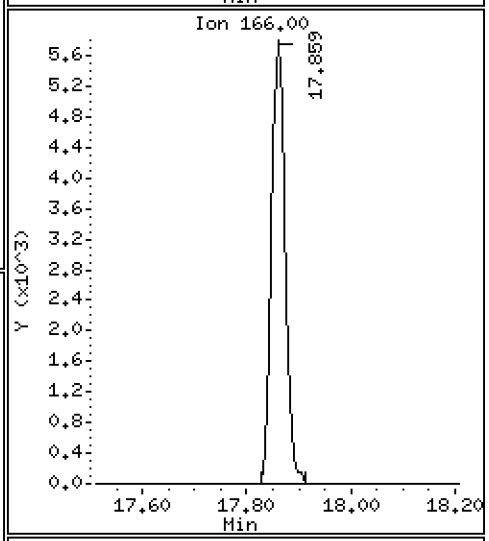


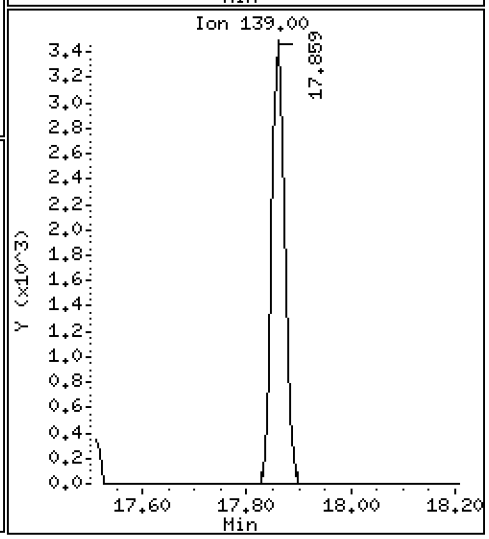












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

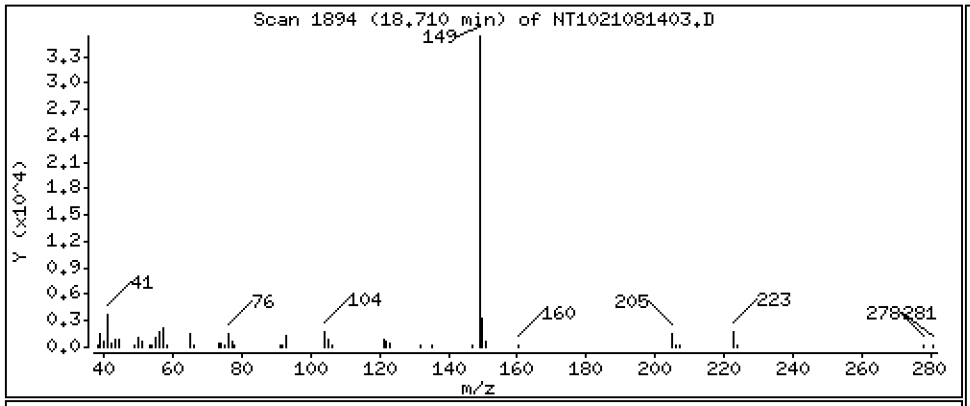
Operator: VTS

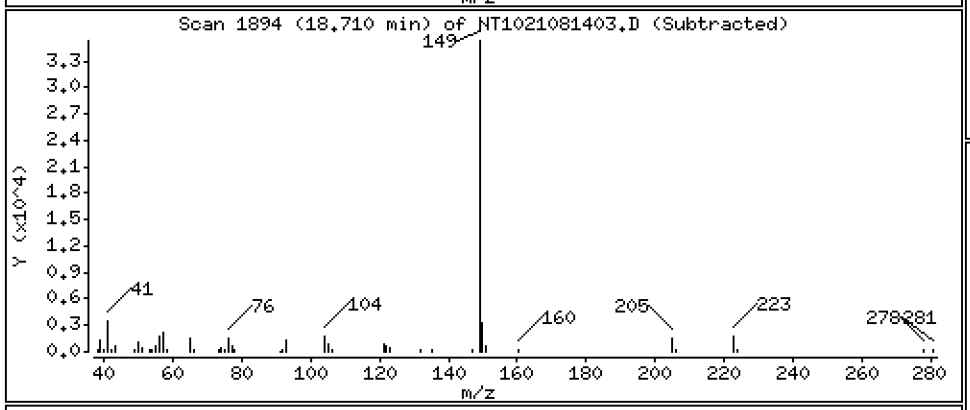
Column phase: ZB-5msi

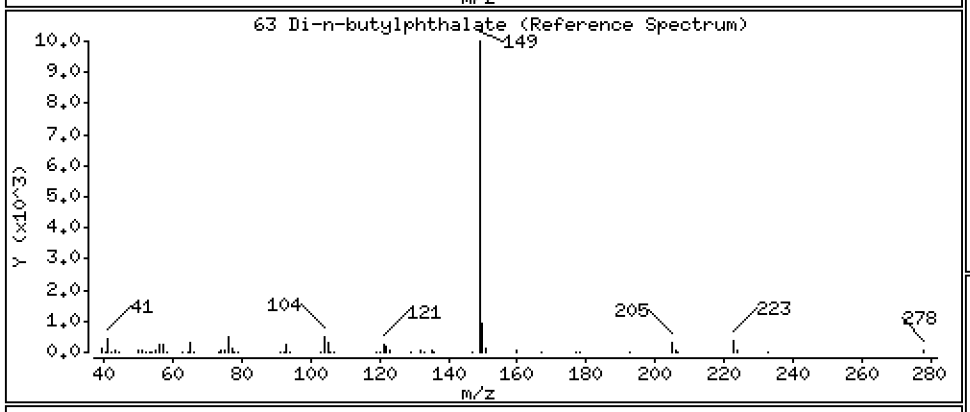
Column diameter: 0.25

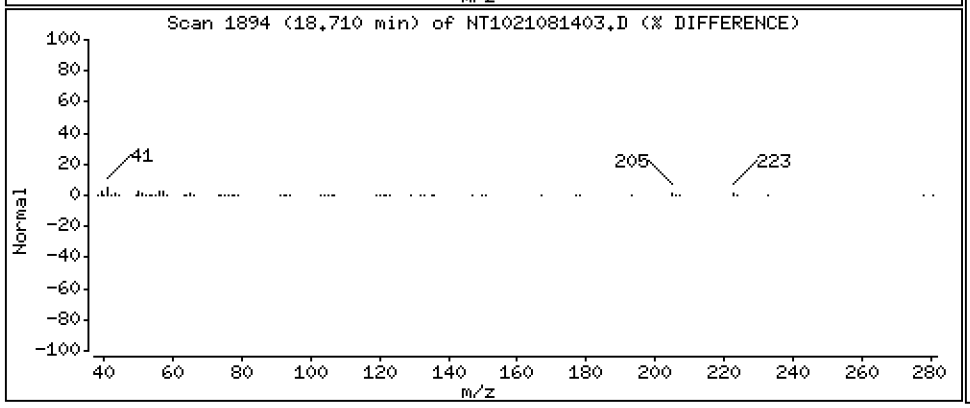
63 Di-n-butylphthalate

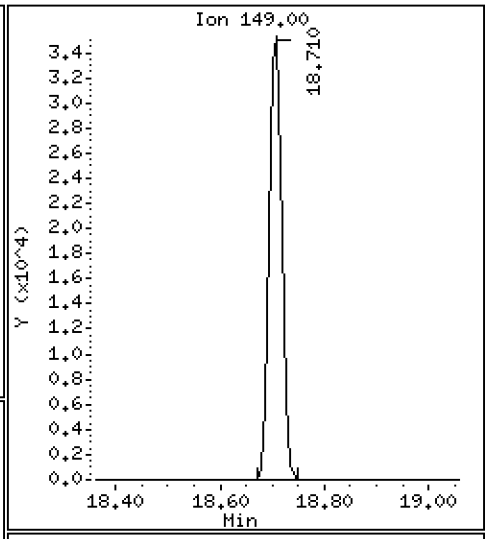
Concentration: 0.3398 ug/mL

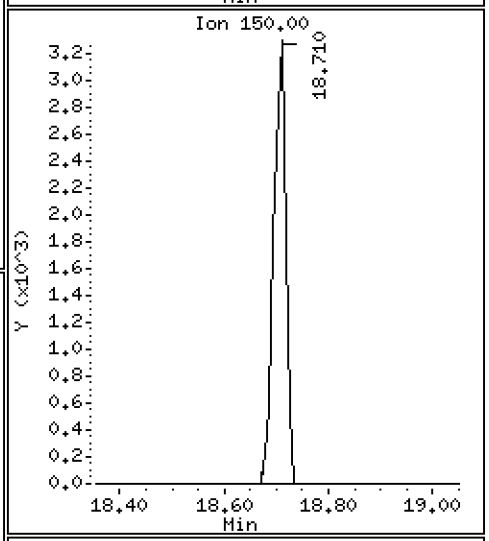


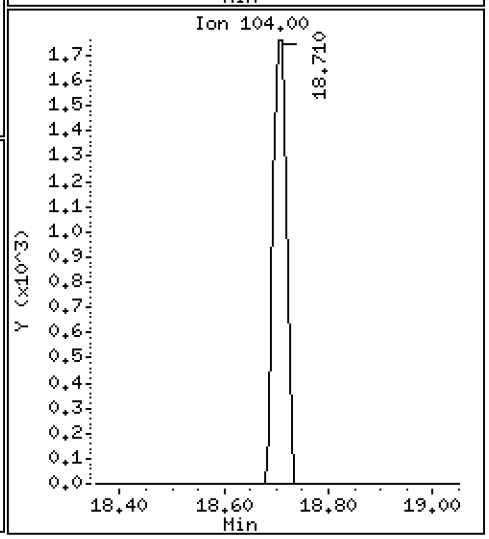












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

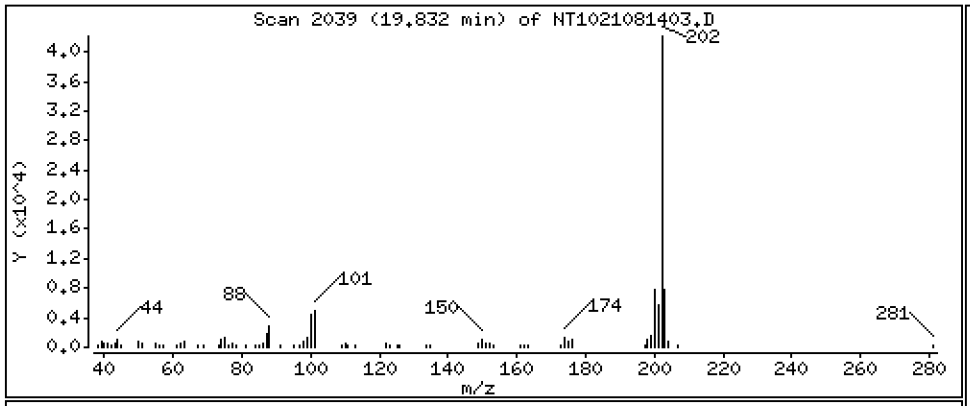
Operator: VTS

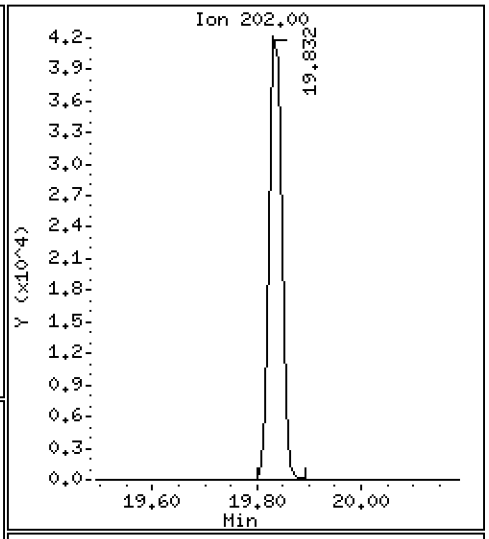
Column phase: ZB-5msi

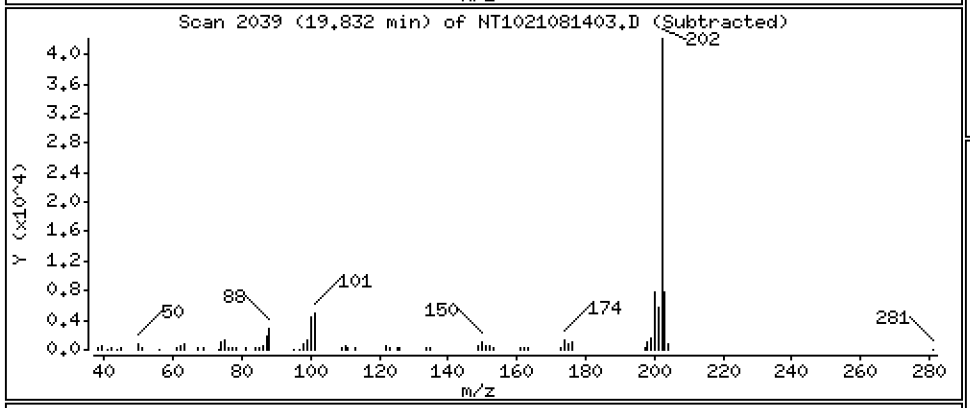
Column diameter: 0.25

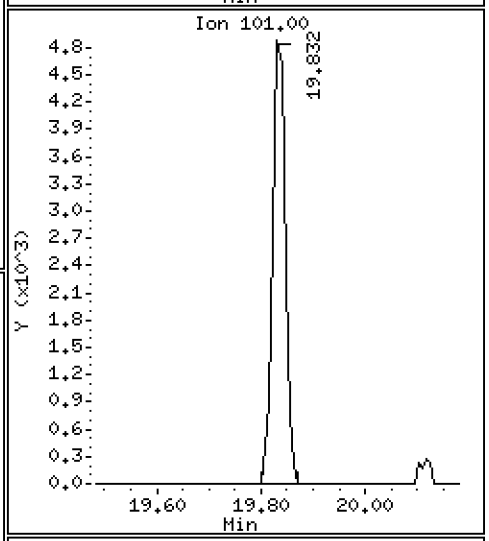
64 Fluoranthene

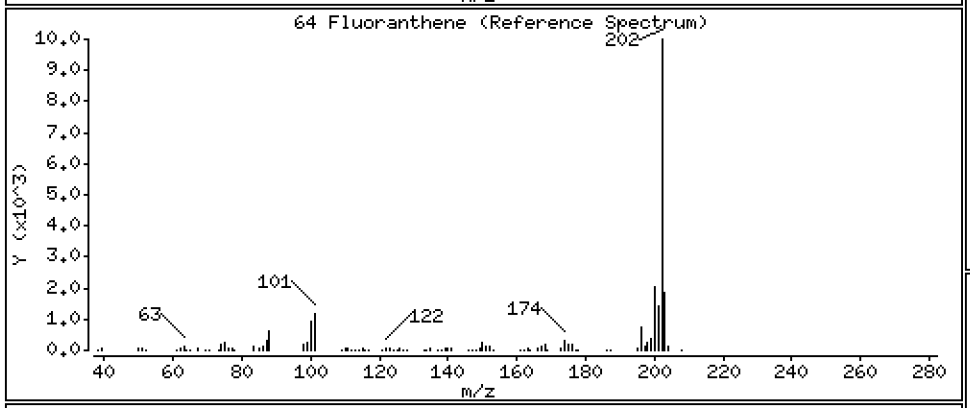
Concentration: 0.4671 ug/mL

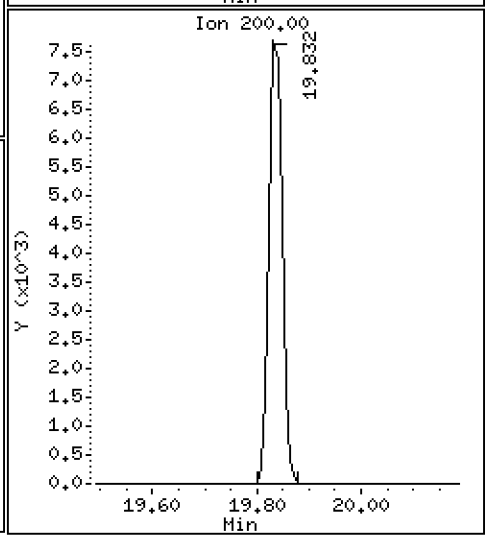


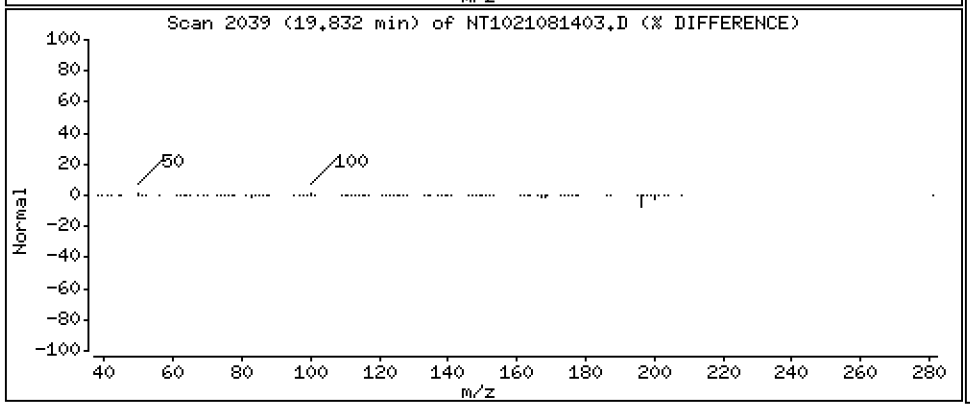












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

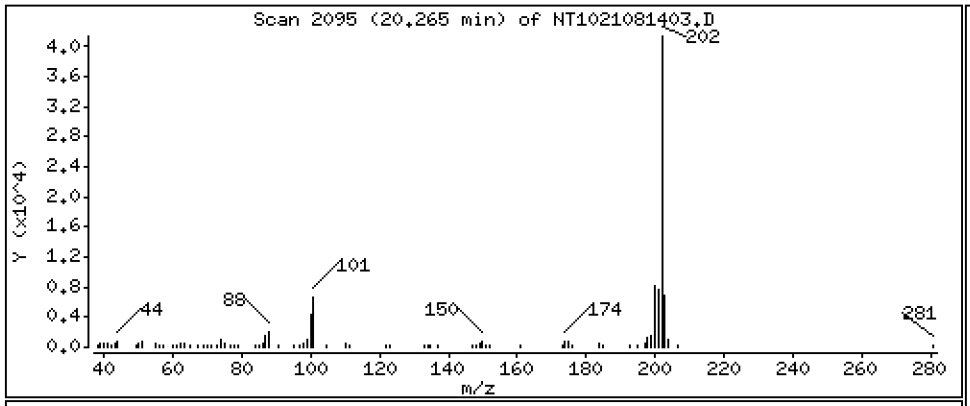
Operator: VTS

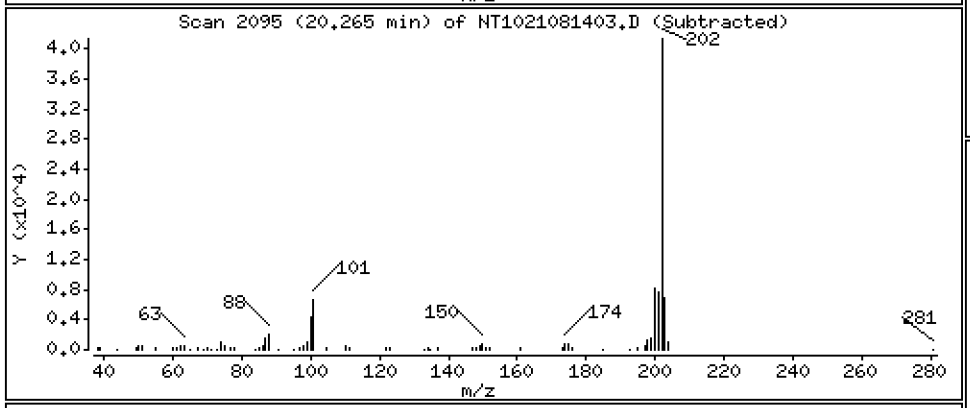
Column phase: ZB-5msi

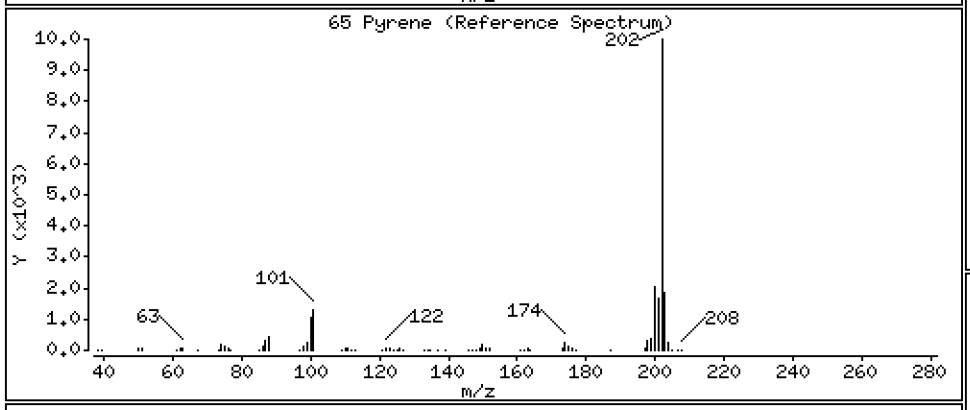
Column diameter: 0.25

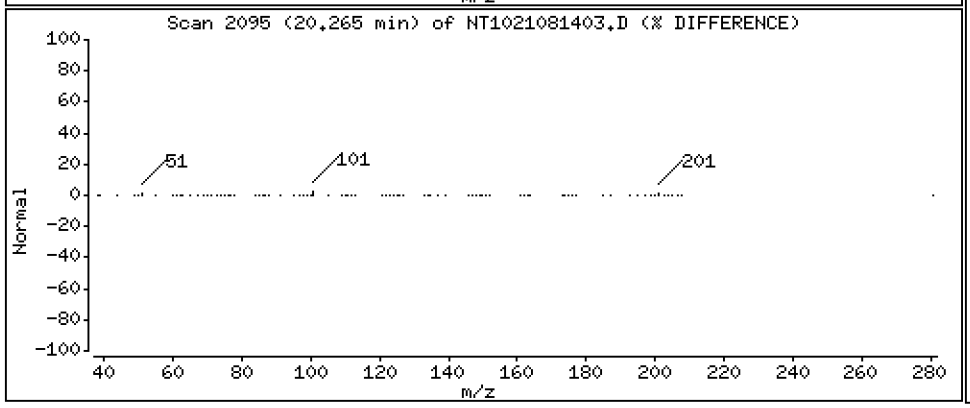
65 Pyrene

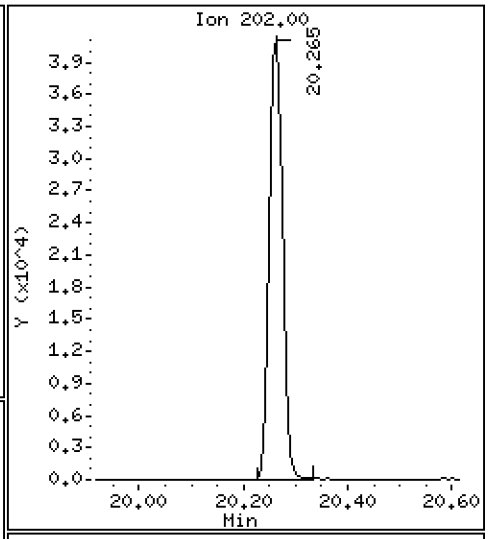
Concentration: 0.4411 ug/mL

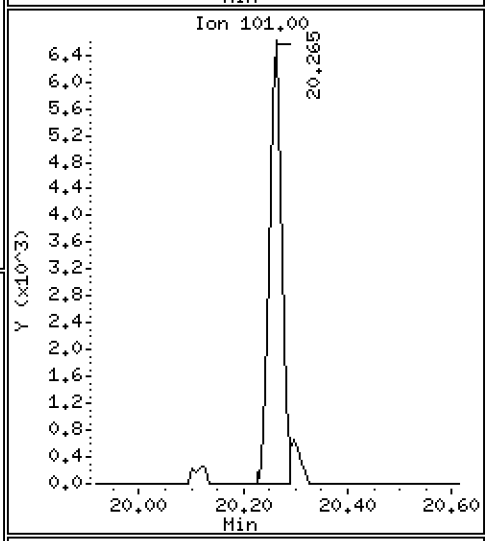


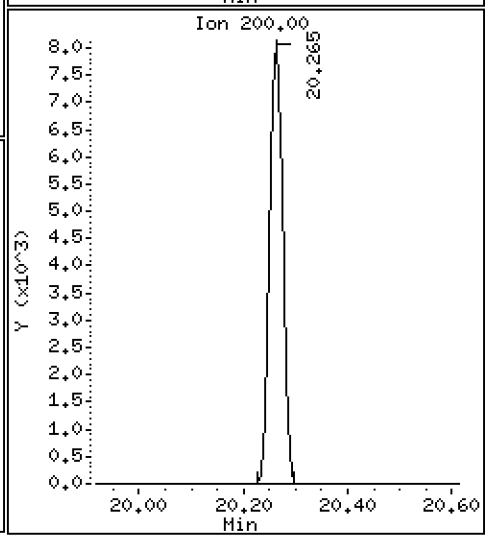












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

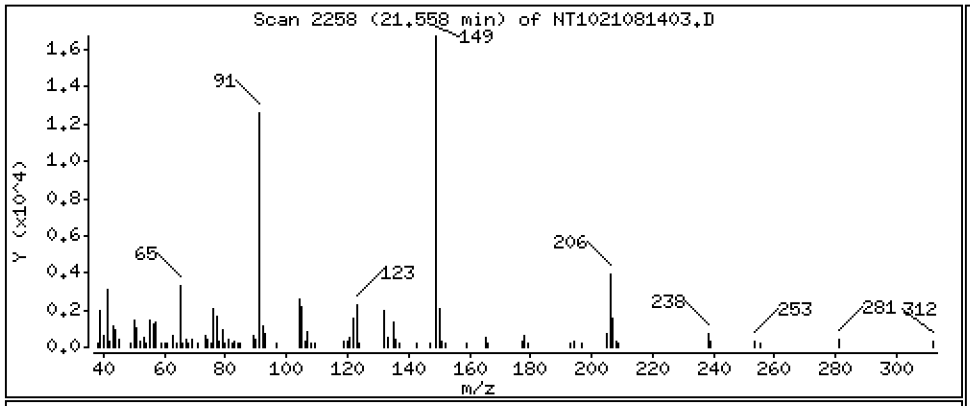
Operator: VTS

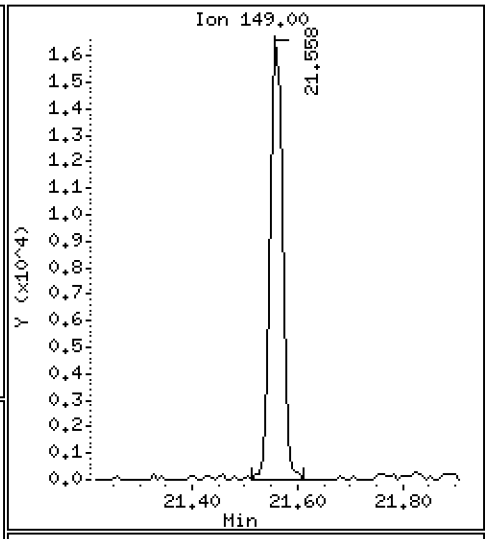
Column phase: ZB-5msi

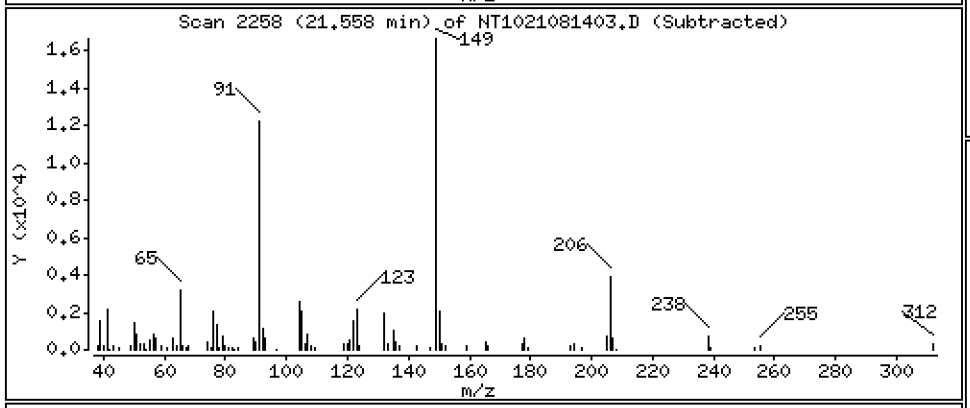
Column diameter: 0.25

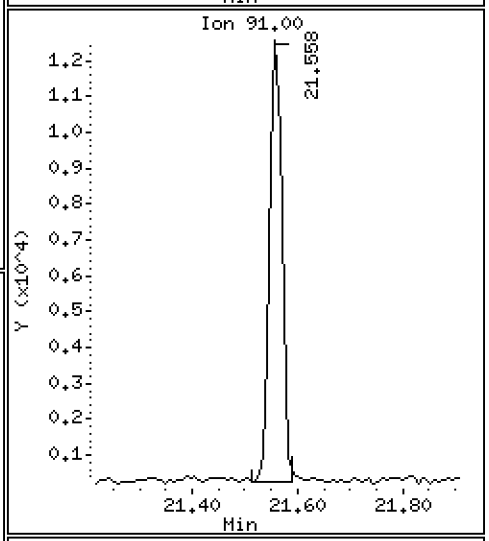
67 Butylbenzylphthalate

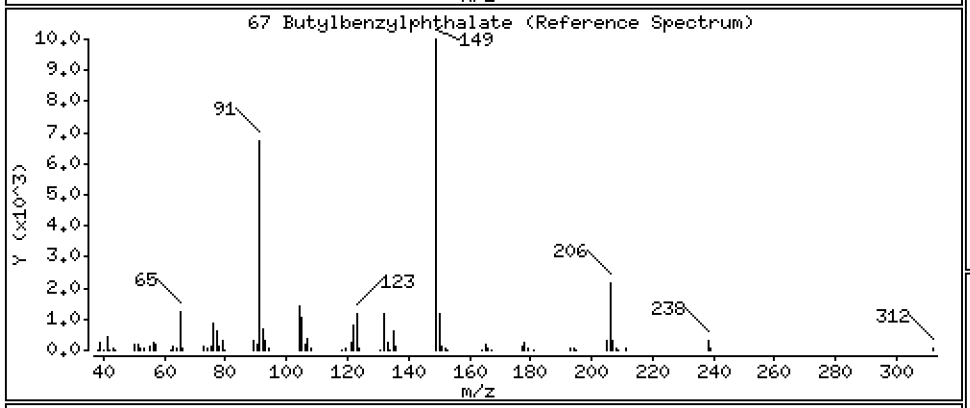
Concentration: 0.5004 ug/mL

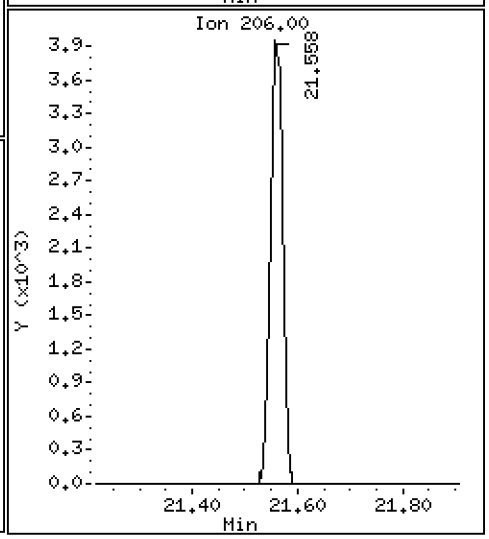


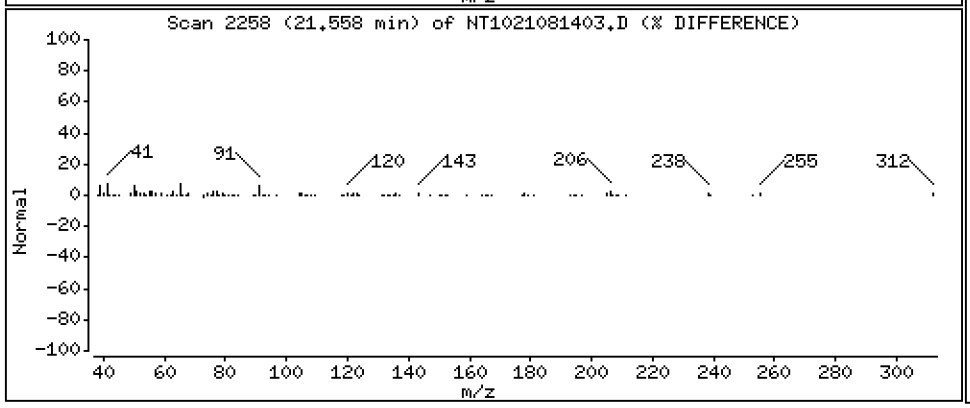












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

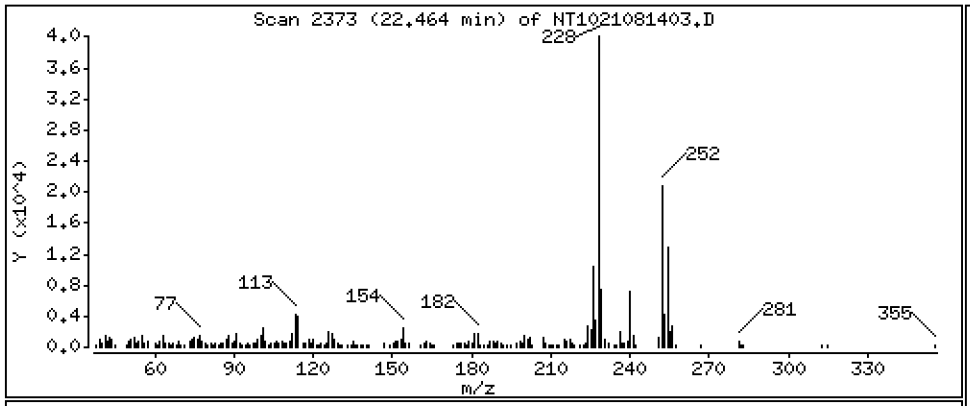
Operator: VTS

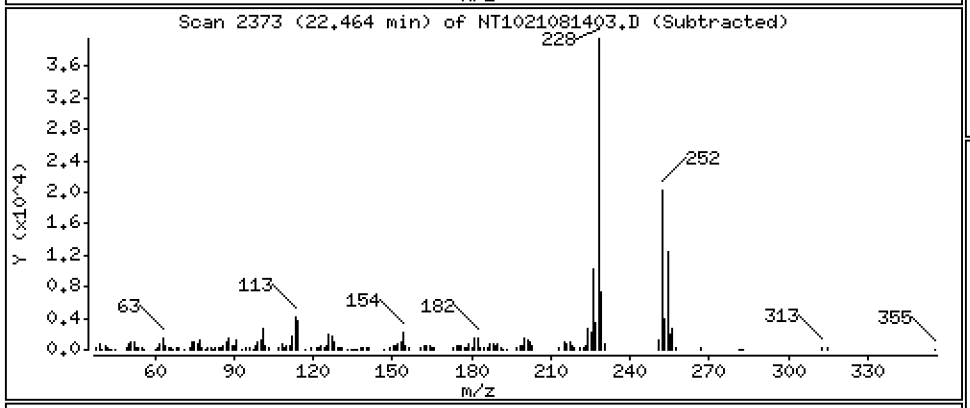
Column phase: ZB-5msi

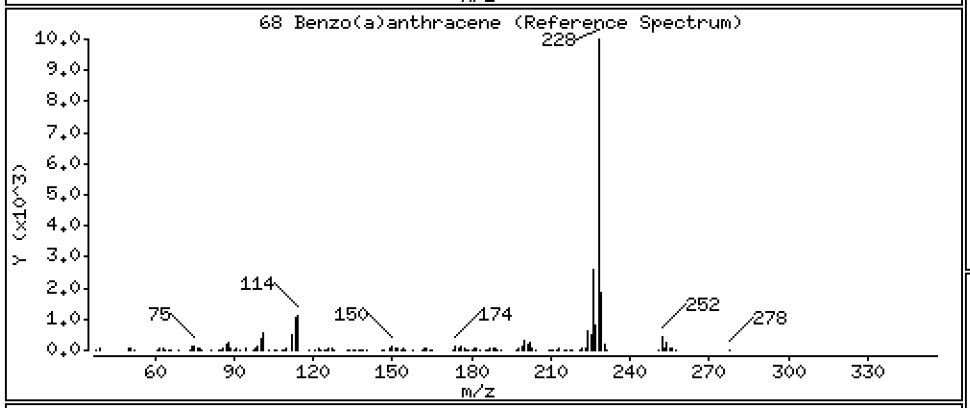
Column diameter: 0.25

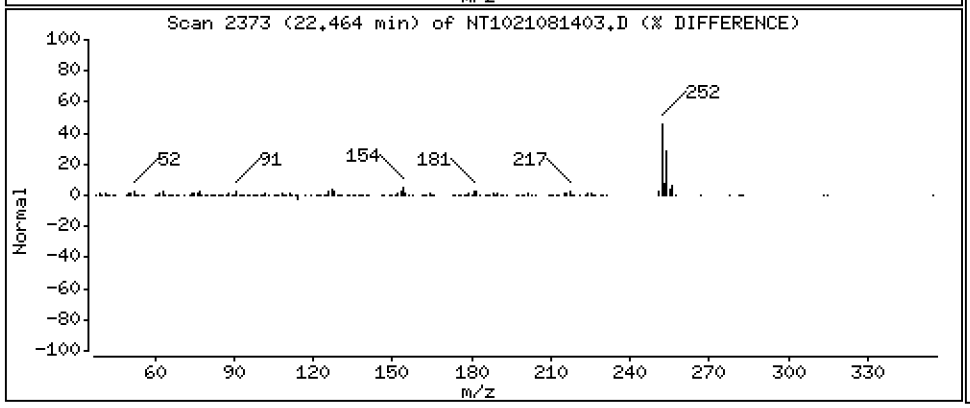
68 Benzo(a)anthracene

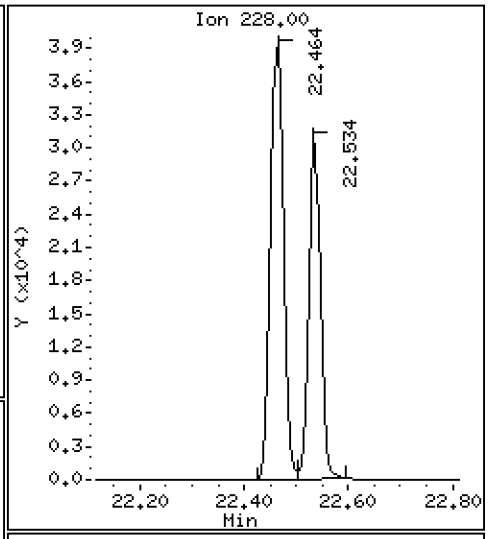
Concentration: 0.5085 ug/mL

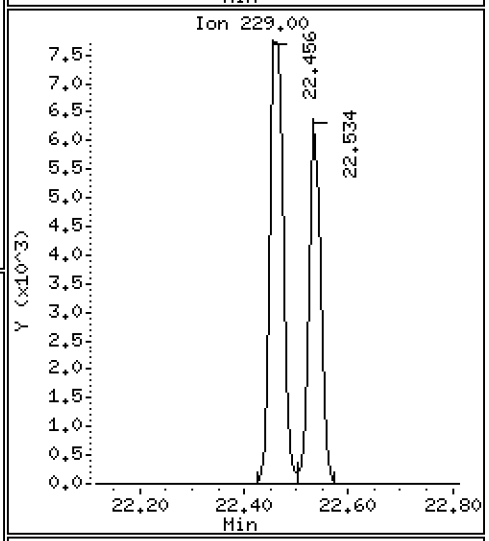


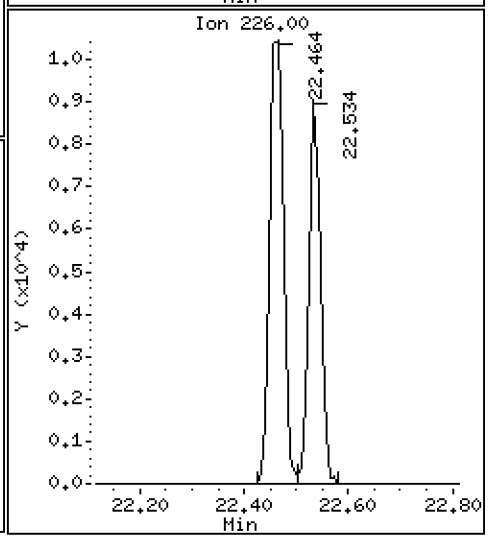












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

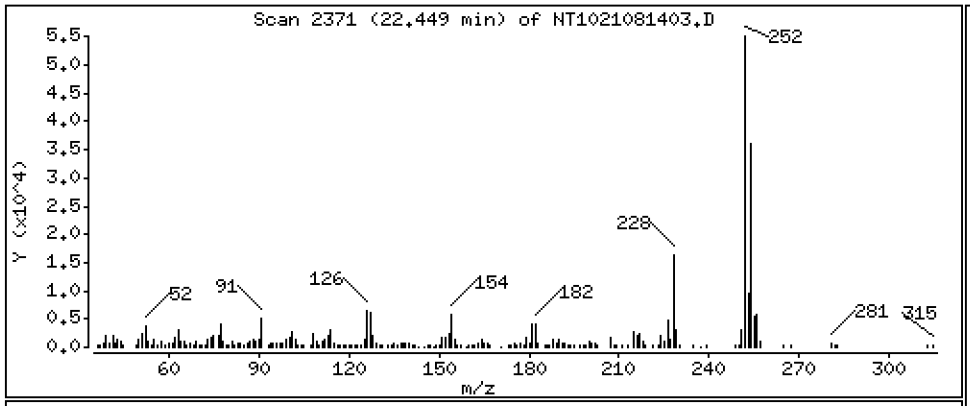
Operator: VTS

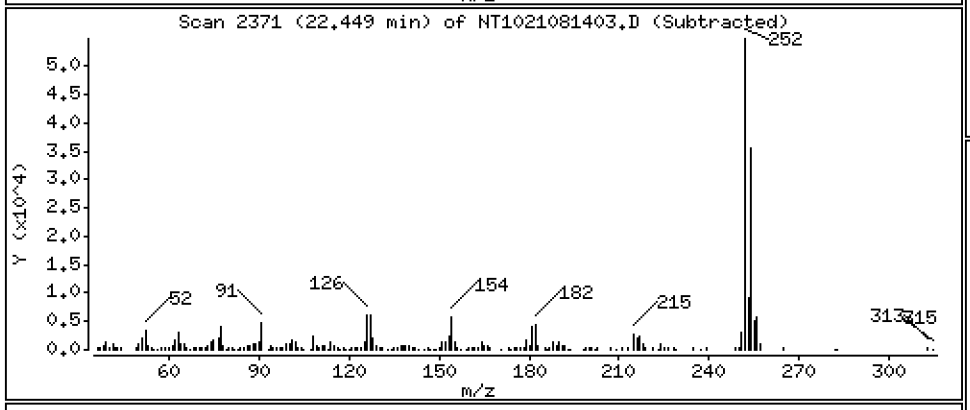
Column phase: ZB-5msi

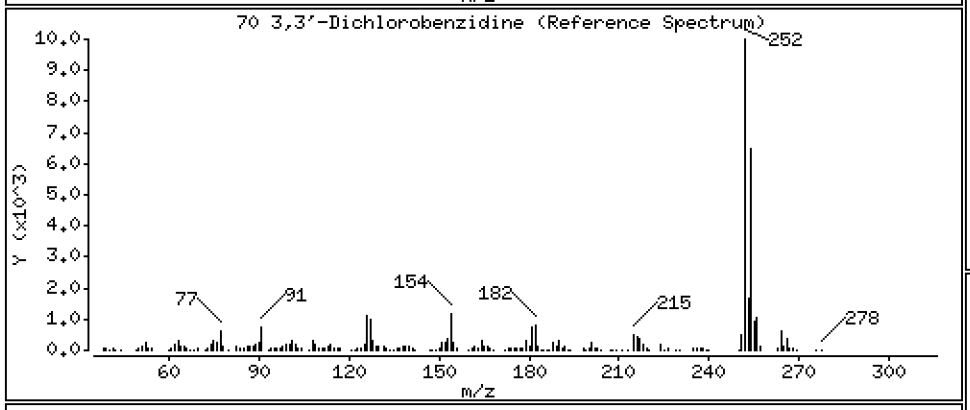
Column diameter: 0.25

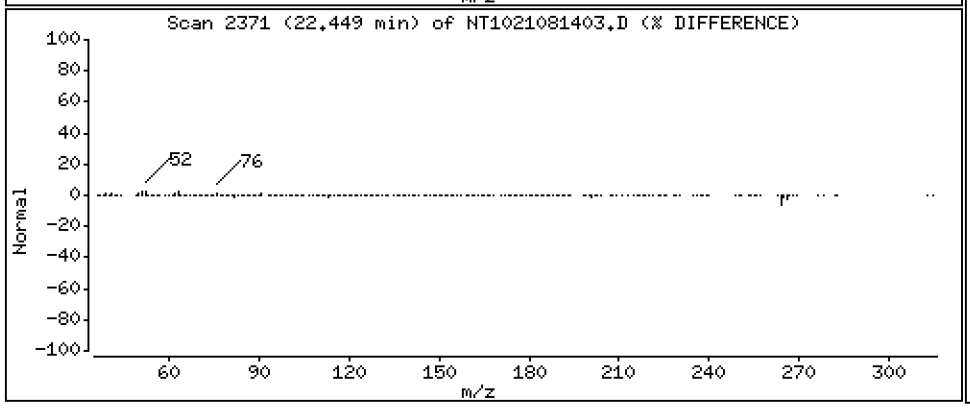
70 3,3'-Dichlorobenzidine

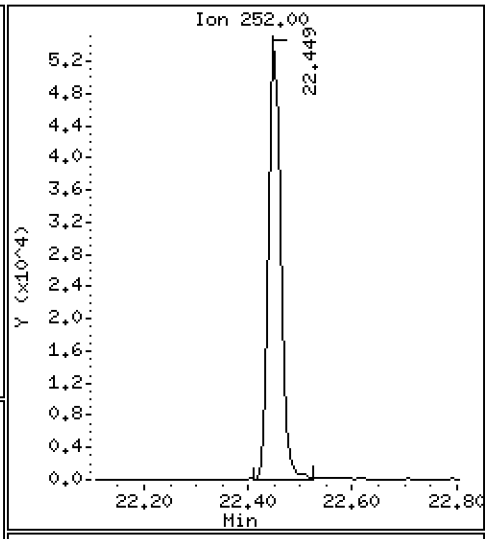
Concentration: 1.611 ug/mL

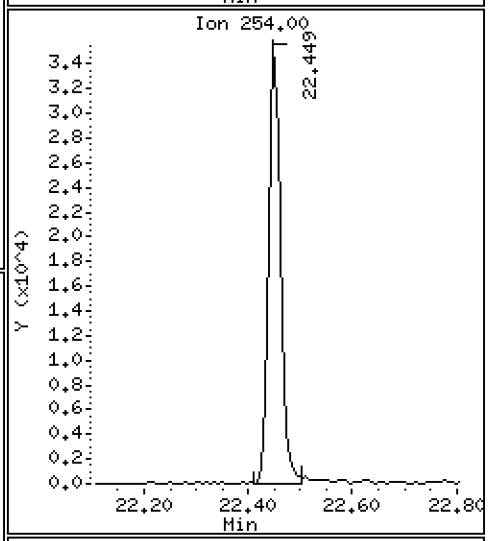


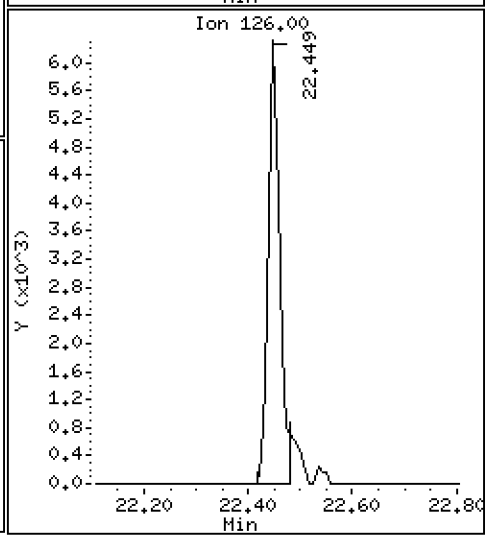












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

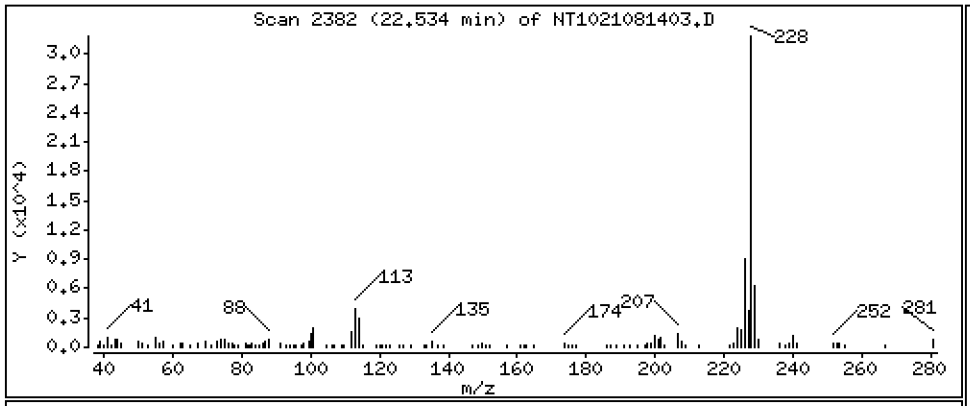
Operator: VTS

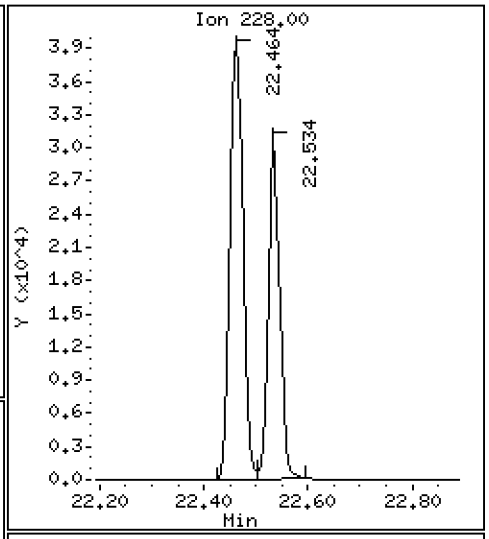
Column phase: ZB-5msi

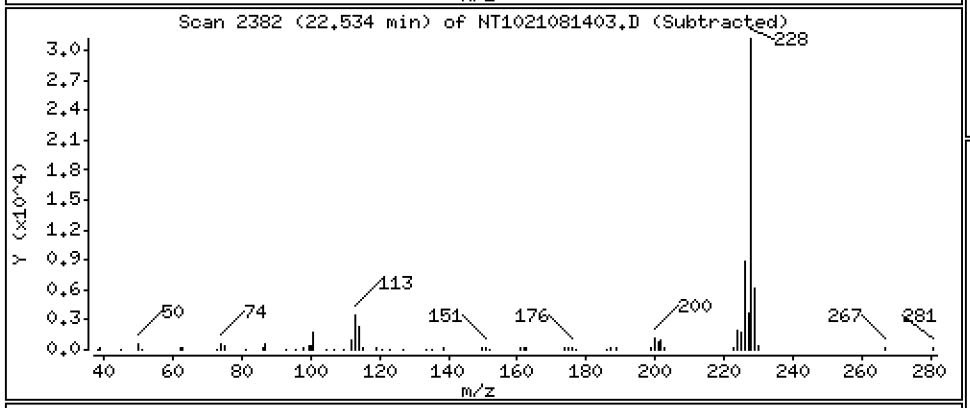
Column diameter: 0.25

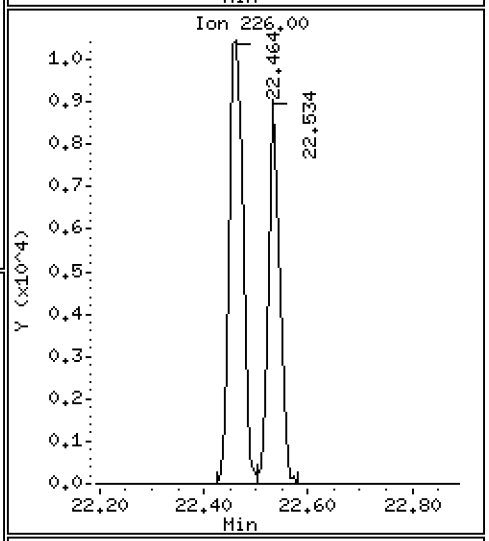
71 Chrysene

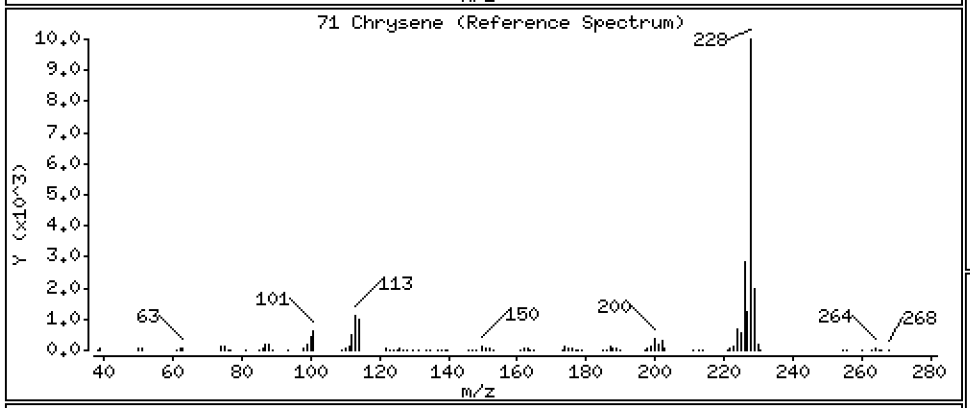
Concentration: 0.4439 ug/mL

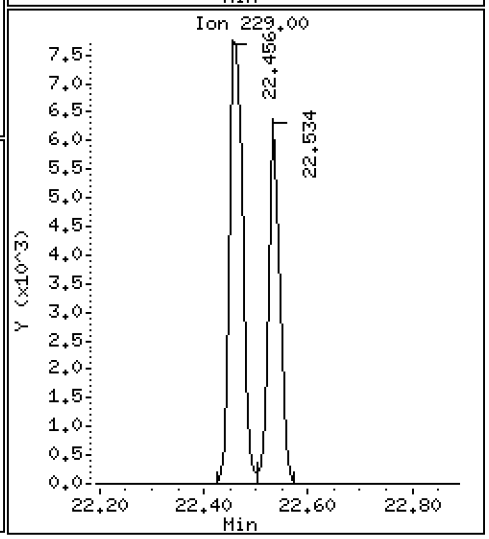


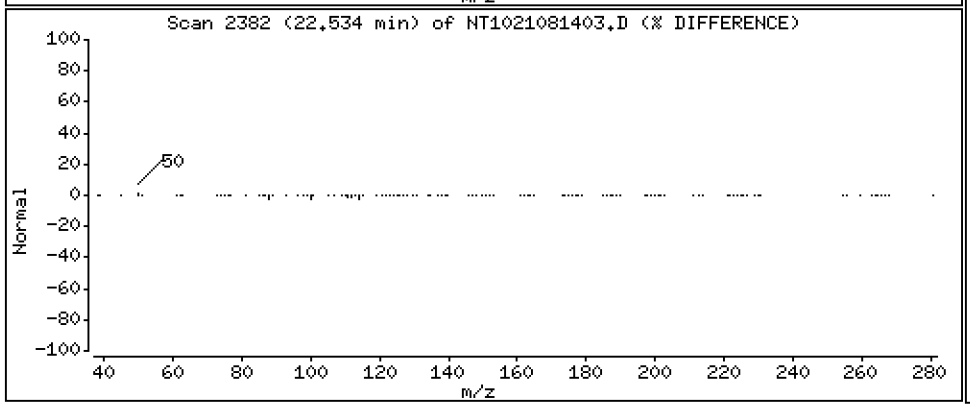












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

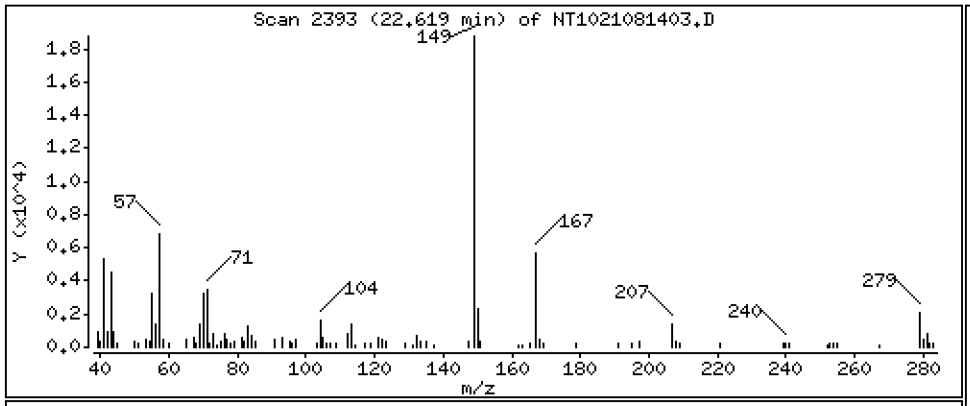
Operator: VTS

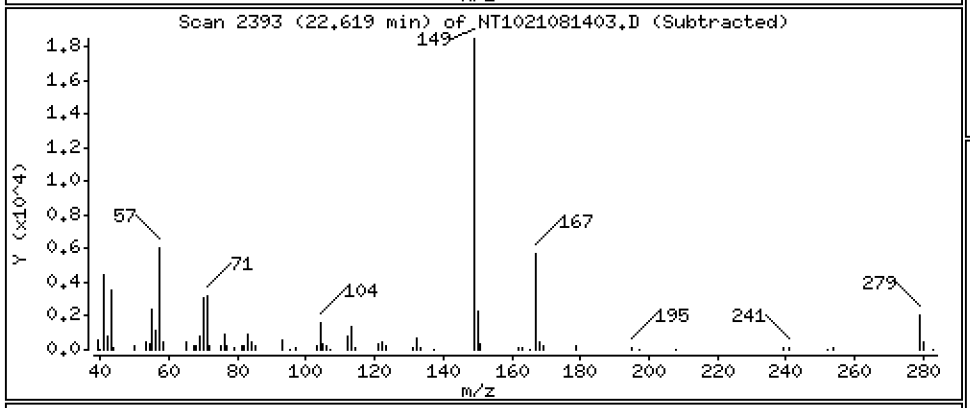
Column phase: ZB-5msi

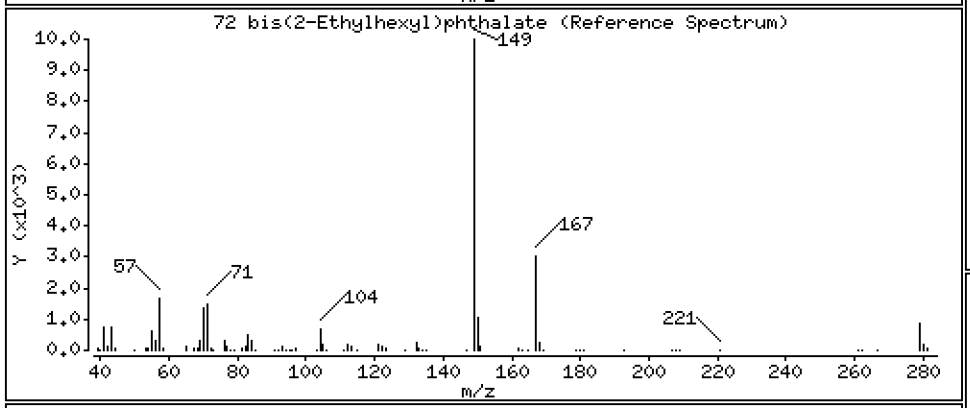
Column diameter: 0.25

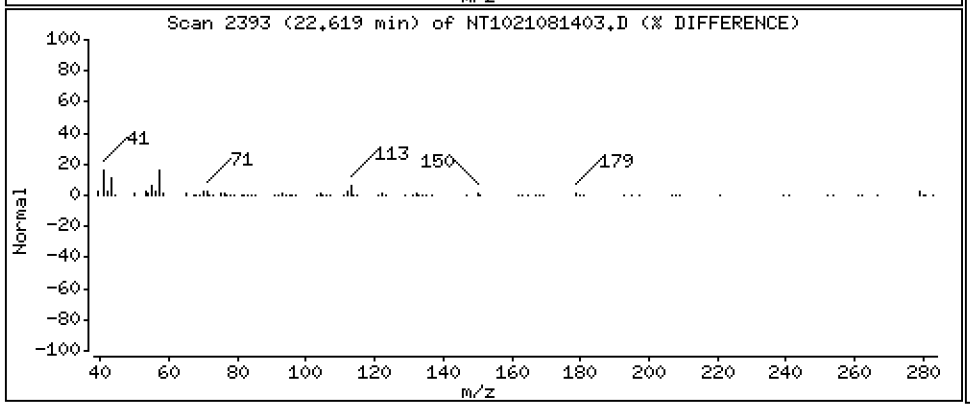
72 bis(2-Ethylhexyl)phthalate

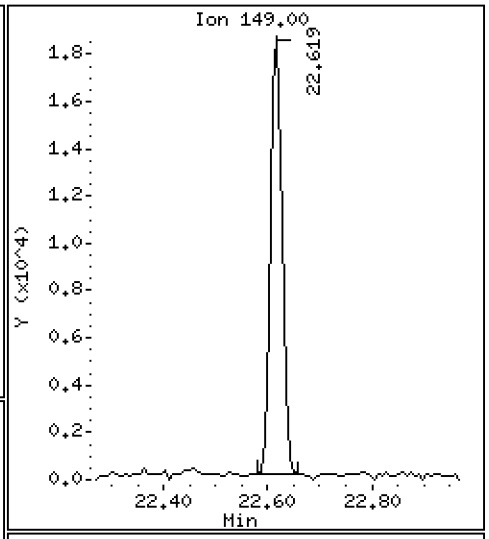
Concentration: 0.6061 ug/mL

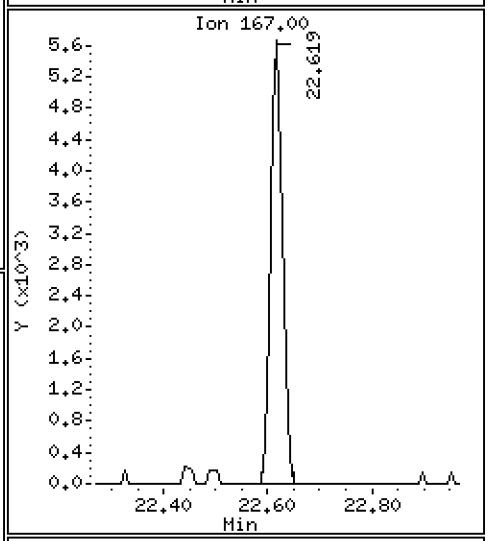


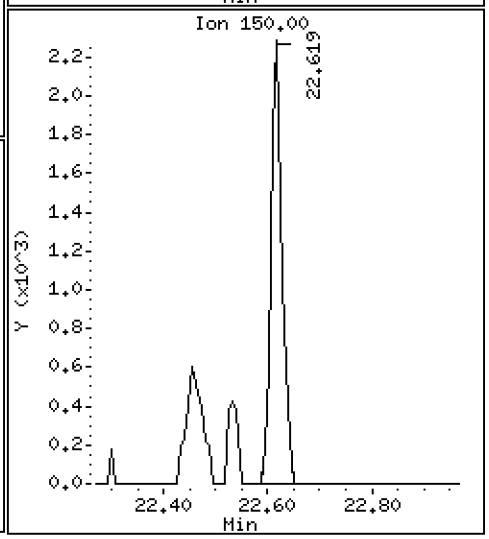












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

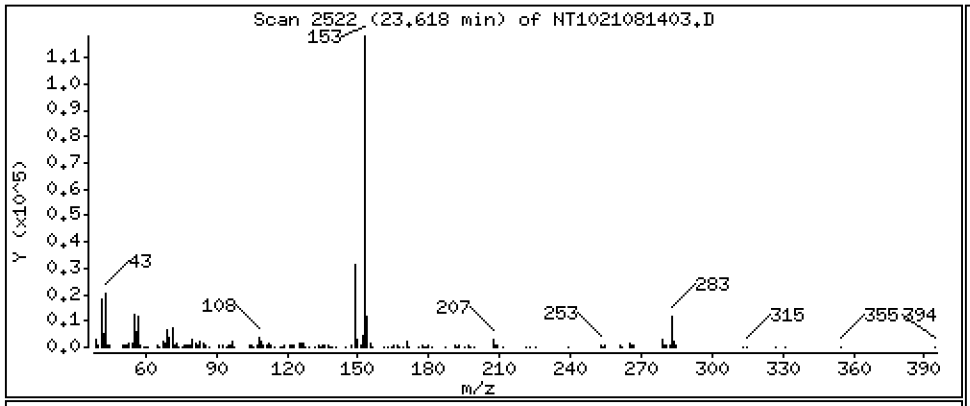
Operator: VTS

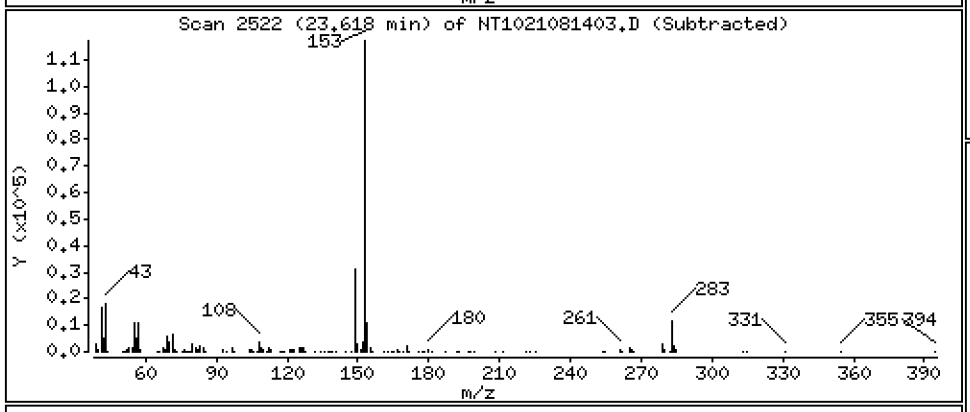
Column phase: ZB-5msi

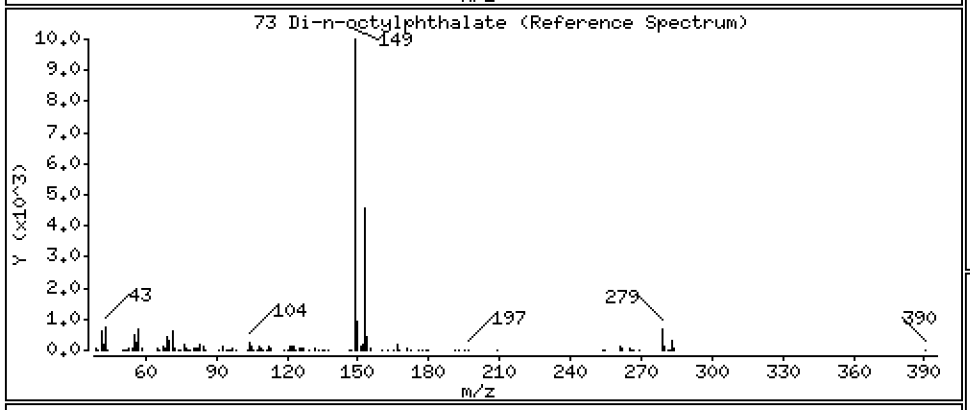
Column diameter: 0.25

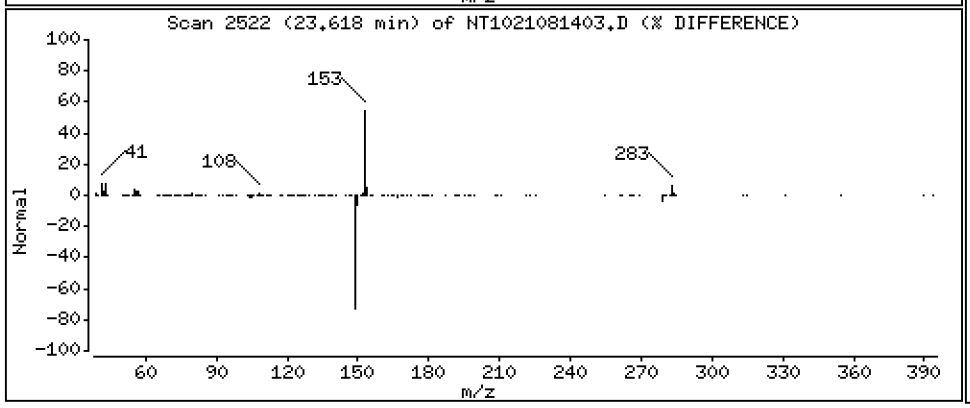
73 Di-n-octylphthalate

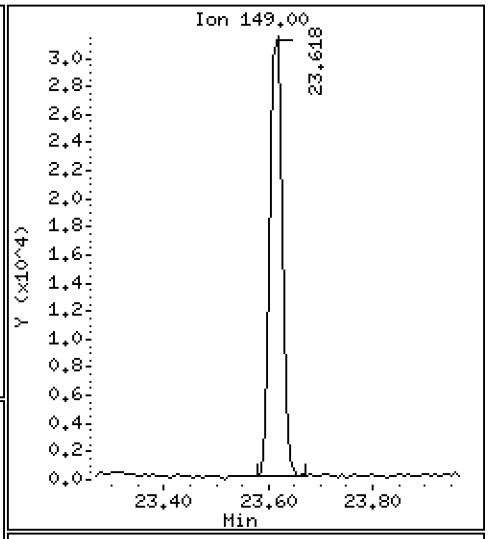
Concentration: 0.4309 ug/mL

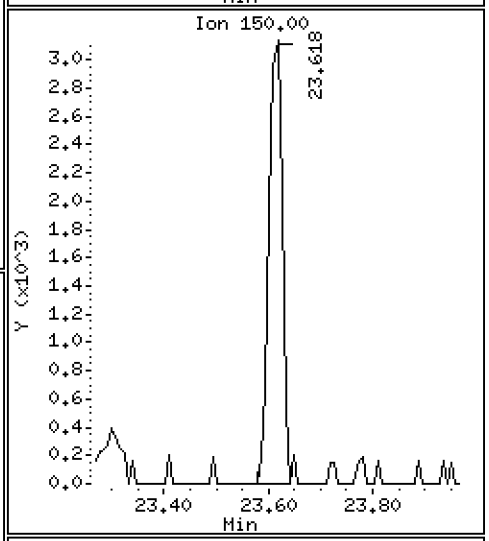


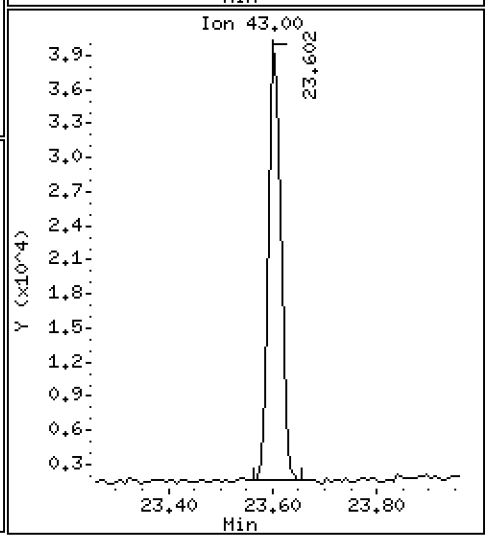












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

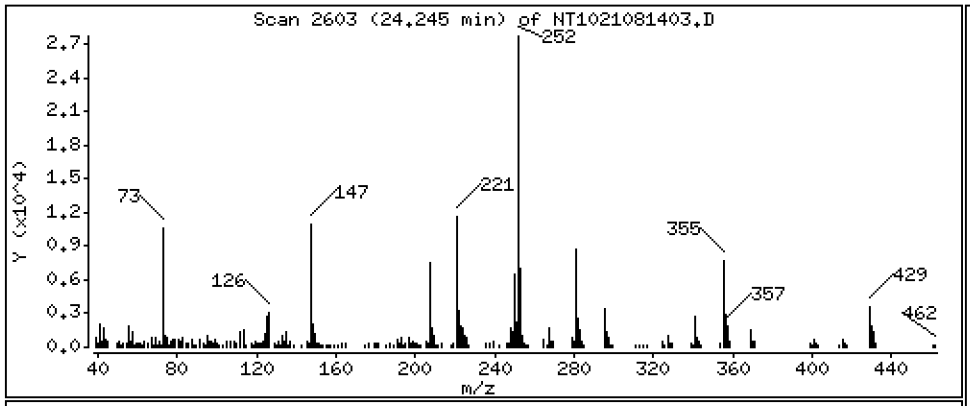
Operator: VTS

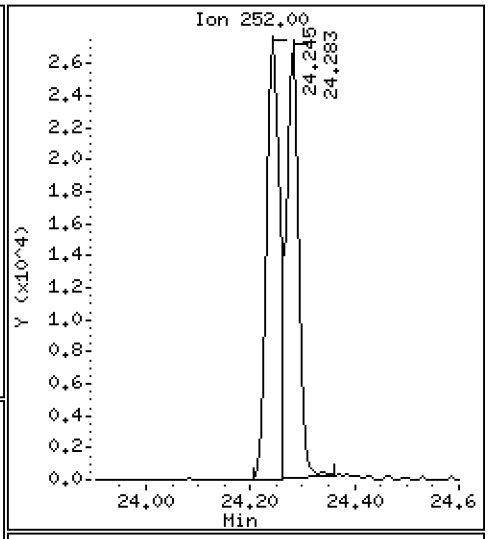
Column phase: ZB-5msi

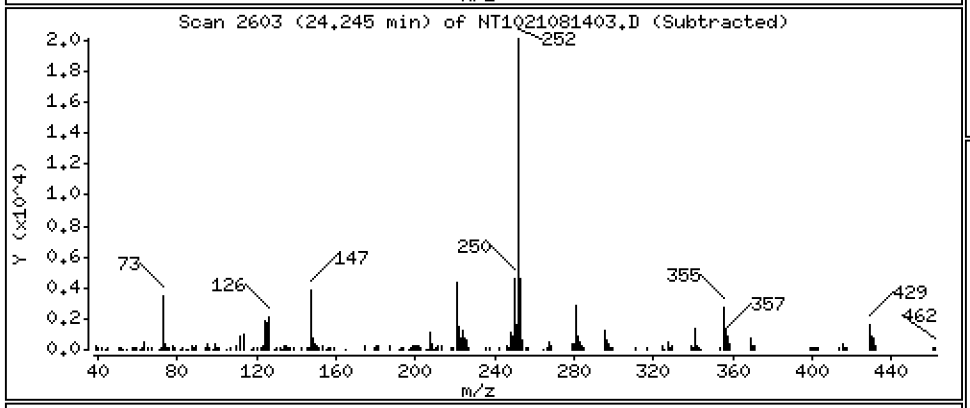
Column diameter: 0.25

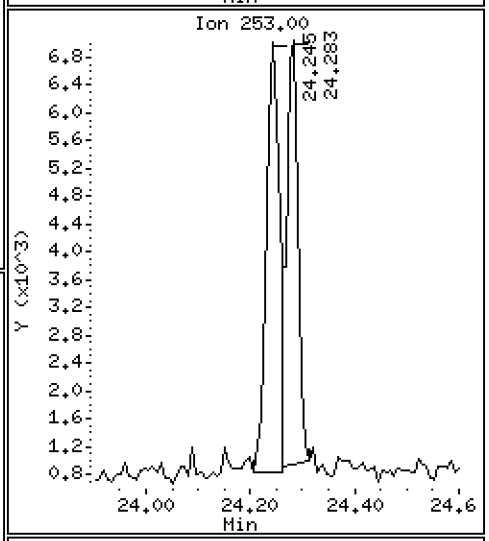
74 Benzo(b)fluoranthene

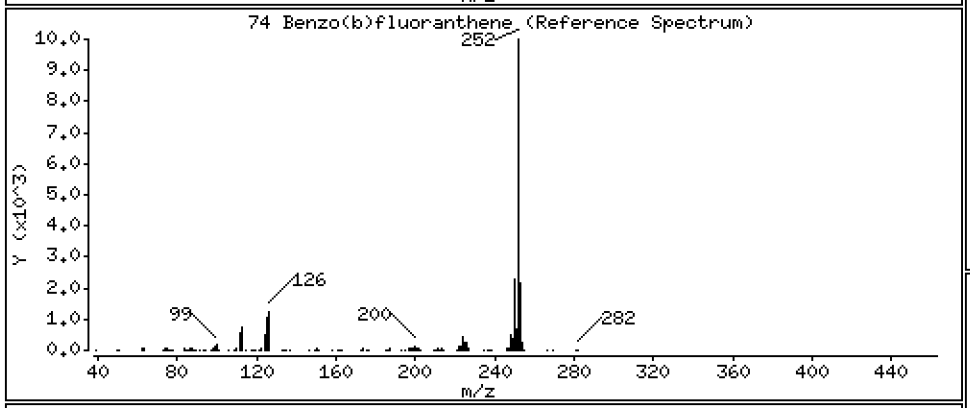
Concentration: 0.4746 ug/mL

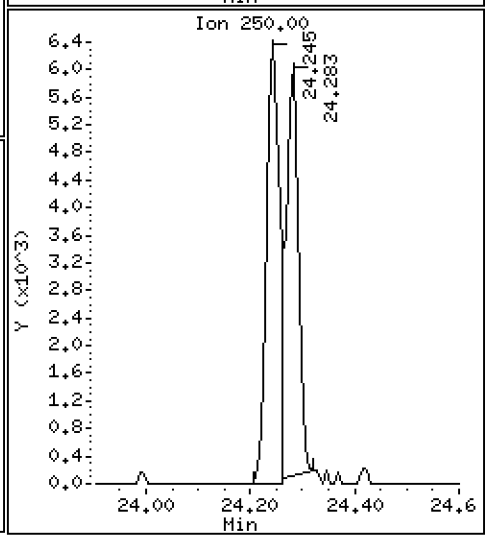


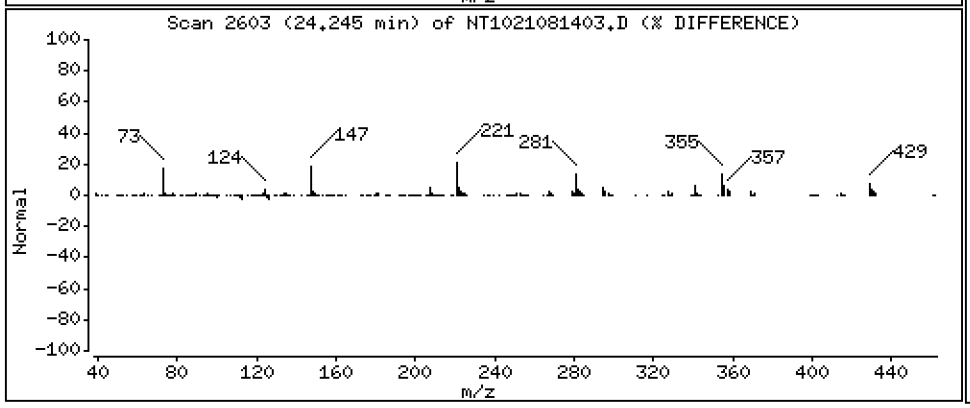












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

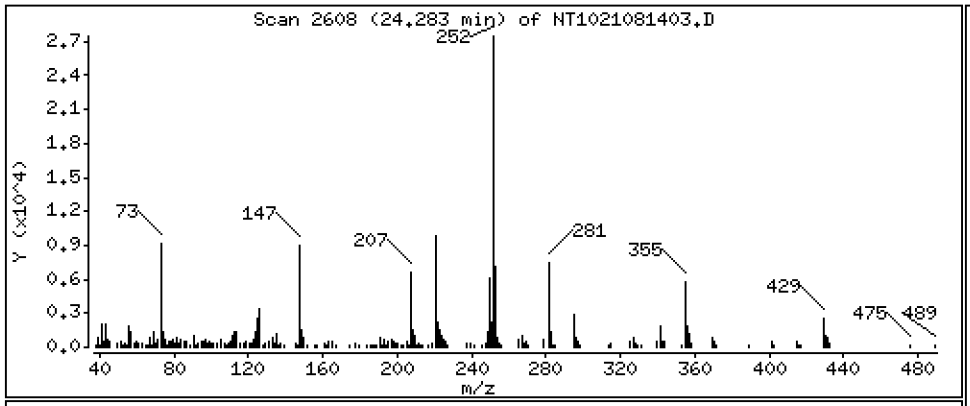
Operator: VTS

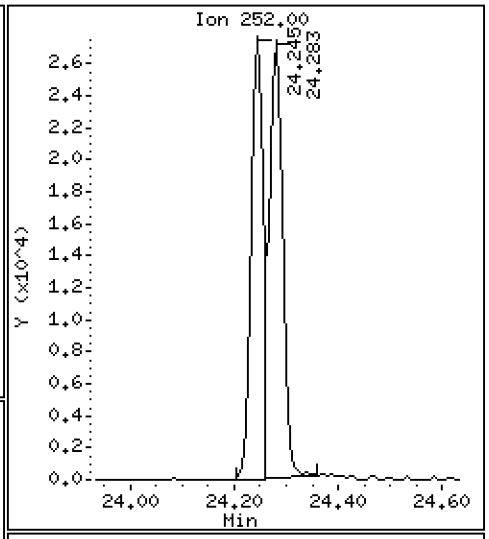
Column phase: ZB-5msi

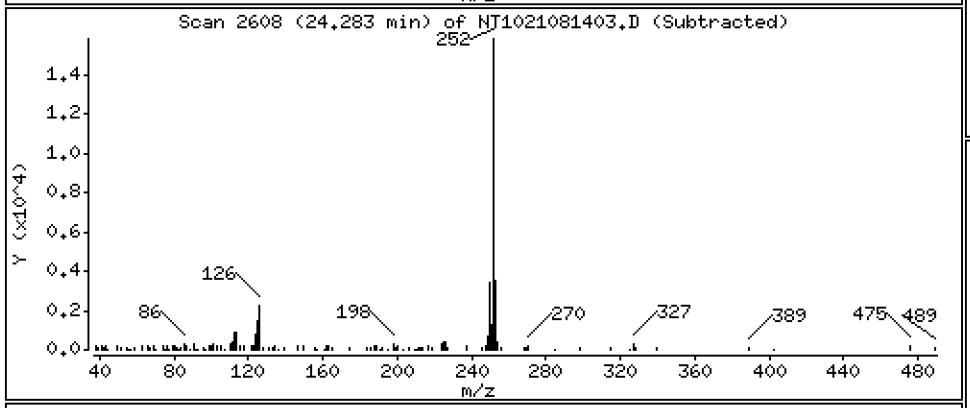
Column diameter: 0.25

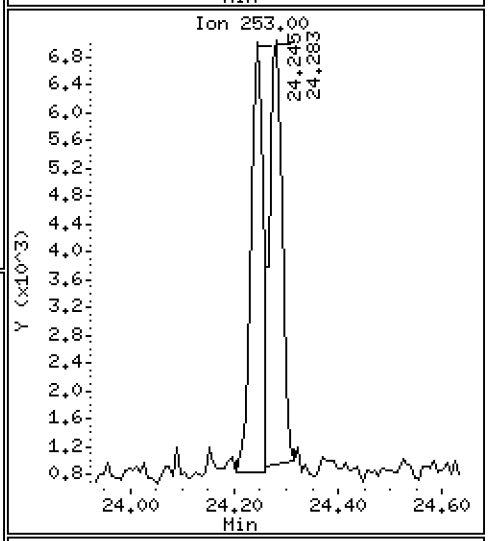
75 Benzo(k)fluoranthene

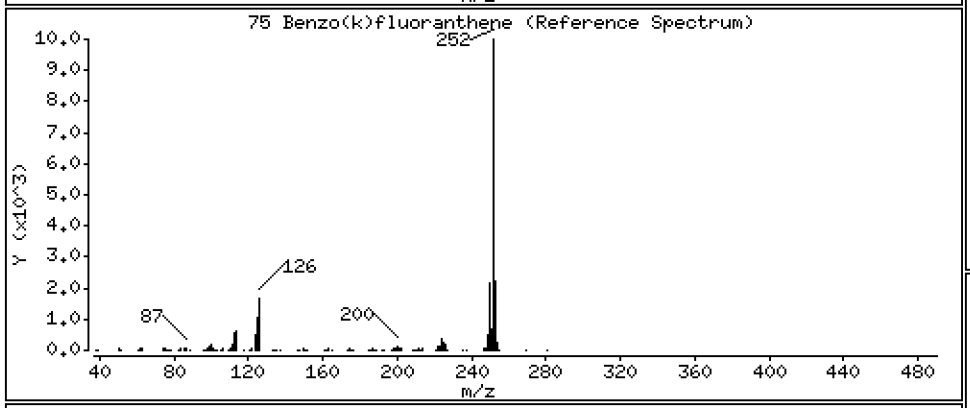
Concentration: 0.5089 ug/mL

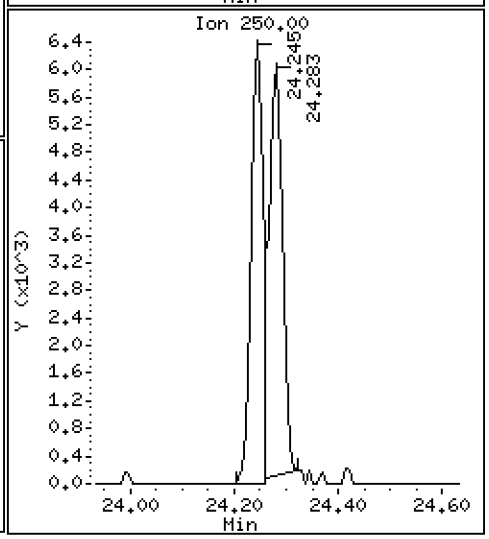


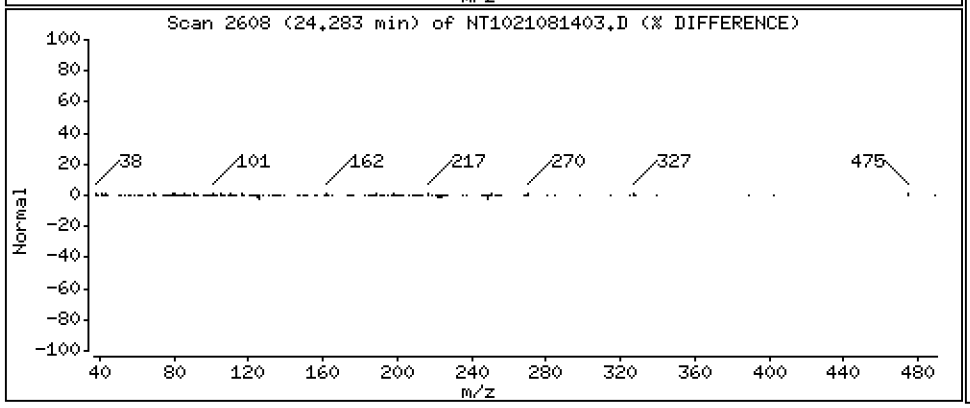












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

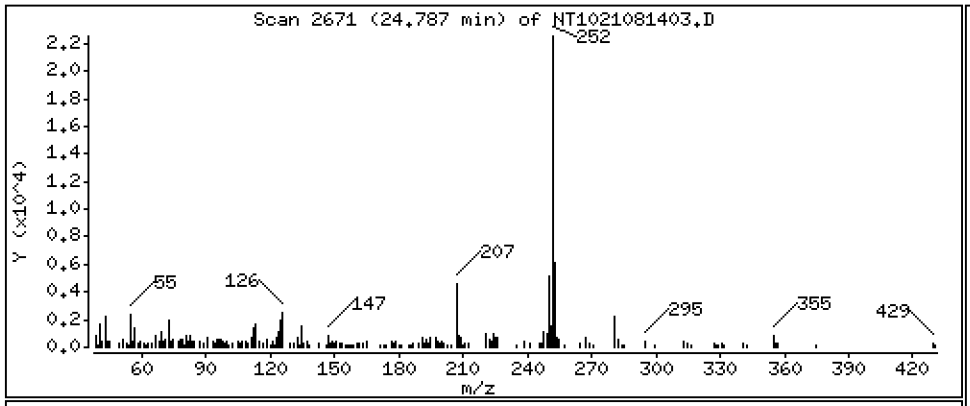
Operator: VTS

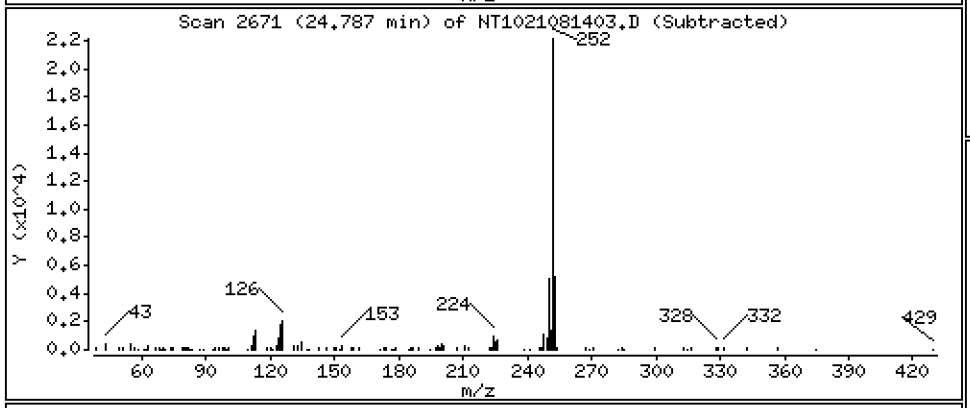
Column phase: ZB-5msi

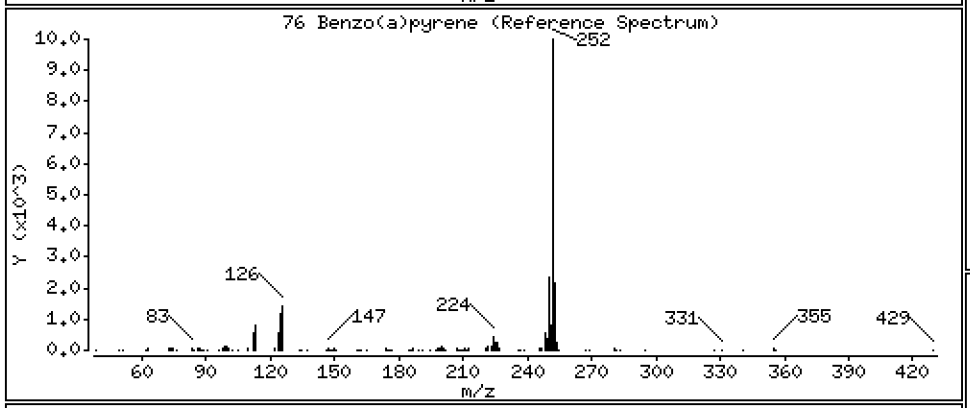
Column diameter: 0.25

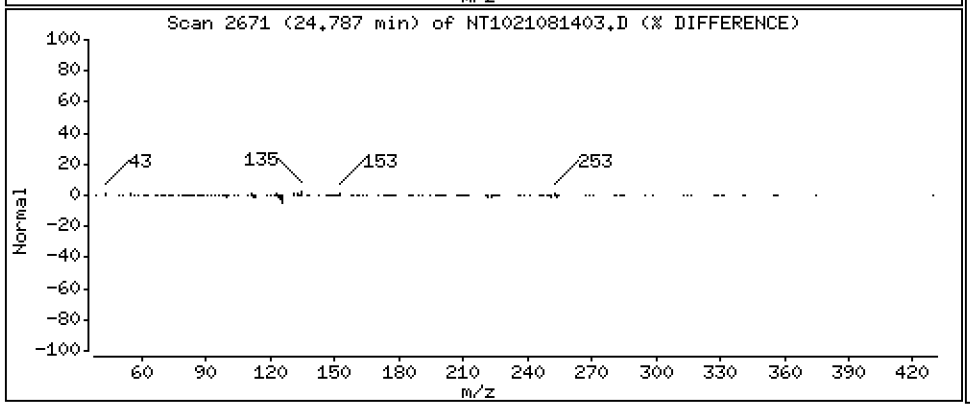
76 Benzo(a)pyrene

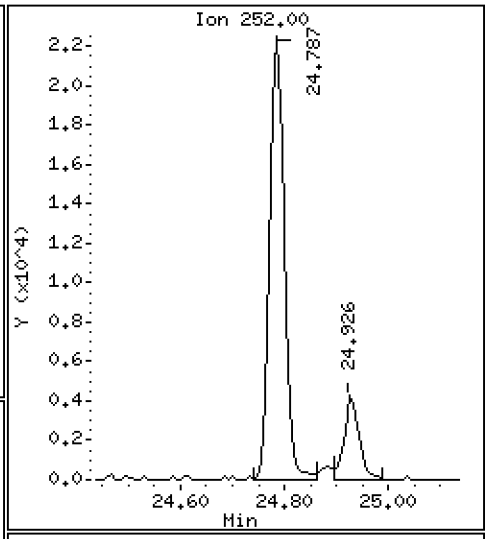
Concentration: 0.4663 ug/mL

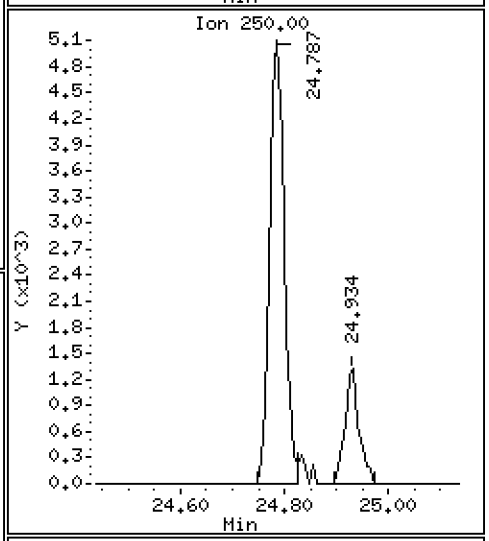


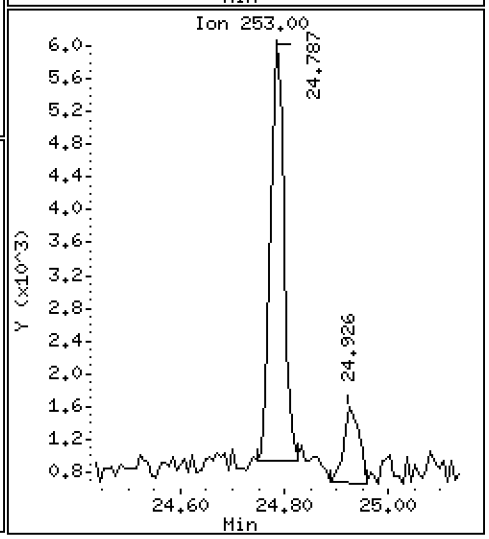












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

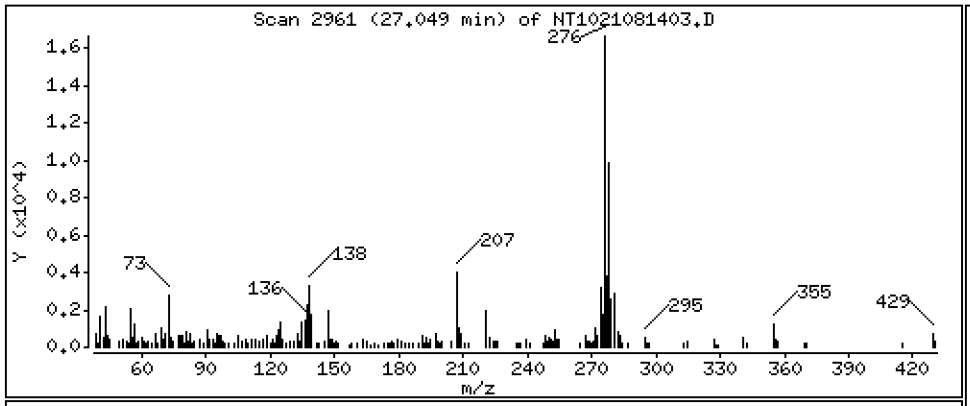
Operator: VTS

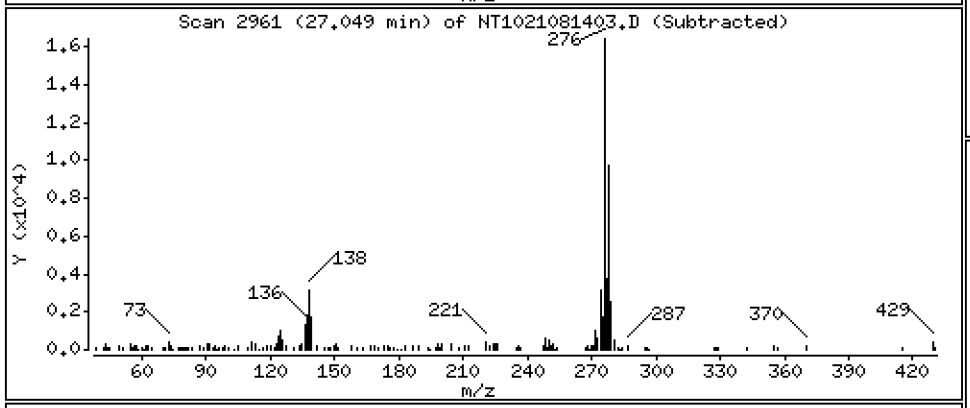
Column phase: ZB-5msi

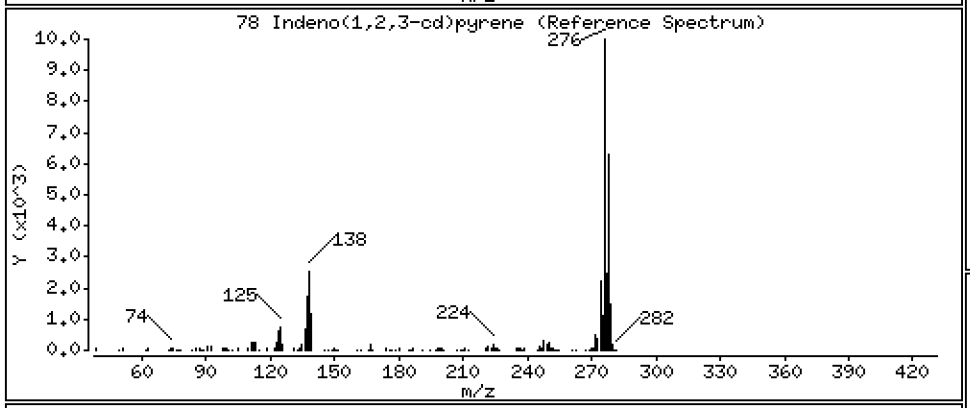
Column diameter: 0.25

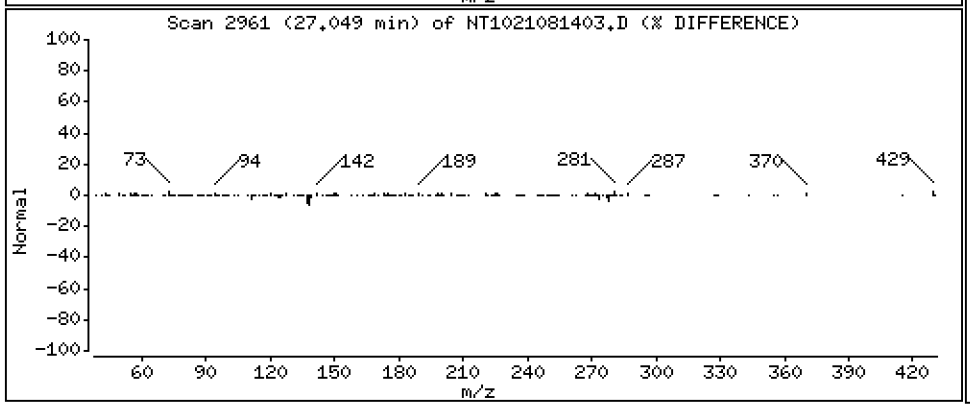
78 Indeno(1,2,3-cd)pyrene

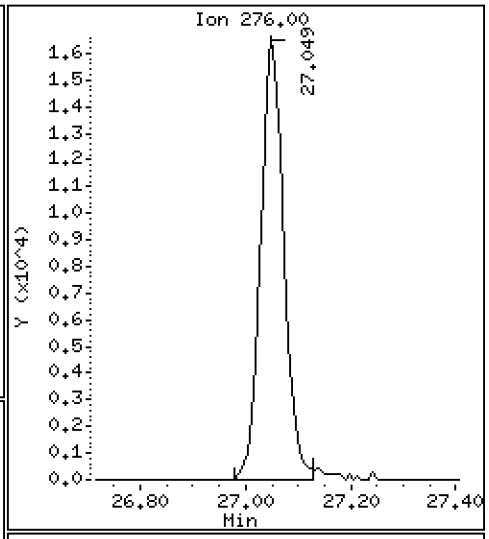
Concentration: 0.4930 ug/mL

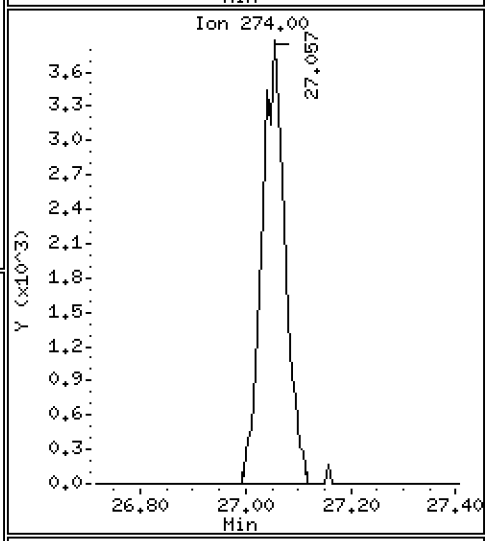


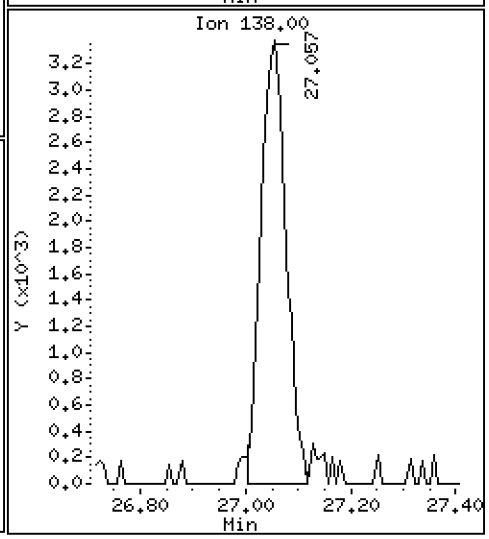












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

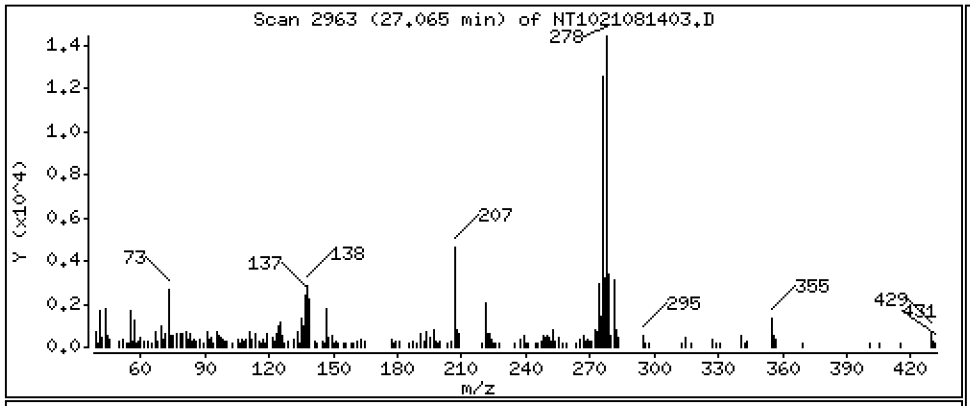
Operator: VTS

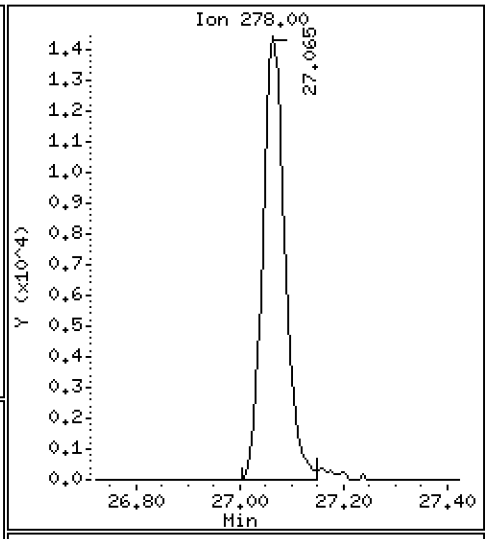
Column phase: ZB-5msi

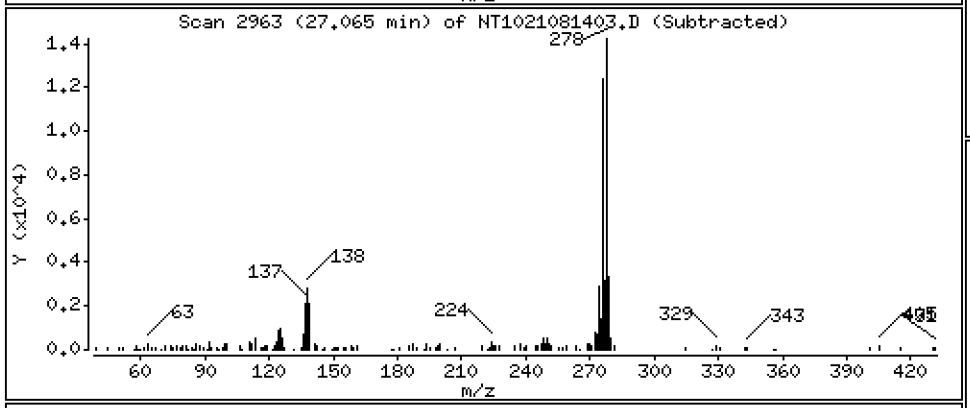
Column diameter: 0.25

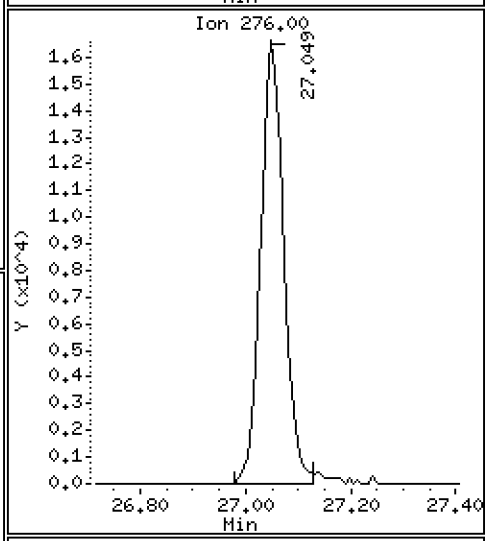
79 Dibenzo(a,h)anthracene

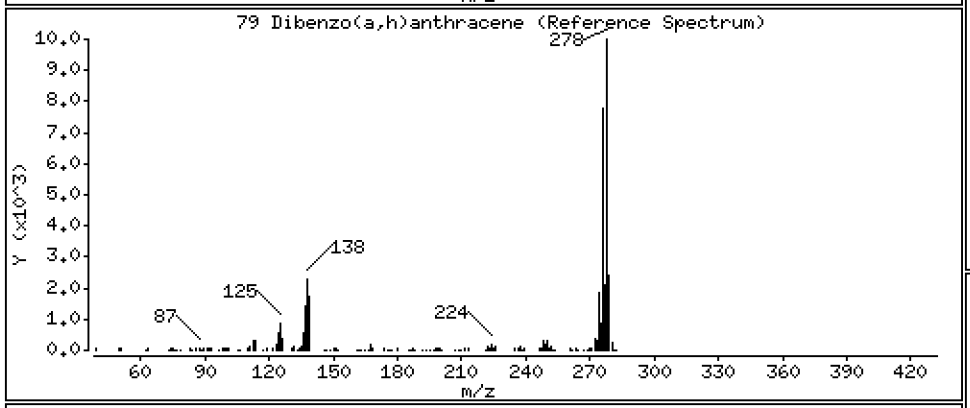
Concentration: 0.5243 ug/mL

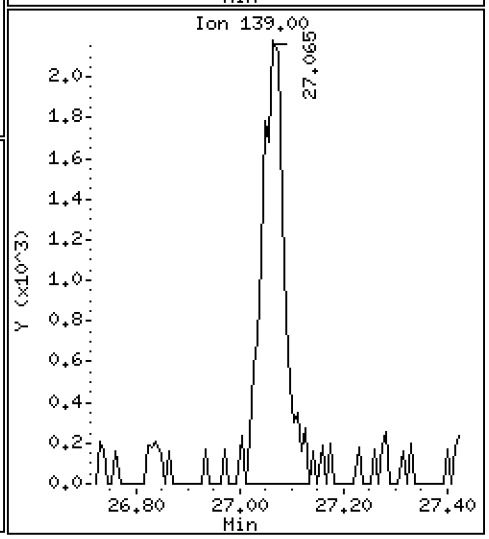


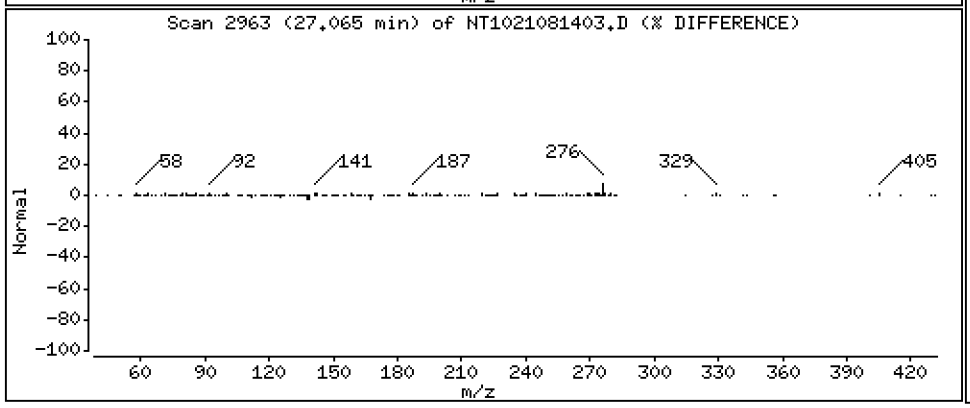












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

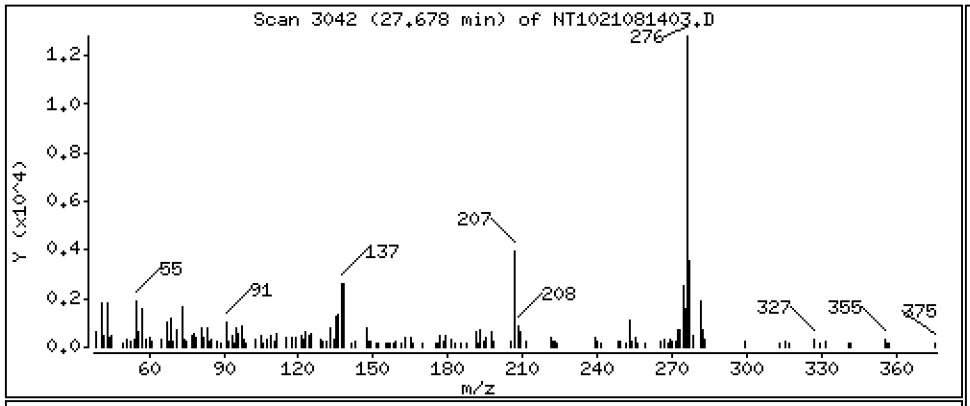
Operator: VTS

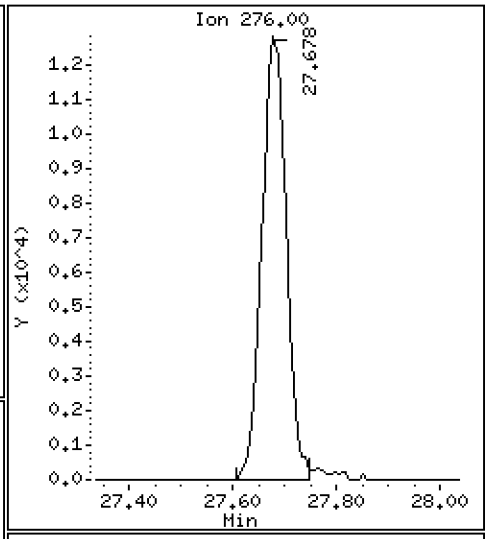
Column phase: ZB-5msi

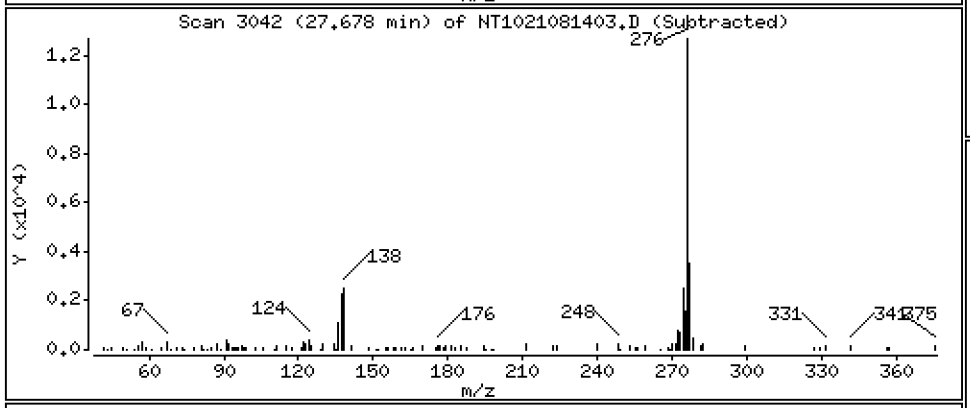
Column diameter: 0.25

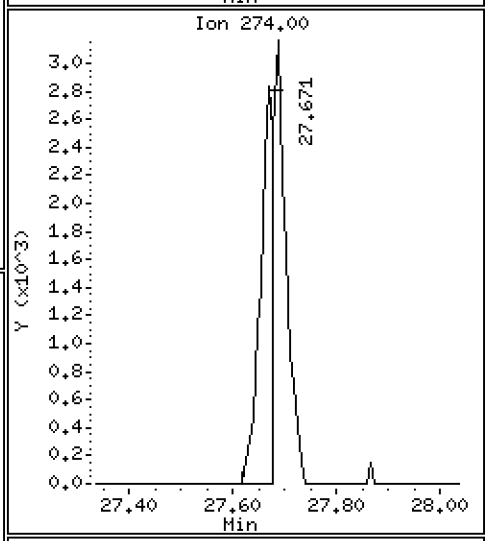
80 Benzo(g,h,i)perylene

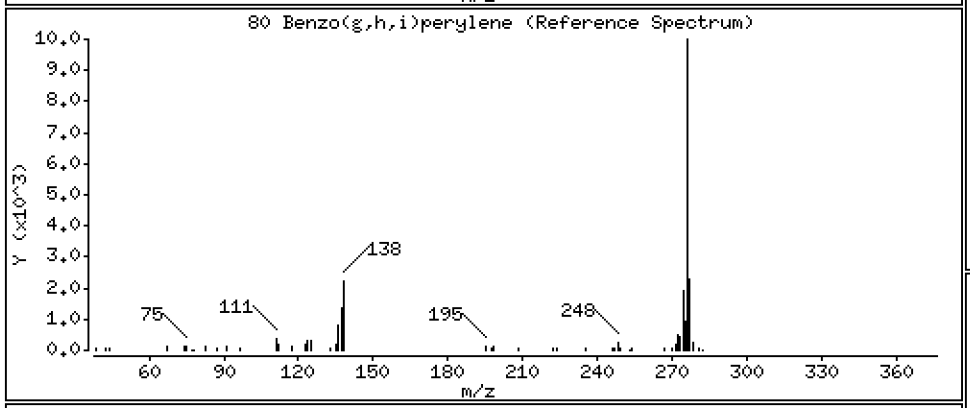
Concentration: 0.4513 ug/mL

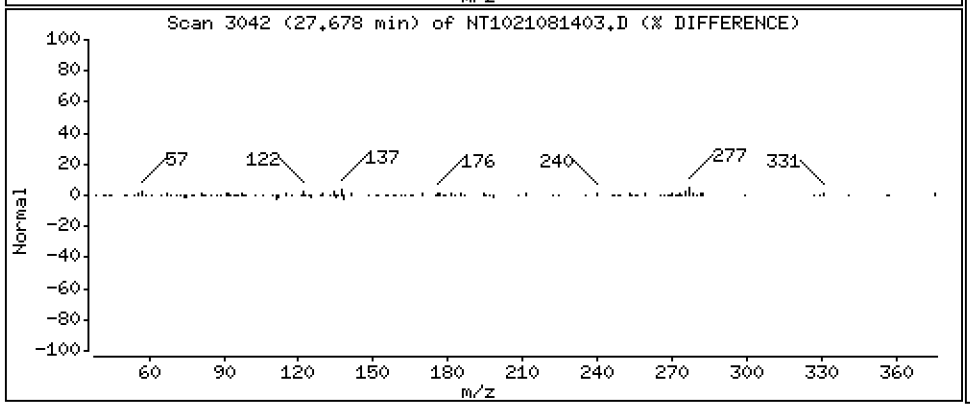


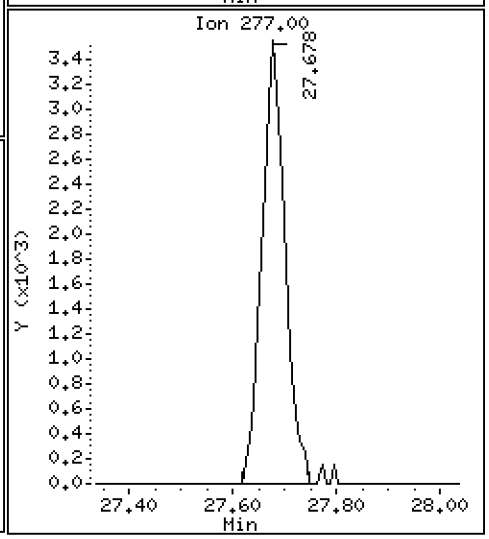












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

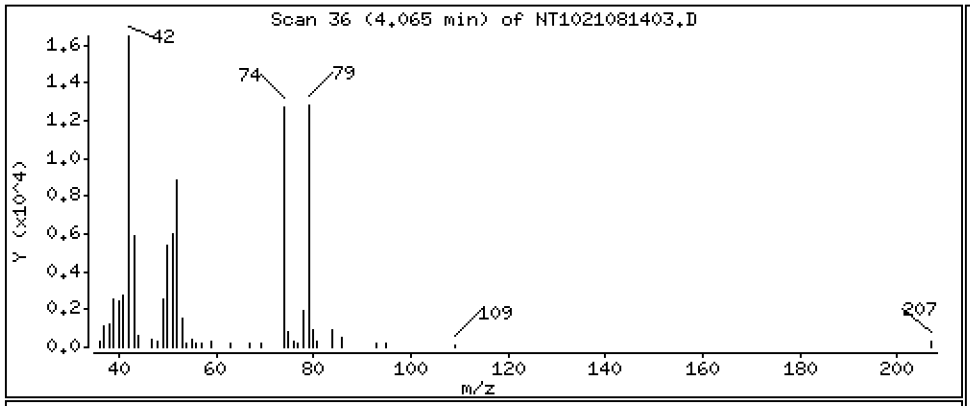
Operator: VTS

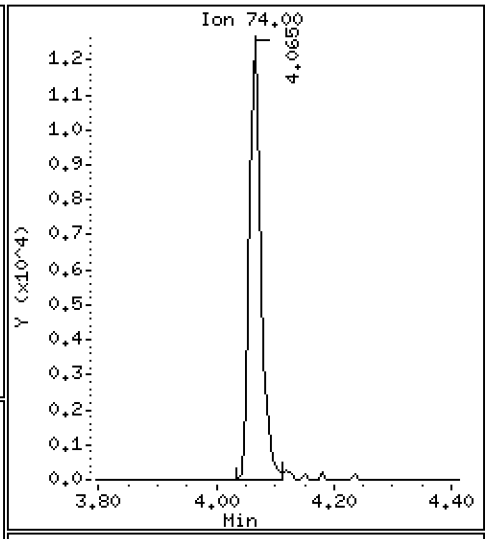
Column phase: ZB-5msi

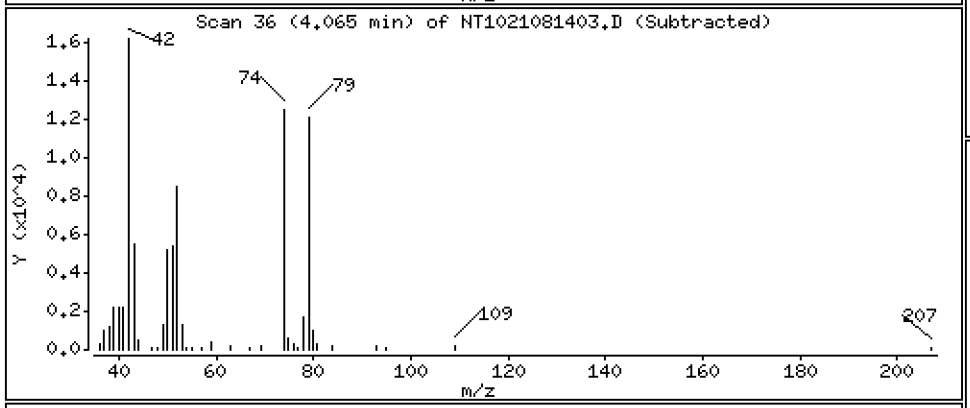
Column diameter: 0.25

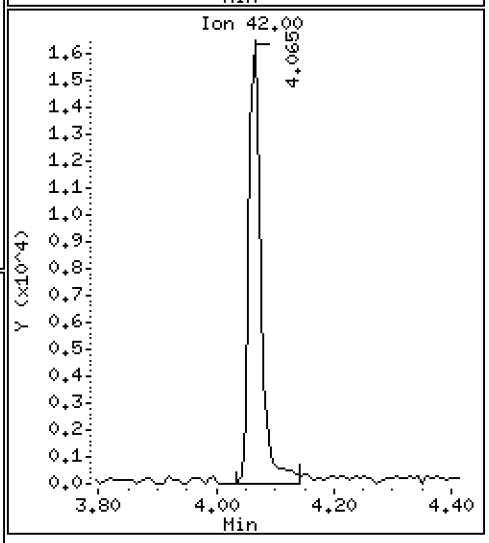
90 N-Nitrosodimethylamine

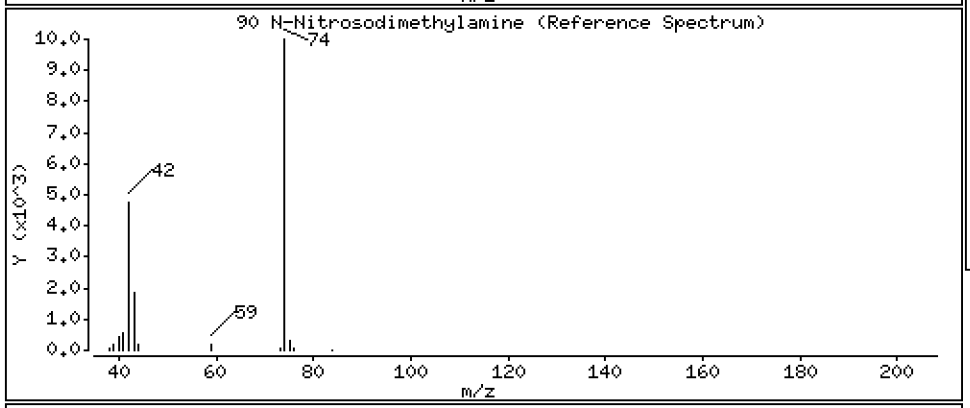
Concentration: 0.5561 ug/mL

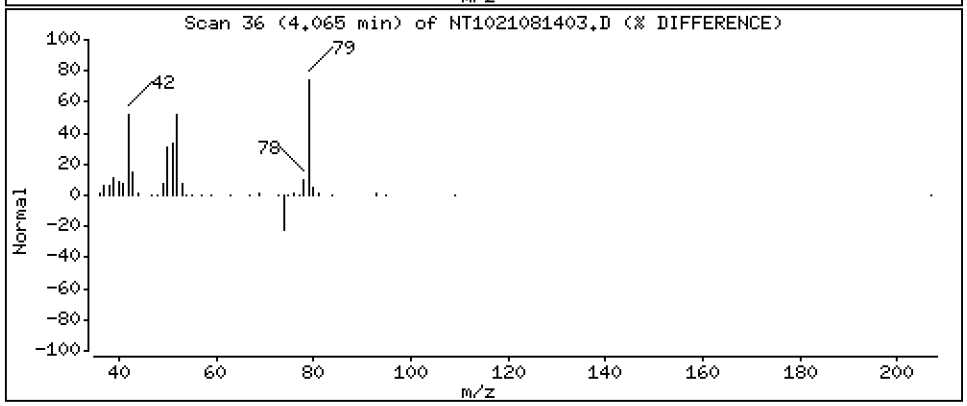












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

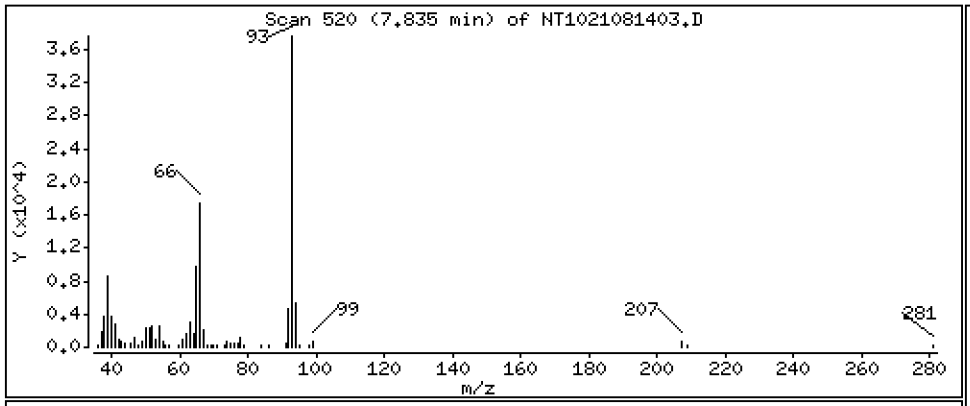
Operator: VTS

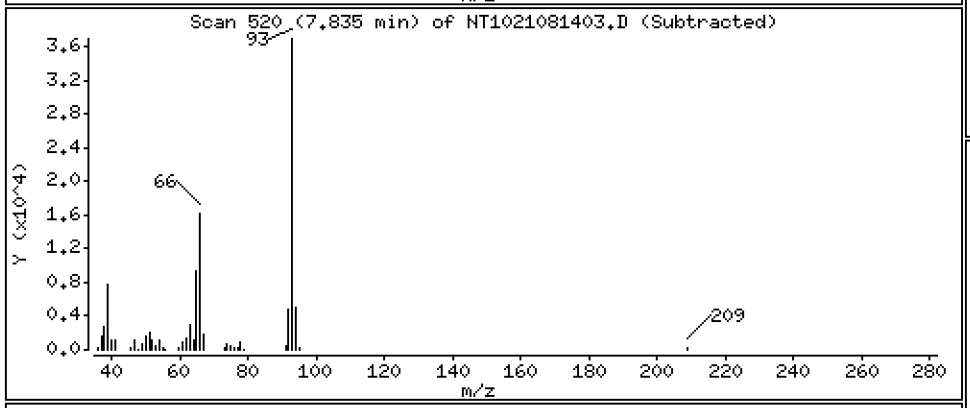
Column phase: ZB-5msi

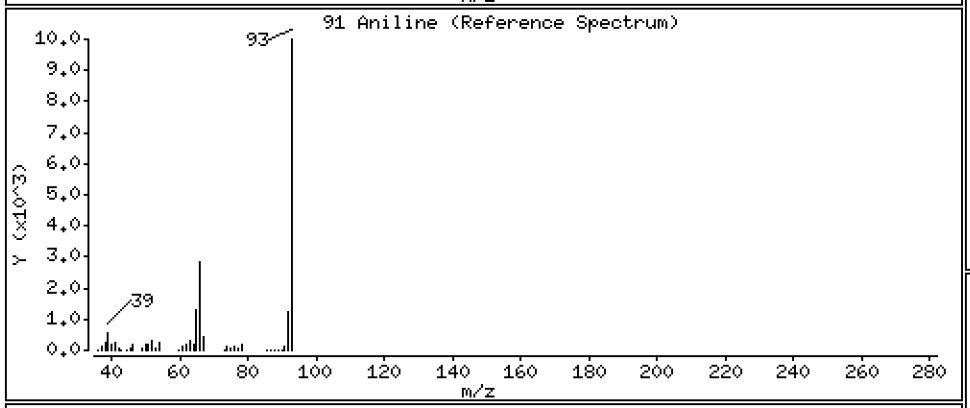
Column diameter: 0.25

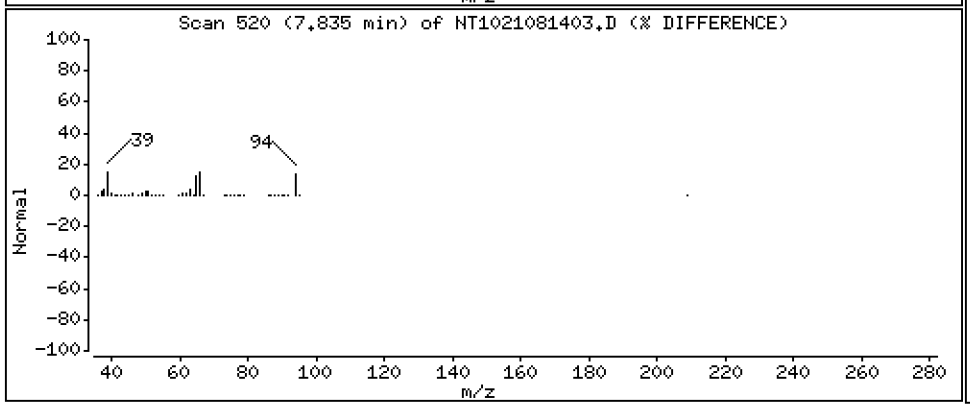
91 Aniline

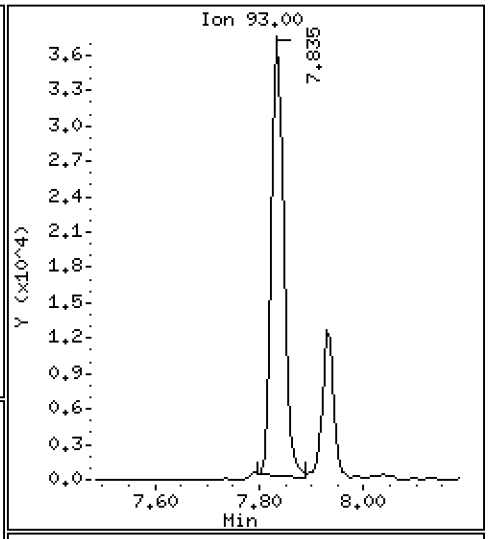
Concentration: 0.9291 ug/mL

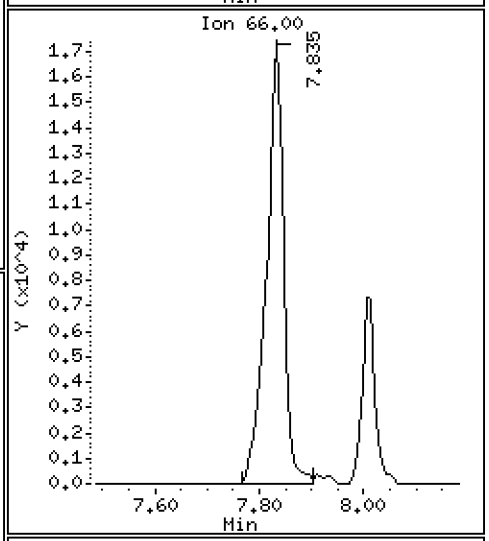


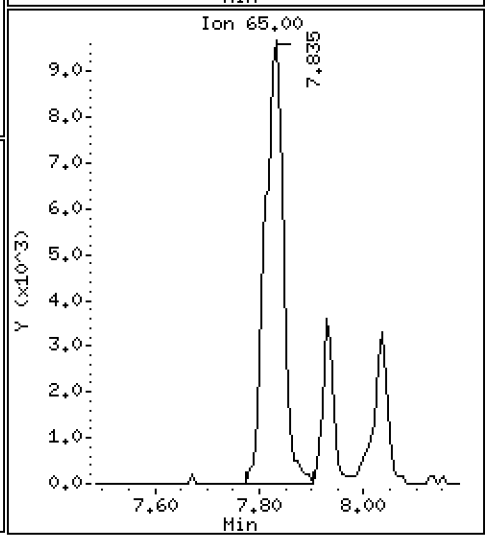












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081403.D

Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

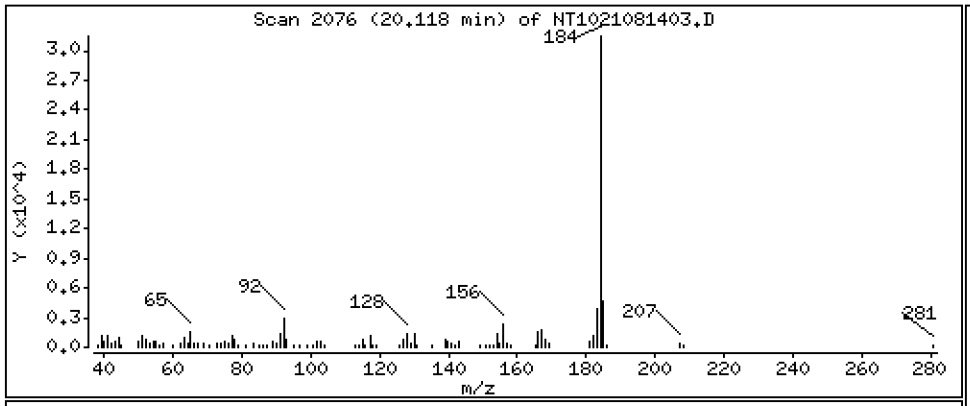
Operator: VTS

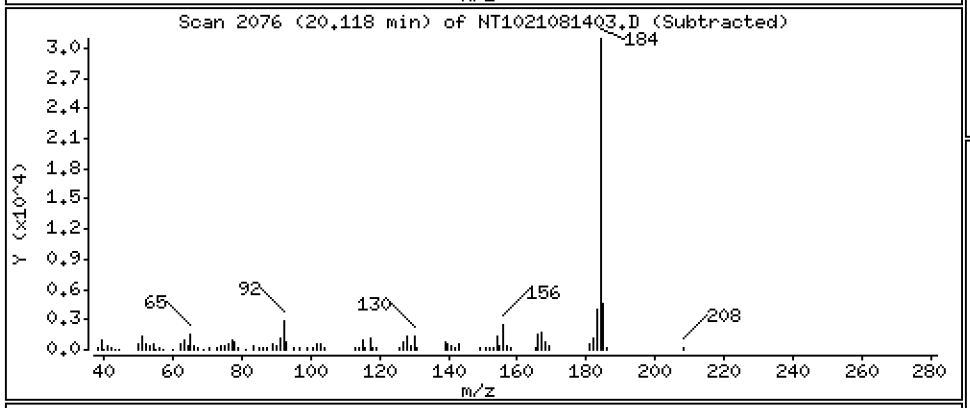
Column phase: ZB-5msi

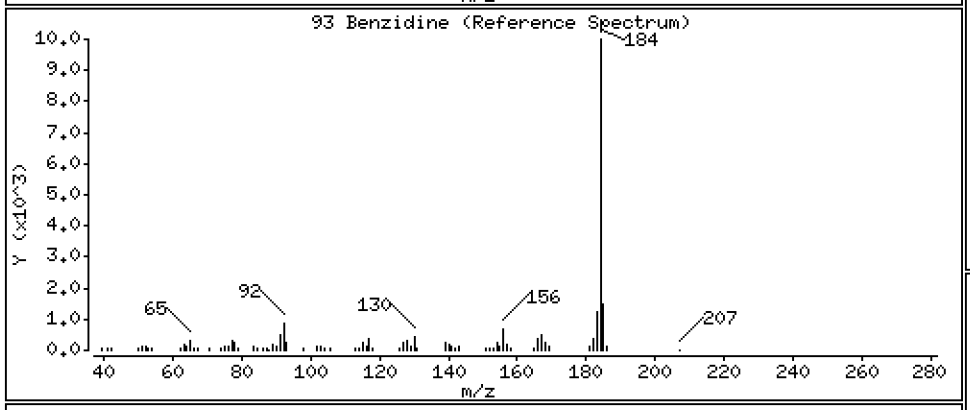
Column diameter: 0.25

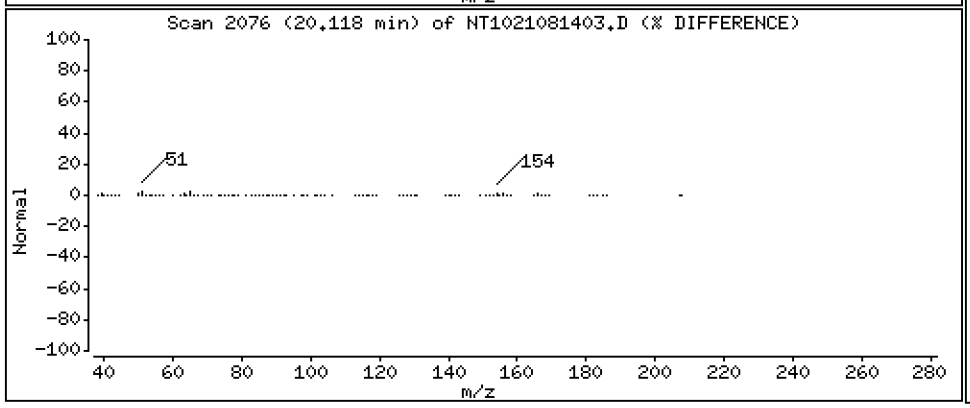
93 Benzidine

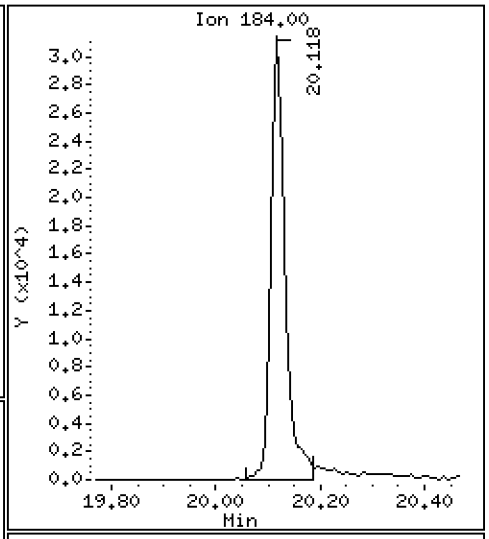
Concentration: 0.8639 ug/mL

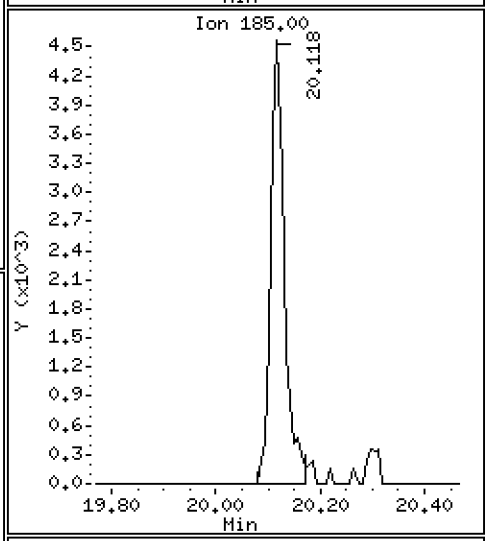


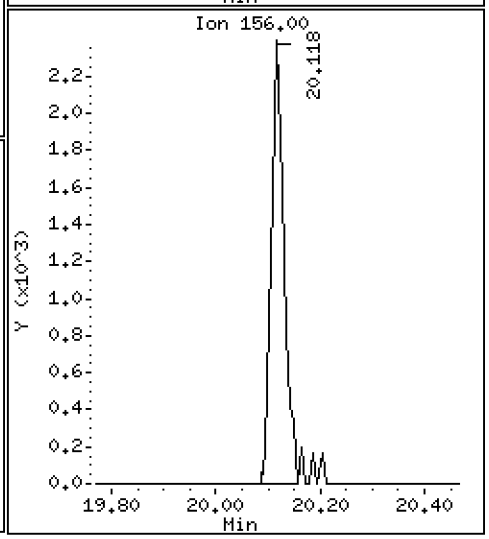












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

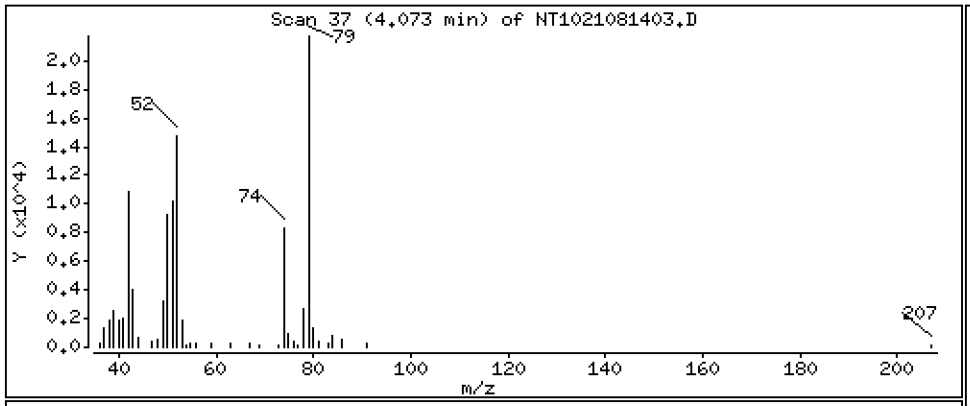
Operator: VTS

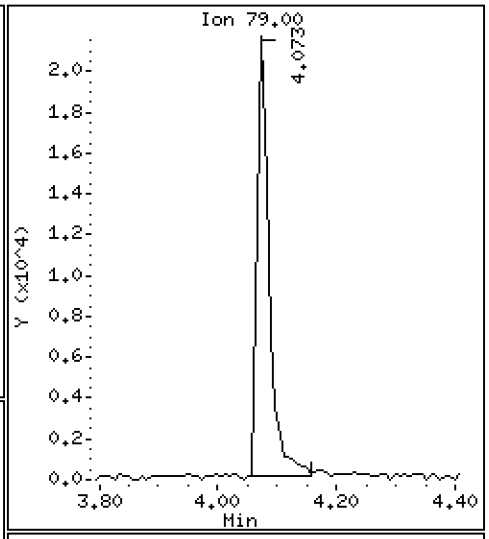
Column phase: ZB-5msi

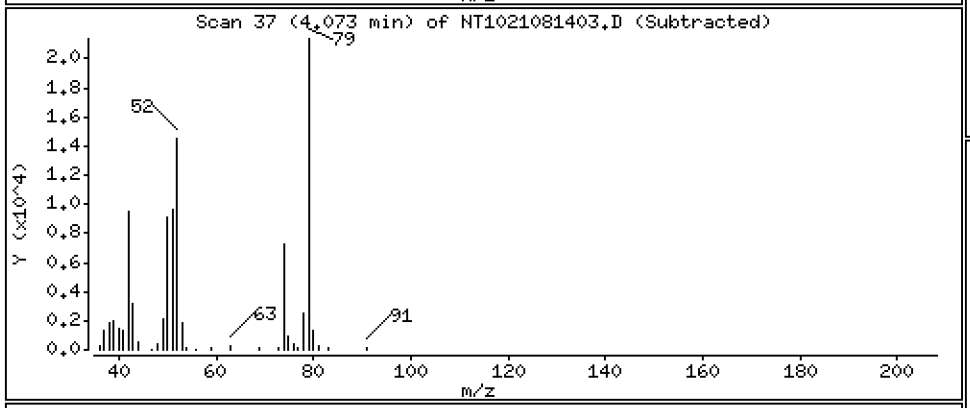
Column diameter: 0.25

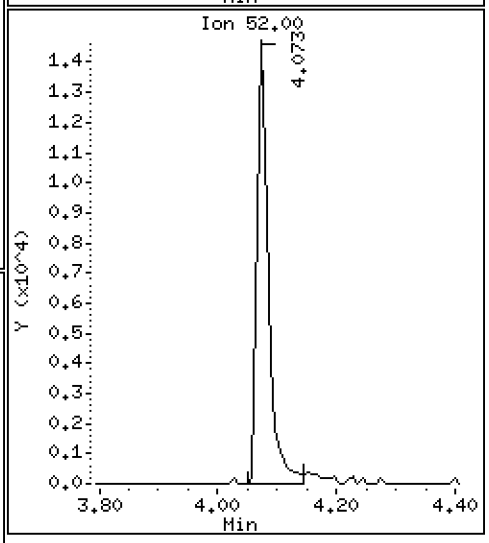
103 Pyridine

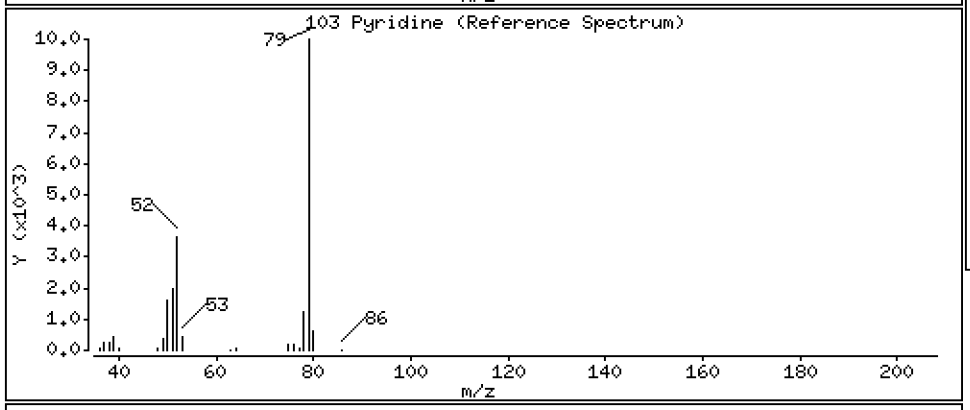
Concentration: 0.6064 ug/mL

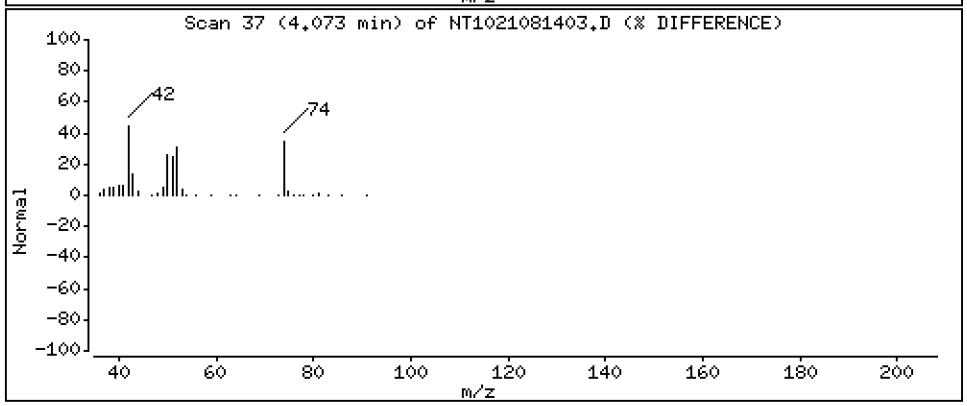












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

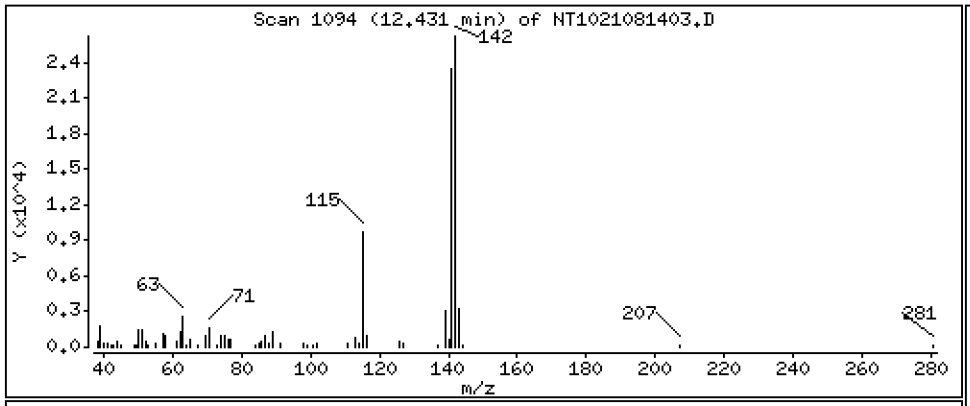
Operator: VTS

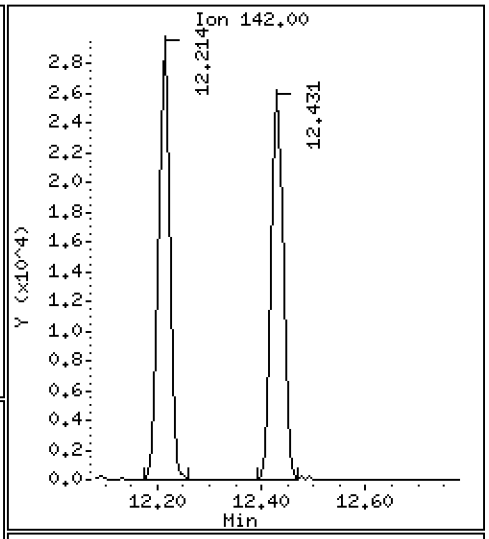
Column phase: ZB-5msi

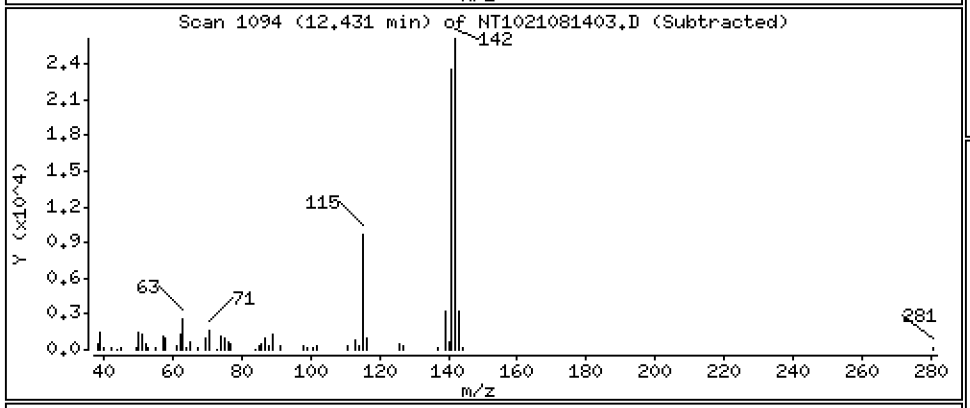
Column diameter: 0.25

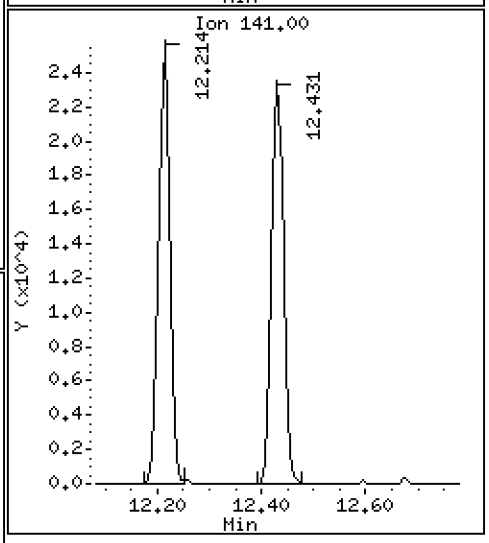
105 1-methylnaphthalene

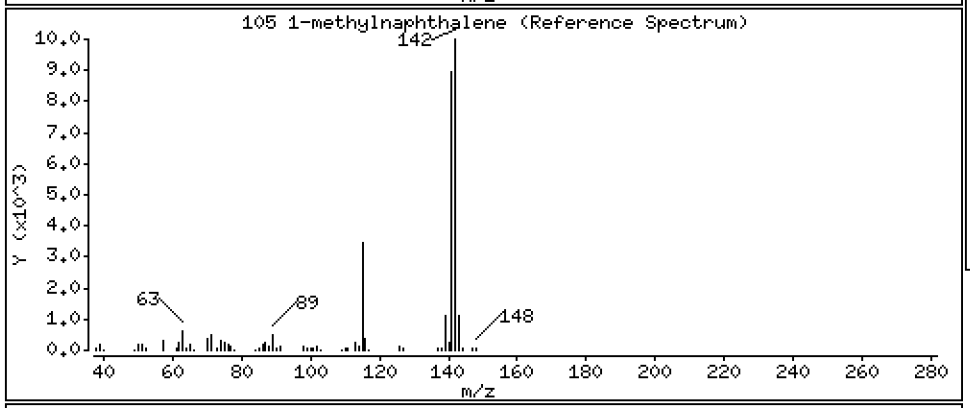
Concentration: 0.4533 ug/mL

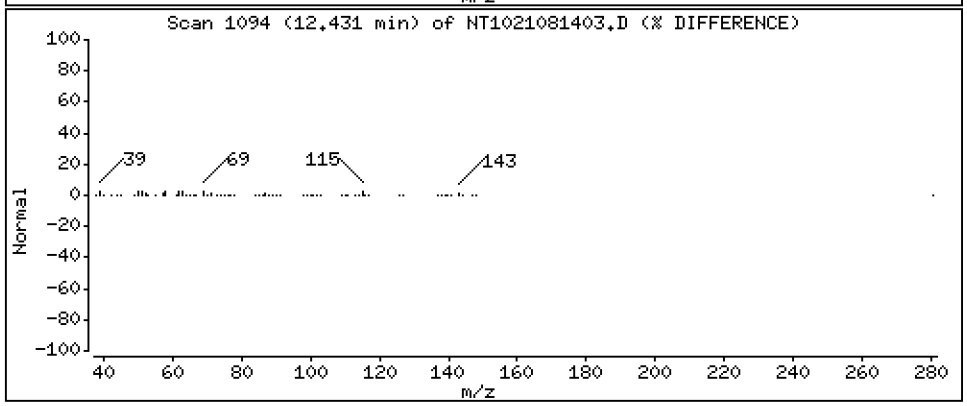












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

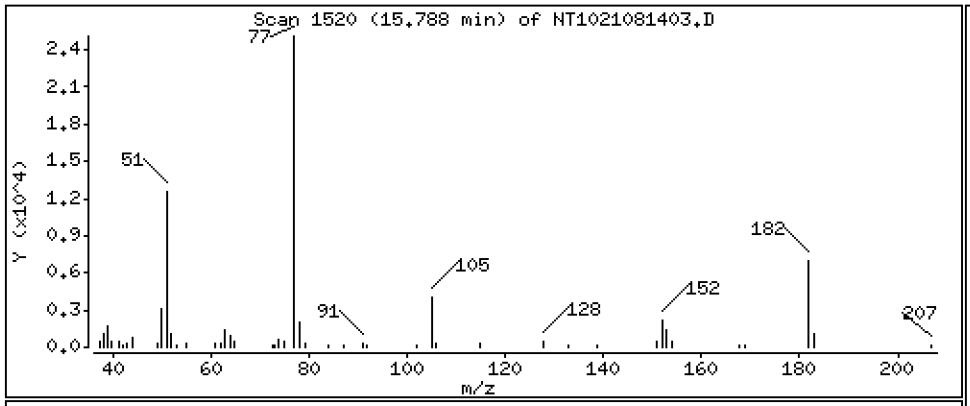
Operator: VTS

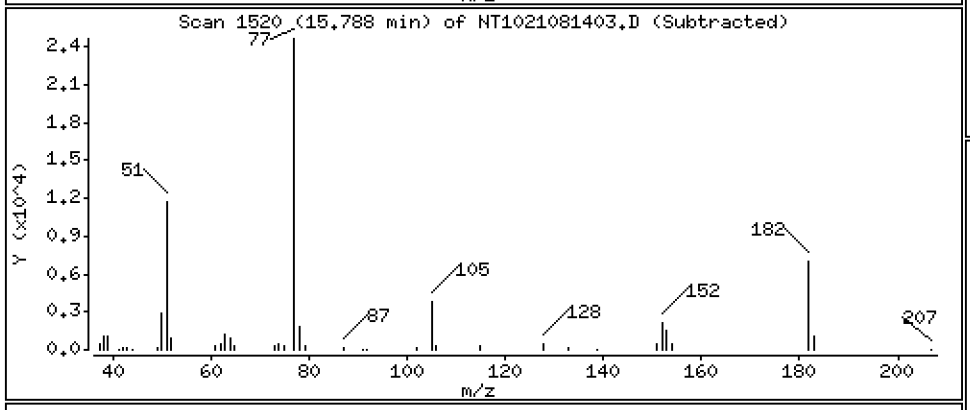
Column phase: ZB-5msi

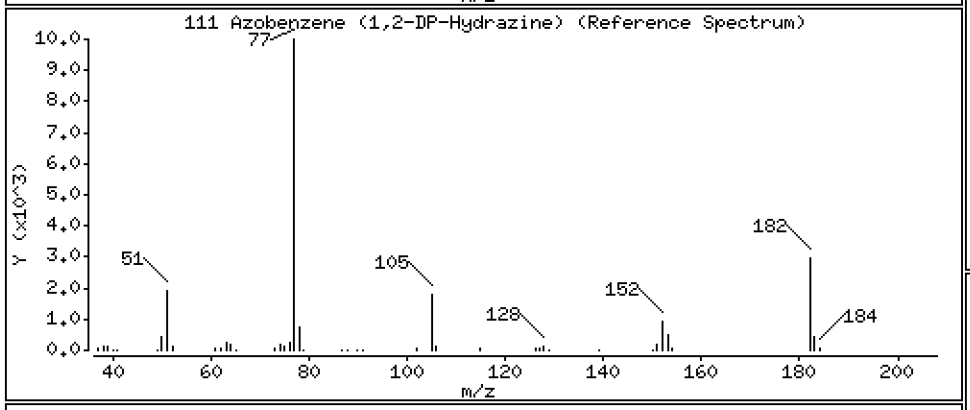
Column diameter: 0.25

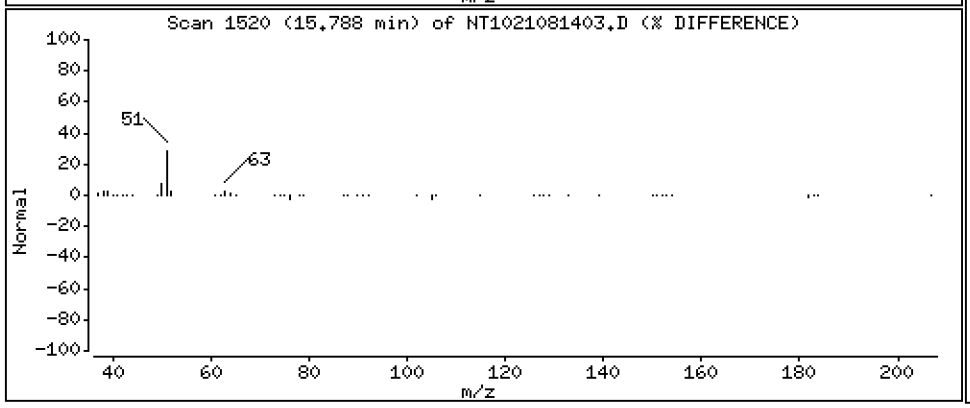
111 Azobenzene (1,2-DP-Hydrazine)

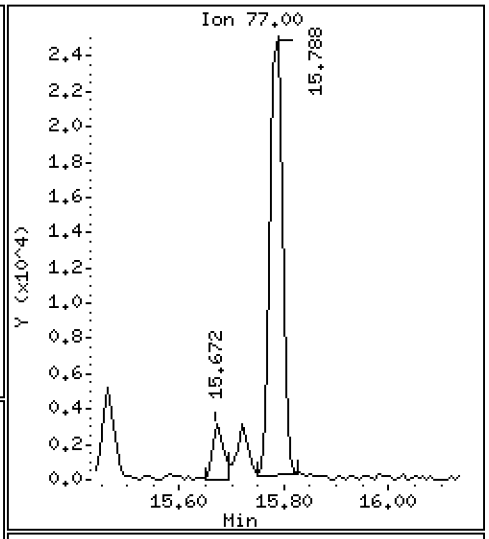
Concentration: 0.4174 ug/mL

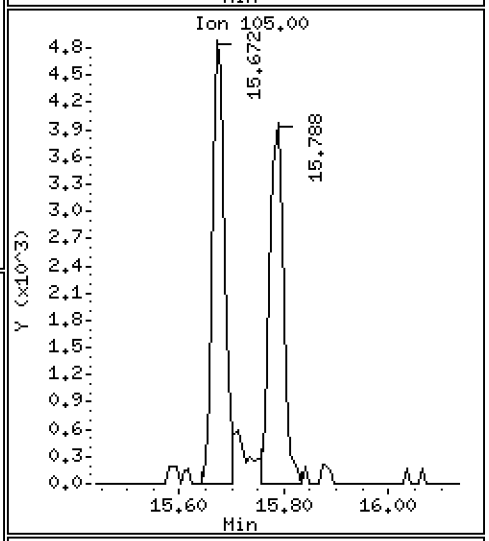


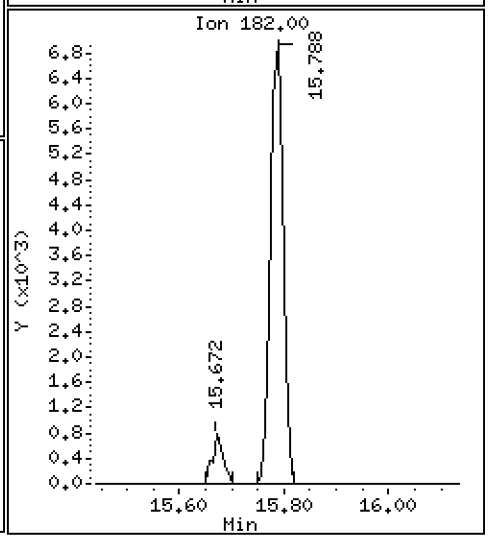












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

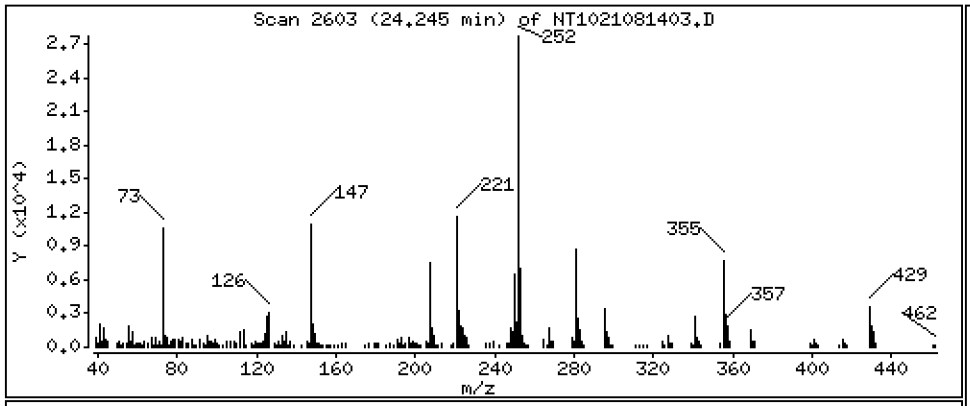
Operator: VTS

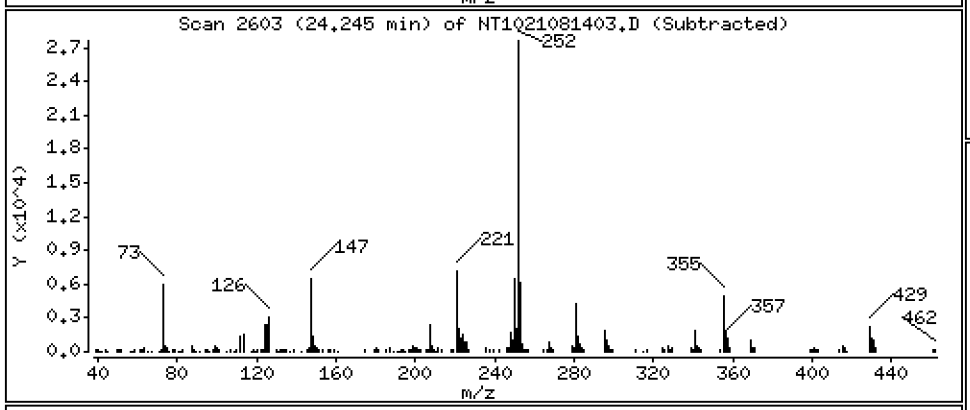
Column phase: ZB-5msi

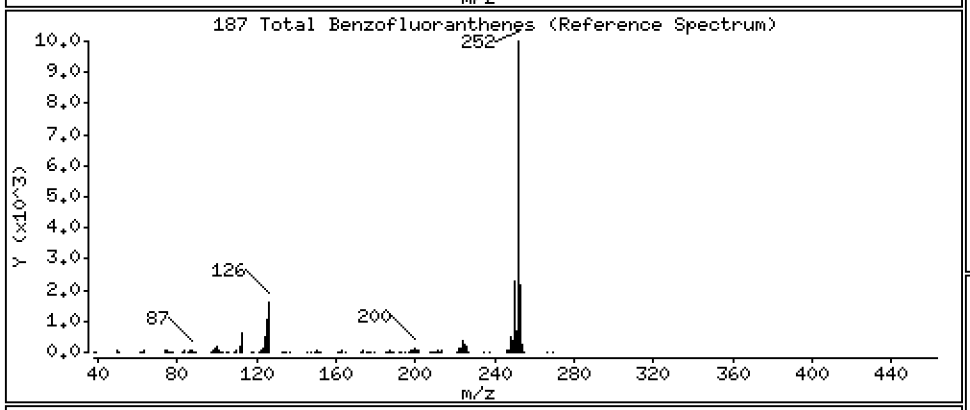
Column diameter: 0.25

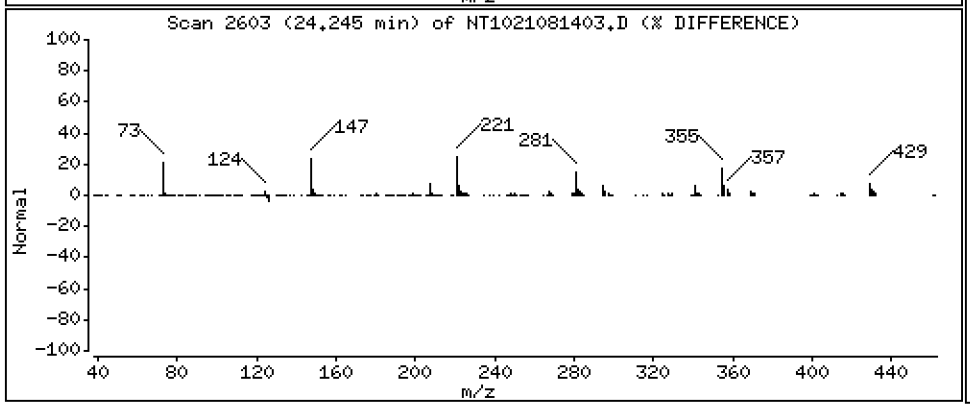
187 Total Benzofluoranthenes

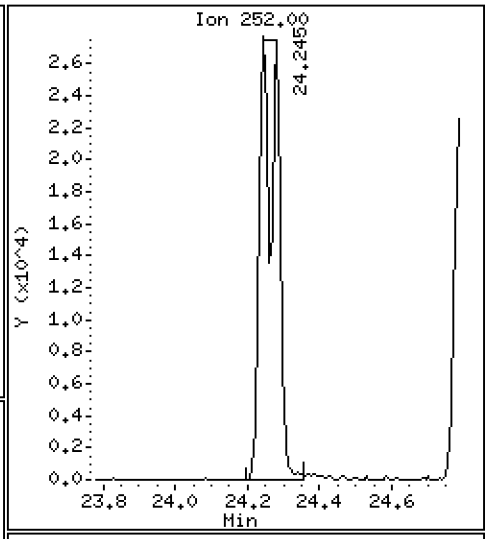
Concentration: 0.9633 ug/mL

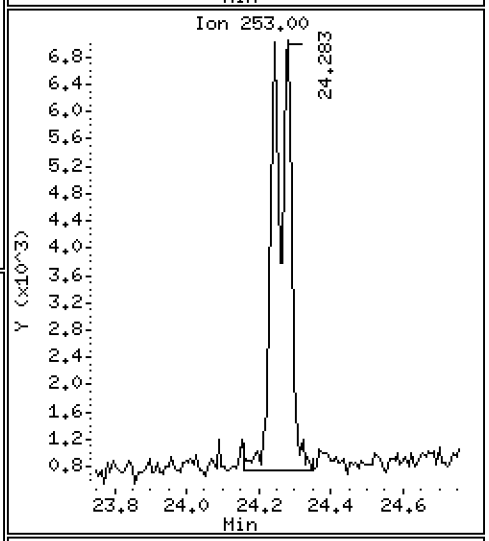


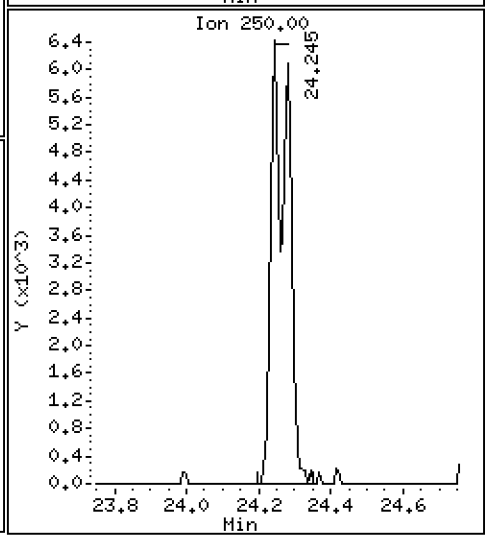












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Date : 14-AUG-2021 10:30

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV1

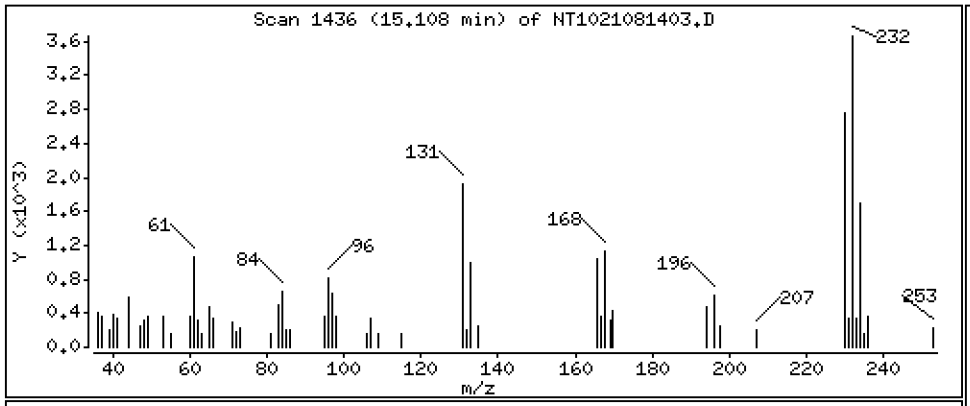
Operator: VTS

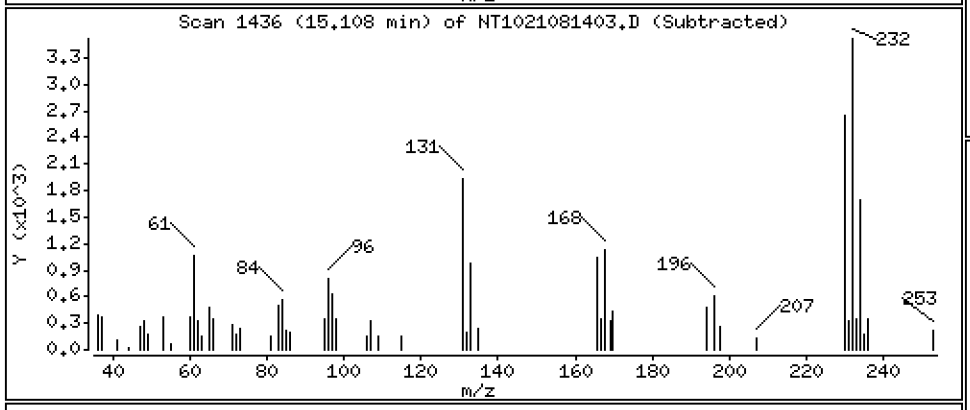
Column phase: ZB-5msi

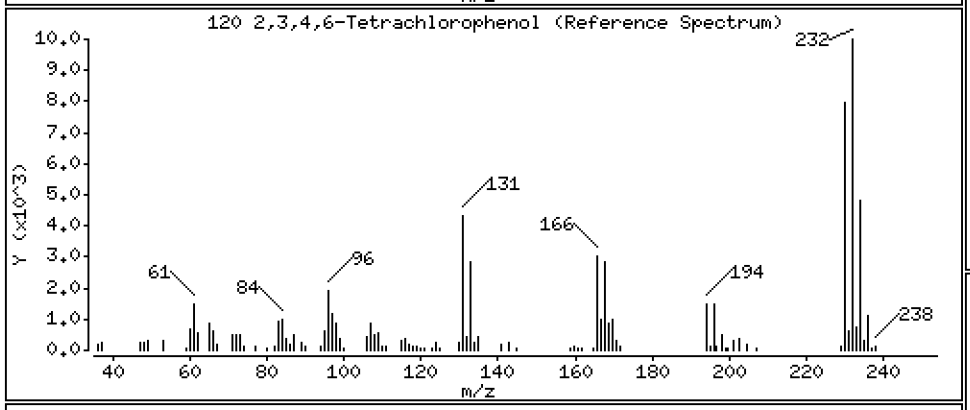
Column diameter: 0.25

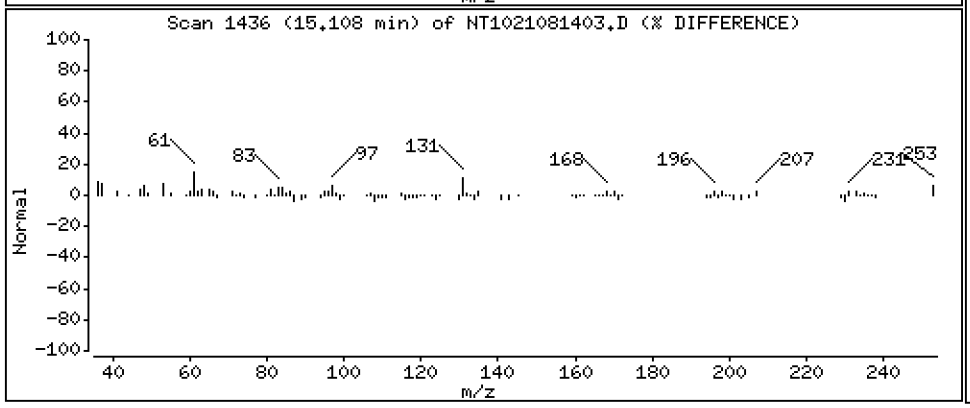
120 2,3,4,6-Tetrachlorophenol

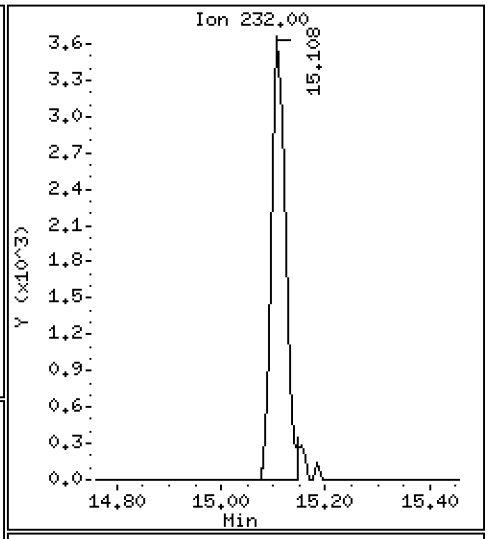
Concentration: 0.2953 ug/mL

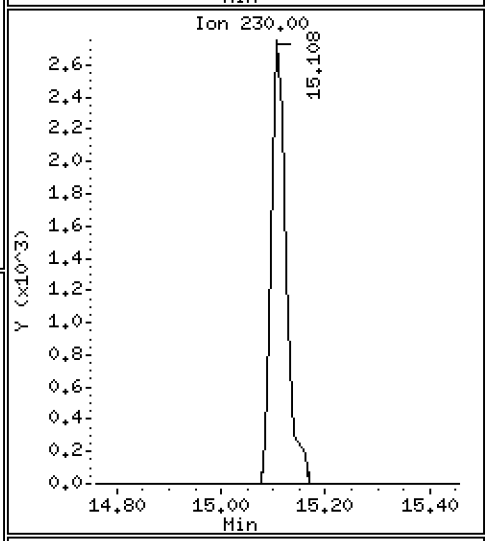


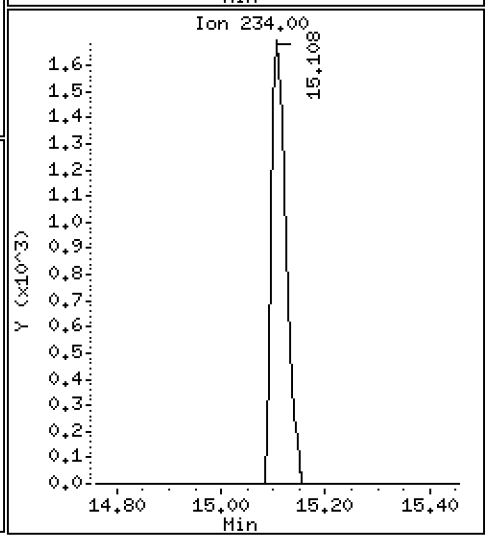












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210814.b\NT1021081403.D
Lab Smp Id: SJH0174-LCV1
Inj Date : 14-AUG-2021 10:30
Operator : VTS Inst ID: nt10.i
Smp Info : SJH0174-LCV1
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 3
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$ 1 2-Fluorophenol	112	6.211	6.204	(0.744)	33104	0.72238	0.7224
$ 2 Phenol-d5	99	7.788	7.788	(0.932)	43266	0.63609	0.6361
3 Phenol	94	7.811	7.811	(0.935)	31830	0.53535	0.5353
$ 5 2-Chlorophenol-d4	132	8.004	8.004	(0.958)	36444	0.75997	0.7600
4 Bis(2-Chloroethyl)ether	93	7.927	7.935	(0.949)	18927	0.39856	0.3986
6 2-Chlorophenol	128	8.035	8.035	(0.962)	26033	0.57846	0.5785
7 1,3-Dichlorobenzene	146	8.283	8.283	(0.992)	23932	0.48409	0.4841
* 8 1,4-Dichlorobenzene-d4	152	8.353	8.353	(1.000)	116447	4.00000	
9 1,4-Dichlorobenzene	146	8.384	8.384	(1.004)	16822	0.39853	0.3985
$ 10 1,2-Dichlorobenzene-d4	152	8.702	8.702	(1.042)	16250	0.52686	0.5269
12 1,2-Dichlorobenzene	146	8.725	8.726	(1.045)	20402	0.45694	0.4569
11 Benzyl alcohol	108	8.694	8.648	(1.041)	1317	0.04731	0.04731
14 2,2'-oxybis(1-Chloropropane)	121	8.927	8.935	(1.069)	4565	0.26651	0.2665
13 2-Methylphenol	108	8.896	8.896	(1.065)	15562	0.42050	0.4205
17 Hexachloroethane	117	9.300	9.300	(1.113)	7473	0.41187	0.4119
16 N-Nitroso-di-n-propylamine	70	9.191	9.191	(1.100)	12502	0.39159	0.3916
15 4-Methylphenol	108	9.168	9.160	(1.098)	17082	0.43012	0.4301
$ 18 Nitrobenzene-d5	82	9.439	9.440	(0.875)	23722	0.50607	0.5061
19 Nitrobenzene	77	9.470	9.471	(0.878)	19386	0.41860	0.4186
20 Isophorone	82	9.913	9.913	(0.919)	25496	0.29173	0.2917
21 2-Nitrophenol	139	10.091	10.091	(0.935)	9501	0.39410	0.3941
22 2,4-Dimethylphenol	107	10.184	10.184	(0.944)	36345	1.00036	1.000
23 Bis(2-Chloroethoxy)methane	93	10.362	10.363	(0.960)	18624	0.41054	0.4105
24 Benzoic acid	105	10.320	10.430	(0.956)	19519	0.96856	0.9686
25 2,4-Dichlorophenol	162	10.549	10.549	(0.978)	30397	1.00972	1.010
26 1,2,4-Trichlorobenzene	180	10.713	10.714	(0.993)	18410	0.54090	0.5409
* 27 Naphthalene-d8	136	10.791	10.791	(1.000)	382181	4.00000	
28 Naphthalene	128	10.829	10.837	(1.004)	44924	0.44416	0.4442
29 4-Chloroaniline	127	10.991	10.992	(1.019)	35763	0.71009	0.7101
30 Hexachlorobutadiene	225	11.192	11.192	(1.037)	10568	0.56868	0.5687
31 4-Chloro-3-methylphenol	107	11.982	11.982	(1.110)	29996	0.83458	0.8346
32 2-Methylnaphthalene	142	12.214	12.214	(1.132)	43211	0.46175	0.4617
33 Hexachlorocyclopentadiene	237	12.670	12.671	(0.882)	2400	0.10863	0.1086

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	12.848	12.849	(0.895)	21082	0.91606	0.9161
	35 2,4,5-Trichlorophenol	196	12.934	12.926	(0.901)	21283	0.86793	0.8679
$	36 2-Fluorobiphenyl	172	13.003	13.003	(0.906)	50850	0.52862	0.5286
	37 2-Chloronaphthalene	162	13.189	13.189	(0.919)	34626	0.43084	0.4308
	38 2-Nitroaniline	65	13.475	13.483	(0.939)	25128	0.83427	0.8343
	39 Dimethylphthalate	163	13.916	13.917	(0.969)	39499	0.50812	0.5081
	40 Acenaphthylene	152	14.048	14.048	(0.978)	58831	0.51471	0.5147
	41 2,6-Dinitrotoluene	165	14.048	14.048	(0.978)	16140	0.91573	0.9157
*	42 Acenaphthene-d10	164	14.358	14.358	(1.000)	209472	4.00000	
	43 3-Nitroaniline	138	14.327	14.335	(0.998)	18560	0.84989	0.8499
	44 Acenaphthene	153	14.427	14.427	(1.005)	28401	0.42799	0.4280
	45 2,4-Dinitrophenol	184	14.551	14.543	(1.013)	3166	0.31707	0.3171
	46 Dibenzofuran	168	14.752	14.752	(1.027)	49083	0.47841	0.4784
	47 4-Nitrophenol	109	14.721	14.713	(1.025)	5907	0.70619	0.7062(M)
	48 2,4-Dinitrotoluene	165	14.845	14.853	(1.034)	19863	0.84364	0.8436
	50 Diethylphthalate	149	15.363	15.363	(1.070)	34250	0.46470	0.4647
	49 Fluorene	166	15.456	15.456	(1.076)	45935	0.46183	0.4618
	51 4-Chlorophenyl-phenylether	204	15.463	15.463	(1.077)	18076	0.31264	0.3126
	52 4-Nitroaniline	138	15.587	15.587	(1.086)	20566	0.88646	0.8865
	53 4,6-Dinitro-2-methylphenol	198	15.672	15.680	(0.903)	20965	1.18747	1.187
	54 N-Nitrosodiphenylamine	169	15.726	15.726	(0.906)	33963	0.49124	0.4912
$	55 2,4,6-Tribromophenol	330	15.995	15.996	(1.114)	14195	0.81832	0.8183
	56 4-Bromophenyl-phenylether	248	16.458	16.458	(0.948)	14953	0.42501	0.4250
	57 Hexachlorobenzene	284	16.752	16.752	(0.965)	20215	0.54673	0.5467
	58 Pentachlorophenol	266	17.139	17.132	(0.987)	2870	0.19169	0.1917
*	59 Phenanthrene-d10	188	17.363	17.364	(1.000)	385291	4.00000	
	60 Phenanthrene	178	17.418	17.418	(1.003)	47568	0.45654	0.4565
	61 Anthracene	178	17.503	17.503	(1.008)	48485	0.43516	0.4352
	62 Carbazole	167	17.859	17.859	(1.029)	48061	0.43694	0.4369
	63 Di-n-butylphthalate	149	18.710	18.710	(1.078)	56910	0.33977	0.3398
	64 Fluoranthene	202	19.832	19.839	(0.882)	67363	0.46707	0.4671
	65 Pyrene	202	20.265	20.265	(0.901)	70134	0.44115	0.4411
$	66 Terphenyl-d14	244	20.590	20.590	(0.915)	69187	0.61060	0.6106
	67 Butylbenzylphthalate	149	21.558	21.558	(0.958)	26170	0.50045	0.5004
	68 Benzo(a)anthracene	228	22.464	22.464	(0.999)	65674	0.50853	0.5085
*	69 Chrysene-d12	240	22.495	22.495	(1.000)	346086	4.00000	
	70 3,3'-Dichlorobenzidine	252	22.448	22.456	(0.998)	83587	1.61111	1.611
	71 Chrysene	228	22.533	22.541	(1.002)	44203	0.44395	0.4439
	72 bis(2-Ethylhexyl)phthalate	149	22.618	22.619	(0.958)	27012	0.60614	0.6061
*	134 Di-n-octylphthalate-d4	153	23.602	23.610	(1.000)	405063	4.00000	
	73 Di-n-octylphthalate	149	23.617	23.617	(1.001)	48914	0.43088	0.4309
	74 Benzo(b)fluoranthene	252	24.244	24.252	(0.974)	47550	0.47460	0.4746
	75 Benzo(k)fluoranthene	252	24.283	24.283	(0.976)	50500	0.50885	0.5089
	76 Benzo(a)pyrene	252	24.786	24.786	(0.996)	42218	0.46625	0.4663
*	77 Perylene-d12	264	24.879	24.887	(1.000)	254250	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.049	27.057	(1.087)	50520	0.49298	0.4930
	79 Dibenzo(a,h)anthracene	278	27.064	27.072	(1.088)	42199	0.52426	0.5243
	80 Benzo(g,h,i)perylene	276	27.678	27.686	(1.112)	41273	0.45132	0.4513
	90 N-Nitrosodimethylamine	74	4.065	4.065	(0.487)	17433	0.55605	0.5561
	91 Aniline	93	7.834	7.834	(0.938)	57507	0.92911	0.9291
	93 Benzidine	184	20.118	20.118	(0.894)	56981	0.86389	0.8639
	103 Pyridine	79	4.073	4.057	(0.488)	29905	0.60635	0.6064
	105 1-methylnaphthalene	142	12.430	12.431	(1.152)	39802	0.45331	0.4533
	111 Azobenzene (1,2-DP-Hydrazine)	77	15.787	15.788	(1.100)	39222	0.41736	0.4174

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.244	24.283	(0.974)	92680	0.96330	0.9633
120 2,3,4,6-Tetrachlorophenol	232	15.107	15.108	(1.052)	6513	0.29529	0.2953

QC Flag Legend

M - Compound response manually integrated.

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081403.D
Lab Smp Id: SJH0174-LCV1
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	116447	36.90
27 Naphthalene-d8	291658	145829	583316	382181	31.04
42 Acenaphthene-d10	163642	81821	327284	209472	28.01
59 Phenanthrene-d10	304099	152050	608198	385291	26.70
69 Chrysene-d12	199453	99727	398906	346086	73.52
134 Di-n-octylphthala	303639	151820	607278	405063	33.40
77 Perylene-d12	200082	100041	400164	254250	27.07

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.35	-0.00
27 Naphthalene-d8	10.79	10.29	11.29	10.79	-0.00
42 Acenaphthene-d10	14.36	13.86	14.86	14.36	-0.00
59 Phenanthrene-d10	17.36	16.86	17.86	17.36	-0.00
69 Chrysene-d12	22.50	22.00	23.00	22.50	-0.00
134 Di-n-octylphthala	23.61	23.11	24.11	23.60	-0.03
77 Perylene-d12	24.89	24.39	25.39	24.88	-0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081403.D

Lab ID: SJH0174-LCV1
nt10.i, ABN.m, 14-AUG-2021 10:30

RT	CO-ELUTION COMPOUNDS
14.049	Acenaphthylene and 2,6-Dinitrotoluene

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
1.041	1.035	0.0056	Benzyl alcohol
0.956	0.967	-0.0102	Benzoic acid

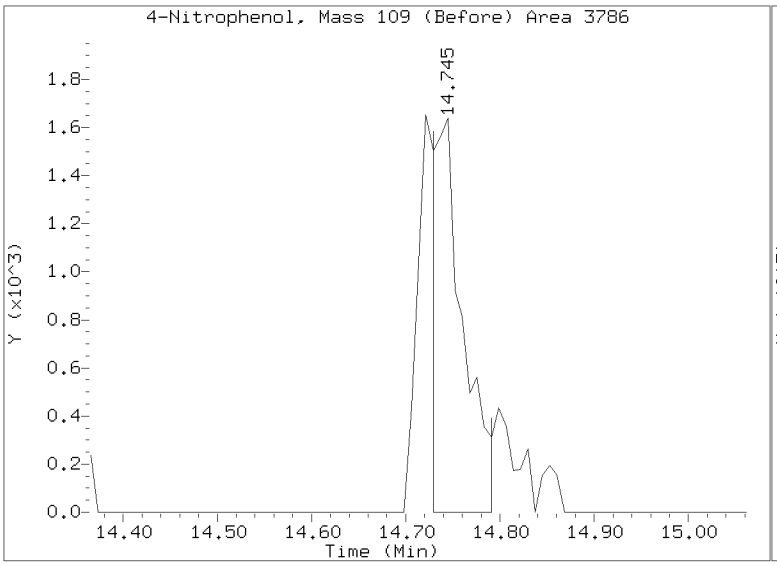
RRT check based on Ccal File: NT1021081402.D

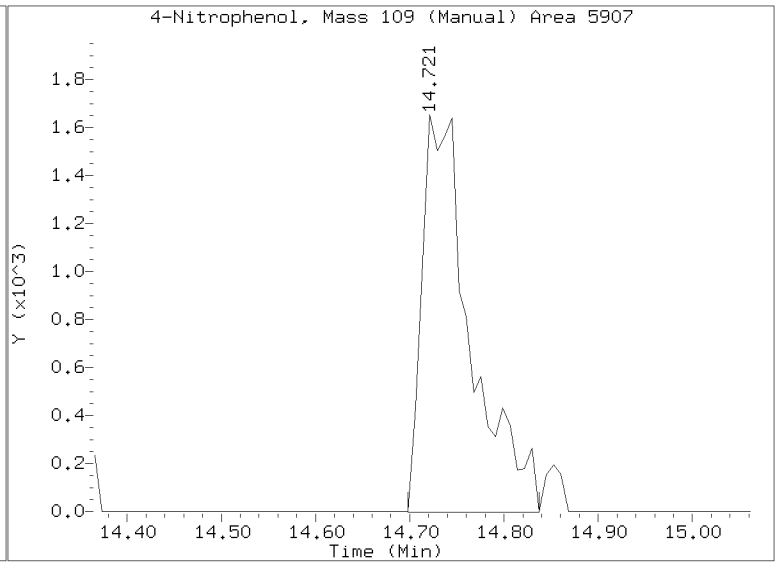
On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

* Only compounds listed in the work order have been verified by the analyst *

Quant Ion Manual Peak Adjustment Report

Datafile: //target/share/chem3/nt10.i/20210814.b/NT1021081403.D
Injection Date: 14-AUG-2021 10:30
Lab ID:SJH0174-LCV1 Client ID:
Report Date: 08/16/2021 09:23





Analytical Resources, Incorporated
Analytical Chemists and Consultants

LOW-CONCENTRATION CONTINUING CALIBRATION CHECK

EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	NT10	Calibration:	EG00057
Lab File ID:	NT1021081404.D	Calibration Date:	07/20/2021
Sequence:	SJH0174	Injection Date:	08/14/21
Lab Sample ID:	SJH0174-LCV2	Injection Time:	11:09
Sequence Name:	ABN 0.2		

COMPOUND	TYPE	CONC. (ug/mL)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Naphthalene	A	0.20000	0.2	1.0586070	0.9162245		-13.5	+/-50
2-Methylnaphthalene	A	0.20000	0.2	0.9794463	0.7840325		-20.0	+/-50
Acenaphthylene	A	0.20000	0.2	2.1826050	2.1170200		-3.0	+/-50
Acenaphthene	A	0.20000	0.2	1.2671560	1.0797520		-14.8	+/-50
Fluorene	A	0.20000	0.1	1.8993190	1.3988130		-26.4	+/-50
Phenanthrene	A	0.20000	0.2	1.0817070	0.9546677		-11.7	+/-50
Anthracene	A	0.20000	0.2	1.1567290	0.9252818		-20.0	+/-50
Fluoranthene	A	0.20000	0.2	1.6669060	1.4168730		-15.0	+/-50
Pyrene	A	0.20000	0.2	1.8374700	1.4496600		-21.1	+/-50
Butylbenzylphthalate	A	0.20000	0.2	0.6043970	0.6044884		0.02	+/-50
Benzo(a)anthracene	A	0.20000	0.2	1.4926470	1.5462900		3.6	+/-50
Chrysene	A	0.20000	0.2	1.1507940	1.0079530		-12.4	+/-50
Benzofluoranthenes, Total	A	0.40000	0.4	1.5136370	1.4487400		-4.3	+/-50
Benzo(a)pyrene	A	0.20000	0.2	1.4245480	1.3622220		-4.4	+/-50
Indeno(1,2,3-cd)pyrene	A	0.20000	0.2	1.6122550	1.4740920		-8.6	+/-50
Dibenzo(a,h)anthracene	A	0.20000	0.2	1.2663450	1.2633630		-0.2	+/-50
Benzo(g,h,i)perylene	A	0.20000	0.2	1.4387340	1.3215110		-8.2	+/-50
1,2-Dichlorobenzene-d4	A	0.20000	0.206	1.0594750	1.0895410		2.8	+/-50
Nitrobenzene-d5	A	0.20000	0.178	0.4906029	0.4367738		-11.0	+/-50
2-Fluorobiphenyl	A	0.20000	0.203	1.8368740	1.8600590		1.3	+/-50
p-Terphenyl-d14	A	0.20000	0.243	1.3096240	1.5914580		21.5	+/-50

* Values outside of QC limits

Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

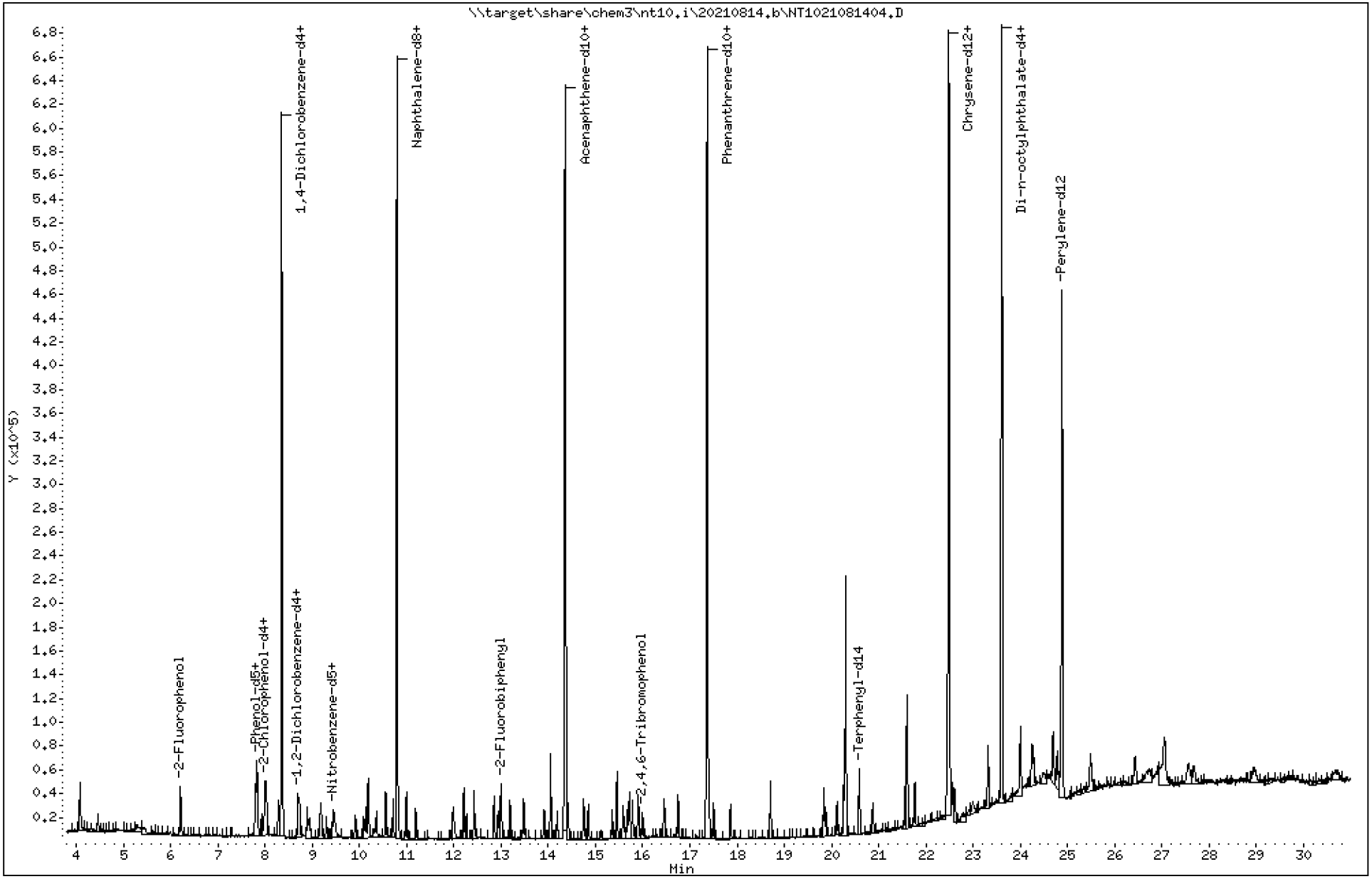
Instrument: nt10.i

Sample Info: SJH0174-LCV2

Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25



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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

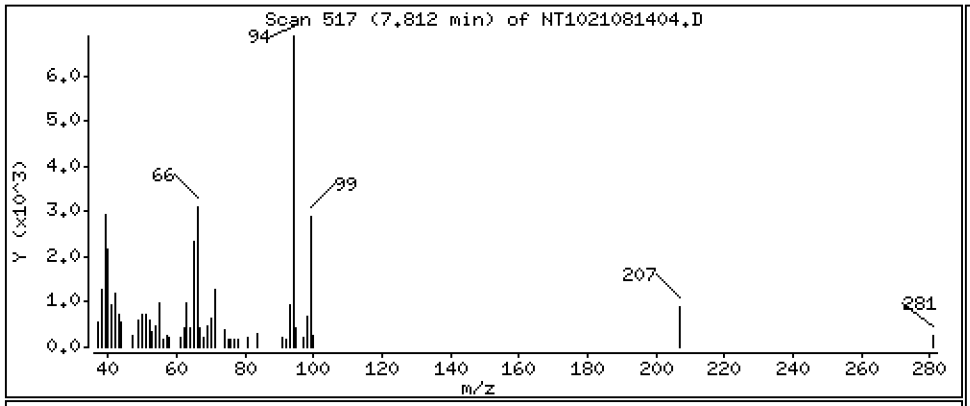
Operator: VTS

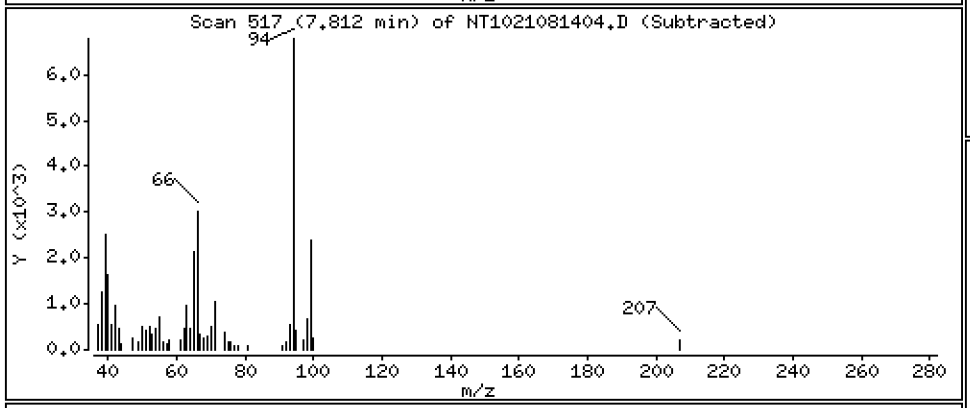
Column phase: ZB-5msi

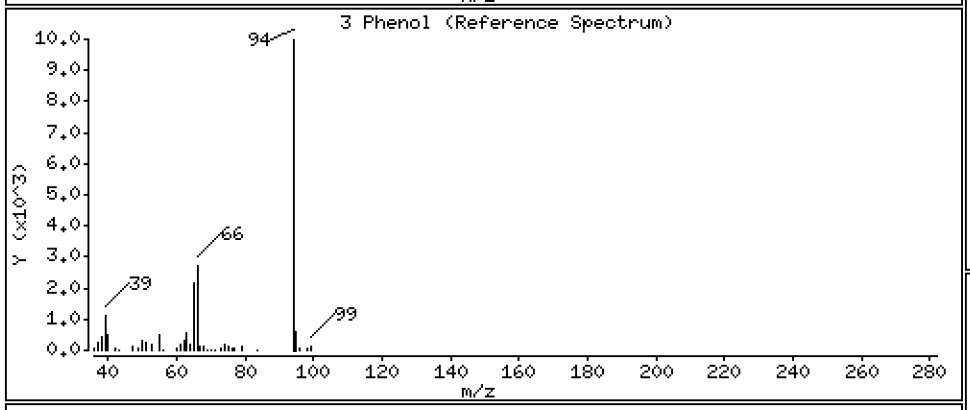
Column diameter: 0.25

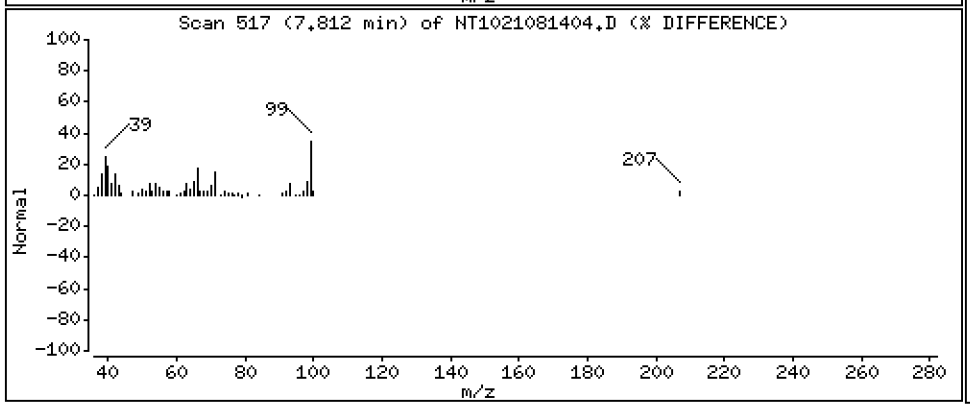
3 Phenol

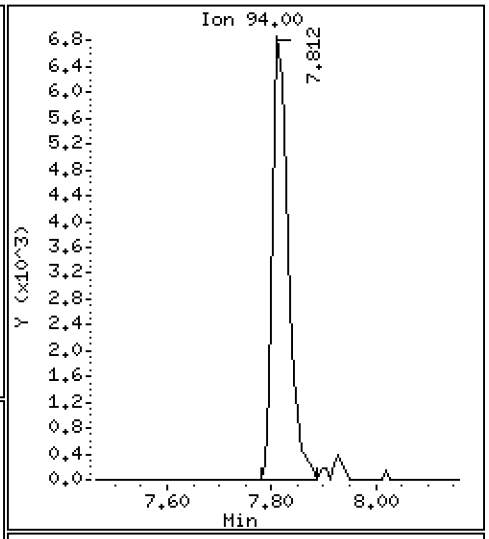
Concentration: 0.2023 ug/mL

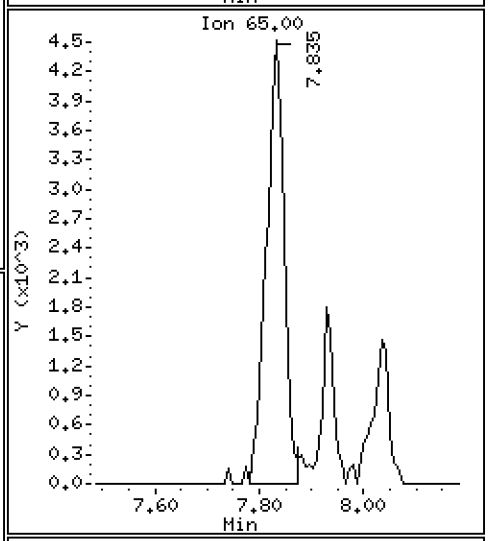


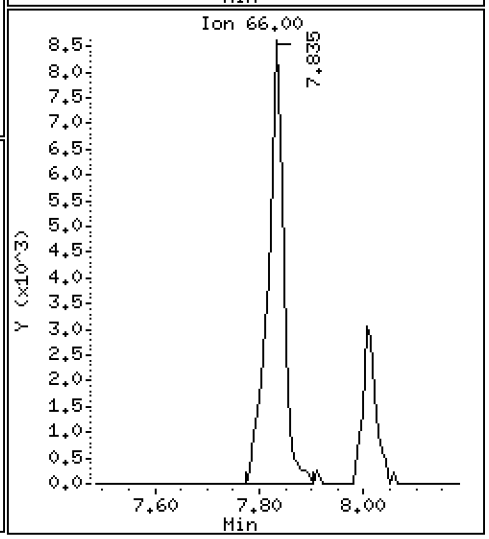












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

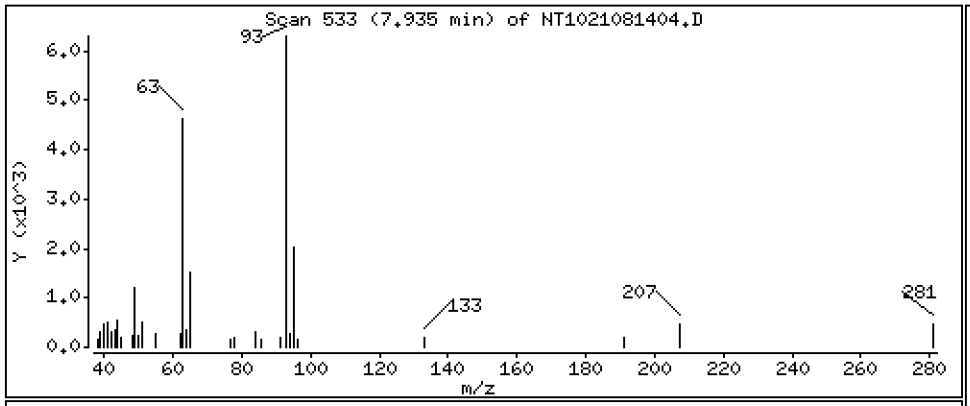
Operator: VTS

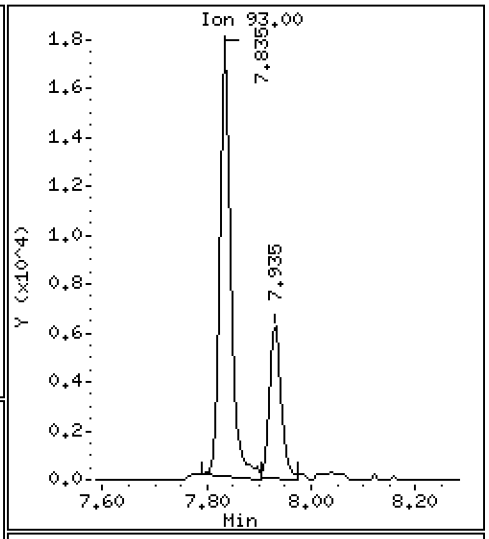
Column phase: ZB-5msi

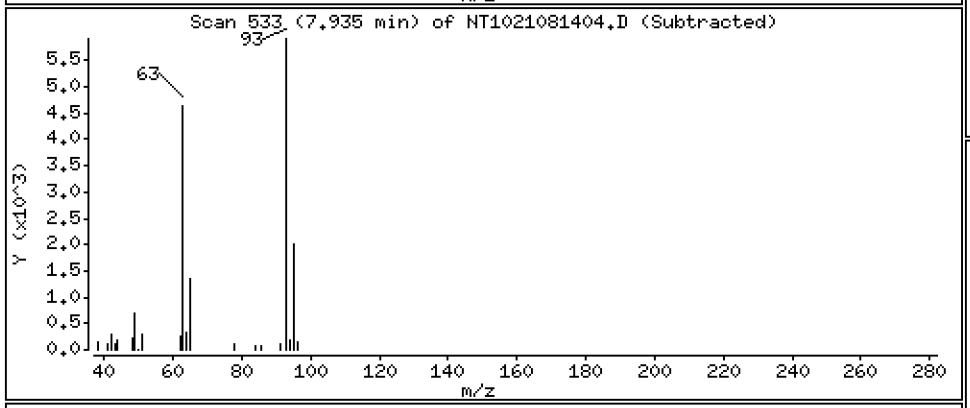
Column diameter: 0.25

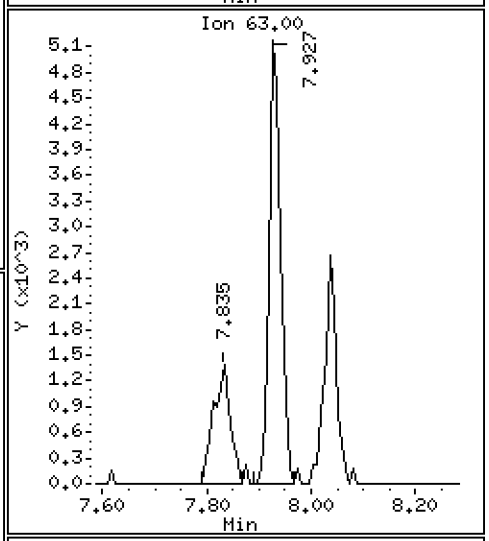
4 Bis(2-Chloroethyl)ether

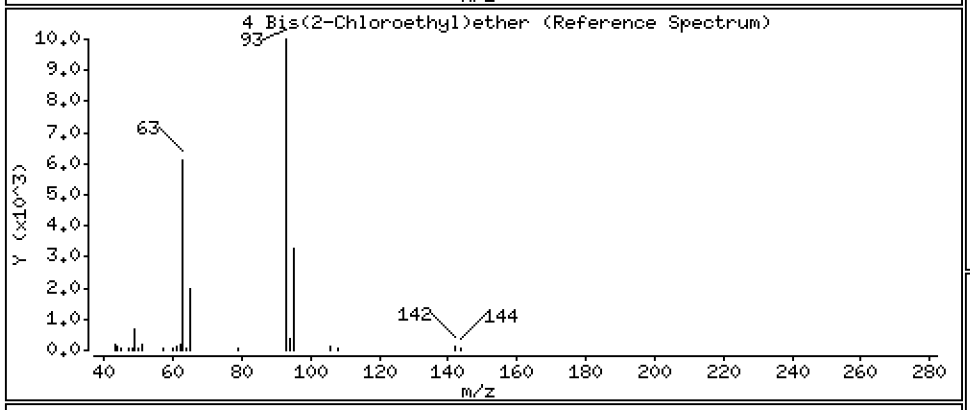
Concentration: 0.1816 ug/mL

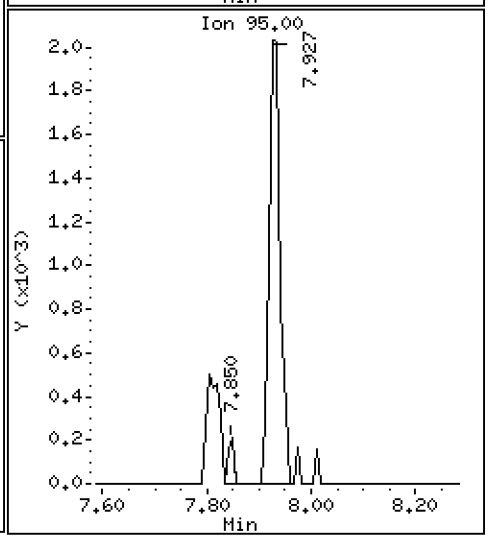


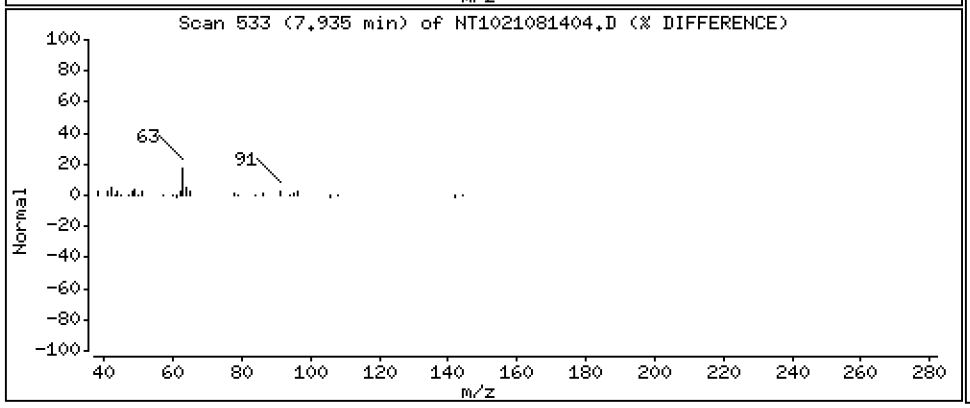












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

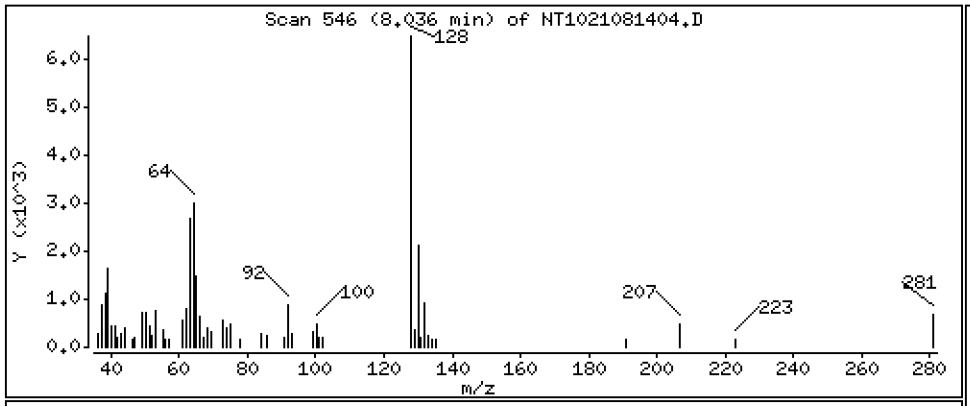
Operator: VTS

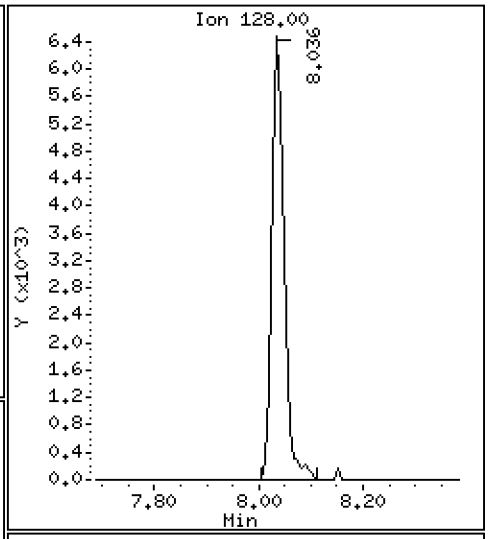
Column phase: ZB-5msi

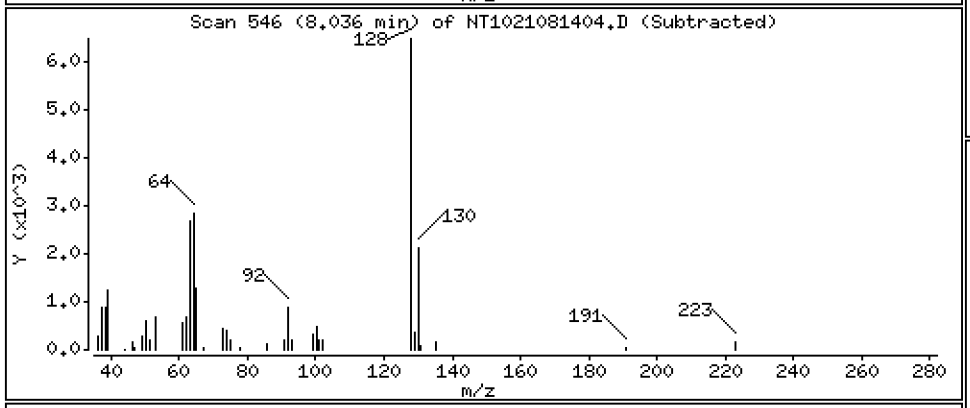
Column diameter: 0.25

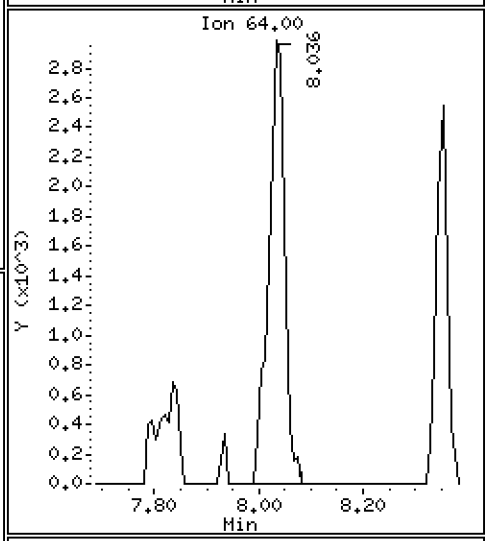
6 2-Chlorophenol

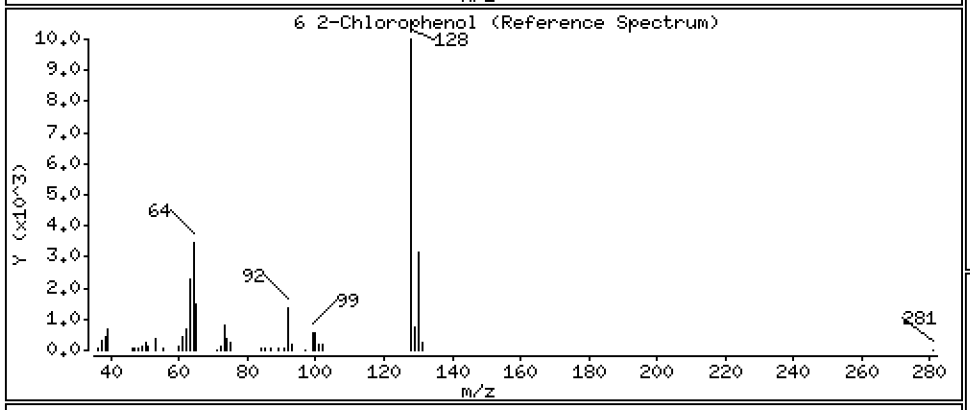
Concentration: 0.2287 ug/mL

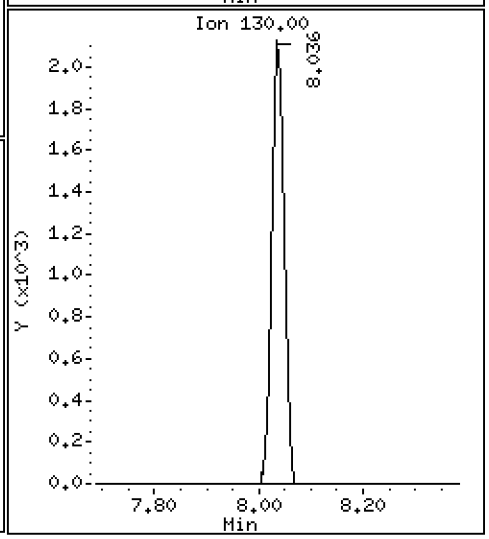


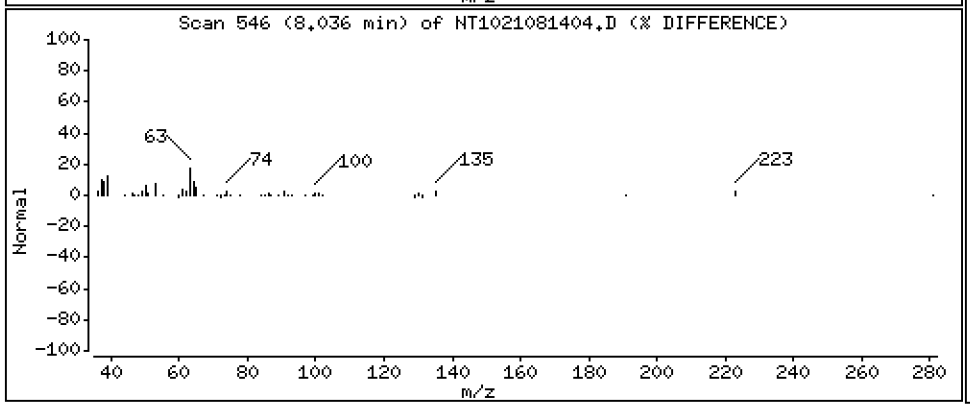












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

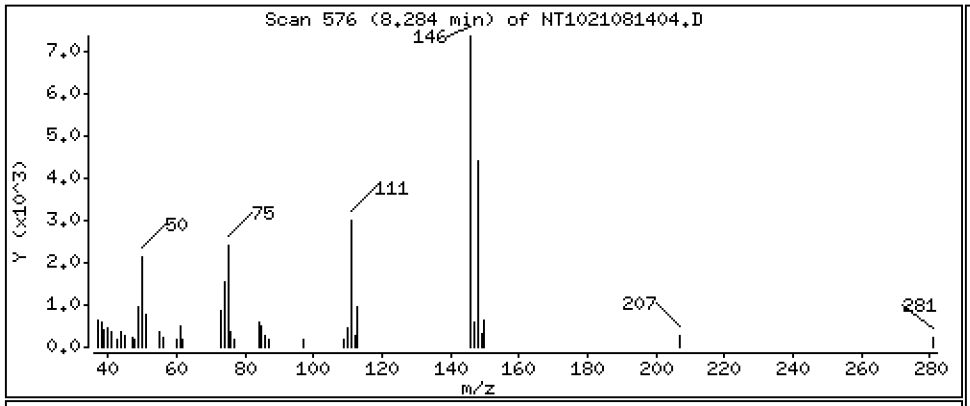
Operator: VTS

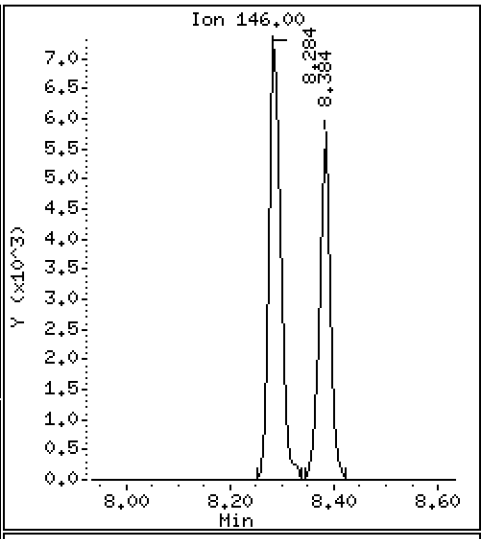
Column phase: ZB-5msi

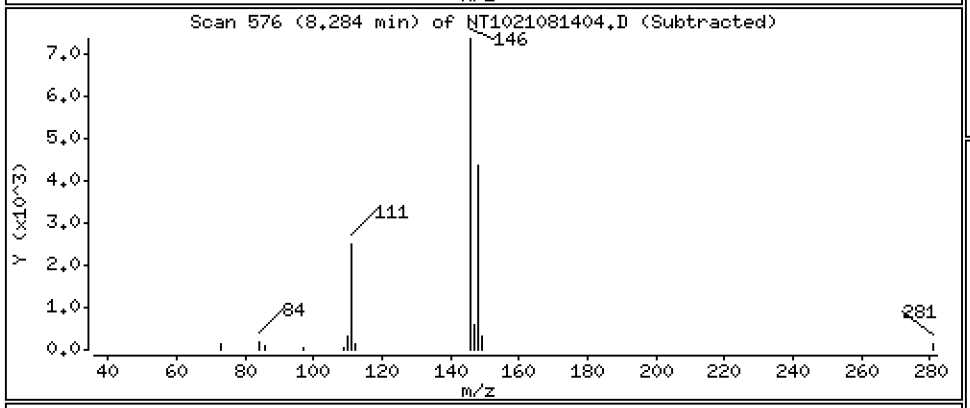
Column diameter: 0.25

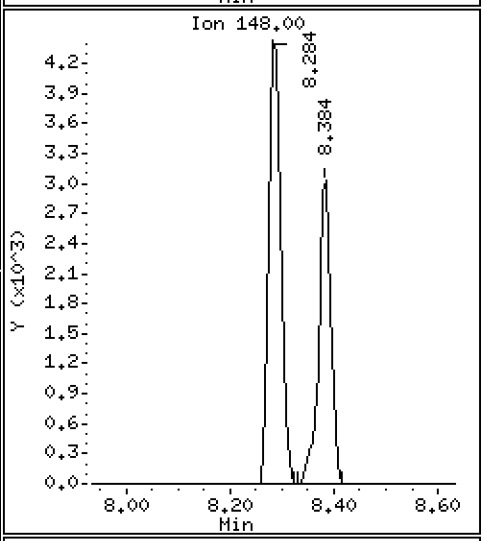
7 1,3-Dichlorobenzene

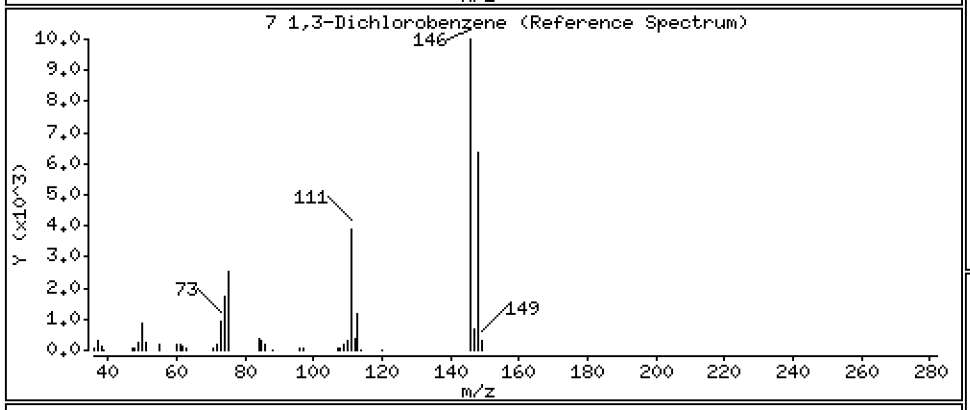
Concentration: 0.1923 ug/mL

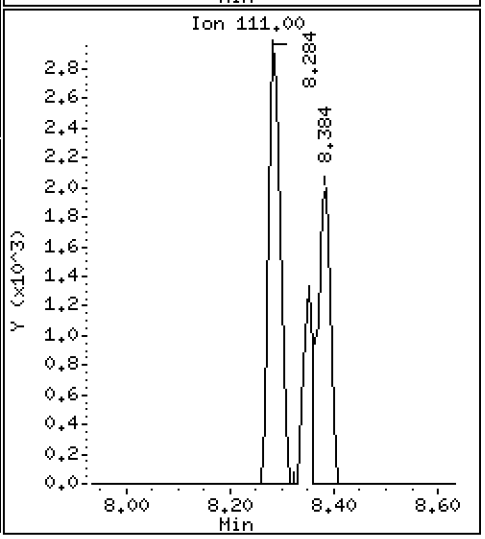


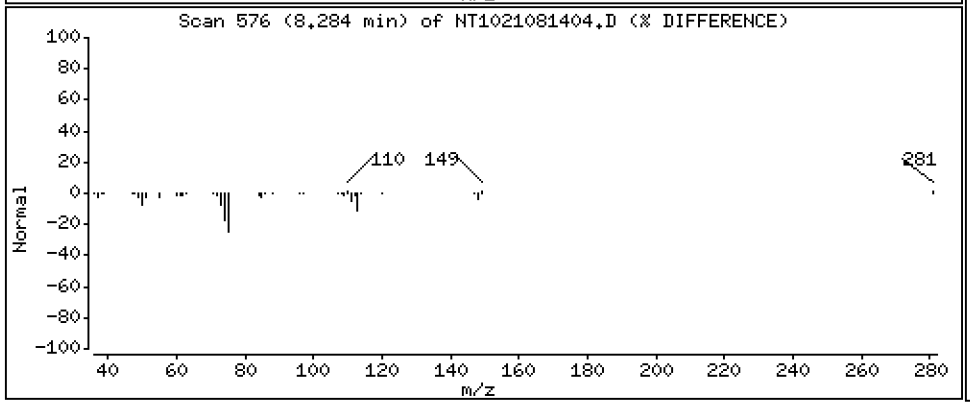












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

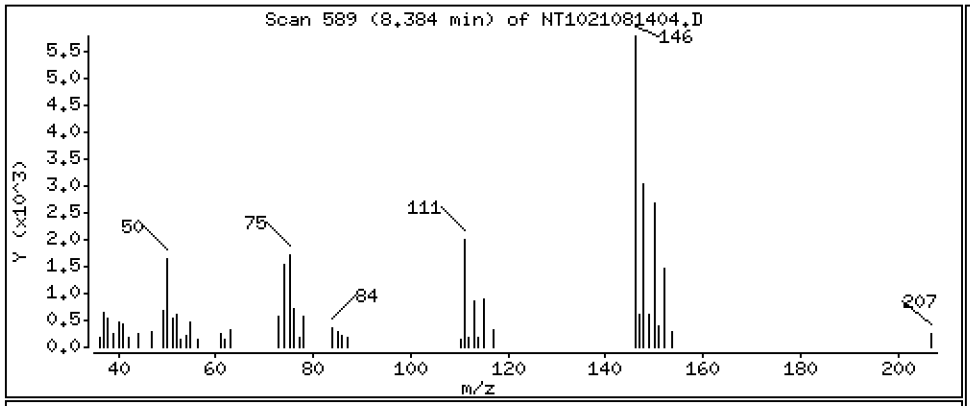
Operator: VTS

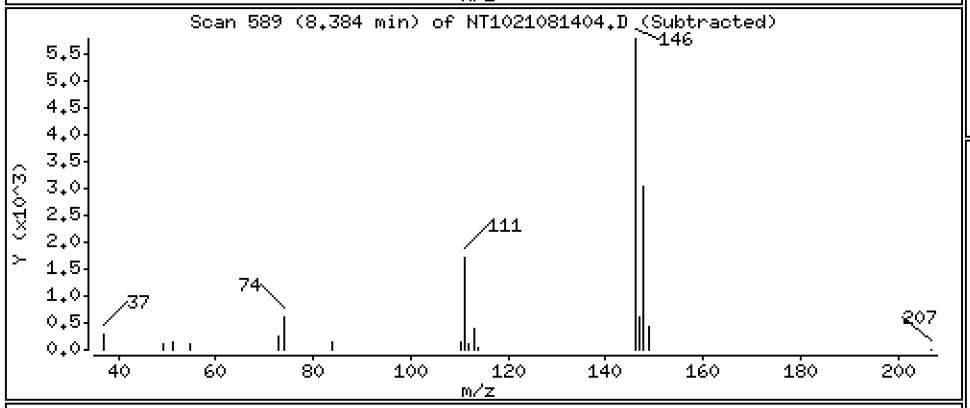
Column phase: ZB-5msi

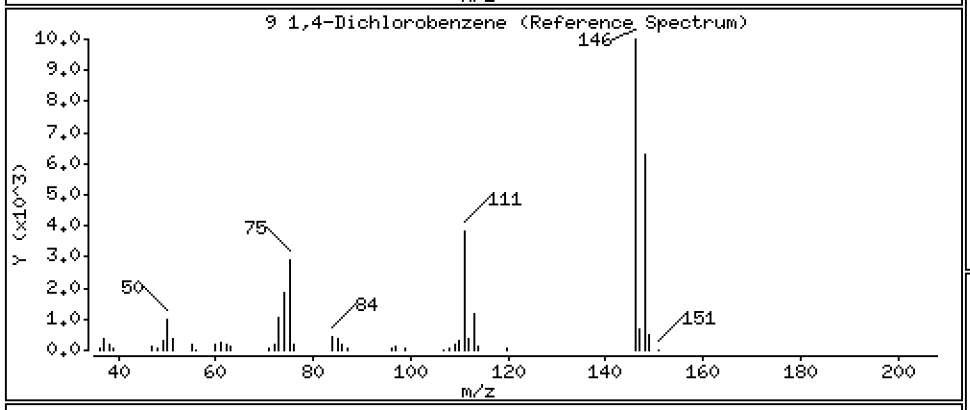
Column diameter: 0.25

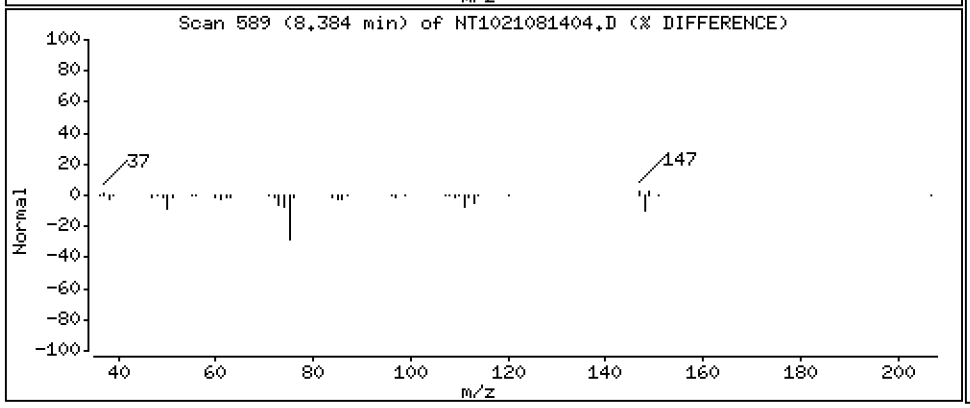
9 1,4-Dichlorobenzene

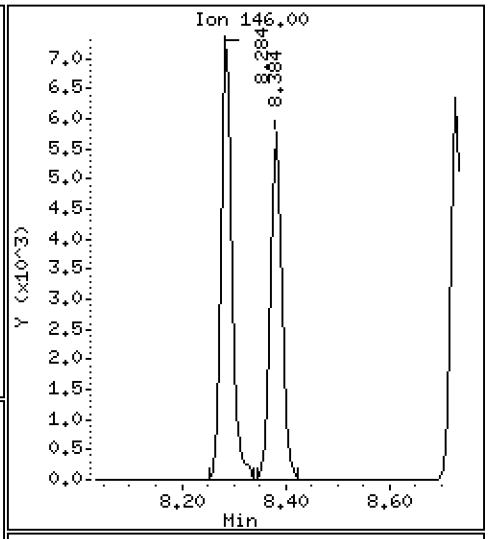
Concentration: 0.1717 ug/mL

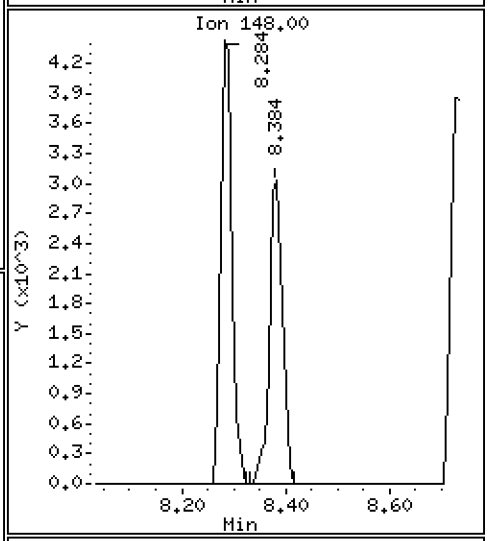


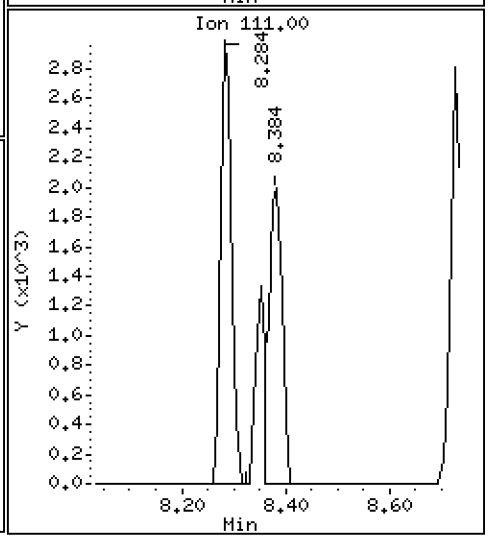












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

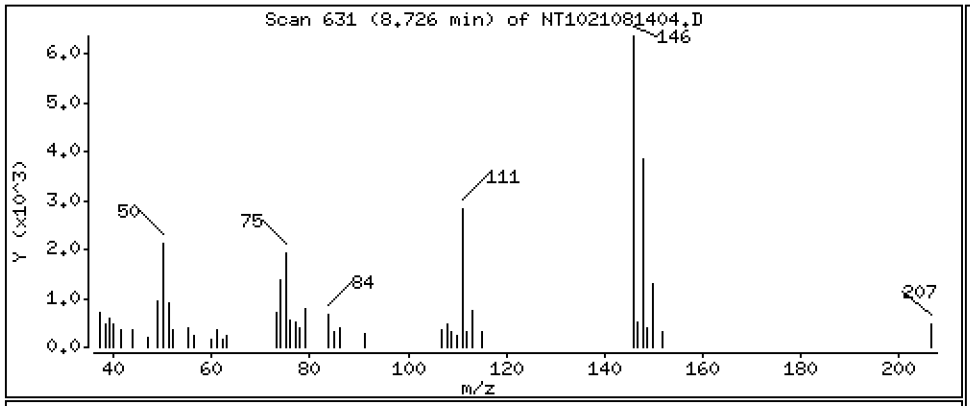
Operator: VTS

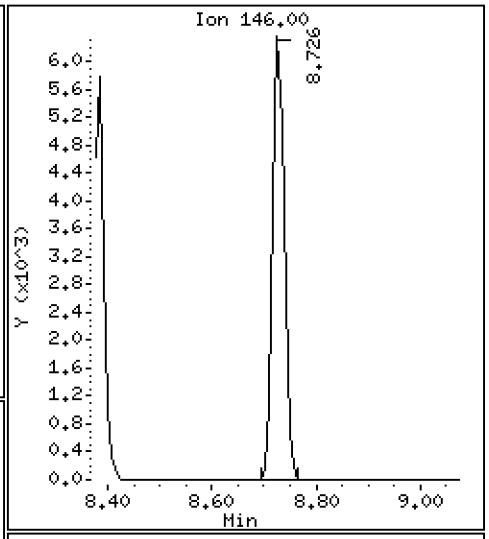
Column phase: ZB-5msi

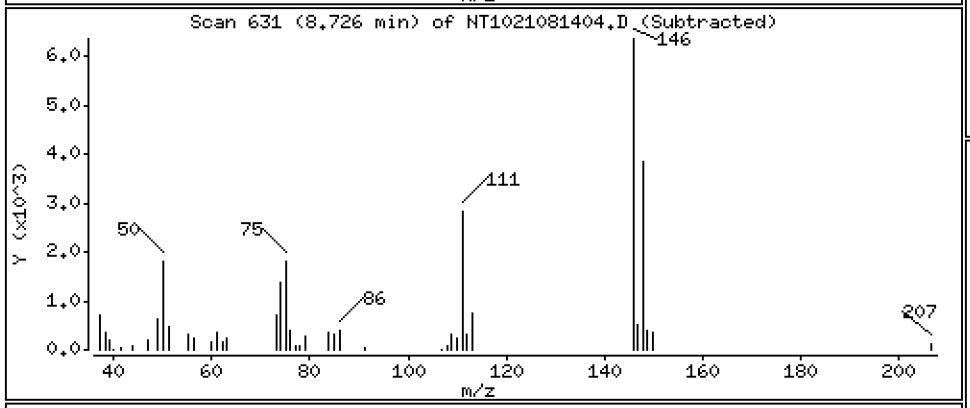
Column diameter: 0.25

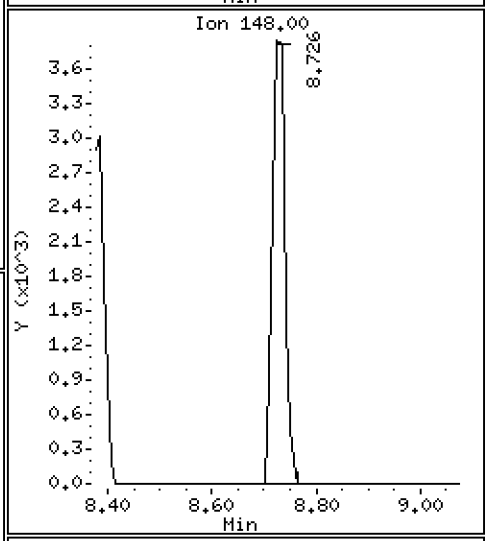
12 1,2-Dichlorobenzene

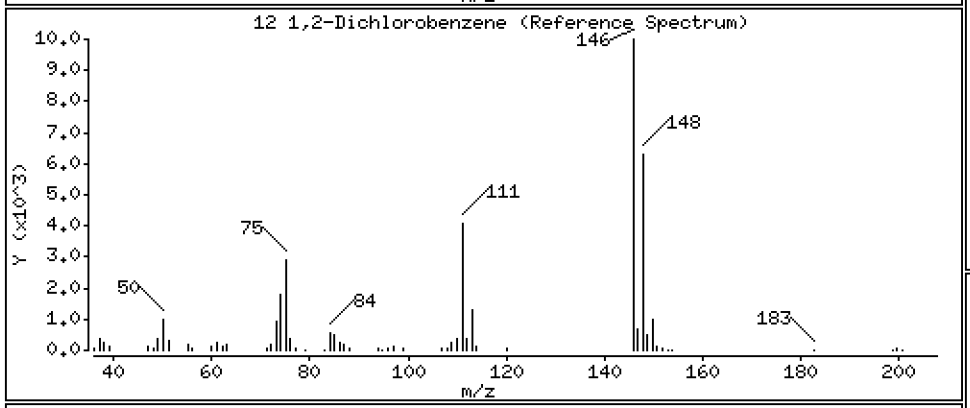
Concentration: 0.1820 ug/mL

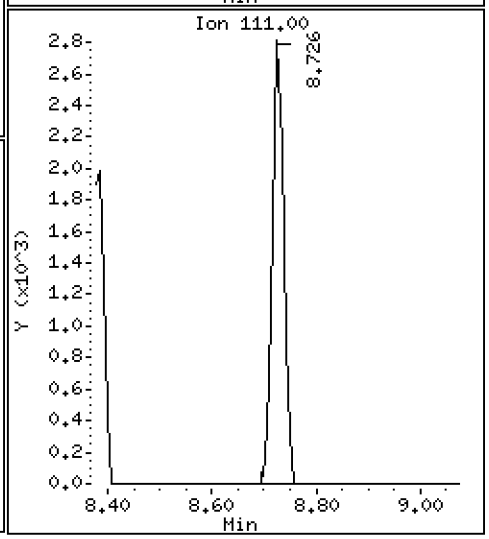


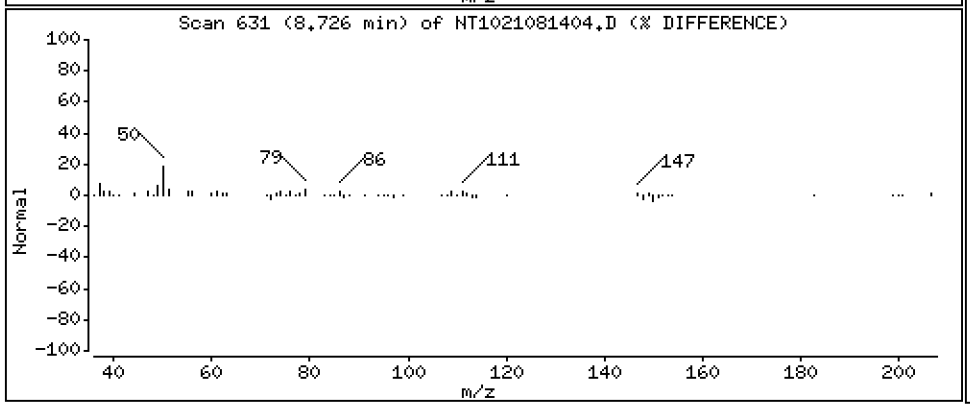












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

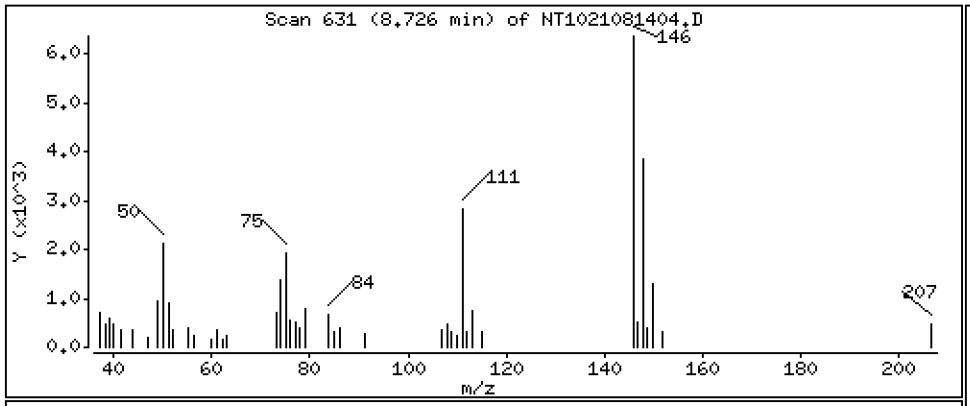
Operator: VTS

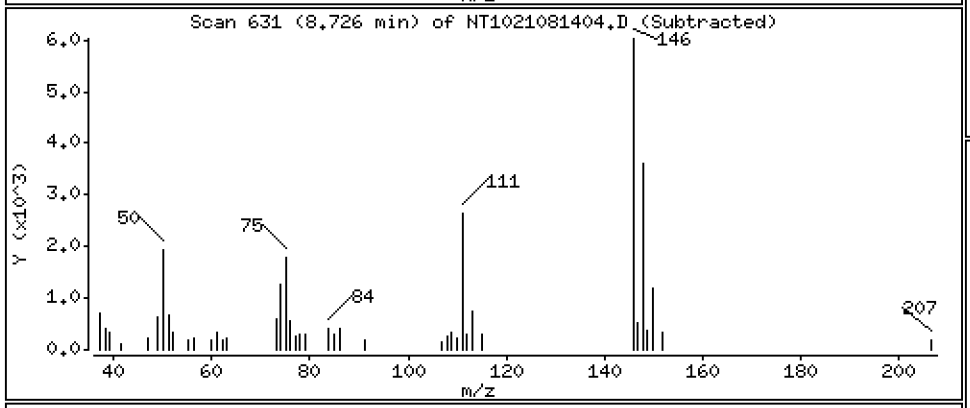
Column phase: ZB-5msi

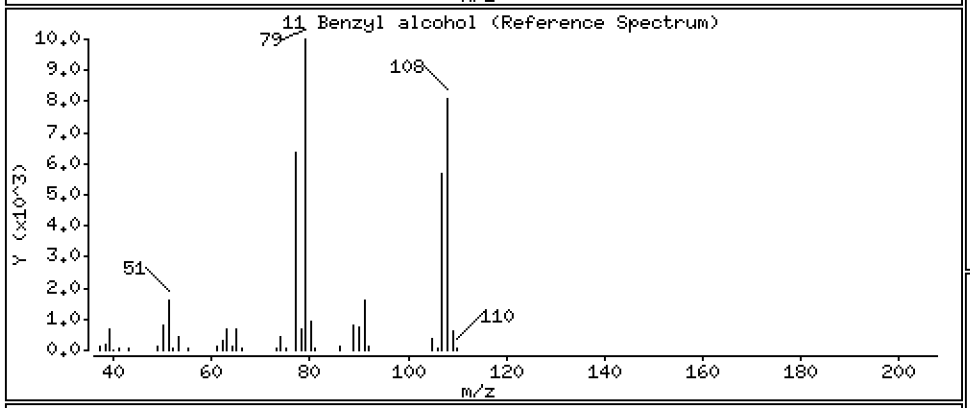
Column diameter: 0.25

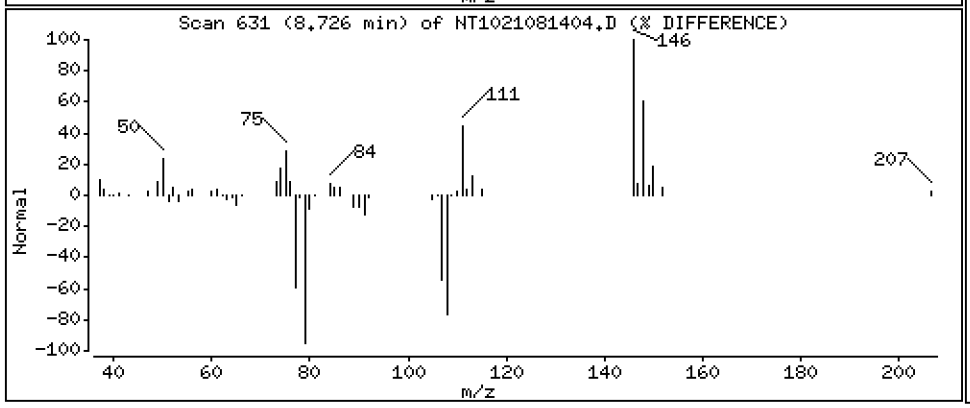
11 Benzyl alcohol

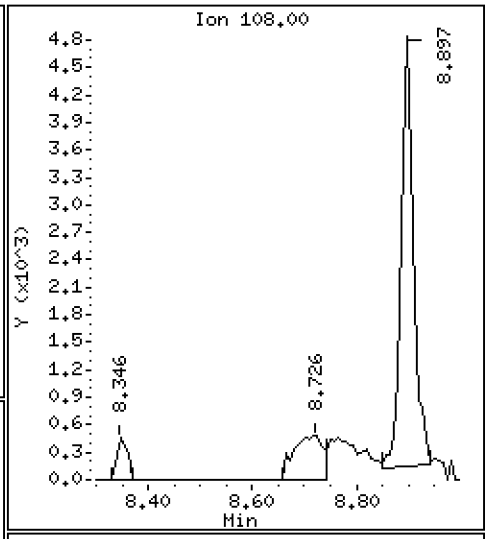
Concentration: 0.06014 ug/mL

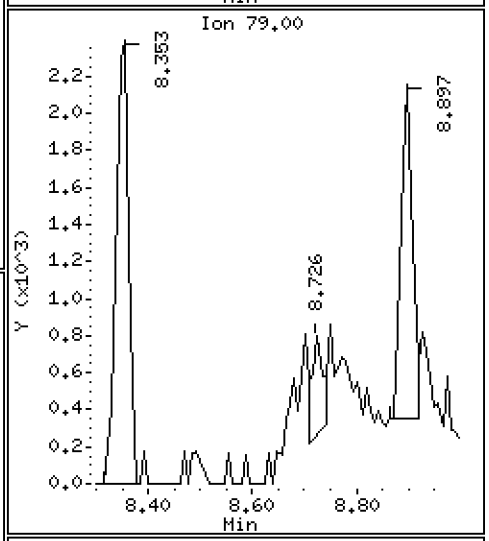


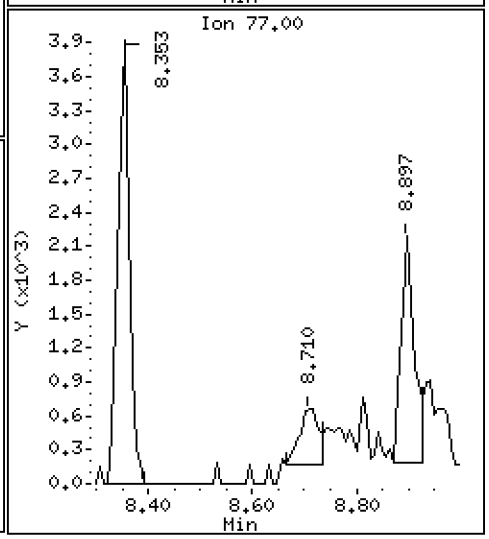












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

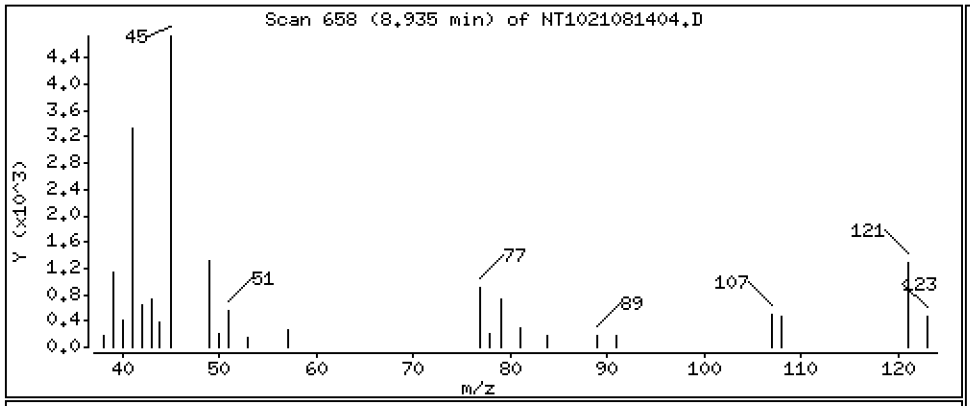
Operator: VTS

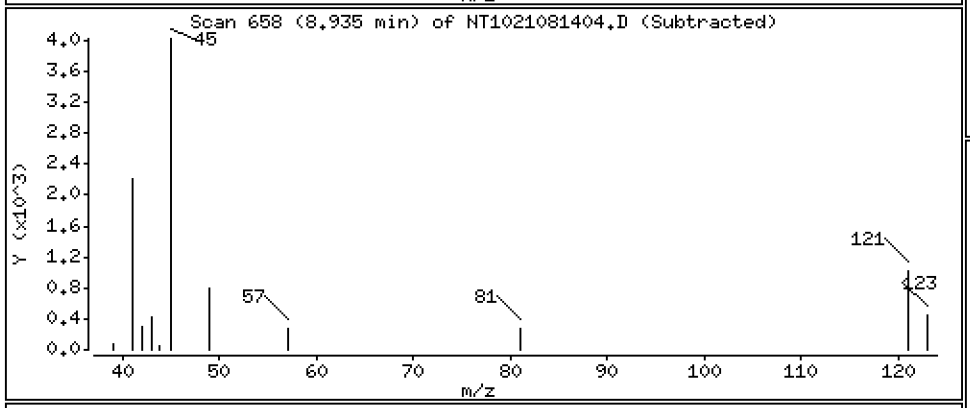
Column phase: ZB-5msi

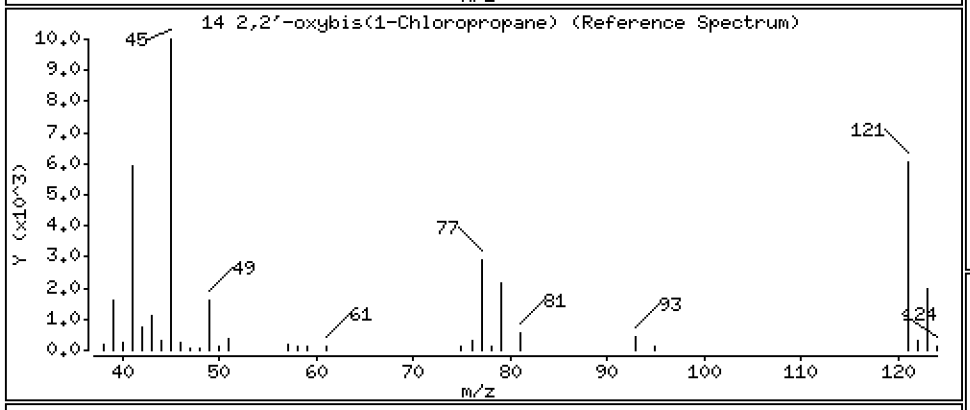
Column diameter: 0.25

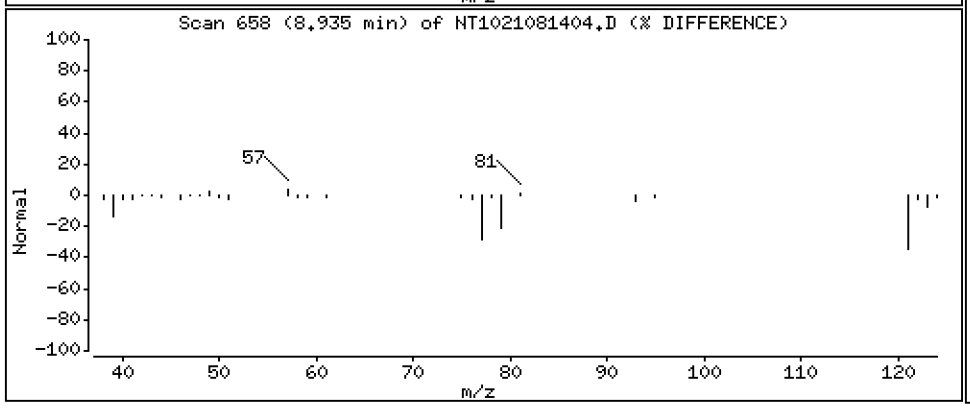
14 2,2'-oxybis(1-Chloropropane)

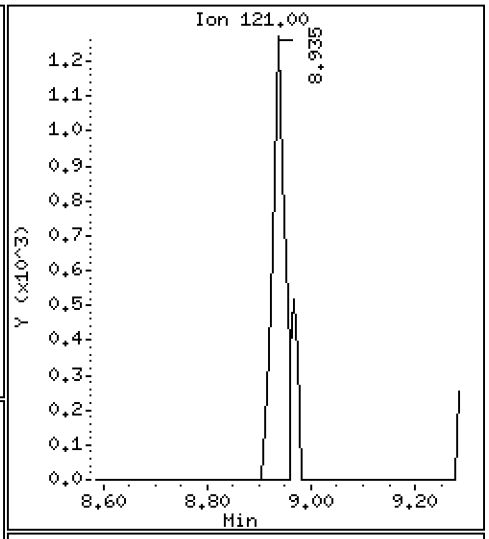
Concentration: 0.1016 ug/mL

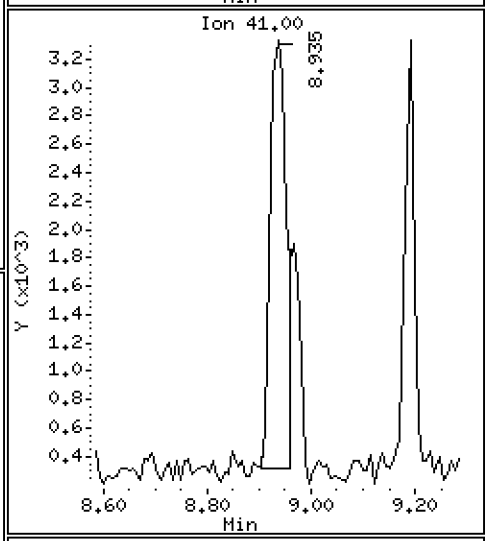


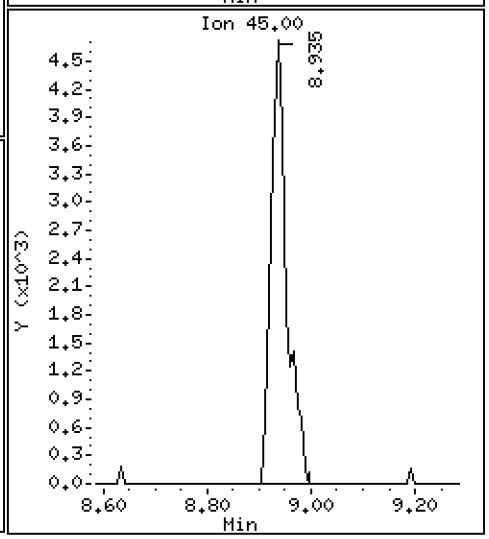












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

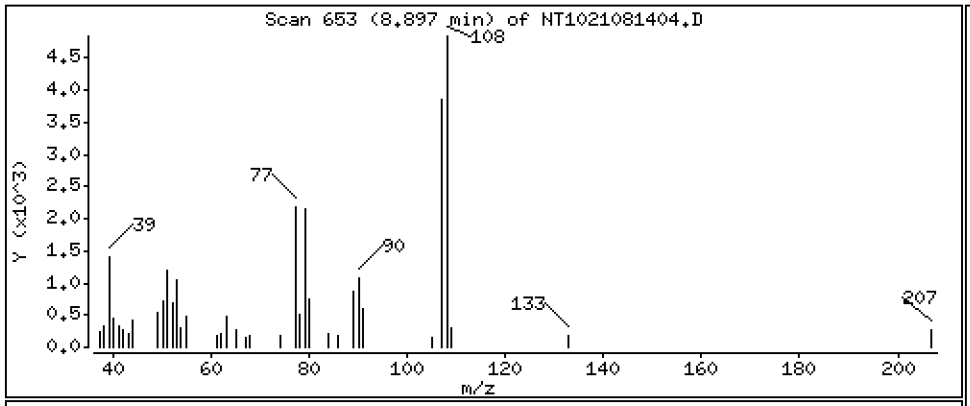
Operator: VTS

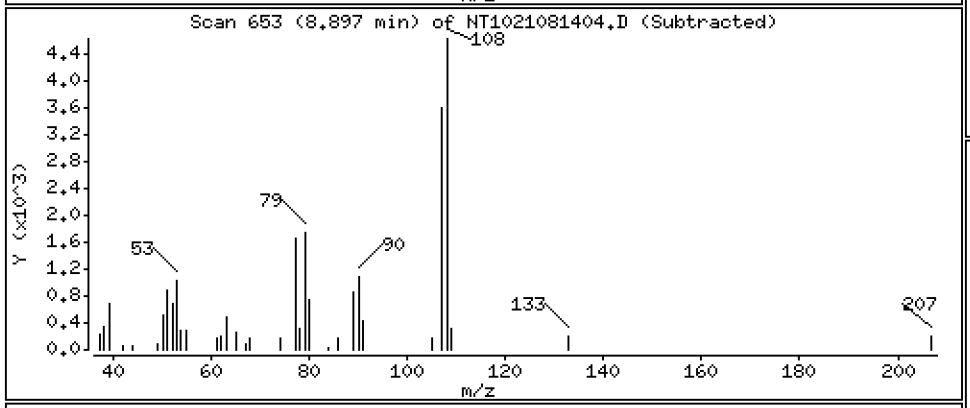
Column phase: ZB-5msi

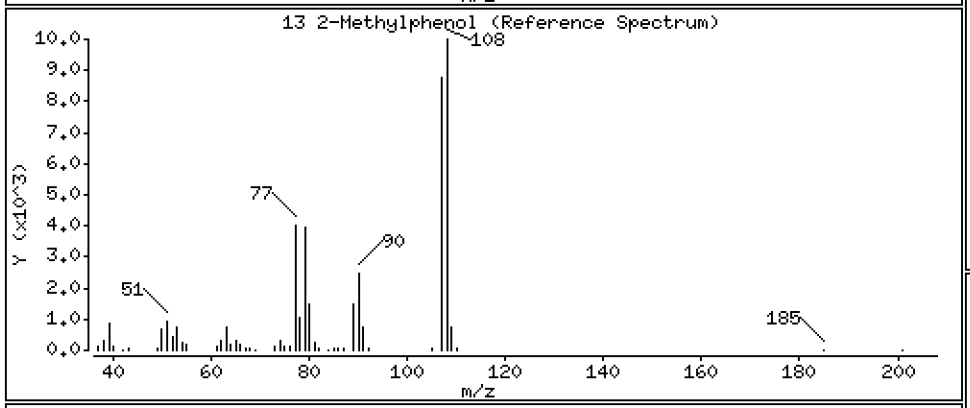
Column diameter: 0.25

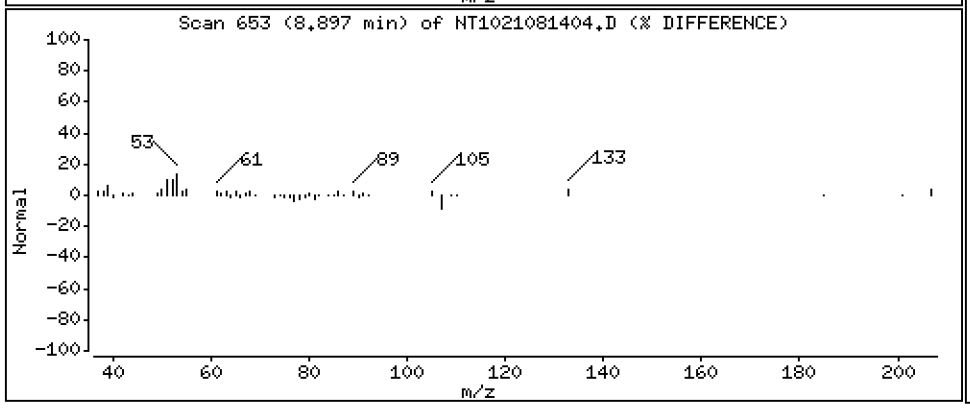
13 2-Methylphenol

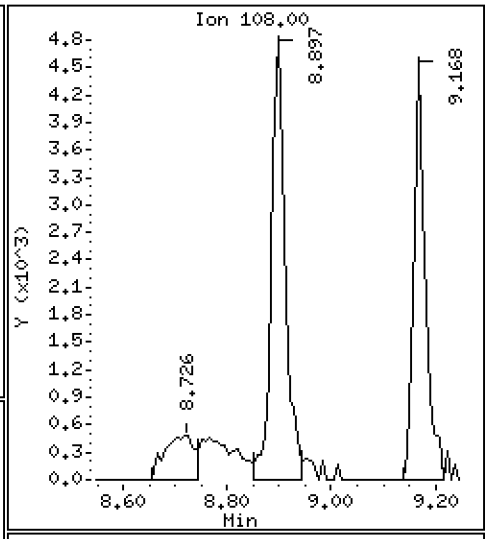
Concentration: 0.2000 ug/mL

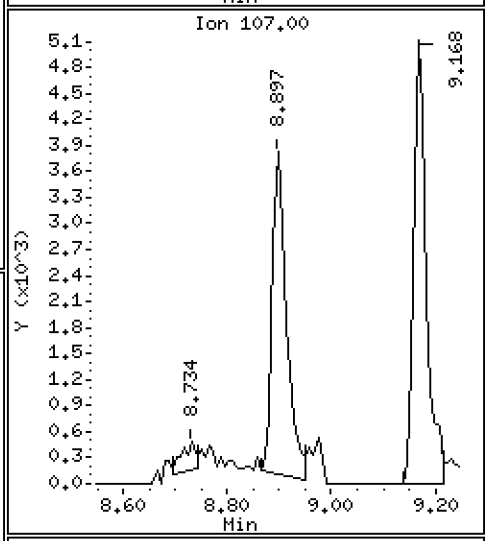


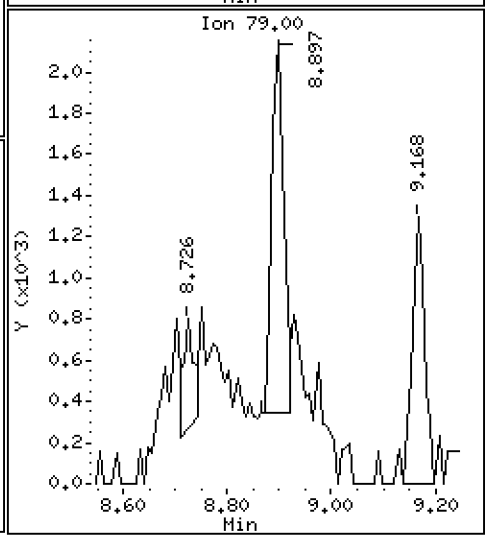












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

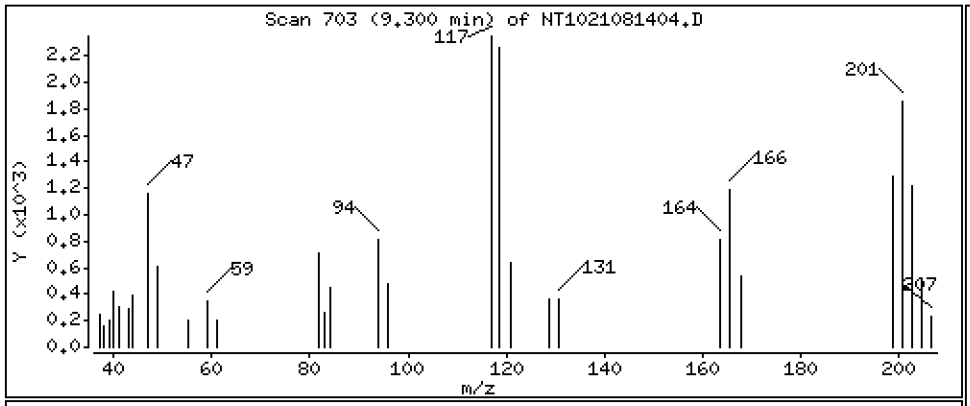
Operator: VTS

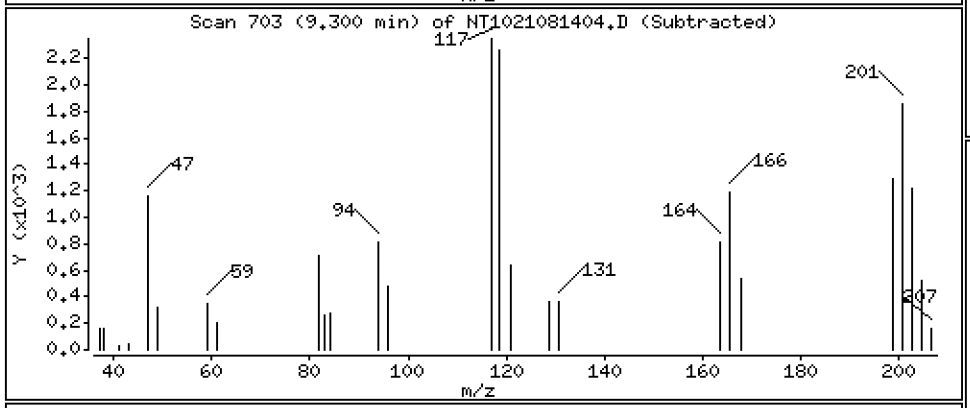
Column phase: ZB-5msi

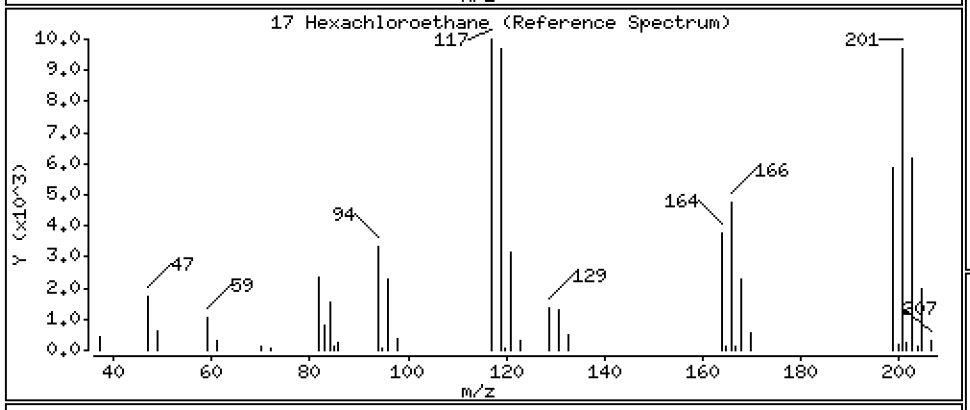
Column diameter: 0.25

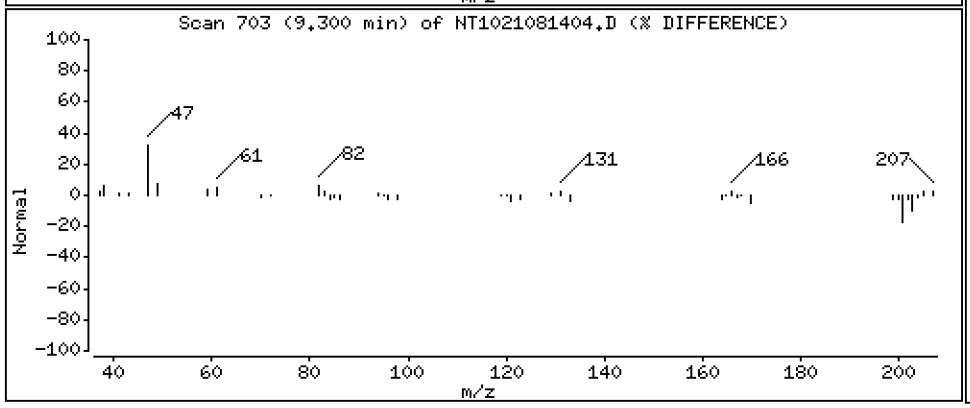
17 Hexachloroethane

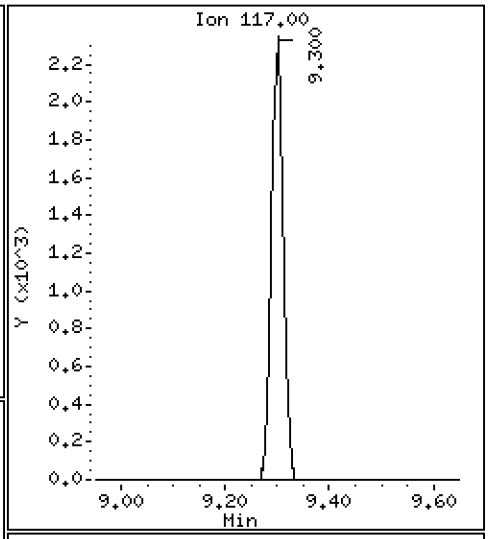
Concentration: 0.1630 ug/mL

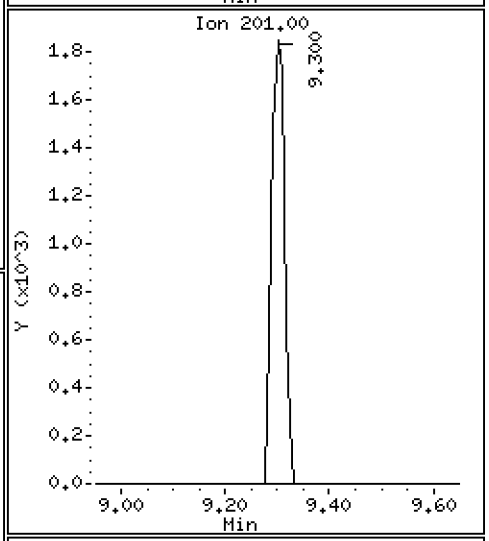


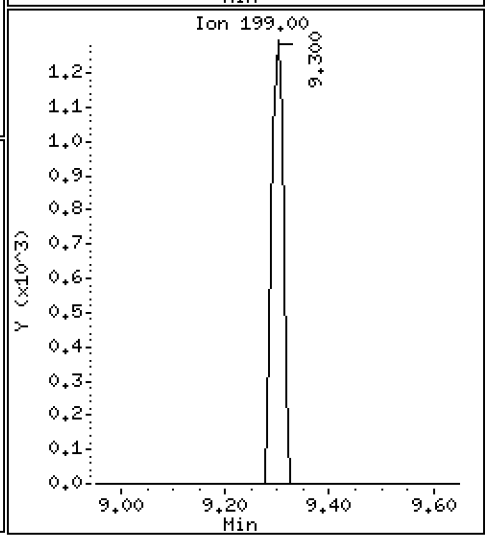












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

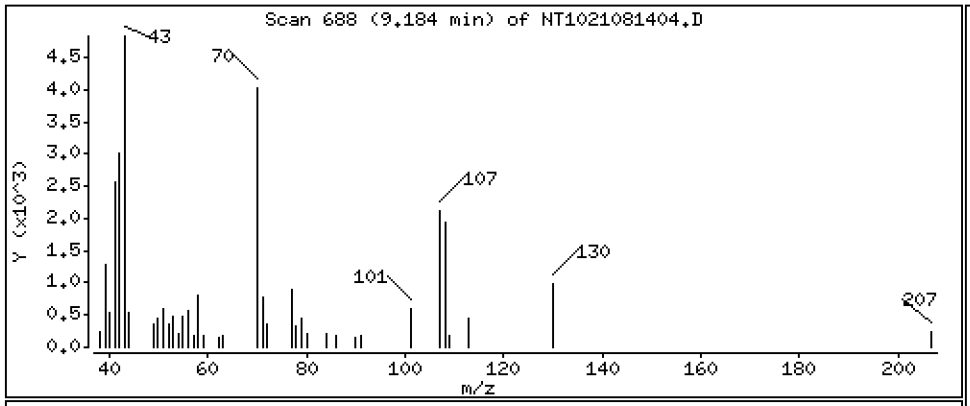
Operator: VTS

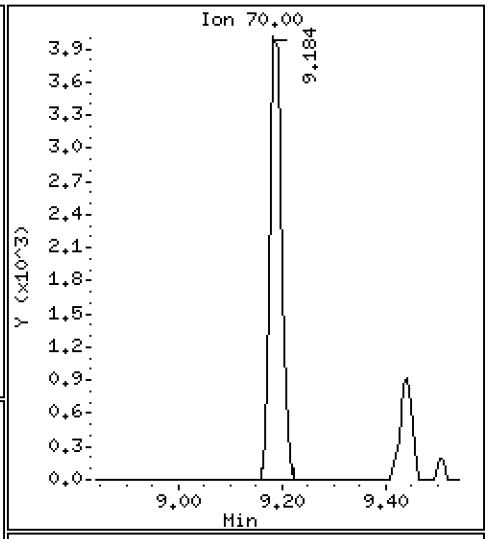
Column phase: ZB-5msi

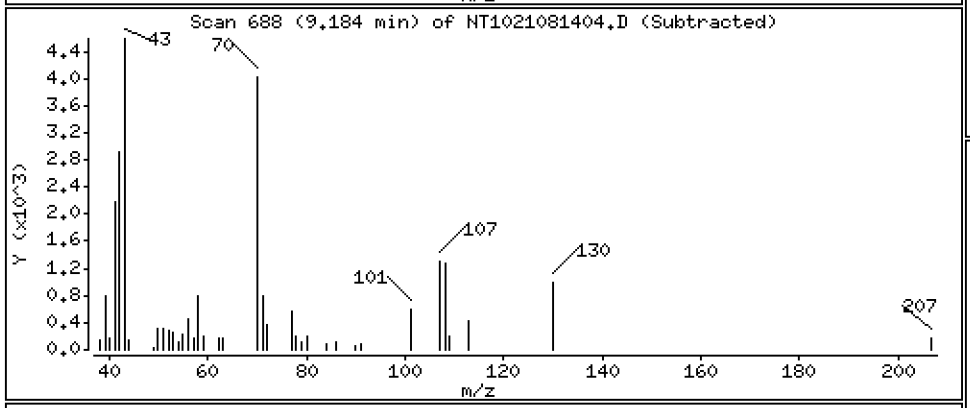
Column diameter: 0.25

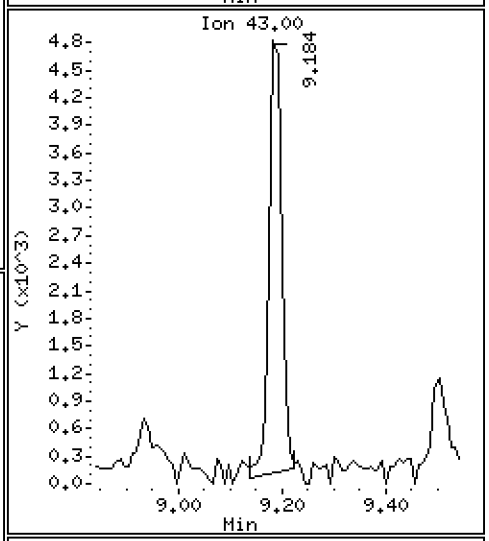
16 N-Nitroso-di-n-propylamine

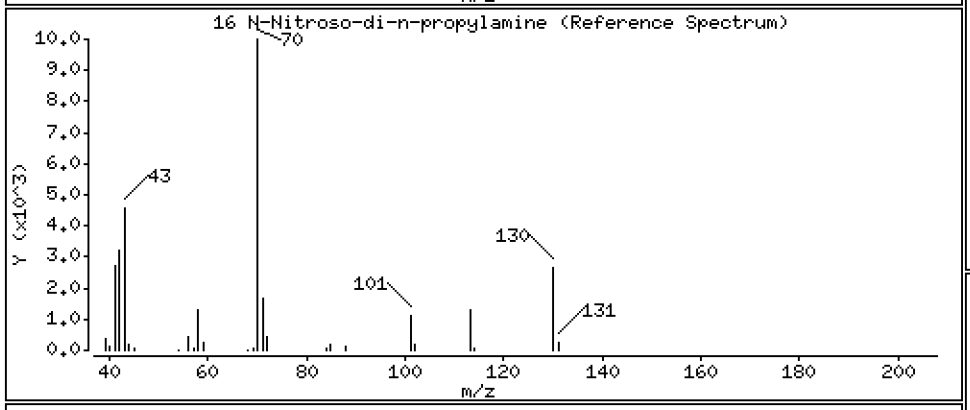
Concentration: 0.1587 ug/mL

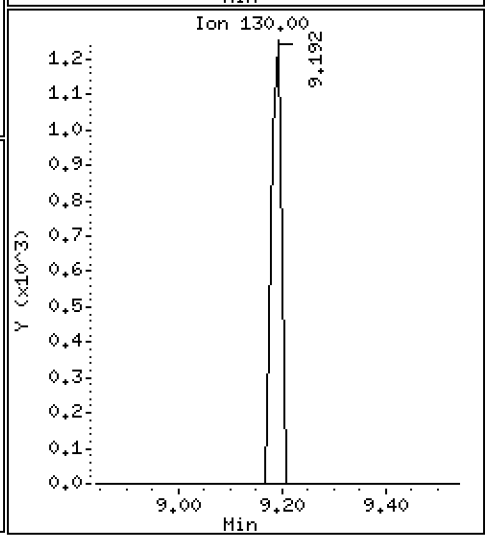


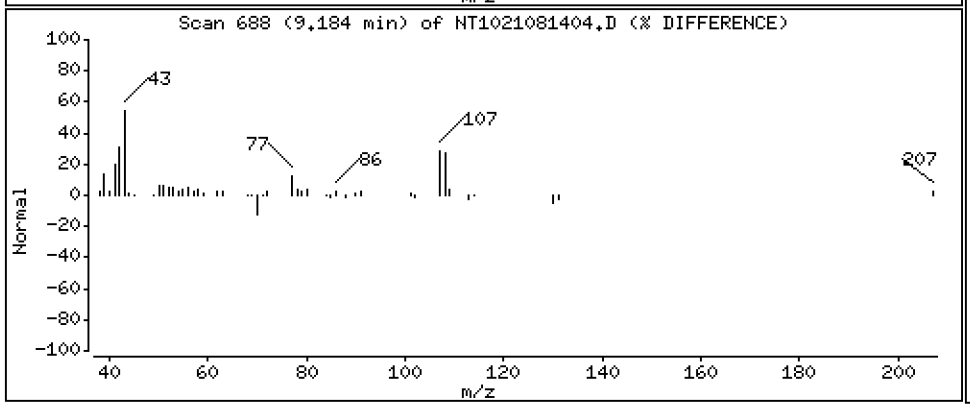












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

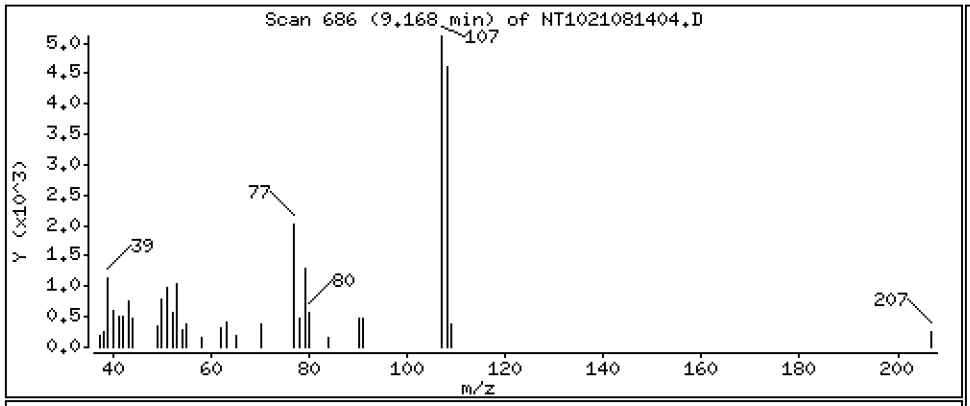
Operator: VTS

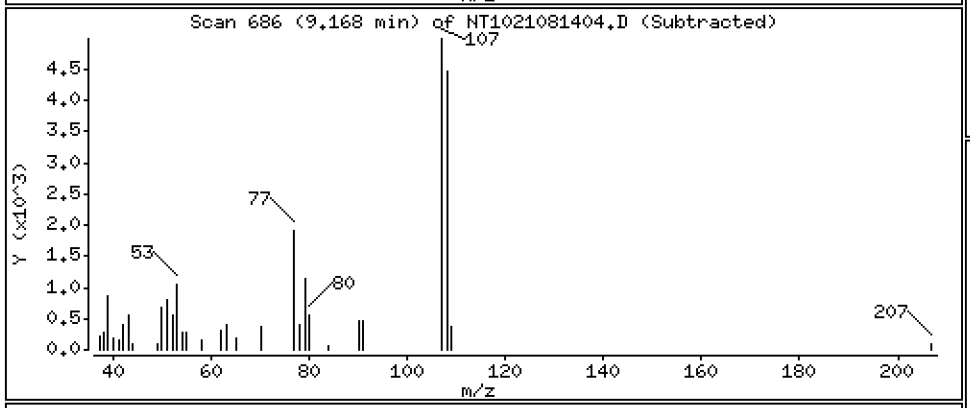
Column phase: ZB-5msi

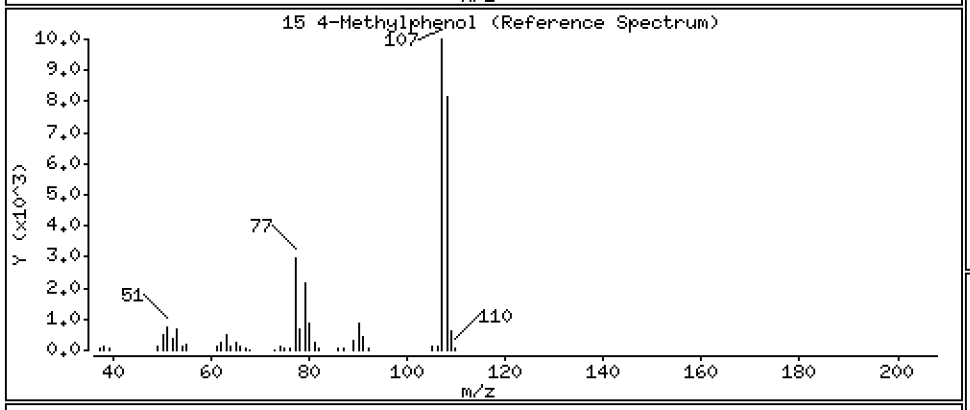
Column diameter: 0.25

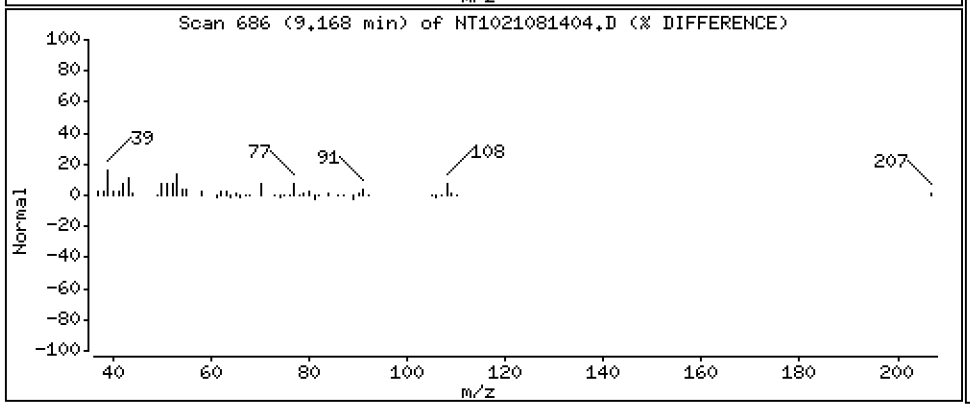
15 4-Methylphenol

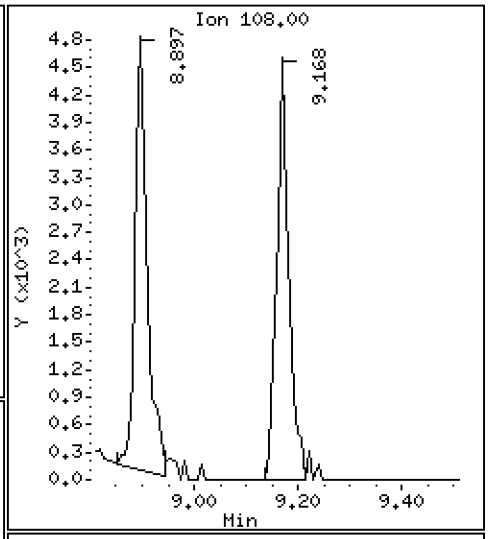
Concentration: 0.1591 ug/mL

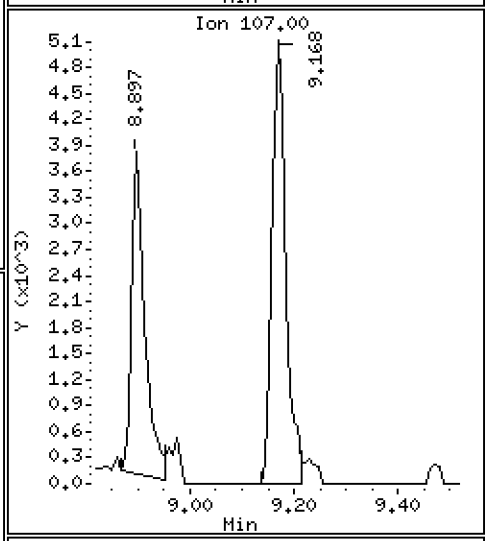


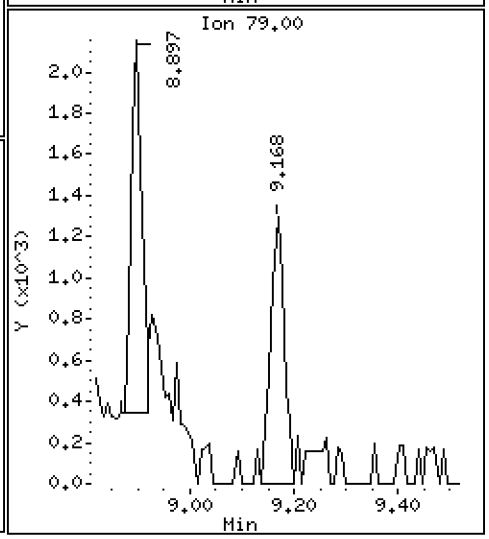












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

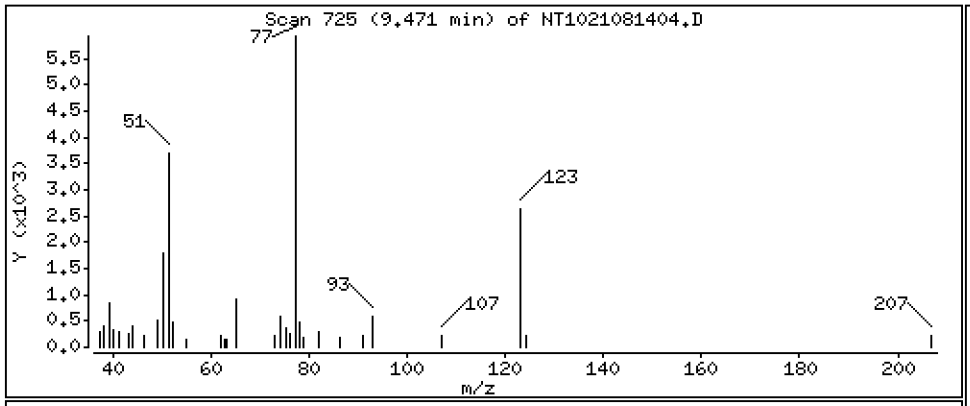
Operator: VTS

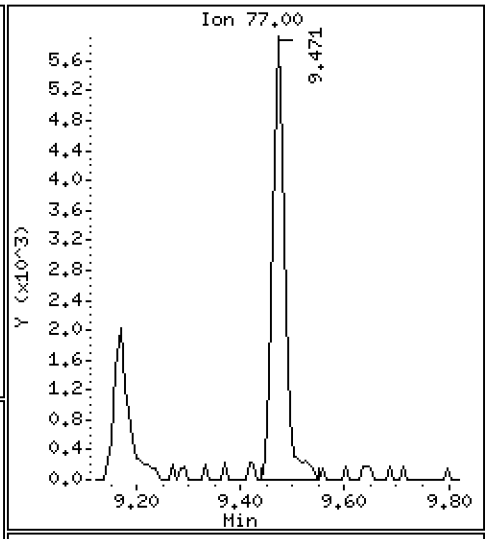
Column phase: ZB-5msi

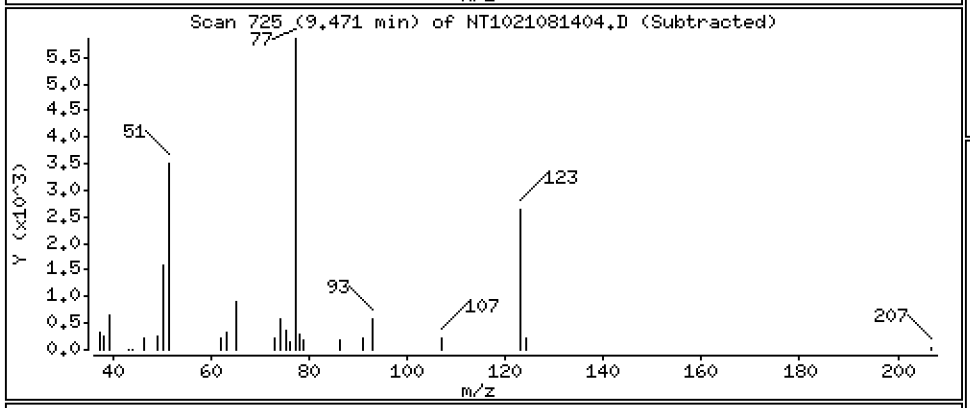
Column diameter: 0.25

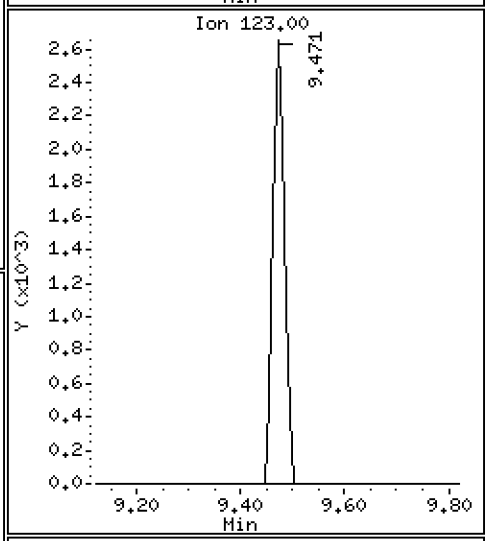
19 Nitrobenzene

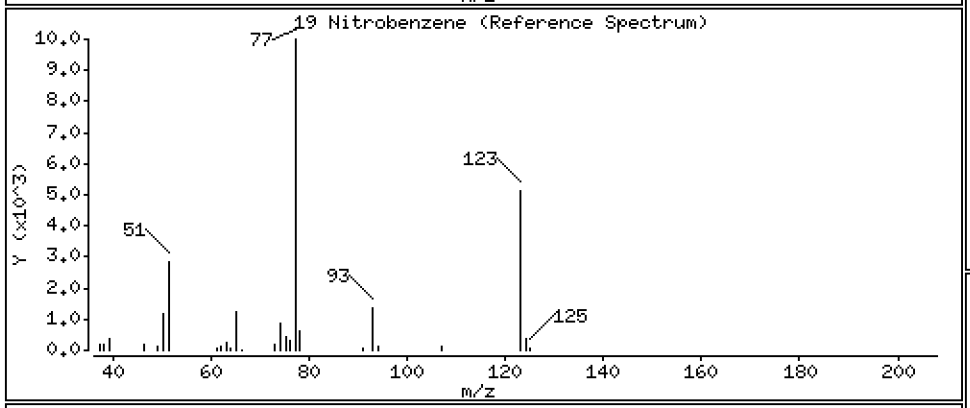
Concentration: 0.1696 ug/mL

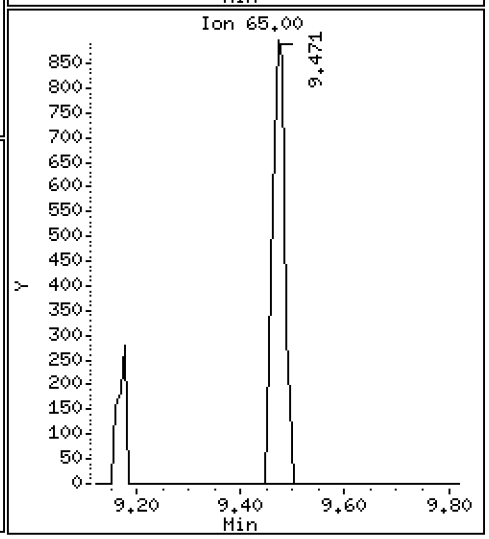


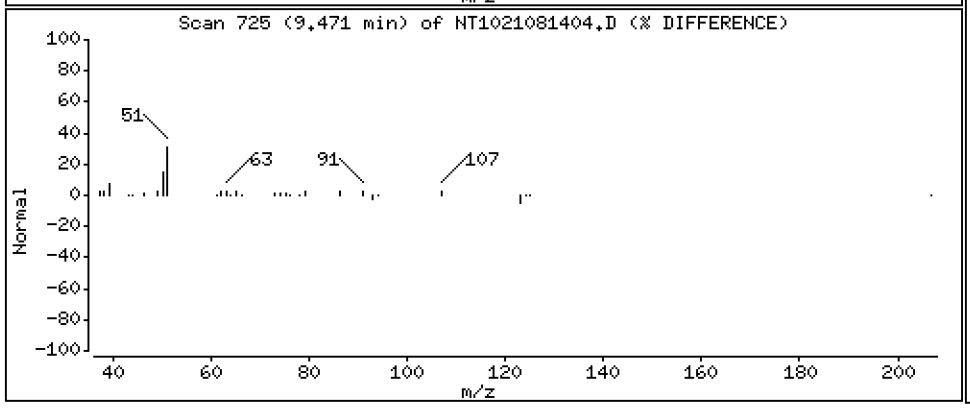












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

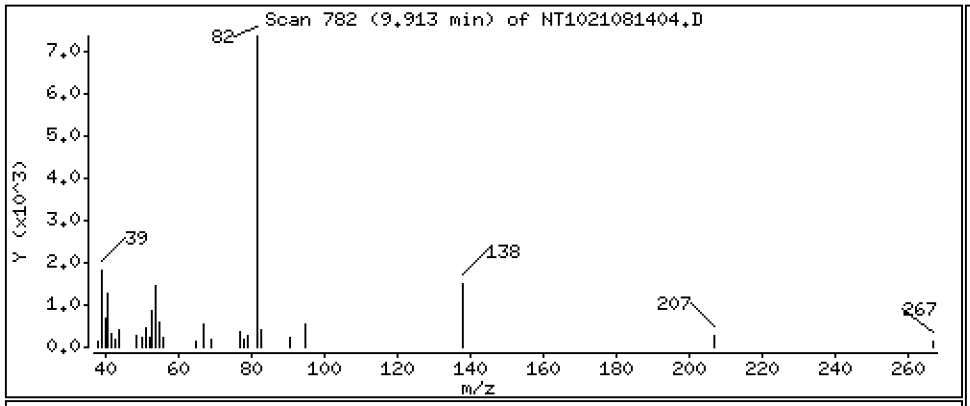
Operator: VTS

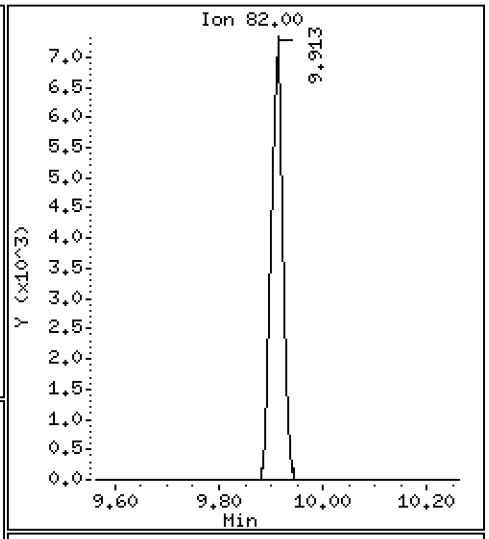
Column phase: ZB-5msi

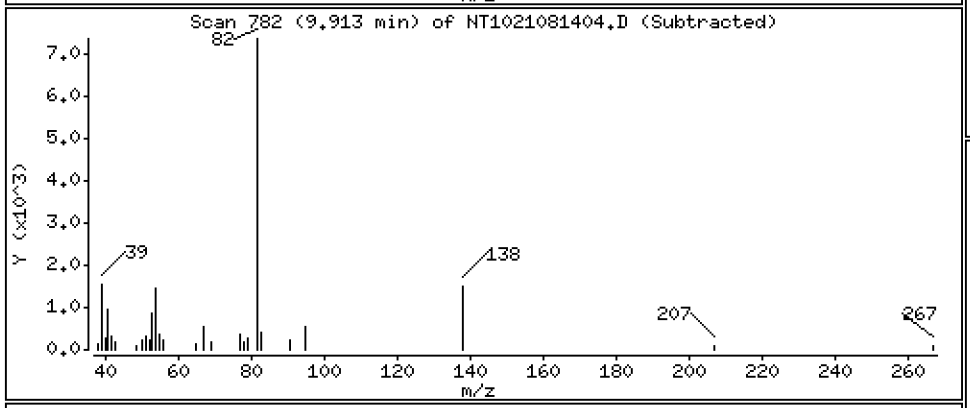
Column diameter: 0.25

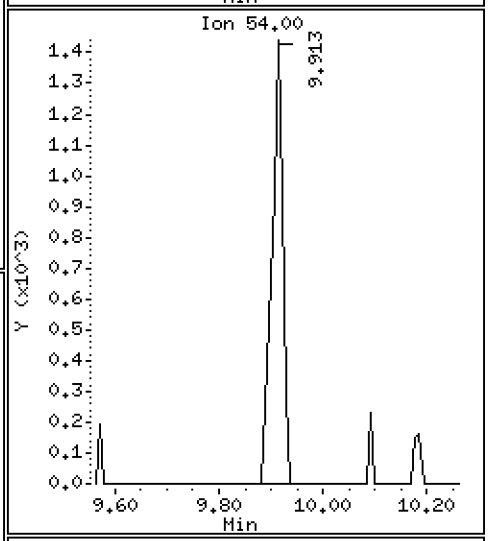
20 Isophorone

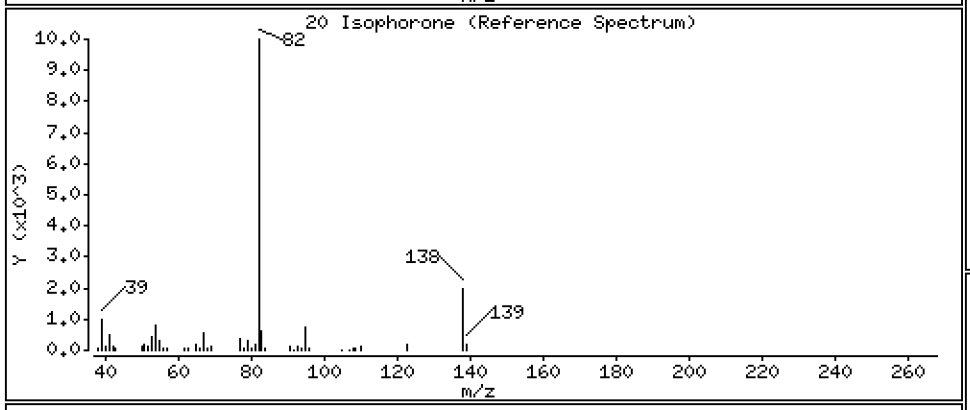
Concentration: 0.1051 ug/mL

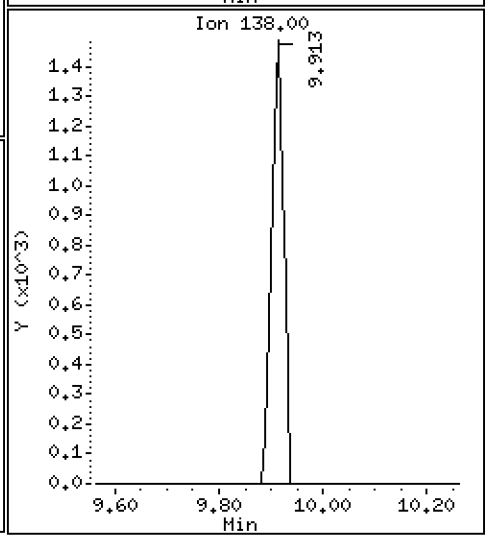


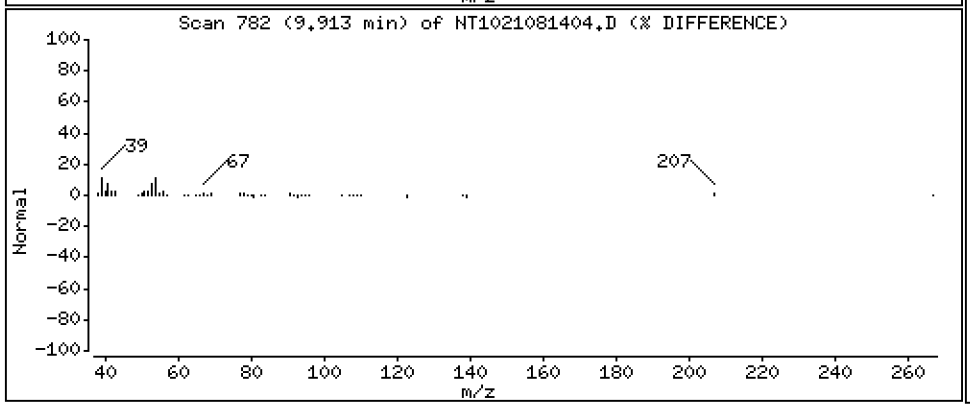












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

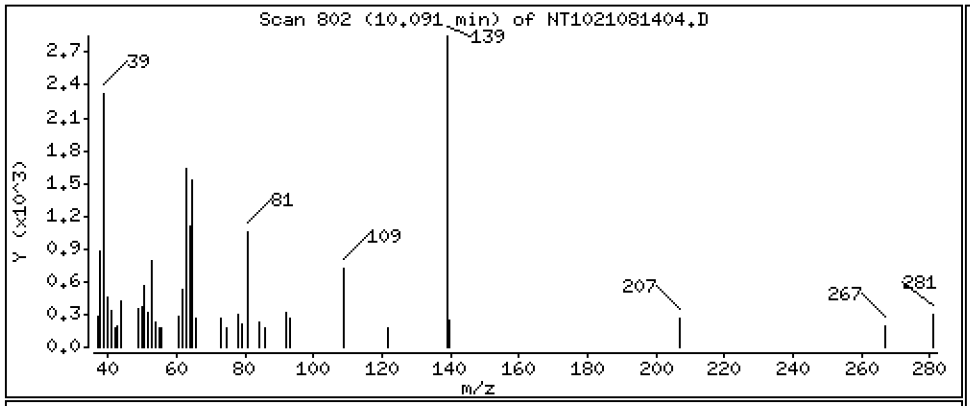
Operator: VTS

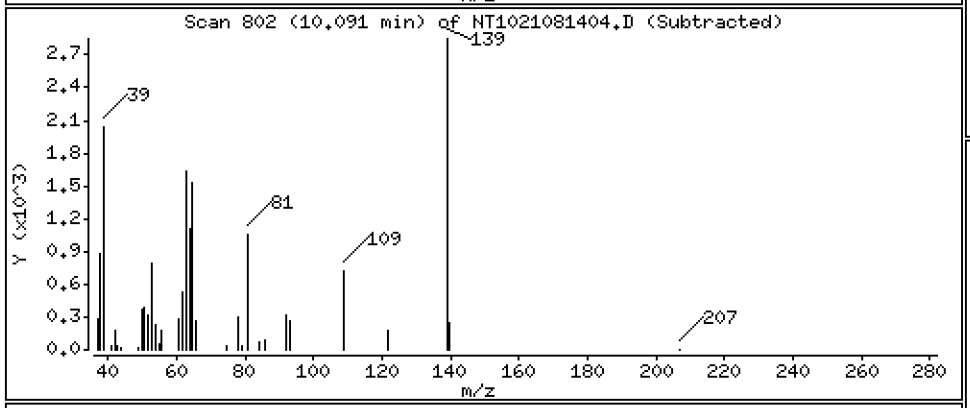
Column phase: ZB-5msi

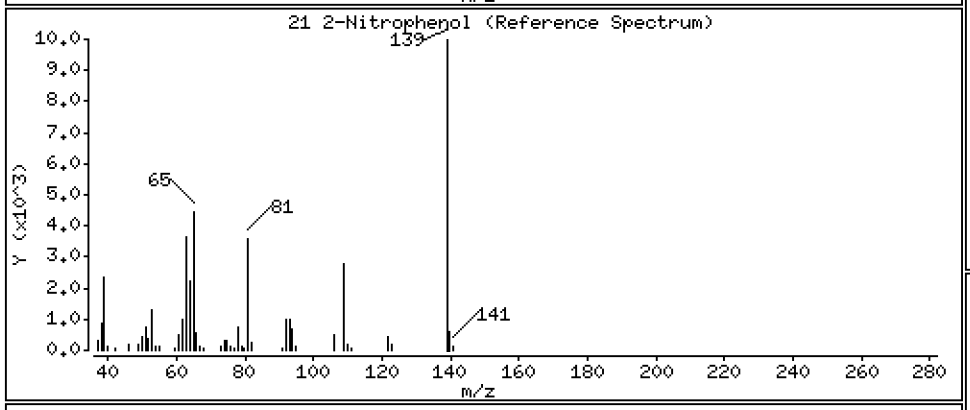
Column diameter: 0.25

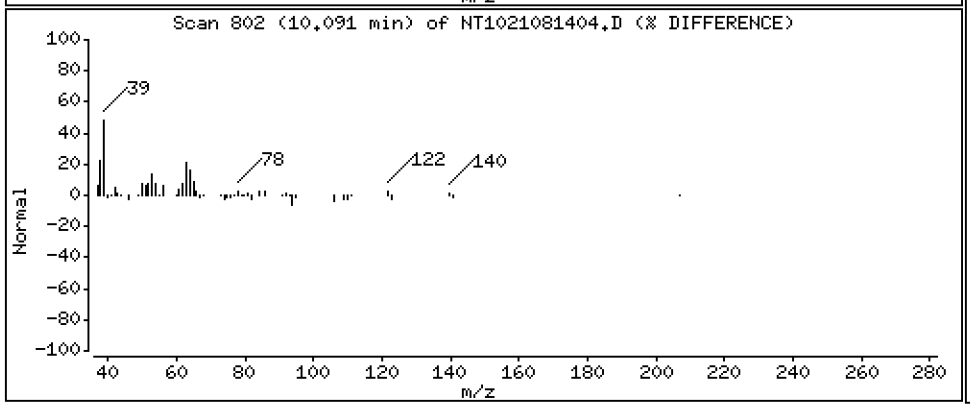
21 2-Nitrophenol

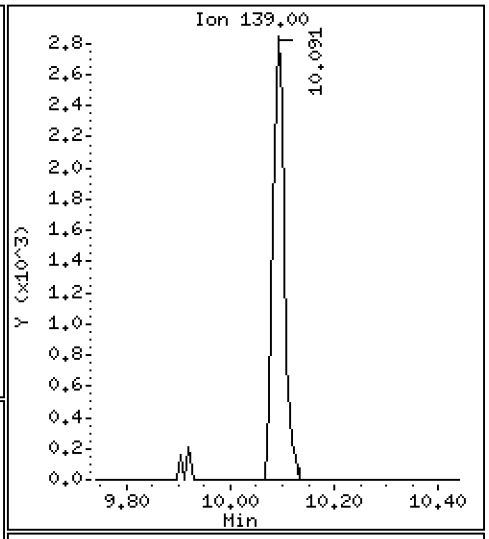
Concentration: 0.1538 ug/mL

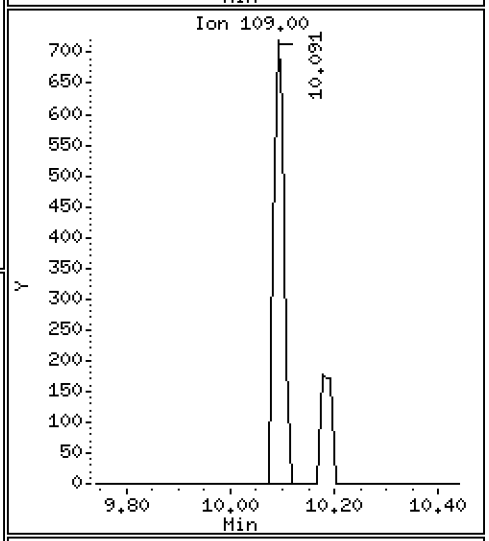


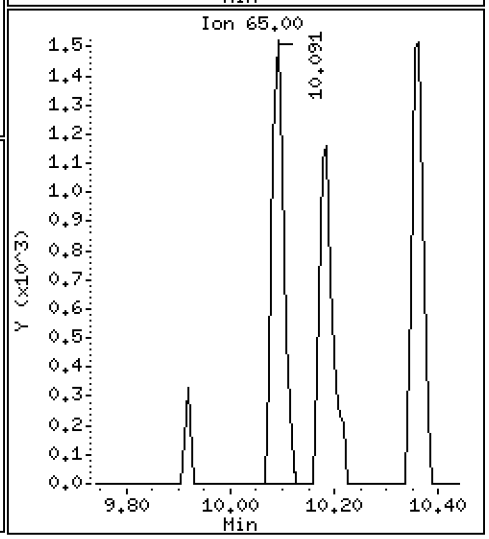












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

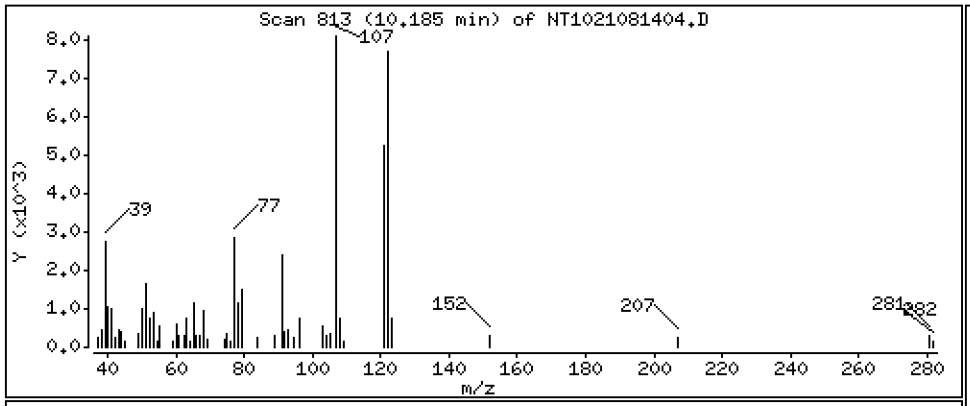
Operator: VTS

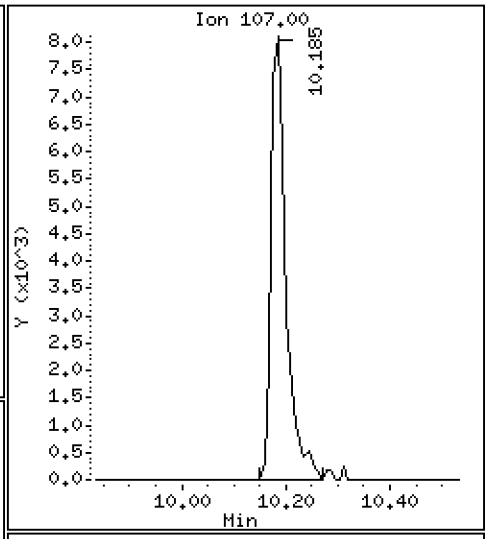
Column phase: ZB-5msi

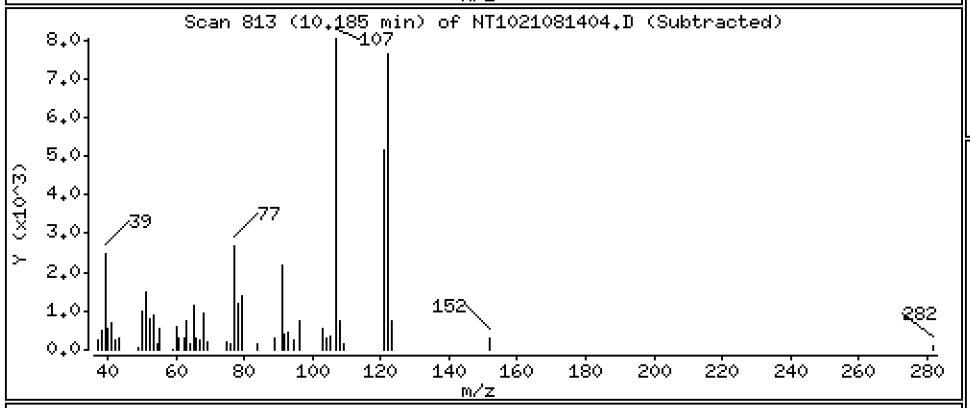
Column diameter: 0.25

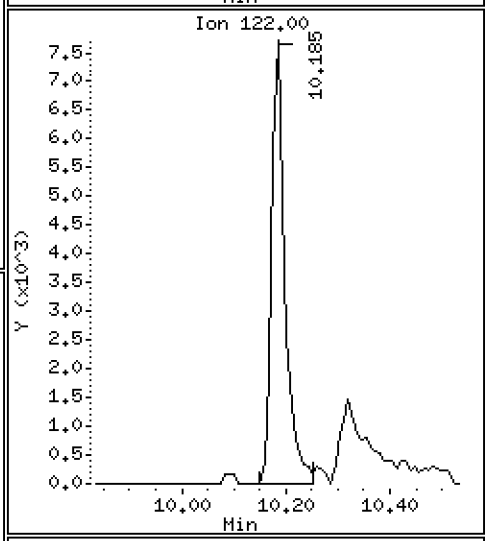
22 2,4-Dimethylphenol

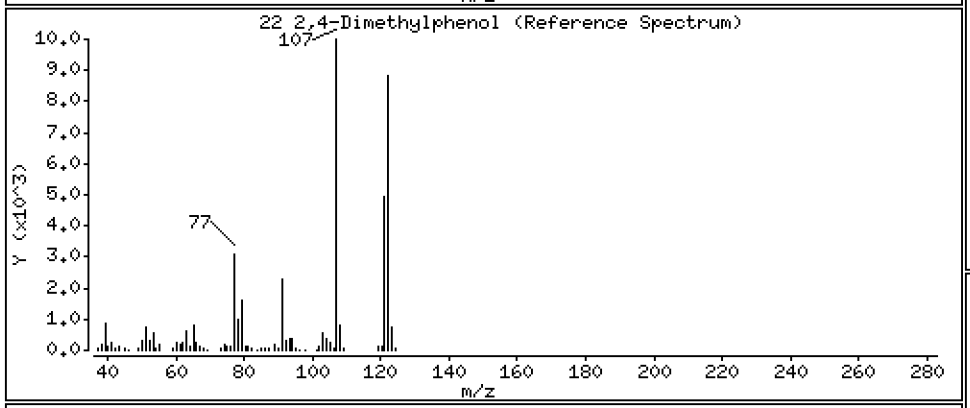
Concentration: 0.3763 ug/mL

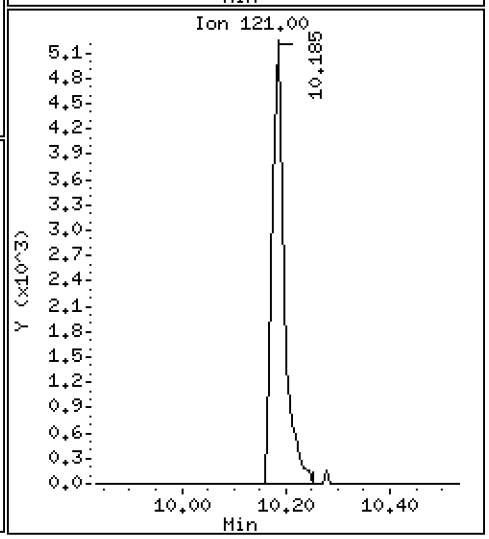


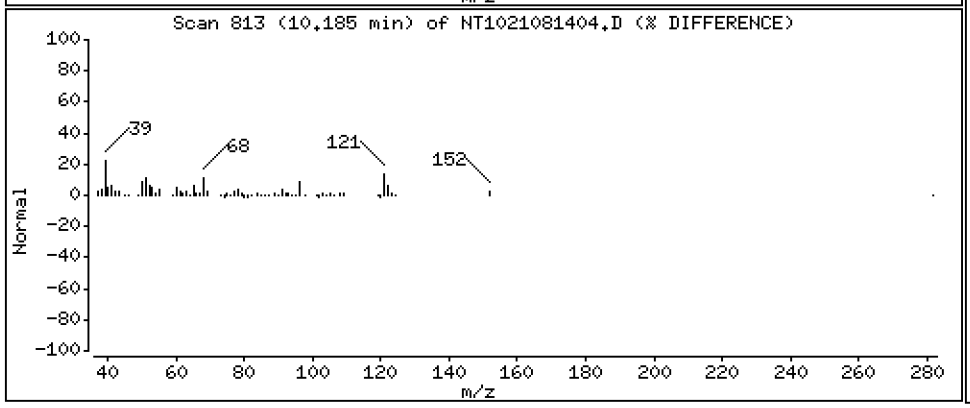












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

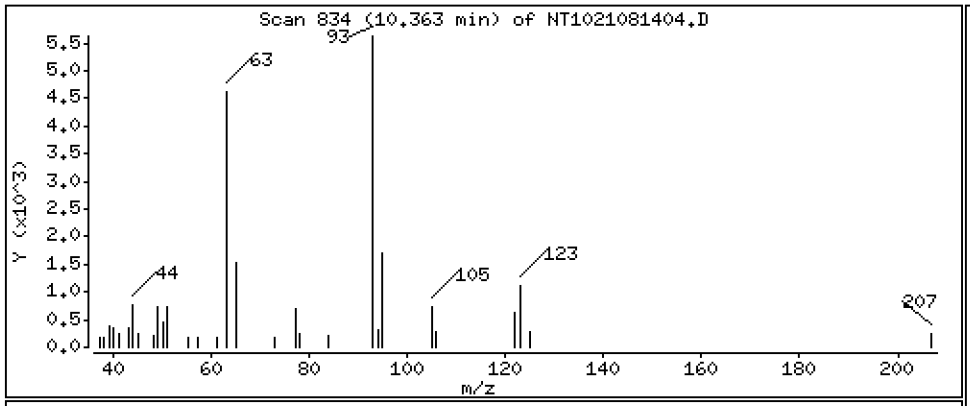
Operator: VTS

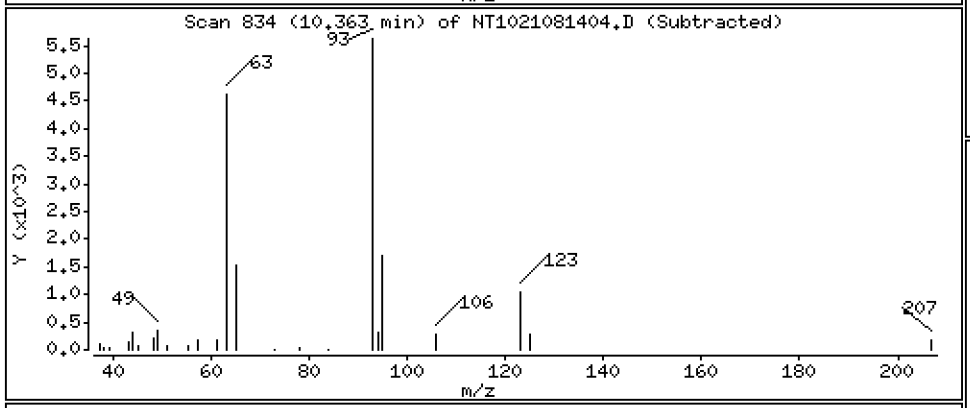
Column phase: ZB-5msi

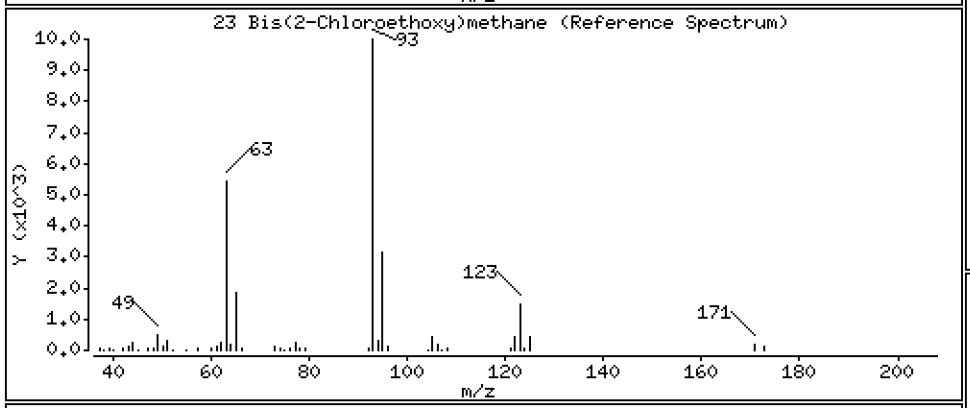
Column diameter: 0.25

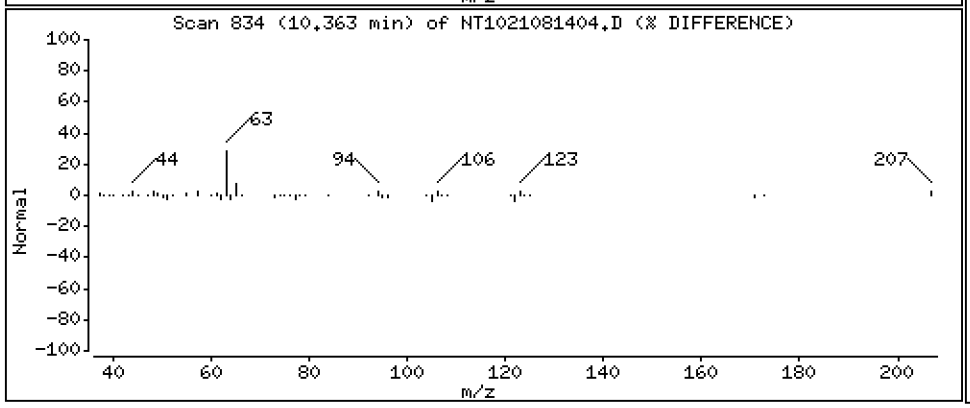
23 Bis(2-Chloroethoxy)methane

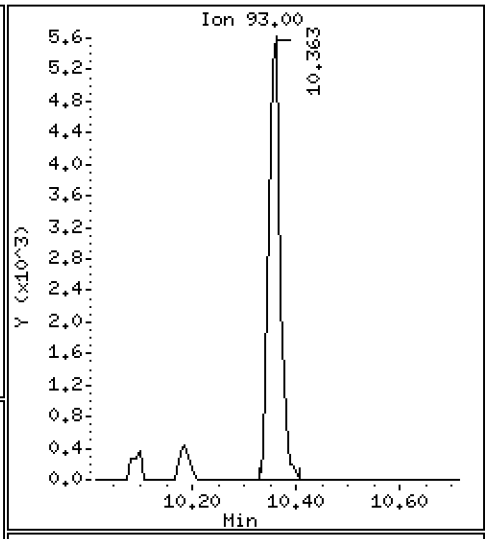
Concentration: 0.1614 ug/mL

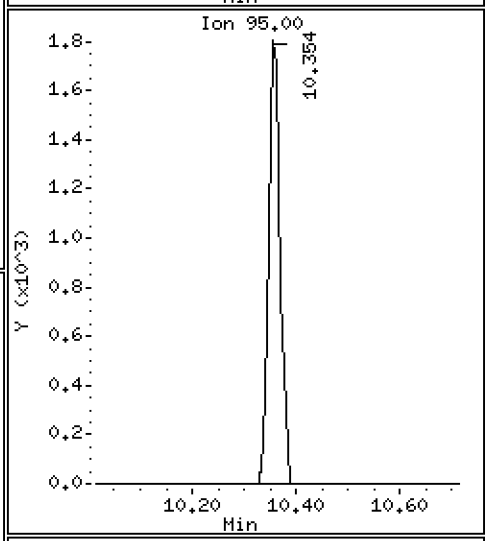


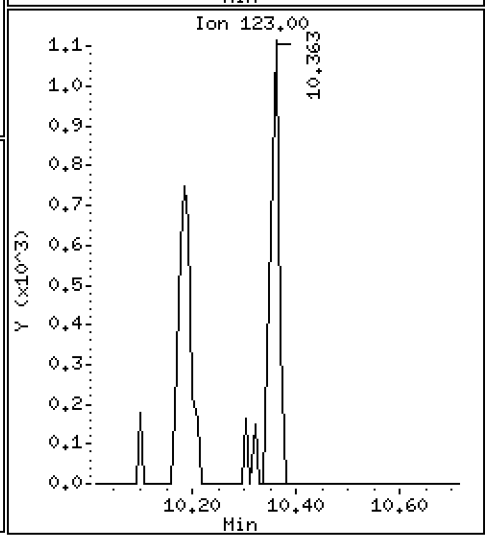












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

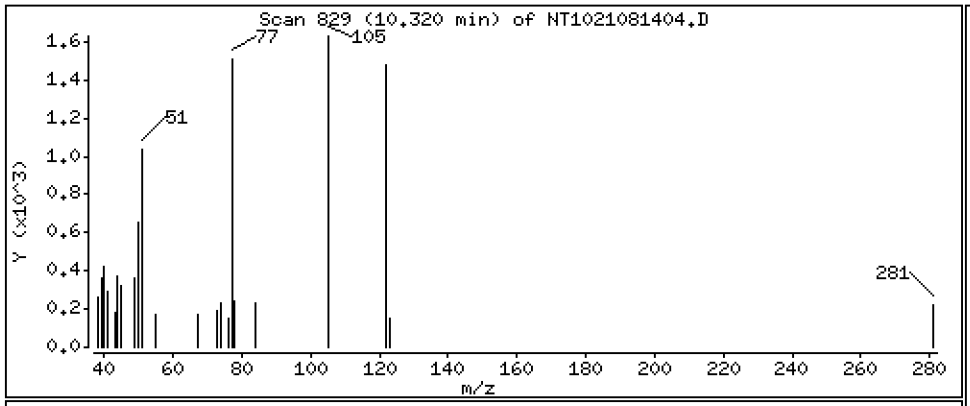
Operator: VTS

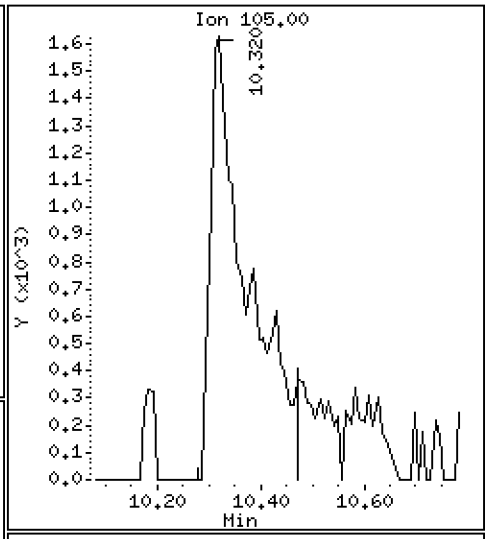
Column phase: ZB-5msi

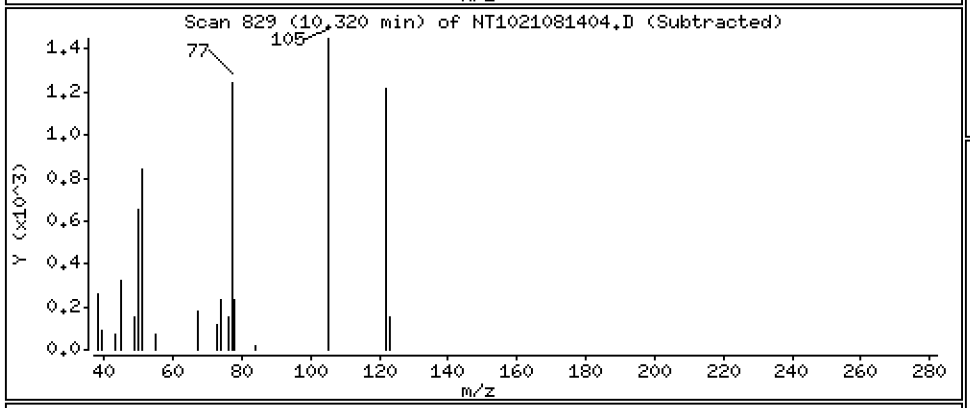
Column diameter: 0.25

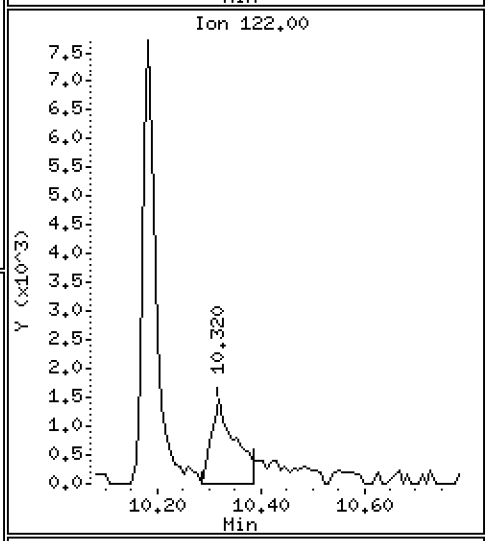
24 Benzoic acid

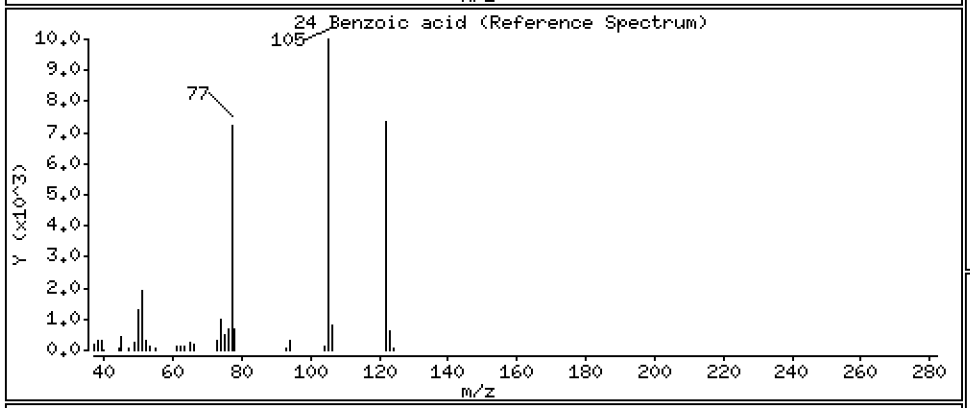
Concentration: 0.3515 ug/mL

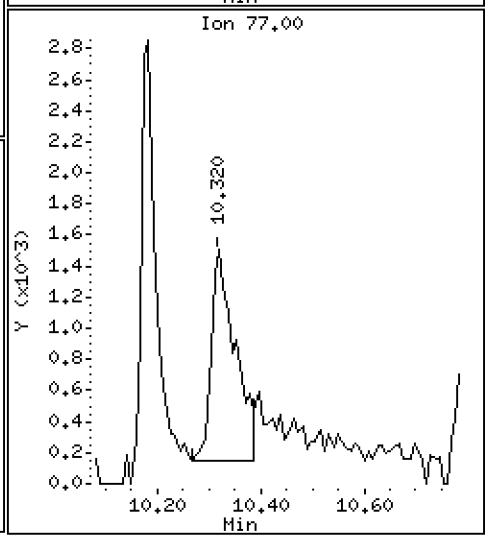


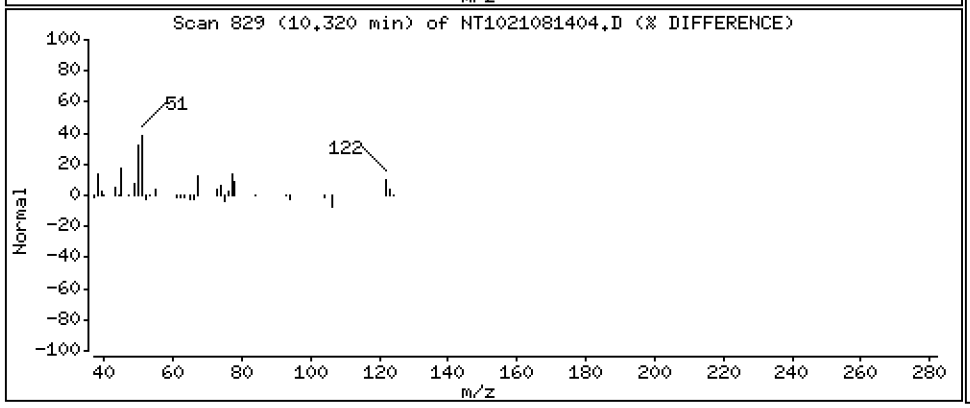












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

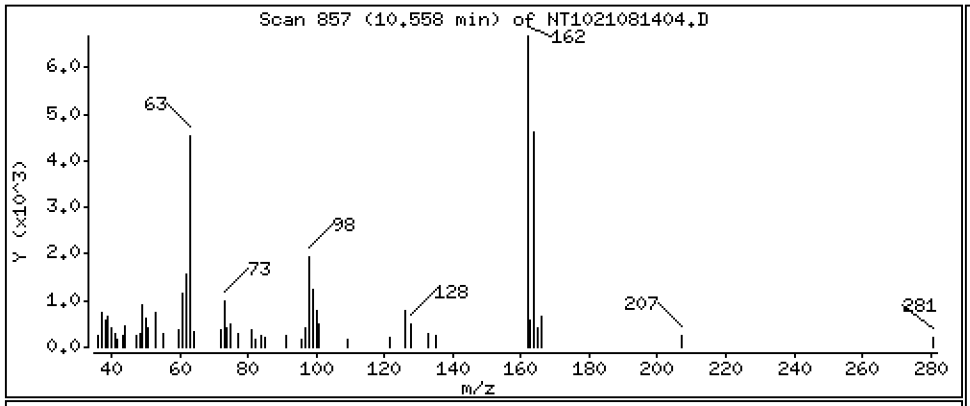
Operator: VTS

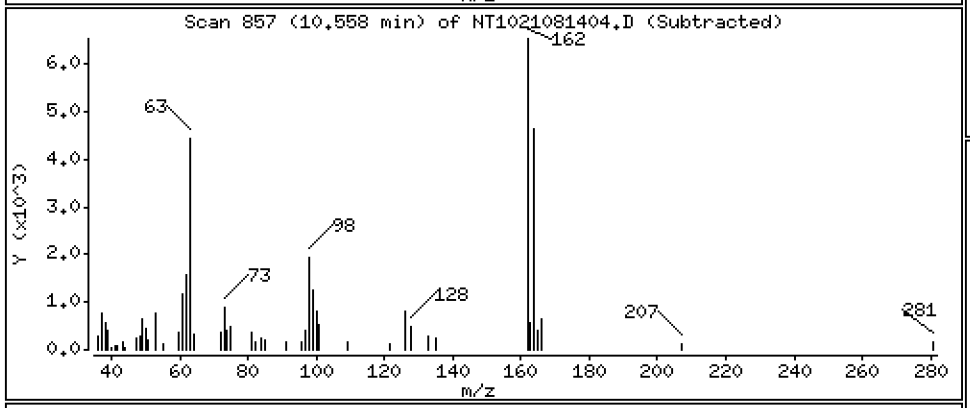
Column phase: ZB-5msi

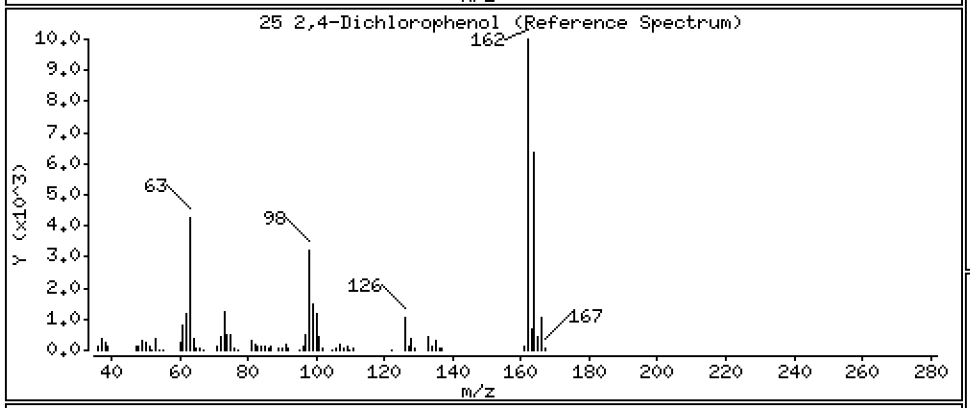
Column diameter: 0.25

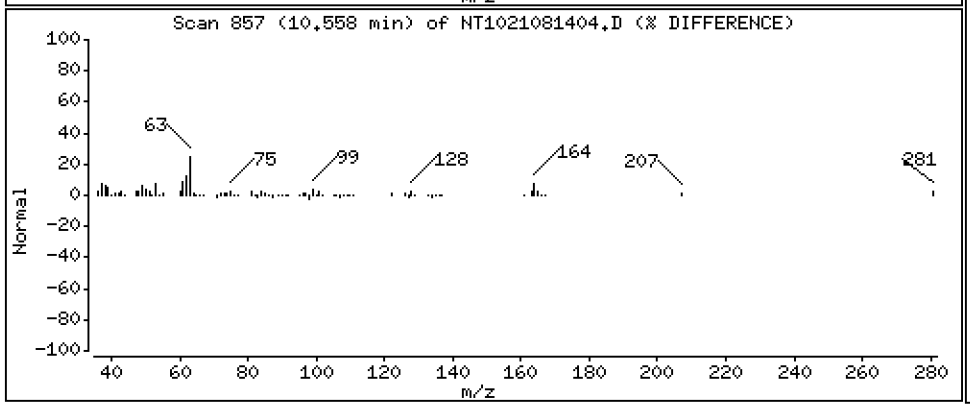
25 2,4-Dichlorophenol

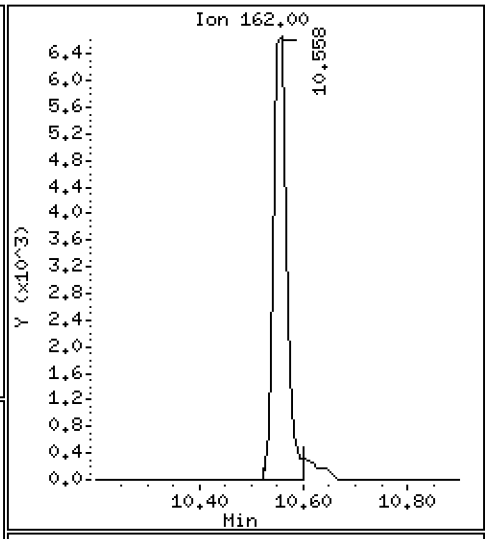
Concentration: 0.3384 ug/mL

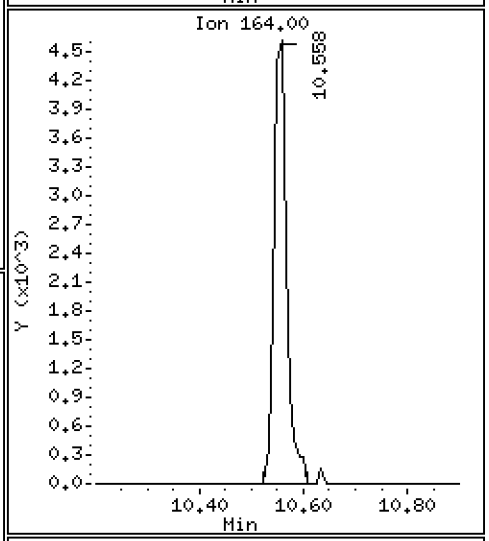


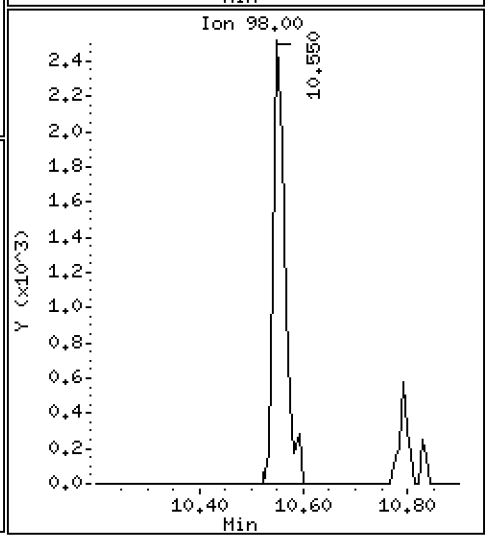












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

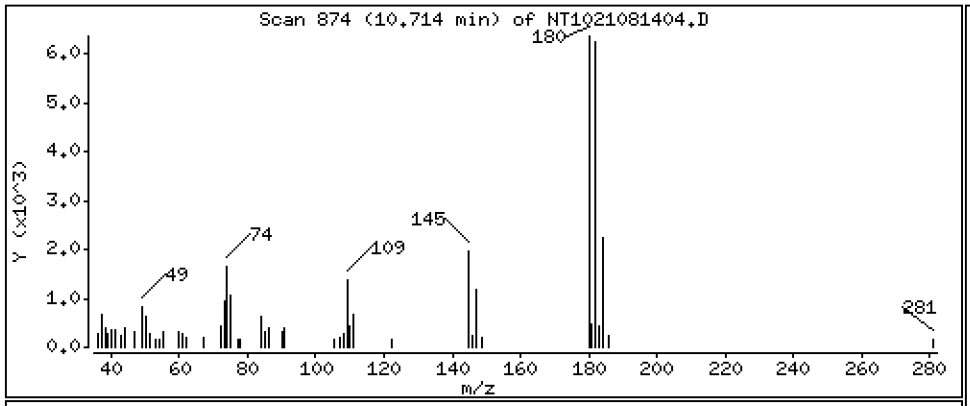
Operator: VTS

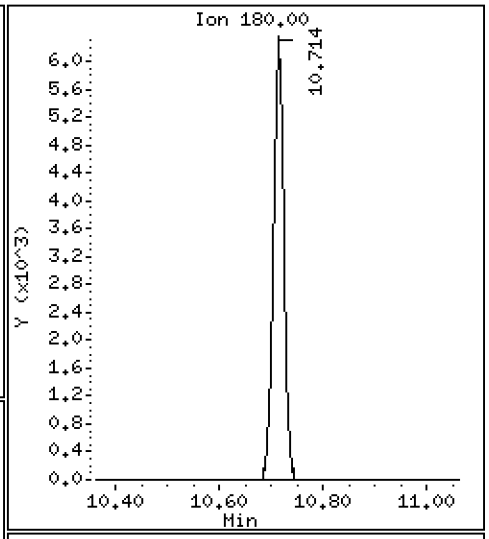
Column phase: ZB-5msi

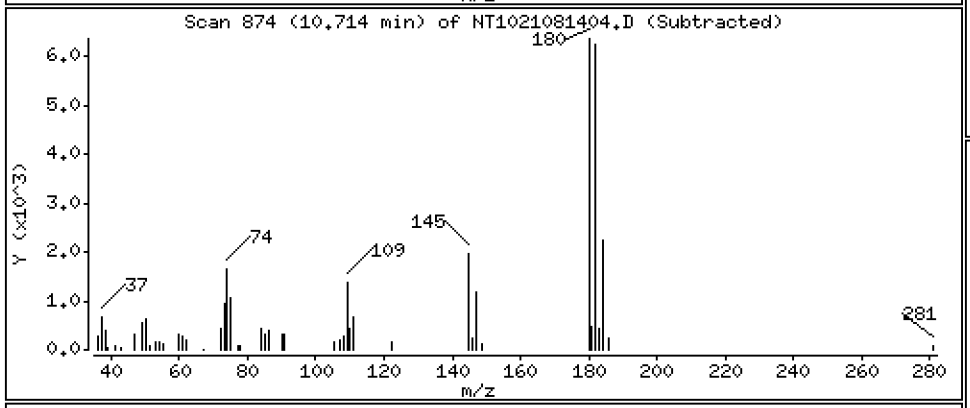
Column diameter: 0.25

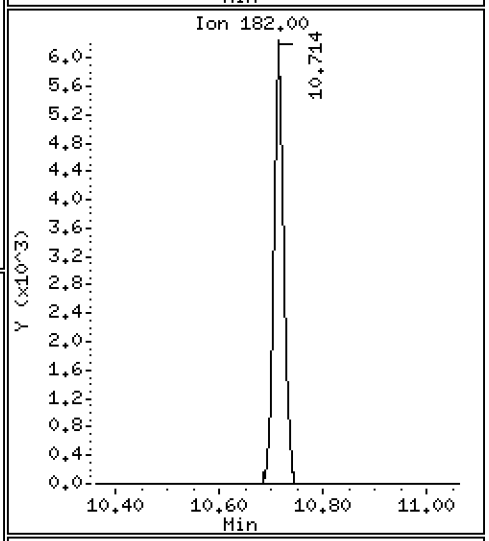
26 1,2,4-Trichlorobenzene

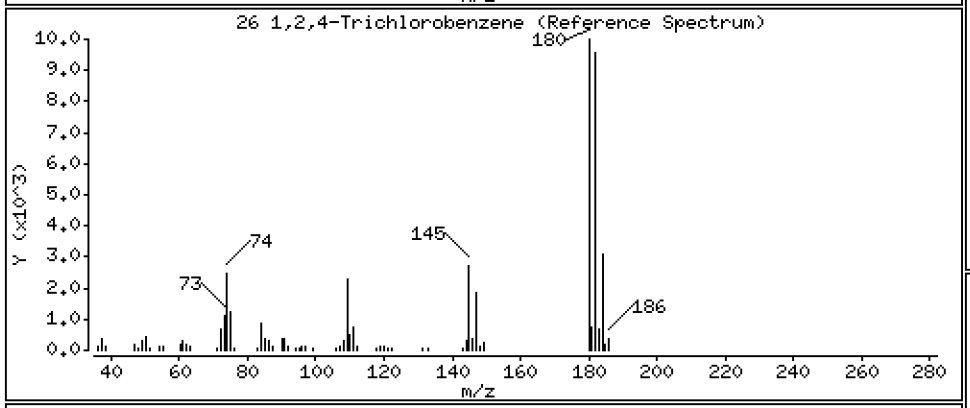
Concentration: 0.2282 ug/mL

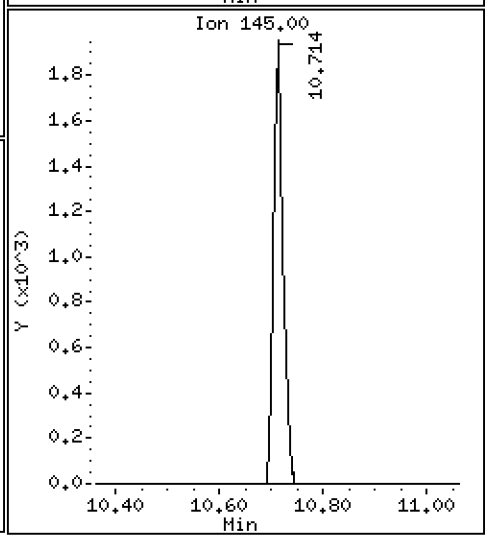


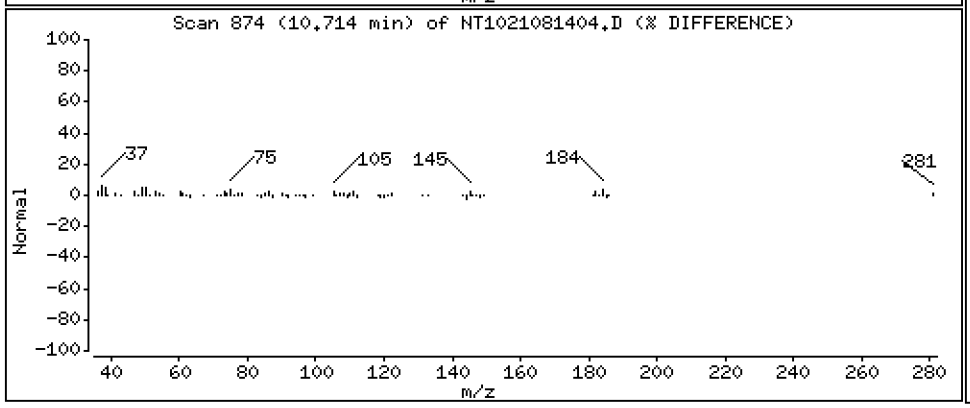












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

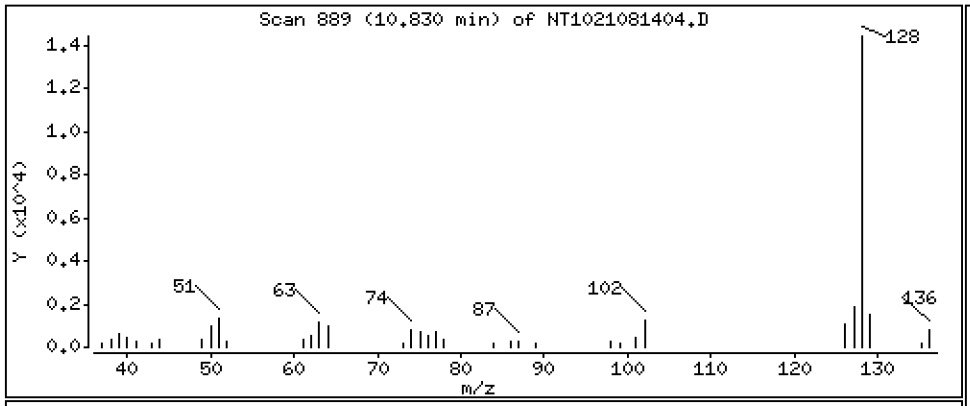
Operator: VTS

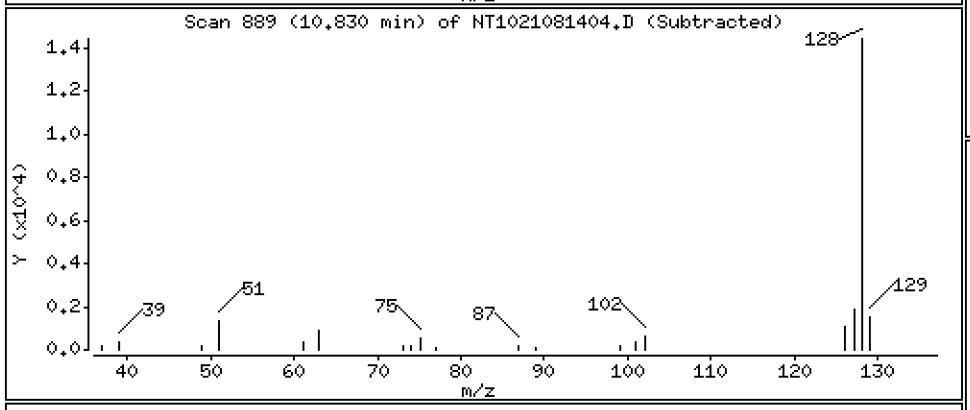
Column phase: ZB-5msi

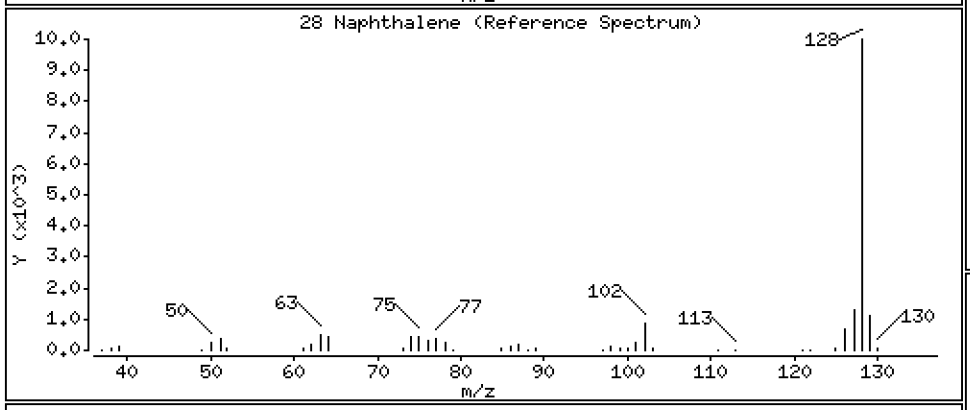
Column diameter: 0.25

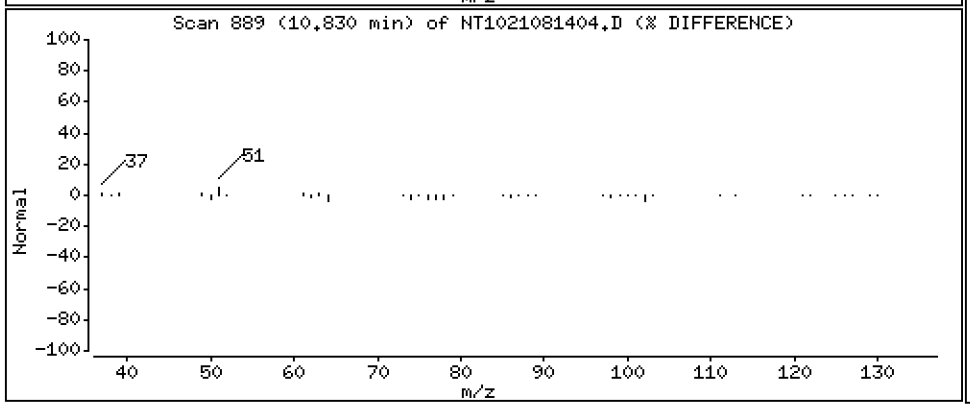
28 Naphthalene

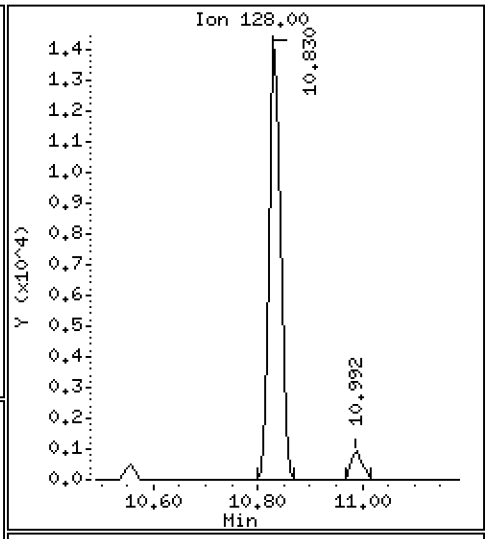
Concentration: 0.1731 ug/mL

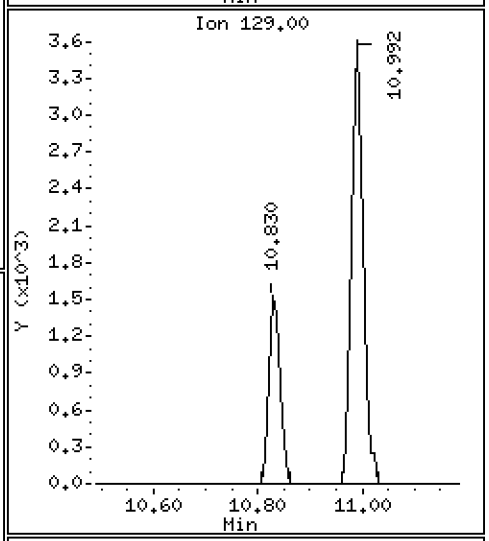


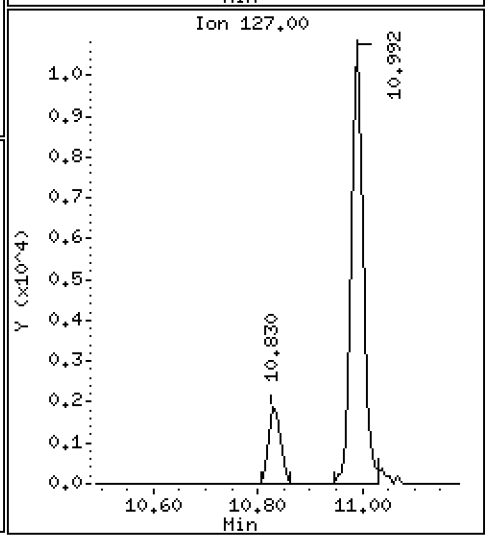












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

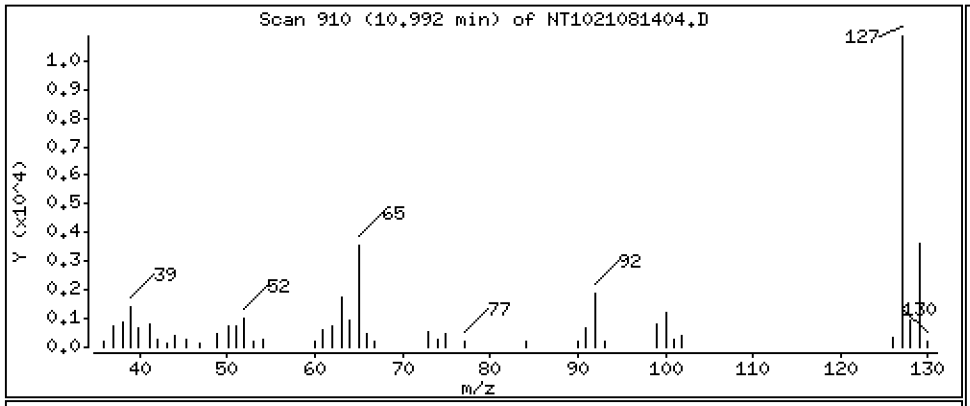
Operator: VTS

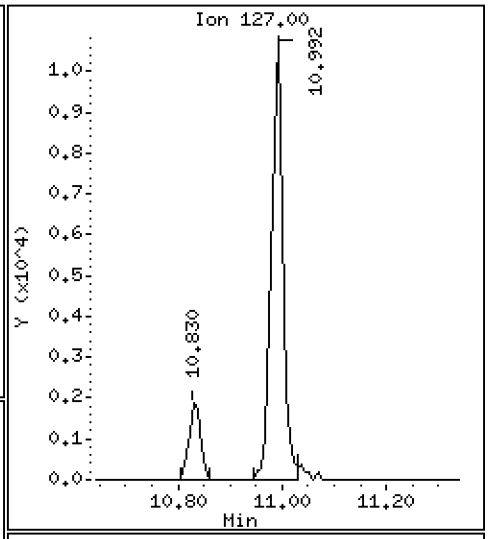
Column phase: ZB-5msi

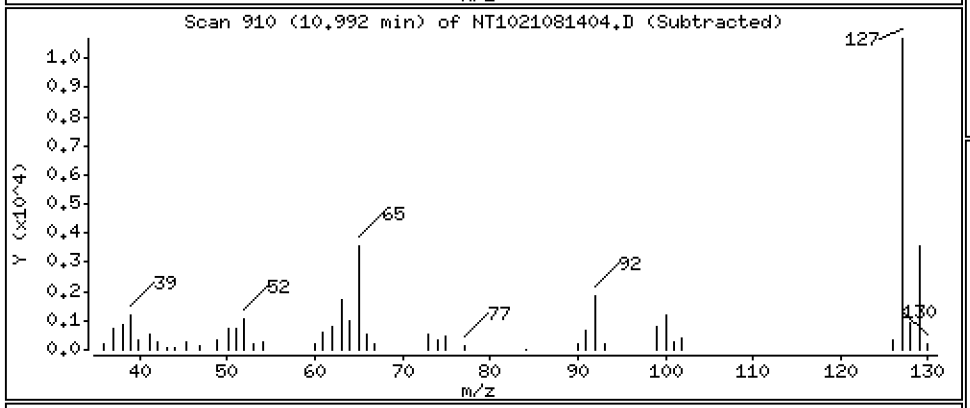
Column diameter: 0.25

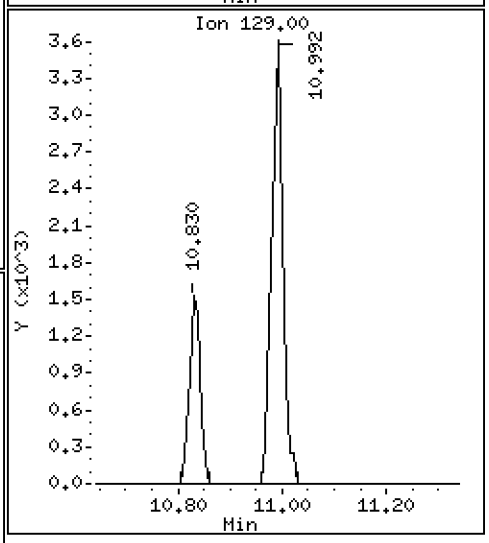
29 4-Chloroaniline

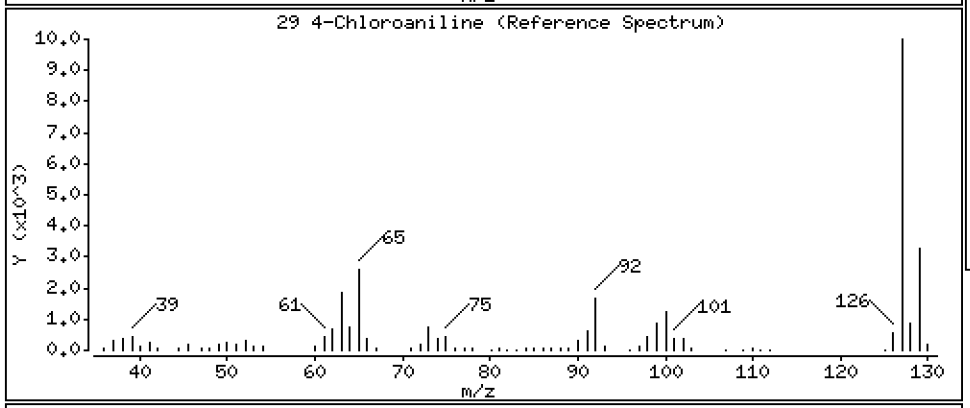
Concentration: 0.2713 ug/mL

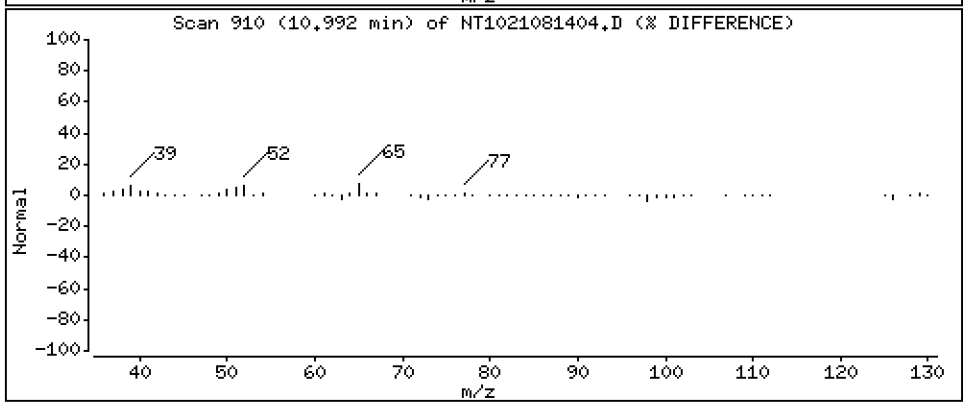












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

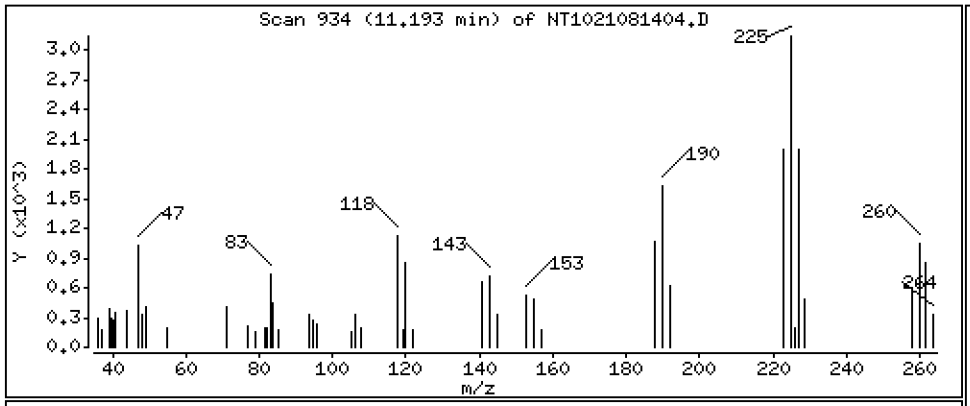
Operator: VTS

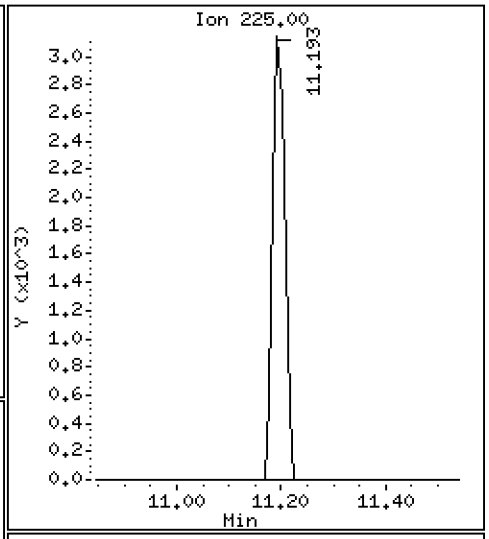
Column phase: ZB-5msi

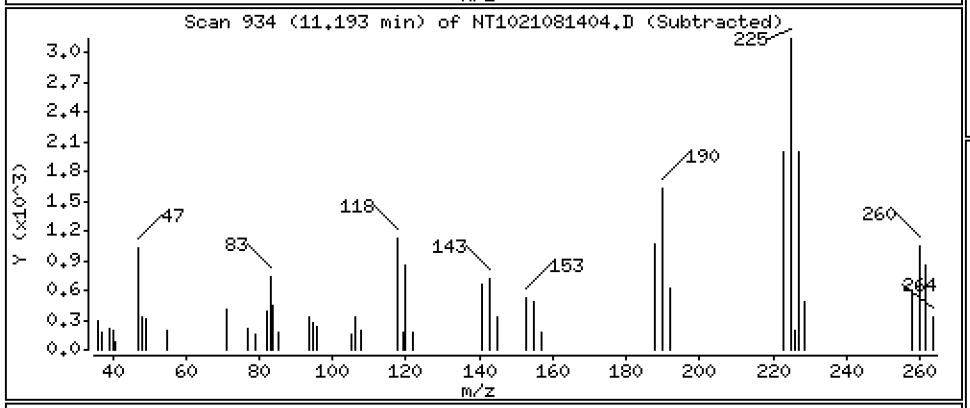
Column diameter: 0.25

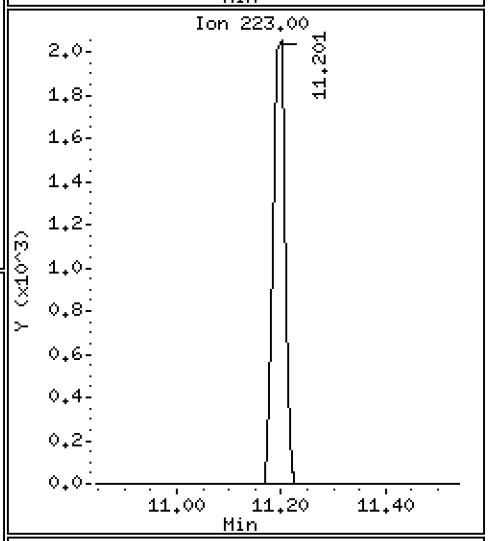
30 Hexachlorobutadiene

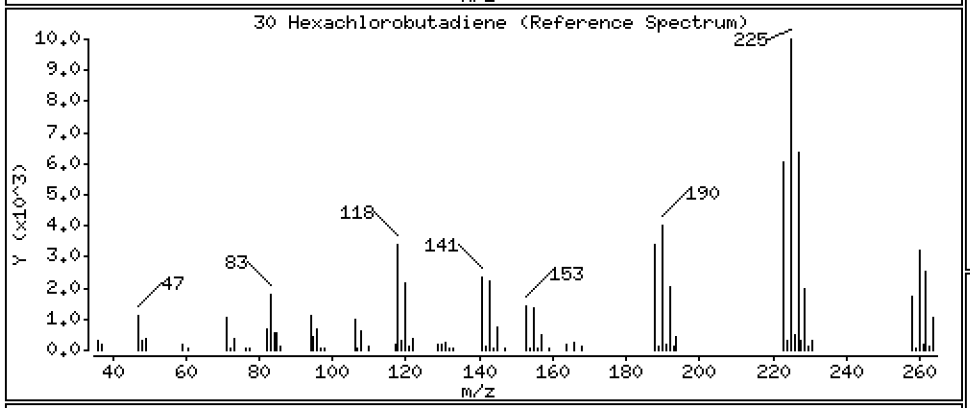
Concentration: 0.2218 ug/mL

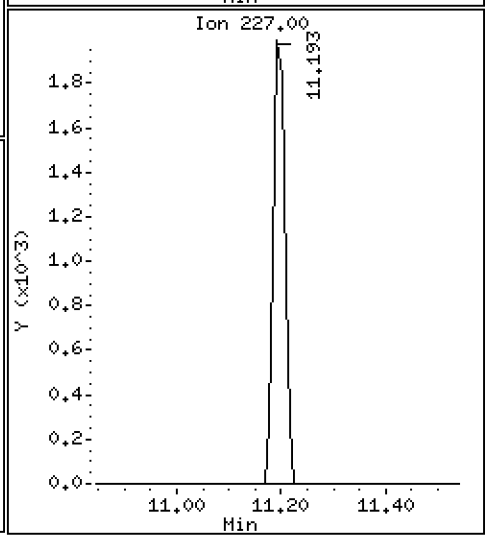


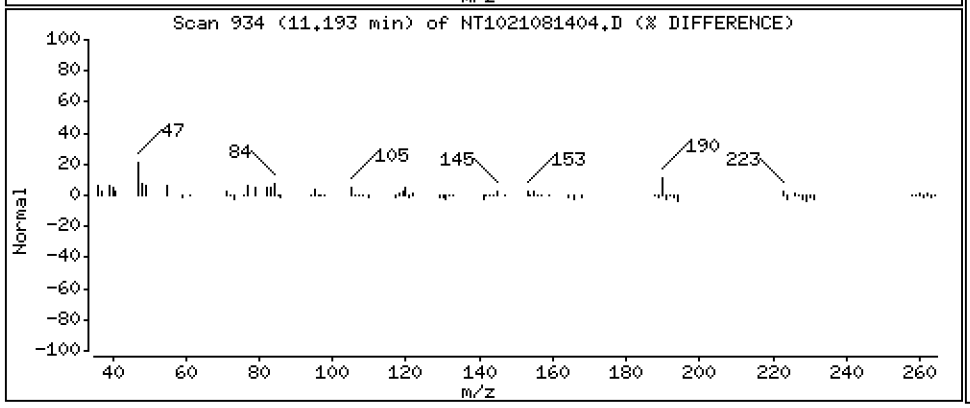












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

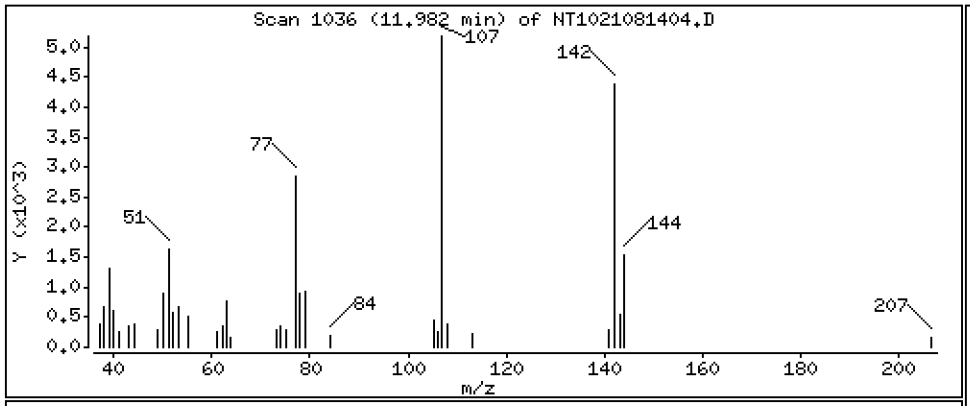
Operator: VTS

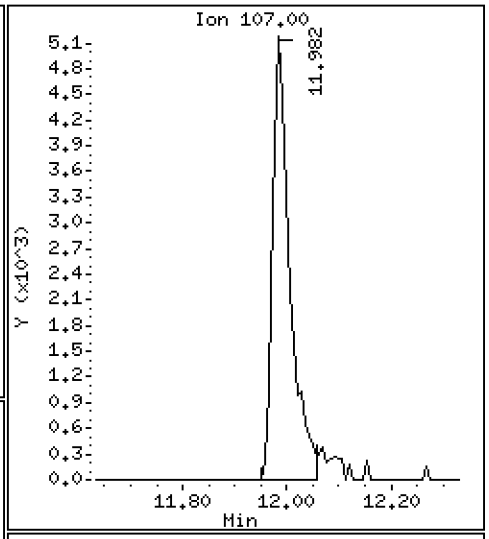
Column phase: ZB-5msi

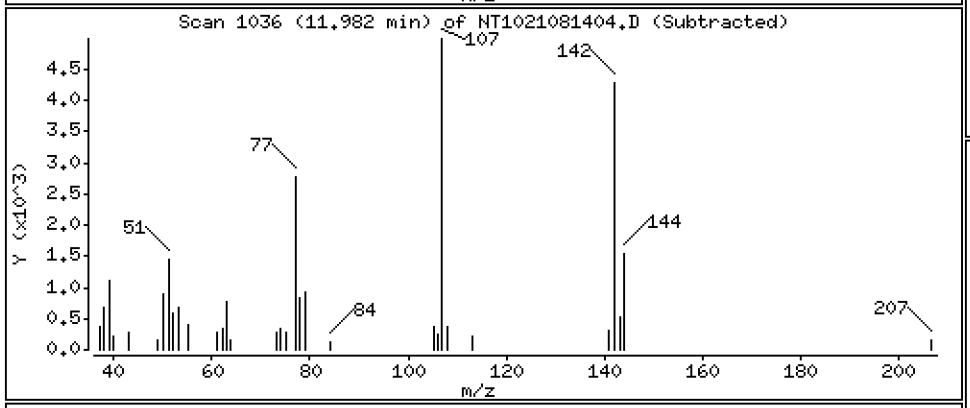
Column diameter: 0.25

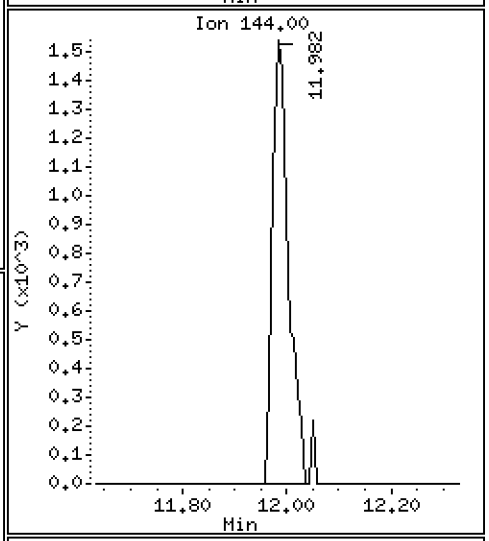
31 4-Chloro-3-methylphenol

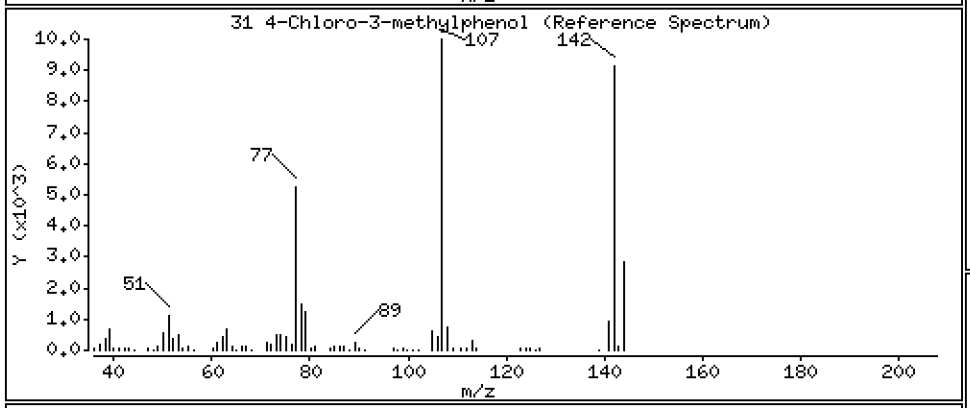
Concentration: 0.2741 ug/mL

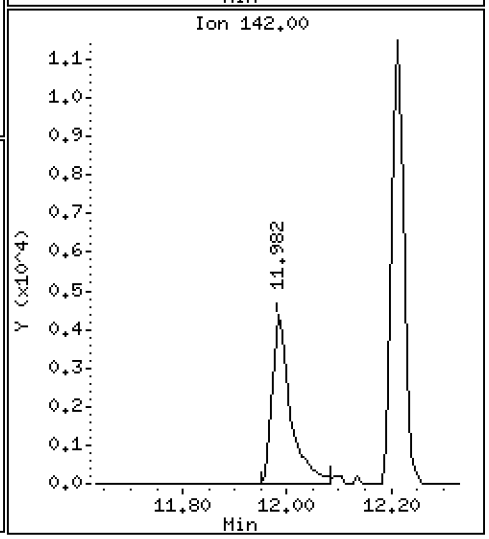


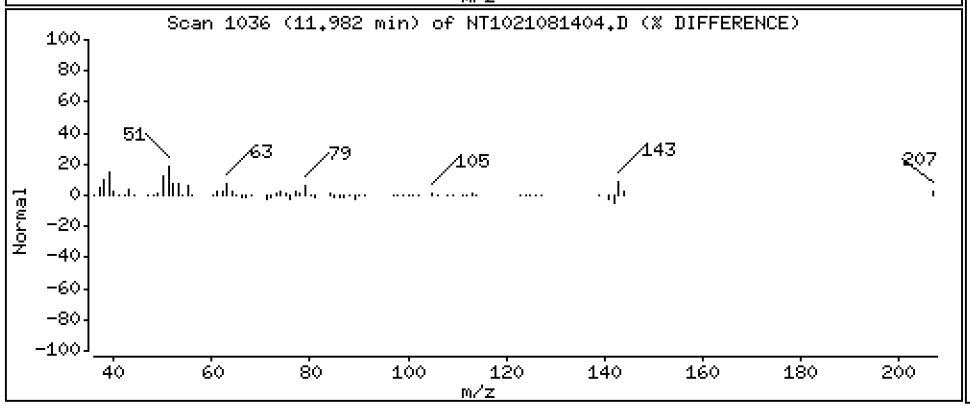












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

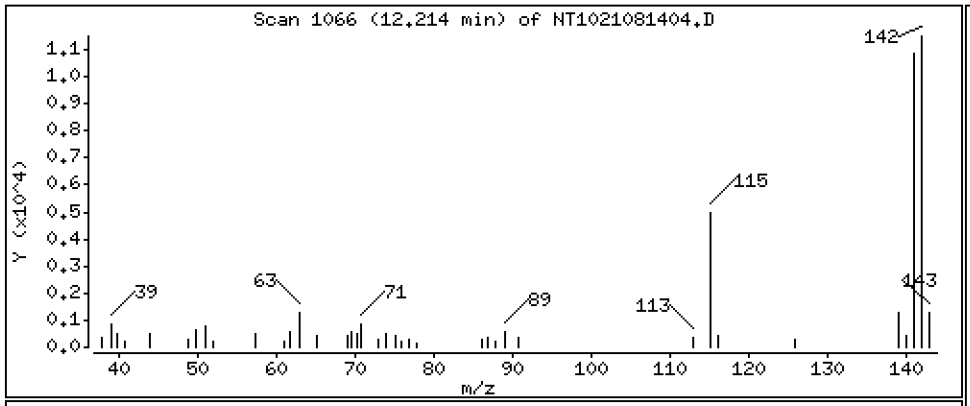
Operator: VTS

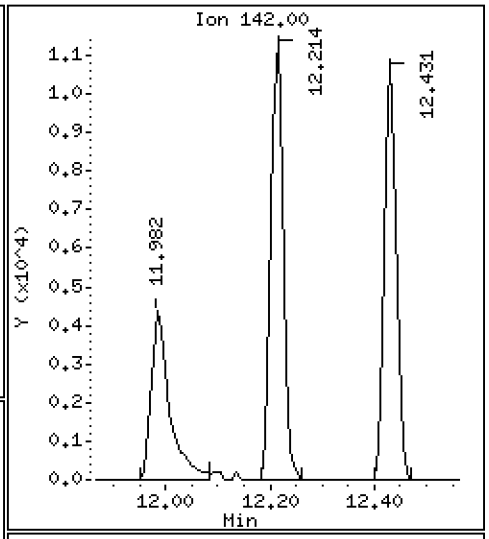
Column phase: ZB-5msi

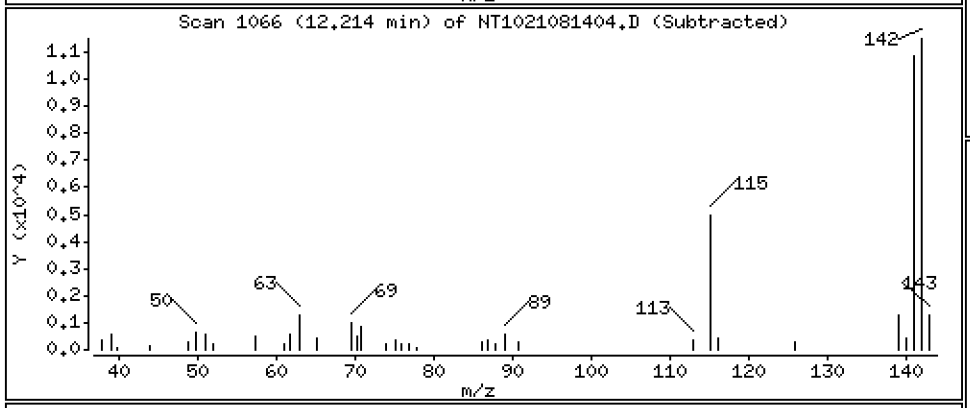
Column diameter: 0.25

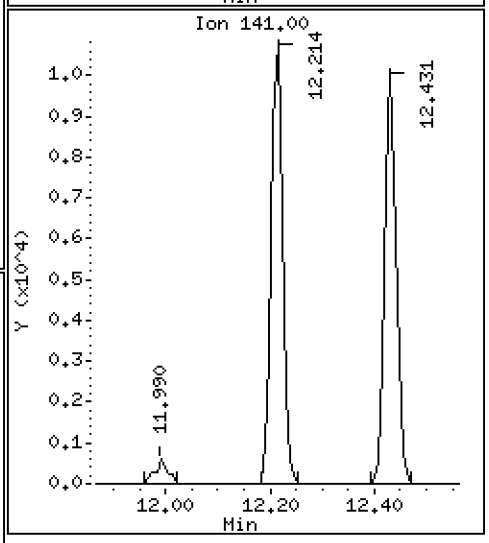
32 2-Methylnaphthalene

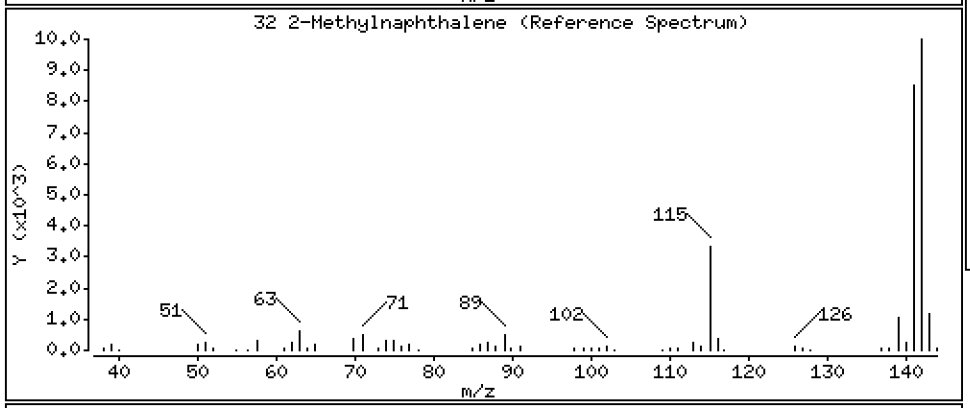
Concentration: 0.1601 ug/mL

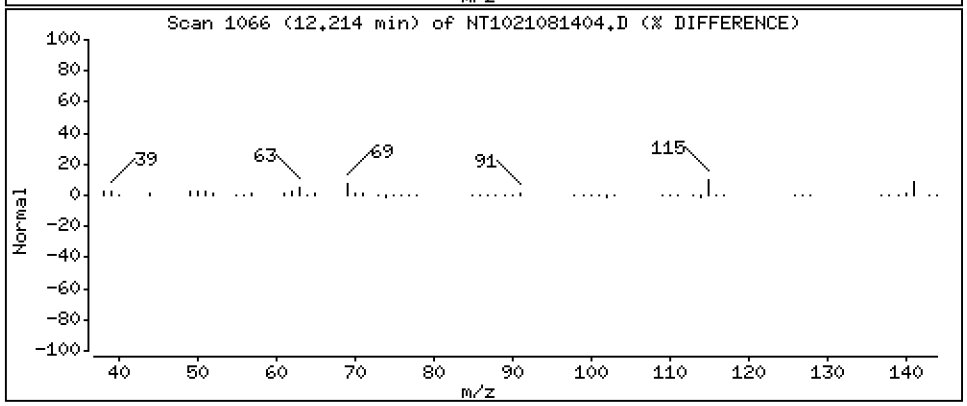












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

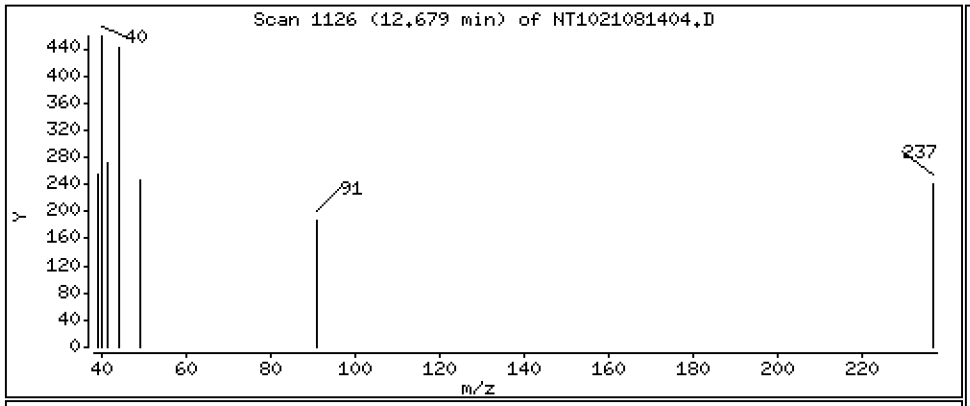
Operator: VTS

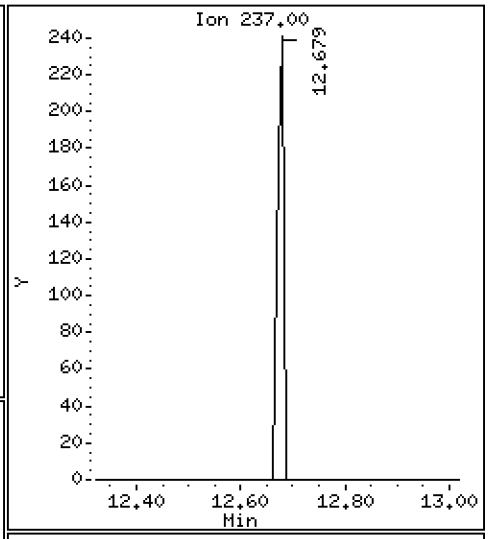
Column phase: ZB-5msi

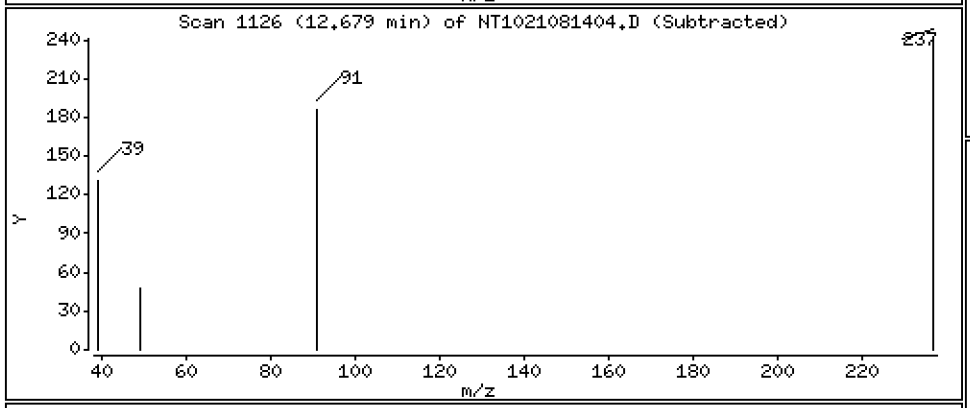
Column diameter: 0.25

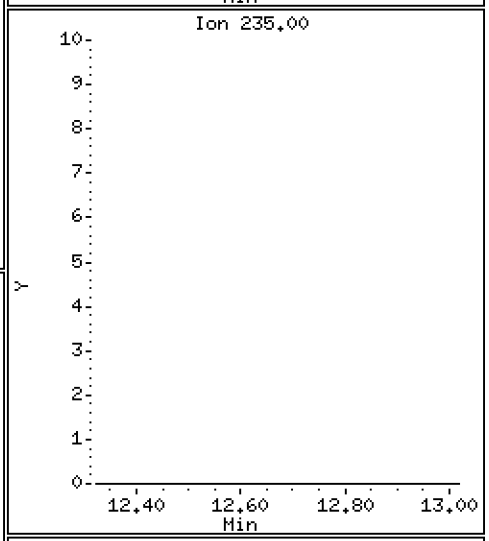
33 Hexachlorocyclopentadiene

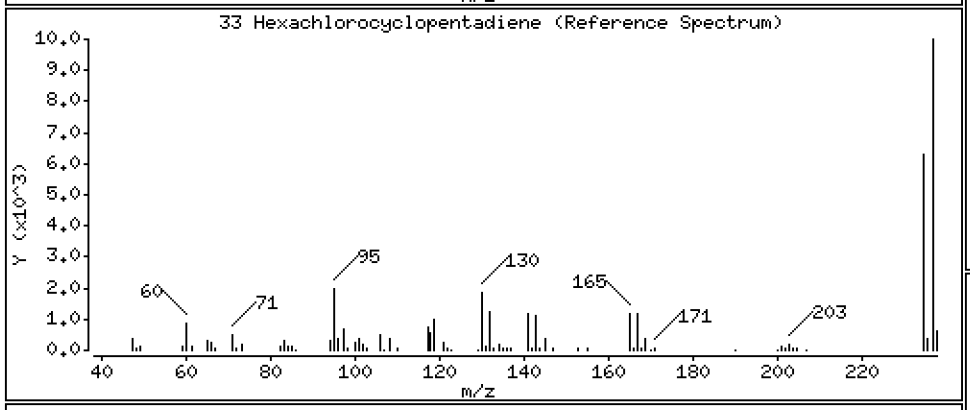
Concentration: 0.007837 ug/mL

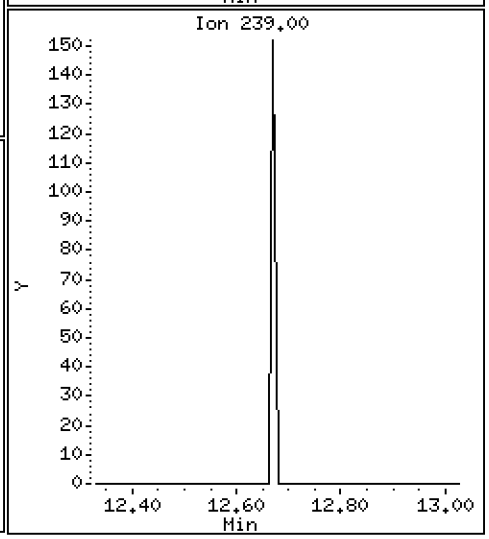


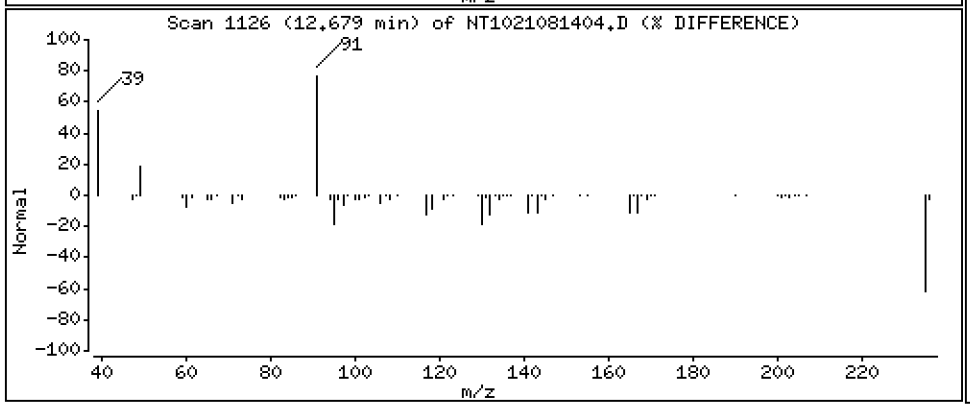












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

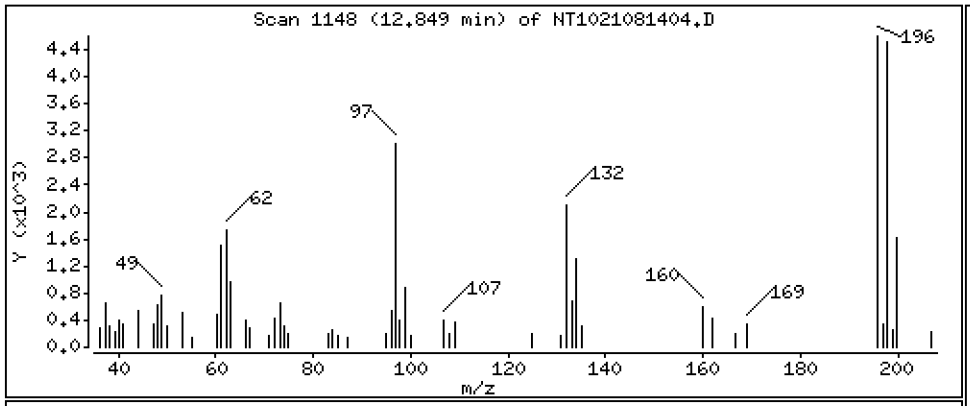
Operator: VTS

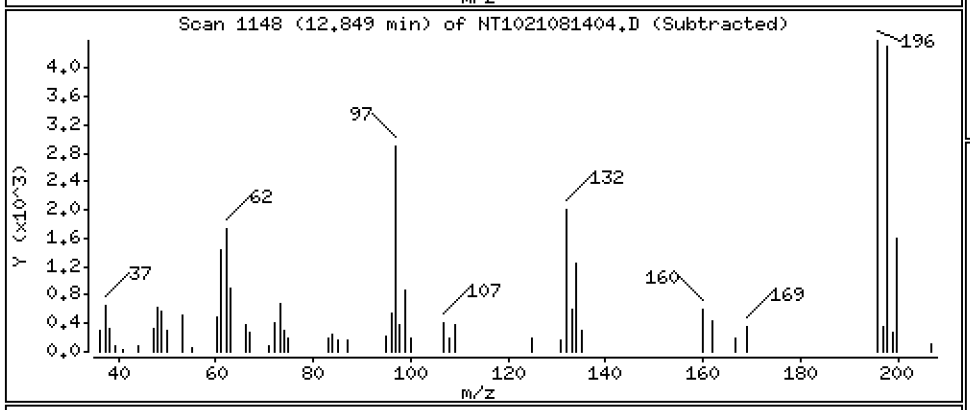
Column phase: ZB-5msi

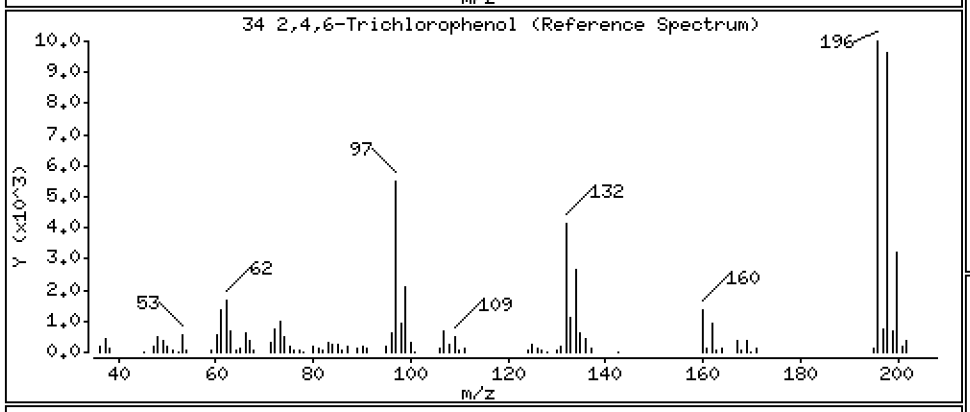
Column diameter: 0.25

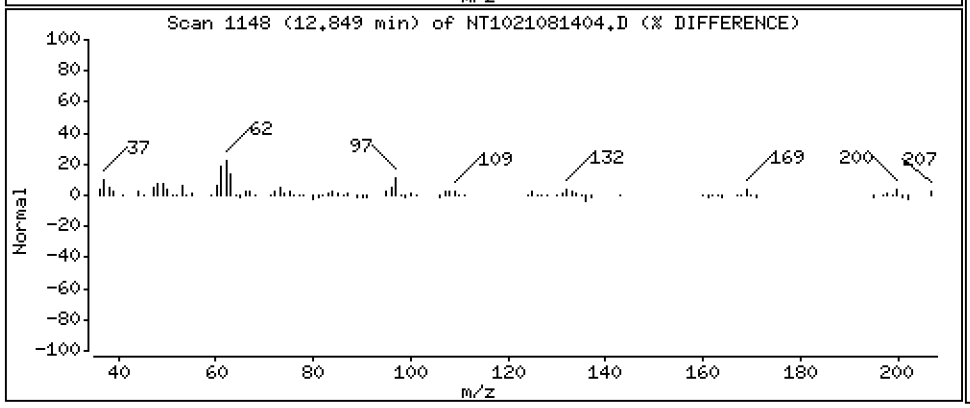
34 2,4,6-Trichlorophenol

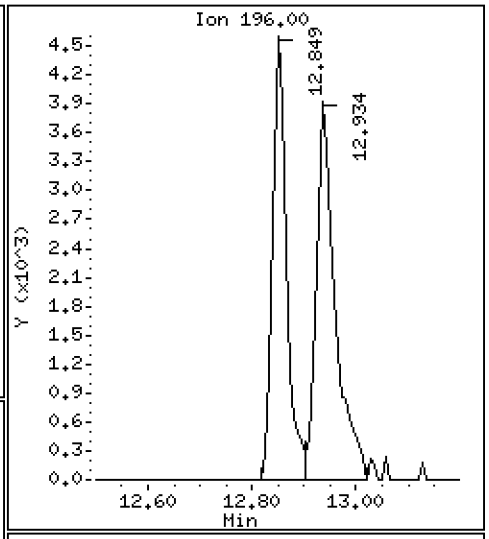
Concentration: 0.3236 ug/mL

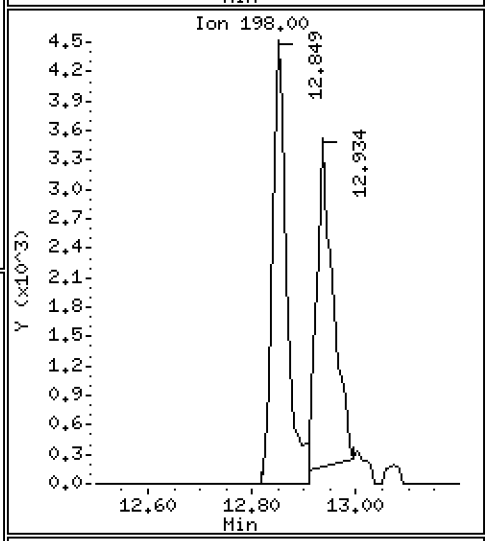


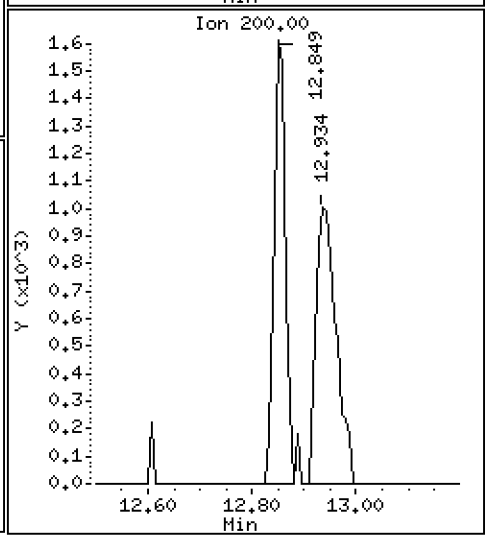












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

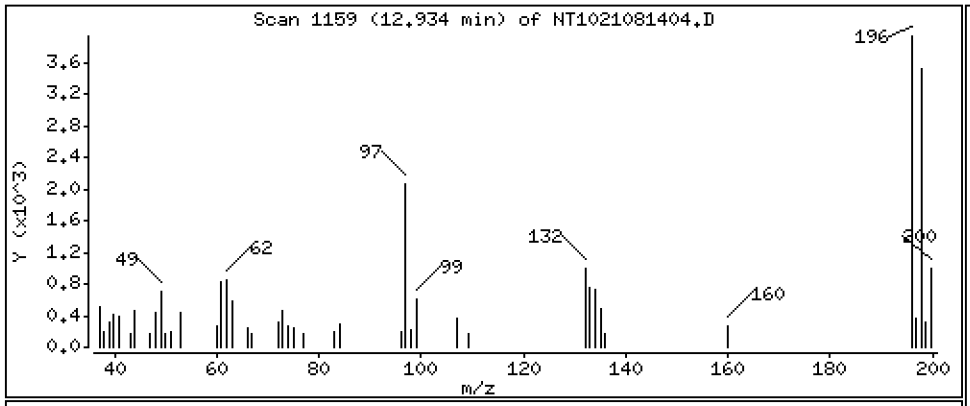
Operator: VTS

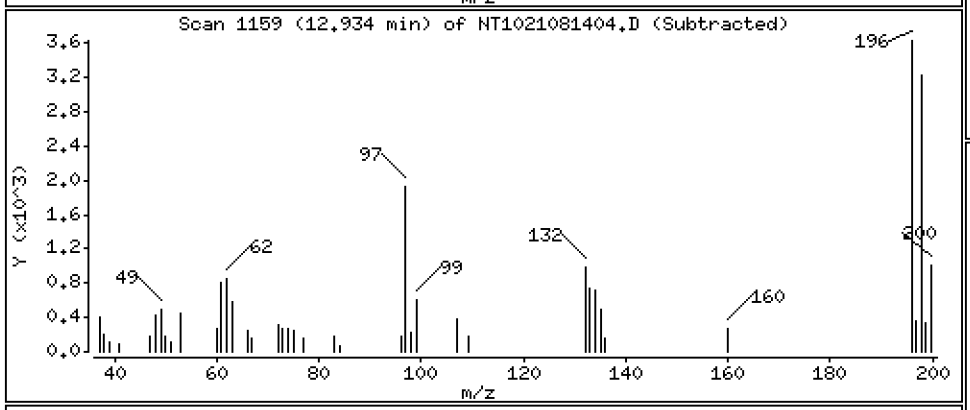
Column phase: ZB-5msi

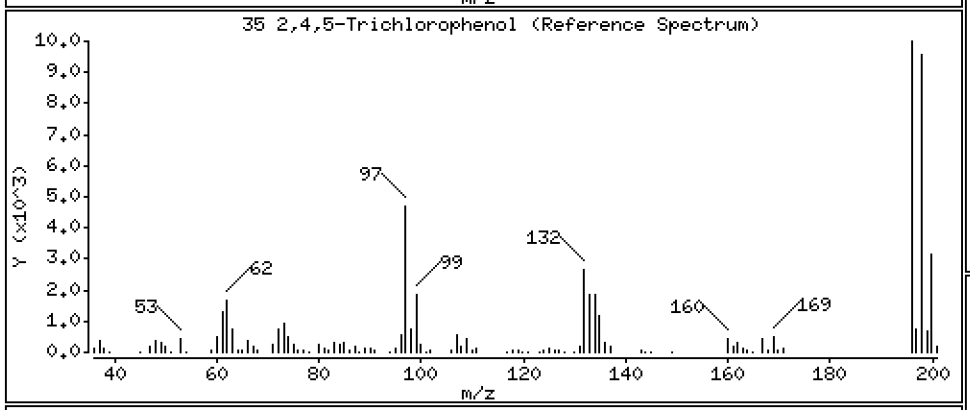
Column diameter: 0.25

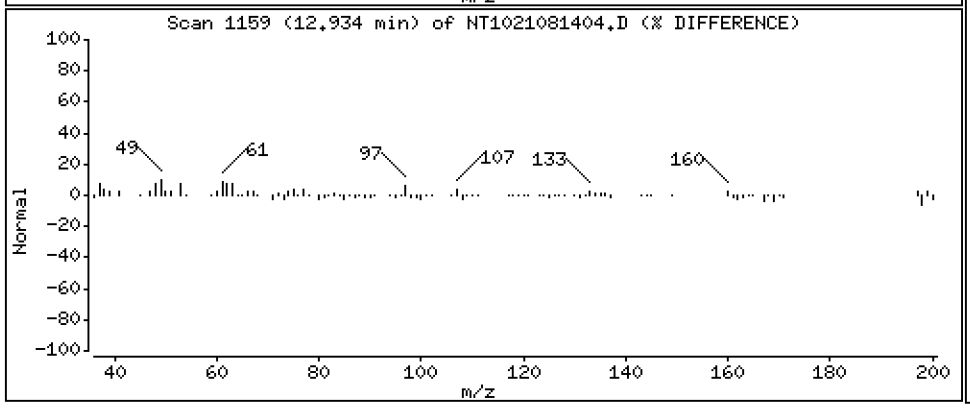
35 2,4,5-Trichlorophenol

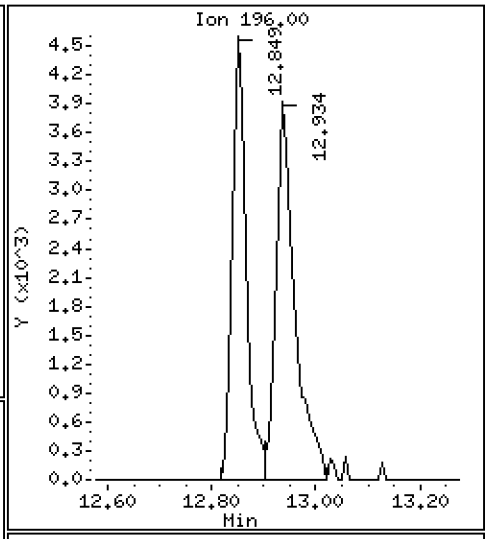
Concentration: 0.3627 ug/mL

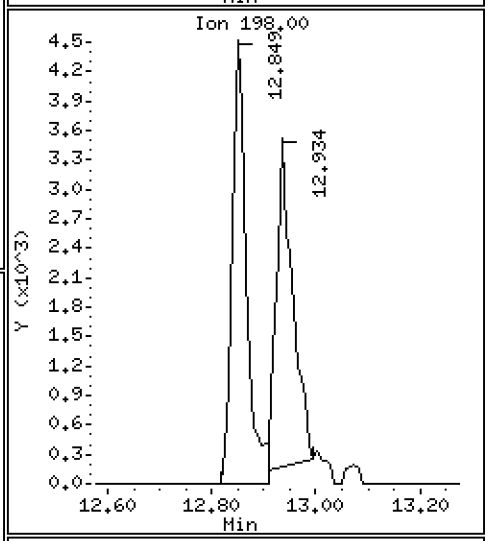


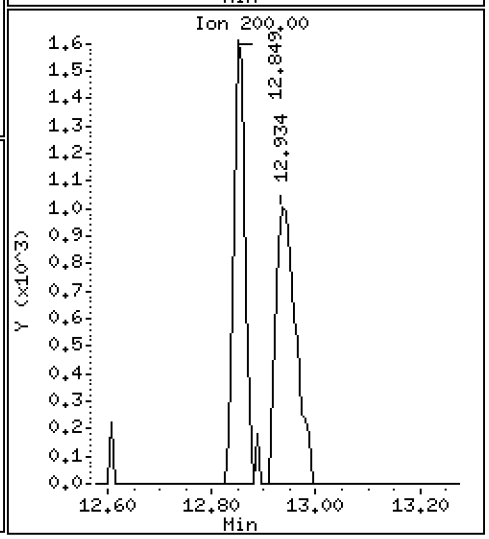












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

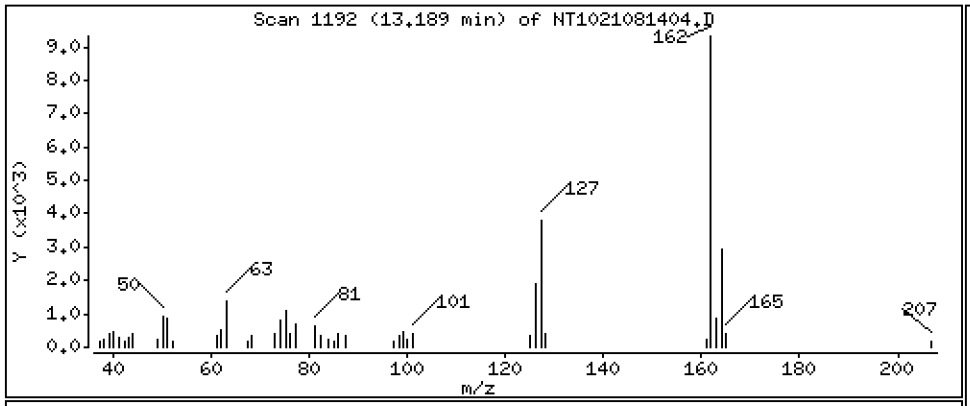
Operator: VTS

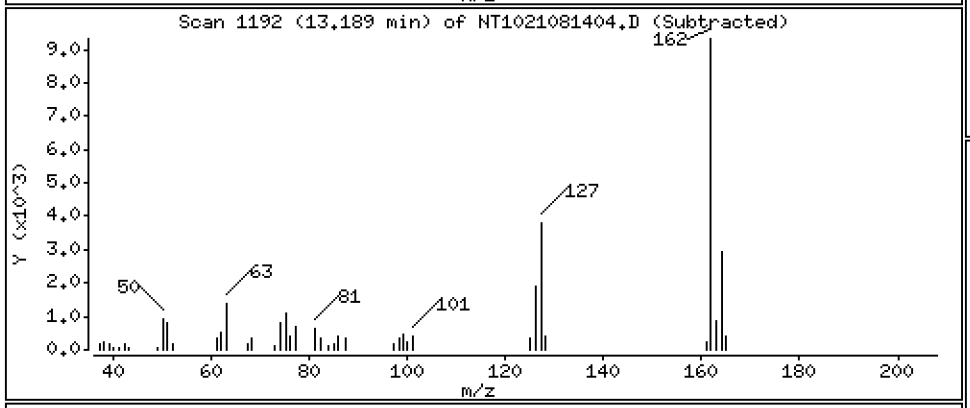
Column phase: ZB-5msi

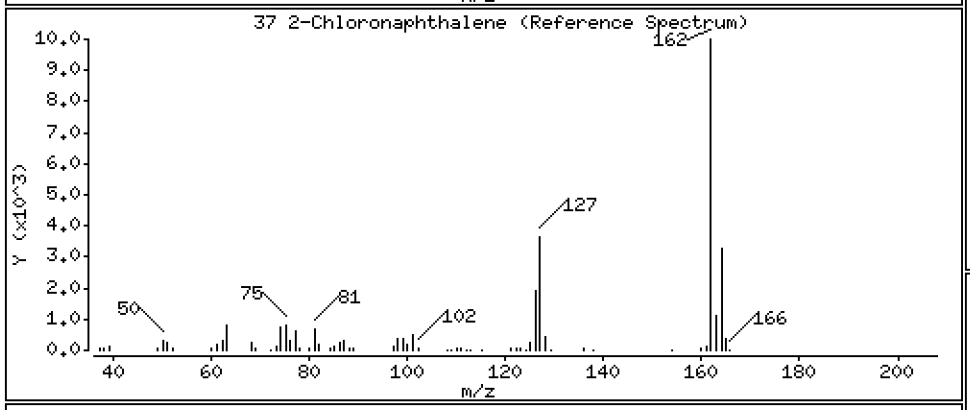
Column diameter: 0.25

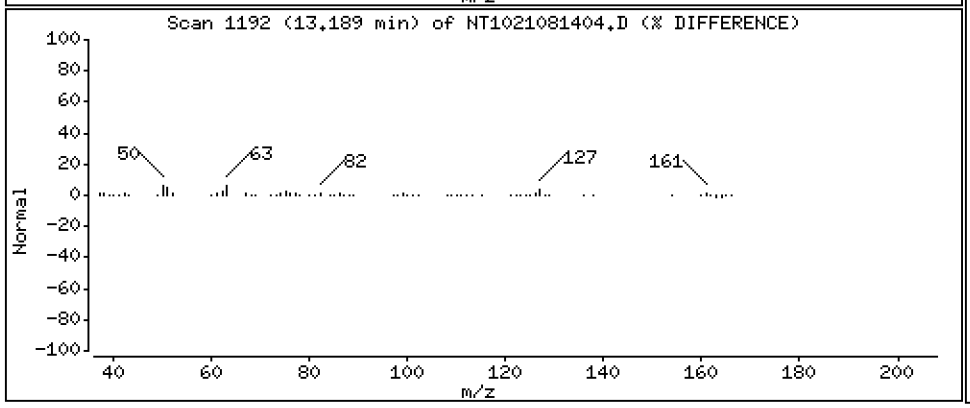
37 2-Chloronaphthalene

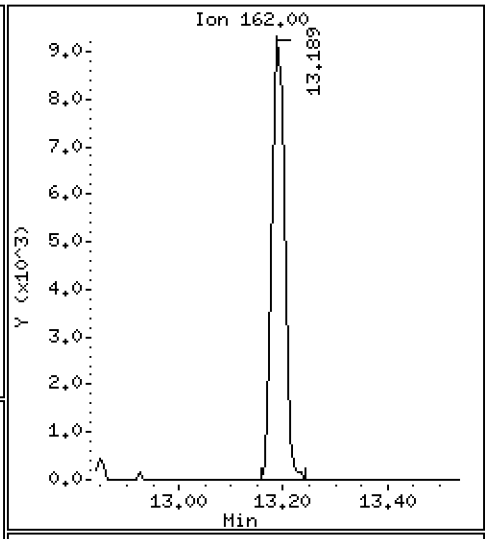
Concentration: 0.1673 ug/mL

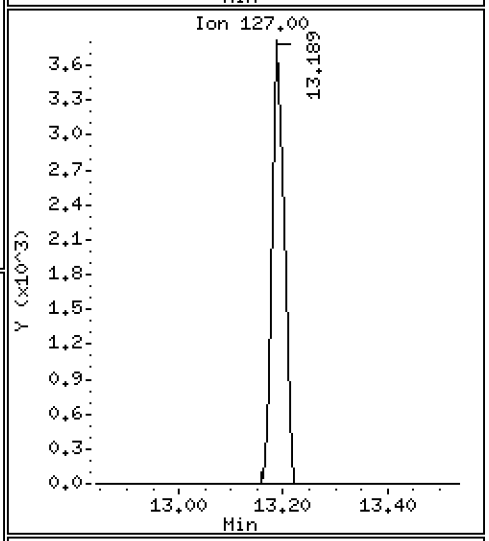


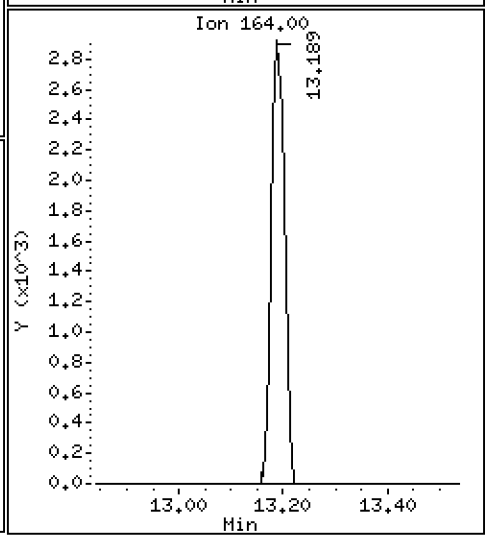












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

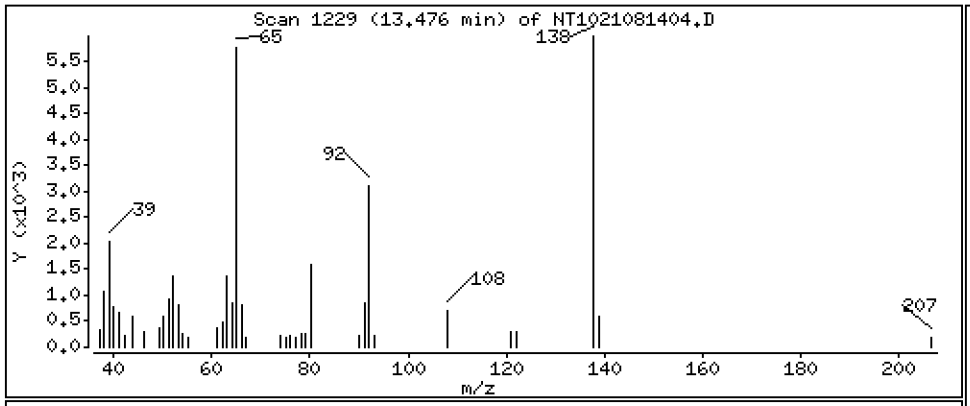
Operator: VTS

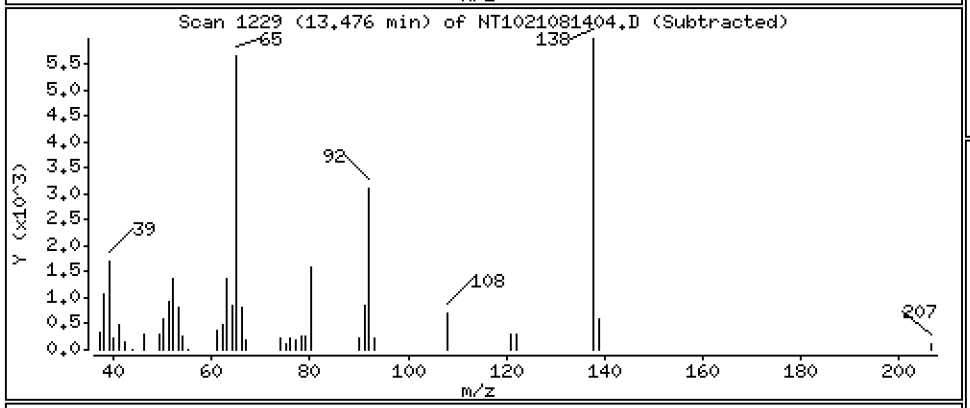
Column phase: ZB-5msi

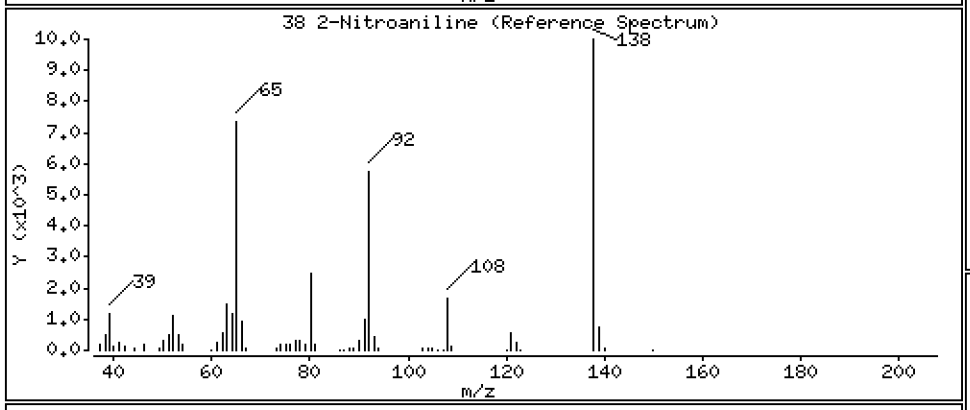
Column diameter: 0.25

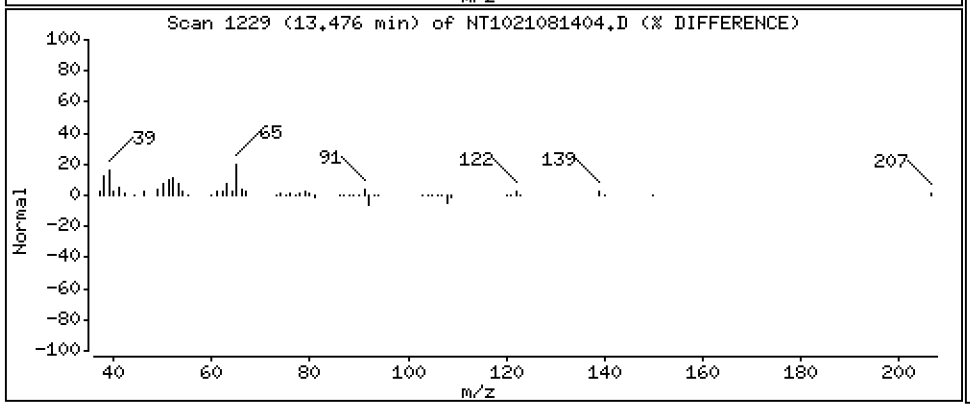
38 2-Nitroaniline

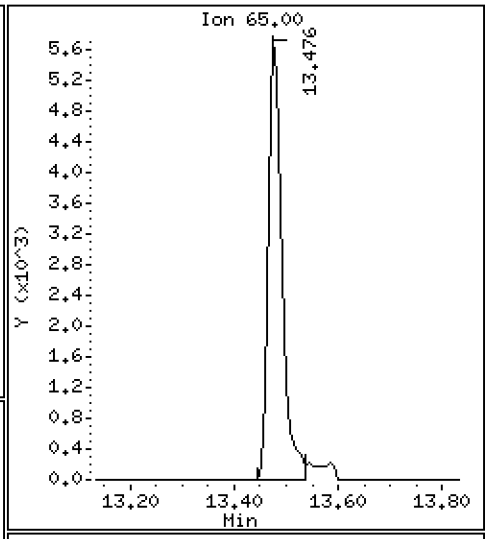
Concentration: 0.3025 ug/mL

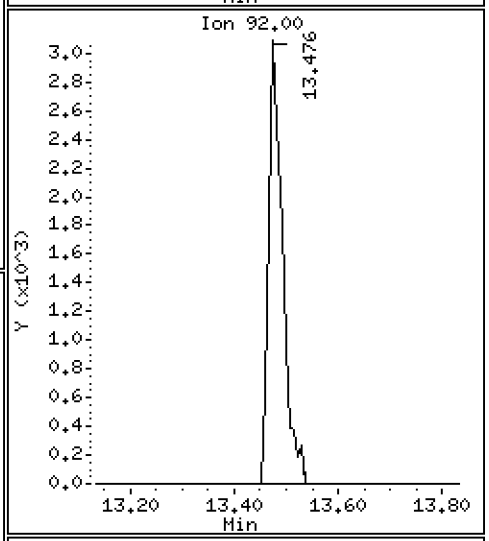


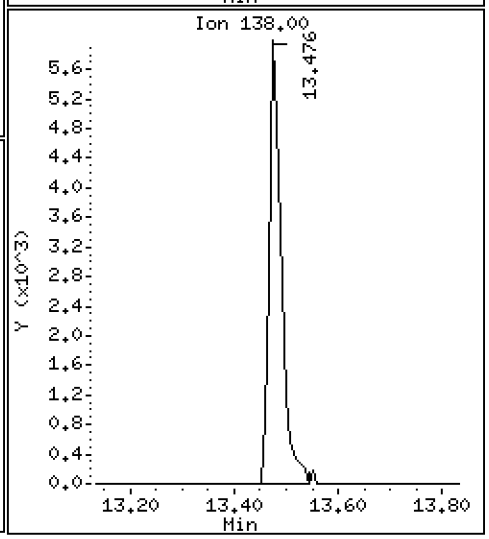












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

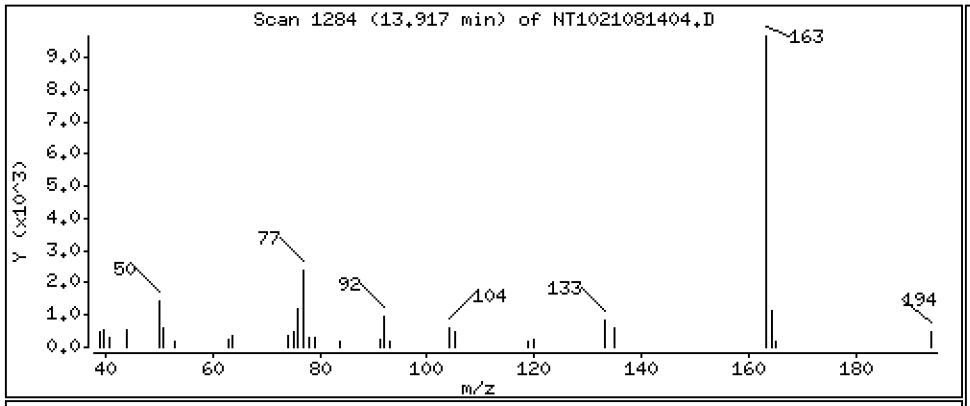
Operator: VTS

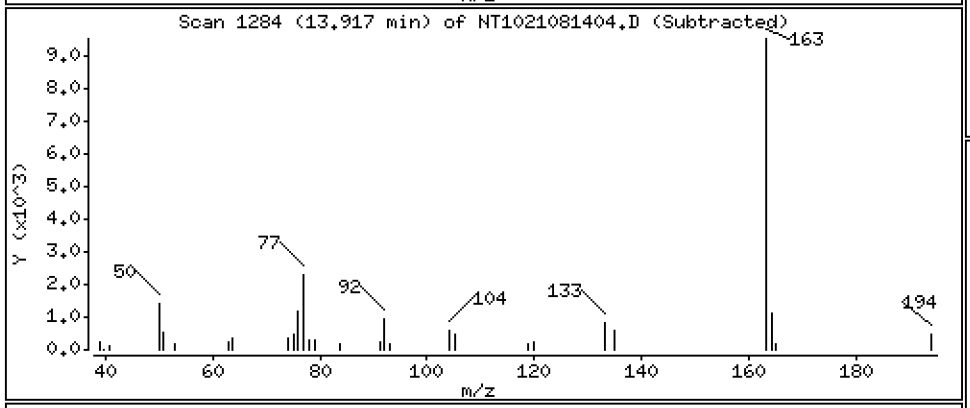
Column phase: ZB-5msi

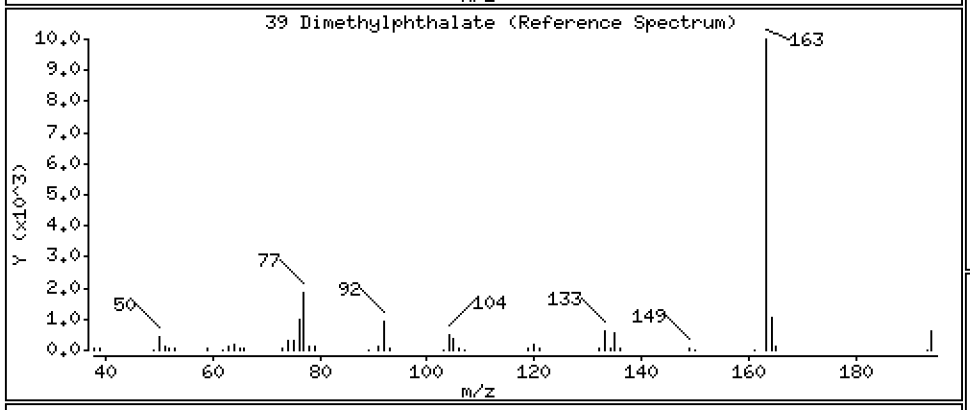
Column diameter: 0.25

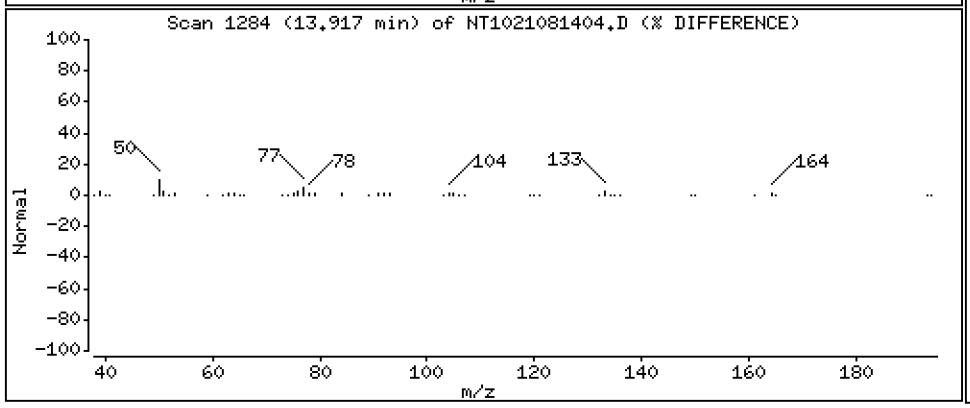
39 Dimethylphthalate

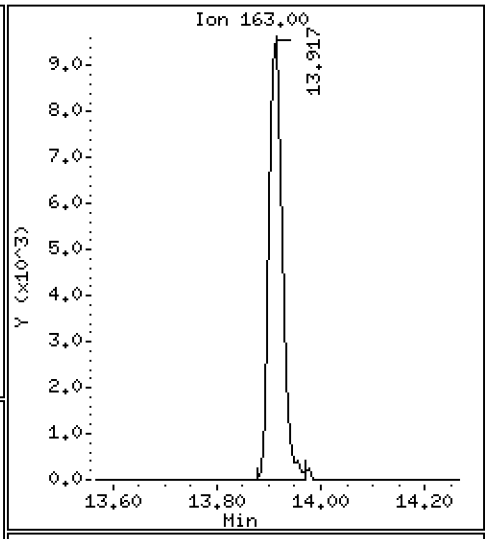
Concentration: 0.1913 ug/mL

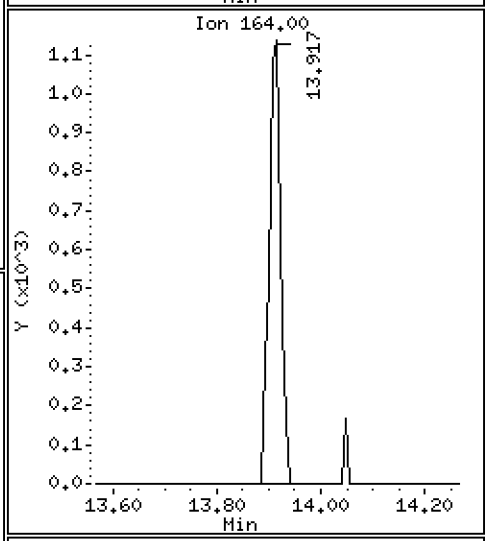


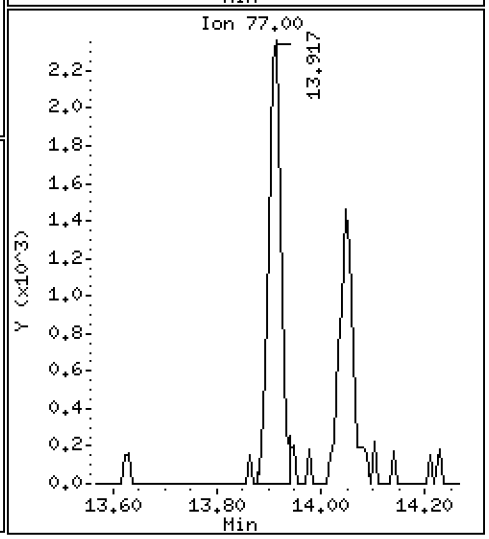












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

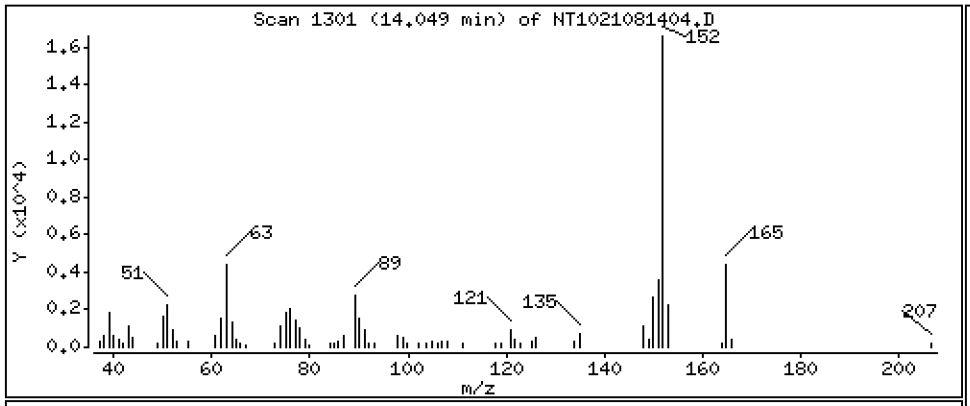
Operator: VTS

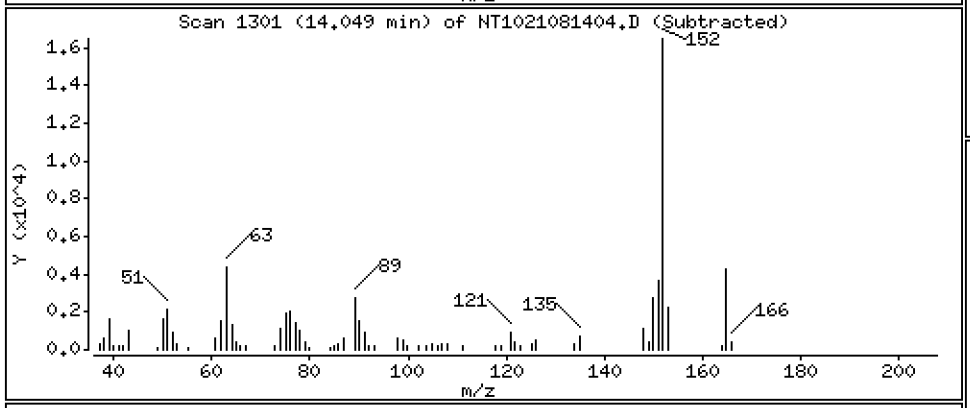
Column phase: ZB-5msi

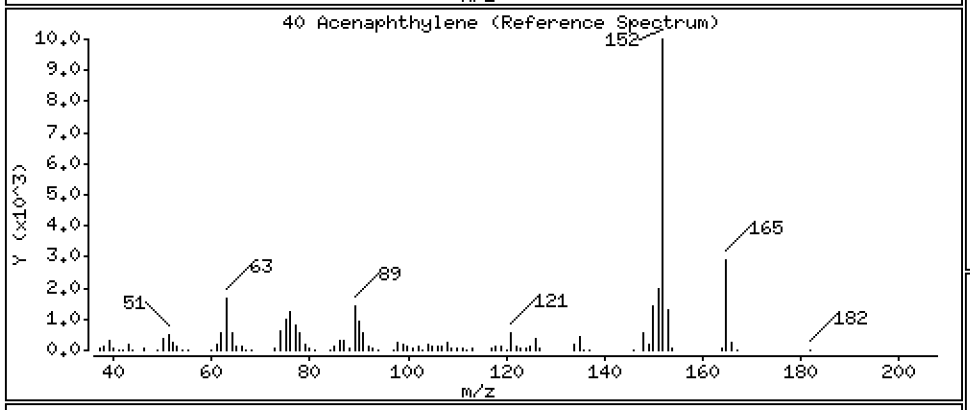
Column diameter: 0.25

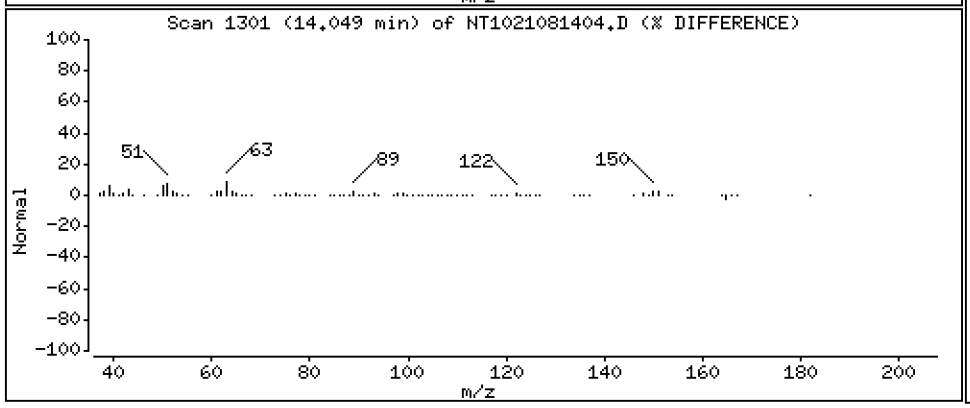
40 Acenaphthylene

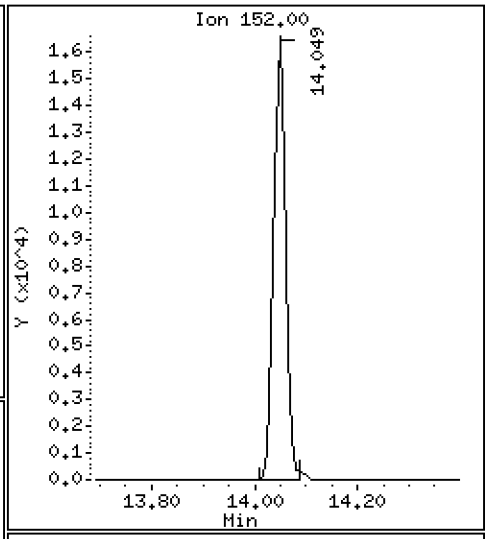
Concentration: 0.1940 ug/mL

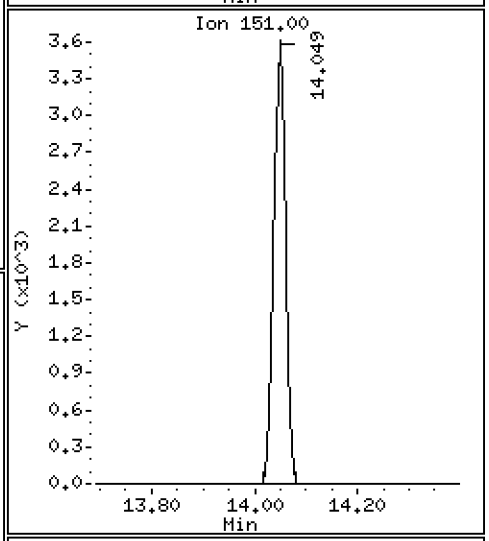


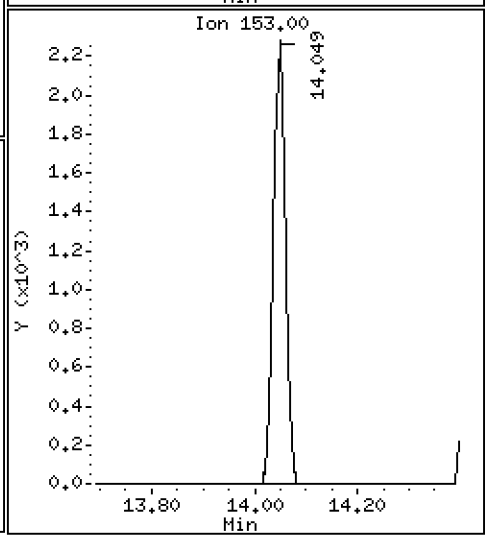












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

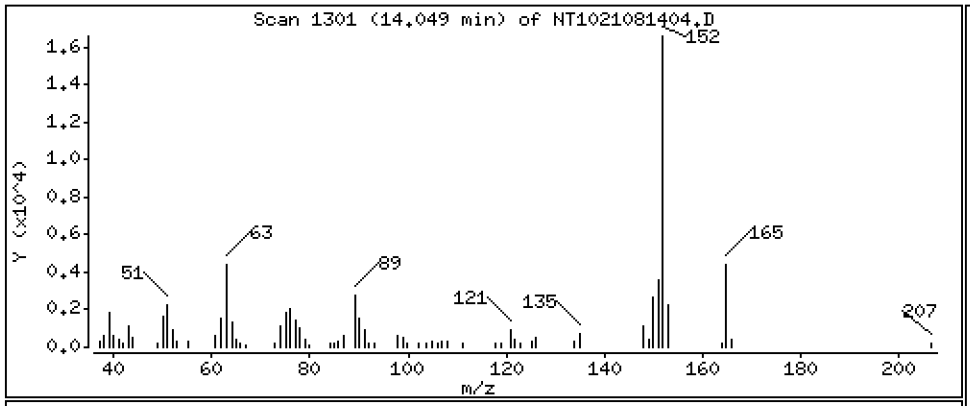
Operator: VTS

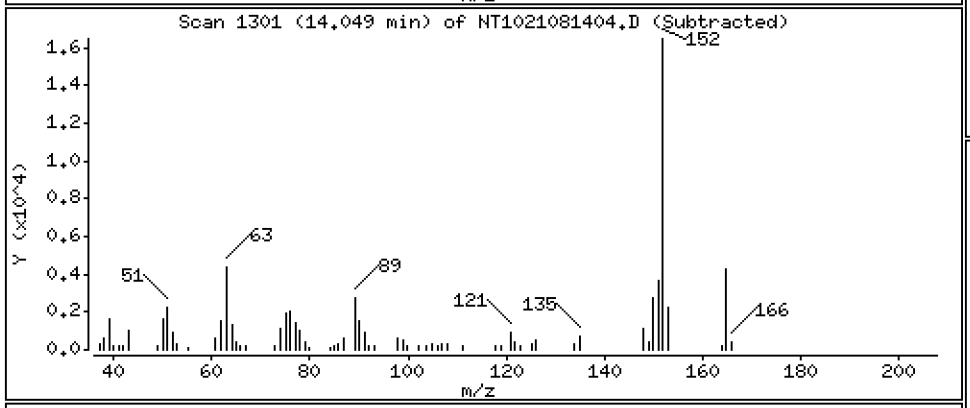
Column phase: ZB-5msi

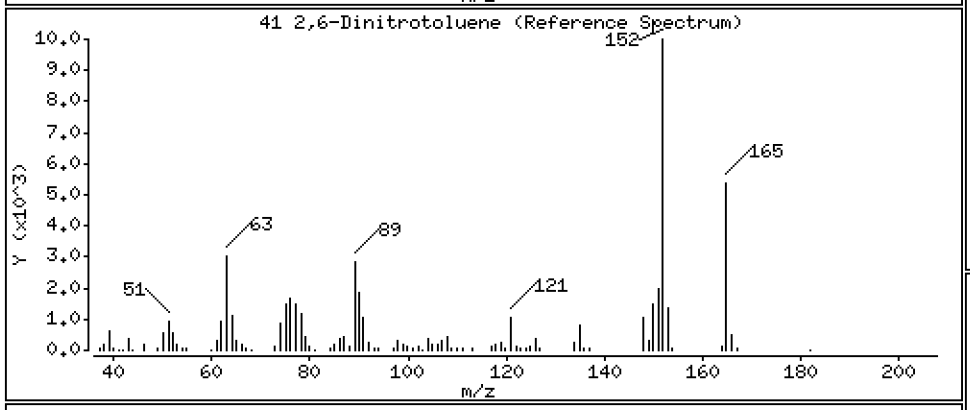
Column diameter: 0.25

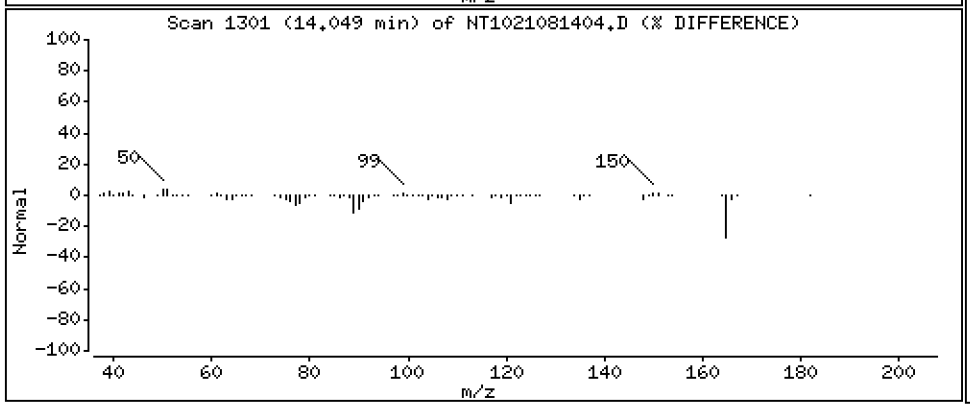
41 2,6-Dinitrotoluene

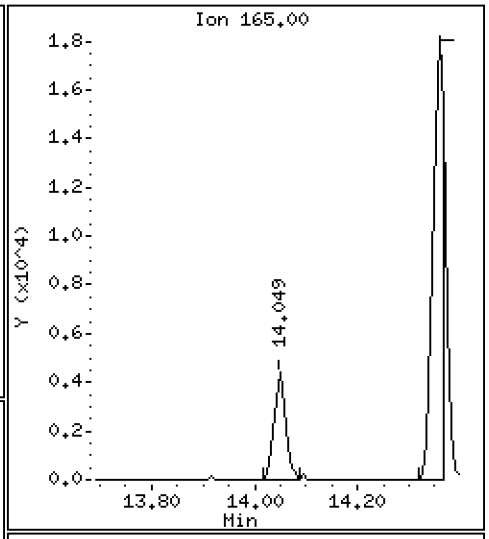
Concentration: 0.3243 ug/mL

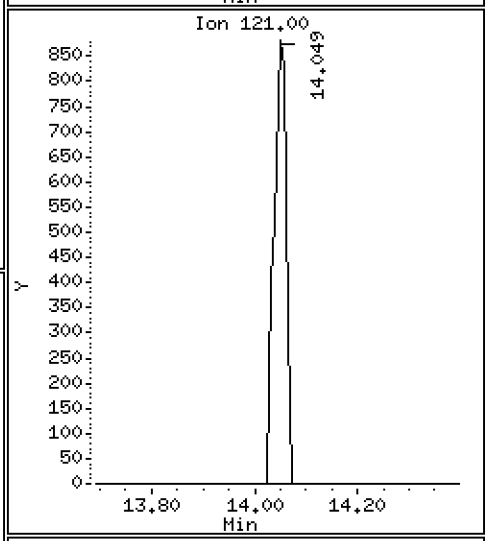


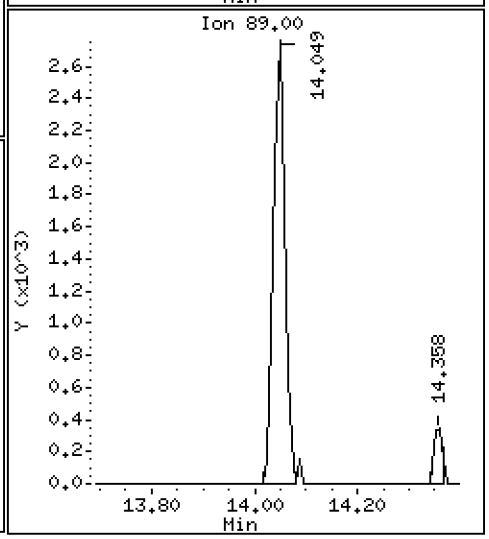












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

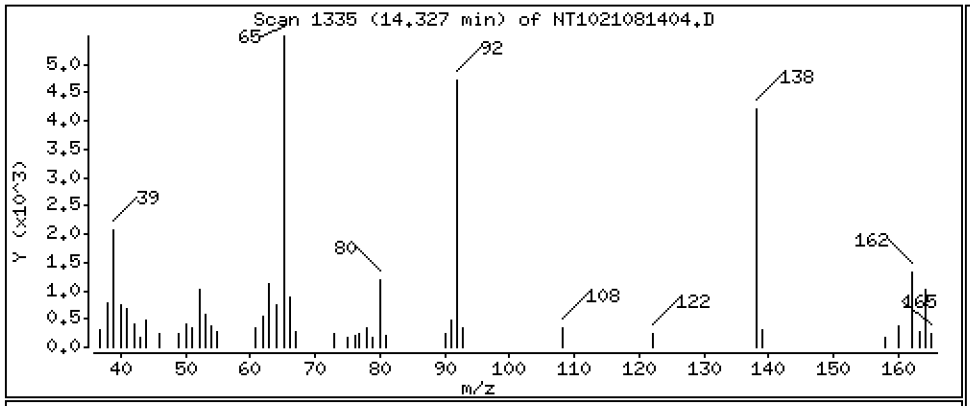
Operator: VTS

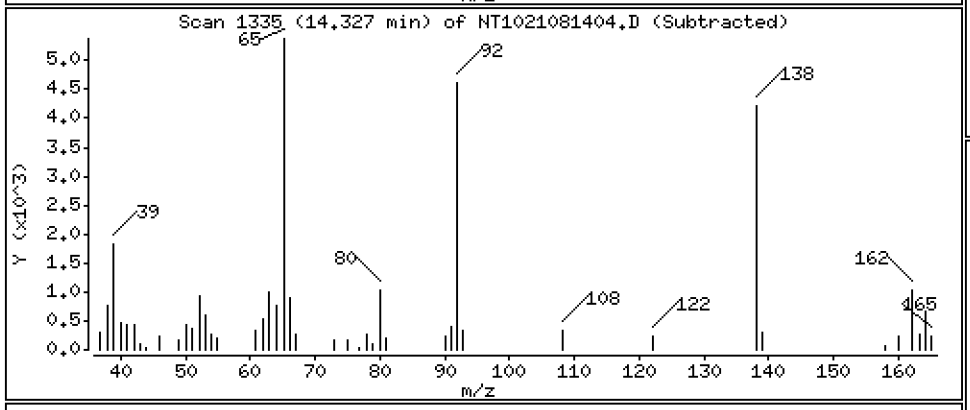
Column phase: ZB-5msi

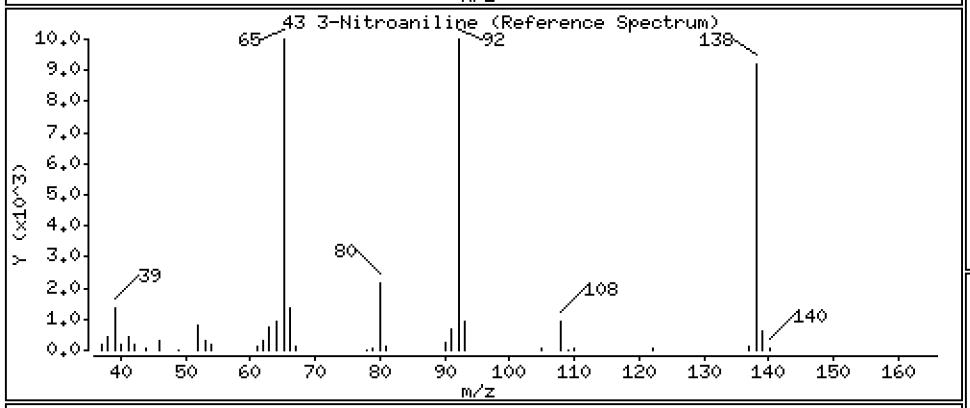
Column diameter: 0.25

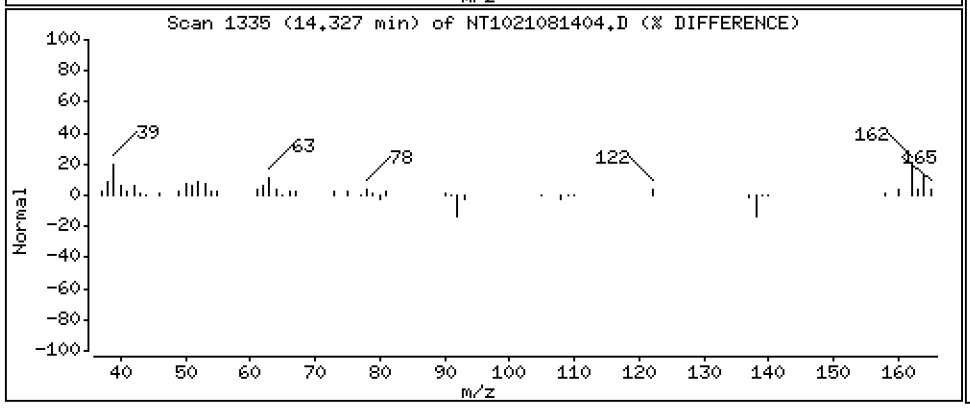
43 3-Nitroaniline

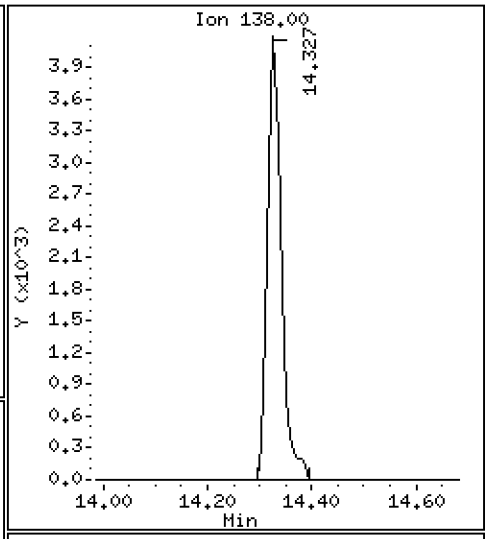
Concentration: 0.3035 ug/mL

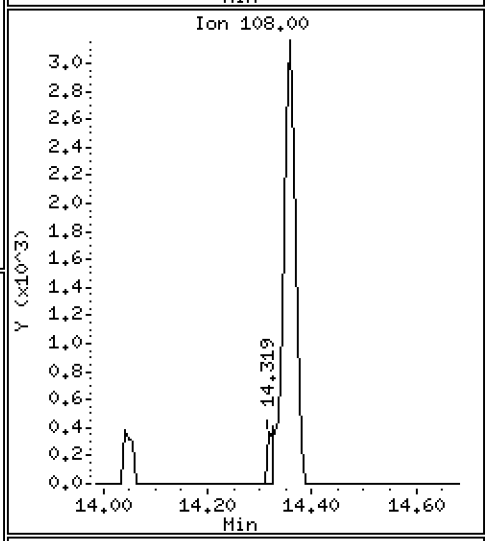


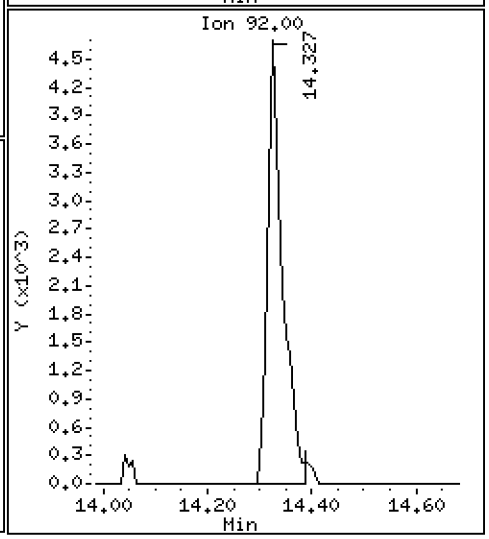












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

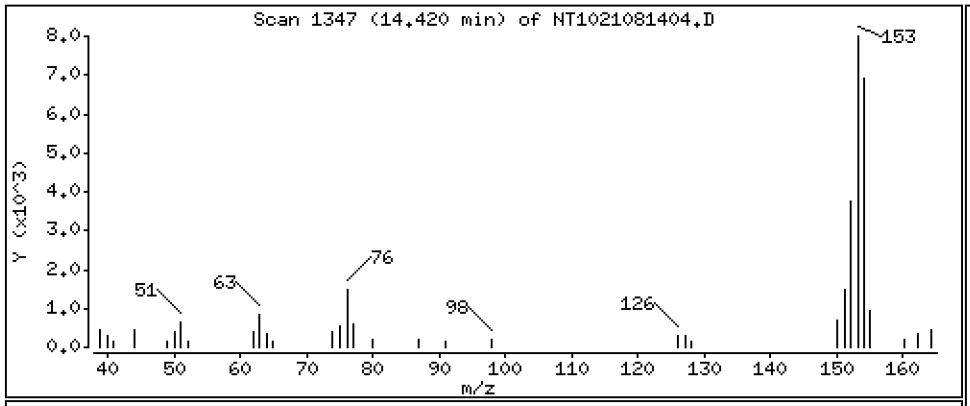
Operator: VTS

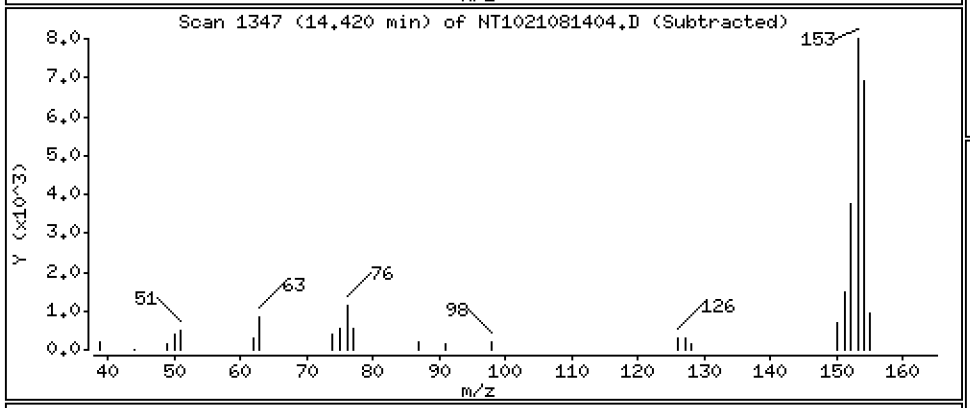
Column phase: ZB-5msi

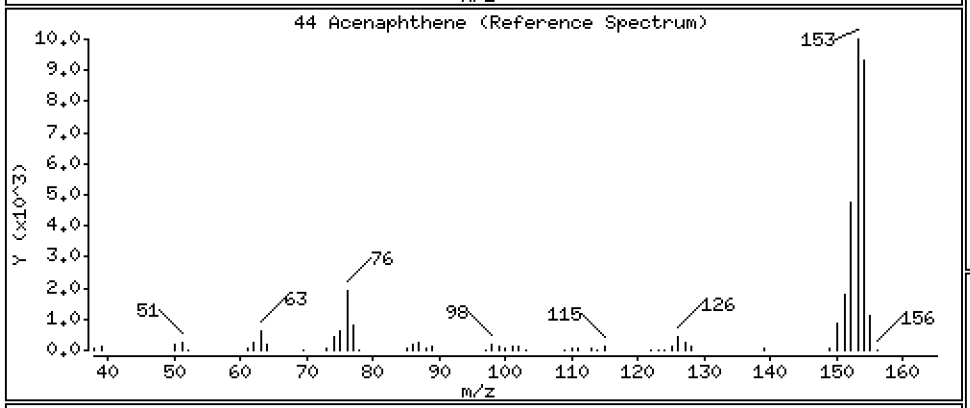
Column diameter: 0.25

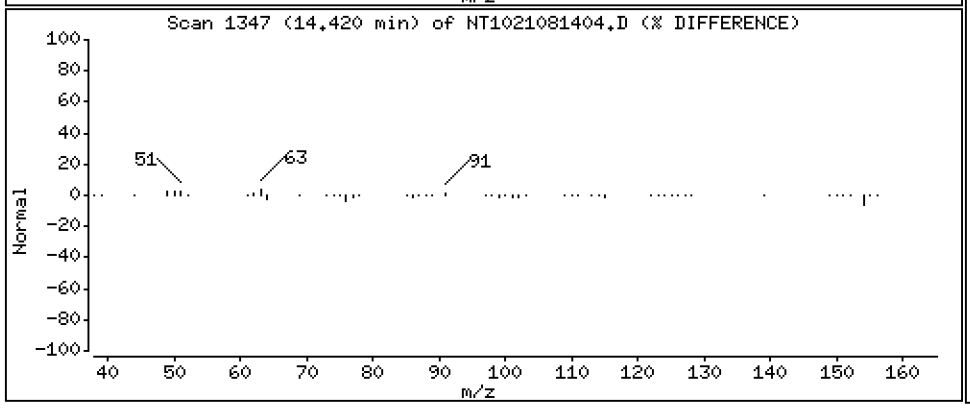
44 Acenaphthene

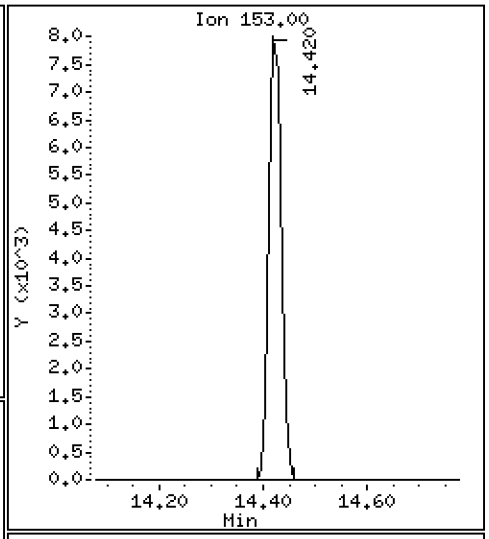
Concentration: 0.1704 ug/mL

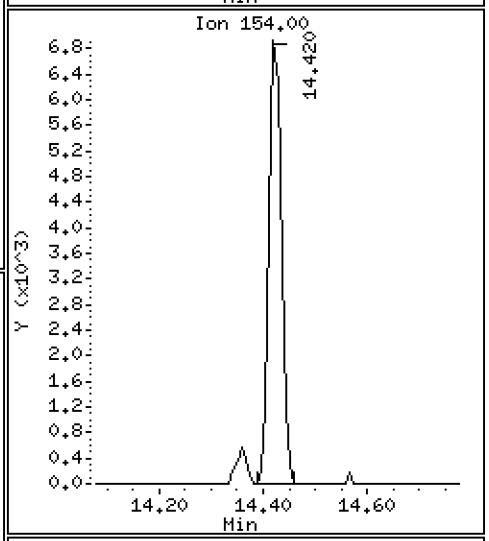


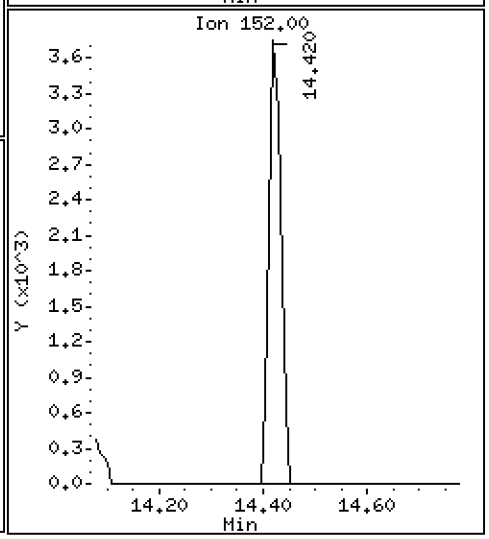












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

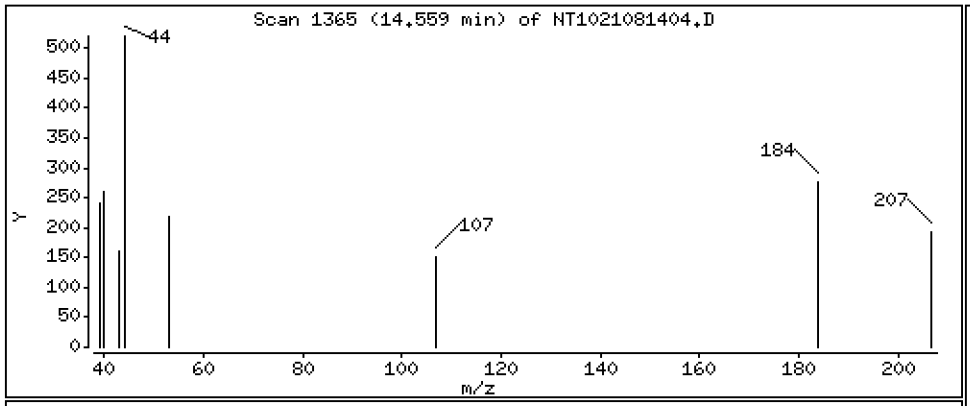
Operator: VTS

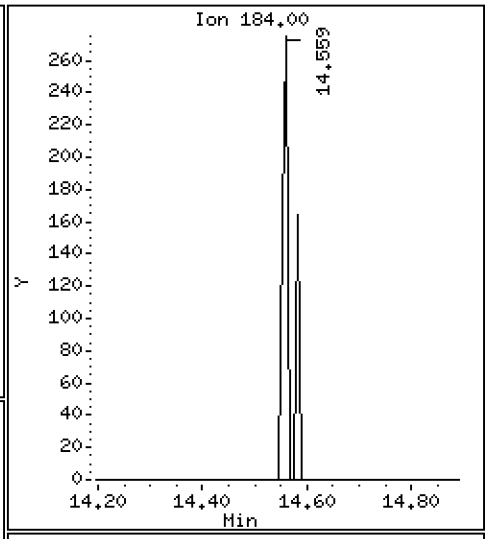
Column phase: ZB-5msi

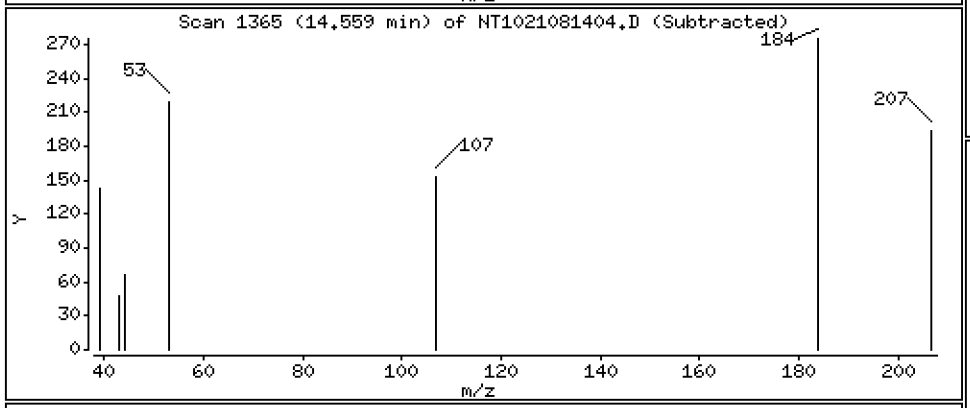
Column diameter: 0.25

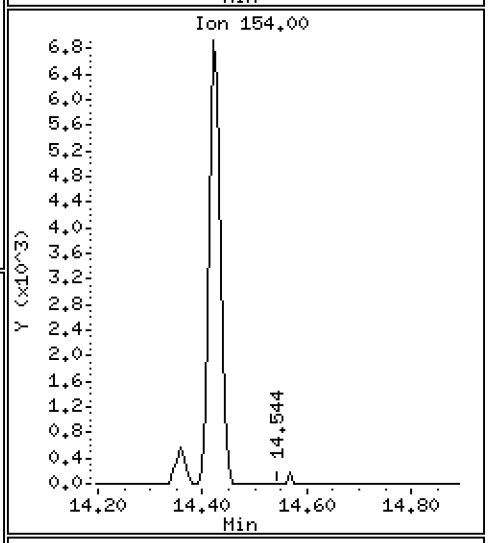
45 2,4-Dinitrophenol

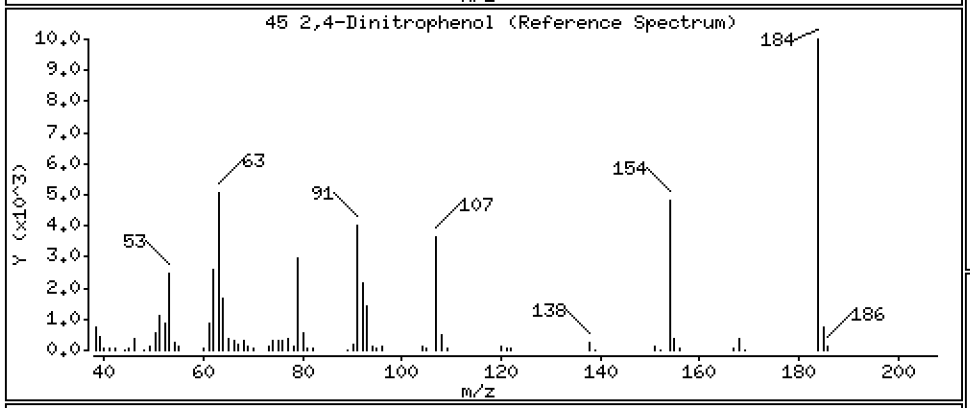
Concentration: 0.02499 ug/mL

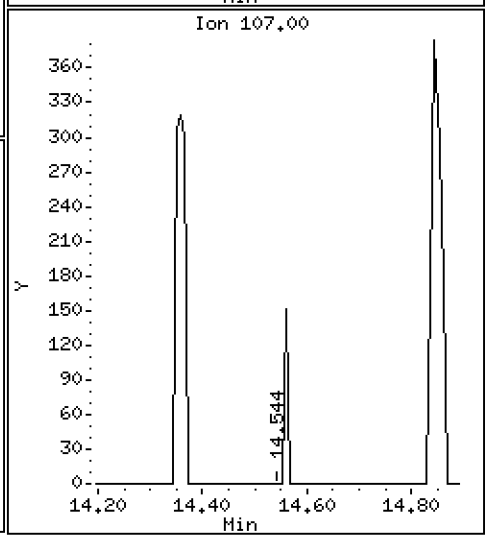


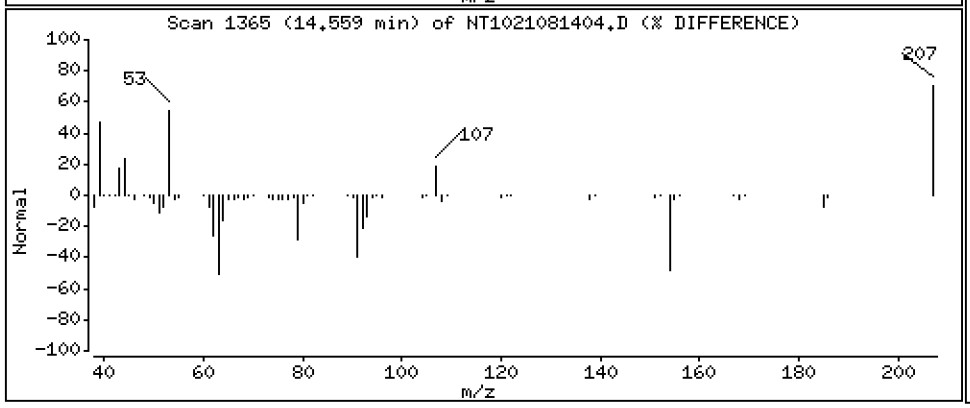












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

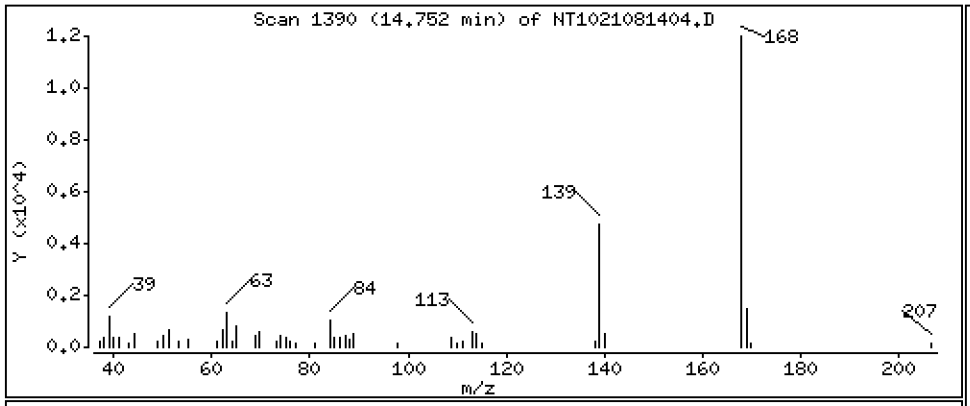
Operator: VTS

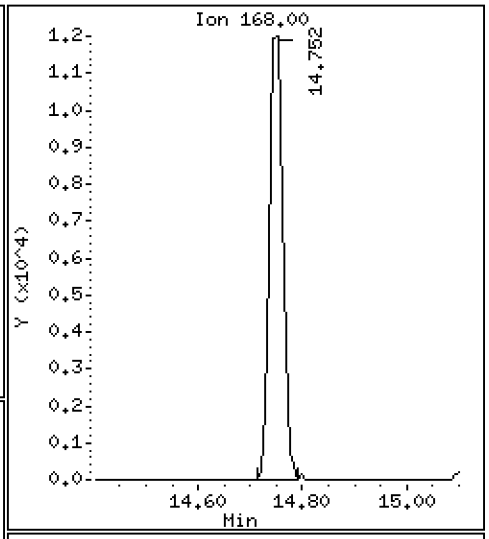
Column phase: ZB-5msi

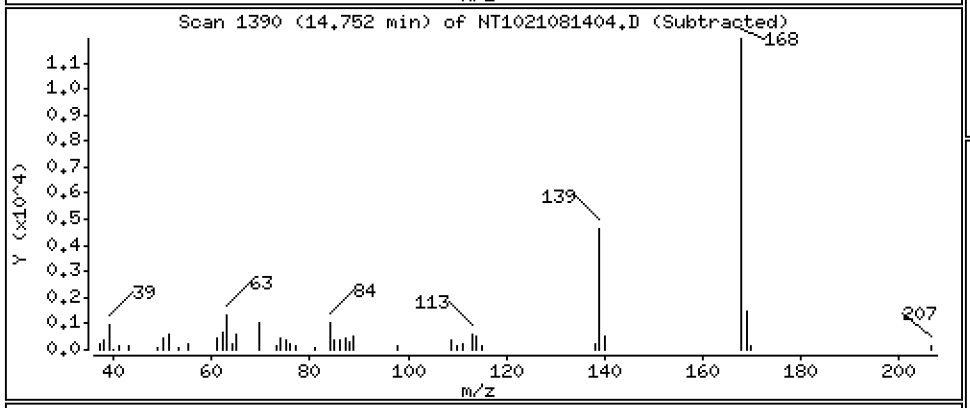
Column diameter: 0.25

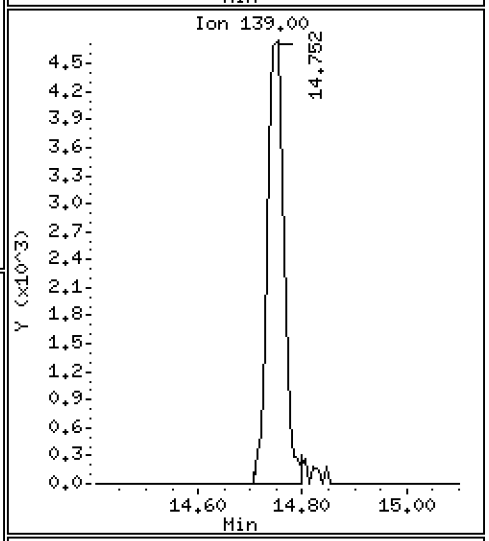
46 Dibenzofuran

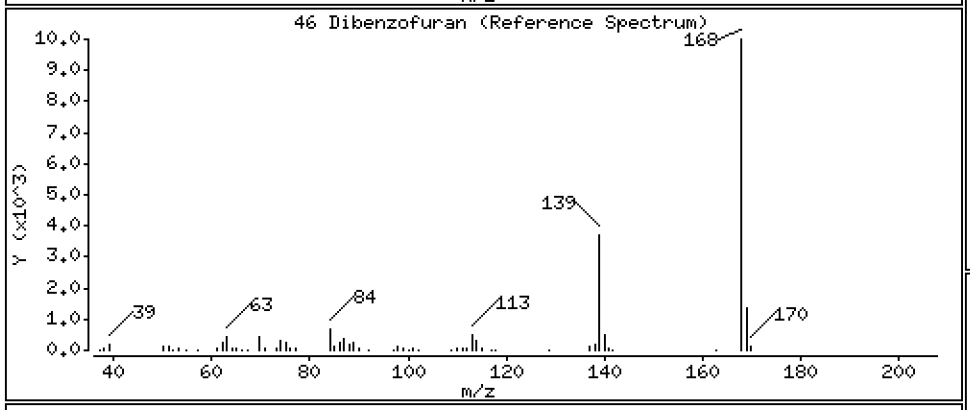
Concentration: 0.1785 ug/mL

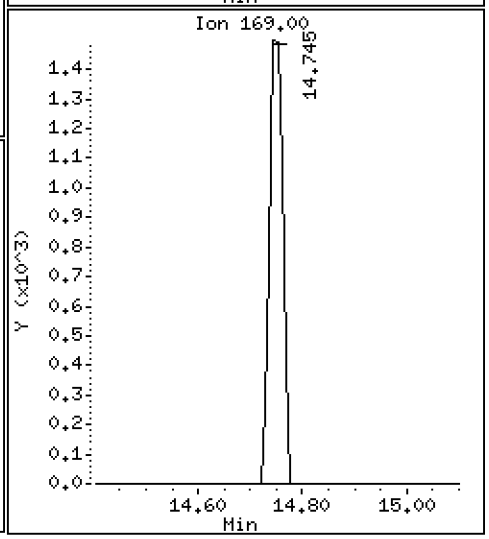


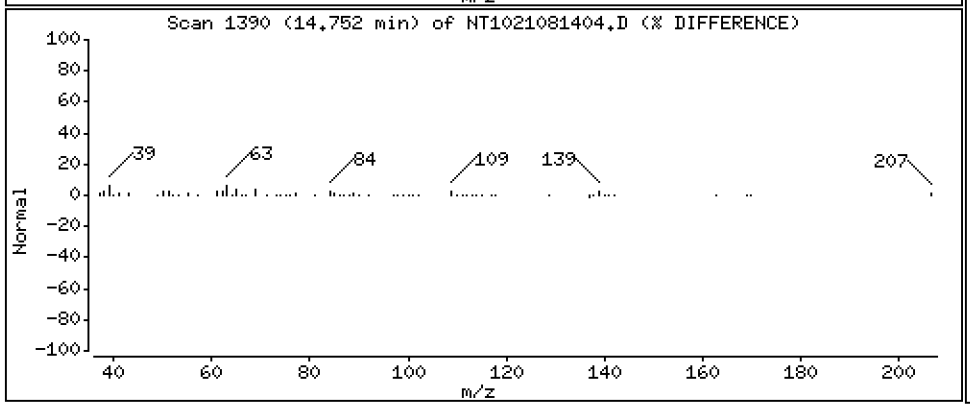












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

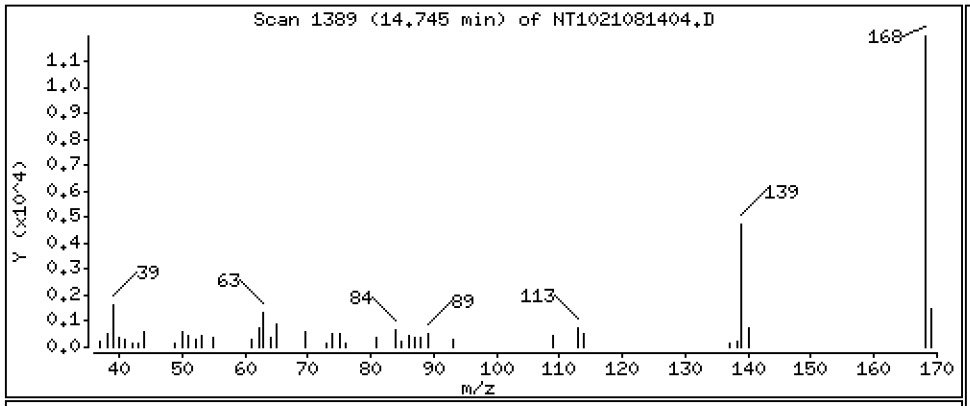
Operator: VTS

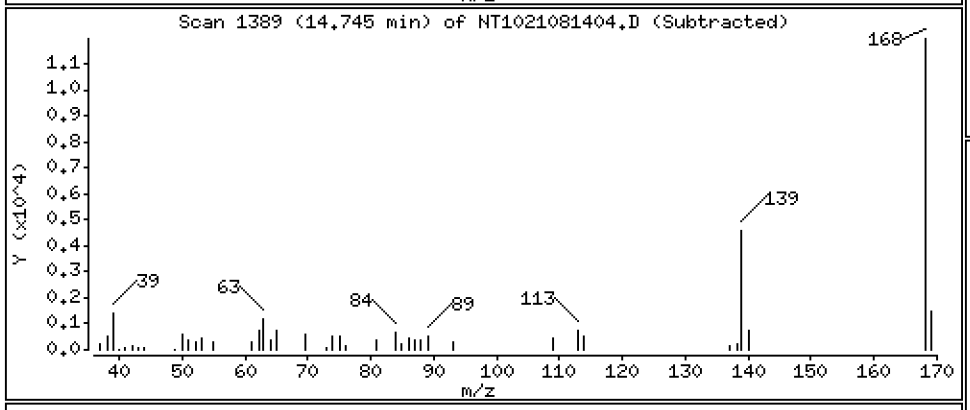
Column phase: ZB-5msi

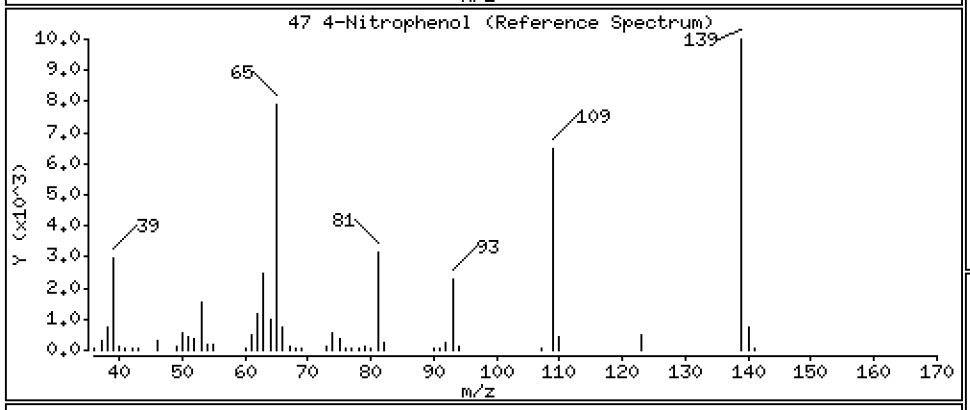
Column diameter: 0.25

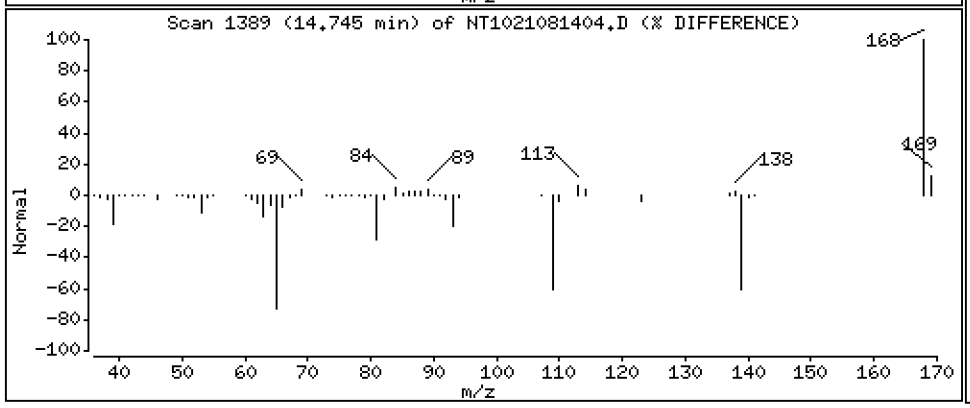
47 4-Nitrophenol

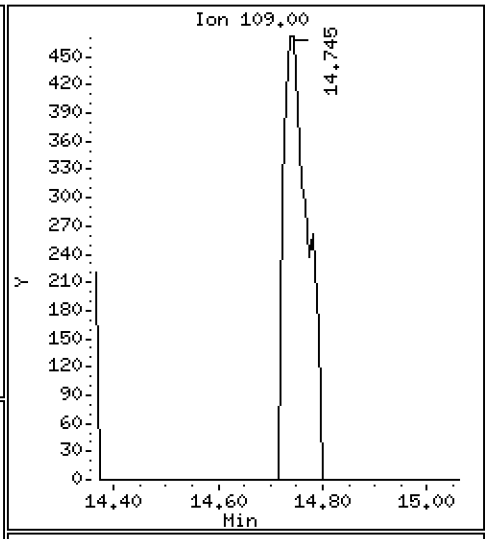
Concentration: 0.1654 ug/mL

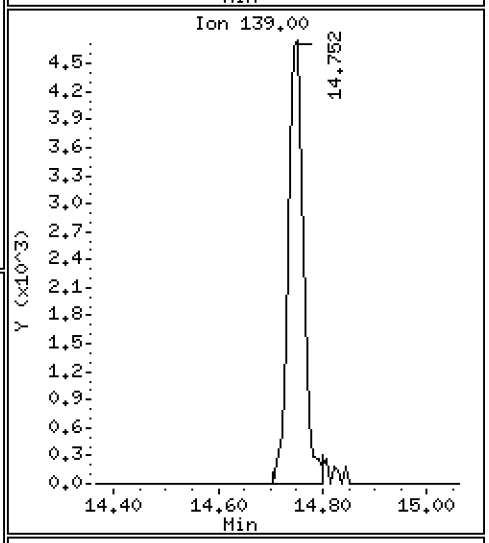


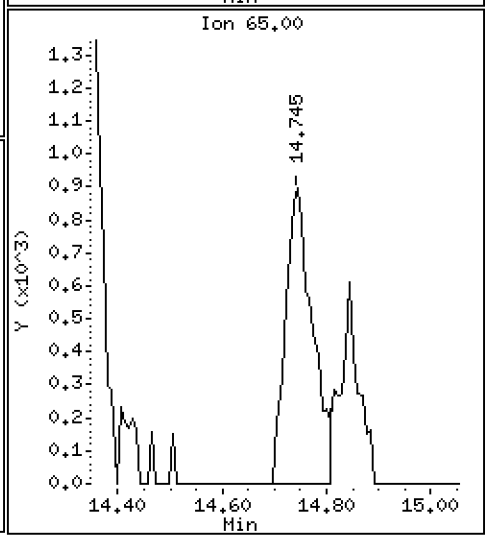












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

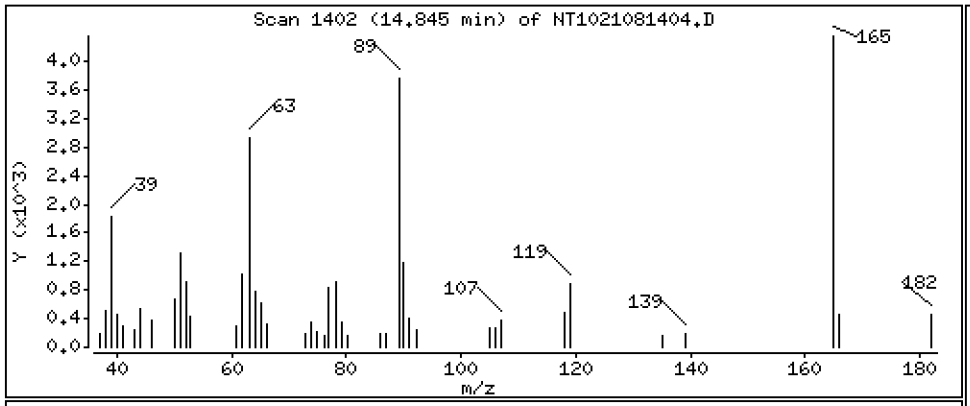
Operator: VTS

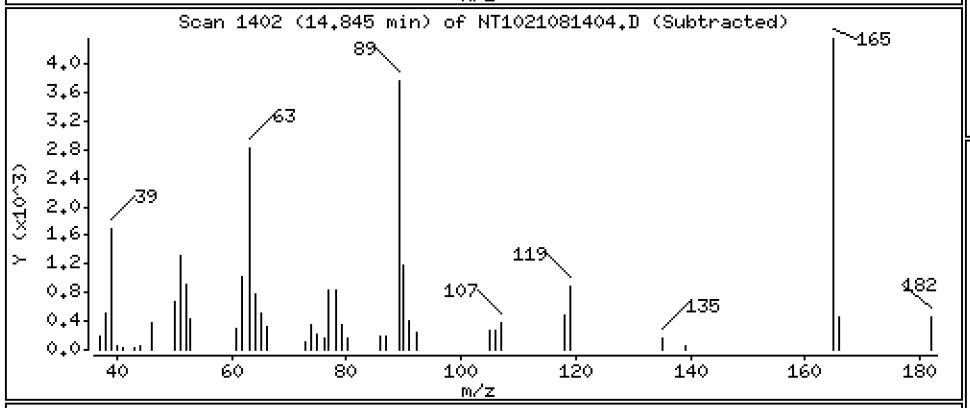
Column phase: ZB-5msi

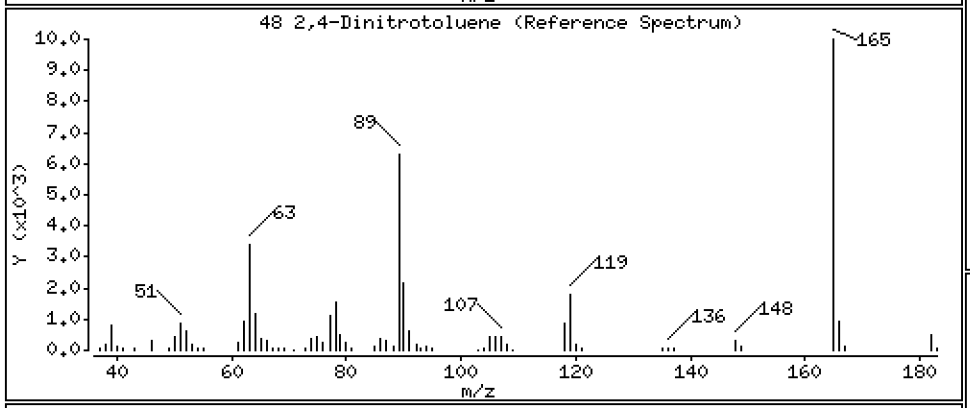
Column diameter: 0.25

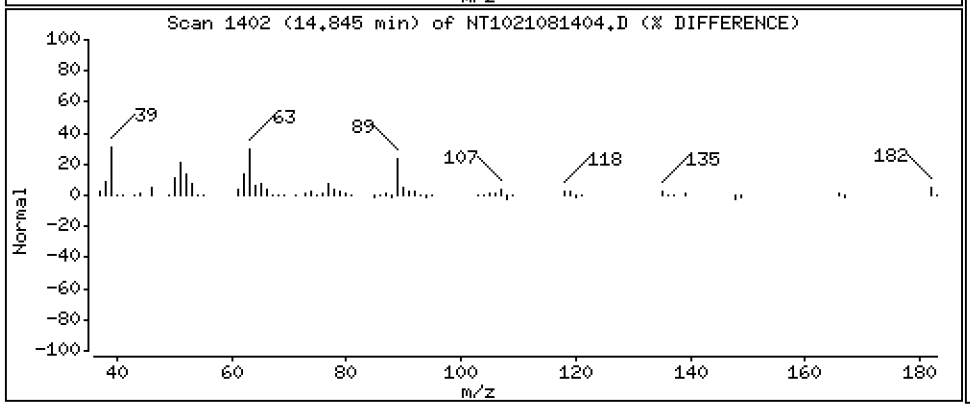
48 2,4-Dinitrotoluene

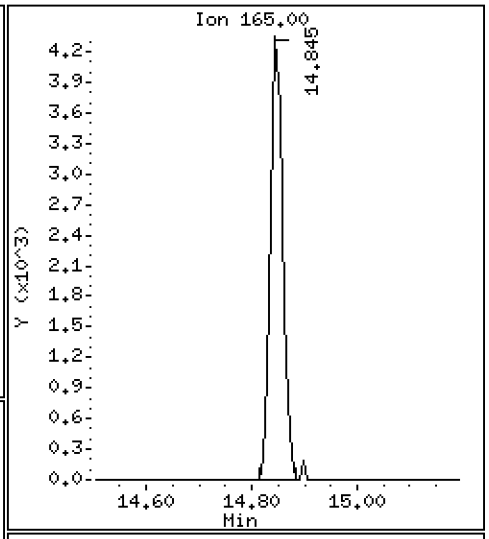
Concentration: 0.2567 ug/mL

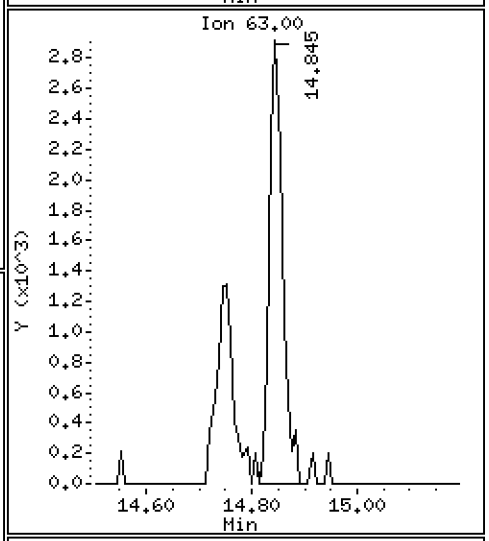


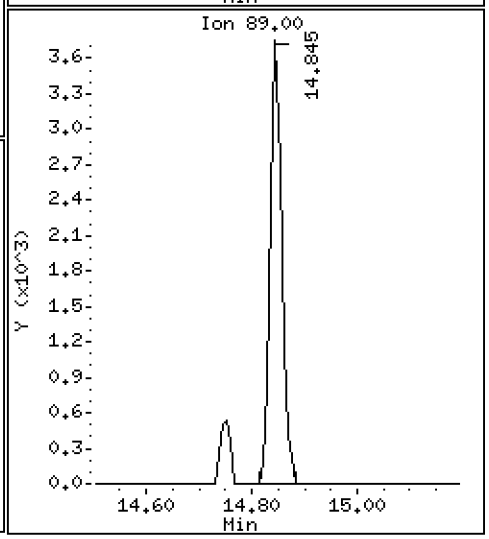












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

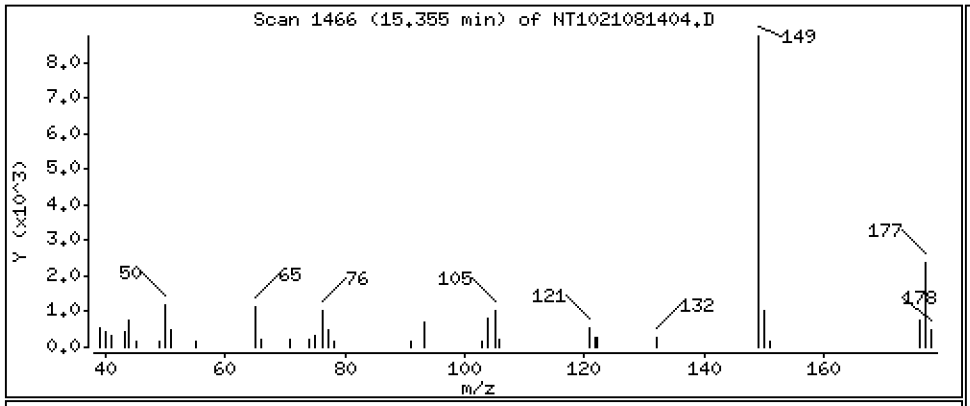
Operator: VTS

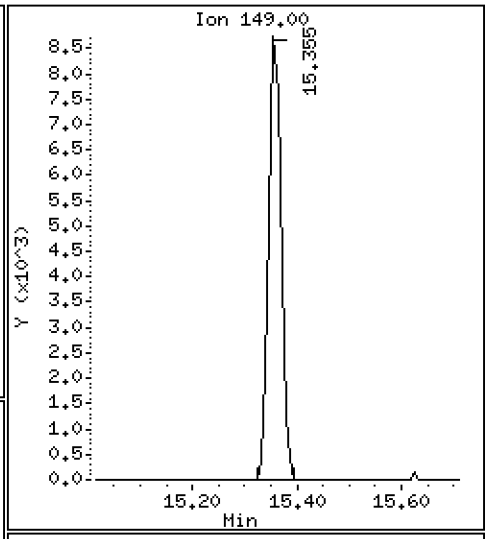
Column phase: ZB-5msi

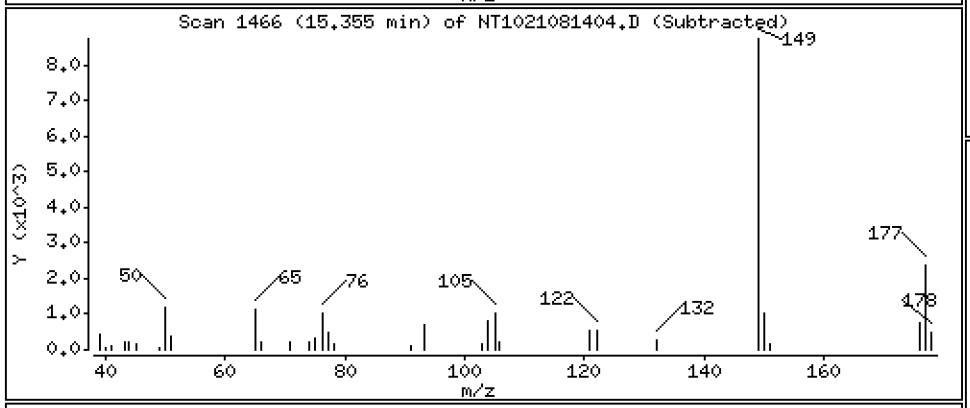
Column diameter: 0.25

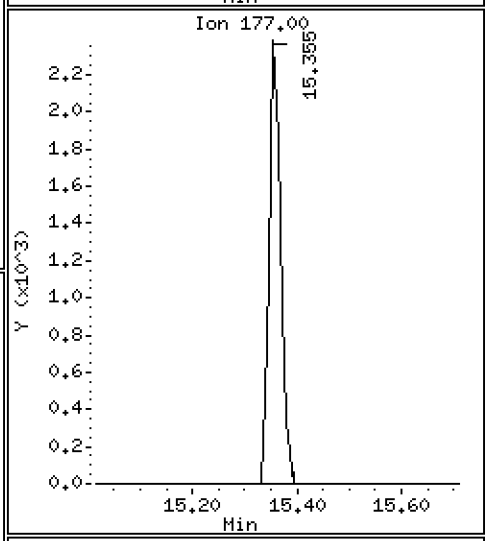
50 Diethylphthalate

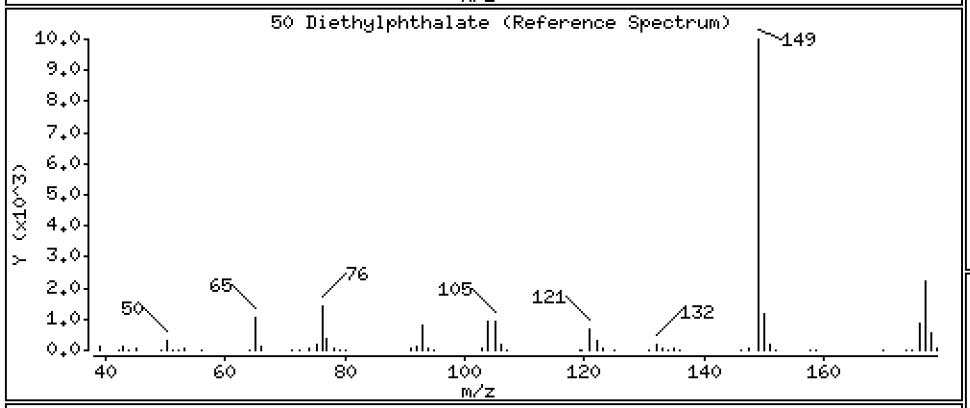
Concentration: 0.1680 ug/mL

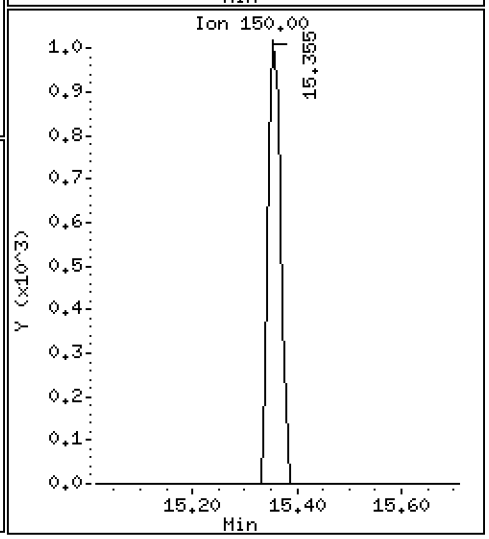


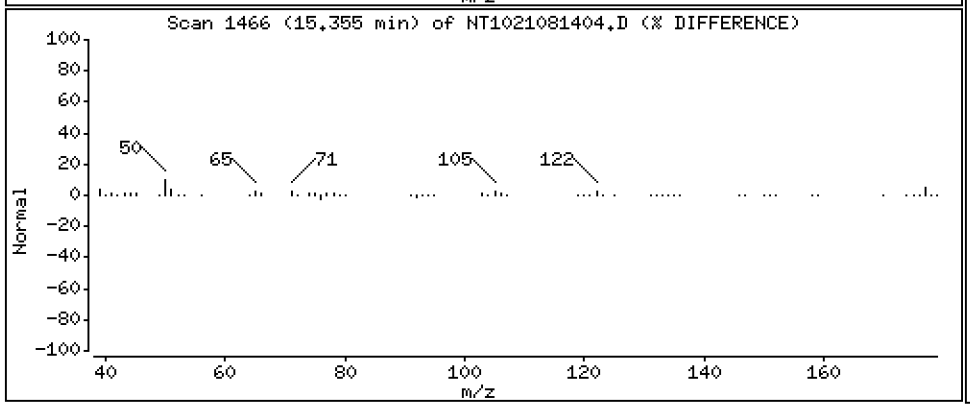












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

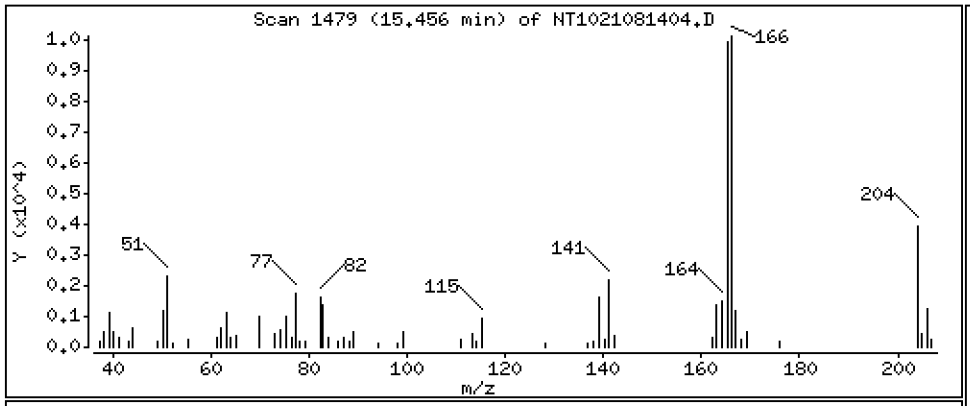
Operator: VTS

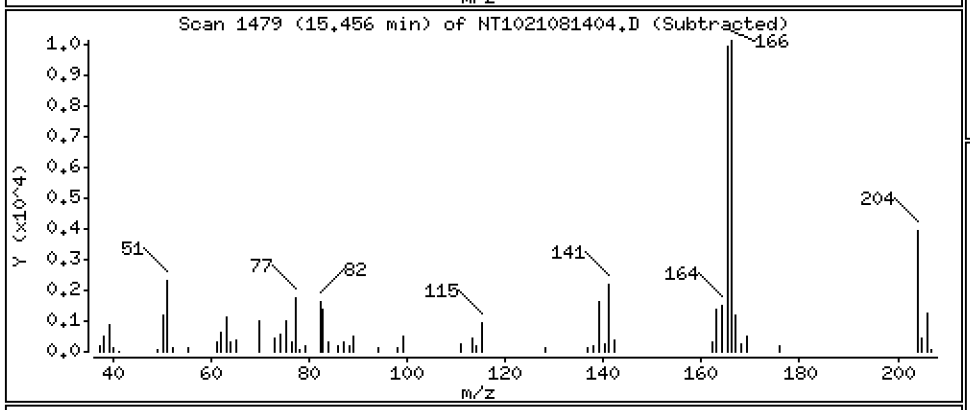
Column phase: ZB-5msi

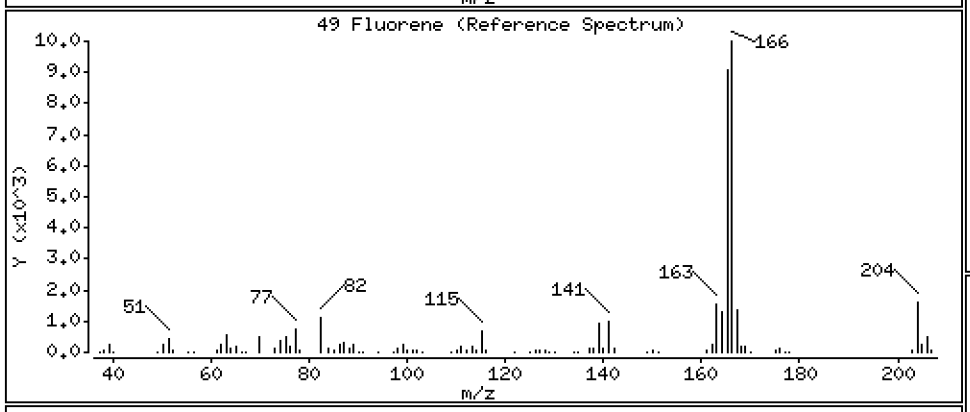
Column diameter: 0.25

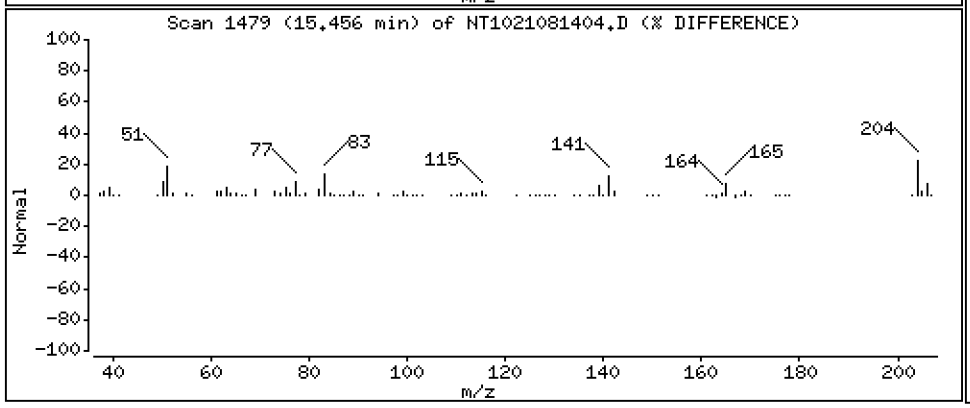
49 Fluorene

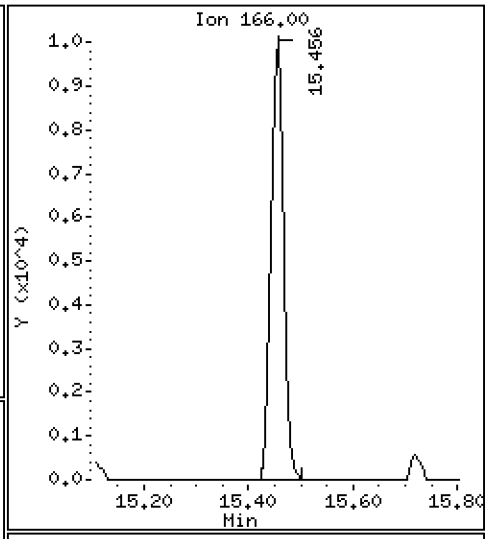
Concentration: 0.1473 ug/mL

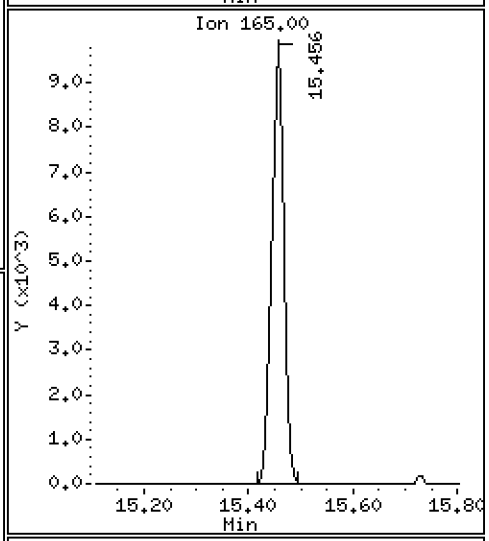


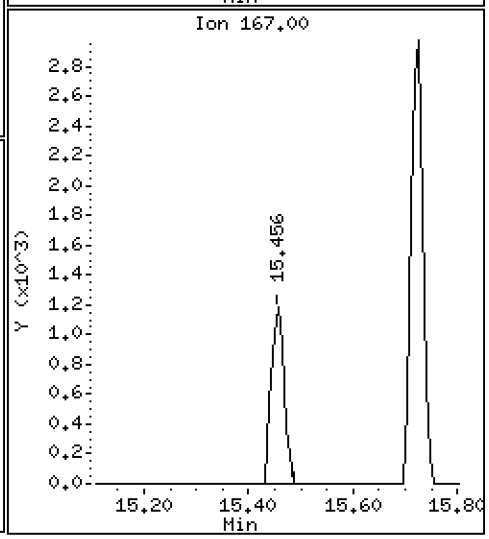












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

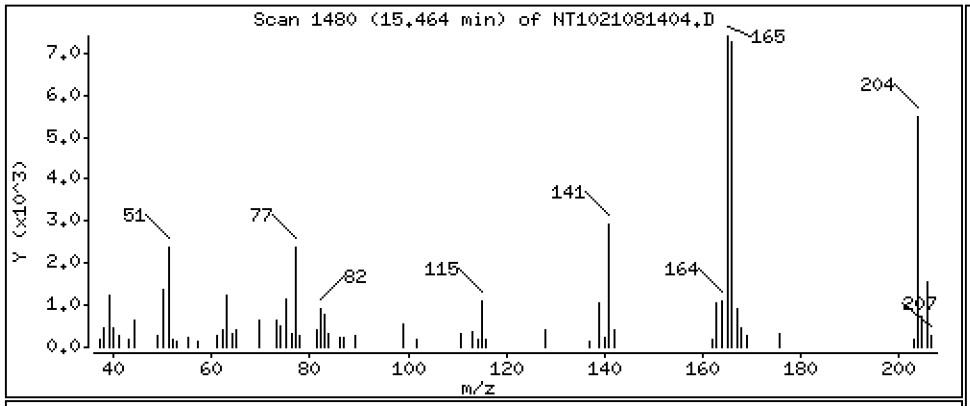
Operator: VTS

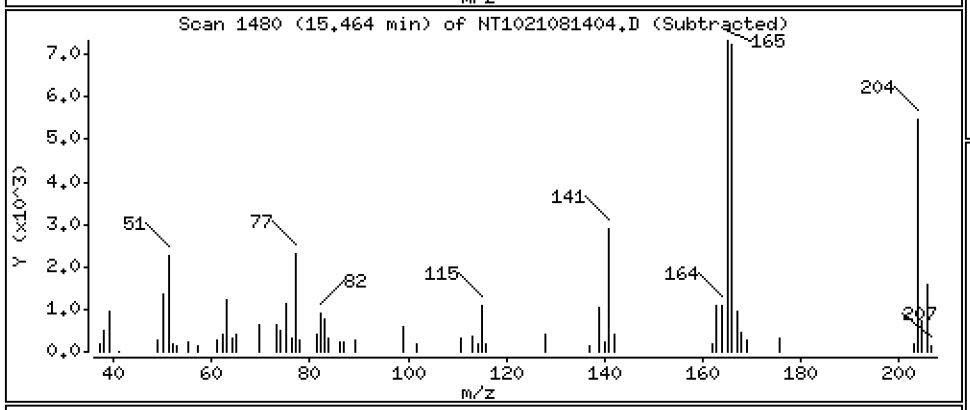
Column phase: ZB-5msi

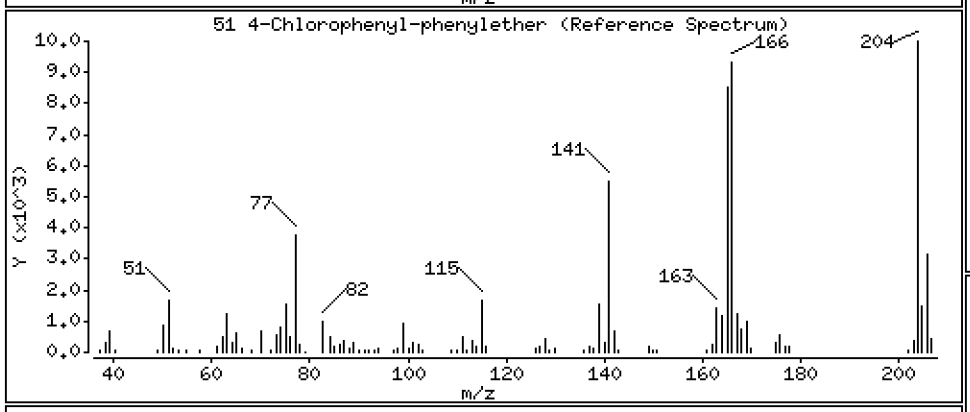
Column diameter: 0.25

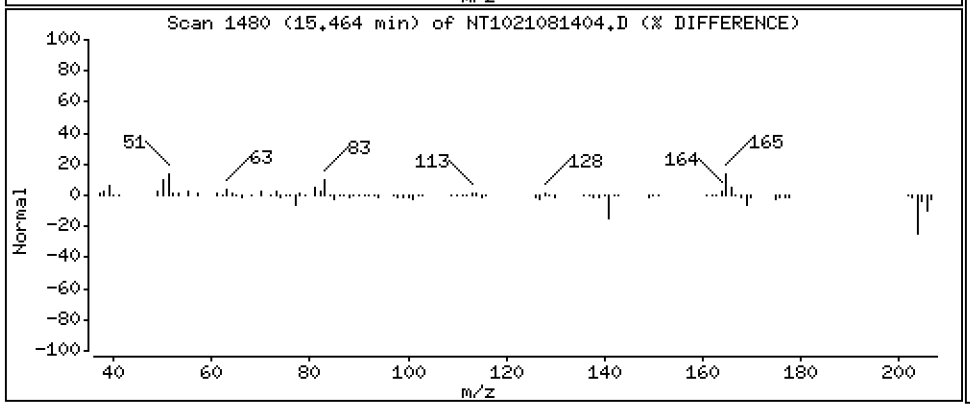
51 4-Chlorophenyl-phenylether

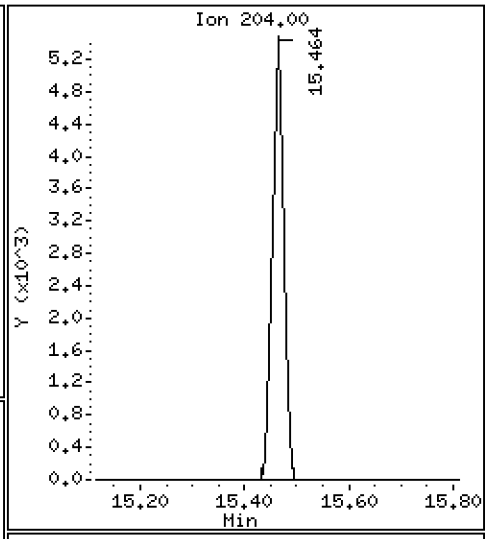
Concentration: 0.1254 ug/mL

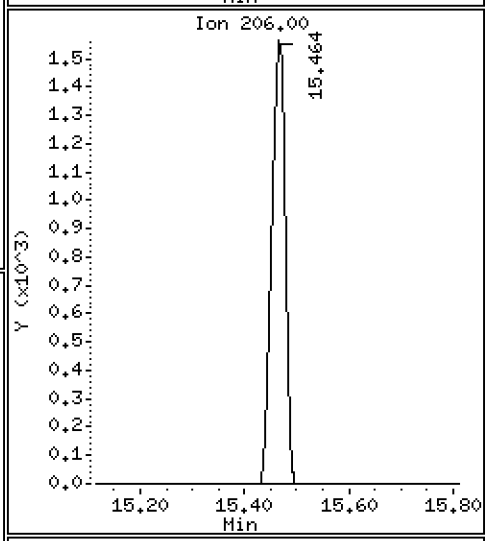


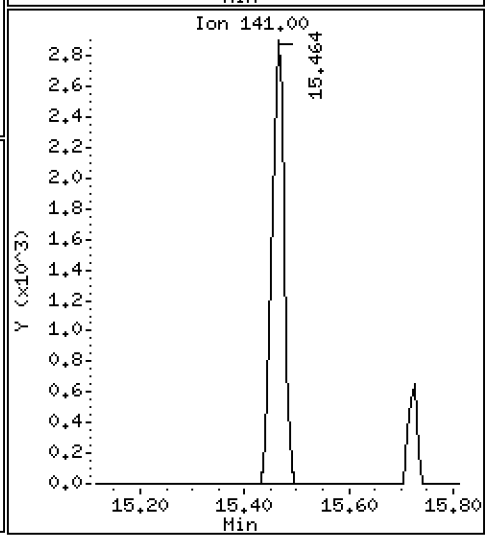












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

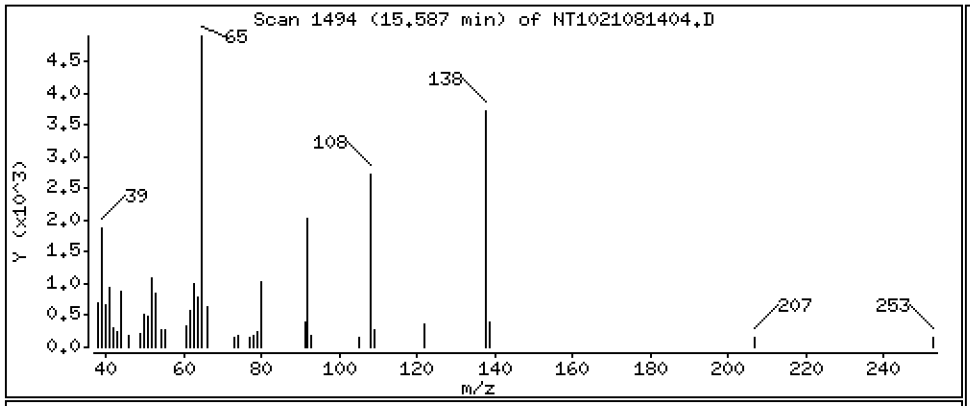
Operator: VTS

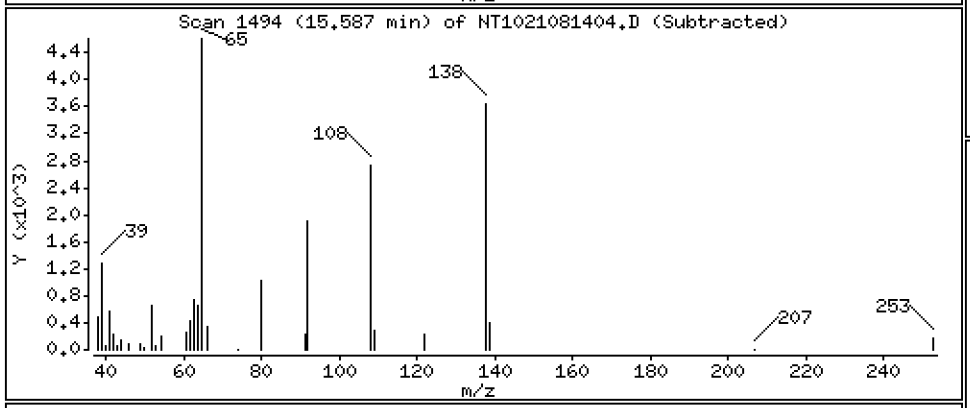
Column phase: ZB-5msi

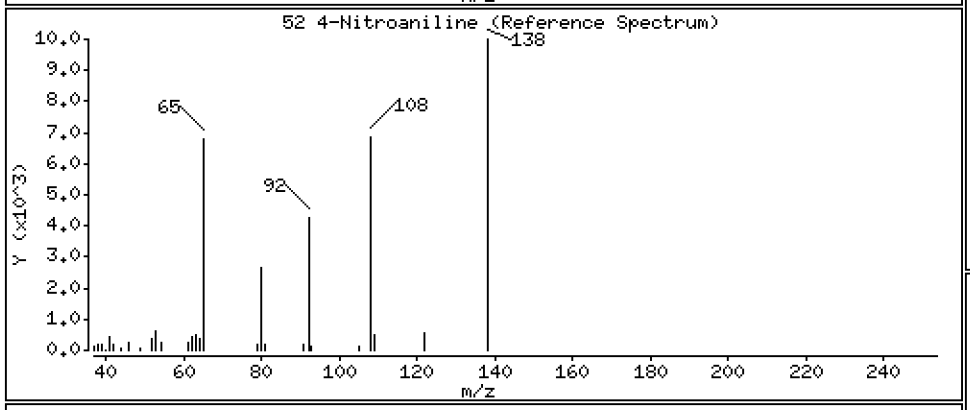
Column diameter: 0.25

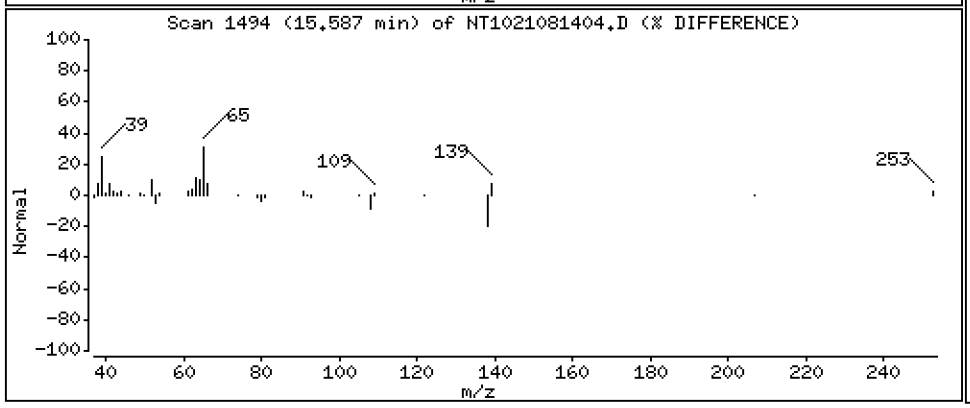
52 4-Nitroaniline

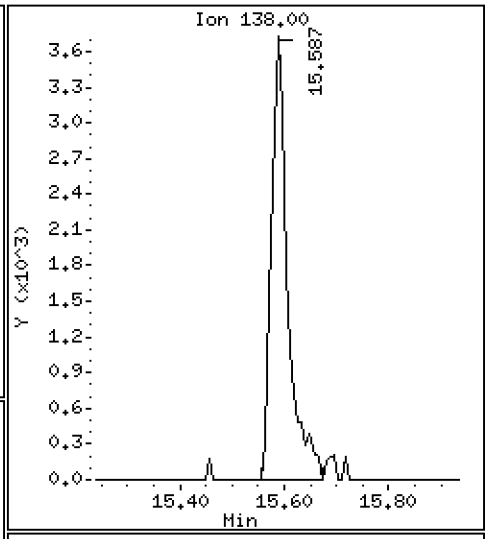
Concentration: 0.3082 ug/mL

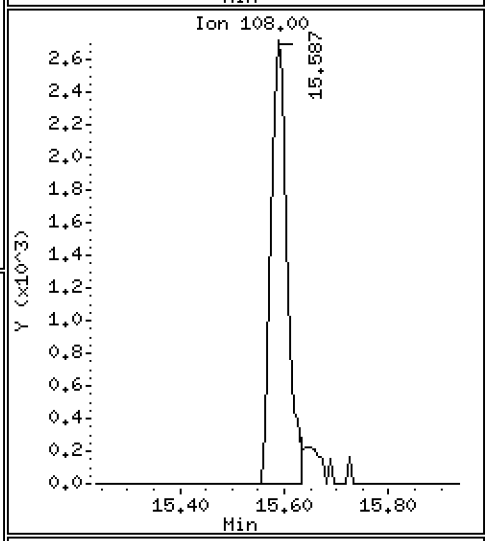


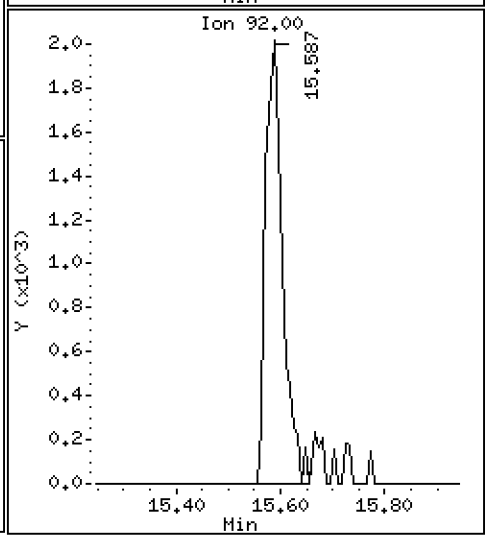












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

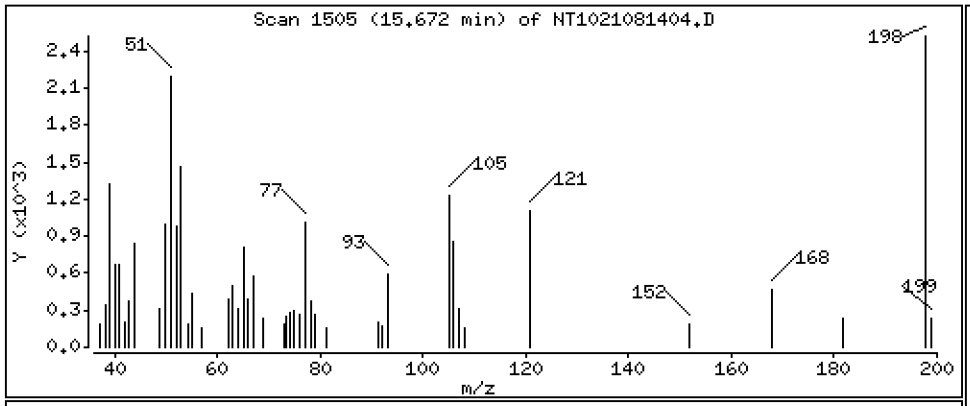
Operator: VTS

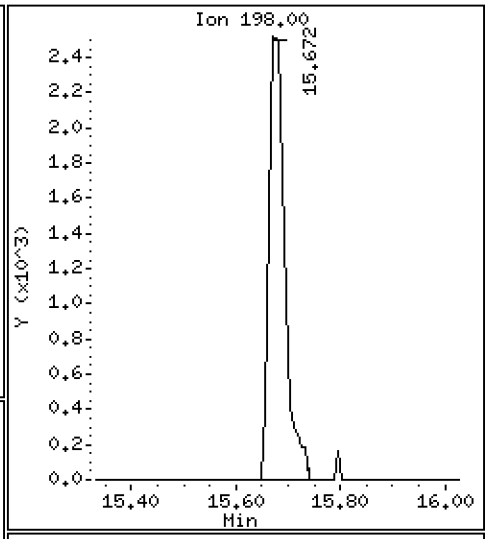
Column phase: ZB-5msi

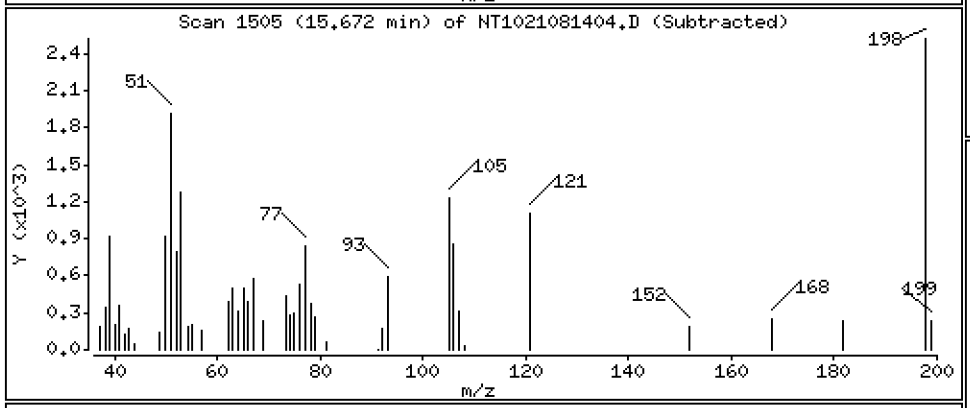
Column diameter: 0.25

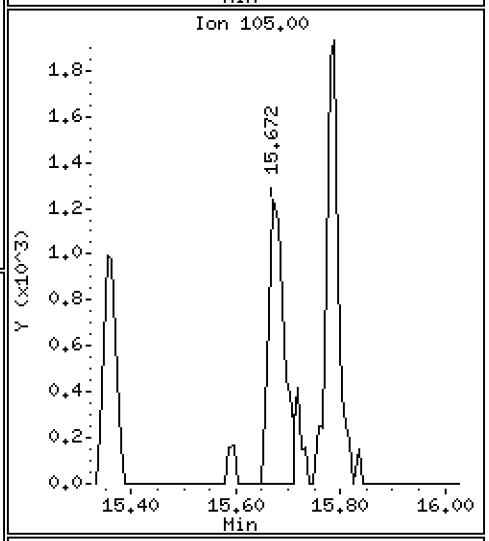
53 4,6-Dinitro-2-methylphenol

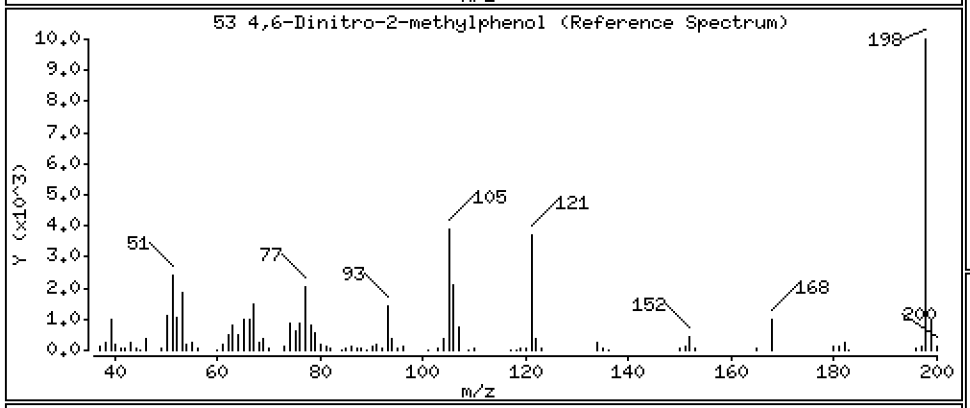
Concentration: 0.2616 ug/mL

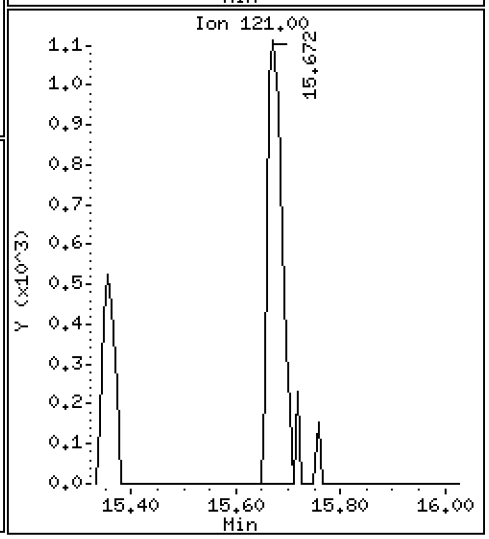


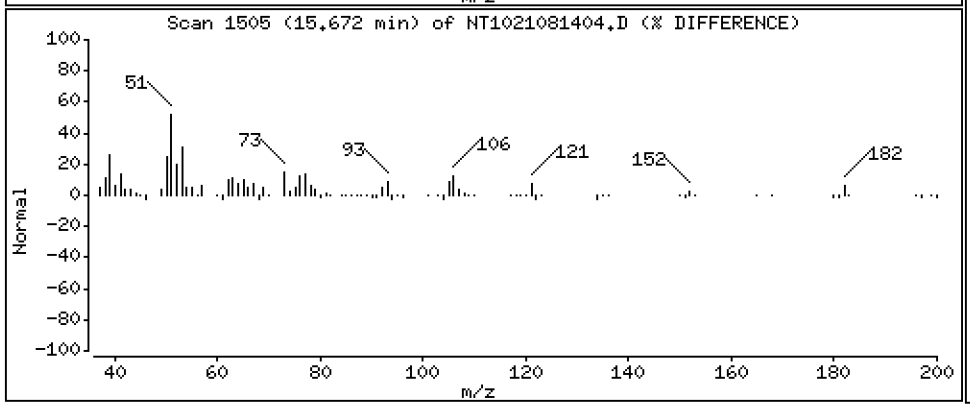












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

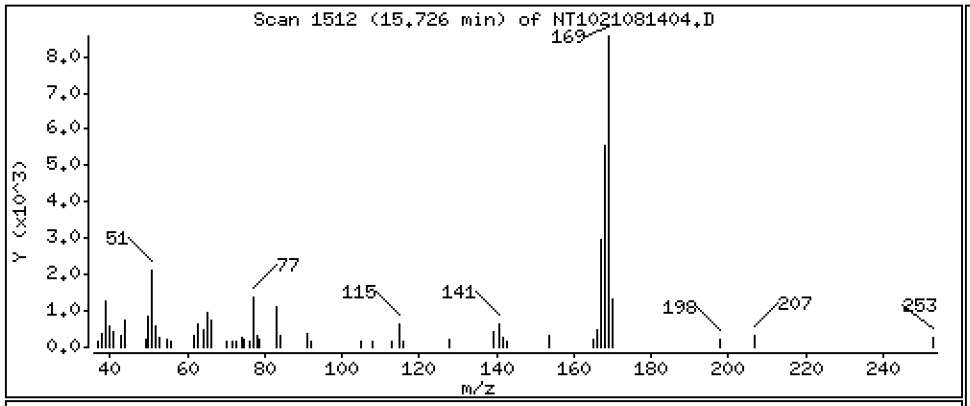
Operator: VTS

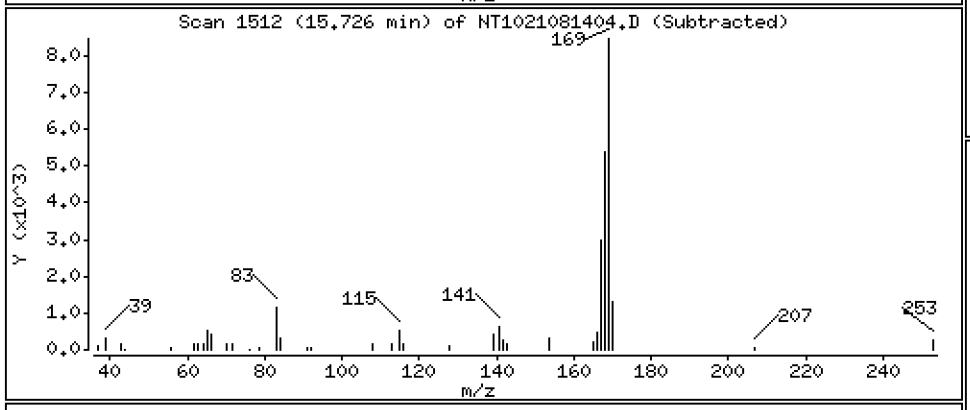
Column phase: ZB-5msi

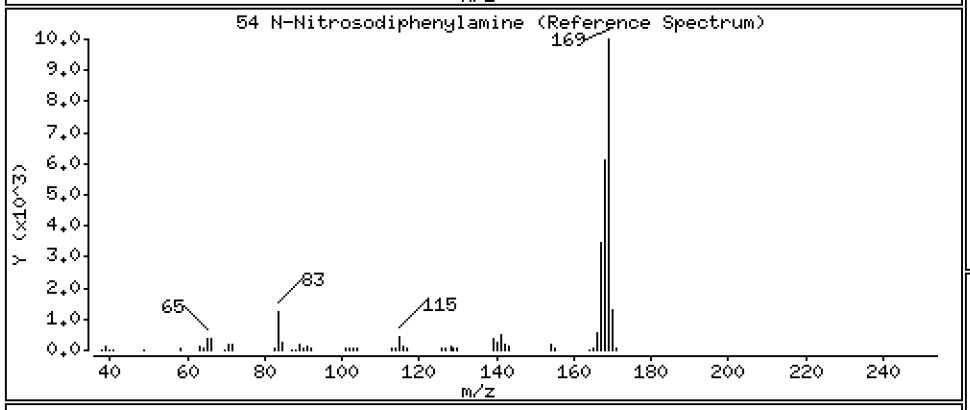
Column diameter: 0.25

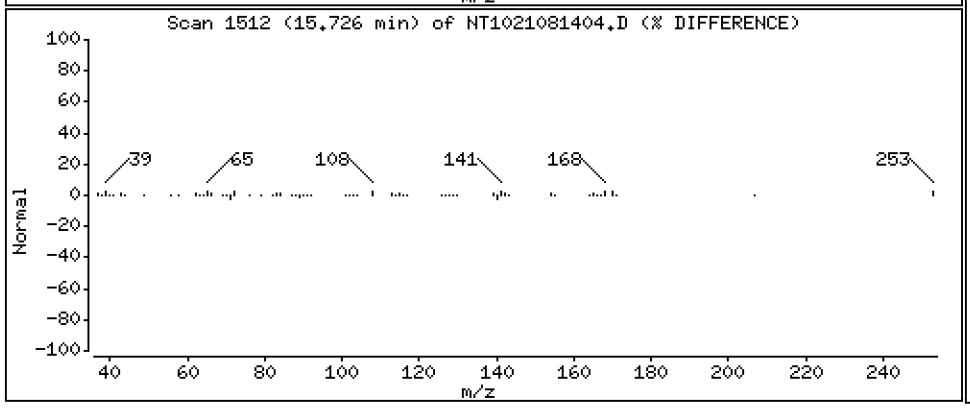
54 N-Nitrosodiphenylamine

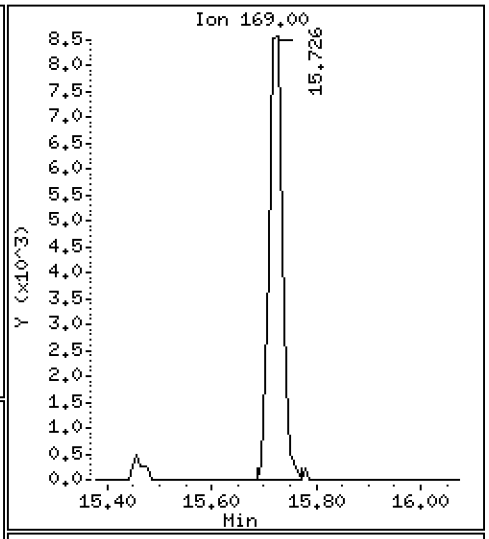
Concentration: 0.1887 ug/mL

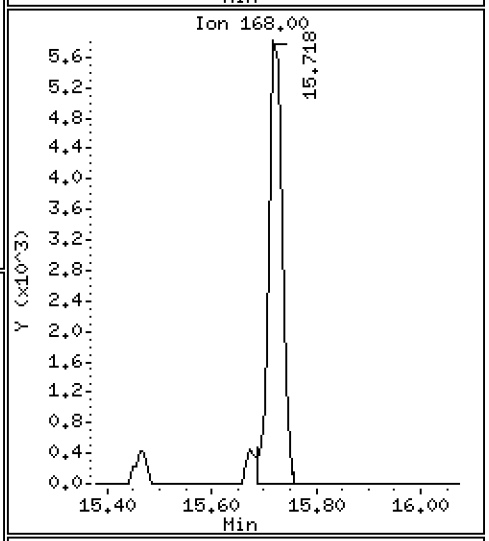


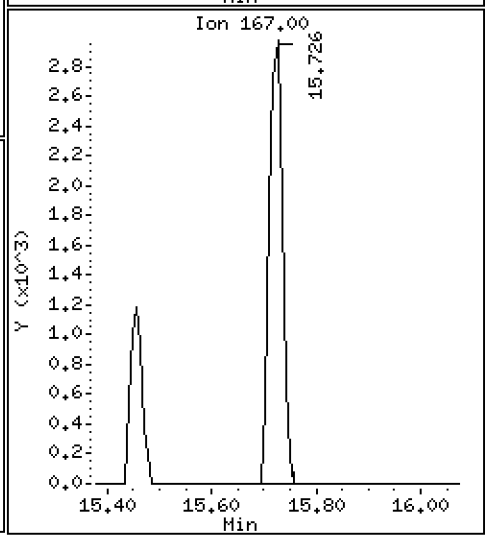












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

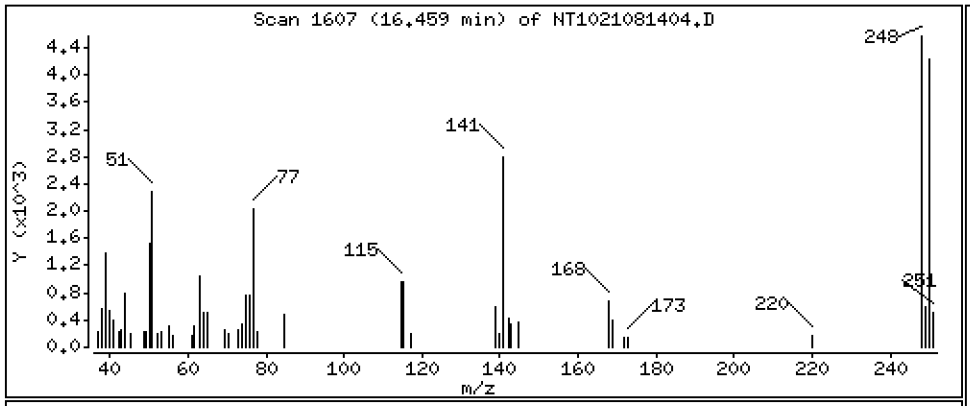
Operator: VTS

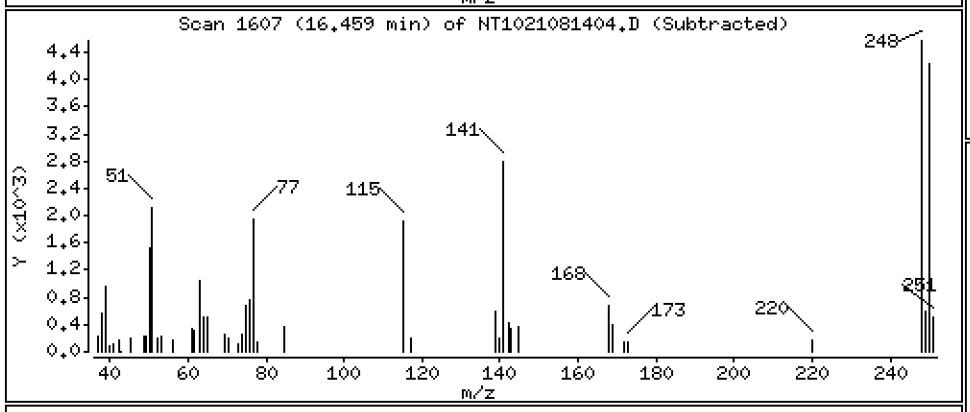
Column phase: ZB-5msi

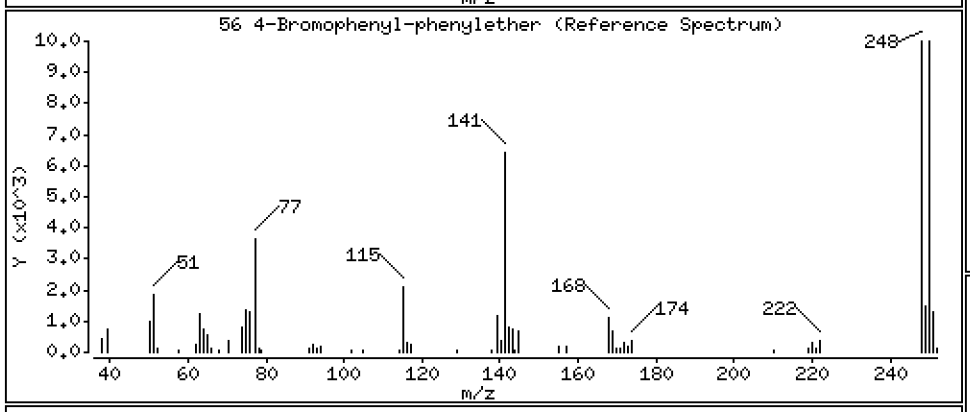
Column diameter: 0.25

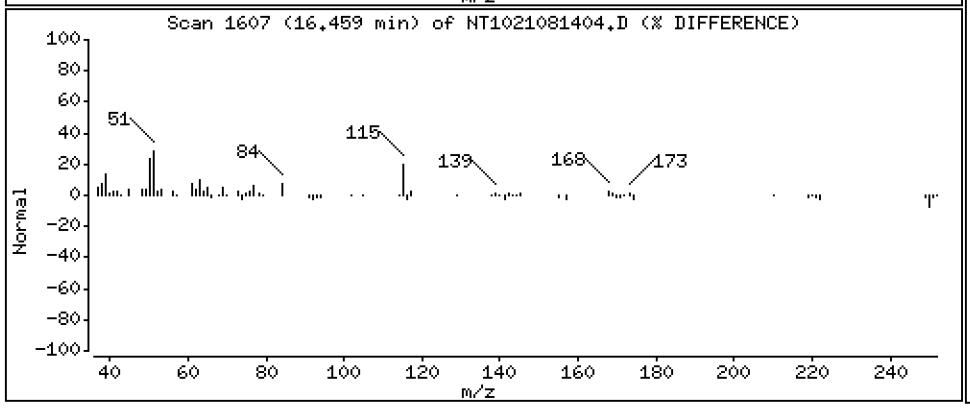
56 4-Bromophenyl-phenylether

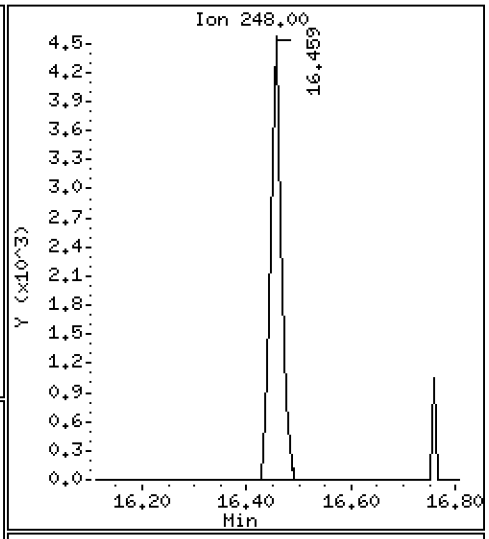
Concentration: 0.1668 ug/mL

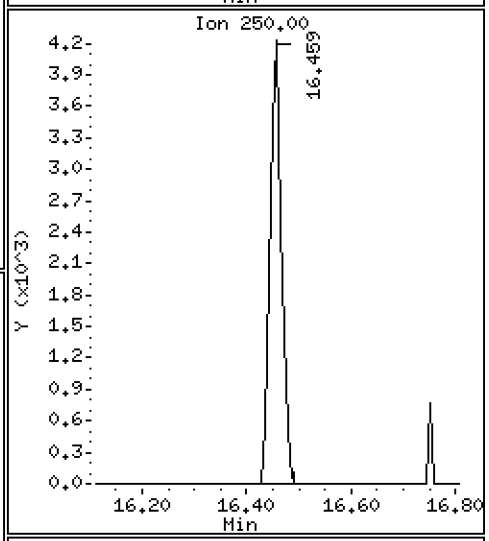


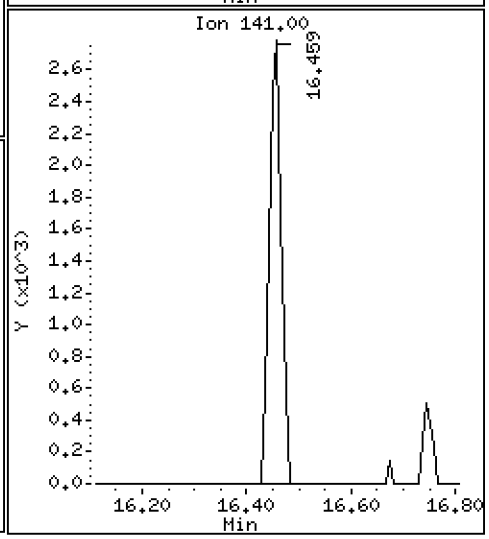












Data File: \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D

Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

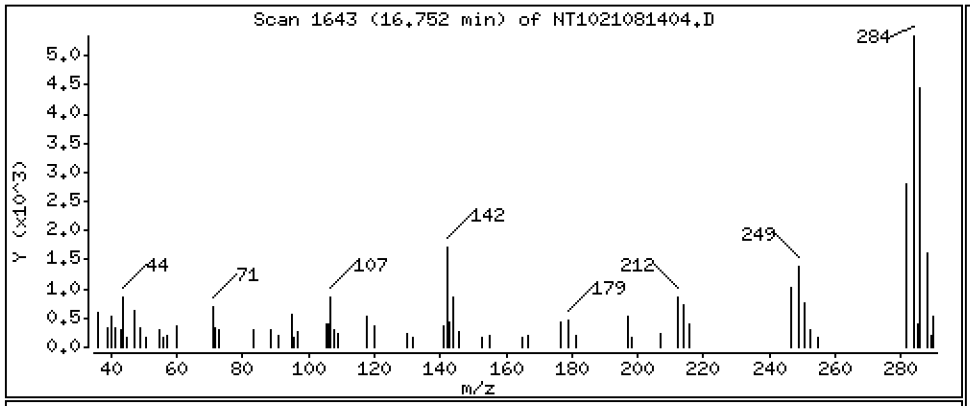
Operator: VTS

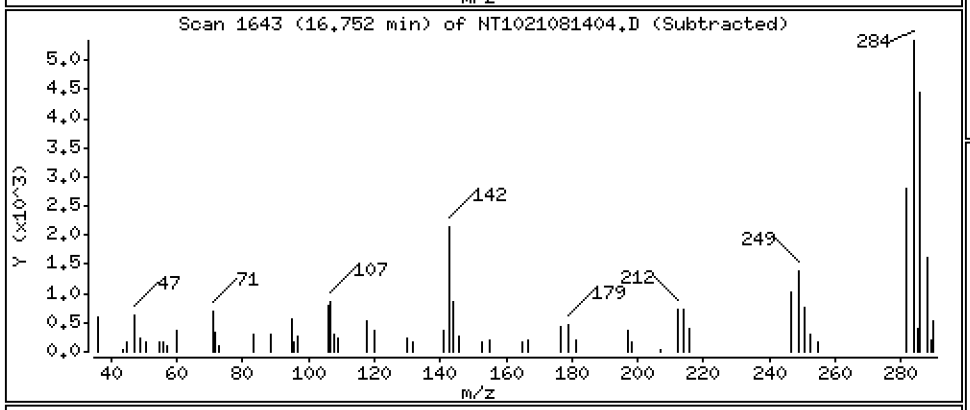
Column phase: ZB-5msi

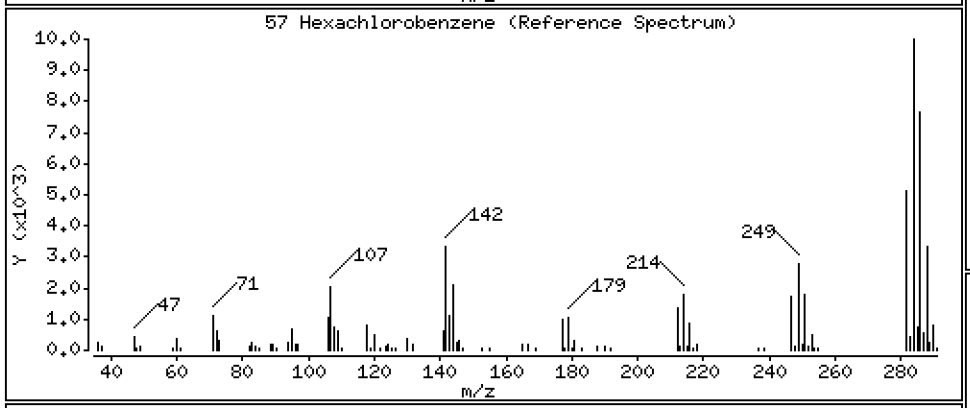
Column diameter: 0.25

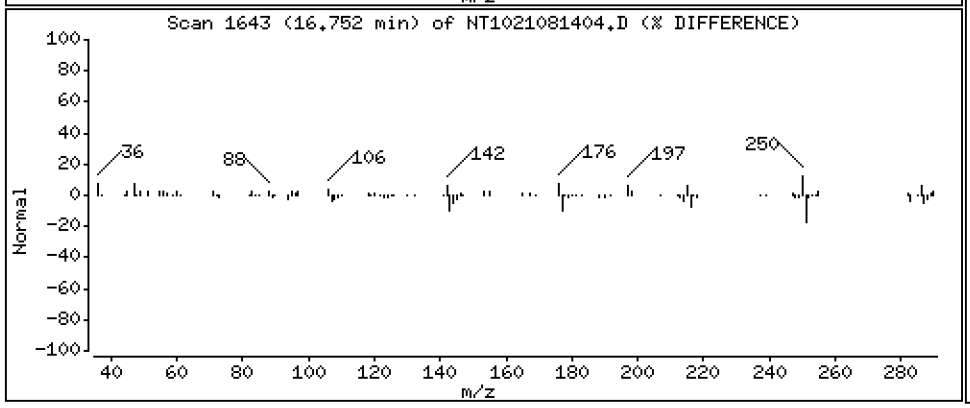
57 Hexachlorobenzene

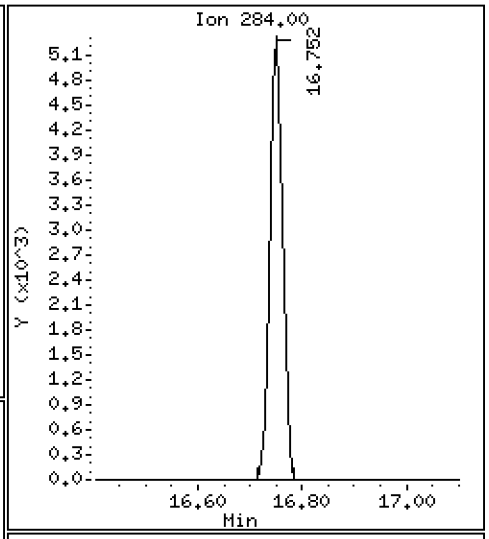
Concentration: 0.2170 ug/mL

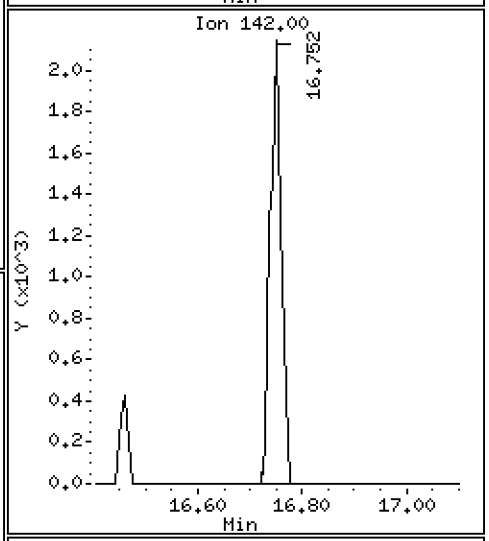


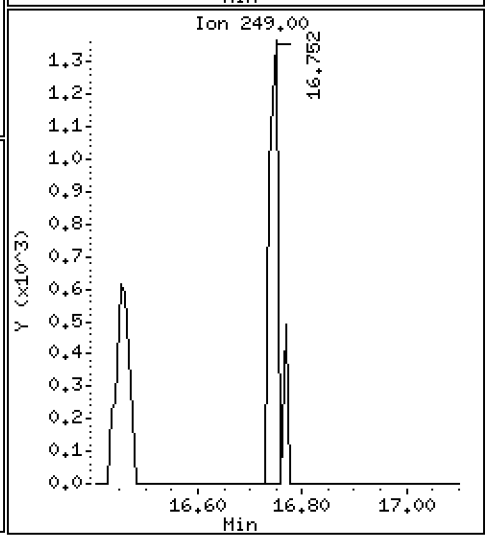












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

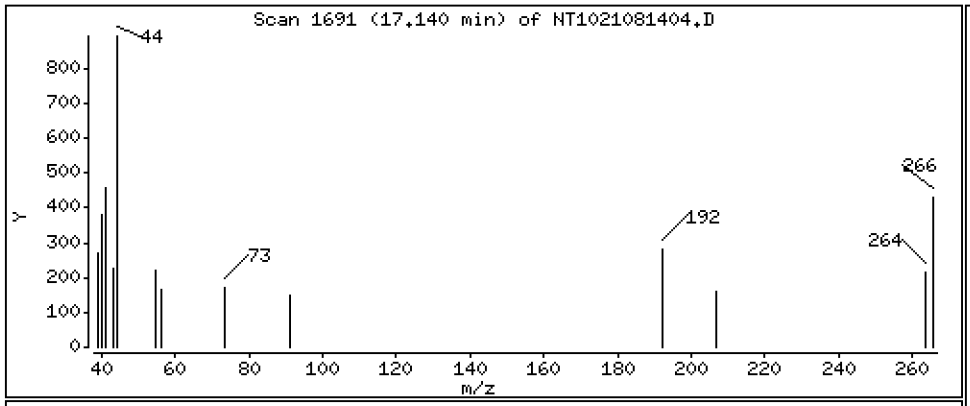
Operator: VTS

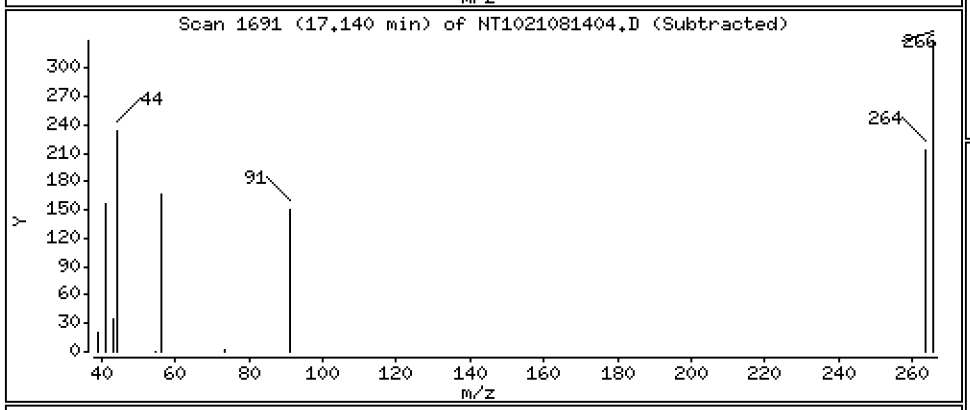
Column phase: ZB-5msi

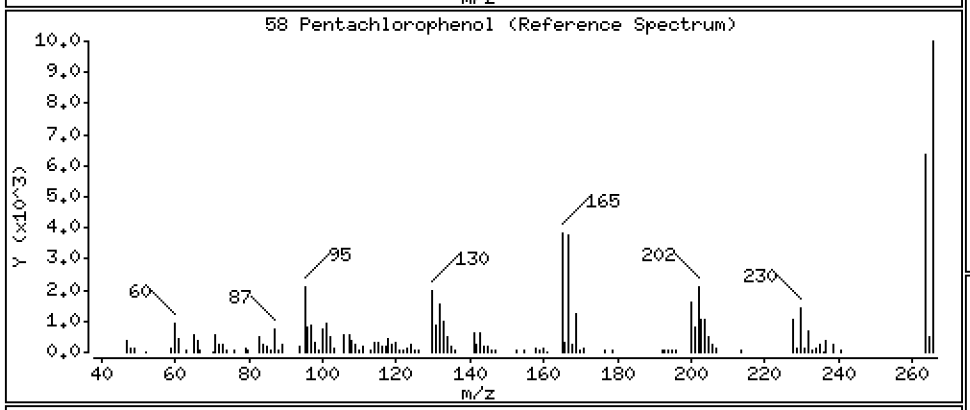
Column diameter: 0.25

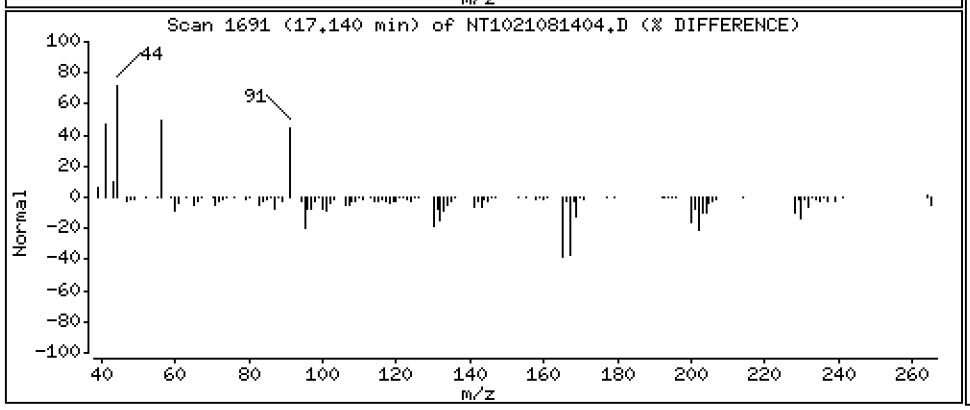
58 Pentachlorophenol

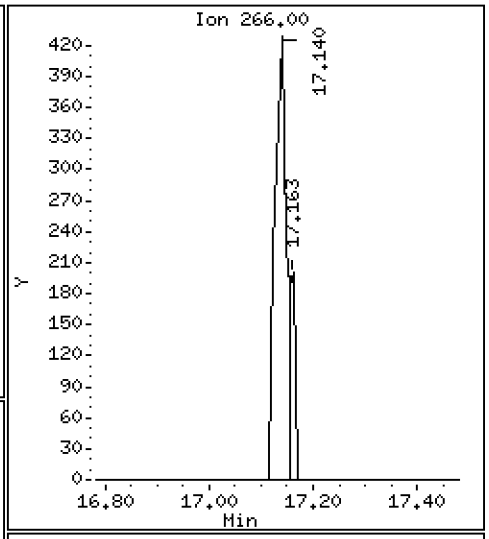
Concentration: 0.03946 ug/mL

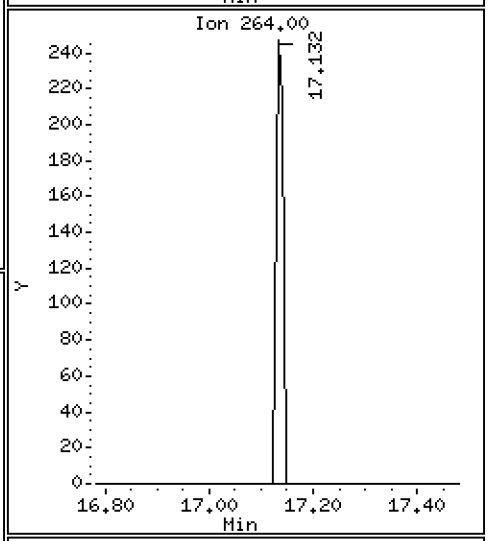


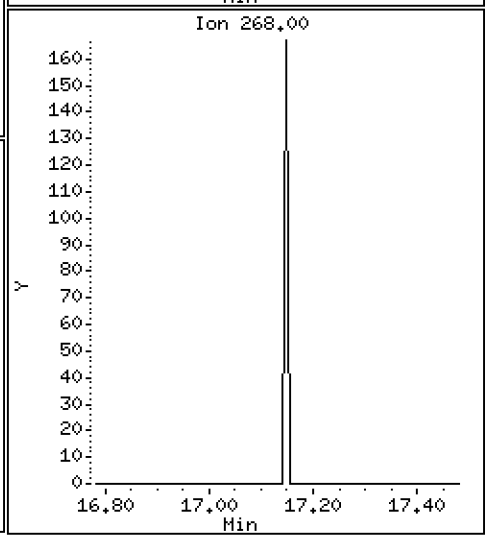












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

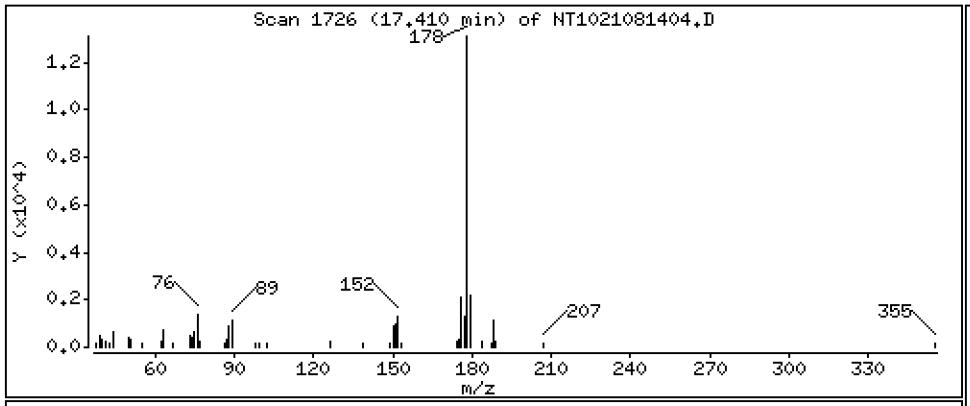
Operator: VTS

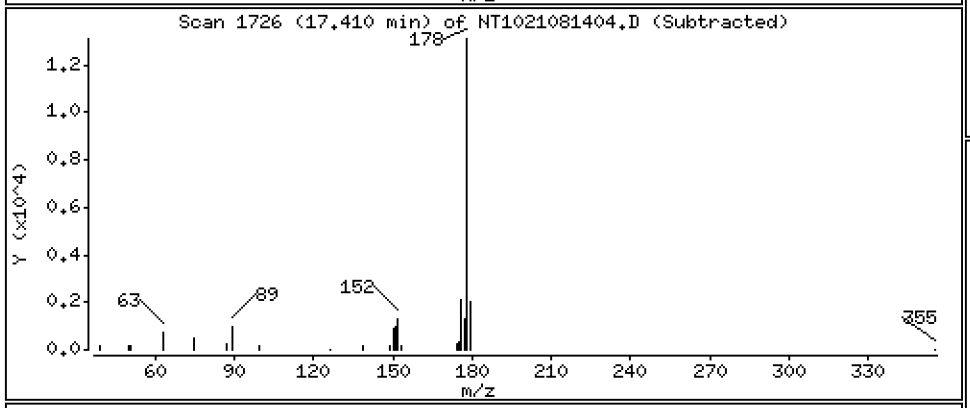
Column phase: ZB-5msi

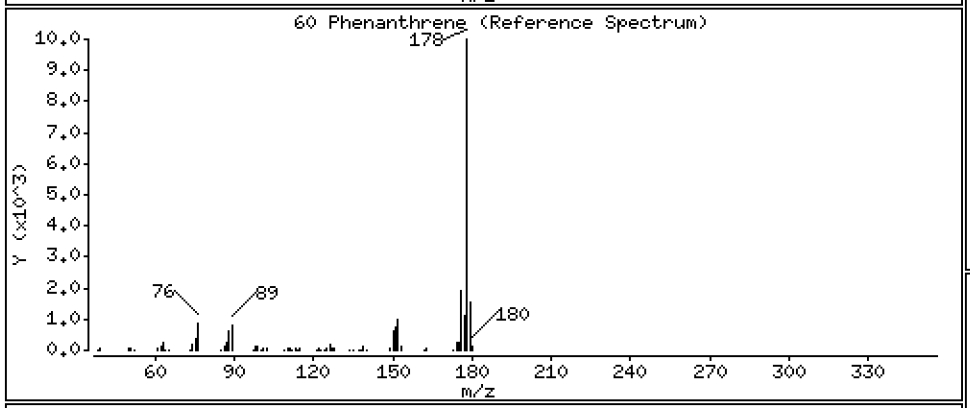
Column diameter: 0.25

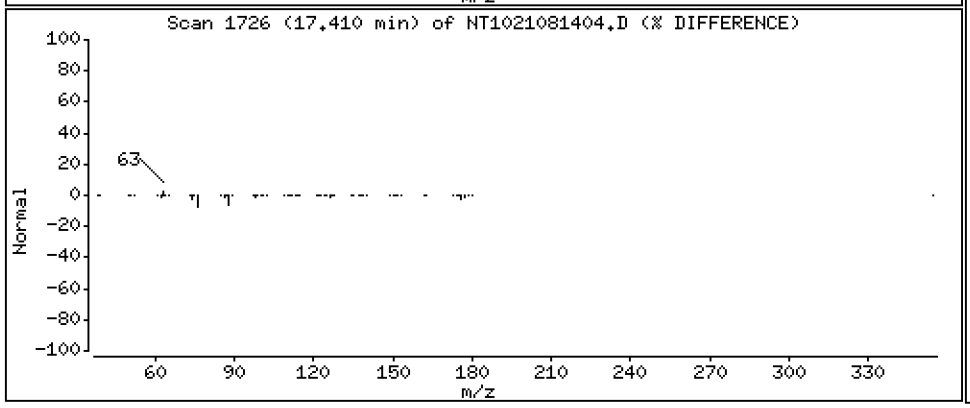
60 Phenanthrene

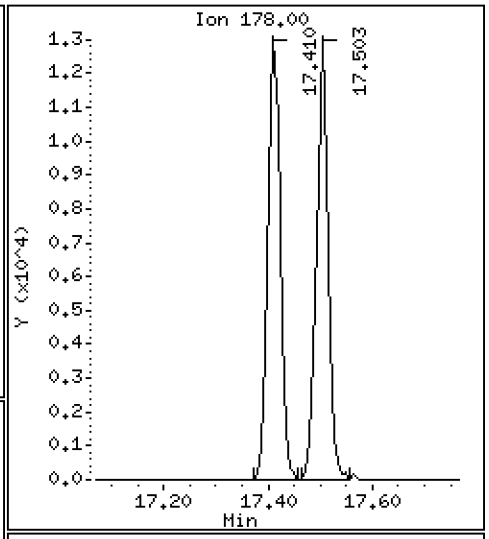
Concentration: 0.1765 ug/mL

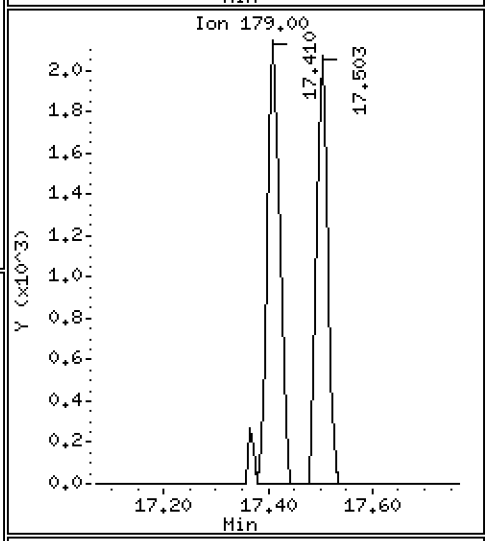


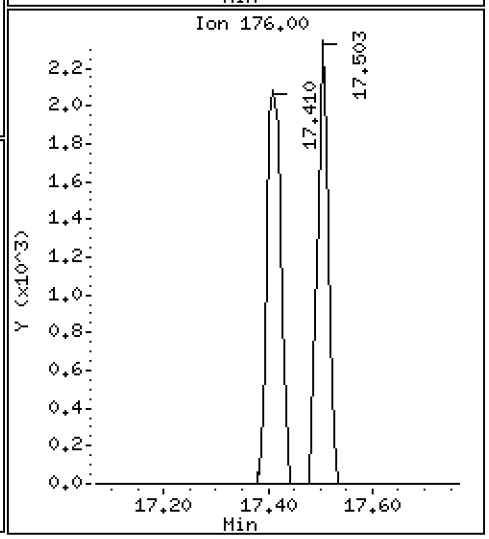












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

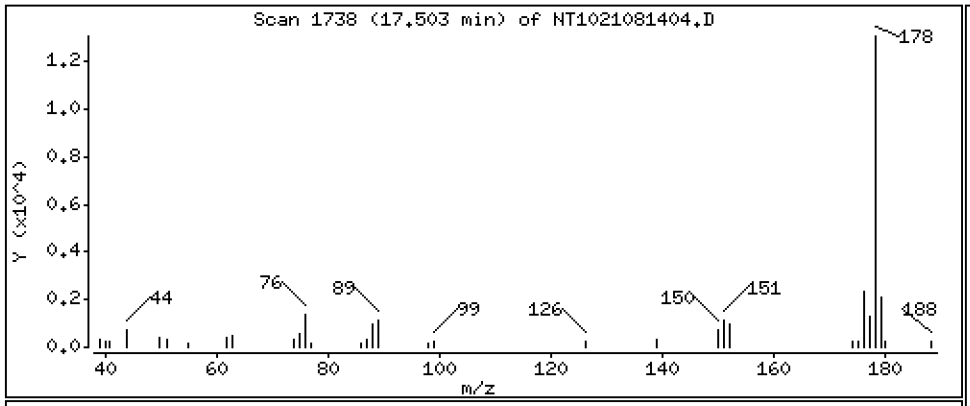
Operator: VTS

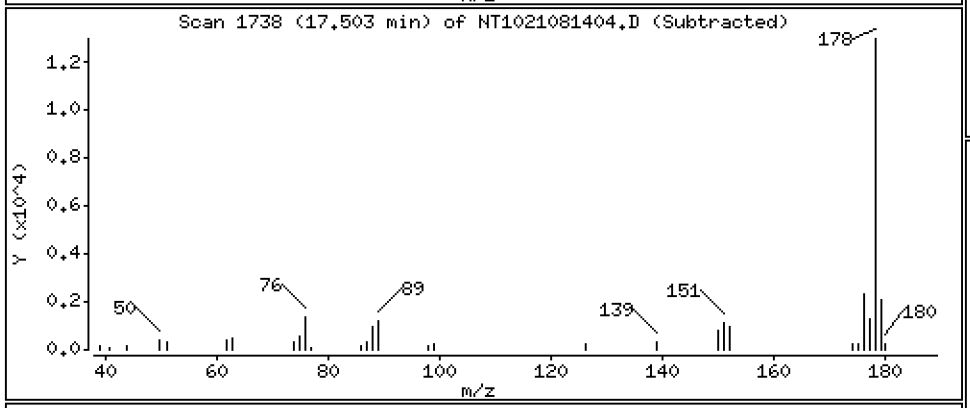
Column phase: ZB-5msi

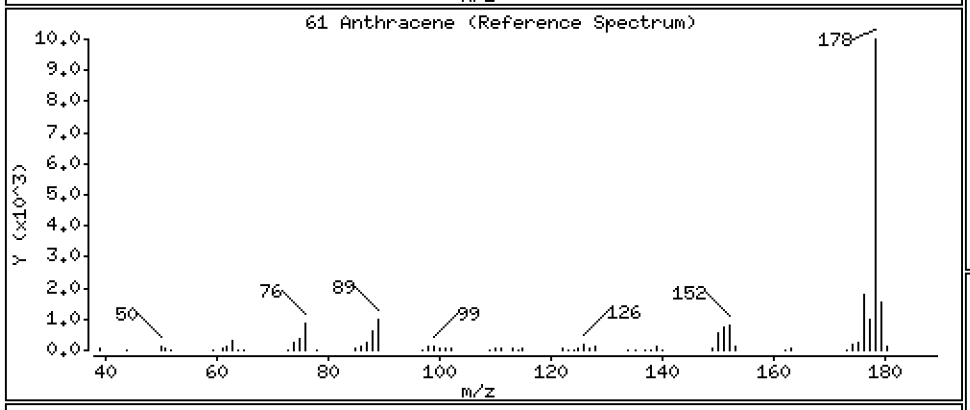
Column diameter: 0.25

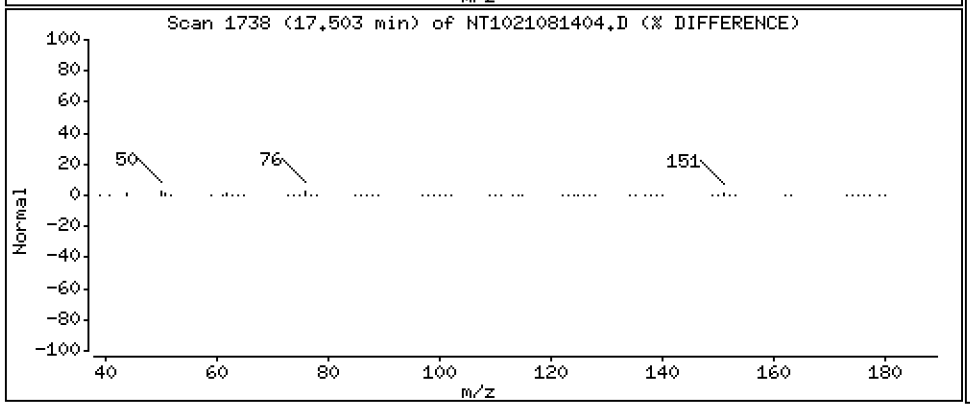
61 Anthracene

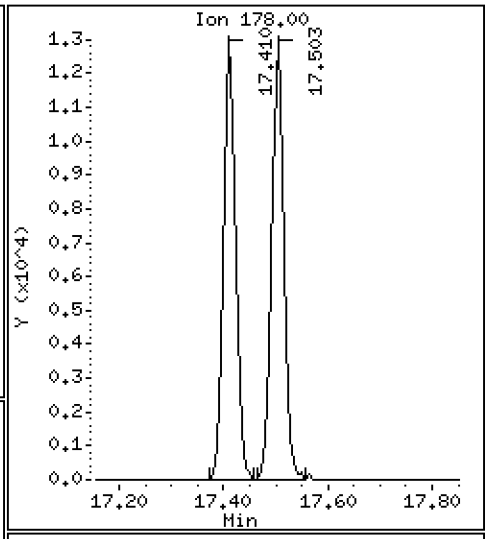
Concentration: 0.1600 ug/mL

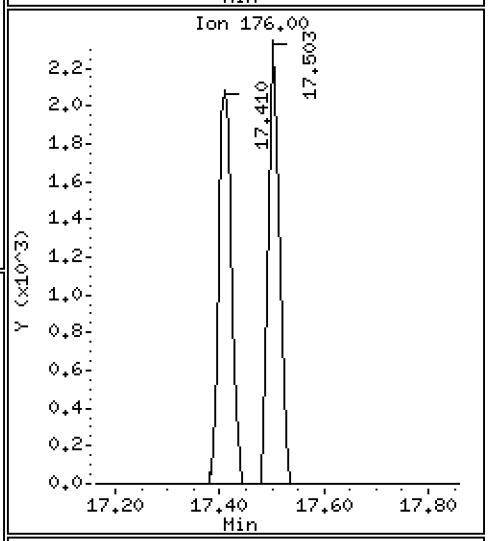


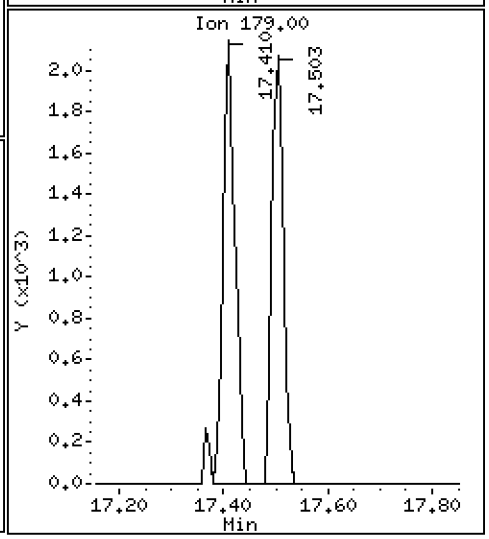












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

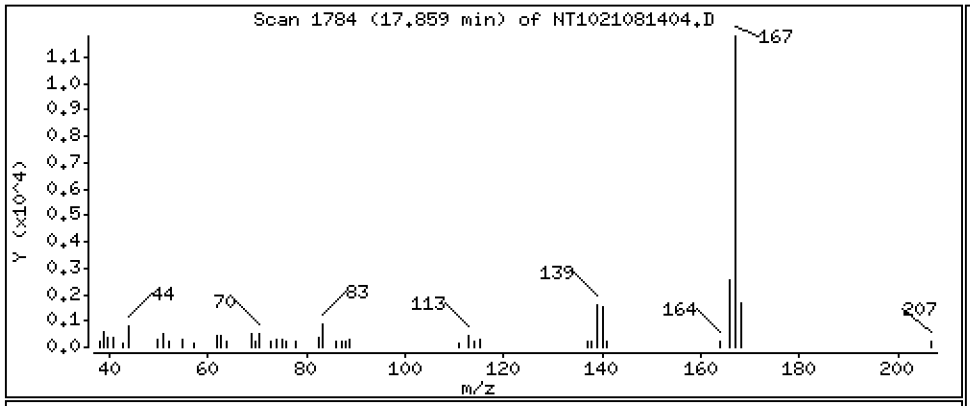
Operator: VTS

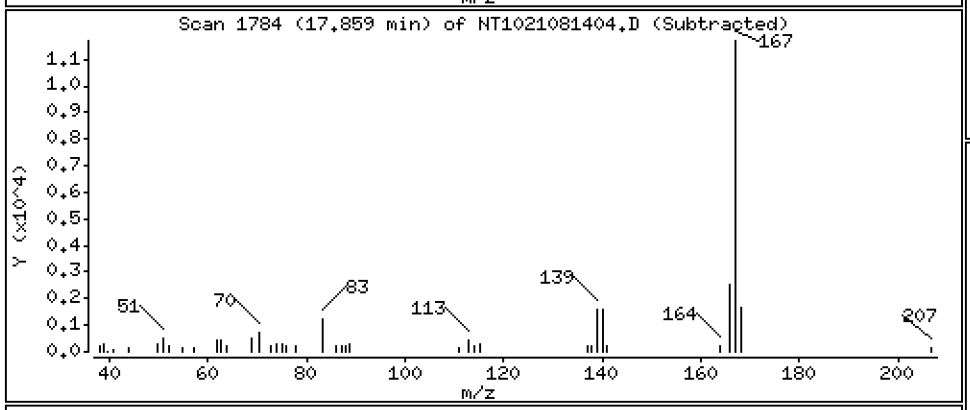
Column phase: ZB-5msi

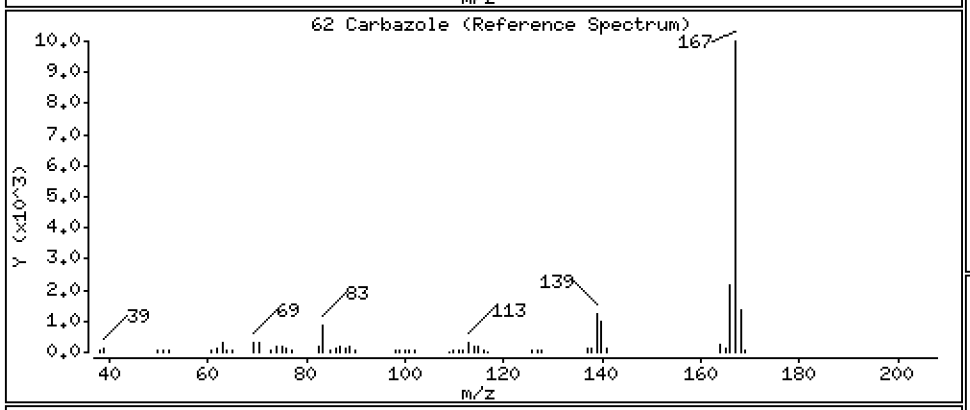
Column diameter: 0.25

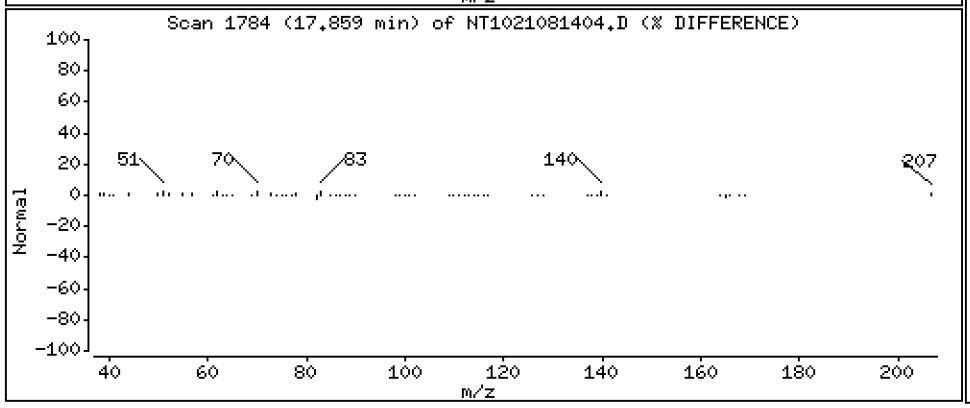
62 Carbazole

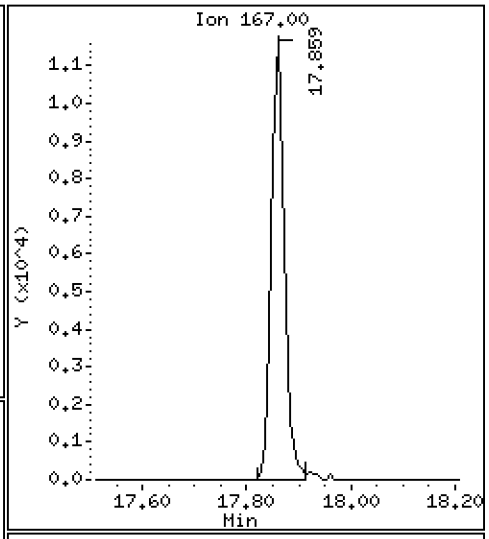
Concentration: 0.1589 ug/mL

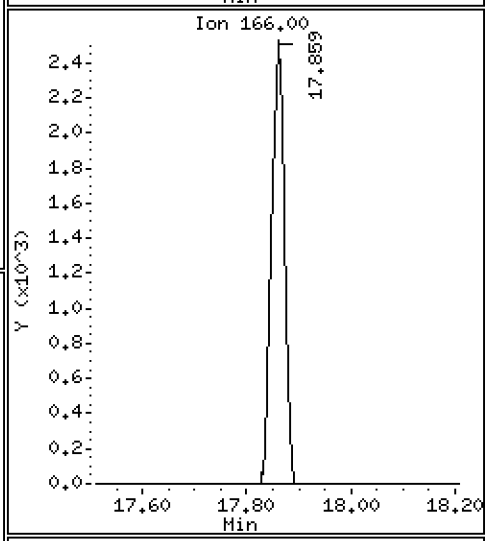


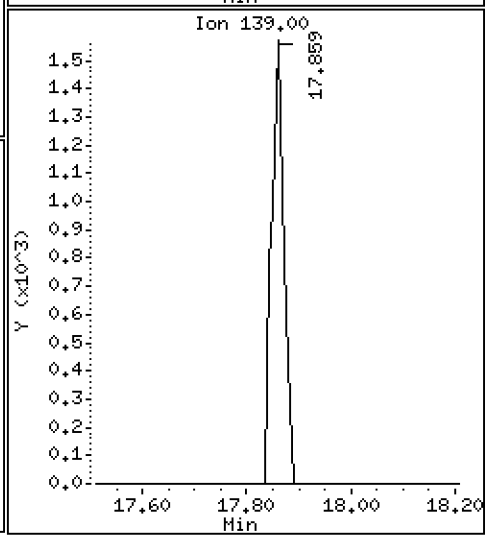












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

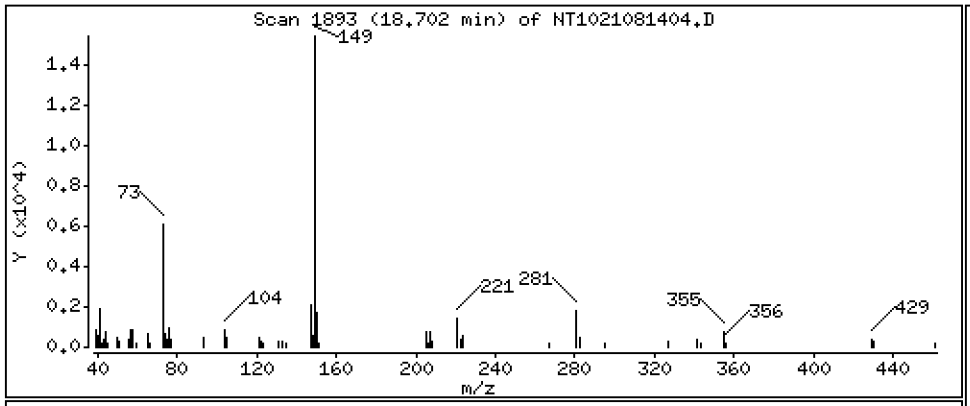
Operator: VTS

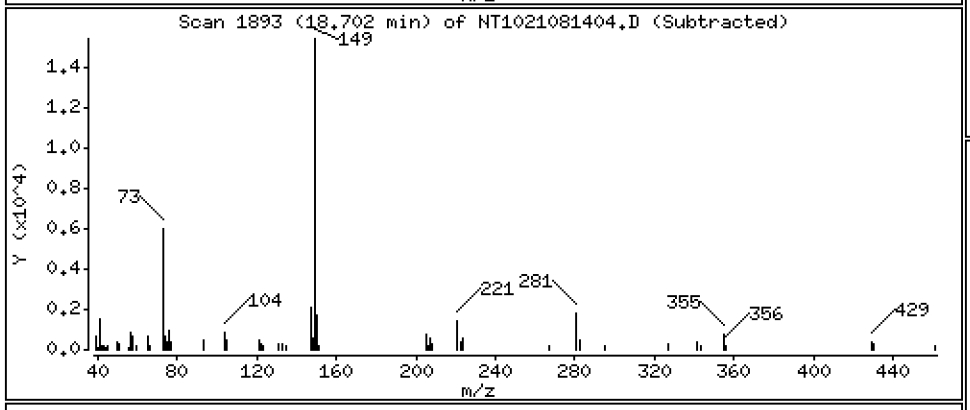
Column phase: ZB-5msi

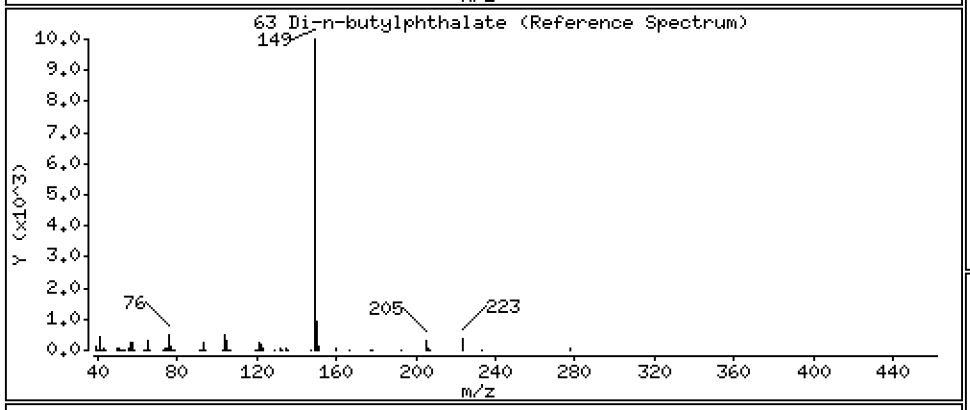
Column diameter: 0.25

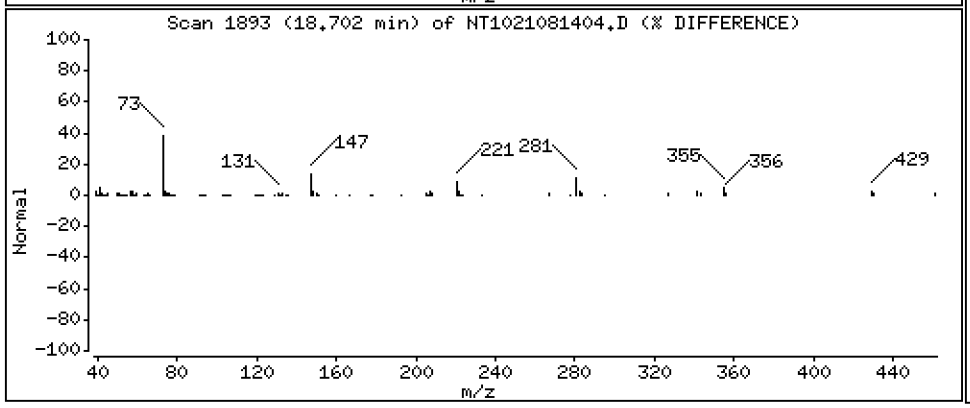
63 Di-n-butylphthalate

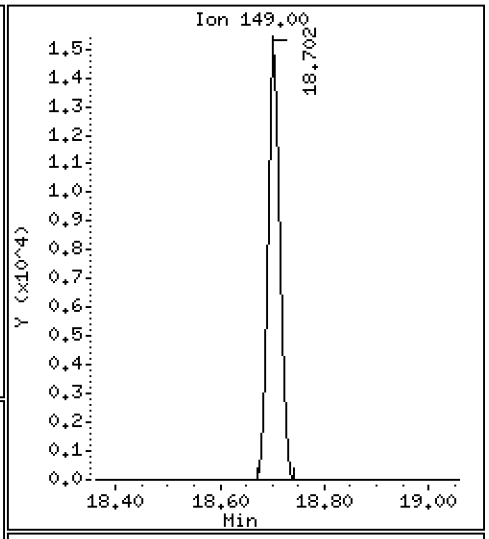
Concentration: 0.1257 ug/mL

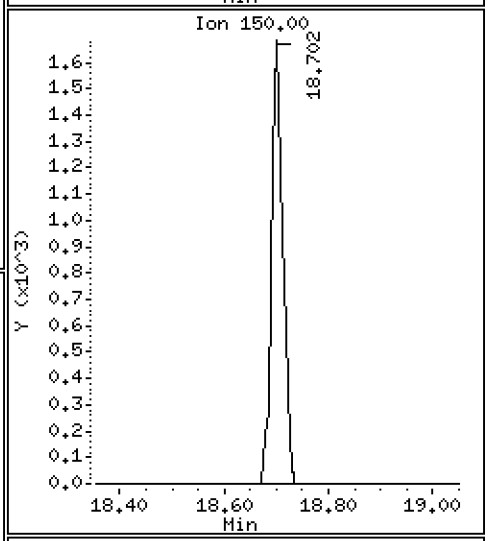


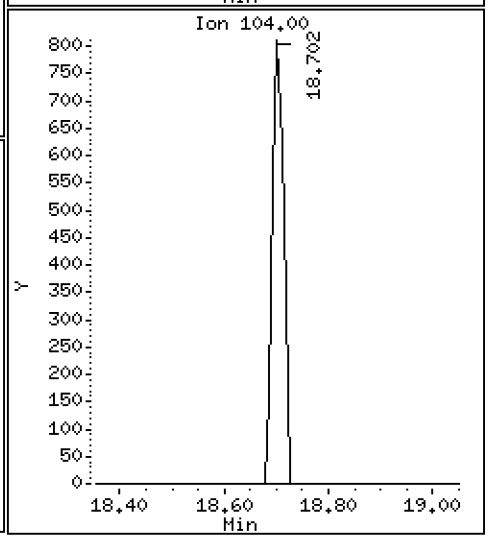












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

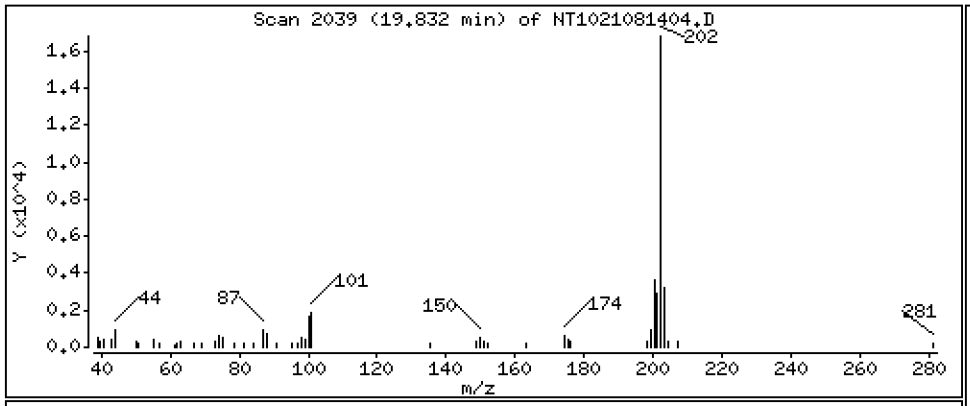
Operator: VTS

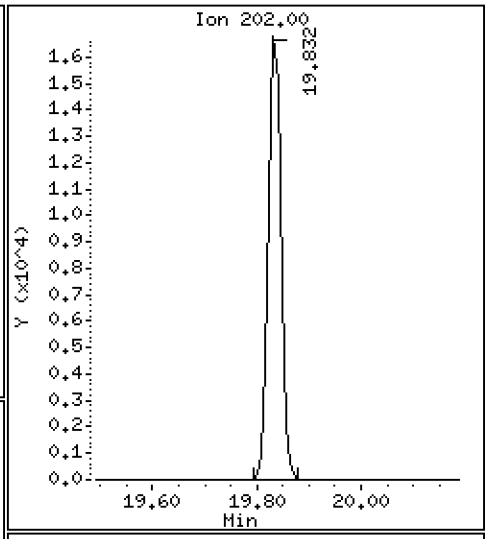
Column phase: ZB-5msi

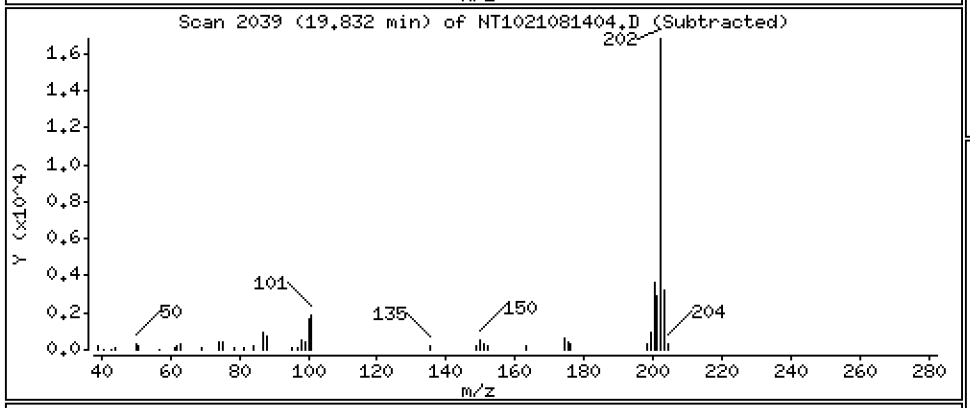
Column diameter: 0.25

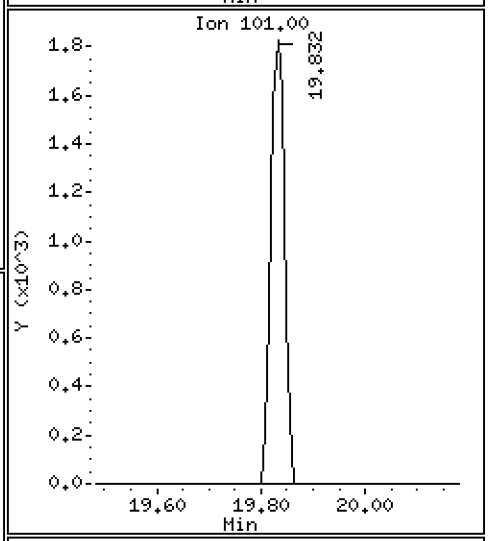
64 Fluoranthene

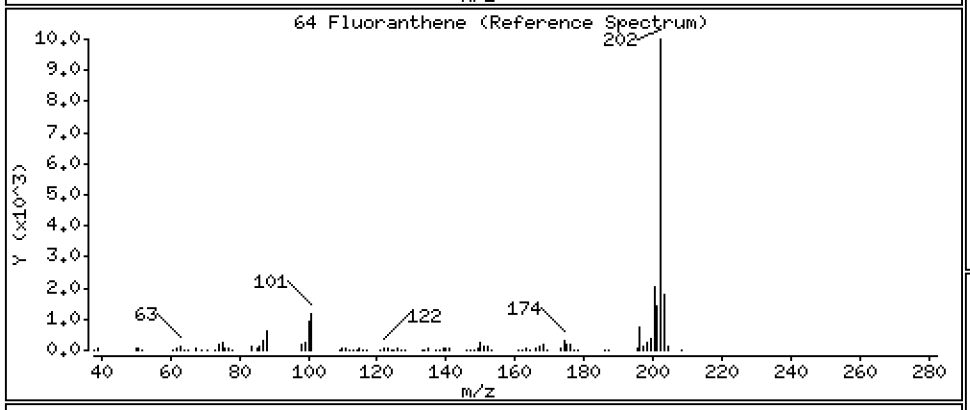
Concentration: 0.1700 ug/mL

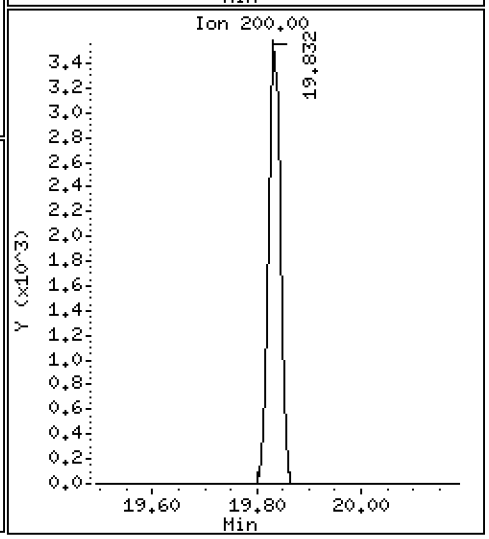


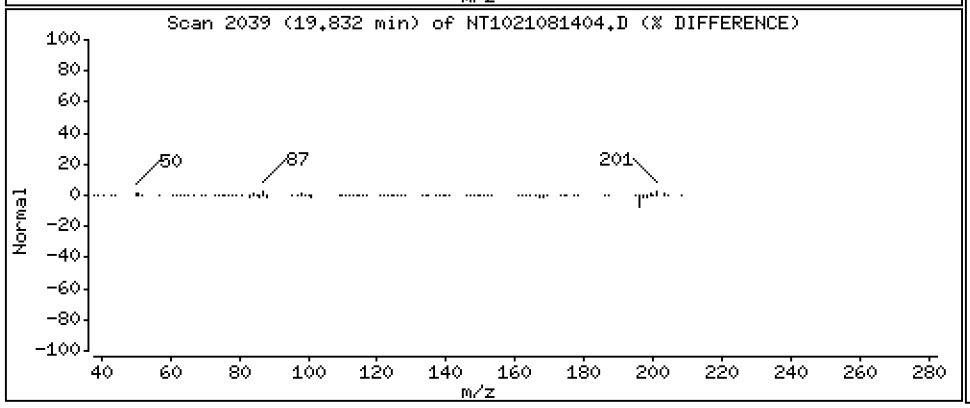












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

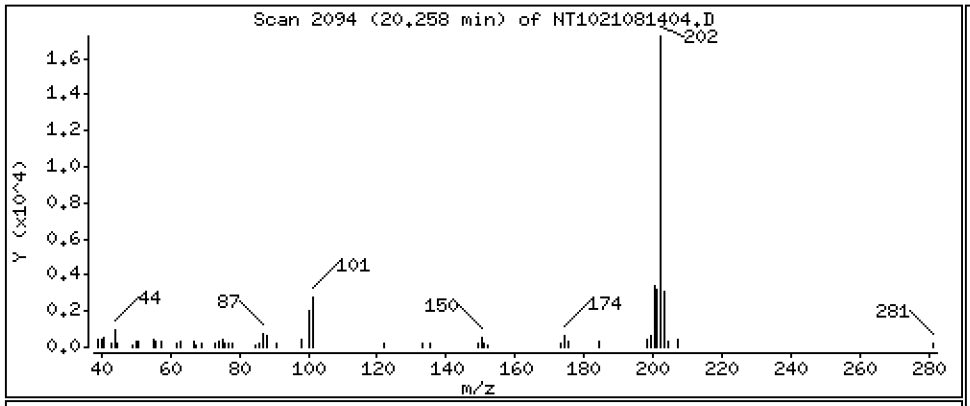
Operator: VTS

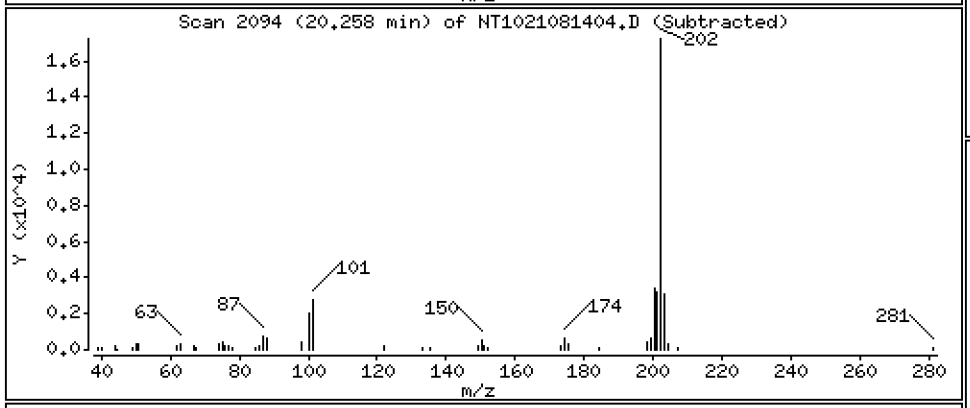
Column phase: ZB-5msi

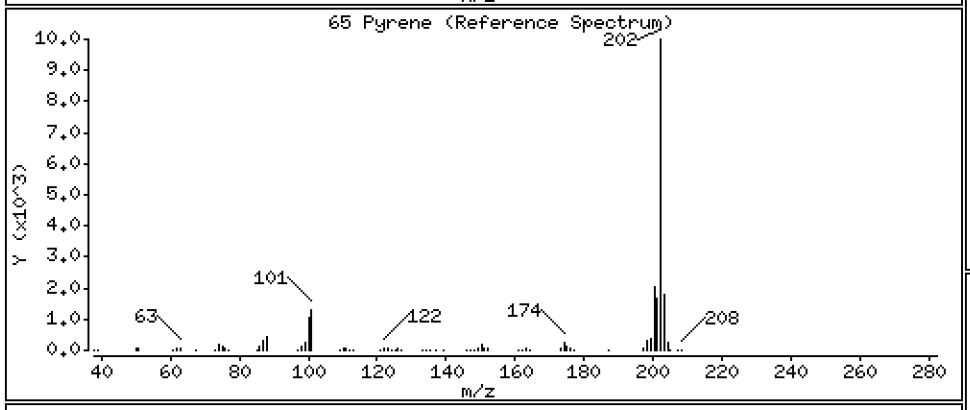
Column diameter: 0.25

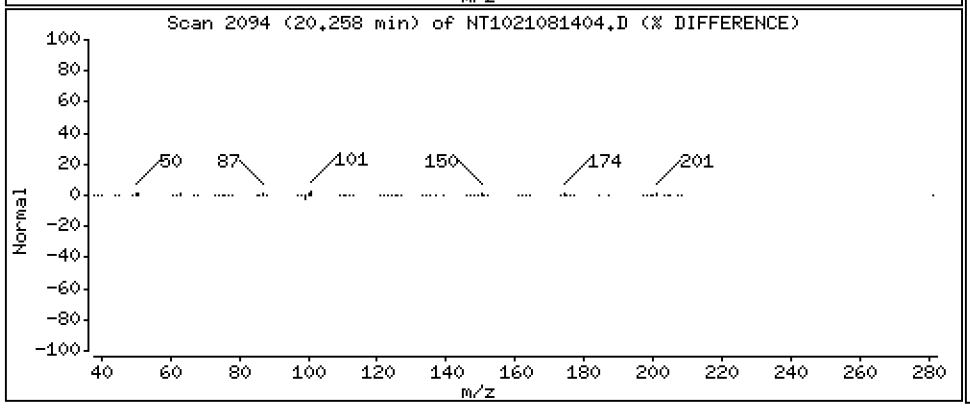
65 Pyrene

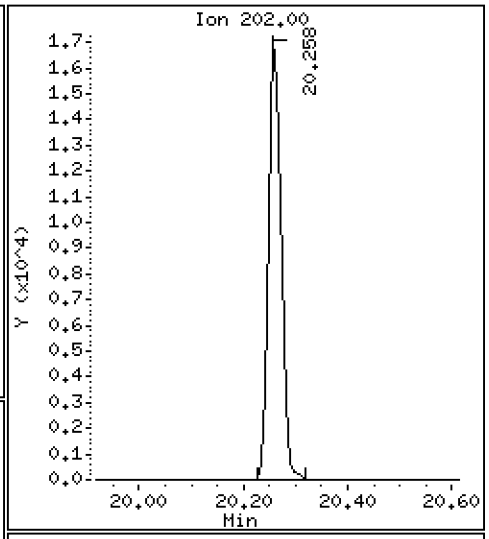
Concentration: 0.1578 ug/mL

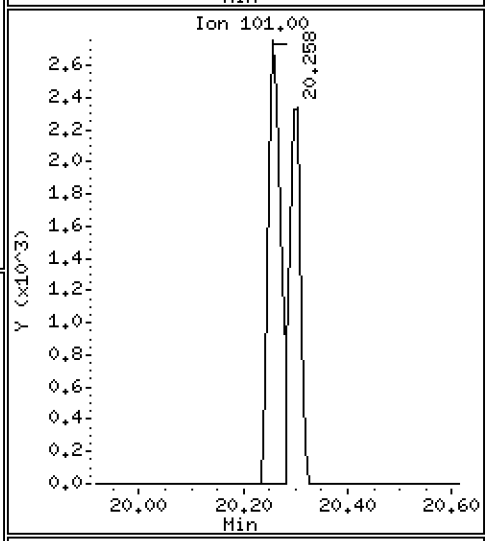


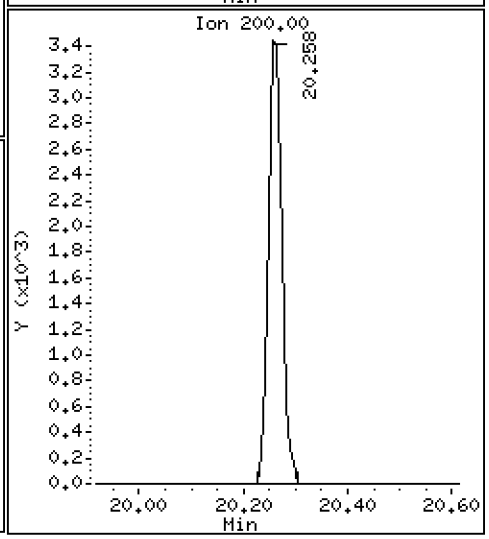












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

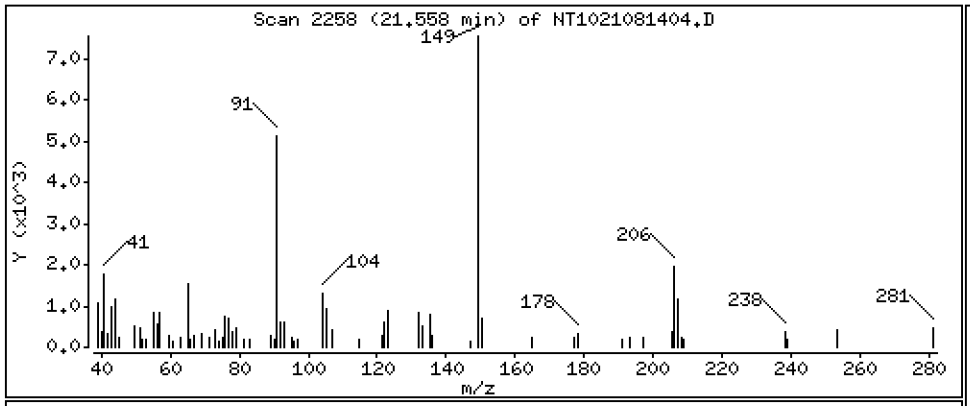
Operator: VTS

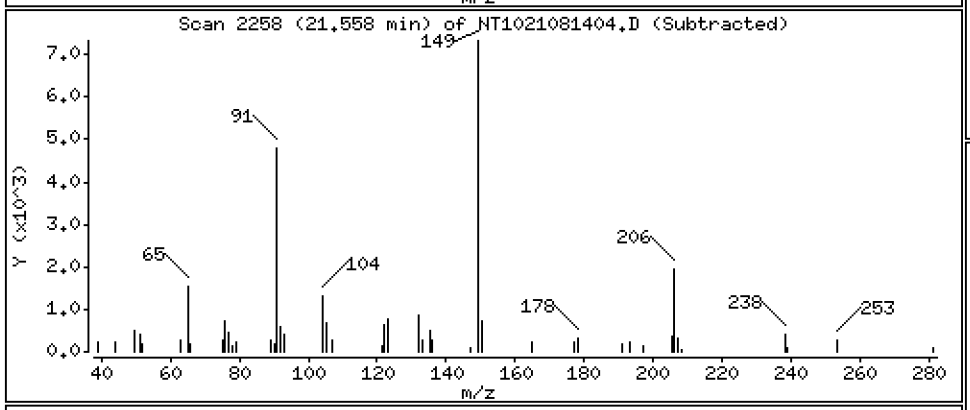
Column phase: ZB-5msi

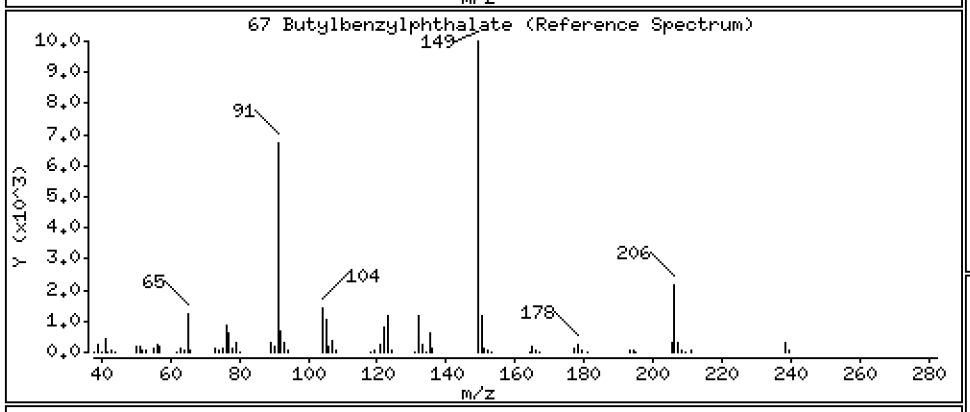
Column diameter: 0.25

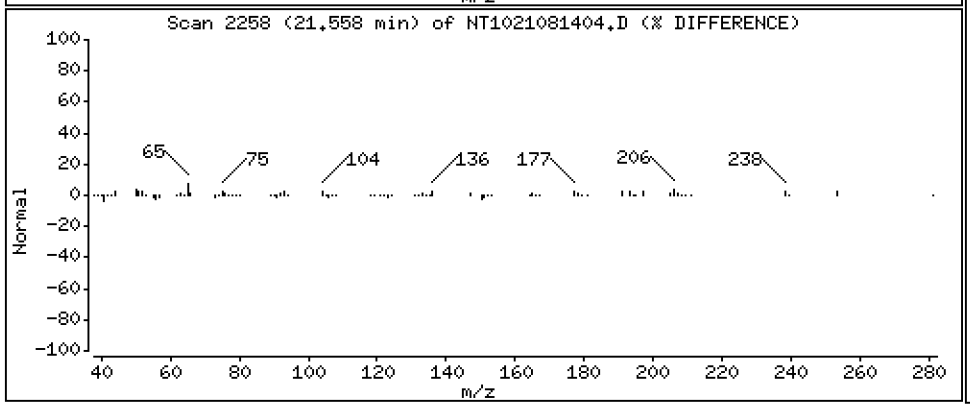
67 Butylbenzylphthalate

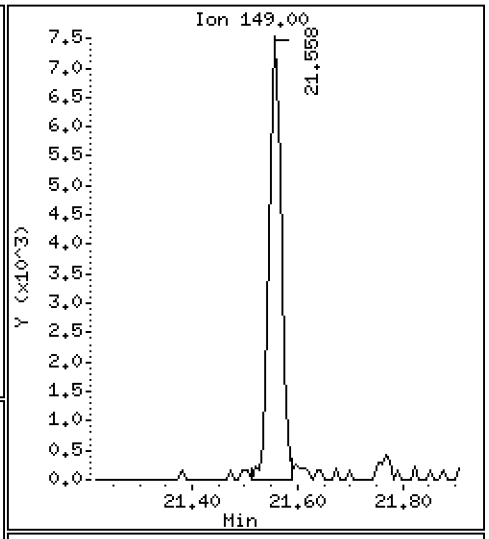
Concentration: 0.2000 ug/mL

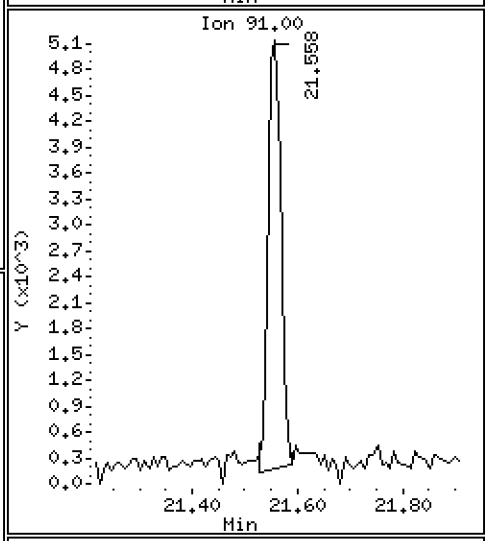


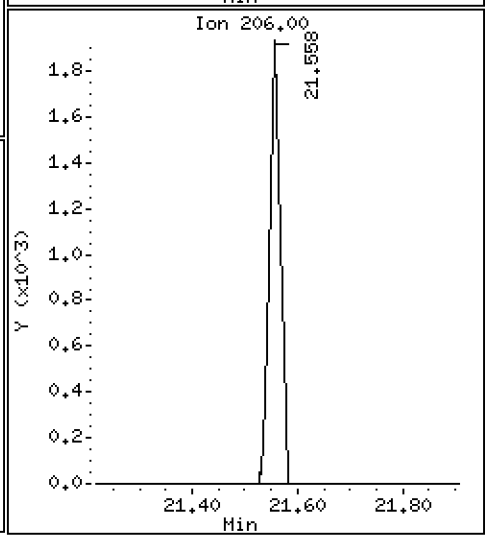












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

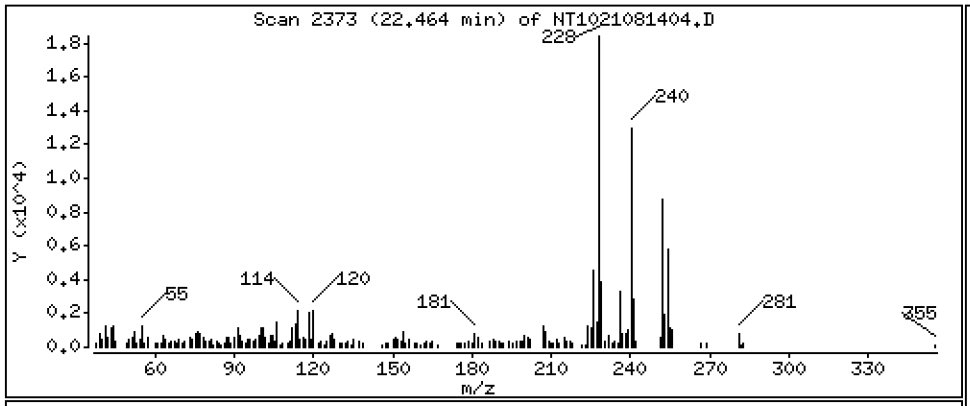
Operator: VTS

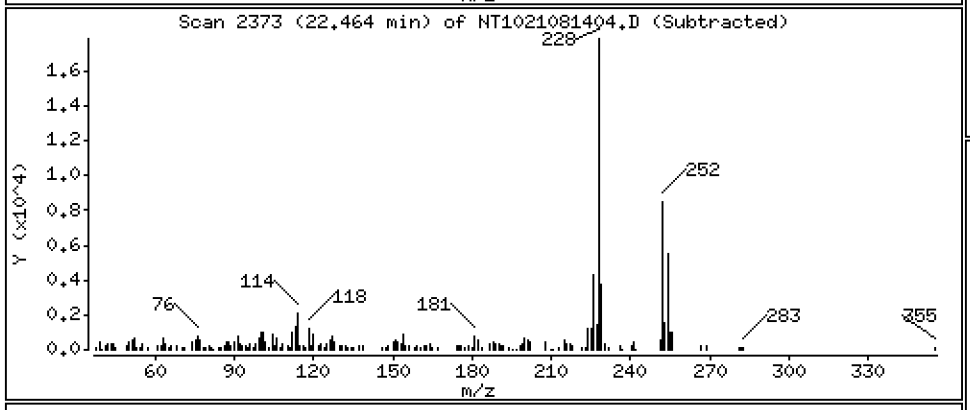
Column phase: ZB-5msi

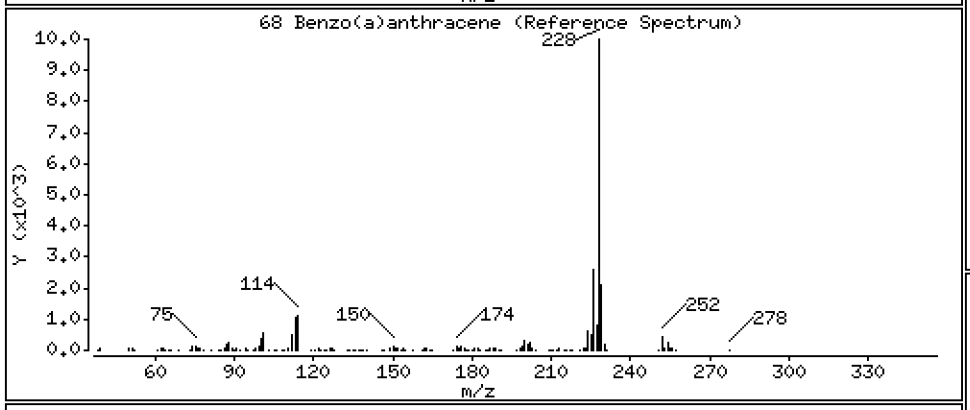
Column diameter: 0.25

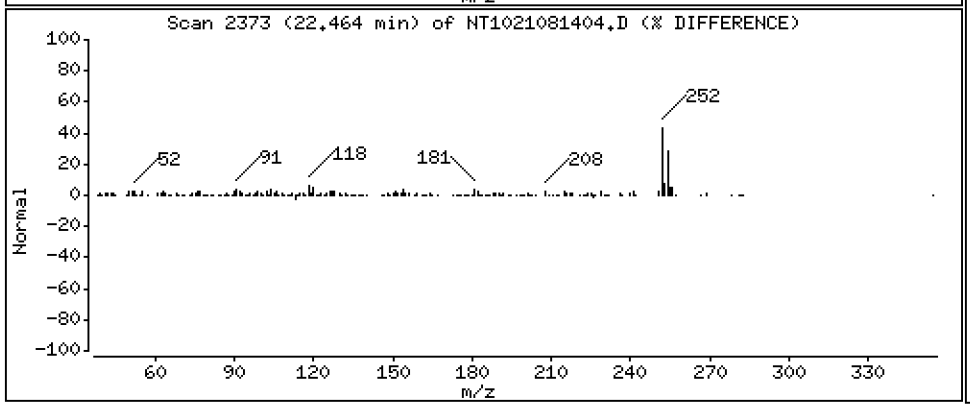
68 Benzo(a)anthracene

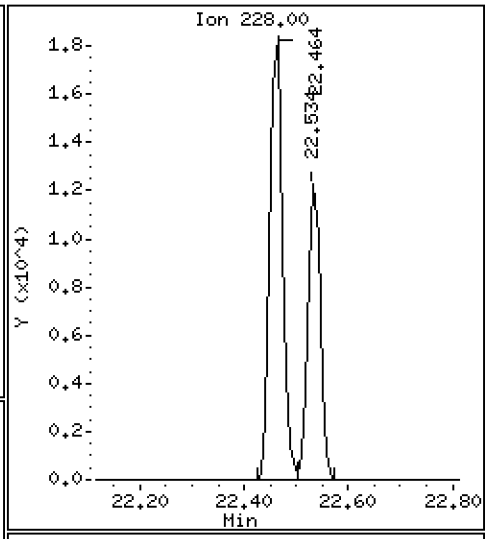
Concentration: 0.2072 ug/mL

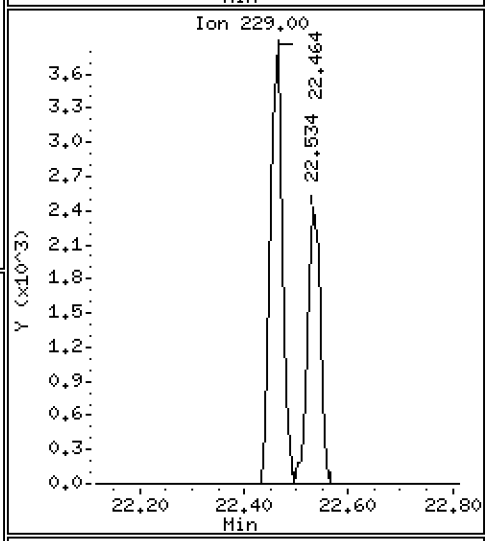


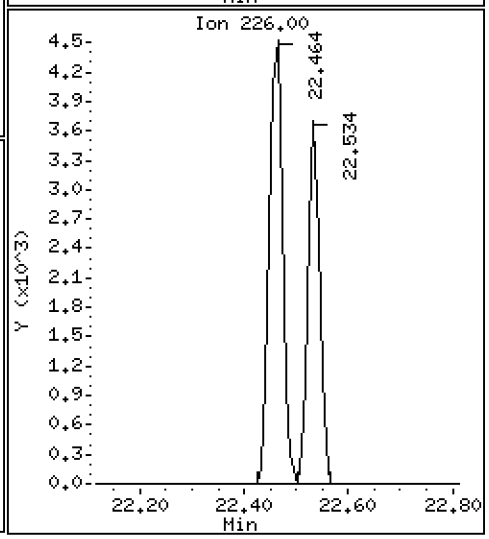












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

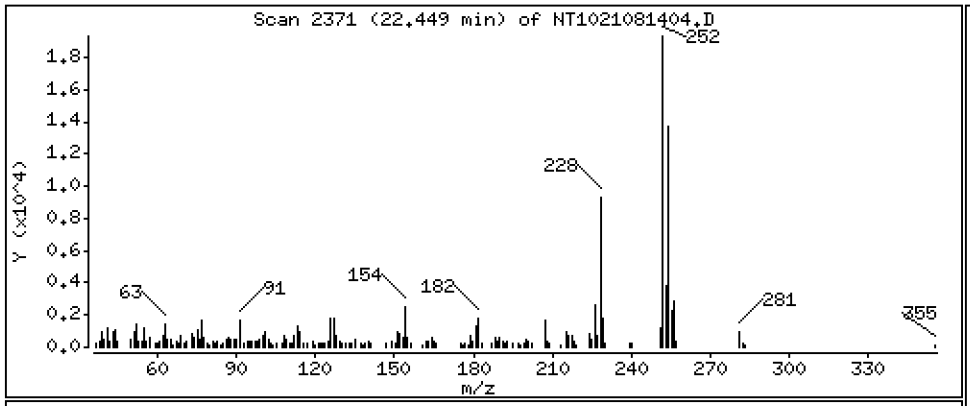
Operator: VTS

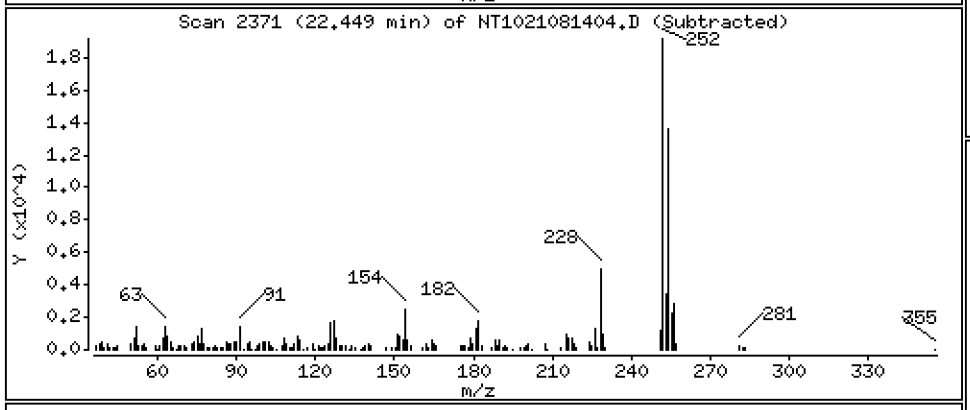
Column phase: ZB-5msi

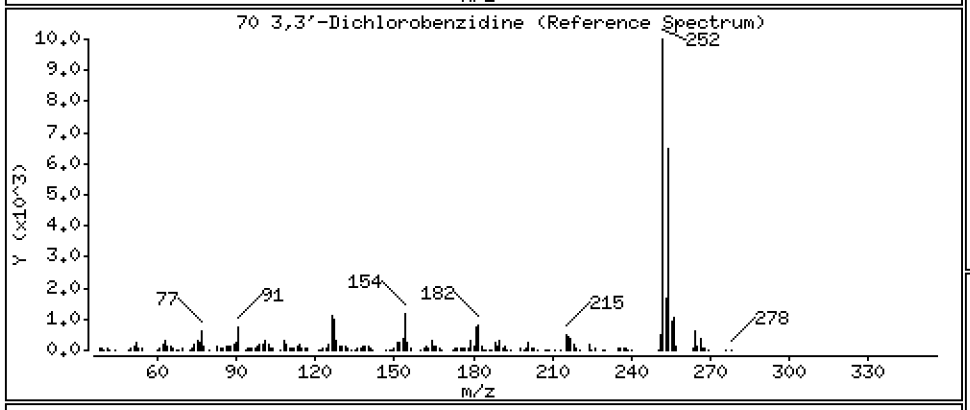
Column diameter: 0.25

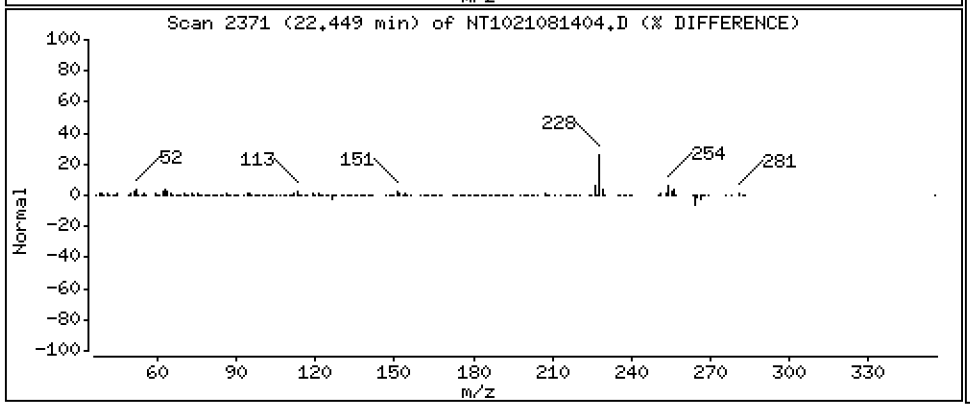
70 3,3'-Dichlorobenzidine

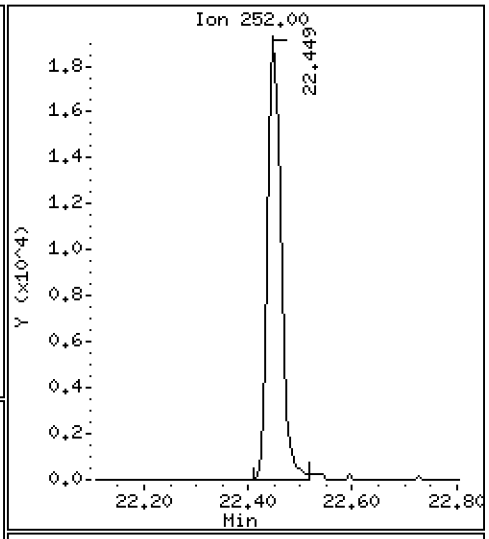
Concentration: 0.5796 ug/mL

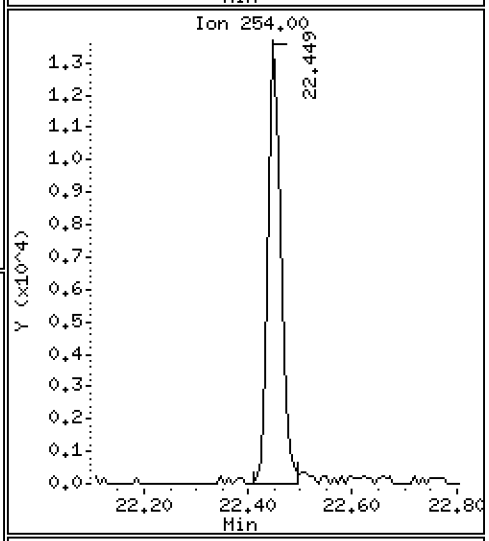


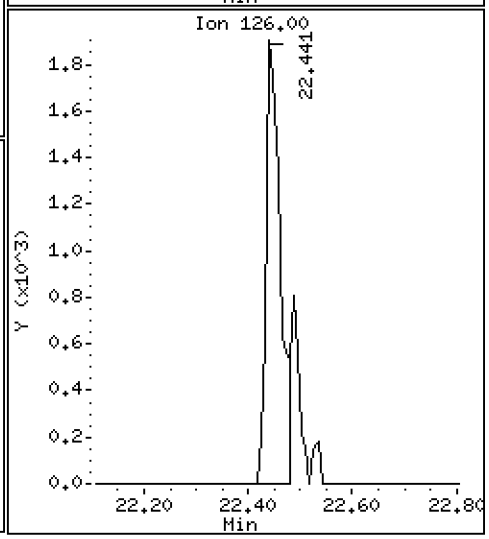












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

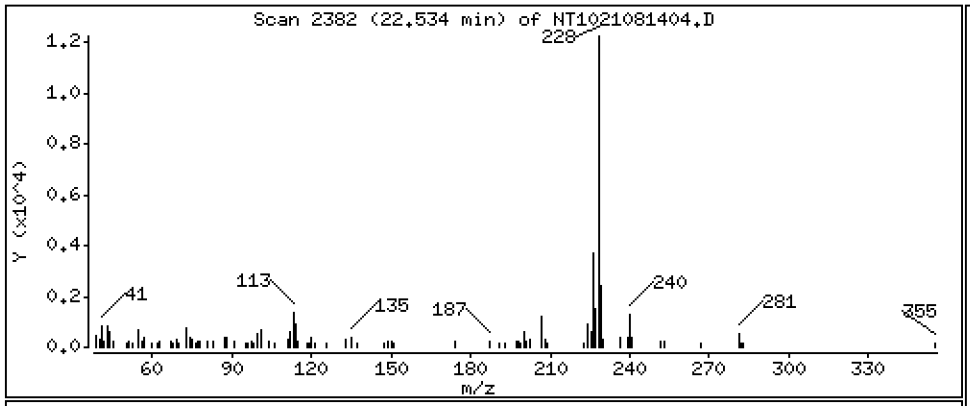
Operator: VTS

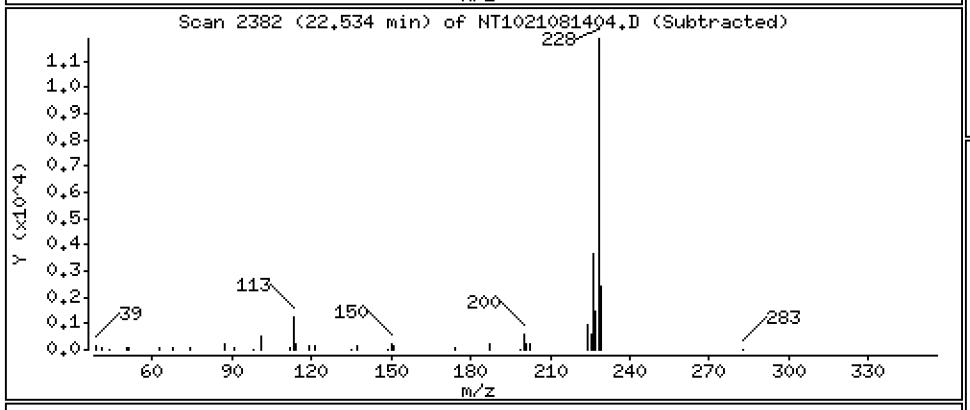
Column phase: ZB-5msi

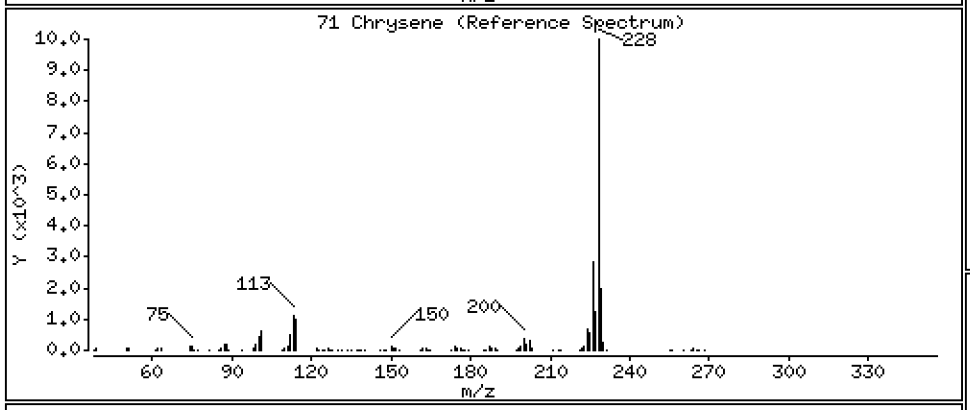
Column diameter: 0.25

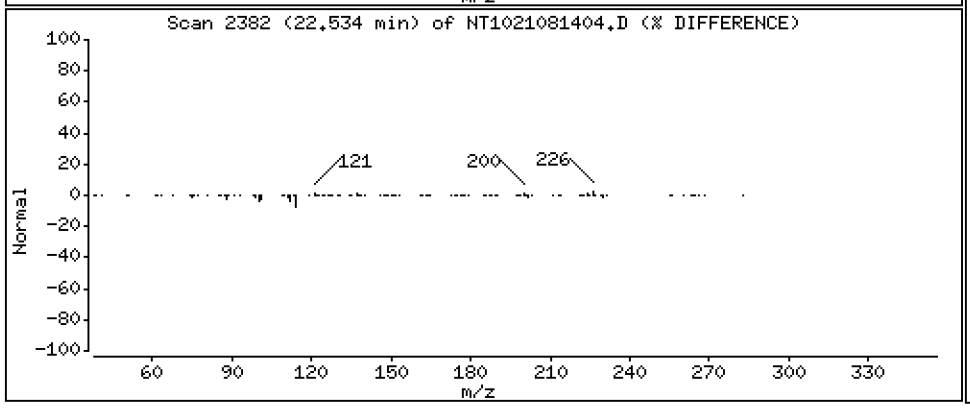
71 Chrysene

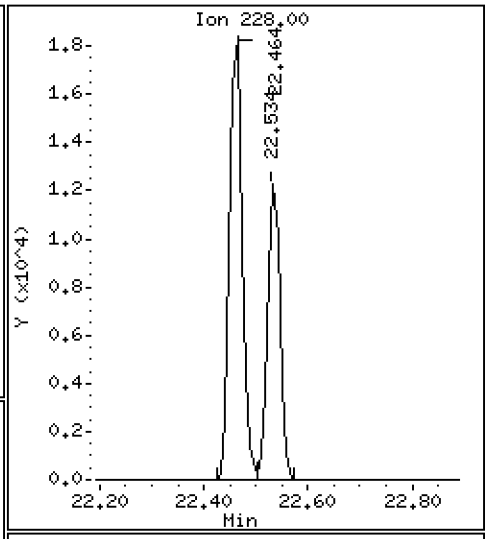
Concentration: 0.1752 ug/mL

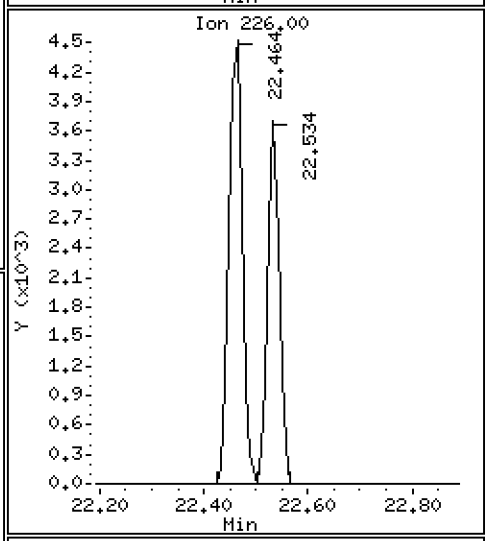


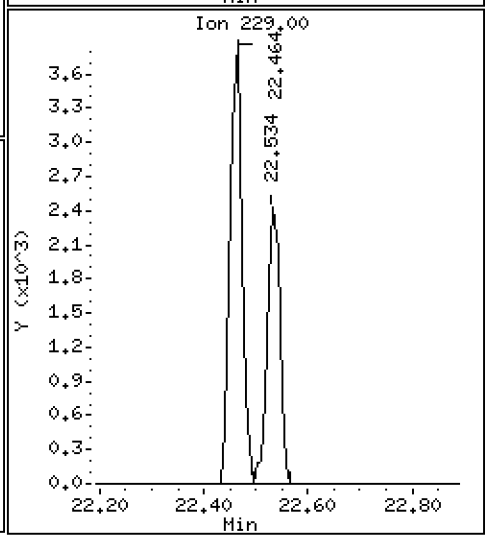












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

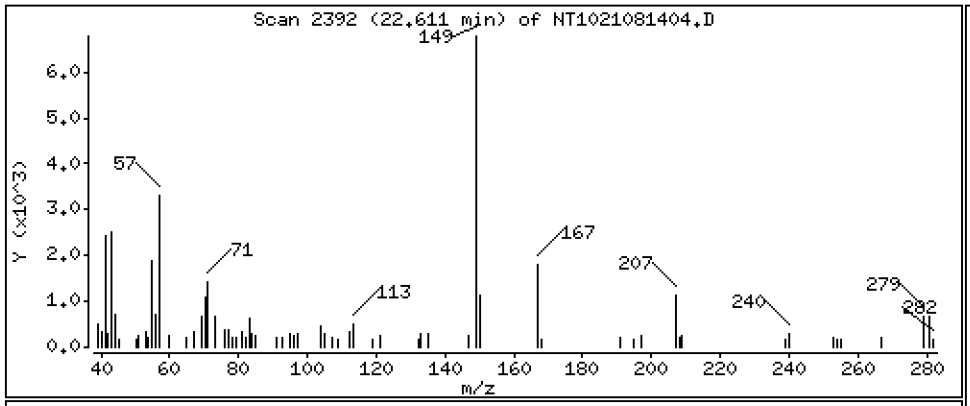
Operator: VTS

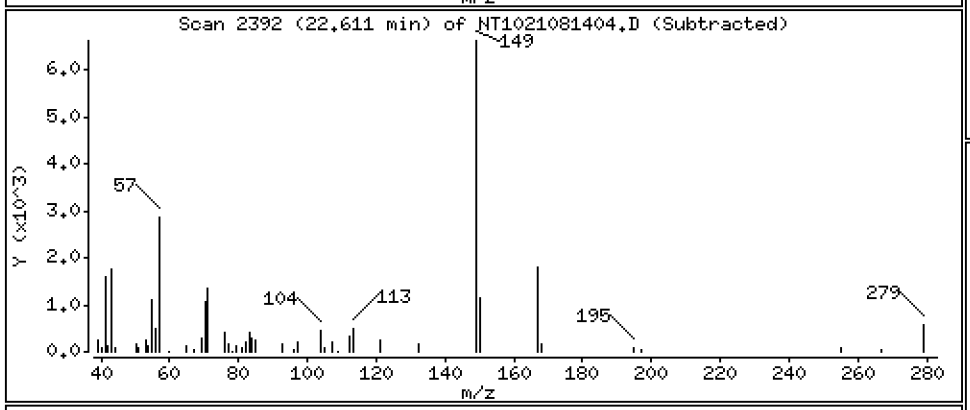
Column phase: ZB-5msi

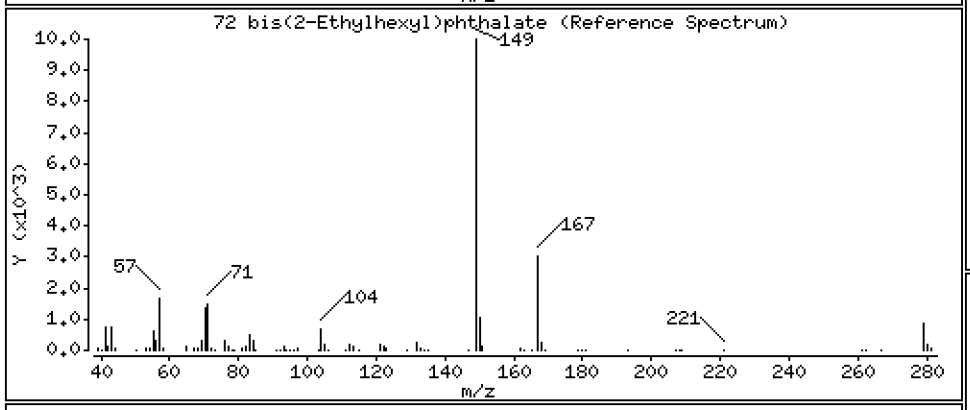
Column diameter: 0.25

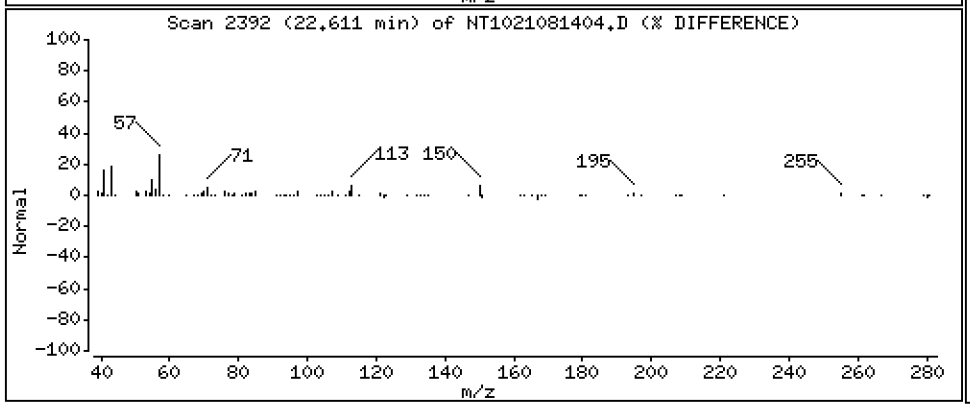
72 bis(2-Ethylhexyl)phthalate

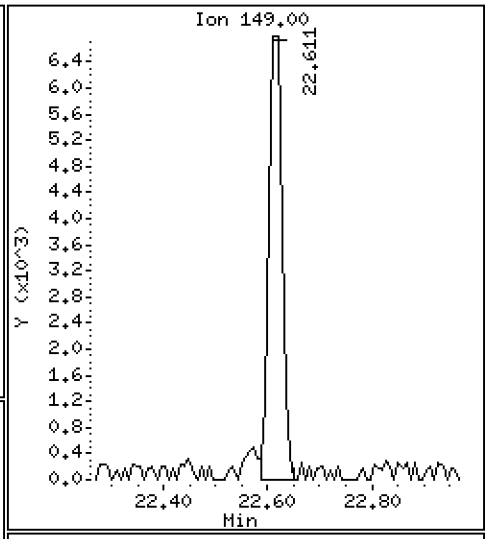
Concentration: 0.2301 ug/mL

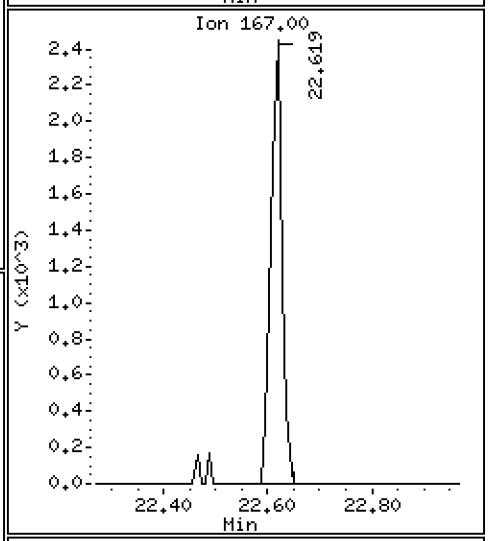


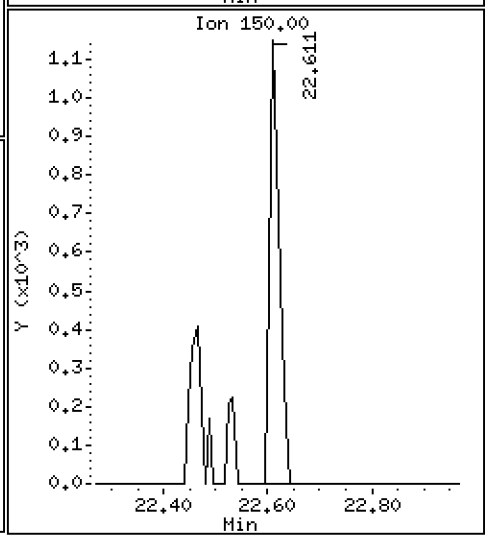












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

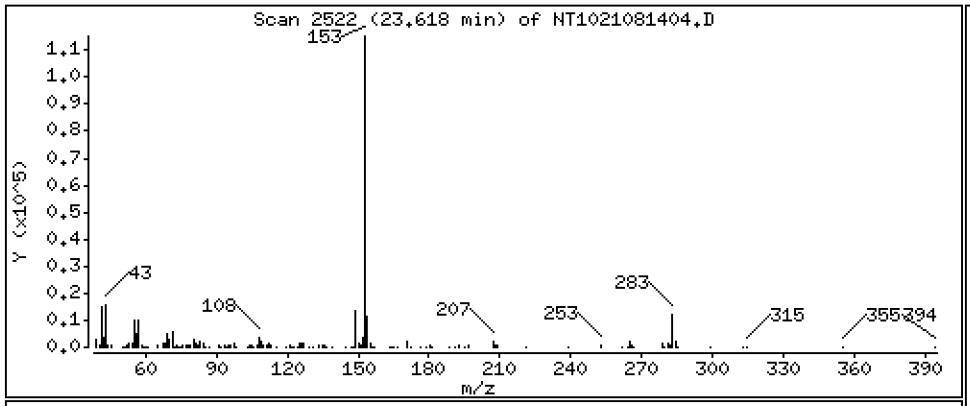
Operator: VTS

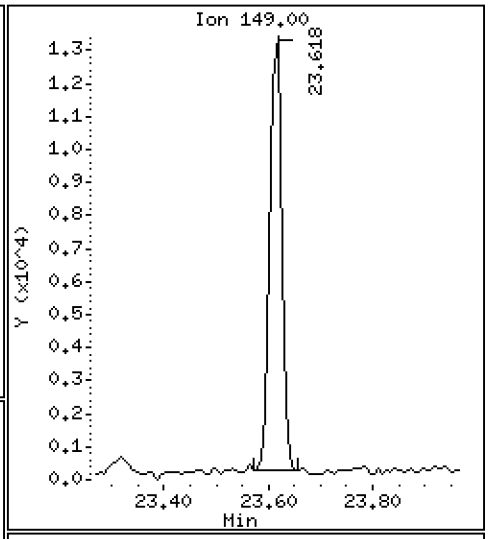
Column phase: ZB-5msi

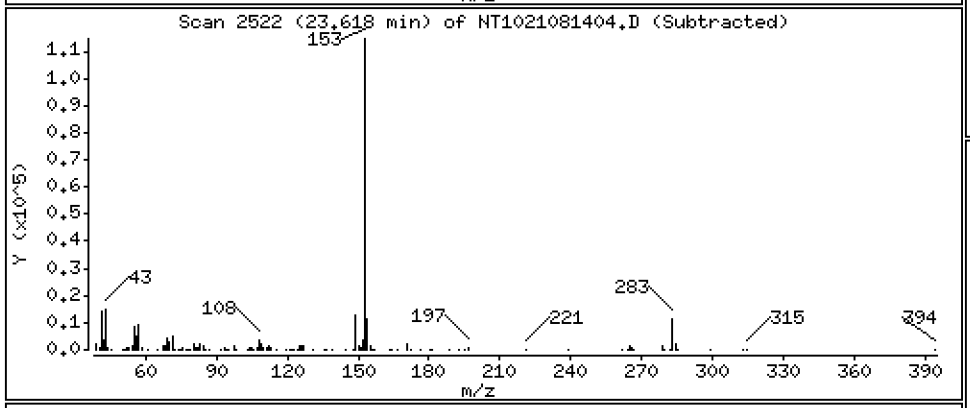
Column diameter: 0.25

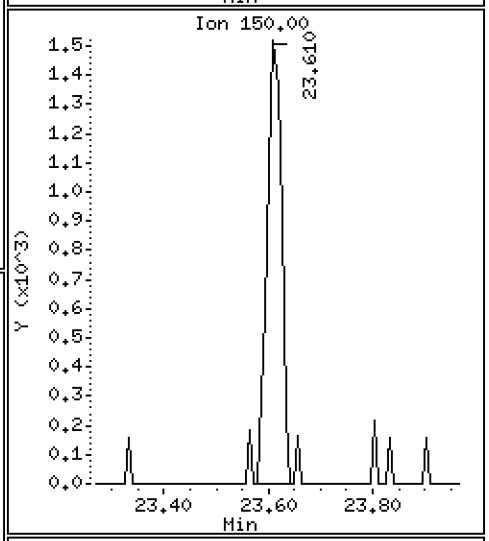
73 Di-n-octylphthalate

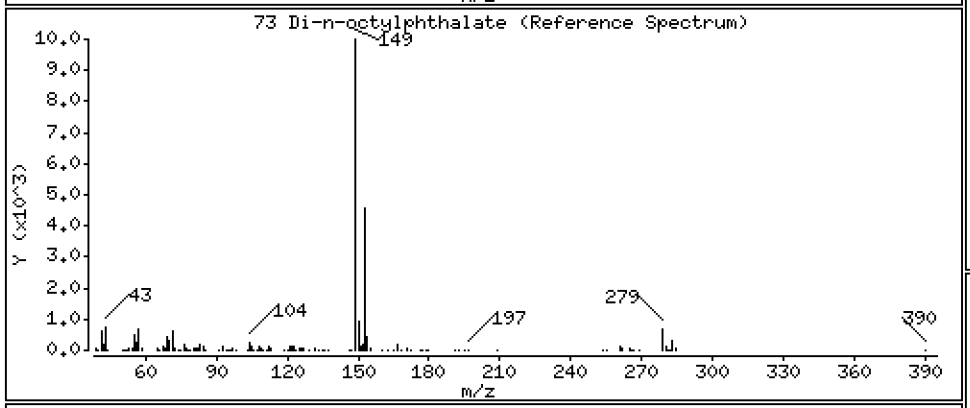
Concentration: 0.1544 ug/mL

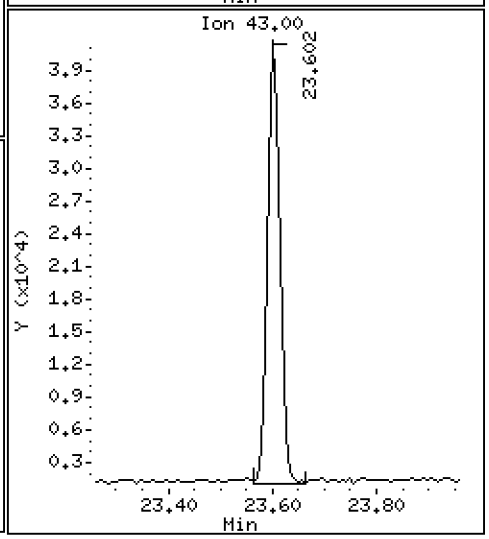


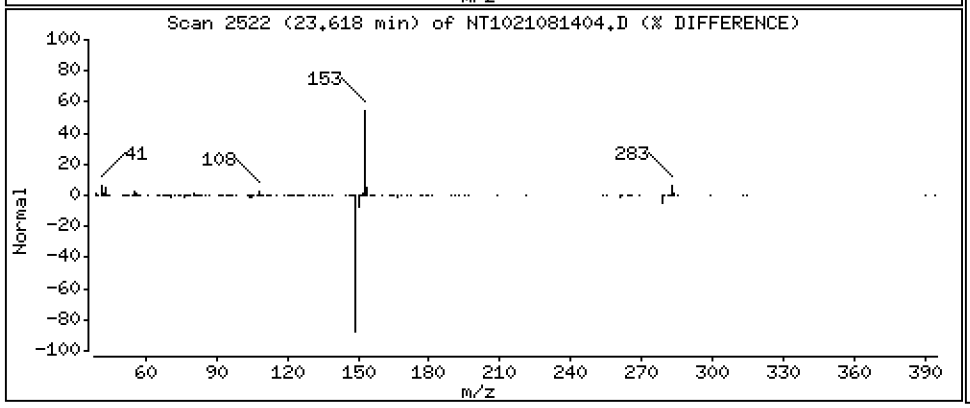












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

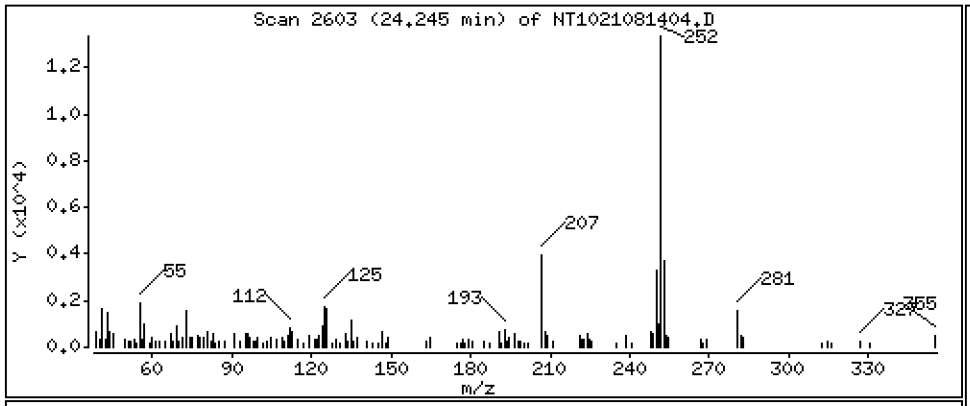
Operator: VTS

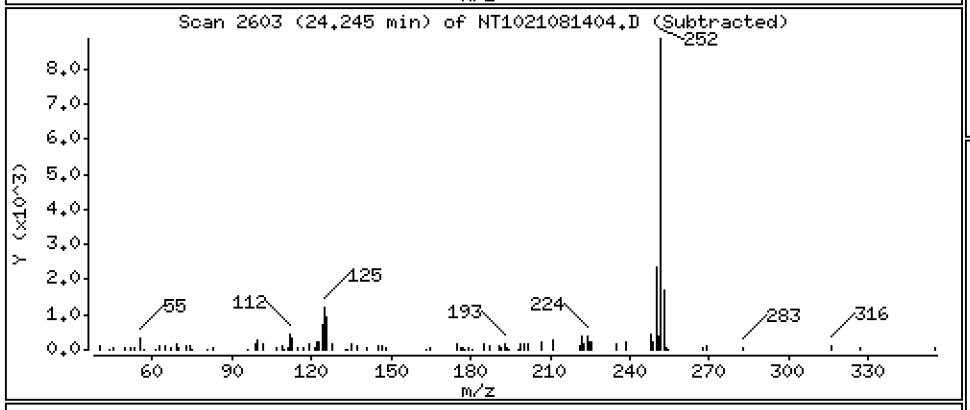
Column phase: ZB-5msi

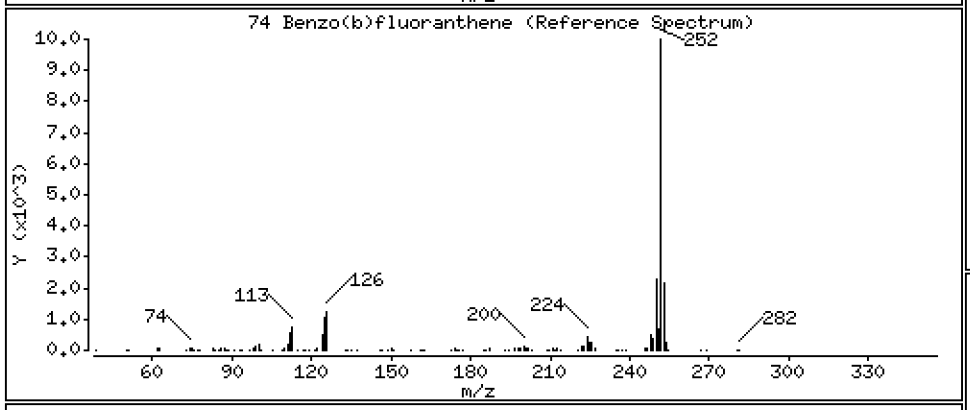
Column diameter: 0.25

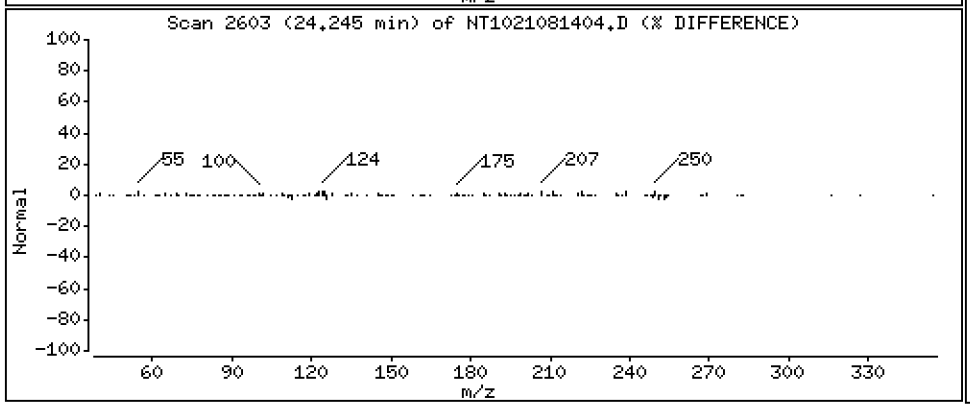
74 Benzo(b)fluoranthene

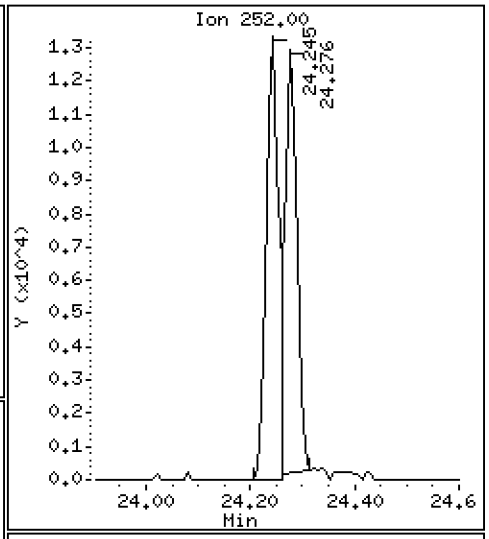
Concentration: 0.1911 ug/mL

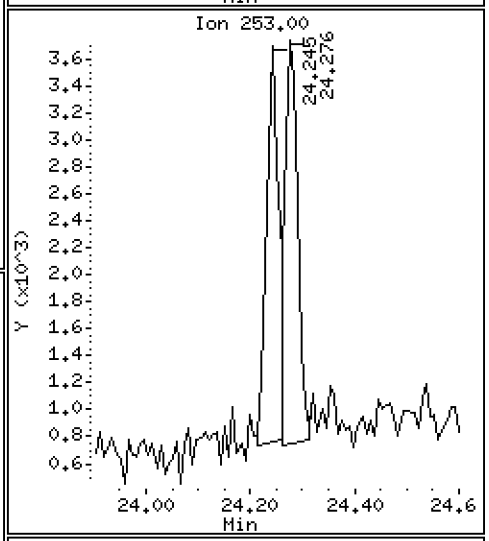


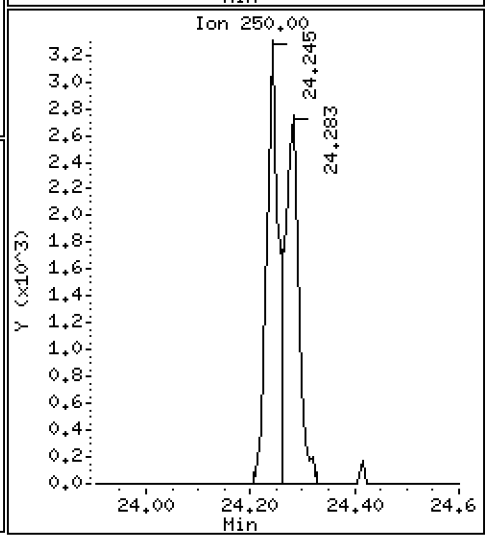












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

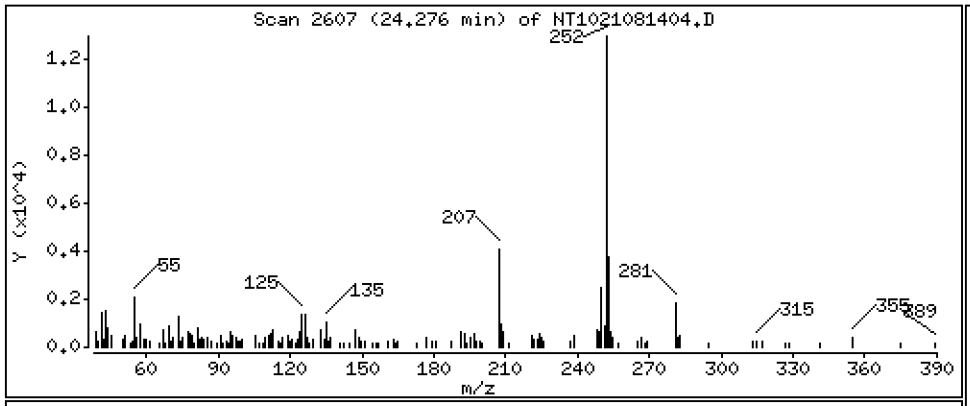
Operator: VTS

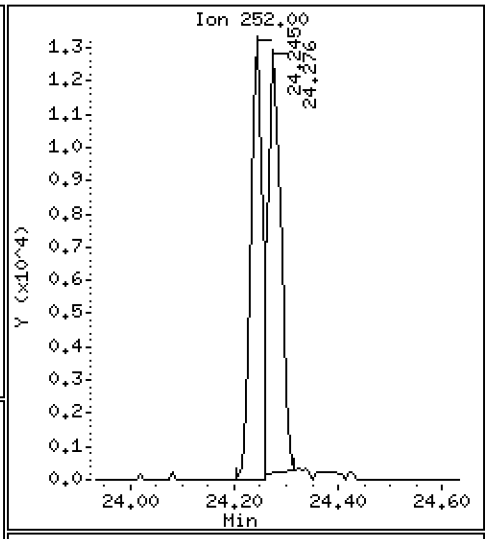
Column phase: ZB-5msi

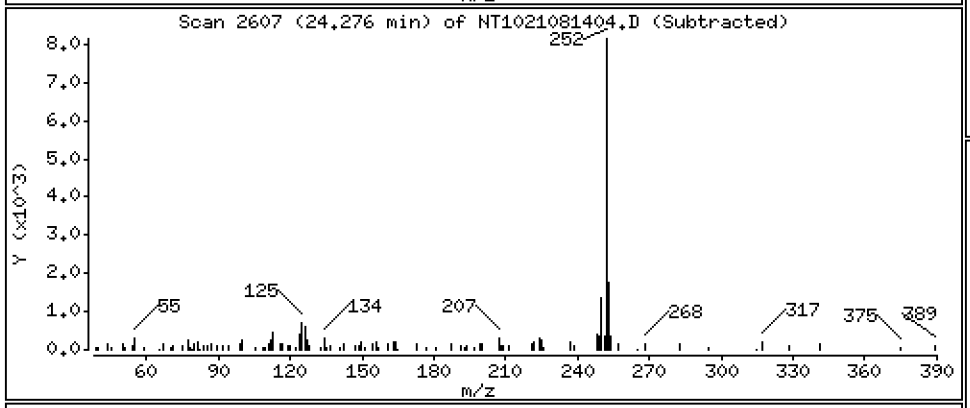
Column diameter: 0.25

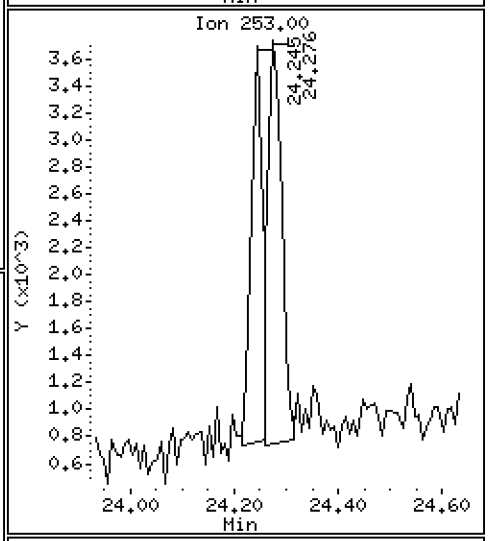
75 Benzo(k)fluoranthene

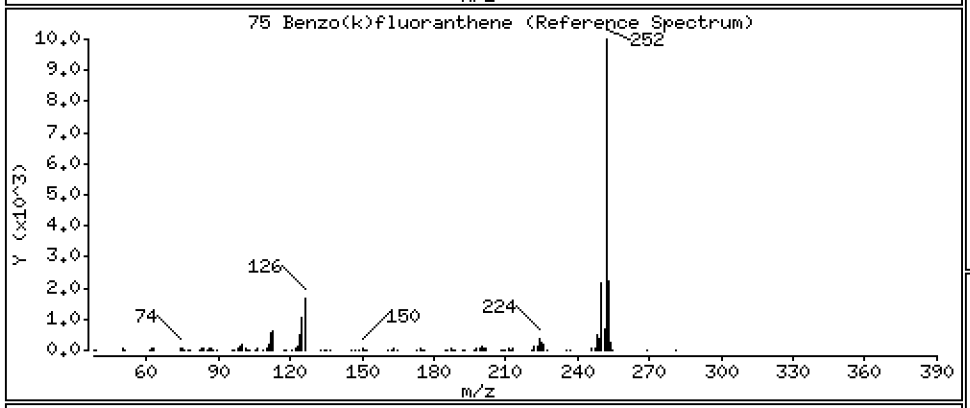
Concentration: 0.1925 ug/mL

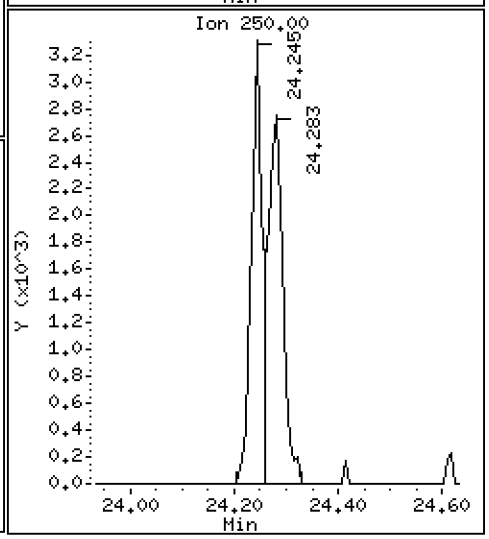


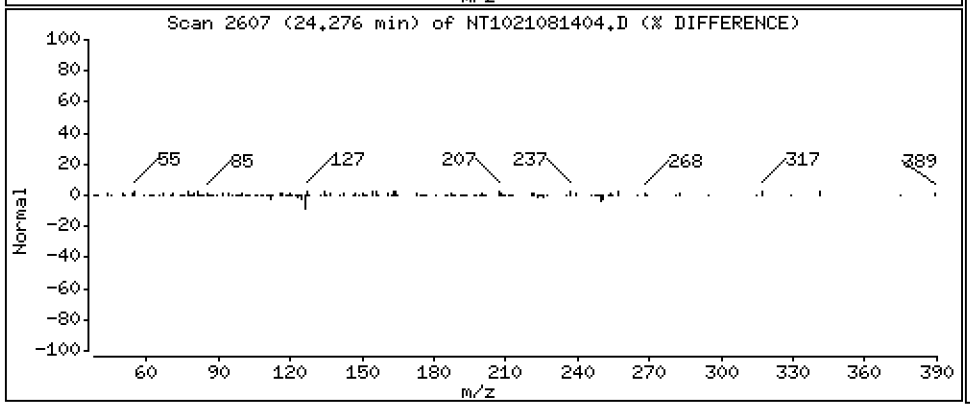












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

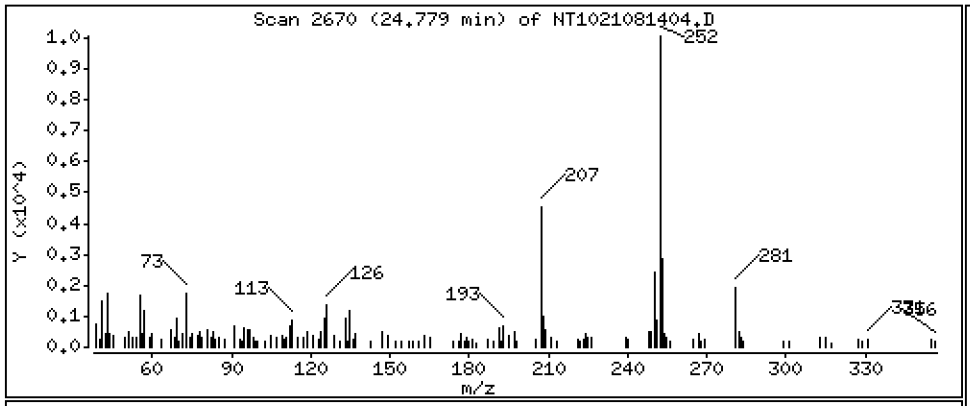
Operator: VTS

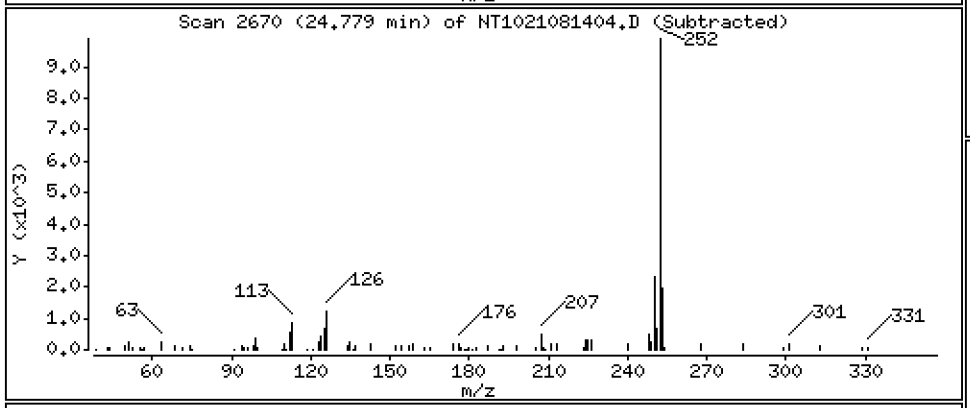
Column phase: ZB-5msi

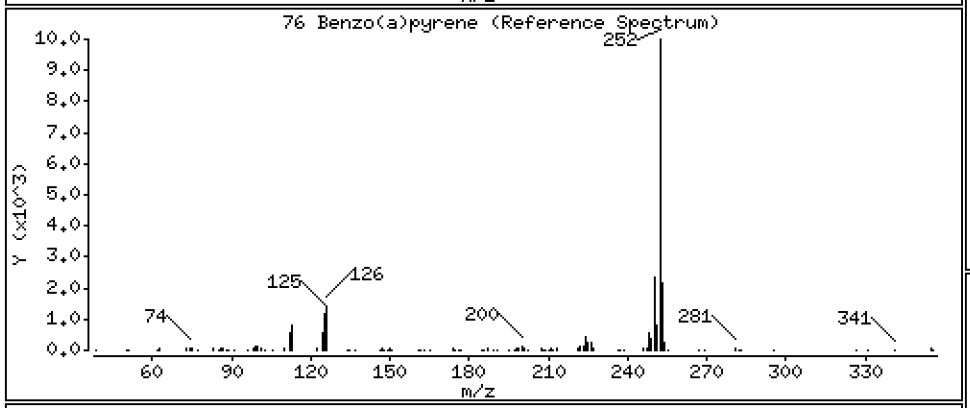
Column diameter: 0.25

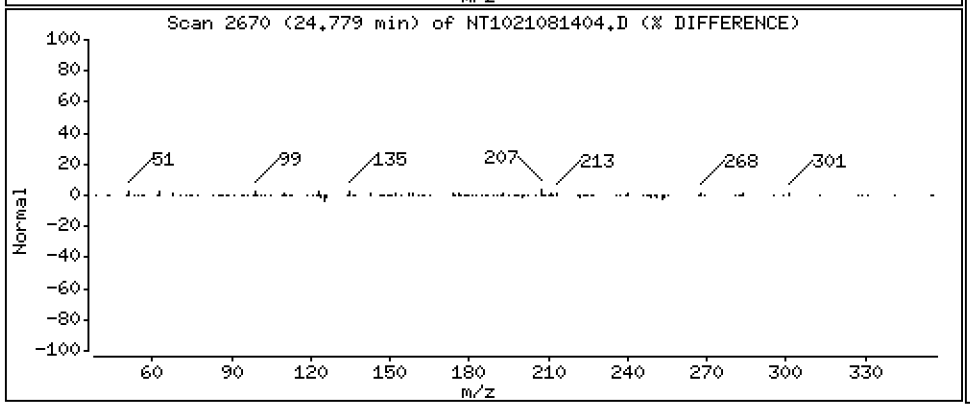
76 Benzo(a)pyrene

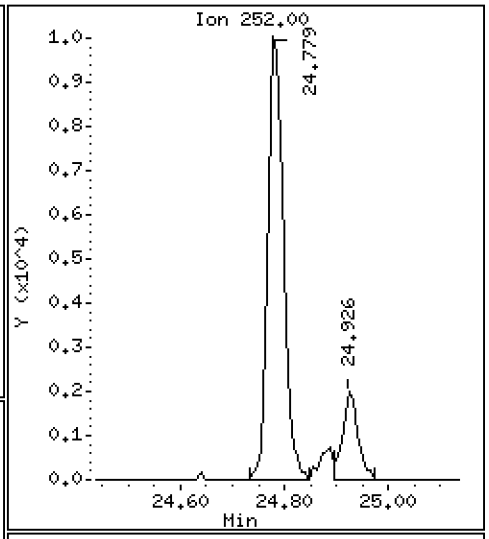
Concentration: 0.1912 ug/mL

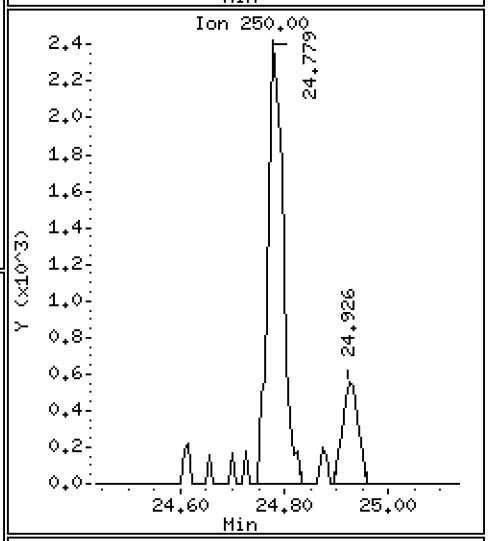


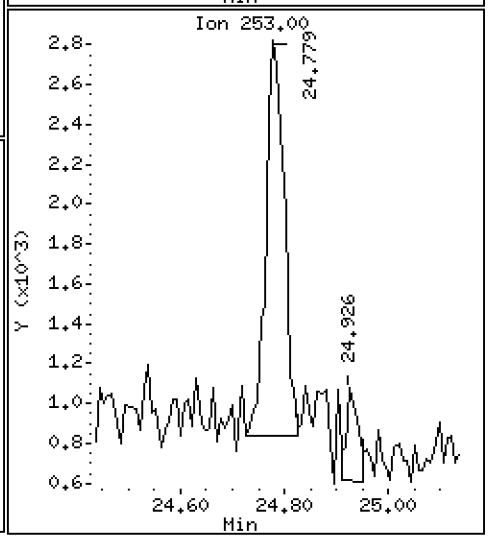












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

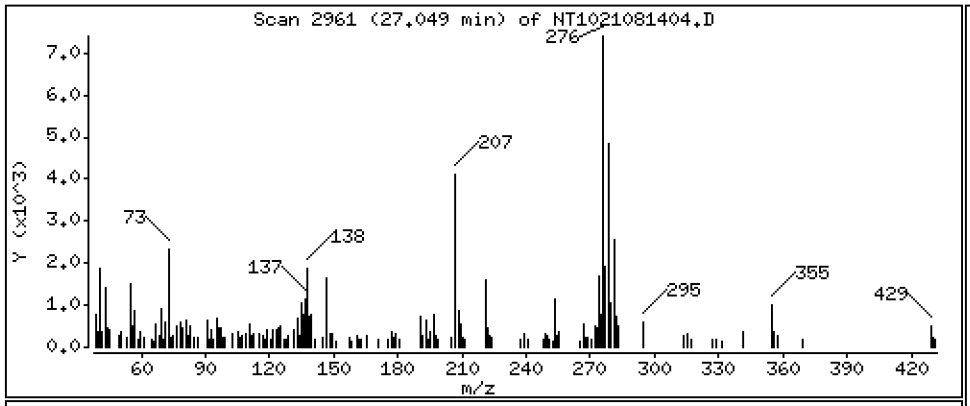
Operator: VTS

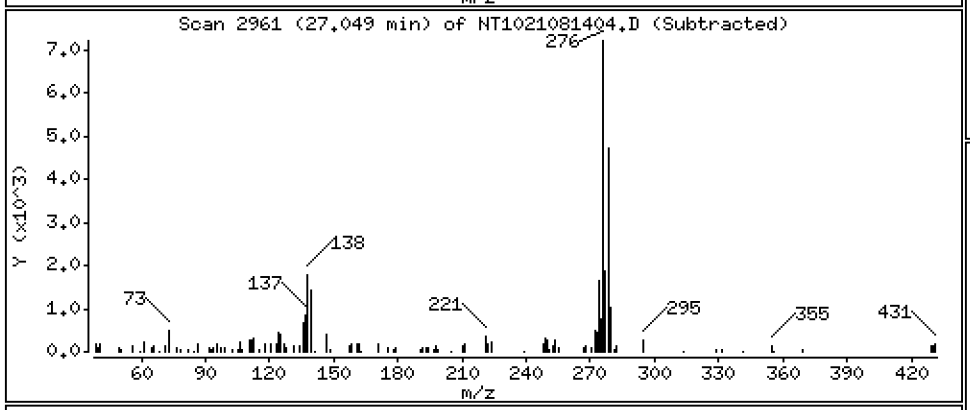
Column phase: ZB-5msi

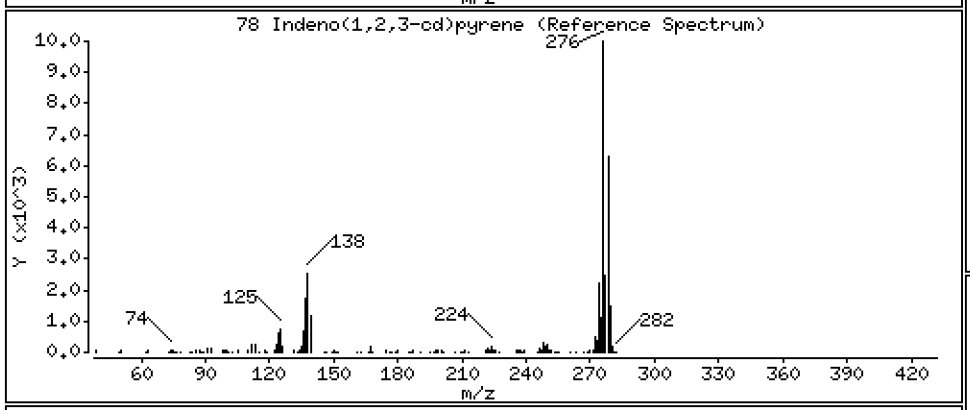
Column diameter: 0.25

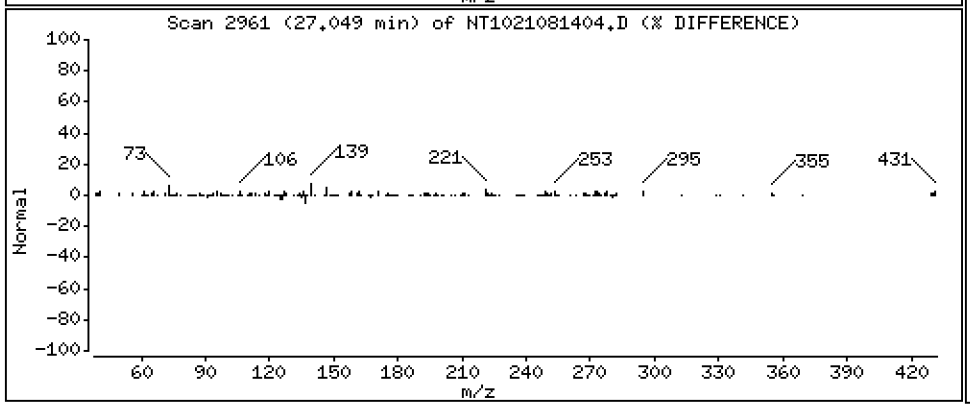
78 Indeno(1,2,3-cd)pyrene

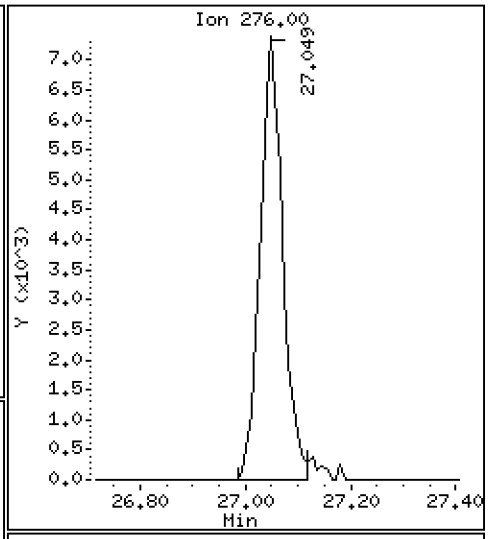
Concentration: 0.1829 ug/mL

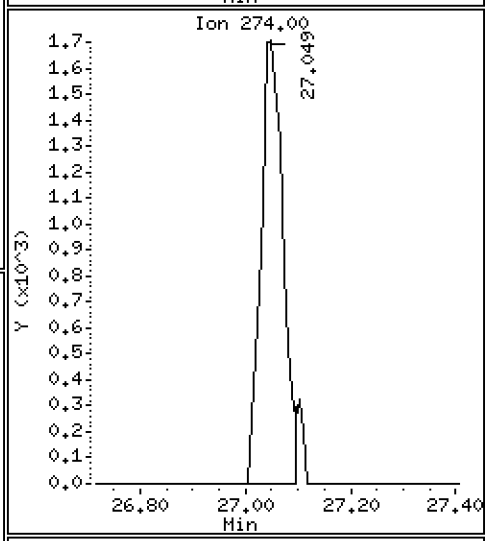


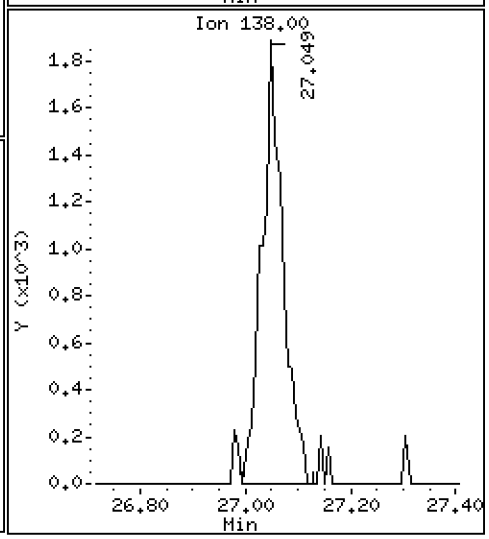












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

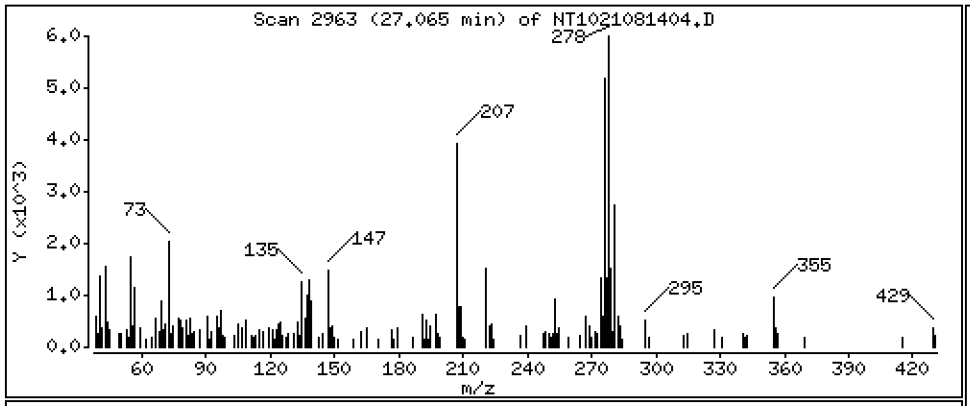
Operator: VTS

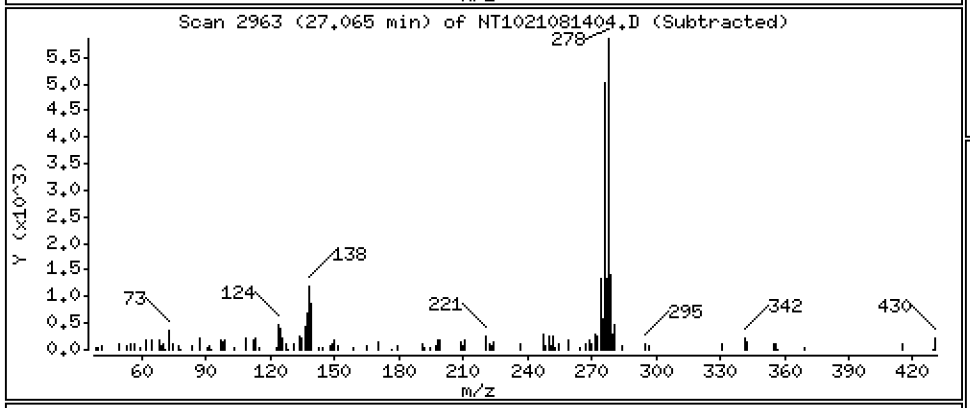
Column phase: ZB-5msi

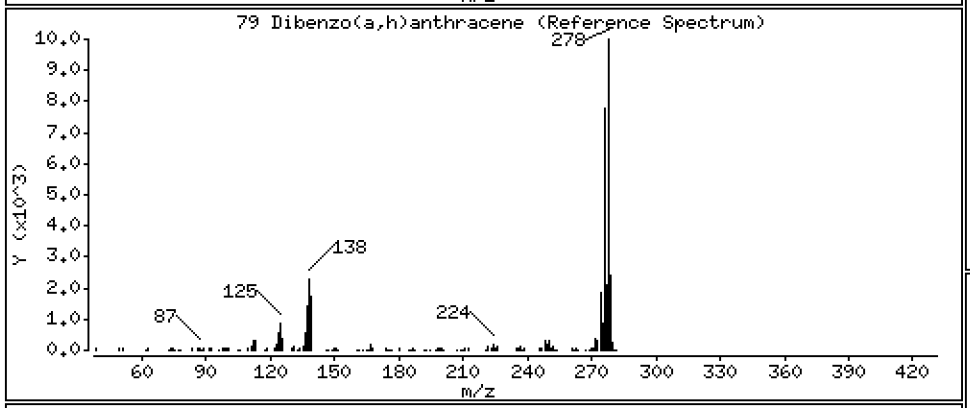
Column diameter: 0.25

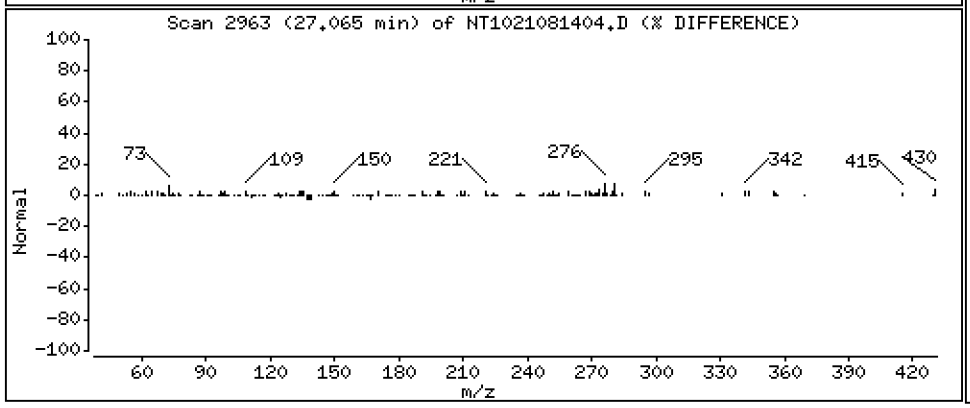
79 Dibenzo(a,h)anthracene

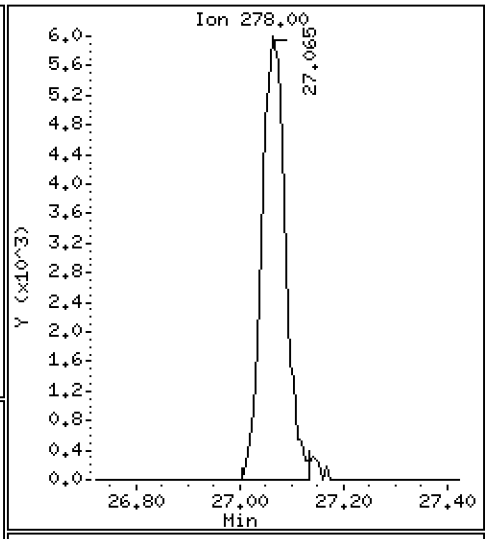
Concentration: 0.1995 ug/mL

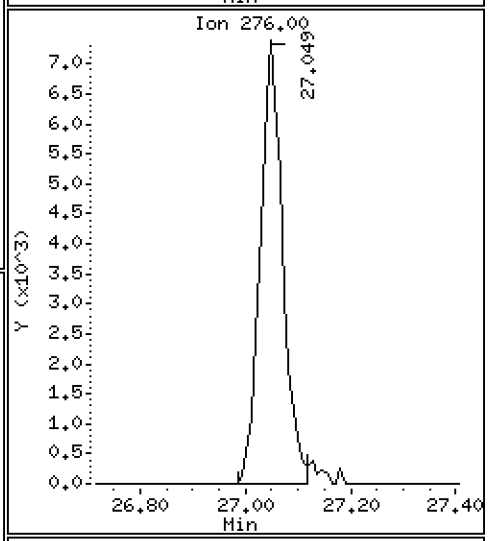


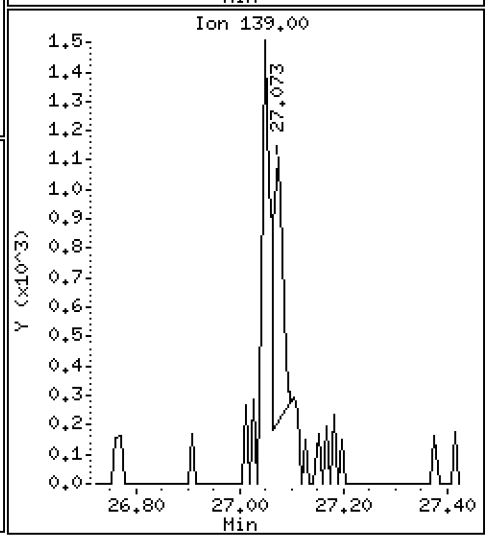












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

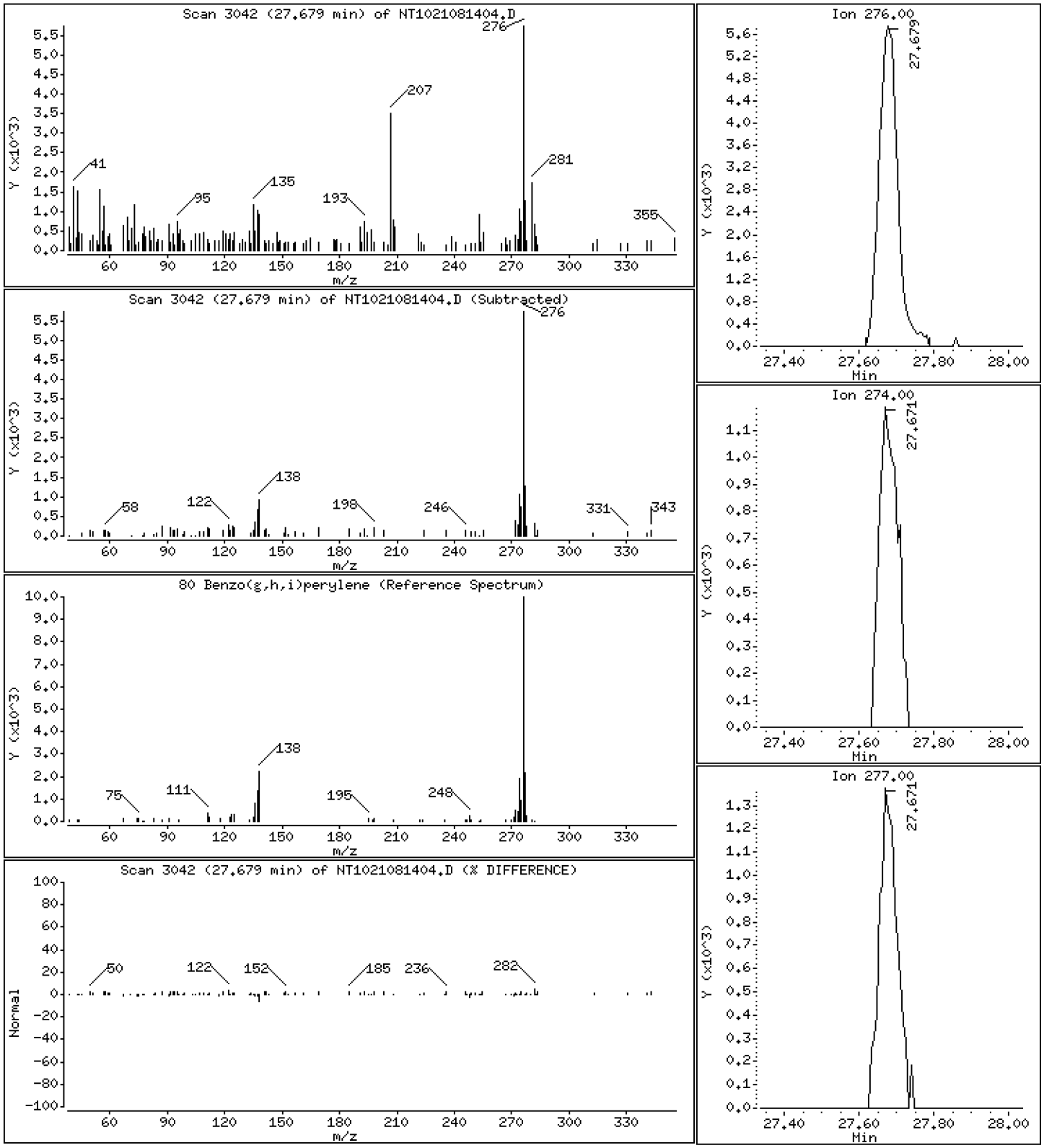
Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25

80 Benzo(g,h,i)perylene

Concentration: 0.1837 ug/mL



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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

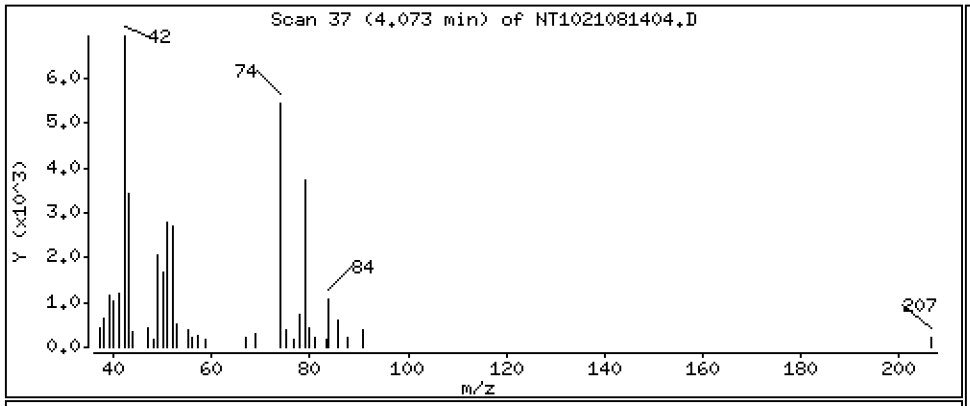
Operator: VTS

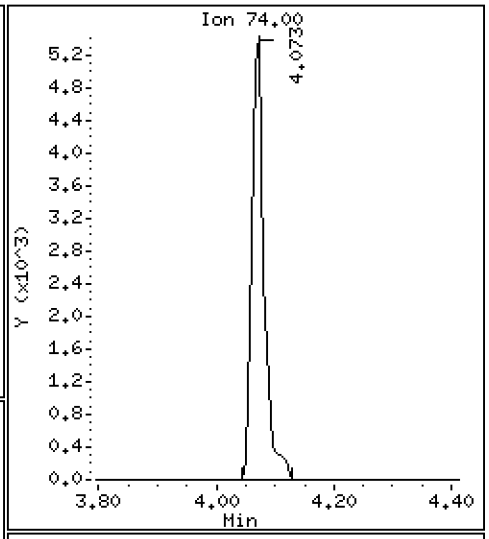
Column phase: ZB-5msi

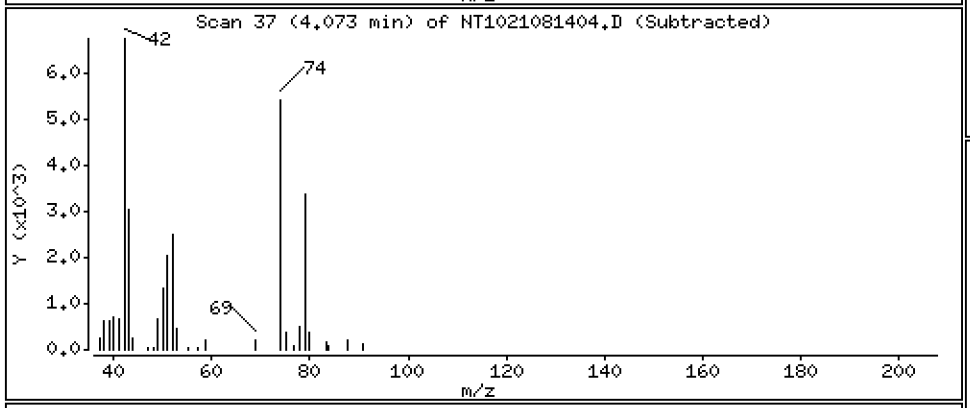
Column diameter: 0.25

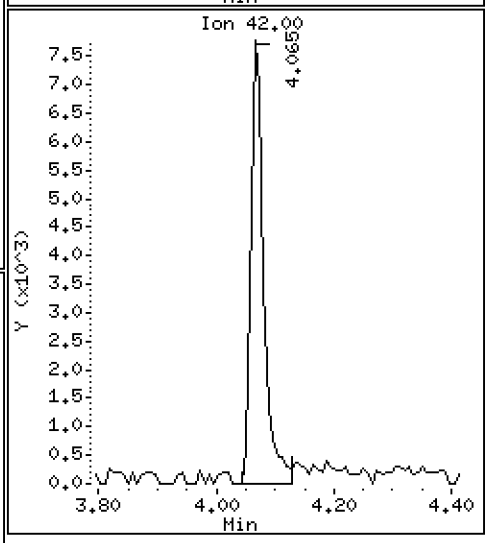
90 N-Nitrosodimethylamine

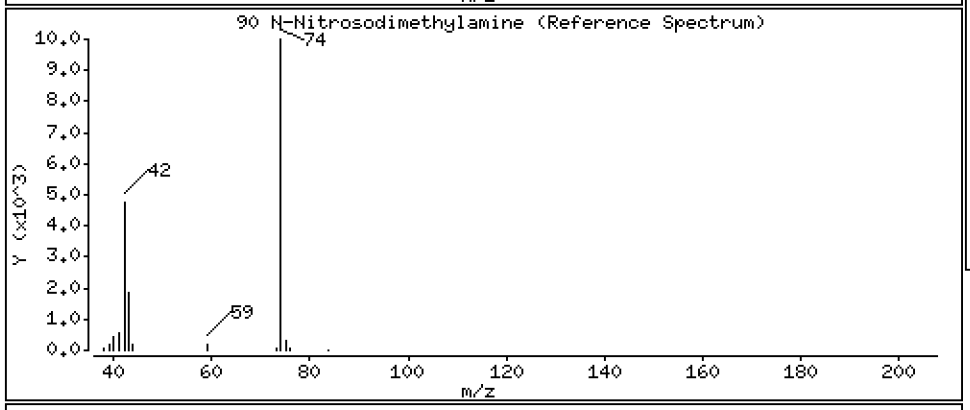
Concentration: 0.2230 ug/mL

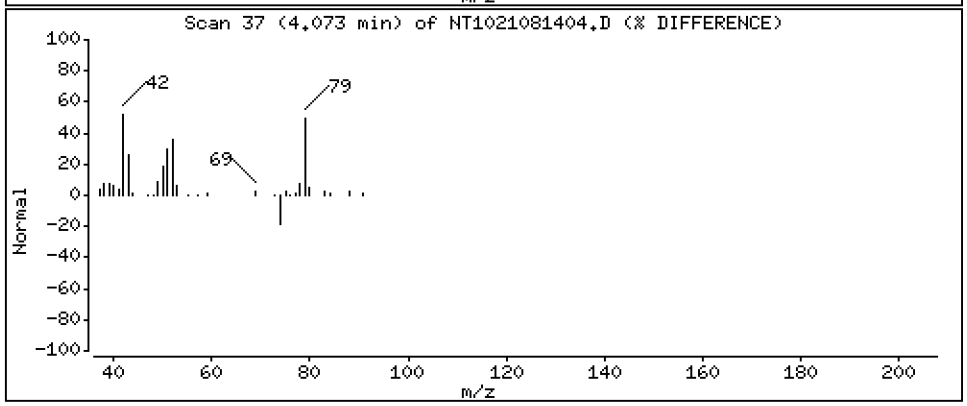












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

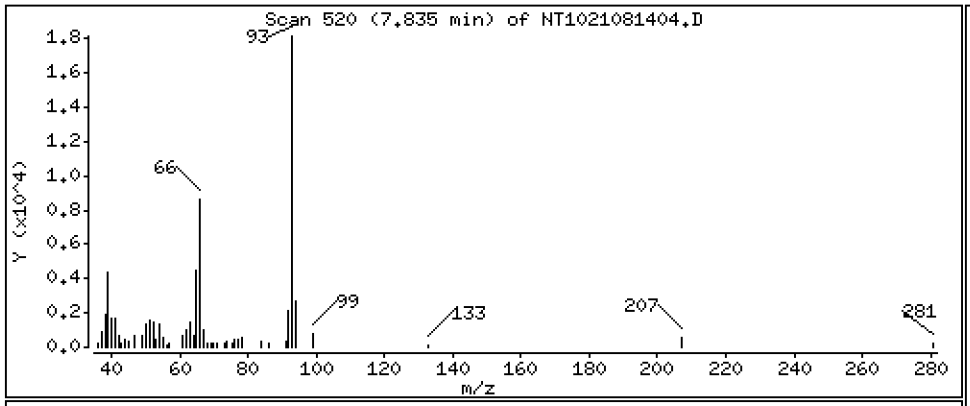
Operator: VTS

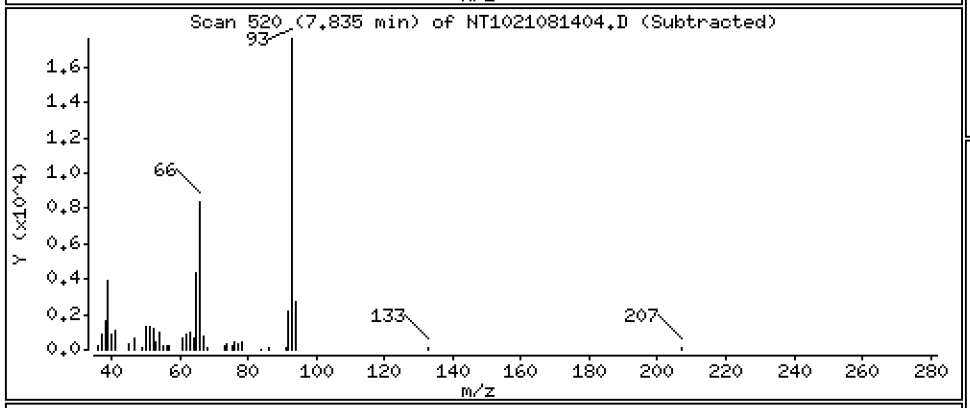
Column phase: ZB-5msi

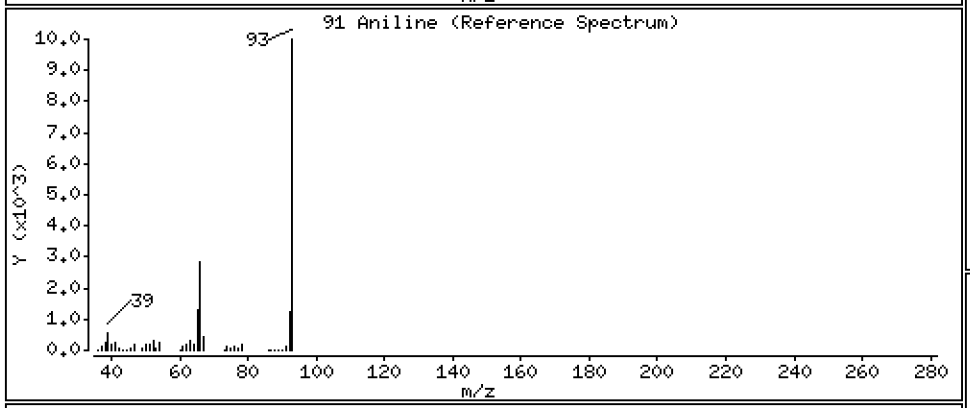
Column diameter: 0.25

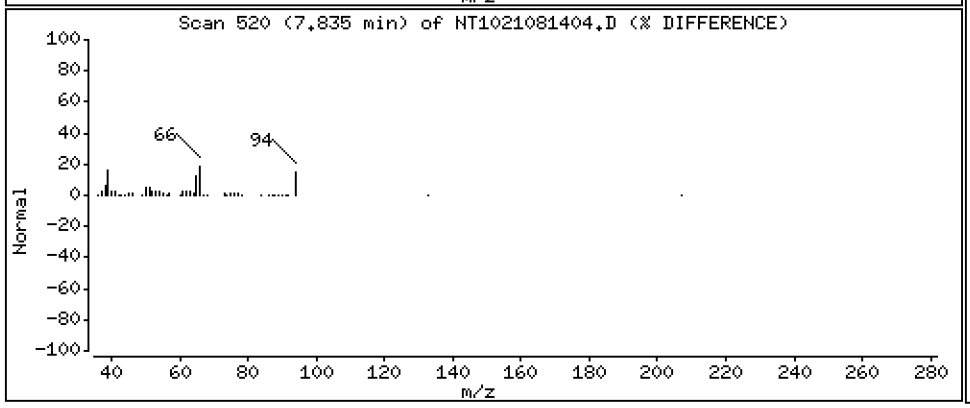
91 Aniline

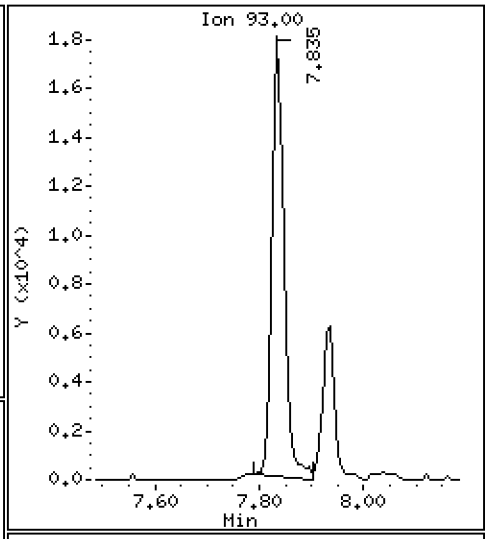
Concentration: 0.3796 ug/mL

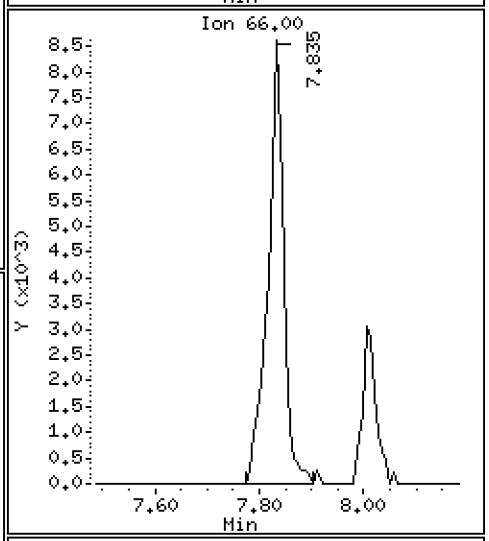


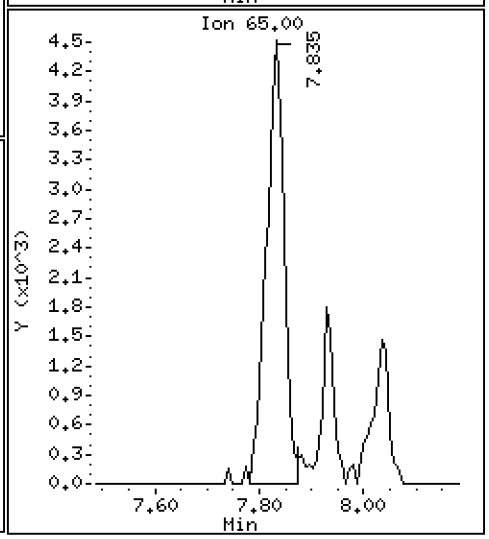












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

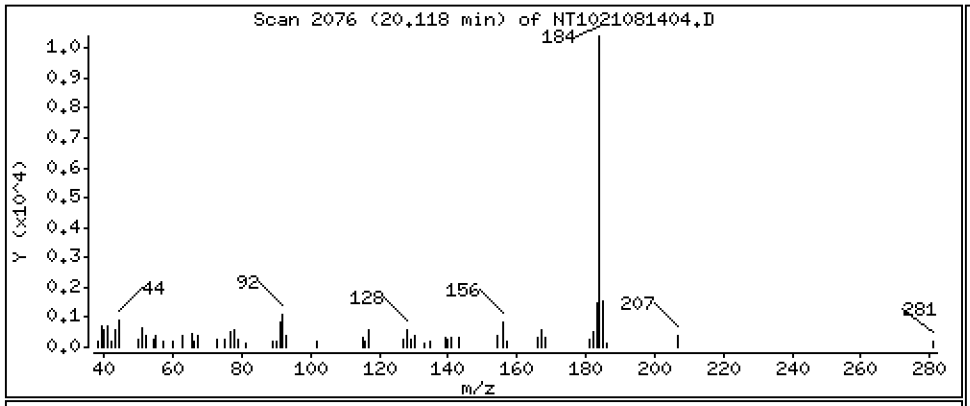
Operator: VTS

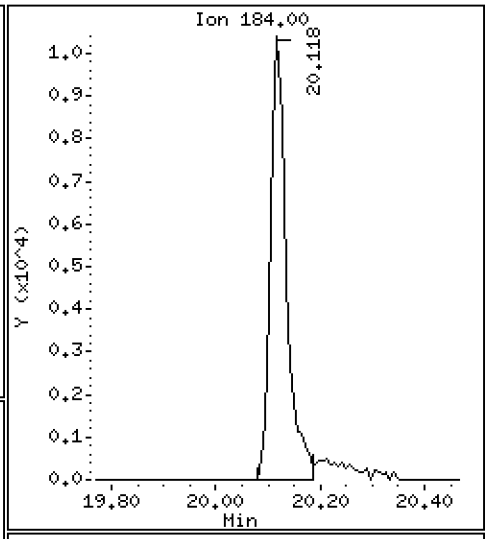
Column phase: ZB-5msi

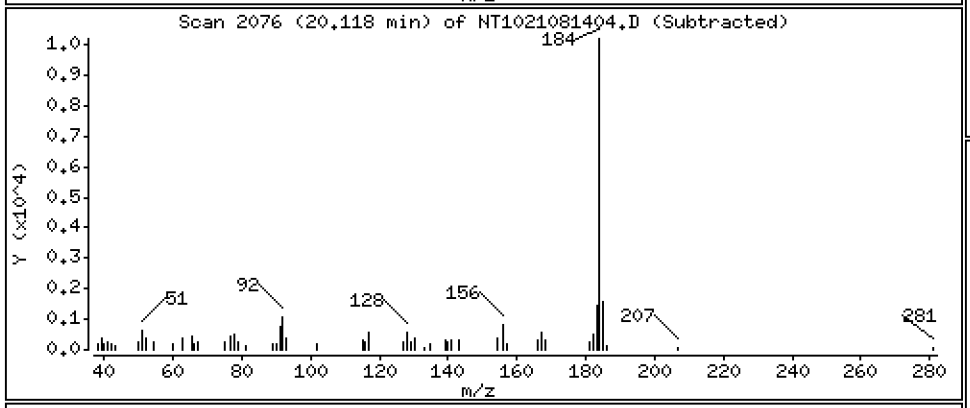
Column diameter: 0.25

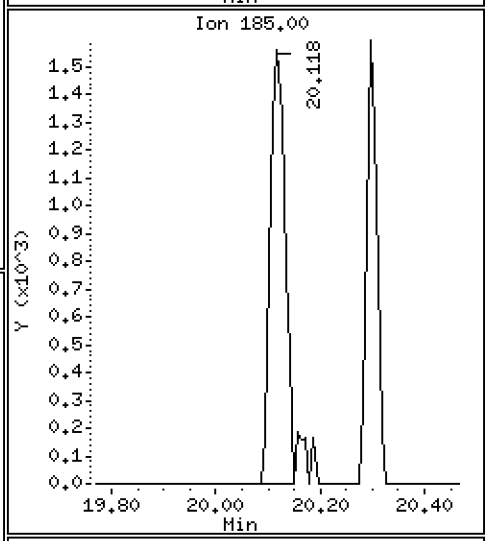
93 Benzidine

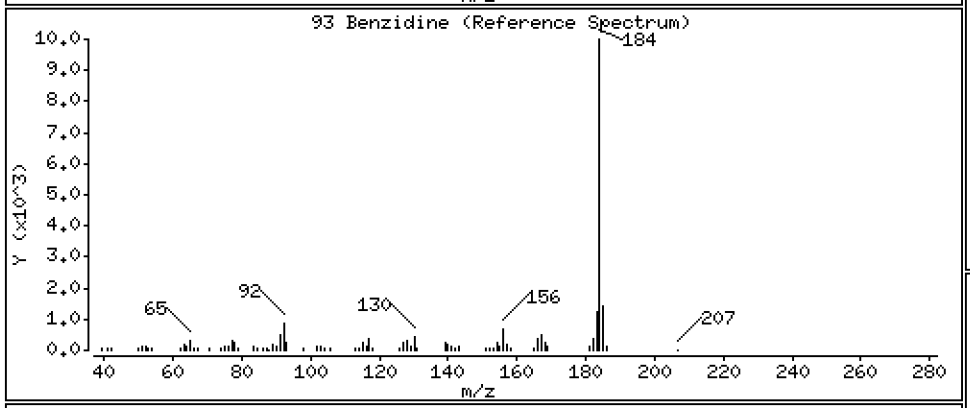
Concentration: 0.2950 ug/mL

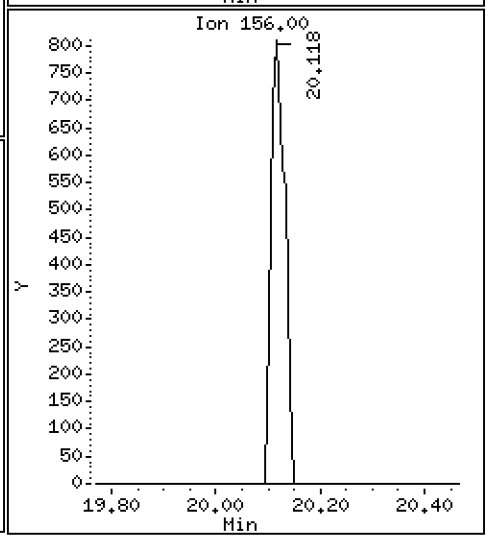


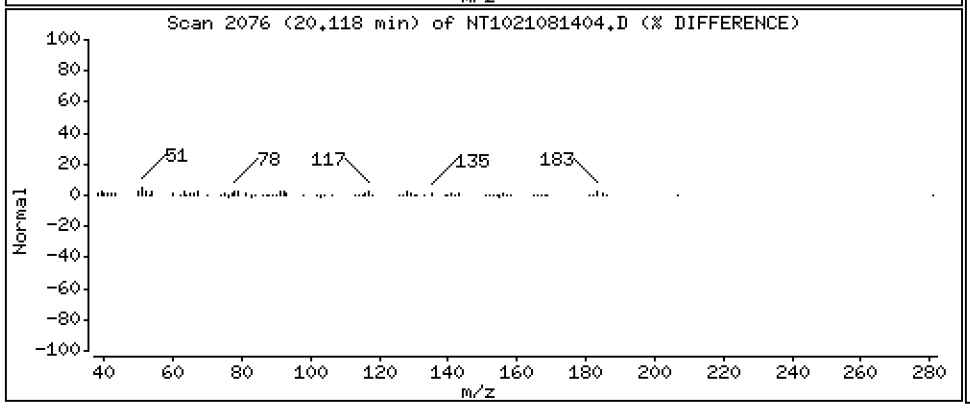












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

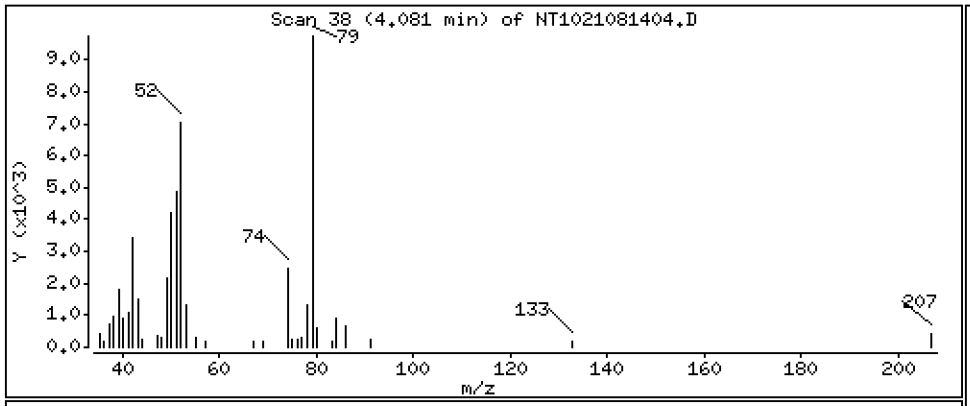
Operator: VTS

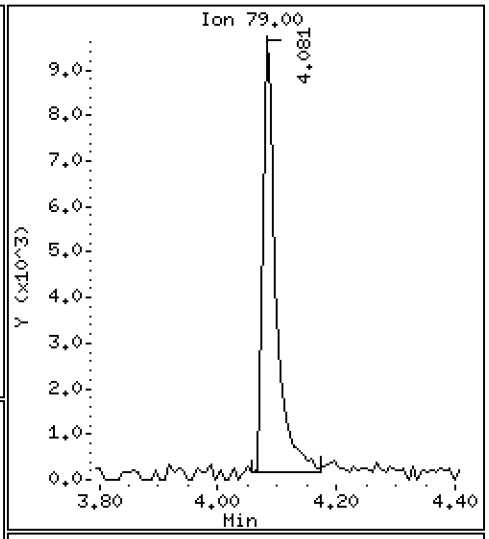
Column phase: ZB-5msi

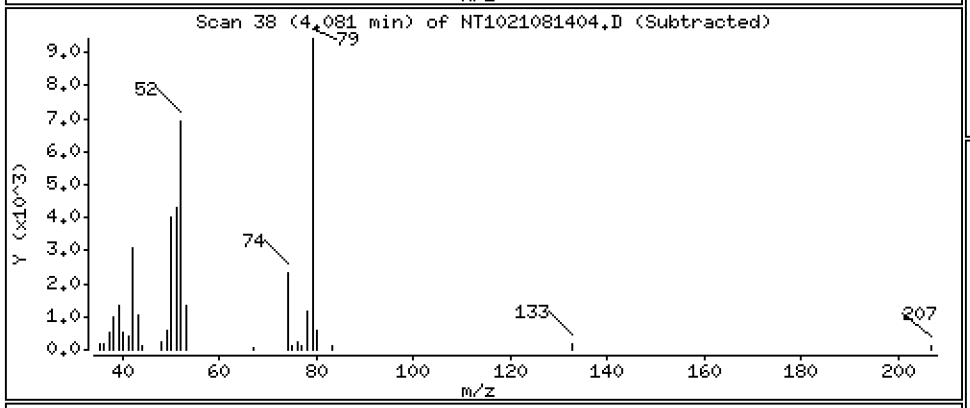
Column diameter: 0.25

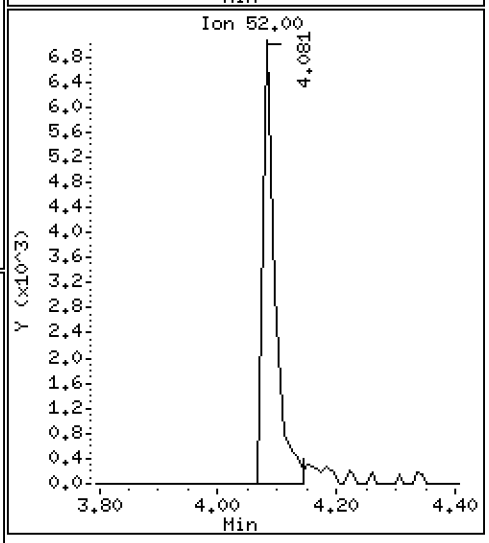
103 Pyridine

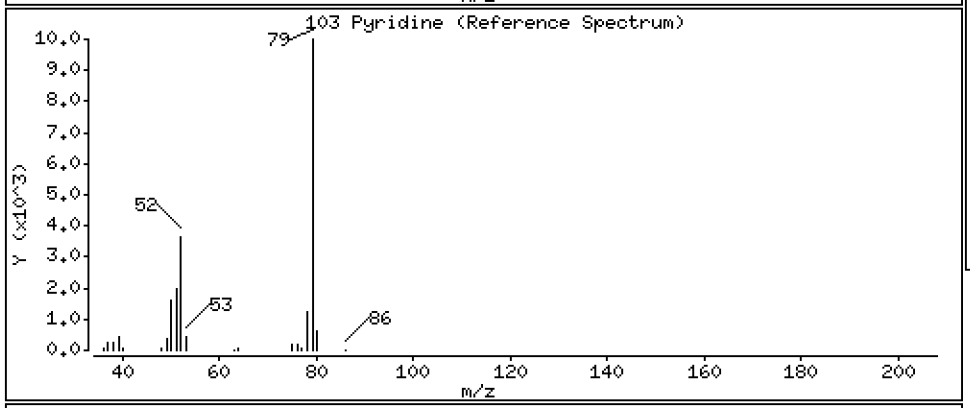
Concentration: 0.2605 ug/mL

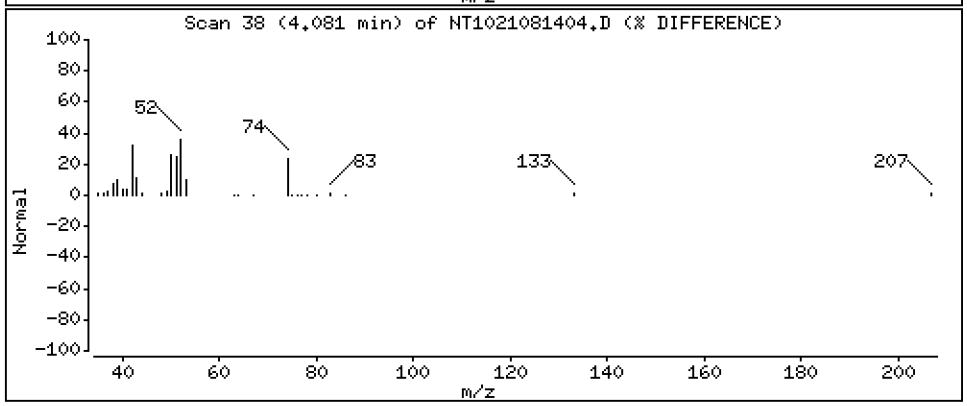












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

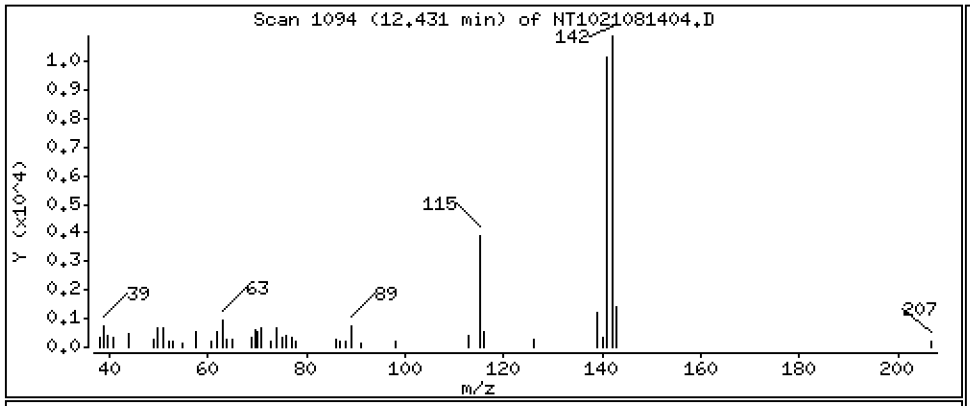
Operator: VTS

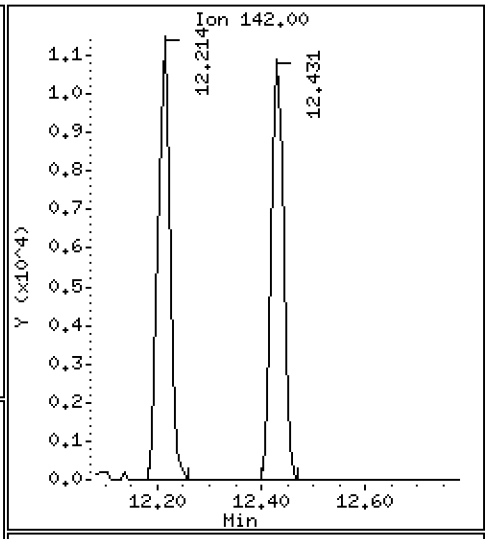
Column phase: ZB-5msi

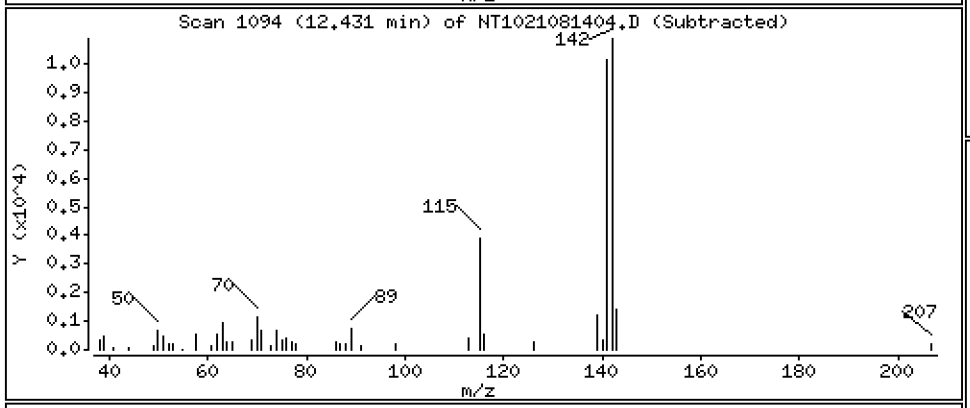
Column diameter: 0.25

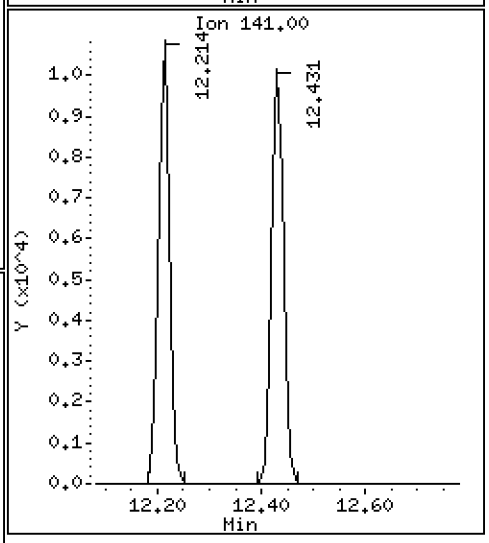
105 1-methylnaphthalene

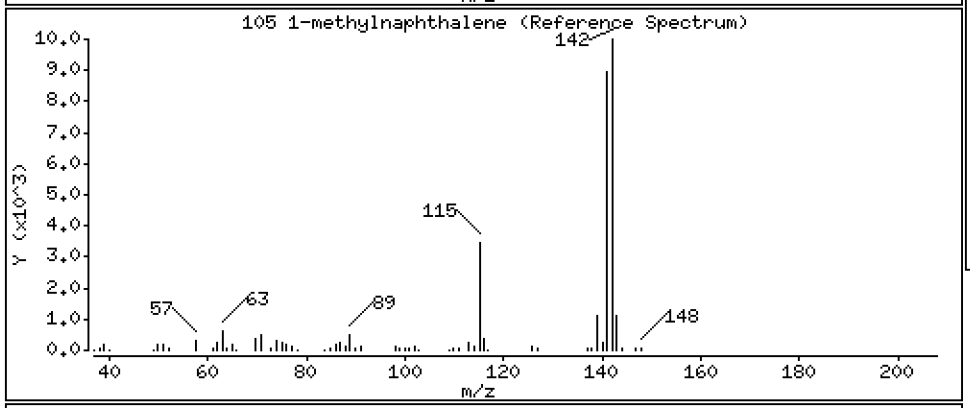
Concentration: 0.1621 ug/mL

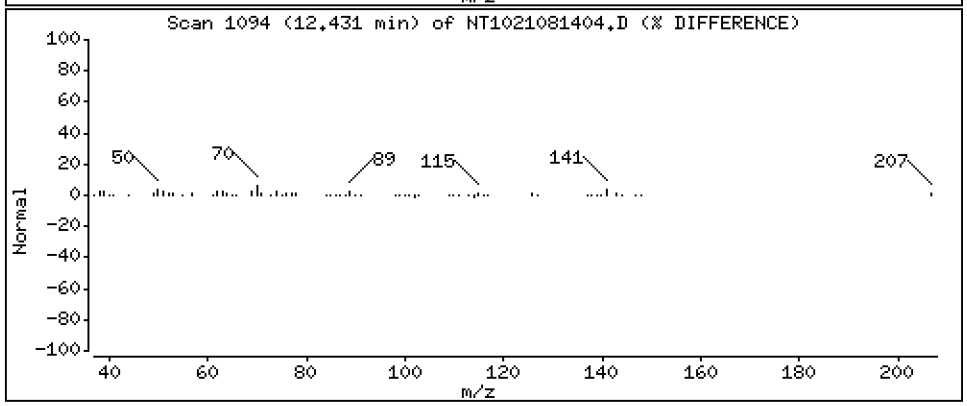












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

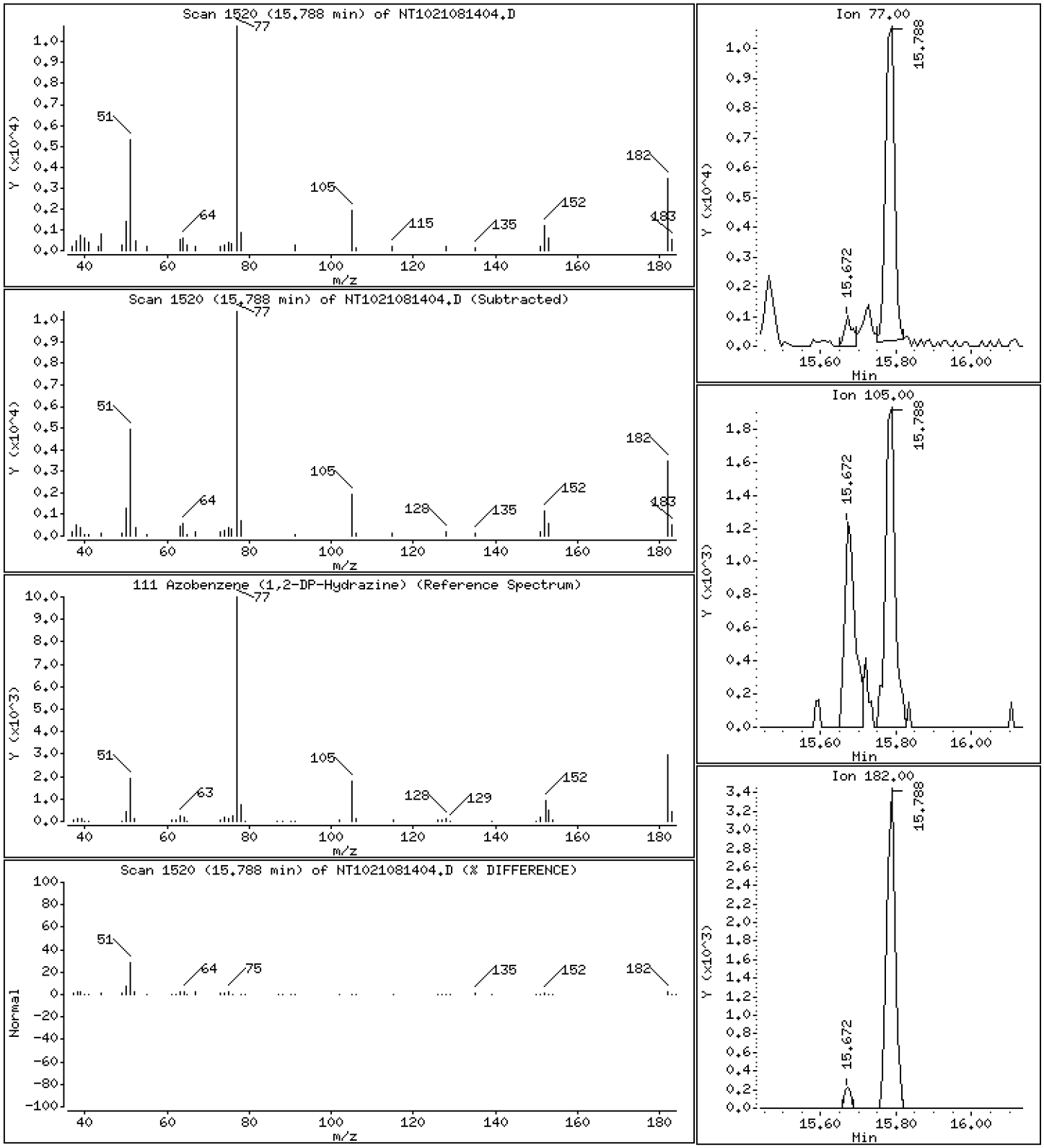
Operator: VTS

Column phase: ZB-5msi

Column diameter: 0.25

111 Azobenzene (1,2-DP-Hydrazine)

Concentration: 0.1568 ug/mL



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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

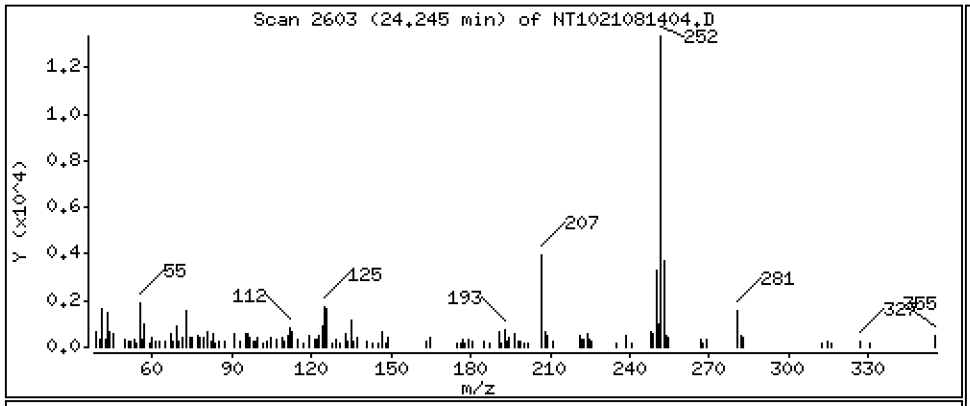
Operator: VTS

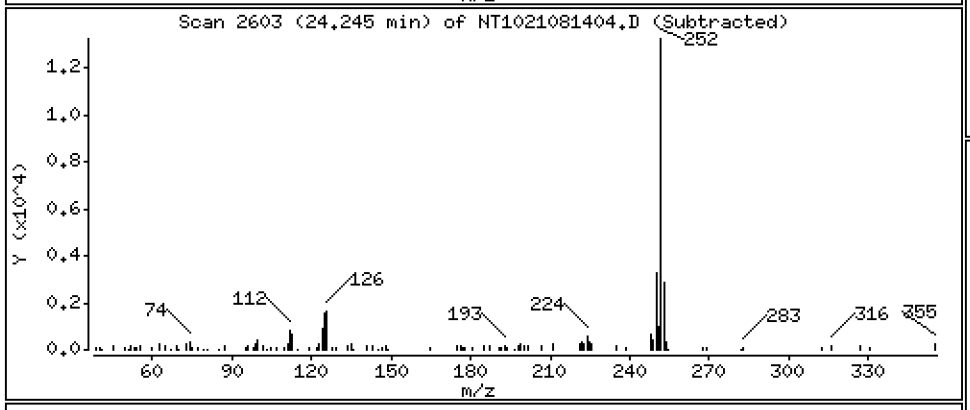
Column phase: ZB-5msi

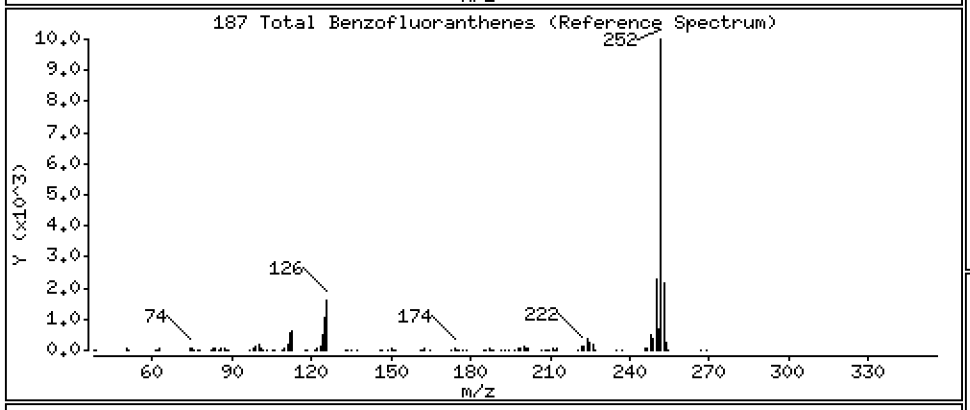
Column diameter: 0.25

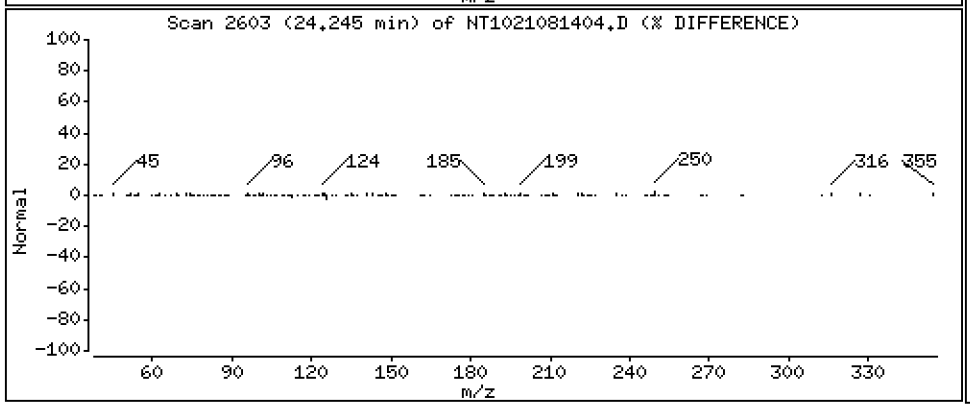
187 Total Benzofluoranthenes

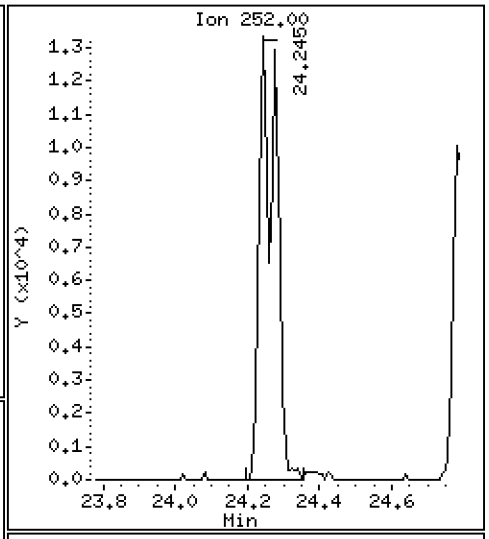
Concentration: 0.3829 ug/mL

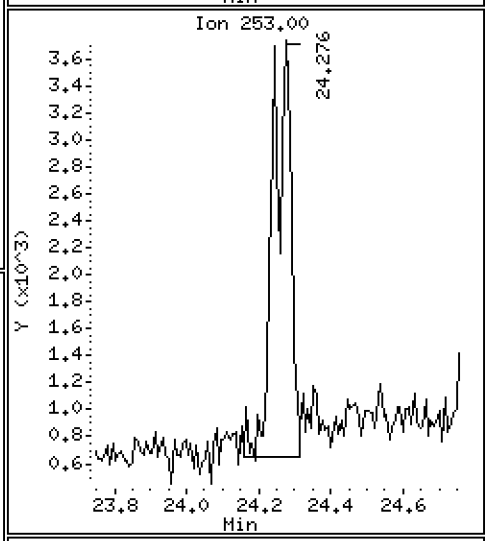


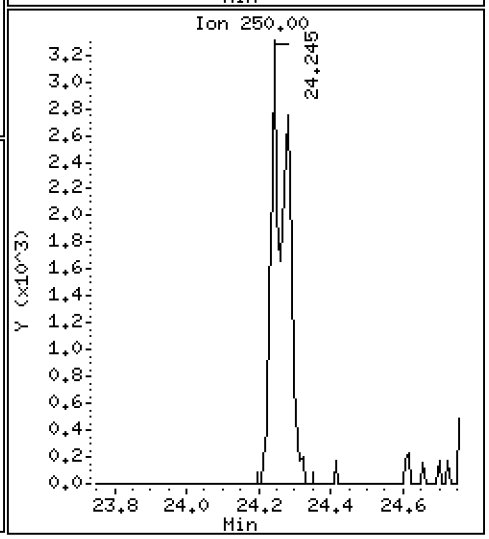












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Date : 14-AUG-2021 11:09

Client ID:

Instrument: nt10.i

Sample Info: SJH0174-LCV2

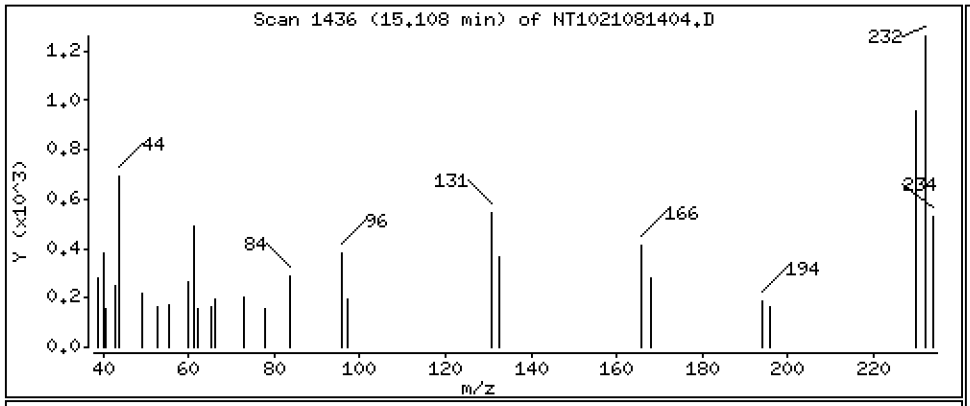
Operator: VTS

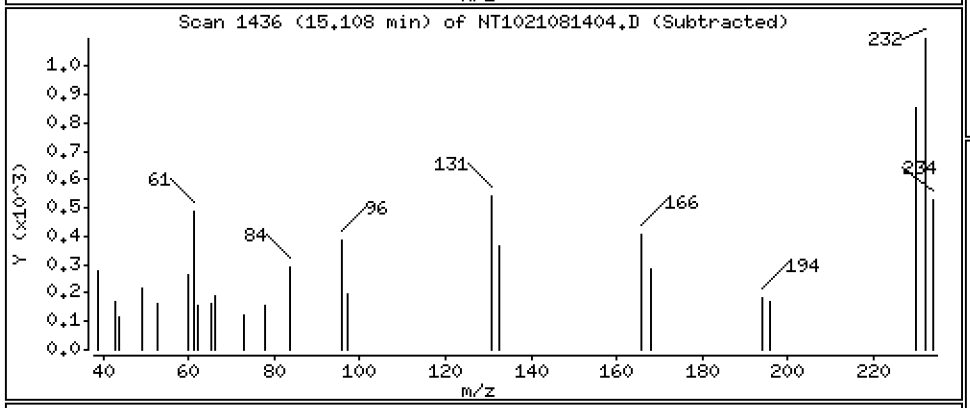
Column phase: ZB-5msi

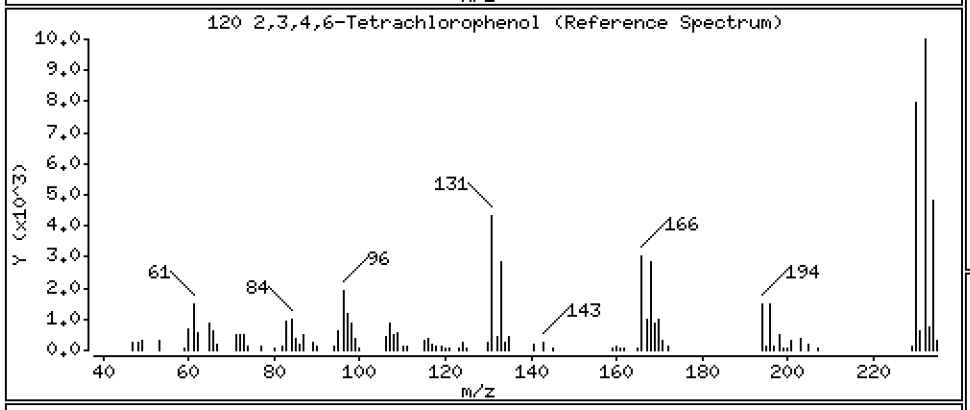
Column diameter: 0.25

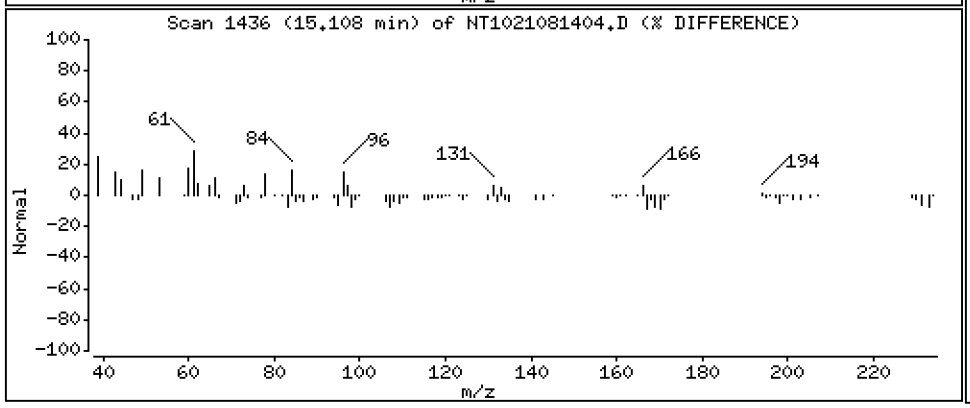
120 2,3,4,6-Tetrachlorophenol

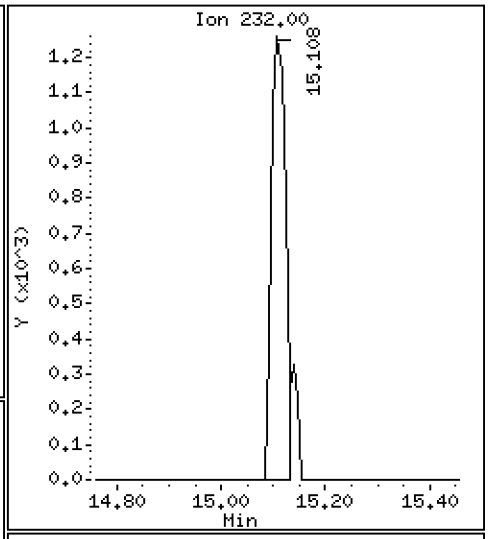
Concentration: 0.09274 ug/mL

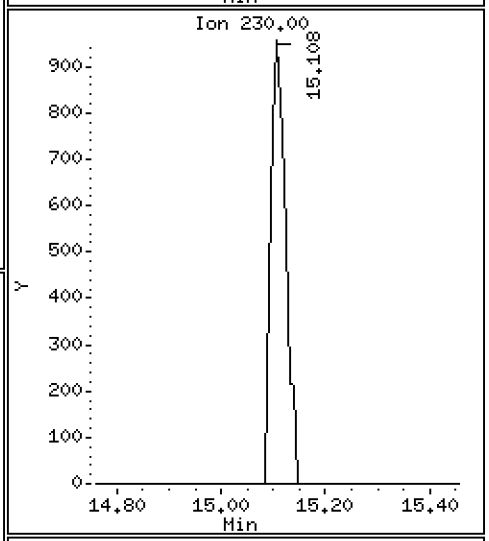


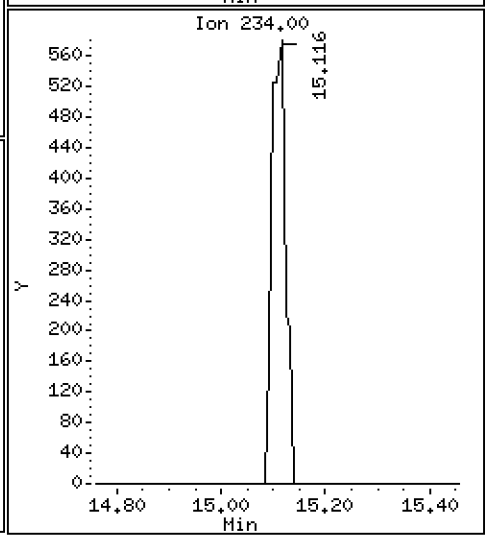












ARI Labs, Inc.

Semivolatile Report SW846 Method 8270D

Data file : \\target\share\chem3\nt10.i\20210814.b\NT1021081404.D
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Inj Date : 14-AUG-2021 11:09
Operator : VTS Inst ID: nt10.i
Smp Info : SJH0174-LCV2
Misc Info :
Comment : 1ul Injection
Method : \\target\share\chem3\nt10.i\20210814.b\ABN.m
Meth Date : 16-Aug-2021 09:23 yev Quant Type: ISTD
Cal Date : 20-JUL-2021 17:30 Cal File: NT1021072010.D
Als bottle: 4
Dil Factor: 1.00000
Integrator: HP RTE Compound Sublist: ICAL.sub
Target Version: 4.14
Processing Host: ORGDATA102

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
$	1 2-Fluorophenol	112	6.211	6.204	(0.744)	14993	0.28218	0.2822
$	2 Phenol-d5	99	7.796	7.788	(0.933)	19481	0.24703	0.2470
	3 Phenol	94	7.811	7.811	(0.935)	13949	0.20235	0.2023
$	5 2-Chlorophenol-d4	132	8.004	8.004	(0.958)	16481	0.29642	0.2964
	4 Bis(2-Chloroethyl)ether	93	7.935	7.935	(0.950)	9997	0.18157	0.1816
	6 2-Chlorophenol	128	8.035	8.035	(0.962)	11932	0.22868	0.2287
	7 1,3-Dichlorobenzene	146	8.283	8.283	(0.992)	11020	0.19226	0.1923
*	8 1,4-Dichlorobenzene-d4	152	8.353	8.353	(1.000)	135011	4.00000	
	9 1,4-Dichlorobenzene	146	8.384	8.384	(1.004)	8402	0.17168	0.1717
$	10 1,2-Dichlorobenzene-d4	152	8.702	8.702	(1.042)	7355	0.20568	0.2057
	12 1,2-Dichlorobenzene	146	8.725	8.726	(1.045)	9420	0.18197	0.1820
	11 Benzyl alcohol	108	8.725	8.648	(1.045)	1941	0.06014	0.06014
	14 2,2'-oxybis(1-Chloropropane)	121	8.935	8.935	(1.070)	2018	0.10161	0.1016
	13 2-Methylphenol	108	8.896	8.896	(1.065)	8580	0.19996	0.2000
	17 Hexachloroethane	117	9.300	9.300	(1.113)	3428	0.16295	0.1630
	16 N-Nitroso-di-n-propylamine	70	9.183	9.191	(1.099)	5873	0.15866	0.1587
	15 4-Methylphenol	108	9.168	9.160	(1.098)	7324	0.15906	0.1591
$	18 Nitrobenzene-d5	82	9.439	9.440	(0.875)	9866	0.17806	0.1781
	19 Nitrobenzene	77	9.471	9.471	(0.878)	9283	0.16957	0.1696
	20 Isophorone	82	9.913	9.913	(0.919)	10854	0.10506	0.1051
	21 2-Nitrophenol	139	10.091	10.091	(0.935)	4379	0.15378	0.1538
	22 2,4-Dimethylphenol	107	10.184	10.184	(0.944)	16161	0.37630	0.3763
	23 Bis(2-Chloroethoxy)methane	93	10.362	10.363	(0.960)	8653	0.16136	0.1614
	24 Benzoic acid	105	10.320	10.430	(0.956)	8364	0.35149	0.3515(M)
	25 2,4-Dichlorophenol	162	10.558	10.549	(0.978)	12041	0.33837	0.3384
	26 1,2,4-Trichlorobenzene	180	10.713	10.714	(0.993)	9181	0.22819	0.2282
*	27 Naphthalene-d8	136	10.791	10.791	(1.000)	451767	4.00000	
	28 Naphthalene	128	10.829	10.837	(1.004)	20696	0.17310	0.1731
	29 4-Chloroaniline	127	10.991	10.992	(1.019)	16149	0.27125	0.2713
	30 Hexachlorobutadiene	225	11.192	11.192	(1.037)	4872	0.22179	0.2218
	31 4-Chloro-3-methylphenol	107	11.982	11.982	(1.110)	11647	0.27414	0.2741
	32 2-Methylnaphthalene	142	12.214	12.214	(1.132)	17710	0.16010	0.1601
	33 Hexachlorocyclopentadiene	237	12.678	12.671	(0.883)	193	0.00784	0.007837

	Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	FINAL (ug/mL)
	34 2,4,6-Trichlorophenol	196	12.848	12.849	(0.895)	8302	0.32362	0.3236
	35 2,4,5-Trichlorophenol	196	12.934	12.926	(0.901)	9915	0.36273	0.3627
$	36 2-Fluorobiphenyl	172	12.995	13.003	(0.905)	21716	0.20252	0.2025
	37 2-Chloronaphthalene	162	13.189	13.189	(0.919)	14988	0.16730	0.1673
	38 2-Nitroaniline	65	13.475	13.483	(0.939)	10157	0.30252	0.3025
	39 Dimethylphthalate	163	13.916	13.917	(0.969)	16575	0.19128	0.1913
	40 Acenaphthylene	152	14.048	14.048	(0.978)	24716	0.19399	0.1940
	41 2,6-Dinitrotoluene	165	14.048	14.048	(0.978)	6372	0.32433	0.3243
*	42 Acenaphthene-d10	164	14.358	14.358	(1.000)	233498	4.00000	
	43 3-Nitroaniline	138	14.327	14.335	(0.998)	7387	0.30346	0.3035
	44 Acenaphthene	153	14.419	14.427	(1.004)	12606	0.17042	0.1704
	45 2,4-Dinitrophenol	184	14.559	14.543	(1.014)	278	0.02499	0.02499(M)
	46 Dibenzofuran	168	14.752	14.752	(1.027)	20418	0.17854	0.1785
	47 4-Nitrophenol	109	14.744	14.713	(1.027)	1541	0.16537	0.1654
	48 2,4-Dinitrotoluene	165	14.845	14.853	(1.034)	6737	0.25670	0.2567
	50 Diethylphthalate	149	15.355	15.363	(1.069)	13804	0.16802	0.1680
	49 Fluorene	166	15.456	15.456	(1.076)	16331	0.14730	0.1473
	51 4-Chlorophenyl-phenylether	204	15.463	15.463	(1.077)	8080	0.12537	0.1254
	52 4-Nitroaniline	138	15.587	15.587	(1.086)	7970	0.30819	0.3082
	53 4,6-Dinitro-2-methylphenol	198	15.672	15.680	(0.903)	5102	0.26162	0.2616
	54 N-Nitrosodiphenylamine	169	15.726	15.726	(0.906)	14430	0.18875	0.1887
$	55 2,4,6-Tribromophenol	330	15.996	15.996	(1.114)	4912	0.25420	0.2542
	56 4-Bromophenyl-phenylether	248	16.458	16.458	(0.948)	6491	0.16684	0.1668
	57 Hexachlorobenzene	284	16.752	16.752	(0.965)	8871	0.21697	0.2170
	58 Pentachlorophenol	266	17.139	17.132	(0.987)	653	0.03946	0.03946
*	59 Phenanthrene-d10	188	17.363	17.364	(1.000)	426054	4.00000	
	60 Phenanthrene	178	17.410	17.418	(1.003)	20337	0.17651	0.1765
	61 Anthracene	178	17.503	17.503	(1.008)	19711	0.15998	0.1600
	62 Carbazole	167	17.859	17.859	(1.029)	19323	0.15887	0.1589
	63 Di-n-butylphthalate	149	18.702	18.710	(1.077)	23260	0.12572	0.1257
	64 Fluoranthene	202	19.832	19.839	(0.882)	27009	0.17000	0.1700
	65 Pyrene	202	20.257	20.265	(0.901)	27634	0.15779	0.1578
$	66 Terphenyl-d14	244	20.590	20.590	(0.916)	30337	0.24304	0.2430
	67 Butylbenzylphthalate	149	21.558	21.558	(0.959)	11523	0.20003	0.2000
	68 Benzo(a)anthracene	228	22.464	22.464	(0.999)	29476	0.20719	0.2072
*	69 Chrysene-d12	240	22.487	22.495	(1.000)	381248	4.00000	
	70 3,3'-Dichlorobenzidine	252	22.448	22.456	(0.998)	33126	0.57960	0.5796
	71 Chrysene	228	22.533	22.541	(1.002)	19214	0.17518	0.1752
	72 bis(2-Ethylhexyl)phthalate	149	22.611	22.619	(0.958)	11469	0.23012	0.2301
*	134 Di-n-octylphthalate-d4	153	23.602	23.610	(1.000)	453021	4.00000	
	73 Di-n-octylphthalate	149	23.617	23.617	(1.001)	19605	0.15442	0.1544
	74 Benzo(b)fluoranthene	252	24.244	24.252	(0.974)	22455	0.19109	0.1911
	75 Benzo(k)fluoranthene	252	24.275	24.283	(0.976)	22405	0.19248	0.1925
	76 Benzo(a)pyrene	252	24.779	24.786	(0.996)	20311	0.19125	0.1912
*	77 Perylene-d12	264	24.879	24.887	(1.000)	298204	4.00000	
	78 Indeno(1,2,3-cd)pyrene	276	27.049	27.057	(1.087)	21979	0.18286	0.1829
	79 Dibenzo(a,h)anthracene	278	27.064	27.072	(1.088)	18837	0.19953	0.1995
	80 Benzo(g,h,i)perylene	276	27.678	27.686	(1.112)	19704	0.18370	0.1837
	90 N-Nitrosodimethylamine	74	4.073	4.065	(0.488)	8106	0.22300	0.2230
	91 Aniline	93	7.834	7.834	(0.938)	27240	0.37959	0.3796
	93 Benzidine	184	20.118	20.118	(0.895)	21438	0.29505	0.2950
	103 Pyridine	79	4.080	4.057	(0.489)	14898	0.26054	0.2605
	105 1-methylnaphthalene	142	12.431	12.431	(1.152)	16828	0.16214	0.1621
	111 Azobenzene (1,2-DP-Hydrazine)	77	15.787	15.788	(1.100)	16422	0.15677	0.1568

Compounds	QUANT SIG MASS	RT	EXP RT	REL RT	RESPONSE	CONCENTRATIONS ON-COLUMN (ug/mL)	CONCENTRATIONS FINAL (ug/mL)
187 Total Benzofluoranthenes	252	24.244	24.283	(0.974)	43202	0.38285	0.3829
120 2,3,4,6-Tetrachlorophenol	232	15.107	15.108	(1.052)	2278	0.09274	0.09274

QC Flag Legend

M - Compound response manually integrated.

ARI Labs, Inc.

INTERNAL STANDARD COMPOUNDS
AREA AND RT SUMMARY

Instrument ID: nt10.i
Lab File ID: NT1021081404.D
Lab Smp Id: SJH0174-LCV2
Analysis Type: SV
Quant Type: ISTD
Operator: VTS
Method File: \\target\share\chem3\nt10.i\20210814.b\ABN.m
Misc Info:

Calibration Date: 14-AUG-2021
Calibration Time: 09:51
Level:
Sample Type:

Test Mode:
Use Last Continuing Calibrator.

COMPOUND	STANDARD	AREA LIMIT LOWER	AREA LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	85058	42529	170116	135011	58.73
27 Naphthalene-d8	291658	145829	583316	451767	54.90
42 Acenaphthene-d10	163642	81821	327284	233498	42.69
59 Phenanthrene-d10	304099	152050	608198	426054	40.10
69 Chrysene-d12	199453	99727	398906	381248	91.15
134 Di-n-octylphthala	303639	151820	607278	453021	49.20
77 Perylene-d12	200082	100041	400164	298204	49.04

COMPOUND	STANDARD	RT LIMIT LOWER	RT LIMIT UPPER	SAMPLE	%DIFF
8 1,4-Dichlorobenze	8.35	7.85	8.85	8.35	-0.00
27 Naphthalene-d8	10.79	10.29	11.29	10.79	-0.00
42 Acenaphthene-d10	14.36	13.86	14.86	14.36	-0.00
59 Phenanthrene-d10	17.36	16.86	17.86	17.36	-0.00
69 Chrysene-d12	22.50	22.00	23.00	22.49	-0.04
134 Di-n-octylphthala	23.61	23.11	24.11	23.60	-0.03
77 Perylene-d12	24.89	24.39	25.39	24.88	-0.03

AREA UPPER LIMIT = +100% of internal standard area.
AREA LOWER LIMIT = - 50% of internal standard area.
RT UPPER LIMIT = + 0.50 minutes of internal standard RT.
RT LOWER LIMIT = - 0.50 minutes of internal standard RT.

REVIEW SUMMARY FOR FILE - NT1021081404.D

Lab ID: SJH0174-LCV2
nt10.i, ABN.m, 14-AUG-2021 11:09

RT	CO-ELUTION COMPOUNDS
8.726	1,2-Dichlorobenzene and Benzyl alcohol
14.049	Acenaphthylene and 2,6-Dinitrotoluene

Quant Method: ICAL

RRT CHECK

RRT	CCV RRT	DELTA	COMPOUND
1.045	1.035	0.0093	Benzyl alcohol
0.956	0.967	-0.0102	Benzoic acid

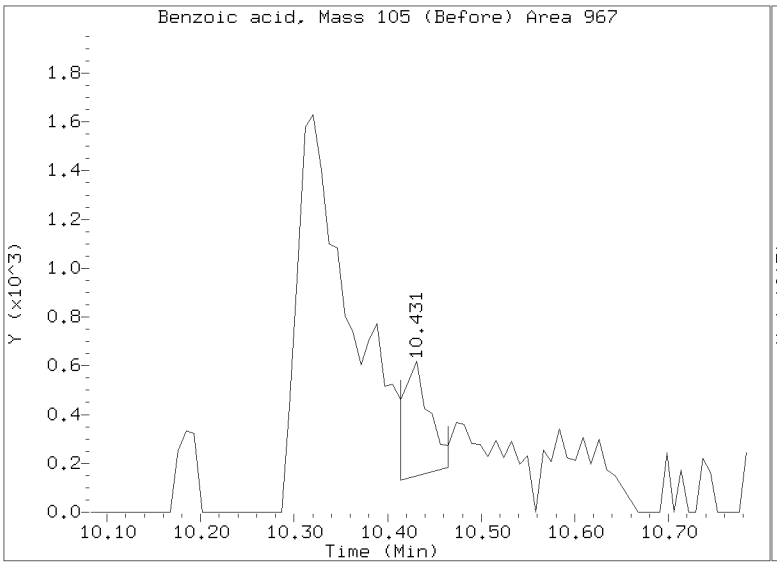
RRT check based on Ccal File: NT1021081402.D

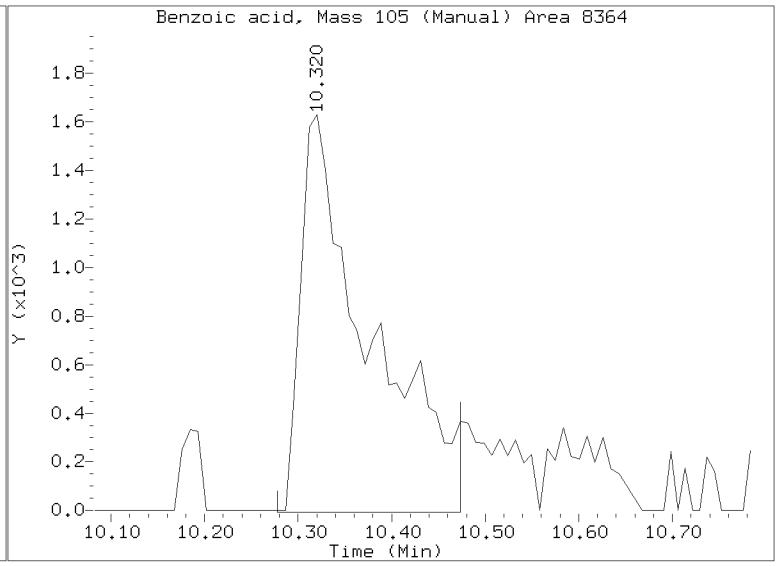
On Column LOD for nt10.i, ABN.m, ICAL.sub = 0.0000

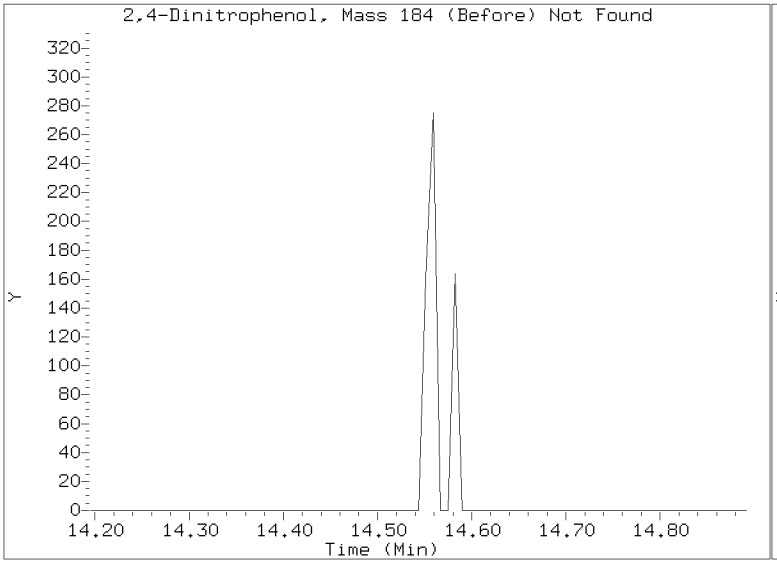
* Only compounds listed in the work order have been verified by the analyst *

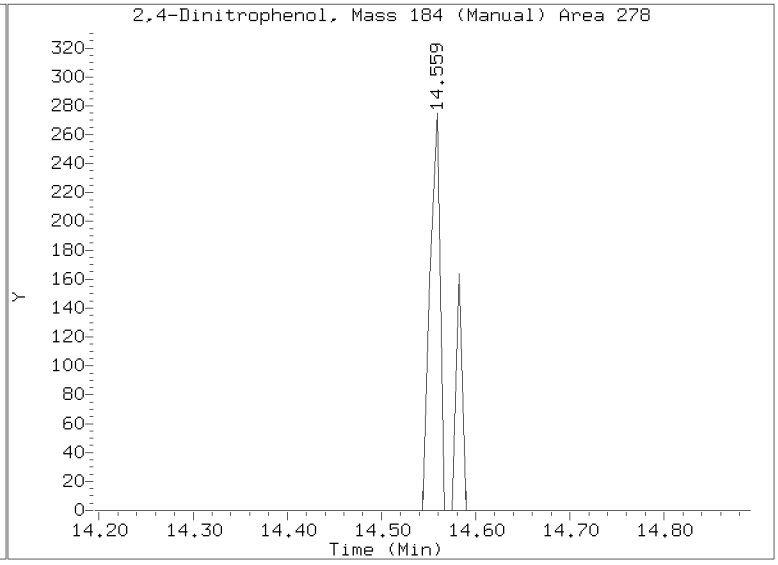
Quant Ion Manual Peak Adjustment Report

Datafile: //target/share/chem3/nt10.i/20210814.b/NT1021081404.D
Injection Date: 14-AUG-2021 11:09
Lab ID:SJH0174-LCV2 Client ID:
Report Date: 08/16/2021 09:23









Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJG0249	Instrument:	NT10
		Calibration:	EG00057

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SJG0249-TUN1	NT1021072001.D	NA	07/20/21 11:51
CAL 5	SJG0249-CAL5	NT1021072004.D	NA	07/20/21 13:41
CAL 20	SJG0249-CAL7	NT1021072005.D	NA	07/20/21 14:19
CAL 0.2	SJG0249-CAL1	NT1021072006.D	NA	07/20/21 14:57
CAL 10	SJG0249-CAL6	NT1021072007.D	NA	07/20/21 15:36
CAL 0.5	SJG0249-CAL2	NT1021072008.D	NA	07/20/21 16:14
CAL 2.5	SJG0249-CAL4	NT1021072009.D	NA	07/20/21 16:52
CAL 1.0	SJG0249-CAL3	NT1021072010.D	NA	07/20/21 17:30
SCV 5.0	SJG0249-SCV1	NT1021072013.D	NA	07/20/21 19:24
Initial Cal Blank	SJG0249-ICB1	NT1021072015ICB.D	NA	07/20/21 20:40
Calibration Check	SJG0249-CCV1	NT1021072019.D	NA	07/20/21 23:13

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Printed: 7/21/2021 10:31:52AM

ANALYSIS SEQUENCE

SJG0249

Instrument: NT10 Element Column ID: J006337
Calibration ID: EG00057 Tune File: 200228.U
EM Voltage: 1953

Lab Number	Sample Name	Analysis	Container	Order	STD ID	ISTD ID	Comments
SJG0249-TUN1	MS Tune	QC		1	J006358	J002469	
SJG0249-CAL5	CAL 5	QC		2	J007208	J002469	
SJG0249-CAL7	CAL 20	QC		3	J007206	J002469	
SJG0249-CAL1	CAL 0.2	QC		4	J007212	J002469	
SJG0249-CAL6	CAL 10	QC		5	J007207	J002469	
SJG0249-CAL2	CAL 0.5	QC		6	J007211	J002469	
SJG0249-CAL4	CAL 2.5	QC		7	J007209	J002469	
SJG0249-CAL3	CAL 1.0	QC		8	J007210	J002469	
SJG0249-SCV1	SCV 5.0	QC		9	J007215	J002469	
SJG0249-ICB1	Initial Cal Blank	QC		10	I008417	J002469	
BJG0105-BLK1	Blank	QC		11		J002469	
BJG0105-BS1	LCS	QC		12		J002469	
BJG0105-BSD1	LCS Dup	QC		13		J002469	
21G0046-01	SS-07-01-2021	625 SVOC 0.2ug/L	A 01	14		J002469	version
SJG0249-CCV1	Calibration Check	QC		15	J007208	J002469	

INTERNAL STANDARD SUMMARY FOR DATABATCH - \\target\share\chem3\nt10.i\20210720.b

	Time	Filename	LabID	ClientId	DF															
1	1151	NT1021072001.D	SJG0249-TUN1		1	|NO ISTDS FOUND||														
2	1206	NT1021072002.D	SJG0249-ICV1		1	| 9.37	140667||11.87	516414||15.50	297034||18.56	520011||23.60	478099||26.39	515602||24.64	867424|							
3	1254	NT1021072003.D	SJG0250-ICV1		1	| 9.38	161240||11.87	564295||15.50	308564||18.56	557306||23.60	508538||26.40	526232||24.64	802478|							
4	1341	NT1021072004.D	SJG0249-CAL5		1	| 9.38	105518||11.87	373252||15.51	212025||18.56	362039||23.61	338032||26.40	375340||24.64	565512|							
5	1419	NT1021072005.D	SJG0249-CAL7		1	| 9.37	94447||11.87	347437||15.51	201591||18.56	333130||23.61	312792||26.41	326526||24.65	607852|							
6	1457	NT1021072006.D	SJG0249-CAL1		1	| 9.37	136921||11.87	460995||15.50	235089||18.55	420382||23.60	383200||26.40	387322||24.64	521067|							
7	1536	NT1021072007.D	SJG0249-CAL6		1	| 9.37	89726||11.87	321946||15.50	185729||18.56	315612||23.61	298153||26.40	317304||24.64	522019|							
8	1614	NT1021072008.D	SJG0249-CAL2		1	| 9.37	134122||11.86	462215||15.50	242680||18.55	417099||23.60	386595||26.40	397318||24.64	541468|							
9	1652	NT1021072009.D	SJG0249-CAL4		1	| 9.37	104970||11.87	371078||15.50	208846||18.55	360965||23.60	341969||26.40	367200||24.64	516798|							
10	1730	NT1021072010.D	SJG0249-CAL3		1	| 9.37	118740||11.86	405845||15.50	216746||18.55	372134||23.60	356061||26.40	371772||24.64	495765|							
11	1808	NT1021072011.D	SJG0250-CAL1		1	| 9.37	147612||11.86	492435||15.50	244073||18.55	425533||23.60	396140||26.39	401737||24.64	505226|							
12	1846	NT1021072012.D	SJG0250-CAL2		1	| 9.37	146384||11.86	484054||15.50	244176||18.55	423629||23.60	380973||26.40	394261||24.64	483057|							
13	1924	NT1021072013.D	SJG0249-SCV1		1	| 9.37	97788||11.87	342760||15.50	192459||18.55	332308||23.60	319618||26.40	334503||24.64	476118|							
14	2002	NT1021072014.D	SJG0249-ICB1		1	| 9.36	120249||11.86	432914||15.50	227633||18.55	396549||23.60	352021||26.39	369383||24.64	446571|							
15	2040	NT1021072015.D	BJG0105-BLK1		1	| 9.36	125755||11.86	449656||15.50	228276||18.55	401727||23.60	352799||26.39	366360||24.64	452323|							
16	2040	NT1021072015ICB.D	SJG0249-ICB1		1	| 9.36	125755||11.86	449656||15.50	228276||18.55	401727||23.60	352799||26.39	366360||24.64	452323|							
17	2118	NT1021072016.D	BJG0105-BS1		1	| 9.37	102285||11.86	398103||15.50	194269||18.55	319981||23.60	320168||26.39	327583||24.64	481456|							
18	2157	NT1021072017.D	BJG0105-BSD1		1	| 9.37	106413||11.86	418990||15.50	203579||18.56	343465||23.60	337523||26.40	339074||24.64	535112|							
19	2235	NT1021072018.D	21G0046-01		1	| 9.37	110052||11.87	446402||15.52	157534||18.57	254292||23.61	262473||26.42	281949||24.65	445090|							
20	2313	NT1021072019.D	SJG0249-CCV1		1	| 9.37	99108||11.87	355338||15.50	203538||18.56	348847||23.61	304145||26.40	315567||24.64	529930|							

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem3\nt10.i\20210720.b

Instrument: nt10.i Date: 20-JUL-2021

Time	Filename	LabID	DF	Manually Integrated Compounds
1151	NT1021072001.D	SJG0249-TUN1	1	NO MANUAL INTEGRATION
1206	NT1021072002.D	SJG0249-ICV1	1	1,2-Dichlorobenzene-d4,
1254	NT1021072003.D	SJG0250-ICV1	1	NO MANUAL INTEGRATION
1341	NT1021072004.D	SJG0249-CAL5	1	NO MANUAL INTEGRATION
1419	NT1021072005.D	SJG0249-CAL7	1	NO MANUAL INTEGRATION
1457	NT1021072006.D	SJG0249-CAL1	1	2,4-Dinitrophenol, Pentachlorophenol, 2,3,4,6-Tetrachlorophenol, 2,4,6-Tribromophenol,
1536	NT1021072007.D	SJG0249-CAL6	1	NO MANUAL INTEGRATION
1614	NT1021072008.D	SJG0249-CAL2	1	Benzoic acid, 2,4-Dinitrophenol,
1652	NT1021072009.D	SJG0249-CAL4	1	NO MANUAL INTEGRATION
1730	NT1021072010.D	SJG0249-CAL3	1	NO MANUAL INTEGRATION
1808	NT1021072011.D	SJG0250-CAL1	1	NO MANUAL INTEGRATION
1846	NT1021072012.D	SJG0250-CAL2	1	NO MANUAL INTEGRATION
1924	NT1021072013.D	SJG0249-SCV1	1	NO MANUAL INTEGRATION
2002	NT1021072014.D	SJG0249-ICB1	1	NO MANUAL INTEGRATION
2040	NT1021072015.D	BJG0105-BLK1	1	NO MANUAL INTEGRATION
2040	NT1021072015ICB.D	SJG0249-ICB1	1	NO MANUAL INTEGRATION
2118	NT1021072016.D	BJG0105-BS1	1	NO MANUAL INTEGRATION

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem3\nt10.i\20210720.b

Instrument: nt10.i Date: 20-JUL-2021

Time	Filename	LabID	DF	Manually Integrated Compounds
2157	NT1021072017.D	BJG0105-BSD1	1	NO MANUAL INTEGRATION
2235	NT1021072018.D	21G0046-01	1	NO MANUAL INTEGRATION
2313	NT1021072019.D	SJG0249-CCV1	1	NO MANUAL INTEGRATION

Security Status Report

Date: 21-Jul-2021 10:28

NT1021072001.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072002.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072003.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072004.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072005.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072006.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072007.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072008.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072009.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072010.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072011.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072012.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072013.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072014.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072015.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072015ICB.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072016.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072017.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072018.D	Data Locked	van, 21-Jul-2021 10:28
NT1021072019.D	Data Locked	van, 21-Jul-2021 10:28

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0174	Instrument:	NT10
		Calibration:	EG00057

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
MS Tune	SJH0174-TUN1	NT1021081401.D	NA	08/14/21 09:36
Initial Cal Check	SJH0174-ICV1	NT1021081402.D	NA	08/14/21 09:51
ABN 0.5	SJH0174-LCV1	NT1021081403.D	NA	08/14/21 10:30
ABN 0.2	SJH0174-LCV2	NT1021081404.D	NA	08/14/21 11:09
Blank	BJH0004-BLK1	NT1021081405.D	Solid	08/14/21 11:48
LCS	BJH0004-BS1	NT1021081406.D	Solid	08/14/21 12:28
Reference	BJH0004-SRM1	NT1021081407.D	Solid	08/14/21 13:13
LDW21-SS687	21G0286-01	NT1021081408.D	Solid	08/14/21 13:53
LDW21-SS625	21G0286-02	NT1021081409.D	Solid	08/14/21 14:32
LDW21-SS627	21G0286-04	NT1021081410.D	Solid	08/14/21 15:12
LDW21-SS627	BJH0004-MS1	NT1021081411.D	Solid	08/14/21 15:52
LDW21-SS627	BJH0004-MSD1	NT1021081412.D	Solid	08/14/21 16:32
LDW21-SS646	21G0286-05	NT1021081413.D	Solid	08/14/21 17:12
ZZZZZ	21G0289-01	NT1021081414.D	Solid	08/14/21 17:52
ZZZZZ	21G0289-02	NT1021081415.D	Solid	08/14/21 18:32
ZZZZZ	21G0289-05	NT1021081416.D	Solid	08/14/21 19:12
Calibration Check	SJH0174-CCV1	NT1021081419.D	NA	08/14/21 21:12

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG/WO:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJG0249	Instrument:	NT10
Calibration:	EG00057	Calibration Date:	07/20/2021

Surrogate Compound	Spike Level ug/mL	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SJG0249-ICB1 (Solid)			Lab File ID: NT1021072015ICB.D				Analyzed: 07/20/21 20:40	
1,2-Dichlorobenzene-d4	5.0000	59.0	32 - 120	9.728	9.738143	-0.0101	N/A	
Nitrobenzene-d5	5.0000	76.6	30 - 120	10.473	10.47757	-0.0046	N/A	
2-Fluorobiphenyl	5.0000	73.6	35 - 120	14.091	14.09329	-0.0023	N/A	
p-Terphenyl-d14	5.0000	78.0	37 - 120	21.677	21.67929	-0.0023	N/A	
SJG0249-CCV1 (Solid)			Lab File ID: NT1021072019.D				Analyzed: 07/20/21 23:13	
1,2-Dichlorobenzene-d4	5.0000	103	50 - 150	9.736	9.738143	-0.0021	N/A	
Nitrobenzene-d5	5.0000	107	50 - 150	10.473	10.47757	-0.0046	N/A	
2-Fluorobiphenyl	5.0000	102	50 - 150	14.091	14.09329	-0.0023	N/A	
p-Terphenyl-d14	5.0000	99.8	50 - 150	21.677	21.67929	-0.0023	N/A	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG/WO:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0174	Instrument:	NT10
Calibration:	EG00057	Calibration Date:	07/20/2021

Surrogate Compound	Spike Level ug/mL	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SJH0174-ICV1 (Solid)			Lab File ID: NT1021081402.D				Analyzed: 08/14/21 09:51	
1,2-Dichlorobenzene-d4	5.0000	102	80 - 120	8.702	9.738143	-1.0361	N/A	
Nitrobenzene-d5	5.0000	104	80 - 120	9.44	10.47757	-1.0376	N/A	
2-Fluorobiphenyl	5.0000	112	80 - 120	13.003	14.09329	-1.0903	N/A	
p-Terphenyl-d14	5.0000	107	80 - 120	20.59	21.67929	-1.0893	N/A	
SJH0174-LCV1 (Solid)			Lab File ID: NT1021081403.D				Analyzed: 08/14/21 10:30	
1,2-Dichlorobenzene-d4	0.50000	105	50 - 150	8.702	9.738143	-1.0361	N/A	
Nitrobenzene-d5	0.50000	101	50 - 150	9.439	10.47757	-1.0386	N/A	
2-Fluorobiphenyl	0.50000	106	50 - 150	13.003	14.09329	-1.0903	N/A	
p-Terphenyl-d14	0.50000	122	50 - 150	20.59	21.67929	-1.0893	N/A	
SJH0174-LCV2 (Solid)			Lab File ID: NT1021081404.D				Analyzed: 08/14/21 11:09	
1,2-Dichlorobenzene-d4	0.20000	103	50 - 150	8.702	9.738143	-1.0361	N/A	
Nitrobenzene-d5	0.20000	89.0	50 - 150	9.439	10.47757	-1.0386	N/A	
2-Fluorobiphenyl	0.20000	101	50 - 150	12.995	14.09329	-1.0983	N/A	
p-Terphenyl-d14	0.20000	122	50 - 150	20.59	21.67929	-1.0893	N/A	
BJH0004-BLK1 (Solid)			Lab File ID: NT1021081405.D				Analyzed: 08/14/21 11:48	
1,2-Dichlorobenzene-d4	500.00	66.4	32 - 120	8.702	9.738143	-1.0361	N/A	
Nitrobenzene-d5	500.00	71.1	30 - 120	9.439	10.47757	-1.0386	N/A	
2-Fluorobiphenyl	500.00	75.6	35 - 120	12.995	14.09329	-1.0983	N/A	
p-Terphenyl-d14	500.00	83.9	37 - 120	20.59	21.67929	-1.0893	N/A	
BJH0004-BS1 (Solid)			Lab File ID: NT1021081406.D				Analyzed: 08/14/21 12:28	
1,2-Dichlorobenzene-d4	500.00	63.0	32 - 120	8.702	9.738143	-1.0361	N/A	
Nitrobenzene-d5	500.00	72.5	30 - 120	9.439	10.47757	-1.0386	N/A	
2-Fluorobiphenyl	500.00	73.6	35 - 120	12.995	14.09329	-1.0983	N/A	
p-Terphenyl-d14	500.00	85.2	37 - 120	20.59	21.67929	-1.0893	N/A	
BJH0004-SRM1 (Solid)			Lab File ID: NT1021081407.D				Analyzed: 08/14/21 13:13	
1,2-Dichlorobenzene-d4	5000.0	70.7	32 - 120	8.71	9.738143	-1.0281	N/A	
Nitrobenzene-d5	5000.0	73.0	30 - 120	9.447	10.47757	-1.0306	N/A	
2-Fluorobiphenyl	5000.0	75.1	35 - 120	13.003	14.09329	-1.0903	N/A	
p-Terphenyl-d14	5000.0	86.2	37 - 120	20.598	21.67929	-1.0813	N/A	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG/WO:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0174	Instrument:	NT10
Calibration:	EG00057	Calibration Date:	07/20/2021

Surrogate Compound	Spike Level ug/kg dry	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
21G0286-01 (Solid)			Lab File ID: NT1021081408.D				Analyzed: 08/14/21 13:53	
1,2-Dichlorobenzene-d4	498.44	65.3	32 - 120	8.702	9.738143	-1.0361	N/A	
Nitrobenzene-d5	498.44	70.0	30 - 120	9.439	10.47757	-1.0386	N/A	
2-Fluorobiphenyl	498.44	76.7	35 - 120	13.003	14.09329	-1.0903	N/A	
p-Terphenyl-d14	498.44	88.5	37 - 120	20.598	21.67929	-1.0813	N/A	
21G0286-02 (Solid)			Lab File ID: NT1021081409.D				Analyzed: 08/14/21 14:32	
p-Terphenyl-d14	498.82	87.8	37 - 120	20.597	21.67929	-1.0823	N/A	
21G0286-04 (Solid)			Lab File ID: NT1021081410.D				Analyzed: 08/14/21 15:12	
p-Terphenyl-d14	500.06	77.7	37 - 120	20.605	21.67929	-1.0743	N/A	
BJH0004-MS1 (Solid)			Lab File ID: NT1021081411.D				Analyzed: 08/14/21 15:52	
1,2-Dichlorobenzene-d4	500.06	65.3	32 - 120	8.71	9.738143	-1.0281	N/A	
Nitrobenzene-d5	500.06	79.1	30 - 120	9.447	10.47757	-1.0306	N/A	
2-Fluorobiphenyl	500.06	79.9	35 - 120	13.011	14.09329	-1.0823	N/A	
p-Terphenyl-d14	500.06	79.1	37 - 120	20.613	21.67929	-1.0663	N/A	
BJH0004-MSD1 (Solid)			Lab File ID: NT1021081412.D				Analyzed: 08/14/21 16:32	
1,2-Dichlorobenzene-d4	500.06	61.1	32 - 120	8.71	9.738143	-1.0281	N/A	
Nitrobenzene-d5	500.06	71.3	30 - 120	9.447	10.47757	-1.0306	N/A	
2-Fluorobiphenyl	500.06	78.5	35 - 120	13.011	14.09329	-1.0823	N/A	
p-Terphenyl-d14	500.06	77.4	37 - 120	20.613	21.67929	-1.0663	N/A	
21G0286-05 (Solid)			Lab File ID: NT1021081413.D				Analyzed: 08/14/21 17:12	
p-Terphenyl-d14	497.98	79.4	37 - 120	20.605	21.67929	-1.0743	N/A	
SJH0174-CCV1 (Solid)			Lab File ID: NT1021081419.D				Analyzed: 08/14/21 21:12	
1,2-Dichlorobenzene-d4	5.0000	104	50 - 150	8.702	9.738143	-1.0361	N/A	
Nitrobenzene-d5	5.0000	108	50 - 150	9.44	10.47757	-1.0376	N/A	
2-Fluorobiphenyl	5.0000	111	50 - 150	13.003	14.09329	-1.0903	N/A	
p-Terphenyl-d14	5.0000	99.0	50 - 150	20.605	21.67929	-1.0743	N/A	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INTERNAL STANDARD AREA AND RT SUMMARY

EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJG0249	Instrument:	NT10
		Calibration:	EG00057

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (SJG0249-SCV1)		(Solid)		Lab File ID: NT1021072013.D				Analyzed: 07/20/21 19:24	
1,4-Dichlorobenzene-d4	97788	9.371	105518	9.379	93	50 - 200	-0.008	+/-0.50	
Naphthalene-d8	342760	11.871	373252	11.871	92	50 - 200	0.000	+/-0.50	
Acenaphthene-d10	192459	15.5	212025	15.508	91	50 - 200	-0.008	+/-0.50	
Phenanthrene-d10	332308	18.551	362039	18.559	92	50 - 200	-0.008	+/-0.50	
Chrysene-d12	319618	23.597	338032	23.605	95	50 - 200	-0.008	+/-0.50	
Di-n-Octylphthalate-d4	476118	24.642	565512	24.643	84	50 - 200	-0.001	+/-0.50	
Perylene-d12	334503	26.4	375340	26.4	89	50 - 200	0.000	+/-0.50	
Initial Cal Blank (SJG0249-ICB1)		(Solid)		Lab File ID: NT1021072015ICB.D				Analyzed: 07/20/21 20:40	
1,4-Dichlorobenzene-d4	125755	9.363	105518	9.379	119	50 - 200	-0.016	+/-0.50	
Naphthalene-d8	449656	11.863	373252	11.871	120	50 - 200	-0.008	+/-0.50	
Acenaphthene-d10	228276	15.5	212025	15.508	108	50 - 200	-0.008	+/-0.50	
Phenanthrene-d10	401727	18.551	362039	18.559	111	50 - 200	-0.008	+/-0.50	
Chrysene-d12	352799	23.597	338032	23.605	104	50 - 200	-0.008	+/-0.50	
Di-n-Octylphthalate-d4	452323	24.643	565512	24.643	80	50 - 200	0.000	+/-0.50	
Perylene-d12	366360	26.392	375340	26.4	98	50 - 200	-0.008	+/-0.50	
Calibration Check (SJG0249-CCV1)		(Solid)		Lab File ID: NT1021072019.D				Analyzed: 07/20/21 23:13	
Phenanthrene-d10	348847	18.559	362039	18.559	96	50 - 200	0.000	+/-0.50	
Chrysene-d12	304145	23.605	338032	23.605	90	50 - 200	0.000	+/-0.50	
Di-n-Octylphthalate-d4	529930	24.642	565512	24.643	94	50 - 200	-0.001	+/-0.50	
Perylene-d12	315567	26.4	375340	26.4	84	50 - 200	0.000	+/-0.50	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INTERNAL STANDARD AREA AND RT SUMMARY

EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0174	Instrument:	NT10
		Calibration:	EG00057

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (SJH0174-ICV1)		(Solid)		Lab File ID: NT1021081402.D				Analyzed: 08/14/21 09:51	
1,4-Dichlorobenzene-d4	85058	8.353	85058	8.353	100	50 - 200	0.000	+/-0.50	
Naphthalene-d8	291658	10.791	291658	10.791	100	50 - 200	0.000	+/-0.50	
Acenaphthene-d10	163642	14.358	163642	14.358	100	50 - 200	0.000	+/-0.50	
Phenanthrene-d10	304099	17.364	304099	17.364	100	50 - 200	0.000	+/-0.50	
Chrysene-d12	199453	22.495	199453	22.495	100	50 - 200	0.000	+/-0.50	
Di-n-Octylphthalate-d4	303639	23.61	303639	23.61	100	50 - 200	0.000	+/-0.50	
Perylene-d12	200082	24.887	200082	24.887	100	50 - 200	0.000	+/-0.50	
Low Cal Check (SJH0174-LCV1)		(Solid)		Lab File ID: NT1021081403.D				Analyzed: 08/14/21 10:30	
1,4-Dichlorobenzene-d4	116447	8.353	85058	8.353	137	50 - 200	0.000	+/-0.50	
Naphthalene-d8	382181	10.791	291658	10.791	131	50 - 200	0.000	+/-0.50	
Acenaphthene-d10	209472	14.358	163642	14.358	128	50 - 200	0.000	+/-0.50	
Phenanthrene-d10	385291	17.363	304099	17.364	127	50 - 200	-0.001	+/-0.50	
Chrysene-d12	346086	22.495	199453	22.495	174	50 - 200	0.000	+/-0.50	
Di-n-Octylphthalate-d4	405063	23.602	303639	23.61	133	50 - 200	-0.008	+/-0.50	
Perylene-d12	254250	24.879	200082	24.887	127	50 - 200	-0.008	+/-0.50	
Low Cal Check (SJH0174-LCV2)		(Solid)		Lab File ID: NT1021081404.D				Analyzed: 08/14/21 11:09	
1,4-Dichlorobenzene-d4	135011	8.353	85058	8.353	159	50 - 200	0.000	+/-0.50	
Naphthalene-d8	451767	10.791	291658	10.791	155	50 - 200	0.000	+/-0.50	
Acenaphthene-d10	233498	14.358	163642	14.358	143	50 - 200	0.000	+/-0.50	
Phenanthrene-d10	426054	17.363	304099	17.364	140	50 - 200	-0.001	+/-0.50	
Chrysene-d12	381248	22.487	199453	22.495	191	50 - 200	-0.008	+/-0.50	
Di-n-Octylphthalate-d4	453021	23.602	303639	23.61	149	50 - 200	-0.008	+/-0.50	
Perylene-d12	298204	24.879	200082	24.887	149	50 - 200	-0.008	+/-0.50	
Blank (BJH0004-BLK1)		(Solid)		Lab File ID: NT1021081405.D				Analyzed: 08/14/21 11:48	
1,4-Dichlorobenzene-d4	116012	8.353	85058	8.353	136	50 - 200	0.000	+/-0.50	
Naphthalene-d8	425275	10.791	291658	10.791	146	50 - 200	0.000	+/-0.50	
Acenaphthene-d10	226488	14.358	163642	14.358	138	50 - 200	0.000	+/-0.50	
Phenanthrene-d10	404061	17.363	304099	17.364	133	50 - 200	-0.001	+/-0.50	
Chrysene-d12	365025	22.487	199453	22.495	183	50 - 200	-0.008	+/-0.50	
Di-n-Octylphthalate-d4	440617	23.602	303639	23.61	145	50 - 200	-0.008	+/-0.50	
Perylene-d12	279618	24.879	200082	24.887	140	50 - 200	-0.008	+/-0.50	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INTERNAL STANDARD AREA AND RT SUMMARY

EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0174	Instrument:	NT10
		Calibration:	EG00057

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LCS (BJH0004-BS1)		(Solid)		Lab File ID: NT1021081406.D				Analyzed: 08/14/21 12:28	
1,4-Dichlorobenzene-d4	85772	8.353	85058	8.353	101	50 - 200	0.000	+/-0.50	
Naphthalene-d8	297264	10.79	291658	10.791	102	50 - 200	-0.001	+/-0.50	
Acenaphthene-d10	172117	14.357	163642	14.358	105	50 - 200	-0.001	+/-0.50	
Phenanthrene-d10	310079	17.363	304099	17.364	102	50 - 200	-0.001	+/-0.50	
Chrysene-d12	282450	22.487	199453	22.495	142	50 - 200	-0.008	+/-0.50	
Di-n-Octylphthalate-d4	389219	23.601	303639	23.61	128	50 - 200	-0.009	+/-0.50	
Perylene-d12	235684	24.879	200082	24.887	118	50 - 200	-0.008	+/-0.50	
Reference (BJH0004-SRM1)		(Solid)		Lab File ID: NT1021081407.D				Analyzed: 08/14/21 13:13	
1,4-Dichlorobenzene-d4	77219	8.361	85058	8.353	91	50 - 200	0.008	+/-0.50	
Naphthalene-d8	274310	10.798	291658	10.791	94	50 - 200	0.007	+/-0.50	
Acenaphthene-d10	167413	14.365	163642	14.358	102	50 - 200	0.007	+/-0.50	
Phenanthrene-d10	284872	17.371	304099	17.364	94	50 - 200	0.007	+/-0.50	
Chrysene-d12	243780	22.495	199453	22.495	122	50 - 200	0.000	+/-0.50	
Di-n-Octylphthalate-d4	347932	23.609	303639	23.61	115	50 - 200	-0.001	+/-0.50	
Perylene-d12	211217	24.895	200082	24.887	106	50 - 200	0.008	+/-0.50	
LDW21-SS687 (21G0286-01)		(Solid)		Lab File ID: NT1021081408.D				Analyzed: 08/14/21 13:53	
1,4-Dichlorobenzene-d4	94063	8.353	85058	8.353	111	50 - 200	0.000	+/-0.50	
Naphthalene-d8	353267	10.791	291658	10.791	121	50 - 200	0.000	+/-0.50	
Acenaphthene-d10	190634	14.365	163642	14.358	116	50 - 200	0.007	+/-0.50	
Phenanthrene-d10	344539	17.371	304099	17.364	113	50 - 200	0.007	+/-0.50	
Chrysene-d12	210440	22.502	199453	22.495	106	50 - 200	0.007	+/-0.50	
Di-n-Octylphthalate-d4	316721	23.617	303639	23.61	104	50 - 200	0.007	+/-0.50	
Perylene-d12	201217	24.895	200082	24.887	101	50 - 200	0.008	+/-0.50	
LDW21-SS625 (21G0286-02)		(Solid)		Lab File ID: NT1021081409.D				Analyzed: 08/14/21 14:32	
Chrysene-d12	205226	22.502	199453	22.495	103	50 - 200	0.007	+/-0.50	
LDW21-SS627 (21G0286-04)		(Solid)		Lab File ID: NT1021081410.D				Analyzed: 08/14/21 15:12	
Chrysene-d12	177477	22.502	199453	22.495	89	50 - 200	0.007	+/-0.50	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INTERNAL STANDARD AREA AND RT SUMMARY

EPA 8270E

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0174	Instrument:	NT10
		Calibration:	EG00057

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Matrix Spike (BJH0004-MS1)		(Solid)		Lab File ID: NT1021081411.D				Analyzed: 08/14/21 15:52	
1,4-Dichlorobenzene-d4	82390	8.361	85058	8.353	97	50 - 200	0.008	+/-0.50	
Naphthalene-d8	300785	10.798	291658	10.791	103	50 - 200	0.007	+/-0.50	
Acenaphthene-d10	168077	14.373	163642	14.358	103	50 - 200	0.015	+/-0.50	
Phenanthrene-d10	310146	17.387	304099	17.364	102	50 - 200	0.023	+/-0.50	
Chrysene-d12	197387	22.518	199453	22.495	99	50 - 200	0.023	+/-0.50	
Di-n-Octylphthalate-d4	359222	23.625	303639	23.61	118	50 - 200	0.015	+/-0.50	
Perylene-d12	192189	24.918	200082	24.887	96	50 - 200	0.031	+/-0.50	
Matrix Spike Dup (BJH0004-MSD1)		(Solid)		Lab File ID: NT1021081412.D				Analyzed: 08/14/21 16:32	
1,4-Dichlorobenzene-d4	85463	8.361	85058	8.353	100	50 - 200	0.008	+/-0.50	
Naphthalene-d8	311902	10.799	291658	10.791	107	50 - 200	0.008	+/-0.50	
Acenaphthene-d10	175711	14.373	163642	14.358	107	50 - 200	0.015	+/-0.50	
Phenanthrene-d10	324552	17.387	304099	17.364	107	50 - 200	0.023	+/-0.50	
Chrysene-d12	201528	22.518	199453	22.495	101	50 - 200	0.023	+/-0.50	
Di-n-Octylphthalate-d4	331293	23.625	303639	23.61	109	50 - 200	0.015	+/-0.50	
Perylene-d12	198652	24.918	200082	24.887	99	50 - 200	0.031	+/-0.50	
LDW21-SS646 (21G0286-05)		(Solid)		Lab File ID: NT1021081413.D				Analyzed: 08/14/21 17:12	
Chrysene-d12	205942	22.51	199453	22.495	103	50 - 200	0.015	+/-0.50	
Calibration Check (SJH0174-CCV1)		(Solid)		Lab File ID: NT1021081419.D				Analyzed: 08/14/21 21:12	
Phenanthrene-d10	274792	17.379	304099	17.364	90	50 - 200	0.015	+/-0.50	
Chrysene-d12	185306	22.502	199453	22.495	93	50 - 200	0.007	+/-0.50	
Di-n-Octylphthalate-d4	280590	23.617	303639	23.61	92	50 - 200	0.007	+/-0.50	
Perylene-d12	168585	24.903	200082	24.887	84	50 - 200	0.016	+/-0.50	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HOLDING TIME SUMMARY

Analysis: EPA 8270E

Laboratory: Analytical Resources, Inc. SDG: 21G0286

Client: Anchor QEA, LLC Project: Lower Duwamish AOC4

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LDW21-SS687 21G0286-01	07/22/21 06:45	07/22/21 17:30	08/02/21 11:20	11	14	08/14/21 13:53	12	40	
LDW21-SS625 21G0286-02	07/22/21 07:50	07/22/21 17:30	08/02/21 11:20	11	14	08/14/21 14:32	12	40	
LDW21-SS627 21G0286-04	07/22/21 08:10	07/22/21 17:30	08/02/21 11:20	11	14	08/14/21 15:12	12	40	
LDW21-SS646 21G0286-05	07/22/21 11:50	07/22/21 17:30	08/02/21 11:20	10	14	08/14/21 17:12	12	40	
Matrix Spike BJH0004-MS1	07/22/21 08:10	07/22/21 17:30	08/02/21 11:20	11	14	08/14/21 15:52	12	40	
Matrix Spike Dup BJH0004-MSD1	07/22/21 08:10	07/22/21 17:30	08/02/21 11:20	11	14	08/14/21 16:32	12	40	

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

EPA 8270E

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument: NT10

Analyte	MDL	RL	Units
Naphthalene	4.2	20.0	ug/kg
2-Methylnaphthalene	4.5	20.0	ug/kg
Acenaphthylene	6.2	20.0	ug/kg
Acenaphthene	5.2	20.0	ug/kg
Fluorene	14.6	20.0	ug/kg
Phenanthrene	8.7	20.0	ug/kg
Anthracene	7.2	20.0	ug/kg
Fluoranthene	6.1	20.0	ug/kg
Pyrene	5.7	20.0	ug/kg
Butylbenzylphthalate	9.4	20.0	ug/kg
Benzo(a)anthracene	6.0	20.0	ug/kg
Chrysene	6.1	20.0	ug/kg
Benzofluoranthenes, Total	10.0	40.0	ug/kg
Benzo(a)pyrene	4.2	20.0	ug/kg
Indeno(1,2,3-cd)pyrene	14.7	20.0	ug/kg
Dibenzo(a,h)anthracene	17.2	20.0	ug/kg
Benzo(g,h,i)perylene	13.6	20.0	ug/kg

Analytical Resources, Incorporated

Analytical Standard Record
Analytical Resources, Inc.
Standard ID: B001875

Printed: 9/23/2013 12:13:55PM

Description:	SVOC alpha-Terpineol	Expires:	31-Dec-29
Standard Type:	Calibration Stan	Prepared:	31-Dec-12
Solvent:	N/A	Prepared By:	Jianqing Zhou
Final Volume (mls):	1	Department:	Organics
Vials:	1	Last Edit:	23-Sep-13 12:13 by JZ
Vendor:	ACROS Organics	Lot #:	AD16481201
Vendor Catalog #:			

Comments

Neat, Purity @ 98%. (ARI#: I1582A)

Analyte	CAS Number	Concentration	Units
alpha-Terpineol	98-55-5	1000000	ug/mL

Reviewed By Date

Appendix 20.1

ALTERNATE CERTIFICATE OF ANALYSIS

The manufacturer of the below chemical was unable to provide a Certificate of Analysis at the time of request by ARI.

Date Requested from Manufacturer:_____

Chemical: alpha-Terpineol

Manufacturer: Acros Organics

Product #: _____

Lot #: A0648170 1

Purity: 98%

Analyst: AZ

Analytical Resources, Incorporated

Analytical Standard Record
Analytical Resources, Inc.
Standard ID: B001941

Printed: 9/25/2013 1:45:31PM

Description:	SVOC 2,4-Dinitrophenol	Expires:	31-Dec-29
Standard Type:	Calibration Stan	Prepared:	25-Sep-13
Solvent:	NA	Prepared By:	Jianqing Zhou
Final Volume (mls):	1	Department:	Organics
Vials:	1	Last Edit:	25-Sep-13 13:45 by JZ
Vendor:	SIGMA	Lot #:	65H5021
Vendor Catalog #:			

Comments

Neat, Purity @ 90-95%. (ARI#: 0466)

Analyte	CAS Number	Concentration	Units
2,4-Dinitrophenol	51-28-5	1000000	ug/mL

Reviewed By Date

Appendix 20.1

ALTERNATE CERTIFICATE OF ANALYSIS

The manufacturer of the below chemical was unable to provide a Certificate of Analysis at the time of request by ARI.

Date Requested from Manufacturer:_____

Chemical: 2,4-Dinitrophenol

Manufacturer: Sigma

Product #: _____

Lot #: bFH 5021

Purity: 90 ~ 94%

Analyst: [illegible]

Analytical Resources, Incorporated

Analytical Standard Record
Analytical Resources, Inc.
Standard ID: B001945

Printed: 9/25/2013 3:23:22PM

Description:	SVOC Benzoic Acid	Expires:	31-Dec-29
Standard Type:	Calibration Stan	Prepared:	31-Dec-12
Solvent:	NA	Prepared By:	Jianqing Zhou
Final Volume (mls):	1	Department:	Organics
Vials:	1	Last Edit:	25-Sep-13 15:23 by JZ
Vendor:	ACROS Organics	Lot #:	A0224339
Vendor Catalog #:			

Comments

Neat, Purity @ 98%.

Analyte	CAS Number	Concentration	Units
Benzoic acid	65-85-0	1000000	ug/mL

Reviewed By Date

Appendix 20.1

ALTERNATE CERTIFICATE OF ANALYSIS

The manufacturer of the below chemical was unable to provide a Certificate of Analysis at the time of request by ARI.

Date Requested from Manufacturer:_____

Chemical: Benzoic Acid

Manufacturer: ACROS Organics

Product #: _____

Lot #: A0224339

Purity: 98%

Analyst: [illegible]

Analytical Resources, Incorporated

Analytical Standard Record
Analytical Resources, Inc.
Standard ID: B001948

Printed: 9/25/2013 3:37:51PM

Description:	SVOC 4,6-Dinitro-2-Methylphenol	Expires:	31-Dec-29
Standard Type:	Calibration Stan	Prepared:	25-Sep-13
Solvent:	NA	Prepared By:	Jianqing Zhou
Final Volume (mls):	1	Department:	Organics
Vials:	1	Last Edit:	25-Sep-13 15:37 by JZ
Vendor:	Chem Service	Lot #:	179-31A
Vendor Catalog #:			

Comments

Neat, Purity @ 99%. (ARI#: 009A)

Analyte	CAS Number	Concentration	Units
4,6-Dinitro-2-methylphenol	534-52-1	1000000	ug/mL

Reviewed By Date

Appendix 20.1

ALTERNATE CERTIFICATE OF ANALYSIS

The manufacturer of the below chemical was unable to provide a Certificate of Analysis at the time of request by ARI.

Date Requested from Manufacturer:_____

Chemical: 4,6-Dinitro-2-Methylphenol

Manufacturer: Chem Service

Product #: _____

Lot #: 179-31A

Purity: 99%

Analyst: KB.

Analytical Resources, Incorporated

Analytical Standard Record
Analytical Resources, Inc.
Standard ID: B002054

Printed: 10/4/2013 6:32:21PM

Description:	SVOA 1-Methylnaphthalene	Expires:	02-Apr-14
Standard Type:	Analyte Spike	Prepared:	13-Dec-12
Solvent:	NA	Prepared By:	Jianqing Zhou
Final Volume (mls):	1	Department:	Organics
Vials:	1	Last Edit:	04-Oct-13 18:32 by JZ
Vendor:	Chem Service	Lot #:	62-5B
Vendor Catalog #:			

Comments

Neat, Purity @ 99%

Analyte	CAS Number	Concentration	Units
1-Methylnaphthalene	90-12-0	1000000	ug/mL

Reviewed By Date

Appendix 20.1

ALTERNATE CERTIFICATE OF ANALYSIS

The manufacturer of the below chemical was unable to provide a Certificate of Analysis at the time of request by ARI.

Date Requested from Manufacturer:_____

Chemical: 1-Methyl naphthalene

Manufacturer: Chem Service

Product #: 0787

Lot #: 67-53

Purity: 99%

Analyst: AB.

Analytical Resources, Incorporated

Analytical Standard Record
Analytical Resources, Inc.
Standard ID: B002135

Printed: 10/15/2013 12:07:39PM

Description:	SVOA Benzidine	Expires:	31-Dec-29
Standard Type:	Analyte Spike	Prepared:	15-Oct-13
Solvent:	N/A	Prepared By:	Jianqing Zhou
Final Volume (mls):	1	Department:	Organics
Vials:	1	Last Edit:	15-Oct-13 12:07 by JZ
Vendor:	SIGMA	Lot #:	18C0024
Vendor Catalog #:			

Comments

Purity @ 95%. ARI#: 0467.

Analyte	CAS Number	Concentration	Units
Benzidine	92-87-5	1000000	ug/mL

Reviewed By Date

Appendix 20.1

ALTERNATE CERTIFICATE OF ANALYSIS

The manufacturer of the below chemical was unable to provide a Certificate of Analysis at the time of request by ARI.

Date Requested from Manufacturer:_____

Chemical: Benzidine

Manufacturer: Sigma

Product #: B-3503

Lot #: 18C0024

Purity: 98%

Analyst: [illegible]

Certificate of Analysis

SIGMA-ALDRICH

Product Name	1,2,4,5-Tetrachlorobenzene, 98%
Product Number	131857
Product Brand	ALDRICH
CAS Number	95-94-3
Molecular Formula	$C_6H_2Cl_4$
Molecular Weight	215.89

F 209172
Re logged
10/06/17
pc

TEST	SPECIFICATION	LOT 19309jr RESULTS
APPEARANCE	WHITE POWDER, CHIPS OR CRYSTALS	WHITE CHIPS
INFRARED SPECTRUM	CONFORMS TO STRUCTURE.	CONFORMS TO STRUCTURE AND STANDARD AS ILLUSTRATED ON PAGE 1011C OF EDITION I, VOLUME 1 OF "THE ALDRICH LIBRARY OF FT-IR SPECTRA".
GAS LIQUID	97.5% (MINIMUM)	99.9 %
QUALITY CONTROL		JULY 1997

Barbara Rajzer

Barbara Rajzer, Supervisor
Quality Control
Milwaukee, Wisconsin USA

See also I 1107A
pc 10/06/17

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Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 31835 **Lot No.:** A0156430

Description : 3,3'- Dichlorobenzidine Standard

3, 3`-Dichlorobenzidine Standard 2000 µg/mL, Methylene Chloride, 1mL/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : August 31, 2024 **Storage:** 10°C or colder

Handling: Contains carcinogen/reproductive toxin.

CERTIFIED VALUES

Elution Order	Compound	Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)			
1	3,3'-Dichlorobenzidine	2,000.0 µg/mL	+/-	11.8794	µg/mL	Gravimetric
	CAS # 91-94-1 (Lot 190725JAM)		+/-	60.5452	µg/mL	Unstressed
	Purity 99%		+/-	60.5452	µg/mL	Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

I000977
SFAM 3,3-dichlorobenzidine-2000ug/ml
Solvent / Lot: DCM
Prep: 1/31/2020 by VS
Exp: 8/31/2024
Location: R-19

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

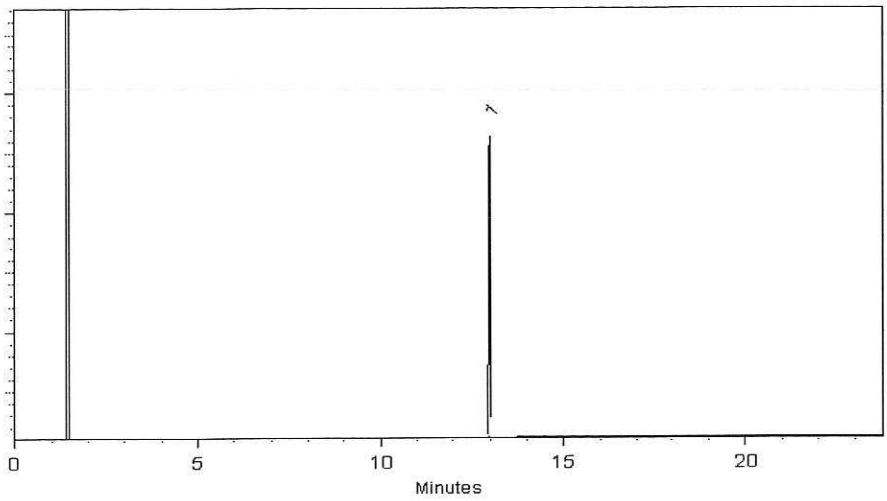
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
75°C (hold 1 min.) to 330°C
@ 20°C/min. (hold 10 min.)

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Cathleen Soltis
Cathleen Soltis - Mix Technician

Date Mixed: 07-Jan-2020 **Balance:** B442140311

Jennifer L Pollino
Jennifer Pollino - Operations Tech-ARM QC

Date Passed: 09-Jan-2020

Manufactured under Restek's ISO 9001:2015
Registered Quality System
Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/µECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

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Certificate #3222.01

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Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 31493 **Lot No.:** A0154977

I4671

Description : CLP 04.1 BNA Surrogate Mix

CLP 04.1 BNA Surrogate Mix 1000-1500 µg/mL, Methylene Chloride, 1mL/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

X9

Expiration Date : August 31, 2023 **Storage:** 10°C or colder

Handling: Sonicate prior to use.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)	
1	2-Fluorophenol **CAS #** 367-12-4 **Purity** 99%	(Lot STBF3761V)	1,504.0 µg/mL	+/- 8.9333 µg/mL +/- 43.9298 µg/mL +/- 53.2923 µg/mL	Gravimetric Unstressed Stressed
2	Phenol-d6 **CAS #** 13127-88-3 **Purity** 99%	(Lot PR-31160)	1,502.0 µg/mL	+/- 8.9214 µg/mL +/- 43.8714 µg/mL +/- 53.2214 µg/mL	Gravimetric Unstressed Stressed
3	2-Chlorophenol-d4 **CAS #** 93951-73-6 **Purity** 97%	(Lot PR-29567)	1,499.6 µg/mL	+/- 8.9073 µg/mL +/- 43.8019 µg/mL +/- 53.1371 µg/mL	Gravimetric Unstressed Stressed
4	1,2-Dichlorobenzene-d4 **CAS #** 2199-69-1 **Purity** 99%	(Lot BP-1072)	1,010.0 µg/mL	+/- 5.9991 µg/mL +/- 29.5007 µg/mL +/- 35.7880 µg/mL	Gravimetric Unstressed Stressed
5	Nitrobenzene-d5 **CAS #** 4165-60-0 **Purity** 99%	(Lot PR-29603)	1,006.0 µg/mL	+/- 5.9753 µg/mL +/- 29.3839 µg/mL +/- 35.6463 µg/mL	Gravimetric Unstressed Stressed
6	2-Fluorobiphenyl **CAS #** 321-60-8 **Purity** 99%	(Lot Q165-67)	1,002.0 µg/mL	+/- 5.9516 µg/mL +/- 29.2671 µg/mL +/- 35.5046 µg/mL	Gravimetric Unstressed Stressed
7	2,4,6-Tribromophenol **CAS #** 118-79-6 **Purity** 99%	(Lot S55013V)	1,506.0 µg/mL	+/- 8.9452 µg/mL +/- 43.9882 µg/mL +/- 53.3632 µg/mL	Gravimetric Unstressed Stressed

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Testing Laboratory
Certificate #3222.02

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 31493 **Lot No.:** A0154977

I4671

Description : CLP 04.1 BNA Surrogate Mix

CLP 04.1 BNA Surrogate Mix 1000-1500 µg/mL, Methylene Chloride, 1mL/ampul

Container Size : 2 mL **Pkg Amt:** > 1 mL

x9

Expiration Date : August 31, 2023 **Storage:** 10°C or colder

Handling: Sonicate prior to use.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	2-Fluorophenol **CAS #** 367-12-4 **Purity** 99%	(Lot STBF3761V)	1,504.0 µg/mL	+/- 8.9333 +/- 43.9298 +/- 53.2923	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
2	Phenol-d6 **CAS #** 13127-88-3 **Purity** 99%	(Lot PR-31160)	1,502.0 µg/mL	+/- 8.9214 +/- 43.8714 +/- 53.2214	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
3	2-Chlorophenol-d4 **CAS #** 93951-73-6 **Purity** 97%	(Lot PR-29567)	1,499.6 µg/mL	+/- 8.9073 +/- 43.8019 +/- 53.1371	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
4	1,2-Dichlorobenzene-d4 **CAS #** 2199-69-1 **Purity** 99%	(Lot BP-1072)	1,010.0 µg/mL	+/- 5.9991 +/- 29.5007 +/- 35.7880	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
5	Nitrobenzene-d5 **CAS #** 4165-60-0 **Purity** 99%	(Lot PR-29603)	1,006.0 µg/mL	+/- 5.9753 +/- 29.3839 +/- 35.6463	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
6	2-Fluorobiphenyl **CAS #** 321-60-8 **Purity** 99%	(Lot Q165-67)	1,002.0 µg/mL	+/- 5.9516 +/- 29.2671 +/- 35.5046	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed
7	2,4,6-Tribromophenol **CAS #** 118-79-6 **Purity** 99%	(Lot S55013V)	1,506.0 µg/mL	+/- 8.9452 +/- 43.9882 +/- 53.3632	µg/mL µg/mL µg/mL	Gravimetric Unstressed Stressed

Certificate of Analysis

BNAs - Sandy Loam50g

Certified Reference Material

Description

Product ID CRM143-50G
Lot **LRAC2475**
Expiration Date April 2022
Manufacturing Date April 2019
Storage Conditions Refrigerate
Solvent/Matrix SOIL

Certified Values

Analyte	*Units*	*Certified Value* [1,4]
1,2-Dichlorobenzene	µg/Kg	1700 ± 23.9
1,3-Dichlorobenzene	µg/Kg	5610 ± 86.1
1,4-Dichlorobenzene	µg/Kg	7450 ± 114
2,4,5-Trichlorophenol	µg/Kg	4150 ± 45.7
2,4,6-Trichlorophenol	µg/Kg	5880 ± 65.8
2,4-Dichlorophenol	µg/Kg	4410 ± 52.9
2,4-Dimethylphenol	µg/Kg	4380 ± 50.1
2,4-Dinitrotoluene (2,4-DNT)	µg/Kg	5760 ± 69.8
2,6-Dichlorophenol	µg/Kg	6720 ± 65.3
2,6-Dinitrotoluene (2,6-DNT)	µg/Kg	7300 ± 85.9
2-Chloronaphthalene	µg/Kg	3000 ± 26.3
2-Chlorophenol	µg/Kg	6050 ± 75.9
2-Methylnaphthalene	µg/Kg	3630 ± 45.8
2-Methylphenol (o-Cresol)	µg/Kg	5870 ± 70.8
2-Nitroaniline	µg/Kg	2350 ± 29.6
2-Nitrophenol	µg/Kg	3670 ± 45
3+4-Methylphenol (m+p-Cresol)	µg/Kg	6150 ± 74.8
4-Bromophenyl phenyl ether	µg/Kg	3500 ± 38.2
4-Chlorophenyl phenylether	µg/Kg	1680 ± 18.6
4-Methylphenol (p-Cresol)	µg/Kg	5980 ± 74.8
4-Nitrophenol	µg/Kg	3870 ± 55.7

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

SIGMA-ALDRICH
2931 Soldier Springs Rd. Laramie, Wyoming 82070 USA
307-742-5452
rtctechgroup@sial.com www.sigma-aldrich.com

Description

Lot **LRAC2475**
Expiration Date April 2022
Manufacturing Date April 2019
Storage Conditions Refrigerate
Solvent/Matrix SOIL

Acenaphthene	µg/Kg	4250 ± 53.4
Acenaphthylene	µg/Kg	5450 ± 70.8
Anthracene	µg/Kg	3240 ± 47.1
Benzo(a)anthracene	µg/Kg	3280 ± 39.9
Benzo(a)pyrene	µg/Kg	1690 ± 23.1
Benzo(b)fluoranthene	µg/Kg	6180 ± 75.2
Benzo(g,h,i)perylene	µg/Kg	2550 ± 33.4
Benzo(k)fluoranthene	µg/Kg	1700 ± 19.8
bis(2-Chloroethoxy)methane	µg/Kg	4860 ± 64.4
bis(2-Chloroethyl) ether	µg/Kg	3490 ± 46.3
Chrysene	µg/Kg	1750 ± 20.6
Dibenzo(a,h)anthracene	µg/Kg	3030 ± 35.6
Dibenzofuran	µg/Kg	4010 ± 55.9
Di-n-octyl phthalate	µg/Kg	7640 ± 89.8
Fluoranthene	µg/Kg	4060 ± 47.3
Fluorene	µg/Kg	5780 ± 71.6
Hexachlorobenzene	µg/Kg	2610 ± 31.4
Hexachloroethane	µg/Kg	5770 ± 90.8
Indeno(1,2,3-cd) pyrene	µg/Kg	2670 ± 32.6
Isophorone	µg/Kg	7010 ± 89.8
Naphthalene	µg/Kg	1920 ± 24.5
n-Nitrosodimethylamine	µg/Kg	2990 ± 52.9
n-Nitroso-di-n-propylamine	µg/Kg	7930 ± 102
n-Nitrosodiphenylamine	µg/Kg	5460 ± 86.1
Pentachlorophenol	µg/Kg	5820 ± 75.9
Phenanthrene	µg/Kg	2210 ± 23.7
Phenol	µg/Kg	4870 ± 60.5

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

Certificate of Analysis

BNAs - Sandy Loam50g

Certified Reference Material

Description

Product ID CRM143-50G
Lot **LRAC2475**
Expiration Date April 2022
Manufacturing Date April 2019
Storage Conditions Refrigerate
Solvent/Matrix SOIL

Pyrene	µg/Kg	6300 ± 70.8

Informational Values

Analyte	*Units*	*Suggested Acceptance Windows*	*Standard Deviation*
1,2-Dichlorobenzene	µg/Kg	283 to 3120	472
1,3-Dichlorobenzene	µg/Kg	924 to 10300	1560
1,4-Dichlorobenzene	µg/Kg	897 to 14000	2180
2,4,5-Trichlorophenol	µg/Kg	1330 to 6970	941
2,4,6-Trichlorophenol	µg/Kg	2510 to 9240	1120
2,4-Dichlorophenol	µg/Kg	1280 to 7550	1040
2,4-Dimethylphenol	µg/Kg	832 to 7930	1180
2,4-Dinitrotoluene (2,4-DNT)	µg/Kg	1840 to 9680	1310
2,6-Dichlorophenol	µg/Kg	1490 to 12000	1750
2,6-Dinitrotoluene (2,6-DNT)	µg/Kg	1940 to 12700	1790
2-Chloronaphthalene	µg/Kg	0 to 6240	1080
2-Chlorophenol	µg/Kg	988 to 11100	1690
2-Methylnaphthalene	µg/Kg	1840 to 5420	597
2-Methylphenol (o-Cresol)	µg/Kg	1580 to 10200	1430
2-Nitroaniline	µg/Kg	940 to 3760	470
2-Nitrophenol	µg/Kg	824 to 6520	950
3+4-Methylphenol (m+p-Cresol)	µg/Kg	776 to 11500	1790
4-Bromophenyl phenyl ether	µg/Kg	1230 to 5770	757
4-Chlorophenyl phenylether	µg/Kg	860 to 2500	274
4-Methylphenol (p-Cresol)	µg/Kg	620 to 11300	1790
4-Nitrophenol	µg/Kg	0 to 12100	2740
Acenaphthene	µg/Kg	2500 to 6000	584
Acenaphthylene	µg/Kg	3130 to 7760	771
Anthracene	µg/Kg	1690 to 4800	519
Benzo(a)anthracene	µg/Kg	1090 to 5470	730
Benzo(a)pyrene	µg/Kg	749 to 2640	315
Benzo(b)fluoranthene	µg/Kg	3100 to 9270	1030
Benzo(g,h,i)perylene	µg/Kg	1020 to 4090	511
Benzo(k)fluoranthene	µg/Kg	0 to 3690	661
bis(2-Chloroethoxy)methane	µg/Kg	1200 to 8520	1220

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

SIGMA-ALDRICH®
2931 Soldier Springs Rd. Laramie, Wyoming 82070 USA
307-742-5452
rtctechgroup@sial.com www.sigma-aldrich.com

Description

Lot **LRAC2475**
Expiration Date April 2022
Manufacturing Date April 2019
Storage Conditions Refrigerate
Solvent/Matrix SOIL

bis(2-Chloroethyl) ether	µg/Kg	37.6 to 6940	1150
Chrysene	µg/Kg	1080 to 2430	225
Dibenzo(a,h)anthracene	µg/Kg	581 to 5470	815
Dibenzofuran	µg/Kg	2310 to 5710	567
Di-n-octyl phthalate	µg/Kg	569 to 14700	2360
Fluoranthene	µg/Kg	1850 to 6280	738
Fluorene	µg/Kg	2750 to 8810	1010
Hexachlorobenzene	µg/Kg	1080 to 4150	512
Hexachloroethane	µg/Kg	493 to 11000	1760
Indeno(1,2,3-cd) pyrene	µg/Kg	710 to 4630	654
Isophorone	µg/Kg	1420 to 12600	1860
Naphthalene	µg/Kg	788 to 3050	377
n-Nitrosodimethylamine	µg/Kg	0 to 6210	1080
n-Nitroso-di-n-propylamine	µg/Kg	2330 to 13500	1870
n-Nitrosodiphenylamine	µg/Kg	1330 to 9590	1380
Pentachlorophenol	µg/Kg	485 to 11200	1780
Phenanthrene	µg/Kg	885 to 3530	440
Phenol	µg/Kg	889 to 8840	1330
Pyrene	µg/Kg	1670 to 10900	1540

Additional Information:

DESCRIPTION

The organic sample is a soil containing extractable BNAs for analysis by 8100, 8270, 8310 or equivalent methods.

This product consist of a 5 vials each containing 10g of soil for analysis of PAHs. Each vial is identical and has been tested how homogeneity. Only one vial is need for test the remaining vials are to be used for multiple methods or routine testing.

The soil has been sterilized to minimize degradation of the sample.

The sample has been sized to 100 mesh.

Required storage condition is 4ºC.

The sample has been intentionally prepared with an apparent headspace.

STORAGE

The sample should be stored at 4ºC. It has been determined to be stable for the duration of the expiration date.

After sub-sampling replace cap securely and store remaining sample at 4ºC.

The shelf life of the product was determined by historic stability of similar CRM's. The expiration date may be extended based on stock and popularity upon successful stability testing by a 17025 accredited laboratory.

Stability and shelf life after opening must be determined by the user, taking into account sampling frequency/volume and all local conditions.

SAMPLE PREPARATION

Extract the complete contents of a single vial. Transfer entire contents of one vial to extraction vessel. Rinse vial and cap with extraction solvent.

Assume a 10g sample size for all calculations.

Note: Sample extracts and calibration solutions should be in the same solvent.

Report all results on a wet weight basis, do not correct for moisture.

NOTE: For method 8100 and using a packed column gas chromatographic method or cannot adequately resolve the following

Certificate of Analysis

BNAs - Sandy Loam50g

Certified Reference Material

Description

Product ID CRM143-50G
Lot **LRAC2475**
Expiration Date April 2022
Manufacturing Date April 2019
Storage Conditions Refrigerate
Solvent/Matrix SOIL

may coelute in four pairs of compounds: anthracene and phenanthrene; chrysene and benzo(a)anthracene; benzo(b)fluoranthene and benzo(k)fluoranthene; and dibenzo(a,h)anthracene and indeno(1,2,3-cd)pyrene.

SCOPE AND APPLICATION

The BNAs in Soil Certified Reference Material (CRM) consists of 5 10mL VOA vials, with a Teflon lined closures containing approximately 10 grams of soil, fortified with BNAs. Being a natural matrix waste sample the analyst is challenged by the same preparation problems, analytical interferences, etc. as is typical for similar matrices received by the laboratory for analysis. Rigorous analyses identified, quantified, and certified various aliphatic and aromatic banding which are listed on the enclosed Certificate of Analysis. The sample has been analyzed by a minimum of 12 independent laboratories in a round-robin to meet the requirements specified by the ISO Guides 34 and 35, and ISO 17025.

1 **Metrological traceability:** Traceable to the SI and higher order standards from NIST through an unbroken chain of comparisons. The balance used to weigh raw materials is accurate to +/-0.0001 g and calibrated regularly using mass standards traceable to NIST. All dilutions were performed gravimetrically. Additionally, individual analytes are traceable to NIST SRMs where available and specified above.
4 Ucrm - Uncertainty values in this document are expressed as Expanded Uncertainty (Ucrm) corresponding to the 95% confidence interval. Ucrm is derived from the combined standard uncertainty multiplied by the coverage factor k, which is obtained from a *t*-distribution and degrees of freedom. The components of combined standard uncertainty include the uncertainties due to characterization, homogeneity, long term stability, and short term stability (transport). The components due to stability are generally considered to be negligible unless otherwise indicated by stability studies. The mathematical representation of the Ucrm calculation is as follows:

$$u_{CRM} = \sqrt{u^2_{char} + u^2_{homogeneity} + u^2_{stability}}$$

k: Coverage factor derived from a t-distribution table, based on the degrees of freedom of the data set. Assume 2.0 for a **Confidence interval = 95%**

6 Analytical Value- For QC verification of the certified value only- not to be used in calculations. Represents the analytical data obtained by comparison to a standard as analyzed by the method described in the CoA or another acceptable method. The result may differ from the certified value and UCRM based on method uncertainty as well as the uncertainty associated with the standard used for comparison.

Traceability: The standard was manufactured under an ISO/IEC 17025:2017 certified quality system. The balance used to weigh raw materials is accurate to +/- 0.0001g and calibrated regularly using mass standards traceable to NIST. All dilutions were preformed gravimetrically. Additionally, individual analytes are traceable to NIST SRMs where available and specified above.

Homogeneity: Homogeneity was assessed in accordance with ISO 17034:2016. Completed units were sampled using a random stratified sampling protocol. The results of chemical analysis were then compared using a one-way analysis of variance approach as described by TNI EL-V3-2009 Appendix A.2. See Instructions for minimum sub-sample size.

Expiration is at end of month given on certificate and label.

THIS PRODUCT WAS DESIGNED, PRODUCED AND VERIFIED FOR ACCURACY AND STABILITY IN ACCORDANCE WITH **ISO/IEC 17025:2017 (ANAB Cert AT-1467)** and **ISO 17034:2016 (ANAB Cert AR-1470).**

MSDS reports for components comprising greater than 1.0% of the solution or 0.1% for components known to be carcinogens are available upon request.

Andy Ommen - QC Manager

Mark Pooler - QA Supervisor

Certification Date August 09, 2019
Version 0-892019

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

SIGMA-ALDRICH®
2931 Soldier Springs Rd. Laramie, Wyoming 82070 USA
307-742-5452
rtctechgroup@sial.com www.sigma-aldrich.com

Agilent

Certificate of Analysis

I007067

Product Name: PAH Standard

Product Number: US-106N-1 **Lot Issue Date:** 11-Jun-2020

Lot Number: 0006540449 **Expiration Date:** 30-Jun-2023

Description:

This analytical reference material (RM) was manufactured and verified in accordance with an ISO 9001 registered quality system, and analyte concentrations were verified by an ISO 17025 accredited laboratory. The concentration and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	Concentration ± Uncertainty
acenaphthene	000083-32-9	RM10879	2008 ± 10 µg/mL
acenaphthylene	000208-96-8	RM10891	2003 ± 10 µg/mL
anthracene	000120-12-7	RM14212	2006 ± 10 µg/mL
benz[a]anthracene	000056-55-3	RM16072	2006 ± 10 µg/mL
benzo[b]fluoranthene	000205-99-2	RM14571	2005 ± 10 µg/mL
benzo[k]fluoranthene	000207-08-9	RM14321	2009 ± 10 µg/mL
benzo[ghi]perylene	000191-24-2	RM15761	2008 ± 10 µg/mL
benzo[a]pyrene	000050-32-8	RM12669	2009 ± 10 µg/mL
chrysene	000218-01-9	RM12260	2009 ± 10 µg/mL
dibenz[a,h]anthracene	000053-70-3	RM06786	2009 ± 10 µg/mL
fluoranthene	000206-44-0	RM12277	2004 ± 10 µg/mL
fluorene	000086-73-7	RM09441	2009 ± 10 µg/mL
indeno[1,2,3-cd]pyrene	000193-39-5	RM14192	2009 ± 10 µg/mL
naphthalene	000091-20-3	NT00970	2008 ± 10 µg/mL
phenanthrene	000085-01-8	RM10495	2009 ± 10 µg/mL
pyrene	000129-00-0	RM03479	2008 ± 10 µg/mL

Matrix: methylene chloride/benzene (1:1)

I007067
SVOA PAH STD 2000ug/ml
Solvent / Lot: DCM/BENZENE
Prep: 8/12/2020 by JZ
Exp: 6/30/2023
Location: Fridge 19

8/12/20

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ISO 17034 Cert No. AR-1936

RM was produced in accordance with TUV USA Inc registered ISO 9001 Quality Management System. Cert # 56 100 18560026

Page: 1 of 2

www.agilent.com/quality/

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 17025 Cert No. AT-1937

Certificate of Analysis

phenova Certified Reference Materials | A Phenomenex Company

Produced by Phenova
6390 Joyce Drive STE 100, Golden, CO 80403 USA ▪ Tel: 303-940-0033 ▪ Fax: 303-940-0043 ▪ info@phenova.com
Access your Safety Data Sheets and digital Certificates at **www.phenova.com/documents.**

Certified Reference Material

This product is certified in accordance with Phenova's ISO 17034 accreditation and supported by Phenova's ISO/IEC 17025 chemical testing accreditation

Catalog No.: AL0-101244
Lot Number: CL15236
Description: Benzidines Standard
Certification Date: April 28, 2020
Storage: 4 °C
Expiration Date: April 30, 2030
Provided As: 1 mL in 2 mL Ampoule in Methylene Chloride

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Benzidine	92-87-5	2000	± 0.231%
3,3'-Dichlorobenzidine	91-94-1	2000	± 0.116%

I007617
Benzidines std @2000ug/ml
Solvent / Lot: Mecl2
Prep: 8/27/2020 by JZ
Exp: 4/30/2030
Location: GC

08/27/20.

ACCREDITED
Reference Material Producer
Certicate No. 2427.02

phenova Certified Reference Materials | A Phenomenex Company

Phenova is an accredited ISO/IEC 17034 Reference Material Producer and ISO/IEC 17025 accredited Chemical Testing Laboratory.

ACCREDITED
Chemical Testing Laboratory
Certicate No. 2427.03

IL64691018_us

Certificate of Analysis

TCL HAZARDOUS SUBSTANCES MIX 2,1X1ML,2000UG/ML,DICHLOROMETHA

Certified Reference Material

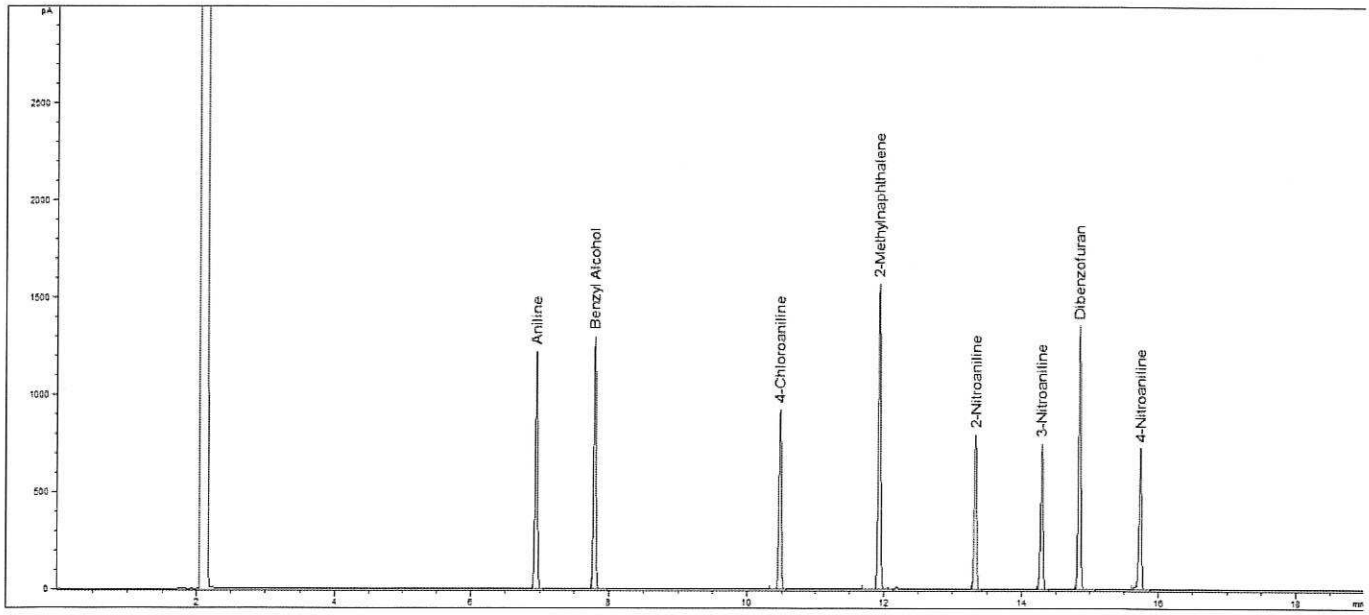
Description

Product ID 48908
Lot **LRAC2138**
Expiration Date February 2022
Manufacturing Date March 2019
Storage Conditions Refrigerate
Solvent/Matrix Dichloromethane/Benzene 80:20

I009199
toxic sub mix#2
Solvent / Lot: LRAC2138
Prep: 10/6/2020 by VS
Exp: 2/28/2022
Location:

Certified Values

Analyte	*Units*	*Certified Value* [1,4]	*Raw Material Purity,%*	*Analytical Value*	*Elution order*	*Raw Material Lot*	*CAS*
ANILINE	µg/mL	2008 ± 89	99.9%	1990	1	LA41596	62-53-3
BENZYL ALCOHOL	µg/mL	2008 ± 87	98.2%	2020	2	LC07608	100-51-6
4-CHLOROANILINE	µg/mL	2008 ± 84	99.5%	1990	3	P500200	106-47-8
2-METHYLNAPHTHALENE	µg/mL	2008 ± 87	98.2%	2005	4	LB97828	91-57-6
2-NITROANILINE	µg/mL	2008 ± 82	99.9%	2021	5	07411KN	88-74-4
3-NITROANILINE	µg/mL	2008 ± 86	100%	2009	6	MKBX1283V	99-09-2
DIBENZOFURAN	µg/mL	2008 ± 80	98.8%	1988	7	LB78814	132-64-9
4-NITROANILINE	µg/mL	2008 ± 91	99.9%	2025	8	LC11400	100-01-6



Additional Information:

Analytical Method Parameters:

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

SIGMA-ALDRICH®
2931 Soldier Springs Rd. Laramie, Wyoming 82070 USA
307-742-5452
rctechgroup@sial.com www.sigma-aldrich.com

Description

Lot	**LRAC2138**
Expiration Date	February 2022
Manufacturing Date	March 2019
Storage Conditions	Refrigerate
Solvent/Matrix	Dichloromethane/Benzene 80:20

Column: SPB-5, 30 m x 0.53 mm x 1.5 µm df
80°C (2 min) to 250°C at 10°C/min
Detector: FID, 300°C
Injection Volume: 1 µL

1 **Metrological traceability:** Traceable to the SI and higher order standards from NIST through an unbroken chain of comparisons. The balance used to weigh raw materials is accurate to +/-0.0001 g and calibrated regularly using mass standards traceable to NIST. All dilutions were performed gravimetrically. Additionally, individual analytes are traceable to NIST SRMs where available and specified above.
4 Ucrm - Uncertainty values in this document are expressed as Expanded Uncertainty (Ucrm) corresponding to the 95% confidence interval. Ucrm is derived from the combined standard uncertainty multiplied by the coverage factor k, which is obtained from a *t*-distribution and degrees of freedom. The components of combined standard uncertainty include the uncertainties due to characterization, homogeneity, long term stability, and short term stability (transport). The components due to stability are generally considered to be negligible unless otherwise indicated by stability studies. The mathematical representation of the Ucrm calculation is as follows:

$$u_{CRM} = \sqrt{u_{char}^2 + u_{homogeneity}^2 + u_{stability}^2}$$

k: Coverage factor derived from a t-distribution table, based on the degrees of freedom of the data set. Assume 2.0 for a **Confidence interval = 95%**

Traceability: The standard was manufactured under an ISO/IEC 17025:2017 certified quality system. The balance used to weigh raw materials is accurate to +/- 0.0001g and calibrated regularly using mass standards traceable to NIST. All dilutions were preformed gravimetrically. Additionally, individual analytes are traceable to NIST SRMs where available and specified above.

Homogeneity: Homogeneity was assessed in accordance with ISO 17034:2016. Completed units were sampled using a random stratified sampling protocol. The results of chemical analysis were then compared using a one-way analysis of variance approach as described by TNI EL-V3-2009 Appendix A.2. See Instructions for minimum sub-sample size.

Expiration is at end of month given on certificate and label.

THIS PRODUCT WAS DESIGNED, PRODUCED AND VERIFIED FOR ACCURACY AND STABILITY IN ACCORDANCE WITH **ISO/IEC 17025:2017 (ANAB Cert AT-1467)** and **ISO 17034:2016 (ANAB Cert AR-1470).**

MSDS reports for components comprising greater than 1.0% of the solution or 0.1% for components known to be carcinogens are available upon request.

Andy Ommen - QC Manager

Mark Pooler - QA Supervisor

Certification Date	March 25, 2019
Version	0-3252019

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

Certificate of Analysis

TCL BASE/NEUTRALS MIX 2,1X1ML,2000UG/ML,METHYLENE CHLORIDE

Certified Reference Material

Description

Product ID 48120-U
Lot **LRAC3867**
Expiration Date November 2022
Manufacturing Date November 2019
Storage Conditions REFRIGERATE
Solvent/Matrix METHYLENE CHLORIDE

I009209
TCL B/N MIX2-2000ug/ml
Solvent / Lot: LRAC3867
Prep: 10/6/2020 by VS
Exp: 11/30/2022
Location:

Certified Values

Analyte	*Certified Value* [1,4]	*Units*	*Raw Material Purity,%*	*Elution order*	*Raw Material Lot*	*CAS*
1,3-DICHLOROBENZENE	2007 ± 54	µg/mL	99.9	01	LC17654	541-73-1
1,4-DICHLOROBENZENE	1999 ± 50	µg/mL	99.9	02	LB90630	106-46-7
1,2-DICHLOROBENZENE	2002 ± 51	µg/mL	99.4	03	LB58923	95-50-1
HEXACHLOROETHANE	2000 ± 55	µg/mL	99.4	04	LB29072	67-72-1
NITROBENZENE	2006 ± 57	µg/mL	99.9	05	LB47070	98-95-3
ISOPHORONE	2003 ± 56	µg/mL	98.5	06	10830MQ	78-59-1
1,2,4-TRICHLOROBENZENE	2004 ± 60	µg/mL	99.4	07	LB48083	120-82-1
HEXACHLOROBUTADIENE	2000 ± 54	µg/mL	97.2	08	MKCG6212	87-68-3
HEXACHLOROCYCLOPENTADIENE	2002 ± 59	µg/mL	96.0	09	LB95525	77-47-4
2-CHLORONAPHTHALENE	2005 ± 51	µg/mL	99.9	10	LC11403	91-58-7
2,6-DINITROTOLUENE	2000 ± 57	µg/mL	99.2	11	11231AN	606-20-2
2,4-DINITROTOLUENE	2000 ± 61	µg/mL	97.8	12	LB46632	121-14-2
AZOBENZENE	2000 ± 64	µg/mL	98.2	13	BCBS6535V	103-33-3
HEXACHLOROBENZENE	2000 ± 60	µg/mL	98.0	14	1-AWT-44-1	118-74-1
CARBAZOLE	2000 ± 56	µg/mL	98.1	15	LC13236	86-74-8

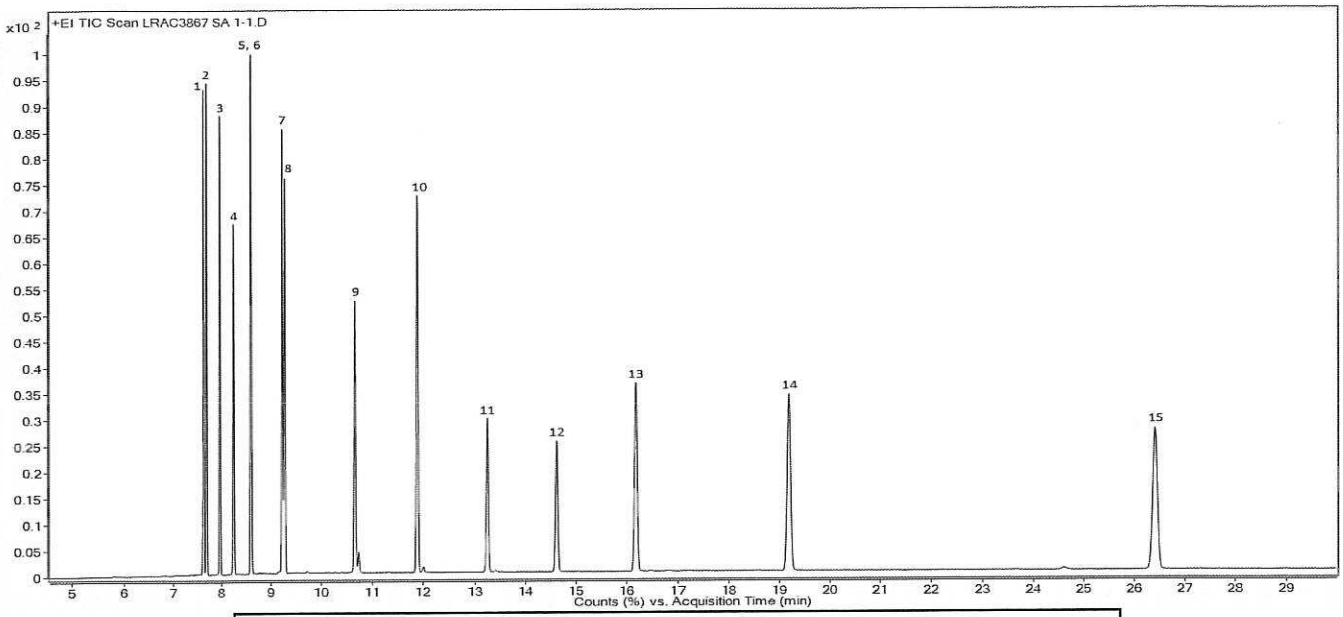
ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED ISO IEC 17025 TESTING LABORATORY

SIGMA-ALDRICH®
2931 Soldier Springs Rd. Laramie, Wyoming 82070 USA
800-325-5832
TechService@milliporesigma.com www.sigma-aldrich.com

Description

Lot	**LRAC3867**
Expiration Date	November 2022
Manufacturing Date	November 2019
Storage Conditions	REFRIGERATE
Solvent/Matrix	METHYLENE CHLORIDE

Informational Values



ELUTION DETAILS

EO	RT(MIN)	ANALYTE
1	7.62	1,3-dichlorobenzene
2	7.68	1,4-dichlorobenzene
3	7.97	1,2-dichlorobenzene
4	8.25	Hexachloroethane
5	8.59	Nitrobenzene
6	8.6	Isophorone
7	9.22	1,2,4-trichlorobenzene
8	9.27	Hexachlorobutadiene
9	10.65	Hexachlorocyclopentadiene
10	11.88	2-chloronaphthalene
11	13.25	2,6-dinitrotoluene
12	14.62	2,4-dinitrotoluene
13	16.19	Azobenzene
14	19.19	Hexachlorobenzene
15	26.43	Carbazole

Additional Information:

Analytical Method Parameters:
Column: VOCOL, 60 m × 0.25 mm I.D., 1.5 µm film thickness (Column #113)
Carrier Gas: He, Flow: 1.5 mL/min
Inlet Temperature: 250 °C, Injection Volume: 1.0 µL
Injection Mode: Split, Split Ratio: 80:1
Temperature Program: 100 °C (Hold 1 min) @ 25 °C/min to 250 °C (Hold 23 min)
Detector: MSD, Mode: FS mode. Mass Range: 40-400 m/z. Scan Rate: 4.1 scans/sec, Solvent delay: 4.5 min
Detector Temperature: Transfer line: 250 °C, Ion Source: 230 °C, and Quadrupole: 150 °C

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

Certificate of Analysis

TCL BASE/NEUTRALS MIX 2,1X1ML,2000UG/ML,METHYLENE CHLORIDE

Certified Reference Material

Description

Product ID 48120-U
Lot **LRAC3867**
Expiration Date November 2022
Manufacturing Date November 2019
Storage Conditions REFRIGERATE
Solvent/Matrix METHYLENE CHLORIDE

1 **Metrological traceability:** Traceable to the SI and higher order standards from NIST through an unbroken chain of comparisons. The balance used to weigh raw materials is accurate to +/-0.0001 g and calibrated regularly using mass standards traceable to NIST. All dilutions were performed gravimetrically. Additionally, individual analytes are traceable to NIST SRMs where available and specified above.
4 Ucrm - Uncertainty values in this document are expressed as Expanded Uncertainty (Ucrm) corresponding to the 95% confidence interval. Ucrm is derived from the combined standard uncertainty multiplied by the coverage factor k, which is obtained from a *t*-distribution and degrees of freedom. The components of combined standard uncertainty include the uncertainties due to characterization, homogeneity, long term stability, and short term stability (transport). The components due to stability are generally considered to be negligible unless otherwise indicated by stability studies. The mathematical representation of the Ucrm calculation is as follows:

$$u_{CRM} = \sqrt{u_{char}^2 + u_{homogeneity}^2 + u_{stability}^2}$$

k: Coverage factor derived from a t-distribution table, based on the degrees of freedom of the data set. Assume 2.0 for a **Confidence interval = 95%**

6 Analytical Value- For QC verification of the certified value only- not to be used in calculations. Represents the analytical data obtained by comparison to a standard as analyzed by the method described in the CoA or another acceptable method. The result may differ from the certified value and UCRM based on method uncertainty as well as the uncertainty associated with the standard used for comparison.

Traceability: The standard was manufactured under an ISO/IEC 17025:2017 certified quality system. The balance used to weigh raw materials is accurate to +/- 0.0001g and calibrated regularly using mass standards traceable to NIST. All dilutions were preformed gravimetrically. Additionally, individual analytes are traceable to NIST SRMs where available and specified above.

Homogeneity: Homogeneity was assessed in accordance with ISO 17034:2016. Completed units were sampled using a random stratified sampling protocol. The results of chemical analysis were then compared using a one-way analysis of variance approach as described by TNI EL-V3-2009 Appendix A.2. See Instructions for minimum sub-sample size.

Expiration is at end of month given on certificate and label.

MSDS reports for components comprising greater than 1.0% of the solution or 0.1% for components known to be carcinogens are available upon request.

THIS PRODUCT WAS DESIGNED, PRODUCED AND VERIFIED FOR ACCURACY AND STABILITY IN ACCORDANCE WITH **ISO/IEC 17025:2017 (ANAB Cert AT-1467)** and **ISO 17034:2016 (ANAB Cert AR-1470).**

Andy Ommen - QC Manager

Mark Pooler - QA Supervisor

Certification Date December 11, 2019
Version 0-12112019

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

SIGMA-ALDRICH®
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800-325-5832
TechService@milliporesigma.com www.sigma-aldrich.com

Certificate of Composition

ANALYTICAL STANDARD

12 Comp. at Varied Concentrations in Dichloromethane

Product ID 22523051
Lot **LRAC8251**
Expiration Date October 2022
Storage Conditions Refrigerate
Solvent/Matrix Dichloromethane

I010140

Analyte	*Assigned Value* [1]	*Units*	*Raw Material Purity,%*	*Raw Material Lot*	*CAS*
3,3'-DICHLOROBENZIDINE	800 ± 24.0	µg/mL	99.9	LC27068	91-94-1
2,4-DINITROTOLUENE	798 ± 23.9	µg/mL	98.9	12316HF	121-14-2
2,6-DINITROTOLUENE	800 ± 24.0	µg/mL	99.9	LB79891	606-20-2
HEXACHLOROCYCLOPENTADIENE	804 ± 24.1	µg/mL	96.0	LB95525	77-47-4
N-NITROSODIMETHYLAMINE	804 ± 24.1	µg/mL	99.5	9815100	62-75-9
PERYLENE	201 ± 6.04	µg/mL	99.6	04101PG	198-55-0
ANILINE	804 ± 24.1	µg/mL	100.0	10126MG	62-53-3
4-CHLOROANILINE	800 ± 24.0	µg/mL	100.0	MKBZ6909V	106-47-8
2-NITROANILINE	801 ± 24.0	µg/mL	99.9	LC05068	88-74-4
3-NITROANILINE	799 ± 24.0	µg/mL	99.9	LC09264	99-09-2
4-NITROANILINE	800 ± 24.0	µg/mL	99.9	LC11400	100-01-6
PYRIDINE (LOW WATER)	816 ± 24.5	µg/mL	100.0	SHBJ4964	110-86-1

Additional Information

1 Assigned value - the gravimetrically prepared value. Uncertainty is based on gravimetric preparation.

Traceability: The standard was manufactured under an ISO/IEC 17025:2017 certified quality system. The balance used to weigh raw materials is accurate to +/- 0.0001g and calibrated regularly using mass standards traceable to NIST. All dilutions were preformed gravimetrically.

MSDS reports for components comprising greater than 1.0% of the solution or 0.1% for components known to be carcinogens are available upon request.

Robert O'Brien - Program Manager

Mark Pooler - QA Supervisor

Certification Date October 12, 2020
Version -10122020

MilliporeSigma
2931 Soldier Springs Rd. Laramie, Wyoming 82070 USA
800-325-3010
www.sigma-aldrich.com

Certificate of Composition

ACID STOCK

ANALYTICAL STANDARD

Product ID 22523046
Lot **LRAC8250**
Expiration Date October 2022
Storage Conditions Refrigerate
Solvent/Matrix Dichloromethane

I 010141

Analyte	*Assigned Value* [1]	*Units*	*Raw Material Purity,%*	*Raw Material Lot*	*CAS*
2,4-DIMETHYLPHENOL	800 ± 24.0	µg/mL	99.2	05421CO	105-67-9
2,4-DICHLOROPHENOL	804 ± 24.1	µg/mL	99.5	03221TN	120-83-2
2,4,5-TRICHLOROPHENOL	800 ± 24.0	µg/mL	99.9	JS00008	95-95-4
2,4-DINITROPHENOL	1,800 ± 54.0	µg/mL	75.9	MKBP5833V	51-28-5
2,4,6-TRICHLOROPHENOL	801 ± 24.0	µg/mL	99.5	04212PS	88-06-2
4-CHLORO-3-METHYLPHENOL	800 ± 24.0	µg/mL	100.0	BCCB3243	59-50-7
4-NITROPHENOL	799 ± 24.0	µg/mL	99.3	P500150	100-02-7
2-METHYL-4,6-DINITROPHENOL	1,800 ± 54.0	µg/mL	99.9	LB99844	534-52-1
PENTACHLOROPHENOL	801 ± 24.0	µg/mL	97.9	MKCD2150	87-86-5
BENZOIC ACID	1,800 ± 54.0	µg/mL	98.8	442-137B	65-85-0

Additional Information

1 Assigned value - the gravimetrically prepared value. Uncertainty is based on gravimetric preparation.

Traceability: The standard was manufactured under an ISO/IEC 17025:2017 certified quality system. The balance used to weigh raw materials is accurate to +/- 0.0001g and calibrated regularly using mass standards traceable to NIST. All dilutions were preformed gravimetrically.

MSDS reports for components comprising greater than 1.0% of the solution or 0.1% for components known to be carcinogens are available upon request.

Robert O'Brien - Program Manager

Mark Pooler - QA Supervisor

Certification Date October 12, 2020
Version -10122020

MilliporeSigma
2931 Soldier Springs Rd. Laramie, Wyoming 82070 USA
800-325-3010
www.sigma-aldrich.com

Certificate of Analysis

Certified Reference Material

TCL BASE/NEUTRALS MIX 1,1X1ML,2000UG/ML,DICHLOROMETHANE

Product ID 48900-U
Lot **LRAB9806**
Expiration Date July 2021
MFG Date July 2018
Storage Conditions Refrigerate
Solvent/Matrix DICHLOROMETHANE

Analyte	*Units*	*Certified Value* [1,4]	*Analytical Value*	*Raw Material Purity,%*	*Raw Material lot*	*Elution order*	*CAS*
N-NITROSODIMETHYLAMINE	ug/ml	2016 ± 54	1980	99.9	.0396806202	1	65-75-9
BIS (2-CHLOROETHYL) ETHER	ug/ml	2015 ± 52	2040	99.8	.0364002626	2	11-44-4
BIS (2-CHLOROISOPROPYL) ETHER	ug/ml	2013 ± 94	2050	68.8	.0281468195	3	108-60-1
N-NITROSODI-N-PROPYLAMINE	ug/ml	2013 ± 53	2000	99.9	.0231791414	4	621-64-7
BIS (2-CHLOROETHOXY) METHANE	ug/ml	2013 ± 43	2030	98.7	.0215224124	5	111-91-1
Methyl decanoate (ISTD)		±				6	
DIMETHYL PHTHALATE	ug/ml	2019 ± 44	1970	99.9	.0181567651	7	131-11-3
DIETHYL PHTHALATE	ug/ml	2015 ± 43	1960	99.9	.0231598629	8	84-66-2
4-CHLOROPHENYLPHENYL ETHER	ug/ml	2013 ± 53	1970	99.3	.0198666105	9	7005-72-3
N-NITROSODIPHENYLAMINE	ug/ml	2013 ± 59	1960	95.5	.0264907857	10	86-30-6
4-BROMOPHENYLPHENYL ETHER	ug/ml	2015 ± 63	1970	98.7	.0231652823	11	101-55-3
DI-N-BUTYL PHTHALATE	ug/ml	2013 ± 72	1990	99.3	.0298081364	12	84-74-2
BENZYL BUTYL PHTHALATE	ug/ml	2017 ± 49	1960	98.4	.0413116013	13	85-68-7
BIS (2-ETHYLHEXYL) PHTHALATE	ug/ml	2014 ± 44	1980	99.7	.0446807263	14	117-81-7
DI-N-OCTYL PHTHALATE	ug/ml	2017 ± 70	1990	98.3	.0528749508	15	117-84-0

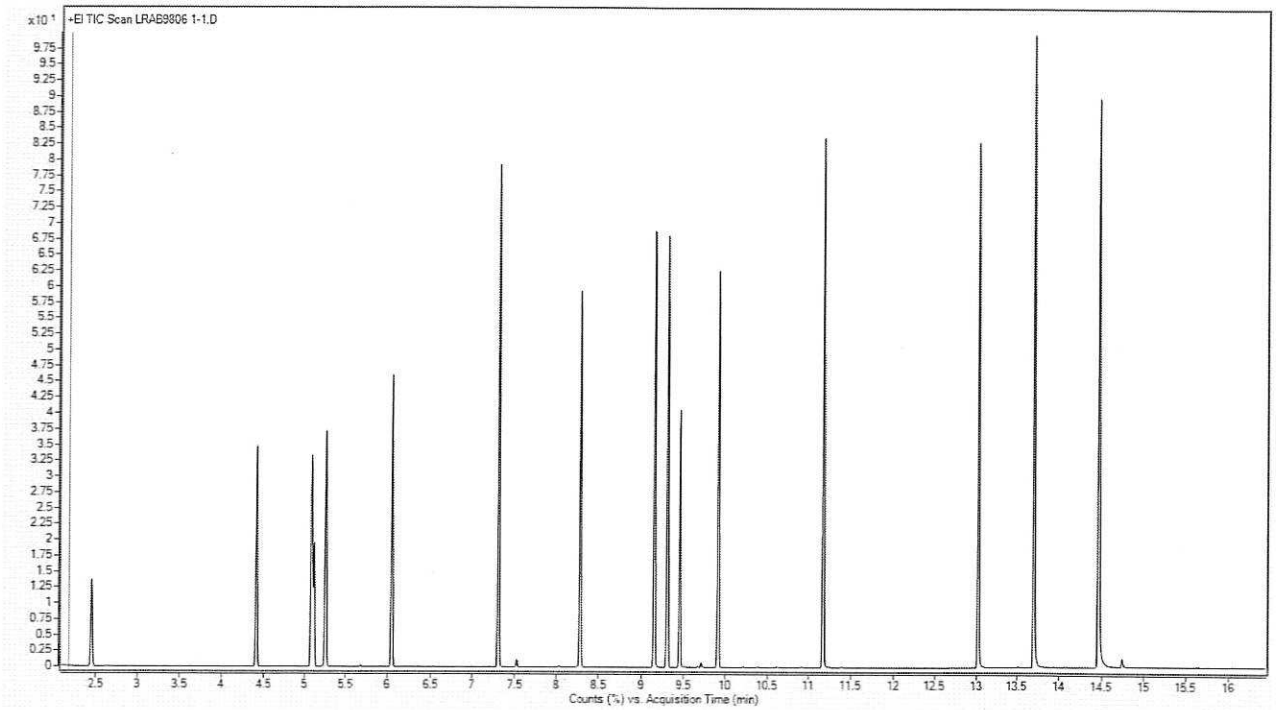
I010653
TCL B/N MIX 1 2000ug/ml
Solvent / Lot: DCM
Prep: 11/17/2020 by YZ
Exp: 7/31/2021
Location:

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

SIGMA-ALDRICH®
2931 Soldier Springs Rd. Laramie, Wyoming 82070 USA
307-742-5452
rtctechgroup@sial.com www.sigma-aldrich.com

Lot **LRAB9806**
Expiration Date July 2021
MFG Date July 2018
Storage Conditions Refrigerate
Solvent/Matrix DICHLOROMETHANE



Additional Information:

Analytical Method Parameters:

Column: SLB-5MS, 30 m x 0.25 mm x 0.25 µm df , Flow: 1.0 ml/min
Inlet: 280 oC, Injection Mode: Split, 30:1
80 oC (2 min) to 320 oC (4 min) at 20 oC/min
Detector: MSD
Injection Volume: 0.8 µL

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TCL BASE/NEUTRALS MIX 1,1X1ML,2000UG/ML,DICHLOROMETHANE

Product ID 48900-U
Lot **LRAB9806**
Expiration Date July 2021
MFG Date July 2018
Storage Conditions Refrigerate
Solvent/Matrix DICHLOROMETHANE

1 Certified value - based on the gravimetric preparation and analytically verified by RTC with associated uncertainties from the preparation and analytical procedures.

4 Ucrm - Uncertainty values in this document are expressed as Expanded Uncertainty (Ucrm) corresponding to the 95% confidence interval. Ucrm is derived from the combined standard uncertainty multiplied by the coverage factor k, which is obtained from a *t*-distribution and degrees of freedom. The components of combined standard uncertainty include the uncertainties due to characterization, homogeneity, long term stability, and short term stability (transport). The components due to stability are generally considered to be negligible unless otherwise indicated by stability studies. The mathematical representation of the Ucrm calculation is as follows:

$$u_{CRM} = \sqrt{u_{char}^2 + u_{homogeneity}^2 + u_{stability}^2}$$

Traceability: The standard was manufactured under an ISO/IEC 17025:2005 certified quality system. The balance used to weigh raw materials is accurate to +/- 0.0001g and calibrated regularly using mass standards traceable to NIST. All dilutions were preformed gravimetrically. Additionally, individual analytes are traceable to NIST SRMs where available and specified above.

Homogeneity: Homogeneity was assessed in accordance with ISO Guide 35. Completed units were sampled using a random stratified sampling protocol. The results of chemical analysis were then compared using a one-way analysis of variance approach as described by TNI EL-V3-2009 Appendix A.2. See Instructions for minimum sub-sample size.

Expiration is at end of month given on certificate and label.

THIS PRODUCT WAS DESIGNED, PRODUCED AND VERIFIED FOR ACCURACY AND STABILITY IN ACCORDANCE WITH ISO/IEC 17025:2005 (ANAB Cert AT-1467) and ISO GUIDE 34:2009 (ANAB Cert AR-1470).

MSDS reports for components comprising greater than 1.0% of the solution or 0.1% for components known to be carcinogens are available upon request.

Robert O'Brien - QC Supervisor

Mark Pooler - QA Supervisor

Certification Date December 07, 2018
Version -1272018

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

SIGMA-ALDRICH®
2931 Soldier Springs Rd. Laramie, Wyoming 82070 USA
307-742-5452
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RESTEK® CERTIFIED REFERENCE MATERIAL

110 Benner Circle
Bellefonte, PA 16823-8812
Tel: (800)356-1688
Fax: (814)353-1309

www.restek.com

ACCREDITED
ISO 17034 Accredited
Reference Material Producer
Certificate #3222.01

ACCREDITED
ISO/IEC 17025 Accredited
Testing Laboratory
Certificate #3222.02

Certificate of Analysis

11/19/2020.

FOR LABORATORY USE ONLY-READ SDS PRIOR TO USE.

This Reference Material is intended for Laboratory Use Only as a standard for the qualitative and/or quantitative determination of the analyte(s) listed.

Catalog No. : 31493 **Lot No.:** A0160[illegible]

Description : CLP 04.1 BNA Surrogate Mix

CLP 04.1 BNA Surrogate Mix 1000-1500 µg/mL, Methylene Ch 1mL/ampul

I010722
CLP 04.1 BNA SURR MIX
Solvent / Lot: methylene chloride
Prep: 11/19/2020 by JZ
Exp: 2/29/2024
Location:

Container Size : 2 mL **Pkg Amt:** > 1 mL

Expiration Date : February 29, 2024 **Storage:** 10°C or colder

Handling: Sonicate prior to use.

CERTIFIED VALUES

Elution Order	Compound		Grav. Conc. (weight/volume)	Expanded Uncertainty (95% C.L.; K=2)		
1	2-Fluorophenol		1,511.0 µg/mL	+/- 8.9749	µg/mL	Gravimetric
	CAS # 367-12-4	(Lot STBF3761V)		+/- 44.1342	µg/mL	Unstressed
	Purity 99%			+/- 53.5403	µg/mL	Stressed
2	Phenol-d6		1,512.0 µg/mL	+/- 8.9808	µg/mL	Gravimetric
	CAS # 13127-88-3	(Lot PR-31658)		+/- 44.1635	µg/mL	Unstressed
	Purity 99%			+/- 53.5758	µg/mL	Stressed
3	2-Chlorophenol-d4		1,501.6 µg/mL	+/- 8.9188	µg/mL	Gravimetric
	CAS # 93951-73-6	(Lot PR-29567)		+/- 43.8585	µg/mL	Unstressed
	Purity 97%			+/- 53.2058	µg/mL	Stressed
4	1,2-Dichlorobenzene-d4		1,003.0 µg/mL	+/- 5.9575	µg/mL	Gravimetric
	CAS # 2199-69-1	(Lot M-2097)		+/- 29.2963	µg/mL	Unstressed
	Purity 99%			+/- 35.5400	µg/mL	Stressed
5	Nitrobenzene-d5		1,004.0 µg/mL	+/- 5.9635	µg/mL	Gravimetric
	CAS # 4165-60-0	(Lot PR-29940B)		+/- 29.3255	µg/mL	Unstressed
	Purity 99%			+/- 35.5754	µg/mL	Stressed
6	2-Fluorobiphenyl		1,003.0 µg/mL	+/- 5.9575	µg/mL	Gravimetric
	CAS # 321-60-8	(Lot Q165-67)		+/- 29.2963	µg/mL	Unstressed
	Purity 99%			+/- 35.5400	µg/mL	Stressed
7	2,4,6-Tribromophenol		1,513.0 µg/mL	+/- 8.9868	µg/mL	Gravimetric
	CAS # 118-79-6	(Lot MKCJ7664)		+/- 44.1927	µg/mL	Unstressed
	Purity 99%			+/- 53.6112	µg/mL	Stressed

8	p-Terphenyl-d14		1,006.0	µg/mL	+/-	5.9753	µg/mL	Gravimetric
	CAS # 1718-51-0	(Lot PR-27278)			+/-	29.3839	µg/mL	Unstressed
	Purity 99%				+/-	35.6463	µg/mL	Stressed

Solvent: Methylene chloride
CAS # 75-09-2
Purity 99%

Tech Tips:
Due to the limited solubility of p-terphenyl-d14 in methanol, we do not recommend that this mixture be diluted in methanol.

Column:
30m x 0.25mm x 0.25µm
Rtx-5 (cat.#10223)

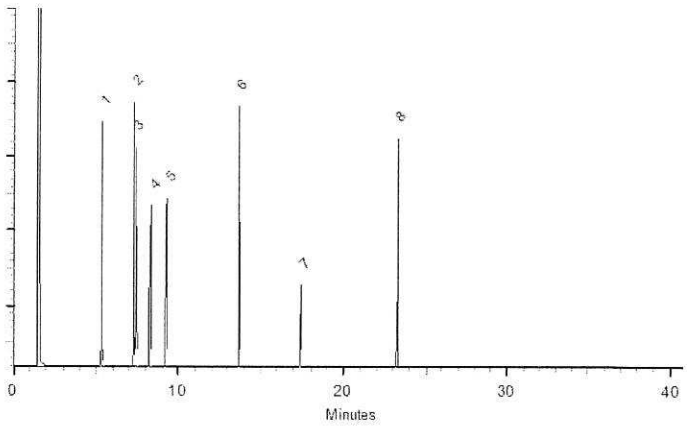
Carrier Gas:
hydrogen-constant pressure 10 psi.

Temp. Program:
40°C (hold 2 min.) to 330°C
@ 10°C/min. (hold 10 min.)

Inj. Temp:
250°C

Det. Temp:
330°C

Det. Type:
FID



This chromatogram represents a general set of testing conditions chosen for product acceptance. For optimal results in your lab, conditions should be adjusted for your specific instrument, method, and application.

Dalton Stover - Operations Technician I

Date Mixed: 19-May-2020 **Balance:** 1128353505

Fang-Yun Lo - QC Analyst

Date Passed: 21-May-2020

Manufactured under Restek's ISO 9001:2015 Registered Quality System Certificate #FM 80397

General Certified Reference Material Notes

Expiration Notes:

- Expiration date valid for unopened ampul stored in compliance with the recommended conditions.
- Uncertainty, concentration, and expiration of the CRM are based on the unopened product being stored according to the recommended condition found in the storage field.

Purity Notes:

- Purity and/or chemical identity are determined by one or more of the following techniques: GC/FID, HPLC, GC/µECD, GC/MS, LC/MS, RI, and/or melting point.
- Compounds with a listed purity of less than 99% have been weight corrected to compensate for impurities and/or salts. A correction factor is used to calculate the amount of compound necessary to achieve the desired concentration of the parent compound in solution.
- Purity of isomeric compounds is reported as the sum of the isomers.
- Purity values are rounded to the nearest whole number.

Certified Uncertainty Value Notes:

- The uncertainties are determined in accordance with ISO 17034 and Guide 35. The certified combined stressed uncertainty value (includes gravimetric uncertainty, homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty and were combined using the following formula:

$$U_{combined\ stressed} = k\sqrt{U^2_{gravimetric} + U^2_{homogeneity} + U^2_{storage\ stability} + U^2_{shipping\ stability}}$$

  k is a coverage factor of 2, which gives a level of confidence of approximately 95%.
- It is important to note that the shipping stability uncertainty was obtained under temperature extremes for specific time intervals; therefore, the certified combined stressed uncertainty value should only be applied to the product if it was stored at non-standard temperature conditions up to and including 7 days. Contact Restek Technical Service at www.restek.com/Contact-Us for use recommendations if your shipment was in-transit for more than 7 days at non-standard temperature conditions.
- Apply the certified combined unstressed uncertainty value if the product was received under standard shipping conditions. Apply the certified combined stressed uncertainty value if the product was received under non-standard conditions as specified below.

Label Conditions	Standard Conditions	Non-Standard Conditions
25°C Nominal (Room Temperature)	< 60°C	≥ 60°C up to 7 days
10°C or colder (Refrigerate)	< 40°C	≥ 40°C up to 7 days
0°C or colder (Freezer)	< 25°C	≥ 25°C up to 7 days

- Separate (not combined) uncertainty values for gravimetric uncertainty are also displayed on the certificate, if needed, separate homogeneity between-ampul uncertainty, storage stability uncertainty and shipping stability uncertainty values are available by contacting Restek Technical Service at www.restek.com/Contact-Us.
- The packaged amount is the minimum sample size for which uncertainty is valid. The ampules are over-filled to ensure that the minimum packaged amount can be sufficiently transferred.

Manufacturing Notes:

- Concentration is based upon gravimetric preparation using either a balance whose calibration has been verified daily using NIST traceable weights, and/or dilutions with Class A glassware.

Handling Notes:

- Stability of the unopened product, when stored in compliance with the recommended conditions, is guaranteed through the expiration displayed on the product label and certificate. Contact Restek for additional opened product stability information, with the knowledge/understanding that open product stability is subject to the specific handling and environmental conditions to which the product is exposed. For your convenience Restek supplies deactivated vials with most standards packed in 2mL ampules. Larger volume deactivated vials are available through Restek as a custom ordered item. Additionally, Restek sells DMDCS for the purpose of glassware deactivation as catalog number 31861, which includes complete instructions.
- If any undissolved material is visible inside the ampul, sonicate the unopened ampul until the material is completely dissolved.

Certificate of Analysis

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Access your Safety Data Sheets and digital Certificates at **www.phenova.com/documents.**

Certified Reference Material

This product is certified in accordance with Phenova's ISO 17034 accreditation and supported by Phenova's ISO/IEC 17025 chemical testing accreditation

Catalog No.: AL0-101444
Description: 8270 Calibration Standard
Storage: -18 °C
Provided As: 1 mL in 2 mL Ampoule in MeCl2/Methanol (97:3)

Lot Number: CL15267
Certification Date: June 1, 2020
Expiration Date: July 31, 2021

J000496

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Acenaphthene	83-32-9	1000	± 0.300%
Acenaphthylene	208-96-8	1000	± 0.224%
Anthracene	120-12-7	1000	± 0.224%
Azobenzene	103-33-3	1000	± 0.224%
Benzo(a)anthracene	56-55-3	1000	± 0.145%
Benzo(a)pyrene	50-32-8	1000	± 0.246%
Benzo(b)fluoranthene	205-99-2	1000	± 0.144%
Benzo(k)fluoranthene	207-08-9	1000	± 0.246%
Benzo(g,h,i)perylene	191-24-2	1000	± 0.145%
Benzyl alcohol	100-51-6	1000	± 0.230%
Benzyl butyl phthalate	85-68-7	1000	± 0.480%
bis(2-Chloroethoxy)methane	111-91-1	1000	± 0.480%
bis(2-Chloroethyl) ether	111-44-4	1000	± 0.478%
bis(2-Chloroisopropyl) ether	108-60-1	1000	± 0.148%
bis(2-Ethylhexyl) adipate	103-23-1	1000	± 0.478%
bis(2-Ethylhexyl) phthalate	117-81-7	1000	± 0.478%
4-Bromophenyl phenyl ether	101-55-3	1000	± 0.478%
Carbazole	86-74-8	1000	± 0.462%

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Reference Material Producer
Certicate No. 2427.02

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Phenova is an accredited ISO/IEC 17034 Reference Material Producer and ISO/IEC 17025 accredited Chemical Testing Laboratory.

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Chemical Testing Laboratory
Certicate No. 2427.03

IL6469101B_us

Certificate of Analysis

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Certified Reference Material

This product is certified in accordance with Phenova's ISO 17034 accreditation and supported by Phenova's ISO/IEC 17025 chemical testing accreditation

Catalog No.: AL0-101444
Lot Number: CL15267
Description: 8270 Calibration Standard
Certification Date: June 1, 2020
Storage: -18 °C
Expiration Date: July 31, 2021
Provided As: 1 mL in 2 mL Ampoule in MeCl2/Methanol (97:3)

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
4-Chloroaniline	106-47-8	1000	± 0.308%
4-Chloro-3-methylphenol	59-50-7	1000	± 0.432%
2-Chloronaphthalene	91-58-7	1000	± 0.224%
2-Chlorophenol	95-57-8	1000	± 0.384%
4-Chlorophenyl phenyl ether	7005-72-3	1000	± 0.480%
Chrysene	218-01-9	1000	± 0.147%
Dibenz(a,h)anthracene	53-70-3	1000	± 0.246%
Dibenzofuran	132-64-9	1000	± 0.301%
Di-n-butyl phthalate	84-74-2	1000	± 0.518%
1,2-Dichlorobenzene	95-50-1	1000	± 0.248%
1,3-Dichlorobenzene	541-73-1	1000	± 0.226%
1,4-Dichlorobenzene	106-46-7	1000	± 0.224%
2,4-Dichlorophenol	120-83-2	1000	± 0.432%
Diethyl phthalate	84-66-2	1000	± 0.518%
2,4-Dimethylphenol	105-67-9	1000	± 0.384%
Dimethyl phthalate	131-11-3	1000	± 2.479%
1,2-Dinitrobenzene	528-29-0	1000	± 0.362%
1,3-Dinitrobenzene	99-65-0	1000	± 2.712%
1,4-Dinitrobenzene	100-25-4	1000	± 0.242%
2,4-Dinitrophenol	51-28-5	1000	± 2.114%
2,4-Dinitrotoluene	121-14-2	1000	± 0.226%

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Certified Reference Material

This product is certified in accordance with Phenova's ISO 17034 accreditation and supported by Phenova's ISO/IEC 17025 chemical testing accreditation

Catalog No.: AL0-101444
Description: 8270 Calibration Standard
Storage: -18 °C
Provided As: 1 mL in 2 mL Ampoule in MeCl2/Methanol (97:3)

Lot Number: CL15267
Certification Date: June 1, 2020
Expiration Date: July 31, 2021

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
2,6-Dinitrotoluene	606-20-2	1000	± 0.224%
Di-n-octyl phthalate	117-84-0	1000	± 0.486%
Fluoranthene	206-44-0	1000	± 0.224%
Fluorene	86-73-7	1000	± 0.224%
Hexachlorobenzene	118-74-1	1000	± 0.151%
Hexachlorobutadiene	87-68-3	1000	± 0.480%
Hexachlorocyclopentadiene	77-47-4	1000	± 0.153%
Hexachloroethane	67-72-1	1000	± 0.300%
Indeno(1,2,3-cd)pyrene	193-39-5	1000	± 0.148%
Isophorone	78-59-1	1000	± 0.145%
2-Methyl-4,6-dinitrophenol	534-52-1	1000	± 0.392%
1-Methylnaphthalene	90-12-0	1000	± 0.506%
2-Methylnaphthalene	91-57-6	1000	± 0.506%
2-Methylphenol	95-48-7	1000	± 0.432%
3-Methylphenol	108-39-4	500	± 0.278%
4-Methylphenol	106-44-5	500	± 0.278%
Naphthalene	91-20-3	1000	± 0.226%
2-Nitroaniline	88-74-4	1000	± 0.236%
3-Nitroaniline	99-09-2	1000	± 0.308%
4-Nitroaniline	100-01-6	1000	± 0.308%
Nitrobenzene	98-95-3	1000	± 0.300%

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Reference Material Producer
Certicate No. 2427.02

Phenova is an accredited ISO/IEC 17034 Reference Material Producer and ISO/IEC 17025 accredited Chemical Testing Laboratory.

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Chemical Testing Laboratory
Certicate No. 2427.03

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Certified Reference Material

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Catalog No.: AL0-101444
Lot Number: CL15267
Description: 8270 Calibration Standard
Certification Date: June 1, 2020
Storage: -18 °C
Expiration Date: July 31, 2021
Provided As: 1 mL in 2 mL Ampoule in MeCl2/Methanol (97:3)

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
2-Nitrophenol	88-75-5	1000	± 0.420%
4-Nitrophenol	100-02-7	1000	± 0.544%
N-Nitrosodimethylamine	62-75-9	1000	± 0.518%
N-Nitrosodiphenylamine	86-30-6	1000	± 0.492%
N-Nitrosodi-n-propylamine	621-64-7	1000	± 0.518%
Pentachlorophenol	87-86-5	1000	± 0.152%
Phenanthrene	85-01-8	1000	± 0.145%
Phenol	108-95-2	1000	± 0.432%
Pyrene	129-00-0	1000	± 0.147%
Pyridine	110-86-1	1000	± 0.518%
2,3,4,6-Tetrachlorophenol	58-90-2	1000	± 0.246%
2,3,5,6-Tetrachlorophenol	935-95-5	1000	± 0.246%
1,2,4-Trichlorobenzene	120-82-1	1000	± 0.224%
2,4,5-Trichlorophenol	95-95-4	1000	± 0.384%
2,4,6-Trichlorophenol	88-06-2	1000	± 1.137%

Notes: The proper chemical name for Bis(2-Chloroiospropyl) ether is 2,2'-oxybis(1-chloropropane). The analytical uncertainty contribution to the expanded uncertainty for 3 and 4-Methylphenol is measured as the total of the two analytes. N-Nitrosodiphenylamine presents as Diphenylamine at 854 µg/mL.

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1. Quality Document: This Certificate of Analysis has been created in accordance with ISO Guide 31[1] and ISO Guide 35.[2]

2. Quality Standards: Phenova is accredited by A2LA to ISO 17034[3] and ISO/IEC 17025[4] as a producer of Certified Reference Materials and Reference Materials. This ensures that our manufacturing processes have been accredited to and meet strict international standards.

3. Intended Use: The product is manufactured for use in calibration, calibration verification, quantification, identification and other appropriate analytical control applications. The product is intended for routine laboratory analysis and research purposes only. Only trained personnel should handle this product.

4. Handling and Usage Notes: Store according to recommended conditions listed and avoid prolonged exposure to light. Visually inspect the solution inside the ampoule for any un-dissolved material. If particulate is visible, sonicate the unopened ampoule until material is fully dissolved. Dilute as required, use only class A glassware and diluents compatible with all analytes in the mixture. Considerations should be made related to repeated use of the opened product. Once opened, exposure to light, air, heat, objects, and additional transfer vessels may cause evaporation, degradation or contamination resulting in changes in concentration, uncertainty and stability duration. Store opened standards in a clean, tightly capped vessel under the recommended temperature. Appropriate controls, such as the use of additional verification standards should be used to confirm the opened product is fit for purpose under repeated use conditions.

5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Safety Data Sheet (SDS) is available at www.phenova.com/documents.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

$$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

   Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO 17034. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC 17025 methodology.

11. Values Obtained During Product Testing: This product is subjected to verification, homogeneity and stability testing using an ISO/IEC 17025 chromatographic methodology. All values obtained during testing meet criteria in accordance with ISO 17034.

12. Period of Validity: The Certified Values, Uncertainties and Expiration Date are based on the unopened product being stored according to the recommended storage condition listed and are guaranteed until the expiration date. This product will be monitored during the period of validity and customers notified of any significant changes in stability.

References:

[1] ISO Guide 31 – Reference Materials – Contents of Certificates and Labels.
[2] ISO Guide 35 – Reference Material – General and Statistical Principles for Certification.
[3] ISO 17034 – General Requirements for the Competence of Reference Material Producers.
[4] ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories.
[5] ISO/IEC Guide 98-3:2008(E) – Uncertainty of Measurement – Part 3: Guide to Expression of Uncertainty in Measurement (GUM: 1995)

Certificate of Analysis

phenova Certified Reference Materials | A Phenomenex Company

Produced by Phenova
6390 Joyce Drive STE 100, Golden, CO 80403 USA ▪ Tel: 303-940-0033 ▪ Fax: 303-940-0043 ▪ info@phenova.com
Access your Safety Data Sheets and digital Certificates at **www.phenova.com/documents.**

Certified Reference Material

This product is certified in accordance with Phenova's ISO 17034 accreditation and supported by Phenova's ISO/IEC 17025 chemical testing accreditation

Catalog No.:	AL0-101443	**Lot Number:**	CL16571
Description:	Aniline	**Certification Date:**	March 23, 2021
Storage:	4 °C	**Expiration Date:**	March 31, 2029
Provided As:	1 mL in 2 mL Ampoule in Methylene Chloride		

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aniline	62-53-3	1000	± 0.561%

J004380
Anline-1000ug/mL
Solvent / Lot: MeCl2
Prep: 4/23/2021 by JZ
Exp: 3/31/2029
Location: GC

04/23/21

ACCREDITED
Reference Material Producer
Certicate No. 2427.02

phenova Certified Reference Materials | A Phenomenex Company

Phenova is an accredited ISO/IEC 17034 Reference Material Producer and ISO/IEC 17025 accredited Chemical Testing Laboratory.

ACCREDITED
Chemical Testing Laboratory
Certicate No. 2427.03

IL64591018_us

Hazardous Communication Guide

Match the icons on your ampoule tag to this key.

Danger: May Cause Drowsiness or Dizziness.
Store in a well-ventilated place. Keep cool.

Danger: Harmful or Toxic to Aquatic Life with Long-Lasting Effects.
Avoid release to the environment.

Danger: Highly or Extremely Flammable Liquid and Vapor.
Keep away from heat/sparks/open flames/hot surfaces. No smoking.
Keep container tightly closed.

Danger: Causes Serious Eye and Skin Irritation.
Wear protective gloves/protective clothing/eye protection/face protection.
If in contact, wash with plenty of soap or water where appropriate.

Danger: Causes Damage to Organs. May Cause Cancer.
Do not eat, drink, or smoke when using this product. Use only in a well-ventilated area.

Danger: Fatal or Toxic if Swallowed, Inhaled, or in Contact with Skin.
Suspected of damaging fertility or the unborn child. IF EXPOSED: Immediately call a POISON CENTER or doctor/physician. Do not breathe dust/fume/gas/mist/vapors/spray.

Warning: Suspected of Causing Cancer.
Wear protective gloves/protective clothing/eye protection/face protection.
If in contact, wash with plenty of soap or water where appropriate.

Material Safety Data Sheet available for all products
Please call us at **866-942-2978** or
Email us at **info@phenova.com**.

FL32630515_us

phenova® Certified Reference Materials | A Phenomenex® Company

These products are manufactured by Phenova, Inc., a Phenomenex Company, which is accredited to

ISO Guide 34 | ISO/IEC 17025 | ISO/IEC 17043 | TNI EL-V3-2009

phenova™ | A Phenomenex® Company
Certified Reference Materials

Phenova Quality
ISO Guide 34 •
ISO/IEC 17025 •
ISO/IEC 17043 •
TNI EL-V3-2009 •

Important Documents and Information for Order 281396

Thank you for choosing Phenova! Please check your items for any damage that may have occurred during transit. If you need replacement standards for damaged items or have any questions, we are here to assist! Please call us at +1-303-940-0033 or email us at info@phenova.com.

Sincerely,

The Phenova Team

6390 Joyce Drive, Suite 100
Golden, CO 80403 USA

Tel: 1-303-940-0033
Fax: 1-303-940-0043

Email: info@phenova.com
www.phenova.com

Reference Materials Producer
Cert #2495.01

ECS

Certificate of Analysis

Chemical Testing
Cert #2495.02

Catalog Number: ECS-A-030 **Lot No.** GS200603005

Description: Base/Neutrals Mix 1

Matrix: Methylene Chloride

Manufactured Date: 6-3-2020
Expiration Date: 6-3-2023

This **SPEXOrganics®** Certified Reference Material, CRM, is intended primarily for use as a calibration standard or quality control standard for organic chromatography instrumentation such as GC, GC-MS, LC, and LC-MS. It can be employed in USEPA, ASTM and other methods relevant to the certified properties listed below.

5/18/21

Certified Compounds:

Compound	CAS #	Labeled	Purity	Certified†	Uncertainty
Azobenzene	103-33-3	2000 µg/mL	98%	1977 µg/mL	± 49 µg/mL
4-Bromodiphenyl ether	101-55-3	2000 µg/mL	99%	1979 µg/mL	± 49 µg/mL
Butylbenzyl phthalate	85-68-7	2000 µg/mL	98%	2017 µg/mL	± 50 µg/mL
Carbazole	86-74-8	2000 µg/mL	95%	1977 µg/mL	± 49 µg/mL
bis(2-Chloroethoxy)methane	111-91-1	2000 µg/mL	97%	2011 µg/mL	± 50 µg/mL
bis(2-Chloroethyl)ether	111-44-4	2000 µg/mL	99%	2020 µg/mL	± 50 µg/mL
Bis(2-chloro-1-methylethyl) ether	108-60-1	2000 µg/mL	98.9%	2004 µg/mL	± 50 µg/mL
2-Chloronaphthalene	91-58-7	2000 µg/mL	98%	1979 µg/mL	± 49 µg/mL
4-Chlorophenyl-phenyl ether	7005-72-3	2000 µg/mL	98%	2012 µg/mL	± 50 µg/mL
1,2-Dichlorobenzene	95-50-1	2000 µg/mL	99%	2003 µg/mL	± 50 µg/mL
1,3-Dichlorobenzene	541-73-1	2000 µg/mL	98%	2001 µg/mL	± 50 µg/mL
1,4-Dichlorobenzene	106-46-7	2000 µg/mL	99%	1994 µg/mL	± 50 µg/mL
Diethyl phthalate	84-66-2	2000 µg/mL	99.5%	1980 µg/mL	± 50 µg/mL
Dimethyl phthalate	131-11-3	2000 µg/mL	99%	2019 µg/mL	± 50 µg/mL
Di-n-butyl phthalate	84-74-2	2000 µg/mL	99%	1972 µg/mL	± 49 µg/mL
Di-n-octyl phthalate	117-84-0	2000 µg/mL	98%	2014 µg/mL	± 50 µg/mL
2,4-Dinitrotoluene	121-14-2	2000 µg/mL	97%	2012 µg/mL	± 50 µg/mL
2,6-Dinitrotoluene	606-20-2	2000 µg/mL	99.6%	1984 µg/mL	± 50 µg/mL
Bis(2-Ethylhexyl)phthalate	117-81-7	2000 µg/mL	99%	1990 µg/mL	± 50 µg/mL
Hexachlorobenzene	118-74-1	2000 µg/mL	99%	2035 µg/mL	± 51 µg/mL
Hexachlorobutadiene	87-68-3	2000 µg/mL	97%	2040 µg/mL	± 51 µg/mL
Hexachlorocyclopentadiene	77-47-4	2000 µg/mL	99.2%	2040 µg/mL	± 51 µg/mL
Hexachloroethane	67-72-1	2000 µg/mL	99%	2038 µg/mL	± 51 µg/mL
Isophorone	78-59-1	2000 µg/mL	97%	1999 µg/mL	± 50 µg/mL
Nitrobenzene	98-95-3	2000 µg/mL	99%	1987 µg/mL	± 50 µg/mL
N-Nitrosodimethylamine	62-75-9	2000 µg/mL	99.5%	1975 µg/mL	± 49 µg/mL
N-Nitrosodiphenylamine	86-30-6	2000 µg/mL	97%	2040 µg/mL	± 51 µg/mL
N-Nitrosodi-n-propylamine	621-64-7	2000 µg/mL	98%	1985 µg/mL	± 50 µg/mL
Pyridine	110-86-1	2000 µg/mL	99%	1984 µg/mL	± 50 µg/mL
1,2,4-Trichlorobenzene	120-82-1	2000 µg/mL	99%	2012 µg/mL	± 50 µg/mL

J005222
EPA 625 B/N MIX 1
Solvent / Lot: METHYLENE CHLORIDE
Prep: 5/18/2021 by JZ
Exp: 6/3/2023
Location:

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Report of Certification

Catalog Number: ECS-A-030 **Lot No.** GS200603005

Description: Base/Neutrals Mix 1

Matrix: Methylene Chloride

Manufactured Date: 6-3-2020

Expiration Date: 6-3-2023

This Certified Reference Material (CRM) has been prepared and certified under an ISO 9001:2008, ISO 17025:2005, and ISO Guide 34:2009 Quality System consistent with the following standards:

- ISO 9001:2008: Quality management systems - Requirements - Certified by UL-DQS
- ISO 17025:2005: General Requirements for the Competence of Testing and Calibration Laboratories - Accredited by A2LA
- ISO Guide 34:2009: General Requirements for the Competence of Reference Material Producers - Accredited by A2LA
- ISO Guide 31:2000: Reference Materials - Contents of Certificates and Labels
- ISO Guide 35:2006: Reference Materials - General and statistical principals for certification
- Guide to the Expression of Uncertainty in Measurement 1997
- EURACHEM/CITAC Guide: Qualifying Uncertainty in Analytical Measurements - Second Edition
- ASTM Guide D6362-98
- NIST Technical Note 1297
- ILAC-G12-2000: Guidelines for the requirements for the competence of reference material producers
- ISO/REMCO N280

Storage Requirements:

To ensure the stability of the product once it arrives in your laboratory, please store this product in a refrigerator (2°C to 8°C). Note: Shipping conditions may differ from storage conditions. The EXPIRATION DATE is calculated from the MANUFACTURED DATE using our stability data and is applicable only if the product is unopened and stored under the prescribed conditions.

Instructions for Use:

Let material come to room temperature before use. Check for precipitate and if necessary sonicate for one minute. If compounds do not dissolve after one minute then sonicate further until the product is dissolved. A clear appearance is acceptable. The minimum recommended amount that should be removed from this vial is 5µL with a 25µL gas tight syringe. All solutions should be thoroughly mixed, by shaking, prior to use. All surfaces that come in contact with the solution must be thoroughly cleaned prior to use. Dilutions should be performed only with Class A volumetric glassware.

Material Source:

All analytes and matrix materials are obtained and verified by SPEX CertiPrep from pre-qualified vendors as per ISO guidelines. Vendor identifications are proprietary, however sources of all materials used in the preparation and testing of SPEX CertiPrep CRMs are tracked and documented. For assistance, please contact sales support at crmsales@spexcsp.com.

Method of Preparation:

Clean laboratory procedures and techniques have been used throughout the preparation. All materials, equipment, and analytical instrumentation have been qualified prior to use. The highest purity solvents and Class A / calibrated volumetrics have been been used in all preparations.

Homogeneity:

The homogeneity of this CRM has been confirmed by procedures consistent with ISO 17025:2005, ISO Guide 34:2009, and ASTM D6362-98 Appendix X2. Random, replicate samples of the final, packaged material have been analyzed to prove homogeneity in accordance with our internal procedure 4300-HOMOGEN-1A. This is consistent with the intended use of this CRM. The Degree of Homogeneity, as expressed as maximum between-bottle variation, is 1.2%

Statistical Estimator and Confidence Limits:

The Certified value 'X' as listed on the reverse of this document is at the 95% level of confidence and can be expressed as:

- $X = x \pm U$ where X=certified value, U=expanded uncertainty, x=property value
- $U = ku_c$ where k=2 is the coverage factor at the 95% confidence level
- u_c = combined standard uncertainty obtained by combining the individual compound standard uncertainty components u_i, where $u_c=\sqrt{\sum u^2}$

Legal Notice:

SPEX CertiPrep Certified Reference Materials are not for any cosmetic, drug, or household application and are to be used only by qualified individuals who are trained in appropriate procedures. No claims against SPEX CertiPrep of any kind whatsoever, whether based on breech of warranty, alleged negligence, or otherwise, with respect to this Reference Material shall be greater than the purchase price. In no event shall SPEX CertiPrep be liable for any loss of profits or any incidental, special, or consequential damages.

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203 Norcross Ave. Metuchen, NJ 08840

www.spexcertiprep.com • E-mail: crmsales@spexcsp.com

Phone: 1-732-549-7144 • Fax 1-732-603-9647

Accredited to 17025 & Guide 34 ISO Certified to 9001

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...breaking with tradition

Certificate of Analysis

Phenova Certified Reference Materials are sold by Phenomenex.
411 Madrid Ave., Torrance, CA 90501 USA ▪ Tel: 310-212-0555 ▪ Fax: 310-328-7768 ▪ info@phenomenex.com
Access your MSDS and digital C of A at **www.phenomenex.com/mysupport. Re-order at www.phenomenex.com/standards**

Certified Reference Material

This product is included in Phenova's ISO/IEC 17025 and ISO Guide 34 Scopes of Accreditation

Catalog No.:	AL0-101291	**Lot Number:**	CL10999
Description:	GC/MS Tuning Mix	**Certification Date:**	May 9, 2014
Storage:	4 °C	**Expiration Date:**	December 31, 2023
Provided As:	1 mL in 2 mL Ampoule in Methylene chloride	**Revision Date:**	June 19, 2015

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty (%)
Benzidine	92-87-5	1000	± 4.575%
Decafluorotriphenylphosphine (DFTPP)	5074-71-5	1000	± 2.420%
4,4'-DDT	50-29-3	1000	± 2.772%
Pentachlorophenol	87-86-5	1000	± 2.616%

J006111
GC/MS Tune solution-1000ug/ml
Solvent / Lot: CL10999
Prep: 6/9/2021 by VS
Exp: 12/31/2023
Location:

ACCREDITED
Reference Material Producer
Certificate No. 2427.02

phenova
Certified Reference Materials

Manufactured by Phenova, Inc.
Phenova's testing and calibration results are internationally recognized through the ILAC MRA. Phenova is an accredited ISO Guide 34 Reference Material Provider and ISO/IEC 17025 accredited Chemical Testing Laboratory.

ilac-MRA
ACCREDITED
Chemical Testing Laboratory
Certificate No. 2427.03

IL111106/13_us

Certificate of Analysis

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411 Madrid Ave., Torrance, CA 90501 USA ▪ Tel: 310-212-0555 ▪ Fax: 310-328-7768 ▪ info@phenomenex.com
Access your MSDS and digital C of A at **www.phenomenex.com/mysupport. Re-order at www.phenomenex.com/standards**

1. Quality Document: This Certificate of Analysis has been created in accordance with ISO Guide 31[1] and ISO Guide 35.[2]

2. Quality Standards: Phenova is accredited by A2LA to ISO Guide 34[3] and ISO/IEC 17025[4] as a producer of Certified Reference Materials and Reference Materials. This ensures that our manufacturing processes have been accredited to and meet strict international standards.

3. Intended Use: The product is manufactured for use in the calibration and calibration verification of chromatographic instrumentation performed in routine laboratory analysis.

4. Instruction: Visually inspect the solution inside the ampoule for any un-dissolved material. If particulate is visible, sonicate the unopened ampoule until material is fully dissolved. Dilute as required, use only class A glassware and diluents compatible with all certified analytes in the mixture.

5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Material Safety Data Sheet (MSDS) is available at www.phenomenex.com/mysupport.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC Guide 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

   $$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

   Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO Guide 34. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC Guide 17025 methodology.

11. Values Obtained During Product Testing: This product is subjected to verification, homogeneity and stability testing using an ISO/IEC Guide 17025 chromatographic methodology. All values obtained during testing meet criteria in accordance with ISO Guide 34.

12. Period of Validity: The Certified Values and their uncertainties are guaranteed until the expiration date. This product will be monitored during the period of validity and customers notified of any significant changes in stability.

References:

[1] ISO Guide 31:2000(E) – Reference Materials – Contents of Certificates and Labels.
[2] ISO Guide 35:2006(E) – Reference Material – General and Statistical Principles for Certification.
[3] ISO Guide 34:2009(E) – General Requirements for the Competence of Reference Material Producers.
[4] ISO/IEC Guide 17025:2005(E) – General Requirements for the Competence of Testing and Calibration Laboratories.
[5] ISO/IEC Guide 98-3:2008(E) – Uncertainty of Measurement – Part 3: Guide to Expression of Uncertainty in Measurement (GUM: 1995)

IL111106/13_us

ACCREDITED
Reference Material Producer
Certificate No. 2427.02

phenova
Certified Reference Materials

Manufactured by Phenova, Inc.
Phenova's testing and calibration results are internationally recognized through the ILAC MRA. Phenova is an accredited ISO Guide 34 Reference Material Provider and ISO/IEC 17025 accredited Chemical Testing Laboratory.

ilac-MRA
ACCREDITED
Chemical Testing Laboratory
Certificate No. 2427.03

Agilent

Certificate of Analysis

Product Name: PAH Standard

Product Number: US-106N-1 **Lot Issue Date:** 11-Jun-2020

Lot Number: 0006540449 **Expiration Date:** 30-Jun-2023

Description:

This analytical reference material (RM) was manufactured and verified in accordance with an ISO 9001 registered quality system, and analyte concentrations were verified by an ISO 17025 accredited laboratory. The concentration and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	Concentration ± Uncertainty
acenaphthene	000083-32-9	RM10879	2008 ± 10 µg/mL
acenaphthylene	000208-96-8	RM10891	2003 ± 10 µg/mL
anthracene	000120-12-7	RM14212	2006 ± 10 µg/mL
benz[a]anthracene	000056-55-3	RM16072	2006 ± 10 µg/mL
benzo[b]fluoranthene	000205-99-2	RM14571	2005 ± 10 µg/mL
benzo[k]fluoranthene	000207-08-9	RM14321	2009 ± 10 µg/mL
benzo[ghi]perylene	000191-24-2	RM15761	2008 ± 10 µg/mL
benzo[a]pyrene	000050-32-8	RM12669	2009 ± 10 µg/mL
chrysene	000218-01-9	RM12260	2009 ± 10 µg/mL
dibenz[a,h]anthracene	000053-70-3	RM06786	2009 ± 10 µg/mL
fluoranthene	000206-44-0	RM12277	2004 ± 10 µg/mL
fluorene	000086-73-7	RM09441	2009 ± 10 µg/mL
indeno[1,2,3-cd]pyrene	000193-39-5	RM14192	2009 ± 10 µg/mL
naphthalene	000091-20-3	NT00970	2008 ± 10 µg/mL
phenanthrene	000085-01-8	RM10495	2009 ± 10 µg/mL
pyrene	000129-00-0	RM03479	2008 ± 10 µg/mL

Matrix: methylene chloride/benzene (1:1)

J006136
SVOA PAH STD 2000ug/ml
Solvent / Lot: 0006540449
Prep: 6/9/2021 by VS
Exp: 6/30/2023
Location: Fridge 19

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ISO 17034 Cert No. AR-1936

RM was produced in accordance with TUV USA Inc registered ISO 9001 Quality Management System. Cert # 56 100 18560026

www.agilent.com/quality/

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 17025 Cert No. AT-1937

Certificate of Composition

ACID STOCK

ANALYTICAL STANDARD

Product ID 22523046
Lot LRAC8250
Expiration Date October 2022
Storage Conditions Refrigerate
Solvent/Matrix Dichloromethane

J006718
SVOA-ACID STOCK 800/1800ug/ml
Solvent / Lot: DCM
Prep: 6/26/2021 by VS
Exp: 12/23/2021
Location:

Analyte	*Assigned Value* [1]	*Units*	*Raw Material Purity,%*	*Raw Material Lot*	*CAS*
2,4-DIMETHYLPHENOL	800 ± 24.0	µg/mL	99.2	05421CO	105-67-9
2,4-DICHLOROPHENOL	804 ± 24.1	µg/mL	99.5	03221TN	120-83-2
2,4,5-TRICHLOROPHENOL	800 ± 24.0	µg/mL	99.9	JS00008	95-95-4
2,4-DINITROPHENOL	1,800 ± 54.0	µg/mL	75.9	MKBP5833V	51-28-5
2,4,6-TRICHLOROPHENOL	801 ± 24.0	µg/mL	99.5	04212PS	88-06-2
4-CHLORO-3-METHYLPHENOL	800 ± 24.0	µg/mL	100.0	BCCB3243	59-50-7
4-NITROPHENOL	799 ± 24.0	µg/mL	99.3	P500150	100-02-7
2-METHYL-4,6-DINITROPHENOL	1,800 ± 54.0	µg/mL	99.9	LB99844	534-52-1
PENTACHLOROPHENOL	801 ± 24.0	µg/mL	97.9	MKCD2150	87-86-5
BENZOIC ACID	1,800 ± 54.0	µg/mL	98.8	442-137B	65-85-0

Additional Information

1 Assigned value - the gravimetrically prepared value. Uncertainty is based on gravimetric preparation.

Traceability: The standard was manufactured under an ISO/IEC 17025:2017 certified quality system. The balance used to weigh raw materials is accurate to +/- 0.0001g and calibrated regularly using mass standards traceable to NIST. All dilutions were preformed gravimetrically.

MSDS reports for components comprising greater than 1.0% of the solution or 0.1% for components known to be carcinogens are available upon request.

Robert O'Brien - Program Manager

Mark Pooler - QA Supervisor

Certification Date October 12, 2020
Version -10122020

MilliporeSigma
2931 Soldier Springs Rd. Laramie, Wyoming 82070 USA
800-325-3010
www.sigma-aldrich.com

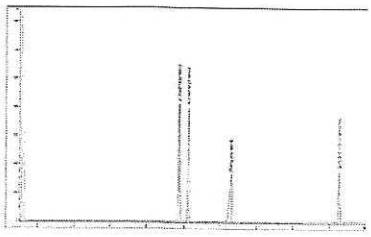
Supelco

www.sigmaaldrich.com

Certificate of Analysis - Certified Reference Material

EPA TCL Hazardous Substances Mix 1

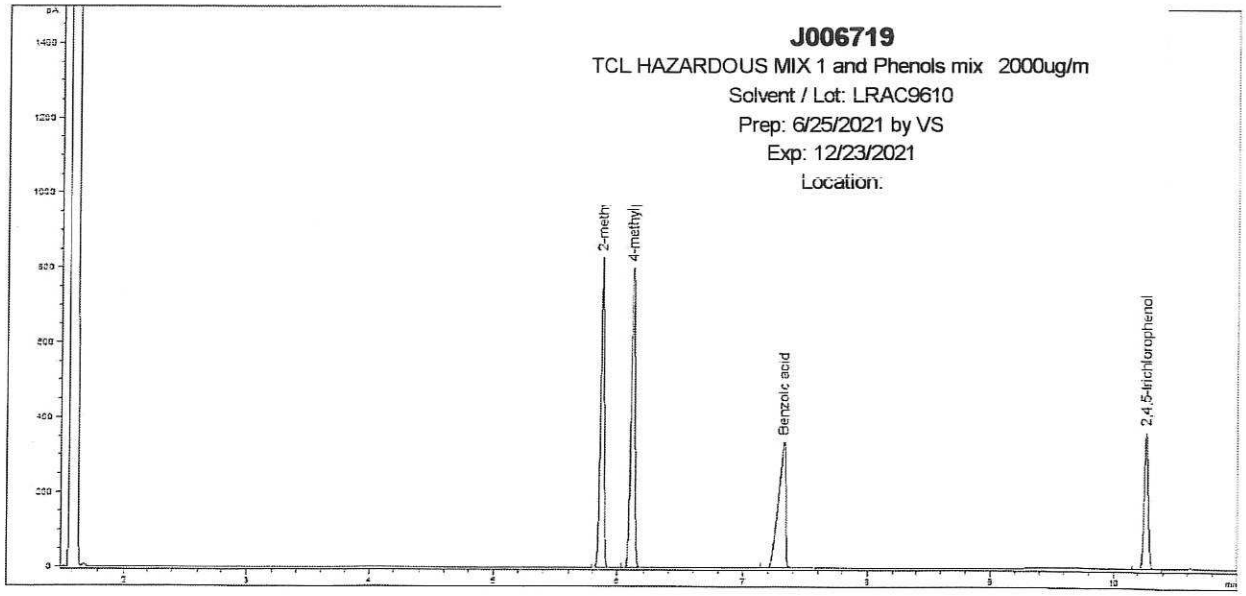
Product no.: 48907
Lot no.: LRAC9610
Expiry Date: May 2024
Manufacturing Date: May 2021
Storage: Refrigerate
Solvent/Matrix: DICHLOROMETHANE
Certificate version: LRAC9610.01 *(Note: Certificates may be updated due to the availability of new data. Check our website at: www.sigma-aldrich.com for the most current version.)*



Certified Values:

Analyte	*Certified Value*	*Units*	*Raw Material Purity,%*	*Elution order*	*Raw Material Lot*
2-METHYLPHENOL CAS# 95-48-7	2004 ± 9	µg/mL	99.0	1	G1735A
4-METHYLPHENOL CAS# 106-44-5	2004 ± 13	µg/mL	98.9	2	06921MG
BENZOIC ACID CAS# 65-85-0	2012 ± 6	µg/mL	99.9	3	LC16514
2,4,5-TRICHLOROPHENOL CAS# 95-95-4	2003 ± 6	µg/mL	99.9	4	JS00008

Informational Values:



Additional Information:

Analytical Method Parameters:
Column: Equity-5, 30 m × 0.53 mm I.D., 1.5 µm film thickness (Column #98)
Carrier Gas: H2, Flow: 4.5 mL/min
Inlet Temperature: 170 °C, Injection Volume: 1 µL
Injection Mode: Split, Split Ratio: 20:1

Sigma-Aldrich RTC, 2931 Soldier Springs Rd. Laramie, WY 82070, USA;
Tel. 1 307-742-5452; Fax 1 855-831-9211; www.sigmaaldrich.com
Sigma-Aldrich RTC is a subsidiary of Merck KGaA, Darmstadt, Germany.

Temperature Program: 80 °C @ 10 °C/min to 190 °C (Hold 5 min)
Detector: FID
Detector Temperature: 310 °C

Metrological traceability: Traceable to the SI and higher order standards from NIST through an unbroken chain of comparisons. The balance used to weigh raw materials is accurate to +/-0.0001 g and calibrated regularly using mass standards traceable to NIST. All dilutions were performed gravimetrically. Additionally, individual analytes are traceable to NIST SRMs where available and specified above.

Measurement method: Where applicable, the assigned value is based on a purity determination by mass balance and gravimetrically prepared value.

Intended use: Intended for R&D and Analytical Use only. Not for drug, household or other uses.

Packaging: 1 mL in amber ampule

Instructions for handling and correct use: Use on the as is basis. The internal pressure of the container may be slightly different from the atmospheric pressure at the user`s location. Open slowly and carefully to avoid dispersion of the material.

Health and safety information: All chemical reference materials should be considered potentially hazardous and should be used only by qualified laboratory personnel. Please refer to the Safety Data Sheet for detailed information about the nature of any hazard and appropriate precautions to be taken.

Accreditation: Sigma-Aldrich RTC is accredited by the US accreditation authority ANAB as a registered reference material producer AR-1470 in accordance with ISO 17034.

Certificate issue date: 20-May-2021

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER

Andy Ommen - QC Manager

Mark Pooler - QA Supervisor

Details on metrological traceability: This standard has been gravimetrically prepared using balances that have been fully qualified and calibrated to ISO 17025 requirements. All calibrations utilize NIST traceable weights which are calibrated externally by a qualified ISO 17025 accredited calibration laboratory to NIST standards. Qualification of each balance includes the assignment of a minimum weighing by a qualified and ISO 17025 accredited calibration vendor taking into consideration the balance and installed environmental conditions to ensure compliance with USP tolerances of NMT 0.10% relative error. Fill volume to predetermined specifications is gravimetrically verified throughout the dispensing process using qualified and calibrated balances. Further traceability to a corresponding Primary Standard may be achieved through a direct comparison assay. Where a Primary Standard is available, the assay value will be included in the specified section of the COA.

Associated uncertainty: Ucrm - Uncertainty values in this document are expressed as Expanded Uncertainty (Ucrm) corresponding to the 95% confidence interval. Ucrm is derived from the combined standard uncertainty multiplied by the coverage factor k, which is obtained from a *t*-distribution and degrees of freedom. The components of combined standard uncertainty include the uncertainties due to characterization, homogeneity, long term stability, and short term stability (transport). The components due to stability are generally considered to be negligible unless otherwise indicated by stability studies. The mathematical representation of the Ucrm calculation is as follows:

$$u_{CRM} = \sqrt{u^2_{char} + u^2_{homogeneity} + u^2_{stability}}$$

Homogeneity assessment: Homogeneity was assessed in accordance with ISO Guide 35. Completed units were sampled using a random stratified sampling protocol. The results of chemical analysis were then compared by Single Factor Analysis of Variance (ANOVA). The uncertainty due to homogeneity was derived from the ANOVA. Heterogeneity was not detected under the conditions of the ANOVA.

Stability assessment: Significance of the stability assessment will be demonstrated if the analytical result of the study and the range of values represented by the Expanded Uncertainty do not overlap the result of the original assay and the range of its values represented by the Expanded Uncertainty. The method employed will usually be the same method used to characterize the assay value in the initial

Certificate of analysis revision history:

Certificate version	Date	Reason for version
LRAC9610.01	20-May-2021	Original Release Date

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS625

Dual Column

ORGANIC ANALYSIS DATA SHEET
EPA 8082A

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Solid	Laboratory ID:	21G0286-02 B	File ID:	08112147ECD7.D
Sampled:	07/22/21 07:50	Prepared:	08/02/21 13:50	Analyzed:	08/12/21 07:09
% Solids:	76.11	Preparation:	EPA 3546 (Microwave)	Initial/Final:	16.51 g Wet / 2.5 mL
Batch:	BJH0005	Sequence:	SJH0202	Calibration:	EE00069
Instrument:	ECD7	Column 1:	ZB5	Column 2:	ZB35

CAS NO.	COMPOUND	Col #	DILUTION	CONC. (ug/kg dry)	MDL	MRL	Q
12674-11-2	Aroclor 1016	1	1	4.0	1.6	4.0	U
11104-28-2	Aroclor 1221	1	1	4.0	1.6	4.0	U
11141-16-5	Aroclor 1232	1	1	4.0	1.6	4.0	U
53469-21-9	Aroclor 1242	1	1	4.0	1.6	4.0	U
12672-29-6	Aroclor 1248	1	1	4.0	1.6	4.0	U
11097-69-1	Aroclor 1254	1	1	13.3	1.6	4.0	
11096-82-5	Aroclor 1260	2	1	12.8	0.6	4.0	

SURROGATES	Col #	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC	QC LIMITS	Q
Decachlorobiphenyl	*1*	*7.9581*	*7.81*	*98.2*	*40 - 126*	
Tetrachlorometaxylene	*1*	*7.9581*	*6.95*	*87.3*	*44 - 120*	
Decachlorobiphenyl	*2*	*7.9581*	*8.10*	*102*	*40 - 126*	
Tetrachlorometaxylene	*2*	*7.9581*	*6.48*	*81.4*	*44 - 120*	

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112147ECD7.D
Data file 2: /210811.b/210811.b/08112147ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: 21G0286-02
Client ID:
Injection Date: 12-AUG-2021 07:09
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.066	-0.001	111100	5.411	-0.001	293147	34.9	32.6	7.1	Tetrachloro-m-xylene
13.155	-0.009	111510	13.839	-0.007	538775	39.3	40.7	3.6	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	266333	-10.2
Hexabromobiphenyl	470266	318524	-32.3

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	730460	2.6
Hexabromobiphenyl	867949	738002	-15.0

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
	ZB5 Col					ZB35 Col				
Aroclor-1016	1	---			0.0	1	---			0.0
Aroclor-1016	2	---			0.0	2	---			0.0
Aroclor-1016	3	---			0.0	3	---			0.0
Aroclor-1016	4	---			0.0	4	---			0.0
Col1Ave: <3 Quant Peaks						Col2Ave: <3 Quant Peaks				
Aroclor-1221	1	---			0.0	1	---			0.0
Aroclor-1221	2	---			0.0	2	---			0.0
Aroclor-1221	3	---			0.0	3	---			0.0
Col1Ave: <3 Quant Peaks						Col2Ave: <3 Quant Peaks				
Aroclor-1232	1	---			0.0	1	---			0.0
Aroclor-1232	2	---			0.0	2	---			0.0
Aroclor-1232	3	---			0.0	3	---			0.0
Aroclor-1232	4	---			0.0	4	---			0.0
Col1Ave: <3 Quant Peaks						Col2Ave: <3 Quant Peaks				
Aroclor-1242	1	---			0.0	1	---			0.0
Aroclor-1242	2	---			0.0	2	---			0.0
Aroclor-1242	3	---			0.0	3	---			0.0
Aroclor-1242	4	---			0.0	4	---			0.0
Col1Ave: <3 Quant Peaks						Col2Ave: <3 Quant Peaks				
Aroclor-1248	1	---			0.0	1	---			0.0
Aroclor-1248	2	---			0.0	2	---			0.0
Aroclor-1248	3	---			0.0	3	---			0.0
Aroclor-1248	4	---			0.0	4	---			0.0
Col1Ave: <3 Quant Peaks						Col2Ave: <3 Quant Peaks				
Aroclor-1254	1	8.665	-0.010	10118	44.9	1	9.230	-0.006	34395	62.2
Aroclor-1254	2	8.737	-0.009	5464	66.6	2	9.321	-0.009	21449	65.8
Aroclor-1254	3	9.037	-0.007	8527	61.8	3	9.753	-0.007	17986	43.2
Aroclor-1254	4	9.164	-0.014	22934	83.9	4	9.901	-0.010	62762	67.8
Aroclor-1254	5	9.851	-0.017	14185	77.0	5	10.137	-0.009	93564	94.3
Total Col1Ave (5 peaks):					66.9	Total Col2Ave (5 peaks):			66.7	RPD = 0
Corrected Ave (4 peaks):					62.6	Corrected Ave (4 peaks):			59.7	RPD = 5
Aroclor-1260	1	10.372	-0.010	6670	57.1	1	11.424	-0.002	50686	110.1
Aroclor-1260	2	10.691	-0.011	5523	46.0	2	11.669	-0.008	59688	49.7
Aroclor-1260	3	11.040	-0.010	16119	51.3	3	12.250	-0.010	36059	46.2
Aroclor-1260	4	11.439	-0.012	8973	56.0	4	12.961	-0.010	17360	51.7
Aroclor-1260	5	11.543	-0.011	3246	52.5	NS	---			----
Total Col1Ave (5 peaks):					52.6	Total Col2Ave (4 peaks):			64.4	RPD = 20
Corrected Ave (4 peaks):					51.4	Corrected Ave (3 peaks):			49.2	RPD = 4
Aroclor-1262	1	---			0.0	1	---			0.0
Aroclor-1262	2	---			0.0	2	---			0.0
Aroclor-1262	3	---			0.0	3	---			0.0
Aroclor-1262	4	---			0.0	4	---			0.0
Col1Ave: <3 Quant Peaks						Col2Ave: <3 Quant Peaks				
Aroclor-1268	1	---			0.0	1	---			0.0
Aroclor-1268	2	---			0.0	2	---			0.0
Aroclor-1268	3	---			0.0	3	---			0.0
Aroclor-1268	4	---			0.0	4	---			0.0
Col1Ave: <3 Quant Peaks						Col2Ave: <3 Quant Peaks				

Total PCB Area Col1 (5.167 - 13.064) = 480575 Col1 Total PCB = 0.2 ppm*

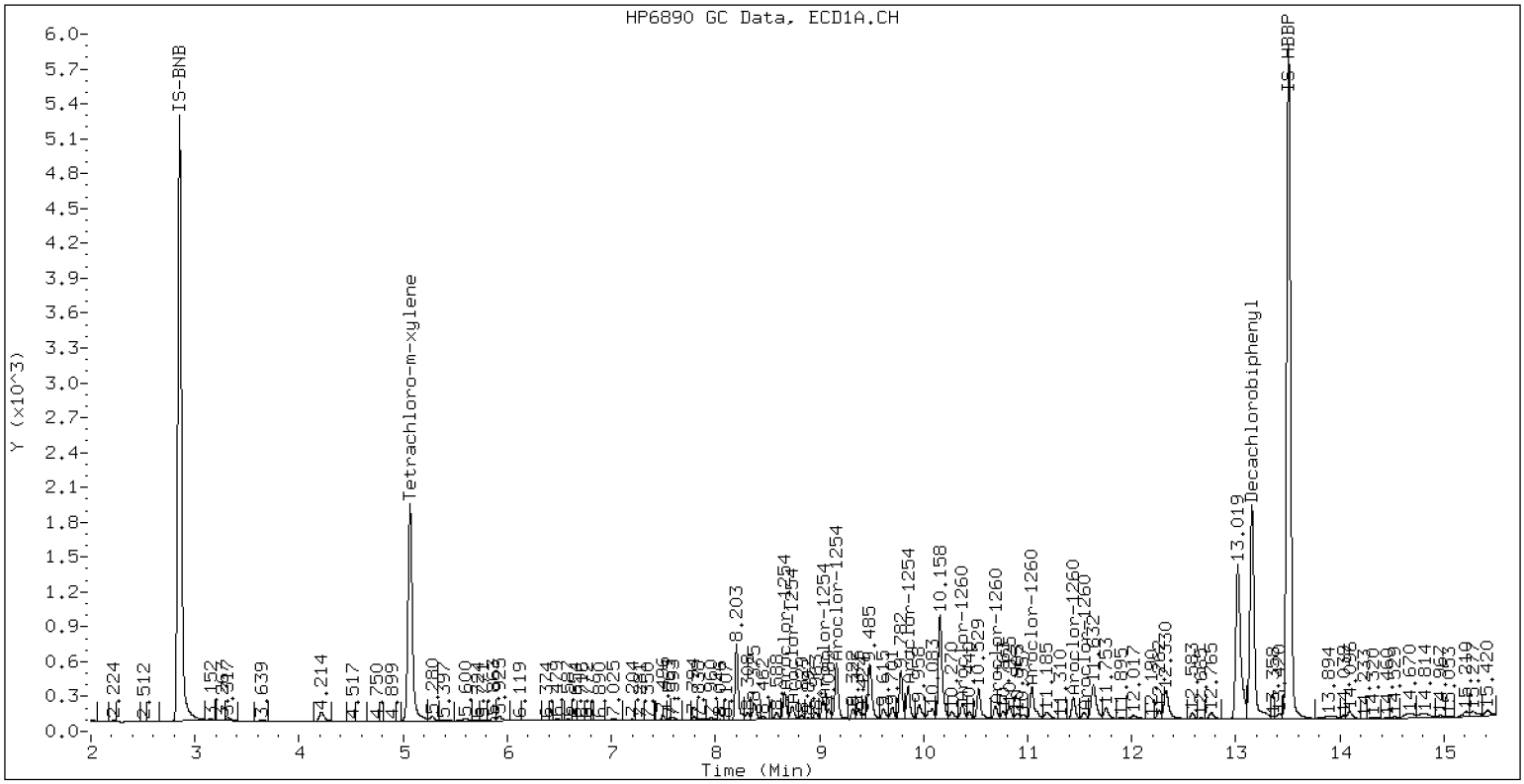
Total PCB Area Col2 (5.167 - 13.064) = 1549364 Col2 Total PCB = 0.2 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

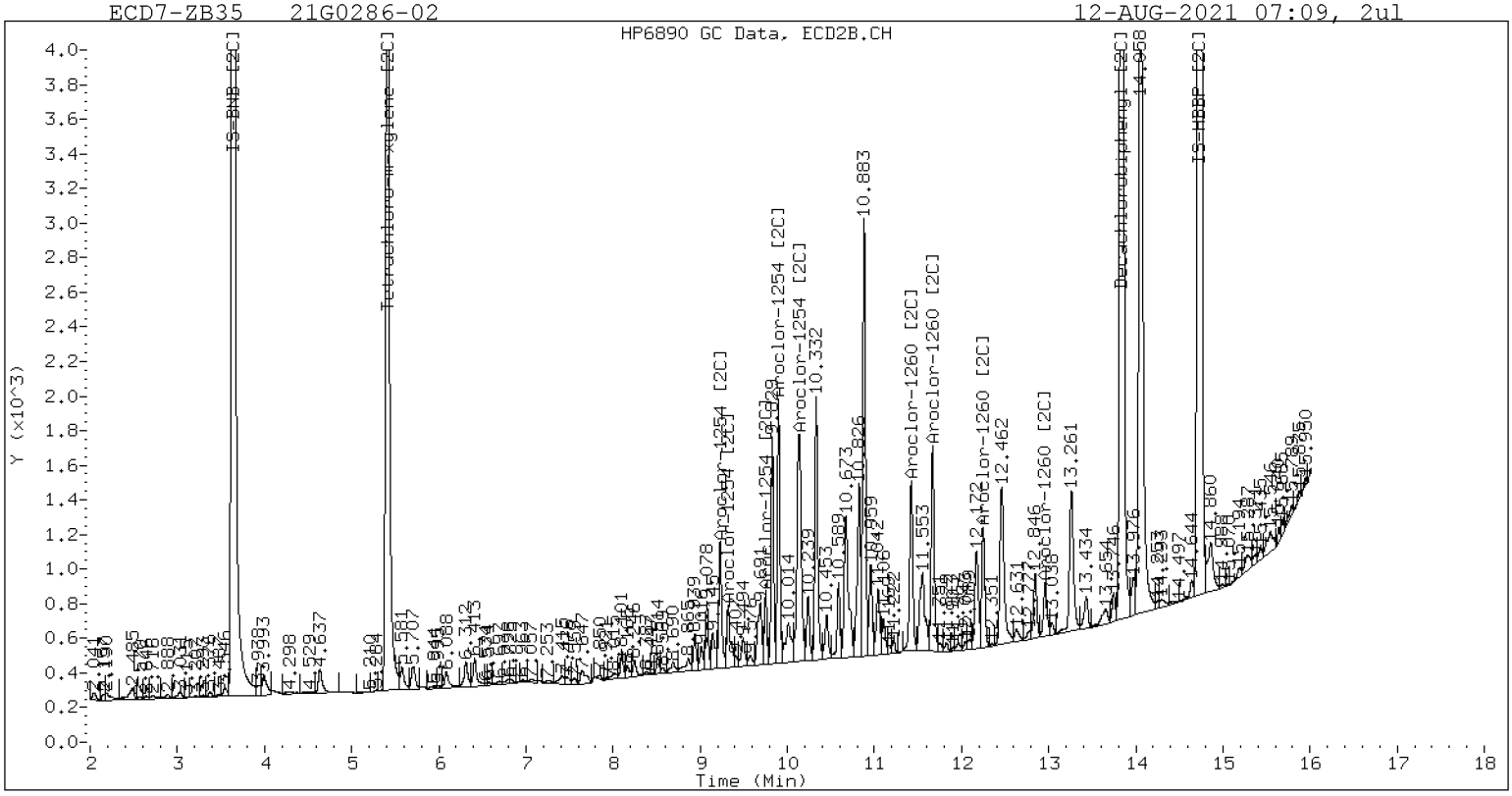
PCB Dual Column Chromatograms

ECD7-ZB5 21G0286-02 12-AUG-2021 07:09, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 21G0286-02 12-AUG-2021 07:09, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Dual Column

LDW21-IT625

ORGANIC ANALYSIS DATA SHEET
EPA 8082A

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Solid	Laboratory ID:	21G0286-03 B	File ID:	08112148ECD7.D
Sampled:	07/22/21 07:50	Prepared:	08/02/21 13:50	Analyzed:	08/12/21 07:29
% Solids:	87.74	Preparation:	EPA 3546 (Microwave)	Initial/Final:	14.25 g Wet / 2.5 mL
Batch:	BJH0005	Sequence:	SJH0202	Calibration:	EE00069
Instrument:	ECD7	Column 1:	ZB5	Column 2:	ZB35

CAS NO.	COMPOUND	Col #	DILUTION	CONC. (ug/kg dry)	MDL	MRL	Q
12674-11-2	Aroclor 1016	1	1	4.0	1.6	4.0	U
11104-28-2	Aroclor 1221	1	1	4.0	1.6	4.0	U
11141-16-5	Aroclor 1232	1	1	4.0	1.6	4.0	U
53469-21-9	Aroclor 1242	1	1	4.0	1.6	4.0	U
12672-29-6	Aroclor 1248	1	1	4.0	1.6	4.0	U
11097-69-1	Aroclor 1254	1	1	74.5	1.6	4.0	
11096-82-5	Aroclor 1260	1	1	57.5	0.6	4.0	

SURROGATES	Col #	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC	QC LIMITS	Q
Decachlorobiphenyl	*1*	*7.9981*	*7.70*	*96.2*	*40 - 126*	
Tetrachlorometaxylene	*1*	*7.9981*	*6.76*	*84.5*	*44 - 120*	

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112148ECD7.D
Data file 2: /210811.b/210811.b/08112148ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: 21G0286-03
Client ID:
Injection Date: 12-AUG-2021 07:29
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.065	-0.002	112502	5.410	-0.001	300726	33.8	32.6	3.6	Tetrachloro-m-xylene
13.156	-0.009	112496	13.838	-0.008	565137	38.5	40.4	4.9	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	278596	-6.0
Hexabromobiphenyl	470266	327831	-30.3

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	747872	5.0
Hexabromobiphenyl	867949	779820	-10.2

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT (ZB5 Col)	Shift	Area	Amount	Peak#	RT (ZB35 Col)	Shift	Area	Amount
Aroclor-1016	1	---			0.0	1	---			0.0
Aroclor-1016	2	---			0.0	2	---			0.0
Aroclor-1016	3	---			0.0	3	---			0.0
Aroclor-1016	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks				Col2Ave: <3 Quant Peaks				
Aroclor-1221	1	---			0.0	1	---			0.0
Aroclor-1221	2	---			0.0	2	---			0.0
Aroclor-1221	3	---			0.0	3	---			0.0
		Col1Ave: <3 Quant Peaks				Col2Ave: <3 Quant Peaks				
Aroclor-1232	1	---			0.0	1	---			0.0
Aroclor-1232	2	---			0.0	2	---			0.0
Aroclor-1232	3	---			0.0	3	---			0.0
Aroclor-1232	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks				Col2Ave: <3 Quant Peaks				
Aroclor-1242	1	---			0.0	1	---			0.0
Aroclor-1242	2	---			0.0	2	---			0.0
Aroclor-1242	3	---			0.0	3	---			0.0
Aroclor-1242	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks				Col2Ave: <3 Quant Peaks				
Aroclor-1248	1	---			0.0	1	---			0.0
Aroclor-1248	2	---			0.0	2	---			0.0
Aroclor-1248	3	---			0.0	3	---			0.0
Aroclor-1248	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks				Col2Ave: <3 Quant Peaks				
Aroclor-1254	1	8.664	-0.011	57865	245.7	1	9.230	-0.007	170068	300.3
Aroclor-1254	2	8.737	-0.010	34353	400.5	2	9.319	-0.010	93757	280.8
Aroclor-1254	3	9.032	-0.012	33697	233.4	3	9.752	-0.008	83989	197.1
Aroclor-1254	4	9.163	-0.014	152562	533.8	4	9.902	-0.009	505598	533.7
Aroclor-1254	5	9.848	-0.021	86460	448.8	5	10.141	-0.005	483686	476.0
		Total Col1Ave (5 peaks):		372.4		Total Col2Ave (5 peaks):			357.6	RPD = 4
		Corrected Ave (4 peaks):		332.1		Corrected Ave (4 peaks):			313.6	RPD = 6
Aroclor-1260	1	10.372	-0.010	34040	283.3	1	11.423	-0.002	298021	612.8
Aroclor-1260	2	10.689	-0.012	35009	283.3	2	11.668	-0.008	380886	300.2
Aroclor-1260	3	11.039	-0.011	91793	283.6	3	12.251	-0.009	238648	289.3
Aroclor-1260	4	11.438	-0.013	57996	351.5	4	12.962	-0.009	83925	236.7
Aroclor-1260	5	11.542	-0.012	15065	236.9	NS	---			----
		Total Col1Ave (5 peaks):		287.7		Total Col2Ave (4 peaks):			359.8	RPD = 22
		Corrected Ave (4 peaks):		271.8		Corrected Ave (3 peaks):			275.4	RPD = 1
Aroclor-1262	1	---			0.0	1	---			0.0
Aroclor-1262	2	---			0.0	2	---			0.0
Aroclor-1262	3	---			0.0	3	---			0.0
Aroclor-1262	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks				Col2Ave: <3 Quant Peaks				
Aroclor-1268	1	---			0.0	1	---			0.0
Aroclor-1268	2	---			0.0	2	---			0.0
Aroclor-1268	3	---			0.0	3	---			0.0
Aroclor-1268	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks				Col2Ave: <3 Quant Peaks				

Total PCB Area Col1 (5.167 - 13.064) = 1988089 Col1 Total PCB = 0.8 ppm*

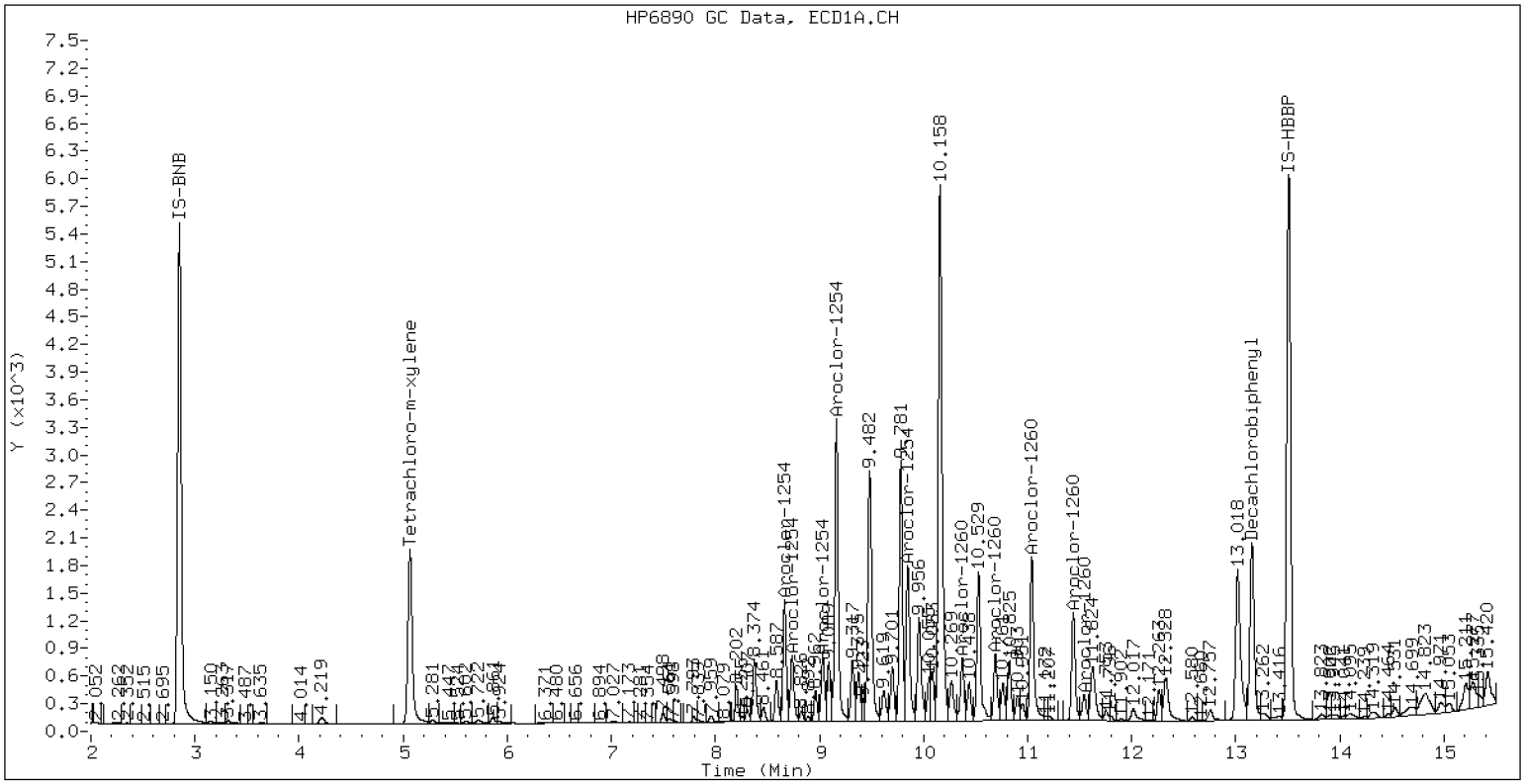
Total PCB Area Col2 (5.167 - 13.064) = 6164430 Col2 Total PCB = 0.8 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

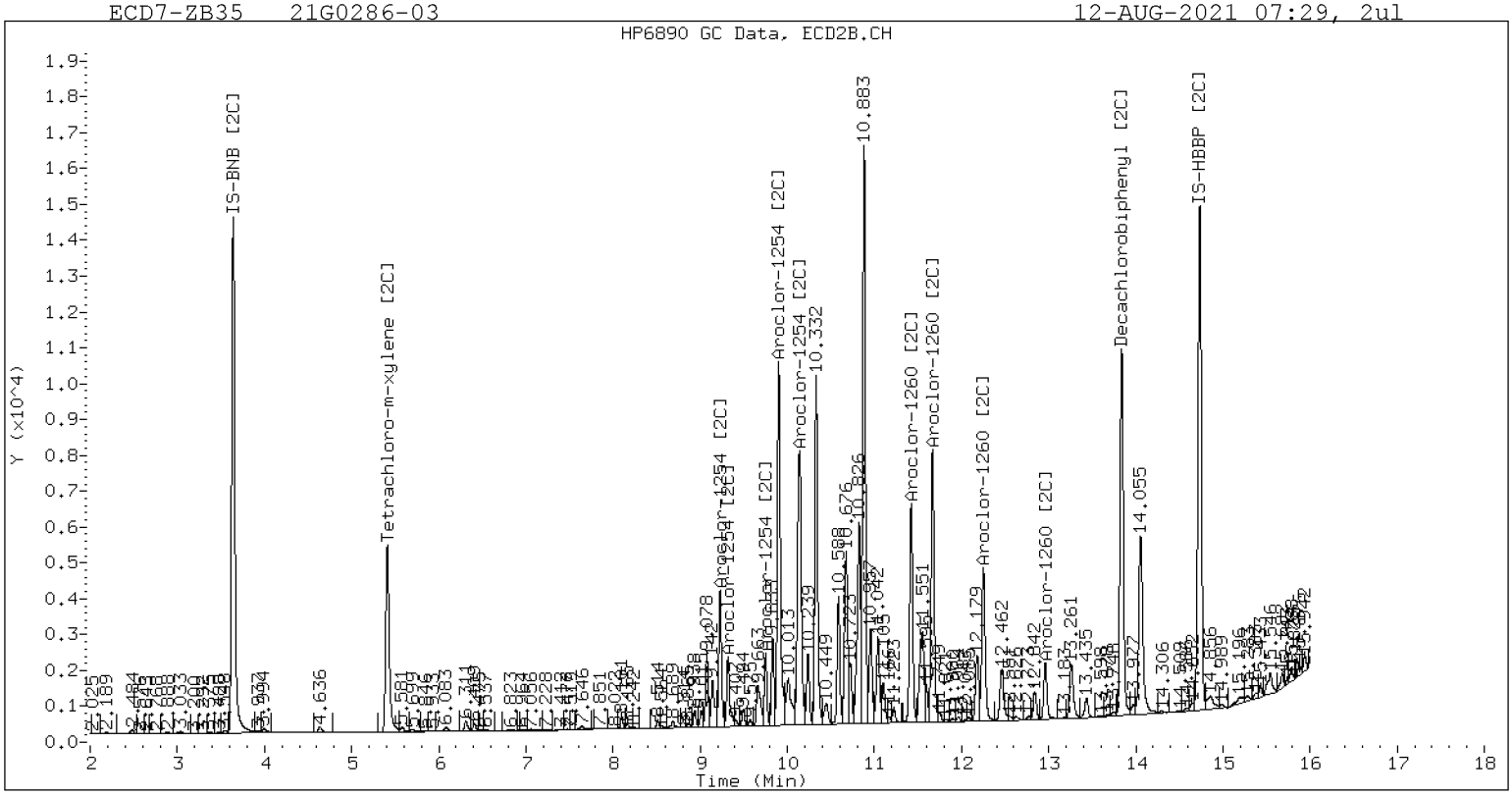
PCB Dual Column Chromatograms

ECD7-ZB5 21G0286-03 12-AUG-2021 07:29, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 21G0286-03 12-AUG-2021 07:29, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Dual Column

LDW21-SS627

ORGANIC ANALYSIS DATA SHEET
EPA 8082A

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Solid	Laboratory ID:	21G0286-04 B	File ID:	08112151ECD7.D
Sampled:	07/22/21 08:10	Prepared:	08/02/21 13:50	Analyzed:	08/12/21 08:31
% Solids:	54.40	Preparation:	EPA 3546 (Microwave)	Initial/Final:	22.99 g Wet / 2.5 mL
Batch:	BJH0005	Sequence:	SJH0202	Calibration:	EE00069
Instrument:	ECD7	Column 1:	ZB5	Column 2:	ZB35

CAS NO.	COMPOUND	Col #	DILUTION	CONC. (ug/kg dry)	MDL	MRL	Q
12674-11-2	Aroclor 1016	1	1	4.0	1.6	4.0	U
11104-28-2	Aroclor 1221	1	1	4.0	1.6	4.0	U
11141-16-5	Aroclor 1232	1	1	4.0	1.6	4.0	U
53469-21-9	Aroclor 1242	1	1	4.0	1.6	4.0	U
12672-29-6	Aroclor 1248	1	1	4.0	1.6	4.0	U
11097-69-1	Aroclor 1254	1	1	164	1.6	4.0	
11096-82-5	Aroclor 1260	1	1	41.6	0.6	4.0	

SURROGATES	Col #	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC	QC LIMITS	Q
Decachlorobiphenyl	*1*	*7.9958*	*6.79*	*84.9*	*40 - 126*	
Tetrachlorometaxylene	*1*	*7.9958*	*6.12*	*76.5*	*44 - 120*	

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112151ECD7.D
Data file 2: /210811.b/210811.b/08112151ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: 21G0286-04
Client ID:
Injection Date: 12-AUG-2021 08:31
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.064	-0.003	94937	5.409	-0.003	246546	30.6	28.7	6.3	Tetrachloro-m-xylene
13.152	-0.012	87076	13.837	-0.009	431616	34.0	33.2	2.3	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	259846	-12.3
Hexabromobiphenyl	470266	287475	-38.9

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	696406	-2.2
Hexabromobiphenyl	867949	725150	-16.5

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
		ZB5 Col					ZB35 Col			
Aroclor-1016	1	---			0.0	1	---			0.0
Aroclor-1016	2	---			0.0	2	---			0.0
Aroclor-1016	3	---			0.0	3	---			0.0
Aroclor-1016	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks				Col2Ave: <3 Quant Peaks				
Aroclor-1221	1	---			0.0	1	---			0.0
Aroclor-1221	2	---			0.0	2	---			0.0
Aroclor-1221	3	---			0.0	3	---			0.0
		Col1Ave: <3 Quant Peaks				Col2Ave: <3 Quant Peaks				
Aroclor-1232	1	---			0.0	1	---			0.0
Aroclor-1232	2	---			0.0	2	---			0.0
Aroclor-1232	3	---			0.0	3	---			0.0
Aroclor-1232	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks				Col2Ave: <3 Quant Peaks				
Aroclor-1242	1	---			0.0	1	---			0.0
Aroclor-1242	2	---			0.0	2	---			0.0
Aroclor-1242	3	---			0.0	3	---			0.0
Aroclor-1242	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks				Col2Ave: <3 Quant Peaks				
Aroclor-1248	1	7.787	-0.011	20422	188.3	1	---			0.0
Aroclor-1248	2	7.952	-0.016	16590	123.4	2	---			0.0
Aroclor-1248	3	8.299	-0.020	41872	310.9	3	---			0.0
Aroclor-1248	4	8.582	-0.026	39949	335.5	4	---			0.0
		Total Col1Ave (4 peaks):			239.5	Col2Ave: <3 Quant Peaks				
Aroclor-1254	1	8.658	-0.017	150590	685.4	1	9.226	-0.011	377304	715.5
Aroclor-1254	2	8.729	-0.017	53528	669.1	2	9.316	-0.014	133222	428.4
Aroclor-1254	3	9.024	-0.020	124186	922.3	3	9.747	-0.013	258611	651.8
Aroclor-1254	4	9.155	-0.023	235304	882.7	4	9.896	-0.015	664252	753.0
Aroclor-1254	5	9.843	-0.026	167699	933.3	5	10.121	-0.025	884127	934.4
		Total Col1Ave (5 peaks):			818.6	Total Col2Ave (5 peaks):			696.6	RPD = 16
		Corrected Ave (4 peaks):			789.9	Corrected Ave (4 peaks):			637.2	RPD = 21
Aroclor-1260	1	10.364	-0.018	20558	195.1	1	11.419	-0.006	241811	534.7
Aroclor-1260	2	10.684	-0.017	20307	187.4	2	11.663	-0.013	235484	199.6
Aroclor-1260	3	11.033	-0.017	61969	218.3	3	12.246	-0.014	142141	185.3
Aroclor-1260	4	11.432	-0.019	44400	306.9	4	12.958	-0.012	47803	145.0
Aroclor-1260	5	11.539	-0.015	7370	132.1	NS	---			----
		Total Col1Ave (5 peaks):			208.0	Total Col2Ave (4 peaks):			266.1	RPD = 25
		Corrected Ave (4 peaks):			183.2	Corrected Ave (3 peaks):			176.6	RPD = 4
Aroclor-1262	1	10.364	-0.027	20558	113.7	1	---			0.0
Aroclor-1262	2	11.432	-0.029	44400	380.6	2	---			0.0
Aroclor-1262	3	11.611	-0.025	13044	82.9	3	---			0.0
Aroclor-1262	4	12.317	0.028	6442	51.8	4	---			0.0
		Total Col1Ave (4 peaks):			157.3	Col2Ave: <3 Quant Peaks				
Aroclor-1268	1	11.539	-0.027	7370	15.3	1	---			0.0
Aroclor-1268	2	11.611	-0.025	13044	26.7	2	---			0.0
Aroclor-1268	3	12.012	0.000	7302	19.0	3	---			0.0
Aroclor-1268	4	12.752	-0.025	4165	3.5	4	---			0.0
		Total Col1Ave (4 peaks):			16.1	Col2Ave: <3 Quant Peaks				

Total PCB Area Col1 (5.167 - 13.064) = 2612191 Col1 Total PCB = 1.1 ppm*

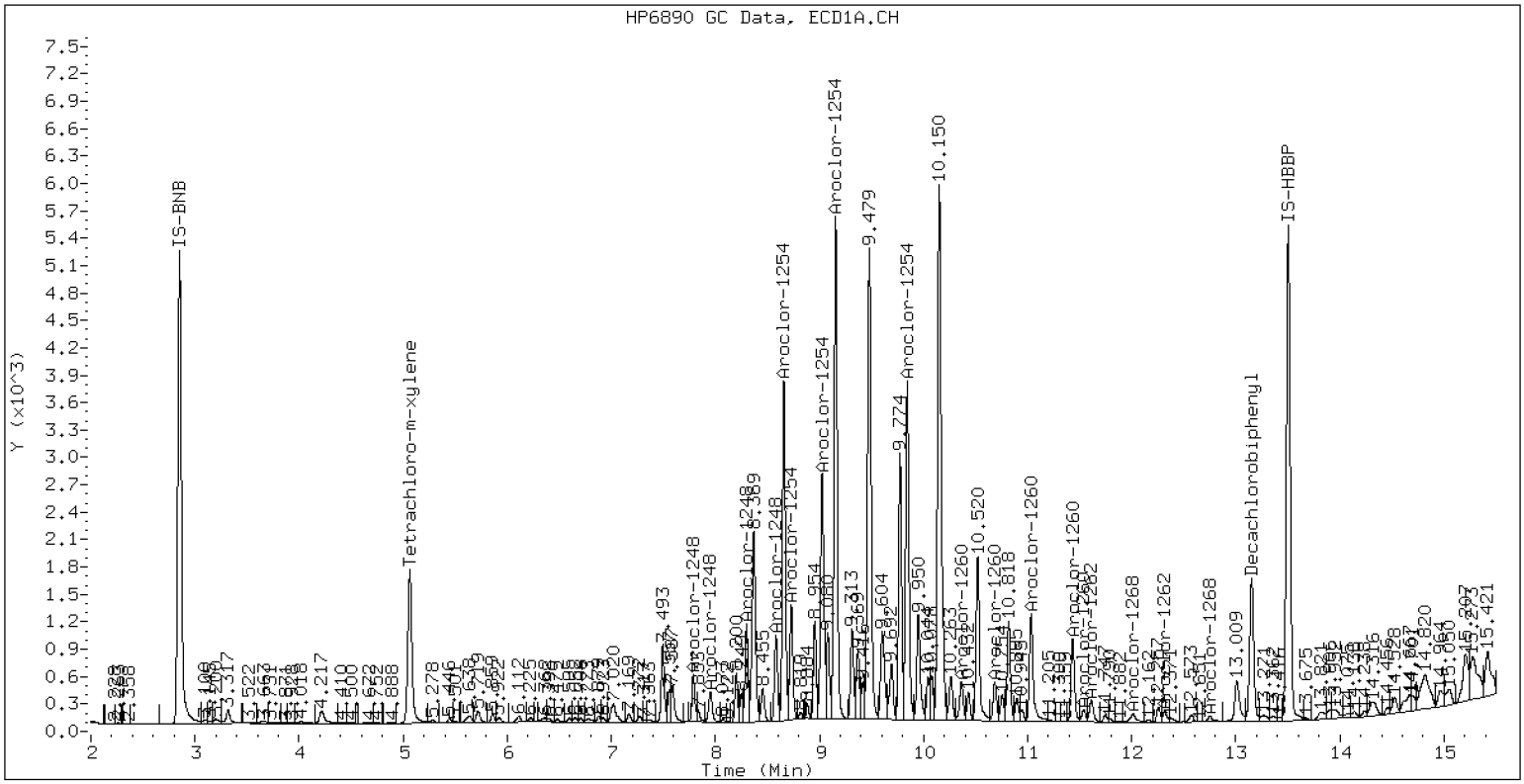
Total PCB Area Col2 (5.167 - 13.064) = 8065456 Col2 Total PCB = 1.1 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

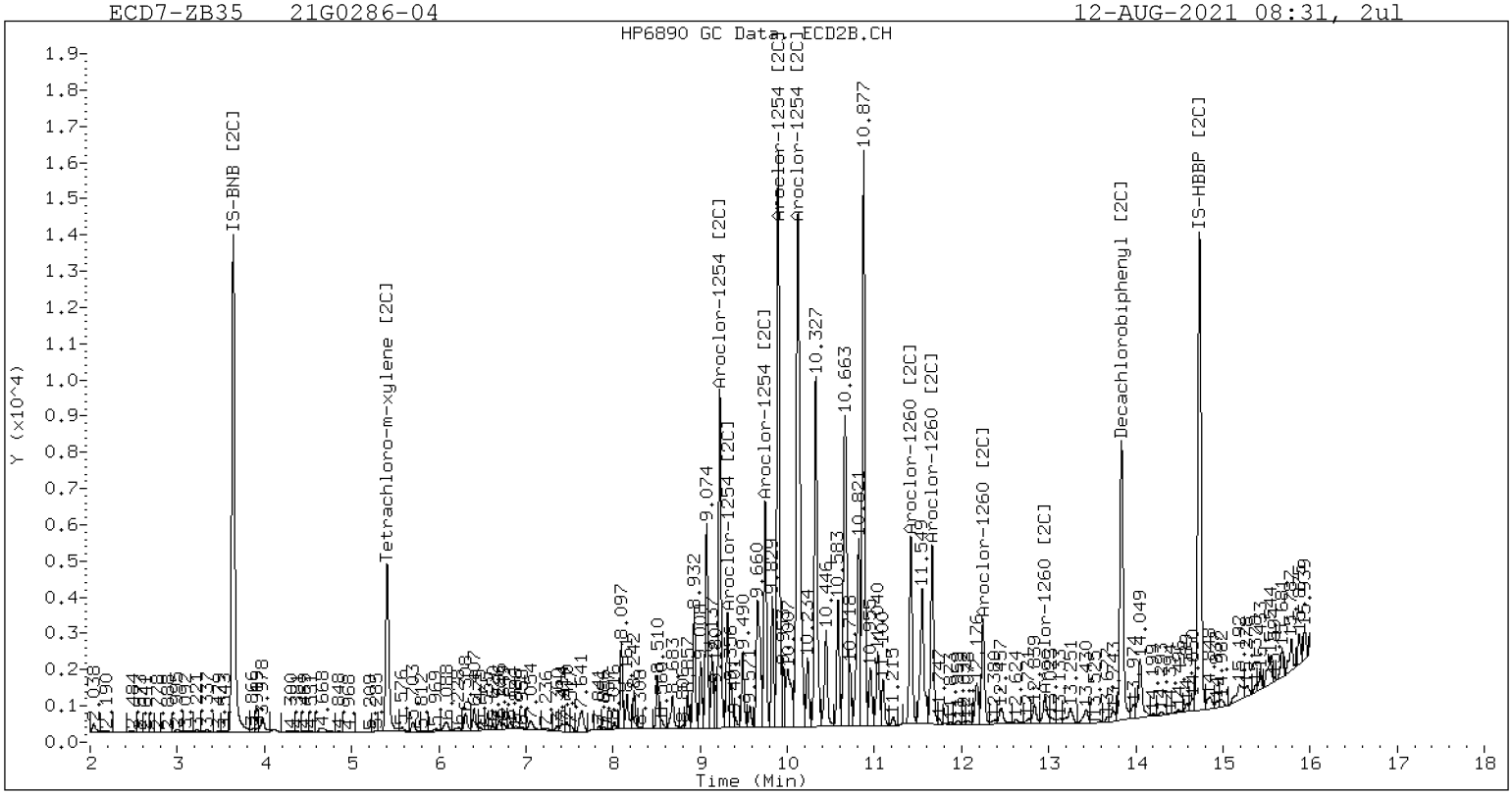
PCB Dual Column Chromatograms

ECD7-ZB5 21G0286-04 12-AUG-2021 08:31, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 21G0286-04 12-AUG-2021 08:31, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS646

Dual Column

ORGANIC ANALYSIS DATA SHEET
EPA 8082A

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Solid	Laboratory ID:	21G0286-05 B	File ID:	08122119ECD7.D
Sampled:	07/22/21 11:50	Prepared:	08/02/21 13:50	Analyzed:	08/12/21 18:58
% Solids:	64.57	Preparation:	EPA 3546 (Microwave)	Initial/Final:	19.44 g Wet / 2.5 mL
Batch:	BJH0005	Sequence:	SJH0190	Calibration:	EE00069
Instrument:	ECD7	Column 1:	ZB5	Column 2:	ZB35

CAS NO.	COMPOUND	Col #	DILUTION	CONC. (ug/kg dry)	MDL	MRL	Q
12674-11-2	Aroclor 1016	1	25	99.6	38.8	99.6	U
11104-28-2	Aroclor 1221	1	25	99.6	38.8	99.6	U
11141-16-5	Aroclor 1232	1	25	99.6	38.8	99.6	U
53469-21-9	Aroclor 1242	1	25	99.6	38.8	99.6	U
12672-29-6	Aroclor 1248	1	25	99.6	38.8	99.6	U
11097-69-1	Aroclor 1254	1	25	1660	38.8	99.6	D
11096-82-5	Aroclor 1260	2	25	653	14.7	99.6	D

SURROGATES	Col #	ADDED (ug/kg dry)	CONC (ug/kg dry)	% REC	QC LIMITS	Q
Decachlorobiphenyl	*1*	*7.9666*	*18.2*	*228*	*40 - 126*	*
Tetrachlorometaxylene	*1*	*7.9666*	*6.76*	*84.8*	*44 - 120*	
Decachlorobiphenyl	*2*	*7.9666*	*18.3*	*230*	*40 - 126*	*
Tetrachlorometaxylene	*2*	*7.9666*	*7.43*	*93.3*	*44 - 120*	

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210812.b/08122119ECD7.D
Data file 2: /210812.b/210812.b/08122119ECD7.D
Method: \\target\share\chem4\ecd7.i\210812.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: 21G0286-05RE1
Client ID:
Injection Date: 12-AUG-2021 18:58
Report Date: 08/16/2021 13:21
Matrix: NONE
Dilution Factor: 25.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.067	-0.002	3844	5.412	-0.000	12597	1.4	1.5	9.5	Tetrachloro-m-xylene
13.159	-0.005	12323	13.843	-0.003	55716	3.6	3.7	0.9	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	237153	-20.0
Hexabromobiphenyl	470266	378923	-19.4

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	684362	-3.9
Hexabromobiphenyl	867949	844456	-2.7

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	ZB5 Col Peak#	RT	Shift	Area	Amount	ZB35 Col Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.672	0.012	101	1.4	1	7.056	-0.000	639	1.8
Aroclor-1016	2	7.036	0.004	1042	4.2	2	7.655	0.004	4081	5.3
Aroclor-1016	3	7.184	0.005	250	2.5	3	7.903	0.046	1345	4.6
Aroclor-1016	4	7.365	0.078	134	2.0	4	8.032	0.002	640	3.6
Total Col1Ave (4 peaks):					2.5	Total Col2Ave (4 peaks):				3.8 RPD = 42*
Corrected Ave (3 peaks):					1.9	Corrected Ave (3 peaks):				3.3 RPD = 53*
Aroclor-1221	1	---			0.0	1	4.638	-0.055	2635	59.2
Aroclor-1221	2	---			0.0	2	6.082	-0.002	1214	11.6
Aroclor-1221	3	---			0.0	3	6.415	-0.007	2318	12.0
Col1Ave: <3 Quant Peaks						Col2Ave: 27.6				
Aroclor-1232	1	---			0.0	1	4.638	-0.054	2635	93.5
Aroclor-1232	2	---			0.0	2	6.082	-0.003	1214	16.1
Aroclor-1232	3	7.036	0.009	1042	9.5	3	6.415	-0.008	2318	14.0
Aroclor-1232	4	8.596	-0.009	16577	505.0	4	7.655	-0.007	4081	11.8
Col1Ave: <3 Quant Peaks						Col2Ave: 33.9				
Aroclor-1242	1	6.672	0.012	101	1.5	1	7.056	-0.001	639	2.1
Aroclor-1242	2	7.036	0.004	1042	4.9	2	7.655	0.004	4081	6.2
Aroclor-1242	3	8.270	-0.004	847	29.0	3	8.950	0.001	17731	59.7
Aroclor-1242	4	8.596	-0.016	16577	253.9	4	9.026	-0.004	36952	141.4
Total Col1Ave (4 peaks):					72.3	Total Col2Ave (4 peaks):				52.4 RPD = 32
Corrected Ave (3 peaks):					11.8	Corrected Ave (3 peaks):				22.7 RPD = 63*
Aroclor-1248	1	7.799	-0.001	2542	25.7	1	8.105	-0.000	18512	74.2
Aroclor-1248	2	7.966	-0.003	5131	41.8	2	8.518	-0.002	8945	26.4
Aroclor-1248	3	8.319	-0.001	3415	27.8	3	8.950	0.001	17731	36.3
Aroclor-1248	4	8.596	-0.012	16577	152.5	4	9.355	-0.023	35375	67.9
Total Col1Ave (4 peaks):					62.0	Total Col2Ave (4 peaks):				51.2 RPD = 19
Corrected Ave (3 peaks):					31.8	Corrected Ave (3 peaks):				43.5 RPD = 31
Aroclor-1254	1	8.671	-0.005	51866	258.7	1	9.236	-0.003	159322	307.5
Aroclor-1254	2	8.743	-0.004	22646	310.2	2	9.328	-0.003	65935	215.8
Aroclor-1254	3	9.038	-0.006	32358	263.3	3	9.759	-0.002	99768	255.9
Aroclor-1254	4	9.172	-0.006	104417	429.2	4	9.909	-0.003	382855	441.6
Aroclor-1254	5	9.859	-0.011	66528	405.7	5	10.145	-0.003	399769	429.9
Total Col1Ave (5 peaks):					333.4	Total Col2Ave (5 peaks):				330.1 RPD = 1
Corrected Ave (4 peaks):					309.4	Corrected Ave (4 peaks):				302.3 RPD = 2
Aroclor-1260	1	10.379	-0.003	13357	96.2	1	11.431	0.006	179142	340.2
Aroclor-1260	2	10.698	-0.002	15747	110.3	2	11.675	-0.001	209027	152.2
Aroclor-1260	3	11.047	-0.003	41499	110.9	3	12.258	-0.001	128097	143.4
Aroclor-1260	4	11.448	-0.003	30427	159.6	4	12.967	-0.003	37591	97.9
Aroclor-1260	5	11.550	-0.003	5983	81.4	NS	---			----
Total Col1Ave (5 peaks):					111.7	Total Col2Ave (4 peaks):				183.4 RPD = 49*
Corrected Ave (4 peaks):					99.7	Corrected Ave (3 peaks):				131.1 RPD = 27
Aroclor-1262	1	10.379	-0.012	13357	56.0	1	10.963	-0.026	64884	76.5
Aroclor-1262	2	11.448	-0.014	30427	197.9	2	11.675	-0.025	209027	124.6
Aroclor-1262	3	11.622	-0.014	8856	42.7	3	12.188	-0.020	43360	53.9
Aroclor-1262	4	12.270	-0.019	7228	44.1	4	12.967	-0.026	37591	51.5
Total Col1Ave (4 peaks):					85.2	Total Col2Ave (4 peaks):				76.6 RPD = 11
Corrected Ave (3 peaks):					47.6	Corrected Ave (3 peaks):				60.6 RPD = 24
Aroclor-1268	1	11.550	-0.015	5983	9.4	1	12.188	-0.019	43360	17.7
Aroclor-1268	2	11.622	-0.014	8856	13.7	2	12.258	-0.017	128097	47.9
Aroclor-1268	3	12.038	0.026	5790	11.4	3	12.681	0.021	668	0.3
Aroclor-1268	4	12.746	-0.031	7893	5.0	4	13.504	0.031	2859	0.4
Total Col1Ave (4 peaks):					9.9	Total Col2Ave (4 peaks):				16.6 RPD = 50*
Corrected Ave (3 peaks):					8.6	Corrected Ave (3 peaks):				6.1 RPD = 34

Total PCB Area Col1 (5.168 - 13.064) = 1159235 Col1 Total PCB = 0.6 ppm*

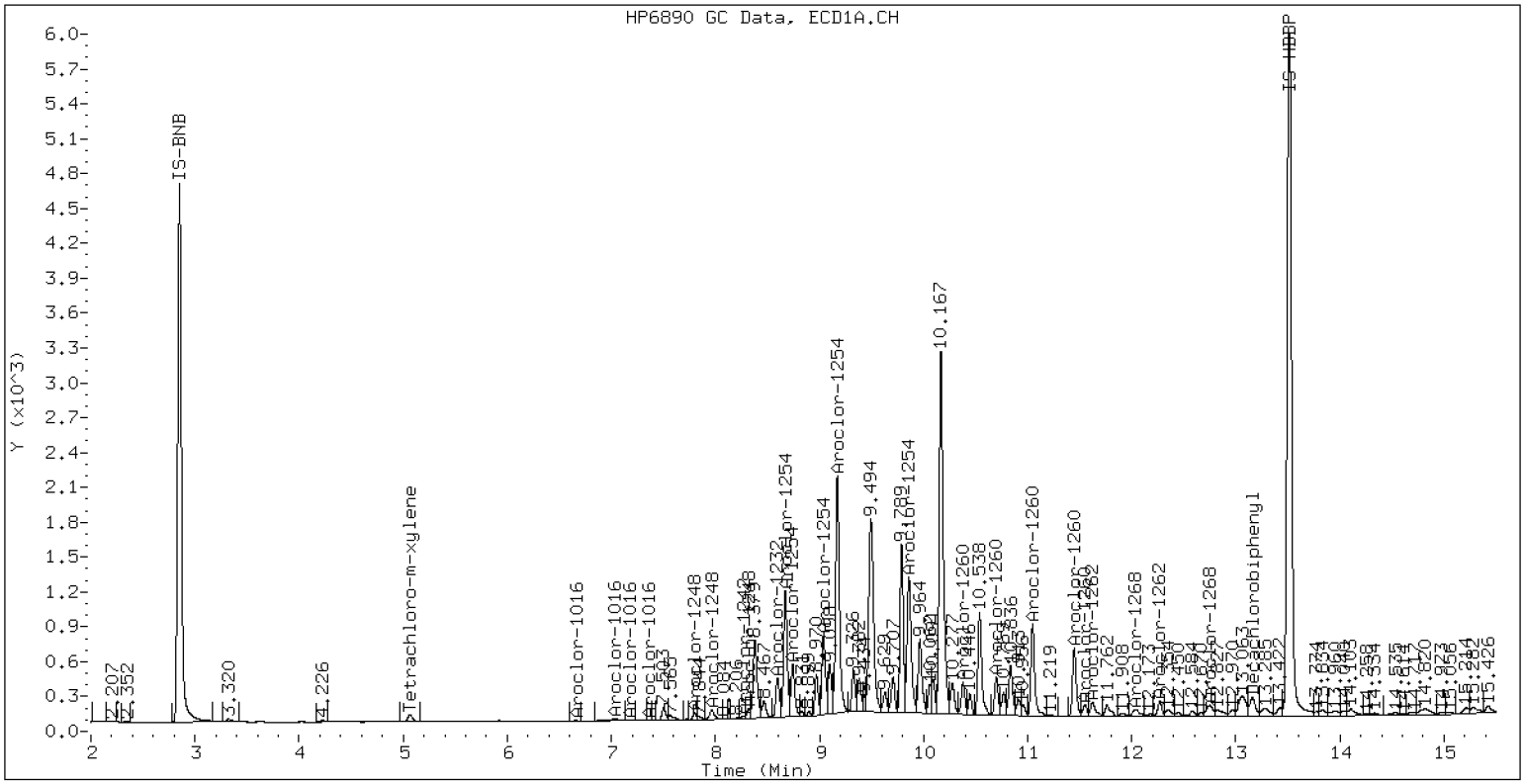
Total PCB Area Col2 (5.168 - 13.064) = 4050845 Col2 Total PCB = 0.5 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

PCB Dual Column Chromatograms

ECD7-ZB5 21G0286-05RE1 12-AUG-2021 18:58, 2ul



ZB-5 Manual Integration: NO

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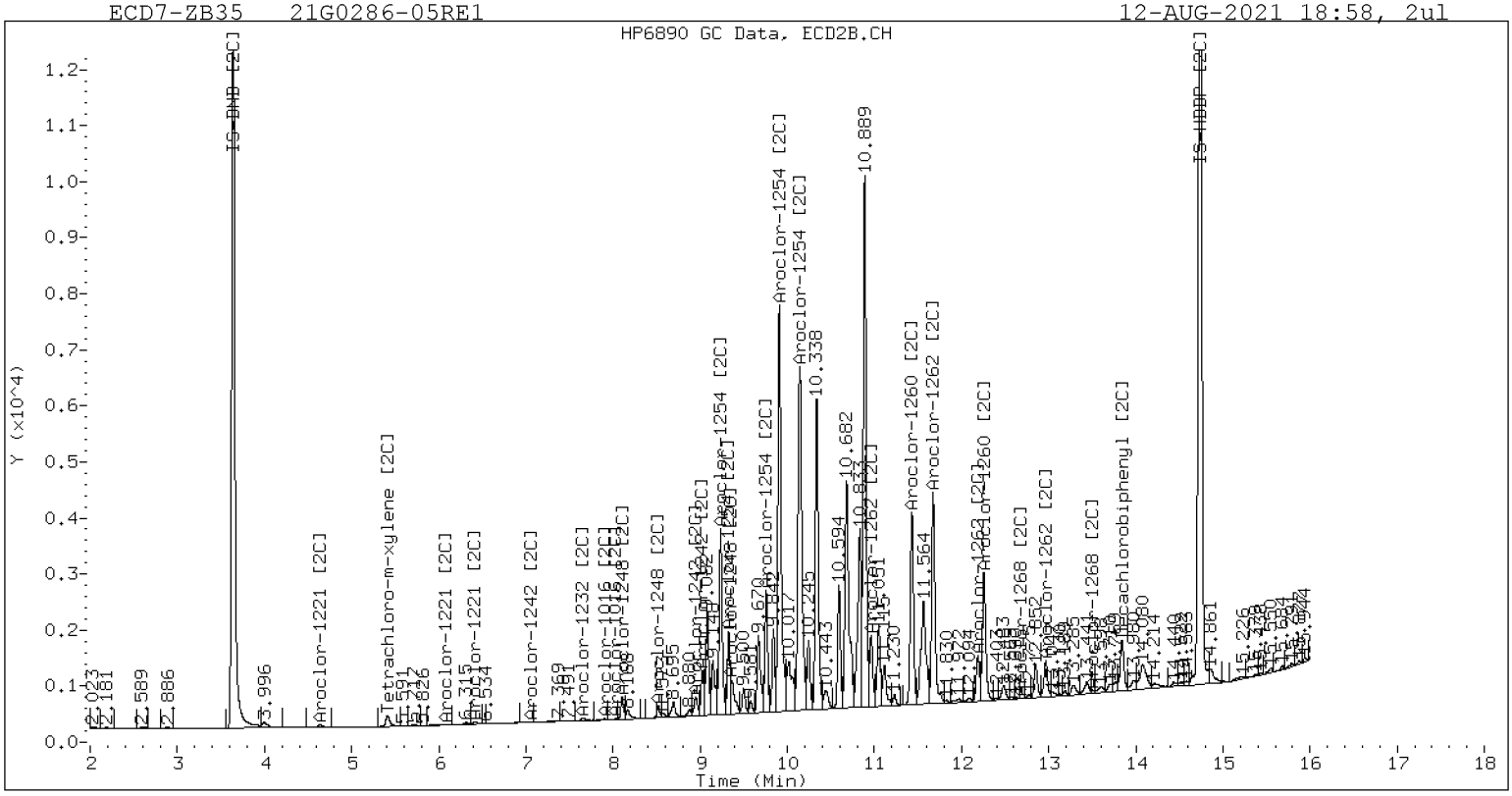
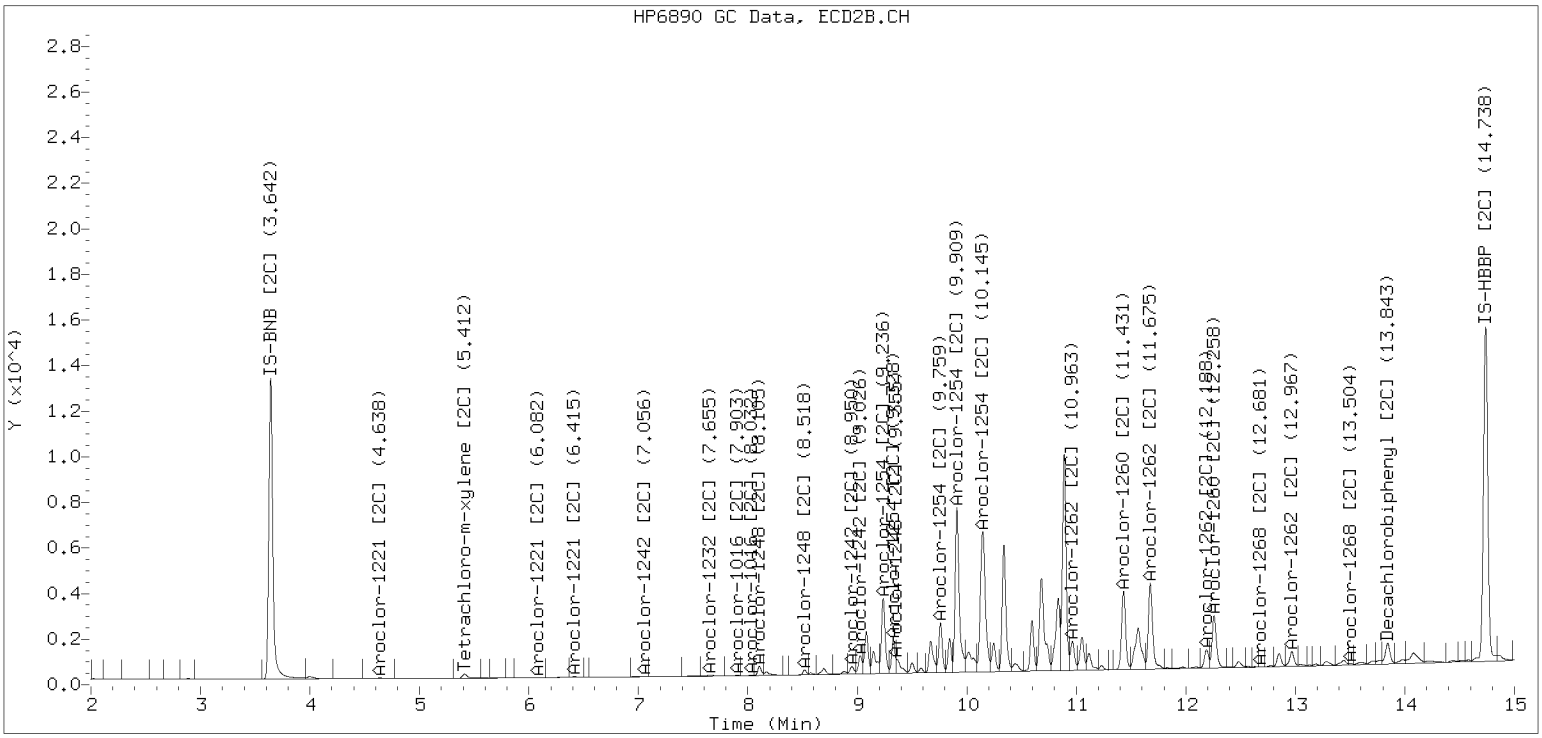


ZB-35 Manual Integration: YES

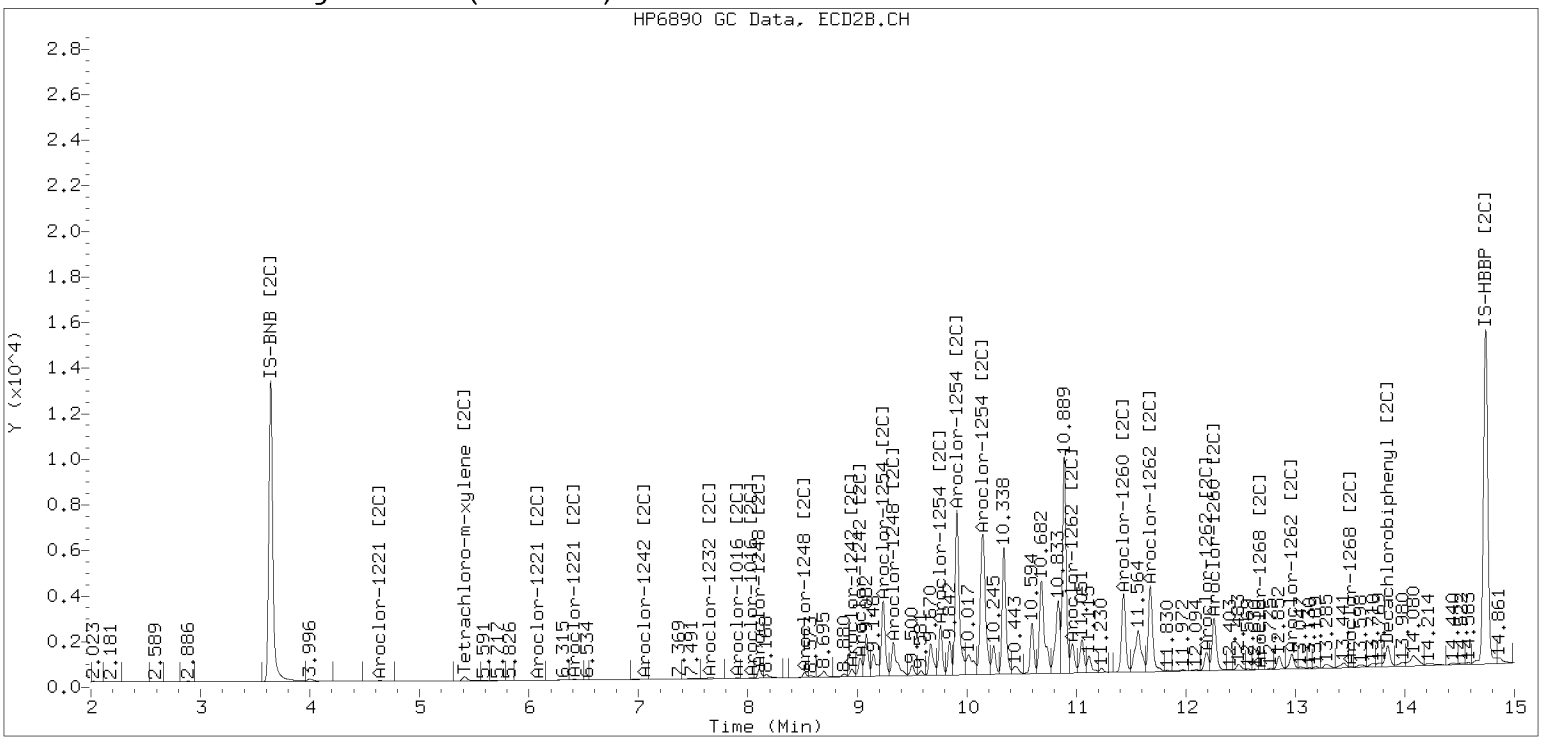
Manual Peak Adjustment, ZB-35

Datafile: ecd7.i/210812.b/210812.b/08122119ECD7.D Injection Date: 12-AUG-2021

Manual Integration (After)



Processed Integration (Before)



Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Batch:	BJH0005	Batch Matrix:	Solid	Preparation:	EPA 3546 (Microwave)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS625	21G0286-02	08112147ECD7.D	08/02/21 13:50	
LDW21-IT625	21G0286-03	08112148ECD7.D	08/02/21 13:50	
LDW21-SS627	21G0286-04	08112151ECD7.D	08/02/21 13:50	
LDW21-SS646	21G0286-05	08122119ECD7.D	08/02/21 13:50	
Blank	BJH0005-BLK1	08112133ECD7.D	08/02/21 13:50	
LCS	BJH0005-BS1	08112134ECD7.D	08/02/21 13:50	
LDW21-IT625	BJH0005-MS1	08112149ECD7.D	08/02/21 13:50	
LDW21-IT625	BJH0005-MSD1	08112150ECD7.D	08/02/21 13:50	
Reference	BJH0005-SRM1	08112135ECD7.D	08/02/21 13:50	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

RUSH

ORGANICS PREPARATION BENCH SHEET

Batch: BJH0005

Prepared using: EPA 3546 (Microwave)

8082A PCB Solid 4 in Solid (Version:7 Aroclors)

Matrix: Solid **Date Prepared:** 08/02/21 **Balance ID:** B1464626 14 **Set Up By:** CTO 8/2/21

WO Comments

21G0285: <G> BPR Project batch as much as possible </G> <C>BPR SRM, MS, DUP </C> <M> BPR PS, MS/MSD </M> <E>BPR 8270E RM H002055, SIM RM H010158, PCB RM J006840-43, MS/MSD </E>
<H> BPR J006840-43, Dup </H>

21G0286: <G> BPR Project batch as mcuh as possible </G> <C>BPR SRM, MS, DUP </C> <M>BPR PS, MS/MSD </M> <E>BPR 8270E RM H002055, SIM RM H010158, PCB RM J006840-43, MS/MSD </E>
<H>BPR J006840-43, Dup </H>

The following standards may be missing from this batch!

Designator	Description
QLS 5	QLS Spike

Analysis: 8082A PCB Solid 4

Lab Number & Container	% Solids	Initial (g) Target Dry: 12.5 (Wet)	Actual	(REQ) Acid C/U (5mL)	(REQ) Sulfur C/U (5mL) 1 2 3	(REQ) Silica Gel C/U (2:5)	Final Effective Vol (mL)	Vol (mL) to Lab	Extraction Comments
21G0285-01 B	41.6	(30.04)	30.09	5mL	5mL	2mL	2.5	1.0	
21G0285-02 B	50.0	(25.03)	25.03	5mL	5mL	2mL	2.5	1.0	
21G0285-03 B	75.9	(16.47)	16.47	5mL	5mL	2mL	2.5	1.0	
21G0285-04 B	79.0	(15.82)	15.86	5mL	5mL	2mL	2.5	1.0	
21G0285-05 B	41.4	(30.23)	30.28	5mL	5mL	2mL	2.5	1.0	
21G0285-06 B	50.8	(24.63)	24.64	5mL	5mL	2mL	2.5	1.0	
21G0285-07 B	78.5	(15.92)	15.95	5mL	5mL	2mL	2.5	1.0	
21G0285-08 B	77.6	(16.11)	16.14	5mL	5mL	2mL	2.5	1.0	
21G0285-09 B	74.4	(16.80)	16.87	5mL	5mL	2mL	2.5	1.0	
21G0286-02 B	76.1	(16.42)	16.51	5mL	5mL	2mL	2.5	1.0	
21G0286-03 B	87.7	(14.25)	14.25	5mL	5mL	2mL	2.5	1.0	
21G0286-04 B	54.4	(22.98)	22.99	5mL	5mL	2mL	2.5	1.0	
21G0286-05 B	64.6	(19.36)	19.44	5mL	5mL	2mL	2.5	1.0	

Batch QC

Lab Number	% Solids	Initial (g) Target Dry: 12.5 (Wet)	Actual	(REQ) Acid C/U (5mL)	(REQ) Sulfur C/U (5mL) 1 2 3	(REQ) Silica Gel C/U (2:5)	Final Effective Vol (mL)	Vol (mL) to Lab	Extraction Comments
BJH0005-BLK1	100.0	(12.50)	12.50	5mL	5mL	2mL	2.5	1.0	(10g Actual Wt.)
BJH0005-BS1	100.0	(12.50)	12.50	5mL	5mL	2mL	2.5	1.0	(10g Actual Wt.)
BJH0005-MS1	87.7	(14.25)	14.25	5mL	5mL	2mL	2.5	1.0	Use 21G0286-03
BJH0005-MSD1	87.7	(14.25)	14.25	5mL	5mL	2mL	2.5	1.0	Use 21G0286-03
BJH0005-SRM1	100.0	~~(12.50)~~ (2.50)	2.50	5mL	5mL	2mL	2.5	1.0	Use J006842

Client ID verified By 08/02/21 Date

DM Preparation Reviewed By 8-11-21 Date

08/02/21 13:50 Extraction Date and Time

Printed: 8/2/2021 8:36:18AM

3099F
Page 1 of 2

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ORGANICS PREPARATION BENCH SHEET

Batch: BJH0005

Prepared using: EPA 3546 (Microwave)

8082A PCB Solid 4 in Solid (Version:7 Aroclors)

WO Comments

21G0285: <G> BPR Project batch as much as possible </G> <C>BPR SRM, MS, DUP </C> <M> BPR PS, MS/MSD </M> <E>BPR 8270E RM H002055, SIM RM H010158, PCB RM J006840-43, MS/MSD </E>
<H> BPR J006840-43, Dup </H>
21G0286: <G> BPR Project batch as mcuh as possible </G> <C>BPR SRM, MS, DUP </C> <M>BPR PS, MS/MSD </M> <E>BPR 8270E RM H002055, SIM RM H010158, PCB RM J006840-43, MS/MSD </E>
<H>BPR J006840-43, Dup </H>

Prep Steps

Microwave
1 (2) 3
CT 08/02/21
Analyst/Date

KD
100°C
Hexane Exchange
(2 X 20 mL)
1 2 3 (4) (5) 6 (00)
RM 08/10/21
Analyst/Date

TurboVap
Pre Cleanups
1 2 3 (4) 5
8-11-21
DM Analyst/Date

TurboVap
Post Cleanups
1 2 3 4 (5)
8-11-21
DM Analyst/Date

Vialing
8-11-21
DM Analyst/Date

Reagents Used

Station/Reagent	Standard ID
Microwave Analyst: CT Date: 08/02/21	
Anhydrous Sodium Sulfate	J007778
Neutral Glass Wool	J006768
1:1 Hexane/Acetone	J007652
Hexane	J006933
KD Analyst: RM Date: 08/10/21	
Hexane	J005194
Anhydrous Sodium Sulfate	J008034
Vialing Analyst: DM Date: 8-11-21	
Hexane	J005194
Concentrated Sulfuric Acid	J006313
Tetrabutylammonium hydrogensulfate (TBAS)	J007842
Sodium Sulfite	J001221
Silica Gel (SPE) Darts	J007869

Surrogates & Spike Standards Used

Type	Vial ID / Standard ID	Vol uL	Analyst	Witness
Surrogate 2µg/mL	N J006926 Exp: 08/08/2021	50µL	CT	
Spike 20µg/mL	1 J004905 Exp: 11/07/2021	63µL	CT	

(V) indicates a virtual standard combining two or more physical standards. In these cases the Standard ID refers to the virtual standard, not the parent standards.

If a Standard ID is missing, but should be present, check the standard definition in Element LIMS to be sure Standard Info 6 has the correct letter or number designator matching the vial designator inthe Standard ID column. If it is correct, check the batch and bench sheet in Element LIMS to be sure the correct standards are selected for surrogate(s) and spike(s).

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Organic Extractions Laboratory Analyst Notes

Extraction Parameter: PCB Extraction Batch BJH0005

Total Solids Batch: BJG0686 Work Order(s): 21G0286

Screens: Soil/Sediment/Solid/Other:	Analyst/Date
☑ No Anomalies (standard soil/wet sediment/sand/gravel)= 01-05	07/30/21
☐ Standing Water Decanted (Not shared)=	
☐ Standing Water Homogenized (Shared samples)=	
☐ Clay/Clumps (Difficult to homogenize)=	
☐ Rocks (%+size)?	
☐ Organics (Leaves/sticks/grass)=	
☐ Oily, obvious fuel/sulfur odors=	
☐ Received in 32oz jar(s)=Homogenized in Pyrex dish=	
☐ Previously Frozen =	
☐ Other (Details)=	
Aqueous:	
☐ No Anomalies	
☐ Turbid/Color=	
☐ Particulates(%)=(Note: >5%=Notify Supervisor/Lead)	
☐ Emulsions (%)=	
☐ Oily, obvious fuel/sulfur odors=	
☐ Other (Details)=	
☐ Received in 1.0L Bottle(s)=No Bottle Rinse=	
☒ Other Notes/Comments= (Note problems, concerns, corrective actions).	
used wrist shaker for sulfur cu	DM 8-11-21
☑ Share Samples Y / N	07/30/21
☑ Multiple Jars Y / N	07/30/21
☐ Sample Pre-Screens indicate analyte activity=	
☐ Sample weights/volumes reduced based on Pre-Screen=	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Organic Extractions Laboratory Analyst Notes

Extraction Parameter: PCB Extraction Batch BJH0005

Total Solids Batch: BJG0685 Work Order(s): 21G0285

Screens: Soil/Sediment/Solid/Other:	Analyst/Date
☐ No Anomalies (standard soil/wet sediment/sand/gravel)=	
☑ Standing Water Decanted (Not shared)= 03, 08, 09	07/30/21
☐ Standing Water Homogenized (Shared samples)=	
☑ Clay/Clumps (Difficult to homogenize)= 02, 06	07/30/21
☐ Rocks (%+size)?	
☑ Organics (Leaves/sticks/grass)= 03	07/30/21
☐ Oily, obvious fuel/sulfur odors=	
☐ Received in 32oz jar(s)=Homogenized in Pyrex dish=	
☐ Previously Frozen =	
☐ Other (Details)=	
Aqueous:	
☐ No Anomalies	
☐ Turbid/Color=	
☐ Particulates(%)=(Note: >5%=Notify Supervisor/Lead)	
☐ Emulsions (%)=	
☐ Oily, obvious fuel/sulfur odors=	
☐ Other (Details)=	
☐ Received in 1.0L Bottle(s)=No Bottle Rinse=	
☒ Other Notes/Comments= (Note problems, concerns, corrective actions).	
Used wrist shaker for Sulfur clu	DM 8-11-21
☑ Share Samples Y / N	07/30/21
☑ Multiple Jars Y / N	07/30/21
☐ Sample Pre-Screens indicate analyte activity=	
☐ Sample weights/volumes reduced based on Pre-Screen=	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ORGANICS PREPARATION BENCH SHEET

Batch: BJH0005

Prepared using: EPA 3546 (Microwave)

8082A PCB Solid 4 in Solid (Version:7 Aroclors)

WO Comments

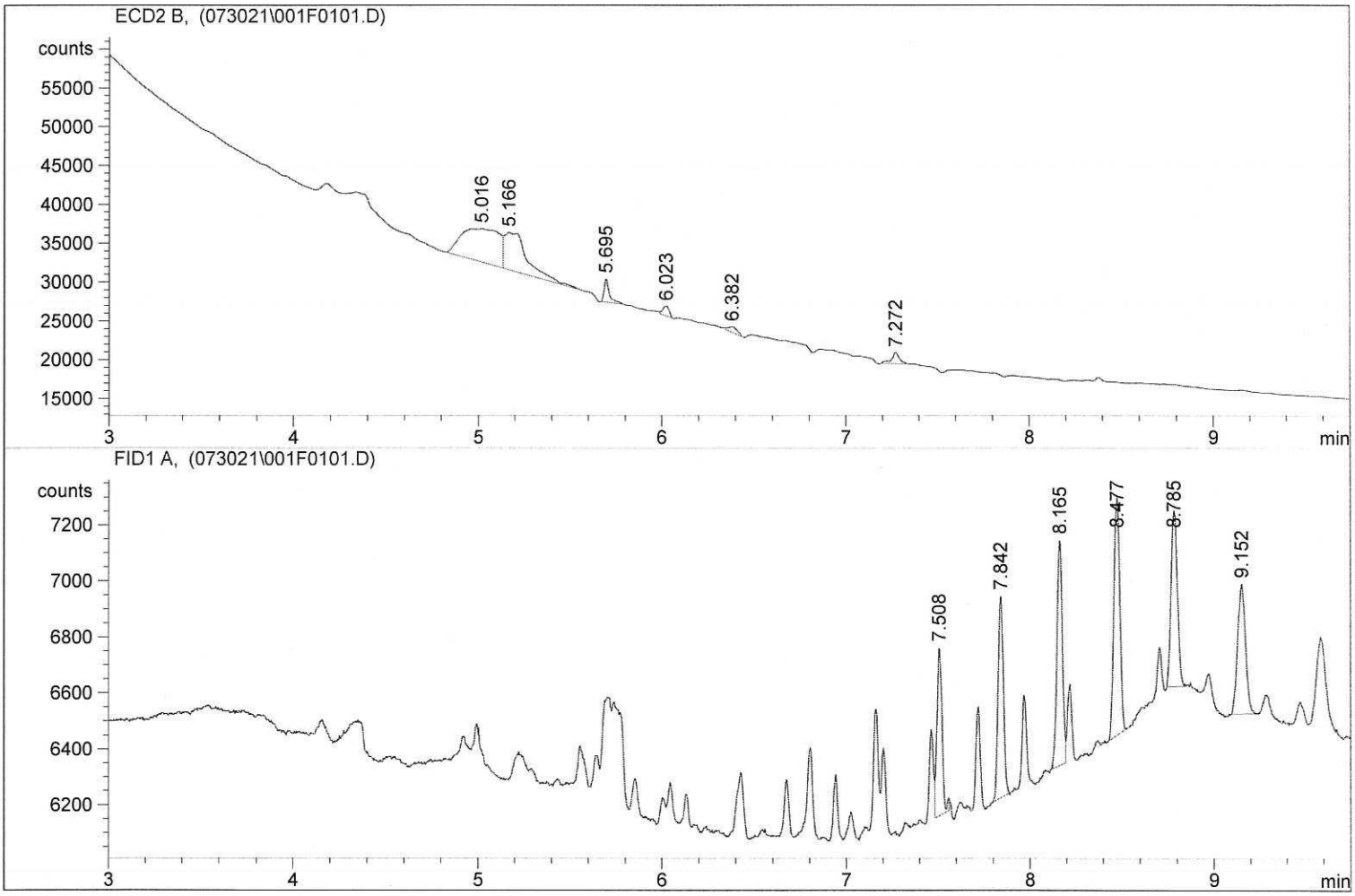
21G0285: <G> BPR Project batch as much as possible </G> <C>BPR SRM, MS, DUP </C> <M> BPR PS, MS/MSD </M> <E>BPR 8270E RM H002055, SIM RM H010158, PCB RM J006840-43, MS/MSD </E>
<H> BPR J006840-43, Dup </H>
21G0286: <G> BPR Project batch as mcuh as possible </G> <C>BPR SRM, MS, DUP </C> <M>BPR PS, MS/MSD </M> <E>BPR 8270E RM H002055, SIM RM H010158, PCB RM J006840-43, MS/MSD </E>
<H>BPR J006840-43, Dup </H>

Prep Instructions	
SPECIAL INSTRUCTIONS: 1. Weigh soil/sed into beakers-lightly dry with sodium sulfate. 2. Transfer to microwave vessel(s). Note: (do not fill vessels more than 2/3rd full. Some samples may require two vessels). 3. Add 1:1 Hexane/Acetone until the solvent layer is 3 inches above the soil layer after homogenization. 4. Add surr/spike. 5. Microwave on appropriate power setting determined by # of samples. 6. After microwave-Re-homogenize while hot then cool vessels in R-05 15 minutes. Re-homogenize while cool. 7. Decant 1:1 Hex/Ace into Erlenmeyer flask with sodium sulfate in bottom and funnel with neutral glasswool plug. 8. Re-homogenize and rinse with 1:1 Hexane/Acetone. 9. Let cool and decant solvent then empty the soil into the funnel and rinse with Hexane. 10. KD on 100° bath. 11. Exchange (2 X with 20mL) Hexane. 12. TurboVap. 13. Clean-ups. 14. TurboVap. 15. Vial with Hexane. A. Need Total Solids Y / N B. Archive/Freeze Y / N	

Printed: 8/2/2021 8:36:18AM

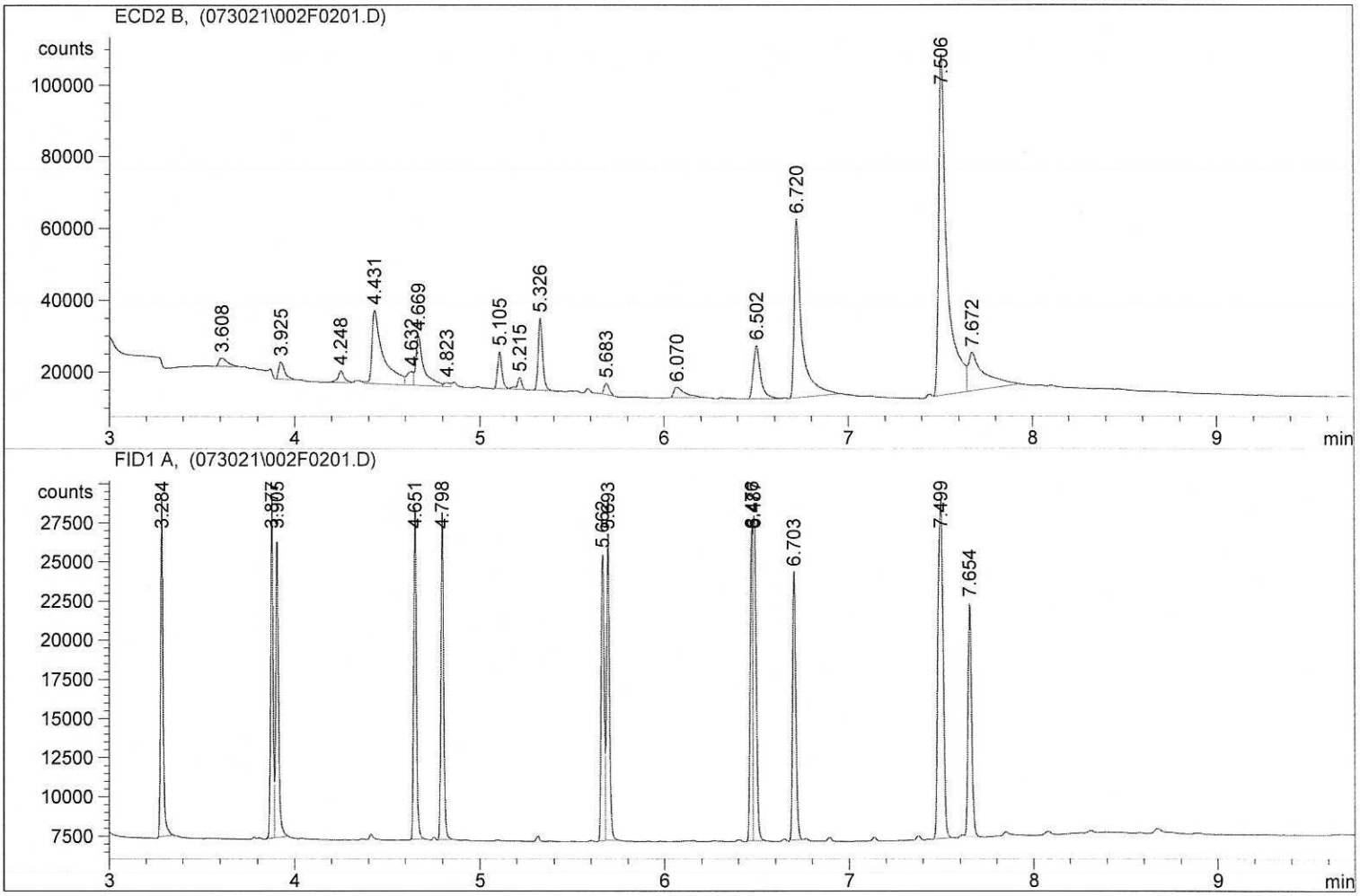
3099F

Injection Date	: 7/30/2021 12:46:33 PM	Seq. Line :	1
Sample Name	: DCM RINSE	Location :	Vial 1
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



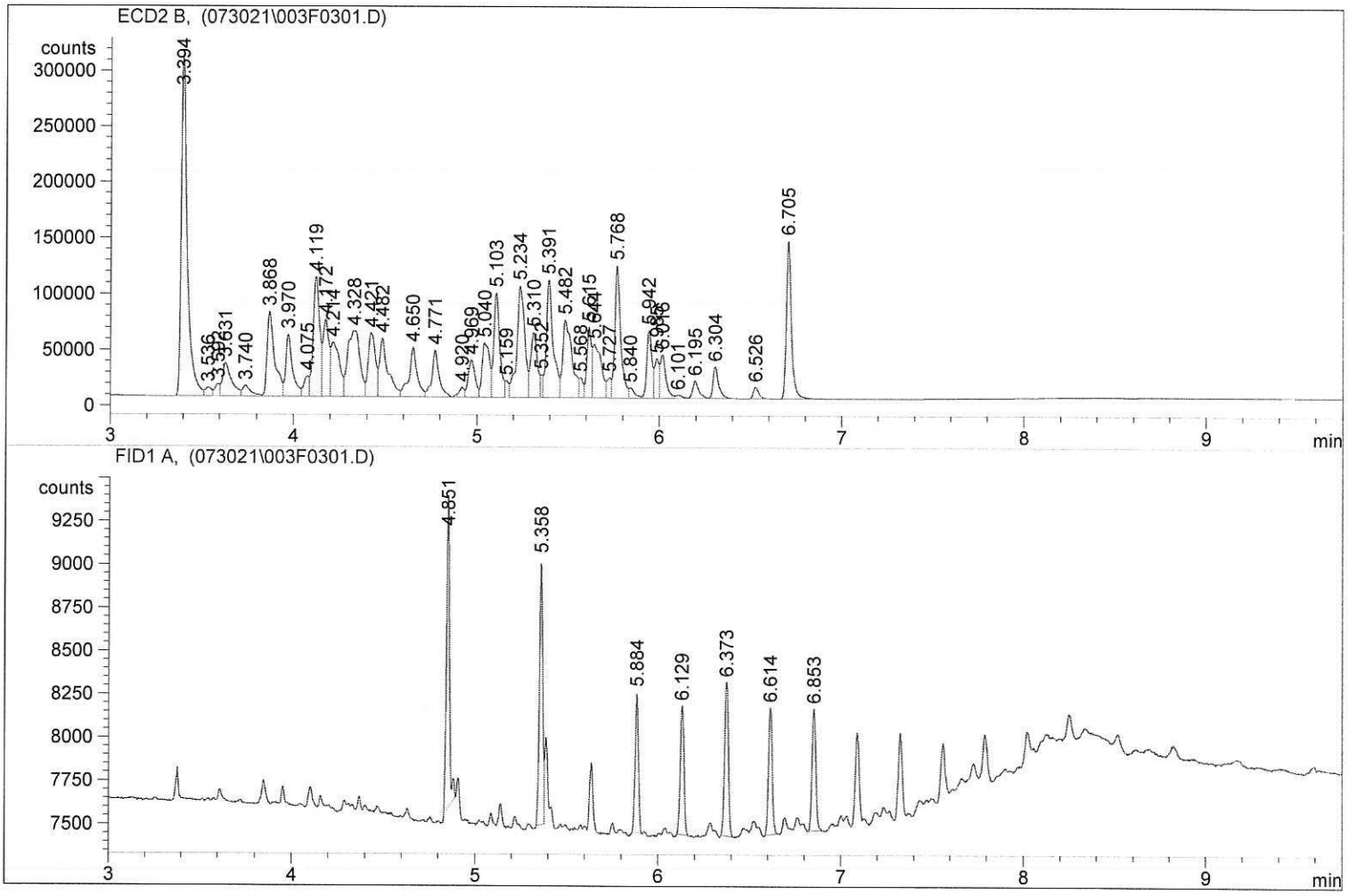
*** End of Report ***

Injection Date	: 7/30/2021 1:00:55 PM	Seq. Line :	2
Sample Name	: PNA STD 10PPM	Location :	Vial 2
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



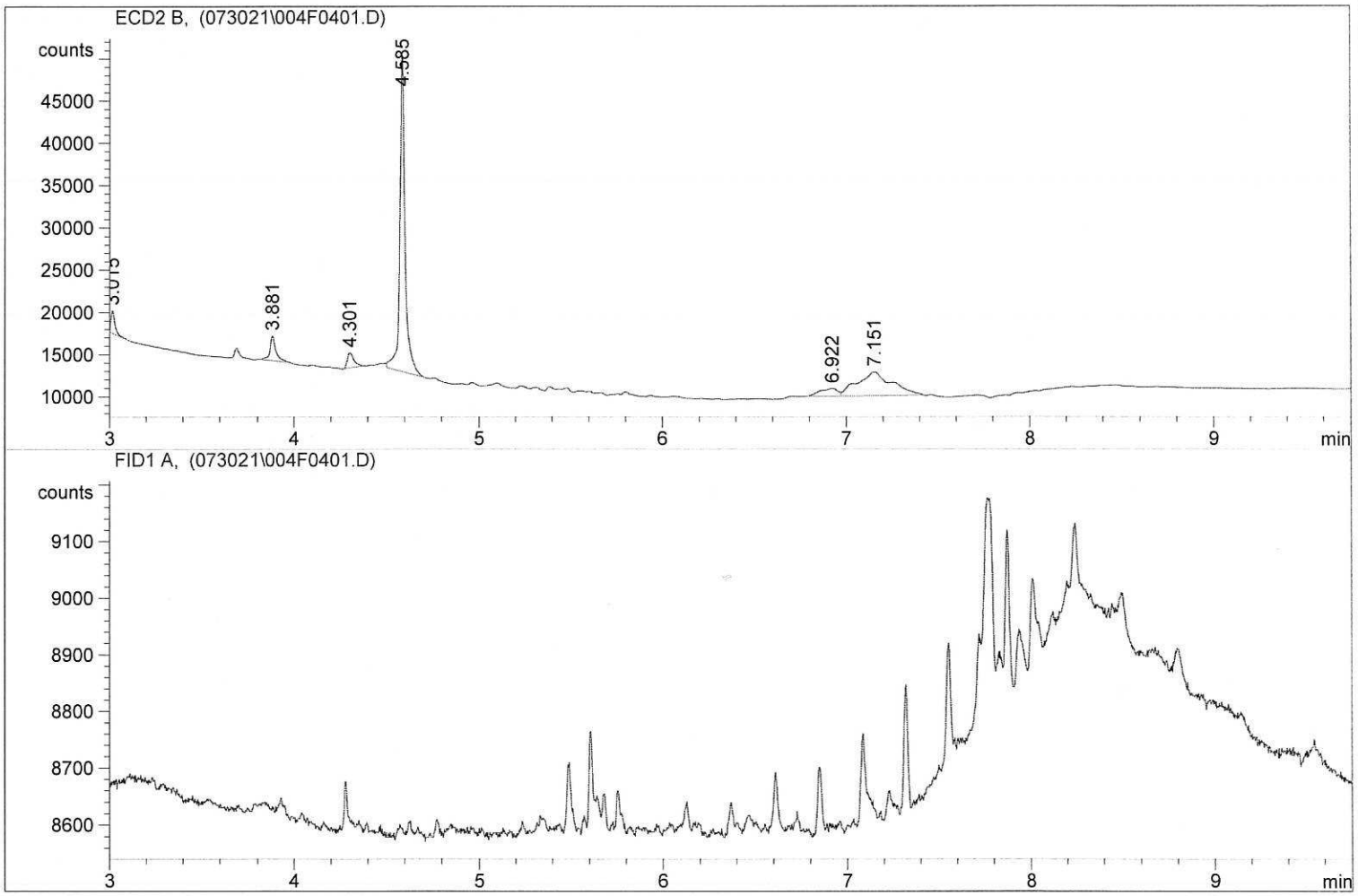
*** End of Report ***

Injection Date	: 7/30/2021 1:14:36 PM	Seq. Line :	3
Sample Name	: AR 1660 1PPM	Location :	Vial 3
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



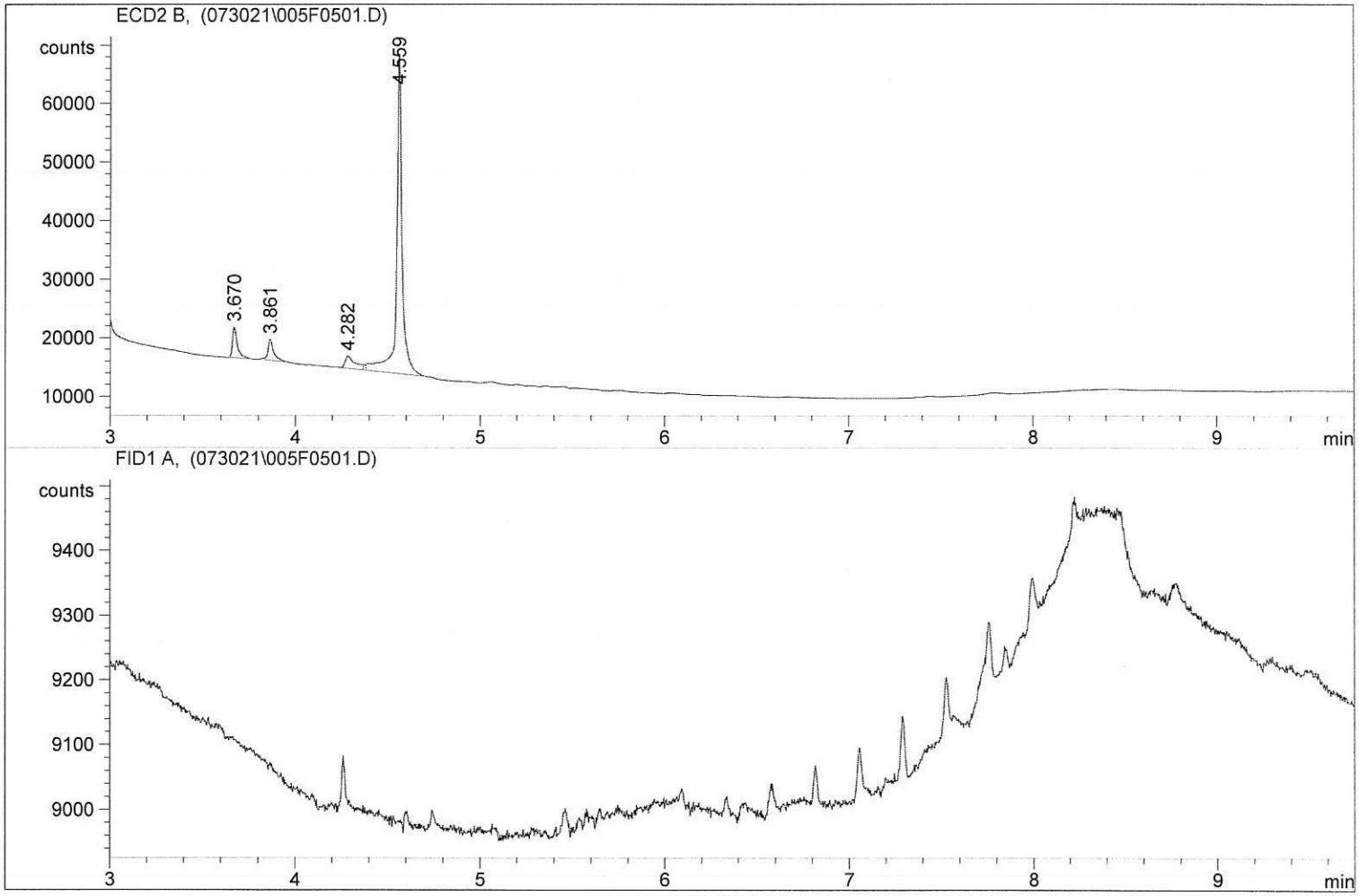
*** End of Report ***

Injection Date	: 7/30/2021 1:28:43 PM	Seq. Line :	4
Sample Name	: 21G0285 1	Location :	Vial 4
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



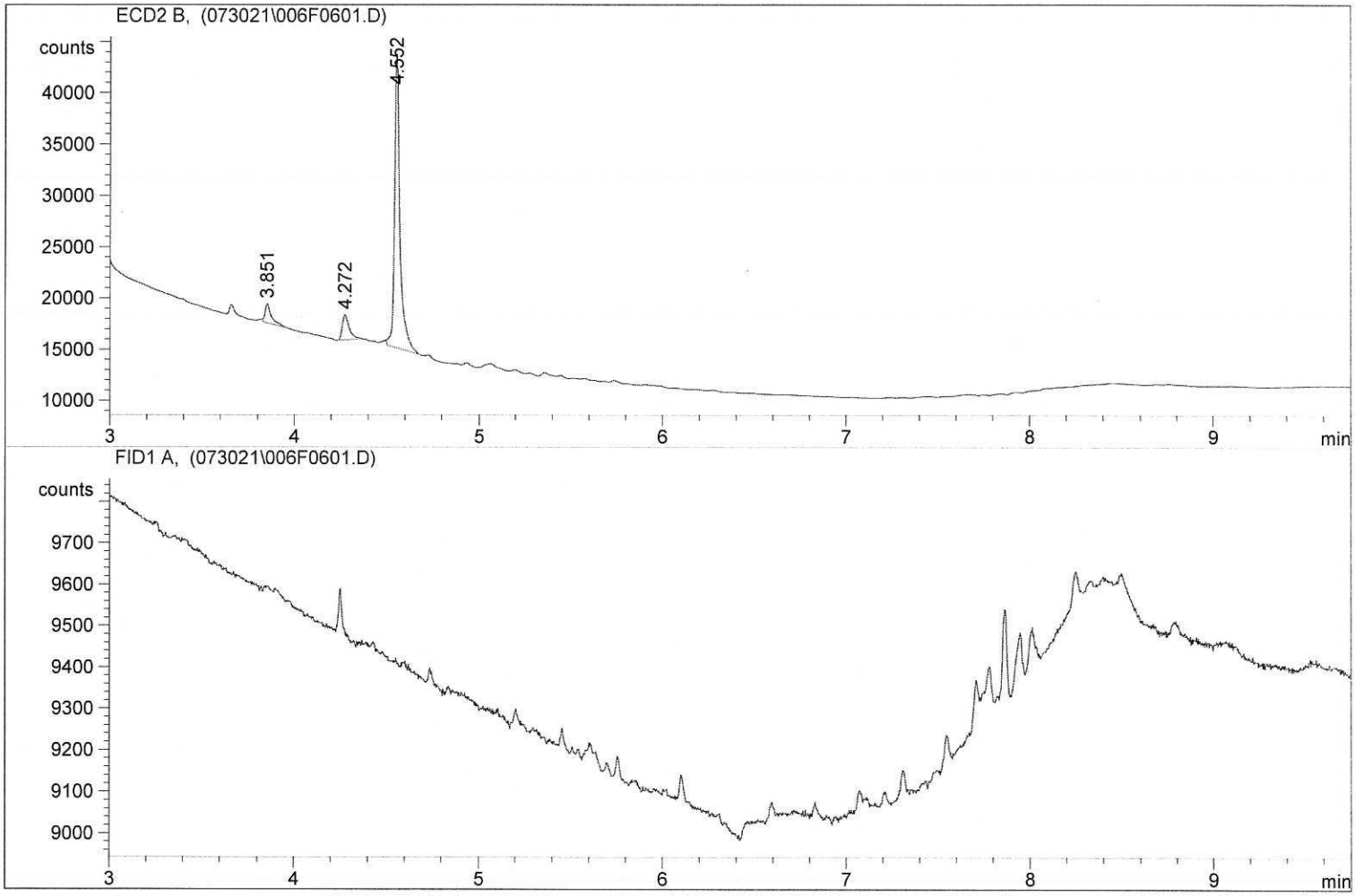
*** End of Report ***

Injection Date	: 7/30/2021 1:42:24 PM	Seq. Line :	5
Sample Name	: 21G0285 2	Location :	Vial 5
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



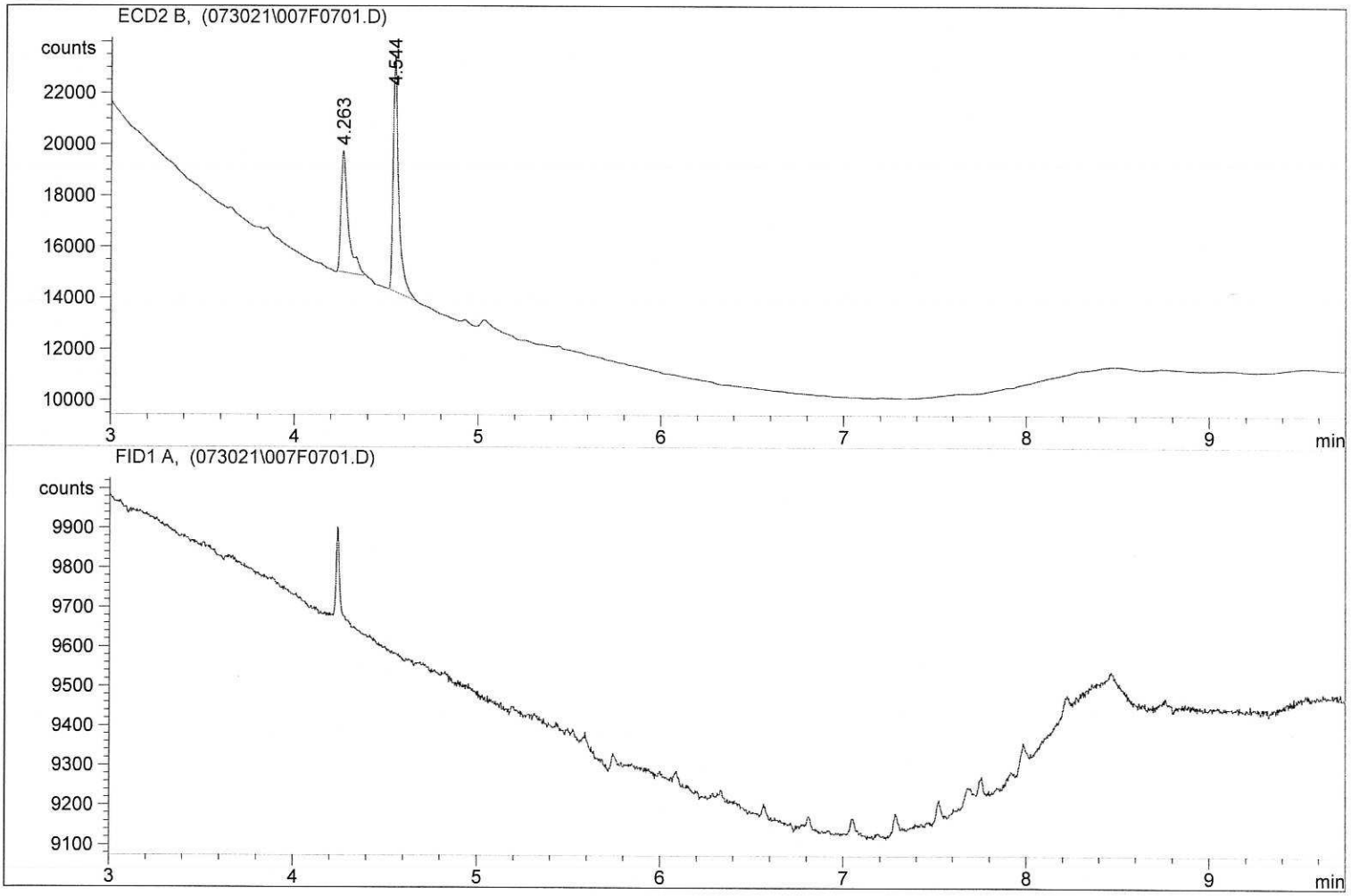
*** End of Report ***

Injection Date	: 7/30/2021 1:56:39 PM	Seq. Line :	6
Sample Name	: 21G0285 3	Location :	Vial 6
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



*** End of Report ***

Injection Date	: 7/30/2021 2:10:20 PM	Seq. Line :	7
Sample Name	: 21G0285 4	Location :	Vial 7
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



*** End of Report ***

Injection Date	: 7/30/2021 2:24:38 PM	Seq. Line :	8
Sample Name	: 21G0285 5	Location :	Vial 8
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
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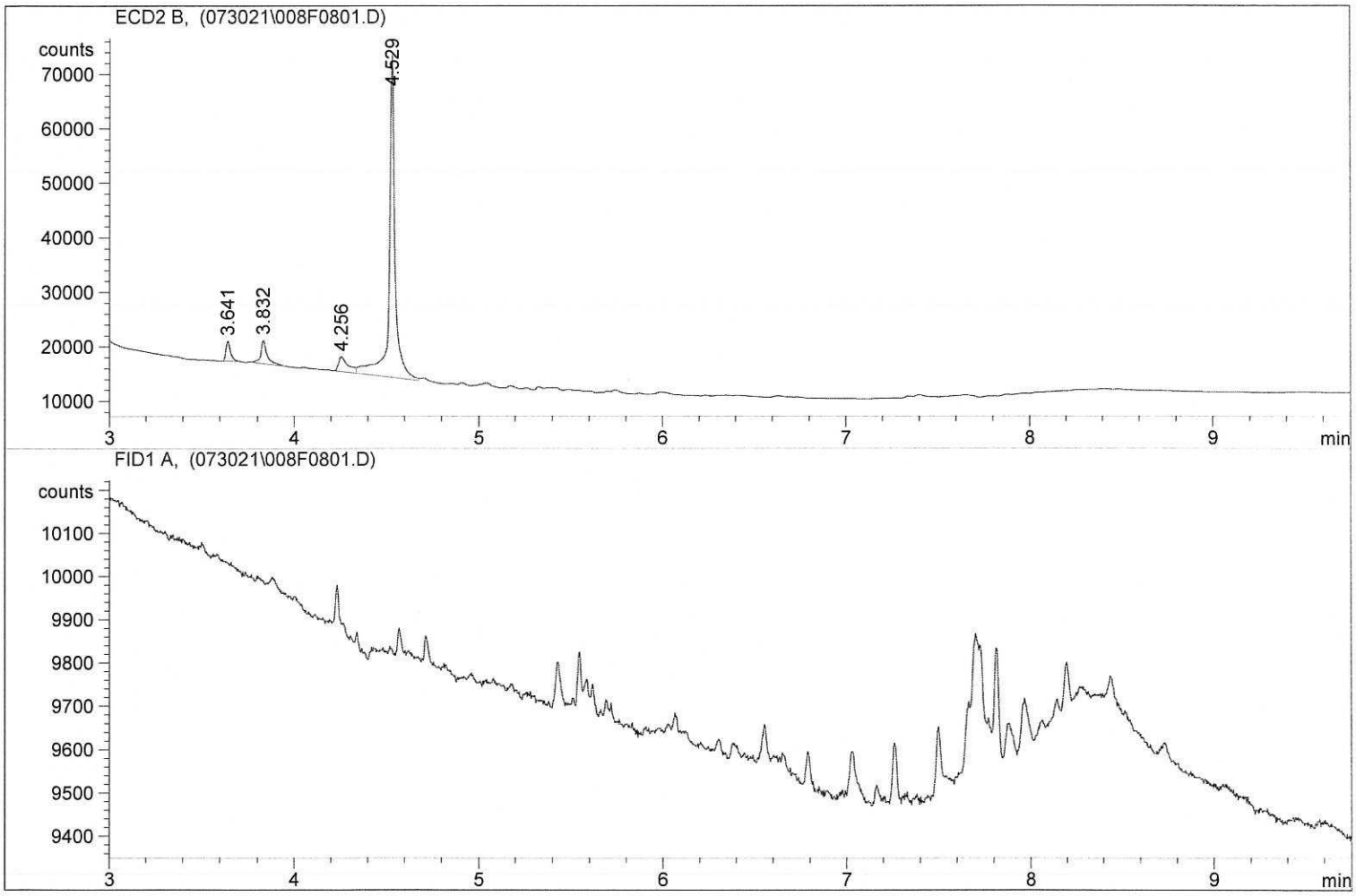
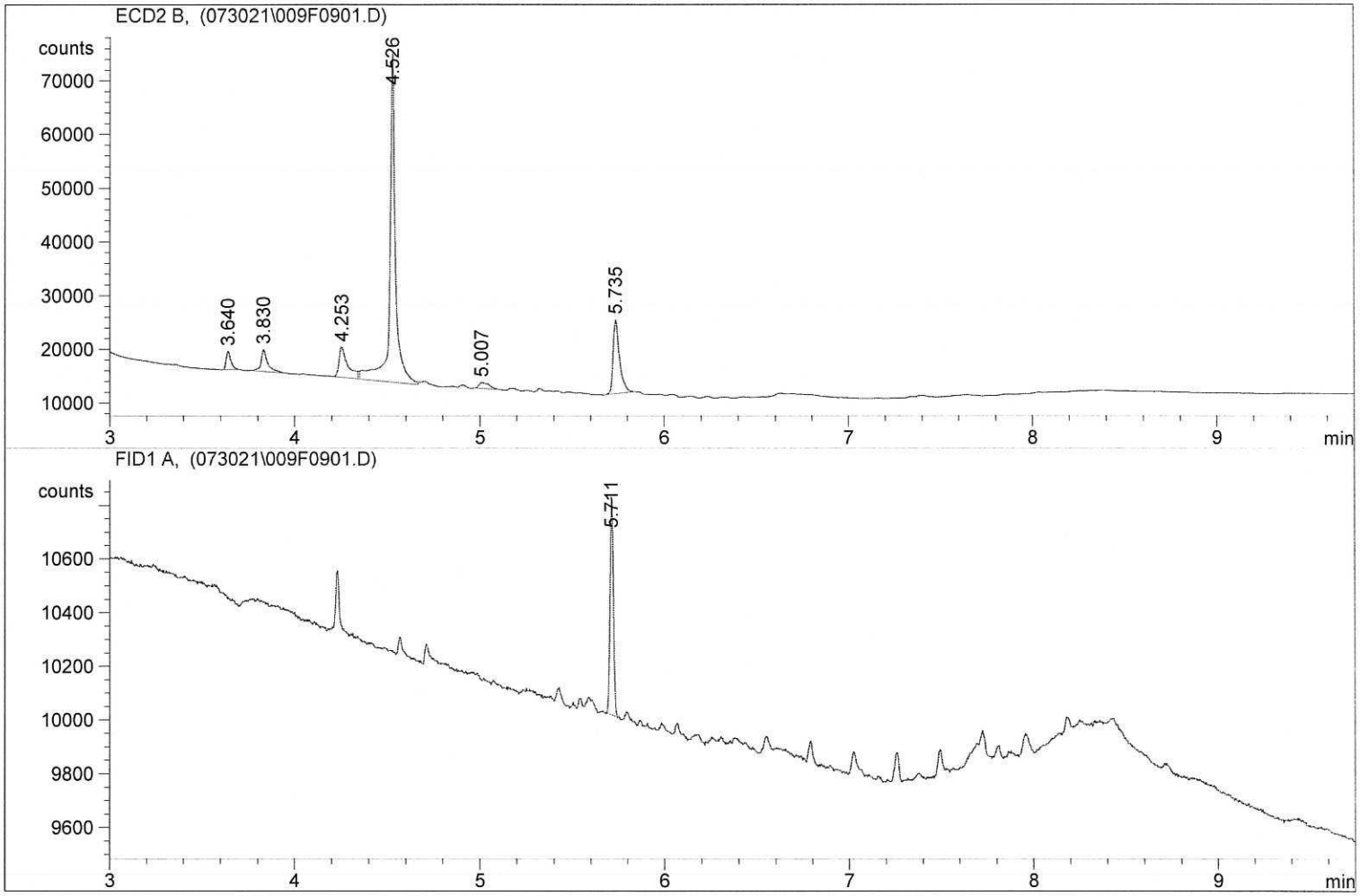
SCREEN METHOD			



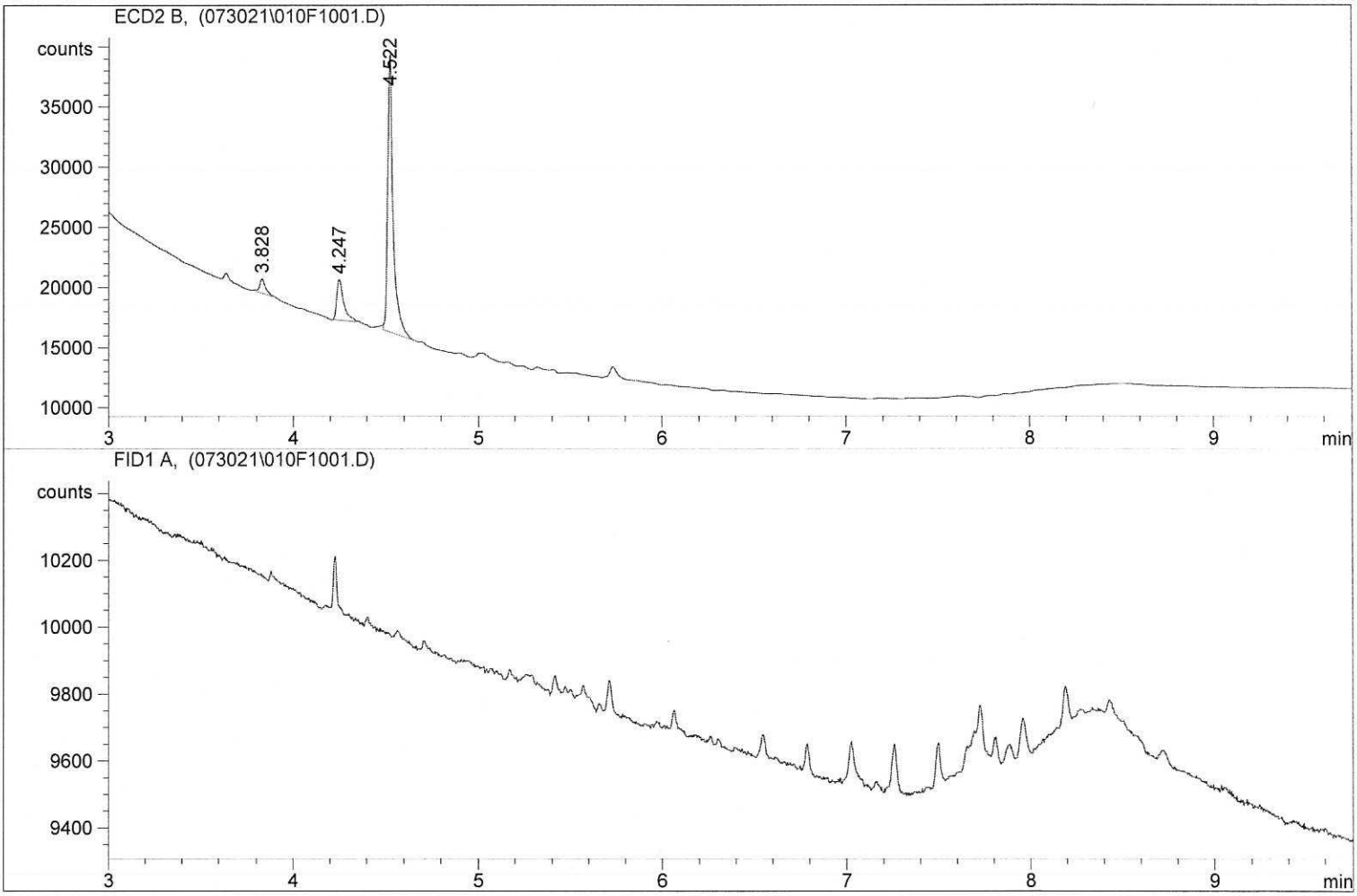
*** End of Report ***

Injection Date	: 7/30/2021 2:38:18 PM	Seq. Line :	9
Sample Name	: 21G0285 6	Location :	Vial 9
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



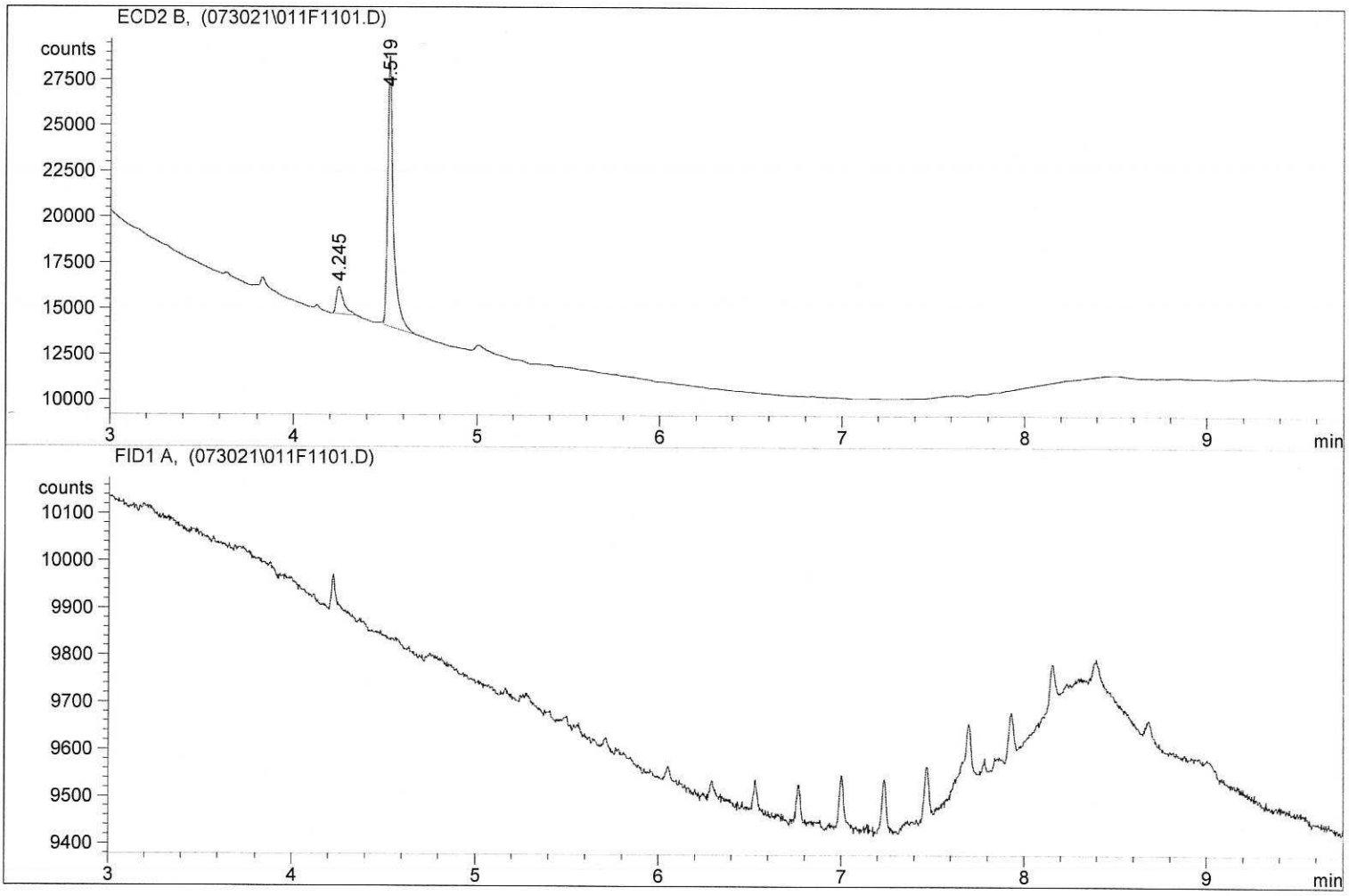
*** End of Report ***

Injection Date	: 7/30/2021 2:52:36 PM	Seq. Line :	10
Sample Name	: 21G0285 7	Location :	Vial 10
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



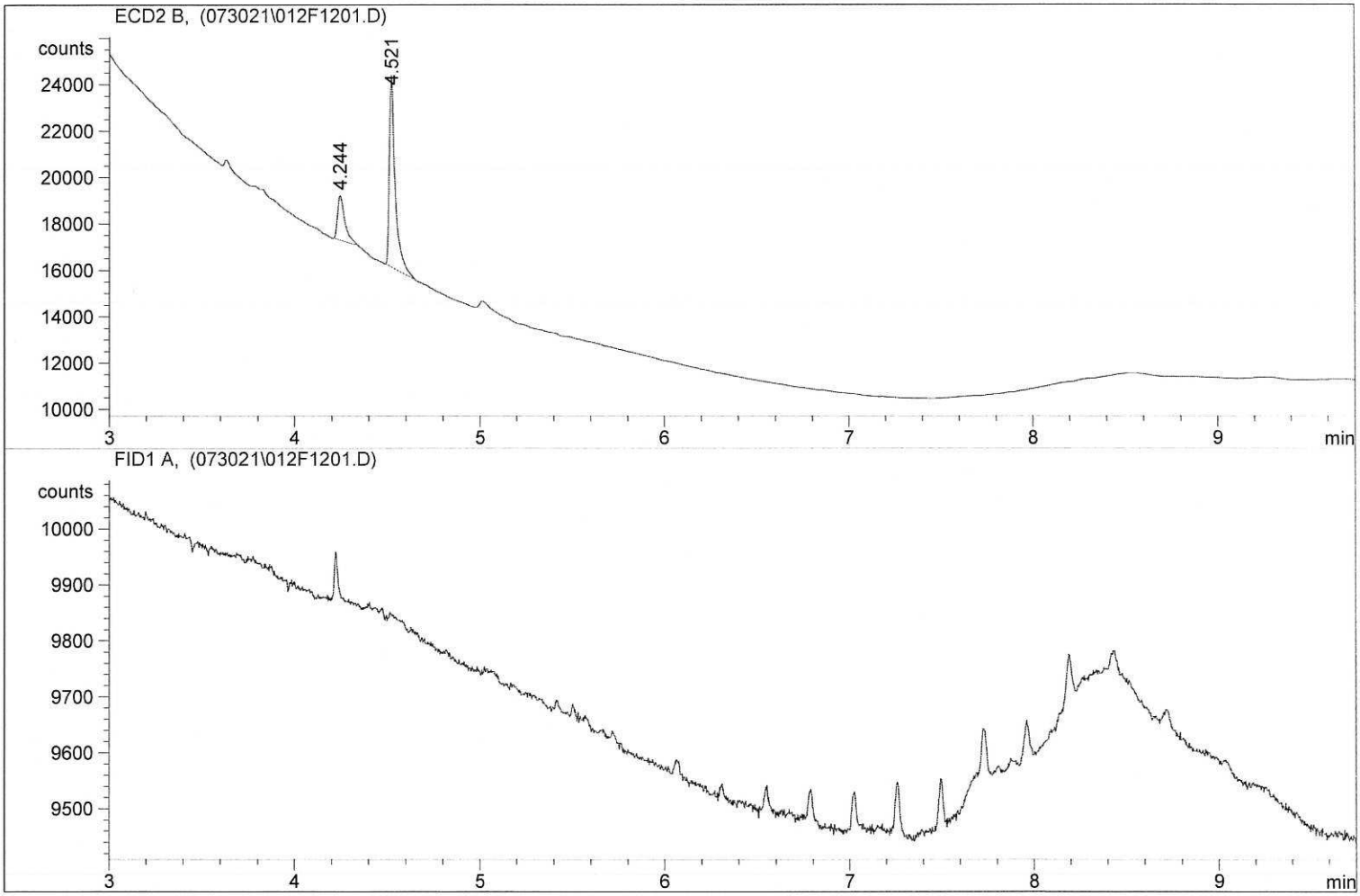
*** End of Report ***

Injection Date	: 7/30/2021 3:06:16 PM	Seq. Line :	11
Sample Name	: 21G0285 8	Location :	Vial 11
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



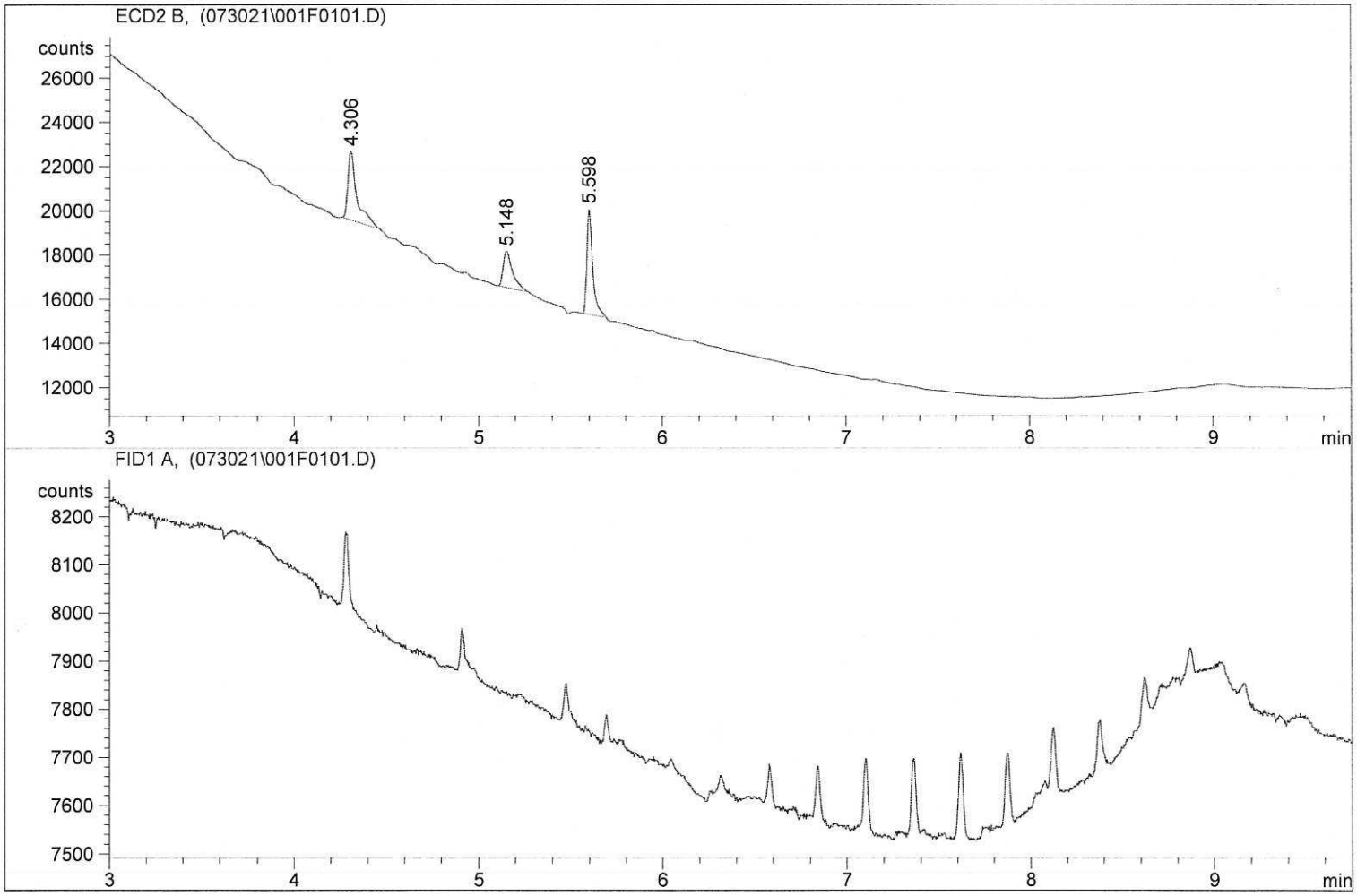
*** End of Report ***

Injection Date	: 7/30/2021 3:20:32 PM	Seq. Line :	12
Sample Name	: 21G0285 9	Location :	Vial 12
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



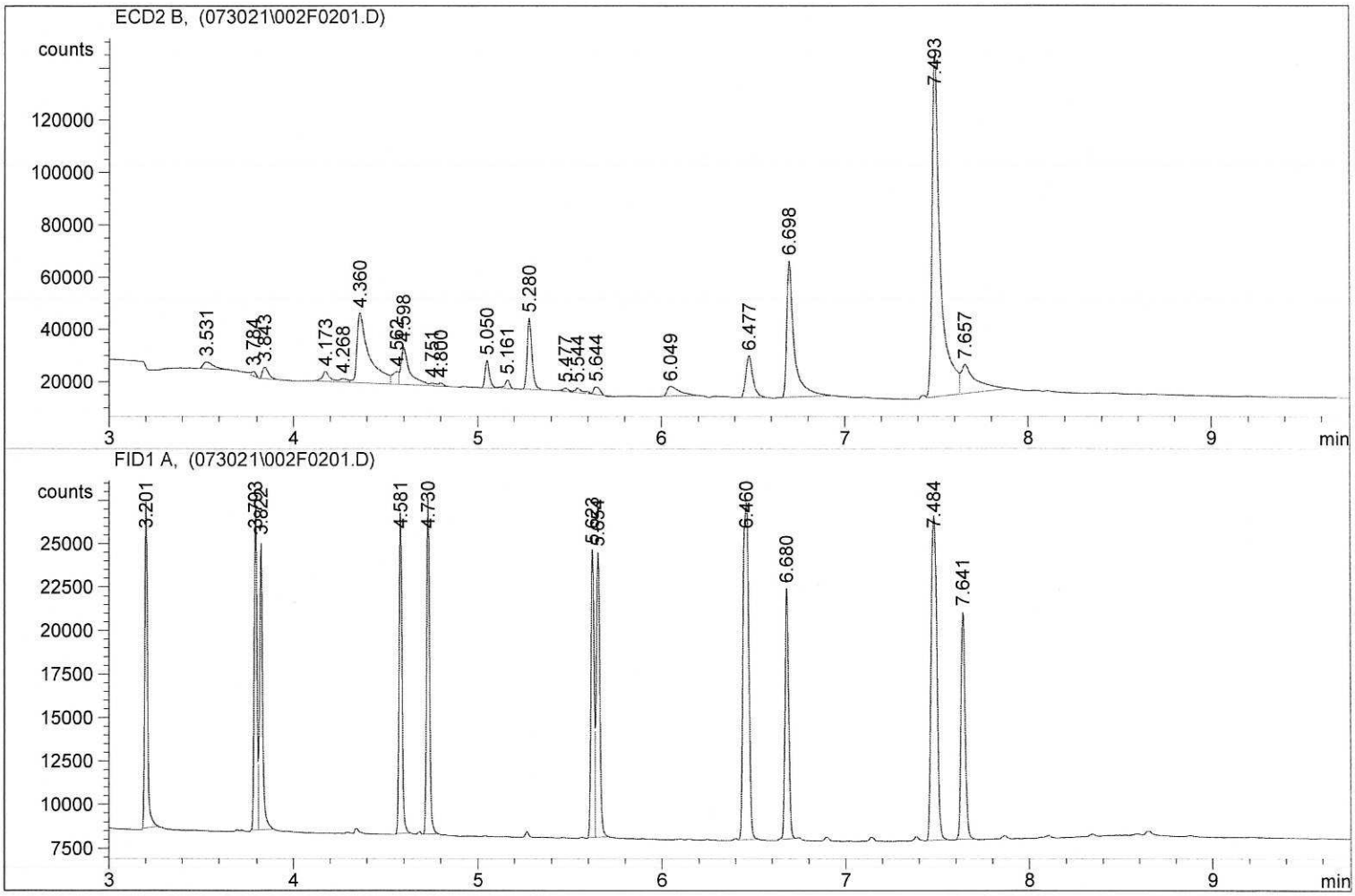
*** End of Report ***

Injection Date	: 7/30/2021 3:53:34 PM	Seq. Line :	1
Sample Name	: DCM RINSE	Location :	Vial 1
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021B.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



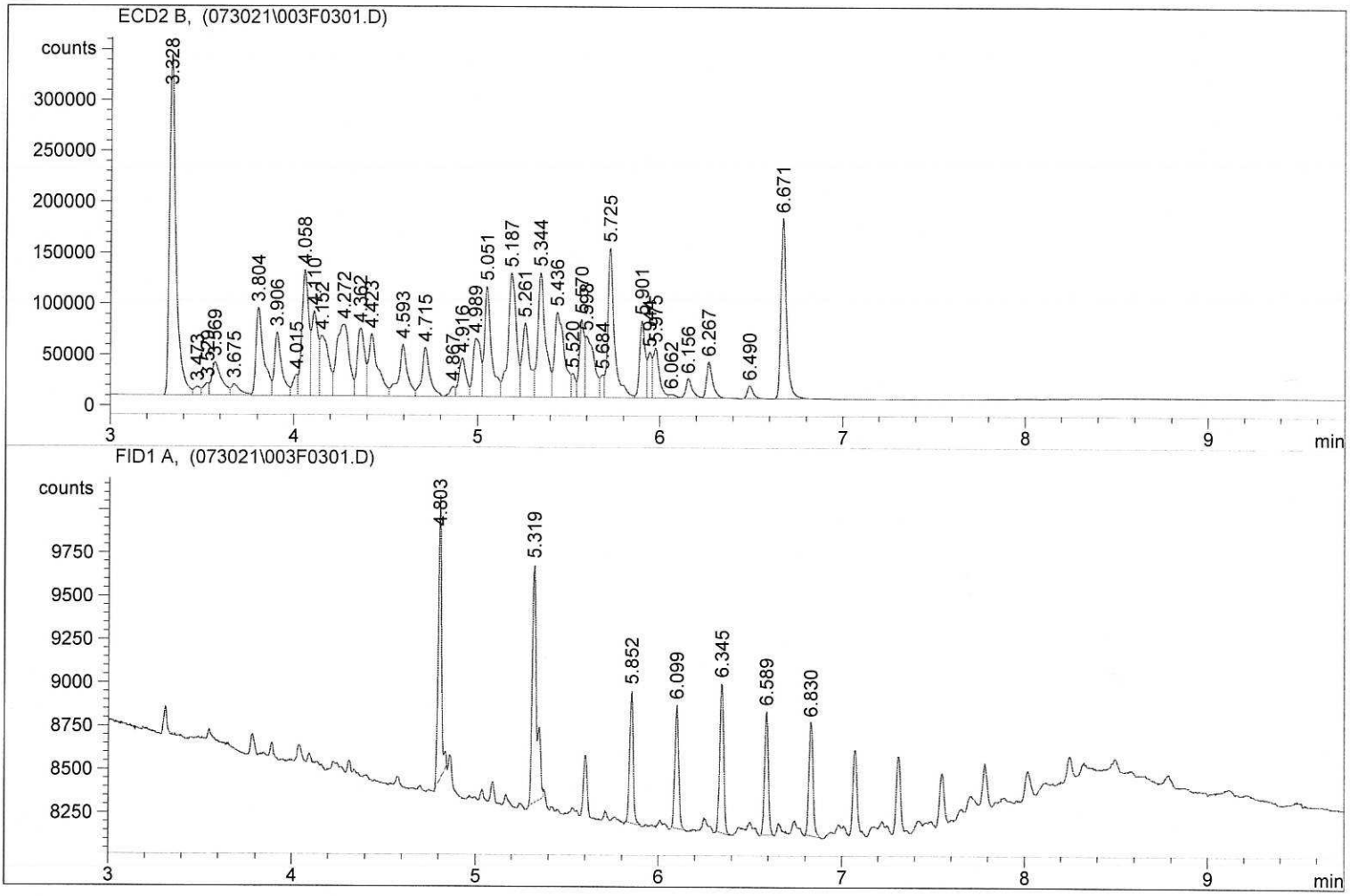
*** End of Report ***

Injection Date	: 7/30/2021 4:07:48 PM	Seq. Line :	2
Sample Name	: PNA STD 10PPM	Location :	Vial 2
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021B.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



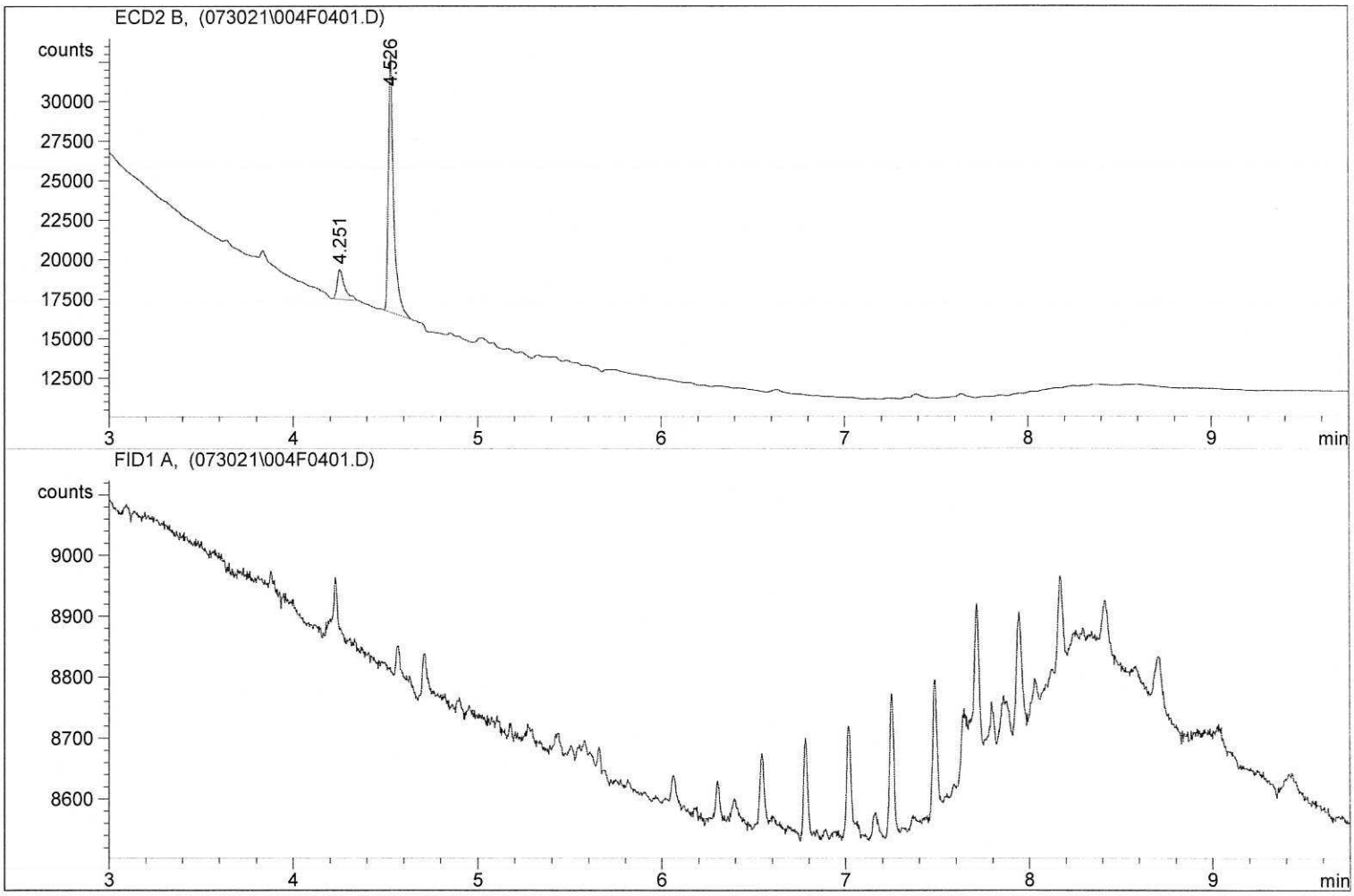
*** End of Report ***

Injection Date	: 7/30/2021 4:21:56 PM	Seq. Line :	3
Sample Name	: AR 1660 1PPM	Location :	Vial 3
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021B.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



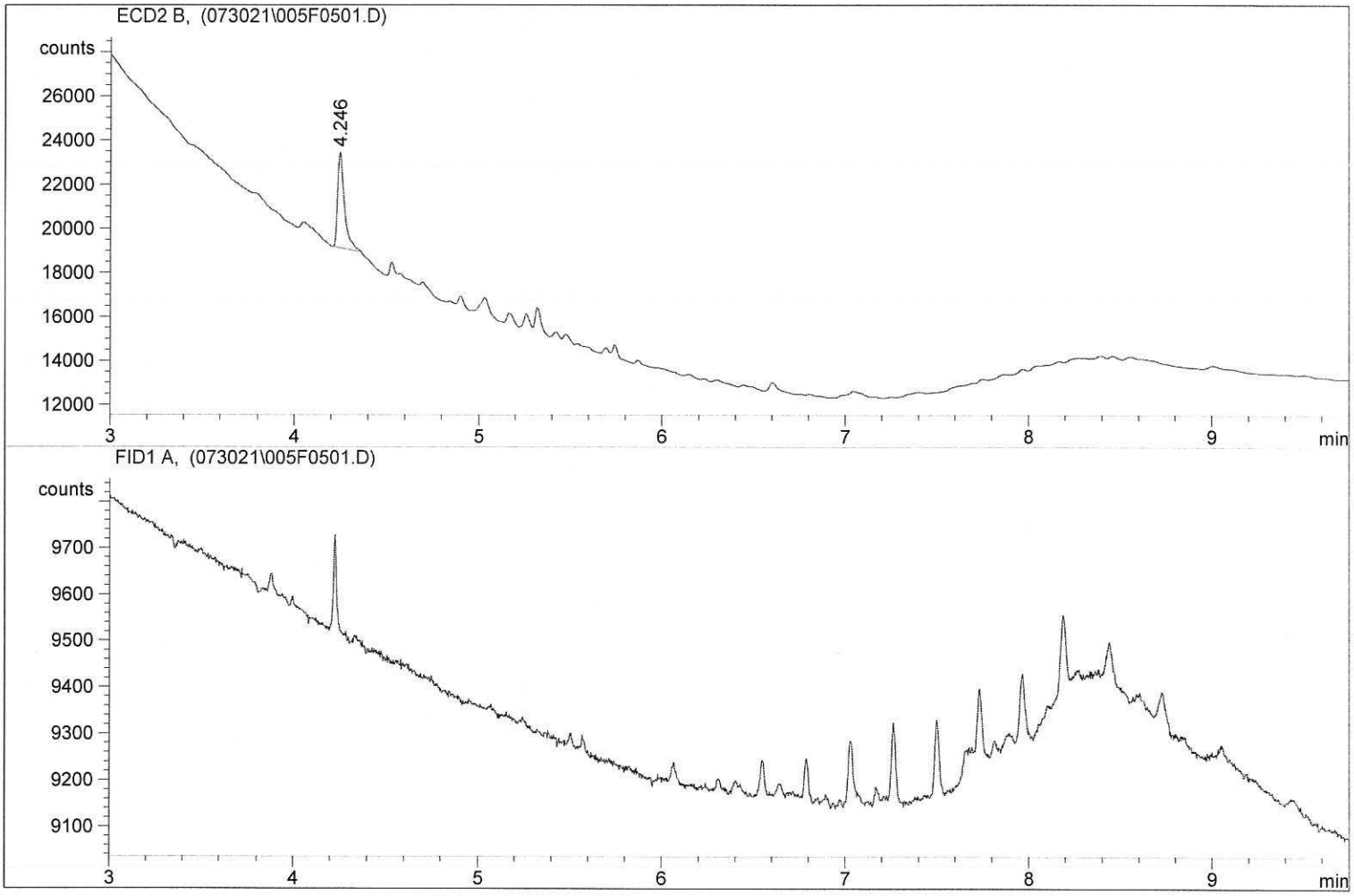
*** End of Report ***

Injection Date	: 7/30/2021 4:35:38 PM	Seq. Line :	4
Sample Name	: 21G0286 1	Location :	Vial 4
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021B.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



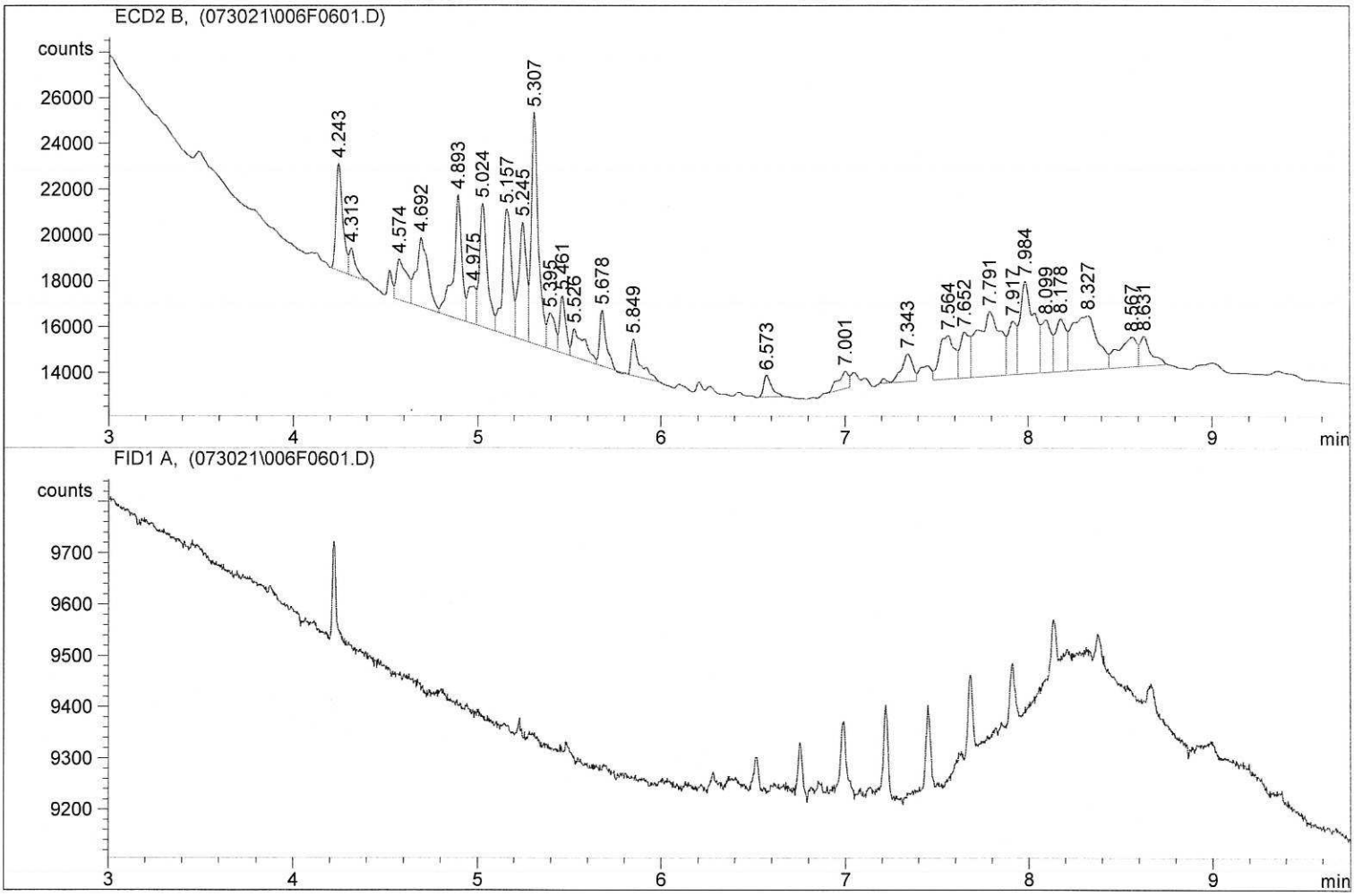
*** End of Report ***

Injection Date	: 7/30/2021 4:49:54 PM	Seq. Line :	5
Sample Name	: 21G0286 2	Location :	Vial 5
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021B.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



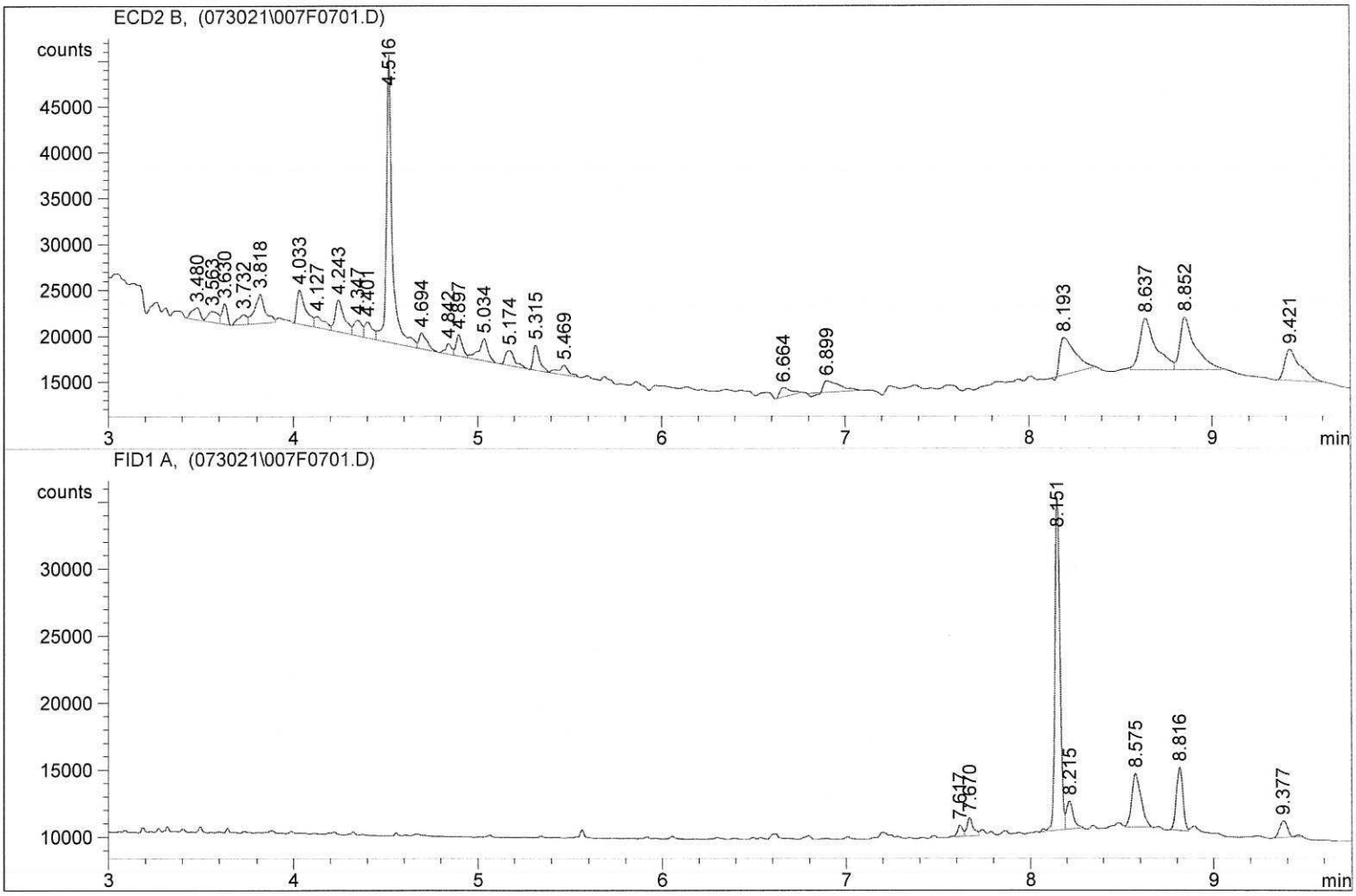
*** End of Report ***

Injection Date	: 7/30/2021 5:03:38 PM	Seq. Line :	6
Sample Name	: 21G0286 3	Location :	Vial 6
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021B.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



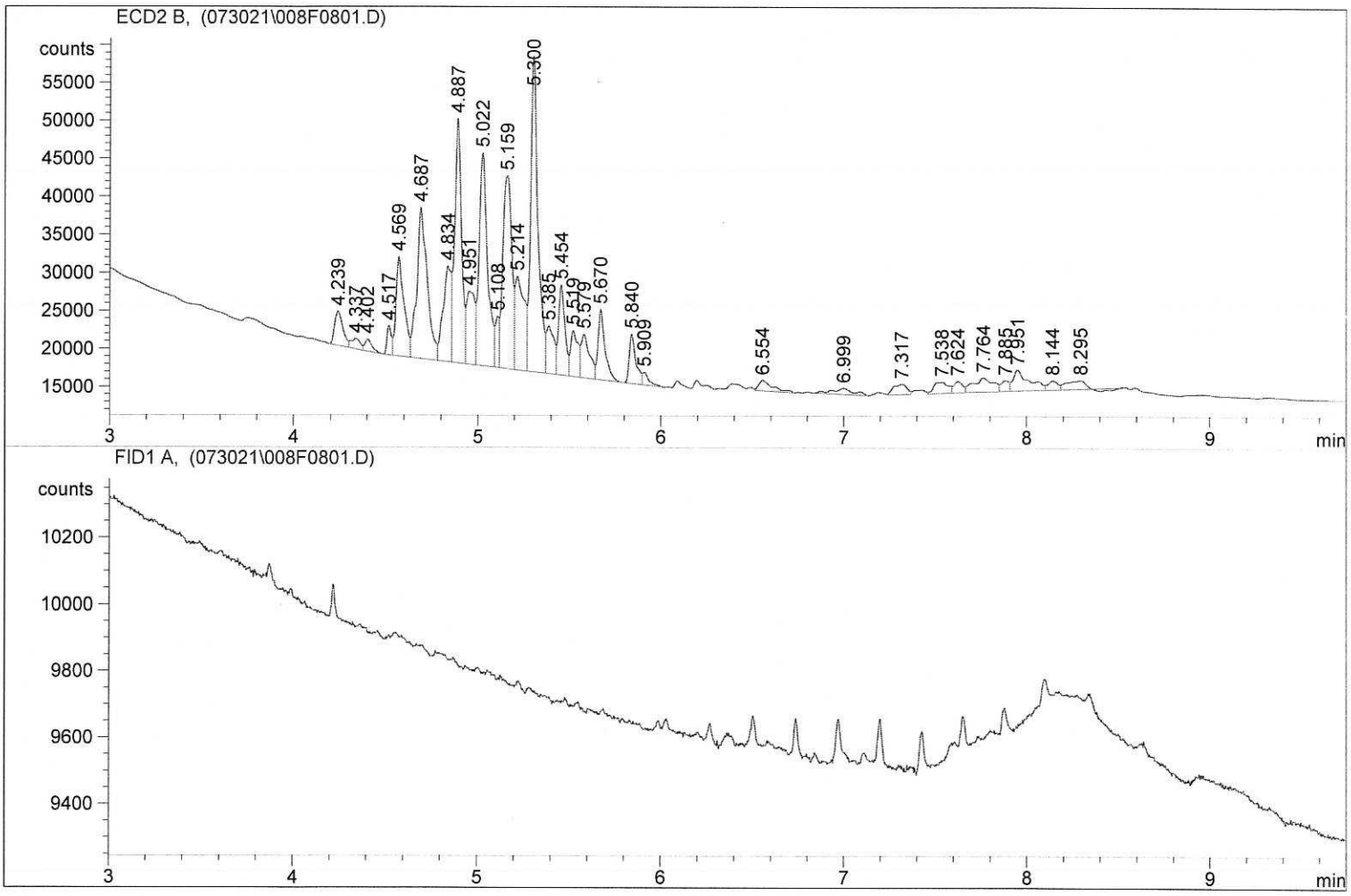
*** End of Report ***

Injection Date	: 7/30/2021 5:17:53 PM	Seq. Line :	7
Sample Name	: 21G0286 4	Location :	Vial 7
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021B.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



*** End of Report ***

Injection Date	: 7/30/2021 5:31:38 PM	Seq. Line :	8
Sample Name	: 21G0286 5	Location :	Vial 8
Acq. Operator	: JL	Inj :	1
		Inj Volume :	1 µl
Sequence File	: C:\HPCHEM\1\SEQUENCE\073021B.S		
Method	: C:\HPCHEM\1\METHODS\SCREEN.M		
Last changed	: 7/9/2021 3:37:33 AM by TW		
SCREEN METHOD			



*** End of Report ***

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BATCH SUMMARY

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Cleanup Batch:	CJH0096	Cleanup Type:	Sulfuric Acid
Cleanup Method:	EPA 3665A Sulfuric Acid Cleanup	Analysis:	EPA 8082A

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	BJH0005-BLK1	08112133ECD7.D	08/11/2021	
Reference	BJH0005-SRM1	08112135ECD7.D	08/11/2021	
Matrix Spike Dup	BJH0005-MSD1	08112150ECD7.D	08/11/2021	
LCS	BJH0005-BS1	08112134ECD7.D	08/11/2021	
LDW21-IT625	21G0286-03	08112148ECD7.D	08/11/2021	
LDW21-SS646	21G0286-05	08122119ECD7.D	08/11/2021	
LDW21-SS627	21G0286-04	08112151ECD7.D	08/11/2021	
LDW21-SS625	21G0286-02	08112147ECD7.D	08/11/2021	
Matrix Spike	BJH0005-MS1	08112149ECD7.D	08/11/2021	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BENCH SHEET

CJH0096

Matrix: Solid **Cleanup using: Organics - EPA 3665A Sulfuric Acid Cleanup** **Printed: 8/11/2021 10:47:01AM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
21G0286-05	B	LDW21-SS646	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0286-04	B	LDW21-SS627	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0286-03	B	LDW21-IT625	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0286-02	B	LDW21-SS625	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-08	B	LDW21-SC673HB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-09	B	LDW21-SC673JB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-01	B	LDW21-SC674AB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-02	B	LDW21-SC674CB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-03	B	LDW21-SC674EB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-04	B	LDW21-SC674GB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-05	B	LDW21-SC673BB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-06	B	LDW21-SC673DB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-07	B	LDW21-SC673FB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
BJH0005-SRM1	-	Reference	-	2.5	2.5	-	8/11/2021	DDM	
BJH0005-MSD1	-	Matrix Spike Dup	-	2.5	2.5	-	8/11/2021	DDM	
BJH0005-BLK1	-	Blank	-	2.5	2.5	-	8/11/2021	DDM	
BJH0005-BS1	-	LCS	-	2.5	2.5	-	8/11/2021	DDM	
BJH0005-MS1	-	Matrix Spike	-	2.5	2.5	-	8/11/2021	DDM	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BATCH SUMMARY

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Cleanup Batch:	CJH0097	Cleanup Type:	Sulfur
Cleanup Method:	EPA 3660B Sulfur Cleanup	Analysis:	EPA 8082A

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Reference	BJH0005-SRM1	08112135ECD7.D	08/11/2021	
Matrix Spike Dup	BJH0005-MSD1	08112150ECD7.D	08/11/2021	
Matrix Spike	BJH0005-MS1	08112149ECD7.D	08/11/2021	
LCS	BJH0005-BS1	08112134ECD7.D	08/11/2021	
Blank	BJH0005-BLK1	08112133ECD7.D	08/11/2021	
LDW21-SS646	21G0286-05	08122119ECD7.D	08/11/2021	
LDW21-SS625	21G0286-02	08112147ECD7.D	08/11/2021	
LDW21-IT625	21G0286-03	08112148ECD7.D	08/11/2021	
LDW21-SS627	21G0286-04	08112151ECD7.D	08/11/2021	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BENCH SHEET

CJH0097

Matrix: Solid **Cleanup using: Organics - EPA 3660B Sulfur Cleanup** **Printed: 8/11/2021 10:47:50AM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
21G0286-05	B	LDW21-SS646	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0286-04	B	LDW21-SS627	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0286-03	B	LDW21-IT625	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0286-02	B	LDW21-SS625	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-08	B	LDW21-SC673HB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-09	B	LDW21-SC673JB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-01	B	LDW21-SC674AB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-02	B	LDW21-SC674CB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-03	B	LDW21-SC674EB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-04	B	LDW21-SC674GB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-05	B	LDW21-SC673BB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-06	B	LDW21-SC673DB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-07	B	LDW21-SC673FB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
BJH0005-SRM1	-	Reference	-	2.5	2.5	-	8/11/2021	DDM	
BJH0005-MSD1	-	Matrix Spike Dup	-	2.5	2.5	-	8/11/2021	DDM	
BJH0005-BLK1	-	Blank	-	2.5	2.5	-	8/11/2021	DDM	
BJH0005-BS1	-	LCS	-	2.5	2.5	-	8/11/2021	DDM	
BJH0005-MS1	-	Matrix Spike	-	2.5	2.5	-	8/11/2021	DDM	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BATCH SUMMARY

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Cleanup Batch:	CJH0098	Cleanup Type:	Silica Gel
Cleanup Method:	EPA 3630C Silica Gel Cleanup	Analysis:	EPA 8082A

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Matrix Spike Dup	BJH0005-MSD1	08112150ECD7.D	08/11/2021	
LDW21-SS627	21G0286-04	08112151ECD7.D	08/11/2021	
LDW21-SS646	21G0286-05	08122119ECD7.D	08/11/2021	
Blank	BJH0005-BLK1	08112133ECD7.D	08/11/2021	
LCS	BJH0005-BS1	08112134ECD7.D	08/11/2021	
LDW21-IT625	21G0286-03	08112148ECD7.D	08/11/2021	
LDW21-SS625	21G0286-02	08112147ECD7.D	08/11/2021	
Reference	BJH0005-SRM1	08112135ECD7.D	08/11/2021	
Matrix Spike	BJH0005-MS1	08112149ECD7.D	08/11/2021	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BENCH SHEET

CJH0098

Matrix: Solid **Cleanup using: Organics - EPA 3630C Silica Gel Cleanup** **Printed: 8/11/2021 10:48:42AM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
21G0286-05	B	LDW21-SS646	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0286-04	B	LDW21-SS627	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0286-03	B	LDW21-IT625	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0286-02	B	LDW21-SS625	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-08	B	LDW21-SC673HB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-09	B	LDW21-SC673JB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-01	B	LDW21-SC674AB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-02	B	LDW21-SC674CB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-03	B	LDW21-SC674EB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-04	B	LDW21-SC674GB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-05	B	LDW21-SC673BB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-06	B	LDW21-SC673DB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
21G0285-07	B	LDW21-SC673FB	B 02	2.5	2.5	8082A PCB Solid 4	8/11/2021	DDM	
BJH0005-SRM1	-	Reference	-	2.5	2.5	-	8/11/2021	DDM	
BJH0005-MSD1	-	Matrix Spike Dup	-	2.5	2.5	-	8/11/2021	DDM	
BJH0005-BLK1	-	Blank	-	2.5	2.5	-	8/11/2021	DDM	
BJH0005-BS1	-	LCS	-	2.5	2.5	-	8/11/2021	DDM	
BJH0005-MS1	-	Matrix Spike	-	2.5	2.5	-	8/11/2021	DDM	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
METHOD BLANK DATA SHEET
EPA 8082A

Blank

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Solid	Laboratory ID:	BJH0005-BLK1	File ID:	08112133ECD7.D
Sampled:	N/A	Prepared:	08/02/21 13:50	Analyzed:	08/12/21 02:22
Solids:		Preparation:	EPA 3546 (Microwave)	Initial/Final:	12.5 g / 2.5 mL
Batch:	BJH0005	Sequence:	SJH0202	Calibration:	EE00069
Instrument:	ECD7	Column:	ZB5	Cleanups:	Silica Gel, Sulfur, Sulfuric Acid

CAS NO.	COMPOUND	DILUTION	CONC: (ug/kg wet)	Q	DL	RL
12674-11-2	Aroclor 1016	1	4.0	U	1.6	4.0
11104-28-2	Aroclor 1221	1	4.0	U	1.6	4.0
11141-16-5	Aroclor 1232	1	4.0	U	1.6	4.0
53469-21-9	Aroclor 1242	1	4.0	U	1.6	4.0
12672-29-6	Aroclor 1248	1	4.0	U	1.6	4.0
11097-69-1	Aroclor 1254	1	4.0	U	1.6	4.0
11096-82-5	Aroclor 1260	1	4.0	U	0.6	4.0

SURROGATES	ADDED: (ug/kg wet)	FOUND: (ug/kg wet)	% REC	QC LIMITS	Q
Decachlorobiphenyl	8.0000	7.42	92.8	40 - 126	
Tetrachlorometaxylene	8.0000	6.31	78.9	44 - 120	
Decachlorobiphenyl [2C]	8.0000	8.95	112	40 - 126	
Tetrachlorometaxylene [2C]	8.0000	6.15	76.9	44 - 120	

[2C] indicates second-column analyte, present if quantification on any batch samples used second column data.

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112133ECD7.D
Data file 2: /210811.b/210811.b/08112133ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: BJH0005-BLK1
Client ID:
Injection Date: 12-AUG-2021 02:22
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.069	0.001	106009	5.412	0.001	289011	31.6	30.8	2.6	Tetrachloro-m-xylene
13.164	0.000	146091	13.847	0.001	716035	37.1	44.8	18.7	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	281218	-5.1
Hexabromobiphenyl	470266	441619	-6.1

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	762221	7.1
Hexabromobiphenyl	867949	892094	2.8

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
		ZB5 Col					ZB35 Col			
Aroclor-1016	1	---			0.0	1	---			0.0
Aroclor-1016	2	---			0.0	2	---			0.0
Aroclor-1016	3	---			0.0	3	---			0.0
Aroclor-1016	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks					Col2Ave: <3 Quant Peaks			
Aroclor-1221	1	---			0.0	1	---			0.0
Aroclor-1221	2	---			0.0	2	---			0.0
Aroclor-1221	3	---			0.0	3	---			0.0
		Col1Ave: <3 Quant Peaks					Col2Ave: <3 Quant Peaks			
Aroclor-1232	1	---			0.0	1	---			0.0
Aroclor-1232	2	---			0.0	2	6.090	0.005	3417	40.7
Aroclor-1232	3	---			0.0	3	6.404	-0.018	1462	7.9
Aroclor-1232	4	---			0.0	4	7.654	-0.008	3134	8.1
		Col1Ave: <3 Quant Peaks					Col2Ave: 18.9			
Aroclor-1242	1	---			0.0	1	---			0.0
Aroclor-1242	2	---			0.0	2	---			0.0
Aroclor-1242	3	---			0.0	3	---			0.0
Aroclor-1242	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks					Col2Ave: <3 Quant Peaks			
Aroclor-1248	1	---			0.0	1	---			0.0
Aroclor-1248	2	---			0.0	2	---			0.0
Aroclor-1248	3	---			0.0	3	---			0.0
Aroclor-1248	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks					Col2Ave: <3 Quant Peaks			
Aroclor-1254	1	---			0.0	1	---			0.0
Aroclor-1254	2	---			0.0	2	---			0.0
Aroclor-1254	3	---			0.0	3	---			0.0
Aroclor-1254	4	---			0.0	4	---			0.0
Aroclor-1254	5	---			0.0	5	---			0.0
		Col1Ave: <3 Quant Peaks					Col2Ave: <3 Quant Peaks			
Aroclor-1260	1	---			0.0	1	---			0.0
Aroclor-1260	2	---			0.0	2	---			0.0
Aroclor-1260	3	---			0.0	3	---			0.0
Aroclor-1260	4	---			0.0	4	---			0.0
Aroclor-1260	5	---			0.0	NS	---			----
		Col1Ave: <3 Quant Peaks					Col2Ave: <3 Quant Peaks			
Aroclor-1262	1	---			0.0	1	---			0.0
Aroclor-1262	2	---			0.0	2	---			0.0
Aroclor-1262	3	---			0.0	3	---			0.0
Aroclor-1262	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks					Col2Ave: <3 Quant Peaks			
Aroclor-1268	1	---			0.0	1	---			0.0
Aroclor-1268	2	---			0.0	2	---			0.0
Aroclor-1268	3	---			0.0	3	---			0.0
Aroclor-1268	4	---			0.0	4	---			0.0
		Col1Ave: <3 Quant Peaks					Col2Ave: <3 Quant Peaks			

Total PCB Area Col1 (5.167 - 13.064) = 327623 Col1 Total PCB = 0.1 ppm*

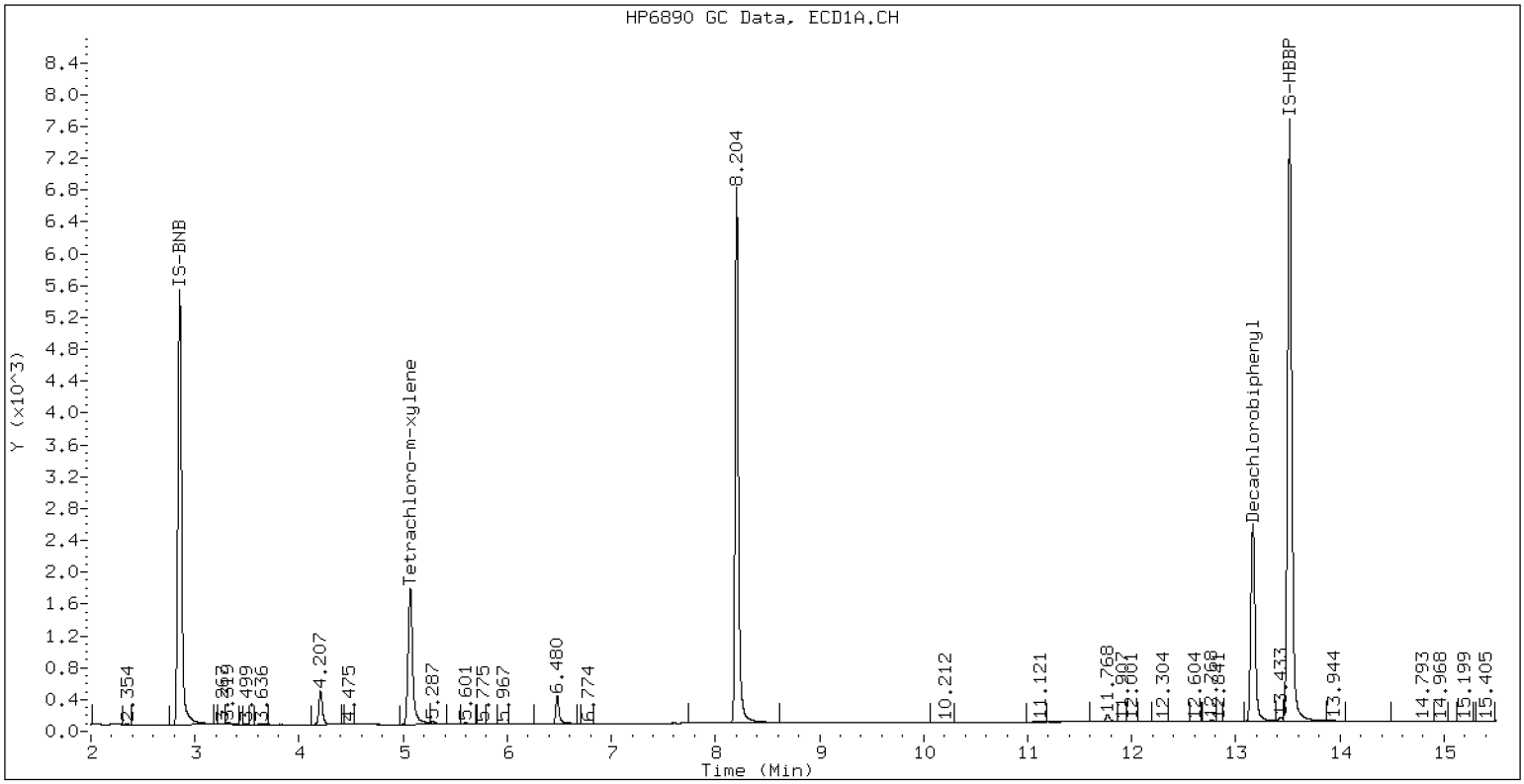
Total PCB Area Col2 (5.167 - 13.064) = 924794 Col2 Total PCB = 0.1 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

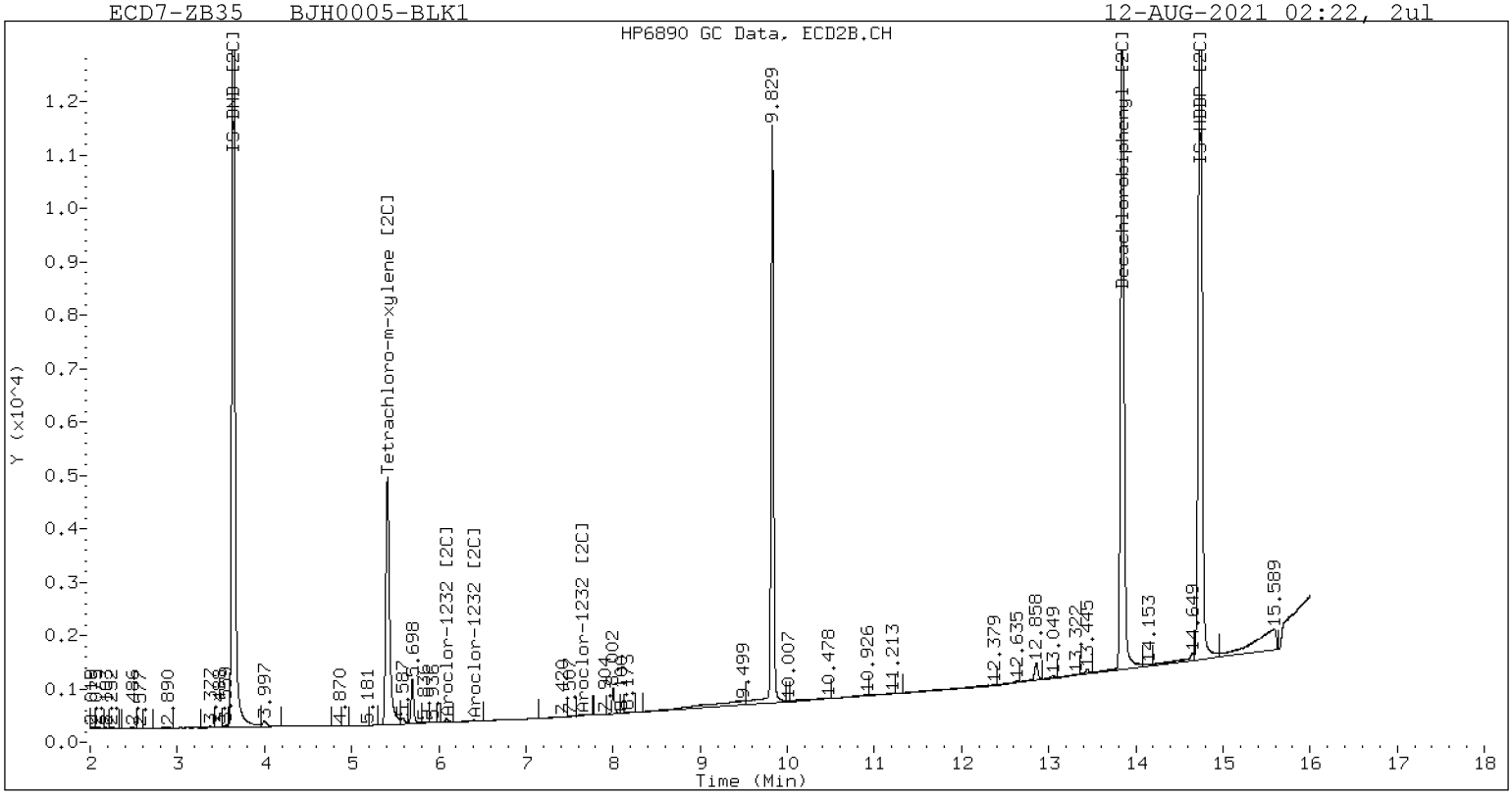
PCB Dual Column Chromatograms

ECD7-ZB5 BJH0005-BLK1 12-AUG-2021 02:22, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 BJH0005-BLK1 12-AUG-2021 02:22, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LCS / LCS DUPLICATE RECOVERY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/12/21 02:42
Batch:	BJH0005	Laboratory ID:	BJH0005-BS1
Preparation:	EPA 3546 (Microwave)	Sequence Name:	LCS
Initial/Final:	12.5 g / 2.5 mL		

COMPOUND	SPIKE ADDED (ug/kg wet)	LCS CONCENTRATION (ug/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Aroclor 1016 [2C]	101	79.9		79.3	56 - 120
Aroclor 1260 [2C]	101	108		107	58 - 120

* Indicates values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112134ECD7.D
Data file 2: /210811.b/210811.b/08112134ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: BJH0005-BS1
Client ID:
Injection Date: 12-AUG-2021 02:42
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.067	-0.000	105733	5.411	0.000	292036	31.5	31.4	0.4	Tetrachloro-m-xylene
13.164	-0.001	146362	13.846	-0.000	731899	37.4	45.0	18.5	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	281394	-5.1
Hexabromobiphenyl	470266	438833	-6.7

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	755449	6.1
Hexabromobiphenyl	867949	906176	4.4

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.657	-0.002	34067	390.3	1	7.055	-0.001	146566	376.7
Aroclor-1016	2	7.029	-0.002	112233	381.0	2	7.647	-0.004	334492	390.8
Aroclor-1016	3	7.175	-0.003	45781	382.6	3	7.853	-0.003	127327	397.3
Aroclor-1016	4	7.284	-0.004	30479	381.3	4	8.025	-0.004	85000	433.2
Total Col1Ave (4 peaks):					383.8	Total Col2Ave (4 peaks):				399.5 RPD = 4
Corrected Ave (3 peaks):					381.7	Corrected Ave (3 peaks):				388.2 RPD = 2
Aroclor-1221	1	4.015	-0.008	135	6.5	1	4.672	-0.020	584	11.9
Aroclor-1221	2	5.448	-0.007	3649	102.3	2	6.074	-0.010	14688	127.2
Aroclor-1221	3	5.723	-0.006	21306	235.7	3	6.409	-0.013	64364	302.4
Total Col1Ave (3 peaks):					114.8	Total Col2Ave (3 peaks):				147.2 RPD = 25
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1232	1	---			0.0	1	4.672	-0.019	584	18.8
Aroclor-1232	2	5.723	-0.007	21306	276.1	2	6.074	-0.011	14688	176.5
Aroclor-1232	3	7.029	0.002	112233	865.4	3	6.409	-0.013	64364	352.7
Aroclor-1232	4	8.597	-0.008	3970	101.9	4	7.647	-0.015	334492	875.7
Total Col1Ave (3 peaks):					414.5	Total Col2Ave (4 peaks):				355.9 RPD = 15
Corrected Ave: < 3 Peaks						Corrected Ave (3 peaks):				182.6
Aroclor-1242	1	6.657	-0.002	34067	438.4	1	7.055	-0.000	146566	437.0
Aroclor-1242	2	7.029	-0.004	112233	444.8	2	7.647	-0.003	334492	461.0
Aroclor-1242	3	8.316	0.041	6123	176.5	3	8.930	-0.018	42089	128.3
Aroclor-1242	4	8.597	-0.016	3970	51.2	4	9.025	-0.004	13915	48.2
Total Col1Ave (4 peaks):					277.7	Total Col2Ave (4 peaks):				268.6 RPD = 3
Corrected Ave (3 peaks):					222.0	Corrected Ave (3 peaks):				204.5 RPD = 8
Aroclor-1248	1	7.797	-0.002	31357	267.1	1	8.103	-0.002	78520	285.1
Aroclor-1248	2	7.966	-0.002	39495	271.2	2	8.516	-0.004	106503	284.4
Aroclor-1248	3	8.316	-0.003	6123	42.0	3	8.930	-0.018	42089	78.1
Aroclor-1248	4	8.597	-0.011	3970	30.8	4	9.375	-0.003	8869	15.4
Total Col1Ave (4 peaks):					152.8	Total Col2Ave (4 peaks):				165.7 RPD = 8
Corrected Ave (3 peaks):					113.3	Corrected Ave (3 peaks):				125.9 RPD = 11
Aroclor-1254	1	8.671	-0.004	27635	116.2	1	9.236	-0.001	83318	145.7
Aroclor-1254	2	---			0.0	2	9.331	0.002	2081	6.2
Aroclor-1254	3	9.039	-0.005	3878	26.6	3	9.760	-0.000	14870	34.5
Aroclor-1254	4	9.170	-0.008	24635	85.3	4	9.924	0.013	204111	213.3
Aroclor-1254	5	9.855	-0.014	33353	171.4	5	10.155	0.009	255365	248.8
Total Col1Ave (4 peaks):					99.9	Total Col2Ave (5 peaks):				129.7 RPD = 26
Corrected Ave (3 peaks):					76.0	Corrected Ave (4 peaks):				99.9 RPD = 27
Aroclor-1260	1	10.382	-0.001	76231	473.9	1	11.424	-0.001	282528	499.9
Aroclor-1260	2	10.700	-0.002	76130	460.3	2	11.676	0.000	768352	521.2
Aroclor-1260	3	11.050	-0.001	201350	464.7	3	12.258	-0.002	506079	527.9
Aroclor-1260	4	11.451	-0.000	94657	428.6	4	12.970	-0.000	251469	610.3
Aroclor-1260	5	11.553	-0.000	44937	527.8	NS	---			----
Total Col1Ave (5 peaks):					471.1	Total Col2Ave (4 peaks):				539.8 RPD = 14
Corrected Ave (4 peaks):					456.9	Corrected Ave (3 peaks):				516.4 RPD = 12
Aroclor-1262	1	10.382	-0.010	76231	276.2	1	10.967	-0.022	302782	332.7
Aroclor-1262	2	11.451	-0.010	94657	531.6	2	11.676	-0.023	768352	426.8
Aroclor-1262	3	11.626	-0.010	56533	235.4	3	12.188	-0.020	246584	285.6
Aroclor-1262	4	12.274	-0.015	54411	286.6	4	12.970	-0.023	251469	321.1
Total Col1Ave (4 peaks):					332.4	Total Col2Ave (4 peaks):				341.5 RPD = 3
Corrected Ave (3 peaks):					266.1	Corrected Ave (3 peaks):				313.1 RPD = 16
Aroclor-1268	1	11.553	-0.012	44937	61.0	1	12.188	-0.020	246584	93.7
Aroclor-1268	2	11.626	-0.010	56533	75.7	2	12.258	-0.016	506079	176.4
Aroclor-1268	3	12.027	0.015	22320	38.1	3	12.633	-0.026	10143	4.0
Aroclor-1268	4	12.767	-0.010	12811	7.0	4	13.444	-0.029	60009	7.4
Total Col1Ave (4 peaks):					45.4	Total Col2Ave (4 peaks):				70.4 RPD = 43*

Corrected Ave (3 peaks): 35.3 Corrected Ave (3 peaks): 35.0 RPD = 1

Total PCB Area Col1 (5.167 - 13.064) = 2036772 Col1 Total PCB = 0.8 ppm*

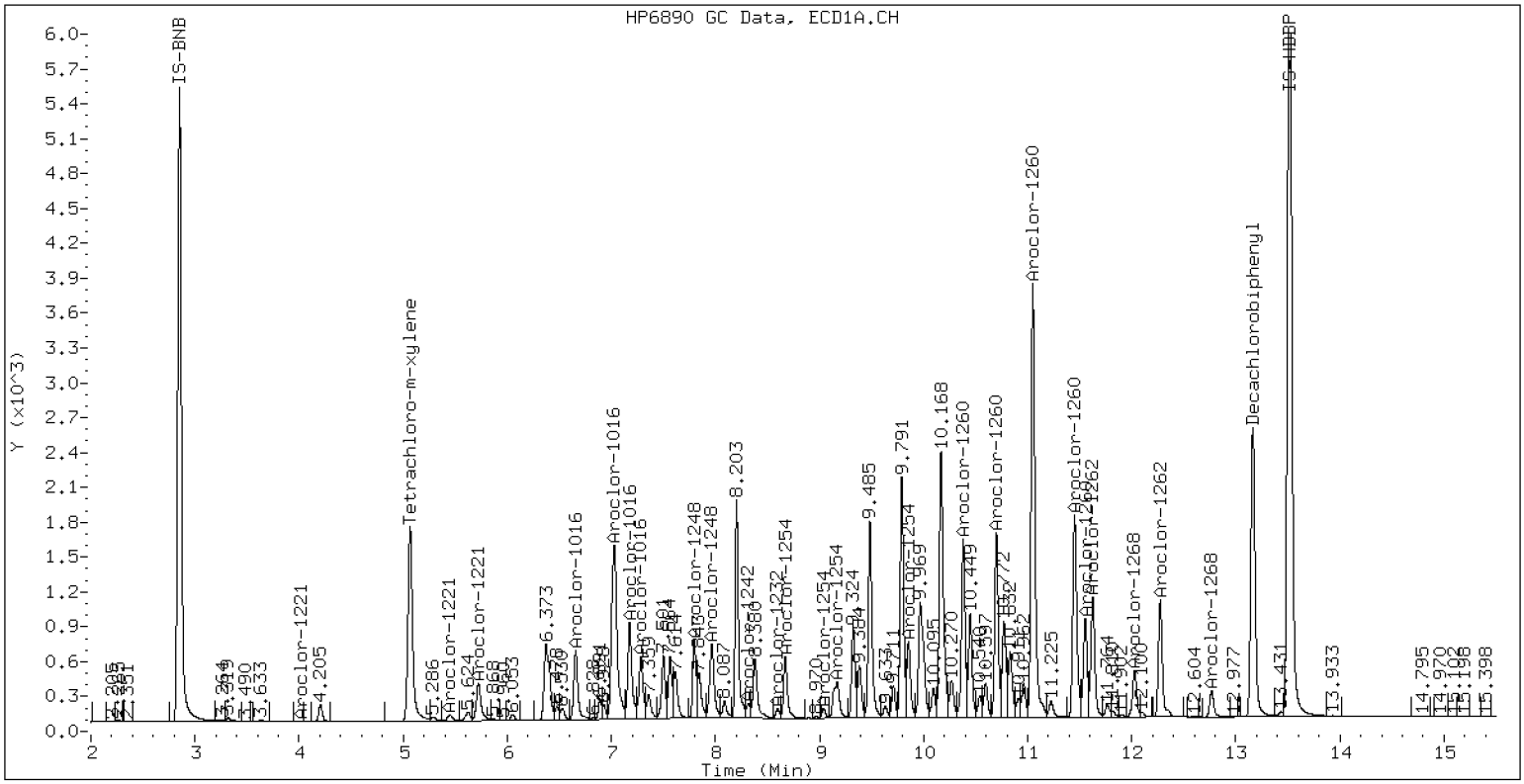
Total PCB Area Col2 (5.167 - 13.064) = 7075492 Col2 Total PCB = 0.9 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

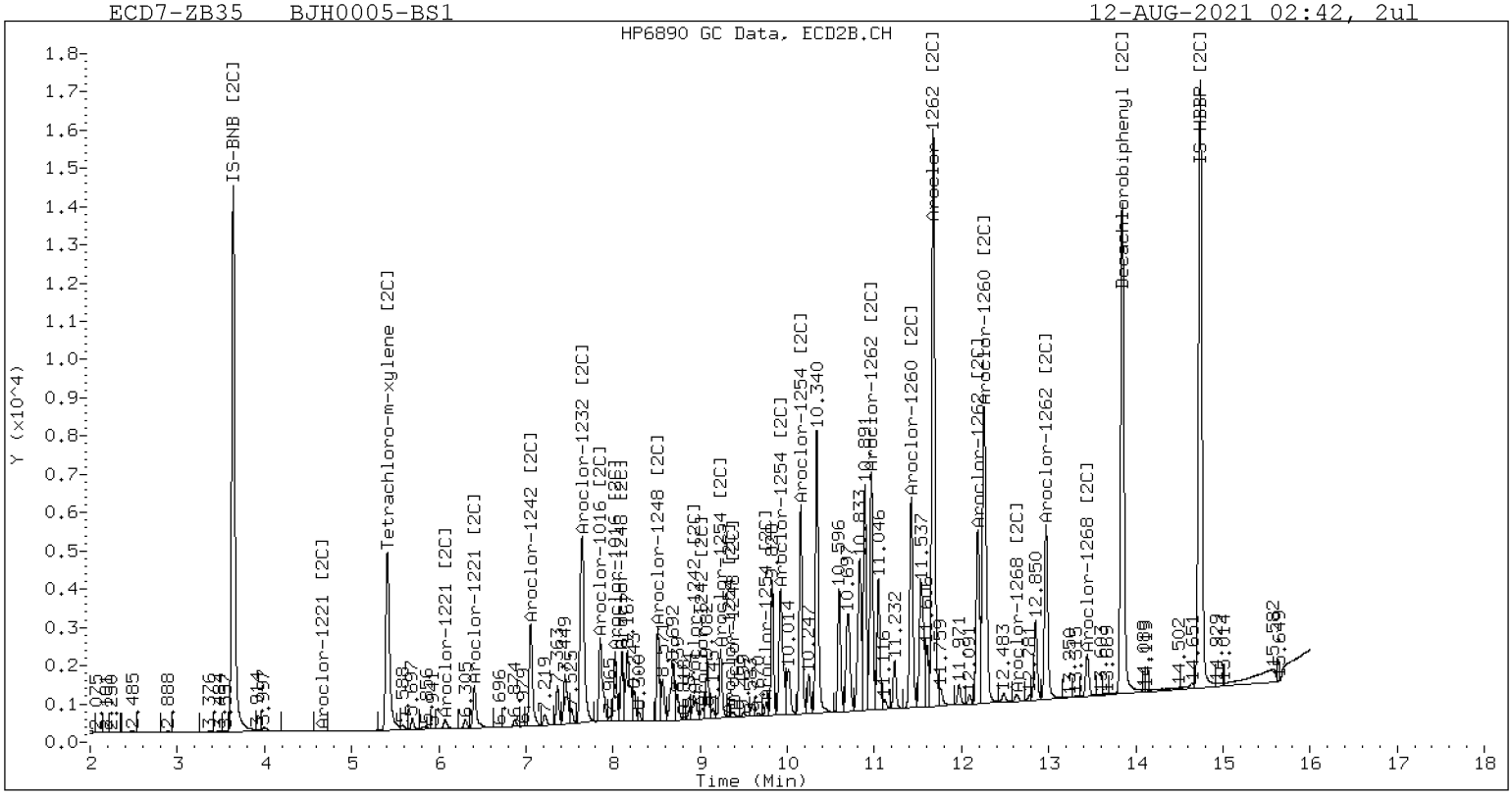
PCB Dual Column Chromatograms

ECD7-ZB5 BJH0005-BS1 12-AUG-2021 02:42, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 BJH0005-BS1 12-AUG-2021 02:42, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-IT625

MS / MS DUPLICATE RECOVERY
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/12/21 07:50
Batch:	BJH0005	Laboratory ID:	BJH0005-MS1
Preparation:	EPA 3546 (Microwave)	Sequence Name:	Matrix Spike
Initial/Final:	14.25 g / 2.5 mL	Source Sample:	LDW21-IT625

COMPOUND	SPIKE ADDED (ug/kg dry)	SAMPLE CONCENTRATION (ug/kg dry)	Q	MS CONCENTRATION (ug/kg dry)	Q	MS % REC. #	QC LIMITS REC.
Aroclor 1016	101	ND	U	72.2		71.6	56 - 120
Aroclor 1260	101	57.5		180	*	122 *	58 - 120

* Values outside of QC limits

[2C] indicates second-column analyte, present if quantification on any batch samples used second column data.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-IT625

MS / MS DUPLICATE RECOVERY
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/12/21 08:10
Batch:	BJH0005	Laboratory ID:	BJH0005-MSD1
Preparation:	EPA 3546 (Microwave)	Sequence Name:	Matrix Spike Dup
Initial/Final:	14.25 g / 2.5 mL	Source Sample:	LDW21-IT625

COMPOUND	SPIKE ADDED (ug/kg dry)	MSD CONCENTRATION (ug/kg dry)	Q	MSD % REC. #	% RPD #	QC LIMITS	
						RPD	REC.
Aroclor 1016	101	85.6		84.8	17.0	30	56 - 120
Aroclor 1260	101	161		103	11.0	30	58 - 120

* Values outside of QC limits

[2C] indicates second-column analyte, present if quantification on any batch samples used second column data.

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112149ECD7.D
Data file 2: /210811.b/210811.b/08112149ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: BJH0005-MS1
Client ID:
Injection Date: 12-AUG-2021 07:50
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.067	-0.001	109725	5.409	-0.002	291895	32.9	31.8	3.4	Tetrachloro-m-xylene
13.153	-0.011	102398	13.838	-0.008	492781	39.2	39.4	0.5	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	279419	-5.7
Hexabromobiphenyl	470266	293337	-37.6

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	744994	4.6
Hexabromobiphenyl	867949	698201	-19.6

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.653	-0.006	32013	369.3	1	7.052	-0.004	139472	363.5
Aroclor-1016	2	7.024	-0.007	107604	367.9	2	7.642	-0.009	308049	364.9
Aroclor-1016	3	7.170	-0.008	42145	354.7	3	7.848	-0.008	115581	365.7
Aroclor-1016	4	7.279	-0.009	27905	351.6	4	8.019	-0.010	71952	371.9
Total Col1Ave (4 peaks):					360.9	Total Col2Ave (4 peaks):				366.5 RPD = 2
Corrected Ave (3 peaks):					358.1	Corrected Ave (3 peaks):				364.7 RPD = 2
Aroclor-1221	1	4.018	-0.004	396	19.2	1	4.637	-0.055	12562	259.1
Aroclor-1221	2	5.447	-0.008	3993	112.8	2	6.070	-0.013	16557	145.4
Aroclor-1221	3	5.721	-0.008	22893	255.0	3	6.406	-0.016	63934	304.6
Total Col1Ave (3 peaks):					129.0	Total Col2Ave (3 peaks):				236.3 RPD = 59*
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1232	1	---			0.0	1	4.637	-0.054	12562	409.6
Aroclor-1232	2	5.721	-0.010	22893	298.7	2	6.070	-0.014	16557	201.7
Aroclor-1232	3	7.024	-0.003	107604	835.5	3	6.406	-0.016	63934	355.2
Aroclor-1232	4	8.584	-0.021	39376	1018.0	4	7.642	-0.020	308049	817.7
Total Col1Ave (3 peaks):					717.4	Total Col2Ave (4 peaks):				446.1 RPD = 47*
Corrected Ave: < 3 Peaks						Corrected Ave (3 peaks):				322.2
Aroclor-1242	1	6.653	-0.006	32013	414.9	1	7.052	-0.003	139472	421.7
Aroclor-1242	2	7.024	-0.009	107604	429.4	2	7.642	-0.008	308049	430.5
Aroclor-1242	3	8.255	-0.020	5025	145.8	3	8.933	-0.016	51323	158.7
Aroclor-1242	4	8.584	-0.028	39376	511.8	4	9.013	-0.016	36410	128.0
Total Col1Ave (4 peaks):					375.5	Total Col2Ave (4 peaks):				284.7 RPD = 27
Corrected Ave (3 peaks):					330.1	Corrected Ave (3 peaks):				236.1 RPD = 33
Aroclor-1248	1	7.791	-0.008	34169	293.1	1	8.098	-0.007	101006	371.9
Aroclor-1248	2	7.958	-0.010	37855	261.8	2	8.512	-0.008	111511	301.9
Aroclor-1248	3	8.306	-0.013	10448	72.2	3	8.933	-0.016	51323	96.5
Aroclor-1248	4	8.584	-0.024	39376	307.5	4	9.404	0.026	13598	24.0
Total Col1Ave (4 peaks):					233.6	Total Col2Ave (4 peaks):				198.6 RPD = 16
Corrected Ave (3 peaks):					209.0	Corrected Ave (3 peaks):				140.8 RPD = 39
Aroclor-1254	1	8.662	-0.013	161100	681.9	1	9.228	-0.009	430104	762.5
Aroclor-1254	2	8.733	-0.013	70450	818.9	2	9.319	-0.010	207118	622.6
Aroclor-1254	3	9.028	-0.016	91589	632.5	3	9.751	-0.009	234234	551.8
Aroclor-1254	4	9.160	-0.017	296625	1034.8	4	9.902	-0.009	1084242	1148.9
Aroclor-1254	5	9.845	-0.024	166232	860.3	5	10.143	-0.003	1000089	988.0
Total Col1Ave (5 peaks):					805.7	Total Col2Ave (5 peaks):				814.8 RPD = 1
Corrected Ave (4 peaks):					748.4	Corrected Ave (4 peaks):				731.2 RPD = 2
Aroclor-1260	1	10.368	-0.014	98903	919.8	1	11.421	-0.004	620363	1424.8
Aroclor-1260	2	10.686	-0.015	99855	903.2	2	11.668	-0.008	1063567	936.3
Aroclor-1260	3	11.037	-0.014	252588	872.1	3	12.250	-0.010	627245	849.2
Aroclor-1260	4	11.437	-0.014	142525	965.5	4	12.961	-0.010	257033	809.6
Aroclor-1260	5	11.541	-0.013	48140	845.9	NS	---			----
Total Col1Ave (5 peaks):					901.3	Total Col2Ave (4 peaks):				1005.0 RPD = 11
Corrected Ave (4 peaks):					885.2	Corrected Ave (3 peaks):				865.1 RPD = 2
Aroclor-1262	1	10.368	-0.023	98903	536.1	1	10.956	-0.033	372270	531.0
Aroclor-1262	2	11.437	-0.024	142525	1197.4	2	11.668	-0.032	1063567	766.7
Aroclor-1262	3	11.616	-0.020	80590	502.0	3	12.179	-0.029	286000	429.9
Aroclor-1262	4	12.262	-0.027	52447	413.3	4	12.961	-0.032	257033	425.9
Total Col1Ave (4 peaks):					662.2	Total Col2Ave (4 peaks):				538.4 RPD = 21
Corrected Ave (3 peaks):					483.8	Corrected Ave (3 peaks):				462.3 RPD = 5
Aroclor-1268	1	11.541	-0.025	48140	97.7	1	12.179	-0.028	286000	141.0
Aroclor-1268	2	11.616	-0.020	80590	161.5	2	12.250	-0.025	627245	283.7
Aroclor-1268	3	12.013	0.001	24645	62.9	3	12.626	-0.034	11354	5.8
Aroclor-1268	4	12.754	-0.023	15738	12.8	4	13.435	-0.038	63293	10.1
Total Col1Ave (4 peaks):					83.7	Total Col2Ave (4 peaks):				110.2 RPD = 27

Corrected Ave (3 peaks): 57.8 Corrected Ave (3 peaks): 52.3 RPD = 10

Total PCB Area Col1 (5.167 - 13.064) = 4537686 Col1 Total PCB = 1.8 ppm*

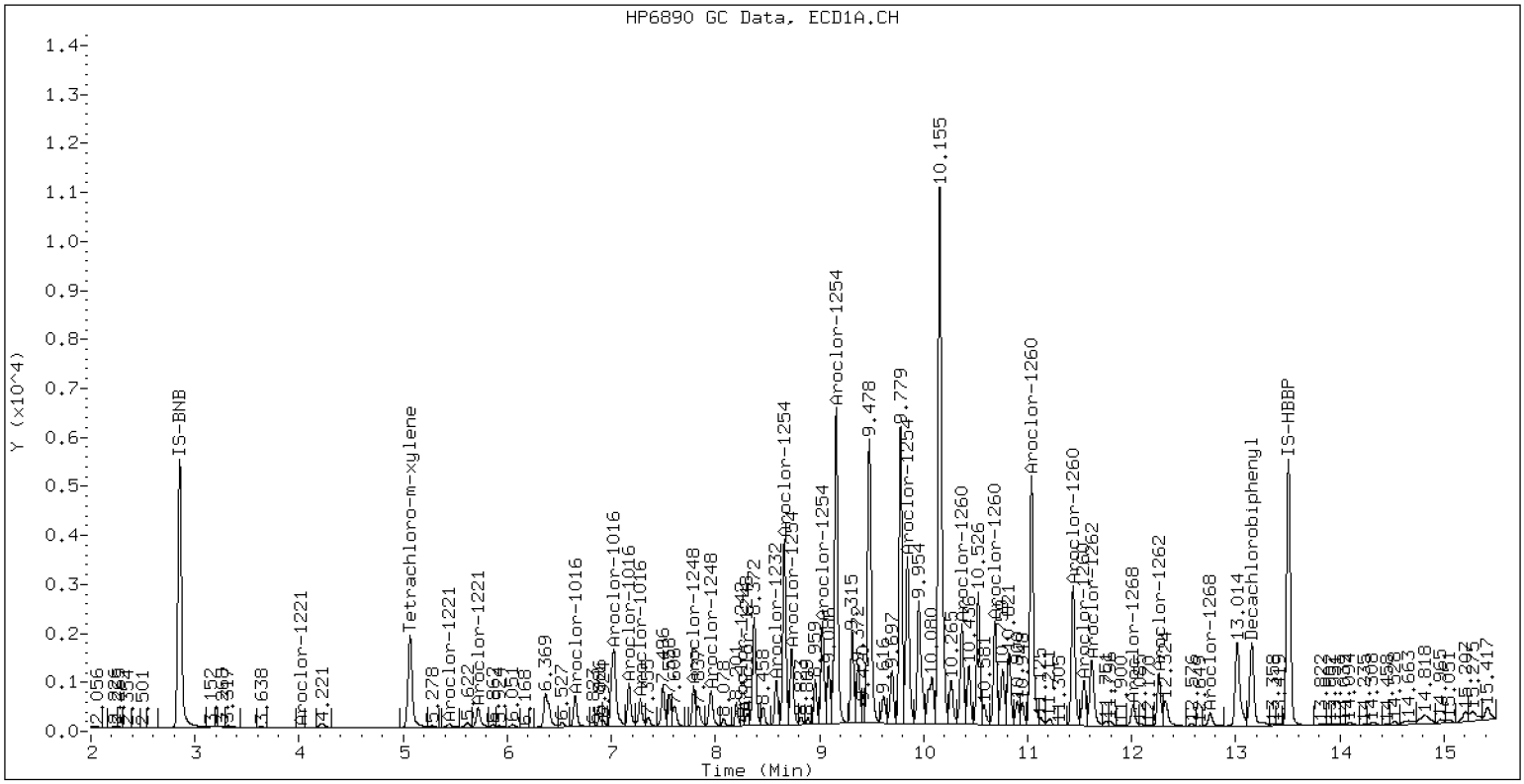
Total PCB Area Col2 (5.167 - 13.064) = 14479109 Col2 Total PCB = 1.8 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

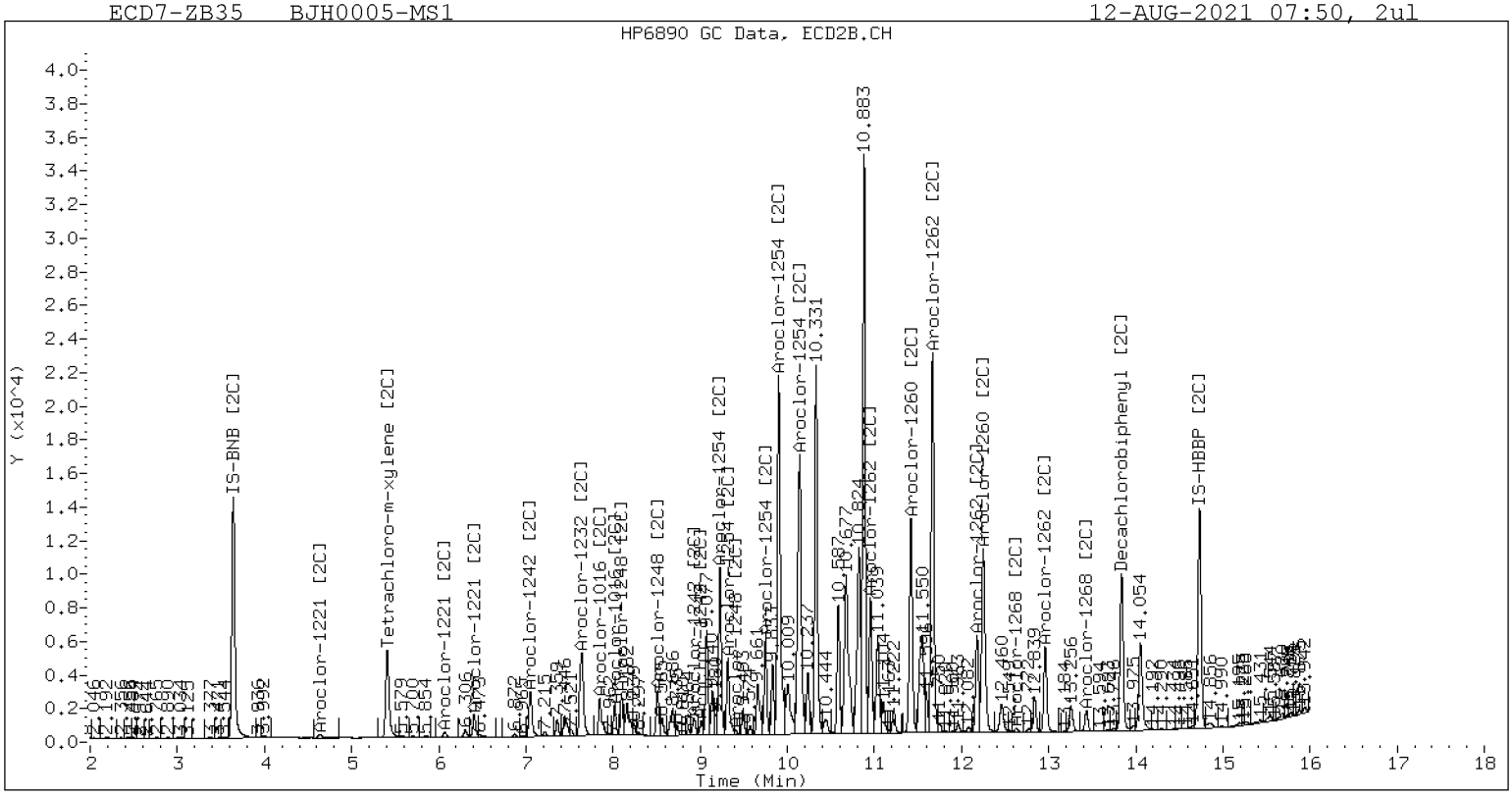
PCB Dual Column Chromatograms

ECD7-ZB5 BJH0005-MS1 12-AUG-2021 07:50, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 BJH0005-MS1 12-AUG-2021 07:50, 2ul



ZB-35 Manual Integration: NO

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112150ECD7.D
Data file 2: /210811.b/210811.b/08112150ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: BJH0005-MSD1
Client ID:
Injection Date: 12-AUG-2021 08:10
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col			ZB35 Col			ZB5	ZB35		
RT	Shift	Response	RT	Shift	Response	on col	on col	RPD	Compound/Flag
5.068	0.001	116973	5.411	-0.000	311420	36.5	34.9	4.5	Tetrachloro-m-xylene
13.156	-0.009	114560	13.840	-0.006	557953	41.8	43.1	3.0	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	268558	-9.4
Hexabromobiphenyl	470266	307590	-34.6

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	724149	1.7
Hexabromobiphenyl	867949	722800	-16.7

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col				ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.655	-0.004	36588	439.2	1	7.053	-0.003	156835	420.5
Aroclor-1016	2	7.026	-0.005	122150	434.5	2	7.645	-0.006	345697	421.3
Aroclor-1016	3	7.172	-0.007	48058	420.8	3	7.850	-0.006	129438	421.3
Aroclor-1016	4	7.280	-0.008	31853	417.6	4	8.021	-0.008	82835	440.4
Total Col1Ave (4 peaks):				428.0		Total Col2Ave (4 peaks):			425.9	RPD = 1
Corrected Ave (3 peaks):				424.3		Corrected Ave (3 peaks):			421.0	RPD = 1
Aroclor-1221	1	4.018	-0.004	329	16.6	1	4.639	-0.053	10027	212.7
Aroclor-1221	2	5.448	-0.007	4179	122.8	2	6.072	-0.012	17706	160.0
Aroclor-1221	3	5.722	-0.007	25301	293.2	3	6.408	-0.014	70004	343.1
Total Col1Ave (3 peaks):				144.2		Total Col2Ave (3 peaks):			238.6	RPD = 49*
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1232	1	---			0.0	1	4.639	-0.052	10027	336.4
Aroclor-1232	2	5.722	-0.009	25301	343.5	2	6.072	-0.013	17706	221.9
Aroclor-1232	3	7.026	-0.001	122150	986.8	3	6.408	-0.015	70004	400.1
Aroclor-1232	4	8.588	-0.017	20923	562.8	4	7.645	-0.017	345697	944.1
Total Col1Ave (3 peaks):				631.1		Total Col2Ave (4 peaks):			475.6	RPD = 28
Corrected Ave: < 3 Peaks						Corrected Ave (3 peaks):			319.5	
Aroclor-1242	1	6.655	-0.005	36588	493.4	1	7.053	-0.002	156835	487.8
Aroclor-1242	2	7.026	-0.007	122150	507.2	2	7.645	-0.005	345697	497.1
Aroclor-1242	3	8.258	-0.017	4907	148.2	3	8.935	-0.014	53168	169.1
Aroclor-1242	4	8.588	-0.025	20923	282.9	4	9.016	-0.012	29659	107.3
Total Col1Ave (4 peaks):				357.9		Total Col2Ave (4 peaks):			315.3	RPD = 13
Corrected Ave (3 peaks):				308.2		Corrected Ave (3 peaks):			254.7	RPD = 19
Aroclor-1248	1	7.794	-0.005	34541	308.2	1	8.101	-0.005	86554	327.9
Aroclor-1248	2	7.960	-0.007	41304	297.2	2	8.514	-0.006	114485	318.9
Aroclor-1248	3	8.308	-0.011	10117	72.7	3	8.935	-0.014	53168	102.9
Aroclor-1248	4	8.588	-0.020	20923	170.0	4	9.408	0.029	7331	13.3
Total Col1Ave (4 peaks):				212.0		Total Col2Ave (4 peaks):			190.7	RPD = 11
Corrected Ave (3 peaks):				180.0		Corrected Ave (3 peaks):			145.0	RPD = 22
Aroclor-1254	1	8.665	-0.011	72213	318.0	1	9.231	-0.006	211610	385.9
Aroclor-1254	2	8.737	-0.009	30469	368.5	2	9.321	-0.008	97871	302.7
Aroclor-1254	3	9.032	-0.012	31102	223.5	3	9.753	-0.007	82434	199.8
Aroclor-1254	4	9.164	-0.013	151596	550.2	4	9.906	-0.005	603316	657.7
Aroclor-1254	5	9.848	-0.020	99616	536.4	5	10.147	0.001	630095	640.4
Total Col1Ave (5 peaks):				399.3		Total Col2Ave (5 peaks):			437.3	RPD = 9
Corrected Ave (4 peaks):				361.6		Corrected Ave (4 peaks):			382.2	RPD = 6
Aroclor-1260	1	10.373	-0.009	93009	824.9	1	11.421	-0.004	483079	1071.7
Aroclor-1260	2	10.690	-0.011	92765	800.1	2	11.670	-0.006	978089	831.8
Aroclor-1260	3	11.041	-0.010	237205	781.1	3	12.251	-0.009	590782	772.6
Aroclor-1260	4	11.441	-0.010	127155	821.4	4	12.963	-0.008	263882	802.9
Aroclor-1260	5	11.545	-0.009	48228	808.1	NS	---			----
Total Col1Ave (5 peaks):				807.1		Total Col2Ave (4 peaks):			869.8	RPD = 7
Corrected Ave (4 peaks):				802.7		Corrected Ave (3 peaks):			802.4	RPD = 0
Aroclor-1262	1	10.373	-0.018	93009	480.8	1	10.959	-0.030	352067	485.1
Aroclor-1262	2	11.441	-0.020	127155	1018.8	2	11.670	-0.029	978089	681.1
Aroclor-1262	3	11.620	-0.016	80721	479.5	3	12.181	-0.027	283586	411.8
Aroclor-1262	4	12.264	-0.025	53328	400.7	4	12.963	-0.030	263882	422.4
Total Col1Ave (4 peaks):				595.0		Total Col2Ave (4 peaks):			500.1	RPD = 17
Corrected Ave (3 peaks):				453.7		Corrected Ave (3 peaks):			439.7	RPD = 3
Aroclor-1268	1	11.545	-0.021	48228	93.4	1	12.181	-0.026	283586	135.1
Aroclor-1268	2	11.620	-0.016	80721	154.2	2	12.251	-0.023	590782	258.1
Aroclor-1268	3	12.018	0.006	24521	59.6	3	12.627	-0.033	11879	5.9
Aroclor-1268	4	12.758	-0.019	15799	12.2	4	13.436	-0.036	67013	10.3
Total Col1Ave (4 peaks):				79.9		Total Col2Ave (4 peaks):			102.4	RPD = 25

Corrected Ave (3 peaks): 55.1 Corrected Ave (3 peaks): 50.4 RPD = 9

Total PCB Area Col1 (5.167 - 13.064) = 3439250 Col1 Total PCB = 1.5 ppm*

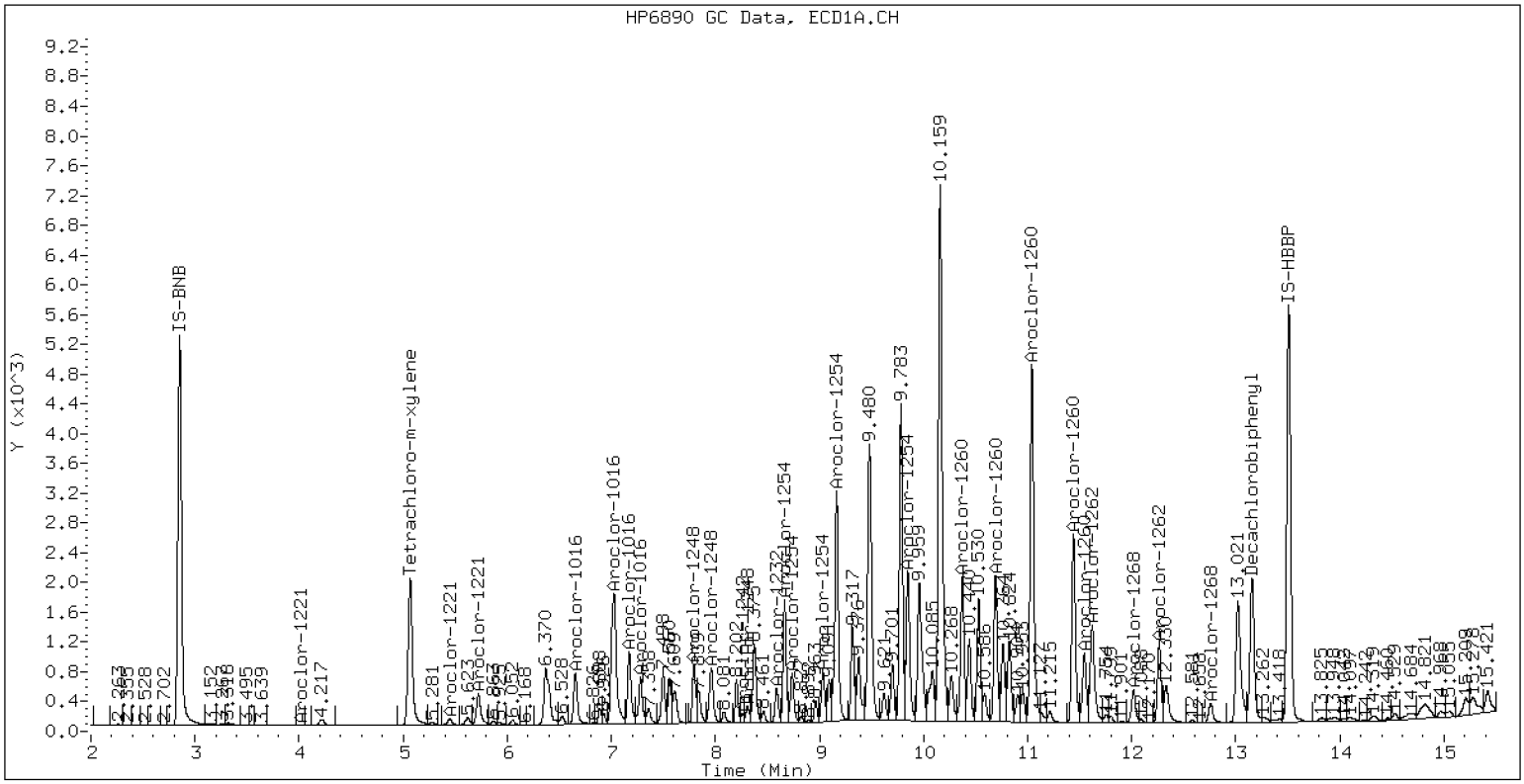
Total PCB Area Col2 (5.167 - 13.064) = 11021215 Col2 Total PCB = 1.4 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

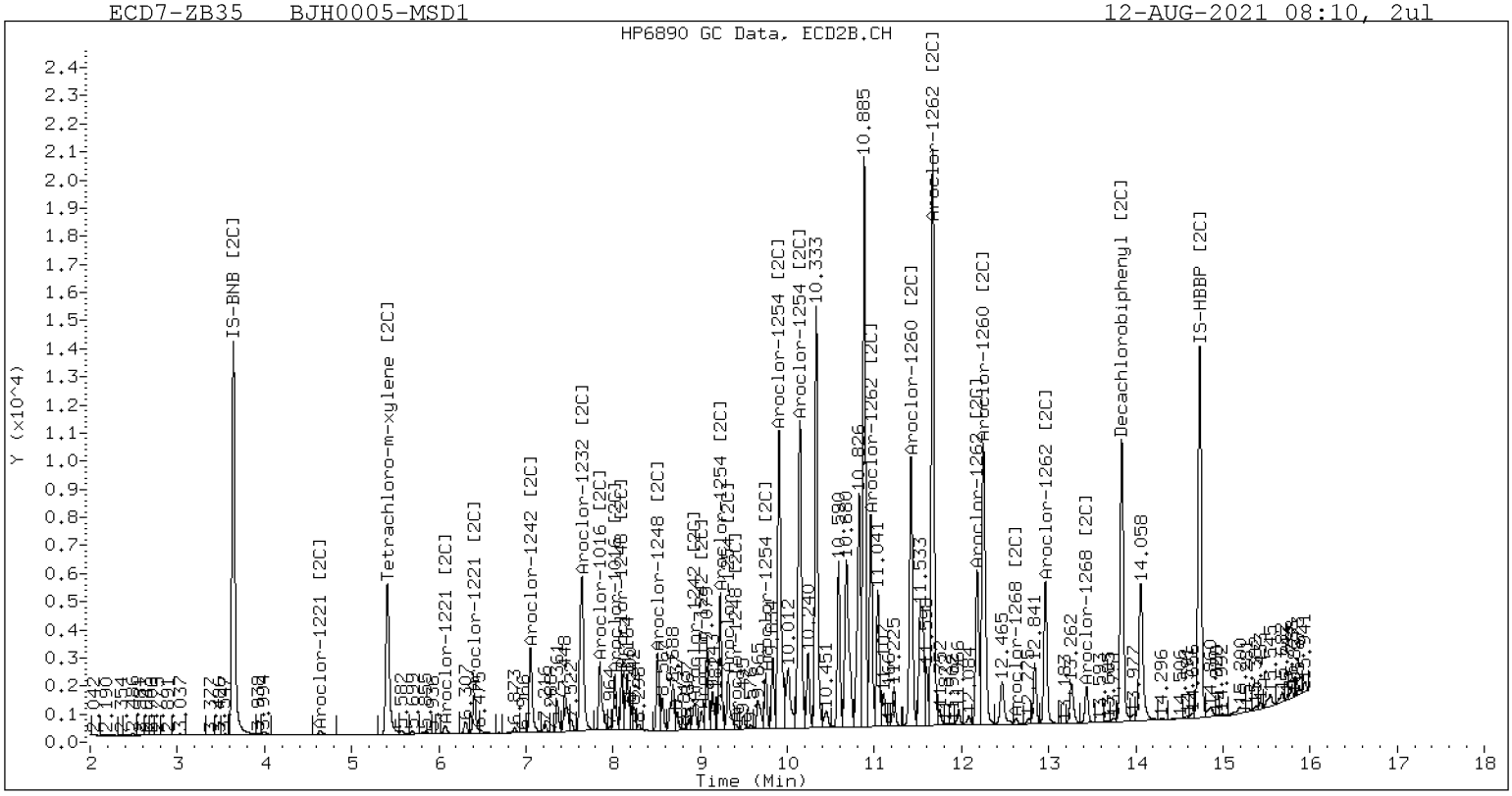
PCB Dual Column Chromatograms

ECD7-ZB5 BJH0005-MSD1 12-AUG-2021 08:10, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 BJH0005-MSD1 12-AUG-2021 08:10, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

STANDARD REFERENCE MATERIAL RECOVERY

EPA 8082A

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJH0005-SRM1
Batch: BJH0005
Initial/Final: 2.5 g / 2.5 mL
Preparation: EPA 3546 (Microwave)
Analyzed: 08/12/2021 3:03
Standard ID: J006842
Expires: 12/28/2021
Standard Lot#: PSRM0136
Description: Puget Sound reference-SRM

ANALYTE	TRUE (ug/kg wet)	FOUND (ug/kg wet)	MDL	MRL	Q	SRM % REC.	QC LIMITS REC.
Aroclor 1260	108.00	116	2.9	20.0		107	38 - 167
Aroclor 1260 [2C]	108.00	127	2.9	20.0		118	38 - 167

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112135ECD7.D
Data file 2: /210811.b/210811.b/08112135ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: BJH0005-SRM1
Client ID:
Injection Date: 12-AUG-2021 03:03
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.066	-0.001	105747	5.411	-0.001	283809	31.0	30.0	3.0	Tetrachloro-m-xylene
13.159	-0.005	118716	13.842	-0.004	599399	34.6	37.6	8.2	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	286131	-3.5
Hexabromobiphenyl	470266	384659	-18.2

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	766312	7.6
Hexabromobiphenyl	867949	889277	2.5

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col				ZB35 Col			
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.659	-0.000	838	9.4	1	---			0.0
Aroclor-1016	2	7.029	-0.003	3513	11.7	2	---			0.0
Aroclor-1016	3	7.177	-0.001	1536	12.6	3	---			0.0
Aroclor-1016	4	7.278	-0.010	1435	17.7	4	---			0.0
Total Col1Ave (4 peaks):				12.9		Col2Ave: <3 Quant Peaks				
Aroclor-1221	1	4.104	0.082	1112	52.5	1	---			0.0
Aroclor-1221	2	5.502	0.046	1377	38.0	2	---			0.0
Aroclor-1221	3	5.722	-0.008	515	5.6	3	---			0.0
Total Col1Ave (3 peaks):				32.0		Col2Ave: <3 Quant Peaks				
Aroclor-1232	1	---			0.0	1	---			0.0
Aroclor-1232	2	5.722	-0.009	515	6.6	2	---			0.0
Aroclor-1232	3	7.029	0.002	3513	26.6	3	---			0.0
Aroclor-1232	4	8.591	-0.014	4055	102.4	4	---			0.0
Total Col1Ave (3 peaks):				45.2		Col2Ave: <3 Quant Peaks				
Aroclor-1242	1	6.659	-0.001	838	10.6	1	---			0.0
Aroclor-1242	2	7.029	-0.004	3513	13.7	2	---			0.0
Aroclor-1242	3	8.308	0.034	4002	113.4	3	---			0.0
Aroclor-1242	4	8.591	-0.021	4055	51.5	4	---			0.0
Total Col1Ave (4 peaks):				47.3		Col2Ave: <3 Quant Peaks				
Aroclor-1248	1	7.795	-0.004	2819	23.6	1	---			0.0
Aroclor-1248	2	7.958	-0.009	2491	16.8	2	---			0.0
Aroclor-1248	3	8.308	-0.011	4002	27.0	3	---			0.0
Aroclor-1248	4	8.591	-0.017	4055	30.9	4	---			0.0
Total Col1Ave (4 peaks):				24.6		Col2Ave: <3 Quant Peaks				
Aroclor-1254	1	8.667	-0.008	12903	53.3	1	9.231	-0.006	43557	75.1
Aroclor-1254	2	8.739	-0.008	4115	46.7	2	9.319	-0.011	11561	33.8
Aroclor-1254	3	9.038	-0.006	6931	46.7	3	9.755	-0.006	21783	49.9
Aroclor-1254	4	9.166	-0.012	17098	58.2	4	9.909	-0.002	80883	83.3
Aroclor-1254	5	9.851	-0.018	13352	67.5	5	10.148	0.002	115299	110.7
Total Col1Ave (5 peaks):				54.5		Total Col2Ave (5 peaks):			70.6	RPD = 26
Corrected Ave (4 peaks):				51.3		Corrected Ave (4 peaks):			60.5	RPD = 17
Aroclor-1260	1	10.376	-0.006	16718	118.6	1	11.420	-0.005	68619	123.7
Aroclor-1260	2	10.694	-0.008	13550	93.5	2	11.670	-0.006	178447	123.3
Aroclor-1260	3	11.043	-0.008	47417	124.9	3	12.253	-0.007	113319	120.5
Aroclor-1260	4	11.443	-0.008	23707	122.5	4	12.964	-0.007	56737	140.3
Aroclor-1260	5	11.547	-0.006	8832	118.3	NS	---			----
Total Col1Ave (5 peaks):				115.5		Total Col2Ave (4 peaks):			127.0	RPD = 9
Corrected Ave (4 peaks):				113.2		Corrected Ave (3 peaks):			122.5	RPD = 8
Aroclor-1262	1	10.376	-0.015	16718	69.1	1	---			0.0
Aroclor-1262	2	11.443	-0.018	23707	151.9	2	---			0.0
Aroclor-1262	3	11.620	-0.016	11312	53.7	3	---			0.0
Aroclor-1262	4	12.267	-0.021	10870	65.3	4	---			0.0
Total Col1Ave (4 peaks):				85.0		Col2Ave: <3 Quant Peaks				
Aroclor-1268	1	11.547	-0.018	8832	13.7	1	---			0.0
Aroclor-1268	2	11.620	-0.016	11312	17.3	2	---			0.0
Aroclor-1268	3	12.020	0.008	5502	10.7	3	---			0.0
Aroclor-1268	4	12.760	-0.017	3241	2.0	4	---			0.0
Total Col1Ave (4 peaks):				10.9		Col2Ave: <3 Quant Peaks				

Total PCB Area Col1 (5.167 - 13.064) = 541542 Col1 Total PCB = 0.2 ppm*

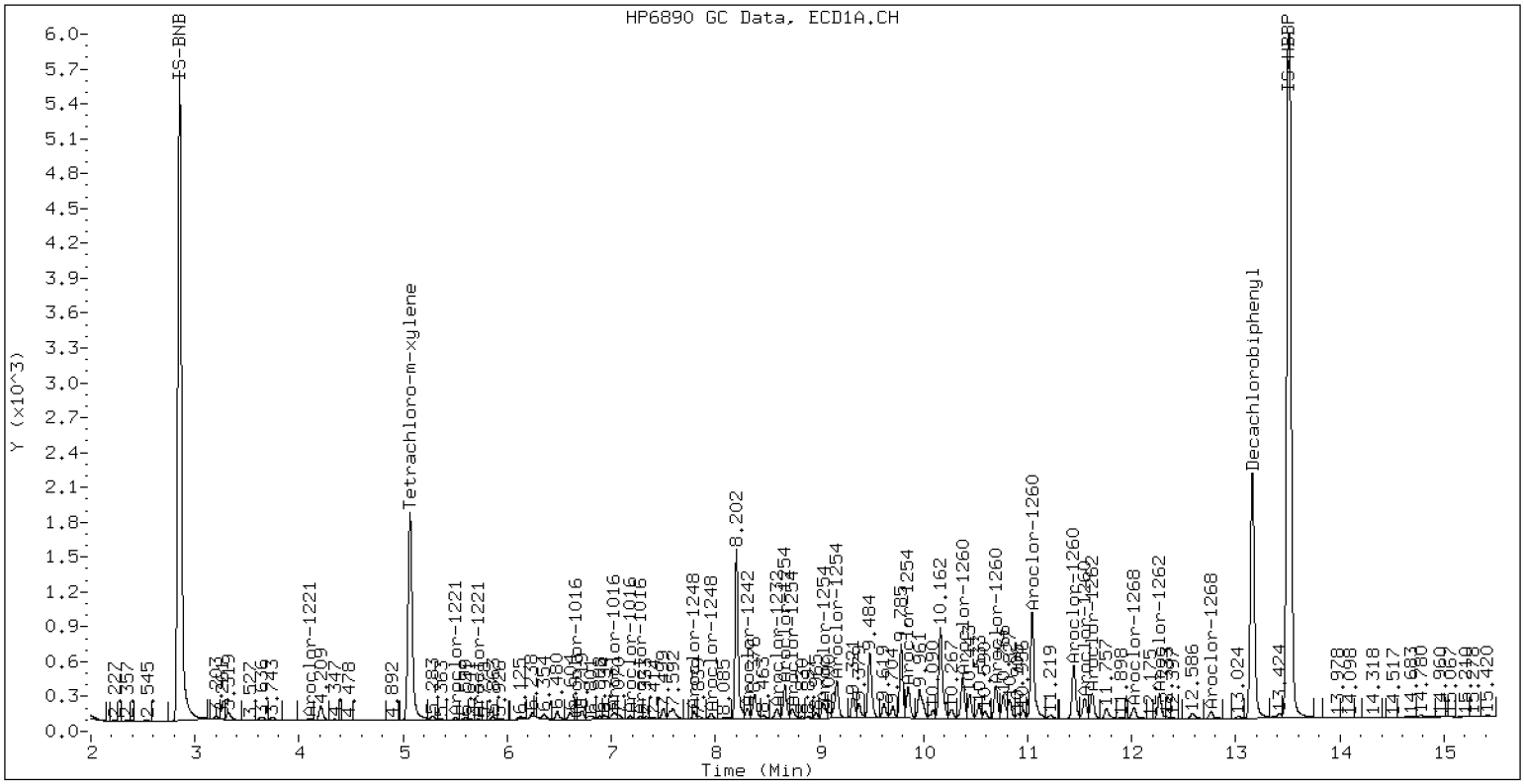
Total PCB Area Col2 (5.167 - 13.064) = 2370416 Col2 Total PCB = 0.3 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

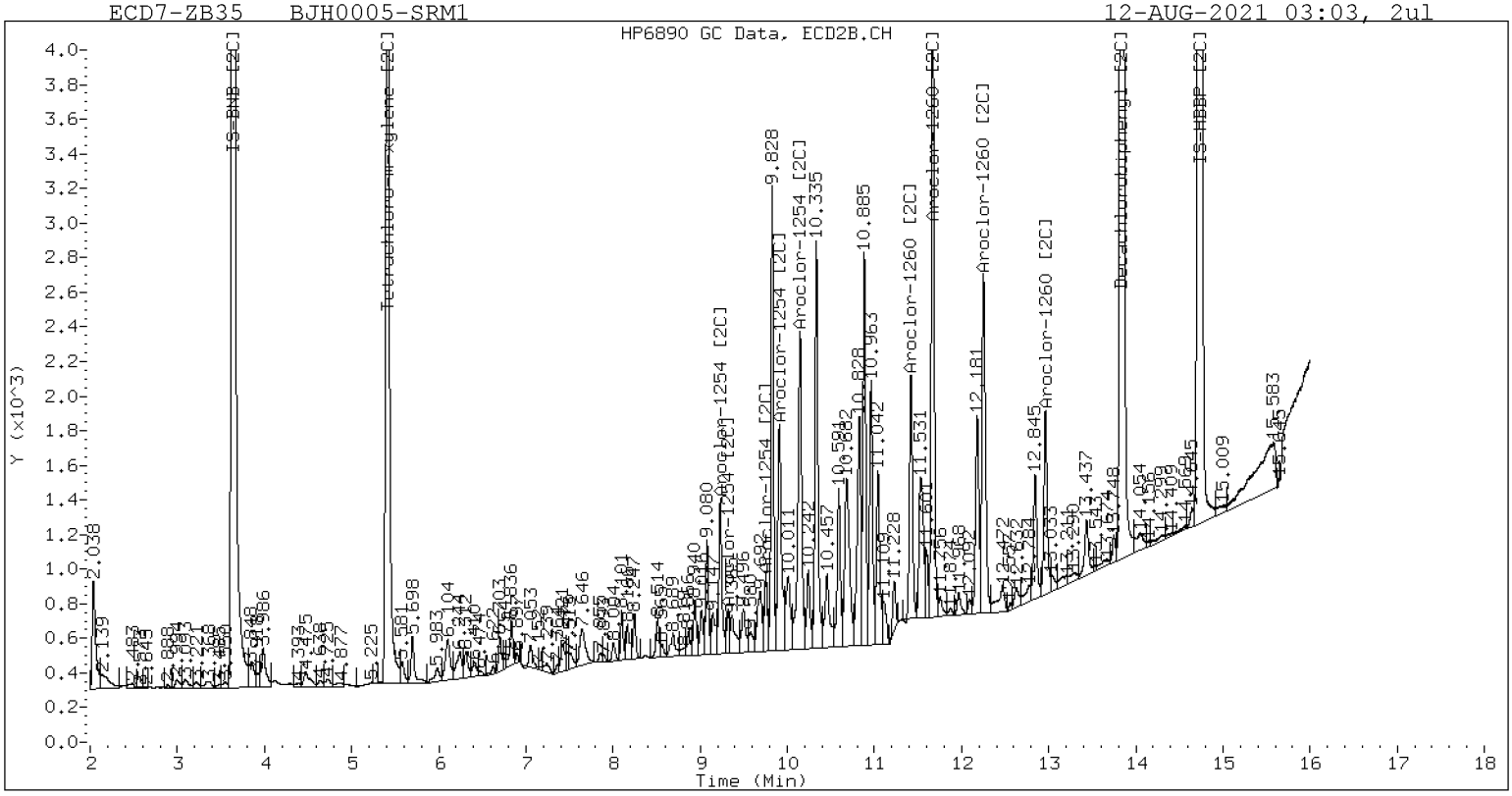
PCB Dual Column Chromatograms

ECD7-ZB5 BJH0005-SRM1 12-AUG-2021 03:03, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 BJH0005-SRM1 12-AUG-2021 03:03, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EE00069	Instrument:	ECD7
Calibration Date:	05/22/2021	Column (1):	ZB5

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RRF		RRF		RRF		RRF		RRF		RRF
Aroclor 1016	250	4.281279E-02	20	3.871182E-02	50	0.0403374	1000	4.123519E-02	100	4.155757E-02	500	4.329345E-02
Aroclor-1016 (1)	250	2.536287E-02	20	2.227229E-02	50	2.543137E-02	1000	2.380487E-02	100	2.583324E-02	500	2.619464E-02
Aroclor-1016 (2)	250	8.744554E-02	20	7.824352E-02	50	8.011398E-02	1000	8.502404E-02	100	8.320027E-02	500	0.0884132
Aroclor-1016 (3)	250	3.512761E-02	20	3.258856E-02	50	3.391883E-02	1000	3.305896E-02	100	3.453077E-02	500	3.488241E-02
Aroclor-1016 (4)	250	2.331514E-02	20	2.174292E-02	50	2.188545E-02	1000	2.305283E-02	100	2.266598E-02	500	2.368355E-02
Aroclor 1260	250	4.049834E-02	20	3.757905E-02	50	3.742661E-02	1000	3.862396E-02	100	3.846127E-02	500	4.050787E-02
Aroclor-1260 (1)	250	3.024331E-02	20	0.0295947	50	2.833626E-02	1000	2.887592E-02	100	2.891171E-02	500	2.999037E-02
Aroclor-1260 (2)	250	3.112451E-02	20	2.960276E-02	50	2.896969E-02	1000	3.034873E-02	100	2.962048E-02	500	3.125267E-02
Aroclor-1260 (3)	250	0.0829488	20	7.636092E-02	50	7.654474E-02	1000	7.682588E-02	100	7.880533E-02	500	8.244053E-02
Aroclor-1260 (4)	250	4.216235E-02	20	3.730173E-02	50	3.824813E-02	1000	4.153595E-02	100	3.954491E-02	500	4.276573E-02
Aroclor-1260 (5)	250	1.601272E-02	20	1.503517E-02	50	1.503425E-02	1000	1.553329E-02	100	1.542391E-02	500	1.609003E-02
Decachlorobiphenyl	40	0.7350733	3.2	0.7186045	8	0.7083055	160	0.6794829	16	0.7197548	80	0.718407
Tetrachlorometaxylene	40	1.012184	3.2	0.8770118	8	0.8951053	160	0.9715738	16	0.9597575	80	1.015792

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EE00069	Instrument:	ECD7
Calibration Date:	05/22/2021	Column (1):	ZB5

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RRF		RRF		RRF		RRF		RRF		RRF
Aroclor 1221							250	1.391921E-02				
Aroclor-1221 (1)							250	5.917406E-03				
Aroclor-1221 (2)							250	1.013896E-02				
Aroclor-1221 (3)							250	2.570124E-02				
Aroclor 1232									250	1.837497E-02		
Aroclor-1232 (1)									250	3.612719E-03		
Aroclor-1232 (2)									250	2.194073E-02		
Aroclor-1232 (3)									250	3.687219E-02		
Aroclor-1232 (4)									250	1.107425E-02		
Aroclor 1242	250	3.143118E-02										
Aroclor-1242 (1)	250	2.209033E-02										
Aroclor-1242 (2)	250	7.174105E-02										
Aroclor-1242 (3)	250	9.865198E-03										
Aroclor-1242 (4)	250	2.202817E-02										
Aroclor 1248			250	3.822602E-02								
Aroclor-1248 (1)			250	0.0333819								
Aroclor-1248 (2)			250	4.140515E-02								
Aroclor-1248 (3)			250	4.145795E-02								
Aroclor-1248 (4)			250	3.665909E-02								
Aroclor 1254					250	5.422381E-02						
Aroclor-1254 (1)					250	6.763994E-02						
Aroclor-1254 (2)					250	0.0246305						
Aroclor-1254 (3)					250	4.145573E-02						
Aroclor-1254 (4)					250	8.207036E-02						
Aroclor-1254 (5)					250	5.532253E-02						
Aroclor 1262							250	4.029314E-02				
Aroclor-1262 (1)							250	5.031797E-02				
Aroclor-1262 (2)							250	0.0324611				

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EE00069	Instrument:	ECD7
Calibration Date:	05/22/2021	Column (1):	ZB5

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RRF		RRF		RRF		RRF		RRF		RRF
Aroclor-1262 (3)							250	0.0437816				
Aroclor-1262 (4)							250	0.0346119				
Aroclor 1268									250	0.1782065		
Aroclor-1268 (1)									250	0.1343391		
Aroclor-1268 (2)									250	0.136111		
Aroclor-1268 (3)									250	0.1069228		
Aroclor-1268 (4)									250	0.3354529		

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EE00069	Instrument:	ECD7
Calibration Date:	05/22/2021	Column (1):	ZB5

COMPOUND	Mean RRF	RRF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Aroclor 1016	0.0413247	4.0			RSD (20)	
Aroclor-1016 (1)	2.481655E-02	6.0			RSD (20)	
Aroclor-1016 (2)	8.374009E-02	4.8			RSD (20)	
Aroclor-1016 (3)	3.401786E-02	3.0			RSD (20)	
Aroclor-1016 (4)	2.272431E-02	3.4			RSD (20)	
Aroclor 1221		0.0			RSD (20)	
Aroclor-1221 (1)		0.0			RSD (20)	
Aroclor-1221 (2)		0.0			RSD (20)	
Aroclor-1221 (3)		0.0			RSD (20)	
Aroclor 1232		0.0			RSD (20)	
Aroclor-1232 (1)		0.0			RSD (20)	
Aroclor-1232 (2)		0.0			RSD (20)	
Aroclor-1232 (3)		0.0			RSD (20)	
Aroclor-1232 (4)		0.0			RSD (20)	
Aroclor 1242		0.0			RSD (20)	
Aroclor-1242 (1)		0.0			RSD (20)	
Aroclor-1242 (2)		0.0			RSD (20)	
Aroclor-1242 (3)		0.0			RSD (20)	
Aroclor-1242 (4)		0.0			RSD (20)	
Aroclor 1248		0.0			RSD (20)	
Aroclor-1248 (1)		0.0			RSD (20)	
Aroclor-1248 (2)		0.0			RSD (20)	
Aroclor-1248 (3)		0.0			RSD (20)	
Aroclor-1248 (4)		0.0			RSD (20)	
Aroclor 1254		0.0			RSD (20)	
Aroclor-1254 (1)		0.0			RSD (20)	
Aroclor-1254 (2)		0.0			RSD (20)	
Aroclor-1254 (3)		0.0			RSD (20)	
Aroclor-1254 (4)		0.0			RSD (20)	
Aroclor-1254 (5)		0.0			RSD (20)	
Aroclor 1260	3.884952E-02	3.5			RSD (20)	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EE00069	Instrument:	ECD7
Calibration Date:	05/22/2021	Column (1):	ZB5

COMPOUND	Mean RRF	RRF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Aroclor-1260 (1)	2.932538E-02	2.5			RSD (20)	
Aroclor-1260 (2)	3.015314E-02	3.0			RSD (20)	
Aroclor-1260 (3)	0.0789877	3.8			RSD (20)	
Aroclor-1260 (4)	0.0402598	5.5			RSD (20)	
Aroclor-1260 (5)	1.552156E-02	2.9			RSD (20)	
Aroclor 1262		0.0			RSD (20)	
Aroclor-1262 (1)		0.0			RSD (20)	
Aroclor-1262 (2)		0.0			RSD (20)	
Aroclor-1262 (3)		0.0			RSD (20)	
Aroclor-1262 (4)		0.0			RSD (20)	
Aroclor 1268		0.0			RSD (20)	
Aroclor-1268 (1)		0.0			RSD (20)	
Aroclor-1268 (2)		0.0			RSD (20)	
Aroclor-1268 (3)		0.0			RSD (20)	
Aroclor-1268 (4)		0.0			RSD (20)	
Decachlorobiphenyl	0.7132713	2.6			RSD (20)	
Tetrachlorometaxylene	0.9552374	6.1			RSD (20)	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EE00069	Instrument:	ECD7
Calibration Date:	05/22/2021	Column (2):	ZB35

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RRF		RRF		RRF		RRF		RRF		RRF
Aroclor 1016 [2C]	250	4.831016E-02	20	4.704819E-02	50	4.628025E-02	1000	4.398583E-02	100	0.0473163	500	4.691569E-02
Aroclor-1016 (1) [2C]	250	4.227934E-02	20	4.463057E-02	50	4.204167E-02	1000	3.625869E-02	100	4.207907E-02	500	3.995641E-02
Aroclor-1016 (2) [2C]	250	0.0934567	20	9.249709E-02	50	9.046024E-02	1000	8.556254E-02	100	9.164228E-02	500	0.0902442
Aroclor-1016 (3) [2C]	250	3.541638E-02	20	3.274937E-02	50	0.0327615	1000	3.292514E-02	100	0.0346121	500	3.518771E-02
Aroclor-1016 (4) [2C]	250	2.208821E-02	20	1.831573E-02	50	0.0198576	1000	2.119692E-02	100	2.093176E-02	500	2.227439E-02
Aroclor 1260 [2C]	250	7.651115E-02	20	7.628202E-02	50	7.484558E-02	1000	7.464166E-02	100	7.449105E-02	500	7.479524E-02
Aroclor-1260 (1) [2C]	250	5.109277E-02	20	0.0513235	50	5.080722E-02	1000	4.665795E-02	100	5.020861E-02	500	4.925182E-02
Aroclor-1260 (2) [2C]	250	0.1304961	20	0.1308898	50	0.1285596	1000	0.1349621	100	0.1281739	500	0.1278062
Aroclor-1260 (3) [2C]	250	8.617502E-02	20	8.719133E-02	50	8.540519E-02	1000	8.050445E-02	100	8.440926E-02	500	8.409056E-02
Aroclor-1260 (4) [2C]	250	3.828059E-02	20	3.572346E-02	50	3.461026E-02	1000	3.644211E-02	100	3.517241E-02	500	3.803236E-02
Decachlorobiphenyl [2C]	40	1.423491	3.2	1.366671	8	1.344486	160	1.589411	16	1.400241	80	1.481925
Tetrachlorometaxylene [2C]	40	1.009093	3.2	0.9667487	8	0.9626062	160	0.9923058	16	0.9826074	80	1.004084

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EE00069	Instrument:	ECD7
Calibration Date:	05/22/2021	Column (2):	ZB35

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RRF		RRF		RRF		RRF		RRF		RRF
Aroclor 1221 [2C]							250	1.332511E-02				
Aroclor-1221 (1) [2C]							250	5.207268E-03				
Aroclor-1221 (2) [2C]							250	0.0122273				
Aroclor-1221 (3) [2C]							250	2.254076E-02				
Aroclor 1232 [2C]									250	1.797132E-02		
Aroclor-1232 (1) [2C]									250	3.293084E-03		
Aroclor-1232 (2) [2C]									250	8.813512E-03		
Aroclor-1232 (3) [2C]									250	1.932692E-02		
Aroclor-1232 (4) [2C]									250	4.045176E-02		
Aroclor 1242 [2C]	250	4.440635E-02										
Aroclor-1242 (1) [2C]	250	3.551807E-02										
Aroclor-1242 (2) [2C]	250	7.683181E-02										
Aroclor-1242 (3) [2C]	250	3.473024E-02										
Aroclor-1242 (4) [2C]	250	3.054528E-02										
Aroclor 1248 [2C]			250	4.670282E-02								
Aroclor-1248 (1) [2C]			250	0.0291658								
Aroclor-1248 (2) [2C]			250	3.966268E-02								
Aroclor-1248 (3) [2C]			250	5.709904E-02								
Aroclor-1248 (4) [2C]			250	6.088369E-02								
Aroclor 1254 [2C]					250	7.038136E-02						
Aroclor-1254 (1) [2C]					250	6.057494E-02						
Aroclor-1254 (2) [2C]					250	3.572117E-02						
Aroclor-1254 (3) [2C]					250	4.558157E-02						
Aroclor-1254 (4) [2C]					250	0.1013365						
Aroclor-1254 (5) [2C]					250	0.1086926						
Aroclor 1262 [2C]							250	9.616195E-02				
Aroclor-1262 (1) [2C]							250	8.033395E-02				
Aroclor-1262 (2) [2C]							250	0.1589417				

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EE00069	Instrument:	ECD7
Calibration Date:	05/22/2021	Column (2):	ZB35

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RRF		RRF		RRF		RRF		RRF		RRF
Aroclor-1262 (3) [2C]							250	0.0762251				
Aroclor-1262 (4) [2C]							250	6.914695E-02				
Aroclor 1268 [2C]									250	0.35673		
Aroclor-1268 (1) [2C]									250	0.2323928		
Aroclor-1268 (2) [2C]									250	0.2533114		
Aroclor-1268 (3) [2C]									250	0.222398		
Aroclor-1268 (4) [2C]									250	0.7188172		

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EE00069	Instrument:	ECD7
Calibration Date:	05/22/2021	Column (2):	ZB35

COMPOUND	Mean RRF	RRF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Aroclor 1016 [2C]	4.664274E-02	3.1			RSD (20)	
Aroclor-1016 (1) [2C]	4.120762E-02	6.9			RSD (20)	
Aroclor-1016 (2) [2C]	9.064384E-02	3.1			RSD (20)	
Aroclor-1016 (3) [2C]	3.394203E-02	3.7			RSD (20)	
Aroclor-1016 (4) [2C]	2.077744E-02	7.2			RSD (20)	
Aroclor 1221 [2C]		0.0			RSD (20)	
Aroclor-1221 (1) [2C]		0.0			RSD (20)	
Aroclor-1221 (2) [2C]		0.0			RSD (20)	
Aroclor-1221 (3) [2C]		0.0			RSD (20)	
Aroclor 1232 [2C]		0.0			RSD (20)	
Aroclor-1232 (1) [2C]		0.0			RSD (20)	
Aroclor-1232 (2) [2C]		0.0			RSD (20)	
Aroclor-1232 (3) [2C]		0.0			RSD (20)	
Aroclor-1232 (4) [2C]		0.0			RSD (20)	
Aroclor 1242 [2C]		0.0			RSD (20)	
Aroclor-1242 (1) [2C]		0.0			RSD (20)	
Aroclor-1242 (2) [2C]		0.0			RSD (20)	
Aroclor-1242 (3) [2C]		0.0			RSD (20)	
Aroclor-1242 (4) [2C]		0.0			RSD (20)	
Aroclor 1248 [2C]		0.0			RSD (20)	
Aroclor-1248 (1) [2C]		0.0			RSD (20)	
Aroclor-1248 (2) [2C]		0.0			RSD (20)	
Aroclor-1248 (3) [2C]		0.0			RSD (20)	
Aroclor-1248 (4) [2C]		0.0			RSD (20)	
Aroclor 1254 [2C]		0.0			RSD (20)	
Aroclor-1254 (1) [2C]		0.0			RSD (20)	
Aroclor-1254 (2) [2C]		0.0			RSD (20)	
Aroclor-1254 (3) [2C]		0.0			RSD (20)	
Aroclor-1254 (4) [2C]		0.0			RSD (20)	
Aroclor-1254 (5) [2C]		0.0			RSD (20)	
Aroclor 1260 [2C]	7.526112E-02	1.2			RSD (20)	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EE00069	Instrument:	ECD7
Calibration Date:	05/22/2021	Column (2):	ZB35

COMPOUND	Mean RRF	RRF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
Aroclor-1260 (1) [2C]	4.989031E-02	3.5			RSD (20)	
Aroclor-1260 (2) [2C]	0.130148	2.1			RSD (20)	
Aroclor-1260 (3) [2C]	0.0846293	2.7			RSD (20)	
Aroclor-1260 (4) [2C]	3.637686E-02	4.1			RSD (20)	
Aroclor 1262 [2C]		0.0			RSD (20)	
Aroclor-1262 (1) [2C]		0.0			RSD (20)	
Aroclor-1262 (2) [2C]		0.0			RSD (20)	
Aroclor-1262 (3) [2C]		0.0			RSD (20)	
Aroclor-1262 (4) [2C]		0.0			RSD (20)	
Aroclor 1268 [2C]		0.0			RSD (20)	
Aroclor-1268 (1) [2C]		0.0			RSD (20)	
Aroclor-1268 (2) [2C]		0.0			RSD (20)	
Aroclor-1268 (3) [2C]		0.0			RSD (20)	
Aroclor-1268 (4) [2C]		0.0			RSD (20)	
Decachlorobiphenyl [2C]	1.434371	6.3			RSD (20)	
Tetrachlorometaxylene [2C]	0.9862409	1.9			RSD (20)	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8082A

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Calibration: EE00069
Sequence: SJE0321

SDG: 21G0286
Project: Lower Duwamish AOC4
Laboratory ID: SJE0321-SCV1
Sequence Name: AR1660SCV1
Standard ID: J000948

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Aroclor 1016	250.00	250	-0.2	20.00
Aroclor 1016 [2C]	250.00	250	0.2	20.00
Aroclor 1260	250.00	295	17.8	20.00
Aroclor 1260 [2C]	250.00	287	14.8	20.00
Decachlorobiphenyl	40.000	39.8	-0.4	20.00
Tetrachlorometaxylene	40.000	42.4	6.0	20.00
Decachlorobiphenyl [2C]	40.000	39.0	-2.4	20.00
Tetrachlorometaxylene [2C]	40.000	40.6	1.4	20.00

* Indicates values outside of QC limits
[2C] indicates second-column analyte.

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210522.b/05222117ECD7.D
Data file 2: /210522.b/210522.b/05222117ECD7.D
Method: \\target\share\chem4\ecd7.i\210522.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1660SCV1
Client ID:
Injection Date: 22-MAY-2021 19:32
Report Date: 05/25/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.074	0.000	150100	5.424	-0.000	360043	42.4	40.6	4.4	Tetrachloro-m-xylene
13.178	0.002	171195	13.872	0.002	637856	39.8	39.0	2.1	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	296594	0.0
Hexabromobiphenyl	470266	481880	2.5

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	719765	1.1
Hexabromobiphenyl	867949	911548	5.0

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.666	0.001	22769	247.5	1	7.071	0.001	92068	248.3
Aroclor-1016	2	7.034	0.000	78003	251.2	2	7.661	0.001	201632	247.2
Aroclor-1016	3	7.182	0.001	31610	250.6	3	7.869	0.001	76459	250.4
Aroclor-1016	4	7.291	0.001	20953	248.7	4	8.041	0.002	47774	255.6
Total Col1Ave (4 peaks):					249.5	Total Col2Ave (4 peaks):				250.4 RPD = 0
Corrected Ave (3 peaks):					248.9	Corrected Ave (3 peaks):				248.6 RPD = 0
Aroclor-1221	1	4.026	0.004	113	5.2	1	4.692	-0.000	432	9.2
Aroclor-1221	2	5.455	-0.000	2657	70.7	2	6.089	0.005	11633	105.7
Aroclor-1221	3	5.729	0.000	16535	173.5	3	6.423	0.001	39442	194.5
Total Col1Ave (3 peaks):					83.1	Total Col2Ave (3 peaks):				103.2 RPD = 22
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1232	1	4.026	0.005	113	8.4	1	4.692	0.000	432	14.6
Aroclor-1232	2	5.729	0.001	16535	203.3	2	6.089	0.004	11633	146.7
Aroclor-1232	3	7.034	0.001	78003	570.6	3	6.423	0.000	39442	226.8
Aroclor-1232	4	8.606	-0.009	2061	50.2	4	7.661	-0.001	201632	554.0
Total Col1Ave (4 peaks):					208.1	Total Col2Ave (4 peaks):				235.5 RPD = 12
Corrected Ave (3 peaks):					87.3	Corrected Ave (3 peaks):				129.4 RPD = 39
Aroclor-1242	1	6.666	0.001	22769	278.0	1	7.071	0.001	92068	288.1
Aroclor-1242	2	7.034	0.000	78003	293.3	2	7.661	0.002	201632	291.7
Aroclor-1242	3	8.276	0.005	2315	63.3	3	8.950	-0.008	27869	89.2
Aroclor-1242	4	8.606	-0.005	2061	25.2	4	9.040	0.003	7790	28.3
Total Col1Ave (4 peaks):					165.0	Total Col2Ave (4 peaks):				174.3 RPD = 6
Corrected Ave (3 peaks):					122.2	Corrected Ave (3 peaks):				135.2 RPD = 10
Aroclor-1248	1	7.807	0.001	21433	173.2	1	8.122	0.001	43799	166.9
Aroclor-1248	2	7.974	0.001	29322	191.0	2	8.536	0.001	66601	186.6
Aroclor-1248	3	8.324	0.002	4130	26.9	3	8.950	-0.011	27869	54.2
Aroclor-1248	4	8.606	-0.007	2061	15.2	4	9.391	0.002	5888	10.7
Total Col1Ave (4 peaks):					101.6	Total Col2Ave (4 peaks):				104.6 RPD = 3
Corrected Ave (3 peaks):					71.7	Corrected Ave (3 peaks):				77.3 RPD = 7
Aroclor-1254	1	8.682	-0.000	16848	67.2	1	9.255	-0.000	44067	80.9
Aroclor-1254	2	---			0.0	2	9.349	0.002	2467	7.7
Aroclor-1254	3	9.050	0.001	1728	11.2	3	9.781	0.001	6046	14.7
Aroclor-1254	4	9.178	-0.005	15131	49.7	4	9.947	0.017	111904	122.7
Aroclor-1254	5	9.867	-0.008	22044	107.5	5	10.177	0.016	145643	148.9
Total Col1Ave (4 peaks):					58.9	Total Col2Ave (5 peaks):				75.0 RPD = 24
Corrected Ave (3 peaks):					42.7	Corrected Ave (4 peaks):				56.5 RPD = 28
Aroclor-1260	1	10.394	0.003	53063	300.4	1	11.446	0.000	155193	273.0
Aroclor-1260	2	10.712	0.001	53264	293.3	2	11.699	0.002	412469	278.1
Aroclor-1260	3	11.062	0.002	141369	297.1	3	12.282	0.002	271072	281.1
Aroclor-1260	4	11.463	0.004	66669	274.9	4	12.994	0.002	130808	315.6
Aroclor-1260	5	11.566	0.001	28694	306.9	NS	---			----
Total Col1Ave (5 peaks):					294.5	Total Col2Ave (4 peaks):				287.0 RPD = 3
Corrected Ave (4 peaks):					291.4	Corrected Ave (3 peaks):				277.4 RPD = 5
Aroclor-1262	1	10.394	-0.001	53063	175.1	1	10.989	-0.000	162597	177.6
Aroclor-1262	2	11.463	0.000	66669	341.0	2	11.699	-0.001	412469	227.8
Aroclor-1262	3	11.638	-0.000	37034	140.4	3	12.211	0.003	127645	147.0
Aroclor-1262	4	12.286	-0.001	33351	160.0	4	12.994	0.001	130808	166.0
Total Col1Ave (4 peaks):					204.1	Total Col2Ave (4 peaks):				179.6 RPD = 13
Corrected Ave (3 peaks):					158.5	Corrected Ave (3 peaks):				163.5 RPD = 3
Aroclor-1268	1	11.566	-0.001	28694	35.5	1	12.211	0.004	127645	48.2
Aroclor-1268	2	11.638	0.002	37034	45.2	2	12.282	0.008	271072	93.9
Aroclor-1268	3	12.040	0.029	15321	23.8	3	12.659	-0.001	4976	2.0
Aroclor-1268	4	12.781	-0.000	8326	4.1	4	13.469	-0.003	26590	3.2
Total Col1Ave (4 peaks):					27.1	Total Col2Ave (4 peaks):				36.8 RPD = 30

Corrected Ave (3 peaks): 21.1 Corrected Ave (3 peaks): 17.8 RPD = 17

Total PCB Area Col1 (5.174 - 13.076) = 1346327 Col1 Total PCB = 0.5 ppm*

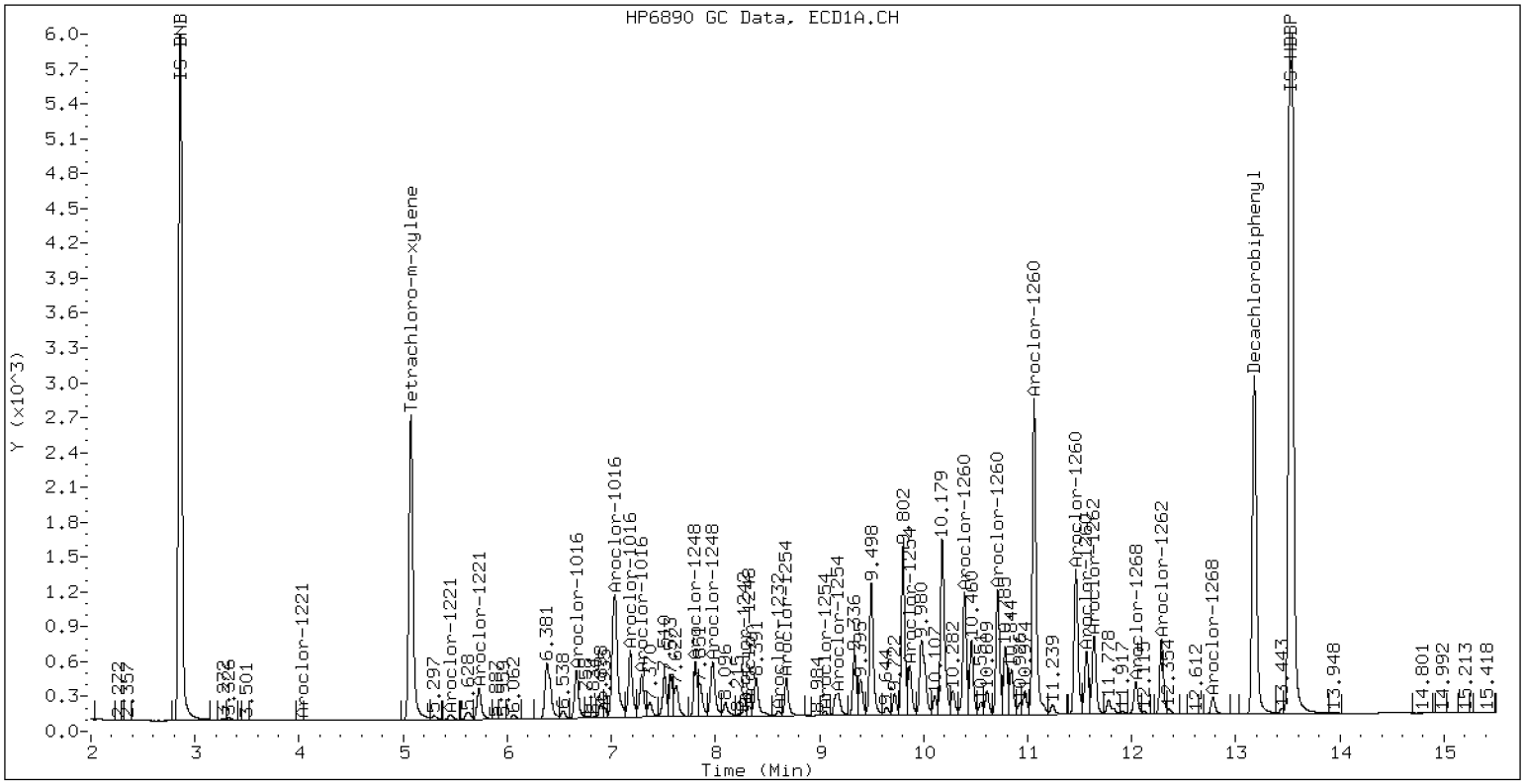
Total PCB Area Col2 (5.174 - 13.076) = 4068268 Col2 Total PCB = 0.5 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

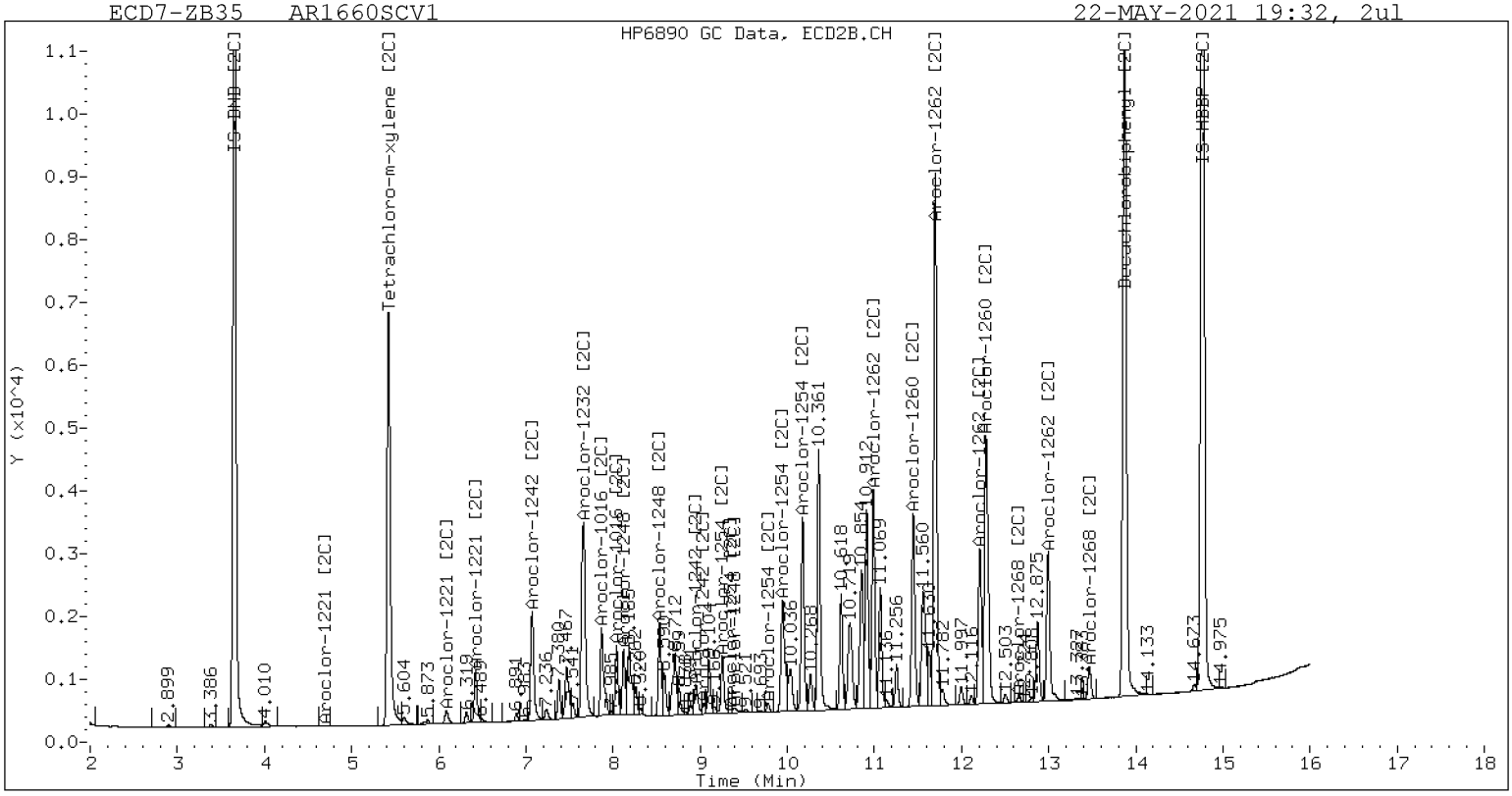
PCB Dual Column Chromatograms

ECD7-ZB5 AR1660SCV1 22-MAY-2021 19:32, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1660SCV1 22-MAY-2021 19:32, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8082A

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Calibration: EE00069
Sequence: SJE0321

SDG: 21G0286
Project: Lower Duwamish AOC4
Laboratory ID: SJE0321-SCV2
Sequence Name: AR1242SCV2
Standard ID: J000949

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Aroclor 1242	250.00	226	-9.7	20.00
Aroclor 1242 [2C]	250.00	222	-11.3	20.00
Decachlorobiphenyl	40.000	40.3	0.7	20.00
Tetrachlorometaxylene	40.000	41.8	4.5	20.00
Decachlorobiphenyl [2C]	40.000	40.3	0.7	20.00
Tetrachlorometaxylene [2C]	40.000	40.5	1.1	20.00

* Indicates values outside of QC limits
[2C] indicates second-column analyte.

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210522.b/05222118ECD7.D
Data file 2: /210522.b/210522.b/05222118ECD7.D
Method: \\target\share\chem4\ecd7.i\210522.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1242SCV2
Client ID:
Injection Date: 22-MAY-2021 19:53
Report Date: 05/25/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.073	-0.001	148026	5.424	-0.000	355279	41.8	40.5	3.3	Tetrachloro-m-xylene
13.177	0.001	171517	13.873	0.003	654853	40.3	40.3	0.0	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	296608	0.1
Hexabromobiphenyl	470266	477702	1.6

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	712373	0.1
Hexabromobiphenyl	867949	906518	4.4

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.665	-0.000	18392	199.9	1	7.071	-0.000	72036	196.3
Aroclor-1016	2	7.033	-0.001	59895	192.9	2	7.660	0.000	156335	193.7
Aroclor-1016	3	7.182	0.001	24546	194.6	3	7.869	0.001	59486	196.8
Aroclor-1016	4	7.291	0.001	16263	193.0	4	8.041	0.001	37109	200.6
Total Col1Ave (4 peaks):				195.1		Total Col2Ave (4 peaks):			196.8	RPD = 1
Corrected Ave (3 peaks):				193.5		Corrected Ave (3 peaks):			195.6	RPD = 1
Aroclor-1221	1	4.021	-0.002	126	5.7	1	---			0.0
Aroclor-1221	2	5.453	-0.002	2075	55.2	2	6.090	0.006	9535	87.6
Aroclor-1221	3	5.729	-0.001	12906	135.4	3	6.422	0.000	30451	151.7
Total Col1Ave (3 peaks):				65.5		Col2Ave: <3 Quant Peaks				
Aroclor-1232	1	4.021	-0.000	126	9.4	1	---			0.0
Aroclor-1232	2	5.729	-0.000	12906	158.7	2	6.090	0.006	9535	121.5
Aroclor-1232	3	7.033	-0.001	59895	438.1	3	6.422	-0.001	30451	176.9
Aroclor-1232	4	8.614	-0.001	18633	453.8	4	7.660	-0.002	156335	434.0
Total Col1Ave (4 peaks):				265.0		Total Col2Ave (3 peaks):			244.1	RPD = 8
Corrected Ave (3 peaks):				202.1		Corrected Ave: < 3 Peaks				
Aroclor-1242	1	6.665	0.000	18392	224.6	1	7.071	-0.000	72036	227.8
Aroclor-1242	2	7.033	-0.001	59895	225.2	2	7.660	0.001	156335	228.5
Aroclor-1242	3	8.275	0.003	8247	225.5	3	8.961	0.003	69303	224.1
Aroclor-1242	4	8.614	0.003	18633	228.1	4	9.040	0.004	56266	206.9
Total Col1Ave (4 peaks):				225.8		Total Col2Ave (4 peaks):			221.8	RPD = 2
Corrected Ave (3 peaks):				225.1		Corrected Ave (3 peaks):			219.6	RPD = 2
Aroclor-1248	1	7.806	-0.001	17228	139.2	1	8.121	-0.001	35861	138.1
Aroclor-1248	2	7.974	0.001	24199	157.6	2	8.536	0.000	54676	154.8
Aroclor-1248	3	8.322	0.000	19391	126.2	3	8.961	0.000	69303	136.3
Aroclor-1248	4	8.614	0.001	18633	137.1	4	9.391	0.001	77643	143.2
Total Col1Ave (4 peaks):				140.0		Total Col2Ave (4 peaks):			143.1	RPD = 2
Corrected Ave (3 peaks):				134.1		Corrected Ave (3 peaks):			139.2	RPD = 4
Aroclor-1254	1	8.683	0.001	12254	48.9	1	9.255	-0.000	28380	52.6
Aroclor-1254	2	8.753	0.000	5283	57.9	2	9.391	0.044	77643	244.1
Aroclor-1254	3	9.050	0.002	5840	38.0	3	9.781	0.001	18362	45.2
Aroclor-1254	4	9.185	0.003	9954	32.7	4	9.930	0.000	37314	41.4
Aroclor-1254	5	9.881	0.005	6746	32.9	5	10.160	-0.000	39089	40.4
Total Col1Ave (5 peaks):				42.1		Total Col2Ave (5 peaks):			84.7	RPD = 67*
Corrected Ave (4 peaks):				38.1		Corrected Ave (4 peaks):			44.9	RPD = 16
Aroclor-1260	1	10.393	0.002	187	1.1	1	11.458	0.012	3982	7.0
Aroclor-1260	2	10.713	0.002	208	1.2	2	11.703	0.006	2513	1.7
Aroclor-1260	3	11.063	0.004	540	1.1	3	12.285	0.005	1926	2.0
Aroclor-1260	4	11.466	0.006	450	1.9	4	13.071	0.079	5406	13.1
Aroclor-1260	5	---			0.0	NS	---			----
Total Col1Ave (4 peaks):				1.3		Total Col2Ave (4 peaks):			6.0	RPD = 128*
Corrected Ave (3 peaks):				1.1		Corrected Ave (3 peaks):			3.6	RPD = 105*
Aroclor-1262	1	10.393	-0.001	187	0.6	1	10.914	-0.075	13876	15.2
Aroclor-1262	2	11.466	0.003	450	2.3	2	11.703	0.003	2513	1.4
Aroclor-1262	3	---			0.0	3	12.209	0.001	1037	1.2
Aroclor-1262	4	12.313	0.026	270	1.3	4	13.071	0.078	5406	6.9
Total Col1Ave (3 peaks):				1.4		Total Col2Ave (4 peaks):			6.2	RPD = 125*
Corrected Ave: < 3 Peaks						Corrected Ave (3 peaks):			3.2	
Aroclor-1268	1	---			0.0	1	12.209	0.002	1037	0.4
Aroclor-1268	2	---			0.0	2	12.285	0.010	1926	0.7
Aroclor-1268	3	12.011	-0.000	683	1.1	3	12.658	-0.002	2315	0.9
Aroclor-1268	4	12.779	-0.002	1999	1.0	4	13.467	-0.005	4164	0.5
Col1Ave: <3 Quant Peaks						Col2Ave: 0.6				

Total PCB Area Col1 (5.174 - 13.076) = 451658 Col1 Total PCB = 0.2 ppm*

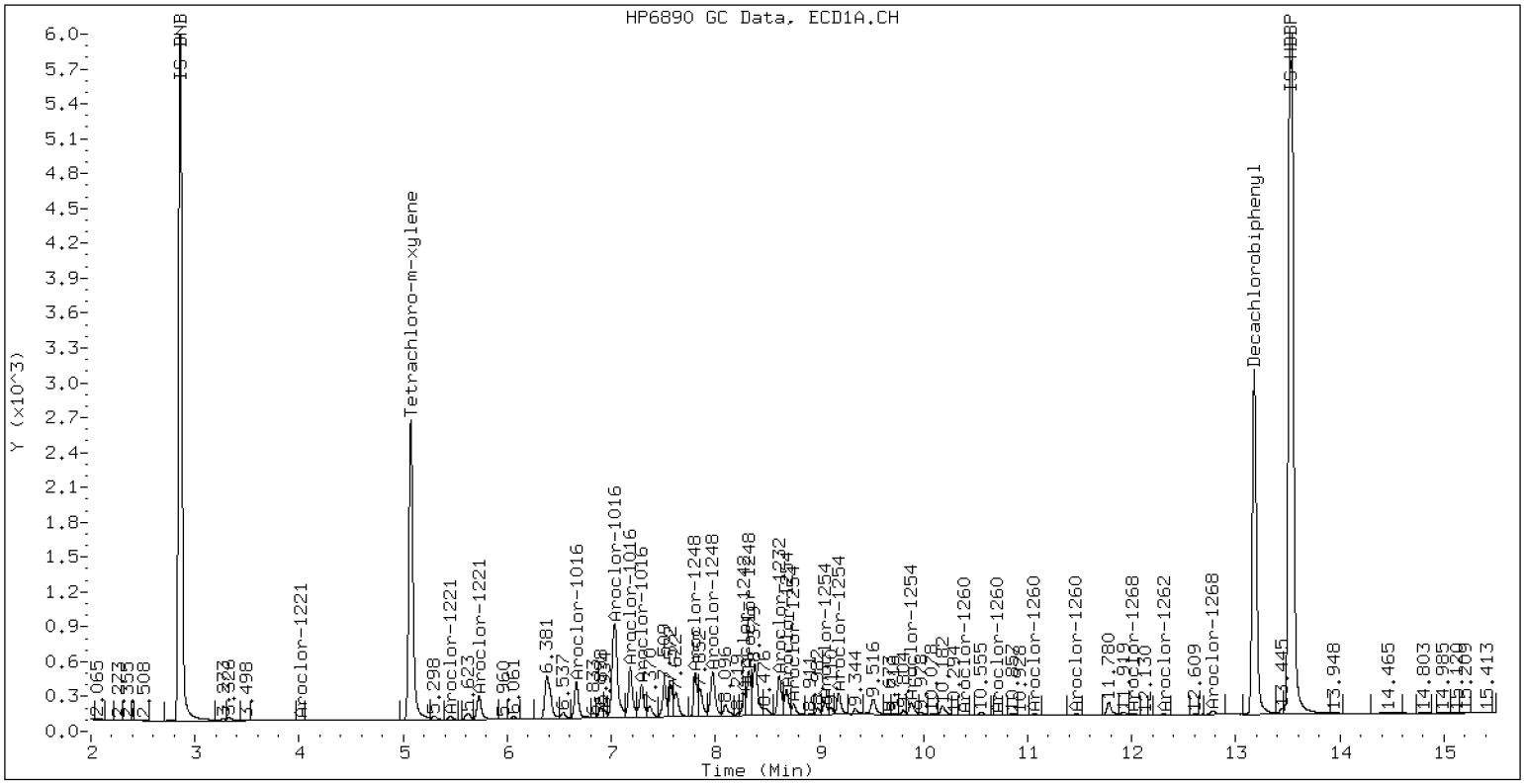
Total PCB Area Col2 (5.174 - 13.076) = 1609207 Col2 Total PCB = 0.2 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

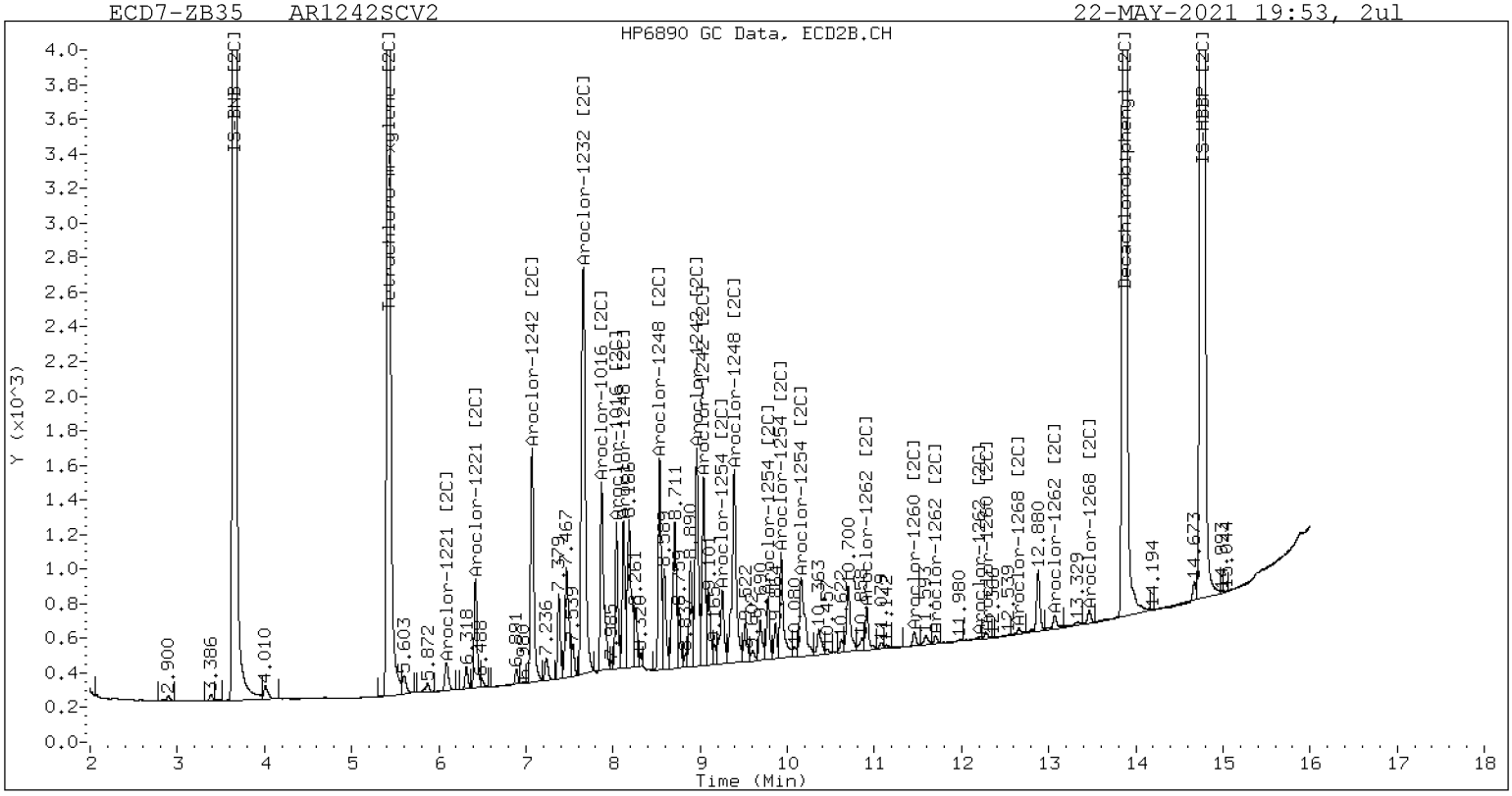
PCB Dual Column Chromatograms

ECD7-ZB5 AR1242SCV2 22-MAY-2021 19:53, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1242SCV2 22-MAY-2021 19:53, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8082A

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Calibration: EE00069
Sequence: SJE0321

SDG: 21G0286
Project: Lower Duwamish AOC4
Laboratory ID: SJE0321-SCV3
Sequence Name: AR1248SCV3
Standard ID: J000950

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Aroclor 1248	250.00	239	-4.5	20.00
Aroclor 1248 [2C]	250.00	240	-4.0	20.00
Decachlorobiphenyl	40.000	40.5	1.3	20.00
Tetrachlorometaxylene	40.000	42.7	6.7	20.00
Decachlorobiphenyl [2C]	40.000	40.4	0.9	20.00
Tetrachlorometaxylene [2C]	40.000	40.8	2.0	20.00

* Indicates values outside of QC limits
[2C] indicates second-column analyte.

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210522.b/05222119ECD7.D
Data file 2: /210522.b/210522.b/05222119ECD7.D
Method: \\target\share\chem4\ecd7.i\210522.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1248SCV3
Client ID:
Injection Date: 22-MAY-2021 20:15
Report Date: 05/25/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.075	0.001	148558	5.424	0.000	355673	42.7	40.8	4.6	Tetrachloro-m-xylene
13.177	0.001	172097	13.874	0.003	652141	40.5	40.4	0.4	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	291470	-1.7
Hexabromobiphenyl	470266	476310	1.3

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	707436	-0.6
Hexabromobiphenyl	867949	901019	3.8

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.665	0.000	8436	93.3	1	7.070	-0.001	37964	104.2
Aroclor-1016	2	7.032	-0.002	39299	128.8	2	7.657	-0.003	105519	131.6
Aroclor-1016	3	7.185	0.004	14510	117.1	3	7.870	0.002	23528	78.4
Aroclor-1016	4	7.290	0.001	9419	113.8	4	8.042	0.002	19521	106.2
Total Col1Ave (4 peaks):				113.2		Total Col2Ave (4 peaks):			105.1	RPD = 7
Corrected Ave (3 peaks):				108.0		Corrected Ave (3 peaks):			96.3	RPD = 12
Aroclor-1221	1	---			0.0	1	---			0.0
Aroclor-1221	2	5.457	0.001	514	13.9	2	6.100	0.016	4839	44.8
Aroclor-1221	3	5.730	0.001	2589	27.6	3	6.422	0.001	7431	37.3
Col1Ave: <3 Quant Peaks						Col2Ave: <3 Quant Peaks				
Aroclor-1232	1	---			0.0	1	---			0.0
Aroclor-1232	2	5.730	0.001	2589	32.4	2	6.100	0.015	4839	62.1
Aroclor-1232	3	7.032	-0.001	39299	292.5	3	6.422	-0.000	7431	43.5
Aroclor-1232	4	8.613	-0.002	31117	771.2	4	7.657	-0.005	105519	295.0
Total Col1Ave (3 peaks):				365.4		Total Col2Ave (3 peaks):			133.5	RPD = 93*
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1242	1	6.665	0.000	8436	104.8	1	7.070	-0.001	37964	120.9
Aroclor-1242	2	7.032	-0.002	39299	150.4	2	7.657	-0.002	105519	155.3
Aroclor-1242	3	8.274	0.003	13538	376.7	3	8.961	0.003	120141	391.2
Aroclor-1242	4	8.613	0.002	31117	387.7	4	9.040	0.003	91529	338.9
Total Col1Ave (4 peaks):				254.9		Total Col2Ave (4 peaks):			251.6	RPD = 1
Corrected Ave (3 peaks):				210.6		Corrected Ave (3 peaks):			205.0	RPD = 3
Aroclor-1248	1	7.807	0.000	29704	244.2	1	8.121	-0.000	63408	245.9
Aroclor-1248	2	7.974	0.001	35985	238.5	2	8.536	0.000	84533	241.0
Aroclor-1248	3	8.323	0.001	36177	239.5	3	8.961	0.000	120141	237.9
Aroclor-1248	4	8.613	0.000	31117	233.0	4	9.391	0.001	126590	235.1
Total Col1Ave (4 peaks):				238.8		Total Col2Ave (4 peaks):			240.0	RPD = 0
Corrected Ave (3 peaks):				237.0		Corrected Ave (3 peaks):			238.0	RPD = 0
Aroclor-1254	1	8.683	0.001	23899	97.0	1	9.255	-0.000	40453	75.5
Aroclor-1254	2	8.753	0.001	11007	122.7	2	9.391	0.044	126590	400.8
Aroclor-1254	3	9.050	0.001	12659	83.8	3	9.780	0.001	36693	91.0
Aroclor-1254	4	9.184	0.002	21298	71.2	4	9.930	0.000	71223	79.5
Aroclor-1254	5	9.881	0.006	14795	73.4	5	10.158	-0.003	48447	50.4
Total Col1Ave (5 peaks):				89.6		Total Col2Ave (5 peaks):			139.4	RPD = 44*
Corrected Ave (4 peaks):				81.4		Corrected Ave (4 peaks):			74.1	RPD = 9
Aroclor-1260	1	10.396	0.005	668	3.8	1	11.456	0.010	5225	9.3
Aroclor-1260	2	10.713	0.002	511	2.8	2	11.701	0.004	5284	3.6
Aroclor-1260	3	11.063	0.003	1423	3.0	3	12.284	0.004	3829	4.0
Aroclor-1260	4	11.464	0.004	549	2.3	4	12.994	0.002	2061	5.0
Aroclor-1260	5	11.570	0.005	526	5.7	NS	---			----
Total Col1Ave (5 peaks):				3.5		Total Col2Ave (4 peaks):			5.5	RPD = 43*
Corrected Ave (4 peaks):				3.0		Corrected Ave (3 peaks):			4.2	RPD = 34
Aroclor-1262	1	10.396	0.002	668	2.2	1	10.988	-0.001	3149	3.5
Aroclor-1262	2	11.464	0.001	549	2.8	2	11.701	0.001	5284	3.0
Aroclor-1262	3	11.638	-0.000	520	2.0	3	12.207	-0.001	2542	3.0
Aroclor-1262	4	12.292	0.005	702	3.4	4	12.994	0.001	2061	2.6
Total Col1Ave (4 peaks):				2.6		Total Col2Ave (4 peaks):			3.0	RPD = 14
Corrected Ave (3 peaks):				2.4		Corrected Ave (3 peaks):			2.9	RPD = 19
Aroclor-1268	1	11.570	0.003	526	0.7	1	12.207	-0.000	2542	1.0
Aroclor-1268	2	11.638	0.001	520	0.6	2	12.284	0.009	3829	1.3
Aroclor-1268	3	12.015	0.004	863	1.4	3	12.657	-0.002	2695	1.1
Aroclor-1268	4	12.780	-0.001	2506	1.3	4	13.467	-0.005	4780	0.6
Total Col1Ave (4 peaks):				1.0		Total Col2Ave (4 peaks):			1.0	RPD = 2
Corrected Ave (3 peaks):				0.9		Corrected Ave (3 peaks):			0.9	RPD = 3

Total PCB Area Col1 (5.174 - 13.076) = 550840 Col1 Total PCB = 0.2 ppm*

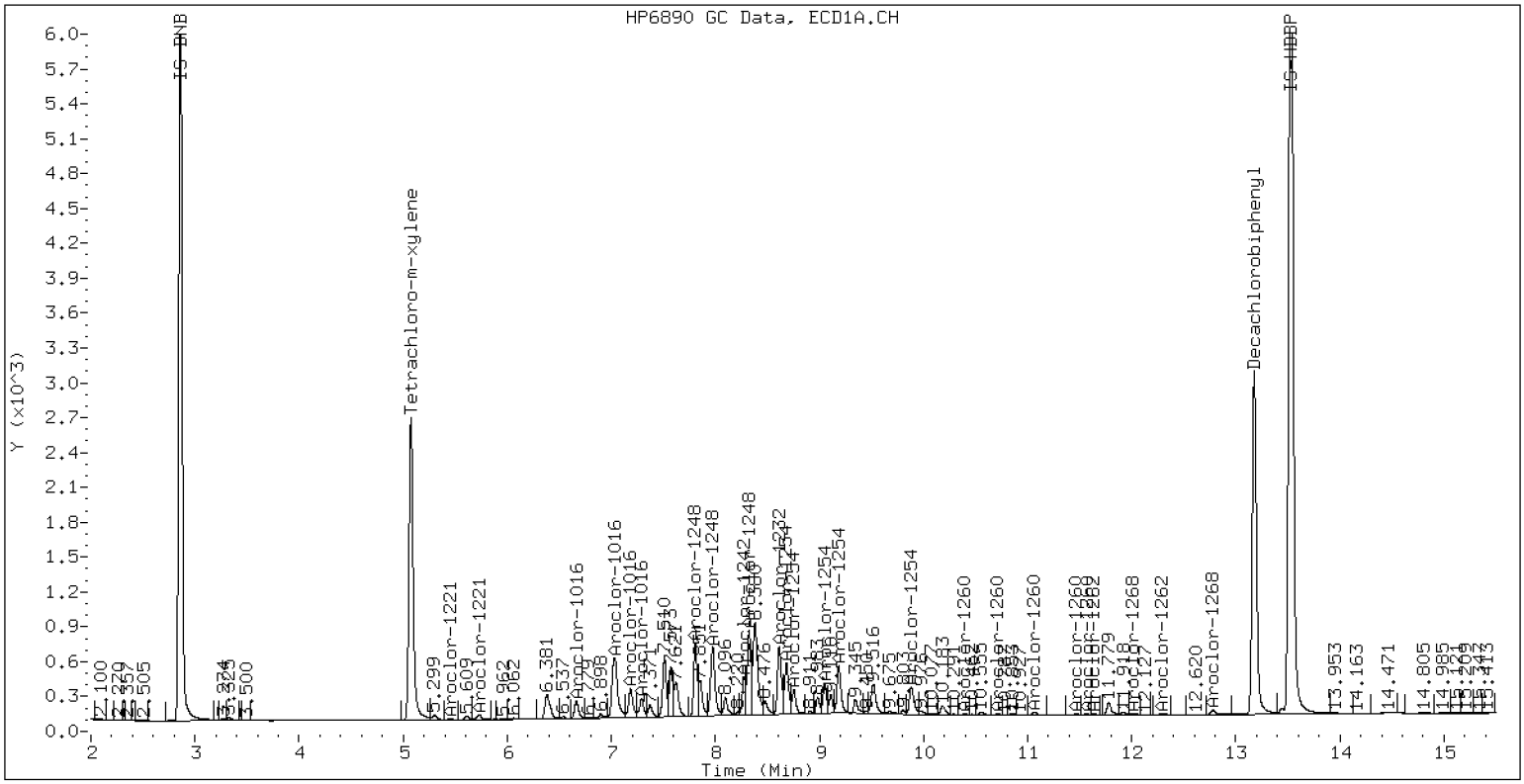
Total PCB Area Col2 (5.174 - 13.076) = 1898867 Col2 Total PCB = 0.2 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

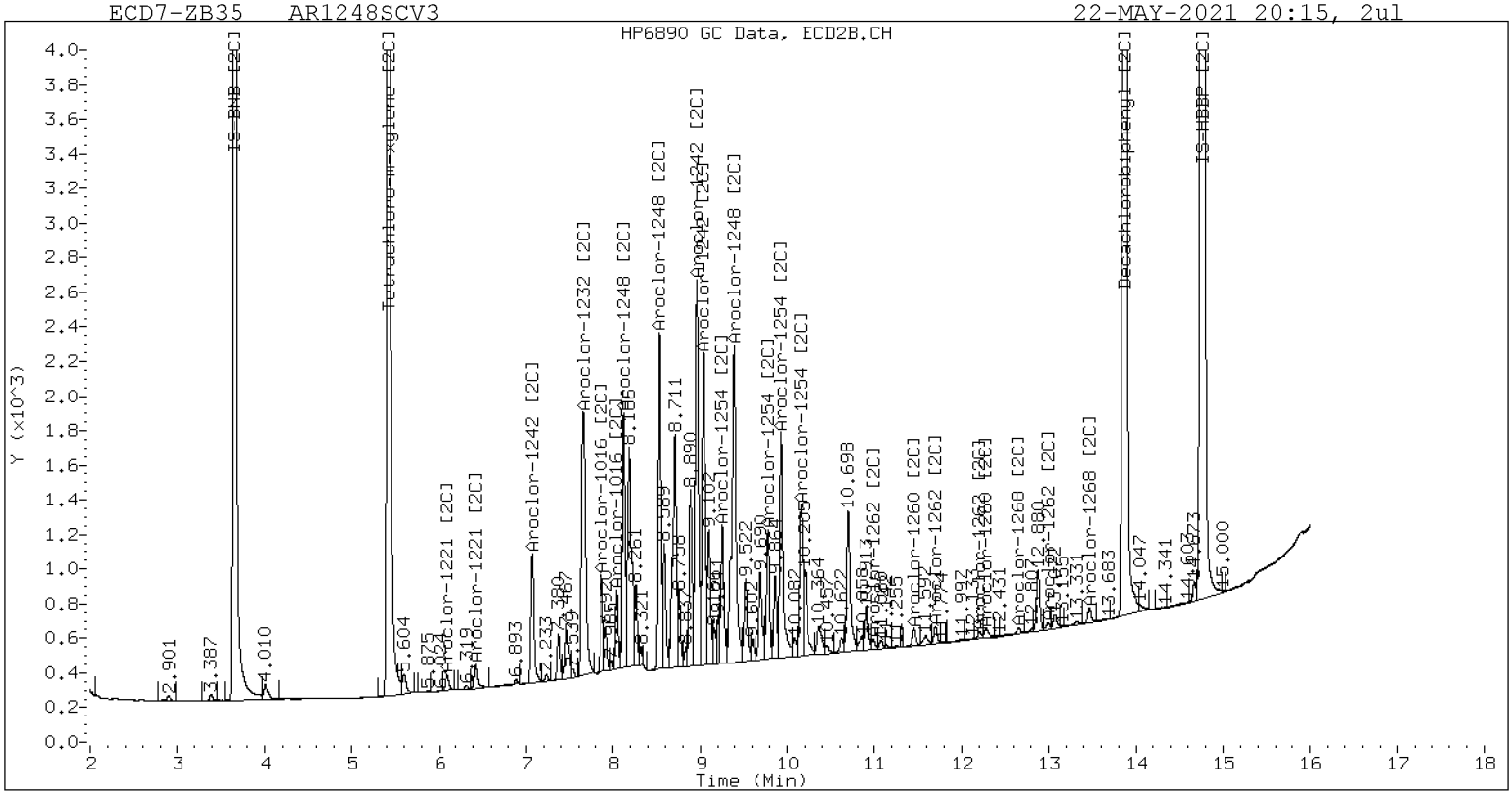
PCB Dual Column Chromatograms

ECD7-ZB5 AR1248SCV3 22-MAY-2021 20:15, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1248SCV3 22-MAY-2021 20:15, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8082A

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Calibration: EE00069
Sequence: SJE0321

SDG: 21G0286
Project: Lower Duwamish AOC4
Laboratory ID: SJE0321-SCV4
Sequence Name: AR1254SCV4
Standard ID: J000951

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Aroclor 1254	250.00	235	-5.9	20.00
Aroclor 1254 [2C]	250.00	244	-2.2	20.00
Decachlorobiphenyl	40.000	40.0	0.09	20.00
Tetrachlorometaxylene	40.000	41.7	4.3	20.00
Decachlorobiphenyl [2C]	40.000	39.6	-1.0	20.00
Tetrachlorometaxylene [2C]	40.000	40.4	1.0	20.00

* Indicates values outside of QC limits
[2C] indicates second-column analyte.

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210522.b/05222120ECD7.D
Data file 2: /210522.b/210522.b/05222120ECD7.D
Method: \\target\share\chem4\ecd7.i\210522.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1254SCV4
Client ID:
Injection Date: 22-MAY-2021 20:37
Report Date: 05/25/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.074	-0.000	147480	5.423	-0.001	353436	41.7	40.4	3.2	Tetrachloro-m-xylene
13.178	0.002	169697	13.873	0.002	645388	40.0	39.6	1.1	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	296015	-0.1
Hexabromobiphenyl	470266	475384	1.1

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	709760	-0.3
Hexabromobiphenyl	867949	908548	4.7

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.670	0.005	136	1.5	1	7.071	0.000	986	2.7
Aroclor-1016	2	7.030	-0.005	825	2.7	2	7.655	-0.005	2851	3.5
Aroclor-1016	3	7.192	0.010	462	3.7	3	7.870	0.002	369	1.2
Aroclor-1016	4	7.290	0.000	114	1.4	4	8.044	0.004	353	1.9
Total Col1Ave (4 peaks):					2.3	Total Col2Ave (4 peaks):				2.3 RPD = 2
Corrected Ave (3 peaks):					1.8	Corrected Ave (3 peaks):				1.9 RPD = 6
Aroclor-1221	1	---			0.0	1	---			0.0
Aroclor-1221	2	---			0.0	2	6.100	0.016	3990	36.8
Aroclor-1221	3	---			0.0	3	6.417	-0.004	870	4.4
Col1Ave: <3 Quant Peaks						Col2Ave: <3 Quant Peaks				
Aroclor-1232	1	---			0.0	1	---			0.0
Aroclor-1232	2	5.730	0.001	136	1.7	2	6.100	0.015	3990	51.0
Aroclor-1232	3	7.030	-0.004	825	6.0	3	6.417	-0.005	870	5.1
Aroclor-1232	4	8.605	-0.010	10628	259.4	4	7.655	-0.007	2851	7.9
Total Col1Ave (3 peaks):					89.0	Total Col2Ave (3 peaks):				21.3 RPD = 123*
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1242	1	6.670	0.005	136	1.7	1	7.071	0.000	986	3.1
Aroclor-1242	2	7.030	-0.004	825	3.1	2	7.655	-0.005	2851	4.2
Aroclor-1242	3	8.324	0.053	18533	507.7	3	8.964	0.006	50428	163.7
Aroclor-1242	4	8.605	-0.006	10628	130.4	4	9.040	0.003	16173	59.7
Total Col1Ave (4 peaks):					160.7	Total Col2Ave (4 peaks):				57.7 RPD = 94*
Corrected Ave (3 peaks):					45.1	Corrected Ave (3 peaks):				22.3 RPD = 67*
Aroclor-1248	1	7.805	-0.001	11633	94.2	1	8.121	-0.000	48527	187.5
Aroclor-1248	2	7.973	0.000	4360	28.5	2	8.536	0.001	30748	87.4
Aroclor-1248	3	8.324	0.002	18533	120.8	3	8.964	0.003	50428	99.5
Aroclor-1248	4	8.605	-0.008	10628	78.4	4	9.348	-0.042	74662	138.2
Total Col1Ave (4 peaks):					80.5	Total Col2Ave (4 peaks):				128.2 RPD = 46*
Corrected Ave (3 peaks):					67.0	Corrected Ave (3 peaks):				108.4 RPD = 47*
Aroclor-1254	1	8.681	-0.000	58854	235.2	1	9.255	-0.001	141492	263.3
Aroclor-1254	2	8.753	0.001	21709	238.2	2	9.348	0.001	74662	235.6
Aroclor-1254	3	9.049	0.000	36329	236.8	3	9.780	0.000	98121	242.6
Aroclor-1254	4	9.183	0.000	70176	231.1	4	9.929	-0.001	214334	238.4
Aroclor-1254	5	9.875	-0.001	48066	234.8	5	10.161	0.000	233499	242.1
Total Col1Ave (5 peaks):					235.2	Total Col2Ave (5 peaks):				244.4 RPD = 4
Corrected Ave (4 peaks):					234.5	Corrected Ave (4 peaks):				239.7 RPD = 2
Aroclor-1260	1	10.392	0.000	2454	14.1	1	11.457	0.011	57455	101.4
Aroclor-1260	2	10.713	0.002	3392	18.9	2	11.702	0.005	38691	26.2
Aroclor-1260	3	11.063	0.003	8860	18.9	3	12.284	0.004	24630	25.6
Aroclor-1260	4	11.464	0.004	9017	37.7	4	12.991	-0.001	1502	3.6
Aroclor-1260	5	11.637	0.072	411	4.5	NS	---			----
Total Col1Ave (5 peaks):					18.8	Total Col2Ave (4 peaks):				39.2 RPD = 70*
Corrected Ave (4 peaks):					14.1	Corrected Ave (3 peaks):				18.5 RPD = 27
Aroclor-1262	1	10.392	-0.003	2454	8.2	1	10.985	-0.004	11671	12.8
Aroclor-1262	2	11.464	0.001	9017	46.7	2	11.702	0.002	38691	21.4
Aroclor-1262	3	11.637	-0.001	411	1.6	3	12.222	0.014	5172	6.0
Aroclor-1262	4	12.293	0.006	557	2.7	4	12.991	-0.002	1502	1.9
Total Col1Ave (4 peaks):					14.8	Total Col2Ave (4 peaks):				10.5 RPD = 34
Corrected Ave (3 peaks):					4.2	Corrected Ave (3 peaks):				6.9 RPD = 49*
Aroclor-1268	1	11.637	0.070	411	0.5	1	12.222	0.015	5172	2.0
Aroclor-1268	2	---			0.0	2	12.284	0.009	24630	8.6
Aroclor-1268	3	12.017	0.006	776	1.2	3	12.662	0.002	1796	0.7
Aroclor-1268	4	12.779	-0.002	1983	1.0	4	13.469	-0.004	4233	0.5
Total Col1Ave (3 peaks):					0.9	Total Col2Ave (4 peaks):				2.9 RPD = 105*
Corrected Ave: < 3 Peaks						Corrected Ave (3 peaks):				1.1

Total PCB Area Col1 (5.174 - 13.076) = 715747 Col1 Total PCB = 0.3 ppm*

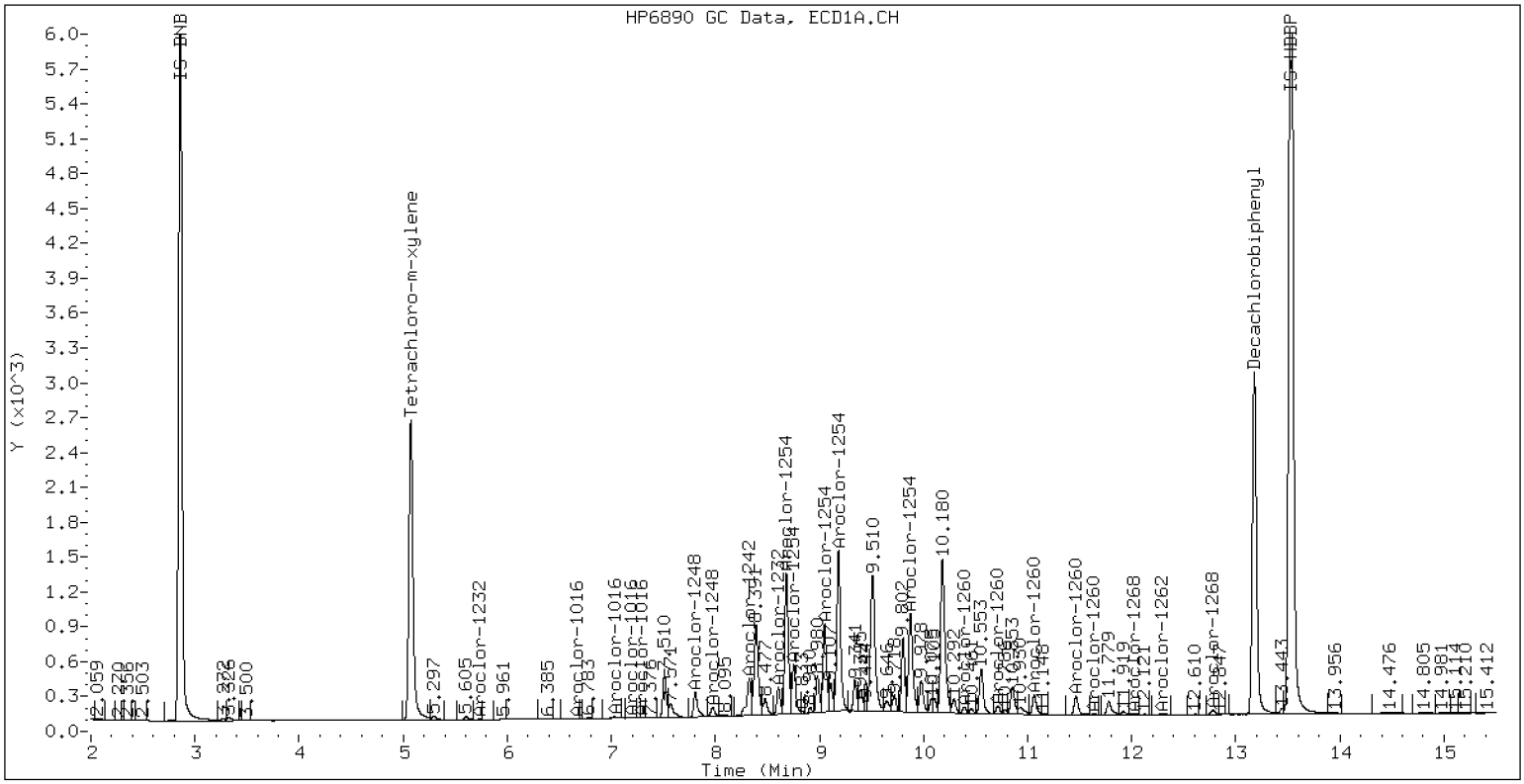
Total PCB Area Col2 (5.174 - 13.076) = 2439127 Col2 Total PCB = 0.3 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

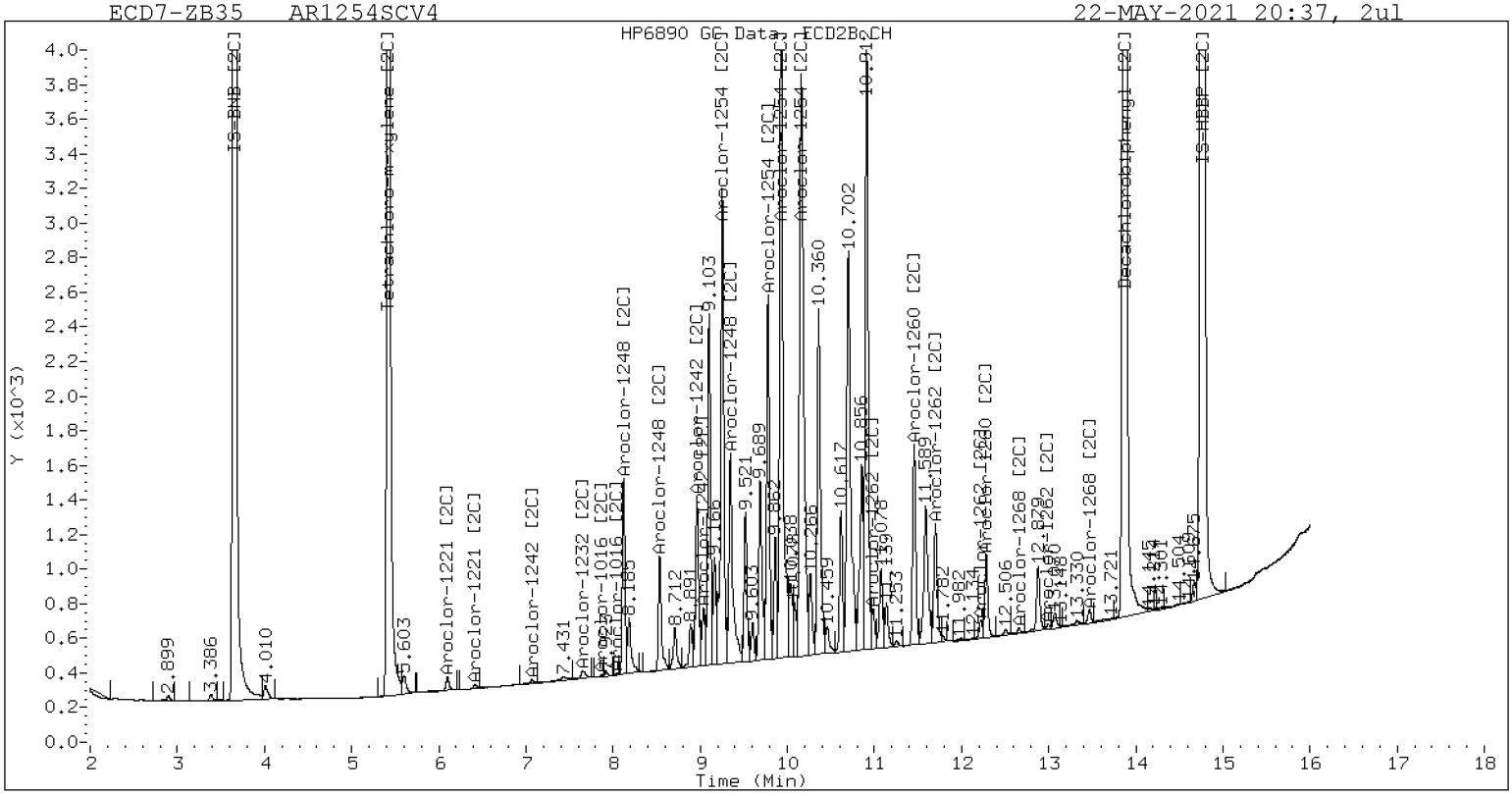
PCB Dual Column Chromatograms

ECD7-ZB5 AR1254SCV4 22-MAY-2021 20:37, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1254SCV4 22-MAY-2021 20:37, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8082A

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Calibration: EE00069
Sequence: SJE0321

SDG: 21G0286
Project: Lower Duwamish AOC4
Laboratory ID: SJE0321-SCV5
Sequence Name: AR2162SCV5
Standard ID: J000952

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Aroclor 1221	250.00	262	4.9	20.00
Aroclor 1221 [2C]	250.00	261	4.4	20.00
Aroclor 1262	250.00	253	1.1	20.00
Aroclor 1262 [2C]	250.00	252	0.7	20.00
Decachlorobiphenyl	40.000	39.7	-0.6	20.00
Tetrachlorometaxylene	40.000	41.1	2.7	20.00
Decachlorobiphenyl [2C]	40.000	39.5	-1.2	20.00
Tetrachlorometaxylene [2C]	40.000	39.1	-2.2	20.00

* Indicates values outside of QC limits
[2C] indicates second-column analyte.

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210522.b/05222121ECD7.D
Data file 2: /210522.b/210522.b/05222121ECD7.D
Method: \\target\share\chem4\ecd7.i\210522.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR2162SCV5
Client ID:
Injection Date: 22-MAY-2021 20:58
Report Date: 05/25/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.074	0.000	144866	5.424	0.000	345727	41.1	39.1	4.8	Tetrachloro-m-xylene
13.178	0.002	169535	13.874	0.004	648797	39.7	39.5	0.6	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	295364	-0.4
Hexabromobiphenyl	470266	478364	1.7

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	716532	0.6
Hexabromobiphenyl	867949	915545	5.5

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.667	0.002	1677	18.3	1	7.081	0.010	15078	40.9
Aroclor-1016	2	7.034	0.000	4823	15.6	2	7.663	0.003	13852	17.1
Aroclor-1016	3	7.183	0.002	2249	17.9	3	7.871	0.003	5670	18.7
Aroclor-1016	4	7.292	0.002	1396	16.6	4	8.043	0.003	3078	16.5
Total Col1Ave (4 peaks):				17.1		Total Col2Ave (4 peaks):			23.3	RPD = 31
Corrected Ave (3 peaks):				16.7		Corrected Ave (3 peaks):			17.4	RPD = 4
Aroclor-1221	1	4.022	-0.001	6055	277.2	1	4.692	-0.000	12493	267.9
Aroclor-1221	2	5.455	0.000	9553	255.2	2	6.085	0.001	28588	261.0
Aroclor-1221	3	5.729	-0.000	24144	254.4	3	6.423	0.001	51294	254.1
Total Col1Ave (3 peaks):				262.3		Total Col2Ave (3 peaks):			261.0	RPD = 0
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1232	1	4.022	0.001	6055	454.0	1	4.692	0.001	12493	423.6
Aroclor-1232	2	5.729	0.000	24144	298.1	2	6.085	-0.000	28588	362.2
Aroclor-1232	3	7.034	0.001	4823	35.4	3	6.423	-0.000	51294	296.3
Aroclor-1232	4	8.610	-0.005	1062	26.0	4	7.663	0.001	13852	38.2
Total Col1Ave (4 peaks):				203.4		Total Col2Ave (4 peaks):			280.1	RPD = 32
Corrected Ave (3 peaks):				119.8		Corrected Ave (3 peaks):			232.2	RPD = 64*
Aroclor-1242	1	6.667	0.002	1677	20.6	1	7.081	0.011	15078	47.4
Aroclor-1242	2	7.034	0.001	4823	18.2	2	7.663	0.003	13852	20.1
Aroclor-1242	3	8.278	0.007	940	25.8	3	8.966	0.008	4328	13.9
Aroclor-1242	4	8.610	-0.001	1062	13.1	4	9.045	0.008	2579	9.4
Total Col1Ave (4 peaks):				19.4		Total Col2Ave (4 peaks):			22.7	RPD = 16
Corrected Ave (3 peaks):				17.3		Corrected Ave (3 peaks):			14.5	RPD = 18
Aroclor-1248	1	7.808	0.002	805	6.5	1	8.121	0.000	2819	10.8
Aroclor-1248	2	7.976	0.003	802	5.2	2	8.537	0.002	2272	6.4
Aroclor-1248	3	8.327	0.005	1117	7.3	3	8.966	0.005	4328	8.5
Aroclor-1248	4	8.610	-0.003	1062	7.8	4	9.393	0.003	7120	13.1
Total Col1Ave (4 peaks):				6.7		Total Col2Ave (4 peaks):			9.7	RPD = 36
Corrected Ave (3 peaks):				6.4		Corrected Ave (3 peaks):			8.5	RPD = 29
Aroclor-1254	1	8.681	-0.000	8014	32.1	1	9.256	0.000	22883	42.2
Aroclor-1254	2	8.749	-0.003	796	8.8	2	9.350	0.003	4670	14.6
Aroclor-1254	3	9.050	0.001	1147	7.5	3	9.781	0.001	4047	9.9
Aroclor-1254	4	9.155	-0.028	10041	33.1	4	9.947	0.018	98893	109.0
Aroclor-1254	5	9.867	-0.009	12222	59.8	5	10.176	0.015	116343	119.5
Total Col1Ave (5 peaks):				28.3		Total Col2Ave (5 peaks):			59.0	RPD = 70*
Corrected Ave (4 peaks):				20.4		Corrected Ave (4 peaks):			43.9	RPD = 73*
Aroclor-1260	1	10.395	0.003	76119	434.1	1	11.446	-0.000	188460	330.1
Aroclor-1260	2	10.711	0.001	62698	347.7	2	11.699	0.002	456681	306.6
Aroclor-1260	3	11.061	0.001	154654	327.4	3	12.280	-0.000	328604	339.3
Aroclor-1260	4	11.463	0.003	49024	203.6	4	12.993	0.002	199946	480.3
Aroclor-1260	5	11.566	0.001	59318	639.1	NS	---			----
Total Col1Ave (5 peaks):				390.4		Total Col2Ave (4 peaks):			364.1	RPD = 7
Corrected Ave (4 peaks):				328.2		Corrected Ave (3 peaks):			325.3	RPD = 1
Aroclor-1262	1	10.395	0.000	76119	253.0	1	10.989	-0.000	230478	250.7
Aroclor-1262	2	11.463	0.000	49024	252.6	2	11.699	-0.001	456681	251.1
Aroclor-1262	3	11.638	-0.000	66180	252.8	3	12.208	0.000	220057	252.3
Aroclor-1262	4	12.286	-0.001	52313	252.8	4	12.993	0.000	199946	252.7
Total Col1Ave (4 peaks):				252.8		Total Col2Ave (4 peaks):			251.7	RPD = 0
Corrected Ave (3 peaks):				252.7		Corrected Ave (3 peaks):			251.3	RPD = 1
Aroclor-1268	1	11.566	-0.001	59318	73.8	1	12.208	0.001	220057	82.7
Aroclor-1268	2	11.638	0.002	66180	81.3	2	12.280	0.005	328604	113.4
Aroclor-1268	3	12.038	0.027	23299	36.4	3	12.658	-0.002	14664	5.8
Aroclor-1268	4	12.780	-0.001	19289	9.6	4	13.468	-0.004	67959	8.3
Total Col1Ave (4 peaks):				50.3		Total Col2Ave (4 peaks):			52.5	RPD = 4

Corrected Ave (3 peaks): 40.0 Corrected Ave (3 peaks): 32.3 RPD = 21

Total PCB Area Col1 (5.174 - 13.076) = 1072965 Col1 Total PCB = 0.4 ppm*

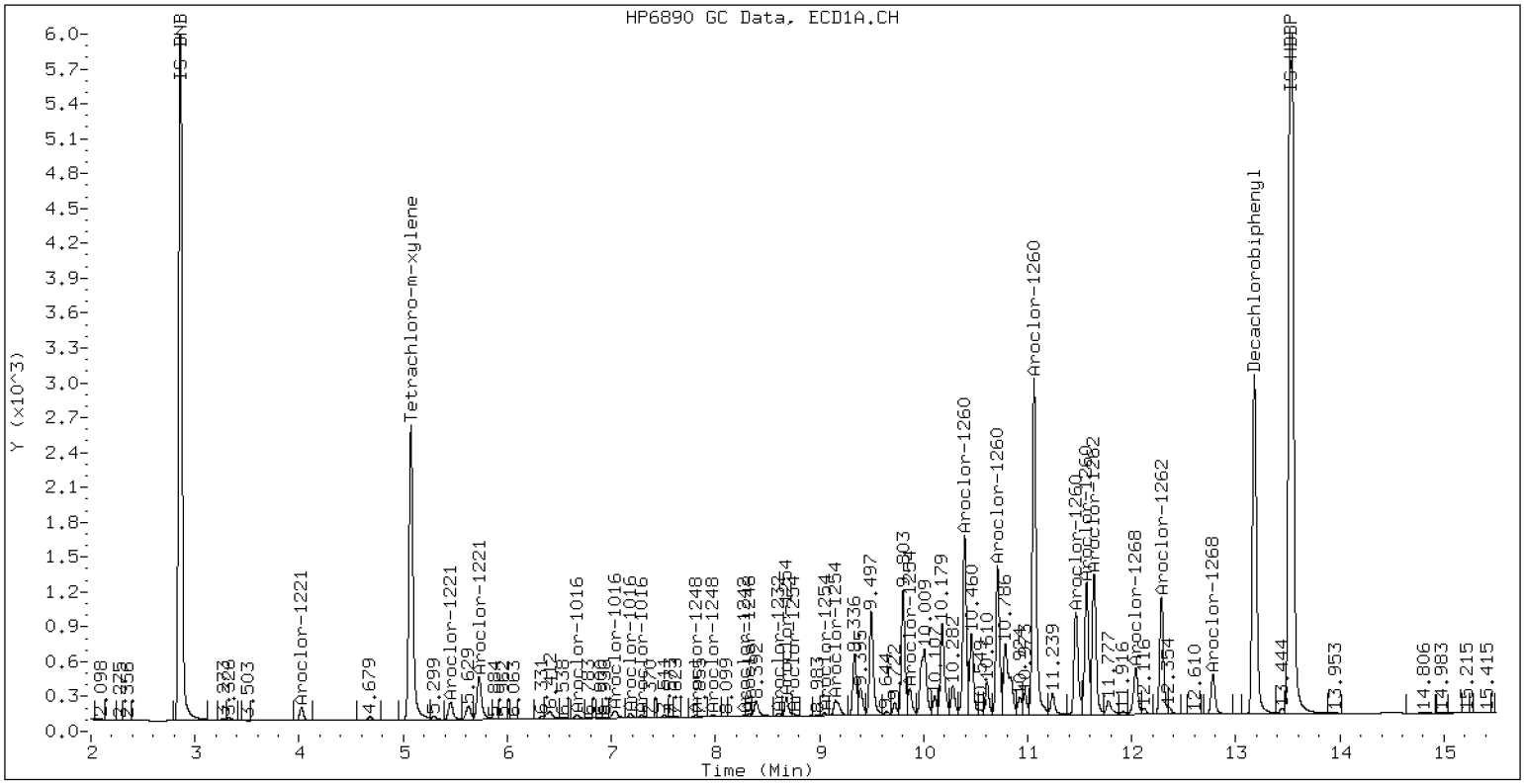
Total PCB Area Col2 (5.174 - 13.076) = 3437225 Col2 Total PCB = 0.4 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

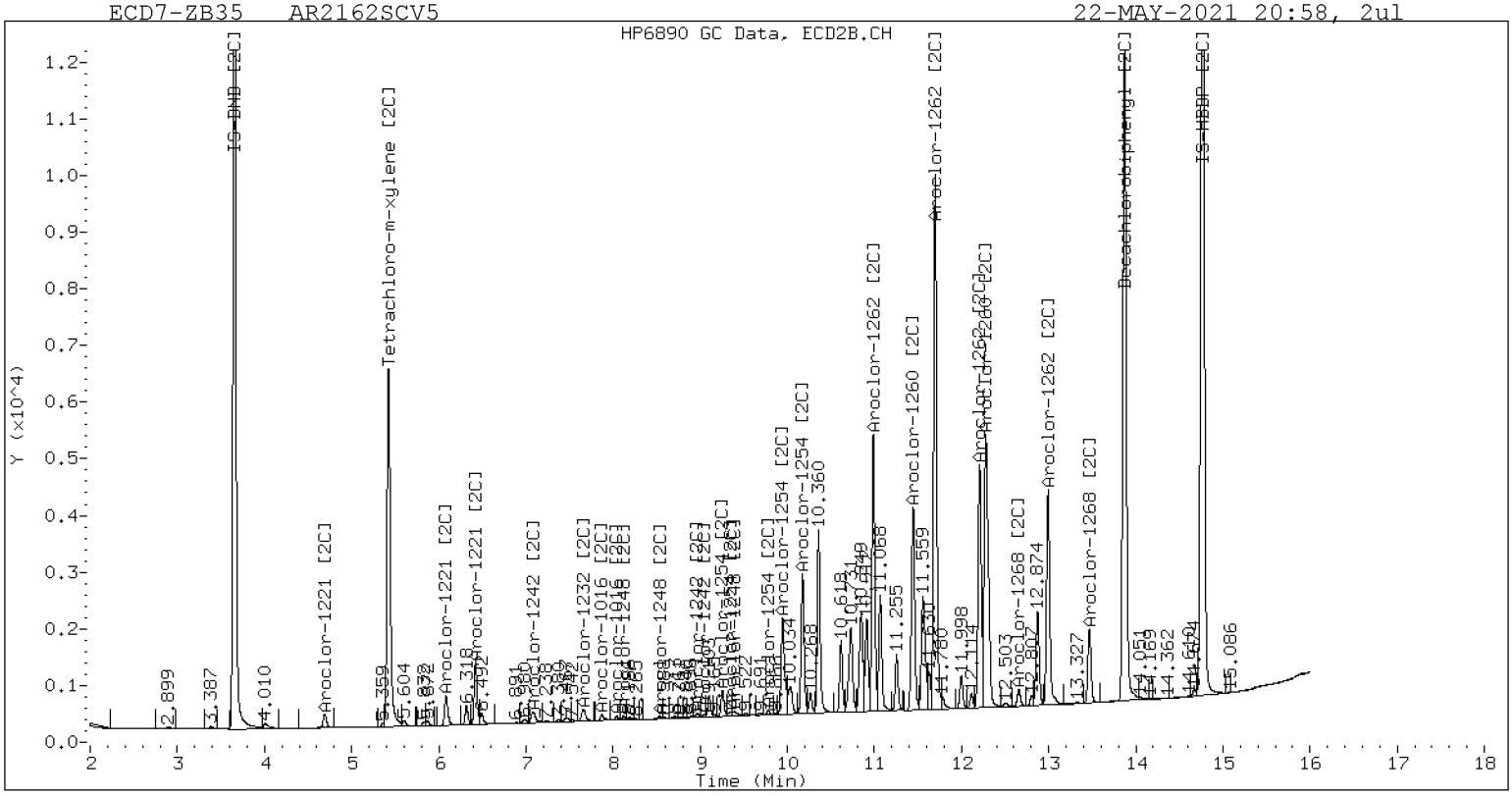
PCB Dual Column Chromatograms

ECD7-ZB5 AR2162SCV5 22-MAY-2021 20:58, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR2162SCV5 22-MAY-2021 20:58, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8082A

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Calibration: EE00069
Sequence: SJE0321

SDG: 21G0286
Project: Lower Duwamish AOC4
Laboratory ID: SJE0321-SCV6
Sequence Name: AR3268SCV6
Standard ID: J000953

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Aroclor 1232	250.00	243	-2.7	20.00
Aroclor 1232 [2C]	250.00	242	-3.3	20.00
Aroclor 1268	250.00	204	-18.5	20.00
Aroclor 1268 [2C]	250.00	206	-17.7	20.00
Decachlorobiphenyl	40.000	59.7	49.2	20.00
Tetrachlorometaxylene	40.000	41.8	4.5	20.00
Decachlorobiphenyl [2C]	40.000	61.1	52.6	20.00
Tetrachlorometaxylene [2C]	40.000	40.5	1.2	20.00

* Indicates values outside of QC limits
[2C] indicates second-column analyte.

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210522.b/05222122ECD7.D
Data file 2: /210522.b/210522.b/05222122ECD7.D
Method: \\target\share\chem4\ecd7.i\210522.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR3268SCV6
Client ID:
Injection Date: 22-MAY-2021 21:20
Report Date: 05/25/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.074	-0.000	148239	5.424	-0.000	355344	41.8	40.5	3.3	Tetrachloro-m-xylene
13.178	0.002	255056	13.875	0.005	1001977	59.7	61.1	2.3	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	296903	0.2
Hexabromobiphenyl	470266	479288	1.9

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	712350	0.0
Hexabromobiphenyl	867949	915257	5.5

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.666	0.001	10346	112.3	1	7.071	-0.000	45781	124.8
Aroclor-1016	2	7.034	0.000	34585	111.3	2	7.661	0.001	91604	113.5
Aroclor-1016	3	7.182	0.001	14354	113.7	3	7.870	0.002	34691	114.8
Aroclor-1016	4	7.291	0.002	9485	112.5	4	8.041	0.002	21844	118.1
Total Col1Ave (4 peaks):					112.4	Total Col2Ave (4 peaks):				117.8 RPD = 5
Corrected Ave (3 peaks):					112.0	Corrected Ave (3 peaks):				115.4 RPD = 3
Aroclor-1221	1	4.022	0.000	3391	154.4	1	4.692	-0.000	7248	156.3
Aroclor-1221	2	5.456	0.000	5464	145.2	2	6.086	0.002	18148	166.7
Aroclor-1221	3	5.730	0.000	18154	190.3	3	6.422	0.001	40400	201.3
Total Col1Ave (3 peaks):					163.3	Total Col2Ave (3 peaks):				174.8 RPD = 7
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1232	1	4.022	0.002	3391	252.9	1	4.692	0.001	7248	247.2
Aroclor-1232	2	5.730	0.001	18154	222.9	2	6.086	0.001	18148	231.2
Aroclor-1232	3	7.034	0.001	34585	252.7	3	6.422	-0.000	40400	234.8
Aroclor-1232	4	8.615	0.000	10043	244.4	4	7.661	-0.001	91604	254.3
Total Col1Ave (4 peaks):					243.2	Total Col2Ave (4 peaks):				241.9 RPD = 1
Corrected Ave (3 peaks):					240.0	Corrected Ave (3 peaks):				237.7 RPD = 1
Aroclor-1242	1	6.666	0.001	10346	126.2	1	7.071	-0.000	45781	144.8
Aroclor-1242	2	7.034	0.000	34585	129.9	2	7.661	0.001	91604	133.9
Aroclor-1242	3	8.278	0.006	4145	113.2	3	8.962	0.004	38109	123.2
Aroclor-1242	4	8.615	0.004	10043	122.8	4	9.041	0.004	32198	118.4
Total Col1Ave (4 peaks):					123.0	Total Col2Ave (4 peaks):				130.1 RPD = 6
Corrected Ave (3 peaks):					120.8	Corrected Ave (3 peaks):				125.2 RPD = 4
Aroclor-1248	1	7.808	0.001	9089	73.4	1	8.121	-0.001	18506	71.3
Aroclor-1248	2	7.975	0.002	12739	82.9	2	8.536	0.000	29545	83.7
Aroclor-1248	3	8.325	0.003	10258	66.7	3	8.962	0.001	38109	75.0
Aroclor-1248	4	8.615	0.002	10043	73.8	4	9.391	0.001	44833	82.7
Total Col1Ave (4 peaks):					74.2	Total Col2Ave (4 peaks):				78.1 RPD = 5
Corrected Ave (3 peaks):					71.3	Corrected Ave (3 peaks):				76.3 RPD = 7
Aroclor-1254	1	8.682	0.000	4617	18.4	1	9.256	0.000	10462	19.4
Aroclor-1254	2	8.753	0.000	1862	20.4	2	9.391	0.044	44833	141.0
Aroclor-1254	3	9.051	0.002	1704	11.1	3	9.781	0.001	6029	14.9
Aroclor-1254	4	9.187	0.004	3103	10.2	4	9.932	0.003	13664	15.1
Aroclor-1254	5	9.883	0.007	2229	10.9	5	10.162	0.002	13230	13.7
Total Col1Ave (5 peaks):					14.2	Total Col2Ave (5 peaks):				40.8 RPD = 97*
Corrected Ave (4 peaks):					12.6	Corrected Ave (4 peaks):				15.8 RPD = 22
Aroclor-1260	1	10.395	0.004	30116	171.4	1	11.426	-0.020	123255	215.9
Aroclor-1260	2	10.713	0.002	2096	11.6	2	11.698	0.001	56961	38.3
Aroclor-1260	3	11.062	0.002	16373	34.6	3	12.275	-0.005	585373	604.6
Aroclor-1260	4	11.463	0.003	591	2.5	4	12.993	0.001	214119	514.5
Aroclor-1260	5	11.567	0.003	163395	1757.1	NS	---			----
Total Col1Ave (5 peaks):					395.4	Total Col2Ave (4 peaks):				343.3 RPD = 14
Corrected Ave (4 peaks):					55.0	Corrected Ave (3 peaks):				256.2 RPD = 129*
Aroclor-1262	1	10.395	0.001	30116	99.9	1	10.988	-0.001	87691	95.4
Aroclor-1262	2	11.463	0.000	591	3.0	2	11.698	-0.002	56961	31.3
Aroclor-1262	3	11.636	-0.003	164716	628.0	3	12.209	0.000	570399	654.1
Aroclor-1262	4	12.286	-0.001	66330	319.9	4	12.993	0.000	214119	270.7
Total Col1Ave (4 peaks):					262.7	Total Col2Ave (4 peaks):				262.9 RPD = 0
Corrected Ave (3 peaks):					140.9	Corrected Ave (3 peaks):				132.5 RPD = 6
Aroclor-1268	1	11.567	0.000	163395	203.0	1	12.209	0.001	570399	214.5
Aroclor-1268	2	11.636	-0.001	164716	202.0	2	12.275	0.000	585373	202.0
Aroclor-1268	3	12.012	0.001	130565	203.8	3	12.658	-0.001	514356	202.2
Aroclor-1268	4	12.781	0.000	415210	206.6	4	13.474	0.002	1683012	204.7
Total Col1Ave (4 peaks):					203.9	Total Col2Ave (4 peaks):				205.8 RPD = 1

Corrected Ave (3 peaks): 202.9 Corrected Ave (3 peaks): 202.9 RPD = 0

Total PCB Area Col1 (5.174 - 13.076) = 1390907 Col1 Total PCB = 0.5 ppm*

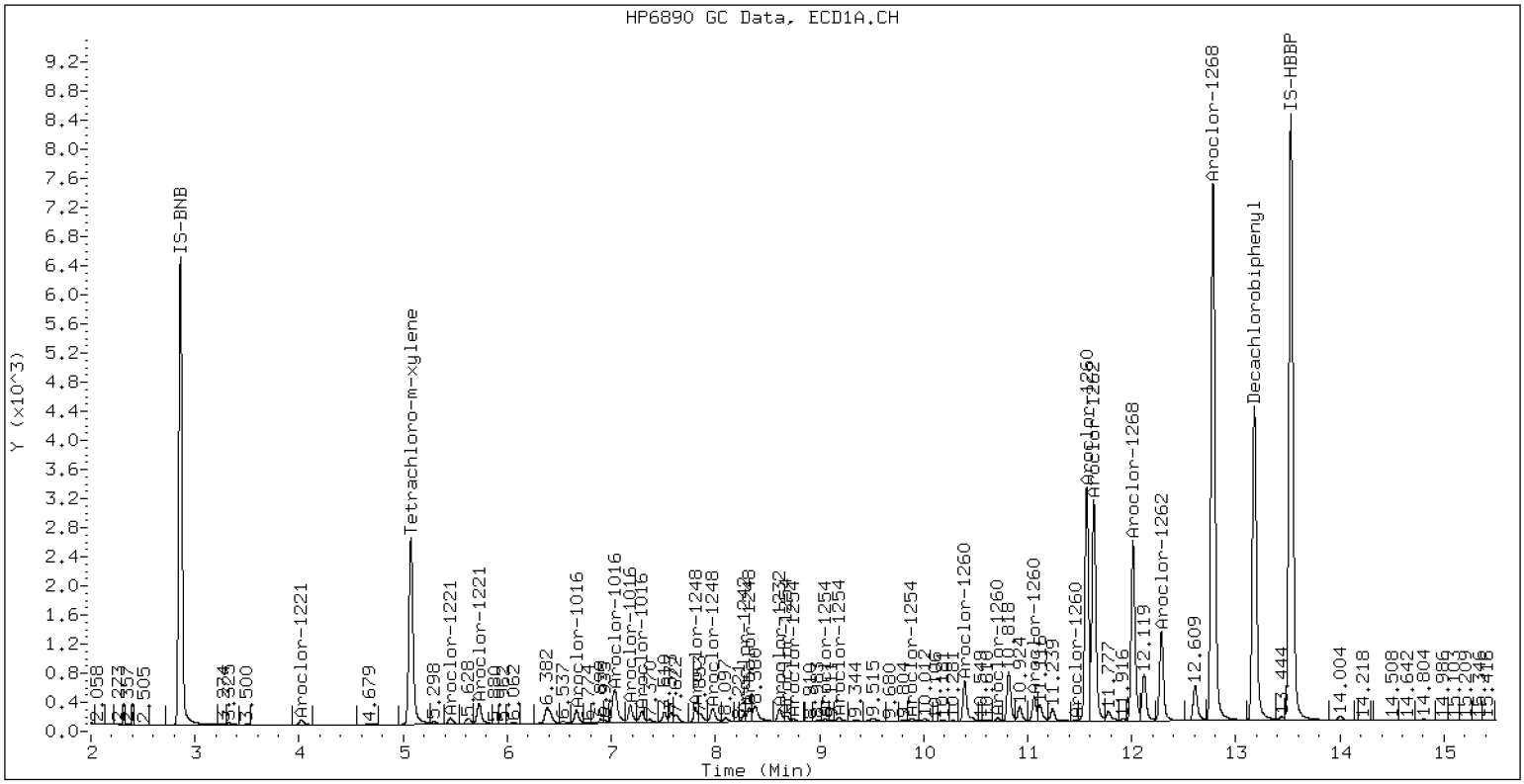
Total PCB Area Col2 (5.174 - 13.076) = 3445589 Col2 Total PCB = 0.4 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

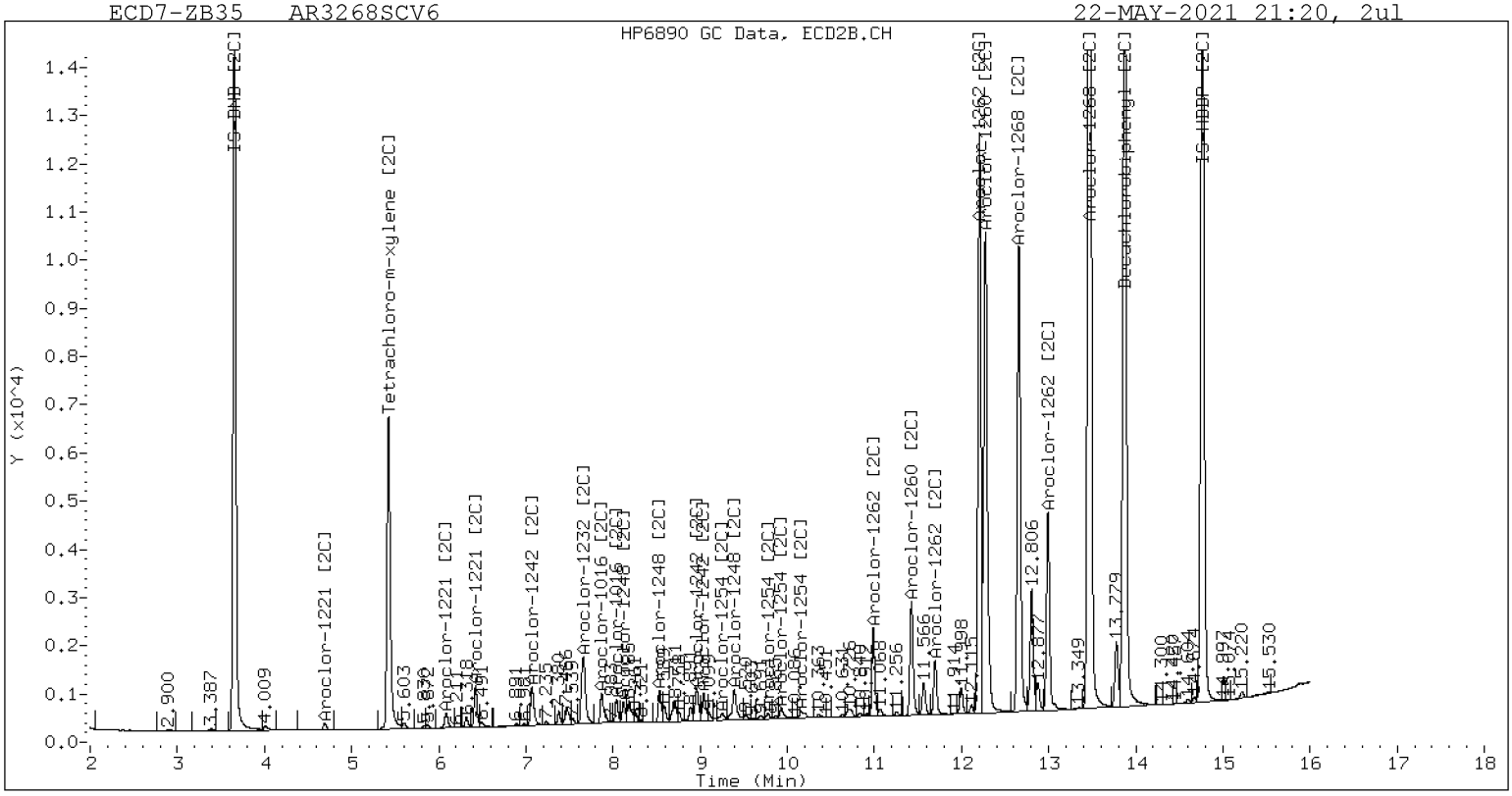
PCB Dual Column Chromatograms

ECD7-ZB5 AR3268SCV6 22-MAY-2021 21:20, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR3268SCV6 22-MAY-2021 21:20, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION CHECK

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08122102ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0190	Injection Date:	08/12/21
Lab Sample ID:	SJH0190-ICV1	Injection Time:	13:09
Sequence Name:	AR1254ICV1		

		CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Aroclor 1254	A	250.00	230	0.0542238	0.0502234		-8.1	+/-20
Aroclor-1254 (1)	A	250.00	246	0.0676399	0.0666797			
Aroclor-1254 (2)	A	250.00	275	0.0246305	0.0270974			
Aroclor-1254 (3)	A	250.00	139	0.0414557	0.0230531			
Aroclor-1254 (4)	A	250.00	242	0.0820704	0.0795976			
Aroclor-1254 (5)	A	250.00	247	0.0553225	0.0546894			
Aroclor 1254 [2C]	A	250.00	255	0.0703814	0.0719060		2.1	+/-20
Aroclor-1254 (1) [2C]	A	250.00	276	0.0605749	0.0669580			
Aroclor-1254 (2) [2C]	A	250.00	279	0.0357212	0.0398669			
Aroclor-1254 (3) [2C]	A	250.00	212	0.0455816	0.0385733			
Aroclor-1254 (4) [2C]	A	250.00	238	0.1013365	0.0964796			
Aroclor-1254 (5) [2C]	A	250.00	271	0.1086926	0.1176520			
Decachlorobiphenyl	A	40.000	39.6	0.7132713	0.7069491		-1.0	+/-20
Tetrachlorometaxylene	A	40.000	42.7	0.9552374	1.0207360		6.8	+/-20
Decachlorobiphenyl [2C]	A	40.000	46.1	1.4343710	1.6534320		15.3	+/-20
Tetrachlorometaxylene [2C]	A	40.000	42.1	0.9862409	1.0379510		5.3	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210812.b/08122102ECD7.D
Data file 2: /210812.b/210812.b/08122102ECD7.D
Method: \\target\share\chem4\ecd7.i\210812.b\PCB.m
Compound Sublist: AR1254.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1254ICV1
Client ID:
Injection Date: 12-AUG-2021 13:09
Report Date: 08/16/2021 13:21
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.068	-0.000	127123	5.410	-0.002	346758	42.7	42.1	1.5	Tetrachloro-m-xylene
13.165	0.001	151098	13.846	-0.000	689750	39.6	46.1	15.1	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	249081	-16.0
Hexabromobiphenyl	470266	427465	-9.1

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	668159	-6.2
Hexabromobiphenyl	867949	834325	-3.9

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
		ZB5 Col					ZB35 Col			
Aroclor-1254	1	8.677	0.000	51902	246.5	1	9.238	0.000	139808	276.3
Aroclor-1254	2	8.747	0.000	21092	275.0	2	9.331	0.000	83242	279.0
Aroclor-1254	3	9.045	0.000	17944	139.0	3	9.761	0.000	80541	211.6
Aroclor-1254	4	9.178	0.000	61957	242.5	4	9.912	0.000	201449	238.0
Aroclor-1254	5	9.869	0.000	42569	247.1	5	10.148	0.000	245657	270.6

Total Col1Ave (5 peaks): 230.0 Total Col2Ave (5 peaks): 255.1 RPD = 10

Corrected Ave (4 peaks): 218.8 Corrected Ave (4 peaks): 249.1 RPD = 13

CalAmt %D: -8.0 CalAmt %D: 2.0

Total PCB Area Col1 (5.168 - 13.064) = 642262 Col1 Total PCB = 0.3 ppm*

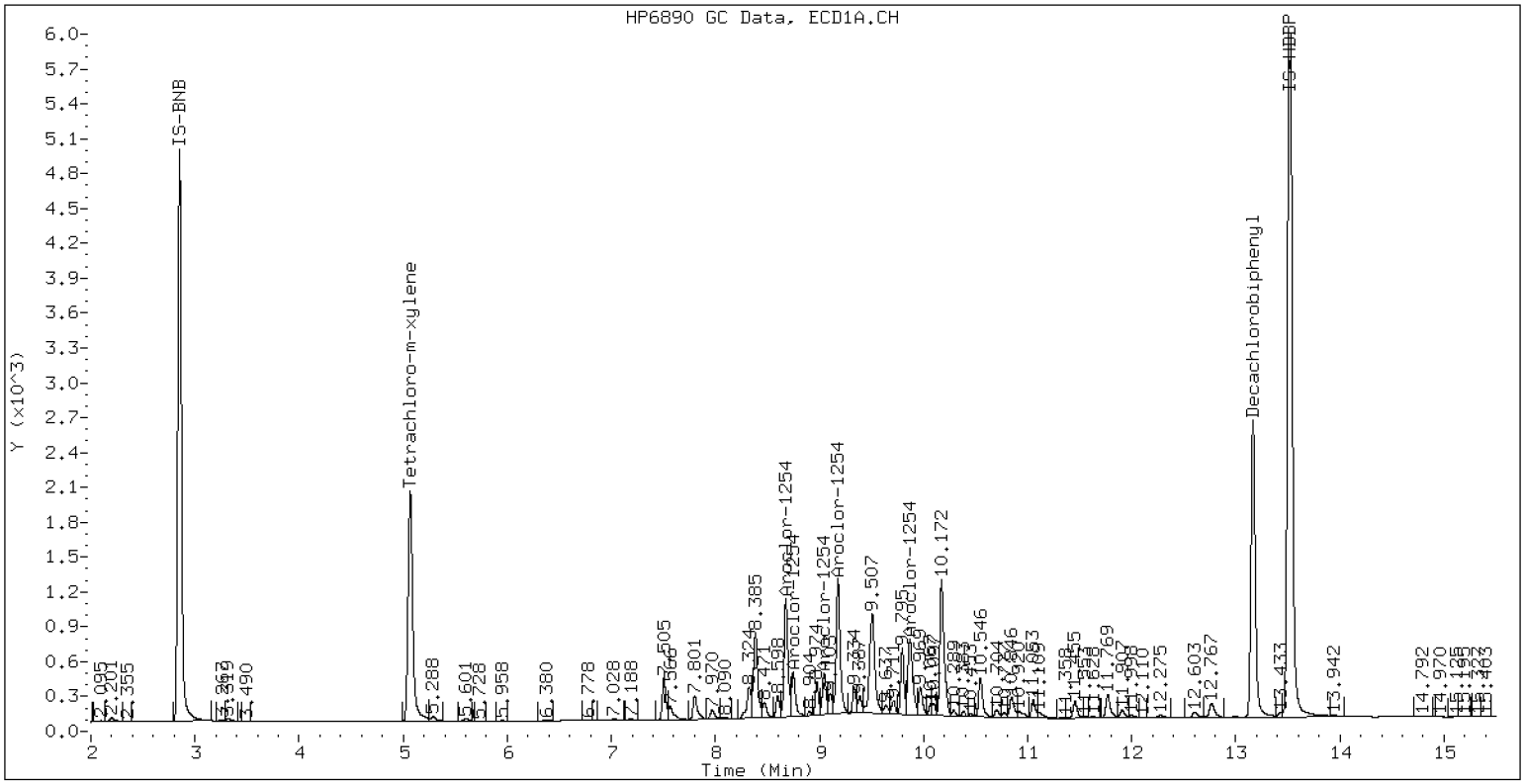
Total PCB Area Col2 (5.168 - 13.064) = 2551854 Col2 Total PCB = 0.3 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

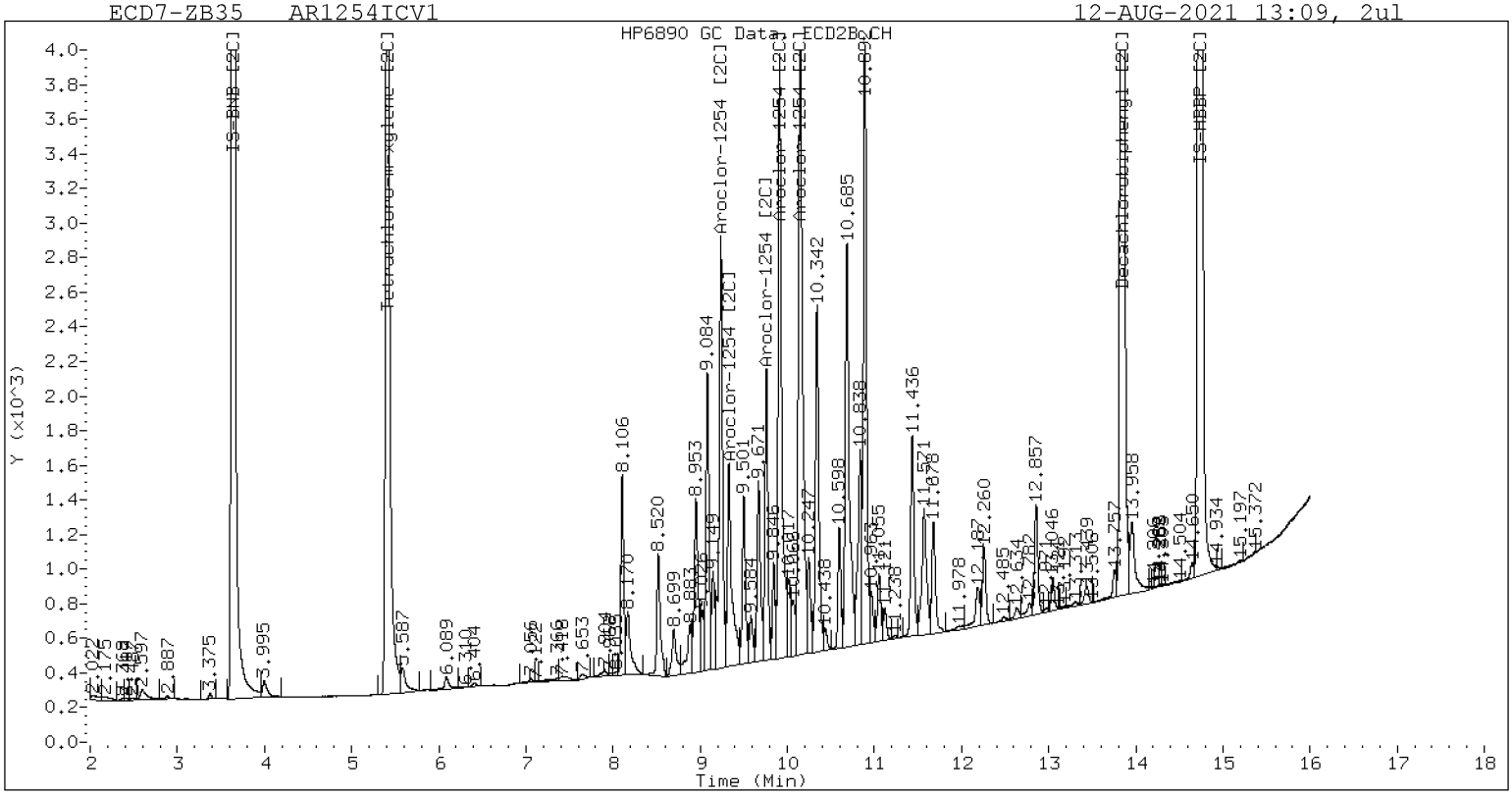
PCB Dual Column Chromatograms

ECD7-ZB5 AR1254ICV1 12-AUG-2021 13:09, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1254ICV1 12-AUG-2021 13:09, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION CHECK

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08122103ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0190	Injection Date:	08/12/21
Lab Sample ID:	SJH0190-ICV2	Injection Time:	13:29
Sequence Name:	AR1660ICV2		

		CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Aroclor 1016	A	250.00	276	0.0413247	0.0451096		10.5	+/-20
Aroclor-1016 (1)	A	250.00	287	0.0248166	0.0285228		14.8	
Aroclor-1016 (2)	A	250.00	266	0.0837401	0.0890135		6.4	
Aroclor-1016 (3)	A	250.00	282	0.0340179	0.0383556		12.8	
Aroclor-1016 (4)	A	250.00	270	0.0227243	0.0245464		8.0	
Aroclor 1016 [2C]	A	250.00	266	0.0466427	0.0475595		6.3	+/-20
Aroclor-1016 (1) [2C]	A	250.00	280	0.0412076	0.0461703		12.0	
Aroclor-1016 (2) [2C]	A	250.00	230	0.0906438	0.0835587		-8.0	
Aroclor-1016 (3) [2C]	A	250.00	274	0.0339420	0.0372810		9.6	
Aroclor-1016 (4) [2C]	A	250.00	279	0.0207774	0.0232280		11.6	
Aroclor 1260	A	250.00	270	0.0388495	0.0421964		8.0	+/-20
Aroclor-1260 (1)	A	250.00	241	0.0293254	0.0282802		-3.6	
Aroclor-1260 (2)	A	250.00	273	0.0301531	0.0329857		9.2	
Aroclor-1260 (3)	A	250.00	276	0.0789877	0.0873274		10.4	
Aroclor-1260 (4)	A	250.00	279	0.0402598	0.0449441		11.6	
Aroclor-1260 (5)	A	250.00	281	0.0155216	0.0174447		12.4	
Aroclor 1260 [2C]	A	250.00	251	0.0752611	0.0723491		0.2	+/-20
Aroclor-1260 (1) [2C]	A	250.00	287	0.0498903	0.0572091		14.8	
Aroclor-1260 (2) [2C]	A	250.00	221	0.1301480	0.1150534		-11.6	
Aroclor-1260 (3) [2C]	A	250.00	235	0.0846293	0.0794942		-6.0	
Aroclor-1260 (4) [2C]	A	250.00	259	0.0363769	0.0376394		3.6	
Decachlorobiphenyl	A	40.000	43.7	0.7132713	0.7790096		9.3	+/-20
Tetrachlorometaxylene	A	40.000	43.5	0.9552374	1.0398880		8.8	+/-20
Decachlorobiphenyl [2C]	A	40.000	47.4	1.4343710	1.7016300		18.5	+/-20
Tetrachlorometaxylene [2C]	A	40.000	43.4	0.9862409	1.0694530		8.5	+/-20

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210812.b/08122103ECD7.D
Data file 2: /210812.b/210812.b/08122103ECD7.D
Method: \\target\share\chem4\ecd7.i\210812.b\PCB.m
Compound Sublist: AR1660.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1660ICV1
Client ID:
Injection Date: 12-AUG-2021 13:29
Report Date: 08/16/2021 13:21
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.067	-0.001	103016	5.412	-0.000	280249	43.5	43.4	0.4	Tetrachloro-m-xylene
13.164	-0.000	128202	13.845	-0.001	572618	43.7	47.5	8.3	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	198129	-33.2
Hexabromobiphenyl	470266	329141	-30.0

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	524098	-26.4
Hexabromobiphenyl	867949	673023	-22.5

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.659	-0.000	17660	287.3	1	7.056	-0.000	75618	280.1
Aroclor-1016	2	7.032	-0.000	55113	265.7	2	7.650	-0.001	136853	230.5
Aroclor-1016	3	7.178	0.000	23748	281.9	3	7.857	-0.000	61059	274.6
Aroclor-1016	4	7.288	0.000	15198	270.0	4	8.030	0.000	38043	279.5

Total Col1Ave (4 peaks): 276.3 Total Col2Ave (4 peaks): 266.2 RPD = 4
Corrected Ave (3 peaks): 272.6 Corrected Ave (3 peaks): 261.5 RPD = 4

CalAmt %D: 10.5 CalAmt %D: 6.5

Aroclor-1260	1	10.383	0.001	29088	241.1	1	11.425	0.001	120322	286.7
Aroclor-1260	2	10.701	0.001	33928	273.5	2	11.676	0.001	241980	221.0
Aroclor-1260	3	11.051	-0.000	89822	276.4	3	12.259	0.000	167192	234.8
Aroclor-1260	4	11.452	0.001	46228	279.1	4	12.970	-0.000	79163	258.7
Aroclor-1260	5	11.553	0.000	17943	281.0	NS	---			----

Total Col1Ave (5 peaks): 270.2 Total Col2Ave (4 peaks): 250.3 RPD = 8
Corrected Ave (4 peaks): 267.5 Corrected Ave (3 peaks): 238.2 RPD = 12

CalAmt %D: 8.1 CalAmt %D: 0.1

Total PCB Area Col1 (5.168 - 13.064) = 954331 Col1 Total PCB = 0.5 ppm*

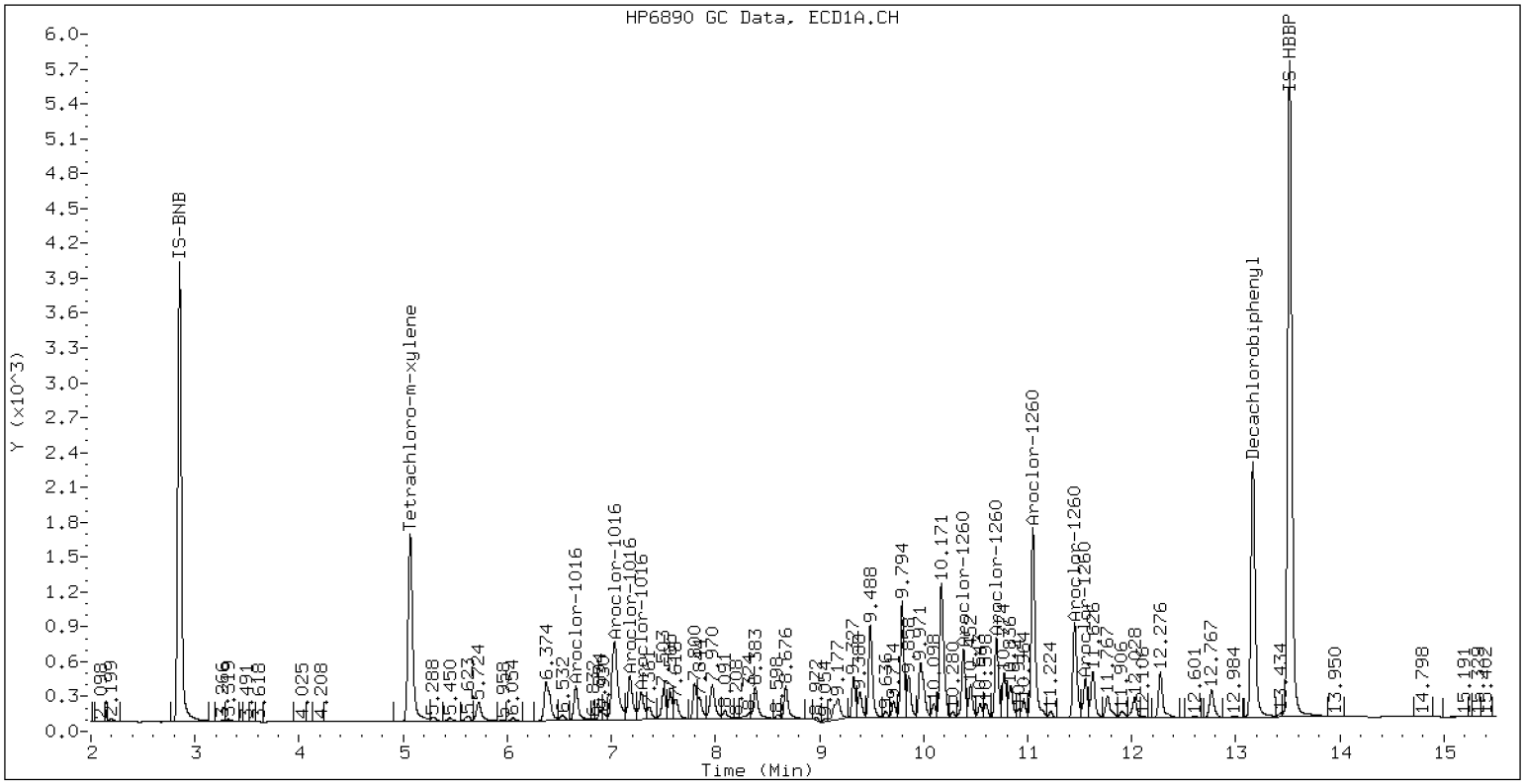
Total PCB Area Col2 (5.168 - 13.064) = 3126429 Col2 Total PCB = 0.5 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

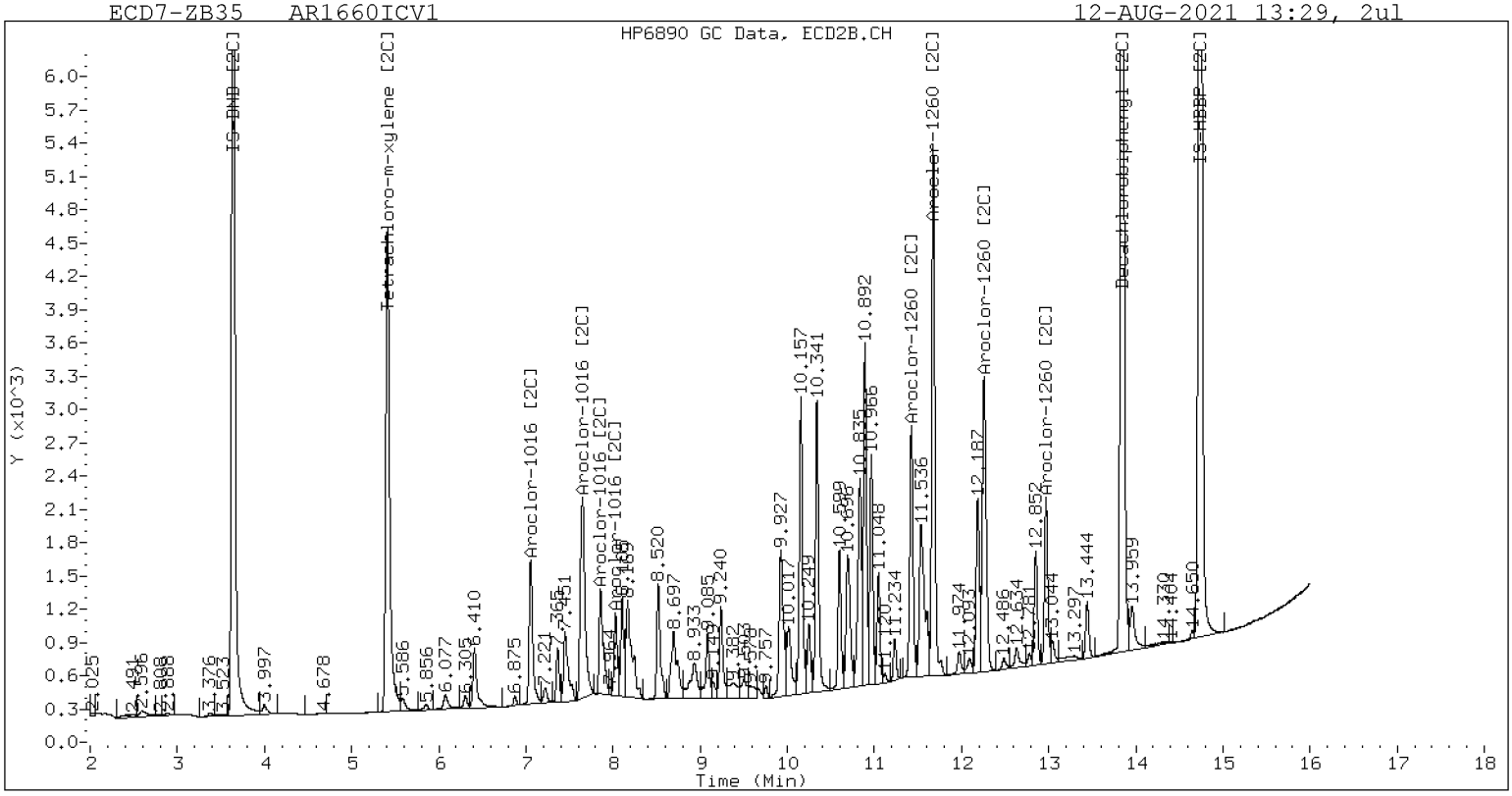
PCB Dual Column Chromatograms

ECD7-ZB5 AR1660ICV1 12-AUG-2021 13:29, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1660ICV1 12-AUG-2021 13:29, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION CHECK

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08112114ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0202	Injection Date:	08/11/21
Lab Sample ID:	SJH0202-ICV1	Injection Time:	19:53
Sequence Name:	AR1254ICV1		

		CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Aroclor 1254	A	250.00	237	0.0542238	0.0518355		-5.2	+/-20
Aroclor-1254 (1)	A	250.00	254	0.0676399	0.0686036			
Aroclor-1254 (2)	A	250.00	279	0.0246305	0.0275116			
Aroclor-1254 (3)	A	250.00	146	0.0414557	0.0242350			
Aroclor-1254 (4)	A	250.00	251	0.0820704	0.0824684			
Aroclor-1254 (5)	A	250.00	255	0.0553225	0.0563587			
Aroclor 1254 [2C]	A	250.00	255	0.0703814	0.0722325		2.2	+/-20
Aroclor-1254 (1) [2C]	A	250.00	281	0.0605749	0.0681329			
Aroclor-1254 (2) [2C]	A	250.00	272	0.0357212	0.0389109			
Aroclor-1254 (3) [2C]	A	250.00	212	0.0455816	0.0386470			
Aroclor-1254 (4) [2C]	A	250.00	242	0.1013365	0.0979221			
Aroclor-1254 (5) [2C]	A	250.00	270	0.1086926	0.1175498			
Decachlorobiphenyl	A	40.000	39.1	0.7132713	0.6970126		-2.3	+/-20
Tetrachlorometaxylene	A	40.000	43.5	0.9552374	1.0383260		8.7	+/-20
Decachlorobiphenyl [2C]	A	40.000	41.0	1.4343710	1.4688250		2.4	+/-20
Tetrachlorometaxylene [2C]	A	40.000	43.1	0.9862409	1.0629330		7.8	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112114ECD7.D
Data file 2: /210811.b/210811.b/08112114ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: AR1254.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1254CCV5
Client ID:
Injection Date: 11-AUG-2021 19:53
Report Date: 08/17/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.067	-0.000	144806	5.411	-0.000	388589	43.5	43.1	0.9	Tetrachloro-m-xylene
13.165	0.001	175827	13.846	0.000	769691	39.1	41.0	4.7	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	278922	-5.9
Hexabromobiphenyl	470266	504516	7.3

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	731164	2.7
Hexabromobiphenyl	867949	1048036	20.7

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT (ZB5 Col)	Shift	Area	Amount	Peak#	RT (ZB35 Col)	Shift	Area	Amount
Aroclor-1254	1	8.675	-0.001	59797	253.6	1	9.237	0.000	155676	281.2
Aroclor-1254	2	8.747	0.000	23980	279.2	2	9.330	0.001	88907	272.3
Aroclor-1254	3	9.043	-0.002	21124	146.2	3	9.760	0.000	88304	212.0
Aroclor-1254	4	9.177	-0.001	71882	251.2	4	9.913	0.002	223741	241.6
Aroclor-1254	5	9.868	-0.001	49124	254.7	5	10.147	0.001	268588	270.4

Total Col1Ave (5 peaks): 237.0 Total Col2Ave (5 peaks): 255.5 RPD = 8

Corrected Ave (4 peaks): 226.4 Corrected Ave (4 peaks): 249.1 RPD = 10

Total PCB Area Col1 (5.167 - 13.064) = 742471 Col1 Total PCB = 0.3 ppm*

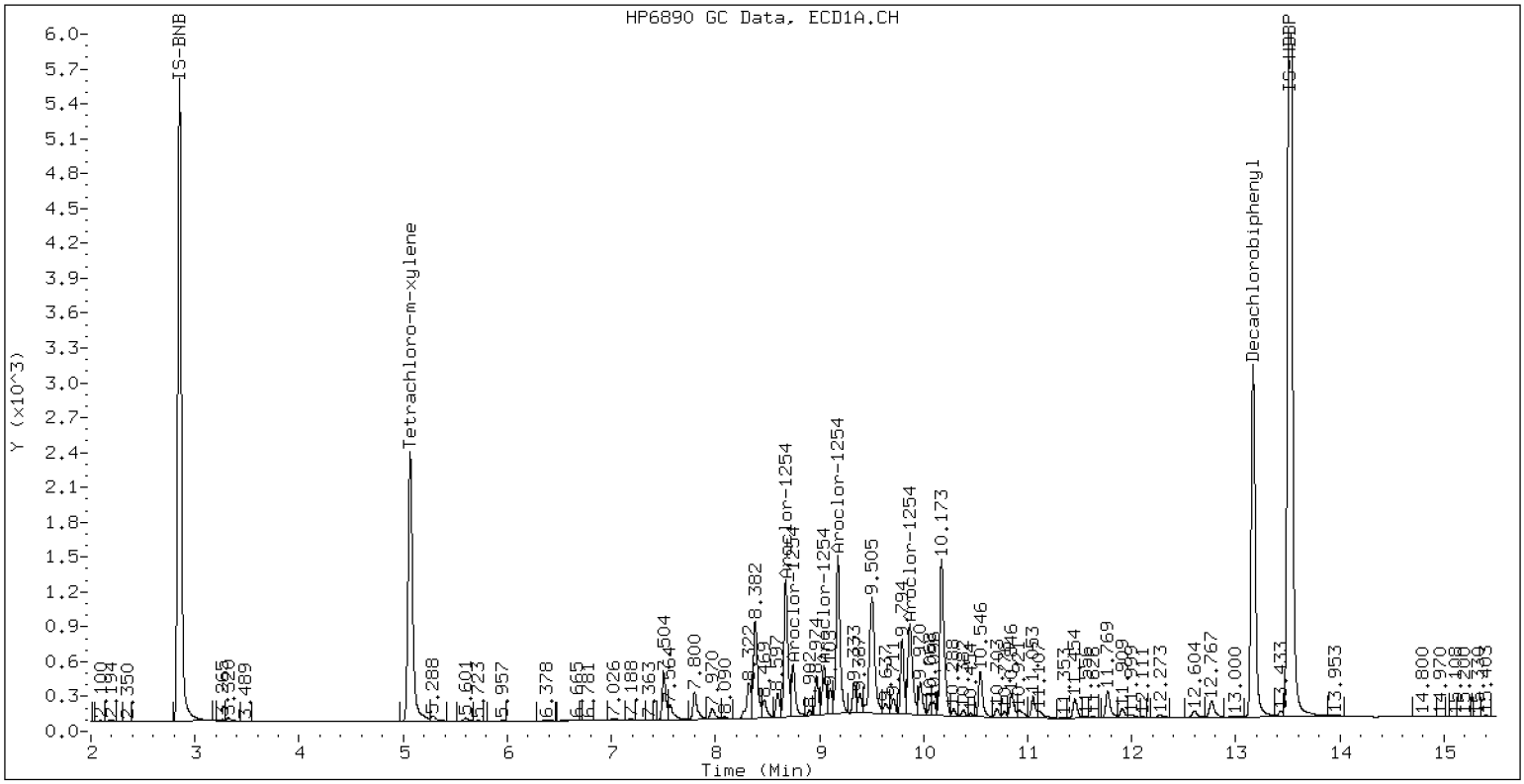
Total PCB Area Col2 (5.167 - 13.064) = 2799241 Col2 Total PCB = 0.4 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

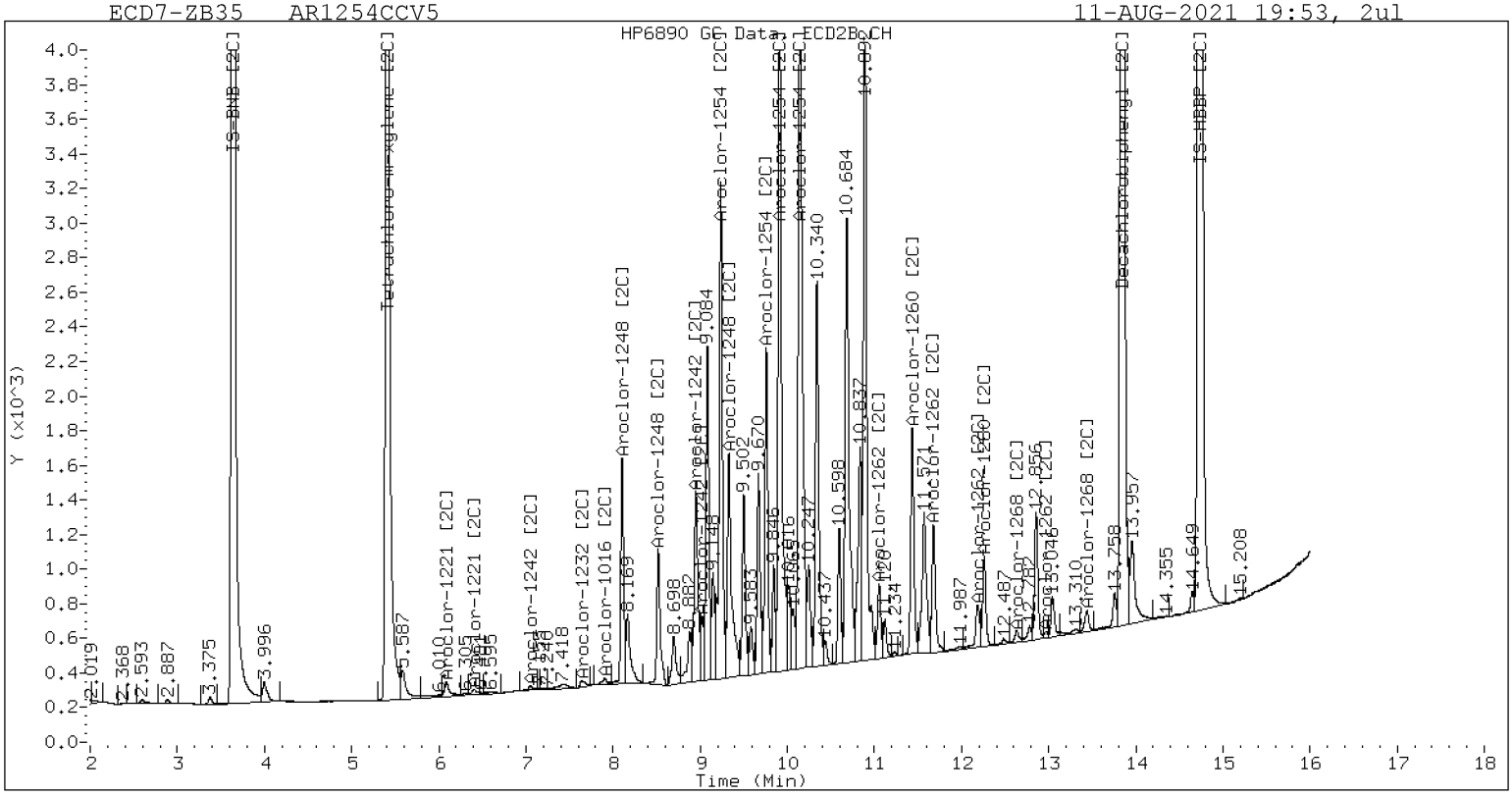
PCB Dual Column Chromatograms

ECD7-ZB5 AR1254CCV5 11-AUG-2021 19:53, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1254CCV5 11-AUG-2021 19:53, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION CHECK

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08112115ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0202	Injection Date:	08/11/21
Lab Sample ID:	SJH0202-ICV2	Injection Time:	20:13
Sequence Name:	AR1660ICV2		

		CONC. (ug/L)		RESPONSE FACTOR			% DRIFT/DIFF	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
Aroclor 1016	A	250.00	277	0.0413247	0.0453517		10.9	+/-20
Aroclor-1016 (1)	A	250.00	287	0.0248166	0.0285192		14.9	
Aroclor-1016 (2)	A	250.00	268	0.0837401	0.0898206		7.3	
Aroclor-1016 (3)	A	250.00	282	0.0340179	0.0383764		12.8	
Aroclor-1016 (4)	A	250.00	272	0.0227243	0.0246907		8.7	
Aroclor 1016 [2C]	A	250.00	269	0.0466427	0.0481830		7.8	+/-20
Aroclor-1016 (1) [2C]	A	250.00	282	0.0412076	0.0465383		12.9	
Aroclor-1016 (2) [2C]	A	250.00	234	0.0906438	0.0849105		-6.3	
Aroclor-1016 (3) [2C]	A	250.00	278	0.0339420	0.0377903		11.3	
Aroclor-1016 (4) [2C]	A	250.00	283	0.0207774	0.0234931		13.1	
Aroclor 1260	A	250.00	264	0.0388495	0.0413111		5.6	+/-20
Aroclor-1260 (1)	A	250.00	231	0.0293254	0.0270854		-7.6	
Aroclor-1260 (2)	A	250.00	268	0.0301531	0.0322756		7.0	
Aroclor-1260 (3)	A	250.00	272	0.0789877	0.0858965		8.7	
Aroclor-1260 (4)	A	250.00	275	0.0402598	0.0442529		9.9	
Aroclor-1260 (5)	A	250.00	275	0.0155216	0.0170450		9.8	
Aroclor 1260 [2C]	A	250.00	226	0.0752611	0.0646950		-9.5	+/-20
Aroclor-1260 (1) [2C]	A	250.00	264	0.0498903	0.0526185		5.5	
Aroclor-1260 (2) [2C]	A	250.00	192	0.1301480	0.0999194		-23.2	
Aroclor-1260 (3) [2C]	A	250.00	212	0.0846293	0.0717		-15.3	
Aroclor-1260 (4) [2C]	A	250.00	237	0.0363769	0.0345419		-5.0	
Decachlorobiphenyl	A	40.000	43.3	0.7132713	0.7719373		8.2	+/-20
Tetrachlorometaxylene	A	40.000	43.9	0.9552374	1.0474		9.6	+/-20
Decachlorobiphenyl [2C]	A	40.000	43.7	1.4343710	1.5682370		9.3	+/-20
Tetrachlorometaxylene [2C]	A	40.000	43.9	0.9862409	1.0832500		9.8	+/-20

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112115ECD7.D
Data file 2: /210811.b/210811.b/08112115ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: AR1660.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1660CCV6
Client ID:
Injection Date: 11-AUG-2021 20:13
Report Date: 08/17/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.067	0.000	112276	5.412	0.000	300219	43.9	43.9	0.2	Tetrachloro-m-xylene
13.165	0.001	143089	13.846	-0.000	606521	43.3	43.7	1.0	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	214390	-27.7
Hexabromobiphenyl	470266	370727	-21.2

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	554293	-22.1
Hexabromobiphenyl	867949	773507	-10.9

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT (ZB5 Col)	Shift	Area	Amount	Peak#	RT (ZB35 Col)	Shift	Area	Amount
Aroclor-1016	1	6.659	0.000	19107	287.3	1	7.056	-0.000	80612	282.3
Aroclor-1016	2	7.032	0.001	60177	268.2	2	7.650	-0.000	147079	234.2
Aroclor-1016	3	7.178	0.000	25711	282.0	3	7.856	0.000	65459	278.3
Aroclor-1016	4	7.287	-0.001	16542	271.6	4	8.028	-0.001	40694	282.7
Total Col1Ave (4 peaks):					277.3	Total Col2Ave (4 peaks):				269.4 RPD = 3
Corrected Ave (3 peaks):					273.9	Corrected Ave (3 peaks):				265.0 RPD = 3
Aroclor-1260	1	10.383	0.001	31379	230.9	1	11.425	0.000	127190	263.7
Aroclor-1260	2	10.701	-0.000	37392	267.6	2	11.677	0.001	241526	191.9
Aroclor-1260	3	11.051	0.000	99513	271.9	3	12.259	-0.001	173314	211.8
Aroclor-1260	4	11.451	-0.000	51268	274.8	4	12.971	0.000	83495	237.4
Aroclor-1260	5	11.555	0.001	19747	274.5	NS	---			----
Total Col1Ave (5 peaks):					263.9	Total Col2Ave (4 peaks):				226.2 RPD = 15
Corrected Ave (4 peaks):					261.2	Corrected Ave (3 peaks):				213.7 RPD = 20

Total PCB Area Col1 (5.167 - 13.064) = 1043375 Col1 Total PCB = 0.6 ppm*

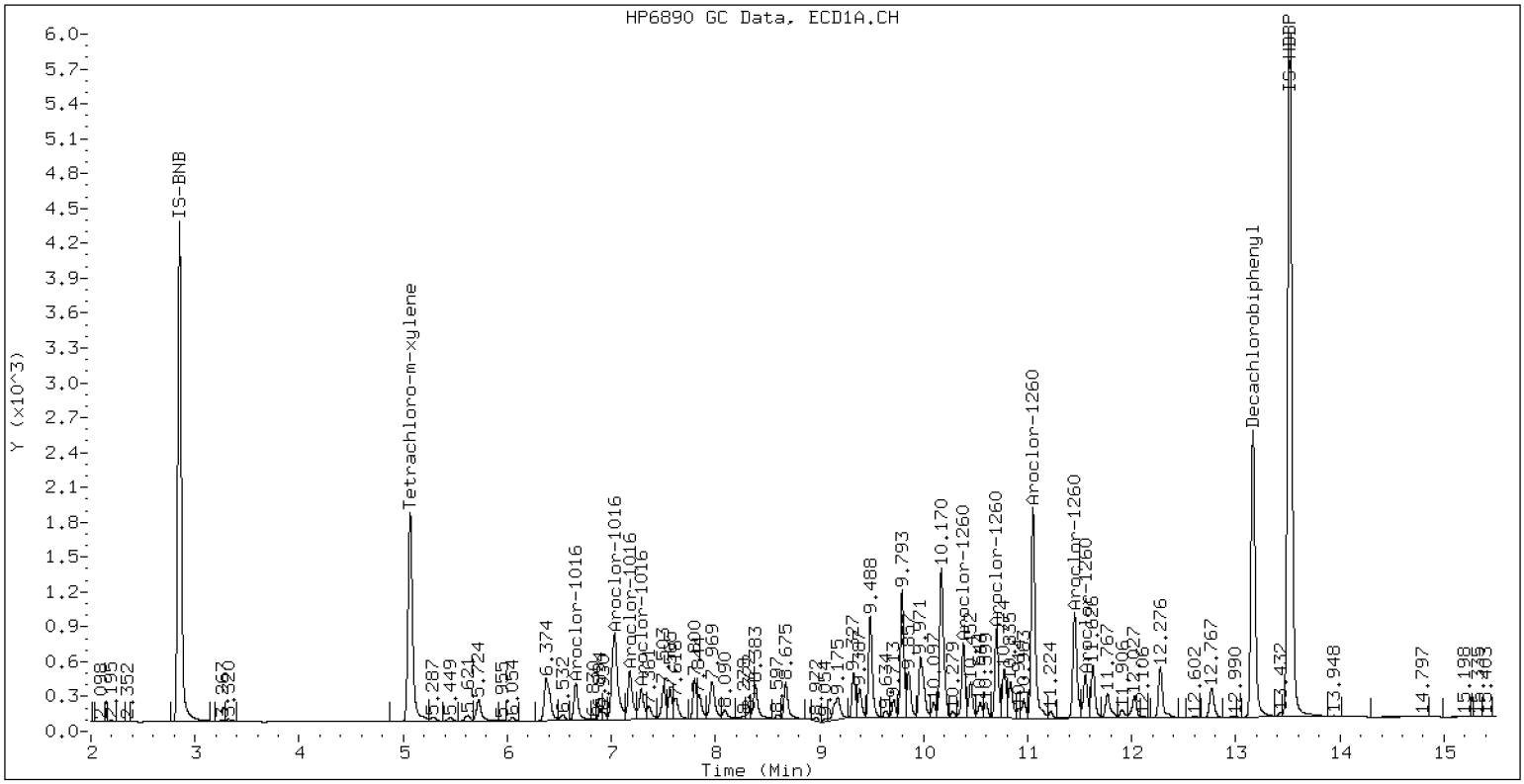
Total PCB Area Col2 (5.167 - 13.064) = 3229808 Col2 Total PCB = 0.5 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

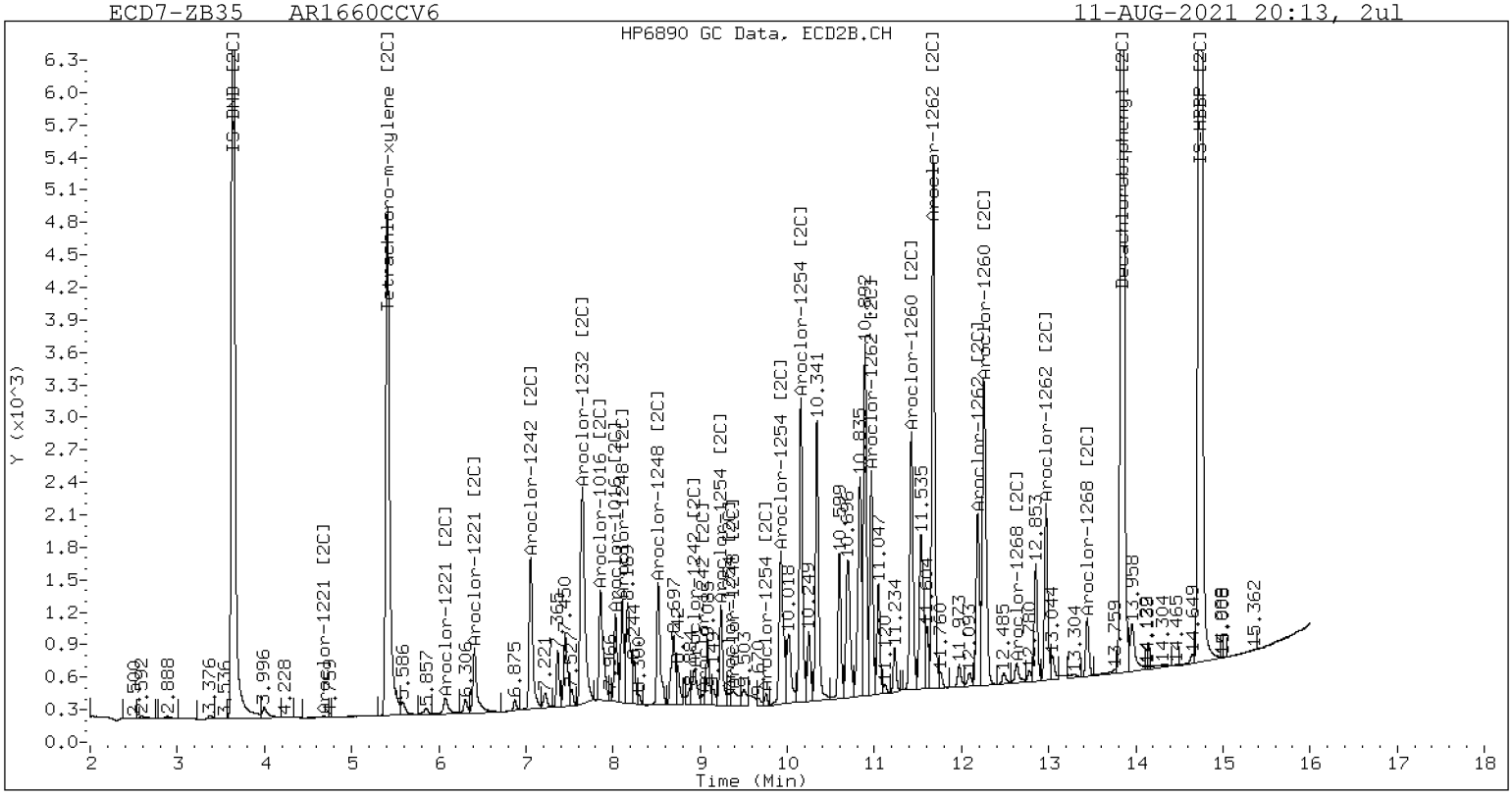
PCB Dual Column Chromatograms

ECD7-ZB5 AR1660CCV6 11-AUG-2021 20:13, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1660CCV6 11-AUG-2021 20:13, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE
CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	05222117ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJE0321	Injection Date:	05/22/21
Lab Sample ID:	SJE0321-SCV1	Injection Time:	19:32
Sequence Name:	AR1660SCV1		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1016	A	250.00	250	0.0413247	0.0413589		-0.2	+/-20
Aroclor 1016 [2C]	A	250.00	250	0.0466427	0.0464522		0.2	+/-20
Aroclor 1260	A	250.00	295	0.0388495	0.0455628		17.8	+/-20
Aroclor 1260 [2C]	A	250.00	287	0.0752611	0.0850897		14.8	+/-20
Decachlorobiphenyl	A	40.000	39.8	0.7132713	0.7105296		-0.4	+/-20
Tetrachlorometaxylene	A	40.000	42.4	0.9552374	1.0121580		6.0	+/-20
Decachlorobiphenyl [2C]	A	40.000	39.0	1.4343710	1.3995010		-2.4	+/-20
Tetrachlorometaxylene [2C]	A	40.000	40.6	0.9862409	1.0004460		1.4	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210522.b/05222117ECD7.D
Data file 2: /210522.b/210522.b/05222117ECD7.D
Method: \\target\share\chem4\ecd7.i\210522.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1660SCV1
Client ID:
Injection Date: 22-MAY-2021 19:32
Report Date: 05/25/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.074	0.000	150100	5.424	-0.000	360043	42.4	40.6	4.4	Tetrachloro-m-xylene
13.178	0.002	171195	13.872	0.002	637856	39.8	39.0	2.1	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	296594	0.0
Hexabromobiphenyl	470266	481880	2.5

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	719765	1.1
Hexabromobiphenyl	867949	911548	5.0

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.666	0.001	22769	247.5	1	7.071	0.001	92068	248.3
Aroclor-1016	2	7.034	0.000	78003	251.2	2	7.661	0.001	201632	247.2
Aroclor-1016	3	7.182	0.001	31610	250.6	3	7.869	0.001	76459	250.4
Aroclor-1016	4	7.291	0.001	20953	248.7	4	8.041	0.002	47774	255.6
Total Col1Ave (4 peaks):					249.5	Total Col2Ave (4 peaks):				250.4 RPD = 0
Corrected Ave (3 peaks):					248.9	Corrected Ave (3 peaks):				248.6 RPD = 0
Aroclor-1221	1	4.026	0.004	113	5.2	1	4.692	-0.000	432	9.2
Aroclor-1221	2	5.455	-0.000	2657	70.7	2	6.089	0.005	11633	105.7
Aroclor-1221	3	5.729	0.000	16535	173.5	3	6.423	0.001	39442	194.5
Total Col1Ave (3 peaks):					83.1	Total Col2Ave (3 peaks):				103.2 RPD = 22
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1232	1	4.026	0.005	113	8.4	1	4.692	0.000	432	14.6
Aroclor-1232	2	5.729	0.001	16535	203.3	2	6.089	0.004	11633	146.7
Aroclor-1232	3	7.034	0.001	78003	570.6	3	6.423	0.000	39442	226.8
Aroclor-1232	4	8.606	-0.009	2061	50.2	4	7.661	-0.001	201632	554.0
Total Col1Ave (4 peaks):					208.1	Total Col2Ave (4 peaks):				235.5 RPD = 12
Corrected Ave (3 peaks):					87.3	Corrected Ave (3 peaks):				129.4 RPD = 39
Aroclor-1242	1	6.666	0.001	22769	278.0	1	7.071	0.001	92068	288.1
Aroclor-1242	2	7.034	0.000	78003	293.3	2	7.661	0.002	201632	291.7
Aroclor-1242	3	8.276	0.005	2315	63.3	3	8.950	-0.008	27869	89.2
Aroclor-1242	4	8.606	-0.005	2061	25.2	4	9.040	0.003	7790	28.3
Total Col1Ave (4 peaks):					165.0	Total Col2Ave (4 peaks):				174.3 RPD = 6
Corrected Ave (3 peaks):					122.2	Corrected Ave (3 peaks):				135.2 RPD = 10
Aroclor-1248	1	7.807	0.001	21433	173.2	1	8.122	0.001	43799	166.9
Aroclor-1248	2	7.974	0.001	29322	191.0	2	8.536	0.001	66601	186.6
Aroclor-1248	3	8.324	0.002	4130	26.9	3	8.950	-0.011	27869	54.2
Aroclor-1248	4	8.606	-0.007	2061	15.2	4	9.391	0.002	5888	10.7
Total Col1Ave (4 peaks):					101.6	Total Col2Ave (4 peaks):				104.6 RPD = 3
Corrected Ave (3 peaks):					71.7	Corrected Ave (3 peaks):				77.3 RPD = 7
Aroclor-1254	1	8.682	-0.000	16848	67.2	1	9.255	-0.000	44067	80.9
Aroclor-1254	2	---			0.0	2	9.349	0.002	2467	7.7
Aroclor-1254	3	9.050	0.001	1728	11.2	3	9.781	0.001	6046	14.7
Aroclor-1254	4	9.178	-0.005	15131	49.7	4	9.947	0.017	111904	122.7
Aroclor-1254	5	9.867	-0.008	22044	107.5	5	10.177	0.016	145643	148.9
Total Col1Ave (4 peaks):					58.9	Total Col2Ave (5 peaks):				75.0 RPD = 24
Corrected Ave (3 peaks):					42.7	Corrected Ave (4 peaks):				56.5 RPD = 28
Aroclor-1260	1	10.394	0.003	53063	300.4	1	11.446	0.000	155193	273.0
Aroclor-1260	2	10.712	0.001	53264	293.3	2	11.699	0.002	412469	278.1
Aroclor-1260	3	11.062	0.002	141369	297.1	3	12.282	0.002	271072	281.1
Aroclor-1260	4	11.463	0.004	66669	274.9	4	12.994	0.002	130808	315.6
Aroclor-1260	5	11.566	0.001	28694	306.9	NS	---			----
Total Col1Ave (5 peaks):					294.5	Total Col2Ave (4 peaks):				287.0 RPD = 3
Corrected Ave (4 peaks):					291.4	Corrected Ave (3 peaks):				277.4 RPD = 5
Aroclor-1262	1	10.394	-0.001	53063	175.1	1	10.989	-0.000	162597	177.6
Aroclor-1262	2	11.463	0.000	66669	341.0	2	11.699	-0.001	412469	227.8
Aroclor-1262	3	11.638	-0.000	37034	140.4	3	12.211	0.003	127645	147.0
Aroclor-1262	4	12.286	-0.001	33351	160.0	4	12.994	0.001	130808	166.0
Total Col1Ave (4 peaks):					204.1	Total Col2Ave (4 peaks):				179.6 RPD = 13
Corrected Ave (3 peaks):					158.5	Corrected Ave (3 peaks):				163.5 RPD = 3
Aroclor-1268	1	11.566	-0.001	28694	35.5	1	12.211	0.004	127645	48.2
Aroclor-1268	2	11.638	0.002	37034	45.2	2	12.282	0.008	271072	93.9
Aroclor-1268	3	12.040	0.029	15321	23.8	3	12.659	-0.001	4976	2.0
Aroclor-1268	4	12.781	-0.000	8326	4.1	4	13.469	-0.003	26590	3.2
Total Col1Ave (4 peaks):					27.1	Total Col2Ave (4 peaks):				36.8 RPD = 30

Corrected Ave (3 peaks): 21.1 Corrected Ave (3 peaks): 17.8 RPD = 17

Total PCB Area Col1 (5.174 - 13.076) = 1346327 Col1 Total PCB = 0.5 ppm*

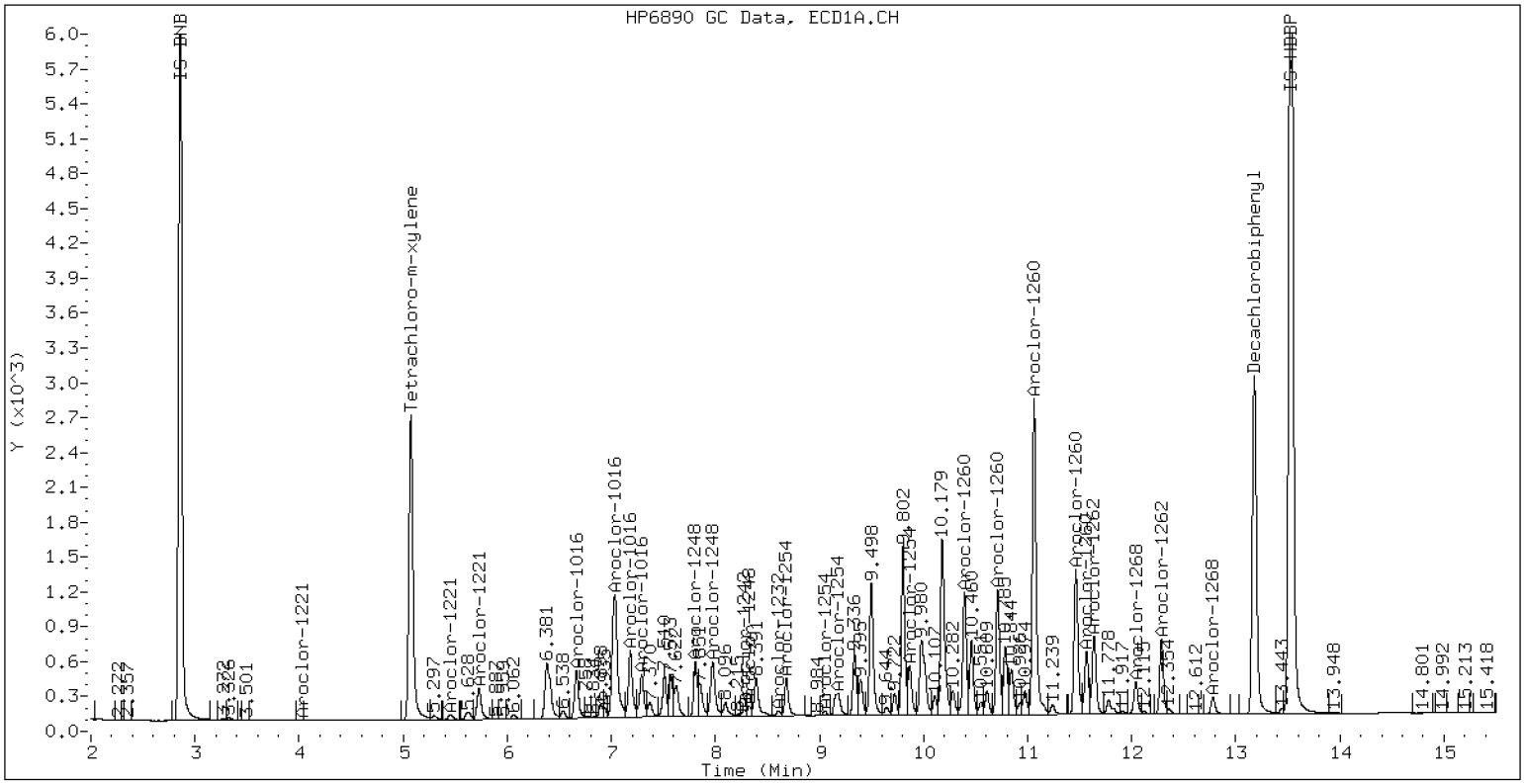
Total PCB Area Col2 (5.174 - 13.076) = 4068268 Col2 Total PCB = 0.5 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

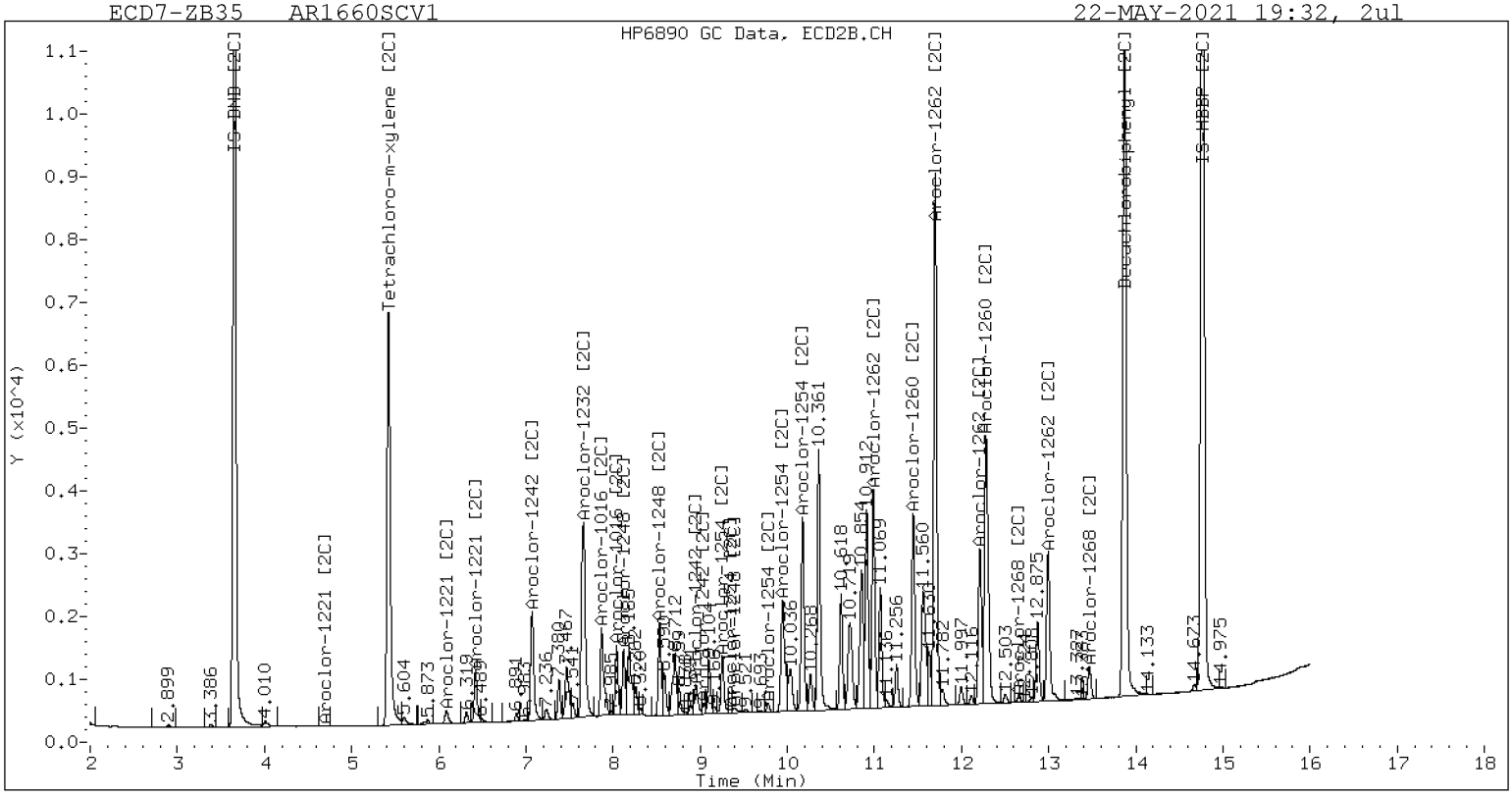
PCB Dual Column Chromatograms

ECD7-ZB5 AR1660SCV1 22-MAY-2021 19:32, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1660SCV1 22-MAY-2021 19:32, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE
CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	05222118ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJE0321	Injection Date:	05/22/21
Lab Sample ID:	SJE0321-SCV2	Injection Time:	19:53
Sequence Name:	AR1242SCV2		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1242	A	250.00	226	0.0314312	0.0283653		-9.7	+/-20
Aroclor 1242 [2C]	A	250.00	222	0.0444064	0.0397477		-11.3	+/-20
Decachlorobiphenyl	A	40.000	40.3	0.7132713	0.7180920		0.7	+/-20
Tetrachlorometaxylene	A	40.000	41.8	0.9552374	0.9981255		4.5	+/-20
Decachlorobiphenyl [2C]	A	40.000	40.3	1.4343710	1.4447660		0.7	+/-20
Tetrachlorometaxylene [2C]	A	40.000	40.5	0.9862409	0.9974522		1.1	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210522.b/05222118ECD7.D
Data file 2: /210522.b/210522.b/05222118ECD7.D
Method: \\target\share\chem4\ecd7.i\210522.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1242SCV2
Client ID:
Injection Date: 22-MAY-2021 19:53
Report Date: 05/25/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.073	-0.001	148026	5.424	-0.000	355279	41.8	40.5	3.3	Tetrachloro-m-xylene
13.177	0.001	171517	13.873	0.003	654853	40.3	40.3	0.0	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	296608	0.1
Hexabromobiphenyl	470266	477702	1.6

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	712373	0.1
Hexabromobiphenyl	867949	906518	4.4

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.665	-0.000	18392	199.9	1	7.071	-0.000	72036	196.3
Aroclor-1016	2	7.033	-0.001	59895	192.9	2	7.660	0.000	156335	193.7
Aroclor-1016	3	7.182	0.001	24546	194.6	3	7.869	0.001	59486	196.8
Aroclor-1016	4	7.291	0.001	16263	193.0	4	8.041	0.001	37109	200.6
Total Col1Ave (4 peaks): 195.1						Total Col2Ave (4 peaks): 196.8 RPD = 1				
Corrected Ave (3 peaks): 193.5						Corrected Ave (3 peaks): 195.6 RPD = 1				
Aroclor-1221	1	4.021	-0.002	126	5.7	1	---			0.0
Aroclor-1221	2	5.453	-0.002	2075	55.2	2	6.090	0.006	9535	87.6
Aroclor-1221	3	5.729	-0.001	12906	135.4	3	6.422	0.000	30451	151.7
Total Col1Ave (3 peaks): 65.5						Col2Ave: <3 Quant Peaks				
Aroclor-1232	1	4.021	-0.000	126	9.4	1	---			0.0
Aroclor-1232	2	5.729	-0.000	12906	158.7	2	6.090	0.006	9535	121.5
Aroclor-1232	3	7.033	-0.001	59895	438.1	3	6.422	-0.001	30451	176.9
Aroclor-1232	4	8.614	-0.001	18633	453.8	4	7.660	-0.002	156335	434.0
Total Col1Ave (4 peaks): 265.0						Total Col2Ave (3 peaks): 244.1 RPD = 8				
Corrected Ave (3 peaks): 202.1						Corrected Ave: < 3 Peaks				
Aroclor-1242	1	6.665	0.000	18392	224.6	1	7.071	-0.000	72036	227.8
Aroclor-1242	2	7.033	-0.001	59895	225.2	2	7.660	0.001	156335	228.5
Aroclor-1242	3	8.275	0.003	8247	225.5	3	8.961	0.003	69303	224.1
Aroclor-1242	4	8.614	0.003	18633	228.1	4	9.040	0.004	56266	206.9
Total Col1Ave (4 peaks): 225.8						Total Col2Ave (4 peaks): 221.8 RPD = 2				
Corrected Ave (3 peaks): 225.1						Corrected Ave (3 peaks): 219.6 RPD = 2				
Aroclor-1248	1	7.806	-0.001	17228	139.2	1	8.121	-0.001	35861	138.1
Aroclor-1248	2	7.974	0.001	24199	157.6	2	8.536	0.000	54676	154.8
Aroclor-1248	3	8.322	0.000	19391	126.2	3	8.961	0.000	69303	136.3
Aroclor-1248	4	8.614	0.001	18633	137.1	4	9.391	0.001	77643	143.2
Total Col1Ave (4 peaks): 140.0						Total Col2Ave (4 peaks): 143.1 RPD = 2				
Corrected Ave (3 peaks): 134.1						Corrected Ave (3 peaks): 139.2 RPD = 4				
Aroclor-1254	1	8.683	0.001	12254	48.9	1	9.255	-0.000	28380	52.6
Aroclor-1254	2	8.753	0.000	5283	57.9	2	9.391	0.044	77643	244.1
Aroclor-1254	3	9.050	0.002	5840	38.0	3	9.781	0.001	18362	45.2
Aroclor-1254	4	9.185	0.003	9954	32.7	4	9.930	0.000	37314	41.4
Aroclor-1254	5	9.881	0.005	6746	32.9	5	10.160	-0.000	39089	40.4
Total Col1Ave (5 peaks): 42.1						Total Col2Ave (5 peaks): 84.7 RPD = 67*				
Corrected Ave (4 peaks): 38.1						Corrected Ave (4 peaks): 44.9 RPD = 16				
Aroclor-1260	1	10.393	0.002	187	1.1	1	11.458	0.012	3982	7.0
Aroclor-1260	2	10.713	0.002	208	1.2	2	11.703	0.006	2513	1.7
Aroclor-1260	3	11.063	0.004	540	1.1	3	12.285	0.005	1926	2.0
Aroclor-1260	4	11.466	0.006	450	1.9	4	13.071	0.079	5406	13.1
Aroclor-1260	5	---			0.0	NS	---			----
Total Col1Ave (4 peaks): 1.3						Total Col2Ave (4 peaks): 6.0 RPD = 128*				
Corrected Ave (3 peaks): 1.1						Corrected Ave (3 peaks): 3.6 RPD = 105*				
Aroclor-1262	1	10.393	-0.001	187	0.6	1	10.914	-0.075	13876	15.2
Aroclor-1262	2	11.466	0.003	450	2.3	2	11.703	0.003	2513	1.4
Aroclor-1262	3	---			0.0	3	12.209	0.001	1037	1.2
Aroclor-1262	4	12.313	0.026	270	1.3	4	13.071	0.078	5406	6.9
Total Col1Ave (3 peaks): 1.4						Total Col2Ave (4 peaks): 6.2 RPD = 125*				
Corrected Ave: < 3 Peaks						Corrected Ave (3 peaks): 3.2				
Aroclor-1268	1	---			0.0	1	12.209	0.002	1037	0.4
Aroclor-1268	2	---			0.0	2	12.285	0.010	1926	0.7
Aroclor-1268	3	12.011	-0.000	683	1.1	3	12.658	-0.002	2315	0.9
Aroclor-1268	4	12.779	-0.002	1999	1.0	4	13.467	-0.005	4164	0.5
Col1Ave: <3 Quant Peaks						Col2Ave: 0.6				

Total PCB Area Col1 (5.174 - 13.076) = 451658 Col1 Total PCB = 0.2 ppm*

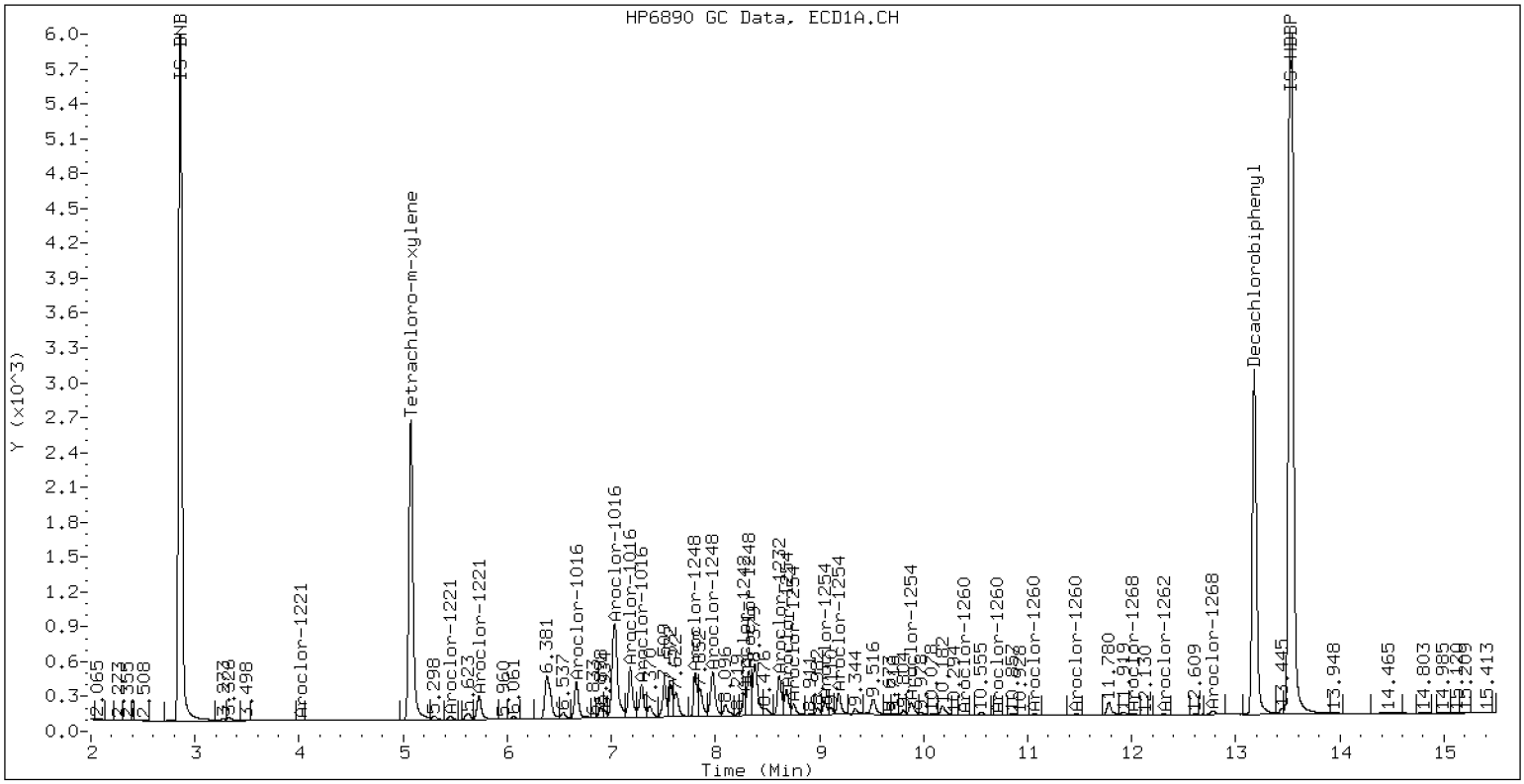
Total PCB Area Col2 (5.174 - 13.076) = 1609207 Col2 Total PCB = 0.2 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

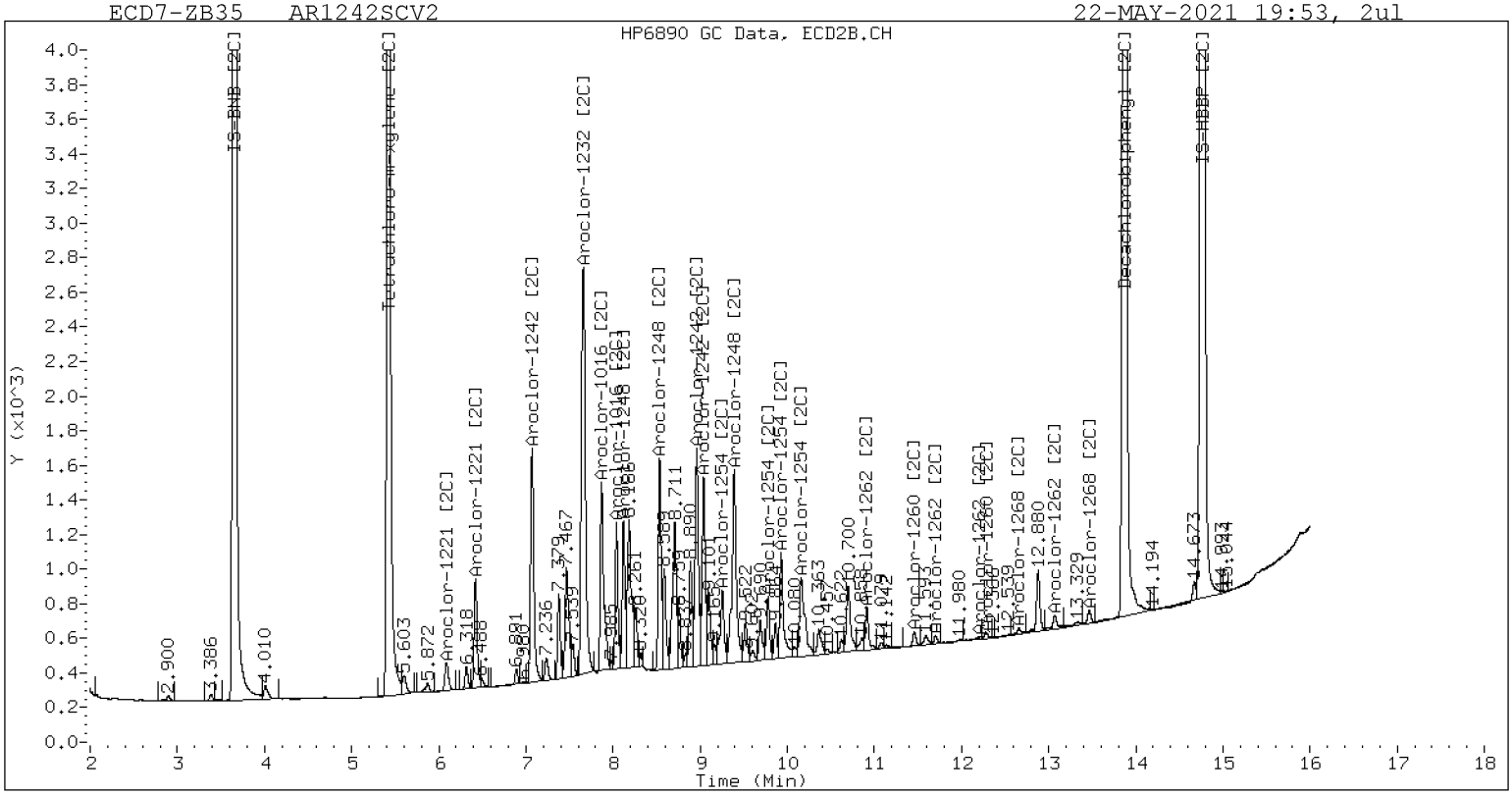
PCB Dual Column Chromatograms

ECD7-ZB5 AR1242SCV2 22-MAY-2021 19:53, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1242SCV2 22-MAY-2021 19:53, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE
CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	05222119ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJE0321	Injection Date:	05/22/21
Lab Sample ID:	SJE0321-SCV3	Injection Time:	20:15
Sequence Name:	AR1248SCV3		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1248	A	250.00	239	0.0382260	0.0365000		-4.5	+/-20
Aroclor 1248 [2C]	A	250.00	240	0.0467028	0.0446313		-4.0	+/-20
Decachlorobiphenyl	A	40.000	40.5	0.7132713	0.7226260		1.3	+/-20
Tetrachlorometaxylene	A	40.000	42.7	0.9552374	1.0193710		6.7	+/-20
Decachlorobiphenyl [2C]	A	40.000	40.4	1.4343710	1.4475630		0.9	+/-20
Tetrachlorometaxylene [2C]	A	40.000	40.8	0.9862409	1.0055270		2.0	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210522.b/05222119ECD7.D
Data file 2: /210522.b/210522.b/05222119ECD7.D
Method: \\target\share\chem4\ecd7.i\210522.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1248SCV3
Client ID:
Injection Date: 22-MAY-2021 20:15
Report Date: 05/25/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.075	0.001	148558	5.424	0.000	355673	42.7	40.8	4.6	Tetrachloro-m-xylene
13.177	0.001	172097	13.874	0.003	652141	40.5	40.4	0.4	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	291470	-1.7
Hexabromobiphenyl	470266	476310	1.3

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	707436	-0.6
Hexabromobiphenyl	867949	901019	3.8

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	ZB5 Col Peak#	RT	Shift	Area	Amount	ZB35 Col Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.665	0.000	8436	93.3	1	7.070	-0.001	37964	104.2
Aroclor-1016	2	7.032	-0.002	39299	128.8	2	7.657	-0.003	105519	131.6
Aroclor-1016	3	7.185	0.004	14510	117.1	3	7.870	0.002	23528	78.4
Aroclor-1016	4	7.290	0.001	9419	113.8	4	8.042	0.002	19521	106.2
Total Col1Ave (4 peaks): 113.2						Total Col2Ave (4 peaks): 105.1				RPD = 7
Corrected Ave (3 peaks): 108.0						Corrected Ave (3 peaks): 96.3				RPD = 12
Aroclor-1221	1	---			0.0	1	---			0.0
Aroclor-1221	2	5.457	0.001	514	13.9	2	6.100	0.016	4839	44.8
Aroclor-1221	3	5.730	0.001	2589	27.6	3	6.422	0.001	7431	37.3
Col1Ave: <3 Quant Peaks						Col2Ave: <3 Quant Peaks				
Aroclor-1232	1	---			0.0	1	---			0.0
Aroclor-1232	2	5.730	0.001	2589	32.4	2	6.100	0.015	4839	62.1
Aroclor-1232	3	7.032	-0.001	39299	292.5	3	6.422	-0.000	7431	43.5
Aroclor-1232	4	8.613	-0.002	31117	771.2	4	7.657	-0.005	105519	295.0
Total Col1Ave (3 peaks): 365.4						Total Col2Ave (3 peaks): 133.5				RPD = 93*
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1242	1	6.665	0.000	8436	104.8	1	7.070	-0.001	37964	120.9
Aroclor-1242	2	7.032	-0.002	39299	150.4	2	7.657	-0.002	105519	155.3
Aroclor-1242	3	8.274	0.003	13538	376.7	3	8.961	0.003	120141	391.2
Aroclor-1242	4	8.613	0.002	31117	387.7	4	9.040	0.003	91529	338.9
Total Col1Ave (4 peaks): 254.9						Total Col2Ave (4 peaks): 251.6				RPD = 1
Corrected Ave (3 peaks): 210.6						Corrected Ave (3 peaks): 205.0				RPD = 3
Aroclor-1248	1	7.807	0.000	29704	244.2	1	8.121	-0.000	63408	245.9
Aroclor-1248	2	7.974	0.001	35985	238.5	2	8.536	0.000	84533	241.0
Aroclor-1248	3	8.323	0.001	36177	239.5	3	8.961	0.000	120141	237.9
Aroclor-1248	4	8.613	0.000	31117	233.0	4	9.391	0.001	126590	235.1
Total Col1Ave (4 peaks): 238.8						Total Col2Ave (4 peaks): 240.0				RPD = 0
Corrected Ave (3 peaks): 237.0						Corrected Ave (3 peaks): 238.0				RPD = 0
Aroclor-1254	1	8.683	0.001	23899	97.0	1	9.255	-0.000	40453	75.5
Aroclor-1254	2	8.753	0.001	11007	122.7	2	9.391	0.044	126590	400.8
Aroclor-1254	3	9.050	0.001	12659	83.8	3	9.780	0.001	36693	91.0
Aroclor-1254	4	9.184	0.002	21298	71.2	4	9.930	0.000	71223	79.5
Aroclor-1254	5	9.881	0.006	14795	73.4	5	10.158	-0.003	48447	50.4
Total Col1Ave (5 peaks): 89.6						Total Col2Ave (5 peaks): 139.4				RPD = 44*
Corrected Ave (4 peaks): 81.4						Corrected Ave (4 peaks): 74.1				RPD = 9
Aroclor-1260	1	10.396	0.005	668	3.8	1	11.456	0.010	5225	9.3
Aroclor-1260	2	10.713	0.002	511	2.8	2	11.701	0.004	5284	3.6
Aroclor-1260	3	11.063	0.003	1423	3.0	3	12.284	0.004	3829	4.0
Aroclor-1260	4	11.464	0.004	549	2.3	4	12.994	0.002	2061	5.0
Aroclor-1260	5	11.570	0.005	526	5.7	NS	---			----
Total Col1Ave (5 peaks): 3.5						Total Col2Ave (4 peaks): 5.5				RPD = 43*
Corrected Ave (4 peaks): 3.0						Corrected Ave (3 peaks): 4.2				RPD = 34
Aroclor-1262	1	10.396	0.002	668	2.2	1	10.988	-0.001	3149	3.5
Aroclor-1262	2	11.464	0.001	549	2.8	2	11.701	0.001	5284	3.0
Aroclor-1262	3	11.638	-0.000	520	2.0	3	12.207	-0.001	2542	3.0
Aroclor-1262	4	12.292	0.005	702	3.4	4	12.994	0.001	2061	2.6
Total Col1Ave (4 peaks): 2.6						Total Col2Ave (4 peaks): 3.0				RPD = 14
Corrected Ave (3 peaks): 2.4						Corrected Ave (3 peaks): 2.9				RPD = 19
Aroclor-1268	1	11.570	0.003	526	0.7	1	12.207	-0.000	2542	1.0
Aroclor-1268	2	11.638	0.001	520	0.6	2	12.284	0.009	3829	1.3
Aroclor-1268	3	12.015	0.004	863	1.4	3	12.657	-0.002	2695	1.1
Aroclor-1268	4	12.780	-0.001	2506	1.3	4	13.467	-0.005	4780	0.6
Total Col1Ave (4 peaks): 1.0						Total Col2Ave (4 peaks): 1.0				RPD = 2
Corrected Ave (3 peaks): 0.9						Corrected Ave (3 peaks): 0.9				RPD = 3

Total PCB Area Col1 (5.174 - 13.076) = 550840 Col1 Total PCB = 0.2 ppm*

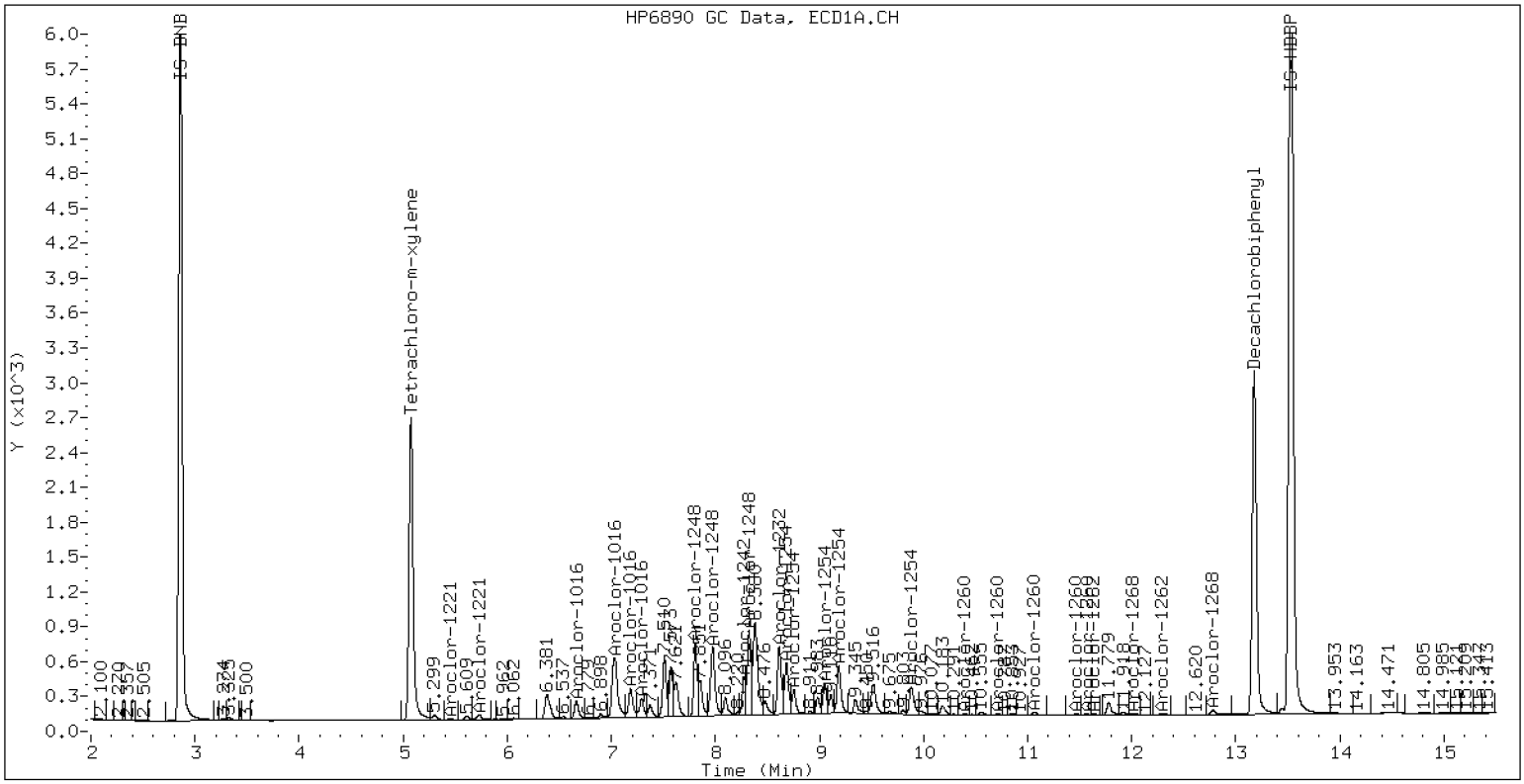
Total PCB Area Col2 (5.174 - 13.076) = 1898867 Col2 Total PCB = 0.2 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

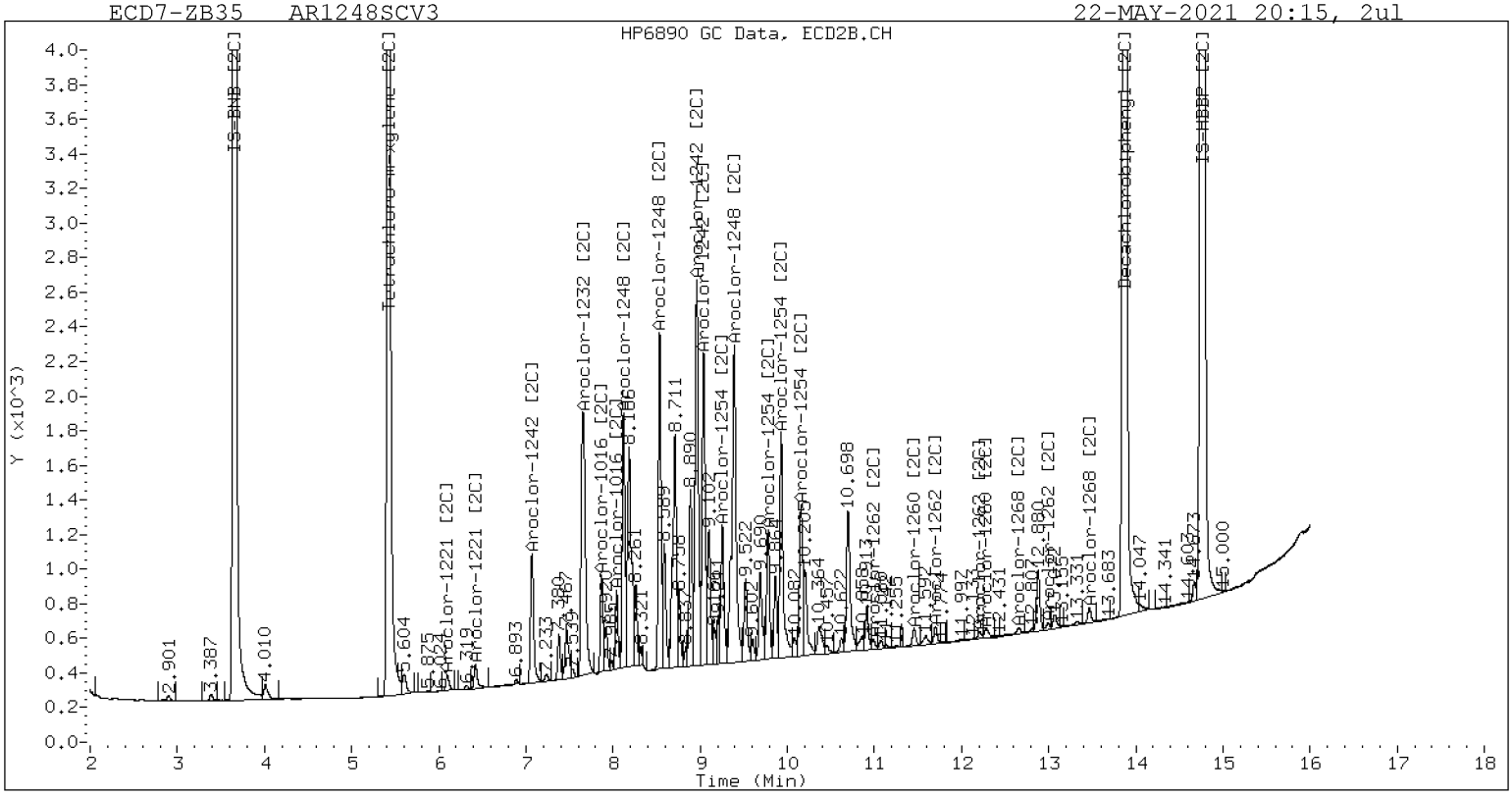
PCB Dual Column Chromatograms

ECD7-ZB5 AR1248SCV3 22-MAY-2021 20:15, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1248SCV3 22-MAY-2021 20:15, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE
CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	05222120ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJE0321	Injection Date:	05/22/21
Lab Sample ID:	SJE0321-SCV4	Injection Time:	20:37
Sequence Name:	AR1254SCV4		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1254	A	250.00	235	0.0542238	0.0508372		-5.9	+/-20
Aroclor 1254 [2C]	A	250.00	244	0.0703814	0.0687203		-2.2	+/-20
Decachlorobiphenyl	A	40.000	40.0	0.7132713	0.7139365		0.09	+/-20
Tetrachlorometaxylene	A	40.000	41.7	0.9552374	0.9964360		4.3	+/-20
Decachlorobiphenyl [2C]	A	40.000	39.6	1.4343710	1.4207020		-1.0	+/-20
Tetrachlorometaxylene [2C]	A	40.000	40.4	0.9862409	0.9959310		1.0	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210522.b/05222120ECD7.D
Data file 2: /210522.b/210522.b/05222120ECD7.D
Method: \\target\share\chem4\ecd7.i\210522.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1254SCV4
Client ID:
Injection Date: 22-MAY-2021 20:37
Report Date: 05/25/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.074	-0.000	147480	5.423	-0.001	353436	41.7	40.4	3.2	Tetrachloro-m-xylene
13.178	0.002	169697	13.873	0.002	645388	40.0	39.6	1.1	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	296015	-0.1
Hexabromobiphenyl	470266	475384	1.1

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	709760	-0.3
Hexabromobiphenyl	867949	908548	4.7

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	ZB5 Col Peak#	RT	Shift	Area	Amount	ZB35 Col Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.670	0.005	136	1.5	1	7.071	0.000	986	2.7
Aroclor-1016	2	7.030	-0.005	825	2.7	2	7.655	-0.005	2851	3.5
Aroclor-1016	3	7.192	0.010	462	3.7	3	7.870	0.002	369	1.2
Aroclor-1016	4	7.290	0.000	114	1.4	4	8.044	0.004	353	1.9
Total Col1Ave (4 peaks):					2.3	Total Col2Ave (4 peaks):				2.3 RPD = 2
Corrected Ave (3 peaks):					1.8	Corrected Ave (3 peaks):				1.9 RPD = 6
Aroclor-1221	1	---			0.0	1	---			0.0
Aroclor-1221	2	---			0.0	2	6.100	0.016	3990	36.8
Aroclor-1221	3	---			0.0	3	6.417	-0.004	870	4.4
Col1Ave: <3 Quant Peaks						Col2Ave: <3 Quant Peaks				
Aroclor-1232	1	---			0.0	1	---			0.0
Aroclor-1232	2	5.730	0.001	136	1.7	2	6.100	0.015	3990	51.0
Aroclor-1232	3	7.030	-0.004	825	6.0	3	6.417	-0.005	870	5.1
Aroclor-1232	4	8.605	-0.010	10628	259.4	4	7.655	-0.007	2851	7.9
Total Col1Ave (3 peaks):					89.0	Total Col2Ave (3 peaks):				21.3 RPD = 123*
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1242	1	6.670	0.005	136	1.7	1	7.071	0.000	986	3.1
Aroclor-1242	2	7.030	-0.004	825	3.1	2	7.655	-0.005	2851	4.2
Aroclor-1242	3	8.324	0.053	18533	507.7	3	8.964	0.006	50428	163.7
Aroclor-1242	4	8.605	-0.006	10628	130.4	4	9.040	0.003	16173	59.7
Total Col1Ave (4 peaks):					160.7	Total Col2Ave (4 peaks):				57.7 RPD = 94*
Corrected Ave (3 peaks):					45.1	Corrected Ave (3 peaks):				22.3 RPD = 67*
Aroclor-1248	1	7.805	-0.001	11633	94.2	1	8.121	-0.000	48527	187.5
Aroclor-1248	2	7.973	0.000	4360	28.5	2	8.536	0.001	30748	87.4
Aroclor-1248	3	8.324	0.002	18533	120.8	3	8.964	0.003	50428	99.5
Aroclor-1248	4	8.605	-0.008	10628	78.4	4	9.348	-0.042	74662	138.2
Total Col1Ave (4 peaks):					80.5	Total Col2Ave (4 peaks):				128.2 RPD = 46*
Corrected Ave (3 peaks):					67.0	Corrected Ave (3 peaks):				108.4 RPD = 47*
Aroclor-1254	1	8.681	-0.000	58854	235.2	1	9.255	-0.001	141492	263.3
Aroclor-1254	2	8.753	0.001	21709	238.2	2	9.348	0.001	74662	235.6
Aroclor-1254	3	9.049	0.000	36329	236.8	3	9.780	0.000	98121	242.6
Aroclor-1254	4	9.183	0.000	70176	231.1	4	9.929	-0.001	214334	238.4
Aroclor-1254	5	9.875	-0.001	48066	234.8	5	10.161	0.000	233499	242.1
Total Col1Ave (5 peaks):					235.2	Total Col2Ave (5 peaks):				244.4 RPD = 4
Corrected Ave (4 peaks):					234.5	Corrected Ave (4 peaks):				239.7 RPD = 2
Aroclor-1260	1	10.392	0.000	2454	14.1	1	11.457	0.011	57455	101.4
Aroclor-1260	2	10.713	0.002	3392	18.9	2	11.702	0.005	38691	26.2
Aroclor-1260	3	11.063	0.003	8860	18.9	3	12.284	0.004	24630	25.6
Aroclor-1260	4	11.464	0.004	9017	37.7	4	12.991	-0.001	1502	3.6
Aroclor-1260	5	11.637	0.072	411	4.5	NS	---			----
Total Col1Ave (5 peaks):					18.8	Total Col2Ave (4 peaks):				39.2 RPD = 70*
Corrected Ave (4 peaks):					14.1	Corrected Ave (3 peaks):				18.5 RPD = 27
Aroclor-1262	1	10.392	-0.003	2454	8.2	1	10.985	-0.004	11671	12.8
Aroclor-1262	2	11.464	0.001	9017	46.7	2	11.702	0.002	38691	21.4
Aroclor-1262	3	11.637	-0.001	411	1.6	3	12.222	0.014	5172	6.0
Aroclor-1262	4	12.293	0.006	557	2.7	4	12.991	-0.002	1502	1.9
Total Col1Ave (4 peaks):					14.8	Total Col2Ave (4 peaks):				10.5 RPD = 34
Corrected Ave (3 peaks):					4.2	Corrected Ave (3 peaks):				6.9 RPD = 49*
Aroclor-1268	1	11.637	0.070	411	0.5	1	12.222	0.015	5172	2.0
Aroclor-1268	2	---			0.0	2	12.284	0.009	24630	8.6
Aroclor-1268	3	12.017	0.006	776	1.2	3	12.662	0.002	1796	0.7
Aroclor-1268	4	12.779	-0.002	1983	1.0	4	13.469	-0.004	4233	0.5
Total Col1Ave (3 peaks):					0.9	Total Col2Ave (4 peaks):				2.9 RPD = 105*
Corrected Ave: < 3 Peaks						Corrected Ave (3 peaks):				1.1

Total PCB Area Col1 (5.174 - 13.076) = 715747 Col1 Total PCB = 0.3 ppm*

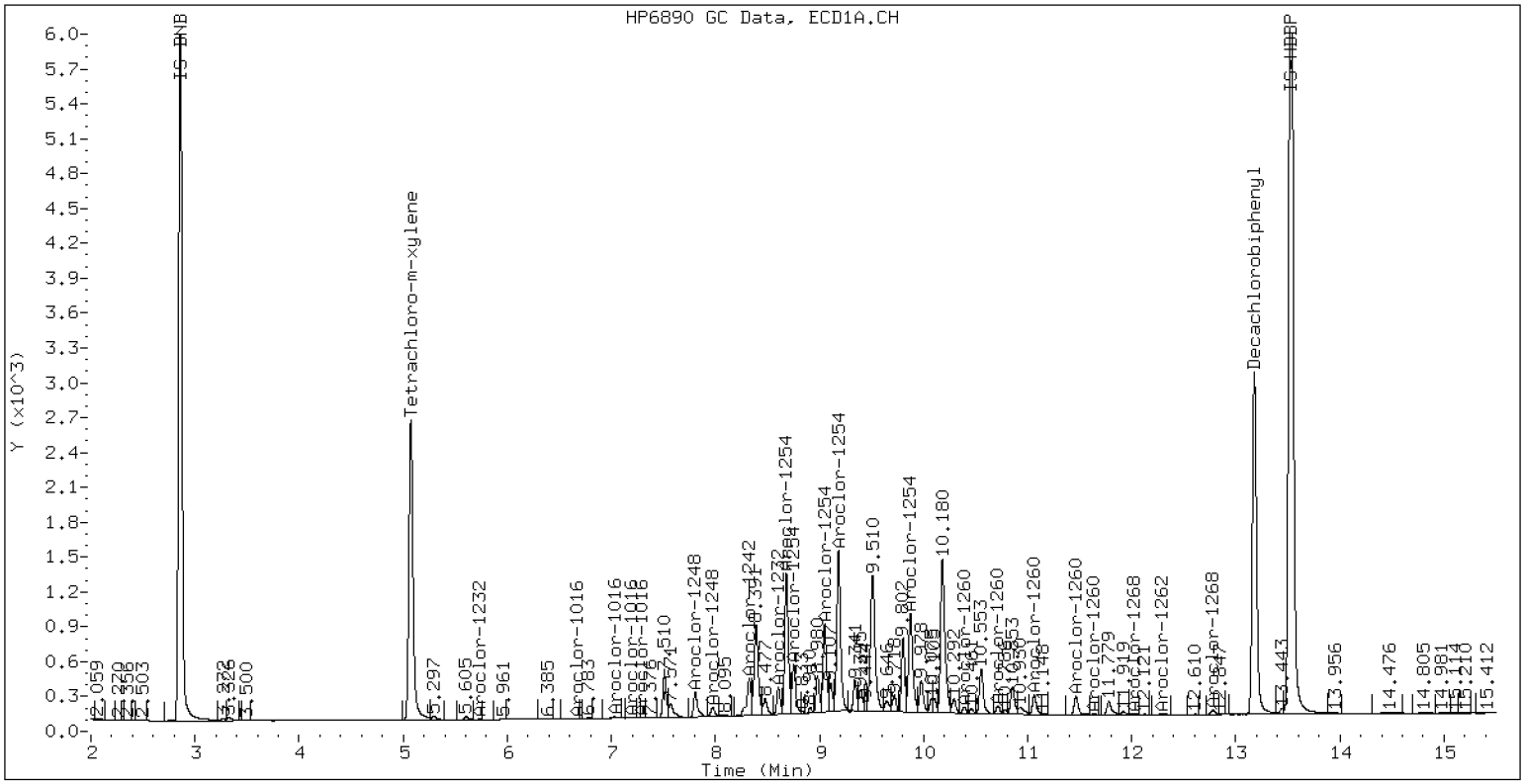
Total PCB Area Col2 (5.174 - 13.076) = 2439127 Col2 Total PCB = 0.3 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

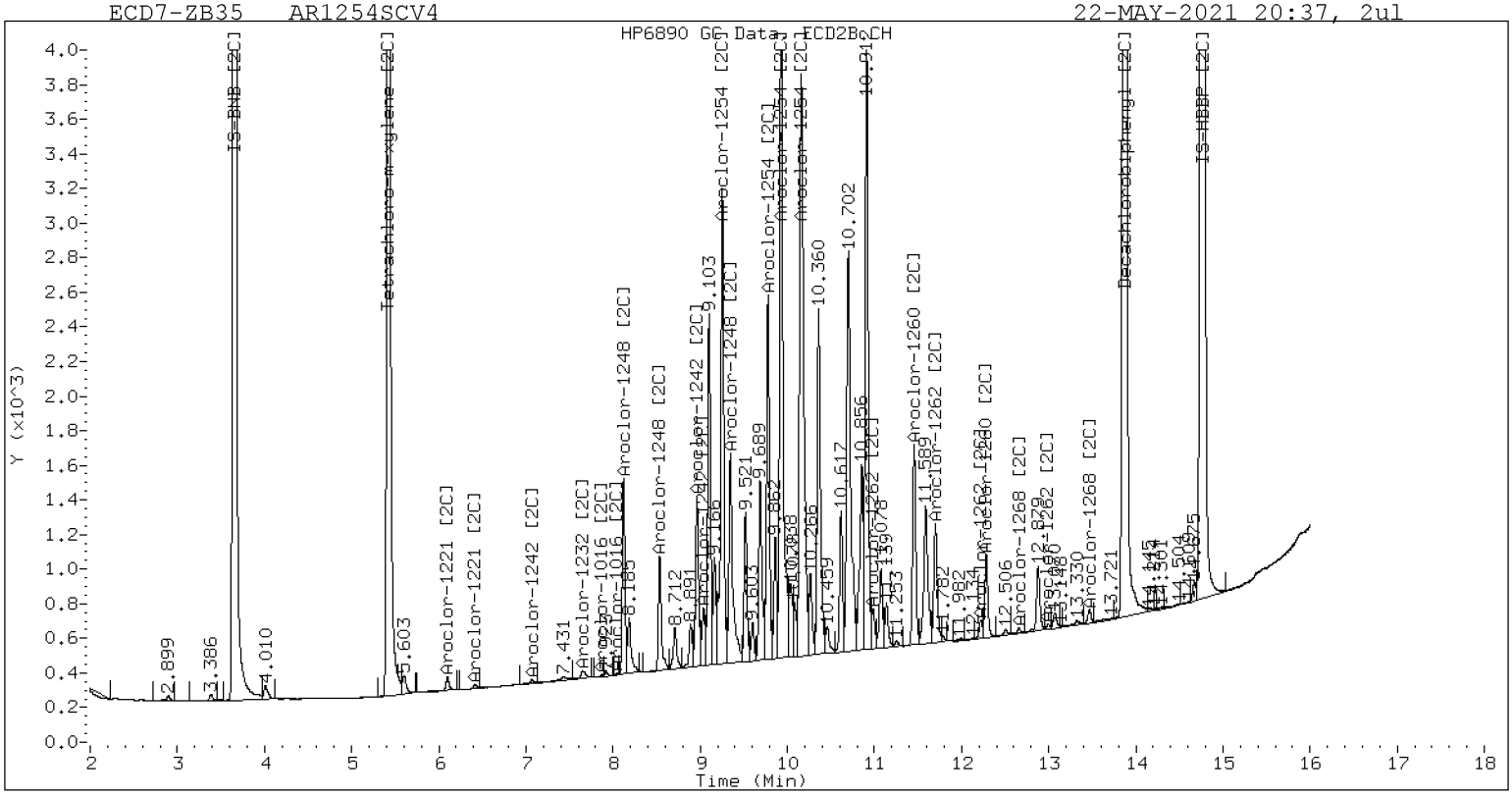
PCB Dual Column Chromatograms

ECD7-ZB5 AR1254SCV4 22-MAY-2021 20:37, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1254SCV4 22-MAY-2021 20:37, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE
CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	05222121ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJE0321	Injection Date:	05/22/21
Lab Sample ID:	SJE0321-SCV5	Injection Time:	20:58
Sequence Name:	AR2162SCV5		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1221	A	250.00	262	0.0139192	0.0143559		4.9	+/-20
Aroclor 1221 [2C]	A	250.00	261	0.0133251	0.0137514		4.4	+/-20
Aroclor 1262	A	250.00	253	0.0402931	0.0407449		1.1	+/-20
Aroclor 1262 [2C]	A	250.00	252	0.0961620	0.0967434		0.7	+/-20
Decachlorobiphenyl	A	40.000	39.7	0.7132713	0.7088117		-0.6	+/-20
Tetrachlorometaxylene	A	40.000	41.1	0.9552374	0.9809320		2.7	+/-20
Decachlorobiphenyl [2C]	A	40.000	39.5	1.4343710	1.4172910		-1.2	+/-20
Tetrachlorometaxylene [2C]	A	40.000	39.1	0.9862409	0.9650009		-2.2	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210522.b/05222121ECD7.D
Data file 2: /210522.b/210522.b/05222121ECD7.D
Method: \\target\share\chem4\ecd7.i\210522.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR2162SCV5
Client ID:
Injection Date: 22-MAY-2021 20:58
Report Date: 05/25/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.074	0.000	144866	5.424	0.000	345727	41.1	39.1	4.8	Tetrachloro-m-xylene
13.178	0.002	169535	13.874	0.004	648797	39.7	39.5	0.6	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	295364	-0.4
Hexabromobiphenyl	470266	478364	1.7

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	716532	0.6
Hexabromobiphenyl	867949	915545	5.5

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.667	0.002	1677	18.3	1	7.081	0.010	15078	40.9
Aroclor-1016	2	7.034	0.000	4823	15.6	2	7.663	0.003	13852	17.1
Aroclor-1016	3	7.183	0.002	2249	17.9	3	7.871	0.003	5670	18.7
Aroclor-1016	4	7.292	0.002	1396	16.6	4	8.043	0.003	3078	16.5
Total Col1Ave (4 peaks):				17.1		Total Col2Ave (4 peaks):			23.3	RPD = 31
Corrected Ave (3 peaks):				16.7		Corrected Ave (3 peaks):			17.4	RPD = 4
Aroclor-1221	1	4.022	-0.001	6055	277.2	1	4.692	-0.000	12493	267.9
Aroclor-1221	2	5.455	0.000	9553	255.2	2	6.085	0.001	28588	261.0
Aroclor-1221	3	5.729	-0.000	24144	254.4	3	6.423	0.001	51294	254.1
Total Col1Ave (3 peaks):				262.3		Total Col2Ave (3 peaks):			261.0	RPD = 0
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1232	1	4.022	0.001	6055	454.0	1	4.692	0.001	12493	423.6
Aroclor-1232	2	5.729	0.000	24144	298.1	2	6.085	-0.000	28588	362.2
Aroclor-1232	3	7.034	0.001	4823	35.4	3	6.423	-0.000	51294	296.3
Aroclor-1232	4	8.610	-0.005	1062	26.0	4	7.663	0.001	13852	38.2
Total Col1Ave (4 peaks):				203.4		Total Col2Ave (4 peaks):			280.1	RPD = 32
Corrected Ave (3 peaks):				119.8		Corrected Ave (3 peaks):			232.2	RPD = 64*
Aroclor-1242	1	6.667	0.002	1677	20.6	1	7.081	0.011	15078	47.4
Aroclor-1242	2	7.034	0.001	4823	18.2	2	7.663	0.003	13852	20.1
Aroclor-1242	3	8.278	0.007	940	25.8	3	8.966	0.008	4328	13.9
Aroclor-1242	4	8.610	-0.001	1062	13.1	4	9.045	0.008	2579	9.4
Total Col1Ave (4 peaks):				19.4		Total Col2Ave (4 peaks):			22.7	RPD = 16
Corrected Ave (3 peaks):				17.3		Corrected Ave (3 peaks):			14.5	RPD = 18
Aroclor-1248	1	7.808	0.002	805	6.5	1	8.121	0.000	2819	10.8
Aroclor-1248	2	7.976	0.003	802	5.2	2	8.537	0.002	2272	6.4
Aroclor-1248	3	8.327	0.005	1117	7.3	3	8.966	0.005	4328	8.5
Aroclor-1248	4	8.610	-0.003	1062	7.8	4	9.393	0.003	7120	13.1
Total Col1Ave (4 peaks):				6.7		Total Col2Ave (4 peaks):			9.7	RPD = 36
Corrected Ave (3 peaks):				6.4		Corrected Ave (3 peaks):			8.5	RPD = 29
Aroclor-1254	1	8.681	-0.000	8014	32.1	1	9.256	0.000	22883	42.2
Aroclor-1254	2	8.749	-0.003	796	8.8	2	9.350	0.003	4670	14.6
Aroclor-1254	3	9.050	0.001	1147	7.5	3	9.781	0.001	4047	9.9
Aroclor-1254	4	9.155	-0.028	10041	33.1	4	9.947	0.018	98893	109.0
Aroclor-1254	5	9.867	-0.009	12222	59.8	5	10.176	0.015	116343	119.5
Total Col1Ave (5 peaks):				28.3		Total Col2Ave (5 peaks):			59.0	RPD = 70*
Corrected Ave (4 peaks):				20.4		Corrected Ave (4 peaks):			43.9	RPD = 73*
Aroclor-1260	1	10.395	0.003	76119	434.1	1	11.446	-0.000	188460	330.1
Aroclor-1260	2	10.711	0.001	62698	347.7	2	11.699	0.002	456681	306.6
Aroclor-1260	3	11.061	0.001	154654	327.4	3	12.280	-0.000	328604	339.3
Aroclor-1260	4	11.463	0.003	49024	203.6	4	12.993	0.002	199946	480.3
Aroclor-1260	5	11.566	0.001	59318	639.1	NS	---			----
Total Col1Ave (5 peaks):				390.4		Total Col2Ave (4 peaks):			364.1	RPD = 7
Corrected Ave (4 peaks):				328.2		Corrected Ave (3 peaks):			325.3	RPD = 1
Aroclor-1262	1	10.395	0.000	76119	253.0	1	10.989	-0.000	230478	250.7
Aroclor-1262	2	11.463	0.000	49024	252.6	2	11.699	-0.001	456681	251.1
Aroclor-1262	3	11.638	-0.000	66180	252.8	3	12.208	0.000	220057	252.3
Aroclor-1262	4	12.286	-0.001	52313	252.8	4	12.993	0.000	199946	252.7
Total Col1Ave (4 peaks):				252.8		Total Col2Ave (4 peaks):			251.7	RPD = 0
Corrected Ave (3 peaks):				252.7		Corrected Ave (3 peaks):			251.3	RPD = 1
Aroclor-1268	1	11.566	-0.001	59318	73.8	1	12.208	0.001	220057	82.7
Aroclor-1268	2	11.638	0.002	66180	81.3	2	12.280	0.005	328604	113.4
Aroclor-1268	3	12.038	0.027	23299	36.4	3	12.658	-0.002	14664	5.8
Aroclor-1268	4	12.780	-0.001	19289	9.6	4	13.468	-0.004	67959	8.3
Total Col1Ave (4 peaks):				50.3		Total Col2Ave (4 peaks):			52.5	RPD = 4

Corrected Ave (3 peaks): 40.0 Corrected Ave (3 peaks): 32.3 RPD = 21

Total PCB Area Col1 (5.174 - 13.076) = 1072965 Col1 Total PCB = 0.4 ppm*

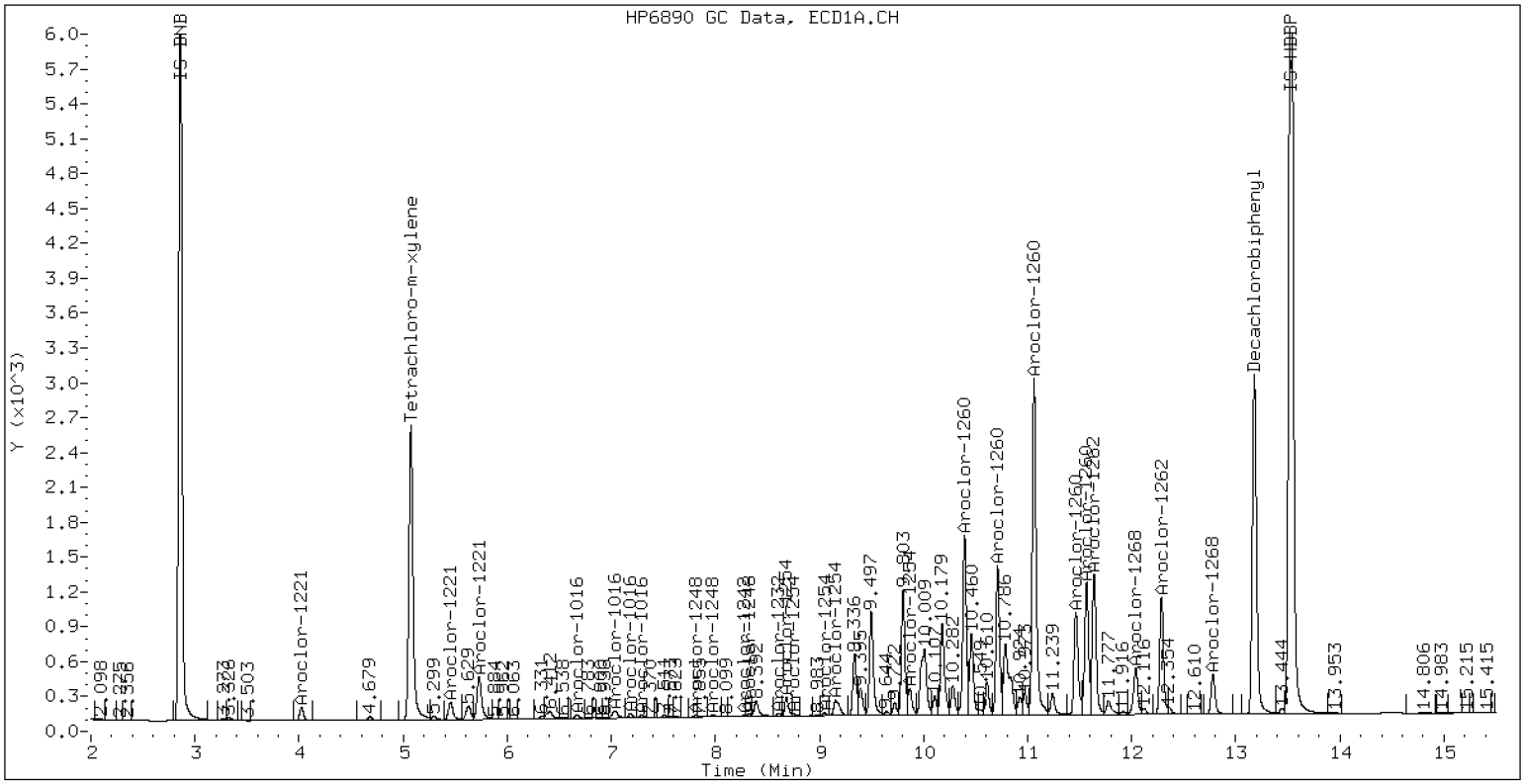
Total PCB Area Col2 (5.174 - 13.076) = 3437225 Col2 Total PCB = 0.4 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

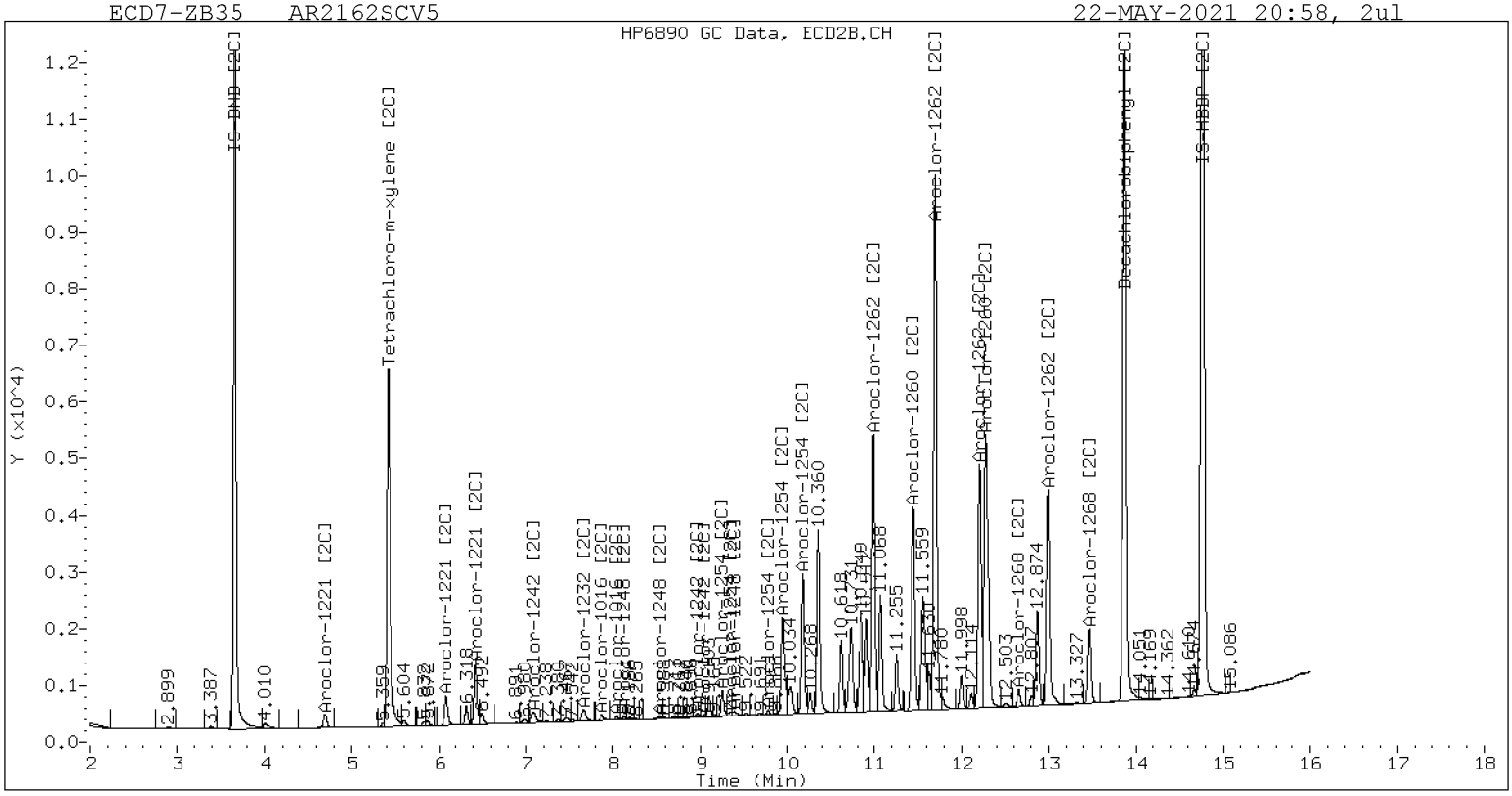
PCB Dual Column Chromatograms

ECD7-ZB5 AR2162SCV5 22-MAY-2021 20:58, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR2162SCV5 22-MAY-2021 20:58, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE
CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	05222122ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJE0321	Injection Date:	05/22/21
Lab Sample ID:	SJE0321-SCV6	Injection Time:	21:20
Sequence Name:	AR3268SCV6		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1232	A	250.00	243	0.0183750	0.0178302		-2.7	+/-20
Aroclor 1232 [2C]	A	250.00	242	0.0179713	0.0176767		-3.3	+/-20
Aroclor 1268	A	250.00	204	0.1782065	0.1458640		-18.5	+/-20
Aroclor 1268 [2C]	A	250.00	206	0.3567300	0.2930884		-17.7	+/-20
Decachlorobiphenyl	A	40.000	59.7	0.7132713	1.0643120		49.2	+/-20
Tetrachlorometaxylene	A	40.000	41.8	0.9552374	0.9985686		4.5	+/-20
Decachlorobiphenyl [2C]	A	40.000	61.1	1.4343710	2.1894990		52.6	+/-20
Tetrachlorometaxylene [2C]	A	40.000	40.5	0.9862409	0.9976669		1.2	+/-20

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210522.b/05222122ECD7.D
Data file 2: /210522.b/210522.b/05222122ECD7.D
Method: \\target\share\chem4\ecd7.i\210522.b\PCB.m
Compound Sublist: PCB.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR3268SCV6
Client ID:
Injection Date: 22-MAY-2021 21:20
Report Date: 05/25/2021 08:47
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.074	-0.000	148239	5.424	-0.000	355344	41.8	40.5	3.3	Tetrachloro-m-xylene
13.178	0.002	255056	13.875	0.005	1001977	59.7	61.1	2.3	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	296903	0.2
Hexabromobiphenyl	470266	479288	1.9

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	712350	0.0
Hexabromobiphenyl	867949	915257	5.5

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1016	1	6.666	0.001	10346	112.3	1	7.071	-0.000	45781	124.8
Aroclor-1016	2	7.034	0.000	34585	111.3	2	7.661	0.001	91604	113.5
Aroclor-1016	3	7.182	0.001	14354	113.7	3	7.870	0.002	34691	114.8
Aroclor-1016	4	7.291	0.002	9485	112.5	4	8.041	0.002	21844	118.1
Total Col1Ave (4 peaks):					112.4	Total Col2Ave (4 peaks):				117.8 RPD = 5
Corrected Ave (3 peaks):					112.0	Corrected Ave (3 peaks):				115.4 RPD = 3
Aroclor-1221	1	4.022	0.000	3391	154.4	1	4.692	-0.000	7248	156.3
Aroclor-1221	2	5.456	0.000	5464	145.2	2	6.086	0.002	18148	166.7
Aroclor-1221	3	5.730	0.000	18154	190.3	3	6.422	0.001	40400	201.3
Total Col1Ave (3 peaks):					163.3	Total Col2Ave (3 peaks):				174.8 RPD = 7
Corrected Ave: < 3 Peaks						Corrected Ave: < 3 Peaks				
Aroclor-1232	1	4.022	0.002	3391	252.9	1	4.692	0.001	7248	247.2
Aroclor-1232	2	5.730	0.001	18154	222.9	2	6.086	0.001	18148	231.2
Aroclor-1232	3	7.034	0.001	34585	252.7	3	6.422	-0.000	40400	234.8
Aroclor-1232	4	8.615	0.000	10043	244.4	4	7.661	-0.001	91604	254.3
Total Col1Ave (4 peaks):					243.2	Total Col2Ave (4 peaks):				241.9 RPD = 1
Corrected Ave (3 peaks):					240.0	Corrected Ave (3 peaks):				237.7 RPD = 1
Aroclor-1242	1	6.666	0.001	10346	126.2	1	7.071	-0.000	45781	144.8
Aroclor-1242	2	7.034	0.000	34585	129.9	2	7.661	0.001	91604	133.9
Aroclor-1242	3	8.278	0.006	4145	113.2	3	8.962	0.004	38109	123.2
Aroclor-1242	4	8.615	0.004	10043	122.8	4	9.041	0.004	32198	118.4
Total Col1Ave (4 peaks):					123.0	Total Col2Ave (4 peaks):				130.1 RPD = 6
Corrected Ave (3 peaks):					120.8	Corrected Ave (3 peaks):				125.2 RPD = 4
Aroclor-1248	1	7.808	0.001	9089	73.4	1	8.121	-0.001	18506	71.3
Aroclor-1248	2	7.975	0.002	12739	82.9	2	8.536	0.000	29545	83.7
Aroclor-1248	3	8.325	0.003	10258	66.7	3	8.962	0.001	38109	75.0
Aroclor-1248	4	8.615	0.002	10043	73.8	4	9.391	0.001	44833	82.7
Total Col1Ave (4 peaks):					74.2	Total Col2Ave (4 peaks):				78.1 RPD = 5
Corrected Ave (3 peaks):					71.3	Corrected Ave (3 peaks):				76.3 RPD = 7
Aroclor-1254	1	8.682	0.000	4617	18.4	1	9.256	0.000	10462	19.4
Aroclor-1254	2	8.753	0.000	1862	20.4	2	9.391	0.044	44833	141.0
Aroclor-1254	3	9.051	0.002	1704	11.1	3	9.781	0.001	6029	14.9
Aroclor-1254	4	9.187	0.004	3103	10.2	4	9.932	0.003	13664	15.1
Aroclor-1254	5	9.883	0.007	2229	10.9	5	10.162	0.002	13230	13.7
Total Col1Ave (5 peaks):					14.2	Total Col2Ave (5 peaks):				40.8 RPD = 97*
Corrected Ave (4 peaks):					12.6	Corrected Ave (4 peaks):				15.8 RPD = 22
Aroclor-1260	1	10.395	0.004	30116	171.4	1	11.426	-0.020	123255	215.9
Aroclor-1260	2	10.713	0.002	2096	11.6	2	11.698	0.001	56961	38.3
Aroclor-1260	3	11.062	0.002	16373	34.6	3	12.275	-0.005	585373	604.6
Aroclor-1260	4	11.463	0.003	591	2.5	4	12.993	0.001	214119	514.5
Aroclor-1260	5	11.567	0.003	163395	1757.1	NS	---			----
Total Col1Ave (5 peaks):					395.4	Total Col2Ave (4 peaks):				343.3 RPD = 14
Corrected Ave (4 peaks):					55.0	Corrected Ave (3 peaks):				256.2 RPD = 129*
Aroclor-1262	1	10.395	0.001	30116	99.9	1	10.988	-0.001	87691	95.4
Aroclor-1262	2	11.463	0.000	591	3.0	2	11.698	-0.002	56961	31.3
Aroclor-1262	3	11.636	-0.003	164716	628.0	3	12.209	0.000	570399	654.1
Aroclor-1262	4	12.286	-0.001	66330	319.9	4	12.993	0.000	214119	270.7
Total Col1Ave (4 peaks):					262.7	Total Col2Ave (4 peaks):				262.9 RPD = 0
Corrected Ave (3 peaks):					140.9	Corrected Ave (3 peaks):				132.5 RPD = 6
Aroclor-1268	1	11.567	0.000	163395	203.0	1	12.209	0.001	570399	214.5
Aroclor-1268	2	11.636	-0.001	164716	202.0	2	12.275	0.000	585373	202.0
Aroclor-1268	3	12.012	0.001	130565	203.8	3	12.658	-0.001	514356	202.2
Aroclor-1268	4	12.781	0.000	415210	206.6	4	13.474	0.002	1683012	204.7
Total Col1Ave (4 peaks):					203.9	Total Col2Ave (4 peaks):				205.8 RPD = 1

Corrected Ave (3 peaks): 202.9 Corrected Ave (3 peaks): 202.9 RPD = 0

Total PCB Area Col1 (5.174 - 13.076) = 1390907 Col1 Total PCB = 0.5 ppm*

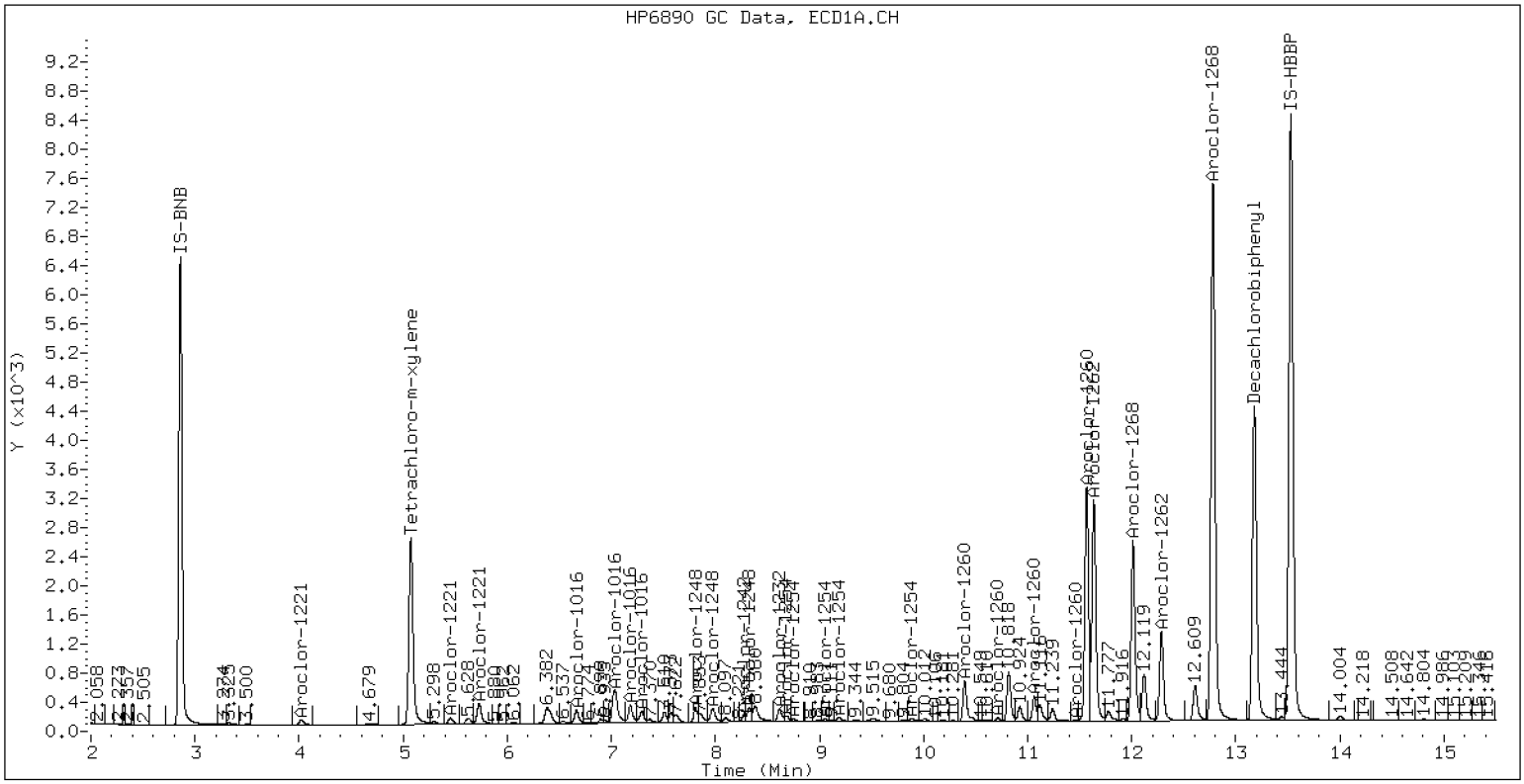
Total PCB Area Col2 (5.174 - 13.076) = 3445589 Col2 Total PCB = 0.4 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

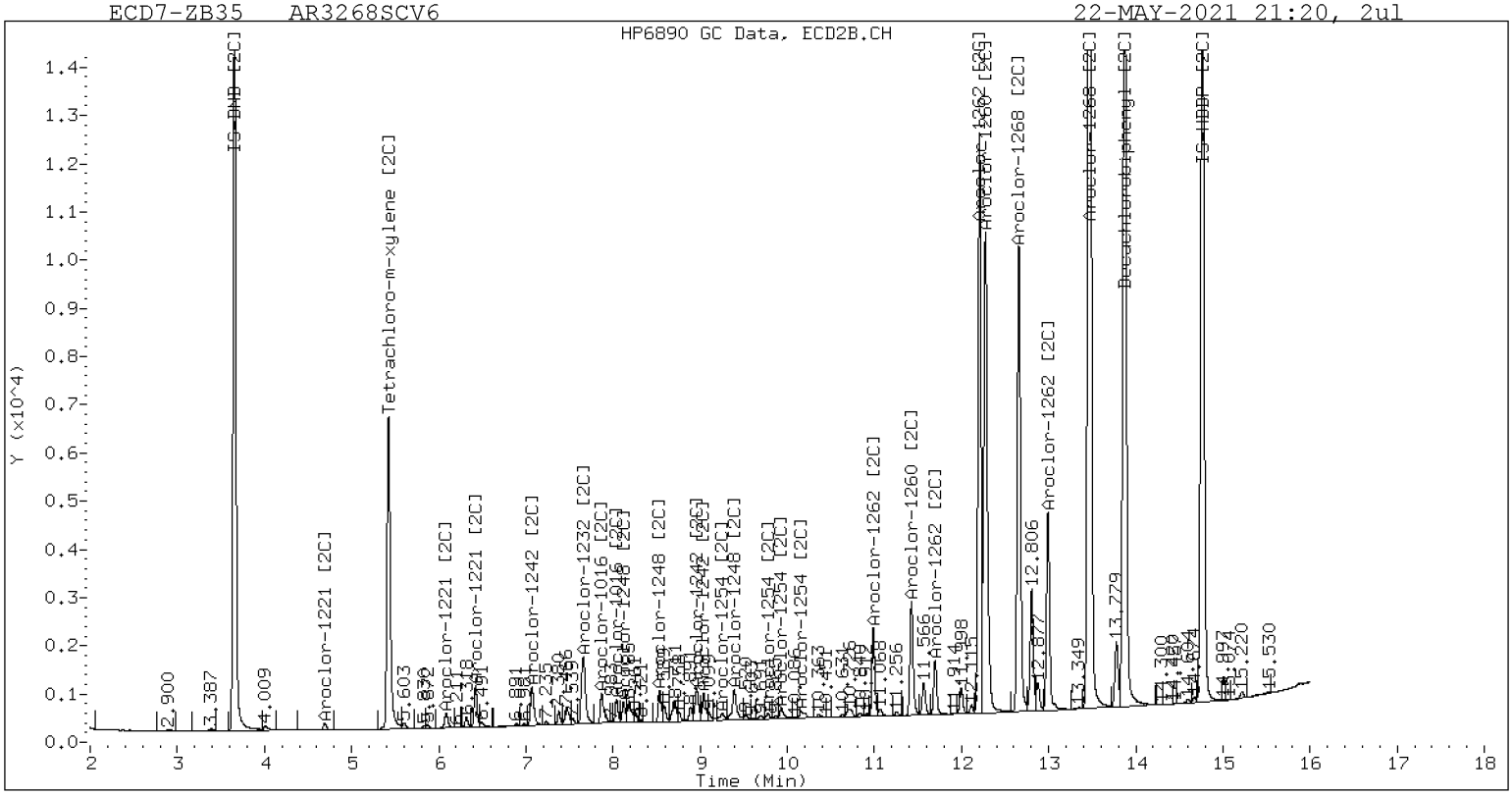
PCB Dual Column Chromatograms

ECD7-ZB5 AR3268SCV6 22-MAY-2021 21:20, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR3268SCV6 22-MAY-2021 21:20, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08122111ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0190	Injection Date:	08/12/21
Lab Sample ID:	SJH0190-CCV1	Injection Time:	16:13
Sequence Name:	AR1248CCV1		

COMPOUND	TYPE	CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
		STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1248	A	250.00	249	0.0382260	0.0381994		-0.4	+/-20
Aroclor-1248 (1)	A	250.00	264		0.0352700			
Aroclor-1248 (2)	A	250.00	277		0.0458503			
Aroclor-1248 (3)	A	250.00	256		0.0425506			
Aroclor-1248 (4)	A	250.00	199		0.0291265			
Aroclor 1248 [2C]	A	250.00	264	0.0467028	0.0484309		5.6	+/-20
Aroclor-1248 (1) [2C]	A	250.00	301		0.0350818			
Aroclor-1248 (2) [2C]	A	250.00	247		0.0392455			
Aroclor-1248 (3) [2C]	A	250.00	282		0.0643347			
Aroclor-1248 (4) [2C]	A	250.00	226		0.0550618			
Decachlorobiphenyl	A	40.000	44.1	0.7132713	0.7870302		10.3	+/-20
Tetrachlorometaxylene	A	40.000	42.0	0.9552374	1.0043470		5.0	+/-20
Decachlorobiphenyl [2C]	A	40.000	49.0	1.4343710	1.7565040		22.5	+/-20 *
Tetrachlorometaxylene [2C]	A	40.000	41.8	0.9862409	1.0320260		4.5	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210812.b/08122111ECD7.D
Data file 2: /210812.b/210812.b/08122111ECD7.D
Method: \\target\share\chem4\ecd7.i\210812.b\PCB.m
Compound Sublist: AR1248.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1248CCV1
Client ID:
Injection Date: 12-AUG-2021 16:13
Report Date: 08/16/2021 13:21
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.069	0.000	111375	5.413	0.000	319406	42.1	41.9	0.5	Tetrachloro-m-xylene
13.163	-0.001	119337	13.845	-0.001	564182	44.1	49.0	10.4	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	221786	-25.2
Hexabromobiphenyl	470266	303259	-35.5

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	618988	-13.1
Hexabromobiphenyl	867949	642392	-26.0

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
		ZB5 Col					ZB35 Col			
Aroclor-1248	1	7.800	0.000	24445	264.1	1	8.105	0.000	67860	300.7
Aroclor-1248	2	7.969	0.000	31778	276.8	2	8.520	0.000	75914	247.4
Aroclor-1248	3	8.320	0.000	29491	256.6	3	8.949	0.000	124445	281.7
Aroclor-1248	4	8.608	0.000	20187	198.6	4	9.378	0.000	106508	226.1

Total Col1Ave (4 peaks): 249.0 Total Col2Ave (4 peaks): 264.0 RPD = 6

Corrected Ave (3 peaks): 239.8 Corrected Ave (3 peaks): 251.7 RPD = 5

CalAmt %D: -0.4 CalAmt %D: 5.6

Total PCB Area Col1 (5.168 - 13.064) = 528300 Col1 Total PCB = 0.3 ppm*

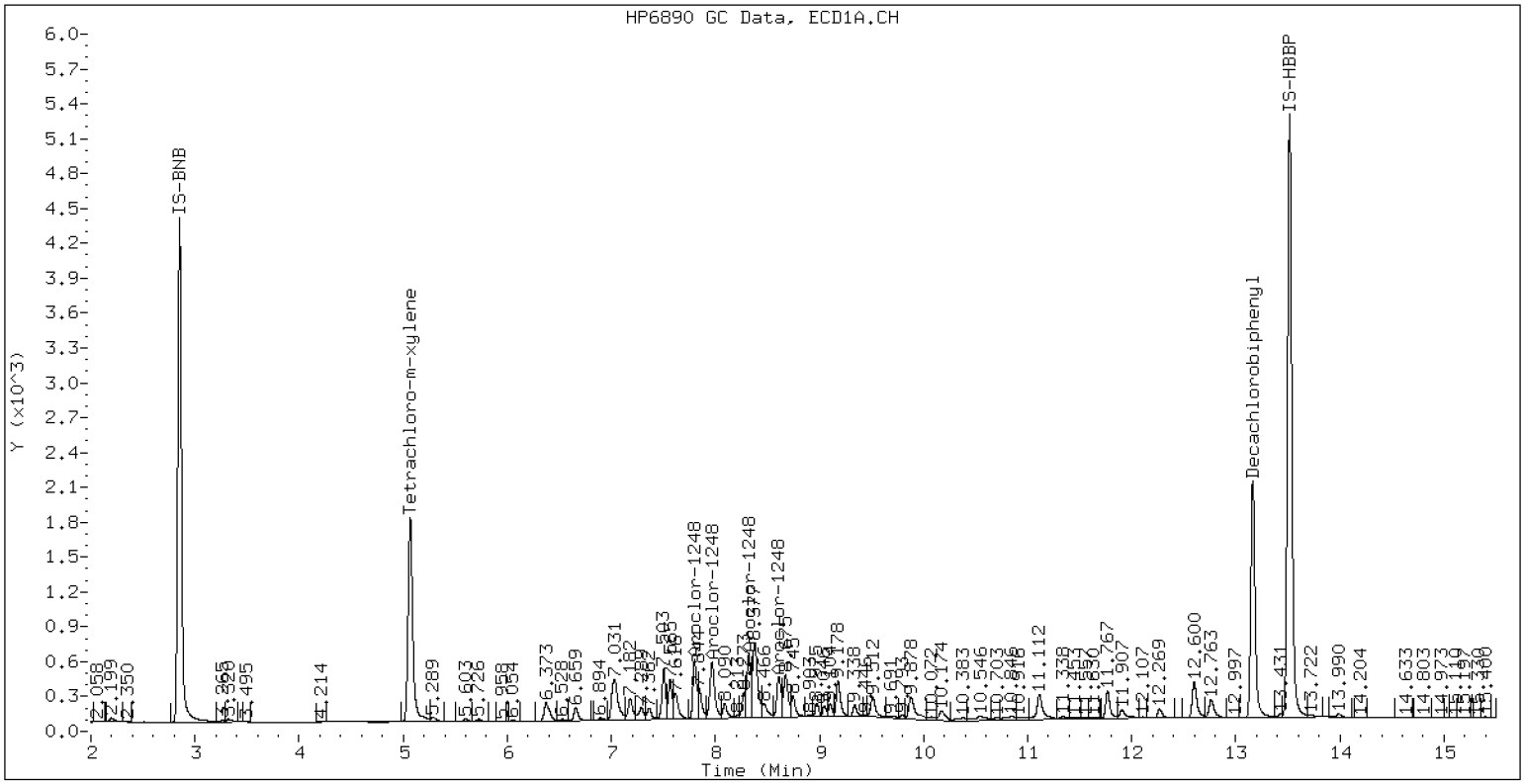
Total PCB Area Col2 (5.168 - 13.064) = 1917718 Col2 Total PCB = 0.3 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

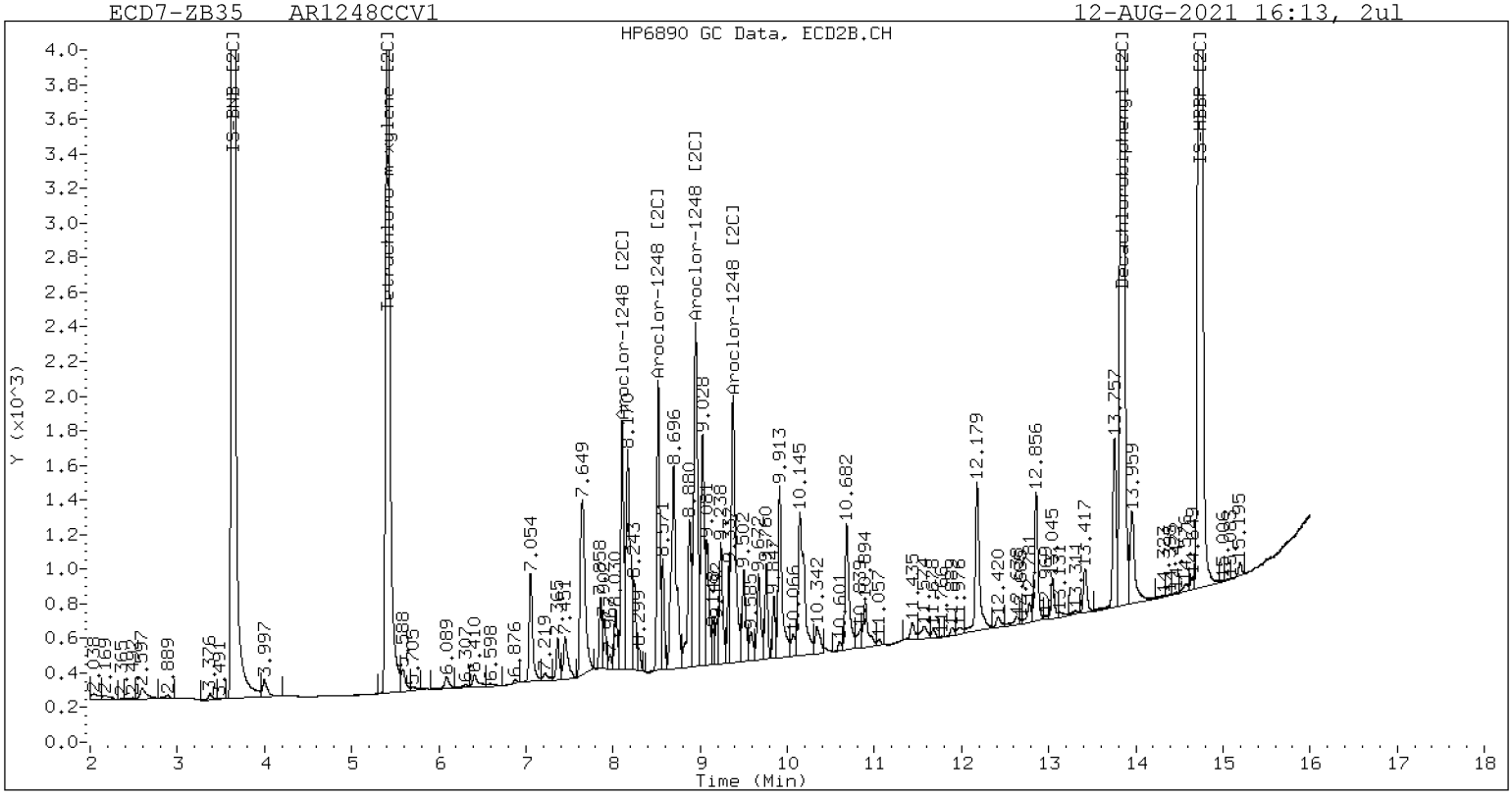
PCB Dual Column Chromatograms

ECD7-ZB5 AR1248CCV1 12-AUG-2021 16:13, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1248CCV1 12-AUG-2021 16:13, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08122112ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0190	Injection Date:	08/12/21
Lab Sample ID:	SJH0190-CCV2	Injection Time:	16:34
Sequence Name:	AR1660CCV2		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1016	A	250.00	279	0.0413247	0.0455734		11.5	+/-20
Aroclor-1016 (1)	A	250.00	290	0.0248166	0.0287956		16.0	
Aroclor-1016 (2)	A	250.00	268	0.0837401	0.0898637		7.2	
Aroclor-1016 (3)	A	250.00	289	0.0340179	0.0393016		15.6	
Aroclor-1016 (4)	A	250.00	268	0.0227243	0.0243327		7.2	
Aroclor 1016 [2C]	A	250.00	267	0.0466427	0.0475937		6.8	+/-20
Aroclor-1016 (1) [2C]	A	250.00	280	0.0412076	0.0461849		12.0	
Aroclor-1016 (2) [2C]	A	250.00	230	0.0906438	0.0833090		-8.0	
Aroclor-1016 (3) [2C]	A	250.00	276	0.0339420	0.0374689		10.4	
Aroclor-1016 (4) [2C]	A	250.00	282	0.0207774	0.0234120		12.8	
Aroclor 1260	A	250.00	278	0.0388495	0.0433926		11.3	+/-20
Aroclor-1260 (1)	A	250.00	252	0.0293254	0.0295866		0.8	
Aroclor-1260 (2)	A	250.00	281	0.0301531	0.0338965		12.4	
Aroclor-1260 (3)	A	250.00	284	0.0789877	0.0895943		13.6	
Aroclor-1260 (4)	A	250.00	286	0.0402598	0.0460166		14.4	
Aroclor-1260 (5)	A	250.00	288	0.0155216	0.0178691		15.2	
Aroclor 1260 [2C]	A	250.00	257	0.0752611	0.0743628		2.7	+/-20
Aroclor-1260 (1) [2C]	A	250.00	290	0.0498903	0.0579659		16.0	
Aroclor-1260 (2) [2C]	A	250.00	226	0.1301480	0.1177852		-9.6	
Aroclor-1260 (3) [2C]	A	250.00	245	0.0846293	0.0829366		-2.0	
Aroclor-1260 (4) [2C]	A	250.00	266	0.0363769	0.0387634		6.4	
Decachlorobiphenyl	A	40.000	43.7	0.7132713	0.7792309		9.3	+/-20
Tetrachlorometaxylene	A	40.000	43.9	0.9552374	1.0489120		9.8	+/-20
Decachlorobiphenyl [2C]	A	40.000	48.0	1.4343710	1.7201590		20.0	+/-20
Tetrachlorometaxylene [2C]	A	40.000	43.4	0.9862409	1.0693780		8.5	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210812.b/08122112ECD7.D
Data file 2: /210812.b/210812.b/08122112ECD7.D
Method: \\target\share\chem4\ecd7.i\210812.b\PCB.m
Compound Sublist: AR1660.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1660CCV2
Client ID:
Injection Date: 12-AUG-2021 16:34
Report Date: 08/16/2021 13:21
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.068	-0.001	100781	5.412	-0.000	284861	43.9	43.4	1.3	Tetrachloro-m-xylene
13.163	-0.002	119820	13.845	-0.001	557446	43.7	48.0	9.3	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	192163	-35.2
Hexabromobiphenyl	470266	307534	-34.6

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	532760	-25.2
Hexabromobiphenyl	867949	648133	-25.3

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT (ZB5 Col)	Shift	Area	Amount	Peak#	RT (ZB35 Col)	Shift	Area	Amount
Aroclor-1016	1	6.658	-0.001	17292	290.1	1	7.056	0.000	76892	280.2
Aroclor-1016	2	7.032	-0.000	53964	268.3	2	7.650	-0.001	138699	229.8
Aroclor-1016	3	7.178	-0.000	23601	288.8	3	7.856	-0.001	62381	276.0
Aroclor-1016	4	7.287	-0.000	14612	267.7	4	8.028	-0.001	38978	281.7
Total Col1Ave (4 peaks):				278.7		Total Col2Ave (4 peaks):			266.9	RPD = 4
Corrected Ave (3 peaks):				274.9		Corrected Ave (3 peaks):			262.0	RPD = 5
CalAmt %D:				11.5		CalAmt %D:			6.8	
Aroclor-1260	1	10.383	0.001	28434	252.2	1	11.424	-0.001	117405	290.5
Aroclor-1260	2	10.700	0.000	32576	281.0	2	11.677	0.001	238564	226.3
Aroclor-1260	3	11.050	-0.000	86104	283.6	3	12.260	0.000	167981	245.0
Aroclor-1260	4	11.451	-0.000	44224	285.7	4	12.970	-0.000	78512	266.4
Aroclor-1260	5	11.554	0.000	17173	287.8	NS	---			----
Total Col1Ave (5 peaks):				278.1		Total Col2Ave (4 peaks):			257.0	RPD = 8
Corrected Ave (4 peaks):				275.6		Corrected Ave (3 peaks):			245.9	RPD = 11
CalAmt %D:				11.2		CalAmt %D:			2.8	

Total PCB Area Col1 (5.168 - 13.064) = 926952 Col1 Total PCB = 0.5 ppm*

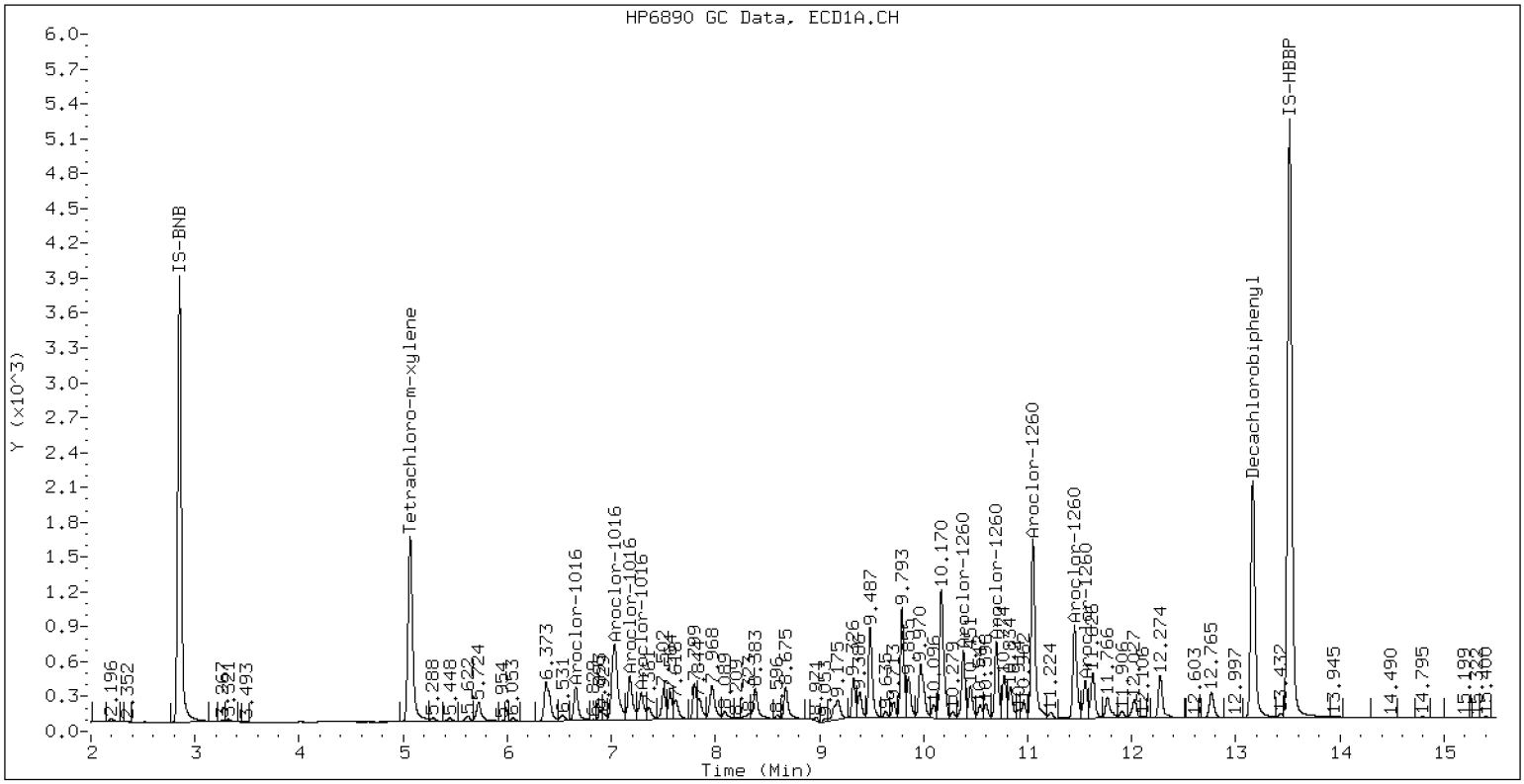
Total PCB Area Col2 (5.168 - 13.064) = 3147944 Col2 Total PCB = 0.5 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

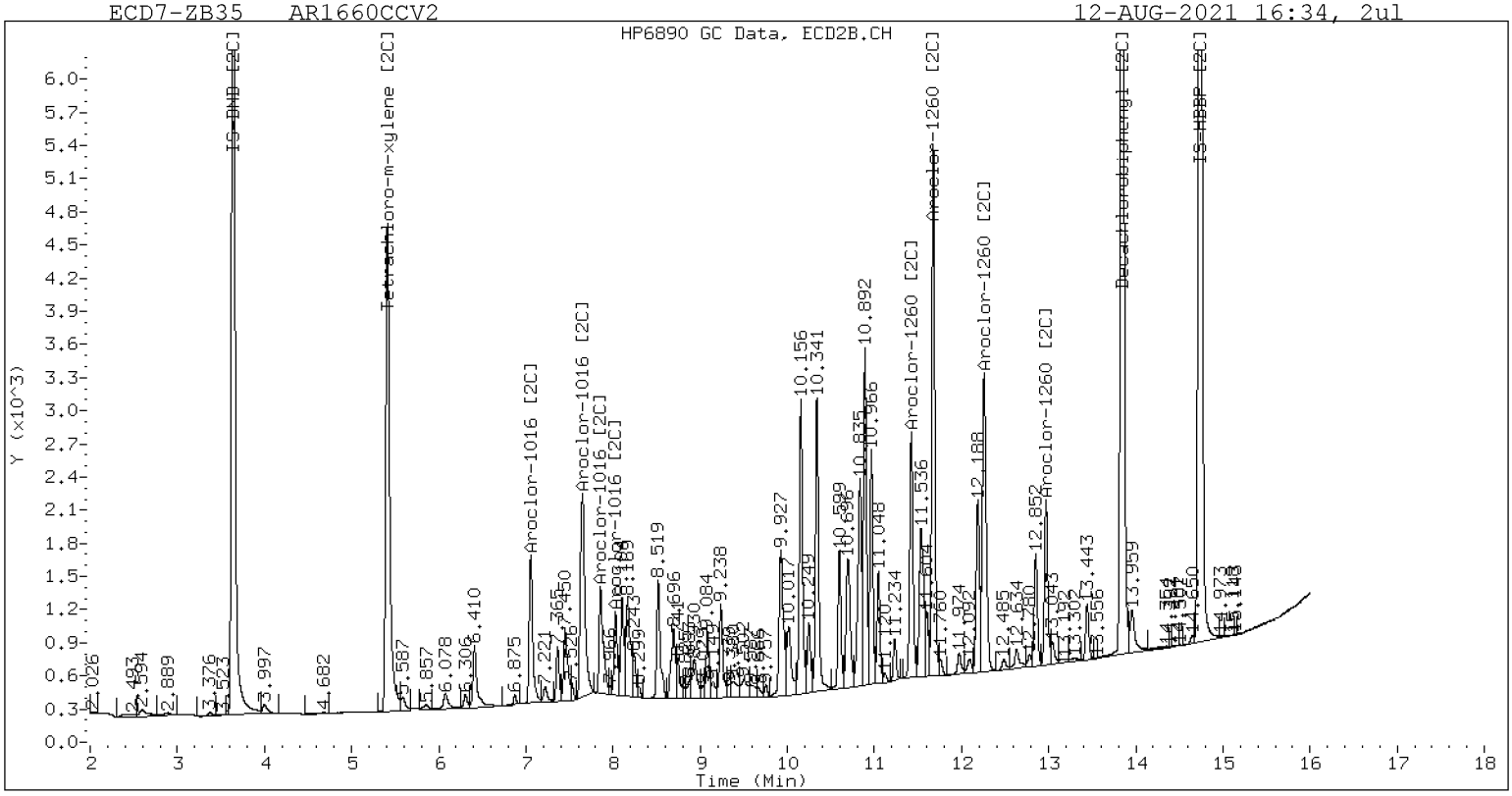
PCB Dual Column Chromatograms

ECD7-ZB5 AR1660CCV2 12-AUG-2021 16:34, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1660CCV2 12-AUG-2021 16:34, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08122120ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0190	Injection Date:	08/12/21
Lab Sample ID:	SJH0190-CCV3	Injection Time:	19:18
Sequence Name:	AR1242CCV3		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1242	A	250.00	239	0.0314312	0.0320832		-4.6	+/-20
Aroclor-1242 (1)	A	250.00	283		0.0250342			
Aroclor-1242 (2)	A	250.00	267		0.0765539			
Aroclor-1242 (3)	A	250.00	182		0.0071721			
Aroclor-1242 (4)	A	250.00	222		0.0195726			
Aroclor 1242 [2C]	A	250.00	278	0.0444064	0.0478003		11.0	+/-20
Aroclor-1242 (1) [2C]	A	250.00	286		0.0405975			
Aroclor-1242 (2) [2C]	A	250.00	243		0.0747216			
Aroclor-1242 (3) [2C]	A	250.00	288		0.0400577			
Aroclor-1242 (4) [2C]	A	250.00	293		0.0358244			
Decachlorobiphenyl	A	40.000	47.7	0.7132713	0.8499958		19.3	+/-20
Tetrachlorometaxylene	A	40.000	45.6	0.9552374	1.0896660		14.0	+/-20
Decachlorobiphenyl [2C]	A	40.000	54.8	1.4343710	1.9669700		37.0	+/-20 *
Tetrachlorometaxylene [2C]	A	40.000	45.1	0.9862409	1.1131750		12.8	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210812.b/08122120ECD7.D
Data file 2: /210812.b/210812.b/08122120ECD7.D
Method: \\target\share\chem4\ecd7.i\210812.b\PCB.m
Compound Sublist: AR1242.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1242CCV3
Client ID:
Injection Date: 12-AUG-2021 19:18
Report Date: 08/16/2021 13:21
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.069	0.001	113644	5.414	0.001	325686	45.6	45.1	1.1	Tetrachloro-m-xylene
13.164	-0.001	135851	13.847	0.001	684530	47.7	54.9	14.0	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	208585	-29.6
Hexabromobiphenyl	470266	319651	-32.0

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	585148	-17.8
Hexabromobiphenyl	867949	696025	-19.8

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
		ZB5 Col					ZB35 Col			
Aroclor-1242	1	6.660	0.000	16318	283.3	1	7.057	0.000	74236	285.8
Aroclor-1242	2	7.032	0.000	49900	266.8	2	7.651	0.000	136635	243.1
Aroclor-1242	3	8.275	0.000	4675	181.8	3	8.949	0.000	73249	288.3
Aroclor-1242	4	8.613	0.000	12758	222.1	4	9.030	0.000	65508	293.2

Total Col1Ave (4 peaks): 238.5 Total Col2Ave (4 peaks): 277.6 RPD = 15

Corrected Ave (3 peaks): 223.6 Corrected Ave (3 peaks): 272.4 RPD = 20

CalAmt %D: -4.6 CalAmt %D: 11.0

Total PCB Area Col1 (5.168 - 13.064) = 399339 Col1 Total PCB = 0.2 ppm*

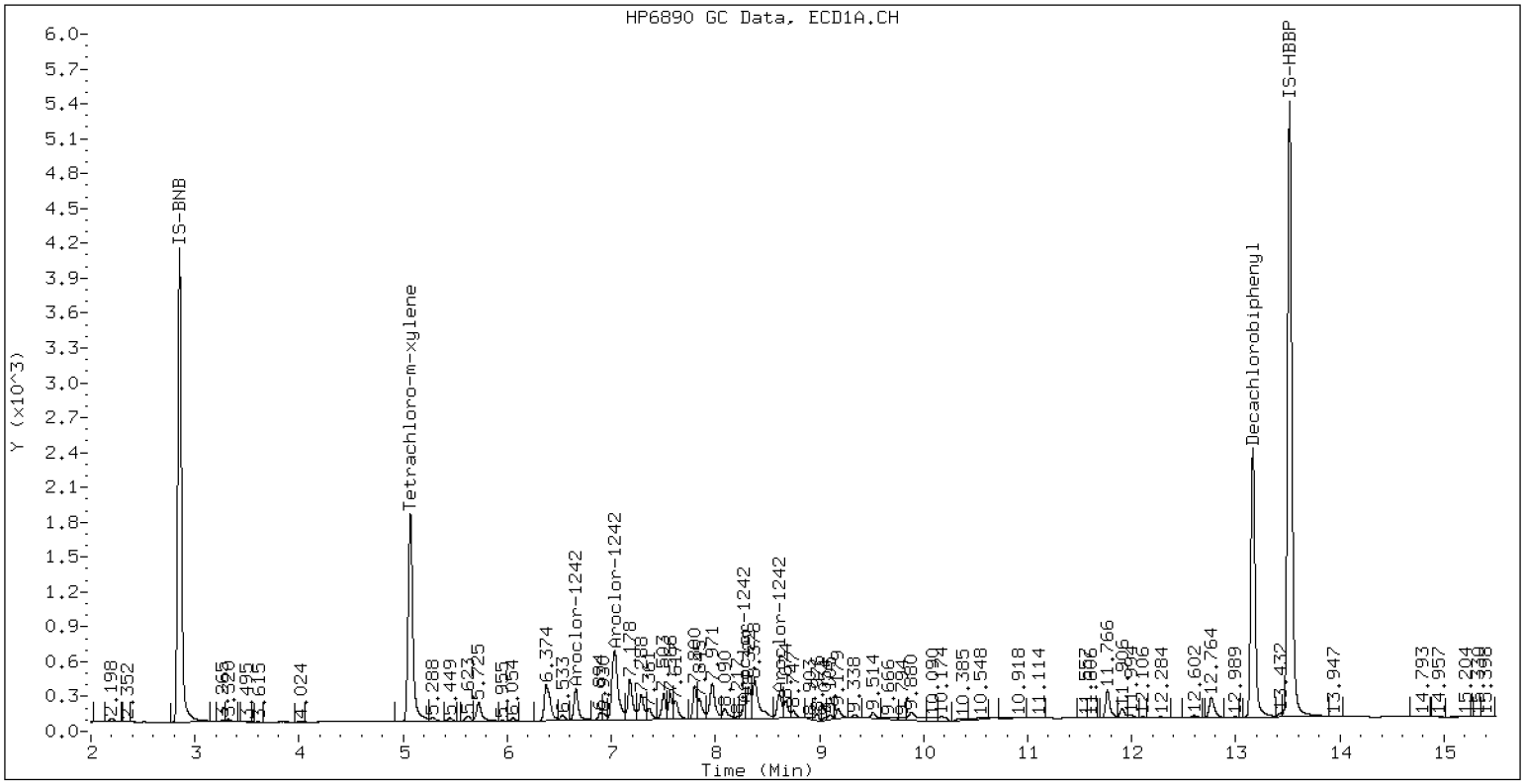
Total PCB Area Col2 (5.168 - 13.064) = 1624107 Col2 Total PCB = 0.3 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

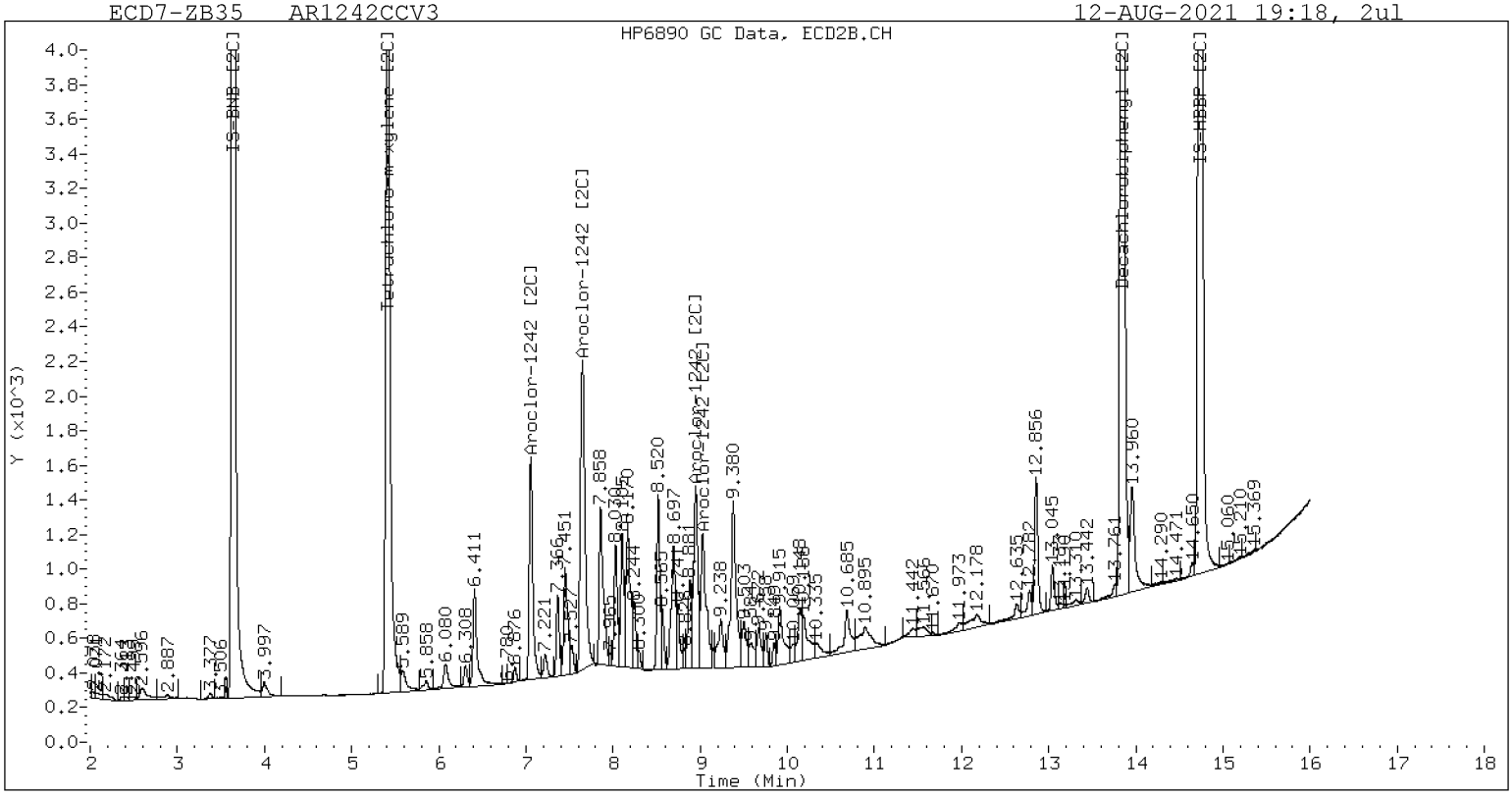
PCB Dual Column Chromatograms

ECD7-ZB5 AR1242CCV3 12-AUG-2021 19:18, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1242CCV3 12-AUG-2021 19:18, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08122121ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0190	Injection Date:	08/12/21
Lab Sample ID:	SJH0190-CCV4	Injection Time:	19:39
Sequence Name:	AR1660CCV4		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1016	A	250.00	274	0.0413247	0.0447668		9.7	+/-20
Aroclor-1016 (1)	A	250.00	286	0.0248166	0.0283915		14.4	
Aroclor-1016 (2)	A	250.00	263	0.0837401	0.0881088		5.2	
Aroclor-1016 (3)	A	250.00	283	0.0340179	0.0384891		13.2	
Aroclor-1016 (4)	A	250.00	265	0.0227243	0.0240779		6.0	
Aroclor 1016 [2C]	A	250.00	265	0.0466427	0.0472701		5.9	+/-20
Aroclor-1016 (1) [2C]	A	250.00	279	0.0412076	0.0460058		11.6	
Aroclor-1016 (2) [2C]	A	250.00	228	0.0906438	0.0828048		-8.8	
Aroclor-1016 (3) [2C]	A	250.00	273	0.0339420	0.0371069		9.2	
Aroclor-1016 (4) [2C]	A	250.00	279	0.0207774	0.0231628		11.6	
Aroclor 1260	A	250.00	268	0.0388495	0.0418800		7.4	+/-20
Aroclor-1260 (1)	A	250.00	240	0.0293254	0.0282104		-4.0	
Aroclor-1260 (2)	A	250.00	270	0.0301531	0.0325576		8.0	
Aroclor-1260 (3)	A	250.00	274	0.0789877	0.0865456		9.6	
Aroclor-1260 (4)	A	250.00	278	0.0402598	0.0446900		11.2	
Aroclor-1260 (5)	A	250.00	280	0.0155216	0.0173966		12.0	
Aroclor 1260 [2C]	A	250.00	246	0.0752611	0.0708308		-1.8	+/-20
Aroclor-1260 (1) [2C]	A	250.00	276	0.0498903	0.0550812		10.4	
Aroclor-1260 (2) [2C]	A	250.00	214	0.1301480	0.1111704		-14.4	
Aroclor-1260 (3) [2C]	A	250.00	236	0.0846293	0.0798533		-5.6	
Aroclor-1260 (4) [2C]	A	250.00	256	0.0363769	0.0372183		2.4	
Decachlorobiphenyl	A	40.000	43.7	0.7132713	0.7791942		9.3	+/-20
Tetrachlorometaxylene	A	40.000	43.3	0.9552374	1.0343760		8.3	+/-20
Decachlorobiphenyl [2C]	A	40.000	46.9	1.4343710	1.6805090		17.3	+/-20
Tetrachlorometaxylene [2C]	A	40.000	43.1	0.9862409	1.0625340		7.8	+/-20

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210812.b/08122121ECD7.D
Data file 2: /210812.b/210812.b/08122121ECD7.D
Method: \\target\share\chem4\ecd7.i\210812.b\PCB.m
Compound Sublist: AR1660.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1660CCV4
Client ID:
Injection Date: 12-AUG-2021 19:39
Report Date: 08/16/2021 13:21
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.068	0.000	101749	5.412	0.000	288241	43.3	43.1	0.5	Tetrachloro-m-xylene
13.164	0.000	128479	13.846	0.000	609324	43.7	46.9	7.0	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	196735	-33.6
Hexabromobiphenyl	470266	329774	-29.9

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	542554	-23.8
Hexabromobiphenyl	867949	725166	-16.5

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT (ZB5 Col)	Shift	Area	Amount	Peak#	RT (ZB35 Col)	Shift	Area	Amount
Aroclor-1016	1	6.659	0.000	17455	286.0	1	7.056	0.000	78002	279.1
Aroclor-1016	2	7.032	0.000	54169	263.0	2	7.651	0.000	140394	228.4
Aroclor-1016	3	7.178	0.000	23663	282.9	3	7.857	0.000	62914	273.3
Aroclor-1016	4	7.288	0.000	14803	264.9	4	8.029	0.000	39272	278.7
Total Col1Ave (4 peaks):				274.2		Total Col2Ave (4 peaks):			264.9	RPD = 3
Corrected Ave (3 peaks):				270.3		Corrected Ave (3 peaks):			260.1	RPD = 4
CalAmt %D:				9.7		CalAmt %D:			6.0	
Aroclor-1260	1	10.382	0.000	29072	240.5	1	11.425	0.000	124822	276.0
Aroclor-1260	2	10.700	0.000	33552	269.9	2	11.676	0.000	251928	213.5
Aroclor-1260	3	11.051	0.000	89189	273.9	3	12.259	0.000	180959	235.9
Aroclor-1260	4	11.451	0.000	46055	277.5	4	12.970	0.000	84342	255.8
Aroclor-1260	5	11.553	0.000	17928	280.2	NS	---			----
Total Col1Ave (5 peaks):				268.4		Total Col2Ave (4 peaks):			245.3	RPD = 9
Corrected Ave (4 peaks):				265.5		Corrected Ave (3 peaks):			235.1	RPD = 12
CalAmt %D:				7.4		CalAmt %D:			-1.9	

Total PCB Area Col1 (5.168 - 13.064) = 949992 Col1 Total PCB = 0.5 ppm*

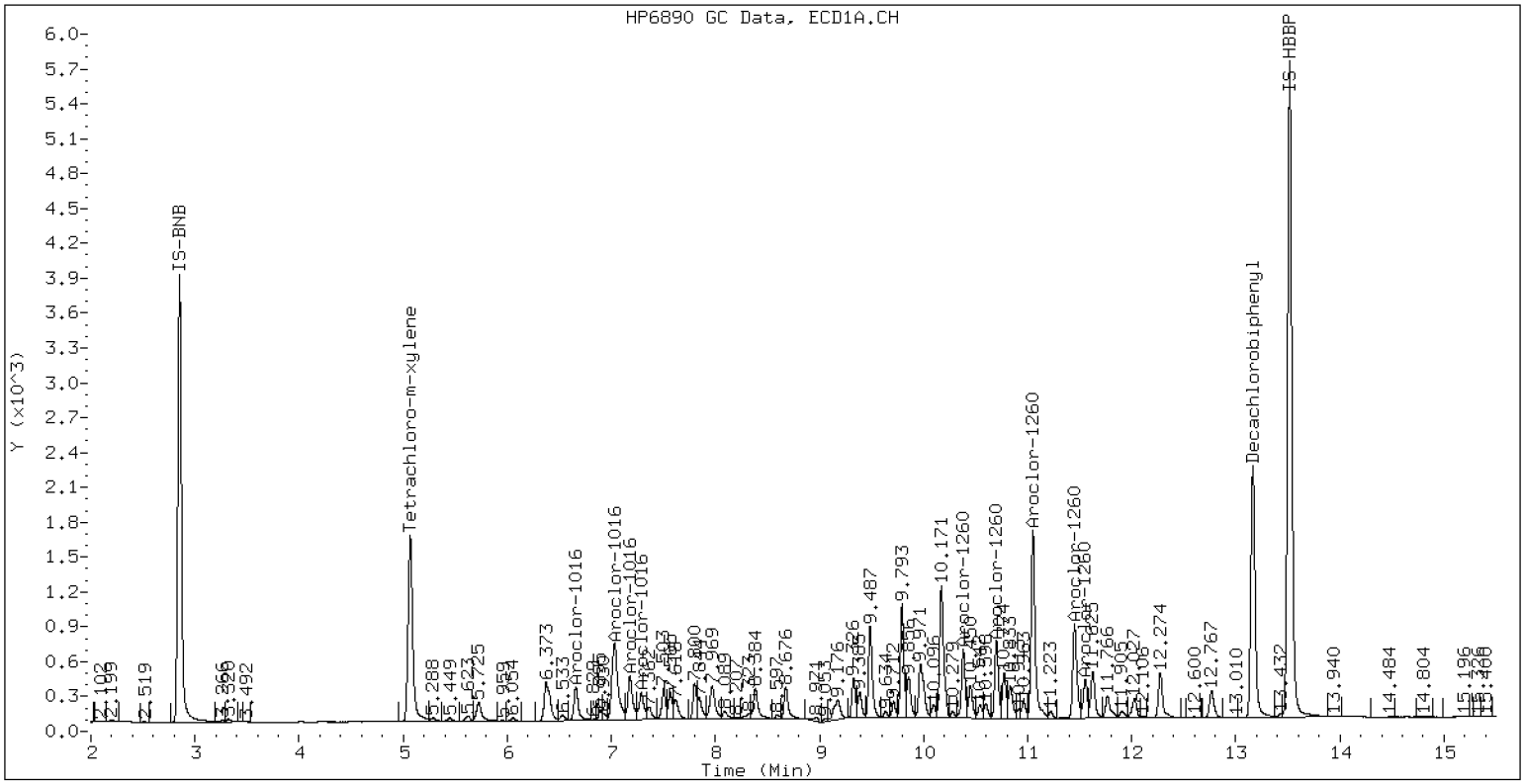
Total PCB Area Col2 (5.168 - 13.064) = 3275046 Col2 Total PCB = 0.6 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

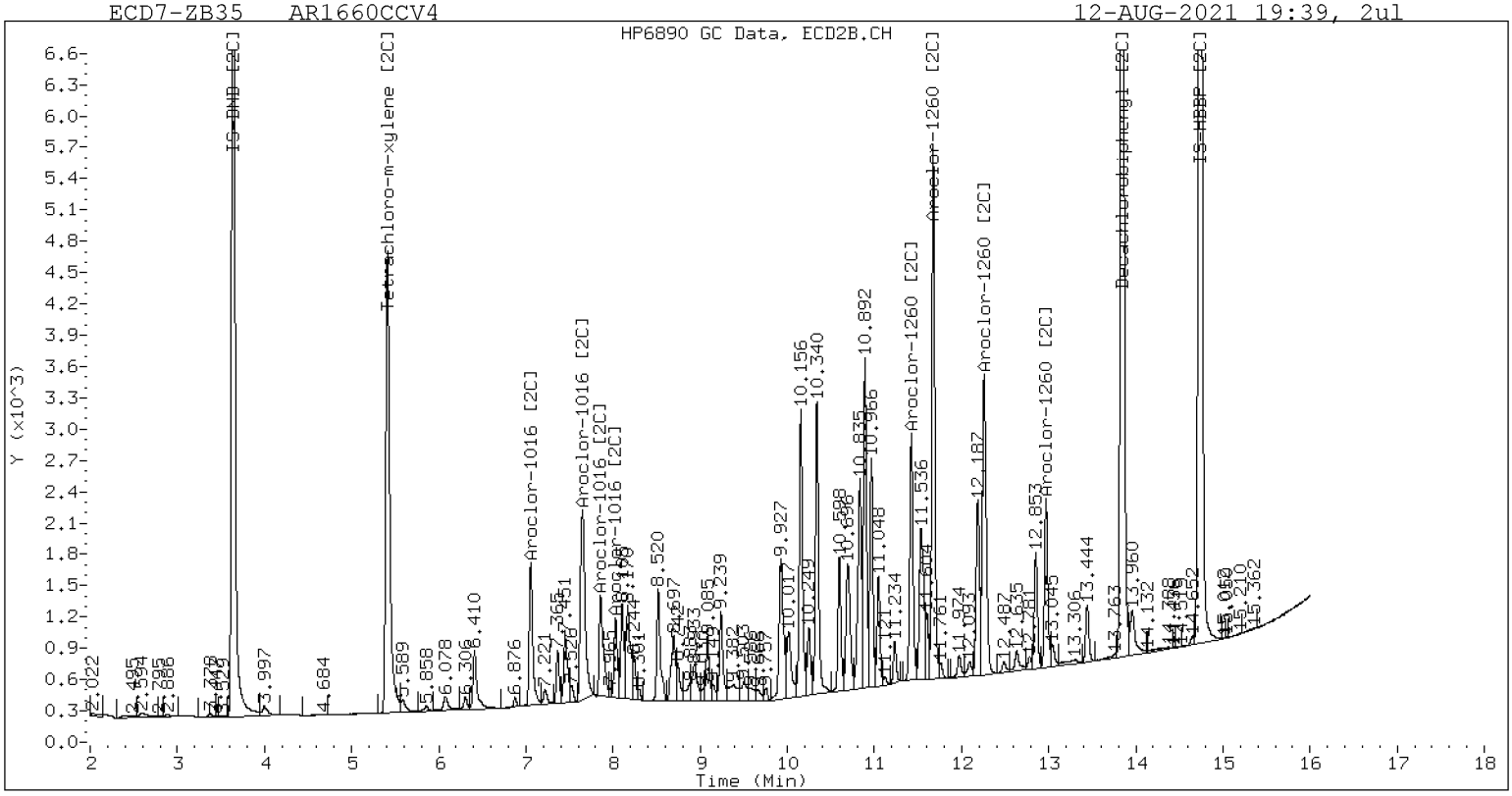
PCB Dual Column Chromatograms

ECD7-ZB5 AR1660CCV4 12-AUG-2021 19:39, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1660CCV4 12-AUG-2021 19:39, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08112131ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0202	Injection Date:	08/12/21
Lab Sample ID:	SJH0202-CCV1	Injection Time:	01:41
Sequence Name:	AR1248CCV1		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1248	A	250.00	246	0.0382260	0.0376767		-1.7	+/-20
Aroclor-1248 (1)	A	250.00	261		0.0348391			
Aroclor-1248 (2)	A	250.00	273		0.0451413			
Aroclor-1248 (3)	A	250.00	251		0.0416739			
Aroclor-1248 (4)	A	250.00	198		0.0290524			
Aroclor 1248 [2C]	A	250.00	290	0.0467028	0.0541909		15.8	+/-20
Aroclor-1248 (1) [2C]	A	250.00	309		0.0360222			
Aroclor-1248 (2) [2C]	A	250.00	254		0.0402900			
Aroclor-1248 (3) [2C]	A	250.00	299		0.0683035			
Aroclor-1248 (4) [2C]	A	250.00	296		0.0721478			
Decachlorobiphenyl	A	40.000	45.3	0.7132713	0.8085904		13.4	+/-20
Tetrachlorometaxylene	A	40.000	41.6	0.9552374	0.9922629		3.9	+/-20
Decachlorobiphenyl [2C]	A	40.000	47.9	1.4343710	1.7187670		19.8	+/-20
Tetrachlorometaxylene [2C]	A	40.000	42.6	0.9862409	1.0512250		6.6	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112131ECD7.D
Data file 2: /210811.b/210811.b/08112131ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: AR1248.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1248CCV7
Client ID:
Injection Date: 12-AUG-2021 01:41
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.068	0.001	109523	5.413	0.001	317335	41.6	42.6	2.6	Tetrachloro-m-xylene
13.163	-0.001	120841	13.845	-0.000	533714	45.3	47.9	5.5	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	220754	-25.5
Hexabromobiphenyl	470266	298893	-36.4

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	603743	-15.2
Hexabromobiphenyl	867949	621043	-28.4

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

	ZB5 Col					ZB35 Col				
Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
Aroclor-1248	1	7.800	0.001	24034	260.9	1	8.105	-0.000	67963	308.8
Aroclor-1248	2	7.968	-0.000	31141	272.6	2	8.520	0.000	76015	254.0
Aroclor-1248	3	8.320	0.002	28749	251.3	3	8.950	0.001	128868	299.1
Aroclor-1248	4	8.609	0.001	20042	198.1	4	9.378	0.000	136121	296.3

Total Col1Ave (4 peaks): 245.7 Total Col2Ave (4 peaks): 289.5 RPD = 16

Corrected Ave (3 peaks): 236.8 Corrected Ave (3 peaks): 283.1 RPD = 18

Total PCB Area Col1 (5.167 - 13.064) = 508607 Col1 Total PCB = 0.3 ppm*

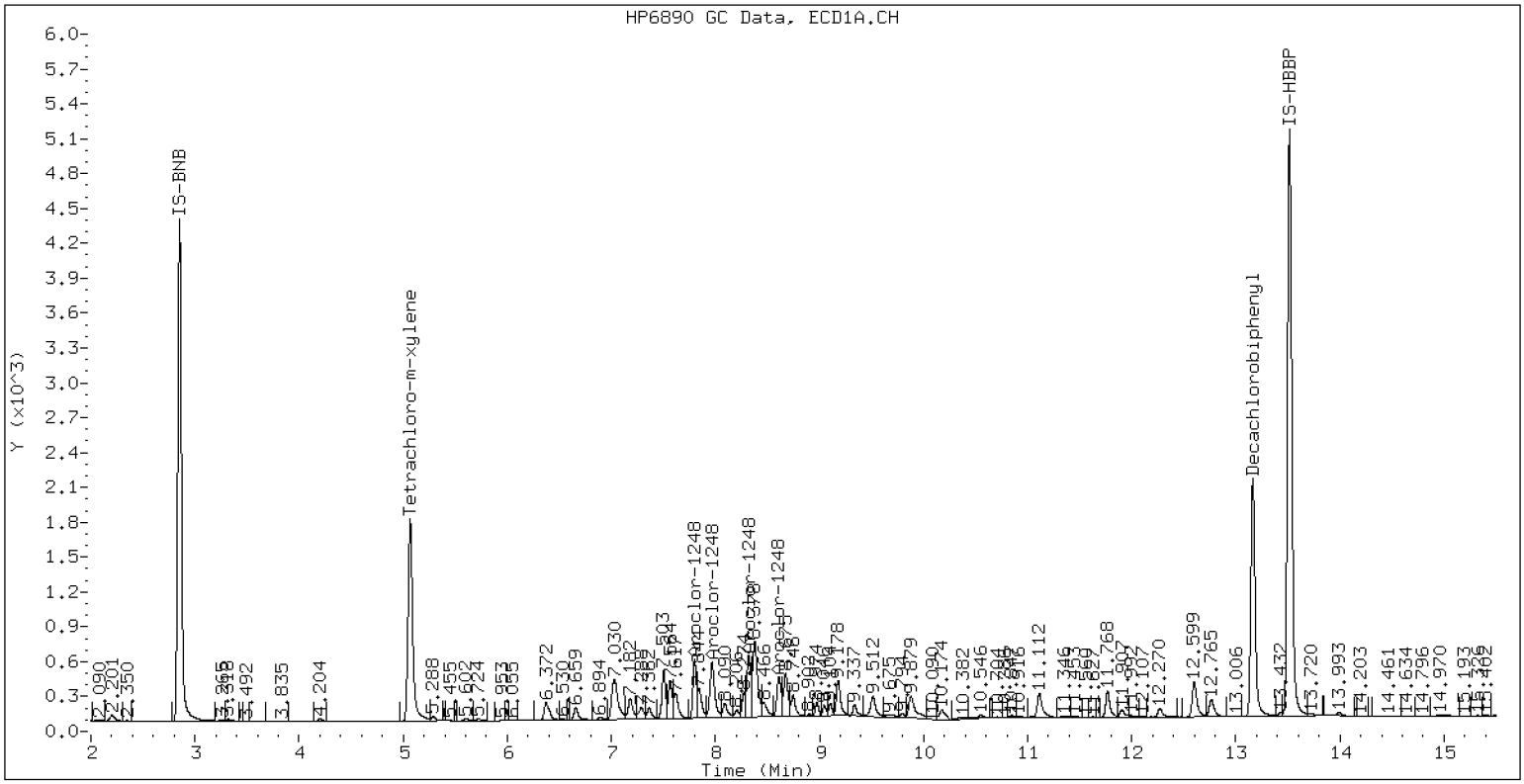
Total PCB Area Col2 (5.167 - 13.064) = 2041109 Col2 Total PCB = 0.3 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

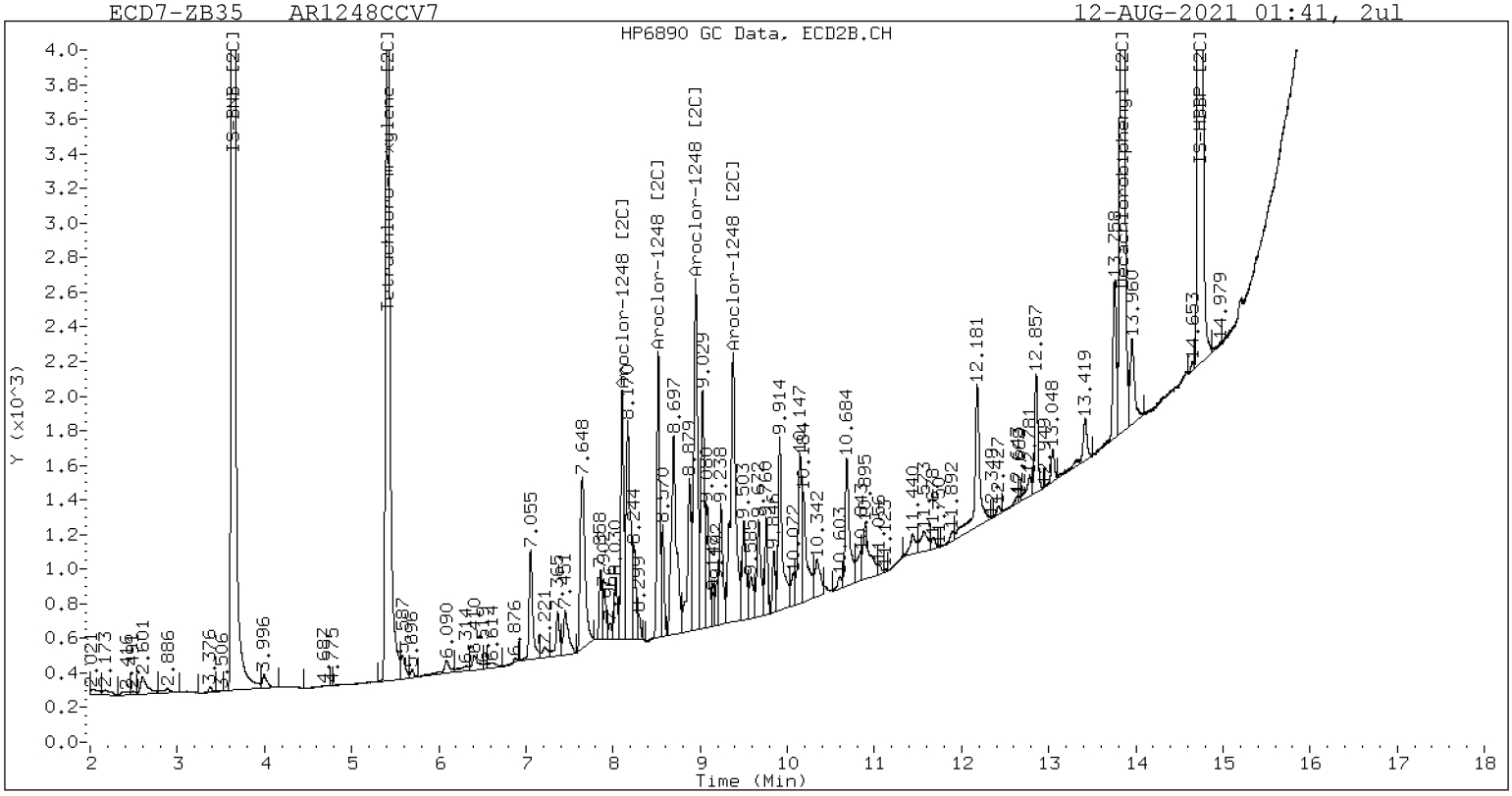
PCB Dual Column Chromatograms

ECD7-ZB5 AR1248CCV7 12-AUG-2021 01:41, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1248CCV7 12-AUG-2021 01:41, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08112132ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0202	Injection Date:	08/12/21
Lab Sample ID:	SJH0202-CCV2	Injection Time:	02:01
Sequence Name:	AR1660CCV2		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1016	A	250.00	277	0.0413247	0.0453048		10.6	+/-20
Aroclor-1016 (1)	A	250.00	286	0.0248166	0.0283735		14.3	
Aroclor-1016 (2)	A	250.00	268	0.0837401	0.0897333		7.2	
Aroclor-1016 (3)	A	250.00	285	0.0340179	0.0387998		14.1	
Aroclor-1016 (4)	A	250.00	267	0.0227243	0.0243125		7.0	
Aroclor 1016 [2C]	A	250.00	272	0.0466427	0.0481842		9.0	+/-20
Aroclor-1016 (1) [2C]	A	250.00	287	0.0412076	0.0472824		14.7	
Aroclor-1016 (2) [2C]	A	250.00	228	0.0906438	0.0828185		-8.6	
Aroclor-1016 (3) [2C]	A	250.00	283	0.0339420	0.0383904		13.1	
Aroclor-1016 (4) [2C]	A	250.00	292	0.0207774	0.0242457		16.7	
Aroclor 1260	A	250.00	279	0.0388495	0.0436688		11.7	+/-20
Aroclor-1260 (1)	A	250.00	249	0.0293254	0.0292185		-0.4	
Aroclor-1260 (2)	A	250.00	284	0.0301531	0.0342425		13.6	
Aroclor-1260 (3)	A	250.00	287	0.0789877	0.0908020		15.0	
Aroclor-1260 (4)	A	250.00	286	0.0402598	0.0460668		14.4	
Aroclor-1260 (5)	A	250.00	290	0.0155216	0.0180141		16.1	
Aroclor 1260 [2C]	A	250.00	264	0.0752611	0.0766108		5.7	+/-20
Aroclor-1260 (1) [2C]	A	250.00	308	0.0498903	0.0614126		23.1	
Aroclor-1260 (2) [2C]	A	250.00	234	0.1301480	0.1216404		-6.5	
Aroclor-1260 (3) [2C]	A	250.00	250	0.0846293	0.0847687		0.2	
Aroclor-1260 (4) [2C]	A	250.00	265	0.0363769	0.0386216		6.2	
Decachlorobiphenyl	A	40.000	44.0	0.7132713	0.7838278		9.9	+/-20
Tetrachlorometaxylene	A	40.000	43.5	0.9552374	1.0389160		8.8	+/-20
Decachlorobiphenyl [2C]	A	40.000	48.9	1.4343710	1.7544650		22.3	+/-20 *
Tetrachlorometaxylene [2C]	A	40.000	43.6	0.9862409	1.0748560		9.0	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112132ECD7.D
Data file 2: /210811.b/210811.b/08112132ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: AR1660.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1660CCV8
Client ID:
Injection Date: 12-AUG-2021 02:02
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.068	0.000	110884	5.411	0.000	310536	43.5	43.6	0.2	Tetrachloro-m-xylene
13.164	-0.001	133926	13.846	-0.000	596126	44.0	48.9	10.7	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	213461	-28.0
Hexabromobiphenyl	470266	341723	-27.3

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	577819	-18.8
Hexabromobiphenyl	867949	679553	-21.7

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT (ZB5 Col)	Shift	Area	Amount	Peak#	RT (ZB35 Col)	Shift	Area	Amount
Aroclor-1016	1	6.658	-0.001	18927	285.8	1	7.055	-0.000	85377	286.9
Aroclor-1016	2	7.031	-0.000	59858	267.9	2	7.649	-0.002	149544	228.4
Aroclor-1016	3	7.177	-0.001	25882	285.1	3	7.856	0.000	69321	282.8
Aroclor-1016	4	7.286	-0.002	16218	267.5	4	8.028	-0.001	43780	291.7
Total Col1Ave (4 peaks):				276.6		Total Col2Ave (4 peaks):			272.4	RPD = 2
Corrected Ave (3 peaks):				273.5		Corrected Ave (3 peaks):			266.0	RPD = 3
Aroclor-1260	1	10.383	0.000	31202	249.1	1	11.425	-0.000	130416	307.7
Aroclor-1260	2	10.701	-0.001	36567	283.9	2	11.676	0.000	258316	233.7
Aroclor-1260	3	11.051	0.000	96966	287.4	3	12.260	-0.000	180015	250.4
Aroclor-1260	4	11.451	0.000	49194	286.1	4	12.970	-0.001	82017	265.4
Aroclor-1260	5	11.554	-0.000	19237	290.1	NS	---			----
Total Col1Ave (5 peaks):				279.3		Total Col2Ave (4 peaks):			264.3	RPD = 6
Corrected Ave (4 peaks):				276.6		Corrected Ave (3 peaks):			249.8	RPD = 10

Total PCB Area Col1 (5.167 - 13.064) = 1023421 Col1 Total PCB = 0.5 ppm*

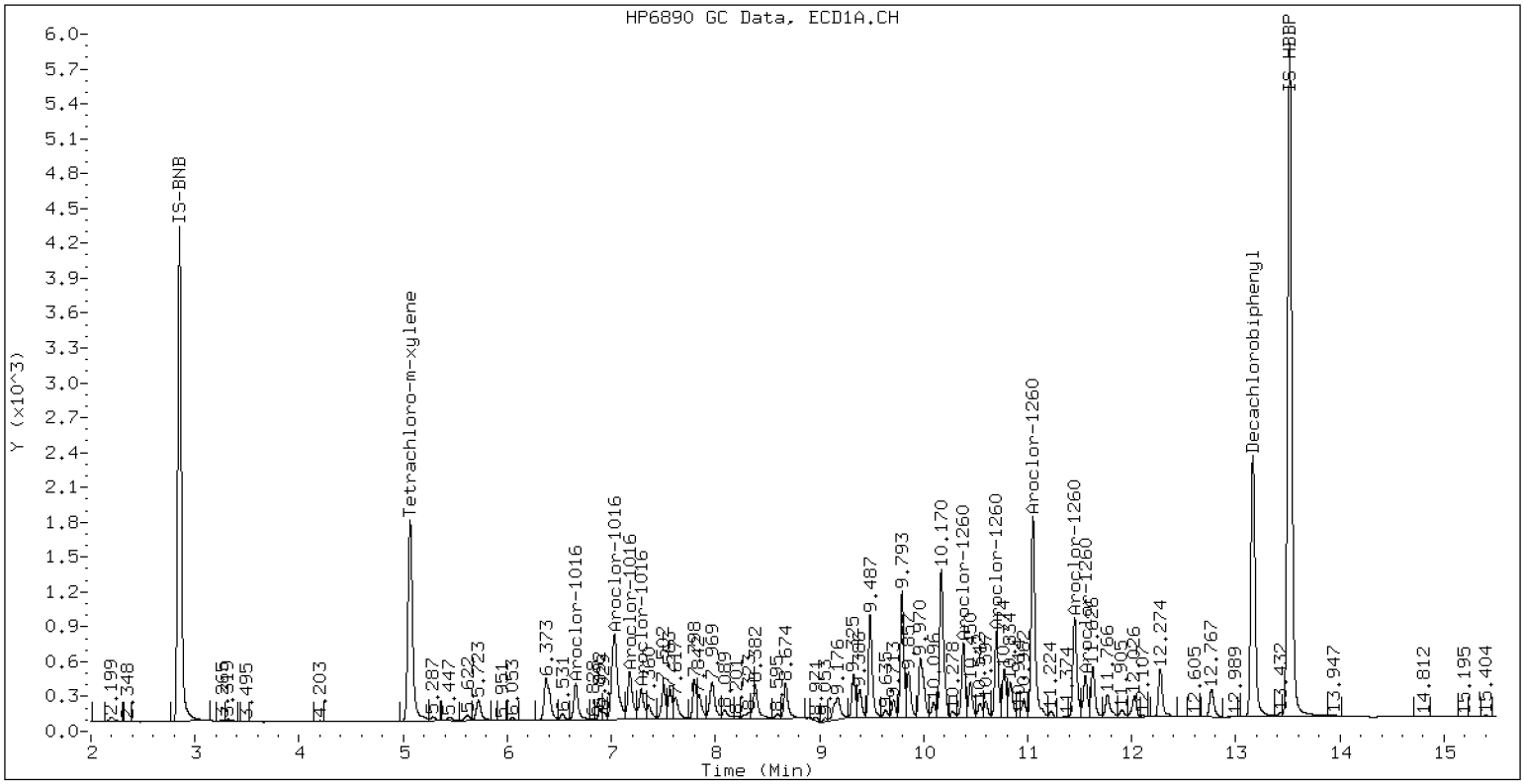
Total PCB Area Col2 (5.167 - 13.064) = 3543207 Col2 Total PCB = 0.6 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

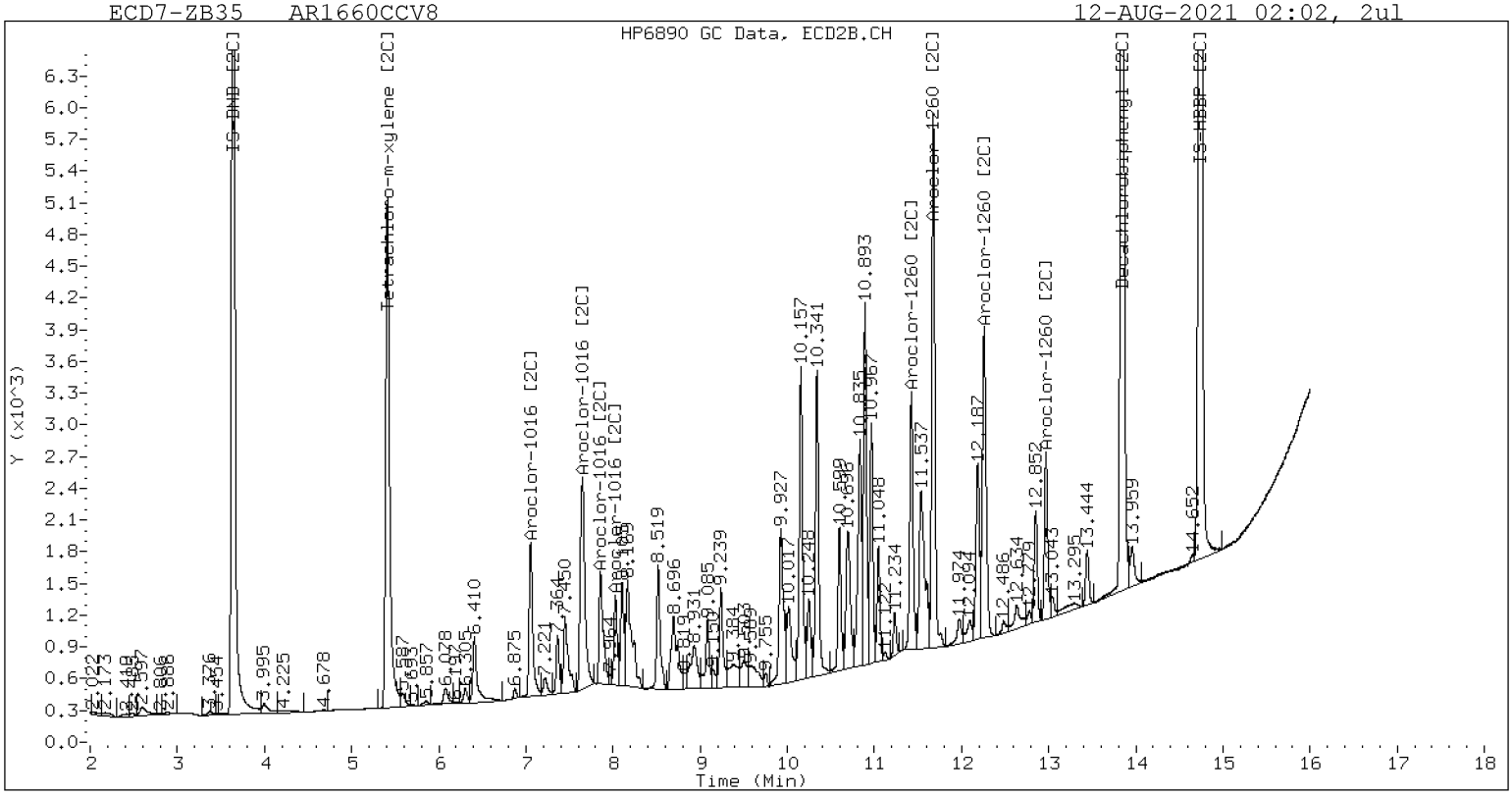
PCB Dual Column Chromatograms

ECD7-ZB5 AR1660CCV8 12-AUG-2021 02:02, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1660CCV8 12-AUG-2021 02:02, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08112143ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0202	Injection Date:	08/12/21
Lab Sample ID:	SJH0202-CCV3	Injection Time:	05:47
Sequence Name:	AR1242CCV3		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1242	A	250.00	239	0.0314312	0.0322638		-4.4	+/-20
Aroclor-1242 (1)	A	250.00	282		0.0248820			
Aroclor-1242 (2)	A	250.00	269		0.0770559			
Aroclor-1242 (3)	A	250.00	178		0.0070298			
Aroclor-1242 (4)	A	250.00	228		0.0200876			
Aroclor 1242 [2C]	A	250.00	283	0.0444064	0.0489981		13.4	+/-20
Aroclor-1242 (1) [2C]	A	250.00	288		0.0409545			
Aroclor-1242 (2) [2C]	A	250.00	253		0.0778867			
Aroclor-1242 (3) [2C]	A	250.00	287		0.0399311			
Aroclor-1242 (4) [2C]	A	250.00	305		0.0372200			
Decachlorobiphenyl	A	40.000	48.1	0.7132713	0.8579339		20.3	+/-20
Tetrachlorometaxylene	A	40.000	45.9	0.9552374	1.0953660		14.7	+/-20
Decachlorobiphenyl [2C]	A	40.000	57.3	1.4343710	2.0530020		43.1	+/-20 *
Tetrachlorometaxylene [2C]	A	40.000	45.5	0.9862409	1.1229500		13.9	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112143ECD7.D
Data file 2: /210811.b/210811.b/08112143ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: AR1242.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1242CCV9
Client ID:
Injection Date: 12-AUG-2021 05:47
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.068	0.001	131560	5.413	0.001	374642	45.9	45.5	0.7	Tetrachloro-m-xylene
13.164	-0.000	149042	13.846	-0.000	713058	48.1	57.3	17.3	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	240212	-19.0
Hexabromobiphenyl	470266	347444	-26.1

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	667246	-6.3
Hexabromobiphenyl	867949	694649	-20.0

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT (ZB5 Col)	Shift	Area	Amount	Peak#	RT (ZB35 Col)	Shift	Area	Amount
Aroclor-1242	1	6.659	-0.001	18678	281.6	1	7.057	0.002	85396	288.3
Aroclor-1242	2	7.032	-0.001	57843	268.5	2	7.650	0.001	162405	253.4
Aroclor-1242	3	8.275	0.001	5277	178.1	3	8.950	0.001	83262	287.4
Aroclor-1242	4	8.613	0.000	15079	228.0	4	9.030	0.001	77609	304.6

Total Col1Ave (4 peaks): 239.1 Total Col2Ave (4 peaks): 283.4 RPD = 17

Corrected Ave (3 peaks): 224.9 Corrected Ave (3 peaks): 276.4 RPD = 21

Total PCB Area Col1 (5.167 - 13.064) = 446210 Col1 Total PCB = 0.2 ppm*

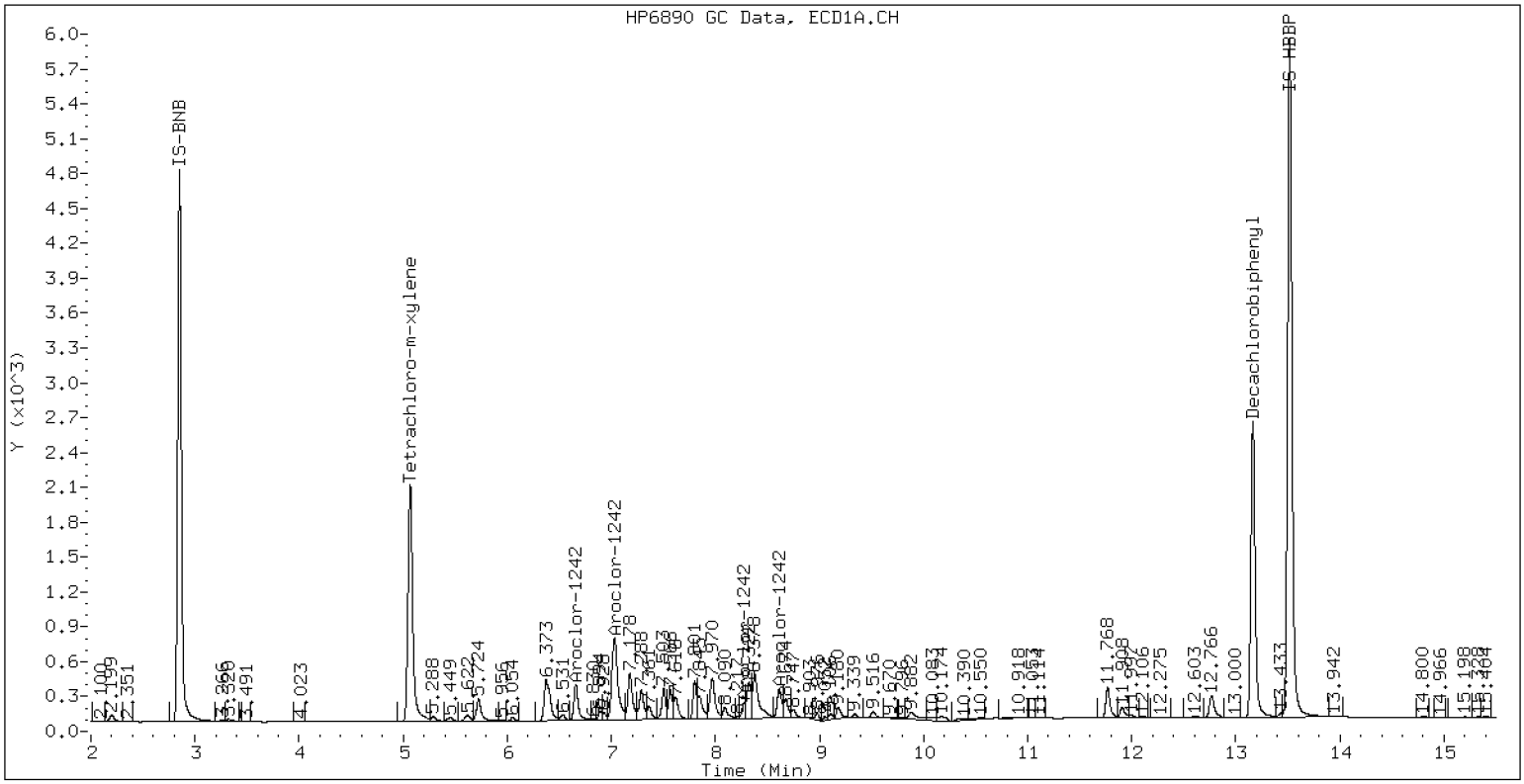
Total PCB Area Col2 (5.167 - 13.064) = 1831319 Col2 Total PCB = 0.3 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

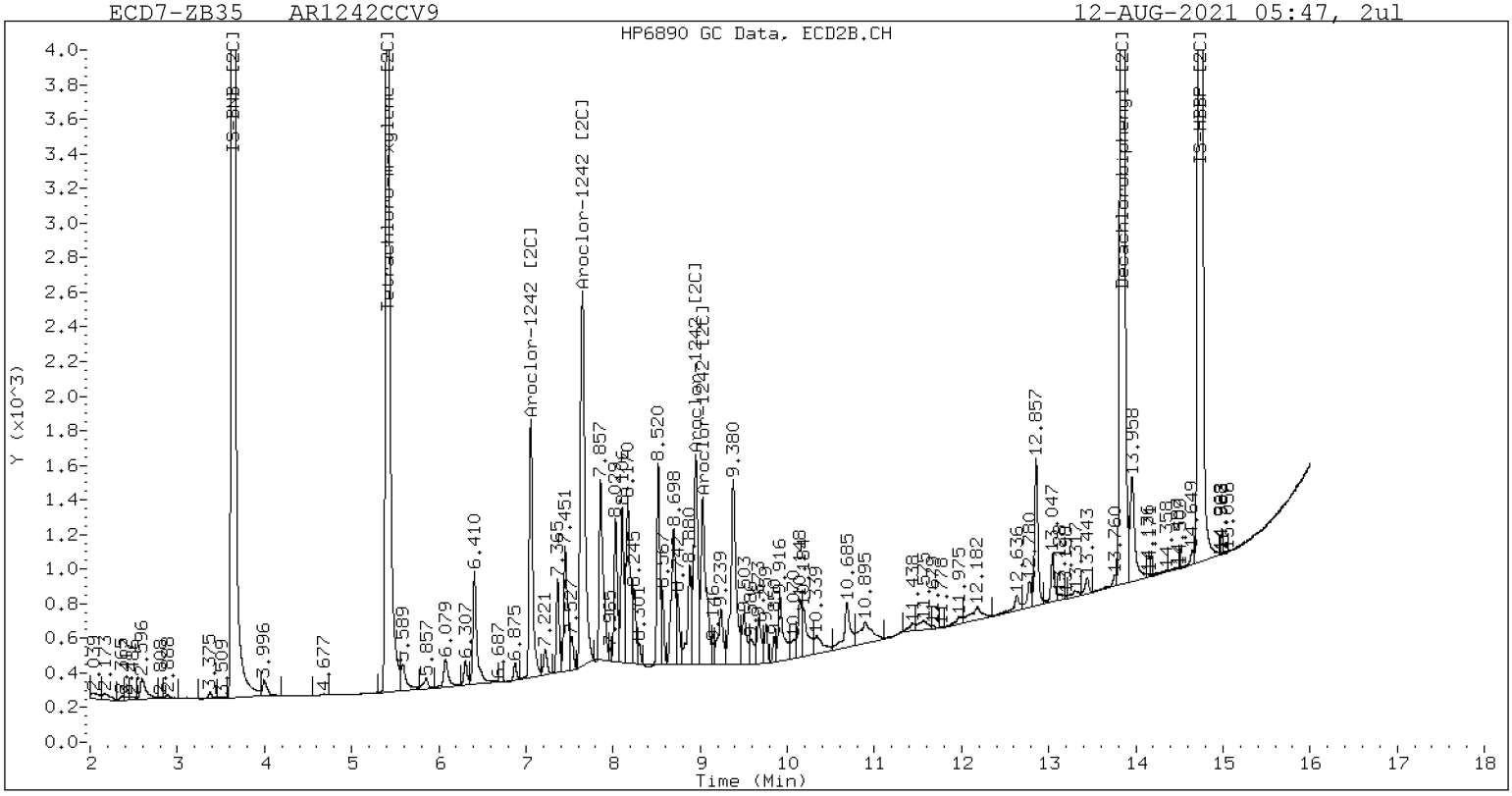
PCB Dual Column Chromatograms

ECD7-ZB5 AR1242CCV9 12-AUG-2021 05:47, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1242CCV9 12-AUG-2021 05:47, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08112144ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0202	Injection Date:	08/12/21
Lab Sample ID:	SJH0202-CCV4	Injection Time:	06:07
Sequence Name:	AR1660CCV4		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1016	A	250.00	278	0.0413247	0.0454327		11.2	+/-20
Aroclor-1016 (1)	A	250.00	288	0.0248166	0.0286067		15.3	
Aroclor-1016 (2)	A	250.00	268	0.0837401	0.0897761		7.2	
Aroclor-1016 (3)	A	250.00	285	0.0340179	0.0387318		13.9	
Aroclor-1016 (4)	A	250.00	271	0.0227243	0.0246163		8.3	
Aroclor 1016 [2C]	A	250.00	270	0.0466427	0.0480023		7.9	+/-20
Aroclor-1016 (1) [2C]	A	250.00	284	0.0412076	0.0468596		13.7	
Aroclor-1016 (2) [2C]	A	250.00	230	0.0906438	0.0835543		-7.8	
Aroclor-1016 (3) [2C]	A	250.00	279	0.0339420	0.0378389		11.5	
Aroclor-1016 (4) [2C]	A	250.00	286	0.0207774	0.0237565		14.3	
Aroclor 1260	A	250.00	272	0.0388495	0.0425697		8.8	+/-20
Aroclor-1260 (1)	A	250.00	242	0.0293254	0.0283671		-3.3	
Aroclor-1260 (2)	A	250.00	275	0.0301531	0.0331716		10.0	
Aroclor-1260 (3)	A	250.00	280	0.0789877	0.0884535		12.0	
Aroclor-1260 (4)	A	250.00	282	0.0402598	0.0454313		12.8	
Aroclor-1260 (5)	A	250.00	281	0.0155216	0.0174248		12.3	
Aroclor 1260 [2C]	A	250.00	265	0.0752611	0.0763349		5.8	+/-20
Aroclor-1260 (1) [2C]	A	250.00	301	0.0498903	0.0601425		20.5	
Aroclor-1260 (2) [2C]	A	250.00	230	0.1301480	0.1199018		-7.9	
Aroclor-1260 (3) [2C]	A	250.00	252	0.0846293	0.0854336		1.0	
Aroclor-1260 (4) [2C]	A	250.00	274	0.0363769	0.0398617		9.6	
Decachlorobiphenyl	A	40.000	43.5	0.7132713	0.7749114		8.6	+/-20
Tetrachlorometaxylene	A	40.000	43.5	0.9552374	1.0379520		8.7	+/-20
Decachlorobiphenyl [2C]	A	40.000	50.1	1.4343710	1.7958160		25.2	+/-20 *
Tetrachlorometaxylene [2C]	A	40.000	43.9	0.9862409	1.0821530		9.7	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112144ECD7.D
Data file 2: /210811.b/210811.b/08112144ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: AR1660.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1660CCVA
Client ID:
Injection Date: 12-AUG-2021 06:07
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.067	-0.000	111829	5.412	0.001	316895	43.5	43.9	1.0	Tetrachloro-m-xylene
13.164	-0.001	138553	13.848	0.002	636678	43.5	50.1	14.2	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	215480	-27.3
Hexabromobiphenyl	470266	357597	-24.0

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	585675	-17.7
Hexabromobiphenyl	867949	709068	-18.3

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT (ZB5 Col)	Shift	Area	Amount	Peak#	RT (ZB35 Col)	Shift	Area	Amount
Aroclor-1016	1	6.659	-0.000	19263	288.2	1	7.056	0.000	85764	284.3
Aroclor-1016	2	7.032	0.000	60453	268.0	2	7.651	-0.000	152924	230.4
Aroclor-1016	3	7.179	0.000	26081	284.6	3	7.857	0.001	69254	278.7
Aroclor-1016	4	7.288	-0.000	16576	270.8	4	8.030	0.001	43480	285.8
Total Col1Ave (4 peaks):				277.9		Total Col2Ave (4 peaks):			269.8	RPD = 3
Corrected Ave (3 peaks):				274.5		Corrected Ave (3 peaks):			264.5	RPD = 4
Aroclor-1260	1	10.383	0.000	31700	241.8	1	11.425	0.000	133266	301.4
Aroclor-1260	2	10.700	-0.001	37069	275.0	2	11.676	0.000	265683	230.3
Aroclor-1260	3	11.050	-0.000	98846	280.0	3	12.259	-0.001	189307	252.4
Aroclor-1260	4	11.452	0.001	50769	282.1	4	12.971	0.001	88327	273.9
Aroclor-1260	5	11.554	0.000	19472	280.7	NS	---			----
Total Col1Ave (5 peaks):				271.9		Total Col2Ave (4 peaks):			264.5	RPD = 3
Corrected Ave (4 peaks):				269.4		Corrected Ave (3 peaks):			252.2	RPD = 7

Total PCB Area Col1 (5.167 - 13.064) = 1038336 Col1 Total PCB = 0.5 ppm*

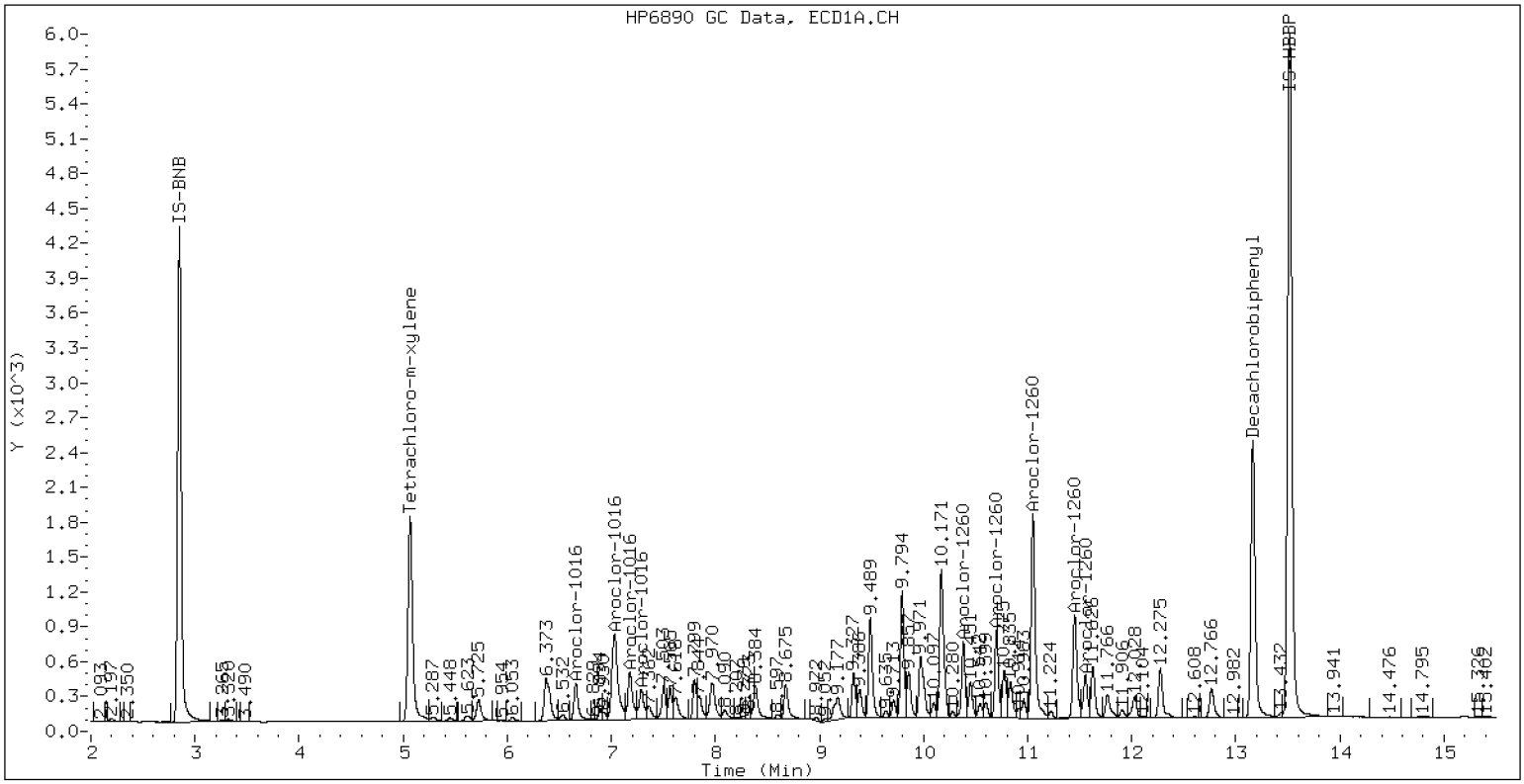
Total PCB Area Col2 (5.167 - 13.064) = 3516054 Col2 Total PCB = 0.5 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

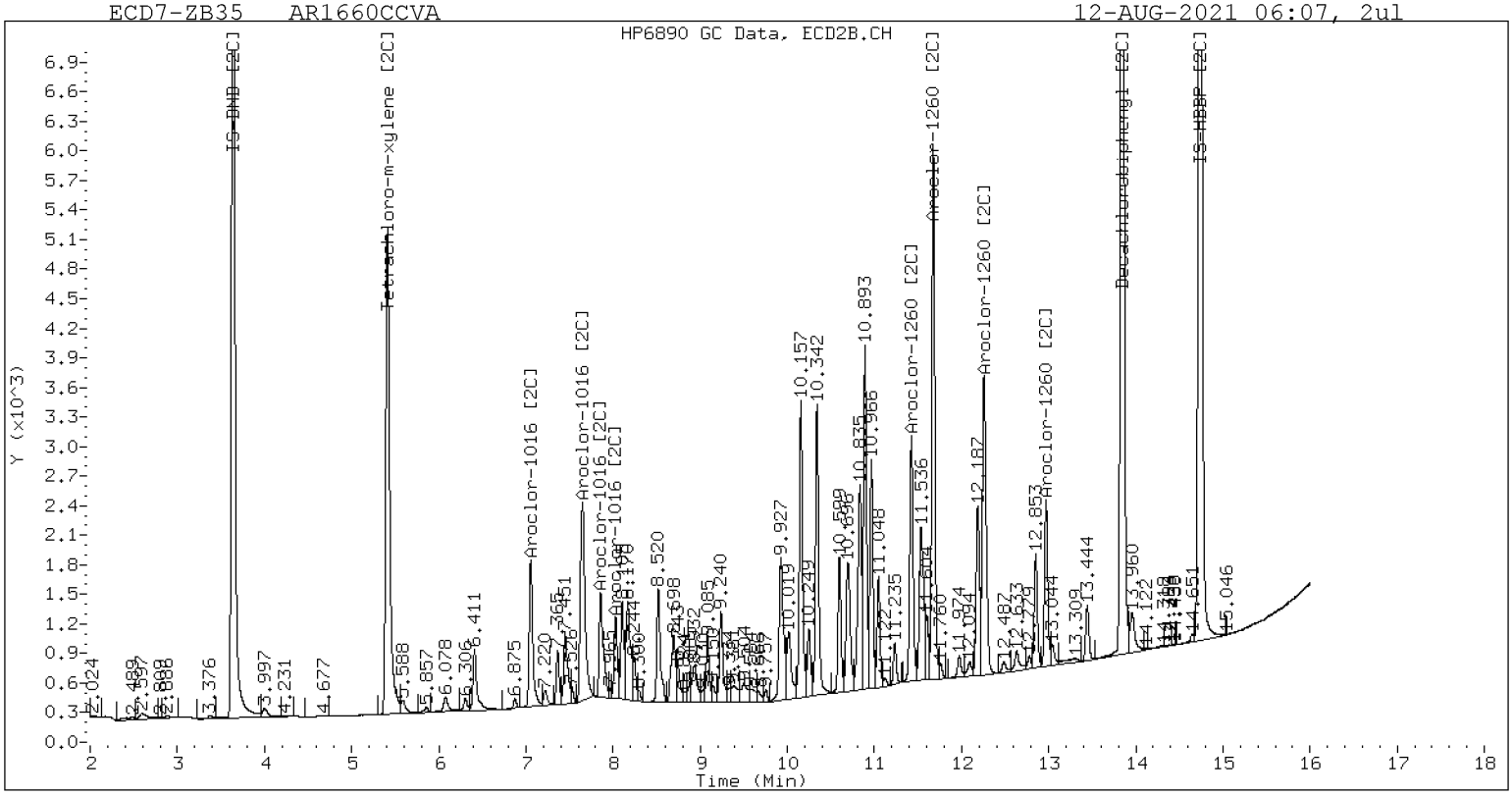
PCB Dual Column Chromatograms

ECD7-ZB5 AR1660CCVA 12-AUG-2021 06:07, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1660CCVA 12-AUG-2021 06:07, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08112153ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0202	Injection Date:	08/12/21
Lab Sample ID:	SJH0202-CCV5	Injection Time:	09:12
Sequence Name:	AR1254CCV5		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1254	A	250.00	259	0.0542238	0.0564507		3.5	+/-20
Aroclor-1254 (1)	A	250.00	258		0.0698082			
Aroclor-1254 (2)	A	250.00	304		0.0299436			
Aroclor-1254 (3)	A	250.00	175		0.0290109			
Aroclor-1254 (4)	A	250.00	282		0.0925447			
Aroclor-1254 (5)	A	250.00	275		0.0609463			
Aroclor 1254 [2C]	A	250.00	249	0.0703814	0.0703202		-0.5	+/-20
Aroclor-1254 (1) [2C]	A	250.00	248		0.0601678			
Aroclor-1254 (2) [2C]	A	250.00	266		0.0380190			
Aroclor-1254 (3) [2C]	A	250.00	224		0.0408262			
Aroclor-1254 (4) [2C]	A	250.00	238		0.0965765			
Aroclor-1254 (5) [2C]	A	250.00	267		0.1160112			
Decachlorobiphenyl	A	40.000	39.8	0.7132713	0.7104296		-0.4	+/-20
Tetrachlorometaxylene	A	40.000	44.0	0.9552374	1.0510960		10.0	+/-20
Decachlorobiphenyl [2C]	A	40.000	45.0	1.4343710	1.6132530		12.5	+/-20
Tetrachlorometaxylene [2C]	A	40.000	43.7	0.9862409	1.0777690		9.3	+/-20

* Values outside of QC limits

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112153ECD7.D
Data file 2: /210811.b/210811.b/08112153ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: AR1254.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1254CCVB
Client ID:
Injection Date: 12-AUG-2021 09:12
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	Shift	Response	ZB35 Col RT	Shift	Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.067	-0.001	146240	5.411	-0.000	416478	44.0	43.7	0.7	Tetrachloro-m-xylene
13.165	0.001	160940	13.846	0.000	763727	39.8	45.0	12.1	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	278262	-6.1
Hexabromobiphenyl	470266	453078	-3.7

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	772852	8.5
Hexabromobiphenyl	867949	946816	9.1

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT	Shift	Area	Amount	Peak#	RT	Shift	Area	Amount
		ZB5 Col					ZB35 Col			
Aroclor-1254	1	8.677	0.001	60703	258.0	1	9.239	0.002	145315	248.3
Aroclor-1254	2	8.746	-0.000	26038	303.9	2	9.332	0.002	91822	266.1
Aroclor-1254	3	9.043	-0.001	25227	175.0	3	9.761	0.001	98602	223.9
Aroclor-1254	4	9.178	0.000	80474	281.9	4	9.913	0.002	233248	238.3
Aroclor-1254	5	9.868	-0.000	52997	275.4	5	10.149	0.003	280186	266.8

Total Col1Ave (5 peaks): 258.8 Total Col2Ave (5 peaks): 248.7 RPD = 4
Corrected Ave (4 peaks): 247.6 Corrected Ave (4 peaks): 244.1 RPD = 1

Total PCB Area Col1 (5.167 - 13.064) = 833698 Col1 Total PCB = 0.3 ppm*

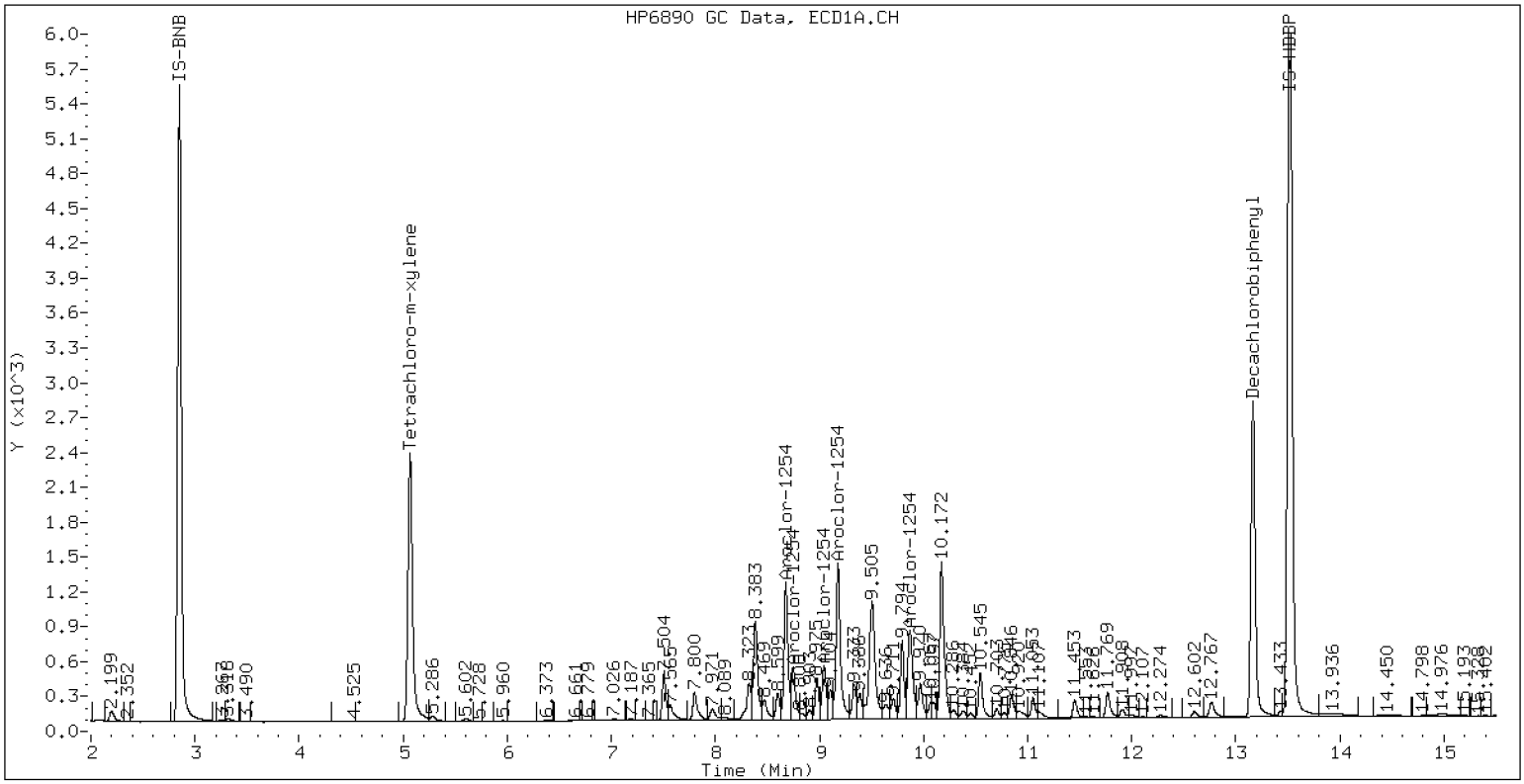
Total PCB Area Col2 (5.167 - 13.064) = 3125426 Col2 Total PCB = 0.4 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

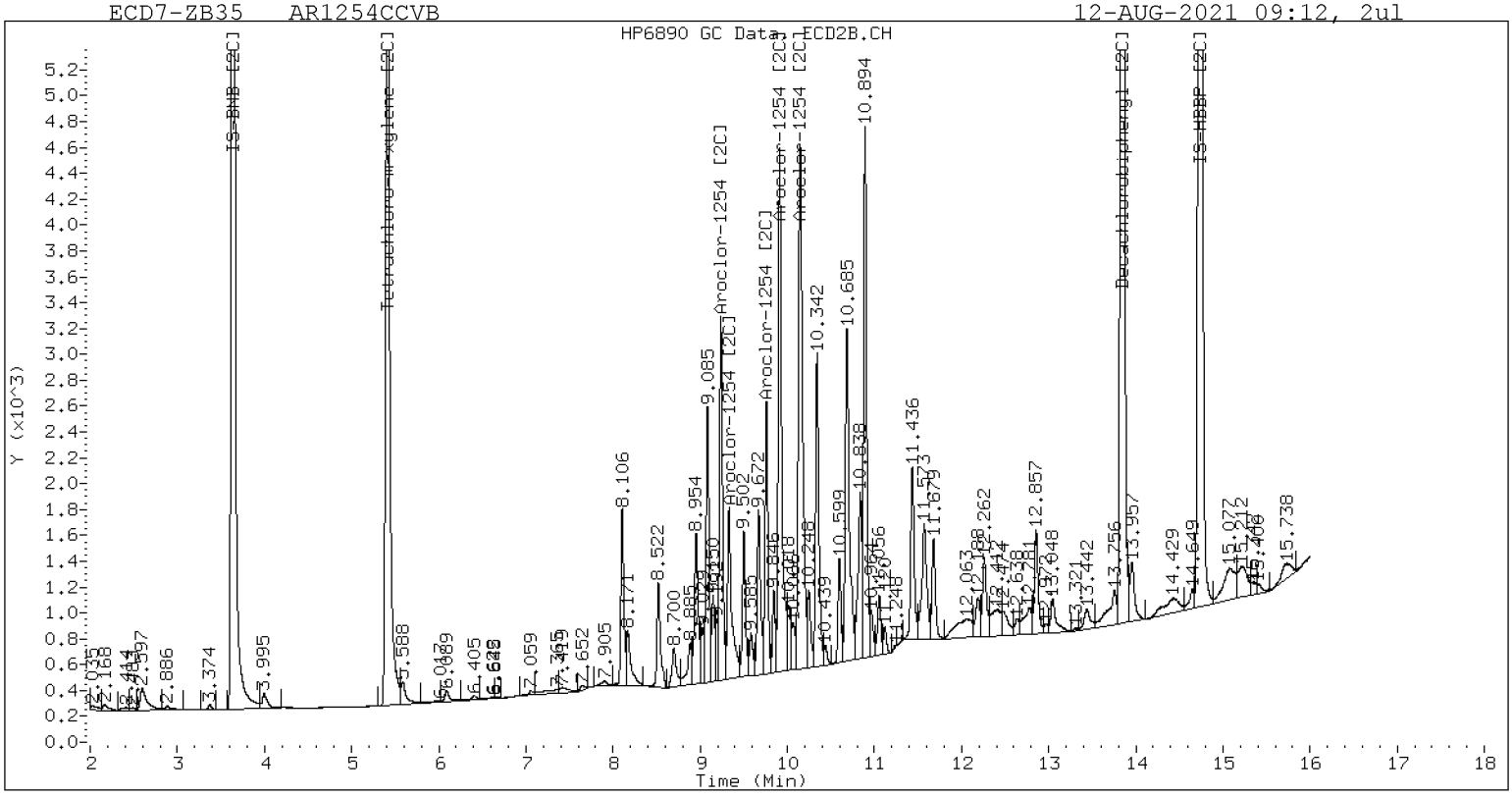
PCB Dual Column Chromatograms

ECD7-ZB5 AR1254CCVB 12-AUG-2021 09:12, 2ul



ZB-5 Manual Integration: YES

ECD7-ZB35 AR1254CCVB 12-AUG-2021 09:12, 2ul

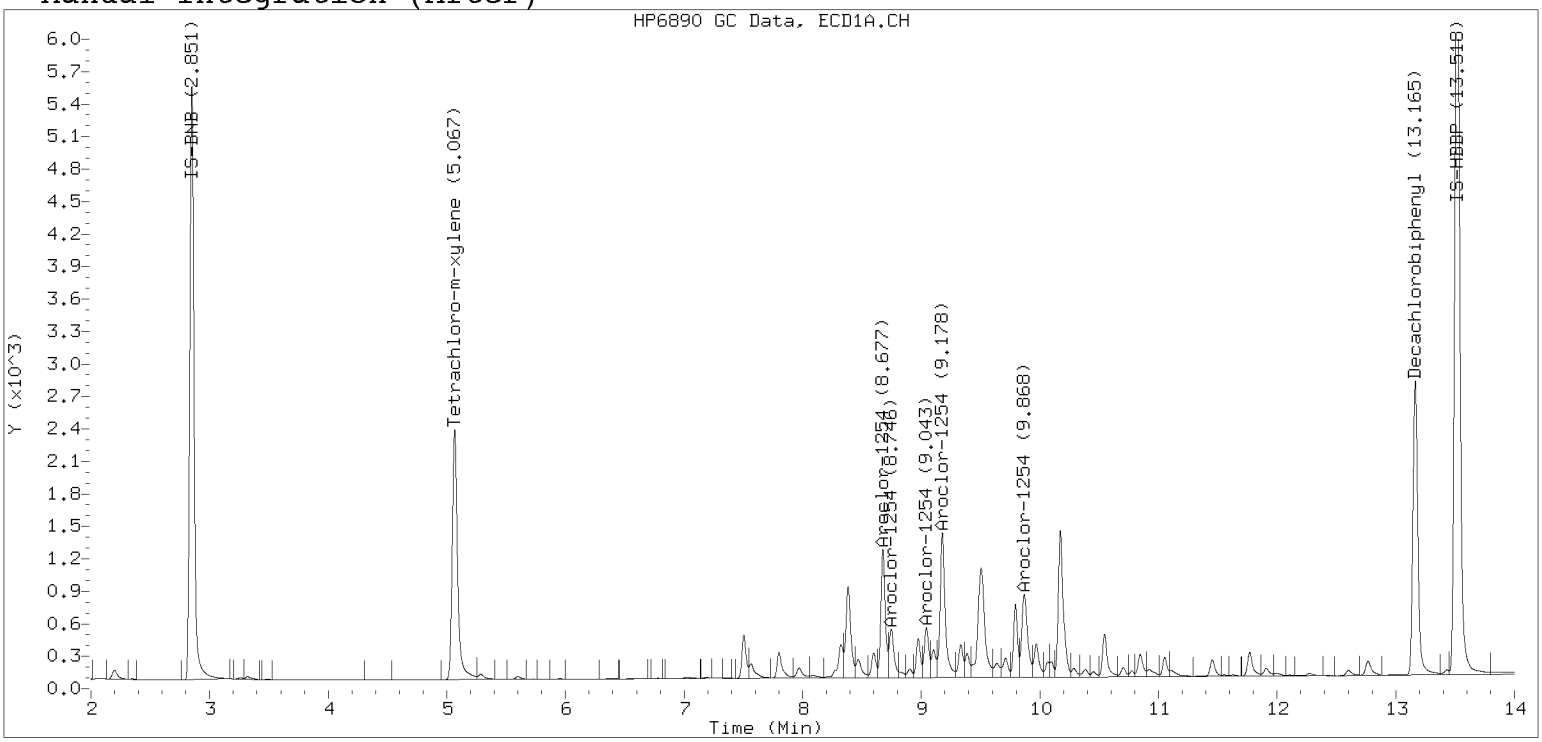


ZB-35 Manual Integration: NO

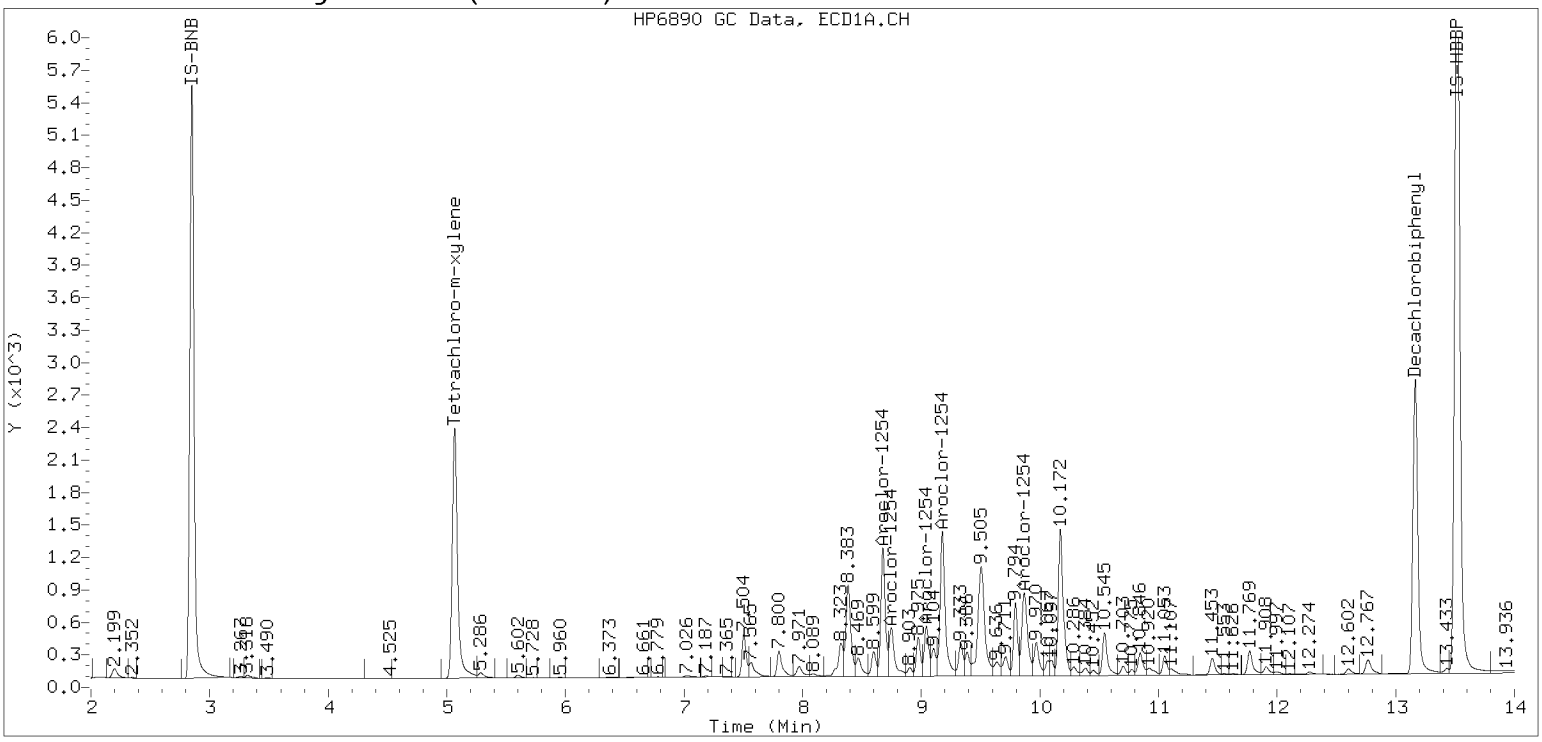
Manual Peak Adjustment, ZB-5

Datafile: ecd7.i/210811.b/08112153ECD7.D Injection Date: 12-AUG-2021 09:12

Manual Integration (After)



Processed Integration (Before)



Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	ECD7	Calibration:	EE00069
Lab File ID:	08112154ECD7.D	Calibration Date:	05/22/2021
Sequence:	SJH0202	Injection Date:	08/12/21
Lab Sample ID:	SJH0202-CCV6	Injection Time:	09:32
Sequence Name:	AR1660CCV6		

		CONC. (ug/L)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
Aroclor 1016	A	250.00	279	0.0413247	0.0456914		11.8	+/-20
Aroclor-1016 (1)	A	250.00	290	0.0248166	0.0288073		16.1	
Aroclor-1016 (2)	A	250.00	270	0.0837401	0.0903414		7.9	
Aroclor-1016 (3)	A	250.00	286	0.0340179	0.0389109		14.4	
Aroclor-1016 (4)	A	250.00	272	0.0227243	0.0247060		8.7	
Aroclor 1016 [2C]	A	250.00	270	0.0466427	0.0479561		7.9	+/-20
Aroclor-1016 (1) [2C]	A	250.00	283	0.0412076	0.0466246		13.1	
Aroclor-1016 (2) [2C]	A	250.00	230	0.0906438	0.0834721		-7.9	
Aroclor-1016 (3) [2C]	A	250.00	279	0.0339420	0.0379260		11.7	
Aroclor-1016 (4) [2C]	A	250.00	286	0.0207774	0.0238017		14.6	
Aroclor 1260	A	250.00	273	0.0388495	0.0426576		9.2	+/-20
Aroclor-1260 (1)	A	250.00	244	0.0293254	0.0286581		-2.3	
Aroclor-1260 (2)	A	250.00	276	0.0301531	0.0333333		10.5	
Aroclor-1260 (3)	A	250.00	280	0.0789877	0.0883231		11.8	
Aroclor-1260 (4)	A	250.00	282	0.0402598	0.0453650		12.7	
Aroclor-1260 (5)	A	250.00	284	0.0155216	0.0176083		13.4	
Aroclor 1260 [2C]	A	250.00	255	0.0752611	0.0734629		1.8	+/-20
Aroclor-1260 (1) [2C]	A	250.00	287	0.0498903	0.0572939		14.8	
Aroclor-1260 (2) [2C]	A	250.00	222	0.1301480	0.1153880		-11.3	
Aroclor-1260 (3) [2C]	A	250.00	244	0.0846293	0.0825531		-2.5	
Aroclor-1260 (4) [2C]	A	250.00	265	0.0363769	0.0386165		6.2	
Decachlorobiphenyl	A	40.000	43.7	0.7132713	0.7788944		9.2	+/-20
Tetrachlorometaxylene	A	40.000	44.1	0.9552374	1.0539600		10.3	+/-20
Decachlorobiphenyl [2C]	A	40.000	48.2	1.4343710	1.7285680		20.5	+/-20 *
Tetrachlorometaxylene [2C]	A	40.000	43.9	0.9862409	1.0829460		9.8	+/-20

* Values outside of QC limits

Analytical Resources Inc.
Dual Column 608/8082 PCB Quantitation Report

Data file 1: /210811.b/08112154ECD7.D
Data file 2: /210811.b/210811.b/08112154ECD7.D
Method: \\target\share\chem4\ecd7.i\210811.b\PCB.m
Compound Sublist: AR1660.sub
Instrument, Inj. Vol.: ecd7.i, 2ul
Quant Method: Internal Std

ARI ID: AR1660CCVC
Client ID:
Injection Date: 12-AUG-2021 09:32
Report Date: 08/17/2021 08:48
Matrix: NONE
Dilution Factor: 1.0

SURROGATES

ZB5 Col RT	ZB5 Col Shift	ZB5 Col Response	ZB35 Col RT	ZB35 Col Shift	ZB35 Col Response	ZB5 on col	ZB35 on col	RPD	Compound/Flag
5.068	0.001	113278	5.413	0.002	317778	44.1	43.9	0.5	Tetrachloro-m-xylene
13.163	-0.002	137573	13.847	0.001	632203	43.7	48.2	9.8	Decachlorobiphenyl

* Indicates RPD > 40%

INTERNAL STANDARD SUMMARY

Column 1

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	296446	214957	-27.5
Hexabromobiphenyl	470266	353252	-24.9

Column 2

Standard Cpnd	Standard Area*	Sample Area	%D
Bromo-Nitrobenzene	711996	586877	-17.6
Hexabromobiphenyl	867949	731476	-15.7

* Standard Areas taken from Initial Cal Level 3
Initial Calibration Date: 22-MAY-2021
<- Indicates standard response outside Limits (-50 to +100%)

Aroclor	Peak#	RT (ZB5 Col)	Shift	Area	Amount	Peak#	RT (ZB35 Col)	Shift	Area	Amount
Aroclor-1016	1	6.660	0.001	19351	290.2	1	7.057	0.001	85509	282.9
Aroclor-1016	2	7.032	0.001	60686	269.7	2	7.651	0.001	153087	230.2
Aroclor-1016	3	7.179	0.001	26138	286.0	3	7.858	0.002	69556	279.3
Aroclor-1016	4	7.288	0.000	16596	271.8	4	8.029	0.000	43652	286.4
Aroclor-1260	1	10.383	0.001	31636	244.3	1	11.425	-0.000	130966	287.1
Aroclor-1260	2	10.701	-0.000	36797	276.4	2	11.676	-0.000	263761	221.6
Aroclor-1260	3	11.051	-0.000	97501	279.5	3	12.259	-0.000	188705	243.9
Aroclor-1260	4	11.451	-0.000	50079	281.7	4	12.970	-0.000	88272	265.4
Aroclor-1260	5	11.553	-0.001	19438	283.6	NS	---			----

Total Col1Ave (4 peaks): 279.4 Total Col2Ave (4 peaks): 269.7 RPD = 4
Corrected Ave (3 peaks): 275.8 Corrected Ave (3 peaks): 264.1 RPD = 4

Total Col1Ave (5 peaks): 273.1 Total Col2Ave (4 peaks): 254.5 RPD = 7
Corrected Ave (4 peaks): 270.5 Corrected Ave (3 peaks): 243.6 RPD = 10

Total PCB Area Col1 (5.167 - 13.064) = 1039007 Col1 Total PCB = 0.5 ppm*

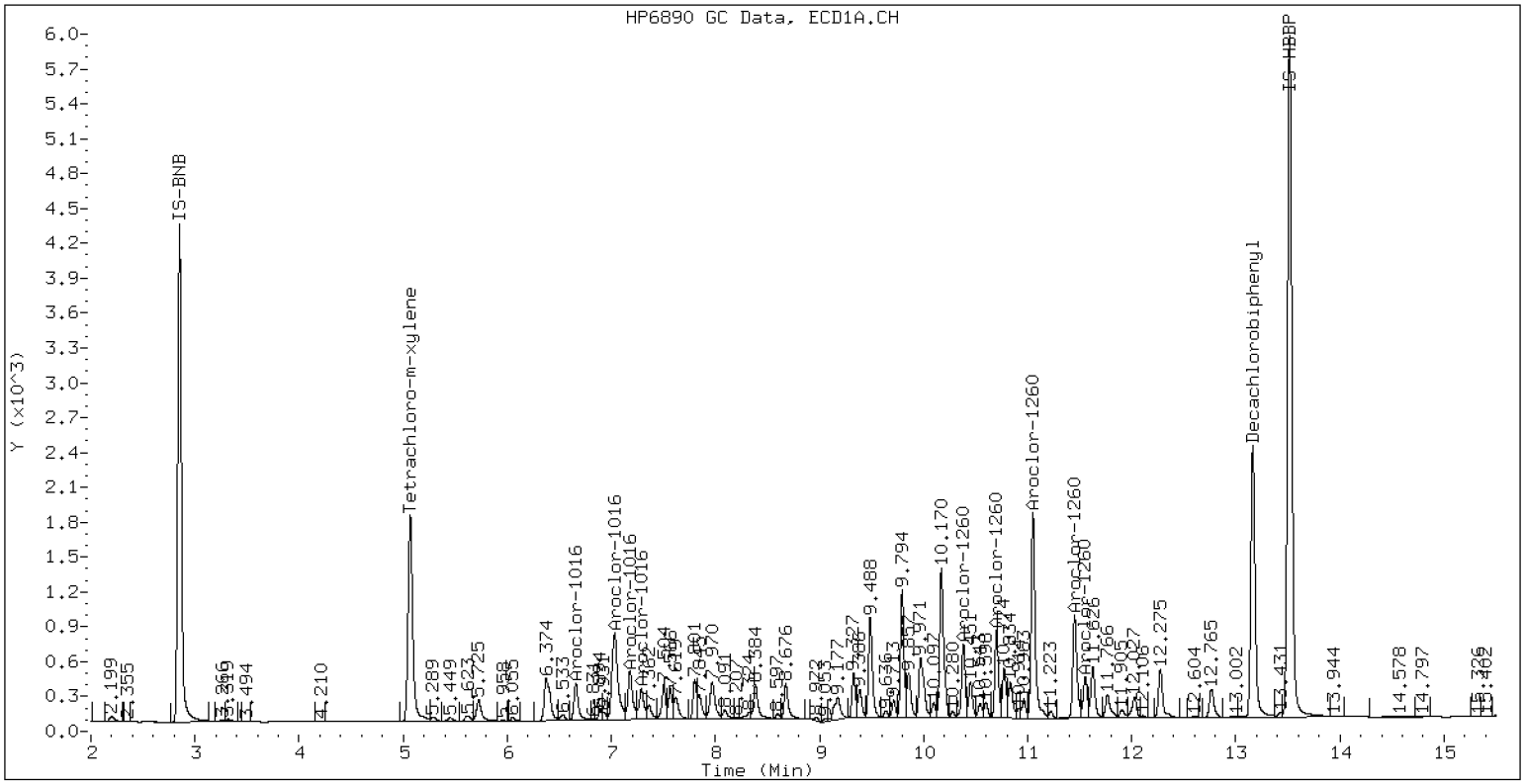
Total PCB Area Col2 (5.167 - 13.064) = 3488180 Col2 Total PCB = 0.5 ppm*

* Quantitated against AR1660 0.25ppm in Ical

PCB-Form 10 Mod.

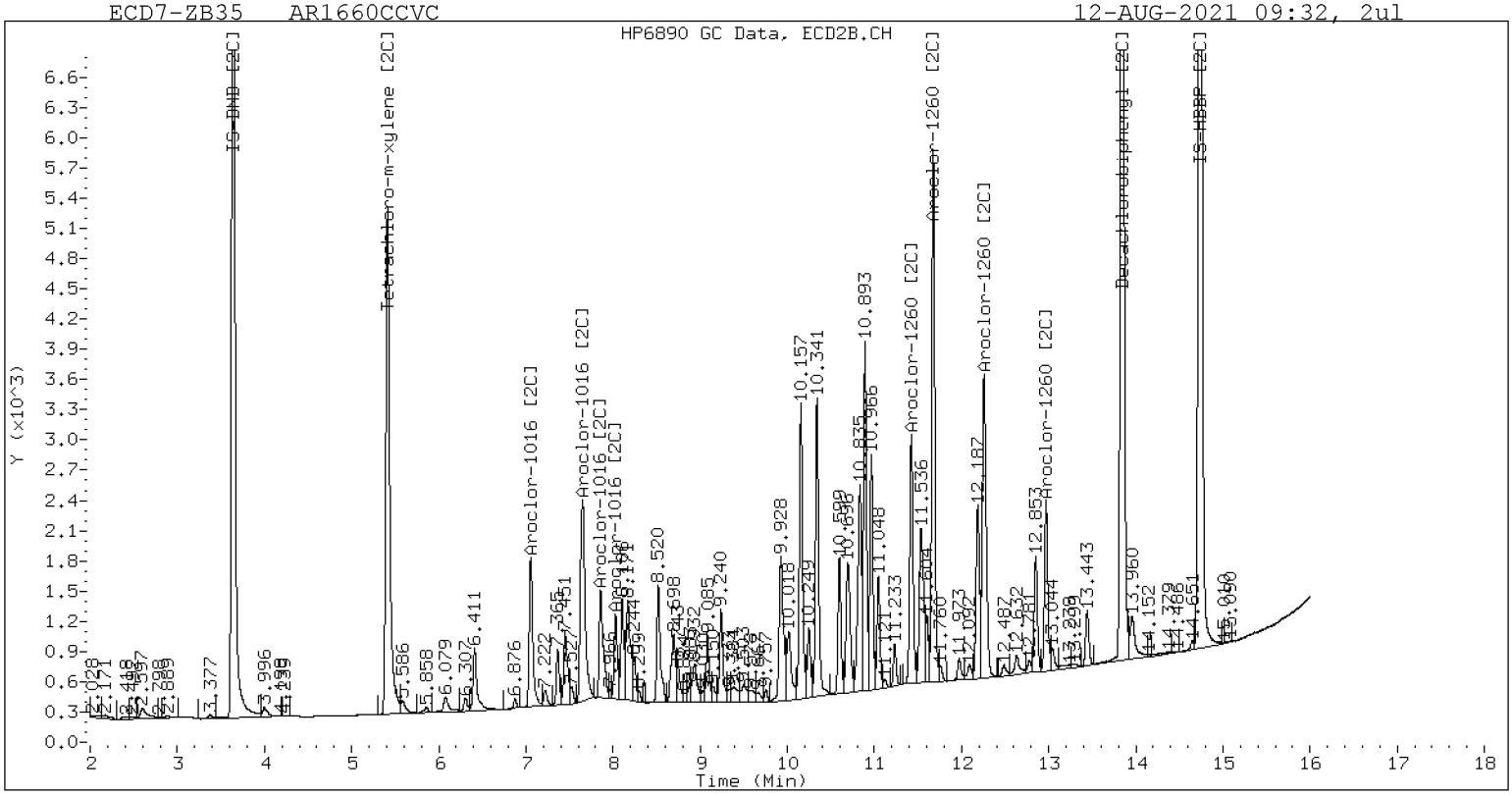
PCB Dual Column Chromatograms

ECD7-ZB5 AR1660CCVC 12-AUG-2021 09:32, 2ul



ZB-5 Manual Integration: NO

ECD7-ZB35 AR1660CCVC 12-AUG-2021 09:32, 2ul



ZB-35 Manual Integration: NO

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Dual Column

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJE0321	Instrument:	ECD7
		Calibration:	EE00069

Sample Name	Lab Sample ID	Column 1 File ID	Column 2 File ID	Matrix	Analysis Date/Time
Cal Standard	SJE0321-CAL1	05222106ECD7.D	05222106ECD7.D	NA	05/22/21 15:34
Cal Standard	SJE0321-CAL2	05222107ECD7.D	05222107ECD7.D	NA	05/22/21 15:55
Cal Standard	SJE0321-CAL3	05222108ECD7.D	05222108ECD7.D	NA	05/22/21 16:17
Cal Standard	SJE0321-CAL4	05222109ECD7.D	05222109ECD7.D	NA	05/22/21 16:39
Cal Standard	SJE0321-CAL5	05222110ECD7.D	05222110ECD7.D	NA	05/22/21 17:00
Cal Standard	SJE0321-CAL6	05222111ECD7.D	05222111ECD7.D	NA	05/22/21 17:22
Cal Standard	SJE0321-CAL7	05222112ECD7.D	05222112ECD7.D	NA	05/22/21 17:44
Cal Standard	SJE0321-CAL8	05222113ECD7.D	05222113ECD7.D	NA	05/22/21 18:05
Cal Standard	SJE0321-CAL9	05222114ECD7.D	05222114ECD7.D	NA	05/22/21 18:27
Cal Standard	SJE0321-CALA	05222115ECD7.D	05222115ECD7.D	NA	05/22/21 18:49
Cal Standard	SJE0321-CALB	05222116ECD7.D	05222116ECD7.D	NA	05/22/21 19:10
Secondary Cal Check	SJE0321-SCV1	05222117ECD7.D	05222117ECD7.D	NA	05/22/21 19:32
Secondary Cal Check	SJE0321-SCV2	05222118ECD7.D	05222118ECD7.D	NA	05/22/21 19:53
Secondary Cal Check	SJE0321-SCV3	05222119ECD7.D	05222119ECD7.D	NA	05/22/21 20:15
Secondary Cal Check	SJE0321-SCV4	05222120ECD7.D	05222120ECD7.D	NA	05/22/21 20:37
Secondary Cal Check	SJE0321-SCV5	05222121ECD7.D	05222121ECD7.D	NA	05/22/21 20:58
Secondary Cal Check	SJE0321-SCV6	05222122ECD7.D	05222122ECD7.D	NA	05/22/21 21:20

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Printed: 5/25/2021 10:02:27AM

ANALYSIS SEQUENCE

SJE0321

Instrument: ECD7 Element Column ID: i10655i10656
Calibration ID: EE00033

Lab Number	Sample Name	Analysis	Container	Order	STD ID	ISTD ID	Comments
SJE0321-CAL1	0.25PPM AR1660	QC		1	J001758	J001757	
SJE0321-CAL2	0.02PPM AR1660	QC		2	J002100	J001757	
SJE0321-CAL3	0.05PPM AR1660	QC		3	J002099	J001757	
SJE0321-CAL4	1.0PPM AR1660	QC		4	J001699	J001757	
SJE0321-CAL5	0.1PPM AR1660	QC		5	J002098	J001757	
SJE0321-CAL6	0.5PPM AR1660	QC		6	J002097	J001757	
SJE0321-CAL7	0.25PPM AR1242	QC		7	J001700	J001757	
SJE0321-CAL8	0.25PPM AR1248	QC		8	J001701	J001757	
SJE0321-CAL9	0.25PPM AR1254	QC		9	J001702	J001757	
SJE0321-CALA	0.25PPM AR2162	QC		10	J001703	J001757	
SJE0321-CALB	0.25PPM AR3268	QC		11	J004709	J001757	
SJE0321-SCV1	AR1660SCV1	QC		12	J000948	J001757	
SJE0321-SCV2	AR1242SCV2	QC		13	J000949	J001757	
SJE0321-SCV3	AR1248SCV3	QC		14	J000950	J001757	
SJE0321-SCV4	AR1254SCV4	QC		15	J000951	J001757	
SJE0321-SCV5	AR2162SCV5	QC		16	J000952	J001757	
SJE0321-SCV6	AR3268SCV6	QC		17	J000953	J001757	

GC LOG SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210522.b

	Inject Date/Time	Filename	DF	LabID	ClientID
1	22-MAY-2021 13:45	05222101ECD7.D	1	RINSE	
2	22-MAY-2021 14:07	05222102ECD7.D	1	RINSE	
3	22-MAY-2021 14:29	05222103ECD7.D	1	RINSE	
4	22-MAY-2021 14:50	05222104ECD7.D	1	RINSE	
5	22-MAY-2021 15:12	05222105ECD7.D	1	IB	
6	22-MAY-2021 15:34	05222106ECD7.D	1	0.25PPMAR1660	
7	22-MAY-2021 15:55	05222107ECD7.D	1	0.02PPMAR1660	
8	22-MAY-2021 16:17	05222108ECD7.D	1	0.05PPMAR1660	
9	22-MAY-2021 16:39	05222109ECD7.D	1	1PPMAR1660	
10	22-MAY-2021 17:00	05222110ECD7.D	1	0.1PPMAR1660	
11	22-MAY-2021 17:22	05222111ECD7.D	1	0.5PPMAR1660	
12	22-MAY-2021 17:44	05222112ECD7.D	1	AR1242	
13	22-MAY-2021 18:05	05222113ECD7.D	1	AR1248	
14	22-MAY-2021 18:27	05222114ECD7.D	1	AR1254	
15	22-MAY-2021 18:49	05222115ECD7.D	1	AR2162	
16	22-MAY-2021 19:10	05222116ECD7.D	1	AR3268	
17	22-MAY-2021 19:32	05222117ECD7.D	1	AR1660SCV1	
18	22-MAY-2021 19:53	05222118ECD7.D	1	AR1242SCV2	
19	22-MAY-2021 20:15	05222119ECD7.D	1	AR1248SCV3	
20	22-MAY-2021 20:37	05222120ECD7.D	1	AR1254SCV4	
21	22-MAY-2021 20:58	05222121ECD7.D	1	AR2162SCV5	
22	22-MAY-2021 21:20	05222122ECD7.D	1	AR3268SCV6	
23	22-MAY-2021 21:42	05222123ECD7.D	1	0.1PPMDDTS	
24	22-MAY-2021 22:03	05222124ECD7.D	1	DDT BD	
25	22-MAY-2021 22:25	05222125ECD7.D	1	AR1254ICV1	
26	22-MAY-2021 22:47	05222126ECD7.D	1	AR1660ICV2	
27	22-MAY-2021 23:08	05222127ECD7.D	1	BJE0408-BLK1	
28	22-MAY-2021 23:30	05222128ECD7.D	1	BJE0408-BS1	
29	22-MAY-2021 23:52	05222129ECD7.D	1	21E0145-01	
30	23-MAY-2021 00:13	05222130ECD7.D	1	BJE0400-BLK1	
31	23-MAY-2021 00:35	05222131ECD7.D	1	BJE0400-BS1	
32	23-MAY-2021 00:56	05222132ECD7.D	1	BJE0400-BSD1	
33	23-MAY-2021 01:18	05222133ECD7.D	1	21E0150-01	
34	23-MAY-2021 01:40	05222134ECD7.D	1	21E0150-02	
35	23-MAY-2021 02:01	05222135ECD7.D	1	21E0150-03	
36	23-MAY-2021 02:23	05222136ECD7.D	1	21E0150-04	
37	23-MAY-2021 02:45	05222137ECD7.D	1	AR1248CCV1	
38	23-MAY-2021 03:06	05222138ECD7.D	1	AR1660CCV2	
39	23-MAY-2021 03:28	05222139ECD7.D	1	BJE0481-BLK1	
40	23-MAY-2021 03:49	05222140ECD7.D	1	BJE0481-BS1	
41	23-MAY-2021 04:11	05222141ECD7.D	1	BJE0481-BSD1	
42	23-MAY-2021 04:33	05222142ECD7.D	1	21E0131-01	
43	23-MAY-2021 04:54	05222143ECD7.D	1	21E0131-02	
44	23-MAY-2021 05:16	05222144ECD7.D	1	21E0131-03	
45	23-MAY-2021 05:37	05222145ECD7.D	1	21E0131-04	
46	23-MAY-2021 05:59	05222146ECD7.D	1	21E0131-05	
47	23-MAY-2021 06:20	05222147ECD7.D	1	21E0131-06	
48	23-MAY-2021 06:42	05222148ECD7.D	1	21E0131-07	
49	23-MAY-2021 07:04	05222149ECD7.D	1	21E0131-08	
50	23-MAY-2021 07:25	05222150ECD7.D	1	21E0199-01	

	Inject Date/Time	Filename	DF	LabID	ClientID
51	23-MAY-2021 07:47	05222151ECD7.D	1	21E0199-02	
52	23-MAY-2021 08:08	05222152ECD7.D	1	AR1242CCV3	
53	23-MAY-2021 08:30	05222153ECD7.D	1	AR1660CCV4	

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210522.b

ARI Job No.: RINS Method: PCB.m Instrument: ecd7.i Date: 22-MAY-2021

Time	Filename	LabID	ClientId	DF	Manually Integrated Compounds
1345	05222101ECD7.D	RINSE		1	NO MANUAL INTEGRATION
1407	05222102ECD7.D	RINSE		1	NO MANUAL INTEGRATION
1429	05222103ECD7.D	RINSE		1	NO MANUAL INTEGRATION
1450	05222104ECD7.D	RINSE		1	NO MANUAL INTEGRATION
1512	05222105ECD7.D	IB		1	NO MANUAL INTEGRATION
1534	05222106ECD7.D	0.25PPMAR1660		1	NO MANUAL INTEGRATION
1555	05222107ECD7.D	0.02PPMAR1660		1	NO MANUAL INTEGRATION
1617	05222108ECD7.D	0.05PPMAR1660		1	NO MANUAL INTEGRATION
1639	05222109ECD7.D	1PPMAR1660		1	NO MANUAL INTEGRATION
1700	05222110ECD7.D	0.1PPMAR1660		1	NO MANUAL INTEGRATION
1722	05222111ECD7.D	0.5PPMAR1660		1	NO MANUAL INTEGRATION
1744	05222112ECD7.D	AR1242		1	NO MANUAL INTEGRATION
1805	05222113ECD7.D	AR1248		1	NO MANUAL INTEGRATION
1827	05222114ECD7.D	AR1254		1	NO MANUAL INTEGRATION
1849	05222115ECD7.D	AR2162		1	NO MANUAL INTEGRATION
1910	05222116ECD7.D	AR3268		1	NO MANUAL INTEGRATION
1932	05222117ECD7.D	AR1660SCV1		1	NO MANUAL INTEGRATION

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210522.b

Time	Filename	LabID	ClientId	DF	Manually Integrated Compounds
1953	05222118ECD7.D	AR1242SCV2		1	NO MANUAL INTEGRATION
2015	05222119ECD7.D	AR1248SCV3		1	NO MANUAL INTEGRATION
2037	05222120ECD7.D	AR1254SCV4		1	NO MANUAL INTEGRATION
2058	05222121ECD7.D	AR2162SCV5		1	NO MANUAL INTEGRATION
2120	05222122ECD7.D	AR3268SCV6		1	NO MANUAL INTEGRATION
2142	05222123ECD7.D	0.1PPMDDTS		1	NO MANUAL INTEGRATION
2203	05222124ECD7.D	DDT BD		1	NO MANUAL INTEGRATION
2225	05222125ECD7.D	AR1254ICV1		1	NO MANUAL INTEGRATION
2247	05222126ECD7.D	AR1660ICV2		1	NO MANUAL INTEGRATION
2308	05222127ECD7.D	BJE0408-BLK1		1	NO MANUAL INTEGRATION
2330	05222128ECD7.D	BJE0408-BS1		1	NO MANUAL INTEGRATION
2352	05222129ECD7.D	21E0145-01		1	NO MANUAL INTEGRATION
0013	05222130ECD7.D	BJE0400-BLK1		1	NO MANUAL INTEGRATION
0035	05222131ECD7.D	BJE0400-BS1		1	NO MANUAL INTEGRATION
0056	05222132ECD7.D	BJE0400-BSD1		1	NO MANUAL INTEGRATION
0118	05222133ECD7.D	21E0150-01		1	NO MANUAL INTEGRATION
0140	05222134ECD7.D	21E0150-02		1	NO MANUAL INTEGRATION
0201	05222135ECD7.D	21E0150-03		1	NO MANUAL INTEGRATION

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210522.b

Time	Filename	LabID	ClientId	DF	Manually Integrated Compounds
0223	05222136ECD7.D	21E0150-04		1	NO MANUAL INTEGRATION
0245	05222137ECD7.D	AR1248CCV1		1	NO MANUAL INTEGRATION
0306	05222138ECD7.D	AR1660CCV2		1	NO MANUAL INTEGRATION
0328	05222139ECD7.D	BJE0481-BLK1		1	NO MANUAL INTEGRATION
0349	05222140ECD7.D	BJE0481-BS1		1	NO MANUAL INTEGRATION
0411	05222141ECD7.D	BJE0481-BSD1		1	NO MANUAL INTEGRATION
0433	05222142ECD7.D	21E0131-01		1	NO MANUAL INTEGRATION
0454	05222143ECD7.D	21E0131-02		1	NO MANUAL INTEGRATION
0516	05222144ECD7.D	21E0131-03		1	NO MANUAL INTEGRATION
0537	05222145ECD7.D	21E0131-04		1	NO MANUAL INTEGRATION
0559	05222146ECD7.D	21E0131-05		1	NO MANUAL INTEGRATION
0620	05222147ECD7.D	21E0131-06		1	NO MANUAL INTEGRATION
0642	05222148ECD7.D	21E0131-07		1	NO MANUAL INTEGRATION
0704	05222149ECD7.D	21E0131-08		1	NO MANUAL INTEGRATION
0725	05222150ECD7.D	21E0199-01		1	NO MANUAL INTEGRATION
0747	05222151ECD7.D	21E0199-02		1	NO MANUAL INTEGRATION
0808	05222152ECD7.D	AR1242CCV3		1	NO MANUAL INTEGRATION
0830	05222153ECD7.D	AR1660CCV4		1	NO MANUAL INTEGRATION

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210522.b\210522.b

Time	Filename	LabID	ClientId	DF	Manually Integrated Compounds
1345	05222101ECD7.D	RINSE		1	NO MANUAL INTEGRATION
1407	05222102ECD7.D	RINSE		1	NO MANUAL INTEGRATION
1429	05222103ECD7.D	RINSE		1	NO MANUAL INTEGRATION
1450	05222104ECD7.D	RINSE		1	NO MANUAL INTEGRATION
1512	05222105ECD7.D	IB		1	NO MANUAL INTEGRATION
1534	05222106ECD7.D	0.25PPMAR1660		1	NO MANUAL INTEGRATION
1555	05222107ECD7.D	0.02PPMAR1660		1	NO MANUAL INTEGRATION
1617	05222108ECD7.D	0.05PPMAR1660		1	NO MANUAL INTEGRATION
1639	05222109ECD7.D	1PPMAR1660		1	NO MANUAL INTEGRATION
1700	05222110ECD7.D	0.1PPMAR1660		1	NO MANUAL INTEGRATION
1722	05222111ECD7.D	0.5PPMAR1660		1	NO MANUAL INTEGRATION
1744	05222112ECD7.D	AR1242		1	NO MANUAL INTEGRATION
1805	05222113ECD7.D	AR1248		1	NO MANUAL INTEGRATION
1827	05222114ECD7.D	AR1254		1	NO MANUAL INTEGRATION
1849	05222115ECD7.D	AR2162		1	NO MANUAL INTEGRATION
1910	05222116ECD7.D	AR3268		1	NO MANUAL INTEGRATION
1932	05222117ECD7.D	AR1660SCV1		1	NO MANUAL INTEGRATION
1953	05222118ECD7.D	AR1242SCV2		1	NO MANUAL INTEGRATION

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210522.b\210522.b

Time	Filename	LabID	ClientId	DF	Manually Integrated Compounds
2015	05222119ECD7.D	AR1248SCV3		1	NO MANUAL INTEGRATION
2037	05222120ECD7.D	AR1254SCV4		1	NO MANUAL INTEGRATION
2058	05222121ECD7.D	AR2162SCV5		1	NO MANUAL INTEGRATION
2120	05222122ECD7.D	AR3268SCV6		1	NO MANUAL INTEGRATION
2142	05222123ECD7.D	0.1PPMDDTS		1	NO MANUAL INTEGRATION
2203	05222124ECD7.D	DDT BD		1	NO MANUAL INTEGRATION
2225	05222125ECD7.D	AR1254ICV1		1	NO MANUAL INTEGRATION
2247	05222126ECD7.D	AR1660ICV2		1	NO MANUAL INTEGRATION
2308	05222127ECD7.D	BJE0408-BLK1		1	NO MANUAL INTEGRATION
2330	05222128ECD7.D	BJE0408-BS1		1	NO MANUAL INTEGRATION
2352	05222129ECD7.D	21E0145-01		1	NO MANUAL INTEGRATION
0013	05222130ECD7.D	BJE0400-BLK1		1	NO MANUAL INTEGRATION
0035	05222131ECD7.D	BJE0400-BS1		1	NO MANUAL INTEGRATION
0056	05222132ECD7.D	BJE0400-BSD1		1	NO MANUAL INTEGRATION
0118	05222133ECD7.D	21E0150-01		1	NO MANUAL INTEGRATION
0140	05222134ECD7.D	21E0150-02		1	NO MANUAL INTEGRATION
0201	05222135ECD7.D	21E0150-03		1	NO MANUAL INTEGRATION
0223	05222136ECD7.D	21E0150-04		1	NO MANUAL INTEGRATION

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210522.b\210522.b

Time	Filename	LabID	ClientId	DF	Manually Integrated Compounds
0245	05222137ECD7.D	AR1248CCV1		1	NO MANUAL INTEGRATION
0306	05222138ECD7.D	AR1660CCV2		1	NO MANUAL INTEGRATION
0328	05222139ECD7.D	BJE0481-BLK1		1	NO MANUAL INTEGRATION
0349	05222140ECD7.D	BJE0481-BS1		1	NO MANUAL INTEGRATION
0411	05222141ECD7.D	BJE0481-BSD1		1	NO MANUAL INTEGRATION
0433	05222142ECD7.D	21E0131-01		1	NO MANUAL INTEGRATION
0454	05222143ECD7.D	21E0131-02		1	NO MANUAL INTEGRATION
0516	05222144ECD7.D	21E0131-03		1	NO MANUAL INTEGRATION
0537	05222145ECD7.D	21E0131-04		1	NO MANUAL INTEGRATION
0559	05222146ECD7.D	21E0131-05		1	NO MANUAL INTEGRATION
0620	05222147ECD7.D	21E0131-06		1	NO MANUAL INTEGRATION
0642	05222148ECD7.D	21E0131-07		1	NO MANUAL INTEGRATION
0704	05222149ECD7.D	21E0131-08		1	NO MANUAL INTEGRATION
0725	05222150ECD7.D	21E0199-01		1	NO MANUAL INTEGRATION
0747	05222151ECD7.D	21E0199-02		1	NO MANUAL INTEGRATION
0808	05222152ECD7.D	AR1242CCV3		1	NO MANUAL INTEGRATION
0830	05222153ECD7.D	AR1660CCV4		1	NO MANUAL INTEGRATION

Security Status Report

Date: 25-May-2021 10:16

05222101ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222102ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222103ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222104ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222105ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222106ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222107ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222108ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222109ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222110ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222111ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222112ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222113ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222114ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222115ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222116ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222117ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222118ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222119ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222120ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222121ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222122ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222123ECD7.D	Data Locked	jrains, 25-May-2021 10:16
05222124ECD7.D	Data Locked	jrains, 25-May-2021 10:16

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Dual Column

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0190	Instrument:	ECD7
		Calibration:	EE00069

Sample Name	Lab Sample ID	Column 1 File ID	Column 2 File ID	Matrix	Analysis Date/Time
Initial Cal Check	SJH0190-ICV1	08122102ECD7.D	08122102ECD7.D	NA	08/12/21 13:09
Initial Cal Check	SJH0190-ICV2	08122103ECD7.D	08122103ECD7.D	NA	08/12/21 13:29
Calibration Check	SJH0190-CCV1	08122111ECD7.D	08122111ECD7.D	NA	08/12/21 16:13
Calibration Check	SJH0190-CCV2	08122112ECD7.D	08122112ECD7.D	NA	08/12/21 16:34
LDW21-SS646	21G0286-05	08122119ECD7.D	08122119ECD7.D	Solid	08/12/21 18:58
Calibration Check	SJH0190-CCV3	08122120ECD7.D	08122120ECD7.D	NA	08/12/21 19:18
Calibration Check	SJH0190-CCV4	08122121ECD7.D	08122121ECD7.D	NA	08/12/21 19:39

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Printed: 8/16/2021 4:36:36PM

ANALYSIS SEQUENCE

SJH0190

Instrument: ECD7 Element Column ID: i10655i10656
Calibration ID: EE00069

Lab Number	Sample Name	Analysis	Container	Order	STD ID	ISTD ID	Comments
SJH0190-ICV1	AR1254ICV1	QC		1	J001702	J008446	
SJH0190-ICV2	AR1660ICV2	QC		2	J001758	J008446	
21G0211-01	LDW21-SC674B	8082A PCB Solid 4	B 01	3		J008446	
21G0211-03	LDW21-SC674E	8082A PCB Solid 4	B 01	4		J008446	
21G0211-04	LDW21-SC674G	8082A PCB Solid 4	B 01	5		J008446	
21G0211-05	LDW21-SC674I	8082A PCB Solid 4	B 01	6		J008446	
21G0211-06	LDW21-SC673B	8082A PCB Solid 4	B 01	7		J008446	
21G0211-10	LDW21-SC673I	8082A PCB Solid 4	B 01	8		J008446	
21G0269-10	LDW21-SS575	8082A PCB Solid 4	A 01	9		J008446	
SJH0190-CCV1	AR1248CCV1	QC		10	J006804	J008446	
SJH0190-CCV2	AR1660CCV2	QC		11	J001758	J008446	
BJG0722-MS1	Matrix Spike	QC		12		J008446	
BJG0722-MSD1	Matrix Spike Dup	QC		13		J008446	
21G0269-11	LDW21-SS505	8082A PCB Solid 4	B 01	14		J008446	
21G0269-12	LDW21-SS506	8082A PCB Solid 4	B 01	15		J008446	
21G0211-11	LDW21-IT665B	8082A PCB Solid 4	B 01	16		J008446	
21G0211-14	LDW21-IT666B	8082A PCB Solid 4	B 01	17		J008446	
21G0286-05	LDW21-SS646	8082A PCB Solid 4	B 02	18		J008446	
SJH0190-CCV3	AR1242CCV3	QC		19	J001700	J008446	
SJH0190-CCV4	AR1660CCV4	QC		20	J001758	J008446	

GC LOG SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210812.b

	Inject Date/Time	Filename	DF	LabID	ClientID
1	12-AUG-2021 12:48	08122101ECD7.D	1	DDTS	
2	12-AUG-2021 13:09	08122102ECD7.D	1	AR1254ICV1	
3	12-AUG-2021 13:29	08122103ECD7.D	1	AR1660ICV1	
4	12-AUG-2021 13:50	08122104ECD7.D	1	21G0211-01	
5	12-AUG-2021 14:10	08122105ECD7.D	1	21G0211-03	
6	12-AUG-2021 14:31	08122106ECD7.D	1	21G0211-04	
7	12-AUG-2021 14:51	08122107ECD7.D	1	21G0211-05	
8	12-AUG-2021 15:12	08122108ECD7.D	1	21G0211-06	
9	12-AUG-2021 15:32	08122109ECD7.D	1	21G0211-10	
10	12-AUG-2021 15:53	08122110ECD7.D	1	21G0269-10	
11	12-AUG-2021 16:13	08122111ECD7.D	1	AR1248CCV1	
12	12-AUG-2021 16:34	08122112ECD7.D	1	AR1660CCV2	
13	12-AUG-2021 16:54	08122113ECD7.D	1	BJG0722-MS1	
14	12-AUG-2021 17:15	08122114ECD7.D	1	BJG0722-MSD1	
15	12-AUG-2021 17:35	08122115ECD7.D	1	21G0269-11	
16	12-AUG-2021 17:56	08122116ECD7.D	1	21G0269-12	
17	12-AUG-2021 18:16	08122117ECD7.D	5	21G0211-11RE1	
18	12-AUG-2021 18:37	08122118ECD7.D	5	21G0211-14RE1	
19	12-AUG-2021 18:58	08122119ECD7.D	25	21G0286-05RE1	
20	12-AUG-2021 19:18	08122120ECD7.D	1	AR1242CCV3	
21	12-AUG-2021 19:39	08122121ECD7.D	1	AR1660CCV4	
22	12-AUG-2021 19:59	08122122ECD7.D	10	J008331	
23	12-AUG-2021 20:20	08122123ECD7.D	500	J008330	

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210812.b

ARI Job No.: DDTS Method: PCB.m Instrument: ecd7.i Date: 12-AUG-2021

Time	Filename	LabID	ClientId	DF	Manually Integrated Compounds
1248	08122101ECD7.D	DDTS		1	NO MANUAL INTEGRATION
1309	08122102ECD7.D	AR1254ICV1		1	NO MANUAL INTEGRATION
1329	08122103ECD7.D	AR1660ICV1		1	NO MANUAL INTEGRATION
1350	08122104ECD7.D	21G0211-01		1	Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254,
1410	08122105ECD7.D	21G0211-03		1	Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254,
1431	08122106ECD7.D	21G0211-04		1	Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254,
1451	08122107ECD7.D	21G0211-05		1	Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254,
1512	08122108ECD7.D	21G0211-06		1	NO MANUAL INTEGRATION
1532	08122109ECD7.D	21G0211-10		1	Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, Aroclor-1260, Aroclor-1262, Aroclor-1268,
1553	08122110ECD7.D	21G0269-10		1	Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254,
1613	08122111ECD7.D	AR1248CCV1		1	NO MANUAL INTEGRATION
1634	08122112ECD7.D	AR1660CCV2		1	NO MANUAL INTEGRATION
1654	08122113ECD7.D	BJG0722-MS1		1	NO MANUAL INTEGRATION
1715	08122114ECD7.D	BJG0722-MSD1		1	NO MANUAL INTEGRATION
1735	08122115ECD7.D	21G0269-11		1	Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254,
1756	08122116ECD7.D	21G0269-12		1	Aroclor-1254,
1816	08122117ECD7.D	21G0211-11RE1		5	NO MANUAL INTEGRATION

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210812.b

Time	Filename	LabID	ClientId	DF	Manually Integrated Compounds
1837	08122118ECD7.D	21G0211-14RE1		5	NO MANUAL INTEGRATION
1858	08122119ECD7.D	21G0286-05RE1		25	NO MANUAL INTEGRATION
1918	08122120ECD7.D	AR1242CCV3		1	NO MANUAL INTEGRATION
1939	08122121ECD7.D	AR1660CCV4		1	NO MANUAL INTEGRATION
1959	08122122ECD7.D	J008331		10	NO MANUAL INTEGRATION
2020	08122123ECD7.D	J008330		500	NO MANUAL INTEGRATION
1248	08122101ECD7.D	DDTS		1	NO MANUAL INTEGRATION
1309	08122102ECD7.D	AR1254ICV1		1	NO MANUAL INTEGRATION
1329	08122103ECD7.D	AR1660ICV1		1	NO MANUAL INTEGRATION
1350	08122104ECD7.D	21G0211-01		1	Aroclor-1248 [2C],
1410	08122105ECD7.D	21G0211-03		1	Aroclor-1248 [2C],
1431	08122106ECD7.D	21G0211-04		1	Aroclor-1248 [2C],
1451	08122107ECD7.D	21G0211-05		1	Aroclor-1248 [2C], Aroclor-1254 [2C],
1512	08122108ECD7.D	21G0211-06		1	Aroclor-1248 [2C],
1532	08122109ECD7.D	21G0211-10		1	Aroclor-1016 [2C], Aroclor-1242 [2C], Aroclor-1248 [2C], Aroclor-1254 [2C], Aroclor-1260 [2C], Aroclor-1262 [2C],
1553	08122110ECD7.D	21G0269-10		1	NO MANUAL INTEGRATION
1613	08122111ECD7.D	AR1248CCV1		1	NO MANUAL INTEGRATION
1634	08122112ECD7.D	AR1660CCV2		1	NO MANUAL INTEGRATION

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210812.b\210812.b

Time	Filename	LabID	ClientId	DF	Manually Integrated Compounds
1654	08122113ECD7.D	BJG0722-MS1		1	NO MANUAL INTEGRATION
1715	08122114ECD7.D	BJG0722-MSD1		1	NO MANUAL INTEGRATION
1735	08122115ECD7.D	21G0269-11		1	NO MANUAL INTEGRATION
1756	08122116ECD7.D	21G0269-12		1	Aroclor-1248 [2C], Aroclor-1254 [2C],
1816	08122117ECD7.D	21G0211-11RE1		5	NO MANUAL INTEGRATION
1837	08122118ECD7.D	21G0211-14RE1		5	NO MANUAL INTEGRATION
1858	08122119ECD7.D	21G0286-05RE1		25	Aroclor-1248 [2C], Aroclor-1254 [2C],
1918	08122120ECD7.D	AR1242CCV3		1	NO MANUAL INTEGRATION
1939	08122121ECD7.D	AR1660CCV4		1	NO MANUAL INTEGRATION
1959	08122122ECD7.D	J008331		10	NO MANUAL INTEGRATION
2020	08122123ECD7.D	J008330		500	Aroclor-1016 [2C], Aroclor-1232 [2C], Aroclor-1242 [2C], Aroclor-1248 [2C],

Security Status Report

Date: 16-Aug-2021 16:36

08122101ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122102ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122103ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122104ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122105ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122106ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122107ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122108ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122109ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122110ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122111ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122112ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122113ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122114ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122115ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122116ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122117ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122118ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122119ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122120ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122121ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122122ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36
08122123ECD7.D	Data Locked	jrains, 16-Aug-2021 16:36

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Dual Column

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0202	Instrument:	ECD7
		Calibration:	EE00069

Sample Name	Lab Sample ID	Column 1 File ID	Column 2 File ID	Matrix	Analysis Date/Time
Initial Cal Check	SJH0202-ICV1	08112114ECD7.D	08112114ECD7.D	NA	08/11/21 19:53
Initial Cal Check	SJH0202-ICV2	08112115ECD7.D	08112115ECD7.D	NA	08/11/21 20:13
Calibration Check	SJH0202-CCV1	08112131ECD7.D	08112131ECD7.D	NA	08/12/21 01:41
Calibration Check	SJH0202-CCV2	08112132ECD7.D	08112132ECD7.D	NA	08/12/21 02:01
Blank	BJH0005-BLK1	08112133ECD7.D	08112133ECD7.D	Solid	08/12/21 02:22
LCS	BJH0005-BS1	08112134ECD7.D	08112134ECD7.D	Solid	08/12/21 02:42
Reference	BJH0005-SRM1	08112135ECD7.D	08112135ECD7.D	Solid	08/12/21 03:03
Calibration Check	SJH0202-CCV3	08112143ECD7.D	08112143ECD7.D	NA	08/12/21 05:47
Calibration Check	SJH0202-CCV4	08112144ECD7.D	08112144ECD7.D	NA	08/12/21 06:07
LDW21-SS625	21G0286-02	08112147ECD7.D	08112147ECD7.D	Solid	08/12/21 07:09
LDW21-IT625	21G0286-03	08112148ECD7.D	08112148ECD7.D	Solid	08/12/21 07:29
LDW21-IT625	BJH0005-MS1	08112149ECD7.D	08112149ECD7.D	Solid	08/12/21 07:50
LDW21-IT625	BJH0005-MSD1	08112150ECD7.D	08112150ECD7.D	Solid	08/12/21 08:10
LDW21-SS627	21G0286-04	08112151ECD7.D	08112151ECD7.D	Solid	08/12/21 08:31
Calibration Check	SJH0202-CCV5	08112153ECD7.D	08112153ECD7.D	NA	08/12/21 09:12
Calibration Check	SJH0202-CCV6	08112154ECD7.D	08112154ECD7.D	NA	08/12/21 09:32

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Printed: 8/17/2021 8:56:49AM

ANALYSIS SEQUENCE

SJH0202

Instrument: ECD7 Element Column ID: i10655/10656
Calibration ID: EE00069 Tune File:
EM Voltage:

Lab Number	Sample Name	Analysis	Container	Order	STD ID	ISTD ID	Comments
SJH0202-ICV1	AR1254ICV1	QC		1	J001702	J001757	
SJH0202-ICV2	AR1660ICV2	QC		2	J001758	J001757	
BJG0722-BLK1	Blank	QC		3		J001757	
BJG0722-BS1	LCS	QC		4		J001757	
BJG0722-SRM1	Reference	QC		5		J001757	
21G0269-01	LDW21-SS583	8082A PCB Solid 4	B 02	6		J001757	
21G0269-02	LDW21-SS586	8082A PCB Solid 4	B 02	7		J001757	
21G0269-03	LDW21-SS570	8082A PCB Solid 4	B 01	8		J001757	
21G0269-04	LDW21-SS556	8082A PCB Solid 4	B 01	9		J001757	
21G0269-05	LDW21-SS555	8082A PCB Solid 4	B 01	10		J001757	
21G0269-06	LDW21-SS555FD	8082A PCB Solid 4	B 01	11		J001757	
21G0269-07	LDW21-SS536	8082A PCB Solid 4	B 01	12		J001757	
SJH0202-CCV1	AR1248CCV1	QC		13	J006804	J001757	
SJH0202-CCV2	AR1660CCV2	QC		14	J001758	J001757	
BJH0005-BLK1	Blank	QC		15		J001757	
BJH0005-BS1	LCS	QC		16		J001757	
BJH0005-SRM1	Reference	QC		17		J001757	
BJH0005-MS1	Matrix Spike	QC		18		J001757	
BJH0005-MSD1	Matrix Spike Dup	QC		19		J001757	
21G0285-01	LDW21-SC674AB	8082A PCB Solid 4	B 02	20		J001757	
21G0285-02	LDW21-SC674CB	8082A PCB Solid 4	B 02	21		J001757	
21G0285-03	LDW21-SC674EB	8082A PCB Solid 4	B 02	22		J001757	

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Printed: 8/17/2021 8:56:49AM

ANALYSIS SEQUENCE

SJH0202

Instrument: ECD7 Element Column ID: i10655/10656
Calibration ID: EE00069 Tune File:
EM Voltage:

Lab Number	Sample Name	Analysis	Container	Order	STD ID	ISTD ID	Comments
21G0285-04	LDW21-SC674GB	8082A PCB Solid 4	B 02	23		J001757	
21G0285-05	LDW21-SC673BB	8082A PCB Solid 4	B 02	24		J001757	
21G0285-06	LDW21-SC673DB	8082A PCB Solid 4	B 02	25		J001757	
21G0285-07	LDW21-SC673FB	8082A PCB Solid 4	B 02	26		J001757	
SJH0202-CCV3	AR1242CCV3	QC		27	J001700	J001757	
SJH0202-CCV4	AR1660CCV4	QC		28	J001758	J001757	
21G0285-08	LDW21-SC673HB	8082A PCB Solid 4	B 02	29		J001757	
21G0285-09	LDW21-SC673JB	8082A PCB Solid 4	B 02	30		J001757	
21G0286-02	LDW21-SS625	8082A PCB Solid 4	B 02	31		J001757	
21G0286-03	LDW21-IT625	8082A PCB Solid 4	B 02	32		J001757	
21G0286-04	LDW21-SS627	8082A PCB Solid 4	B 02	33		J001757	
SJH0202-CCV5	AR1254CCV5	QC		34	J001702	J001757	
SJH0202-CCV6	AR1660CCV6	QC		35	J001758	J001757	

GC LOG SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210811.b

	Inject Date/Time	Filename	DF	LabID	ClientID
1	11-AUG-2021 19:53	08112114ECD7.D	1	AR1254CCV5	
2	11-AUG-2021 20:13	08112115ECD7.D	1	AR1660CCV6	
3	11-AUG-2021 20:34	08112116ECD7.D	1	BJG0722-BLK1	
4	11-AUG-2021 20:54	08112117ECD7.D	1	BJG0722-BS1	
5	11-AUG-2021 21:15	08112118ECD7.D	1	BJG0722-SRM1	
6	11-AUG-2021 21:35	08112119ECD7.D	1	21G0269-01	
7	11-AUG-2021 21:56	08112120ECD7.D	1	21G0269-02	
8	11-AUG-2021 22:16	08112121ECD7.D	1	21G0269-03	
9	11-AUG-2021 22:37	08112122ECD7.D	1	21G0269-04	
10	11-AUG-2021 22:57	08112123ECD7.D	1	21G0269-05	
11	11-AUG-2021 23:18	08112124ECD7.D	1	21G0269-06	
12	11-AUG-2021 23:38	08112125ECD7.D	1	21G0269-07	
13	11-AUG-2021 23:59	08112126ECD7.D	1	21G0269-10	
14	12-AUG-2021 00:19	08112127ECD7.D	1	BJG0722-MS1	
15	12-AUG-2021 00:40	08112128ECD7.D	1	BJG0722-MSD1	
16	12-AUG-2021 01:00	08112129ECD7.D	1	21G0269-11	
17	12-AUG-2021 01:21	08112130ECD7.D	1	21G0269-12	
18	12-AUG-2021 01:41	08112131ECD7.D	1	AR1248CCV7	
19	12-AUG-2021 02:02	08112132ECD7.D	1	AR1660CCV8	
20	12-AUG-2021 02:22	08112133ECD7.D	1	BJH0005-BLK1	
21	12-AUG-2021 02:42	08112134ECD7.D	1	BJH0005-BS1	
22	12-AUG-2021 03:03	08112135ECD7.D	1	BJH0005-SRM1	
23	12-AUG-2021 03:23	08112136ECD7.D	1	21G0285-01	
24	12-AUG-2021 03:44	08112137ECD7.D	1	21G0285-02	
25	12-AUG-2021 04:04	08112138ECD7.D	1	21G0285-03	
26	12-AUG-2021 04:25	08112139ECD7.D	1	21G0285-04	
27	12-AUG-2021 04:45	08112140ECD7.D	1	21G0285-05	
28	12-AUG-2021 05:06	08112141ECD7.D	1	21G0285-06	
29	12-AUG-2021 05:26	08112142ECD7.D	1	21G0285-07	
30	12-AUG-2021 05:47	08112143ECD7.D	1	AR1242CCV9	
31	12-AUG-2021 06:07	08112144ECD7.D	1	AR1660CCVA	
32	12-AUG-2021 06:28	08112145ECD7.D	1	21G0285-08	
33	12-AUG-2021 06:48	08112146ECD7.D	1	21G0285-09	
34	12-AUG-2021 07:09	08112147ECD7.D	1	21G0286-02	
35	12-AUG-2021 07:29	08112148ECD7.D	1	21G0286-03	
36	12-AUG-2021 07:50	08112149ECD7.D	1	BJH0005-MS1	
37	12-AUG-2021 08:10	08112150ECD7.D	1	BJH0005-MSD1	
38	12-AUG-2021 08:31	08112151ECD7.D	1	21G0286-04	
39	12-AUG-2021 08:51	08112152ECD7.D	1	21G0286-05	
40	12-AUG-2021 09:12	08112153ECD7.D	1	AR1254CCVB	
41	12-AUG-2021 09:32	08112154ECD7.D	1	AR1660CCVC	

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210811.b

ARI Job No.: AR12 Method: PCB.m Instrument: ecd7.i Date: 11-AUG-2021

Time	Filename	LabID	ClientId	DF	Manually Integrated Compounds
1953	08112114ECD7.D	AR1254CCV5		1	NO MANUAL INTEGRATION
2013	08112115ECD7.D	AR1660CCV6		1	NO MANUAL INTEGRATION
2034	08112116ECD7.D	BJG0722-BLK1		1	NO MANUAL INTEGRATION
2054	08112117ECD7.D	BJG0722-BS1		1	NO MANUAL INTEGRATION
2115	08112118ECD7.D	BJG0722-SRM1		1	NO MANUAL INTEGRATION
2135	08112119ECD7.D	21G0269-01		1	NO MANUAL INTEGRATION
2156	08112120ECD7.D	21G0269-02		1	NO MANUAL INTEGRATION
2216	08112121ECD7.D	21G0269-03		1	NO MANUAL INTEGRATION
2237	08112122ECD7.D	21G0269-04		1	NO MANUAL INTEGRATION
2257	08112123ECD7.D	21G0269-05		1	NO MANUAL INTEGRATION
2318	08112124ECD7.D	21G0269-06		1	NO MANUAL INTEGRATION
2338	08112125ECD7.D	21G0269-07		1	NO MANUAL INTEGRATION
2359	08112126ECD7.D	21G0269-10		1	NO MANUAL INTEGRATION
0019	08112127ECD7.D	BJG0722-MS1		1	NO MANUAL INTEGRATION
0040	08112128ECD7.D	BJG0722-MSD1		1	NO MANUAL INTEGRATION
0100	08112129ECD7.D	21G0269-11		1	NO MANUAL INTEGRATION
0121	08112130ECD7.D	21G0269-12		1	NO MANUAL INTEGRATION

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210811.b

Time	Filename	LabID	ClientId	DF	Manually Integrated Compounds
0141	08112131ECD7.D	AR1248CCV7		1	NO MANUAL INTEGRATION
0202	08112132ECD7.D	AR1660CCV8		1	NO MANUAL INTEGRATION
0222	08112133ECD7.D	BJH0005-BLK1		1	NO MANUAL INTEGRATION
0242	08112134ECD7.D	BJH0005-BS1		1	NO MANUAL INTEGRATION
0303	08112135ECD7.D	BJH0005-SRM1		1	NO MANUAL INTEGRATION
0323	08112136ECD7.D	21G0285-01		1	NO MANUAL INTEGRATION
0344	08112137ECD7.D	21G0285-02		1	NO MANUAL INTEGRATION
0404	08112138ECD7.D	21G0285-03		1	NO MANUAL INTEGRATION
0425	08112139ECD7.D	21G0285-04		1	NO MANUAL INTEGRATION
0445	08112140ECD7.D	21G0285-05		1	NO MANUAL INTEGRATION
0506	08112141ECD7.D	21G0285-06		1	NO MANUAL INTEGRATION
0526	08112142ECD7.D	21G0285-07		1	NO MANUAL INTEGRATION
0547	08112143ECD7.D	AR1242CCV9		1	NO MANUAL INTEGRATION
0607	08112144ECD7.D	AR1660CCVA		1	NO MANUAL INTEGRATION
0628	08112145ECD7.D	21G0285-08		1	NO MANUAL INTEGRATION
0648	08112146ECD7.D	21G0285-09		1	NO MANUAL INTEGRATION
0709	08112147ECD7.D	21G0286-02		1	NO MANUAL INTEGRATION
0729	08112148ECD7.D	21G0286-03		1	NO MANUAL INTEGRATION

MANUAL INTEGRATION SUMMARY FOR DATABATCH - \\target\share\chem4\ecd7.i\210811.b

Time	Filename	LabID	ClientId	DF	Manually Integrated Compounds
0750	08112149ECD7.D	BJH0005-MS1		1	NO MANUAL INTEGRATION
0810	08112150ECD7.D	BJH0005-MSD1		1	NO MANUAL INTEGRATION
0831	08112151ECD7.D	21G0286-04		1	NO MANUAL INTEGRATION
0851	08112152ECD7.D	21G0286-05		1	NO MANUAL INTEGRATION
0912	08112153ECD7.D	AR1254CCVB		1	Aroclor-1254,
0932	08112154ECD7.D	AR1660CCVC		1	NO MANUAL INTEGRATION

Security Status Report

Date: 17-Aug-2021 08:58

08112114ECD7.D	Data Locked	yev, 17-
08112115ECD7.D	Data Locked	yev, 17-
08112116ECD7.D	Data Locked	yev, 17-
08112117ECD7.D	Data Locked	yev, 17-
08112118ECD7.D	Data Locked	yev, 17-
08112119ECD7.D	Data Locked	yev, 17-
08112120ECD7.D	Data Locked	yev, 17-
08112121ECD7.D	Data Locked	yev, 17-
08112122ECD7.D	Data Locked	yev, 17-
08112123ECD7.D	Data Locked	yev, 17-
08112124ECD7.D	Data Locked	yev, 17-
08112125ECD7.D	Data Locked	yev, 17-
08112126ECD7.D	Data Locked	yev, 17-
08112127ECD7.D	Data Locked	yev, 17-
08112128ECD7.D	Data Locked	yev, 17-
08112129ECD7.D	Data Locked	yev, 17-
08112130ECD7.D	Data Locked	yev, 17-
08112131ECD7.D	Data Locked	yev, 17-
08112132ECD7.D	Data Locked	yev, 17-
08112133ECD7.D	Data Locked	yev, 17-
08112134ECD7.D	Data Locked	yev, 17-
08112135ECD7.D	Data Locked	yev, 17-
08112136ECD7.D	Data Locked	yev, 17-
08112137ECD7.D	Data Locked	yev, 17-
08112138ECD7.D	Data Locked	yev, 17-
08112139ECD7.D	Data Locked	yev, 17-
08112140ECD7.D	Data Locked	yev, 17-
08112141ECD7.D	Data Locked	yev, 17-
08112142ECD7.D	Data Locked	yev, 17-
08112143ECD7.D	Data Locked	yev, 17-
08112144ECD7.D	Data Locked	yev, 17-
08112145ECD7.D	Data Locked	yev, 17-
08112146ECD7.D	Data Locked	yev, 17-
08112147ECD7.D	Data Locked	yev, 17-
08112148ECD7.D	Data Locked	yev, 17-
08112149ECD7.D	Data Locked	yev, 17-
08112150ECD7.D	Data Locked	yev, 17-
08112151ECD7.D	Data Locked	yev, 17-
08112152ECD7.D	Data Locked	yev, 17-
08112153ECD7.D	Data Locked	yev, 17-
08112154ECD7.D	Data Locked	yev, 17-

Analytical Resources, Incorporated
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SURROGATE RECOVERY AND RT SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG/WO:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJE0321	Instrument:	ECD7
Calibration:	EE00069	Calibration Date:	05/22/2021

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SJE0321-SCV1 (Water)			Lab File ID: 05222117ECD7.D				Analyzed: 05/22/21 19:32	
Decachlorobiphenyl	40.000	99.6	80 - 120	13.177	13.1765	0.0005	N/A	
Tetrachlorometaxylene	40.000	106	80 - 120	5.074	5.072667	0.0013	N/A	
Decachlorobiphenyl [2C]	40.000	97.6	80 - 120	13.872	13.8715	0.0005	N/A	
Tetrachlorometaxylene [2C]	40.000	101	80 - 120	5.423	5.423333	-0.0003	N/A	
SJE0321-SCV2 (Water)			Lab File ID: 05222118ECD7.D				Analyzed: 05/22/21 19:53	
Decachlorobiphenyl	40.000	101	80 - 120	13.176	13.1765	-0.0005	N/A	
Tetrachlorometaxylene	40.000	104	80 - 120	5.072	5.072667	-0.0007	N/A	
Decachlorobiphenyl [2C]	40.000	101	80 - 120	13.873	13.8715	0.0015	N/A	
Tetrachlorometaxylene [2C]	40.000	101	80 - 120	5.423	5.423333	-0.0003	N/A	
SJE0321-SCV3 (Water)			Lab File ID: 05222119ECD7.D				Analyzed: 05/22/21 20:15	
Decachlorobiphenyl	40.000	101	80 - 120	13.176	13.1765	-0.0005	N/A	
Tetrachlorometaxylene	40.000	107	80 - 120	5.074	5.072667	0.0013	N/A	
Decachlorobiphenyl [2C]	40.000	101	80 - 120	13.873	13.8715	0.0015	N/A	
Tetrachlorometaxylene [2C]	40.000	102	80 - 120	5.424	5.423333	0.0007	N/A	
SJE0321-SCV4 (Water)			Lab File ID: 05222120ECD7.D				Analyzed: 05/22/21 20:37	
Decachlorobiphenyl	40.000	100	80 - 120	13.177	13.1765	0.0005	N/A	
Tetrachlorometaxylene	40.000	104	80 - 120	5.073	5.072667	0.0003	N/A	
Decachlorobiphenyl [2C]	40.000	99.0	80 - 120	13.872	13.8715	0.0005	N/A	
Tetrachlorometaxylene [2C]	40.000	101	80 - 120	5.423	5.423333	-0.0003	N/A	
SJE0321-SCV5 (Water)			Lab File ID: 05222121ECD7.D				Analyzed: 05/22/21 20:58	
Decachlorobiphenyl	40.000	99.4	80 - 120	13.178	13.1765	0.0015	N/A	
Tetrachlorometaxylene	40.000	103	80 - 120	5.074	5.072667	0.0013	N/A	
Decachlorobiphenyl [2C]	40.000	98.8	80 - 120	13.874	13.8715	0.0025	N/A	
Tetrachlorometaxylene [2C]	40.000	97.8	80 - 120	5.423	5.423333	-0.0003	N/A	
SJE0321-SCV6 (Water)			Lab File ID: 05222122ECD7.D				Analyzed: 05/22/21 21:20	
Decachlorobiphenyl	40.000	149	80 - 200	13.177	13.1765	0.0005	N/A	
Tetrachlorometaxylene	40.000	105	80 - 120	5.073	5.072667	0.0003	N/A	
Decachlorobiphenyl [2C]	40.000	153	80 - 200	13.875	13.8715	0.0035	N/A	
Tetrachlorometaxylene [2C]	40.000	101	80 - 120	5.423	5.423333	-0.0003	N/A	

Analytical Resources, Incorporated
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SURROGATE RECOVERY AND RT SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG/WO:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0190	Instrument:	ECD7
Calibration:	EE00069	Calibration Date:	05/22/2021

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SJH0190-ICV1 (Solid)			Lab File ID: 08122102ECD7.D				Analyzed: 08/12/21 13:09	
Decachlorobiphenyl	40.000	99.0	80 - 120	13.164	13.1765	-0.0125	N/A	
Tetrachlorometaxylene	40.000	107	80 - 120	5.068	5.072667	-0.0047	N/A	
Decachlorobiphenyl [2C]	40.000	115	80 - 120	13.846	13.8715	-0.0255	N/A	
Tetrachlorometaxylene [2C]	40.000	105	80 - 120	5.41	5.423333	-0.0133	N/A	
SJH0190-ICV2 (Solid)			Lab File ID: 08122103ECD7.D				Analyzed: 08/12/21 13:29	
Decachlorobiphenyl	40.000	109	80 - 120	13.163	13.1765	-0.0135	N/A	
Tetrachlorometaxylene	40.000	109	80 - 120	5.067	5.072667	-0.0057	N/A	
Decachlorobiphenyl [2C]	40.000	119	80 - 120	13.845	13.8715	-0.0265	N/A	
Tetrachlorometaxylene [2C]	40.000	109	80 - 120	5.412	5.423333	-0.0113	N/A	
SJH0190-CCV1 (Solid)			Lab File ID: 08122111ECD7.D				Analyzed: 08/12/21 16:13	
Decachlorobiphenyl	40.000	110	80 - 120	13.163	13.1765	-0.0135	N/A	
Tetrachlorometaxylene	40.000	105	80 - 120	5.068	5.072667	-0.0047	N/A	
Decachlorobiphenyl [2C]	40.000	123	80 - 120	13.845	13.8715	-0.0265	N/A	*
Tetrachlorometaxylene [2C]	40.000	105	80 - 120	5.412	5.423333	-0.0113	N/A	
SJH0190-CCV2 (Solid)			Lab File ID: 08122112ECD7.D				Analyzed: 08/12/21 16:34	
Decachlorobiphenyl	40.000	109	80 - 120	13.162	13.1765	-0.0145	N/A	
Tetrachlorometaxylene	40.000	110	80 - 120	5.067	5.072667	-0.0057	N/A	
Decachlorobiphenyl [2C]	40.000	120	80 - 120	13.844	13.8715	-0.0275	N/A	
Tetrachlorometaxylene [2C]	40.000	109	80 - 120	5.412	5.423333	-0.0113	N/A	
21G0286-05 (Solid)			Lab File ID: 08122119ECD7.D				Analyzed: 08/12/21 18:58	
Decachlorobiphenyl	7.9666	228	40 - 126	13.159	13.1765	-0.0175	N/A	*
Tetrachlorometaxylene	7.9666	84.8	44 - 120	5.066	5.072667	-0.0067	N/A	
Decachlorobiphenyl [2C]	7.9666	230	40 - 126	13.843	13.8715	-0.0285	N/A	*
Tetrachlorometaxylene [2C]	7.9666	93.3	44 - 120	5.412	5.423333	-0.0113	N/A	
SJH0190-CCV3 (Solid)			Lab File ID: 08122120ECD7.D				Analyzed: 08/12/21 19:18	
Decachlorobiphenyl	40.000	119	80 - 120	13.163	13.1765	-0.0135	N/A	
Tetrachlorometaxylene	40.000	114	80 - 120	5.069	5.072667	-0.0037	N/A	
Decachlorobiphenyl [2C]	40.000	137	80 - 120	13.846	13.8715	-0.0255	N/A	*
Tetrachlorometaxylene [2C]	40.000	113	80 - 120	5.413	5.423333	-0.0103	N/A	

Analytical Resources, Incorporated
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SURROGATE RECOVERY AND RT SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG/WO:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0190	Instrument:	ECD7
Calibration:	EE00069	Calibration Date:	05/22/2021

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SJH0190-CCV4 (Solid)			Lab File ID: 08122121ECD7.D				Analyzed: 08/12/21 19:39	
Decachlorobiphenyl	40.000	109	80 - 120	13.164	13.1765	-0.0125	N/A	
Tetrachlorometaxylene	40.000	108	80 - 120	5.068	5.072667	-0.0047	N/A	
Decachlorobiphenyl [2C]	40.000	117	80 - 120	13.846	13.8715	-0.0255	N/A	
Tetrachlorometaxylene [2C]	40.000	108	80 - 120	5.412	5.423333	-0.0113	N/A	

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SURROGATE RECOVERY AND RT SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG/WO:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0202	Instrument:	ECD7
Calibration:	EE00069	Calibration Date:	05/22/2021

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
SJH0202-ICV1 (Solid)			Lab File ID: 08112114ECD7.D				Analyzed: 08/11/21 19:53	
Decachlorobiphenyl	40.000	97.7	80 - 120	13.165	13.1765	-0.0115	N/A	
Tetrachlorometaxylene	40.000	109	80 - 120	5.066	5.072667	-0.0067	N/A	
Decachlorobiphenyl [2C]	40.000	102	80 - 120	13.845	13.8715	-0.0265	N/A	
Tetrachlorometaxylene [2C]	40.000	108	80 - 120	5.411	5.423333	-0.0123	N/A	
SJH0202-ICV2 (Solid)			Lab File ID: 08112115ECD7.D				Analyzed: 08/11/21 20:13	
Decachlorobiphenyl	40.000	108	80 - 120	13.164	13.1765	-0.0125	N/A	
Tetrachlorometaxylene	40.000	110	80 - 120	5.067	5.072667	-0.0057	N/A	
Decachlorobiphenyl [2C]	40.000	109	80 - 120	13.845	13.8715	-0.0265	N/A	
Tetrachlorometaxylene [2C]	40.000	110	80 - 120	5.411	5.423333	-0.0123	N/A	
SJH0202-CCV1 (Solid)			Lab File ID: 08112131ECD7.D				Analyzed: 08/12/21 01:41	
Decachlorobiphenyl	40.000	113	80 - 120	13.163	13.1765	-0.0135	N/A	
Tetrachlorometaxylene	40.000	104	80 - 120	5.067	5.072667	-0.0057	N/A	
Decachlorobiphenyl [2C]	40.000	120	80 - 120	13.845	13.8715	-0.0265	N/A	
Tetrachlorometaxylene [2C]	40.000	107	80 - 120	5.412	5.423333	-0.0113	N/A	
SJH0202-CCV2 (Solid)			Lab File ID: 08112132ECD7.D				Analyzed: 08/12/21 02:01	
Decachlorobiphenyl	40.000	110	80 - 120	13.163	13.1765	-0.0135	N/A	
Tetrachlorometaxylene	40.000	109	80 - 120	5.067	5.072667	-0.0057	N/A	
Decachlorobiphenyl [2C]	40.000	122	80 - 120	13.845	13.8715	-0.0265	N/A	*
Tetrachlorometaxylene [2C]	40.000	109	80 - 120	5.411	5.423333	-0.0123	N/A	
BJH0005-BLK1 (Solid)			Lab File ID: 08112133ECD7.D				Analyzed: 08/12/21 02:22	
Decachlorobiphenyl	8.0000	92.8	40 - 126	13.164	13.1765	-0.0125	N/A	
Tetrachlorometaxylene	8.0000	78.9	44 - 120	5.068	5.072667	-0.0047	N/A	
Decachlorobiphenyl [2C]	8.0000	112	40 - 126	13.846	13.8715	-0.0255	N/A	
Tetrachlorometaxylene [2C]	8.0000	76.9	44 - 120	5.412	5.423333	-0.0113	N/A	
BJH0005-BS1 (Solid)			Lab File ID: 08112134ECD7.D				Analyzed: 08/12/21 02:42	
Decachlorobiphenyl	8.0000	93.5	40 - 126	13.163	13.1765	-0.0135	N/A	
Tetrachlorometaxylene	8.0000	78.7	44 - 120	5.067	5.072667	-0.0057	N/A	
Decachlorobiphenyl [2C]	8.0000	113	40 - 126	13.845	13.8715	-0.0265	N/A	
Tetrachlorometaxylene [2C]	8.0000	78.4	44 - 120	5.411	5.423333	-0.0123	N/A	

Analytical Resources, Incorporated
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SURROGATE RECOVERY AND RT SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG/WO:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0202	Instrument:	ECD7
Calibration:	EE00069	Calibration Date:	05/22/2021

Surrogate Compound	Spike Level ug/kg wet	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
BJH0005-SRM1 (Solid)			Lab File ID: 08112135ECD7.D				Analyzed: 08/12/21 03:03	
Decachlorobiphenyl	40.000	86.5	40 - 126	13.158	13.1765	-0.0185	N/A	
Tetrachlorometaxylene	40.000	77.4	44 - 120	5.066	5.072667	-0.0067	N/A	
Decachlorobiphenyl [2C]	40.000	94.0	40 - 126	13.841	13.8715	-0.0305	N/A	
Tetrachlorometaxylene [2C]	40.000	75.1	44 - 120	5.41	5.423333	-0.0133	N/A	
SJH0202-CCV3 (Solid)			Lab File ID: 08112143ECD7.D				Analyzed: 08/12/21 05:47	
Decachlorobiphenyl	40.000	120	80 - 120	13.164	13.1765	-0.0125	N/A	
Tetrachlorometaxylene	40.000	115	80 - 120	5.067	5.072667	-0.0057	N/A	
Decachlorobiphenyl [2C]	40.000	143	80 - 120	13.845	13.8715	-0.0265	N/A	*
Tetrachlorometaxylene [2C]	40.000	114	80 - 120	5.412	5.423333	-0.0113	N/A	
SJH0202-CCV4 (Solid)			Lab File ID: 08112144ECD7.D				Analyzed: 08/12/21 06:07	
Decachlorobiphenyl	40.000	109	80 - 120	13.163	13.1765	-0.0135	N/A	
Tetrachlorometaxylene	40.000	109	80 - 120	5.066	5.072667	-0.0067	N/A	
Decachlorobiphenyl [2C]	40.000	125	80 - 120	13.847	13.8715	-0.0245	N/A	*
Tetrachlorometaxylene [2C]	40.000	110	80 - 120	5.412	5.423333	-0.0113	N/A	
21G0286-02 (Solid)			Lab File ID: 08112147ECD7.D				Analyzed: 08/12/21 07:09	
Decachlorobiphenyl	7.9581	98.2	40 - 126	13.154	13.1765	-0.0225	N/A	
Tetrachlorometaxylene	7.9581	87.3	44 - 120	5.066	5.072667	-0.0067	N/A	
Decachlorobiphenyl [2C]	7.9581	102	40 - 126	13.839	13.8715	-0.0325	N/A	
Tetrachlorometaxylene [2C]	7.9581	81.4	44 - 120	5.41	5.423333	-0.0133	N/A	
21G0286-03 (Solid)			Lab File ID: 08112148ECD7.D				Analyzed: 08/12/21 07:29	
Decachlorobiphenyl	7.9981	96.2	40 - 126	13.155	13.1765	-0.0215	N/A	
Tetrachlorometaxylene	7.9981	84.5	44 - 120	5.065	5.072667	-0.0077	N/A	
Decachlorobiphenyl [2C]	7.9981	101	40 - 126	13.838	13.8715	-0.0335	N/A	
Tetrachlorometaxylene [2C]	7.9981	81.5	44 - 120	5.41	5.423333	-0.0133	N/A	
BJH0005-MS1 (Solid)			Lab File ID: 08112149ECD7.D				Analyzed: 08/12/21 07:50	
Decachlorobiphenyl	7.9981	97.9	40 - 126	13.153	13.1765	-0.0235	N/A	
Tetrachlorometaxylene	7.9981	82.2	44 - 120	5.066	5.072667	-0.0067	N/A	
Decachlorobiphenyl [2C]	7.9981	98.4	40 - 126	13.838	13.8715	-0.0335	N/A	
Tetrachlorometaxylene [2C]	7.9981	79.5	44 - 120	5.409	5.423333	-0.0143	N/A	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG/WO:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0202	Instrument:	ECD7
Calibration:	EE00069	Calibration Date:	05/22/2021

Surrogate Compound	Spike Level ug/kg dry	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
BJH0005-MSD1 (Solid)			Lab File ID: 08112150ECD7.D				Analyzed: 08/12/21 08:10	
Decachlorobiphenyl	7.9981	104	40 - 126	13.155	13.1765	-0.0215	N/A	
Tetrachlorometaxylene	7.9981	91.2	44 - 120	5.067	5.072667	-0.0057	N/A	
Decachlorobiphenyl [2C]	7.9981	108	40 - 126	13.839	13.8715	-0.0325	N/A	
Tetrachlorometaxylene [2C]	7.9981	87.2	44 - 120	5.411	5.423333	-0.0123	N/A	
21G0286-04 (Solid)			Lab File ID: 08112151ECD7.D				Analyzed: 08/12/21 08:31	
Decachlorobiphenyl	7.9958	84.9	40 - 126	13.152	13.1765	-0.0245	N/A	
Tetrachlorometaxylene	7.9958	76.5	44 - 120	5.064	5.072667	-0.0087	N/A	
Decachlorobiphenyl [2C]	7.9958	83.0	40 - 126	13.836	13.8715	-0.0355	N/A	
Tetrachlorometaxylene [2C]	7.9958	71.8	44 - 120	5.408	5.423333	-0.0153	N/A	
SJH0202-CCV5 (Solid)			Lab File ID: 08112153ECD7.D				Analyzed: 08/12/21 09:12	
Decachlorobiphenyl	40.000	99.6	80 - 120	13.164	13.1765	-0.0125	N/A	
Tetrachlorometaxylene	40.000	110	80 - 120	5.066	5.072667	-0.0067	N/A	
Decachlorobiphenyl [2C]	40.000	112	80 - 120	13.845	13.8715	-0.0265	N/A	
Tetrachlorometaxylene [2C]	40.000	109	80 - 120	5.411	5.423333	-0.0123	N/A	
SJH0202-CCV6 (Solid)			Lab File ID: 08112154ECD7.D				Analyzed: 08/12/21 09:32	
Decachlorobiphenyl	40.000	109	80 - 120	13.162	13.1765	-0.0145	N/A	
Tetrachlorometaxylene	40.000	110	80 - 120	5.068	5.072667	-0.0047	N/A	
Decachlorobiphenyl [2C]	40.000	121	80 - 120	13.846	13.8715	-0.0255	N/A	*
Tetrachlorometaxylene [2C]	40.000	110	80 - 120	5.413	5.423333	-0.0103	N/A	

Analytical Resources, Incorporated
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INTERNAL STANDARD AREA AND RT SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJE0321	Instrument:	ECD7
		Calibration:	EE00069

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (SJE0321-SCV1)		(Water)		Lab File ID: 05222117ECD7.D				Analyzed: 05/22/21 19:32	
1-Bromo-2-Nitrobenzene	296594	2.858	296446	2.859	100	50 - 200	-0.001	+/-0.50	
Hexabromobiphenyl	481880	13.529	470266	13.529	102	50 - 200	0.000	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	719765	3.655	711996	3.656	101	50 - 200	-0.001	+/-0.50	
Hexabromobiphenyl [2C]	911548	14.767	867949	14.766	105	50 - 200	0.001	+/-0.50	
Secondary Cal Check (SJE0321-SCV2)		(Water)		Lab File ID: 05222118ECD7.D				Analyzed: 05/22/21 19:53	
1-Bromo-2-Nitrobenzene	296608	2.858	296446	2.859	100	50 - 200	-0.001	+/-0.50	
Hexabromobiphenyl	477702	13.529	470266	13.529	102	50 - 200	0.000	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	712373	3.655	711996	3.656	100	50 - 200	-0.001	+/-0.50	
Hexabromobiphenyl [2C]	906518	14.765	867949	14.766	104	50 - 200	-0.001	+/-0.50	
Secondary Cal Check (SJE0321-SCV3)		(Water)		Lab File ID: 05222119ECD7.D				Analyzed: 05/22/21 20:15	
1-Bromo-2-Nitrobenzene	291470	2.86	296446	2.859	98	50 - 200	0.001	+/-0.50	
Hexabromobiphenyl	476310	13.529	470266	13.529	101	50 - 200	0.000	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	707436	3.657	711996	3.656	99	50 - 200	0.001	+/-0.50	
Hexabromobiphenyl [2C]	901019	14.766	867949	14.766	104	50 - 200	0.000	+/-0.50	
Secondary Cal Check (SJE0321-SCV4)		(Water)		Lab File ID: 05222120ECD7.D				Analyzed: 05/22/21 20:37	
1-Bromo-2-Nitrobenzene	296015	2.859	296446	2.859	100	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl	475384	13.529	470266	13.529	101	50 - 200	0.000	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	709760	3.656	711996	3.656	100	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl [2C]	908548	14.767	867949	14.766	105	50 - 200	0.001	+/-0.50	
Secondary Cal Check (SJE0321-SCV5)		(Water)		Lab File ID: 05222121ECD7.D				Analyzed: 05/22/21 20:58	
1-Bromo-2-Nitrobenzene	295364	2.859	296446	2.859	100	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl	478364	13.529	470266	13.529	102	50 - 200	0.000	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	716532	3.656	711996	3.656	101	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl [2C]	915545	14.765	867949	14.766	105	50 - 200	-0.001	+/-0.50	
Secondary Cal Check (SJE0321-SCV6)		(Water)		Lab File ID: 05222122ECD7.D				Analyzed: 05/22/21 21:20	
1-Bromo-2-Nitrobenzene	296903	2.859	296446	2.859	100	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl	479288	13.528	470266	13.529	102	50 - 200	-0.001	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	712350	3.656	711996	3.656	100	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl [2C]	915257	14.765	867949	14.766	105	50 - 200	-0.001	+/-0.50	

Analytical Resources, Incorporated
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INTERNAL STANDARD AREA AND RT SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0190	Instrument:	ECD7
		Calibration:	EE00069

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (SJH0190-ICV1)		(Solid)		Lab File ID: 08122102ECD7.D				Analyzed: 08/12/21 13:09	
1-Bromo-2-Nitrobenzene	249081	2.852	198129	2.852	126	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl	427465	13.518	329141	13.516	130	50 - 200	0.002	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	668159	3.641	524098	3.641	127	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl [2C]	834325	14.739	673023	14.741	124	50 - 200	-0.002	+/-0.50	
Initial Cal Check (SJH0190-ICV2)		(Solid)		Lab File ID: 08122103ECD7.D				Analyzed: 08/12/21 13:29	
1-Bromo-2-Nitrobenzene	198129	2.852	198129	2.852	100	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl	329141	13.516	329141	13.516	100	50 - 200	0.000	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	524098	3.641	524098	3.641	100	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl [2C]	673023	14.741	673023	14.741	100	50 - 200	0.000	+/-0.50	
LDW21-SS646 (21G0286-05)		(Solid)		Lab File ID: 08122119ECD7.D				Analyzed: 08/12/21 18:58	
1-Bromo-2-Nitrobenzene	237153	2.851	198129	2.852	120	50 - 200	-0.001	+/-0.50	
Hexabromobiphenyl	378923	13.513	329141	13.516	115	50 - 200	-0.003	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	684362	3.641	524098	3.641	131	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl [2C]	844456	14.738	673023	14.741	125	50 - 200	-0.003	+/-0.50	

Analytical Resources, Incorporated
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INTERNAL STANDARD AREA AND RT SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0202	Instrument:	ECD7
		Calibration:	EE00069

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Initial Cal Check (SJH0202-ICV1)		(Solid)		Lab File ID: 08112114ECD7.D				Analyzed: 08/11/21 19:53	
1-Bromo-2-Nitrobenzene	278922	2.851	214390	2.851	130	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl	504516	13.517	370727	13.517	136	50 - 200	0.000	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	731164	3.64	554293	3.64	132	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl [2C]	1048036	14.742	773507	14.739	135	50 - 200	0.003	+/-0.50	
Initial Cal Check (SJH0202-ICV2)		(Solid)		Lab File ID: 08112115ECD7.D				Analyzed: 08/11/21 20:13	
1-Bromo-2-Nitrobenzene	214390	2.851	214390	2.851	100	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl	370727	13.517	370727	13.517	100	50 - 200	0.000	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	554293	3.64	554293	3.64	100	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl [2C]	773507	14.739	773507	14.739	100	50 - 200	0.000	+/-0.50	
Blank (BJH0005-BLK1)		(Solid)		Lab File ID: 08112133ECD7.D				Analyzed: 08/12/21 02:22	
1-Bromo-2-Nitrobenzene	281218	2.853	214390	2.851	131	50 - 200	0.002	+/-0.50	
Hexabromobiphenyl	441619	13.517	370727	13.517	119	50 - 200	0.000	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	762221	3.643	554293	3.64	138	50 - 200	0.003	+/-0.50	
Hexabromobiphenyl [2C]	892094	14.74	773507	14.739	115	50 - 200	0.001	+/-0.50	
LCS (BJH0005-BS1)		(Solid)		Lab File ID: 08112134ECD7.D				Analyzed: 08/12/21 02:42	
1-Bromo-2-Nitrobenzene	281394	2.851	214390	2.851	131	50 - 200	0.000	+/-0.50	
Hexabromobiphenyl	438833	13.517	370727	13.517	118	50 - 200	0.000	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	755449	3.641	554293	3.64	136	50 - 200	0.001	+/-0.50	
Hexabromobiphenyl [2C]	906176	14.741	773507	14.739	117	50 - 200	0.002	+/-0.50	
Reference (BJH0005-SRM1)		(Solid)		Lab File ID: 08112135ECD7.D				Analyzed: 08/12/21 03:03	
1-Bromo-2-Nitrobenzene	286131	2.852	214390	2.851	133	50 - 200	0.001	+/-0.50	
Hexabromobiphenyl	384659	13.51	370727	13.517	104	50 - 200	-0.007	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	766312	3.642	554293	3.64	138	50 - 200	0.002	+/-0.50	
Hexabromobiphenyl [2C]	889277	14.738	773507	14.739	115	50 - 200	-0.001	+/-0.50	
LDW21-SS625 (21G0286-02)		(Solid)		Lab File ID: 08112147ECD7.D				Analyzed: 08/12/21 07:09	
1-Bromo-2-Nitrobenzene	266333	2.852	214390	2.851	124	50 - 200	0.001	+/-0.50	
Hexabromobiphenyl	318524	13.506	370727	13.517	86	50 - 200	-0.011	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	730460	3.641	554293	3.64	132	50 - 200	0.001	+/-0.50	
Hexabromobiphenyl [2C]	738002	14.733	773507	14.739	95	50 - 200	-0.006	+/-0.50	

Analytical Resources, Incorporated
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INTERNAL STANDARD AREA AND RT SUMMARY

EPA 8082A

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0202	Instrument:	ECD7
		Calibration:	EE00069

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
LDW21-IT625 (21G0286-03)		(Solid)		Lab File ID: 08112148ECD7.D				Analyzed: 08/12/21 07:29	
1-Bromo-2-Nitrobenzene	278596	2.85	214390	2.851	130	50 - 200	-0.001	+/-0.50	
Hexabromobiphenyl	327831	13.508	370727	13.517	88	50 - 200	-0.009	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	747872	3.641	554293	3.64	135	50 - 200	0.001	+/-0.50	
Hexabromobiphenyl [2C]	779820	14.735	773507	14.739	101	50 - 200	-0.004	+/-0.50	
Matrix Spike (BJH0005-MS1)		(Solid)		Lab File ID: 08112149ECD7.D				Analyzed: 08/12/21 07:50	
1-Bromo-2-Nitrobenzene	279419	2.853	214390	2.851	130	50 - 200	0.002	+/-0.50	
Hexabromobiphenyl	293337	13.505	370727	13.517	79	50 - 200	-0.012	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	744994	3.642	554293	3.64	134	50 - 200	0.002	+/-0.50	
Hexabromobiphenyl [2C]	698201	14.733	773507	14.739	90	50 - 200	-0.006	+/-0.50	
Matrix Spike Dup (BJH0005-MSD1)		(Solid)		Lab File ID: 08112150ECD7.D				Analyzed: 08/12/21 08:10	
1-Bromo-2-Nitrobenzene	268558	2.853	214390	2.851	125	50 - 200	0.002	+/-0.50	
Hexabromobiphenyl	307590	13.508	370727	13.517	83	50 - 200	-0.009	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	724149	3.643	554293	3.64	131	50 - 200	0.003	+/-0.50	
Hexabromobiphenyl [2C]	722800	14.735	773507	14.739	93	50 - 200	-0.004	+/-0.50	
LDW21-SS627 (21G0286-04)		(Solid)		Lab File ID: 08112151ECD7.D				Analyzed: 08/12/21 08:31	
1-Bromo-2-Nitrobenzene	259846	2.852	214390	2.851	121	50 - 200	0.001	+/-0.50	
Hexabromobiphenyl	287475	13.503	370727	13.517	78	50 - 200	-0.014	+/-0.50	
1-Bromo-2-Nitrobenzene [2C]	696406	3.641	554293	3.64	126	50 - 200	0.001	+/-0.50	
Hexabromobiphenyl [2C]	725150	14.732	773507	14.739	94	50 - 200	-0.007	+/-0.50	

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DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Sediment	Laboratory ID:	21G0286-05	File ID:	08122119ECD7.D
Sampled:	07/22/21 11:50	Prepared:	08/02/21 13:50	Analyzed:	08/12/21 18:58
Solids:	64.57	Preparation:	EPA 3546 (Microwave)	Instrument:	ECD7
Batch:	BJH0005	Sequence:	SJH0190		
GC Column(1):	ZB5			GC Column(2):	ZB35

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
Aroclor 1254	* 1	9.858	9.874	0.016	55563	1660	1.2
	2	10.144	10.16	0.016	221529.8	1640	
Aroclor 1260	1	11.55	11.56567	0.0157	21402.6	556	16.
	* 2	12.967	12.993	0.026	138464.3	653	

* Column used for quantitation

Analytical Resources, Incorporated
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DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Sediment	Laboratory ID:	21G0286-02	File ID:	08112147ECD7.D
Sampled:	07/22/21 07:50	Prepared:	08/02/21 13:50	Analyzed:	08/12/21 07:09
Solids:	76.11	Preparation:	EPA 3546 (Microwave)	Instrument:	ECD7
Batch:	BJH0005	Sequence:	SJH0202		
GC Column(1):	ZB5			GC Column(2):	ZB35

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
Aroclor 1254	* 1	9.851	9.874	0.023	12245.6	13.3	.
	2	10.137	10.16	0.023	46031.2	13.3	
Aroclor 1260	1	11.543	11.56567	0.0227	8106.2	10.5	19.7
	* 2	12.96	12.993	0.033	40948.25	12.8	

* Column used for quantitation

Analytical Resources, Incorporated
Analytical Chemists and Consultants

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Sediment	Laboratory ID:	21G0286-03	File ID:	08112148ECD7.D
Sampled:	07/22/21 07:50	Prepared:	08/02/21 13:50	Analyzed:	08/12/21 07:29
Solids:	87.74	Preparation:	EPA 3546 (Microwave)	Instrument:	ECD7
Batch:	BJH0005	Sequence:	SJH0202		
GC Column(1):	ZB5			GC Column(2):	ZB35

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
Aroclor 1254	* 1	9.847	9.874	0.027	72987.4	74.5	4.1
	2	10.141	10.16	0.019	267419.6	71.5	
Aroclor 1260	* 1	11.541	11.56567	0.0247	46780.6	57.5	22.3
	2	12.961	12.993	0.032	250370	71.9	

* Column used for quantitation

Analytical Resources, Incorporated
Analytical Chemists and Consultants

DUAL COLUMN CONFIRMATION SUMMARY

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Sediment	Laboratory ID:	21G0286-04	File ID:	08112151ECD7.D
Sampled:	07/22/21 08:10	Prepared:	08/02/21 13:50	Analyzed:	08/12/21 08:31
Solids:	54.40	Preparation:	EPA 3546 (Microwave)	Instrument:	ECD7
Batch:	BJH0005	Sequence:	SJH0202		
GC Column(1):	ZB5			GC Column(2):	ZB35

COMPOUND	COL	RT	EXP RT	RT DIFF	AREA	CONC	RPD
Aroclor 1254	* 1	9.842	9.874	0.032	146261.4	164	16.5
	2	10.12	10.16	0.04	463503.2	139	
Aroclor 1260	* 1	11.538	11.56567	0.0277	30920.8	41.6	24.5
	2	12.958	12.993	0.035	166809.8	53.2	

* Column used for quantitation

Analytical Resources, Incorporated
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HOLDING TIME SUMMARY

Analysis: EPA 8082A

Laboratory: Analytical Resources, Inc. SDG: 21G0286

Client: Anchor QEA, LLC Project: Lower Duwamish AOC4

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LDW21-SS625 21G0286-02	07/22/21 07:50	07/22/21 17:30	08/02/21 13:50	11	14	08/12/21 07:09	10	40	
LDW21-IT625 21G0286-03	07/22/21 07:50	07/22/21 17:30	08/02/21 13:50	11	14	08/12/21 07:29	10	40	
LDW21-SS627 21G0286-04	07/22/21 08:10	07/22/21 17:30	08/02/21 13:50	11	14	08/12/21 08:31	10	40	
LDW21-SS646 21G0286-05	07/22/21 11:50	07/22/21 17:30	08/02/21 13:50	11	14	08/12/21 18:58	10	40	
Matrix Spike BJH0005-MS1	07/22/21 07:50	07/22/21 17:30	08/02/21 13:50	11	14	08/12/21 07:50	10	40	
Matrix Spike Dup BJH0005-MSD1	07/22/21 07:50	07/22/21 17:30	08/02/21 13:50	11	14	08/12/21 08:10	10	40	

* Indicates hold time exceedance.

Analytical Resources, Incorporated
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METHOD DETECTION AND REPORTING LIMITS

EPA 8082A

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument: ECD7

Analyte	MDL	RL	Units
Aroclor 1016	1.6	4.0	ug/kg
Aroclor 1016 [2C]	1.6	4.0	ug/kg
Aroclor 1221	1.6	4.0	ug/kg
Aroclor 1221 [2C]	1.6	4.0	ug/kg
Aroclor 1232	1.6	4.0	ug/kg
Aroclor 1232 [2C]	1.6	4.0	ug/kg
Aroclor 1242	1.6	4.0	ug/kg
Aroclor 1242 [2C]	1.6	4.0	ug/kg
Aroclor 1248	1.6	4.0	ug/kg
Aroclor 1248 [2C]	1.6	4.0	ug/kg
Aroclor 1254	1.6	4.0	ug/kg
Aroclor 1254 [2C]	1.6	4.0	ug/kg
Aroclor 1260	0.6	4.0	ug/kg
Aroclor 1260 [2C]	0.6	4.0	ug/kg

Analytical Resources, Incorporated
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METHOD DETECTION AND REPORTING LIMITS

EPA 8082A

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Water
Instrument: ECD7

Analyte	MDL	RL	Units
Aroclor 1016	1.56	4.00	ug/kg
Aroclor 1016 [2C]	1.56	4.00	ug/kg
Aroclor 1221	1.56	4.00	ug/kg
Aroclor 1221 [2C]	1.56	4.00	ug/kg
Aroclor 1232	1.56	4.00	ug/kg
Aroclor 1232 [2C]	1.56	4.00	ug/kg
Aroclor 1242	1.56	4.00	ug/kg
Aroclor 1242 [2C]	1.56	4.00	ug/kg
Aroclor 1248	1.56	4.00	ug/kg
Aroclor 1248 [2C]	1.56	4.00	ug/kg
Aroclor 1254	1.56	4.00	ug/kg
Aroclor 1254 [2C]	1.56	4.00	ug/kg
Aroclor 1260	0.589	4.00	ug/kg
Aroclor 1260 [2C]	0.589	4.00	ug/kg
Aroclor 1262	0.589	4.00	ug/kg
Aroclor 1262 [2C]	0.589	4.00	ug/kg
Aroclor 1268	0.589	4.00	ug/kg
Aroclor 1268 [2C]	0.589	4.00	ug/kg

AccuStandard
125 Market Street
New Haven, CT 06513
(203) 786-5290

CERTIFICATE OF PRODUCT DATA

PRODUCT: S-279N
DESCRIPTION: Volatile Organic Compound (TCMx)
LOT #: 0052481B-1
SOLVENT: N/A

EXPIRATION: July 28, 2015

This product is guaranteed accurate to ±0.5% of the Certified Analyte concentration through the Expiration Date on the Label.

Component	CAS #	Purity % (GC/FID)	Prepared Concentration[1]	Certified Analyte Concentration[2]
Tetrachloro-meta-xylene (TCMX)	877-09-8	96.0	N/A	N/A

Te

* I1769A

Certified by: R. Cooper

1. All weights are traceable through National Institute of Standards & Technology, Test No. 822/254480
2. Certified Analyte Concentration = Purity x Prepared Concentration. The Uncertainty calculated for this product is ±4% which is the Combined Uncertainty uc(y). It represents an estimated standard deviation equal to the positive square root of the total variance of the uncertainty of components. The Expanded Uncertainty is U which is Uc(y) *K where K is the coverage factor at the 95% confidence level (K=2).
3. A product with a suffix (-1A, -2B, etc.) on its lot# has had its expiration date extended and is identical to the same lot# without the suffix.

Please note: AccuStandard follows the U.S. conventions in reporting numerical values, on both certificates and labels.

A comma (,) is used to separate units of one-thousand or greater.
A period (.) is used as a decimal place marker.

This product was manufactured in accordance to quality system requirements of ISO 9001:2000 and ISO 17025

* Recertified ~ 4-6-09 (8)

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Standard Record
Standard ID: C000147

Printed: 4/23/2015 11:52:09AM

Description:	tetrachlormetaxylene	Expires:	15-Jan-2020
Standard Type:	Other	Prepared:	15-Jan-2014
Solvent:	n/a	Prepared By:	Joshua Rains
Final Volume (mls):	1	Department:	Organics
Vials:	1	Last Edit:	27-Feb-2015 13:01 by JGR
Vendor:	Accustandard	Lot #:	0052481b-1
Vendor Catalog #:			

Comments

see I1769a
updated for calibration TCX DCBP 06/12/14 sdrd

Analyte	CAS Number	Concentration	Units
Tetrachlorometaxylene [2C]	877-09-8	1000000	ug/mL
Tetrachlorometaxylene	877-09-8	1000000	ug/mL
TCX 1660 [2C]	877-09-8	1000000	ug/mL
TCX 1660	877-09-8	1000000	ug/mL
TCX [2C]	877-09-8	1000000	ug/mL
TCX (A) [2C]	877-09-8	1000000	ug/mL
TCX (A)	877-09-8	1000000	ug/mL
TCX	877-09-8	1000000	ug/mL

Reviewed By Date

AccuStandard
125 Market Street
New Haven, CT 06513
(203) 786-5290

CERTIFICATE OF PRODUCT DATA

PRODUCT: C-209N
EXPIRATION: Jul 28, 2015
DESCRIPTION: 2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl
LOT #: 990521LB-AC
SOLVENT: N/A

This product is guaranteed accurate to ±0.5% of the Certified Analyte concentration through the Expiration Date on the Label.

Component	CAS #	Purity % (GC/MS)	Prepared Concentration[1]	Certified Analyte Concentration[2]
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	2051-24-3	100	N/A	N/A

2,

* I1768A

Certified by: R. Cooper

1. All weights are traceable through National Institute of Standards & Technology, Test No. 822/254480
2. Certified Analyte Concentration = Purity x Prepared Concentration. The Uncertainty calculated for this product is ±4% which is the Combined Uncertainty uc(y). It represents an estimated standard deviation equal to the positive square root of the total variance of the uncertainty of components. The Expanded Uncertainty is U which is Uc(y) *K where K is the coverage factor at the 95% confidence level (K=2).
3. A product with a suffix (-1A, -2B, etc.) on its lot# has had its expiration date extended and is identical to the same lot# without the suffix.

Please note: AccuStandard follows the U.S. conventions in reporting numerical values, on both certificates and labels.

A comma (,) is used to separate units of one-thousand or greater.
A period (.) is used as a decimal place marker.

This product was manufactured in accordance to quality system requirements of ISO 9001:2000 and ISO 17025

* Recertified 2 4-6-09 (JS)

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Standard Record

Standard ID: C000148

Printed: 4/23/2015 11:54:44AM

Description:	decachlorbiphenyl	Expires:	15-Jan-2020
Standard Type:	Other	Prepared:	15-Jan-2014
Solvent:	na/a	Prepared By:	Joshua Rains
Final Volume (mls):	1	Department:	Organics
Vials:	1	Last Edit:	27-Feb-2015 13:03 by JGR
Vendor:	Accustandard	Lot #:	990521lb-ac
Vendor Catalog #:			

Comments

see i1768a
SOM calibrations added 06/12/14 sdrd

Analyte	CAS Number	Concentration	Units
Decachlorobiphenyl [2C]	2051-24-3	1000000	ug/mL
Decachlorobiphenyl	2051-24-3	1000000	ug/mL
DCB 1660 [2C]	2051-24-3	1000000	ug/mL
DCB 1660	2051-24-3	1000000	ug/mL
DCB [2C]	2051-24-3	1000000	ug/mL
DCB (A) [2C]	2051-24-3	1000000	ug/mL
DCB (A)	2051-24-3	1000000	ug/mL
DCB	2051-24-3	1000000	ug/mL

Reviewed By Date

H008387

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Certified Reference Material

This product is included in Phenova's ISO/IEC 17025 and ISO Guide 34 Scopes of Accreditation

Catalog No.: AL0-101467
Description: Aroclor 1016
Storage: 4 °C
Provided As: 1 mL in 2 mL Ampoule in Isooctane

Lot Number: CL12975
Certification Date: November 19, 2018
Expiration Date: October 31, 2026

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aroclor 1016	12674-11-2	1000	± 0.553%

ACCREDITED
Reference Material Producer
Certificate No. 2427.02

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Manufactured by Phenova, Inc.
Phenova's testing and calibration results are internationally recognized through the ILAC MRA. Phenova is an accredited ISO Guide 34 Reference Material Provider and ISO/IEC 17025 accredited Chemical Testing Laboratory.

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Chemical Testing Laboratory
Certificate No. 2427.03

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1. Quality Document: This Certificate of Analysis has been created in accordance with ISO Guide 31[1] and ISO Guide 35.[2]

2. Quality Standards: Phenova is accredited by A2LA to ISO Guide 34[3] and ISO/IEC 17025[4] as a producer of Certified Reference Materials and Reference Materials. This ensures that our manufacturing processes have been accredited to and meet strict international standards.

3. Intended Use: The product is manufactured for use in the calibration and calibration verification of chromatographic instrumentation performed in routine laboratory analysis.

4. Instruction: Visually inspect the solution inside the ampoule for any un-dissolved material. If particulate is visible, sonicate the unopened ampoule until material is fully dissolved. Dilute as required, use only class A glassware and diluents compatible with all certified analytes in the mixture.

5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Material Safety Data Sheet (MSDS) is available at www.phenomenex.com/mysupport.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

   $$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

   Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO Guide 34. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC 17025 methodology.

11. Values Obtained During Product Testing: This product is subjected to verification, homogeneity and stability testing using an ISO/IEC 17025 chromatographic methodology. All values obtained during testing meet criteria in accordance with ISO Guide 34.

12. Period of Validity: The Certified Values and their uncertainties are guaranteed until the expiration date. This product will be monitored during the period of validity and customers notified of any significant changes in stability.

References:

[1] ISO Guide 31:2000(E) – Reference Materials – Contents of Certificates and Labels.
[2] ISO Guide 35:2006(E) – Reference Material – General and Statistical Principles for Certification.
[3] ISO Guide 34:2009(E) – General Requirements for the Competence of Reference Material Producers.
[4] ISO/IEC 17025:2005(E) – General Requirements for the Competence of Testing and Calibration Laboratories.
[5] ISO/IEC Guide 98-3:2008(E) – Uncertainty of Measurement – Part 3: Guide to Expression of Uncertainty in Measurement (GUM: 1995)

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Certified Reference Material

This product is included in Phenova's ISO/IEC 17025 and ISO Guide 34 Scopes of Accreditation

Catalog No.: AL0-101467
Description: Aroclor 1016
Storage: 4 °C
Provided As: 1 mL in 2 mL Ampoule in Isooctane

Lot Number: CL12975
Certification Date: November 19, 2018
Expiration Date: October 31, 2026

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aroclor 1016	12674-11-2	1000	± 0.553%

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Reference Material Producer
Certificate No. 2427.02

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1. Quality Document: This Certificate of Analysis has been created in accordance with ISO Guide 31[1] and ISO Guide 35.[2]

2. Quality Standards: Phenova is accredited by A2LA to ISO Guide 34[3] and ISO/IEC 17025[4] as a producer of Certified Reference Materials and Reference Materials. This ensures that our manufacturing processes have been accredited to and meet strict international standards.

3. Intended Use: The product is manufactured for use in the calibration and calibration verification of chromatographic instrumentation performed in routine laboratory analysis.

4. Instruction: Visually inspect the solution inside the ampoule for any un-dissolved material. If particulate is visible, sonicate the unopened ampoule until material is fully dissolved. Dilute as required, use only class A glassware and diluents compatible with all certified analytes in the mixture.

5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Material Safety Data Sheet (MSDS) is available at www.phenomenex.com/mysupport.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

   $$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

   Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO Guide 34. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC 17025 methodology.

11. Values Obtained During Product Testing: This product is subjected to verification, homogeneity and stability testing using an ISO/IEC 17025 chromatographic methodology. All values obtained during testing meet criteria in accordance with ISO Guide 34.

12. Period of Validity: The Certified Values and their uncertainties are guaranteed until the expiration date. This product will be monitored during the period of validity and customers notified of any significant changes in stability.

References:

[1] ISO Guide 31:2000(E) – Reference Materials – Contents of Certificates and Labels.
[2] ISO Guide 35:2006(E) – Reference Material – General and Statistical Principles for Certification.
[3] ISO Guide 34:2009(E) – General Requirements for the Competence of Reference Material Producers.
[4] ISO/IEC 17025:2005(E) – General Requirements for the Competence of Testing and Calibration Laboratories.
[5] ISO/IEC Guide 98-3:2008(E) – Uncertainty of Measurement – Part 3: Guide to Expression of Uncertainty in Measurement (GUM: 1995)

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Certified Reference Material

This product is included in Phenova's ISO/IEC 17025 and ISO Guide 34 Scopes of Accreditation

Catalog No.: AL0-101467
Description: Aroclor 1016
Storage: 4 °C
Provided As: 1 mL in 2 mL Ampoule in Isooctane

Lot Number: CL12908
Certification Date: November 19, 2018
Expiration Date: October 31, 2026

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aroclor 1016	12674-11-2	1000	± 0.553%

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1. Quality Document: This Certificate of Analysis has been created in accordance with ISO Guide 31[1] and ISO Guide 35.[2]

2. Quality Standards: Phenova is accredited by A2LA to ISO 17034[3] and ISO/IEC 17025[4] as a producer of Certified Reference Materials and Reference Materials. This ensures that our manufacturing processes have been accredited to and meet strict international standards.

3. Intended Use: The product is manufactured for use in calibration, calibration verification, quantification, identification and other appropriate analytical control applications. The product is intended for routine laboratory analysis and research purposes only. Only trained personnel should handle this product.

4. Handling and Usage Notes: Store according to recommended conditions listed and avoid prolonged exposure to light. Visually inspect the solution inside the ampoule for any un-dissolved material. If particulate is visible, sonicate the unopened ampoule until material is fully dissolved. Dilute as required, use only class A glassware and diluents compatible with all analytes in the mixture. Considerations should be made related to repeated use of the opened product. Once opened, exposure to light, air, heat, objects, and additional transfer vessels may cause evaporation, degradation or contamination resulting in changes in concentration, uncertainty and stability duration. Store opened standards in a clean, tightly capped vessel under the recommended temperature. Appropriate controls, such as the use of additional verification standards should be used to confirm the opened product is fit for purpose under repeated use conditions.

5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Safety Data Sheet (SDS) is available at www.phenova.com/documents.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

$$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

   Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO 17034. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC 17025 methodology.

11. Values Obtained During Product Testing: This product is subjected to verification, homogeneity and stability testing using an ISO/IEC17025 chromatographic methodology. All values obtained during testing meet criteria in accordance with ISO 17034.

12. Period of Validity: The Certified Values, Uncertainties and Expiration Date are based on the unopened product being stored according to the recommended storage condition listed and are guaranteed until the expiration date. This product will be monitored during the period of validity and customers notified of any significant changes in stability.

References:

[1] ISO Guide 31 – Reference Materials – Contents of Certificates and Labels.
[2] ISO Guide 35 – Reference Material – General and Statistical Principles for Certification.
[3] ISO 17034 – General Requirements for the Competence of Reference Material Producers.
[4] ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories.
[5] ISO/IEC Guide 98-3:2008(E) – Uncertainty of Measurement – Part 3: Guide to Expression of Uncertainty in Measurement (GUM: 1995)

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Certified Reference Material

This product is included in Phenova's ISO/IEC 17025 and ISO Guide 34 Scopes of Accreditation

Catalog No.: AL0-101462
Description: Aroclor 1260
Storage: 4 °C
Provided As: 1 mL in 2 mL Ampoule in Hexane

Lot Number: CL13054
Certification Date: November 29, 2018
Expiration Date: November 30, 2026

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aroclor 1260	11096-82-5	1000	± 0.520%

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09/22/20

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Manufactured by Phenova, Inc.
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1. Quality Document: This Certificate of Analysis has been created in accordance with ISO Guide 31[1] and ISO Guide 35.[2]

2. Quality Standards: Phenova is accredited by A2LA to ISO 17034[3] and ISO/IEC 17025[4] as a producer of Certified Reference Materials and Reference Materials. This ensures that our manufacturing processes have been accredited to and meet strict international standards.

3. Intended Use: The product is manufactured for use in calibration, calibration verification, quantification, identification and other appropriate analytical control applications. The product is intended for routine laboratory analysis and research purposes only. Only trained personnel should handle this product.

4. Handling and Usage Notes: Store according to recommended conditions listed and avoid prolonged exposure to light. Visually inspect the solution inside the ampoule for any un-dissolved material. If particulate is visible, sonicate the unopened ampoule until material is fully dissolved. Dilute as required, use only class A glassware and diluents compatible with all analytes in the mixture. Considerations should be made related to repeated use of the opened product. Once opened, exposure to light, air, heat, objects, and additional transfer vessels may cause evaporation, degradation or contamination resulting in changes in concentration, uncertainty and stability duration. Store opened standards in a clean, tightly capped vessel under the recommended temperature. Appropriate controls, such as the use of additional verification standards should be used to confirm the opened product is fit for purpose under repeated use conditions.

5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Safety Data Sheet (SDS) is available at www.phenova.com/documents.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

$$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

   Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO 17034. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC 17025 methodology.

11. Values Obtained During Product Testing: This product is subjected to verification, homogeneity and stability testing using an ISO/IEC 17025 chromatographic methodology. All values obtained during testing meet criteria in accordance with ISO 17034.

12. Period of Validity: The Certified Values, Uncertainties and Expiration Date are based on the unopened product being stored according to the recommended storage condition listed and are guaranteed until the expiration date. This product will be monitored during the period of validity and customers notified of any significant changes in stability.

References:

[1] ISO Guide 31 – Reference Materials – Contents of Certificates and Labels.
[2] ISO Guide 35 – Reference Material – General and Statistical Principles for Certification.
[3] ISO 17034 – General Requirements for the Competence of Reference Material Producers.
[4] ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories.
[5] ISO/IEC Guide 98-3:2008(E) – Uncertainty of Measurement – Part 3: Guide to Expression of Uncertainty in Measurement (GUM: 1995)

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Certified Reference Material

This product is certified in accordance with Phenova's ISO 17034 accreditation and supported by Phenova's ISO/IEC 17025 chemical testing accreditation

Catalog No.: AL0-101468
Description: Aroclor 1221
Storage: 4 °C
Provided As: 1 mL in 2 mL Ampoule in Isooctane

Lot Number: CL14017
Certification Date: August 20, 2019
Expiration Date: August 31, 2027

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aroclor 1221	11104-28-2	1000	± 0.553%

I009074

ACCREDITED
Reference Material Producer
Certicate No. 2427.02

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Phenova is an accredited ISO/IEC 17034 Reference Material Producer and ISO/IEC 17025 accredited Chemical Testing Laboratory.

ACCREDITED
Chemical Testing Laboratory
Certicate No. 2427.03

IL64691018_us

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1. Quality Document: This Certificate of Analysis has been created in accordance with ISO Guide 31[1] and ISO Guide 35.[2]

2. Quality Standards: Phenova is accredited by A2LA to ISO 17034[3] and ISO/IEC 17025[4] as a producer of Certified Reference Materials and Reference Materials. This ensures that our manufacturing processes have been accredited to and meet strict international standards.

3. Intended Use: The product is manufactured for use in calibration, calibration verification, quantification, identification and other appropriate analytical control applications. The product is intended for routine laboratory analysis and research purposes only. Only trained personnel should handle this product.

4. Handling and Usage Notes: Store according to recommended conditions listed and avoid prolonged exposure to light. Visually inspect the solution inside the ampoule for any un-dissolved material. If particulate is visible, sonicate the unopened ampoule until material is fully dissolved. Dilute as required, use only class A glassware and diluents compatible with all analytes in the mixture. Considerations should be made related to repeated use of the opened product. Once opened, exposure to light, air, heat, objects, and additional transfer vessels may cause evaporation, degradation or contamination resulting in changes in concentration, uncertainty and stability duration. Store opened standards in a clean, tightly capped vessel under the recommended temperature. Appropriate controls, such as the use of additional verification standards should be used to confirm the opened product is fit for purpose under repeated use conditions.

5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Safety Data Sheet (SDS) is available at www.phenova.com/documents.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

$$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO 17034. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC 17025 methodology.

11. Values Obtained During Product Testing: This product is subjected to verification, homogeneity and stability testing using an ISO/IEC17025 chromatographic methodology. All values obtained during testing meet criteria in accordance with ISO 17034.

12. Period of Validity: The Certified Values, Uncertainties and Expiration Date are based on the unopened product being stored according to the recommended storage condition listed and are guaranteed until the expiration date. This product will be monitored during the period of validity and customers notified of any significant changes in stability.

References:

[1] ISO Guide 31 – Reference Materials – Contents of Certificates and Labels.
[2] ISO Guide 35 – Reference Material – General and Statistical Principles for Certification.
[3] ISO 17034 – General Requirements for the Competence of Reference Material Producers.
[4] ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories.
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Certified Reference Material

This product is certified in accordance with Phenova's ISO 17034 accreditation and supported by Phenova's ISO/IEC 17025 chemical testing accreditation

Catalog No.: AL0-101469
Description: Aroclor 1232
Storage: 4 °C
Provided As: 1 mL in 2 mL Ampoule in Isooctane

Lot Number: CL14914
Certification Date: January 31, 2020
Expiration Date: January 31, 2028

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aroclor 1232	11141-16-5	1000	± 0.738%

I 009075

ACCREDITED
Reference Material Producer
Certicate No. 2427.02

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3. Intended Use: The product is manufactured for use in calibration, calibration verification, quantification, identification and other appropriate analytical control applications. The product is intended for routine laboratory analysis and research purposes only. Only trained personnel should handle this product.

4. Handling and Usage Notes: Store according to recommended conditions listed and avoid prolonged exposure to light. Visually inspect the solution inside the ampoule for any un-dissolved material. If particulate is visible, sonicate the unopened ampoule until material is fully dissolved. Dilute as required, use only class A glassware and diluents compatible with all analytes in the mixture. Considerations should be made related to repeated use of the opened product. Once opened, exposure to light, air, heat, objects, and additional transfer vessels may cause evaporation, degradation or contamination resulting in changes in concentration, uncertainty and stability duration. Store opened standards in a clean, tightly capped vessel under the recommended temperature. Appropriate controls, such as the use of additional verification standards should be used to confirm the opened product is fit for purpose under repeated use conditions.

5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Safety Data Sheet (SDS) is available at www.phenova.com/documents.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

$$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

   Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO 17034. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC 17025 methodology.

11. Values Obtained During Product Testing: This product is subjected to verification, homogeneity and stability testing using an ISO/IEC17025 chromatographic methodology. All values obtained during testing meet criteria in accordance with ISO 17034.

12. Period of Validity: The Certified Values, Uncertainties and Expiration Date are based on the unopened product being stored according to the recommended storage condition listed and are guaranteed until the expiration date. This product will be monitored during the period of validity and customers notified of any significant changes in stability.

References:

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Certified Reference Material

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Catalog No.:	AL0-101470	**Lot Number:**	CL14018
Description:	Aroclor 1242	**Certification Date:**	August 20, 2019
Storage:	4 °C	**Expiration Date:**	August 31, 2027
Provided As:	1 mL in 2 mL Ampoule in Isooctane		

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aroclor 1242	53469-21-9	1000	± 0.553%

I 009076

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Reference Material Producer
Certicate No. 2427.02

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Certified Reference Material

This product is certified in accordance with Phenova's ISO 17034 accreditation and supported by Phenova's ISO/IEC 17025 chemical testing accreditation

Catalog No.:	AL0-101471	**Lot Number:**	CL15384
Description:	Aroclor 1248	**Certification Date:**	June 19, 2020
Storage:	4 °C	**Expiration Date:**	June 30, 2028
Provided As:	1 mL in 2 mL Ampoule in Isooctane		

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aroclor 1248	12672-29-6	1000	± 0.520%

I 009077

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Certicate No. 2427.02

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5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Safety Data Sheet (SDS) is available at www.phenova.com/documents.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

$$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

   Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO 17034. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC 17025 methodology.

11. Values Obtained During Product Testing: This product is subjected to verification, homogeneity and stability testing using an ISO/IEC17025 chromatographic methodology. All values obtained during testing meet criteria in accordance with ISO 17034.

12. Period of Validity: The Certified Values, Uncertainties and Expiration Date are based on the unopened product being stored according to the recommended storage condition listed and are guaranteed until the expiration date. This product will be monitored during the period of validity and customers notified of any significant changes in stability.

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Certified Reference Material

This product is certified in accordance with Phenova's ISO 17034 accreditation and supported by Phenova's ISO/IEC 17025 chemical testing accreditation

Catalog No.:	AL0-101471	**Lot Number:**	CL15384
Description:	Aroclor 1248	**Certification Date:**	June 19, 2020
Storage:	4 °C	**Expiration Date:**	June 30, 2028
Provided As:	1 mL in 2 mL Ampoule in Isooctane		

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aroclor 1248	12672-29-6	1000	± 0.520%

I 009077

ACCREDITED
Reference Material Producer
Certicate No. 2427.02

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5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Safety Data Sheet (SDS) is available at www.phenova.com/documents.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

$$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

   Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO 17034. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC 17025 methodology.

11. Values Obtained During Product Testing: This product is subjected to verification, homogeneity and stability testing using an ISO/IEC17025 chromatographic methodology. All values obtained during testing meet criteria in accordance with ISO 17034.

12. Period of Validity: The Certified Values, Uncertainties and Expiration Date are based on the unopened product being stored according to the recommended storage condition listed and are guaranteed until the expiration date. This product will be monitored during the period of validity and customers notified of any significant changes in stability.

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[5] ISO/IEC Guide 98-3:2008(E) – Uncertainty of Measurement – Part 3: Guide to Expression of Uncertainty in Measurement (GUM: 1995)

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Certified Reference Material

This product is included in Phenova's ISO/IEC 17025 and ISO Guide 34 Scopes of Accreditation

Catalog No.: AL0-101472
Description: Aroclor 1254
Storage: 4 °C
Provided As: 1 mL in 2 mL Ampoule in Isooctane

Lot Number: CL13055
Certification Date: November 29, 2018
Expiration Date: November 30, 2026

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aroclor 1254	11097-69-1	1000	± 0.247%

I009078

ACCREDITED
Reference Material Producer
Certificate No. 2427.02

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Certified Reference Materials

Manufactured by Phenova, Inc.
Phenova's testing and calibration results are internationally recognized through the ILAC MRA. Phenova is an accredited ISO Guide 34 Reference Material Provider and ISO/IEC 17025 accredited Chemical Testing Laboratory.

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5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Safety Data Sheet (SDS) is available at www.phenova.com/documents.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

$$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

   Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO 17034. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC 17025 methodology.

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Certified Reference Material

This product is included in Phenova's ISO/IEC 17025 and ISO Guide 34 Scopes of Accreditation

Catalog No.:	AL0-101474	**Lot Number:**	CL11330
Description:	Aroclor 1262	**Certification Date:**	May 15, 2015
Storage:	4 °C	**Expiration Date:**	April 30, 2023
Provided As:	1 mL in 2 mL Ampoule in Isooctane	**Revision Date:**	April 2, 2018

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aroclor 1262	37324-23-5	1000	± 0.516%

I 009079

ACCREDITED
Reference Material Producer
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Manufactured by Phenova, Inc.

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3. Intended Use: The product is manufactured for use in calibration, calibration verification, quantification, identification and other appropriate analytical control applications. The product is intended for routine laboratory analysis and research purposes only. Only trained personnel should handle this product.

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5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Safety Data Sheet (SDS) is available at www.phenova.com/documents.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

$$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO 17034. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC 17025 methodology.

11. Values Obtained During Product Testing: This product is subjected to verification, homogeneity and stability testing using an ISO/IEC17025 chromatographic methodology. All values obtained during testing meet criteria in accordance with ISO 17034.

12. Period of Validity: The Certified Values, Uncertainties and Expiration Date are based on the unopened product being stored according to the recommended storage condition listed and are guaranteed until the expiration date. This product will be monitored during the period of validity and customers notified of any significant changes in stability.

References:

[1] ISO Guide 31 – Reference Materials – Contents of Certificates and Labels.
[2] ISO Guide 35 – Reference Material – General and Statistical Principles for Certification.
[3] ISO 17034 – General Requirements for the Competence of Reference Material Producers.
[4] ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories.
[5] ISO/IEC Guide 98-3:2008(E) – Uncertainty of Measurement – Part 3: Guide to Expression of Uncertainty in Measurement (GUM: 1995)

phenomenex

Certificate of Analysis

Phenova Certified Reference Materials are sold by Phenomenex.
411 Madrid Ave., Torrance, CA 90501 USA ▪ Tel: 310-212-0555 ▪ Fax: 310-328-7768 ▪ info@phenomenex.com
Access your MSDS and digital C of A at **www.phenomenex.com/mysupport. Re-order at www.phenomenex.com/standards**

Certified Reference Material

This product is included in Phenova's ISO/IEC 17025 and ISO Guide 34 Scopes of Accreditation

Catalog No.:	AL0-101475	**Lot Number:**	CL11331
Description:	Aroclor 1268	**Certification Date:**	May 15, 2015
Storage:	4 °C	**Expiration Date:**	April 30, 2023
Provided As:	1 mL in 2 mL Ampoule in Isooctane	**Revision Date:**	April 2, 2018

Andrea L Gill

Andrea Gill, Certified Reference Materials Manager

Component	CAS #	Certified Value µg/mL	Expanded Uncertainty
Aroclor 1268	11100-14-4	1000	± 0.516%

I0090800 10/04/20

ACCREDITED
Reference Material Producer
Certificate No. 2427.02

phenova
Certified Reference Materials

Manufactured by Phenova, Inc.

Phenova's testing and calibration results are internationally recognized through the ILAC MRA. Phenova is an accredited ISO Guide 34 Reference Material Provider and ISO/IEC 17025 accredited Chemical Testing Laboratory.

ilac-MRA ACCREDITED
Chemical Testing Laboratory
Certificate No. 2427.03

IL111110613_US

Certificate of Analysis

Produced by Phenova
6390 Joyce Drive STE 100, Golden, CO 80403 USA ▪ Tel: 303-940-0033 ▪ Fax: 303-940-0043 ▪ info@phenova.com
Access your Safety Data Sheets and digital Certificates at **www.phenova.com/documents.**

1. Quality Document: This Certificate of Analysis has been created in accordance with ISO Guide 31[1] and ISO Guide 35.[2]

2. Quality Standards: Phenova is accredited by A2LA to ISO 17034[3] and ISO/IEC 17025[4] as a producer of Certified Reference Materials and Reference Materials. This ensures that our manufacturing processes have been accredited to and meet strict international standards.

3. Intended Use: The product is manufactured for use in calibration, calibration verification, quantification, identification and other appropriate analytical control applications. The product is intended for routine laboratory analysis and research purposes only. Only trained personnel should handle this product.

4. Handling and Usage Notes: Store according to recommended conditions listed and avoid prolonged exposure to light. Visually inspect the solution inside the ampoule for any un-dissolved material. If particulate is visible, sonicate the unopened ampoule until material is fully dissolved. Dilute as required, use only class A glassware and diluents compatible with all analytes in the mixture. Considerations should be made related to repeated use of the opened product. Once opened, exposure to light, air, heat, objects, and additional transfer vessels may cause evaporation, degradation or contamination resulting in changes in concentration, uncertainty and stability duration. Store opened standards in a clean, tightly capped vessel under the recommended temperature. Appropriate controls, such as the use of additional verification standards should be used to confirm the opened product is fit for purpose under repeated use conditions.

5. Hazardous Situation: The product is intended for use by experienced professional personnel. A Safety Data Sheet (SDS) is available at www.phenova.com/documents.

6. Level of Homogeneity: The product has been certified to guarantee the certified values and their uncertainties at a volume of 2 µL.

7. Certified Value: Certified Value is based upon gravimetric and volumetric preparation using calibrated balances and Class A glassware.

8. Raw Materials and Purity: Phenova reference standard products are prepared from the highest quality starting materials. The purity of this material was verified using an ISO/IEC 17025 methodology.

9. Expanded Uncertainty: The expanded uncertainty (uCRM) as stated is determined in accordance with ISO/IEC Guide 98[5] and ISO Guide 35 incorporating Type A standard uncertainty at a 95% confidence level. The uncertainty contains elements of manufacturing (uM), homogeneity analysis (uH) and long-term stability testing (uLTS). The uncertainty is calculated based on the root-sum-of-squares equation times a coverage factor (k=2).

$$uCRM = k\sqrt{uM^2 + uH^2 + uLTS^2}$$

Transport conditions (short-term stability) have been tested such that there is no contribution to the uncertainty reported. The expanded uncertainty applies to the product as received.

10. Metrological Traceability: The property value (certified value and its uncertainty) are traceable through an unbroken chain of calibration to the SI base unit kg through a NIST traceable weight in accordance with ISO 17034. This is achieved through calibration of balances, verification of weights, use of national methodology for glassware calibration and product homogeneity and stability testing utilizing an ISO/IEC 17025 methodology.

11. Values Obtained During Product Testing: This product is subjected to verification, homogeneity and stability testing using an ISO/IEC 17025 chromatographic methodology. All values obtained during testing meet criteria in accordance with ISO 17034.

12. Period of Validity: The Certified Values, Uncertainties and Expiration Date are based on the unopened product being stored according to the recommended storage condition listed and are guaranteed until the expiration date. This product will be monitored during the period of validity and customers notified of any significant changes in stability.

References:

[1] ISO Guide 31 – Reference Materials – Contents of Certificates and Labels.
[2] ISO Guide 35 – Reference Material – General and Statistical Principles for Certification.
[3] ISO 17034 – General Requirements for the Competence of Reference Material Producers.
[4] ISO/IEC 17025 – General Requirements for the Competence of Testing and Calibration Laboratories.
[5] ISO/IEC Guide 98-3:2008(E) – Uncertainty of Measurement – Part 3: Guide to Expression of Uncertainty in Measurement (GUM: 1995)

Agilent

Certificate of Analysis

Aroclor 1016 Solution

Product Number:	PP-282			**Page:**	1 of 1
Lot Number:	CR-0761	**Lot Issue Date:**	28-Feb-2017	**Expiration Date:**	31-Mar-2025

This ISO Guide 34 Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
Aroclor 1016	012674-11-2	NT01016	100.2 ± 0.5 µg/mL

Matrix: isooctane (2,2,4-trimethylpentane)

Storage: Store at Room Temperature (15° to 30°C).

J000580

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 9001
Registered
TUV USA, Inc.

John Russo
President

Monica Bourgeois
Director of QA/RA

250 Smith Street North Kingstown, Rhode Island 02852 **www.agilent.com/quality**

Agilent

Certificate of Analysis

Product Name: Aroclor 1221 Standard

Product Number: PP-292-1 **Lot Issue Date:** 28-Apr-2020

Lot Number: 0006535333 **Expiration Date:** 31-May-2024

Description:

This analytical reference material (RM) was manufactured and verified in accordance with an ISO 9001 registered quality system, and analyte concentrations were verified by an ISO 17025 accredited laboratory. The concentration and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	Concentration ± Uncertainty
Aroclor 1221	011104-28-2	RM04278	100.2 ± 0.5 µg/mL

Matrix: isooctane (2,2,4-trimethylpentane)

Storage Conditions: Store at Room Temperature (15° to 30°C).

J000581

Traceability:

The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z540.3, ISO 9001, ISO 17025, and ISO 17034. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 1088.

Homogeneity:

This RM was unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:

This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods, and continuing calibration verification.

Instructions for Use:

Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening the container and should be processed without delay for the certified values to be valid within the stated uncertainties.

Hazards:

Refer to the Safety Data Sheet on www.agilent.com for information regarding this RM.

Expiration of Certification:

The certification of this RM is valid until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

Maintenance of Certification:

If substantive changes are noted that affect the certification before the expiration of this certificate, Agilent will notify the purchaser.

Sample lot approver:

Monica Bourgeois
QMS Representative

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

ISO 17034 Cert No. AR-1936

RM was produced in accordance with TUV USA Inc registered ISO 9001 Quality Management System. Cert # 56 100 18560026

www.agilent.com/quality/
CSD-QA-015.1

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO 17025 Cert No. AT-1937

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Agilent

Certificate of Analysis
ISO 17034

Aroclor 1232 Standard

Product Number: PP-302-1 **Page:** 1 of 1

Lot Number: CF-2197A **Lot Issue Date:** 05-Jul-2016 **Expiration Date:** 31-Aug-2023

This ISO 17034 Reference Material (RM) was manufactured and verified in accordance with Agilent's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
Aroclor 1232	011141-16-5	NT01717	100.4 ± 0.5 µg/mL

Matrix: isooctane (2,2,4-trimethylpentane)

Storage: Store at Room Temperature (15° to 30°C).

Agilent uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

Monica Bourgeois
QMS Representative

2021/15/21
J000582

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER
ISO 17034 Cert No. AR-1936

Produced in accordance with TUV USA Inc 56 100 18560026 registered ISO 9001 Quality Management System

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY
ISO17025 Cert No. AT-1937

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Agilent

Certificate of Analysis
ISO Guide 34

Aroclor 1242 Solution

Product Number: PP-312 **Page:** 1 of 1

Lot Number: CS-6293 **Lot Issue Date:** 04-Jan-2019 **Expiration Date:** 31-Jan-2023

This ISO Guide 34 Reference Material (RM) was manufactured and verified in accordance with Agilent's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
Aroclor 1242	053469-21-9	NT01020	100.4 ± 0.5 µg/mL

Matrix: isooctane (2,2,4-trimethylpentane)

Storage: Store at Room Temperature (15° to 30°C).

Agilent uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

M Bourgeois

Monica Bourgeois
QMS Representative

J 000583

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

ISO Guide 34 Cert No.
AR-1936

Produced in accordance with TUV USA Inc 56 100 18560026
registered ISO 9001 Quality Management System

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO17025 Cert No.
AT-1937

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Agilent

Certificate of Analysis
ISO Guide 34

Aroclor 1248 Standard

Product Number: PP-342 **Page:** 1 of 1

Lot Number: CT-0774 **Lot Issue Date:** 08-Mar-2019 **Expiration Date:** 31-Mar-2023

This ISO Guide 34 Reference Material (RM) was manufactured and verified in accordance with Agilent's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
Aroclor 1248	012672-29-6	NT01718	100.3 ± 0.5 µg/mL

Matrix: isooctane (2,2,4-trimethylpentane)

Storage: Store at Room Temperature (15° to 30°C).

Agilent uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

M Bourgeois

Monica Bourgeois
QMS Representative

J000584
01/15/21

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

ISO Guide 34 Cert No.
AR-1936

Produced in accordance with TUV USA Inc 56 100 18560026
registered ISO 9001 Quality Management System

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY

ISO17025 Cert No.
AT-1937

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Certificate of Analysis

Aroclor 1254 Solution

Product Number:	PP-352			**Page:**	1 of 1
Lot Number:	CK-4250	**Lot Issue Date:**	31-Dec-2013	**Expiration Date:**	31-Jan-2022

This certified Reference Material (RM) was manufactured and verified in accordance with ULTRA's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
Aroclor 1254	011097-69-1	RM00922	100.0 ± 0.5 µg/mL

Matrix: isooctane (2,2,4-trimethylpentane)

Storage: Store at Room Temperature (15-30°C).

J000585

ULTRA uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

ACCREDITED

ISO 17025:2005 Accredited A2LA Cert. No. 0851-01

ISO 9001:2008 Registered TUV USA, Inc. Cert. No. 09-1009

250 Smith Street, North Kingstown, RI 02852 USA
401-294-9400 Fax: 295-2330
wwww.ultrasci.com

William J. Leary
Quality Assurance Manager

Agilent

Certificate of Analysis
ISO 17034

Aroclor 1262 Standard

Product Number: PP-372-1 **Page:** 1 of 1

Lot Number: 0006499800 **Lot Issue Date:** 04-Nov-2019 **Expiration Date:** 30-Nov-2023

This ISO 17034 Reference Material (RM) was manufactured and verified in accordance with Agilent Technologies ISO 9001 registered quality system. A review of the gravimetric preparation data by our ISO 17025 accredited laboratory serves to verify the concentration of each analyte. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
Aroclor 1262	037324-23-5	RM14263	100.0 ± 0.5 µg/mL

Matrix: isooctane (2,2,4-trimethylpentane)

Storage: Store at Room Temperature (15° to 30°C).

Agilent uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

M Bourgeois

Monica Bourgeois
QMS Representative

J000 587

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER
ISO 17034 Cert No. AR-1936

Produced in accordance with TUV USA Inc 56 100 18560026 registered ISO 9001 Quality Management System

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY
ISO 17025 Cert No. AT-1937

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Agilent

Certificate of Analysis
ISO 17034

Aroclor 1268 Standard

Product Number: PP-382-1 **Page:** 1 of 1

Lot Number: 0006478417 **Lot Issue Date:** 24-Jul-2019 **Expiration Date:** 31-Aug-2027

This ISO 17034 Reference Material (RM) was manufactured and verified in accordance with Agilent's ISO 9001 registered quality system, and the analyte concentrations were verified by our ISO 17025 accredited laboratory. The true value and uncertainty value at the 95% confidence level for each analyte, determined gravimetrically, is listed below.

Analyte	CAS#	Analyte Lot	True Value
Aroclor 1268	011100-14-4	RM00937	100.3 ± 0.5 µg/mL

Matrix: isooctane (2,2,4-trimethylpentane)

Storage: Store at Room Temperature (15° to 30°C).

Agilent uses balances calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1 and ISO 9001, and calibrated Class A glassware in the manufacturing of these standards.

M Bourgeois

Monica Bourgeois
QMS Representative

J000588

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER
ISO 17034 Cert No. AR-1936

Produced in accordance with TUV USA Inc 56 100 18560026 registered ISO 9001 Quality Management System

ANAB ACCREDITED ISO/IEC 17025 TESTING LABORATORY
ISO 17025 Cert No. AT-1937

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Recipient Copy

CHAIN-OF-CUSTODY RECORD

COC No. 15130

Order Number: CB014550

Date Shipped: 6/30/2021

AirBill No(s): 460843969796

From: QATS LABORATORY
2700 CHANDLER AVENUE, BLDG. C
LAS VEGAS, NV 89120
PHONE: 1-702-895-8712
FAX: 1-702-795-8210

To: SUE DUNNIHOO
ANALYTICAL RESOURCES INC.
4611 S. 134TH PLACE SUITE 100
TUKWILA WA 98168
250-695-6207

Sample ID	Qty	Description/Remarks	→ Catalogue Number
PSRM0134 - J006840	1	PUGET SOUND SEDIMENT RM	PS-SRM
PSRM0135 - J006841	1	PUGET SOUND SEDIMENT RM	PS-SRM
PSRM0136 - J006842	1	PUGET SOUND SEDIMENT RM	PS-SRM
PSRM0137 - J006843	1	PUGET SOUND SEDIMENT RM	PS-SRM
		6/30/2021	
		DUWAMISH AOC4	

Please use the enclosed Sample Preparation Instructions. If catalogue number(s) are listed at the top of the Sample Preparation Instructions use the Sample Preparation Instructions with catalogue number(s) matching the catalogue number(s) of each of the samples listed above.

Relinquished by: (Signature)	Date/Time 1400 6/30/2021	Received by: (Signature)	Date/Time 07/01/2021 1042
Custody Seal(s): Present/Absent	Remarks:		
Relinquished by: (Signature)	Date/Time	Received by: (Signature)	Date/Time

Report No. 00, 9/11/2014

SMP Version 3.3

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020B
Total Metals

LDW21-SS625

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-02 B	SDG:	21G0286
Sampled:	07/22/21 07:50	Prepared:	08/06/21 11:30	File ID:	XDT_m1210809-046
% Solids:	73.19	Preparation:	SWN EPA 3050B	Analyzed:	08/09/21 18:23
Batch:	BJH0134	Sequence:	SJH0114	Initial/Final:	1.022 g Wet / 50 mL
Instrument:	ICPMS1			Calibration:	EH00022

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead	22.8	20	0.07	0.13	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020B
Total Metals

LDW21-SS627

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-04 B	SDG:	21G0286
Sampled:	07/22/21 08:10	Prepared:	08/06/21 11:30	File ID:	XDT_m1210809-045
% Solids:	54.79	Preparation:	SWN EPA 3050B	Analyzed:	08/09/21 18:19
Batch:	BJH0134	Sequence:	SJH0114	Initial/Final:	1.08 g Wet / 50 mL
Instrument:	ICPMS1			Calibration:	EH00022

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead	14.6	20	0.09	0.17	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

EPA 6020B

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Batch:	BJH0134	Batch Matrix:	Solid	Preparation:	SWN EPA 3050B

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS625	21G0286-02	XDT_m1210809-046	08/06/21 11:30	
LDW21-SS627	21G0286-04	XDT_m1210809-045	08/06/21 11:30	
Blank	BJH0134-BLK1	XDT_m1210809-042	08/06/21 11:30	BJH0134 SWN
LCS	BJH0134-BS1	XDT_m1210809-043	08/06/21 11:30	BJH0134 SWN
LDW21-SS625	BJH0134-DUP1	XDT_m1210809-047	08/06/21 11:30	BJH0134 SWN
LDW21-SS625	BJH0134-MS1	XDT_m1210809-048	08/06/21 11:30	BJH0134 SWN
LDW21-SS625	BJH0134-MSD1	XDT_m1210809-049	08/06/21 11:30	BJH0134 SWN

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Digestion Log

Analyst: MM Date: 8/6/21 Time: 1130-1650

Matrix: Soil Block ID: 6 Block Temp: 95°C Thermometer: 20-4

ARI Sample ID	Btl #	pH<2	Prep Code: SWN Initial Wt (g) Vol (mL)	Prep Code: SWN Final Vol (mL)	Prep Code: Initial Wt (g) Vol (mL)	Prep Code: Final Vol (mL)	Comments
216286-2	C		1.022	50			
-3	B		1.075				
-4	B		1.080				
BJT1134-BLK	–		–				
-BS1	–		–				
-MS1	–		1.025				216286-2
-MSD1	–		1.025				
-DUP1	–		1.019				

MM 8/6/21

Chemical/Reagent ID:

HNO_3: 7647 1:1 HNO_3: 7648 HCl: – H_2O_2: I 9826

Tube Lot#: 2109005 Boiling Chip Lot#: – (DoD Only)

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I

METHOD BLANK DATA SHEET

EPA 6020B

Total Metals

Blank

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Batch: BJH0134
Laboratory ID: BJH0134-BLK1
Prepared: 08/06/21 11:30
Matrix: Solid
Preparation: SWN EPA 3050B
Analyzed: 08/09/21 18:07
Sequence: SJH0114
Calibration: EH00022
Instrument: ICPMS1

CAS NO.	Analyte	Concentration (mg/kg wet)	Dilution Factor	MDL	MRL	Q
7439-92-1	Lead-208	ND	20	0.05	0.10	U

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LCS / LCS DUPLICATE RECOVERY

EPA 6020B

Total Metals

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/09/21 18:11
Batch:	BJH0134	Laboratory ID:	BJH0134-BS1
Preparation:	SWN EPA 3050B	Sequence Name:	LCS
Initial/Final:	1 g / 50 mL		

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Lead-208	25.0	25.7		103	80 - 120

* Indicates values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS625

DUPLICATES

EPA 6020B

Total Metals

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJH0134-DUP1
Batch: BJH0134
Lab Source ID: 21G0286-02
Preparation: SWN EPA 3050B
Initial/Final: 1.019 g / 50 mL
Source Sample Name: LDW21-SS625
% Solids: 73.19

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION	DUPLICATE CONCENTRATION	RPD %	Q
Lead-208	20	22.8	37.0	47.6	*

*: Values outside of QC limits
L: Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to Dup = +/- RL instead of 20% RPD

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS625

MS / MS DUPLICATE RECOVERY

EPA 6020B

Total Metals

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/09/21 18:31
Batch:	BJH0134	Laboratory ID:	BJH0134-MS1
Preparation:	SWN EPA 3050B	Sequence Name:	Matrix Spike
Initial/Final:	1.025 g / 50 mL	Source Sample:	LDW21-SS625

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	Q	MS CONCENTRATION (mg/kg dry)	Q	MS % REC. #		QC LIMITS REC.
Lead-208	33.3	22.8		64.7	*	126	*	75 - 125

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS625

MS / MS DUPLICATE RECOVERY

EPA 6020B

Total Metals

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/09/21 18:35
Batch:	BJH0134	Laboratory ID:	BJH0134-MSD1
Preparation:	SWN EPA 3050B	Sequence Name:	Matrix Spike Dup
Initial/Final:	1.025 g / 50 mL	Source Sample:	LDW21-SS625

COMPOUND	SPIKE ADDED (mg/kg dry)	MSD CONCENTRATION (mg/kg dry)	Q	MSD % REC. #		% RPD #		QC LIMITS RPD	QC LIMITS REC.
Lead-208	33.3	46.0	*	69.7	*	33.7	*	20	75 - 125

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS625

POST DIGEST SPIKE SAMPLE RECOVERY

EPA 6020B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJH0134-PS1
Batch: BJH0134
Lab Source ID: 21G0286-02
Preparation: SWN EPA 3050B
Initial/Final: 0.12264 g / 6 mL
Source Sample Name: LDW21-SS625
% Solids: 73.19

Analyte	Control Limit %R	Spike Sample Result (SSR) (ug/L)	Sample Result (SR) (ug/L)	Spike Added (SA) (ug/L)	%R
Lead-208	80 - 120	796	22.8	500.00	91.0
Zinc-66	80 - 120	2460	70.2	1600.0	88.3

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 6020B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00022	Instrument:	ICPMS1
Calibration Date:	08/09/2021 13:58		

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Lead-208	0	0	0.1	145040	10	139162	20	136461.2	50	134663.8	100	133533.9

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 6020B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00022	Instrument:	ICPMS1
Calibration Date:	08/09/2021 13:58		

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	COD Limit	Q
Lead-208	114810.1	49.1	1.0000		0.998	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ICP/MS - 01 SAMPLE RUN LOG

PE Nexion ICP-MS Serial No. 85DN5032601

Analysis Date: 8/9/21 **Analyst:** MB **Sequence:** SJHΦ114 **Cal:** EHΦΦΦ22

All corrections made by analyst unless otherwise noted.

Edit Label	Delete Data	ARI Sample ID	Prep Code	Dilution	Comments
		SEQ-CAL1	J8253		
		-CAL2	J8254		
		-CAL3	J8255		
		-CAL4	J8256		In sl. noisy - %R + Analytes OK
		-CAL5	J8257		
		-CAL6	J8258		
		-IBL1	—		
		-ICV1	J6292		
		-ICB1	J8253		
		-CCV1	J8257		Li, Sc, In, Tb sl. noisy - %R + Analytes OK
		-CCB1	J8253		
		-CRL1	J8254		In sl. noisy - %R + Analytes OK
		-IFA1	J8Φ98		Cr^{53} ↑
		-IFB1	J8Φ99		
		-HCV1	J7549		
		-HCV2	J7893		Ba^{135} ↓ - Ba < 200
		-IBL2	—		
		-IBL3	—		
		-CCV2			
		-CCB2			
	✓	BJHΦ215-BLK1	REN		Mn ↑
		-BS1			No Al, Fe
		-BLK			Mn ↑ (0.543) - Affected Samples > 10x conc. / ↓
		21GΦ34Φ-Φ1			

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ICP/MS - 01 SAMPLE RUN LOG

PE Nexion ICP-MS Serial No. 85DN5032601

Analysis Date: 8/9/21 **Analyst:** MB **Sequence:** — **Cal:** —

All corrections made by analyst unless otherwise noted. MB 8/9/21

Edit Label	Delete Data	ARI Sample ID	Prep Code	Dilution	Comments
	✓	21GΦ384-Φ1	REN		Ge, In-1, In, Tb ↓
		SEQ-IBL4			
		21GΦ384-Φ1	REN	5	Li, In sl. noisy - %R+ Analytes OK/Match DUP; No Al, Fe
		BJHΦ215-DUP1	↓	↓	↓
		↓ -MS1			
		SEQ-IBL5			
		-CCV3			Mg, Al, Ca, Fe ↓
		-CCB3			
	✓	-CAL1			Multiple analytes removed
		-CCV4			
		↓ -CCB4			
		BJHΦ134-BLK1	SWN	20	
		↓ -BS1	↓	↓	
		21GΦ286-Φ3			
		-Φ4			
		↓ -Φ2			
		BJHΦ134-DUP1			Pb RPD↑
		-MS1			Pb %R↑
		-MSD1			Pb, Zn %R↓
		↓ -PS1	↓	↓	0.060mL 5733Φ; Pb, Zn only
		SEQ-IBL6			
		-CCV5			
		↓ -CCB5			
		BJHΦ218-BLK1	REN		

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ICP/MS - 01 SAMPLE RUN LOG

PE Nexion ICP-MS Serial No. 85DN5032601

Analysis Date: 8/9/21 **Analyst:** MB **Sequence:** — **Cal:** —

All corrections made by analyst unless otherwise noted.

Edit Label	Delete Data	ARI Sample ID	Prep Code	Dilution	Comments
		BJH0218-BS1	REN		
		21G0324-02			
		-04			
		-06			
		-08			
		BJH0218-DUP1			
		-MS1			
		21H0079-01		10	
		SEQ-IBL7			
		-CCV6			
		-CCB6			
		21G0331-01	REN	20	
		21G0349-01		10	
		21G0373-01			
		-03			
		21H0049-01			
		21H0057-01			
		SEQ-IBL8			
		-CCV7			
		-CCB7			
		Rinse/DI			
			MB 8/9/21		

Performance Check Report

Sample ID: STD Performance Check
Sample Date/Time: Monday, August 09, 2021 12:56:14
Sample Description:
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\STD Performance Check.mth
Dataset File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\Default\STD Performance Check.11541
MassCal File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Conditions File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Dual Detector Mode: Pulse
Acq. Dead Time (ns): 35
Current Dead Time (ns): 35
Torch Z position (mm): 0.00

Summary

	Analyte	Mass	Meas. Intens. Mean	Net Intens. Mean	Net Intens. SD	Net Intens. RSD	Mode
	Be	9.0	9163.1	9163.071	94.977	1.0	Standard
	In	114.9	127576.4	127576.373	2606.461	2.0	Standard
	U	238.1	202922.9	202922.944	3596.709	1.8	Standard
⌈	CeO	155.9	3022.7	0.017	0.000	2.3	Standard
| >	Ce	139.9	174157.4	174157.367	872.251	0.5	Standard
⌊	Ce++	70.0	1681.8	0.010	0.000	2.1	Standard
	Bkgd	220.0	5.2	5.167	1.514	29.3	Standard

Current Conditions File Data

Current Value	Description
0.97	Nebulizer Gas Flow STD/KED [NEB]
1.25	Auxiliary Gas Flow
17.50	Plasma Gas Flow
-10.75	Deflector Voltage
1600.00	ICP RF Power
-1862.00	Analog Stage Voltage
1550.00	Pulse Stage Voltage
0.00	Quadrupole Rod Offset STD [QRO]
-17.00	Cell Rod Offset STD [CRO]
14.00	Discriminator Threshold
-2.00	Cell Entrance/Exit Voltage STD
0.00	RPa
0.45	RPq
0.97	DRC Mode NEB
-7.50	DRC Mode QRO
-2.00	DRC Mode CRO
-5.00	DRC Mode Cell Entrance/Exit Voltage
1.00	Cell Gas A
0.00	Cell Gas B
200.00	Axial Field Voltage
-11.00	KED Mode CRO
-12.00	KED Mode QRO
-11.00	KED Mode Cell Entrance Voltage
-33.00	KED Mode Cell Exit Voltage
0.00	KED Cell Gas A
3.00	KED Cell Gas B
0.00	KED RPa
0.25	KED RPq
125.00	KED Mode Axial Field Voltage

Performance Check Report

Sample ID: STD Performance Check
Sample Date/Time: Monday, August 09, 2021 13:05:04
Sample Description:
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\STD Performance Check.mth
Dataset File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\Default\STD Performance Check.11547
MassCal File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Conditions File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Dual Detector Mode: Pulse
Acq. Dead Time (ns): 35
Current Dead Time (ns): 35
Torch Z position (mm): 0.00

Summary

	Analyte	Mass	Meas. Intens. Mean	Net Intens. Mean	Net Intens. SD	Net Intens. RSD	Mode
	Be	9.0	8625.9	8625.873	297.189	3.4	Standard
	In	114.9	118053.6	118053.593	787.652	0.7	Standard
	U	238.1	207995.5	207995.462	1893.334	0.9	Standard
⌈	CeO	155.9	3036.5	0.018	0.000	1.8	Standard
| >	Ce	139.9	168359.1	168359.064	540.638	0.3	Standard
⌊	Ce++	70.0	1407.3	0.008	0.000	1.7	Standard
	Bkgd	220.0	3.0	3.033	2.428	80.0	Standard

Current Conditions File Data

Current Value	Description
0.97	Nebulizer Gas Flow STD/KED [NEB]
1.25	Auxiliary Gas Flow
17.50	Plasma Gas Flow
-10.75	Deflector Voltage
1600.00	ICP RF Power
-1862.00	Analog Stage Voltage
1550.00	Pulse Stage Voltage
0.00	Quadrupole Rod Offset STD [QRO]
-17.00	Cell Rod Offset STD [CRO]
14.00	Discriminator Threshold
-2.00	Cell Entrance/Exit Voltage STD
0.00	RPa
0.45	RPq
0.97	DRC Mode NEB
-7.50	DRC Mode QRO
-2.00	DRC Mode CRO
-5.00	DRC Mode Cell Entrance/Exit Voltage
1.00	Cell Gas A
0.00	Cell Gas B
200.00	Axial Field Voltage
-11.00	KED Mode CRO
-12.00	KED Mode QRO
-11.00	KED Mode Cell Entrance Voltage
-33.00	KED Mode Cell Exit Voltage
0.00	KED Cell Gas A
3.00	KED Cell Gas B
0.00	KED RPa
0.25	KED RPq
125.00	KED Mode Axial Field Voltage

SmartTune Wizard - Summary

Optimization Summary

SmartTune file: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Wizard\SmartTune\ARISmartTuneDailyUCT.swz

Start Time: 8/9/2021 12:55:53 PM
End Time: 8/9/2021 1:07:09 PM

STD Performance Check - [Failed]
Obtained Intensity (Be 9): 9163.07
Obtained Intensity (In 115): 127576.37
Obtained Intensity (U 238): 202922.94
Obtained Intensity (Bkgd 220): 5.17 - <Target not achieved>
Obtained Formula (Ce++ 70 / Ce 140): 0.010 (=1681.83 / 174157.37)
Obtained Formula (CeO 156 / Ce 140): 0.017 (=3022.65 / 174157.37)
Obtained RSD (Be 9): 0.0104
Obtained RSD (In 115): 0.0204
Obtained RSD (U 238): 0.0177

Torch Alignment - [Passed]

Vertical	Horizontal	Intensity
1.96 mm	-0.14 mm	137998.32

Nebulizer Gas Flow STD/KED [NEB] - [Passed] Optimum value(s): 0.97
Obtained Intensity (In 115): 127861.65
Obtained Formula (CeO 156 / Ce 140): 0.0182 (=3178.35 / 174672.38)

Mass Calibration and Resolution - [Passed] Optimum value(s): N/A
Target/Obtained mass (7.016/7.025), Target/Obtained resolution (0.7/0.715)
Target/Obtained mass (23.985/23.975), Target/Obtained resolution (0.7/0.712)
Target/Obtained mass (114.904/114.925), Target/Obtained resolution (0.7/0.699)
Target/Obtained mass (238.05/238.075), Target/Obtained resolution (0.7/0.696)

QID STD/DRC - Optimum value(s): Correlation Coefficient = 0.999; Intercept = -15.77

KED Mode QID - Optimum value(s): Correlation Coefficient = 0.998; Intercept = -14.27

STD Performance Check - [Passed] Optimum value(s): N/A
Obtained Intensity (Be 9): 8625.87
Obtained Intensity (In 115): 118053.59
Obtained Intensity (U 238): 207995.46
Obtained Intensity (Bkgd 220): 3.03
Obtained Formula (Ce++ 70 / Ce 140): 0.008 (=1407.27 / 168359.06)
Obtained Formula (CeO 156 / Ce 140): 0.018 (=3036.46 / 168359.06)
Obtained RSD (Be 9): 0.0345
Obtained RSD (In 115): 0.0067
Obtained RSD (U 238): 0.0091

SmartTune Wizard - Details

```
Optimization Details

SmartTune file: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Wizard\SmartTune\ARISmartTuneDailyUCT.swz

Optimization Status

Start Time: 8/9/2021 12:55:53 PM

STD Performance Check
        Optimization Settings:
                Method: STD Performance Check.mth.
                Intensity Criterion: Be 9 > 2000
                Intensity Criterion: In 115 > 40000
                Intensity Criterion: U 238 > 30000
                Intensity Criterion: Bkgd 220 <= 5
                Formula Criterion: Ce++ 70 / Ce 140 <= 0.03
                Formula Criterion: CeO 156 / Ce 140 <= 0.025
                RSD Criterion: Be 9.0122 < 0.05
                RSD Criterion: In 114.904 < 0.05
                RSD Criterion: U 238.05 < 0.05

        Optimization Results:
        Initial Try
                Obtained Intensity (Be 9): 9163.07
                Obtained Intensity (In 115): 127576.37
                Obtained Intensity (U 238): 202922.94
                Obtained Intensity (Bkgd 220): 5.17 - <Target not achieved>
                Obtained Formula (Ce++ 70 / Ce 140): 0.010 (=1681.83 / 174157.37)
                Obtained Formula (CeO 156 / Ce 140): 0.017 (=3022.65 / 174157.37)
                Obtained RSD (Be 9): 0.0104
                Obtained RSD (In 115): 0.0204
                Obtained RSD (U 238): 0.0177

                [Failed]
[Failed]

Torch Alignment
        Optimization Settings:
                Method: Torch Alignment.mth.
                Intensity Criterion: In 115 Maximum

        Optimization Results:
                Vertical      Horizontal      Intensity
[Passed]        1.96 mm     -0.14 mm       137998.32

Nebulizer Gas Flow STD/KED [NEB]
        Optimization Settings:
                Method: Optimize.mth.
                        Initial Try - Start/End/Step: 0.95/1/0.01.
                Intensity Criterion: In 115 Maximum
                Formula Criterion: CeO 156 / Ce 140 <= 0.023

        Optimization Results:
        Initial Try

                Obtained Intensity (In 115): 127861.65
                Obtained Formula (CeO 156 / Ce 140): 0.0182 (=3178.35 / 174672.38)
[Passed]  Optimum value(s): 0.97
```

Mass Calibration and Resolution

Optimization Settings:

Method: Tuning.mth.

MassCal File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun

Iterations: 6

Target accuracy (+/- amu): 0.05 for Mass Cal. and 0.03 for Resolution

Peak height (%) for Res. Opt.: 10

Optimization Results:

Initial Try

Target/Obtained mass (7.016/7.025), Target/Obtained resolution (0.7/0.715)

Target/Obtained mass (23.985/23.975), Target/Obtained resolution (0.7/0.712)

Target/Obtained mass (114.904/114.925), Target/Obtained resolution (0.7/0.699)

Target/Obtained mass (238.05/238.075), Target/Obtained resolution (0.7/0.696)

[Passed] Optimum value(s): N/A

QID STD/DRC

Optimization Settings:

Method: QID Calibration.mth.

Initial Try - Start/End/Step: -20/0/0.5.

Optimization Results:

Initial Try

Optimum value(s): Correlation Coefficient = 0.999; Intercept = -15.77

Analyte	Mass	Points	DAC	MaxIntensity
Li	7	41	-15.5	38062.6
Mg	24	41	-15	68049.7
In	115	41	-12.5	132920
Ce	140	41	-12	177249
Pb	208	41	-10.5	115441
U	238	41	-10.5	221630

KED Mode QID

Optimization Settings:

Method: QID Calibration.mth.

Initial Try - Start/End/Step: -20/0/0.5.

Optimization Results:

Initial Try

Optimum value(s): Correlation Coefficient = 0.998; Intercept = -14.27

Analyte	Mass	Points	DAC	MaxIntensity
Li	7	41	-14.5	32721.4
Mg	24	41	-14.5	70212.1
In	115	41	-11.5	148164
Ce	140	41	-10.5	124500
Pb	208	41	-10	74139.9
U	238	41	-9.5	150468

STD Performance Check

Optimization Settings:

Method: STD Performance Check.mth.

Intensity Criterion: Be 9 > 2000

```
        Intensity Criterion: In 115 > 40000
        Intensity Criterion: U 238 > 30000
        Intensity Criterion: Bkgd 220 <= 5
        Formula Criterion: Ce++ 70 / Ce 140 <= 0.03
        Formula Criterion: CeO 156 / Ce 140 <= 0.025
        RSD Criterion: Be 9.0122 < 0.05
        RSD Criterion: In 114.904 < 0.05
        RSD Criterion: U 238.05 < 0.05

    Optimization Results:
    Initial Try
        Obtained Intensity (Be 9): 8625.87
        Obtained Intensity (In 115): 118053.59
        Obtained Intensity (U 238): 207995.46
        Obtained Intensity (Bkgd 220): 3.03
        Obtained Formula (Ce++ 70 / Ce 140): 0.008 (=1407.27 / 168359.06)
        Obtained Formula (CeO 156 / Ce 140): 0.018 (=3036.46 / 168359.06)
        Obtained RSD (Be 9): 0.0345
        Obtained RSD (In 115): 0.0067
        Obtained RSD (U 238): 0.0091

[Passed]  Optimum value(s): N/A

End Time: 8/9/2021 1:07:09 PM
```

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 13:58:56
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L				851347	0	Standard
	Be	9		ug/L				10	39	Standard
	C	13		ug/L				24210	4	Standard
	Cl	37		ug/L				3807524	1	Standard
>	Sc	45		ug/L				924614	3	Standard
	Na	23		ug/L				19857	2	Standard
	Mg	24		ug/L				3421	1	Standard
	Al	27		ug/L				5910	2	Standard
	K	39		ug/L				397696	0	Standard
	Ca	44		ug/L				8558	0	Standard
	V	51		ug/L				4329	3	Standard
	V-1	51		ug/L				172	10	Standard
	Cr	52		ug/L				12806	2	Standard
	Cr	53		ug/L				117	5	Standard
	Fe	54		ug/L				68439	1	Standard
	Fe	57		ug/L				14875	2	Standard
	Mn	55		ug/L				529	3	Standard
>	Ge	72		ug/L				86245	2	KED
	Co	59		ug/L				8	44	KED
	Ni	60		ug/L				213	8	KED
	Ni	62		ug/L				34	30	KED
	Cu	63		ug/L				139	7	KED
	Cu	65		ug/L				80	18	KED
	Zn	66		ug/L				340	5	KED
	Zn	67		ug/L				53	25	KED
	As	75		ug/L				3	21	KED
	Se	78		ug/L				9	22	KED
	Y	89		ug/L				449540	1	Standard
	Kr	83		ug/L				109	4	Standard
>	In-1	115		ug/L				21778	2	KED
	Mo	98		ug/L				3	62	KED
	Cd	111		ug/L				2	88	KED
	Cd	114		ug/L				4	25	KED
>	In	115		ug/L				1112607	0	Standard
	Ag	107		ug/L				36	34	Standard
	Sb	121		ug/L				113	7	Standard
	Sb	123		ug/L				89	12	Standard
	Ba	135		ug/L				100	2	Standard
	Ba	137		ug/L				170	8	Standard
>	Tb	159		ug/L				2978637	2	Standard
	Tl	205		ug/L				193	14	Standard
	Pb	208		ug/L				495	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL2
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:03:47
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	843382	2	Standard
	Be	9	0.200	ug/L	0.017	8	10	1310	6	Standard
	C	13		ug/L			24210	26777	2	Standard
	Cl	37		ug/L			3807524	3724230	1	Standard
>	Sc	45		ug/L			924614	931818	1	Standard
	Na	23	100.000	ug/L	1.575	1	19857	2389698	2	Standard
	Mg	24	20.000	ug/L	0.587	2	3421	641523	1	Standard
	Al	27	20.000	ug/L	0.609	3	5910	516078	3	Standard
	K	39	20.000	ug/L	0.617	3	397696	668245	0	Standard
	Ca	44	50.000	ug/L	1.380	2	8558	66646	1	Standard
	V	51	0.200	ug/L	0.002	1	4329	8832	1	Standard
	V-1	51	0.200	ug/L	0.001	0	172	4962	1	Standard
	Cr	52	0.500	ug/L	0.003	0	12806	22649	1	Standard
	Cr	53	0.500	ug/L	0.001	0	117	1321	1	Standard
	Fe	54	36.000	ug/L	1.689	4	68439	153612	1	Standard
	Fe	57	36.000	ug/L	0.471	1	14875	49202	0	Standard
	Mn	55	0.500	ug/L	0.017	3	529	14576	3	Standard
>	Ge	72		ug/L			86245	88575	0	KED
	Co	59	0.200	ug/L	0.007	3	8	1397	3	KED
	Ni	60	0.500	ug/L	0.031	6	213	1148	4	KED
	Ni	62	0.500	ug/L	0.060	12	34	192	10	KED
	Cu	63	0.500	ug/L	0.018	3	139	3155	3	KED
	Cu	65	0.500	ug/L	0.024	4	80	1623	4	KED
	Zn	66	6.000	ug/L	0.147	2	340	4915	2	KED
	Zn	67	6.000	ug/L	0.067	1	53	762	0	KED
	As	75	0.200	ug/L	0.017	8	3	73	8	KED
	Se	78	0.500	ug/L	0.073	14	9	23	7	KED
	Y	89		ug/L			449540	456799	0	Standard
	Kr	83		ug/L			109	113	19	Standard
>	In-1	115		ug/L			21778	21043	0	KED
	Mo	98	0.200	ug/L	0.007	3	3	307	2	KED
	Cd	111	0.100	ug/L	0.011	10	2	40	9	KED
	Cd	114	0.100	ug/L	0.009	9	4	102	8	KED
>	In	115		ug/L			1112607	1128967	2	Standard
	Ag	107	0.200	ug/L	0.005	2	36	3008	2	Standard
	Sb	121	0.200	ug/L	0.002	0	113	3866	2	Standard
	Sb	123	0.200	ug/L	0.007	3	89	2935	5	Standard
	Ba	135	0.500	ug/L	0.017	3	100	3869	0	Standard
	Ba	137	0.500	ug/L	0.015	3	170	6914	1	Standard
>	Tb	159		ug/L			2978637	2991335	1	Standard
	Tl	205	0.200	ug/L	0.005	2	193	20720	1	Standard
	Pb	208	0.100	ug/L	0.001	1	495	14504	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL3
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:08:38
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	899450	2	Standard
	Be	9	10.000	ug/L	0.134	1	10	68350	2	Standard
	C	13		ug/L			24210	52258	3	Standard
	Cl	37		ug/L			3807524	3930331	1	Standard
>	Sc	45		ug/L			924614	935754	3	Standard
	Na	23	1000.260	ug/L	21.643	2	19857	24451256	3	Standard
	Mg	24	1000.030	ug/L	59.320	5	3421	34584544	2	Standard
	Al	27	1000.038	ug/L	14.450	1	5910	28314372	2	Standard
	K	39	1000.039	ug/L	34.371	3	397696	15264875	1	Standard
	Ca	44	1000.067	ug/L	50.523	5	8558	1204901	1	Standard
	V	51	10.000	ug/L	0.309	3	4329	247547	0	Standard
	V-1	51	10.000	ug/L	0.299	2	172	243520	0	Standard
	Cr	52	10.002	ug/L	0.281	2	12806	226675	2	Standard
	Cr	53	10.000	ug/L	0.241	2	117	24326	2	Standard
	Fe	54	999.801	ug/L	40.925	4	68439	2113824	0	Standard
	Fe	57	1000.044	ug/L	34.406	3	14875	1001973	0	Standard
	Mn	55	10.002	ug/L	0.484	4	529	300464	2	Standard
>	Ge	72		ug/L			86245	87462	0	KED
	Co	59	10.000	ug/L	0.080	0	8	69803	1	KED
	Ni	60	10.003	ug/L	0.114	1	213	21299	1	KED
	Ni	62	10.001	ug/L	0.289	2	34	3282	2	KED
	Cu	63	10.001	ug/L	0.085	0	139	61770	0	KED
	Cu	65	10.001	ug/L	0.354	3	80	31171	2	KED
	Zn	66	10.305	ug/L	0.101	0	340	8804	1	KED
	Zn	67	10.496	ug/L	0.244	2	53	1471	1	KED
	As	75	10.000	ug/L	0.087	0	3	3746	0	KED
	Se	78	10.007	ug/L	0.398	3	9	393	4	KED
	Y	89		ug/L			449540	449567	3	Standard
	Kr	83		ug/L			109	109	9	Standard
>	In-1	115		ug/L			21778	20558	1	KED
	Mo	98	10.001	ug/L	0.294	2	3	17122	1	KED
	Cd	111	10.000	ug/L	0.183	1	2	3838	2	KED
	Cd	114	10.000	ug/L	0.228	2	4	10012	3	KED
>	In	115		ug/L			1112607	1136692	1	Standard
	Ag	107	10.000	ug/L	0.276	2	36	152087	1	Standard
	Sb	121	10.000	ug/L	0.280	2	113	190184	1	Standard
	Sb	123	10.000	ug/L	0.296	2	89	149080	1	Standard
	Ba	135	10.001	ug/L	0.166	1	100	79163	0	Standard
	Ba	137	10.001	ug/L	0.108	1	170	140950	0	Standard
>	Tb	159		ug/L			2978637	3007406	0	Standard
	Tl	205	10.000	ug/L	0.092	0	193	1067296	0	Standard
	Pb	208	10.000	ug/L	0.124	1	495	1391620	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL4
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:13:43
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	873825	1	Standard
	Be	9	19.996	ug/L	0.344	1	10	132662	1	Standard
	C	13		ug/L			24210	53294	2	Standard
	Cl	37		ug/L			3807524	4050830	3	Standard
>	Sc	45		ug/L			924614	944081	1	Standard
	Na	23	1984.029	ug/L	47.379	2	19857	47416429	1	Standard
	Mg	24	1990.222	ug/L	72.084	3	3421	68205025	3	Standard
	Al	27	1984.155	ug/L	51.112	2	5910	54940495	1	Standard
	K	39	1991.864	ug/L	11.589	0	397696	29815969	0	Standard
	Ca	44	2015.847	ug/L	4.595	0	8558	2523969	1	Standard
	V	51	19.958	ug/L	0.279	1	4329	490312	1	Standard
	V-1	51	19.948	ug/L	0.183	0	172	485193	0	Standard
	Cr	52	19.977	ug/L	0.463	2	12806	441881	1	Standard
	Cr	53	19.943	ug/L	0.227	1	117	48295	0	Standard
	Fe	54	1989.983	ug/L	15.243	0	68439	4099340	2	Standard
	Fe	57	2002.184	ug/L	107.535	5	14875	2019674	6	Standard
	Mn	55	19.914	ug/L	0.499	2	529	593410	2	Standard
>	Ge	72		ug/L			86245	85541	0	KED
	Co	59	20.019	ug/L	0.340	1	8	137156	1	KED
	Ni	60	20.055	ug/L	0.395	1	213	42001	1	KED
	Ni	62	20.160	ug/L	0.534	2	34	6649	3	KED
	Cu	63	20.022	ug/L	0.236	1	139	121359	1	KED
	Cu	65	20.053	ug/L	0.175	0	80	61710	0	KED
	Zn	66	19.852	ug/L	0.258	1	340	15936	1	KED
	Zn	67	20.028	ug/L	0.495	2	53	2708	2	KED
	As	75	20.077	ug/L	0.183	0	3	7467	0	KED
	Se	78	20.049	ug/L	0.458	2	9	768	1	KED
	Y	89		ug/L			449540	451274	1	Standard
	Kr	83		ug/L			109	123	13	Standard
>	In-1	115		ug/L			21778	20600	1	KED
	Mo	98	19.935	ug/L	0.274	1	3	33769	1	KED
	Cd	111	19.894	ug/L	0.154	0	2	7489	0	KED
	Cd	114	19.945	ug/L	0.376	1	4	19783	1	KED
>	In	115		ug/L			1112607	1101325	6	Standard
	Ag	107	20.256	ug/L	0.874	4	36	314018	2	Standard
	Sb	121	20.152	ug/L	1.496	7	113	381746	1	Standard
	Sb	123	20.167	ug/L	1.293	6	89	300531	1	Standard
	Ba	135	20.121	ug/L	1.191	5	100	157641	0	Standard
	Ba	137	20.105	ug/L	1.429	7	170	279387	0	Standard
>	Tb	159		ug/L			2978637	3057530	1	Standard
	Tl	205	20.167	ug/L	0.494	2	193	2263187	1	Standard
	Pb	208	19.855	ug/L	0.260	1	495	2729223	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL5
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:18:58
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	824281	2	Standard
	Be	9	50.508	ug/L	0.275	0	10	332980	2	Standard
	C	13		ug/L			24210	22342	2	Standard
	Cl	37		ug/L			3807524	4126297	1	Standard
>	Sc	45		ug/L			924614	887622	2	Standard
	Na	23	5023.701	ug/L	180.653	3	19857	115549743	2	Standard
	Mg	24	5021.685	ug/L	169.600	3	3421	165312571	2	Standard
	Al	27	5012.985	ug/L	103.716	2	5910	132209741	2	Standard
	K	39	5022.801	ug/L	99.198	1	397696	71717661	1	Standard
	Ca	44	5023.377	ug/L	204.697	4	8558	6039883	3	Standard
	V	51	50.192	ug/L	0.866	1	4329	1175730	3	Standard
	V-1	51	50.239	ug/L	0.564	1	172	1176898	3	Standard
	Cr	52	50.003	ug/L	1.762	3	12806	1021342	1	Standard
	Cr	53	50.155	ug/L	1.312	2	117	115785	0	Standard
	Fe	54	5012.883	ug/L	62.389	1	68439	9730766	1	Standard
	Fe	57	5049.831	ug/L	164.619	3	14875	5012345	0	Standard
	Mn	55	50.159	ug/L	0.956	1	529	1427416	3	Standard
>	Ge	72		ug/L			86245	83857	0	KED
	Co	59	49.844	ug/L	1.176	2	8	329643	2	KED
	Ni	60	49.734	ug/L	0.869	1	213	99168	1	KED
	Ni	62	49.834	ug/L	1.001	2	34	15801	1	KED
	Cu	63	49.728	ug/L	0.312	0	139	287450	0	KED
	Cu	65	49.624	ug/L	0.702	1	80	144180	1	KED
	Zn	66	49.644	ug/L	1.529	3	340	37343	3	KED
	Zn	67	49.686	ug/L	0.400	0	53	6325	0	KED
	As	75	49.740	ug/L	0.215	0	3	17672	0	KED
	Se	78	49.542	ug/L	0.765	1	9	1766	1	KED
	Y	89		ug/L			449540	442946	3	Standard
	Kr	83		ug/L			109	116	12	Standard
>	In-1	115		ug/L			21778	19674	1	KED
	Mo	98	50.109	ug/L	1.352	2	3	81937	1	KED
	Cd	111	49.926	ug/L	0.507	1	2	17816	0	KED
	Cd	114	49.941	ug/L	0.834	1	4	47030	1	KED
>	In	115		ug/L			1112607	1092970	0	Standard
	Ag	107	49.684	ug/L	1.023	2	36	742261	1	Standard
	Sb	121	49.816	ug/L	1.059	2	113	922290	1	Standard
	Sb	123	49.741	ug/L	0.636	1	89	718829	0	Standard
	Ba	135	49.837	ug/L	1.525	3	100	382043	2	Standard
	Ba	137	49.692	ug/L	0.997	2	170	666591	1	Standard
>	Tb	159		ug/L			2978637	2955233	1	Standard
	Tl	205	49.750	ug/L	0.627	1	193	5266222	2	Standard
	Pb	208	50.113	ug/L	0.557	1	495	6733188	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL6
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:25:53
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	798906	1	Standard
	Be	9	99.508	ug/L	1.013	1	10	625477	0	Standard
	C	13		ug/L			24210	39989	2	Standard
	Cl	37		ug/L			3807524	4237466	2	Standard
>	Sc	45		ug/L			924614	880696	1	Standard
	Na	23	9955.836	ug/L	192.701	1	19857	224002959	2	Standard
	Mg	24	9934.945	ug/L	203.227	2	3421	317698074	0	Standard
	Al	27	9962.781	ug/L	265.166	2	5910	257593638	3	Standard
	K	39	10023.961	ug/L	174.844	1	397696	142791760	0	Standard
	Ca	44	9957.889	ug/L	235.240	2	8558	11709583	1	Standard
	V	51	101.096	ug/L	0.575	0	4329	2434084	0	Standard
	V-1	51	100.802	ug/L	0.522	0	172	2406892	1	Standard
	Cr	52	101.097	ug/L	1.985	1	12806	2114040	0	Standard
	Cr	53	100.119	ug/L	1.557	1	117	230190	0	Standard
	Fe	54	9960.856	ug/L	137.718	1	68439	18877205	1	Standard
	Fe	57	10010.026	ug/L	100.664	1	14875	9882256	0	Standard
	Mn	55	100.053	ug/L	1.182	1	529	2829476	1	Standard
>	Ge	72		ug/L			86245	80028	1	KED
	Co	59	100.746	ug/L	1.002	0	8	652075	1	KED
	Ni	60	100.588	ug/L	1.300	1	213	195028	1	KED
	Ni	62	100.538	ug/L	1.714	1	34	30945	2	KED
	Cu	63	100.193	ug/L	1.930	1	139	556208	2	KED
	Cu	65	100.413	ug/L	1.958	1	80	282245	2	KED
	Zn	66	100.045	ug/L	2.497	2	340	71589	1	KED
	Zn	67	99.590	ug/L	1.737	1	53	11887	0	KED
	As	75	100.605	ug/L	0.548	0	3	34809	0	KED
	Se	78	100.520	ug/L	0.412	0	9	3471	1	KED
	Y	89		ug/L			449540	434491	0	Standard
	Kr	83		ug/L			109	126	13	Standard
>	In-1	115		ug/L			21778	19123	1	KED
	Mo	98	100.295	ug/L	1.081	1	3	161005	1	KED
	Cd	111	100.255	ug/L	1.156	1	2	35067	0	KED
	Cd	114	99.834	ug/L	1.341	1	4	90866	1	KED
>	In	115		ug/L			1112607	1031936	1	Standard
	Ag	107	100.617	ug/L	0.700	0	36	1449221	2	Standard
	Sb	121	100.641	ug/L	3.640	3	113	1797245	2	Standard
	Sb	123	100.300	ug/L	4.629	4	89	1381878	3	Standard
	Ba	135	100.368	ug/L	1.158	1	100	735450	0	Standard
	Ba	137	100.803	ug/L	0.440	0	170	1311775	1	Standard
>	Tb	159		ug/L			2978637	2842084	1	Standard
	Tl	205	99.774	ug/L	1.418	1	193	10079190	1	Standard
	Pb	208	100.750	ug/L	0.344	0	495	13353386	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:33:28
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
⌈>	**Li**	**6**		ug/L			851347	885372	2	Standard
⌊	**Be**	**9**	**0.003**	ug/L	0.001	41	10	29	27	Standard
	C	**13**		ug/L			24210	23547	1	Standard
	Cl	**37**		ug/L			3807524	3960737	3	Standard
⌈>	**Sc**	**45**		ug/L			924614	920622	1	Standard
|	**Na**	**23**	**0.382**	ug/L	0.030	7	19857	28761	2	Standard
|	**Mg**	**24**	**0.202**	ug/L	0.017	8	3421	10159	4	Standard
|	**Al**	**27**	**0.190**	ug/L	0.016	8	5910	11028	2	Standard
|	**K**	**39**	**1.261**	ug/L	0.429	34	397696	414646	0	Standard
|	**Ca**	**44**	**-0.298**	ug/L	0.042	14	8558	8155	1	Standard
|	**V**	**51**	**-0.002**	ug/L	0.005	271	4329	4264	1	Standard
|	**V-1**	**51**	**0.001**	ug/L	0.001	45	172	200	7	Standard
|	**Cr**	**52**	**-0.016**	ug/L	0.018	117	12806	12406	1	Standard
|	**Cr**	**53**	**-0.006**	ug/L	0.003	40	117	102	5	Standard
|	**Fe**	**54**	**-0.937**	ug/L	0.332	35	68439	66286	0	Standard
|	**Fe**	**57**	**1.953**	ug/L	0.051	2	14875	16824	1	Standard
⌊	**Mn**	**55**	**0.003**	ug/L	0.001	45	529	615	5	Standard
⌈>	**Ge**	**72**		ug/L			86245	84548	0	KED
|	**Co**	**59**	**0.002**	ug/L	0.001	89	8	19	49	KED
|	**Ni**	**60**	**-0.016**	ug/L	0.005	29	213	177	5	KED
|	**Ni**	**62**	**0.006**	ug/L	0.033	540	34	36	29	KED
|	**Cu**	**63**	**-0.001**	ug/L	0.003	326	139	131	12	KED
|	**Cu**	**65**	**-0.001**	ug/L	0.006	1109	80	77	23	KED
|	**Zn**	**66**	**-0.045**	ug/L	0.039	87	340	299	9	KED
|	**Zn**	**67**	**-0.153**	ug/L	0.063	40	53	33	22	KED
|	**As**	**75**	**0.007**	ug/L	0.001	20	3	6	8	KED
⌊	**Se**	**78**	**-0.016**	ug/L	0.061	386	9	8	24	KED
	Y	**89**		ug/L			449540	441201	1	Standard
	Kr	**83**		ug/L			109	116	14	Standard
⌈>	**In-1**	**115**		ug/L			21778	20214	2	KED
|	**Mo**	**98**	**0.018**	ug/L	0.002	8	3	34	8	KED
|	**Cd**	**111**	**0.002**	ug/L	0.005	234	2	3	56	KED
⌊	**Cd**	**114**	**0.001**	ug/L	0.002	254	4	4	45	KED
⌈>	**In**	**115**		ug/L			1112607	1113688	0	Standard
|	**Ag**	**107**	**0.007**	ug/L	0.001	19	36	140	13	Standard
|	**Sb**	**121**	**0.026**	ug/L	0.001	4	113	617	4	Standard
|	**Sb**	**123**	**0.024**	ug/L	0.001	4	89	443	4	Standard
|	**Ba**	**135**	**0.000**	ug/L	0.002	632	100	102	15	Standard
⌊	**Ba**	**137**	**-0.002**	ug/L	0.000	17	170	139	4	Standard
⌈>	**Tb**	**159**		ug/L			2978637	2908751	1	Standard
|	**Tl**	**205**	**0.010**	ug/L	0.000	2	193	1175	4	Standard
⌊	**Pb**	**208**	**0.004**	ug/L	0.001	15	495	986	6	Standard

Sample Information

Sample Date/Time: Monday, August 09, 2021 14:25:53
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.m
Mass Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Conditions File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

Calibration

Analyte	Mass	**r Corr Coef**	Slope	Std 1 Conc	Std 2 Conc	Std 3 Conc	Std 4 Conc	Std 5 Conc
Li	6							
Be	9	**0.9999**	0.008	0.20	10	20	50	100
C	13							
Cl	37							
Sc	45							
Na	23	**0.9999**	0.026	100.00	1000	2000	5000	10000
Mg	24	**0.9999**	0.036	20.00	1000	2000	5000	10000
Al	27	**1.0000**	0.029	20.00	1000	2000	5000	10000
K	39	**1.0000**	0.016	20.00	1000	2000	5000	10000
Ca	44	**1.0000**	0.001	50.00	1000	2000	5000	10000
V	51	**0.9998**	0.027	0.20	10	20	50	100
V-1	51	**0.9999**	0.027	0.20	10	20	50	100
Cr	52	**0.9998**	0.024	0.50	10	20	50	100
Cr	53	**1.0000**	0.003	0.50	10	20	50	100
Fe	54	**1.0000**	0.002	36.00	1000	2000	5000	10000
Fe	57	**0.9999**	0.001	36.00	1000	2000	5000	10000
Mn	55	**1.0000**	0.032	0.50	10	20	50	100
Ge	72							
Co	59	**0.9999**	0.081	0.20	10	20	50	100
Ni	60	**0.9999**	0.024	0.50	10	20	50	100
Ni	62	**0.9999**	0.004	0.50	10	20	50	100
Cu	63	**1.0000**	0.069	0.50	10	20	50	100
Cu	65	**0.9999**	0.035	0.50	10	20	50	100
Zn	66	**1.0000**	0.009	6.00	10	20	50	100
Zn	67	**0.9999**	0.001	6.00	10	20	50	100
As	75	**0.9999**	0.004	0.20	10	20	50	100
Se	78	**0.9999**	0.000	0.50	10	20	50	100
Y	89							
Kr	83							
In-1	115							
Mo	98	**1.0000**	0.084	0.20	10	20	50	100
Cd	111	**1.0000**	0.018	0.10	10	20	50	100
Cd	114	**1.0000**	0.048	0.10	10	20	50	100
In	115							
Ag	107	**0.9999**	0.014	0.20	10	20	50	100
Sb	121	**0.9999**	0.017	0.20	10	20	50	100
Sb	123	**1.0000**	0.013	0.20	10	20	50	100
Ba	135	**1.0000**	0.007	0.50	10	20	50	100
Ba	137	**0.9999**	0.013	0.50	10	20	50	100
Tb	159							
Tl	205	**1.0000**	0.036	0.20	10	20	50	100
Pb	208	**0.9999**	0.047	0.10	10	20	50	100

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-ICV1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:49:07
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	840943	0	Standard
	Be	9	48.446	ug/L	0.947	1	10	320576	1	Standard
	C	13		ug/L			24210	29221	3	Standard
	Cl	37		ug/L			3807524	4312766	1	Standard
>	Sc	45		ug/L			924614	902397	1	Standard
	Na	23	4839.769	ug/L	122.472	2	19857	111567886	1	Standard
	Mg	24	4808.042	ug/L	13.881	0	3421	157565703	1	Standard
	Al	27	4800.265	ug/L	134.849	2	5910	127144664	2	Standard
	K	39	4820.289	ug/L	110.116	2	397696	70554712	1	Standard
	Ca	44	4740.189	ug/L	12.328	0	8558	5717017	1	Standard
	V	51	47.601	ug/L	1.003	2	4329	1176464	1	Standard
	V-1	51	48.245	ug/L	1.172	2	172	1180319	1	Standard
	Cr	52	47.447	ug/L	0.645	1	12806	1023340	1	Standard
	Cr	53	49.584	ug/L	0.678	1	117	116870	0	Standard
	Fe	54	4934.686	ug/L	40.587	0	68439	9616226	0	Standard
	Fe	57	4780.945	ug/L	79.556	1	14875	4844453	2	Standard
	Mn	55	49.958	ug/L	0.232	0	529	1447924	1	Standard
>	Ge	72		ug/L			86245	84395	2	KED
	Co	59	48.642	ug/L	0.692	1	8	331959	1	KED
	Ni	60	48.092	ug/L	0.749	1	213	98421	1	KED
	Ni	62	47.917	ug/L	0.855	1	34	15569	2	KED
	Cu	63	47.971	ug/L	1.245	2	139	280839	2	KED
	Cu	65	48.160	ug/L	0.572	1	80	142773	1	KED
	Zn	66	47.451	ug/L	0.921	1	340	35985	2	KED
	Zn	67	47.456	ug/L	0.455	0	53	6002	2	KED
	As	75	47.461	ug/L	0.430	0	3	17320	2	KED
	Se	78	74.010	ug/L	1.671	2	9	2698	4	KED
	Y	89		ug/L			449540	438786	1	Standard
	Kr	83		ug/L			109	122	14	Standard
>	In-1	115		ug/L			21778	20303	0	KED
	Mo	98	48.567	ug/L	0.814	1	3	82786	1	KED
	Cd	111	48.084	ug/L	0.126	0	2	17861	0	KED
	Cd	114	47.886	ug/L	0.382	0	4	46283	0	KED
>	In	115		ug/L			1112607	1093613	3	Standard
	Ag	107	47.183	ug/L	1.428	3	36	719684	0	Standard
	Sb	121	48.235	ug/L	1.793	3	113	912524	2	Standard
	Sb	123	47.834	ug/L	2.017	4	89	698033	0	Standard
	Ba	135	46.870	ug/L	2.236	4	100	363680	1	Standard
	Ba	137	47.315	ug/L	1.526	3	170	652152	0	Standard
>	Tb	159		ug/L			2978637	2923554	1	Standard
	Tl	205	49.192	ug/L	1.777	3	193	5110540	2	Standard
	Pb	208	47.645	ug/L	0.857	1	495	6494737	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-ICB1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:56:43
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	864771	2	Standard
	Be	9	0.001	ug/L	0.000	62	10	15	21	Standard
	C	13		ug/L			24210	23605	2	Standard
	Cl	37		ug/L			3807524	4005937	2	Standard
>	Sc	45		ug/L			924614	931037	2	Standard
	Na	23	0.229	ug/L	0.025	10	19857	25439	0	Standard
	Mg	24	0.054	ug/L	0.011	19	3421	5278	4	Standard
	Al	27	0.033	ug/L	0.015	45	5910	6837	4	Standard
	K	39	0.757	ug/L	0.686	90	397696	411632	0	Standard
	Ca	44	-0.813	ug/L	0.179	22	8558	7603	0	Standard
	V	51	-0.007	ug/L	0.005	71	4329	4178	2	Standard
	V-1	51	-0.000	ug/L	0.000	66	172	165	0	Standard
	Cr	52	-0.025	ug/L	0.013	52	12806	12344	2	Standard
	Cr	53	-0.003	ug/L	0.003	95	117	111	8	Standard
	Fe	54	-1.467	ug/L	0.439	29	68439	65991	3	Standard
	Fe	57	1.023	ug/L	0.328	32	14875	16040	1	Standard
	Mn	55	0.000	ug/L	0.001	127	529	546	3	Standard
>	Ge	72		ug/L			86245	86205	1	KED
	Co	59	0.004	ug/L	0.006	156	8	35	117	KED
	Ni	60	-0.030	ug/L	0.001	2	213	151	1	KED
	Ni	62	-0.031	ug/L	0.020	64	34	24	27	KED
	Cu	63	0.003	ug/L	0.007	233	139	158	28	KED
	Cu	65	0.002	ug/L	0.005	282	80	86	18	KED
	Zn	66	-0.041	ug/L	0.026	61	340	308	7	KED
	Zn	67	-0.094	ug/L	0.056	59	53	41	18	KED
	As	75	0.004	ug/L	0.003	90	3	5	24	KED
	Se	78	-0.024	ug/L	0.029	118	9	8	11	KED
	Y	89		ug/L			449540	442485	1	Standard
	Kr	83		ug/L			109	126	5	Standard
>	In-1	115		ug/L			21778	20662	1	KED
	Mo	98	0.010	ug/L	0.002	19	3	19	15	KED
	Cd	111	-0.004	ug/L	0.004	103	2	1	114	KED
	Cd	114	0.001	ug/L	0.002	125	4	5	34	KED
>	In	115		ug/L			1112607	1100411	3	Standard
	Ag	107	0.003	ug/L	0.001	29	36	75	11	Standard
	Sb	121	0.007	ug/L	0.001	9	113	250	4	Standard
	Sb	123	0.007	ug/L	0.002	21	89	198	9	Standard
	Ba	135	-0.003	ug/L	0.001	19	100	73	9	Standard
	Ba	137	-0.004	ug/L	0.002	45	170	111	19	Standard
>	Tb	159		ug/L			2978637	2907353	1	Standard
	Tl	205	0.007	ug/L	0.000	3	193	902	1	Standard
	Pb	208	0.001	ug/L	0.000	9	495	618	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:01:34
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	802201	8	Standard
	Be	9	51.726	ug/L	3.860	7	10	325183	1	Standard
	C	13		ug/L			24210	22527	1	Standard
	Cl	37		ug/L			3807524	4150182	1	Standard
>	Sc	45		ug/L			924614	847194	6	Standard
	Na	23	5193.883	ug/L	349.589	6	19857	112094801	2	Standard
	Mg	24	5224.229	ug/L	305.824	5	3421	160299807	1	Standard
	Al	27	5182.417	ug/L	301.366	5	5910	128540998	1	Standard
	K	39	5133.057	ug/L	395.753	7	397696	70279142	1	Standard
	Ca	44	5070.415	ug/L	295.111	5	8558	5725039	1	Standard
	V	51	49.854	ug/L	2.924	5	4329	1153668	2	Standard
	V-1	51	50.489	ug/L	3.162	6	172	1156457	1	Standard
	Cr	52	50.111	ug/L	2.619	5	12806	1011691	2	Standard
	Cr	53	52.228	ug/L	3.690	7	117	115212	1	Standard
	Fe	54	5191.243	ug/L	308.131	5	68439	9468973	1	Standard
	Fe	57	5088.001	ug/L	304.779	5	14875	4826557	2	Standard
	Mn	55	51.762	ug/L	2.165	4	529	1405709	3	Standard
>	Ge	72		ug/L			86245	84353	0	KED
	Co	59	48.315	ug/L	0.434	0	8	329609	0	KED
	Ni	60	47.871	ug/L	1.062	2	213	97935	1	KED
	Ni	62	48.109	ug/L	1.988	4	34	15623	3	KED
	Cu	63	48.290	ug/L	0.419	0	139	282607	0	KED
	Cu	65	48.694	ug/L	1.106	2	80	144287	1	KED
	Zn	66	49.422	ug/L	0.691	1	340	37450	1	KED
	Zn	67	49.132	ug/L	0.452	0	53	6208	0	KED
	As	75	48.708	ug/L	0.627	1	3	17765	0	KED
	Se	78	48.528	ug/L	0.786	1	9	1771	1	KED
	Y	89		ug/L			449540	421686	5	Standard
	Kr	83		ug/L			109	129	18	Standard
>	In-1	115		ug/L			21778	19524	2	KED
	Mo	98	49.508	ug/L	1.004	2	3	81127	0	KED
	Cd	111	50.194	ug/L	1.348	2	2	17921	0	KED
	Cd	114	49.648	ug/L	1.547	3	4	46122	1	KED
>	In	115		ug/L			1112607	1049611	8	Standard
	Ag	107	50.668	ug/L	4.577	9	36	738458	0	Standard
	Sb	121	49.907	ug/L	2.396	4	113	904326	3	Standard
	Sb	123	49.542	ug/L	4.164	8	89	691231	0	Standard
	Ba	135	50.954	ug/L	4.302	8	100	378072	1	Standard
	Ba	137	50.598	ug/L	3.652	7	170	667077	1	Standard
>	Tb	159		ug/L			2978637	2788748	8	Standard
	Tl	205	51.225	ug/L	3.532	6	193	5058718	1	Standard
	Pb	208	50.455	ug/L	4.087	8	495	6532402	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:09:10
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	869253	3	Standard
	Be	9	0.001	ug/L	0.001	137	10	15	45	Standard
	C	13		ug/L			24210	23420	1	Standard
	Cl	37		ug/L			3807524	3933126	0	Standard
>	Sc	45		ug/L			924614	901709	0	Standard
	Na	23	0.285	ug/L	0.018	6	19857	25927	1	Standard
	Mg	24	0.098	ug/L	0.007	7	3421	6532	4	Standard
	Al	27	0.068	ug/L	0.004	5	5910	7557	0	Standard
	K	39	1.474	ug/L	0.396	26	397696	409267	0	Standard
	Ca	44	-0.781	ug/L	0.157	20	8558	7406	2	Standard
	V	51	-0.007	ug/L	0.002	32	4329	4058	1	Standard
	V-1	51	-0.001	ug/L	0.000	64	172	152	6	Standard
	Cr	52	-0.024	ug/L	0.008	35	12806	11986	1	Standard
	Cr	53	-0.004	ug/L	0.003	80	117	105	6	Standard
	Fe	54	-0.862	ug/L	0.491	56	68439	65077	1	Standard
	Fe	57	1.246	ug/L	0.247	19	14875	15765	2	Standard
	Mn	55	0.002	ug/L	0.001	35	529	560	2	Standard
>	Ge	72		ug/L			86245	85108	1	KED
	Co	59	0.001	ug/L	0.000	60	8	12	17	KED
	Ni	60	-0.039	ug/L	0.001	3	213	130	0	KED
	Ni	62	-0.041	ug/L	0.025	61	34	20	39	KED
	Cu	63	-0.002	ug/L	0.001	42	139	125	3	KED
	Cu	65	-0.006	ug/L	0.006	106	80	62	28	KED
	Zn	66	-0.048	ug/L	0.038	78	340	299	10	KED
	Zn	67	-0.064	ug/L	0.049	75	53	45	12	KED
	As	75	0.002	ug/L	0.003	114	3	4	21	KED
	Se	78	-0.039	ug/L	0.036	92	9	8	17	KED
	Y	89		ug/L			449540	437940	1	Standard
	Kr	83		ug/L			109	111	6	Standard
>	In-1	115		ug/L			21778	20499	1	KED
	Mo	98	0.011	ug/L	0.001	11	3	21	11	KED
	Cd	111	0.002	ug/L	0.007	299	2	3	68	KED
	Cd	114	0.001	ug/L	0.003	376	4	4	60	KED
>	In	115		ug/L			1112607	1116577	1	Standard
	Ag	107	0.003	ug/L	0.000	14	36	81	6	Standard
	Sb	121	0.040	ug/L	0.003	7	113	887	5	Standard
	Sb	123	0.040	ug/L	0.002	3	89	692	3	Standard
	Ba	135	-0.005	ug/L	0.001	15	100	59	12	Standard
	Ba	137	-0.003	ug/L	0.001	18	170	122	7	Standard
>	Tb	159		ug/L			2978637	2887786	1	Standard
	Tl	205	0.006	ug/L	0.000	2	193	820	1	Standard
	Pb	208	0.002	ug/L	0.000	14	495	695	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CRL1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:18:23
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	852585	3	Standard
	Be	9	0.188	ug/L	0.008	4	10	1269	1	Standard
	C	13		ug/L			24210	29198	0	Standard
	Cl	37		ug/L			3807524	3938701	0	Standard
>	Sc	45		ug/L			924614	900550	0	Standard
	Na	23	97.919	ug/L	0.629	0	19857	2272126	1	Standard
	Mg	24	19.100	ug/L	0.483	2	3421	628065	3	Standard
	Al	27	18.882	ug/L	0.097	0	5910	504916	1	Standard
	K	39	18.772	ug/L	0.423	2	397696	660062	0	Standard
	Ca	44	47.435	ug/L	0.894	1	8558	65339	1	Standard
	V	51	0.176	ug/L	0.003	1	4329	8534	1	Standard
	V-1	51	0.188	ug/L	0.003	1	172	4768	0	Standard
	Cr	52	0.462	ug/L	0.029	6	12806	22293	3	Standard
	Cr	53	0.511	ug/L	0.022	4	117	1314	4	Standard
	Fe	54	41.739	ug/L	2.280	5	68439	147245	2	Standard
	Fe	57	34.857	ug/L	0.398	1	14875	49631	1	Standard
	Mn	55	0.476	ug/L	0.008	1	529	14289	2	Standard
>	Ge	72		ug/L			86245	84272	3	KED
	Co	59	0.195	ug/L	0.007	3	8	1334	3	KED
	Ni	60	0.409	ug/L	0.027	6	213	1041	3	KED
	Ni	62	0.399	ug/L	0.059	14	34	163	14	KED
	Cu	63	0.490	ug/L	0.028	5	139	2999	2	KED
	Cu	65	0.478	ug/L	0.038	7	80	1491	4	KED
	Zn	66	5.808	ug/L	0.076	1	340	4689	1	KED
	Zn	67	5.049	ug/L	0.150	2	53	685	5	KED
	As	75	0.195	ug/L	0.009	4	3	74	5	KED
	Se	78	0.543	ug/L	0.044	8	9	29	3	KED
	Y	89		ug/L			449540	440795	0	Standard
	Kr	83		ug/L			109	118	12	Standard
>	In-1	115		ug/L			21778	20532	0	KED
	Mo	98	0.191	ug/L	0.015	8	3	331	8	KED
	Cd	111	0.125	ug/L	0.012	9	2	49	9	KED
	Cd	114	0.101	ug/L	0.019	18	4	102	17	KED
>	In	115		ug/L			1112607	1091941	6	Standard
	Ag	107	0.187	ug/L	0.005	2	36	2886	3	Standard
	Sb	121	0.205	ug/L	0.022	10	113	3968	5	Standard
	Sb	123	0.204	ug/L	0.015	7	89	3060	1	Standard
	Ba	135	0.473	ug/L	0.039	8	100	3754	2	Standard
	Ba	137	0.457	ug/L	0.030	6	170	6440	0	Standard
>	Tb	159		ug/L			2978637	2875348	2	Standard
	Tl	205	0.194	ug/L	0.002	0	193	20028	2	Standard
	Pb	208	0.099	ug/L	0.001	1	495	13791	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IFA1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:23:37
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	805437	1	Standard
	Be	9	0.001	ug/L	0.001	120	10	15	45	Standard
	C	13		ug/L			24210	118382	2	Standard
	Cl	37		ug/L			3807524	10027070	2	Standard
>	Sc	45		ug/L			924614	859589	0	Standard
	Na	23	19130.974	ug/L	339.959	1	19857	420089535	1	Standard
	Mg	24	18760.549	ug/L	271.897	1	3421	585687134	2	Standard
	Al	27	19330.417	ug/L	308.183	1	5910	487736961	1	Standard
	K	39	20690.166	ug/L	64.930	0	397696	287319788	0	Standard
	Ca	44	18768.847	ug/L	321.181	1	8558	21537480	1	Standard
	V	51	0.052	ug/L	0.008	16	4329	5241	2	Standard
	V-1	51	0.348	ug/L	0.006	1	172	8280	2	Standard
	Cr	52	0.396	ug/L	0.029	7	12806	19952	3	Standard
	Cr	53	1.389	ug/L	0.056	4	117	3226	4	Standard
	Fe	54	19659.360	ug/L	52.649	0	68439	36306010	0	Standard
	Fe	57	19690.477	ug/L	320.713	1	14875	18961426	1	Standard
	Mn	55	0.113	ug/L	0.003	2	529	3605	1	Standard
>	Ge	72		ug/L			86245	78544	1	KED
	Co	59	0.043	ug/L	0.008	18	8	283	18	KED
	Ni	60	-0.042	ug/L	0.004	9	213	115	7	KED
	Ni	62	0.021	ug/L	0.033	159	34	38	25	KED
	Cu	63	0.041	ug/L	0.007	17	139	347	10	KED
	Cu	65	0.037	ug/L	0.007	19	80	175	10	KED
	Zn	66	-0.097	ug/L	0.034	34	340	241	8	KED
	Zn	67	-0.144	ug/L	0.003	2	53	32	0	KED
	As	75	0.019	ug/L	0.003	13	3	10	9	KED
	Se	78	0.095	ug/L	0.090	94	9	12	26	KED
	Y	89		ug/L			449540	415657	1	Standard
	Kr	83		ug/L			109	172	2	Standard
>	In-1	115		ug/L			21778	18603	1	KED
	Mo	98	395.883	ug/L	9.974	2	3	618172	1	KED
	Cd	111	0.048	ug/L	0.005	9	2	18	7	KED
	Cd	114	0.017	ug/L	0.007	42	4	18	34	KED
>	In	115		ug/L			1112607	1019072	1	Standard
	Ag	107	0.007	ug/L	0.001	11	36	132	9	Standard
	Sb	121	0.010	ug/L	0.002	17	113	277	9	Standard
	Sb	123	0.010	ug/L	0.001	5	89	221	1	Standard
	Ba	135	0.025	ug/L	0.005	21	100	269	12	Standard
	Ba	137	0.025	ug/L	0.001	3	170	477	1	Standard
>	Tb	159		ug/L			2978637	2672022	1	Standard
	Tl	205	0.006	ug/L	0.000	7	193	737	4	Standard
	Pb	208	0.017	ug/L	0.000	2	495	2615	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IFB1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:28:28
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	790993	3	Standard
	Be	9	0.000	ug/L	0.000	51	10	12	9	Standard
	C	13		ug/L			24210	128773	0	Standard
	Cl	37		ug/L			3807524	9365543	1	Standard
>	Sc	45		ug/L			924614	842046	4	Standard
	Na	23	18710.750	ug/L	920.922	4	19857	401938265	2	Standard
	Mg	24	18079.543	ug/L	1015.716	5	3421	551869287	0	Standard
	Al	27	18908.177	ug/L	1425.543	7	5910	466237017	2	Standard
	K	39	20381.733	ug/L	1115.386	5	397696	276790777	1	Standard
	Ca	44	18205.572	ug/L	453.589	2	8558	20451046	2	Standard
	V	51	0.022	ug/L	0.078	358	4329	4453	42	Standard
	V-1	51	0.364	ug/L	0.012	3	172	8466	3	Standard
	Cr	52	19.634	ug/L	0.646	3	12806	401647	2	Standard
	Cr	53	21.210	ug/L	0.662	3	117	46669	1	Standard
	Fe	54	19287.987	ug/L	711.164	3	68439	34855599	2	Standard
	Fe	57	18928.845	ug/L	687.097	3	14875	17838511	2	Standard
	Mn	55	20.043	ug/L	1.059	5	529	541409	0	Standard
>	Ge	72		ug/L			86245	76971	0	KED
	Co	59	20.570	ug/L	0.189	0	8	128052	0	KED
	Ni	60	20.182	ug/L	0.468	2	213	37784	1	KED
	Ni	62	20.345	ug/L	0.428	2	34	6046	1	KED
	Cu	63	19.604	ug/L	0.207	1	139	104761	1	KED
	Cu	65	19.442	ug/L	0.272	1	80	52614	1	KED
	Zn	66	18.620	ug/L	0.176	0	340	13065	1	KED
	Zn	67	17.332	ug/L	0.417	2	53	2029	2	KED
	As	75	19.376	ug/L	0.097	0	3	6451	0	KED
	Se	78	-0.031	ug/L	0.034	110	9	7	15	KED
	Y	89		ug/L			449540	411192	6	Standard
	Kr	83		ug/L			109	164	26	Standard
>	In-1	115		ug/L			21778	18217	1	KED
	Mo	98	398.168	ug/L	6.471	1	3	608920	0	KED
	Cd	111	19.240	ug/L	0.138	0	2	6413	1	KED
	Cd	114	19.288	ug/L	0.300	1	4	16732	2	KED
>	In	115		ug/L			1112607	980907	2	Standard
	Ag	107	20.244	ug/L	0.288	1	36	277119	0	Standard
	Sb	121	0.006	ug/L	0.001	23	113	196	11	Standard
	Sb	123	0.007	ug/L	0.000	1	89	166	2	Standard
	Ba	135	0.027	ug/L	0.003	12	100	275	9	Standard
	Ba	137	0.024	ug/L	0.005	18	170	448	12	Standard
>	Tb	159		ug/L			2978637	2593373	3	Standard
	Tl	205	0.004	ug/L	0.001	14	193	507	6	Standard
	Pb	208	0.013	ug/L	0.001	6	495	2052	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-HCV1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:39:03
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	783702	2	Standard
	Be	9	184.210	ug/L	8.276	4	10	1135291	2	Standard
	C	13		ug/L			24210	30868	5	Standard
	Cl	37		ug/L			3807524	4035787	0	Standard
>	Sc	45		ug/L			924614	806841	2	Standard
	Na	23	19425.523	ug/L	508.798	2	19857	400233114	0	Standard
	Mg	24	18877.718	ug/L	661.473	3	3421	553146359	4	Standard
	Al	27	18803.172	ug/L	336.098	1	5910	445204513	0	Standard
	K	39	20501.519	ug/L	560.426	2	397696	267184491	2	Standard
	Ca	44	18917.035	ug/L	436.833	2	8558	20368626	0	Standard
	V	51	193.791	ug/L	2.087	1	4329	4270550	1	Standard
	V-1	51	195.346	ug/L	2.700	1	172	4272217	1	Standard
	Cr	52	192.964	ug/L	4.102	2	12806	3685991	1	Standard
	Cr	53	198.112	ug/L	6.146	3	117	417050	1	Standard
	Fe	54	19580.974	ug/L	630.499	3	68439	33927418	1	Standard
	Fe	57	19553.813	ug/L	269.745	1	14875	17672381	2	Standard
	Mn	55	203.415	ug/L	3.151	1	529	5268563	1	Standard
>	Ge	72		ug/L			86245	73963	1	KED
	Co	59	204.350	ug/L	2.084	1	8	1222510	2	KED
	Ni	60	195.212	ug/L	3.446	1	213	349581	0	KED
	Ni	62	196.367	ug/L	2.730	1	34	55826	1	KED
	Cu	63	196.568	ug/L	2.714	1	139	1008253	1	KED
	Cu	65	194.875	ug/L	4.077	2	80	506073	1	KED
	Zn	66	193.501	ug/L	3.531	1	340	127711	1	KED
	Zn	67	189.478	ug/L	1.151	0	53	20864	1	KED
	As	75	198.895	ug/L	1.085	0	3	63602	1	KED
	Se	78	195.561	ug/L	4.968	2	9	6234	3	KED
	Y	89		ug/L			449540	400625	2	Standard
	Kr	83		ug/L			109	176	5	Standard
>	In-1	115		ug/L			21778	17411	1	KED
	Mo	98	204.879	ug/L	4.479	2	3	299449	1	KED
	Cd	111	197.337	ug/L	1.136	0	2	62849	0	KED
	Cd	114	197.353	ug/L	0.559	0	4	163562	1	KED
>	In	115		ug/L			1112607	939163	0	Standard
	Ag	107	209.854	ug/L	3.227	1	36	2750489	1	Standard
	Sb	121	199.511	ug/L	6.286	3	113	3243129	3	Standard
	Sb	123	200.327	ug/L	1.098	0	89	2512623	0	Standard
	Ba	135	186.011	ug/L	3.046	1	100	1240582	2	Standard
	Ba	137	193.330	ug/L	6.212	3	170	2289485	3	Standard
>	Tb	159		ug/L			2978637	2543167	1	Standard
	Tl	205	197.166	ug/L	5.393	2	193	17822856	2	Standard
	Pb	208	193.607	ug/L	2.013	1	495	22959160	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-HCV2
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:43:54
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	714021	2	Standard
	Be	9	286.690	ug/L	7.927	2	10	1610013	0	Standard
	C	13		ug/L			24210	28321	1	Standard
	Cl	37		ug/L			3807524	4045783	1	Standard
>	Sc	45		ug/L			924614	782671	1	Standard
	Na	23	28210.494	ug/L	255.688	0	19857	564033539	0	Standard
	Mg	24	27121.345	ug/L	444.743	1	3421	770819093	1	Standard
	Al	27	28138.536	ug/L	302.611	1	5910	646428952	0	Standard
	K	39	31385.658	ug/L	460.097	1	397696	396642140	1	Standard
	Ca	44	27330.483	ug/L	416.807	1	8558	28551535	0	Standard
	V	51	280.426	ug/L	4.786	1	4329	5993977	1	Standard
	V-1	51	283.861	ug/L	3.520	1	172	6023141	1	Standard
	Cr	52	283.147	ug/L	4.109	1	12806	5243501	2	Standard
	Cr	53	294.619	ug/L	3.483	1	117	601842	0	Standard
	Fe	54	28681.923	ug/L	321.751	1	68439	48200896	1	Standard
	Fe	57	28911.815	ug/L	4.325	0	14875	25344026	1	Standard
	Mn	55	291.574	ug/L	0.917	0	529	7326835	0	Standard
>	Ge	72		ug/L			86245	71057	3	KED
	Co	59	297.807	ug/L	6.950	2	8	1710602	0	KED
	Ni	60	291.991	ug/L	8.584	2	213	502017	0	KED
	Ni	62	290.130	ug/L	8.287	2	34	79185	0	KED
	Cu	63	281.597	ug/L	5.785	2	139	1387092	1	KED
	Cu	65	279.691	ug/L	6.474	2	80	697537	0	KED
	Zn	66	280.153	ug/L	5.902	2	340	177452	1	KED
	Zn	67	275.554	ug/L	1.557	0	53	29133	3	KED
	As	75	289.951	ug/L	5.818	2	3	89037	1	KED
	Se	78	279.075	ug/L	3.430	1	9	8542	3	KED
	Y	89		ug/L			449540	385771	1	Standard
	Kr	83		ug/L			109	252	10	Standard
>	In-1	115		ug/L			21778	16746	0	KED
	Mo	98	304.314	ug/L	4.176	1	3	427829	0	KED
	Cd	111	285.392	ug/L	1.787	0	2	87426	0	KED
	Cd	114	287.662	ug/L	3.595	1	4	229299	0	KED
>	In	115		ug/L			1112607	888181	2	Standard
	Ag	107	303.080	ug/L	1.788	0	36	3756976	2	Standard
	Sb	121	289.237	ug/L	12.009	4	113	4443820	2	Standard
	Sb	123	283.117	ug/L	8.555	3	89	3356901	1	Standard
	Ba	135	263.895	ug/L	9.780	3	100	1663463	1	Standard
	Ba	137	271.722	ug/L	7.461	2	170	3041922	0	Standard
>	Tb	159		ug/L			2978637	2365790	1	Standard
	Tl	205	302.235	ug/L	2.139	0	193	25417360	1	Standard
	Pb	208	288.636	ug/L	2.605	0	495	31840772	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL2
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:51:29
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	837644	0	Standard
	Be	9	0.007	ug/L	0.001	20	10	57	16	Standard
	C	13		ug/L			24210	24171	3	Standard
	Cl	37		ug/L			3807524	3929344	1	Standard
>	Sc	45		ug/L			924614	865107	2	Standard
	Na	23	3.181	ug/L	0.129	4	19857	88827	0	Standard
	Mg	24	0.705	ug/L	0.013	1	3421	25347	3	Standard
	Al	27	0.617	ug/L	0.007	1	5910	21185	1	Standard
	K	39	4.234	ug/L	0.717	16	397696	431047	0	Standard
	Ca	44	-0.864	ug/L	0.137	15	8558	7007	0	Standard
	V	51	0.001	ug/L	0.008	883	4329	4069	2	Standard
	V-1	51	0.013	ug/L	0.001	6	172	474	3	Standard
	Cr	52	-0.014	ug/L	0.023	160	12806	11686	1	Standard
	Cr	53	0.027	ug/L	0.003	9	117	170	5	Standard
	Fe	54	-0.157	ug/L	0.938	599	68439	63729	2	Standard
	Fe	57	-1.998	ug/L	0.033	1	14875	11984	2	Standard
	Mn	55	0.008	ug/L	0.001	14	529	711	3	Standard
>	Ge	72		ug/L			86245	78589	0	KED
	Co	59	0.009	ug/L	0.004	41	8	64	35	KED
	Ni	60	-0.075	ug/L	0.006	8	213	51	23	KED
	Ni	62	-0.055	ug/L	0.017	31	34	15	33	KED
	Cu	63	0.007	ug/L	0.002	36	139	162	8	KED
	Cu	65	0.007	ug/L	0.003	40	80	93	9	KED
	Zn	66	-0.218	ug/L	0.024	11	340	157	10	KED
	Zn	67	-0.253	ug/L	0.037	14	53	19	22	KED
	As	75	0.009	ug/L	0.007	79	3	6	37	KED
	Se	78	0.053	ug/L	0.080	149	9	10	24	KED
	Y	89		ug/L			449540	414972	4	Standard
	Kr	83		ug/L			109	122	13	Standard
>	In-1	115		ug/L			21778	18627	0	KED
	Mo	98	0.035	ug/L	0.003	9	3	58	8	KED
	Cd	111	0.015	ug/L	0.012	80	2	7	54	KED
	Cd	114	0.009	ug/L	0.005	57	4	11	39	KED
>	In	115		ug/L			1112607	1013604	1	Standard
	Ag	107	0.013	ug/L	0.000	1	36	223	1	Standard
	Sb	121	0.193	ug/L	0.008	4	113	3486	5	Standard
	Sb	123	0.188	ug/L	0.006	3	89	2632	4	Standard
	Ba	135	0.004	ug/L	0.004	94	100	118	20	Standard
	Ba	137	0.006	ug/L	0.002	38	170	233	11	Standard
>	Tb	159		ug/L			2978637	2641270	1	Standard
	Tl	205	0.050	ug/L	0.002	4	193	4884	4	Standard
	Pb	208	0.011	ug/L	0.001	6	495	1782	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL3
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:58:15
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	841446	2	Standard
	Be	9	0.005	ug/L	0.002	39	10	41	29	Standard
	C	13		ug/L			24210	23891	2	Standard
	Cl	37		ug/L			3807524	3892765	2	Standard
>	Sc	45		ug/L			924614	883067	1	Standard
	Na	23	1.628	ug/L	0.046	2	19857	55680	1	Standard
	Mg	24	0.477	ug/L	0.013	2	3421	18553	3	Standard
	Al	27	0.417	ug/L	0.017	4	5910	16462	2	Standard
	K	39	2.246	ug/L	0.318	14	397696	411794	0	Standard
	Ca	44	-1.464	ug/L	0.074	5	8558	6449	2	Standard
	V	51	0.003	ug/L	0.003	97	4329	4202	1	Standard
	V-1	51	0.009	ug/L	0.000	4	172	376	2	Standard
	Cr	52	-0.001	ug/L	0.010	1733	12806	12218	1	Standard
	Cr	53	0.019	ug/L	0.003	15	117	157	5	Standard
	Fe	54	-0.993	ug/L	0.673	67	68439	63475	1	Standard
	Fe	57	-0.983	ug/L	0.356	36	14875	13237	3	Standard
	Mn	55	0.003	ug/L	0.001	18	529	600	3	Standard
>	Ge	72		ug/L			86245	80148	0	KED
	Co	59	0.005	ug/L	0.001	21	8	40	16	KED
	Ni	60	-0.079	ug/L	0.004	5	213	45	19	KED
	Ni	62	-0.072	ug/L	0.007	10	34	10	21	KED
	Cu	63	0.000	ug/L	0.002	680	139	130	8	KED
	Cu	65	0.001	ug/L	0.004	426	80	77	13	KED
	Zn	66	-0.215	ug/L	0.005	2	340	162	2	KED
	Zn	67	-0.165	ug/L	0.026	15	53	30	10	KED
	As	75	0.008	ug/L	0.005	55	3	6	24	KED
	Se	78	-0.029	ug/L	0.092	320	9	7	39	KED
	Y	89		ug/L			449540	426140	0	Standard
	Kr	83		ug/L			109	109	16	Standard
>	In-1	115		ug/L			21778	19144	1	KED
	Mo	98	0.008	ug/L	0.003	34	3	16	28	KED
	Cd	111	0.006	ug/L	0.007	113	2	4	52	KED
	Cd	114	0.007	ug/L	0.003	44	4	9	28	KED
>	In	115		ug/L			1112607	1061994	1	Standard
	Ag	107	0.006	ug/L	0.001	14	36	130	11	Standard
	Sb	121	0.059	ug/L	0.002	4	113	1182	1	Standard
	Sb	123	0.058	ug/L	0.002	2	89	901	1	Standard
	Ba	135	0.003	ug/L	0.001	48	100	118	9	Standard
	Ba	137	0.003	ug/L	0.001	19	170	206	5	Standard
>	Tb	159		ug/L			2978637	2650480	1	Standard
	Tl	205	0.021	ug/L	0.000	1	193	2104	1	Standard
	Pb	208	0.007	ug/L	0.000	3	495	1358	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV2
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:08:17
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	867706	1	Standard
	Be	9	48.074	ug/L	1.192	2	10	328172	1	Standard
	C	13		ug/L			24210	21578	1	Standard
	Cl	37		ug/L			3807524	4083864	0	Standard
>	Sc	45		ug/L			924614	893222	1	Standard
	Na	23	4774.976	ug/L	75.588	1	19857	108968261	1	Standard
	Mg	24	4741.386	ug/L	123.273	2	3421	153789658	2	Standard
	Al	27	4799.513	ug/L	169.101	3	5910	125825752	2	Standard
	K	39	4643.532	ug/L	61.981	1	397696	67311304	2	Standard
	Ca	44	4621.757	ug/L	145.263	3	8558	5516378	2	Standard
	V	51	47.062	ug/L	1.657	3	4329	1151210	2	Standard
	V-1	51	47.793	ug/L	1.438	3	172	1157275	1	Standard
	Cr	52	46.814	ug/L	1.471	3	12806	999454	2	Standard
	Cr	53	49.236	ug/L	0.633	1	117	114877	0	Standard
	Fe	54	4719.620	ug/L	43.961	0	68439	9106584	0	Standard
	Fe	57	4718.857	ug/L	243.036	5	14875	4731174	4	Standard
	Mn	55	48.374	ug/L	0.512	1	529	1387649	0	Standard
>	Ge	72		ug/L			86245	79806	1	KED
	Co	59	50.364	ug/L	0.798	1	8	325018	0	KED
	Ni	60	49.562	ug/L	0.808	1	213	95910	0	KED
	Ni	62	49.639	ug/L	0.987	1	34	15249	1	KED
	Cu	63	50.759	ug/L	1.212	2	139	281024	2	KED
	Cu	65	49.763	ug/L	0.777	1	80	139505	1	KED
	Zn	66	50.758	ug/L	0.649	1	340	36382	2	KED
	Zn	67	48.565	ug/L	0.946	1	53	5807	2	KED
	As	75	49.423	ug/L	0.120	0	3	17055	1	KED
	Se	78	50.776	ug/L	0.450	0	9	1752	1	KED
	Y	89		ug/L			449540	422459	0	Standard
	Kr	83		ug/L			109	110	10	Standard
>	In-1	115		ug/L			21778	19386	1	KED
	Mo	98	48.558	ug/L	1.400	2	3	79022	2	KED
	Cd	111	48.765	ug/L	0.951	1	2	17293	1	KED
	Cd	114	49.206	ug/L	0.833	1	4	45406	0	KED
>	In	115		ug/L			1112607	1043957	2	Standard
	Ag	107	49.538	ug/L	1.009	2	36	721605	0	Standard
	Sb	121	49.125	ug/L	0.980	1	113	887745	2	Standard
	Sb	123	48.751	ug/L	0.136	0	89	679753	1	Standard
	Ba	135	49.051	ug/L	1.755	3	100	363526	1	Standard
	Ba	137	48.839	ug/L	1.455	2	170	642821	1	Standard
>	Tb	159		ug/L			2978637	2757947	0	Standard
	Tl	205	50.036	ug/L	0.591	1	193	4905475	1	Standard
	Pb	208	48.763	ug/L	0.774	1	495	6271342	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB2
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:15:52
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	881782	3	Standard
	Be	9	0.001	ug/L	0.000	32	10	20	14	Standard
	C	13		ug/L			24210	23125	2	Standard
	Cl	37		ug/L			3807524	3840419	0	Standard
>	Sc	45		ug/L			924614	889812	1	Standard
	Na	23	0.780	ug/L	0.011	1	19857	36829	1	Standard
	Mg	24	0.183	ug/L	0.007	3	3421	9211	1	Standard
	Al	27	0.172	ug/L	0.010	6	5910	10176	1	Standard
	K	39	1.822	ug/L	0.386	21	397696	408841	0	Standard
	Ca	44	-1.742	ug/L	0.067	3	8558	6167	2	Standard
	V	51	-0.003	ug/L	0.002	78	4329	4097	2	Standard
	V-1	51	0.005	ug/L	0.001	18	172	288	7	Standard
	Cr	52	-0.018	ug/L	0.010	54	12806	11941	2	Standard
	Cr	53	0.008	ug/L	0.003	40	117	131	6	Standard
	Fe	54	-0.475	ug/L	0.730	153	68439	64945	1	Standard
	Fe	57	-0.802	ug/L	0.249	31	14875	13515	0	Standard
	Mn	55	0.003	ug/L	0.001	40	529	588	4	Standard
>	Ge	72		ug/L			86245	81119	1	KED
	Co	59	0.004	ug/L	0.002	62	8	33	47	KED
	Ni	60	-0.034	ug/L	0.010	28	213	133	14	KED
	Ni	62	-0.028	ug/L	0.040	145	34	24	50	KED
	Cu	63	0.003	ug/L	0.006	200	139	147	24	KED
	Cu	65	-0.000	ug/L	0.002	526	80	74	8	KED
	Zn	66	-0.002	ug/L	0.017	858	340	318	5	KED
	Zn	67	-0.032	ug/L	0.130	404	53	46	33	KED
	As	75	0.011	ug/L	0.009	82	3	7	41	KED
	Se	78	-0.020	ug/L	0.018	89	9	8	9	KED
	Y	89		ug/L			449540	428864	1	Standard
	Kr	83		ug/L			109	102	23	Standard
>	In-1	115		ug/L			21778	19430	1	KED
	Mo	98	0.012	ug/L	0.004	36	3	22	29	KED
	Cd	111	0.006	ug/L	0.005	75	2	4	34	KED
	Cd	114	0.004	ug/L	0.004	103	4	7	50	KED
>	In	115		ug/L			1112607	1049845	2	Standard
	Ag	107	0.004	ug/L	0.001	26	36	96	17	Standard
	Sb	121	0.057	ug/L	0.001	1	113	1149	3	Standard
	Sb	123	0.057	ug/L	0.003	5	89	878	2	Standard
	Ba	135	-0.003	ug/L	0.002	68	100	72	19	Standard
	Ba	137	-0.002	ug/L	0.001	34	170	128	7	Standard
>	Tb	159		ug/L			2978637	2676306	1	Standard
	Tl	205	0.012	ug/L	0.000	4	193	1281	3	Standard
	Pb	208	0.004	ug/L	0.001	23	495	953	13	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0215-BLK1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:21:24

DEL

Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	887252	3	Standard
	Be	9	0.001	ug/L	0.001	98	10	19	43	Standard
	C	13		ug/L			24210	36101	2	Standard
	Cl	37		ug/L			3807524	3811000	0	Standard
>	Sc	45		ug/L			924614	903286	3	Standard
	Na	23	7.185	ug/L	0.176	2	19857	185119	1	Standard
	Mg	24	0.733	ug/L	0.011	1	3421	27378	3	Standard
	Al	27	1.165	ug/L	0.046	3	5910	36634	0	Standard
	K	39	3.721	ug/L	0.827	22	397696	442513	0	Standard
	Ca	44	1.621	ug/L	0.316	19	8558	10307	1	Standard
	V	51	0.001	ug/L	0.006	1091	4329	4242	4	Standard
	V-1	51	0.006	ug/L	0.000	5	172	321	5	Standard
	Cr	52	0.019	ug/L	0.019	100	12806	12911	4	Standard
	Cr	53	0.038	ug/L	0.001	1	117	205	3	Standard
	Fe	54	0.179	ug/L	1.370	767	68439	67153	1	Standard
	Fe	57	0.434	ug/L	0.128	29	14875	14969	2	Standard
	Mn	55	0.958	ug/L	0.016	1	529	28282	1	Standard
>	Ge	72		ug/L			86245	82928	1	KED
	Co	59	0.002	ug/L	0.001	35	8	19	20	KED
	Ni	60	-0.025	ug/L	0.009	34	213	156	12	KED
	Ni	62	-0.042	ug/L	0.012	29	34	20	19	KED
	Cu	63	0.020	ug/L	0.001	5	139	247	2	KED
	Cu	65	0.020	ug/L	0.003	13	80	135	6	KED
	Zn	66	0.025	ug/L	0.040	157	340	346	9	KED
	Zn	67	0.022	ug/L	0.078	351	53	54	17	KED
	As	75	0.001	ug/L	0.002	155	3	4	17	KED
	Se	78	-0.017	ug/L	0.026	155	9	8	10	KED
	Y	89		ug/L			449540	426116	1	Standard
	Kr	83		ug/L			109	117	16	Standard
>	In-1	115		ug/L			21778	19161	0	KED
	Mo	98	0.015	ug/L	0.004	24	3	27	21	KED
	Cd	111	0.006	ug/L	0.005	72	2	4	34	KED
	Cd	114	0.002	ug/L	0.002	123	4	5	36	KED
>	In	115		ug/L			1112607	1065753	1	Standard
	Ag	107	0.002	ug/L	0.001	40	36	62	16	Standard
	Sb	121	0.026	ug/L	0.002	6	113	580	4	Standard
	Sb	123	0.026	ug/L	0.003	10	89	455	9	Standard
	Ba	135	-0.002	ug/L	0.003	187	100	83	26	Standard
	Ba	137	-0.001	ug/L	0.000	32	170	145	3	Standard
>	Tb	159		ug/L			2978637	2737811	1	Standard
	Tl	205	0.009	ug/L	0.001	7	193	1027	5	Standard
	Pb	208	0.008	ug/L	0.001	8	495	1429	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0215-BS1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:26:15
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
⌈>	Li	6		ug/L			851347	870352	1	Standard
⌊	Be	9	23.629	ug/L	0.460	1	10	161803	0	Standard
	C	13		ug/L			24210	40802	0	Standard
	Cl	37		ug/L			3807524	4075049	1	Standard
⌈>	Sc	45		ug/L			924614	879209	1	Standard
|	Na	23	4847.934	ug/L	10.245	0	19857	108907078	1	Standard
|	Mg	24	4628.957	ug/L	163.490	3	3421	147759387	2	Standard
|	Al	27	4647.553	ug/L	102.387	2	5910	119928871	0	Standard
|	K	39	4654.099	ug/L	73.928	1	397696	66389107	0	Standard
|	Ca	44	4630.654	ug/L	153.174	3	8558	5442995	4	Standard
|	V	51	23.370	ug/L	0.435	1	4329	564930	2	Standard
|	V-1	51	23.749	ug/L	0.661	2	172	566215	2	Standard
|	Cr	52	23.447	ug/L	0.184	0	12806	498935	1	Standard
|	Cr	53	24.708	ug/L	1.037	4	117	56790	3	Standard
|	Fe	54	4668.648	ug/L	77.807	1	68439	8867004	0	Standard
|	Fe	57	4549.702	ug/L	58.085	1	14875	4491596	0	Standard
⌊	Mn	55	25.250	ug/L	0.780	3	529	713242	3	Standard
⌈>	Ge	72		ug/L			86245	82267	1	KED
|	Co	59	23.931	ug/L	0.279	1	8	159219	1	KED
|	Ni	60	23.923	ug/L	0.213	0	213	47832	0	KED
|	Ni	62	24.142	ug/L	0.645	2	34	7663	3	KED
|	Cu	63	24.003	ug/L	0.334	1	139	137054	0	KED
|	Cu	65	23.945	ug/L	0.337	1	80	69236	1	KED
|	Zn	66	74.342	ug/L	1.632	2	340	54768	1	KED
|	Zn	67	70.158	ug/L	1.324	1	53	8623	1	KED
|	As	75	23.746	ug/L	0.637	2	3	8447	1	KED
⌊	Se	78	72.979	ug/L	1.532	2	9	2592	1	KED
	Y	89		ug/L			449540	441829	1	Standard
	Kr	83		ug/L			109	116	4	Standard
⌈>	In-1	115		ug/L			21778	19036	0	KED
|	Mo	98	23.904	ug/L	0.423	1	3	38205	1	KED
|	Cd	111	24.381	ug/L	0.472	1	2	8491	1	KED
⌊	Cd	114	24.226	ug/L	0.840	3	4	21953	2	KED
⌈>	In	115		ug/L			1112607	1059605	2	Standard
|	Ag	107	24.573	ug/L	0.830	3	36	363245	1	Standard
|	Sb	121	23.703	ug/L	0.510	2	113	434706	1	Standard
|	Sb	123	23.922	ug/L	1.048	4	89	338383	2	Standard
|	Ba	135	23.773	ug/L	0.451	1	100	178940	2	Standard
⌊	Ba	137	23.716	ug/L	0.531	2	170	316929	0	Standard
⌈>	Tb	159		ug/L			2978637	2735177	1	Standard
|	Tl	205	24.879	ug/L	0.793	3	193	2418678	2	Standard
⌊	Pb	208	24.266	ug/L	0.633	2	495	3095241	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0215-BLK1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:33:12
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	915089	2	Standard
	Be	9	-0.000	ug/L	0.001	183	10	7	75	Standard
	C	13		ug/L			24210	36042	1	Standard
	Cl	37		ug/L			3807524	3856783	1	Standard
>	Sc	45		ug/L			924614	906596	1	Standard
	Na	23	4.924	ug/L	0.164	3	19857	133540	3	Standard
	Mg	24	0.600	ug/L	0.005	0	3421	23109	1	Standard
	Al	27	1.049	ug/L	0.020	1	5910	33703	2	Standard
	K	39	2.418	ug/L	0.132	5	397696	425295	0	Standard
	Ca	44	0.183	ug/L	0.084	46	8558	8613	1	Standard
	V	51	0.004	ug/L	0.003	62	4329	4346	2	Standard
	V-1	51	0.005	ug/L	0.001	16	172	294	6	Standard
	Cr	52	0.029	ug/L	0.004	13	12806	13173	1	Standard
	Cr	53	0.033	ug/L	0.004	12	117	192	4	Standard
	Fe	54	-0.133	ug/L	0.886	667	68439	66839	2	Standard
	Fe	57	0.557	ug/L	0.072	12	14875	15151	0	Standard
	Mn	55	0.543	ug/L	0.009	1	529	16320	2	Standard
>	Ge	72		ug/L			86245	83535	0	KED
	Co	59	-0.000	ug/L	0.001	1562	8	8	70	KED
	Ni	60	-0.040	ug/L	0.003	8	213	126	4	KED
	Ni	62	-0.050	ug/L	0.007	13	34	17	12	KED
	Cu	63	0.009	ug/L	0.003	33	139	189	9	KED
	Cu	65	0.005	ug/L	0.003	57	80	93	9	KED
	Zn	66	-0.066	ug/L	0.031	46	340	280	7	KED
	Zn	67	-0.114	ug/L	0.072	62	53	38	22	KED
	As	75	0.001	ug/L	0.003	357	3	3	24	KED
	Se	78	0.002	ug/L	0.112	5637	9	9	43	KED
	Y	89		ug/L			449540	439719	1	Standard
	Kr	83		ug/L			109	115	4	Standard
>	In-1	115		ug/L			21778	19423	0	KED
	Mo	98	0.013	ug/L	0.007	56	3	23	48	KED
	Cd	111	0.001	ug/L	0.003	309	2	2	33	KED
	Cd	114	-0.001	ug/L	0.003	279	4	2	104	KED
>	In	115		ug/L			1112607	1083524	4	Standard
	Ag	107	0.003	ug/L	0.001	20	36	82	11	Standard
	Sb	121	0.018	ug/L	0.002	13	113	437	6	Standard
	Sb	123	0.017	ug/L	0.003	18	89	332	11	Standard
	Ba	135	-0.004	ug/L	0.001	16	100	67	11	Standard
	Ba	137	-0.003	ug/L	0.001	29	170	128	4	Standard
>	Tb	159		ug/L			2978637	2759979	2	Standard
	Tl	205	0.006	ug/L	0.001	9	193	777	8	Standard
	Pb	208	0.006	ug/L	0.000	5	495	1187	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0340-01
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:39:22
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	895681	2	Standard
	Be	9	0.000	ug/L	0.001	316	10	12	36	Standard
	C	13		ug/L			24210	97148	4	Standard
	Cl	37		ug/L			3807524	6026222	3	Standard
>	Sc	45		ug/L			924614	1037390	1	Standard
	Na	23	S	ug/L	S	S	19857	S	S	Standard
	Mg	24	303.704	ug/L	2.240	0	3421	11444869	0	Standard
	Al	27	39.179	ug/L	0.890	2	5910	1199569	1	Standard
	K	39	7525.758	ug/L	161.290	2	397696	126388636	1	Standard
	Ca	44	443.532	ug/L	9.660	2	8558	623549	1	Standard
	V	51	1.800	ug/L	0.048	2	4329	55805	2	Standard
	V-1	51	1.931	ug/L	0.038	1	172	54491	1	Standard
	Cr	52	0.262	ug/L	0.005	2	12806	20788	1	Standard
	Cr	53	0.664	ug/L	0.039	5	117	1929	5	Standard
	Fe	54	77.753	ug/L	1.146	1	68439	249779	1	Standard
	Fe	57	57.042	ug/L	3.397	5	14875	82956	5	Standard
	Mn	55	2.421	ug/L	0.020	0	529	81241	1	Standard
>	Ge	72		ug/L			86245	74737	1	KED
	Co	59	0.038	ug/L	0.003	8	8	238	9	KED
	Ni	60	0.098	ug/L	0.007	7	213	361	4	KED
	Ni	62	0.132	ug/L	0.035	26	34	67	13	KED
	Cu	63	4.375	ug/L	0.045	1	139	22796	1	KED
	Cu	65	4.408	ug/L	0.050	1	80	11636	0	KED
	Zn	66	8.609	ug/L	0.116	1	340	6023	1	KED
	Zn	67	8.013	ug/L	0.656	8	53	935	7	KED
	As	75	1.574	ug/L	0.026	1	3	512	3	KED
	Se	78	0.101	ug/L	0.109	108	9	11	28	KED
	Y	89		ug/L			449540	431481	1	Standard
	Kr	83		ug/L			109	119	17	Standard
>	In-1	115		ug/L			21778	17602	2	KED
	Mo	98	2.804	ug/L	0.088	3	3	4145	1	KED
	Cd	111	0.003	ug/L	0.005	168	2	3	45	KED
	Cd	114	-0.001	ug/L	0.007	686	4	2	232	KED
>	In	115		ug/L			1112607	955032	4	Standard
	Ag	107	0.005	ug/L	0.001	11	36	100	4	Standard
	Sb	121	0.063	ug/L	0.005	7	113	1130	3	Standard
	Sb	123	0.065	ug/L	0.003	4	89	903	3	Standard
	Ba	135	0.031	ug/L	0.006	19	100	294	11	Standard
	Ba	137	0.035	ug/L	0.004	12	170	567	5	Standard
>	Tb	159		ug/L			2978637	2695328	0	Standard
	Tl	205	0.006	ug/L	0.000	6	193	754	4	Standard
	Pb	208	0.531	ug/L	0.008	1	495	67222	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0384-01
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:47:36

DEL

Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	**Li**	**6**		ug/L			851347	819561	0	Standard
	Be	**9**	**0.041**	ug/L	0.002	3	10	273	2	Standard
	C	**13**		ug/L			24210	34242	3	Standard
	Cl	**37**		ug/L			3807524	37002020	2	Standard
>	**Sc**	**45**		ug/L			924614	779017	1	Standard
	Na	**23**	**38043.462**	ug/L	8165.700	21	19857	755903755	20	Standard
	Mg	**24**	**S**	ug/L	S	S	3421	S	S	Standard
	Al	**27**	**17.625**	ug/L	0.318	1	5910	407987	1	Standard
	K	**39**	**36080.097**	ug/L	707.567	1	397696	453757520	1	Standard
	Ca	**44**	**270002.346**	ug/L	7432.253	2	8558	280677703	2	Standard
	V	**51**	**7.771**	ug/L	0.153	1	4329	168888	2	Standard
	V-1	**51**	**13.363**	ug/L	0.135	1	172	282376	1	Standard
	Cr	**52**	**1.844**	ug/L	0.013	0	12806	44711	1	Standard
	Cr	**53**	**20.292**	ug/L	0.490	2	117	41345	1	Standard
	Fe	**54**	**61.392**	ug/L	0.804	1	68439	160221	0	Standard
	Fe	**57**	**640.266**	ug/L	7.252	1	14875	570867	1	Standard
	Mn	**55**	**5.694**	ug/L	0.045	0	529	142847	1	Standard
>	**Ge**	**72**		ug/L			86245	53290	1	KED
	Co	**59**	**0.055**	ug/L	0.002	3	8	242	4	KED
	Ni	**60**	**0.434**	ug/L	0.025	5	213	692	3	KED
	Ni	**62**	**0.643**	ug/L	0.071	11	34	153	7	KED
	Cu	**63**	**0.072**	ug/L	0.001	1	139	350	1	KED
	Cu	**65**	**0.069**	ug/L	0.005	6	80	179	3	KED
	Zn	**66**	**11.748**	ug/L	0.272	2	340	5782	0	KED
	Zn	**67**	**11.674**	ug/L	0.633	5	53	956	3	KED
	As	**75**	**0.307**	ug/L	0.011	3	3	73	3	KED
	Se	**78**	**35.155**	ug/L	0.227	0	9	812	1	KED
	Y	**89**		ug/L			449540	348385	1	Standard
	Kr	**83**		ug/L			109	271	10	Standard
>	**In-1**	**115**		ug/L			21778	12902	0	KED
	Mo	**98**	**52.558**	ug/L	0.255	0	3	56935	0	KED
	Cd	**111**	**0.028**	ug/L	0.006	21	2	8	17	KED
	Cd	**114**	**0.010**	ug/L	0.002	19	4	8	14	KED
>	**In**	**115**		ug/L			1112607	597138	1	Standard
	Ag	**107**	**0.020**	ug/L	0.003	13	36	185	11	Standard
	Sb	**121**	**0.016**	ug/L	0.001	9	113	227	6	Standard
	Sb	**123**	**0.050**	ug/L	0.006	12	89	443	10	Standard
	Ba	**135**	**22.760**	ug/L	0.578	2	100	96539	1	Standard
	Ba	**137**	**22.485**	ug/L	0.519	2	170	169380	1	Standard
>	**Tb**	**159**		ug/L			2978637	1699883	1	Standard
	Tl	**205**	**0.012**	ug/L	0.001	5	193	843	5	Standard
	Pb	**208**	**0.033**	ug/L	0.003	8	495	2934	8	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL4
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:55:44
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	956242	0	Standard
	Be	9	-0.000	ug/L	0.001	293	10	9	60	Standard
	C	13		ug/L			24210	26464	1	Standard
	Cl	37		ug/L			3807524	4625935	1	Standard
>	Sc	45		ug/L			924614	966772	2	Standard
	Na	23	17.862	ug/L	3.485	19	19857	460596	16	Standard
	Mg	24	2.472	ug/L	0.708	28	3421	89883	24	Standard
	Al	27	-0.020	ug/L	0.012	57	5910	5608	5	Standard
	K	39	9.273	ug/L	1.097	11	397696	560135	0	Standard
	Ca	44	3.230	ug/L	1.320	40	8558	13083	10	Standard
	V	51	0.027	ug/L	0.012	42	4329	5244	2	Standard
	V-1	51	0.123	ug/L	0.005	4	172	3406	1	Standard
	Cr	52	0.090	ug/L	0.027	30	12806	15424	2	Standard
	Cr	53	0.409	ug/L	0.015	3	117	1155	4	Standard
	Fe	54	-0.569	ug/L	1.136	199	68439	70334	0	Standard
	Fe	57	2.631	ug/L	0.702	26	14875	18386	1	Standard
	Mn	55	0.001	ug/L	0.002	121	529	593	6	Standard
>	Ge	72		ug/L			86245	86724	0	KED
	Co	59	-0.000	ug/L	0.001	14954	8	8	44	KED
	Ni	60	-0.081	ug/L	0.001	1	213	45	4	KED
	Ni	62	-0.077	ug/L	0.006	7	34	9	20	KED
	Cu	63	-0.006	ug/L	0.003	44	139	106	13	KED
	Cu	65	-0.009	ug/L	0.004	42	80	54	19	KED
	Zn	66	-0.257	ug/L	0.017	6	340	143	8	KED
	Zn	67	-0.273	ug/L	0.068	25	53	19	45	KED
	As	75	-0.001	ug/L	0.002	183	3	3	28	KED
	Se	78	0.054	ug/L	0.047	88	9	11	14	KED
	Y	89		ug/L			449540	452634	2	Standard
	Kr	83		ug/L			109	102	23	Standard
>	In-1	115		ug/L			21778	20289	1	KED
	Mo	98	0.008	ug/L	0.012	148	3	17	121	KED
	Cd	111	-0.001	ug/L	0.004	317	2	2	65	KED
	Cd	114	-0.001	ug/L	0.003	301	4	3	97	KED
>	In	115		ug/L			1112607	1064123	0	Standard
	Ag	107	0.001	ug/L	0.000	32	36	50	9	Standard
	Sb	121	0.001	ug/L	0.001	111	113	121	12	Standard
	Sb	123	0.001	ug/L	0.001	103	89	93	8	Standard
	Ba	135	-0.005	ug/L	0.001	22	100	59	14	Standard
	Ba	137	-0.005	ug/L	0.001	31	170	99	19	Standard
>	Tb	159		ug/L			2978637	2717675	1	Standard
	Tl	205	0.005	ug/L	0.001	14	193	634	11	Standard
	Pb	208	0.003	ug/L	0.000	11	495	862	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0384-01
Sample Dil Factor: 5
Comments:
Sample Date/Time: Monday, August 09, 2021 17:03:19
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	925106	7	Standard
	Be	9	0.011	ug/L	0.002	14	10	93	18	Standard
	C	13		ug/L			24210	32619	1	Standard
	Cl	37		ug/L			3807524	12240192	2	Standard
>	Sc	45		ug/L			924614	974559	3	Standard
	Na	23	S	ug/L	S	S	19857	S	S	Standard
	Mg	24	24728.194	ug/L	1388.789	5	3421	874193062	3	Standard
	Al	27	4.193	ug/L	0.310	7	5910	126232	8	Standard
	K	39	5689.961	ug/L	205.418	3	397696	89816176	1	Standard
	Ca	44	62378.849	ug/L	2570.093	4	8558	81084303	3	Standard
	V	51	1.628	ug/L	0.062	3	4329	47902	6	Standard
	V-1	51	3.707	ug/L	0.089	2	172	98077	2	Standard
	Cr	52	0.531	ug/L	0.024	4	12806	25698	2	Standard
	Cr	53	7.411	ug/L	0.374	5	117	18949	1	Standard
	Fe	54	12.298	ug/L	3.174	25	68439	97679	3	Standard
	Fe	57	133.455	ug/L	4.700	3	14875	161169	2	Standard
	Mn	55	1.289	ug/L	0.064	4	529	40857	4	Standard
>	Ge	72		ug/L			86245	78515	1	KED
	Co	59	0.010	ug/L	0.003	25	8	72	21	KED
	Ni	60	0.110	ug/L	0.013	11	213	404	7	KED
	Ni	62	0.151	ug/L	0.013	8	34	77	6	KED
	Cu	63	0.056	ug/L	0.002	3	139	432	3	KED
	Cu	65	0.054	ug/L	0.004	7	80	222	4	KED
	Zn	66	2.947	ug/L	0.106	3	340	2369	2	KED
	Zn	67	3.161	ug/L	0.294	9	53	417	8	KED
	As	75	0.060	ug/L	0.006	10	3	23	8	KED
	Se	78	7.576	ug/L	0.243	3	9	264	3	KED
	Y	89		ug/L			449540	422152	2	Standard
	Kr	83		ug/L			109	121	2	Standard
>	In-1	115		ug/L			21778	18100	0	KED
	Mo	98	10.330	ug/L	0.097	0	3	15699	0	KED
	Cd	111	0.011	ug/L	0.011	98	2	6	59	KED
	Cd	114	0.004	ug/L	0.004	119	4	6	56	KED
>	In	115		ug/L			1112607	860017	6	Standard
	Ag	107	0.004	ug/L	0.000	12	36	74	7	Standard
	Sb	121	0.003	ug/L	0.002	80	113	127	19	Standard
	Sb	123	0.005	ug/L	0.002	32	89	130	9	Standard
	Ba	135	5.050	ug/L	0.235	4	100	30855	1	Standard
	Ba	137	5.058	ug/L	0.194	3	170	54900	2	Standard
>	Tb	159		ug/L			2978637	2446804	1	Standard
	Tl	205	0.004	ug/L	0.001	15	193	543	9	Standard
	Pb	208	0.012	ug/L	0.001	4	495	1817	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0215-DUP1
Sample Dil Factor: 5
Comments:
Sample Date/Time: Monday, August 09, 2021 17:09:34
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	939359	1	Standard
	Be	9	0.010	ug/L	0.003	28	10	86	23	Standard
	C	13		ug/L			24210	32691	2	Standard
	Cl	37		ug/L			3807524	12750217	2	Standard
>	Sc	45		ug/L			924614	991543	2	Standard
	Na	23	S	ug/L	S	S	19857	S	S	Standard
	Mg	24	24669.225	ug/L	3202.427	12	3421	886315101	10	Standard
	Al	27	6.560	ug/L	0.270	4	5910	197137	1	Standard
	K	39	5488.055	ug/L	82.361	1	397696	88207295	1	Standard
	Ca	44	60219.867	ug/L	3008.548	4	8558	79626091	2	Standard
	V	51	1.665	ug/L	0.044	2	4329	49692	0	Standard
	V-1	51	3.689	ug/L	0.055	1	172	99344	1	Standard
	Cr	52	0.583	ug/L	0.032	5	12806	27364	0	Standard
	Cr	53	7.283	ug/L	0.130	1	117	18970	2	Standard
	Fe	54	14.886	ug/L	0.630	4	68439	105029	1	Standard
	Fe	57	137.902	ug/L	4.205	3	14875	168940	0	Standard
	Mn	55	1.312	ug/L	0.035	2	529	42321	0	Standard
>	Ge	72		ug/L			86245	76904	1	KED
	Co	59	0.011	ug/L	0.002	18	8	78	15	KED
	Ni	60	0.117	ug/L	0.012	10	213	408	5	KED
	Ni	62	0.129	ug/L	0.017	13	34	69	5	KED
	Cu	63	0.028	ug/L	0.006	20	139	270	9	KED
	Cu	65	0.029	ug/L	0.006	19	80	149	9	KED
	Zn	66	3.025	ug/L	0.163	5	340	2373	3	KED
	Zn	67	3.033	ug/L	0.228	7	53	394	5	KED
	As	75	0.063	ug/L	0.011	17	3	24	13	KED
	Se	78	7.775	ug/L	0.373	4	9	265	3	KED
	Y	89		ug/L			449540	431037	3	Standard
	Kr	83		ug/L			109	137	2	Standard
>	In-1	115		ug/L			21778	17516	0	KED
	Mo	98	10.485	ug/L	0.150	1	3	15421	1	KED
	Cd	111	0.005	ug/L	0.005	110	2	3	43	KED
	Cd	114	0.002	ug/L	0.003	151	4	4	44	KED
>	In	115		ug/L			1112607	899543	2	Standard
	Ag	107	0.002	ug/L	0.001	28	36	59	16	Standard
	Sb	121	0.001	ug/L	0.000	43	113	104	3	Standard
	Sb	123	0.003	ug/L	0.001	30	89	110	10	Standard
	Ba	135	4.857	ug/L	0.076	1	100	31094	1	Standard
	Ba	137	4.878	ug/L	0.155	3	170	55441	1	Standard
>	Tb	159		ug/L			2978637	2500782	3	Standard
	Tl	205	0.003	ug/L	0.000	9	193	463	4	Standard
	Pb	208	0.012	ug/L	0.000	2	495	1836	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0215-MS1
Sample Dil Factor: 5
Comments:
Sample Date/Time: Monday, August 09, 2021 17:17:49
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	973840	1	Standard
	Be	9	4.513	ug/L	0.020	0	10	34595	1	Standard
	C	13		ug/L			24210	33364	1	Standard
	Cl	37		ug/L			3807524	12266650	2	Standard
>	Sc	45		ug/L			924614	1008257	3	Standard
	Na	23	S	ug/L	S	S	19857	S	S	Standard
	Mg	24	S	ug/L	S	S	3421	S	S	Standard
	Al	27	859.633	ug/L	20.234	2	5910	25437856	1	Standard
	K	39	6521.549	ug/L	115.870	1	397696	106504481	2	Standard
	Ca	44	62770.947	ug/L	2273.210	3	8558	84406321	0	Standard
	V	51	6.185	ug/L	0.063	1	4329	174959	4	Standard
	V-1	51	8.918	ug/L	0.042	0	172	243938	2	Standard
	Cr	52	4.836	ug/L	0.060	1	12806	129073	2	Standard
	Cr	53	13.885	ug/L	0.330	2	117	36644	0	Standard
	Fe	54	848.486	ug/L	23.519	2	68439	1908730	2	Standard
	Fe	57	968.093	ug/L	25.880	2	14875	1108444	2	Standard
	Mn	55	5.457	ug/L	0.061	1	529	177225	3	Standard
>	Ge	72		ug/L			86245	78877	0	KED
	Co	59	5.022	ug/L	0.043	0	8	32046	1	KED
	Ni	60	4.864	ug/L	0.020	0	213	9481	0	KED
	Ni	62	4.825	ug/L	0.244	5	34	1494	4	KED
	Cu	63	4.633	ug/L	0.093	2	139	25465	1	KED
	Cu	65	4.625	ug/L	0.042	0	80	12882	0	KED
	Zn	66	16.507	ug/L	0.831	5	340	11904	5	KED
	Zn	67	16.174	ug/L	0.496	3	53	1944	2	KED
	As	75	5.213	ug/L	0.129	2	3	1781	2	KED
	Se	78	22.917	ug/L	1.381	6	9	786	5	KED
	Y	89		ug/L			449540	447745	1	Standard
	Kr	83		ug/L			109	125	12	Standard
>	In-1	115		ug/L			21778	18199	0	KED
	Mo	98	15.604	ug/L	0.365	2	3	23846	2	KED
	Cd	111	4.764	ug/L	0.055	1	2	1588	1	KED
	Cd	114	4.653	ug/L	0.074	1	4	4034	1	KED
>	In	115		ug/L			1112607	903810	1	Standard
	Ag	107	4.675	ug/L	0.079	1	36	59013	3	Standard
	Sb	121	4.845	ug/L	0.097	2	113	75861	0	Standard
	Sb	123	4.924	ug/L	0.133	2	89	59491	0	Standard
	Ba	135	10.466	ug/L	0.047	0	100	67250	2	Standard
	Ba	137	10.382	ug/L	0.252	2	170	118420	0	Standard
>	Tb	159		ug/L			2978637	2540249	1	Standard
	Tl	205	4.497	ug/L	0.127	2	193	406153	1	Standard
	Pb	208	4.176	ug/L	0.081	1	495	494969	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL5
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 17:27:05
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	970521	3	Standard
	Be	9	-0.001	ug/L	0.001	72	10	6	62	Standard
	C	13		ug/L			24210	26688	2	Standard
	Cl	37		ug/L			3807524	4542808	1	Standard
>	Sc	45		ug/L			924614	1004752	1	Standard
	Na	23	1.191	ug/L	0.379	31	19857	52077	17	Standard
	Mg	24	0.129	ug/L	0.086	66	3421	8422	36	Standard
	Al	27	-0.053	ug/L	0.011	19	5910	4845	6	Standard
	K	39	6.525	ug/L	0.404	6	397696	537915	0	Standard
	Ca	44	-2.548	ug/L	0.242	9	8558	5882	4	Standard
	V	51	0.017	ug/L	0.003	19	4329	5175	1	Standard
	V-1	51	0.064	ug/L	0.003	3	172	1920	3	Standard
	Cr	52	0.046	ug/L	0.011	23	12806	14999	2	Standard
	Cr	53	0.201	ug/L	0.014	7	117	653	5	Standard
	Fe	54	-2.083	ug/L	0.304	14	68439	69883	1	Standard
	Fe	57	-1.281	ug/L	0.293	22	14875	14722	1	Standard
	Mn	55	-0.001	ug/L	0.001	165	529	558	6	Standard
>	Ge	72		ug/L			86245	89151	3	KED
	Co	59	-0.000	ug/L	0.001	347	8	6	110	KED
	Ni	60	-0.084	ug/L	0.004	4	213	39	21	KED
	Ni	62	-0.082	ug/L	0.013	16	34	8	58	KED
	Cu	63	-0.003	ug/L	0.001	29	139	124	2	KED
	Cu	65	-0.009	ug/L	0.004	47	80	56	22	KED
	Zn	66	-0.270	ug/L	0.007	2	340	137	3	KED
	Zn	67	-0.293	ug/L	0.047	16	53	17	40	KED
	As	75	-0.003	ug/L	0.001	42	3	2	16	KED
	Se	78	-0.005	ug/L	0.061	1177	9	9	23	KED
	Y	89		ug/L			449540	456478	1	Standard
	Kr	83		ug/L			109	112	20	Standard
>	In-1	115		ug/L			21778	21166	2	KED
	Mo	98	0.004	ug/L	0.002	40	3	10	28	KED
	Cd	111	0.001	ug/L	0.004	368	2	3	45	KED
	Cd	114	0.002	ug/L	0.004	211	4	6	69	KED
>	In	115		ug/L			1112607	1052001	0	Standard
	Ag	107	0.000	ug/L	0.001	636	36	36	24	Standard
	Sb	121	-0.000	ug/L	0.000	96	113	100	6	Standard
	Sb	123	-0.002	ug/L	0.001	30	89	52	18	Standard
	Ba	135	-0.006	ug/L	0.000	2	100	52	2	Standard
	Ba	137	-0.007	ug/L	0.001	17	170	73	21	Standard
>	Tb	159		ug/L			2978637	2679208	0	Standard
	Tl	205	0.002	ug/L	0.000	15	193	387	8	Standard
	Pb	208	0.002	ug/L	0.000	7	495	699	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV3
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 17:33:20
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	896601	1	Standard
	Be	9	50.668	ug/L	0.440	0	10	357458	1	Standard
	C	13		ug/L			24210	24831	2	Standard
	Cl	37		ug/L			3807524	4374510	0	Standard
>	Sc	45		ug/L			924614	987094	0	Standard
	Na	23	4581.011	ug/L	64.522	1	19857	115537083	1	Standard
	Mg	24	4489.780	ug/L	51.244	1	3421	160951141	1	Standard
	Al	27	4396.901	ug/L	62.891	1	5910	127410318	1	Standard
	K	39	4622.319	ug/L	70.722	1	397696	74038630	1	Standard
	Ca	44	4431.829	ug/L	120.052	2	8558	5847160	2	Standard
	V	51	46.202	ug/L	1.259	2	4329	1249391	2	Standard
	V-1	51	46.812	ug/L	0.945	2	172	1252948	2	Standard
	Cr	52	46.144	ug/L	0.424	0	12806	1089119	0	Standard
	Cr	53	48.168	ug/L	0.922	1	117	124208	1	Standard
	Fe	54	4479.387	ug/L	21.961	0	68439	9555769	0	Standard
	Fe	57	4275.616	ug/L	141.112	3	14875	4740497	3	Standard
	Mn	55	47.076	ug/L	0.632	1	529	1492412	1	Standard
>	Ge	72		ug/L			86245	87348	1	KED
	Co	59	49.009	ug/L	1.114	2	8	346183	1	KED
	Ni	60	48.429	ug/L	0.500	1	213	102596	1	KED
	Ni	62	48.960	ug/L	0.777	1	34	16464	0	KED
	Cu	63	48.709	ug/L	0.656	1	139	295215	2	KED
	Cu	65	49.027	ug/L	0.825	1	80	150427	0	KED
	Zn	66	49.992	ug/L	1.878	3	340	39213	2	KED
	Zn	67	49.057	ug/L	0.798	1	53	6420	2	KED
	As	75	50.056	ug/L	0.602	1	3	18906	1	KED
	Se	78	50.928	ug/L	0.334	0	9	1924	1	KED
	Y	89		ug/L			449540	454844	2	Standard
	Kr	83		ug/L			109	130	15	Standard
>	In-1	115		ug/L			21778	20801	2	KED
	Mo	98	48.446	ug/L	0.941	1	3	84584	1	KED
	Cd	111	49.420	ug/L	0.850	1	2	18801	0	KED
	Cd	114	48.914	ug/L	0.883	1	4	48422	0	KED
>	In	115		ug/L			1112607	1048214	1	Standard
	Ag	107	46.133	ug/L	0.246	0	36	674902	1	Standard
	Sb	121	48.427	ug/L	1.042	2	113	878645	2	Standard
	Sb	123	47.836	ug/L	1.121	2	89	669568	0	Standard
	Ba	135	50.107	ug/L	0.533	1	100	373048	2	Standard
	Ba	137	50.975	ug/L	1.142	2	170	673753	0	Standard
>	Tb	159		ug/L			2978637	2780766	1	Standard
	Tl	205	47.724	ug/L	1.538	3	193	4717601	3	Standard
	Pb	208	48.877	ug/L	0.697	1	495	6337820	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB3
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 17:40:56
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	934032	1	Standard
	Be	9	0.000	ug/L	0.000	102	10	13	20	Standard
	C	13		ug/L			24210	24314	1	Standard
	Cl	37		ug/L			3807524	4250758	0	Standard
>	Sc	45		ug/L			924614	971171	2	Standard
	Na	23	2.268	ug/L	0.066	2	19857	77100	1	Standard
	Mg	24	0.328	ug/L	0.010	3	3421	15153	2	Standard
	Al	27	0.052	ug/L	0.012	23	5910	7688	2	Standard
	K	39	5.031	ug/L	0.807	16	397696	496348	0	Standard
	Ca	44	-1.855	ug/L	0.169	9	8558	6582	2	Standard
	V	51	-0.005	ug/L	0.005	86	4329	4400	1	Standard
	V-1	51	0.044	ug/L	0.002	3	172	1337	1	Standard
	Cr	52	-0.035	ug/L	0.013	37	12806	12648	0	Standard
	Cr	53	0.129	ug/L	0.013	9	117	449	6	Standard
	Fe	54	-2.679	ug/L	1.236	46	68439	66279	3	Standard
	Fe	57	-3.623	ug/L	0.433	11	14875	11678	1	Standard
	Mn	55	0.003	ug/L	0.001	38	529	638	4	Standard
>	Ge	72		ug/L			86245	88320	1	KED
	Co	59	0.001	ug/L	0.001	90	8	15	38	KED
	Ni	60	-0.044	ug/L	0.012	26	213	125	19	KED
	Ni	62	-0.053	ug/L	0.019	35	34	17	34	KED
	Cu	63	-0.001	ug/L	0.002	270	139	139	7	KED
	Cu	65	-0.007	ug/L	0.002	32	80	61	11	KED
	Zn	66	-0.018	ug/L	0.004	22	340	334	1	KED
	Zn	67	-0.010	ug/L	0.105	1001	53	53	26	KED
	As	75	0.003	ug/L	0.006	215	3	4	44	KED
	Se	78	0.048	ug/L	0.070	147	9	11	22	KED
	Y	89		ug/L			449540	457533	1	Standard
	Kr	83		ug/L			109	111	12	Standard
>	In-1	115		ug/L			21778	20610	0	KED
	Mo	98	0.006	ug/L	0.002	36	3	14	28	KED
	Cd	111	0.002	ug/L	0.008	370	2	3	83	KED
	Cd	114	0.000	ug/L	0.003	1009	4	4	65	KED
>	In	115		ug/L			1112607	1069161	2	Standard
	Ag	107	0.002	ug/L	0.001	25	36	65	14	Standard
	Sb	121	0.036	ug/L	0.004	11	113	772	7	Standard
	Sb	123	0.036	ug/L	0.003	7	89	599	4	Standard
	Ba	135	-0.005	ug/L	0.002	42	100	62	24	Standard
	Ba	137	-0.002	ug/L	0.001	37	170	133	5	Standard
>	Tb	159		ug/L			2978637	2698531	0	Standard
	Tl	205	0.006	ug/L	0.000	4	193	735	3	Standard
	Pb	208	0.005	ug/L	0.000	9	495	1082	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 17:49:45
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L				23373	4	Standard
	Cl	**37**		ug/L				4398521	1	Standard
>	**Sc**	**45**		ug/L				973163	0	Standard
	Cr	**52**		ug/L				12991	4	Standard
	Cr	**53**		ug/L				432	2	Standard
	Mn	**55**		ug/L				589	4	Standard
>	**Ge**	**72**		ug/L				85811	0	KED
	Ni	**60**		ug/L				126	9	KED
	Ni	**62**		ug/L				26	25	KED
	Cu	**63**		ug/L				110	18	KED
	Cu	**65**		ug/L				64	11	KED
	Zn	**66**		ug/L				311	1	KED
	Zn	**67**		ug/L				36	22	KED
	As	**75**		ug/L				4	59	KED
	Y	**89**		ug/L				443918	0	Standard
	Kr	**83**		ug/L				121	17	Standard
>	**In-1**	**115**		ug/L				20884	2	KED
	Mo	**98**		ug/L				9	19	KED
	Cd	**111**		ug/L				3	34	KED
	Cd	**114**		ug/L				5	33	KED
>	**Tb**	**159**		ug/L				2689662	1	Standard
	Pb	**208**		ug/L				744	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV4
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 17:55:07
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	24665	2	Standard
	Cl	**37**		ug/L			4398521	4452771	1	Standard
>	**Sc**	**45**		ug/L			973163	992432	1	Standard
	Cr	**52**	**46.076**	ug/L	0.160	0	12991	1092941	2	Standard
	Cr	**53**	**48.345**	ug/L	1.066	2	432	125623	0	Standard
	Mn	**55**	**46.545**	ug/L	1.384	2	589	1483070	1	Standard
>	**Ge**	**72**		ug/L			85811	86874	0	KED
	Ni	**60**	**48.489**	ug/L	0.239	0	126	102079	0	KED
	Ni	**62**	**47.774**	ug/L	0.587	1	26	15970	0	KED
	Cu	**63**	**48.981**	ug/L	0.513	1	110	295194	1	KED
	Cu	**65**	**47.905**	ug/L	0.442	0	64	146189	0	KED
	Zn	**66**	**50.327**	ug/L	0.354	0	311	39243	0	KED
	Zn	**67**	**49.999**	ug/L	1.373	2	36	6488	2	KED
	As	**75**	**50.179**	ug/L	0.147	0	4	18850	0	KED
	Y	**89**		ug/L			443918	476535	1	Standard
	Kr	**83**		ug/L			121	139	7	Standard
>	**In-1**	**115**		ug/L			20884	20762	1	KED
	Mo	**98**	**48.550**	ug/L	1.012	2	9	84618	0	KED
	Cd	**111**	**49.526**	ug/L	0.641	1	3	18813	2	KED
	Cd	**114**	**49.265**	ug/L	0.717	1	5	48689	1	KED
>	**Tb**	**159**		ug/L			2689662	2770482	1	Standard
	Pb	**208**	**48.968**	ug/L	1.047	2	744	6326515	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB4
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 18:01:49
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	23741	3	Standard
	Cl	**37**		ug/L			4398521	4281053	1	Standard
>	**Sc**	**45**		ug/L			973163	1000249	1	Standard
	Cr	**52**	**-0.005**	ug/L	0.012	253	12991	13244	2	Standard
	Cr	**53**	**-0.019**	ug/L	0.009	47	432	395	5	Standard
	Mn	**55**	**0.000**	ug/L	0.001	430	589	614	6	Standard
>	**Ge**	**72**		ug/L			85811	89305	0	KED
	Ni	**60**	**-0.001**	ug/L	0.004	264	126	128	5	KED
	Ni	**62**	**-0.018**	ug/L	0.030	166	26	20	48	KED
	Cu	**63**	**-0.000**	ug/L	0.003	1365	110	113	16	KED
	Cu	**65**	**-0.004**	ug/L	0.002	59	64	55	11	KED
	Zn	**66**	**0.025**	ug/L	0.024	97	311	343	5	KED
	Zn	**67**	**0.046**	ug/L	0.036	78	36	43	11	KED
	As	**75**	**-0.001**	ug/L	0.006	701	4	4	58	KED
	Y	**89**		ug/L			443918	464081	0	Standard
	Kr	**83**		ug/L			121	116	4	Standard
>	**In-1**	**115**		ug/L			20884	21109	1	KED
	Mo	**98**	**0.007**	ug/L	0.006	82	9	21	45	KED
	Cd	**111**	**0.002**	ug/L	0.002	153	3	3	25	KED
	Cd	**114**	**-0.002**	ug/L	0.001	81	5	4	28	KED
>	**Tb**	**159**		ug/L			2689662	2764475	0	Standard
	Pb	**208**	**0.000**	ug/L	0.000	537	744	770	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0134-BLK1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:07:45
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	36303	1	Standard
	Cl	37		ug/L			4398521	4547452	0	Standard
>	Sc	45		ug/L			973163	1003227	0	Standard
	Cr	52	0.048	ug/L	0.006	13	12991	14520	1	Standard
	Cr	53	-0.011	ug/L	0.002	16	432	417	0	Standard
	Mn	55	0.009	ug/L	0.001	9	589	904	3	Standard
>	Ge	72		ug/L			85811	89793	1	KED
	Ni	60	0.064	ug/L	0.010	14	126	272	6	KED
	Ni	62	0.070	ug/L	0.027	38	26	51	19	KED
	Cu	63	0.003	ug/L	0.002	45	110	136	7	KED
	Cu	65	0.004	ug/L	0.004	94	64	80	14	KED
	Zn	66	0.085	ug/L	0.014	16	311	393	2	KED
	Zn	67	0.127	ug/L	0.107	84	36	54	24	KED
	As	75	-0.001	ug/L	0.008	625	4	4	73	KED
	Y	89		ug/L			443918	471042	2	Standard
	Kr	83		ug/L			121	117	14	Standard
>	In-1	115		ug/L			20884	21283	1	KED
	Mo	98	-0.002	ug/L	0.003	186	9	6	100	KED
	Cd	111	0.001	ug/L	0.005	332	3	3	50	KED
	Cd	114	-0.004	ug/L	0.001	29	5	2	48	KED
>	Tb	159		ug/L			2689662	2766995	1	Standard
	Pb	208	0.003	ug/L	0.000	8	744	1155	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0134-BS1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:11:42
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	36471	1	Standard
	Cl	37		ug/L			4398521	4587451	3	Standard
>	Sc	45		ug/L			973163	1008218	1	Standard
	Cr	52	24.089	ug/L	0.273	1	12991	586842	0	Standard
	Cr	53	25.469	ug/L	0.202	0	432	67459	1	Standard
	Mn	55	25.554	ug/L	0.489	1	589	827597	0	Standard
>	Ge	72		ug/L			85811	90571	0	KED
	Ni	60	24.277	ug/L	0.199	0	126	53348	0	KED
	Ni	62	24.954	ug/L	0.404	1	26	8709	0	KED
	Cu	63	25.212	ug/L	0.365	1	110	158454	0	KED
	Cu	65	25.165	ug/L	0.431	1	64	80088	0	KED
	Zn	66	75.405	ug/L	0.552	0	311	61134	0	KED
	Zn	67	72.497	ug/L	1.998	2	36	9793	3	KED
	As	75	24.499	ug/L	0.219	0	4	9597	0	KED
	Y	89		ug/L			443918	483898	1	Standard
	Kr	83		ug/L			121	130	4	Standard
>	In-1	115		ug/L			20884	21950	1	KED
	Mo	98	-0.001	ug/L	0.002	351	9	8	44	KED
	Cd	111	24.532	ug/L	0.360	1	3	9853	1	KED
	Cd	114	24.509	ug/L	0.631	2	5	25610	2	KED
>	Tb	159		ug/L			2689662	2835629	0	Standard
	Pb	208	25.674	ug/L	0.079	0	744	3395760	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0286-03
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:15:40
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	39365	0	Standard
	Cl	**37**		ug/L			4398521	4286280	2	Standard
>	**Sc**	**45**		ug/L			973163	1074080	1	Standard
	Cr	**52**	**12.320**	ug/L	0.260	2	12991	326739	1	Standard
	Cr	**53**	**12.698**	ug/L	0.120	0	432	36070	1	Standard
	Mn	**55**	**259.447**	ug/L	7.843	3	589	8944993	1	Standard
>	**Ge**	**72**		ug/L			85811	92508	1	KED
	Ni	**60**	**17.997**	ug/L	0.146	0	126	40431	1	KED
	Ni	**62**	**18.532**	ug/L	0.317	1	26	6613	0	KED
	Cu	**63**	**35.500**	ug/L	0.276	0	110	227869	1	KED
	Cu	**65**	**35.016**	ug/L	0.776	2	64	113789	1	KED
	Zn	**66**	**44.590**	ug/L	0.868	1	311	37058	1	KED
	Zn	**67**	**43.193**	ug/L	0.538	1	36	5974	1	KED
	As	**75**	**3.613**	ug/L	0.017	0	4	1449	1	KED
	Y	**89**		ug/L			443918	620743	2	Standard
	Kr	**83**		ug/L			121	186	9	Standard
>	**In-1**	**115**		ug/L			20884	21641	2	KED
	Mo	**98**	**0.238**	ug/L	0.009	3	9	441	3	KED
	Cd	**111**	**0.062**	ug/L	0.014	23	3	27	19	KED
	Cd	**114**	**0.059**	ug/L	0.008	13	5	67	13	KED
>	**Tb**	**159**		ug/L			2689662	2868211	2	Standard
	Pb	**208**	**34.044**	ug/L	1.046	3	744	4551764	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0286-04
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:19:38
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	52873	1	Standard
	Cl	**37**		ug/L			4398521	4317090	0	Standard
>	**Sc**	**45**		ug/L			973163	1095933	1	Standard
	Cr	**52**	**9.595**	ug/L	0.259	2	12991	262866	1	Standard
	Cr	**53**	**9.819**	ug/L	0.122	1	432	28568	1	Standard
	Mn	**55**	**89.396**	ug/L	1.144	1	589	3145761	0	Standard
>	**Ge**	**72**		ug/L			85811	90903	0	KED
	Ni	**60**	**8.184**	ug/L	0.118	1	126	18139	1	KED
	Ni	**62**	**8.295**	ug/L	0.255	3	26	2924	3	KED
	Cu	**63**	**17.568**	ug/L	0.341	1	110	110866	2	KED
	Cu	**65**	**17.450**	ug/L	0.505	2	64	55767	3	KED
	Zn	**66**	**41.846**	ug/L	0.897	2	311	34197	1	KED
	Zn	**67**	**40.644**	ug/L	0.964	2	36	5526	2	KED
	As	**75**	**4.897**	ug/L	0.034	0	4	1929	0	KED
	Y	**89**		ug/L			443918	648817	2	Standard
	Kr	**83**		ug/L			121	170	5	Standard
>	**In-1**	**115**		ug/L			20884	21831	1	KED
	Mo	**98**	**0.401**	ug/L	0.026	6	9	745	7	KED
	Cd	**111**	**0.104**	ug/L	0.017	15	3	45	15	KED
	Cd	**114**	**0.099**	ug/L	0.015	15	5	109	15	KED
>	**Tb**	**159**		ug/L			2689662	2874470	0	Standard
	Pb	**208**	**8.615**	ug/L	0.142	1	744	1155444	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0286-02
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:23:35
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	47926	1	Standard
	Cl	**37**		ug/L			4398521	4217766	1	Standard
>	**Sc**	**45**		ug/L			973163	1074870	0	Standard
	Cr	**52**	**11.988**	ug/L	0.086	0	12991	318576	0	Standard
	Cr	**53**	**12.274**	ug/L	0.208	1	432	34906	1	Standard
	Mn	**55**	**289.416**	ug/L	1.126	0	589	9987878	0	Standard
>	**Ge**	**72**		ug/L			85811	91832	1	KED
	Ni	**60**	**9.277**	ug/L	0.183	1	126	20755	2	KED
	Ni	**62**	**9.346**	ug/L	0.212	2	26	3324	2	KED
	Cu	**63**	**16.180**	ug/L	0.067	0	110	103159	1	KED
	Cu	**65**	**16.188**	ug/L	0.278	1	64	52267	2	KED
	Zn	**66**	**52.492**	ug/L	0.419	0	311	43251	0	KED
	Zn	**67**	**48.920**	ug/L	0.403	0	36	6712	1	KED
	As	**75**	**4.085**	ug/L	0.069	1	4	1626	2	KED
	Y	**89**		ug/L			443918	640878	1	Standard
	Kr	**83**		ug/L			121	183	17	Standard
>	**In-1**	**115**		ug/L			20884	21948	0	KED
	Mo	**98**	**0.265**	ug/L	0.012	4	9	498	4	KED
	Cd	**111**	**0.083**	ug/L	0.012	14	3	36	12	KED
	Cd	**114**	**0.079**	ug/L	0.015	19	5	88	17	KED
>	**Tb**	**159**		ug/L			2689662	2911897	0	Standard
	Pb	**208**	**17.036**	ug/L	0.254	1	744	2313968	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0134-DUP1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:27:32
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	49405	1	Standard
	Cl	37		ug/L			4398521	4322804	0	Standard
>	Sc	45		ug/L			973163	1083432	0	Standard
	Cr	52	12.775	ug/L	0.330	2	12991	341218	1	Standard
	Cr	53	13.012	ug/L	0.112	0	432	37273	1	Standard
	Mn	55	288.207	ug/L	3.504	1	589	10025157	1	Standard
>	Ge	72		ug/L			85811	92118	1	KED
	Ni	60	10.161	ug/L	0.132	1	126	22787	1	KED
	Ni	62	10.496	ug/L	0.094	0	26	3742	2	KED
	Cu	63	18.404	ug/L	0.246	1	110	117682	2	KED
	Cu	65	17.917	ug/L	0.217	1	64	58022	2	KED
	Zn	66	43.218	ug/L	1.004	2	311	35771	0	KED
	Zn	67	41.330	ug/L	0.371	0	36	5693	1	KED
	As	75	4.649	ug/L	0.049	1	4	1855	1	KED
	Y	89		ug/L			443918	645657	1	Standard
	Kr	83		ug/L			121	179	1	Standard
>	In-1	115		ug/L			20884	21649	1	KED
	Mo	98	0.478	ug/L	0.027	5	9	877	6	KED
	Cd	111	0.093	ug/L	0.012	12	3	40	12	KED
	Cd	114	0.064	ug/L	0.003	5	5	72	5	KED
>	Tb	159		ug/L			2689662	2910019	3	Standard
	Pb	208	27.599	ug/L	0.994	3	744	3743554	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0134-MS1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:31:30
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	41735	1	Standard
	Cl	37		ug/L			4398521	4283110	2	Standard
>	Sc	45		ug/L			973163	1105826	4	Standard
	Cr	52	32.455	ug/L	1.453	4	12991	861172	1	Standard
	Cr	53	33.981	ug/L	0.776	2	432	98496	2	Standard
	Mn	55	290.859	ug/L	13.838	4	589	10313054	0	Standard
>	Ge	72		ug/L			85811	91947	1	KED
	Ni	60	32.034	ug/L	0.620	1	126	71409	1	KED
	Ni	62	32.559	ug/L	0.708	2	26	11526	0	KED
	Cu	63	39.056	ug/L	0.994	2	110	249086	1	KED
	Cu	65	39.048	ug/L	1.280	3	64	126090	1	KED
	Zn	66	114.986	ug/L	1.472	1	311	94461	1	KED
	Zn	67	109.937	ug/L	1.519	1	36	15051	0	KED
	As	75	27.200	ug/L	0.248	0	4	10815	0	KED
	Y	89		ug/L			443918	633675	3	Standard
	Kr	83		ug/L			121	164	6	Standard
>	In-1	115		ug/L			20884	21894	1	KED
	Mo	98	0.286	ug/L	0.028	9	9	534	7	KED
	Cd	111	23.724	ug/L	0.401	1	3	9505	2	KED
	Cd	114	23.628	ug/L	0.533	2	5	24627	1	KED
>	Tb	159		ug/L			2689662	2850449	2	Standard
	Pb	208	48.536	ug/L	1.095	2	744	6450085	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0134-MSD1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:35:27
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	41081	1	Standard
	Cl	37		ug/L			4398521	4357562	0	Standard
>	Sc	45		ug/L			973163	1061258	1	Standard
	Cr	52	31.260	ug/L	0.342	1	12991	797368	1	Standard
	Cr	53	32.303	ug/L	0.981	3	432	89905	1	Standard
	Mn	55	285.415	ug/L	3.751	1	589	9726083	2	Standard
>	Ge	72		ug/L			85811	92752	1	KED
	Ni	60	30.201	ug/L	0.402	1	126	67923	0	KED
	Ni	62	29.850	ug/L	1.162	3	26	10660	2	KED
	Cu	63	37.024	ug/L	0.986	2	110	238205	1	KED
	Cu	65	36.798	ug/L	0.624	1	64	119888	0	KED
	Zn	66	108.507	ug/L	2.487	2	311	89922	0	KED
	Zn	67	102.324	ug/L	1.134	1	36	14136	1	KED
	As	75	26.581	ug/L	0.576	2	4	10660	0	KED
	Y	89		ug/L			443918	610936	2	Standard
	Kr	83		ug/L			121	188	8	Standard
>	In-1	115		ug/L			20884	21907	2	KED
	Mo	98	0.273	ug/L	0.022	7	9	511	7	KED
	Cd	111	23.734	ug/L	0.543	2	3	9510	1	KED
	Cd	114	23.760	ug/L	0.323	1	5	24777	1	KED
>	Tb	159		ug/L			2689662	2894297	0	Standard
	Pb	208	34.522	ug/L	0.557	1	744	4659741	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0134-PS1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:39:25
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	50635	1	Standard
	Cl	37		ug/L			4398521	4404805	2	Standard
>	Sc	45		ug/L			973163	1086767	2	Standard
	Cr	52	32.535	ug/L	0.583	1	12991	849114	1	Standard
	Cr	53	34.057	ug/L	0.563	1	432	97052	1	Standard
	Mn	55	304.407	ug/L	3.742	1	589	10623735	3	Standard
>	Ge	72		ug/L			85811	92465	0	KED
	Ni	60	31.608	ug/L	0.077	0	126	70874	1	KED
	Ni	62	31.908	ug/L	0.337	1	26	11363	1	KED
	Cu	63	38.911	ug/L	0.552	1	110	249644	2	KED
	Cu	65	38.566	ug/L	0.794	2	64	125268	1	KED
	Zn	66	123.101	ug/L	2.364	1	311	101676	1	KED
	Zn	67	117.227	ug/L	1.140	0	36	16141	1	KED
	As	75	26.865	ug/L	0.144	0	4	10744	1	KED
	Y	89		ug/L			443918	647321	1	Standard
	Kr	83		ug/L			121	180	7	Standard
>	In-1	115		ug/L			20884	21937	1	KED
	Mo	98	0.258	ug/L	0.010	4	9	485	5	KED
	Cd	111	22.904	ug/L	0.290	1	3	9194	1	KED
	Cd	114	22.489	ug/L	0.309	1	5	23489	1	KED
>	Tb	159		ug/L			2689662	2909214	1	Standard
	Pb	208	39.791	ug/L	0.357	0	744	5398714	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL6
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 18:43:24
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	26651	4	Standard
	Cl	**37**		ug/L			4398521	4211217	0	Standard
>	**Sc**	**45**		ug/L			973163	1002759	1	Standard
	Cr	**52**	**-0.017**	ug/L	0.010	56	12991	12977	0	Standard
	Cr	**53**	**-0.039**	ug/L	0.009	22	432	343	7	Standard
	Mn	**55**	**0.058**	ug/L	0.002	3	589	2478	1	Standard
>	**Ge**	**72**		ug/L			85811	89629	1	KED
	Ni	**60**	**-0.042**	ug/L	0.007	17	126	41	39	KED
	Ni	**62**	**-0.057**	ug/L	0.009	16	26	7	43	KED
	Cu	**63**	**0.001**	ug/L	0.002	156	110	123	10	KED
	Cu	**65**	**-0.004**	ug/L	0.003	86	64	55	17	KED
	Zn	**66**	**-0.237**	ug/L	0.012	5	311	135	8	KED
	Zn	**67**	**-0.175**	ug/L	0.053	30	36	14	49	KED
	As	**75**	**0.002**	ug/L	0.005	349	4	5	39	KED
	Y	**89**		ug/L			443918	471153	3	Standard
	Kr	**83**		ug/L			121	133	7	Standard
>	**In-1**	**115**		ug/L			20884	21263	2	KED
	Mo	**98**	**-0.002**	ug/L	0.002	111	9	6	46	KED
	Cd	**111**	**-0.001**	ug/L	0.004	408	3	2	57	KED
	Cd	**114**	**-0.001**	ug/L	0.003	334	5	4	56	KED
>	**Tb**	**159**		ug/L			2689662	2809096	1	Standard
	Pb	**208**	**0.007**	ug/L	0.001	10	744	1686	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV5
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 18:47:22
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	25239	2	Standard
	Cl	**37**		ug/L			4398521	4583197	1	Standard
>	**Sc**	**45**		ug/L			973163	995461	2	Standard
	Cr	**52**	**48.470**	ug/L	1.311	2	12991	1152101	0	Standard
	Cr	**53**	**48.966**	ug/L	0.942	1	432	127625	1	Standard
	Mn	**55**	**48.194**	ug/L	1.043	2	589	1540573	1	Standard
>	**Ge**	**72**		ug/L			85811	89566	1	KED
	Ni	**60**	**46.949**	ug/L	1.002	2	126	101896	1	KED
	Ni	**62**	**47.020**	ug/L	0.731	1	26	16205	0	KED
	Cu	**63**	**48.157**	ug/L	0.533	1	110	299207	0	KED
	Cu	**65**	**47.389**	ug/L	0.863	1	64	149079	0	KED
	Zn	**66**	**48.733**	ug/L	1.387	2	311	39181	2	KED
	Zn	**67**	**49.990**	ug/L	0.710	1	36	6688	1	KED
	As	**75**	**50.027**	ug/L	0.248	0	4	19376	1	KED
	Y	**89**		ug/L			443918	481899	2	Standard
	Kr	**83**		ug/L			121	126	16	Standard
>	**In-1**	**115**		ug/L			20884	21404	1	KED
	Mo	**98**	**48.501**	ug/L	1.052	2	9	87145	0	KED
	Cd	**111**	**50.027**	ug/L	1.342	2	3	19585	1	KED
	Cd	**114**	**49.181**	ug/L	1.428	2	5	50098	1	KED
>	**Tb**	**159**		ug/L			2689662	2823029	2	Standard
	Pb	**208**	**48.954**	ug/L	0.765	1	744	6443863	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB5
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 18:54:04
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	24832	1	Standard
	Cl	**37**		ug/L			4398521	4307872	0	Standard
>	**Sc**	**45**		ug/L			973163	1008172	1	Standard
	Cr	**52**	**-0.004**	ug/L	0.001	25	12991	13360	1	Standard
	Cr	**53**	**-0.058**	ug/L	0.007	11	432	296	6	Standard
	Mn	**55**	**0.012**	ug/L	0.004	33	589	1007	13	Standard
>	**Ge**	**72**		ug/L			85811	91850	0	KED
	Ni	**60**	**0.003**	ug/L	0.003	113	126	142	5	KED
	Ni	**62**	**-0.005**	ug/L	0.015	288	26	26	21	KED
	Cu	**63**	**0.004**	ug/L	0.004	108	110	142	18	KED
	Cu	**65**	**0.001**	ug/L	0.001	106	64	71	4	KED
	Zn	**66**	**-0.033**	ug/L	0.029	88	311	306	8	KED
	Zn	**67**	**0.051**	ug/L	0.048	94	36	45	15	KED
	As	**75**	**-0.000**	ug/L	0.002	614	4	4	21	KED
	Y	**89**		ug/L			443918	496425	1	Standard
	Kr	**83**		ug/L			121	118	16	Standard
>	**In-1**	**115**		ug/L			20884	22739	0	KED
	Mo	**98**	**0.005**	ug/L	0.007	141	9	19	67	KED
	Cd	**111**	**-0.001**	ug/L	0.007	1086	3	3	96	KED
	Cd	**114**	**-0.001**	ug/L	0.002	191	5	4	46	KED
>	**Tb**	**159**		ug/L			2689662	2823021	1	Standard
	Pb	**208**	**0.002**	ug/L	0.001	62	744	1020	12	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0218-BLK1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:00:43
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	44760	2	Standard
	Cl	**37**		ug/L			4398521	4274421	1	Standard
>	**Sc**	**45**		ug/L			973163	1044809	1	Standard
	Cr	**52**	**0.096**	ug/L	0.007	7	12991	16305	0	Standard
	Cr	**53**	**0.027**	ug/L	0.005	19	432	538	1	Standard
	Mn	**55**	**0.033**	ug/L	0.002	5	589	1734	2	Standard
>	**Ge**	**72**		ug/L			85811	91188	1	KED
	Ni	**60**	**-0.050**	ug/L	0.002	4	126	25	18	KED
	Ni	**62**	**-0.050**	ug/L	0.017	33	26	10	60	KED
	Cu	**63**	**0.006**	ug/L	0.005	74	110	156	19	KED
	Cu	**65**	**0.006**	ug/L	0.009	132	64	88	31	KED
	Zn	**66**	**-0.153**	ug/L	0.024	15	311	206	8	KED
	Zn	**67**	**0.006**	ug/L	0.098	1641	36	39	35	KED
	As	**75**	**0.001**	ug/L	0.003	235	4	5	24	KED
	Y	**89**		ug/L			443918	506603	2	Standard
	Kr	**83**		ug/L			121	95	25	Standard
>	**In-1**	**115**		ug/L			20884	22715	2	KED
	Mo	**98**	**0.003**	ug/L	0.001	45	9	15	14	KED
	Cd	**111**	**0.001**	ug/L	0.004	462	3	3	43	KED
	Cd	**114**	**-0.002**	ug/L	0.001	52	5	4	26	KED
>	**Tb**	**159**		ug/L			2689662	2939601	1	Standard
	Pb	**208**	**0.001**	ug/L	0.001	38	744	1015	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0218-BS1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:04:41
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	45500	1	Standard
	Cl	37		ug/L			4398521	4410005	0	Standard
>	Sc	45		ug/L			973163	1032186	1	Standard
	Cr	52	23.901	ug/L	0.488	2	12991	596201	1	Standard
	Cr	53	25.043	ug/L	0.572	2	432	67907	1	Standard
	Mn	55	24.658	ug/L	0.031	0	589	817751	1	Standard
>	Ge	72		ug/L			85811	93456	0	KED
	Ni	60	23.613	ug/L	0.687	2	126	53540	2	KED
	Ni	62	24.022	ug/L	0.568	2	26	8652	2	KED
	Cu	63	24.241	ug/L	0.234	0	110	157220	1	KED
	Cu	65	24.544	ug/L	0.542	2	64	80605	2	KED
	Zn	66	73.472	ug/L	0.770	1	311	61471	0	KED
	Zn	67	69.037	ug/L	0.556	0	36	9623	1	KED
	As	75	24.058	ug/L	0.409	1	4	9724	0	KED
	Y	89		ug/L			443918	502366	1	Standard
	Kr	83		ug/L			121	122	7	Standard
>	In-1	115		ug/L			20884	22517	1	KED
	Mo	98	0.005	ug/L	0.002	51	9	19	24	KED
	Cd	111	24.261	ug/L	0.369	1	3	9995	0	KED
	Cd	114	24.141	ug/L	0.110	0	5	25880	0	KED
>	Tb	159		ug/L			2689662	2946226	1	Standard
	Pb	208	24.586	ug/L	0.371	1	744	3378126	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0324-02
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:08:38
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	47485	1	Standard
	Cl	**37**		ug/L			4398521	4012416	3	Standard
>	**Sc**	**45**		ug/L			973163	1000513	9	Standard
	Cr	**52**	**0.188**	ug/L	0.047	24	12991	17740	4	Standard
	Cr	**53**	**0.192**	ug/L	0.034	17	432	941	2	Standard
	Mn	**55**	**3.481**	ug/L	0.194	5	589	112050	3	Standard
>	**Ge**	**72**		ug/L			85811	93096	3	KED
	Ni	**60**	**0.042**	ug/L	0.016	38	126	231	13	KED
	Ni	**62**	**0.044**	ug/L	0.032	71	26	43	23	KED
	Cu	**63**	**1.196**	ug/L	0.037	3	110	7836	0	KED
	Cu	**65**	**1.150**	ug/L	0.073	6	64	3824	3	KED
	Zn	**66**	**0.514**	ug/L	0.058	11	311	763	5	KED
	Zn	**67**	**0.861**	ug/L	0.089	10	36	158	5	KED
	As	**75**	**0.650**	ug/L	0.014	2	4	266	3	KED
	Y	**89**		ug/L			443918	474959	11	Standard
	Kr	**83**		ug/L			121	148	7	Standard
>	**In-1**	**115**		ug/L			20884	22588	2	KED
	Mo	**98**	**0.800**	ug/L	0.015	1	9	1526	3	KED
	Cd	**111**	**0.005**	ug/L	0.006	118	3	5	44	KED
	Cd	**114**	**0.005**	ug/L	0.002	44	5	11	18	KED
>	**Tb**	**159**		ug/L			2689662	2755387	10	Standard
	Pb	**208**	**0.054**	ug/L	0.007	12	744	7674	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0324-04
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:15:19
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	47343	2	Standard
	Cl	37		ug/L			4398521	4126157	0	Standard
>	Sc	45		ug/L			973163	1044619	1	Standard
	Cr	52	0.125	ug/L	0.012	9	12991	17030	0	Standard
	Cr	53	0.150	ug/L	0.005	3	432	872	0	Standard
	Mn	55	3.374	ug/L	0.047	1	589	113794	1	Standard
>	Ge	72		ug/L			85811	90976	0	KED
	Ni	60	0.061	ug/L	0.014	22	126	269	10	KED
	Ni	62	0.043	ug/L	0.006	14	26	42	5	KED
	Cu	63	0.726	ug/L	0.027	3	110	4697	2	KED
	Cu	65	0.728	ug/L	0.027	3	64	2393	3	KED
	Zn	66	0.569	ug/L	0.099	17	311	791	10	KED
	Zn	67	0.909	ug/L	0.060	6	36	161	5	KED
	As	75	0.617	ug/L	0.037	6	4	247	5	KED
	Y	89		ug/L			443918	498392	1	Standard
	Kr	83		ug/L			121	116	15	Standard
>	In-1	115		ug/L			20884	22311	1	KED
	Mo	98	0.805	ug/L	0.048	5	9	1518	5	KED
	Cd	111	0.006	ug/L	0.005	83	3	5	33	KED
	Cd	114	-0.001	ug/L	0.004	460	5	5	72	KED
>	Tb	159		ug/L			2689662	2860578	0	Standard
	Pb	208	0.045	ug/L	0.001	1	744	6806	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0324-06
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:19:17
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	46469	2	Standard
	Cl	**37**		ug/L			4398521	4402469	1	Standard
>	**Sc**	**45**		ug/L			973163	1047914	1	Standard
	Cr	**52**	**0.198**	ug/L	0.012	5	12991	18888	2	Standard
	Cr	**53**	**0.802**	ug/L	0.050	6	432	2658	4	Standard
	Mn	**55**	**1.356**	ug/L	0.022	1	589	46267	1	Standard
>	**Ge**	**72**		ug/L			85811	87920	2	KED
	Ni	**60**	**0.206**	ug/L	0.023	11	126	568	8	KED
	Ni	**62**	**0.201**	ug/L	0.028	13	26	94	8	KED
	Cu	**63**	**0.884**	ug/L	0.035	3	110	5496	0	KED
	Cu	**65**	**0.871**	ug/L	0.051	5	64	2751	3	KED
	Zn	**66**	**1.435**	ug/L	0.083	5	311	1441	3	KED
	Zn	**67**	**2.120**	ug/L	0.135	6	36	313	3	KED
	As	**75**	**0.275**	ug/L	0.010	3	4	109	0	KED
	Y	**89**		ug/L			443918	473472	2	Standard
	Kr	**83**		ug/L			121	131	8	Standard
>	**In-1**	**115**		ug/L			20884	21343	1	KED
	Mo	**98**	**0.164**	ug/L	0.018	10	9	302	9	KED
	Cd	**111**	**0.001**	ug/L	0.009	603	3	3	90	KED
	Cd	**114**	**-0.000**	ug/L	0.003	2403	5	5	53	KED
>	**Tb**	**159**		ug/L			2689662	2790179	0	Standard
	Pb	**208**	**0.003**	ug/L	0.000	13	744	1191	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0324-08
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:23:14
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	41893	0	Standard
	Cl	**37**		ug/L			4398521	4284834	1	Standard
>	**Sc**	**45**		ug/L			973163	1000494	0	Standard
	Cr	**52**	**0.189**	ug/L	0.003	1	12991	17816	0	Standard
	Cr	**53**	**0.110**	ug/L	0.010	9	432	731	4	Standard
	Mn	**55**	**0.370**	ug/L	0.005	1	589	12504	2	Standard
>	**Ge**	**72**		ug/L			85811	89885	1	KED
	Ni	**60**	**0.537**	ug/L	0.016	2	126	1300	2	KED
	Ni	**62**	**0.532**	ug/L	0.027	5	26	210	3	KED
	Cu	**63**	**0.126**	ug/L	0.008	6	110	900	6	KED
	Cu	**65**	**0.123**	ug/L	0.007	5	64	455	3	KED
	Zn	**66**	**0.518**	ug/L	0.076	14	311	740	8	KED
	Zn	**67**	**0.924**	ug/L	0.018	1	36	161	2	KED
	As	**75**	**0.013**	ug/L	0.006	42	4	9	23	KED
	Y	**89**		ug/L			443918	474884	2	Standard
	Kr	**83**		ug/L			121	127	25	Standard
>	**In-1**	**115**		ug/L			20884	22325	0	KED
	Mo	**98**	**0.004**	ug/L	0.005	119	9	17	51	KED
	Cd	**111**	**-0.002**	ug/L	0.004	167	3	2	57	KED
	Cd	**114**	**-0.004**	ug/L	0.001	30	5	2	54	KED
>	**Tb**	**159**		ug/L			2689662	2839279	1	Standard
	Pb	**208**	**0.016**	ug/L	0.001	3	744	2924	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0218-DUP1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:27:11
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	43771	0	Standard
	Cl	**37**		ug/L			4398521	4360037	2	Standard
>	**Sc**	**45**		ug/L			973163	998100	2	Standard
	Cr	**52**	**0.160**	ug/L	0.028	17	12991	17080	2	Standard
	Cr	**53**	**0.074**	ug/L	0.008	10	432	635	2	Standard
	Mn	**55**	**0.229**	ug/L	0.002	0	589	7957	2	Standard
>	**Ge**	**72**		ug/L			85811	90992	1	KED
	Ni	**60**	**0.513**	ug/L	0.031	6	126	1264	4	KED
	Ni	**62**	**0.526**	ug/L	0.041	7	26	211	7	KED
	Cu	**63**	**0.114**	ug/L	0.006	5	110	838	5	KED
	Cu	**65**	**0.118**	ug/L	0.010	8	64	443	6	KED
	Zn	**66**	**0.125**	ug/L	0.019	14	311	431	4	KED
	Zn	**67**	**0.591**	ug/L	0.168	28	36	118	18	KED
	As	**75**	**0.006**	ug/L	0.003	60	4	6	19	KED
	Y	**89**		ug/L			443918	474615	0	Standard
	Kr	**83**		ug/L			121	104	10	Standard
>	**In-1**	**115**		ug/L			20884	22093	1	KED
	Mo	**98**	**-0.004**	ug/L	0.001	28	9	3	61	KED
	Cd	**111**	**-0.007**	ug/L	0.001	20	3	0	86	KED
	Cd	**114**	**0.000**	ug/L	0.002	496	5	6	31	KED
>	**Tb**	**159**		ug/L			2689662	2837003	1	Standard
	Pb	**208**	**0.001**	ug/L	0.000	51	744	892	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0218-MS1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:31:33
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	46074	3	Standard
	Cl	**37**		ug/L			4398521	4514487	2	Standard
>	**Sc**	**45**		ug/L			973163	980530	2	Standard
	Cr	**52**	**24.210**	ug/L	0.213	0	12991	573503	1	Standard
	Cr	**53**	**24.832**	ug/L	0.600	2	432	63963	1	Standard
	Mn	**55**	**25.009**	ug/L	0.679	2	589	787601	1	Standard
>	**Ge**	**72**		ug/L			85811	91007	1	KED
	Ni	**60**	**24.153**	ug/L	0.164	0	126	53335	1	KED
	Ni	**62**	**24.657**	ug/L	0.387	1	26	8648	1	KED
	Cu	**63**	**24.545**	ug/L	0.332	1	110	155016	1	KED
	Cu	**65**	**24.460**	ug/L	0.151	0	64	78225	0	KED
	Zn	**66**	**73.713**	ug/L	1.924	2	311	60052	2	KED
	Zn	**67**	**70.916**	ug/L	2.937	4	36	9622	3	KED
	As	**75**	**23.839**	ug/L	0.179	0	4	9384	1	KED
	Y	**89**		ug/L			443918	471993	1	Standard
	Kr	**83**		ug/L			121	133	7	Standard
>	**In-1**	**115**		ug/L			20884	21935	0	KED
	Mo	**98**	**0.007**	ug/L	0.005	79	9	21	44	KED
	Cd	**111**	**23.860**	ug/L	0.635	2	3	9575	1	KED
	Cd	**114**	**23.910**	ug/L	0.318	1	5	24972	2	KED
>	**Tb**	**159**		ug/L			2689662	2808632	0	Standard
	Pb	**208**	**24.904**	ug/L	0.223	0	744	3262402	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21H0079-01
Sample Dil Factor: 10
Comments:
Sample Date/Time: Monday, August 09, 2021 19:38:43
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	150539	4	Standard
	Cl	37		ug/L			4398521	4686358	2	Standard
>	Sc	45		ug/L			973163	966815	0	Standard
	Cr	52	30.925	ug/L	0.520	1	12991	718847	1	Standard
	Cr	53	31.635	ug/L	0.528	1	432	80246	1	Standard
	Mn	55	24.685	ug/L	0.306	1	589	766773	0	Standard
>	Ge	72		ug/L			85811	87889	1	KED
	Ni	60	1.736	ug/L	0.029	1	126	3823	1	KED
	Ni	62	1.775	ug/L	0.055	3	26	626	2	KED
	Cu	63	1.527	ug/L	0.012	0	110	9420	1	KED
	Cu	65	1.524	ug/L	0.053	3	64	4767	2	KED
	Zn	66	76.786	ug/L	1.634	2	311	60395	1	KED
	Zn	67	70.474	ug/L	0.989	1	36	9238	2	KED
	As	75	0.161	ug/L	0.003	1	4	65	2	KED
	Y	89		ug/L			443918	472965	2	Standard
	Kr	83		ug/L			121	111	2	Standard
>	In-1	115		ug/L			20884	21651	1	KED
	Mo	98	1.044	ug/L	0.044	4	9	1907	3	KED
	Cd	111	0.393	ug/L	0.037	9	3	159	8	KED
	Cd	114	0.400	ug/L	0.013	3	5	418	2	KED
>	Tb	159		ug/L			2689662	2800845	0	Standard
	Pb	208	0.218	ug/L	0.004	1	744	29231	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL7
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:45:24
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	25626	0	Standard
	Cl	**37**		ug/L			4398521	4732878	1	Standard
>	**Sc**	**45**		ug/L			973163	964825	1	Standard
	Cr	**52**	**0.012**	ug/L	0.019	156	12991	13146	1	Standard
	Cr	**53**	**-0.072**	ug/L	0.011	14	432	247	9	Standard
	Mn	**55**	**-0.002**	ug/L	0.001	33	589	526	4	Standard
>	**Ge**	**72**		ug/L			85811	87201	1	KED
	Ni	**60**	**-0.047**	ug/L	0.002	3	126	30	10	KED
	Ni	**62**	**-0.049**	ug/L	0.007	14	26	10	21	KED
	Cu	**63**	**-0.002**	ug/L	0.002	97	110	101	10	KED
	Cu	**65**	**-0.004**	ug/L	0.001	25	64	51	7	KED
	Zn	**66**	**-0.223**	ug/L	0.009	4	311	142	3	KED
	Zn	**67**	**-0.152**	ug/L	0.023	15	36	17	19	KED
	As	**75**	**-0.002**	ug/L	0.004	189	4	3	37	KED
	Y	**89**		ug/L			443918	465758	1	Standard
	Kr	**83**		ug/L			121	117	3	Standard
>	**In-1**	**115**		ug/L			20884	22113	1	KED
	Mo	**98**	**-0.002**	ug/L	0.001	33	9	6	22	KED
	Cd	**111**	**0.001**	ug/L	0.006	557	3	3	66	KED
	Cd	**114**	**-0.003**	ug/L	0.001	28	5	2	43	KED
>	**Tb**	**159**		ug/L			2689662	2766247	1	Standard
	Pb	**208**	**-0.001**	ug/L	0.000	19	744	666	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV6
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:49:46
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	24579	1	Standard
	Cl	**37**		ug/L			4398521	4766246	1	Standard
>	**Sc**	**45**		ug/L			973163	957899	1	Standard
	Cr	**52**	**48.532**	ug/L	0.756	1	12991	1110306	0	Standard
	Cr	**53**	**50.895**	ug/L	0.992	1	432	127642	1	Standard
	Mn	**55**	**50.415**	ug/L	0.315	0	589	1551008	1	Standard
>	**Ge**	**72**		ug/L			85811	87810	0	KED
	Ni	**60**	**47.717**	ug/L	0.919	1	126	101537	2	KED
	Ni	**62**	**47.954**	ug/L	0.939	1	26	16204	2	KED
	Cu	**63**	**47.902**	ug/L	0.755	1	110	291831	2	KED
	Cu	**65**	**47.588**	ug/L	0.199	0	64	146785	0	KED
	Zn	**66**	**49.548**	ug/L	0.955	1	311	39052	1	KED
	Zn	**67**	**50.382**	ug/L	0.881	1	36	6607	0	KED
	As	**75**	**50.122**	ug/L	0.542	1	4	19032	1	KED
	Y	**89**		ug/L			443918	475635	1	Standard
	Kr	**83**		ug/L			121	128	5	Standard
>	**In-1**	**115**		ug/L			20884	21649	1	KED
	Mo	**98**	**46.991**	ug/L	0.421	0	9	85411	0	KED
	Cd	**111**	**48.599**	ug/L	0.483	0	3	19247	0	KED
	Cd	**114**	**48.632**	ug/L	0.614	1	5	50117	0	KED
>	**Tb**	**159**		ug/L			2689662	2854863	1	Standard
	Pb	**208**	**48.573**	ug/L	0.488	1	744	6466568	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB6
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:56:28
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	23733	1	Standard
	Cl	**37**		ug/L			4398521	4653700	2	Standard
>	**Sc**	**45**		ug/L			973163	973555	1	Standard
	Cr	**52**	**0.025**	ug/L	0.014	56	12991	13558	1	Standard
	Cr	**53**	**-0.073**	ug/L	0.002	2	432	247	1	Standard
	Mn	**55**	**0.002**	ug/L	0.001	47	589	640	3	Standard
>	**Ge**	**72**		ug/L			85811	89334	1	KED
	Ni	**60**	**0.001**	ug/L	0.006	528	126	134	8	KED
	Ni	**62**	**0.004**	ug/L	0.034	770	26	28	40	KED
	Cu	**63**	**0.005**	ug/L	0.000	7	110	144	1	KED
	Cu	**65**	**-0.002**	ug/L	0.004	186	64	60	18	KED
	Zn	**66**	**0.008**	ug/L	0.035	457	311	330	9	KED
	Zn	**67**	**0.085**	ug/L	0.027	31	36	48	5	KED
	As	**75**	**-0.001**	ug/L	0.001	120	4	4	11	KED
	Y	**89**		ug/L			443918	475932	2	Standard
	Kr	**83**		ug/L			121	120	11	Standard
>	**In-1**	**115**		ug/L			20884	21872	3	KED
	Mo	**98**	**0.005**	ug/L	0.006	116	9	18	56	KED
	Cd	**111**	**-0.002**	ug/L	0.001	68	3	2	21	KED
	Cd	**114**	**-0.002**	ug/L	0.001	65	5	4	23	KED
>	**Tb**	**159**		ug/L			2689662	2790009	1	Standard
	Pb	**208**	**0.001**	ug/L	0.001	36	744	965	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0331-01
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 20:00:26
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	110577	2	Standard
	Cl	37		ug/L			4398521	4966285	1	Standard
>	Sc	45		ug/L			973163	995765	2	Standard
	Cr	52	103.542	ug/L	3.896	3	12991	2446242	1	Standard
	Cr	53	106.822	ug/L	0.749	0	432	278055	2	Standard
	Mn	55	38.723	ug/L	1.144	2	589	1238049	1	Standard
>	Ge	72		ug/L			85811	89602	0	KED
	Ni	60	1.229	ug/L	0.045	3	126	2797	3	KED
	Ni	62	1.174	ug/L	0.157	13	26	431	12	KED
	Cu	63	1.761	ug/L	0.035	1	110	11055	2	KED
	Cu	65	1.763	ug/L	0.013	0	64	5613	0	KED
	Zn	66	97.574	ug/L	2.003	2	311	78165	1	KED
	Zn	67	89.818	ug/L	0.508	0	36	11992	0	KED
	As	75	0.259	ug/L	0.009	3	4	104	3	KED
	Y	89		ug/L			443918	480060	3	Standard
	Kr	83		ug/L			121	111	5	Standard
>	In-1	115		ug/L			20884	22019	1	KED
	Mo	98	0.273	ug/L	0.013	4	9	514	5	KED
	Cd	111	0.467	ug/L	0.029	6	3	191	7	KED
	Cd	114	0.448	ug/L	0.038	8	5	475	9	KED
>	Tb	159		ug/L			2689662	2855448	0	Standard
	Pb	208	0.211	ug/L	0.002	1	744	28949	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0349-01
Sample Dil Factor: 10
Comments:
Sample Date/Time: Monday, August 09, 2021 20:07:07
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	149662	2	Standard
	Cl	37		ug/L			4398521	4793441	2	Standard
>	Sc	45		ug/L			973163	1005158	0	Standard
	Cr	52	27.968	ug/L	0.534	1	12991	677121	1	Standard
	Cr	53	29.593	ug/L	0.313	1	432	78072	0	Standard
	Mn	55	15.353	ug/L	0.261	1	589	496039	1	Standard
>	Ge	72		ug/L			85811	90219	2	KED
	Ni	60	2.673	ug/L	0.145	5	126	5965	3	KED
	Ni	62	2.674	ug/L	0.110	4	26	953	1	KED
	Cu	63	7.525	ug/L	0.221	2	110	47172	1	KED
	Cu	65	7.336	ug/L	0.114	1	64	23305	2	KED
	Zn	66	247.339	ug/L	1.729	0	311	198997	2	KED
	Zn	67	224.523	ug/L	2.022	0	36	30123	1	KED
	As	75	0.106	ug/L	0.006	5	4	46	5	KED
	Y	89		ug/L			443918	484633	3	Standard
	Kr	83		ug/L			121	112	14	Standard
>	In-1	115		ug/L			20884	21711	2	KED
	Mo	98	0.376	ug/L	0.014	3	9	694	2	KED
	Cd	111	2.818	ug/L	0.156	5	3	1121	4	KED
	Cd	114	2.790	ug/L	0.084	3	5	2888	2	KED
>	Tb	159		ug/L			2689662	2870389	0	Standard
	Pb	208	0.661	ug/L	0.016	2	744	89204	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0373-01
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:13:49
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	48859	1	Standard
	Cl	**37**		ug/L			4398521	4447919	3	Standard
>	**Sc**	**45**		ug/L			973163	1115768	1	Standard
	Cr	**52**	**0.065**	ug/L	0.013	19	12991	16616	0	Standard
	Cr	**53**	**0.217**	ug/L	0.021	9	432	1128	5	Standard
	Mn	**55**	**69.987**	ug/L	0.653	0	589	2507953	2	Standard
>	**Ge**	**72**		ug/L			85811	89129	2	KED
	Ni	**60**	**-0.033**	ug/L	0.003	10	126	60	14	KED
	Ni	**62**	**-0.043**	ug/L	0.022	49	26	12	59	KED
	Cu	**63**	**0.016**	ug/L	0.003	15	110	213	9	KED
	Cu	**65**	**0.012**	ug/L	0.007	59	64	103	21	KED
	Zn	**66**	**0.309**	ug/L	0.023	7	311	568	5	KED
	Zn	**67**	**1.034**	ug/L	0.262	25	36	174	20	KED
	As	**75**	**0.118**	ug/L	0.014	11	4	50	8	KED
	Y	**89**		ug/L			443918	486832	1	Standard
	Kr	**83**		ug/L			121	122	28	Standard
>	**In-1**	**115**		ug/L			20884	22230	0	KED
	Mo	**98**	**0.425**	ug/L	0.012	2	9	802	2	KED
	Cd	**111**	**-0.004**	ug/L	0.002	63	3	1	50	KED
	Cd	**114**	**-0.002**	ug/L	0.003	155	5	4	77	KED
>	**Tb**	**159**		ug/L			2689662	2846327	0	Standard
	Pb	**208**	**0.001**	ug/L	0.000	31	744	891	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0373-03
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:17:46
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	55341	1	Standard
	Cl	**37**		ug/L			4398521	4307260	1	Standard
>	**Sc**	**45**		ug/L			973163	1115228	3	Standard
	Cr	**52**	**0.784**	ug/L	0.046	5	12991	35504	0	Standard
	Cr	**53**	**0.938**	ug/L	0.023	2	432	3226	3	Standard
	Mn	**55**	**274.665**	ug/L	7.629	2	589	9829259	1	Standard
>	**Ge**	**72**		ug/L			85811	89788	1	KED
	Ni	**60**	**1.107**	ug/L	0.065	5	126	2537	4	KED
	Ni	**62**	**1.149**	ug/L	0.085	7	26	423	6	KED
	Cu	**63**	**1.504**	ug/L	0.033	2	110	9478	1	KED
	Cu	**65**	**1.546**	ug/L	0.039	2	64	4939	3	KED
	Zn	**66**	**3.983**	ug/L	0.030	0	311	3509	1	KED
	Zn	**67**	**4.712**	ug/L	0.233	4	36	666	3	KED
	As	**75**	**2.963**	ug/L	0.012	0	4	1154	1	KED
	Y	**89**		ug/L			443918	494524	3	Standard
	Kr	**83**		ug/L			121	132	9	Standard
>	**In-1**	**115**		ug/L			20884	21880	1	KED
	Mo	**98**	**0.407**	ug/L	0.027	6	9	756	5	KED
	Cd	**111**	**0.018**	ug/L	0.006	36	3	10	24	KED
	Cd	**114**	**0.018**	ug/L	0.001	7	5	24	4	KED
>	**Tb**	**159**		ug/L			2689662	2910238	1	Standard
	Pb	**208**	**1.639**	ug/L	0.035	2	744	223232	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21H0049-01
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:22:07
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	52184	2	Standard
	Cl	37		ug/L			4398521	7824529	3	Standard
>	Sc	45		ug/L			973163	1051219	0	Standard
	Cr	52	1.794	ug/L	0.017	0	12991	58555	1	Standard
	Cr	53	7.760	ug/L	0.094	1	432	21756	1	Standard
	Mn	55	10.065	ug/L	0.202	2	589	340312	2	Standard
>	Ge	72		ug/L			85811	86536	0	KED
	Ni	60	0.733	ug/L	0.044	6	126	1662	4	KED
	Ni	62	0.746	ug/L	0.100	13	26	274	12	KED
	Cu	63	1.449	ug/L	0.017	1	110	8806	0	KED
	Cu	65	1.507	ug/L	0.028	1	64	4643	1	KED
	Zn	66	6.137	ug/L	0.172	2	311	5042	2	KED
	Zn	67	7.208	ug/L	0.275	3	36	963	4	KED
	As	75	7.174	ug/L	0.069	0	4	2688	0	KED
	Y	89		ug/L			443918	475678	1	Standard
	Kr	83		ug/L			121	125	7	Standard
>	In-1	115		ug/L			20884	21242	0	KED
	Mo	98	23.265	ug/L	0.206	0	9	41499	0	KED
	Cd	111	0.028	ug/L	0.006	21	3	13	17	KED
	Cd	114	0.010	ug/L	0.005	48	5	15	29	KED
>	Tb	159		ug/L			2689662	2793789	0	Standard
	Pb	208	0.255	ug/L	0.001	0	744	33980	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21H0057-01
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:26:29
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	311988	2	Standard
	Cl	37		ug/L			4398521	4523914	1	Standard
>	Sc	45		ug/L			973163	931863	1	Standard
	Cr	52	2.973	ug/L	0.064	2	12991	77863	2	Standard
	Cr	53	2.487	ug/L	0.080	3	432	6460	2	Standard
	Mn	55	141.865	ug/L	0.858	0	589	4244637	0	Standard
>	Ge	72		ug/L			85811	79605	1	KED
	Ni	60	10.266	ug/L	0.242	2	126	19892	0	KED
	Ni	62	10.698	ug/L	0.333	3	26	3294	1	KED
	Cu	63	2.502	ug/L	0.062	2	110	13913	1	KED
	Cu	65	2.448	ug/L	0.070	2	64	6900	1	KED
	Zn	66	7.324	ug/L	0.109	1	311	5479	0	KED
	Zn	67	10.382	ug/L	0.197	1	36	1261	0	KED
	As	75	0.195	ug/L	0.018	9	4	71	8	KED
	Y	89		ug/L			443918	455160	0	Standard
	Kr	83		ug/L			121	127	5	Standard
>	In-1	115		ug/L			20884	18744	0	KED
	Mo	98	2.861	ug/L	0.025	0	9	4510	1	KED
	Cd	111	0.058	ug/L	0.019	32	3	22	28	KED
	Cd	114	0.043	ug/L	0.003	7	5	43	6	KED
>	Tb	159		ug/L			2689662	2699962	0	Standard
	Pb	208	0.024	ug/L	0.001	4	744	3764	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL8
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:33:11
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	27946	4	Standard
	Cl	**37**		ug/L			4398521	5100896	2	Standard
>	**Sc**	**45**		ug/L			973163	999818	0	Standard
	Cr	**52**	**0.081**	ug/L	0.008	9	12991	15270	1	Standard
	Cr	**53**	**-0.065**	ug/L	0.003	5	432	273	2	Standard
	Mn	**55**	**0.001**	ug/L	0.002	145	589	648	9	Standard
>	**Ge**	**72**		ug/L			85811	89978	0	KED
	Ni	**60**	**-0.040**	ug/L	0.005	13	126	46	24	KED
	Ni	**62**	**-0.057**	ug/L	0.015	25	26	7	66	KED
	Cu	**63**	**-0.001**	ug/L	0.003	207	110	107	16	KED
	Cu	**65**	**-0.005**	ug/L	0.003	56	64	52	15	KED
	Zn	**66**	**-0.047**	ug/L	0.035	75	311	288	10	KED
	Zn	**67**	**0.044**	ug/L	0.051	115	36	43	15	KED
	As	**75**	**-0.009**	ug/L	0.002	21	4	1	57	KED
	Y	**89**		ug/L			443918	479999	1	Standard
	Kr	**83**		ug/L			121	99	22	Standard
>	**In-1**	**115**		ug/L			20884	21381	2	KED
	Mo	**98**	**-0.002**	ug/L	0.001	50	9	5	36	KED
	Cd	**111**	**0.001**	ug/L	0.006	461	3	3	66	KED
	Cd	**114**	**-0.003**	ug/L	0.001	35	5	2	34	KED
>	**Tb**	**159**		ug/L			2689662	2865691	2	Standard
	Pb	**208**	**0.000**	ug/L	0.001	275	744	826	11	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV7
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:37:33
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	25565	0	Standard
	Cl	**37**		ug/L			4398521	4885758	0	Standard
>	**Sc**	**45**		ug/L			973163	1000292	0	Standard
	Cr	**52**	**47.058**	ug/L	0.271	0	12991	1124719	0	Standard
	Cr	**53**	**49.121**	ug/L	0.970	1	432	128675	2	Standard
	Mn	**55**	**49.182**	ug/L	0.706	1	589	1580081	1	Standard
>	**Ge**	**72**		ug/L			85811	89548	0	KED
	Ni	**60**	**47.272**	ug/L	0.768	1	126	102582	1	KED
	Ni	**62**	**47.045**	ug/L	0.854	1	26	16212	1	KED
	Cu	**63**	**47.858**	ug/L	0.197	0	110	297310	0	KED
	Cu	**65**	**47.437**	ug/L	0.546	1	64	149217	0	KED
	Zn	**66**	**50.677**	ug/L	0.199	0	311	40731	0	KED
	Zn	**67**	**48.909**	ug/L	1.343	2	36	6543	2	KED
	As	**75**	**48.778**	ug/L	0.519	1	4	18888	0	KED
	Y	**89**		ug/L			443918	491695	1	Standard
	Kr	**83**		ug/L			121	111	10	Standard
>	**In-1**	**115**		ug/L			20884	21304	0	KED
	Mo	**98**	**47.691**	ug/L	0.405	0	9	85309	0	KED
	Cd	**111**	**50.304**	ug/L	1.070	2	3	19606	1	KED
	Cd	**114**	**49.566**	ug/L	0.350	0	5	50271	0	KED
>	**Tb**	**159**		ug/L			2689662	2919107	1	Standard
	Pb	**208**	**50.110**	ug/L	0.741	1	744	6821189	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB7
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:44:15
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	24203	2	Standard
	Cl	**37**		ug/L			4398521	4868796	1	Standard
>	**Sc**	**45**		ug/L			973163	991893	1	Standard
	Cr	**52**	**0.001**	ug/L	0.008	1408	12991	13255	2	Standard
	Cr	**53**	**-0.088**	ug/L	0.004	4	432	213	5	Standard
	Mn	**55**	**0.002**	ug/L	0.001	58	589	662	5	Standard
>	**Ge**	**72**		ug/L			85811	90100	1	KED
	Ni	**60**	**-0.003**	ug/L	0.008	239	126	126	12	KED
	Ni	**62**	**-0.002**	ug/L	0.016	880	26	26	18	KED
	Cu	**63**	**0.002**	ug/L	0.002	117	110	125	10	KED
	Cu	**65**	**0.001**	ug/L	0.001	114	64	69	5	KED
	Zn	**66**	**-0.013**	ug/L	0.038	288	311	316	10	KED
	Zn	**67**	**0.086**	ug/L	0.039	45	36	49	10	KED
	As	**75**	**0.000**	ug/L	0.001	435	4	4	10	KED
	Y	**89**		ug/L			443918	481940	0	Standard
	Kr	**83**		ug/L			121	126	10	Standard
>	**In-1**	**115**		ug/L			20884	21485	1	KED
	Mo	**98**	**0.002**	ug/L	0.000	20	9	13	7	KED
	Cd	**111**	**-0.000**	ug/L	0.006	2172	3	3	75	KED
	Cd	**114**	**0.000**	ug/L	0.004	1772	5	6	72	KED
>	**Tb**	**159**		ug/L			2689662	2852465	1	Standard
	Pb	**208**	**0.001**	ug/L	0.000	12	744	876	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: RINSE
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:48:12
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	43319	1	Standard
	Cl	**37**		ug/L			4398521	5119567	2	Standard
>	**Sc**	**45**		ug/L			973163	1139924	0	Standard
	Cr	**52**	**0.093**	ug/L	0.015	16	12991	17728	2	Standard
	Cr	**53**	**-0.041**	ug/L	0.007	17	432	384	5	Standard
	Mn	**55**	**0.103**	ug/L	0.001	1	589	4455	1	Standard
>	**Ge**	**72**		ug/L			85811	94590	0	KED
	Ni	**60**	**0.142**	ug/L	0.026	18	126	465	12	KED
	Ni	**62**	**0.127**	ug/L	0.009	7	26	74	5	KED
	Cu	**63**	**0.125**	ug/L	0.016	12	110	944	10	KED
	Cu	**65**	**0.123**	ug/L	0.005	4	64	480	3	KED
	Zn	**66**	**1.440**	ug/L	0.015	1	311	1555	1	KED
	Zn	**67**	**1.546**	ug/L	0.093	6	36	257	5	KED
	As	**75**	**-0.003**	ug/L	0.001	41	4	3	15	KED
	Y	**89**		ug/L			443918	550739	0	Standard
	Kr	**83**		ug/L			121	126	13	Standard
>	**In-1**	**115**		ug/L			20884	23861	0	KED
	Mo	**98**	**0.005**	ug/L	0.003	68	9	20	34	KED
	Cd	**111**	**-0.002**	ug/L	0.000	1	3	2	0	KED
	Cd	**114**	**-0.003**	ug/L	0.002	81	5	3	82	KED
>	**Tb**	**159**		ug/L			2689662	3158283	2	Standard
	Pb	**208**	**0.052**	ug/L	0.001	2	744	8510	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: RINSE
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:52:10
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	44082	3	Standard
	Cl	**37**		ug/L			4398521	5122863	0	Standard
>	**Sc**	**45**		ug/L			973163	1119646	0	Standard
	Cr	**52**	**0.107**	ug/L	0.020	18	12991	17782	3	Standard
	Cr	**53**	**-0.051**	ug/L	0.007	14	432	350	6	Standard
	Mn	**55**	**0.107**	ug/L	0.001	0	589	4509	1	Standard
>	**Ge**	**72**		ug/L			85811	95459	0	KED
	Ni	**60**	**0.146**	ug/L	0.009	6	126	478	4	KED
	Ni	**62**	**0.143**	ug/L	0.033	23	26	81	15	KED
	Cu	**63**	**0.127**	ug/L	0.006	4	110	964	3	KED
	Cu	**65**	**0.121**	ug/L	0.017	14	64	477	11	KED
	Zn	**66**	**1.580**	ug/L	0.131	8	311	1688	6	KED
	Zn	**67**	**1.584**	ug/L	0.141	8	36	264	6	KED
	As	**75**	**-0.000**	ug/L	0.002	4952	4	4	20	KED
	Y	**89**		ug/L			443918	546185	0	Standard
	Kr	**83**		ug/L			121	131	3	Standard
>	**In-1**	**115**		ug/L			20884	23950	2	KED
	Mo	**98**	**0.004**	ug/L	0.003	58	9	19	25	KED
	Cd	**111**	**-0.000**	ug/L	0.003	918	3	3	41	KED
	Cd	**114**	**-0.002**	ug/L	0.004	193	5	3	117	KED
>	**Tb**	**159**		ug/L			2689662	3184532	1	Standard
	Pb	**208**	**0.052**	ug/L	0.001	2	744	8566	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: RINSE
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:56:08
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	43786	2	Standard
	Cl	**37**		ug/L			4398521	5063830	2	Standard
>	**Sc**	**45**		ug/L			973163	1138202	0	Standard
	Cr	**52**	**0.088**	ug/L	0.001	1	12991	17548	0	Standard
	Cr	**53**	**-0.048**	ug/L	0.006	13	432	363	5	Standard
	Mn	**55**	**0.105**	ug/L	0.001	1	589	4535	0	Standard
>	**Ge**	**72**		ug/L			85811	95868	2	KED
	Ni	**60**	**0.131**	ug/L	0.014	10	126	445	6	KED
	Ni	**62**	**0.096**	ug/L	0.054	56	26	64	29	KED
	Cu	**63**	**0.120**	ug/L	0.006	5	110	919	2	KED
	Cu	**65**	**0.124**	ug/L	0.013	10	64	487	7	KED
	Zn	**66**	**1.535**	ug/L	0.103	6	311	1658	6	KED
	Zn	**67**	**1.428**	ug/L	0.073	5	36	243	4	KED
	As	**75**	**-0.003**	ug/L	0.005	173	4	3	61	KED
	Y	**89**		ug/L			443918	549125	2	Standard
	Kr	**83**		ug/L			121	144	2	Standard
>	**In-1**	**115**		ug/L			20884	23737	0	KED
	Mo	**98**	**0.000**	ug/L	0.002	506	9	11	32	KED
	Cd	**111**	**0.003**	ug/L	0.002	82	3	4	20	KED
	Cd	**114**	**-0.003**	ug/L	0.001	44	5	2	60	KED
>	**Tb**	**159**		ug/L			2689662	3207692	1	Standard
	Pb	**208**	**0.050**	ug/L	0.001	1	744	8356	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: DI
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 21:00:05
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	25564	1	Standard
	Cl	**37**		ug/L			4398521	4770931	3	Standard
>	**Sc**	**45**		ug/L			973163	956644	0	Standard
	Cr	**52**	**-0.011**	ug/L	0.011	99	12991	12524	1	Standard
	Cr	**53**	**-0.090**	ug/L	0.006	7	432	199	7	Standard
	Mn	**55**	**-0.011**	ug/L	0.001	7	589	242	9	Standard
>	**Ge**	**72**		ug/L			85811	90468	1	KED
	Ni	**60**	**-0.057**	ug/L	0.001	1	126	9	20	KED
	Ni	**62**	**-0.064**	ug/L	0.003	5	26	5	21	KED
	Cu	**63**	**-0.008**	ug/L	0.003	45	110	69	29	KED
	Cu	**65**	**-0.011**	ug/L	0.004	37	64	34	36	KED
	Zn	**66**	**-0.320**	ug/L	0.020	6	311	70	23	KED
	Zn	**67**	**-0.203**	ug/L	0.046	22	36	10	56	KED
	As	**75**	**-0.003**	ug/L	0.002	91	4	3	27	KED
	Y	**89**		ug/L			443918	465029	2	Standard
	Kr	**83**		ug/L			121	139	9	Standard
>	**In-1**	**115**		ug/L			20884	21719	1	KED
	Mo	**98**	**-0.003**	ug/L	0.003	98	9	4	108	KED
	Cd	**111**	**-0.002**	ug/L	0.006	319	3	2	94	KED
	Cd	**114**	**-0.003**	ug/L	0.001	43	5	3	39	KED
>	**Tb**	**159**		ug/L			2689662	2769572	1	Standard
	Pb	**208**	**-0.003**	ug/L	0.000	2	744	328	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: DI
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 21:04:03
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	26080	2	Standard
	Cl	**37**		ug/L			4398521	4717362	1	Standard
>	**Sc**	**45**		ug/L			973163	957125	1	Standard
	Cr	**52**	**0.012**	ug/L	0.005	42	12991	13057	0	Standard
	Cr	**53**	**-0.091**	ug/L	0.006	6	432	198	6	Standard
	Mn	**55**	**-0.010**	ug/L	0.000	3	589	284	4	Standard
>	**Ge**	**72**		ug/L			85811	89550	0	KED
	Ni	**60**	**-0.057**	ug/L	0.002	2	126	9	34	KED
	Ni	**62**	**-0.066**	ug/L	0.012	17	26	4	89	KED
	Cu	**63**	**-0.008**	ug/L	0.001	13	110	62	10	KED
	Cu	**65**	**-0.009**	ug/L	0.004	40	64	39	29	KED
	Zn	**66**	**-0.340**	ug/L	0.016	4	311	53	24	KED
	Zn	**67**	**-0.203**	ug/L	0.030	15	36	10	36	KED
	As	**75**	**-0.007**	ug/L	0.002	25	4	1	41	KED
	Y	**89**		ug/L			443918	467065	2	Standard
	Kr	**83**		ug/L			121	107	12	Standard
>	**In-1**	**115**		ug/L			20884	21489	1	KED
	Mo	**98**	**-0.003**	ug/L	0.001	35	9	3	57	KED
	Cd	**111**	**-0.000**	ug/L	0.006	2506	3	3	69	KED
	Cd	**114**	**-0.003**	ug/L	0.002	64	5	2	92	KED
>	**Tb**	**159**		ug/L			2689662	2802536	0	Standard
	Pb	**208**	**-0.004**	ug/L	0.000	5	744	303	7	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: DI
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 21:08:01
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	25823	0	Standard
	Cl	**37**		ug/L			4398521	4753302	3	Standard
>	**Sc**	**45**		ug/L			973163	950976	0	Standard
	Cr	**52**	**0.007**	ug/L	0.004	54	12991	12847	0	Standard
	Cr	**53**	**-0.097**	ug/L	0.002	2	432	182	3	Standard
	Mn	**55**	**-0.010**	ug/L	0.000	3	589	257	5	Standard
>	**Ge**	**72**		ug/L			85811	89390	2	KED
	Ni	**60**	**-0.054**	ug/L	0.004	6	126	14	49	KED
	Ni	**62**	**-0.066**	ug/L	0.003	5	26	4	24	KED
	Cu	**63**	**-0.007**	ug/L	0.002	24	110	70	15	KED
	Cu	**65**	**-0.009**	ug/L	0.004	41	64	38	31	KED
	Zn	**66**	**-0.337**	ug/L	0.024	7	311	55	34	KED
	Zn	**67**	**-0.236**	ug/L	0.020	8	36	6	45	KED
	As	**75**	**-0.005**	ug/L	0.003	71	4	2	44	KED
	Y	**89**		ug/L			443918	462254	1	Standard
	Kr	**83**		ug/L			121	109	13	Standard
>	**In-1**	**115**		ug/L			20884	20811	0	KED
	Mo	**98**	**-0.003**	ug/L	0.003	90	9	3	151	KED
	Cd	**111**	**-0.002**	ug/L	0.004	152	3	2	65	KED
	Cd	**114**	**-0.002**	ug/L	0.004	201	5	3	99	KED
>	**Tb**	**159**		ug/L			2689662	2751184	1	Standard
	Pb	**208**	**-0.004**	ug/L	0.000	2	744	253	7	Standard

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICPMS1
Calibration: EH00022
Control Limt: +/- 10.00%
Sequence: SJH0114

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SJH0114-ICV1	Lead-208	50.000	47.6	95.3	ug/L	EPA 6020B
SJH0114-CCV1	Lead-208	50.000	50.5	101	ug/L	EPA 6020B
SJH0114-CCV2	Lead-208	50.000	48.8	97.5	ug/L	EPA 6020B
SJH0114-CCV3	Lead-208	50.000	48.9	97.8	ug/L	EPA 6020B
SJH0114-CCV4	Lead-208	50.000	49.0	97.9	ug/L	EPA 6020B
SJH0114-CCV5	Lead-208	50.000	49.0	97.9	ug/L	EPA 6020B
SJH0114-CCV6	Lead-208	50.000	48.6	97.1	ug/L	EPA 6020B
SJH0114-CCV7	Lead-208	50.000	50.1	100	ug/L	EPA 6020B

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INSTRUMENT BLANKS
EPA 6020B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICPMS1
Calibration: EH00022
Sequence: SJH0114
Date Analyzed: 08/09/21 14:33

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SJH0114-IBL1	Lead-208	0.00400	0.0513	0.100	ug/L	
SJH0114-ICB1	Lead-208	0.00100	0.0513	0.100	ug/L	
SJH0114-CCB1	Lead-208	0.00200	0.0513	0.100	ug/L	
SJH0114-IBL2	Lead-208	0.0110	0.0513	0.100	ug/L	
SJH0114-IBL3	Lead-208	0.00700	0.0513	0.100	ug/L	
SJH0114-CCB2	Lead-208	0.00400	0.0513	0.100	ug/L	
SJH0114-IBL4	Lead-208	0.00300	0.0513	0.100	ug/L	
SJH0114-IBL5	Lead-208	0.00200	0.0513	0.100	ug/L	
SJH0114-CCB3	Lead-208	0.00500	0.0513	0.100	ug/L	
SJH0114-CCB4	Lead-208	0.00	0.0513	0.100	ug/L	
SJH0114-IBL6	Lead-208	0.00700	0.0513	0.100	ug/L	
SJH0114-CCB5	Lead-208	0.00200	0.0513	0.100	ug/L	
SJH0114-IBL7	Lead-208	-0.00100	0.0513	0.100	ug/L	
SJH0114-CCB6	Lead-208	0.00100	0.0513	0.100	ug/L	
SJH0114-IBL8	Lead-208	0.00	0.0513	0.100	ug/L	
SJH0114-CCB7	Lead-208	0.00100	0.0513	0.100	ug/L	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0114	Instrument:	ICPMS1
		Calibration:	EH00022

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
CAL 0	SJH0114-CAL1	XDT_m1210809-006	NA	08/09/21 13:58
CAL 1 - LOW CHECK	SJH0114-CAL2	XDT_m1210809-007	NA	08/09/21 14:03
CAL 2	SJH0114-CAL3	XDT_m1210809-008	NA	08/09/21 14:08
CAL 3	SJH0114-CAL4	XDT_m1210809-009	NA	08/09/21 14:13
CAL 4	SJH0114-CAL5	XDT_m1210809-010	NA	08/09/21 14:18
CAL 5	SJH0114-CAL6	XDT_m1210809-011	NA	08/09/21 14:25
RINSE	SJH0114-IBL1	XDT_m1210809-012	NA	08/09/21 14:33
Initial Cal Check	SJH0114-ICV1	XDT_m1210809-014	NA	08/09/21 14:49
Initial Cal Blank	SJH0114-ICB1	XDT_m1210809-015	NA	08/09/21 14:56
Calibration Check	SJH0114-CCV1	XDT_m1210809-016	NA	08/09/21 15:01
Calibration Blank	SJH0114-CCB1	XDT_m1210809-017	NA	08/09/21 15:09
Instrument RL Check	SJH0114-CRL1	XDT_m1210809-018	NA	08/09/21 15:18
Interference Check A	SJH0114-IFA1	XDT_m1210809-019	NA	08/09/21 15:23
Interference Check B	SJH0114-IFB1	XDT_m1210809-020	NA	08/09/21 15:28
LR200	SJH0114-HCV1	XDT_m1210809-021	NA	08/09/21 15:39
LR300	SJH0114-HCV2	XDT_m1210809-022	NA	08/09/21 15:43
Instrument Blank	SJH0114-IBL2	XDT_m1210809-023	NA	08/09/21 15:51
Instrument Blank	SJH0114-IBL3	XDT_m1210809-024	NA	08/09/21 15:58
Calibration Check	SJH0114-CCV2	XDT_m1210809-025	NA	08/09/21 16:08
Calibration Blank	SJH0114-CCB2	XDT_m1210809-026	NA	08/09/21 16:15
ZZZZZ	BJH0215-BS1	XDT_m1210809-028	Water	08/09/21 16:26
ZZZZZ	BJH0215-BLK1	XDT_m1210809-029	Water	08/09/21 16:33
Instrument Blank	SJH0114-IBL4	XDT_m1210809-032	NA	08/09/21 16:55
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0114	Instrument:	ICPMS1
		Calibration:	EH00022

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
Instrument Blank	SJH0114-IBL5	XDT_m1210809-036	NA	08/09/21 17:27
Calibration Check	SJH0114-CCV3	XDT_m1210809-037	NA	08/09/21 17:33
Calibration Blank	SJH0114-CCB3	XDT_m1210809-038	NA	08/09/21 17:40
Calibration Check	SJH0114-CCV4	XDT_m1210809-040	NA	08/09/21 17:55
Calibration Blank	SJH0114-CCB4	XDT_m1210809-041	NA	08/09/21 18:01
Blank	BJH0134-BLK1	XDT_m1210809-042	Solid	08/09/21 18:07
LCS	BJH0134-BS1	XDT_m1210809-043	Solid	08/09/21 18:11
LDW21-SS627	21G0286-04	XDT_m1210809-045	Solid	08/09/21 18:19
LDW21-SS625	21G0286-02	XDT_m1210809-046	Solid	08/09/21 18:23
LDW21-SS625	BJH0134-DUP1	XDT_m1210809-047	Solid	08/09/21 18:27
LDW21-SS625	BJH0134-DUP1	XDT_m1210809-047	Solid	08/09/21 18:27
LDW21-SS625	BJH0134-DUP1	XDT_m1210809-047	Solid	08/09/21 18:27
LDW21-SS625	BJH0134-MS1	XDT_m1210809-048	Solid	08/09/21 18:31
LDW21-SS625	BJH0134-MS1	XDT_m1210809-048	Solid	08/09/21 18:31
LDW21-SS625	BJH0134-MS1	XDT_m1210809-048	Solid	08/09/21 18:31
LDW21-SS625	BJH0134-MSD1	XDT_m1210809-049	Solid	08/09/21 18:35
LDW21-SS625	BJH0134-MSD1	XDT_m1210809-049	Solid	08/09/21 18:35
LDW21-SS625	BJH0134-MSD1	XDT_m1210809-049	Solid	08/09/21 18:35
LDW21-SS625	BJH0134-PS1	XDT_m1210809-050	Solid	08/09/21 18:39
LDW21-SS625	BJH0134-PS1	XDT_m1210809-050	Solid	08/09/21 18:39
LDW21-SS625	BJH0134-PS1	XDT_m1210809-050	Solid	08/09/21 18:39
Instrument Blank	SJH0114-IBL6	XDT_m1210809-051	NA	08/09/21 18:43
Calibration Check	SJH0114-CCV5	XDT_m1210809-052	NA	08/09/21 18:47
Calibration Blank	SJH0114-CCB5	XDT_m1210809-053	NA	08/09/21 18:54
Instrument Blank	SJH0114-IBL7	XDT_m1210809-063	NA	08/09/21 19:45
Calibration Check	SJH0114-CCV6	XDT_m1210809-064	NA	08/09/21 19:49
Calibration Blank	SJH0114-CCB6	XDT_m1210809-065	NA	08/09/21 19:56
Instrument Blank	SJH0114-IBL8	XDT_m1210809-072	NA	08/09/21 20:33

Analytical Resources, Incorporated
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ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0114	Instrument:	ICPMS1
		Calibration:	EH00022

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Calibration Check	SJH0114-CCV7	XDT_m1210809-073	NA	08/09/21 20:37
Calibration Blank	SJH0114-CCB7	XDT_m1210809-074	NA	08/09/21 20:44

Analytical Resources, Incorporated
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ICP INTERFERENCE CHECK SAMPLE

EPA 6020B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICPMS1
Calibration: EH00022
Sequence: SJH0114
Standard ID: J008098

Lab Sample ID	Analyte	True	Found	%R	Units
SJH0114-IFA1	Lead-208	0	0.0170		ug/L

* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.

Analytical Resources, Incorporated
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ICP INTERFERENCE CHECK SAMPLE

EPA 6020B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICPMS1
Calibration: EH00022
Sequence: SJH0114
Standard ID: J008098

Lab Sample ID	Analyte	True	Found	%R	Units
SJH0114-IFB1	Lead-208	0	0.0130		ug/L

* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.

Analytical Resources, Incorporated
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DETECTION LEVEL STANDARD
EPA 6020B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICPMS1
Calibration: EH00022
Sequence: SJH0114
Lab Sample ID: SJH0114-CRL1

Analyte	True	Found	%R	Units	QC Limts
Lead-208	0.10000	0.0990	99.0	ug/L	50 - 150

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HIGH-CONCENTRATION CALIBRATION VERIFICATION

EPA 6020B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Calibration: EH00022
Laboratory ID: SJH0114-HCV1
Sequence: SJH0114
Standard ID: J007549

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Lead-208	200.00	194	-3.2	10.00

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HIGH-CONCENTRATION CALIBRATION VERIFICATION

EPA 6020B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Calibration: EH00022
Laboratory ID: SJH0114-HCV2
Sequence: SJH0114
Standard ID: J007893

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Lead-208	300.00	289	-3.8	10.00

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HOLDING TIME SUMMARY

Analysis: EPA 6020B

Laboratory: Analytical Resources, Inc. SDG: 21G0286

Client: Anchor QEA, LLC Project: Lower Duwamish AOC4

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LDW21-SS625 21G0286-02	07/22/21 07:50	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:23	18	180	
LDW21-SS627 21G0286-04	07/22/21 08:10	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:19	18	180	
Duplicate BJH0134-DUP1	07/22/21 07:50	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:27	18	180	
Matrix Spike BJH0134-MS1	07/22/21 07:50	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:31	18	180	
Matrix Spike Dup BJH0134-MSD1	07/22/21 07:50	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:35	18	180	
Post Spike BJH0134-PS1	07/22/21 07:50	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:39	18	180	

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

EPA 6020B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument: ICPMS1

Analyte	MDL	RL	Units
Lead-208	0.05	0.10	mg/kg

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

EPA 6020B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Water
Instrument: ICPMS1

Analyte	MDL	RL	Units
Lead-208	0.0513	0.100	ug/L

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGAG10
Lot Number:	P2-AG679501
Matrix:	7% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Silver
Starting Material:	Ag Shot
Starting Material Lot#:	2217
Starting Material Purity:	99.9993%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9996 ± 30 µg/mL

Density: 1.053 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10015 ± 56 µg/mL**
ICP Assay NIST SRM 3151 Lot Number: 160729

Assay Method #2 **9992 ± 25 µg/mL**
Volhard NIST SRM 999c Lot Number: 999c

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

s	Ag	<		M	Eu	<	0.000253	O	Na		0.005562	M	Se	<	0.018179	M	Zn		0.005799
O	Al		0.006295	O	Fe		0.002932	M	Nb	<	0.000253	M	Si		0.022484	M	Zr	<	0.005559
M	As	<	0.002403	M	Ga	<	0.000253	M	Nd	<	0.000253	M	Sm	<	0.000253				
M	Au		0.001634	M	Gd	<	0.000253	O	Ni	<	0.005472	M	Sn		0.001927				
O	B	<	0.009978	M	Ge	<	0.000754	M	Os	<	0.000254	O	Sr		0.000086				
M	Ba	<	0.000785	M	Hf	<	0.000253	M	P	<	0.053784	M	Ta	<	0.000253				
M	Be	<	0.002407	M	Hg	<	0.001332	M	Pb		0.003281	M	Tb	<	0.000253				
M	Bi		0.001671	M	Ho	<	0.000253	M	Pd	<	0.001382	M	Te	<	0.003715				
O	Ca		0.007115	M	In	<	0.003483	M	Pr	<	0.000253	M	Th	<	0.000253				
M	Cd	<	0.000253	M	Ir	<	0.000254	M	Pt	<	0.000253	M	Ti	<	0.002706				
M	Ce	<	0.000573	O	K		0.004010	M	Rb	<	0.000253	M	Tl	<	0.000253				
M	Co	<	0.000253	M	La	<	0.000253	M	Re	<	0.000253	M	Tm	<	0.000253				
O	Cr	<	0.005043	O	Li	<	0.000214	M	Rh	<	0.000253	M	U	<	0.000253				
M	Cs	<	0.002769	M	Lu	<	0.000253	M	Ru	<	0.000254	M	V	<	0.000822				
O	Cu		0.004614	O	Mg		0.001034	M	S	<	0.560935	M	W	<	0.002146				
M	Dy	<	0.000253	M	Mn	<	0.000253	M	Sb	<	0.006899	M	Y	<	0.000253				
M	Er	<	0.000253	M	Mo	<	0.000479	M	Sc	<	0.000733	M	Yb	<	0.000253				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 107.87 +1 6 $Ag(H_2O)_6^+$
Chemical Compatibility -Stable in HNO_3, and HF. Avoid basic media. Ag forms more insoluble salts than any other metal. It also is subject to photochemical reduction to the metal in HCl media although 10 µg/mL solutions in 10% HCl [$AgCl_{x1-x}$] are commonly used in the analytical laboratory. The most common solubility problems exist with arsenate, arsenite , bromide, chloride, iodide, carbonate , chromate, cyanide, iodate, oxalate, oxide, sulfate, sulfide, tartrate, and thiocyanate in aqueous media. The addition of nitric acid renders many of these salts soluble.
Stability - 2-100 ppb levels stable for 75+ days when mixed with equivalent levels of all other elements including the precious metals (where chloride is present) when in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3 / LDPE container.
Ag Containing Samples (Preparation and Solution) -Metal (Soluble in HNO_3); Oxides (Soluble in HNO_3); Ores (Digestion with conc. HNO_3).
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 107 amu	1 ppt	N/A	91Zr16O
ICP-OES 243.779 nm	0.12/0.01 µg/mL	1	Mn, Th, Ni, Rh
ICP-OES 328.068 nm	0.007/0.0007 µg/mL	1	Ce, Rh, V
ICP-OES 338.289 nm	0.013/0.001 µg/mL	1	Ce, Cr, Th

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

June 07, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **June 07, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGAS10
Lot Number:	R2-AS691113
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Arsenic
Starting Material:	As Pieces
Starting Material Lot#:	2208
Starting Material Purity:	99.9980%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9981 ± 55 µg/mL

Density: 1.028 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9981 ± 55 µg/mL**
ICP Assay NIST SRM 3103a Lot Number: 100818

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2 (u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001578	M	Eu	<	0.000526	O	Na		0.036136	M	Se	<	0.014204	O	Zn	<	0.003390
O	Al		0.006694	M	Fe		0.002633	O	Nb	<	0.011526	O	Si		0.139479	M	Zr	<	0.003156
s	As	<		M	Ga	<	0.000526	M	Nd	<	0.000526	M	Sm	<	0.000526				
M	Au	<	0.000526	M	Gd	<	0.000526	O	Ni	<	0.005537	M	Sn	<	0.001052				
M	B		0.017011	M	Ge	<	0.000526	M	Os	<	0.000526	M	Sr	<	0.000526				
M	Ba	<	0.000526	M	Hf	<	0.000526	O	P	<	0.056500	M	Ta	<	0.000526				
O	Be	<	0.001130	M	Hg	<	0.002104	M	Pb	<	0.000526	M	Tb	<	0.000526				
M	Bi	<	0.002104	M	Ho	<	0.000526	M	Pd	<	0.000526	M	Te	<	0.003682				
O	Ca		0.005657	M	In	<	0.000526	M	Pr	<	0.002630	M	Th	<	0.000526				
M	Cd	<	0.000526	M	Ir	<	0.000526	M	Pt	<	0.000526	O	Ti	<	0.001017				
M	Ce	<	0.000526	O	K		0.003865	M	Rb	<	0.002104	M	Tl	<	0.000526				
M	Co	<	0.003156	M	La	<	0.000526	M	Re	<	0.000526	M	Tm	<	0.000526				
M	Cr		0.000877	M	Li	<	0.000526	M	Rh	<	0.000526	M	U	<	0.000526				
M	Cs	<	0.002104	M	Lu	<	0.000526	M	Ru	<	0.000526	M	V	<	0.001578				
M	Cu	<	0.003156	O	Mg		0.000235	O	S	<	0.056500	M	W	<	0.000526				
M	Dy	<	0.000526	M	Mn	<	0.001052	M	Sb	<	0.000526	M	Y	<	0.000526				
M	Er	<	0.000526	M	Mo	<	0.000526	M	Sc	<	0.002104	M	Yb	<	0.000526				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 74.92 ; mix of +3 and +5 ; 6 ; H_3AsO_4 and $HAsO_2$

Chemical Compatibility - Arsenic has no cationic chemistry. It is soluble in HCl, HNO_3,H_3PO_4, H_2SO_4 and HF aqueous matrices water and NH_4OH . It is stable with most inorganic anions (forms arsenate when boiled with chromate) but many cationic metals form the insoluble arsenates under pH neutral conditions. When fluorinated and / or under acidic conditions arsenate formation is typically not a problem at moderate to low concentrations.

Stability - 2-100 ppb levels stable for months alone or mixed with other elements at equivalent levels in 1% HNO_3 / LDPE container.

As Containing Samples (Preparation and Solution) - Metal (soluble in 1:1 H_2O / HNO_3); Oxides (the oxide exists in crystalline and amorphous forms where the amorphic form is more water soluble. The oxides typically dissolve in dilute acidic solutions when boiled); Minerals (one gram of powered sample is fused in a Ni crucible with 10 grams of a 1:1 mix of K_2CO_3 and KNO_3 and the melt extracted with hot water); Organic Matrices (0.2 to 0.5 grams of sample are fused with 15 grams of a 1:1 Na_2CO_3 / Na_2O_2 mix in a Ni crucible. The fuseate is extracted with water and acidified with HNO_3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 75 amu	20 ppt	N/A	40Ar35Cl, 59Co16O, 36Ar38Ar1H,8Ar37Cl,Ar39K, 150Nd2+,150Sm2+
ICP-OES 189.042 nm	0.05/0.005 µg/mL	1	Cr
ICP-OES 193.696 nm	0.1/0.01 µg/mL	1	V, Ge
ICP-OES 228.812 nm	0.1/0.01 µg/mL	1	Cd, Pt, Ir, Co

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 25, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 25, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCD10
Lot Number:	P2-CD675954
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Cadmium
Starting Material:	Cd Shot
Starting Material Lot#:	1954
Starting Material Purity:	99.9998%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10014 ± 30 µg/mL

Density: 1.029 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10021 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #2 **10038 ± 43 µg/mL**
ICP Assay NIST SRM 3108 Lot Number: 130116

Assay Method #3 **9996 ± 30 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag		0.000834	O	Eu	<	0.002146	O	Na		0.003359	M	Se	<	0.003997	O	Zn		0.000251
O	Al		0.002435	O	Fe	<	0.001180	M	Nb	<	0.000399	O	Si		0.009519	M	Zr	<	0.000399
M	As	<	0.003997	M	Ga	<	0.000399	M	Nd	<	0.000399	M	Sm	<	0.000799				
M	Au	<	0.002809	M	Gd	<	0.000399	M	Ni	<	0.002398	M	Sn	<	0.000799				
M	B	<	0.005197	M	Ge	<	0.004397	M	Os	<	0.000401	O	Sr	<	0.000107				
M	Ba	<	0.000399	M	Hf	<	0.000399	O	P	<	0.023606	M	Ta	<	0.000399				
O	Be	<	0.000107	O	Hg	<	0.010730	M	Pb	<	0.001599	M	Tb	<	0.000399				
M	Bi	<	0.000399	M	Ho	<	0.000399	M	Pd	<	0.000799	M	Te	<	0.005596				
O	Ca		0.001399	O	In	<	0.015558	M	Pr	<	0.000399	M	Th	<	0.000399				
s	Cd	<		M	Ir	<	0.000401	M	Pt	<	0.000399	O	Ti	<	0.000536				
M	Ce	<	0.000399	O	K		0.004479	M	Rb	<	0.000399	M	Tl		0.000625				
M	Co	<	0.000399	M	La	<	0.000399	M	Re	<	0.000399	M	Tm	<	0.000399				
M	Cr	<	0.001199	O	Li	<	0.000214	M	Rh	<	0.000399	M	U	<	0.000399				
M	Cs	<	0.000399	M	Lu	<	0.000399	M	Ru	<	0.000401	M	V	<	0.001599				
O	Cu	<	0.003219	O	Mg		0.000083	O	S	<	0.021460	M	W	<	0.000799				
M	Dy	<	0.000399	O	Mn	<	0.000429	M	Sb	<	0.001599	M	Y	<	0.000399				
M	Er	<	0.000399	M	Mo	<	0.000399	O	Sc	<	0.000429	M	Yb	<	0.000399				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 112.41 +2 4 Cd2(OH) (aq)3+ and Cd(OH)(aq)
Chemical Compatibility -Stable in HCl, HNO3, H2SO4 , and HF. Avoid basic media forming insoluble carbonate and hydroxide.
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5 % HNO3 / LDPE container.
Cd Containing Samples (Preparation and Solution) -Metal (soluble in HNO3); Oxides (soluble in HCl or HNO3); Ores (dissolve in HCl /HNO3 then take to fumes with H2SO4. The silica and lead sulfate are filtered off after the addition of water); Organic based (dry ash at 450°C and dissolve ash in HCl), (sulfuric / peroxide acid digestion).
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 111 amu	11 ppt	n/a	95Mo16O
ICP-OES 214.438 nm	0.003 / 0.0003 µg/mL	1	Pt, Ir
ICP-OES 226.502 nm	0.003 / 0.0003 µg/mL	1	Ir
ICP-OES 228.802 nm	0.003 / 0.0003 µg/mL	1	Co, Ir, As, Pt

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 07, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 07, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCO10
Lot Number:	N2-CO671028
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Cobalt
Starting Material:	COBALT
Starting Material Lot#:	1749
Starting Material Purity:	99.9978%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9988 ± 34 µg/mL

Density: 1.057 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9973 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #2 **10024 ± 50 µg/mL**
ICP Assay NIST SRM traceable to 3113 Lot Number: M2-CO661665

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag		0.022956	M	Eu	<	0.000422	O	Na		0.008125	M	Se	<	0.009290	M	Zn		0.007197
O	Al		0.013621	O	Fe		0.048700	M	Nb	<	0.000422	O	Si		0.017539	M	Zr	<	0.014357
i	As	<		M	Ga	<	0.000844	M	Nd	<	0.017735	M	Sm	<	0.001689				
M	Au	<	0.000583	M	Gd		0.003247	O	Ni	<	0.043642	M	Sn	<	0.005067				
M	B	<	0.013512	M	Ge	<	0.004645	M	Os	<	0.000583	O	Sr		0.000841				
O	Ba		0.071210	M	Hf	<	0.000422	n	P	<		M	Ta	<	0.000422				
O	Be	<	0.001771	M	Hg	<	0.002334	M	Pb		0.010094	M	Tb	<	0.001689				
M	Bi		0.000614	M	Ho	<	0.000422	M	Pd	<	0.000422	M	Te	<	0.008445				
O	Ca		0.025034	M	In	<	0.003378	M	Pr	<	0.006756	M	Th	<	0.000422				
M	Cd	<	0.000844	M	Ir	<	0.000583	M	Pt	<	0.000422	M	Ti	<	0.002533				
M	Ce		0.002721	O	K		0.005785	M	Rb	<	0.001689	M	Tl	<	0.000422				
s	Co	<		M	La		0.000877	M	Re		0.016853	M	Tm	<	0.000422				
M	Cr	<	0.020269	O	Li		0.000262	M	Rh	<	0.000422	M	U	<	0.000422				
M	Cs		0.000877	M	Lu	<	0.000422	M	Ru	<	0.000583	M	V	<	0.001689				
M	Cu		0.007197	O	Mg		0.003444	n	S	<		M	W	<	0.000844				
M	Dy	<	0.000422	O	Mn	<	0.006072	M	Sb	<	0.005911	M	Y		0.001228				
M	Er	<	0.000422	M	Mo	<	0.005911	M	Sc	<	0.001689	M	Yb	<	0.003378				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 58.93 +2 6 Co(H2O)62+
Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.
Co Containing Samples (Preparation and Solution) - Metal (soluble in HNO3); Oxides (Soluble in HCl); Ores (dissolve in HCl / HNO3).
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 59 amu	2 ppt	n/a	42Ca16O1H , 40Ar18O1H , 36Ar23Na, 43Ca16O, 24Mg35Cl
ICP-OES 228.616 nm	0.01/0.001 µg/mL	1	
ICP-OES 237.862 nm	0.01/0.002 µg/mL	1	W, Re, Al, Ta
ICP-OES 238.892 nm	0.01/0.002 µg/mL	1	Fe, W, Ta

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 15, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 15, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCR(3)10
Lot Number:	P2-CR684202
Matrix:	10% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Chromium
Starting Material:	Cr METAL
Starting Material Lot#:	2077
Starting Material Purity:	99.9942%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10056 ± 49 µg/mL

Density: 1.084 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10061 ± 71 µg/mL**
ICP Assay NIST SRM 3112a Lot Number: 170630

Assay Method #2 **10052 ± 64 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000540	M	Eu	<	0.003200	O	Na		0.130027	M	Se	<	0.012000	O	Zn	<	0.002700
O	Al		0.016626	O	Fe		0.202502	M	Nb	<	0.022000	n	Si	<		M	Zr	<	0.020000
M	As		0.003836	O	Ga	<	0.031000	M	Nd	<	0.000540	M	Sm	<	0.035000				
M	Au	<	0.000540	M	Gd	<	0.000540	O	Ni		0.009165	M	Sn		0.004049				
M	B	<	0.049000	M	Ge	<	0.005400	M	Os	<	0.088000	O	Sr	<	0.000250				
O	Ba	<	0.002000	M	Hf	<	0.000540	i	P	<		M	Ta	<	0.000540				
O	Be	<	0.000250	M	Hg	<	0.001600	M	Pb		0.002557	M	Tb	<	0.000540				
M	Bi		0.008952	M	Ho	<	0.000540	M	Pd	<	0.001100	M	Te	<	0.004800				
O	Ca		0.074605	M	In	<	0.001100	M	Pr	<	0.000540	M	Th	<	0.000540				
M	Cd	<	0.000540	M	Ir	<	0.000540	M	Pt	<	0.000540	O	Ti		0.013428				
M	Ce	<	0.000540	O	K		0.034105	i	Rb	<		M	Tl	<	0.001100				
O	Co	<	0.002900	M	La	<	0.001100	M	Re	<	0.002700	O	Tm	<	0.001800				
s	Cr	<		O	Li	<	0.000130	M	Rh	<	0.032000	M	U	<	0.001100				
M	Cs	<	0.019000	M	Lu	<	0.000540	M	Ru	<	0.094000	O	V		0.159869				
O	Cu		0.010018	O	Mg		0.001449	i	S	<		M	W	<	0.028000				
M	Dy	<	0.000540	O	Mn	<	0.014000	M	Sb	<	0.008600	M	Y	<	0.001100				
M	Er	<	0.016000	O	Mo	<	0.013000	O	Sc	<	0.001400	M	Yb	<	0.000540				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 52.00 +3 6 Cr(H2O)63+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4, HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Cr3 Containing Samples (Preparation and Solution) -Metal (soluble in HCl); Oxides/Ores (Chrome ore/oxides are very difficult to dissolve. The following procedures [A-D] are commonly used: A. Fusion with KHSO4 and extraction with hot KCl. The residue fused with Na2CO3 and KClO3, 3:1. B. Fusion with NaKSO4 and NaF 2:1, C. Fusion with magnesia or lime and sodium or potassium carbonates, 4:1. D. Fusion with Na2O2 or NaOH and KNO3 or NaOH and Na2O2. Nickel, iron, copper, or silver crucibles should be used for D. Platinum may be used for A, B, C); Organic Matrices (ash at 4500C followed by one of the fusion methods above or sulfuric/hydrogen peroxide acid digestions may be applicable to non oxide containing samples).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 52 amu	40 ppt	N/A	36S16O, 36Ar16O - The 50Cr, 53Cr, 54Cr lines suffer from many more potential interferences from sulfur, chlorine and argon compounds of oxygen, nitrogen and carbon.
ICP-OES 205.552 nm	0.006/0.0008 µg/mL	1	Os
ICP-OES 276.654 nm	0.01/0.001 µg/mL	1	Cu, Ta, V
ICP-OES 284.325 nm	0.008/0.0007 µg/mL	1	

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

November 02, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **November 02, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

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fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCU10
Lot Number:	P2-CU682108
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Copper
Starting Material:	Cu Metal
Starting Material Lot#:	2095
Starting Material Purity:	99.9996%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10013 ± 30 µg/mL

Density: 1.032 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9977 ± 50 µg/mL**
ICP Assay NIST SRM 3114 Lot Number: 121207

Assay Method #2 **10024 ± 26 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10007 ± 46 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.007542	M	Eu	<	0.000942	O	Na		0.001434	M	Se	<	0.016971	M	Zn	<	0.005657
O	Al	<	0.000609	O	Fe		0.008700	M	Nb	<	0.000942	O	Si		0.003052	M	Zr	<	0.000942
M	As	<	0.010371	M	Ga	<	0.000942	M	Nd	<	0.000942	M	Sm	<	0.000942				
M	Au	<	0.001885	M	Gd	<	0.000942	M	Ni		0.003781	M	Sn	<	0.005657				
O	B		0.003663	M	Ge	<	0.005657	M	Os	<	0.000942	M	Sr	<	0.000942				
M	Ba		0.004253	M	Hf	<	0.000942	O	P	<	0.031668	M	Ta	<	0.000942				
M	Be	<	0.000942	O	Hg	<	0.007064	M	Pb		0.005789	M	Tb	<	0.000942				
M	Bi	<	0.000942	M	Ho	<	0.000942	M	Pd	<	0.000942	M	Te	<	0.004714				
O	Ca		0.002304	M	In	<	0.000942	M	Pr	<	0.000942	M	Th	<	0.000942				
M	Cd	<	0.000942	M	Ir	<	0.000942	M	Pt	<	0.000942	O	Ti	<	0.002801				
M	Ce	<	0.000942	O	K		0.000763	M	Rb	<	0.000942	M	Tl	<	0.000942				
M	Co		0.001890	M	La	<	0.000942	M	Re	<	0.000942	M	Tm	<	0.000942				
M	Cr	<	0.005657	O	Li	<	0.000243	i	Rh	<		M	U	<	0.000942				
M	Cs	<	0.000942	M	Lu	<	0.000942	M	Ru	<	0.039588	M	V	<	0.003771				
s	Cu	<		O	Mg		0.000320	O	S		0.007174	M	W	<	0.005657				
M	Dy	<	0.000942	O	Mn		0.000793	M	Sb	<	0.001885	M	Y	<	0.000942				
M	Er	<	0.000942	M	Mo	<	0.005657	M	Sc	<	0.000942	M	Yb	<	0.000942				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 63.55 +2 6 Cu(H2O)62+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4, HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Cu Containing Samples (Preparation and Solution) -Metal (soluble in HNO3); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 63 amu	10 ppt	n/a	40Ar23Na 47Ti16O, 14N12C37Cl, 16O12C35Cl, 23Na40Ca
ICP-OES 219.958 nm	0.01/.002 µg/mL	1	Th, Ta, Nb, U, Hf
ICP-OES 224.700 nm	0.01/.001 µg/mL	1	Pb, Ir, Ni, W
ICP-OES 324.754 nm	0.06/.001 µg/mL		Nb, U, Th, Mo, Hf

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 24, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **August 24, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGMN10
Lot Number:	P2-MN687536
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Manganese
Starting Material:	Mn Metal
Starting Material Lot#:	2275
Starting Material Purity:	99.9909%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10046 ± 30 µg/mL

Density: 1.035 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10045 ± 25 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #2 **10083 ± 68 µg/mL**
ICP Assay NIST SRM 3132 Lot Number: 050429

Assay Method #3 **10031 ± 47 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001500	M	Eu	<	0.000730	O	Na		0.176713	M	Se	<	0.006600	M	Zn		0.009960
O	Al		0.004337	M	Fe	<	0.650000	M	Nb	<	0.000730	O	Si		0.097995	M	Zr	<	0.000730
M	As	<	0.008000	M	Ga		0.004337	M	Nd	<	0.001500	M	Sm	<	0.000730				
M	Au	<	0.000730	M	Gd	<	0.000730	M	Ni		0.024097	M	Sn	<	0.002200				
M	B		0.069078	M	Ge	<	0.004400	M	Os	<	0.000730	O	Sr		0.000931				
M	Ba	<	0.001500	M	Hf	<	0.000730	i	P	<		M	Ta	<	0.000730				
M	Be	<	0.000730	M	Hg	<	0.002200	M	Pb		0.007389	M	Tb	<	0.000730				
M	Bi	<	0.003000	M	Ho	<	0.000730	M	Pd	<	0.000730	M	Te	<	0.019000				
O	Ca		0.062652	M	In	<	0.003000	M	Pr	<	0.000730	M	Th	<	0.000730				
M	Cd	<	0.001500	M	Ir	<	0.000730	M	Pt	<	0.000730	O	Ti	<	0.006500				
M	Ce	<	0.007300	O	K		0.006425	M	Rb	<	0.006600	M	Tl	<	0.000730				
O	Co		0.014779	M	La	<	0.003000	M	Re	<	0.000730	M	Tm	<	0.000730				
O	Cr		0.273102	O	Li		0.000417	M	Rh	<	0.003000	M	U	<	0.001500				
M	Cs	<	0.000730	M	Lu	<	0.000730	M	Ru	<	0.004400	M	V	<	0.000730				
O	Cu		0.007711	O	Mg		0.321297	i	S	<		M	W	<	0.004400				
M	Dy	<	0.001500	s	Mn	<		M	Sb	<	0.021000	O	Y		0.001365				
M	Er	<	0.001500	M	Mo		0.010281	O	Sc	<	0.004100	M	Yb	<	0.000730				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 54.94 +2 6 Mn(H2O)62+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5 % HNO3/LDPE container.

Mn Containing Samples (Preparation and Solution) -Metal (Soluble in dilute acids); Oxides (Soluble in dilute acids); Ores (Dissolve with HCl. If silica is present add HF and then fume off silica by adding H2SO4 and heat to SO3 fumes - dense white fumes).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 55 amu	10 ppt	n/a	40Ar14N1H,39K16O,37Cl18O,40Ar15N,38Ar17O,36Ar18O1H ,38Ar16O1H,37Cl17O1H,23Na32S
ICP-OES 257.610 nm	0.0014 / 0.00002 µg/mL	1	Ce, W, Re
ICP-OES 259.373 nm	0.0016 / 0.00002 µg/mL	1	U, Ta, Mo, Fe, Nb
ICP-OES 260.569 nm	0.0021 / 0.00002 µg/mL	1	Co

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 05, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 05, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGNI10
Lot Number:	P2-NI686384
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Nickel
Starting Material:	Ni Metal
Starting Material Lot#:	2277 and 2282
Starting Material Purity:	99.9992%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9979 ± 30 µg/mL

Density: 1.038 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9971 ± 54 µg/mL**
ICP Assay NIST SRM 3136 Lot Number: 120619

Assay Method #2 **9970 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **9993 ± 33 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag		0.002606	M	Eu	<	0.001100	O	Na		0.004965	O	Se	<	0.067000	M	Zn		0.006578
M	Al	<	0.013000	O	Fe		0.018618	M	Nb	<	0.001100	O	Si		0.010923	M	Zr	<	0.001100
O	As	<	0.067000	M	Ga	<	0.001100	M	Nd	<	0.001100	M	Sm	<	0.001100				
M	Au	<	0.002100	M	Gd	<	0.001100	s	Ni	<		M	Sn	<	0.016000				
M	B	<	0.017000	M	Ge	<	0.004200	M	Os		0.002110	O	Sr	<	0.000940				
M	Ba	<	0.001100	M	Hf	<	0.001100	i	P	<		M	Ta	<	0.001100				
O	Be	<	0.000410	M	Hg		0.014895	M	Pb		0.006578	M	Tb	<	0.001100				
M	Bi	<	0.004200	M	Ho	<	0.001100	M	Pd	<	0.001100	M	Te	<	0.015000				
O	Ca		0.003351	M	In	<	0.001100	M	Pr	<	0.001100	M	Th	<	0.001100				
M	Cd		0.001365	M	Ir		0.004716	M	Pt	<	0.001100	M	Ti	<	0.004200				
M	Ce	<	0.001100	O	K		0.004716	M	Rb	<	0.001100	M	Tl	<	0.001100				
O	Co		0.017377	M	La	<	0.001100	M	Re		0.001737	M	Tm	<	0.001100				
O	Cr	<	0.006700	O	Li	<	0.000140	M	Rh	<	0.006300	M	U	<	0.001100				
M	Cs	<	0.007300	M	Lu	<	0.001100	M	Ru	<	0.019000	M	V	<	0.002100				
M	Cu		0.004096	O	Mg		0.000372	i	S	<		M	W	<	0.006300				
M	Dy	<	0.001100	O	Mn	<	0.001900	M	Sb		0.005833	O	Y	<	0.000540				
M	Er	<	0.001100	M	Mo	<	0.008400	M	Sc	<	0.002100	M	Yb	<	0.001100				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 58.69 +2 6 Ni(H2O)62+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Ni Containing Samples (Preparation and Solution) -Metal (Soluble in HNO3); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 60 amu	100 ppt	n/a	43Ca16O1H , 44Ca16O, 23Na37Cl
ICP-OES 221.647 nm	0.01 / 0.0009 µg/mL	1	Si
ICP-OES 231.604 nm	0.02 / 0.002 µg/mL	1	Sb, Ta, Co
ICP-OES 232.003 nm	0.02 / 0.006 µg/mL	1	Cr, Re, Os, Nb, Ag, Pt, Fe

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

December 02, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **December 02, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

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300 Technology Drive
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGZN10
Lot Number:	P2-ZN686137
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Zinc
Starting Material:	Zn Shot
Starting Material Lot#:	2201
Starting Material Purity:	99.9993%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10040 ± 30 µg/mL

Density: 1.033 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10009 ± 54 µg/mL**
ICP Assay NIST SRM 3168a Lot Number: 120629

Assay Method #2 **10049 ± 33 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10041 ± 28 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.003057	M	Eu	<	0.000509	O	Na		0.001874	M	Se	<	0.023441	s	Zn	<	
O	Al	<	0.005720	O	Fe		0.006348	M	Nb	<	0.000509	O	Si	<	0.057200	M	Zr	<	0.000509
M	As	<	0.003057	M	Ga	<	0.007134	M	Nd	<	0.000509	M	Sm	<	0.000509				
M	Au	<	0.000510	M	Gd	<	0.000509	M	Ni	<	0.000509	M	Sn	<	0.000509				
O	B	<	0.017160	M	Ge	<	0.003057	M	Os	<	0.000510	M	Sr	<	0.000509				
M	Ba	<	0.000509	M	Hf	<	0.000509	O	P	<	0.057200	M	Ta	<	0.000509				
M	Be	<	0.000509	M	Hg	<	0.001021	O	Pb		0.023870	M	Tb	<	0.000509				
M	Bi	<	0.005095	M	Ho	<	0.000509	M	Pd	<	0.002038	M	Te	<	0.023441				
O	Ca		0.033793	M	In	<	0.000509	M	Pr	<	0.000509	M	Th	<	0.000509				
O	Cd		0.003924	M	Ir	<	0.000510	M	Pt	<	0.000509	M	Ti	<	0.000509				
M	Ce	<	0.000509	O	K		0.001499	M	Rb	<	0.002038	M	Tl	<	0.009172				
M	Co	<	0.000509	M	La	<	0.000509	M	Re	<	0.000509	M	Tm	<	0.000509				
O	Cr		0.001549	O	Li	<	0.000457	M	Rh	<	0.000509	M	U	<	0.000509				
M	Cs	<	0.000509	M	Lu	<	0.000509	M	Ru	<	0.006129	M	V	<	0.000509				
O	Cu	<	0.010296	O	Mg		0.000349	O	S	<	0.034320	M	W	<	0.001019				
M	Dy	<	0.000509	M	Mn	<	0.000509	M	Sb	<	0.001019	M	Y	<	0.000509				
M	Er	<	0.000509	M	Mo	<	0.000509	M	Sc	<	0.000509	M	Yb	<	0.000509				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 65.39 +2 4 Zn(OH)(aq)1+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media forming insoluble carbonate and hydroxide. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Zn Containing Samples (Preparation and Solution) -Metal (soluble in HNO3); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3); Organic based (dry ash at 4500C and dissolve ash in HCl) (sulfuric/peroxide acid digestion)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 66 amu	7 ppt	N/A	50Ti16O,50Cr16O, 50V16O, 34S16O2, 32S16O18O, 32S17O2, 33S16O17O, 32S34S, 33S2
ICP-OES 202.548 nm	0.004/0.0002 µg/mL	1	Nb, Cu, Co, Hf
ICP-OES 206.200 nm	0.006/0.0006 µg/mL	1	Sb, Ta, Bi, Os
ICP-OES 213.856 nm	0.002/0.0004 µg/mL	1	Ni, Cu, V

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

December 05, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **December 05, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

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ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGU1
Lot Number:	P2-U683975
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	1 000 µg/mL ea: Uranium
Starting Material:	Uranyl Nitrate
Starting Material Lot#:	1948
Starting Material Purity:	99.9985%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1001 ± 5 µg/mL

Density: 1.010 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **1001 ± 5 µg/mL**
ICP Assay NIST SRM 3164 Lot Number: 080521

Assay Method #2 **1002 ± 6 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Certified Abundance:

IV's Certified Abundance

Isotope	Atom %
Uranium 238U	99.8 ± 0.1
Uranium 235U	0.24 ± 0.05

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000103	M	Eu	<	0.000103	M	Na		0.020618	M	Se	<	0.001246	M	Zn	<	0.003533
M	Al	<	0.003740	M	Fe		0.001029	M	Nb	<	0.000207	M	Si	<	0.035027	M	Zr	<	0.000103
M	As	<	0.001143	M	Ga	<	0.001350	M	Nd	<	0.000623	M	Sm	<	0.000311				
M	Au	<	0.000207	M	Gd	<	0.000311	M	Ni	<	0.008313	M	Sn	<	0.007273				
M	B	<	0.005819	M	Ge	<	0.001974	M	Os	<	0.000103	M	Sr	<	0.001039				
M	Ba	<	0.002286	M	Hf	<	0.000103	i	P	<		M	Ta	<	0.000103				
M	Be	<	0.001350	M	Hg	<	0.000415	M	Pb	<	0.000103	M	Tb	<	0.000103				
M	Bi	<	0.000103	M	Ho	<	0.000103	M	Pd	<	0.000207	M	Te	<	0.006234				
M	Ca	<	0.010391	M	In	<	0.000103	M	Pr	<	0.000103	M	Th		0.010535				
M	Cd	<	0.000103	M	Ir	<	0.000103	M	Pt	<	0.000103	M	Ti	<	0.000207				
M	Ce	<	0.000103	M	K	<	0.041565	M	Rb	<	0.000519	M	Tl	<	0.000103				
M	Co	<	0.000415	M	La	<	0.001662	M	Re	<	0.000103	M	Tm	<	0.000103				
M	Cr	<	0.001870	M	Li	<	0.001662	M	Rh	<	0.000103	s	U	<					
M	Cs		0.000175	M	Lu	<	0.000103	M	Ru	<	0.000519	M	V	<	0.000207				
M	Cu		0.000792	M	Mg	<	0.002493	i	S	<		M	W	<	0.000103				
M	Dy	<	0.000103	M	Mn	<	0.001454	M	Sb	<	0.000103	M	Y	<	0.000103				
M	Er	<	0.000103	M	Mo	<	0.000415	M	Sc	<	0.006234	M	Yb	<	0.000103				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 238.03 +6 8 UO22+(uranyl)
Chemical Compatibility - Soluble in HCl and HNO3. Avoid H3PO4. H2SO4 and HF matrices should not be a problem depending upon [U]. Although the UO22+ ion is distinctly basic, any U+4 will precipitate in basic media. UO22+salts are generally soluble in water and UO22+ is stable with most metals and inorganic anions. The uranyl phosphate is insoluble in water. UF4 and UF6 are water soluble.
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO3 / LDPE container.
U Containing Samples (Preparation and Solution) -Metal (Dissolves rapidly in HCl and HNO3); Oxide (Soluble in HNO3); Ores (Digest for 1-2 hours with 1 gram of ore to 30 mL 1:1 HNO3. Silica insolubles are removed by filtration after bringing the sample to fumes with conc. H2SO4.)
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 238 amu	2 ppt	N/A	206Pb16O2
ICP-OES 263.553 nm	0.3 / 0.01 µg/mL	1	Ce, Ir, Th, Rh, W, Zr, Ta, Ti, V, Hf, Fe, Re, Ru
ICP-OES 367.007 nm	0.3 / 0.02 µg/mL	1	Th, Ce
ICP-OES 385.958 nm	0.3 / 0.01 µg/mL	1	Th, Fe

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 28, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 28, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Michael L Booth

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Paul R Gaines

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution

Catalog Number: AR-6020ICS-0A10

Lot Number: R2-MEB692465

Matrix: 1.4% (v/v) HNO3

Value / Analyte(s):

1 000 µg/mL ea:
Chloride,

200 µg/mL ea:
Carbon,

100 µg/mL ea:
Calcium, Aluminum,
Iron, Potassium,
Magnesium, Sodium,
Phosphorus, Sulfur,

2 µg/mL ea:
Titanium, Molybdenum

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	100.0 ± 0.3 µg/mL	Calcium, Ca	100.0 ± 0.5 µg/mL
Carbon, C	200.1 ± 0.5 µg/mL	Chloride, Cl	1 000 ± 5 µg/mL
Iron, Fe	100.0 ± 0.5 µg/mL	Magnesium, Mg	100.0 ± 0.5 µg/mL
Molybdenum, Mo	2.001 ± 0.012 µg/mL	Phosphorus, P	100.1 ± 0.6 µg/mL
Potassium, K	100.0 ± 0.5 µg/mL	Sodium, Na	100.0 ± 0.5 µg/mL
Sulfur, S	100.0 ± 0.5 µg/mL	Titanium, Ti	2.001 ± 0.017 µg/mL

Density: 1.007 g/mL (measured at 20 ± 4 ºC)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
C	Acidimetric	84L	84L
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Mo	ICP Assay	3134	130418
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L
S	Acidimetric	84L	84L
S	ICP Assay	traceable to 3154	M2-S657208
Ti	ICP Assay	3162a	130925

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

April 22, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 22, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

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ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGAG10
Lot Number:	P2-AG688237
Matrix:	7% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Silver
Starting Material:	Ag Shot
Starting Material Lot#:	2217
Starting Material Purity:	99.9993%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10004 ± 30 µg/mL

Density: 1.054 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9984 ± 32 µg/mL**
ICP Assay NIST SRM 3151 Lot Number: 160729

Assay Method #2 **10016 ± 26 µg/mL**
Volhard NIST SRM 999c Lot Number: 999c

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

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u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

s	Ag	<		M	Eu	<	0.000253	O	Na		0.005563	M	Se	<	0.018179	M	Zn		0.005800
O	Al		0.006296	O	Fe		0.002932	M	Nb	<	0.000253	M	Si		0.022487	M	Zr	<	0.005559
M	As	<	0.002403	M	Ga	<	0.000253	M	Nd	<	0.000253	M	Sm	<	0.000253				
M	Au		0.001635	M	Gd	<	0.000253	O	Ni	<	0.005472	M	Sn		0.001928				
O	B	<	0.009978	M	Ge	<	0.000754	M	Os	<	0.000254	O	Sr		0.000086				
M	Ba	<	0.000785	M	Hf	<	0.000253	M	P	<	0.053784	M	Ta	<	0.000253				
M	Be	<	0.002407	M	Hg	<	0.001332	M	Pb		0.003281	M	Tb	<	0.000253				
M	Bi		0.001671	M	Ho	<	0.000253	M	Pd	<	0.001382	M	Te	<	0.003715				
O	Ca		0.007116	M	In	<	0.003483	M	Pr	<	0.000253	M	Th	<	0.000253				
M	Cd	<	0.000253	M	Ir	<	0.000254	M	Pt	<	0.000253	M	Ti	<	0.002706				
M	Ce	<	0.000573	O	K		0.004010	M	Rb	<	0.000253	M	Tl	<	0.000253				
M	Co	<	0.000253	M	La	<	0.000253	M	Re	<	0.000253	M	Tm	<	0.000253				
O	Cr	<	0.005043	O	Li	<	0.000214	M	Rh	<	0.000253	M	U	<	0.000253				
M	Cs	<	0.002769	M	Lu	<	0.000253	M	Ru	<	0.000254	M	V	<	0.000822				
O	Cu		0.004614	O	Mg		0.001035	M	S	<	0.560935	M	W	<	0.002146				
M	Dy	<	0.000253	M	Mn	<	0.000253	M	Sb	<	0.006899	M	Y	<	0.000253				
M	Er	<	0.000253	M	Mo	<	0.000479	M	Sc	<	0.000733	M	Yb	<	0.000253				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 107.87 +1 6 $Ag(H_2O)_6^+$

Chemical Compatibility -Stable in HNO_3, and HF. Avoid basic media. Ag forms more insoluble salts than any other metal. It also is subject to photochemical reduction to the metal in HCl media although 10 µg/mL solutions in 10% HCl [$AgCl_{x1-x}$] are commonly used in the analytical laboratory. The most common solubility problems exist with arsenate, arsenite , bromide, chloride, iodide, carbonate , chromate, cyanide, iodate, oxalate, oxide, sulfate, sulfide, tartrate, and thiocyanate in aqueous media. The addition of nitric acid renders many of these salts soluble.

Stability - 2-100 ppb levels stable for 75+ days when mixed with equivalent levels of all other elements including the precious metals (where chloride is present) when in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3 / LDPE container.

Ag Containing Samples (Preparation and Solution) -Metal (Soluble in HNO_3); Oxides (Soluble in HNO_3); Ores (Digestion with conc. HNO_3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 107 amu	1 ppt	N/A	91Zr16O
ICP-OES 243.779 nm	0.12/0.01 µg/mL	1	Mn, Th, Ni, Rh
ICP-OES 328.068 nm	0.007/0.0007 µg/mL	1	Ce, Rh, V
ICP-OES 338.289 nm	0.013/0.001 µg/mL	1	Ce, Cr, Th

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 29, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 29, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGAL10
Lot Number:	S2-AL700843
Matrix:	7% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Aluminum
Starting Material:	Al(NO3)3 * 9H2O
Starting Material Lot#:	P2-2302
Starting Material Purity:	99.9913%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10011 ± 31 µg/mL

Density: 1.087 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10015 ± 44 µg/mL**
ICP Assay NIST SRM 3101a Lot Number: 140903

Assay Method #2 **10008 ± 25 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10014 ± 36 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001500	M	Eu	<	0.000680	O	Na		0.510200	M	Se	<	0.014000	M	Zn		0.009183
s	Al	<		O	Fe		0.114284	M	Nb	<	0.000680	O	Si		0.053060	O	Zr		0.003673
M	As	<	0.006800	O	Ga		0.191835	M	Nd	<	0.000680	M	Sm	<	0.000680				
M	Au	<	0.000680	M	Gd	<	0.004100	O	Ni		0.001102	M	Sn	<	0.006800				
O	B	<	0.021000	M	Ge	<	0.001400	M	Os	<	0.008700	O	Sr		0.006530				
O	Ba		0.012652	M	Hf	<	0.002700	n	P	<		M	Ta	<	0.000680				
O	Be	<	0.001300	M	Hg	<	0.006100	M	Pb		0.006530	M	Tb	<	0.000680				
M	Bi	<	0.008100	M	Ho	<	0.000680	M	Pd	<	0.000680	M	Te	<	0.030000				
O	Ca		0.071428	M	In	<	0.000900	M	Pr	<	0.000680	M	Th	<	0.000680				
M	Cd	<	0.001400	M	Ir	<	0.000680	M	Pt	<	0.000680	O	Ti		0.001142				
M	Ce	<	0.002700	O	K		0.053060	M	Rb	<	0.014000	M	Tl	<	0.000680				
O	Co		0.001979	M	La	<	0.002900	M	Re	<	0.000680	M	Tm	<	0.000680				
O	Cr		0.014285	O	Li		0.000142	M	Rh	<	0.000680	M	U	<	0.001400				
M	Cs		0.005306	M	Lu	<	0.000680	M	Ru	<	0.000680	M	V	<	0.005400				
O	Cu		0.003469	O	Mg		0.069387	i	S	<		M	W	<	0.012000				
M	Dy	<	0.005400	O	Mn		0.001653	M	Sb	<	0.004200	M	Y	<	0.000680				
M	Er	<	0.000680	M	Mo	<	0.012000	M	Sc	<	0.002100	M	Yb	<	0.000680				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 26.98 +3 6 Al(H2O)6+3

Chemical Compatibility -Soluble in HCl, HNO3, HF and H2SO4. Avoid neutral media. Soluble in strongly basic NaOH forming the Al(OH)4(H2O)21- species. Stable with most metals and inorganic anions. The phosphate is insoluble in water and only slightly soluble in acid.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO3 / LDPE container.

Al Containing Samples (Preparation and Solution) -Metal (Best dissolved in HCl / HNO3); a- Al2O3 (Na2CO3 fusion in Pt0);

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 27 amu	30 ppt	N/A	12C15N, 13C14N, 1H12C14N, 11B16O, 54Cr2+, 54Fe2+
ICP-OES 167.078 nm	0.1/0.009 µg/mL	1	Fe
ICP-OES 394.401 nm	0.05/0.006 µg/mL	1	U, Ce
ICP-OES 396.152 nm	0.03/0.006 µg/mL	1	Mo, Zr, Ce

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 27, 2021

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 27, 2025**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGAS10
Lot Number:	R2-AS691113
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Arsenic
Starting Material:	As Pieces
Starting Material Lot#:	2208
Starting Material Purity:	99.9980%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9981 ± 55 µg/mL

Density: 1.028 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9981 ± 55 µg/mL**
ICP Assay NIST SRM 3103a Lot Number: 100818

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2 (u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001578	M	Eu	<	0.000526	O	Na		0.036136	M	Se	<	0.014204	O	Zn	<	0.003390
O	Al		0.006694	M	Fe		0.002633	O	Nb	<	0.011526	O	Si		0.139479	M	Zr	<	0.003156
s	As	<		M	Ga	<	0.000526	M	Nd	<	0.000526	M	Sm	<	0.000526				
M	Au	<	0.000526	M	Gd	<	0.000526	O	Ni	<	0.005537	M	Sn	<	0.001052				
M	B		0.017011	M	Ge	<	0.000526	M	Os	<	0.000526	M	Sr	<	0.000526				
M	Ba	<	0.000526	M	Hf	<	0.000526	O	P	<	0.056500	M	Ta	<	0.000526				
O	Be	<	0.001130	M	Hg	<	0.002104	M	Pb	<	0.000526	M	Tb	<	0.000526				
M	Bi	<	0.002104	M	Ho	<	0.000526	M	Pd	<	0.000526	M	Te	<	0.003682				
O	Ca		0.005657	M	In	<	0.000526	M	Pr	<	0.002630	M	Th	<	0.000526				
M	Cd	<	0.000526	M	Ir	<	0.000526	M	Pt	<	0.000526	O	Ti	<	0.001017				
M	Ce	<	0.000526	O	K		0.003865	M	Rb	<	0.002104	M	Tl	<	0.000526				
M	Co	<	0.003156	M	La	<	0.000526	M	Re	<	0.000526	M	Tm	<	0.000526				
M	Cr		0.000877	M	Li	<	0.000526	M	Rh	<	0.000526	M	U	<	0.000526				
M	Cs	<	0.002104	M	Lu	<	0.000526	M	Ru	<	0.000526	M	V	<	0.001578				
M	Cu	<	0.003156	O	Mg		0.000235	O	S	<	0.056500	M	W	<	0.000526				
M	Dy	<	0.000526	M	Mn	<	0.001052	M	Sb	<	0.000526	M	Y	<	0.000526				
M	Er	<	0.000526	M	Mo	<	0.000526	M	Sc	<	0.002104	M	Yb	<	0.000526				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 74.92 ; mix of +3 and +5 ; 6 ; H_3AsO_4 and $HAsO_2$

Chemical Compatibility - Arsenic has no cationic chemistry. It is soluble in HCl, HNO_3,H_3PO_4, H_2SO_4 and HF aqueous matrices water and NH_4OH . It is stable with most inorganic anions (forms arsenate when boiled with chromate) but many cationic metals form the insoluble arsenates under pH neutral conditions. When fluorinated and / or under acidic conditions arsenate formation is typically not a problem at moderate to low concentrations.

Stability - 2-100 ppb levels stable for months alone or mixed with other elements at equivalent levels in 1% HNO_3 / LDPE container.

As Containing Samples (Preparation and Solution) - Metal (soluble in 1:1 H_2O / HNO_3); Oxides (the oxide exists in crystalline and amorphous forms where the amorphic form is more water soluble. The oxides typically dissolve in dilute acidic solutions when boiled); Minerals (one gram of powered sample is fused in a Ni crucible with 10 grams of a 1:1 mix of K_2CO_3 and KNO_3 and the melt extracted with hot water); Organic Matrices (0.2 to 0.5 grams of sample are fused with 15 grams of a 1:1 Na_2CO_3 / Na_2O_2 mix in a Ni crucible. The fuseate is extracted with water and acidified with HNO_3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 75 amu	20 ppt	N/A	40Ar35Cl, 59Co16O, 36Ar38Ar1H,8Ar37Cl,Ar39K, 150Nd2+,150Sm2+
ICP-OES 189.042 nm	0.05/0.005 µg/mL	1	Cr
ICP-OES 193.696 nm	0.1/0.01 µg/mL	1	V, Ge
ICP-OES 228.812 nm	0.1/0.01 µg/mL	1	Cd, Pt, Ir, Co

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 25, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 25, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGBA10
Lot Number:	P2-BA682107
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Barium
Starting Material:	Ba(NO3)2
Starting Material Lot#:	Mixed Lots
Starting Material Purity:	99.9995%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10072 ± 32 µg/mL

Density: 1.024 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10054 ± 80 µg/mL**
ICP Assay NIST SRM 3104a Lot Number: 140909

Assay Method #2 **10075 ± 30 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001538	O	Eu	<	0.028728	O	Na		0.006767	M	Se	<	0.007964	O	Zn		0.004335
M	Al		0.005194	M	Fe		0.016554	M	Nb	<	0.000200	O	Si	<	0.020780	M	Zr	<	0.000271
M	As	<	0.000519	M	Ga	<	0.000200	M	Nd	<	0.000200	M	Sm	<	0.082480				
M	Au	<	0.003452	M	Gd	<	0.000200	M	Ni	<	0.001290	M	Sn	<	0.000200				
M	B	<	0.002519	M	Ge	<	0.000430	M	Os	<	0.000752	O	Sr		0.027070				
s	Ba	<		M	Hf	<	0.002746	O	P	<	0.044677	M	Ta	<	0.001008				
M	Be	<	0.000430	M	Hg	<	0.001063	M	Pb	<	0.002257	M	Tb	<	0.000200				
M	Bi	<	0.002971	M	Ho	<	0.000200	M	Pd	<	0.000286	M	Te	<	0.001470				
O	Ca		0.026224	M	In	<	0.000200	M	Pr	<	0.000200	M	Th	<	0.000200				
M	Cd	<	0.000200	M	Ir	<	0.000446	M	Pt	<	0.000200	M	Ti	<	0.000324				
M	Ce	<	0.004362	O	K		0.011526	M	Rb		0.001487	M	Tl	<	0.000200				
M	Co	<	0.000200	O	La	<	0.091587	M	Re	<	0.000200	M	Tm	<	0.000954				
M	Cr	<	0.002191	O	Li	<	0.002181	M	Rh	<	0.000200	M	U	<	0.000200				
M	Cs	<	0.001640	M	Lu	<	0.002934	M	Ru	<	0.000200	M	V	<	0.000229				
M	Cu	<	0.003646	O	Mg		0.002379	O	S	<	0.073041	M	W	<	0.001627				
M	Dy	<	0.000200	M	Mn	<	0.000902	M	Sb	<	0.000514	O	Y	<	0.019637				
M	Er	<	0.000556	M	Mo	<	0.000455	M	Sc	<	0.000478	M	Yb	<	0.001991				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 137.33 +2 6 Ba(H2O)6+2
Chemical Compatibility - Soluble in HCl, and HNO3. Avoid H2SO4, HF and neutral to basic media. Stable with most metals and inorganic anions forming insoluble silicate, carbonate, hydroxide, oxide, fluoride, sulfate, oxalate, chromate, arsenate, iodate, molybdate, sulfite and tungstate in neutral aqueous media.
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1 -10,000 ppm solutions chemically stable for years in 1-3.5% HNO3 / LDPE container.
Ba Containing Samples (Preparation and Solution) -Metal(is best dissolved in diluted HNO3); Ores(Carbonate fusion in Pt0 followed by HCl dissolution. If sulfate is present dissolve the fuseate using HCl / tartaric acid to prevent BaSO4 precipitate); Organic Matrices (dry ash and dissolve in dilute HCl.)
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 138 amu	1 ppt	N/A	122Sn16O, 122Te16O
ICP-OES 230.424 nm	0.004/0.0005 µg/mL	1	Mo, Ir, Co
ICP-OES 233.527 nm	0.004/0.0003 µg/mL	1	
ICP-OES 455.403 nm	0.002/0.0001 µg/mL	1	Zr, U

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 13, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 13, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGBE10
Lot Number:	P2-BE678865
Matrix:	6% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Beryllium
Starting Material:	Beryllium diacetate
Starting Material Lot#:	2221
Starting Material Purity:	99.9998%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10036 ± 35 µg/mL

Density: 1.140 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10051 ± 42 µg/mL**
ICP Assay NIST SRM 3105a Lot Number: 090514

Assay Method #2 **10008 ± 59 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag		0.045414	M	Eu	<	0.000254	O	Na		0.015009	M	Se	<	0.015257	O	Zn		0.004059
O	Al		0.008058	O	Fe		0.011749	M	Nb	<	0.000254	O	Si		0.063793	O	Zr	<	0.007064
M	As	<	0.006473	M	Ga	<	0.000254	M	Nd	<	0.000254	M	Sm	<	0.000254				
M	Au	<	0.000248	M	Gd	<	0.000254	M	Ni	<	0.002034	M	Sn	<	0.002542				
O	B	<	0.021661	M	Ge	<	0.000508	M	Os	<	0.000248	M	Sr	<	0.000254				
M	Ba		0.001760	M	Hf	<	0.000254	O	P	<	0.666500	M	Ta	<	0.000254				
s	Be	<		M	Hg	<	0.001244	M	Pb	<	0.001271	M	Tb	<	0.000254				
M	Bi	<	0.000254	M	Ho	<	0.000254	M	Pd	<	0.000254	M	Te	<	0.001780				
O	Ca		0.015256	M	In	<	0.000254	M	Pr	<	0.000254	M	Th	<	0.000254				
M	Cd	<	0.000254	M	Ir	<	0.000248	M	Pt	<	0.000254	O	Ti	<	0.002266				
M	Ce	<	0.000254	O	K		0.031127	M	Rb	<	0.000508	M	Tl	<	0.000254				
M	Co	<	0.004068	M	La	<	0.000254	M	Re	<	0.000254	M	Tm	<	0.000254				
M	Cr	<	0.001525	O	Li	<	0.000666	M	Rh	<	0.000254	M	U	<	0.000254				
M	Cs		0.001642	M	Lu	<	0.000254	M	Ru	<	0.000248	M	V	<	0.000508				
M	Cu	<	0.005085	O	Mg		0.001907	i	S	<		M	W	<	0.004068				
M	Dy	<	0.000254	O	Mn	<	0.001333	M	Sb	<	0.000254	M	Y	<	0.000254				
M	Er	<	0.000254	M	Mo	<	0.000762	O	Sc	<	0.001333	M	Yb	<	0.000254				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 9.01 +2 4 Be(H2O)4+2

Chemical Compatibility -Soluble in HCl, HNO3, H2SO4 and HF aqueous matrices. Stable with all metals and inorganic anions.

Stability - 2-100 ppb levels stable for months in 1 % HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 5-10 % HNO3 / LDPE container.

Be Containing Samples (Preparation and Solution) - Meta l(is best dissolved in diluted H2SO4); BeO (boiling nitric, hydrochloric, or sulfuric acids or KHSO4 fusion); Ores (H2SO4/HF digestion or carbonate fusion in Pt0); Organic Matrices (sulfuric/peroxide digestion or nitric/sulfuric/perchloric acid decomposition, or dry ash and dissolution according to the BeO procedure above).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 9 amu	4 ppt	N/A	
ICP-OES 234.861 nm	0.0003/0.00016 µg/mL	1	Fe, Ta, Mo
ICP-OES 313.042 nm	0.0003/0.00009 µg/mL	1	V, Ce, U
ICP-OES 313.107 nm	0.0007/0.0005 µg/mL	1	Ce, Th, Tm

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION, PERIOD OF VALIDITY AND REVISION HISTORY

11.1 Certification Issue Date

April 22, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 22, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

11.4 Revision Status

- Revision 1 - Revised on Thursday, Jan 14, 2021 by utruong. Revision was made for the following reason: Modified Section 7 Chemical Form in Solution.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

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ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCA10
Lot Number:	R2-CA697921
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Calcium
Starting Material:	Calcium Oxide
Starting Material Lot#:	P2-CA677788
Starting Material Purity:	99.9995%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9985 ± 30 µg/mL

Density: 1.039 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1	**9976 ± 43 µg/mL** ICP Assay NIST SRM 3109a Lot Number: 130213
Assay Method #2	**9965 ± 25 µg/mL** EDTA NIST SRM 928 Lot Number: 928
Assay Method #3	**10008 ± 26 µg/mL** Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.002500	M	Eu	<	0.001300	M	Na		0.008214	O	Se	<	0.022000	O	Zn		0.001158
O	Al	<	0.030000	O	Fe		0.002316	M	Nb	<	0.001300	O	Si	<	0.022000	M	Zr	<	0.006200
O	As	<	0.025000	M	Ga	<	0.002500	M	Nd	<	0.001300	M	Sm	<	0.001300				
M	Au	<	0.013000	M	Gd	<	0.001300	O	Ni	<	0.005300	O	Sn	<	0.013000				
O	B	<	0.006900	O	Ge	<	0.018000	M	Os	<	0.002500	M	Sr		0.115847				
M	Ba		0.000905	M	Hf	<	0.002500	O	P	<	0.027000	M	Ta	<	0.008600				
O	Be	<	0.000270	M	Hg	<	0.001300	M	Pb		0.001685	M	Tb	<	0.001300				
M	Bi	<	0.002500	M	Ho	<	0.001300	M	Pd	<	0.006200	O	Te	<	0.045000				
s	Ca	<		M	In	<	0.001300	M	Pr	<	0.001300	M	Th	<	0.001300				
O	Cd	<	0.000540	M	Ir	<	0.001300	M	Pt	<	0.001300	O	Ti	<	0.004200				
M	Ce	<	0.001300	O	K		0.015797	M	Rb	<	0.014000	M	Tl	<	0.001300				
O	Co		0.000558	M	La	<	0.001300	M	Re	<	0.001300	M	Tm	<	0.001300				
O	Cr	<	0.006000	O	Li	<	0.006900	M	Rh	<	0.002500	M	U	<	0.001300				
M	Cs	<	0.001300	M	Lu	<	0.001300	M	Ru	<	0.003800	O	V	<	0.002200				
M	Cu	<	0.002500	O	Mg		0.002843	n	S	<		M	W	<	0.012000				
M	Dy	<	0.001300	O	Mn		0.000115	M	Sb	<	0.007400	M	Y	<	0.001300				
M	Er	<	0.001300	M	Mo		0.002527	O	Sc	<	0.006100	M	Yb	<	0.001300				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 40.08 +2 6 Ca(H2O)6+2

Chemical Compatibility - Soluble in HCl and HNO3. Avoid H2SO4, HF, H3PO4 and neutral to basic media. Stable with most metals and inorganic anions forming insoluble silicate, carbonate, hydroxide, oxide, fluoride, sulfate, oxalate, chromate, arsenate, and tungstate in neutral aqueous media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-10% HNO3 / LDPE container.

Ca Containing Samples (Preparation and Solution) -Metal (best dissolved in diluted HNO3); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (dry ash and dissolution in dilute HCl. Do not heat when dissolving to avoid precipitation of SiO2). The oxide, hydroxide, carbonate, phosphate, and fluoride of calcium are soluble in % levels of HCl or HNO3. The sulfates (gypsum, anhydrite, etc.), certain silicates, and complex compounds require fusion with Na2CO3 followed by HCl / water dissolution. Note that contamination is a very real problem when analyzing for trace levels.

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 44 amu	1200 ppt	n/a	16O212C, 28Si16O, 88Sr
ICP-OES 393.366 nm	0.0002 / 0.00004 µg/mL	1	U, Ce
ICP-OES 396.847 nm	0.0005 / 0.00006 µg/mL	1	Th
ICP-OES 422.673 nm	0.01 / 0.001 µg/mL	1	Ge

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

November 09, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **November 09, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCD10
Lot Number:	P2-CD685077
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Cadmium
Starting Material:	Cd Shot
Starting Material Lot#:	1954
Starting Material Purity:	99.9996%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9954 ± 30 µg/mL

Density: 1.029 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9956 ± 54 µg/mL**
ICP Assay NIST SRM 3108 Lot Number: 130116

Assay Method #2 **9953 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag	<	0.006348	M	Eu	<	0.010622	O	Na		0.004020	M	Se	<	0.008116	O	Zn	<	0.002152
O	Al		0.011566	M	Fe		0.003011	M	Nb	<	0.000405	O	Si		0.005480	M	Zr	<	0.000405
M	As	<	0.001623	M	Ga	<	0.000405	M	Nd	<	0.000405	M	Sm	<	0.000405				
M	Au	<	0.000405	M	Gd	<	0.000405	M	Ni	<	0.002840	M	Sn	<	0.001217				
M	B	<	0.004463	M	Ge	<	0.000405	M	Os	<	0.000405	M	Sr	<	0.000405				
O	Ba	<	0.000968	M	Hf	<	0.000405	O	P	<	0.045730	M	Ta	<	0.000405				
M	Be	<	0.000405	O	Hg	<	0.002152	M	Pb	<	0.002434	M	Tb	<	0.000405				
M	Bi	<	0.000405	M	Ho	<	0.000405	M	Pd	<	0.000405	M	Te	<	0.016636				
O	Ca		0.002946	O	In	<	0.021520	M	Pr	<	0.000405	M	Th	<	0.000405				
s	Cd	<		M	Ir	<	0.000405	M	Pt	<	0.000405	M	Ti	<	0.001217				
M	Ce	<	0.000405	O	K		0.008179	M	Rb	<	0.000405	M	Tl	<	0.004495				
M	Co	<	0.000405	M	La	<	0.000405	M	Re	<	0.000405	M	Tm	<	0.000405				
M	Cr		0.002907	M	Li	<	0.000405	M	Rh	<	0.000405	M	U	<	0.000405				
M	Cs	<	0.002374	M	Lu	<	0.000405	M	Ru	<	0.000405	M	V	<	0.003179				
M	Cu	<	0.002434	O	Mg		0.000137	O	S	<	0.037660	M	W	<	0.000405				
M	Dy	<	0.000405	M	Mn	<	0.001623	M	Sb	<	0.004057	M	Y	<	0.000405				
M	Er	<	0.000405	M	Mo	<	0.000811	M	Sc	<	0.001623	M	Yb	<	0.000811				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 112.41 +2 4 Cd2(OH) (aq)3+ and Cd(OH)(aq)

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 , and HF. Avoid basic media forming insoluble carbonate and hydroxide.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5 % HNO3 / LDPE container.

Cd Containing Samples (Preparation and Solution) -Metal (soluble in HNO3); Oxides (soluble in HCl or HNO3); Ores (dissolve in HCl /HNO3 then take to fumes with H2SO4. The silica and lead sulfate are filtered off after the addition of water); Organic based (dry ash at 450°C and dissolve ash in HCl), (sulfuric / peroxide acid digestion).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 111 amu	11 ppt	n/a	95Mo16O
ICP-OES 214.438 nm	0.003 / 0.0003 µg/mL	1	Pt, Ir
ICP-OES 226.502 nm	0.003 / 0.0003 µg/mL	1	Ir
ICP-OES 228.802 nm	0.003 / 0.0003 µg/mL	1	Co, Ir, As, Pt

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

November 08, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **November 08, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCO10
Lot Number:	N2-CO671028
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Cobalt
Starting Material:	COBALT
Starting Material Lot#:	1749
Starting Material Purity:	99.9978%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9988 ± 34 µg/mL

Density: 1.057 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9973 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #2 **10024 ± 50 µg/mL**
ICP Assay NIST SRM traceable to 3113 Lot Number: M2-CO661665

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag		0.022956	M	Eu	<	0.000422	O	Na		0.008125	M	Se	<	0.009290	M	Zn		0.007197
O	Al		0.013621	O	Fe		0.048700	M	Nb	<	0.000422	O	Si		0.017539	M	Zr	<	0.014357
i	As	<		M	Ga	<	0.000844	M	Nd	<	0.017735	M	Sm	<	0.001689				
M	Au	<	0.000583	M	Gd		0.003247	O	Ni	<	0.043642	M	Sn	<	0.005067				
M	B	<	0.013512	M	Ge	<	0.004645	M	Os	<	0.000583	O	Sr		0.000841				
O	Ba		0.071210	M	Hf	<	0.000422	n	P	<		M	Ta	<	0.000422				
O	Be	<	0.001771	M	Hg	<	0.002334	M	Pb		0.010094	M	Tb	<	0.001689				
M	Bi		0.000614	M	Ho	<	0.000422	M	Pd	<	0.000422	M	Te	<	0.008445				
O	Ca		0.025034	M	In	<	0.003378	M	Pr	<	0.006756	M	Th	<	0.000422				
M	Cd	<	0.000844	M	Ir	<	0.000583	M	Pt	<	0.000422	M	Ti	<	0.002533				
M	Ce		0.002721	O	K		0.005785	M	Rb	<	0.001689	M	Tl	<	0.000422				
s	Co	<		M	La		0.000877	M	Re		0.016853	M	Tm	<	0.000422				
M	Cr	<	0.020269	O	Li		0.000262	M	Rh	<	0.000422	M	U	<	0.000422				
M	Cs		0.000877	M	Lu	<	0.000422	M	Ru	<	0.000583	M	V	<	0.001689				
M	Cu		0.007197	O	Mg		0.003444	n	S	<		M	W	<	0.000844				
M	Dy	<	0.000422	O	Mn	<	0.006072	M	Sb	<	0.005911	M	Y		0.001228				
M	Er	<	0.000422	M	Mo	<	0.005911	M	Sc	<	0.001689	M	Yb	<	0.003378				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 58.93 +2 6 Co(H2O)62+
Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.
Co Containing Samples (Preparation and Solution) - Metal (soluble in HNO3); Oxides (Soluble in HCl); Ores (dissolve in HCl / HNO3).
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 59 amu	2 ppt	n/a	42Ca16O1H , 40Ar18O1H , 36Ar23Na, 43Ca16O, 24Mg35Cl
ICP-OES 228.616 nm	0.01/0.001 µg/mL	1	
ICP-OES 237.862 nm	0.01/0.002 µg/mL	1	W, Re, Al, Ta
ICP-OES 238.892 nm	0.01/0.002 µg/mL	1	Fe, W, Ta

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 15, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 15, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

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fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCR(3)10
Lot Number:	R2-CR691013
Matrix:	10% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Chromium
Starting Material:	Cr METAL
Starting Material Lot#:	2077
Starting Material Purity:	99.9942%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10044 ± 40 µg/mL

Density: 1.082 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10057 ± 58 µg/mL**
ICP Assay NIST SRM 3112a Lot Number: 170630

Assay Method #2 **10035 ± 50 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000540	M	Eu	<	0.003200	O	Na		0.130091	M	Se	<	0.012000	O	Zn	<	0.002700
O	Al		0.016634	O	Fe		0.202602	M	Nb	<	0.022000	n	Si	<		M	Zr	<	0.020000
M	As		0.003838	O	Ga	<	0.031000	M	Nd	<	0.000540	M	Sm	<	0.035000				
M	Au	<	0.000540	M	Gd	<	0.000540	O	Ni		0.009170	M	Sn		0.004051				
M	B	<	0.049000	M	Ge	<	0.005400	M	Os	<	0.088000	O	Sr	<	0.000250				
O	Ba	<	0.002000	M	Hf	<	0.000540	i	P	<		M	Ta	<	0.000540				
O	Be	<	0.000250	M	Hg	<	0.001600	M	Pb		0.002559	M	Tb	<	0.000540				
M	Bi		0.008956	M	Ho	<	0.000540	M	Pd	<	0.001100	M	Te	<	0.004800				
O	Ca		0.074642	M	In	<	0.001100	M	Pr	<	0.000540	M	Th	<	0.000540				
M	Cd	<	0.000540	M	Ir	<	0.000540	M	Pt	<	0.000540	O	Ti		0.013435				
M	Ce	<	0.000540	O	K		0.034122	i	Rb	<		M	Tl	<	0.001100				
O	Co	<	0.002900	M	La	<	0.001100	M	Re	<	0.002700	O	Tm	<	0.001800				
s	Cr	<		O	Li	<	0.000130	M	Rh	<	0.032000	M	U	<	0.001100				
M	Cs	<	0.019000	M	Lu	<	0.000540	M	Ru	<	0.094000	O	V		0.159949				
O	Cu		0.010023	O	Mg		0.001450	i	S	<		M	W	<	0.028000				
M	Dy	<	0.000540	O	Mn	<	0.014000	M	Sb	<	0.008600	M	Y	<	0.001100				
M	Er	<	0.016000	O	Mo	<	0.013000	O	Sc	<	0.001400	M	Yb	<	0.000540				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 52.00 +3 6 Cr(H2O)63+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4, HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Cr3 Containing Samples (Preparation and Solution) -Metal (soluble in HCl); Oxides/Ores (Chrome ore/oxides are very difficult to dissolve. The following procedures [A-D] are commonly used: A. Fusion with KHSO4 and extraction with hot KCl. The residue fused with Na2CO3 and KClO3, 3:1. B. Fusion with NaKSO4 and NaF 2:1, C. Fusion with magnesia or lime and sodium or potassium carbonates, 4:1. D. Fusion with Na2O2 or NaOH and KNO3 or NaOH and Na2O2. Nickel, iron, copper, or silver crucibles should be used for D. Platinum may be used for A, B, C); Organic Matrices (ash at 4500C followed by one of the fusion methods above or sulfuric/hydrogen peroxide acid digestions may be applicable to non oxide containing samples).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	**Interferences** (underlined indicates severe)
ICP-MS 52 amu	40 ppt	N/A	36S16O, 36Ar16O - The 50Cr, 53Cr, 54Cr lines suffer from many more potential interferences from sulfur, chlorine and argon compounds of oxygen, nitrogen and carbon.
ICP-OES 205.552 nm	0.006/0.0008 µg/mL	1	Os
ICP-OES 276.654 nm	0.01/0.001 µg/mL	1	Cu, Ta, V
ICP-OES 284.325 nm	0.008/0.0007 µg/mL	1	

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 25, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 25, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCU10
Lot Number:	R2-CU693370
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Copper
Starting Material:	Cu Metal
Starting Material Lot#:	2095
Starting Material Purity:	99.9996%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10016 ± 30 µg/mL

Density: 1.033 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10010 ± 55 µg/mL**
ICP Assay NIST SRM 3114 Lot Number: 121207

Assay Method #2 **10017 ± 26 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10015 ± 25 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.007542	M	Eu	<	0.000942	O	Na		0.001434	M	Se	<	0.016971	M	Zn	<	0.005657
O	Al	<	0.000609	O	Fe		0.008698	M	Nb	<	0.000942	O	Si		0.003052	M	Zr	<	0.000942
M	As	<	0.010371	M	Ga	<	0.000942	M	Nd	<	0.000942	M	Sm	<	0.000942				
M	Au	<	0.001885	M	Gd	<	0.000942	M	Ni		0.003780	M	Sn	<	0.005657				
O	B		0.003662	M	Ge	<	0.005657	M	Os	<	0.000942	M	Sr	<	0.000942				
M	Ba		0.004252	M	Hf	<	0.000942	O	P	<	0.031668	M	Ta	<	0.000942				
M	Be	<	0.000942	O	Hg	<	0.007064	M	Pb		0.005788	M	Tb	<	0.000942				
M	Bi	<	0.000942	M	Ho	<	0.000942	M	Pd	<	0.000942	M	Te	<	0.004714				
O	Ca		0.002304	M	In	<	0.000942	M	Pr	<	0.000942	M	Th	<	0.000942				
M	Cd	<	0.000942	M	Ir	<	0.000942	M	Pt	<	0.000942	O	Ti	<	0.002801				
M	Ce	<	0.000942	O	K		0.000762	M	Rb	<	0.000942	M	Tl	<	0.000942				
M	Co		0.001890	M	La	<	0.000942	M	Re	<	0.000942	M	Tm	<	0.000942				
M	Cr	<	0.005657	O	Li	<	0.000243	i	Rh	<		M	U	<	0.000942				
M	Cs	<	0.000942	M	Lu	<	0.000942	M	Ru	<	0.039588	M	V	<	0.003771				
s	Cu	<		O	Mg		0.000320	O	S		0.007172	M	W	<	0.005657				
M	Dy	<	0.000942	O	Mn		0.000793	M	Sb	<	0.001885	M	Y	<	0.000942				
M	Er	<	0.000942	M	Mo	<	0.005657	M	Sc	<	0.000942	M	Yb	<	0.000942				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 63.55 +2 6 Cu(H2O)62+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4, HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Cu Containing Samples (Preparation and Solution) -Metal (soluble in HNO3); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 63 amu	10 ppt	n/a	40Ar23Na 47Ti16O, 14N12C37Cl, 16O12C35Cl, 23Na40Ca
ICP-OES 219.958 nm	0.01/.002 µg/mL	1	Th, Ta, Nb, U, Hf
ICP-OES 224.700 nm	0.01/.001 µg/mL	1	Pb, Ir, Ni, W
ICP-OES 324.754 nm	0.06/.001 µg/mL		Nb, U, Th, Mo, Hf

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

June 05, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **June 05, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Certificate of Analysis

Refine your results. Redefine your industry.

300 Technology Drive
Christiansburg, VA 24073 USA
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F: 540-585-3012
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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Multi Analyte Custom Grade Solution
Catalog Number:	ARI-1
Lot Number:	S2-MEB704284
Matrix:	5% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Iron

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Iron, Fe	**10 000.0 ± 40.0 µg/mL**		

Density: 1.033 g/mL (measured at 20 ± 4 ºC)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2 (u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

April 20, 2021

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 20, 2025**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGK10
Lot Number:	S2-K700978
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Potassium
Starting Material:	KNO3
Starting Material Lot#:	2313
Starting Material Purity:	99.9971%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10016 ± 30 µg/mL

Density: 1.025 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10018 ± 54 µg/mL**
ICP Assay NIST SRM 3141a Lot Number: 140813

Assay Method #2 **10016 ± 24 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

Assay Method #3 **10014 ± 45 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001400	M	Eu	<	0.000660	O	Na		0.240000	M	Se	<	0.007900	O	Zn		0.017000
O	Al		0.001600	O	Fe		0.005800	M	Nb	<	0.000660	O	Si		0.012000	O	Zr	<	0.001600
M	As	<	0.005300	M	Ga	<	0.000660	M	Nd	<	0.000660	M	Sm	<	0.000660				
M	Au	<	0.002000	M	Gd	<	0.000660	O	Ni	<	0.004900	M	Sn	<	0.000660				
O	B	<	0.005600	M	Ge	<	0.002000	M	Os	<	0.003300	O	Sr		0.000055				
O	Ba	<	0.000860	M	Hf	<	0.000660	O	P	<	0.032000	M	Ta	<	0.000660				
O	Be	<	0.000082	M	Hg	<	0.002000	M	Pb	<	0.002300	M	Tb	<	0.000660				
M	Bi	<	0.006600	M	Ho	<	0.000660	M	Pd	<	0.000660	M	Te	<	0.017000				
O	Ca		0.031000	M	In	<	0.000660	M	Pr	<	0.000660	M	Th	<	0.000660				
O	Cd	<	0.000450	M	Ir	<	0.000660	M	Pt	<	0.002700	M	Ti	<	0.000660				
M	Ce	<	0.000660	s	K	<		M	Rb		0.480000	M	Tl	<	0.000660				
O	Co	<	0.000780	M	La	<	0.000660	M	Re	<	0.000660	M	Tm	<	0.000660				
O	Cr		0.000530	O	Li	<	0.000084	M	Rh	<	0.000660	M	U	<	0.000660				
M	Cs	<	0.000660	M	Lu	<	0.000660	M	Ru	<	0.000660	O	V	<	0.001100				
M	Cu	<	0.002700	O	Mg		0.006300	O	S		0.028000	M	W	<	0.000660				
M	Dy	<	0.000660	O	Mn		0.000480	M	Sb	<	0.000660	M	Y	<	0.000660				
M	Er	<	0.000660	M	Mo	<	0.000660	O	Sc	<	0.000340	O	Yb	<	0.000270				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 39.10 +1 (6) K+(aq)

Chemical Compatibility -Soluble in HCl, HNO3, H2SO4 and HF aqueous matrices. Avoid use of HClO4 due to insolubility of the perchlorate. Stable with all metals and inorganic anions except ClO4-.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

K Containing Samples (Preparation and Solution) - Metal (Dissolves very rapidly in water); Ores (Sodium carbonate fusion in Pt0 followed by HCl dissolution-blank levels of K in sodium carbonate critical); Organic Matrices (Sulfuric/peroxide digestion)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 39 amu	10 ppt	n/a	38ArH, 23Na16O, 78Se
ICP-OES 404.721 nm	1.1 / 0.05 µg/mL	1	U, Ce
ICP-OES 766.490 nm	0.4 / 0.001 µg/mL	1	2nd order radiation from R.E.s on some optical designs
ICP-OES 771.531 nm	1.0 / 0.03 µg/mL	1	2nd order radiation from R.E.s on some optical designs

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

February 06, 2021

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **February 06, 2025**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

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ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGMG10
Lot Number:	R2-MG695748
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Magnesium
Starting Material:	Magnesium Metal
Starting Material Lot#:	2168
Starting Material Purity:	99.9984%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10044 ± 30 µg/mL

Density: 1.053 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1	**10055 ± 26 µg/mL** EDTA NIST SRM 928 Lot Number: 928
Assay Method #2	**10042 ± 57 µg/mL** ICP Assay NIST SRM 3131a Lot Number: 140110
Assay Method #3	**10033 ± 26 µg/mL** Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag		0.002104	M	Eu	<	0.000910	O	Na		0.071011	O	Se	<	0.048000	O	Zn		0.003296
M	Al		0.003550	M	Fe		0.002536	M	Nb	<	0.000460	O	Si	<	0.032000	O	Zr	<	0.002700
M	As	<	0.001400	M	Ga	<	0.000460	M	Nd	<	0.000910	M	Sm	<	0.000460				
M	Au	<	0.001400	M	Gd	<	0.000460	O	Ni	<	0.001600	M	Sn	<	0.002300				
O	B		0.006847	M	Ge	<	0.001400	M	Os	<	0.000460	O	Sr		0.000278				
O	Ba		0.000963	M	Hf	<	0.000460	O	P		0.015216	M	Ta	<	0.000460				
O	Be	<	0.000120	M	Hg	<	0.000460	M	Pb	<	0.000460	M	Tb	<	0.000460				
M	Bi	<	0.000460	M	Ho	<	0.000460	M	Pd	<	0.003200	M	Te	<	0.007300				
O	Ca		0.053258	M	In	<	0.000460	M	Pr	<	0.000460	M	Th	<	0.000460				
O	Cd	<	0.000360	M	Ir	<	0.000460	M	Pt	<	0.001900	O	Ti	<	0.001700				
M	Ce	<	0.002300	M	K		0.048186	M	Rb		0.002409	M	Tl		0.003043				
M	Co	<	0.000910	M	La	<	0.002800	M	Re	<	0.000460	M	Tm	<	0.000460				
M	Cr	<	0.002300	O	Li		0.027897	M	Rh	<	0.000460	M	U	<	0.000460				
M	Cs		0.001039	M	Lu	<	0.000460	M	Ru	<	0.000460	M	V	<	0.000460				
O	Cu	<	0.003000	s	Mg	<		O	S	<	0.190000	M	W	<	0.000460				
M	Dy	<	0.000460	O	Mn		0.015216	M	Sb		0.020796	O	Y	<	0.000720				
M	Er	<	0.000460	M	Mo	<	0.000910	O	Sc	<	0.000480	M	Yb	<	0.000460				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 24.31 +2 6 Mg(H2O)6+2

Chemical Compatibility -Soluble in HCl, HNO3, and H2SO4 avoid HF, H3PO4 and neutral to basic media. Stable with most metals and inorganic anions forming insoluble silicates, carbonates, hydroxides, oxides, and tungstates in neutral and slightly acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-10% HNO3 / LDPE container.

Mg Containing Samples (Preparation and Solution) -Metal (Best dissolved in diluted HNO3); Oxide (Readily soluble in above compatible aqueous acidic solutions); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (Sulfuric / peroxide digestion or nitric / sulfuric / perchloric acid decomposition, or dry ash and dissolution in dilute HCl).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 24 amu	42 ppt	n/a	7Li17O, 48Ti+2 , 48Ca+2
ICP-OES 279.553 nm	0.0002 / 0.00003 µg/mL	1	Th
ICP-OES 280.270 nm	0.0003 / 0.00005 µg/mL	1	U, V
ICP-OES 285.213 nm	0.002 / 0.00003 µg/mL	1	U, Hf, Cr, Zr

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 01, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 01, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

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fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGMN10
Lot Number:	P2-MN687536
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Manganese
Starting Material:	Mn Metal
Starting Material Lot#:	2275
Starting Material Purity:	99.9909%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10046 ± 30 µg/mL

Density: 1.035 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10045 ± 25 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #2 **10083 ± 68 µg/mL**
ICP Assay NIST SRM 3132 Lot Number: 050429

Assay Method #3 **10031 ± 47 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001500	M	Eu	<	0.000730	O	Na		0.176713	M	Se	<	0.006600	M	Zn		0.009960
O	Al		0.004337	M	Fe	<	0.650000	M	Nb	<	0.000730	O	Si		0.097995	M	Zr	<	0.000730
M	As	<	0.008000	M	Ga		0.004337	M	Nd	<	0.001500	M	Sm	<	0.000730				
M	Au	<	0.000730	M	Gd	<	0.000730	M	Ni		0.024097	M	Sn	<	0.002200				
M	B		0.069078	M	Ge	<	0.004400	M	Os	<	0.000730	O	Sr		0.000931				
M	Ba	<	0.001500	M	Hf	<	0.000730	i	P	<		M	Ta	<	0.000730				
M	Be	<	0.000730	M	Hg	<	0.002200	M	Pb		0.007389	M	Tb	<	0.000730				
M	Bi	<	0.003000	M	Ho	<	0.000730	M	Pd	<	0.000730	M	Te	<	0.019000				
O	Ca		0.062652	M	In	<	0.003000	M	Pr	<	0.000730	M	Th	<	0.000730				
M	Cd	<	0.001500	M	Ir	<	0.000730	M	Pt	<	0.000730	O	Ti	<	0.006500				
M	Ce	<	0.007300	O	K		0.006425	M	Rb	<	0.006600	M	Tl	<	0.000730				
O	Co		0.014779	M	La	<	0.003000	M	Re	<	0.000730	M	Tm	<	0.000730				
O	Cr		0.273102	O	Li		0.000417	M	Rh	<	0.003000	M	U	<	0.001500				
M	Cs	<	0.000730	M	Lu	<	0.000730	M	Ru	<	0.004400	M	V	<	0.000730				
O	Cu		0.007711	O	Mg		0.321297	i	S	<		M	W	<	0.004400				
M	Dy	<	0.001500	s	Mn	<		M	Sb	<	0.021000	O	Y		0.001365				
M	Er	<	0.001500	M	Mo		0.010281	O	Sc	<	0.004100	M	Yb	<	0.000730				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 54.94 +2 6 Mn(H2O)62+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5 % HNO3/LDPE container.

Mn Containing Samples (Preparation and Solution) -Metal (Soluble in dilute acids); Oxides (Soluble in dilute acids); Ores (Dissolve with HCl. If silica is present add HF and then fume off silica by adding H2SO4 and heat to SO3 fumes - dense white fumes).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 55 amu	10 ppt	n/a	40Ar14N1H,39K16 O,37Cl18O,40Ar15 N,38Ar17O,36Ar18O 1H ,38Ar16O1H,37Cl17 O1H,23Na32S
ICP-OES 257.610 nm	0.0014 / 0.00002 µg/mL	1	Ce, W, Re
ICP-OES 259.373 nm	0.0016 / 0.00002 µg/mL	1	U, Ta, Mo, Fe, Nb
ICP-OES 260.569 nm	0.0021 / 0.00002 µg/mL	1	Co

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 05, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 05, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGMO10
Lot Number:	R2-MO693167
Matrix:	tr. NH4OH H2O
Value / Analyte(s):	10 000 µg/mL ea: Molybdenum
Starting Material:	Ammonium Molybdate
Starting Material Lot#:	2257
Starting Material Purity:	99.9914%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10013 ± 35 µg/mL

Density: 1.011 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10035 ± 67 µg/mL**
ICP Assay NIST SRM 3134 Lot Number: 130418

Assay Method #2 **10005 ± 40 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001826	M	Eu	<	0.000300	M	Na		0.008750	M	Se	<	0.007480	M	Zn		0.002553
M	Al		0.004455	M	Fe		0.002093	M	Nb	<	0.015030	i	Si	<		M	Zr	<	0.005393
M	As	<	0.003006	M	Ga	<	0.000300	i	Nd	<		M	Sm	<	0.000300				
M	Au	<	0.006012	M	Gd	<	0.000300	M	Ni	<	0.004828	M	Sn		0.001004				
M	B	<	0.035184	M	Ge	<	0.000903	M	Os	<	0.003006	M	Sr		0.001903				
O	Ba		0.015613	M	Hf	<	0.000896	i	P	<		M	Ta	<	0.000300				
M	Be	<	0.003006	M	Hg	<	0.003006	M	Pb	<	0.000409	M	Tb	<	0.000300				
M	Bi	<	0.000401	M	Ho	<	0.000300	M	Pd	<	0.001114	M	Te	<	0.060122				
O	Ca		0.032589	M	In	<	0.015030	M	Pr	<	0.090184	M	Th	<	0.000786				
O	Cd	<	0.051800	M	Ir	<	0.007483	M	Pt	<	0.000388	O	Ti	<	0.093240				
M	Ce	<	0.015030	M	K		1.114508	M	Rb		0.040641	M	Tl		0.013140				
M	Co		0.004032	M	La	<	0.000300	M	Re	<	0.000300	M	Tm	<	0.000300				
M	Cr		0.005931	O	Li		0.000215	M	Rh	<	0.000300	M	U		0.000937				
M	Cs		0.002812	M	Lu	<	0.000300	M	Ru	<	0.003006	M	V	<	0.000759				
M	Cu		0.005172	M	Mg		0.005212	i	S	<		M	W		0.592427				
M	Dy	<	0.000300	M	Mn		0.000952	M	Sb		0.003147	M	Y	<	0.000300				
M	Er	<	0.000300	s	Mo	<		M	Sc	<	0.009019	M	Yb	<	0.000300				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 95.94 +6 6,7,8,9 [MoO4] -2(chemical form as received)

Chemical Compatibility -Mo is received in a NH4OH matrix giving the operator the option of using HCl or HF to stabilize acidic solutions. The [MoO4]-2 is soluble in concentrated HCl [MoOCl5]-2, dilute HF / HNO3 [MoOF5] -2 and basic media [MoO4]-2. Stable at ppm levels with some metals provided it is fluorinated. Do not mix with Alkaline or Rare Earths when HF is present. Stable with most inorganic anions provided it is in the [MoO4]-2 chemical form.

Stability - 2-100 ppb levels stable (alone or mixed with all other metals that are at comparable levels) as the [MoOF5]-2 for months in 1% HNO3 / LDPE container. 1-10,000 ppm single element solutions as the [MoO4] -2 chemically stable for years in 1% NH4OH in a LDPE container.

Mo Containing Samples (Preparation and Solution) -Metal (Soluble in HF / HNO3 or hot dilute HCl); Oxide (soluble in HF or NH4OH) ; Organic Matrices (Dry ash at 450EC in Pt0 and dissolve oxide with HF or HCl).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 95 amu	3 ppt	n/a	40Ar39K16O,79Br16O,190Os2+,190Pt2+
ICP-OES 202.030 nm	0.008 / 0.0002 µg/mL	1	Os, Hf
ICP-OES 203.844 nm	0.012 / 0.002 µg/mL	1	
ICP-OES 204.598 nm	0.012 / 0.001 µg/mL	1	Ir, Ta

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

May 28, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **May 28, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGNA10
Lot Number:	S2-NA700842
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Sodium
Starting Material:	Na2CO3
Starting Material Lot#:	2274
Starting Material Purity:	99.9958%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10053 ± 30 µg/mL

Density: 1.036 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10070 ± 26 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

Assay Method #2 **10012 ± 31 µg/mL**
ICP Assay NIST SRM 3152a Lot Number: 120715

Assay Method #3 **10059 ± 20 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag	<	0.000250	M	Eu	<	0.000840	s	Na	<		O	Se	<	0.004700	O	Zn		0.000226
O	Al		0.003688	O	Fe		0.001560	O	Nb	<	0.001300	O	Si		0.049648	O	Zr		0.000680
O	As	<	0.006900	M	Ga	<	0.000840	M	Nd	<	0.000840	M	Sm	<	0.000840				
M	Au	<	0.000840	M	Gd	<	0.000840	O	Ni	<	0.000250	M	Sn	<	0.001700				
O	B		0.000936	M	Ge	<	0.003400	M	Os	<	0.000840	O	Sr		0.000255				
O	Ba		0.002269	M	Hf	<	0.000840	O	P		0.006525	M	Ta	<	0.004200				
O	Be	<	0.000130	M	Hg	<	0.001700	M	Pb	<	0.000840	M	Tb	<	0.000840				
O	Bi	<	0.008100	M	Ho	<	0.000840	M	Pd	<	0.000840	O	Te	<	0.004800				
O	Ca		0.085112	M	In	<	0.000840	M	Pr	<	0.000840	M	Th	<	0.002500				
O	Cd	<	0.000250	M	Ir	<	0.000840	M	Pt	<	0.000840	O	Ti		0.000553				
M	Ce	<	0.001700	O	K		1.049718	M	Rb	<	0.003400	M	Tl	<	0.000840				
O	Co	<	0.000370	M	La	<	0.000840	M	Re	<	0.000840	M	Tm	<	0.000840				
O	Cr	<	0.001400	O	Li		0.000069	M	Rh	<	0.000840	M	U	<	0.000840				
M	Cs	<	0.003400	M	Lu	<	0.000840	M	Ru	<	0.001700	O	V	<	0.001600				
O	Cu	<	0.001400	O	Mg		0.028370	O	S		0.048230	O	W	<	0.005000				
M	Dy	<	0.000840	O	Mn		0.000139	M	Sb	<	0.001700	O	Y	<	0.000730				
M	Er	<	0.000840	O	Mo	<	0.004800	O	Sc	<	0.000370	O	Yb	<	0.000130				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 22.99 +1 (6) Na+(aq) largely ionic in nature

Chemical Compatibility -Soluble in HCl, HNO3, H2SO4 and HF aqueous matrices. Stable with all metals and inorganic anions.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Na Containing Samples (Preparation and Solution) - Metal (Dissolves very rapidly in water); Ores (Lithium carbonate fusion in graphite crucible followed by HCl dissolution - blank levels of Na in lithium carbonate critical); Organic Matrices (Sulfuric / peroxide digestion or nitric/sulfuric/perchloric acid decomposition).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 23 amu	310 ppt	n/a	46Ti+2 , 46Ca+2
ICP-OES 330.237 nm	2.0 / 0.09 µg/mL	1	Pd, Zn
ICP-OES 588.995 nm	0.03 / 0.006 µg/mL	1	2nd order radiation from R.E.s on some optical designs
ICP-OES 589.595 nm	0.07 / 0.00009 µg/mL	1	2nd order radiation from R.E.s on some optical designs

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 25, 2021

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 25, 2025**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGNI10
Lot Number:	P2-NI686384
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Nickel
Starting Material:	Ni Metal
Starting Material Lot#:	2277 and 2282
Starting Material Purity:	99.9992%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9979 ± 30 µg/mL

Density: 1.038 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9971 ± 54 µg/mL**
ICP Assay NIST SRM 3136 Lot Number: 120619

Assay Method #2 **9970 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **9993 ± 33 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag		0.002606	M	Eu	<	0.001100	O	Na		0.004965	O	Se	<	0.067000	M	Zn		0.006578
M	Al	<	0.013000	O	Fe		0.018618	M	Nb	<	0.001100	O	Si		0.010923	M	Zr	<	0.001100
O	As	<	0.067000	M	Ga	<	0.001100	M	Nd	<	0.001100	M	Sm	<	0.001100				
M	Au	<	0.002100	M	Gd	<	0.001100	s	Ni	<		M	Sn	<	0.016000				
M	B	<	0.017000	M	Ge	<	0.004200	M	Os		0.002110	O	Sr	<	0.000940				
M	Ba	<	0.001100	M	Hf	<	0.001100	i	P	<		M	Ta	<	0.001100				
O	Be	<	0.000410	M	Hg		0.014895	M	Pb		0.006578	M	Tb	<	0.001100				
M	Bi	<	0.004200	M	Ho	<	0.001100	M	Pd	<	0.001100	M	Te	<	0.015000				
O	Ca		0.003351	M	In	<	0.001100	M	Pr	<	0.001100	M	Th	<	0.001100				
M	Cd		0.001365	M	Ir		0.004716	M	Pt	<	0.001100	M	Ti	<	0.004200				
M	Ce	<	0.001100	O	K		0.004716	M	Rb	<	0.001100	M	Tl	<	0.001100				
O	Co		0.017377	M	La	<	0.001100	M	Re		0.001737	M	Tm	<	0.001100				
O	Cr	<	0.006700	O	Li	<	0.000140	M	Rh	<	0.006300	M	U	<	0.001100				
M	Cs	<	0.007300	M	Lu	<	0.001100	M	Ru	<	0.019000	M	V	<	0.002100				
M	Cu		0.004096	O	Mg		0.000372	i	S	<		M	W	<	0.006300				
M	Dy	<	0.001100	O	Mn	<	0.001900	M	Sb		0.005833	O	Y	<	0.000540				
M	Er	<	0.001100	M	Mo	<	0.008400	M	Sc	<	0.002100	M	Yb	<	0.001100				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 58.69 +2 6 Ni(H2O)62+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Ni Containing Samples (Preparation and Solution) -Metal (Soluble in HNO3); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 60 amu	100 ppt	n/a	43Ca16O1H , 44Ca16O, 23Na37Cl
ICP-OES 221.647 nm	0.01 / 0.0009 µg/mL	1	Si
ICP-OES 231.604 nm	0.02 / 0.002 µg/mL	1	Sb, Ta, Co
ICP-OES 232.003 nm	0.02 / 0.006 µg/mL	1	Cr, Re, Os, Nb, Ag, Pt, Fe

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

December 02, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **December 02, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

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ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGPB10
Lot Number:	P2-PB686383
Matrix:	0.5% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Lead
Starting Material:	Lead Nitrate
Starting Material Lot#:	2299
Starting Material Purity:	99.9974%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10031 ± 30 µg/mL

Density: 1.015 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10060 ± 63 µg/mL**
ICP Assay NIST SRM 3128 Lot Number: 101026

Assay Method #2 **10048 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10007 ± 32 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag		0.000850	M	Eu	<	0.000310	O	Na		0.005780	M	Se	<	0.004600	M	Zn		0.005440
O	Al		0.234602	O	Fe		0.023460	M	Nb	<	0.000310	O	Si		0.047600	M	Zr	<	0.000610
M	As	<	0.001900	M	Ga	<	0.000310	M	Nd	<	0.000310	M	Sm	<	0.000310				
M	Au	<	0.002200	M	Gd	<	0.004300	M	Ni	<	0.001600	M	Sn	<	0.000610				
O	B	<	0.005200	M	Ge	<	0.000610	M	Os	<	0.000310	O	Sr		0.000442				
O	Ba		0.001530	M	Hf	<	0.000310	O	P	<	0.052000	M	Ta	<	0.000310				
O	Be	<	0.000630	M	Hg	<	0.001600	s	Pb	<		M	Tb	<	0.000310				
O	Bi		0.021080	M	Ho	<	0.000610	M	Pd	<	0.000310	M	Te	<	0.004300				
O	Ca		0.037400	M	In	<	0.000310	M	Pr	<	0.000310	M	Th	<	0.000310				
M	Cd	<	0.000610	M	Ir	<	0.000310	M	Pt	<	0.000310	M	Ti		0.002992				
M	Ce	<	0.000910	O	K		0.008840	M	Rb	<	0.000610	M	Tl		0.037400				
M	Co	<	0.000610	M	La	<	0.000610	M	Re	<	0.000310	M	Tm	<	0.000610				
M	Cr	<	0.003400	O	Li		0.000108	O	Rh	<	0.006300	M	U	<	0.000310				
M	Cs		0.002686	M	Lu	<	0.000310	M	Ru	<	0.000310	M	V	<	0.000310				
M	Cu	<	0.002500	O	Mg		0.004760	O	S	<	0.052000	M	W	<	0.002200				
M	Dy	<	0.000310	M	Mn	<	0.000310	M	Sb	<	0.001300	M	Y	<	0.000310				
M	Er	<	0.000310	O	Mo	<	0.005400	M	Sc	<	0.000310	M	Yb	<	0.000310				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 207.20 +2 6 $Pb(H_2O)_6^{+2}$

Chemical Compatibility - Soluble in HCl, HF and HNO_3. Avoid H_2SO_4. Stable with most metals and inorganic anions forming insoluble carbonate, borate, sulfate, sulfite, sulfide, phosphate, oxalate, chromate, tannate, iodate, and cyanide in neutral aqueous media.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO_3 / LDPE container.

Pb Containing Samples (Preparation and Solution) -Metal (Best dissolved in 1:1 H_2O / HNO_3); Oxides (The many different Pb oxides are soluble in HNO_3 with the exception of PbO_2 which is soluble in HCl or HF); Ores and Alloys (Best attacked using 1:1 H_2O / HNO_3); Organic Matrices (Dry ash and dissolve in dilute HCl).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 208 amu	5 ppt	n/a	192Pt16O, 192Os16O
ICP-OES 168.215 nm	0.03 / 0.003 µg/mL	1	Co
ICP-OES 217.000 nm	0.09 / 0.03 µg/mL	1	W, Ir, Hf, Sb, Th
ICP-OES 220.353 nm	0.04 / 0.006 µg/mL	1	Bi, Nb

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

December 02, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **December 02, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGSB10
Lot Number:	R2-SB688559
Matrix:	3% (v/v) HNO3 3% (w/v) tartaric acid
Value / Analyte(s):	10 000 µg/mL ea: Antimony
Starting Material:	Antimony Metal
Starting Material Lot#:	1857
Starting Material Purity:	99.9894%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10003 ± 47 µg/mL

Density: 1.061 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10003 ± 41 µg/mL**
ICP Assay NIST SRM 3102a Lot Number: 140911

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$
w_i = the weighting factors for each method calculated using the inverse square of the variance:
$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2
$u_{char} = [\Sigma((w_i)^2 (u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method
u_{bb} = bottle to bottle homogeneity standard uncertainty
u_{lts} = long term stability standard uncertainty (storage)
u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)(u_{char\ a})$

X_a = mean of Assay Method A with
$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2
$u_{char\ a}$ = the errors from characterization
u_{bb} = bottle to bottle homogeneity standard uncertainty
u_{lts} = long term stability standard uncertainty (storage)
u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000200	M	Eu	<	0.000300	O	Na		0.140000	M	Se	<	0.007300	O	Zn		0.005000
M	Al		0.003200	O	Fe		0.060000	M	Nb	<	0.000100	O	Si		0.150000	O	Zr	<	0.006300
M	As	<	0.004400	M	Ga	<	0.000400	M	Nd	<	0.000100	M	Sm	<	0.000100				
M	Au	<	0.000210	M	Gd	<	0.000100	O	Ni		0.004800	M	Sn	<	0.001800				
M	B	<	0.011000	M	Ge	<	0.000600	M	Os	<	0.000110	O	Sr		0.000750				
O	Ba	<	0.004900	M	Hf	<	0.000100	O	P		0.540000	M	Ta		0.003300				
M	Be	<	0.000400	M	Hg	<	0.000110	M	Pb	<	0.000400	M	Tb	<	0.000100				
M	Bi	<	0.000200	M	Ho	<	0.000100	M	Pd	<	0.000210	M	Te	<	0.000600				
O	Ca		0.110000	M	In	<	0.000100	M	Pr	<	0.001600	M	Th	<	0.000100				
M	Cd	<	0.000200	M	Ir	<	0.000110	M	Pt	<	0.000600	M	Ti	<	0.002800				
M	Ce		0.006500	O	K		0.020000	M	Rb	<	0.001000	M	Tl	<	0.000100				
M	Co	<	0.000200	O	La	<	0.016000	M	Re	<	0.000100	M	Tm	<	0.000100				
M	Cr		0.006900	O	Li	<	0.000430	M	Rh	<	0.000300	M	U	<	0.000100				
M	Cs	<	0.000200	M	Lu	<	0.000100	M	Ru	<	0.000310	M	V	<	0.000800				
M	Cu	<	0.000600	O	Mg		0.021000	n	S	<		M	W	<	0.000200				
M	Dy	<	0.000100	O	Mn		0.001900	s	Sb	<		M	Y	<	0.000100				
M	Er	<	0.000100	M	Mo	<	0.000500	O	Sc	<	0.002300	M	Yb	<	0.000100				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 121.75 +3 6 Sb(O)C4H4O6-1

Chemical Compatibility -Stable in conc. HCl, dilute or conc. HF. Stable in dilute HNO3 as the fluoride or tartrate complex. Avoid basic media. Stable with most metals and inorganic anions in acidic media as the tartrate provided the acidity is not too high or the acid is oxidizing causing loss of the stabilizing tartrate ion. The fluoride complex of antimony is stable in strong acid but you should only mix with other metals that are fluorinated.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-2% HNO3 / LDPE container.

Sb Containing Samples (Preparation and Solution) -Metal and alloys (Soluble in H2O / HF / HNO3 mixture); Oxides (Soluble in HCl and tartaric acid or H2O / HF / HNO3 mixtures); Ores (fusion with Na2CO3 in Pt0 followed by dissolving the fuseate in a H2O / HF / HNO3 mixture); Organic based (sulfuric acid / hydrogen peroxide digestion)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 121 amu	5 ppt	N/A	105Pd16O, 89Y16O2
ICP-OES 206.833 nm	0.03/0.003 µg/mL	1	Ta, Cr, Ge, Hf
ICP-OES 217.581 nm	0.05/0.005 µg/mL	1	Nb, W, Re, Fe
ICP-OES 231.147 nm	0.06/0.006 µg/mL	1	Ni, Co, Pt

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

April 30, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 30, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGSE10
Lot Number:	P2-SE684206
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Selenium
Starting Material:	Se Metal
Starting Material Lot#:	1962
Starting Material Purity:	99.9991%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9992 ± 61 µg/mL

Density: 1.035 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9993 ± 67 µg/mL**
ICP Assay NIST SRM 3149 Lot Number: 100901

Assay Method #2 **9992 ± 73 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.002242	M	Eu	<	0.000373	O	Na		0.013700	s	Se	<		O	Zn		0.002382
M	Al		0.004465	M	Fe		0.008506	O	Nb	<	0.002975	O	Si		0.006270	M	Zr	<	0.001868
O	As	<	0.022040	M	Ga	<	0.000373	M	Nd	<	0.000373	M	Sm	<	0.000373				
M	Au	<	0.000373	M	Gd	<	0.000373	O	Ni		0.001849	M	Sn		0.000850				
O	B	<	0.007714	M	Ge	<	0.002616	M	Os	<	0.000373	M	Sr	<	0.001121				
M	Ba	<	0.001495	M	Hf	<	0.000373	O	P	<	0.022040	M	Ta	<	0.000373				
M	Be	<	0.001495	M	Hg	<	0.002240	M	Pb		0.006379	M	Tb	<	0.006353				
M	Bi	<	0.000373	M	Ho	<	0.000373	M	Pd	<	0.000373	M	Te	<	0.012707				
O	Ca		0.006552	M	In	<	0.000373	M	Pr	<	0.001495	M	Th	<	0.002990				
M	Cd		0.001169	M	Ir	<	0.000373	M	Pt	<	0.000373	M	Ti	<	0.003363				
M	Ce	<	0.000373	O	K		0.002006	M	Rb	<	0.001868	M	Tl		0.008613				
M	Co	<	0.000373	M	La	<	0.001121	M	Re	<	0.000373	M	Tm	<	0.000373				
M	Cr		0.002870	O	Li		0.000062	M	Rh	<	0.000373	M	U	<	0.000373				
M	Cs	<	0.001121	M	Lu	<	0.000373	M	Ru	<	0.001493	M	V	<	0.000747				
M	Cu	<	0.000747	O	Mg		0.001159	O	S		0.024674	M	W	<	0.002242				
M	Dy	<	0.000373	M	Mn	<	0.000373	M	Sb	<	0.002242	M	Y	<	0.000373				
M	Er	<	0.000373	O	Mo	<	0.003195	M	Sc	<	0.001121	M	Yb	<	0.000373				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 78.96 +4 6 H_2SeO_3

Chemical Compatibility -Soluble in HCl, HNO_3,H_3PO_4, H_2SO_4 and HF aqueous matrices and water. It is stable with most inorganic anions but many cationic metals form the insoluble selenites under pH neutral conditions. When fluorinated and/or under acidic conditions precipitation is typically not a problem at moderate to low concentrations.

Stability - 2-100 ppb levels stable for months alone or mixed with other elements at equivalent levels in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3 / LDPE container.

Se Containing Samples (Preparation and Solution) -Metal (soluble in HNO_3); Oxides (readily soluble in water); Minerals and alloys (acid digestion with HNO_3or HNO_3 / HF); Organic Matrices (acid digestion with hot concentrated H_2SO_4 accompanied by the careful dropwise addition of H_2O_2 until clear).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 82 amu	200 ppt	N/A	12C35Cl2
ICP-OES 196.026 nm	0.08/0.006 µg/mL	1	Fe
ICP-OES 203.985 nm	0.2/0.05 µg/mL	1	Sb, Ir, Cr, Ta
ICP-OES 206.279 nm	0.3/0.16 µg/mL	1	Cr, Pt

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 13, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 13, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGTL10
Lot Number:	R2-TL691937
Matrix:	5% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Thallium
Starting Material:	TlNO3
Starting Material Lot#:	2118
Starting Material Purity:	99.9998%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9987 ± 49 µg/mL

Density: 1.035 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9968 ± 68 µg/mL**
ICP Assay NIST SRM 3158 Lot Number: 151215

Assay Method #2 **10001 ± 58 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000200	M	Eu	<	0.000200	O	Na		0.002479	M	Se	<	0.011019	O	Zn		0.002288
O	Al	<	0.004184	O	Fe	<	0.002824	M	Nb	<	0.000200	O	Si		0.003744	M	Zr	<	0.000200
M	As	<	0.002003	M	Ga	<	0.000200	M	Nd	<	0.000200	M	Sm	<	0.000200				
O	Au	<	0.002824	M	Gd	<	0.000200	M	Ni		0.001717	M	Sn	<	0.000601				
O	B	<	0.004184	M	Ge	<	0.000801	M	Os	<	0.000198	O	Sr	<	0.000313				
M	Ba	<	0.000400	M	Hf	<	0.000200	O	P	<	0.010460	M	Ta	<	0.000200				
O	Be	<	0.000104	M	Hg	<	0.000794	M	Pb		0.000807	M	Tb	<	0.000200				
M	Bi	<	0.005209	M	Ho	<	0.000200	M	Pd	<	0.000400	M	Te	<	0.005008				
O	Ca		0.002426	M	In	<	0.000200	M	Pr	<	0.000200	M	Th	<	0.000200				
M	Cd		0.001312	M	Ir	<	0.000198	M	Pt	<	0.000801	O	Ti	<	0.001255				
M	Ce	<	0.000200	O	K		0.006150	M	Rb	<	0.000200	s	Tl	<					
M	Co	<	0.000601	M	La	<	0.000200	M	Re	<	0.000200	M	Tm	<	0.000200				
M	Cr	<	0.000801	O	Li	<	0.000177	M	Rh	<	0.000200	M	U	<	0.000200				
M	Cs	<	0.003606	M	Lu	<	0.000200	M	Ru	<	0.000397	M	V	<	0.002203				
M	Cu	<	0.001001	O	Mg		0.000527	O	S	<	0.015690	M	W	<	0.000601				
M	Dy	<	0.000200	M	Mn	<	0.000801	M	Sb	<	0.000400	M	Y	<	0.000200				
M	Er	<	0.000200	M	Mo	<	0.001202	O	Sc	<	0.000711	M	Yb	<	0.000200				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 204.38 +1 6 Tl(H2O)61+

Chemical Compatibility - Soluble in HCl, HNO3, and H2SO4. Stable with most metals and inorganic anions. The sulfite, thiocyanate and oxalate are moderately soluble; the phosphate and arsenite are slightly soluble and the sulfide is insoluble.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO3 / LDPE container.

Tl Containing Samples (Preparation and Solution) -Metal (Best dissolved in HNO3 which forms chiefly the Tl1+ ion.); Oxide (The thallous oxide is readily soluble in water. The thallic oxide requires high levels of acid); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (Sulfuric/peroxide digestion or dry ash and dissolution in HCl).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 205 amu	2 ppt	N/A	189Os16O
ICP-OES 190.864 nm	0.04 / 0.004 µg/mL	1	V, Ti
ICP-OES 276.787 nm	0.1 / 0.01 µg/mL	1	Ta, V, Fe, Cr
ICP-OES 351.924 nm	0.2 / 0.02 µg/mL	1	Th, Ce, Zr

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

April 08, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 08, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGV10
Lot Number:	R2-V688296
Matrix:	7% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Vanadium
Starting Material:	Vanadium pentoxide
Starting Material Lot#:	1782
Starting Material Purity:	99.9907%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10026 ± 30 µg/mL

Density: 1.105 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10025 ± 56 µg/mL**
ICP Assay NIST SRM 3165 Lot Number: 160906

Assay Method #2 **10027 ± 30 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000510	M	Eu	<	0.000110	M	Na		0.095000	M	Se	<	0.002300	M	Zn		0.008900
O	Al		0.051000	O	Fe		0.350000	M	Nb	<	0.000710	O	Si		0.260000	M	Zr	<	0.002500
M	As	<	0.000410	M	Ga	<	0.007100	M	Nd	<	0.000210	M	Sm	<	0.000110				
M	Au	<	0.000410	M	Gd	<	0.000110	M	Ni		0.011000	M	Sn	<	0.003300				
M	B	<	0.006000	M	Ge	<	0.000110	M	Os	<	0.000410	M	Sr		0.001400				
M	Ba		0.001800	M	Hf	<	0.000110	O	P	<	0.120000	M	Ta	<	0.000110				
M	Be	<	0.000110	M	Hg	<	0.000310	M	Pb	<	0.002300	M	Tb	<	0.000110				
M	Bi	<	0.000610	M	Ho	<	0.000110	M	Pd	<	0.000610	M	Te	<	0.000610				
M	Ca		0.180000	M	In	<	0.000110	M	Pr	<	0.000110	M	Th	<	0.000210				
M	Cd	<	0.000410	M	Ir	<	0.000110	M	Pt	<	0.000410	M	Ti	<	0.021000				
M	Ce	<	0.000310	M	K		0.400000	M	Rb	<	0.000410	M	Tl	<	0.000110				
M	Co	<	0.001100	M	La	<	0.000110	M	Re	<	0.000110	M	Tm	<	0.000110				
O	Cr		0.190000	M	Li	<	0.001400	M	Rh	<	0.000110	M	U	<	0.000310				
M	Cs		0.005700	M	Lu	<	0.000110	M	Ru	<	0.000410	s	V	<					
M	Cu	<	0.001800	M	Mg		0.009200	n	S	<		M	W	<	0.003100				
M	Dy	<	0.000110	M	Mn		0.008700	M	Sb		0.076000	M	Y	<	0.000110				
M	Er	<	0.000110	M	Mo		0.086000	M	Sc	<	0.000310	M	Yb	<	0.000110				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 50.94 +5 6 $H_2V_{10}O_{28}^{4-}$

Chemical Compatibility -Soluble in HCl, HNO_3, H_2SO_4, HF, H_3PO_4 and strong basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3 / LDPE container.

V Containing Samples (Preparation and Solution) -Metal (Fusion with NaOH or KOH in Ni0 or Na_2CO_3 / KNO_3); Oxides (V_2O_3 - use HCl, V_2O_4 - use HCl or HNO_3, V_2O_5 - use concentrated acids); Ores (Na_2CO_3 / KNO_3 in Pt0 caution - nitrates attack Pto followed by water extraction of fuseate); Organic Matrices (Ash at 450 EC followed by dissolving according to V_2O_5 above) .

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 51 amu	4 ppt	N/A	34S16O1H, 35Cl16O, 38Ar13C, 36Ar15N, 36Ar14N1H, 37Cl14N,36S15N, 33S18O, 34S17O, 102Ru+2,02Pd+2
ICP-OES 290.882 nm	0.008 / 0.0008 µg/mL	1	Hf, Nb
ICP-OES 292.402 nm	0.006 / 0.001 µg/mL	1	Th
ICP-OES 309.311 nm	0.005 / 0.001 µg/mL	1	Mg, U, Th

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 01, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 01, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGZN10
Lot Number:	P2-ZN686137
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Zinc
Starting Material:	Zn Shot
Starting Material Lot#:	2201
Starting Material Purity:	99.9993%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10040 ± 30 µg/mL

Density: 1.033 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10009 ± 54 µg/mL**
ICP Assay NIST SRM 3168a Lot Number: 120629

Assay Method #2 **10049 ± 33 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10041 ± 28 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.003057	M	Eu	<	0.000509	O	Na		0.001874	M	Se	<	0.023441	s	Zn	<	
O	Al	<	0.005720	O	Fe		0.006348	M	Nb	<	0.000509	O	Si	<	0.057200	M	Zr	<	0.000509
M	As	<	0.003057	M	Ga	<	0.007134	M	Nd	<	0.000509	M	Sm	<	0.000509				
M	Au	<	0.000510	M	Gd	<	0.000509	M	Ni	<	0.000509	M	Sn	<	0.000509				
O	B	<	0.017160	M	Ge	<	0.003057	M	Os	<	0.000510	M	Sr	<	0.000509				
M	Ba	<	0.000509	M	Hf	<	0.000509	O	P	<	0.057200	M	Ta	<	0.000509				
M	Be	<	0.000509	M	Hg	<	0.001021	O	Pb		0.023870	M	Tb	<	0.000509				
M	Bi	<	0.005095	M	Ho	<	0.000509	M	Pd	<	0.002038	M	Te	<	0.023441				
O	Ca		0.033793	M	In	<	0.000509	M	Pr	<	0.000509	M	Th	<	0.000509				
O	Cd		0.003924	M	Ir	<	0.000510	M	Pt	<	0.000509	M	Ti	<	0.000509				
M	Ce	<	0.000509	O	K		0.001499	M	Rb	<	0.002038	M	Tl	<	0.009172				
M	Co	<	0.000509	M	La	<	0.000509	M	Re	<	0.000509	M	Tm	<	0.000509				
O	Cr		0.001549	O	Li	<	0.000457	M	Rh	<	0.000509	M	U	<	0.000509				
M	Cs	<	0.000509	M	Lu	<	0.000509	M	Ru	<	0.006129	M	V	<	0.000509				
O	Cu	<	0.010296	O	Mg		0.000349	O	S	<	0.034320	M	W	<	0.001019				
M	Dy	<	0.000509	M	Mn	<	0.000509	M	Sb	<	0.001019	M	Y	<	0.000509				
M	Er	<	0.000509	M	Mo	<	0.000509	M	Sc	<	0.000509	M	Yb	<	0.000509				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 65.39 +2 4 Zn(OH)(aq)1+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media forming insoluble carbonate and hydroxide. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Zn Containing Samples (Preparation and Solution) -Metal (soluble in HNO3); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3); Organic based (dry ash at 4500C and dissolve ash in HCl) (sulfuric/peroxide acid digestion)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 66 amu	7 ppt	N/A	50Ti16O,50Cr16O, 50V16O, 34S16O2, 32S16O18O, 32S17O2, 33S16O17O, 32S34S, 33S2
ICP-OES 202.548 nm	0.004/0.0002 µg/mL	1	Nb, Cu, Co, Hf
ICP-OES 206.200 nm	0.006/0.0006 µg/mL	1	Sb, Ta, Bi, Os
ICP-OES 213.856 nm	0.002/0.0004 µg/mL	1	Ni, Cu, V

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

December 05, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **December 05, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 7471B

Total Metals

LDW21-SS625

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-02 B	SDG:	21G0286
Sampled:	07/22/21 07:50	Prepared:	08/06/21 14:40	File ID:	SMM 08-06-21-117
% Solids:	73.19	Preparation:	SMM EPA 7471B	Analyzed:	08/06/21 17:30
Batch:	BJH0135	Sequence:	SJH0086	Initial/Final:	0.26 g Wet / 50 mL
Instrument:	ICP2			Calibration:	EH00014

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-97-6	Mercury	0.0204	1	0.00552	0.0263	J

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 7471B
Total Metals

LDW21-SS627

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-04 B	SDG:	21G0286
Sampled:	07/22/21 08:10	Prepared:	08/06/21 14:40	File ID:	SMM 08-06-21-123
% Solids:	54.79	Preparation:	SMM EPA 7471B	Analyzed:	08/06/21 17:44
Batch:	BJH0135	Sequence:	SJH0086	Initial/Final:	0.273 g Wet / 50 mL
Instrument:	ICP2			Calibration:	EH00014

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7439-97-6	Mercury	0.0712	1	0.00702	0.0334	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

EPA 7471B

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Batch:	BJH0135	Batch Matrix:	Solid	Preparation:	SMM EPA 7471B

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS625	21G0286-02	SMM 08-06-21-117	08/06/21 14:40	Store frozen
LDW21-SS627	21G0286-04	SMM 08-06-21-123	08/06/21 14:40	Store frozen
Blank	BJH0135-BLK1	SMM 08-06-21-115	08/06/21 14:40	BJH0135 SMM
LCS	BJH0135-BS1	SMM 08-06-21-116	08/06/21 14:40	BJH0135 SMM
LDW21-SS625	BJH0135-DUP1	SMM 08-06-21-120	08/06/21 14:40	BJH0135 SMM
LDW21-SS625	BJH0135-MS1	SMM 08-06-21-121	08/06/21 14:40	BJH0135 SMM
LDW21-SS625	BJH0135-MSD1	SMM 08-06-21-122	08/06/21 14:40	BJH0135 SMM

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Mercury Digestion Log

Prep Code: SMM
Analyst: MM
Bath Temp: 95C
Start Time: 1440
Matrix: Soil
Date: 8/6/21
End Time: 1535

ARI Sample ID	Sample Bottle #	pH<2	Initial Weight (g) Volume (mL)	Final Volume (mL)	# $KMnO_4$ Aliquots	CLP	Comments
216286-2	B		0.260	50	4		
-4	B		0.273				
216305-9	D		0.278				
216306-1	C		0.219				
BSH135-MK	—		—				
-BS1	—		—				
-MS1	—		0.260				216286-2
-MSD1	—		0.256				
-DUP1	—		0.256				

MM 8/6/21

Chemical/Reagent ID:

HNO_3: 57647
H_2SO_4: 3931
HCl: —
5% $K_2S_2O_8$: J6919
5% $KMnO_4$: J6407
Digest Tube Lot: 2010035

5037F

Revision 007
6/18/09

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Form I

METHOD BLANK DATA SHEET

EPA 7471B

Total Metals

Blank

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Batch:	BJH0135	Laboratory ID:	BJH0135-BLK1	Prepared:	08/06/21 14:40
Matrix:	Solid	Preparation:	SMM EPA 7471B	Analyzed:	08/06/21 17:26
Sequence:	SJH0086	Calibration:	EH00014	Instrument:	ICP2

CAS NO.	Analyte	Concentration (mg/kg wet)	Dilution Factor	MDL	MRL	Q
7439-97-6	Mercury	ND	1	0.00525	0.0250	U

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LCS / LCS DUPLICATE RECOVERY

EPA 7471B

Total Metals

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/06/21 17:28
Batch:	BJH0135	Laboratory ID:	BJH0135-BS1
Preparation:	SMM EPA 7471B	Sequence Name:	LCS
Initial/Final:	0.2 g / 50 mL		

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Mercury	0.500	0.480		96.1	80 - 120

* Indicates values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS625

DUPLICATES

EPA 7471B

Total Metals

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJH0135-DUP1
Batch: BJH0135
Lab Source ID: 21G0286-02
Preparation: SMM EPA 7471B
Initial/Final: 0.26 g / 50 mL
Source Sample Name: LDW21-SS625
% Solids: 73.19

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION	DUPLICATE CONCENTRATION	RPD %	Q
Mercury	20	0.0204	0.0197	3.27	

*: Values outside of QC limits
L: Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to Dup = +/- RL instead of 20% RPD

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS625

MS / MS DUPLICATE RECOVERY

EPA 7471B

Total Metals

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/06/21 17:40
Batch:	BJH0135	Laboratory ID:	BJH0135-MS1
Preparation:	SMM EPA 7471B	Sequence Name:	Matrix Spike
Initial/Final:	0.256 g / 50 mL	Source Sample:	LDW21-SS625

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	Q	MS CONCENTRATION (mg/kg dry)	Q	MS % REC. #	QC LIMITS REC.
Mercury	0.267	0.0204	J	0.297		104	75 - 125

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS625

MS / MS DUPLICATE RECOVERY

EPA 7471B

Total Metals

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/06/21 17:42
Batch:	BJH0135	Laboratory ID:	BJH0135-MSD1
Preparation:	SMM EPA 7471B	Sequence Name:	Matrix Spike Dup
Initial/Final:	0.256 g / 50 mL	Source Sample:	LDW21-SS625

COMPOUND	SPIKE ADDED (mg/kg dry)	MSD CONCENTRATION (mg/kg dry)	Q	MSD % REC. #	% RPD #	QC LIMITS	
						RPD	REC.
Mercury	0.267	0.304		106	2.53	20	75 - 125

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 7471B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00014	Instrument:	ICP2
Calibration Date:	08/06/2021 18:04		

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Mercury	0	0	0.0001	1.344E+07	0.0005	8020000	0.001	7131000	0.002	6731000	0.005	6693800

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 7471B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00014	Instrument:	ICP2
Calibration Date:	08/06/2021 18:04		

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	COD Limit	Q
Mercury	7002633	61.2	0.9998		0.99	

SMM 08-06-21

E1400014

Method: ARI 5 ppb (NO 0.05) Operator: Admin Date of Analysis: 06 Aug 2021 12:58:07

Sample ID	Mean	Units	Date	Method
SEQ-CAL1	269	PPB	06 Aug 2021 13:00:33	ARI 5 ppb (NO 0.05)
SEQ-CAL2	1344	PPB	06 Aug 2021 13:02:54	ARI 5 ppb (NO 0.05)
SEQ-CAL3	4010	PPB	06 Aug 2021 13:05:14	ARI 5 ppb (NO 0.05)
SEQ-CAL4	7131	PPB	06 Aug 2021 13:07:34	ARI 5 ppb (NO 0.05)
SEQ-CAL5	13462	PPB	06 Aug 2021 13:09:54	ARI 5 ppb (NO 0.05)
SEQ-CAL6	33469	PPB	06 Aug 2021 13:12:13	ARI 5 ppb (NO 0.05)
SEQ-ICV	95.1% 3.8055	PPB	06 Aug 2021 13:14:57	ARI 5 ppb (NO 0.05)
SEQ-ICB	-0.0595	PPB	06 Aug 2021 13:17:15	ARI 5 ppb (NO 0.05)
SEQ-CRL	114.7% 0.1147	PPB	06 Aug 2021 13:19:38	ARI 5 ppb (NO 0.05)
SEQ-CCV	96.2% 3.8491	PPB	06 Aug 2021 13:21:59	ARI 5 ppb (NO 0.05)
SEQ-CCB	-0.0593	PPB	06 Aug 2021 13:24:17	ARI 5 ppb (NO 0.05)
BJG0748-BLK1	-0.0396	PPB	06 Aug 2021 13:26:39	ARI 5 ppb (NO 0.05)
BJG0748-BS1	2.0004	PPB	06 Aug 2021 13:28:57	ARI 5 ppb (NO 0.05)
21G0247-06	0.0346	PPB	06 Aug 2021 13:31:15	ARI 5 ppb (NO 0.05)
BJG0748-DUP1	0.0248	PPB	06 Aug 2021 13:33:34	ARI 5 ppb (NO 0.05)
BJG0748-MS1	1.1601	PPB	06 Aug 2021 13:35:52	ARI 5 ppb (NO 0.05)
BJG0748-MSD1	1.0708	PPB	06 Aug 2021 13:38:10	ARI 5 ppb (NO 0.05)
21G0247-07	0.0181	PPB	06 Aug 2021 13:40:30	ARI 5 ppb (NO 0.05)
21G0247-08	-0.0029	PPB	06 Aug 2021 13:42:49	ARI 5 ppb (NO 0.05)
21G0247-12	0.0450	PPB	06 Aug 2021 13:45:08	ARI 5 ppb (NO 0.05)
21G0247-13	0.0970	PPB	06 Aug 2021 13:47:27	ARI 5 ppb (NO 0.05)
SEQ-CCV	95.0% 3.8003	PPB	06 Aug 2021 13:49:47	ARI 5 ppb (NO 0.05)
SEQ-CCB	-0.0571	PPB	06 Aug 2021 13:52:05	ARI 5 ppb (NO 0.05)
21G0247-17	0.0846	PPB	06 Aug 2021 13:54:28	ARI 5 ppb (NO 0.05)
21G0247-18	0.0385	PPB	06 Aug 2021 13:56:48	ARI 5 ppb (NO 0.05)
21G0247-22	0.0364	PPB	06 Aug 2021 13:59:08	ARI 5 ppb (NO 0.05)
21G0247-23	-0.0022	PPB	06 Aug 2021 14:01:27	ARI 5 ppb (NO 0.05)
21G0247-27	0.1042	PPB	06 Aug 2021 14:03:45	ARI 5 ppb (NO 0.05)
21G0247-28	0.1342	PPB	06 Aug 2021 14:06:03	ARI 5 ppb (NO 0.05)
BJG0751-BLK1	-0.0204	PPB	06 Aug 2021 14:08:22	ARI 5 ppb (NO 0.05)
BJG0751-BS1	2.0005	PPB	06 Aug 2021 14:10:40	ARI 5 ppb (NO 0.05)
21G0199-04	0.2820	PPB	06 Aug 2021 14:12:58	ARI 5 ppb (NO 0.05)
BJG0751-DUP1	0.1181	PPB	06 Aug 2021 14:15:17	ARI 5 ppb (NO 0.05)
SEQ-CCV	96.1% 3.8440	PPB	06 Aug 2021 14:17:36	ARI 5 ppb (NO 0.05)
SEQ-CCB	-0.0573	PPB	06 Aug 2021 14:19:54	ARI 5 ppb (NO 0.05)
BJG0751-MS1	1.2474	PPB	06 Aug 2021 14:22:17	ARI 5 ppb (NO 0.05)
BJG0751-MSD1	1.1732	PPB	06 Aug 2021 14:24:36	ARI 5 ppb (NO 0.05)
21G0253-01	0.4258	PPB	06 Aug 2021 14:26:56	ARI 5 ppb (NO 0.05)
BJG0751-DUP2	0.4131	PPB	06 Aug 2021 14:29:16	ARI 5 ppb (NO 0.05)
BJG0751-MS2	1.5791	PPB	06 Aug 2021 14:31:36	ARI 5 ppb (NO 0.05)
21G0199-09	0.2090	PPB	06 Aug 2021 14:33:55	ARI 5 ppb (NO 0.05)
21G0253-02	0.7210	PPB	06 Aug 2021 14:36:15	ARI 5 ppb (NO 0.05)
21G0253-03	0.6067	PPB	06 Aug 2021 14:38:34	ARI 5 ppb (NO 0.05)
21G0253-04	0.5506	PPB	06 Aug 2021 14:40:52	ARI 5 ppb (NO 0.05)
21G0253-05	0.6743	PPB	06 Aug 2021 14:43:11	ARI 5 ppb (NO 0.05)
SEQ-CCV	95.8% 3.8334	PPB	06 Aug 2021 14:45:30	ARI 5 ppb (NO 0.05)
SEQ-CCB	-0.0511	PPB	06 Aug 2021 14:47:48	ARI 5 ppb (NO 0.05)
21G0253-06	1.3696	PPB	06 Aug 2021 14:50:11	ARI 5 ppb (NO 0.05)
21G0253-07	1.3434	PPB	06 Aug 2021 14:52:30	ARI 5 ppb (NO 0.05)
21G0253-08	0.9888	PPB	06 Aug 2021 14:54:50	ARI 5 ppb (NO 0.05)
21G0253-09	0.6825	PPB	06 Aug 2021 14:57:09	ARI 5 ppb (NO 0.05)
21G0282-01	0.2835	PPB	06 Aug 2021 14:59:29	ARI 5 ppb (NO 0.05)
21G0282-02	0.8832	PPB	06 Aug 2021 15:01:49	ARI 5 ppb (NO 0.05)
21G0282-03	0.6084	PPB	06 Aug 2021 15:04:09	ARI 5 ppb (NO 0.05)
21G0282-04	0.2951	PPB	06 Aug 2021 15:06:27	ARI 5 ppb (NO 0.05)
21G0282-05	0.4640	PPB	06 Aug 2021 15:08:46	ARI 5 ppb (NO 0.05)
21G0282-06	0.4752	PPB	06 Aug 2021 15:11:05	ARI 5 ppb (NO 0.05)
SEQ-CCV	96.5% 3.8601	PPB	06 Aug 2021 15:13:24	ARI 5 ppb (NO 0.05)
SEQ-CCB	-0.0535	PPB	06 Aug 2021 15:15:42	ARI 5 ppb (NO 0.05)
21G0289-01	0.1488	PPB	06 Aug 2021 15:18:04	ARI 5 ppb (NO 0.05)

SMM 08-06-21

Method: ARI 5 ppb (NO 0.05) Operator: Admin Date of Analysis: 06 Aug 2021 12:58:07

Sample ID	Mean	Units	Date	Method
21G0289-02	0.1891	PPB	06 Aug 2021 15:20:22	ARI 5 ppb (NO 0.05)
21G0289-05	0.1587	PPB	06 Aug 2021 15:22:41	ARI 5 ppb (NO 0.05)
BJH0069-BLK1	-0.0415	PPB	06 Aug 2021 15:25:00	ARI 5 ppb (NO 0.05)
BJH0069-BS1	1.9459	PPB	06 Aug 2021 15:27:19	ARI 5 ppb (NO 0.05)
21G0272-01	0.8086	PPB	06 Aug 2021 15:29:38	ARI 5 ppb (NO 0.05)
BJH0069-DUP1	0.7624	PPB	06 Aug 2021 15:31:59	ARI 5 ppb (NO 0.05)
BJH0069-MS1	1.9085	PPB	06 Aug 2021 15:34:20	ARI 5 ppb (NO 0.05)
21G0272-02	0.7245	PPB	06 Aug 2021 15:36:40	ARI 5 ppb (NO 0.05)
21G0272-03	0.8353	PPB	06 Aug 2021 15:38:59	ARI 5 ppb (NO 0.05)
SEQ-CCV	94.1% 3.7636	PPB	06 Aug 2021 15:41:18	ARI 5 ppb (NO 0.05)
SEQ-CCB	-0.0541	PPB	06 Aug 2021 15:43:36	ARI 5 ppb (NO 0.05)
21G0272-04	0.7496	PPB	06 Aug 2021 15:45:58	ARI 5 ppb (NO 0.05)
BJH0071-BLK1	-0.0451	PPB	06 Aug 2021 15:48:17	ARI 5 ppb (NO 0.05)
BJH0071-BS1	2.0213	PPB	06 Aug 2021 15:50:36	ARI 5 ppb (NO 0.05)
21G0283-09	0.2349	PPB	06 Aug 2021 15:52:55	ARI 5 ppb (NO 0.05)
BJH0071-DUP1	0.1579	PPB	06 Aug 2021 15:55:15	ARI 5 ppb (NO 0.05)
BJH0071-MS1	1.2347	PPB	06 Aug 2021 15:57:35	ARI 5 ppb (NO 0.05)
BJH0071-MSD1	1.2621	PPB	06 Aug 2021 15:59:53	ARI 5 ppb (NO 0.05)
BJH0107-BLK1	-0.0482	PPB	06 Aug 2021 16:02:13	ARI 5 ppb (NO 0.05)
BJH0107-BS1	1.9399	PPB	06 Aug 2021 16:04:32	ARI 5 ppb (NO 0.05)
21G0276-01	0.1432	PPB	06 Aug 2021 16:06:52	ARI 5 ppb (NO 0.05)
SEQ-CCV	94.8% 3.7910	PPB	06 Aug 2021 16:09:13	ARI 5 ppb (NO 0.05)
SEQ-CCB	-0.0540	PPB	06 Aug 2021 16:11:32	ARI 5 ppb (NO 0.05)
BJH0107-DUP1	0.1461	PPB	06 Aug 2021 16:13:55	ARI 5 ppb (NO 0.05)
BJH0107-MS1	1.2450	PPB	06 Aug 2021 16:16:15	ARI 5 ppb (NO 0.05)
21G0276-02	0.6643	PPB	06 Aug 2021 16:18:34	ARI 5 ppb (NO 0.05)
21G0276-03	0.3441	PPB	06 Aug 2021 16:20:54	ARI 5 ppb (NO 0.05)
21G0276-04	0.1233	PPB	06 Aug 2021 16:23:13	ARI 5 ppb (NO 0.05)
21G0284-01	0.6959	PPB	06 Aug 2021 16:25:32	ARI 5 ppb (NO 0.05)
21G0284-02	0.4587	PPB	06 Aug 2021 16:27:51	ARI 5 ppb (NO 0.05)
21G0284-03	0.5674	PPB	06 Aug 2021 16:30:10	ARI 5 ppb (NO 0.05)
21G0284-04	0.7067	PPB	06 Aug 2021 16:32:29	ARI 5 ppb (NO 0.05)
21G0284-06	0.7864	PPB	06 Aug 2021 16:34:49	ARI 5 ppb (NO 0.05)
SEQ-CCV	103.1% 4.1253	PPB	06 Aug 2021 16:37:09	ARI 5 ppb (NO 0.05)
SEQ-CCB	-0.0526	PPB	06 Aug 2021 16:39:27	ARI 5 ppb (NO 0.05)
21G0284-07	0.1182	PPB	06 Aug 2021 16:41:49	ARI 5 ppb (NO 0.05)
21G0284-08	0.0945	PPB	06 Aug 2021 16:44:10	ARI 5 ppb (NO 0.05)
BJH0108-BLK1	0.0263	PPB	06 Aug 2021 16:46:30	ARI 5 ppb (NO 0.05)
BJH0108-BS1	2.0550	PPB	06 Aug 2021 16:48:49	ARI 5 ppb (NO 0.05)
21G0269-10	0.2442	PPB	06 Aug 2021 16:51:09	ARI 5 ppb (NO 0.05)
BJH0108-DUP1	0.1813	PPB	06 Aug 2021 16:53:29	ARI 5 ppb (NO 0.05)
BJH0108-MS1	1.2880	PPB	06 Aug 2021 16:55:49	ARI 5 ppb (NO 0.05)
BJH0108-MSD1	1.3293	PPB	06 Aug 2021 16:58:09	ARI 5 ppb (NO 0.05)
BJH0136-BLK1	-0.0001	PPB	06 Aug 2021 17:00:28	ARI 5 ppb (NO 0.05)
BJH0136-BS1	2.0598	PPB	06 Aug 2021 17:02:48	ARI 5 ppb (NO 0.05)
SEQ-CCV	102.9% 4.1161	PPB	06 Aug 2021 17:05:07	ARI 5 ppb (NO 0.05)
SEQ-CCB	-0.0546	PPB	06 Aug 2021 17:07:26	ARI 5 ppb (NO 0.05)
21G0280-01	0.4789	PPB	06 Aug 2021 17:09:49	ARI 5 ppb (NO 0.05)
BJH0136-DUP1	0.1504	PPB	06 Aug 2021 17:12:08	ARI 5 ppb (NO 0.05)
BJH0136-MS1	0.0392	PPB	06 Aug 2021 17:14:29	ARI 5 ppb (NO 0.05)
21G0277-02	0.1293	PPB	06 Aug 2021 17:16:49	ARI 5 ppb (NO 0.05)
21G0277-03	0.1768	PPB	06 Aug 2021 17:19:10	ARI 5 ppb (NO 0.05)
21G0280-02	0.1189	PPB	06 Aug 2021 17:21:29	ARI 5 ppb (NO 0.05)
21G0280-03	-0.0006	PPB	06 Aug 2021 17:23:49	ARI 5 ppb (NO 0.05)
BJH0135-BLK1	-0.0109	PPB	06 Aug 2021 17:26:09	ARI 5 ppb (NO 0.05)
BJH0135-BS1	1.9210	PPB	06 Aug 2021 17:28:28	ARI 5 ppb (NO 0.05)
21G0286-02	0.0776	PPB	06 Aug 2021 17:30:48	ARI 5 ppb (NO 0.05)
SEQ-CCV	103.6% 4.1445	PPB	06 Aug 2021 17:33:08	ARI 5 ppb (NO 0.05)
SEQ-CCB	-0.0550	PPB	06 Aug 2021 17:35:26	ARI 5 ppb (NO 0.05)
BJH0135-DUP1	0.0751	PPB	06 Aug 2021 17:37:49	ARI 5 ppb (NO 0.05)

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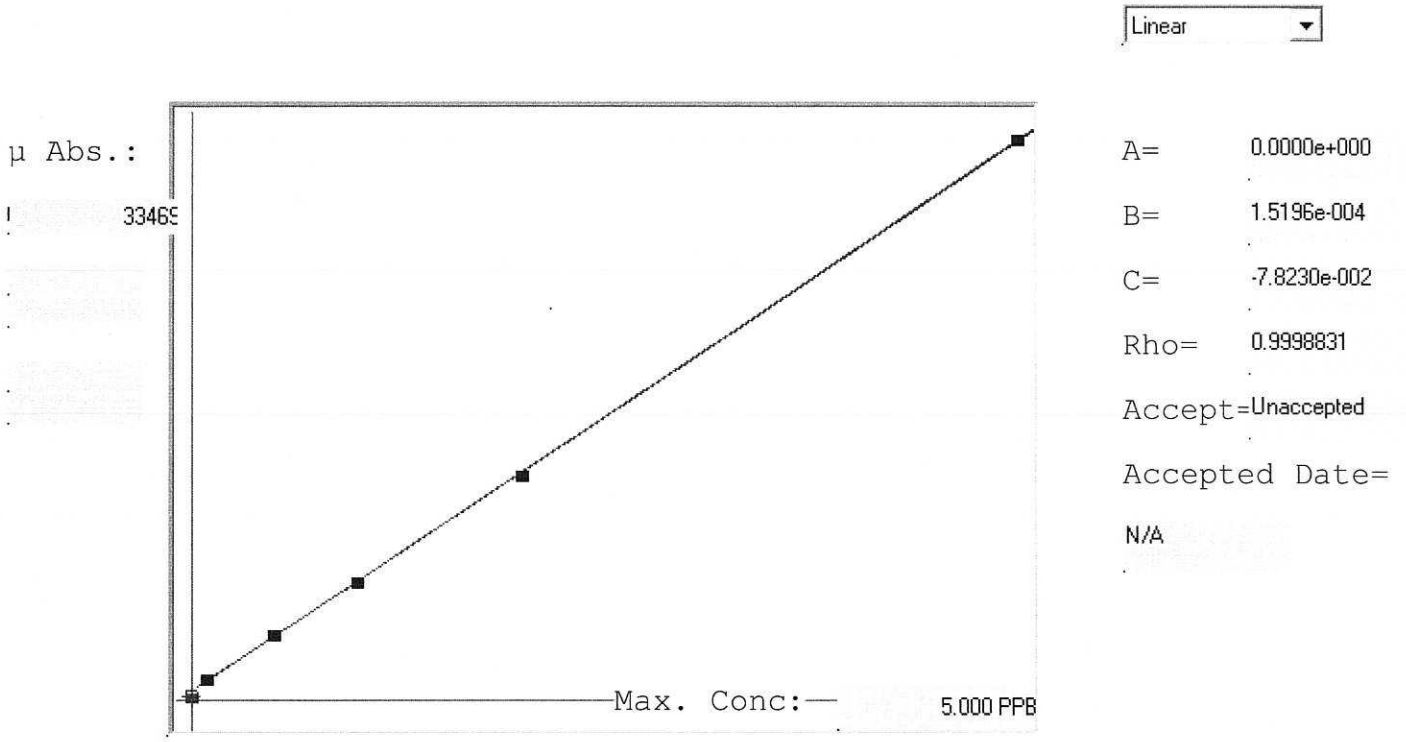
Method: ARI 5 ppb (NO 0.05) Operator: Admin Date of Analysis: 06 Aug 2021 12:58:07

Sample ID	Mean	Units	Date	Method
BJH0135-MS1	1.1121	PPB	06 Aug 2021 17:40:08	ARI 5 ppb (NO 0.05)
BJH0135-MSD1	1.1406	PPB	06 Aug 2021 17:42:28	ARI 5 ppb (NO 0.05)
21G0286-04	0.2131	PPB	06 Aug 2021 17:44:47	ARI 5 ppb (NO 0.05)
21G0305-09	0.3467	PPB	06 Aug 2021 17:47:07	ARI 5 ppb (NO 0.05)
21G0306-01	0.1095	PPB	06 Aug 2021 17:49:27	ARI 5 ppb (NO 0.05)
SEQ-CCV	103.0% 4.1180	PPB	06 Aug 2021 17:51:47	ARI 5 ppb (NO 0.05)
SEQ-CCB	-0.0580	PPB	06 Aug 2021 17:54:05	ARI 5 ppb (NO 0.05)

ARI 5 ppb (NO 0.05)



Std ID	Conc.	Calc.	Dev.	Mean	SD or %RSD	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5
SEQ-CAL1 - Blank	0.000	-0.037	-0.037	269	1.414	270	267	270		
SEQ-CAL2 - 0.1 PPB	0.100	0.126	0.026	1344	1.2 %	1335	1331	1367		
SEQ-CAL3 - 0.5 PPB	0.500	0.531	0.031	4010	1.9 %	3907	4043	4080		
SEQ-CAL4 - 1.0 PPB	1.000	1.005	0.005	7130	0.9 %	7049	7131	7212		
SEQ-CAL5 - 2.0 PPB	2.000	1.967	-0.033	13461	0.6 %	13341	13510	13534		
SEQ-CAL6 - 5.0 PPB	5.000	5.008	0.008	33468	0.7 %	33155	33526	33725		

Mercury Analysis Log

Analyst: MIL

Instrument: HMDRA

Date: 08/06/21

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ARI Sample ID	Prep Code	Dilution	QC Data (ppb)	Comments
SEQ -Cal1	JMM	1X		
-Cal2				
-Cal3				
-Cal4				
-Cal5				
-Cal6				
-ICV			✓3.80	
-ICB			✓-0.05	
-CRL			✓0.11	
-CCV			✓3.84	
-CCB			✓-0.05	
BJG0748 -BIK1				
-BS1			✓2.00	100% R
21G0247 -06			0.034	
BJG0748 -PDS1				
-MS1			1.16	112 %R
-MSD1			1.07	103 %R
21G0247 -07				
-08				
-12				
-13				
SEQ -CCV			✓3.80	
-CCB			✓-0.05	
21G0247 -17				
-18				
-22				
-23				
-27				
-28				
BJG0751 -BIK1				

Chemical/Reagent ID:

10% $SnCl_2$: J8803

14% $NH_2OH/NaCl$: J2396

Standard ID:

Standard: J8067 - J8072

ICV/CCV: J8066

Mercury Analysis Log

Analyst: ——

Date: ——

Instrument: ——

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ARI Sample ID		Prep Code	Dilution	QC Data (ppb)	Comments
↓	-BS1			2.00	100 % R
21G0199	-04			0.28	
BJG0751	-DUP1				
SEQ	-CCV			3.84	
↓	-CCB			-0.05	
BJG0751	-MS1			1.24	97 % R
↓	-MSD1			1.17	89 % R
21G0253	-01			0.42	
BJG0751	-DX2				
↓	-MS2			1.57	115 % R
21G0199	-09				
21G0253	-02				
	-03				
	-04				
↓	-05				
SEQ	-CCV			3.83	
↓	-CCB			-0.05	
21G253	-06				
	-07				
	-08				
↓	-09				
21G0282	-01				
	-02				
	-03				
	-04				
	-05				
↓	-06				
SEQ	-CCV			3.86	
↓	-CCB			-0.05	
21G0289	-01				

Chemical/Reagent ID:

10% $SnCl_2$: ——

14% $NH_2OH/NaCl$: ——

Standard ID: ——

Standard: ——

ICV/CCV: ——

Mercury Analysis Log

Analyst: ——

Instrument: ——

Date: ——

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ARI Sample ID		Prep Code	Dilution	QC Data (ppb)	Comments
↓	-02				
↓	-05				
BJH0069	-BIK1				
↓	-BS1			1.94	97% R
2160272	-01			0.80	
BJH0069	-DUP1				
↓	-MS1			1.90	110% R
2160272	-02				
↓	-03				
SEQ	-CCV			3.76	
↓	-CCB			-0.05	
2160272	-04				
BJH0071	-BIK1				
↓	-BS1			2.02	101% R
2160283	-09			0.23	
BJH0071	-DUP1				
↓	-MS1			1.23	100% R
↓	-MSD1			1.26	103% R
BJH0107	-BIK1				
↓	-BS1			1.93	96.5% R
2160276	-01			0.14	
SEQ	-CCV			3.79	
↓	-CCB			-0.05	
BJH0107	-DUP1				
↓	-MS1			1.24	110% R
2160276	-02				
↓	-03				
↓	-04				
2160284	-01				
↓	-02				

Chemical/Reagent ID:

10% $SnCl_2$: ——

14% $NH_2OH/NaCl$: ——

Standard ID:

Standard: ——

ICV/CCV: ——

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1/26/01

Mercury Analysis Log

Analyst: _____ Date: _____

Instrument: _____ Page: 4 of 5

ARI Sample ID	Prep Code	Dilution	QC Data (ppb)	Comments
-03				
-04				
-06				
SEQ -CCV			✓4.12	
↓ -CCB			✓-0.05	
21G0284 -07				
↓ -08				
BJH0103 -BIK1				
↓ -BS1			✓2.05	102.5% R
21G0269 -10			0.24	
BJH0103 -DUP1				
-MS1			✓1.28	104% R
↓ -MSD1			✓1.32	108% R
BJH0136 -BIK1				
↓ -BS1			2.05	102% R
SEQ -CCV			✓4.11	
↓ -CCB				
21G0280 -01			0.47	
BJH0136 -DUP1				
↓ -MS1			✗003	
21G0277 -02				
↓ -03				
21G0280 -02				
↓ -03				
BJH0135 -BIK1				
↓ -BS1			✓1.92	96% R
21G0286 -02			0.07	
SEQ -CCV			✓4.14	
↓ -CCB				
BJH0135 -DUP1				

Chemical/Reagent ID:

10% $SnCl_2$: _____ 14% $NH_2OH/NaCl$: _____

Standard ID: _____

Standard: _____ ICV/CCV: _____

Mercury Analysis Log

Analyst: —

Instrument: —

Date: —

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ARI Sample ID	Prep Code	Dilution	QC Data (ppb)	Comments
-MS1			1.11	104 % R
-MSD1			1.14	107 % R
21G0286 -04				
21G0305 -09				
21G0306 -01				
SEQ -CCV			4.11	
-CCB			-6.05	

MH 08/06/21

Chemical/Reagent ID:

10% $SnCl_2$: —

Standard ID: —

Standard: _____

14% $NH_2OH/NaCl$: —

ICV/CCV: —

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 7471B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICP2
Calibration: EH00014
Control Limt: +/- 20.00%
Sequence: SJH0086

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SJH0086-ICV1	Mercury	0.0040000	0.00381	95.1	mg/L	EPA 7471B
SJH0086-CCV1	Mercury	0.0040000	0.00385	96.2	mg/L	EPA 7471B
SJH0086-CCV2	Mercury	0.0040000	0.00380	95.0	mg/L	EPA 7471B
SJH0086-CCV3	Mercury	0.0040000	0.00384	96.1	mg/L	EPA 7471B
SJH0086-CCV4	Mercury	0.0040000	0.00383	95.8	mg/L	EPA 7471B
SJH0086-CCV5	Mercury	0.0040000	0.00386	96.5	mg/L	EPA 7471B
SJH0086-CCV6	Mercury	0.0040000	0.00376	94.1	mg/L	EPA 7471B
SJH0086-CCV7	Mercury	0.0040000	0.00379	94.8	mg/L	EPA 7471B
SJH0086-CCV8	Mercury	0.0040000	0.00413	103	mg/L	EPA 7471B
SJH0086-CCV9	Mercury	0.0040000	0.00412	103	mg/L	EPA 7471B
SJH0086-CCVA	Mercury	0.0040000	0.00414	104	mg/L	EPA 7471B
SJH0086-CCVB	Mercury	0.0040000	0.00412	103	mg/L	EPA 7471B

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INSTRUMENT BLANKS
EPA 7471B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICP2
Calibration: EH00014
Sequence: SJH0086
Date Analyzed: 08/06/21 13:17

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SJH0086-ICB1	Mercury	-0.000060	0.000021	0.000100	mg/L	
SJH0086-CCB1	Mercury	-0.000059	0.000021	0.000100	mg/L	
SJH0086-CCB2	Mercury	-0.000057	0.000021	0.000100	mg/L	
SJH0086-CCB3	Mercury	-0.000057	0.000021	0.000100	mg/L	
SJH0086-CCB4	Mercury	-0.000051	0.000021	0.000100	mg/L	
SJH0086-CCB5	Mercury	-0.000054	0.000021	0.000100	mg/L	
SJH0086-CCB6	Mercury	-0.000054	0.000021	0.000100	mg/L	
SJH0086-CCB7	Mercury	-0.000054	0.000021	0.000100	mg/L	
SJH0086-CCB8	Mercury	-0.000053	0.000021	0.000100	mg/L	
SJH0086-CCB9	Mercury	-0.000055	0.000021	0.000100	mg/L	
SJH0086-CCBA	Mercury	-0.000055	0.000021	0.000100	mg/L	
SJH0086-CCBB	Mercury	-0.000058	0.000021	0.000100	mg/L	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 7471B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0086	Instrument:	ICP2
		Calibration:	EH00014

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Cal Standard	SJH0086-CAL1	SMM 08-06-21-001	NA	08/06/21 13:00
Cal Standard	SJH0086-CAL2	SMM 08-06-21-002	NA	08/06/21 13:02
Cal Standard	SJH0086-CAL3	SMM 08-06-21-003	NA	08/06/21 13:05
Cal Standard	SJH0086-CAL4	SMM 08-06-21-004	NA	08/06/21 13:07
Cal Standard	SJH0086-CAL5	SMM 08-06-21-005	NA	08/06/21 13:09
Cal Standard	SJH0086-CAL6	SMM 08-06-21-006	NA	08/06/21 13:12
Initial Cal Check	SJH0086-ICV1	SMM 08-06-21-007	NA	08/06/21 13:14
Initial Cal Blank	SJH0086-ICB1	SMM 08-06-21-008	NA	08/06/21 13:17
Instrument RL Check	SJH0086-CRL1	SMM 08-06-21-009	NA	08/06/21 13:19
Calibration Check	SJH0086-CCV1	SMM 08-06-21-010	NA	08/06/21 13:21
Calibration Blank	SJH0086-CCB1	SMM 08-06-21-011	NA	08/06/21 13:24
Calibration Check	SJH0086-CCV2	SMM 08-06-21-022	NA	08/06/21 13:49
Calibration Blank	SJH0086-CCB2	SMM 08-06-21-023	NA	08/06/21 13:52
Calibration Check	SJH0086-CCV3	SMM 08-06-21-034	NA	08/06/21 14:17
Calibration Blank	SJH0086-CCB3	SMM 08-06-21-035	NA	08/06/21 14:19
Calibration Check	SJH0086-CCV4	SMM 08-06-21-046	NA	08/06/21 14:45
Calibration Blank	SJH0086-CCB4	SMM 08-06-21-047	NA	08/06/21 14:47
Calibration Check	SJH0086-CCV5	SMM 08-06-21-058	NA	08/06/21 15:13
Calibration Blank	SJH0086-CCB5	SMM 08-06-21-059	NA	08/06/21 15:15
Calibration Check	SJH0086-CCV6	SMM 08-06-21-070	NA	08/06/21 15:41
Calibration Blank	SJH0086-CCB6	SMM 08-06-21-071	NA	08/06/21 15:43
Calibration Check	SJH0086-CCV7	SMM 08-06-21-082	NA	08/06/21 16:09
Calibration Blank	SJH0086-CCB7	SMM 08-06-21-083	NA	08/06/21 16:11
Calibration Check	SJH0086-CCV8	SMM 08-06-21-094	NA	08/06/21 16:37
Calibration Blank	SJH0086-CCB8	SMM 08-06-21-095	NA	08/06/21 16:39
Calibration Check	SJH0086-CCV9	SMM 08-06-21-106	NA	08/06/21 17:05
Calibration Blank	SJH0086-CCB9	SMM 08-06-21-107	NA	08/06/21 17:07
Blank	BJH0135-BLK1	SMM 08-06-21-115	Solid	08/06/21 17:26
LCS	BJH0135-BS1	SMM 08-06-21-116	Solid	08/06/21 17:28
LDW21-SS625	21G0286-02	SMM 08-06-21-117	Solid	08/06/21 17:30

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 7471B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0086	Instrument:	ICP2
		Calibration:	EH00014

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Calibration Check	SJH0086-CCVA	SMM 08-06-21-118	NA	08/06/21 17:33
Calibration Blank	SJH0086-CCBA	SMM 08-06-21-119	NA	08/06/21 17:35
LDW21-SS625	BJH0135-DUP1	SMM 08-06-21-120	Solid	08/06/21 17:37
LDW21-SS625	BJH0135-MS1	SMM 08-06-21-121	Solid	08/06/21 17:40
LDW21-SS625	BJH0135-MSD1	SMM 08-06-21-122	Solid	08/06/21 17:42
LDW21-SS627	21G0286-04	SMM 08-06-21-123	Solid	08/06/21 17:44
Calibration Check	SJH0086-CCVB	SMM 08-06-21-126	NA	08/06/21 17:51
Calibration Blank	SJH0086-CCBB	SMM 08-06-21-127	NA	08/06/21 17:54

Analytical Resources, Incorporated
Analytical Chemists and Consultants

DETECTION LEVEL STANDARD
EPA 7471B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICP2
Calibration: EH00014
Sequence: SJH0086
Lab Sample ID: SJH0086-CRL1

Analyte	True	Found	%R	Units	QC Limts
Mercury	0.000100	0.000115	115	mg/L	70 - 130

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HOLDING TIME SUMMARY

Analysis: EPA 7471B

Laboratory: Analytical Resources, Inc. SDG: 21G0286

Client: Anchor QEA, LLC Project: Lower Duwamish AOC4

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LDW21-SS625 21G0286-02	07/22/21 07:50	07/22/21 17:30	08/06/21 14:40	15	28	08/06/21 17:30	15	28	
LDW21-SS627 21G0286-04	07/22/21 08:10	07/22/21 17:30	08/06/21 14:40	15	28	08/06/21 17:44	15	28	
Duplicate BJH0135-DUP1	07/22/21 07:50	07/22/21 17:30	08/06/21 14:40	15	28	08/06/21 17:37	15	28	
Matrix Spike BJH0135-MS1	07/22/21 07:50	07/22/21 17:30	08/06/21 14:40	15	28	08/06/21 17:40	15	28	
Matrix Spike Dup BJH0135-MSD1	07/22/21 07:50	07/22/21 17:30	08/06/21 14:40	15	28	08/06/21 17:42	15	28	

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

EPA 7471B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument: ICP2

Analyte	MDL	RL	Units
Mercury	0.00525	0.0250	mg/kg

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGHG1
Lot Number:	P2-HG677010
Matrix:	5% (v/v) HNO3
Value / Analyte(s):	1 000 µg/mL ea: Mercury
Starting Material:	Hg metal
Starting Material Lot#:	1959
Starting Material Purity:	99.9994%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1000 ± 3 µg/mL

Density: 1.026 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **999 ± 3 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #2 **999 ± 7 µg/mL**
ICP Assay NIST SRM 3133 Lot Number: 061204

Assay Method #3 **1001 ± 3 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag		0.001157	M	Eu	<	0.000201	O	Na		0.000434	M	Se	<	0.015915	O	Zn	<	0.001510
O	Al		0.000090	O	Fe		0.000112	M	Nb	<	0.000201	O	Si		0.000525	M	Zr	<	0.000201
M	As	<	0.000402	M	Ga	<	0.000201	M	Nd	<	0.000201	M	Sm	<	0.000201				
M	Au	<	0.003631	M	Gd	<	0.000201	M	Ni	<	0.000402	M	Sn	<	0.001007				
M	B	<	0.001208	M	Ge	<	0.000201	M	Os	<	0.000605	M	Sr	<	0.000201				
M	Ba	<	0.000201	M	Hf	<	0.000201	O	P	<	0.032370	M	Ta	<	0.000201				
M	Be	<	0.000201	s	Hg	<		M	Pb	<	0.000201	M	Tb	<	0.000201				
M	Bi	<	0.000201	M	Ho	<	0.000201	M	Pd	<	0.000403	M	Te	<	0.002216				
O	Ca		0.000745	M	In	<	0.000201	M	Pr	<	0.000201	M	Th	<	0.000201				
M	Cd	<	0.000201	M	Ir	<	0.000201	M	Pt	<	0.000402	M	Ti	<	0.000402				
M	Ce	<	0.000201	O	K		0.002004	M	Rb	<	0.000201	O	Tl	<	0.016508				
M	Co	<	0.000201	M	La	<	0.000201	M	Re	<	0.000201	M	Tm	<	0.000201				
O	Cr	<	0.003021	O	Li	<	0.000107	M	Rh	<	0.000201	M	U	<	0.008058				
M	Cs	<	0.001208	M	Lu	<	0.000201	M	Ru	<	0.000201	M	V	<	0.000201				
M	Cu	<	0.000402	O	Mg		0.000095	O	S	<	0.053950	M	W	<	0.000604				
M	Dy	<	0.000201	M	Mn	<	0.000604	M	Sb	<	0.001208	M	Y	<	0.000201				
M	Er	<	0.000201	M	Mo		0.000969	M	Sc	<	0.000201	M	Yb	<	0.000201				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 200.59 +2 4 Hg(OH)(aq) 1+
Chemical Compatibility - Stable in HNO3. Avoid basic media forming insoluble carbonate. The sulfide, basic carbonate, oxalate, phosphate, arsenite, arsenate and iodide are insoluble in water.
Stability - 2-100 ppb levels not stable in 1% HNO3 / LDPE container, stable in 10% HNO3 packaged in borosilicate glass. 1-100 ppm levels stable in 7% HNO3 packaged in borosilicate glass. 1000-10,000 ppm solutions are chemically stable for years in 5-10% HNO3 / LDPE container.
Hg Containing Samples (Preparation and Solution) - Metal (soluble in HNO3); Oxide (Soluble in HNO3); Ores and Organic based (The literature has more references to the preparation of Hg containing samples than any other element. Please consult the literature for your specific sample type, since such preparations are prone to error. Or e-mail our technical staff and we will contact you to discuss your particular sample preparation questions in further detail.).
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 202 amu	9 ppt	n/a	186W16O
ICP-OES 184.950 nm	0.03 / 0.005 µg/mL	1	
ICP-OES 194.227 nm	0.03 / 0.005 µg/mL	1	V
ICP-OES 253.652 nm	0.1 / 0.03 µg/mL	1	Ta, Co, Th ,Rh , Fe, U

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

May 10, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **May 10, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Multi Analyte Custom Grade Solution
Catalog Number:	QCP-QCS-4
Lot Number:	P2-MEB683982
Matrix:	7% (v/v) HNO3
Value / Analyte(s):	5 µg/mL ea: Mercury

Second Source: Whenever possible, this solution was manufactured from a second set of concentrates in our manufacturing facility.

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Mercury, Hg	**5.000 ± 0.022 µg/mL**		

Density: 1.034 g/mL (measured at 20 ± 4 ºC)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Hg	ICP Assay	3133	061204
Hg	EDTA	928	928

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2 (u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 03, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 03, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020B UCT-KED
Total Metals

LDW21-SS625

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-02 B	SDG:	21G0286
Sampled:	07/22/21 07:50	Prepared:	08/06/21 11:30	File ID:	XDT_m1210809-046
% Solids:	73.19	Preparation:	SWN EPA 3050B	Analyzed:	08/09/21 18:23
Batch:	BJH0134	Sequence:	SJH0114	Initial/Final:	1.022 g Wet / 50 mL
Instrument:	ICPMS1			Calibration:	EH00022

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic	5.46	20	0.05	0.27	
7440-66-6	Zinc	70.2	20	3.9	8.0	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020B UCT-KED
Total Metals

LDW21-IT625

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-03 B	SDG:	21G0286
Sampled:	07/22/21 07:50	Prepared:	08/06/21 11:30	File ID:	XDT_m1210809-044
% Solids:	88.19	Preparation:	SWN EPA 3050B	Analyzed:	08/09/21 18:15
Batch:	BJH0134	Sequence:	SJH0114	Initial/Final:	1.075 g Wet / 50 mL
Instrument:	ICPMS1			Calibration:	EH00022

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic	3.81	20	0.04	0.21	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 6020B UCT-KED
Total Metals

LDW21-SS627

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-04 B	SDG:	21G0286
Sampled:	07/22/21 08:10	Prepared:	08/06/21 11:30	File ID:	XDT_m1210809-045
% Solids:	54.79	Preparation:	SWN EPA 3050B	Analyzed:	08/09/21 18:19
Batch:	BJH0134	Sequence:	SJH0114	Initial/Final:	1.08 g Wet / 50 mL
Instrument:	ICPMS1			Calibration:	EH00022

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic	8.28	20	0.06	0.34	
7440-66-6	Zinc	70.7	20	4.9	10.1	

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PREPARATION BATCH SUMMARY

EPA 6020B UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Batch:	BJH0134 Batch Matrix: Solid	Preparation:	SWN EPA 3050B

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS625	21G0286-02	XDT_m1210809-046	08/06/21 11:30	
LDW21-IT625	21G0286-03	XDT_m1210809-044	08/06/21 11:30	
LDW21-SS627	21G0286-04	XDT_m1210809-045	08/06/21 11:30	
Blank	BJH0134-BLK1	XDT_m1210809-042	08/06/21 11:30	BJH0134 SWN
LCS	BJH0134-BS1	XDT_m1210809-043	08/06/21 11:30	BJH0134 SWN
LDW21-SS625	BJH0134-DUP1	XDT_m1210809-047	08/06/21 11:30	BJH0134 SWN
LDW21-SS625	BJH0134-MS1	XDT_m1210809-048	08/06/21 11:30	BJH0134 SWN
LDW21-SS625	BJH0134-MSD1	XDT_m1210809-049	08/06/21 11:30	BJH0134 SWN

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Digestion Log

Analyst: MM Date: 8/6/21 Time: 1130-1650

Matrix: Soil Block ID: 6 Block Temp: 95°C Thermometer: 20-4

ARI Sample ID	Btl #	pH<2	Prep Code: SWN Initial Wt (g) Vol (mL)	Prep Code: SWN Final Vol (mL)	Prep Code: Initial Wt (g) Vol (mL)	Prep Code: Final Vol (mL)	Comments
216286-2	C		1.022	50			
-3	B		1.075				
-4	B		1.080				
BJT1134-BLK	–		–				
-BS1	–		–				
-MS1	–		1.025				216286-2
-MSD1	–		1.025				
-DUP1	–		1.019				

MM 8/6/21

Chemical/Reagent ID:

HNO_3: 7647 1:1 HNO_3: 7648 HCl: – H_2O_2: I 9826

Tube Lot#: 2109005 Boiling Chip Lot#: – (DoD Only)

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Form I

METHOD BLANK DATA SHEET

EPA 6020B UCT-KED

Total Metals

Blank

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Batch: BJH0134
Laboratory ID: BJH0134-BLK1
Prepared: 08/06/21 11:30
Matrix: Solid
Preparation: SWN EPA 3050B
Analyzed: 08/09/21 18:07
Sequence: SJH0114
Calibration: EH00022
Instrument: ICPMS1

CAS NO.	Analyte	Concentration (mg/kg wet)	Dilution Factor	MDL	MRL	Q
7440-38-2	Arsenic-75a	ND	20	0.04	0.20	U
7440-66-6	Zinc-66	ND	20	2.9	6.0	U
7440-66-6	Zinc-67	ND	20	0.9	6.0	U

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LCS / LCS DUPLICATE RECOVERY

EPA 6020B UCT-KED

Total Metals

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/09/21 18:11
Batch:	BJH0134	Laboratory ID:	BJH0134-BS1
Preparation:	SWN EPA 3050B	Sequence Name:	LCS
Initial/Final:	1 g / 50 mL		

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Arsenic-75a	25.0	24.5		98.0	80 - 120
Zinc-66	80.0	75.4		94.3	80 - 120
Zinc-67	80.0	72.5		90.6	80 - 120

* Indicates values outside of QC limits

Analytical Resources, Incorporated
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LDW21-SS625

DUPLICATES

EPA 6020B UCT-KED

Total Metals

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJH0134-DUP1
Batch: BJH0134
Lab Source ID: 21G0286-02
Preparation: SWN EPA 3050B
Initial/Final: 1.019 g / 50 mL
Source Sample Name: LDW21-SS625
% Solids: 73.19

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION	DUPLICATE CONCENTRATION	RPD %	Q
Arsenic-75a	20	5.46	6.23	13.2	
Zinc-66	20	70.2	57.9	19.1	

*: Values outside of QC limits
L: Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to Dup = +/- RL instead of 20% RPD

Analytical Resources, Incorporated
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LDW21-SS625

MS / MS DUPLICATE RECOVERY
EPA 6020B UCT-KED
Total Metals

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/09/21 18:31
Batch:	BJH0134	Laboratory ID:	BJH0134-MS1
Preparation:	SWN EPA 3050B	Sequence Name:	Matrix Spike
Initial/Final:	1.025 g / 50 mL	Source Sample:	LDW21-SS625

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	Q	MS CONCENTRATION (mg/kg dry)	Q	MS % REC. #	QC LIMITS REC.
Arsenic-75a	33.3	5.46		36.3		92.4	75 - 125
Zinc-66	107	70.2		153		77.9	75 - 125

* Values outside of QC limits

Analytical Resources, Incorporated
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LDW21-SS625

MS / MS DUPLICATE RECOVERY
EPA 6020B UCT-KED
Total Metals

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/09/21 18:35
Batch:	BJH0134	Laboratory ID:	BJH0134-MSD1
Preparation:	SWN EPA 3050B	Sequence Name:	Matrix Spike Dup
Initial/Final:	1.025 g / 50 mL	Source Sample:	LDW21-SS625

COMPOUND	SPIKE ADDED (mg/kg dry)	MSD CONCENTRATION (mg/kg dry)	Q	MSD % REC. #		% RPD #	QC LIMITS RPD	QC LIMITS REC.
Arsenic-75a	33.3	35.4		89.9		2.30	20	75 - 125
Zinc-66	107	145	*	69.8	*	5.80	20	75 - 125

* Values outside of QC limits

Analytical Resources, Incorporated
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LDW21-SS625

POST DIGEST SPIKE SAMPLE RECOVERY

EPA 6020B

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJH0134-PS1
Batch: BJH0134
Lab Source ID: 21G0286-02
Preparation: SWN EPA 3050B
Initial/Final: 0.12264 g / 6 mL
Source Sample Name: LDW21-SS625
% Solids: 73.19

Analyte	Control Limit %R	Spike Sample Result (SSR) (ug/L)	Sample Result (SR) (ug/L)	Spike Added (SA) (ug/L)	%R
Lead-208	80 - 120	796	22.8	500.00	91.0
Zinc-66	80 - 120	2460	70.2	1600.0	88.3

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 6020B UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00022	Instrument:	ICPMS1
Calibration Date:	08/09/2021 13:58		

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Arsenic-75a	0	0	0.2	365	10	374.6	20	373.35	50	353.44	100	348.09
Zinc-66	0	0	6	819.1667	10	880.4	20	796.8	50	746.86	100	715.89
Zinc-67	0	0	6	127	10	147.1	20	135.4	50	126.5	100	118.87

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 6020B UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00022	Instrument:	ICPMS1
Calibration Date:	08/09/2021 13:58		

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	COD Limit	Q
Arsenic-75a	302.4133	49.1	0.9998		0.998	
Zinc-66	659.8528	49.8	0.9994		0.998	
Zinc-67	109.145	49.8	0.9987		0.998	

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ICP/MS - 01 SAMPLE RUN LOG

PE Nexion ICP-MS Serial No. 85DN5032601

Analysis Date: 8/9/21 **Analyst:** MB **Sequence:** SJHΦ114 **Cal:** EHΦΦΦ22

All corrections made by analyst unless otherwise noted.

Edit Label	Delete Data	ARI Sample ID	Prep Code	Dilution	Comments
		SEQ-CAL1	J8253		
		-CAL2	J8254		
		-CAL3	J8255		
		-CAL4	J8256		In sl. noisy - %R + Analytes OK
		-CAL5	J8257		
		-CAL6	J8258		
		-IBL1	—		
		-ICV1	J6292		
		-ICB1	J8253		
		-CCV1	J8257		Li, Sc, In, Tb sl. noisy - %R + Analytes OK
		-CCB1	J8253		
		-CRL1	J8254		In sl. noisy - %R + Analytes OK
		-IFA1	J8Φ98		Cr^{53} ↑
		-IFB1	J8Φ99		
		-HCV1	J7549		
		-HCV2	J7893		Ba^{135} ↓ - Ba < 200
		-IBL2	—		
		-IBL3	—		
		-CCV2			
		-CCB2			
	✓	BJHΦ215-BLK1	REN		Mn ↑
		-BS1			No Al, Fe
		-BLK			Mn ↑ (0.543) - Affected Samples > 10x conc. / ↓
		21GΦ34Φ-Φ1			

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ICP/MS - 01 SAMPLE RUN LOG

PE Nexion ICP-MS Serial No. 85DN5032601

Analysis Date: 8/9/21 **Analyst:** MB **Sequence:** — **Cal:** —

All corrections made by analyst unless otherwise noted. MB 8/9/21

Edit Label	Delete Data	ARI Sample ID	Prep Code	Dilution	Comments
	✓	21GΦ384-Φ1	REN		Ge, In-1, In, Tb ↓
		SEQ-IBL4			
		21GΦ384-Φ1	REN	5	Li, In sl. noisy - %R+ Analytes OK/Match DUP; No Al, Fe
		BJHΦ215-DUP1	↓	↓	↓
		↓ -MS1			
		SEQ-IBL5			
		-CCV3			Mg, Al, Ca, Fe ↓
		-CCB3			
	✓	-CAL1			Multiple analytes removed
		-CCV4			
		↓ -CCB4			
		BJHΦ134-BLK1	SWN	20	
		↓ -BS1			
		21GΦ286-Φ3			
		-Φ4			
		↓ -Φ2			
		BJHΦ134-DUP1			Pb RPD↑
		-MS1			Pb %R↑
		-MSD1			Pb, Zn %R↓
		↓ -PS1	↓	↓	0.060mL 5733Φ; Pb, Zn only
		SEQ-IBL6			
		-CCV5			
		↓ -CCB5			
		BJHΦ218-BLK1	REN		

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ICP/MS - 01 SAMPLE RUN LOG

PE Nexion ICP-MS Serial No. 85DN5032601

Analysis Date: 8/9/21 **Analyst:** MB **Sequence:** — **Cal:** —

All corrections made by analyst unless otherwise noted.

Edit Label	Delete Data	ARI Sample ID	Prep Code	Dilution	Comments
		BJH0218-BS1	REN		
		21G0324-02			
		-04			
		-06			
		-08			
		BJH0218-DUP1			
		-MS1			
		21H0079-01		10	
		SEQ-IBL7			
		-CCV6			
		-CCB6			
		21G0331-01	REN	20	
		21G0349-01		10	
		21G0373-01			
		-03			
		21H0049-01			
		21H0057-01			
		SEQ-IBL8			
		-CCV7			
		-CCB7			
		Rinse/DI			
			MB 8/9/21		

Performance Check Report

Sample ID: STD Performance Check
Sample Date/Time: Monday, August 09, 2021 12:56:14
Sample Description:
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\STD Performance Check.mth
Dataset File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\Default\STD Performance Check.11541
MassCal File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Conditions File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Dual Detector Mode: Pulse
Acq. Dead Time (ns): 35
Current Dead Time (ns): 35
Torch Z position (mm): 0.00

Summary

	Analyte	Mass	Meas. Intens. Mean	Net Intens. Mean	Net Intens. SD	Net Intens. RSD	Mode
	Be	9.0	9163.1	9163.071	94.977	1.0	Standard
	In	114.9	127576.4	127576.373	2606.461	2.0	Standard
	U	238.1	202922.9	202922.944	3596.709	1.8	Standard
⌈	CeO	155.9	3022.7	0.017	0.000	2.3	Standard
| >	Ce	139.9	174157.4	174157.367	872.251	0.5	Standard
⌊	Ce++	70.0	1681.8	0.010	0.000	2.1	Standard
	Bkgd	220.0	5.2	5.167	1.514	29.3	Standard

Current Conditions File Data

Current Value	Description
0.97	Nebulizer Gas Flow STD/KED [NEB]
1.25	Auxiliary Gas Flow
17.50	Plasma Gas Flow
-10.75	Deflector Voltage
1600.00	ICP RF Power
-1862.00	Analog Stage Voltage
1550.00	Pulse Stage Voltage
0.00	Quadrupole Rod Offset STD [QRO]
-17.00	Cell Rod Offset STD [CRO]
14.00	Discriminator Threshold
-2.00	Cell Entrance/Exit Voltage STD
0.00	RPa
0.45	RPq
0.97	DRC Mode NEB
-7.50	DRC Mode QRO
-2.00	DRC Mode CRO
-5.00	DRC Mode Cell Entrance/Exit Voltage
1.00	Cell Gas A
0.00	Cell Gas B
200.00	Axial Field Voltage
-11.00	KED Mode CRO
-12.00	KED Mode QRO
-11.00	KED Mode Cell Entrance Voltage
-33.00	KED Mode Cell Exit Voltage
0.00	KED Cell Gas A
3.00	KED Cell Gas B
0.00	KED RPa
0.25	KED RPq
125.00	KED Mode Axial Field Voltage

Performance Check Report

Sample ID: STD Performance Check
Sample Date/Time: Monday, August 09, 2021 13:05:04
Sample Description:
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\STD Performance Check.mth
Dataset File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\DataSet\Default\STD Performance Check.11547
MassCal File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Conditions File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Dual Detector Mode: Pulse
Acq. Dead Time (ns): 35
Current Dead Time (ns): 35
Torch Z position (mm): 0.00

Summary

	Analyte	Mass	Meas. Intens. Mean	Net Intens. Mean	Net Intens. SD	Net Intens. RSD	Mode
	Be	9.0	8625.9	8625.873	297.189	3.4	Standard
	In	114.9	118053.6	118053.593	787.652	0.7	Standard
	U	238.1	207995.5	207995.462	1893.334	0.9	Standard
⌈	CeO	155.9	3036.5	0.018	0.000	1.8	Standard
| >	Ce	139.9	168359.1	168359.064	540.638	0.3	Standard
⌊	Ce++	70.0	1407.3	0.008	0.000	1.7	Standard
	Bkgd	220.0	3.0	3.033	2.428	80.0	Standard

Current Conditions File Data

Current Value	Description
0.97	Nebulizer Gas Flow STD/KED [NEB]
1.25	Auxiliary Gas Flow
17.50	Plasma Gas Flow
-10.75	Deflector Voltage
1600.00	ICP RF Power
-1862.00	Analog Stage Voltage
1550.00	Pulse Stage Voltage
0.00	Quadrupole Rod Offset STD [QRO]
-17.00	Cell Rod Offset STD [CRO]
14.00	Discriminator Threshold
-2.00	Cell Entrance/Exit Voltage STD
0.00	RPa
0.45	RPq
0.97	DRC Mode NEB
-7.50	DRC Mode QRO
-2.00	DRC Mode CRO
-5.00	DRC Mode Cell Entrance/Exit Voltage
1.00	Cell Gas A
0.00	Cell Gas B
200.00	Axial Field Voltage
-11.00	KED Mode CRO
-12.00	KED Mode QRO
-11.00	KED Mode Cell Entrance Voltage
-33.00	KED Mode Cell Exit Voltage
0.00	KED Cell Gas A
3.00	KED Cell Gas B
0.00	KED RPa
0.25	KED RPq
125.00	KED Mode Axial Field Voltage

SmartTune Wizard - Summary

Optimization Summary

SmartTune file: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Wizard\SmartTune\ARISmartTuneDailyUCT.swz

Start Time: 8/9/2021 12:55:53 PM
End Time: 8/9/2021 1:07:09 PM

STD Performance Check - [Failed]
Obtained Intensity (Be 9): 9163.07
Obtained Intensity (In 115): 127576.37
Obtained Intensity (U 238): 202922.94
Obtained Intensity (Bkgd 220): 5.17 - <Target not achieved>
Obtained Formula (Ce++ 70 / Ce 140): 0.010 (=1681.83 / 174157.37)
Obtained Formula (CeO 156 / Ce 140): 0.017 (=3022.65 / 174157.37)
Obtained RSD (Be 9): 0.0104
Obtained RSD (In 115): 0.0204
Obtained RSD (U 238): 0.0177

Torch Alignment - [Passed]

Vertical	Horizontal	Intensity
1.96 mm	-0.14 mm	137998.32

Nebulizer Gas Flow STD/KED [NEB] - [Passed] Optimum value(s): 0.97
Obtained Intensity (In 115): 127861.65
Obtained Formula (CeO 156 / Ce 140): 0.0182 (=3178.35 / 174672.38)

Mass Calibration and Resolution - [Passed] Optimum value(s): N/A
Target/Obtained mass (7.016/7.025), Target/Obtained resolution (0.7/0.715)
Target/Obtained mass (23.985/23.975), Target/Obtained resolution (0.7/0.712)
Target/Obtained mass (114.904/114.925), Target/Obtained resolution (0.7/0.699)
Target/Obtained mass (238.05/238.075), Target/Obtained resolution (0.7/0.696)

QID STD/DRC - Optimum value(s): Correlation Coefficient = 0.999; Intercept = -15.77

KED Mode QID - Optimum value(s): Correlation Coefficient = 0.998; Intercept = -14.27

STD Performance Check - [Passed] Optimum value(s): N/A
Obtained Intensity (Be 9): 8625.87
Obtained Intensity (In 115): 118053.59
Obtained Intensity (U 238): 207995.46
Obtained Intensity (Bkgd 220): 3.03
Obtained Formula (Ce++ 70 / Ce 140): 0.008 (=1407.27 / 168359.06)
Obtained Formula (CeO 156 / Ce 140): 0.018 (=3036.46 / 168359.06)
Obtained RSD (Be 9): 0.0345
Obtained RSD (In 115): 0.0067
Obtained RSD (U 238): 0.0091

SmartTune Wizard - Details

```
Optimization Details

SmartTune file: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Wizard\SmartTune\ARISmartTuneDailyUCT.swz

Optimization Status

Start Time: 8/9/2021 12:55:53 PM

STD Performance Check
        Optimization Settings:
                Method: STD Performance Check.mth.
                Intensity Criterion: Be 9 > 2000
                Intensity Criterion: In 115 > 40000
                Intensity Criterion: U 238 > 30000
                Intensity Criterion: Bkgd 220 <= 5
                Formula Criterion: Ce++ 70 / Ce 140 <= 0.03
                Formula Criterion: CeO 156 / Ce 140 <= 0.025
                RSD Criterion: Be 9.0122 < 0.05
                RSD Criterion: In 114.904 < 0.05
                RSD Criterion: U 238.05 < 0.05

        Optimization Results:
        Initial Try
                Obtained Intensity (Be 9): 9163.07
                Obtained Intensity (In 115): 127576.37
                Obtained Intensity (U 238): 202922.94
                Obtained Intensity (Bkgd 220): 5.17 - <Target not achieved>
                Obtained Formula (Ce++ 70 / Ce 140): 0.010 (=1681.83 / 174157.37)
                Obtained Formula (CeO 156 / Ce 140): 0.017 (=3022.65 / 174157.37)
                Obtained RSD (Be 9): 0.0104
                Obtained RSD (In 115): 0.0204
                Obtained RSD (U 238): 0.0177

                [Failed]
[Failed]

Torch Alignment
        Optimization Settings:
                Method: Torch Alignment.mth.
                Intensity Criterion: In 115 Maximum

        Optimization Results:
                Vertical      Horizontal      Intensity
[Passed]        1.96 mm     -0.14 mm       137998.32

Nebulizer Gas Flow STD/KED [NEB]
        Optimization Settings:
                Method: Optimize.mth.
                        Initial Try - Start/End/Step: 0.95/1/0.01.
                Intensity Criterion: In 115 Maximum
                Formula Criterion: CeO 156 / Ce 140 <= 0.023

        Optimization Results:
        Initial Try

                Obtained Intensity (In 115): 127861.65
                Obtained Formula (CeO 156 / Ce 140): 0.0182 (=3178.35 / 174672.38)
[Passed]  Optimum value(s): 0.97
```

Mass Calibration and Resolution

Optimization Settings:

Method: Tuning.mth.

MassCal File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun

Iterations: 6

Target accuracy (+/- amu): 0.05 for Mass Cal. and 0.03 for Resolution

Peak height (%) for Res. Opt.: 10

Optimization Results:

Initial Try

Target/Obtained mass (7.016/7.025), Target/Obtained resolution (0.7/0.715)

Target/Obtained mass (23.985/23.975), Target/Obtained resolution (0.7/0.712)

Target/Obtained mass (114.904/114.925), Target/Obtained resolution (0.7/0.699)

Target/Obtained mass (238.05/238.075), Target/Obtained resolution (0.7/0.696)

[Passed] Optimum value(s): N/A

QID STD/DRC

Optimization Settings:

Method: QID Calibration.mth.

Initial Try - Start/End/Step: -20/0/0.5.

Optimization Results:

Initial Try

Optimum value(s): Correlation Coefficient = 0.999; Intercept = -15.77

Analyte	Mass	Points	DAC	MaxIntensity
Li	7	41	-15.5	38062.6
Mg	24	41	-15	68049.7
In	115	41	-12.5	132920
Ce	140	41	-12	177249
Pb	208	41	-10.5	115441
U	238	41	-10.5	221630

KED Mode QID

Optimization Settings:

Method: QID Calibration.mth.

Initial Try - Start/End/Step: -20/0/0.5.

Optimization Results:

Initial Try

Optimum value(s): Correlation Coefficient = 0.998; Intercept = -14.27

Analyte	Mass	Points	DAC	MaxIntensity
Li	7	41	-14.5	32721.4
Mg	24	41	-14.5	70212.1
In	115	41	-11.5	148164
Ce	140	41	-10.5	124500
Pb	208	41	-10	74139.9
U	238	41	-9.5	150468

STD Performance Check

Optimization Settings:

Method: STD Performance Check.mth.

Intensity Criterion: Be 9 > 2000

```
        Intensity Criterion: In 115 > 40000
        Intensity Criterion: U 238 > 30000
        Intensity Criterion: Bkgd 220 <= 5
        Formula Criterion: Ce++ 70 / Ce 140 <= 0.03
        Formula Criterion: CeO 156 / Ce 140 <= 0.025
        RSD Criterion: Be 9.0122 < 0.05
        RSD Criterion: In 114.904 < 0.05
        RSD Criterion: U 238.05 < 0.05

    Optimization Results:
    Initial Try
        Obtained Intensity (Be 9): 8625.87
        Obtained Intensity (In 115): 118053.59
        Obtained Intensity (U 238): 207995.46
        Obtained Intensity (Bkgd 220): 3.03
        Obtained Formula (Ce++ 70 / Ce 140): 0.008 (=1407.27 / 168359.06)
        Obtained Formula (CeO 156 / Ce 140): 0.018 (=3036.46 / 168359.06)
        Obtained RSD (Be 9): 0.0345
        Obtained RSD (In 115): 0.0067
        Obtained RSD (U 238): 0.0091

[Passed]  Optimum value(s): N/A

End Time: 8/9/2021 1:07:09 PM
```

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 13:58:56
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L				851347	0	Standard
	Be	9		ug/L				10	39	Standard
	C	13		ug/L				24210	4	Standard
	Cl	37		ug/L				3807524	1	Standard
>	Sc	45		ug/L				924614	3	Standard
	Na	23		ug/L				19857	2	Standard
	Mg	24		ug/L				3421	1	Standard
	Al	27		ug/L				5910	2	Standard
	K	39		ug/L				397696	0	Standard
	Ca	44		ug/L				8558	0	Standard
	V	51		ug/L				4329	3	Standard
	V-1	51		ug/L				172	10	Standard
	Cr	52		ug/L				12806	2	Standard
	Cr	53		ug/L				117	5	Standard
	Fe	54		ug/L				68439	1	Standard
	Fe	57		ug/L				14875	2	Standard
	Mn	55		ug/L				529	3	Standard
>	Ge	72		ug/L				86245	2	KED
	Co	59		ug/L				8	44	KED
	Ni	60		ug/L				213	8	KED
	Ni	62		ug/L				34	30	KED
	Cu	63		ug/L				139	7	KED
	Cu	65		ug/L				80	18	KED
	Zn	66		ug/L				340	5	KED
	Zn	67		ug/L				53	25	KED
	As	75		ug/L				3	21	KED
	Se	78		ug/L				9	22	KED
	Y	89		ug/L				449540	1	Standard
	Kr	83		ug/L				109	4	Standard
>	In-1	115		ug/L				21778	2	KED
	Mo	98		ug/L				3	62	KED
	Cd	111		ug/L				2	88	KED
	Cd	114		ug/L				4	25	KED
>	In	115		ug/L				1112607	0	Standard
	Ag	107		ug/L				36	34	Standard
	Sb	121		ug/L				113	7	Standard
	Sb	123		ug/L				89	12	Standard
	Ba	135		ug/L				100	2	Standard
	Ba	137		ug/L				170	8	Standard
>	Tb	159		ug/L				2978637	2	Standard
	Tl	205		ug/L				193	14	Standard
	Pb	208		ug/L				495	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL2
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:03:47
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	843382	2	Standard
	Be	9	0.200	ug/L	0.017	8	10	1310	6	Standard
	C	13		ug/L			24210	26777	2	Standard
	Cl	37		ug/L			3807524	3724230	1	Standard
>	Sc	45		ug/L			924614	931818	1	Standard
	Na	23	100.000	ug/L	1.575	1	19857	2389698	2	Standard
	Mg	24	20.000	ug/L	0.587	2	3421	641523	1	Standard
	Al	27	20.000	ug/L	0.609	3	5910	516078	3	Standard
	K	39	20.000	ug/L	0.617	3	397696	668245	0	Standard
	Ca	44	50.000	ug/L	1.380	2	8558	66646	1	Standard
	V	51	0.200	ug/L	0.002	1	4329	8832	1	Standard
	V-1	51	0.200	ug/L	0.001	0	172	4962	1	Standard
	Cr	52	0.500	ug/L	0.003	0	12806	22649	1	Standard
	Cr	53	0.500	ug/L	0.001	0	117	1321	1	Standard
	Fe	54	36.000	ug/L	1.689	4	68439	153612	1	Standard
	Fe	57	36.000	ug/L	0.471	1	14875	49202	0	Standard
	Mn	55	0.500	ug/L	0.017	3	529	14576	3	Standard
>	Ge	72		ug/L			86245	88575	0	KED
	Co	59	0.200	ug/L	0.007	3	8	1397	3	KED
	Ni	60	0.500	ug/L	0.031	6	213	1148	4	KED
	Ni	62	0.500	ug/L	0.060	12	34	192	10	KED
	Cu	63	0.500	ug/L	0.018	3	139	3155	3	KED
	Cu	65	0.500	ug/L	0.024	4	80	1623	4	KED
	Zn	66	6.000	ug/L	0.147	2	340	4915	2	KED
	Zn	67	6.000	ug/L	0.067	1	53	762	0	KED
	As	75	0.200	ug/L	0.017	8	3	73	8	KED
	Se	78	0.500	ug/L	0.073	14	9	23	7	KED
	Y	89		ug/L			449540	456799	0	Standard
	Kr	83		ug/L			109	113	19	Standard
>	In-1	115		ug/L			21778	21043	0	KED
	Mo	98	0.200	ug/L	0.007	3	3	307	2	KED
	Cd	111	0.100	ug/L	0.011	10	2	40	9	KED
	Cd	114	0.100	ug/L	0.009	9	4	102	8	KED
>	In	115		ug/L			1112607	1128967	2	Standard
	Ag	107	0.200	ug/L	0.005	2	36	3008	2	Standard
	Sb	121	0.200	ug/L	0.002	0	113	3866	2	Standard
	Sb	123	0.200	ug/L	0.007	3	89	2935	5	Standard
	Ba	135	0.500	ug/L	0.017	3	100	3869	0	Standard
	Ba	137	0.500	ug/L	0.015	3	170	6914	1	Standard
>	Tb	159		ug/L			2978637	2991335	1	Standard
	Tl	205	0.200	ug/L	0.005	2	193	20720	1	Standard
	Pb	208	0.100	ug/L	0.001	1	495	14504	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL3
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:08:38
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
⌈>	Li	6		ug/L			851347	899450	2	Standard
⌊	Be	9	10.000	ug/L	0.134	1	10	68350	2	Standard
	C	13		ug/L			24210	52258	3	Standard
	Cl	37		ug/L			3807524	3930331	1	Standard
⌈>	Sc	45		ug/L			924614	935754	3	Standard
|	Na	23	1000.260	ug/L	21.643	2	19857	24451256	3	Standard
|	Mg	24	1000.030	ug/L	59.320	5	3421	34584544	2	Standard
|	Al	27	1000.038	ug/L	14.450	1	5910	28314372	2	Standard
|	K	39	1000.039	ug/L	34.371	3	397696	15264875	1	Standard
|	Ca	44	1000.067	ug/L	50.523	5	8558	1204901	1	Standard
|	V	51	10.000	ug/L	0.309	3	4329	247547	0	Standard
|	V-1	51	10.000	ug/L	0.299	2	172	243520	0	Standard
|	Cr	52	10.002	ug/L	0.281	2	12806	226675	2	Standard
|	Cr	53	10.000	ug/L	0.241	2	117	24326	2	Standard
|	Fe	54	999.801	ug/L	40.925	4	68439	2113824	0	Standard
|	Fe	57	1000.044	ug/L	34.406	3	14875	1001973	0	Standard
⌊	Mn	55	10.002	ug/L	0.484	4	529	300464	2	Standard
⌈>	Ge	72		ug/L			86245	87462	0	KED
|	Co	59	10.000	ug/L	0.080	0	8	69803	1	KED
|	Ni	60	10.003	ug/L	0.114	1	213	21299	1	KED
|	Ni	62	10.001	ug/L	0.289	2	34	3282	2	KED
|	Cu	63	10.001	ug/L	0.085	0	139	61770	0	KED
|	Cu	65	10.001	ug/L	0.354	3	80	31171	2	KED
|	Zn	66	10.305	ug/L	0.101	0	340	8804	1	KED
|	Zn	67	10.496	ug/L	0.244	2	53	1471	1	KED
|	As	75	10.000	ug/L	0.087	0	3	3746	0	KED
⌊	Se	78	10.007	ug/L	0.398	3	9	393	4	KED
	Y	89		ug/L			449540	449567	3	Standard
	Kr	83		ug/L			109	109	9	Standard
⌈>	In-1	115		ug/L			21778	20558	1	KED
|	Mo	98	10.001	ug/L	0.294	2	3	17122	1	KED
|	Cd	111	10.000	ug/L	0.183	1	2	3838	2	KED
⌊	Cd	114	10.000	ug/L	0.228	2	4	10012	3	KED
⌈>	In	115		ug/L			1112607	1136692	1	Standard
|	Ag	107	10.000	ug/L	0.276	2	36	152087	1	Standard
|	Sb	121	10.000	ug/L	0.280	2	113	190184	1	Standard
|	Sb	123	10.000	ug/L	0.296	2	89	149080	1	Standard
|	Ba	135	10.001	ug/L	0.166	1	100	79163	0	Standard
⌊	Ba	137	10.001	ug/L	0.108	1	170	140950	0	Standard
⌈>	Tb	159		ug/L			2978637	3007406	0	Standard
|	Tl	205	10.000	ug/L	0.092	0	193	1067296	0	Standard
⌊	Pb	208	10.000	ug/L	0.124	1	495	1391620	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL4
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:13:43
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	873825	1	Standard
	Be	9	19.996	ug/L	0.344	1	10	132662	1	Standard
	C	13		ug/L			24210	53294	2	Standard
	Cl	37		ug/L			3807524	4050830	3	Standard
>	Sc	45		ug/L			924614	944081	1	Standard
	Na	23	1984.029	ug/L	47.379	2	19857	47416429	1	Standard
	Mg	24	1990.222	ug/L	72.084	3	3421	68205025	3	Standard
	Al	27	1984.155	ug/L	51.112	2	5910	54940495	1	Standard
	K	39	1991.864	ug/L	11.589	0	397696	29815969	0	Standard
	Ca	44	2015.847	ug/L	4.595	0	8558	2523969	1	Standard
	V	51	19.958	ug/L	0.279	1	4329	490312	1	Standard
	V-1	51	19.948	ug/L	0.183	0	172	485193	0	Standard
	Cr	52	19.977	ug/L	0.463	2	12806	441881	1	Standard
	Cr	53	19.943	ug/L	0.227	1	117	48295	0	Standard
	Fe	54	1989.983	ug/L	15.243	0	68439	4099340	2	Standard
	Fe	57	2002.184	ug/L	107.535	5	14875	2019674	6	Standard
	Mn	55	19.914	ug/L	0.499	2	529	593410	2	Standard
>	Ge	72		ug/L			86245	85541	0	KED
	Co	59	20.019	ug/L	0.340	1	8	137156	1	KED
	Ni	60	20.055	ug/L	0.395	1	213	42001	1	KED
	Ni	62	20.160	ug/L	0.534	2	34	6649	3	KED
	Cu	63	20.022	ug/L	0.236	1	139	121359	1	KED
	Cu	65	20.053	ug/L	0.175	0	80	61710	0	KED
	Zn	66	19.852	ug/L	0.258	1	340	15936	1	KED
	Zn	67	20.028	ug/L	0.495	2	53	2708	2	KED
	As	75	20.077	ug/L	0.183	0	3	7467	0	KED
	Se	78	20.049	ug/L	0.458	2	9	768	1	KED
	Y	89		ug/L			449540	451274	1	Standard
	Kr	83		ug/L			109	123	13	Standard
>	In-1	115		ug/L			21778	20600	1	KED
	Mo	98	19.935	ug/L	0.274	1	3	33769	1	KED
	Cd	111	19.894	ug/L	0.154	0	2	7489	0	KED
	Cd	114	19.945	ug/L	0.376	1	4	19783	1	KED
>	In	115		ug/L			1112607	1101325	6	Standard
	Ag	107	20.256	ug/L	0.874	4	36	314018	2	Standard
	Sb	121	20.152	ug/L	1.496	7	113	381746	1	Standard
	Sb	123	20.167	ug/L	1.293	6	89	300531	1	Standard
	Ba	135	20.121	ug/L	1.191	5	100	157641	0	Standard
	Ba	137	20.105	ug/L	1.429	7	170	279387	0	Standard
>	Tb	159		ug/L			2978637	3057530	1	Standard
	Tl	205	20.167	ug/L	0.494	2	193	2263187	1	Standard
	Pb	208	19.855	ug/L	0.260	1	495	2729223	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL5
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:18:58
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	824281	2	Standard
	Be	9	50.508	ug/L	0.275	0	10	332980	2	Standard
	C	13		ug/L			24210	22342	2	Standard
	Cl	37		ug/L			3807524	4126297	1	Standard
>	Sc	45		ug/L			924614	887622	2	Standard
	Na	23	5023.701	ug/L	180.653	3	19857	115549743	2	Standard
	Mg	24	5021.685	ug/L	169.600	3	3421	165312571	2	Standard
	Al	27	5012.985	ug/L	103.716	2	5910	132209741	2	Standard
	K	39	5022.801	ug/L	99.198	1	397696	71717661	1	Standard
	Ca	44	5023.377	ug/L	204.697	4	8558	6039883	3	Standard
	V	51	50.192	ug/L	0.866	1	4329	1175730	3	Standard
	V-1	51	50.239	ug/L	0.564	1	172	1176898	3	Standard
	Cr	52	50.003	ug/L	1.762	3	12806	1021342	1	Standard
	Cr	53	50.155	ug/L	1.312	2	117	115785	0	Standard
	Fe	54	5012.883	ug/L	62.389	1	68439	9730766	1	Standard
	Fe	57	5049.831	ug/L	164.619	3	14875	5012345	0	Standard
	Mn	55	50.159	ug/L	0.956	1	529	1427416	3	Standard
>	Ge	72		ug/L			86245	83857	0	KED
	Co	59	49.844	ug/L	1.176	2	8	329643	2	KED
	Ni	60	49.734	ug/L	0.869	1	213	99168	1	KED
	Ni	62	49.834	ug/L	1.001	2	34	15801	1	KED
	Cu	63	49.728	ug/L	0.312	0	139	287450	0	KED
	Cu	65	49.624	ug/L	0.702	1	80	144180	1	KED
	Zn	66	49.644	ug/L	1.529	3	340	37343	3	KED
	Zn	67	49.686	ug/L	0.400	0	53	6325	0	KED
	As	75	49.740	ug/L	0.215	0	3	17672	0	KED
	Se	78	49.542	ug/L	0.765	1	9	1766	1	KED
	Y	89		ug/L			449540	442946	3	Standard
	Kr	83		ug/L			109	116	12	Standard
>	In-1	115		ug/L			21778	19674	1	KED
	Mo	98	50.109	ug/L	1.352	2	3	81937	1	KED
	Cd	111	49.926	ug/L	0.507	1	2	17816	0	KED
	Cd	114	49.941	ug/L	0.834	1	4	47030	1	KED
>	In	115		ug/L			1112607	1092970	0	Standard
	Ag	107	49.684	ug/L	1.023	2	36	742261	1	Standard
	Sb	121	49.816	ug/L	1.059	2	113	922290	1	Standard
	Sb	123	49.741	ug/L	0.636	1	89	718829	0	Standard
	Ba	135	49.837	ug/L	1.525	3	100	382043	2	Standard
	Ba	137	49.692	ug/L	0.997	2	170	666591	1	Standard
>	Tb	159		ug/L			2978637	2955233	1	Standard
	Tl	205	49.750	ug/L	0.627	1	193	5266222	2	Standard
	Pb	208	50.113	ug/L	0.557	1	495	6733188	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL6
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:25:53
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
⌈>	Li	6		ug/L			851347	798906	1	Standard
⌊	Be	9	99.508	ug/L	1.013	1	10	625477	0	Standard
	C	13		ug/L			24210	39989	2	Standard
	Cl	37		ug/L			3807524	4237466	2	Standard
⌈>	Sc	45		ug/L			924614	880696	1	Standard
|	Na	23	9955.836	ug/L	192.701	1	19857	224002959	2	Standard
|	Mg	24	9934.945	ug/L	203.227	2	3421	317698074	0	Standard
|	Al	27	9962.781	ug/L	265.166	2	5910	257593638	3	Standard
|	K	39	10023.961	ug/L	174.844	1	397696	142791760	0	Standard
|	Ca	44	9957.889	ug/L	235.240	2	8558	11709583	1	Standard
|	V	51	101.096	ug/L	0.575	0	4329	2434084	0	Standard
|	V-1	51	100.802	ug/L	0.522	0	172	2406892	1	Standard
|	Cr	52	101.097	ug/L	1.985	1	12806	2114040	0	Standard
|	Cr	53	100.119	ug/L	1.557	1	117	230190	0	Standard
|	Fe	54	9960.856	ug/L	137.718	1	68439	18877205	1	Standard
|	Fe	57	10010.026	ug/L	100.664	1	14875	9882256	0	Standard
⌊	Mn	55	100.053	ug/L	1.182	1	529	2829476	1	Standard
⌈>	Ge	72		ug/L			86245	80028	1	KED
|	Co	59	100.746	ug/L	1.002	0	8	652075	1	KED
|	Ni	60	100.588	ug/L	1.300	1	213	195028	1	KED
|	Ni	62	100.538	ug/L	1.714	1	34	30945	2	KED
|	Cu	63	100.193	ug/L	1.930	1	139	556208	2	KED
|	Cu	65	100.413	ug/L	1.958	1	80	282245	2	KED
|	Zn	66	100.045	ug/L	2.497	2	340	71589	1	KED
|	Zn	67	99.590	ug/L	1.737	1	53	11887	0	KED
|	As	75	100.605	ug/L	0.548	0	3	34809	0	KED
⌊	Se	78	100.520	ug/L	0.412	0	9	3471	1	KED
	Y	89		ug/L			449540	434491	0	Standard
	Kr	83		ug/L			109	126	13	Standard
⌈>	In-1	115		ug/L			21778	19123	1	KED
|	Mo	98	100.295	ug/L	1.081	1	3	161005	1	KED
|	Cd	111	100.255	ug/L	1.156	1	2	35067	0	KED
⌊	Cd	114	99.834	ug/L	1.341	1	4	90866	1	KED
⌈>	In	115		ug/L			1112607	1031936	1	Standard
|	Ag	107	100.617	ug/L	0.700	0	36	1449221	2	Standard
|	Sb	121	100.641	ug/L	3.640	3	113	1797245	2	Standard
|	Sb	123	100.300	ug/L	4.629	4	89	1381878	3	Standard
|	Ba	135	100.368	ug/L	1.158	1	100	735450	0	Standard
⌊	Ba	137	100.803	ug/L	0.440	0	170	1311775	1	Standard
⌈>	Tb	159		ug/L			2978637	2842084	1	Standard
|	Tl	205	99.774	ug/L	1.418	1	193	10079190	1	Standard
⌊	Pb	208	100.750	ug/L	0.344	0	495	13353386	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:33:28
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	885372	2	Standard
	Be	9	0.003	ug/L	0.001	41	10	29	27	Standard
	C	13		ug/L			24210	23547	1	Standard
	Cl	37		ug/L			3807524	3960737	3	Standard
>	Sc	45		ug/L			924614	920622	1	Standard
	Na	23	0.382	ug/L	0.030	7	19857	28761	2	Standard
	Mg	24	0.202	ug/L	0.017	8	3421	10159	4	Standard
	Al	27	0.190	ug/L	0.016	8	5910	11028	2	Standard
	K	39	1.261	ug/L	0.429	34	397696	414646	0	Standard
	Ca	44	-0.298	ug/L	0.042	14	8558	8155	1	Standard
	V	51	-0.002	ug/L	0.005	271	4329	4264	1	Standard
	V-1	51	0.001	ug/L	0.001	45	172	200	7	Standard
	Cr	52	-0.016	ug/L	0.018	117	12806	12406	1	Standard
	Cr	53	-0.006	ug/L	0.003	40	117	102	5	Standard
	Fe	54	-0.937	ug/L	0.332	35	68439	66286	0	Standard
	Fe	57	1.953	ug/L	0.051	2	14875	16824	1	Standard
	Mn	55	0.003	ug/L	0.001	45	529	615	5	Standard
>	Ge	72		ug/L			86245	84548	0	KED
	Co	59	0.002	ug/L	0.001	89	8	19	49	KED
	Ni	60	-0.016	ug/L	0.005	29	213	177	5	KED
	Ni	62	0.006	ug/L	0.033	540	34	36	29	KED
	Cu	63	-0.001	ug/L	0.003	326	139	131	12	KED
	Cu	65	-0.001	ug/L	0.006	1109	80	77	23	KED
	Zn	66	-0.045	ug/L	0.039	87	340	299	9	KED
	Zn	67	-0.153	ug/L	0.063	40	53	33	22	KED
	As	75	0.007	ug/L	0.001	20	3	6	8	KED
	Se	78	-0.016	ug/L	0.061	386	9	8	24	KED
	Y	89		ug/L			449540	441201	1	Standard
	Kr	83		ug/L			109	116	14	Standard
>	In-1	115		ug/L			21778	20214	2	KED
	Mo	98	0.018	ug/L	0.002	8	3	34	8	KED
	Cd	111	0.002	ug/L	0.005	234	2	3	56	KED
	Cd	114	0.001	ug/L	0.002	254	4	4	45	KED
>	In	115		ug/L			1112607	1113688	0	Standard
	Ag	107	0.007	ug/L	0.001	19	36	140	13	Standard
	Sb	121	0.026	ug/L	0.001	4	113	617	4	Standard
	Sb	123	0.024	ug/L	0.001	4	89	443	4	Standard
	Ba	135	0.000	ug/L	0.002	632	100	102	15	Standard
	Ba	137	-0.002	ug/L	0.000	17	170	139	4	Standard
>	Tb	159		ug/L			2978637	2908751	1	Standard
	Tl	205	0.010	ug/L	0.000	2	193	1175	4	Standard
	Pb	208	0.004	ug/L	0.001	15	495	986	6	Standard

Sample Information

Sample Date/Time: Monday, August 09, 2021 14:25:53
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.m
Mass Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Conditions File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

Calibration

Analyte	Mass	**r Corr Coef**	Slope	Std 1 Conc	Std 2 Conc	Std 3 Conc	Std 4 Conc	Std 5 Conc
Li	6							
Be	9	**0.9999**	0.008	0.20	10	20	50	100
C	13							
Cl	37							
Sc	45							
Na	23	**0.9999**	0.026	100.00	1000	2000	5000	10000
Mg	24	**0.9999**	0.036	20.00	1000	2000	5000	10000
Al	27	**1.0000**	0.029	20.00	1000	2000	5000	10000
K	39	**1.0000**	0.016	20.00	1000	2000	5000	10000
Ca	44	**1.0000**	0.001	50.00	1000	2000	5000	10000
V	51	**0.9998**	0.027	0.20	10	20	50	100
V-1	51	**0.9999**	0.027	0.20	10	20	50	100
Cr	52	**0.9998**	0.024	0.50	10	20	50	100
Cr	53	**1.0000**	0.003	0.50	10	20	50	100
Fe	54	**1.0000**	0.002	36.00	1000	2000	5000	10000
Fe	57	**0.9999**	0.001	36.00	1000	2000	5000	10000
Mn	55	**1.0000**	0.032	0.50	10	20	50	100
Ge	72							
Co	59	**0.9999**	0.081	0.20	10	20	50	100
Ni	60	**0.9999**	0.024	0.50	10	20	50	100
Ni	62	**0.9999**	0.004	0.50	10	20	50	100
Cu	63	**1.0000**	0.069	0.50	10	20	50	100
Cu	65	**0.9999**	0.035	0.50	10	20	50	100
Zn	66	**1.0000**	0.009	6.00	10	20	50	100
Zn	67	**0.9999**	0.001	6.00	10	20	50	100
As	75	**0.9999**	0.004	0.20	10	20	50	100
Se	78	**0.9999**	0.000	0.50	10	20	50	100
Y	89							
Kr	83							
In-1	115							
Mo	98	**1.0000**	0.084	0.20	10	20	50	100
Cd	111	**1.0000**	0.018	0.10	10	20	50	100
Cd	114	**1.0000**	0.048	0.10	10	20	50	100
In	115							
Ag	107	**0.9999**	0.014	0.20	10	20	50	100
Sb	121	**0.9999**	0.017	0.20	10	20	50	100
Sb	123	**1.0000**	0.013	0.20	10	20	50	100
Ba	135	**1.0000**	0.007	0.50	10	20	50	100
Ba	137	**0.9999**	0.013	0.50	10	20	50	100
Tb	159							
Tl	205	**1.0000**	0.036	0.20	10	20	50	100
Pb	208	**0.9999**	0.047	0.10	10	20	50	100

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-ICV1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:49:07
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	840943	0	Standard
	Be	9	48.446	ug/L	0.947	1	10	320576	1	Standard
	C	13		ug/L			24210	29221	3	Standard
	Cl	37		ug/L			3807524	4312766	1	Standard
>	Sc	45		ug/L			924614	902397	1	Standard
	Na	23	4839.769	ug/L	122.472	2	19857	111567886	1	Standard
	Mg	24	4808.042	ug/L	13.881	0	3421	157565703	1	Standard
	Al	27	4800.265	ug/L	134.849	2	5910	127144664	2	Standard
	K	39	4820.289	ug/L	110.116	2	397696	70554712	1	Standard
	Ca	44	4740.189	ug/L	12.328	0	8558	5717017	1	Standard
	V	51	47.601	ug/L	1.003	2	4329	1176464	1	Standard
	V-1	51	48.245	ug/L	1.172	2	172	1180319	1	Standard
	Cr	52	47.447	ug/L	0.645	1	12806	1023340	1	Standard
	Cr	53	49.584	ug/L	0.678	1	117	116870	0	Standard
	Fe	54	4934.686	ug/L	40.587	0	68439	9616226	0	Standard
	Fe	57	4780.945	ug/L	79.556	1	14875	4844453	2	Standard
	Mn	55	49.958	ug/L	0.232	0	529	1447924	1	Standard
>	Ge	72		ug/L			86245	84395	2	KED
	Co	59	48.642	ug/L	0.692	1	8	331959	1	KED
	Ni	60	48.092	ug/L	0.749	1	213	98421	1	KED
	Ni	62	47.917	ug/L	0.855	1	34	15569	2	KED
	Cu	63	47.971	ug/L	1.245	2	139	280839	2	KED
	Cu	65	48.160	ug/L	0.572	1	80	142773	1	KED
	Zn	66	47.451	ug/L	0.921	1	340	35985	2	KED
	Zn	67	47.456	ug/L	0.455	0	53	6002	2	KED
	As	75	47.461	ug/L	0.430	0	3	17320	2	KED
	Se	78	74.010	ug/L	1.671	2	9	2698	4	KED
	Y	89		ug/L			449540	438786	1	Standard
	Kr	83		ug/L			109	122	14	Standard
>	In-1	115		ug/L			21778	20303	0	KED
	Mo	98	48.567	ug/L	0.814	1	3	82786	1	KED
	Cd	111	48.084	ug/L	0.126	0	2	17861	0	KED
	Cd	114	47.886	ug/L	0.382	0	4	46283	0	KED
>	In	115		ug/L			1112607	1093613	3	Standard
	Ag	107	47.183	ug/L	1.428	3	36	719684	0	Standard
	Sb	121	48.235	ug/L	1.793	3	113	912524	2	Standard
	Sb	123	47.834	ug/L	2.017	4	89	698033	0	Standard
	Ba	135	46.870	ug/L	2.236	4	100	363680	1	Standard
	Ba	137	47.315	ug/L	1.526	3	170	652152	0	Standard
>	Tb	159		ug/L			2978637	2923554	1	Standard
	Tl	205	49.192	ug/L	1.777	3	193	5110540	2	Standard
	Pb	208	47.645	ug/L	0.857	1	495	6494737	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-ICB1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 14:56:43
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	864771	2	Standard
	Be	9	0.001	ug/L	0.000	62	10	15	21	Standard
	C	13		ug/L			24210	23605	2	Standard
	Cl	37		ug/L			3807524	4005937	2	Standard
>	Sc	45		ug/L			924614	931037	2	Standard
	Na	23	0.229	ug/L	0.025	10	19857	25439	0	Standard
	Mg	24	0.054	ug/L	0.011	19	3421	5278	4	Standard
	Al	27	0.033	ug/L	0.015	45	5910	6837	4	Standard
	K	39	0.757	ug/L	0.686	90	397696	411632	0	Standard
	Ca	44	-0.813	ug/L	0.179	22	8558	7603	0	Standard
	V	51	-0.007	ug/L	0.005	71	4329	4178	2	Standard
	V-1	51	-0.000	ug/L	0.000	66	172	165	0	Standard
	Cr	52	-0.025	ug/L	0.013	52	12806	12344	2	Standard
	Cr	53	-0.003	ug/L	0.003	95	117	111	8	Standard
	Fe	54	-1.467	ug/L	0.439	29	68439	65991	3	Standard
	Fe	57	1.023	ug/L	0.328	32	14875	16040	1	Standard
	Mn	55	0.000	ug/L	0.001	127	529	546	3	Standard
>	Ge	72		ug/L			86245	86205	1	KED
	Co	59	0.004	ug/L	0.006	156	8	35	117	KED
	Ni	60	-0.030	ug/L	0.001	2	213	151	1	KED
	Ni	62	-0.031	ug/L	0.020	64	34	24	27	KED
	Cu	63	0.003	ug/L	0.007	233	139	158	28	KED
	Cu	65	0.002	ug/L	0.005	282	80	86	18	KED
	Zn	66	-0.041	ug/L	0.026	61	340	308	7	KED
	Zn	67	-0.094	ug/L	0.056	59	53	41	18	KED
	As	75	0.004	ug/L	0.003	90	3	5	24	KED
	Se	78	-0.024	ug/L	0.029	118	9	8	11	KED
	Y	89		ug/L			449540	442485	1	Standard
	Kr	83		ug/L			109	126	5	Standard
>	In-1	115		ug/L			21778	20662	1	KED
	Mo	98	0.010	ug/L	0.002	19	3	19	15	KED
	Cd	111	-0.004	ug/L	0.004	103	2	1	114	KED
	Cd	114	0.001	ug/L	0.002	125	4	5	34	KED
>	In	115		ug/L			1112607	1100411	3	Standard
	Ag	107	0.003	ug/L	0.001	29	36	75	11	Standard
	Sb	121	0.007	ug/L	0.001	9	113	250	4	Standard
	Sb	123	0.007	ug/L	0.002	21	89	198	9	Standard
	Ba	135	-0.003	ug/L	0.001	19	100	73	9	Standard
	Ba	137	-0.004	ug/L	0.002	45	170	111	19	Standard
>	Tb	159		ug/L			2978637	2907353	1	Standard
	Tl	205	0.007	ug/L	0.000	3	193	902	1	Standard
	Pb	208	0.001	ug/L	0.000	9	495	618	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:01:34
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	802201	8	Standard
	Be	9	51.726	ug/L	3.860	7	10	325183	1	Standard
	C	13		ug/L			24210	22527	1	Standard
	Cl	37		ug/L			3807524	4150182	1	Standard
>	Sc	45		ug/L			924614	847194	6	Standard
	Na	23	5193.883	ug/L	349.589	6	19857	112094801	2	Standard
	Mg	24	5224.229	ug/L	305.824	5	3421	160299807	1	Standard
	Al	27	5182.417	ug/L	301.366	5	5910	128540998	1	Standard
	K	39	5133.057	ug/L	395.753	7	397696	70279142	1	Standard
	Ca	44	5070.415	ug/L	295.111	5	8558	5725039	1	Standard
	V	51	49.854	ug/L	2.924	5	4329	1153668	2	Standard
	V-1	51	50.489	ug/L	3.162	6	172	1156457	1	Standard
	Cr	52	50.111	ug/L	2.619	5	12806	1011691	2	Standard
	Cr	53	52.228	ug/L	3.690	7	117	115212	1	Standard
	Fe	54	5191.243	ug/L	308.131	5	68439	9468973	1	Standard
	Fe	57	5088.001	ug/L	304.779	5	14875	4826557	2	Standard
	Mn	55	51.762	ug/L	2.165	4	529	1405709	3	Standard
>	Ge	72		ug/L			86245	84353	0	KED
	Co	59	48.315	ug/L	0.434	0	8	329609	0	KED
	Ni	60	47.871	ug/L	1.062	2	213	97935	1	KED
	Ni	62	48.109	ug/L	1.988	4	34	15623	3	KED
	Cu	63	48.290	ug/L	0.419	0	139	282607	0	KED
	Cu	65	48.694	ug/L	1.106	2	80	144287	1	KED
	Zn	66	49.422	ug/L	0.691	1	340	37450	1	KED
	Zn	67	49.132	ug/L	0.452	0	53	6208	0	KED
	As	75	48.708	ug/L	0.627	1	3	17765	0	KED
	Se	78	48.528	ug/L	0.786	1	9	1771	1	KED
	Y	89		ug/L			449540	421686	5	Standard
	Kr	83		ug/L			109	129	18	Standard
>	In-1	115		ug/L			21778	19524	2	KED
	Mo	98	49.508	ug/L	1.004	2	3	81127	0	KED
	Cd	111	50.194	ug/L	1.348	2	2	17921	0	KED
	Cd	114	49.648	ug/L	1.547	3	4	46122	1	KED
>	In	115		ug/L			1112607	1049611	8	Standard
	Ag	107	50.668	ug/L	4.577	9	36	738458	0	Standard
	Sb	121	49.907	ug/L	2.396	4	113	904326	3	Standard
	Sb	123	49.542	ug/L	4.164	8	89	691231	0	Standard
	Ba	135	50.954	ug/L	4.302	8	100	378072	1	Standard
	Ba	137	50.598	ug/L	3.652	7	170	667077	1	Standard
>	Tb	159		ug/L			2978637	2788748	8	Standard
	Tl	205	51.225	ug/L	3.532	6	193	5058718	1	Standard
	Pb	208	50.455	ug/L	4.087	8	495	6532402	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:09:10
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	869253	3	Standard
	Be	9	0.001	ug/L	0.001	137	10	15	45	Standard
	C	13		ug/L			24210	23420	1	Standard
	Cl	37		ug/L			3807524	3933126	0	Standard
>	Sc	45		ug/L			924614	901709	0	Standard
	Na	23	0.285	ug/L	0.018	6	19857	25927	1	Standard
	Mg	24	0.098	ug/L	0.007	7	3421	6532	4	Standard
	Al	27	0.068	ug/L	0.004	5	5910	7557	0	Standard
	K	39	1.474	ug/L	0.396	26	397696	409267	0	Standard
	Ca	44	-0.781	ug/L	0.157	20	8558	7406	2	Standard
	V	51	-0.007	ug/L	0.002	32	4329	4058	1	Standard
	V-1	51	-0.001	ug/L	0.000	64	172	152	6	Standard
	Cr	52	-0.024	ug/L	0.008	35	12806	11986	1	Standard
	Cr	53	-0.004	ug/L	0.003	80	117	105	6	Standard
	Fe	54	-0.862	ug/L	0.491	56	68439	65077	1	Standard
	Fe	57	1.246	ug/L	0.247	19	14875	15765	2	Standard
	Mn	55	0.002	ug/L	0.001	35	529	560	2	Standard
>	Ge	72		ug/L			86245	85108	1	KED
	Co	59	0.001	ug/L	0.000	60	8	12	17	KED
	Ni	60	-0.039	ug/L	0.001	3	213	130	0	KED
	Ni	62	-0.041	ug/L	0.025	61	34	20	39	KED
	Cu	63	-0.002	ug/L	0.001	42	139	125	3	KED
	Cu	65	-0.006	ug/L	0.006	106	80	62	28	KED
	Zn	66	-0.048	ug/L	0.038	78	340	299	10	KED
	Zn	67	-0.064	ug/L	0.049	75	53	45	12	KED
	As	75	0.002	ug/L	0.003	114	3	4	21	KED
	Se	78	-0.039	ug/L	0.036	92	9	8	17	KED
	Y	89		ug/L			449540	437940	1	Standard
	Kr	83		ug/L			109	111	6	Standard
>	In-1	115		ug/L			21778	20499	1	KED
	Mo	98	0.011	ug/L	0.001	11	3	21	11	KED
	Cd	111	0.002	ug/L	0.007	299	2	3	68	KED
	Cd	114	0.001	ug/L	0.003	376	4	4	60	KED
>	In	115		ug/L			1112607	1116577	1	Standard
	Ag	107	0.003	ug/L	0.000	14	36	81	6	Standard
	Sb	121	0.040	ug/L	0.003	7	113	887	5	Standard
	Sb	123	0.040	ug/L	0.002	3	89	692	3	Standard
	Ba	135	-0.005	ug/L	0.001	15	100	59	12	Standard
	Ba	137	-0.003	ug/L	0.001	18	170	122	7	Standard
>	Tb	159		ug/L			2978637	2887786	1	Standard
	Tl	205	0.006	ug/L	0.000	2	193	820	1	Standard
	Pb	208	0.002	ug/L	0.000	14	495	695	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CRL1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:18:23
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	852585	3	Standard
	Be	9	0.188	ug/L	0.008	4	10	1269	1	Standard
	C	13		ug/L			24210	29198	0	Standard
	Cl	37		ug/L			3807524	3938701	0	Standard
>	Sc	45		ug/L			924614	900550	0	Standard
	Na	23	97.919	ug/L	0.629	0	19857	2272126	1	Standard
	Mg	24	19.100	ug/L	0.483	2	3421	628065	3	Standard
	Al	27	18.882	ug/L	0.097	0	5910	504916	1	Standard
	K	39	18.772	ug/L	0.423	2	397696	660062	0	Standard
	Ca	44	47.435	ug/L	0.894	1	8558	65339	1	Standard
	V	51	0.176	ug/L	0.003	1	4329	8534	1	Standard
	V-1	51	0.188	ug/L	0.003	1	172	4768	0	Standard
	Cr	52	0.462	ug/L	0.029	6	12806	22293	3	Standard
	Cr	53	0.511	ug/L	0.022	4	117	1314	4	Standard
	Fe	54	41.739	ug/L	2.280	5	68439	147245	2	Standard
	Fe	57	34.857	ug/L	0.398	1	14875	49631	1	Standard
	Mn	55	0.476	ug/L	0.008	1	529	14289	2	Standard
>	Ge	72		ug/L			86245	84272	3	KED
	Co	59	0.195	ug/L	0.007	3	8	1334	3	KED
	Ni	60	0.409	ug/L	0.027	6	213	1041	3	KED
	Ni	62	0.399	ug/L	0.059	14	34	163	14	KED
	Cu	63	0.490	ug/L	0.028	5	139	2999	2	KED
	Cu	65	0.478	ug/L	0.038	7	80	1491	4	KED
	Zn	66	5.808	ug/L	0.076	1	340	4689	1	KED
	Zn	67	5.049	ug/L	0.150	2	53	685	5	KED
	As	75	0.195	ug/L	0.009	4	3	74	5	KED
	Se	78	0.543	ug/L	0.044	8	9	29	3	KED
	Y	89		ug/L			449540	440795	0	Standard
	Kr	83		ug/L			109	118	12	Standard
>	In-1	115		ug/L			21778	20532	0	KED
	Mo	98	0.191	ug/L	0.015	8	3	331	8	KED
	Cd	111	0.125	ug/L	0.012	9	2	49	9	KED
	Cd	114	0.101	ug/L	0.019	18	4	102	17	KED
>	In	115		ug/L			1112607	1091941	6	Standard
	Ag	107	0.187	ug/L	0.005	2	36	2886	3	Standard
	Sb	121	0.205	ug/L	0.022	10	113	3968	5	Standard
	Sb	123	0.204	ug/L	0.015	7	89	3060	1	Standard
	Ba	135	0.473	ug/L	0.039	8	100	3754	2	Standard
	Ba	137	0.457	ug/L	0.030	6	170	6440	0	Standard
>	Tb	159		ug/L			2978637	2875348	2	Standard
	Tl	205	0.194	ug/L	0.002	0	193	20028	2	Standard
	Pb	208	0.099	ug/L	0.001	1	495	13791	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IFA1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:23:37
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	805437	1	Standard
	Be	9	0.001	ug/L	0.001	120	10	15	45	Standard
	C	13		ug/L			24210	118382	2	Standard
	Cl	37		ug/L			3807524	10027070	2	Standard
>	Sc	45		ug/L			924614	859589	0	Standard
	Na	23	19130.974	ug/L	339.959	1	19857	420089535	1	Standard
	Mg	24	18760.549	ug/L	271.897	1	3421	585687134	2	Standard
	Al	27	19330.417	ug/L	308.183	1	5910	487736961	1	Standard
	K	39	20690.166	ug/L	64.930	0	397696	287319788	0	Standard
	Ca	44	18768.847	ug/L	321.181	1	8558	21537480	1	Standard
	V	51	0.052	ug/L	0.008	16	4329	5241	2	Standard
	V-1	51	0.348	ug/L	0.006	1	172	8280	2	Standard
	Cr	52	0.396	ug/L	0.029	7	12806	19952	3	Standard
	Cr	53	1.389	ug/L	0.056	4	117	3226	4	Standard
	Fe	54	19659.360	ug/L	52.649	0	68439	36306010	0	Standard
	Fe	57	19690.477	ug/L	320.713	1	14875	18961426	1	Standard
	Mn	55	0.113	ug/L	0.003	2	529	3605	1	Standard
>	Ge	72		ug/L			86245	78544	1	KED
	Co	59	0.043	ug/L	0.008	18	8	283	18	KED
	Ni	60	-0.042	ug/L	0.004	9	213	115	7	KED
	Ni	62	0.021	ug/L	0.033	159	34	38	25	KED
	Cu	63	0.041	ug/L	0.007	17	139	347	10	KED
	Cu	65	0.037	ug/L	0.007	19	80	175	10	KED
	Zn	66	-0.097	ug/L	0.034	34	340	241	8	KED
	Zn	67	-0.144	ug/L	0.003	2	53	32	0	KED
	As	75	0.019	ug/L	0.003	13	3	10	9	KED
	Se	78	0.095	ug/L	0.090	94	9	12	26	KED
	Y	89		ug/L			449540	415657	1	Standard
	Kr	83		ug/L			109	172	2	Standard
>	In-1	115		ug/L			21778	18603	1	KED
	Mo	98	395.883	ug/L	9.974	2	3	618172	1	KED
	Cd	111	0.048	ug/L	0.005	9	2	18	7	KED
	Cd	114	0.017	ug/L	0.007	42	4	18	34	KED
>	In	115		ug/L			1112607	1019072	1	Standard
	Ag	107	0.007	ug/L	0.001	11	36	132	9	Standard
	Sb	121	0.010	ug/L	0.002	17	113	277	9	Standard
	Sb	123	0.010	ug/L	0.001	5	89	221	1	Standard
	Ba	135	0.025	ug/L	0.005	21	100	269	12	Standard
	Ba	137	0.025	ug/L	0.001	3	170	477	1	Standard
>	Tb	159		ug/L			2978637	2672022	1	Standard
	Tl	205	0.006	ug/L	0.000	7	193	737	4	Standard
	Pb	208	0.017	ug/L	0.000	2	495	2615	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IFB1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:28:28
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	790993	3	Standard
	Be	9	0.000	ug/L	0.000	51	10	12	9	Standard
	C	13		ug/L			24210	128773	0	Standard
	Cl	37		ug/L			3807524	9365543	1	Standard
>	Sc	45		ug/L			924614	842046	4	Standard
	Na	23	18710.750	ug/L	920.922	4	19857	401938265	2	Standard
	Mg	24	18079.543	ug/L	1015.716	5	3421	551869287	0	Standard
	Al	27	18908.177	ug/L	1425.543	7	5910	466237017	2	Standard
	K	39	20381.733	ug/L	1115.386	5	397696	276790777	1	Standard
	Ca	44	18205.572	ug/L	453.589	2	8558	20451046	2	Standard
	V	51	0.022	ug/L	0.078	358	4329	4453	42	Standard
	V-1	51	0.364	ug/L	0.012	3	172	8466	3	Standard
	Cr	52	19.634	ug/L	0.646	3	12806	401647	2	Standard
	Cr	53	21.210	ug/L	0.662	3	117	46669	1	Standard
	Fe	54	19287.987	ug/L	711.164	3	68439	34855599	2	Standard
	Fe	57	18928.845	ug/L	687.097	3	14875	17838511	2	Standard
	Mn	55	20.043	ug/L	1.059	5	529	541409	0	Standard
>	Ge	72		ug/L			86245	76971	0	KED
	Co	59	20.570	ug/L	0.189	0	8	128052	0	KED
	Ni	60	20.182	ug/L	0.468	2	213	37784	1	KED
	Ni	62	20.345	ug/L	0.428	2	34	6046	1	KED
	Cu	63	19.604	ug/L	0.207	1	139	104761	1	KED
	Cu	65	19.442	ug/L	0.272	1	80	52614	1	KED
	Zn	66	18.620	ug/L	0.176	0	340	13065	1	KED
	Zn	67	17.332	ug/L	0.417	2	53	2029	2	KED
	As	75	19.376	ug/L	0.097	0	3	6451	0	KED
	Se	78	-0.031	ug/L	0.034	110	9	7	15	KED
	Y	89		ug/L			449540	411192	6	Standard
	Kr	83		ug/L			109	164	26	Standard
>	In-1	115		ug/L			21778	18217	1	KED
	Mo	98	398.168	ug/L	6.471	1	3	608920	0	KED
	Cd	111	19.240	ug/L	0.138	0	2	6413	1	KED
	Cd	114	19.288	ug/L	0.300	1	4	16732	2	KED
>	In	115		ug/L			1112607	980907	2	Standard
	Ag	107	20.244	ug/L	0.288	1	36	277119	0	Standard
	Sb	121	0.006	ug/L	0.001	23	113	196	11	Standard
	Sb	123	0.007	ug/L	0.000	1	89	166	2	Standard
	Ba	135	0.027	ug/L	0.003	12	100	275	9	Standard
	Ba	137	0.024	ug/L	0.005	18	170	448	12	Standard
>	Tb	159		ug/L			2978637	2593373	3	Standard
	Tl	205	0.004	ug/L	0.001	14	193	507	6	Standard
	Pb	208	0.013	ug/L	0.001	6	495	2052	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-HCV1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:39:03
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	783702	2	Standard
	Be	9	184.210	ug/L	8.276	4	10	1135291	2	Standard
	C	13		ug/L			24210	30868	5	Standard
	Cl	37		ug/L			3807524	4035787	0	Standard
>	Sc	45		ug/L			924614	806841	2	Standard
	Na	23	19425.523	ug/L	508.798	2	19857	400233114	0	Standard
	Mg	24	18877.718	ug/L	661.473	3	3421	553146359	4	Standard
	Al	27	18803.172	ug/L	336.098	1	5910	445204513	0	Standard
	K	39	20501.519	ug/L	560.426	2	397696	267184491	2	Standard
	Ca	44	18917.035	ug/L	436.833	2	8558	20368626	0	Standard
	V	51	193.791	ug/L	2.087	1	4329	4270550	1	Standard
	V-1	51	195.346	ug/L	2.700	1	172	4272217	1	Standard
	Cr	52	192.964	ug/L	4.102	2	12806	3685991	1	Standard
	Cr	53	198.112	ug/L	6.146	3	117	417050	1	Standard
	Fe	54	19580.974	ug/L	630.499	3	68439	33927418	1	Standard
	Fe	57	19553.813	ug/L	269.745	1	14875	17672381	2	Standard
	Mn	55	203.415	ug/L	3.151	1	529	5268563	1	Standard
>	Ge	72		ug/L			86245	73963	1	KED
	Co	59	204.350	ug/L	2.084	1	8	1222510	2	KED
	Ni	60	195.212	ug/L	3.446	1	213	349581	0	KED
	Ni	62	196.367	ug/L	2.730	1	34	55826	1	KED
	Cu	63	196.568	ug/L	2.714	1	139	1008253	1	KED
	Cu	65	194.875	ug/L	4.077	2	80	506073	1	KED
	Zn	66	193.501	ug/L	3.531	1	340	127711	1	KED
	Zn	67	189.478	ug/L	1.151	0	53	20864	1	KED
	As	75	198.895	ug/L	1.085	0	3	63602	1	KED
	Se	78	195.561	ug/L	4.968	2	9	6234	3	KED
	Y	89		ug/L			449540	400625	2	Standard
	Kr	83		ug/L			109	176	5	Standard
>	In-1	115		ug/L			21778	17411	1	KED
	Mo	98	204.879	ug/L	4.479	2	3	299449	1	KED
	Cd	111	197.337	ug/L	1.136	0	2	62849	0	KED
	Cd	114	197.353	ug/L	0.559	0	4	163562	1	KED
>	In	115		ug/L			1112607	939163	0	Standard
	Ag	107	209.854	ug/L	3.227	1	36	2750489	1	Standard
	Sb	121	199.511	ug/L	6.286	3	113	3243129	3	Standard
	Sb	123	200.327	ug/L	1.098	0	89	2512623	0	Standard
	Ba	135	186.011	ug/L	3.046	1	100	1240582	2	Standard
	Ba	137	193.330	ug/L	6.212	3	170	2289485	3	Standard
>	Tb	159		ug/L			2978637	2543167	1	Standard
	Tl	205	197.166	ug/L	5.393	2	193	17822856	2	Standard
	Pb	208	193.607	ug/L	2.013	1	495	22959160	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-HCV2
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:43:54
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	714021	2	Standard
	Be	9	286.690	ug/L	7.927	2	10	1610013	0	Standard
	C	13		ug/L			24210	28321	1	Standard
	Cl	37		ug/L			3807524	4045783	1	Standard
>	Sc	45		ug/L			924614	782671	1	Standard
	Na	23	28210.494	ug/L	255.688	0	19857	564033539	0	Standard
	Mg	24	27121.345	ug/L	444.743	1	3421	770819093	1	Standard
	Al	27	28138.536	ug/L	302.611	1	5910	646428952	0	Standard
	K	39	31385.658	ug/L	460.097	1	397696	396642140	1	Standard
	Ca	44	27330.483	ug/L	416.807	1	8558	28551535	0	Standard
	V	51	280.426	ug/L	4.786	1	4329	5993977	1	Standard
	V-1	51	283.861	ug/L	3.520	1	172	6023141	1	Standard
	Cr	52	283.147	ug/L	4.109	1	12806	5243501	2	Standard
	Cr	53	294.619	ug/L	3.483	1	117	601842	0	Standard
	Fe	54	28681.923	ug/L	321.751	1	68439	48200896	1	Standard
	Fe	57	28911.815	ug/L	4.325	0	14875	25344026	1	Standard
	Mn	55	291.574	ug/L	0.917	0	529	7326835	0	Standard
>	Ge	72		ug/L			86245	71057	3	KED
	Co	59	297.807	ug/L	6.950	2	8	1710602	0	KED
	Ni	60	291.991	ug/L	8.584	2	213	502017	0	KED
	Ni	62	290.130	ug/L	8.287	2	34	79185	0	KED
	Cu	63	281.597	ug/L	5.785	2	139	1387092	1	KED
	Cu	65	279.691	ug/L	6.474	2	80	697537	0	KED
	Zn	66	280.153	ug/L	5.902	2	340	177452	1	KED
	Zn	67	275.554	ug/L	1.557	0	53	29133	3	KED
	As	75	289.951	ug/L	5.818	2	3	89037	1	KED
	Se	78	279.075	ug/L	3.430	1	9	8542	3	KED
	Y	89		ug/L			449540	385771	1	Standard
	Kr	83		ug/L			109	252	10	Standard
>	In-1	115		ug/L			21778	16746	0	KED
	Mo	98	304.314	ug/L	4.176	1	3	427829	0	KED
	Cd	111	285.392	ug/L	1.787	0	2	87426	0	KED
	Cd	114	287.662	ug/L	3.595	1	4	229299	0	KED
>	In	115		ug/L			1112607	888181	2	Standard
	Ag	107	303.080	ug/L	1.788	0	36	3756976	2	Standard
	Sb	121	289.237	ug/L	12.009	4	113	4443820	2	Standard
	Sb	123	283.117	ug/L	8.555	3	89	3356901	1	Standard
	Ba	135	263.895	ug/L	9.780	3	100	1663463	1	Standard
	Ba	137	271.722	ug/L	7.461	2	170	3041922	0	Standard
>	Tb	159		ug/L			2978637	2365790	1	Standard
	Tl	205	302.235	ug/L	2.139	0	193	25417360	1	Standard
	Pb	208	288.636	ug/L	2.605	0	495	31840772	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL2
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:51:29
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	837644	0	Standard
	Be	9	0.007	ug/L	0.001	20	10	57	16	Standard
	C	13		ug/L			24210	24171	3	Standard
	Cl	37		ug/L			3807524	3929344	1	Standard
>	Sc	45		ug/L			924614	865107	2	Standard
	Na	23	3.181	ug/L	0.129	4	19857	88827	0	Standard
	Mg	24	0.705	ug/L	0.013	1	3421	25347	3	Standard
	Al	27	0.617	ug/L	0.007	1	5910	21185	1	Standard
	K	39	4.234	ug/L	0.717	16	397696	431047	0	Standard
	Ca	44	-0.864	ug/L	0.137	15	8558	7007	0	Standard
	V	51	0.001	ug/L	0.008	883	4329	4069	2	Standard
	V-1	51	0.013	ug/L	0.001	6	172	474	3	Standard
	Cr	52	-0.014	ug/L	0.023	160	12806	11686	1	Standard
	Cr	53	0.027	ug/L	0.003	9	117	170	5	Standard
	Fe	54	-0.157	ug/L	0.938	599	68439	63729	2	Standard
	Fe	57	-1.998	ug/L	0.033	1	14875	11984	2	Standard
	Mn	55	0.008	ug/L	0.001	14	529	711	3	Standard
>	Ge	72		ug/L			86245	78589	0	KED
	Co	59	0.009	ug/L	0.004	41	8	64	35	KED
	Ni	60	-0.075	ug/L	0.006	8	213	51	23	KED
	Ni	62	-0.055	ug/L	0.017	31	34	15	33	KED
	Cu	63	0.007	ug/L	0.002	36	139	162	8	KED
	Cu	65	0.007	ug/L	0.003	40	80	93	9	KED
	Zn	66	-0.218	ug/L	0.024	11	340	157	10	KED
	Zn	67	-0.253	ug/L	0.037	14	53	19	22	KED
	As	75	0.009	ug/L	0.007	79	3	6	37	KED
	Se	78	0.053	ug/L	0.080	149	9	10	24	KED
	Y	89		ug/L			449540	414972	4	Standard
	Kr	83		ug/L			109	122	13	Standard
>	In-1	115		ug/L			21778	18627	0	KED
	Mo	98	0.035	ug/L	0.003	9	3	58	8	KED
	Cd	111	0.015	ug/L	0.012	80	2	7	54	KED
	Cd	114	0.009	ug/L	0.005	57	4	11	39	KED
>	In	115		ug/L			1112607	1013604	1	Standard
	Ag	107	0.013	ug/L	0.000	1	36	223	1	Standard
	Sb	121	0.193	ug/L	0.008	4	113	3486	5	Standard
	Sb	123	0.188	ug/L	0.006	3	89	2632	4	Standard
	Ba	135	0.004	ug/L	0.004	94	100	118	20	Standard
	Ba	137	0.006	ug/L	0.002	38	170	233	11	Standard
>	Tb	159		ug/L			2978637	2641270	1	Standard
	Tl	205	0.050	ug/L	0.002	4	193	4884	4	Standard
	Pb	208	0.011	ug/L	0.001	6	495	1782	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL3
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 15:58:15
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	841446	2	Standard
	Be	9	0.005	ug/L	0.002	39	10	41	29	Standard
	C	13		ug/L			24210	23891	2	Standard
	Cl	37		ug/L			3807524	3892765	2	Standard
>	Sc	45		ug/L			924614	883067	1	Standard
	Na	23	1.628	ug/L	0.046	2	19857	55680	1	Standard
	Mg	24	0.477	ug/L	0.013	2	3421	18553	3	Standard
	Al	27	0.417	ug/L	0.017	4	5910	16462	2	Standard
	K	39	2.246	ug/L	0.318	14	397696	411794	0	Standard
	Ca	44	-1.464	ug/L	0.074	5	8558	6449	2	Standard
	V	51	0.003	ug/L	0.003	97	4329	4202	1	Standard
	V-1	51	0.009	ug/L	0.000	4	172	376	2	Standard
	Cr	52	-0.001	ug/L	0.010	1733	12806	12218	1	Standard
	Cr	53	0.019	ug/L	0.003	15	117	157	5	Standard
	Fe	54	-0.993	ug/L	0.673	67	68439	63475	1	Standard
	Fe	57	-0.983	ug/L	0.356	36	14875	13237	3	Standard
	Mn	55	0.003	ug/L	0.001	18	529	600	3	Standard
>	Ge	72		ug/L			86245	80148	0	KED
	Co	59	0.005	ug/L	0.001	21	8	40	16	KED
	Ni	60	-0.079	ug/L	0.004	5	213	45	19	KED
	Ni	62	-0.072	ug/L	0.007	10	34	10	21	KED
	Cu	63	0.000	ug/L	0.002	680	139	130	8	KED
	Cu	65	0.001	ug/L	0.004	426	80	77	13	KED
	Zn	66	-0.215	ug/L	0.005	2	340	162	2	KED
	Zn	67	-0.165	ug/L	0.026	15	53	30	10	KED
	As	75	0.008	ug/L	0.005	55	3	6	24	KED
	Se	78	-0.029	ug/L	0.092	320	9	7	39	KED
	Y	89		ug/L			449540	426140	0	Standard
	Kr	83		ug/L			109	109	16	Standard
>	In-1	115		ug/L			21778	19144	1	KED
	Mo	98	0.008	ug/L	0.003	34	3	16	28	KED
	Cd	111	0.006	ug/L	0.007	113	2	4	52	KED
	Cd	114	0.007	ug/L	0.003	44	4	9	28	KED
>	In	115		ug/L			1112607	1061994	1	Standard
	Ag	107	0.006	ug/L	0.001	14	36	130	11	Standard
	Sb	121	0.059	ug/L	0.002	4	113	1182	1	Standard
	Sb	123	0.058	ug/L	0.002	2	89	901	1	Standard
	Ba	135	0.003	ug/L	0.001	48	100	118	9	Standard
	Ba	137	0.003	ug/L	0.001	19	170	206	5	Standard
>	Tb	159		ug/L			2978637	2650480	1	Standard
	Tl	205	0.021	ug/L	0.000	1	193	2104	1	Standard
	Pb	208	0.007	ug/L	0.000	3	495	1358	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV2
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:08:17
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	867706	1	Standard
	Be	9	48.074	ug/L	1.192	2	10	328172	1	Standard
	C	13		ug/L			24210	21578	1	Standard
	Cl	37		ug/L			3807524	4083864	0	Standard
>	Sc	45		ug/L			924614	893222	1	Standard
	Na	23	4774.976	ug/L	75.588	1	19857	108968261	1	Standard
	Mg	24	4741.386	ug/L	123.273	2	3421	153789658	2	Standard
	Al	27	4799.513	ug/L	169.101	3	5910	125825752	2	Standard
	K	39	4643.532	ug/L	61.981	1	397696	67311304	2	Standard
	Ca	44	4621.757	ug/L	145.263	3	8558	5516378	2	Standard
	V	51	47.062	ug/L	1.657	3	4329	1151210	2	Standard
	V-1	51	47.793	ug/L	1.438	3	172	1157275	1	Standard
	Cr	52	46.814	ug/L	1.471	3	12806	999454	2	Standard
	Cr	53	49.236	ug/L	0.633	1	117	114877	0	Standard
	Fe	54	4719.620	ug/L	43.961	0	68439	9106584	0	Standard
	Fe	57	4718.857	ug/L	243.036	5	14875	4731174	4	Standard
	Mn	55	48.374	ug/L	0.512	1	529	1387649	0	Standard
>	Ge	72		ug/L			86245	79806	1	KED
	Co	59	50.364	ug/L	0.798	1	8	325018	0	KED
	Ni	60	49.562	ug/L	0.808	1	213	95910	0	KED
	Ni	62	49.639	ug/L	0.987	1	34	15249	1	KED
	Cu	63	50.759	ug/L	1.212	2	139	281024	2	KED
	Cu	65	49.763	ug/L	0.777	1	80	139505	1	KED
	Zn	66	50.758	ug/L	0.649	1	340	36382	2	KED
	Zn	67	48.565	ug/L	0.946	1	53	5807	2	KED
	As	75	49.423	ug/L	0.120	0	3	17055	1	KED
	Se	78	50.776	ug/L	0.450	0	9	1752	1	KED
	Y	89		ug/L			449540	422459	0	Standard
	Kr	83		ug/L			109	110	10	Standard
>	In-1	115		ug/L			21778	19386	1	KED
	Mo	98	48.558	ug/L	1.400	2	3	79022	2	KED
	Cd	111	48.765	ug/L	0.951	1	2	17293	1	KED
	Cd	114	49.206	ug/L	0.833	1	4	45406	0	KED
>	In	115		ug/L			1112607	1043957	2	Standard
	Ag	107	49.538	ug/L	1.009	2	36	721605	0	Standard
	Sb	121	49.125	ug/L	0.980	1	113	887745	2	Standard
	Sb	123	48.751	ug/L	0.136	0	89	679753	1	Standard
	Ba	135	49.051	ug/L	1.755	3	100	363526	1	Standard
	Ba	137	48.839	ug/L	1.455	2	170	642821	1	Standard
>	Tb	159		ug/L			2978637	2757947	0	Standard
	Tl	205	50.036	ug/L	0.591	1	193	4905475	1	Standard
	Pb	208	48.763	ug/L	0.774	1	495	6271342	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB2
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:15:52
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	881782	3	Standard
	Be	9	0.001	ug/L	0.000	32	10	20	14	Standard
	C	13		ug/L			24210	23125	2	Standard
	Cl	37		ug/L			3807524	3840419	0	Standard
>	Sc	45		ug/L			924614	889812	1	Standard
	Na	23	0.780	ug/L	0.011	1	19857	36829	1	Standard
	Mg	24	0.183	ug/L	0.007	3	3421	9211	1	Standard
	Al	27	0.172	ug/L	0.010	6	5910	10176	1	Standard
	K	39	1.822	ug/L	0.386	21	397696	408841	0	Standard
	Ca	44	-1.742	ug/L	0.067	3	8558	6167	2	Standard
	V	51	-0.003	ug/L	0.002	78	4329	4097	2	Standard
	V-1	51	0.005	ug/L	0.001	18	172	288	7	Standard
	Cr	52	-0.018	ug/L	0.010	54	12806	11941	2	Standard
	Cr	53	0.008	ug/L	0.003	40	117	131	6	Standard
	Fe	54	-0.475	ug/L	0.730	153	68439	64945	1	Standard
	Fe	57	-0.802	ug/L	0.249	31	14875	13515	0	Standard
	Mn	55	0.003	ug/L	0.001	40	529	588	4	Standard
>	Ge	72		ug/L			86245	81119	1	KED
	Co	59	0.004	ug/L	0.002	62	8	33	47	KED
	Ni	60	-0.034	ug/L	0.010	28	213	133	14	KED
	Ni	62	-0.028	ug/L	0.040	145	34	24	50	KED
	Cu	63	0.003	ug/L	0.006	200	139	147	24	KED
	Cu	65	-0.000	ug/L	0.002	526	80	74	8	KED
	Zn	66	-0.002	ug/L	0.017	858	340	318	5	KED
	Zn	67	-0.032	ug/L	0.130	404	53	46	33	KED
	As	75	0.011	ug/L	0.009	82	3	7	41	KED
	Se	78	-0.020	ug/L	0.018	89	9	8	9	KED
	Y	89		ug/L			449540	428864	1	Standard
	Kr	83		ug/L			109	102	23	Standard
>	In-1	115		ug/L			21778	19430	1	KED
	Mo	98	0.012	ug/L	0.004	36	3	22	29	KED
	Cd	111	0.006	ug/L	0.005	75	2	4	34	KED
	Cd	114	0.004	ug/L	0.004	103	4	7	50	KED
>	In	115		ug/L			1112607	1049845	2	Standard
	Ag	107	0.004	ug/L	0.001	26	36	96	17	Standard
	Sb	121	0.057	ug/L	0.001	1	113	1149	3	Standard
	Sb	123	0.057	ug/L	0.003	5	89	878	2	Standard
	Ba	135	-0.003	ug/L	0.002	68	100	72	19	Standard
	Ba	137	-0.002	ug/L	0.001	34	170	128	7	Standard
>	Tb	159		ug/L			2978637	2676306	1	Standard
	Tl	205	0.012	ug/L	0.000	4	193	1281	3	Standard
	Pb	208	0.004	ug/L	0.001	23	495	953	13	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0215-BLK1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:21:24

DEL

Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	887252	3	Standard
	Be	9	0.001	ug/L	0.001	98	10	19	43	Standard
	C	13		ug/L			24210	36101	2	Standard
	Cl	37		ug/L			3807524	3811000	0	Standard
>	Sc	45		ug/L			924614	903286	3	Standard
	Na	23	7.185	ug/L	0.176	2	19857	185119	1	Standard
	Mg	24	0.733	ug/L	0.011	1	3421	27378	3	Standard
	Al	27	1.165	ug/L	0.046	3	5910	36634	0	Standard
	K	39	3.721	ug/L	0.827	22	397696	442513	0	Standard
	Ca	44	1.621	ug/L	0.316	19	8558	10307	1	Standard
	V	51	0.001	ug/L	0.006	1091	4329	4242	4	Standard
	V-1	51	0.006	ug/L	0.000	5	172	321	5	Standard
	Cr	52	0.019	ug/L	0.019	100	12806	12911	4	Standard
	Cr	53	0.038	ug/L	0.001	1	117	205	3	Standard
	Fe	54	0.179	ug/L	1.370	767	68439	67153	1	Standard
	Fe	57	0.434	ug/L	0.128	29	14875	14969	2	Standard
	Mn	55	0.958	ug/L	0.016	1	529	28282	1	Standard
>	Ge	72		ug/L			86245	82928	1	KED
	Co	59	0.002	ug/L	0.001	35	8	19	20	KED
	Ni	60	-0.025	ug/L	0.009	34	213	156	12	KED
	Ni	62	-0.042	ug/L	0.012	29	34	20	19	KED
	Cu	63	0.020	ug/L	0.001	5	139	247	2	KED
	Cu	65	0.020	ug/L	0.003	13	80	135	6	KED
	Zn	66	0.025	ug/L	0.040	157	340	346	9	KED
	Zn	67	0.022	ug/L	0.078	351	53	54	17	KED
	As	75	0.001	ug/L	0.002	155	3	4	17	KED
	Se	78	-0.017	ug/L	0.026	155	9	8	10	KED
	Y	89		ug/L			449540	426116	1	Standard
	Kr	83		ug/L			109	117	16	Standard
>	In-1	115		ug/L			21778	19161	0	KED
	Mo	98	0.015	ug/L	0.004	24	3	27	21	KED
	Cd	111	0.006	ug/L	0.005	72	2	4	34	KED
	Cd	114	0.002	ug/L	0.002	123	4	5	36	KED
>	In	115		ug/L			1112607	1065753	1	Standard
	Ag	107	0.002	ug/L	0.001	40	36	62	16	Standard
	Sb	121	0.026	ug/L	0.002	6	113	580	4	Standard
	Sb	123	0.026	ug/L	0.003	10	89	455	9	Standard
	Ba	135	-0.002	ug/L	0.003	187	100	83	26	Standard
	Ba	137	-0.001	ug/L	0.000	32	170	145	3	Standard
>	Tb	159		ug/L			2978637	2737811	1	Standard
	Tl	205	0.009	ug/L	0.001	7	193	1027	5	Standard
	Pb	208	0.008	ug/L	0.001	8	495	1429	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0215-BS1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:26:15
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	870352	1	Standard
	Be	9	23.629	ug/L	0.460	1	10	161803	0	Standard
	C	13		ug/L			24210	40802	0	Standard
	Cl	37		ug/L			3807524	4075049	1	Standard
>	Sc	45		ug/L			924614	879209	1	Standard
	Na	23	4847.934	ug/L	10.245	0	19857	108907078	1	Standard
	Mg	24	4628.957	ug/L	163.490	3	3421	147759387	2	Standard
	Al	27	4647.553	ug/L	102.387	2	5910	119928871	0	Standard
	K	39	4654.099	ug/L	73.928	1	397696	66389107	0	Standard
	Ca	44	4630.654	ug/L	153.174	3	8558	5442995	4	Standard
	V	51	23.370	ug/L	0.435	1	4329	564930	2	Standard
	V-1	51	23.749	ug/L	0.661	2	172	566215	2	Standard
	Cr	52	23.447	ug/L	0.184	0	12806	498935	1	Standard
	Cr	53	24.708	ug/L	1.037	4	117	56790	3	Standard
	Fe	54	4668.648	ug/L	77.807	1	68439	8867004	0	Standard
	Fe	57	4549.702	ug/L	58.085	1	14875	4491596	0	Standard
	Mn	55	25.250	ug/L	0.780	3	529	713242	3	Standard
>	Ge	72		ug/L			86245	82267	1	KED
	Co	59	23.931	ug/L	0.279	1	8	159219	1	KED
	Ni	60	23.923	ug/L	0.213	0	213	47832	0	KED
	Ni	62	24.142	ug/L	0.645	2	34	7663	3	KED
	Cu	63	24.003	ug/L	0.334	1	139	137054	0	KED
	Cu	65	23.945	ug/L	0.337	1	80	69236	1	KED
	Zn	66	74.342	ug/L	1.632	2	340	54768	1	KED
	Zn	67	70.158	ug/L	1.324	1	53	8623	1	KED
	As	75	23.746	ug/L	0.637	2	3	8447	1	KED
	Se	78	72.979	ug/L	1.532	2	9	2592	1	KED
	Y	89		ug/L			449540	441829	1	Standard
	Kr	83		ug/L			109	116	4	Standard
>	In-1	115		ug/L			21778	19036	0	KED
	Mo	98	23.904	ug/L	0.423	1	3	38205	1	KED
	Cd	111	24.381	ug/L	0.472	1	2	8491	1	KED
	Cd	114	24.226	ug/L	0.840	3	4	21953	2	KED
>	In	115		ug/L			1112607	1059605	2	Standard
	Ag	107	24.573	ug/L	0.830	3	36	363245	1	Standard
	Sb	121	23.703	ug/L	0.510	2	113	434706	1	Standard
	Sb	123	23.922	ug/L	1.048	4	89	338383	2	Standard
	Ba	135	23.773	ug/L	0.451	1	100	178940	2	Standard
	Ba	137	23.716	ug/L	0.531	2	170	316929	0	Standard
>	Tb	159		ug/L			2978637	2735177	1	Standard
	Tl	205	24.879	ug/L	0.793	3	193	2418678	2	Standard
	Pb	208	24.266	ug/L	0.633	2	495	3095241	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0215-BLK1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:33:12
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	915089	2	Standard
	Be	9	-0.000	ug/L	0.001	183	10	7	75	Standard
	C	13		ug/L			24210	36042	1	Standard
	Cl	37		ug/L			3807524	3856783	1	Standard
>	Sc	45		ug/L			924614	906596	1	Standard
	Na	23	4.924	ug/L	0.164	3	19857	133540	3	Standard
	Mg	24	0.600	ug/L	0.005	0	3421	23109	1	Standard
	Al	27	1.049	ug/L	0.020	1	5910	33703	2	Standard
	K	39	2.418	ug/L	0.132	5	397696	425295	0	Standard
	Ca	44	0.183	ug/L	0.084	46	8558	8613	1	Standard
	V	51	0.004	ug/L	0.003	62	4329	4346	2	Standard
	V-1	51	0.005	ug/L	0.001	16	172	294	6	Standard
	Cr	52	0.029	ug/L	0.004	13	12806	13173	1	Standard
	Cr	53	0.033	ug/L	0.004	12	117	192	4	Standard
	Fe	54	-0.133	ug/L	0.886	667	68439	66839	2	Standard
	Fe	57	0.557	ug/L	0.072	12	14875	15151	0	Standard
	Mn	55	0.543	ug/L	0.009	1	529	16320	2	Standard
>	Ge	72		ug/L			86245	83535	0	KED
	Co	59	-0.000	ug/L	0.001	1562	8	8	70	KED
	Ni	60	-0.040	ug/L	0.003	8	213	126	4	KED
	Ni	62	-0.050	ug/L	0.007	13	34	17	12	KED
	Cu	63	0.009	ug/L	0.003	33	139	189	9	KED
	Cu	65	0.005	ug/L	0.003	57	80	93	9	KED
	Zn	66	-0.066	ug/L	0.031	46	340	280	7	KED
	Zn	67	-0.114	ug/L	0.072	62	53	38	22	KED
	As	75	0.001	ug/L	0.003	357	3	3	24	KED
	Se	78	0.002	ug/L	0.112	5637	9	9	43	KED
	Y	89		ug/L			449540	439719	1	Standard
	Kr	83		ug/L			109	115	4	Standard
>	In-1	115		ug/L			21778	19423	0	KED
	Mo	98	0.013	ug/L	0.007	56	3	23	48	KED
	Cd	111	0.001	ug/L	0.003	309	2	2	33	KED
	Cd	114	-0.001	ug/L	0.003	279	4	2	104	KED
>	In	115		ug/L			1112607	1083524	4	Standard
	Ag	107	0.003	ug/L	0.001	20	36	82	11	Standard
	Sb	121	0.018	ug/L	0.002	13	113	437	6	Standard
	Sb	123	0.017	ug/L	0.003	18	89	332	11	Standard
	Ba	135	-0.004	ug/L	0.001	16	100	67	11	Standard
	Ba	137	-0.003	ug/L	0.001	29	170	128	4	Standard
>	Tb	159		ug/L			2978637	2759979	2	Standard
	Tl	205	0.006	ug/L	0.001	9	193	777	8	Standard
	Pb	208	0.006	ug/L	0.000	5	495	1187	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0340-01
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:39:22
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	895681	2	Standard
	Be	9	0.000	ug/L	0.001	316	10	12	36	Standard
	C	13		ug/L			24210	97148	4	Standard
	Cl	37		ug/L			3807524	6026222	3	Standard
>	Sc	45		ug/L			924614	1037390	1	Standard
	Na	23	S	ug/L	S	S	19857	S	S	Standard
	Mg	24	303.704	ug/L	2.240	0	3421	11444869	0	Standard
	Al	27	39.179	ug/L	0.890	2	5910	1199569	1	Standard
	K	39	7525.758	ug/L	161.290	2	397696	126388636	1	Standard
	Ca	44	443.532	ug/L	9.660	2	8558	623549	1	Standard
	V	51	1.800	ug/L	0.048	2	4329	55805	2	Standard
	V-1	51	1.931	ug/L	0.038	1	172	54491	1	Standard
	Cr	52	0.262	ug/L	0.005	2	12806	20788	1	Standard
	Cr	53	0.664	ug/L	0.039	5	117	1929	5	Standard
	Fe	54	77.753	ug/L	1.146	1	68439	249779	1	Standard
	Fe	57	57.042	ug/L	3.397	5	14875	82956	5	Standard
	Mn	55	2.421	ug/L	0.020	0	529	81241	1	Standard
>	Ge	72		ug/L			86245	74737	1	KED
	Co	59	0.038	ug/L	0.003	8	8	238	9	KED
	Ni	60	0.098	ug/L	0.007	7	213	361	4	KED
	Ni	62	0.132	ug/L	0.035	26	34	67	13	KED
	Cu	63	4.375	ug/L	0.045	1	139	22796	1	KED
	Cu	65	4.408	ug/L	0.050	1	80	11636	0	KED
	Zn	66	8.609	ug/L	0.116	1	340	6023	1	KED
	Zn	67	8.013	ug/L	0.656	8	53	935	7	KED
	As	75	1.574	ug/L	0.026	1	3	512	3	KED
	Se	78	0.101	ug/L	0.109	108	9	11	28	KED
	Y	89		ug/L			449540	431481	1	Standard
	Kr	83		ug/L			109	119	17	Standard
>	In-1	115		ug/L			21778	17602	2	KED
	Mo	98	2.804	ug/L	0.088	3	3	4145	1	KED
	Cd	111	0.003	ug/L	0.005	168	2	3	45	KED
	Cd	114	-0.001	ug/L	0.007	686	4	2	232	KED
>	In	115		ug/L			1112607	955032	4	Standard
	Ag	107	0.005	ug/L	0.001	11	36	100	4	Standard
	Sb	121	0.063	ug/L	0.005	7	113	1130	3	Standard
	Sb	123	0.065	ug/L	0.003	4	89	903	3	Standard
	Ba	135	0.031	ug/L	0.006	19	100	294	11	Standard
	Ba	137	0.035	ug/L	0.004	12	170	567	5	Standard
>	Tb	159		ug/L			2978637	2695328	0	Standard
	Tl	205	0.006	ug/L	0.000	6	193	754	4	Standard
	Pb	208	0.531	ug/L	0.008	1	495	67222	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0384-01
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:47:36

DEL

Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	819561	0	Standard
	Be	9	0.041	ug/L	0.002	3	10	273	2	Standard
	C	13		ug/L			24210	34242	3	Standard
	Cl	37		ug/L			3807524	37002020	2	Standard
>	Sc	45		ug/L			924614	779017	1	Standard
	Na	23	38043.462	ug/L	8165.700	21	19857	755903755	20	Standard
	Mg	24	S	ug/L	S	S	3421	S	S	Standard
	Al	27	17.625	ug/L	0.318	1	5910	407987	1	Standard
	K	39	36080.097	ug/L	707.567	1	397696	453757520	1	Standard
	Ca	44	270002.346	ug/L	7432.253	2	8558	280677703	2	Standard
	V	51	7.771	ug/L	0.153	1	4329	168888	2	Standard
	V-1	51	13.363	ug/L	0.135	1	172	282376	1	Standard
	Cr	52	1.844	ug/L	0.013	0	12806	44711	1	Standard
	Cr	53	20.292	ug/L	0.490	2	117	41345	1	Standard
	Fe	54	61.392	ug/L	0.804	1	68439	160221	0	Standard
	Fe	57	640.266	ug/L	7.252	1	14875	570867	1	Standard
	Mn	55	5.694	ug/L	0.045	0	529	142847	1	Standard
>	Ge	72		ug/L			86245	53290	1	KED
	Co	59	0.055	ug/L	0.002	3	8	242	4	KED
	Ni	60	0.434	ug/L	0.025	5	213	692	3	KED
	Ni	62	0.643	ug/L	0.071	11	34	153	7	KED
	Cu	63	0.072	ug/L	0.001	1	139	350	1	KED
	Cu	65	0.069	ug/L	0.005	6	80	179	3	KED
	Zn	66	11.748	ug/L	0.272	2	340	5782	0	KED
	Zn	67	11.674	ug/L	0.633	5	53	956	3	KED
	As	75	0.307	ug/L	0.011	3	3	73	3	KED
	Se	78	35.155	ug/L	0.227	0	9	812	1	KED
	Y	89		ug/L			449540	348385	1	Standard
	Kr	83		ug/L			109	271	10	Standard
>	In-1	115		ug/L			21778	12902	0	KED
	Mo	98	52.558	ug/L	0.255	0	3	56935	0	KED
	Cd	111	0.028	ug/L	0.006	21	2	8	17	KED
	Cd	114	0.010	ug/L	0.002	19	4	8	14	KED
>	In	115		ug/L			1112607	597138	1	Standard
	Ag	107	0.020	ug/L	0.003	13	36	185	11	Standard
	Sb	121	0.016	ug/L	0.001	9	113	227	6	Standard
	Sb	123	0.050	ug/L	0.006	12	89	443	10	Standard
	Ba	135	22.760	ug/L	0.578	2	100	96539	1	Standard
	Ba	137	22.485	ug/L	0.519	2	170	169380	1	Standard
>	Tb	159		ug/L			2978637	1699883	1	Standard
	Tl	205	0.012	ug/L	0.001	5	193	843	5	Standard
	Pb	208	0.033	ug/L	0.003	8	495	2934	8	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL4
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 16:55:44
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	956242	0	Standard
	Be	9	-0.000	ug/L	0.001	293	10	9	60	Standard
	C	13		ug/L			24210	26464	1	Standard
	Cl	37		ug/L			3807524	4625935	1	Standard
>	Sc	45		ug/L			924614	966772	2	Standard
	Na	23	17.862	ug/L	3.485	19	19857	460596	16	Standard
	Mg	24	2.472	ug/L	0.708	28	3421	89883	24	Standard
	Al	27	-0.020	ug/L	0.012	57	5910	5608	5	Standard
	K	39	9.273	ug/L	1.097	11	397696	560135	0	Standard
	Ca	44	3.230	ug/L	1.320	40	8558	13083	10	Standard
	V	51	0.027	ug/L	0.012	42	4329	5244	2	Standard
	V-1	51	0.123	ug/L	0.005	4	172	3406	1	Standard
	Cr	52	0.090	ug/L	0.027	30	12806	15424	2	Standard
	Cr	53	0.409	ug/L	0.015	3	117	1155	4	Standard
	Fe	54	-0.569	ug/L	1.136	199	68439	70334	0	Standard
	Fe	57	2.631	ug/L	0.702	26	14875	18386	1	Standard
	Mn	55	0.001	ug/L	0.002	121	529	593	6	Standard
>	Ge	72		ug/L			86245	86724	0	KED
	Co	59	-0.000	ug/L	0.001	14954	8	8	44	KED
	Ni	60	-0.081	ug/L	0.001	1	213	45	4	KED
	Ni	62	-0.077	ug/L	0.006	7	34	9	20	KED
	Cu	63	-0.006	ug/L	0.003	44	139	106	13	KED
	Cu	65	-0.009	ug/L	0.004	42	80	54	19	KED
	Zn	66	-0.257	ug/L	0.017	6	340	143	8	KED
	Zn	67	-0.273	ug/L	0.068	25	53	19	45	KED
	As	75	-0.001	ug/L	0.002	183	3	3	28	KED
	Se	78	0.054	ug/L	0.047	88	9	11	14	KED
	Y	89		ug/L			449540	452634	2	Standard
	Kr	83		ug/L			109	102	23	Standard
>	In-1	115		ug/L			21778	20289	1	KED
	Mo	98	0.008	ug/L	0.012	148	3	17	121	KED
	Cd	111	-0.001	ug/L	0.004	317	2	2	65	KED
	Cd	114	-0.001	ug/L	0.003	301	4	3	97	KED
>	In	115		ug/L			1112607	1064123	0	Standard
	Ag	107	0.001	ug/L	0.000	32	36	50	9	Standard
	Sb	121	0.001	ug/L	0.001	111	113	121	12	Standard
	Sb	123	0.001	ug/L	0.001	103	89	93	8	Standard
	Ba	135	-0.005	ug/L	0.001	22	100	59	14	Standard
	Ba	137	-0.005	ug/L	0.001	31	170	99	19	Standard
>	Tb	159		ug/L			2978637	2717675	1	Standard
	Tl	205	0.005	ug/L	0.001	14	193	634	11	Standard
	Pb	208	0.003	ug/L	0.000	11	495	862	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0384-01
Sample Dil Factor: 5
Comments:
Sample Date/Time: Monday, August 09, 2021 17:03:19
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	925106	7	Standard
	Be	9	0.011	ug/L	0.002	14	10	93	18	Standard
	C	13		ug/L			24210	32619	1	Standard
	Cl	37		ug/L			3807524	12240192	2	Standard
>	Sc	45		ug/L			924614	974559	3	Standard
	Na	23	S	ug/L	S	S	19857	S	S	Standard
	Mg	24	24728.194	ug/L	1388.789	5	3421	874193062	3	Standard
	Al	27	4.193	ug/L	0.310	7	5910	126232	8	Standard
	K	39	5689.961	ug/L	205.418	3	397696	89816176	1	Standard
	Ca	44	62378.849	ug/L	2570.093	4	8558	81084303	3	Standard
	V	51	1.628	ug/L	0.062	3	4329	47902	6	Standard
	V-1	51	3.707	ug/L	0.089	2	172	98077	2	Standard
	Cr	52	0.531	ug/L	0.024	4	12806	25698	2	Standard
	Cr	53	7.411	ug/L	0.374	5	117	18949	1	Standard
	Fe	54	12.298	ug/L	3.174	25	68439	97679	3	Standard
	Fe	57	133.455	ug/L	4.700	3	14875	161169	2	Standard
	Mn	55	1.289	ug/L	0.064	4	529	40857	4	Standard
>	Ge	72		ug/L			86245	78515	1	KED
	Co	59	0.010	ug/L	0.003	25	8	72	21	KED
	Ni	60	0.110	ug/L	0.013	11	213	404	7	KED
	Ni	62	0.151	ug/L	0.013	8	34	77	6	KED
	Cu	63	0.056	ug/L	0.002	3	139	432	3	KED
	Cu	65	0.054	ug/L	0.004	7	80	222	4	KED
	Zn	66	2.947	ug/L	0.106	3	340	2369	2	KED
	Zn	67	3.161	ug/L	0.294	9	53	417	8	KED
	As	75	0.060	ug/L	0.006	10	3	23	8	KED
	Se	78	7.576	ug/L	0.243	3	9	264	3	KED
	Y	89		ug/L			449540	422152	2	Standard
	Kr	83		ug/L			109	121	2	Standard
>	In-1	115		ug/L			21778	18100	0	KED
	Mo	98	10.330	ug/L	0.097	0	3	15699	0	KED
	Cd	111	0.011	ug/L	0.011	98	2	6	59	KED
	Cd	114	0.004	ug/L	0.004	119	4	6	56	KED
>	In	115		ug/L			1112607	860017	6	Standard
	Ag	107	0.004	ug/L	0.000	12	36	74	7	Standard
	Sb	121	0.003	ug/L	0.002	80	113	127	19	Standard
	Sb	123	0.005	ug/L	0.002	32	89	130	9	Standard
	Ba	135	5.050	ug/L	0.235	4	100	30855	1	Standard
	Ba	137	5.058	ug/L	0.194	3	170	54900	2	Standard
>	Tb	159		ug/L			2978637	2446804	1	Standard
	Tl	205	0.004	ug/L	0.001	15	193	543	9	Standard
	Pb	208	0.012	ug/L	0.001	4	495	1817	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0215-DUP1
Sample Dil Factor: 5
Comments:
Sample Date/Time: Monday, August 09, 2021 17:09:34
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	939359	1	Standard
	Be	9	0.010	ug/L	0.003	28	10	86	23	Standard
	C	13		ug/L			24210	32691	2	Standard
	Cl	37		ug/L			3807524	12750217	2	Standard
>	Sc	45		ug/L			924614	991543	2	Standard
	Na	23	S	ug/L	S	S	19857	S	S	Standard
	Mg	24	24669.225	ug/L	3202.427	12	3421	886315101	10	Standard
	Al	27	6.560	ug/L	0.270	4	5910	197137	1	Standard
	K	39	5488.055	ug/L	82.361	1	397696	88207295	1	Standard
	Ca	44	60219.867	ug/L	3008.548	4	8558	79626091	2	Standard
	V	51	1.665	ug/L	0.044	2	4329	49692	0	Standard
	V-1	51	3.689	ug/L	0.055	1	172	99344	1	Standard
	Cr	52	0.583	ug/L	0.032	5	12806	27364	0	Standard
	Cr	53	7.283	ug/L	0.130	1	117	18970	2	Standard
	Fe	54	14.886	ug/L	0.630	4	68439	105029	1	Standard
	Fe	57	137.902	ug/L	4.205	3	14875	168940	0	Standard
	Mn	55	1.312	ug/L	0.035	2	529	42321	0	Standard
>	Ge	72		ug/L			86245	76904	1	KED
	Co	59	0.011	ug/L	0.002	18	8	78	15	KED
	Ni	60	0.117	ug/L	0.012	10	213	408	5	KED
	Ni	62	0.129	ug/L	0.017	13	34	69	5	KED
	Cu	63	0.028	ug/L	0.006	20	139	270	9	KED
	Cu	65	0.029	ug/L	0.006	19	80	149	9	KED
	Zn	66	3.025	ug/L	0.163	5	340	2373	3	KED
	Zn	67	3.033	ug/L	0.228	7	53	394	5	KED
	As	75	0.063	ug/L	0.011	17	3	24	13	KED
	Se	78	7.775	ug/L	0.373	4	9	265	3	KED
	Y	89		ug/L			449540	431037	3	Standard
	Kr	83		ug/L			109	137	2	Standard
>	In-1	115		ug/L			21778	17516	0	KED
	Mo	98	10.485	ug/L	0.150	1	3	15421	1	KED
	Cd	111	0.005	ug/L	0.005	110	2	3	43	KED
	Cd	114	0.002	ug/L	0.003	151	4	4	44	KED
>	In	115		ug/L			1112607	899543	2	Standard
	Ag	107	0.002	ug/L	0.001	28	36	59	16	Standard
	Sb	121	0.001	ug/L	0.000	43	113	104	3	Standard
	Sb	123	0.003	ug/L	0.001	30	89	110	10	Standard
	Ba	135	4.857	ug/L	0.076	1	100	31094	1	Standard
	Ba	137	4.878	ug/L	0.155	3	170	55441	1	Standard
>	Tb	159		ug/L			2978637	2500782	3	Standard
	Tl	205	0.003	ug/L	0.000	9	193	463	4	Standard
	Pb	208	0.012	ug/L	0.000	2	495	1836	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0215-MS1
Sample Dil Factor: 5
Comments:
Sample Date/Time: Monday, August 09, 2021 17:17:49
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	973840	1	Standard
	Be	9	4.513	ug/L	0.020	0	10	34595	1	Standard
	C	13		ug/L			24210	33364	1	Standard
	Cl	37		ug/L			3807524	12266650	2	Standard
>	Sc	45		ug/L			924614	1008257	3	Standard
	Na	23	S	ug/L	S	S	19857	S	S	Standard
	Mg	24	S	ug/L	S	S	3421	S	S	Standard
	Al	27	859.633	ug/L	20.234	2	5910	25437856	1	Standard
	K	39	6521.549	ug/L	115.870	1	397696	106504481	2	Standard
	Ca	44	62770.947	ug/L	2273.210	3	8558	84406321	0	Standard
	V	51	6.185	ug/L	0.063	1	4329	174959	4	Standard
	V-1	51	8.918	ug/L	0.042	0	172	243938	2	Standard
	Cr	52	4.836	ug/L	0.060	1	12806	129073	2	Standard
	Cr	53	13.885	ug/L	0.330	2	117	36644	0	Standard
	Fe	54	848.486	ug/L	23.519	2	68439	1908730	2	Standard
	Fe	57	968.093	ug/L	25.880	2	14875	1108444	2	Standard
	Mn	55	5.457	ug/L	0.061	1	529	177225	3	Standard
>	Ge	72		ug/L			86245	78877	0	KED
	Co	59	5.022	ug/L	0.043	0	8	32046	1	KED
	Ni	60	4.864	ug/L	0.020	0	213	9481	0	KED
	Ni	62	4.825	ug/L	0.244	5	34	1494	4	KED
	Cu	63	4.633	ug/L	0.093	2	139	25465	1	KED
	Cu	65	4.625	ug/L	0.042	0	80	12882	0	KED
	Zn	66	16.507	ug/L	0.831	5	340	11904	5	KED
	Zn	67	16.174	ug/L	0.496	3	53	1944	2	KED
	As	75	5.213	ug/L	0.129	2	3	1781	2	KED
	Se	78	22.917	ug/L	1.381	6	9	786	5	KED
	Y	89		ug/L			449540	447745	1	Standard
	Kr	83		ug/L			109	125	12	Standard
>	In-1	115		ug/L			21778	18199	0	KED
	Mo	98	15.604	ug/L	0.365	2	3	23846	2	KED
	Cd	111	4.764	ug/L	0.055	1	2	1588	1	KED
	Cd	114	4.653	ug/L	0.074	1	4	4034	1	KED
>	In	115		ug/L			1112607	903810	1	Standard
	Ag	107	4.675	ug/L	0.079	1	36	59013	3	Standard
	Sb	121	4.845	ug/L	0.097	2	113	75861	0	Standard
	Sb	123	4.924	ug/L	0.133	2	89	59491	0	Standard
	Ba	135	10.466	ug/L	0.047	0	100	67250	2	Standard
	Ba	137	10.382	ug/L	0.252	2	170	118420	0	Standard
>	Tb	159		ug/L			2978637	2540249	1	Standard
	Tl	205	4.497	ug/L	0.127	2	193	406153	1	Standard
	Pb	208	4.176	ug/L	0.081	1	495	494969	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL5
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 17:27:05
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	970521	3	Standard
	Be	9	-0.001	ug/L	0.001	72	10	6	62	Standard
	C	13		ug/L			24210	26688	2	Standard
	Cl	37		ug/L			3807524	4542808	1	Standard
>	Sc	45		ug/L			924614	1004752	1	Standard
	Na	23	1.191	ug/L	0.379	31	19857	52077	17	Standard
	Mg	24	0.129	ug/L	0.086	66	3421	8422	36	Standard
	Al	27	-0.053	ug/L	0.011	19	5910	4845	6	Standard
	K	39	6.525	ug/L	0.404	6	397696	537915	0	Standard
	Ca	44	-2.548	ug/L	0.242	9	8558	5882	4	Standard
	V	51	0.017	ug/L	0.003	19	4329	5175	1	Standard
	V-1	51	0.064	ug/L	0.003	3	172	1920	3	Standard
	Cr	52	0.046	ug/L	0.011	23	12806	14999	2	Standard
	Cr	53	0.201	ug/L	0.014	7	117	653	5	Standard
	Fe	54	-2.083	ug/L	0.304	14	68439	69883	1	Standard
	Fe	57	-1.281	ug/L	0.293	22	14875	14722	1	Standard
	Mn	55	-0.001	ug/L	0.001	165	529	558	6	Standard
>	Ge	72		ug/L			86245	89151	3	KED
	Co	59	-0.000	ug/L	0.001	347	8	6	110	KED
	Ni	60	-0.084	ug/L	0.004	4	213	39	21	KED
	Ni	62	-0.082	ug/L	0.013	16	34	8	58	KED
	Cu	63	-0.003	ug/L	0.001	29	139	124	2	KED
	Cu	65	-0.009	ug/L	0.004	47	80	56	22	KED
	Zn	66	-0.270	ug/L	0.007	2	340	137	3	KED
	Zn	67	-0.293	ug/L	0.047	16	53	17	40	KED
	As	75	-0.003	ug/L	0.001	42	3	2	16	KED
	Se	78	-0.005	ug/L	0.061	1177	9	9	23	KED
	Y	89		ug/L			449540	456478	1	Standard
	Kr	83		ug/L			109	112	20	Standard
>	In-1	115		ug/L			21778	21166	2	KED
	Mo	98	0.004	ug/L	0.002	40	3	10	28	KED
	Cd	111	0.001	ug/L	0.004	368	2	3	45	KED
	Cd	114	0.002	ug/L	0.004	211	4	6	69	KED
>	In	115		ug/L			1112607	1052001	0	Standard
	Ag	107	0.000	ug/L	0.001	636	36	36	24	Standard
	Sb	121	-0.000	ug/L	0.000	96	113	100	6	Standard
	Sb	123	-0.002	ug/L	0.001	30	89	52	18	Standard
	Ba	135	-0.006	ug/L	0.000	2	100	52	2	Standard
	Ba	137	-0.007	ug/L	0.001	17	170	73	21	Standard
>	Tb	159		ug/L			2978637	2679208	0	Standard
	Tl	205	0.002	ug/L	0.000	15	193	387	8	Standard
	Pb	208	0.002	ug/L	0.000	7	495	699	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV3
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 17:33:20
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	896601	1	Standard
	Be	9	50.668	ug/L	0.440	0	10	357458	1	Standard
	C	13		ug/L			24210	24831	2	Standard
	Cl	37		ug/L			3807524	4374510	0	Standard
>	Sc	45		ug/L			924614	987094	0	Standard
	Na	23	4581.011	ug/L	64.522	1	19857	115537083	1	Standard
	Mg	24	4489.780	ug/L	51.244	1	3421	160951141	1	Standard
	Al	27	4396.901	ug/L	62.891	1	5910	127410318	1	Standard
	K	39	4622.319	ug/L	70.722	1	397696	74038630	1	Standard
	Ca	44	4431.829	ug/L	120.052	2	8558	5847160	2	Standard
	V	51	46.202	ug/L	1.259	2	4329	1249391	2	Standard
	V-1	51	46.812	ug/L	0.945	2	172	1252948	2	Standard
	Cr	52	46.144	ug/L	0.424	0	12806	1089119	0	Standard
	Cr	53	48.168	ug/L	0.922	1	117	124208	1	Standard
	Fe	54	4479.387	ug/L	21.961	0	68439	9555769	0	Standard
	Fe	57	4275.616	ug/L	141.112	3	14875	4740497	3	Standard
	Mn	55	47.076	ug/L	0.632	1	529	1492412	1	Standard
>	Ge	72		ug/L			86245	87348	1	KED
	Co	59	49.009	ug/L	1.114	2	8	346183	1	KED
	Ni	60	48.429	ug/L	0.500	1	213	102596	1	KED
	Ni	62	48.960	ug/L	0.777	1	34	16464	0	KED
	Cu	63	48.709	ug/L	0.656	1	139	295215	2	KED
	Cu	65	49.027	ug/L	0.825	1	80	150427	0	KED
	Zn	66	49.992	ug/L	1.878	3	340	39213	2	KED
	Zn	67	49.057	ug/L	0.798	1	53	6420	2	KED
	As	75	50.056	ug/L	0.602	1	3	18906	1	KED
	Se	78	50.928	ug/L	0.334	0	9	1924	1	KED
	Y	89		ug/L			449540	454844	2	Standard
	Kr	83		ug/L			109	130	15	Standard
>	In-1	115		ug/L			21778	20801	2	KED
	Mo	98	48.446	ug/L	0.941	1	3	84584	1	KED
	Cd	111	49.420	ug/L	0.850	1	2	18801	0	KED
	Cd	114	48.914	ug/L	0.883	1	4	48422	0	KED
>	In	115		ug/L			1112607	1048214	1	Standard
	Ag	107	46.133	ug/L	0.246	0	36	674902	1	Standard
	Sb	121	48.427	ug/L	1.042	2	113	878645	2	Standard
	Sb	123	47.836	ug/L	1.121	2	89	669568	0	Standard
	Ba	135	50.107	ug/L	0.533	1	100	373048	2	Standard
	Ba	137	50.975	ug/L	1.142	2	170	673753	0	Standard
>	Tb	159		ug/L			2978637	2780766	1	Standard
	Tl	205	47.724	ug/L	1.538	3	193	4717601	3	Standard
	Pb	208	48.877	ug/L	0.697	1	495	6337820	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB3
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 17:40:56
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
>	Li	6		ug/L			851347	934032	1	Standard
	Be	9	0.000	ug/L	0.000	102	10	13	20	Standard
	C	13		ug/L			24210	24314	1	Standard
	Cl	37		ug/L			3807524	4250758	0	Standard
>	Sc	45		ug/L			924614	971171	2	Standard
	Na	23	2.268	ug/L	0.066	2	19857	77100	1	Standard
	Mg	24	0.328	ug/L	0.010	3	3421	15153	2	Standard
	Al	27	0.052	ug/L	0.012	23	5910	7688	2	Standard
	K	39	5.031	ug/L	0.807	16	397696	496348	0	Standard
	Ca	44	-1.855	ug/L	0.169	9	8558	6582	2	Standard
	V	51	-0.005	ug/L	0.005	86	4329	4400	1	Standard
	V-1	51	0.044	ug/L	0.002	3	172	1337	1	Standard
	Cr	52	-0.035	ug/L	0.013	37	12806	12648	0	Standard
	Cr	53	0.129	ug/L	0.013	9	117	449	6	Standard
	Fe	54	-2.679	ug/L	1.236	46	68439	66279	3	Standard
	Fe	57	-3.623	ug/L	0.433	11	14875	11678	1	Standard
	Mn	55	0.003	ug/L	0.001	38	529	638	4	Standard
>	Ge	72		ug/L			86245	88320	1	KED
	Co	59	0.001	ug/L	0.001	90	8	15	38	KED
	Ni	60	-0.044	ug/L	0.012	26	213	125	19	KED
	Ni	62	-0.053	ug/L	0.019	35	34	17	34	KED
	Cu	63	-0.001	ug/L	0.002	270	139	139	7	KED
	Cu	65	-0.007	ug/L	0.002	32	80	61	11	KED
	Zn	66	-0.018	ug/L	0.004	22	340	334	1	KED
	Zn	67	-0.010	ug/L	0.105	1001	53	53	26	KED
	As	75	0.003	ug/L	0.006	215	3	4	44	KED
	Se	78	0.048	ug/L	0.070	147	9	11	22	KED
	Y	89		ug/L			449540	457533	1	Standard
	Kr	83		ug/L			109	111	12	Standard
>	In-1	115		ug/L			21778	20610	0	KED
	Mo	98	0.006	ug/L	0.002	36	3	14	28	KED
	Cd	111	0.002	ug/L	0.008	370	2	3	83	KED
	Cd	114	0.000	ug/L	0.003	1009	4	4	65	KED
>	In	115		ug/L			1112607	1069161	2	Standard
	Ag	107	0.002	ug/L	0.001	25	36	65	14	Standard
	Sb	121	0.036	ug/L	0.004	11	113	772	7	Standard
	Sb	123	0.036	ug/L	0.003	7	89	599	4	Standard
	Ba	135	-0.005	ug/L	0.002	42	100	62	24	Standard
	Ba	137	-0.002	ug/L	0.001	37	170	133	5	Standard
>	Tb	159		ug/L			2978637	2698531	0	Standard
	Tl	205	0.006	ug/L	0.000	4	193	735	3	Standard
	Pb	208	0.005	ug/L	0.000	9	495	1082	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CAL1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 17:49:45
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File:

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L				23373	4	Standard
	Cl	**37**		ug/L				4398521	1	Standard
>	**Sc**	**45**		ug/L				973163	0	Standard
	Cr	**52**		ug/L				12991	4	Standard
	Cr	**53**		ug/L				432	2	Standard
	Mn	**55**		ug/L				589	4	Standard
>	**Ge**	**72**		ug/L				85811	0	KED
	Ni	**60**		ug/L				126	9	KED
	Ni	**62**		ug/L				26	25	KED
	Cu	**63**		ug/L				110	18	KED
	Cu	**65**		ug/L				64	11	KED
	Zn	**66**		ug/L				311	1	KED
	Zn	**67**		ug/L				36	22	KED
	As	**75**		ug/L				4	59	KED
	Y	**89**		ug/L				443918	0	Standard
	Kr	**83**		ug/L				121	17	Standard
>	**In-1**	**115**		ug/L				20884	2	KED
	Mo	**98**		ug/L				9	19	KED
	Cd	**111**		ug/L				3	34	KED
	Cd	**114**		ug/L				5	33	KED
>	**Tb**	**159**		ug/L				2689662	1	Standard
	Pb	**208**		ug/L				744	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV4
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 17:55:07
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	24665	2	Standard
	Cl	**37**		ug/L			4398521	4452771	1	Standard
>	**Sc**	**45**		ug/L			973163	992432	1	Standard
	Cr	**52**	**46.076**	ug/L	0.160	0	12991	1092941	2	Standard
	Cr	**53**	**48.345**	ug/L	1.066	2	432	125623	0	Standard
	Mn	**55**	**46.545**	ug/L	1.384	2	589	1483070	1	Standard
>	**Ge**	**72**		ug/L			85811	86874	0	KED
	Ni	**60**	**48.489**	ug/L	0.239	0	126	102079	0	KED
	Ni	**62**	**47.774**	ug/L	0.587	1	26	15970	0	KED
	Cu	**63**	**48.981**	ug/L	0.513	1	110	295194	1	KED
	Cu	**65**	**47.905**	ug/L	0.442	0	64	146189	0	KED
	Zn	**66**	**50.327**	ug/L	0.354	0	311	39243	0	KED
	Zn	**67**	**49.999**	ug/L	1.373	2	36	6488	2	KED
	As	**75**	**50.179**	ug/L	0.147	0	4	18850	0	KED
	Y	**89**		ug/L			443918	476535	1	Standard
	Kr	**83**		ug/L			121	139	7	Standard
>	**In-1**	**115**		ug/L			20884	20762	1	KED
	Mo	**98**	**48.550**	ug/L	1.012	2	9	84618	0	KED
	Cd	**111**	**49.526**	ug/L	0.641	1	3	18813	2	KED
	Cd	**114**	**49.265**	ug/L	0.717	1	5	48689	1	KED
>	**Tb**	**159**		ug/L			2689662	2770482	1	Standard
	Pb	**208**	**48.968**	ug/L	1.047	2	744	6326515	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB4
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 18:01:49
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	23741	3	Standard
	Cl	**37**		ug/L			4398521	4281053	1	Standard
>	**Sc**	**45**		ug/L			973163	1000249	1	Standard
	Cr	**52**	**-0.005**	ug/L	0.012	253	12991	13244	2	Standard
	Cr	**53**	**-0.019**	ug/L	0.009	47	432	395	5	Standard
	Mn	**55**	**0.000**	ug/L	0.001	430	589	614	6	Standard
>	**Ge**	**72**		ug/L			85811	89305	0	KED
	Ni	**60**	**-0.001**	ug/L	0.004	264	126	128	5	KED
	Ni	**62**	**-0.018**	ug/L	0.030	166	26	20	48	KED
	Cu	**63**	**-0.000**	ug/L	0.003	1365	110	113	16	KED
	Cu	**65**	**-0.004**	ug/L	0.002	59	64	55	11	KED
	Zn	**66**	**0.025**	ug/L	0.024	97	311	343	5	KED
	Zn	**67**	**0.046**	ug/L	0.036	78	36	43	11	KED
	As	**75**	**-0.001**	ug/L	0.006	701	4	4	58	KED
	Y	**89**		ug/L			443918	464081	0	Standard
	Kr	**83**		ug/L			121	116	4	Standard
>	**In-1**	**115**		ug/L			20884	21109	1	KED
	Mo	**98**	**0.007**	ug/L	0.006	82	9	21	45	KED
	Cd	**111**	**0.002**	ug/L	0.002	153	3	3	25	KED
	Cd	**114**	**-0.002**	ug/L	0.001	81	5	4	28	KED
>	**Tb**	**159**		ug/L			2689662	2764475	0	Standard
	Pb	**208**	**0.000**	ug/L	0.000	537	744	770	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0134-BLK1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:07:45
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	36303	1	Standard
	Cl	37		ug/L			4398521	4547452	0	Standard
>	Sc	45		ug/L			973163	1003227	0	Standard
	Cr	52	0.048	ug/L	0.006	13	12991	14520	1	Standard
	Cr	53	-0.011	ug/L	0.002	16	432	417	0	Standard
	Mn	55	0.009	ug/L	0.001	9	589	904	3	Standard
>	Ge	72		ug/L			85811	89793	1	KED
	Ni	60	0.064	ug/L	0.010	14	126	272	6	KED
	Ni	62	0.070	ug/L	0.027	38	26	51	19	KED
	Cu	63	0.003	ug/L	0.002	45	110	136	7	KED
	Cu	65	0.004	ug/L	0.004	94	64	80	14	KED
	Zn	66	0.085	ug/L	0.014	16	311	393	2	KED
	Zn	67	0.127	ug/L	0.107	84	36	54	24	KED
	As	75	-0.001	ug/L	0.008	625	4	4	73	KED
	Y	89		ug/L			443918	471042	2	Standard
	Kr	83		ug/L			121	117	14	Standard
>	In-1	115		ug/L			20884	21283	1	KED
	Mo	98	-0.002	ug/L	0.003	186	9	6	100	KED
	Cd	111	0.001	ug/L	0.005	332	3	3	50	KED
	Cd	114	-0.004	ug/L	0.001	29	5	2	48	KED
>	Tb	159		ug/L			2689662	2766995	1	Standard
	Pb	208	0.003	ug/L	0.000	8	744	1155	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0134-BS1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:11:42
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	36471	1	Standard
	Cl	37		ug/L			4398521	4587451	3	Standard
>	Sc	45		ug/L			973163	1008218	1	Standard
	Cr	52	24.089	ug/L	0.273	1	12991	586842	0	Standard
	Cr	53	25.469	ug/L	0.202	0	432	67459	1	Standard
	Mn	55	25.554	ug/L	0.489	1	589	827597	0	Standard
>	Ge	72		ug/L			85811	90571	0	KED
	Ni	60	24.277	ug/L	0.199	0	126	53348	0	KED
	Ni	62	24.954	ug/L	0.404	1	26	8709	0	KED
	Cu	63	25.212	ug/L	0.365	1	110	158454	0	KED
	Cu	65	25.165	ug/L	0.431	1	64	80088	0	KED
	Zn	66	75.405	ug/L	0.552	0	311	61134	0	KED
	Zn	67	72.497	ug/L	1.998	2	36	9793	3	KED
	As	75	24.499	ug/L	0.219	0	4	9597	0	KED
	Y	89		ug/L			443918	483898	1	Standard
	Kr	83		ug/L			121	130	4	Standard
>	In-1	115		ug/L			20884	21950	1	KED
	Mo	98	-0.001	ug/L	0.002	351	9	8	44	KED
	Cd	111	24.532	ug/L	0.360	1	3	9853	1	KED
	Cd	114	24.509	ug/L	0.631	2	5	25610	2	KED
>	Tb	159		ug/L			2689662	2835629	0	Standard
	Pb	208	25.674	ug/L	0.079	0	744	3395760	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0286-03
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:15:40
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	39365	0	Standard
	Cl	**37**		ug/L			4398521	4286280	2	Standard
>	**Sc**	**45**		ug/L			973163	1074080	1	Standard
	Cr	**52**	**12.320**	ug/L	0.260	2	12991	326739	1	Standard
	Cr	**53**	**12.698**	ug/L	0.120	0	432	36070	1	Standard
	Mn	**55**	**259.447**	ug/L	7.843	3	589	8944993	1	Standard
>	**Ge**	**72**		ug/L			85811	92508	1	KED
	Ni	**60**	**17.997**	ug/L	0.146	0	126	40431	1	KED
	Ni	**62**	**18.532**	ug/L	0.317	1	26	6613	0	KED
	Cu	**63**	**35.500**	ug/L	0.276	0	110	227869	1	KED
	Cu	**65**	**35.016**	ug/L	0.776	2	64	113789	1	KED
	Zn	**66**	**44.590**	ug/L	0.868	1	311	37058	1	KED
	Zn	**67**	**43.193**	ug/L	0.538	1	36	5974	1	KED
	As	**75**	**3.613**	ug/L	0.017	0	4	1449	1	KED
	Y	**89**		ug/L			443918	620743	2	Standard
	Kr	**83**		ug/L			121	186	9	Standard
>	**In-1**	**115**		ug/L			20884	21641	2	KED
	Mo	**98**	**0.238**	ug/L	0.009	3	9	441	3	KED
	Cd	**111**	**0.062**	ug/L	0.014	23	3	27	19	KED
	Cd	**114**	**0.059**	ug/L	0.008	13	5	67	13	KED
>	**Tb**	**159**		ug/L			2689662	2868211	2	Standard
	Pb	**208**	**34.044**	ug/L	1.046	3	744	4551764	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0286-04
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:19:38
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	52873	1	Standard
	Cl	**37**		ug/L			4398521	4317090	0	Standard
>	**Sc**	**45**		ug/L			973163	1095933	1	Standard
	Cr	**52**	**9.595**	ug/L	0.259	2	12991	262866	1	Standard
	Cr	**53**	**9.819**	ug/L	0.122	1	432	28568	1	Standard
	Mn	**55**	**89.396**	ug/L	1.144	1	589	3145761	0	Standard
>	**Ge**	**72**		ug/L			85811	90903	0	KED
	Ni	**60**	**8.184**	ug/L	0.118	1	126	18139	1	KED
	Ni	**62**	**8.295**	ug/L	0.255	3	26	2924	3	KED
	Cu	**63**	**17.568**	ug/L	0.341	1	110	110866	2	KED
	Cu	**65**	**17.450**	ug/L	0.505	2	64	55767	3	KED
	Zn	**66**	**41.846**	ug/L	0.897	2	311	34197	1	KED
	Zn	**67**	**40.644**	ug/L	0.964	2	36	5526	2	KED
	As	**75**	**4.897**	ug/L	0.034	0	4	1929	0	KED
	Y	**89**		ug/L			443918	648817	2	Standard
	Kr	**83**		ug/L			121	170	5	Standard
>	**In-1**	**115**		ug/L			20884	21831	1	KED
	Mo	**98**	**0.401**	ug/L	0.026	6	9	745	7	KED
	Cd	**111**	**0.104**	ug/L	0.017	15	3	45	15	KED
	Cd	**114**	**0.099**	ug/L	0.015	15	5	109	15	KED
>	**Tb**	**159**		ug/L			2689662	2874470	0	Standard
	Pb	**208**	**8.615**	ug/L	0.142	1	744	1155444	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0286-02
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:23:35
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	47926	1	Standard
	Cl	**37**		ug/L			4398521	4217766	1	Standard
>	**Sc**	**45**		ug/L			973163	1074870	0	Standard
	Cr	**52**	**11.988**	ug/L	0.086	0	12991	318576	0	Standard
	Cr	**53**	**12.274**	ug/L	0.208	1	432	34906	1	Standard
	Mn	**55**	**289.416**	ug/L	1.126	0	589	9987878	0	Standard
>	**Ge**	**72**		ug/L			85811	91832	1	KED
	Ni	**60**	**9.277**	ug/L	0.183	1	126	20755	2	KED
	Ni	**62**	**9.346**	ug/L	0.212	2	26	3324	2	KED
	Cu	**63**	**16.180**	ug/L	0.067	0	110	103159	1	KED
	Cu	**65**	**16.188**	ug/L	0.278	1	64	52267	2	KED
	Zn	**66**	**52.492**	ug/L	0.419	0	311	43251	0	KED
	Zn	**67**	**48.920**	ug/L	0.403	0	36	6712	1	KED
	As	**75**	**4.085**	ug/L	0.069	1	4	1626	2	KED
	Y	**89**		ug/L			443918	640878	1	Standard
	Kr	**83**		ug/L			121	183	17	Standard
>	**In-1**	**115**		ug/L			20884	21948	0	KED
	Mo	**98**	**0.265**	ug/L	0.012	4	9	498	4	KED
	Cd	**111**	**0.083**	ug/L	0.012	14	3	36	12	KED
	Cd	**114**	**0.079**	ug/L	0.015	19	5	88	17	KED
>	**Tb**	**159**		ug/L			2689662	2911897	0	Standard
	Pb	**208**	**17.036**	ug/L	0.254	1	744	2313968	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0134-DUP1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:27:32
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	49405	1	Standard
	Cl	37		ug/L			4398521	4322804	0	Standard
>	Sc	45		ug/L			973163	1083432	0	Standard
	Cr	52	12.775	ug/L	0.330	2	12991	341218	1	Standard
	Cr	53	13.012	ug/L	0.112	0	432	37273	1	Standard
	Mn	55	288.207	ug/L	3.504	1	589	10025157	1	Standard
>	Ge	72		ug/L			85811	92118	1	KED
	Ni	60	10.161	ug/L	0.132	1	126	22787	1	KED
	Ni	62	10.496	ug/L	0.094	0	26	3742	2	KED
	Cu	63	18.404	ug/L	0.246	1	110	117682	2	KED
	Cu	65	17.917	ug/L	0.217	1	64	58022	2	KED
	Zn	66	43.218	ug/L	1.004	2	311	35771	0	KED
	Zn	67	41.330	ug/L	0.371	0	36	5693	1	KED
	As	75	4.649	ug/L	0.049	1	4	1855	1	KED
	Y	89		ug/L			443918	645657	1	Standard
	Kr	83		ug/L			121	179	1	Standard
>	In-1	115		ug/L			20884	21649	1	KED
	Mo	98	0.478	ug/L	0.027	5	9	877	6	KED
	Cd	111	0.093	ug/L	0.012	12	3	40	12	KED
	Cd	114	0.064	ug/L	0.003	5	5	72	5	KED
>	Tb	159		ug/L			2689662	2910019	3	Standard
	Pb	208	27.599	ug/L	0.994	3	744	3743554	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0134-MS1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:31:30
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	41735	1	Standard
	Cl	37		ug/L			4398521	4283110	2	Standard
>	Sc	45		ug/L			973163	1105826	4	Standard
	Cr	52	32.455	ug/L	1.453	4	12991	861172	1	Standard
	Cr	53	33.981	ug/L	0.776	2	432	98496	2	Standard
	Mn	55	290.859	ug/L	13.838	4	589	10313054	0	Standard
>	Ge	72		ug/L			85811	91947	1	KED
	Ni	60	32.034	ug/L	0.620	1	126	71409	1	KED
	Ni	62	32.559	ug/L	0.708	2	26	11526	0	KED
	Cu	63	39.056	ug/L	0.994	2	110	249086	1	KED
	Cu	65	39.048	ug/L	1.280	3	64	126090	1	KED
	Zn	66	114.986	ug/L	1.472	1	311	94461	1	KED
	Zn	67	109.937	ug/L	1.519	1	36	15051	0	KED
	As	75	27.200	ug/L	0.248	0	4	10815	0	KED
	Y	89		ug/L			443918	633675	3	Standard
	Kr	83		ug/L			121	164	6	Standard
>	In-1	115		ug/L			20884	21894	1	KED
	Mo	98	0.286	ug/L	0.028	9	9	534	7	KED
	Cd	111	23.724	ug/L	0.401	1	3	9505	2	KED
	Cd	114	23.628	ug/L	0.533	2	5	24627	1	KED
>	Tb	159		ug/L			2689662	2850449	2	Standard
	Pb	208	48.536	ug/L	1.095	2	744	6450085	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0134-MSD1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:35:27
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	41081	1	Standard
	Cl	37		ug/L			4398521	4357562	0	Standard
>	Sc	45		ug/L			973163	1061258	1	Standard
	Cr	52	31.260	ug/L	0.342	1	12991	797368	1	Standard
	Cr	53	32.303	ug/L	0.981	3	432	89905	1	Standard
	Mn	55	285.415	ug/L	3.751	1	589	9726083	2	Standard
>	Ge	72		ug/L			85811	92752	1	KED
	Ni	60	30.201	ug/L	0.402	1	126	67923	0	KED
	Ni	62	29.850	ug/L	1.162	3	26	10660	2	KED
	Cu	63	37.024	ug/L	0.986	2	110	238205	1	KED
	Cu	65	36.798	ug/L	0.624	1	64	119888	0	KED
	Zn	66	108.507	ug/L	2.487	2	311	89922	0	KED
	Zn	67	102.324	ug/L	1.134	1	36	14136	1	KED
	As	75	26.581	ug/L	0.576	2	4	10660	0	KED
	Y	89		ug/L			443918	610936	2	Standard
	Kr	83		ug/L			121	188	8	Standard
>	In-1	115		ug/L			20884	21907	2	KED
	Mo	98	0.273	ug/L	0.022	7	9	511	7	KED
	Cd	111	23.734	ug/L	0.543	2	3	9510	1	KED
	Cd	114	23.760	ug/L	0.323	1	5	24777	1	KED
>	Tb	159		ug/L			2689662	2894297	0	Standard
	Pb	208	34.522	ug/L	0.557	1	744	4659741	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0134-PS1
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 18:39:25
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	50635	1	Standard
	Cl	37		ug/L			4398521	4404805	2	Standard
>	Sc	45		ug/L			973163	1086767	2	Standard
	Cr	52	32.535	ug/L	0.583	1	12991	849114	1	Standard
	Cr	53	34.057	ug/L	0.563	1	432	97052	1	Standard
	Mn	55	304.407	ug/L	3.742	1	589	10623735	3	Standard
>	Ge	72		ug/L			85811	92465	0	KED
	Ni	60	31.608	ug/L	0.077	0	126	70874	1	KED
	Ni	62	31.908	ug/L	0.337	1	26	11363	1	KED
	Cu	63	38.911	ug/L	0.552	1	110	249644	2	KED
	Cu	65	38.566	ug/L	0.794	2	64	125268	1	KED
	Zn	66	123.101	ug/L	2.364	1	311	101676	1	KED
	Zn	67	117.227	ug/L	1.140	0	36	16141	1	KED
	As	75	26.865	ug/L	0.144	0	4	10744	1	KED
	Y	89		ug/L			443918	647321	1	Standard
	Kr	83		ug/L			121	180	7	Standard
>	In-1	115		ug/L			20884	21937	1	KED
	Mo	98	0.258	ug/L	0.010	4	9	485	5	KED
	Cd	111	22.904	ug/L	0.290	1	3	9194	1	KED
	Cd	114	22.489	ug/L	0.309	1	5	23489	1	KED
>	Tb	159		ug/L			2689662	2909214	1	Standard
	Pb	208	39.791	ug/L	0.357	0	744	5398714	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL6
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 18:43:24
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	26651	4	Standard
	Cl	**37**		ug/L			4398521	4211217	0	Standard
>	**Sc**	**45**		ug/L			973163	1002759	1	Standard
	Cr	**52**	**-0.017**	ug/L	0.010	56	12991	12977	0	Standard
	Cr	**53**	**-0.039**	ug/L	0.009	22	432	343	7	Standard
	Mn	**55**	**0.058**	ug/L	0.002	3	589	2478	1	Standard
>	**Ge**	**72**		ug/L			85811	89629	1	KED
	Ni	**60**	**-0.042**	ug/L	0.007	17	126	41	39	KED
	Ni	**62**	**-0.057**	ug/L	0.009	16	26	7	43	KED
	Cu	**63**	**0.001**	ug/L	0.002	156	110	123	10	KED
	Cu	**65**	**-0.004**	ug/L	0.003	86	64	55	17	KED
	Zn	**66**	**-0.237**	ug/L	0.012	5	311	135	8	KED
	Zn	**67**	**-0.175**	ug/L	0.053	30	36	14	49	KED
	As	**75**	**0.002**	ug/L	0.005	349	4	5	39	KED
	Y	**89**		ug/L			443918	471153	3	Standard
	Kr	**83**		ug/L			121	133	7	Standard
>	**In-1**	**115**		ug/L			20884	21263	2	KED
	Mo	**98**	**-0.002**	ug/L	0.002	111	9	6	46	KED
	Cd	**111**	**-0.001**	ug/L	0.004	408	3	2	57	KED
	Cd	**114**	**-0.001**	ug/L	0.003	334	5	4	56	KED
>	**Tb**	**159**		ug/L			2689662	2809096	1	Standard
	Pb	**208**	**0.007**	ug/L	0.001	10	744	1686	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV5
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 18:47:22
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	25239	2	Standard
	Cl	**37**		ug/L			4398521	4583197	1	Standard
>	**Sc**	**45**		ug/L			973163	995461	2	Standard
	Cr	**52**	**48.470**	ug/L	1.311	2	12991	1152101	0	Standard
	Cr	**53**	**48.966**	ug/L	0.942	1	432	127625	1	Standard
	Mn	**55**	**48.194**	ug/L	1.043	2	589	1540573	1	Standard
>	**Ge**	**72**		ug/L			85811	89566	1	KED
	Ni	**60**	**46.949**	ug/L	1.002	2	126	101896	1	KED
	Ni	**62**	**47.020**	ug/L	0.731	1	26	16205	0	KED
	Cu	**63**	**48.157**	ug/L	0.533	1	110	299207	0	KED
	Cu	**65**	**47.389**	ug/L	0.863	1	64	149079	0	KED
	Zn	**66**	**48.733**	ug/L	1.387	2	311	39181	2	KED
	Zn	**67**	**49.990**	ug/L	0.710	1	36	6688	1	KED
	As	**75**	**50.027**	ug/L	0.248	0	4	19376	1	KED
	Y	**89**		ug/L			443918	481899	2	Standard
	Kr	**83**		ug/L			121	126	16	Standard
>	**In-1**	**115**		ug/L			20884	21404	1	KED
	Mo	**98**	**48.501**	ug/L	1.052	2	9	87145	0	KED
	Cd	**111**	**50.027**	ug/L	1.342	2	3	19585	1	KED
	Cd	**114**	**49.181**	ug/L	1.428	2	5	50098	1	KED
>	**Tb**	**159**		ug/L			2689662	2823029	2	Standard
	Pb	**208**	**48.954**	ug/L	0.765	1	744	6443863	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB5
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 18:54:04
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	24832	1	Standard
	Cl	**37**		ug/L			4398521	4307872	0	Standard
>	**Sc**	**45**		ug/L			973163	1008172	1	Standard
	Cr	**52**	**-0.004**	ug/L	0.001	25	12991	13360	1	Standard
	Cr	**53**	**-0.058**	ug/L	0.007	11	432	296	6	Standard
	Mn	**55**	**0.012**	ug/L	0.004	33	589	1007	13	Standard
>	**Ge**	**72**		ug/L			85811	91850	0	KED
	Ni	**60**	**0.003**	ug/L	0.003	113	126	142	5	KED
	Ni	**62**	**-0.005**	ug/L	0.015	288	26	26	21	KED
	Cu	**63**	**0.004**	ug/L	0.004	108	110	142	18	KED
	Cu	**65**	**0.001**	ug/L	0.001	106	64	71	4	KED
	Zn	**66**	**-0.033**	ug/L	0.029	88	311	306	8	KED
	Zn	**67**	**0.051**	ug/L	0.048	94	36	45	15	KED
	As	**75**	**-0.000**	ug/L	0.002	614	4	4	21	KED
	Y	**89**		ug/L			443918	496425	1	Standard
	Kr	**83**		ug/L			121	118	16	Standard
>	**In-1**	**115**		ug/L			20884	22739	0	KED
	Mo	**98**	**0.005**	ug/L	0.007	141	9	19	67	KED
	Cd	**111**	**-0.001**	ug/L	0.007	1086	3	3	96	KED
	Cd	**114**	**-0.001**	ug/L	0.002	191	5	4	46	KED
>	**Tb**	**159**		ug/L			2689662	2823021	1	Standard
	Pb	**208**	**0.002**	ug/L	0.001	62	744	1020	12	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0218-BLK1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:00:43
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	44760	2	Standard
	Cl	**37**		ug/L			4398521	4274421	1	Standard
>	**Sc**	**45**		ug/L			973163	1044809	1	Standard
	Cr	**52**	**0.096**	ug/L	0.007	7	12991	16305	0	Standard
	Cr	**53**	**0.027**	ug/L	0.005	19	432	538	1	Standard
	Mn	**55**	**0.033**	ug/L	0.002	5	589	1734	2	Standard
>	**Ge**	**72**		ug/L			85811	91188	1	KED
	Ni	**60**	**-0.050**	ug/L	0.002	4	126	25	18	KED
	Ni	**62**	**-0.050**	ug/L	0.017	33	26	10	60	KED
	Cu	**63**	**0.006**	ug/L	0.005	74	110	156	19	KED
	Cu	**65**	**0.006**	ug/L	0.009	132	64	88	31	KED
	Zn	**66**	**-0.153**	ug/L	0.024	15	311	206	8	KED
	Zn	**67**	**0.006**	ug/L	0.098	1641	36	39	35	KED
	As	**75**	**0.001**	ug/L	0.003	235	4	5	24	KED
	Y	**89**		ug/L			443918	506603	2	Standard
	Kr	**83**		ug/L			121	95	25	Standard
>	**In-1**	**115**		ug/L			20884	22715	2	KED
	Mo	**98**	**0.003**	ug/L	0.001	45	9	15	14	KED
	Cd	**111**	**0.001**	ug/L	0.004	462	3	3	43	KED
	Cd	**114**	**-0.002**	ug/L	0.001	52	5	4	26	KED
>	**Tb**	**159**		ug/L			2689662	2939601	1	Standard
	Pb	**208**	**0.001**	ug/L	0.001	38	744	1015	5	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0218-BS1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:04:41
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	45500	1	Standard
	Cl	37		ug/L			4398521	4410005	0	Standard
>	Sc	45		ug/L			973163	1032186	1	Standard
	Cr	52	23.901	ug/L	0.488	2	12991	596201	1	Standard
	Cr	53	25.043	ug/L	0.572	2	432	67907	1	Standard
	Mn	55	24.658	ug/L	0.031	0	589	817751	1	Standard
>	Ge	72		ug/L			85811	93456	0	KED
	Ni	60	23.613	ug/L	0.687	2	126	53540	2	KED
	Ni	62	24.022	ug/L	0.568	2	26	8652	2	KED
	Cu	63	24.241	ug/L	0.234	0	110	157220	1	KED
	Cu	65	24.544	ug/L	0.542	2	64	80605	2	KED
	Zn	66	73.472	ug/L	0.770	1	311	61471	0	KED
	Zn	67	69.037	ug/L	0.556	0	36	9623	1	KED
	As	75	24.058	ug/L	0.409	1	4	9724	0	KED
	Y	89		ug/L			443918	502366	1	Standard
	Kr	83		ug/L			121	122	7	Standard
>	In-1	115		ug/L			20884	22517	1	KED
	Mo	98	0.005	ug/L	0.002	51	9	19	24	KED
	Cd	111	24.261	ug/L	0.369	1	3	9995	0	KED
	Cd	114	24.141	ug/L	0.110	0	5	25880	0	KED
>	Tb	159		ug/L			2689662	2946226	1	Standard
	Pb	208	24.586	ug/L	0.371	1	744	3378126	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0324-02
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:08:38
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	47485	1	Standard
	Cl	**37**		ug/L			4398521	4012416	3	Standard
>	**Sc**	**45**		ug/L			973163	1000513	9	Standard
	Cr	**52**	**0.188**	ug/L	0.047	24	12991	17740	4	Standard
	Cr	**53**	**0.192**	ug/L	0.034	17	432	941	2	Standard
	Mn	**55**	**3.481**	ug/L	0.194	5	589	112050	3	Standard
>	**Ge**	**72**		ug/L			85811	93096	3	KED
	Ni	**60**	**0.042**	ug/L	0.016	38	126	231	13	KED
	Ni	**62**	**0.044**	ug/L	0.032	71	26	43	23	KED
	Cu	**63**	**1.196**	ug/L	0.037	3	110	7836	0	KED
	Cu	**65**	**1.150**	ug/L	0.073	6	64	3824	3	KED
	Zn	**66**	**0.514**	ug/L	0.058	11	311	763	5	KED
	Zn	**67**	**0.861**	ug/L	0.089	10	36	158	5	KED
	As	**75**	**0.650**	ug/L	0.014	2	4	266	3	KED
	Y	**89**		ug/L			443918	474959	11	Standard
	Kr	**83**		ug/L			121	148	7	Standard
>	**In-1**	**115**		ug/L			20884	22588	2	KED
	Mo	**98**	**0.800**	ug/L	0.015	1	9	1526	3	KED
	Cd	**111**	**0.005**	ug/L	0.006	118	3	5	44	KED
	Cd	**114**	**0.005**	ug/L	0.002	44	5	11	18	KED
>	**Tb**	**159**		ug/L			2689662	2755387	10	Standard
	Pb	**208**	**0.054**	ug/L	0.007	12	744	7674	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0324-04
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:15:19
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	47343	2	Standard
	Cl	37		ug/L			4398521	4126157	0	Standard
>	Sc	45		ug/L			973163	1044619	1	Standard
	Cr	52	0.125	ug/L	0.012	9	12991	17030	0	Standard
	Cr	53	0.150	ug/L	0.005	3	432	872	0	Standard
	Mn	55	3.374	ug/L	0.047	1	589	113794	1	Standard
>	Ge	72		ug/L			85811	90976	0	KED
	Ni	60	0.061	ug/L	0.014	22	126	269	10	KED
	Ni	62	0.043	ug/L	0.006	14	26	42	5	KED
	Cu	63	0.726	ug/L	0.027	3	110	4697	2	KED
	Cu	65	0.728	ug/L	0.027	3	64	2393	3	KED
	Zn	66	0.569	ug/L	0.099	17	311	791	10	KED
	Zn	67	0.909	ug/L	0.060	6	36	161	5	KED
	As	75	0.617	ug/L	0.037	6	4	247	5	KED
	Y	89		ug/L			443918	498392	1	Standard
	Kr	83		ug/L			121	116	15	Standard
>	In-1	115		ug/L			20884	22311	1	KED
	Mo	98	0.805	ug/L	0.048	5	9	1518	5	KED
	Cd	111	0.006	ug/L	0.005	83	3	5	33	KED
	Cd	114	-0.001	ug/L	0.004	460	5	5	72	KED
>	Tb	159		ug/L			2689662	2860578	0	Standard
	Pb	208	0.045	ug/L	0.001	1	744	6806	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0324-06
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:19:17
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	46469	2	Standard
	Cl	**37**		ug/L			4398521	4402469	1	Standard
>	**Sc**	**45**		ug/L			973163	1047914	1	Standard
	Cr	**52**	**0.198**	ug/L	0.012	5	12991	18888	2	Standard
	Cr	**53**	**0.802**	ug/L	0.050	6	432	2658	4	Standard
	Mn	**55**	**1.356**	ug/L	0.022	1	589	46267	1	Standard
>	**Ge**	**72**		ug/L			85811	87920	2	KED
	Ni	**60**	**0.206**	ug/L	0.023	11	126	568	8	KED
	Ni	**62**	**0.201**	ug/L	0.028	13	26	94	8	KED
	Cu	**63**	**0.884**	ug/L	0.035	3	110	5496	0	KED
	Cu	**65**	**0.871**	ug/L	0.051	5	64	2751	3	KED
	Zn	**66**	**1.435**	ug/L	0.083	5	311	1441	3	KED
	Zn	**67**	**2.120**	ug/L	0.135	6	36	313	3	KED
	As	**75**	**0.275**	ug/L	0.010	3	4	109	0	KED
	Y	**89**		ug/L			443918	473472	2	Standard
	Kr	**83**		ug/L			121	131	8	Standard
>	**In-1**	**115**		ug/L			20884	21343	1	KED
	Mo	**98**	**0.164**	ug/L	0.018	10	9	302	9	KED
	Cd	**111**	**0.001**	ug/L	0.009	603	3	3	90	KED
	Cd	**114**	**-0.000**	ug/L	0.003	2403	5	5	53	KED
>	**Tb**	**159**		ug/L			2689662	2790179	0	Standard
	Pb	**208**	**0.003**	ug/L	0.000	13	744	1191	4	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0324-08
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:23:14
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	41893	0	Standard
	Cl	**37**		ug/L			4398521	4284834	1	Standard
>	**Sc**	**45**		ug/L			973163	1000494	0	Standard
	Cr	**52**	**0.189**	ug/L	0.003	1	12991	17816	0	Standard
	Cr	**53**	**0.110**	ug/L	0.010	9	432	731	4	Standard
	Mn	**55**	**0.370**	ug/L	0.005	1	589	12504	2	Standard
>	**Ge**	**72**		ug/L			85811	89885	1	KED
	Ni	**60**	**0.537**	ug/L	0.016	2	126	1300	2	KED
	Ni	**62**	**0.532**	ug/L	0.027	5	26	210	3	KED
	Cu	**63**	**0.126**	ug/L	0.008	6	110	900	6	KED
	Cu	**65**	**0.123**	ug/L	0.007	5	64	455	3	KED
	Zn	**66**	**0.518**	ug/L	0.076	14	311	740	8	KED
	Zn	**67**	**0.924**	ug/L	0.018	1	36	161	2	KED
	As	**75**	**0.013**	ug/L	0.006	42	4	9	23	KED
	Y	**89**		ug/L			443918	474884	2	Standard
	Kr	**83**		ug/L			121	127	25	Standard
>	**In-1**	**115**		ug/L			20884	22325	0	KED
	Mo	**98**	**0.004**	ug/L	0.005	119	9	17	51	KED
	Cd	**111**	**-0.002**	ug/L	0.004	167	3	2	57	KED
	Cd	**114**	**-0.004**	ug/L	0.001	30	5	2	54	KED
>	**Tb**	**159**		ug/L			2689662	2839279	1	Standard
	Pb	**208**	**0.016**	ug/L	0.001	3	744	2924	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0218-DUP1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:27:11
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	43771	0	Standard
	Cl	**37**		ug/L			4398521	4360037	2	Standard
>	**Sc**	**45**		ug/L			973163	998100	2	Standard
	Cr	**52**	**0.160**	ug/L	0.028	17	12991	17080	2	Standard
	Cr	**53**	**0.074**	ug/L	0.008	10	432	635	2	Standard
	Mn	**55**	**0.229**	ug/L	0.002	0	589	7957	2	Standard
>	**Ge**	**72**		ug/L			85811	90992	1	KED
	Ni	**60**	**0.513**	ug/L	0.031	6	126	1264	4	KED
	Ni	**62**	**0.526**	ug/L	0.041	7	26	211	7	KED
	Cu	**63**	**0.114**	ug/L	0.006	5	110	838	5	KED
	Cu	**65**	**0.118**	ug/L	0.010	8	64	443	6	KED
	Zn	**66**	**0.125**	ug/L	0.019	14	311	431	4	KED
	Zn	**67**	**0.591**	ug/L	0.168	28	36	118	18	KED
	As	**75**	**0.006**	ug/L	0.003	60	4	6	19	KED
	Y	**89**		ug/L			443918	474615	0	Standard
	Kr	**83**		ug/L			121	104	10	Standard
>	**In-1**	**115**		ug/L			20884	22093	1	KED
	Mo	**98**	**-0.004**	ug/L	0.001	28	9	3	61	KED
	Cd	**111**	**-0.007**	ug/L	0.001	20	3	0	86	KED
	Cd	**114**	**0.000**	ug/L	0.002	496	5	6	31	KED
>	**Tb**	**159**		ug/L			2689662	2837003	1	Standard
	Pb	**208**	**0.001**	ug/L	0.000	51	744	892	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: BJH0218-MS1
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:31:33
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	46074	3	Standard
	Cl	37		ug/L			4398521	4514487	2	Standard
>	Sc	45		ug/L			973163	980530	2	Standard
	Cr	52	24.210	ug/L	0.213	0	12991	573503	1	Standard
	Cr	53	24.832	ug/L	0.600	2	432	63963	1	Standard
	Mn	55	25.009	ug/L	0.679	2	589	787601	1	Standard
>	Ge	72		ug/L			85811	91007	1	KED
	Ni	60	24.153	ug/L	0.164	0	126	53335	1	KED
	Ni	62	24.657	ug/L	0.387	1	26	8648	1	KED
	Cu	63	24.545	ug/L	0.332	1	110	155016	1	KED
	Cu	65	24.460	ug/L	0.151	0	64	78225	0	KED
	Zn	66	73.713	ug/L	1.924	2	311	60052	2	KED
	Zn	67	70.916	ug/L	2.937	4	36	9622	3	KED
	As	75	23.839	ug/L	0.179	0	4	9384	1	KED
	Y	89		ug/L			443918	471993	1	Standard
	Kr	83		ug/L			121	133	7	Standard
>	In-1	115		ug/L			20884	21935	0	KED
	Mo	98	0.007	ug/L	0.005	79	9	21	44	KED
	Cd	111	23.860	ug/L	0.635	2	3	9575	1	KED
	Cd	114	23.910	ug/L	0.318	1	5	24972	2	KED
>	Tb	159		ug/L			2689662	2808632	0	Standard
	Pb	208	24.904	ug/L	0.223	0	744	3262402	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21H0079-01
Sample Dil Factor: 10
Comments:
Sample Date/Time: Monday, August 09, 2021 19:38:43
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	150539	4	Standard
	Cl	37		ug/L			4398521	4686358	2	Standard
>	Sc	45		ug/L			973163	966815	0	Standard
	Cr	52	30.925	ug/L	0.520	1	12991	718847	1	Standard
	Cr	53	31.635	ug/L	0.528	1	432	80246	1	Standard
	Mn	55	24.685	ug/L	0.306	1	589	766773	0	Standard
>	Ge	72		ug/L			85811	87889	1	KED
	Ni	60	1.736	ug/L	0.029	1	126	3823	1	KED
	Ni	62	1.775	ug/L	0.055	3	26	626	2	KED
	Cu	63	1.527	ug/L	0.012	0	110	9420	1	KED
	Cu	65	1.524	ug/L	0.053	3	64	4767	2	KED
	Zn	66	76.786	ug/L	1.634	2	311	60395	1	KED
	Zn	67	70.474	ug/L	0.989	1	36	9238	2	KED
	As	75	0.161	ug/L	0.003	1	4	65	2	KED
	Y	89		ug/L			443918	472965	2	Standard
	Kr	83		ug/L			121	111	2	Standard
>	In-1	115		ug/L			20884	21651	1	KED
	Mo	98	1.044	ug/L	0.044	4	9	1907	3	KED
	Cd	111	0.393	ug/L	0.037	9	3	159	8	KED
	Cd	114	0.400	ug/L	0.013	3	5	418	2	KED
>	Tb	159		ug/L			2689662	2800845	0	Standard
	Pb	208	0.218	ug/L	0.004	1	744	29231	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL7
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:45:24
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	25626	0	Standard
	Cl	**37**		ug/L			4398521	4732878	1	Standard
>	**Sc**	**45**		ug/L			973163	964825	1	Standard
	Cr	**52**	**0.012**	ug/L	0.019	156	12991	13146	1	Standard
	Cr	**53**	**-0.072**	ug/L	0.011	14	432	247	9	Standard
	Mn	**55**	**-0.002**	ug/L	0.001	33	589	526	4	Standard
>	**Ge**	**72**		ug/L			85811	87201	1	KED
	Ni	**60**	**-0.047**	ug/L	0.002	3	126	30	10	KED
	Ni	**62**	**-0.049**	ug/L	0.007	14	26	10	21	KED
	Cu	**63**	**-0.002**	ug/L	0.002	97	110	101	10	KED
	Cu	**65**	**-0.004**	ug/L	0.001	25	64	51	7	KED
	Zn	**66**	**-0.223**	ug/L	0.009	4	311	142	3	KED
	Zn	**67**	**-0.152**	ug/L	0.023	15	36	17	19	KED
	As	**75**	**-0.002**	ug/L	0.004	189	4	3	37	KED
	Y	**89**		ug/L			443918	465758	1	Standard
	Kr	**83**		ug/L			121	117	3	Standard
>	**In-1**	**115**		ug/L			20884	22113	1	KED
	Mo	**98**	**-0.002**	ug/L	0.001	33	9	6	22	KED
	Cd	**111**	**0.001**	ug/L	0.006	557	3	3	66	KED
	Cd	**114**	**-0.003**	ug/L	0.001	28	5	2	43	KED
>	**Tb**	**159**		ug/L			2689662	2766247	1	Standard
	Pb	**208**	**-0.001**	ug/L	0.000	19	744	666	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV6
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:49:46
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	24579	1	Standard
	Cl	**37**		ug/L			4398521	4766246	1	Standard
>	**Sc**	**45**		ug/L			973163	957899	1	Standard
	Cr	**52**	**48.532**	ug/L	0.756	1	12991	1110306	0	Standard
	Cr	**53**	**50.895**	ug/L	0.992	1	432	127642	1	Standard
	Mn	**55**	**50.415**	ug/L	0.315	0	589	1551008	1	Standard
>	**Ge**	**72**		ug/L			85811	87810	0	KED
	Ni	**60**	**47.717**	ug/L	0.919	1	126	101537	2	KED
	Ni	**62**	**47.954**	ug/L	0.939	1	26	16204	2	KED
	Cu	**63**	**47.902**	ug/L	0.755	1	110	291831	2	KED
	Cu	**65**	**47.588**	ug/L	0.199	0	64	146785	0	KED
	Zn	**66**	**49.548**	ug/L	0.955	1	311	39052	1	KED
	Zn	**67**	**50.382**	ug/L	0.881	1	36	6607	0	KED
	As	**75**	**50.122**	ug/L	0.542	1	4	19032	1	KED
	Y	**89**		ug/L			443918	475635	1	Standard
	Kr	**83**		ug/L			121	128	5	Standard
>	**In-1**	**115**		ug/L			20884	21649	1	KED
	Mo	**98**	**46.991**	ug/L	0.421	0	9	85411	0	KED
	Cd	**111**	**48.599**	ug/L	0.483	0	3	19247	0	KED
	Cd	**114**	**48.632**	ug/L	0.614	1	5	50117	0	KED
>	**Tb**	**159**		ug/L			2689662	2854863	1	Standard
	Pb	**208**	**48.573**	ug/L	0.488	1	744	6466568	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB6
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 19:56:28
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	23733	1	Standard
	Cl	**37**		ug/L			4398521	4653700	2	Standard
>	**Sc**	**45**		ug/L			973163	973555	1	Standard
	Cr	**52**	**0.025**	ug/L	0.014	56	12991	13558	1	Standard
	Cr	**53**	**-0.073**	ug/L	0.002	2	432	247	1	Standard
	Mn	**55**	**0.002**	ug/L	0.001	47	589	640	3	Standard
>	**Ge**	**72**		ug/L			85811	89334	1	KED
	Ni	**60**	**0.001**	ug/L	0.006	528	126	134	8	KED
	Ni	**62**	**0.004**	ug/L	0.034	770	26	28	40	KED
	Cu	**63**	**0.005**	ug/L	0.000	7	110	144	1	KED
	Cu	**65**	**-0.002**	ug/L	0.004	186	64	60	18	KED
	Zn	**66**	**0.008**	ug/L	0.035	457	311	330	9	KED
	Zn	**67**	**0.085**	ug/L	0.027	31	36	48	5	KED
	As	**75**	**-0.001**	ug/L	0.001	120	4	4	11	KED
	Y	**89**		ug/L			443918	475932	2	Standard
	Kr	**83**		ug/L			121	120	11	Standard
>	**In-1**	**115**		ug/L			20884	21872	3	KED
	Mo	**98**	**0.005**	ug/L	0.006	116	9	18	56	KED
	Cd	**111**	**-0.002**	ug/L	0.001	68	3	2	21	KED
	Cd	**114**	**-0.002**	ug/L	0.001	65	5	4	23	KED
>	**Tb**	**159**		ug/L			2689662	2790009	1	Standard
	Pb	**208**	**0.001**	ug/L	0.001	36	744	965	6	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0331-01
Sample Dil Factor: 20
Comments:
Sample Date/Time: Monday, August 09, 2021 20:00:26
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	110577	2	Standard
	Cl	37		ug/L			4398521	4966285	1	Standard
>	Sc	45		ug/L			973163	995765	2	Standard
	Cr	52	103.542	ug/L	3.896	3	12991	2446242	1	Standard
	Cr	53	106.822	ug/L	0.749	0	432	278055	2	Standard
	Mn	55	38.723	ug/L	1.144	2	589	1238049	1	Standard
>	Ge	72		ug/L			85811	89602	0	KED
	Ni	60	1.229	ug/L	0.045	3	126	2797	3	KED
	Ni	62	1.174	ug/L	0.157	13	26	431	12	KED
	Cu	63	1.761	ug/L	0.035	1	110	11055	2	KED
	Cu	65	1.763	ug/L	0.013	0	64	5613	0	KED
	Zn	66	97.574	ug/L	2.003	2	311	78165	1	KED
	Zn	67	89.818	ug/L	0.508	0	36	11992	0	KED
	As	75	0.259	ug/L	0.009	3	4	104	3	KED
	Y	89		ug/L			443918	480060	3	Standard
	Kr	83		ug/L			121	111	5	Standard
>	In-1	115		ug/L			20884	22019	1	KED
	Mo	98	0.273	ug/L	0.013	4	9	514	5	KED
	Cd	111	0.467	ug/L	0.029	6	3	191	7	KED
	Cd	114	0.448	ug/L	0.038	8	5	475	9	KED
>	Tb	159		ug/L			2689662	2855448	0	Standard
	Pb	208	0.211	ug/L	0.002	1	744	28949	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0349-01
Sample Dil Factor: 10
Comments:
Sample Date/Time: Monday, August 09, 2021 20:07:07
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	149662	2	Standard
	Cl	37		ug/L			4398521	4793441	2	Standard
>	Sc	45		ug/L			973163	1005158	0	Standard
	Cr	52	27.968	ug/L	0.534	1	12991	677121	1	Standard
	Cr	53	29.593	ug/L	0.313	1	432	78072	0	Standard
	Mn	55	15.353	ug/L	0.261	1	589	496039	1	Standard
>	Ge	72		ug/L			85811	90219	2	KED
	Ni	60	2.673	ug/L	0.145	5	126	5965	3	KED
	Ni	62	2.674	ug/L	0.110	4	26	953	1	KED
	Cu	63	7.525	ug/L	0.221	2	110	47172	1	KED
	Cu	65	7.336	ug/L	0.114	1	64	23305	2	KED
	Zn	66	247.339	ug/L	1.729	0	311	198997	2	KED
	Zn	67	224.523	ug/L	2.022	0	36	30123	1	KED
	As	75	0.106	ug/L	0.006	5	4	46	5	KED
	Y	89		ug/L			443918	484633	3	Standard
	Kr	83		ug/L			121	112	14	Standard
>	In-1	115		ug/L			20884	21711	2	KED
	Mo	98	0.376	ug/L	0.014	3	9	694	2	KED
	Cd	111	2.818	ug/L	0.156	5	3	1121	4	KED
	Cd	114	2.790	ug/L	0.084	3	5	2888	2	KED
>	Tb	159		ug/L			2689662	2870389	0	Standard
	Pb	208	0.661	ug/L	0.016	2	744	89204	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0373-01
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:13:49
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	48859	1	Standard
	Cl	**37**		ug/L			4398521	4447919	3	Standard
>	**Sc**	**45**		ug/L			973163	1115768	1	Standard
	Cr	**52**	**0.065**	ug/L	0.013	19	12991	16616	0	Standard
	Cr	**53**	**0.217**	ug/L	0.021	9	432	1128	5	Standard
	Mn	**55**	**69.987**	ug/L	0.653	0	589	2507953	2	Standard
>	**Ge**	**72**		ug/L			85811	89129	2	KED
	Ni	**60**	**-0.033**	ug/L	0.003	10	126	60	14	KED
	Ni	**62**	**-0.043**	ug/L	0.022	49	26	12	59	KED
	Cu	**63**	**0.016**	ug/L	0.003	15	110	213	9	KED
	Cu	**65**	**0.012**	ug/L	0.007	59	64	103	21	KED
	Zn	**66**	**0.309**	ug/L	0.023	7	311	568	5	KED
	Zn	**67**	**1.034**	ug/L	0.262	25	36	174	20	KED
	As	**75**	**0.118**	ug/L	0.014	11	4	50	8	KED
	Y	**89**		ug/L			443918	486832	1	Standard
	Kr	**83**		ug/L			121	122	28	Standard
>	**In-1**	**115**		ug/L			20884	22230	0	KED
	Mo	**98**	**0.425**	ug/L	0.012	2	9	802	2	KED
	Cd	**111**	**-0.004**	ug/L	0.002	63	3	1	50	KED
	Cd	**114**	**-0.002**	ug/L	0.003	155	5	4	77	KED
>	**Tb**	**159**		ug/L			2689662	2846327	0	Standard
	Pb	**208**	**0.001**	ug/L	0.000	31	744	891	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21G0373-03
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:17:46
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	55341	1	Standard
	Cl	**37**		ug/L			4398521	4307260	1	Standard
>	**Sc**	**45**		ug/L			973163	1115228	3	Standard
	Cr	**52**	**0.784**	ug/L	0.046	5	12991	35504	0	Standard
	Cr	**53**	**0.938**	ug/L	0.023	2	432	3226	3	Standard
	Mn	**55**	**274.665**	ug/L	7.629	2	589	9829259	1	Standard
>	**Ge**	**72**		ug/L			85811	89788	1	KED
	Ni	**60**	**1.107**	ug/L	0.065	5	126	2537	4	KED
	Ni	**62**	**1.149**	ug/L	0.085	7	26	423	6	KED
	Cu	**63**	**1.504**	ug/L	0.033	2	110	9478	1	KED
	Cu	**65**	**1.546**	ug/L	0.039	2	64	4939	3	KED
	Zn	**66**	**3.983**	ug/L	0.030	0	311	3509	1	KED
	Zn	**67**	**4.712**	ug/L	0.233	4	36	666	3	KED
	As	**75**	**2.963**	ug/L	0.012	0	4	1154	1	KED
	Y	**89**		ug/L			443918	494524	3	Standard
	Kr	**83**		ug/L			121	132	9	Standard
>	**In-1**	**115**		ug/L			20884	21880	1	KED
	Mo	**98**	**0.407**	ug/L	0.027	6	9	756	5	KED
	Cd	**111**	**0.018**	ug/L	0.006	36	3	10	24	KED
	Cd	**114**	**0.018**	ug/L	0.001	7	5	24	4	KED
>	**Tb**	**159**		ug/L			2689662	2910238	1	Standard
	Pb	**208**	**1.639**	ug/L	0.035	2	744	223232	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21H0049-01
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:22:07
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	52184	2	Standard
	Cl	37		ug/L			4398521	7824529	3	Standard
>	Sc	45		ug/L			973163	1051219	0	Standard
	Cr	52	1.794	ug/L	0.017	0	12991	58555	1	Standard
	Cr	53	7.760	ug/L	0.094	1	432	21756	1	Standard
	Mn	55	10.065	ug/L	0.202	2	589	340312	2	Standard
>	Ge	72		ug/L			85811	86536	0	KED
	Ni	60	0.733	ug/L	0.044	6	126	1662	4	KED
	Ni	62	0.746	ug/L	0.100	13	26	274	12	KED
	Cu	63	1.449	ug/L	0.017	1	110	8806	0	KED
	Cu	65	1.507	ug/L	0.028	1	64	4643	1	KED
	Zn	66	6.137	ug/L	0.172	2	311	5042	2	KED
	Zn	67	7.208	ug/L	0.275	3	36	963	4	KED
	As	75	7.174	ug/L	0.069	0	4	2688	0	KED
	Y	89		ug/L			443918	475678	1	Standard
	Kr	83		ug/L			121	125	7	Standard
>	In-1	115		ug/L			20884	21242	0	KED
	Mo	98	23.265	ug/L	0.206	0	9	41499	0	KED
	Cd	111	0.028	ug/L	0.006	21	3	13	17	KED
	Cd	114	0.010	ug/L	0.005	48	5	15	29	KED
>	Tb	159		ug/L			2689662	2793789	0	Standard
	Pb	208	0.255	ug/L	0.001	0	744	33980	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: 21H0057-01
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:26:29
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	13		ug/L			23373	311988	2	Standard
	Cl	37		ug/L			4398521	4523914	1	Standard
>	Sc	45		ug/L			973163	931863	1	Standard
	Cr	52	2.973	ug/L	0.064	2	12991	77863	2	Standard
	Cr	53	2.487	ug/L	0.080	3	432	6460	2	Standard
	Mn	55	141.865	ug/L	0.858	0	589	4244637	0	Standard
>	Ge	72		ug/L			85811	79605	1	KED
	Ni	60	10.266	ug/L	0.242	2	126	19892	0	KED
	Ni	62	10.698	ug/L	0.333	3	26	3294	1	KED
	Cu	63	2.502	ug/L	0.062	2	110	13913	1	KED
	Cu	65	2.448	ug/L	0.070	2	64	6900	1	KED
	Zn	66	7.324	ug/L	0.109	1	311	5479	0	KED
	Zn	67	10.382	ug/L	0.197	1	36	1261	0	KED
	As	75	0.195	ug/L	0.018	9	4	71	8	KED
	Y	89		ug/L			443918	455160	0	Standard
	Kr	83		ug/L			121	127	5	Standard
>	In-1	115		ug/L			20884	18744	0	KED
	Mo	98	2.861	ug/L	0.025	0	9	4510	1	KED
	Cd	111	0.058	ug/L	0.019	32	3	22	28	KED
	Cd	114	0.043	ug/L	0.003	7	5	43	6	KED
>	Tb	159		ug/L			2689662	2699962	0	Standard
	Pb	208	0.024	ug/L	0.001	4	744	3764	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-IBL8
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:33:11
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	27946	4	Standard
	Cl	**37**		ug/L			4398521	5100896	2	Standard
>	**Sc**	**45**		ug/L			973163	999818	0	Standard
	Cr	**52**	**0.081**	ug/L	0.008	9	12991	15270	1	Standard
	Cr	**53**	**-0.065**	ug/L	0.003	5	432	273	2	Standard
	Mn	**55**	**0.001**	ug/L	0.002	145	589	648	9	Standard
>	**Ge**	**72**		ug/L			85811	89978	0	KED
	Ni	**60**	**-0.040**	ug/L	0.005	13	126	46	24	KED
	Ni	**62**	**-0.057**	ug/L	0.015	25	26	7	66	KED
	Cu	**63**	**-0.001**	ug/L	0.003	207	110	107	16	KED
	Cu	**65**	**-0.005**	ug/L	0.003	56	64	52	15	KED
	Zn	**66**	**-0.047**	ug/L	0.035	75	311	288	10	KED
	Zn	**67**	**0.044**	ug/L	0.051	115	36	43	15	KED
	As	**75**	**-0.009**	ug/L	0.002	21	4	1	57	KED
	Y	**89**		ug/L			443918	479999	1	Standard
	Kr	**83**		ug/L			121	99	22	Standard
>	**In-1**	**115**		ug/L			20884	21381	2	KED
	Mo	**98**	**-0.002**	ug/L	0.001	50	9	5	36	KED
	Cd	**111**	**0.001**	ug/L	0.006	461	3	3	66	KED
	Cd	**114**	**-0.003**	ug/L	0.001	35	5	2	34	KED
>	**Tb**	**159**		ug/L			2689662	2865691	2	Standard
	Pb	**208**	**0.000**	ug/L	0.001	275	744	826	11	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCV7
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:37:33
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	25565	0	Standard
	Cl	**37**		ug/L			4398521	4885758	0	Standard
>	**Sc**	**45**		ug/L			973163	1000292	0	Standard
	Cr	**52**	**47.058**	ug/L	0.271	0	12991	1124719	0	Standard
	Cr	**53**	**49.121**	ug/L	0.970	1	432	128675	2	Standard
	Mn	**55**	**49.182**	ug/L	0.706	1	589	1580081	1	Standard
>	**Ge**	**72**		ug/L			85811	89548	0	KED
	Ni	**60**	**47.272**	ug/L	0.768	1	126	102582	1	KED
	Ni	**62**	**47.045**	ug/L	0.854	1	26	16212	1	KED
	Cu	**63**	**47.858**	ug/L	0.197	0	110	297310	0	KED
	Cu	**65**	**47.437**	ug/L	0.546	1	64	149217	0	KED
	Zn	**66**	**50.677**	ug/L	0.199	0	311	40731	0	KED
	Zn	**67**	**48.909**	ug/L	1.343	2	36	6543	2	KED
	As	**75**	**48.778**	ug/L	0.519	1	4	18888	0	KED
	Y	**89**		ug/L			443918	491695	1	Standard
	Kr	**83**		ug/L			121	111	10	Standard
>	**In-1**	**115**		ug/L			20884	21304	0	KED
	Mo	**98**	**47.691**	ug/L	0.405	0	9	85309	0	KED
	Cd	**111**	**50.304**	ug/L	1.070	2	3	19606	1	KED
	Cd	**114**	**49.566**	ug/L	0.350	0	5	50271	0	KED
>	**Tb**	**159**		ug/L			2689662	2919107	1	Standard
	Pb	**208**	**50.110**	ug/L	0.741	1	744	6821189	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: SEQ-CCB7
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:44:15
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	24203	2	Standard
	Cl	**37**		ug/L			4398521	4868796	1	Standard
>	**Sc**	**45**		ug/L			973163	991893	1	Standard
	Cr	**52**	**0.001**	ug/L	0.008	1408	12991	13255	2	Standard
	Cr	**53**	**-0.088**	ug/L	0.004	4	432	213	5	Standard
	Mn	**55**	**0.002**	ug/L	0.001	58	589	662	5	Standard
>	**Ge**	**72**		ug/L			85811	90100	1	KED
	Ni	**60**	**-0.003**	ug/L	0.008	239	126	126	12	KED
	Ni	**62**	**-0.002**	ug/L	0.016	880	26	26	18	KED
	Cu	**63**	**0.002**	ug/L	0.002	117	110	125	10	KED
	Cu	**65**	**0.001**	ug/L	0.001	114	64	69	5	KED
	Zn	**66**	**-0.013**	ug/L	0.038	288	311	316	10	KED
	Zn	**67**	**0.086**	ug/L	0.039	45	36	49	10	KED
	As	**75**	**0.000**	ug/L	0.001	435	4	4	10	KED
	Y	**89**		ug/L			443918	481940	0	Standard
	Kr	**83**		ug/L			121	126	10	Standard
>	**In-1**	**115**		ug/L			20884	21485	1	KED
	Mo	**98**	**0.002**	ug/L	0.000	20	9	13	7	KED
	Cd	**111**	**-0.000**	ug/L	0.006	2172	3	3	75	KED
	Cd	**114**	**0.000**	ug/L	0.004	1772	5	6	72	KED
>	**Tb**	**159**		ug/L			2689662	2852465	1	Standard
	Pb	**208**	**0.001**	ug/L	0.000	12	744	876	0	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: RINSE
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:48:12
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	43319	1	Standard
	Cl	**37**		ug/L			4398521	5119567	2	Standard
>	**Sc**	**45**		ug/L			973163	1139924	0	Standard
	Cr	**52**	**0.093**	ug/L	0.015	16	12991	17728	2	Standard
	Cr	**53**	**-0.041**	ug/L	0.007	17	432	384	5	Standard
	Mn	**55**	**0.103**	ug/L	0.001	1	589	4455	1	Standard
>	**Ge**	**72**		ug/L			85811	94590	0	KED
	Ni	**60**	**0.142**	ug/L	0.026	18	126	465	12	KED
	Ni	**62**	**0.127**	ug/L	0.009	7	26	74	5	KED
	Cu	**63**	**0.125**	ug/L	0.016	12	110	944	10	KED
	Cu	**65**	**0.123**	ug/L	0.005	4	64	480	3	KED
	Zn	**66**	**1.440**	ug/L	0.015	1	311	1555	1	KED
	Zn	**67**	**1.546**	ug/L	0.093	6	36	257	5	KED
	As	**75**	**-0.003**	ug/L	0.001	41	4	3	15	KED
	Y	**89**		ug/L			443918	550739	0	Standard
	Kr	**83**		ug/L			121	126	13	Standard
>	**In-1**	**115**		ug/L			20884	23861	0	KED
	Mo	**98**	**0.005**	ug/L	0.003	68	9	20	34	KED
	Cd	**111**	**-0.002**	ug/L	0.000	1	3	2	0	KED
	Cd	**114**	**-0.003**	ug/L	0.002	81	5	3	82	KED
>	**Tb**	**159**		ug/L			2689662	3158283	2	Standard
	Pb	**208**	**0.052**	ug/L	0.001	2	744	8510	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: RINSE
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:52:10
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	44082	3	Standard
	Cl	**37**		ug/L			4398521	5122863	0	Standard
>	**Sc**	**45**		ug/L			973163	1119646	0	Standard
	Cr	**52**	**0.107**	ug/L	0.020	18	12991	17782	3	Standard
	Cr	**53**	**-0.051**	ug/L	0.007	14	432	350	6	Standard
	Mn	**55**	**0.107**	ug/L	0.001	0	589	4509	1	Standard
>	**Ge**	**72**		ug/L			85811	95459	0	KED
	Ni	**60**	**0.146**	ug/L	0.009	6	126	478	4	KED
	Ni	**62**	**0.143**	ug/L	0.033	23	26	81	15	KED
	Cu	**63**	**0.127**	ug/L	0.006	4	110	964	3	KED
	Cu	**65**	**0.121**	ug/L	0.017	14	64	477	11	KED
	Zn	**66**	**1.580**	ug/L	0.131	8	311	1688	6	KED
	Zn	**67**	**1.584**	ug/L	0.141	8	36	264	6	KED
	As	**75**	**-0.000**	ug/L	0.002	4952	4	4	20	KED
	Y	**89**		ug/L			443918	546185	0	Standard
	Kr	**83**		ug/L			121	131	3	Standard
>	**In-1**	**115**		ug/L			20884	23950	2	KED
	Mo	**98**	**0.004**	ug/L	0.003	58	9	19	25	KED
	Cd	**111**	**-0.000**	ug/L	0.003	918	3	3	41	KED
	Cd	**114**	**-0.002**	ug/L	0.004	193	5	3	117	KED
>	**Tb**	**159**		ug/L			2689662	3184532	1	Standard
	Pb	**208**	**0.052**	ug/L	0.001	2	744	8566	3	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: RINSE
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 20:56:08
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	43786	2	Standard
	Cl	**37**		ug/L			4398521	5063830	2	Standard
>	**Sc**	**45**		ug/L			973163	1138202	0	Standard
	Cr	**52**	**0.088**	ug/L	0.001	1	12991	17548	0	Standard
	Cr	**53**	**-0.048**	ug/L	0.006	13	432	363	5	Standard
	Mn	**55**	**0.105**	ug/L	0.001	1	589	4535	0	Standard
>	**Ge**	**72**		ug/L			85811	95868	2	KED
	Ni	**60**	**0.131**	ug/L	0.014	10	126	445	6	KED
	Ni	**62**	**0.096**	ug/L	0.054	56	26	64	29	KED
	Cu	**63**	**0.120**	ug/L	0.006	5	110	919	2	KED
	Cu	**65**	**0.124**	ug/L	0.013	10	64	487	7	KED
	Zn	**66**	**1.535**	ug/L	0.103	6	311	1658	6	KED
	Zn	**67**	**1.428**	ug/L	0.073	5	36	243	4	KED
	As	**75**	**-0.003**	ug/L	0.005	173	4	3	61	KED
	Y	**89**		ug/L			443918	549125	2	Standard
	Kr	**83**		ug/L			121	144	2	Standard
>	**In-1**	**115**		ug/L			20884	23737	0	KED
	Mo	**98**	**0.000**	ug/L	0.002	506	9	11	32	KED
	Cd	**111**	**0.003**	ug/L	0.002	82	3	4	20	KED
	Cd	**114**	**-0.003**	ug/L	0.001	44	5	2	60	KED
>	**Tb**	**159**		ug/L			2689662	3207692	1	Standard
	Pb	**208**	**0.050**	ug/L	0.001	1	744	8356	1	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: DI
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 21:00:05
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	25564	1	Standard
	Cl	**37**		ug/L			4398521	4770931	3	Standard
>	**Sc**	**45**		ug/L			973163	956644	0	Standard
	Cr	**52**	**-0.011**	ug/L	0.011	99	12991	12524	1	Standard
	Cr	**53**	**-0.090**	ug/L	0.006	7	432	199	7	Standard
	Mn	**55**	**-0.011**	ug/L	0.001	7	589	242	9	Standard
>	**Ge**	**72**		ug/L			85811	90468	1	KED
	Ni	**60**	**-0.057**	ug/L	0.001	1	126	9	20	KED
	Ni	**62**	**-0.064**	ug/L	0.003	5	26	5	21	KED
	Cu	**63**	**-0.008**	ug/L	0.003	45	110	69	29	KED
	Cu	**65**	**-0.011**	ug/L	0.004	37	64	34	36	KED
	Zn	**66**	**-0.320**	ug/L	0.020	6	311	70	23	KED
	Zn	**67**	**-0.203**	ug/L	0.046	22	36	10	56	KED
	As	**75**	**-0.003**	ug/L	0.002	91	4	3	27	KED
	Y	**89**		ug/L			443918	465029	2	Standard
	Kr	**83**		ug/L			121	139	9	Standard
>	**In-1**	**115**		ug/L			20884	21719	1	KED
	Mo	**98**	**-0.003**	ug/L	0.003	98	9	4	108	KED
	Cd	**111**	**-0.002**	ug/L	0.006	319	3	2	94	KED
	Cd	**114**	**-0.003**	ug/L	0.001	43	5	3	39	KED
>	**Tb**	**159**		ug/L			2689662	2769572	1	Standard
	Pb	**208**	**-0.003**	ug/L	0.000	2	744	328	2	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: DI
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 21:04:03
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	26080	2	Standard
	Cl	**37**		ug/L			4398521	4717362	1	Standard
>	**Sc**	**45**		ug/L			973163	957125	1	Standard
	Cr	**52**	**0.012**	ug/L	0.005	42	12991	13057	0	Standard
	Cr	**53**	**-0.091**	ug/L	0.006	6	432	198	6	Standard
	Mn	**55**	**-0.010**	ug/L	0.000	3	589	284	4	Standard
>	**Ge**	**72**		ug/L			85811	89550	0	KED
	Ni	**60**	**-0.057**	ug/L	0.002	2	126	9	34	KED
	Ni	**62**	**-0.066**	ug/L	0.012	17	26	4	89	KED
	Cu	**63**	**-0.008**	ug/L	0.001	13	110	62	10	KED
	Cu	**65**	**-0.009**	ug/L	0.004	40	64	39	29	KED
	Zn	**66**	**-0.340**	ug/L	0.016	4	311	53	24	KED
	Zn	**67**	**-0.203**	ug/L	0.030	15	36	10	36	KED
	As	**75**	**-0.007**	ug/L	0.002	25	4	1	41	KED
	Y	**89**		ug/L			443918	467065	2	Standard
	Kr	**83**		ug/L			121	107	12	Standard
>	**In-1**	**115**		ug/L			20884	21489	1	KED
	Mo	**98**	**-0.003**	ug/L	0.001	35	9	3	57	KED
	Cd	**111**	**-0.000**	ug/L	0.006	2506	3	3	69	KED
	Cd	**114**	**-0.003**	ug/L	0.002	64	5	2	92	KED
>	**Tb**	**159**		ug/L			2689662	2802536	0	Standard
	Pb	**208**	**-0.004**	ug/L	0.000	5	744	303	7	Standard

ICP-MS Quantitative Analysis - Summary Report

Sample ID: DI
Sample Dil Factor:
Comments:
Sample Date/Time: Monday, August 09, 2021 21:08:01
Number of Replicates: 3
Method File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Method\200.8_DailyMethod_KED_UCT.mth
Tuning File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\MassCal\Default.tun
Optimization File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\Conditions\Default.dac
Calibration File: C:\Users\Public\Documents\PerkinElmer Syngistix\ICPMS\System\080921_mod.cal

	Analyte	Mass	Conc. Mean	Units	Conc. SD	Conc. RSD	Blank Intens.	Meas. Intens.	Intens. RSD	Mode
	C	**13**		ug/L			23373	25823	0	Standard
	Cl	**37**		ug/L			4398521	4753302	3	Standard
⌈>	**Sc**	**45**		ug/L			973163	950976	0	Standard
|	**Cr**	**52**	**0.007**	ug/L	0.004	54	12991	12847	0	Standard
|	**Cr**	**53**	**-0.097**	ug/L	0.002	2	432	182	3	Standard
⌊	**Mn**	**55**	**-0.010**	ug/L	0.000	3	589	257	5	Standard
⌈>	**Ge**	**72**		ug/L			85811	89390	2	KED
|	**Ni**	**60**	**-0.054**	ug/L	0.004	6	126	14	49	KED
|	**Ni**	**62**	**-0.066**	ug/L	0.003	5	26	4	24	KED
|	**Cu**	**63**	**-0.007**	ug/L	0.002	24	110	70	15	KED
|	**Cu**	**65**	**-0.009**	ug/L	0.004	41	64	38	31	KED
|	**Zn**	**66**	**-0.337**	ug/L	0.024	7	311	55	34	KED
|	**Zn**	**67**	**-0.236**	ug/L	0.020	8	36	6	45	KED
⌊	**As**	**75**	**-0.005**	ug/L	0.003	71	4	2	44	KED
	Y	**89**		ug/L			443918	462254	1	Standard
	Kr	**83**		ug/L			121	109	13	Standard
⌈>	**In-1**	**115**		ug/L			20884	20811	0	KED
|	**Mo**	**98**	**-0.003**	ug/L	0.003	90	9	3	151	KED
|	**Cd**	**111**	**-0.002**	ug/L	0.004	152	3	2	65	KED
⌊	**Cd**	**114**	**-0.002**	ug/L	0.004	201	5	3	99	KED
⌈>	**Tb**	**159**		ug/L			2689662	2751184	1	Standard
⌊	**Pb**	**208**	**-0.004**	ug/L	0.000	2	744	253	7	Standard

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 6020B UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICPMS1
Calibration: EH00022
Control Limt: +/- 10.00%
Sequence: SJH0114

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SJH0114-ICV1	Arsenic-75a	50.000	47.5	94.9	ug/L	PA 6020B UCT-KE
	Zinc-66	50.000	47.5	94.9	ug/L	PA 6020B UCT-KE
	Zinc-67	50.000	47.5	94.9	ug/L	PA 6020B UCT-KE
SJH0114-CCV1	Arsenic-75a	50.000	48.7	97.4	ug/L	PA 6020B UCT-KE
	Zinc-66	50.000	49.4	98.8	ug/L	PA 6020B UCT-KE
	Zinc-67	50.000	49.1	98.3	ug/L	PA 6020B UCT-KE
SJH0114-CCV2	Arsenic-75a	50.000	49.4	98.8	ug/L	PA 6020B UCT-KE
	Zinc-66	50.000	50.8	102	ug/L	PA 6020B UCT-KE
	Zinc-67	50.000	48.6	97.1	ug/L	PA 6020B UCT-KE
SJH0114-CCV3	Arsenic-75a	50.000	50.1	100	ug/L	PA 6020B UCT-KE
	Zinc-66	50.000	50.0	100	ug/L	PA 6020B UCT-KE
	Zinc-67	50.000	49.1	98.1	ug/L	PA 6020B UCT-KE
SJH0114-CCV4	Arsenic-75a	50.000	50.2	100	ug/L	PA 6020B UCT-KE
	Zinc-66	50.000	50.3	101	ug/L	PA 6020B UCT-KE
	Zinc-67	50.000	50.0	100	ug/L	PA 6020B UCT-KE
SJH0114-CCV5	Arsenic-75a	50.000	50.0	100	ug/L	PA 6020B UCT-KE
	Zinc-66	50.000	48.7	97.5	ug/L	PA 6020B UCT-KE
	Zinc-67	50.000	50.0	100	ug/L	PA 6020B UCT-KE
SJH0114-CCV6	Arsenic-75a	50.000	50.1	100	ug/L	PA 6020B UCT-KE
	Zinc-66	50.000	49.5	99.1	ug/L	PA 6020B UCT-KE
	Zinc-67	50.000	50.4	101	ug/L	PA 6020B UCT-KE
SJH0114-CCV7	Arsenic-75a	50.000	48.8	97.6	ug/L	PA 6020B UCT-KE
	Zinc-66	50.000	50.7	101	ug/L	PA 6020B UCT-KE
	Zinc-67	50.000	48.9	97.8	ug/L	PA 6020B UCT-KE

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INSTRUMENT BLANKS
EPA 6020B UCT-KED

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Instrument ID: ICPMS1
Sequence: SJH0114

SDG: 21G0286
Project: Lower Duwamish AOC4
Calibration: EH00022
Date Analyzed: 08/09/21 14:33

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SJH0114-IBL1	Arsenic-75a	0.00700	0.0373	0.200	ug/L	
SJH0114-IBL1	Zinc-66	-0.0450	2.92	6.00	ug/L	
SJH0114-IBL1	Zinc-67	-0.153	0.94	6.00	ug/L	
SJH0114-ICB1	Arsenic-75a	0.00400	0.0373	0.200	ug/L	
SJH0114-ICB1	Zinc-66	-0.0410	2.92	6.00	ug/L	
SJH0114-ICB1	Zinc-67	-0.0940	0.94	6.00	ug/L	
SJH0114-CCB1	Arsenic-75a	0.00200	0.0373	0.200	ug/L	
SJH0114-CCB1	Zinc-66	-0.0480	2.92	6.00	ug/L	
SJH0114-CCB1	Zinc-67	-0.0640	0.94	6.00	ug/L	
SJH0114-IBL2	Arsenic-75a	0.00900	0.0373	0.200	ug/L	
SJH0114-IBL2	Zinc-66	-0.218	2.92	6.00	ug/L	
SJH0114-IBL2	Zinc-67	-0.253	0.94	6.00	ug/L	
SJH0114-IBL3	Arsenic-75a	0.00800	0.0373	0.200	ug/L	
SJH0114-IBL3	Zinc-66	-0.215	2.92	6.00	ug/L	
SJH0114-IBL3	Zinc-67	-0.165	0.94	6.00	ug/L	
SJH0114-CCB2	Arsenic-75a	0.0110	0.0373	0.200	ug/L	
SJH0114-CCB2	Zinc-66	-0.0020	2.92	6.00	ug/L	
SJH0114-CCB2	Zinc-67	-0.0320	0.94	6.00	ug/L	
SJH0114-IBL4	Arsenic-75a	-0.00100	0.0373	0.200	ug/L	
SJH0114-IBL4	Zinc-66	-0.257	2.92	6.00	ug/L	
SJH0114-IBL4	Zinc-67	-0.273	0.94	6.00	ug/L	
SJH0114-IBL5	Arsenic-75a	-0.00300	0.0373	0.200	ug/L	
SJH0114-IBL5	Zinc-66	-0.270	2.92	6.00	ug/L	
SJH0114-IBL5	Zinc-67	-0.293	0.94	6.00	ug/L	
SJH0114-CCB3	Arsenic-75a	0.00300	0.0373	0.200	ug/L	
SJH0114-CCB3	Zinc-66	-0.0180	2.92	6.00	ug/L	
SJH0114-CCB3	Zinc-67	-0.0100	0.94	6.00	ug/L	
SJH0114-CCB4	Arsenic-75a	-0.00100	0.0373	0.200	ug/L	
SJH0114-CCB4	Zinc-66	0.0250	2.92	6.00	ug/L	
SJH0114-CCB4	Zinc-67	0.0460	0.94	6.00	ug/L	
SJH0114-IBL6	Arsenic-75a	0.00200	0.0373	0.200	ug/L	
SJH0114-IBL6	Zinc-66	-0.237	2.92	6.00	ug/L	
SJH0114-IBL6	Zinc-67	-0.175	0.94	6.00	ug/L	
SJH0114-CCB5	Arsenic-75a	0.00	0.0373	0.200	ug/L	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INSTRUMENT BLANKS
EPA 6020B UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICPMS1
Calibration: EH00022
Sequence: SJH0114
Date Analyzed: 08/09/21 18:54

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SJH0114-CCB5	Zinc-66	-0.0330	2.92	6.00	ug/L	
SJH0114-CCB5	Zinc-67	0.0510	0.94	6.00	ug/L	
SJH0114-IBL7	Arsenic-75a	-0.00200	0.0373	0.200	ug/L	
SJH0114-IBL7	Zinc-66	-0.223	2.92	6.00	ug/L	
SJH0114-IBL7	Zinc-67	-0.152	0.94	6.00	ug/L	
SJH0114-CCB6	Arsenic-75a	-0.00100	0.0373	0.200	ug/L	
SJH0114-CCB6	Zinc-66	0.0080	2.92	6.00	ug/L	
SJH0114-CCB6	Zinc-67	0.0850	0.94	6.00	ug/L	
SJH0114-IBL8	Arsenic-75a	-0.00900	0.0373	0.200	ug/L	
SJH0114-IBL8	Zinc-66	-0.0470	2.92	6.00	ug/L	
SJH0114-IBL8	Zinc-67	0.0440	0.94	6.00	ug/L	
SJH0114-CCB7	Arsenic-75a	0.00	0.0373	0.200	ug/L	
SJH0114-CCB7	Zinc-66	-0.0130	2.92	6.00	ug/L	
SJH0114-CCB7	Zinc-67	0.0860	0.94	6.00	ug/L	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020B UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0114	Instrument:	ICPMS1
		Calibration:	EH00022

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
CAL 0	SJH0114-CAL1	XDT_m1210809-006	NA	08/09/21 13:58
CAL 1 - LOW CHECK	SJH0114-CAL2	XDT_m1210809-007	NA	08/09/21 14:03
CAL 2	SJH0114-CAL3	XDT_m1210809-008	NA	08/09/21 14:08
CAL 3	SJH0114-CAL4	XDT_m1210809-009	NA	08/09/21 14:13
CAL 4	SJH0114-CAL5	XDT_m1210809-010	NA	08/09/21 14:18
CAL 5	SJH0114-CAL6	XDT_m1210809-011	NA	08/09/21 14:25
RINSE	SJH0114-IBL1	XDT_m1210809-012	NA	08/09/21 14:33
Initial Cal Check	SJH0114-ICV1	XDT_m1210809-014	NA	08/09/21 14:49
Initial Cal Blank	SJH0114-ICB1	XDT_m1210809-015	NA	08/09/21 14:56
Calibration Check	SJH0114-CCV1	XDT_m1210809-016	NA	08/09/21 15:01
Calibration Blank	SJH0114-CCB1	XDT_m1210809-017	NA	08/09/21 15:09
Instrument RL Check	SJH0114-CRL1	XDT_m1210809-018	NA	08/09/21 15:18
Interference Check A	SJH0114-IFA1	XDT_m1210809-019	NA	08/09/21 15:23
Interference Check B	SJH0114-IFB1	XDT_m1210809-020	NA	08/09/21 15:28
LR200	SJH0114-HCV1	XDT_m1210809-021	NA	08/09/21 15:39
LR300	SJH0114-HCV2	XDT_m1210809-022	NA	08/09/21 15:43
Instrument Blank	SJH0114-IBL2	XDT_m1210809-023	NA	08/09/21 15:51
Instrument Blank	SJH0114-IBL3	XDT_m1210809-024	NA	08/09/21 15:58
Calibration Check	SJH0114-CCV2	XDT_m1210809-025	NA	08/09/21 16:08
Calibration Blank	SJH0114-CCB2	XDT_m1210809-026	NA	08/09/21 16:15
ZZZZZ	BJH0215-BS1	XDT_m1210809-028	Water	08/09/21 16:26
ZZZZZ	BJH0215-BLK1	XDT_m1210809-029	Water	08/09/21 16:33
Instrument Blank	SJH0114-IBL4	XDT_m1210809-032	NA	08/09/21 16:55
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020B UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0114	Instrument:	ICPMS1
		Calibration:	EH00022

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	21G0384-01	XDT_m1210809-033	Water	08/09/21 17:03
Instrument Blank	SJH0114-IBL5	XDT_m1210809-036	NA	08/09/21 17:27
Calibration Check	SJH0114-CCV3	XDT_m1210809-037	NA	08/09/21 17:33
Calibration Blank	SJH0114-CCB3	XDT_m1210809-038	NA	08/09/21 17:40
Calibration Check	SJH0114-CCV4	XDT_m1210809-040	NA	08/09/21 17:55
Calibration Blank	SJH0114-CCB4	XDT_m1210809-041	NA	08/09/21 18:01
Blank	BJH0134-BLK1	XDT_m1210809-042	Solid	08/09/21 18:07
LCS	BJH0134-BS1	XDT_m1210809-043	Solid	08/09/21 18:11
LDW21-IT625	21G0286-03	XDT_m1210809-044	Solid	08/09/21 18:15
LDW21-SS627	21G0286-04	XDT_m1210809-045	Solid	08/09/21 18:19
LDW21-SS627	21G0286-04	XDT_m1210809-045	Solid	08/09/21 18:19
LDW21-SS625	21G0286-02	XDT_m1210809-046	Solid	08/09/21 18:23
LDW21-SS625	21G0286-02	XDT_m1210809-046	Solid	08/09/21 18:23
LDW21-SS625	BJH0134-DUP1	XDT_m1210809-047	Solid	08/09/21 18:27
LDW21-SS625	BJH0134-DUP1	XDT_m1210809-047	Solid	08/09/21 18:27
LDW21-SS625	BJH0134-DUP1	XDT_m1210809-047	Solid	08/09/21 18:27
LDW21-SS625	BJH0134-MS1	XDT_m1210809-048	Solid	08/09/21 18:31
LDW21-SS625	BJH0134-MS1	XDT_m1210809-048	Solid	08/09/21 18:31
LDW21-SS625	BJH0134-MS1	XDT_m1210809-048	Solid	08/09/21 18:31
LDW21-SS625	BJH0134-MSD1	XDT_m1210809-049	Solid	08/09/21 18:35
LDW21-SS625	BJH0134-MSD1	XDT_m1210809-049	Solid	08/09/21 18:35
LDW21-SS625	BJH0134-MSD1	XDT_m1210809-049	Solid	08/09/21 18:35
LDW21-SS625	BJH0134-PS1	XDT_m1210809-050	Solid	08/09/21 18:39
LDW21-SS625	BJH0134-PS1	XDT_m1210809-050	Solid	08/09/21 18:39
LDW21-SS625	BJH0134-PS1	XDT_m1210809-050	Solid	08/09/21 18:39
Instrument Blank	SJH0114-IBL6	XDT_m1210809-051	NA	08/09/21 18:43
Calibration Check	SJH0114-CCV5	XDT_m1210809-052	NA	08/09/21 18:47
Calibration Blank	SJH0114-CCB5	XDT_m1210809-053	NA	08/09/21 18:54
ZZZZZ	21G0324-02	XDT_m1210809-056	Water	08/09/21 19:08
ZZZZZ	21G0324-02	XDT_m1210809-056	Water	08/09/21 19:08

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 6020B UCT-KED

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0114	Instrument:	ICPMS1
		Calibration:	EH00022

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
ZZZZZ	21G0324-04	XDT_m1210809-057	Water	08/09/21 19:15
ZZZZZ	21G0324-04	XDT_m1210809-057	Water	08/09/21 19:15
ZZZZZ	21G0324-06	XDT_m1210809-058	Water	08/09/21 19:19
ZZZZZ	21G0324-06	XDT_m1210809-058	Water	08/09/21 19:19
ZZZZZ	21G0324-08	XDT_m1210809-059	Water	08/09/21 19:23
ZZZZZ	21G0324-08	XDT_m1210809-059	Water	08/09/21 19:23
Instrument Blank	SJH0114-IBL7	XDT_m1210809-063	NA	08/09/21 19:45
Calibration Check	SJH0114-CCV6	XDT_m1210809-064	NA	08/09/21 19:49
Calibration Blank	SJH0114-CCB6	XDT_m1210809-065	NA	08/09/21 19:56
Instrument Blank	SJH0114-IBL8	XDT_m1210809-072	NA	08/09/21 20:33
Calibration Check	SJH0114-CCV7	XDT_m1210809-073	NA	08/09/21 20:37
Calibration Blank	SJH0114-CCB7	XDT_m1210809-074	NA	08/09/21 20:44

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ICP INTERFERENCE CHECK SAMPLE

EPA 6020B UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICPMS1
Calibration: EH00022
Sequence: SJH0114
Standard ID: J008098

Lab Sample ID	Analyte	True	Found	%R	Units
SJH0114-IFA1	Arsenic-75a	0	0.0190		ug/L
	Zinc-66	0	-0.0970		ug/L
	Zinc-67	0	-0.1440		ug/L

* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ICP INTERFERENCE CHECK SAMPLE

EPA 6020B UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICPMS1
Calibration: EH00022
Sequence: SJH0114
Standard ID: J008098

Lab Sample ID	Analyte	True	Found	%R	Units
SJH0114-IFB1	Arsenic-75a	20.000	19.376	96.9	ug/L
	Zinc-66	20.000	18.620	93.1	ug/L
	Zinc-67	20.000	17.332	86.7	ug/L

* Indicates %R outside of QC limits

NOTE: True value and %R are populated only for analytes found in the interference check standards, and will be seen only if those analytes were requested.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

DETECTION LEVEL STANDARD
EPA 6020B UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: ICPMS1
Calibration: EH00022
Sequence: SJH0114
Lab Sample ID: SJH0114-CRL1

Analyte	True	Found	%R	Units	QC Limts
Arsenic-75a	0.20000	0.195	97.5	ug/L	50 - 150
Zinc-66	6.0000	5.81	96.8	ug/L	50 - 150
Zinc-67	6.0000	5.05	84.2	ug/L	50 - 150

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HIGH-CONCENTRATION CALIBRATION VERIFICATION

EPA 6020B UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Calibration: EH00022
Laboratory ID: SJH0114-HCV1
Sequence: SJH0114
Standard ID: J007549

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Arsenic-75a	200.00	199	-0.6	10.00
Zinc-66	200.00	194	-3.2	10.00
Zinc-67	200.00	189	-5.3	10.00

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HIGH-CONCENTRATION CALIBRATION VERIFICATION

EPA 6020B UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Calibration: EH00022
Laboratory ID: SJH0114-HCV2
Sequence: SJH0114
Standard ID: J007893

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Arsenic-75a	300.00	290	-3.3	10.00
Zinc-66	300.00	280	-6.6	10.00
Zinc-67	300.00	276	-8.1	10.00

* Values outside of QC limits

Analytical Resources, Incorporated
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HOLDING TIME SUMMARY

Analysis: EPA 6020B UCT-KED

Laboratory: Analytical Resources, Inc. SDG: 21G0286

Client: Anchor QEA, LLC Project: Lower Duwamish AOC4

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LDW21-SS625 21G0286-02	07/22/21 07:50	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:23	18	180	
LDW21-IT625 21G0286-03	07/22/21 07:50	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:15	18	180	
LDW21-SS627 21G0286-04	07/22/21 08:10	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:19	18	180	
Duplicate BJH0134-DUP1	07/22/21 07:50	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:27	18	180	
Matrix Spike BJH0134-MS1	07/22/21 07:50	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:31	18	180	
Matrix Spike Dup BJH0134-MSD1	07/22/21 07:50	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:35	18	180	
Post Spike BJH0134-PS1	07/22/21 07:50	07/22/21 17:30	08/06/21 11:30	15	180	08/09/21 18:39	18	180	

* Indicates hold time exceedance.

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METHOD DETECTION AND REPORTING LIMITS

EPA 6020B UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument: ICPMS1

Analyte	MDL	RL	Units
Arsenic-75a	0.04	0.20	mg/kg
Zinc-66	2.9	6.0	mg/kg
Zinc-67	0.9	6.0	mg/kg

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METHOD DETECTION AND REPORTING LIMITS

EPA 6020B UCT-KED

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Water
Instrument: ICPMS1

Analyte	MDL	RL	Units
Arsenic-75a	0.0373	0.200	ug/L
Zinc-66	2.92	6.00	ug/L
Zinc-67	0.940	6.00	ug/L

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGAG10
Lot Number:	P2-AG679501
Matrix:	7% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Silver
Starting Material:	Ag Shot
Starting Material Lot#:	2217
Starting Material Purity:	99.9993%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9996 ± 30 µg/mL

Density: 1.053 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10015 ± 56 µg/mL**
ICP Assay NIST SRM 3151 Lot Number: 160729

Assay Method #2 **9992 ± 25 µg/mL**
Volhard NIST SRM 999c Lot Number: 999c

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

s	Ag	<		M	Eu	<	0.000253	O	Na		0.005562	M	Se	<	0.018179	M	Zn		0.005799
O	Al		0.006295	O	Fe		0.002932	M	Nb	<	0.000253	M	Si		0.022484	M	Zr	<	0.005559
M	As	<	0.002403	M	Ga	<	0.000253	M	Nd	<	0.000253	M	Sm	<	0.000253				
M	Au		0.001634	M	Gd	<	0.000253	O	Ni	<	0.005472	M	Sn		0.001927				
O	B	<	0.009978	M	Ge	<	0.000754	M	Os	<	0.000254	O	Sr		0.000086				
M	Ba	<	0.000785	M	Hf	<	0.000253	M	P	<	0.053784	M	Ta	<	0.000253				
M	Be	<	0.002407	M	Hg	<	0.001332	M	Pb		0.003281	M	Tb	<	0.000253				
M	Bi		0.001671	M	Ho	<	0.000253	M	Pd	<	0.001382	M	Te	<	0.003715				
O	Ca		0.007115	M	In	<	0.003483	M	Pr	<	0.000253	M	Th	<	0.000253				
M	Cd	<	0.000253	M	Ir	<	0.000254	M	Pt	<	0.000253	M	Ti	<	0.002706				
M	Ce	<	0.000573	O	K		0.004010	M	Rb	<	0.000253	M	Tl	<	0.000253				
M	Co	<	0.000253	M	La	<	0.000253	M	Re	<	0.000253	M	Tm	<	0.000253				
O	Cr	<	0.005043	O	Li	<	0.000214	M	Rh	<	0.000253	M	U	<	0.000253				
M	Cs	<	0.002769	M	Lu	<	0.000253	M	Ru	<	0.000254	M	V	<	0.000822				
O	Cu		0.004614	O	Mg		0.001034	M	S	<	0.560935	M	W	<	0.002146				
M	Dy	<	0.000253	M	Mn	<	0.000253	M	Sb	<	0.006899	M	Y	<	0.000253				
M	Er	<	0.000253	M	Mo	<	0.000479	M	Sc	<	0.000733	M	Yb	<	0.000253				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 107.87 +1 6 $Ag(H_2O)_6^+$
Chemical Compatibility -Stable in HNO_3, and HF. Avoid basic media. Ag forms more insoluble salts than any other metal. It also is subject to photochemical reduction to the metal in HCl media although 10 µg/mL solutions in 10% HCl [$AgCl_{x1-x}$] are commonly used in the analytical laboratory. The most common solubility problems exist with arsenate, arsenite , bromide, chloride, iodide, carbonate , chromate, cyanide, iodate, oxalate, oxide, sulfate, sulfide, tartrate, and thiocyanate in aqueous media. The addition of nitric acid renders many of these salts soluble.
Stability - 2-100 ppb levels stable for 75+ days when mixed with equivalent levels of all other elements including the precious metals (where chloride is present) when in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3 / LDPE container.
Ag Containing Samples (Preparation and Solution) -Metal (Soluble in HNO_3); Oxides (Soluble in HNO_3); Ores (Digestion with conc. HNO_3).
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 107 amu	1 ppt	N/A	91Zr16O
ICP-OES 243.779 nm	0.12/0.01 µg/mL	1	Mn, Th, Ni, Rh
ICP-OES 328.068 nm	0.007/0.0007 µg/mL	1	Ce, Rh, V
ICP-OES 338.289 nm	0.013/0.001 µg/mL	1	Ce, Cr, Th

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

June 07, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **June 07, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGAS10
Lot Number:	R2-AS691113
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Arsenic
Starting Material:	As Pieces
Starting Material Lot#:	2208
Starting Material Purity:	99.9980%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9981 ± 55 µg/mL

Density: 1.028 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9981 ± 55 µg/mL**
ICP Assay NIST SRM 3103a Lot Number: 100818

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2 (u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001578	M	Eu	<	0.000526	O	Na		0.036136	M	Se	<	0.014204	O	Zn	<	0.003390
O	Al		0.006694	M	Fe		0.002633	O	Nb	<	0.011526	O	Si		0.139479	M	Zr	<	0.003156
s	As	<		M	Ga	<	0.000526	M	Nd	<	0.000526	M	Sm	<	0.000526				
M	Au	<	0.000526	M	Gd	<	0.000526	O	Ni	<	0.005537	M	Sn	<	0.001052				
M	B		0.017011	M	Ge	<	0.000526	M	Os	<	0.000526	M	Sr	<	0.000526				
M	Ba	<	0.000526	M	Hf	<	0.000526	O	P	<	0.056500	M	Ta	<	0.000526				
O	Be	<	0.001130	M	Hg	<	0.002104	M	Pb	<	0.000526	M	Tb	<	0.000526				
M	Bi	<	0.002104	M	Ho	<	0.000526	M	Pd	<	0.000526	M	Te	<	0.003682				
O	Ca		0.005657	M	In	<	0.000526	M	Pr	<	0.002630	M	Th	<	0.000526				
M	Cd	<	0.000526	M	Ir	<	0.000526	M	Pt	<	0.000526	O	Ti	<	0.001017				
M	Ce	<	0.000526	O	K		0.003865	M	Rb	<	0.002104	M	Tl	<	0.000526				
M	Co	<	0.003156	M	La	<	0.000526	M	Re	<	0.000526	M	Tm	<	0.000526				
M	Cr		0.000877	M	Li	<	0.000526	M	Rh	<	0.000526	M	U	<	0.000526				
M	Cs	<	0.002104	M	Lu	<	0.000526	M	Ru	<	0.000526	M	V	<	0.001578				
M	Cu	<	0.003156	O	Mg		0.000235	O	S	<	0.056500	M	W	<	0.000526				
M	Dy	<	0.000526	M	Mn	<	0.001052	M	Sb	<	0.000526	M	Y	<	0.000526				
M	Er	<	0.000526	M	Mo	<	0.000526	M	Sc	<	0.002104	M	Yb	<	0.000526				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 74.92 ; mix of +3 and +5 ; 6 ; H_3AsO_4 and $HAsO_2$

Chemical Compatibility - Arsenic has no cationic chemistry. It is soluble in HCl, HNO_3,H_3PO_4, H_2SO_4 and HF aqueous matrices water and NH_4OH . It is stable with most inorganic anions (forms arsenate when boiled with chromate) but many cationic metals form the insoluble arsenates under pH neutral conditions. When fluorinated and / or under acidic conditions arsenate formation is typically not a problem at moderate to low concentrations.

Stability - 2-100 ppb levels stable for months alone or mixed with other elements at equivalent levels in 1% HNO_3 / LDPE container.

As Containing Samples (Preparation and Solution) - Metal (soluble in 1:1 H_2O / HNO_3); Oxides (the oxide exists in crystalline and amorphous forms where the amorphic form is more water soluble. The oxides typically dissolve in dilute acidic solutions when boiled); Minerals (one gram of powered sample is fused in a Ni crucible with 10 grams of a 1:1 mix of K_2CO_3 and KNO_3 and the melt extracted with hot water); Organic Matrices (0.2 to 0.5 grams of sample are fused with 15 grams of a 1:1 Na_2CO_3 / Na_2O_2 mix in a Ni crucible. The fuseate is extracted with water and acidified with HNO_3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 75 amu	20 ppt	N/A	40Ar35Cl, 59Co16O, 36Ar38Ar1H,8Ar37Cl,Ar39K, 150Nd2+,150Sm2+
ICP-OES 189.042 nm	0.05/0.005 µg/mL	1	Cr
ICP-OES 193.696 nm	0.1/0.01 µg/mL	1	V, Ge
ICP-OES 228.812 nm	0.1/0.01 µg/mL	1	Cd, Pt, Ir, Co

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 25, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 25, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

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ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCD10
Lot Number:	P2-CD675954
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Cadmium
Starting Material:	Cd Shot
Starting Material Lot#:	1954
Starting Material Purity:	99.9998%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10014 ± 30 µg/mL

Density: 1.029 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10021 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #2 **10038 ± 43 µg/mL**
ICP Assay NIST SRM 3108 Lot Number: 130116

Assay Method #3 **9996 ± 30 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag		0.000834	O	Eu	<	0.002146	O	Na		0.003359	M	Se	<	0.003997	O	Zn		0.000251
O	Al		0.002435	O	Fe	<	0.001180	M	Nb	<	0.000399	O	Si		0.009519	M	Zr	<	0.000399
M	As	<	0.003997	M	Ga	<	0.000399	M	Nd	<	0.000399	M	Sm	<	0.000799				
M	Au	<	0.002809	M	Gd	<	0.000399	M	Ni	<	0.002398	M	Sn	<	0.000799				
M	B	<	0.005197	M	Ge	<	0.004397	M	Os	<	0.000401	O	Sr	<	0.000107				
M	Ba	<	0.000399	M	Hf	<	0.000399	O	P	<	0.023606	M	Ta	<	0.000399				
O	Be	<	0.000107	O	Hg	<	0.010730	M	Pb	<	0.001599	M	Tb	<	0.000399				
M	Bi	<	0.000399	M	Ho	<	0.000399	M	Pd	<	0.000799	M	Te	<	0.005596				
O	Ca		0.001399	O	In	<	0.015558	M	Pr	<	0.000399	M	Th	<	0.000399				
s	Cd	<		M	Ir	<	0.000401	M	Pt	<	0.000399	O	Ti	<	0.000536				
M	Ce	<	0.000399	O	K		0.004479	M	Rb	<	0.000399	M	Tl		0.000625				
M	Co	<	0.000399	M	La	<	0.000399	M	Re	<	0.000399	M	Tm	<	0.000399				
M	Cr	<	0.001199	O	Li	<	0.000214	M	Rh	<	0.000399	M	U	<	0.000399				
M	Cs	<	0.000399	M	Lu	<	0.000399	M	Ru	<	0.000401	M	V	<	0.001599				
O	Cu	<	0.003219	O	Mg		0.000083	O	S	<	0.021460	M	W	<	0.000799				
M	Dy	<	0.000399	O	Mn	<	0.000429	M	Sb	<	0.001599	M	Y	<	0.000399				
M	Er	<	0.000399	M	Mo	<	0.000399	O	Sc	<	0.000429	M	Yb	<	0.000399				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 112.41 +2 4 Cd2(OH) (aq)3+ and Cd(OH)(aq)
Chemical Compatibility -Stable in HCl, HNO3, H2SO4 , and HF. Avoid basic media forming insoluble carbonate and hydroxide.
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5 % HNO3 / LDPE container.
Cd Containing Samples (Preparation and Solution) -Metal (soluble in HNO3); Oxides (soluble in HCl or HNO3); Ores (dissolve in HCl /HNO3 then take to fumes with H2SO4. The silica and lead sulfate are filtered off after the addition of water); Organic based (dry ash at 450°C and dissolve ash in HCl), (sulfuric / peroxide acid digestion).
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 111 amu	11 ppt	n/a	95Mo16O
ICP-OES 214.438 nm	0.003 / 0.0003 µg/mL	1	Pt, Ir
ICP-OES 226.502 nm	0.003 / 0.0003 µg/mL	1	Ir
ICP-OES 228.802 nm	0.003 / 0.0003 µg/mL	1	Co, Ir, As, Pt

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 07, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 07, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

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ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCO10
Lot Number:	N2-CO671028
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Cobalt
Starting Material:	COBALT
Starting Material Lot#:	1749
Starting Material Purity:	99.9978%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9988 ± 34 µg/mL

Density: 1.057 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9973 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #2 **10024 ± 50 µg/mL**
ICP Assay NIST SRM traceable to 3113 Lot Number: M2-CO661665

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag		0.022956	M	Eu	<	0.000422	O	Na		0.008125	M	Se	<	0.009290	M	Zn		0.007197
O	Al		0.013621	O	Fe		0.048700	M	Nb	<	0.000422	O	Si		0.017539	M	Zr	<	0.014357
i	As	<		M	Ga	<	0.000844	M	Nd	<	0.017735	M	Sm	<	0.001689				
M	Au	<	0.000583	M	Gd		0.003247	O	Ni	<	0.043642	M	Sn	<	0.005067				
M	B	<	0.013512	M	Ge	<	0.004645	M	Os	<	0.000583	O	Sr		0.000841				
O	Ba		0.071210	M	Hf	<	0.000422	n	P	<		M	Ta	<	0.000422				
O	Be	<	0.001771	M	Hg	<	0.002334	M	Pb		0.010094	M	Tb	<	0.001689				
M	Bi		0.000614	M	Ho	<	0.000422	M	Pd	<	0.000422	M	Te	<	0.008445				
O	Ca		0.025034	M	In	<	0.003378	M	Pr	<	0.006756	M	Th	<	0.000422				
M	Cd	<	0.000844	M	Ir	<	0.000583	M	Pt	<	0.000422	M	Ti	<	0.002533				
M	Ce		0.002721	O	K		0.005785	M	Rb	<	0.001689	M	Tl	<	0.000422				
s	Co	<		M	La		0.000877	M	Re		0.016853	M	Tm	<	0.000422				
M	Cr	<	0.020269	O	Li		0.000262	M	Rh	<	0.000422	M	U	<	0.000422				
M	Cs		0.000877	M	Lu	<	0.000422	M	Ru	<	0.000583	M	V	<	0.001689				
M	Cu		0.007197	O	Mg		0.003444	n	S	<		M	W	<	0.000844				
M	Dy	<	0.000422	O	Mn	<	0.006072	M	Sb	<	0.005911	M	Y		0.001228				
M	Er	<	0.000422	M	Mo	<	0.005911	M	Sc	<	0.001689	M	Yb	<	0.003378				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 58.93 +2 6 Co(H2O)62+
Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.
Co Containing Samples (Preparation and Solution) - Metal (soluble in HNO3); Oxides (Soluble in HCl); Ores (dissolve in HCl / HNO3).
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 59 amu	2 ppt	n/a	42Ca16O1H , 40Ar18O1H , 36Ar23Na, 43Ca16O, 24Mg35Cl
ICP-OES 228.616 nm	0.01/0.001 µg/mL	1	
ICP-OES 237.862 nm	0.01/0.002 µg/mL	1	W, Re, Al, Ta
ICP-OES 238.892 nm	0.01/0.002 µg/mL	1	Fe, W, Ta

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 15, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 15, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCR(3)10
Lot Number:	P2-CR684202
Matrix:	10% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Chromium
Starting Material:	Cr METAL
Starting Material Lot#:	2077
Starting Material Purity:	99.9942%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10056 ± 49 µg/mL

Density: 1.084 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10061 ± 71 µg/mL**
ICP Assay NIST SRM 3112a Lot Number: 170630

Assay Method #2 **10052 ± 64 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000540	M	Eu	<	0.003200	O	Na		0.130027	M	Se	<	0.012000	O	Zn	<	0.002700
O	Al		0.016626	O	Fe		0.202502	M	Nb	<	0.022000	n	Si	<		M	Zr	<	0.020000
M	As		0.003836	O	Ga	<	0.031000	M	Nd	<	0.000540	M	Sm	<	0.035000				
M	Au	<	0.000540	M	Gd	<	0.000540	O	Ni		0.009165	M	Sn		0.004049				
M	B	<	0.049000	M	Ge	<	0.005400	M	Os	<	0.088000	O	Sr	<	0.000250				
O	Ba	<	0.002000	M	Hf	<	0.000540	i	P	<		M	Ta	<	0.000540				
O	Be	<	0.000250	M	Hg	<	0.001600	M	Pb		0.002557	M	Tb	<	0.000540				
M	Bi		0.008952	M	Ho	<	0.000540	M	Pd	<	0.001100	M	Te	<	0.004800				
O	Ca		0.074605	M	In	<	0.001100	M	Pr	<	0.000540	M	Th	<	0.000540				
M	Cd	<	0.000540	M	Ir	<	0.000540	M	Pt	<	0.000540	O	Ti		0.013428				
M	Ce	<	0.000540	O	K		0.034105	i	Rb	<		M	Tl	<	0.001100				
O	Co	<	0.002900	M	La	<	0.001100	M	Re	<	0.002700	O	Tm	<	0.001800				
s	Cr	<		O	Li	<	0.000130	M	Rh	<	0.032000	M	U	<	0.001100				
M	Cs	<	0.019000	M	Lu	<	0.000540	M	Ru	<	0.094000	O	V		0.159869				
O	Cu		0.010018	O	Mg		0.001449	i	S	<		M	W	<	0.028000				
M	Dy	<	0.000540	O	Mn	<	0.014000	M	Sb	<	0.008600	M	Y	<	0.001100				
M	Er	<	0.016000	O	Mo	<	0.013000	O	Sc	<	0.001400	M	Yb	<	0.000540				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 52.00 +3 6 Cr(H2O)63+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4, HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Cr3 Containing Samples (Preparation and Solution) -Metal (soluble in HCl); Oxides/Ores (Chrome ore/oxides are very difficult to dissolve. The following procedures [A-D] are commonly used: A. Fusion with KHSO4 and extraction with hot KCl. The residue fused with Na2CO3 and KClO3, 3:1. B. Fusion with NaKSO4 and NaF 2:1, C. Fusion with magnesia or lime and sodium or potassium carbonates, 4:1. D. Fusion with Na2O2 or NaOH and KNO3 or NaOH and Na2O2. Nickel, iron, copper, or silver crucibles should be used for D. Platinum may be used for A, B, C); Organic Matrices (ash at 4500C followed by one of the fusion methods above or sulfuric/hydrogen peroxide acid digestions may be applicable to non oxide containing samples).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 52 amu	40 ppt	N/A	36S16O, 36Ar16O - The 50Cr, 53Cr, 54Cr lines suffer from many more potential interferences from sulfur, chlorine and argon compounds of oxygen, nitrogen and carbon.
ICP-OES 205.552 nm	0.006/0.0008 µg/mL	1	Os
ICP-OES 276.654 nm	0.01/0.001 µg/mL	1	Cu, Ta, V
ICP-OES 284.325 nm	0.008/0.0007 µg/mL	1	

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

November 02, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **November 02, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCU10
Lot Number:	P2-CU682108
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Copper
Starting Material:	Cu Metal
Starting Material Lot#:	2095
Starting Material Purity:	99.9996%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10013 ± 30 µg/mL

Density: 1.032 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9977 ± 50 µg/mL**
ICP Assay NIST SRM 3114 Lot Number: 121207

Assay Method #2 **10024 ± 26 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10007 ± 46 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.007542	M	Eu	<	0.000942	O	Na		0.001434	M	Se	<	0.016971	M	Zn	<	0.005657
O	Al	<	0.000609	O	Fe		0.008700	M	Nb	<	0.000942	O	Si		0.003052	M	Zr	<	0.000942
M	As	<	0.010371	M	Ga	<	0.000942	M	Nd	<	0.000942	M	Sm	<	0.000942				
M	Au	<	0.001885	M	Gd	<	0.000942	M	Ni		0.003781	M	Sn	<	0.005657				
O	B		0.003663	M	Ge	<	0.005657	M	Os	<	0.000942	M	Sr	<	0.000942				
M	Ba		0.004253	M	Hf	<	0.000942	O	P	<	0.031668	M	Ta	<	0.000942				
M	Be	<	0.000942	O	Hg	<	0.007064	M	Pb		0.005789	M	Tb	<	0.000942				
M	Bi	<	0.000942	M	Ho	<	0.000942	M	Pd	<	0.000942	M	Te	<	0.004714				
O	Ca		0.002304	M	In	<	0.000942	M	Pr	<	0.000942	M	Th	<	0.000942				
M	Cd	<	0.000942	M	Ir	<	0.000942	M	Pt	<	0.000942	O	Ti	<	0.002801				
M	Ce	<	0.000942	O	K		0.000763	M	Rb	<	0.000942	M	Tl	<	0.000942				
M	Co		0.001890	M	La	<	0.000942	M	Re	<	0.000942	M	Tm	<	0.000942				
M	Cr	<	0.005657	O	Li	<	0.000243	i	Rh	<		M	U	<	0.000942				
M	Cs	<	0.000942	M	Lu	<	0.000942	M	Ru	<	0.039588	M	V	<	0.003771				
s	Cu	<		O	Mg		0.000320	O	S		0.007174	M	W	<	0.005657				
M	Dy	<	0.000942	O	Mn		0.000793	M	Sb	<	0.001885	M	Y	<	0.000942				
M	Er	<	0.000942	M	Mo	<	0.005657	M	Sc	<	0.000942	M	Yb	<	0.000942				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 63.55 +2 6 Cu(H2O)62+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4, HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Cu Containing Samples (Preparation and Solution) -Metal (soluble in HNO3); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 63 amu	10 ppt	n/a	40Ar23Na 47Ti16O, 14N12C37Cl, 16O12C35Cl, 23Na40Ca
ICP-OES 219.958 nm	0.01/.002 µg/mL	1	Th, Ta, Nb, U, Hf
ICP-OES 224.700 nm	0.01/.001 µg/mL	1	Pb, Ir, Ni, W
ICP-OES 324.754 nm	0.06/.001 µg/mL		Nb, U, Th, Mo, Hf

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

August 24, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **August 24, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGMN10
Lot Number:	P2-MN687536
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Manganese
Starting Material:	Mn Metal
Starting Material Lot#:	2275
Starting Material Purity:	99.9909%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10046 ± 30 µg/mL

Density: 1.035 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10045 ± 25 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #2 **10083 ± 68 µg/mL**
ICP Assay NIST SRM 3132 Lot Number: 050429

Assay Method #3 **10031 ± 47 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001500	M	Eu	<	0.000730	O	Na		0.176713	M	Se	<	0.006600	M	Zn		0.009960
O	Al		0.004337	M	Fe	<	0.650000	M	Nb	<	0.000730	O	Si		0.097995	M	Zr	<	0.000730
M	As	<	0.008000	M	Ga		0.004337	M	Nd	<	0.001500	M	Sm	<	0.000730				
M	Au	<	0.000730	M	Gd	<	0.000730	M	Ni		0.024097	M	Sn	<	0.002200				
M	B		0.069078	M	Ge	<	0.004400	M	Os	<	0.000730	O	Sr		0.000931				
M	Ba	<	0.001500	M	Hf	<	0.000730	i	P	<		M	Ta	<	0.000730				
M	Be	<	0.000730	M	Hg	<	0.002200	M	Pb		0.007389	M	Tb	<	0.000730				
M	Bi	<	0.003000	M	Ho	<	0.000730	M	Pd	<	0.000730	M	Te	<	0.019000				
O	Ca		0.062652	M	In	<	0.003000	M	Pr	<	0.000730	M	Th	<	0.000730				
M	Cd	<	0.001500	M	Ir	<	0.000730	M	Pt	<	0.000730	O	Ti	<	0.006500				
M	Ce	<	0.007300	O	K		0.006425	M	Rb	<	0.006600	M	Tl	<	0.000730				
O	Co		0.014779	M	La	<	0.003000	M	Re	<	0.000730	M	Tm	<	0.000730				
O	Cr		0.273102	O	Li		0.000417	M	Rh	<	0.003000	M	U	<	0.001500				
M	Cs	<	0.000730	M	Lu	<	0.000730	M	Ru	<	0.004400	M	V	<	0.000730				
O	Cu		0.007711	O	Mg		0.321297	i	S	<		M	W	<	0.004400				
M	Dy	<	0.001500	s	Mn	<		M	Sb	<	0.021000	O	Y		0.001365				
M	Er	<	0.001500	M	Mo		0.010281	O	Sc	<	0.004100	M	Yb	<	0.000730				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 54.94 +2 6 Mn(H2O)62+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5 % HNO3/LDPE container.

Mn Containing Samples (Preparation and Solution) -Metal (Soluble in dilute acids); Oxides (Soluble in dilute acids); Ores (Dissolve with HCl. If silica is present add HF and then fume off silica by adding H2SO4 and heat to SO3 fumes - dense white fumes).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 55 amu	10 ppt	n/a	40Ar14N1H,39K16O,37Cl18O,40Ar15N,38Ar17O,36Ar18O1H ,38Ar16O1H,37Cl17O1H,23Na32S
ICP-OES 257.610 nm	0.0014 / 0.00002 µg/mL	1	Ce, W, Re
ICP-OES 259.373 nm	0.0016 / 0.00002 µg/mL	1	U, Ta, Mo, Fe, Nb
ICP-OES 260.569 nm	0.0021 / 0.00002 µg/mL	1	Co

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 05, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 05, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGNI10
Lot Number:	P2-NI686384
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Nickel
Starting Material:	Ni Metal
Starting Material Lot#:	2277 and 2282
Starting Material Purity:	99.9992%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9979 ± 30 µg/mL

Density: 1.038 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9971 ± 54 µg/mL**
ICP Assay NIST SRM 3136 Lot Number: 120619

Assay Method #2 **9970 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **9993 ± 33 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag		0.002606	M	Eu	<	0.001100	O	Na		0.004965	O	Se	<	0.067000	M	Zn		0.006578
M	Al	<	0.013000	O	Fe		0.018618	M	Nb	<	0.001100	O	Si		0.010923	M	Zr	<	0.001100
O	As	<	0.067000	M	Ga	<	0.001100	M	Nd	<	0.001100	M	Sm	<	0.001100				
M	Au	<	0.002100	M	Gd	<	0.001100	s	Ni	<		M	Sn	<	0.016000				
M	B	<	0.017000	M	Ge	<	0.004200	M	Os		0.002110	O	Sr	<	0.000940				
M	Ba	<	0.001100	M	Hf	<	0.001100	i	P	<		M	Ta	<	0.001100				
O	Be	<	0.000410	M	Hg		0.014895	M	Pb		0.006578	M	Tb	<	0.001100				
M	Bi	<	0.004200	M	Ho	<	0.001100	M	Pd	<	0.001100	M	Te	<	0.015000				
O	Ca		0.003351	M	In	<	0.001100	M	Pr	<	0.001100	M	Th	<	0.001100				
M	Cd		0.001365	M	Ir		0.004716	M	Pt	<	0.001100	M	Ti	<	0.004200				
M	Ce	<	0.001100	O	K		0.004716	M	Rb	<	0.001100	M	Tl	<	0.001100				
O	Co		0.017377	M	La	<	0.001100	M	Re		0.001737	M	Tm	<	0.001100				
O	Cr	<	0.006700	O	Li	<	0.000140	M	Rh	<	0.006300	M	U	<	0.001100				
M	Cs	<	0.007300	M	Lu	<	0.001100	M	Ru	<	0.019000	M	V	<	0.002100				
M	Cu		0.004096	O	Mg		0.000372	i	S	<		M	W	<	0.006300				
M	Dy	<	0.001100	O	Mn	<	0.001900	M	Sb		0.005833	O	Y	<	0.000540				
M	Er	<	0.001100	M	Mo	<	0.008400	M	Sc	<	0.002100	M	Yb	<	0.001100				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 58.69 +2 6 Ni(H2O)62+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Ni Containing Samples (Preparation and Solution) -Metal (Soluble in HNO3); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 60 amu	100 ppt	n/a	43Ca16O1H , 44Ca16O, 23Na37Cl
ICP-OES 221.647 nm	0.01 / 0.0009 µg/mL	1	Si
ICP-OES 231.604 nm	0.02 / 0.002 µg/mL	1	Sb, Ta, Co
ICP-OES 232.003 nm	0.02 / 0.006 µg/mL	1	Cr, Re, Os, Nb, Ag, Pt, Fe

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

December 02, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **December 02, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGZN10
Lot Number:	P2-ZN686137
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Zinc
Starting Material:	Zn Shot
Starting Material Lot#:	2201
Starting Material Purity:	99.9993%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10040 ± 30 µg/mL

Density: 1.033 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10009 ± 54 µg/mL**
ICP Assay NIST SRM 3168a Lot Number: 120629

Assay Method #2 **10049 ± 33 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10041 ± 28 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.003057	M	Eu	<	0.000509	O	Na		0.001874	M	Se	<	0.023441	s	Zn	<	
O	Al	<	0.005720	O	Fe		0.006348	M	Nb	<	0.000509	O	Si	<	0.057200	M	Zr	<	0.000509
M	As	<	0.003057	M	Ga	<	0.007134	M	Nd	<	0.000509	M	Sm	<	0.000509				
M	Au	<	0.000510	M	Gd	<	0.000509	M	Ni	<	0.000509	M	Sn	<	0.000509				
O	B	<	0.017160	M	Ge	<	0.003057	M	Os	<	0.000510	M	Sr	<	0.000509				
M	Ba	<	0.000509	M	Hf	<	0.000509	O	P	<	0.057200	M	Ta	<	0.000509				
M	Be	<	0.000509	M	Hg	<	0.001021	O	Pb		0.023870	M	Tb	<	0.000509				
M	Bi	<	0.005095	M	Ho	<	0.000509	M	Pd	<	0.002038	M	Te	<	0.023441				
O	Ca		0.033793	M	In	<	0.000509	M	Pr	<	0.000509	M	Th	<	0.000509				
O	Cd		0.003924	M	Ir	<	0.000510	M	Pt	<	0.000509	M	Ti	<	0.000509				
M	Ce	<	0.000509	O	K		0.001499	M	Rb	<	0.002038	M	Tl	<	0.009172				
M	Co	<	0.000509	M	La	<	0.000509	M	Re	<	0.000509	M	Tm	<	0.000509				
O	Cr		0.001549	O	Li	<	0.000457	M	Rh	<	0.000509	M	U	<	0.000509				
M	Cs	<	0.000509	M	Lu	<	0.000509	M	Ru	<	0.006129	M	V	<	0.000509				
O	Cu	<	0.010296	O	Mg		0.000349	O	S	<	0.034320	M	W	<	0.001019				
M	Dy	<	0.000509	M	Mn	<	0.000509	M	Sb	<	0.001019	M	Y	<	0.000509				
M	Er	<	0.000509	M	Mo	<	0.000509	M	Sc	<	0.000509	M	Yb	<	0.000509				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 65.39 +2 4 Zn(OH)(aq)1+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media forming insoluble carbonate and hydroxide. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Zn Containing Samples (Preparation and Solution) -Metal (soluble in HNO3); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3); Organic based (dry ash at 4500C and dissolve ash in HCl) (sulfuric/peroxide acid digestion)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 66 amu	7 ppt	N/A	50Ti16O,50Cr16O, 50V16O, 34S16O2, 32S16O18O, 32S17O2, 33S16O17O, 32S34S, 33S2
ICP-OES 202.548 nm	0.004/0.0002 µg/mL	1	Nb, Cu, Co, Hf
ICP-OES 206.200 nm	0.006/0.0006 µg/mL	1	Sb, Ta, Bi, Os
ICP-OES 213.856 nm	0.002/0.0004 µg/mL	1	Ni, Cu, V

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

December 05, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **December 05, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGU1
Lot Number:	P2-U683975
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	1 000 µg/mL ea: Uranium
Starting Material:	Uranyl Nitrate
Starting Material Lot#:	1948
Starting Material Purity:	99.9985%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 1001 ± 5 µg/mL

Density: 1.010 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **1001 ± 5 µg/mL**
ICP Assay NIST SRM 3164 Lot Number: 080521

Assay Method #2 **1002 ± 6 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Certified Abundance:

IV's Certified Abundance

Isotope	Atom %
Uranium 238U	99.8 ± 0.1
Uranium 235U	0.24 ± 0.05

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000103	M	Eu	<	0.000103	M	Na		0.020618	M	Se	<	0.001246	M	Zn	<	0.003533
M	Al	<	0.003740	M	Fe		0.001029	M	Nb	<	0.000207	M	Si	<	0.035027	M	Zr	<	0.000103
M	As	<	0.001143	M	Ga	<	0.001350	M	Nd	<	0.000623	M	Sm	<	0.000311				
M	Au	<	0.000207	M	Gd	<	0.000311	M	Ni	<	0.008313	M	Sn	<	0.007273				
M	B	<	0.005819	M	Ge	<	0.001974	M	Os	<	0.000103	M	Sr	<	0.001039				
M	Ba	<	0.002286	M	Hf	<	0.000103	i	P	<		M	Ta	<	0.000103				
M	Be	<	0.001350	M	Hg	<	0.000415	M	Pb	<	0.000103	M	Tb	<	0.000103				
M	Bi	<	0.000103	M	Ho	<	0.000103	M	Pd	<	0.000207	M	Te	<	0.006234				
M	Ca	<	0.010391	M	In	<	0.000103	M	Pr	<	0.000103	M	Th		0.010535				
M	Cd	<	0.000103	M	Ir	<	0.000103	M	Pt	<	0.000103	M	Ti	<	0.000207				
M	Ce	<	0.000103	M	K	<	0.041565	M	Rb	<	0.000519	M	Tl	<	0.000103				
M	Co	<	0.000415	M	La	<	0.001662	M	Re	<	0.000103	M	Tm	<	0.000103				
M	Cr	<	0.001870	M	Li	<	0.001662	M	Rh	<	0.000103	s	U	<					
M	Cs		0.000175	M	Lu	<	0.000103	M	Ru	<	0.000519	M	V	<	0.000207				
M	Cu		0.000792	M	Mg	<	0.002493	i	S	<		M	W	<	0.000103				
M	Dy	<	0.000103	M	Mn	<	0.001454	M	Sb	<	0.000103	M	Y	<	0.000103				
M	Er	<	0.000103	M	Mo	<	0.000415	M	Sc	<	0.006234	M	Yb	<	0.000103				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 238.03 +6 8 UO22+(uranyl)

Chemical Compatibility - Soluble in HCl and HNO3. Avoid H3PO4. H2SO4 and HF matrices should not be a problem depending upon [U]. Although the UO22+ ion is distinctly basic, any U+4 will precipitate in basic media. UO22+salts are generally soluble in water and UO22+ is stable with most metals and inorganic anions. The uranyl phosphate is insoluble in water. UF4 and UF6 are water soluble.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO3 / LDPE container.

U Containing Samples (Preparation and Solution) -Metal (Dissolves rapidly in HCl and HNO3); Oxide (Soluble in HNO3); Ores (Digest for 1-2 hours with 1 gram of ore to 30 mL 1:1 HNO3. Silica insolubles are removed by filtration after bringing the sample to fumes with conc. H2SO4.)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 238 amu	2 ppt	N/A	206Pb16O2
ICP-OES 263.553 nm	0.3 / 0.01 µg/mL	1	Ce, Ir, Th, Rh, W, Zr, Ta, Ti, V, Hf, Fe, Re, Ru
ICP-OES 367.007 nm	0.3 / 0.02 µg/mL	1	Th, Ce
ICP-OES 385.958 nm	0.3 / 0.01 µg/mL	1	Th, Fe

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 28, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 28, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Michael L Booth

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Paul R Gaines

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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code: Multi Analyte Custom Grade Solution

Catalog Number: AR-6020ICS-0A10

Lot Number: R2-MEB692465

Matrix: 1.4% (v/v) HNO3

Value / Analyte(s):

1 000 µg/mL ea:
Chloride,

200 µg/mL ea:
Carbon,

100 µg/mL ea:
Calcium, Aluminum,
Iron, Potassium,
Magnesium, Sodium,
Phosphorus, Sulfur,

2 µg/mL ea:
Titanium, Molybdenum

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Aluminum, Al	100.0 ± 0.3 µg/mL	Calcium, Ca	100.0 ± 0.5 µg/mL
Carbon, C	200.1 ± 0.5 µg/mL	Chloride, Cl	1 000 ± 5 µg/mL
Iron, Fe	100.0 ± 0.5 µg/mL	Magnesium, Mg	100.0 ± 0.5 µg/mL
Molybdenum, Mo	2.001 ± 0.012 µg/mL	Phosphorus, P	100.1 ± 0.6 µg/mL
Potassium, K	100.0 ± 0.5 µg/mL	Sodium, Na	100.0 ± 0.5 µg/mL
Sulfur, S	100.0 ± 0.5 µg/mL	Titanium, Ti	2.001 ± 0.017 µg/mL

Density: 1.007 g/mL (measured at 20 ± 4 ºC)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Al	ICP Assay	3101a	140903
Al	EDTA	928	928
C	Acidimetric	84L	84L
Ca	ICP Assay	3109a	130213
Ca	EDTA	928	928
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928
K	ICP Assay	3141a	140813
K	Gravimetric		See Sec. 4.2
Mg	ICP Assay	3131a	140110
Mg	EDTA	928	928
Mo	ICP Assay	3134	130418
Na	ICP Assay	3152a	120715
Na	Gravimetric		See Sec. 4.2
P	ICP Assay	3139a	060717
P	Acidimetric	84L	84L
S	Acidimetric	84L	84L
S	ICP Assay	traceable to 3154	M2-S657208
Ti	ICP Assay	3162a	130925

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

April 22, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 22, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGAG10
Lot Number:	P2-AG688237
Matrix:	7% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Silver
Starting Material:	Ag Shot
Starting Material Lot#:	2217
Starting Material Purity:	99.9993%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10004 ± 30 µg/mL

Density: 1.054 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9984 ± 32 µg/mL**
ICP Assay NIST SRM 3151 Lot Number: 160729

Assay Method #2 **10016 ± 26 µg/mL**
Volhard NIST SRM 999c Lot Number: 999c

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

s	Ag	<		M	Eu	<	0.000253	O	Na		0.005563	M	Se	<	0.018179	M	Zn		0.005800
O	Al		0.006296	O	Fe		0.002932	M	Nb	<	0.000253	M	Si		0.022487	M	Zr	<	0.005559
M	As	<	0.002403	M	Ga	<	0.000253	M	Nd	<	0.000253	M	Sm	<	0.000253				
M	Au		0.001635	M	Gd	<	0.000253	O	Ni	<	0.005472	M	Sn		0.001928				
O	B	<	0.009978	M	Ge	<	0.000754	M	Os	<	0.000254	O	Sr		0.000086				
M	Ba	<	0.000785	M	Hf	<	0.000253	M	P	<	0.053784	M	Ta	<	0.000253				
M	Be	<	0.002407	M	Hg	<	0.001332	M	Pb		0.003281	M	Tb	<	0.000253				
M	Bi		0.001671	M	Ho	<	0.000253	M	Pd	<	0.001382	M	Te	<	0.003715				
O	Ca		0.007116	M	In	<	0.003483	M	Pr	<	0.000253	M	Th	<	0.000253				
M	Cd	<	0.000253	M	Ir	<	0.000254	M	Pt	<	0.000253	M	Ti	<	0.002706				
M	Ce	<	0.000573	O	K		0.004010	M	Rb	<	0.000253	M	Tl	<	0.000253				
M	Co	<	0.000253	M	La	<	0.000253	M	Re	<	0.000253	M	Tm	<	0.000253				
O	Cr	<	0.005043	O	Li	<	0.000214	M	Rh	<	0.000253	M	U	<	0.000253				
M	Cs	<	0.002769	M	Lu	<	0.000253	M	Ru	<	0.000254	M	V	<	0.000822				
O	Cu		0.004614	O	Mg		0.001035	M	S	<	0.560935	M	W	<	0.002146				
M	Dy	<	0.000253	M	Mn	<	0.000253	M	Sb	<	0.006899	M	Y	<	0.000253				
M	Er	<	0.000253	M	Mo	<	0.000479	M	Sc	<	0.000733	M	Yb	<	0.000253				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 107.87 +1 6 $Ag(H_2O)_6^+$

Chemical Compatibility -Stable in HNO_3, and HF. Avoid basic media. Ag forms more insoluble salts than any other metal. It also is subject to photochemical reduction to the metal in HCl media although 10 µg/mL solutions in 10% HCl [$AgCl_{x1-x}$] are commonly used in the analytical laboratory. The most common solubility problems exist with arsenate, arsenite , bromide, chloride, iodide, carbonate , chromate, cyanide, iodate, oxalate, oxide, sulfate, sulfide, tartrate, and thiocyanate in aqueous media. The addition of nitric acid renders many of these salts soluble.

Stability - 2-100 ppb levels stable for 75+ days when mixed with equivalent levels of all other elements including the precious metals (where chloride is present) when in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3 / LDPE container.

Ag Containing Samples (Preparation and Solution) -Metal (Soluble in HNO_3); Oxides (Soluble in HNO_3); Ores (Digestion with conc. HNO_3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 107 amu	1 ppt	N/A	91Zr16O
ICP-OES 243.779 nm	0.12/0.01 µg/mL	1	Mn, Th, Ni, Rh
ICP-OES 328.068 nm	0.007/0.0007 µg/mL	1	Ce, Rh, V
ICP-OES 338.289 nm	0.013/0.001 µg/mL	1	Ce, Cr, Th

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 29, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 29, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGAL10
Lot Number:	S2-AL700843
Matrix:	7% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Aluminum
Starting Material:	Al(NO3)3 * 9H2O
Starting Material Lot#:	P2-2302
Starting Material Purity:	99.9913%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10011 ± 31 µg/mL

Density: 1.087 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10015 ± 44 µg/mL**
ICP Assay NIST SRM 3101a Lot Number: 140903

Assay Method #2 **10008 ± 25 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10014 ± 36 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001500	M	Eu	<	0.000680	O	Na		0.510200	M	Se	<	0.014000	M	Zn		0.009183
s	Al	<		O	Fe		0.114284	M	Nb	<	0.000680	O	Si		0.053060	O	Zr		0.003673
M	As	<	0.006800	O	Ga		0.191835	M	Nd	<	0.000680	M	Sm	<	0.000680				
M	Au	<	0.000680	M	Gd	<	0.004100	O	Ni		0.001102	M	Sn	<	0.006800				
O	B	<	0.021000	M	Ge	<	0.001400	M	Os	<	0.008700	O	Sr		0.006530				
O	Ba		0.012652	M	Hf	<	0.002700	n	P	<		M	Ta	<	0.000680				
O	Be	<	0.001300	M	Hg	<	0.006100	M	Pb		0.006530	M	Tb	<	0.000680				
M	Bi	<	0.008100	M	Ho	<	0.000680	M	Pd	<	0.000680	M	Te	<	0.030000				
O	Ca		0.071428	M	In	<	0.000900	M	Pr	<	0.000680	M	Th	<	0.000680				
M	Cd	<	0.001400	M	Ir	<	0.000680	M	Pt	<	0.000680	O	Ti		0.001142				
M	Ce	<	0.002700	O	K		0.053060	M	Rb	<	0.014000	M	Tl	<	0.000680				
O	Co		0.001979	M	La	<	0.002900	M	Re	<	0.000680	M	Tm	<	0.000680				
O	Cr		0.014285	O	Li		0.000142	M	Rh	<	0.000680	M	U	<	0.001400				
M	Cs		0.005306	M	Lu	<	0.000680	M	Ru	<	0.000680	M	V	<	0.005400				
O	Cu		0.003469	O	Mg		0.069387	i	S	<		M	W	<	0.012000				
M	Dy	<	0.005400	O	Mn		0.001653	M	Sb	<	0.004200	M	Y	<	0.000680				
M	Er	<	0.000680	M	Mo	<	0.012000	M	Sc	<	0.002100	M	Yb	<	0.000680				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 26.98 +3 6 Al(H2O)6+3

Chemical Compatibility -Soluble in HCl, HNO3, HF and H2SO4. Avoid neutral media. Soluble in strongly basic NaOH forming the Al(OH)4(H2O)21- species. Stable with most metals and inorganic anions. The phosphate is insoluble in water and only slightly soluble in acid.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO3 / LDPE container.

Al Containing Samples (Preparation and Solution) -Metal (Best dissolved in HCl / HNO3); a- Al2O3 (Na2CO3 fusion in Pt0);

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 27 amu	30 ppt	N/A	12C15N, 13C14N, 1H12C14N, 11B16O, 54Cr2+, 54Fe2+
ICP-OES 167.078 nm	0.1/0.009 µg/mL	1	Fe
ICP-OES 394.401 nm	0.05/0.006 µg/mL	1	U, Ce
ICP-OES 396.152 nm	0.03/0.006 µg/mL	1	Mo, Zr, Ce

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 27, 2021

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 27, 2025**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
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inorganicventures.com

CERTIFICATE OF ANALYSIS

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fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGAS10
Lot Number:	R2-AS691113
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Arsenic
Starting Material:	As Pieces
Starting Material Lot#:	2208
Starting Material Purity:	99.9980%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9981 ± 55 µg/mL

Density: 1.028 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9981 ± 55 µg/mL**
ICP Assay NIST SRM 3103a Lot Number: 100818

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2 (u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001578	M	Eu	<	0.000526	O	Na		0.036136	M	Se	<	0.014204	O	Zn	<	0.003390
O	Al		0.006694	M	Fe		0.002633	O	Nb	<	0.011526	O	Si		0.139479	M	Zr	<	0.003156
s	As	<		M	Ga	<	0.000526	M	Nd	<	0.000526	M	Sm	<	0.000526				
M	Au	<	0.000526	M	Gd	<	0.000526	O	Ni	<	0.005537	M	Sn	<	0.001052				
M	B		0.017011	M	Ge	<	0.000526	M	Os	<	0.000526	M	Sr	<	0.000526				
M	Ba	<	0.000526	M	Hf	<	0.000526	O	P	<	0.056500	M	Ta	<	0.000526				
O	Be	<	0.001130	M	Hg	<	0.002104	M	Pb	<	0.000526	M	Tb	<	0.000526				
M	Bi	<	0.002104	M	Ho	<	0.000526	M	Pd	<	0.000526	M	Te	<	0.003682				
O	Ca		0.005657	M	In	<	0.000526	M	Pr	<	0.002630	M	Th	<	0.000526				
M	Cd	<	0.000526	M	Ir	<	0.000526	M	Pt	<	0.000526	O	Ti	<	0.001017				
M	Ce	<	0.000526	O	K		0.003865	M	Rb	<	0.002104	M	Tl	<	0.000526				
M	Co	<	0.003156	M	La	<	0.000526	M	Re	<	0.000526	M	Tm	<	0.000526				
M	Cr		0.000877	M	Li	<	0.000526	M	Rh	<	0.000526	M	U	<	0.000526				
M	Cs	<	0.002104	M	Lu	<	0.000526	M	Ru	<	0.000526	M	V	<	0.001578				
M	Cu	<	0.003156	O	Mg		0.000235	O	S	<	0.056500	M	W	<	0.000526				
M	Dy	<	0.000526	M	Mn	<	0.001052	M	Sb	<	0.000526	M	Y	<	0.000526				
M	Er	<	0.000526	M	Mo	<	0.000526	M	Sc	<	0.002104	M	Yb	<	0.000526				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 74.92 ; mix of +3 and +5 ; 6 ; H_3AsO_4 and $HAsO_2$

Chemical Compatibility - Arsenic has no cationic chemistry. It is soluble in HCl, HNO_3,H_3PO_4, H_2SO_4 and HF aqueous matrices water and NH_4OH . It is stable with most inorganic anions (forms arsenate when boiled with chromate) but many cationic metals form the insoluble arsenates under pH neutral conditions. When fluorinated and / or under acidic conditions arsenate formation is typically not a problem at moderate to low concentrations.

Stability - 2-100 ppb levels stable for months alone or mixed with other elements at equivalent levels in 1% HNO_3 / LDPE container.

As Containing Samples (Preparation and Solution) - Metal (soluble in 1:1 H_2O / HNO_3); Oxides (the oxide exists in crystalline and amorphous forms where the amorphic form is more water soluble. The oxides typically dissolve in dilute acidic solutions when boiled); Minerals (one gram of powered sample is fused in a Ni crucible with 10 grams of a 1:1 mix of K_2CO_3 and KNO_3 and the melt extracted with hot water); Organic Matrices (0.2 to 0.5 grams of sample are fused with 15 grams of a 1:1 Na_2CO_3 / Na_2O_2 mix in a Ni crucible. The fuseate is extracted with water and acidified with HNO_3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 75 amu	20 ppt	N/A	40Ar35Cl, 59Co16O, 36Ar38Ar1H,8Ar37Cl,Ar39K, 150Nd2+,150Sm2+
ICP-OES 189.042 nm	0.05/0.005 µg/mL	1	Cr
ICP-OES 193.696 nm	0.1/0.01 µg/mL	1	V, Ge
ICP-OES 228.812 nm	0.1/0.01 µg/mL	1	Cd, Pt, Ir, Co

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 25, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 25, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGBA10
Lot Number:	P2-BA682107
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Barium
Starting Material:	Ba(NO3)2
Starting Material Lot#:	Mixed Lots
Starting Material Purity:	99.9995%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10072 ± 32 µg/mL

Density: 1.024 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10054 ± 80 µg/mL**
ICP Assay NIST SRM 3104a Lot Number: 140909

Assay Method #2 **10075 ± 30 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001538	O	Eu	<	0.028728	O	Na		0.006767	M	Se	<	0.007964	O	Zn		0.004335
M	Al		0.005194	M	Fe		0.016554	M	Nb	<	0.000200	O	Si	<	0.020780	M	Zr	<	0.000271
M	As	<	0.000519	M	Ga	<	0.000200	M	Nd	<	0.000200	M	Sm	<	0.082480				
M	Au	<	0.003452	M	Gd	<	0.000200	M	Ni	<	0.001290	M	Sn	<	0.000200				
M	B	<	0.002519	M	Ge	<	0.000430	M	Os	<	0.000752	O	Sr		0.027070				
s	Ba	<		M	Hf	<	0.002746	O	P	<	0.044677	M	Ta	<	0.001008				
M	Be	<	0.000430	M	Hg	<	0.001063	M	Pb	<	0.002257	M	Tb	<	0.000200				
M	Bi	<	0.002971	M	Ho	<	0.000200	M	Pd	<	0.000286	M	Te	<	0.001470				
O	Ca		0.026224	M	In	<	0.000200	M	Pr	<	0.000200	M	Th	<	0.000200				
M	Cd	<	0.000200	M	Ir	<	0.000446	M	Pt	<	0.000200	M	Ti	<	0.000324				
M	Ce	<	0.004362	O	K		0.011526	M	Rb		0.001487	M	Tl	<	0.000200				
M	Co	<	0.000200	O	La	<	0.091587	M	Re	<	0.000200	M	Tm	<	0.000954				
M	Cr	<	0.002191	O	Li	<	0.002181	M	Rh	<	0.000200	M	U	<	0.000200				
M	Cs	<	0.001640	M	Lu	<	0.002934	M	Ru	<	0.000200	M	V	<	0.000229				
M	Cu	<	0.003646	O	Mg		0.002379	O	S	<	0.073041	M	W	<	0.001627				
M	Dy	<	0.000200	M	Mn	<	0.000902	M	Sb	<	0.000514	O	Y	<	0.019637				
M	Er	<	0.000556	M	Mo	<	0.000455	M	Sc	<	0.000478	M	Yb	<	0.001991				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 137.33 +2 6 $Ba(H_2O)_6^{+2}$

Chemical Compatibility - Soluble in HCl, and HNO_3. Avoid H_2SO_4, HF and neutral to basic media. Stable with most metals and inorganic anions forming insoluble silicate, carbonate, hydroxide, oxide, fluoride, sulfate, oxalate, chromate, arsenate, iodate, molybdate, sulfite and tungstate in neutral aqueous media.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1 -10,000 ppm solutions chemically stable for years in 1-3.5% HNO_3 / LDPE container.

Ba Containing Samples (Preparation and Solution) -Metal(is best dissolved in diluted HNO_3); Ores(Carbonate fusion in Pt0 followed by HCl dissolution. If sulfate is present dissolve the fuseate using HCl / tartaric acid to prevent $BaSO_4$ precipitate); Organic Matrices (dry ash and dissolve in dilute HCl.)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 138 amu	1 ppt	N/A	122Sn16O, 122Te16O
ICP-OES 230.424 nm	0.004/0.0005 µg/mL	1	Mo, Ir, Co
ICP-OES 233.527 nm	0.004/0.0003 µg/mL	1	
ICP-OES 455.403 nm	0.002/0.0001 µg/mL	1	Zr, U

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 13, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 13, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGBE10
Lot Number:	P2-BE678865
Matrix:	6% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Beryllium
Starting Material:	Beryllium diacetate
Starting Material Lot#:	2221
Starting Material Purity:	99.9998%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10036 ± 35 µg/mL

Density: 1.140 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10051 ± 42 µg/mL**
ICP Assay NIST SRM 3105a Lot Number: 090514

Assay Method #2 **10008 ± 59 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag		0.045414	M	Eu	<	0.000254	O	Na		0.015009	M	Se	<	0.015257	O	Zn		0.004059
O	Al		0.008058	O	Fe		0.011749	M	Nb	<	0.000254	O	Si		0.063793	O	Zr	<	0.007064
M	As	<	0.006473	M	Ga	<	0.000254	M	Nd	<	0.000254	M	Sm	<	0.000254				
M	Au	<	0.000248	M	Gd	<	0.000254	M	Ni	<	0.002034	M	Sn	<	0.002542				
O	B	<	0.021661	M	Ge	<	0.000508	M	Os	<	0.000248	M	Sr	<	0.000254				
M	Ba		0.001760	M	Hf	<	0.000254	O	P	<	0.666500	M	Ta	<	0.000254				
s	Be	<		M	Hg	<	0.001244	M	Pb	<	0.001271	M	Tb	<	0.000254				
M	Bi	<	0.000254	M	Ho	<	0.000254	M	Pd	<	0.000254	M	Te	<	0.001780				
O	Ca		0.015256	M	In	<	0.000254	M	Pr	<	0.000254	M	Th	<	0.000254				
M	Cd	<	0.000254	M	Ir	<	0.000248	M	Pt	<	0.000254	O	Ti	<	0.002266				
M	Ce	<	0.000254	O	K		0.031127	M	Rb	<	0.000508	M	Tl	<	0.000254				
M	Co	<	0.004068	M	La	<	0.000254	M	Re	<	0.000254	M	Tm	<	0.000254				
M	Cr	<	0.001525	O	Li	<	0.000666	M	Rh	<	0.000254	M	U	<	0.000254				
M	Cs		0.001642	M	Lu	<	0.000254	M	Ru	<	0.000248	M	V	<	0.000508				
M	Cu	<	0.005085	O	Mg		0.001907	i	S	<		M	W	<	0.004068				
M	Dy	<	0.000254	O	Mn	<	0.001333	M	Sb	<	0.000254	M	Y	<	0.000254				
M	Er	<	0.000254	M	Mo	<	0.000762	O	Sc	<	0.001333	M	Yb	<	0.000254				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 9.01 +2 4 $Be(H_2O)_4^{+2}$

Chemical Compatibility -Soluble in HCl, HNO_3, H_2SO_4 and HF aqueous matrices. Stable with all metals and inorganic anions.

Stability - 2-100 ppb levels stable for months in 1 % HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 5-10 % HNO_3 / LDPE container.

Be Containing Samples (Preparation and Solution) - Meta l(is best dissolved in diluted H_2SO_4); BeO (boiling nitric, hydrochloric, or sulfuric acids or $KHSO_4$ fusion); Ores (H_2SO_4/HF digestion or carbonate fusion in Pt0); Organic Matrices (sulfuric/peroxide digestion or nitric/sulfuric/perchloric acid decomposition, or dry ash and dissolution according to the BeO procedure above).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 9 amu	4 ppt	N/A	
ICP-OES 234.861 nm	0.0003/0.00016 µg/mL	1	Fe, Ta, Mo
ICP-OES 313.042 nm	0.0003/0.00009 µg/mL	1	V, Ce, U
ICP-OES 313.107 nm	0.0007/0.0005 µg/mL	1	Ce, Th, Tm

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION, PERIOD OF VALIDITY AND REVISION HISTORY

11.1 Certification Issue Date

April 22, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 22, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

11.4 Revision Status

- Revision 1 - Revised on Thursday, Jan 14, 2021 by utruong. Revision was made for the following reason: Modified Section 7 Chemical Form in Solution.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCA10
Lot Number:	R2-CA697921
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Calcium
Starting Material:	Calcium Oxide
Starting Material Lot#:	P2-CA677788
Starting Material Purity:	99.9995%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9985 ± 30 µg/mL

Density: 1.039 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9976 ± 43 µg/mL**
ICP Assay NIST SRM 3109a Lot Number: 130213

Assay Method #2 **9965 ± 25 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10008 ± 26 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.002500	M	Eu	<	0.001300	M	Na		0.008214	O	Se	<	0.022000	O	Zn		0.001158
O	Al	<	0.030000	O	Fe		0.002316	M	Nb	<	0.001300	O	Si	<	0.022000	M	Zr	<	0.006200
O	As	<	0.025000	M	Ga	<	0.002500	M	Nd	<	0.001300	M	Sm	<	0.001300				
M	Au	<	0.013000	M	Gd	<	0.001300	O	Ni	<	0.005300	O	Sn	<	0.013000				
O	B	<	0.006900	O	Ge	<	0.018000	M	Os	<	0.002500	M	Sr		0.115847				
M	Ba		0.000905	M	Hf	<	0.002500	O	P	<	0.027000	M	Ta	<	0.008600				
O	Be	<	0.000270	M	Hg	<	0.001300	M	Pb		0.001685	M	Tb	<	0.001300				
M	Bi	<	0.002500	M	Ho	<	0.001300	M	Pd	<	0.006200	O	Te	<	0.045000				
s	Ca	<		M	In	<	0.001300	M	Pr	<	0.001300	M	Th	<	0.001300				
O	Cd	<	0.000540	M	Ir	<	0.001300	M	Pt	<	0.001300	O	Ti	<	0.004200				
M	Ce	<	0.001300	O	K		0.015797	M	Rb	<	0.014000	M	Tl	<	0.001300				
O	Co		0.000558	M	La	<	0.001300	M	Re	<	0.001300	M	Tm	<	0.001300				
O	Cr	<	0.006000	O	Li	<	0.006900	M	Rh	<	0.002500	M	U	<	0.001300				
M	Cs	<	0.001300	M	Lu	<	0.001300	M	Ru	<	0.003800	O	V	<	0.002200				
M	Cu	<	0.002500	O	Mg		0.002843	n	S	<		M	W	<	0.012000				
M	Dy	<	0.001300	O	Mn		0.000115	M	Sb	<	0.007400	M	Y	<	0.001300				
M	Er	<	0.001300	M	Mo		0.002527	O	Sc	<	0.006100	M	Yb	<	0.001300				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 40.08 +2 6 Ca(H2O)6+2

Chemical Compatibility - Soluble in HCl and HNO3. Avoid H2SO4, HF, H3PO4 and neutral to basic media. Stable with most metals and inorganic anions forming insoluble silicate, carbonate, hydroxide, oxide, fluoride, sulfate, oxalate, chromate, arsenate, and tungstate in neutral aqueous media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-10% HNO3 / LDPE container.

Ca Containing Samples (Preparation and Solution) -Metal (best dissolved in diluted HNO3); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (dry ash and dissolution in dilute HCl. Do not heat when dissolving to avoid precipitation of SiO2). The oxide, hydroxide, carbonate, phosphate, and fluoride of calcium are soluble in % levels of HCl or HNO3. The sulfates (gypsum, anhydrite, etc.), certain silicates, and complex compounds require fusion with Na2CO3 followed by HCl / water dissolution. Note that contamination is a very real problem when analyzing for trace levels.

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 44 amu	1200 ppt	n/a	16O212C, 28Si16O, 88Sr
ICP-OES 393.366 nm	0.0002 / 0.00004 µg/mL	1	U, Ce
ICP-OES 396.847 nm	0.0005 / 0.00006 µg/mL	1	Th
ICP-OES 422.673 nm	0.01 / 0.001 µg/mL	1	Ge

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

November 09, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **November 09, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

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ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCD10
Lot Number:	P2-CD685077
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Cadmium
Starting Material:	Cd Shot
Starting Material Lot#:	1954
Starting Material Purity:	99.9996%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9954 ± 30 µg/mL

Density: 1.029 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9956 ± 54 µg/mL**
ICP Assay NIST SRM 3108 Lot Number: 130116

Assay Method #2 **9953 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag	<	0.006348	M	Eu	<	0.010622	O	Na		0.004020	M	Se	<	0.008116	O	Zn	<	0.002152
O	Al		0.011566	M	Fe		0.003011	M	Nb	<	0.000405	O	Si		0.005480	M	Zr	<	0.000405
M	As	<	0.001623	M	Ga	<	0.000405	M	Nd	<	0.000405	M	Sm	<	0.000405				
M	Au	<	0.000405	M	Gd	<	0.000405	M	Ni	<	0.002840	M	Sn	<	0.001217				
M	B	<	0.004463	M	Ge	<	0.000405	M	Os	<	0.000405	M	Sr	<	0.000405				
O	Ba	<	0.000968	M	Hf	<	0.000405	O	P	<	0.045730	M	Ta	<	0.000405				
M	Be	<	0.000405	O	Hg	<	0.002152	M	Pb	<	0.002434	M	Tb	<	0.000405				
M	Bi	<	0.000405	M	Ho	<	0.000405	M	Pd	<	0.000405	M	Te	<	0.016636				
O	Ca		0.002946	O	In	<	0.021520	M	Pr	<	0.000405	M	Th	<	0.000405				
s	Cd	<		M	Ir	<	0.000405	M	Pt	<	0.000405	M	Ti	<	0.001217				
M	Ce	<	0.000405	O	K		0.008179	M	Rb	<	0.000405	M	Tl	<	0.004495				
M	Co	<	0.000405	M	La	<	0.000405	M	Re	<	0.000405	M	Tm	<	0.000405				
M	Cr		0.002907	M	Li	<	0.000405	M	Rh	<	0.000405	M	U	<	0.000405				
M	Cs	<	0.002374	M	Lu	<	0.000405	M	Ru	<	0.000405	M	V	<	0.003179				
M	Cu	<	0.002434	O	Mg		0.000137	O	S	<	0.037660	M	W	<	0.000405				
M	Dy	<	0.000405	M	Mn	<	0.001623	M	Sb	<	0.004057	M	Y	<	0.000405				
M	Er	<	0.000405	M	Mo	<	0.000811	M	Sc	<	0.001623	M	Yb	<	0.000811				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 112.41 +2 4 Cd2(OH) (aq)3+ and Cd(OH)(aq)

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 , and HF. Avoid basic media forming insoluble carbonate and hydroxide.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5 % HNO3 / LDPE container.

Cd Containing Samples (Preparation and Solution) -Metal (soluble in HNO3); Oxides (soluble in HCl or HNO3); Ores (dissolve in HCl /HNO3 then take to fumes with H2SO4. The silica and lead sulfate are filtered off after the addition of water); Organic based (dry ash at 450°C and dissolve ash in HCl), (sulfuric / peroxide acid digestion).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 111 amu	11 ppt	n/a	95Mo16O
ICP-OES 214.438 nm	0.003 / 0.0003 µg/mL	1	Pt, Ir
ICP-OES 226.502 nm	0.003 / 0.0003 µg/mL	1	Ir
ICP-OES 228.802 nm	0.003 / 0.0003 µg/mL	1	Co, Ir, As, Pt

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

November 08, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **November 08, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCO10
Lot Number:	N2-CO671028
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Cobalt
Starting Material:	COBALT
Starting Material Lot#:	1749
Starting Material Purity:	99.9978%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9988 ± 34 µg/mL

Density: 1.057 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9973 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #2 **10024 ± 50 µg/mL**
ICP Assay NIST SRM traceable to 3113 Lot Number: M2-CO661665

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag		0.022956	M	Eu	<	0.000422	O	Na		0.008125	M	Se	<	0.009290	M	Zn		0.007197
O	Al		0.013621	O	Fe		0.048700	M	Nb	<	0.000422	O	Si		0.017539	M	Zr	<	0.014357
i	As	<		M	Ga	<	0.000844	M	Nd	<	0.017735	M	Sm	<	0.001689				
M	Au	<	0.000583	M	Gd		0.003247	O	Ni	<	0.043642	M	Sn	<	0.005067				
M	B	<	0.013512	M	Ge	<	0.004645	M	Os	<	0.000583	O	Sr		0.000841				
O	Ba		0.071210	M	Hf	<	0.000422	n	P	<		M	Ta	<	0.000422				
O	Be	<	0.001771	M	Hg	<	0.002334	M	Pb		0.010094	M	Tb	<	0.001689				
M	Bi		0.000614	M	Ho	<	0.000422	M	Pd	<	0.000422	M	Te	<	0.008445				
O	Ca		0.025034	M	In	<	0.003378	M	Pr	<	0.006756	M	Th	<	0.000422				
M	Cd	<	0.000844	M	Ir	<	0.000583	M	Pt	<	0.000422	M	Ti	<	0.002533				
M	Ce		0.002721	O	K		0.005785	M	Rb	<	0.001689	M	Tl	<	0.000422				
s	Co	<		M	La		0.000877	M	Re		0.016853	M	Tm	<	0.000422				
M	Cr	<	0.020269	O	Li		0.000262	M	Rh	<	0.000422	M	U	<	0.000422				
M	Cs		0.000877	M	Lu	<	0.000422	M	Ru	<	0.000583	M	V	<	0.001689				
M	Cu		0.007197	O	Mg		0.003444	n	S	<		M	W	<	0.000844				
M	Dy	<	0.000422	O	Mn	<	0.006072	M	Sb	<	0.005911	M	Y		0.001228				
M	Er	<	0.000422	M	Mo	<	0.005911	M	Sc	<	0.001689	M	Yb	<	0.003378				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 58.93 +2 6 Co(H2O)62+
Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.
Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.
Co Containing Samples (Preparation and Solution) - Metal (soluble in HNO3); Oxides (Soluble in HCl); Ores (dissolve in HCl / HNO3).
Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 59 amu	2 ppt	n/a	42Ca16O1H , 40Ar18O1H , 36Ar23Na, 43Ca16O, 24Mg35Cl
ICP-OES 228.616 nm	0.01/0.001 µg/mL	1	
ICP-OES 237.862 nm	0.01/0.002 µg/mL	1	W, Re, Al, Ta
ICP-OES 238.892 nm	0.01/0.002 µg/mL	1	Fe, W, Ta

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 15, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 15, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Supervisor, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCR(3)10
Lot Number:	R2-CR691013
Matrix:	10% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Chromium
Starting Material:	Cr METAL
Starting Material Lot#:	2077
Starting Material Purity:	99.9942%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10044 ± 40 µg/mL

Density: 1.082 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10057 ± 58 µg/mL**
ICP Assay NIST SRM 3112a Lot Number: 170630

Assay Method #2 **10035 ± 50 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000540	M	Eu	<	0.003200	O	Na		0.130091	M	Se	<	0.012000	O	Zn	<	0.002700
O	Al		0.016634	O	Fe		0.202602	M	Nb	<	0.022000	n	Si	<		M	Zr	<	0.020000
M	As		0.003838	O	Ga	<	0.031000	M	Nd	<	0.000540	M	Sm	<	0.035000				
M	Au	<	0.000540	M	Gd	<	0.000540	O	Ni		0.009170	M	Sn		0.004051				
M	B	<	0.049000	M	Ge	<	0.005400	M	Os	<	0.088000	O	Sr	<	0.000250				
O	Ba	<	0.002000	M	Hf	<	0.000540	i	P	<		M	Ta	<	0.000540				
O	Be	<	0.000250	M	Hg	<	0.001600	M	Pb		0.002559	M	Tb	<	0.000540				
M	Bi		0.008956	M	Ho	<	0.000540	M	Pd	<	0.001100	M	Te	<	0.004800				
O	Ca		0.074642	M	In	<	0.001100	M	Pr	<	0.000540	M	Th	<	0.000540				
M	Cd	<	0.000540	M	Ir	<	0.000540	M	Pt	<	0.000540	O	Ti		0.013435				
M	Ce	<	0.000540	O	K		0.034122	i	Rb	<		M	Tl	<	0.001100				
O	Co	<	0.002900	M	La	<	0.001100	M	Re	<	0.002700	O	Tm	<	0.001800				
s	Cr	<		O	Li	<	0.000130	M	Rh	<	0.032000	M	U	<	0.001100				
M	Cs	<	0.019000	M	Lu	<	0.000540	M	Ru	<	0.094000	O	V		0.159949				
O	Cu		0.010023	O	Mg		0.001450	i	S	<		M	W	<	0.028000				
M	Dy	<	0.000540	O	Mn	<	0.014000	M	Sb	<	0.008600	M	Y	<	0.001100				
M	Er	<	0.016000	O	Mo	<	0.013000	O	Sc	<	0.001400	M	Yb	<	0.000540				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 52.00 +3 6 Cr(H2O)63+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4, HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Cr3 Containing Samples (Preparation and Solution) -Metal (soluble in HCl); Oxides/Ores (Chrome ore/oxides are very difficult to dissolve. The following procedures [A-D] are commonly used: A. Fusion with KHSO4 and extraction with hot KCl. The residue fused with Na2CO3 and KClO3, 3:1. B. Fusion with NaKSO4 and NaF 2:1, C. Fusion with magnesia or lime and sodium or potassium carbonates, 4:1. D. Fusion with Na2O2 or NaOH and KNO3 or NaOH and Na2O2. Nickel, iron, copper, or silver crucibles should be used for D. Platinum may be used for A, B, C); Organic Matrices (ash at 4500C followed by one of the fusion methods above or sulfuric/hydrogen peroxide acid digestions may be applicable to non oxide containing samples).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	**Interferences** (underlined indicates severe)
ICP-MS 52 amu	40 ppt	N/A	36S16O, 36Ar16O - The 50Cr, 53Cr, 54Cr lines suffer from many more potential interferences from sulfur, chlorine and argon compounds of oxygen, nitrogen and carbon.
ICP-OES 205.552 nm	0.006/0.0008 µg/mL	1	Os
ICP-OES 276.654 nm	0.01/0.001 µg/mL	1	Cu, Ta, V
ICP-OES 284.325 nm	0.008/0.0007 µg/mL	1	

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 25, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 25, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGCU10
Lot Number:	R2-CU693370
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Copper
Starting Material:	Cu Metal
Starting Material Lot#:	2095
Starting Material Purity:	99.9996%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10016 ± 30 µg/mL

Density: 1.033 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10010 ± 55 µg/mL**
ICP Assay NIST SRM 3114 Lot Number: 121207

Assay Method #2 **10017 ± 26 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10015 ± 25 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.007542	M	Eu	<	0.000942	O	Na		0.001434	M	Se	<	0.016971	M	Zn	<	0.005657
O	Al	<	0.000609	O	Fe		0.008698	M	Nb	<	0.000942	O	Si		0.003052	M	Zr	<	0.000942
M	As	<	0.010371	M	Ga	<	0.000942	M	Nd	<	0.000942	M	Sm	<	0.000942				
M	Au	<	0.001885	M	Gd	<	0.000942	M	Ni		0.003780	M	Sn	<	0.005657				
O	B		0.003662	M	Ge	<	0.005657	M	Os	<	0.000942	M	Sr	<	0.000942				
M	Ba		0.004252	M	Hf	<	0.000942	O	P	<	0.031668	M	Ta	<	0.000942				
M	Be	<	0.000942	O	Hg	<	0.007064	M	Pb		0.005788	M	Tb	<	0.000942				
M	Bi	<	0.000942	M	Ho	<	0.000942	M	Pd	<	0.000942	M	Te	<	0.004714				
O	Ca		0.002304	M	In	<	0.000942	M	Pr	<	0.000942	M	Th	<	0.000942				
M	Cd	<	0.000942	M	Ir	<	0.000942	M	Pt	<	0.000942	O	Ti	<	0.002801				
M	Ce	<	0.000942	O	K		0.000762	M	Rb	<	0.000942	M	Tl	<	0.000942				
M	Co		0.001890	M	La	<	0.000942	M	Re	<	0.000942	M	Tm	<	0.000942				
M	Cr	<	0.005657	O	Li	<	0.000243	i	Rh	<		M	U	<	0.000942				
M	Cs	<	0.000942	M	Lu	<	0.000942	M	Ru	<	0.039588	M	V	<	0.003771				
s	Cu	<		O	Mg		0.000320	O	S		0.007172	M	W	<	0.005657				
M	Dy	<	0.000942	O	Mn		0.000793	M	Sb	<	0.001885	M	Y	<	0.000942				
M	Er	<	0.000942	M	Mo	<	0.005657	M	Sc	<	0.000942	M	Yb	<	0.000942				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 63.55 +2 6 Cu(H2O)62+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4, HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Cu Containing Samples (Preparation and Solution) -Metal (soluble in HNO3); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 63 amu	10 ppt	n/a	40Ar23Na 47Ti16O, 14N12C37Cl, 16O12C35Cl, 23Na40Ca
ICP-OES 219.958 nm	0.01/.002 µg/mL	1	Th, Ta, Nb, U, Hf
ICP-OES 224.700 nm	0.01/.001 µg/mL	1	Pb, Ir, Ni, W
ICP-OES 324.754 nm	0.06/.001 µg/mL		Nb, U, Th, Mo, Hf

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

June 05, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **June 05, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Certificate of Analysis

Refine your results. Redefine your industry.

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Multi Analyte Custom Grade Solution
Catalog Number:	ARI-1
Lot Number:	S2-MEB704284
Matrix:	5% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Iron

3.0 CERTIFIED VALUES AND UNCERTAINTIES

ANALYTE	CERTIFIED VALUE	ANALYTE	CERTIFIED VALUE
Iron, Fe	**10 000.0 ± 40.0 µg/mL**		

Density: 1.033 g/mL (measured at 20 ± 4 ºC)

Assay Information:

ANALYTE	METHOD	NIST SRM#	SRM LOT#
Fe	ICP Assay	3126a	140812
Fe	EDTA	928	928

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2 (u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

N/A

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

April 20, 2021

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 20, 2025**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

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ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGK10
Lot Number:	S2-K700978
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Potassium
Starting Material:	KNO3
Starting Material Lot#:	2313
Starting Material Purity:	99.9971%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10016 ± 30 µg/mL

Density: 1.025 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10018 ± 54 µg/mL**
ICP Assay NIST SRM 3141a Lot Number: 140813

Assay Method #2 **10016 ± 24 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

Assay Method #3 **10014 ± 45 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001400	M	Eu	<	0.000660	O	Na		0.240000	M	Se	<	0.007900	O	Zn		0.017000
O	Al		0.001600	O	Fe		0.005800	M	Nb	<	0.000660	O	Si		0.012000	O	Zr	<	0.001600
M	As	<	0.005300	M	Ga	<	0.000660	M	Nd	<	0.000660	M	Sm	<	0.000660				
M	Au	<	0.002000	M	Gd	<	0.000660	O	Ni	<	0.004900	M	Sn	<	0.000660				
O	B	<	0.005600	M	Ge	<	0.002000	M	Os	<	0.003300	O	Sr		0.000055				
O	Ba	<	0.000860	M	Hf	<	0.000660	O	P	<	0.032000	M	Ta	<	0.000660				
O	Be	<	0.000082	M	Hg	<	0.002000	M	Pb	<	0.002300	M	Tb	<	0.000660				
M	Bi	<	0.006600	M	Ho	<	0.000660	M	Pd	<	0.000660	M	Te	<	0.017000				
O	Ca		0.031000	M	In	<	0.000660	M	Pr	<	0.000660	M	Th	<	0.000660				
O	Cd	<	0.000450	M	Ir	<	0.000660	M	Pt	<	0.002700	M	Ti	<	0.000660				
M	Ce	<	0.000660	s	K	<		M	Rb		0.480000	M	Tl	<	0.000660				
O	Co	<	0.000780	M	La	<	0.000660	M	Re	<	0.000660	M	Tm	<	0.000660				
O	Cr		0.000530	O	Li	<	0.000084	M	Rh	<	0.000660	M	U	<	0.000660				
M	Cs	<	0.000660	M	Lu	<	0.000660	M	Ru	<	0.000660	O	V	<	0.001100				
M	Cu	<	0.002700	O	Mg		0.006300	O	S		0.028000	M	W	<	0.000660				
M	Dy	<	0.000660	O	Mn		0.000480	M	Sb	<	0.000660	M	Y	<	0.000660				
M	Er	<	0.000660	M	Mo	<	0.000660	O	Sc	<	0.000340	O	Yb	<	0.000270				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 39.10 +1 (6) K+(aq)

Chemical Compatibility -Soluble in HCl, HNO3, H2SO4 and HF aqueous matrices. Avoid use of HClO4 due to insolubility of the perchlorate. Stable with all metals and inorganic anions except ClO4-.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

K Containing Samples (Preparation and Solution) - Metal (Dissolves very rapidly in water); Ores (Sodium carbonate fusion in Pt0 followed by HCl dissolution-blank levels of K in sodium carbonate critical); Organic Matrices (Sulfuric/peroxide digestion)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 39 amu	10 ppt	n/a	38ArH, 23Na16O, 78Se
ICP-OES 404.721 nm	1.1 / 0.05 µg/mL	1	U, Ce
ICP-OES 766.490 nm	0.4 / 0.001 µg/mL	1	2nd order radiation from R.E.s on some optical designs
ICP-OES 771.531 nm	1.0 / 0.03 µg/mL	1	2nd order radiation from R.E.s on some optical designs

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

February 06, 2021

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **February 06, 2025**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGMG10
Lot Number:	R2-MG695748
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Magnesium
Starting Material:	Magnesium Metal
Starting Material Lot#:	2168
Starting Material Purity:	99.9984%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10044 ± 30 µg/mL

Density: 1.053 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1	**10055 ± 26 µg/mL** EDTA NIST SRM 928 Lot Number: 928
Assay Method #2	**10042 ± 57 µg/mL** ICP Assay NIST SRM 3131a Lot Number: 140110
Assay Method #3	**10033 ± 26 µg/mL** Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag		0.002104	M	Eu	<	0.000910	O	Na		0.071011	O	Se	<	0.048000	O	Zn		0.003296
M	Al		0.003550	M	Fe		0.002536	M	Nb	<	0.000460	O	Si	<	0.032000	O	Zr	<	0.002700
M	As	<	0.001400	M	Ga	<	0.000460	M	Nd	<	0.000910	M	Sm	<	0.000460				
M	Au	<	0.001400	M	Gd	<	0.000460	O	Ni	<	0.001600	M	Sn	<	0.002300				
O	B		0.006847	M	Ge	<	0.001400	M	Os	<	0.000460	O	Sr		0.000278				
O	Ba		0.000963	M	Hf	<	0.000460	O	P		0.015216	M	Ta	<	0.000460				
O	Be	<	0.000120	M	Hg	<	0.000460	M	Pb	<	0.000460	M	Tb	<	0.000460				
M	Bi	<	0.000460	M	Ho	<	0.000460	M	Pd	<	0.003200	M	Te	<	0.007300				
O	Ca		0.053258	M	In	<	0.000460	M	Pr	<	0.000460	M	Th	<	0.000460				
O	Cd	<	0.000360	M	Ir	<	0.000460	M	Pt	<	0.001900	O	Ti	<	0.001700				
M	Ce	<	0.002300	M	K		0.048186	M	Rb		0.002409	M	Tl		0.003043				
M	Co	<	0.000910	M	La	<	0.002800	M	Re	<	0.000460	M	Tm	<	0.000460				
M	Cr	<	0.002300	O	Li		0.027897	M	Rh	<	0.000460	M	U	<	0.000460				
M	Cs		0.001039	M	Lu	<	0.000460	M	Ru	<	0.000460	M	V	<	0.000460				
O	Cu	<	0.003000	s	Mg	<		O	S	<	0.190000	M	W	<	0.000460				
M	Dy	<	0.000460	O	Mn		0.015216	M	Sb		0.020796	O	Y	<	0.000720				
M	Er	<	0.000460	M	Mo	<	0.000910	O	Sc	<	0.000480	M	Yb	<	0.000460				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 24.31 +2 6 Mg(H2O)6+2

Chemical Compatibility -Soluble in HCl, HNO3, and H2SO4 avoid HF, H3PO4 and neutral to basic media. Stable with most metals and inorganic anions forming insoluble silicates, carbonates, hydroxides, oxides, and tungstates in neutral and slightly acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-10% HNO3 / LDPE container.

Mg Containing Samples (Preparation and Solution) -Metal (Best dissolved in diluted HNO3); Oxide (Readily soluble in above compatible aqueous acidic solutions); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (Sulfuric / peroxide digestion or nitric / sulfuric / perchloric acid decomposition, or dry ash and dissolution in dilute HCl).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 24 amu	42 ppt	n/a	7Li17O, 48Ti+2 , 48Ca+2
ICP-OES 279.553 nm	0.0002 / 0.00003 µg/mL	1	Th
ICP-OES 280.270 nm	0.0003 / 0.00005 µg/mL	1	U, V
ICP-OES 285.213 nm	0.002 / 0.00003 µg/mL	1	U, Hf, Cr, Zr

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 01, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 01, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGMN10
Lot Number:	P2-MN687536
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Manganese
Starting Material:	Mn Metal
Starting Material Lot#:	2275
Starting Material Purity:	99.9909%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10046 ± 30 µg/mL

Density: 1.035 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10045 ± 25 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #2 **10083 ± 68 µg/mL**
ICP Assay NIST SRM 3132 Lot Number: 050429

Assay Method #3 **10031 ± 47 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001500	M	Eu	<	0.000730	O	Na		0.176713	M	Se	<	0.006600	M	Zn		0.009960
O	Al		0.004337	M	Fe	<	0.650000	M	Nb	<	0.000730	O	Si		0.097995	M	Zr	<	0.000730
M	As	<	0.008000	M	Ga		0.004337	M	Nd	<	0.001500	M	Sm	<	0.000730				
M	Au	<	0.000730	M	Gd	<	0.000730	M	Ni		0.024097	M	Sn	<	0.002200				
M	B		0.069078	M	Ge	<	0.004400	M	Os	<	0.000730	O	Sr		0.000931				
M	Ba	<	0.001500	M	Hf	<	0.000730	i	P	<		M	Ta	<	0.000730				
M	Be	<	0.000730	M	Hg	<	0.002200	M	Pb		0.007389	M	Tb	<	0.000730				
M	Bi	<	0.003000	M	Ho	<	0.000730	M	Pd	<	0.000730	M	Te	<	0.019000				
O	Ca		0.062652	M	In	<	0.003000	M	Pr	<	0.000730	M	Th	<	0.000730				
M	Cd	<	0.001500	M	Ir	<	0.000730	M	Pt	<	0.000730	O	Ti	<	0.006500				
M	Ce	<	0.007300	O	K		0.006425	M	Rb	<	0.006600	M	Tl	<	0.000730				
O	Co		0.014779	M	La	<	0.003000	M	Re	<	0.000730	M	Tm	<	0.000730				
O	Cr		0.273102	O	Li		0.000417	M	Rh	<	0.003000	M	U	<	0.001500				
M	Cs	<	0.000730	M	Lu	<	0.000730	M	Ru	<	0.004400	M	V	<	0.000730				
O	Cu		0.007711	O	Mg		0.321297	i	S	<		M	W	<	0.004400				
M	Dy	<	0.001500	s	Mn	<		M	Sb	<	0.021000	O	Y		0.001365				
M	Er	<	0.001500	M	Mo		0.010281	O	Sc	<	0.004100	M	Yb	<	0.000730				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 54.94 +2 6 Mn(H2O)62+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5 % HNO3/LDPE container.

Mn Containing Samples (Preparation and Solution) -Metal (Soluble in dilute acids); Oxides (Soluble in dilute acids); Ores (Dissolve with HCl. If silica is present add HF and then fume off silica by adding H2SO4 and heat to SO3 fumes - dense white fumes).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 55 amu	10 ppt	n/a	40Ar14N1H,39K16 O,37Cl18O,40Ar15 N,38Ar17O,36Ar18O 1H ,38Ar16O1H,37Cl17 O1H,23Na32S
ICP-OES 257.610 nm	0.0014 / 0.00002 µg/mL	1	Ce, W, Re
ICP-OES 259.373 nm	0.0016 / 0.00002 µg/mL	1	U, Ta, Mo, Fe, Nb
ICP-OES 260.569 nm	0.0021 / 0.00002 µg/mL	1	Co

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 05, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 05, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGMO10
Lot Number:	R2-MO693167
Matrix:	tr. NH_4OH H_2O
Value / Analyte(s):	10 000 µg/mL ea: Molybdenum
Starting Material:	Ammonium Molybdate
Starting Material Lot#:	2257
Starting Material Purity:	99.9914%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10013 ± 35 µg/mL

Density: 1.011 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10035 ± 67 µg/mL**
ICP Assay NIST SRM 3134 Lot Number: 130418

Assay Method #2 **10005 ± 40 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.001826	M	Eu	<	0.000300	M	Na		0.008750	M	Se	<	0.007480	M	Zn	0.002553
M	Al		0.004455	M	Fe		0.002093	M	Nb	<	0.015030	i	Si	<		M	Zr	< 0.005393
M	As	<	0.003006	M	Ga	<	0.000300	i	Nd	<		M	Sm	<	0.000300			
M	Au	<	0.006012	M	Gd	<	0.000300	M	Ni	<	0.004828	M	Sn		0.001004			
M	B	<	0.035184	M	Ge	<	0.000903	M	Os	<	0.003006	M	Sr		0.001903			
O	Ba		0.015613	M	Hf	<	0.000896	i	P	<		M	Ta	<	0.000300			
M	Be	<	0.003006	M	Hg	<	0.003006	M	Pb	<	0.000409	M	Tb	<	0.000300			
M	Bi	<	0.000401	M	Ho	<	0.000300	M	Pd	<	0.001114	M	Te	<	0.060122			
O	Ca		0.032589	M	In	<	0.015030	M	Pr	<	0.090184	M	Th	<	0.000786			
O	Cd	<	0.051800	M	Ir	<	0.007483	M	Pt	<	0.000388	O	Ti	<	0.093240			
M	Ce	<	0.015030	M	K		1.114508	M	Rb		0.040641	M	Tl		0.013140			
M	Co		0.004032	M	La	<	0.000300	M	Re	<	0.000300	M	Tm	<	0.000300			
M	Cr		0.005931	O	Li		0.000215	M	Rh	<	0.000300	M	U		0.000937			
M	Cs		0.002812	M	Lu	<	0.000300	M	Ru	<	0.003006	M	V	<	0.000759			
M	Cu		0.005172	M	Mg		0.005212	i	S	<		M	W		0.592427			
M	Dy	<	0.000300	M	Mn		0.000952	M	Sb		0.003147	M	Y	<	0.000300			
M	Er	<	0.000300	s	Mo	<		M	Sc	<	0.009019	M	Yb	<	0.000300			

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 95.94 +6 6,7,8,9 [MoO4] -2(chemical form as received)

Chemical Compatibility -Mo is received in a NH4OH matrix giving the operator the option of using HCl or HF to stabilize acidic solutions. The [MoO4]-2 is soluble in concentrated HCl [MoOCl5]-2, dilute HF / HNO3 [MoOF5] -2 and basic media [MoO4]-2. Stable at ppm levels with some metals provided it is fluorinated. Do not mix with Alkaline or Rare Earths when HF is present. Stable with most inorganic anions provided it is in the [MoO4]-2 chemical form.

Stability - 2-100 ppb levels stable (alone or mixed with all other metals that are at comparable levels) as the [MoOF5]-2 for months in 1% HNO3 / LDPE container. 1-10,000 ppm single element solutions as the [MoO4] -2 chemically stable for years in 1% NH4OH in a LDPE container.

Mo Containing Samples (Preparation and Solution) -Metal (Soluble in HF / HNO3 or hot dilute HCl); Oxide (soluble in HF or NH4OH) ; Organic Matrices (Dry ash at 450EC in Pt0 and dissolve oxide with HF or HCl).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 95 amu	3 ppt	n/a	40Ar39K16O,79Br16O,190Os2+,190Pt2+
ICP-OES 202.030 nm	0.008 / 0.0002 µg/mL	1	Os, Hf
ICP-OES 203.844 nm	0.012 / 0.002 µg/mL	1	
ICP-OES 204.598 nm	0.012 / 0.001 µg/mL	1	Ir, Ta

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

May 28, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **May 28, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Michael L Booth

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Paul R Gaines

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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGNA10
Lot Number:	S2-NA700842
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Sodium
Starting Material:	Na2CO3
Starting Material Lot#:	2274
Starting Material Purity:	99.9958%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10053 ± 30 µg/mL

Density: 1.036 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10070 ± 26 µg/mL**
Gravimetric NIST SRM Lot Number: See Sec. 4.2

Assay Method #2 **10012 ± 31 µg/mL**
ICP Assay NIST SRM 3152a Lot Number: 120715

Assay Method #3 **10059 ± 20 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

O	Ag	<	0.000250	M	Eu	<	0.000840	s	Na	<		O	Se	<	0.004700	O	Zn		0.000226
O	Al		0.003688	O	Fe		0.001560	O	Nb	<	0.001300	O	Si		0.049648	O	Zr		0.000680
O	As	<	0.006900	M	Ga	<	0.000840	M	Nd	<	0.000840	M	Sm	<	0.000840				
M	Au	<	0.000840	M	Gd	<	0.000840	O	Ni	<	0.000250	M	Sn	<	0.001700				
O	B		0.000936	M	Ge	<	0.003400	M	Os	<	0.000840	O	Sr		0.000255				
O	Ba		0.002269	M	Hf	<	0.000840	O	P		0.006525	M	Ta	<	0.004200				
O	Be	<	0.000130	M	Hg	<	0.001700	M	Pb	<	0.000840	M	Tb	<	0.000840				
O	Bi	<	0.008100	M	Ho	<	0.000840	M	Pd	<	0.000840	O	Te	<	0.004800				
O	Ca		0.085112	M	In	<	0.000840	M	Pr	<	0.000840	M	Th	<	0.002500				
O	Cd	<	0.000250	M	Ir	<	0.000840	M	Pt	<	0.000840	O	Ti		0.000553				
M	Ce	<	0.001700	O	K		1.049718	M	Rb	<	0.003400	M	Tl	<	0.000840				
O	Co	<	0.000370	M	La	<	0.000840	M	Re	<	0.000840	M	Tm	<	0.000840				
O	Cr	<	0.001400	O	Li		0.000069	M	Rh	<	0.000840	M	U	<	0.000840				
M	Cs	<	0.003400	M	Lu	<	0.000840	M	Ru	<	0.001700	O	V	<	0.001600				
O	Cu	<	0.001400	O	Mg		0.028370	O	S		0.048230	O	W	<	0.005000				
M	Dy	<	0.000840	O	Mn		0.000139	M	Sb	<	0.001700	O	Y	<	0.000730				
M	Er	<	0.000840	O	Mo	<	0.004800	O	Sc	<	0.000370	O	Yb	<	0.000130				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 22.99 +1 (6) Na+(aq) largely ionic in nature

Chemical Compatibility -Soluble in HCl, HNO3, H2SO4 and HF aqueous matrices. Stable with all metals and inorganic anions.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Na Containing Samples (Preparation and Solution) - Metal (Dissolves very rapidly in water); Ores (Lithium carbonate fusion in graphite crucible followed by HCl dissolution - blank levels of Na in lithium carbonate critical); Organic Matrices (Sulfuric / peroxide digestion or nitric/sulfuric/perchloric acid decomposition).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 23 amu	310 ppt	n/a	46Ti+2 , 46Ca+2
ICP-OES 330.237 nm	2.0 / 0.09 µg/mL	1	Pd, Zn
ICP-OES 588.995 nm	0.03 / 0.006 µg/mL	1	2nd order radiation from R.E.s on some optical designs
ICP-OES 589.595 nm	0.07 / 0.00009 µg/mL	1	2nd order radiation from R.E.s on some optical designs

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

January 25, 2021

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **January 25, 2025**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Director, Quality Control

Certifying Officer:

Paul Gaines
Chairman / Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGNI10
Lot Number:	P2-NI686384
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Nickel
Starting Material:	Ni Metal
Starting Material Lot#:	2277 and 2282
Starting Material Purity:	99.9992%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9979 ± 30 µg/mL

Density: 1.038 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9971 ± 54 µg/mL**
ICP Assay NIST SRM 3136 Lot Number: 120619

Assay Method #2 **9970 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **9993 ± 33 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag		0.002606	M	Eu	<	0.001100	O	Na		0.004965	O	Se	<	0.067000	M	Zn		0.006578
M	Al	<	0.013000	O	Fe		0.018618	M	Nb	<	0.001100	O	Si		0.010923	M	Zr	<	0.001100
O	As	<	0.067000	M	Ga	<	0.001100	M	Nd	<	0.001100	M	Sm	<	0.001100				
M	Au	<	0.002100	M	Gd	<	0.001100	s	Ni	<		M	Sn	<	0.016000				
M	B	<	0.017000	M	Ge	<	0.004200	M	Os		0.002110	O	Sr	<	0.000940				
M	Ba	<	0.001100	M	Hf	<	0.001100	i	P	<		M	Ta	<	0.001100				
O	Be	<	0.000410	M	Hg		0.014895	M	Pb		0.006578	M	Tb	<	0.001100				
M	Bi	<	0.004200	M	Ho	<	0.001100	M	Pd	<	0.001100	M	Te	<	0.015000				
O	Ca		0.003351	M	In	<	0.001100	M	Pr	<	0.001100	M	Th	<	0.001100				
M	Cd		0.001365	M	Ir		0.004716	M	Pt	<	0.001100	M	Ti	<	0.004200				
M	Ce	<	0.001100	O	K		0.004716	M	Rb	<	0.001100	M	Tl	<	0.001100				
O	Co		0.017377	M	La	<	0.001100	M	Re		0.001737	M	Tm	<	0.001100				
O	Cr	<	0.006700	O	Li	<	0.000140	M	Rh	<	0.006300	M	U	<	0.001100				
M	Cs	<	0.007300	M	Lu	<	0.001100	M	Ru	<	0.019000	M	V	<	0.002100				
M	Cu		0.004096	O	Mg		0.000372	i	S	<		M	W	<	0.006300				
M	Dy	<	0.001100	O	Mn	<	0.001900	M	Sb		0.005833	O	Y	<	0.000540				
M	Er	<	0.001100	M	Mo	<	0.008400	M	Sc	<	0.002100	M	Yb	<	0.001100				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 58.69 +2 6 Ni(H2O)62+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Ni Containing Samples (Preparation and Solution) -Metal (Soluble in HNO3); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 60 amu	100 ppt	n/a	43Ca16O1H , 44Ca16O, 23Na37Cl
ICP-OES 221.647 nm	0.01 / 0.0009 µg/mL	1	Si
ICP-OES 231.604 nm	0.02 / 0.002 µg/mL	1	Sb, Ta, Co
ICP-OES 232.003 nm	0.02 / 0.006 µg/mL	1	Cr, Re, Os, Nb, Ag, Pt, Fe

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

December 02, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **December 02, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

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CERTIFICATE OF ANALYSIS

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ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGPB10
Lot Number:	P2-PB686383
Matrix:	0.5% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Lead
Starting Material:	Lead Nitrate
Starting Material Lot#:	2299
Starting Material Purity:	99.9974%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10031 ± 30 µg/mL

Density: 1.015 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10060 ± 63 µg/mL**
ICP Assay NIST SRM 3128 Lot Number: 101026

Assay Method #2 **10048 ± 32 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10007 ± 32 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag		0.000850	M	Eu	<	0.000310	O	Na		0.005780	M	Se	<	0.004600	M	Zn		0.005440
O	Al		0.234602	O	Fe		0.023460	M	Nb	<	0.000310	O	Si		0.047600	M	Zr	<	0.000610
M	As	<	0.001900	M	Ga	<	0.000310	M	Nd	<	0.000310	M	Sm	<	0.000310				
M	Au	<	0.002200	M	Gd	<	0.004300	M	Ni	<	0.001600	M	Sn	<	0.000610				
O	B	<	0.005200	M	Ge	<	0.000610	M	Os	<	0.000310	O	Sr		0.000442				
O	Ba		0.001530	M	Hf	<	0.000310	O	P	<	0.052000	M	Ta	<	0.000310				
O	Be	<	0.000630	M	Hg	<	0.001600	s	Pb	<		M	Tb	<	0.000310				
O	Bi		0.021080	M	Ho	<	0.000610	M	Pd	<	0.000310	M	Te	<	0.004300				
O	Ca		0.037400	M	In	<	0.000310	M	Pr	<	0.000310	M	Th	<	0.000310				
M	Cd	<	0.000610	M	Ir	<	0.000310	M	Pt	<	0.000310	M	Ti		0.002992				
M	Ce	<	0.000910	O	K		0.008840	M	Rb	<	0.000610	M	Tl		0.037400				
M	Co	<	0.000610	M	La	<	0.000610	M	Re	<	0.000310	M	Tm	<	0.000610				
M	Cr	<	0.003400	O	Li		0.000108	O	Rh	<	0.006300	M	U	<	0.000310				
M	Cs		0.002686	M	Lu	<	0.000310	M	Ru	<	0.000310	M	V	<	0.000310				
M	Cu	<	0.002500	O	Mg		0.004760	O	S	<	0.052000	M	W	<	0.002200				
M	Dy	<	0.000310	M	Mn	<	0.000310	M	Sb	<	0.001300	M	Y	<	0.000310				
M	Er	<	0.000310	O	Mo	<	0.005400	M	Sc	<	0.000310	M	Yb	<	0.000310				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 207.20 +2 6 $Pb(H_2O)_6^{+2}$

Chemical Compatibility - Soluble in HCl, HF and HNO_3. Avoid H_2SO_4. Stable with most metals and inorganic anions forming insoluble carbonate, borate, sulfate, sulfite, sulfide, phosphate, oxalate, chromate, tannate, iodate, and cyanide in neutral aqueous media.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO_3 / LDPE container.

Pb Containing Samples (Preparation and Solution) -Metal (Best dissolved in 1:1 H_2O / HNO_3); Oxides (The many different Pb oxides are soluble in HNO_3 with the exception of PbO_2 which is soluble in HCl or HF); Ores and Alloys (Best attacked using 1:1 H_2O / HNO_3); Organic Matrices (Dry ash and dissolve in dilute HCl).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 208 amu	5 ppt	n/a	192Pt16O, 192Os16O
ICP-OES 168.215 nm	0.03 / 0.003 µg/mL	1	Co
ICP-OES 217.000 nm	0.09 / 0.03 µg/mL	1	W, Ir, Hf, Sb, Th
ICP-OES 220.353 nm	0.04 / 0.006 µg/mL	1	Bi, Nb

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

December 02, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **December 02, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
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CERTIFICATE OF ANALYSIS

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ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGSB10
Lot Number:	R2-SB688559
Matrix:	3% (v/v) HNO3 3% (w/v) tartaric acid
Value / Analyte(s):	10 000 µg/mL ea: Antimony
Starting Material:	Antimony Metal
Starting Material Lot#:	1857
Starting Material Purity:	99.9894%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10003 ± 47 µg/mL

Density: 1.061 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10003 ± 41 µg/mL**
ICP Assay NIST SRM 3102a Lot Number: 140911

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$
w_i = the weighting factors for each method calculated using the inverse square of the variance:
$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2
$u_{char} = [\Sigma((w_i)^2 (u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method
u_{bb} = bottle to bottle homogeneity standard uncertainty
u_{lts} = long term stability standard uncertainty (storage)
u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)(u_{char\ a})$

X_a = mean of Assay Method A with
$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2
$u_{char\ a}$ = the errors from characterization
u_{bb} = bottle to bottle homogeneity standard uncertainty
u_{lts} = long term stability standard uncertainty (storage)
u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000200	M	Eu	<	0.000300	O	Na		0.140000	M	Se	<	0.007300	O	Zn		0.005000
M	Al		0.003200	O	Fe		0.060000	M	Nb	<	0.000100	O	Si		0.150000	O	Zr	<	0.006300
M	As	<	0.004400	M	Ga	<	0.000400	M	Nd	<	0.000100	M	Sm	<	0.000100				
M	Au	<	0.000210	M	Gd	<	0.000100	O	Ni		0.004800	M	Sn	<	0.001800				
M	B	<	0.011000	M	Ge	<	0.000600	M	Os	<	0.000110	O	Sr		0.000750				
O	Ba	<	0.004900	M	Hf	<	0.000100	O	P		0.540000	M	Ta		0.003300				
M	Be	<	0.000400	M	Hg	<	0.000110	M	Pb	<	0.000400	M	Tb	<	0.000100				
M	Bi	<	0.000200	M	Ho	<	0.000100	M	Pd	<	0.000210	M	Te	<	0.000600				
O	Ca		0.110000	M	In	<	0.000100	M	Pr	<	0.001600	M	Th	<	0.000100				
M	Cd	<	0.000200	M	Ir	<	0.000110	M	Pt	<	0.000600	M	Ti	<	0.002800				
M	Ce		0.006500	O	K		0.020000	M	Rb	<	0.001000	M	Tl	<	0.000100				
M	Co	<	0.000200	O	La	<	0.016000	M	Re	<	0.000100	M	Tm	<	0.000100				
M	Cr		0.006900	O	Li	<	0.000430	M	Rh	<	0.000300	M	U	<	0.000100				
M	Cs	<	0.000200	M	Lu	<	0.000100	M	Ru	<	0.000310	M	V	<	0.000800				
M	Cu	<	0.000600	O	Mg		0.021000	n	S	<		M	W	<	0.000200				
M	Dy	<	0.000100	O	Mn		0.001900	s	Sb	<		M	Y	<	0.000100				
M	Er	<	0.000100	M	Mo	<	0.000500	O	Sc	<	0.002300	M	Yb	<	0.000100				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 121.75 +3 6 Sb(O)C4H4O6-1

Chemical Compatibility -Stable in conc. HCl, dilute or conc. HF. Stable in dilute HNO3 as the fluoride or tartrate complex. Avoid basic media. Stable with most metals and inorganic anions in acidic media as the tartrate provided the acidity is not too high or the acid is oxidizing causing loss of the stabilizing tartrate ion. The fluoride complex of antimony is stable in strong acid but you should only mix with other metals that are fluorinated.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-2% HNO3 / LDPE container.

Sb Containing Samples (Preparation and Solution) -Metal and alloys (Soluble in H2O / HF / HNO3 mixture); Oxides (Soluble in HCl and tartaric acid or H2O / HF / HNO3 mixtures); Ores (fusion with Na2CO3 in Pt0 followed by dissolving the fuseate in a H2O / HF / HNO3 mixture); Organic based (sulfuric acid / hydrogen peroxide digestion)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 121 amu	5 ppt	N/A	105Pd16O, 89Y16O2
ICP-OES 206.833 nm	0.03/0.003 µg/mL	1	Ta, Cr, Ge, Hf
ICP-OES 217.581 nm	0.05/0.005 µg/mL	1	Nb, W, Re, Fe
ICP-OES 231.147 nm	0.06/0.006 µg/mL	1	Ni, Co, Pt

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

April 30, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 30, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGSE10
Lot Number:	P2-SE684206
Matrix:	3% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Selenium
Starting Material:	Se Metal
Starting Material Lot#:	1962
Starting Material Purity:	99.9991%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9992 ± 61 µg/mL

Density: 1.035 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9993 ± 67 µg/mL**
ICP Assay NIST SRM 3149 Lot Number: 100901

Assay Method #2 **9992 ± 73 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.002242	M	Eu	<	0.000373	O	Na		0.013700	s	Se	<		O	Zn		0.002382
M	Al		0.004465	M	Fe		0.008506	O	Nb	<	0.002975	O	Si		0.006270	M	Zr	<	0.001868
O	As	<	0.022040	M	Ga	<	0.000373	M	Nd	<	0.000373	M	Sm	<	0.000373				
M	Au	<	0.000373	M	Gd	<	0.000373	O	Ni		0.001849	M	Sn		0.000850				
O	B	<	0.007714	M	Ge	<	0.002616	M	Os	<	0.000373	M	Sr	<	0.001121				
M	Ba	<	0.001495	M	Hf	<	0.000373	O	P	<	0.022040	M	Ta	<	0.000373				
M	Be	<	0.001495	M	Hg	<	0.002240	M	Pb		0.006379	M	Tb	<	0.006353				
M	Bi	<	0.000373	M	Ho	<	0.000373	M	Pd	<	0.000373	M	Te	<	0.012707				
O	Ca		0.006552	M	In	<	0.000373	M	Pr	<	0.001495	M	Th	<	0.002990				
M	Cd		0.001169	M	Ir	<	0.000373	M	Pt	<	0.000373	M	Ti	<	0.003363				
M	Ce	<	0.000373	O	K		0.002006	M	Rb	<	0.001868	M	Tl		0.008613				
M	Co	<	0.000373	M	La	<	0.001121	M	Re	<	0.000373	M	Tm	<	0.000373				
M	Cr		0.002870	O	Li		0.000062	M	Rh	<	0.000373	M	U	<	0.000373				
M	Cs	<	0.001121	M	Lu	<	0.000373	M	Ru	<	0.001493	M	V	<	0.000747				
M	Cu	<	0.000747	O	Mg		0.001159	O	S		0.024674	M	W	<	0.002242				
M	Dy	<	0.000373	M	Mn	<	0.000373	M	Sb	<	0.002242	M	Y	<	0.000373				
M	Er	<	0.000373	O	Mo	<	0.003195	M	Sc	<	0.001121	M	Yb	<	0.000373				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 78.96 +4 6 H_2SeO_3

Chemical Compatibility -Soluble in HCl, HNO_3,H_3PO_4, H_2SO_4 and HF aqueous matrices and water. It is stable with most inorganic anions but many cationic metals form the insoluble selenites under pH neutral conditions. When fluorinated and/or under acidic conditions precipitation is typically not a problem at moderate to low concentrations.

Stability - 2-100 ppb levels stable for months alone or mixed with other elements at equivalent levels in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3 / LDPE container.

Se Containing Samples (Preparation and Solution) -Metal (soluble in HNO_3); Oxides (readily soluble in water); Minerals and alloys (acid digestion with HNO_3or HNO_3 / HF); Organic Matrices (acid digestion with hot concentrated H_2SO_4 accompanied by the careful dropwise addition of H_2O_2 until clear).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	Estimated D.L.	Order	Interferences (underlined indicates severe)
ICP-MS 82 amu	200 ppt	N/A	12C35Cl2
ICP-OES 196.026 nm	0.08/0.006 µg/mL	1	Fe
ICP-OES 203.985 nm	0.2/0.05 µg/mL	1	Sb, Ir, Cr, Ta
ICP-OES 206.279 nm	0.3/0.16 µg/mL	1	Cr, Pt

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

September 13, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **September 13, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 - USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 - 540.585.3030
fax: 540.585.3012
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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01

ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGTL10
Lot Number:	R2-TL691937
Matrix:	5% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Thallium
Starting Material:	TlNO3
Starting Material Lot#:	2118
Starting Material Purity:	99.9998%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 9987 ± 49 µg/mL

Density: 1.035 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **9968 ± 68 µg/mL**
ICP Assay NIST SRM 3158 Lot Number: 151215

Assay Method #2 **10001 ± 58 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000200	M	Eu	<	0.000200	O	Na		0.002479	M	Se	<	0.011019	O	Zn		0.002288
O	Al	<	0.004184	O	Fe	<	0.002824	M	Nb	<	0.000200	O	Si		0.003744	M	Zr	<	0.000200
M	As	<	0.002003	M	Ga	<	0.000200	M	Nd	<	0.000200	M	Sm	<	0.000200				
O	Au	<	0.002824	M	Gd	<	0.000200	M	Ni		0.001717	M	Sn	<	0.000601				
O	B	<	0.004184	M	Ge	<	0.000801	M	Os	<	0.000198	O	Sr	<	0.000313				
M	Ba	<	0.000400	M	Hf	<	0.000200	O	P	<	0.010460	M	Ta	<	0.000200				
O	Be	<	0.000104	M	Hg	<	0.000794	M	Pb		0.000807	M	Tb	<	0.000200				
M	Bi	<	0.005209	M	Ho	<	0.000200	M	Pd	<	0.000400	M	Te	<	0.005008				
O	Ca		0.002426	M	In	<	0.000200	M	Pr	<	0.000200	M	Th	<	0.000200				
M	Cd		0.001312	M	Ir	<	0.000198	M	Pt	<	0.000801	O	Ti	<	0.001255				
M	Ce	<	0.000200	O	K		0.006150	M	Rb	<	0.000200	s	Tl	<					
M	Co	<	0.000601	M	La	<	0.000200	M	Re	<	0.000200	M	Tm	<	0.000200				
M	Cr	<	0.000801	O	Li	<	0.000177	M	Rh	<	0.000200	M	U	<	0.000200				
M	Cs	<	0.003606	M	Lu	<	0.000200	M	Ru	<	0.000397	M	V	<	0.002203				
M	Cu	<	0.001001	O	Mg		0.000527	O	S	<	0.015690	M	W	<	0.000601				
M	Dy	<	0.000200	M	Mn	<	0.000801	M	Sb	<	0.000400	M	Y	<	0.000200				
M	Er	<	0.000200	M	Mo	<	0.001202	O	Sc	<	0.000711	M	Yb	<	0.000200				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 204.38 +1 6 Tl(H2O)61+

Chemical Compatibility - Soluble in HCl, HNO3, and H2SO4. Stable with most metals and inorganic anions. The sulfite, thiocyanate and oxalate are moderately soluble; the phosphate and arsenite are slightly soluble and the sulfide is insoluble.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 2-5% HNO3 / LDPE container.

Tl Containing Samples (Preparation and Solution) -Metal (Best dissolved in HNO3 which forms chiefly the Tl1+ ion.); Oxide (The thallous oxide is readily soluble in water. The thallic oxide requires high levels of acid); Ores (Carbonate fusion in Pt0 followed by HCl dissolution); Organic Matrices (Sulfuric/peroxide digestion or dry ash and dissolution in HCl).

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 205 amu	2 ppt	N/A	189Os16O
ICP-OES 190.864 nm	0.04 / 0.004 µg/mL	1	V, Ti
ICP-OES 276.787 nm	0.1 / 0.01 µg/mL	1	Ta, V, Fe, Cr
ICP-OES 351.924 nm	0.2 / 0.02 µg/mL	1	Th, Ce, Zr

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

April 08, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **April 08, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
inorganicventures.com

CERTIFICATE OF ANALYSIS

tel: 800.669.6799 · 540.585.3030
fax: 540.585.3012
info@inorganicventures.com

1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGV10
Lot Number:	R2-V688296
Matrix:	7% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Vanadium
Starting Material:	Vanadium pentoxide
Starting Material Lot#:	1782
Starting Material Purity:	99.9907%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10026 ± 30 µg/mL

Density: 1.105 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10025 ± 56 µg/mL**
ICP Assay NIST SRM 3165 Lot Number: 160906

Assay Method #2 **10027 ± 30 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.000510	M	Eu	<	0.000110	M	Na		0.095000	M	Se	<	0.002300	M	Zn		0.008900
O	Al		0.051000	O	Fe		0.350000	M	Nb	<	0.000710	O	Si		0.260000	M	Zr	<	0.002500
M	As	<	0.000410	M	Ga	<	0.007100	M	Nd	<	0.000210	M	Sm	<	0.000110				
M	Au	<	0.000410	M	Gd	<	0.000110	M	Ni		0.011000	M	Sn	<	0.003300				
M	B	<	0.006000	M	Ge	<	0.000110	M	Os	<	0.000410	M	Sr		0.001400				
M	Ba		0.001800	M	Hf	<	0.000110	O	P	<	0.120000	M	Ta	<	0.000110				
M	Be	<	0.000110	M	Hg	<	0.000310	M	Pb	<	0.002300	M	Tb	<	0.000110				
M	Bi	<	0.000610	M	Ho	<	0.000110	M	Pd	<	0.000610	M	Te	<	0.000610				
M	Ca		0.180000	M	In	<	0.000110	M	Pr	<	0.000110	M	Th	<	0.000210				
M	Cd	<	0.000410	M	Ir	<	0.000110	M	Pt	<	0.000410	M	Ti	<	0.021000				
M	Ce	<	0.000310	M	K		0.400000	M	Rb	<	0.000410	M	Tl	<	0.000110				
M	Co	<	0.001100	M	La	<	0.000110	M	Re	<	0.000110	M	Tm	<	0.000110				
O	Cr		0.190000	M	Li	<	0.001400	M	Rh	<	0.000110	M	U	<	0.000310				
M	Cs		0.005700	M	Lu	<	0.000110	M	Ru	<	0.000410	s	V	<					
M	Cu	<	0.001800	M	Mg		0.009200	n	S	<		M	W	<	0.003100				
M	Dy	<	0.000110	M	Mn		0.008700	M	Sb		0.076000	M	Y	<	0.000110				
M	Er	<	0.000110	M	Mo		0.086000	M	Sc	<	0.000310	M	Yb	<	0.000110				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 50.94 +5 6 $H_2V_{10}O_{28}^{4-}$

Chemical Compatibility -Soluble in HCl, HNO_3, H_2SO_4, HF, H_3PO_4 and strong basic media. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO_3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO_3 / LDPE container.

V Containing Samples (Preparation and Solution) -Metal (Fusion with NaOH or KOH in Ni0 or Na_2CO_3 / KNO_3); Oxides (V_2O_3 - use HCl, V_2O_4 - use HCl or HNO_3, V_2O_5 - use concentrated acids); Ores (Na_2CO_3 / KNO_3 in Pt0 caution - nitrates attack Pto followed by water extraction of fuseate); Organic Matrices (Ash at 450 EC followed by dissolving according to V_2O_5 above) .

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 51 amu	4 ppt	N/A	34S16O1H, 35Cl16O, 38Ar13C, 36Ar15N, 36Ar14N1H, 37Cl14N,36S15N, 33S18O, 34S17O, 102Ru+2,02Pd+2
ICP-OES 290.882 nm	0.008 / 0.0008 µg/mL	1	Hf, Nb
ICP-OES 292.402 nm	0.006 / 0.001 µg/mL	1	Th
ICP-OES 309.311 nm	0.005 / 0.001 µg/mL	1	Mg, U, Th

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

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11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

March 01, 2020

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **March 01, 2024**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

INORGANIC VENTURES
300 Technology Drive
Christiansburg, VA 24073 · USA
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CERTIFICATE OF ANALYSIS

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1.0 ACCREDITATION / REGISTRATION

INORGANIC VENTURES is accredited to ISO 17034, "General Requirements for the Competence of Reference Material Producers" and ISO/IEC 17025, "General Requirements for the Competence of Testing and Calibration Laboratories". Inorganic Ventures is also an ISO 9001 registered manufacturer (QSR Certificate Number QSR-1034).

ACCREDITED Testing Laboratory Certificate 883.01
ACCREDITED Reference Material Producer Certificate 883.02

2.0 PRODUCT DESCRIPTION

Product Code:	Single Analyte Custom Grade Solution
Catalog Number:	CGZN10
Lot Number:	P2-ZN686137
Matrix:	2% (v/v) HNO3
Value / Analyte(s):	10 000 µg/mL ea: Zinc
Starting Material:	Zn Shot
Starting Material Lot#:	2201
Starting Material Purity:	99.9993%

3.0 CERTIFIED VALUES AND UNCERTAINTIES

Certified Value: 10040 ± 30 µg/mL

Density: 1.033 g/mL (measured at 20 ± 4 ºC)

Assay Information:

Assay Method #1 **10009 ± 54 µg/mL**
ICP Assay NIST SRM 3168a Lot Number: 120629

Assay Method #2 **10049 ± 33 µg/mL**
EDTA NIST SRM 928 Lot Number: 928

Assay Method #3 **10041 ± 28 µg/mL**
Calculated NIST SRM Lot Number: See Sec. 4.2

- The Calculated Value is a value calculated from the weight of a starting material that has been certified directly vs. a National Institute of Standards and Technology (NIST) SRM/RM. See Sec 4.2 for balance traceability.

The following equations are used in the calculation of the certified value and the uncertainty. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k = 2.

Characterization of CRM/RM by Two or More Methods

Certified Value, $X_{CRM/RM}$, where two or more methods of characterization are used is the weighted mean of the results:

$X_{CRM/RM} = \Sigma(w_i)(X_i)$

X_i = mean of Assay Method i with standard uncertainty $u_{char\ i}$

w_i = the weighting factors for each method calculated using the inverse square of the variance:

$w_i = (1/u_{char\ i})^2 / (\Sigma(1/(u_{char\ i})^2)$

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char} = [\Sigma((w_i)^2\,(u_{char\ i})^2)]^{1/2}$ where $u_{char\ i}$ are the errors from each characterization method

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

Characterization of CRM/RM by One Method

Certified Value, $X_{CRM/RM}$, where one method of characterization is used is the mean of individual results:

$X_{CRM/RM} = (X_a)\,(u_{char\ a})$

X_a = mean of Assay Method A with

$u_{char\ a}$ = the standard uncertainty of characterization Method A

CRM/RM Expanded Uncertainty (±) = $U_{CRM/RM} = k\,(u^2_{char\ a} + u^2_{bb} + u^2_{lts} + u^2_{ts})^{1/2}$

k = coverage factor = 2

$u_{char\ a}$ = the errors from characterization

u_{bb} = bottle to bottle homogeneity standard uncertainty

u_{lts} = long term stability standard uncertainty (storage)

u_{ts} = transport stability standard uncertainty

4.0 TRACEABILITY TO NIST

- This product is traceable to NIST via an unbroken chain of comparisons. The uncertainties for each certified value are reported, taking into account the SRM/RM uncertainty error and the measurement, weighing and volume dilution errors. In rare cases where no NIST SRM/RM are available, the term 'in-house std.' is specified.

4.1 Thermometer Calibration

- All thermometers are NIST traceable through thermometers that are calibrated by an accredited calibration laboratory.

4.2 Balance Calibration

- All analytical balances are calibrated by an accredited calibration laboratory and procedure. The weights used for testing are annually compared to master weights and are traceable to NIST.

4.3 Glassware Calibration

- An in-house procedure is used to calibrate all Class A glassware used in the manufacturing and quality control of CRM/RMs.

5.0 TRACE METALLIC IMPURITIES (TMI) DETERMINED BY ICP-MS AND ICP-OES (µg/mL)

CRM/RMs are tested for trace metallic impurities by Axial ICP-OES and ICP-MS. The result from the most sensitive method for each element, is reported below. Solutions tested by ICP-MS were analyzed in an ULPA-Filtered Clean Room. An ULPA-Filter is 99.9985% efficient for the removal of particles down to 0.3 µm.

M	Ag	<	0.003057	M	Eu	<	0.000509	O	Na		0.001874	M	Se	<	0.023441	s	Zn	<	
O	Al	<	0.005720	O	Fe		0.006348	M	Nb	<	0.000509	O	Si	<	0.057200	M	Zr	<	0.000509
M	As	<	0.003057	M	Ga	<	0.007134	M	Nd	<	0.000509	M	Sm	<	0.000509				
M	Au	<	0.000510	M	Gd	<	0.000509	M	Ni	<	0.000509	M	Sn	<	0.000509				
O	B	<	0.017160	M	Ge	<	0.003057	M	Os	<	0.000510	M	Sr	<	0.000509				
M	Ba	<	0.000509	M	Hf	<	0.000509	O	P	<	0.057200	M	Ta	<	0.000509				
M	Be	<	0.000509	M	Hg	<	0.001021	O	Pb		0.023870	M	Tb	<	0.000509				
M	Bi	<	0.005095	M	Ho	<	0.000509	M	Pd	<	0.002038	M	Te	<	0.023441				
O	Ca		0.033793	M	In	<	0.000509	M	Pr	<	0.000509	M	Th	<	0.000509				
O	Cd		0.003924	M	Ir	<	0.000510	M	Pt	<	0.000509	M	Ti	<	0.000509				
M	Ce	<	0.000509	O	K		0.001499	M	Rb	<	0.002038	M	Tl	<	0.009172				
M	Co	<	0.000509	M	La	<	0.000509	M	Re	<	0.000509	M	Tm	<	0.000509				
O	Cr		0.001549	O	Li	<	0.000457	M	Rh	<	0.000509	M	U	<	0.000509				
M	Cs	<	0.000509	M	Lu	<	0.000509	M	Ru	<	0.006129	M	V	<	0.000509				
O	Cu	<	0.010296	O	Mg		0.000349	O	S	<	0.034320	M	W	<	0.001019				
M	Dy	<	0.000509	M	Mn	<	0.000509	M	Sb	<	0.001019	M	Y	<	0.000509				
M	Er	<	0.000509	M	Mo	<	0.000509	M	Sc	<	0.000509	M	Yb	<	0.000509				

M - Checked by ICP-MS O - Checked by ICP-OES i - Spectral Interference
n - Not Checked For s - Solution Standard Element

6.0 INTENDED USE

- For the calibration of analytical instruments and validation of analytical methods as appropriate.

7.0 INSTRUCTIONS FOR THE CORRECT USE OF THIS REFERENCE MATERIAL

7.1 Storage and Handling Recommendations

- Store between approximately 4° - 30° C while in sealed TCT bag.

- While stored in the sealed TCT bag, transpiration of this CRM/RM is negligible. After opening the sealed TCT bag transpiration of the CRM/RM will occur, resulting in a gradual increase in the analyte concentration(s). It is the responsibility of the user to account for this effect. When the bottle is weighed both before and after being placed in storage, the mass difference observed will be a measure of transpiration mass loss.

- After opening the sealed TCT bag, keep cap tightly sealed when not in use and store between 4° - 24° C to minimize the effects of transpiration. Use at 20° ± 4° C to minimize volumetric dilution error when using the reported density. Do not pipette from the container. Do not return removed aliquots to container.

- For more information, visit **www.inorganicventures.com/TCT**

Atomic Weight; Valence; Coordination Number; Chemical Form in Solution - 65.39 +2 4 Zn(OH)(aq)1+

Chemical Compatibility -Stable in HCl, HNO3, H2SO4 ,HF, H3PO4. Avoid basic media forming insoluble carbonate and hydroxide. Stable with most metals and inorganic anions in acidic media.

Stability - 2-100 ppb levels stable for months in 1% HNO3 / LDPE container. 1-10,000 ppm solutions chemically stable for years in 1-5% HNO3 / LDPE container.

Zn Containing Samples (Preparation and Solution) -Metal (soluble in HNO3); Oxides (Soluble in HCl); Ores (Dissolve in HCl / HNO3); Organic based (dry ash at 4500C and dissolve ash in HCl) (sulfuric/peroxide acid digestion)

Atomic Spectroscopic Information (ICP-OES D.L.s are given as radial/axial view):

Technique/Line	**Estimated D.L.**	**Order**	**Interferences** (underlined indicates severe)
ICP-MS 66 amu	7 ppt	N/A	50Ti16O,50Cr16O, 50V16O, 34S16O2, 32S16O18O, 32S17O2, 33S16O17O, 32S34S, 33S2
ICP-OES 202.548 nm	0.004/0.0002 µg/mL	1	Nb, Cu, Co, Hf
ICP-OES 206.200 nm	0.006/0.0006 µg/mL	1	Sb, Ta, Bi, Os
ICP-OES 213.856 nm	0.002/0.0004 µg/mL	1	Ni, Cu, V

8.0 HAZARDOUS INFORMATION

- Please refer to the Safety Data Sheet for information regarding this CRM/RM.

9.0 HOMOGENEITY

- This solution was mixed according to an in-house procedure and is guaranteed to be homogeneous. Homogeneity data indicate that the end user should take a minimum sample size of 0.2 mL to assure homogeneity.

10.0 QUALITY STANDARD DOCUMENTATION

10.1 ISO 9001 Quality Management System Registration

- QSR Certificate Number QSR-1034

10.2 ISO/IEC 17025 "General Requirements for the Competence of Testing and Calibration Laboratories"

- Chemical Testing - Accredited / A2LA Certificate Number 883.01

10.3 ISO 17034 "General Requirements for the Competence of Reference Material Producers"

- Reference Material Producer - Accredited / A2LA Certificate Number 883.02

Inorganic Ventures, 300 Technology Drive, Christiansburg, Va. 24073, USA; Telephone: 800.669.6799; 540.585.3030, Fax: 540.585.3012; inorganicventures.com; info@inorganicventures.com

11.0 CERTIFICATION, LOT EXPIRATION AND PERIOD OF VALIDITY

11.1 Certification Issue Date

December 05, 2019

- The certification is valid within the measurement uncertainty specified provided the CRM/RM is stored and handled in accordance with instructions given in Sec 7.1. This certification is nullified if instructions in Sec 7.1 are not followed or if the CRM/RM is damaged, contaminated, or otherwise modified.

11.2 Lot Expiration Date

- **December 05, 2023**

- The date after which this CRM/RM should not be used.

- The lot expiration date reflects the period of time that the stability of a CRM/RM can be supported by long term stability studies conducted on properly stored and handled CRM/RMs. Lot expiration is limited primarily by transpiration (loss of water from the solution) and infrequently by chemical stability.

11.3 Period of Validity

- Sealed TCT Bag Open Date: _____

- This CRM/RM should not be used longer than one year (or six months in the case of a 30 mL bottle) from the date of opening the aluminized bag or after the date given in Sec. 11.2, whichever comes first. This is contingent upon the CRM/RM being stored and handled in accordance with the instructions given in Sec. 7.1.

12.0 NAMES AND SIGNATURES OF CERTIFYING OFFICERS

Certificate Approved By:

Michael Booth
Manager, Quality Control

Certifying Officer:

Paul Gaines
CEO, Senior Technical Director

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 9060A m

LDW21-SS687

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-01 F	SDG:	21G0286
Sampled:	07/22/21 06:45	Prepared:	08/11/21 14:09	File ID:	CubeData_08162021@1103-046
% Solids:	74.81	Preparation:	PSEP 1986 (modified)	Analyzed:	08/13/21 12:41
Batch:	BJH0300	Sequence:	SJH0136	Initial/Final:	0.5671 g Wet / 0.5671 mL
Instrument:	TOC Cube			Calibration:	EH00021

CAS NO.	Analyte	Concentration (% dry)	Dilution Factor	MDL	MRL	Q
	Total Organic Carbon	1.26	1	0.02	0.02	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 9060A m

LDW21-SS625

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-02 D	SDG:	21G0286
Sampled:	07/22/21 07:50	Prepared:	08/11/21 14:09	File ID:	CubeData_08162021@1103-047
% Solids:	73.19	Preparation:	PSEP 1986 (modified)	Analyzed:	08/13/21 13:13
Batch:	BJH0300	Sequence:	SJH0136	Initial/Final:	0.7369 g Wet / 0.7369 mL
Instrument:	TOC Cube			Calibration:	EH00021

CAS NO.	Analyte	Concentration (% dry)	Dilution Factor	MDL	MRL	Q
	Total Organic Carbon	0.61	1	0.02	0.02	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 9060A m

LDW21-IT625

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-03 C	SDG:	21G0286
Sampled:	07/22/21 07:50	Prepared:	08/11/21 14:09	File ID:	CubeData_08162021@1103-052
% Solids:	88.19	Preparation:	PSEP 1986 (modified)	Analyzed:	08/13/21 16:23
Batch:	BJH0300	Sequence:	SJH0136	Initial/Final:	0.5221 g Wet / 0.5221 mL
Instrument:	TOC Cube			Calibration:	EH00021

CAS NO.	Analyte	Concentration (% dry)	Dilution Factor	MDL	MRL	Q
	Total Organic Carbon	0.22	1	0.02	0.02	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 9060A m

LDW21-SS627

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-04 D	SDG:	21G0286
Sampled:	07/22/21 08:10	Prepared:	08/11/21 14:09	File ID:	CubeData_08162021@1103-053
% Solids:	54.79	Preparation:	PSEP 1986 (modified)	Analyzed:	08/13/21 16:55
Batch:	BJH0300	Sequence:	SJH0136	Initial/Final:	0.5953 g Wet / 0.5953 mL
Instrument:	TOC Cube			Calibration:	EH00021

CAS NO.	Analyte	Concentration (% dry)	Dilution Factor	MDL	MRL	Q
	Total Organic Carbon	2.06	1	0.02	0.02	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
EPA 9060A m

LDW21-SS646

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-05 D	SDG:	21G0286
Sampled:	07/22/21 11:50	Prepared:	08/11/21 14:09	File ID:	CubeData_08162021@1103-054
% Solids:	65.53	Preparation:	PSEP 1986 (modified)	Analyzed:	08/13/21 17:26
Batch:	BJH0300	Sequence:	SJH0136	Initial/Final:	0.5642 g Wet / 0.5642 mL
Instrument:	TOC Cube			Calibration:	EH00021

CAS NO.	Analyte	Concentration (% dry)	Dilution Factor	MDL	MRL	Q
	Total Organic Carbon	1.08	1	0.02	0.02	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

EPA 9060A m

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Batch:	BJH0300	Batch Matrix:	Solid	Preparation:	PSEP 1986 (modified)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS687	21G0286-01	eData_08162021@1103-	08/11/21 14:09	
LDW21-SS625	21G0286-02	eData_08162021@1103-	08/11/21 14:09	
LDW21-IT625	21G0286-03	eData_08162021@1103-	08/11/21 14:09	
LDW21-SS627	21G0286-04	eData_08162021@1103-	08/11/21 14:09	
LDW21-SS646	21G0286-05	eData_08162021@1103-	08/11/21 14:09	
Blank	BJH0300-BLK1	eData_08162021@1103-	08/11/21 14:09	
LCS	BJH0300-BS1	eData_08162021@1103-	08/11/21 14:09	
MRL Check	BJH0300-MRL1	eData_08162021@1103-	08/11/21 14:09	
Reference	BJH0300-SRM1	eData_08162021@1103-	08/11/21 14:09	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I

METHOD BLANK DATA SHEET

EPA 9060A m

TotalAnalytes

Blank

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Batch: BJH0300
Laboratory ID: BJH0300-BLK1
Prepared: 08/11/21 14:09
Matrix: Solid
Preparation: PSEP 1986 (modified)
Analyzed: 08/13/21 00:35
Sequence: SJH0136
Calibration: EH00021
Instrument: TOC Cube

CAS NO.	Analyte	Concentration (% wet)	Dilution Factor	MDL	MRL	Q
	Total Organic Carbon	ND	1	0.02	0.02	U

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LCS / LCS DUPLICATE RECOVERY

EPA 9060A m

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/13/21 01:07
Batch:	BJH0300	Laboratory ID:	BJH0300-BS1
Preparation:	PSEP 1986 (modified)	Sequence Name:	LCS
Initial/Final:	0.0208 g / 0.0208 mL		

COMPOUND	SPIKE ADDED (% wet)	LCS CONCENTRATION (% wet)	Q	LCS % REC. #	QC LIMITS REC.
Total Organic Carbon	44.4	44.5		100	80 - 120

* Indicates values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 9060A m

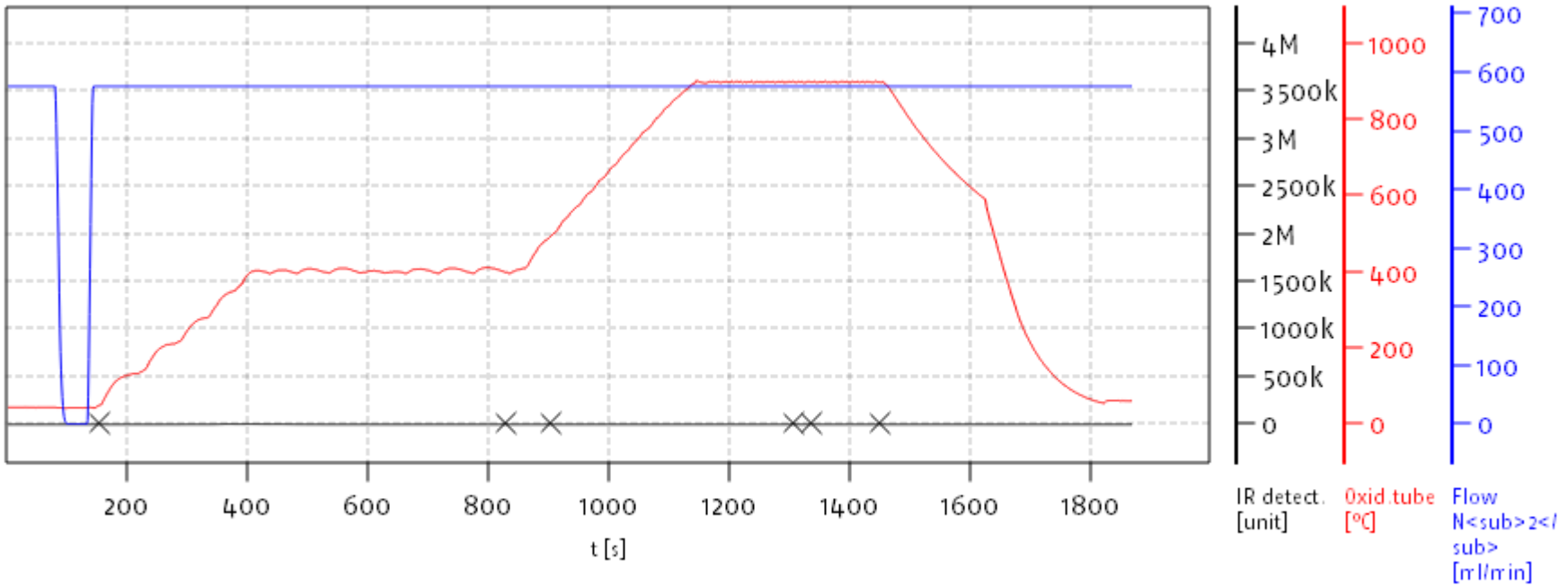
Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0113	Instrument:	TOC Cube
		Calibration:	EH00021

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Cal Standard	SJH0113-CAL1	peData_08112021@1352-(	NA	08/10/21 14:19
Cal Standard	SJH0113-CAL2	peData_08112021@1352-(	NA	08/10/21 14:51
Cal Standard	SJH0113-CAL3	peData_08112021@1352-(	NA	08/10/21 15:22
Cal Standard	SJH0113-CAL4	peData_08112021@1352-(	NA	08/10/21 15:54
Cal Standard	SJH0113-CAL5	peData_08112021@1352-(	NA	08/10/21 16:25
Cal Standard	SJH0113-CAL6	peData_08112021@1352-(	NA	08/10/21 16:57
Cal Standard	SJH0113-CAL7	peData_08112021@1352-(	NA	08/10/21 17:28
Cal Standard	SJH0113-CAL8	peData_08112021@1352-(	NA	08/10/21 18:00
Cal Standard	SJH0113-CAL9	peData_08112021@1352-(	NA	08/10/21 18:32
Cal Standard	SJH0113-CALA	peData_08112021@1352-(	NA	08/10/21 19:03
Cal Standard	SJH0113-CALB	peData_08112021@1352-(	NA	08/10/21 19:34
Cal Standard	SJH0113-CALC	peData_08112021@1352-(	NA	08/10/21 20:06
Cal Standard	SJH0113-CALD	peData_08112021@1352-(	NA	08/10/21 20:37
Cal Standard	SJH0113-CALE	peData_08112021@1352-(	NA	08/10/21 21:08
Cal Standard	SJH0113-CALF	peData_08112021@1352-(	NA	08/10/21 21:40
Cal Standard	SJH0113-CALG	peData_08112021@1352-(	NA	08/10/21 22:11
Cal Standard	SJH0113-CALH	peData_08112021@1352-(	NA	08/10/21 22:42
Cal Standard	SJH0113-CALI	peData_08112021@1352-(	NA	08/10/21 23:14
Cal Standard	SJH0113-CALJ	peData_08112021@1352-(	NA	08/10/21 23:45
Cal Standard	SJH0113-CALK	peData_08112021@1352-(	NA	08/11/21 00:16
Cal Standard	SJH0113-CALL	peData_08112021@1352-(	NA	08/11/21 00:48
Cal Standard	SJH0113-CALM	peData_08112021@1352-(	NA	08/11/21 01:19
Cal Standard	SJH0113-CALN	peData_08112021@1352-(	NA	08/11/21 01:50
Cal Standard	SJH0113-CALO	peData_08112021@1352-(	NA	08/11/21 02:22
Initial Cal Check	SJH0113-ICV1	peData_08112021@1352-(	NA	08/11/21 04:27
Initial Cal Blank	SJH0113-ICB1	peData_08112021@1352-(	NA	08/11/21 04:59

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
1	1	BLANK	1.00		1.00	CARBON	8/10/2021 1:17 PM	0.000	0.000	0.000	bl	22 805	4 168	1 160	1.0000	1.0000



Name:

Access: soliTOC superuser

Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

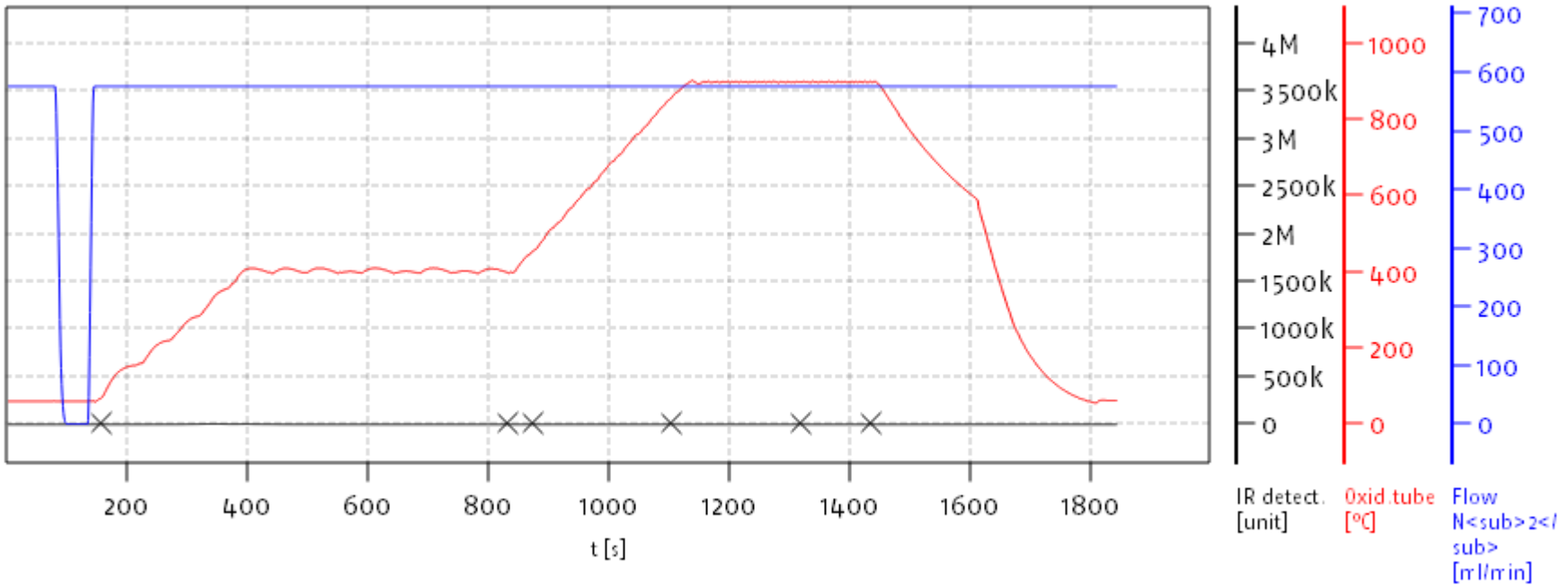
elementar
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00021 081021BF from: --.--.-- (modified)

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
2	2	BLANK	1.00		1.00	CARBON	8/10/2021 1:48 PM	0.000	0.000	0.000	bl	25 029	584	417	1.0000	1.0000



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Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

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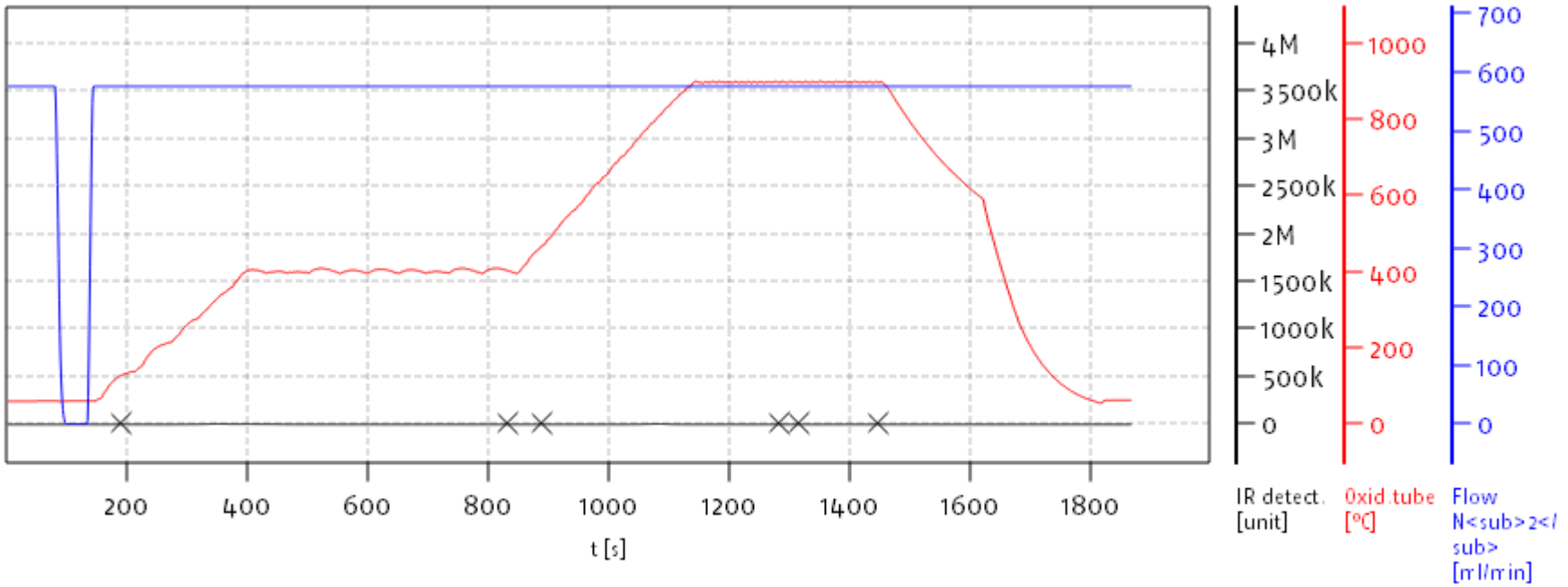
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
3	3	SJH0113-CAL1	200.00	0.0028	1.00	CARBON	8/10/2021 2:19 PM	0.022	0.010	0.032	bl,C2u	22 693	9 521	406	1.0000	1.0000



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soliTOC V2.0.2 (31015f9) 2018-11-19
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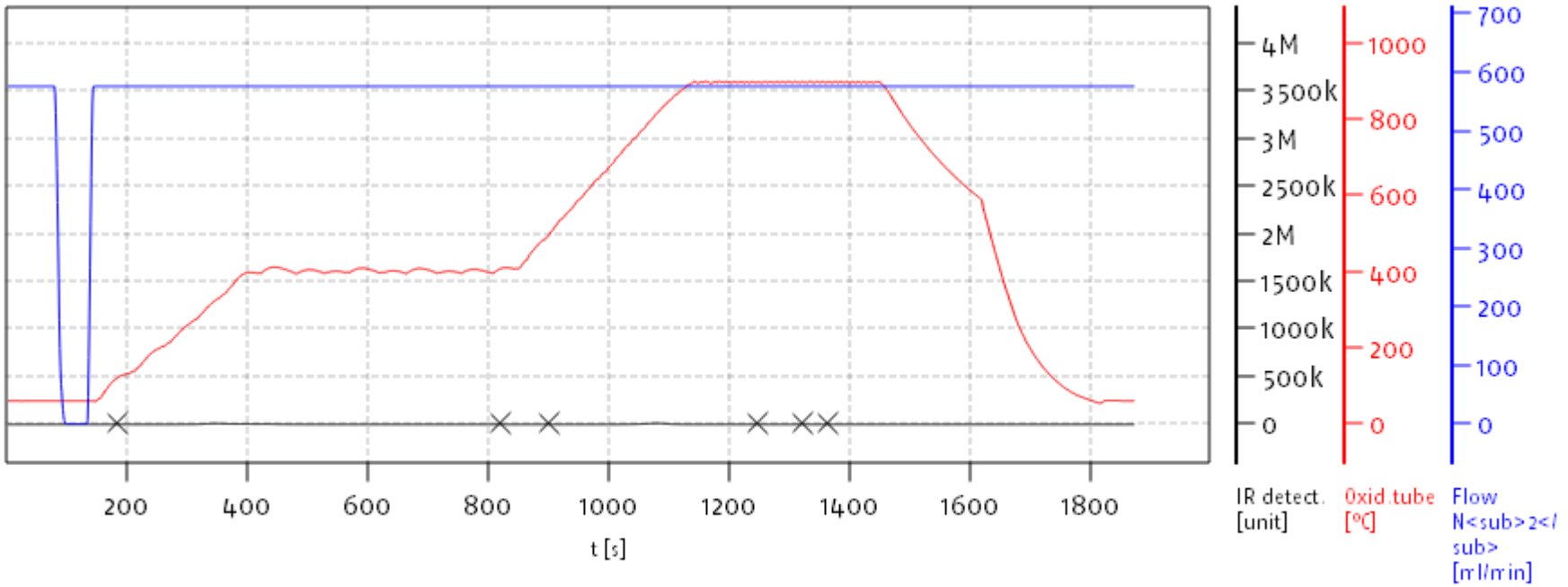
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
4	4	SJH0113-CAL2	200.00	0.0053	1.00	CARBON	8/10/2021 2:51 PM	0.029	0.018	0.046	bl,C2u	30 832	20 112	139	1.0000	1.0000



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Date: Wed Aug 11 13:04:23 2021

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Serial No: 0300.181017
Mode CCC

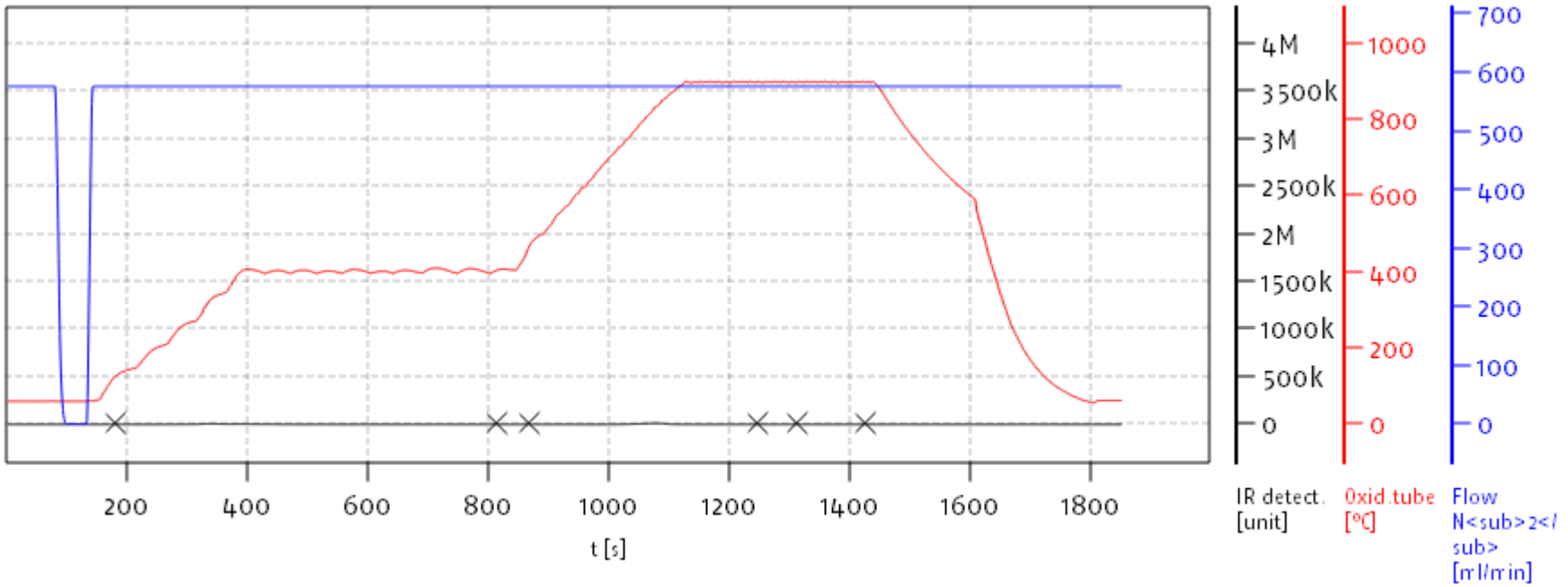
elementar
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00021 081021BF from: --.--.-- (modified)

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
5	5	SJH0113-CAL3	200.00	0.0070	1.00	CARBON	8/10/2021 3:22 PM	0.022	0.021	0.043	bl,C2u	22 146	23 616	314	1.0000	1.0000



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Date: Wed Aug 11 13:04:23 2021

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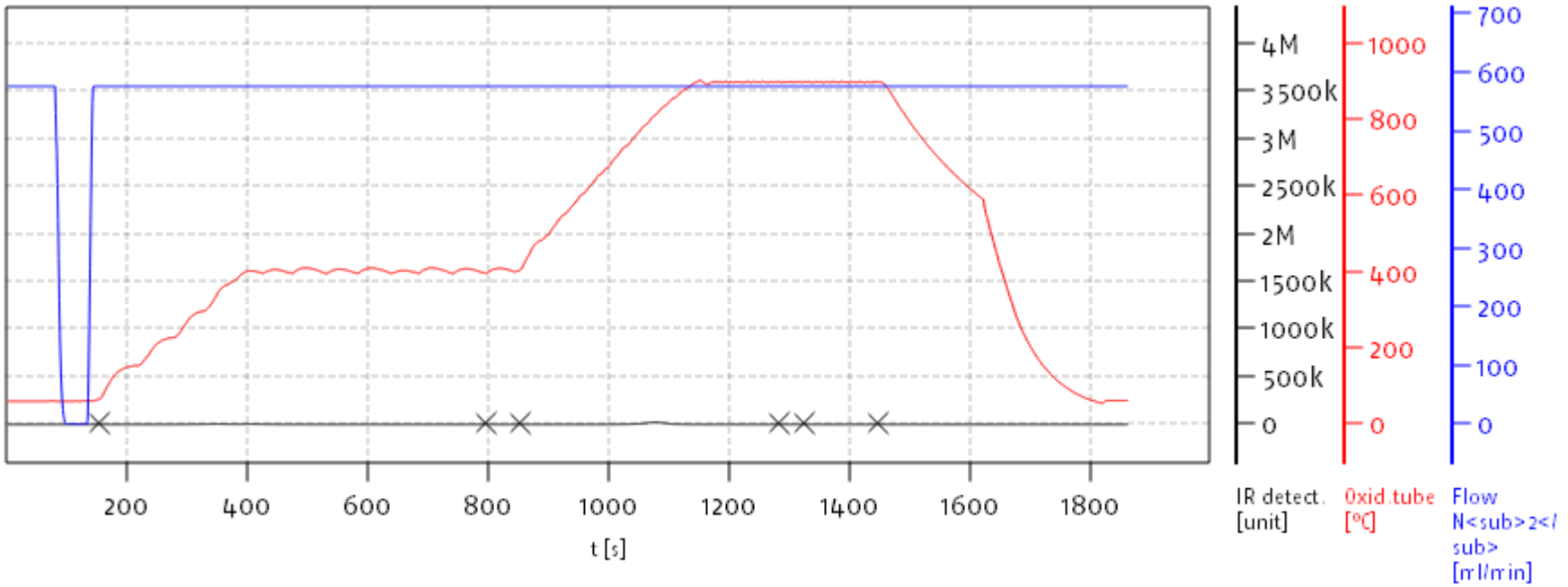
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
6	6	SJH0113-CAL4	200.00	0.0103	1.00	CARBON	8/10/2021 3:54 PM	0.018	0.032	0.050	bl,C2u	17 342	38 128	280	1.0000	1.0000



Name:

Access: soliTOC superuser

Date: Wed Aug 11 13:04:23 2021

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Serial No: 0300.181017
Mode CCC

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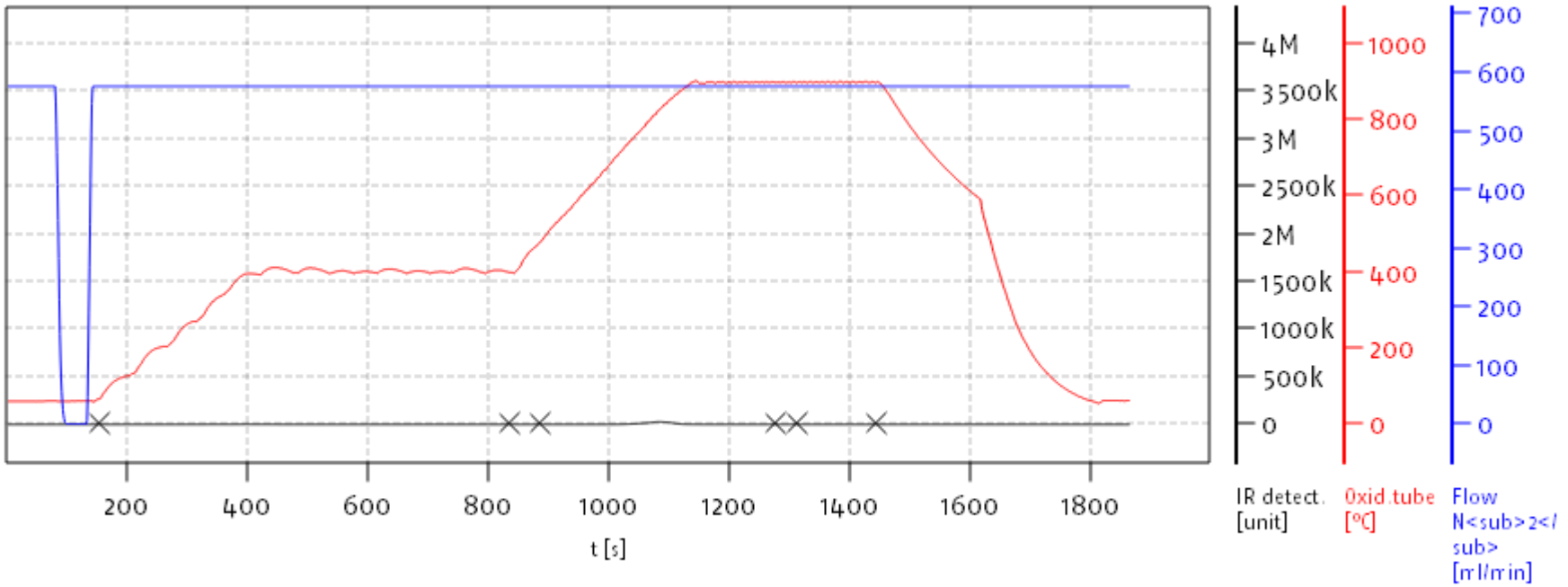
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00021 081021BF from: --.--.-- (modified)

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
7	7	SJH0113-CAL5	200.00	0.0150	1.00	CARBON	8/10/2021 4:25 PM	0.009	0.046	0.055	bl,C1u,C2u	6 405	55 349	275	1.0000	1.0000



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Access: soliTOC superuser

Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

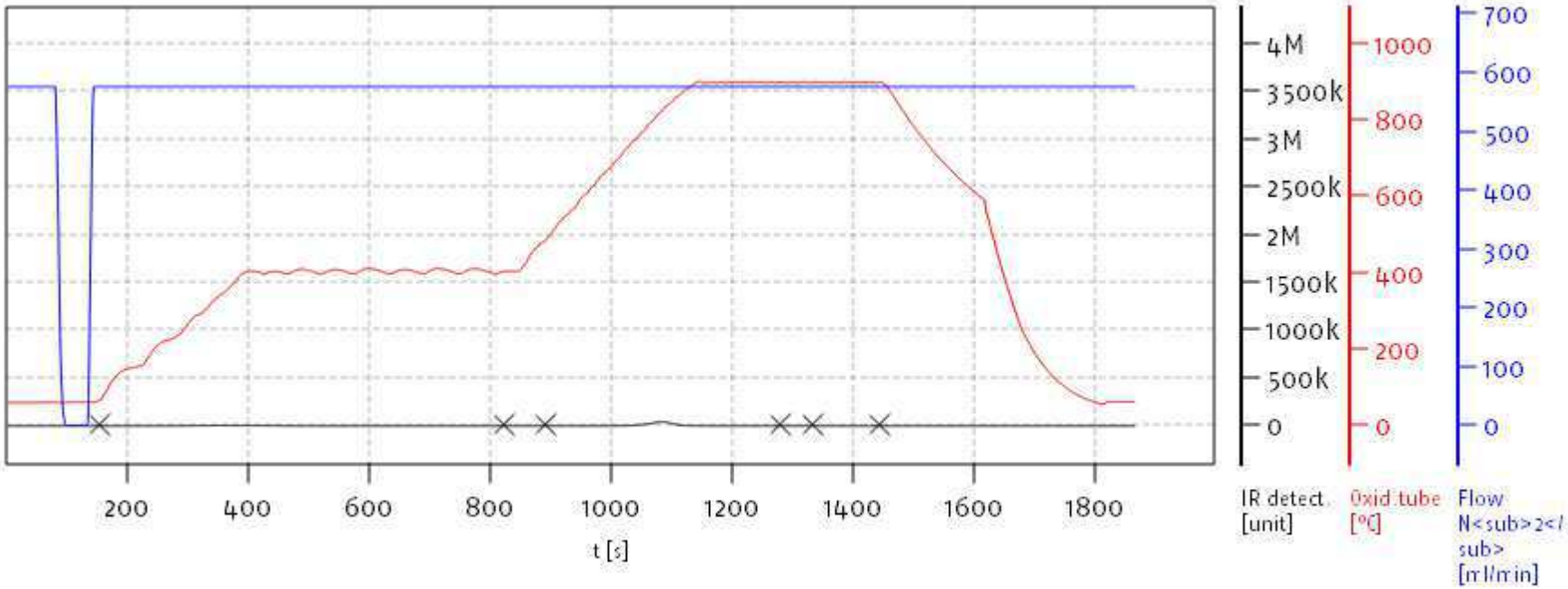
elementar
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00021 081021BF from: --.--.-- (modified)

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
8	8	SJH0113-CAL6	200.00	0.0199	1.00	CARBON	8/10/2021 4:57 PM	0.024	0.063	0.087	bl,C2u	25 078	76 805	308	1.0000	1.0000



Name:

Access: soliTOC superuser

Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

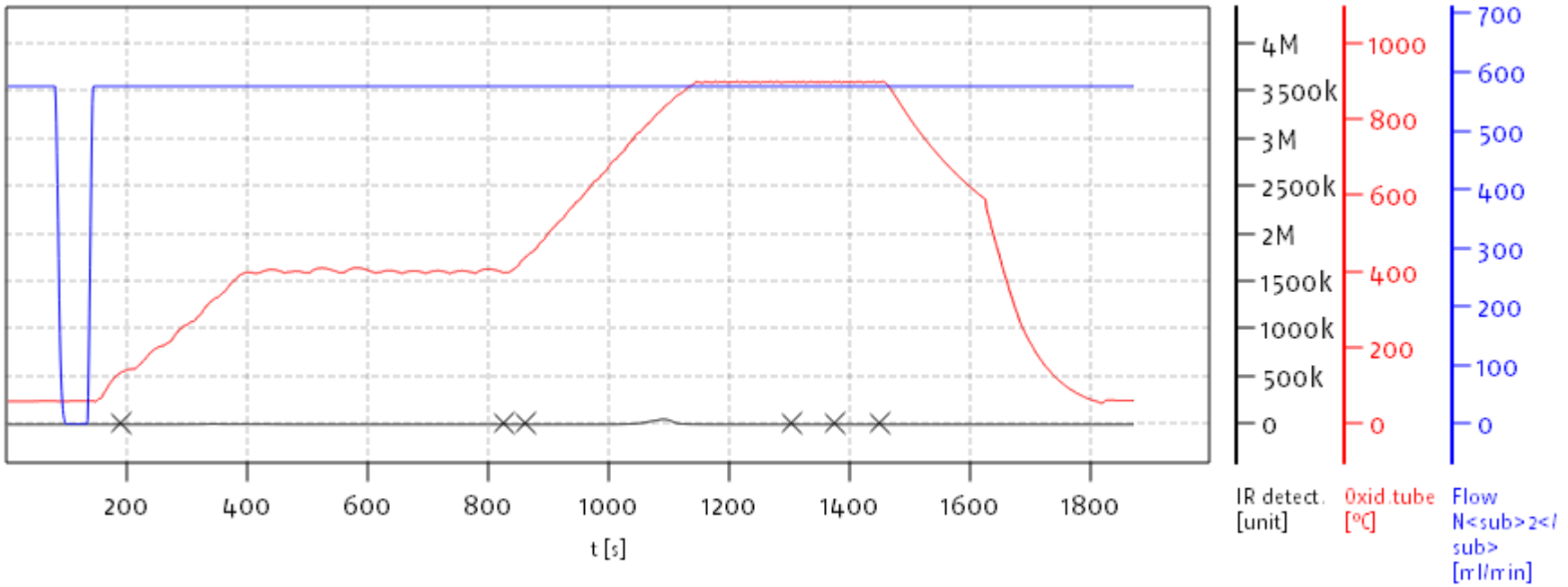
elementar
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00021 081021BF from: --.--.-- (modified)

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
9	9	SJH0113-CAL7	200.00	0.0248	1.00	CARBON	8/10/2021 5:28 PM	0.017	0.079	0.096	bl,C2u	16 608	97 209	190	1.0000	1.0000



Name:

Access: soliTOC superuser

Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

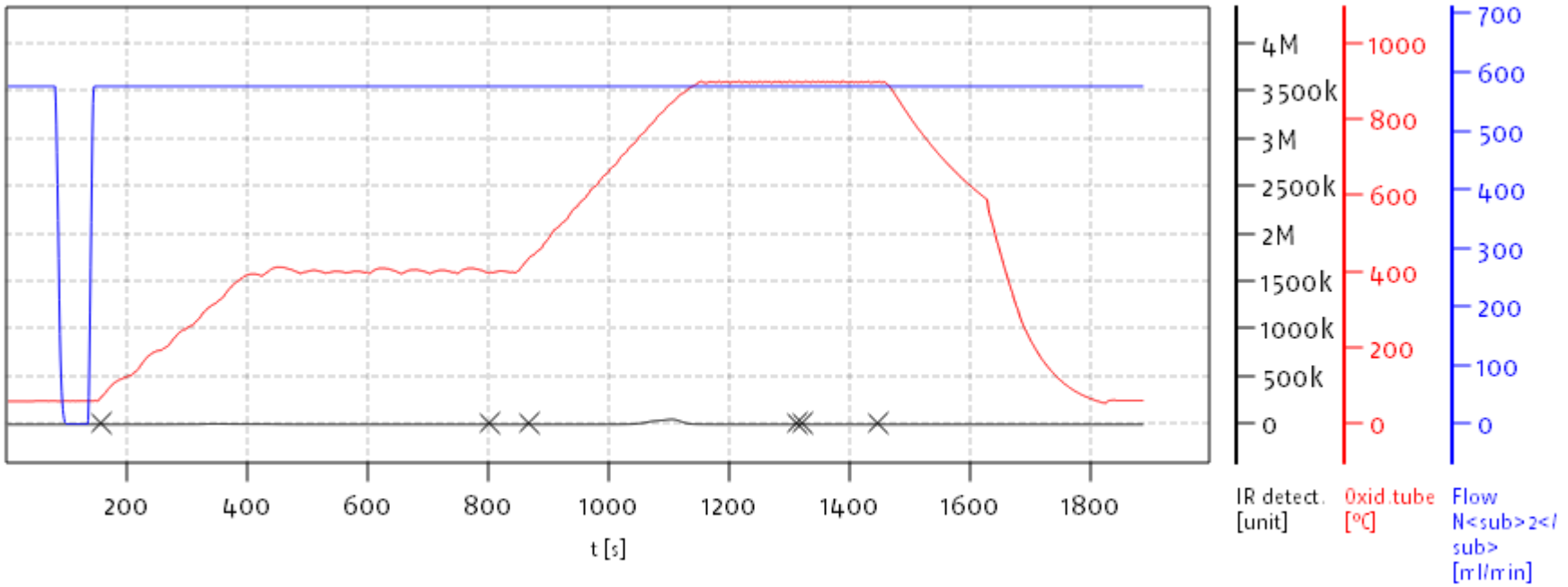
elementar
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00021 081021BF from: --.--.-- (modified)

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
10	10	SJH0113-CAL8	200.00	0.0302	1.00	CARBON	8/10/2021 6:00 PM	0.024	0.092	0.116	bl,C2u	24 582	114 459	270	1.0000	1.0000



Name:

Access: soliTOC superuser

Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

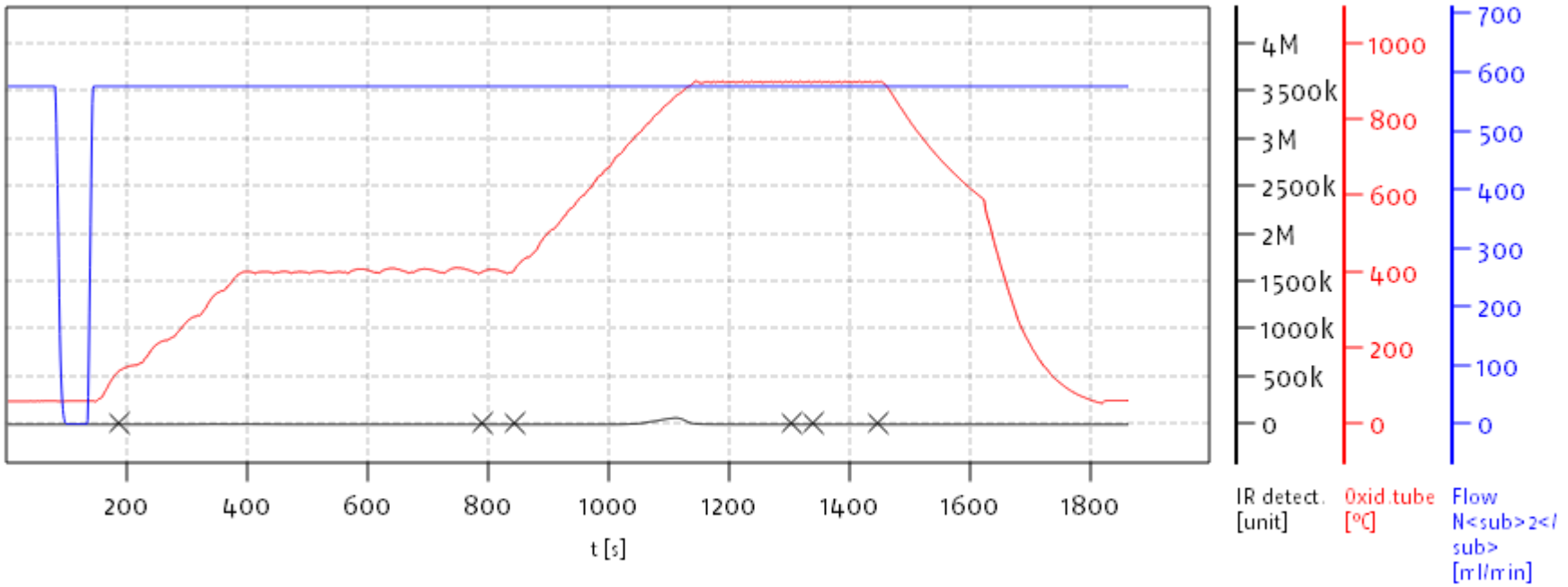
elementar
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00021 081021BF from: --.--.-- (modified)

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
11	11	SJH0113-CAL9	200.00	0.0397	1.00	CARBON	8/10/2021 6:32 PM	0.014	0.118	0.132	bl,C2u	12 556	147 448	246	1.0000	1.0000



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soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

elementar
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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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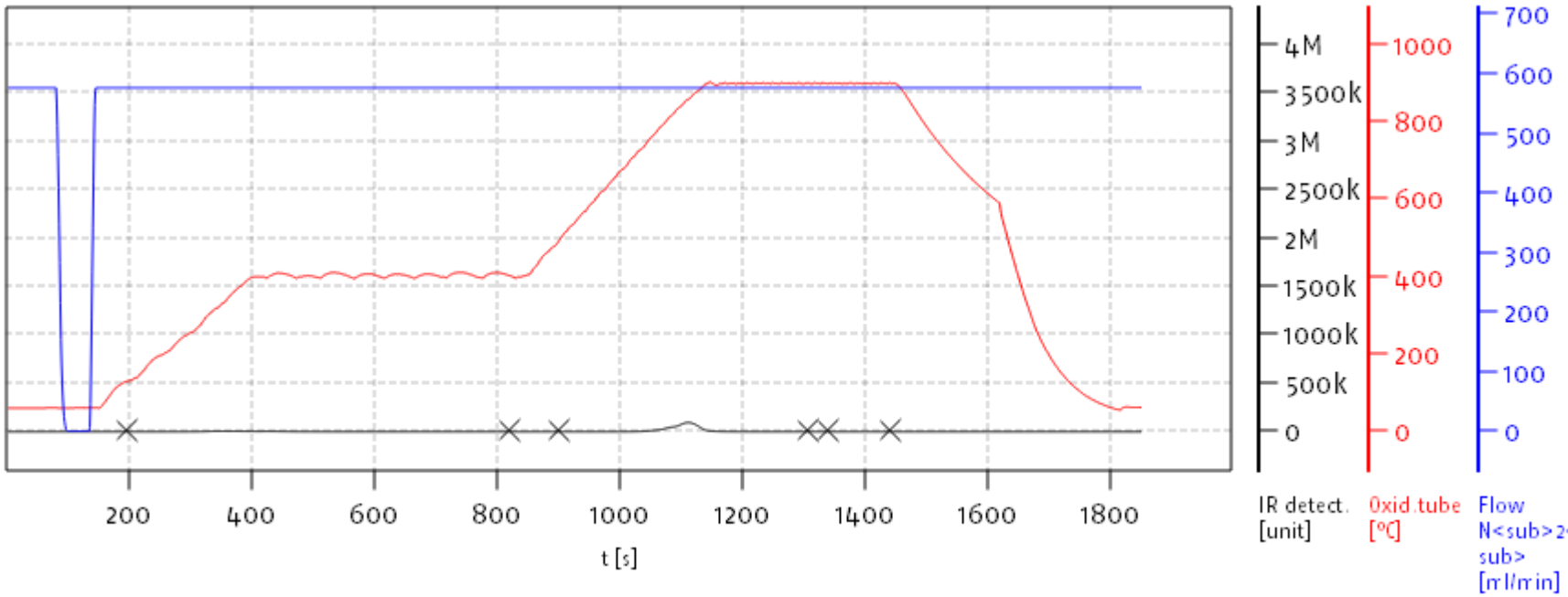
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
12	12	SJH0113-CALA	200.00	0.0497	1.00	CARBON	8/10/2021 7:03 PM	0.024	0.145	0.168	bl,C2u	24 575	180 758	227	1.0000	1.0000



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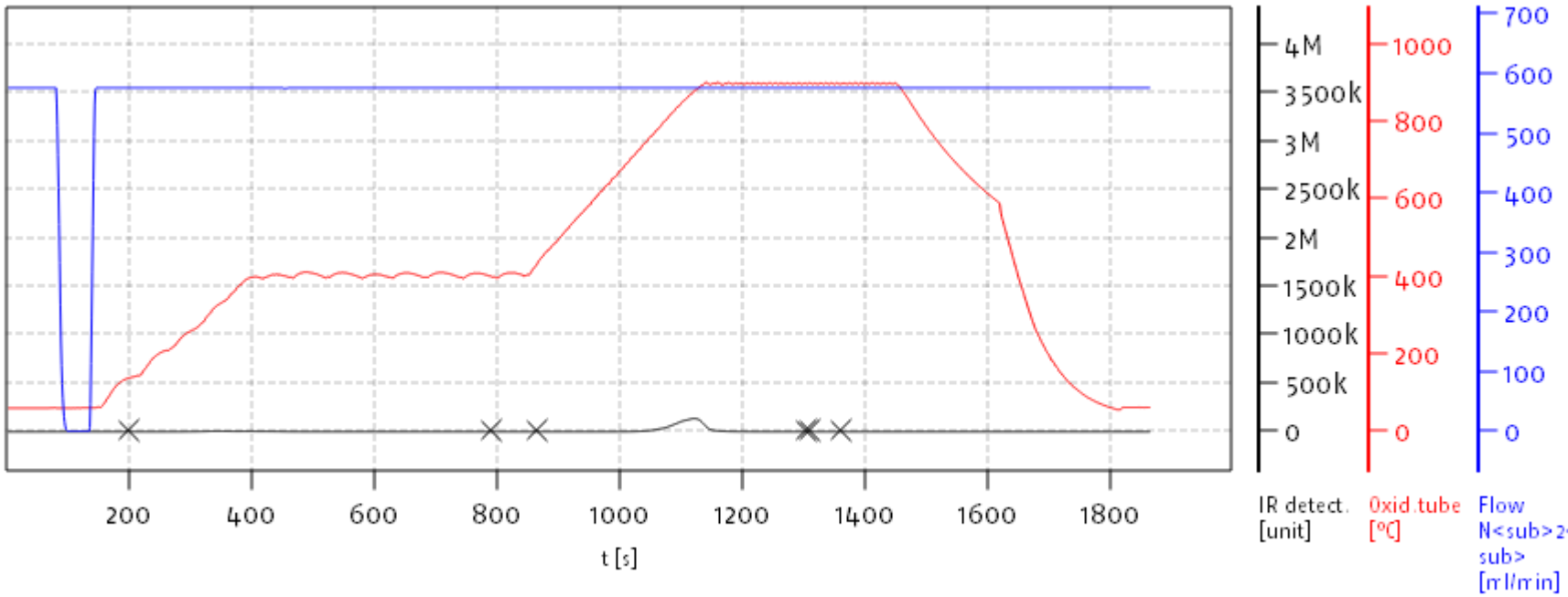
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
13	13	SJH0113-CALB	200.00	0.0039	1.00	CARBON	8/10/2021 7:34 PM	0.023	0.236	0.260	bl,C2u	24 401	297 056	121	1.0000	1.0000



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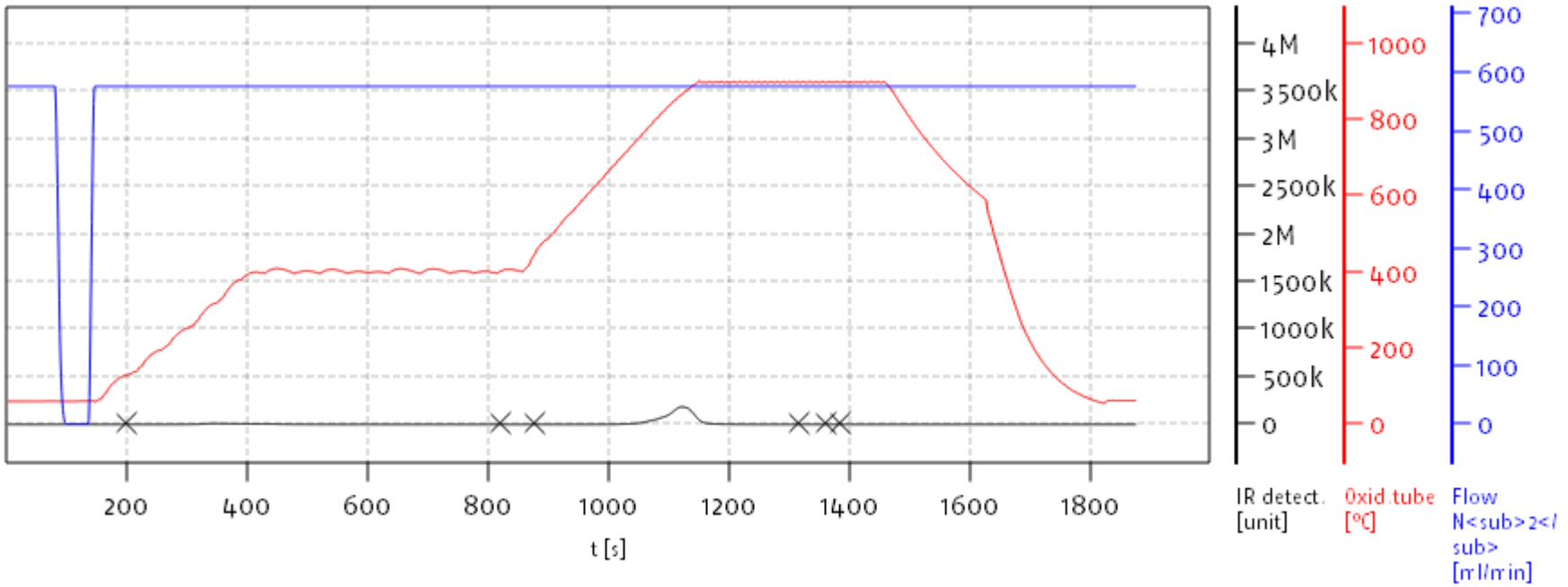
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
14	14	SJH0113-CALC	200.00	0.0052	1.00	CARBON	8/10/2021 8:06 PM	0.036	0.311	0.347	bl,C2u	40 501	391 829	67	1.0000	1.0000



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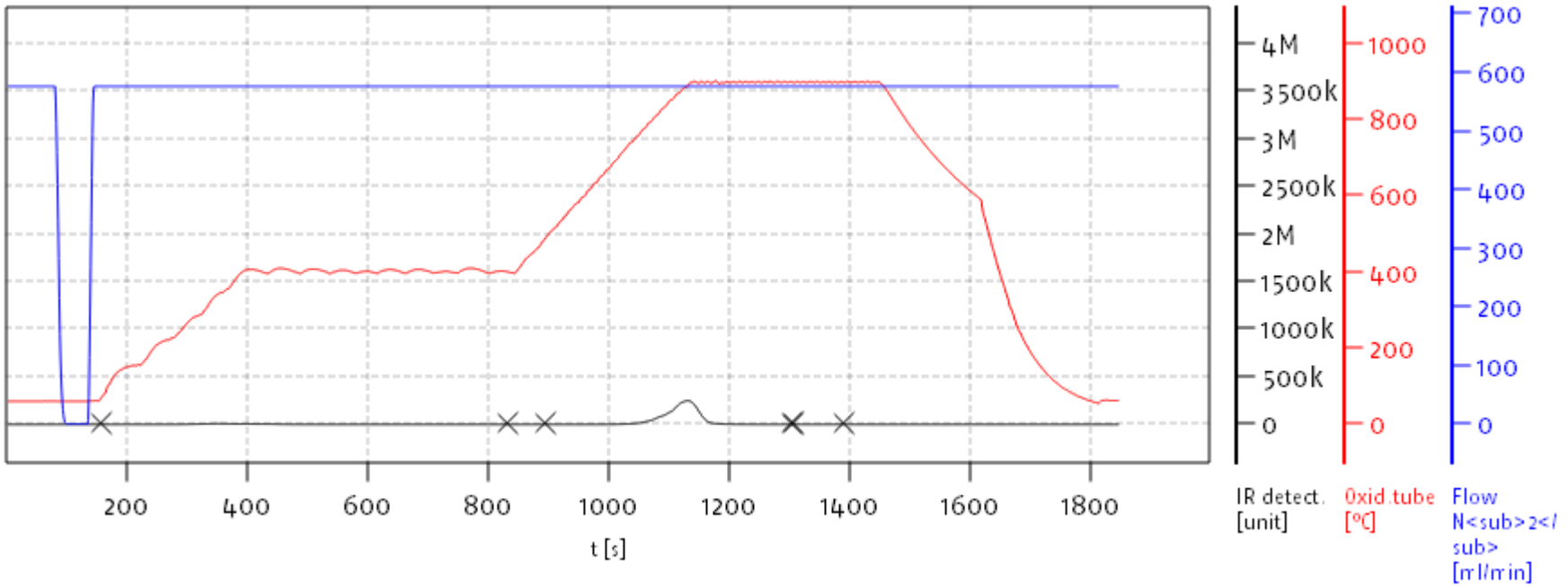
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
15	15	SJH0113-CALD	200.00	0.0072	1.00	CARBON	8/10/2021 8:37 PM	0.032	0.439	0.470	bl,C2u	34 638	553 926	294	1.0000	1.0000



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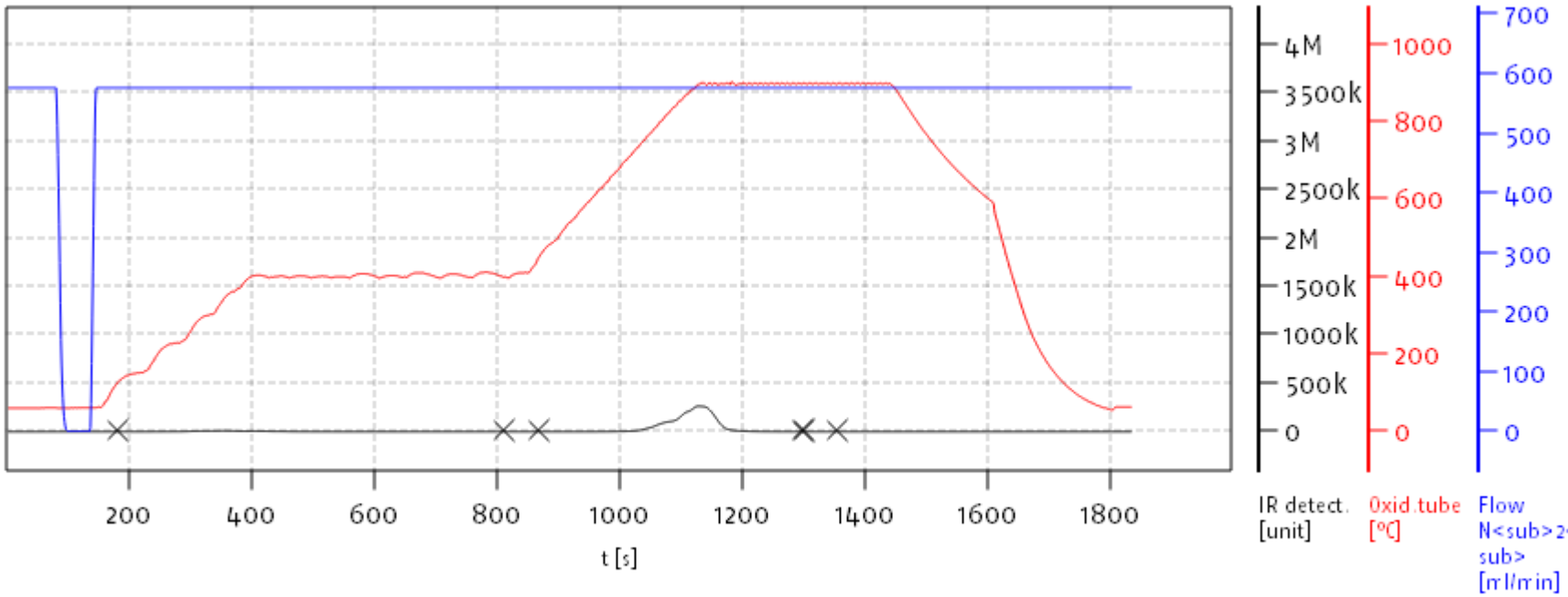
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
16	16	SJH0113-CALE	200.00	0.0098	1.00	CARBON	8/10/2021 9:08 PM	0.037	0.592	0.630	bl,C2u	42 067	748 510	251	1.0000	1.0000



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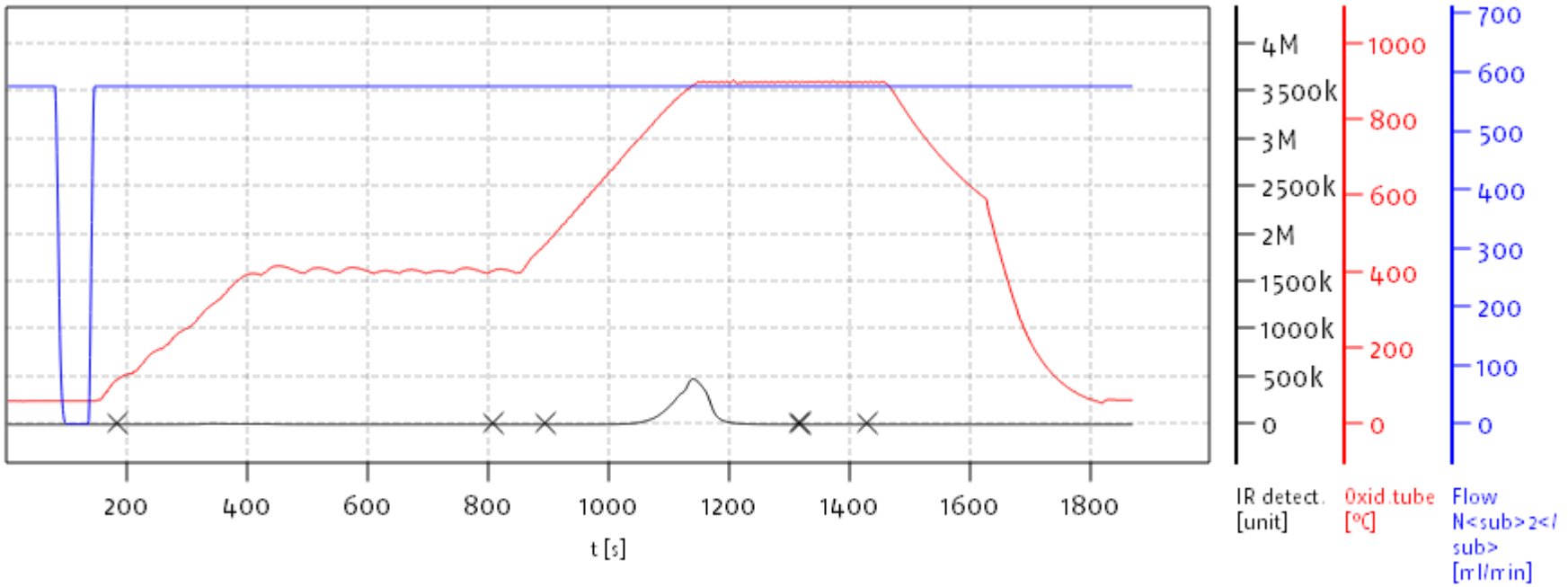
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
17	17	SJH0113-CALF	200.00	0.0150	1.00	CARBON	8/10/2021 9:40 PM	0.030	0.934	0.964	bl,C2u	32 751	1 182 576	479	1.0000	1.0000



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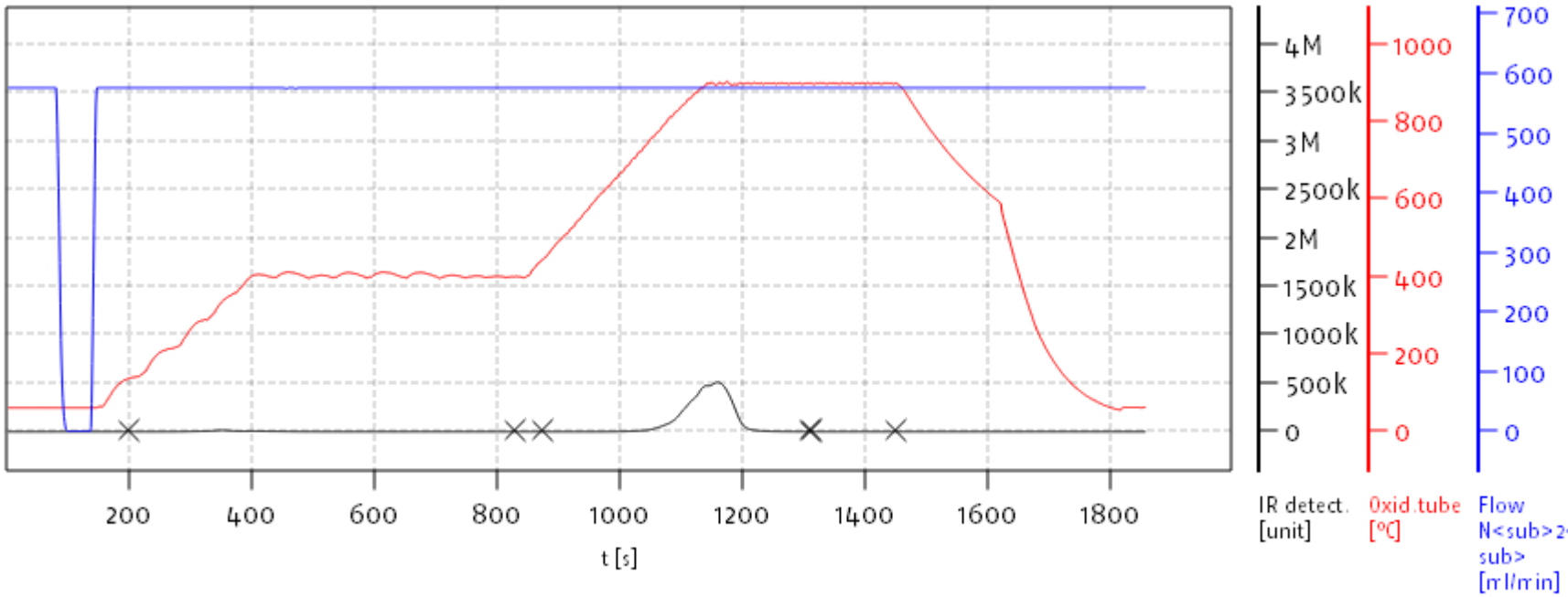
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
18	18	SJH0113-CALG	200.00	0.0203	1.00	CARBON	8/10/2021 10:11 PM	0.039	1.249	1.287	bl,C2u	42 932	1 581 667	955	1.0000	1.0000



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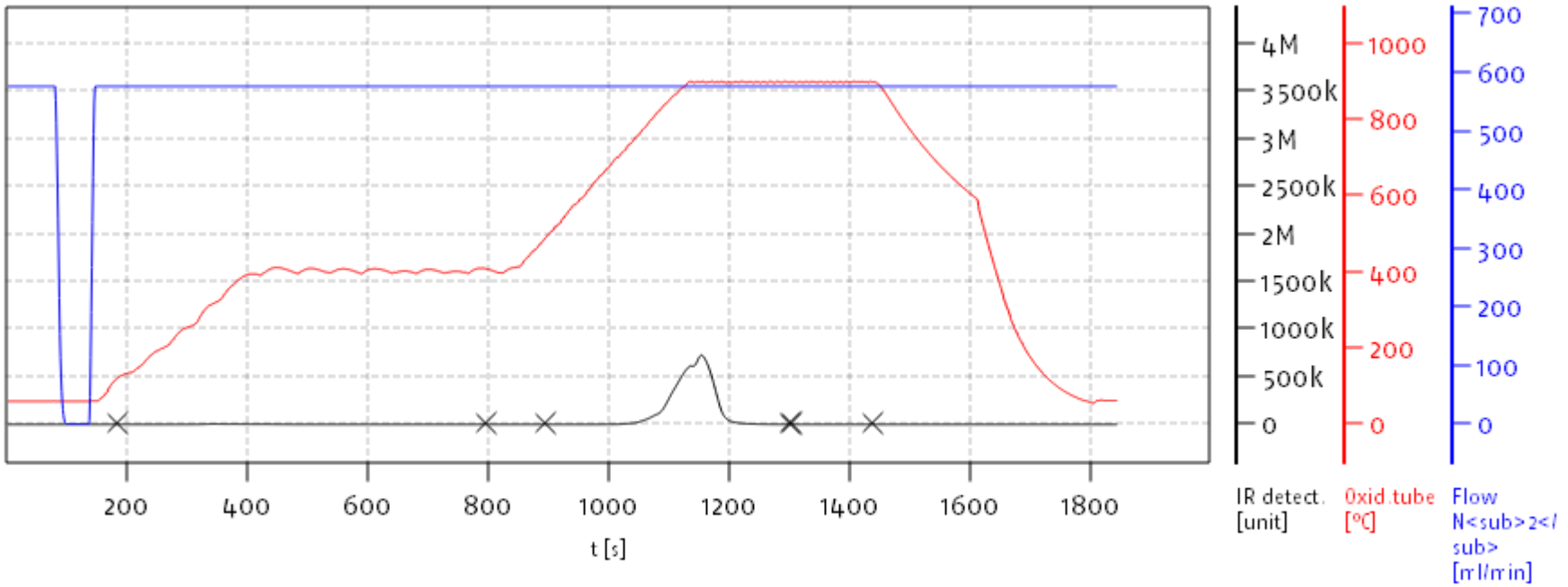
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
19	19	SJH0113-CALH	200.00	0.0251	1.00	CARBON	8/10/2021 10:42 PM	0.019	1.538	1.557	bl,C2u	17 895	1 948 888	1 191	1.0000	1.0000



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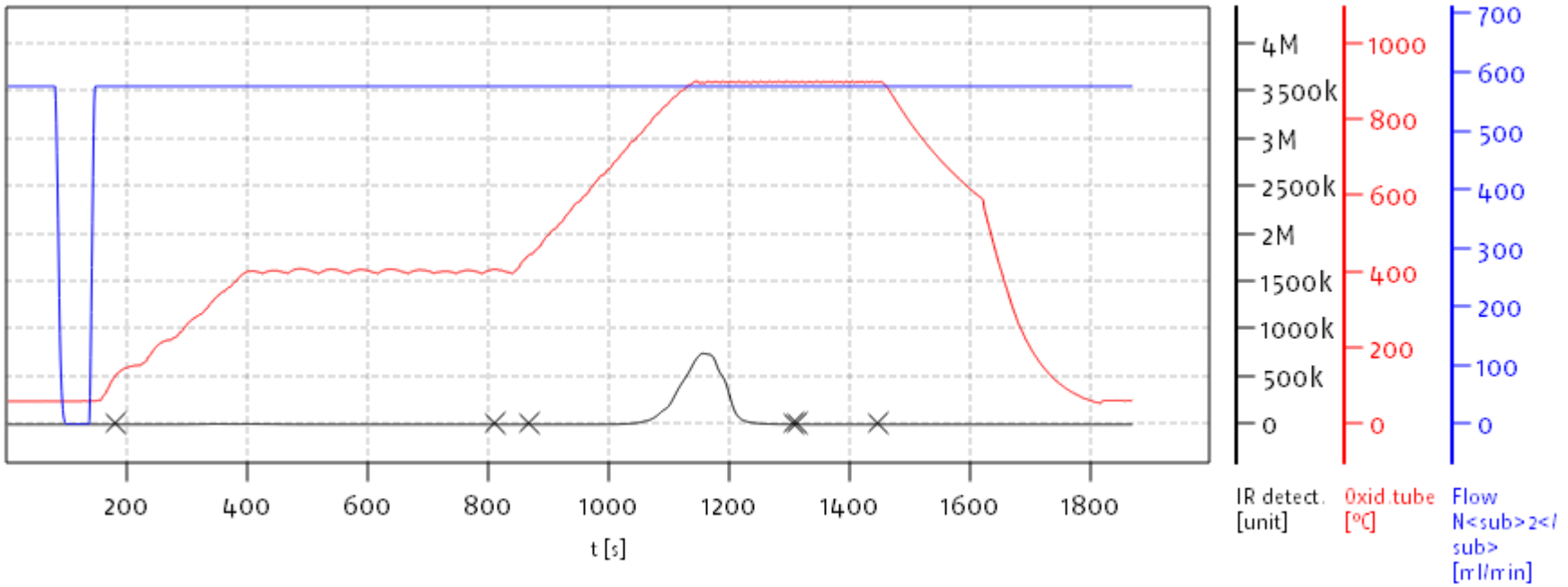
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
20	20	SJH0113-CALI	200.00	0.0304	1.00	CARBON	8/10/2021 11:14 PM	0.024	1.868	1.892	bl,C2u	23 738	2 367 098	1 836	1.0000	1.0000



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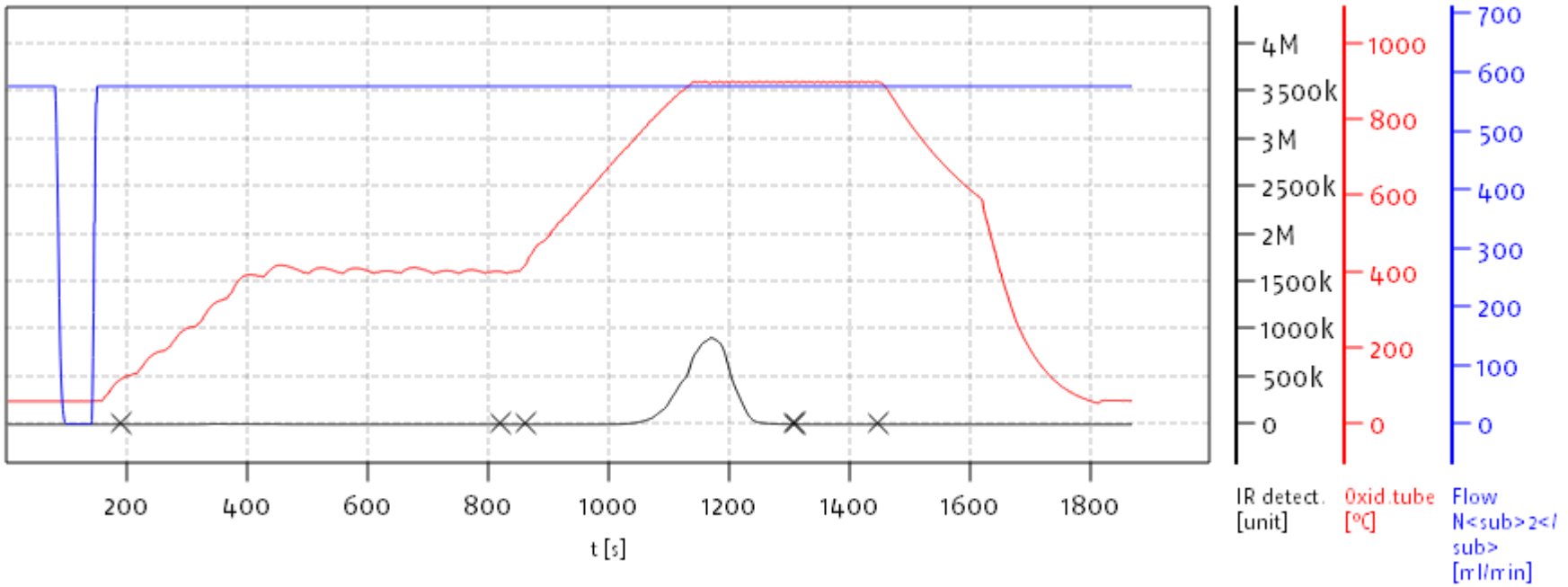
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
21	21	SJH0113-CALJ	200.00	0.0399	1.00	CARBON	8/10/2021 11:45 PM	0.023	2.454	2.477	bl,C2u	21 349	3 110 916	2 579	1.0000	1.0000



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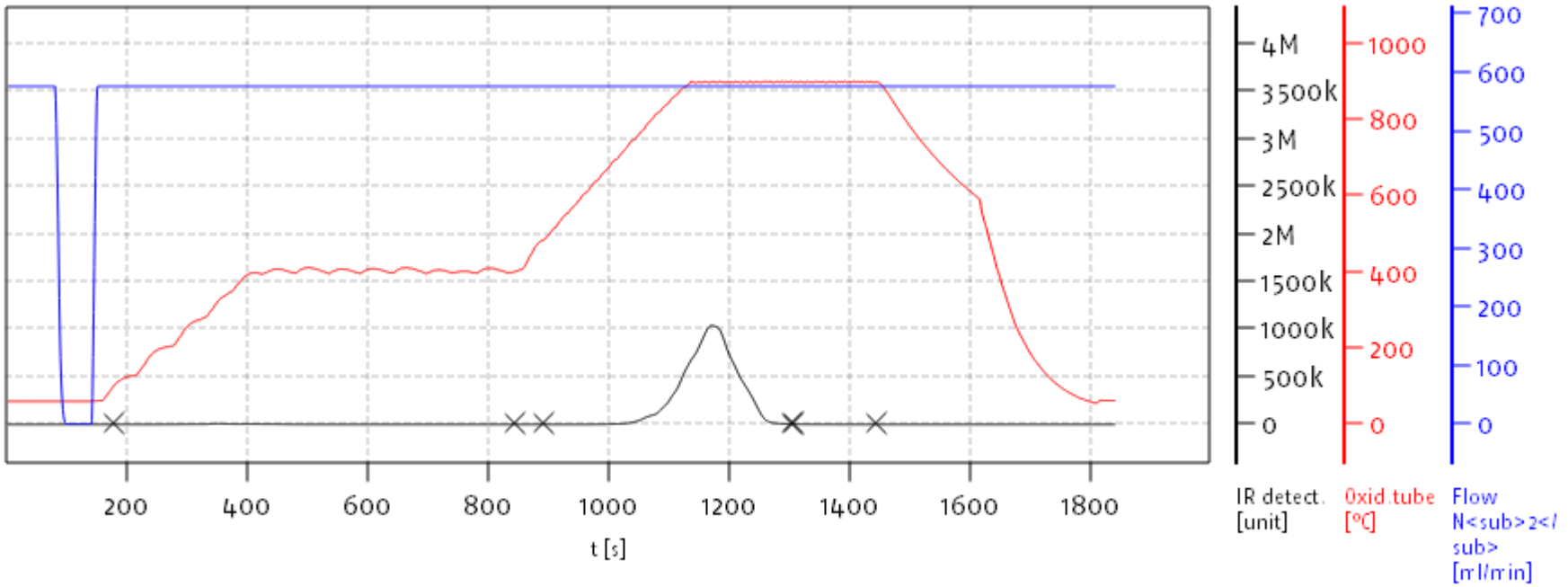
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
22	22	SJH0113-CALK	200.00	0.0500	1.00	CARBON	8/11/2021 12:16 AM	0.030	3.054	3.084	bl,C2u	29 231	3 872 043	4 133	1.0000	1.0000



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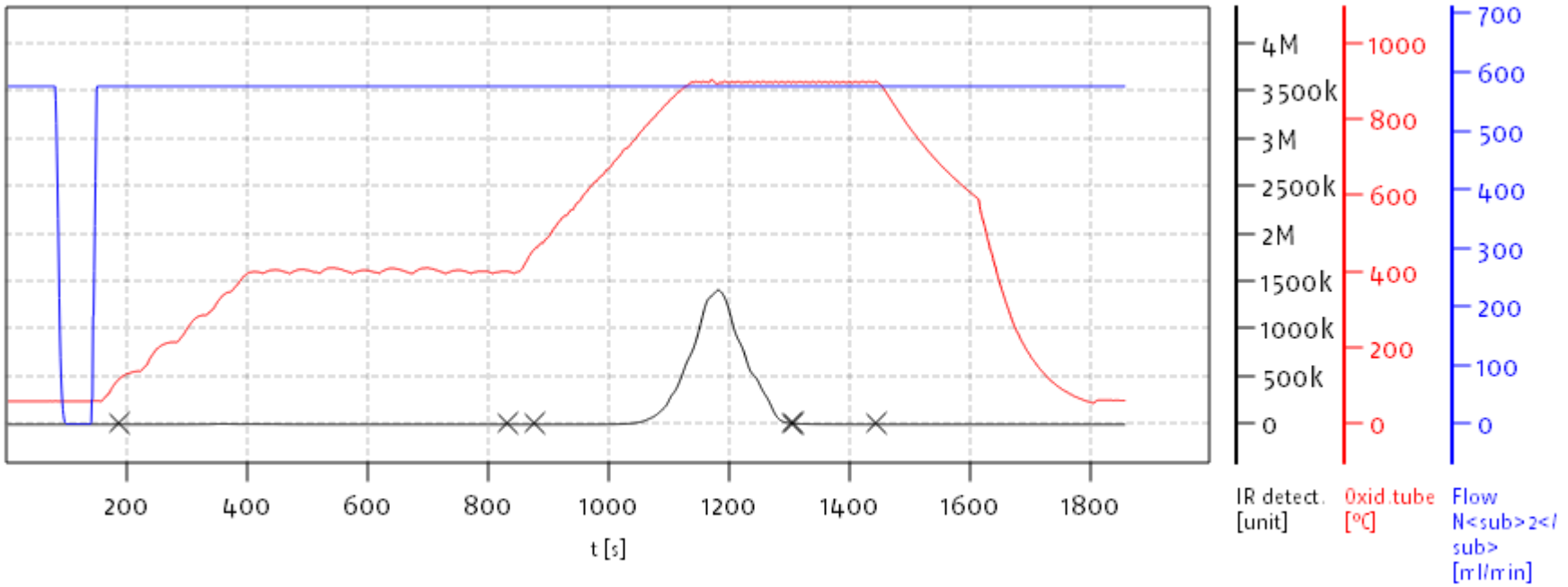
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
23	23	SJH0113-CALL	200.00	0.0699	1.00	CARBON	8/11/2021 12:48 AM	0.028	4.289	4.317	bl	19 838	5 438 583	10 830	1.0000	1.0000



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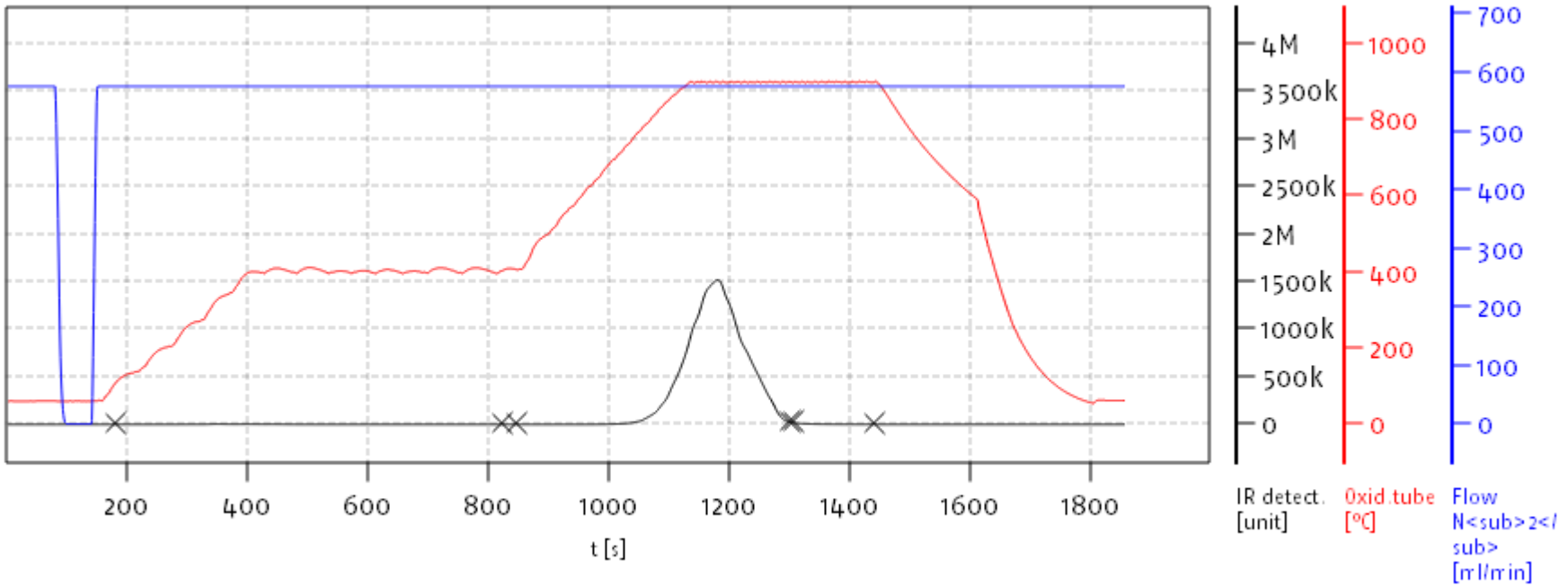
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
24	24	SJH0113-CALM	200.00	0.0801	1.00	CARBON	8/11/2021 1:19 AM	0.030	4.919	4.949	bl	16 438	6 238 324	16 703	1.0000	1.0000



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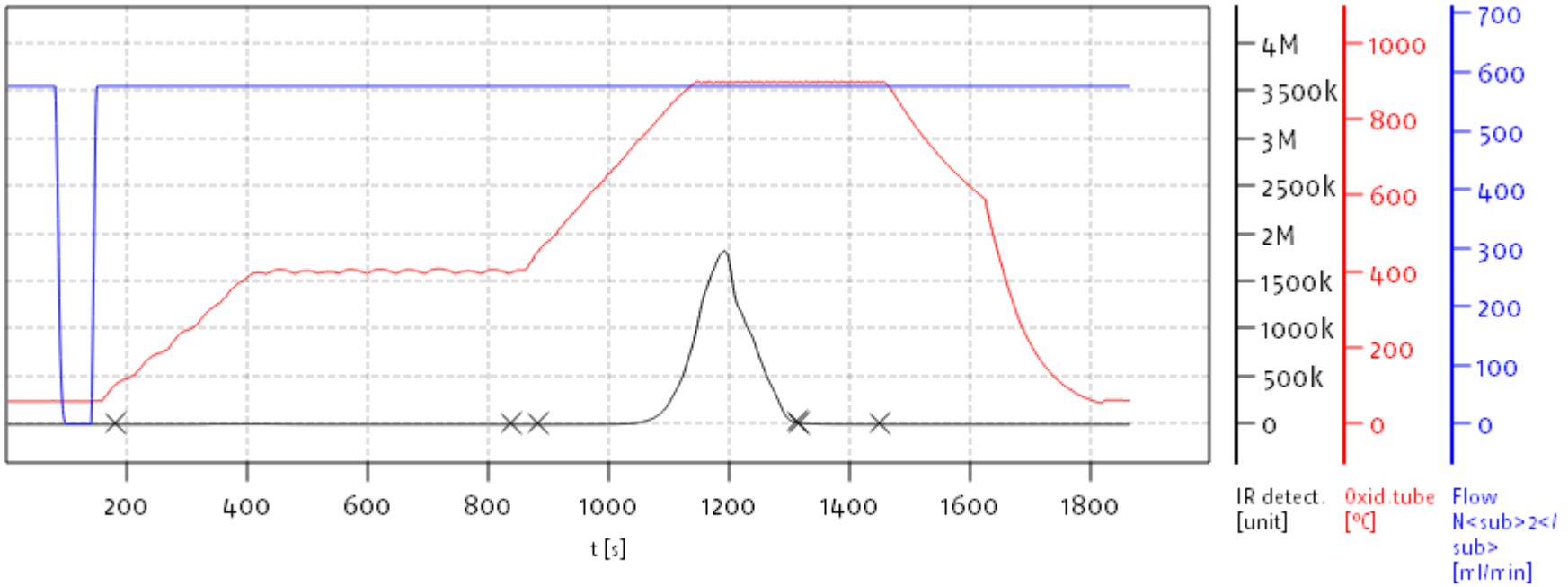
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
25	25	SJH0113-CALN	200.00	0.0903	1.00	CARBON	8/11/2021 1:50 AM	0.035	5.550	5.585	bl	23 597	7 038 842	15 761	1.0000	1.0000



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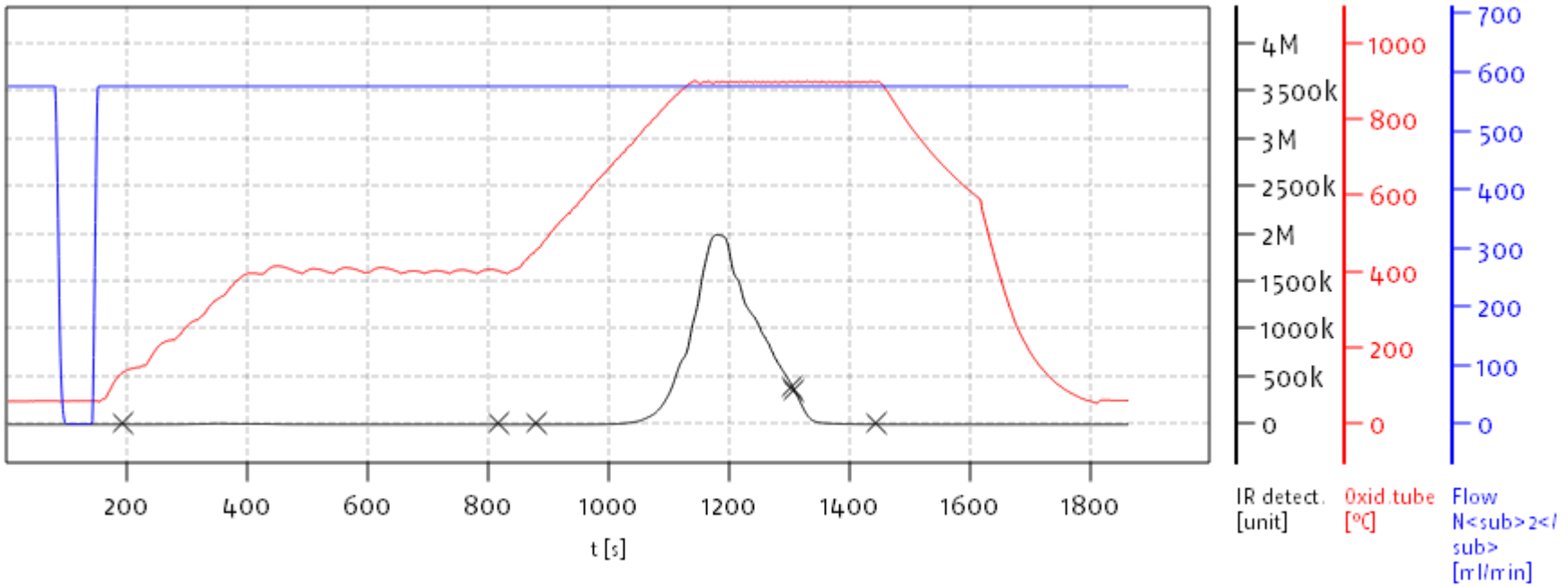
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
26	26	SJH0113-CALO	200.00	0.1198	1.00	CARBON	8/11/2021 2:22 AM	0.206	7.202	7.408	bl,C3o	38 020	9 134 974	218 134	1.0000	1.0000



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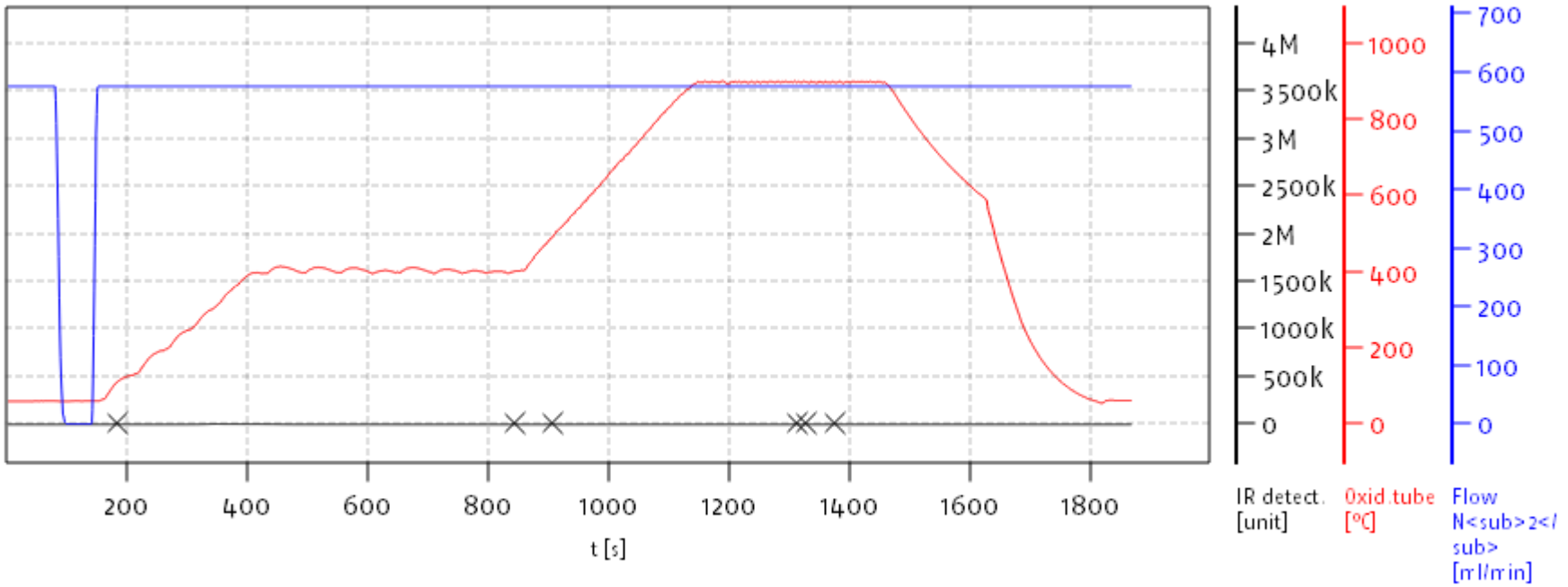
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
27	27	BLANK	1.00		1.00	CARBON	8/11/2021 2:53 AM	0.000	0.000	0.000	bl	19 335	23	0	1.0000	1.0000



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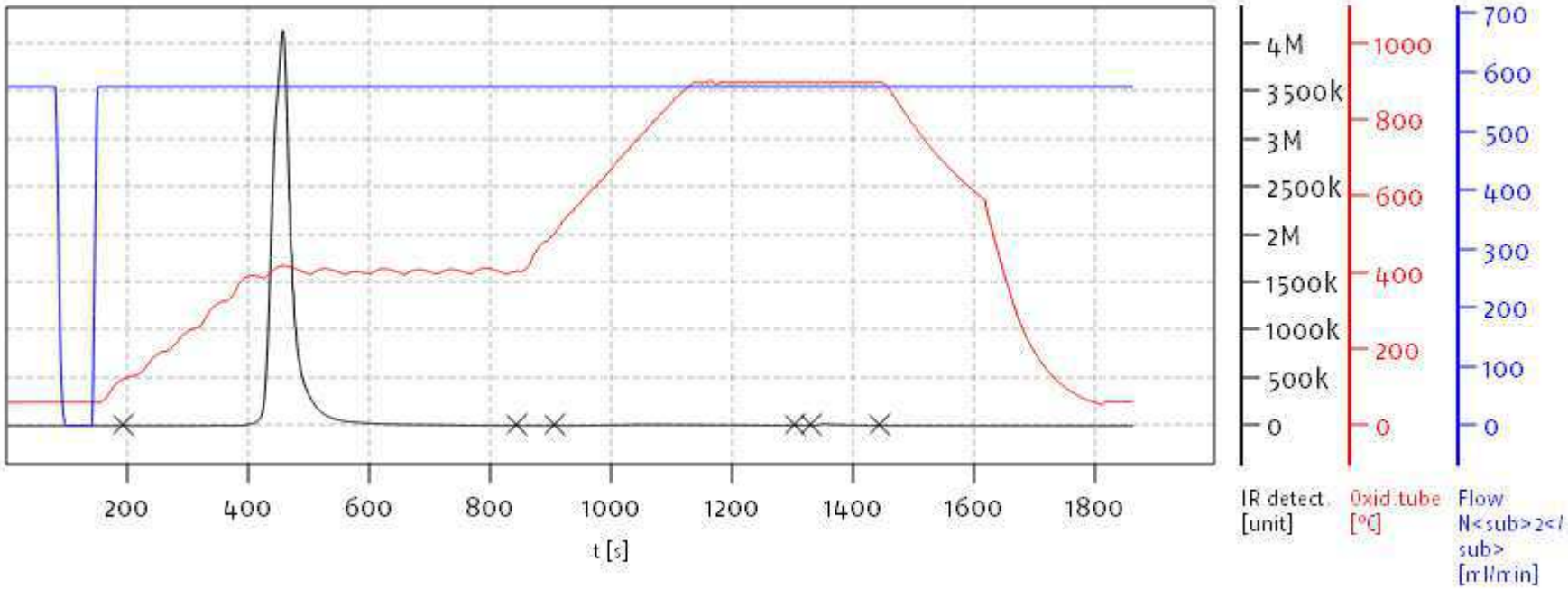
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
28	28	Dfactor	20.90		1.00	CARBON	8/11/2021 3:25 AM	44.744	0.921	45.666	bl	5 800 620	119 521	37 001	1.0154	1.0000



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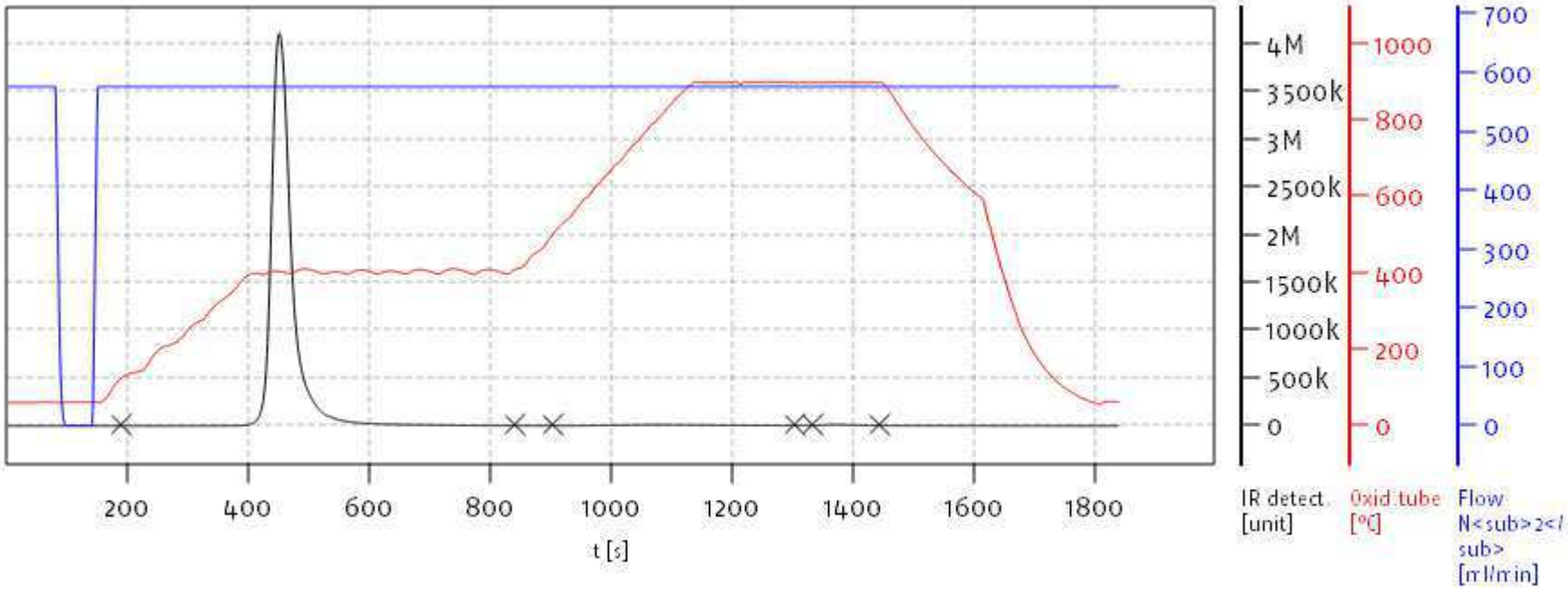
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
29	29	Dfactor	21.50		1.00	CARBON	8/11/2021 3:56 AM	44.697	0.738	45.435	bl	5 956 386	98 039	31 649	1.0173	1.0000



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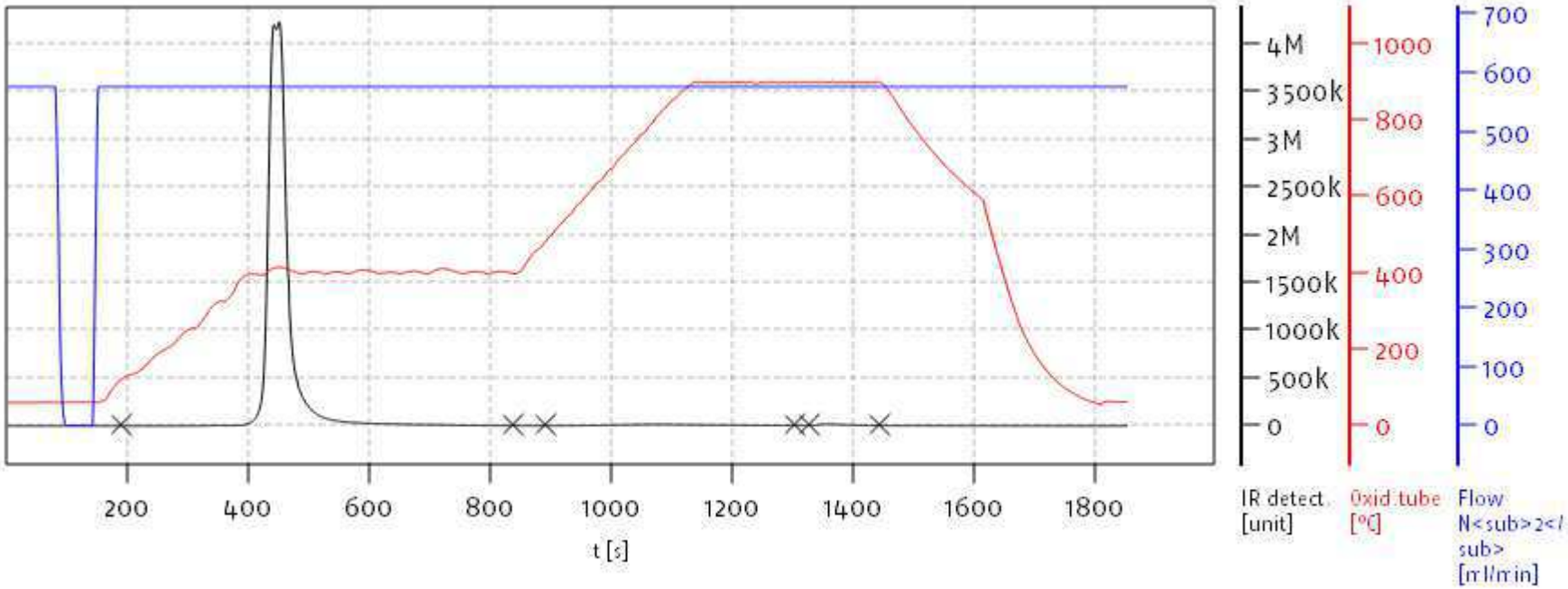
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
30	30	SJH0113-ICV1	21.40		1.00	CARBON	8/11/2021 4:27 AM	44.407	0.930	45.337	bl	5 886 637	123 684	40 335	1.0163	1.0000



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Access: soliTOC superuser

Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

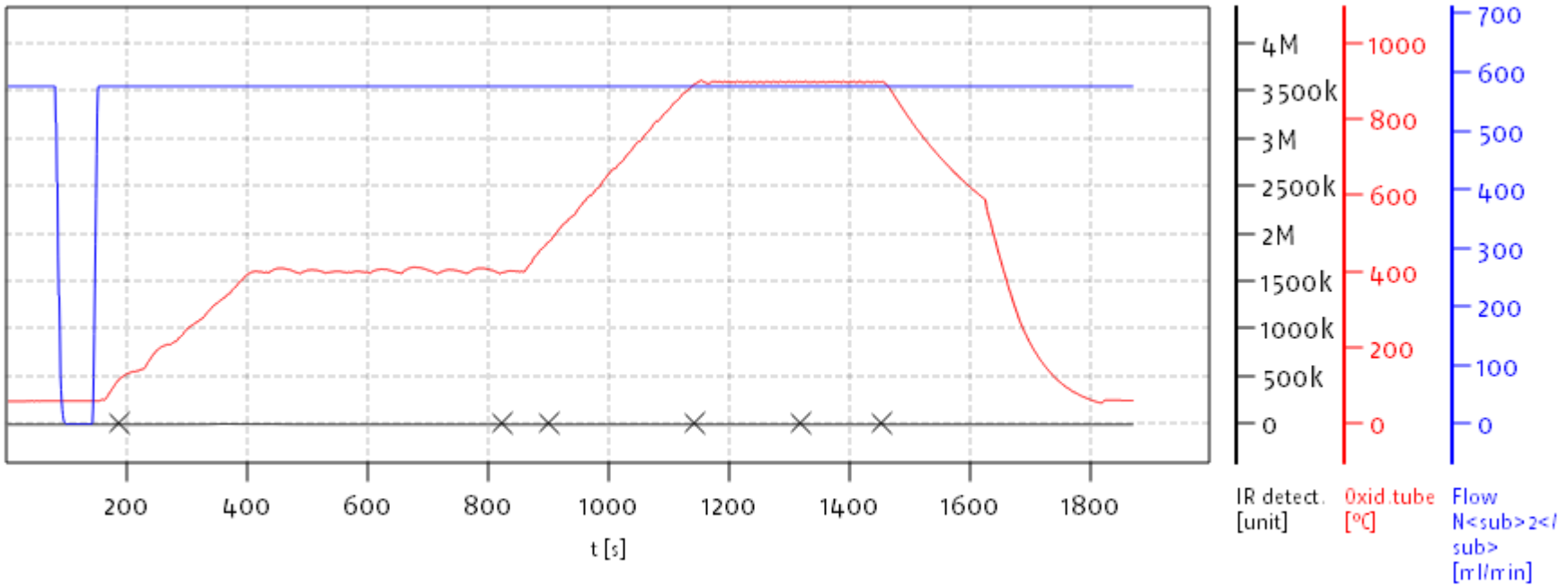
elementar
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00021 081021BF from: --.--.-- (modified)

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
31	31	SJH0113-ICB1	613.30		1.00	CARBON	8/11/2021 4:59 AM	0.007	0.001	0.008	bl,C3u,C2u	20 520	1 826	970	1.0163	1.0000



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Document: TOC Calibration EH00021 081021BF from: --.--.-- (modified)

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ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 9060A m

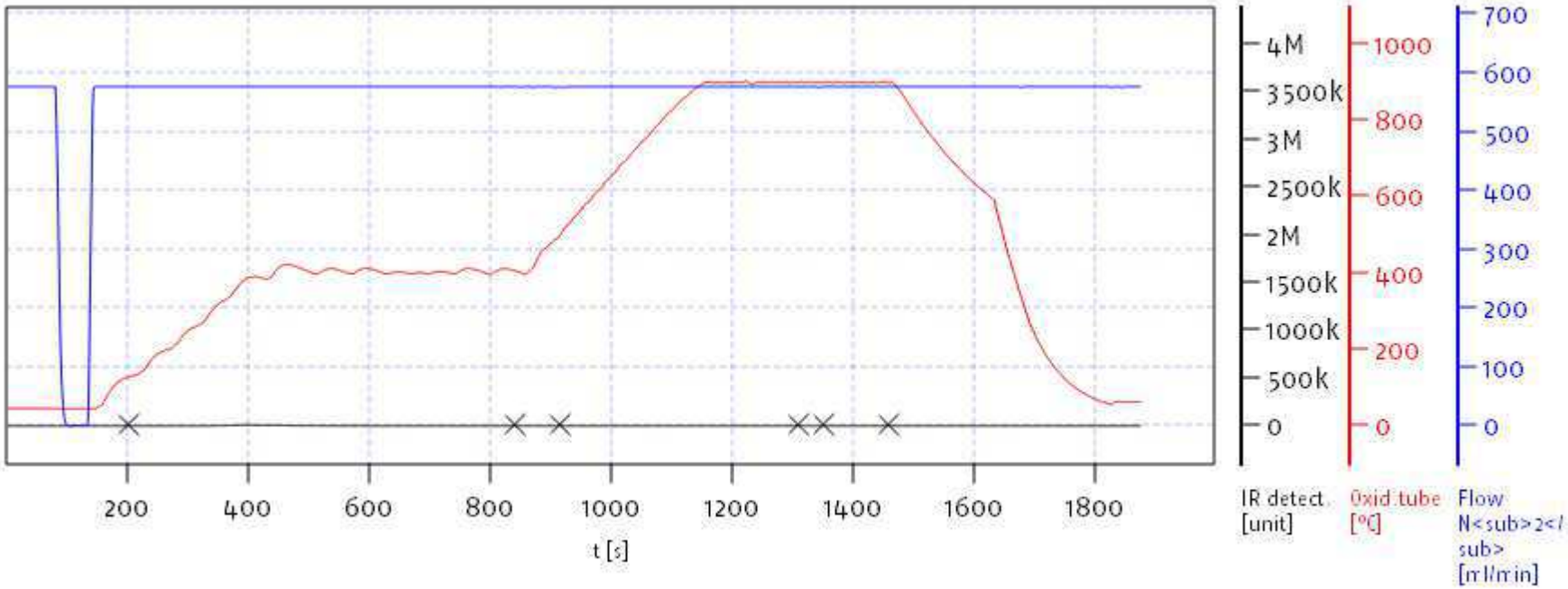
Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0136	Instrument:	TOC Cube
		Calibration:	EH00021

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Initial Cal Check	SJH0136-ICV1	peData_08162021@1103-(	NA	08/12/21 14:07
Initial Cal Blank	SJH0136-ICB1	peData_08162021@1103-(	NA	08/12/21 14:39
Calibration Check	SJH0136-CCV1	peData_08162021@1103-(	NA	08/12/21 20:25
Calibration Blank	SJH0136-CCB1	peData_08162021@1103-(	NA	08/12/21 20:56
MRL Check	BJH0300-MRL1	peData_08162021@1103-(	Solid	08/13/21 00:04
Blank	BJH0300-BLK1	peData_08162021@1103-(	Solid	08/13/21 00:35
LCS	BJH0300-BS1	peData_08162021@1103-(	Solid	08/13/21 01:07
Reference	BJH0300-SRM1	peData_08162021@1103-(	Solid	08/13/21 01:38
Calibration Check	SJH0136-CCV2	peData_08162021@1103-(	NA	08/13/21 02:41
Calibration Blank	SJH0136-CCB2	peData_08162021@1103-(	NA	08/13/21 03:12
Calibration Check	SJH0136-CCV3	peData_08162021@1103-(	NA	08/13/21 08:59
Calibration Blank	SJH0136-CCB3	peData_08162021@1103-(	NA	08/13/21 09:31
LDW21-SS687	21G0286-01	peData_08162021@1103-(	Solid	08/13/21 12:41
LDW21-SS625	21G0286-02	peData_08162021@1103-(	Solid	08/13/21 13:13
Calibration Check	SJH0136-CCV4	peData_08162021@1103-(	NA	08/13/21 15:19
Calibration Blank	SJH0136-CCB4	peData_08162021@1103-(	NA	08/13/21 15:51
LDW21-IT625	21G0286-03	peData_08162021@1103-(	Solid	08/13/21 16:23
LDW21-SS627	21G0286-04	peData_08162021@1103-(	Solid	08/13/21 16:55
LDW21-SS646	21G0286-05	peData_08162021@1103-(	Solid	08/13/21 17:26
Calibration Check	SJH0136-CCV5	peData_08162021@1103-(	NA	08/13/21 21:38
Calibration Blank	SJH0136-CCB5	peData_08162021@1103-(	NA	08/13/21 22:09

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
1	1	BLANK	1.00		1.00	CARBON	8/12/2021 12:33 PM	0.000	0.000	0.000	bl	41 948	5 336	1 662	1.0000	1.0000



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Serial No: 0300.181017
Mode CCC

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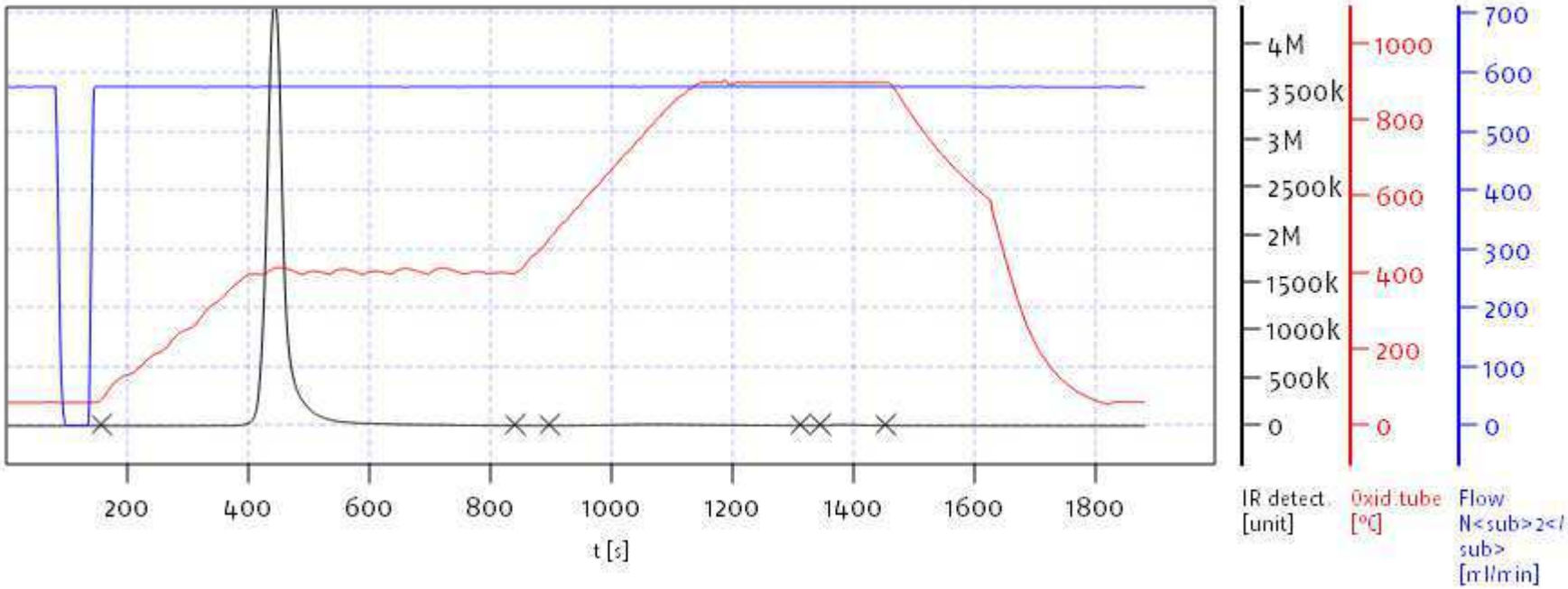
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
2	2	Dfactor	20.20		1.00	CARBON	8/12/2021 1:04 PM	44.572	0.855	45.427	bl	5 595 942	121 740	27 062	1.0329	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
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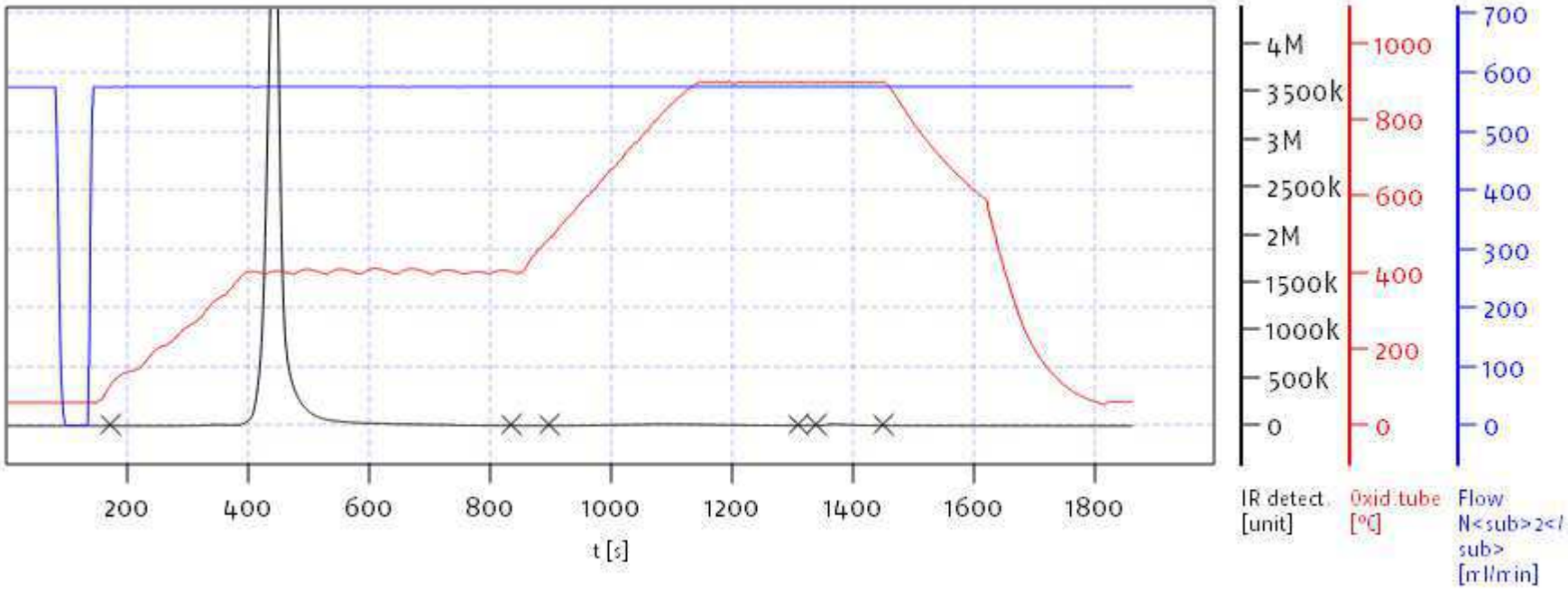
Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
3	3	Dfactor	20.90		1.00	CARBON	8/12/2021 1:36 PM	44.614	0.945	45.560	bl	5 909 514	137 627	33 371	1.0119	1.0000



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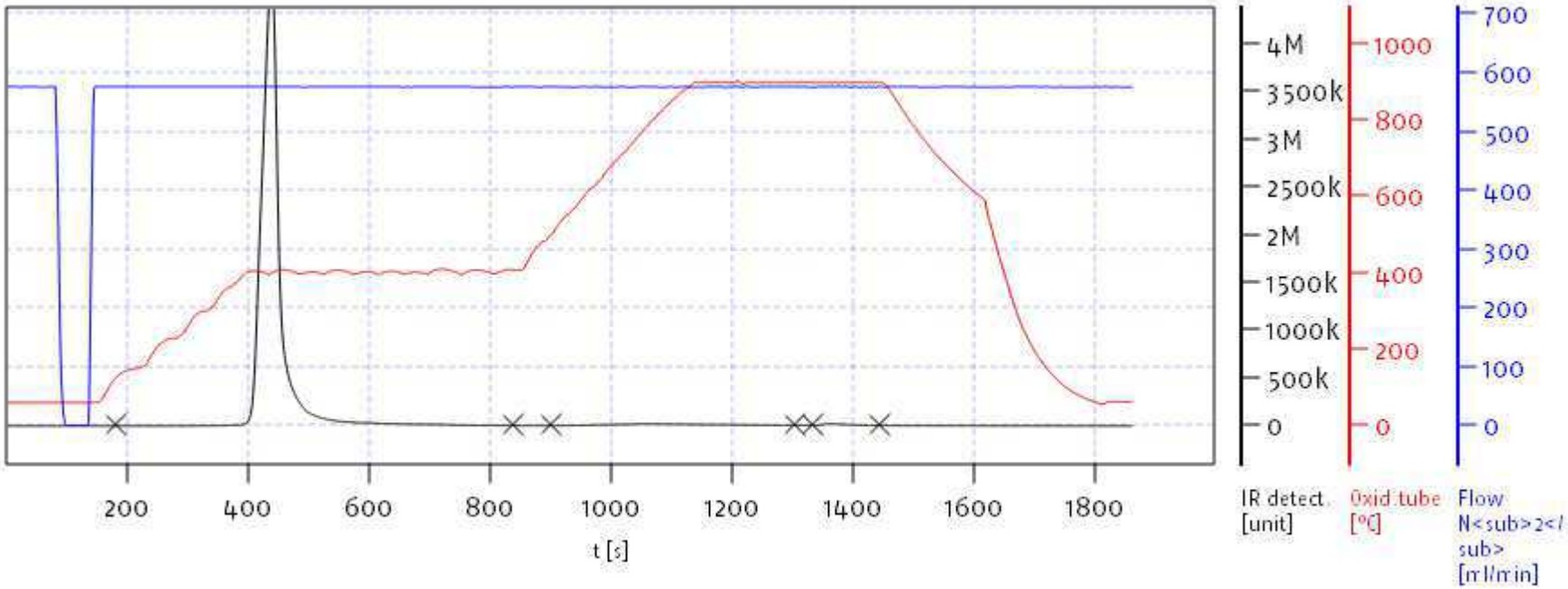
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
4	4	SJH0136-ICV1	21.90		1.00	CARBON	8/12/2021 2:07 PM	43.713	1.159	44.872	bl	5 993 607	173 728	45 260	1.0224	1.0000



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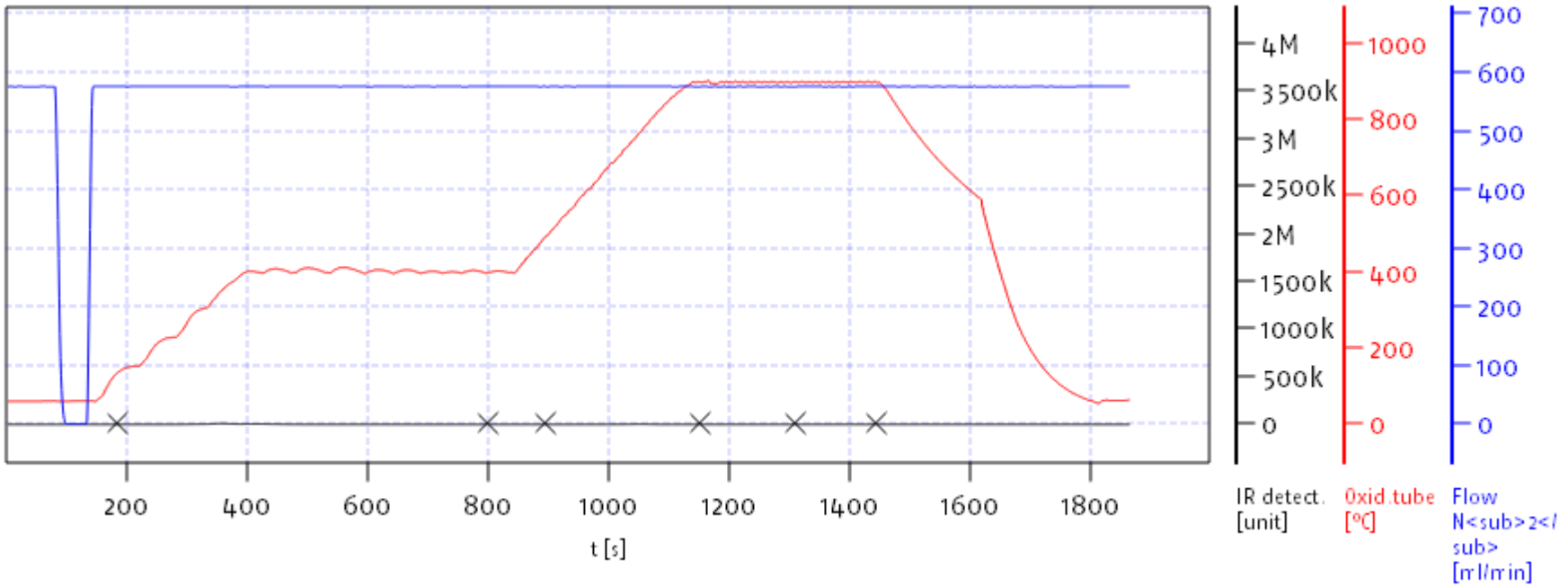
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
5	5	SJH0136-ICB1	577.90		1.00	CARBON	8/12/2021 2:39 PM	0.005	0.000	0.005	bl,C3u,C2u	29 519	5 556	1 151	1.0224	1.0000



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Soli TOC Cube, Carbon
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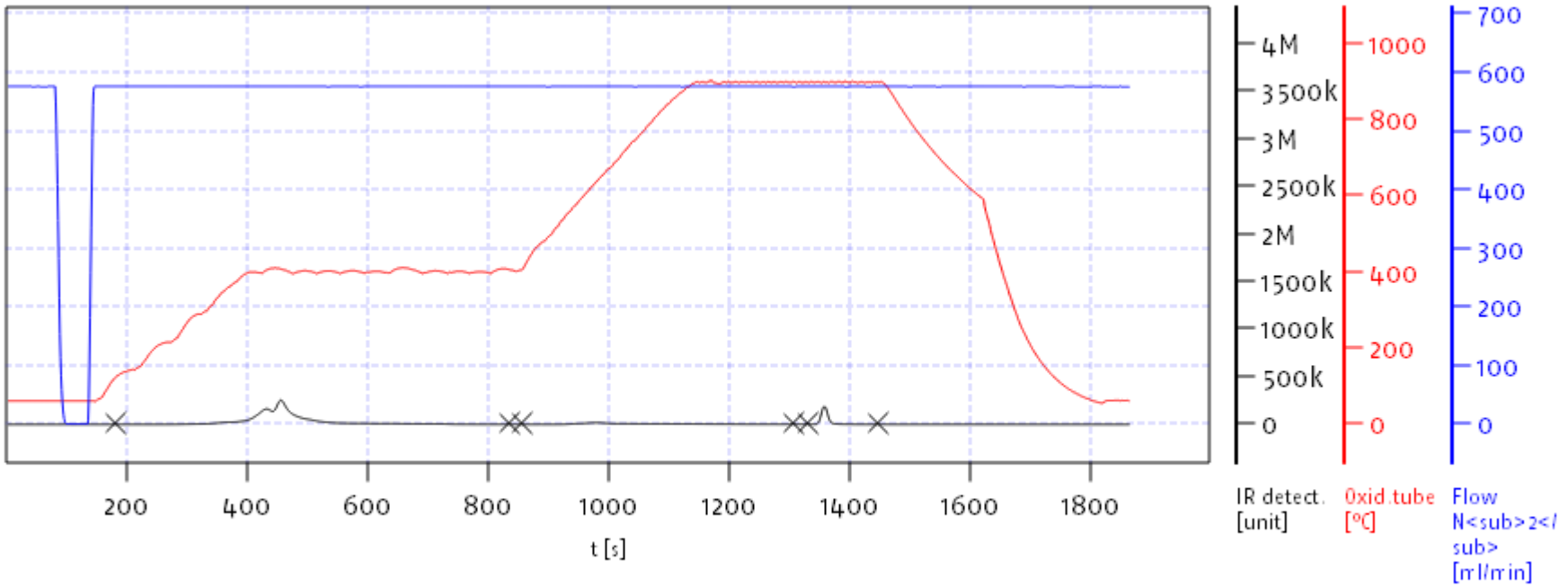
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
6	6	21G0178-09RE1	591.20		1.00	CARBON	8/12/2021 3:10 PM	0.197	0.019	0.216	bl	658 608	83 826	95 834	1.0224	1.0000



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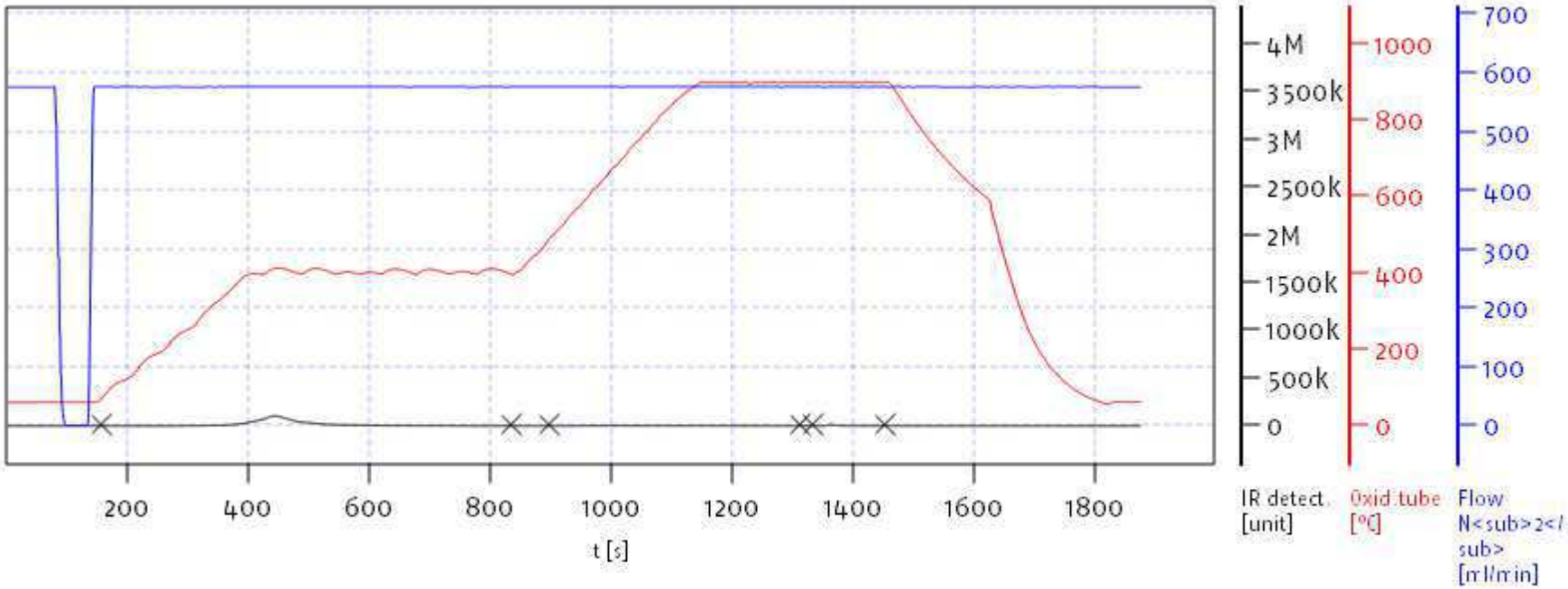
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
7	7	BJG0675-DUP3	540.50		1.00	CARBON	8/12/2021 3:42 PM	0.100	0.004	0.103	bl	349 752	23 420	9 502	1.0224	1.0000



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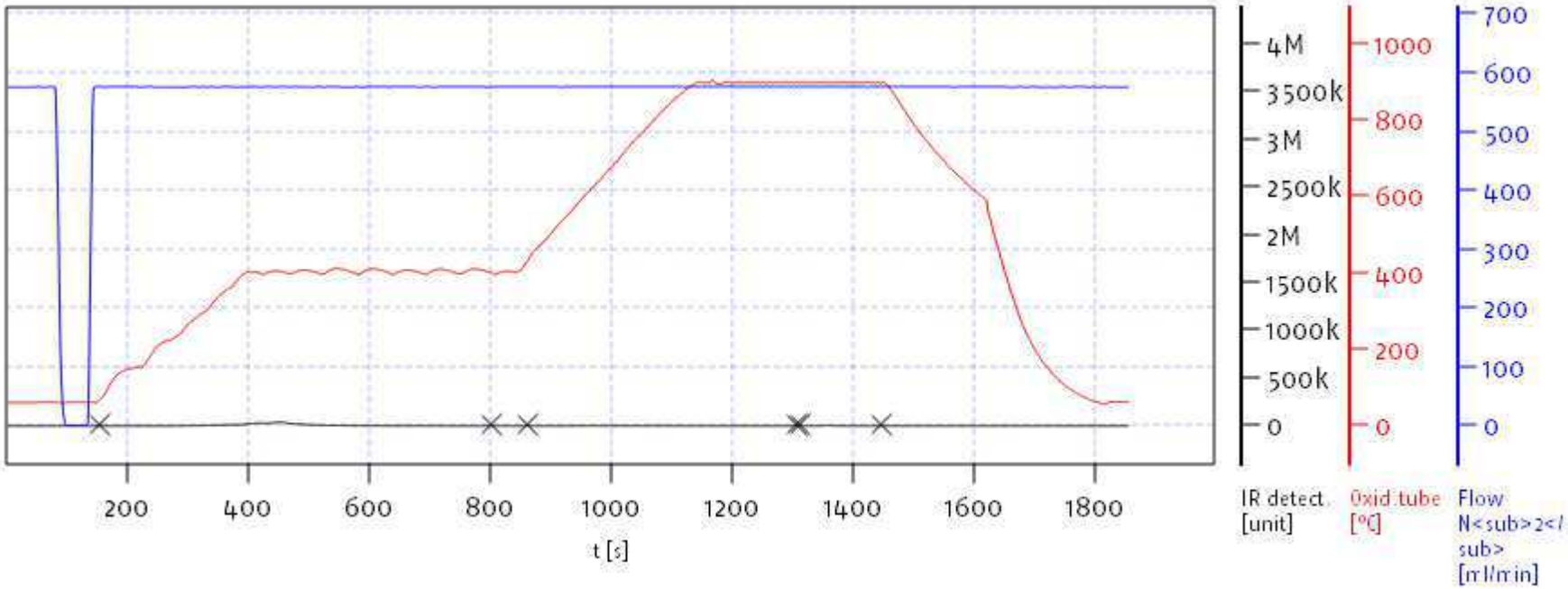
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
8	8	21G0178-10RE2	523.00		1.00	CARBON	8/12/2021 4:13 PM	0.044	0.000	0.044	bl,C2u	153 726	10 002	4 057	1.0224	1.0000



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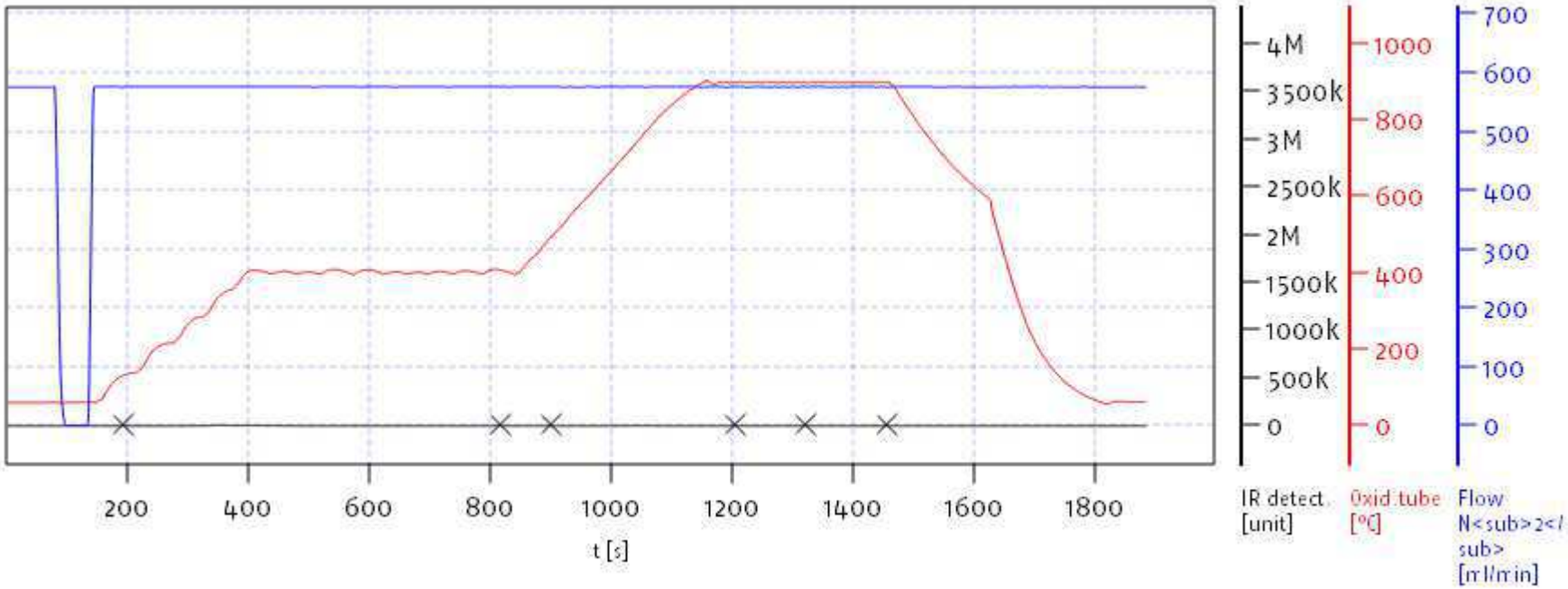
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
9	9	BJH0016-BLK2	503.10		1.00	CARBON	8/12/2021 4:45 PM	0.004	0.000	0.004	bl,C3u,C2u	23 185	3 811	605	1.0224	1.0000



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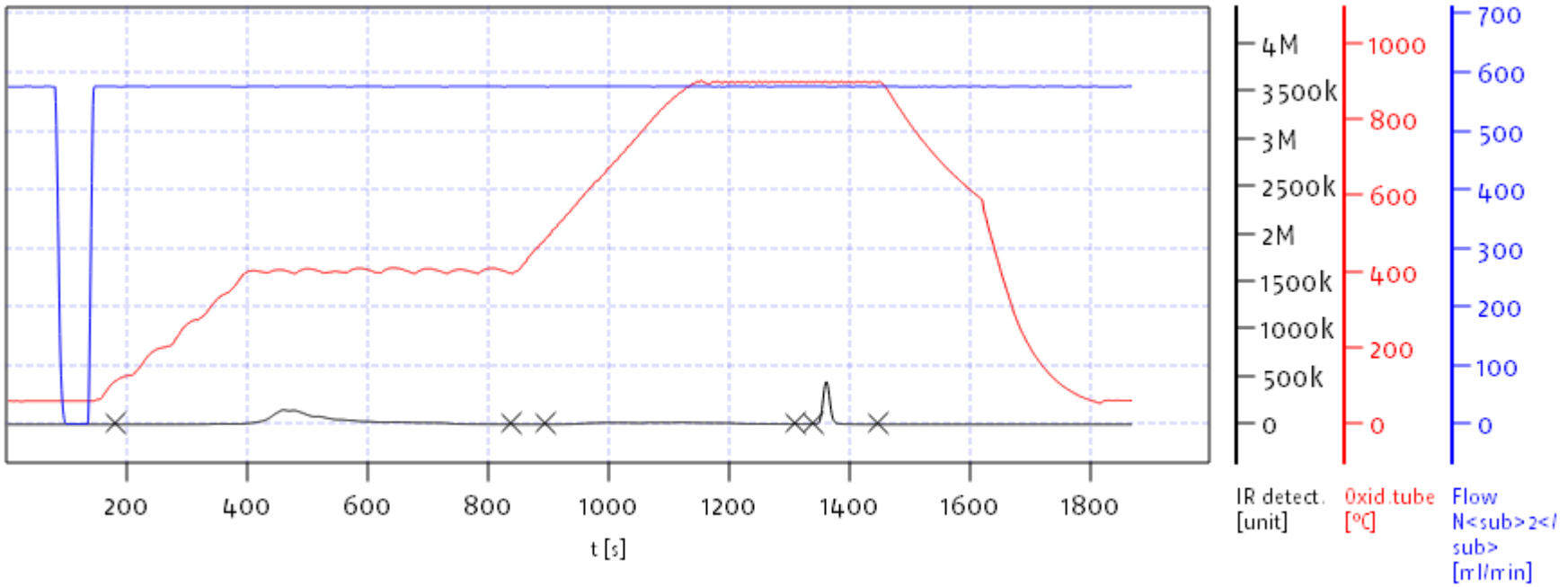
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
10	10	21G0211-14RE1	693.80		1.00	CARBON	8/12/2021 5:16 PM	0.205	0.039	0.244	bl	689 524	186 465	229 196	1.0224	1.0000



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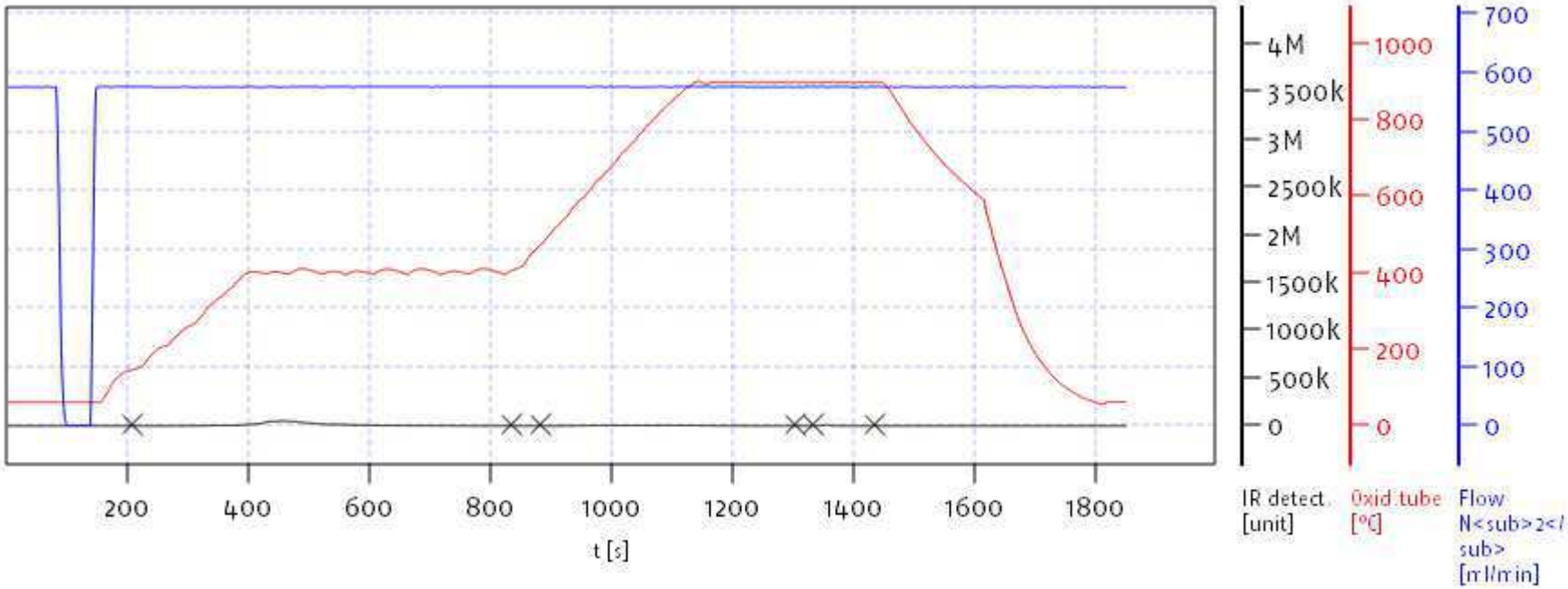
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
11	11	21G0211-16RE1	539.30		1.00	CARBON	8/12/2021 5:48 PM	0.066	0.009	0.075	bl,C2u	233 609	43 572	5 608	1.0224	1.0000



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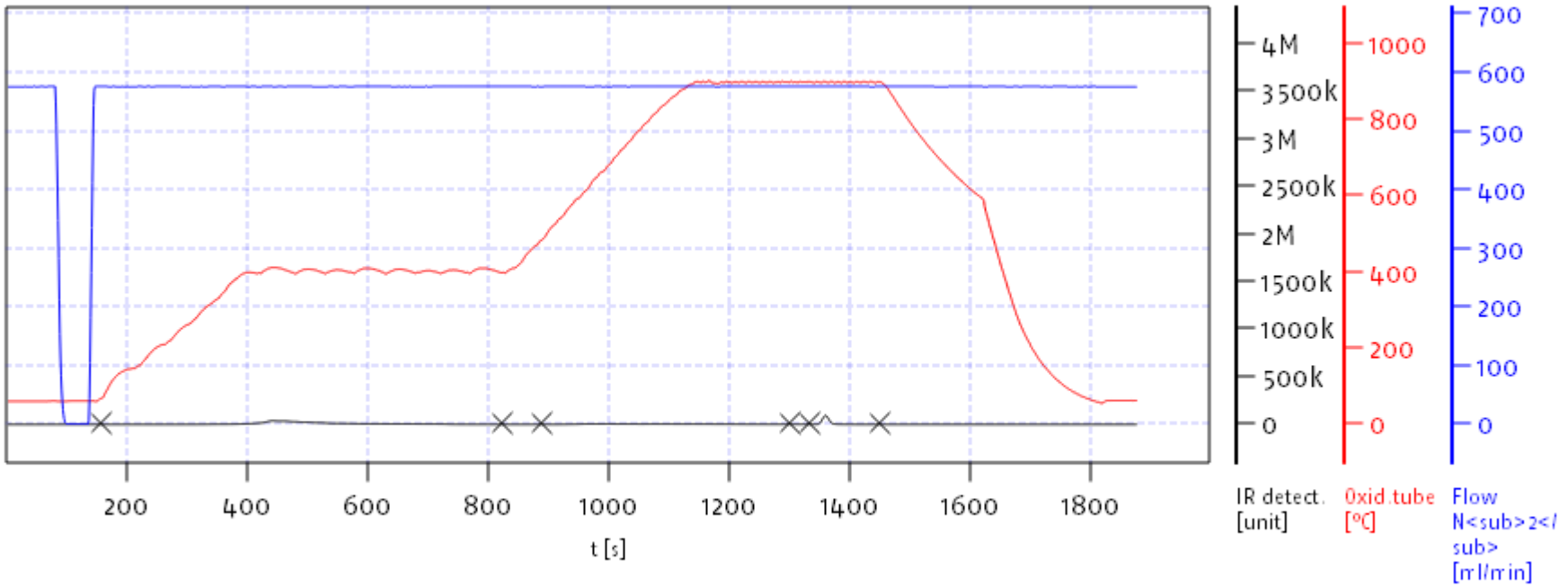
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
12	12	21G0213-01RE1	501.80		1.00	CARBON	8/12/2021 6:19 PM	0.065	0.012	0.077	bl	178 641	50 040	47 338	1.0224	1.0000



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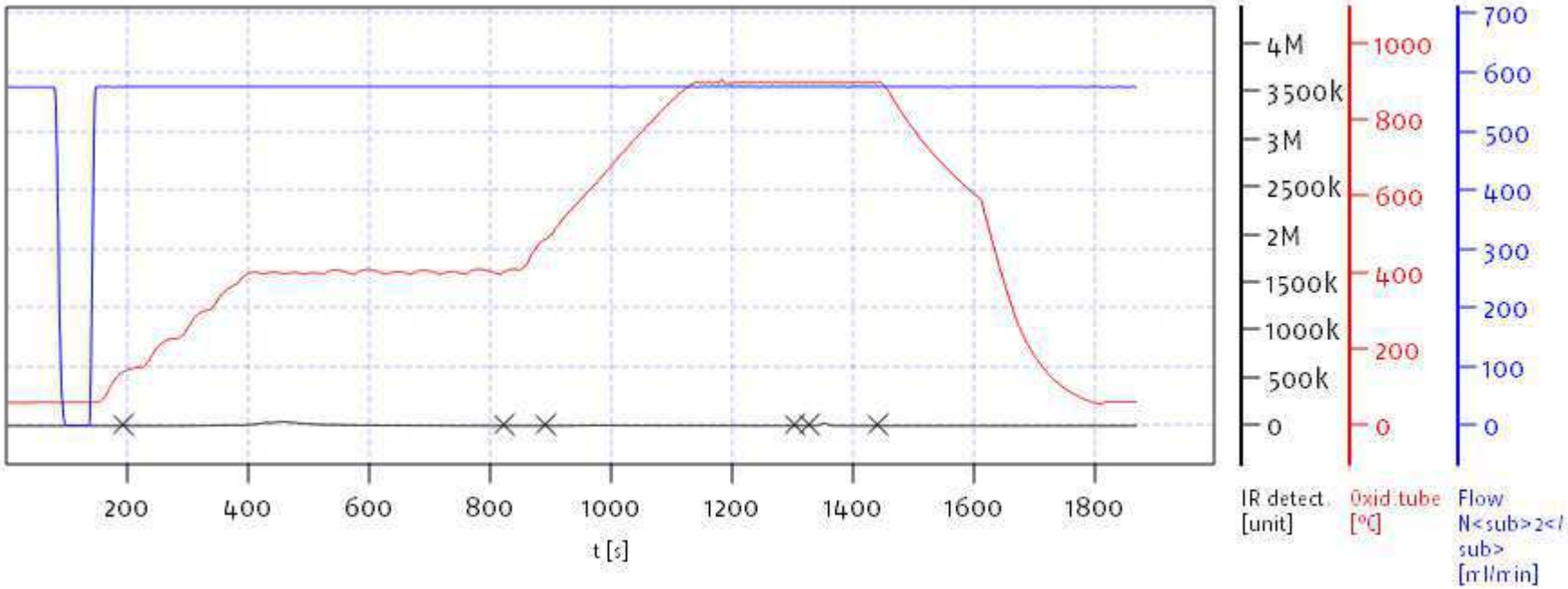
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
13	13	21G0213-02RE1	601.30		1.00	CARBON	8/12/2021 6:51 PM	0.050	0.007	0.057	bl	195 797	38 562	14 083	1.0224	1.0000



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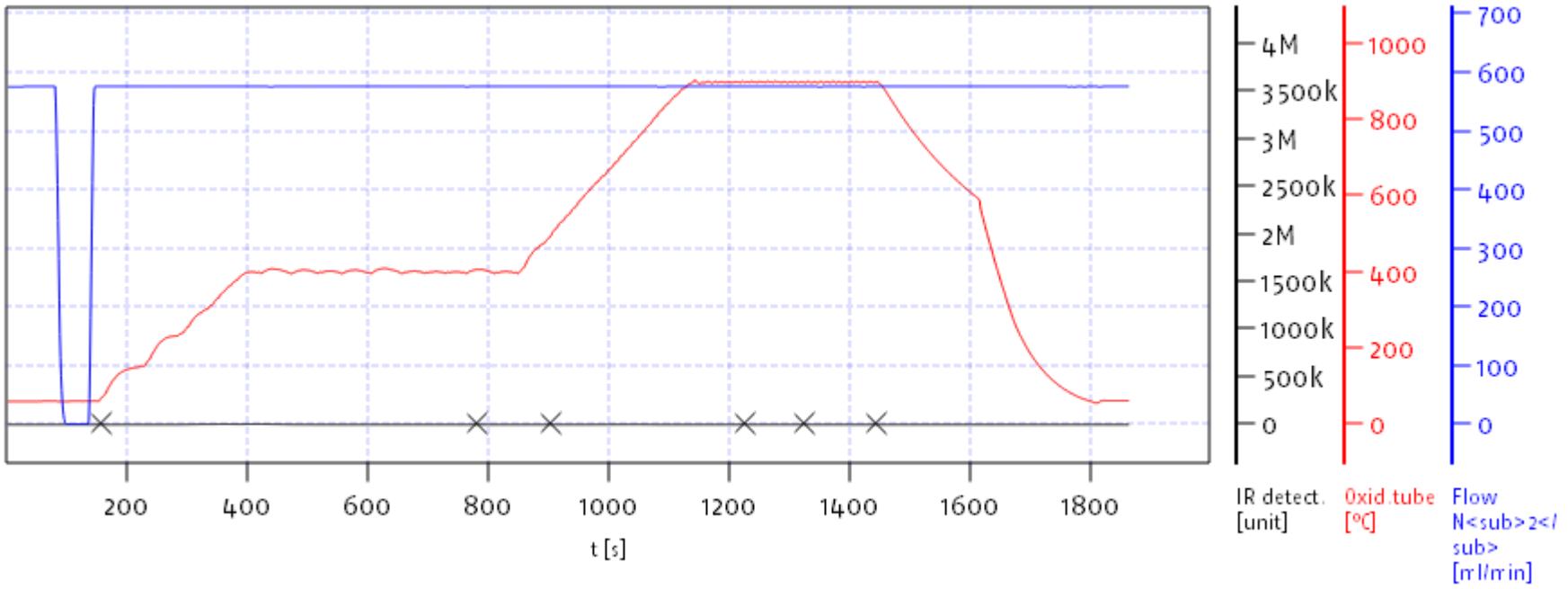
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
14	14	BJH0022-BLK2	556.20		1.00	CARBON	8/12/2021 7:22 PM	0.006	0.000	0.006	bl,C3u,C2u	30 212	6 574	391	1.0224	1.0000



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Soli TOC Cube, Carbon
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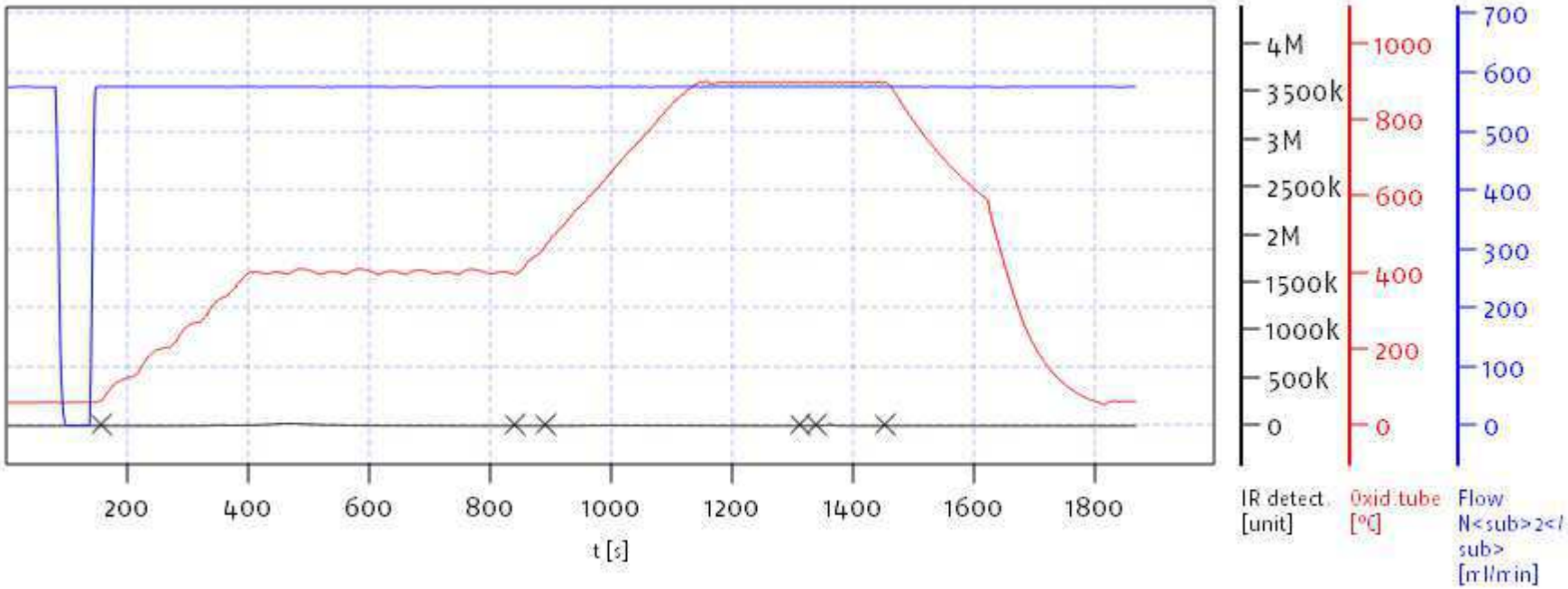
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
15	15	21G0213-08RE1	579.00		1.00	CARBON	8/12/2021 7:54 PM	0.031	0.006	0.037	bl	123 692	32 071	8 050	1.0224	1.0000



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Soli TOC Cube, Carbon
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Analyst: BF

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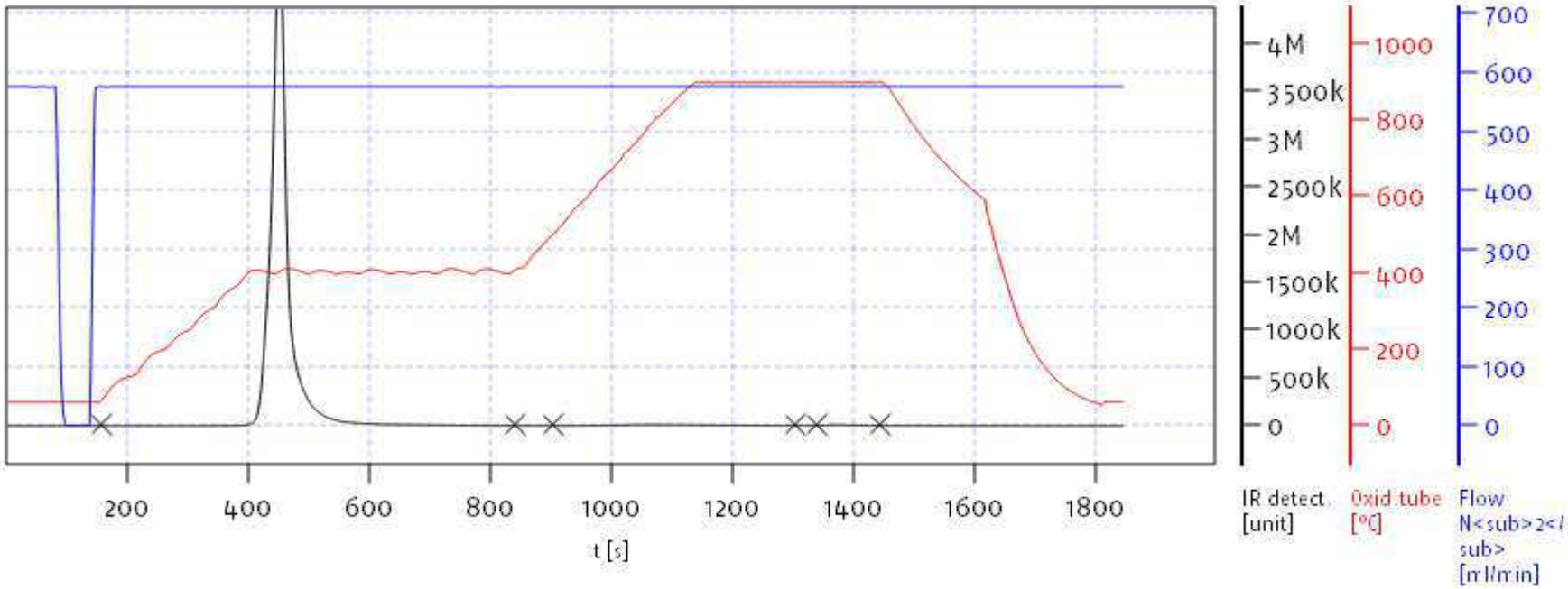
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
16	16	SJH0136-CCV1	21.20		1.00	CARBON	8/12/2021 8:25 PM	44.537	0.644	45.181	bl	5 931 953	98 361	23 951	1.0224	1.0000



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Date: Mon Aug 16 10:56:12 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

elementar
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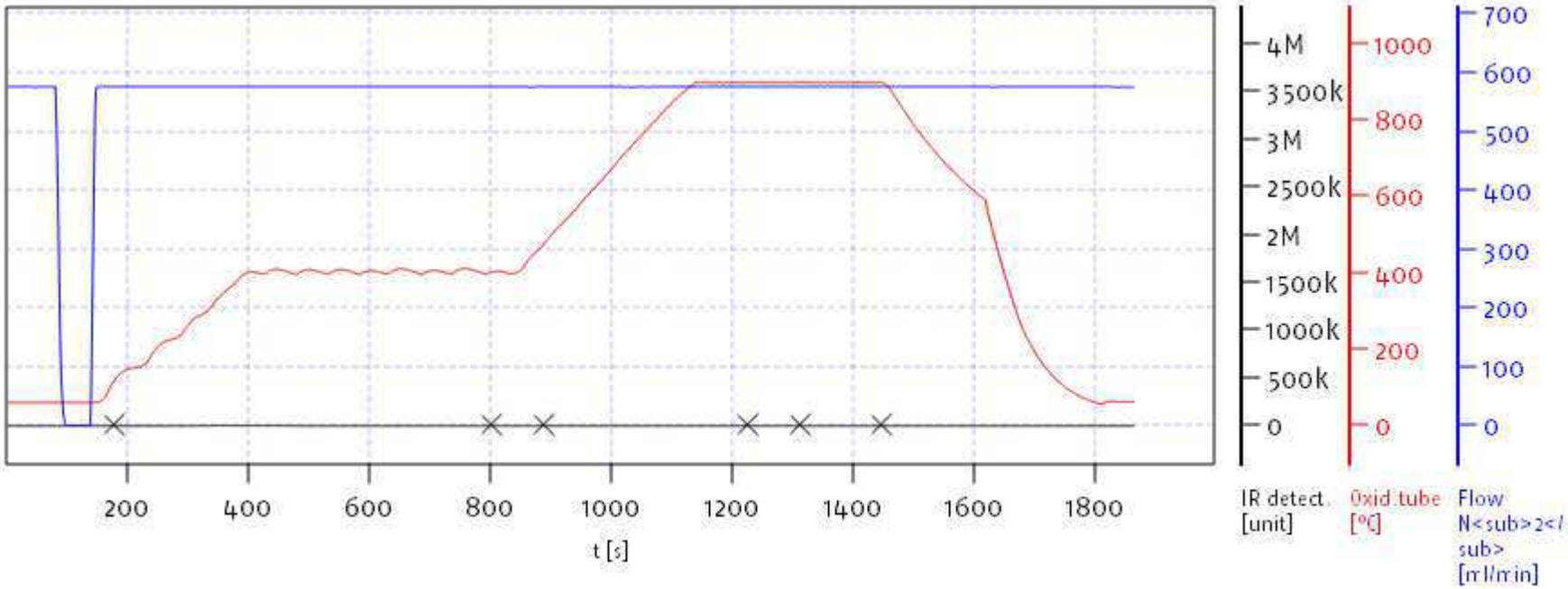
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
17	17	SJH0136-CCB1	567.30		1.00	CARBON	8/12/2021 8:56 PM	0.001	0.000	0.001	bl,C3u,C2u	15 804	1 054	542	1.0224	1.0000



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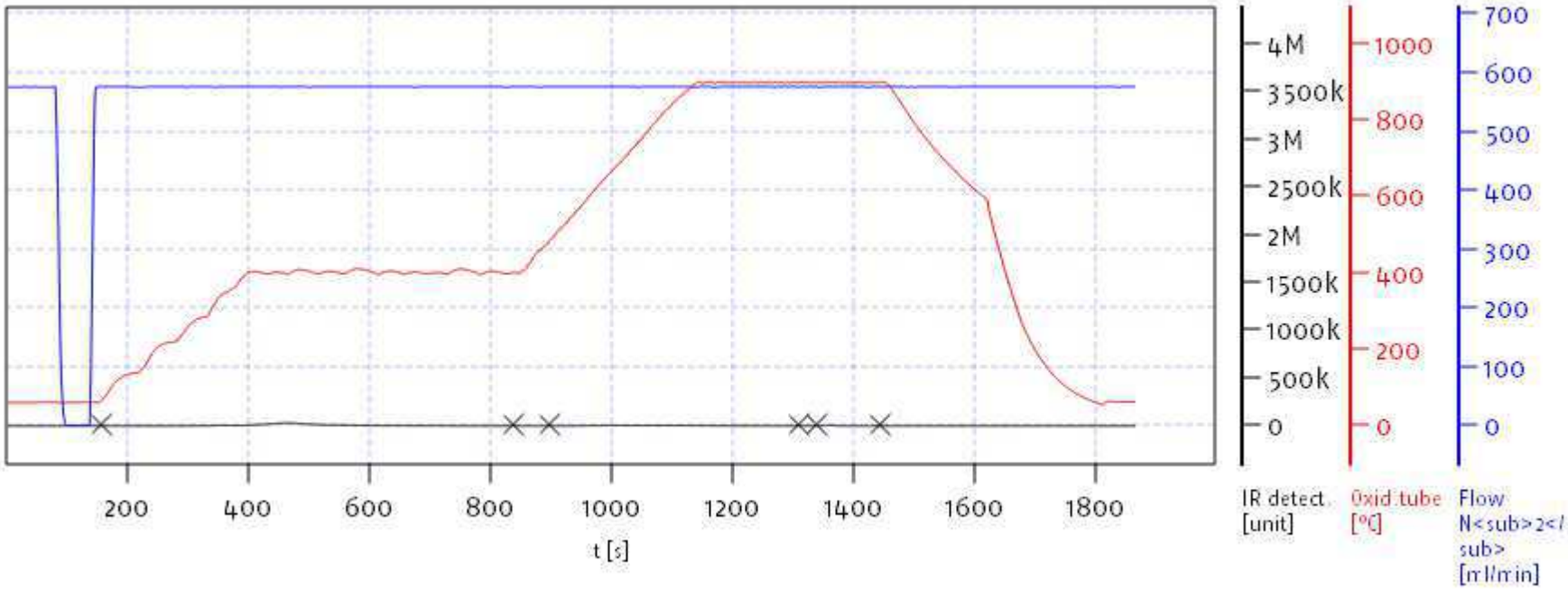
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
18	18	BJH0022-DUP3	617.70		1.00	CARBON	8/12/2021 9:28 PM	0.034	0.007	0.041	bl,C2u	140 903	38 526	5 357	1.0224	1.0000



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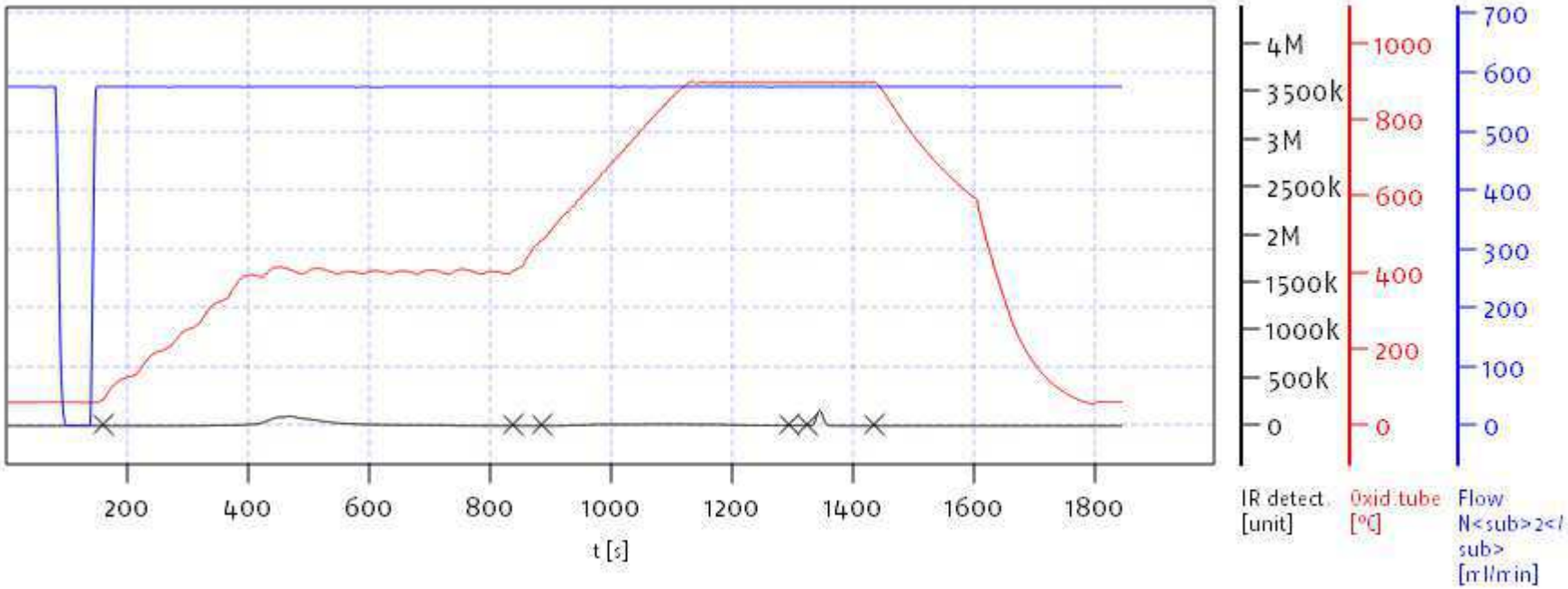
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
19	19	21G0285-04RE1	545.50		1.00	CARBON	8/12/2021 9:59 PM	0.148	0.044	0.192	bl	450 760	165 757	79 186	1.0224	1.0000



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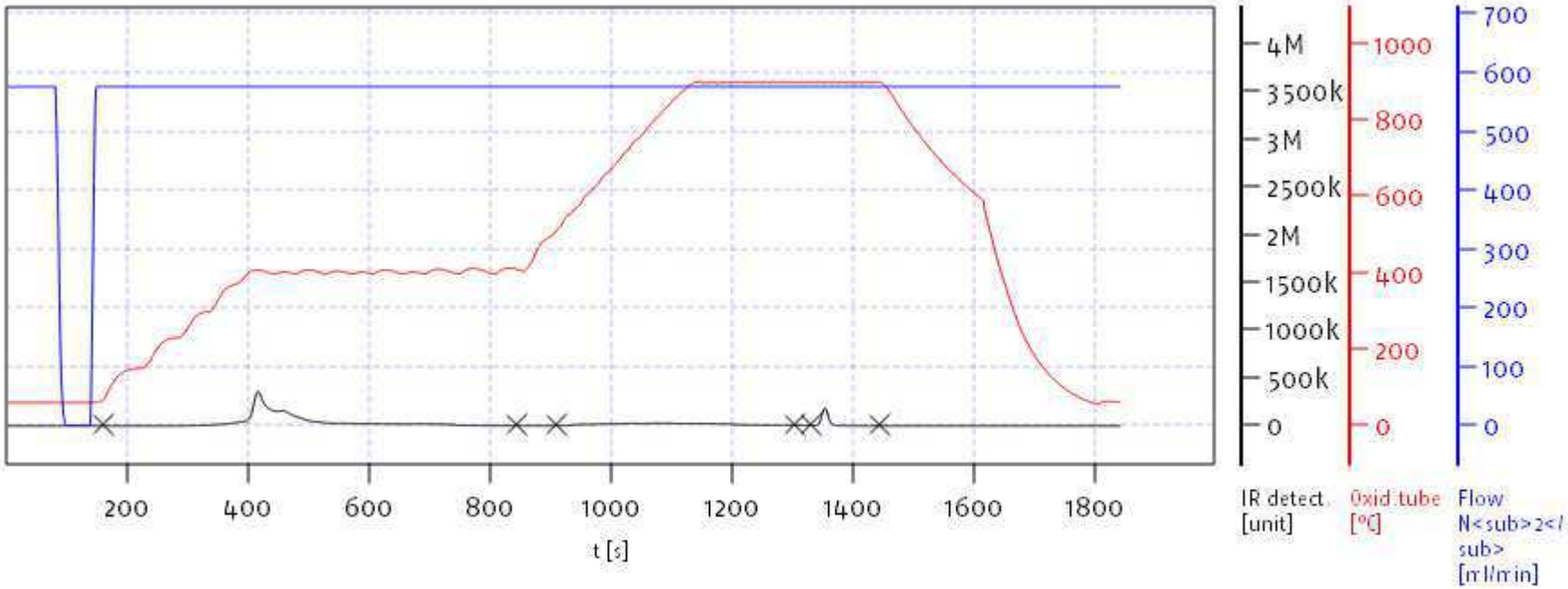
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
20	20	21G0285-07RE1	543.90		1.00	CARBON	8/12/2021 10:30 PM	0.285	0.071	0.355	bl	901 749	257 671	94 244	1.0224	1.0000



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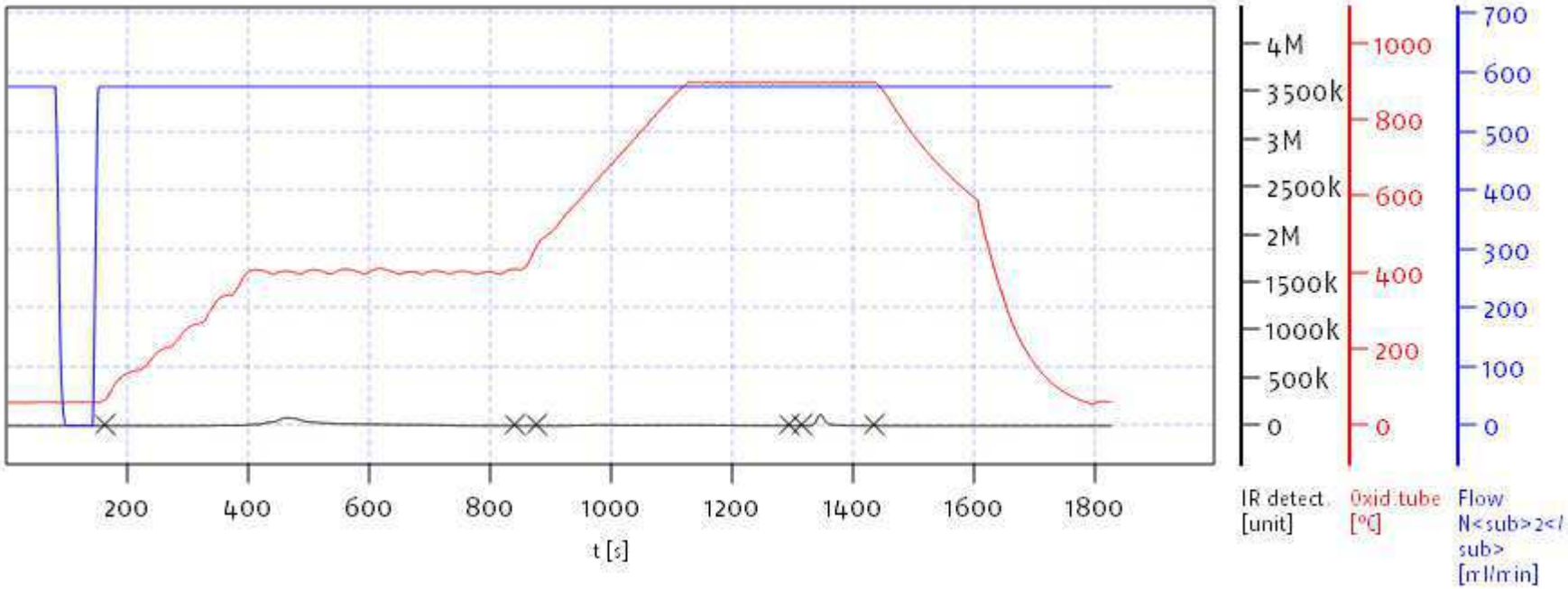
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
21	21	21G0289-01RE1	612.70		1.00	CARBON	8/12/2021 11:01 PM	0.105	0.017	0.122	bl	350 182	78 169	76 548	1.0224	1.0000



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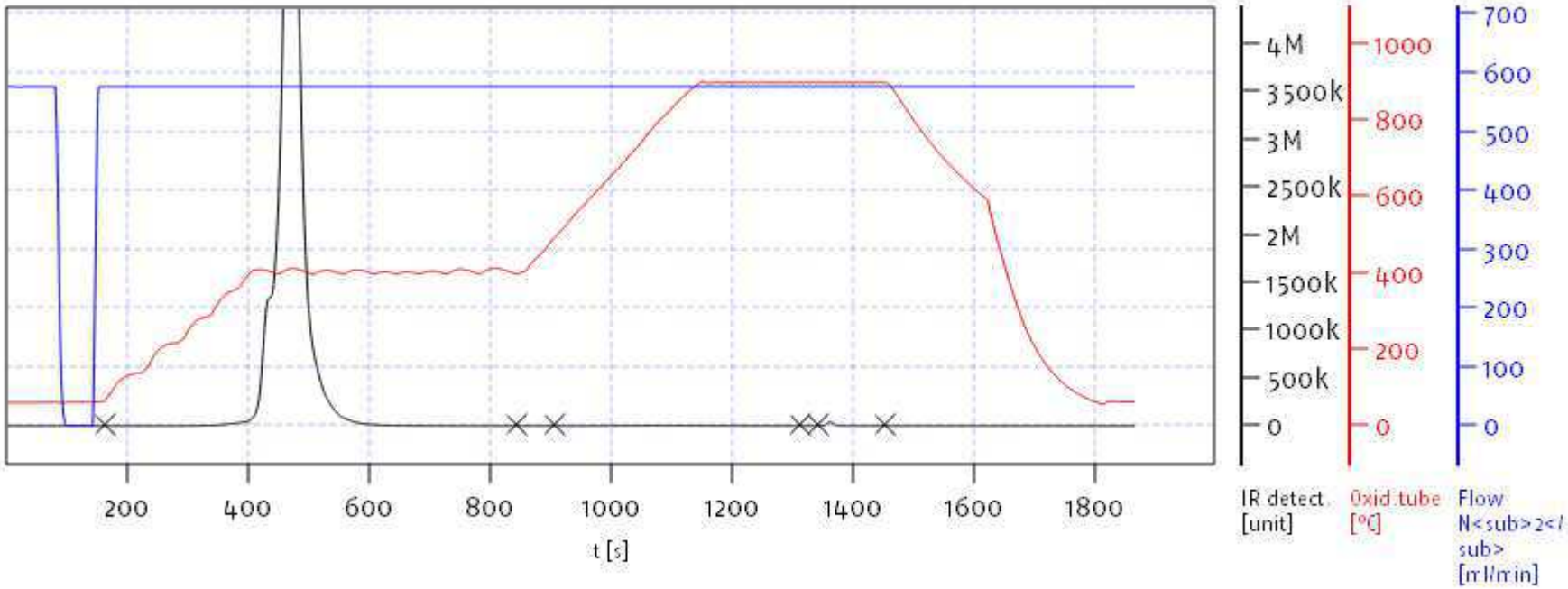
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
22	22	21G0303-02RE1	328.50		1.00	CARBON	8/12/2021 11:33 PM	5.492	0.010	5.501	bl,Co	11 339 005	31 023	20 693	1.0224	1.0000



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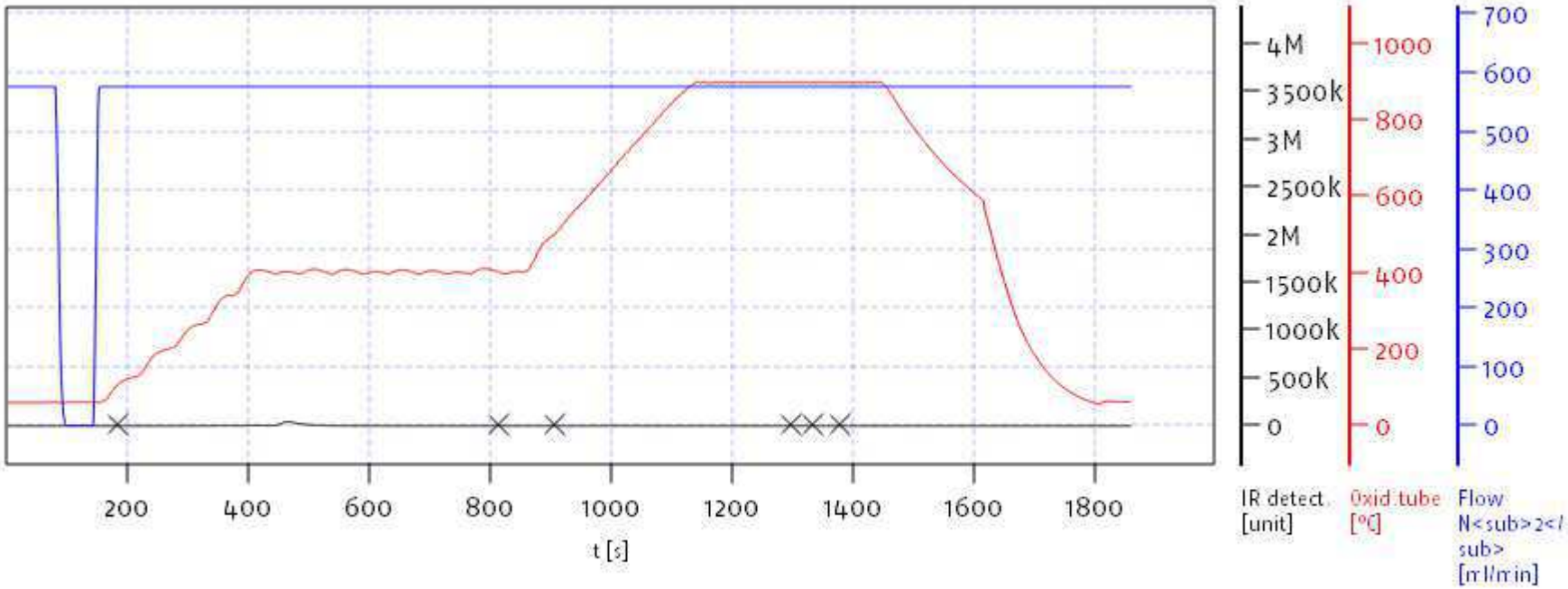
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
23	23	BJH0300-MRL1	545.90		1.00	CARBON	8/13/2021 12:04 AM	0.022	0.000	0.022	bl,C3u,C2u	85 074	5 823	189	1.0224	1.0000



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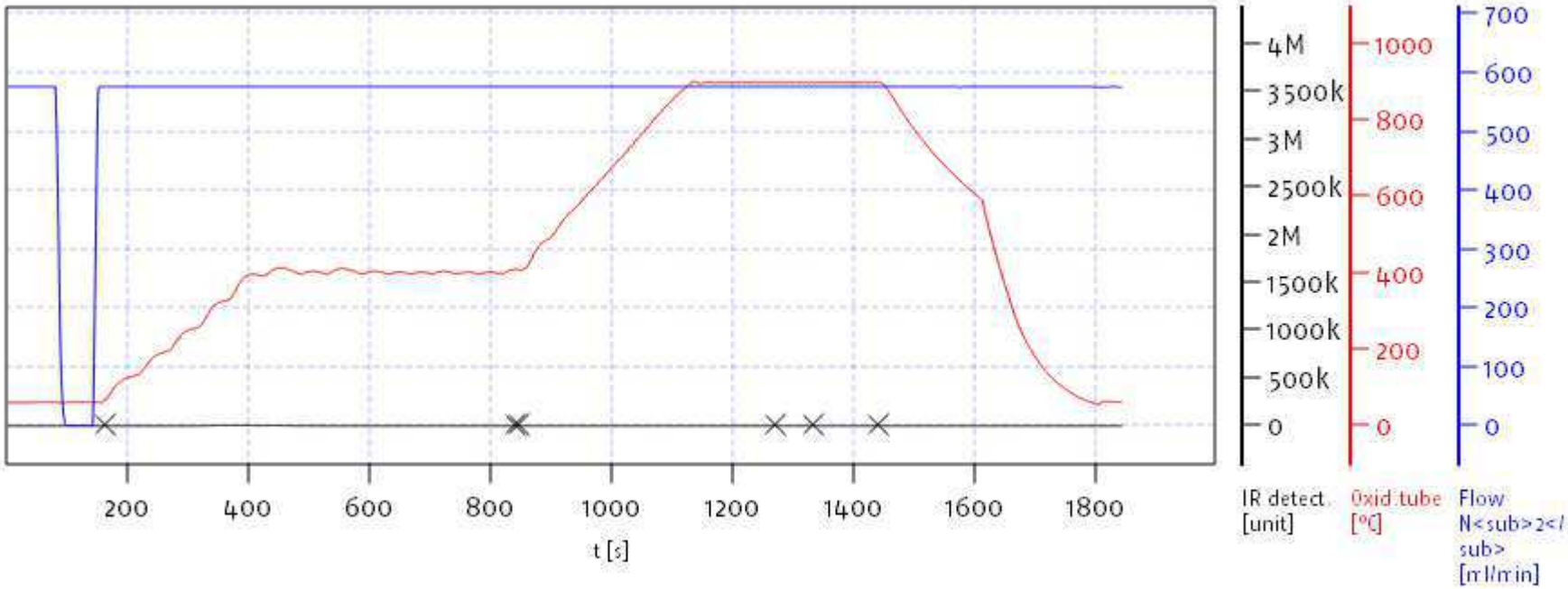
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
24	24	BJH0300-BLK1	565.10		1.00	CARBON	8/13/2021 12:35 AM	0.006	0.000	0.006	bl,C3u,C2u	30 517	1 924	280	1.0224	1.0000



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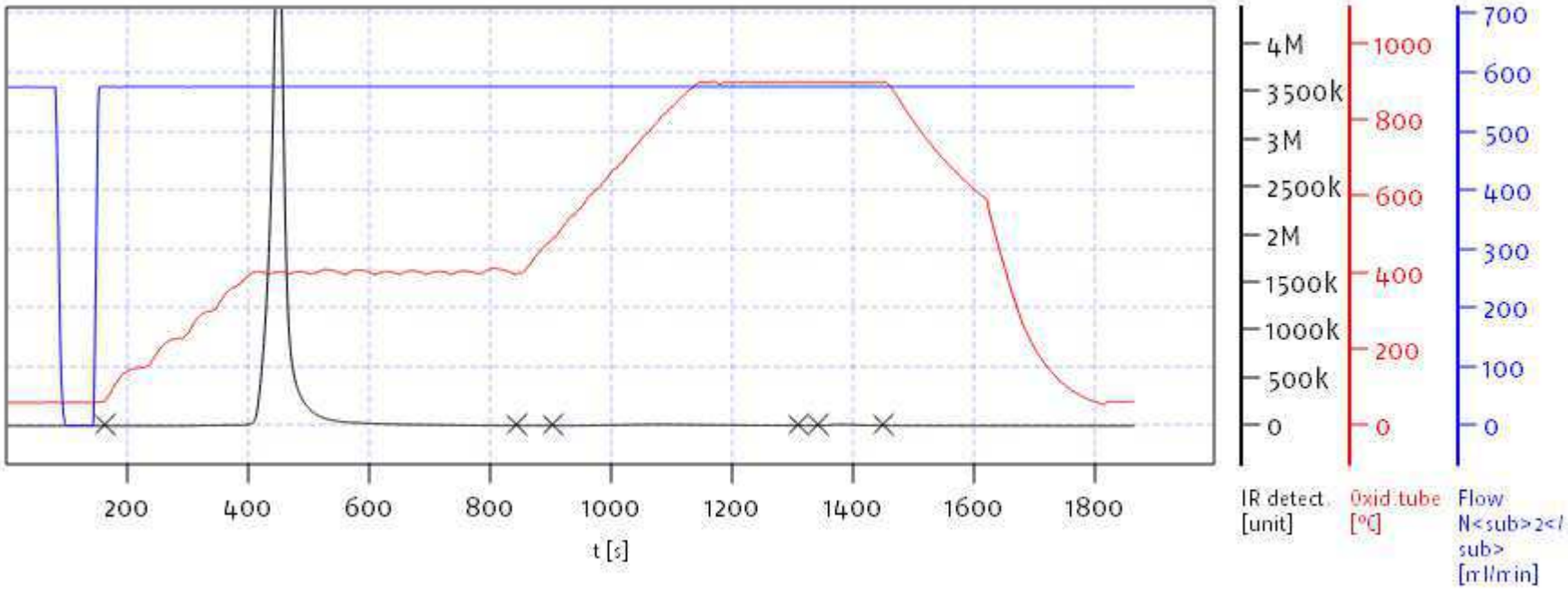
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
25	25	BJH0300-BS1	20.80		1.00	CARBON	8/13/2021 1:07 AM	44.500	0.813	45.312	bl	5 807 955	119 306	31 228	1.0224	1.0000



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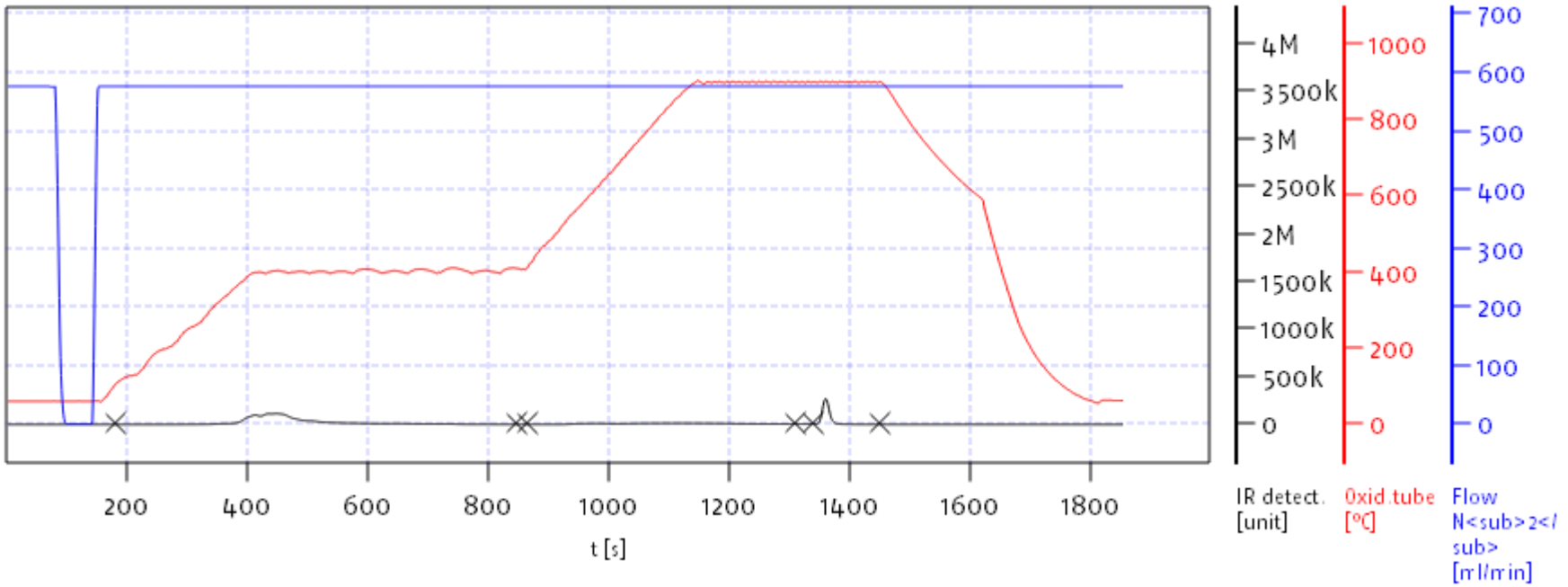
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
26	26	BJH0300-SRM1	39.50		1.00	CARBON	8/13/2021 1:38 AM	2.422	0.461	2.883	bl	484 152	127 774	141 317	1.0224	1.0000



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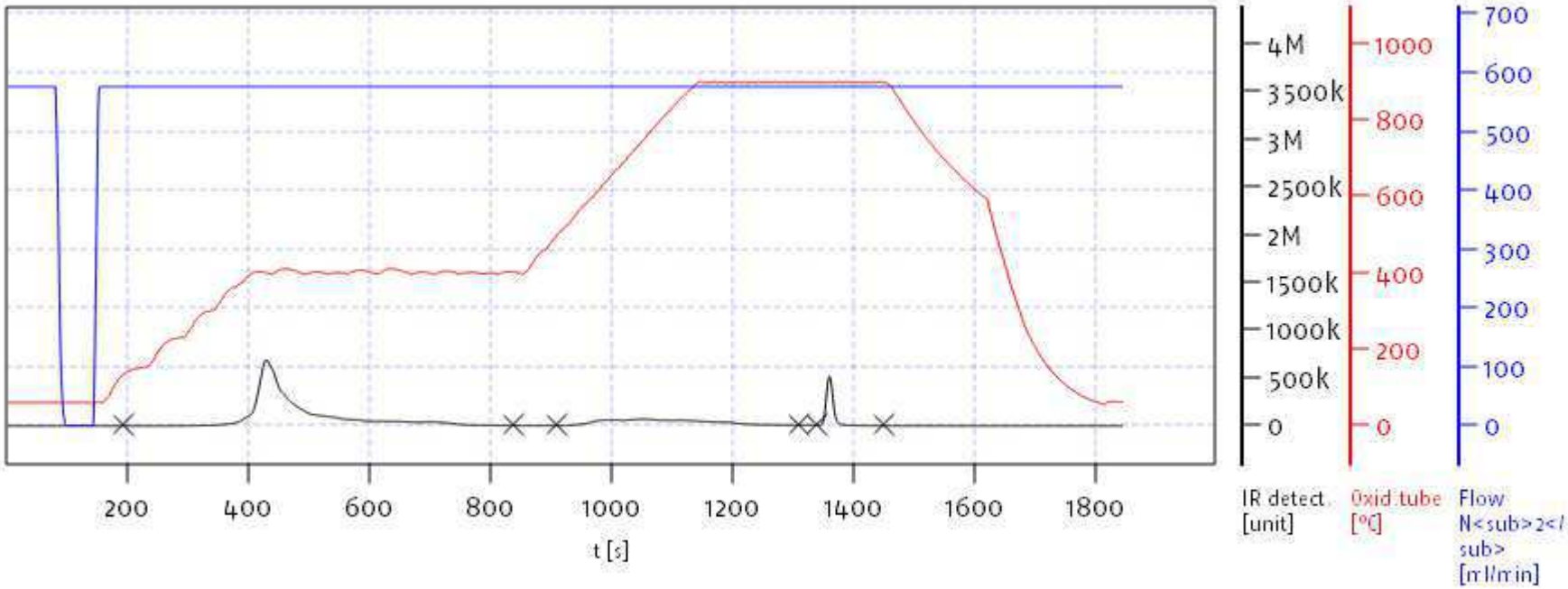
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
27	27	21G0269-12	555.10		1.00	CARBON	8/13/2021 2:09 AM	0.618	0.156	0.774	bl	1 918 678	567 810	264 618	1.0224	1.0000



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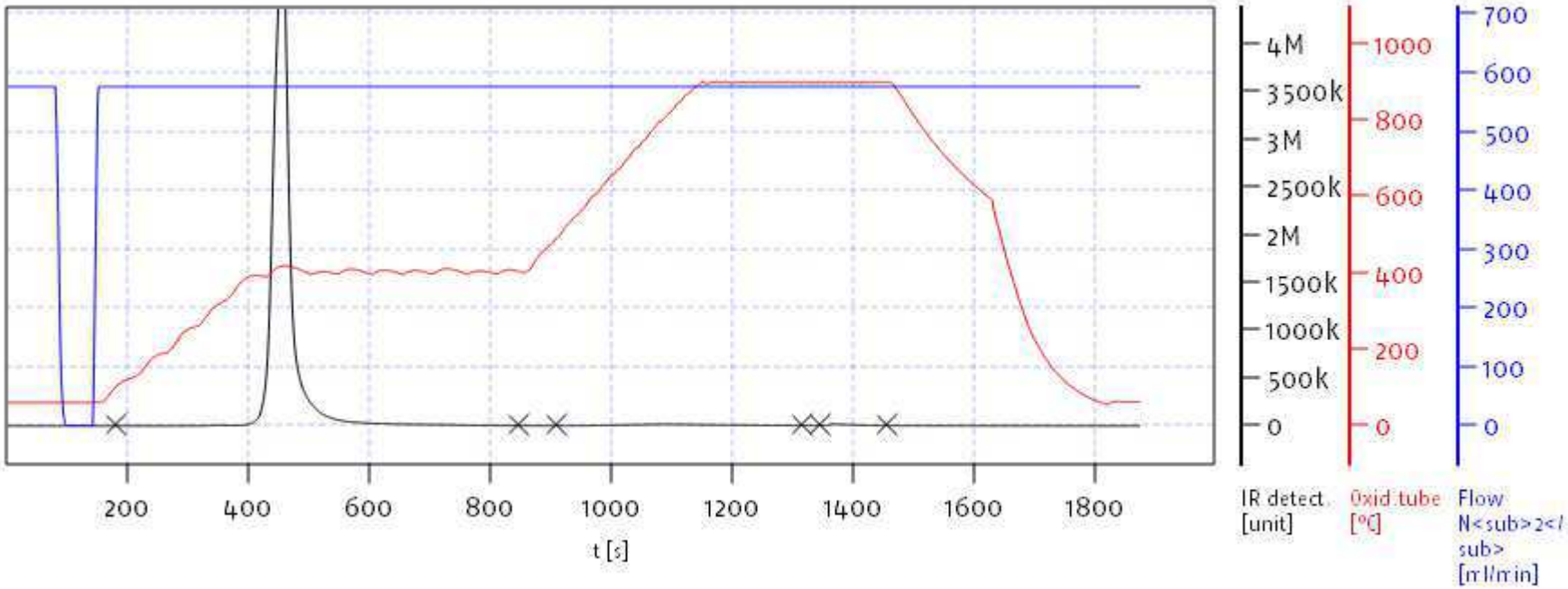
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
28	28	SJH0136-CCV2	22.10		1.00	CARBON	8/13/2021 2:41 AM	44.604	0.826	45.430	bl	6 181 251	128 062	36 085	1.0224	1.0000



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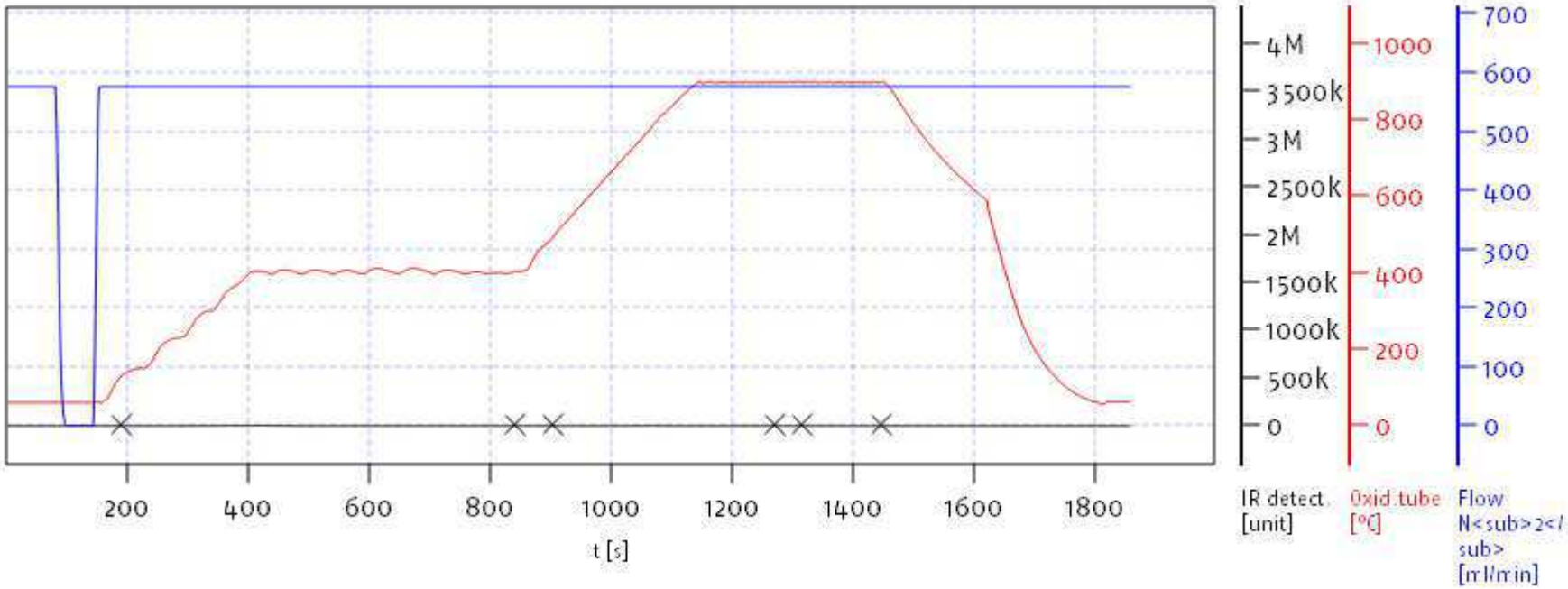
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
29	29	SJH0136-CCB2	572.00		1.00	CARBON	8/13/2021 3:12 AM	0.003	0.000	0.003	bl,C3u,C2u	21 310	4 531	752	1.0224	1.0000



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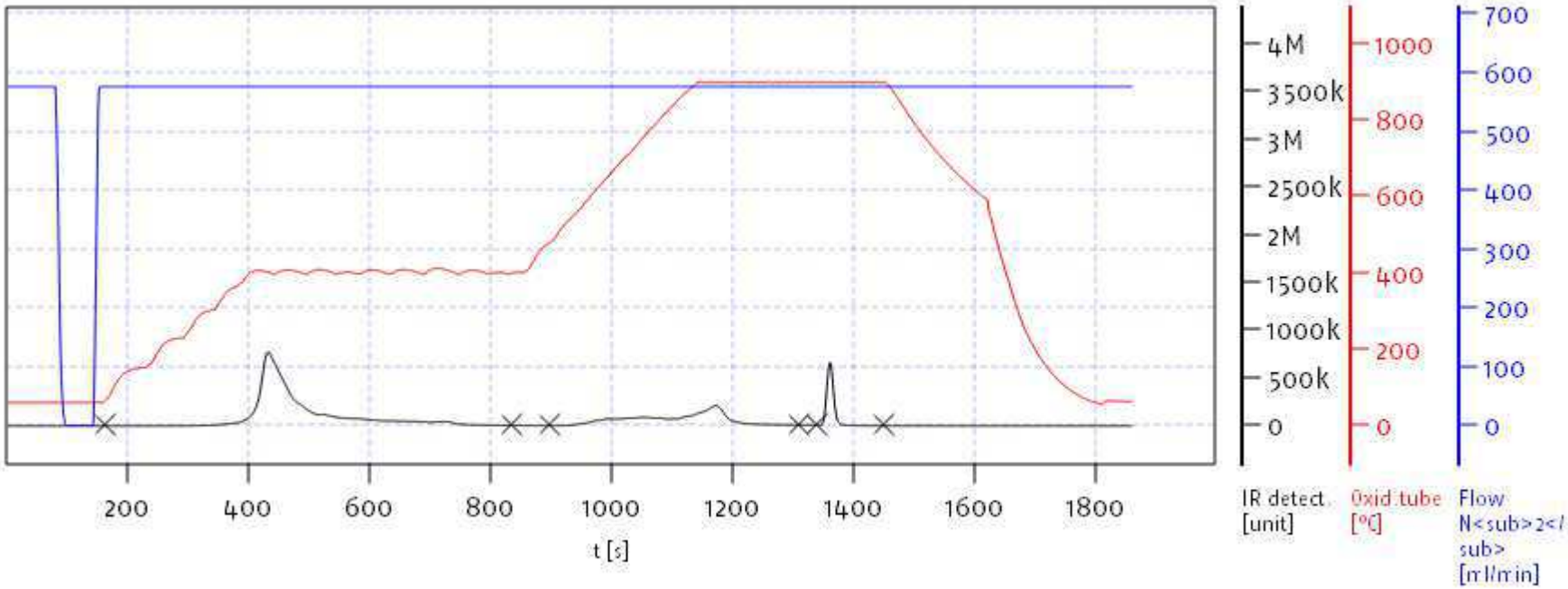
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
30	30	BJH0300-DUP1	589.00		1.00	CARBON	8/13/2021 3:43 AM	0.672	0.251	0.923	bl	2 179 612	962 224	336 683	1.0224	1.0000



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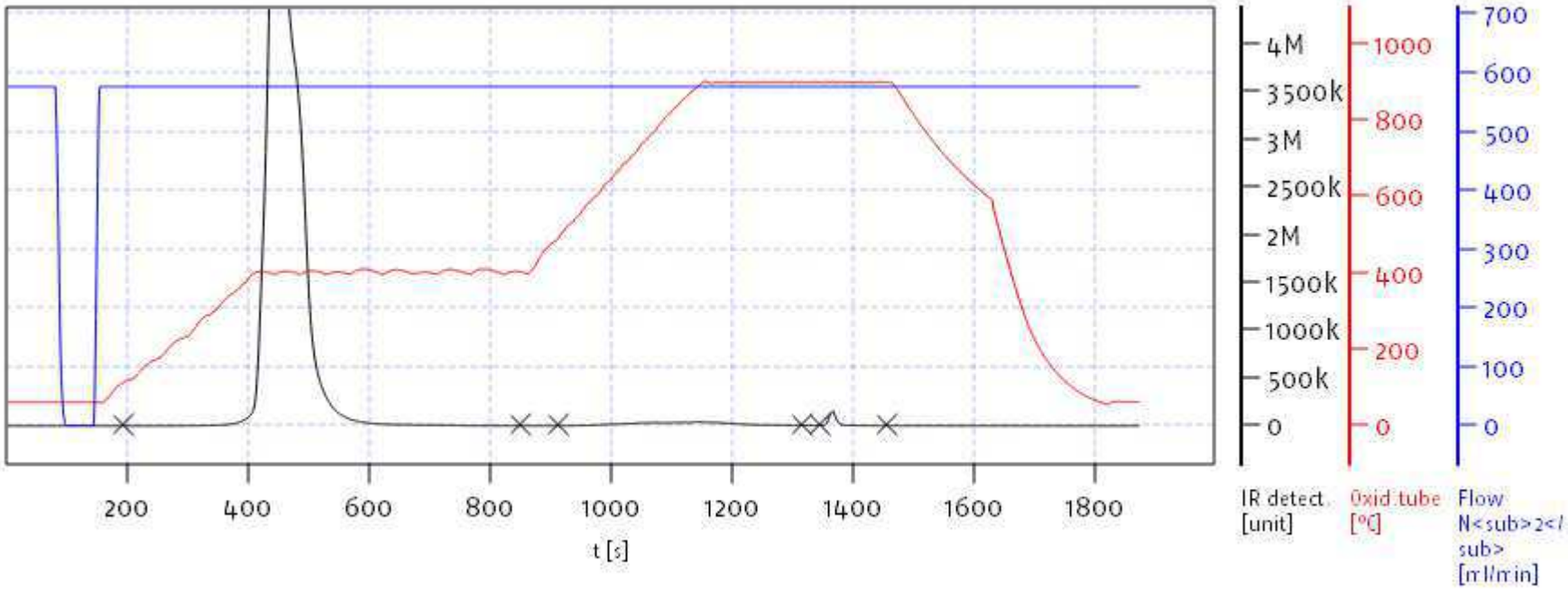
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
31	31	BJH0300-MS1	535.20	0.0127	1.00	CARBON	8/13/2021 4:15 AM	3.925	0.084	4.009	bl,C1o	13 137386	299 495	88 503	1.0224	1.0000



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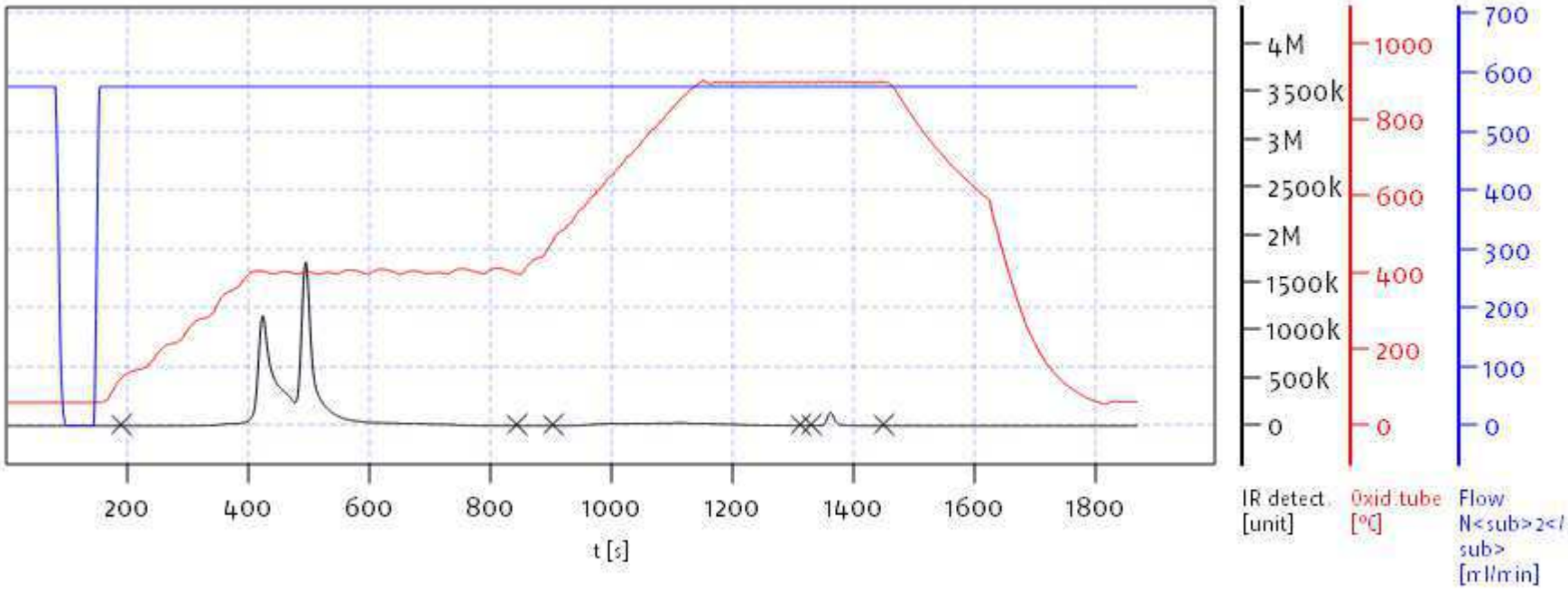
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
32	32	21G0276-01	631.30		1.00	CARBON	8/13/2021 4:47 AM	0.814	0.056	0.871	bl	3 173 044	239 366	80 738	1.0224	1.0000



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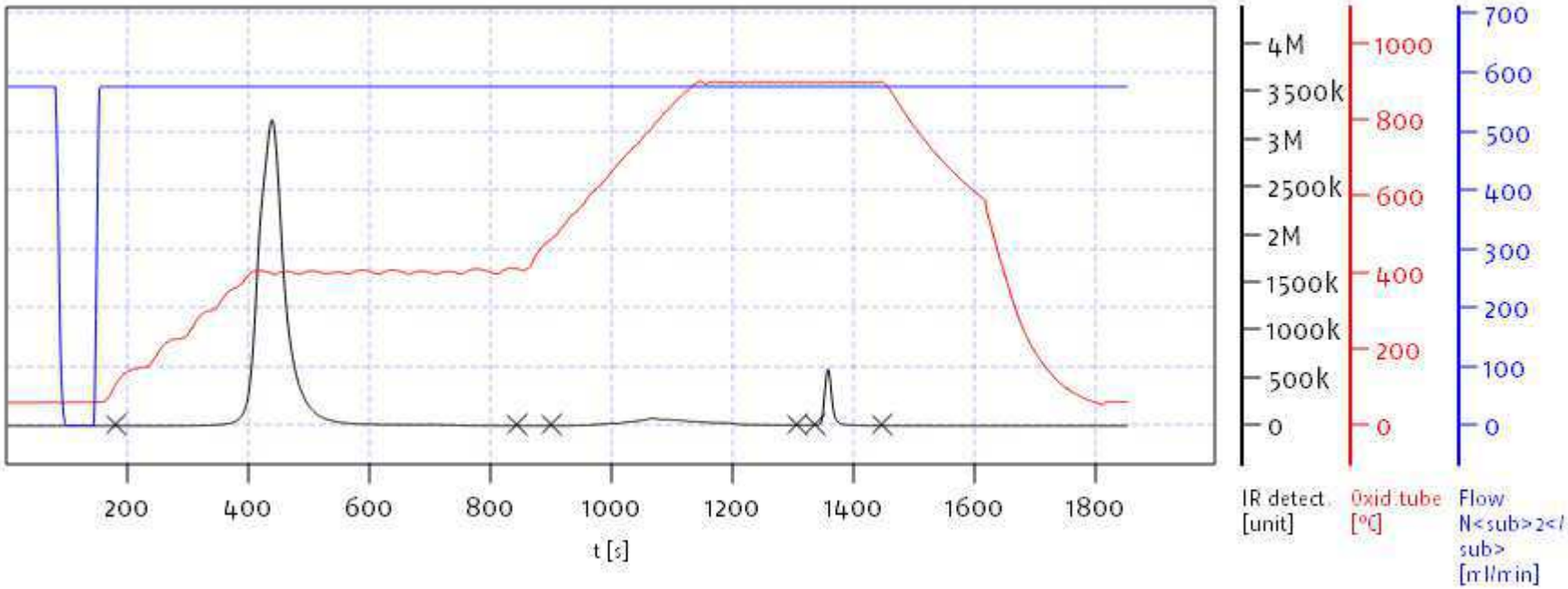
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
33	33	21G0276-02	573.10		1.00	CARBON	8/13/2021 5:18 AM	1.780	0.114	1.893	bl	6 117 406	430 072	320 471	1.0224	1.0000



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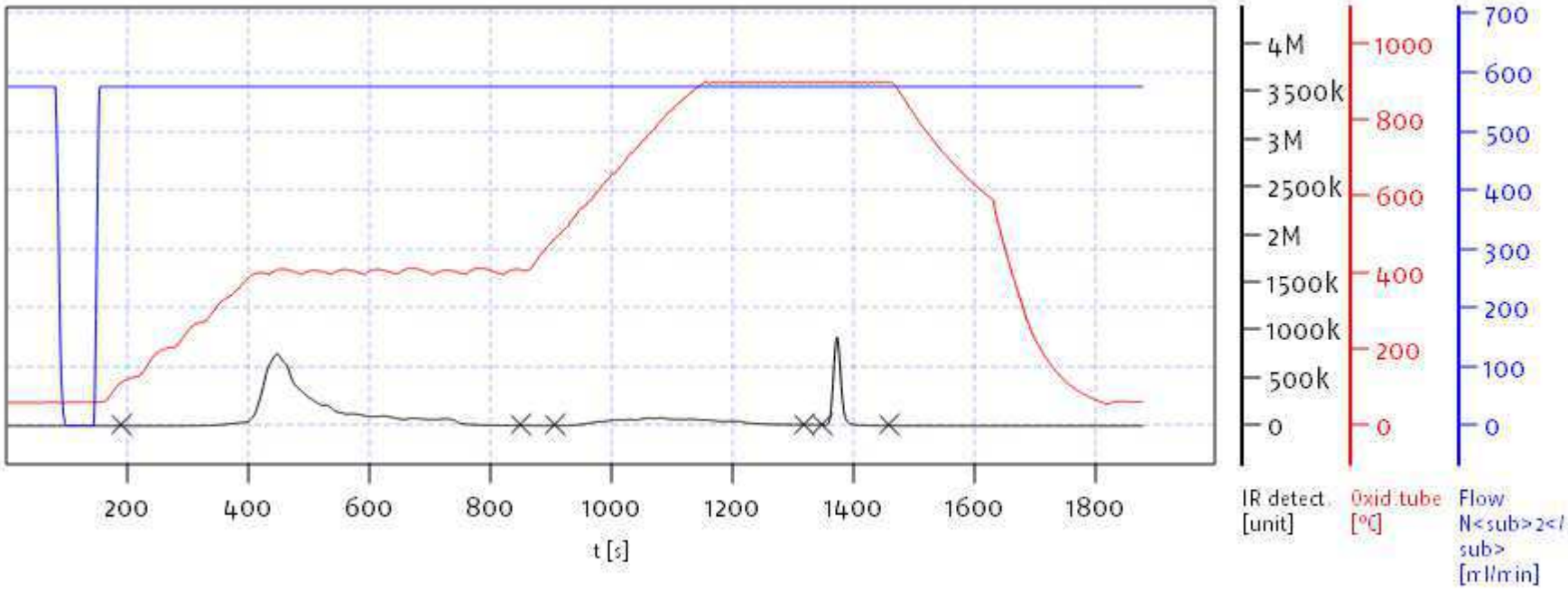
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
34	34	21G0276-03	597.40		1.00	CARBON	8/13/2021 5:50 AM	0.888	0.173	1.061	bl	2 850 374	674 045	515 168	1.0224	1.0000



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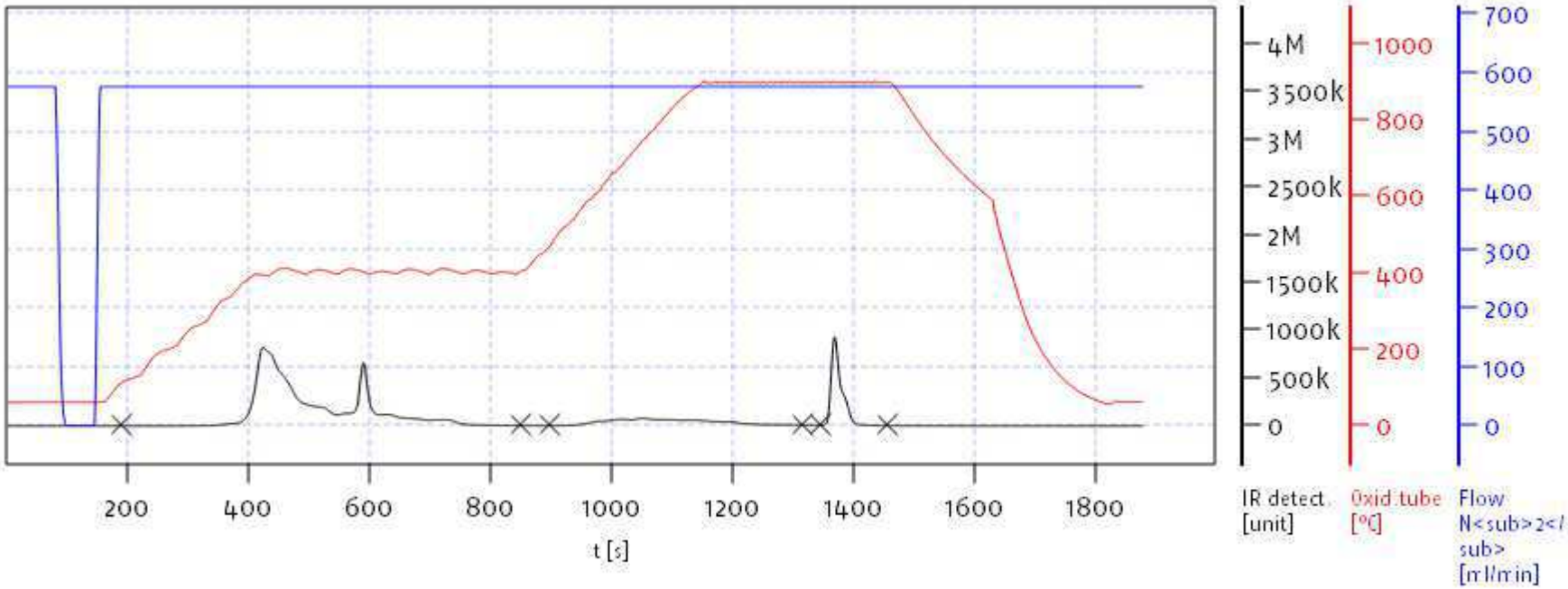
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
35	35	21G0276-04	558.60		1.00	CARBON	8/13/2021 6:21 AM	1.102	0.166	1.268	bl	3 221 716	606 516	683 587	1.0224	1.0000



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Date: Mon Aug 16 10:56:12 2021

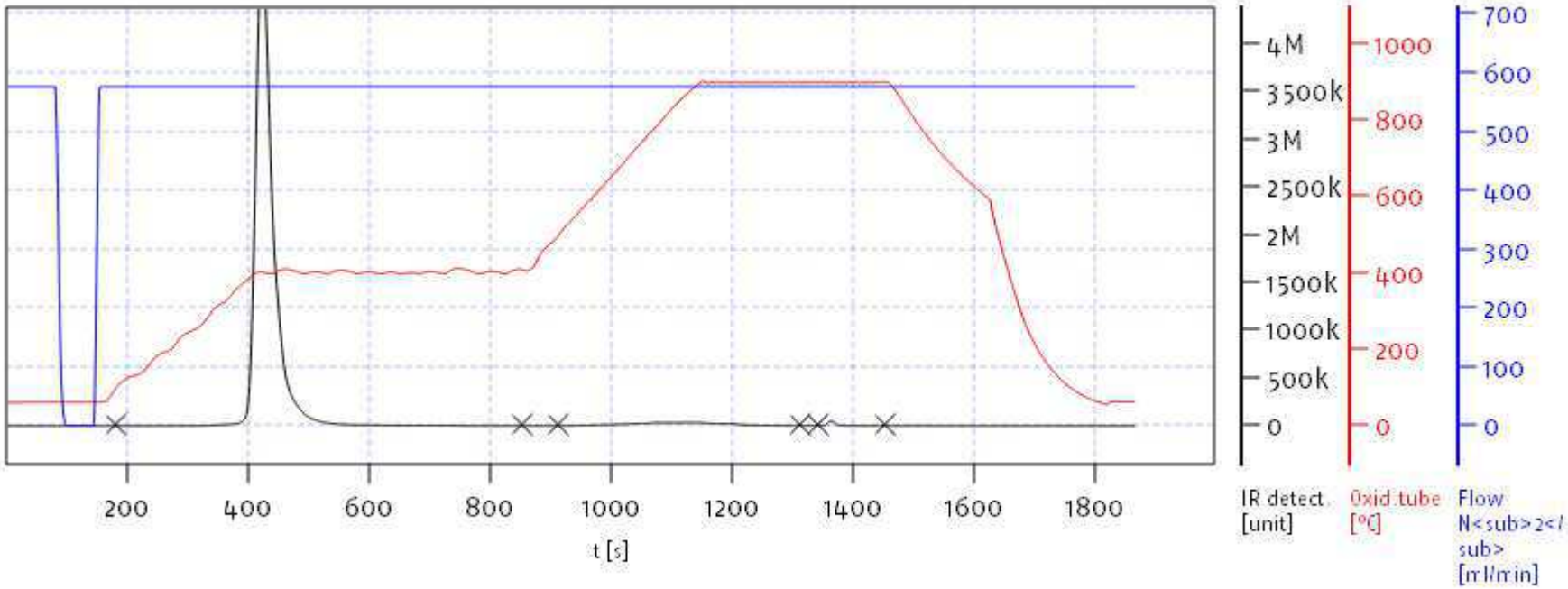
soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

elementar
EXCELLENCE IN ELEMENTS

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
36	36	21G0284-01	523.50		1.00	CARBON	8/13/2021 6:53 AM	1.911	0.071	1.982	bl	6 277 909	249 006	31 980	1.0224	1.0000



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Balance: BAL3
Analyst: BF

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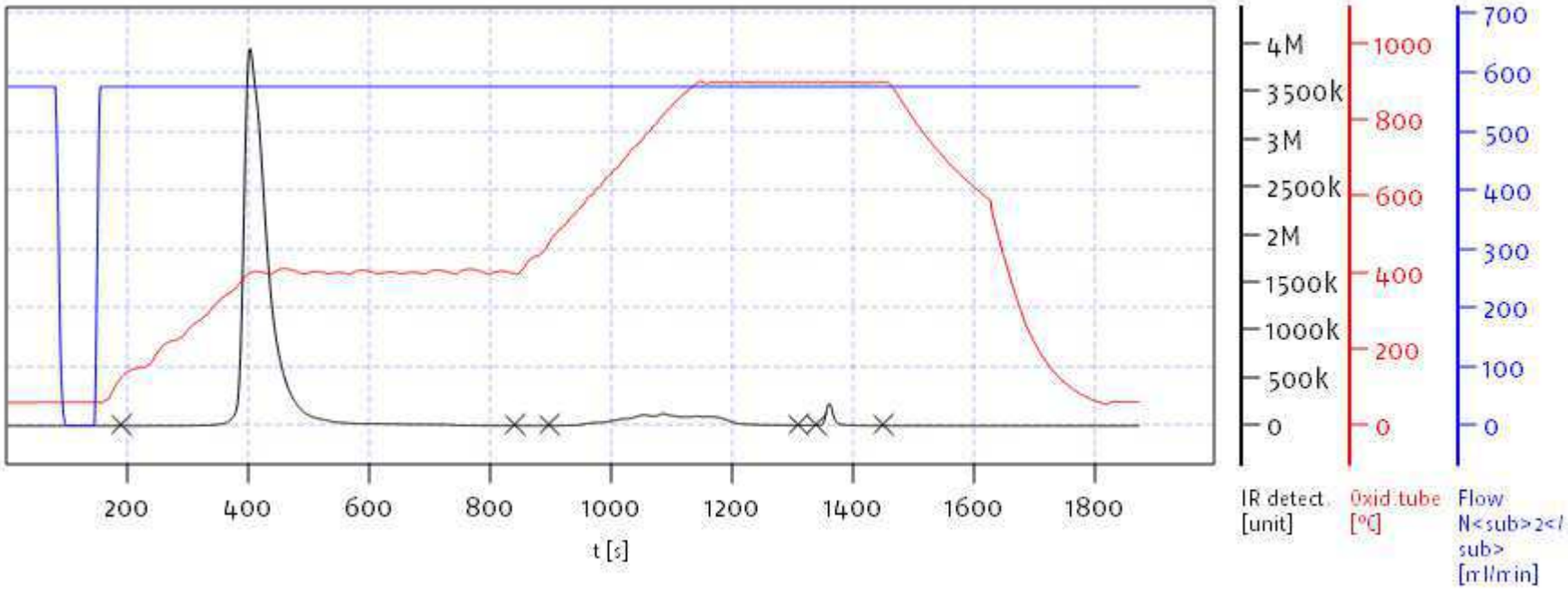
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
37	37	BJH0300-DUP2	626.80		1.00	CARBON	8/13/2021 7:24 AM	1.747	0.200	1.947	bl	6 769 883	816 521	135 391	1.0224	1.0000



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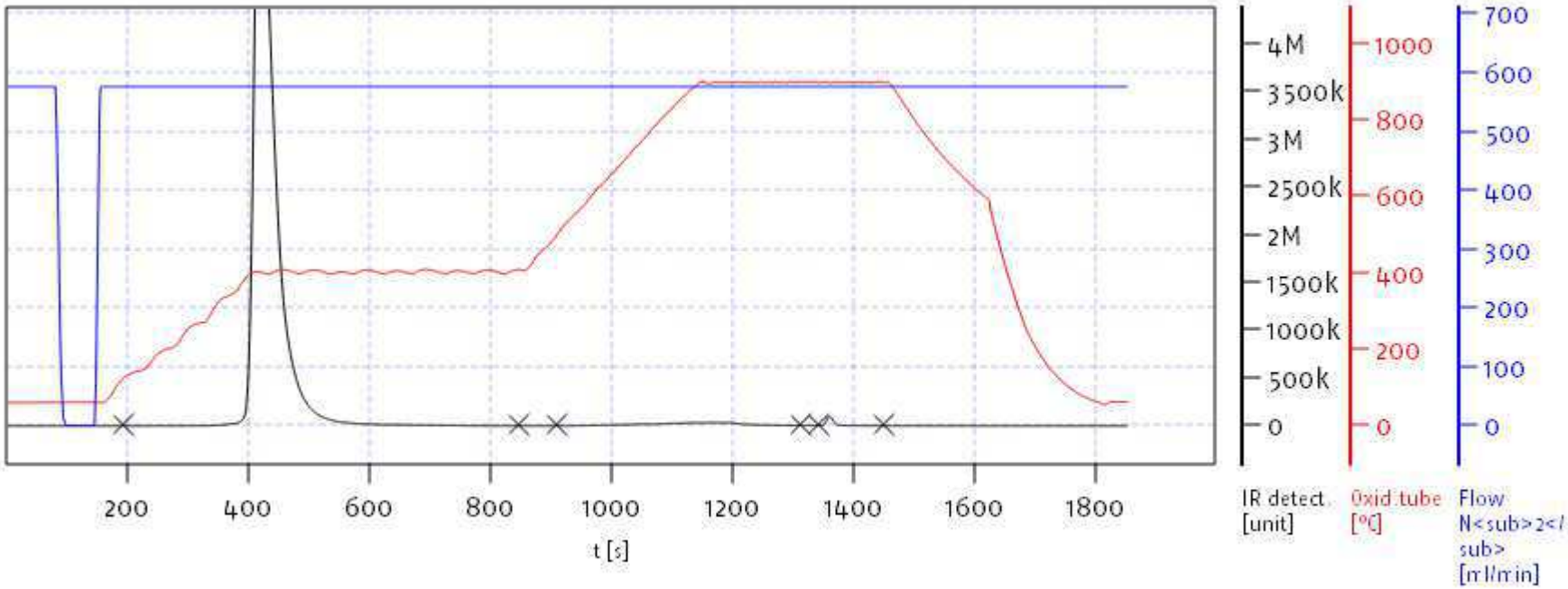
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
38	38	BJH0300-MS2	524.80	0.0130	1.00	CARBON	8/13/2021 7:56 AM	2.925	0.068	2.993	bl,C1o	9 613 544	241 346	55 455	1.0224	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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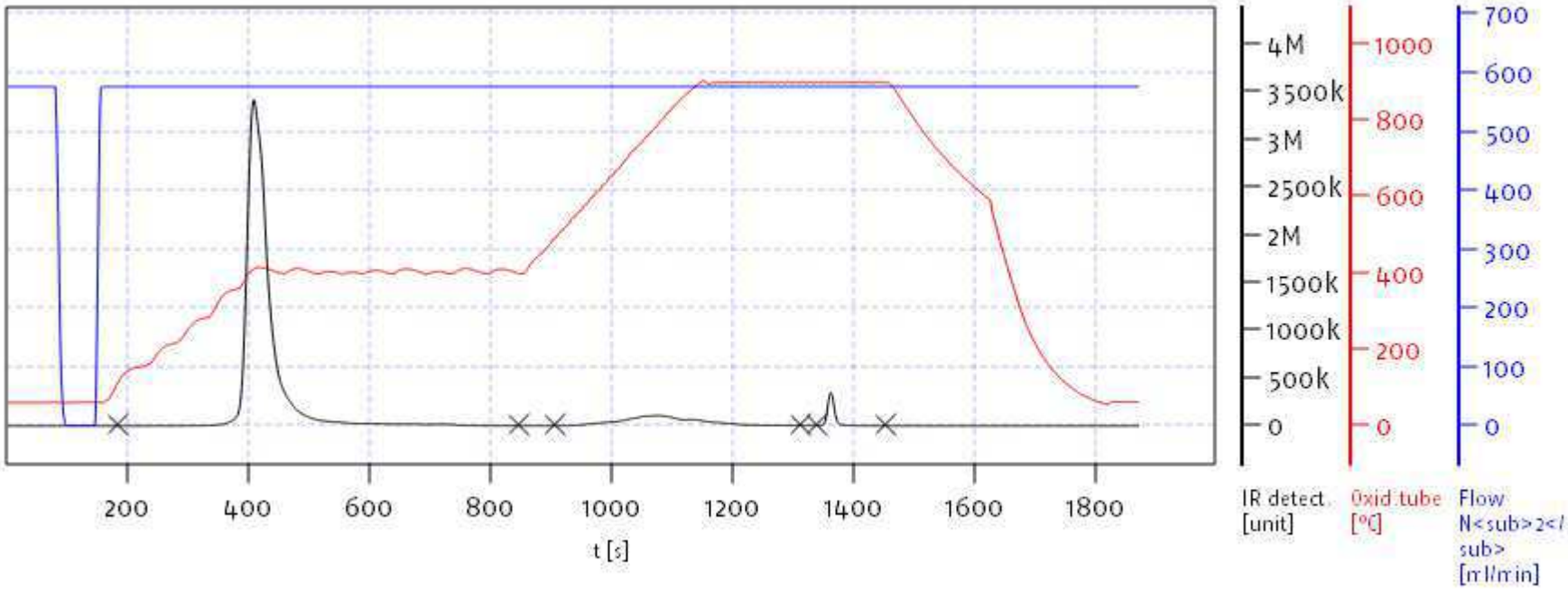
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
39	39	21G0284-02	510.20		1.00	CARBON	8/13/2021 8:27 AM	1.721	0.177	1.898	bl	5 370 681	592 151	172 971	1.0224	1.0000



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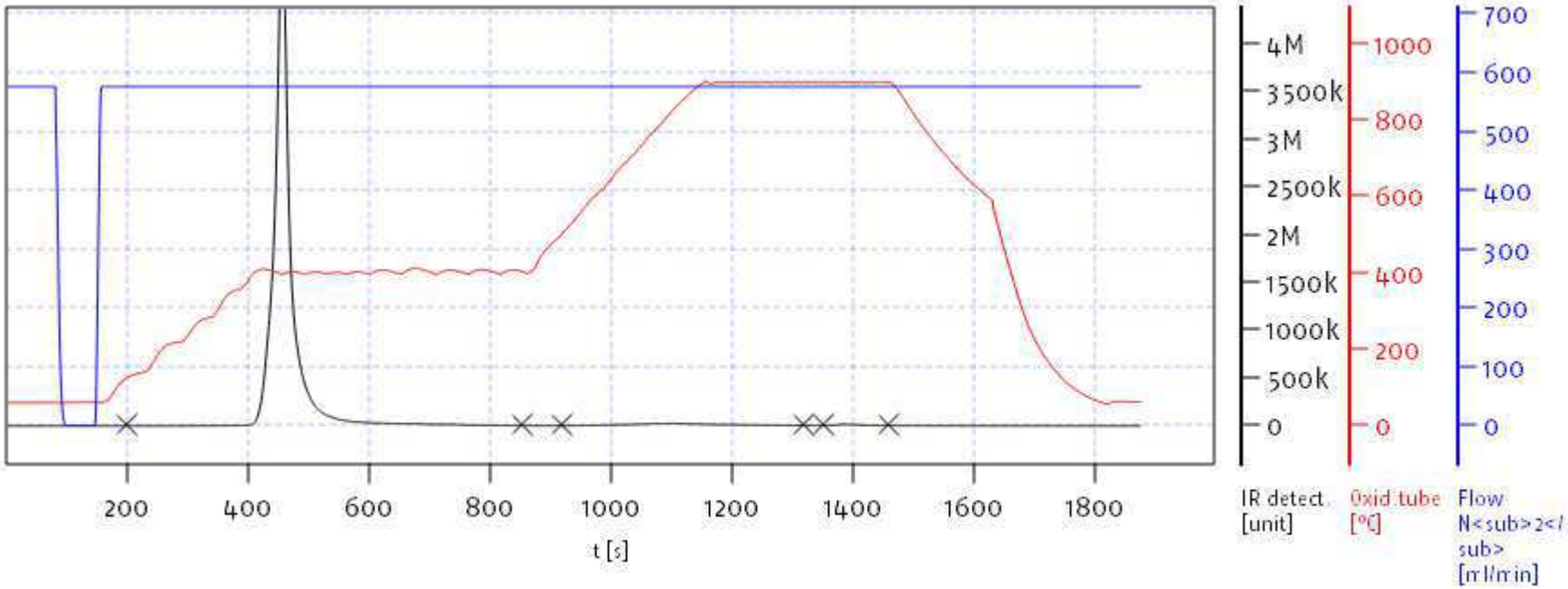
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
40	40	SJH0136-CCV3	21.60		1.00	CARBON	8/13/2021 8:59 AM	43.660	1.255	44.916	bl	5 917 170	184 920	31 809	1.0224	1.0000



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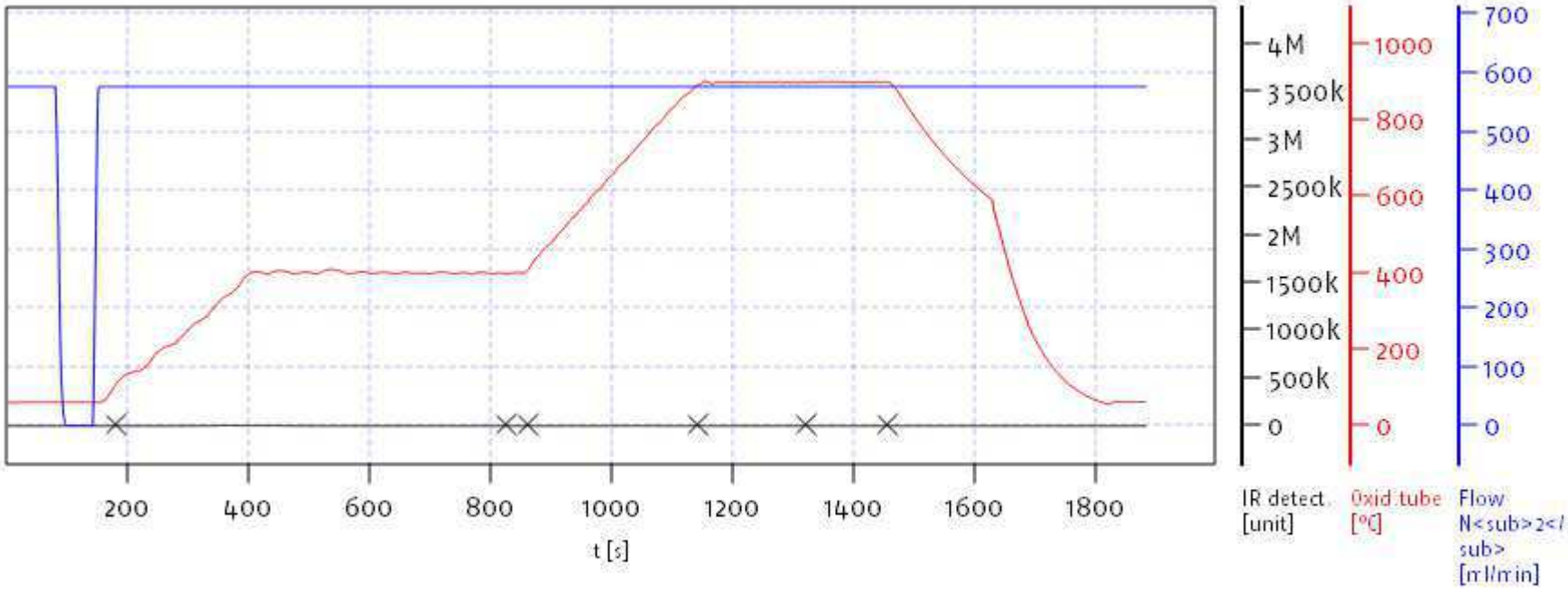
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
41	41	SJH0136-CCB3	591.00		1.00	CARBON	8/13/2021 9:31 AM	0.003	0.000	0.003	bl,C3u,C2u	21 119	3 240	816	1.0224	1.0000



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Soli TOC Cube, Carbon
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Analyst: BF

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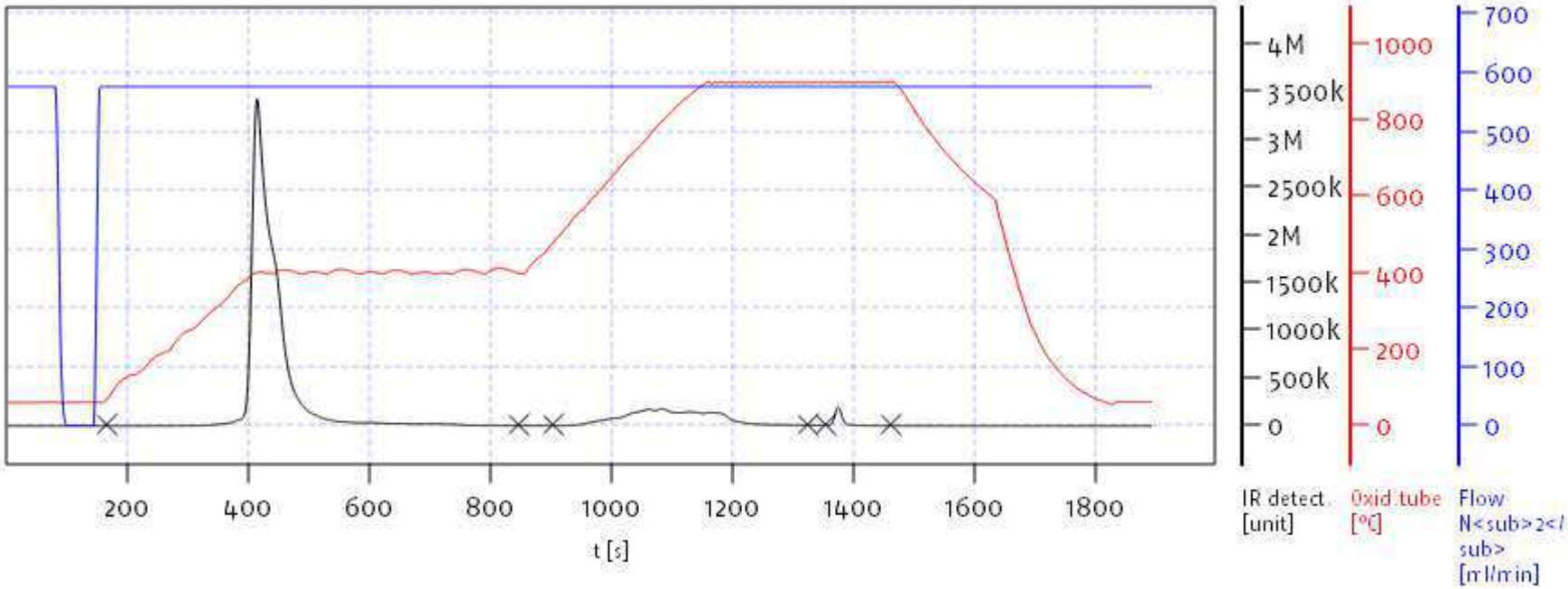
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
42	42	21G0284-03	671.80		1.00	CARBON	8/13/2021 10:03 AM	1.366	0.273	1.639	bl	5 679 800	1 190 746	111 502	1.0224	1.0000



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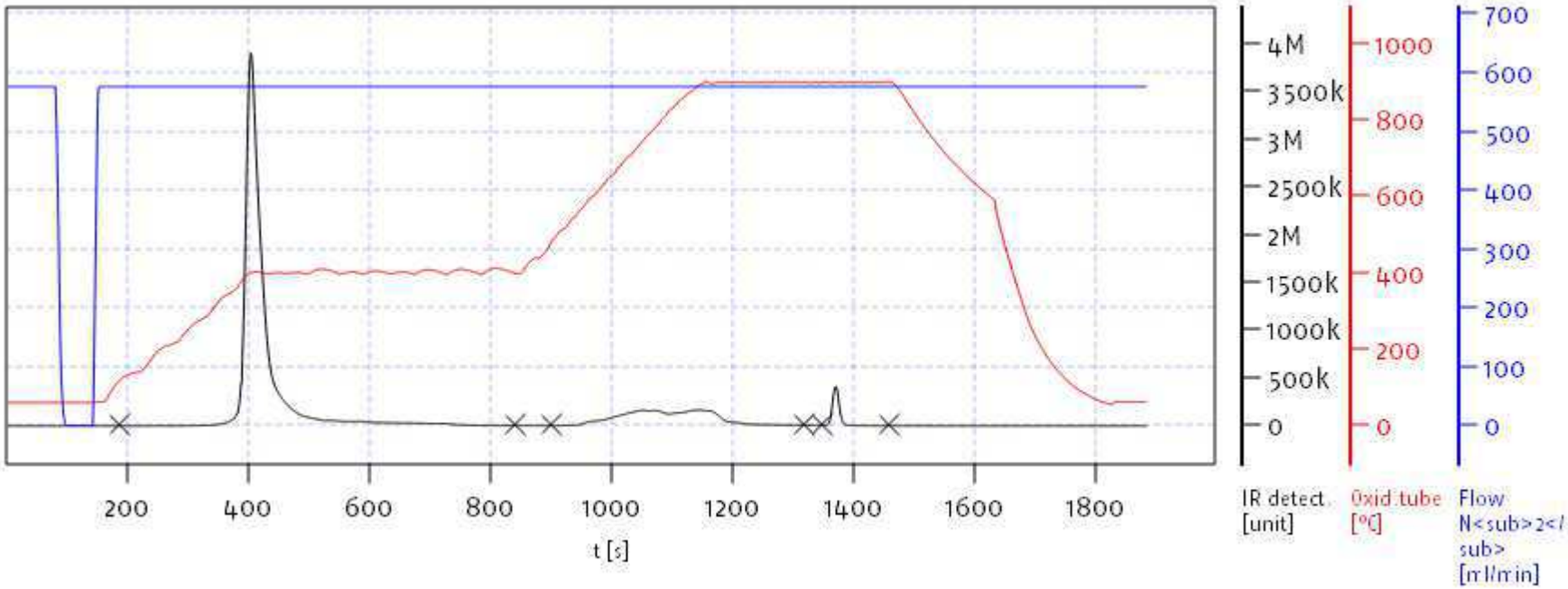
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
43	43	21G0284-04	511.90		1.00	CARBON	8/13/2021 10:34 AM	1.583	0.353	1.937	bl	4 911 346	1 172 729	208 620	1.0224	1.0000



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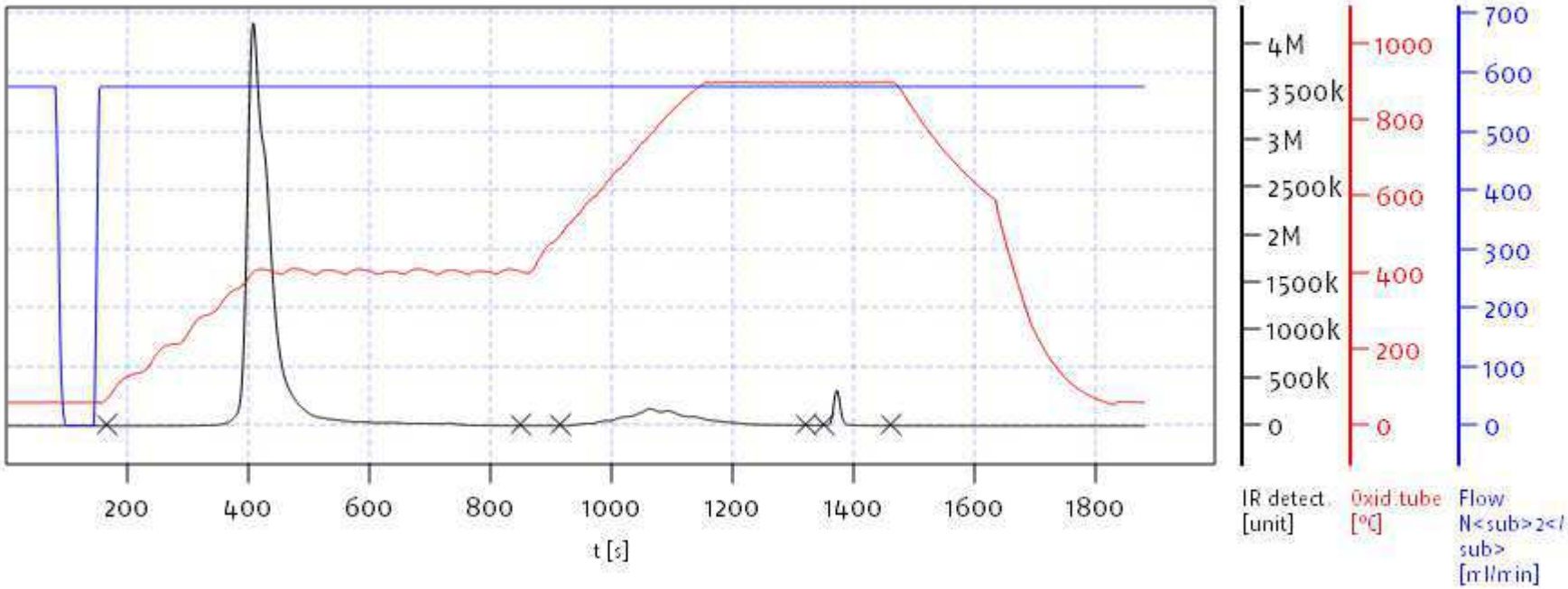
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
44	44	21G0284-06	631.10		1.00	CARBON	8/13/2021 11:06 AM	1.783	0.222	2.005	bl	6 907 258	909 006	191 734	1.0224	1.0000



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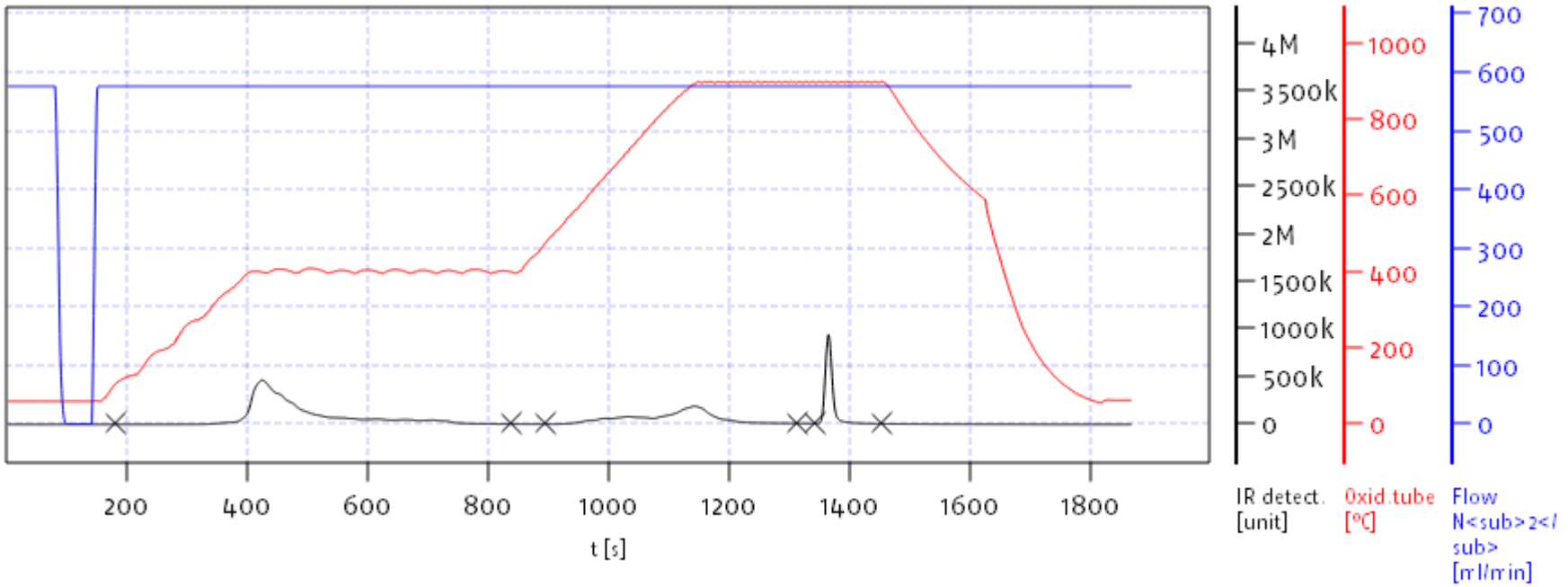
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
45	45	21G0284-07	593.00		1.00	CARBON	8/13/2021 11:38 AM	0.590	0.240	0.830	bl	1 719 178	926 990	510 550	1.0224	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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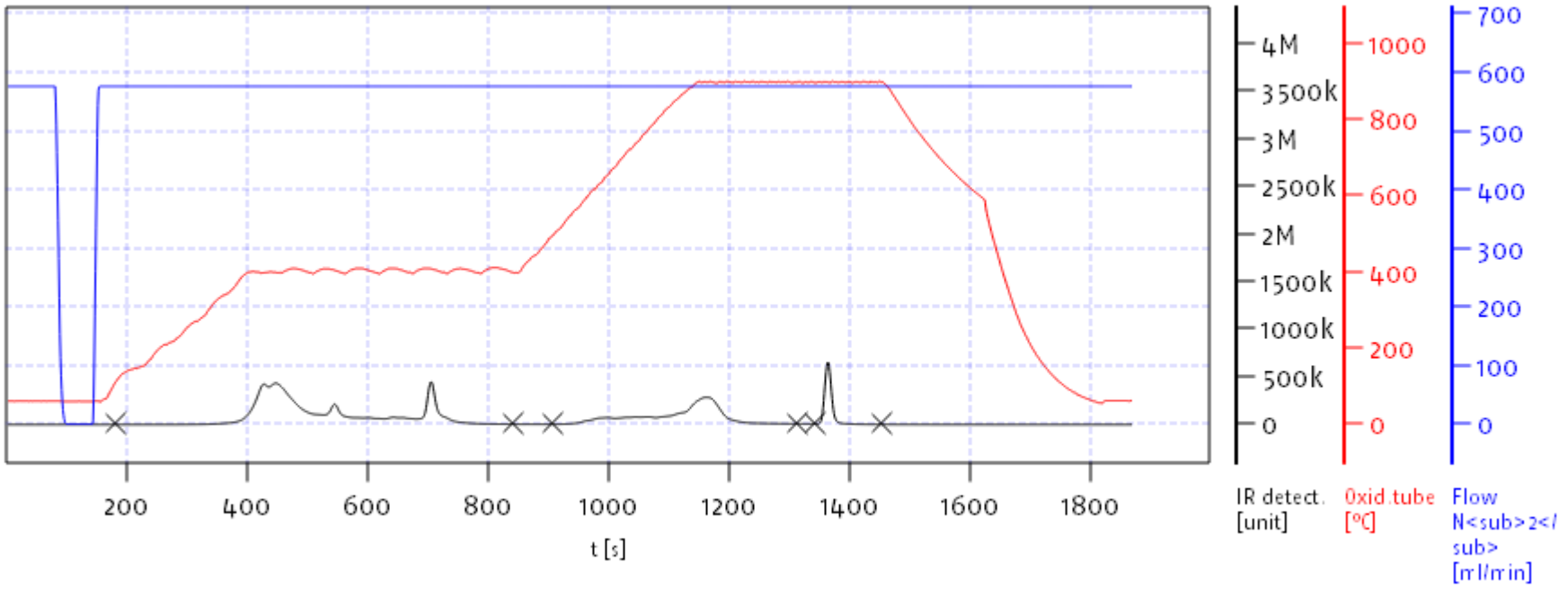
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
46	46	21G0284-08	561.90		1.00	CARBON	8/13/2021 12:09 PM	0.706	0.314	1.020	bl	2 185 124	1 143 800	336 948	1.0224	1.0000



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Soli TOC Cube, Carbon
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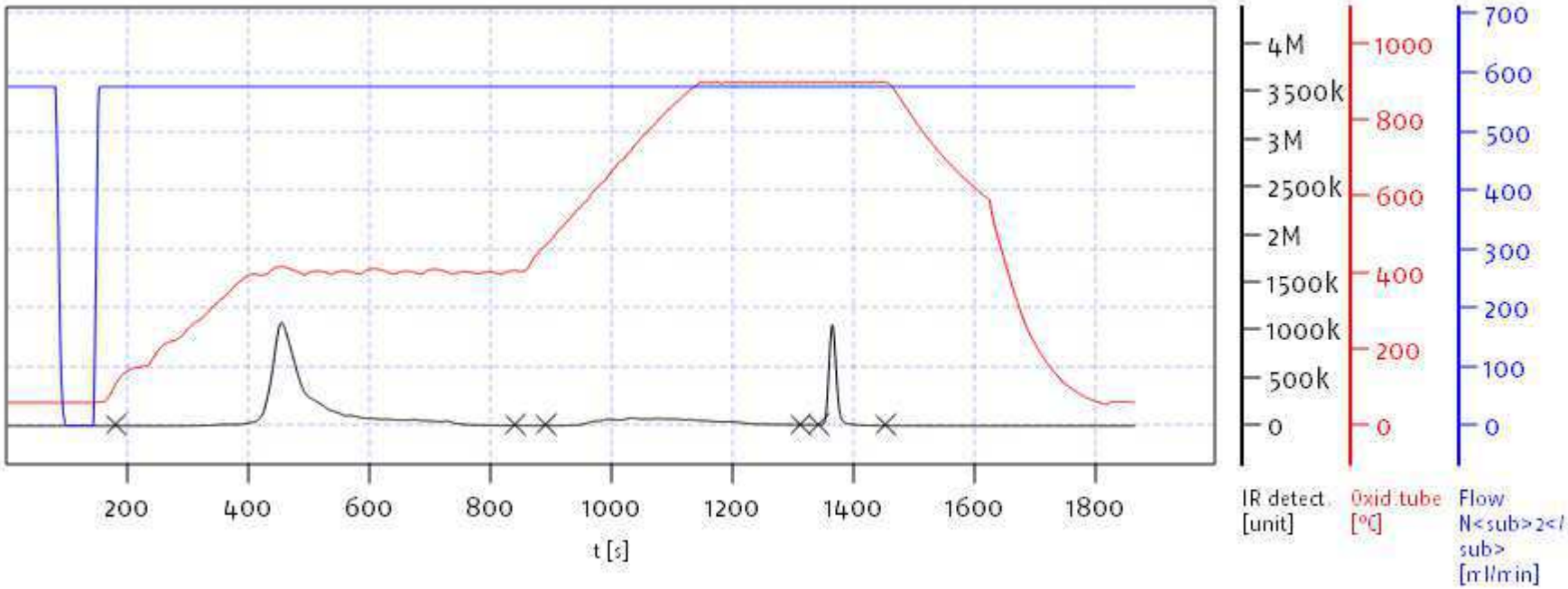
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
47	47	21G0286-01	567.10		1.00	CARBON	8/13/2021 12:41 PM	0.944	0.178	1.122	bl	2 817 518	658 656	581 586	1.0224	1.0000



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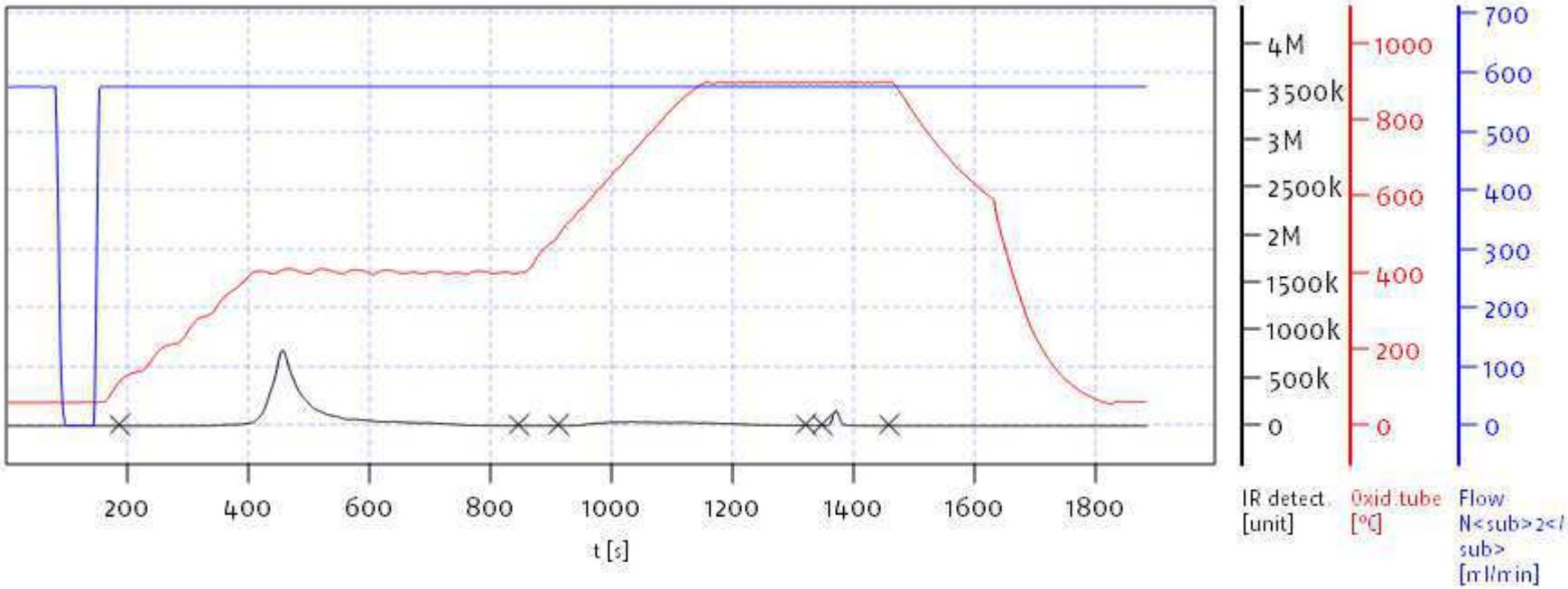
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
48	48	21G0286-02	736.90		1.00	CARBON	8/13/2021 1:13 PM	0.443	0.069	0.512	bl	1 991 731	337 588	83 734	1.0224	1.0000



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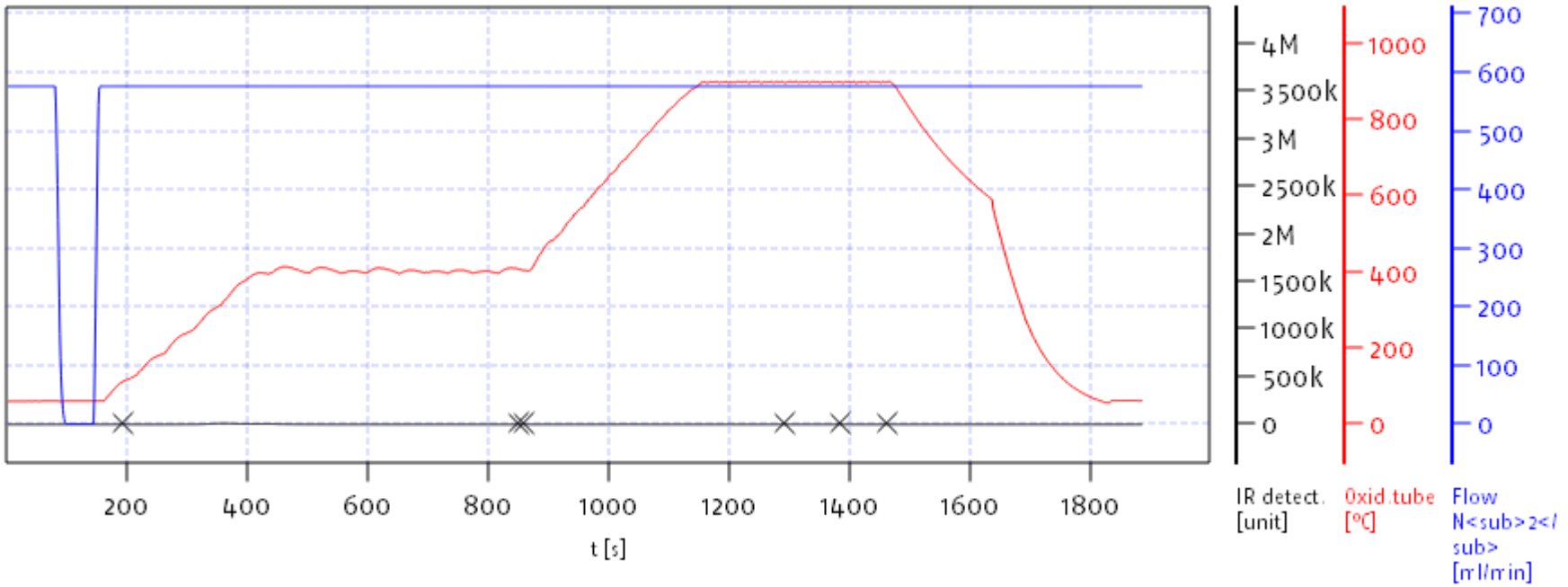
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
49	49	BLANK	1.00		1.00	CARBON	8/13/2021 1:44 PM	0.000	0.000	0.000	bl	38 490	3 016	262	1.0224	1.0000



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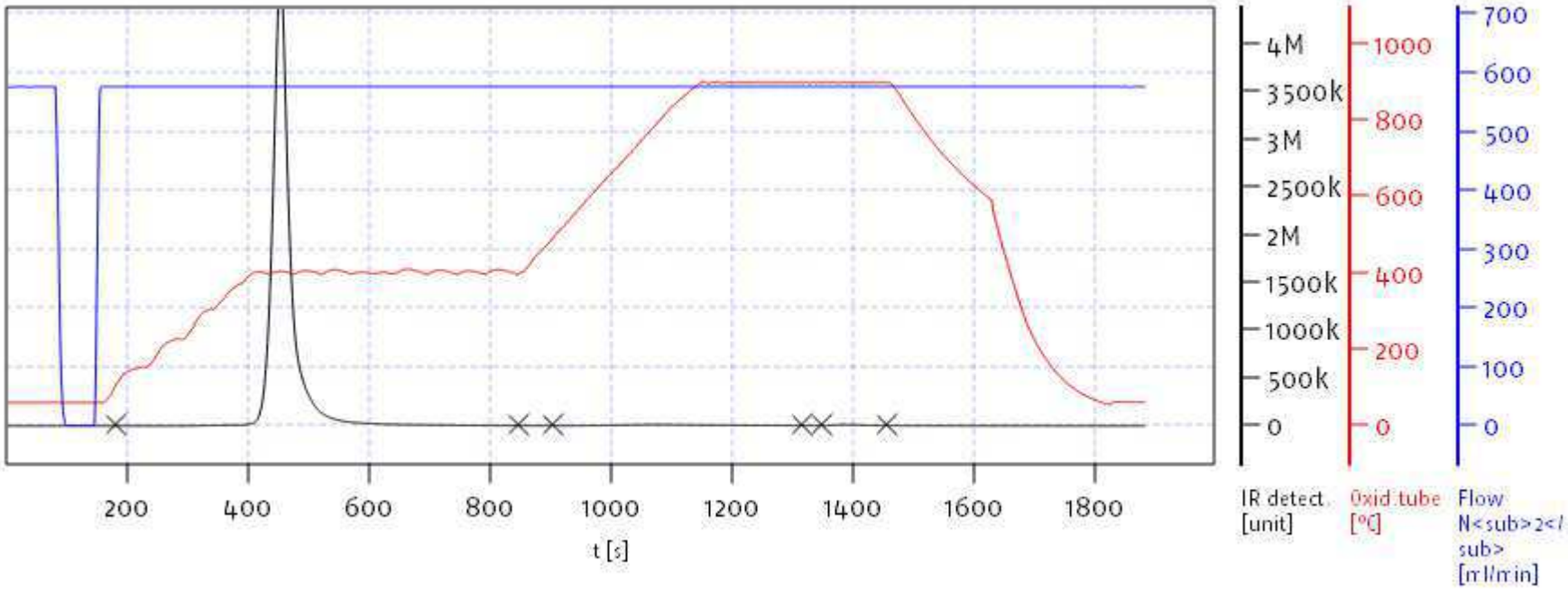
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
50	50	Dfactor	21.10		1.00	CARBON	8/13/2021 2:16 PM	44.580	0.683	45.263	bl	5 889 374	103 326	28 903	1.0251	1.0000



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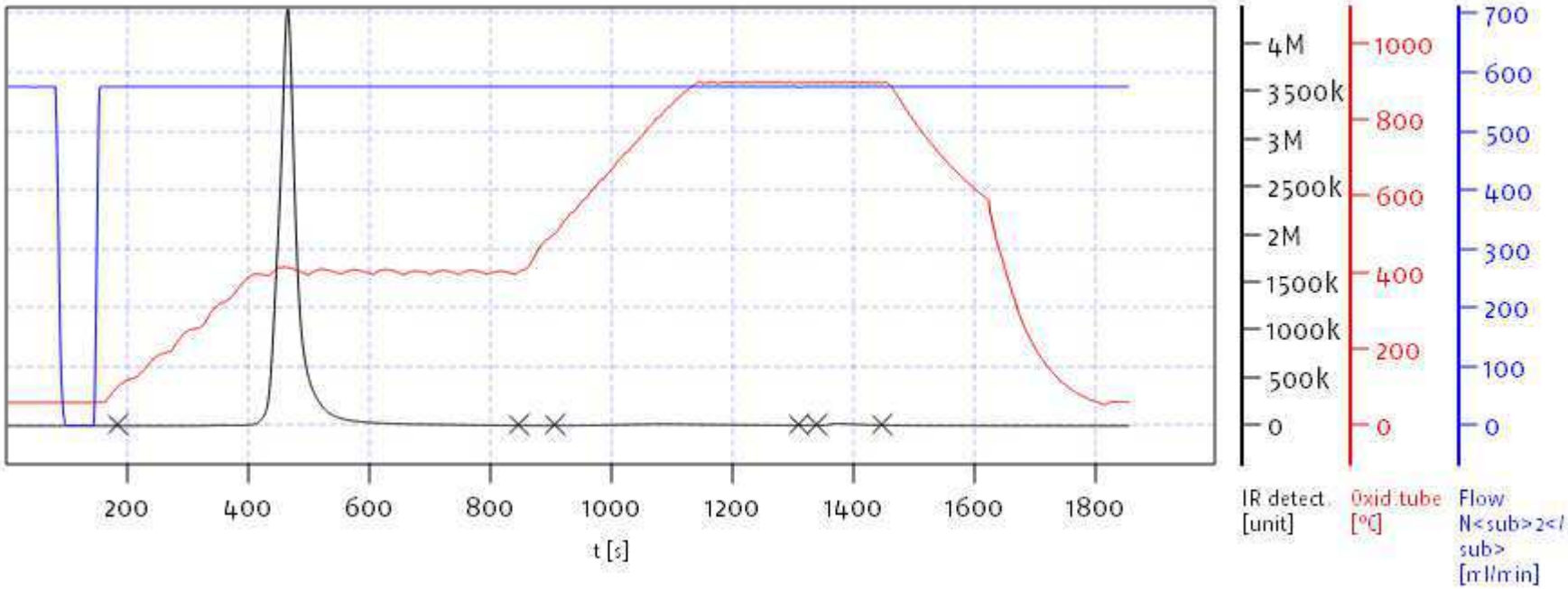
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
51	51	Dfactor	21.40		1.00	CARBON	8/13/2021 2:47 PM	44.746	1.021	45.767	bl	5 848 510	151 033	52 061	1.0469	1.0000



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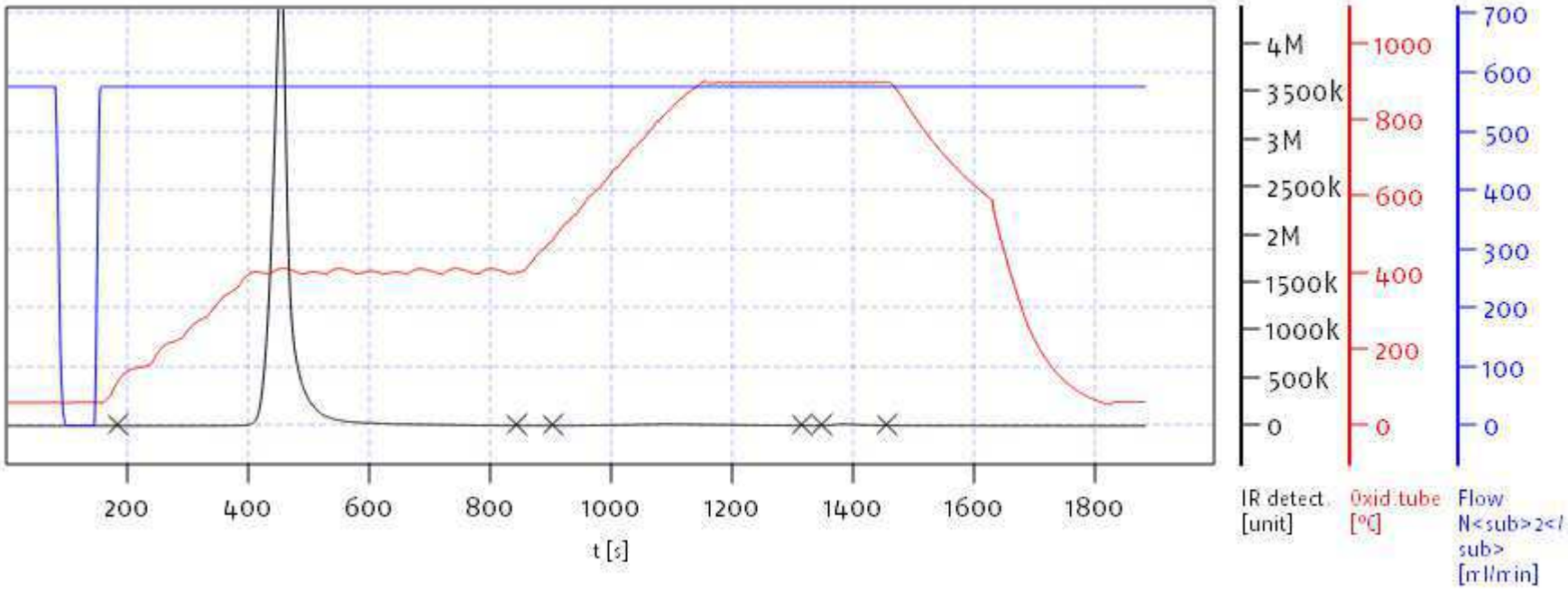
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
52	52	SJH0136-CCV4	20.70		1.00	CARBON	8/13/2021 3:19 PM	44.592	0.977	45.569	bl	5 709 297	140 650	38 200	1.0360	1.0000



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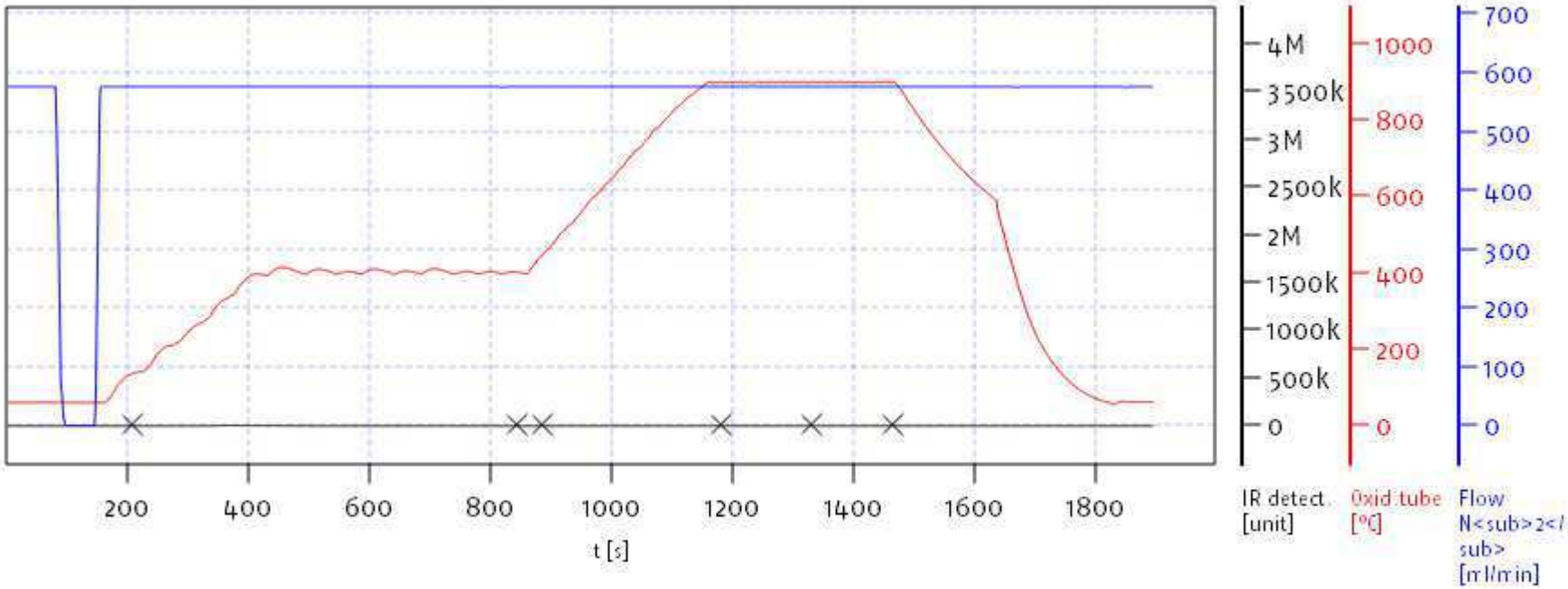
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
53	53	SJH0136-CCB4	554.30		1.00	CARBON	8/13/2021 3:51 PM	0.002	0.000	0.002	bl,C3u,C2u	18 340	856	1 281	1.0360	1.0000



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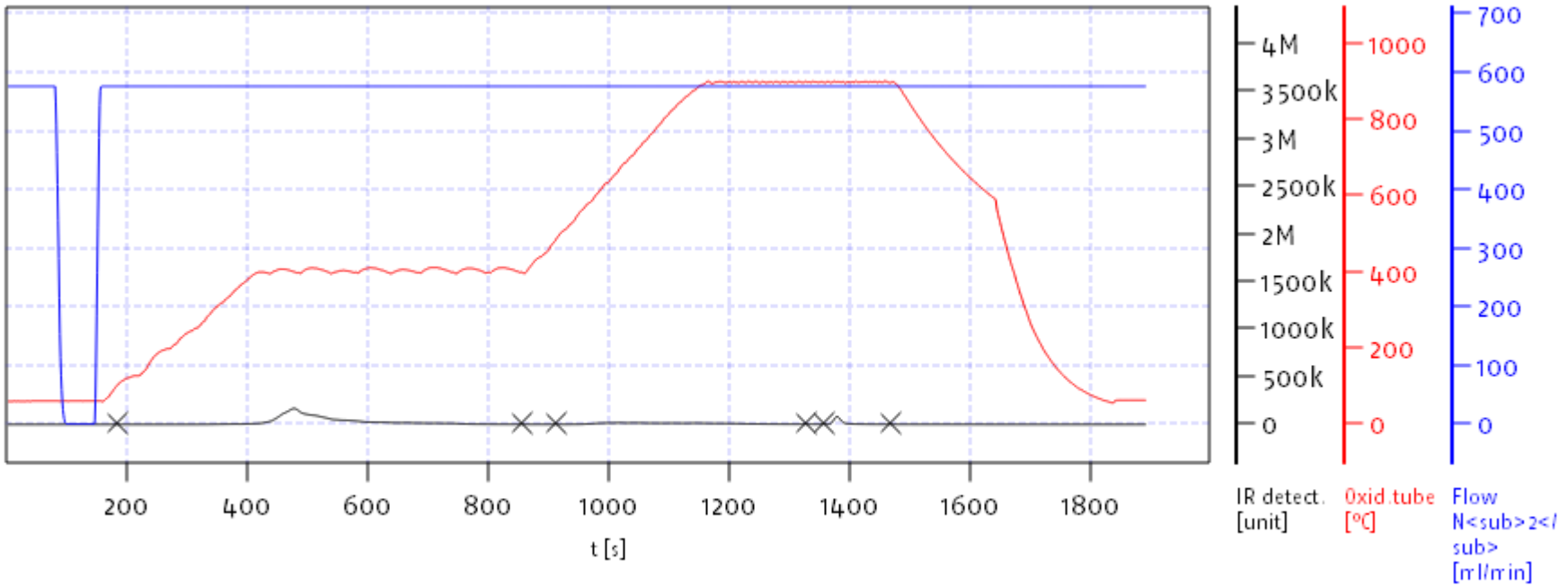
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
54	54	21G0286-03	522.10		1.00	CARBON	8/13/2021 4:23 PM	0.198	0.040	0.238	bl	609 620	145 032	53 040	1.0360	1.0000



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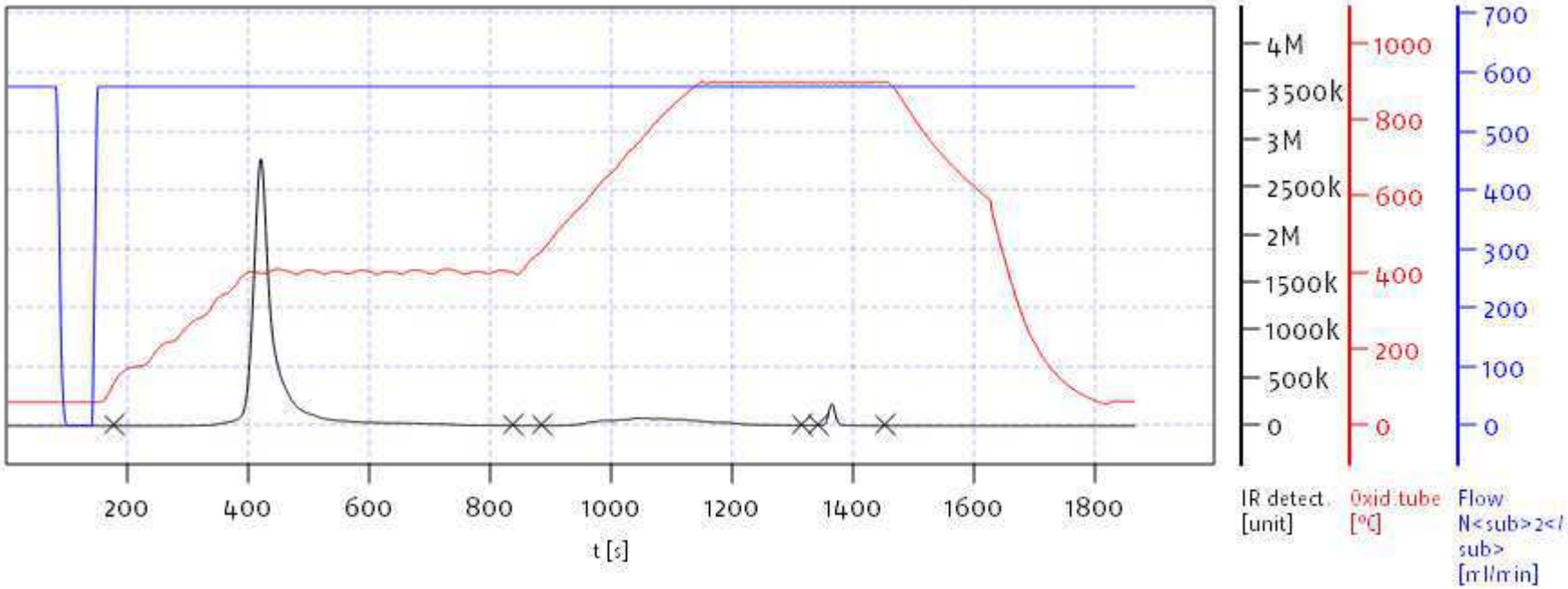
EXCELLENCE IN ELEMENTS

Document: 081321BF from: 8/14/2021 4:11 PM

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
55	55	21G0286-04	595.30		1.00	CARBON	8/13/2021 4:55 PM	1.130	0.151	1.281	bl	4 076 907	588 870	118 856	1.0360	1.0000



Name:

Access: soliTOC superuser

Date: Mon Aug 16 10:56:12 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

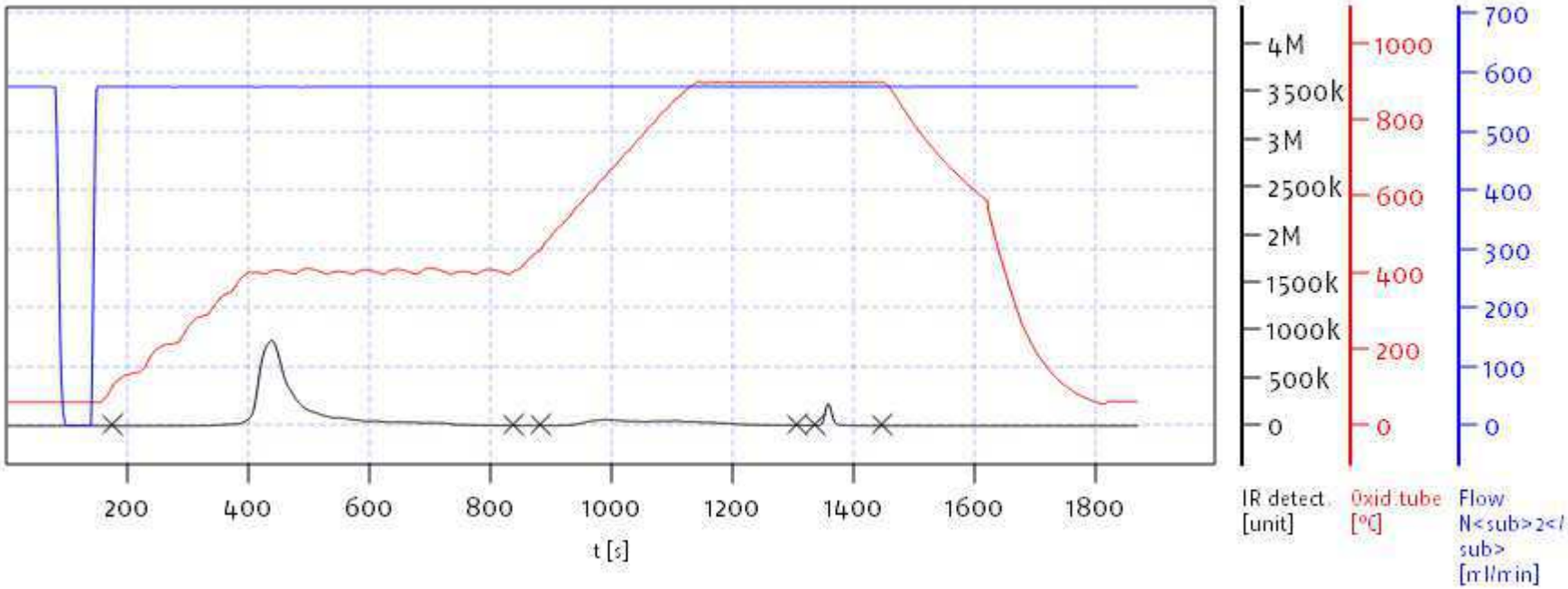
elementar
EXCELLENCE IN ELEMENTS

Document: 081321BF from: 8/14/2021 4:11 PM

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
56	56	21G0286-05	564.20		1.00	CARBON	8/13/2021 5:26 PM	0.705	0.131	0.836	bl	2 366 436	485 502	124 893	1.0360	1.0000



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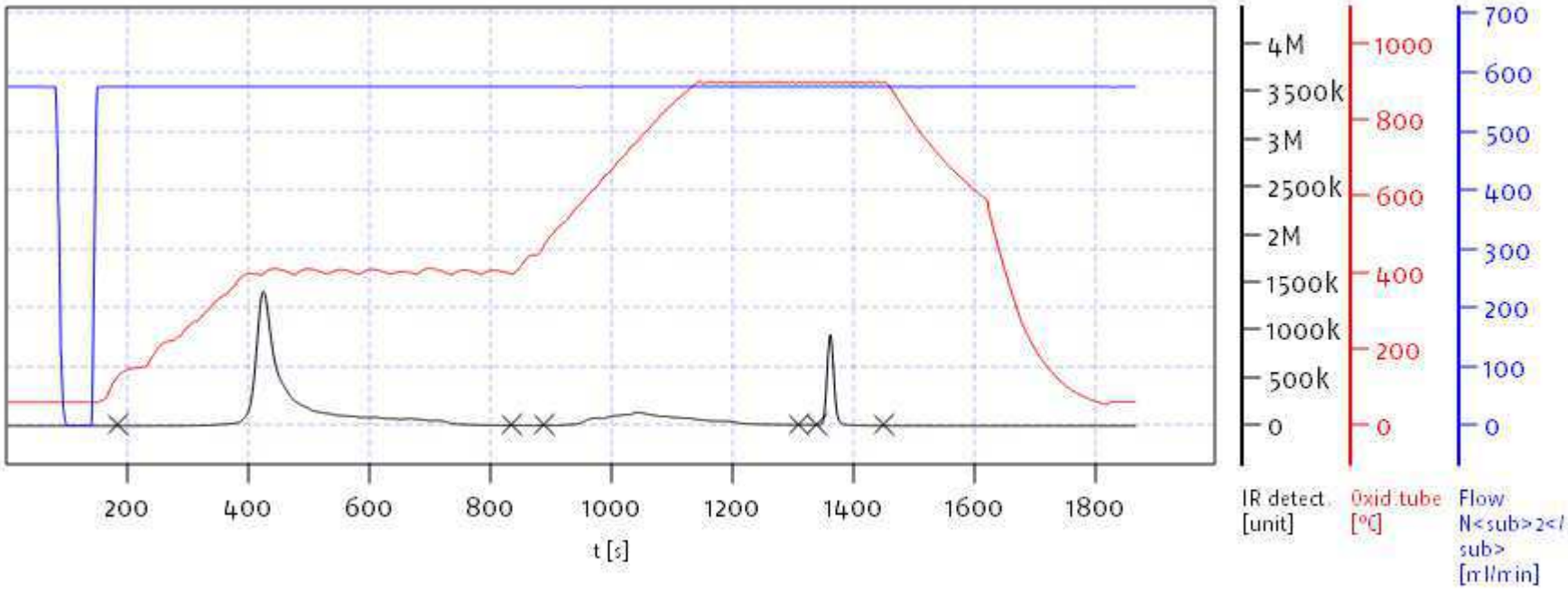
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
57	57	21G0305-01	596.10		1.00	CARBON	8/13/2021 5:58 PM	0.955	0.236	1.191	bl	3 079 026	914 557	491 759	1.0360	1.0000



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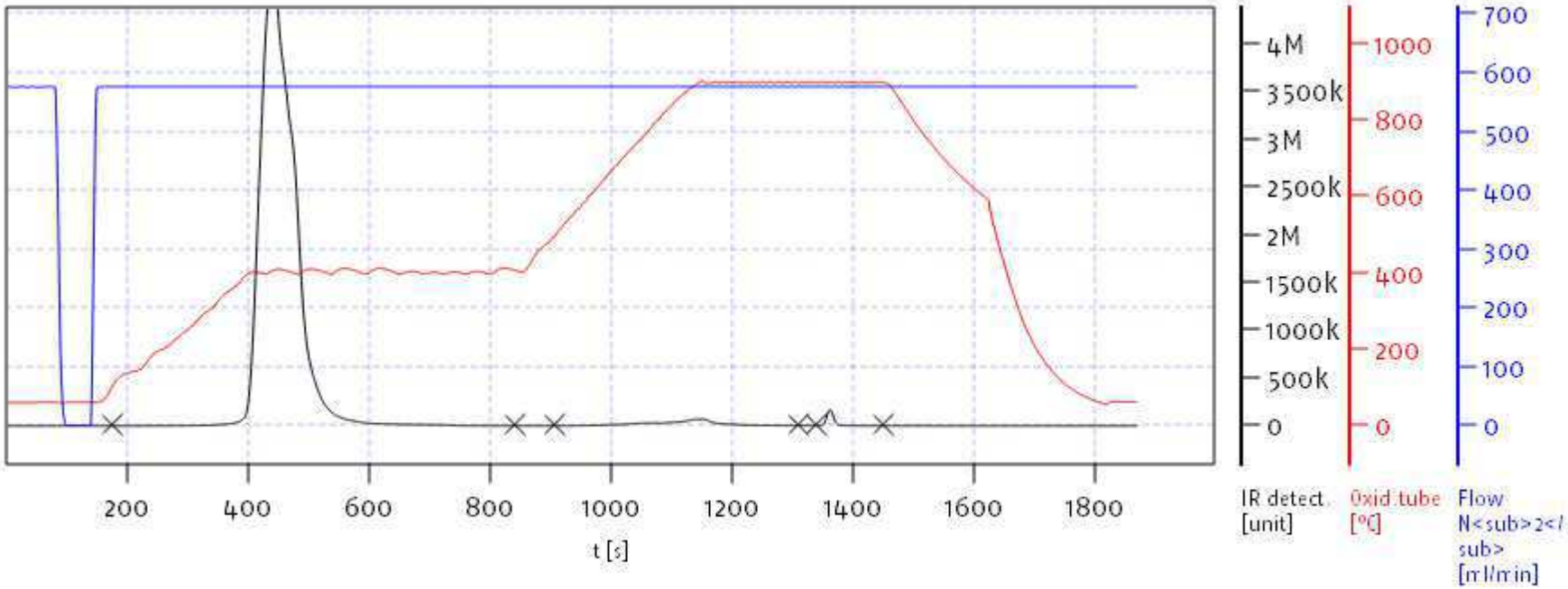
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
58	58	21G0305-02	577.10		1.00	CARBON	8/13/2021 6:29 PM	3.223	0.077	3.300	bl,C1o	11 470300	297 189	89 388	1.0360	1.0000



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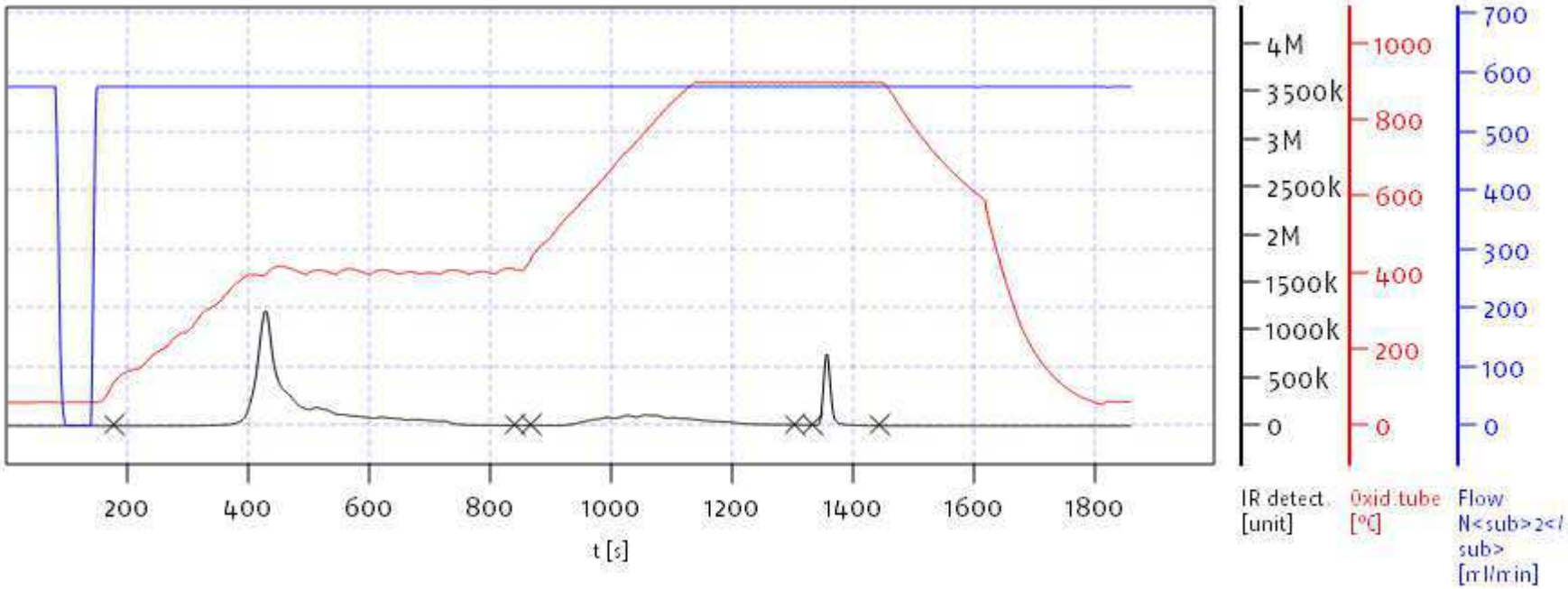
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
59	59	21G0305-03	550.90		1.00	CARBON	8/13/2021 7:01 PM	0.938	0.228	1.166	bl	2 838 498	816 801	402 021	1.0360	1.0000



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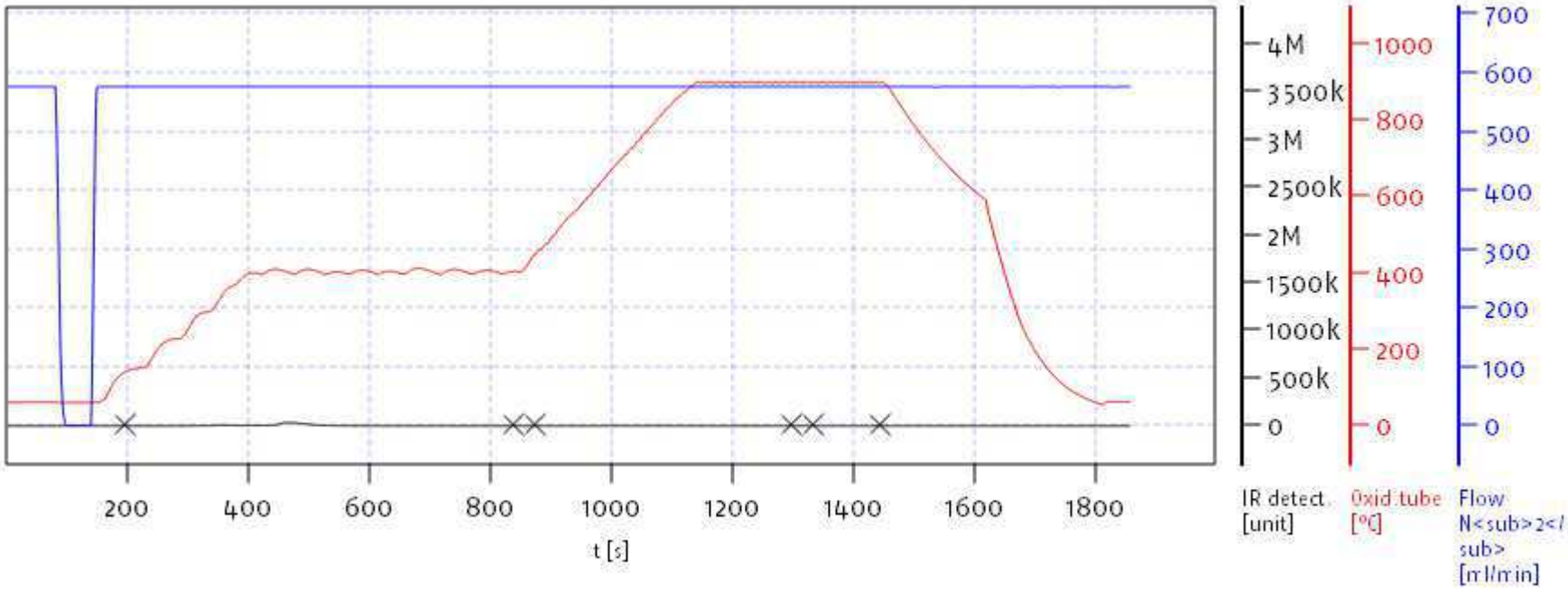
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
60	60	BJH0301-MRL1	606.60		1.00	CARBON	8/13/2021 7:32 PM	0.023	0.000	0.023	bl,C3u,C2u	95 952	6 374	368	1.0360	1.0000



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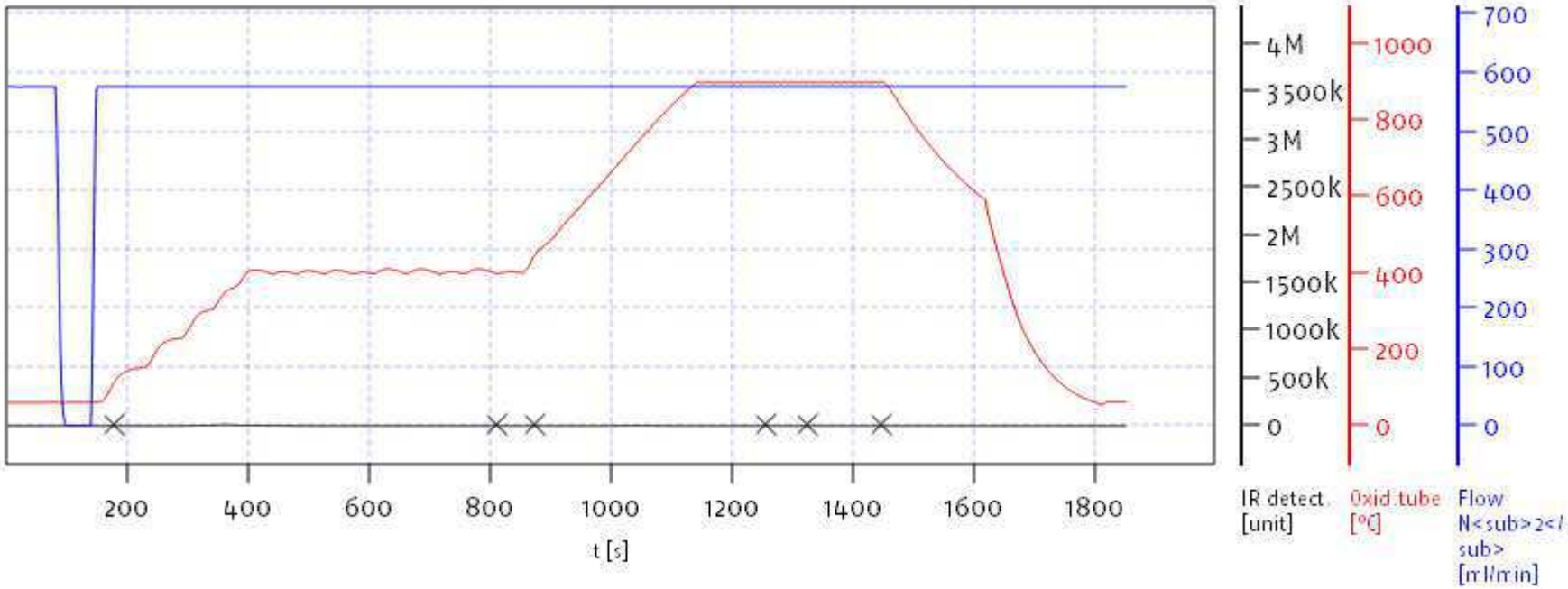
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
61	61	BJH0301-BLK1	638.60		1.00	CARBON	8/13/2021 8:03 PM	0.008	0.000	0.008	bl,C2u	40 664	11 009	424	1.0360	1.0000



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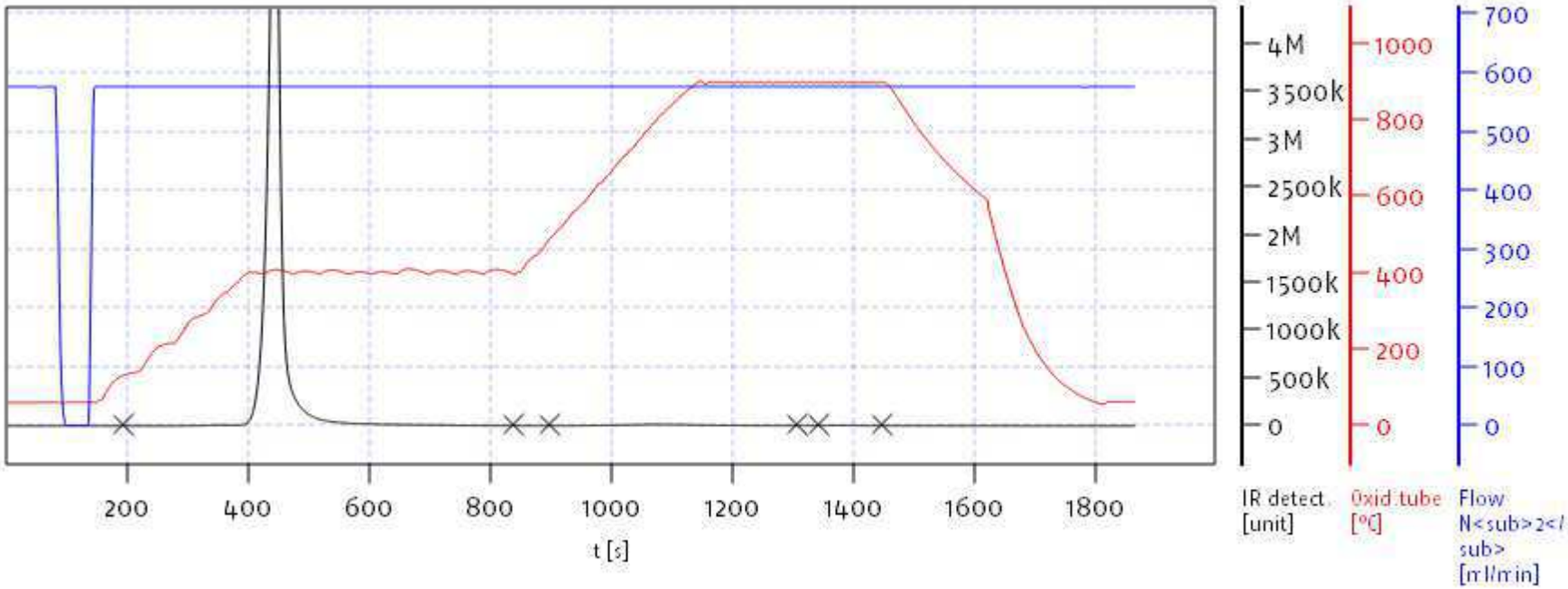
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
62	62	BJH0301-BS1	21.50		1.00	CARBON	8/13/2021 8:35 PM	46.107	0.647	46.753	bl	6 156 006	100 042	13 965	1.0360	1.0000



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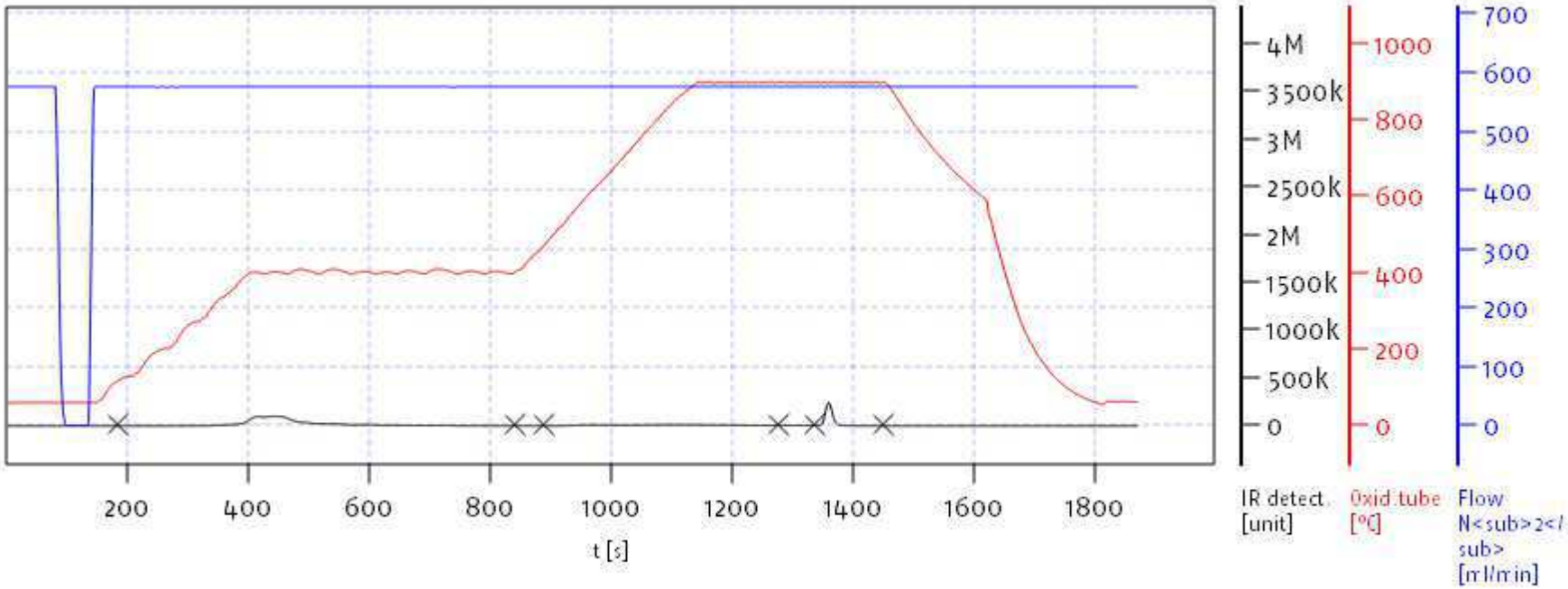
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
63	63	BJH0301-SRM1	35.10		1.00	CARBON	8/13/2021 9:06 PM	2.438	0.439	2.877	bl	426 524	109 654	129 876	1.0360	1.0000



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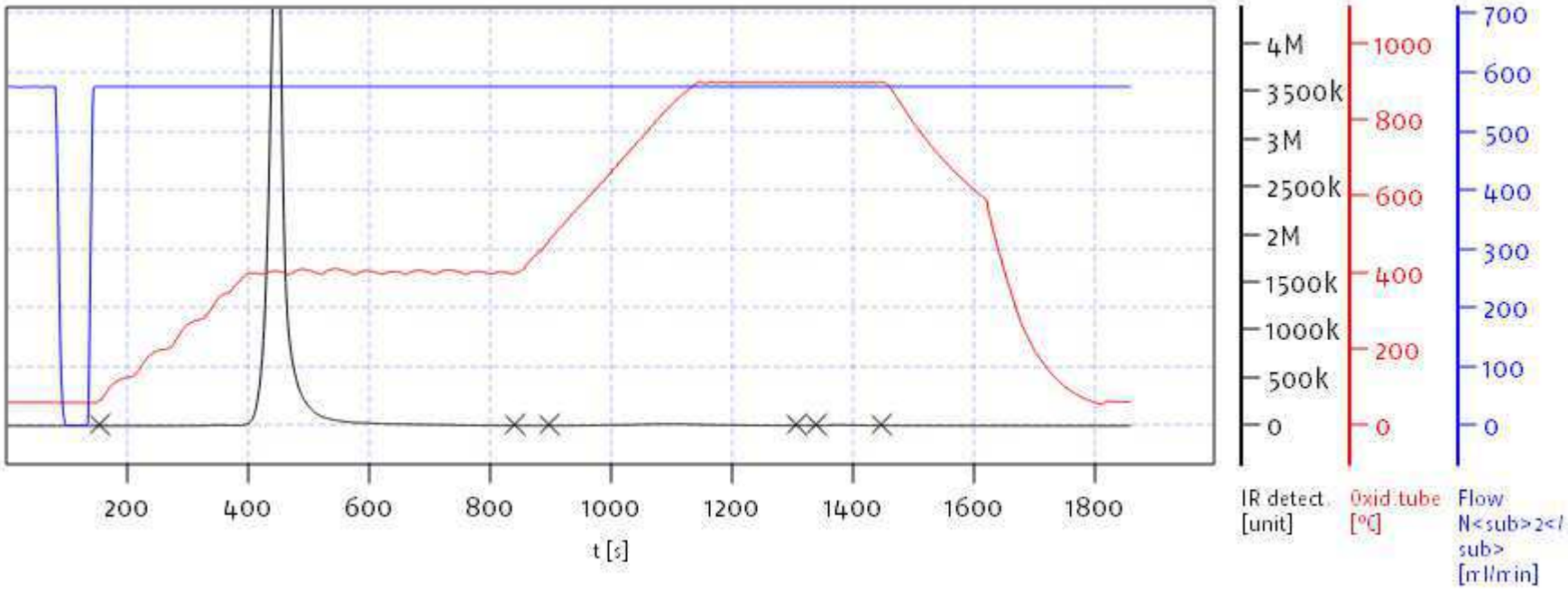
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
64	64	SJH0136-CCV5	22.60		1.00	CARBON	8/13/2021 9:38 PM	45.156	0.873	46.030	bl	6 328 328	137 522	23 307	1.0360	1.0000



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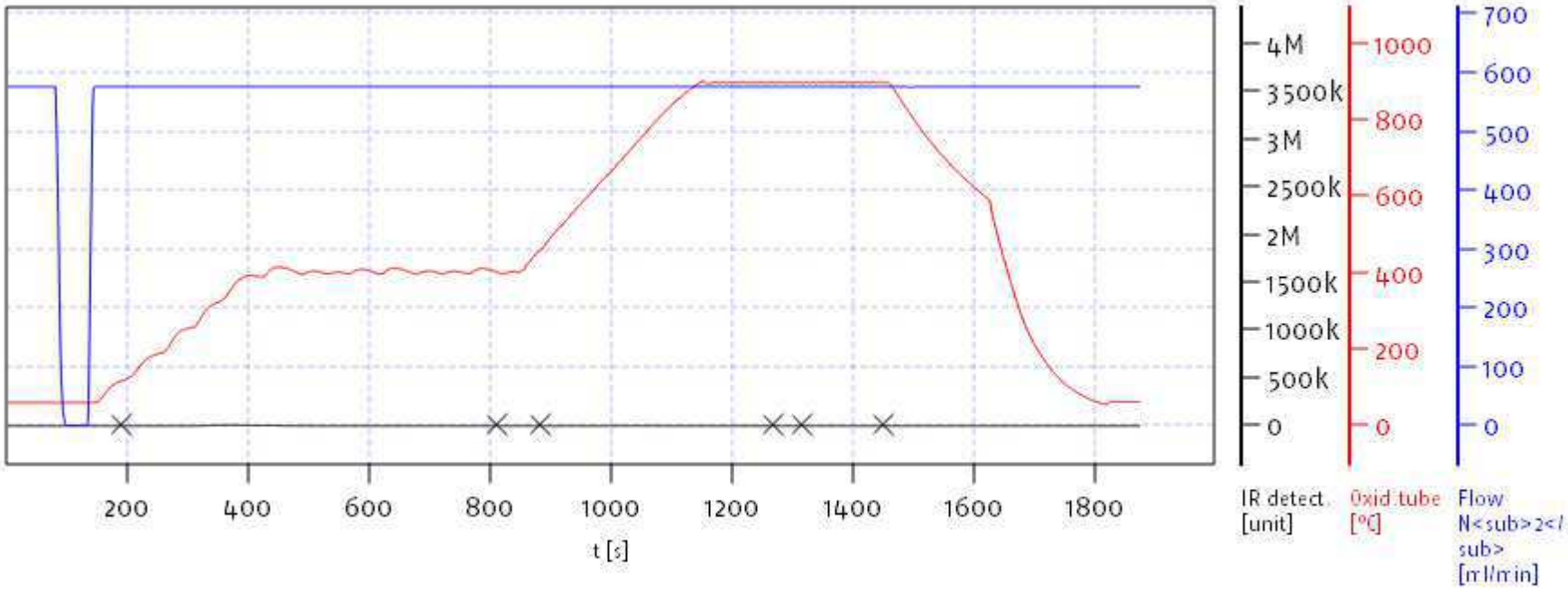
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
65	65	SJH0136-CCB5	502.20		1.00	CARBON	8/13/2021 10:09 PM	0.007	0.000	0.007	bl,C3u,C2u	33 223	3 760	847	1.0360	1.0000



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Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 9060A m

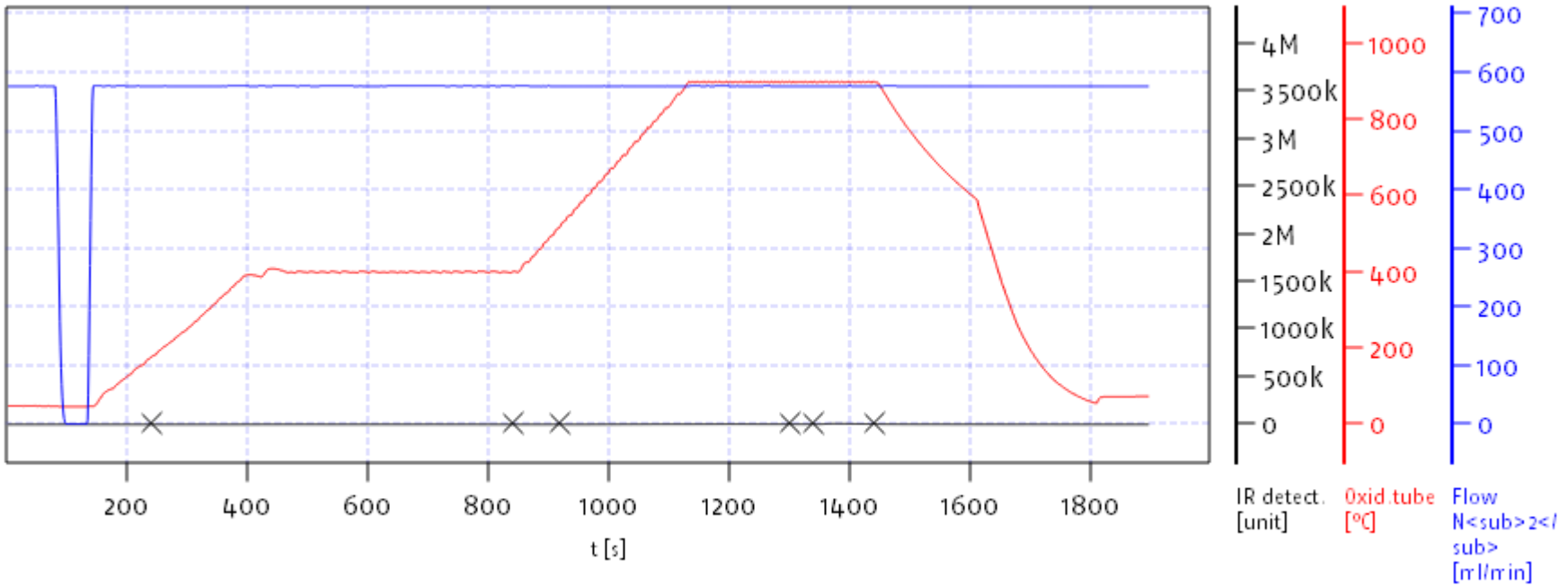
Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0323	Instrument:	TOC Cube
		Calibration:	EH00065

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Cal Standard	SJH0323-CAL1	peData_08252021@1209-(	NA	08/24/21 19:03
Cal Standard	SJH0323-CAL2	peData_08252021@1209-(	NA	08/24/21 19:34
Cal Standard	SJH0323-CAL3	peData_08252021@1209-(	NA	08/24/21 20:06
Cal Standard	SJH0323-CAL4	peData_08252021@1209-(	NA	08/24/21 20:38
Cal Standard	SJH0323-CAL5	peData_08252021@1209-(	NA	08/24/21 21:10
Cal Standard	SJH0323-CAL6	peData_08252021@1209-(	NA	08/24/21 21:41
Cal Standard	SJH0323-CAL7	peData_08252021@1209-(	NA	08/24/21 22:13
Cal Standard	SJH0323-CAL8	peData_08252021@1209-(	NA	08/24/21 22:44
Cal Standard	SJH0323-CAL9	peData_08252021@1209-(	NA	08/24/21 23:16
Cal Standard	SJH0323-CALA	peData_08252021@1209-(	NA	08/24/21 23:48
Cal Standard	SJH0323-CALB	peData_08252021@1209-(	NA	08/25/21 00:19
Cal Standard	SJH0323-CALC	peData_08252021@1209-(	NA	08/25/21 00:51
Cal Standard	SJH0323-CALD	peData_08252021@1209-(	NA	08/25/21 01:22
Cal Standard	SJH0323-CALE	peData_08252021@1209-(	NA	08/25/21 01:54
Cal Standard	SJH0323-CALF	peData_08252021@1209-(	NA	08/25/21 02:26
Cal Standard	SJH0323-CALG	peData_08252021@1209-(	NA	08/25/21 02:58
Cal Standard	SJH0323-CALH	peData_08252021@1209-(	NA	08/25/21 03:29
Cal Standard	SJH0323-CALI	peData_08252021@1209-(	NA	08/25/21 04:01
Cal Standard	SJH0323-CALJ	peData_08252021@1209-(	NA	08/25/21 04:33
Initial Cal Check	SJH0323-ICV1	peData_08252021@1209-(	NA	08/25/21 09:19
Initial Cal Blank	SJH0323-ICB1	peData_08252021@1209-(	NA	08/25/21 09:51
Cal Standard	SJH0323-CALK	peData_08252021@1209-(	NA	08/25/21 11:41
Cal Standard	SJH0323-CALL	peData_08252021@1209-(	NA	08/25/21 11:42
Cal Standard	SJH0323-CALM	peData_08252021@1209-(	NA	08/25/21 11:43
Cal Standard	SJH0323-CALN	peData_08252021@1209-(	NA	08/25/21 11:45
Cal Standard	SJH0323-CALO	peData_08252021@1209-(	NA	08/25/21 11:46

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
1	9	BLANK	1.00		1.00	CARBON	8/24/2021 6:00 PM	0.000	0.000	0.000	bl	13 861	33 454	21 567	1.0000	1.0000



Name:

Access: soliTOC superuser

Date: Wed Aug 25 11:48:01 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

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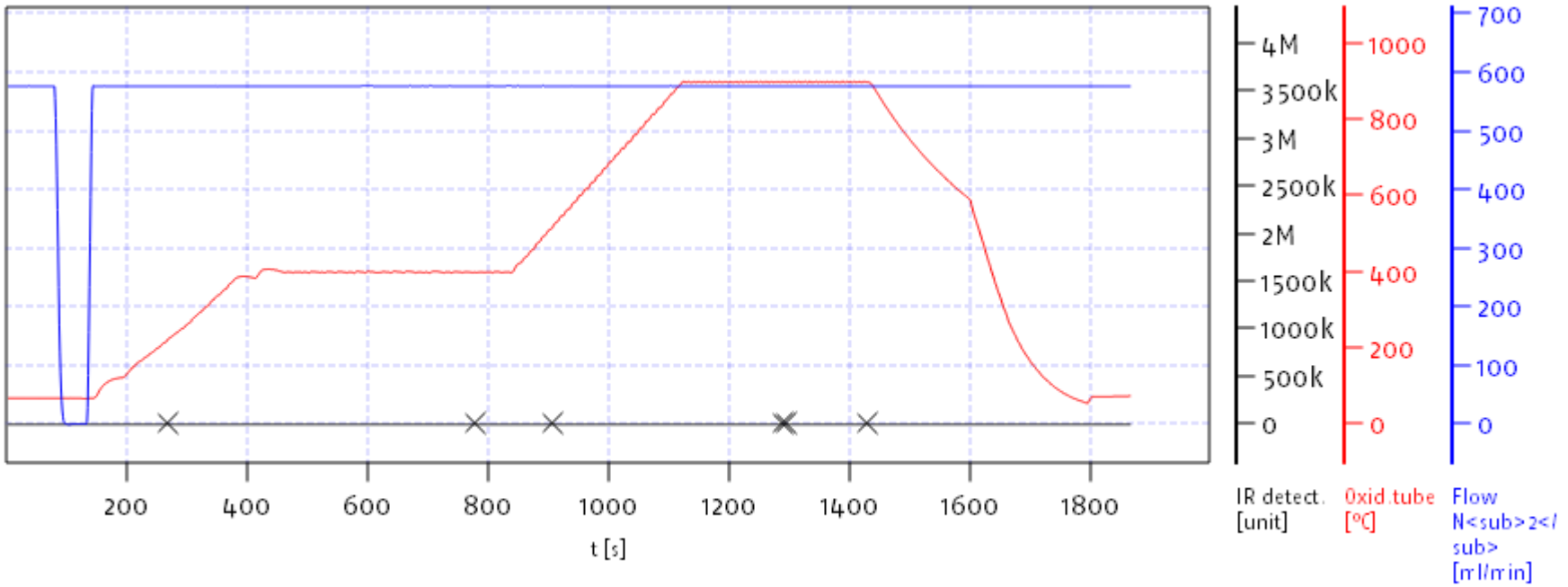
Document: TOC Calibration EH00065 082421BFb from: 8/25/2021 11:47 AM

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
2	10	BLANK	1.00		1.00	CARBON	8/24/2021 6:31 PM	0.000	0.000	0.000	bl	1 643	8	245	1.0000	1.0000



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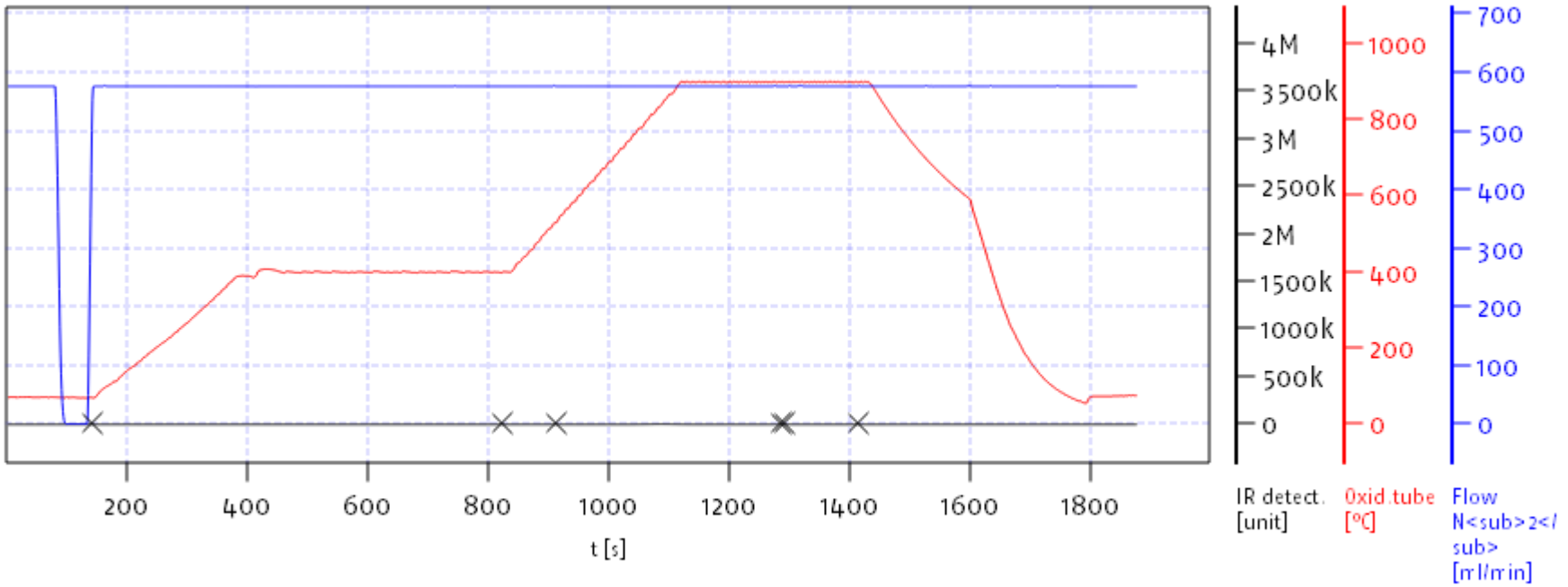
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
3	11	SEQ-CAL1	200.00	0.0017	1.00	CARBON	8/24/2021 7:03 PM	0.000	0.008	0.008	bl,C1u,C3u,C2u	1 070	6 478	141	1.0000	1.1719



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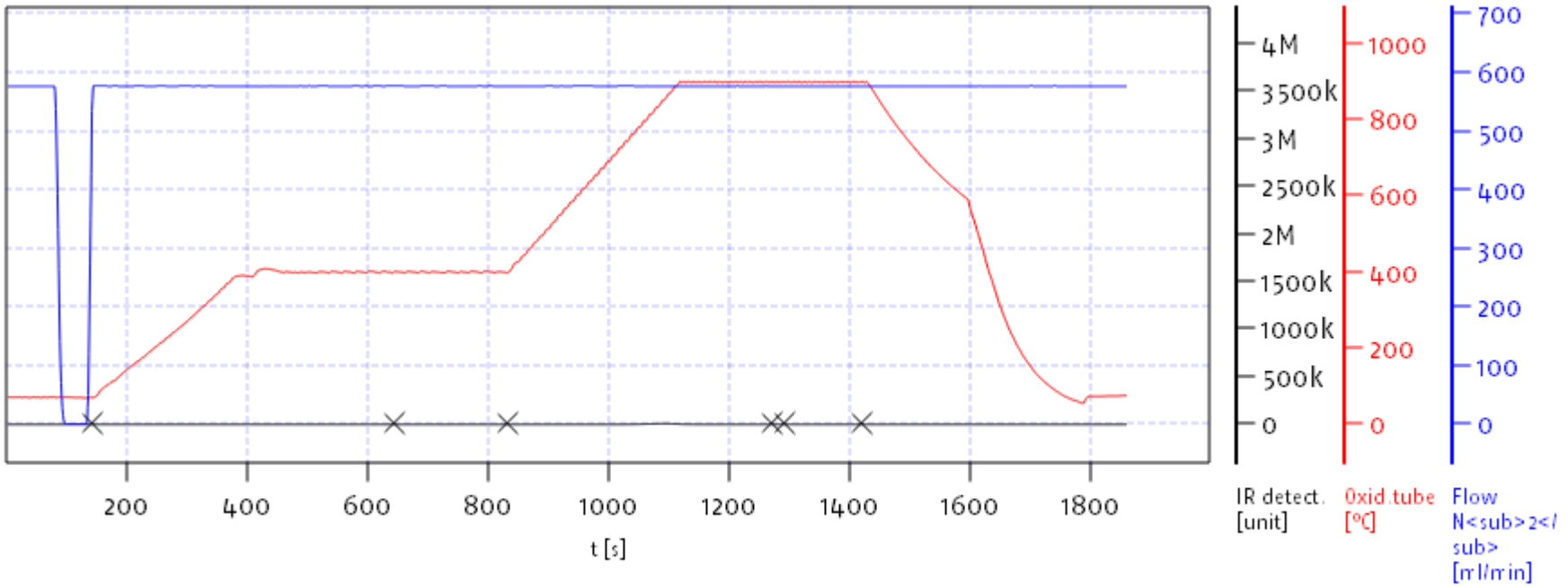
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
4	12	SEQ-CAL2	200.00	0.0054	1.00	CARBON	8/24/2021 7:34 PM	0.000	0.015	0.015	bl,C1u,C2u	660	18 783	85	1.0000	0.9072



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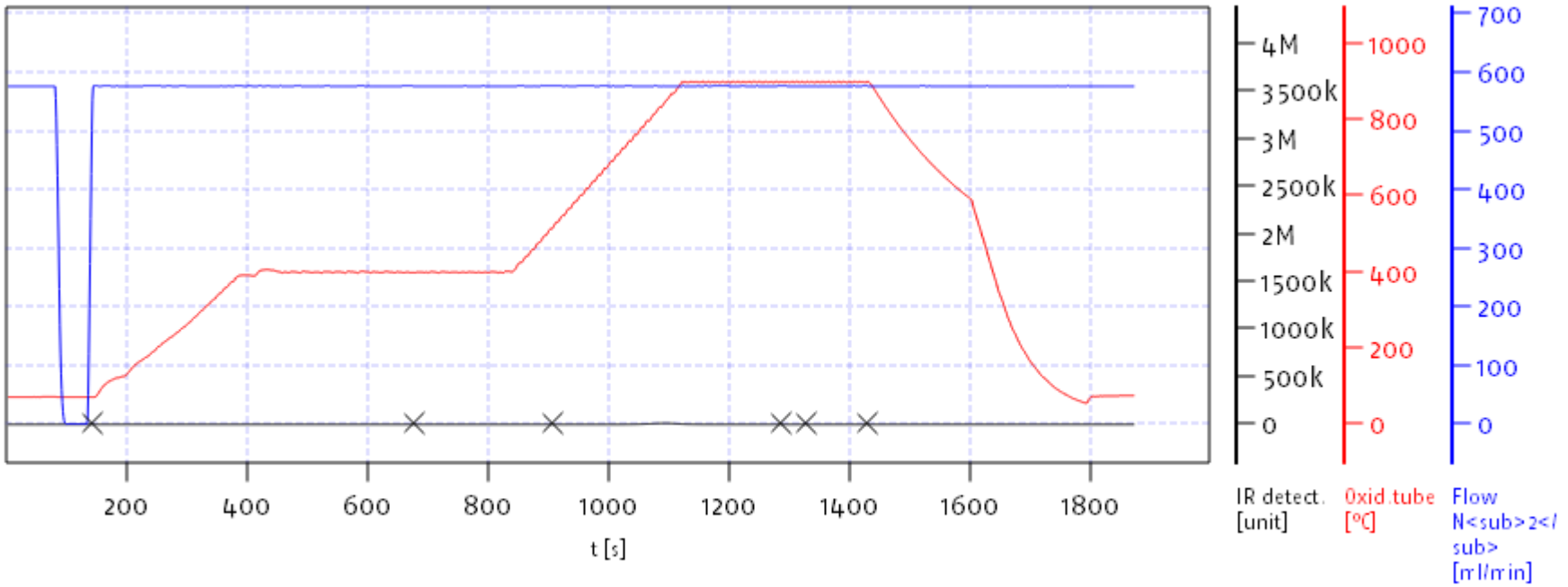
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
5	13	SEQ-CAL3	200.00	0.0068	1.00	CARBON	8/24/2021 8:06 PM	0.000	0.022	0.022	bl,C1u,C2u	889	24 712	60	1.0000	1.0307



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Balance: BAL3
Analyst: BF

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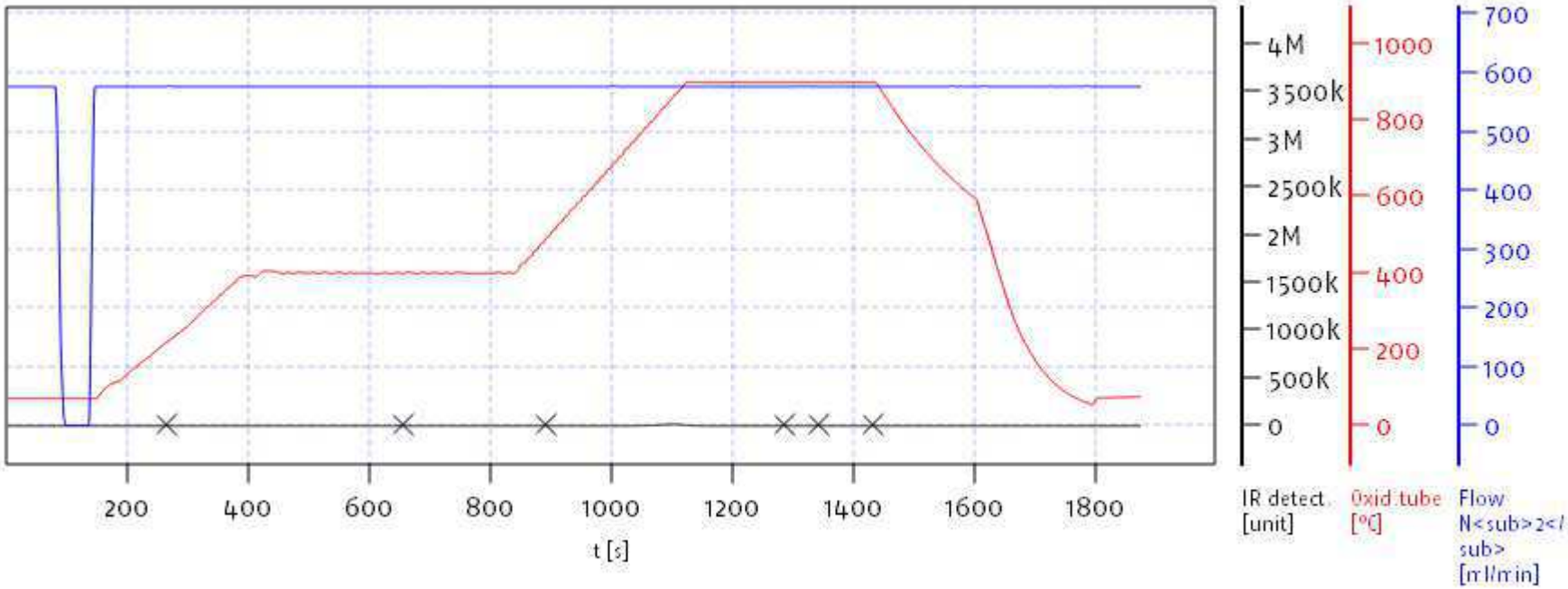
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
6	14	SEQ-CAL4	200.00	0.0101	1.00	CARBON	8/24/2021 8:38 PM	0.000	0.030	0.030	bl,C1u,C2u	1 503	31 221	84	1.0000	1.1361



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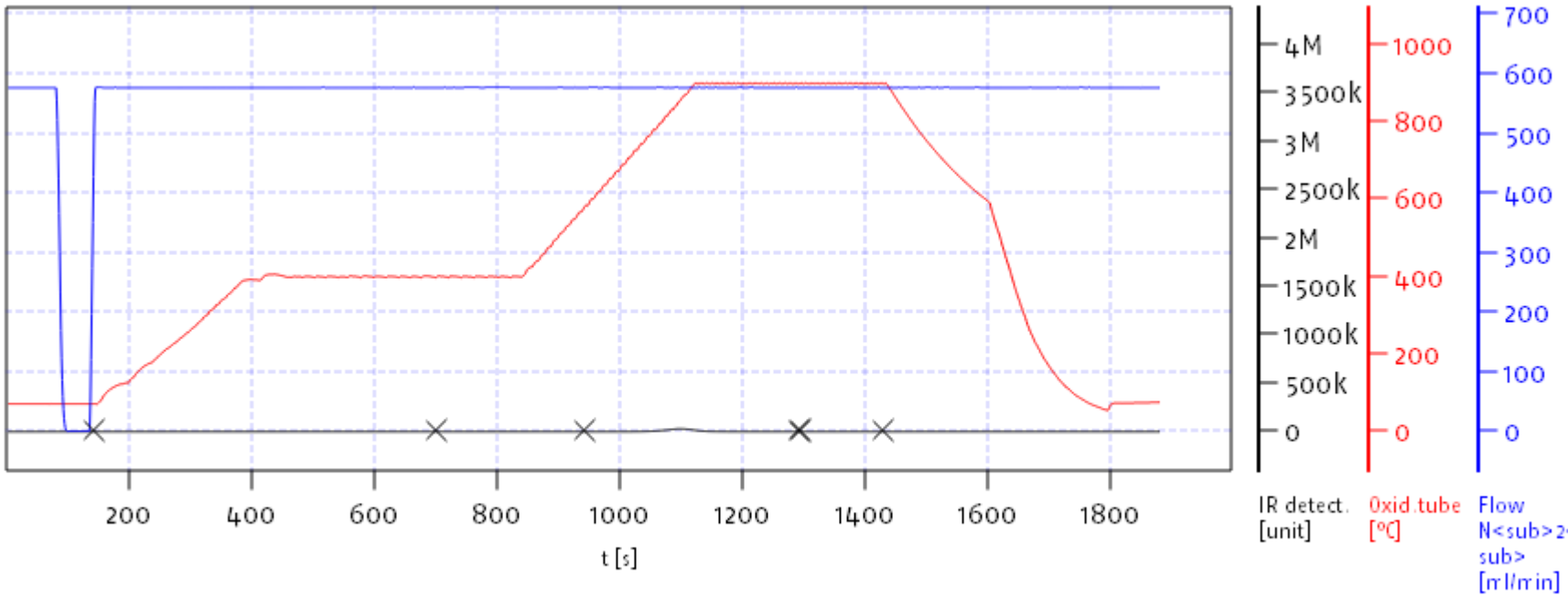
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
7	15	SEQ-CAL5	200.00	0.0151	1.00	CARBON	8/24/2021 9:10 PM	0.000	0.045	0.045	bl,C1u,C2u	776	61 535	62	1.0000	0.8900



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Access: soliTOC superuser

Date: Wed Aug 25 11:48:01 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

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Document: TOC Calibration EH00065 082421BFb from: 8/25/2021 11:47 AM

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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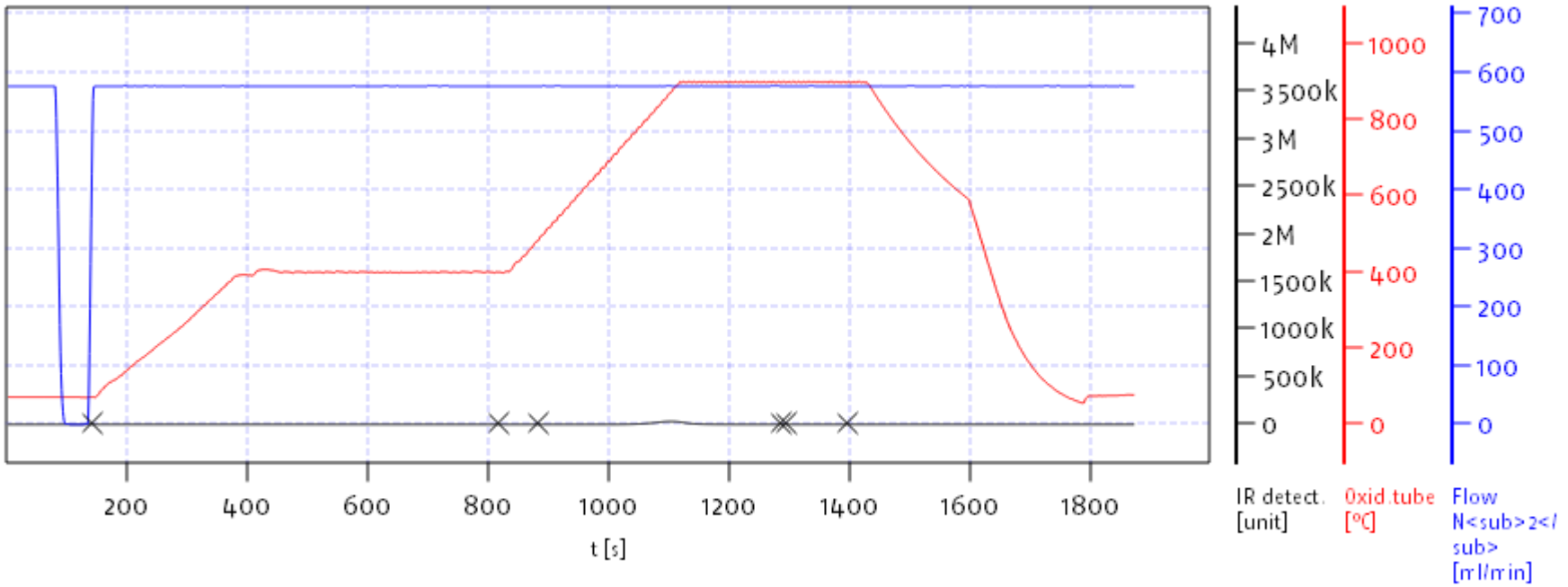
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
8	16	SEQ-CAL6	200.00	0.0200	1.00	CARBON	8/24/2021 9:41 PM	0.000	0.061	0.061	bl,C1u,C2u	1 086	73 745	55	1.0000	1.0168



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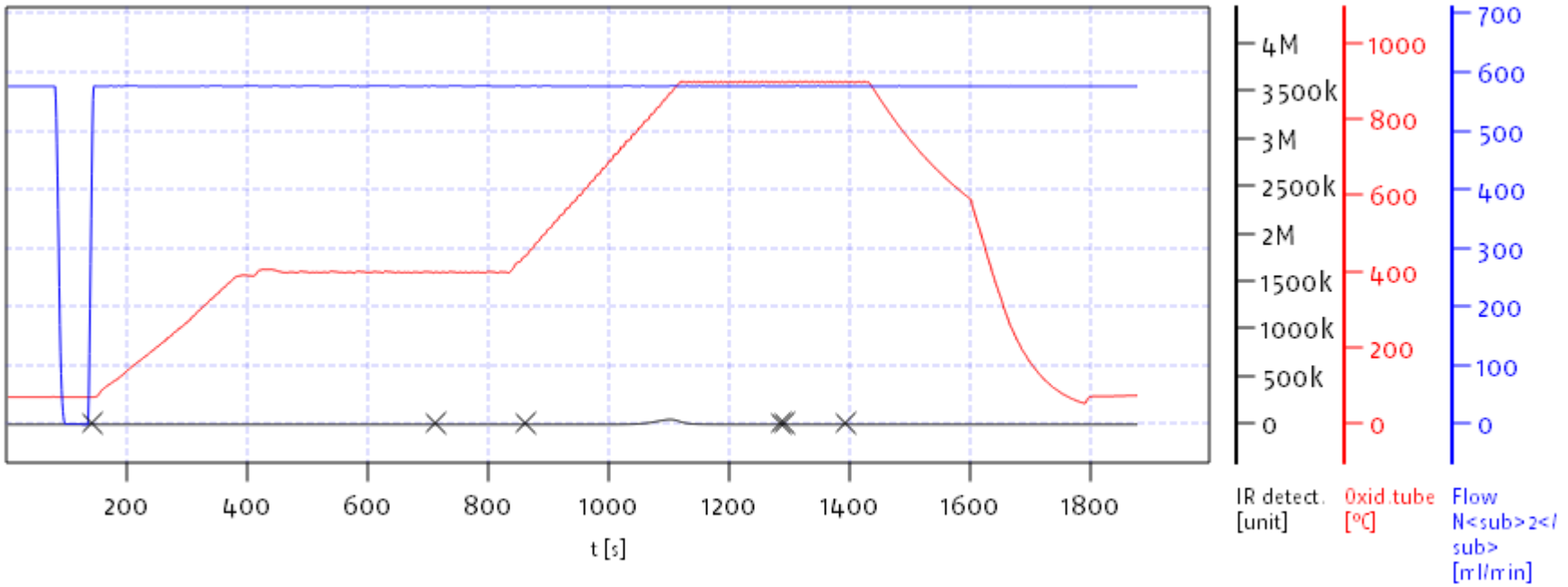
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
9	17	SEQ-CAL7	200.00	0.0256	1.00	CARBON	8/24/2021 10:13 PM	0.000	0.075	0.075	bl,C1u,C2u	1 149	100 193	99	1.0000	0.9293



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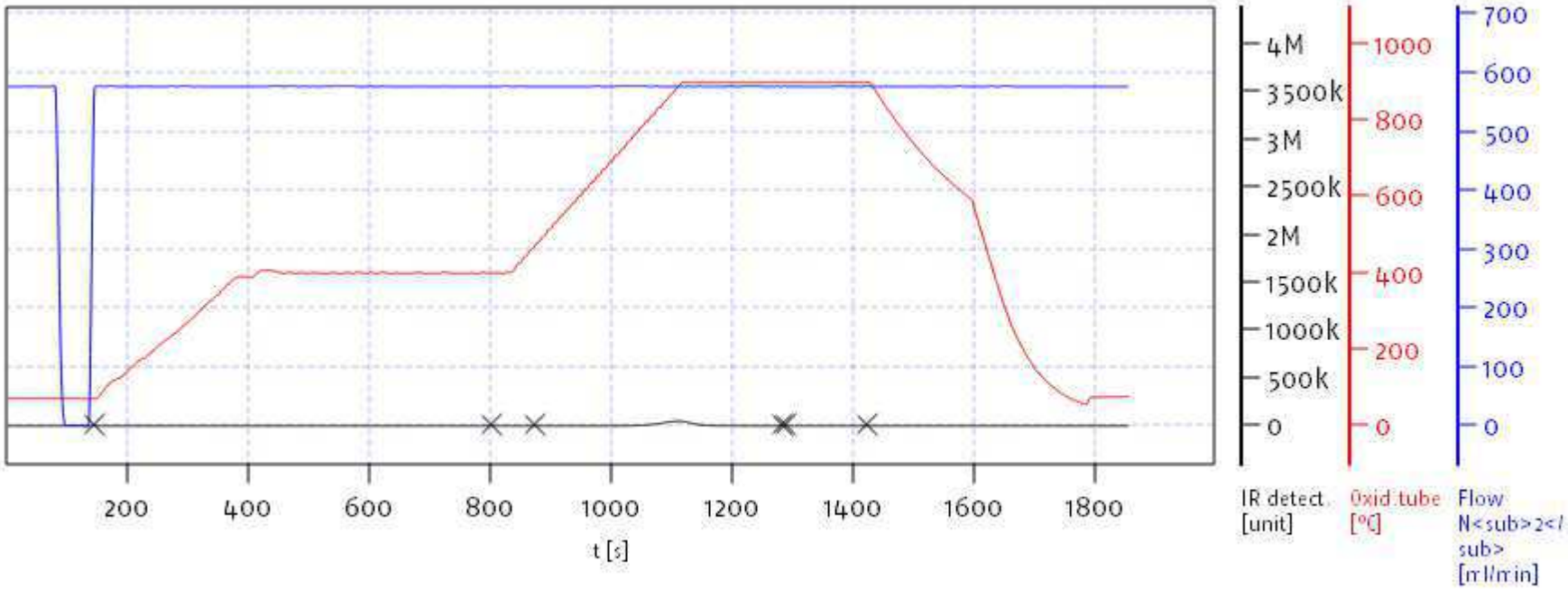
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
10	18	SEQ-CAL8	200.00	0.0303	1.00	CARBON	8/24/2021 10:44 PM	0.000	0.091	0.091	bl,C1u,C2u	779	118 482	109	1.0000	0.9492



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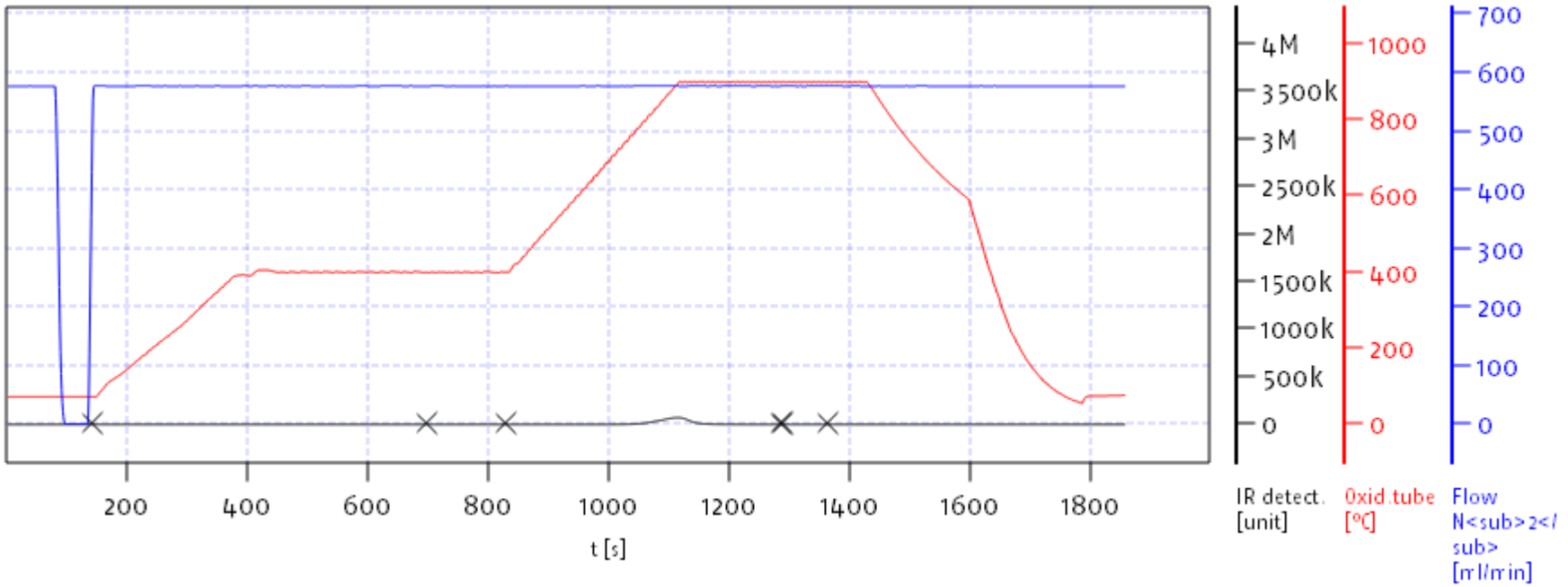
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
11	19	SEQ-CAL9	200.00	0.0396	1.00	CARBON	8/24/2021 11:16 PM	0.000	0.120	0.120	bl,C1u,C2u	848	163 267	93	1.0000	0.9178



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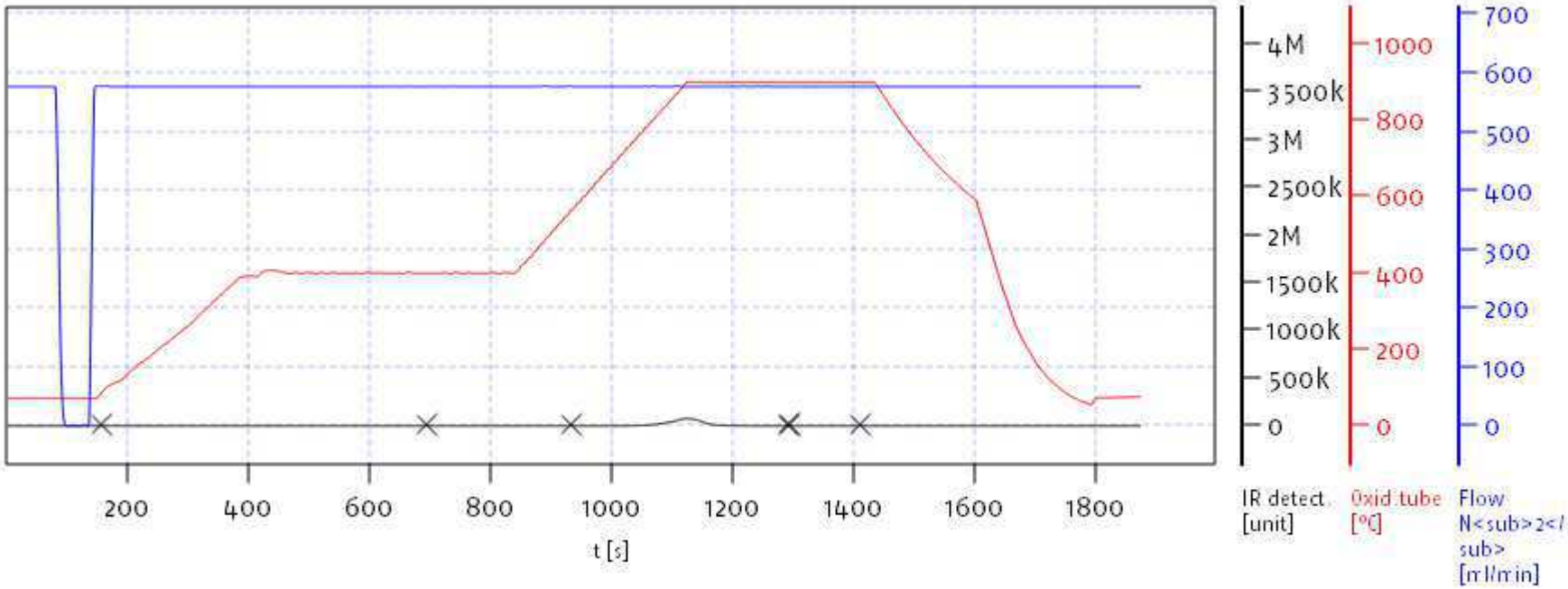
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
12	20	SEQ-CALA	200.00	0.0498	1.00	CARBON	8/24/2021 11:48 PM	0.000	0.151	0.151	bl,C1u,C2u	1 818	184 410	146	1.0000	1.0237



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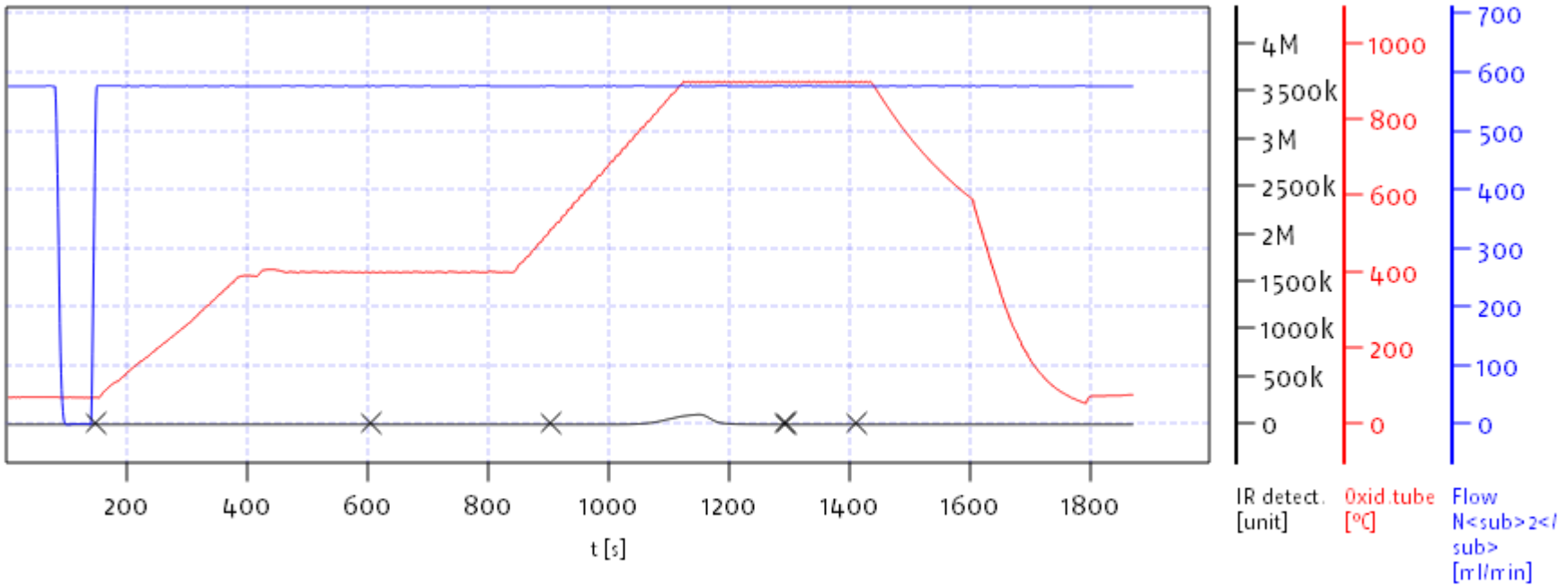
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
13	21	SEQ-CALB	200.00	0.0042	1.00	CARBON	8/25/2021 12:19 AM	0.000	0.258	0.258	bl,C1u,C2u	972	305 136	284	1.0000	1.0636



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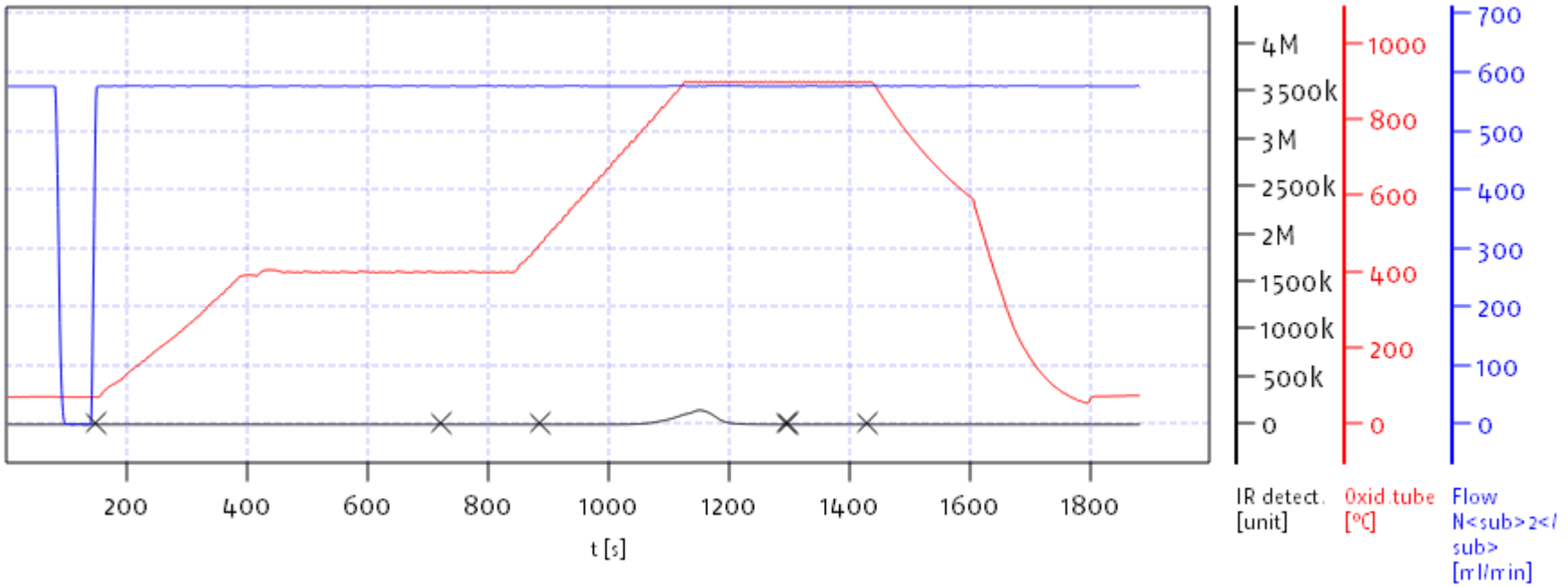
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
14	22	SEQ-CALC	200.00	0.0056	1.00	CARBON	8/25/2021 12:51 AM	0.000	0.324	0.324	bl,C1u,C2u	925	413 926	393	1.0000	0.9869



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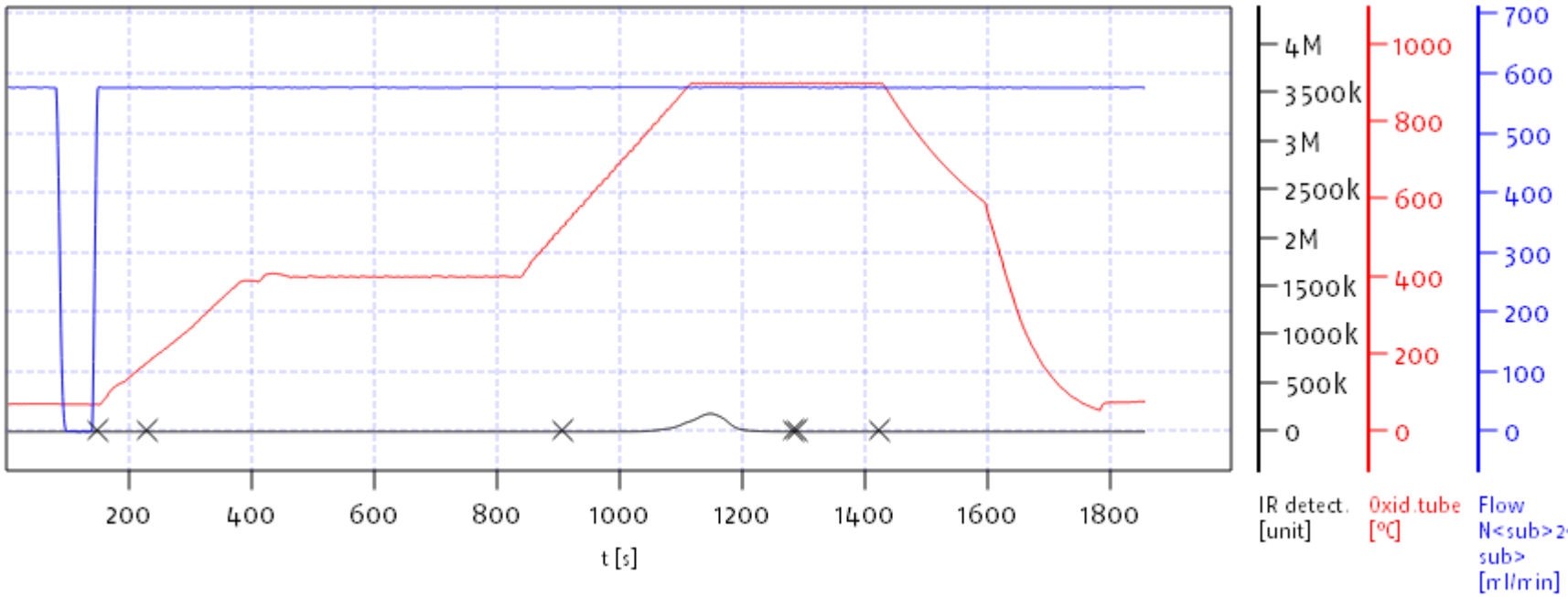
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
15	23	SEQ-CALD	200.00	0.0069	1.00	CARBON	8/25/2021 1:22 AM	0.000	0.444	0.444	bl,C1u,C2u	172	525 080	677	1.0000	1.0675



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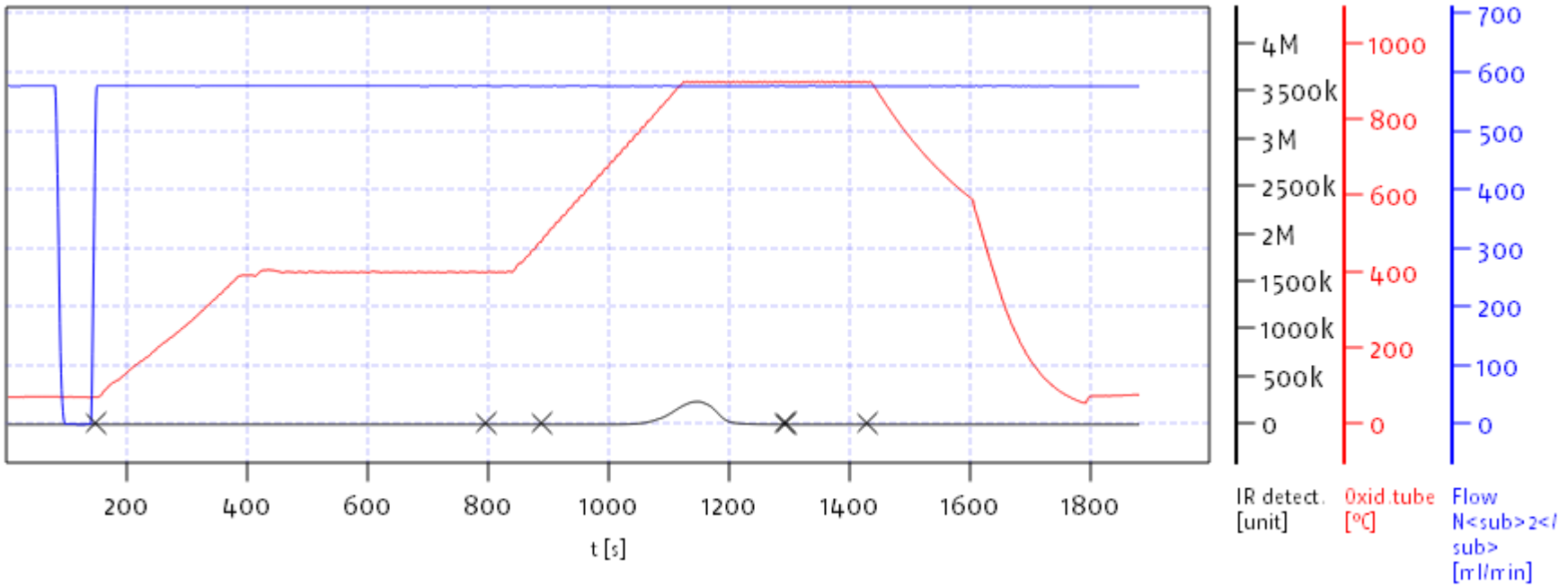
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
16	24	SEQ-CALE	200.00	0.0097	1.00	CARBON	8/25/2021 1:54 AM	0.000	0.600	0.600	bl,C1u,C2u	989	743 966	687	1.0000	1.0196



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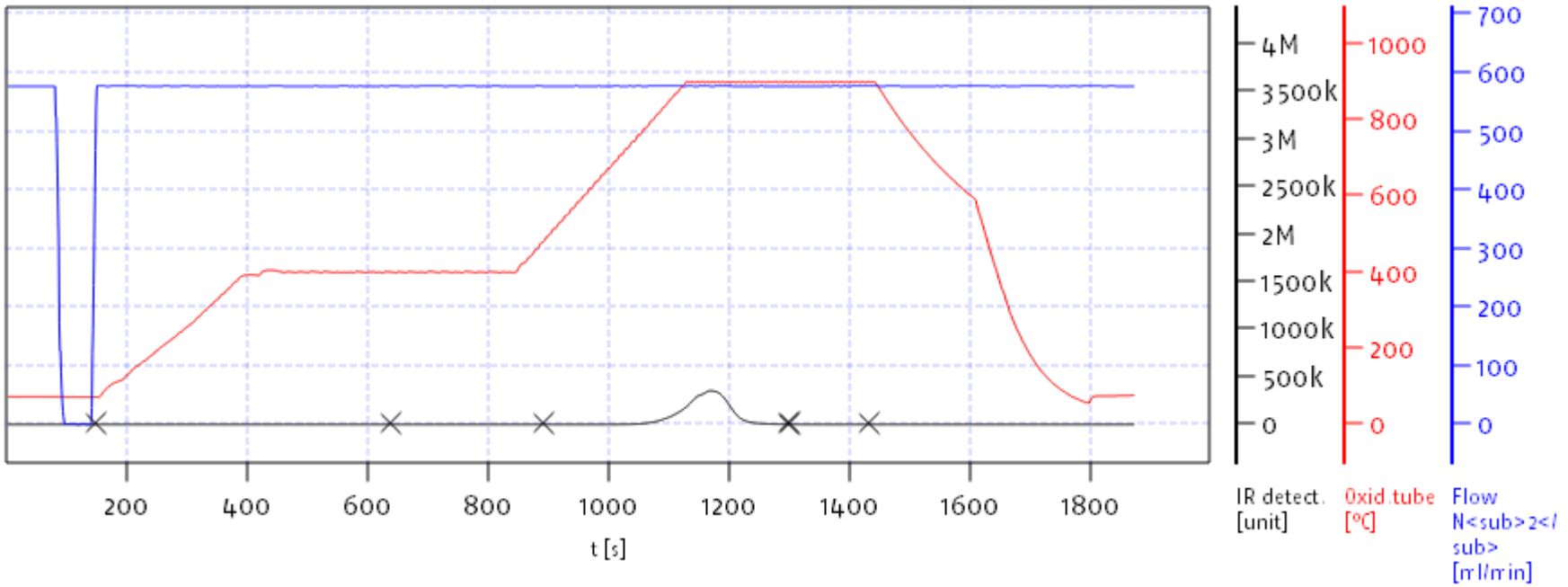
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
17	25	SEQ-CALF	200.00	0.0147	1.00	CARBON	8/25/2021 2:26 AM	0.000	0.906	0.906	bl,C1u,C2u	925	1 115 840	1 898	1.0000	1.0277



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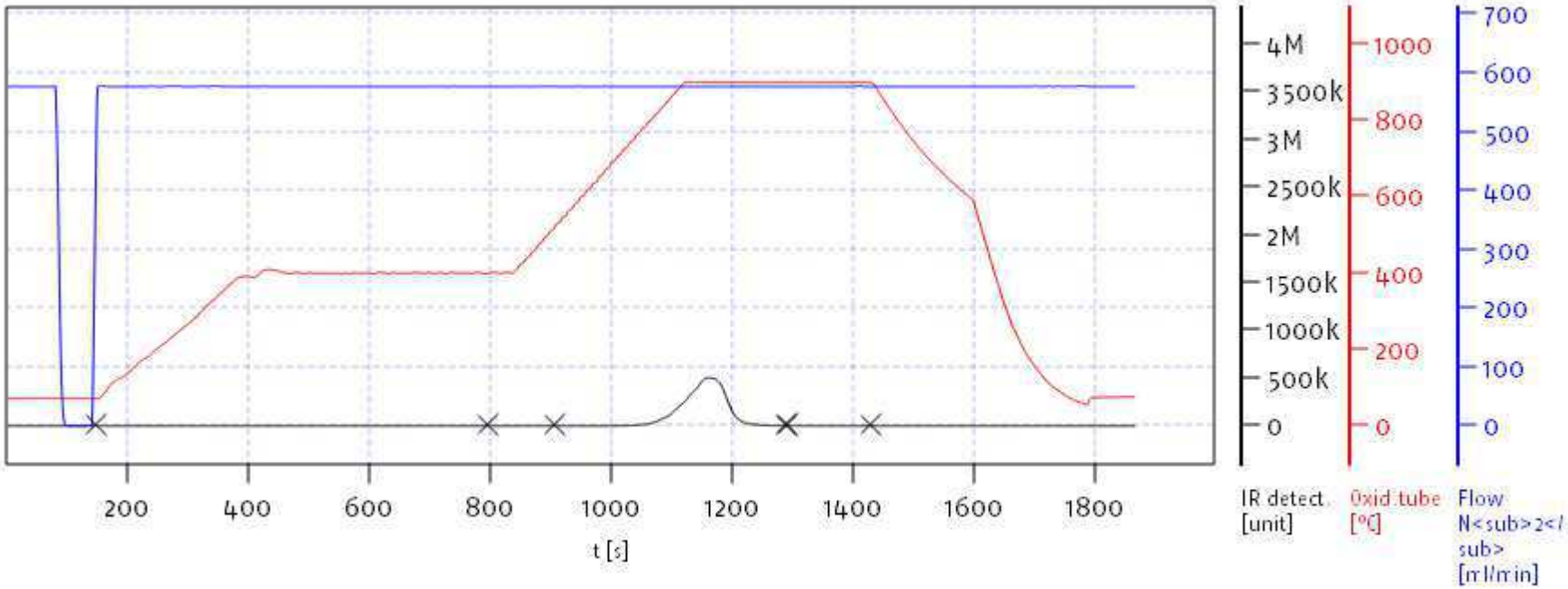
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
18	26	SEQ-CALG	200.00	0.0199	1.00	CARBON	8/25/2021 2:58 AM	0.000	1.206	1.206	bl,C1u,C2u	1 253	1 509 240	2 258	1.0000	1.0121



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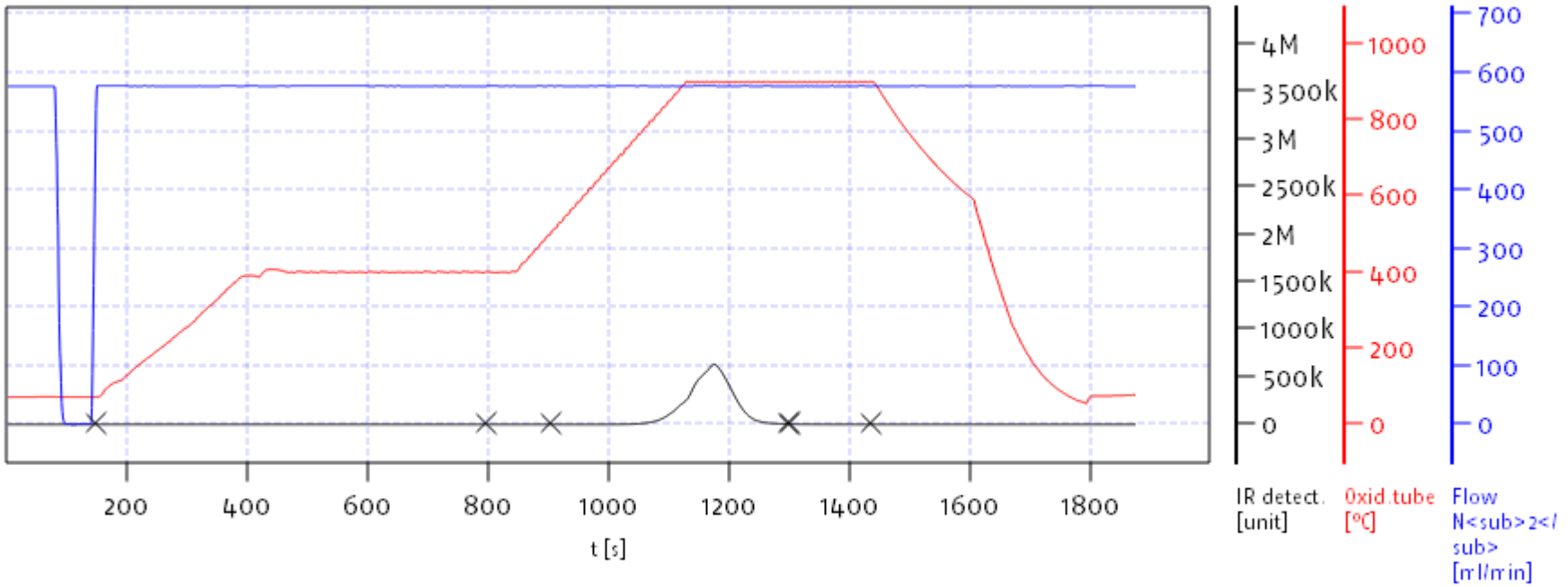
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
19	27	SEQ-CALH	200.00	0.0253	1.00	CARBON	8/25/2021 3:29 AM	0.000	1.524	1.524	bl,C1u,C2u	1 233	1 930 390	4 311	1.0000	1.0003



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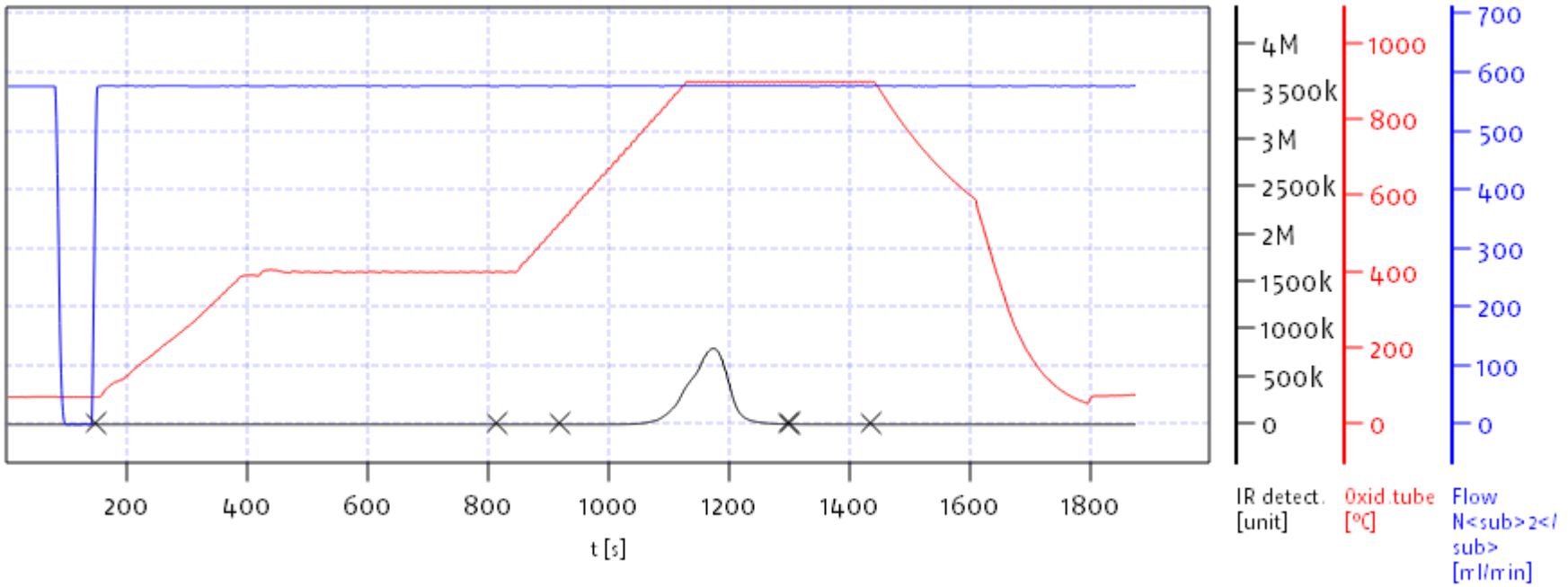
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
20	28	SEQ-CALI	200.00	0.0302	1.00	CARBON	8/25/2021 4:01 AM	0.000	1.800	1.800	bl,C1u,C2u	1 600	2 286 540	3 907	1.0000	0.9976



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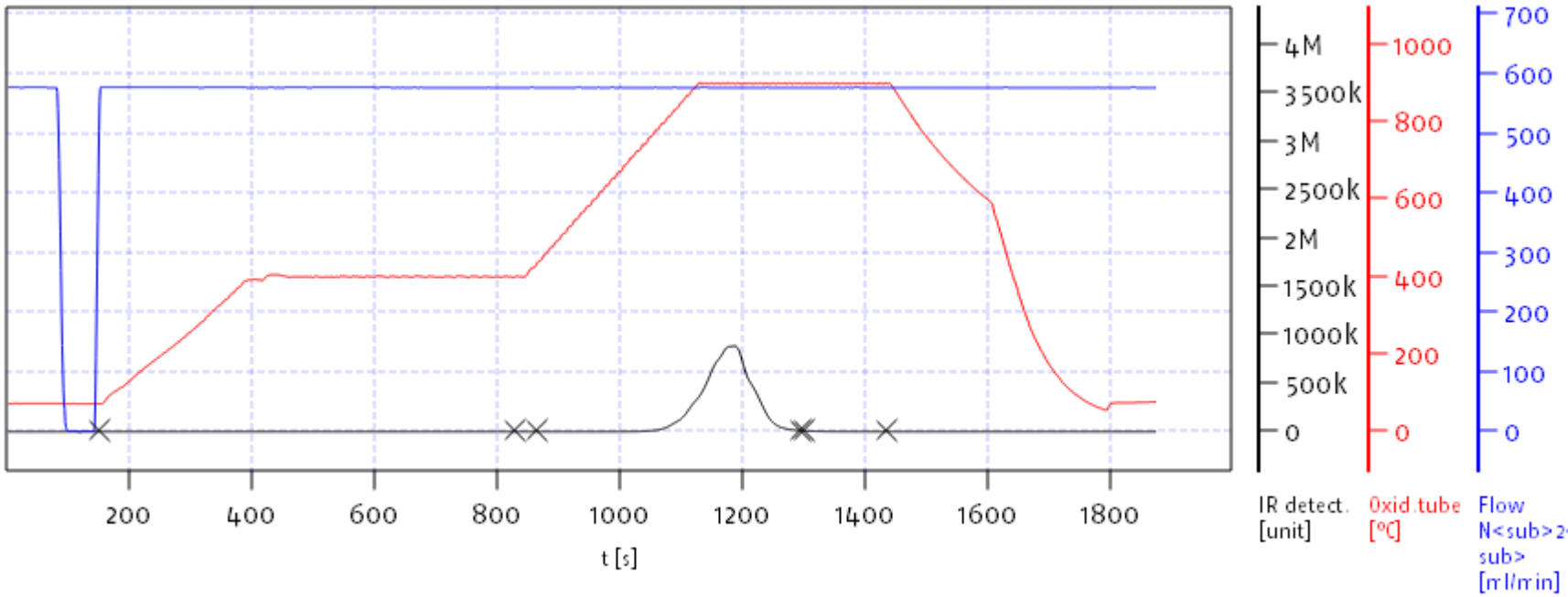
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
21	29	SEQ-CALJ	200.00	0.0400	1.00	CARBON	8/25/2021 4:33 AM	0.000	2.400	2.400	bl,C1u	1 589	**3 013 270**	**9 826**	1.0000	1.0096



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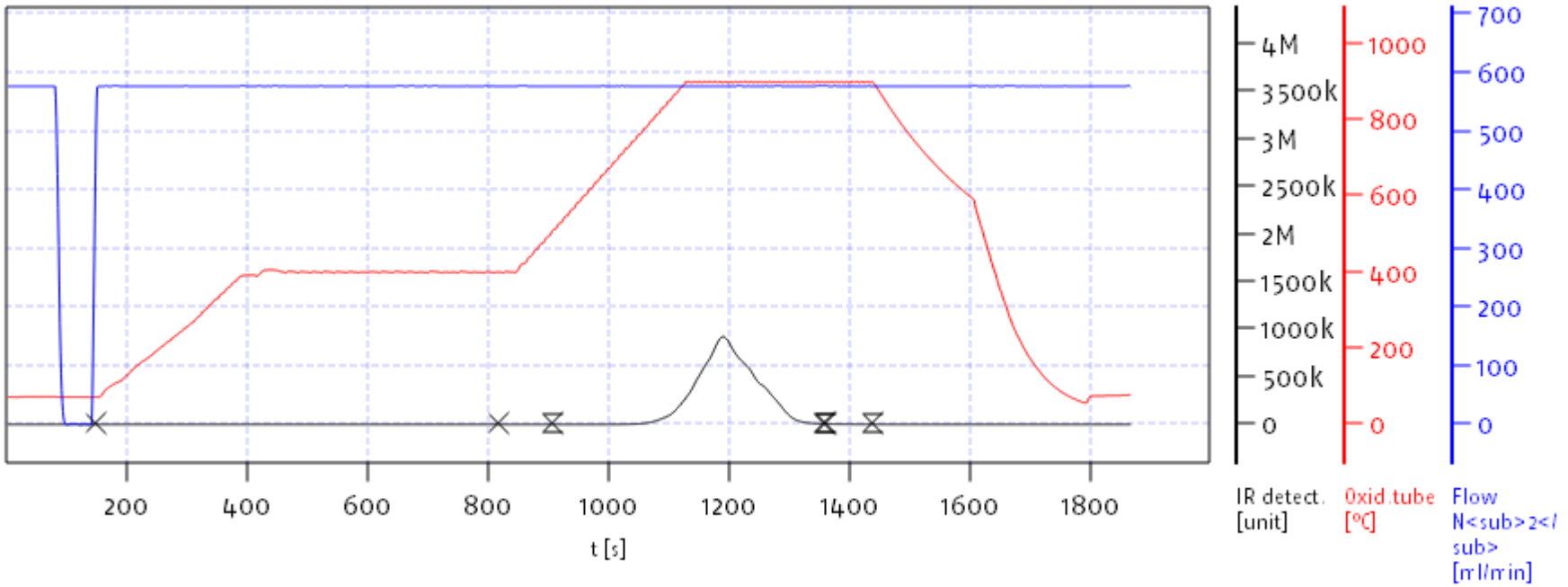
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
22	30	SEQ-CALK	200.00	0.0498	1.00	CARBON	8/25/2021 11:41 AM	0.000	3.012	3.012	bl,C1u	2 117	**3 411 713**	**0**	1.0000	1.0310



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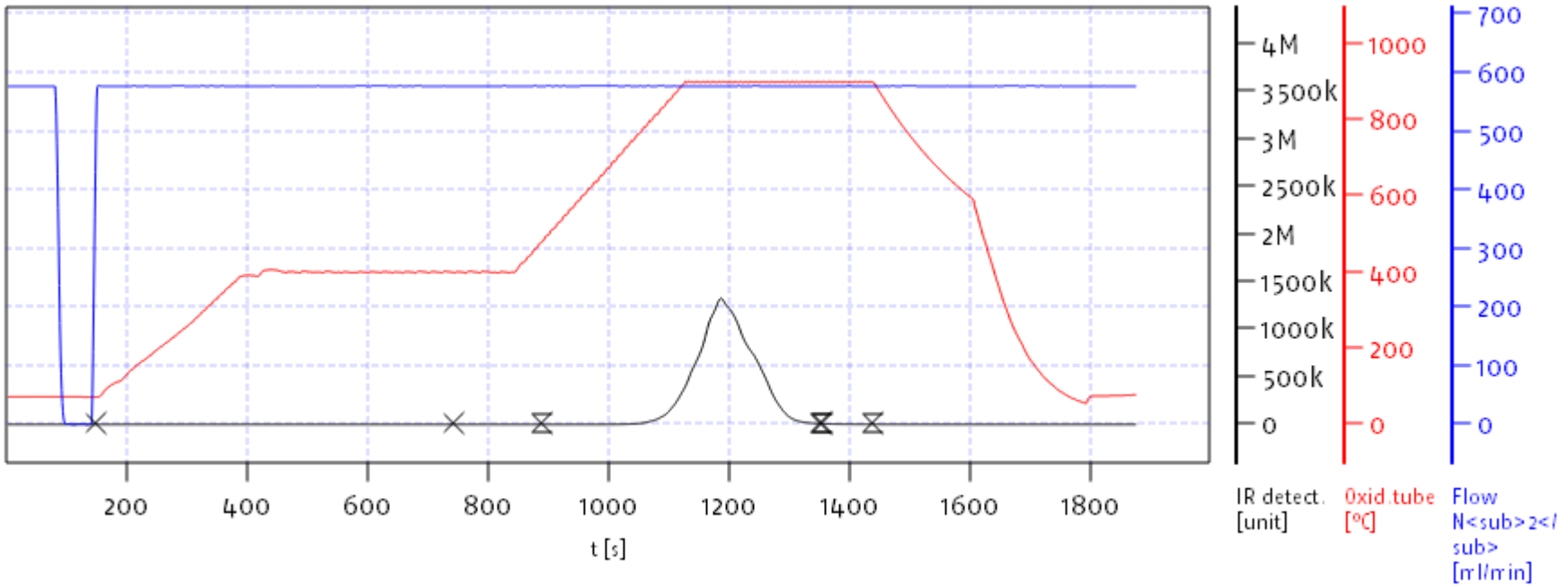
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
23	31	SEQ-CALL	200.00	0.0699	1.00	CARBON	8/25/2021 11:42 AM	0.000	4.206	4.206	bl,C1u	1 285	**4 920 073**	**0**	1.0000	1.0206



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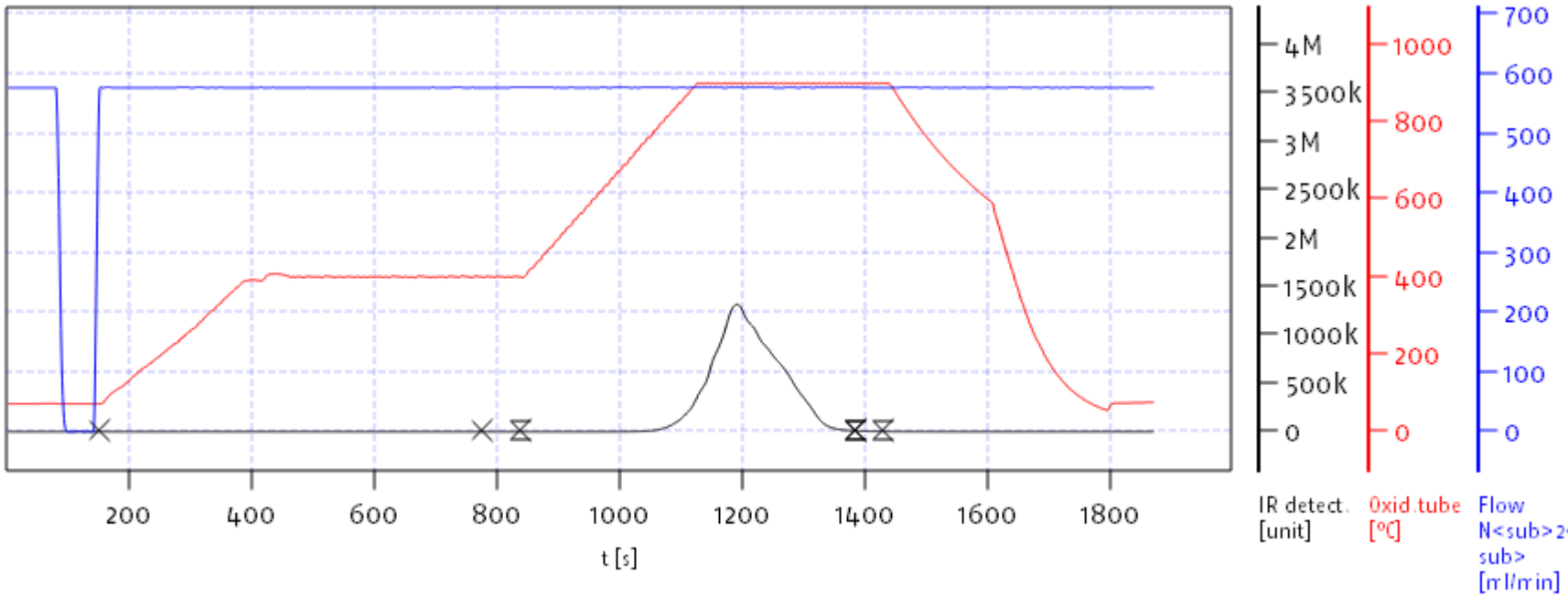
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
24	32	SEQ-CALM	200.00	0.0803	1.00	CARBON	8/25/2021 11:43 AM	0.000	4.812	4.812	bl,C1u	1 537	**5 655 573**	**0**	1.0000	1.0683



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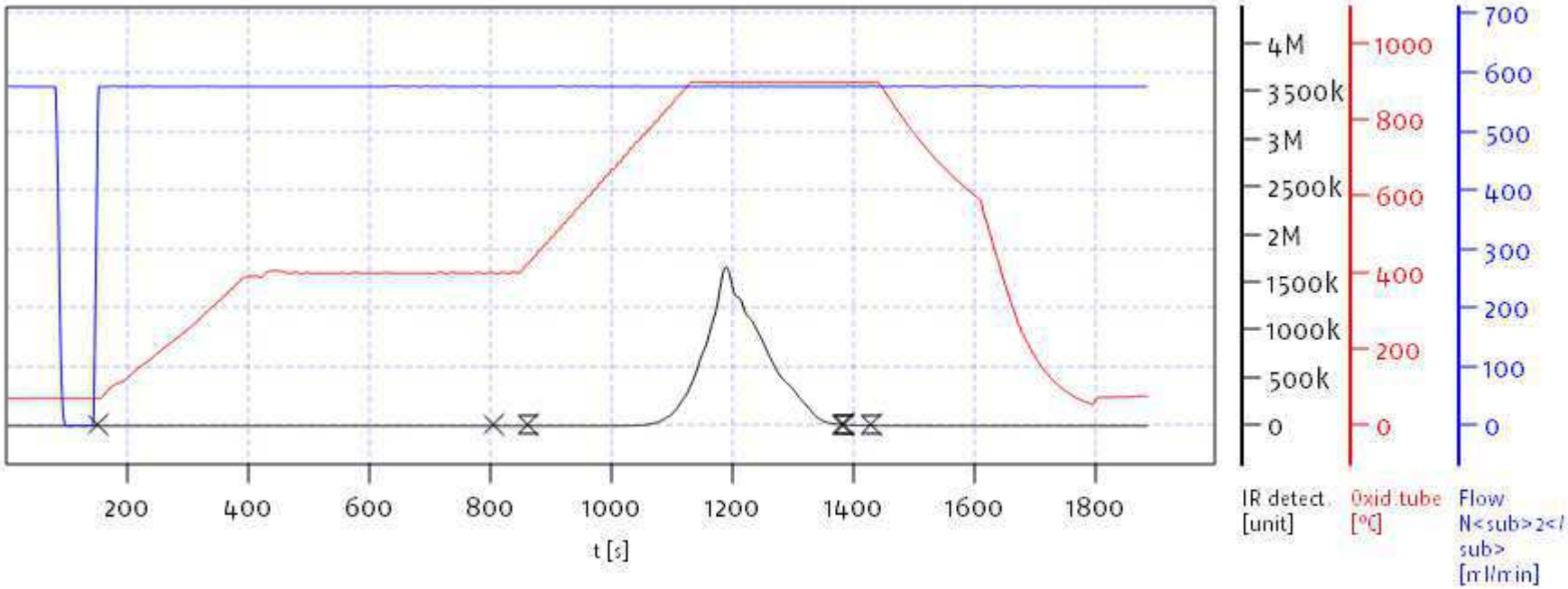
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
25	33	SEQ-CALN	200.00	0.0902	1.00	CARBON	8/25/2021 11:45 AM	0.000	5.406	5.406	bl,C1u	1 694	**6 449 031**	**0**	1.0000	1.0610



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Access: soliTOC superuser

Date: Wed Aug 25 11:48:01 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

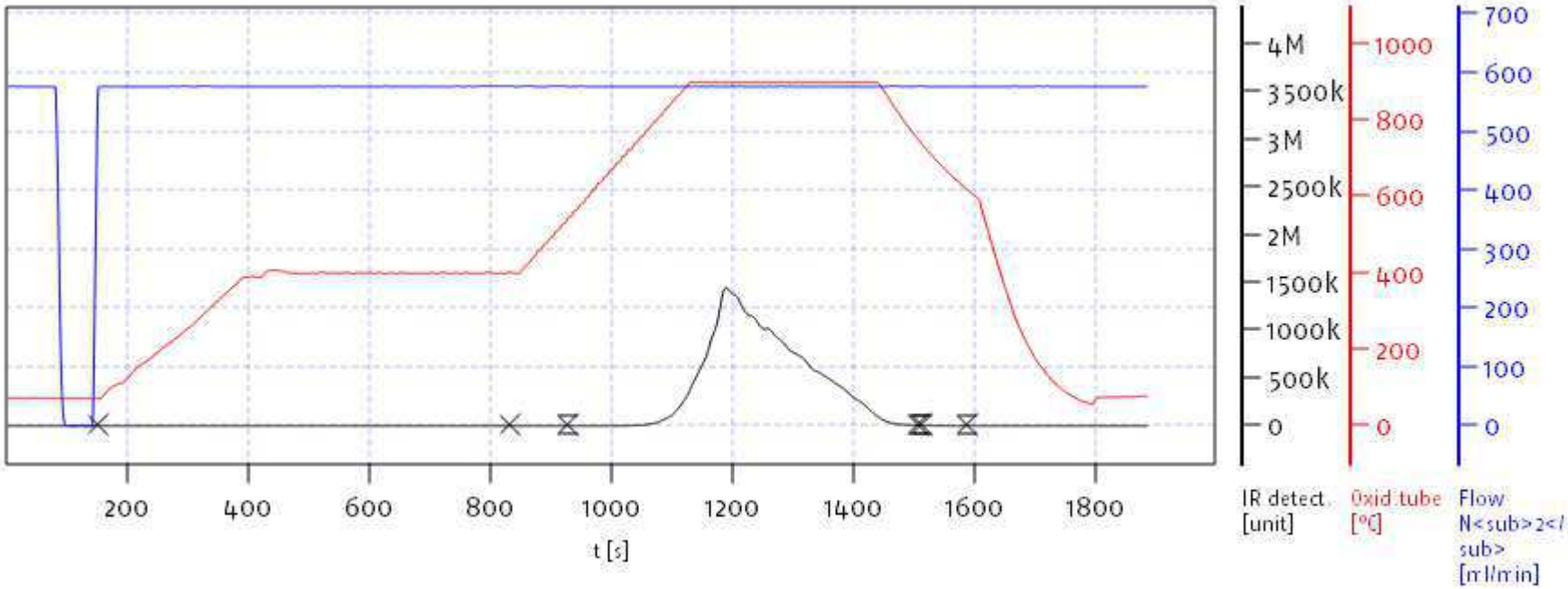
elementar
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00065 082421BFb from: 8/25/2021 11:47 AM

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
26	34	SEQ-CALO	200.00	0.1204	1.00	CARBON	8/25/2021 11:46 AM	0.000	7.218	7.218	bl,C1u,C3o	1 658	8 593 324	0	1.0000	1.3657



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Date: Wed Aug 25 11:48:01 2021

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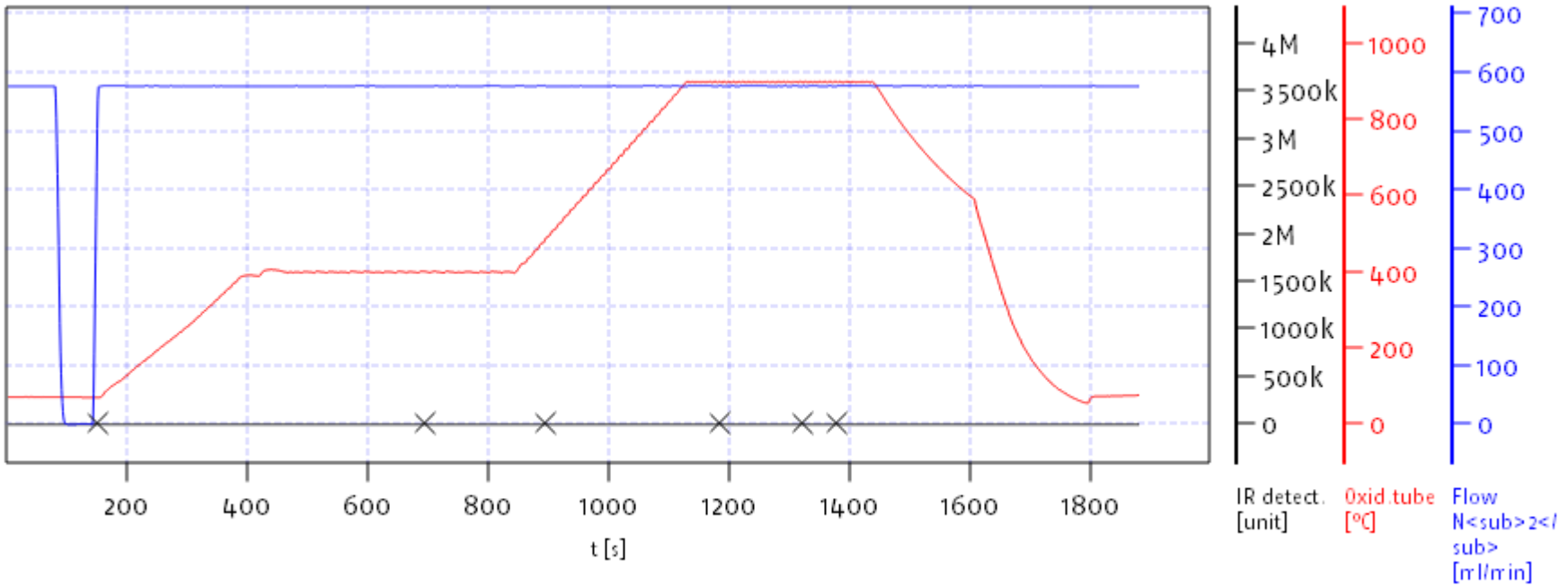
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
27	35	BLANK	1.00		1.00	CARBON	8/25/2021 7:43 AM	0.000	0.000	0.000	bl	708	0	0	1.0000	1.0293



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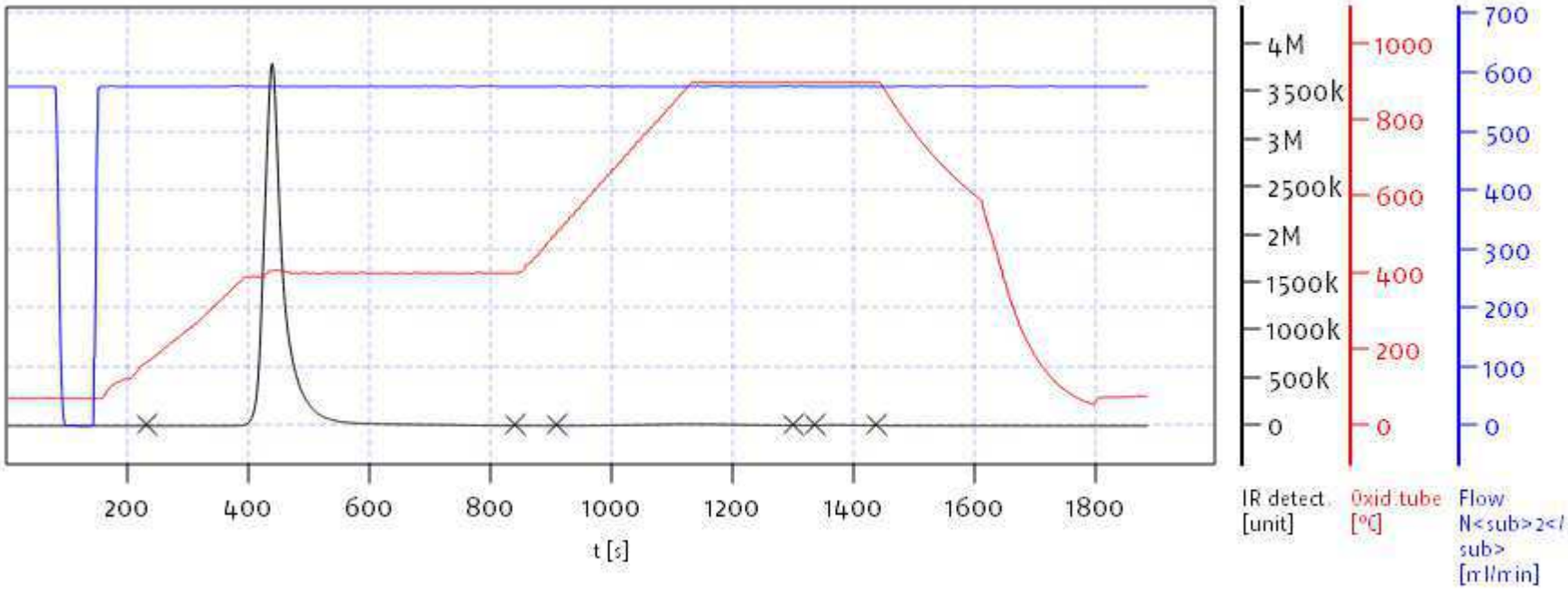
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
28	36	Dfactor	20.30		1.00	CARBON	8/25/2021 8:15 AM	44.446	0.000	44.446	bl	5 319 150	136 410	24 452	1.0755	1.0000



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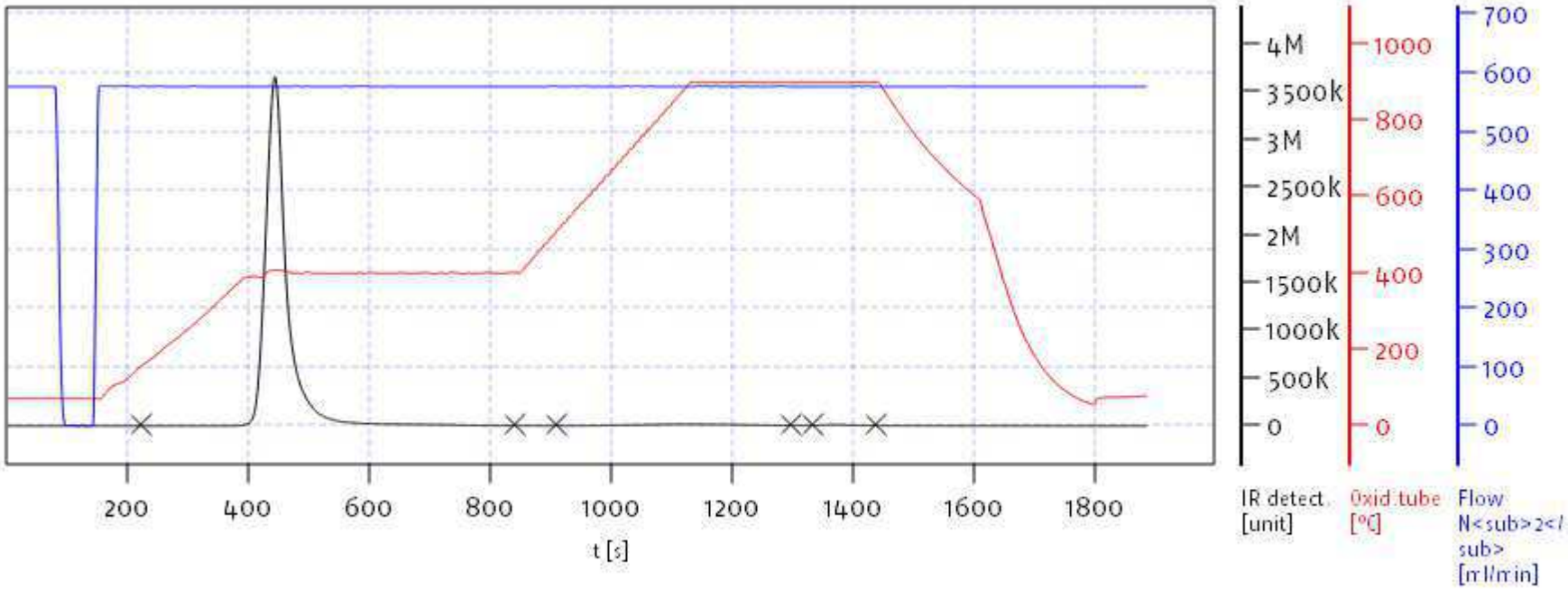
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
29	37	Dfactor	21.00		1.00	CARBON	8/25/2021 8:47 AM	44.446	0.000	44.446	bl	5 524 800	134 598	27 280	1.0712	1.0000



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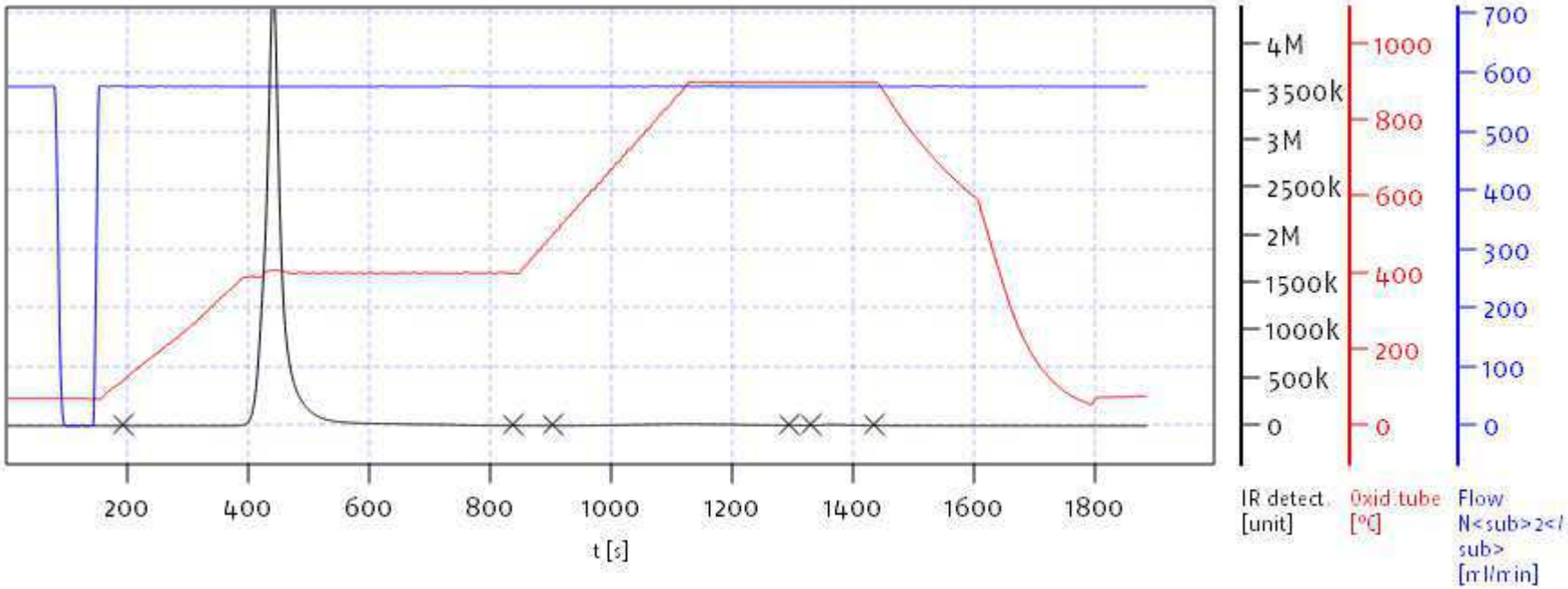
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
30	38	SEQ-ICV1	20.50		1.00	CARBON	8/25/2021 9:19 AM	47.154	1.091	48.245	bl	5 328 380	151 538	28 760	1.0733	1.0293



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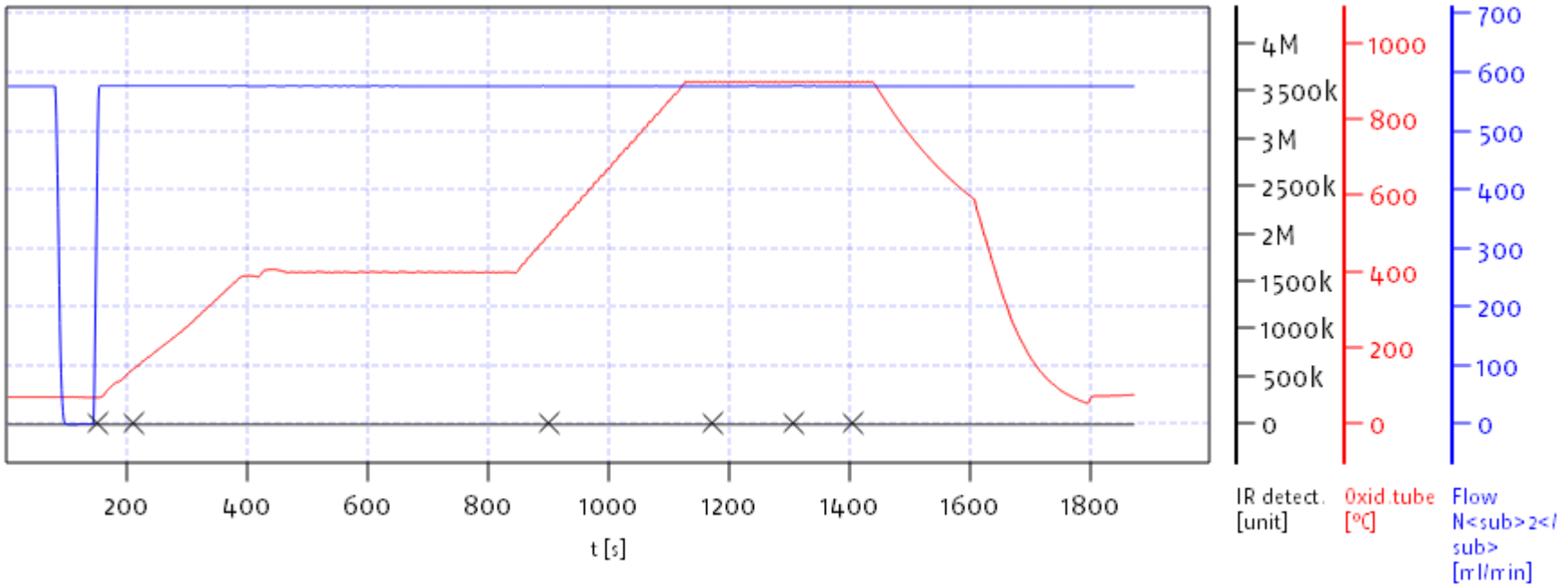
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
31	39	SEQ-ICB1	599.20		1.00	CARBON	8/25/2021 9:51 AM	0.000	0.000	0.000	bl,C1u,C3u,C2u	172	1 307	338	1.0733	1.0293



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Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 9060A m

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0331	Instrument:	TOC Cube
		Calibration:	EH00065

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Initial Cal Check	SJH0331-ICV1	peData_08312021@1034-2	NA	08/25/21 16:08
Initial Cal Blank	SJH0331-ICB1	peData_08312021@1034-3	NA	08/25/21 16:40
Calibration Check	SJH0331-CCV1	peData_08312021@1034-4	NA	08/25/21 22:29
Calibration Blank	SJH0331-CCB1	peData_08312021@1034-4	NA	08/25/21 23:01
Calibration Check	SJH0331-CCV2	peData_08312021@1034-5	NA	08/26/21 04:48
Calibration Blank	SJH0331-CCB2	peData_08312021@1034-5	NA	08/26/21 05:20
Calibration Check	SJH0331-CCV3	peData_08312021@1034-6	NA	08/26/21 11:09
Calibration Blank	SJH0331-CCB3	peData_08312021@1034-7	NA	08/26/21 11:41
Calibration Check	SJH0331-CCV4	peData_08312021@1034-6	NA	08/26/21 17:29
Calibration Blank	SJH0331-CCB4	peData_08312021@1034-6	NA	08/26/21 18:01
Calibration Check	SJH0331-CCV5	peData_08312021@1034-1	NA	08/26/21 23:59
Calibration Blank	SJH0331-CCB5	peData_08312021@1034-1	NA	08/27/21 00:30
Calibration Check	SJH0331-CCV6	peData_08312021@1034-1	NA	08/27/21 06:16
Calibration Blank	SJH0331-CCB6	peData_08312021@1034-1	NA	08/27/21 06:47
Calibration Check	SJH0331-CCV7	peData_08312021@1034-2	NA	08/27/21 12:34
Calibration Blank	SJH0331-CCB7	peData_08312021@1034-2	NA	08/27/21 13:06
Calibration Check	SJH0331-CCV8	peData_08312021@1034-3	NA	08/27/21 18:53
Calibration Blank	SJH0331-CCB8	peData_08312021@1034-3	NA	08/27/21 19:24
Calibration Check	SJH0331-CCV9	peData_08312021@1034-5	NA	08/28/21 01:09
Calibration Blank	SJH0331-CCB9	peData_08312021@1034-5	NA	08/28/21 01:40
Calibration Check	SJH0331-CCVA	peData_08312021@1034-6	NA	08/28/21 07:24
Calibration Blank	SJH0331-CCBA	peData_08312021@1034-6	NA	08/28/21 07:56
Calibration Check	SJH0331-CCVB	peData_08312021@1034-7	NA	08/28/21 13:42
Calibration Blank	SJH0331-CCBB	peData_08312021@1034-7	NA	08/28/21 14:13
Calibration Check	SJH0331-CCVC	peData_08312021@1034-6	NA	08/28/21 19:57
Calibration Blank	SJH0331-CCBC	peData_08312021@1034-6	NA	08/28/21 20:28
Calibration Check	SJH0331-CCVD	peData_08312021@1034-1	NA	08/29/21 02:10
Calibration Blank	SJH0331-CCBD	peData_08312021@1034-1	NA	08/29/21 02:41
Calibration Check	SJH0331-CCVE	peData_08312021@1034-2	NA	08/29/21 08:25
Calibration Blank	SJH0331-CCBE	peData_08312021@1034-2	NA	08/29/21 08:56

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 9060A m

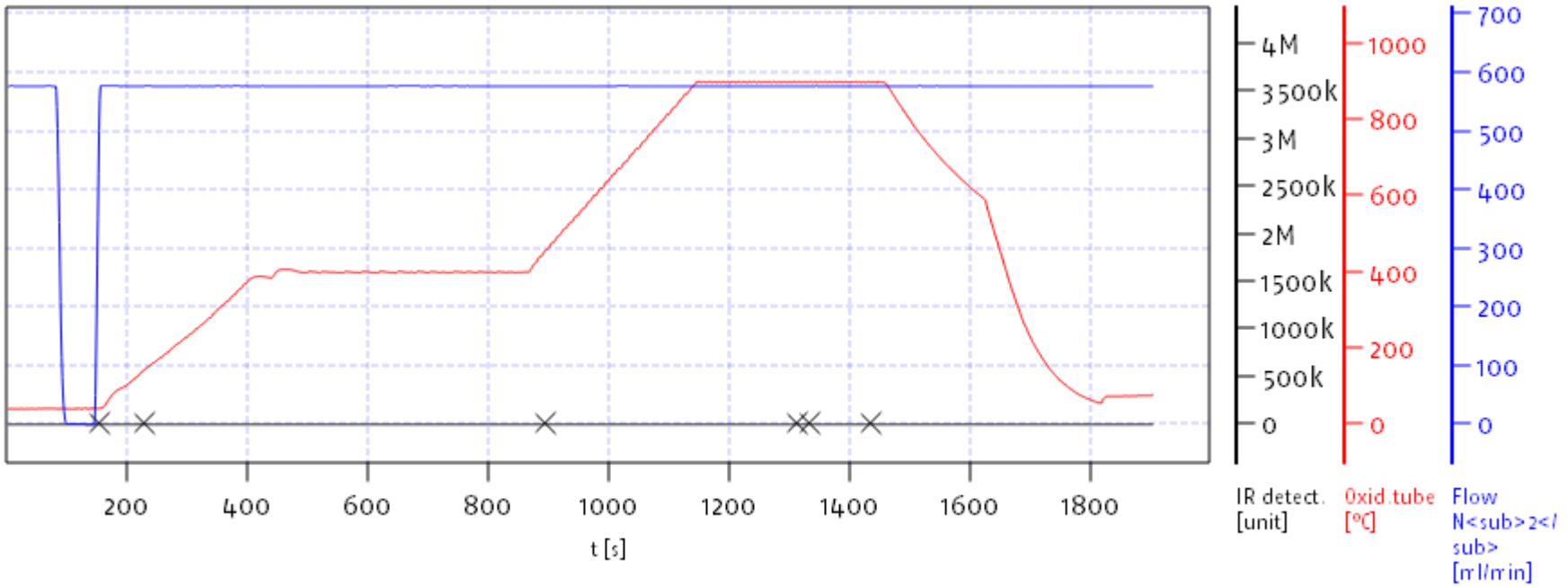
Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0331	Instrument:	TOC Cube
		Calibration:	EH00065

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Calibration Check	SJH0331-CCVF	peData_08312021@1034-3	NA	08/29/21 14:41
Calibration Blank	SJH0331-CCBF	peData_08312021@1034-3	NA	08/29/21 15:13
Calibration Check	SJH0331-CCVG	peData_08312021@1034-4	NA	08/29/21 20:58
Calibration Blank	SJH0331-CCBG	peData_08312021@1034-4	NA	08/29/21 21:29
Calibration Check	SJH0331-CCVH	peData_08312021@1034-5	NA	08/30/21 03:12
Calibration Blank	SJH0331-CCBH	peData_08312021@1034-5	NA	08/30/21 03:43
Calibration Check	SJH0331-CCVI	peData_08312021@1034-7	NA	08/30/21 09:27
Calibration Blank	SJH0331-CCBI	peData_08312021@1034-7	NA	08/30/21 09:59
Calibration Check	SJH0331-CCVJ	peData_08312021@1034-(	NA	08/30/21 15:45
Calibration Blank	SJH0331-CCBJ	peData_08312021@1034-(	NA	08/30/21 16:16

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
1	39	BLANK	1.00		1.00	CARBON	8/25/2021 2:33 PM	0.000	0.000	0.000	bl	269	2 397	1 039	1.0000	1.0000



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Date: Tue Aug 31 14:32:59 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

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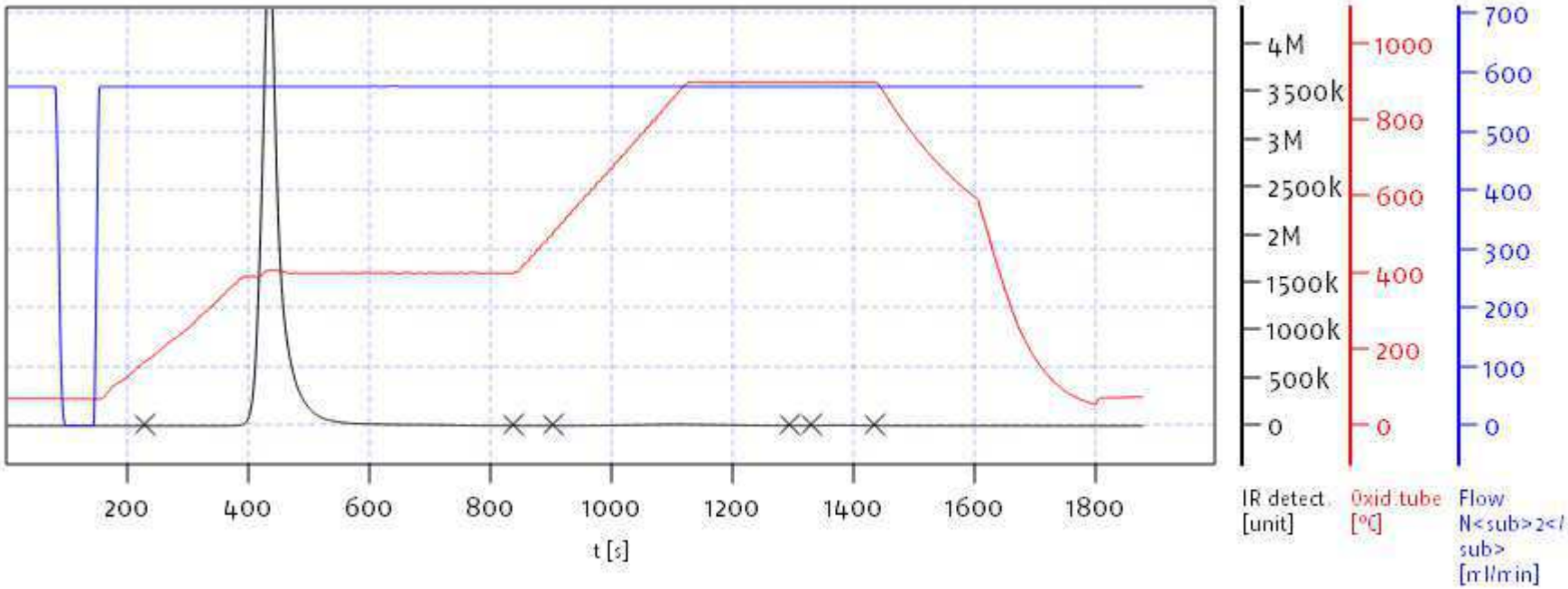
Document: 082521BFb from: 8/31/2021 10:17 AM

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
2	40	Dfactor	23.10		1.00	CARBON	8/25/2021 3:05 PM	44.489	0.729	45.218	bl	6 305 580	111 318	17 655	0.9659	1.0000



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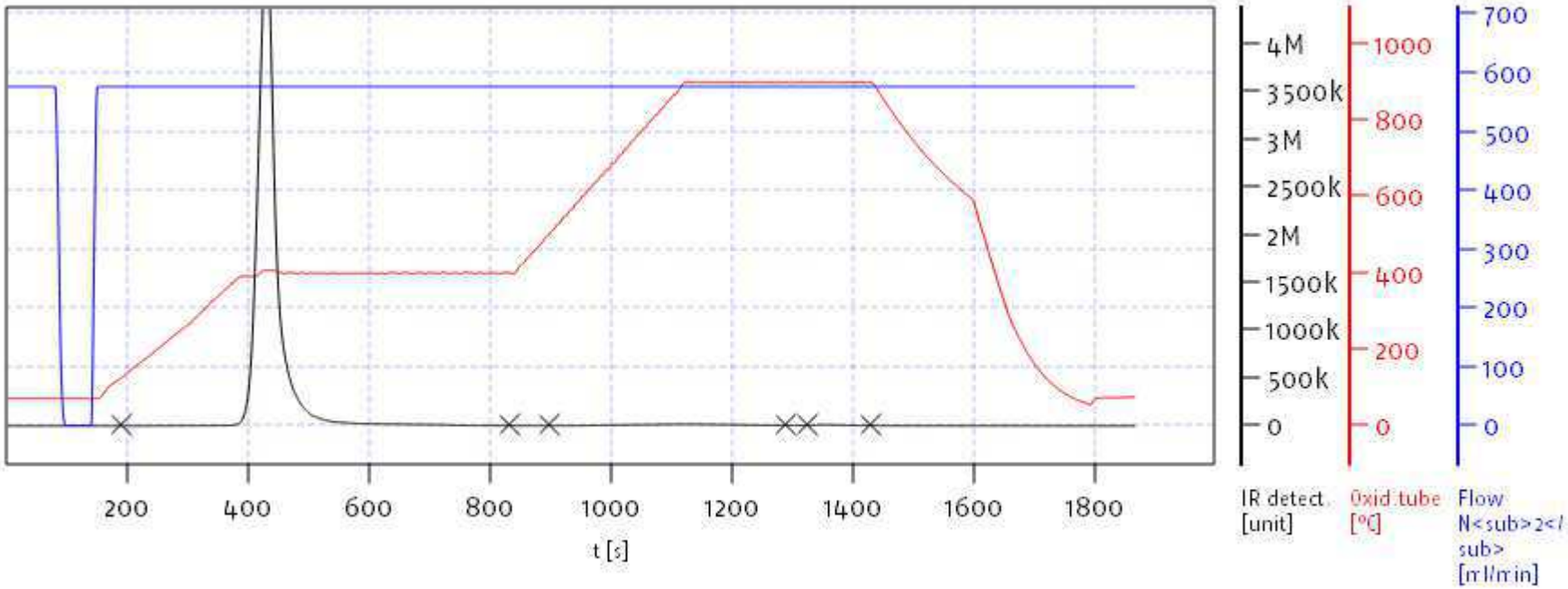
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
3	41	Dfactor	24.40		1.00	CARBON	8/25/2021 3:36 PM	44.543	0.898	45.441	bl	6 680 720	141 475	25 730	0.9629	1.0000



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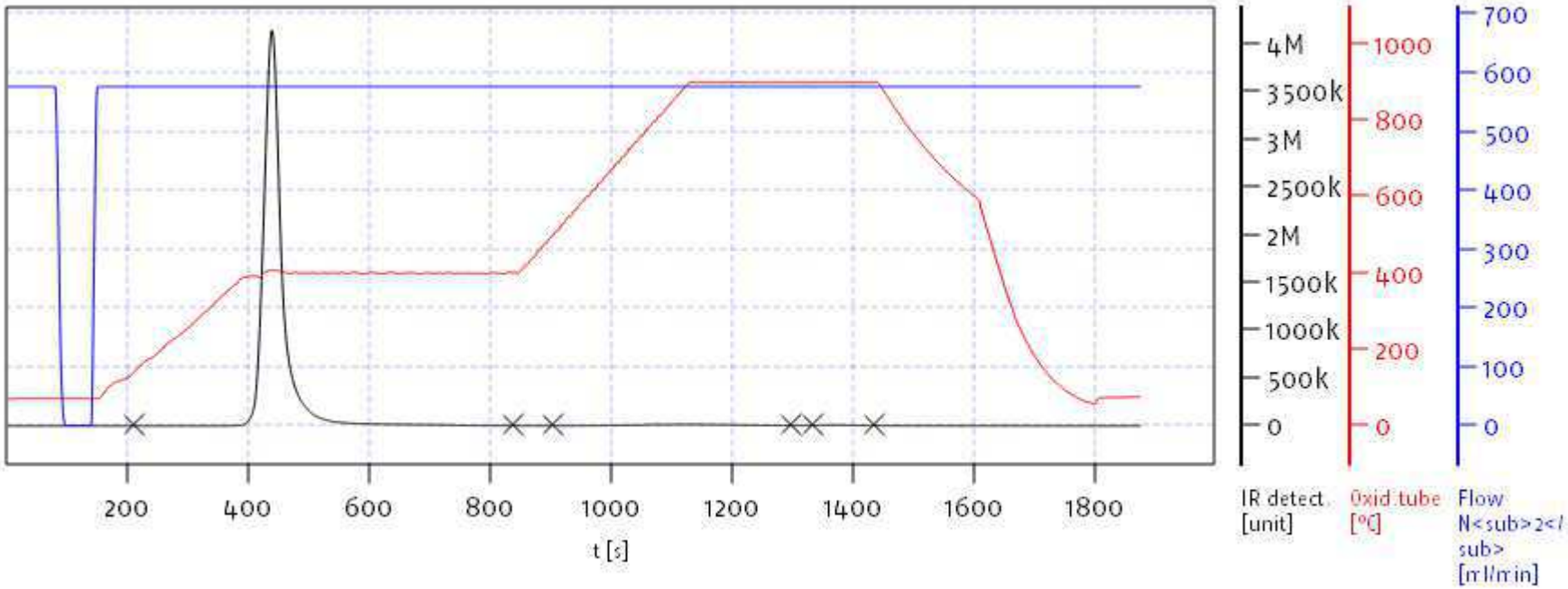
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
4	42	SJH0331-ICV1	20.10		1.00	CARBON	8/25/2021 4:08 PM	43.884	0.897	44.781	bl	5 416 100	118 414	22 631	0.9644	1.0000



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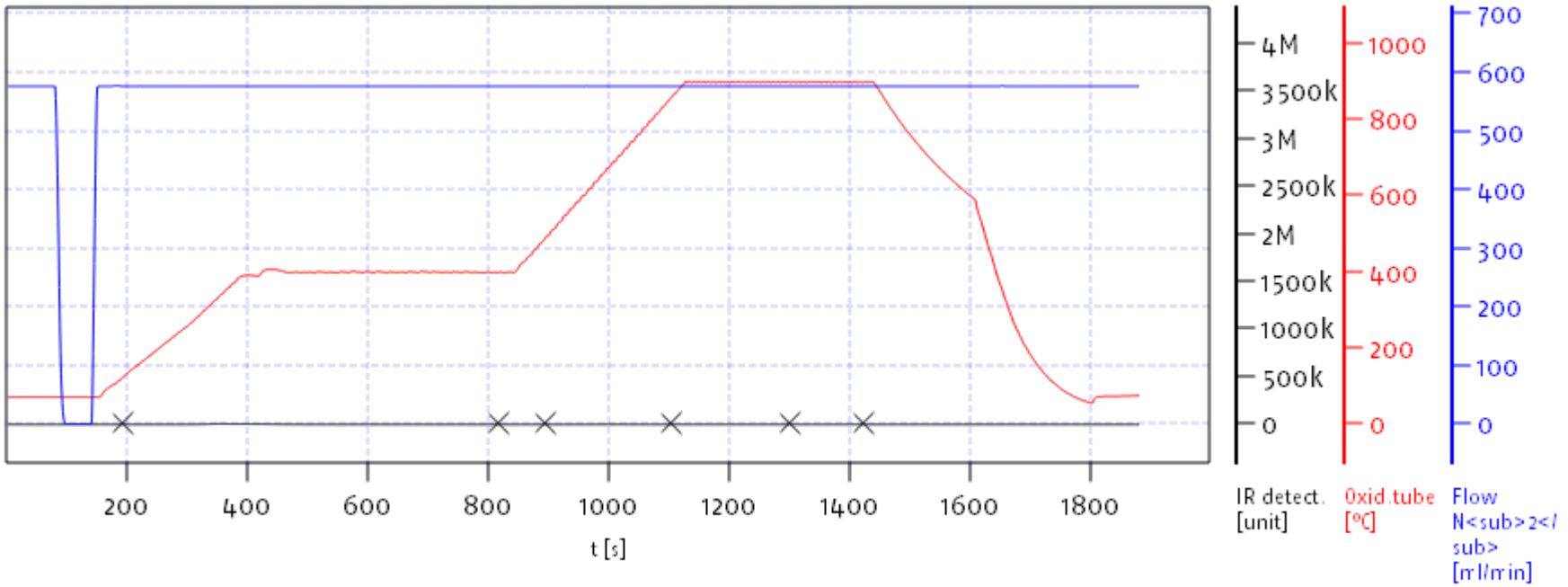
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
5	43	SJH0331-ICB1	554.10		1.00	CARBON	8/25/2021 4:40 PM	0.003	0.000	0.003	bl,C3u,C2u	23 343	1 885	805	0.9644	1.0000



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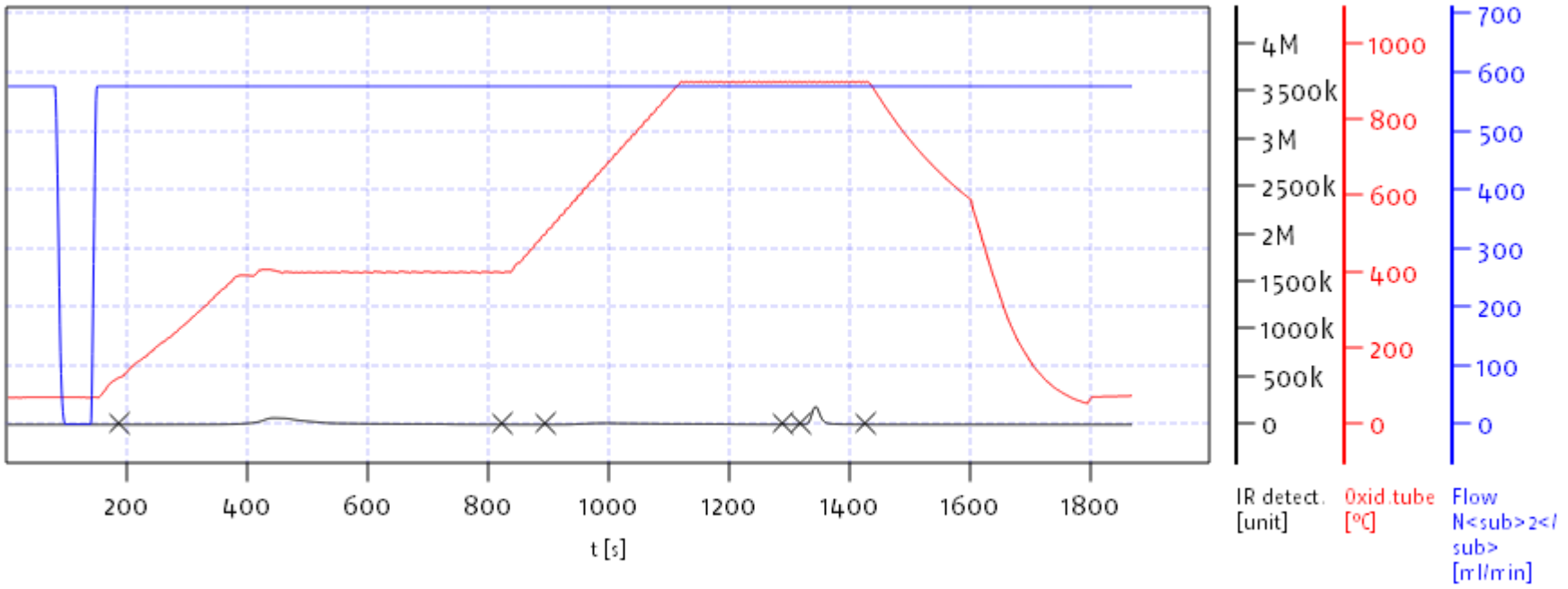
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
6	44	21G0313-17	621.60		1.00	CARBON	8/25/2021 5:12 PM	0.103	0.022	0.125	bl	287 974	92 124	123 678	0.9644	1.0000



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Balance: BAL3
Analyst: BF

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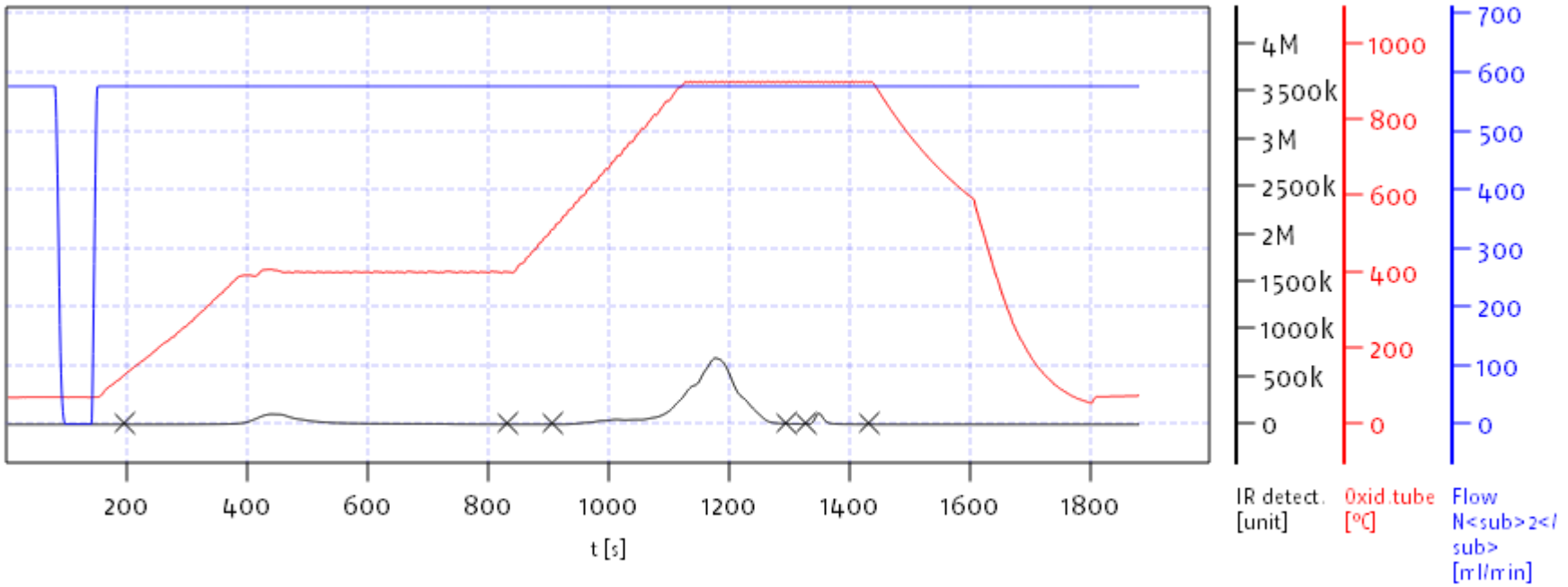
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
7	45	21G0313-18	364.50		1.00	CARBON	8/25/2021 5:43 PM	0.210	1.195	1.405	bl	412 259	2 590 880	78 972	0.9644	1.0000



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Analyst: BF

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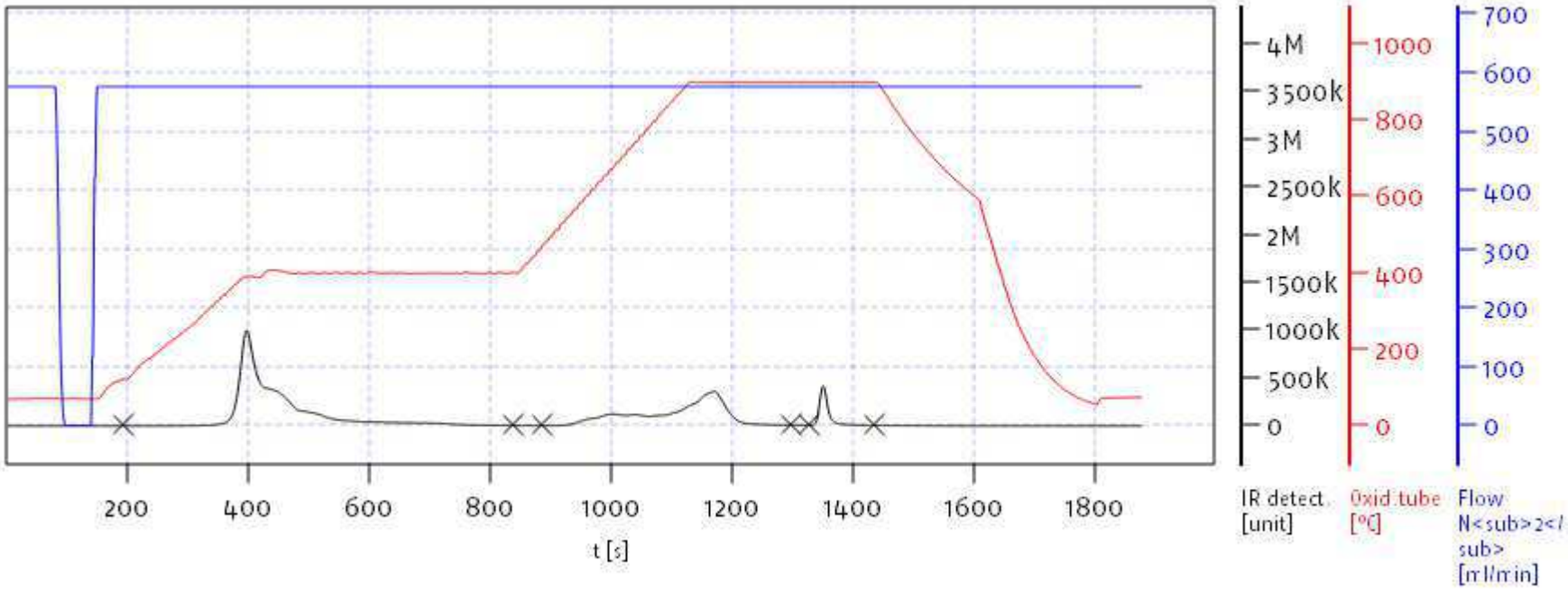
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
8	46	21G0322-05	555.60		1.00	CARBON	8/25/2021 6:15 PM	0.794	0.479	1.274	bl	2 451 470	1 589 110	272 309	0.9644	1.0000



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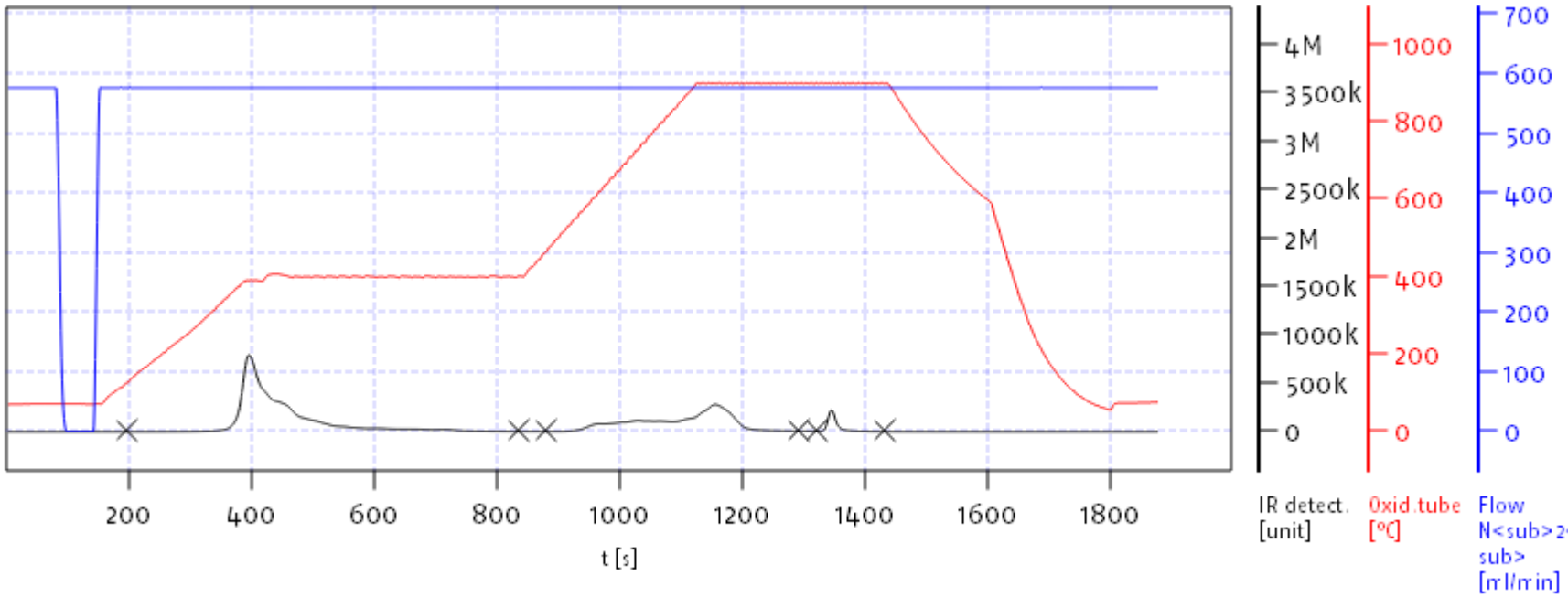
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
9	47	BJH0434-DUP3	525.50		1.00	CARBON	8/25/2021 6:47 PM	0.682	0.425	1.107	bl	2 074 920	1 332 920	144 038	0.9644	1.0000



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soliTOC V2.0.2 (31015f9) 2018-11-19
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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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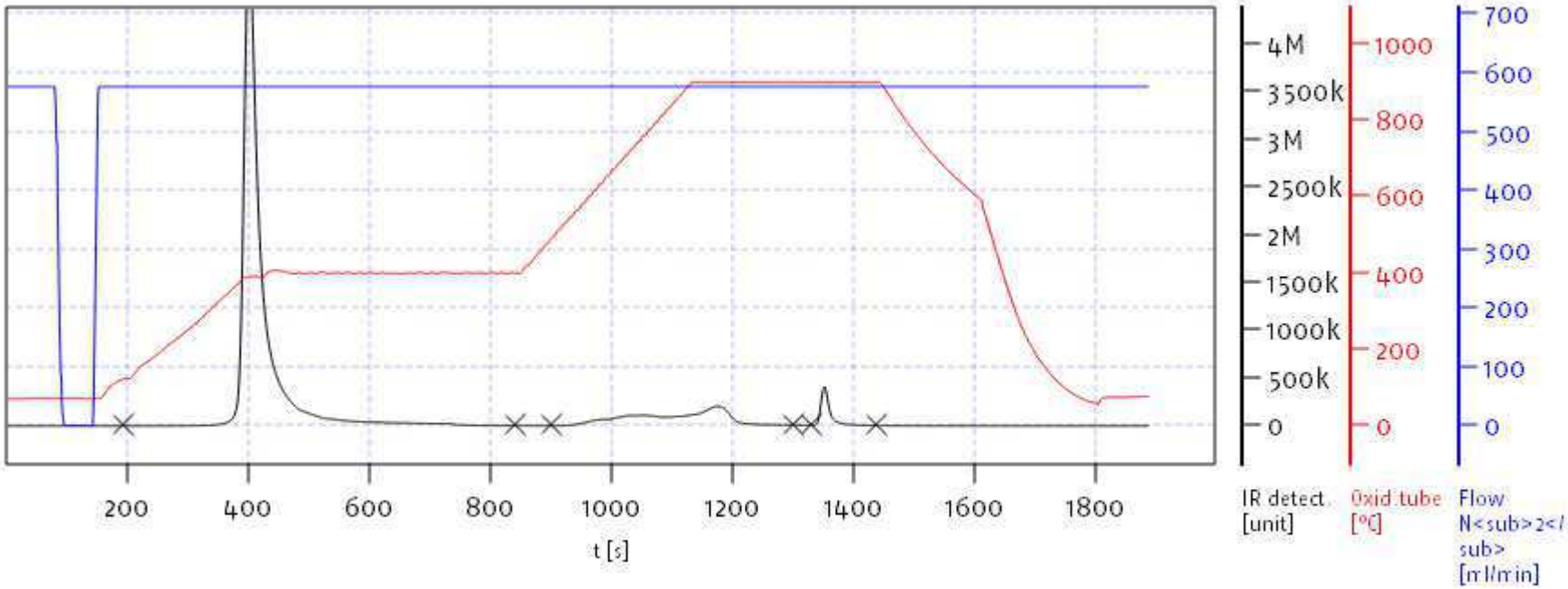
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
10	48	BJH0434-MS3	537.50	0.0145	1.00	CARBON	8/25/2021 7:19 PM	1.970	0.338	2.309	bl	6 246 020	1 088 690	269 680	0.9644	1.0000



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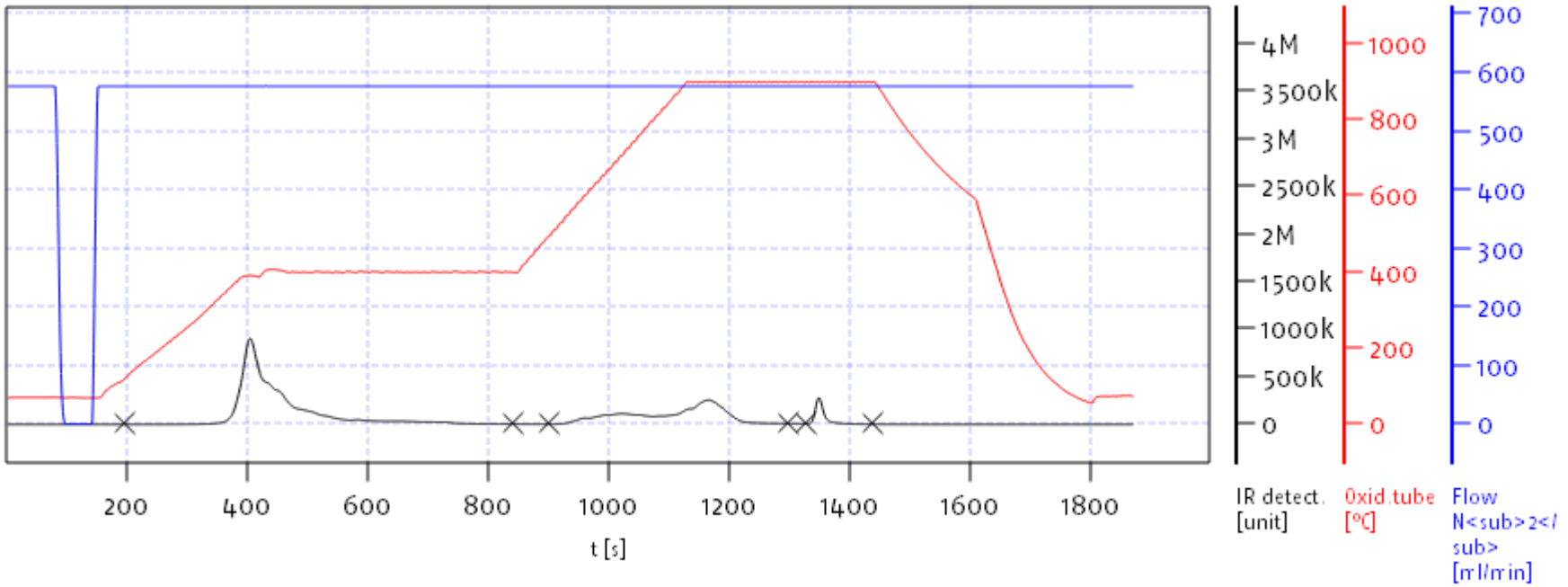
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
11	49	21G0322-06	586.50		1.00	CARBON	8/25/2021 7:51 PM	0.703	0.368	1.071	bl	2 364 740	1 288 930	184 548	0.9644	1.0000



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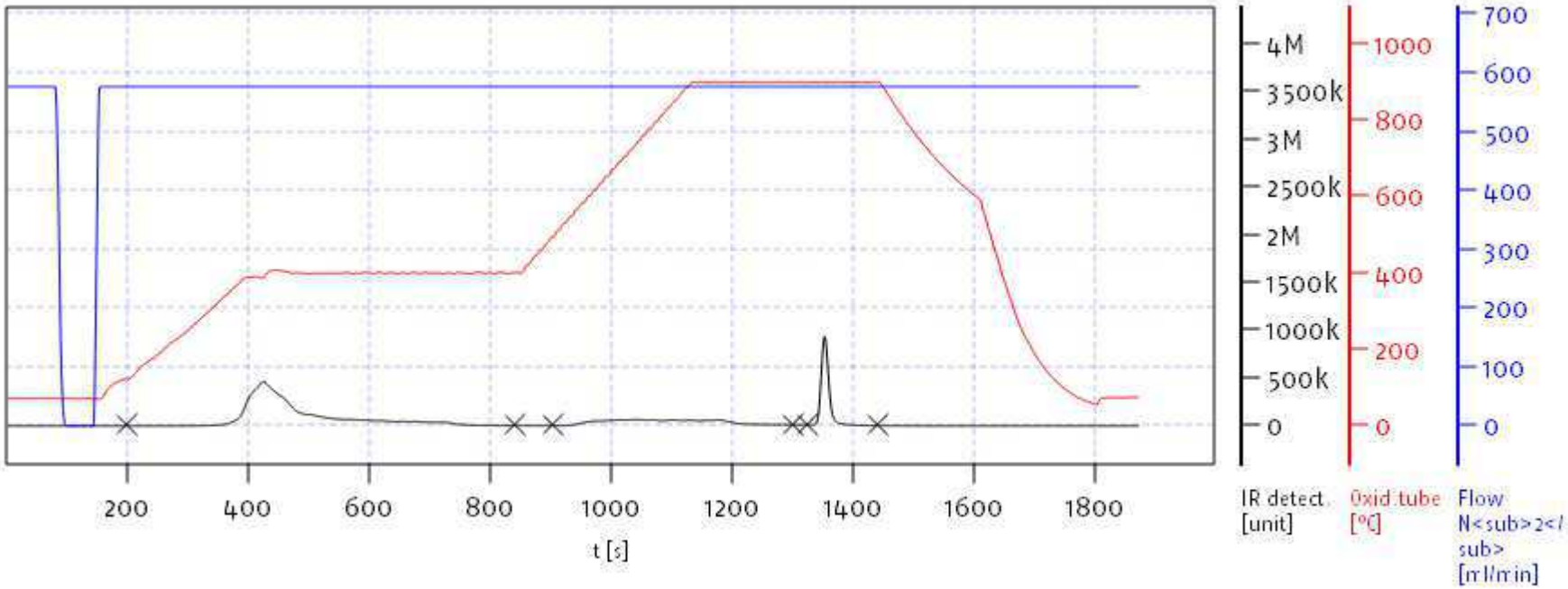
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
12	50	21G0322-07	645.40		1.00	CARBON	8/25/2021 8:22 PM	0.587	0.155	0.742	bl	1 802 760	603 747	527 933	0.9644	1.0000



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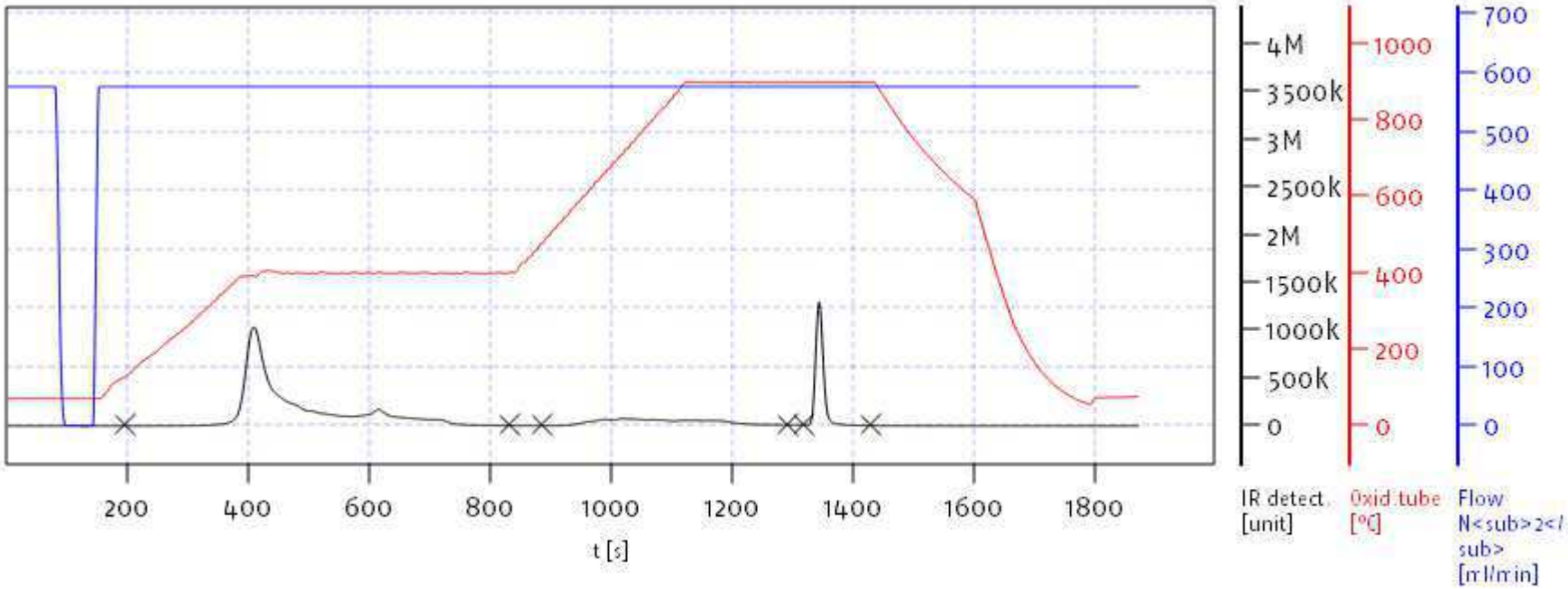
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
13	51	21G0322-08	526.80		1.00	CARBON	8/25/2021 8:54 PM	1.132	0.194	1.327	bl	2 929 100	618 360	729 749	0.9644	1.0000



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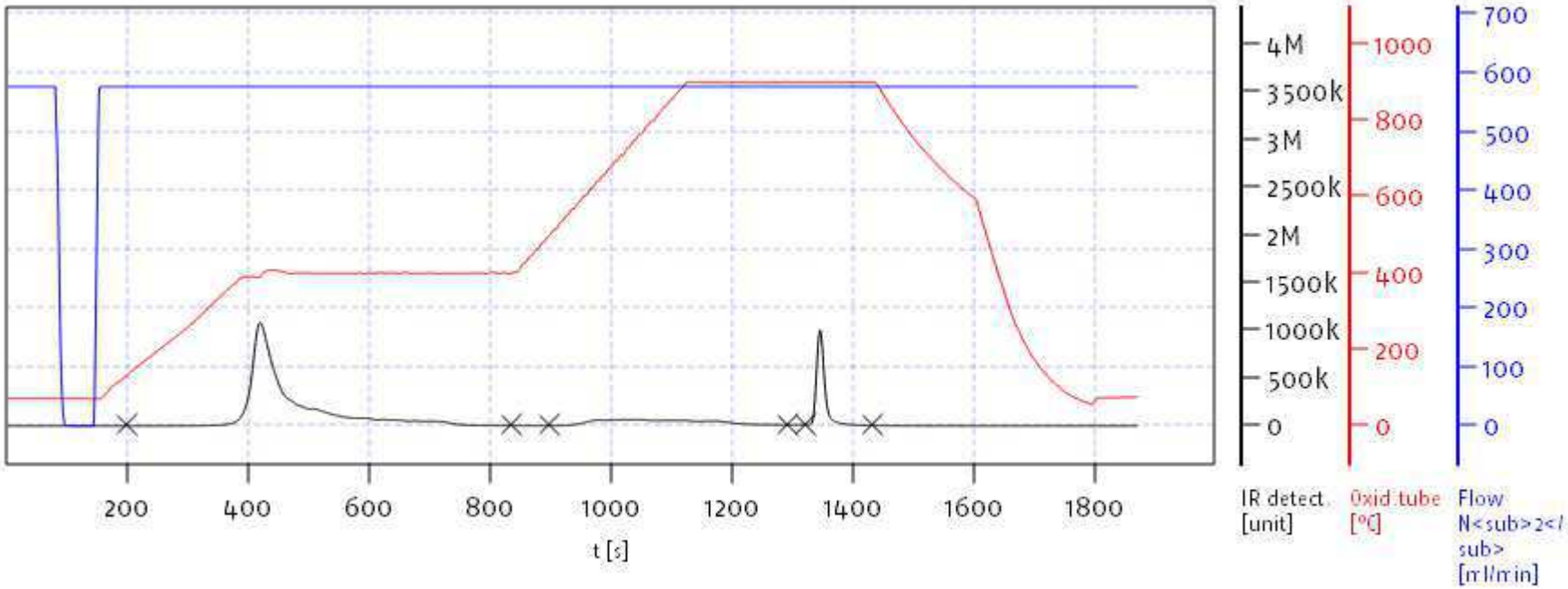
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
14	52	21G0322-09	525.60		1.00	CARBON	8/25/2021 9:26 PM	1.042	0.183	1.225	bl	2 762 510	580 911	600 994	0.9644	1.0000



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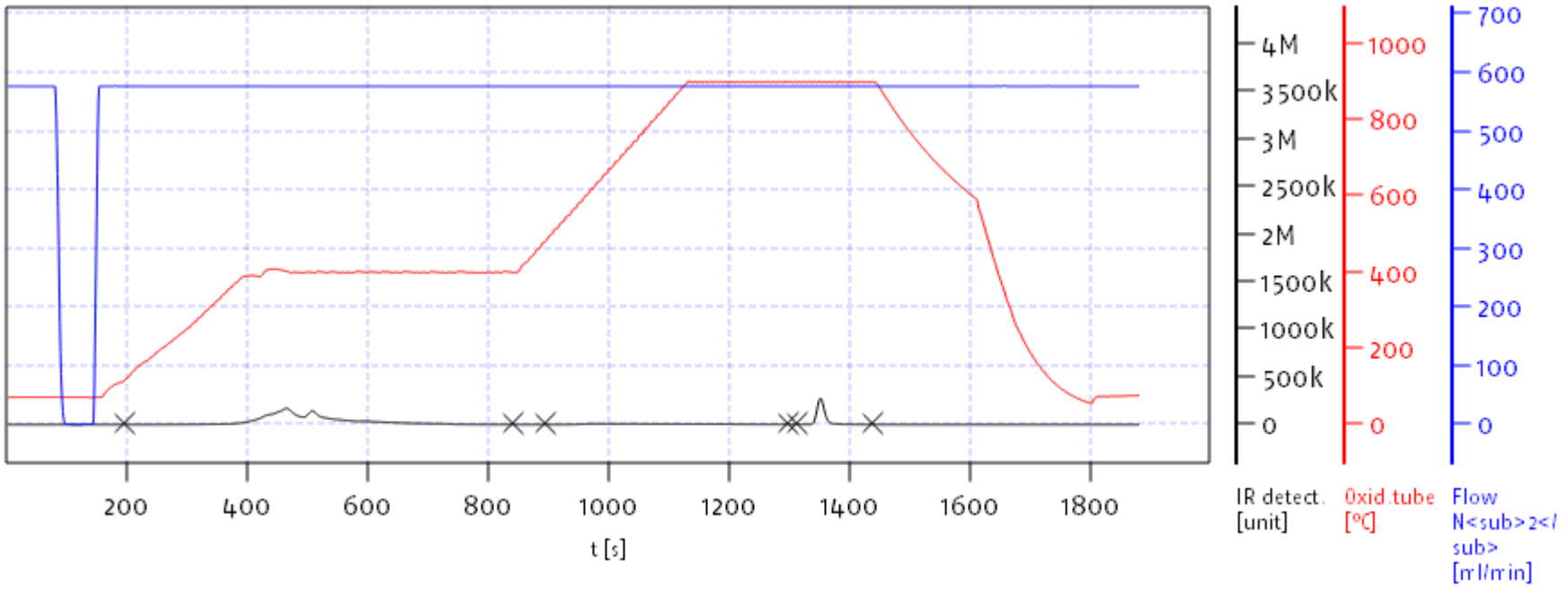
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
15	53	21G0330-01	587.30		1.00	CARBON	8/25/2021 9:57 PM	0.242	0.018	0.260	bl	734 950	73 410	156 753	0.9644	1.0000



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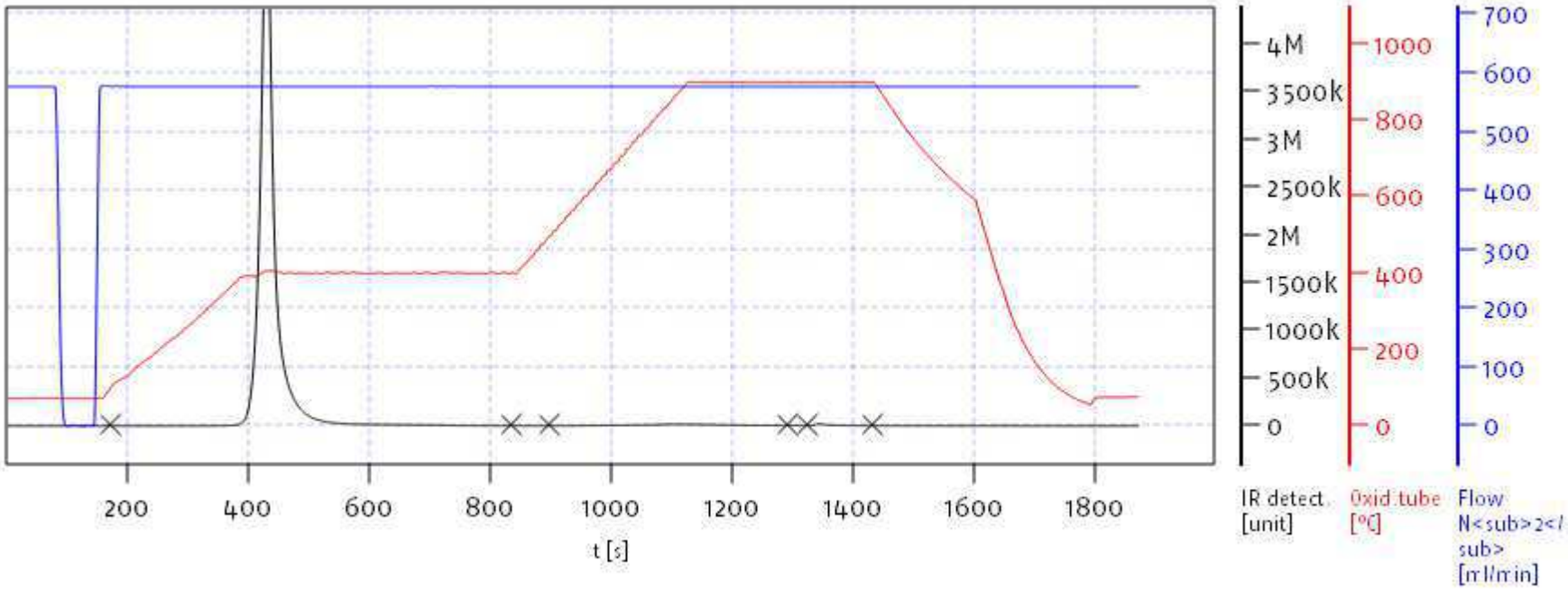
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
16	54	SJH0331-CCV1	20.90		1.00	CARBON	8/25/2021 10:29 PM	43.755	0.830	44.585	bl	5 610 790	114 398	26 780	0.9644	1.0000



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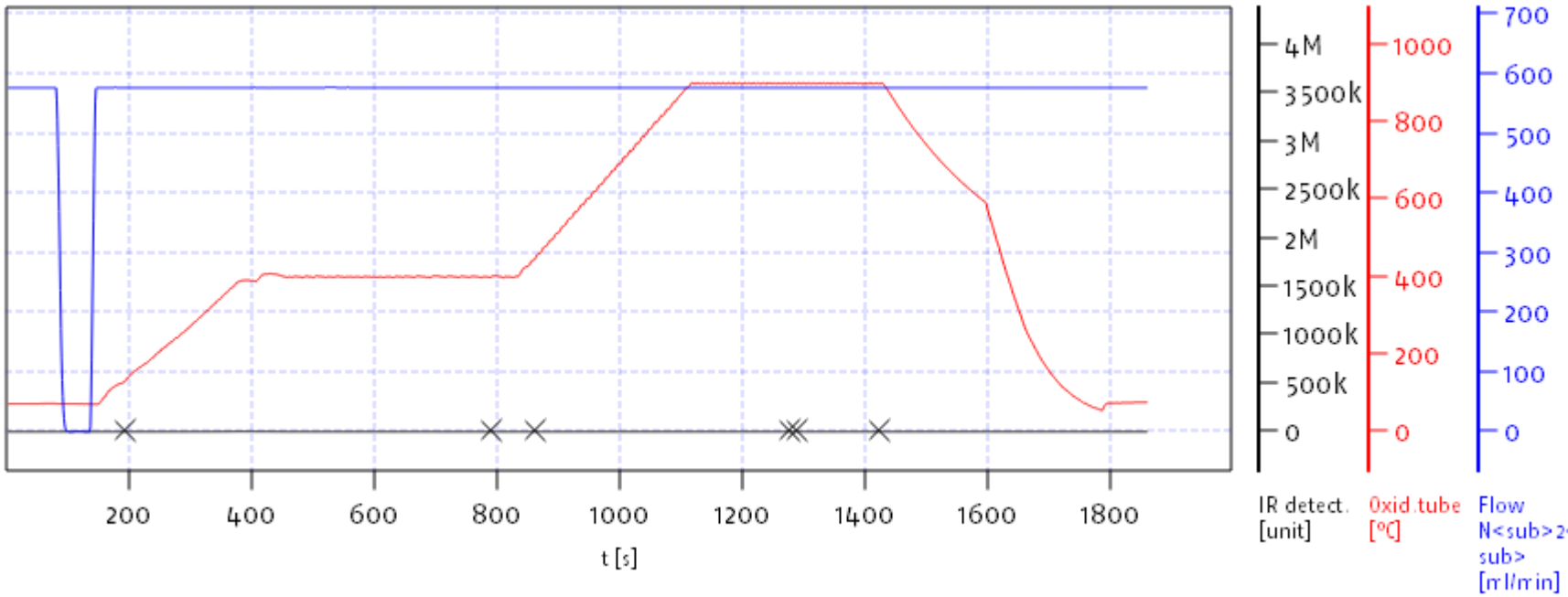
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
17	55	SJH0331-CCB1	539.70		1.00	CARBON	8/25/2021 11:01 PM	0.000	0.000	0.000	bl,C3u,C2u	8 568	654	96	0.9644	1.0000



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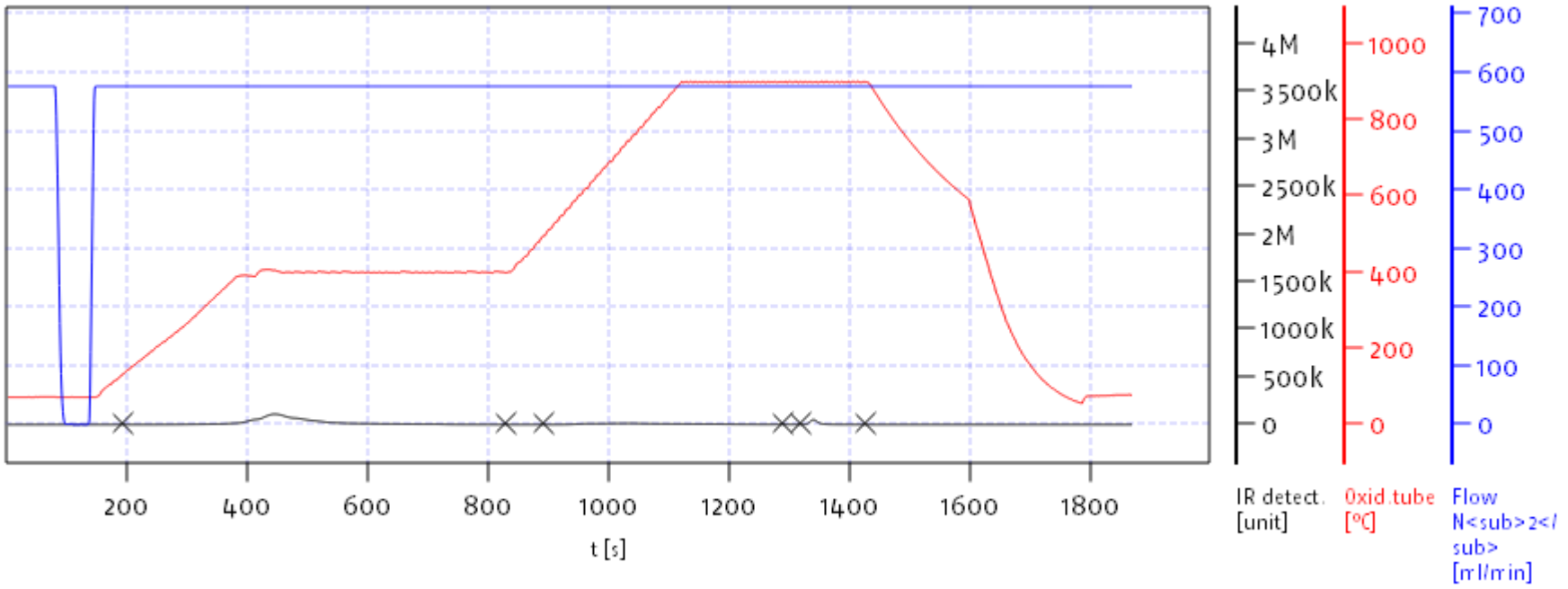
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
18	56	BJH0434-DUP4	597.30		1.00	CARBON	8/25/2021 11:32 PM	0.120	0.021	0.141	bl	430 799	87 095	32 284	0.9644	1.0000



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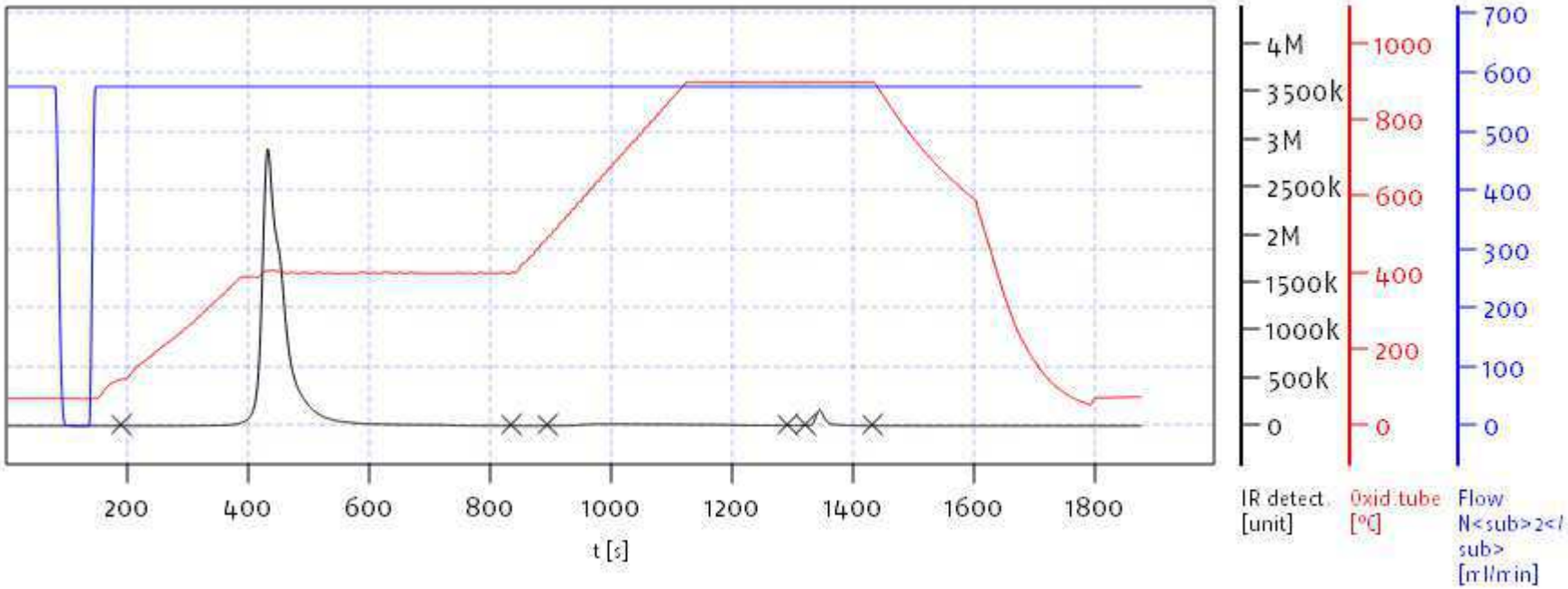
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
19	57	BJH0434-MS4	640.80	0.0128	1.00	CARBON	8/26/2021 12:04 AM	1.164	0.041	1.205	bl	4 483 710	165 615	115 595	0.9644	1.0000



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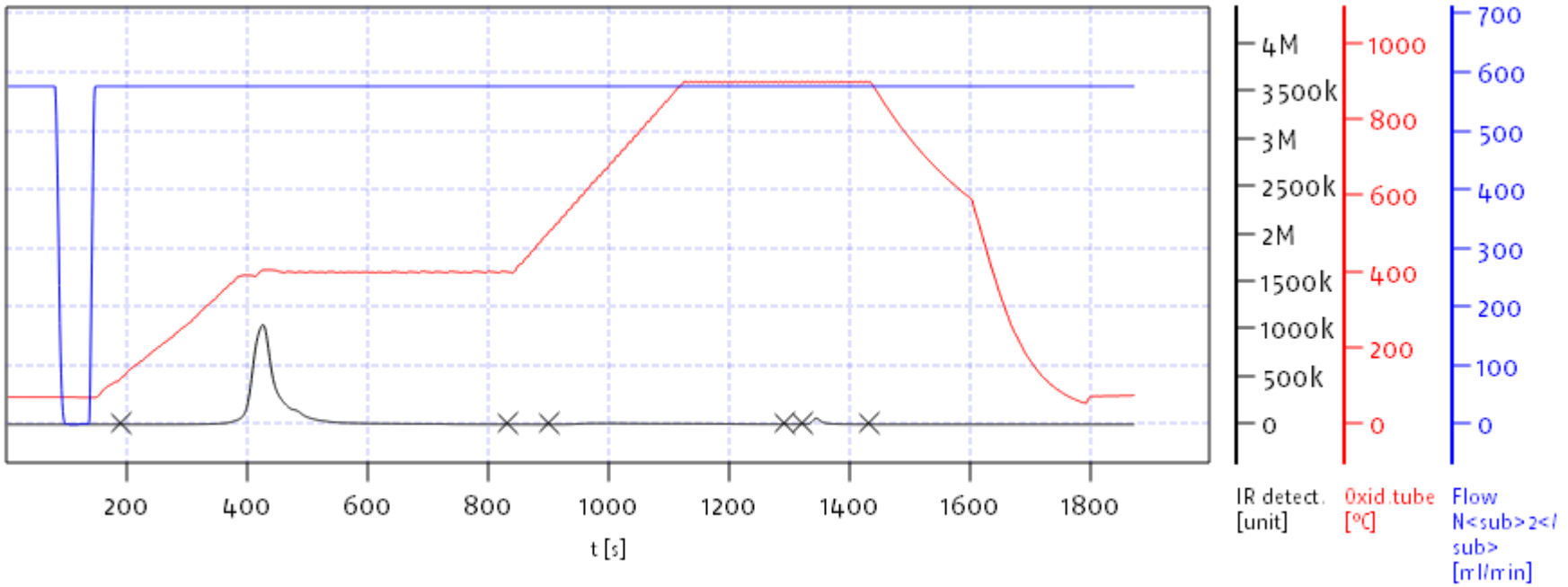
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
20	58	21G0330-02	694.00		1.00	CARBON	8/26/2021 12:36 AM	0.444	0.021	0.465	bl	1 867 910	96 006	47 239	0.9644	1.0000



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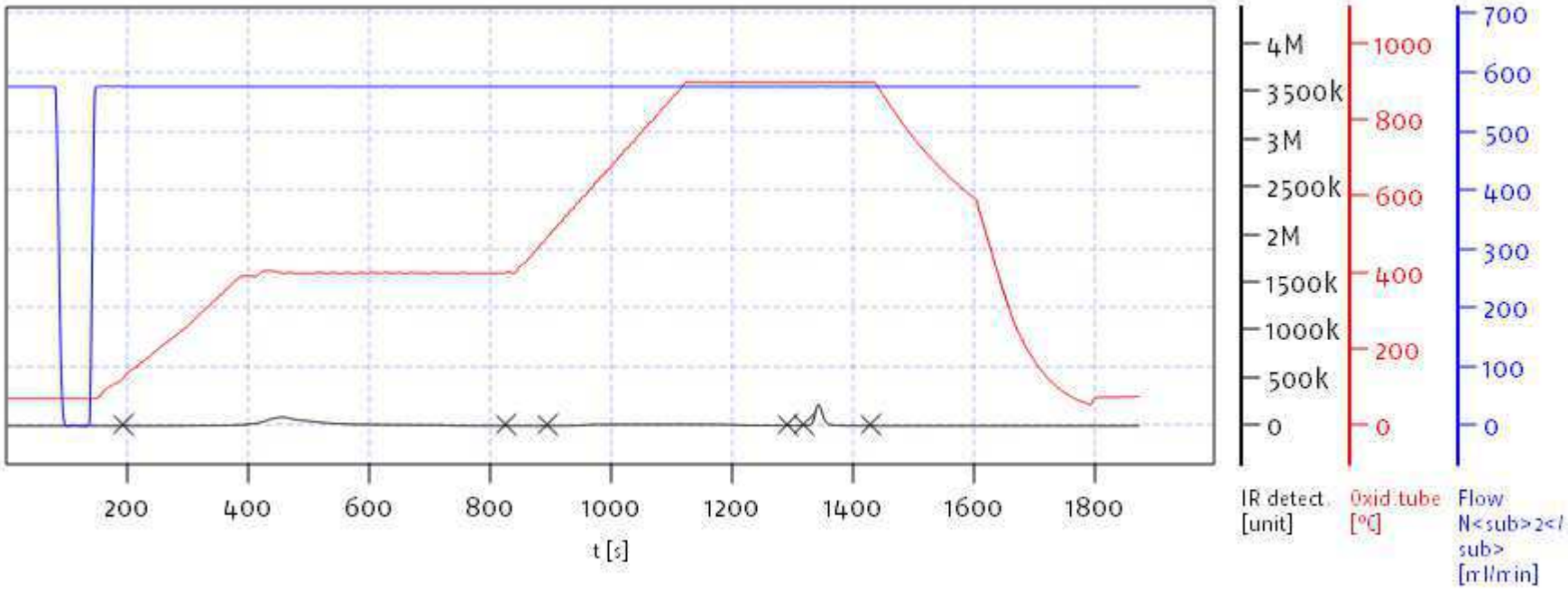
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
21	59	21G0330-03	566.50		1.00	CARBON	8/26/2021 1:07 AM	0.147	0.042	0.189	bl	400 378	151 075	129 909	0.9644	1.0000



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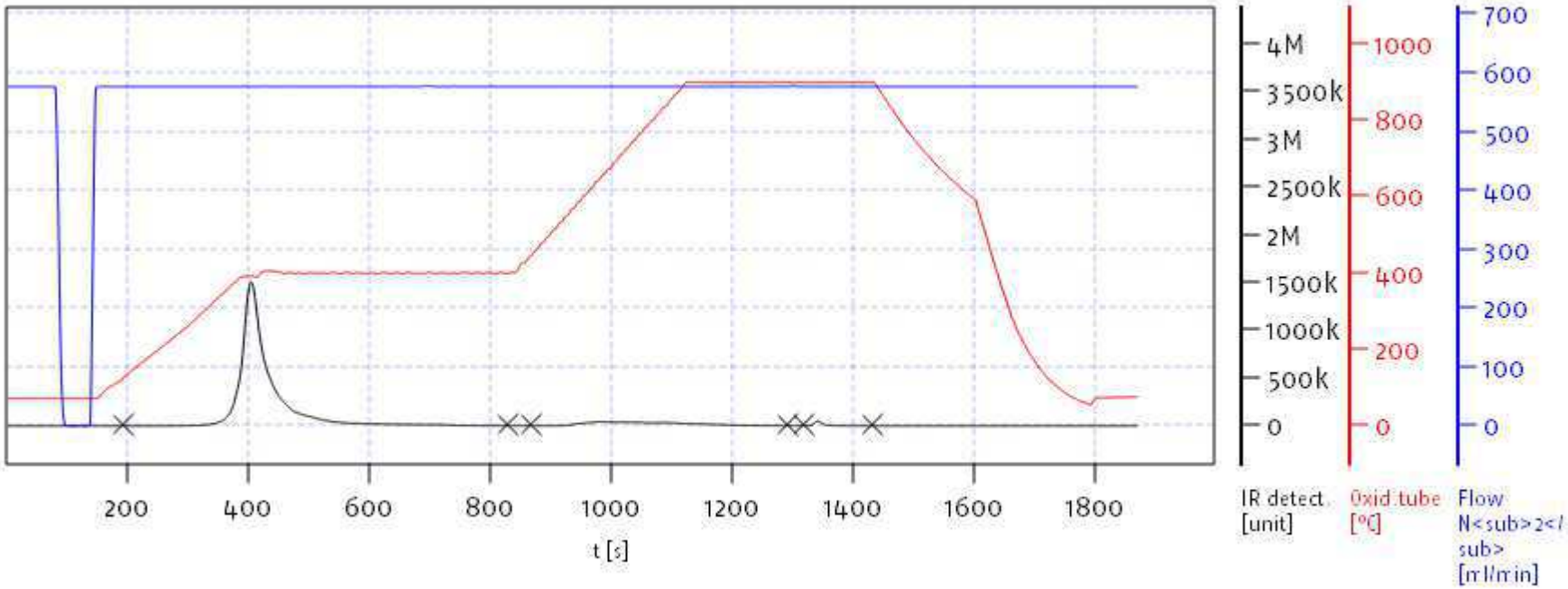
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
22	60	21H0072-13	522.70		1.00	CARBON	8/26/2021 1:39 AM	0.911	0.094	1.005	bl	2 912 900	303 233	33 518	0.9644	1.0000



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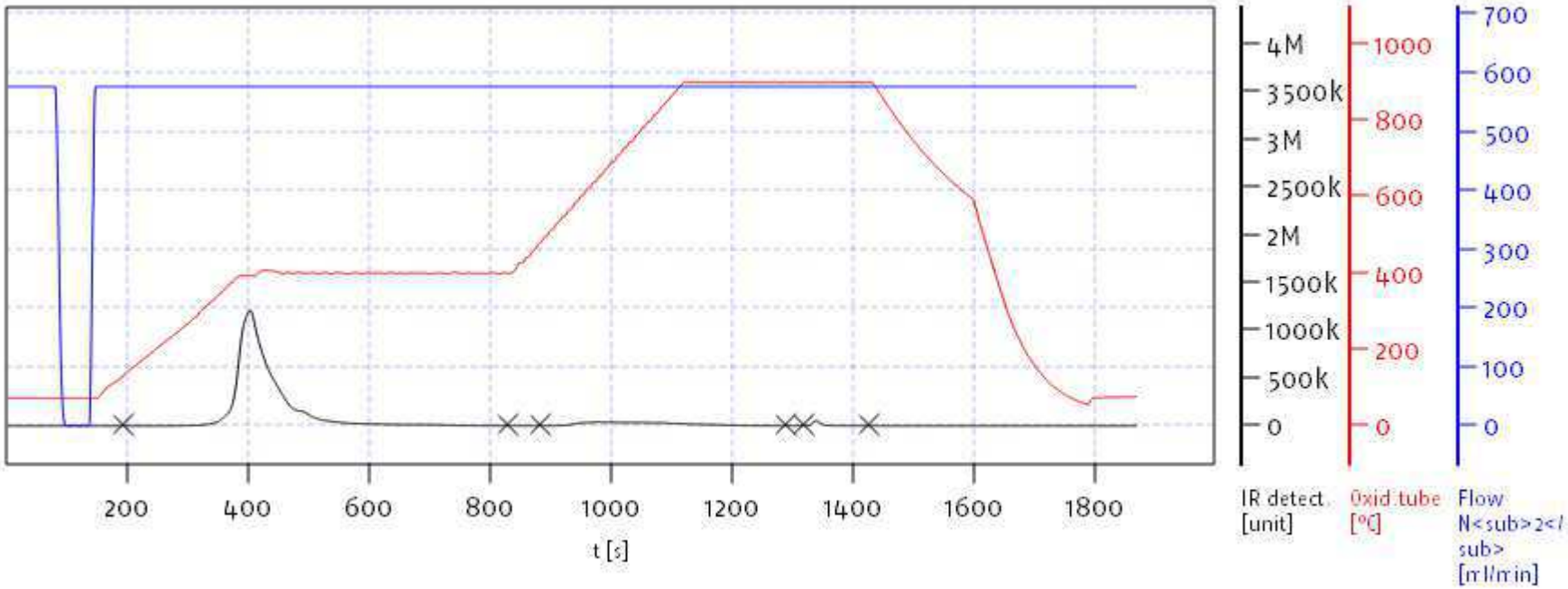
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
23	61	BJH0434-DUP1	541.00		1.00	CARBON	8/26/2021 2:11 AM	0.899	0.085	0.984	bl	2 974 090	282 649	34 924	0.9644	1.0000



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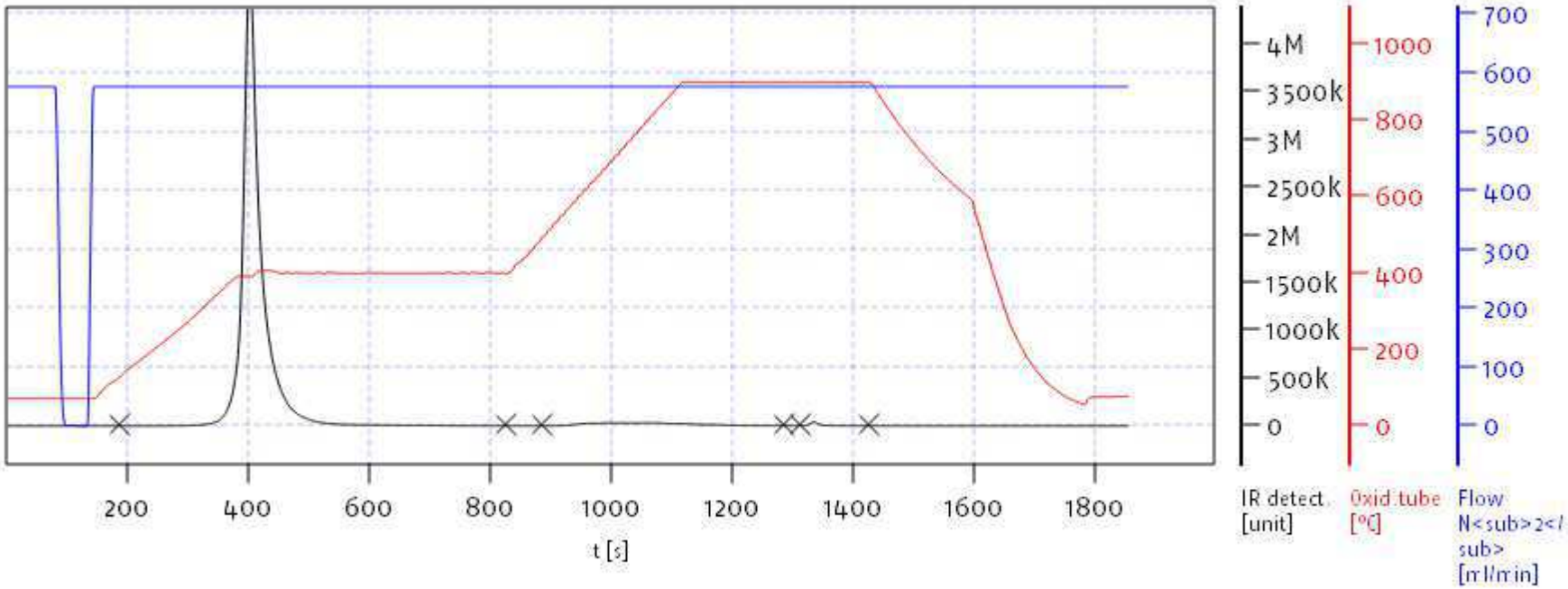
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
24	62	BJH0434-MS1	522.80	0.0110	1.00	CARBON	8/26/2021 2:42 AM	1.895	0.075	1.970	bl	6 077 010	242 912	29 009	0.9644	1.0000



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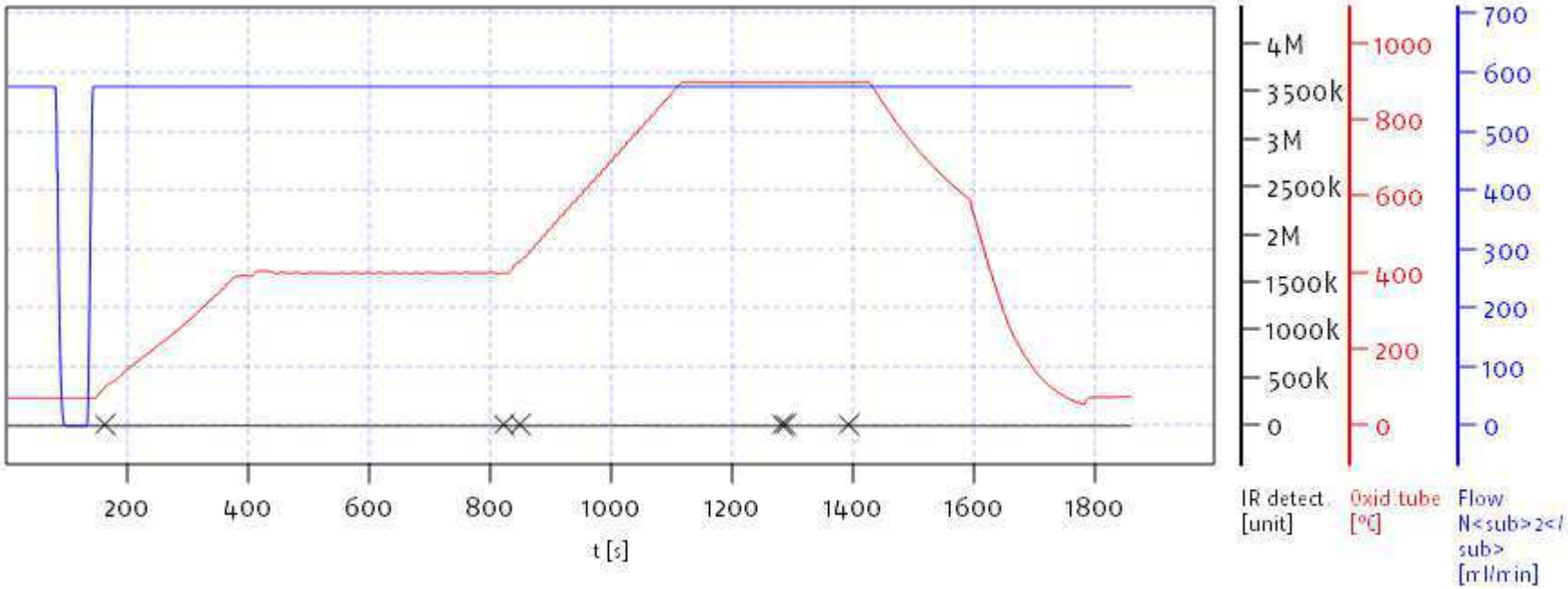
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
25	63	BLANK	1.00		1.00	CARBON	8/26/2021 3:13 AM	0.000	0.000	0.000	bl	13 366	5 962	130	0.9644	1.0000



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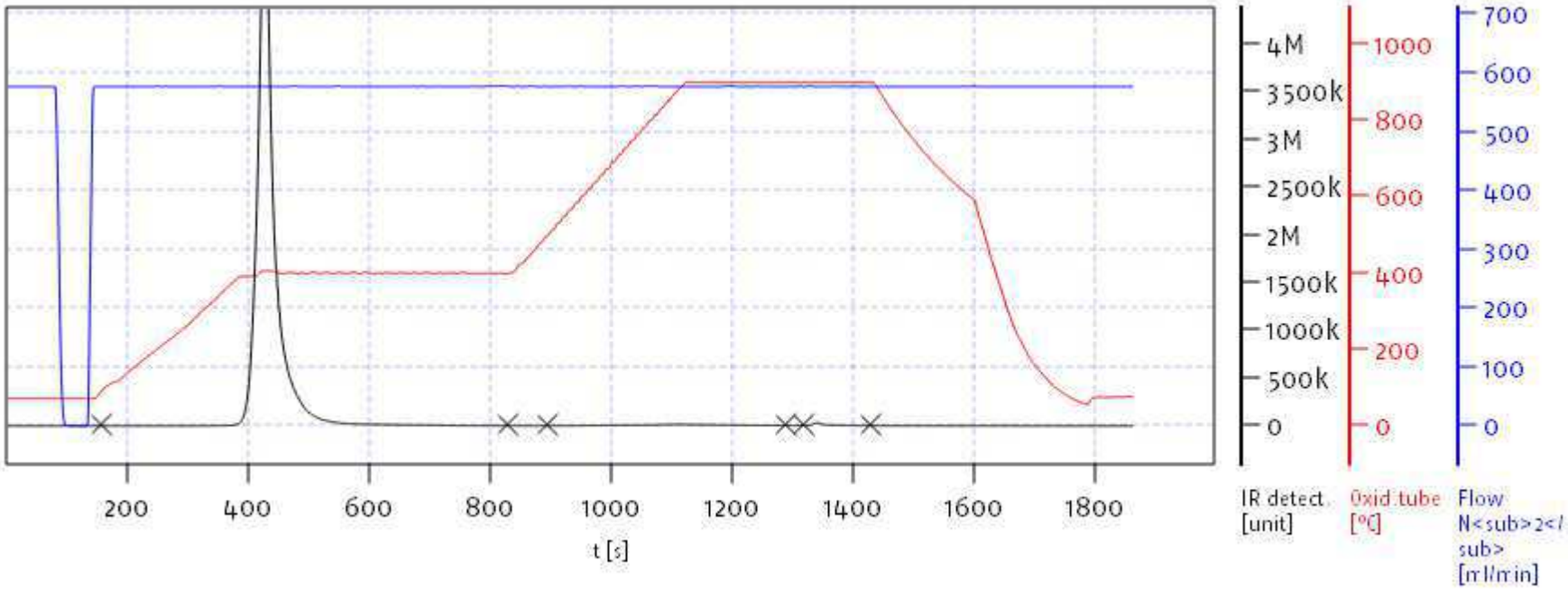
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
26	64	Dfactor	24.70		1.00	CARBON	8/26/2021 3:45 AM	44.611	0.662	45.273	bl	6 594 660	108 528	35 848	0.9874	1.0000



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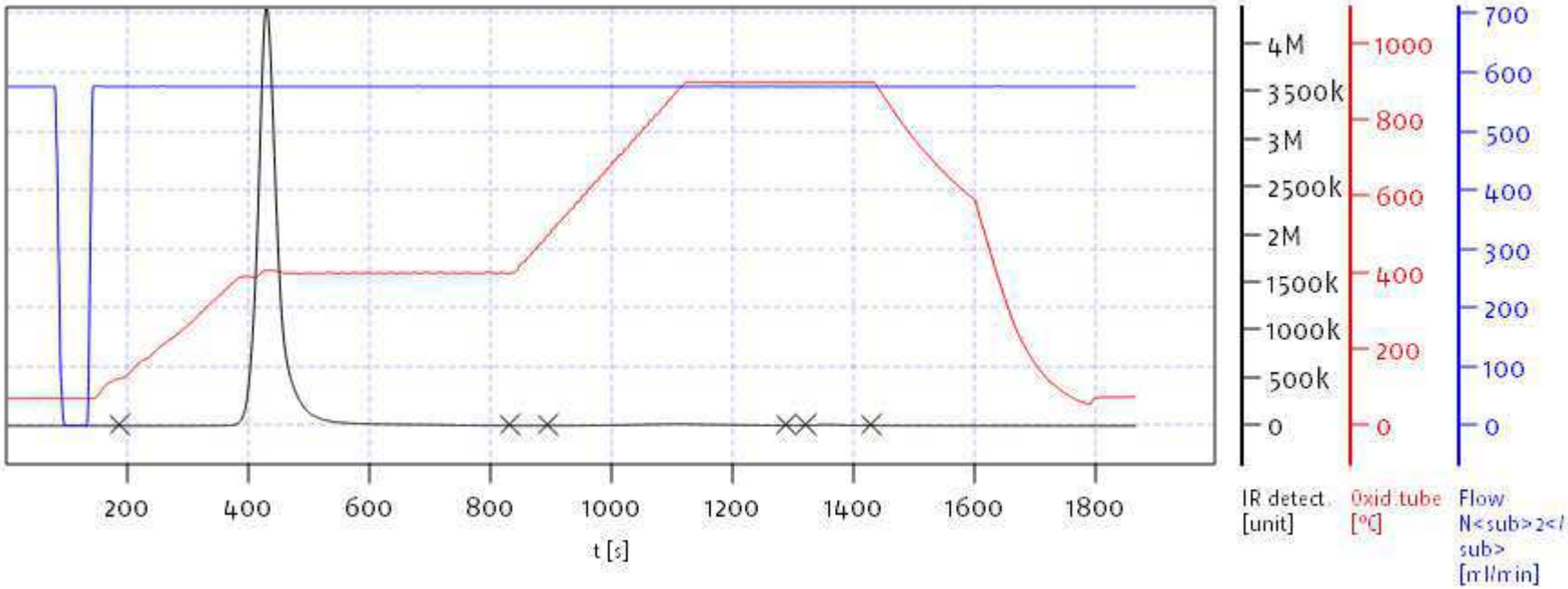
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
27	65	Dfactor	23.90		1.00	CARBON	8/26/2021 4:16 AM	44.558	0.869	45.427	bl	6 381 320	134 583	27 642	0.9875	1.0000



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Analyst: BF

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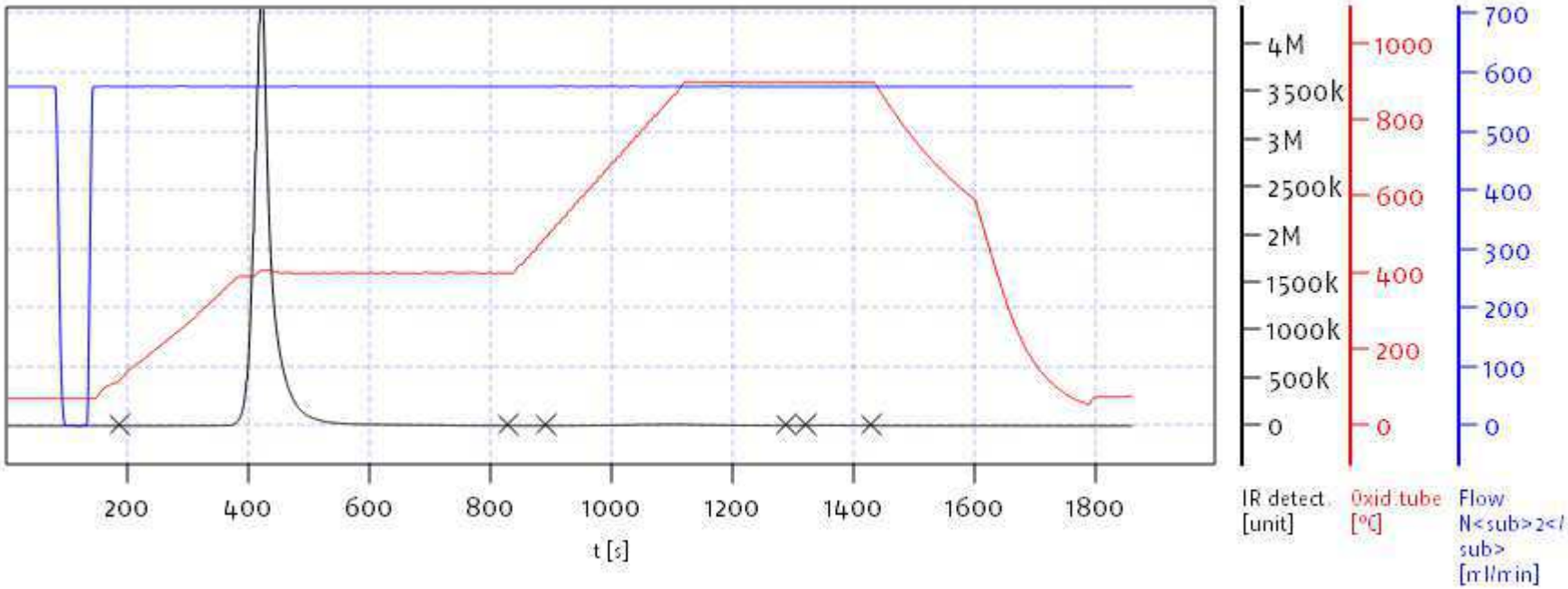
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
28	66	SJH0331-CCV2	21.00		1.00	CARBON	8/26/2021 4:48 AM	44.434	0.764	45.198	bl	5 602 300	106 661	16 290	0.9874	1.0000



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Date: Tue Aug 31 14:32:59 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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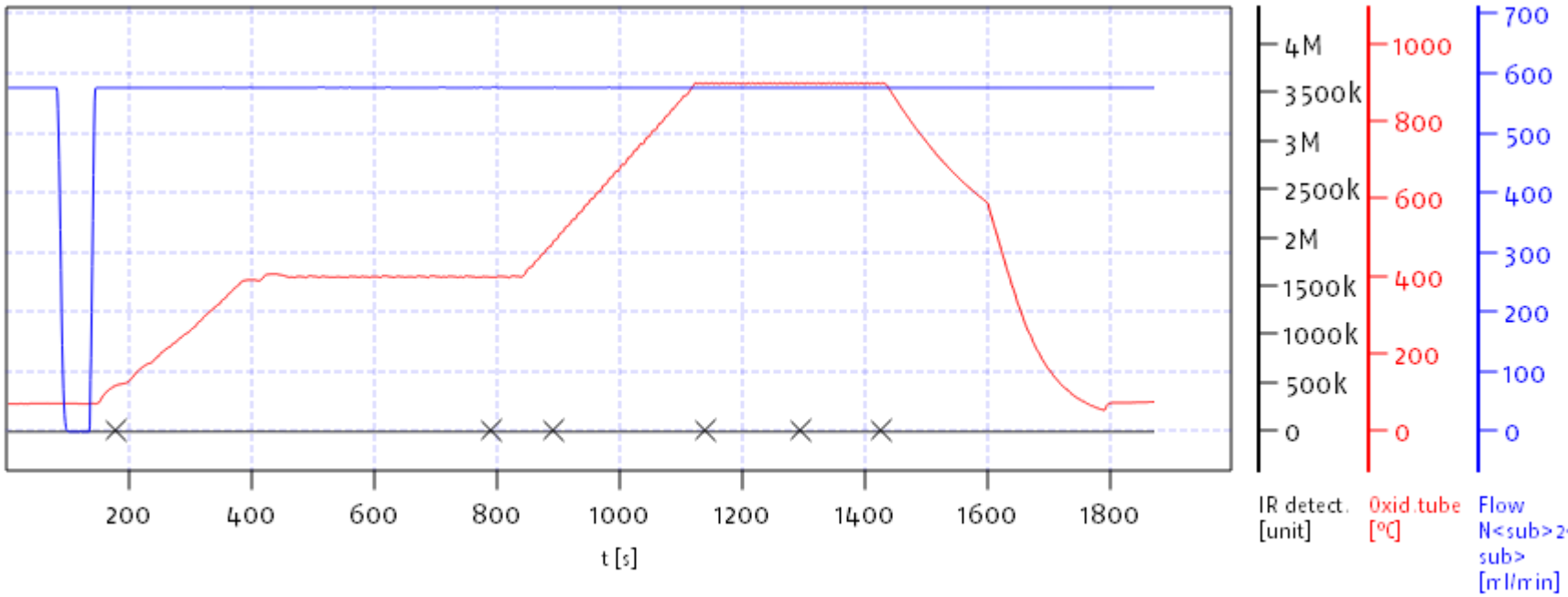
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
29	67	SJH0331-CCB2	533.80		1.00	CARBON	8/26/2021 5:20 AM	0.000	0.000	0.000	bl,C1u,C3u,C2u	6 424	425	331	0.9874	1.0000



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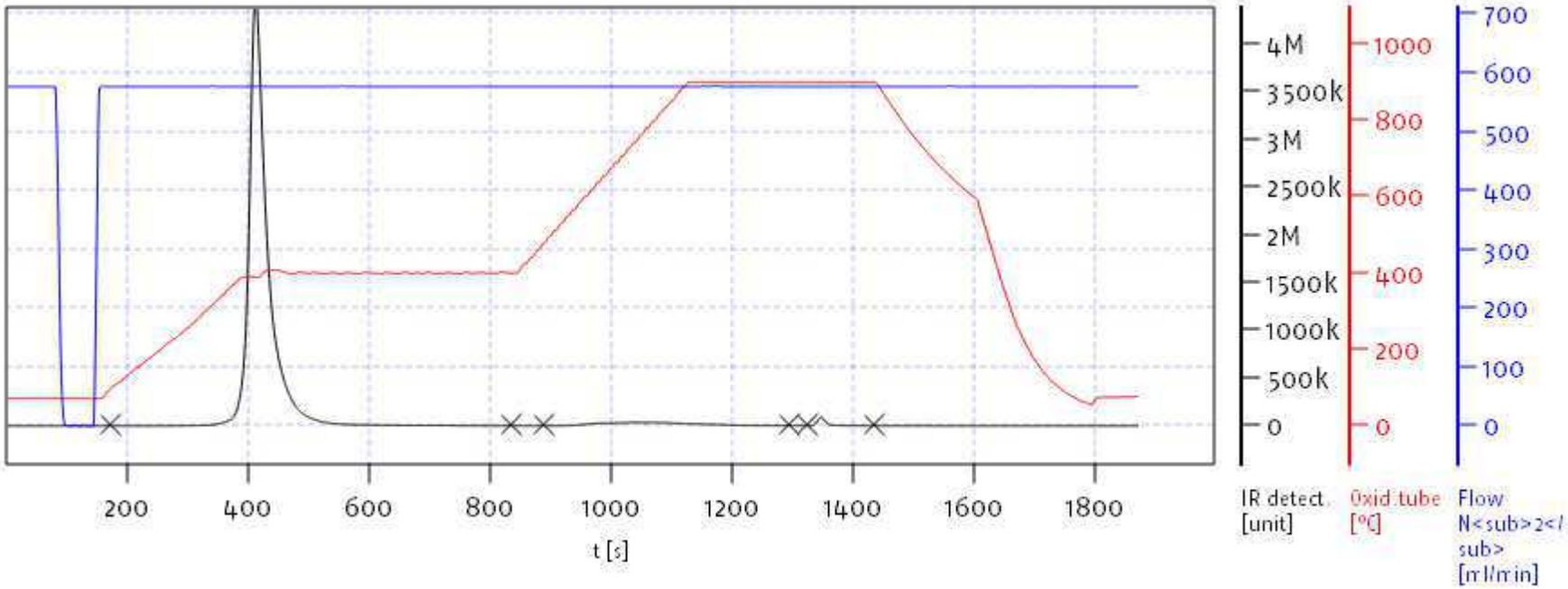
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
30	68	BJH0434-MSD1	528.30	0.0106	1.00	CARBON	8/26/2021 5:51 AM	1.899	0.078	1.977	bl	5 979 850	256 903	58 386	0.9874	1.0000



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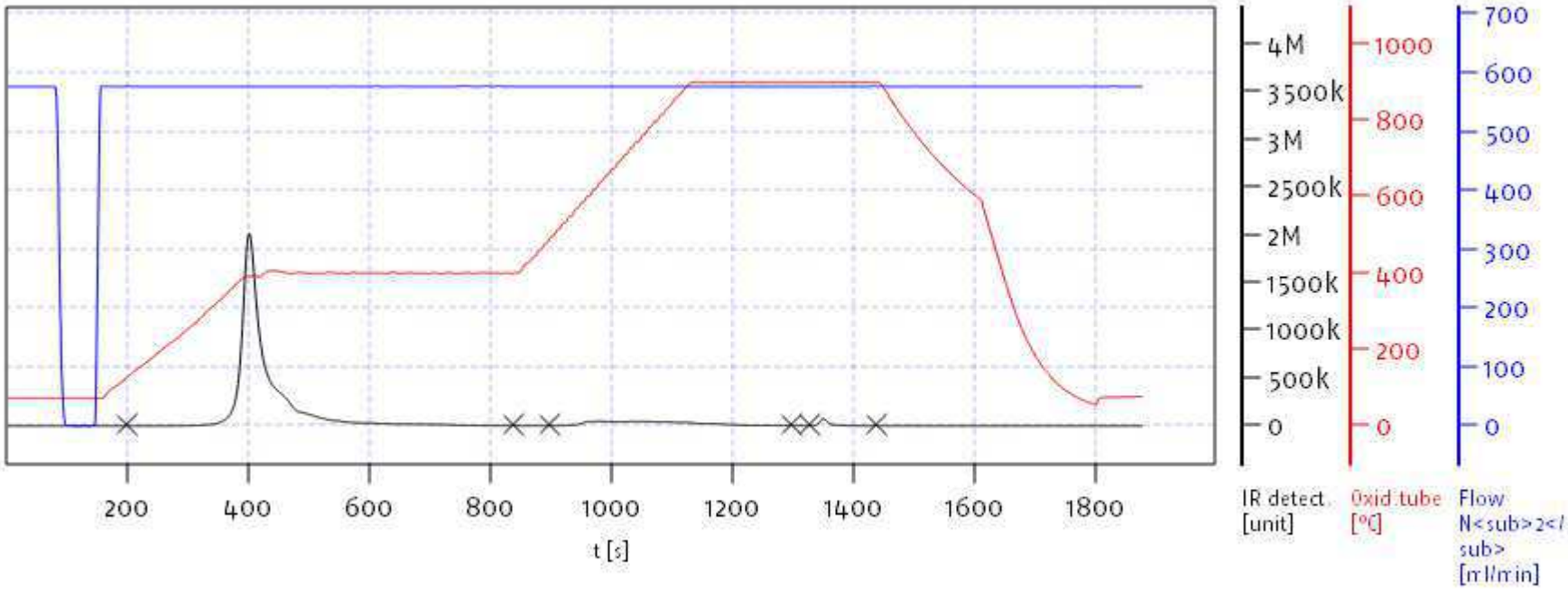
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
31	69	21H0072-21	518.60		1.00	CARBON	8/26/2021 6:23 AM	1.107	0.118	1.225	bl	3 412 750	373 576	53 031	0.9874	1.0000



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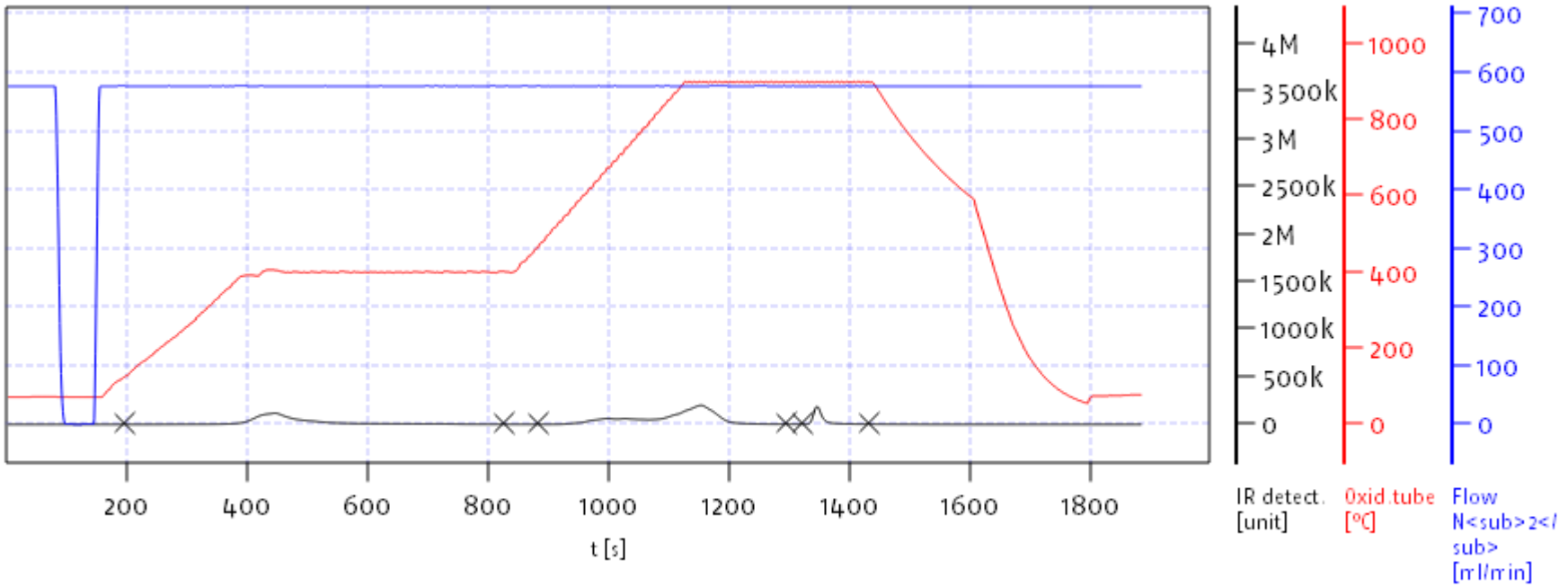
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
32	70	21H0187-07	530.70		1.00	CARBON	8/26/2021 6:55 AM	0.169	0.256	0.425	bl	429 842	816 538	128 915	0.9874	1.0000



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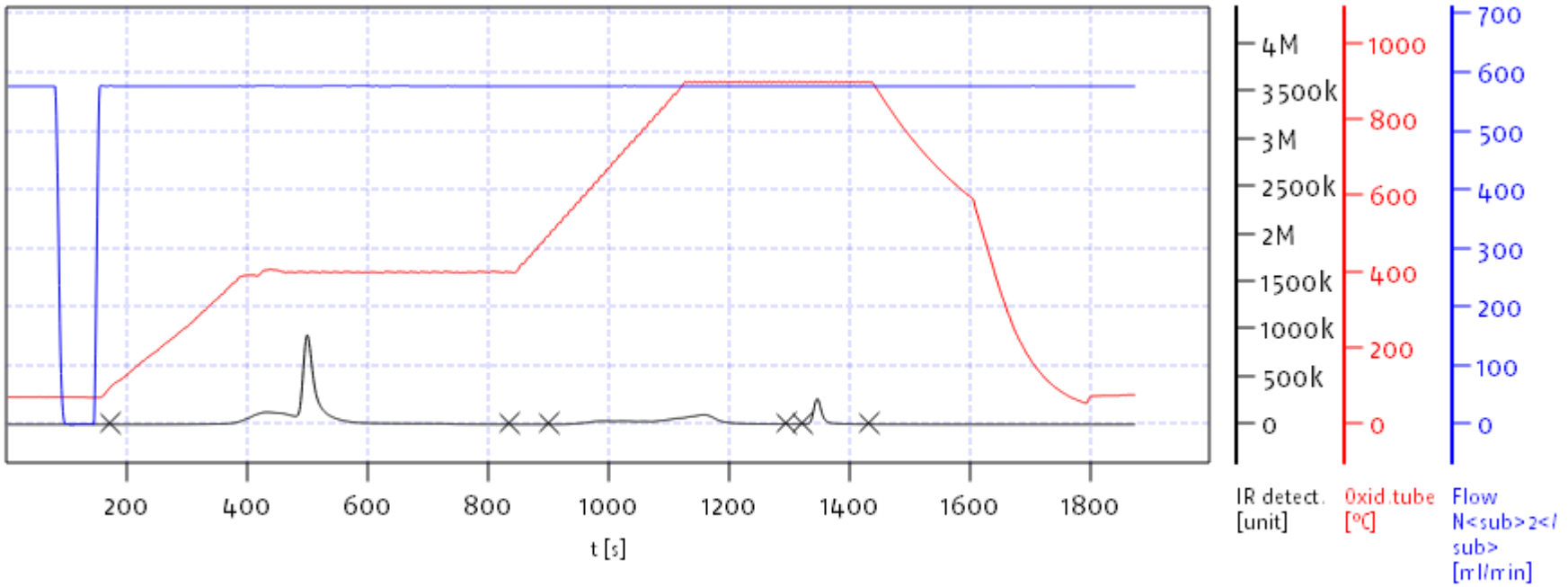
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
33	71	21H0187-08	554.70		1.00	CARBON	8/26/2021 7:27 AM	0.438	0.138	0.576	bl	1 311 880	465 029	167 039	0.9874	1.0000



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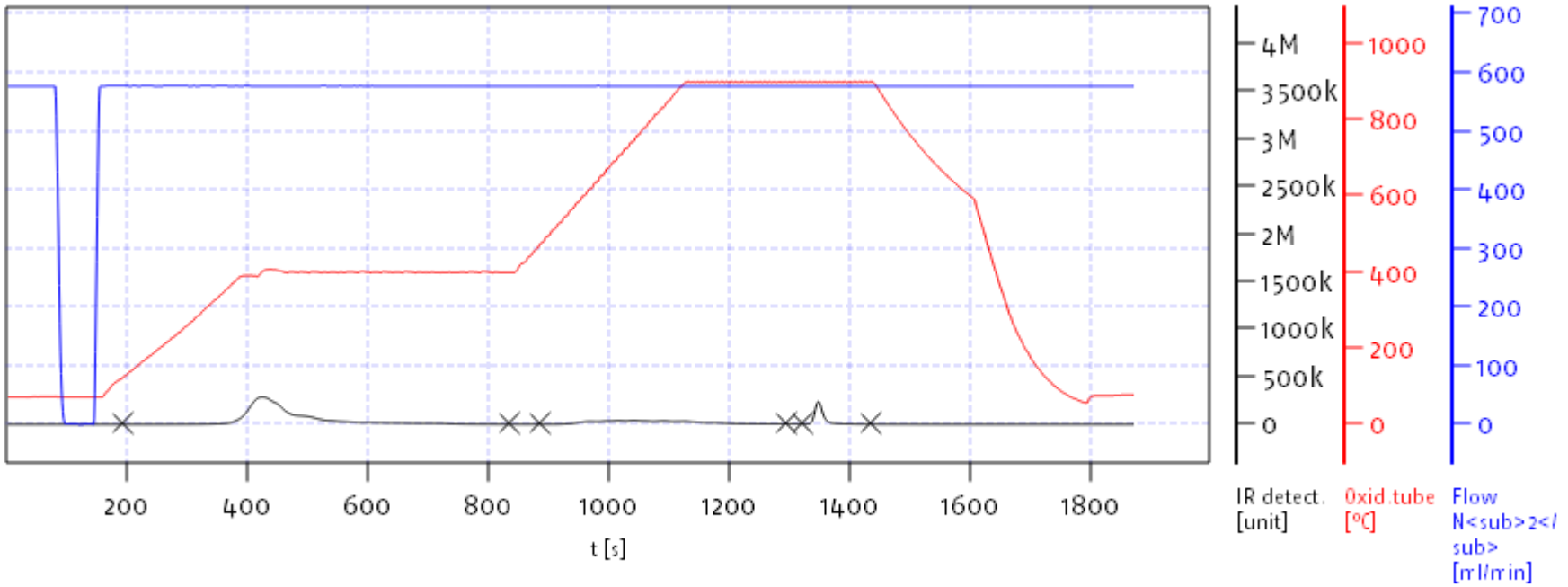
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
34	72	21H0187-09	521.80		1.00	CARBON	8/26/2021 7:58 AM	0.363	0.099	0.462	bl	1 003 630	317 868	152 982	0.9874	1.0000



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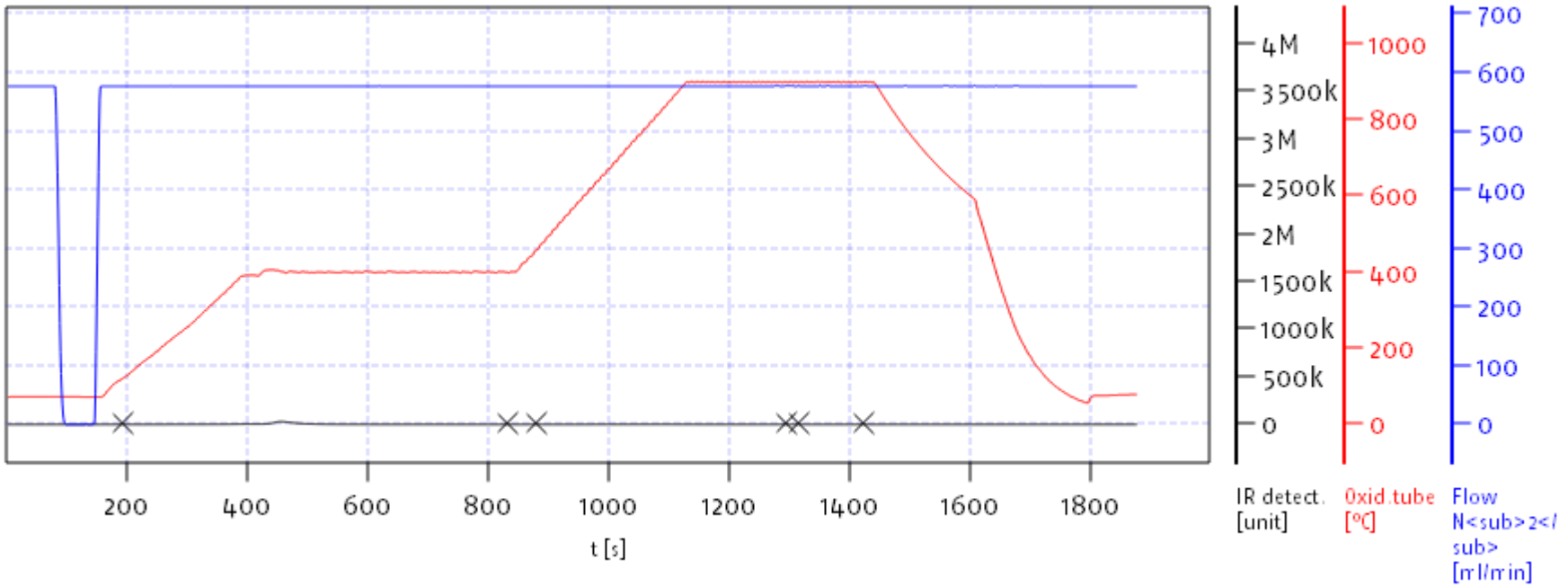
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
35	73	BJH0435-MRL1	524.20		1.00	CARBON	8/26/2021 8:30 AM	0.017	0.000	0.017	bl,C3u,C2u	66 010	6 866	196	0.9874	1.0000



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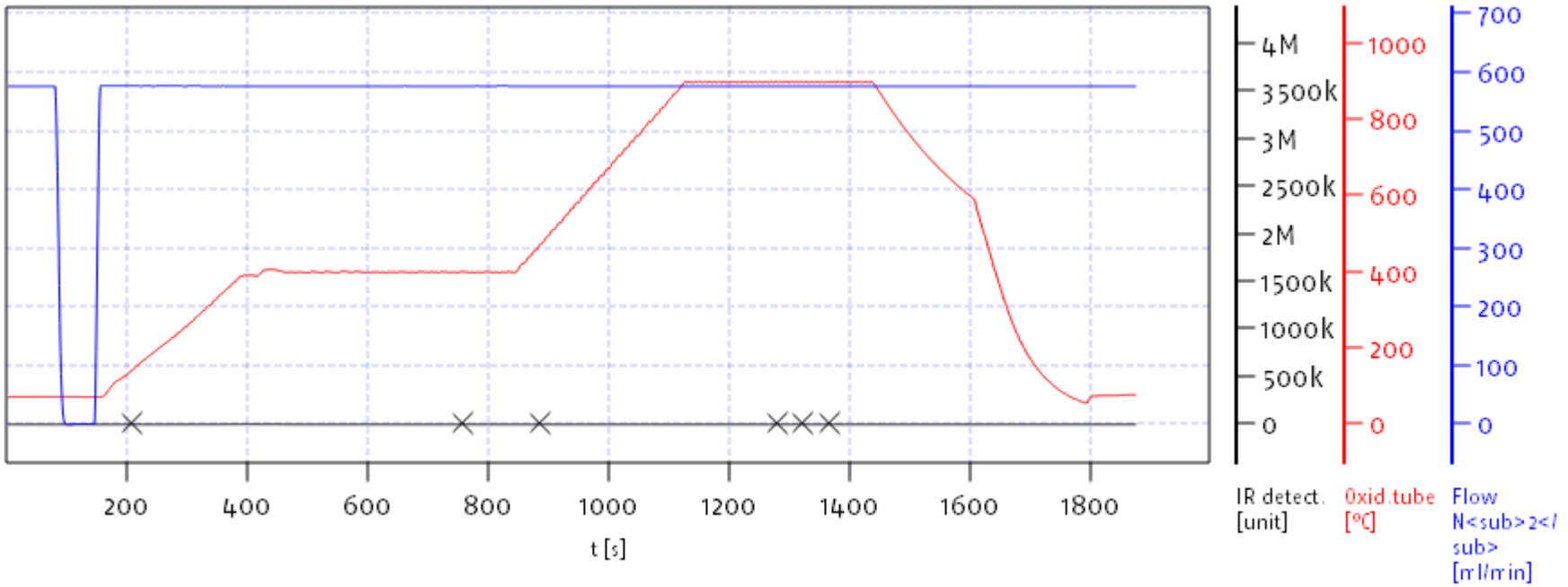
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
36	74	BJH0435-BLK1	502.50		1.00	CARBON	8/26/2021 9:02 AM	0.000	0.000	0.000	bl,C3u,C2u	10 640	1 609	83	0.9874	1.0000



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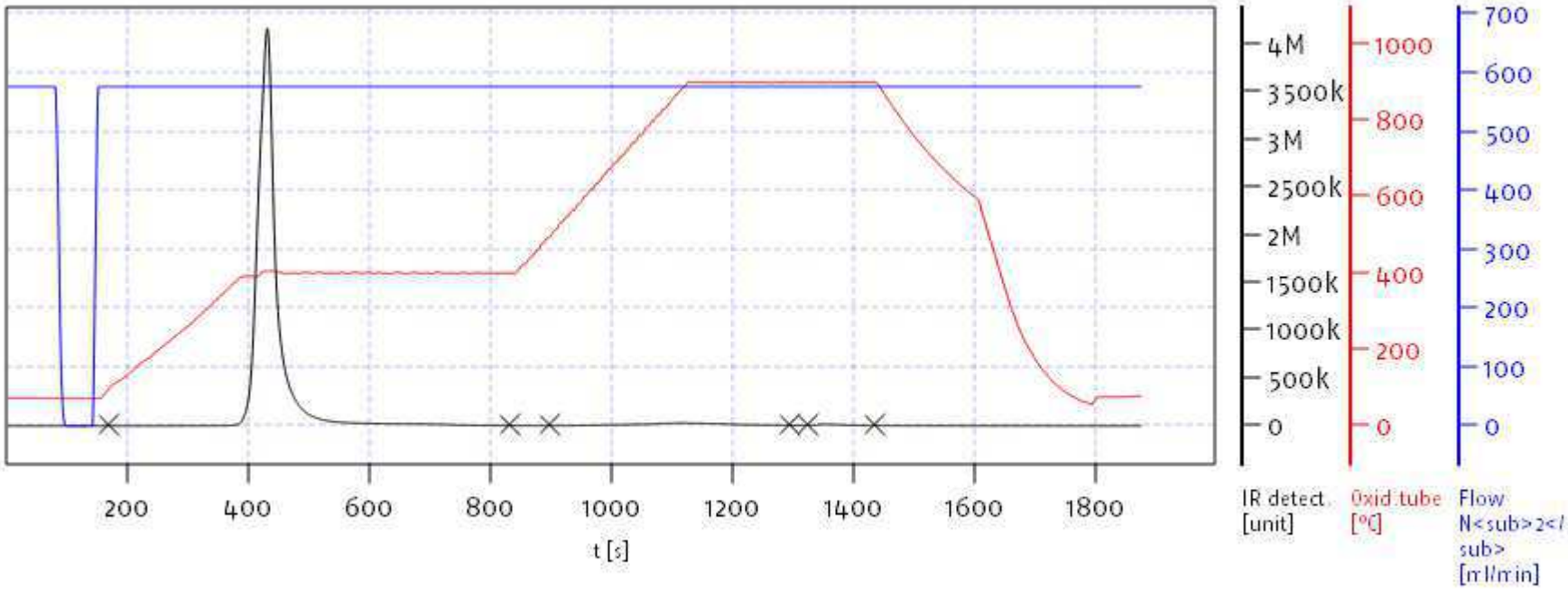
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
37	75	BJH0435-BS1	21.00		1.00	CARBON	8/26/2021 9:33 AM	43.894	1.611	45.505	bl	5 514 320	211 943	36 116	0.9874	1.0000



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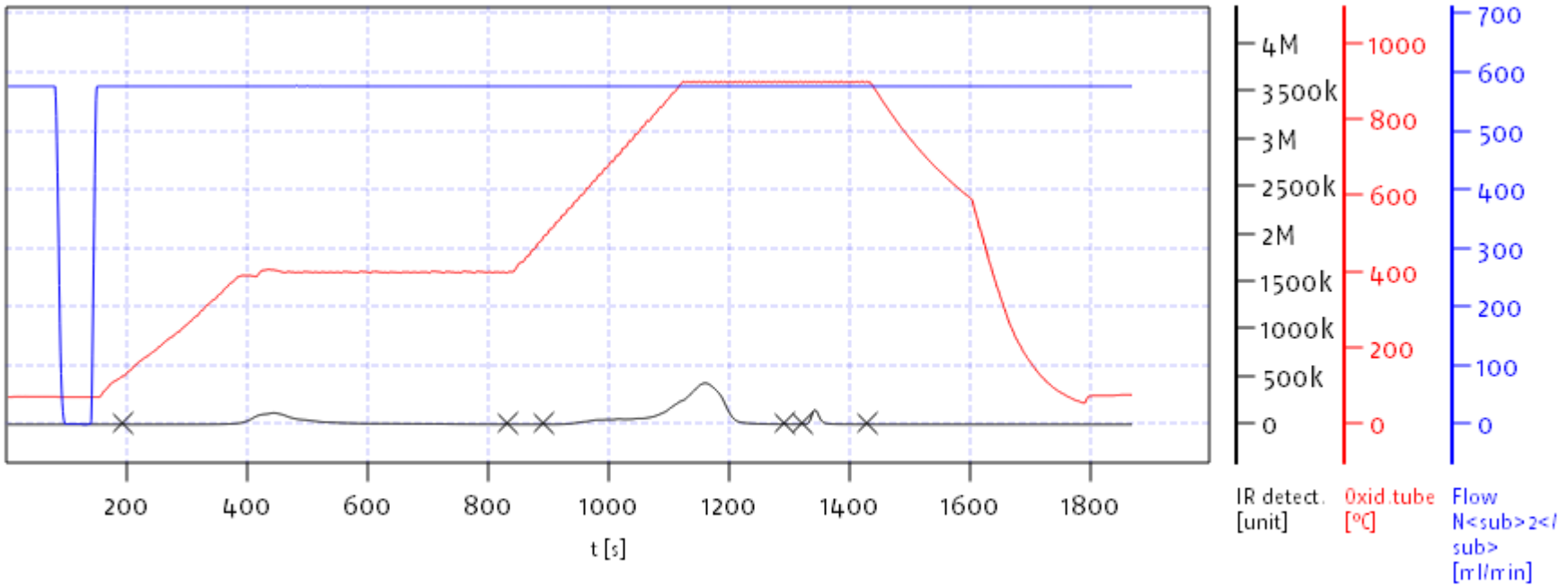
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
38	76	21H0089-01	581.50		1.00	CARBON	8/26/2021 10:05 AM	0.150	0.456	0.605	bl	451 971	1 580 450	91 893	0.9874	1.0000



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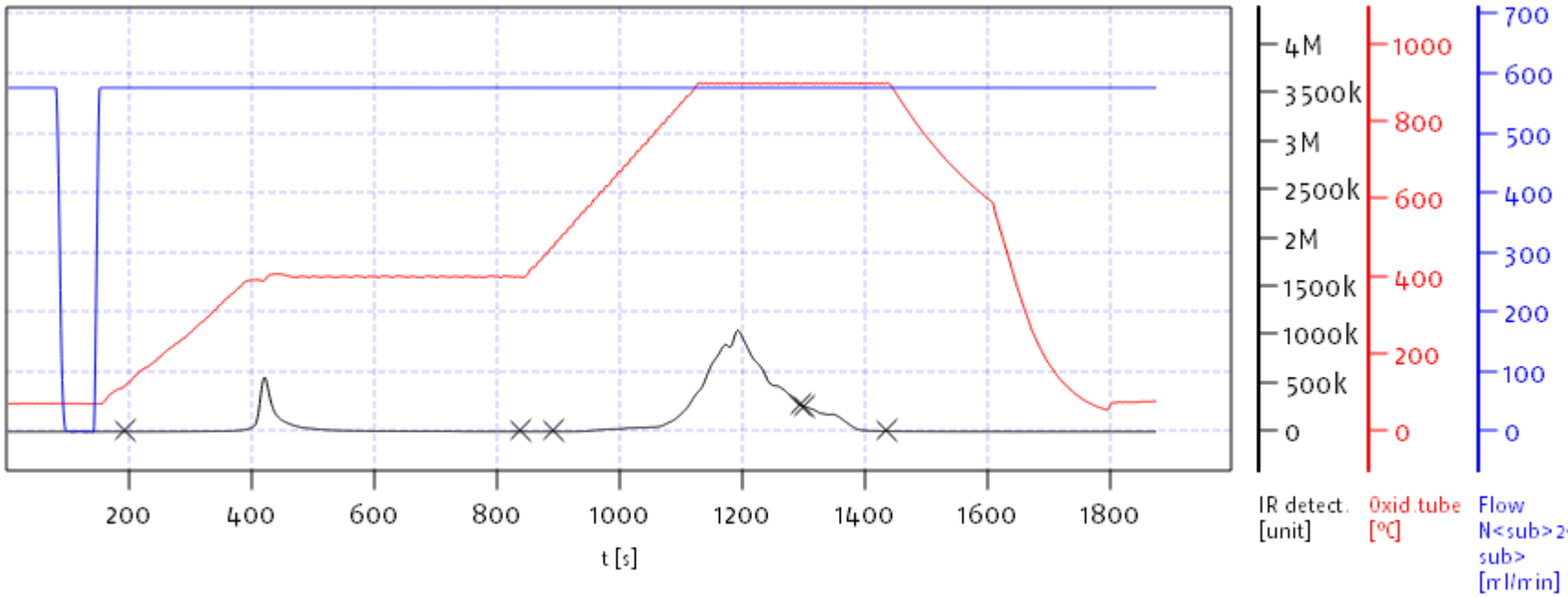
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
39	77	21H0089-02	385.10		1.00	CARBON	8/26/2021 10:37 AM	0.538	2.055	2.593	bl	724 446	4 697 810	535 223	0.9874	1.0000



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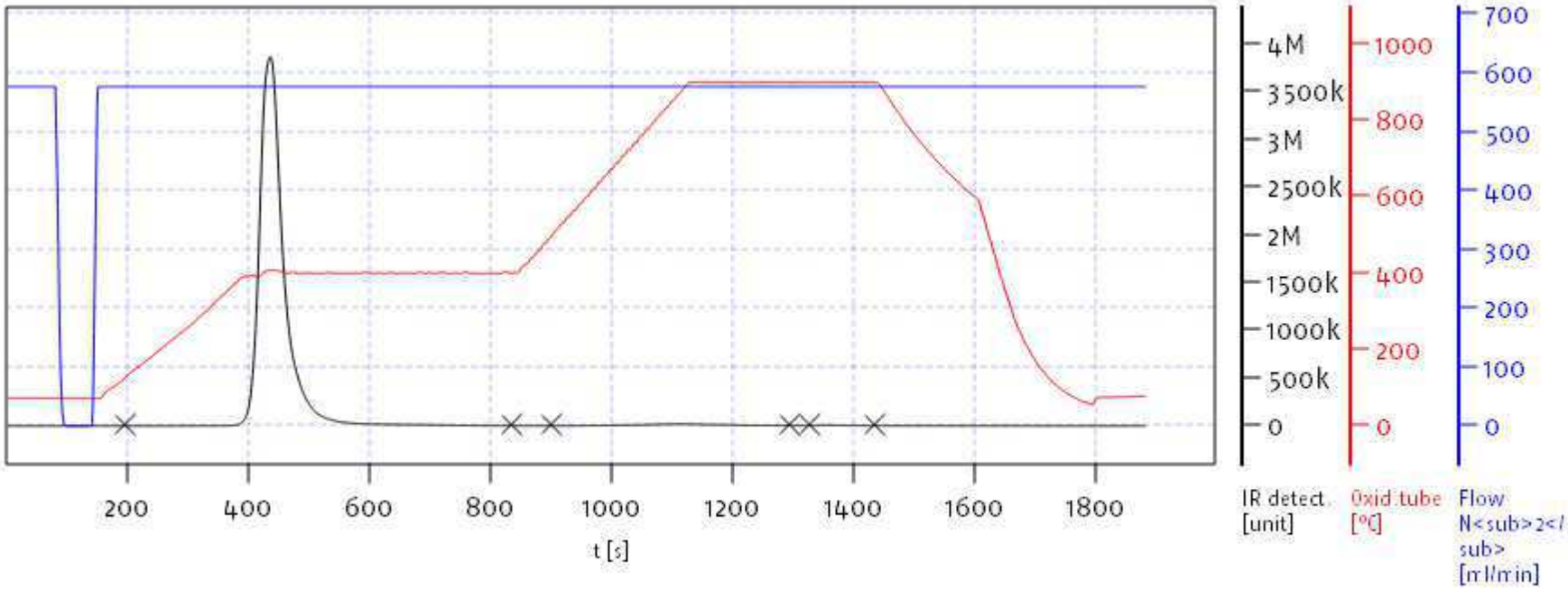
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
40	78	SJH0331-CCV3	25.10		1.00	CARBON	8/26/2021 11:09 AM	44.440	0.785	45.225	bl	6 692 970	128 338	18 911	0.9874	1.0000



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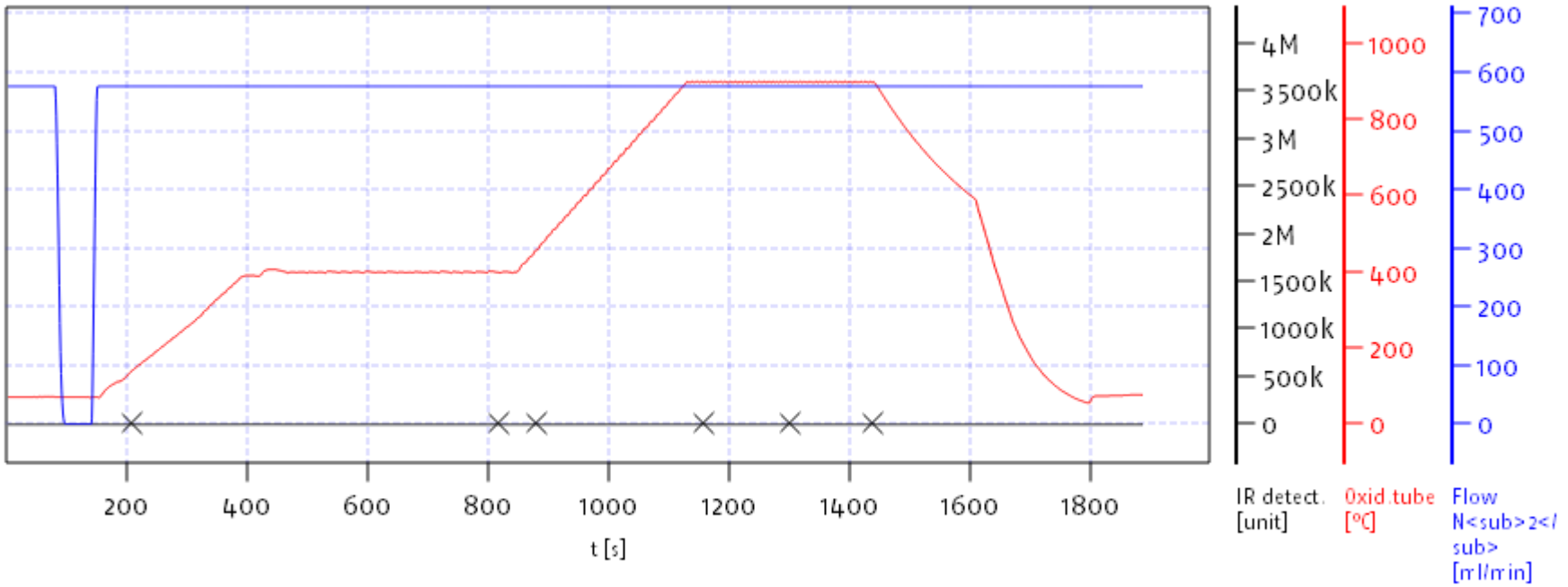
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
41	79	SJH0331-CCB3	569.10		1.00	CARBON	8/26/2021 11:41 AM	0.000	0.000	0.000	bl,C1u,C3u,C2u	2 768	263	150	0.9874	1.0000



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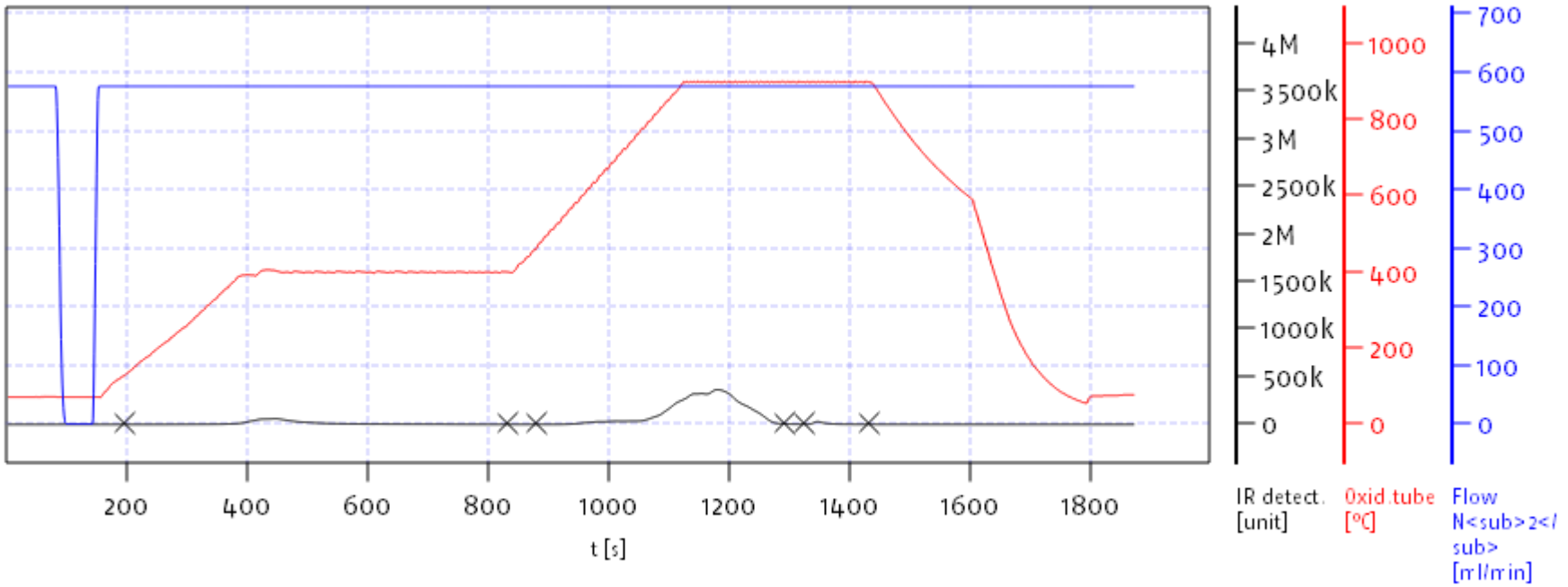
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
42	80	21H0089-03	516.00		1.00	CARBON	8/26/2021 12:12 PM	0.080	0.604	0.684	bl	242 131	1 857 580	27 577	0.9874	1.0000



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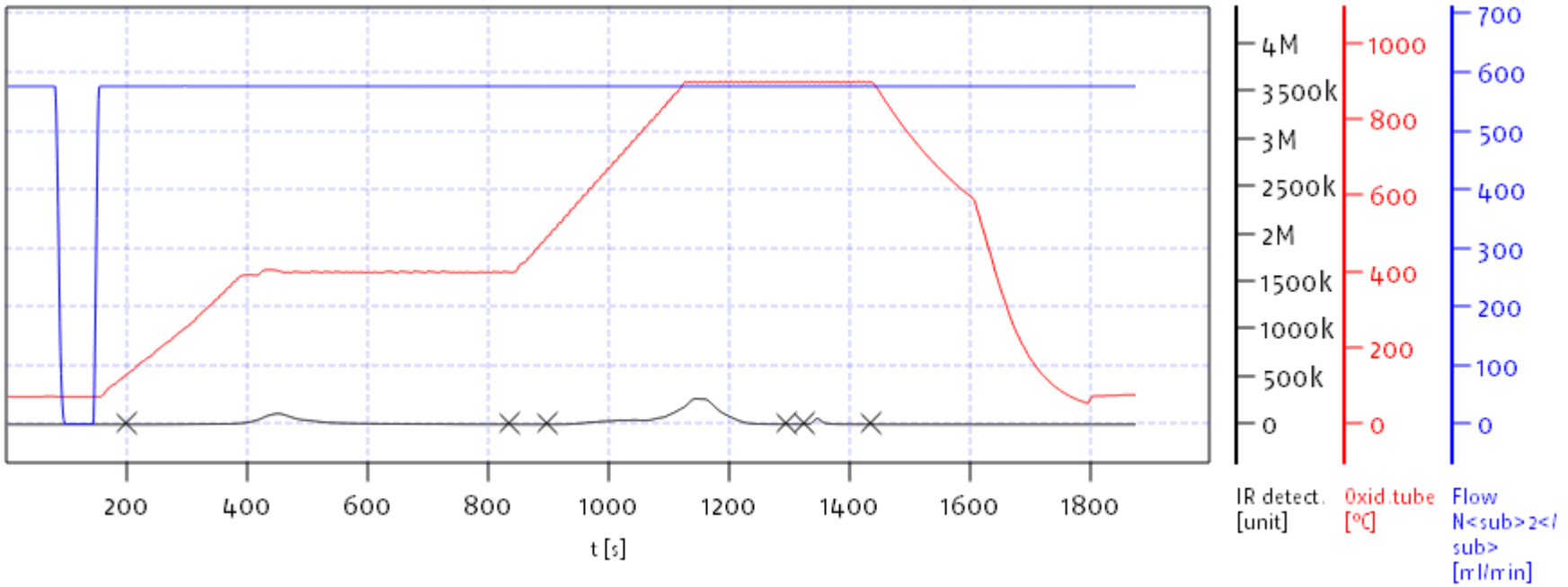
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
43	81	21H0089-04	552.80		1.00	CARBON	8/26/2021 12:44 PM	0.126	0.306	0.432	bl	397 649	1 014 540	42 472	0.9874	1.0000



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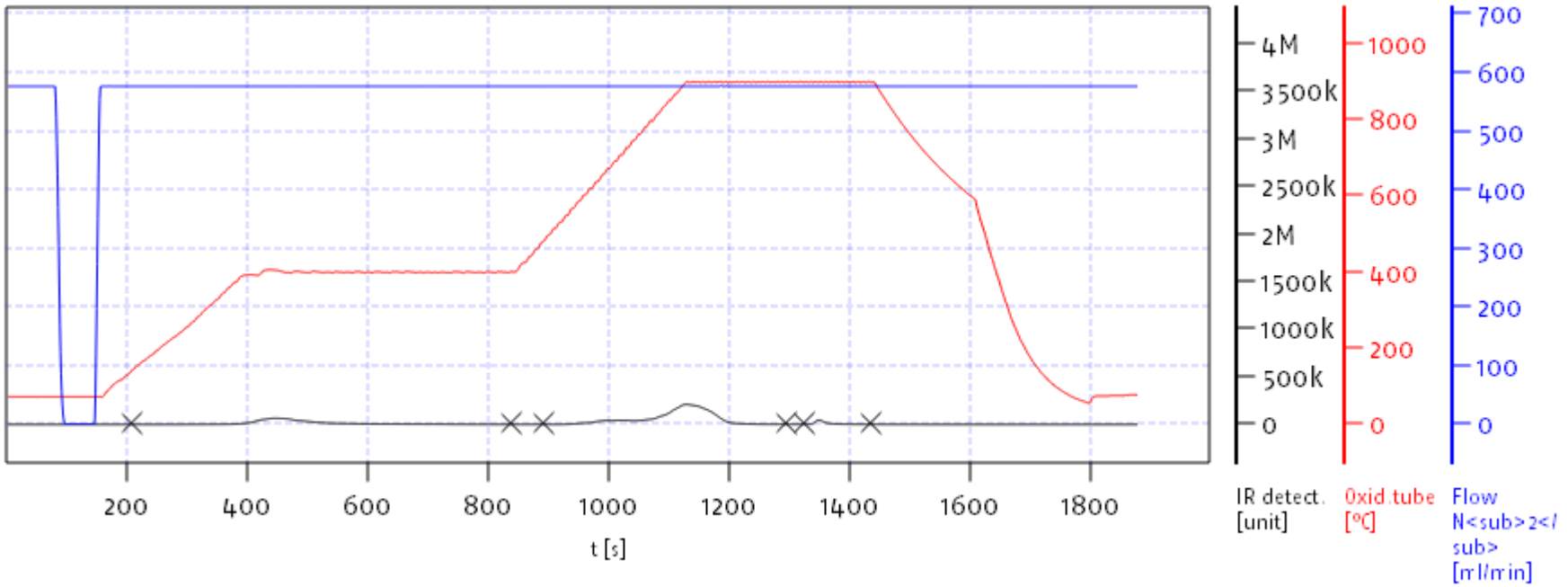
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
44	82	21H0089-05	564.10		1.00	CARBON	8/26/2021 1:16 PM	0.084	0.244	0.327	bl	266 687	825 800	39 239	0.9874	1.0000



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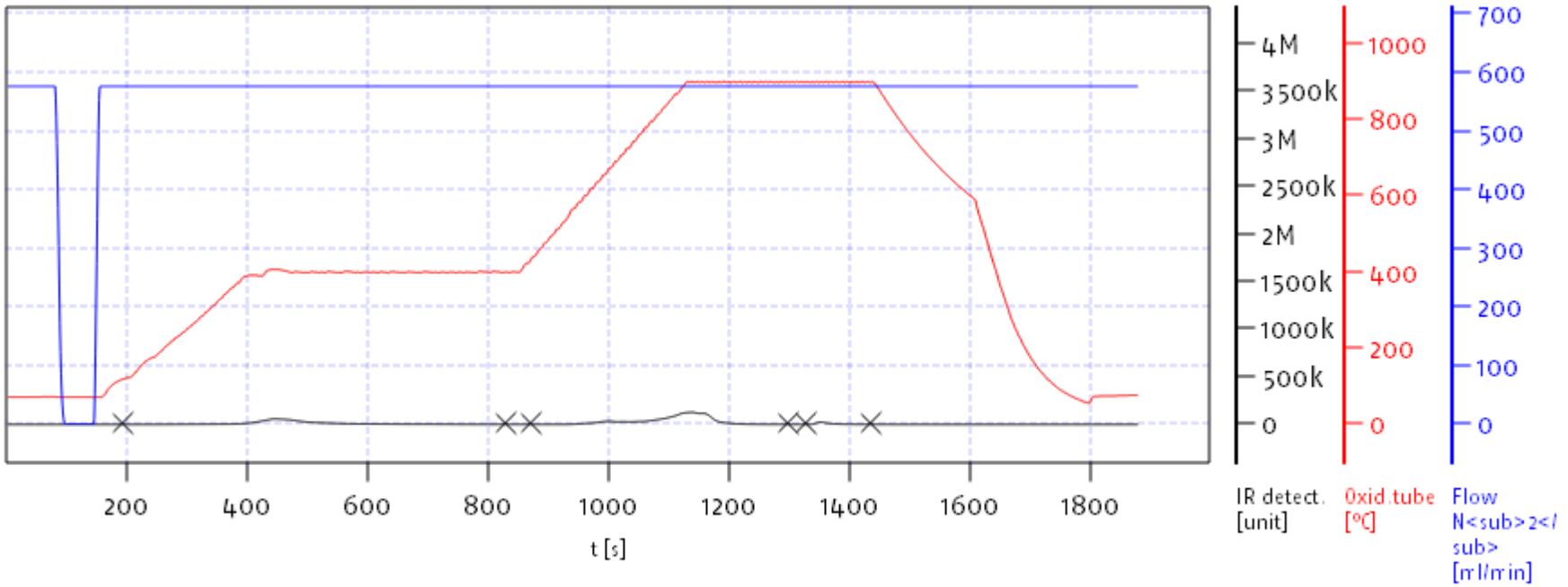
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
45	83	21H0089-06	588.50		1.00	CARBON	8/26/2021 1:48 PM	0.067	0.144	0.210	bl	233 472	511 885	24 682	0.9874	1.0000



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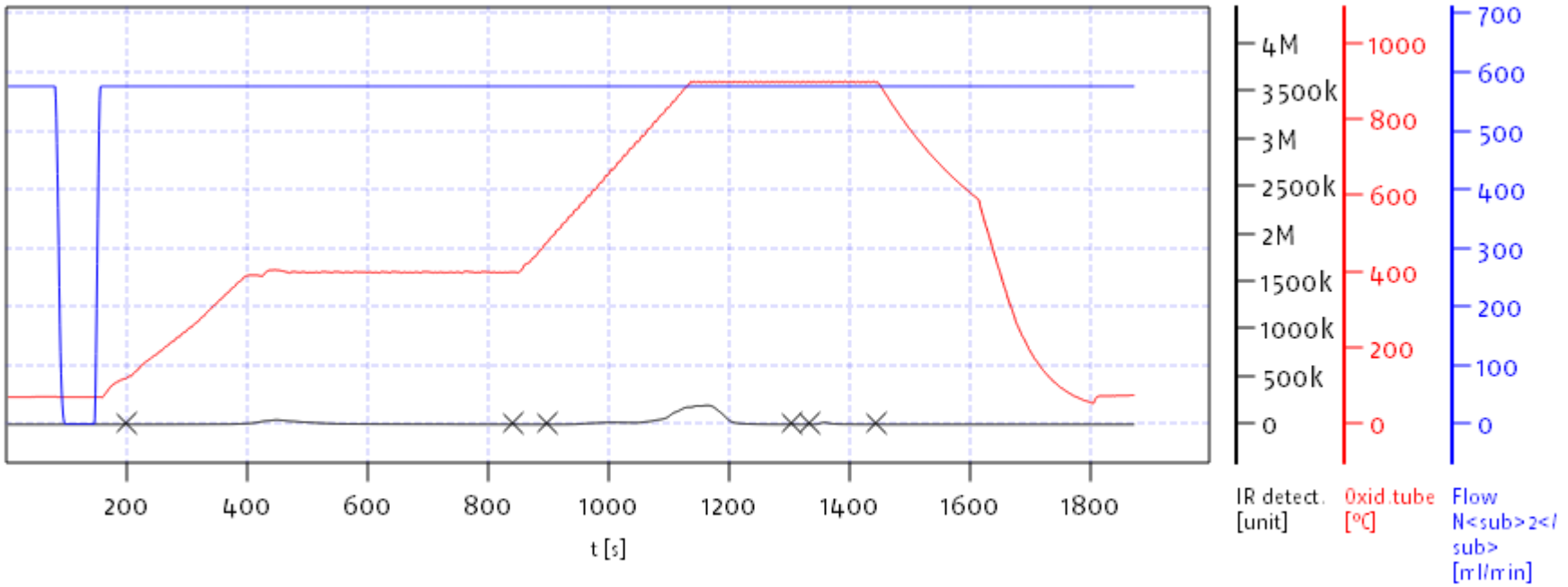
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
46	84	21H0089-07	361.00		1.00	CARBON	8/26/2021 2:19 PM	0.082	0.347	0.429	bl	182 745	753 491	17 851	0.9874	1.0000



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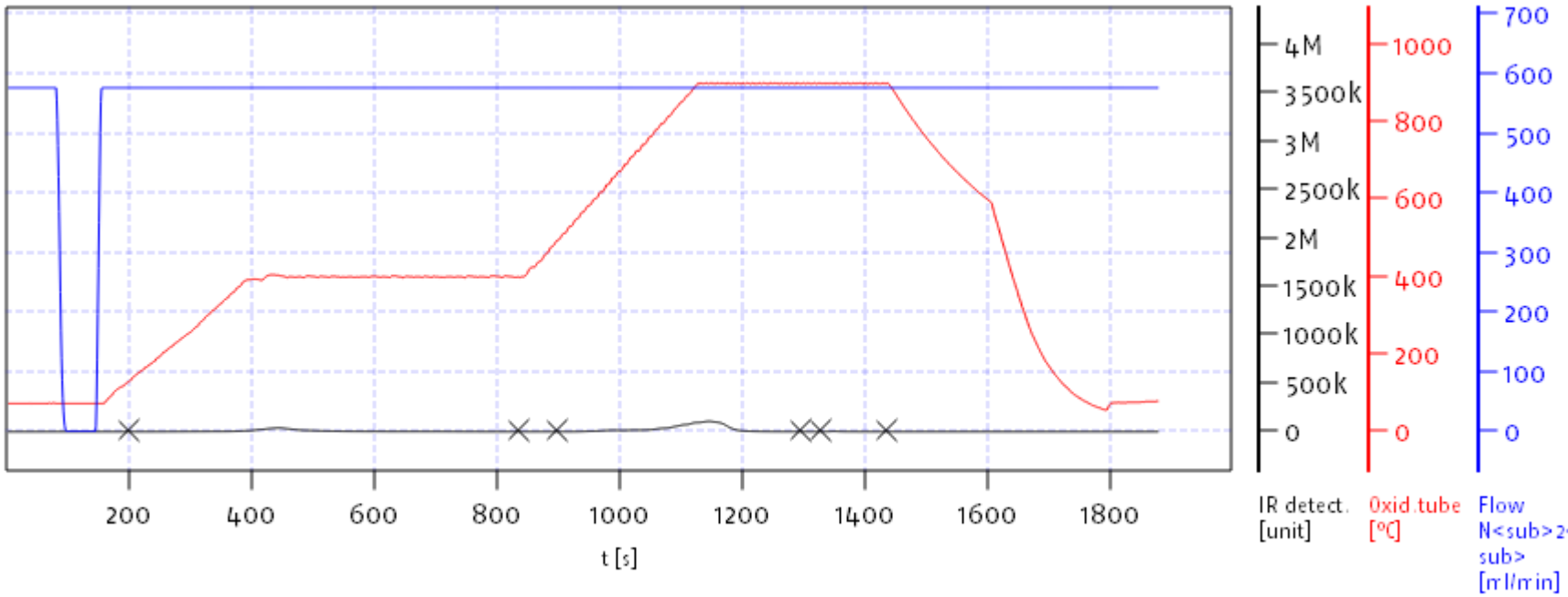
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
47	85	21H0089-08	317.80		1.00	CARBON	8/26/2021 2:51 PM	0.067	0.212	0.279	bl,C2u	138 785	410 820	4 329	0.9874	1.0000



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soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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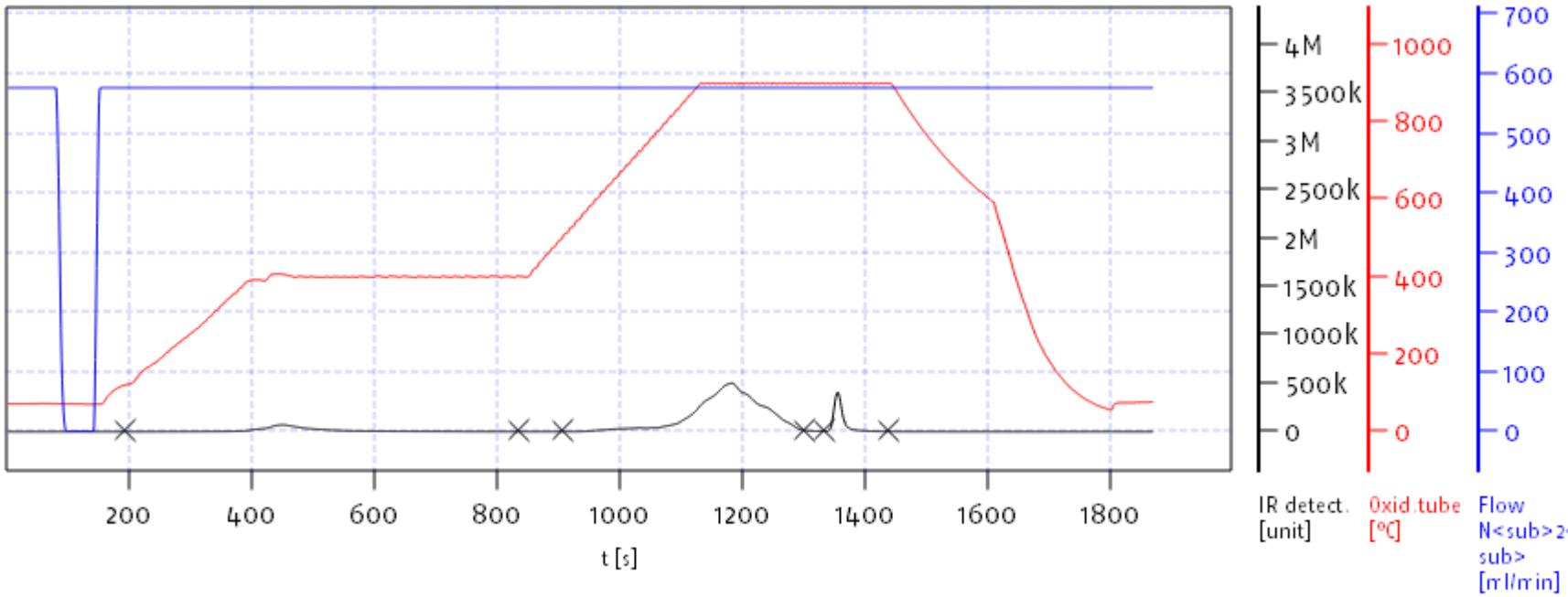
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
48	86	21H0089-09	632.60		1.00	CARBON	8/26/2021 3:23 PM	0.131	0.591	0.722	bl	257 988	2 225 310	257 517	0.9874	1.0000



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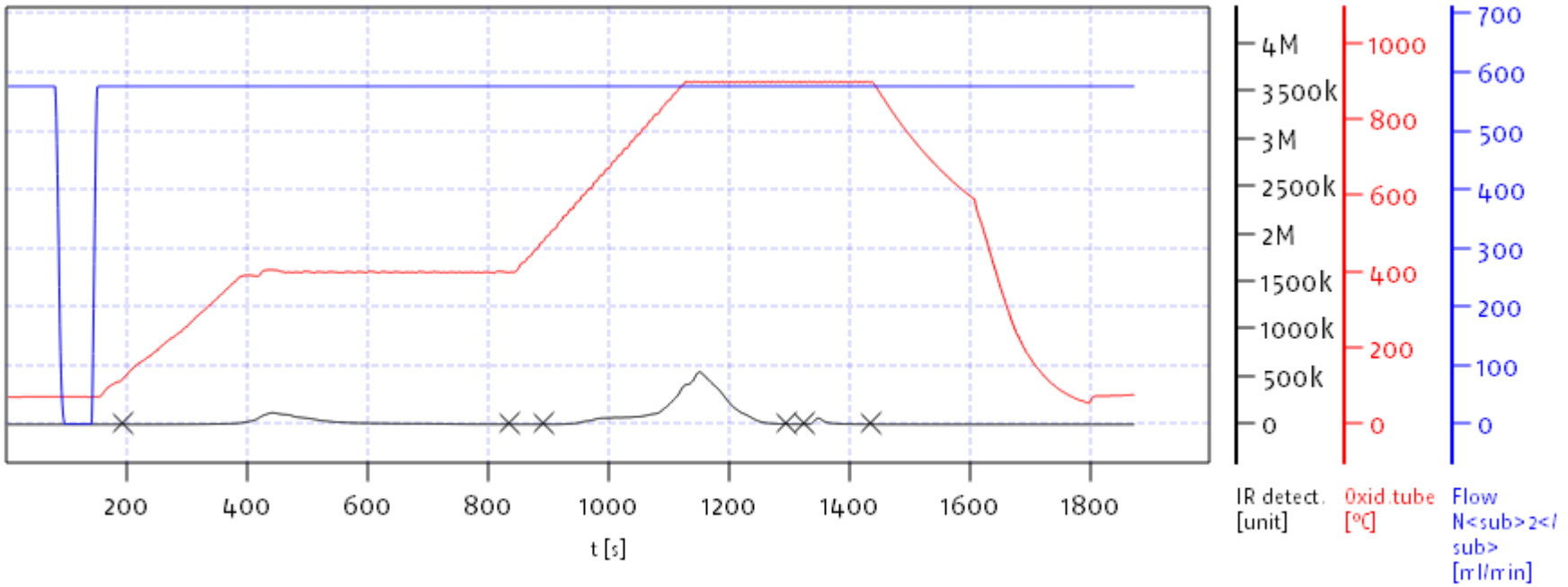
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
49	87	21H0089-10	546.30		1.00	CARBON	8/26/2021 3:54 PM	0.167	0.670	0.837	bl	513 495	2 178 030	57 477	0.9874	1.0000



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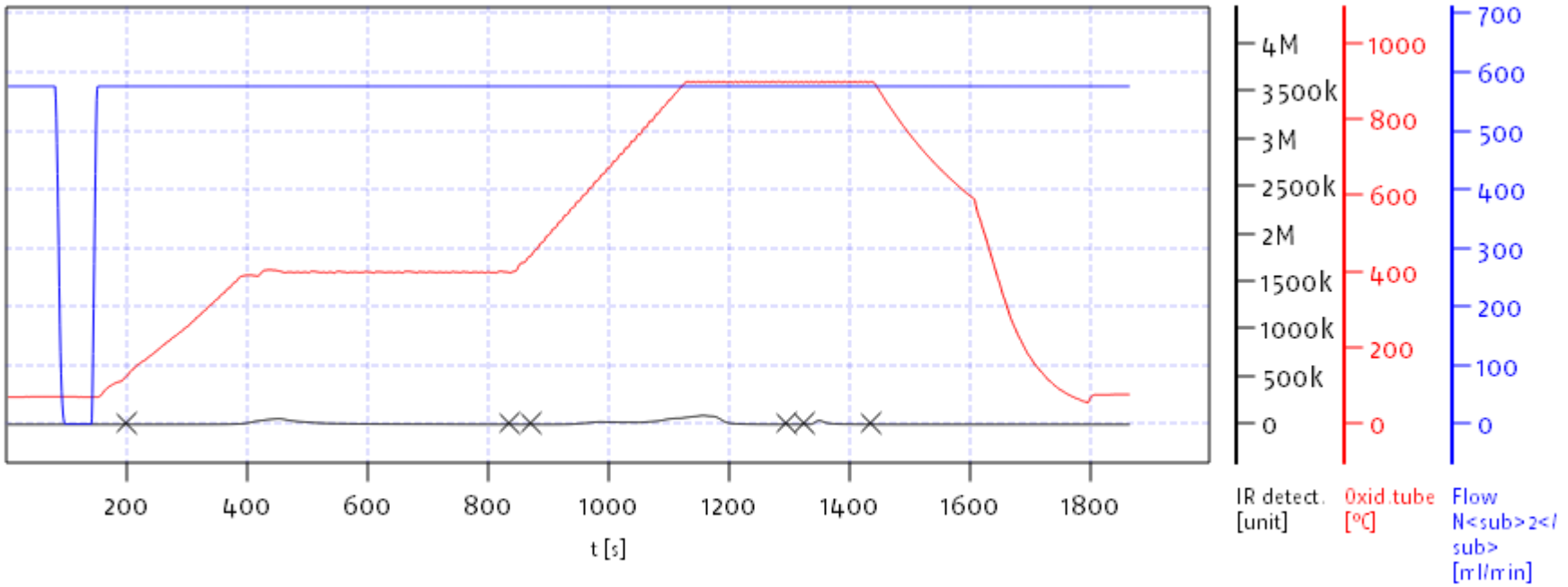
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
50	88	BJH0435-DUP1	576.50		1.00	CARBON	8/26/2021 4:26 PM	0.068	0.121	0.189	bl	221 089	424 708	36 187	0.9874	1.0000



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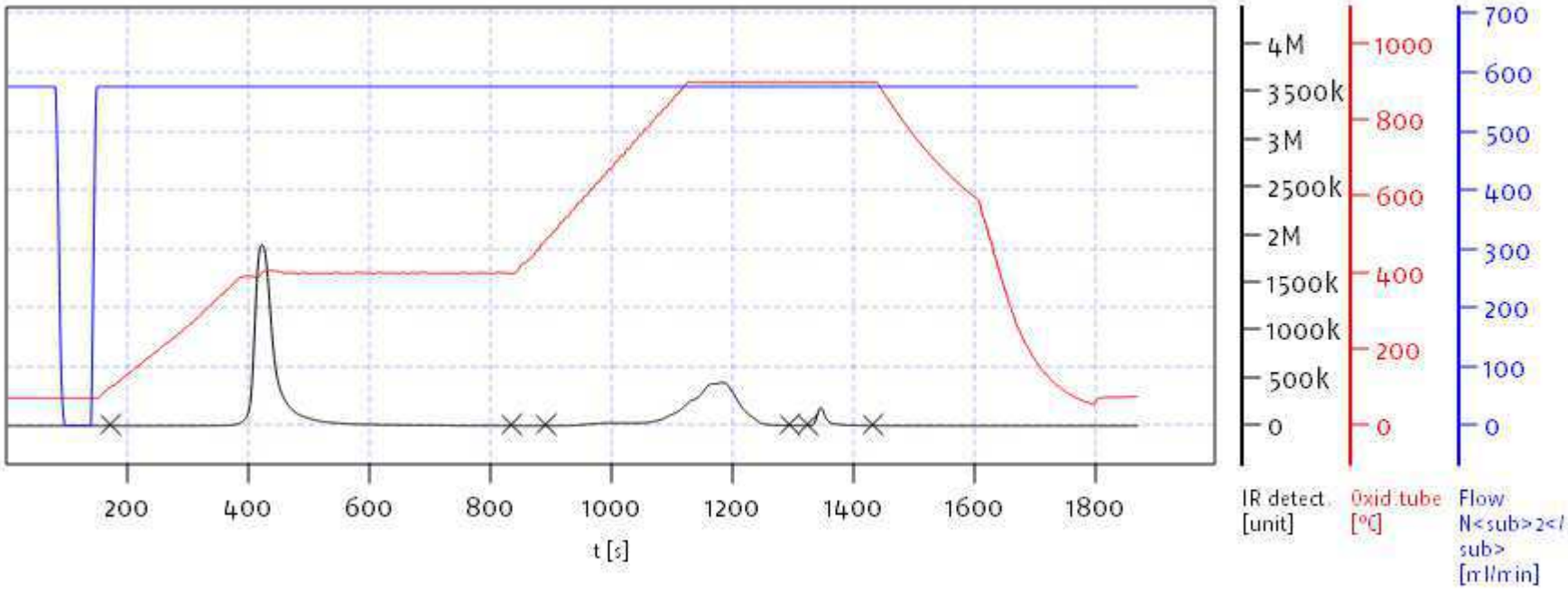
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
51	89	BJH0435-MS1	537.40	0.0097	1.00	CARBON	8/26/2021 4:58 PM	0.883	0.541	1.424	bl	2 731 800	1 732 510	134 777	0.9874	1.0000



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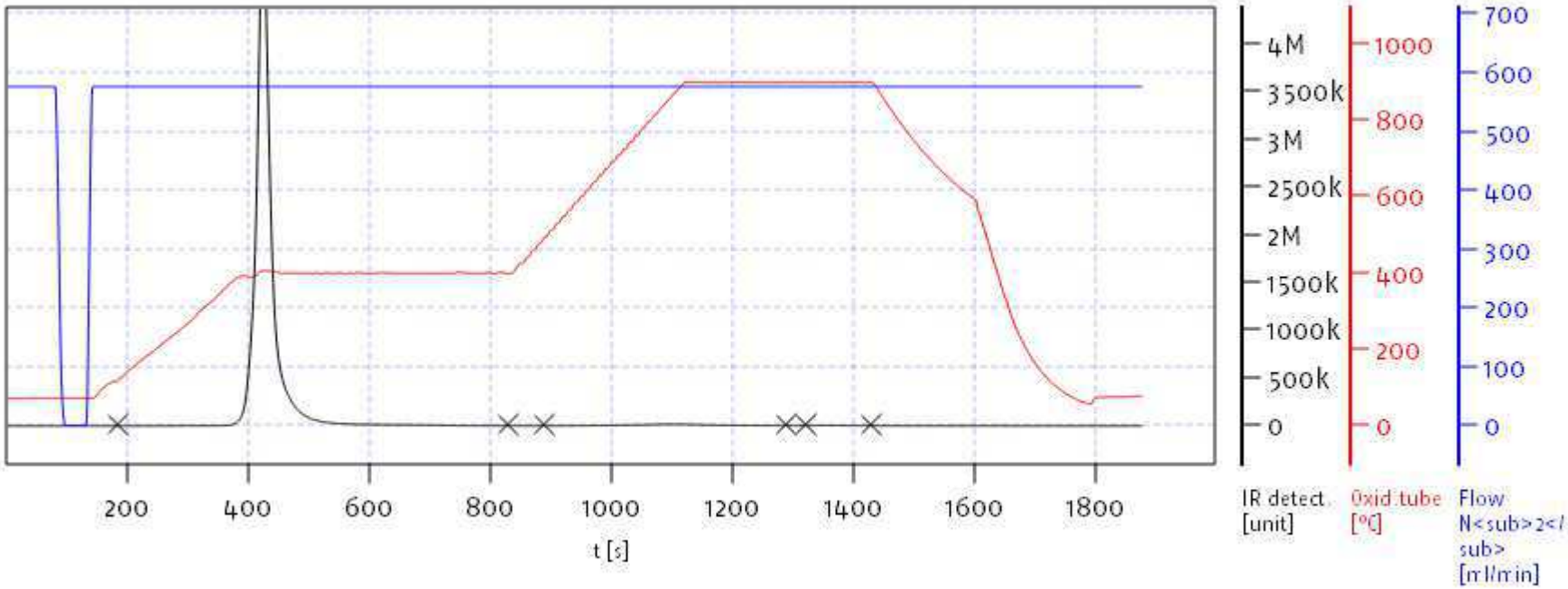
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
52	1	SJH0331-CCV4	20.80		1.00	CARBON	8/26/2021 5:29 PM	45.104	0.777	45.882	bl	5 633 340	107 423	15 635	0.9874	1.0000



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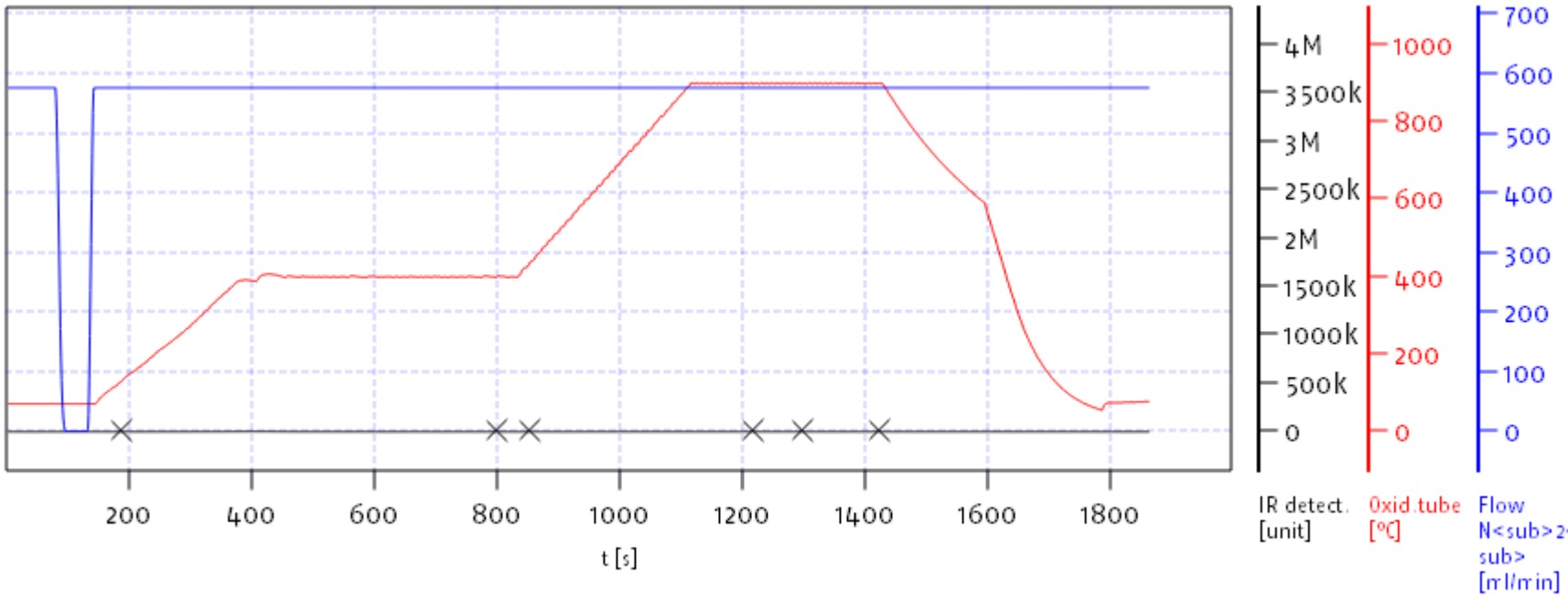
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
53	2	SJH0331-CCB4	501.80		1.00	CARBON	8/26/2021 6:01 PM	0.000	0.000	0.000	bl,C3u,C2u	9 295	757	141	0.9874	1.0000



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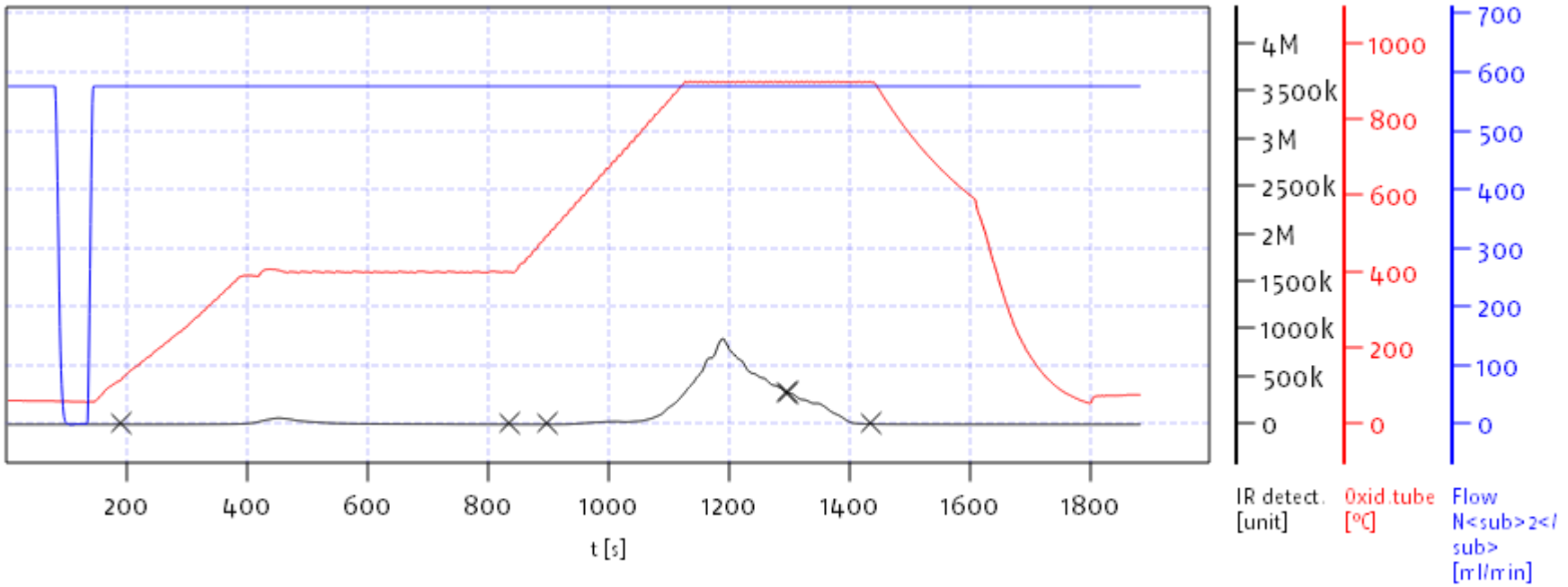
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
54	3	21H0089-11	509.70		1.00	CARBON	8/26/2021 6:45 PM	0.313	1.378	1.691	bl	249 160	4 170 120	721 848	0.9874	1.0000



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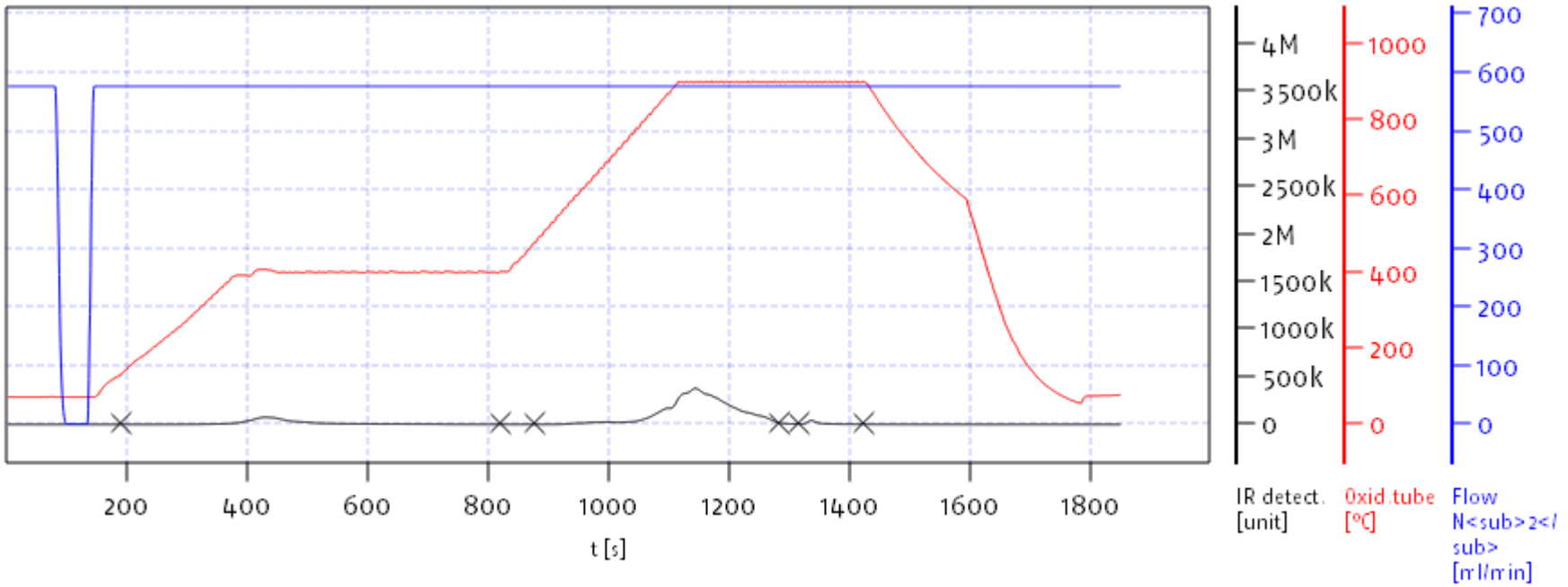
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
55	4	21H0089-12	594.10		1.00	CARBON	8/26/2021 7:17 PM	0.084	0.483	0.567	bl	282 821	1 711 920	37 656	0.9874	1.0000



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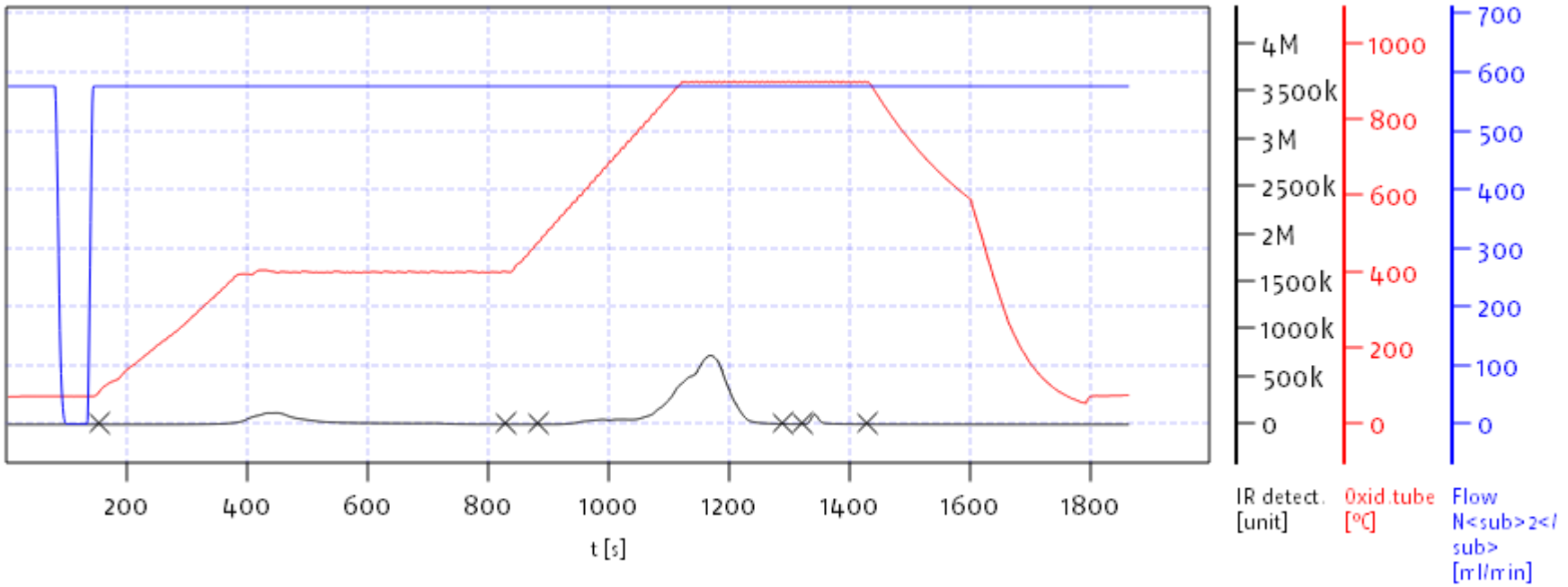
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
56	5	21H0089-13	519.30		1.00	CARBON	8/26/2021 7:48 PM	0.187	0.863	1.050	bl	532 313	2 666 160	71 419	0.9874	1.0000



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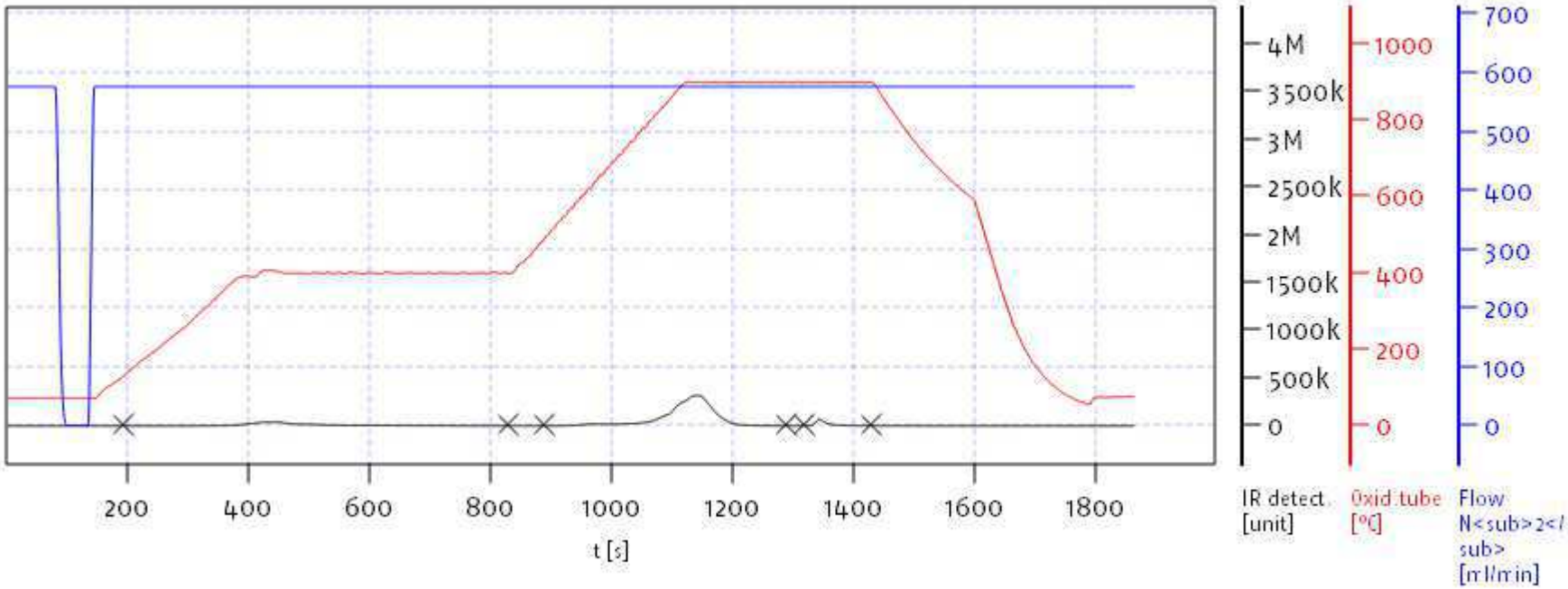
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
57	6	21H0089-14	585.70		1.00	CARBON	8/26/2021 8:20 PM	0.061	0.285	0.345	bl	178 011	998 528	57 679	0.9874	1.0000



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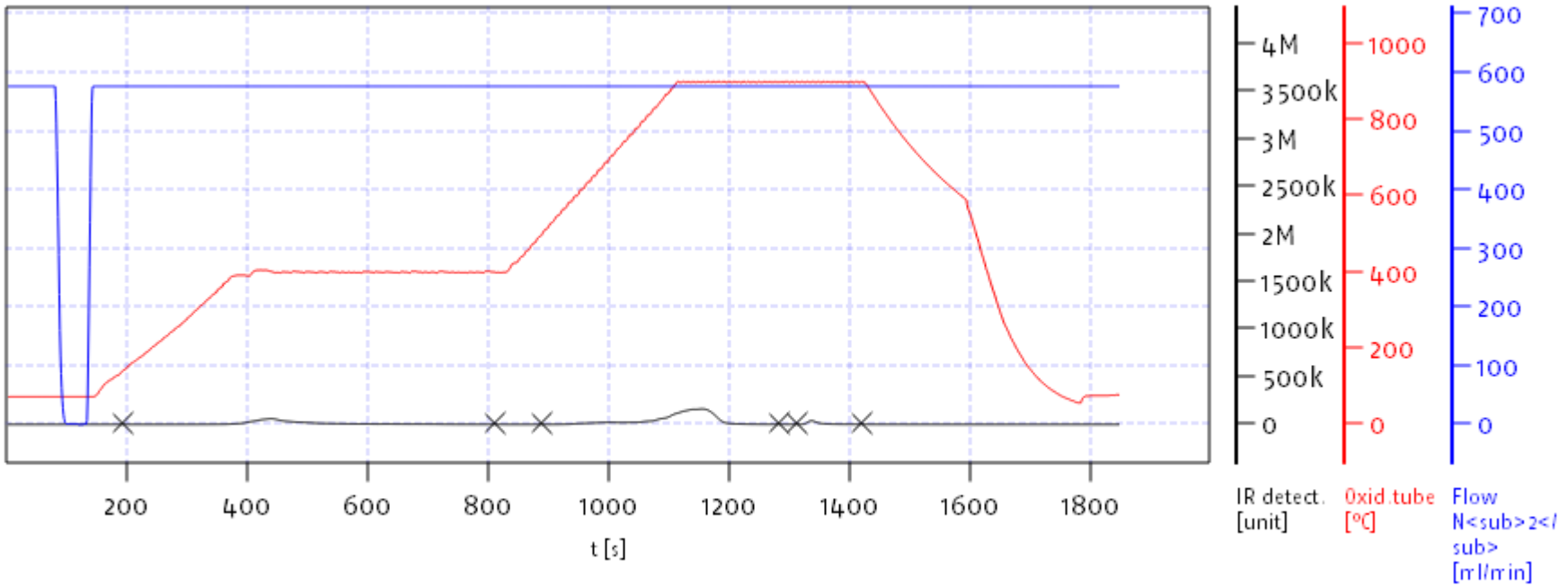
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
58	7	21H0089-15	556.20		1.00	CARBON	8/26/2021 8:51 PM	0.067	0.179	0.246	bl	213 437	600 872	33 727	0.9874	1.0000



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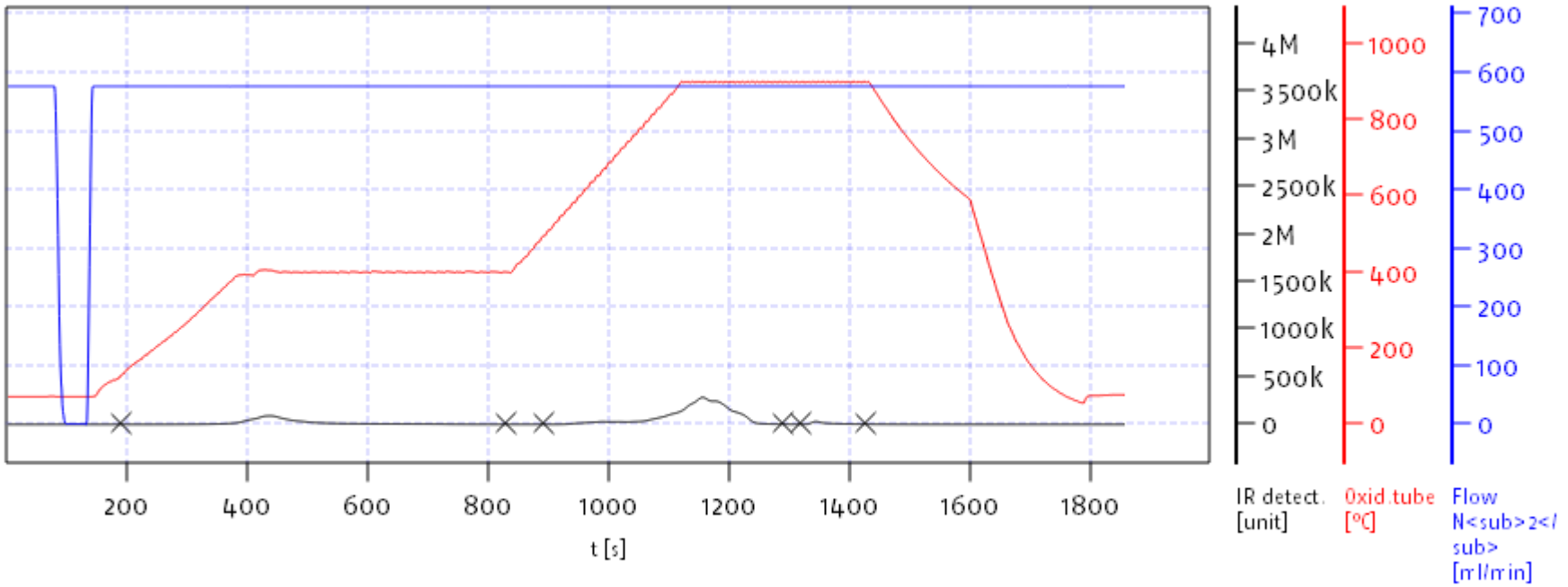
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
59	8	21H0089-16	505.30		1.00	CARBON	8/26/2021 9:22 PM	0.114	0.378	0.492	bl	331 092	1 143 220	37 581	0.9874	1.0000



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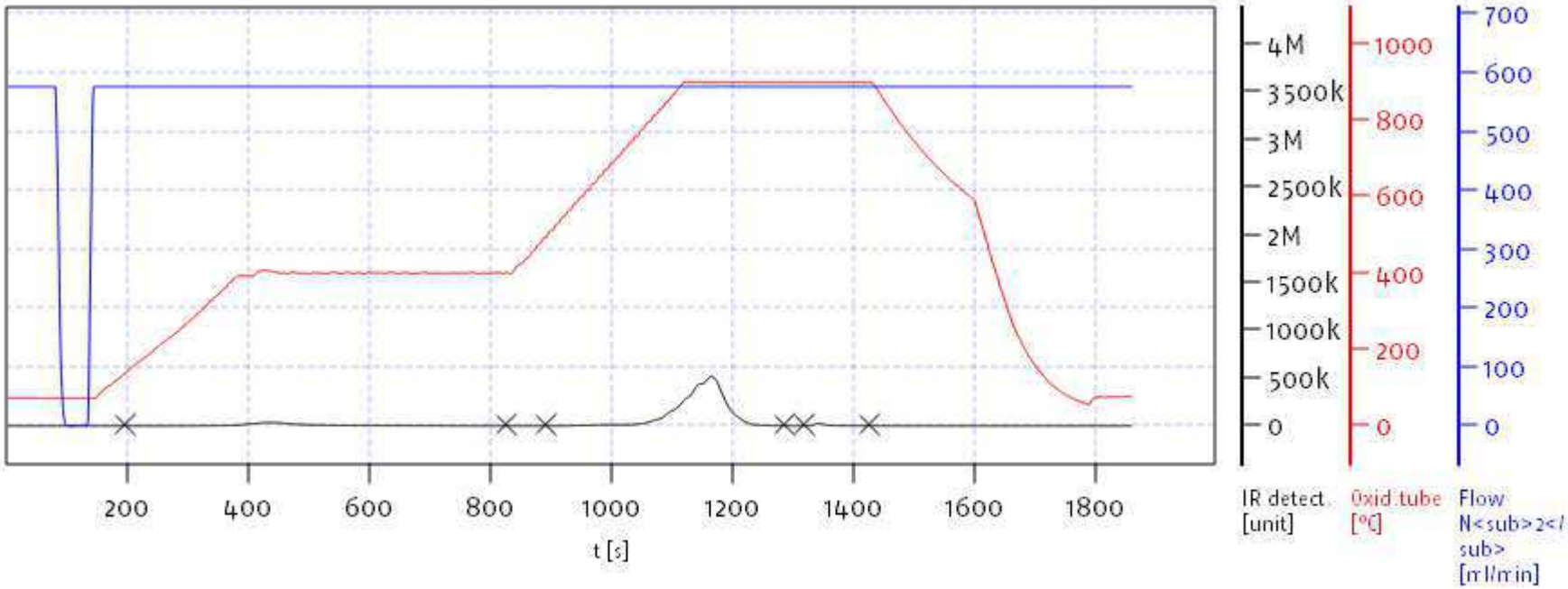
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
60	9	21H0089-17	586.90		1.00	CARBON	8/26/2021 9:54 PM	0.042	0.443	0.486	bl	149 159	1 552 010	23 359	0.9874	1.0000



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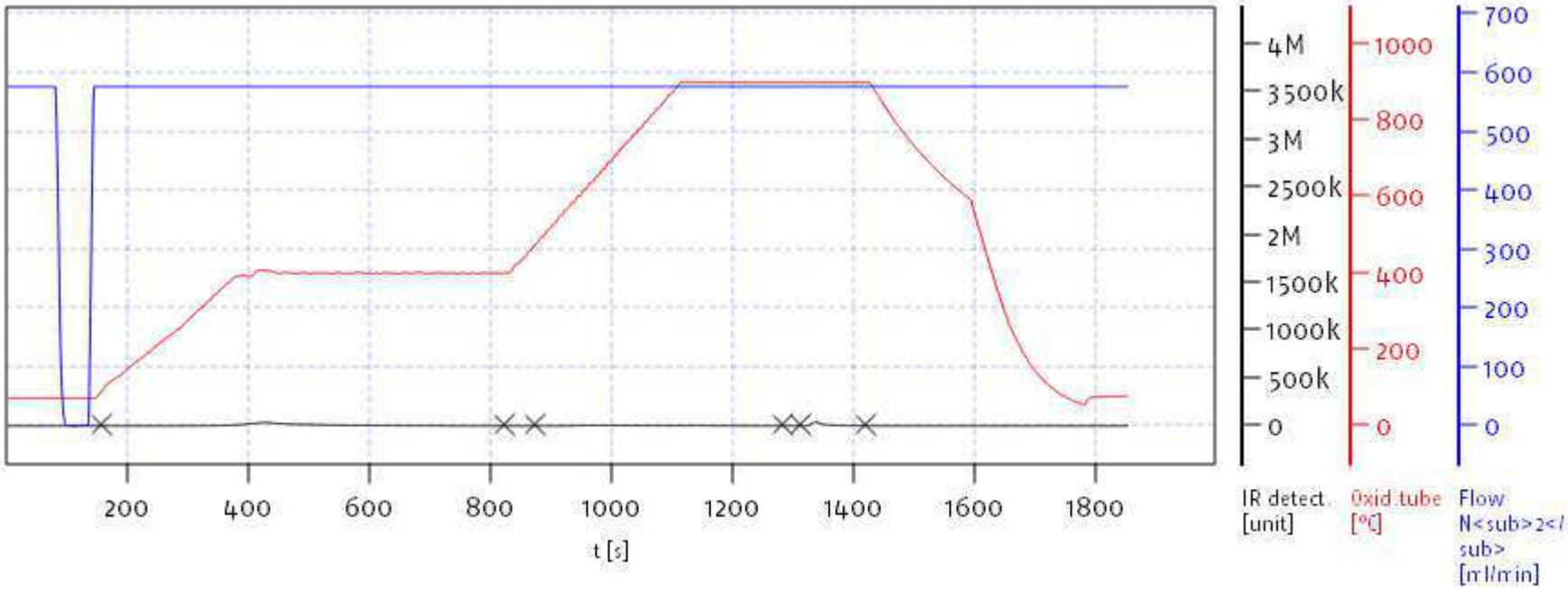
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
61	10	21H0089-18	534.50		1.00	CARBON	8/26/2021 10:25 PM	0.053	0.009	0.061	bl	154 711	38 983	37 170	0.9874	1.0000



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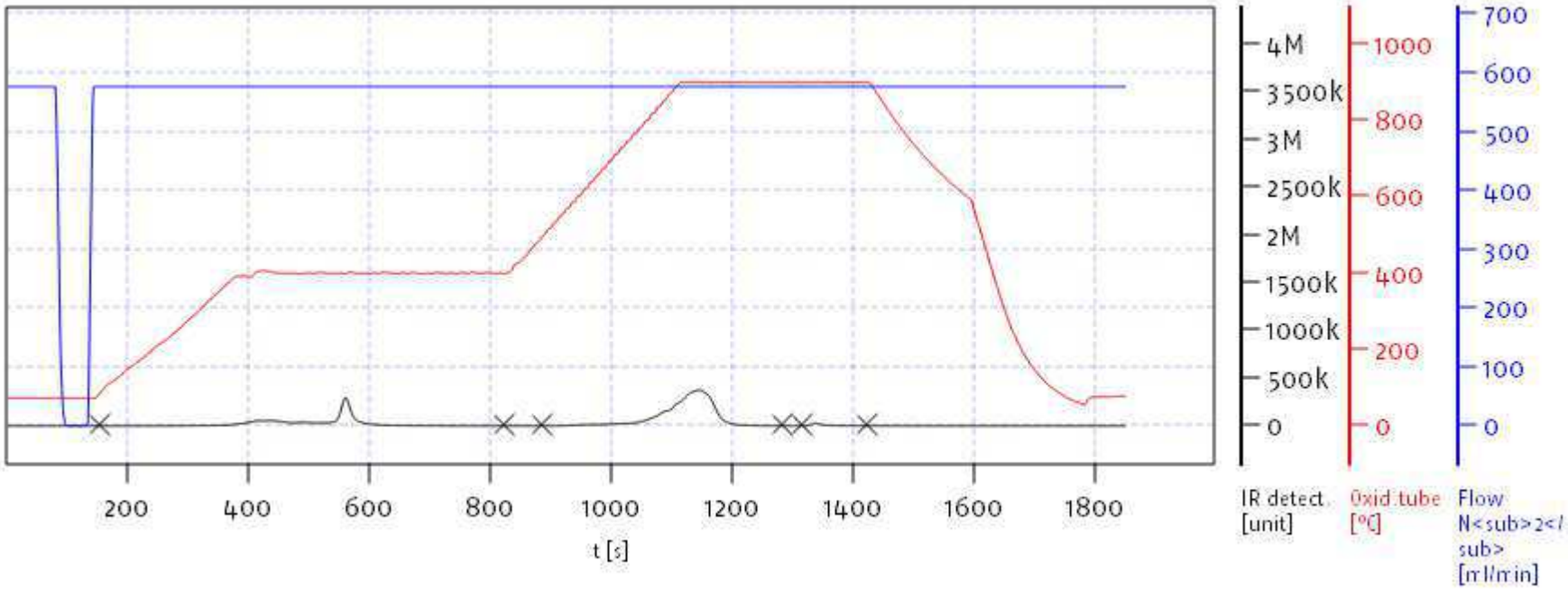
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
62	11	21H0089-19	509.70		1.00	CARBON	8/26/2021 10:56 PM	0.173	0.392	0.565	bl	528 317	1 193 990	24 687	0.9874	1.0000



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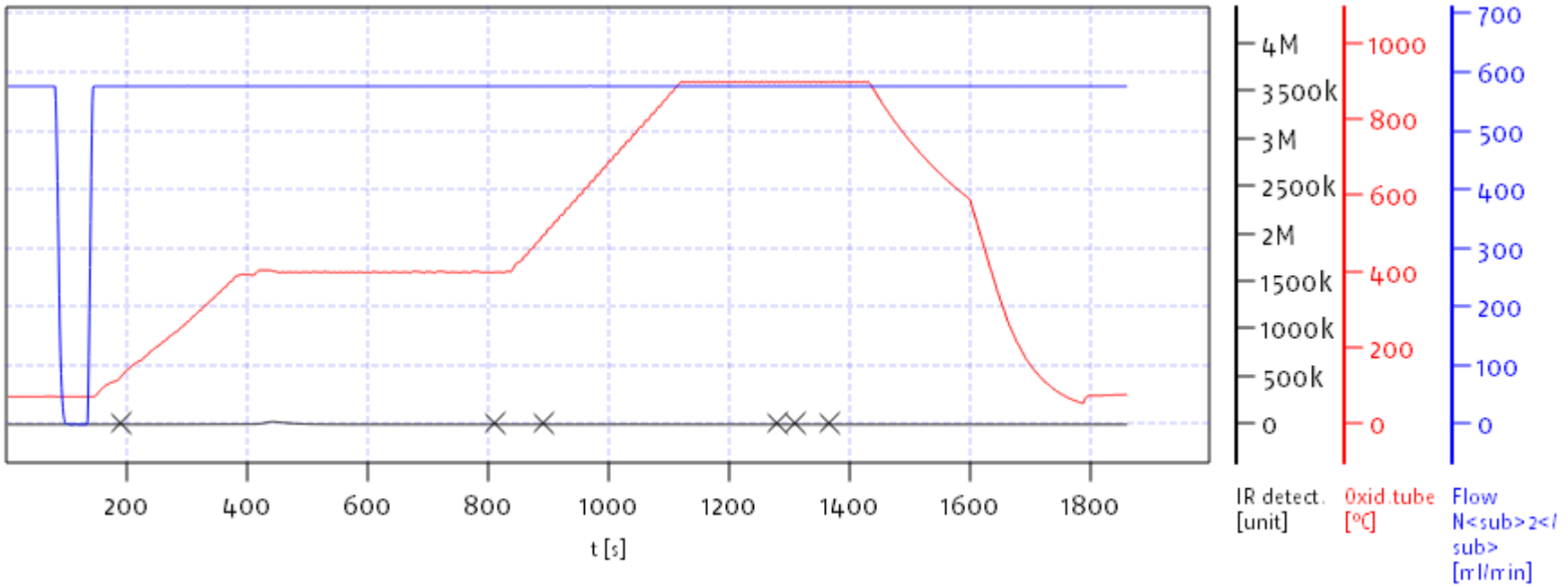
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
63	12	BJH0512-MRL1	505.70		1.00	CARBON	8/26/2021 11:28 PM	0.016	0.000	0.016	bl,C3u,C2u	61 318	4 395	68	0.9874	1.0000



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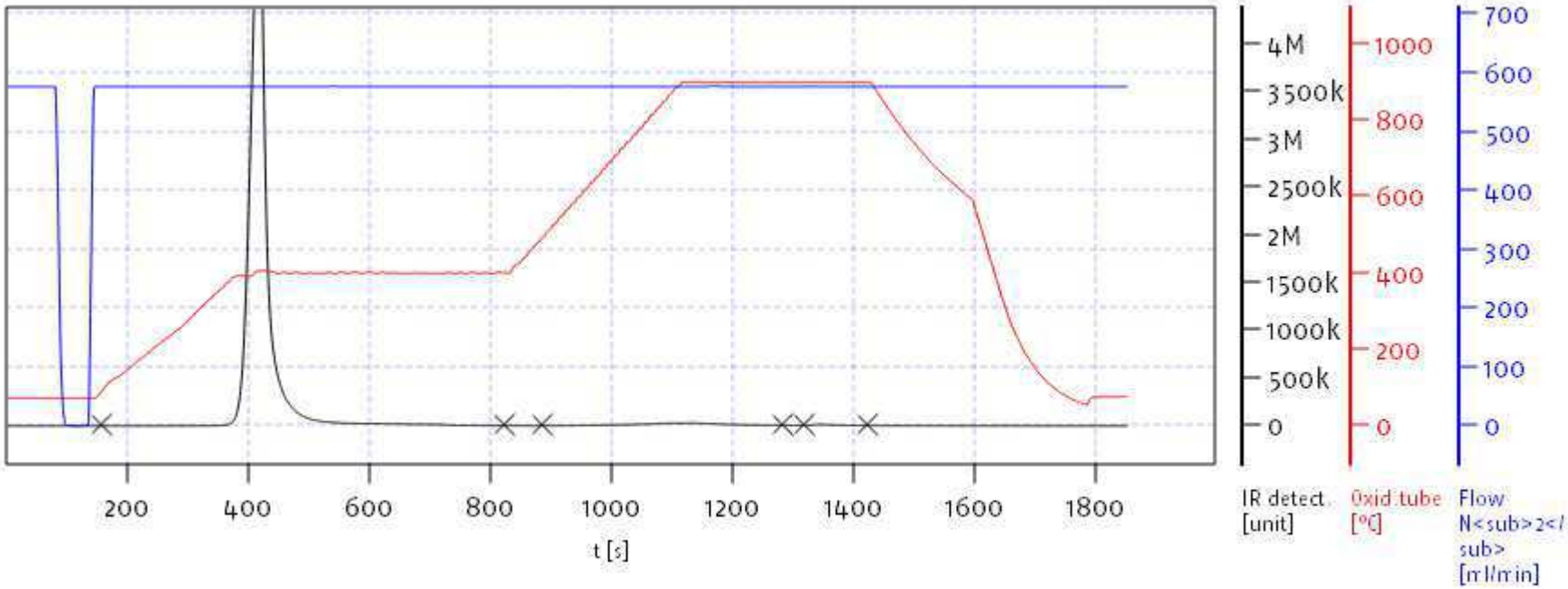
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
64	13	SJH0331-CCV5	25.20		1.00	CARBON	8/26/2021 11:59 PM	44.658	1.274	45.931	bl	6 741 860	201 751	29 459	0.9874	1.0000



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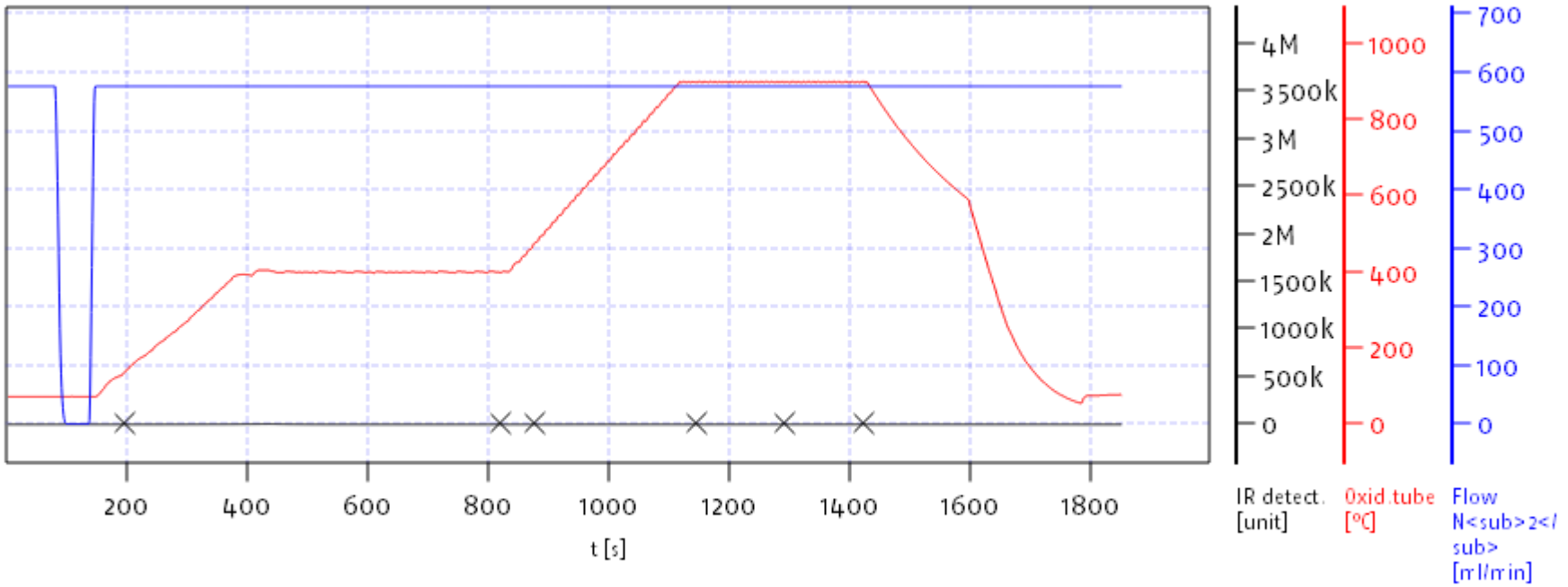
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
65	14	SJH0331-CCB5	635.00		1.00	CARBON	8/27/2021 12:30 AM	0.001	0.000	0.001	bl,C2u	15 694	0	30	0.9874	1.0000



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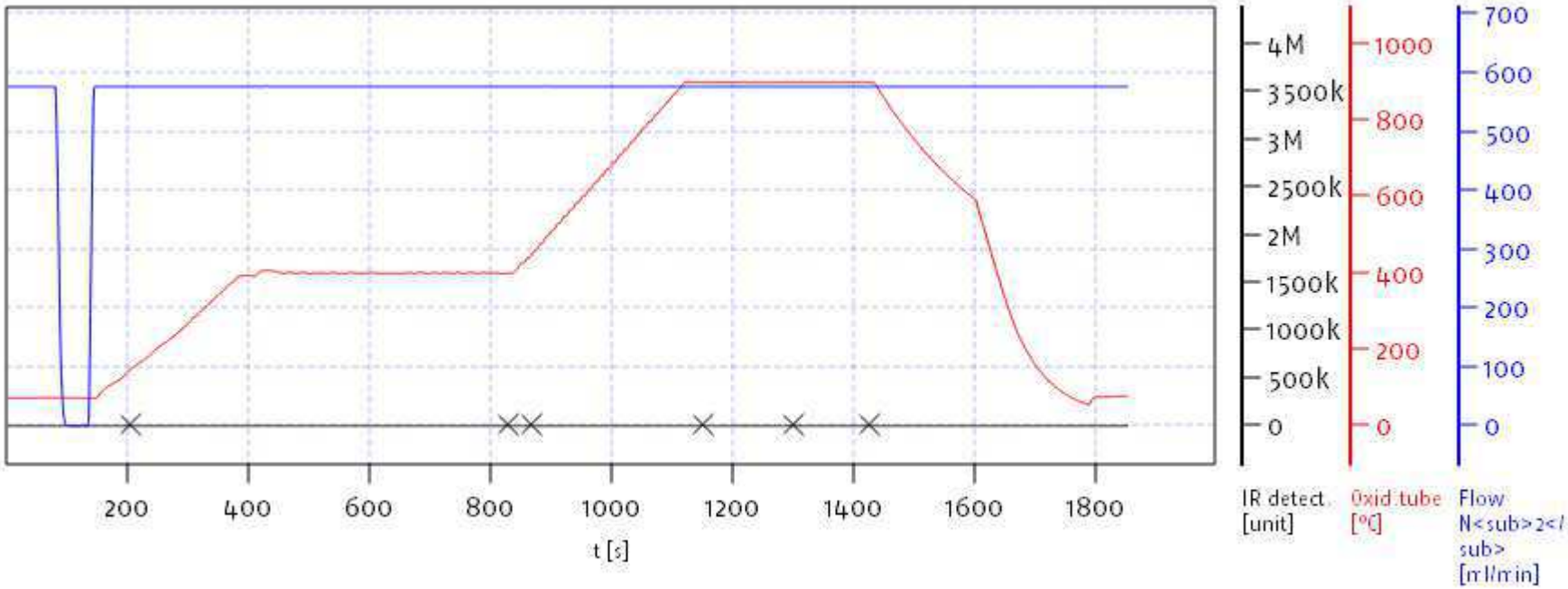
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
66	15	BJH0512-BLK1	632.60		1.00	CARBON	8/27/2021 1:02 AM	0.000	0.000	0.000	bl,C1u,C3u,C2u	3 308	920	473	0.9874	1.0000



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Date: Tue Aug 31 14:32:59 2021

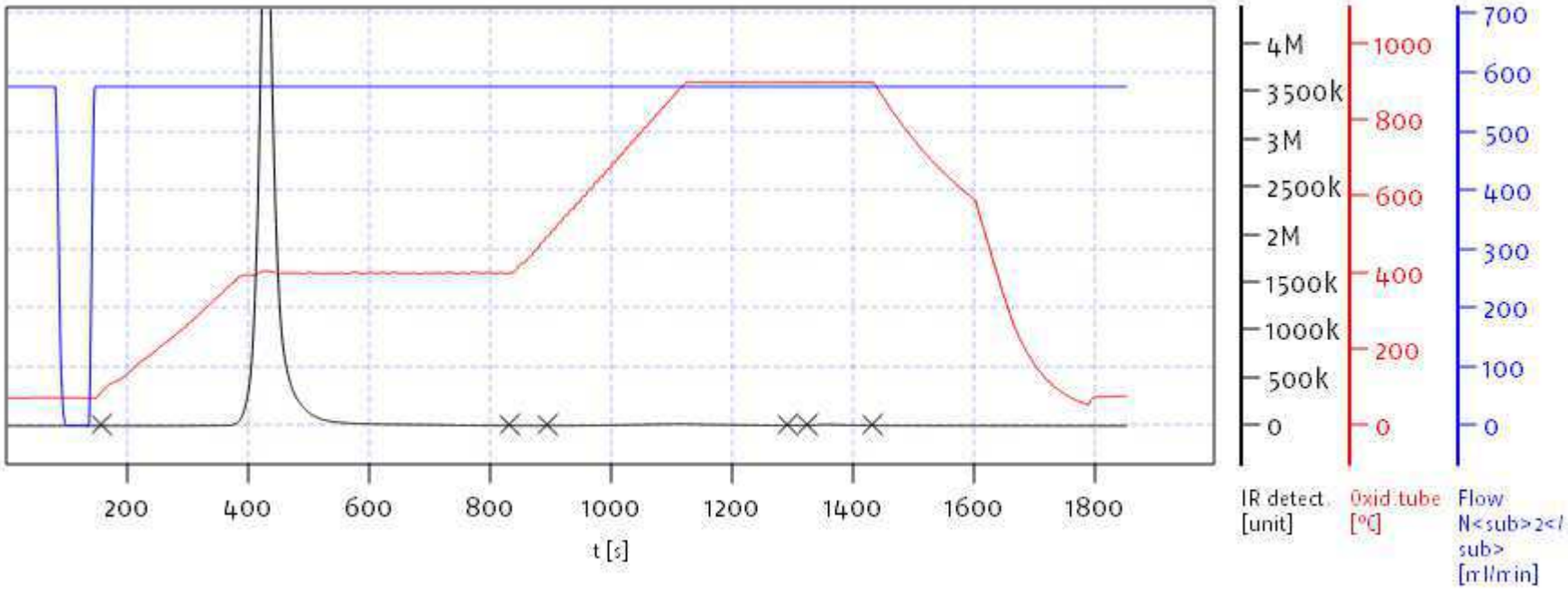
soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

elementar
EXCELLENCE IN ELEMENTS

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
67	16	BJH0512-BS1	25.40		1.00	CARBON	8/27/2021 1:33 AM	45.782	0.838	46.620	bl	6 966 500	137 684	29 632	0.9874	1.0000



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Analyst: BF

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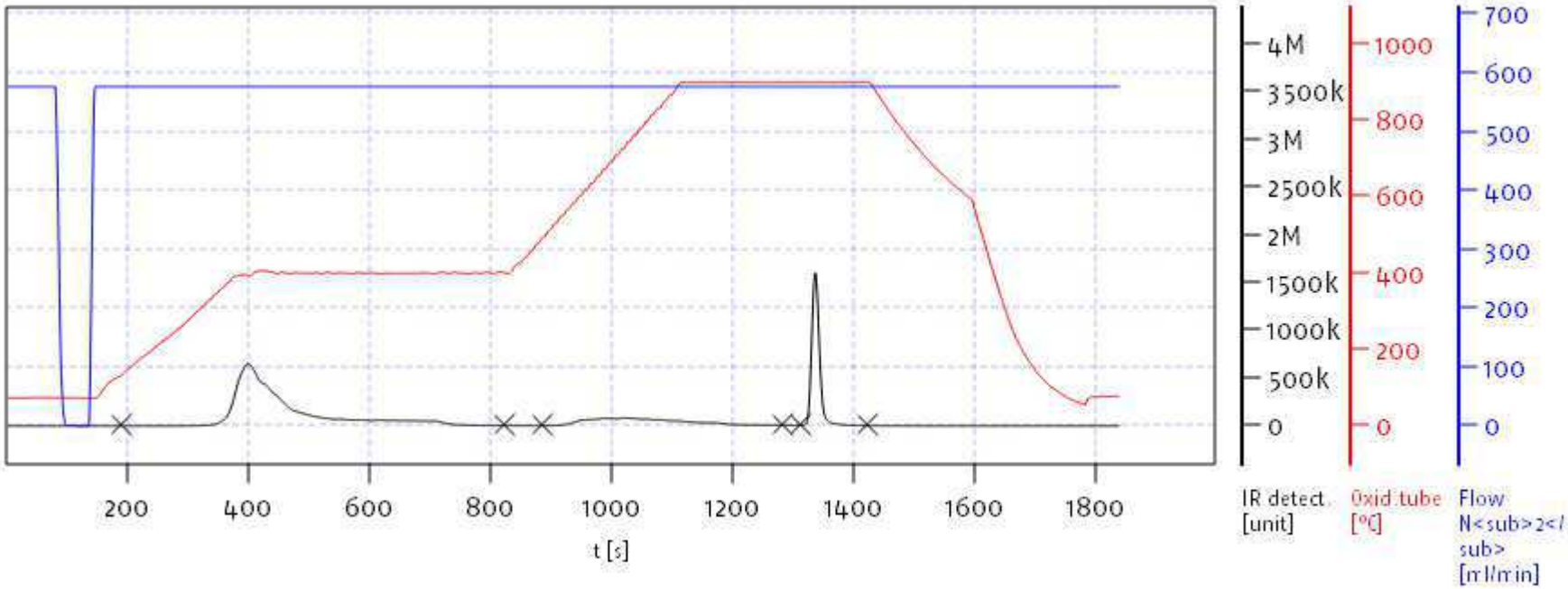
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
68	17	21H0140-01	515.40		1.00	CARBON	8/27/2021 2:04 AM	1.042	0.192	1.235	bl	2 331 590	599 122	901 849	0.9874	1.0000



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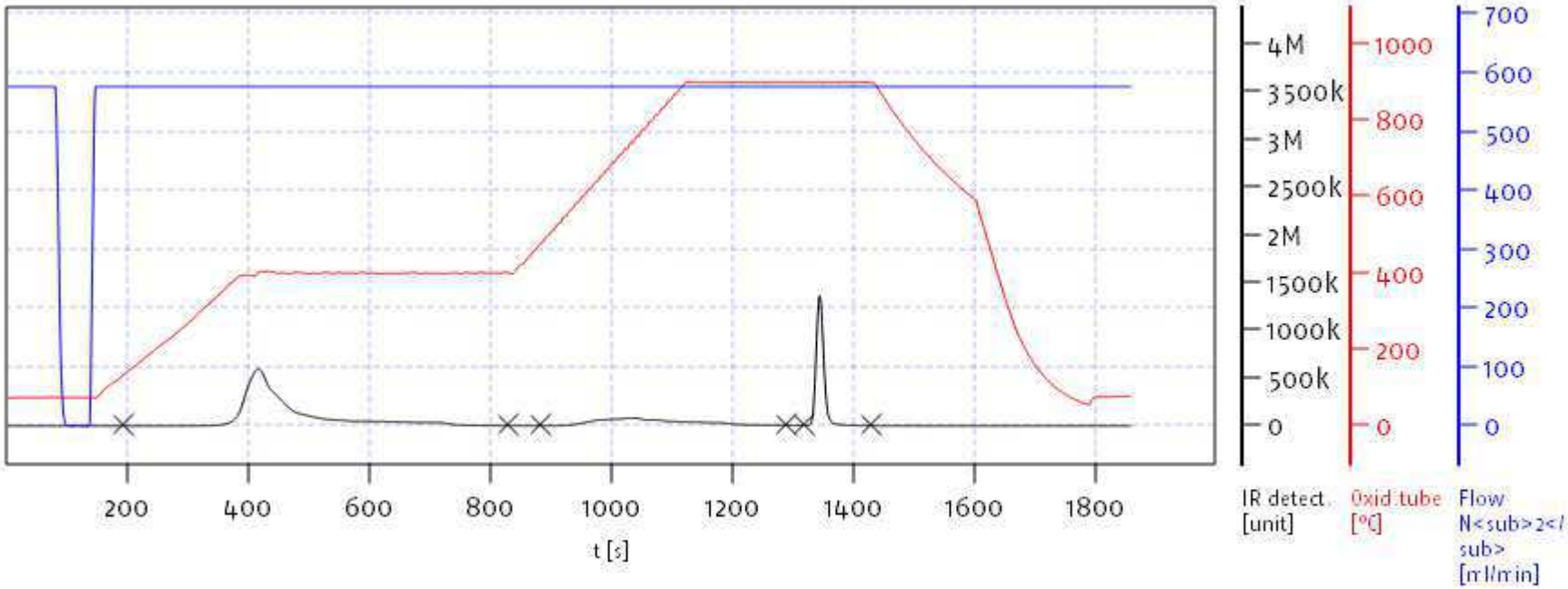
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
69	18	BJH0512-DUP1	505.50		1.00	CARBON	8/27/2021 2:36 AM	0.859	0.174	1.033	bl	1 863 800	533 584	753 606	0.9874	1.0000



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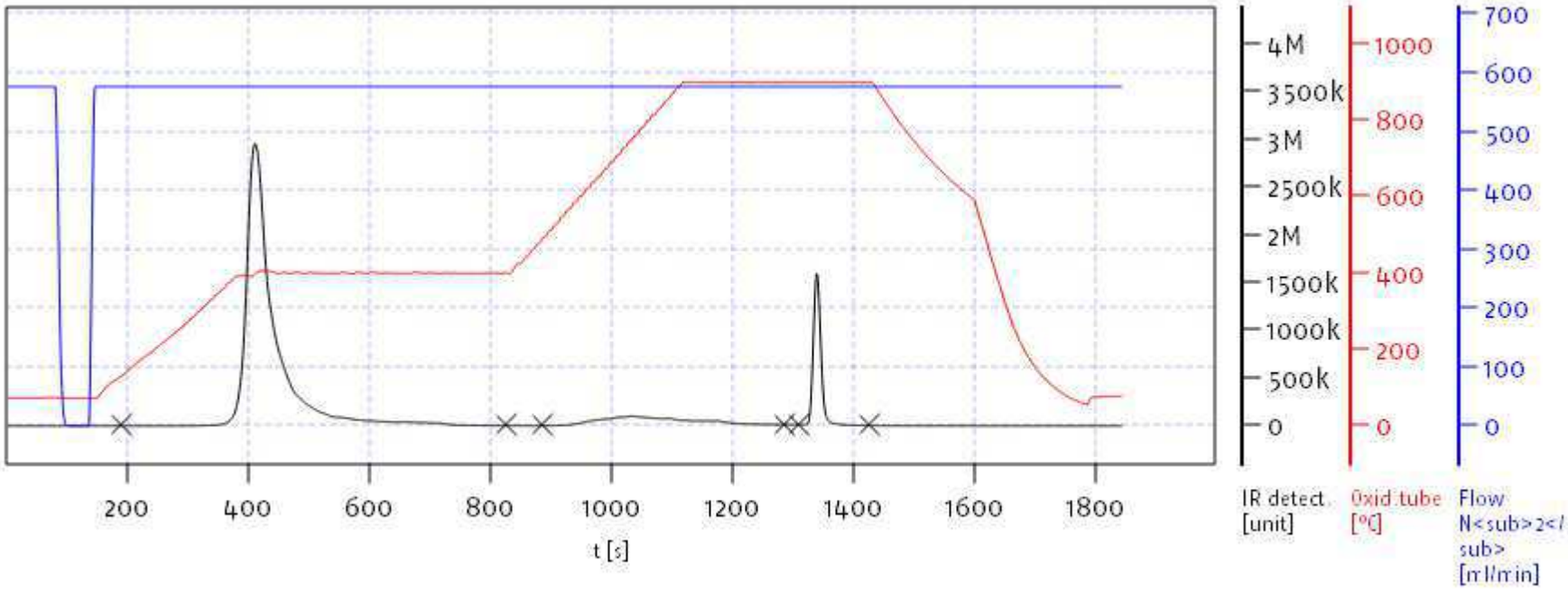
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
70	19	BJH0512-MS1	555.00	0.0119	1.00	CARBON	8/27/2021 3:07 AM	1.974	0.213	2.187	bl	5 694 500	710 678	888 309	0.9874	1.0000



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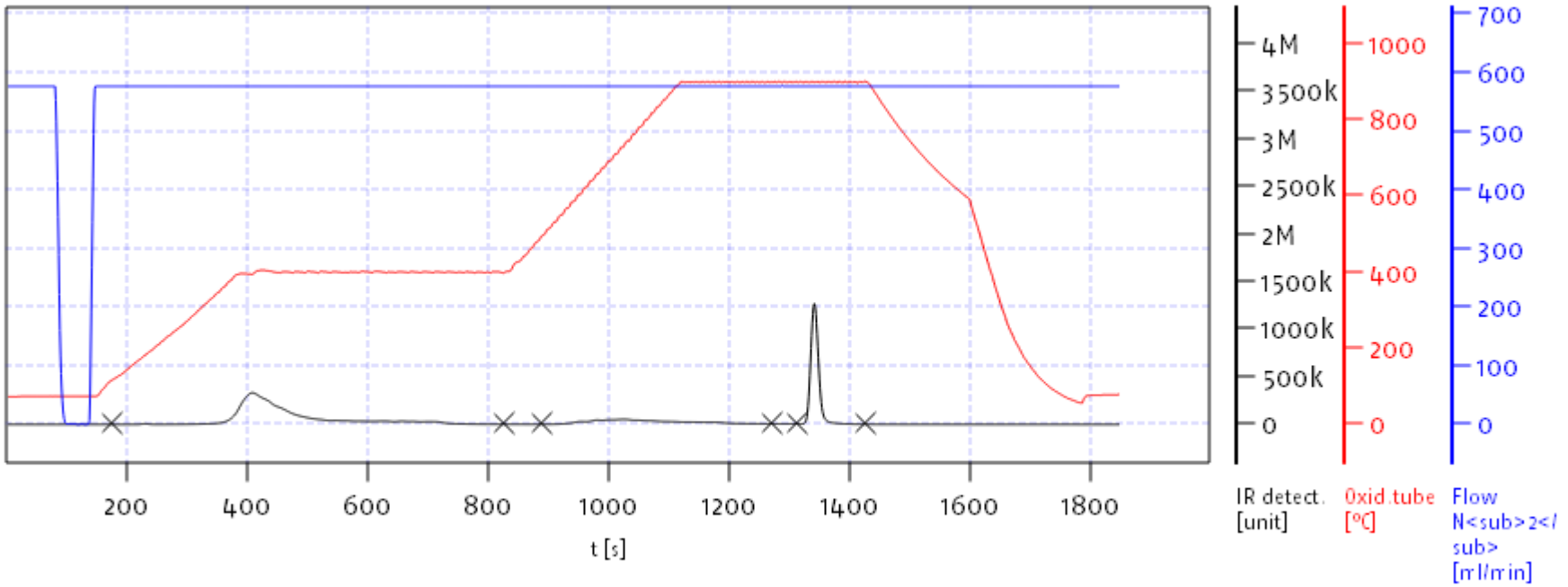
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
71	20	21H0140-02	358.70		1.00	CARBON	8/27/2021 3:38 AM	0.926	0.164	1.090	bl	1 281 940	359 426	725 012	0.9874	1.0000



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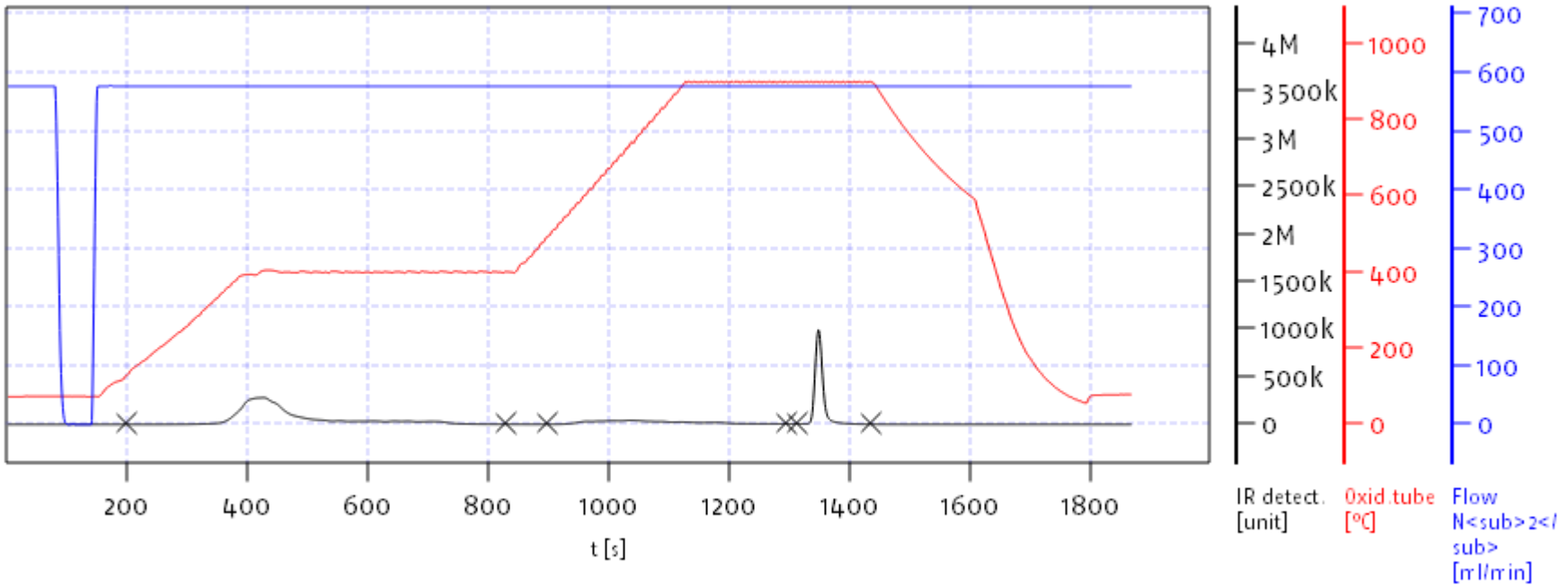
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
72	21	21H0140-03	294.80		1.00	CARBON	8/27/2021 4:10 AM	0.993	0.171	1.164	bl	1 209 590	309 979	562 495	0.9874	1.0000



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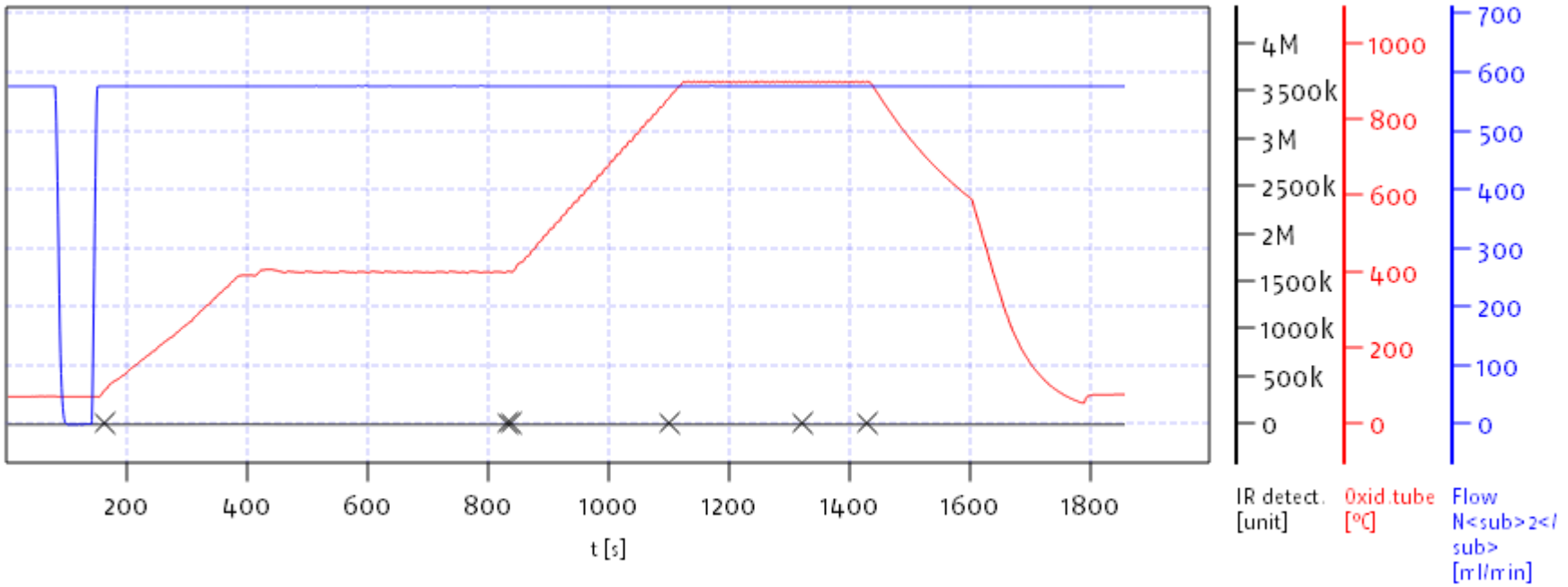
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
73	22	BLANK	1.00		1.00	CARBON	8/27/2021 4:41 AM	0.000	0.000	0.000	bl	7 936	478	259	0.9874	1.0000



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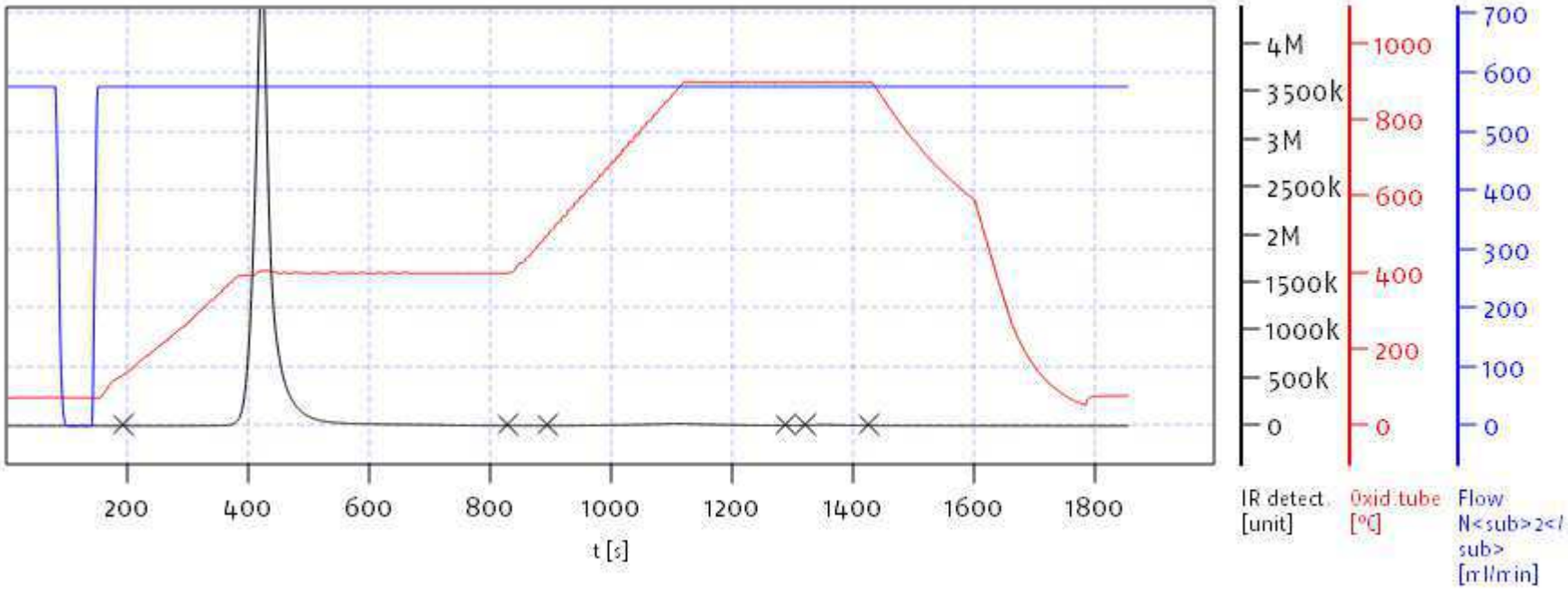
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
74	23	Dfactor	21.10		1.00	CARBON	8/27/2021 5:13 AM	44.565	1.103	45.668	bl	5 624 490	149 430	26 588	0.9893	1.0000



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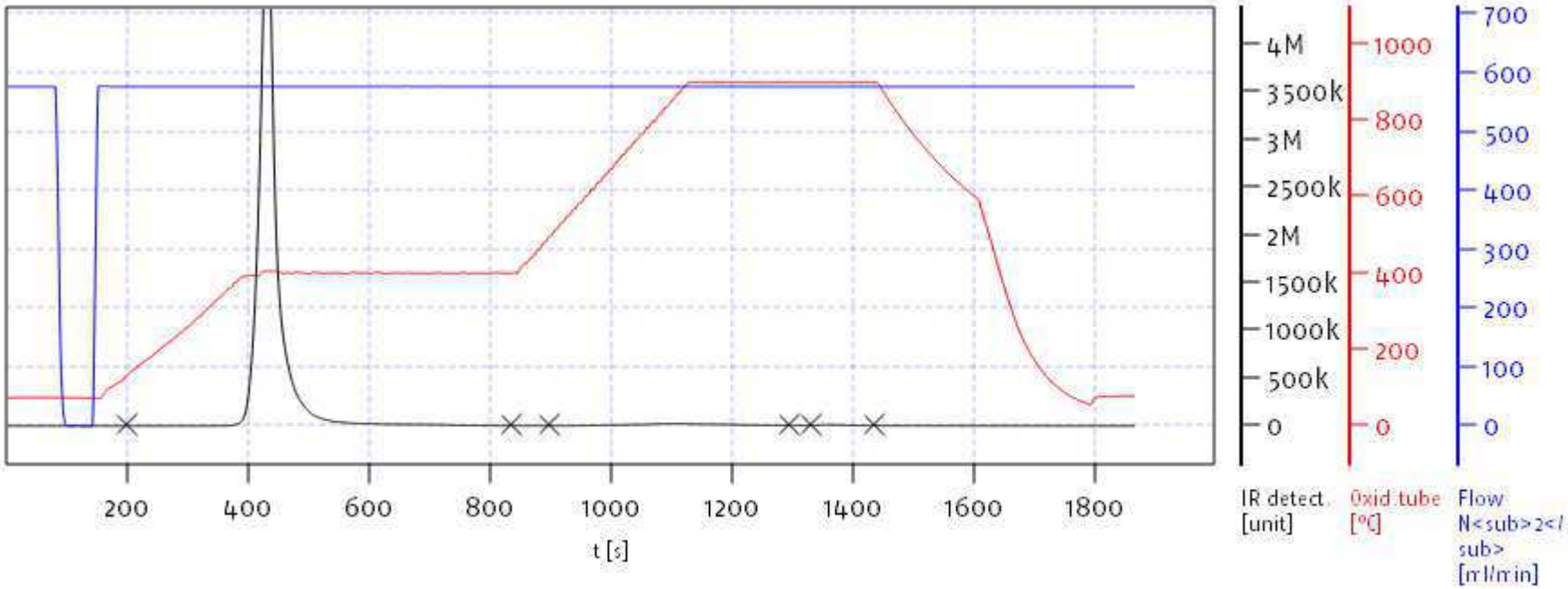
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
75	24	Dfactor	24.80		1.00	CARBON	8/27/2021 5:44 AM	44.537	1.026	45.563	bl	6 724 490	162 352	25 078	0.9723	1.0000



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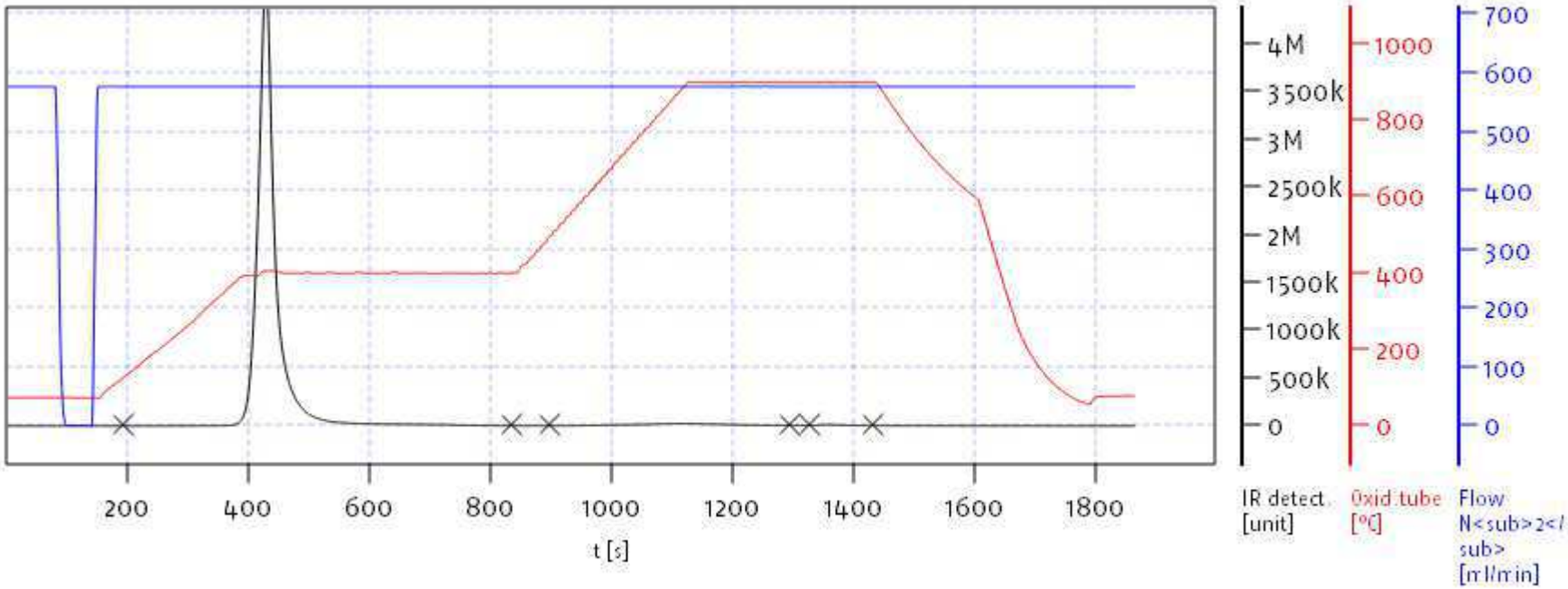
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
76	25	SJH0331-CCV6	22.00		1.00	CARBON	8/27/2021 6:16 AM	44.038	1.236	45.274	bl	5 845 220	172 698	26 767	0.9808	1.0000



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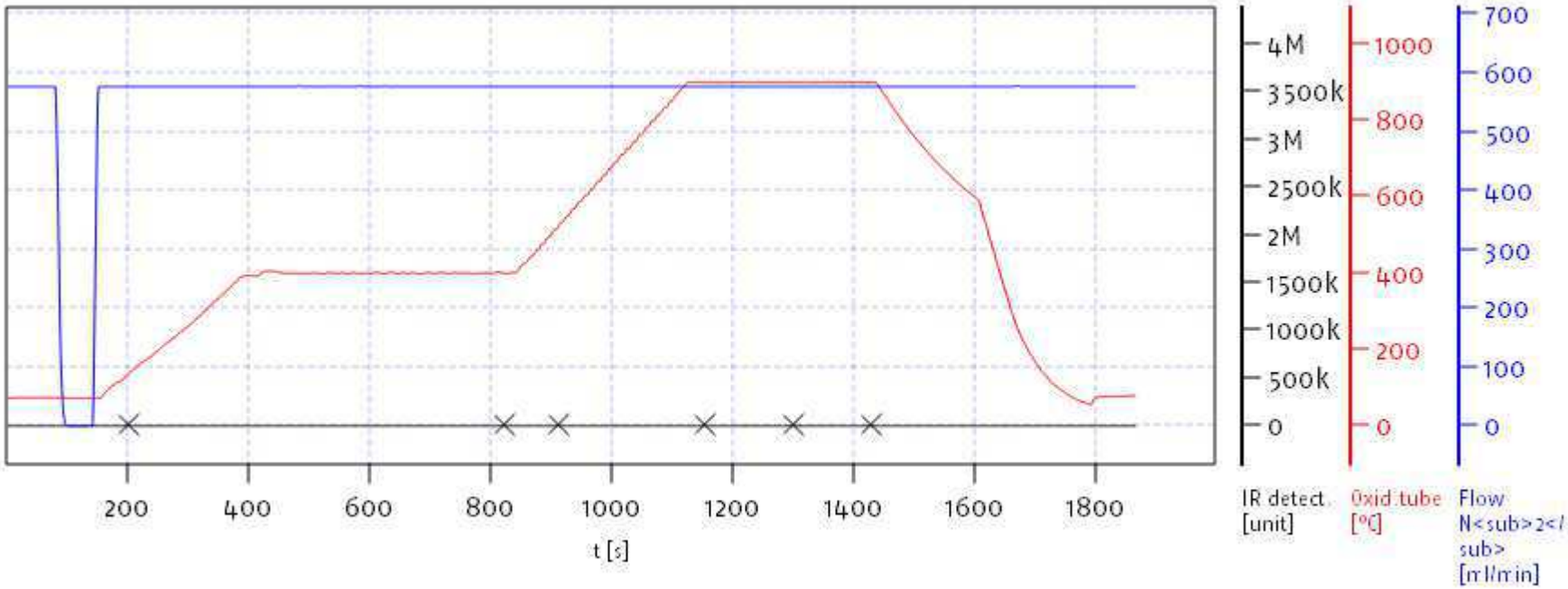
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
77	26	SJH0331-CCB6	548.30		1.00	CARBON	8/27/2021 6:47 AM	0.000	0.000	0.000	bl,C1u,C3u,C2u	1 753	1 180	250	0.9808	1.0000



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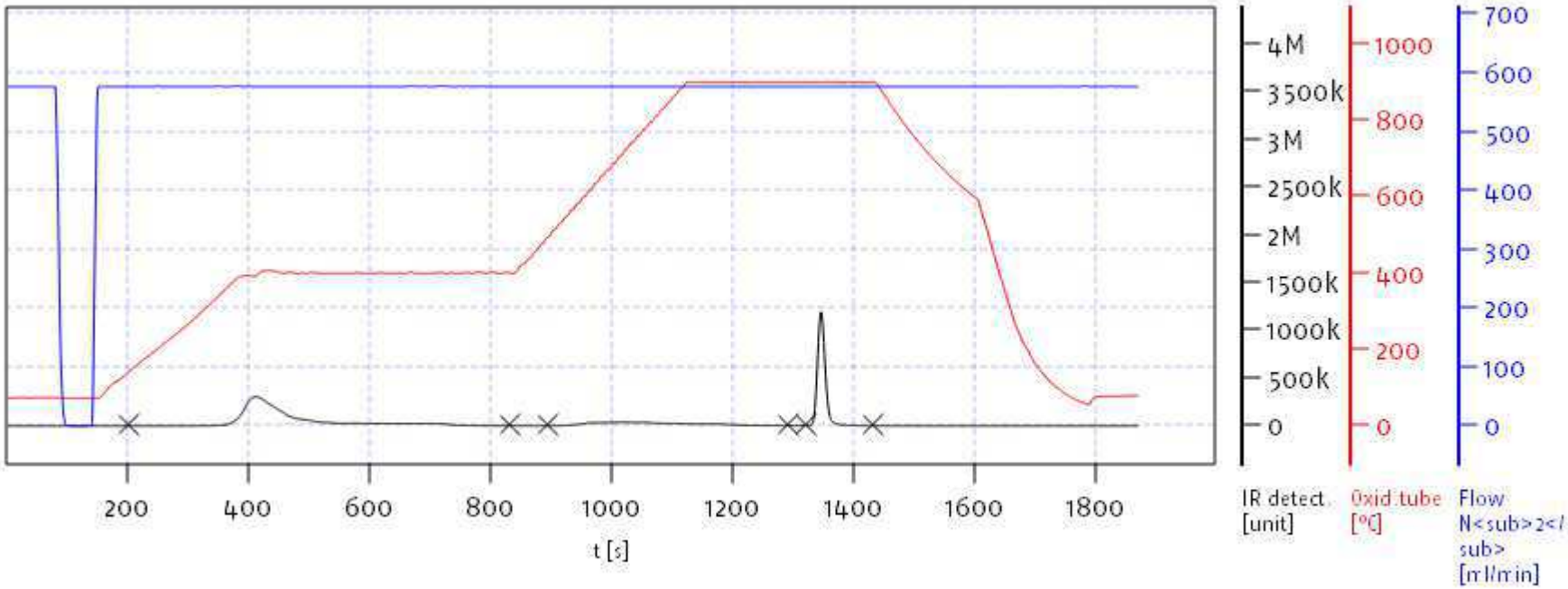
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
78	27	21H0140-04	303.90		1.00	CARBON	8/27/2021 7:19 AM	0.932	0.155	1.086	bl	1 049 770	290 373	669 853	0.9808	1.0000



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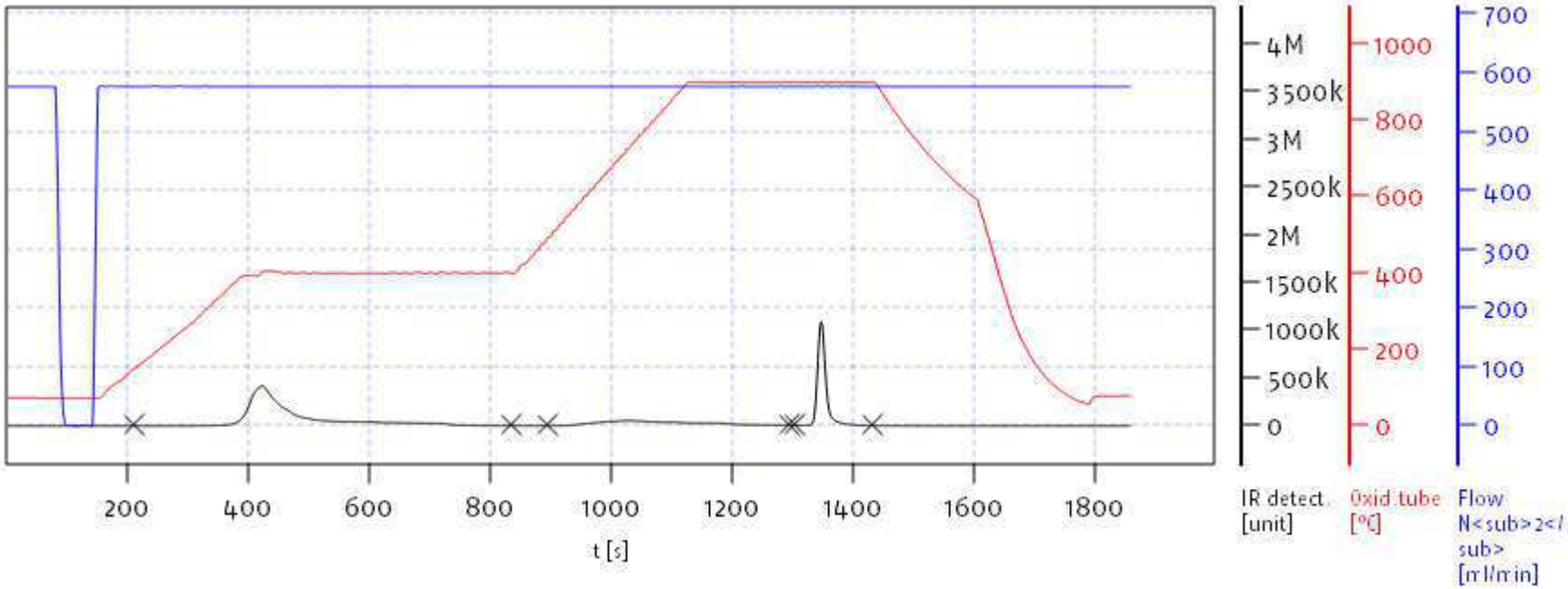
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
79	28	21H0140-05	398.10		1.00	CARBON	8/27/2021 7:50 AM	0.819	0.162	0.981	bl	1 317 800	393 649	661 266	0.9808	1.0000



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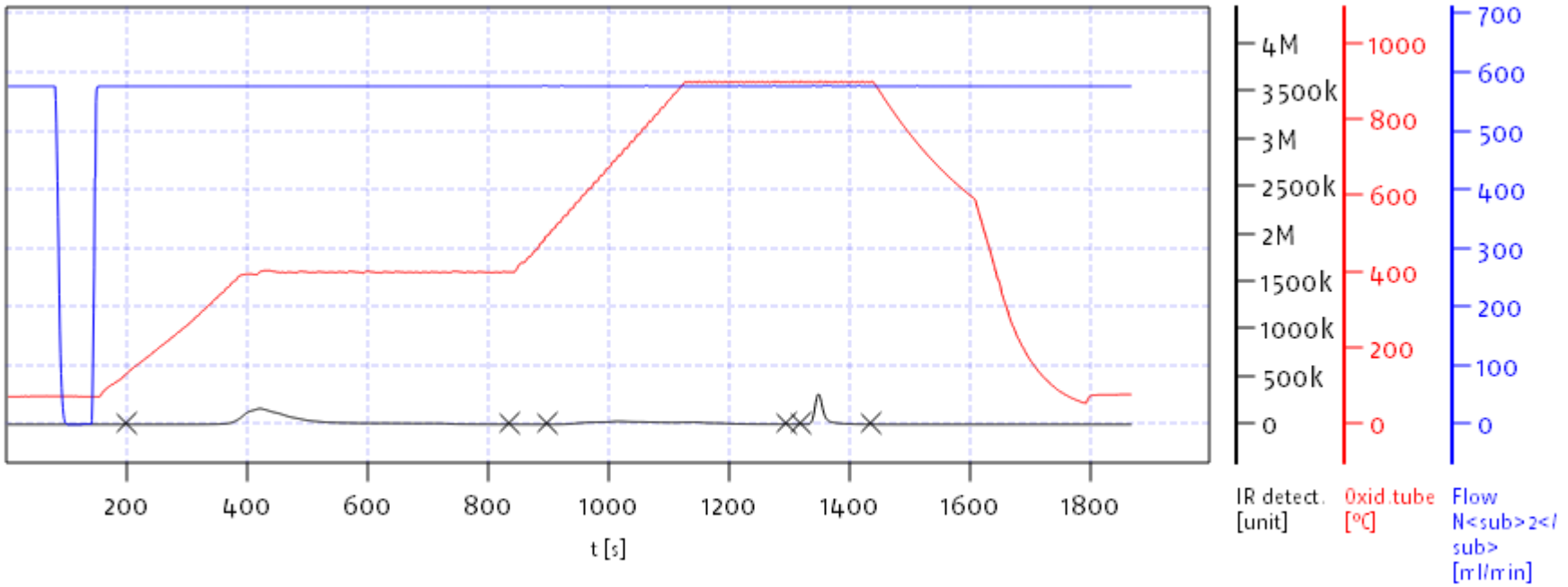
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
80	29	21H0140-06	334.50		1.00	CARBON	8/27/2021 8:22 AM	0.404	0.109	0.514	bl	634 956	228 189	201 330	0.9808	1.0000



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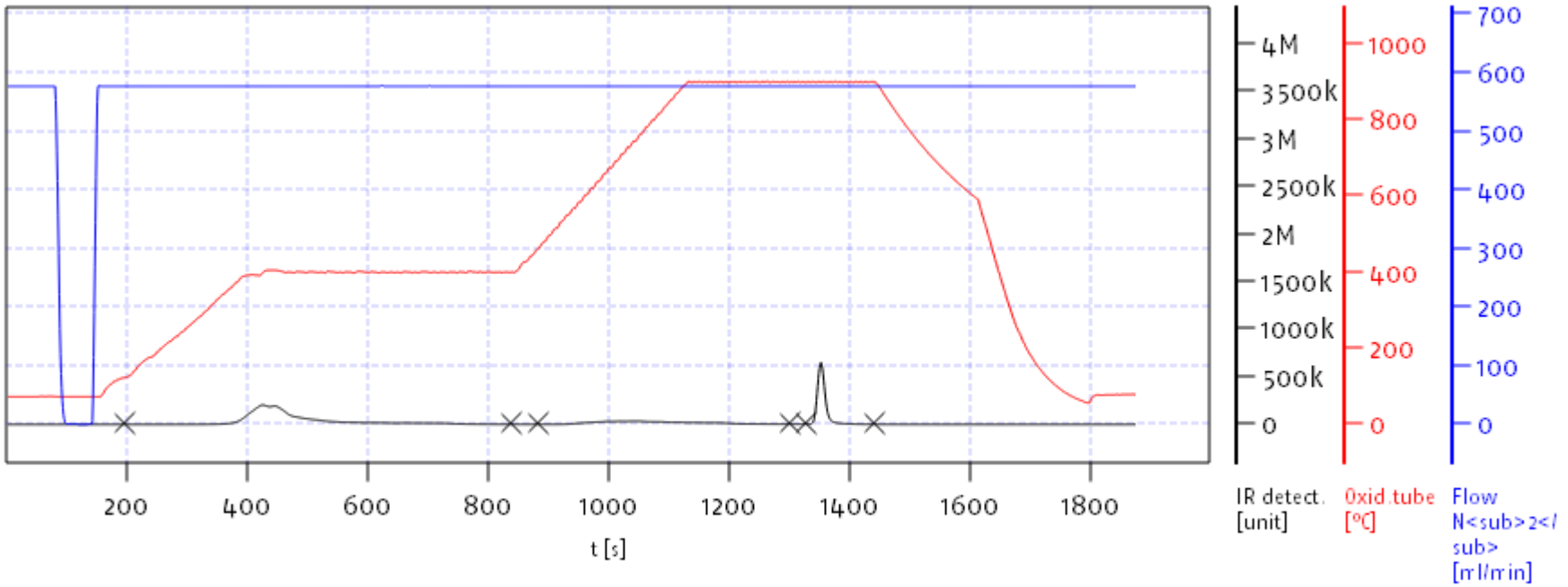
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
81	30	21H0140-07	323.10		1.00	CARBON	8/27/2021 8:54 AM	0.579	0.126	0.705	bl	777 363	252 881	367 554	0.9808	1.0000



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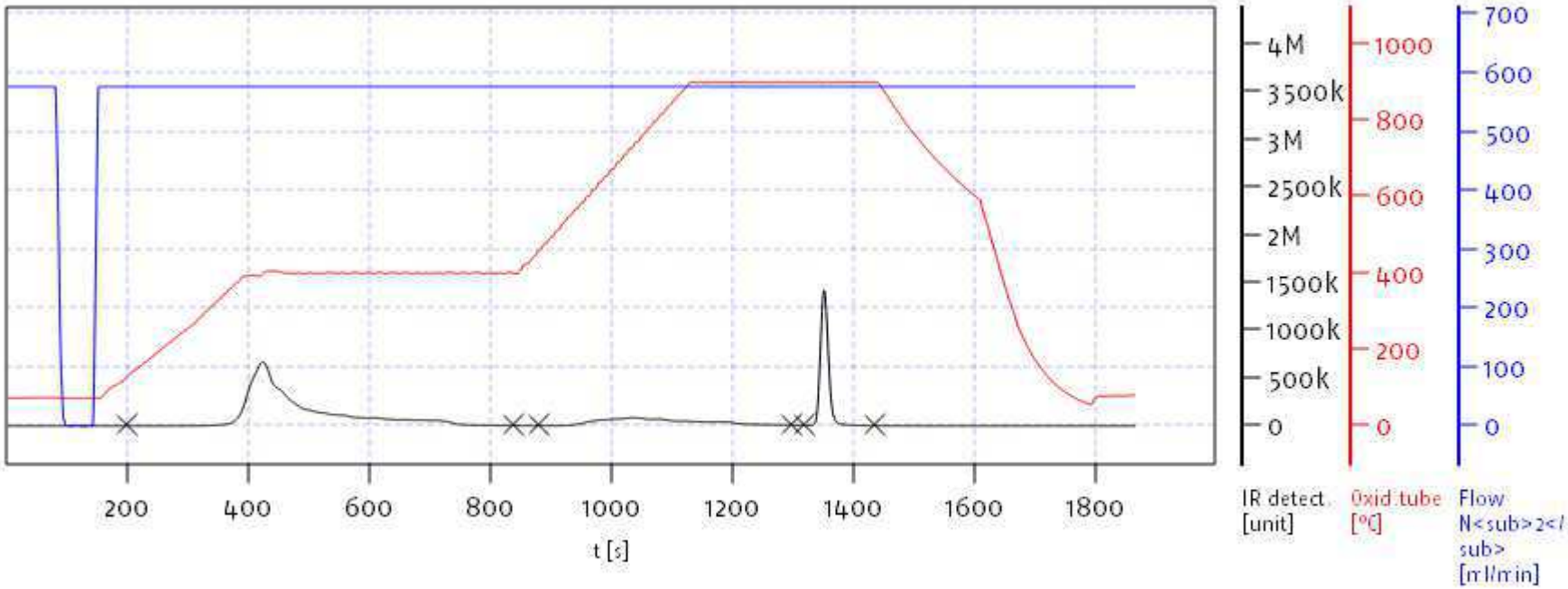
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
82	31	21H0140-08	608.70		1.00	CARBON	8/27/2021 9:25 AM	0.884	0.165	1.050	bl	2 427 370	607 996	828 909	0.9808	1.0000



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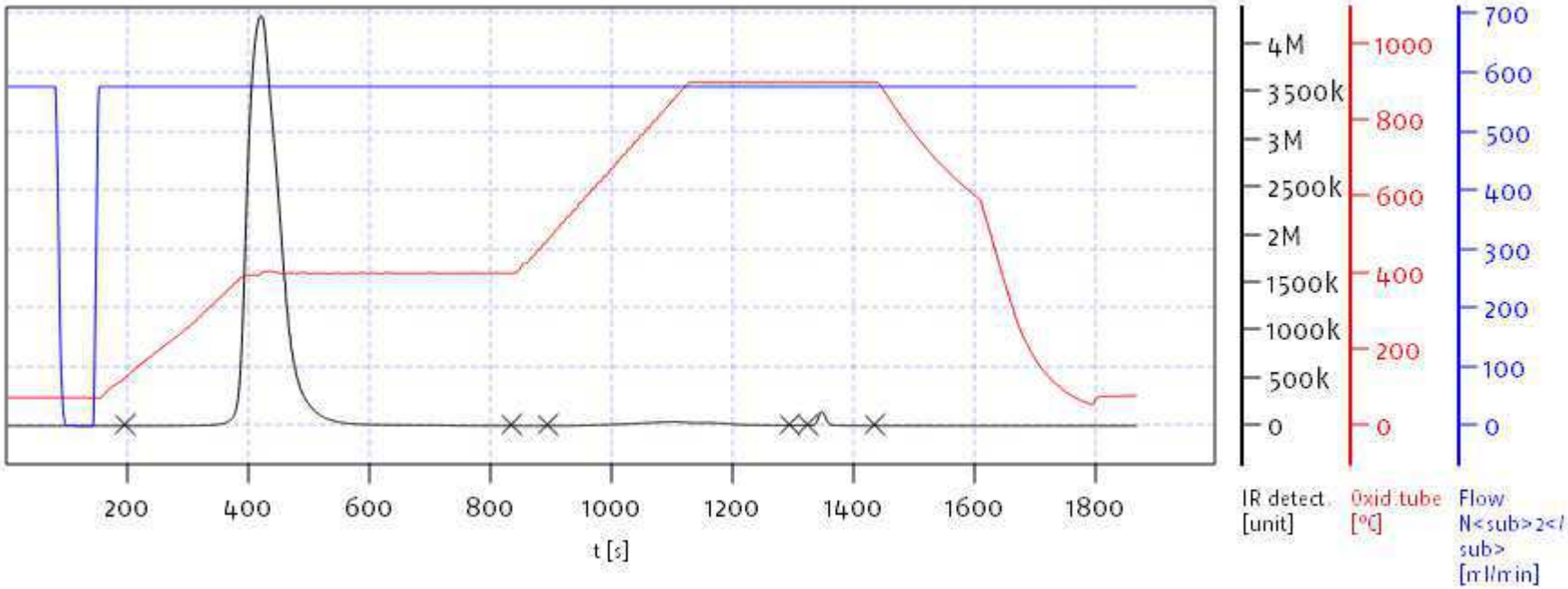
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
83	32	21H0140-09	579.90		1.00	CARBON	8/27/2021 9:57 AM	2.798	0.076	2.875	bl,Cl o	9 729 350	274 246	89 035	0.9808	1.0000



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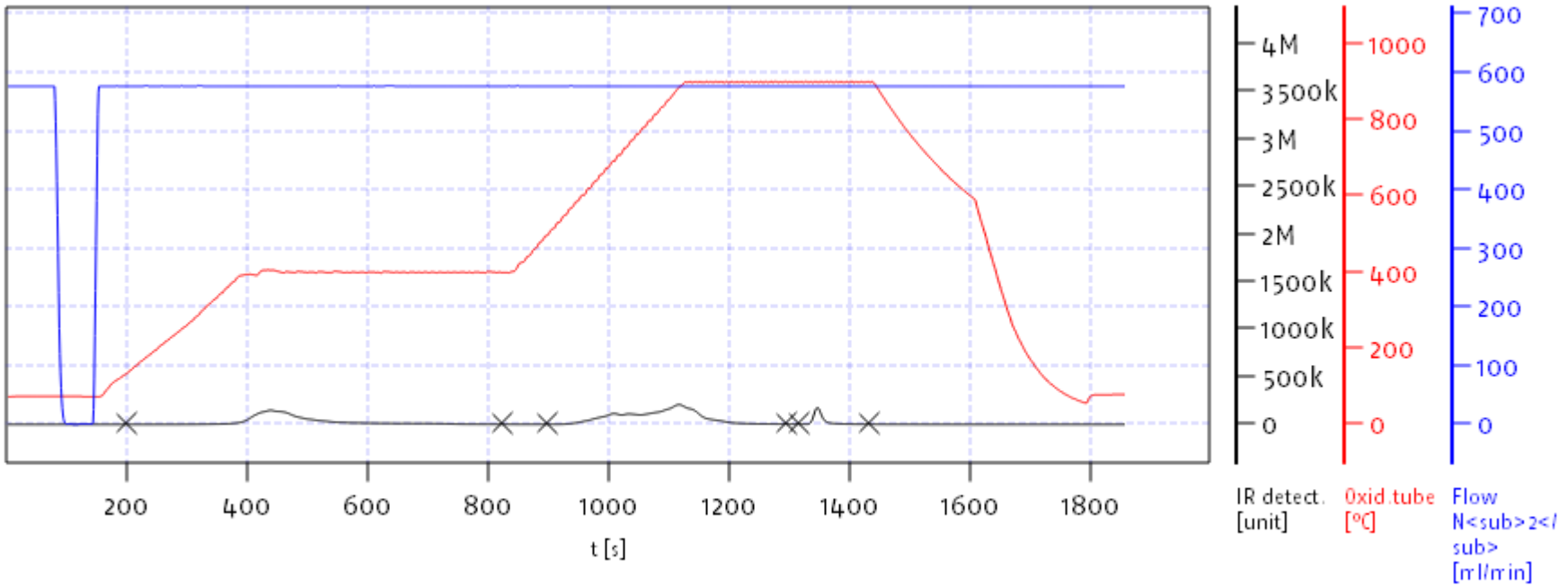
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
84	33	21H0140-10	723.80		1.00	CARBON	8/27/2021 10:28 AM	0.160	0.231	0.391	bl	601 404	1 003 240	117 021	0.9808	1.0000



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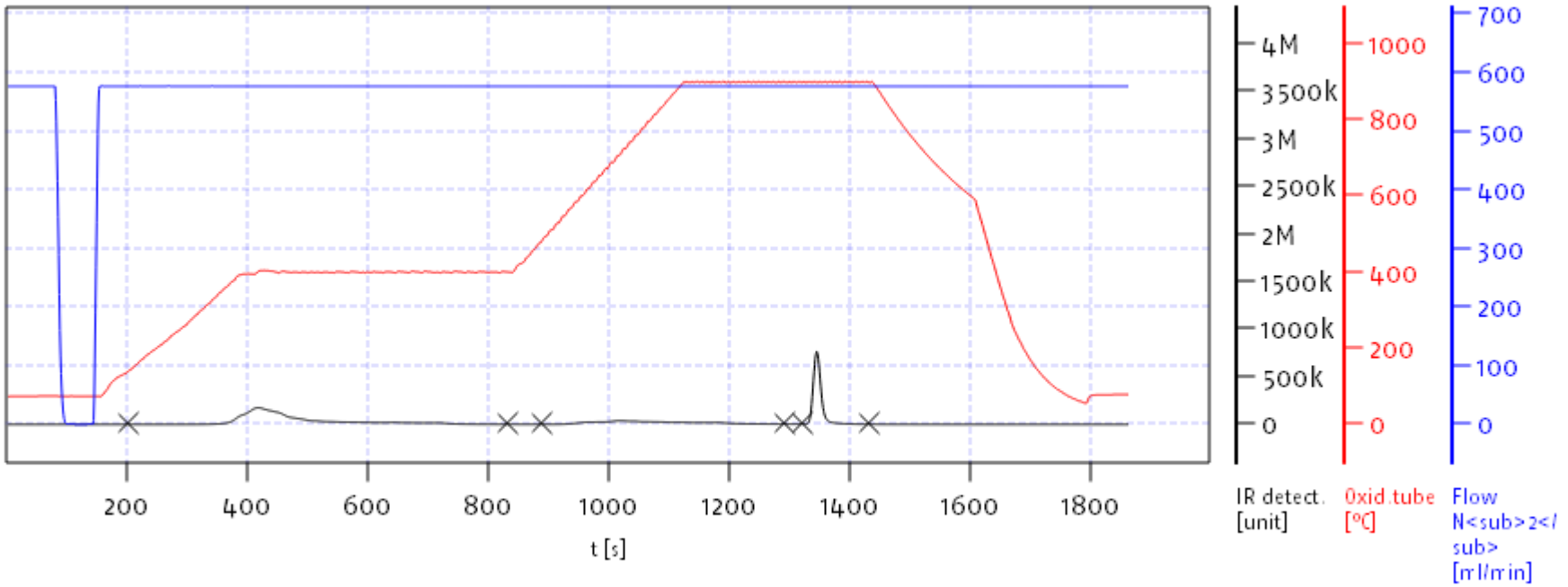
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
85	34	21H0184-01	375.90		1.00	CARBON	8/27/2021 11:00 AM	0.506	0.113	0.620	bl	728 873	263 986	434 915	0.9808	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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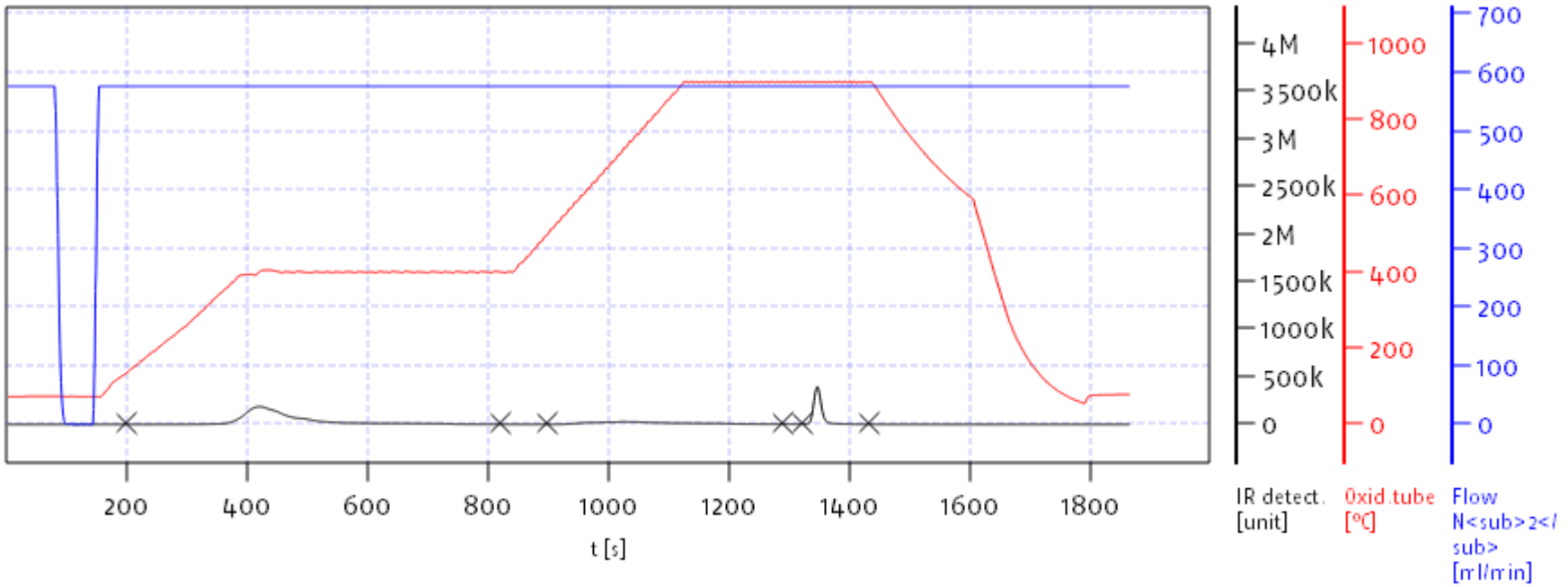
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
86	35	21H0184-02	319.90		1.00	CARBON	8/27/2021 11:31 AM	0.466	0.091	0.557	bl	693 735	184 376	224 532	0.9808	1.0000



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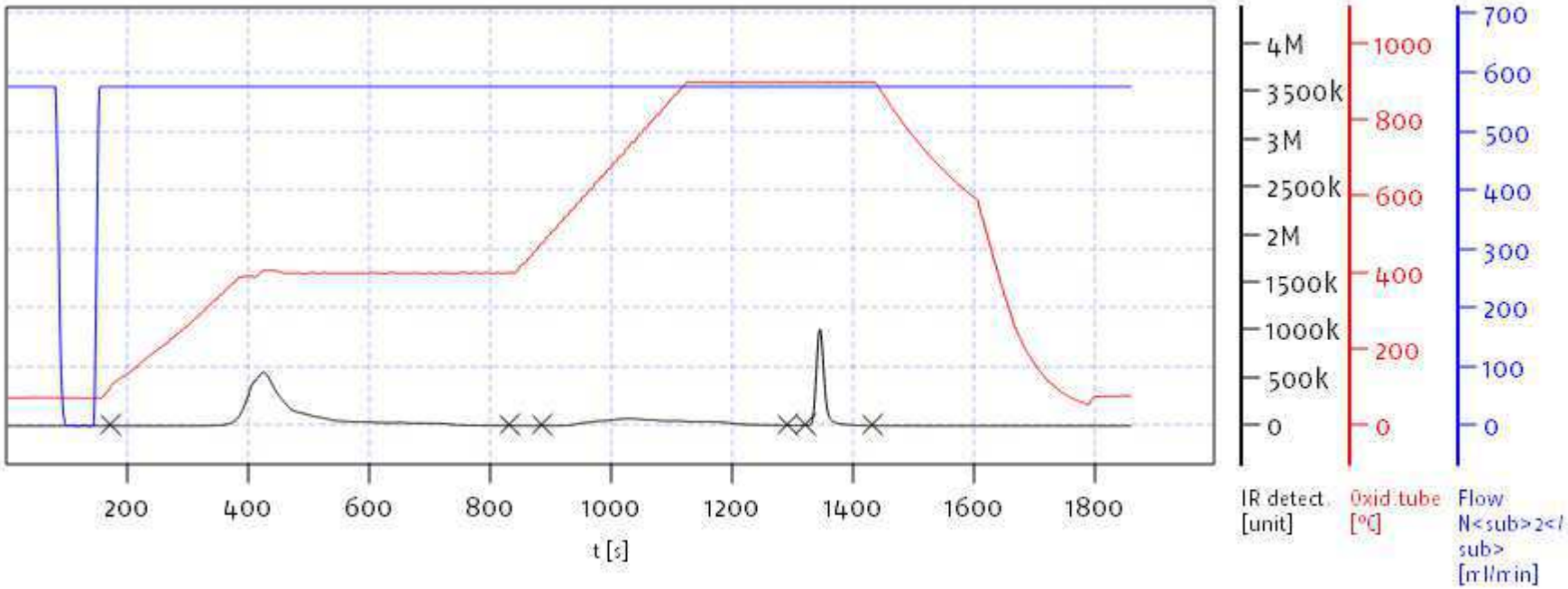
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
87	36	21H0184-03	526.60		1.00	CARBON	8/27/2021 12:03 PM	0.741	0.172	0.912	bl	1 774 540	546 694	592 063	0.9808	1.0000



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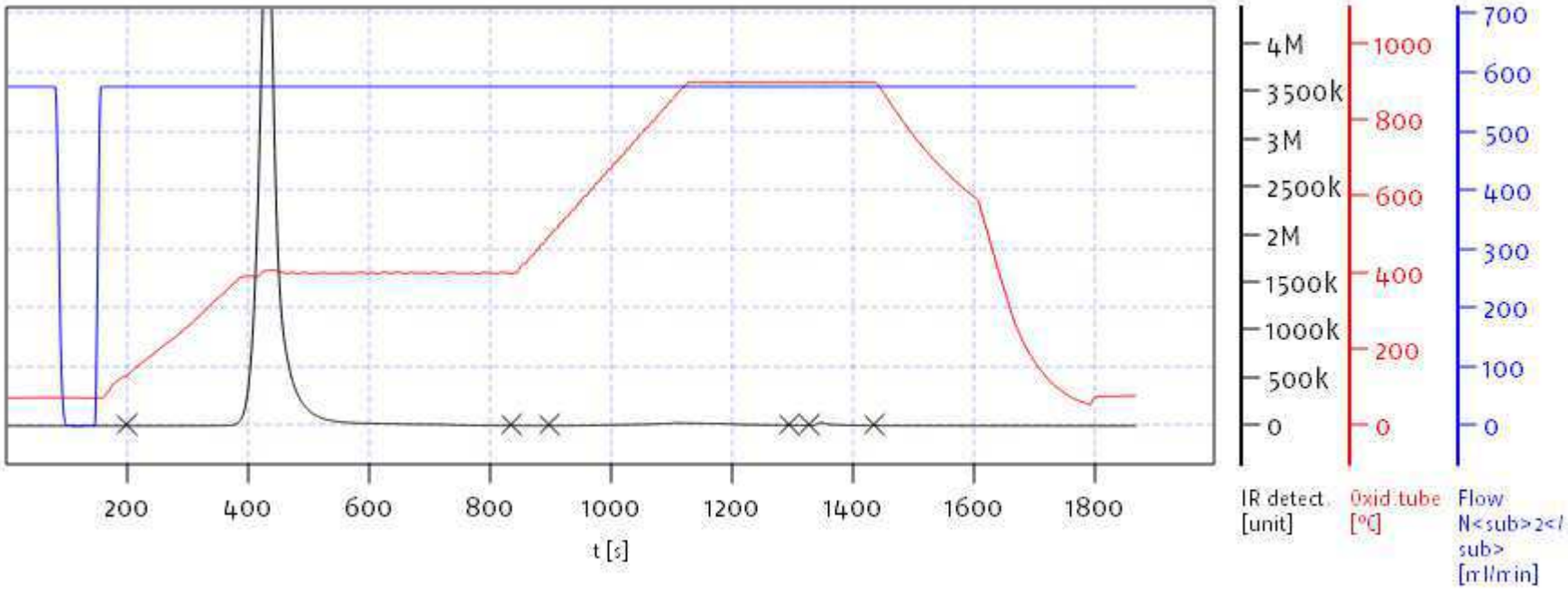
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
88	37	SJH0331-CCV7	27.10		1.00	CARBON	8/27/2021 12:34 PM	44.781	1.263	46.044	bl	7 306 970	214 316	42 302	0.9808	1.0000



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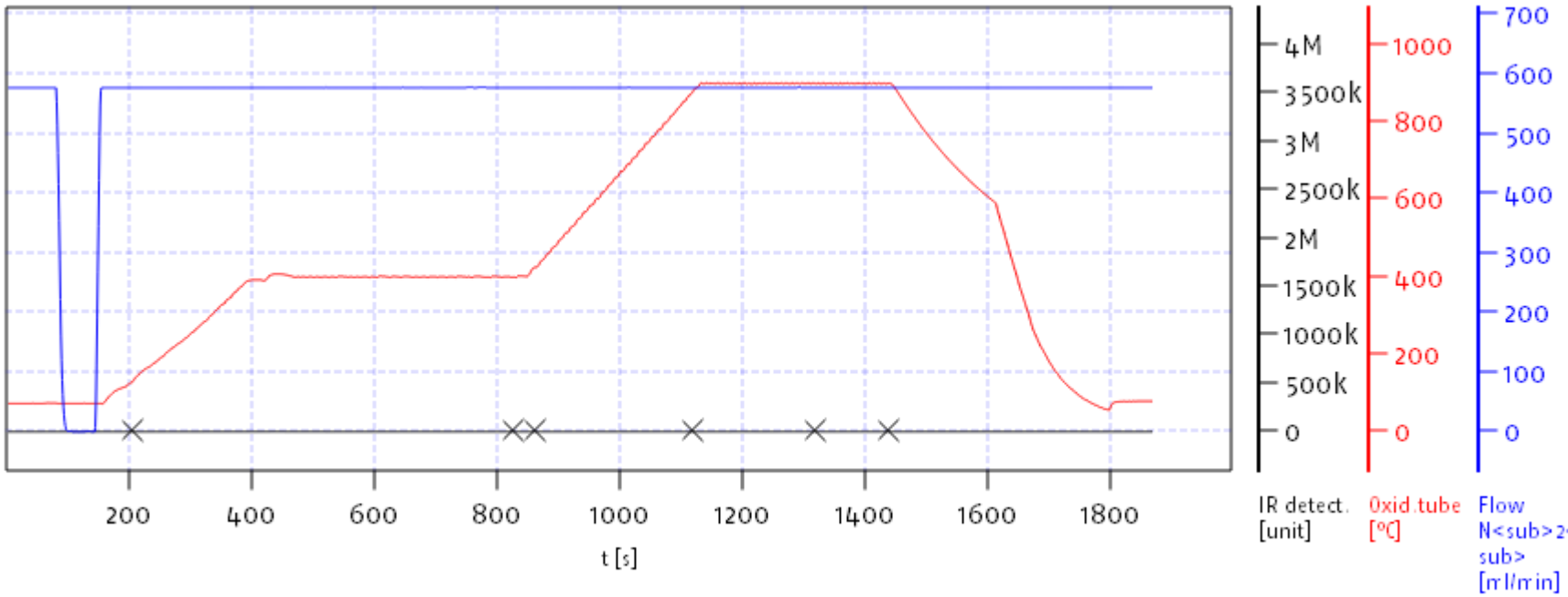
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
89	38	SJH0331-CCB7	695.50		1.00	CARBON	8/27/2021 1:06 PM	0.000	0.000	0.000	bl,C1u,C3u,C2u	1 587	48	62	0.9808	1.0000



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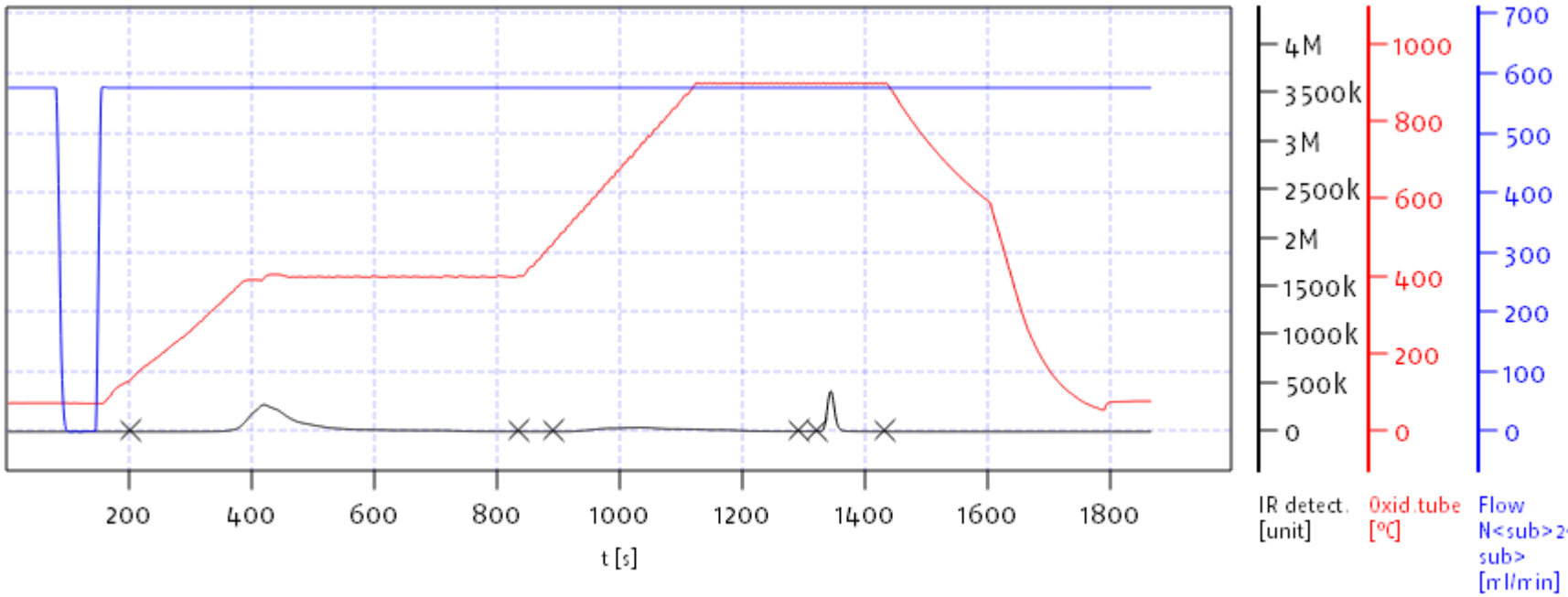
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
90	39	21H0184-04	393.70		1.00	CARBON	8/27/2021 1:38 PM	0.492	0.119	0.611	bl	963 846	288 789	225 300	0.9808	1.0000



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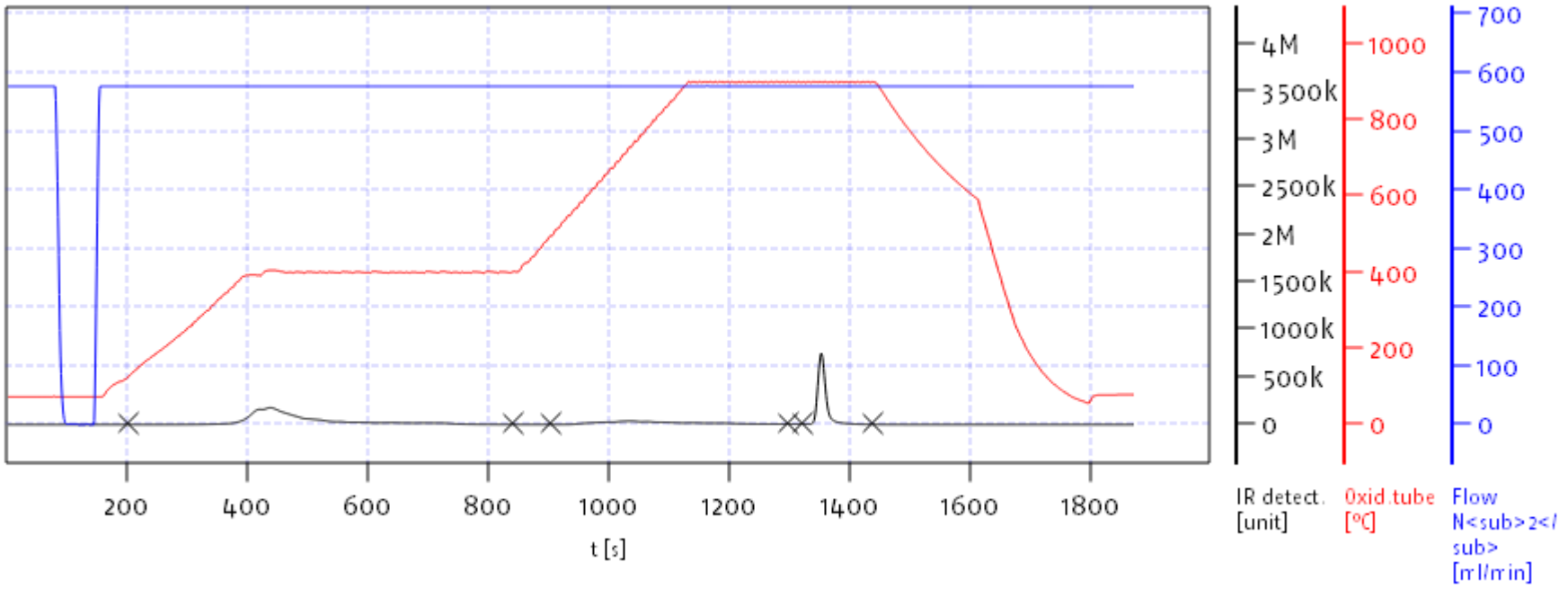
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
91	40	21H0184-05	349.50		1.00	CARBON	8/27/2021 2:09 PM	0.553	0.110	0.663	bl	744 608	240 260	437 124	0.9808	1.0000



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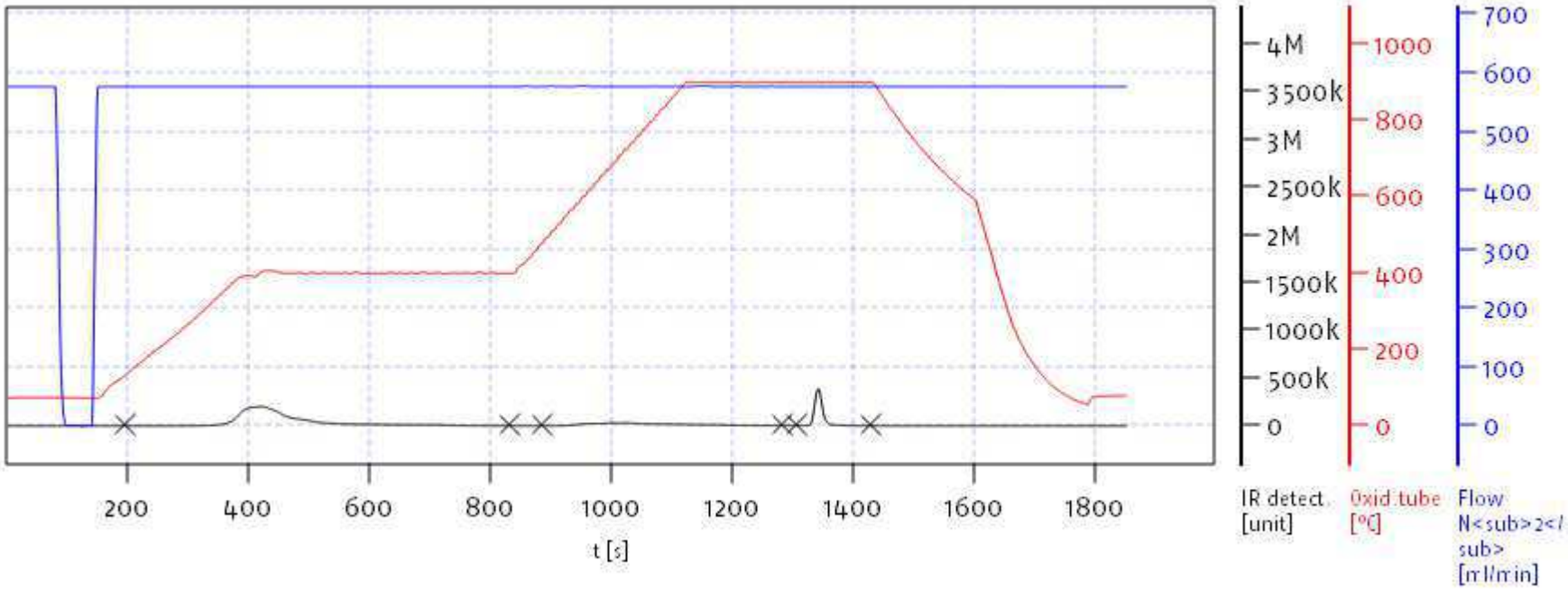
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
92	41	21H0184-06	341.10		1.00	CARBON	8/27/2021 2:41 PM	0.500	0.097	0.596	bl	825 519	206 956	222 455	0.9808	1.0000



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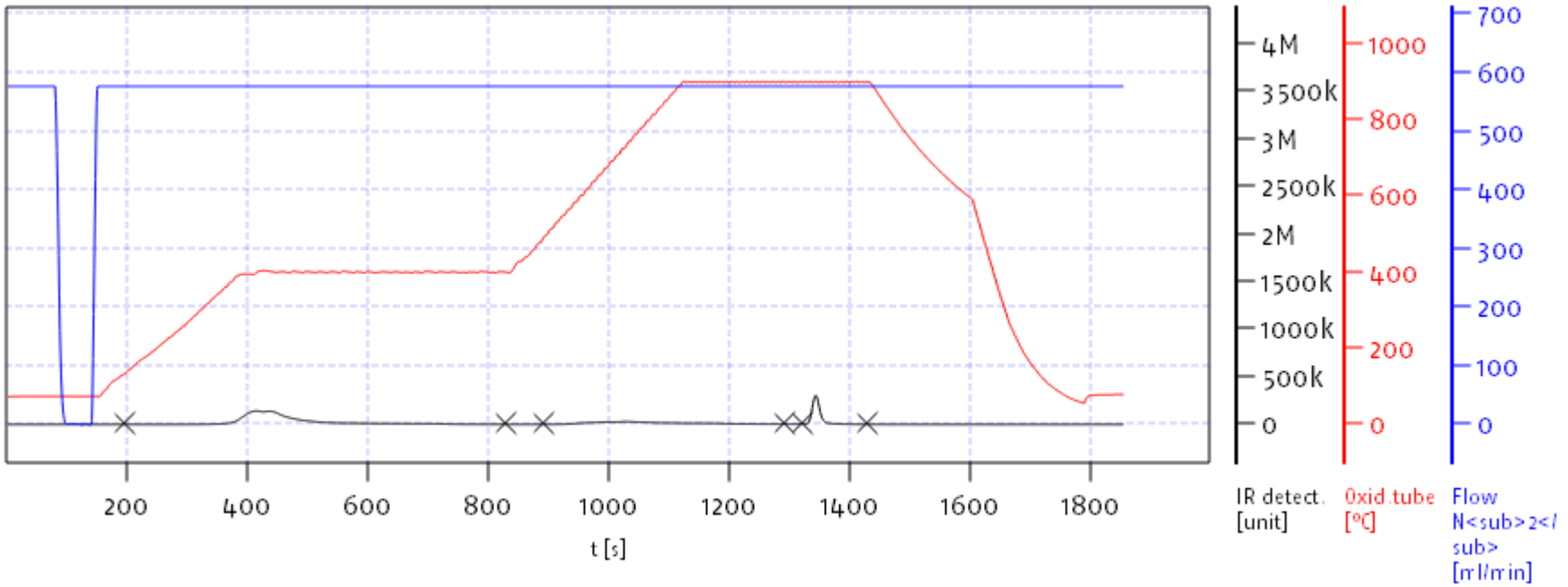
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
93	42	21H0184-07	370.40		1.00	CARBON	8/27/2021 3:12 PM	0.322	0.082	0.404	bl	564 895	191 885	174 826	0.9808	1.0000



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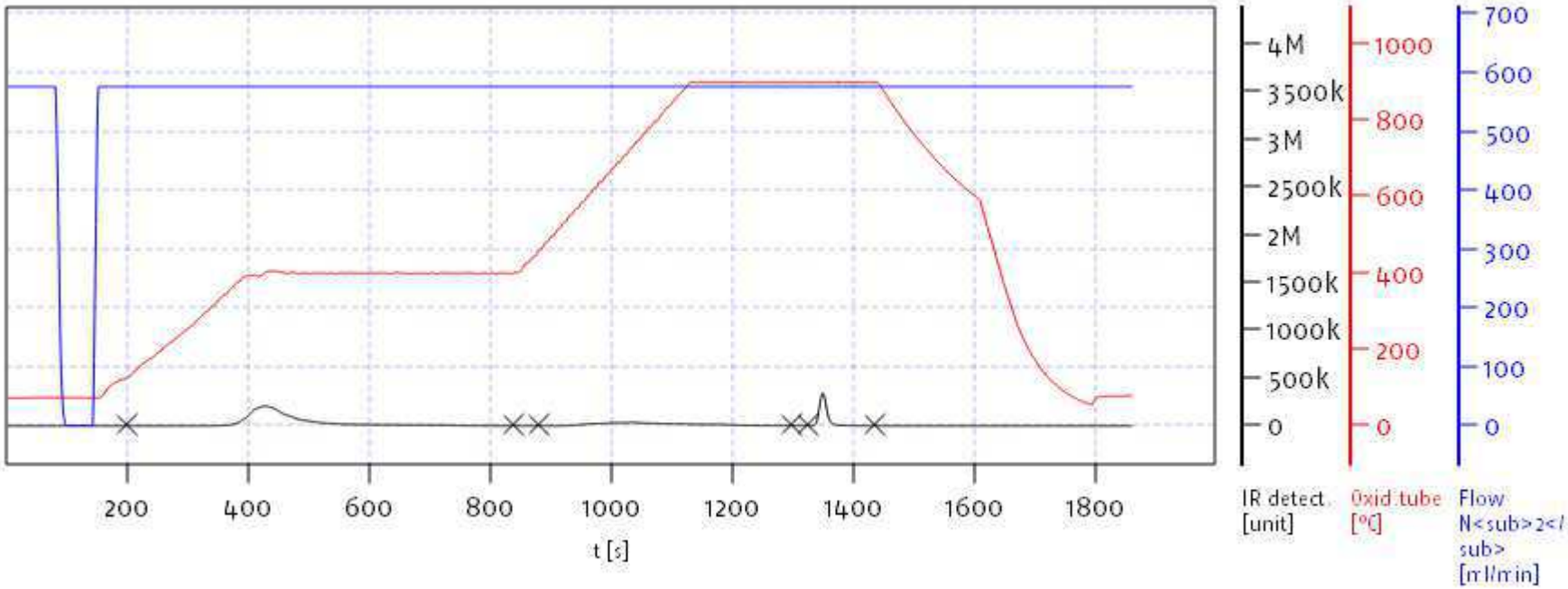
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
94	43	21H0184-08	373.40		1.00	CARBON	8/27/2021 3:44 PM	0.392	0.102	0.494	bl	713 486	236 589	189 620	0.9808	1.0000



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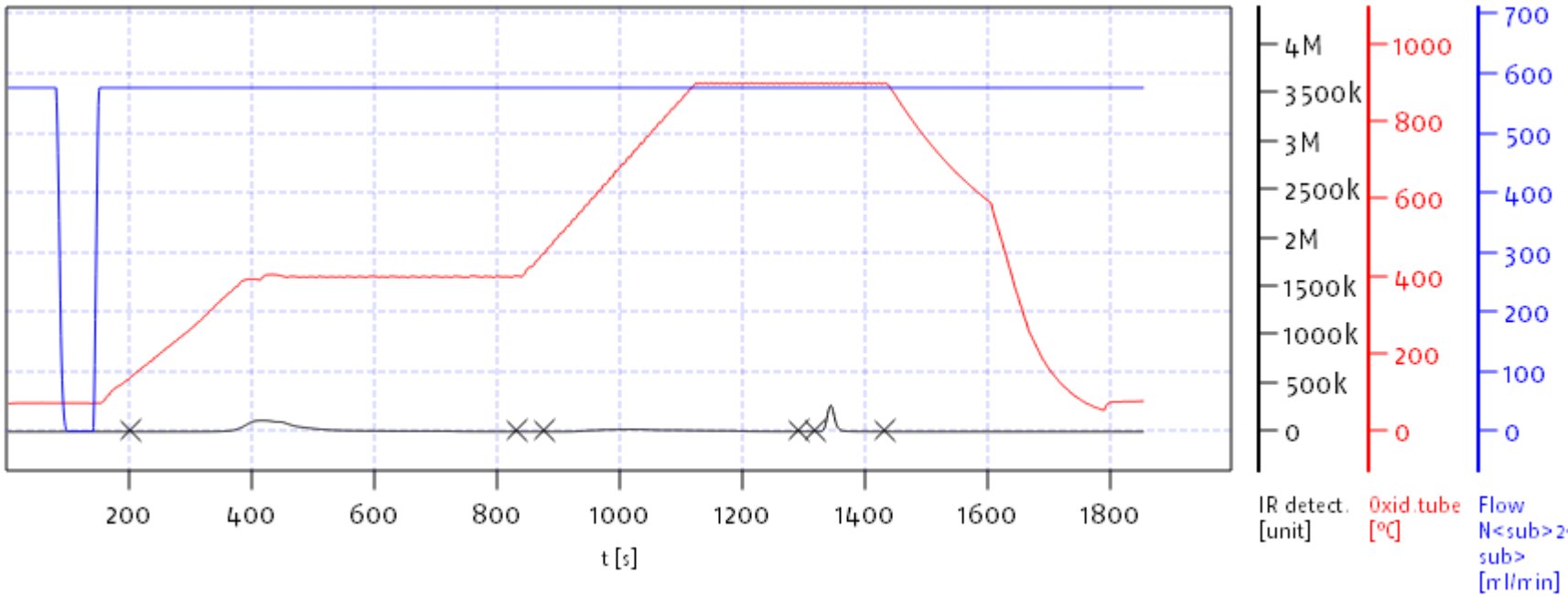
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
95	44	21H0184-09	358.60		1.00	CARBON	8/27/2021 4:15 PM	0.276	0.069	0.345	bl	469 728	158 825	148 800	0.9808	1.0000



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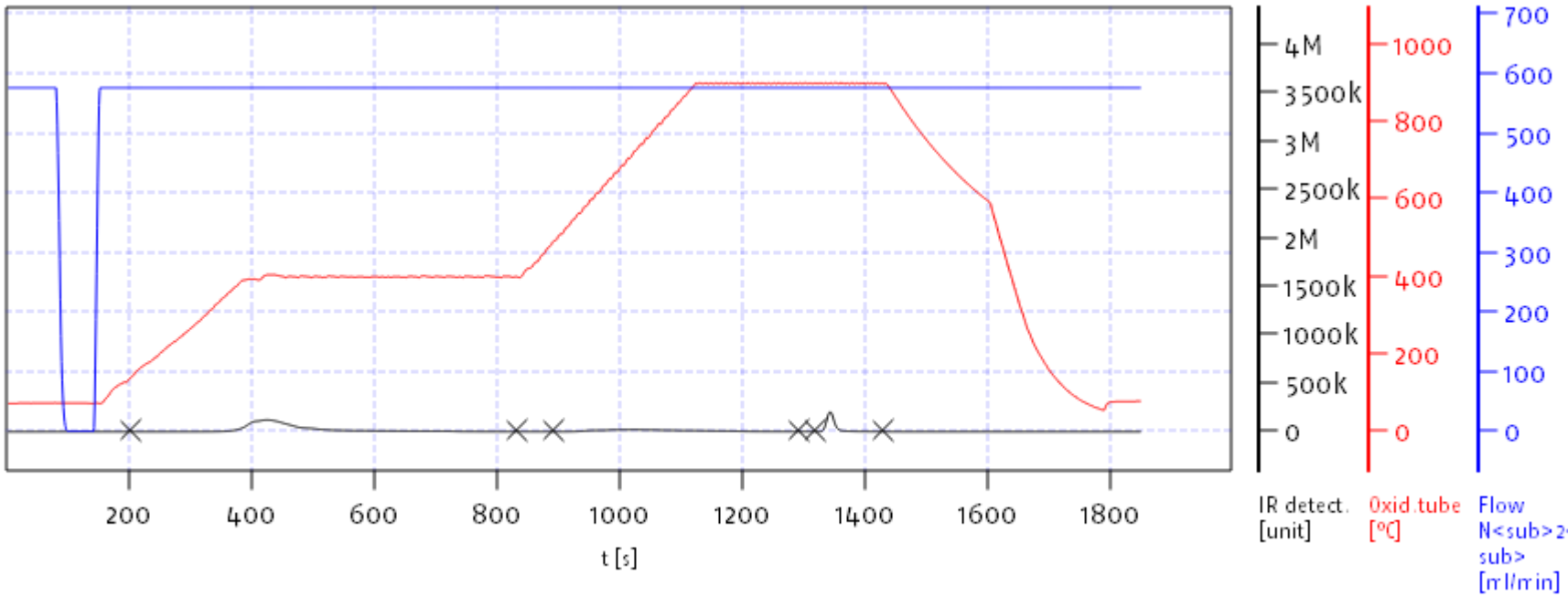
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
96	45	21H0184-10	306.60		1.00	CARBON	8/27/2021 4:46 PM	0.298	0.071	0.369	bl	455 082	139 894	117 552	0.9808	1.0000



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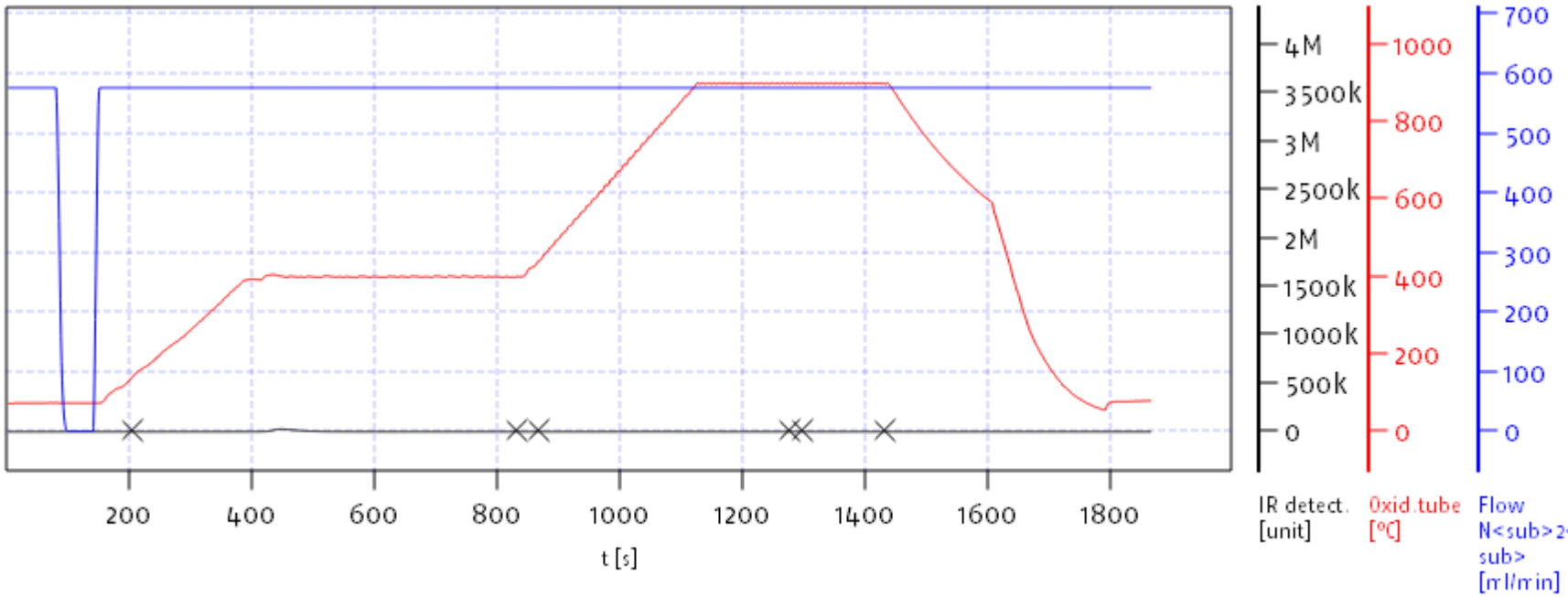
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
97	46	BJH0513-MRL1	500.20		1.00	CARBON	8/27/2021 5:18 PM	0.013	0.000	0.013	bl,C3u,C2u	51 185	4 331	286	0.9808	1.0000



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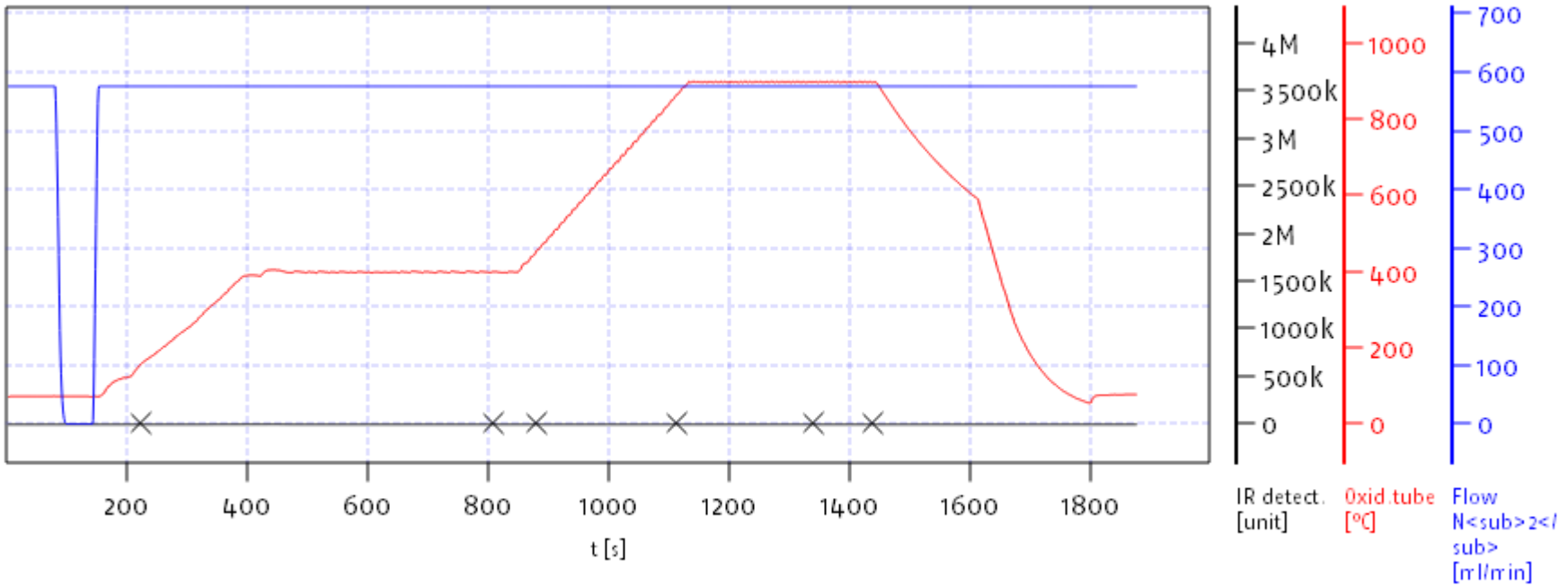
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
98	47	BJH0513-BLK1	571.50		1.00	CARBON	8/27/2021 5:50 PM	0.000	0.000	0.000	bl,C1u,C3u,C2u	7 247	601	259	0.9808	1.0000



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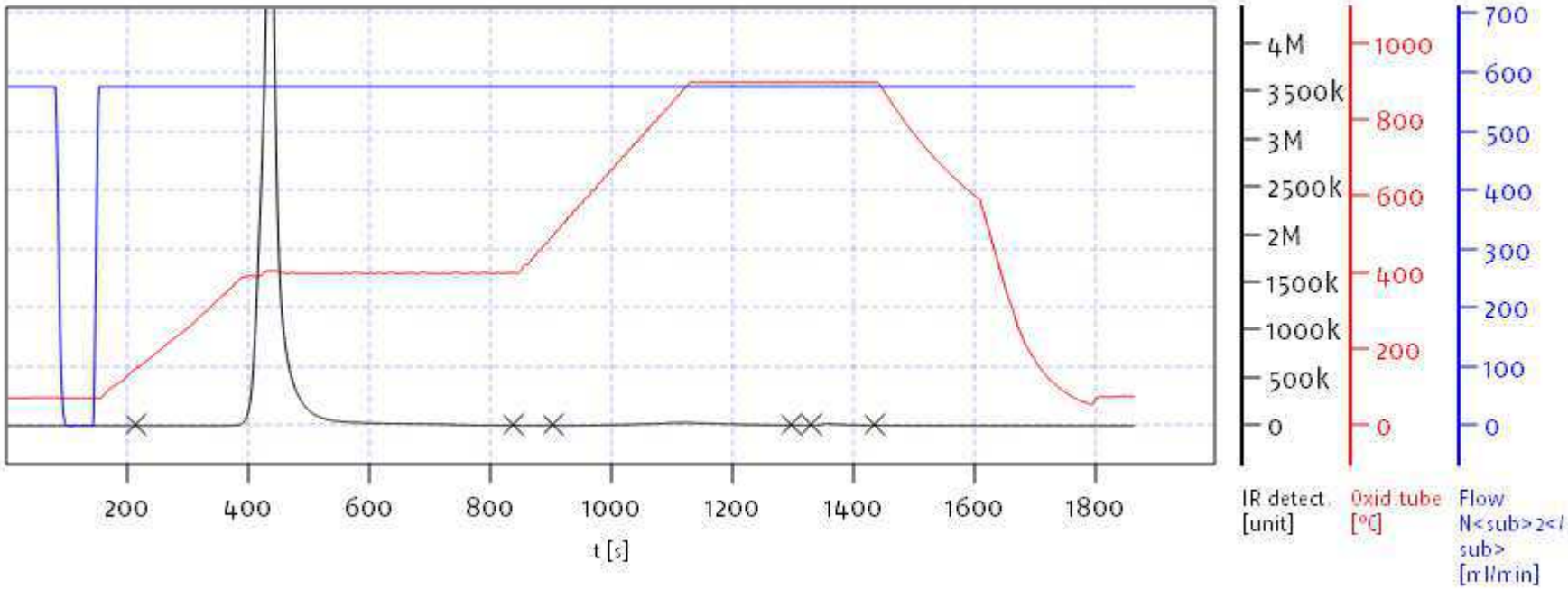
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
99	48	BJH0513-BS1	25.20		1.00	CARBON	8/27/2021 6:21 PM	44.727	1.438	46.165	bl	6 784 580	226 203	42 714	0.9808	1.0000



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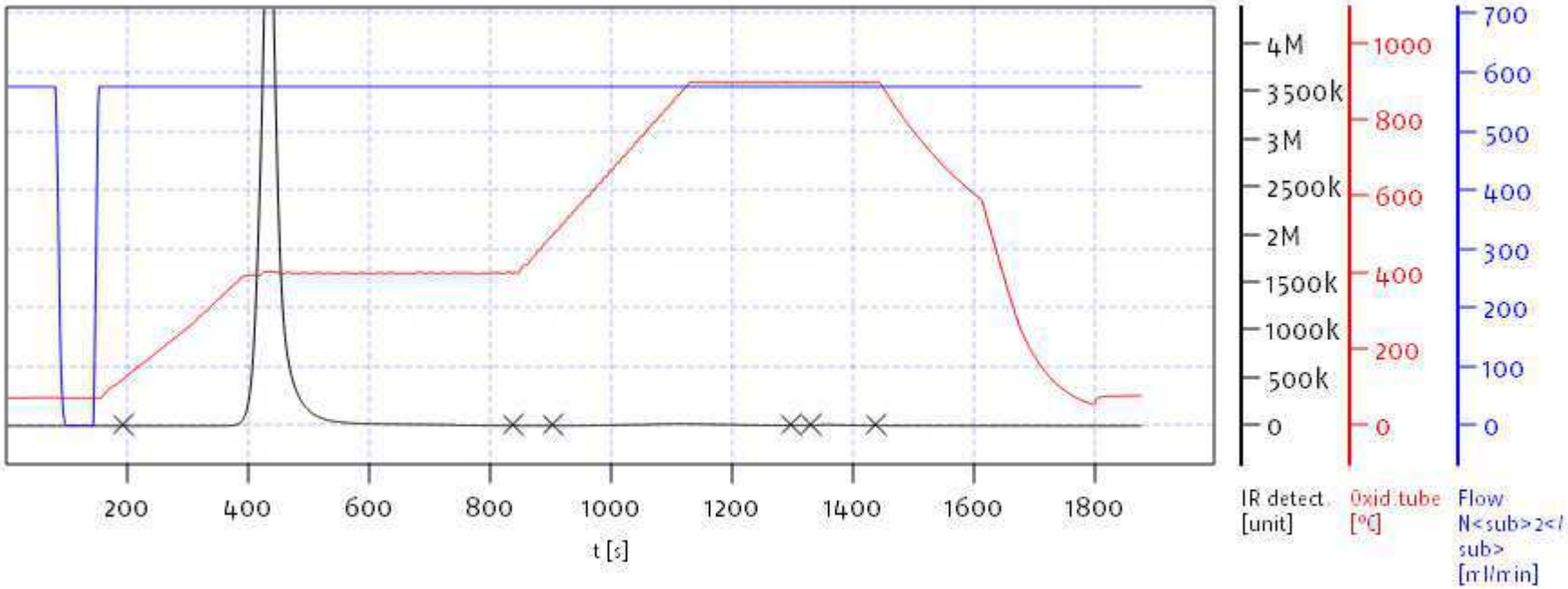
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
100	49	SJH0331-CCV8	26.70		1.00	CARBON	8/27/2021 6:53 PM	45.580	0.857	46.437	bl	7 346 060	147 195	24 181	0.9808	1.0000



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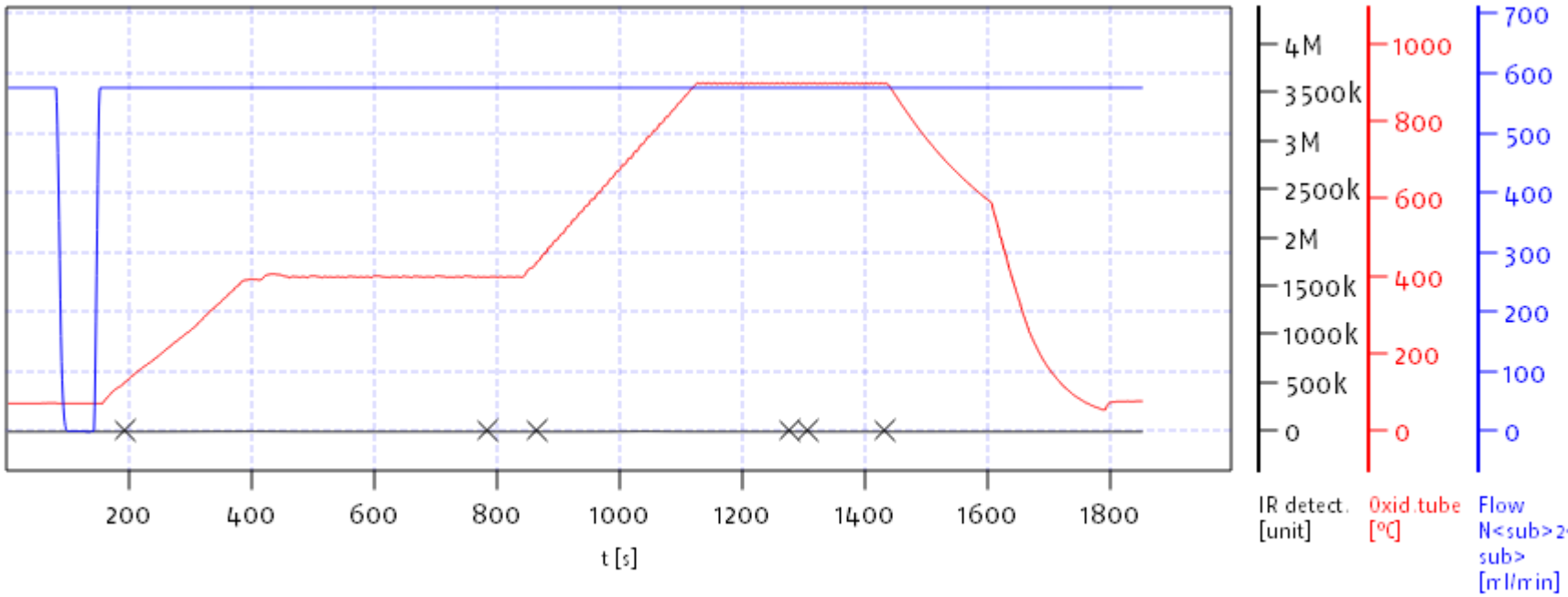
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
101	50	SJH0331-CCB8	587.00		1.00	CARBON	8/27/2021 7:24 PM	0.001	0.000	0.001	bl,C2u	16 174	10 034	388	0.9808	1.0000



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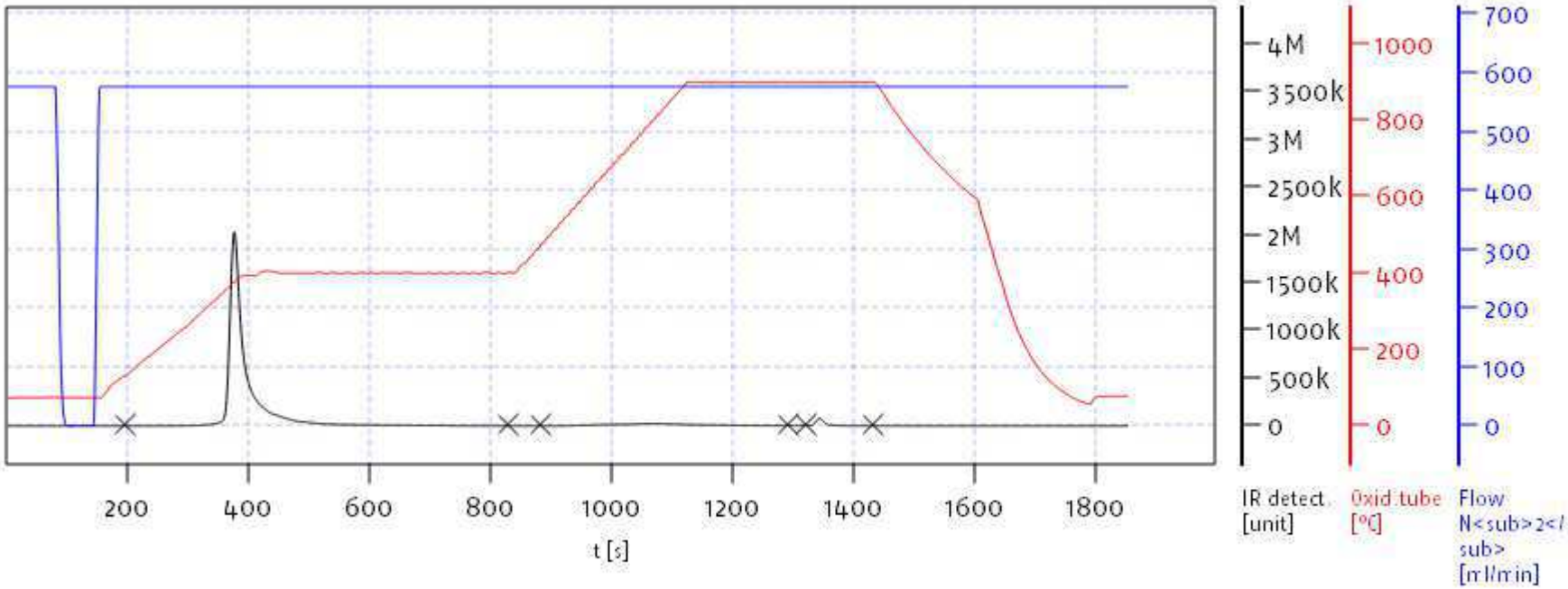
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
102	51	21H0103-01	107.50		1.00	CARBON	8/27/2021 7:56 PM	3.481	0.212	3.693	bl	2 231 660	146 521	50 144	0.9808	1.0000



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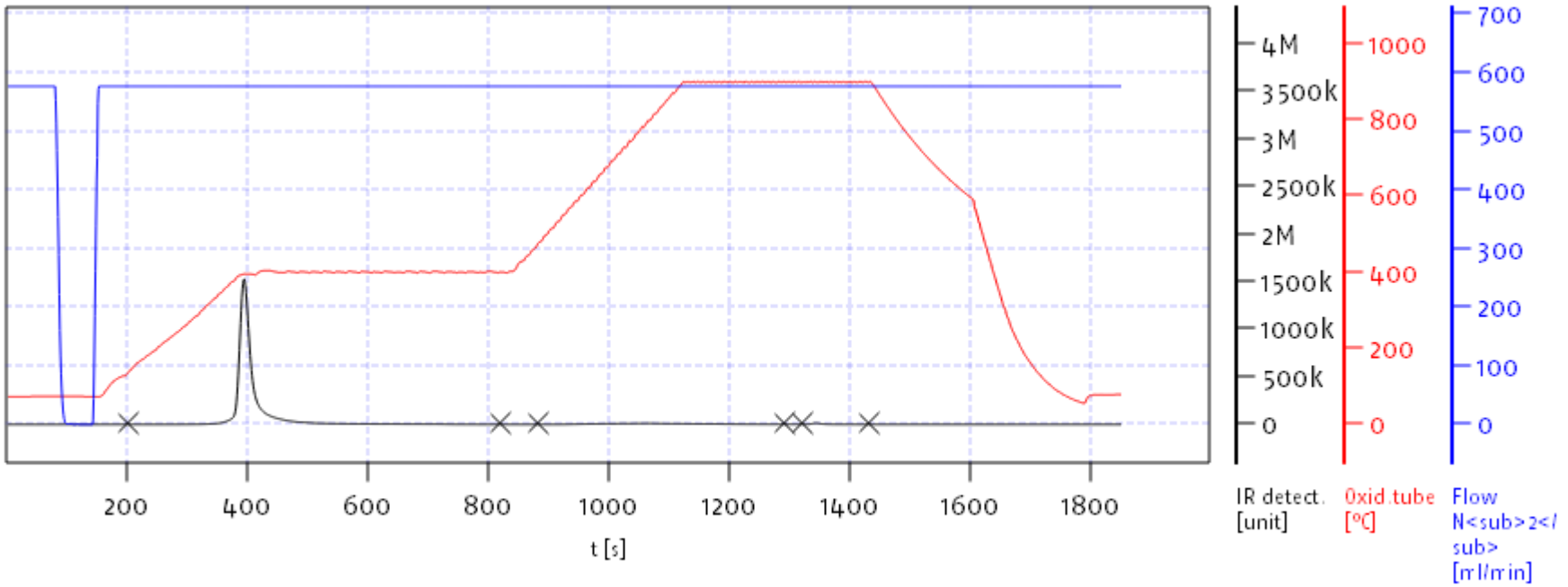
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
103	52	21H0103-02	115.30		1.00	CARBON	8/27/2021 8:27 PM	2.022	0.095	2.118	bl	1 419 470	76 665	11 001	0.9808	1.0000



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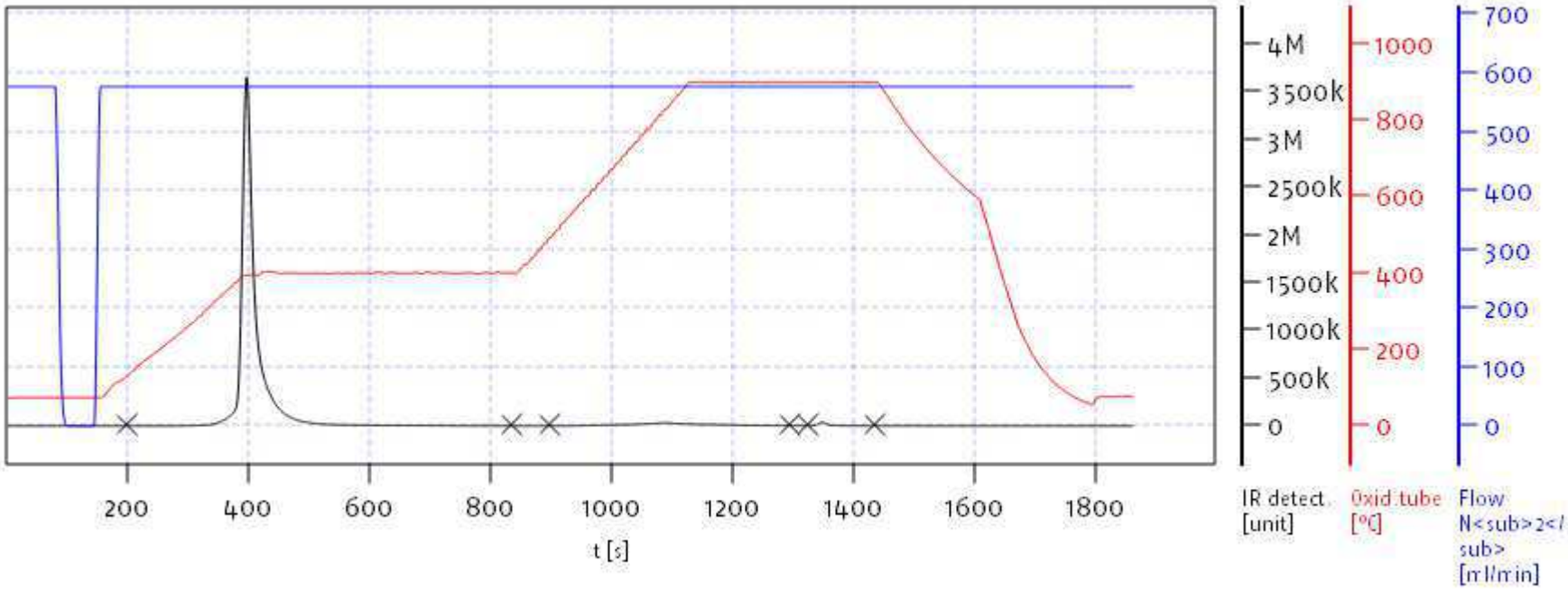
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
104	53	21H0103-03	107.10		1.00	CARBON	8/27/2021 8:59 PM	5.418	0.247	5.665	bl	3 497 970	168 576	28 083	0.9808	1.0000



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Date: Tue Aug 31 14:32:59 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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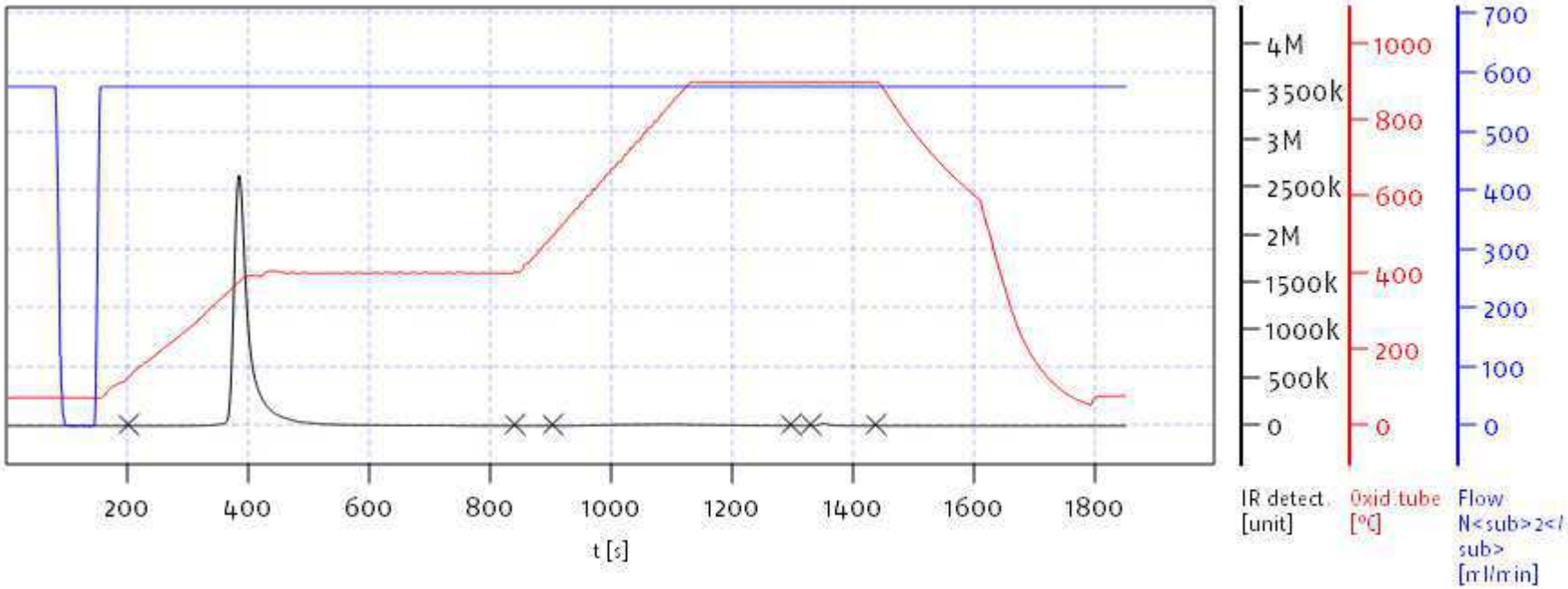
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
105	54	21H0103-04	149.90		1.00	CARBON	8/27/2021 9:30 PM	3.161	0.124	3.285	bl	2 864 670	121 706	19 422	0.9808	1.0000



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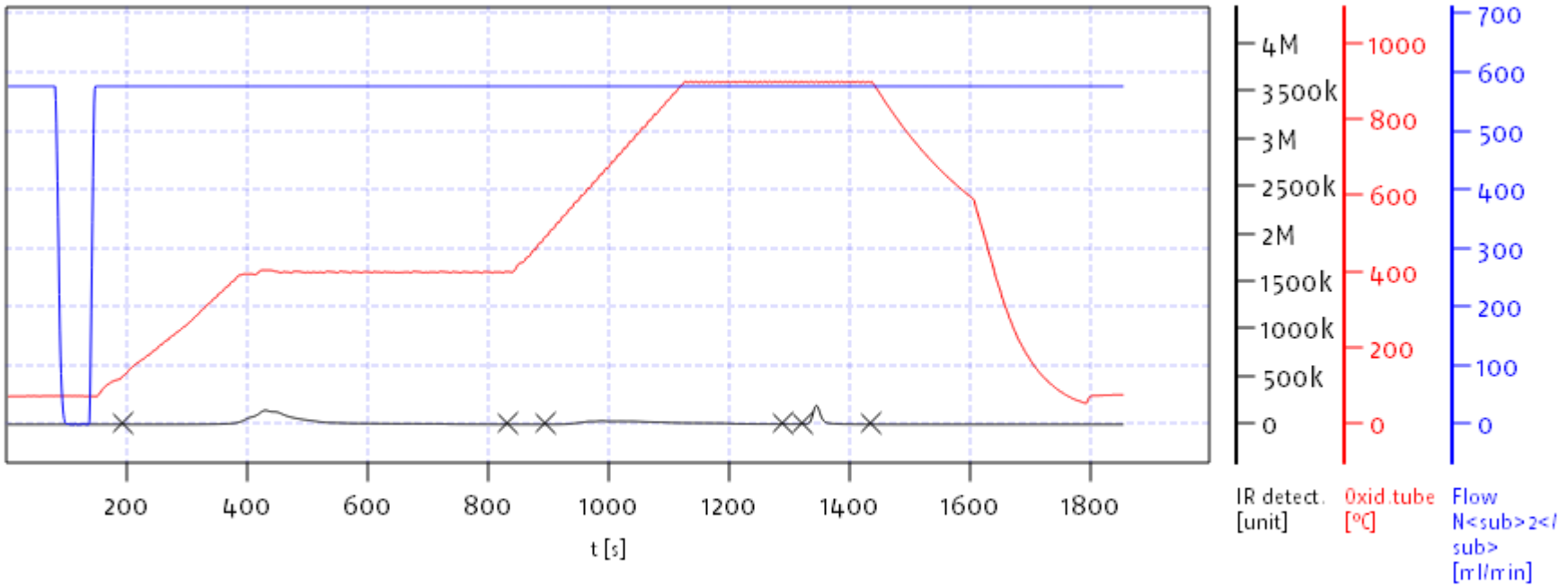
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
106	55	21H0176-01	541.00		1.00	CARBON	8/27/2021 10:01 PM	0.188	0.072	0.260	bl	515 890	241 787	120 500	0.9808	1.0000



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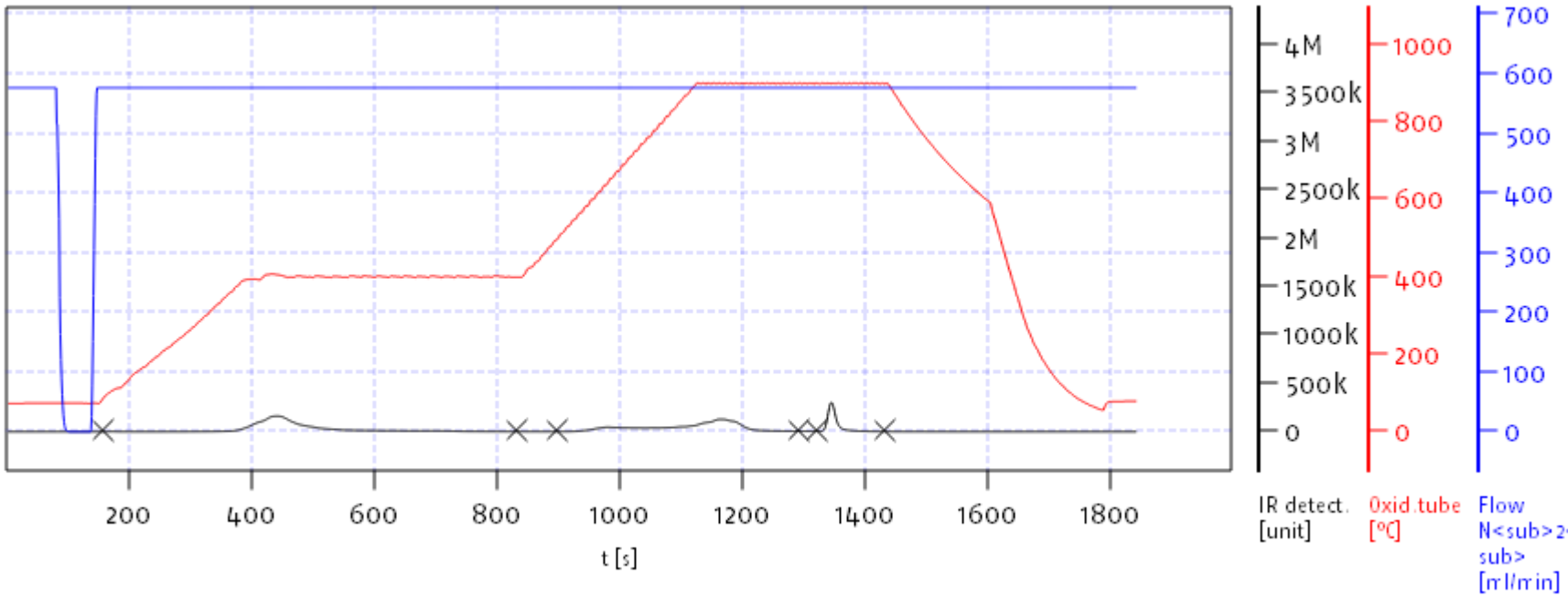
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
107	56	BJH0513-DUP1	581.10		1.00	CARBON	8/27/2021 10:33 PM	0.213	0.178	0.390	bl	577 819	622 448	187 712	0.9808	1.0000



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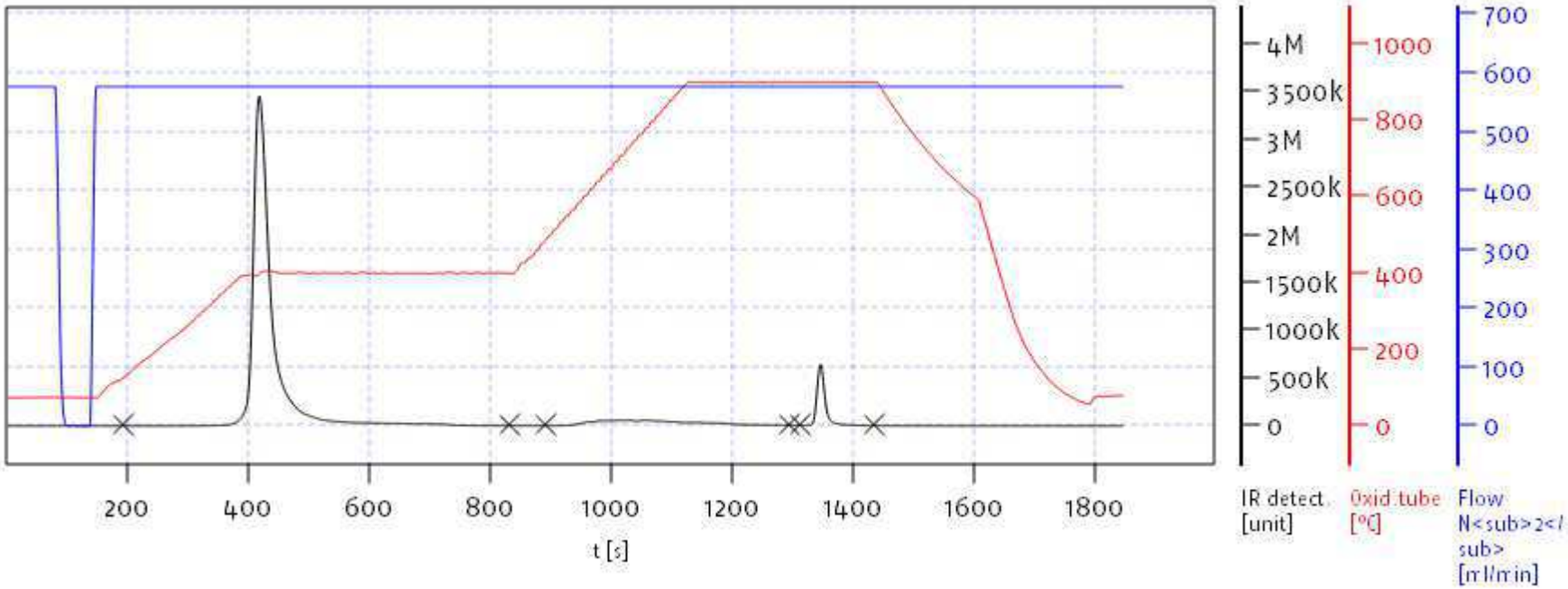
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
108	57	BJH0513-MS1	676.20	0.0142	1.00	CARBON	8/27/2021 11:04 PM	1.188	0.112	1.300	bl	4 484 310	458 939	382 479	0.9808	1.0000



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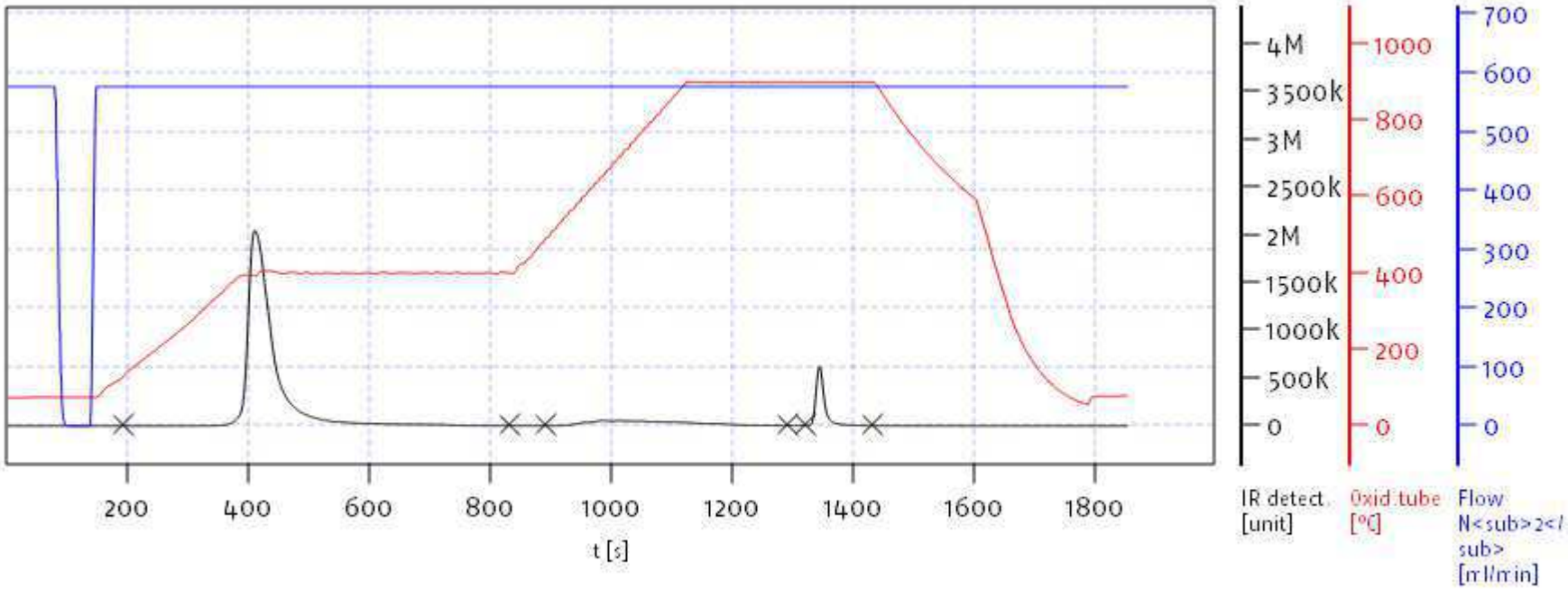
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
109	58	BJH0513-MSD1	535.30	0.0122	1.00	CARBON	8/27/2021 11:35 PM	1.231	0.124	1.355	bl	3 614 900	405 006	377 980	0.9808	1.0000



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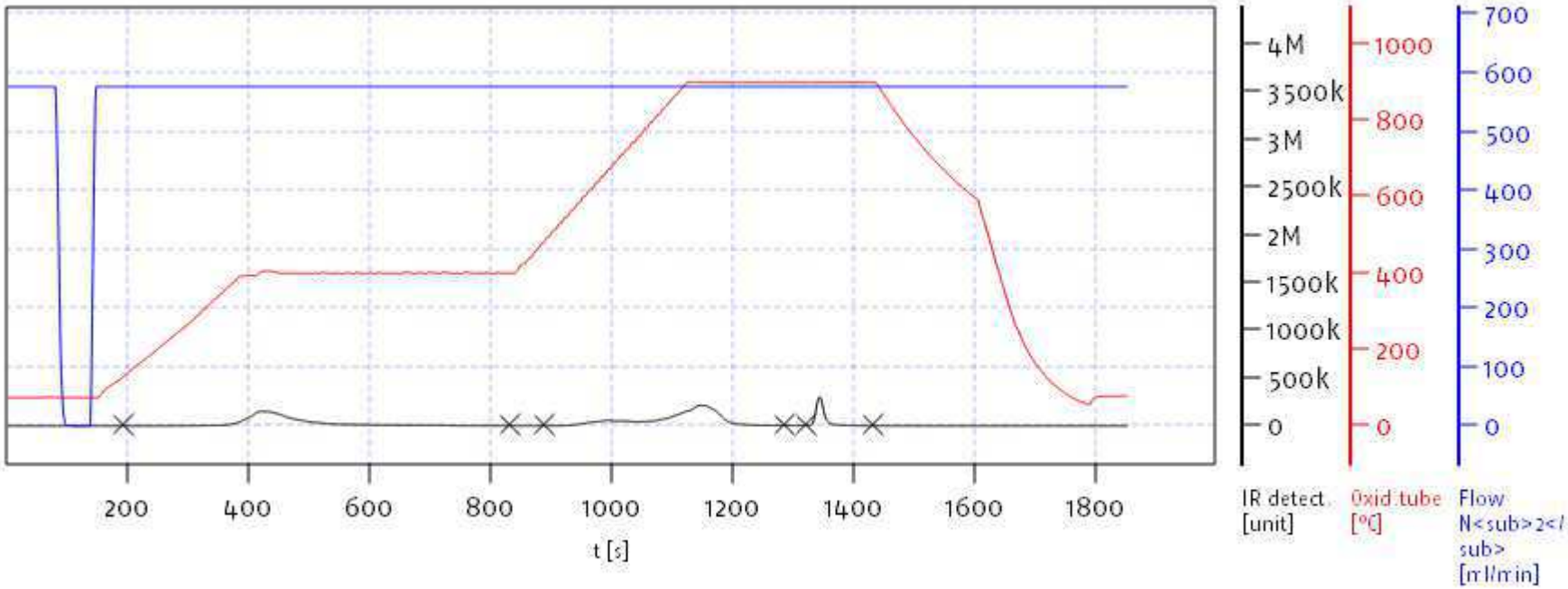
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
110	59	21H0176-02	541.10		1.00	CARBON	8/28/2021 12:07 AM	0.228	0.268	0.496	bl	581 433	870 357	184 279	0.9808	1.0000



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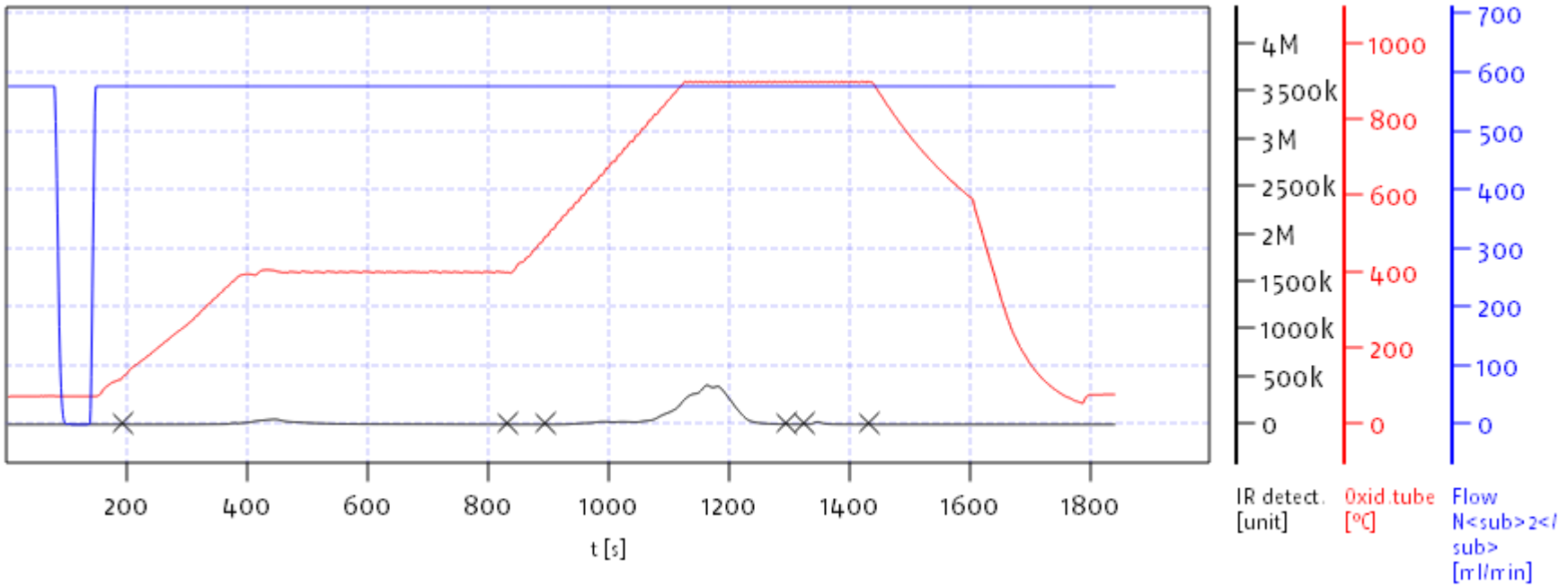
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
111	60	21H0176-03	416.50		1.00	CARBON	8/28/2021 12:38 AM	0.077	0.631	0.708	bl	197 028	1 568 240	20 300	0.9808	1.0000



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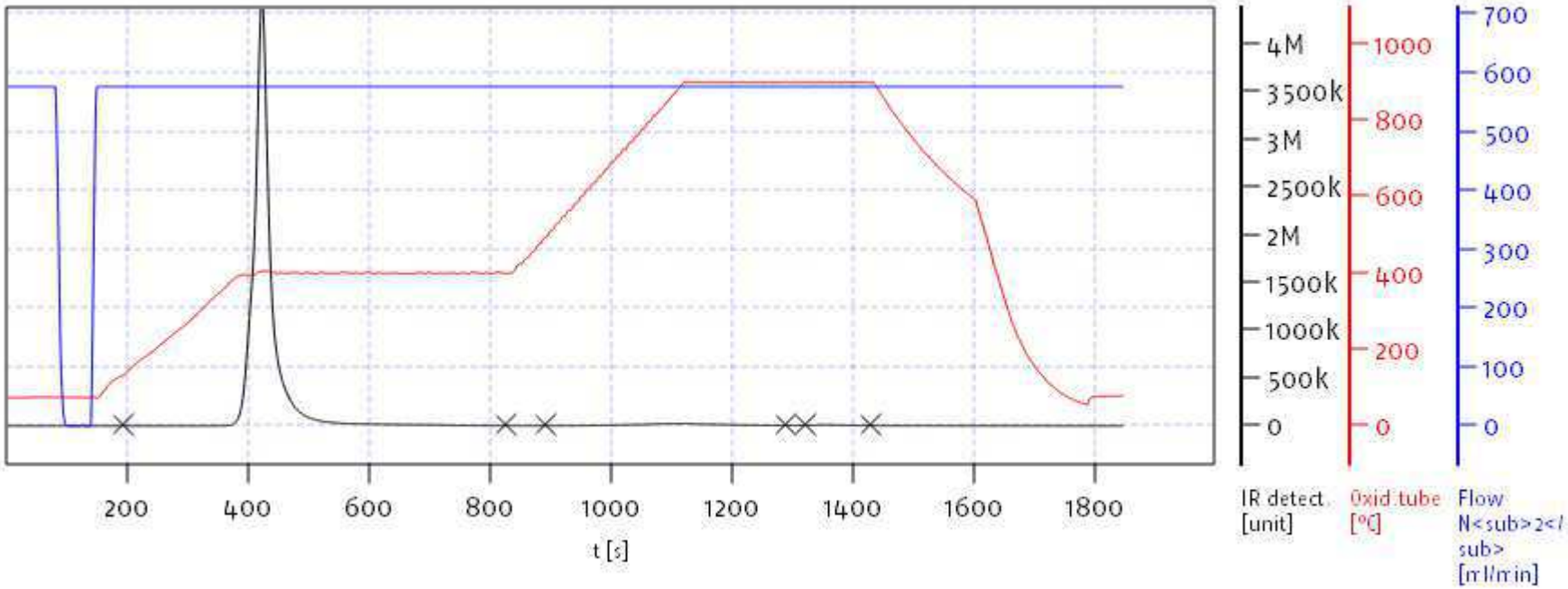
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
112	61	SJH0331-CCV9	20.30		1.00	CARBON	8/28/2021 1:09 AM	43.170	1.200	44.370	bl	5 288 560	155 914	25 110	0.9808	1.0000



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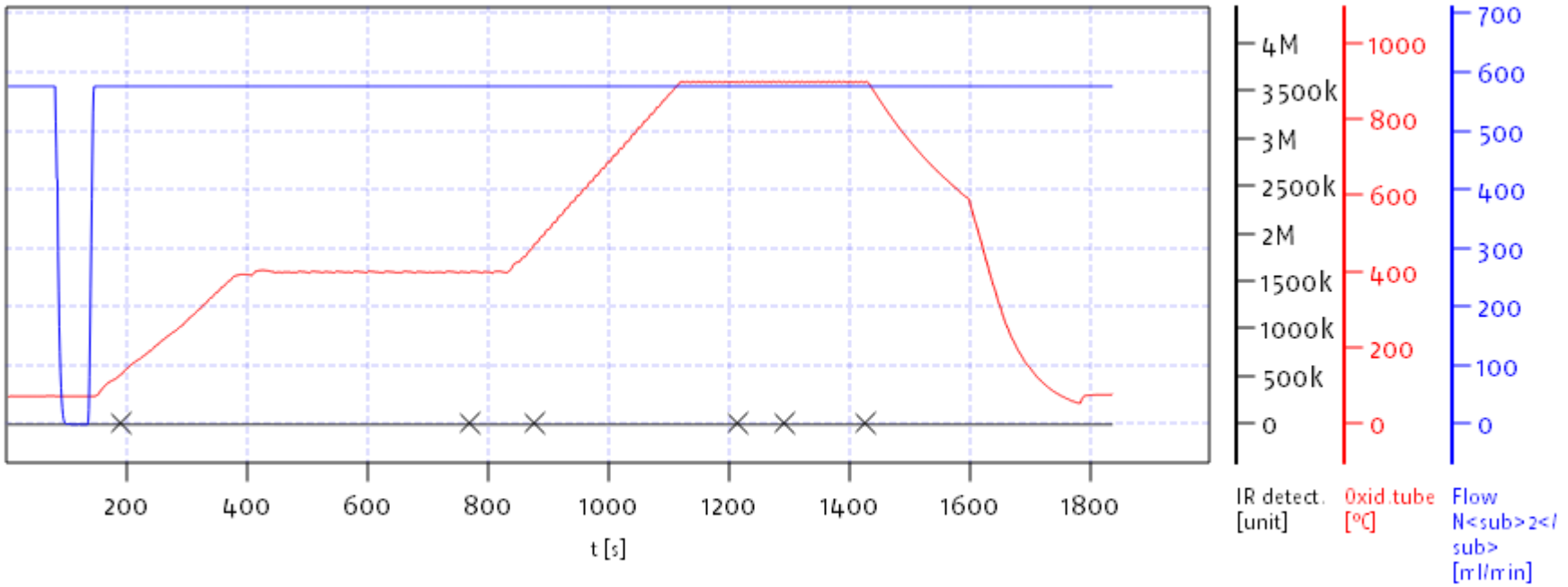
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
113	62	SJH0331-CCB9	597.10		1.00	CARBON	8/28/2021 1:40 AM	0.000	0.000	0.000	bl,C1u,C3u,C2u	2 135	522	52	0.9808	1.0000



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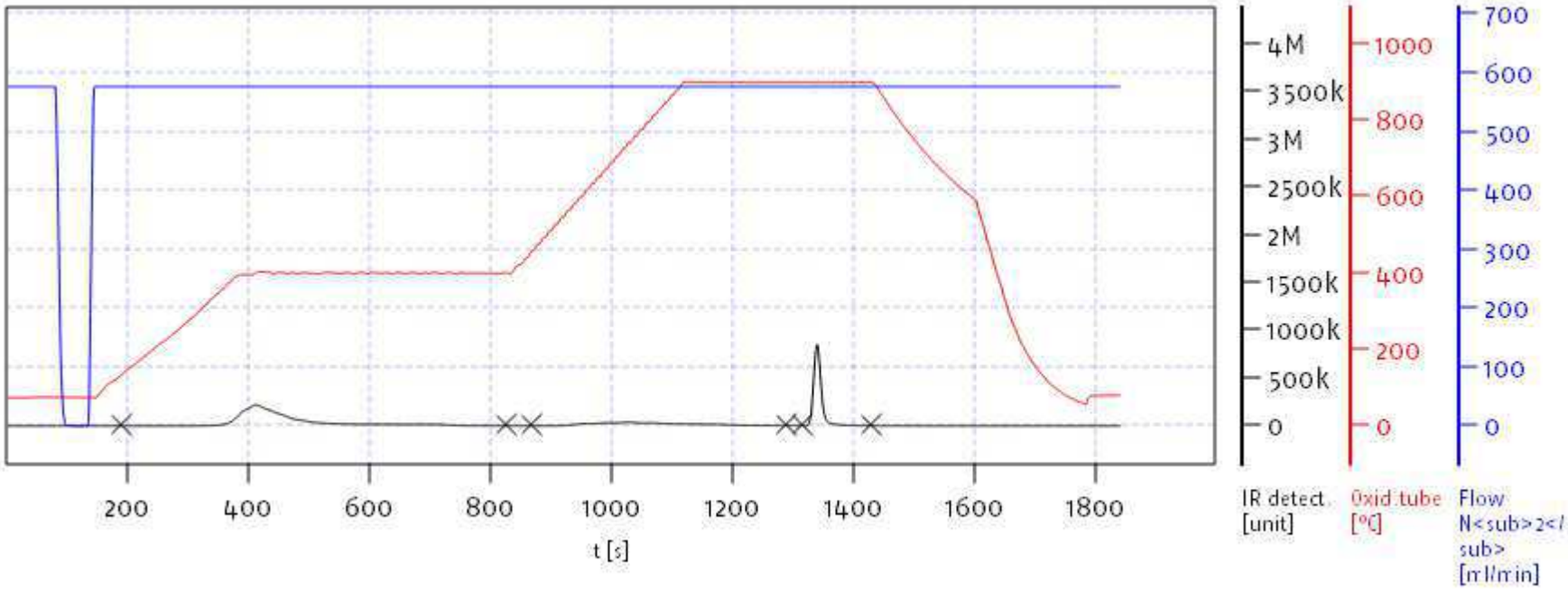
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
114	63	21H0184-11	319.30		1.00	CARBON	8/28/2021 2:11 AM	0.657	0.131	0.788	bl	812 426	258 742	468 624	0.9808	1.0000



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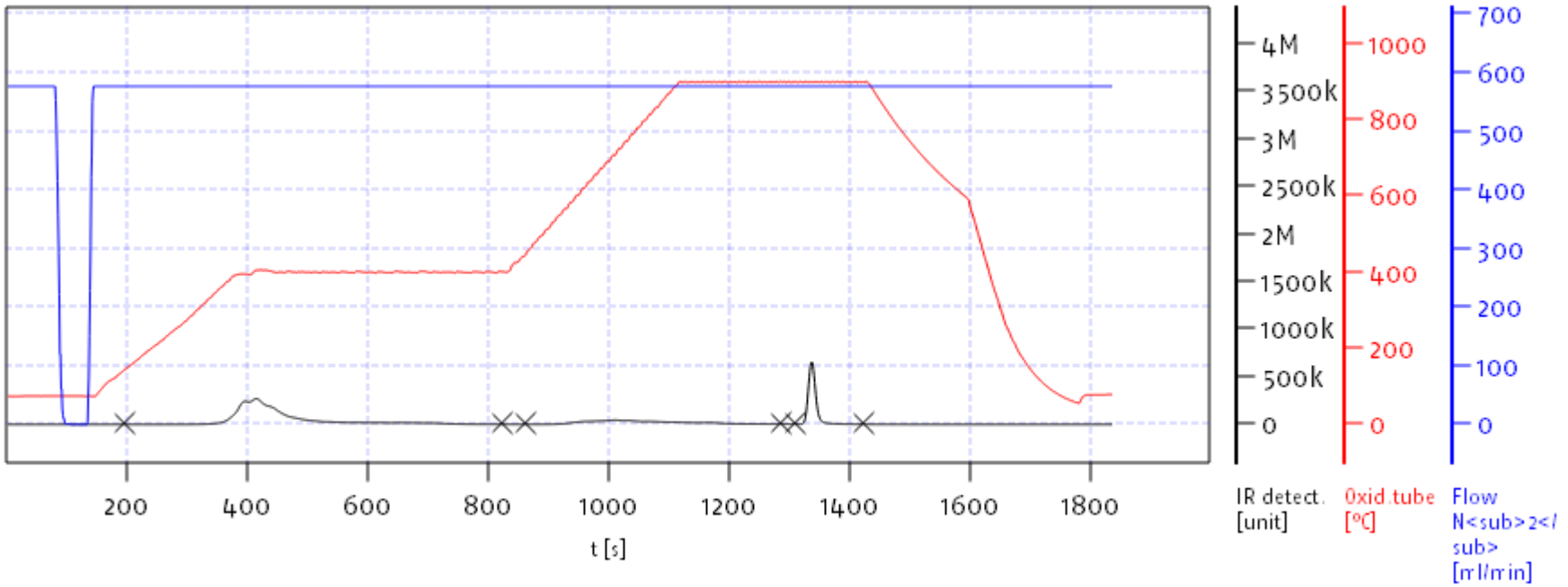
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
115	64	BJH0513-DUP3	383.80		1.00	CARBON	8/28/2021 2:42 AM	0.561	0.127	0.688	bl	960 731	300 644	356 407	0.9808	1.0000



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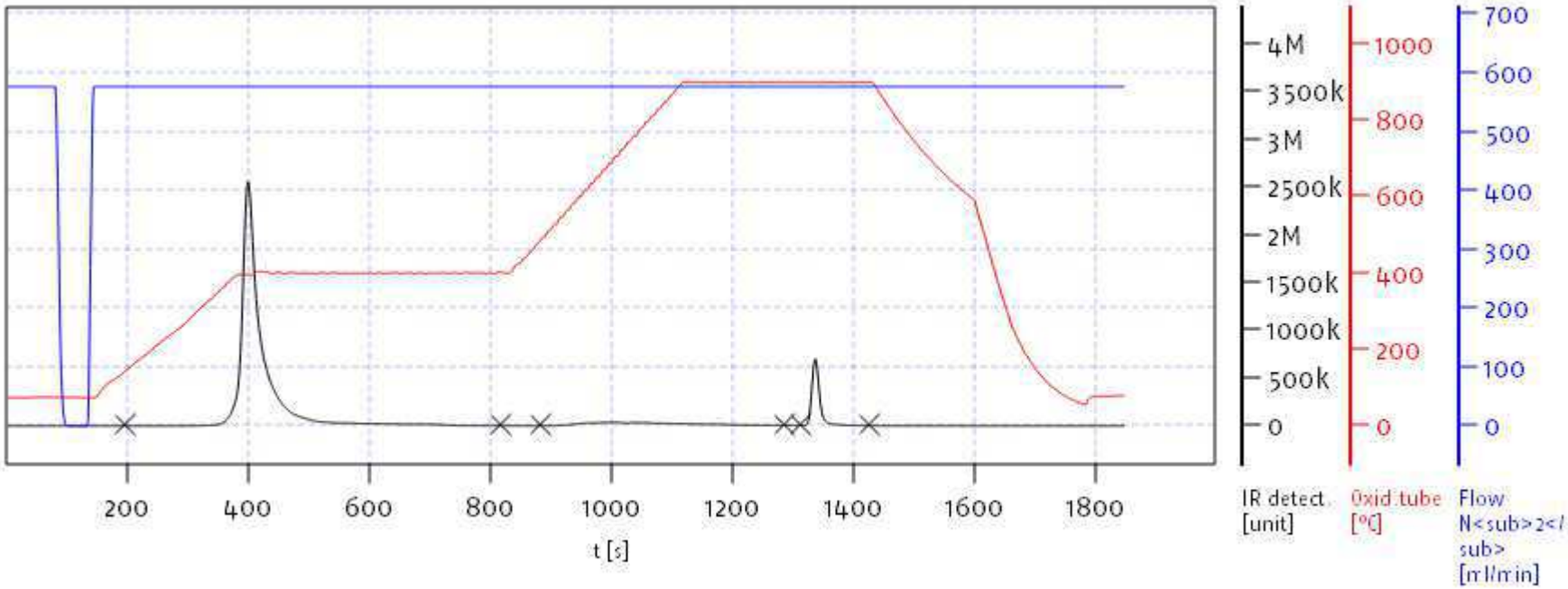
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
116	65	BJH0513-MS3	313.40	0.0104	1.00	CARBON	8/28/2021 3:13 AM	2.034	0.150	2.185	bl	3 467 590	290 894	396 867	0.9808	1.0000



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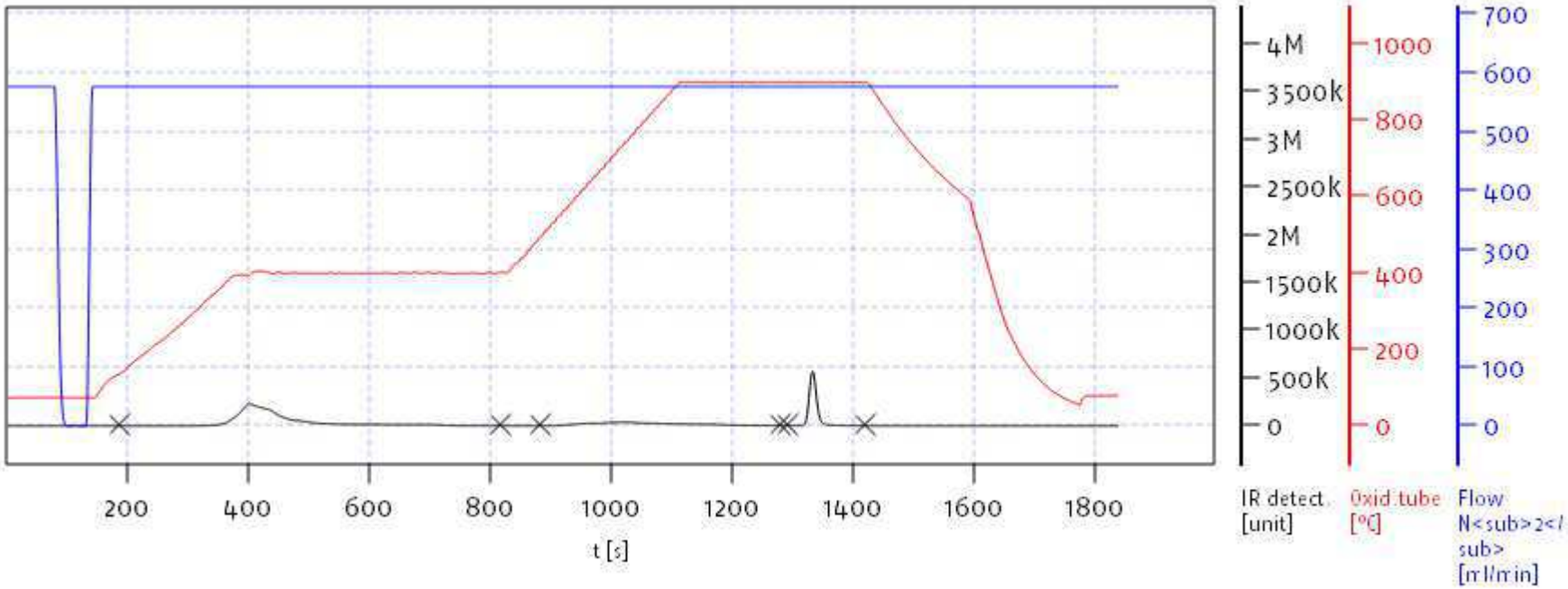
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
117	66	21H0184-12	306.00		1.00	CARBON	8/28/2021 3:45 AM	0.585	0.135	0.720	bl	786 153	255 459	312 050	0.9808	1.0000



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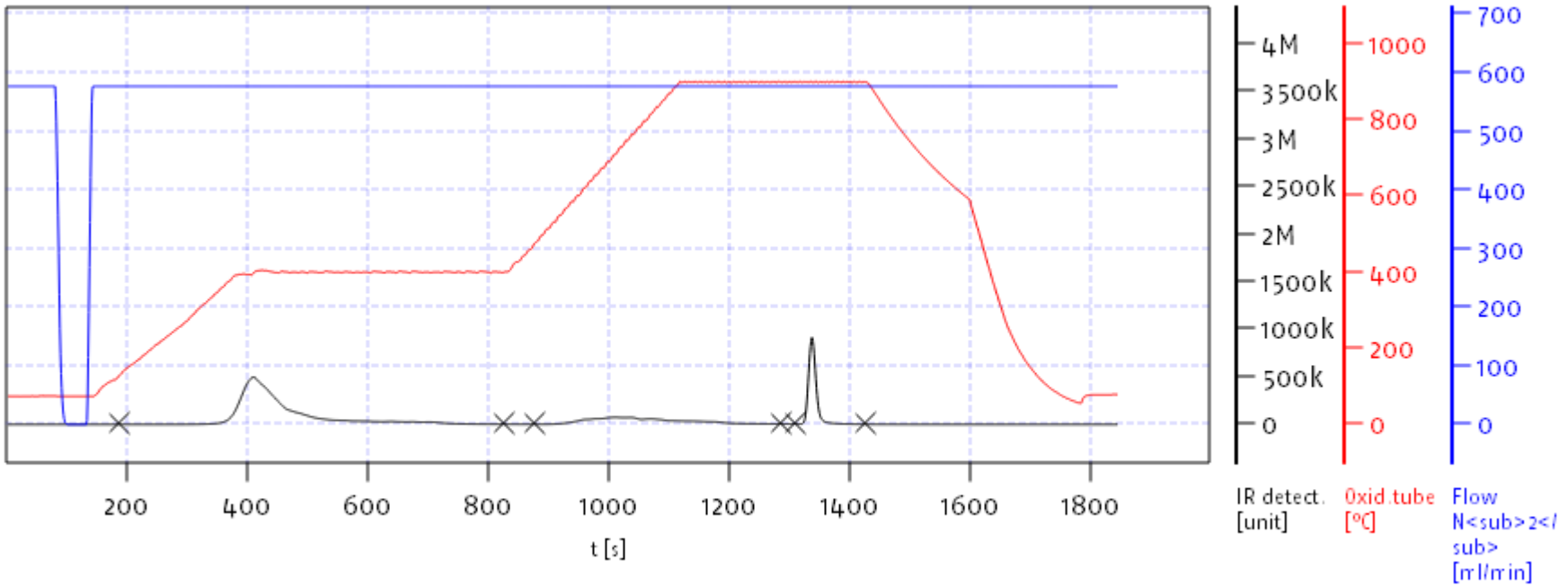
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
118	67	21H0184-13	597.90		1.00	CARBON	8/28/2021 4:16 AM	0.589	0.140	0.729	bl	1 637 950	506 802	502 418	0.9808	1.0000



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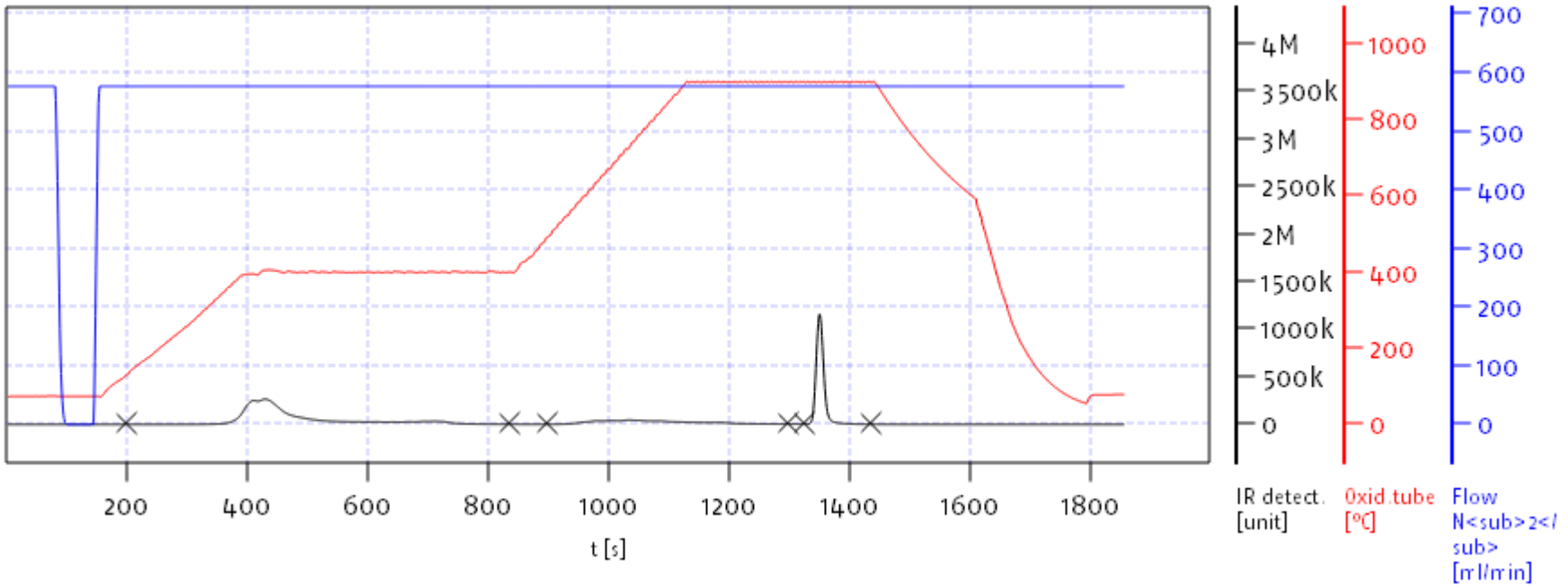
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
119	68	21H0184-14	283.00		1.00	CARBON	8/28/2021 4:47 AM	0.977	0.184	1.160	bl	1 042 850	319 175	637 140	0.9808	1.0000



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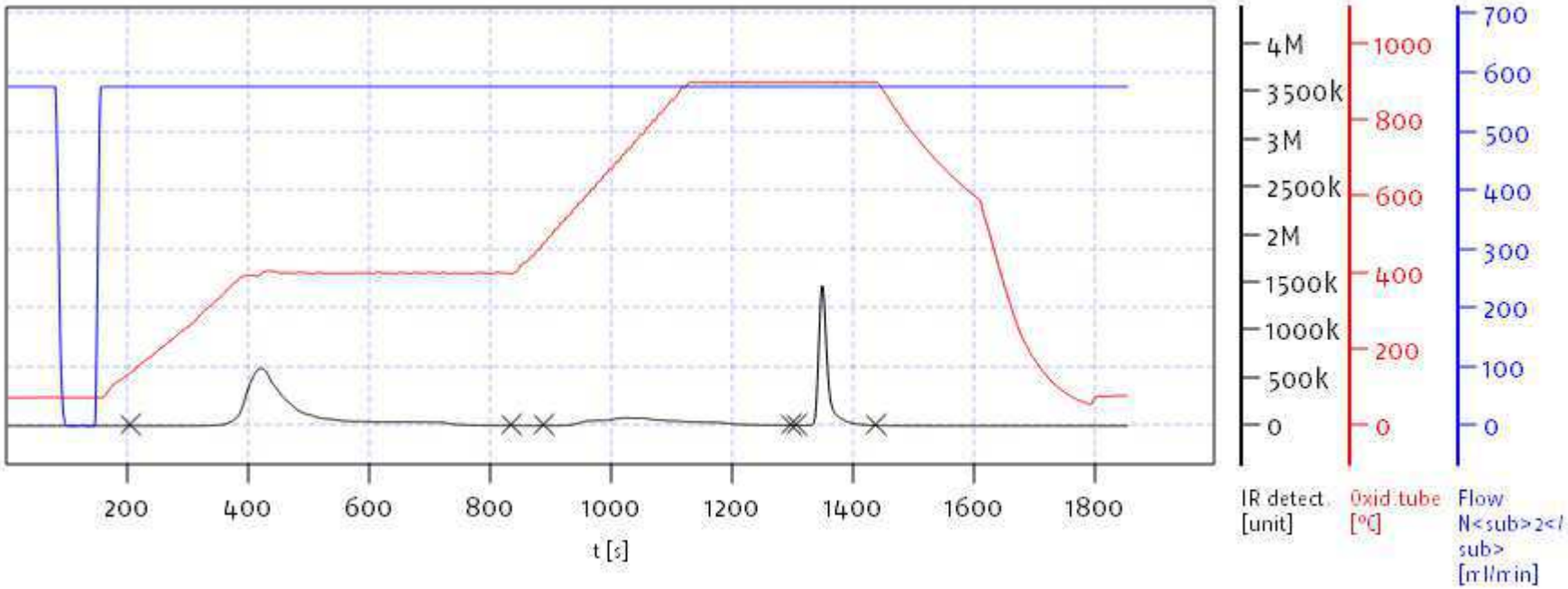
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
120	69	21H0184-15	519.90		1.00	CARBON	8/28/2021 5:18 AM	0.944	0.182	1.126	bl	2 016 720	573 102	951 018	0.9808	1.0000



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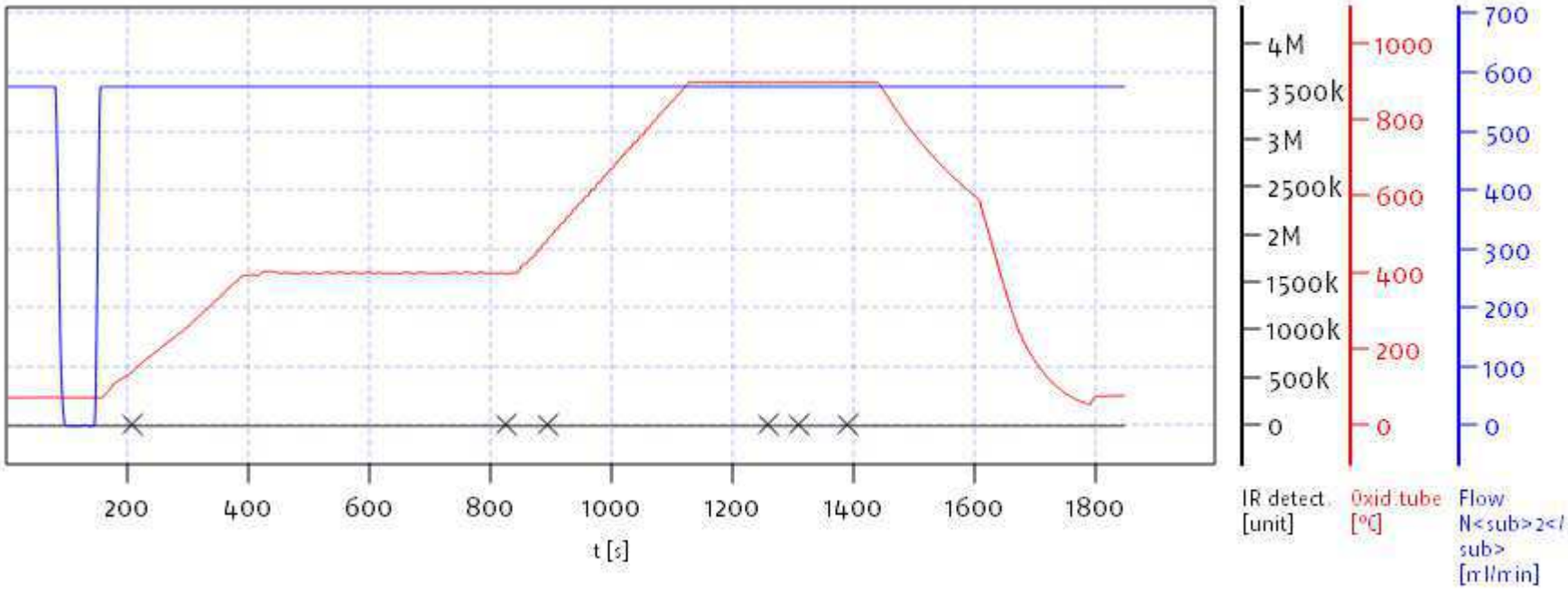
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
121	70	BLANK	1.00		1.00	CARBON	8/28/2021 5:50 AM	0.000	0.000	0.000	bl	1 460	264	159	0.9808	1.0000



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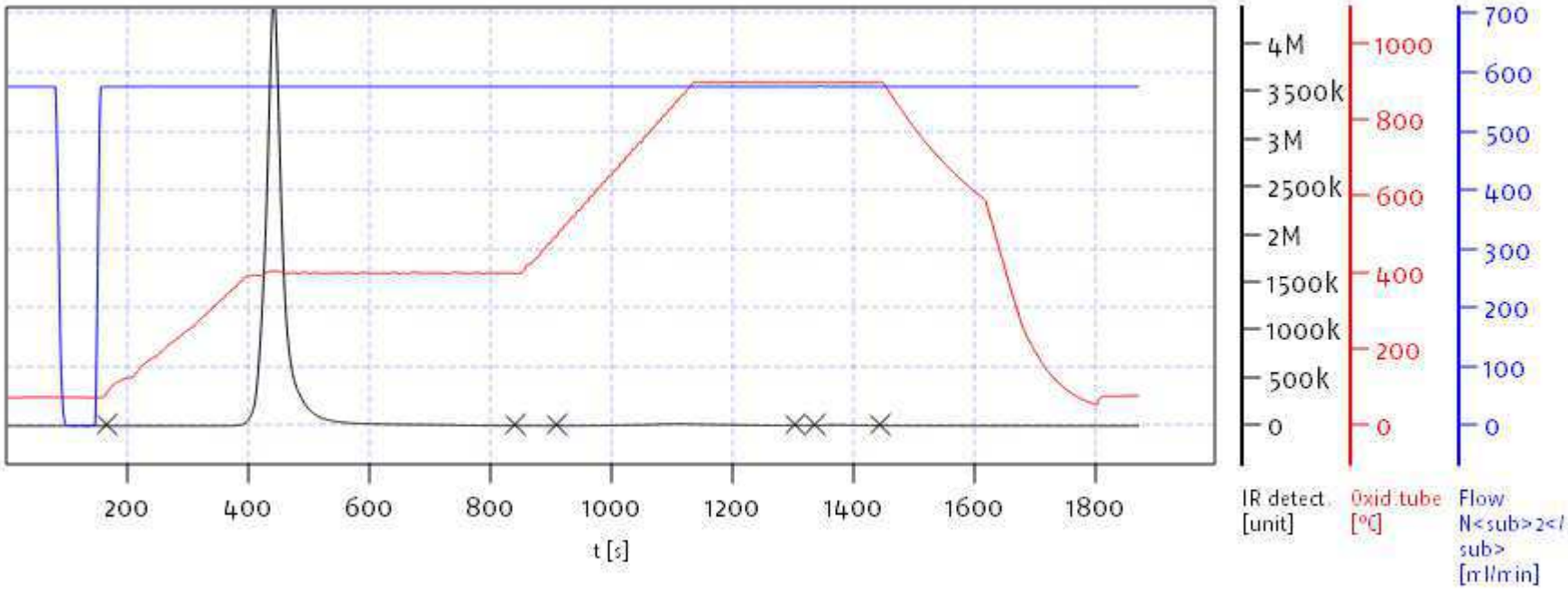
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
122	71	Dfactor	20.90		1.00	CARBON	8/28/2021 6:21 AM	44.549	0.999	45.547	bl	5 558 350	135 245	24 453	0.9916	1.0000



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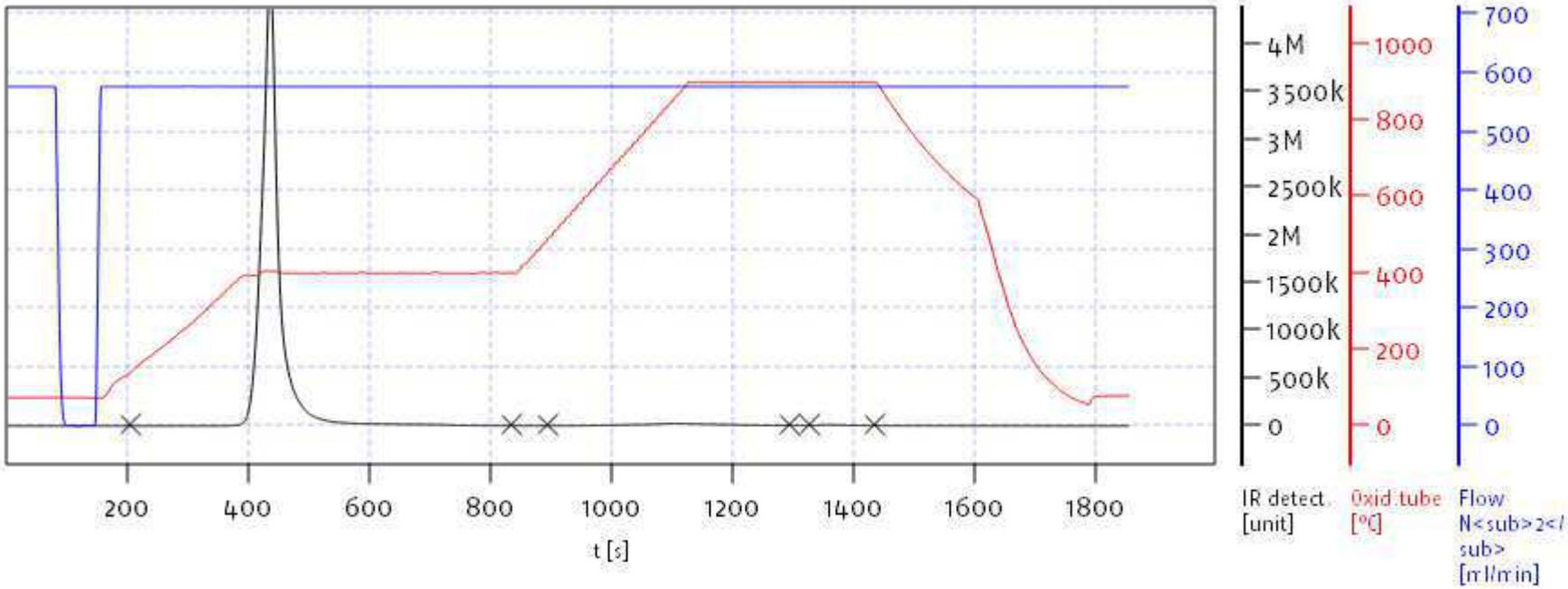
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
123	72	Dfactor	21.40		1.00	CARBON	8/28/2021 6:53 AM	44.550	1.165	45.715	bl	5 694 210	159 244	24 952	0.9911	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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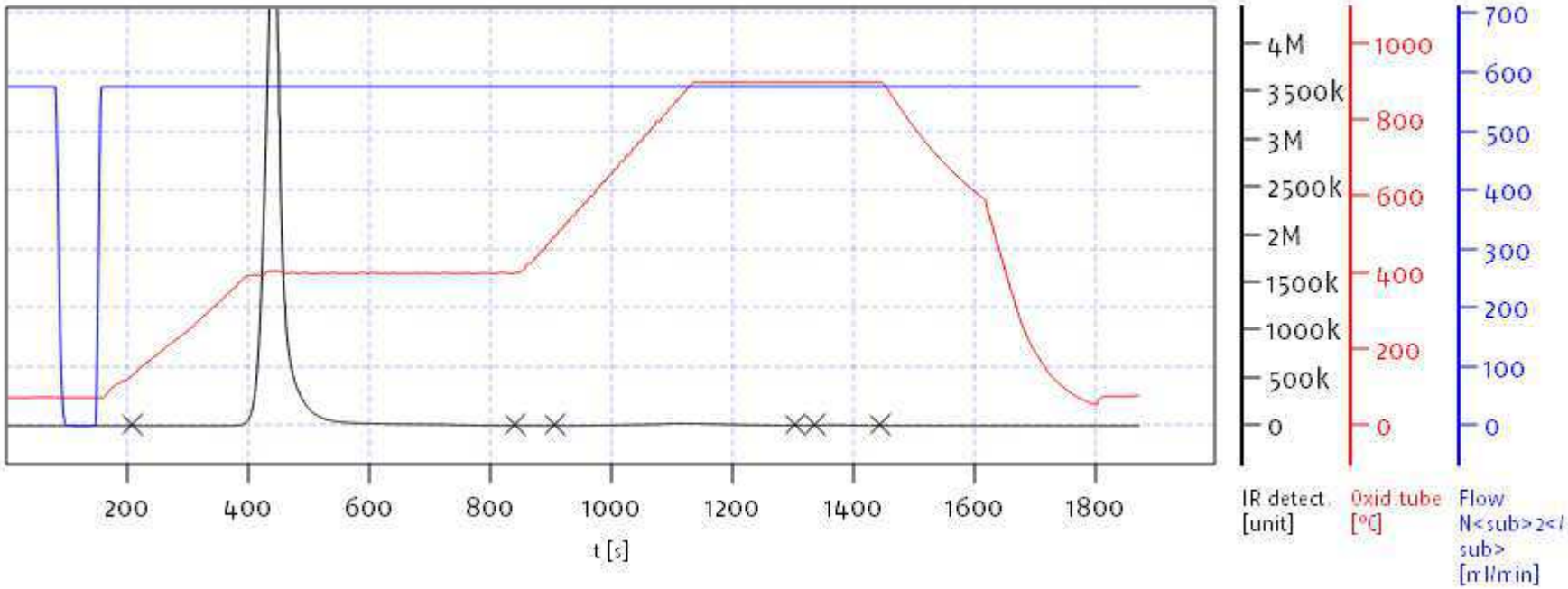
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
124	73	SJH0331-CCVA	24.30		1.00	CARBON	8/28/2021 7:24 AM	45.175	1.141	46.317	bl	6 557 250	175 865	22 725	0.9913	1.0000



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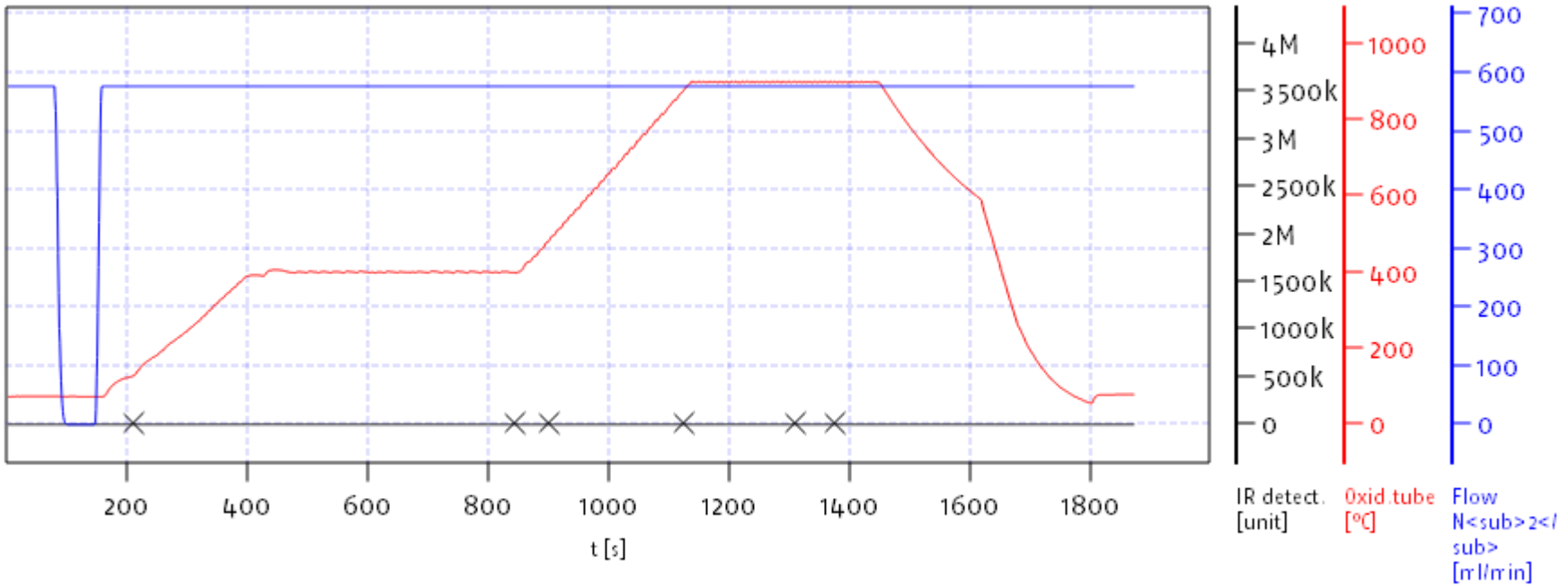
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
125	74	SJH0331-CCBA	622.30		1.00	CARBON	8/28/2021 7:56 AM	0.000	0.000	0.000	bl,C1u,C3u,C2u	2 179	58	345	0.9913	1.0000



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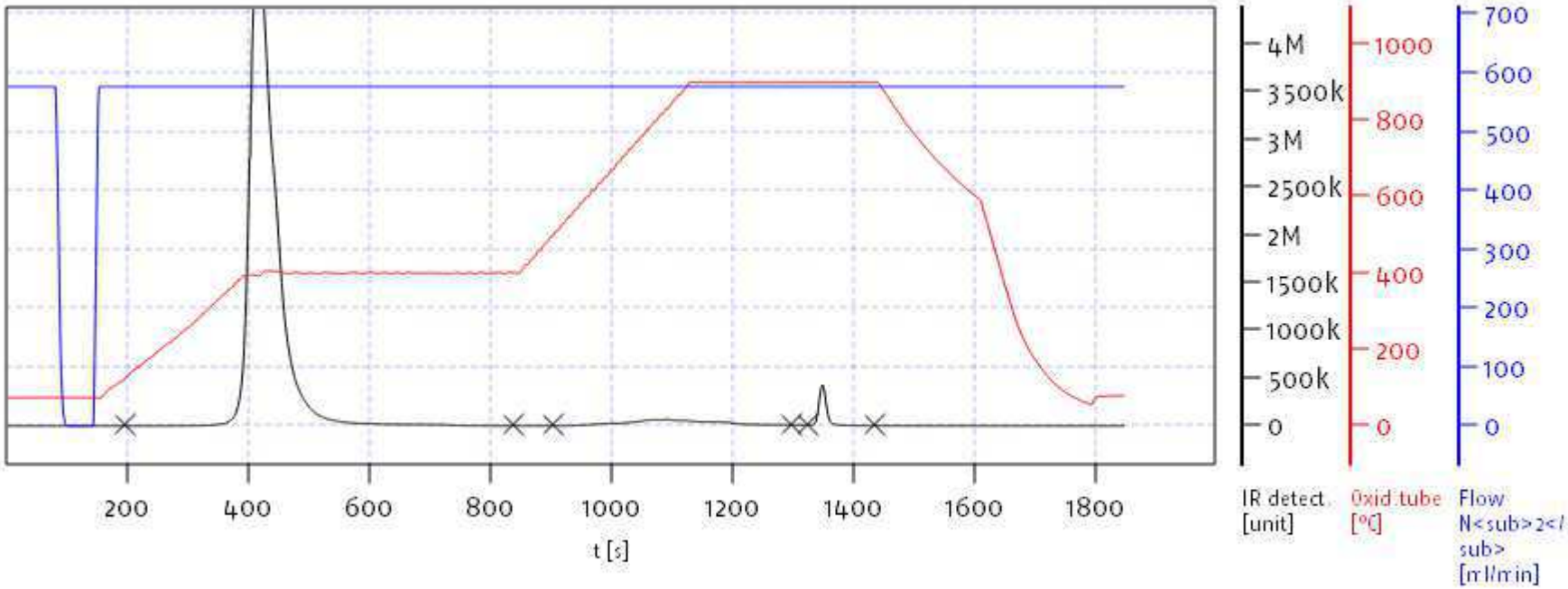
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
126	75	21H0184-16	565.70		1.00	CARBON	8/28/2021 8:27 AM	2.809	0.127	2.936	bl,Cl o	9 272 570	438 152	238 331	0.9913	1.0000



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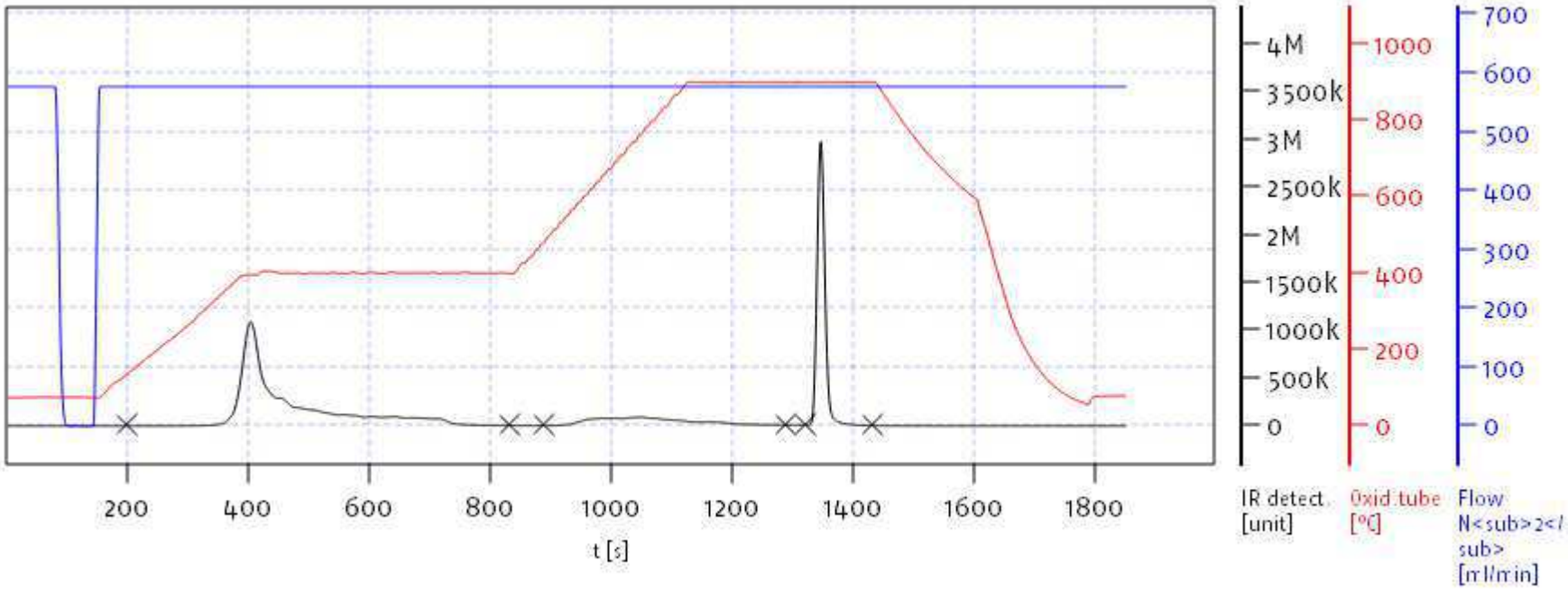
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
127	76	21H0184-17	328.10		1.00	CARBON	8/28/2021 8:59 AM	2.389	0.337	2.725	bl	2 990 010	665 689	1 699 900	0.9913	1.0000



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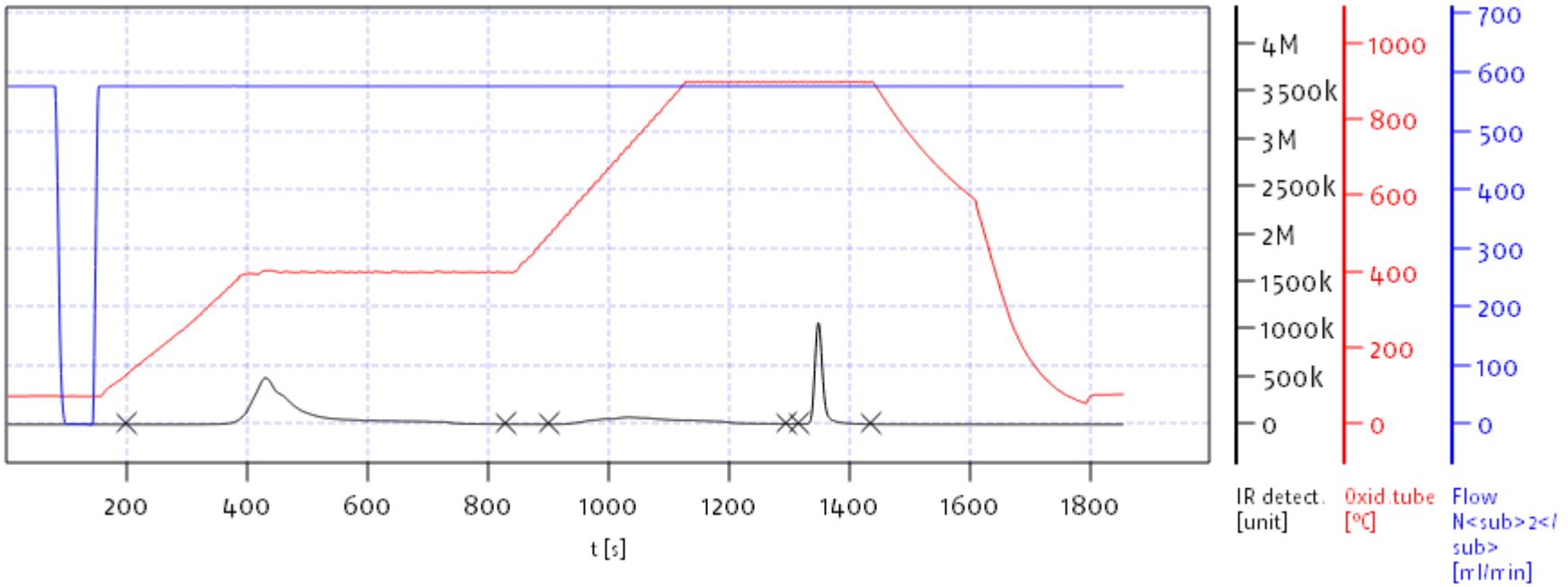
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
128	77	21H0184-18	627.00		1.00	CARBON	8/28/2021 9:30 AM	0.588	0.134	0.722	bl	1 591 990	510 199	627 006	0.9913	1.0000



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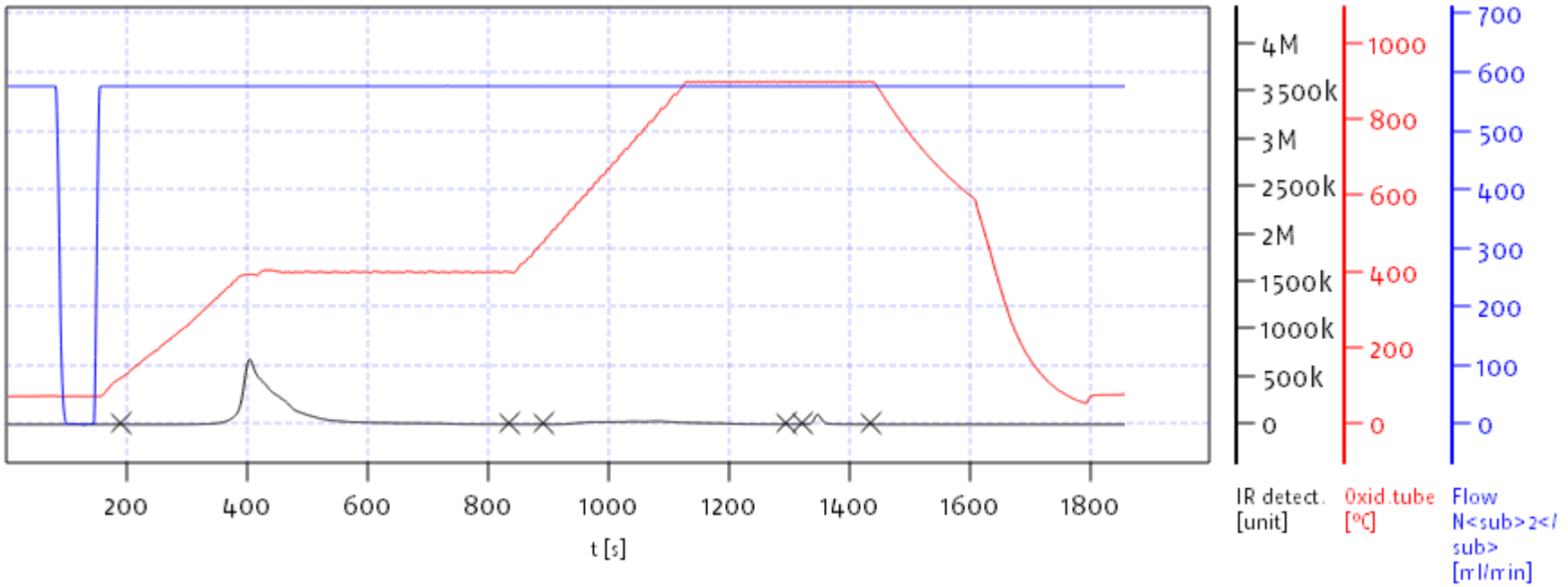
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
129	78	21H0219-01	527.60		1.00	CARBON	8/28/2021 10:02 AM	0.565	0.071	0.636	bl	1 743 570	232 620	60 843	0.9913	1.0000



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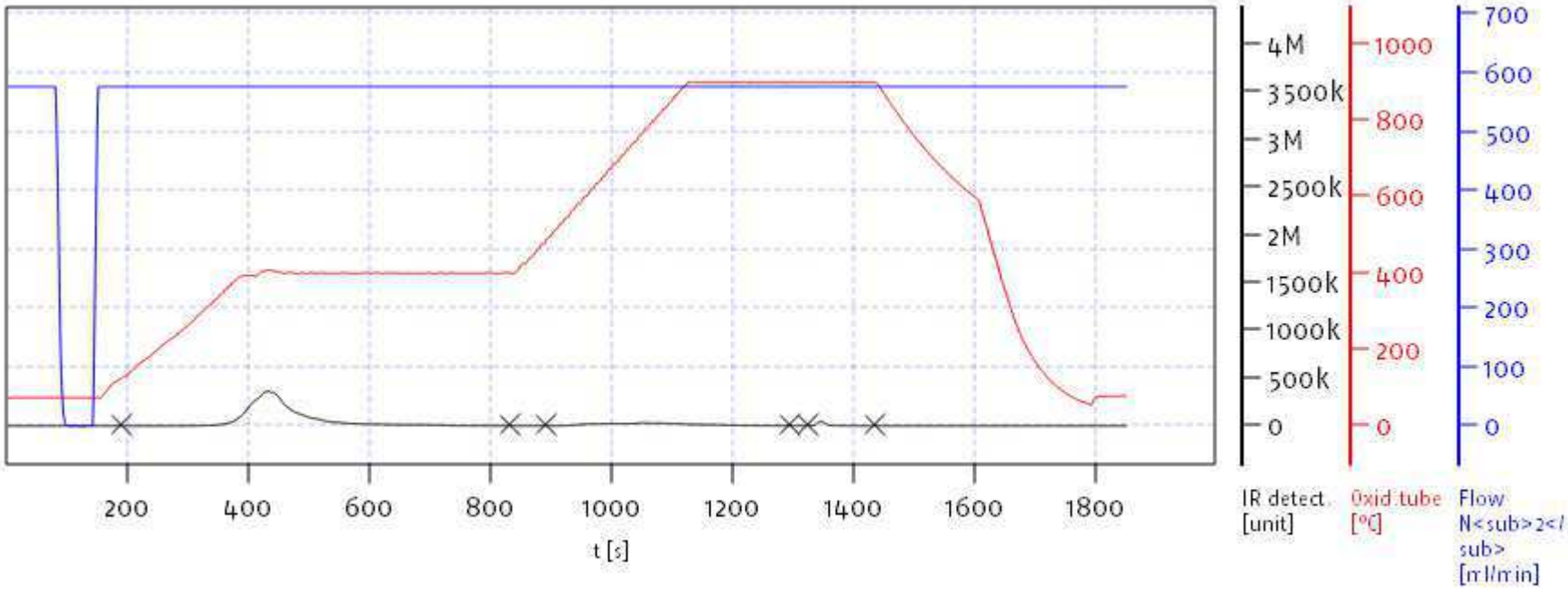
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
130	79	BJH0513-DUP2	532.50		1.00	CARBON	8/28/2021 10:33 AM	0.393	0.062	0.455	bl	1 241 740	208 054	30 430	0.9913	1.0000



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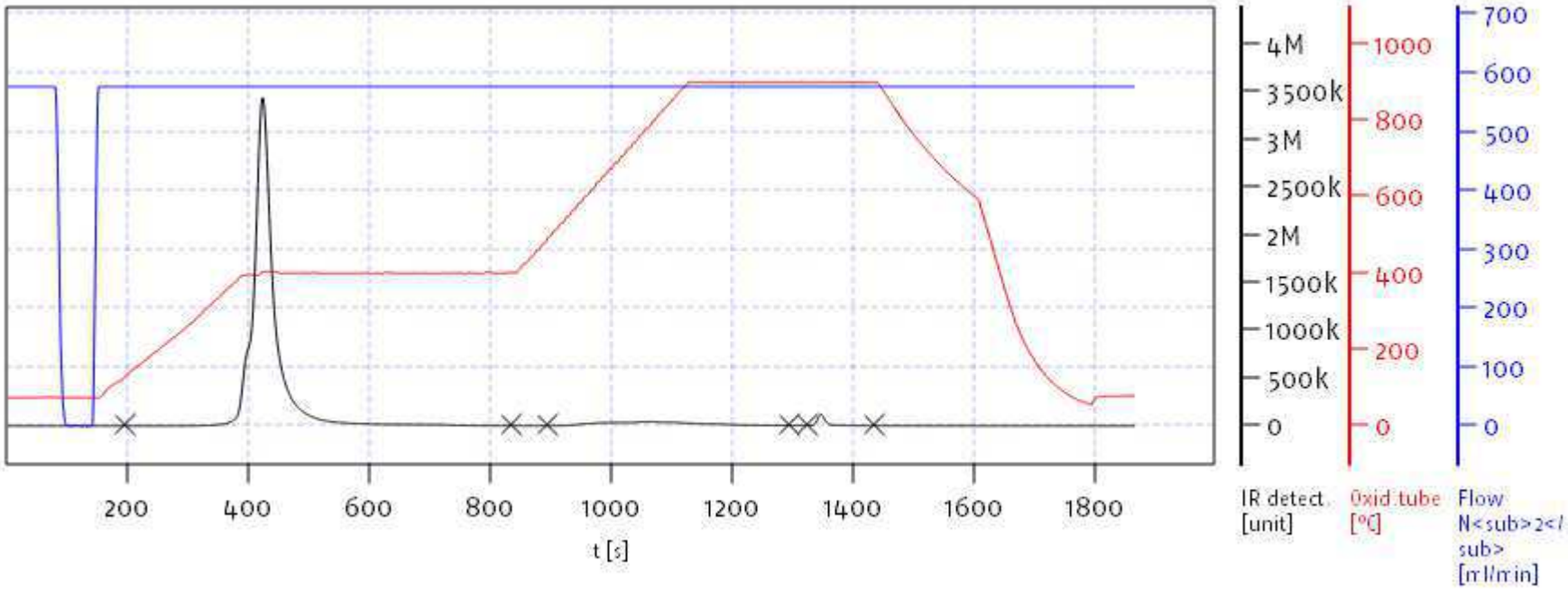
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
131	80	BJH0513-MS2	566.50	0.0108	1.00	CARBON	8/28/2021 11:04 AM	1.473	0.091	1.564	bl	4 929 470	318 082	77 016	0.9913	1.0000



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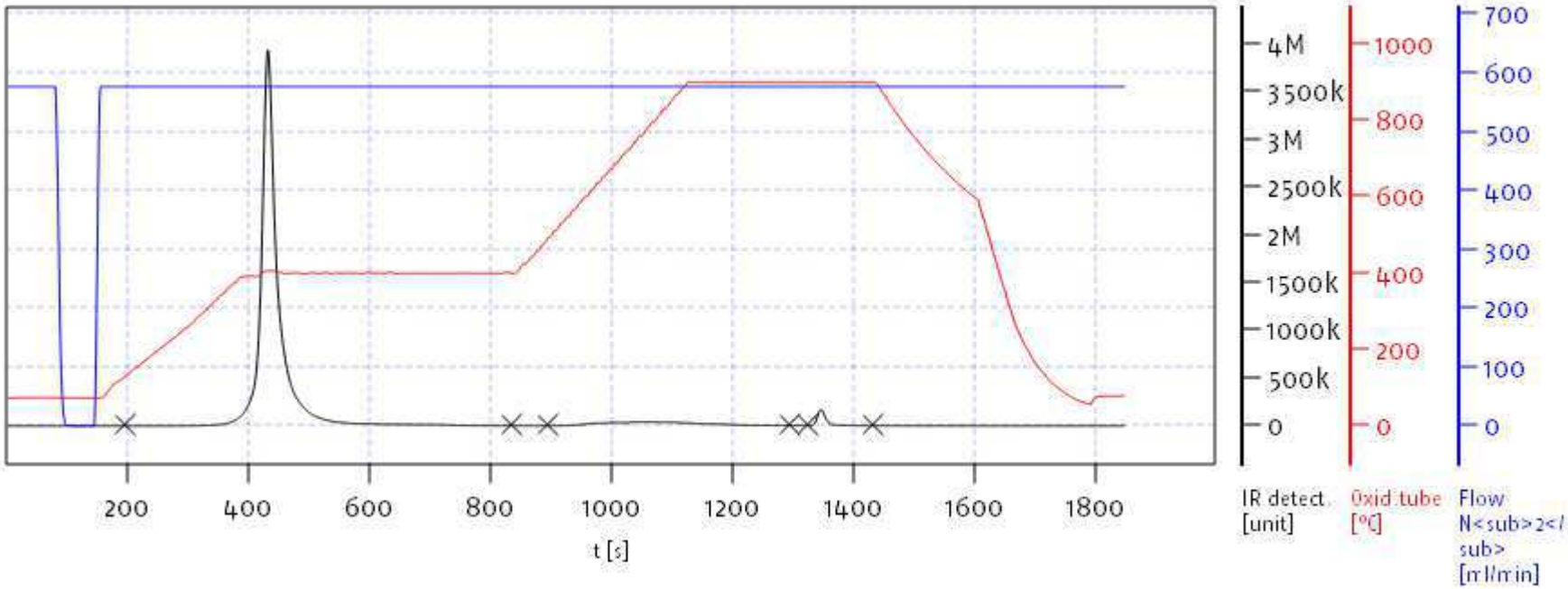
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
132	81	BJH0513-MSD2	598.70	0.0113	1.00	CARBON	8/28/2021 11:36 AM	1.347	0.084	1.431	bl	4 728 330	308 742	109 916	0.9913	1.0000



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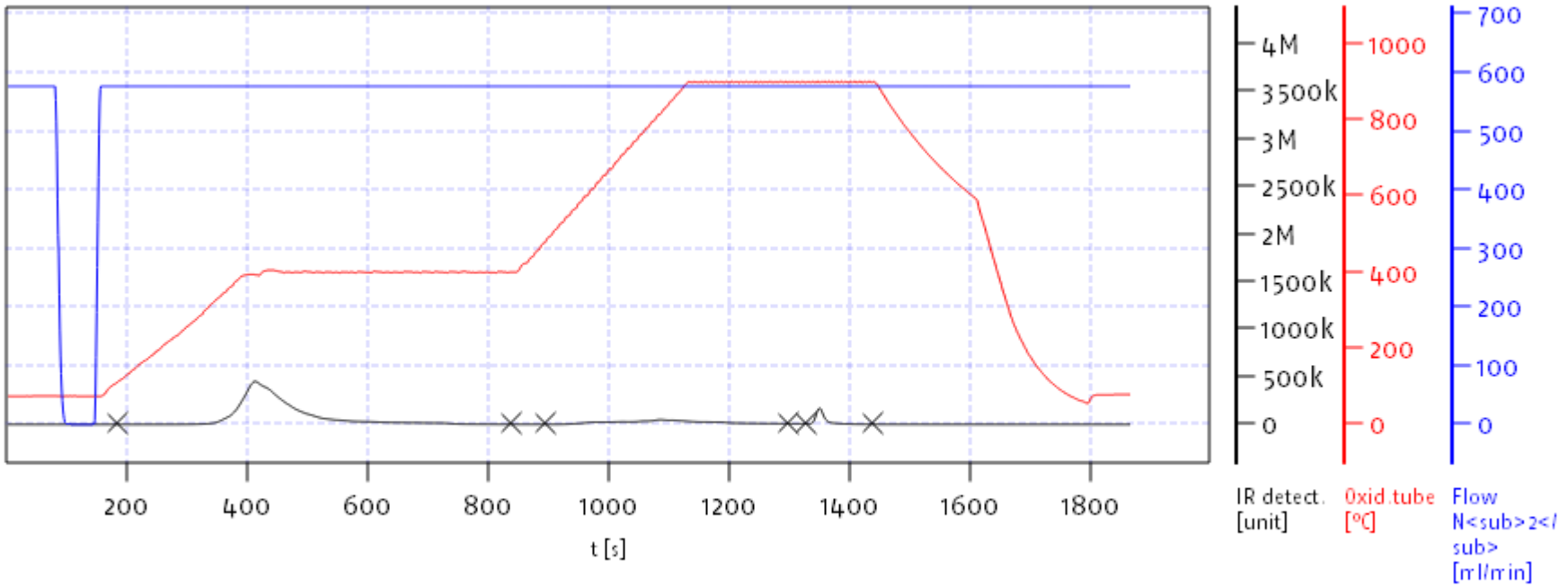
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
133	82	21H0223-01	105.40		1.00	CARBON	8/28/2021 12:07 PM	2.778	0.500	3.278	bl	1 657 300	323 449	113 953	0.9913	1.0000



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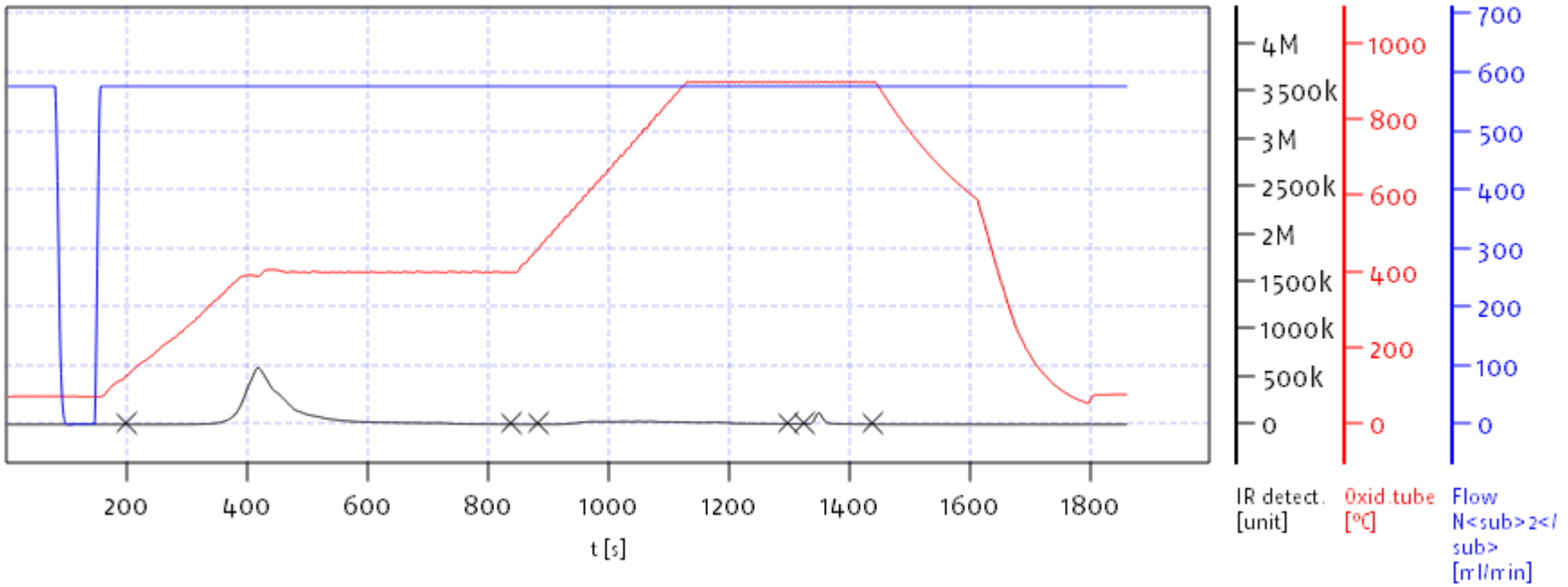
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
134	83	21H0223-02	114.70		1.00	CARBON	8/28/2021 12:39 PM	2.679	0.397	3.077	bl	1 777 140	281 623	81 103	0.9913	1.0000



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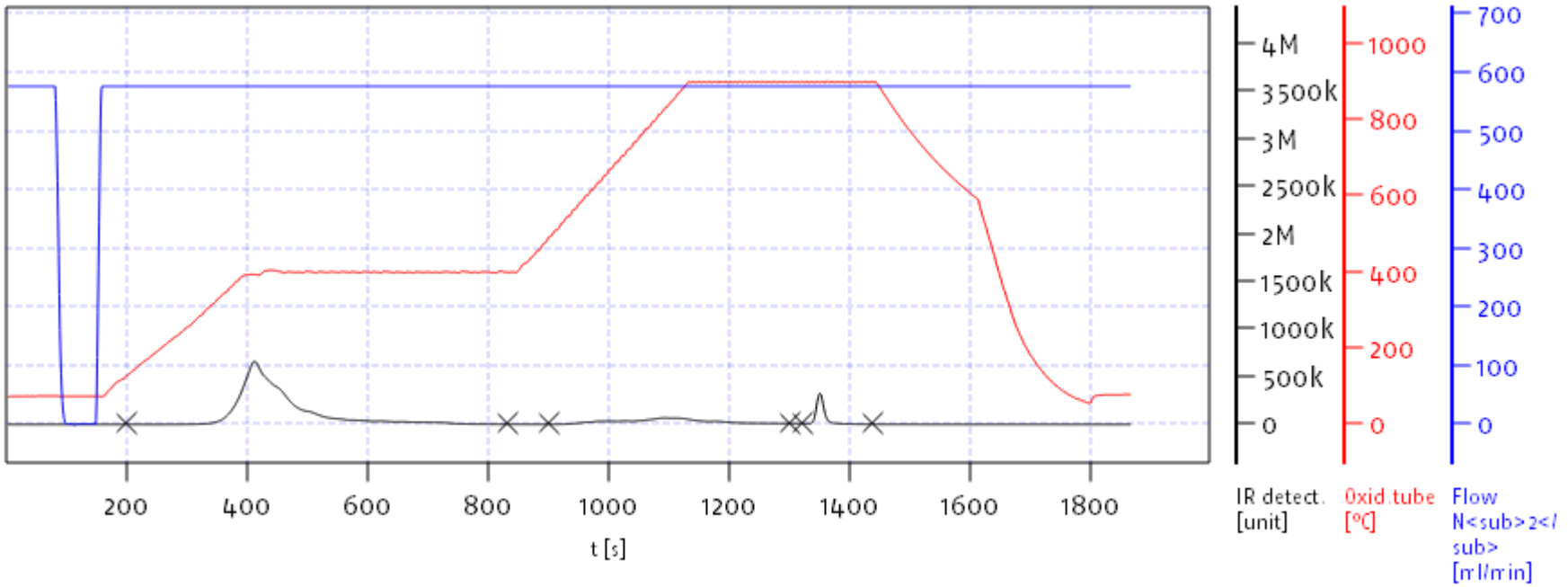
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
135	84	21H0223-03	121.20		1.00	CARBON	8/28/2021 1:10 PM	3.307	0.600	3.908	bl	2 220 990	442 362	195 018	0.9913	1.0000



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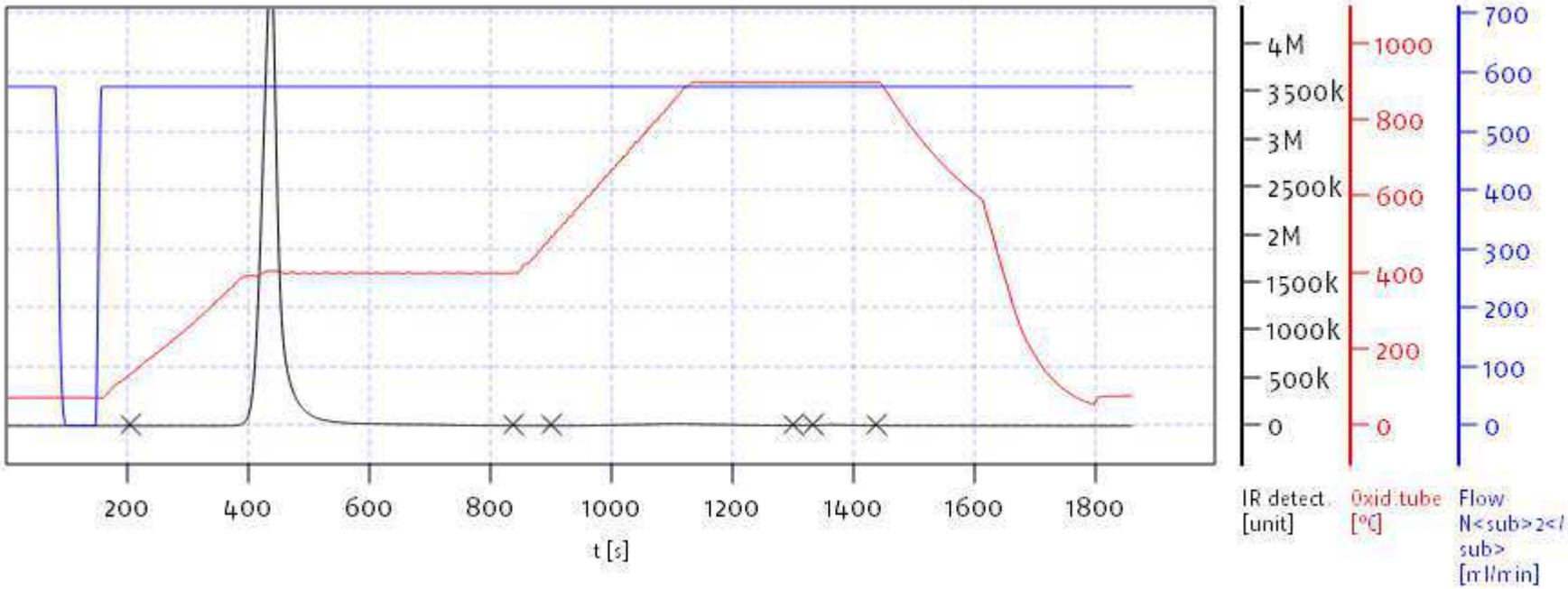
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
136	85	SJH0331-CCVB	21.80		1.00	CARBON	8/28/2021 1:42 PM	44.633	1.082	45.716	bl	5 809 870	151 374	24 927	0.9913	1.0000



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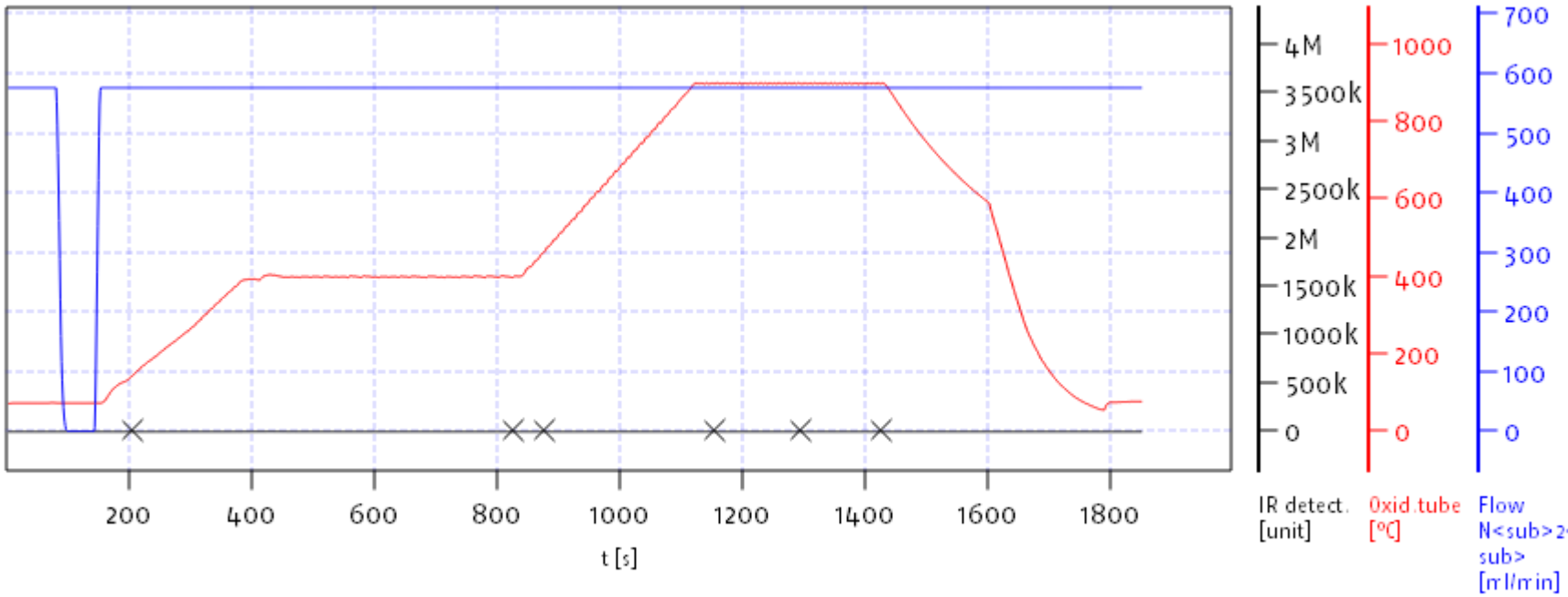
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
137	86	SJH0331-CCBB	553.80		1.00	CARBON	8/28/2021 2:13 PM	0.000	0.000	0.000	bl,C1u,C3u,C2u	3 219	275	254	0.9913	1.0000



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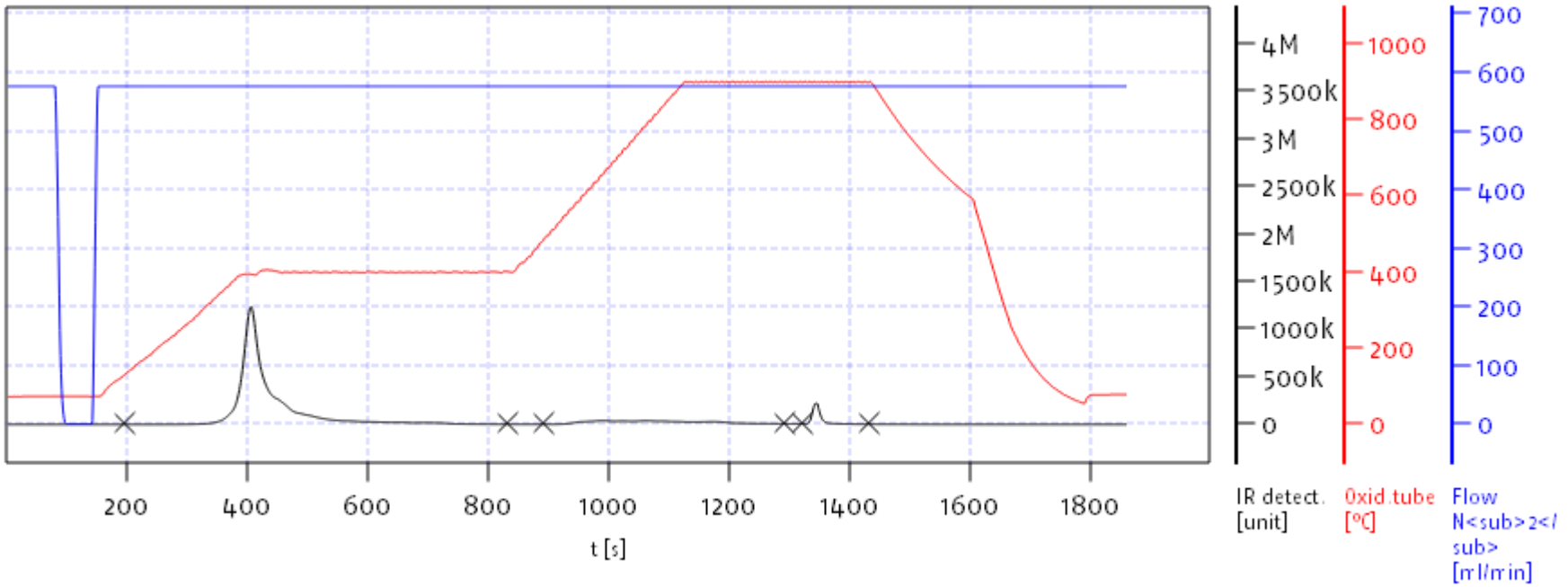
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
138	87	21H0223-04	138.40		1.00	CARBON	8/28/2021 2:45 PM	2.972	0.409	3.381	bl	2 338 910	346 798	139 874	0.9913	1.0000



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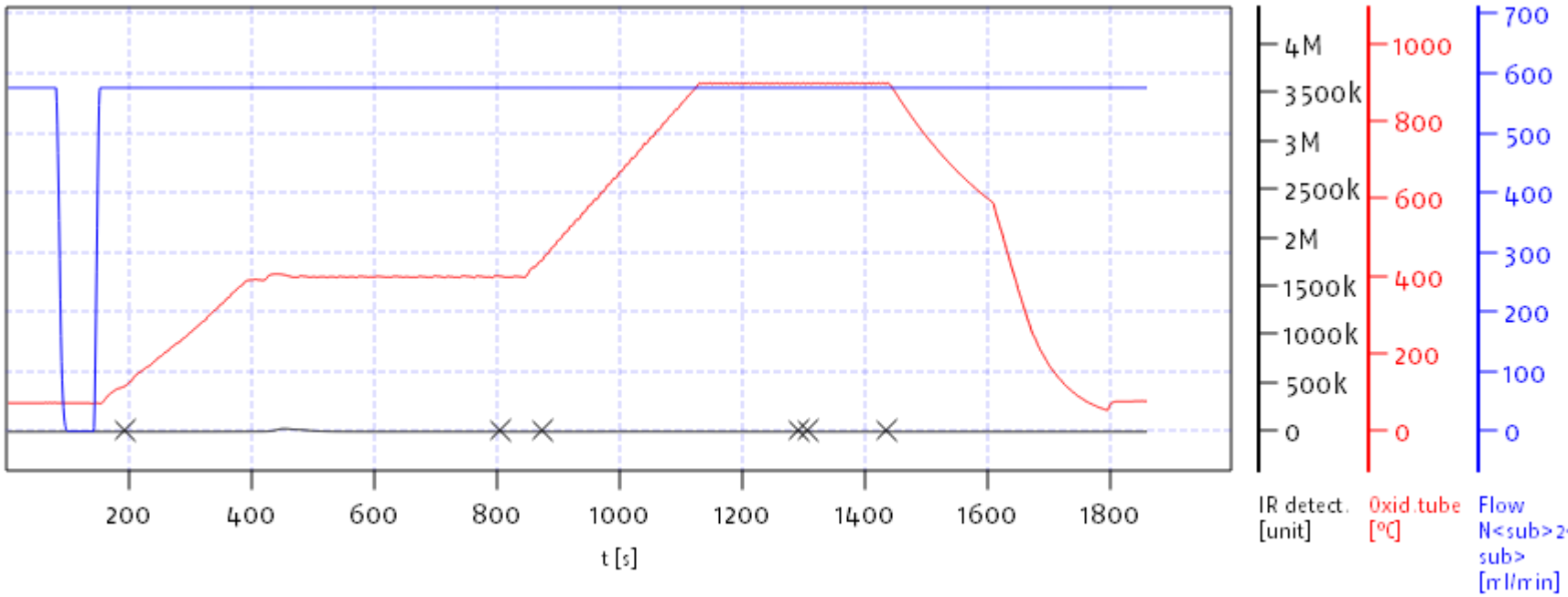
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
139	88	BJH0434-MRL1	556.70		1.00	CARBON	8/28/2021 3:16 PM	0.017	0.000	0.017	bl,C3u,C2u	68 246	7 250	503	0.9913	1.0000



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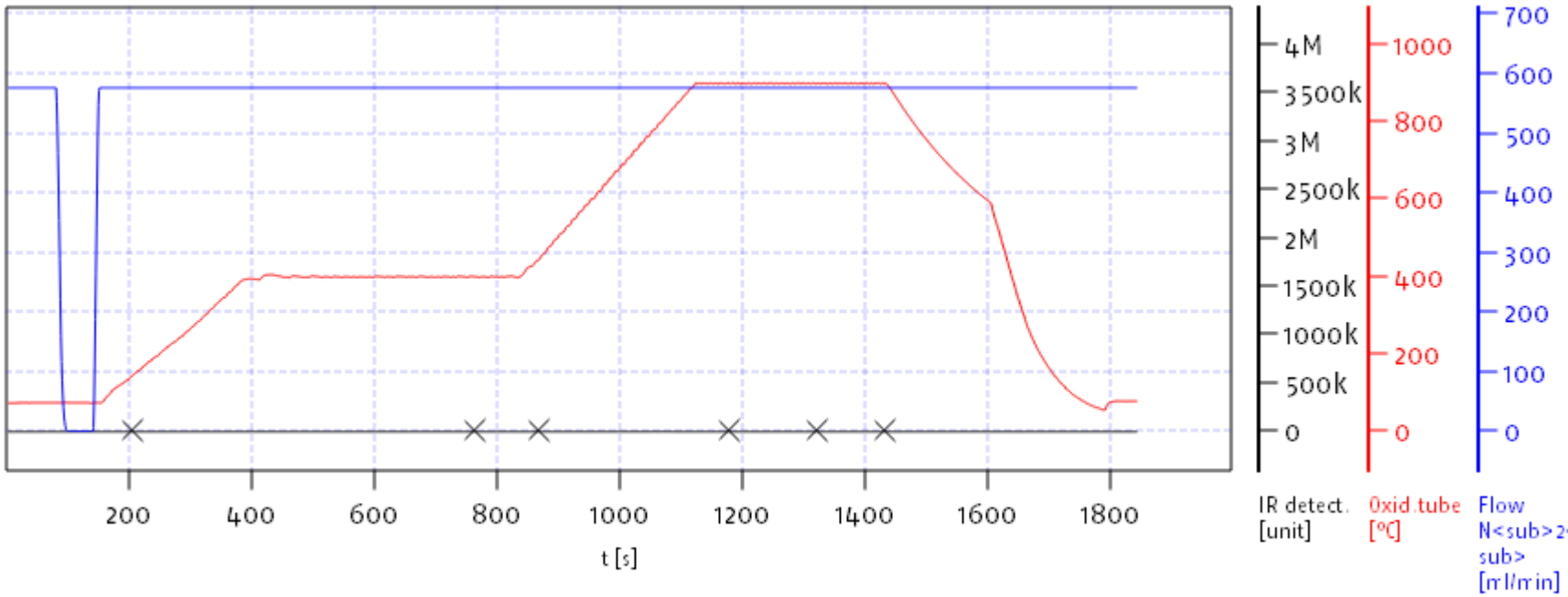
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
140	89	BJH0434-BLK1	518.90		1.00	CARBON	8/28/2021 3:47 PM	0.000	0.000	0.000	bl,C1u,C3u,C2u	1 696	2 157	367	0.9913	1.0000



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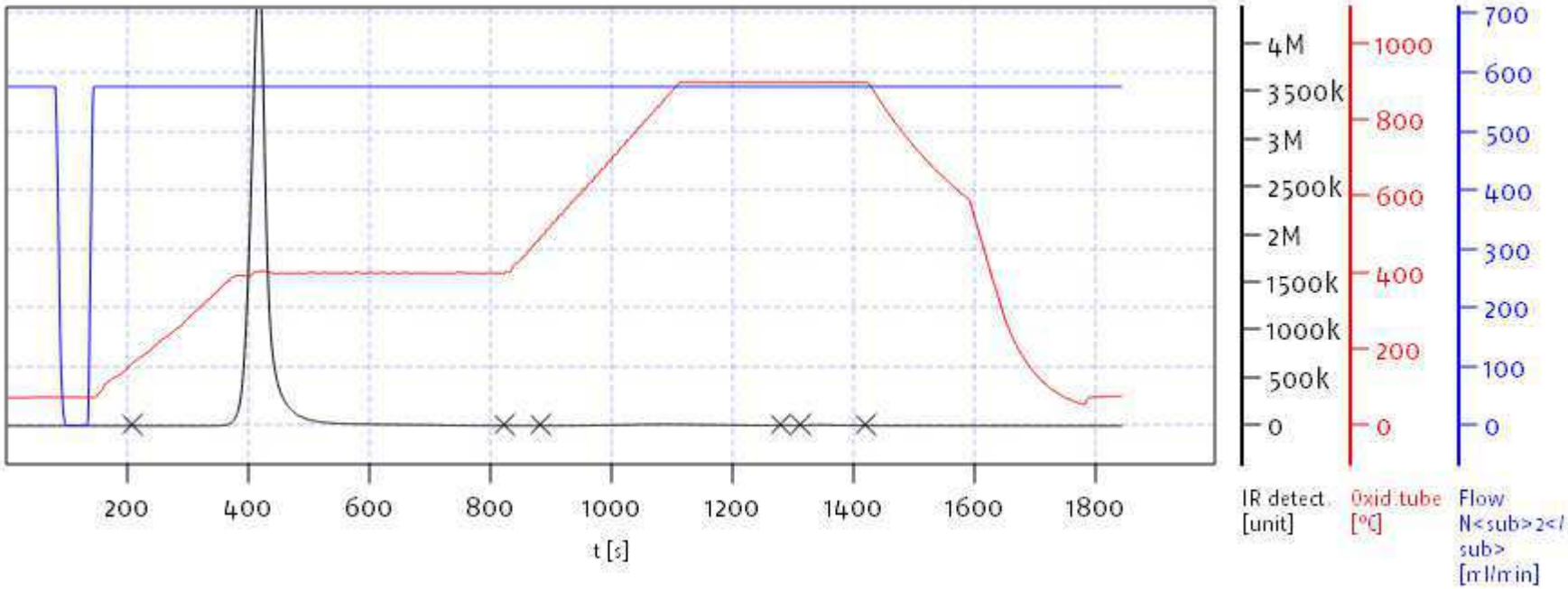
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
141	1	BJH0434-BS1	20.20		1.00	CARBON	8/28/2021 4:19 PM	46.270	0.931	47.201	bl	5 582 080	123 050	23 665	0.9913	1.0000



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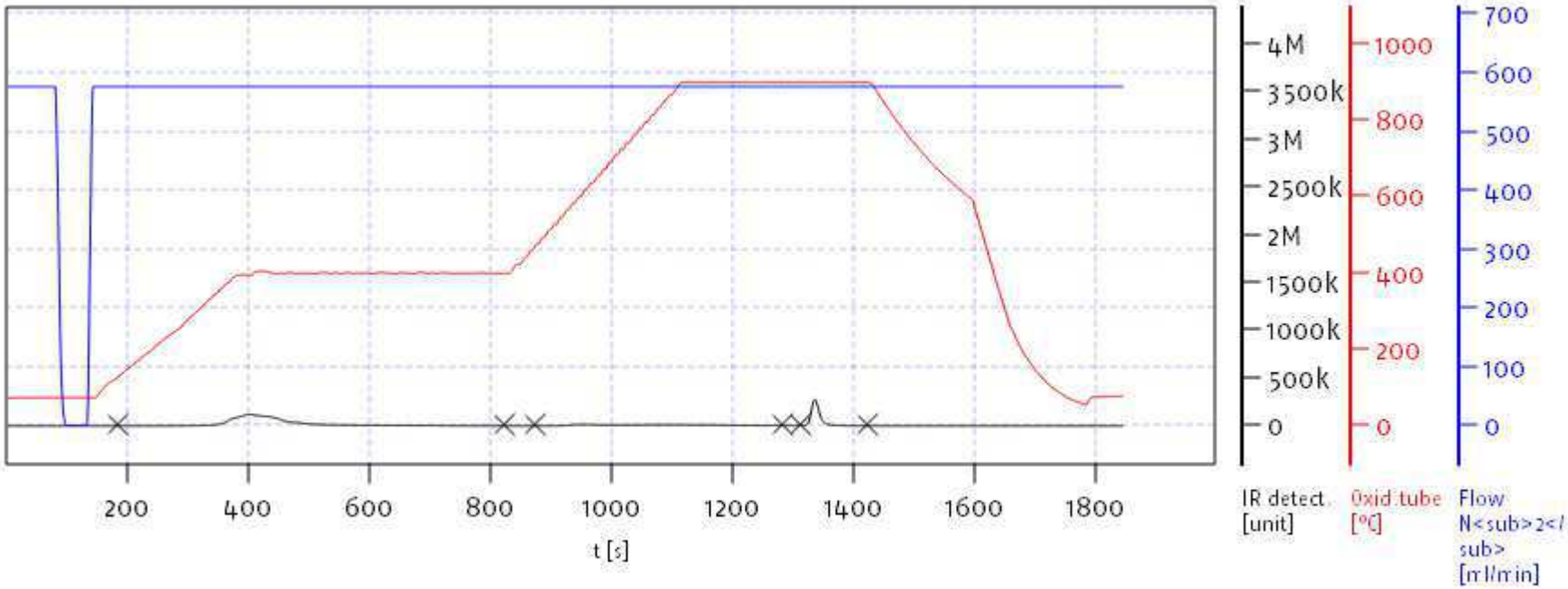
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
142	2	BJH0434-SRM1	40.00		1.00	CARBON	8/28/2021 4:50 PM	2.600	0.445	3.046	bl	473 382	117 120	169 870	0.9913	1.0000



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soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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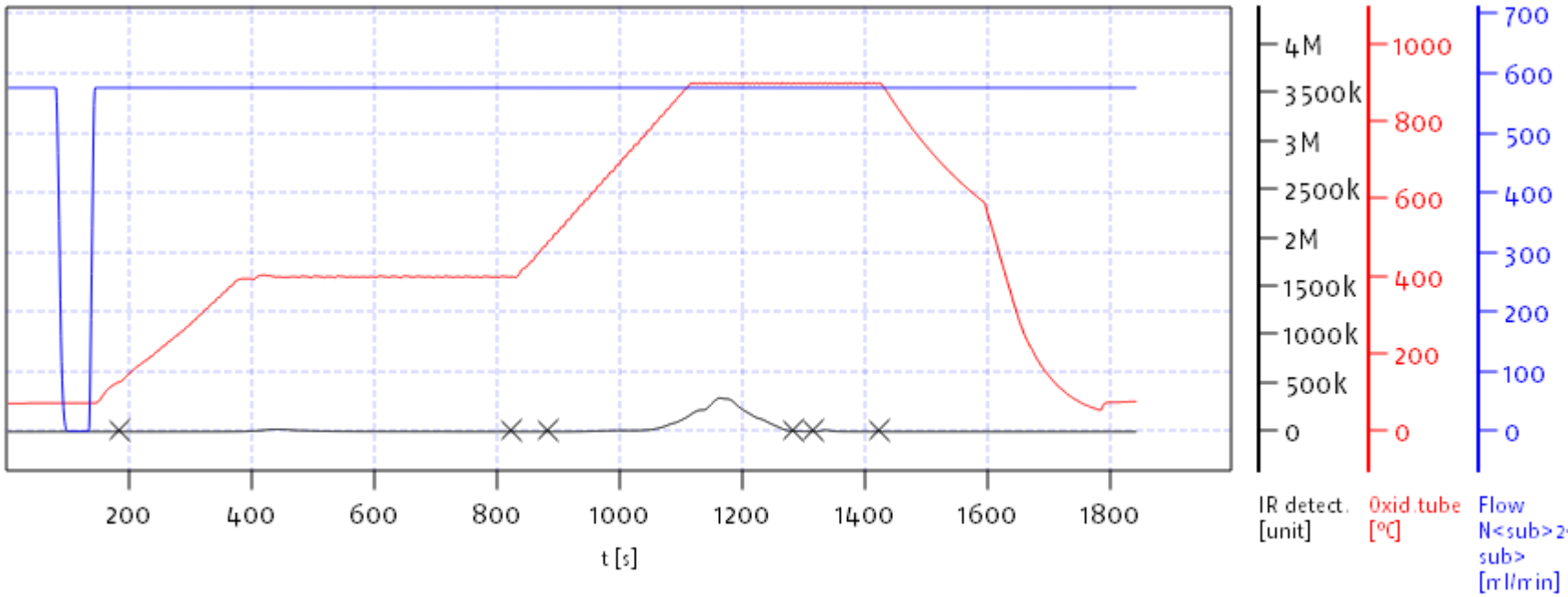
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
143	3	21G0313-15	362.60		1.00	CARBON	8/28/2021 5:21 PM	0.036	0.662	0.698	bl	87 395	1 432 640	14 807	0.9913	1.0000



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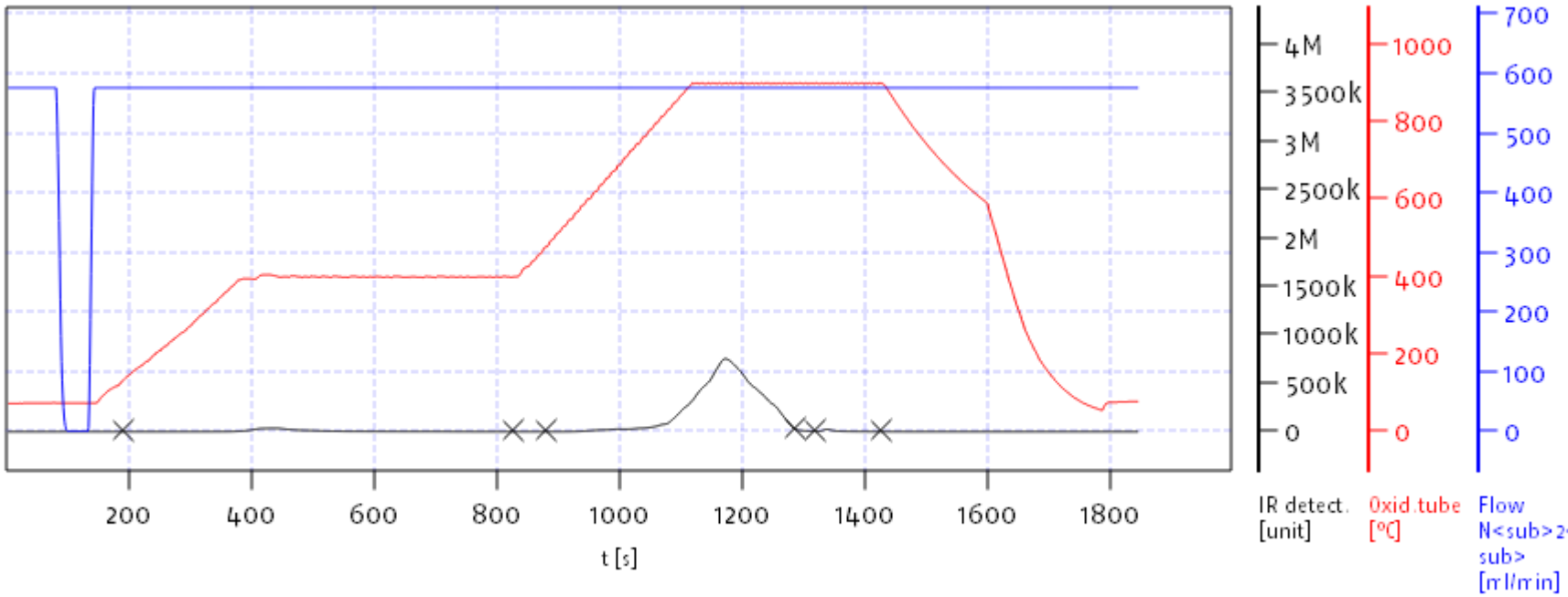
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
144	4	BJH0434-DUP2	376.10		1.00	CARBON	8/28/2021 5:52 PM	0.059	1.468	1.527	bl	133 193	3 280 160	22 916	0.9913	1.0000



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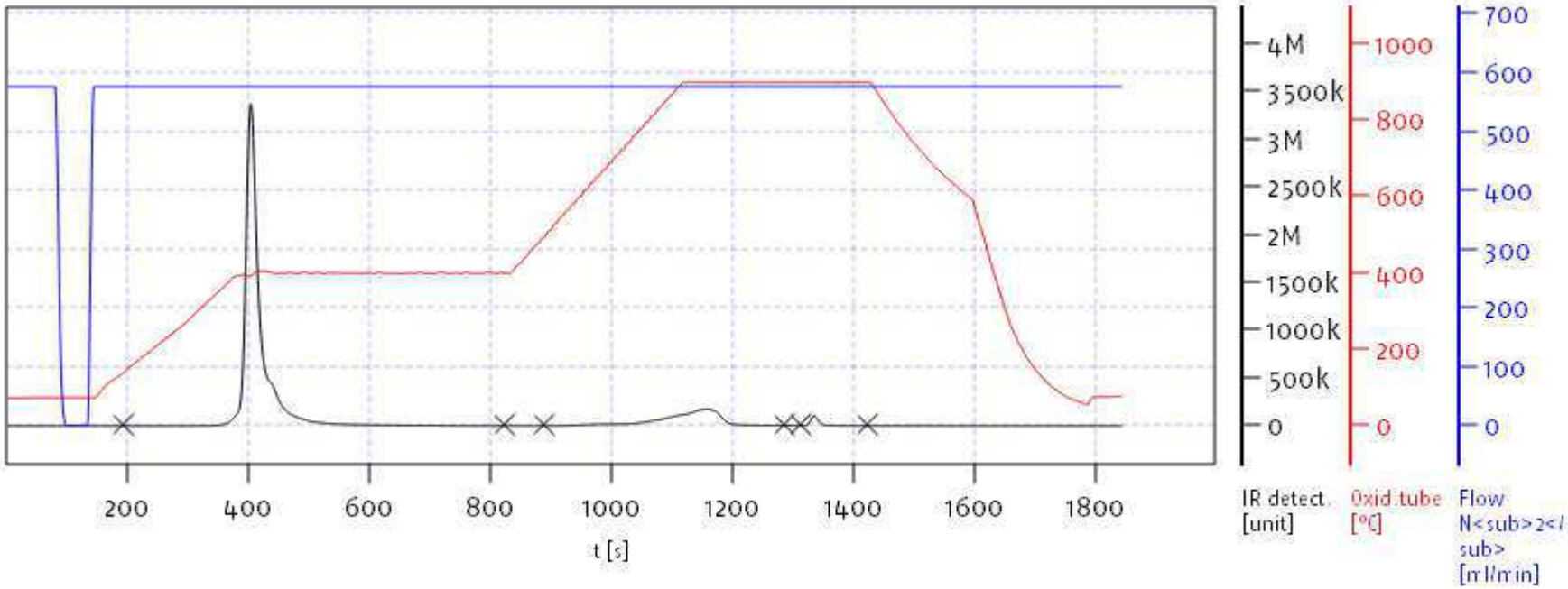
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
145	5	BJH0434-MS2	313.00	0.0113	1.00	CARBON	8/28/2021 6:23 PM	1.881	0.357	2.239	bl	3 473 330	674 151	66 394	0.9913	1.0000



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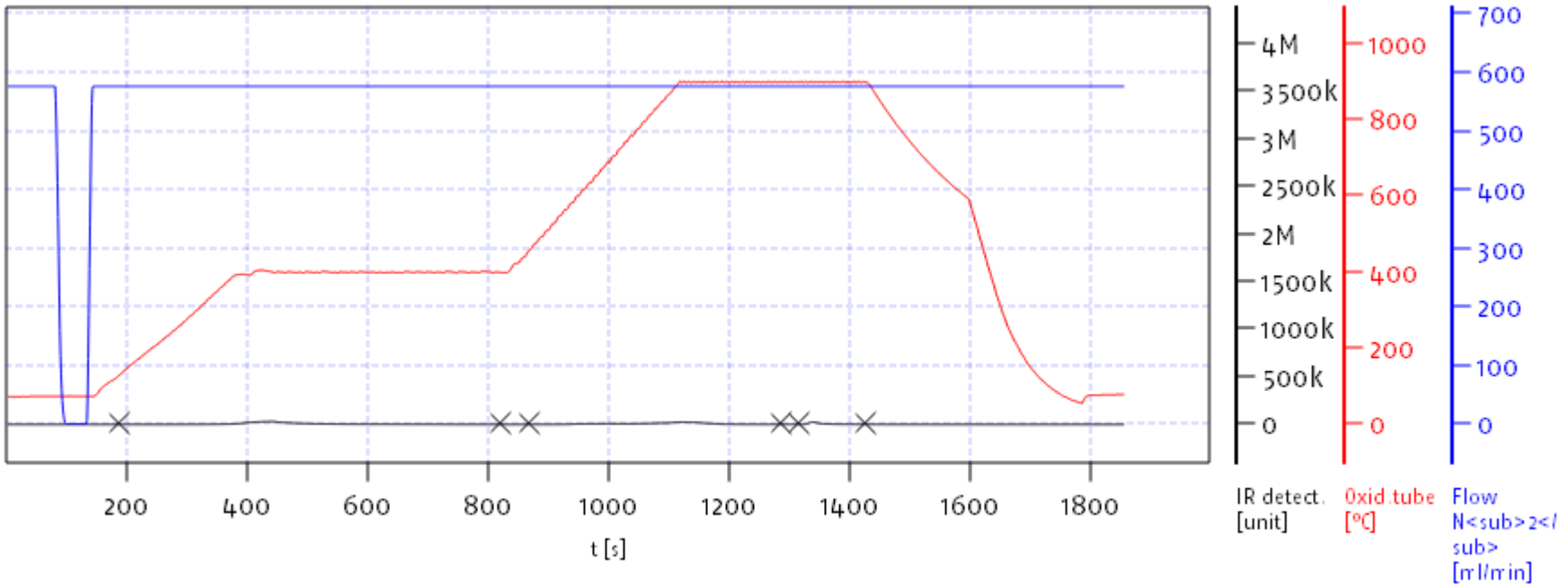
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
146	6	21G0313-16	500.80		1.00	CARBON	8/28/2021 6:55 PM	0.041	0.035	0.076	bl	122 396	114 752	23 407	0.9913	1.0000



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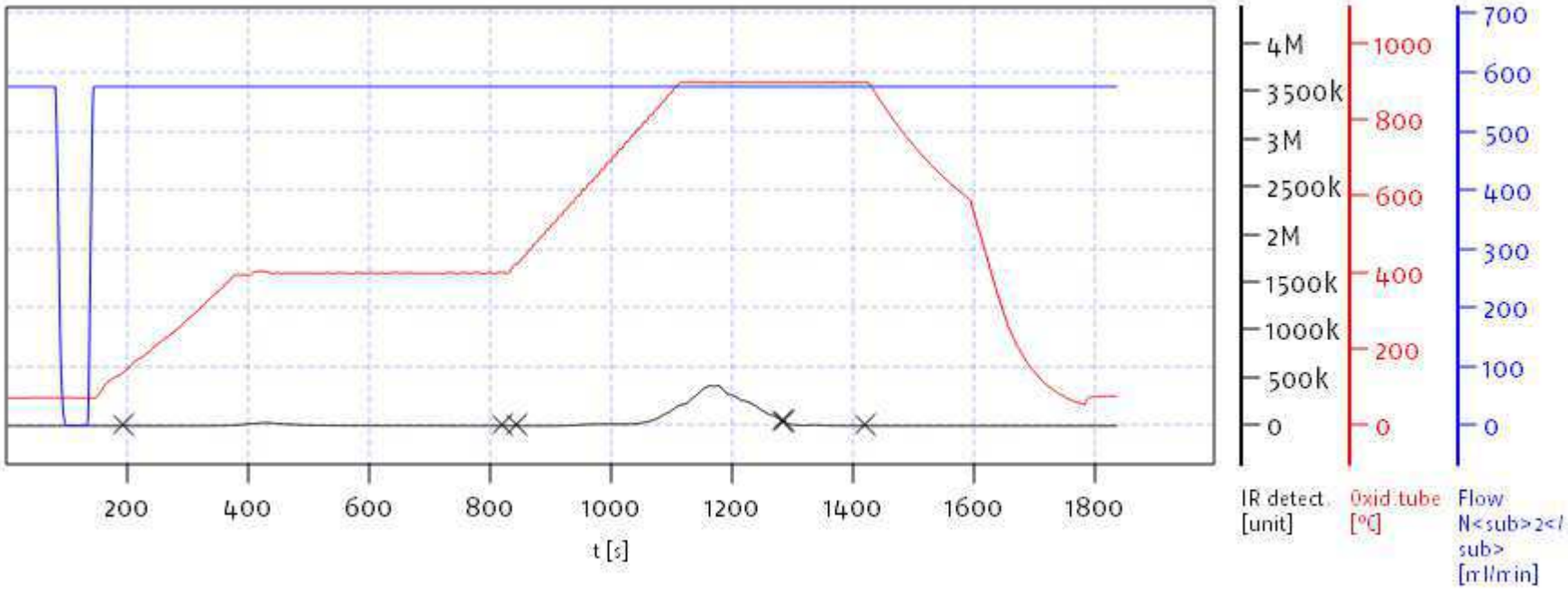
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
147	7	21G0310-03RE1	217.60		1.00	CARBON	8/28/2021 7:26 PM	0.083	1.270	1.353	bl	119 849	2 040 220	29 068	0.9913	1.0000



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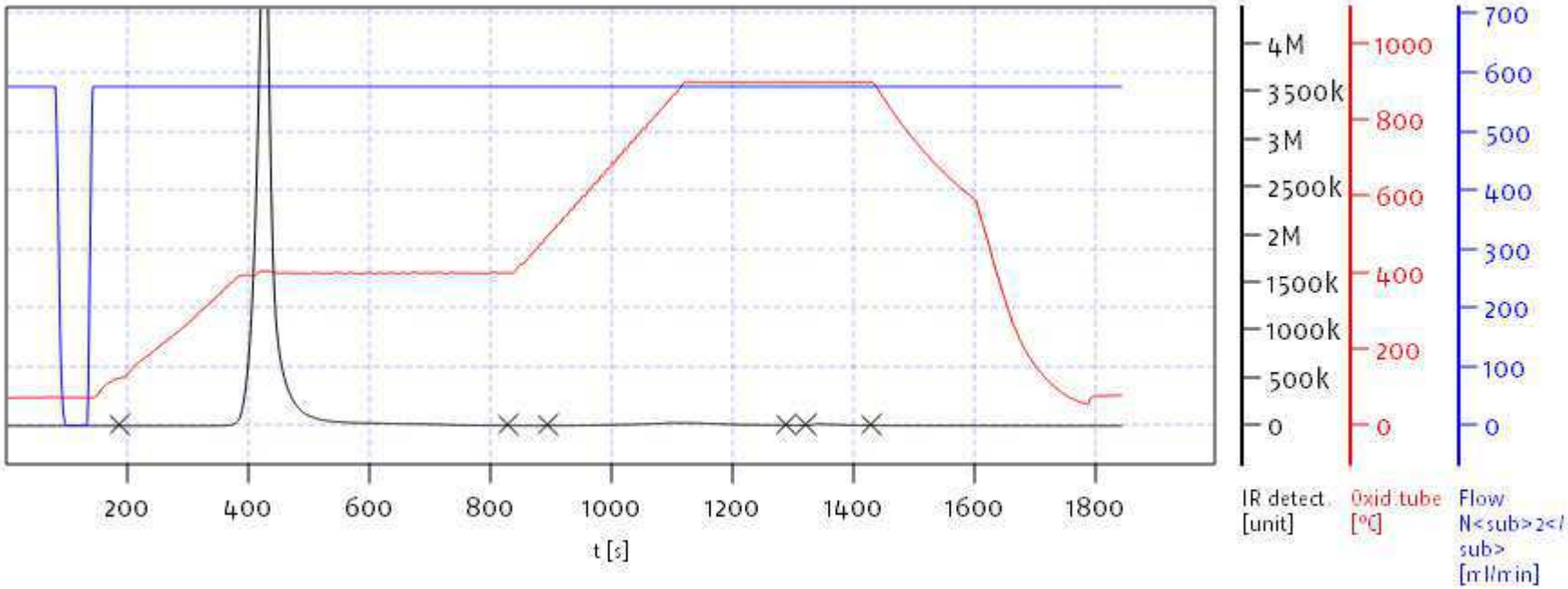
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
148	8	SJH0331-CCVC	23.90		1.00	CARBON	8/28/2021 7:57 PM	44.711	1.455	46.166	bl	6 364 610	217 611	40 995	0.9913	1.0000



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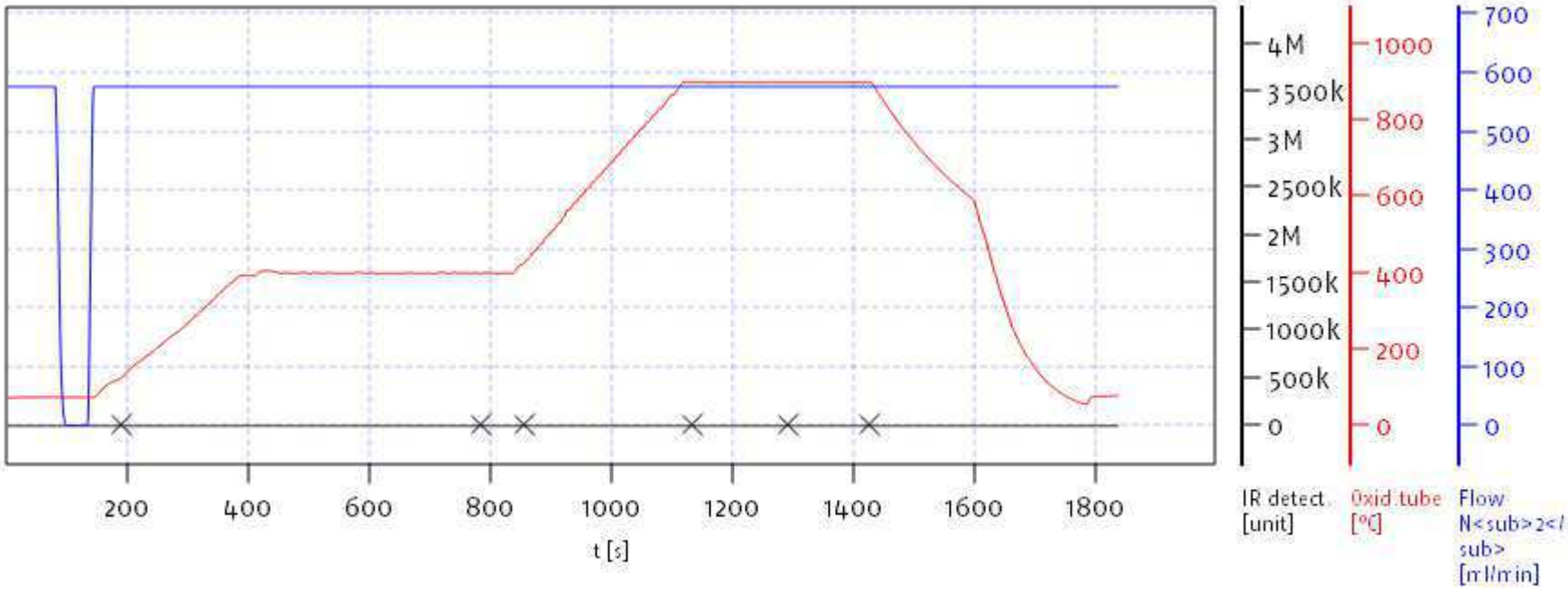
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
149	9	SJH0331-CCBC	588.20		1.00	CARBON	8/28/2021 8:28 PM	0.000	0.000	0.000	bl,C1u,C3u,C2u	2 316	13	79	0.9913	1.0000



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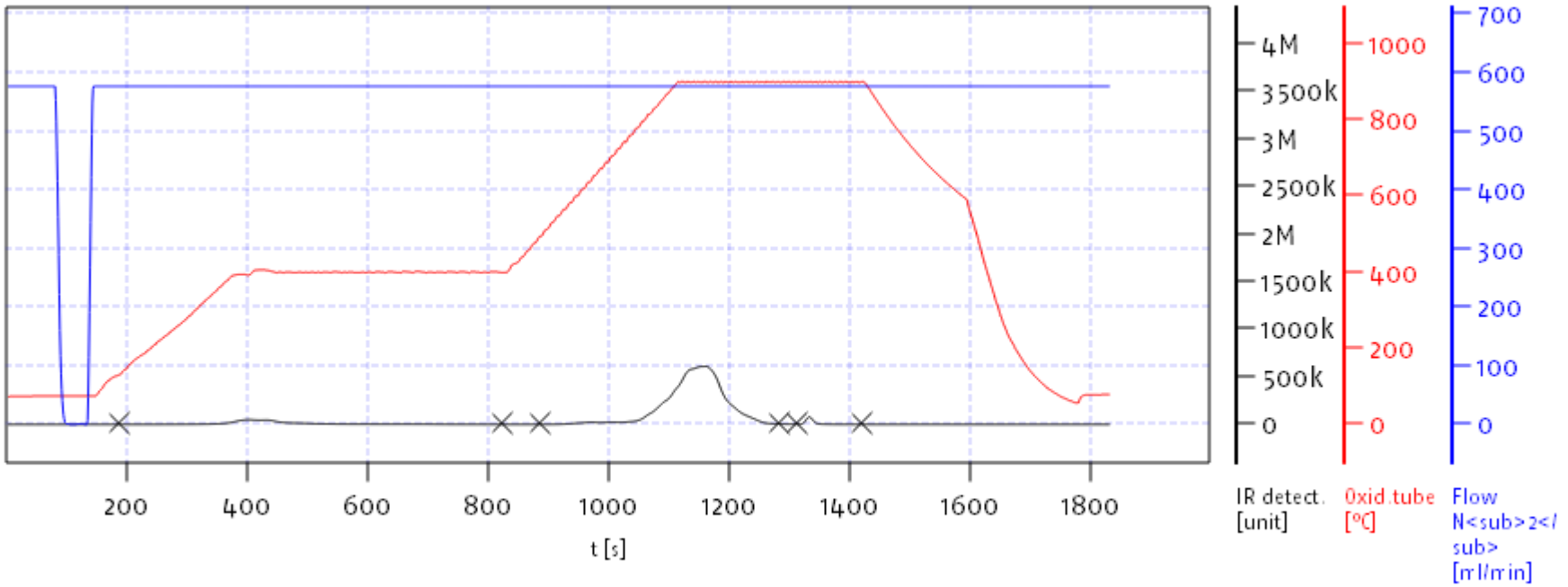
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
150	10	21G0310-06RE1	131.50		1.00	CARBON	8/28/2021 8:59 PM	0.285	3.067	3.353	bl	201 867	2 399 770	45 380	0.9913	1.0000



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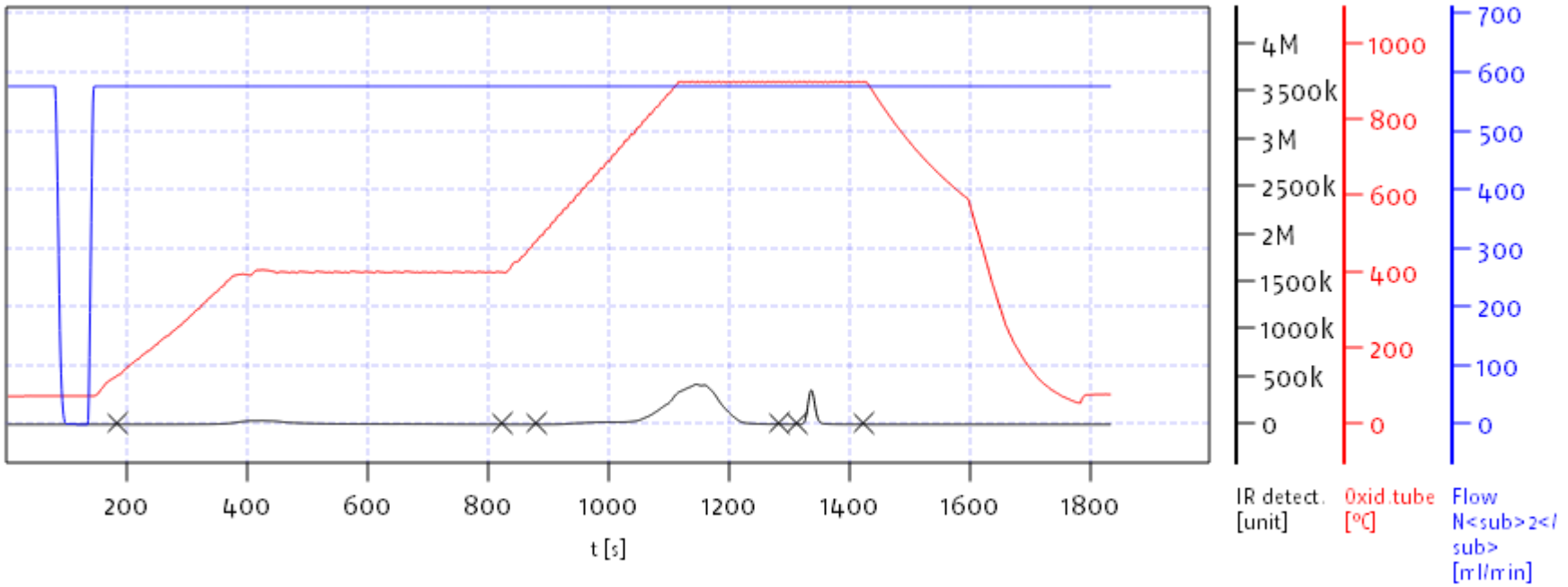
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
151	11	21G0310-07RE1	184.30		1.00	CARBON	8/28/2021 9:30 PM	0.325	1.485	1.810	bl	188 140	1 632 090	190 979	0.9913	1.0000



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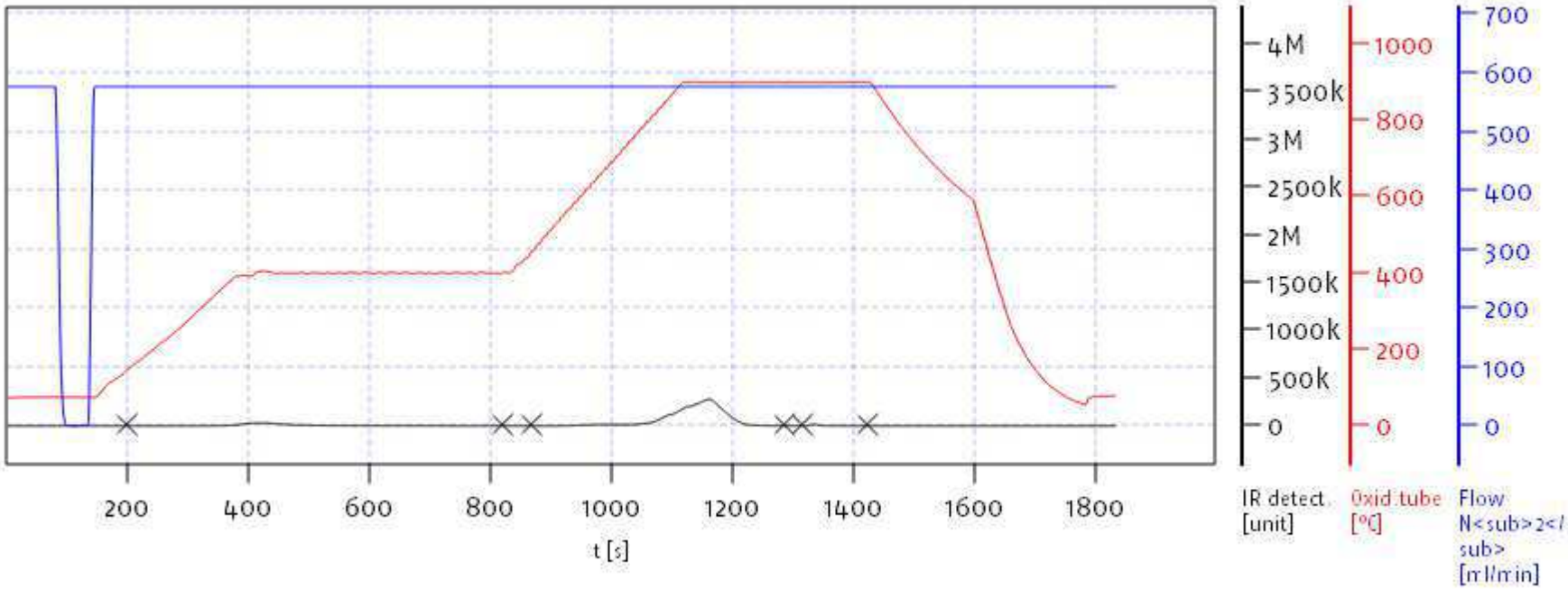
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
152	12	21G0312-14RE1	105.00		1.00	CARBON	8/28/2021 10:01 PM	0.163	1.524	1.687	bl	113 787	959 154	10 137	0.9913	1.0000



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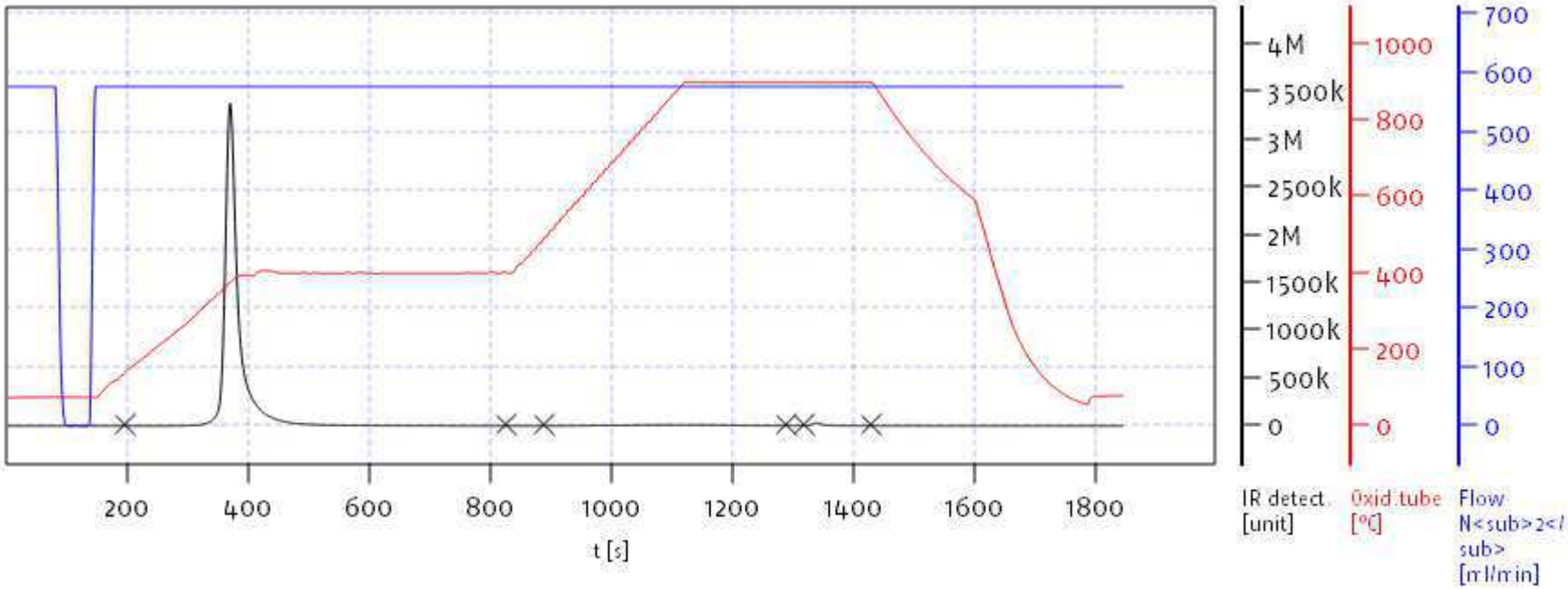
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
153	13	21H0061-01RE1	100.70		1.00	CARBON	8/28/2021 10:32 PM	5.373	0.116	5.489	bl	3 228 540	80 938	26 398	0.9913	1.0000



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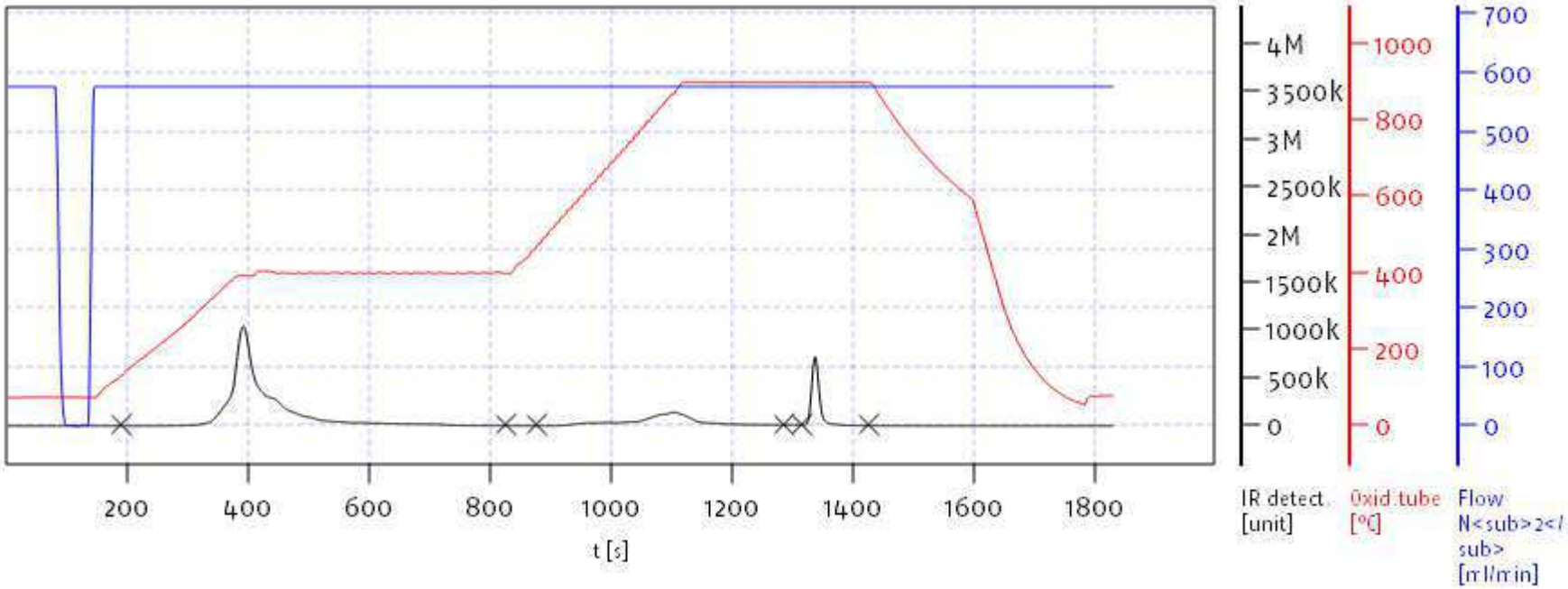
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
154	14	21H0061-03RE1	104.30		1.00	CARBON	8/28/2021 11:03 PM	4.442	0.954	5.396	bl	2 376 800	601 105	410 254	0.9913	1.0000



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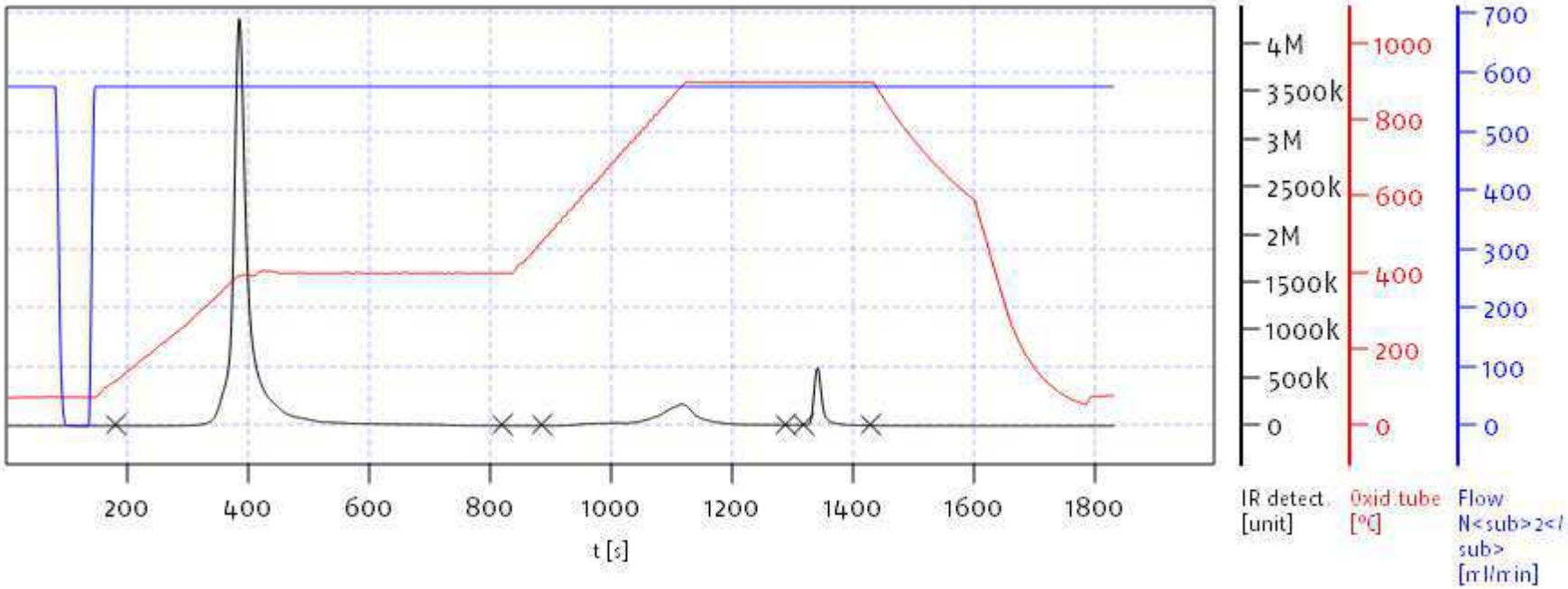
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
155	15	21H0061-04RE1	112.90		1.00	CARBON	8/28/2021 11:34 PM	7.662	1.113	8.775	bl	4 816 740	755 540	370 349	0.9913	1.0000



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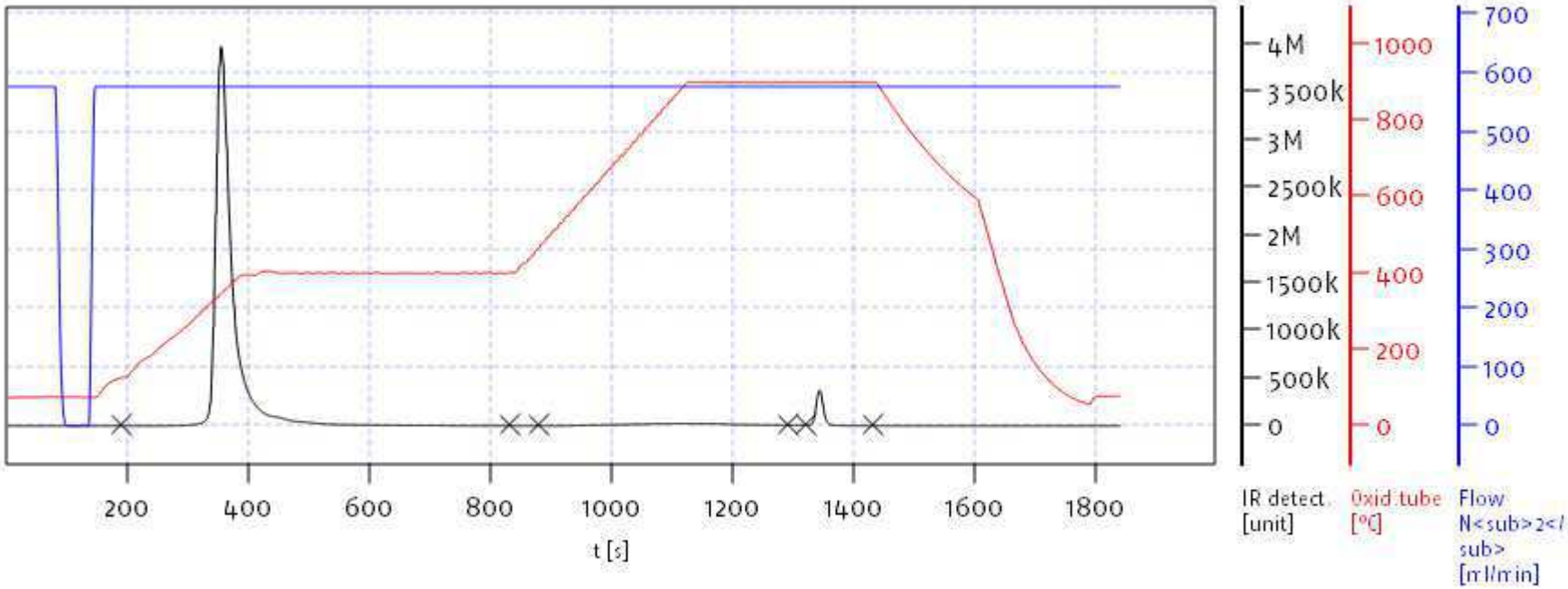
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
156	16	21H0061-05RE1	128.60		1.00	CARBON	8/29/2021 12:06 AM	6.375	0.247	6.622	bl	4 719 210	199 614	199 518	0.9913	1.0000



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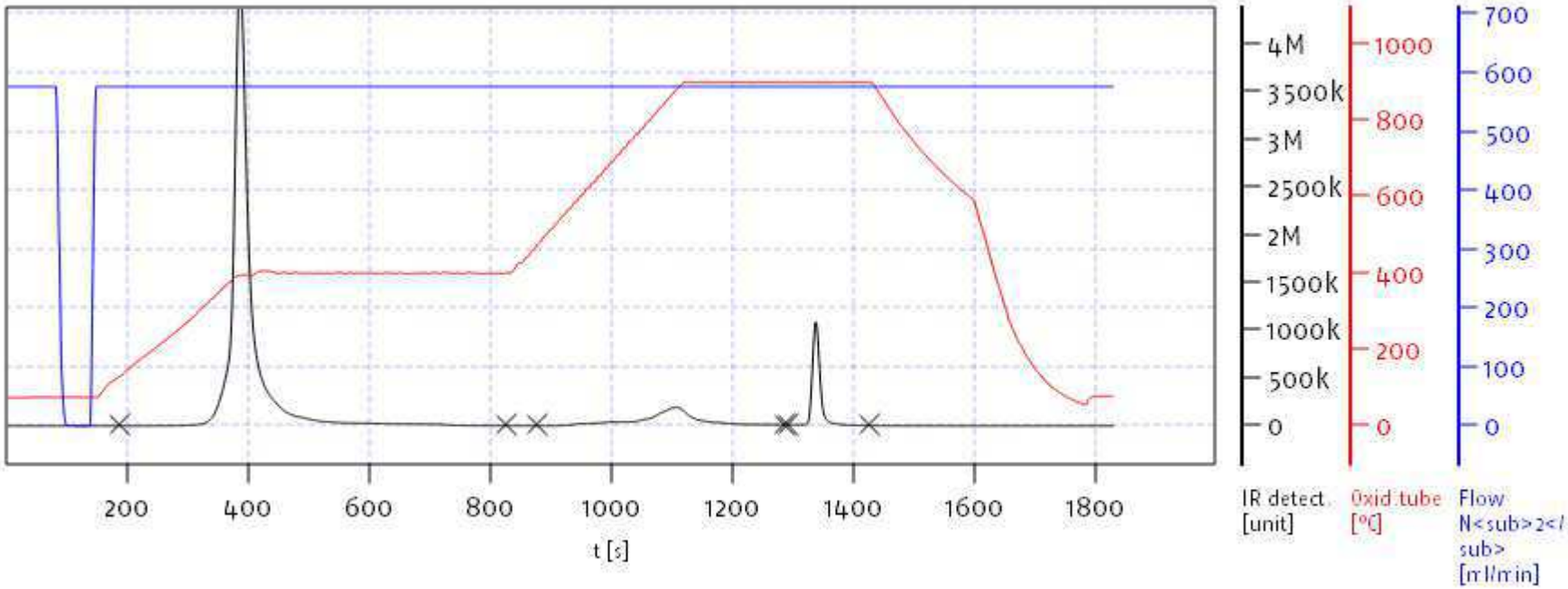
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
157	17	21H0061-06RE1	157.50		1.00	CARBON	8/29/2021 12:36 AM	6.566	0.765	7.331	bl	5 574 890	725 044	620 006	0.9913	1.0000



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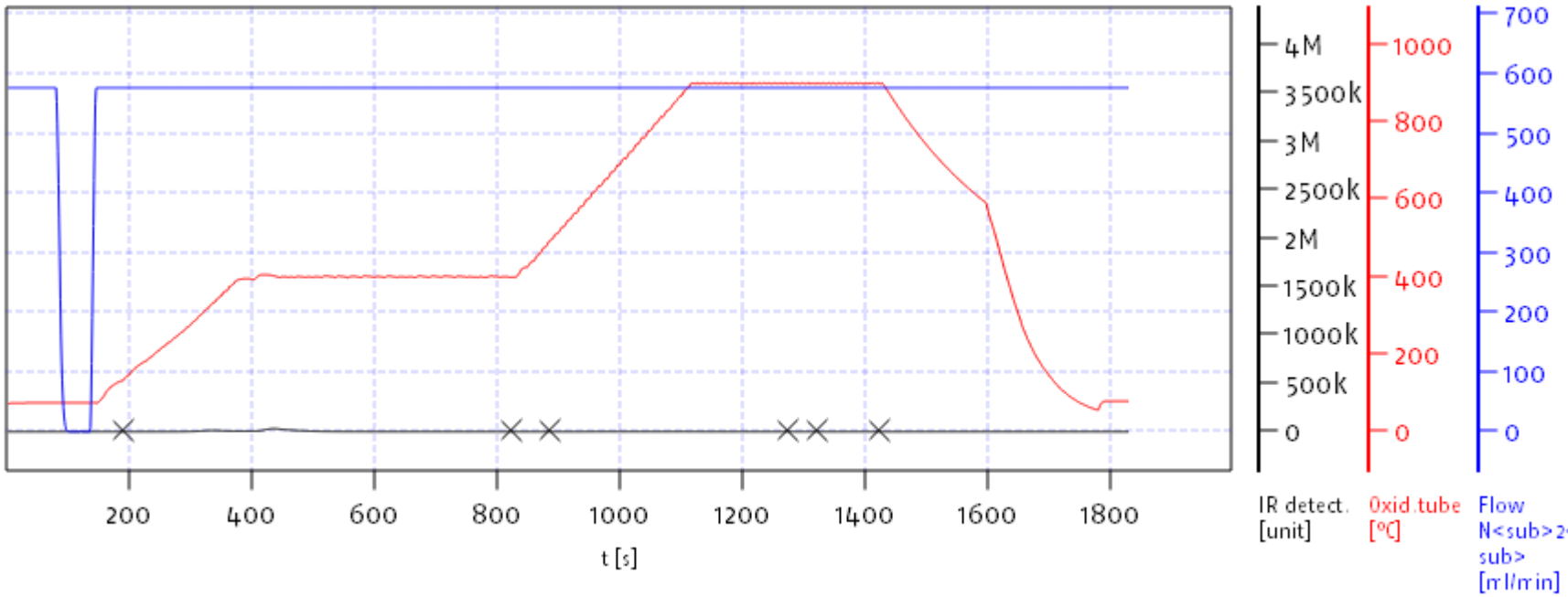
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
158	18	BJH0674-MRL1	519.00		1.00	CARBON	8/29/2021 1:07 AM	0.028	0.000	0.028	bl,C3u,C2u	97 908	6 907	347	0.9913	1.0000



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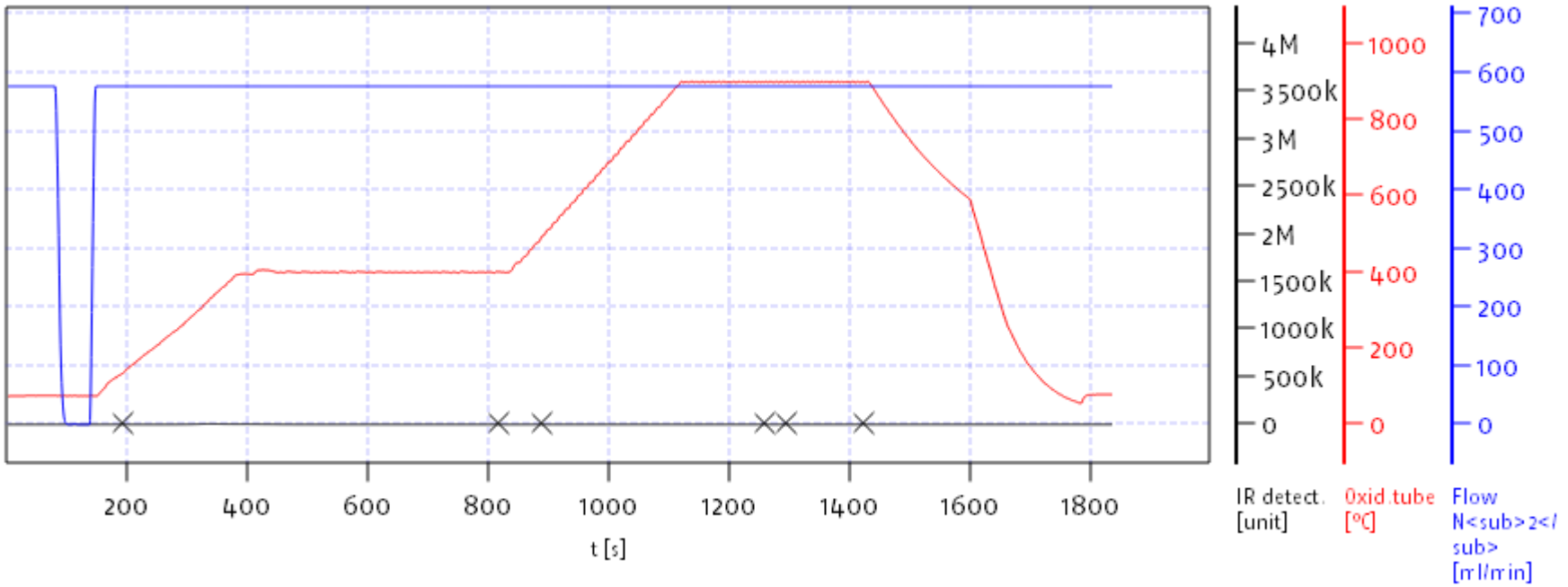
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
159	19	BJH0674-BLK1	618.30		1.00	CARBON	8/29/2021 1:38 AM	0.003	0.000	0.003	bl,C3u,C2u	23 033	2 269	472	0.9913	1.0000



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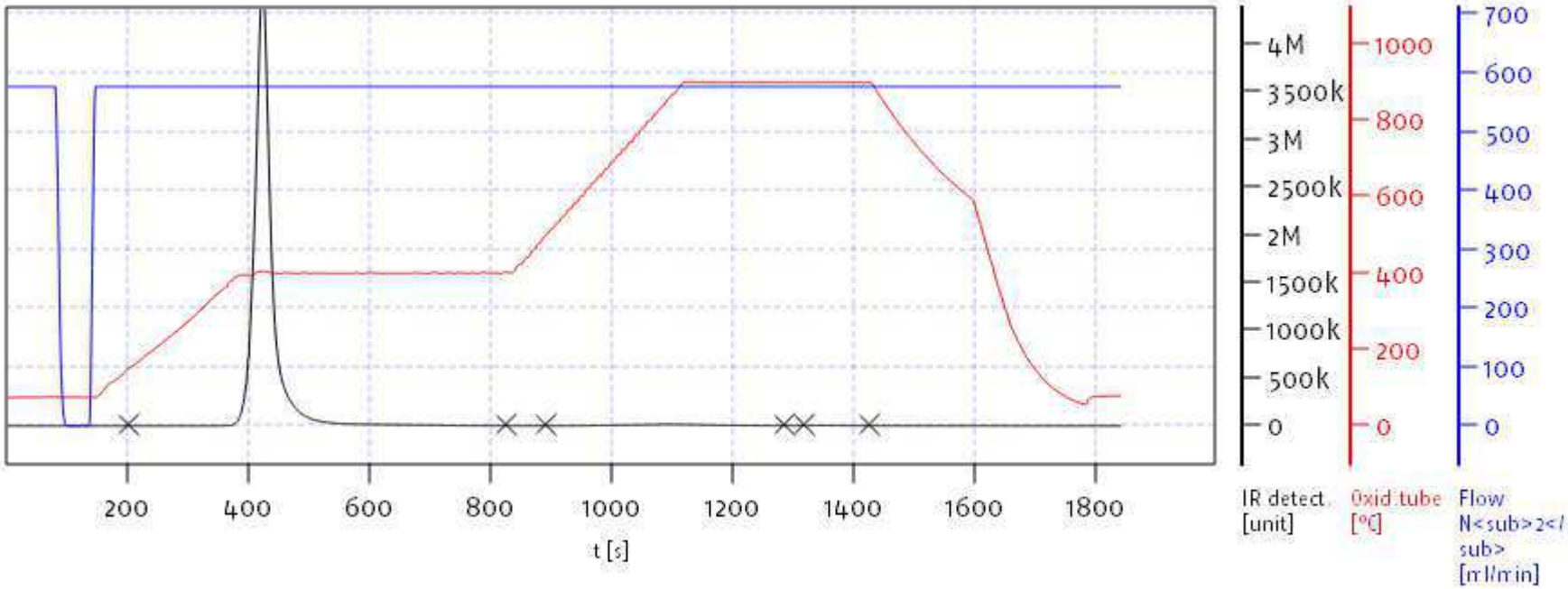
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
160	20	SJH0331-CCVD	20.30		1.00	CARBON	8/29/2021 2:10 AM	45.619	0.782	46.401	bl	5 540 110	105 612	14 448	0.9913	1.0000



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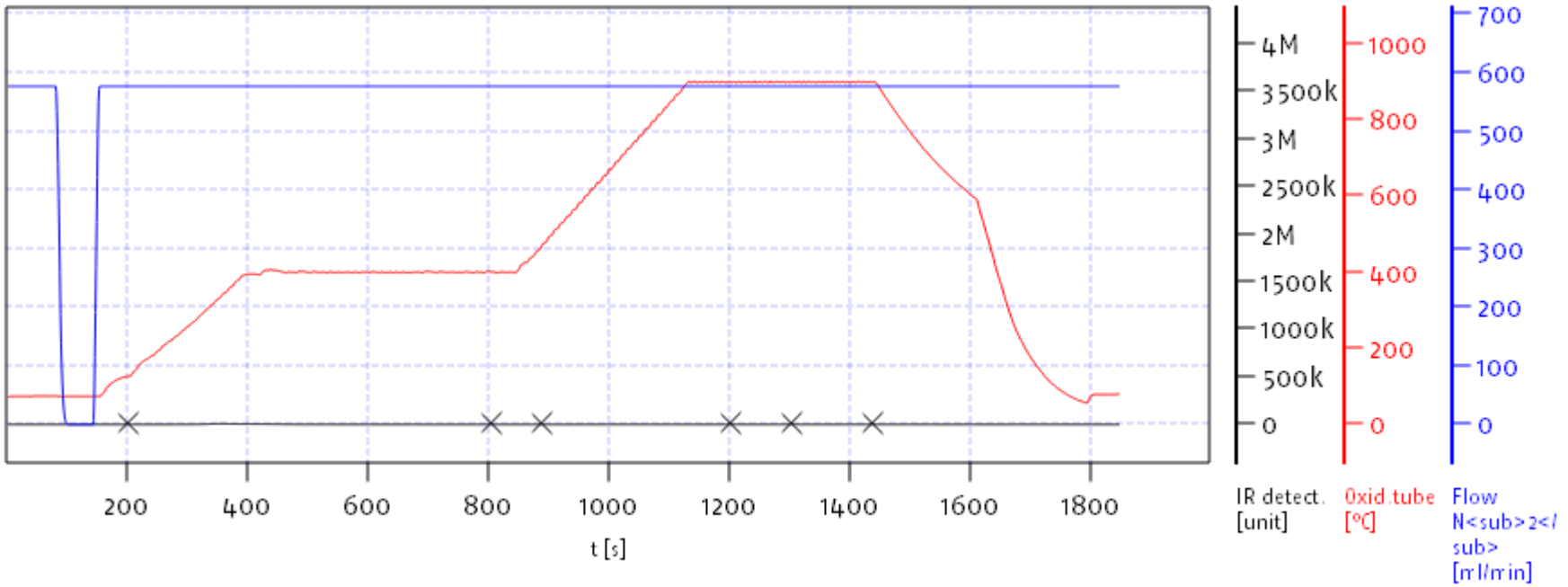
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
161	21	SJH0331-CCBD	664.20		1.00	CARBON	8/29/2021 2:41 AM	0.004	0.000	0.004	bl,C3u,C2u	25 929	1 898	287	0.9913	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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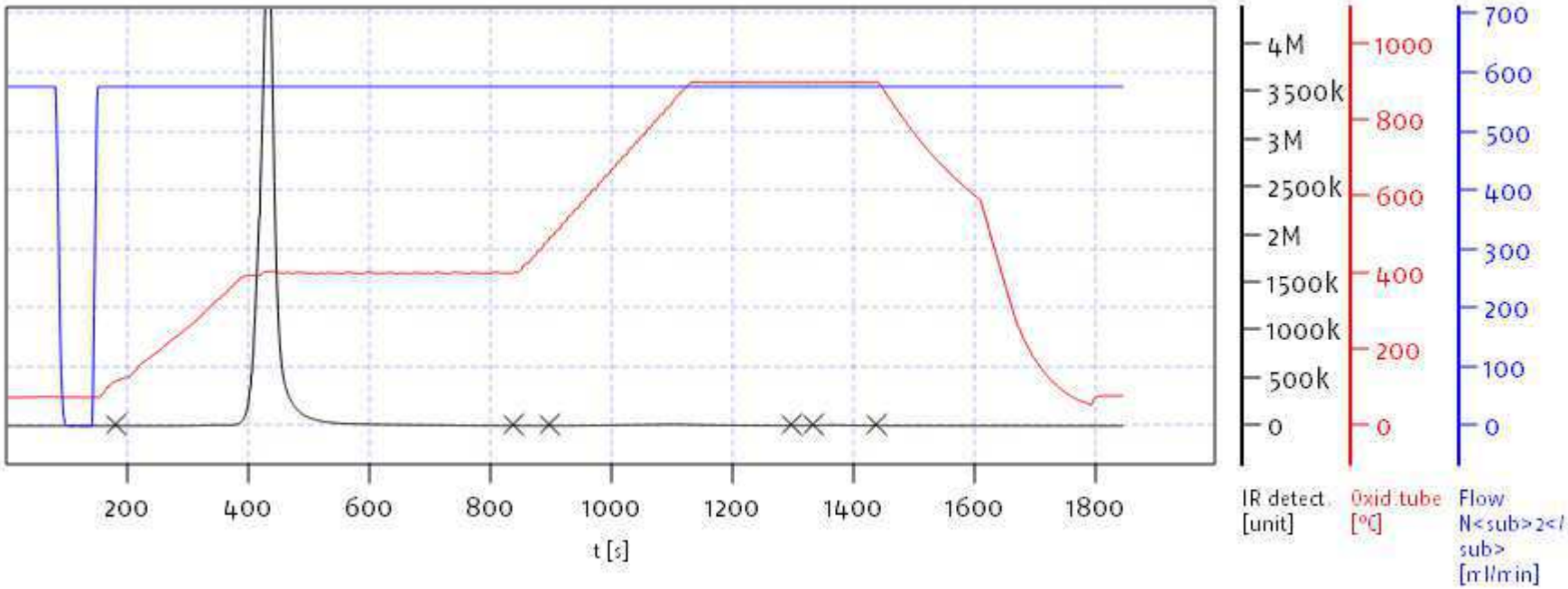
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
162	22	BJH0674-BS1	20.70		1.00	CARBON	8/29/2021 3:12 AM	45.521	0.772	46.292	bl	5 631 530	106 242	19 786	0.9913	1.0000



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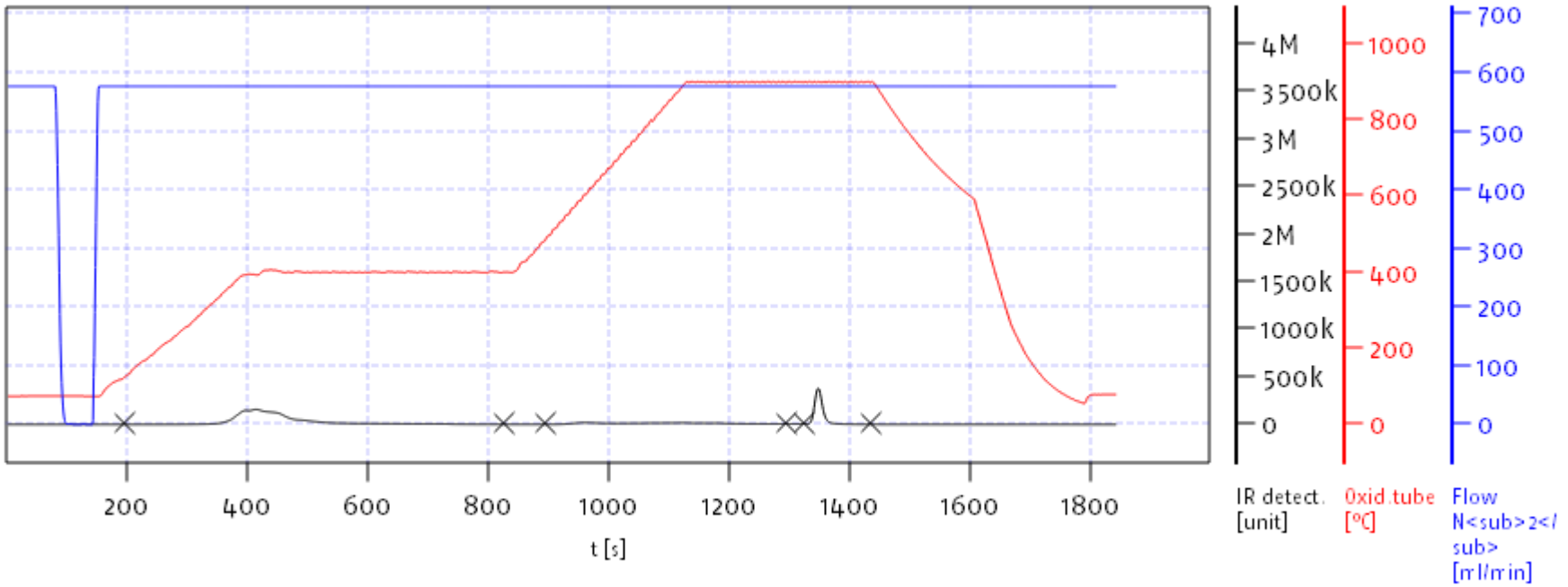
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
163	23	BJH0674-SRM1	54.60		1.00	CARBON	8/29/2021 3:43 AM	2.569	0.462	3.031	bl	634 862	161 145	224 316	0.9913	1.0000



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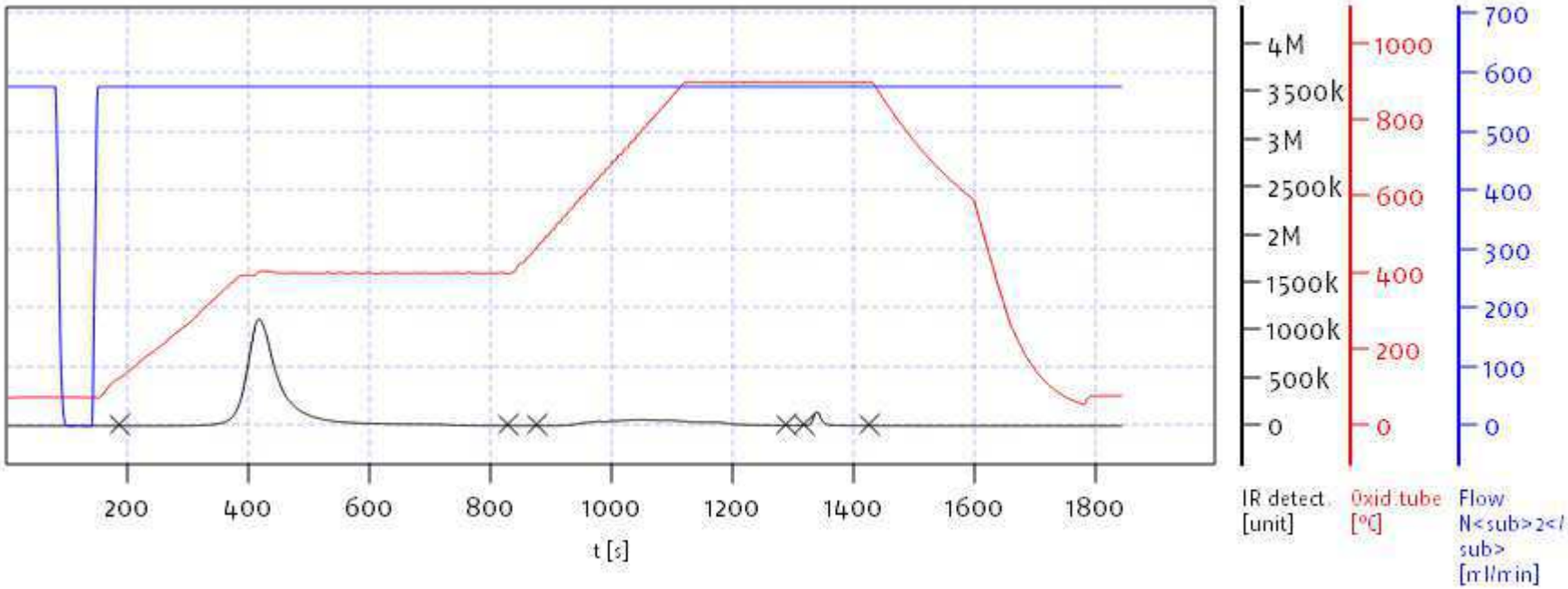
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
164	24	21H0244-01	598.90		1.00	CARBON	8/29/2021 4:14 AM	0.785	0.135	0.920	bl	2 735 500	491 425	93 499	0.9913	1.0000



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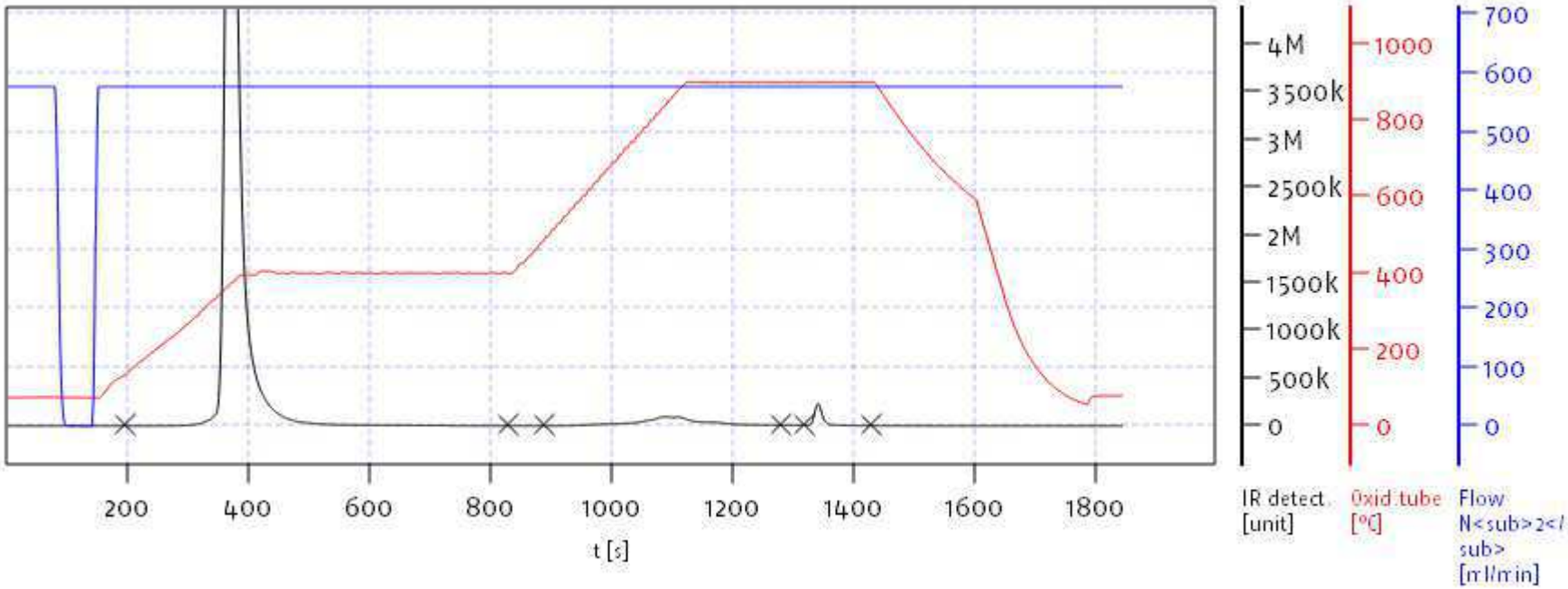
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
165	25	21H0260-01	202.60		1.00	CARBON	8/29/2021 4:46 AM	7.327	0.359	7.686	bl,Cl o	8 747 300	442 274	141 368	0.9913	1.0000



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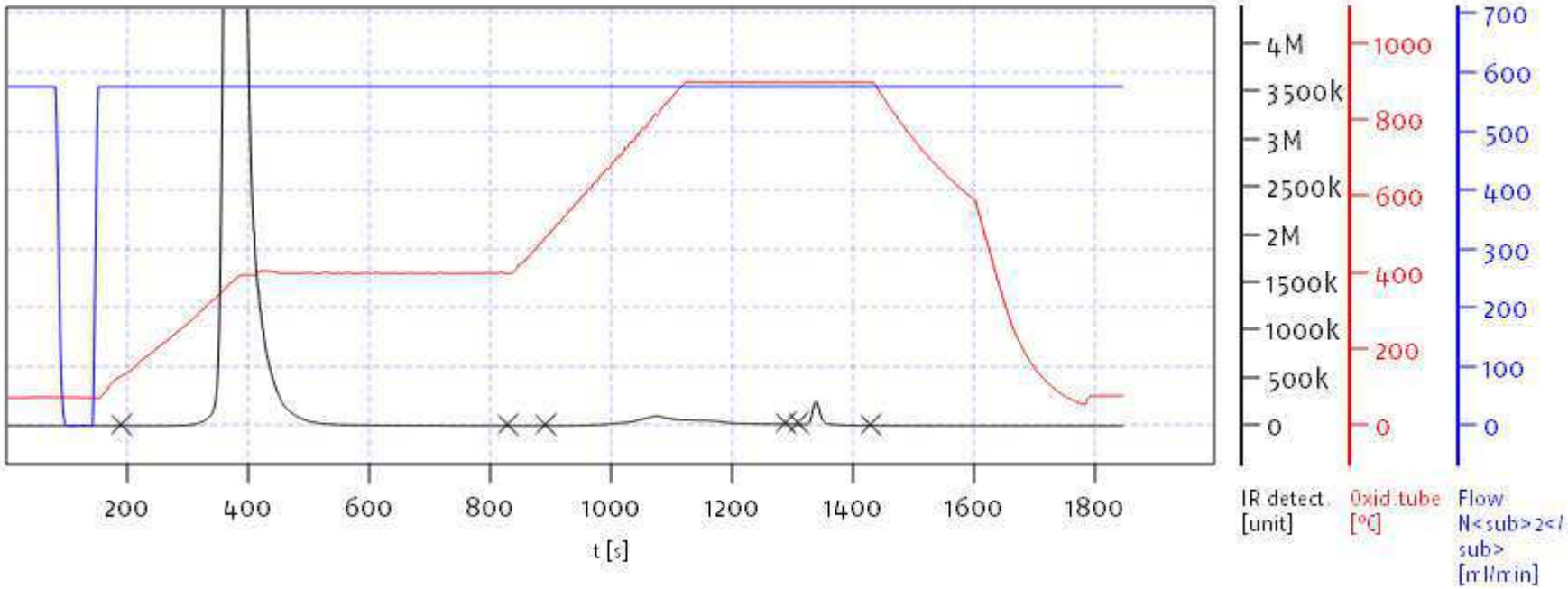
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
166	26	21H0260-02	170.80		1.00	CARBON	8/29/2021 5:17 AM	19.149	0.520	19.670	bl,C1o	19 383800	538 066	173 440	0.9913	1.0000



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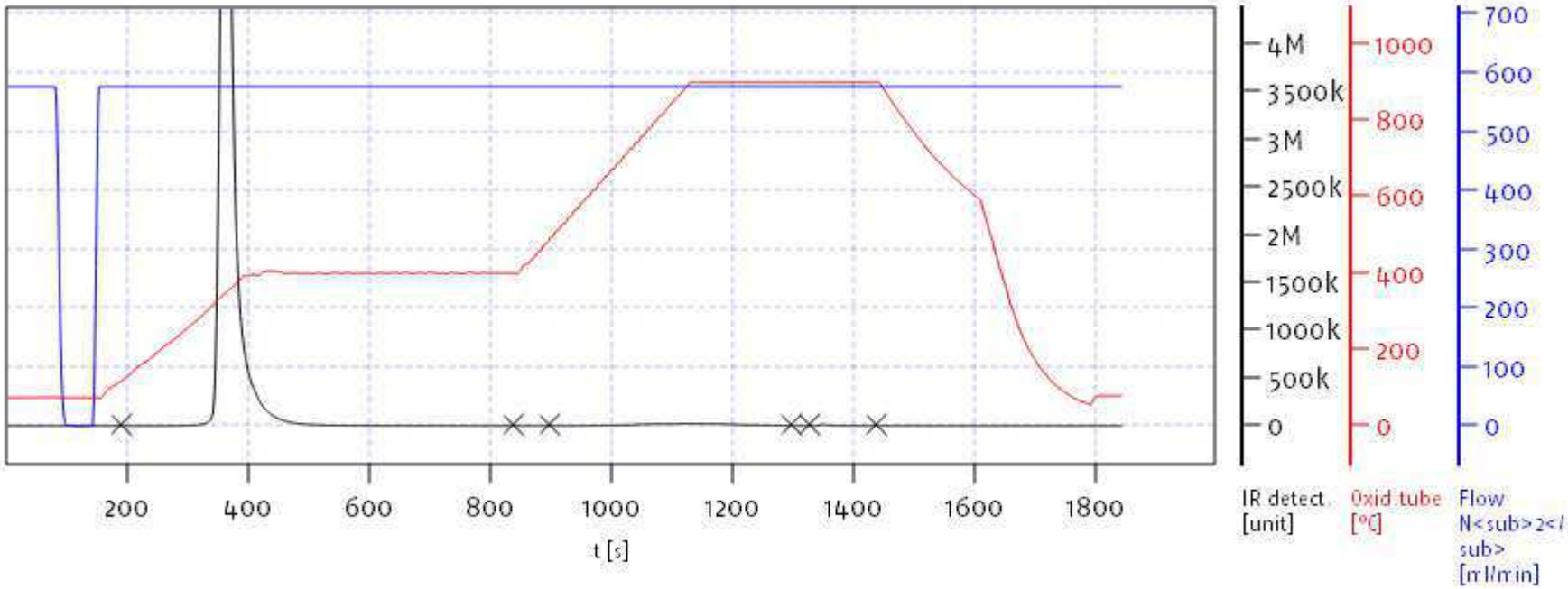
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
167	27	21H0260-03	206.90		1.00	CARBON	8/29/2021 5:48 AM	6.145	0.130	6.275	bl	7 604 160	170 475	13 148	0.9913	1.0000



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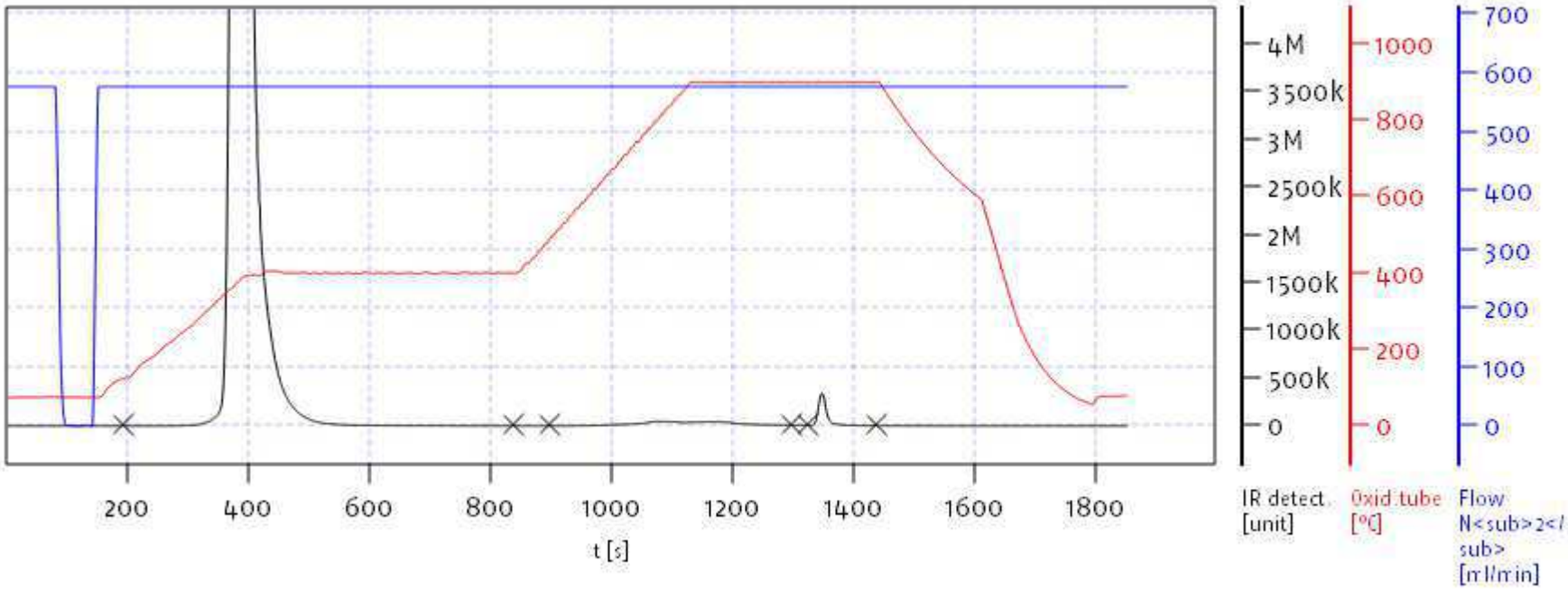
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
168	28	21H0261-01	209.00		1.00	CARBON	8/29/2021 6:19 AM	14.878	0.250	15.127	bl,C1o	18 385400	320 810	208 132	0.9913	1.0000



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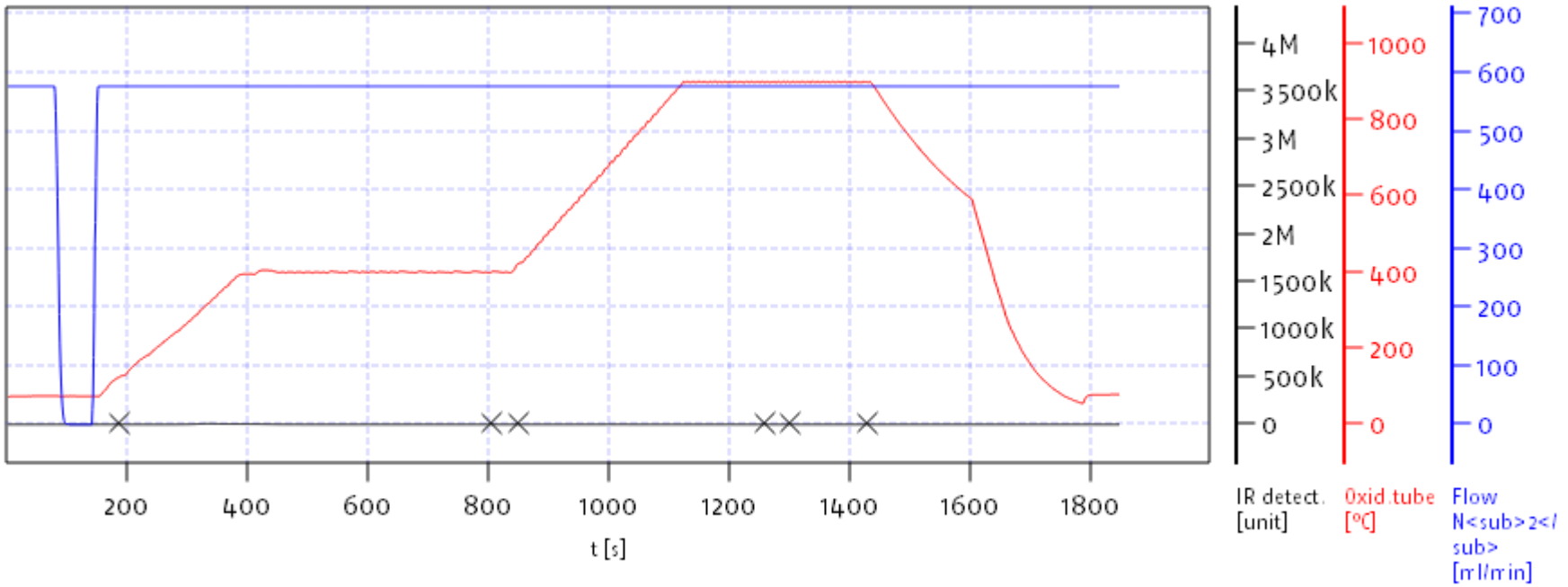
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
169	29	BLANK	1.00		1.00	CARBON	8/29/2021 6:51 AM	0.000	0.000	0.000	bl	28 416	2 891	319	0.9913	1.0000



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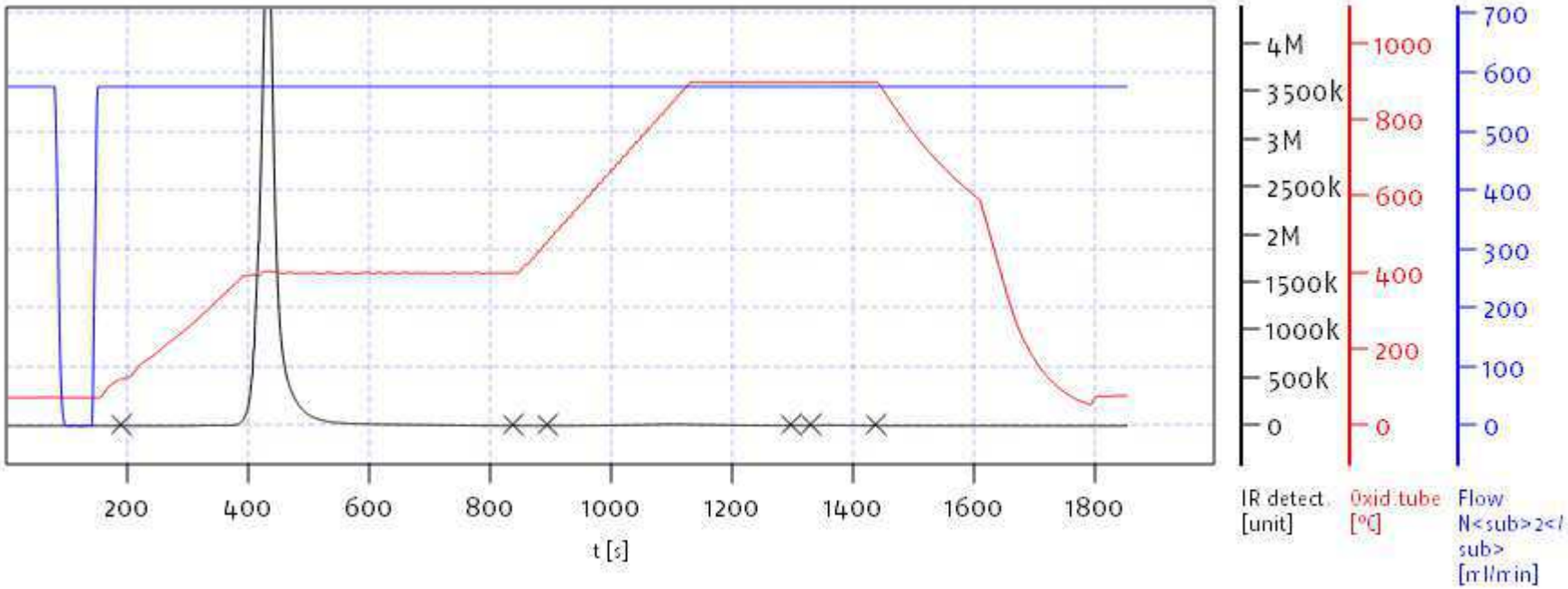
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
170	30	Dfactor	21.90		1.00	CARBON	8/29/2021 7:22 AM	44.490	0.782	45.272	bl	5 966 290	113 062	17 465	0.9679	1.0000



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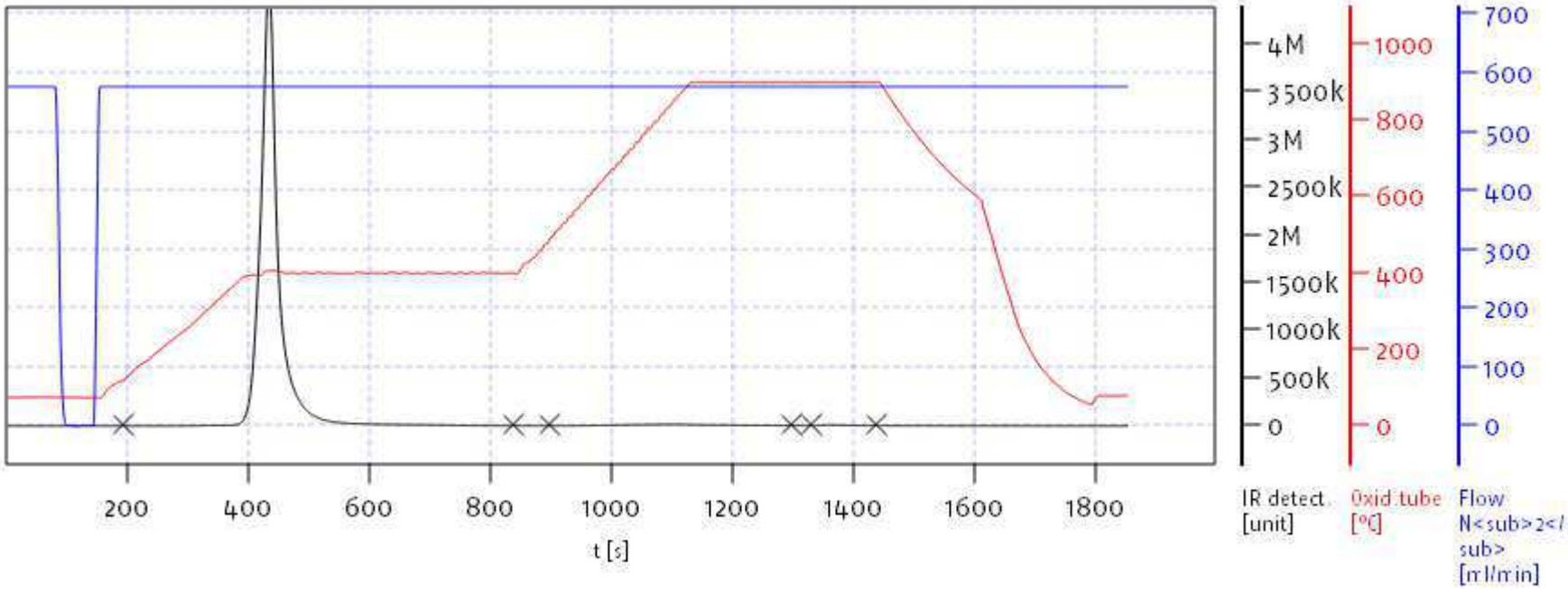
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
171	31	Dfactor	21.20		1.00	CARBON	8/29/2021 7:53 AM	44.523	0.814	45.338	bl	5 808 890	113 876	21 433	0.9624	1.0000



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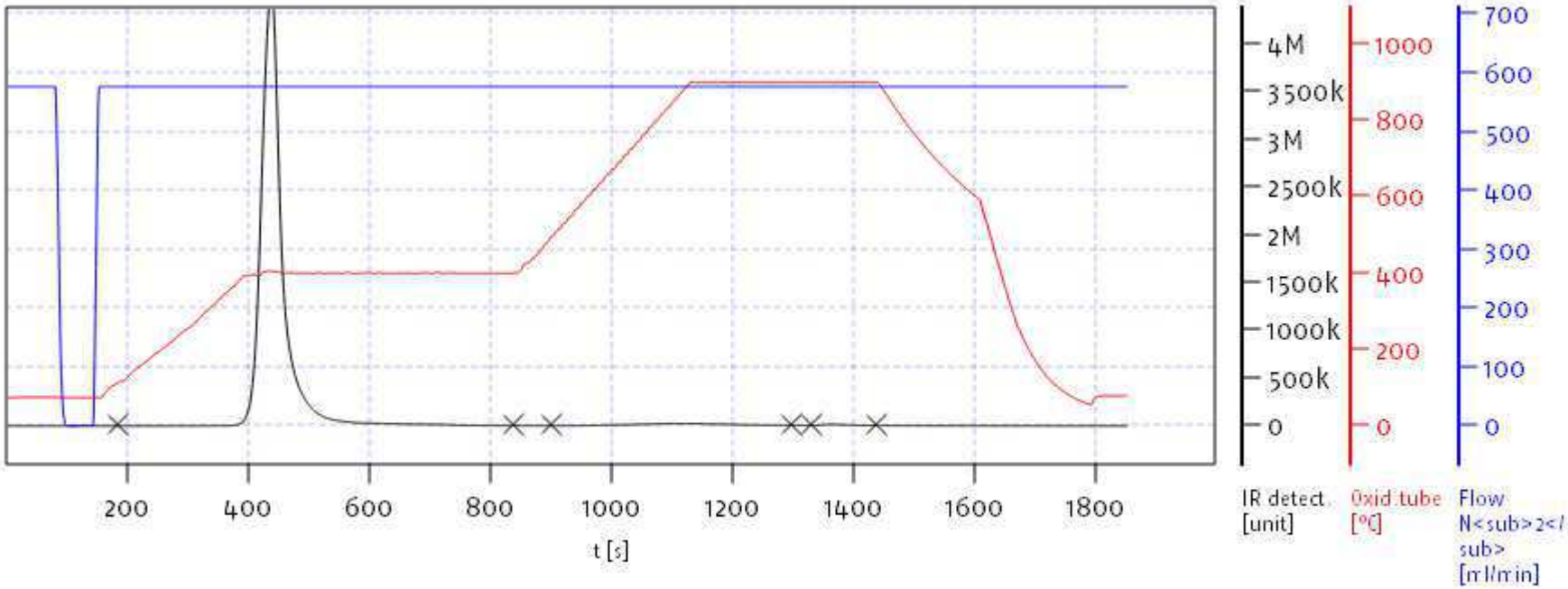
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
172	32	SJH0331-CCVE	25.60		1.00	CARBON	8/29/2021 8:25 AM	43.530	1.131	44.661	bl	6 823 460	183 162	35 661	0.9651	1.0000



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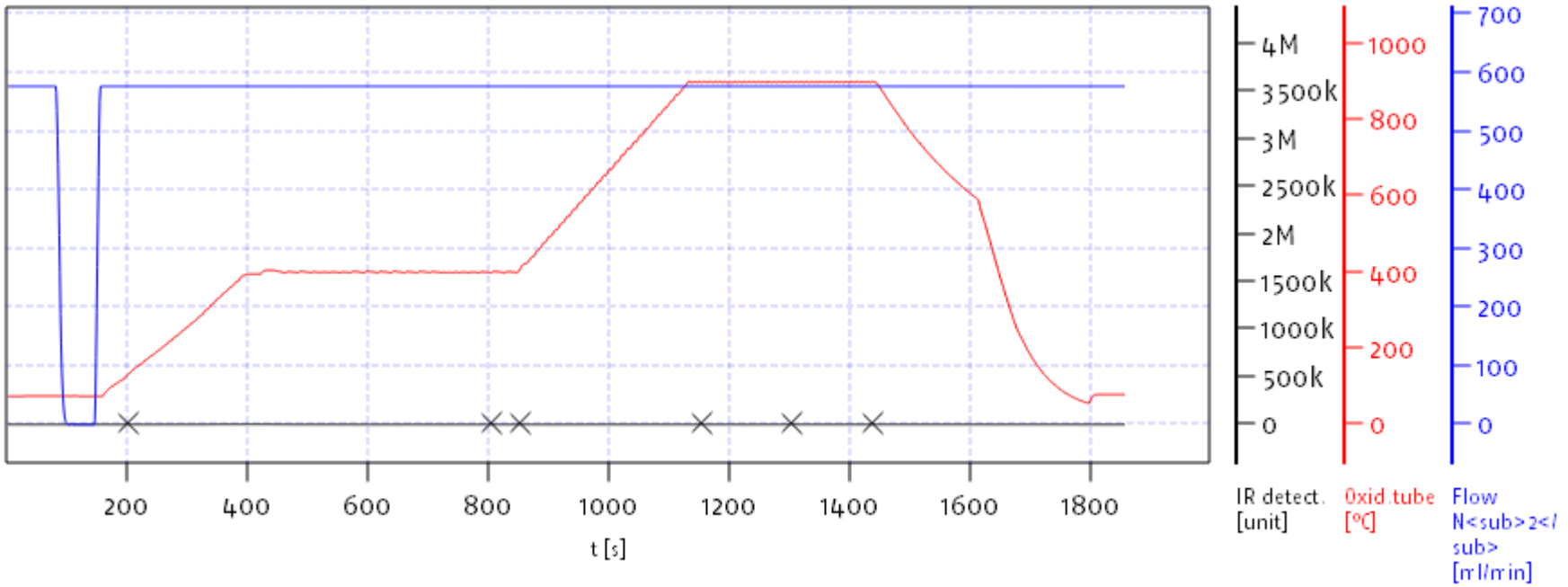
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
173	33	SJH0331-CCBE	558.70		1.00	CARBON	8/29/2021 8:56 AM	0.000	0.000	0.000	bl,C3u,C2u	8 363	771	466	0.9651	1.0000



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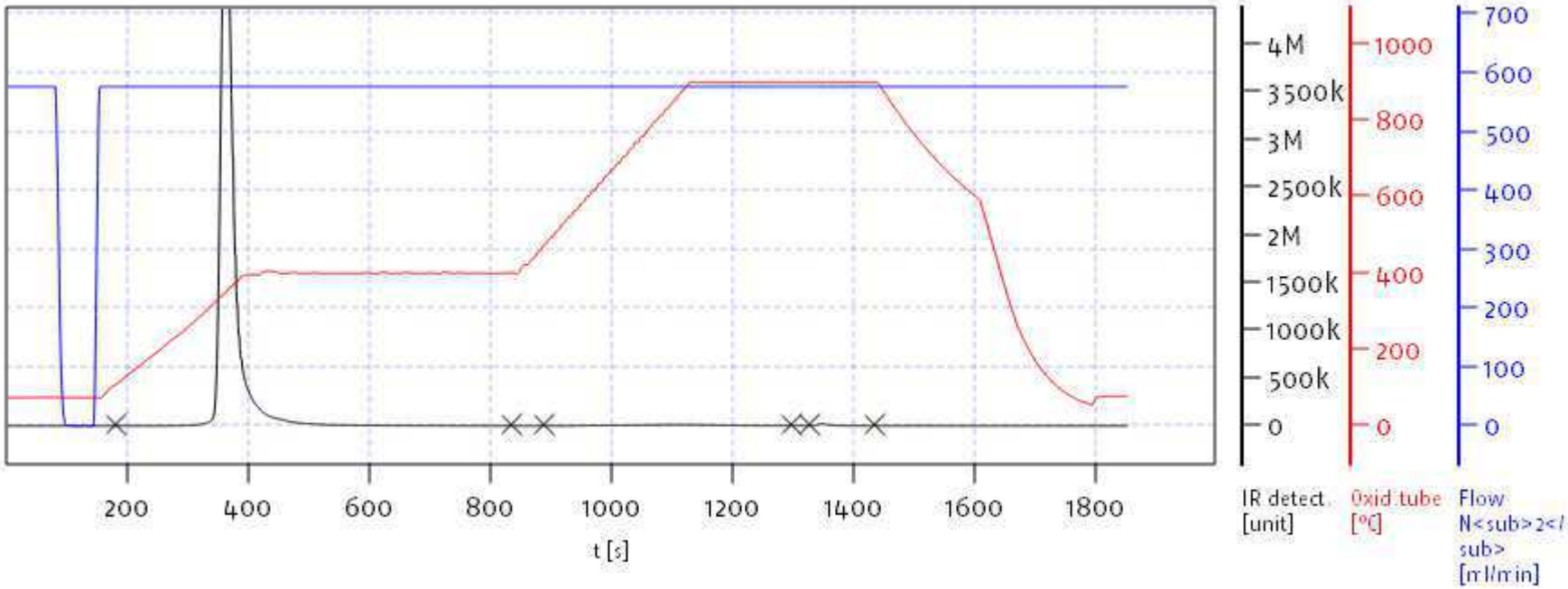
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
174	34	21H0261-02	203.40		1.00	CARBON	8/29/2021 9:28 AM	4.376	0.063	4.439	bl	5 463 700	87 012	20 134	0.9651	1.0000



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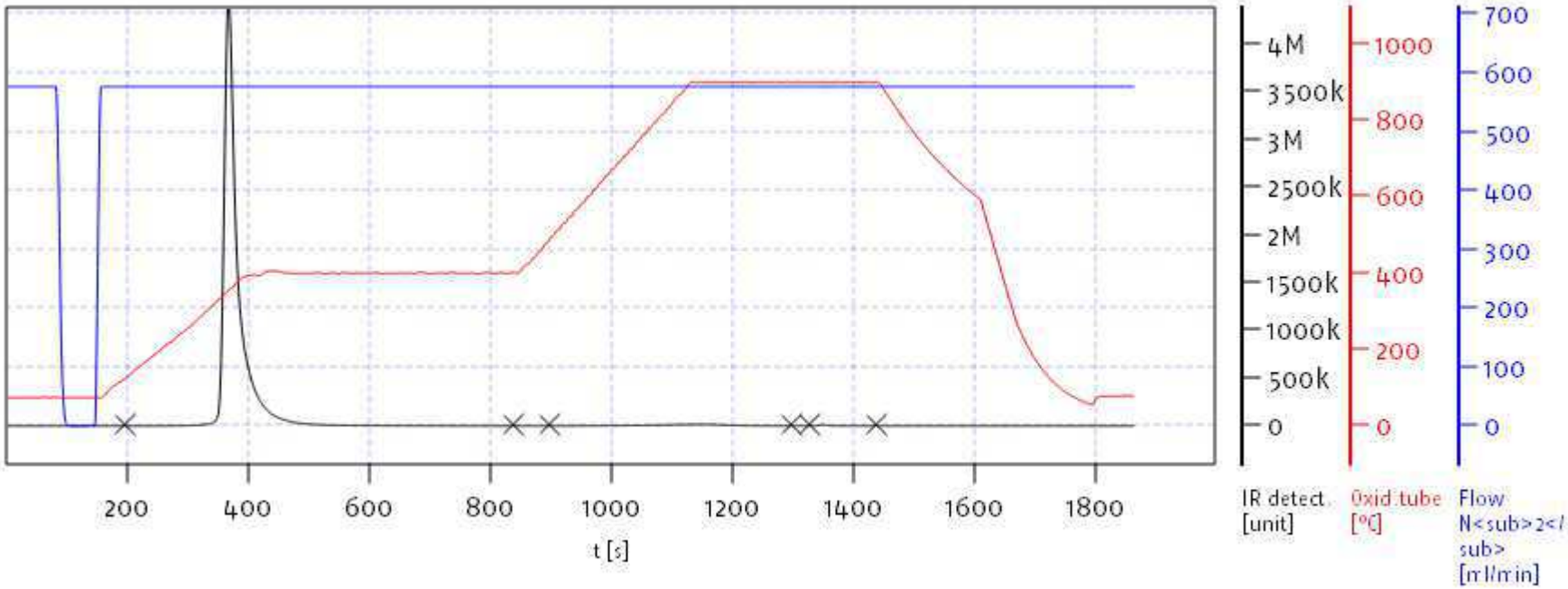
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
175	35	21H0261-03	159.20		1.00	CARBON	8/29/2021 9:59 AM	4.463	0.073	4.536	bl	4 370 410	80 886	9 432	0.9651	1.0000



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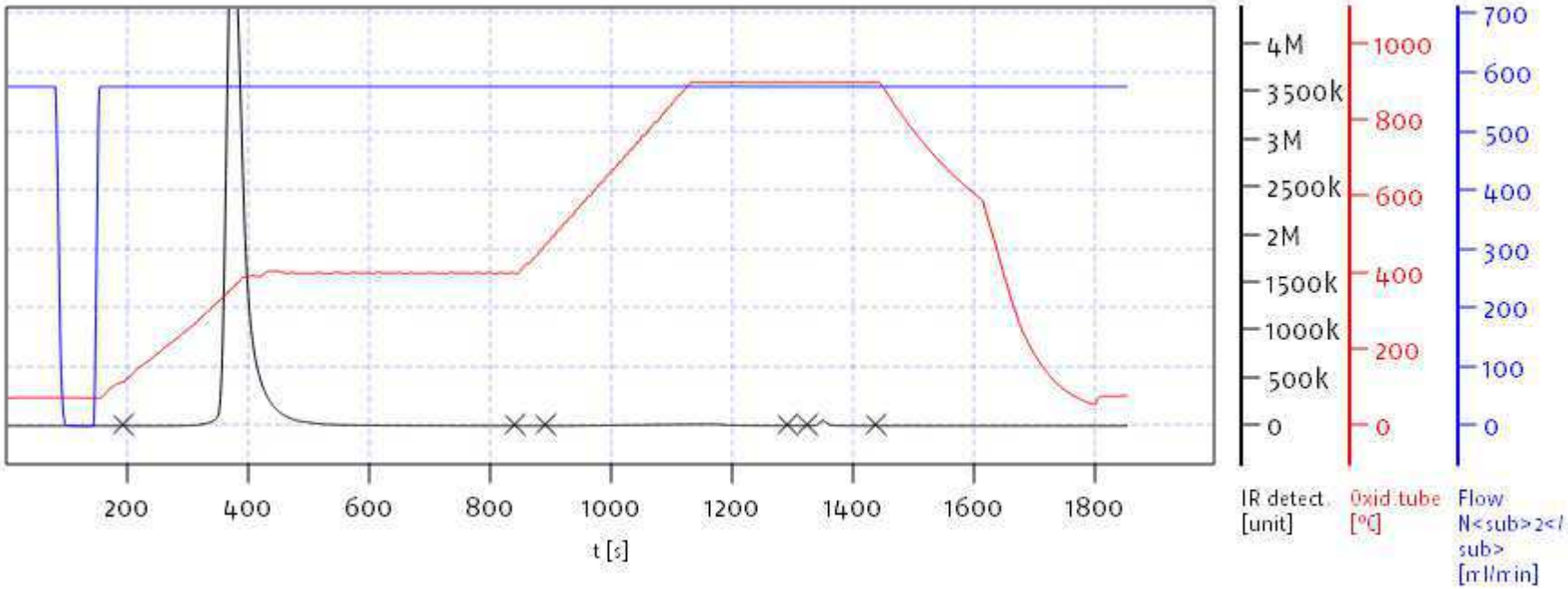
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
176	36	21H0261-04	216.30		1.00	CARBON	8/29/2021 10:30 AM	5.130	0.077	5.207	bl	6 795 630	110 543	34 709	0.9651	1.0000



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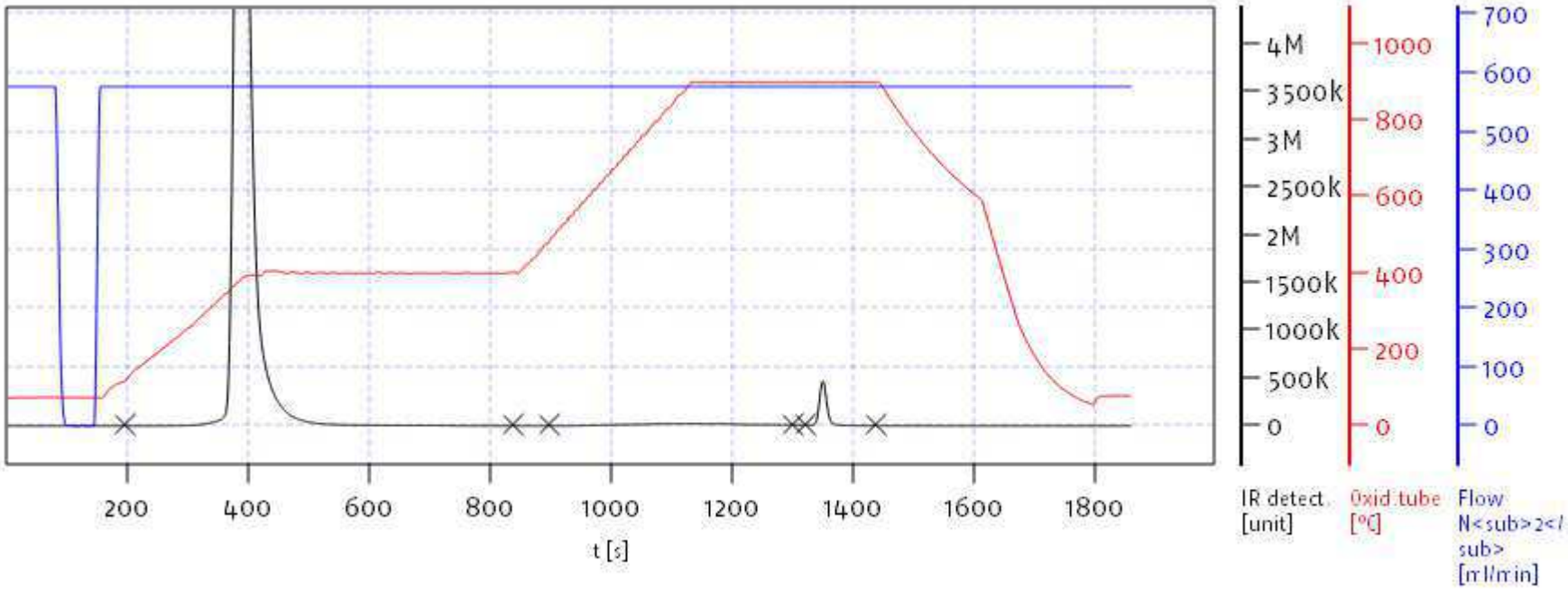
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
177	37	21H0262-01	157.10		1.00	CARBON	8/29/2021 11:02 AM	10.857	0.204	11.061	bl,C1o	10 220 000	201 520	258 859	0.9651	1.0000



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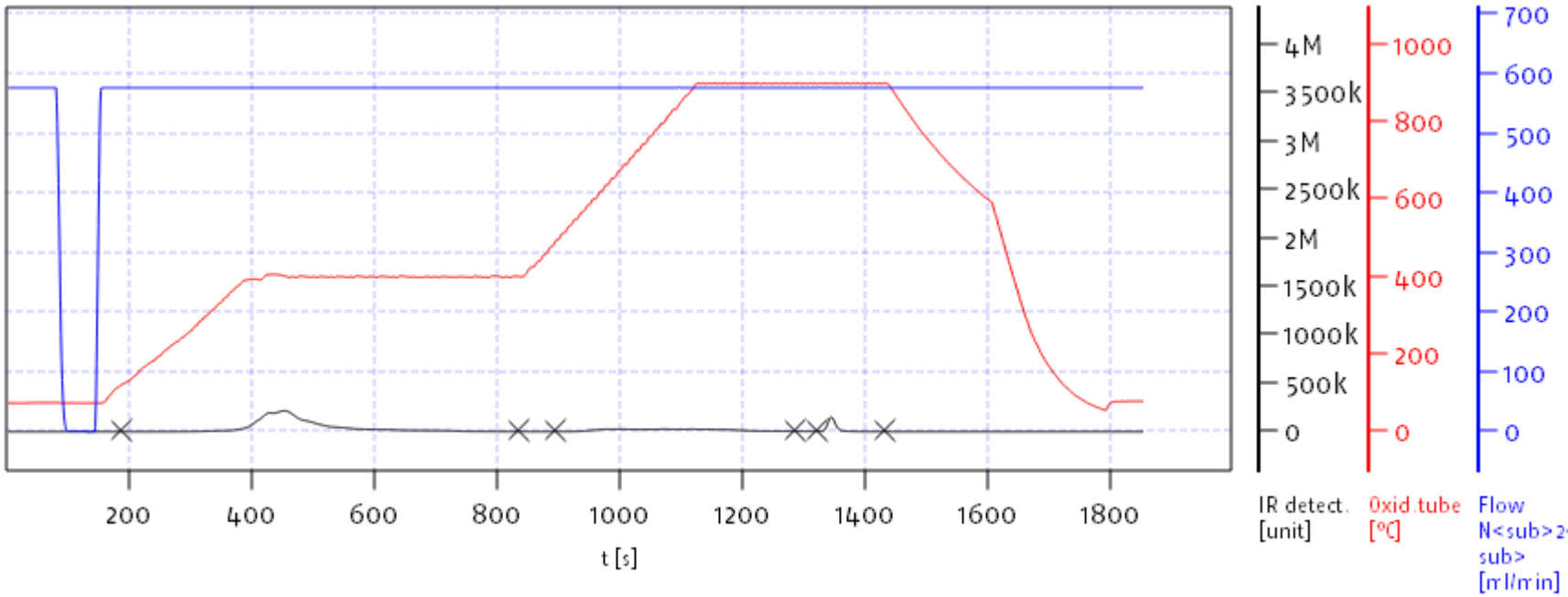
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
178	38	21H0263-01	564.90		1.00	CARBON	8/29/2021 11:33 AM	0.278	0.069	0.347	bl	895 505	242 038	88 665	0.9651	1.0000



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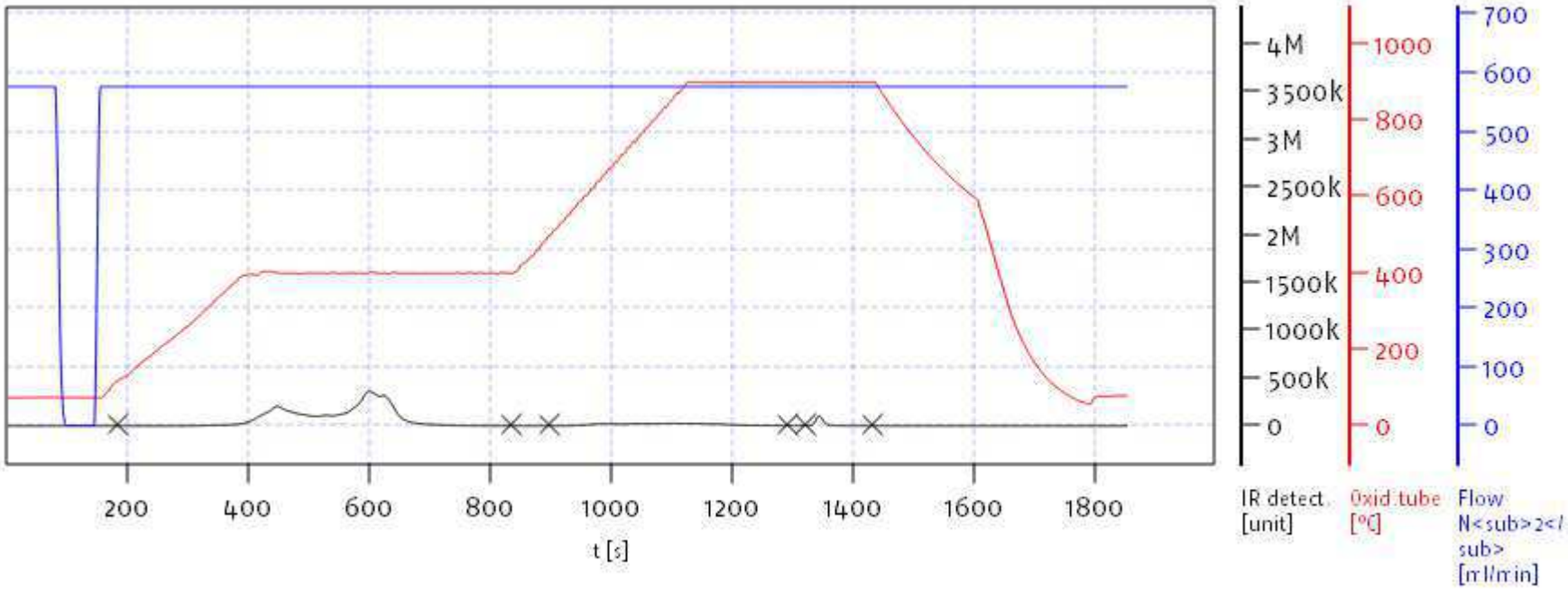
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
179	39	BJH0674-DUP1	530.50		1.00	CARBON	8/29/2021 12:05 PM	0.546	0.065	0.611	bl	1 737 790	214 569	61 081	0.9651	1.0000



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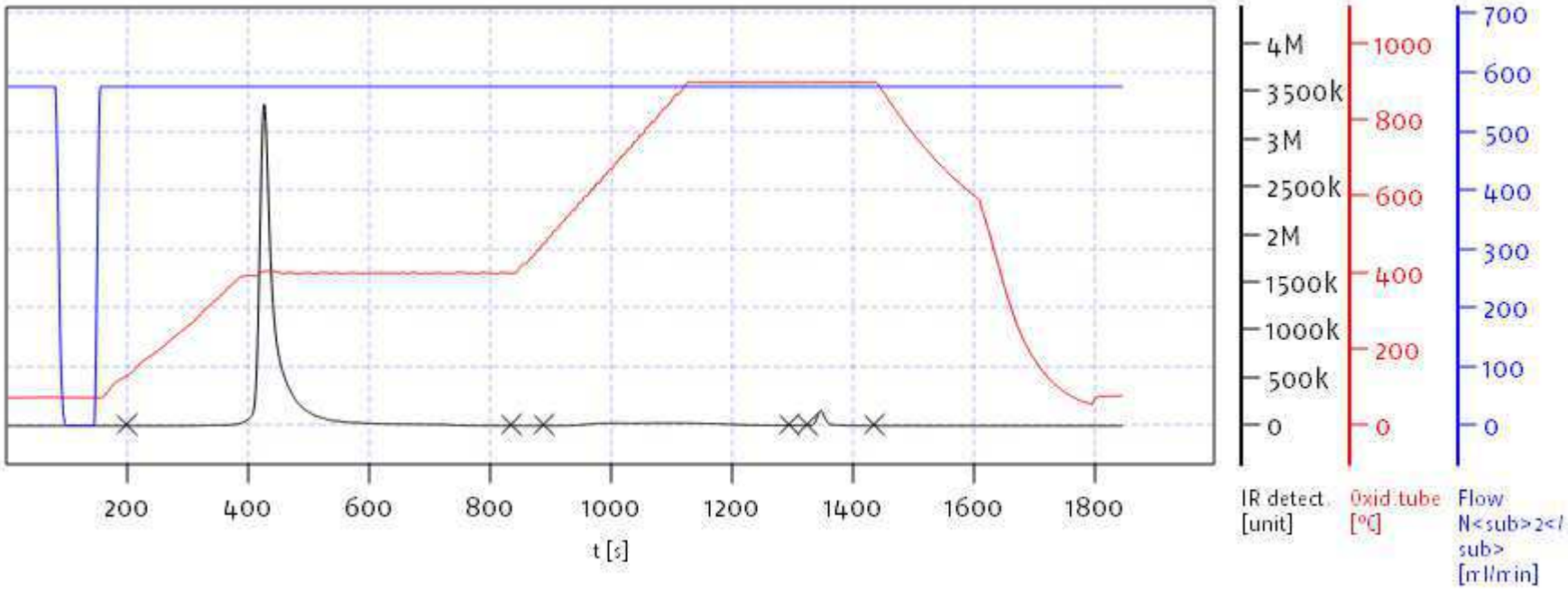
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
180	40	BJH0674-MS1	545.40	0.0106	1.00	CARBON	8/29/2021 12:36 PM	1.140	0.081	1.221	bl	3 733 680	273 424	100 090	0.9651	1.0000



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Access: soliTOC superuser

Date: Tue Aug 31 14:32:59 2021

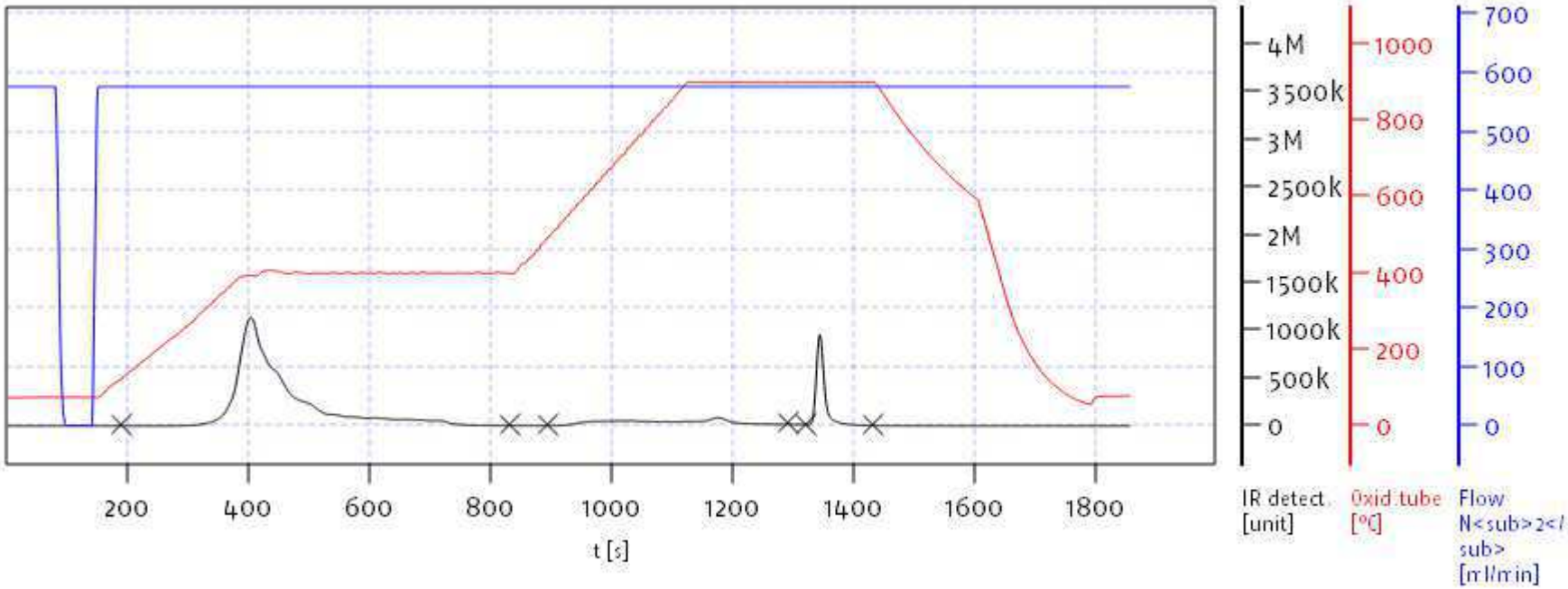
soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

elementar
EXCELLENCE IN ELEMENTS

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
181	41	21H0274-01	165.80		1.00	CARBON	8/29/2021 1:07 PM	4.321	0.571	4.892	bl	3 818 180	572 056	580 044	0.9651	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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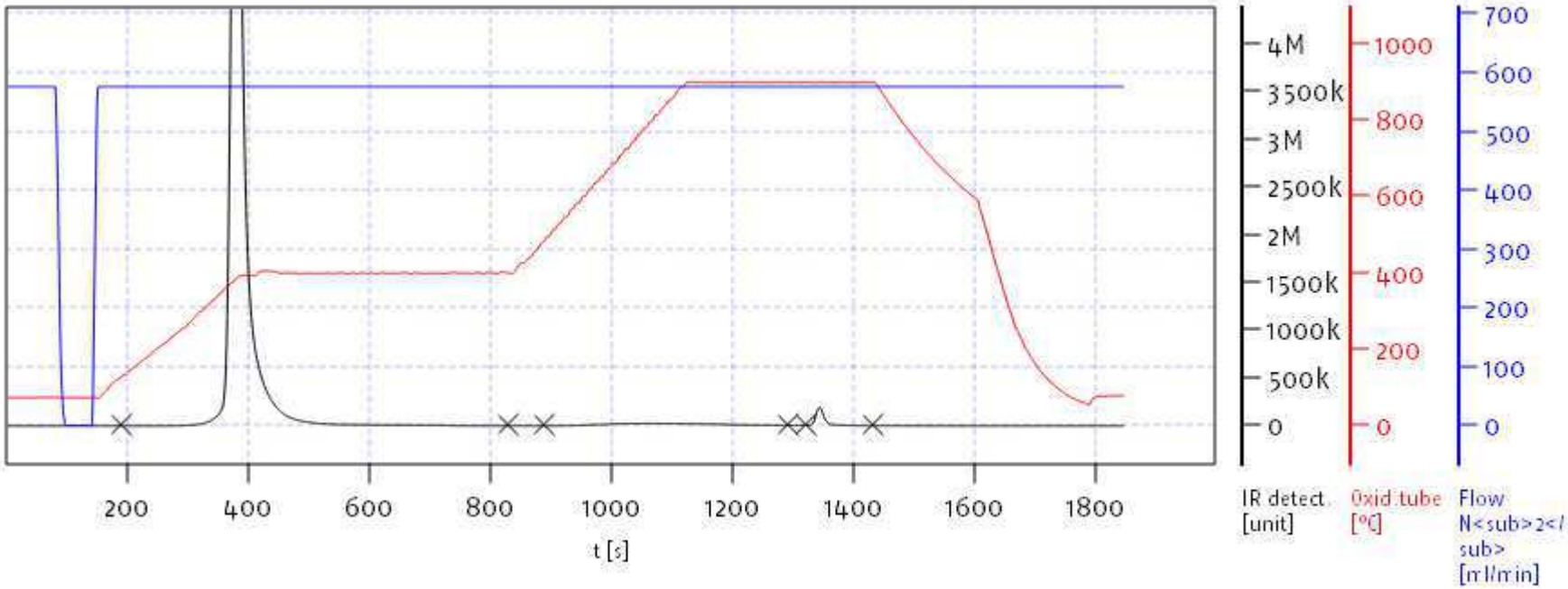
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
182	42	21H0274-02	138.80		1.00	CARBON	8/29/2021 1:39 PM	9.473	0.246	9.719	bl	7 959 620	213 893	126 043	0.9651	1.0000



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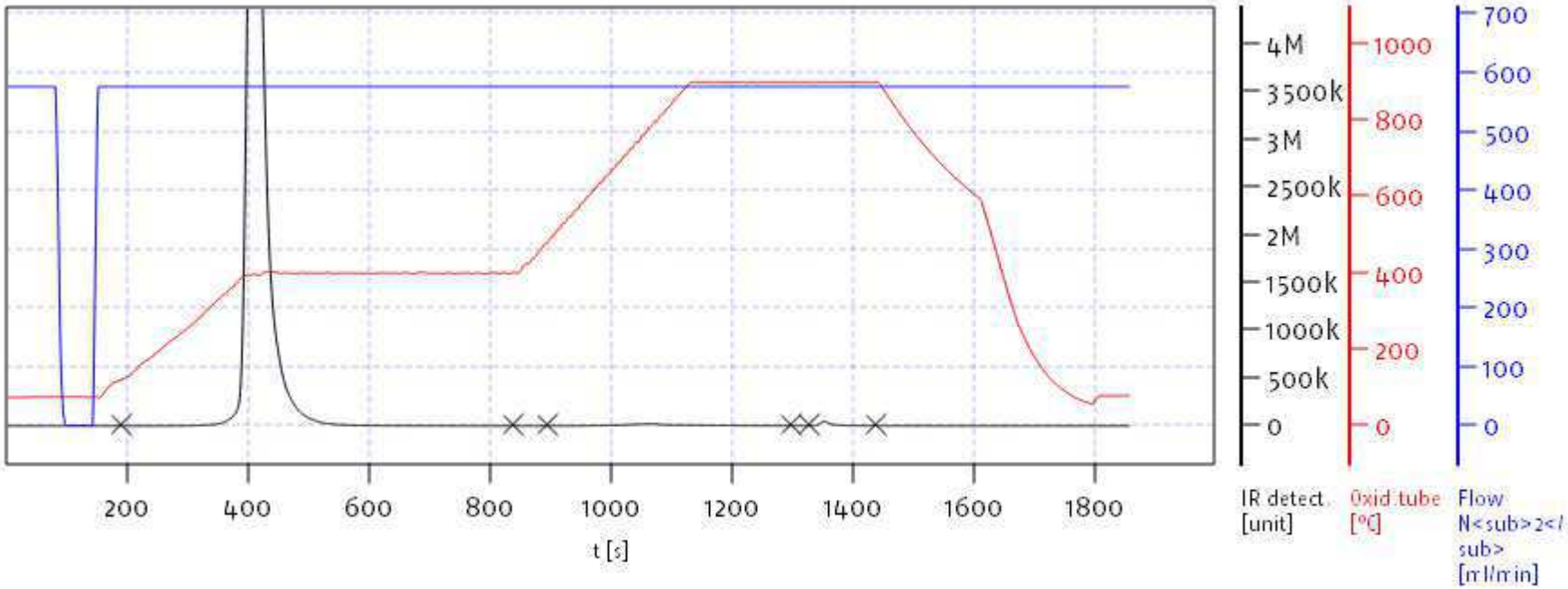
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
183	43	21H0274-03	520.80		1.00	CARBON	8/29/2021 2:10 PM	2.924	0.026	2.950	bl,Cl o	9 325 870	92 408	39 198	0.9651	1.0000



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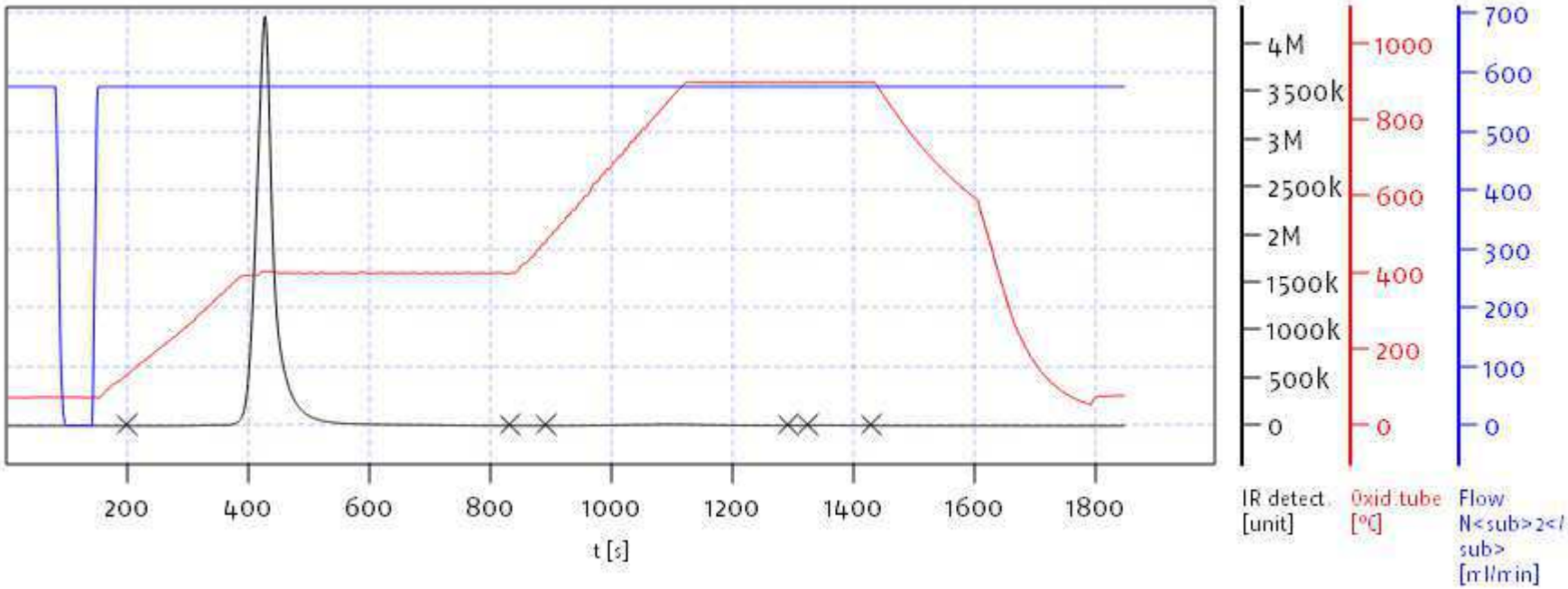
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
184	44	SJH0331-CCVF	20.30		1.00	CARBON	8/29/2021 2:41 PM	44.779	0.801	45.580	bl	5 584 430	107 969	15 612	0.9651	1.0000



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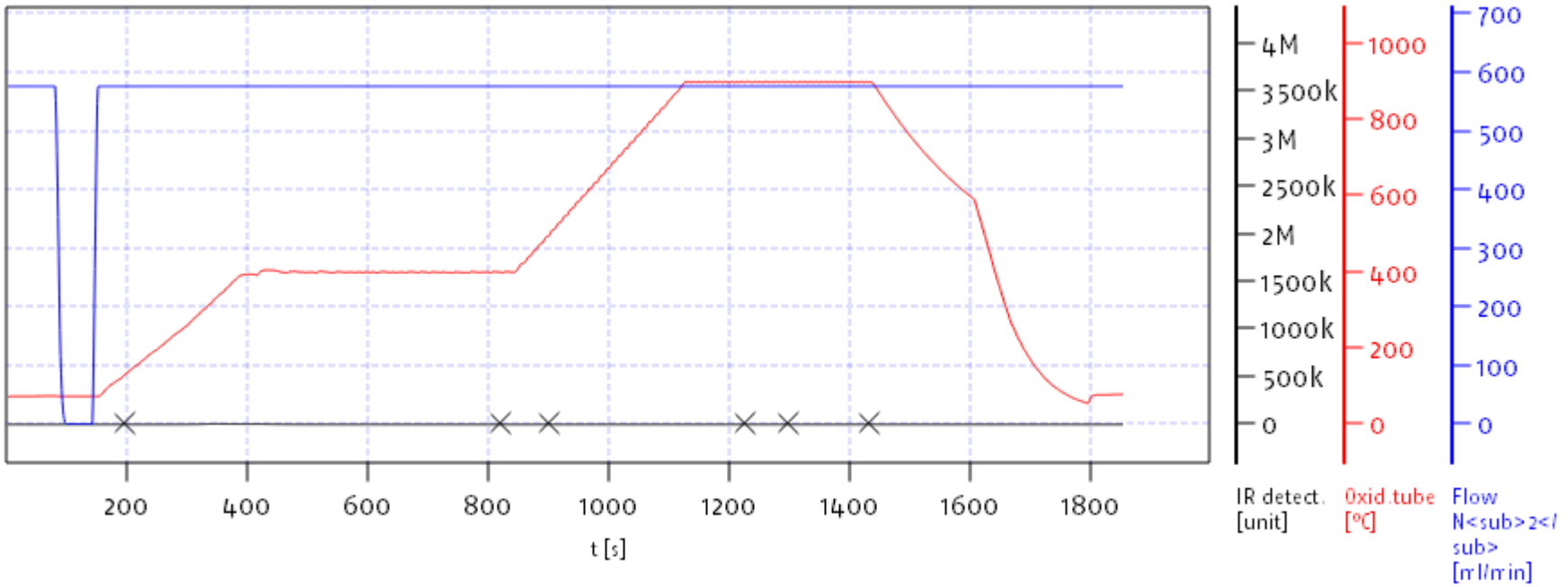
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
185	45	SJH0331-CCBF	512.70		1.00	CARBON	8/29/2021 3:13 PM	0.004	0.000	0.004	bl,C3u,C2u	24 272	1 086	436	0.9651	1.0000



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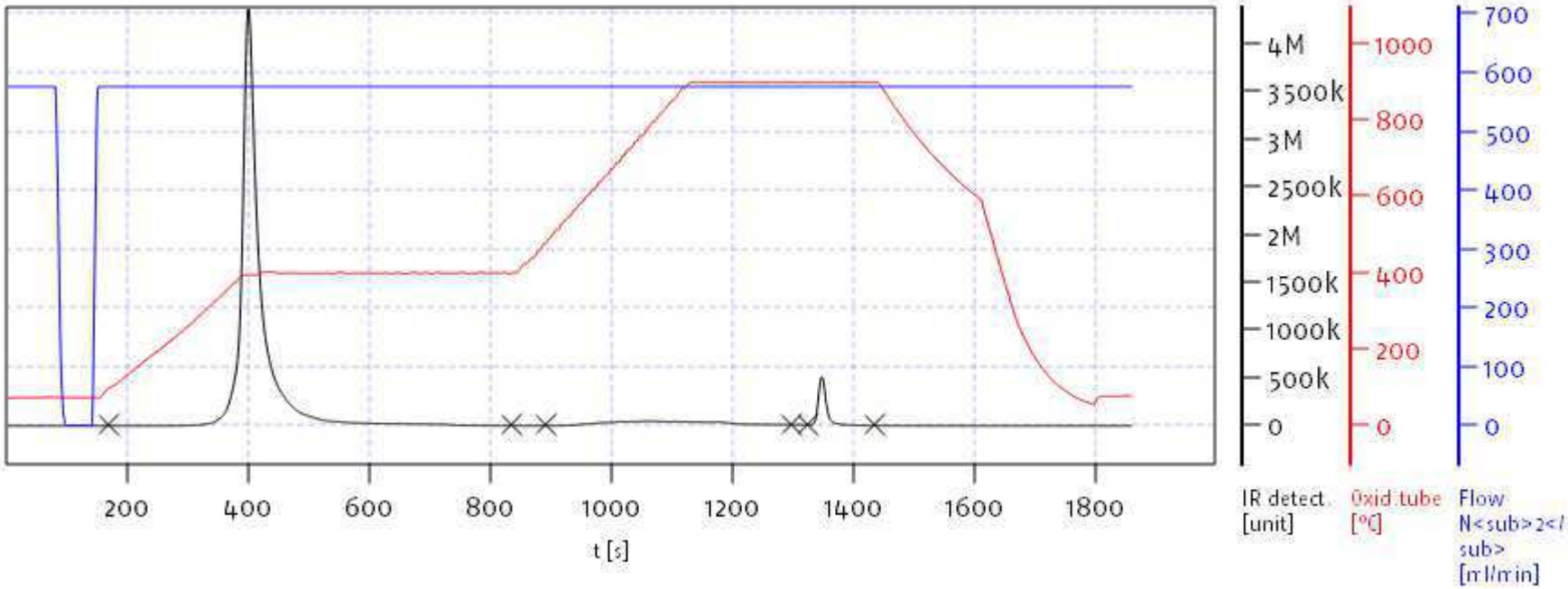
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
186	46	21H0274-04	172.00		1.00	CARBON	8/29/2021 3:44 PM	5.685	0.416	6.101	bl	5 703 440	435 100	307 981	0.9651	1.0000



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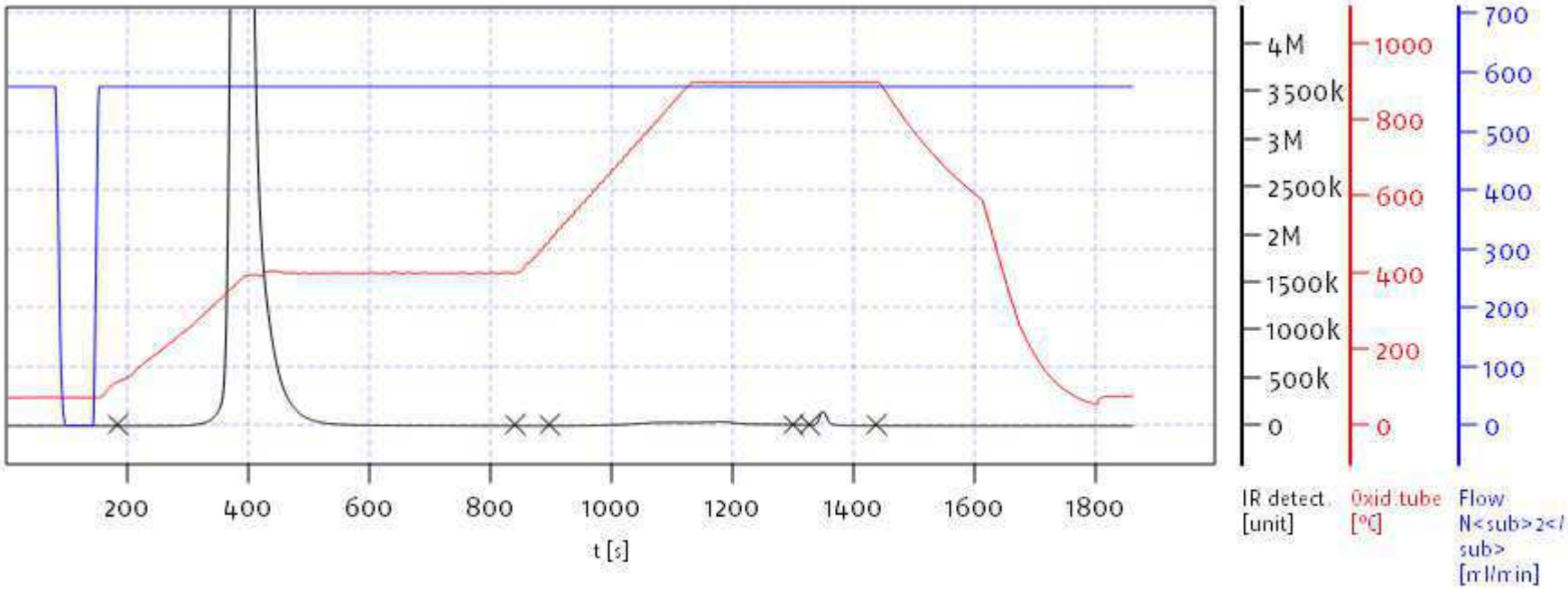
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
187	47	21H0275-01	152.70		1.00	CARBON	8/29/2021 4:16 PM	18.942	0.327	19.268	bl,C1o	17 668300	307 174	96 733	0.9651	1.0000



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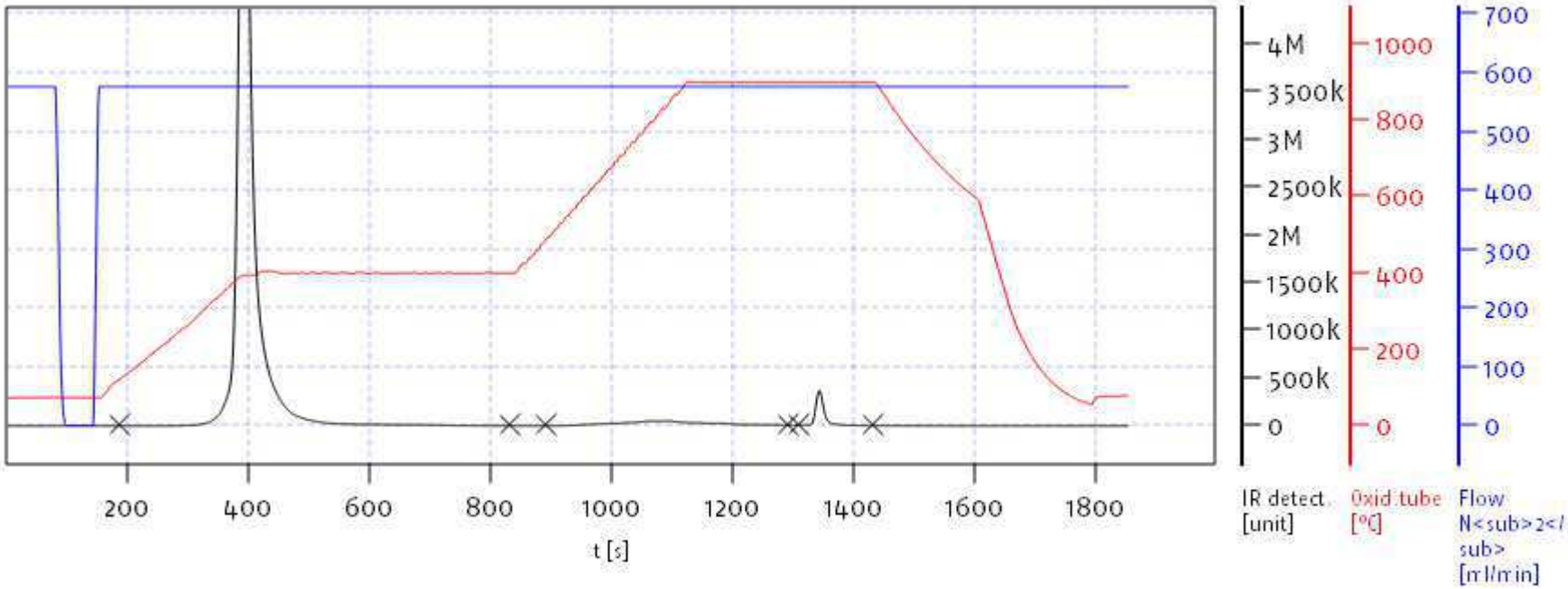
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
188	48	21H0275-02	181.60		1.00	CARBON	8/29/2021 4:47 PM	7.225	0.314	7.540	bl	7 834 780	349 790	230 470	0.9651	1.0000



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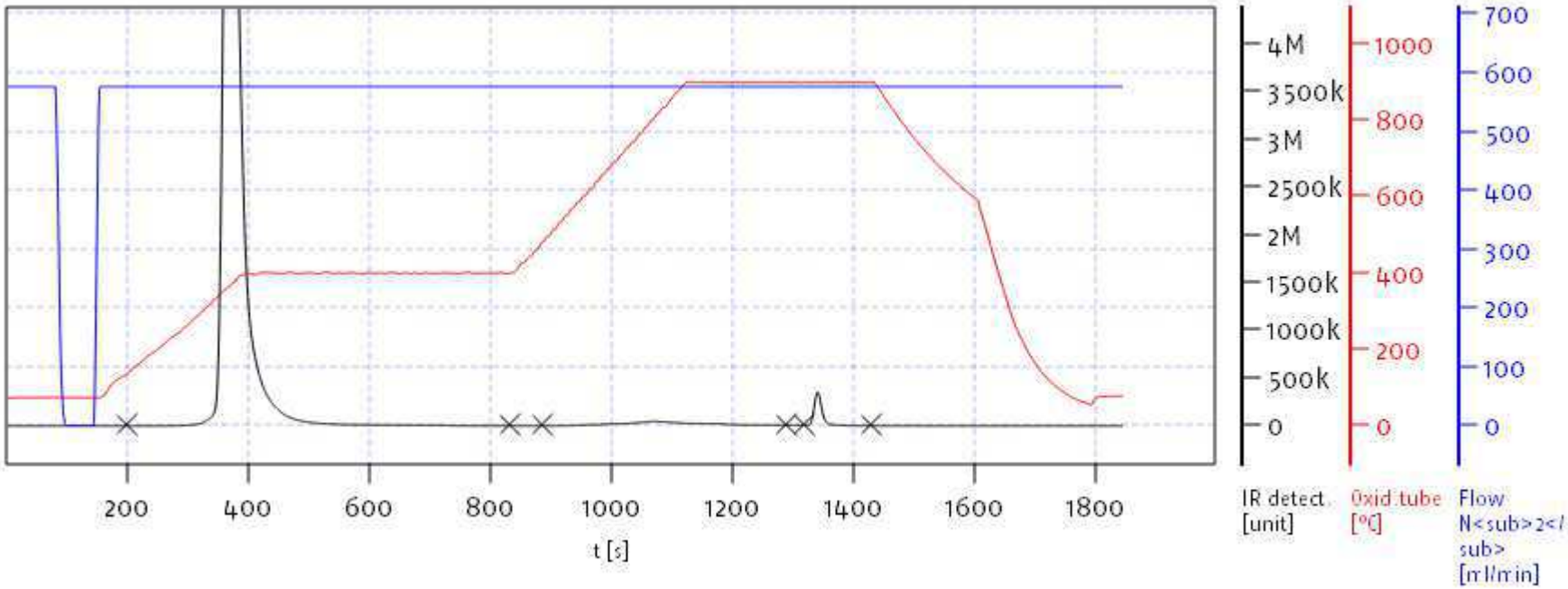
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
189	49	21H0275-03	175.40		1.00	CARBON	8/29/2021 5:18 PM	9.928	0.256	10.184	bl,C1o	10 495 200	278 007	204 224	0.9651	1.0000



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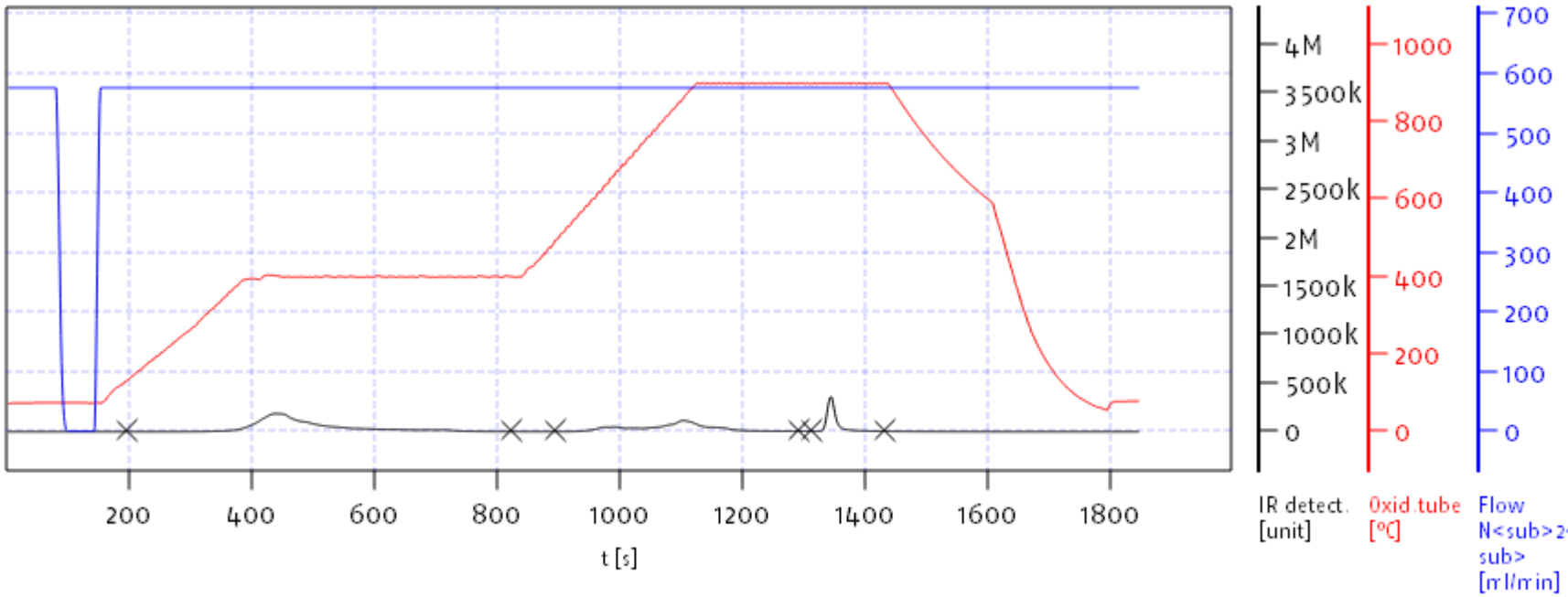
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
190	50	21H0275-04	595.50		1.00	CARBON	8/29/2021 5:49 PM	0.288	0.138	0.426	bl	832 669	498 138	234 707	0.9651	1.0000



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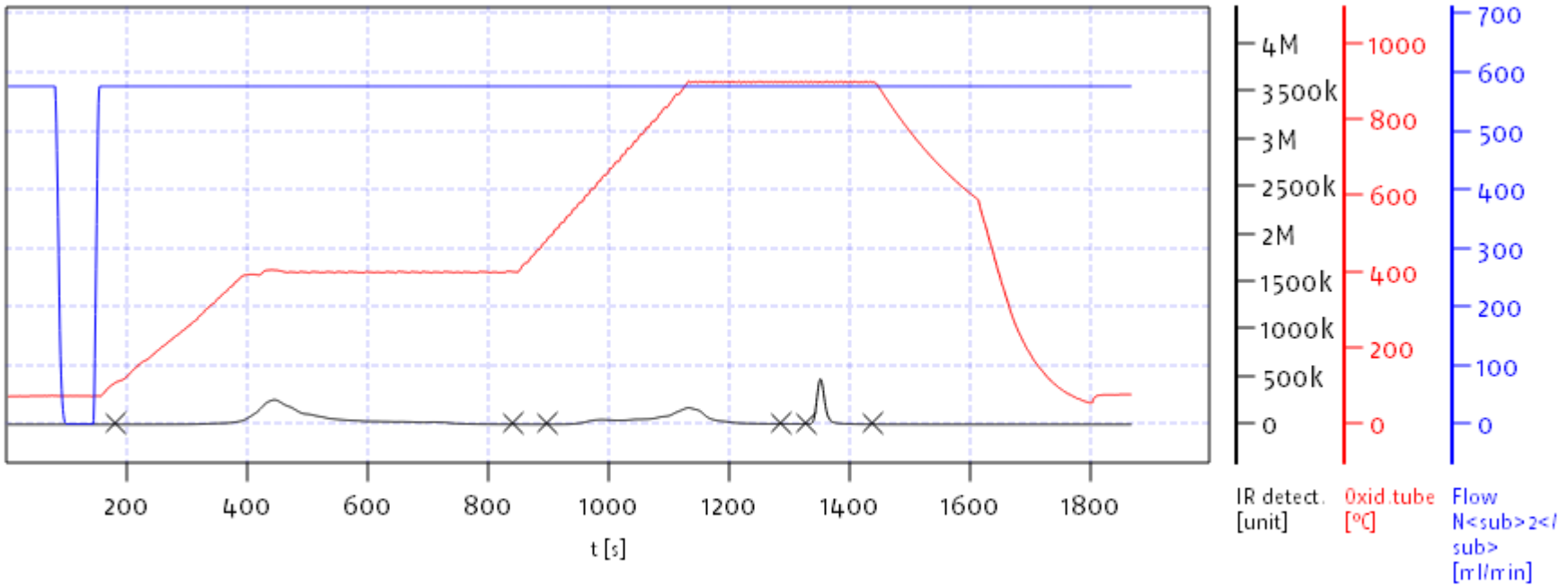
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
191	51	21H0275-05	526.70		1.00	CARBON	8/29/2021 6:21 PM	0.421	0.225	0.645	bl	1 085 710	711 901	286 674	0.9651	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
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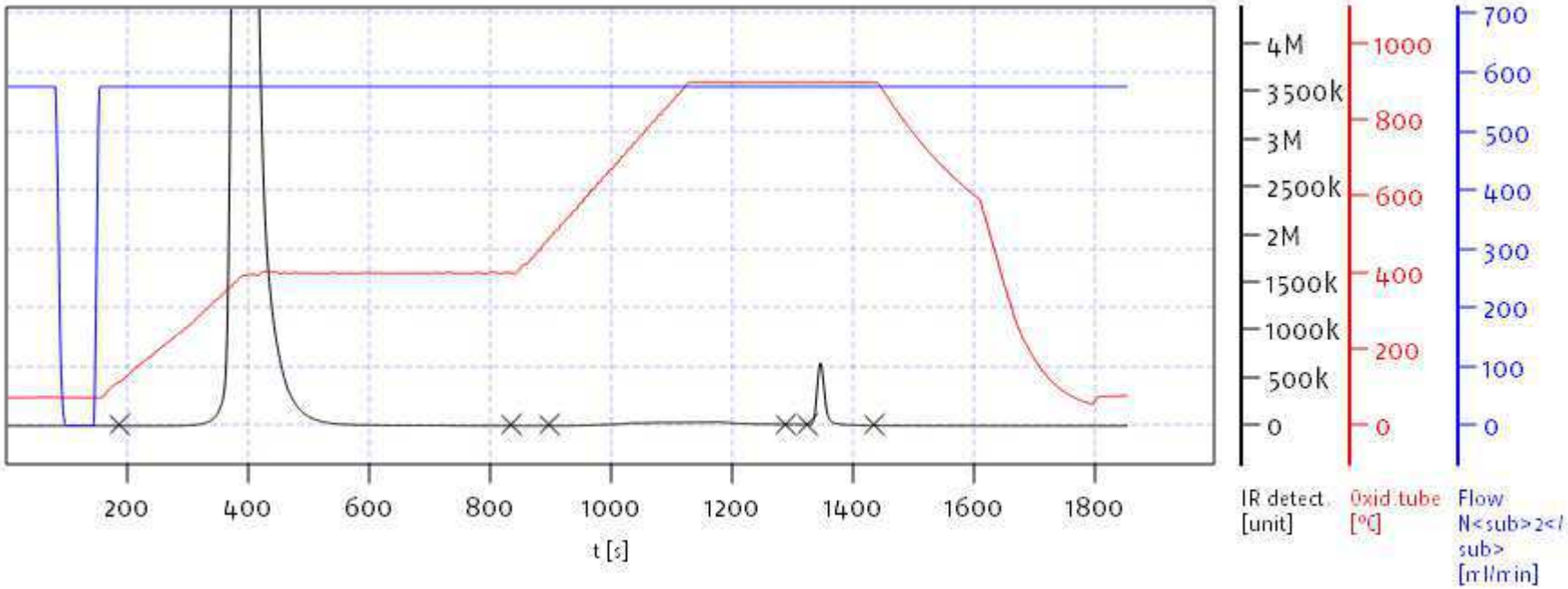
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
192	52	21H0275-06	179.70		1.00	CARBON	8/29/2021 6:52 PM	19.636	0.297	19.934	bl,Cl o	21 271 400	328 099	386 832	0.9651	1.0000



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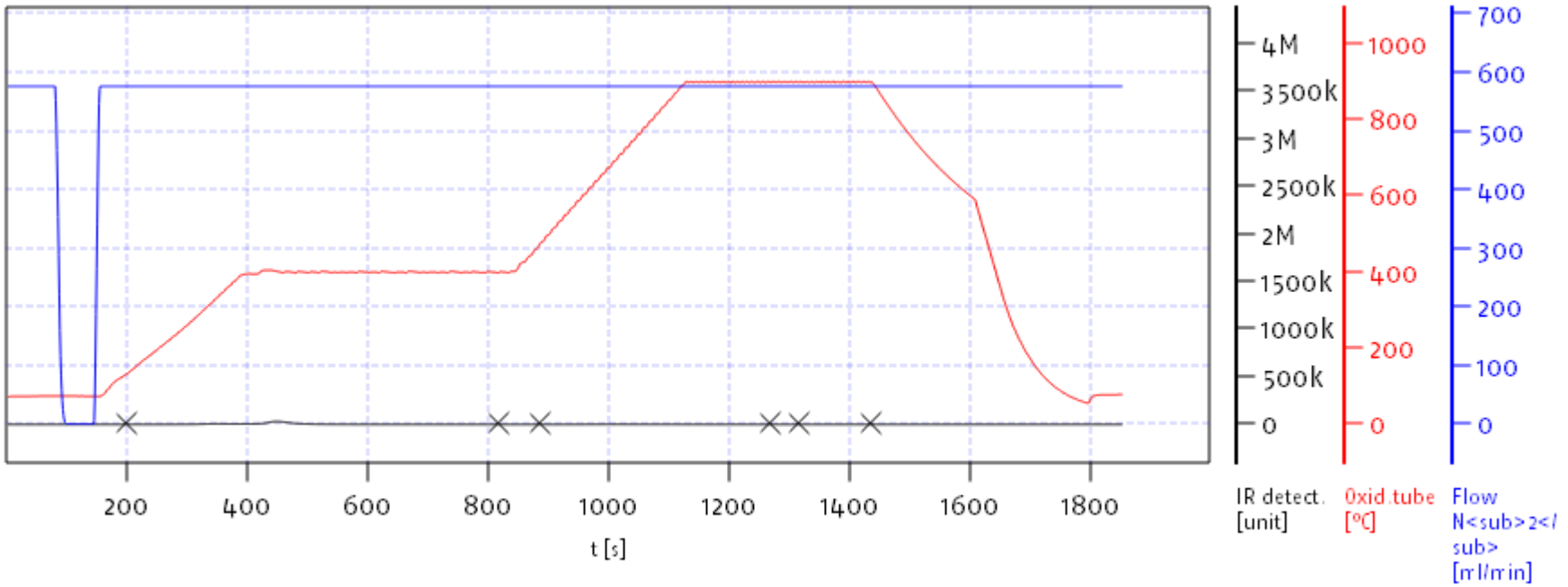
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
193	53	BJH0677-MRL1	538.30		1.00	CARBON	8/29/2021 7:24 PM	0.021	0.000	0.021	bl,C3u,C2u	81 334	6 834	305	0.9651	1.0000



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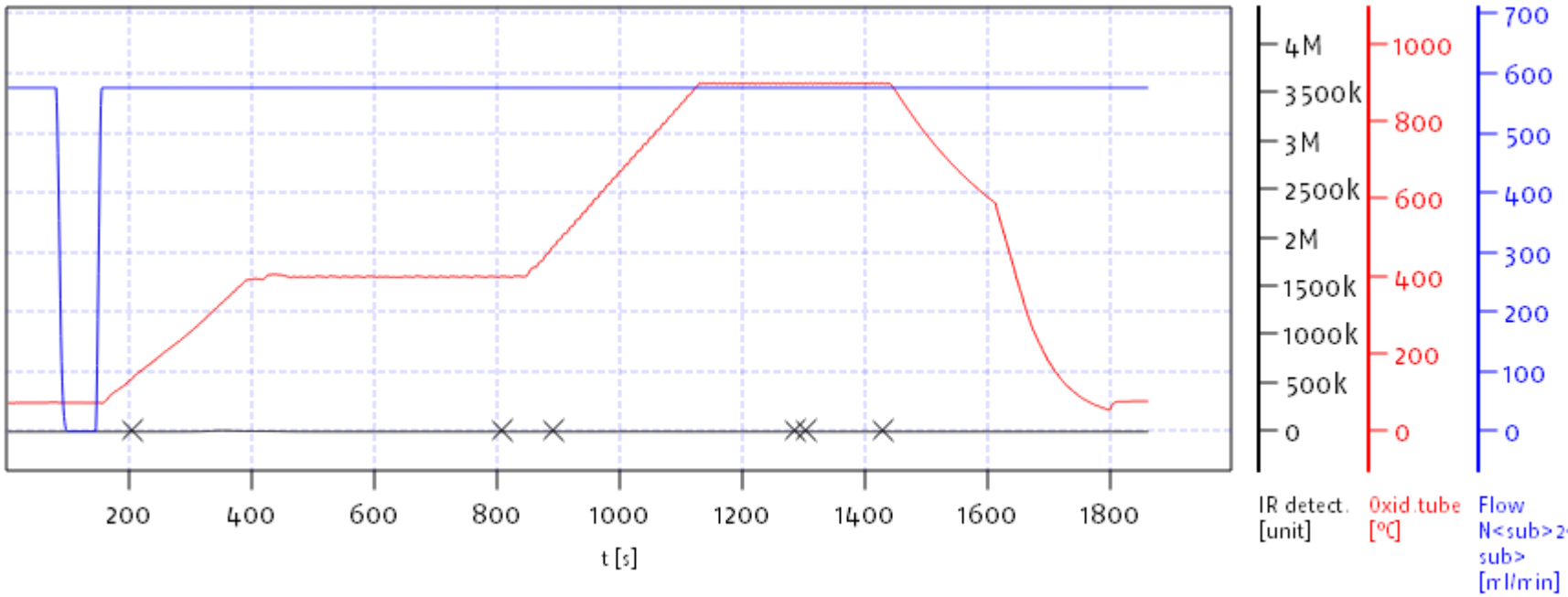
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
194	54	BJH0677-BLK1	537.20		1.00	CARBON	8/29/2021 7:55 PM	0.008	0.000	0.008	bl,C3u,C2u	36 820	4 881	448	0.9651	1.0000



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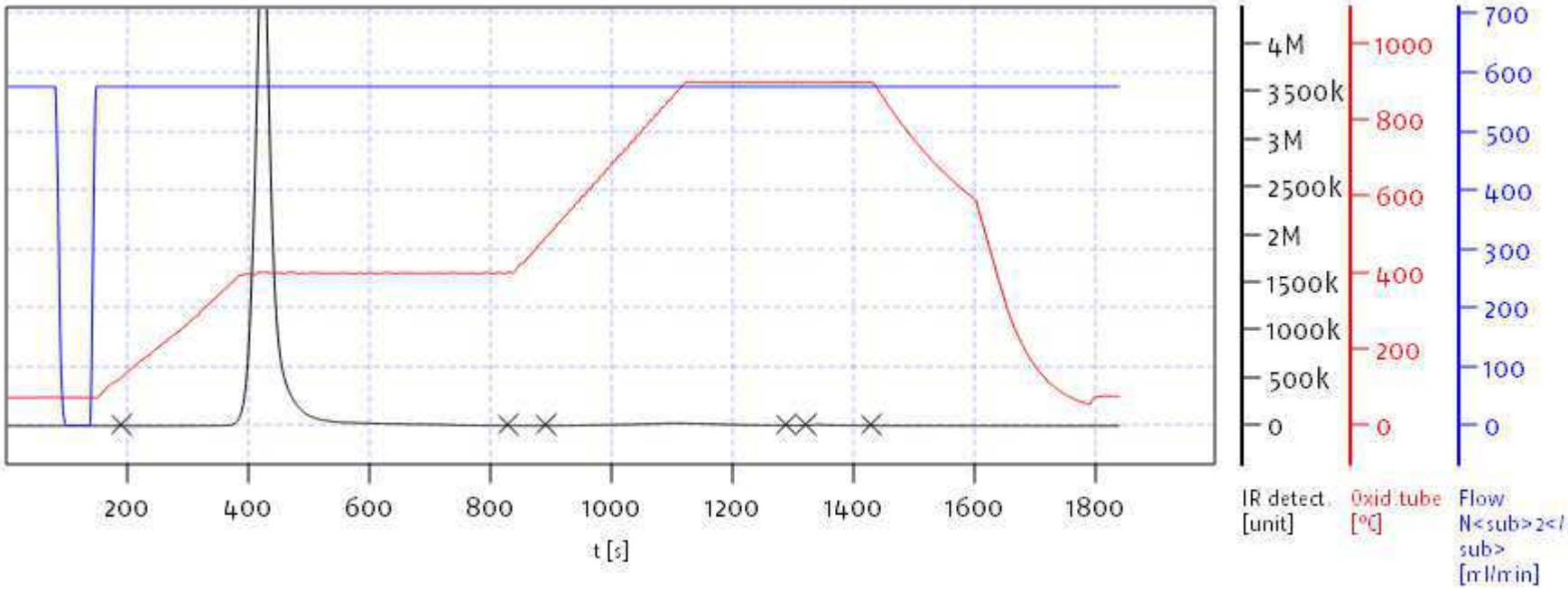
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
195	55	BJH0677-BS1	24.50		1.00	CARBON	8/29/2021 8:26 PM	44.364	1.263	45.627	bl	6 667 020	194 880	24 111	0.9651	1.0000



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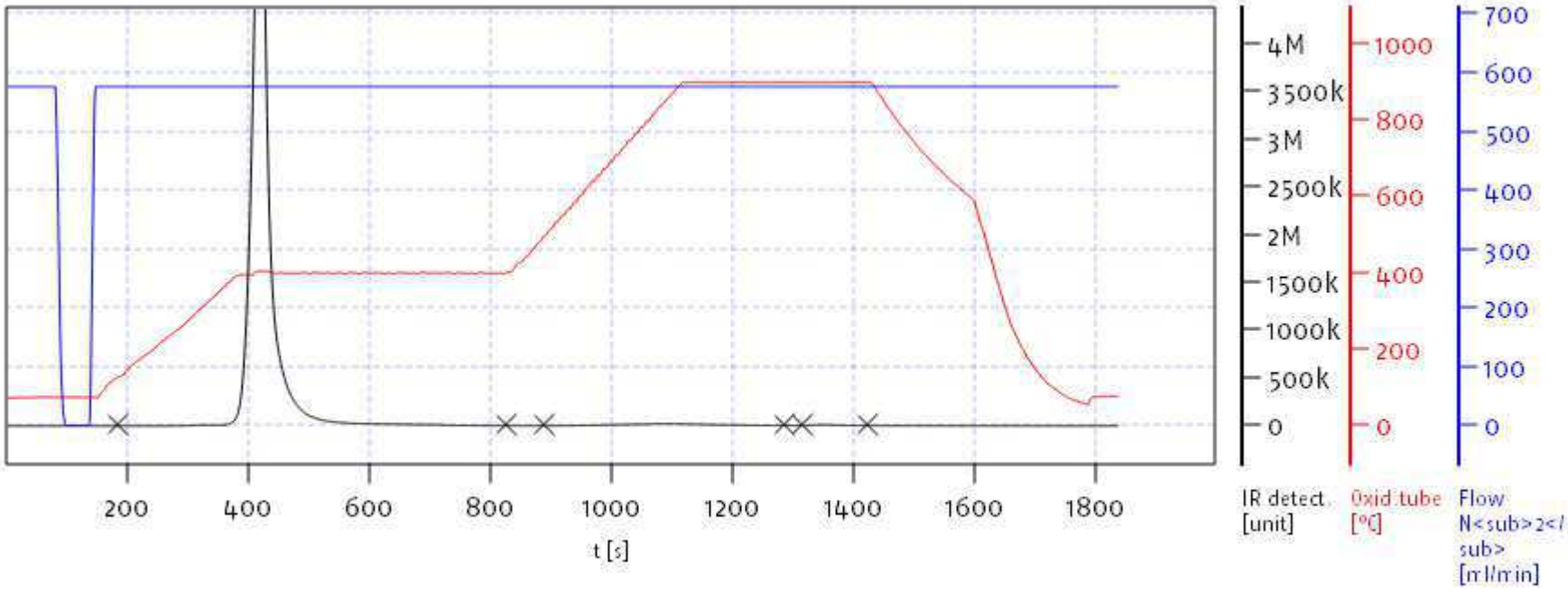
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
196	56	SJH0331-CCVG	28.20		1.00	CARBON	8/29/2021 8:58 PM	45.395	0.880	46.275	bl	7 851 740	158 612	24 729	0.9651	1.0000



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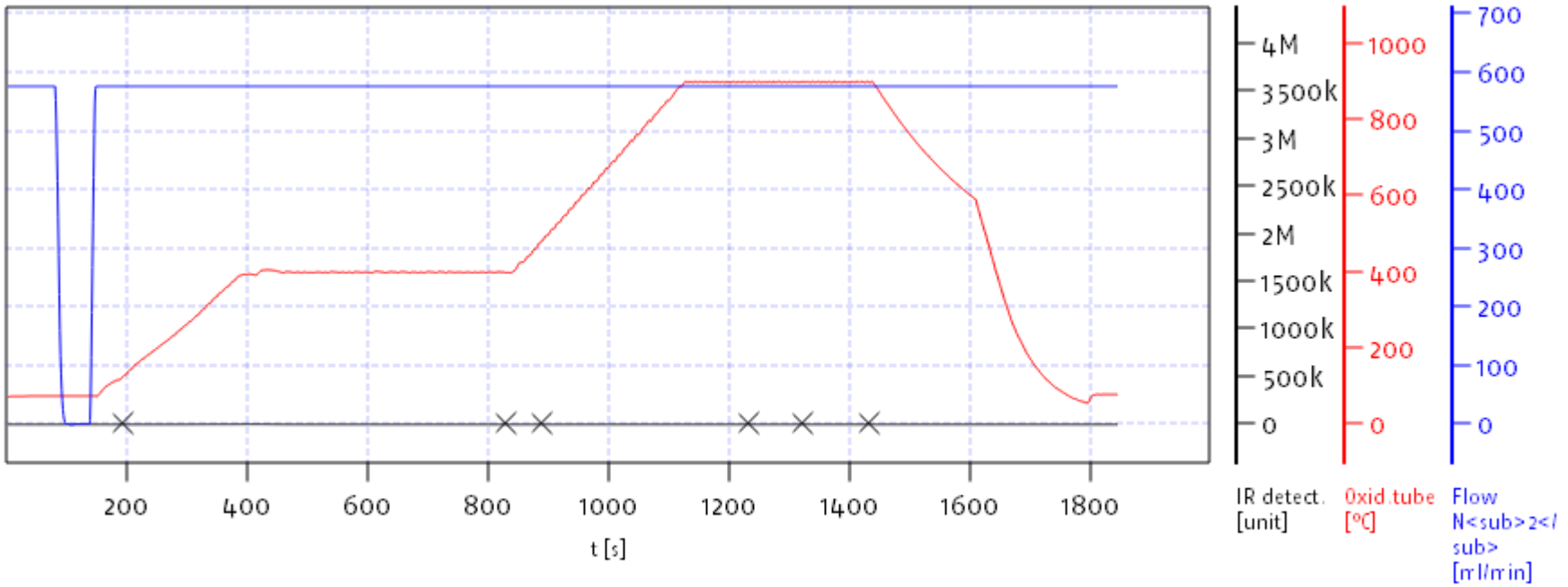
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
197	57	SJH0331-CCBG	515.50		1.00	CARBON	8/29/2021 9:29 PM	0.000	0.000	0.000	bl,C3u,C2u	12 285	1 549	397	0.9651	1.0000



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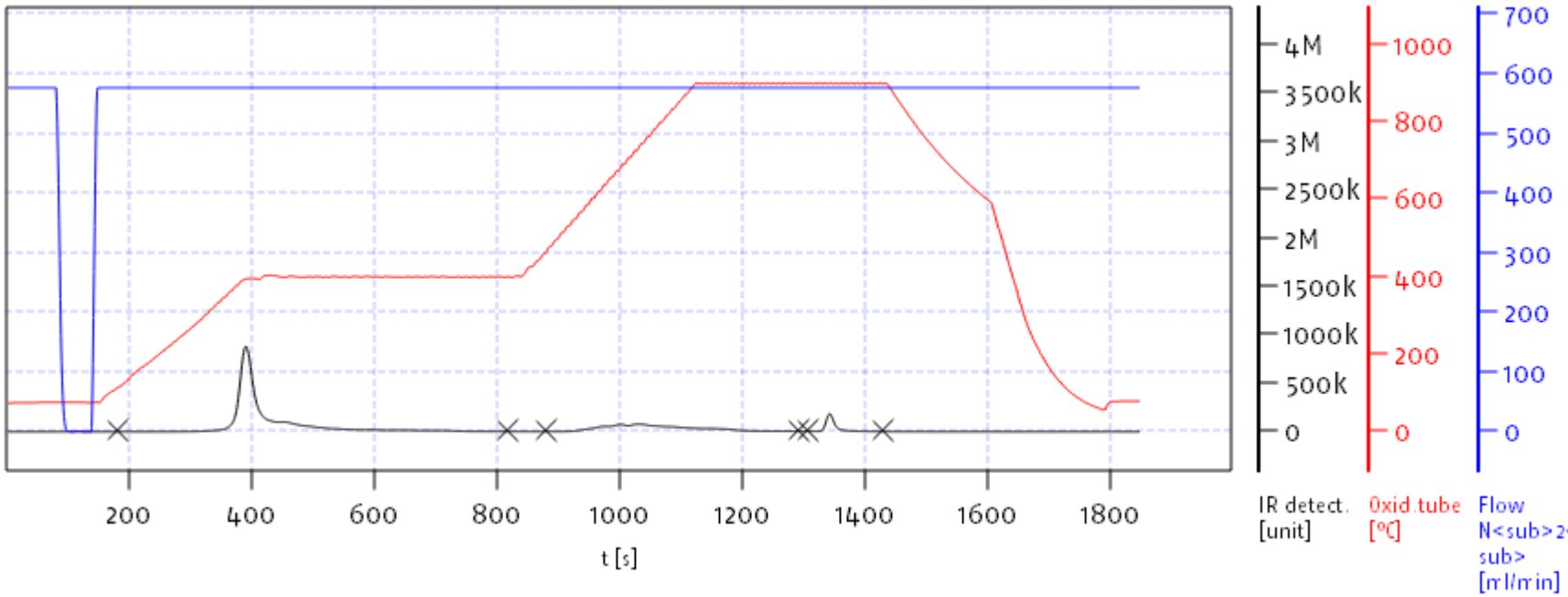
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
198	58	21H0224-02	321.90		1.00	CARBON	8/29/2021 10:00 PM	0.739	0.246	0.985	bl	1 357 010	480 652	122 297	0.9651	1.0000



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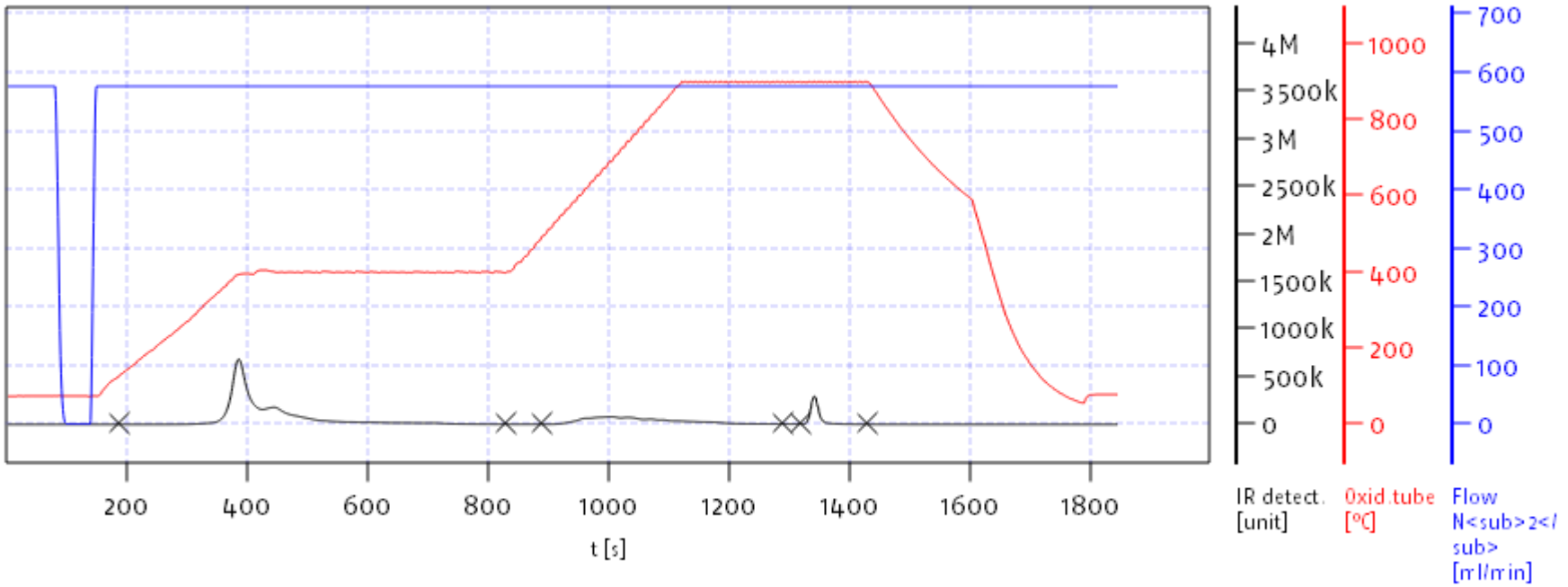
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
199	59	BJH0677-DUP1	331.90		1.00	CARBON	8/29/2021 10:31 PM	0.791	0.254	1.045	bl	1 448 930	511 750	178 206	0.9651	1.0000



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soliTOC V2.0.2 (31015f9) 2018-11-19
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Balance: BAL3
Analyst: BF

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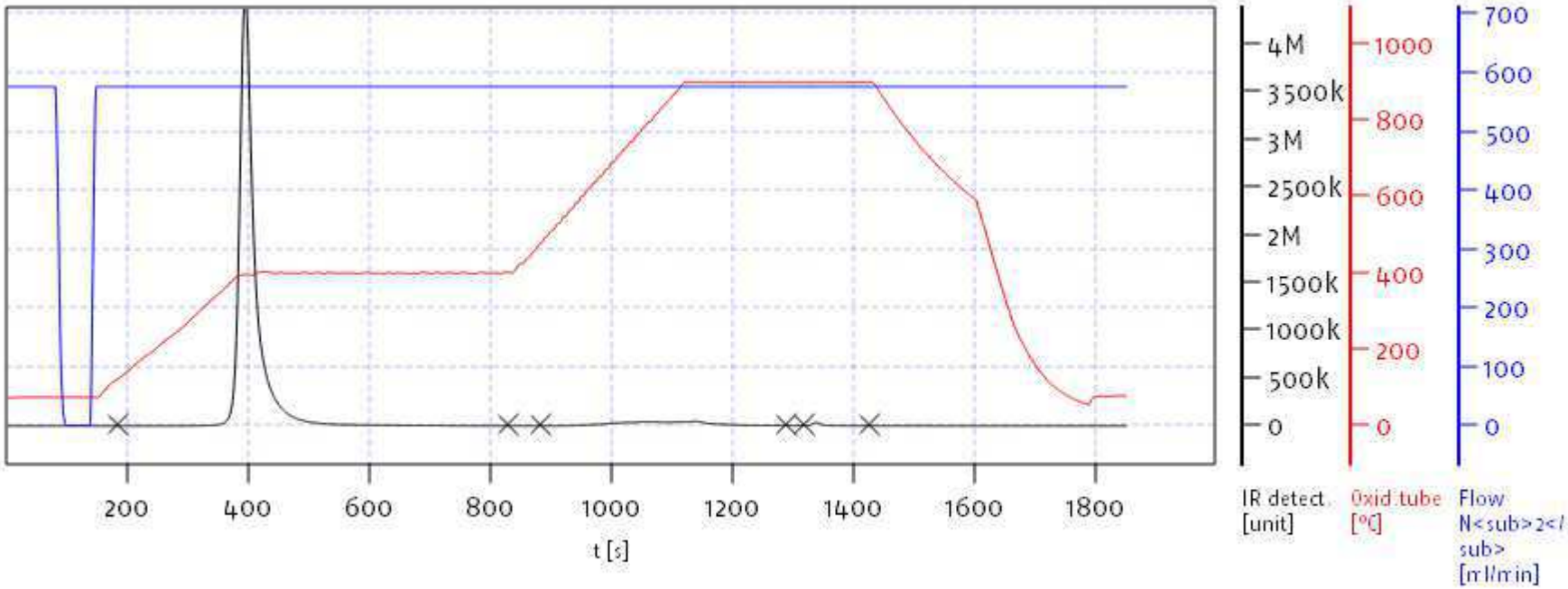
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
200	60	BJH0677-MS1	268.40	0.0122	1.00	CARBON	8/29/2021 11:03 PM	3.006	0.189	3.195	bl	4 945 240	311 892	26 776	0.9651	1.0000



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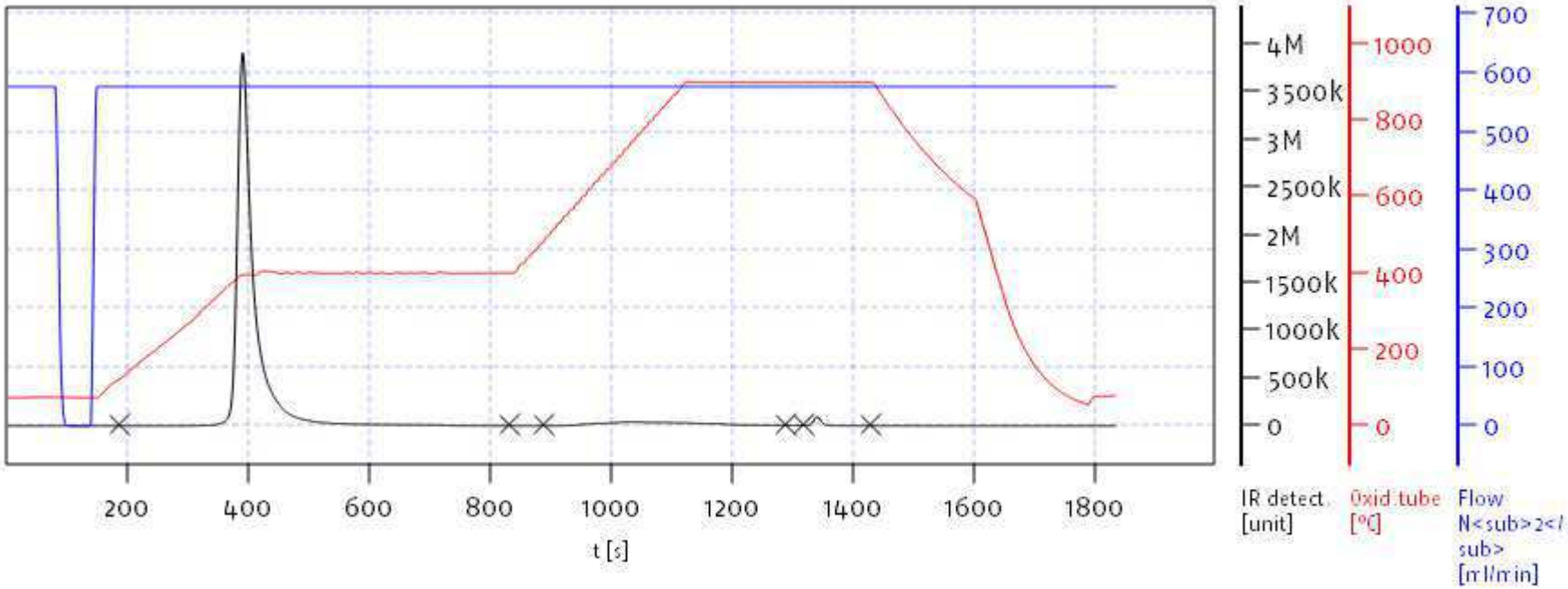
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
201	61	BJH0677-MSD1	258.10	0.0119	1.00	CARBON	8/29/2021 11:34 PM	2.949	0.195	3.144	bl	4 632 900	309 617	58 939	0.9651	1.0000



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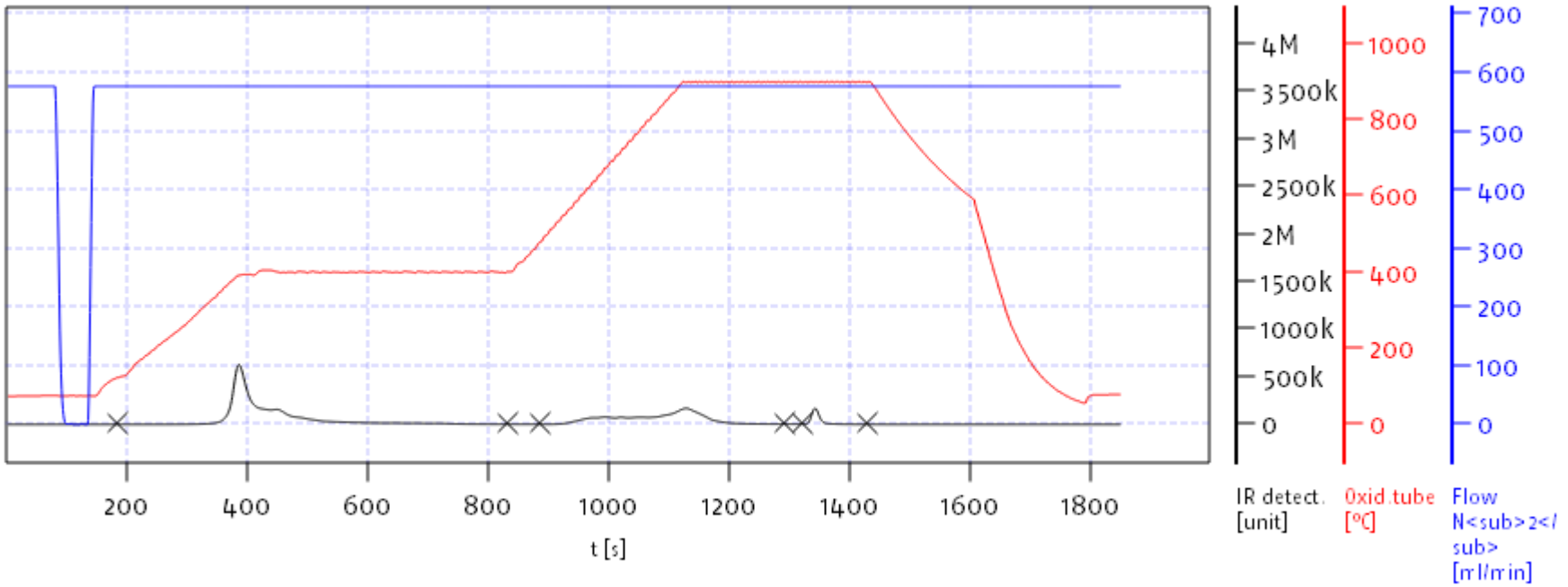
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
202	62	21H0224-03	331.30		1.00	CARBON	8/30/2021 12:05 AM	0.674	0.413	1.087	bl	1 287 520	821 348	102 649	0.9651	1.0000



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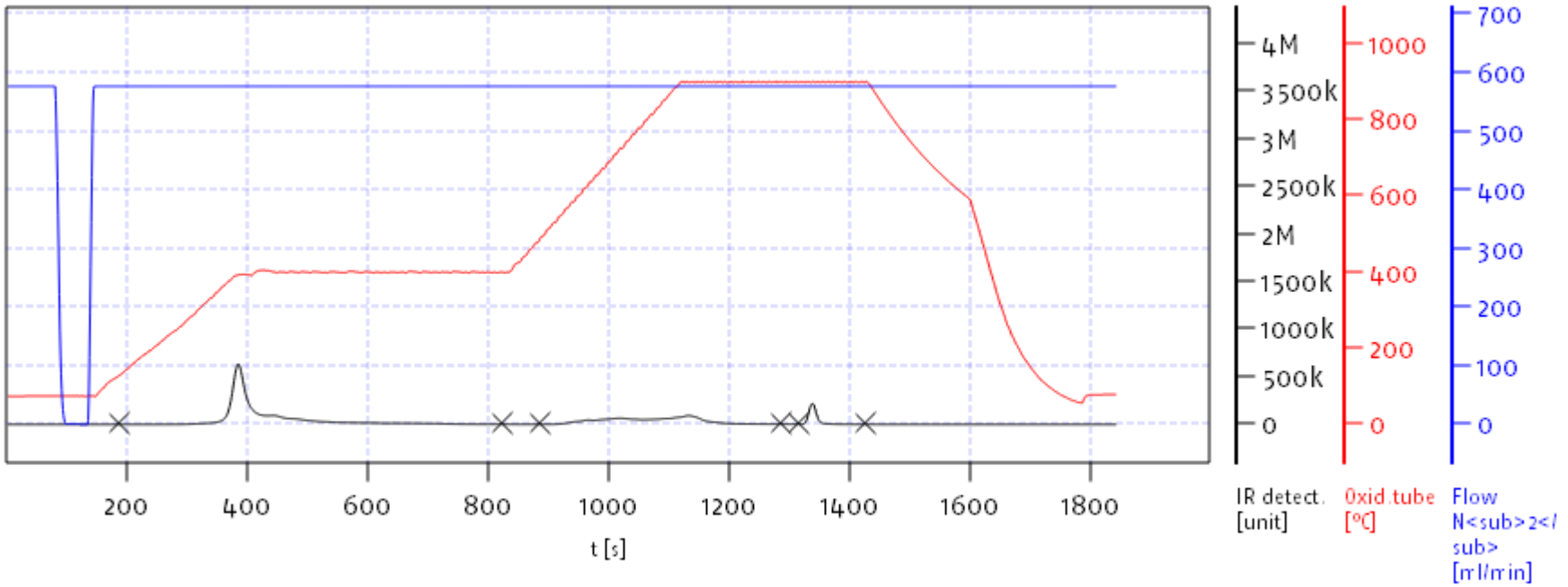
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
203	63	21H0224-04	216.30		1.00	CARBON	8/30/2021 12:36 AM	0.883	0.409	1.292	bl	1 064 670	535 045	126 428	0.9651	1.0000



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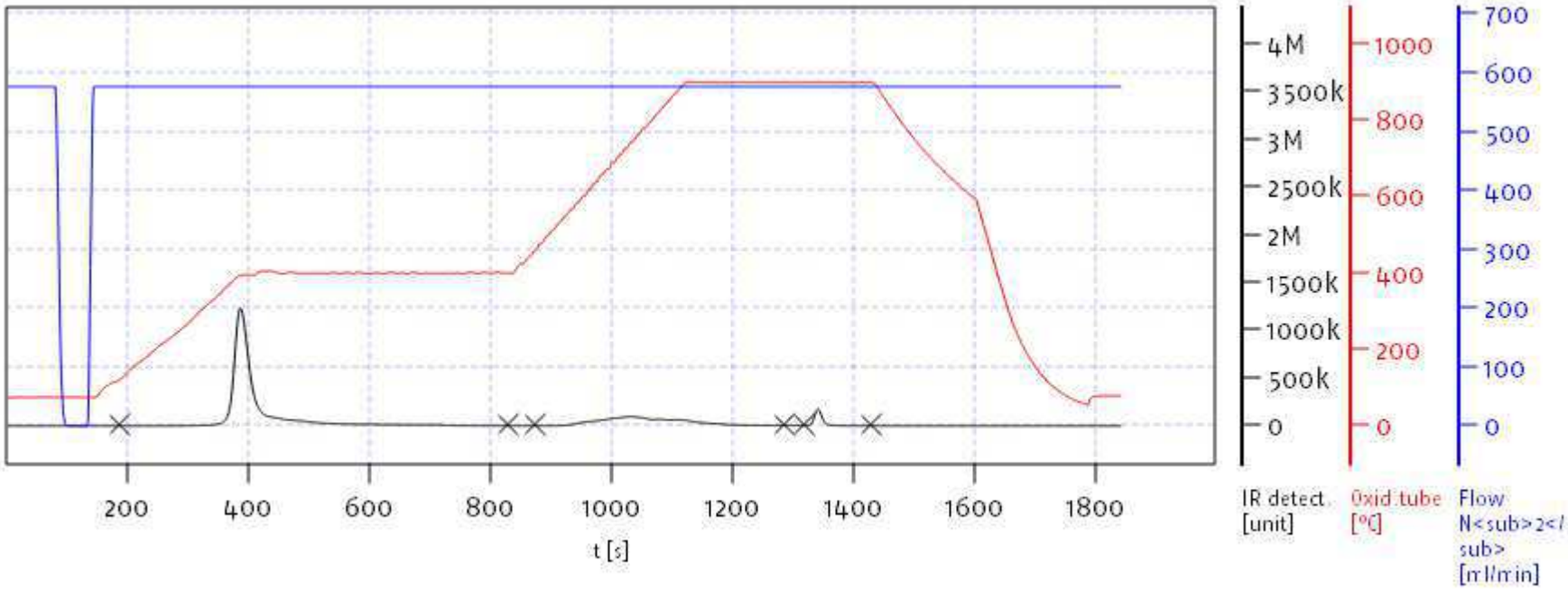
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
204	64	21H0224-05	325.20		1.00	CARBON	8/30/2021 1:07 AM	0.894	0.294	1.188	bl	1 702 020	577 355	102 413	0.9651	1.0000



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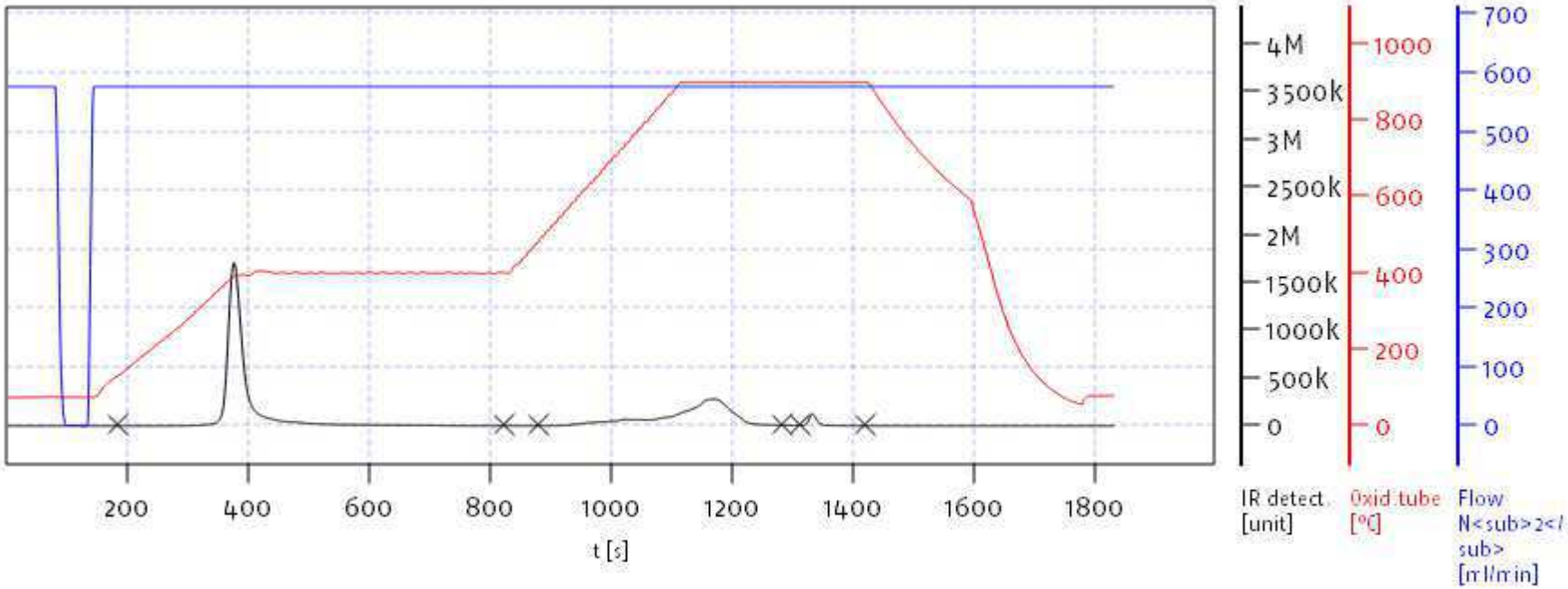
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
205	65	21H0224-06	343.50		1.00	CARBON	8/30/2021 1:38 AM	0.978	0.587	1.565	bl	2 005 360	1 205 480	77 385	0.9651	1.0000



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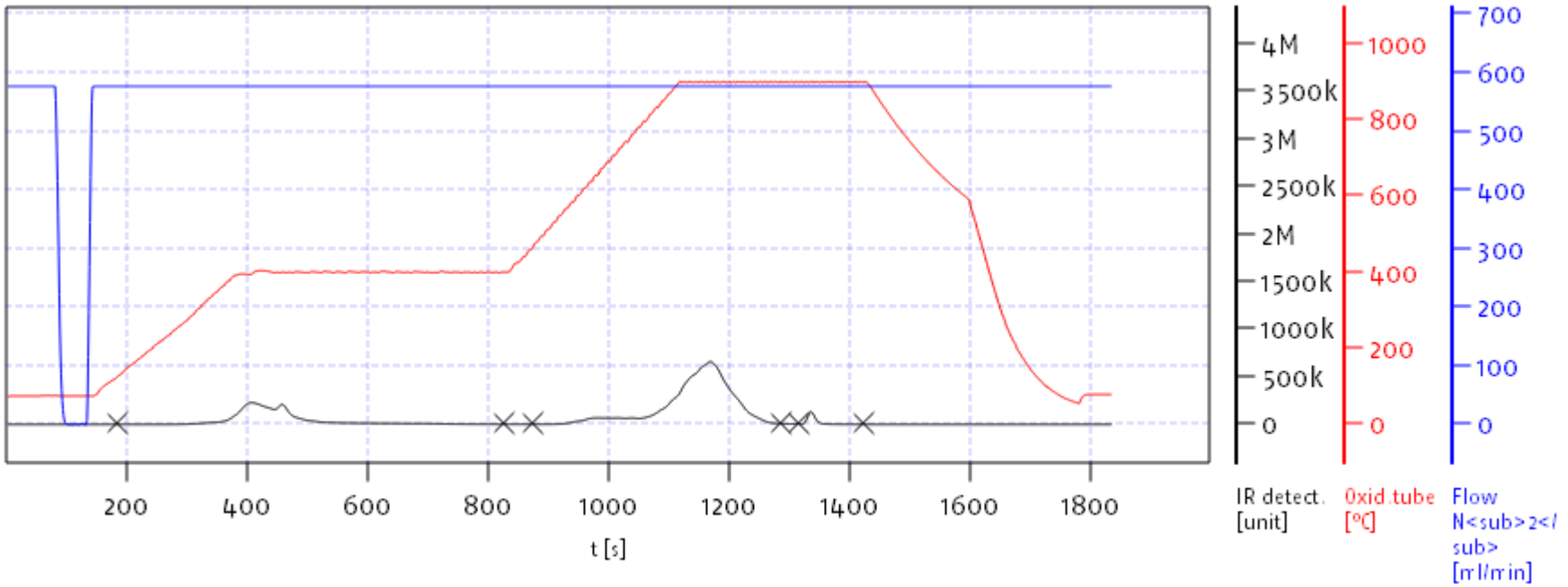
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
206	66	21H0224-07	345.80		1.00	CARBON	8/30/2021 2:09 AM	0.456	1.305	1.761	bl	909 599	2 684 350	78 594	0.9651	1.0000



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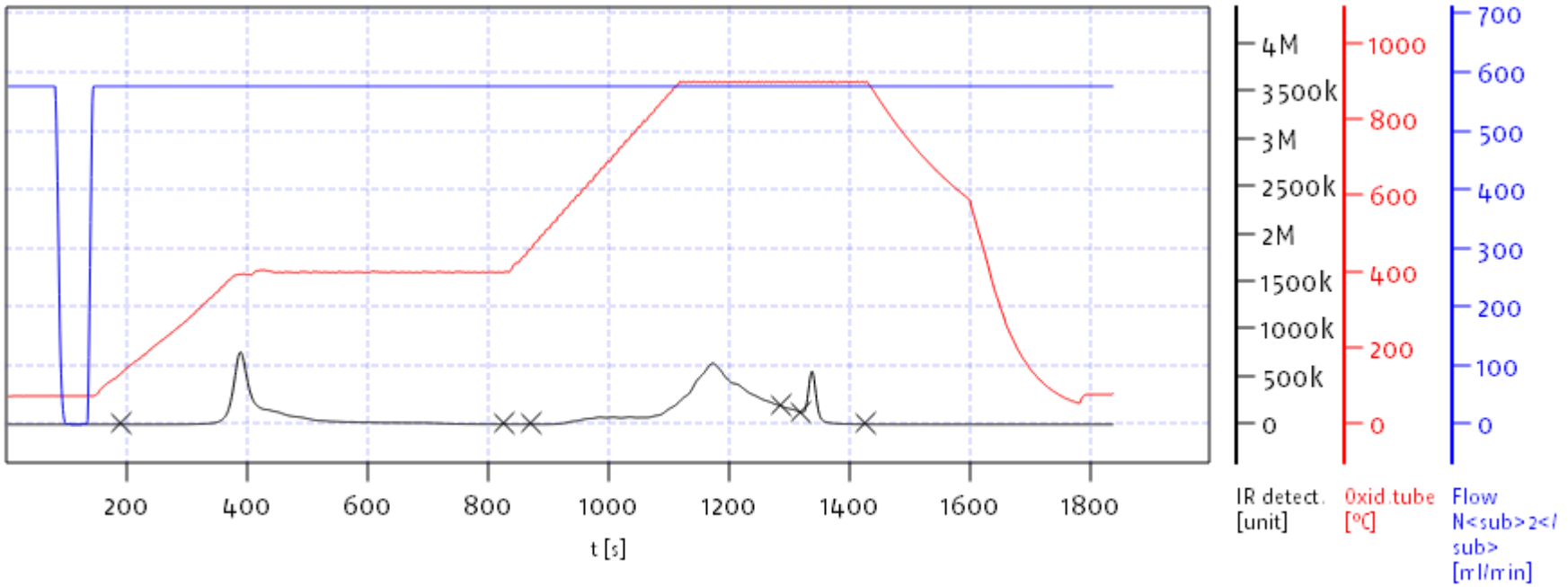
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
207	67	21H0224-08	336.20		1.00	CARBON	8/30/2021 2:40 AM	0.880	1.549	2.429	bl	1 447 370	3 095 250	376 840	0.9651	1.0000



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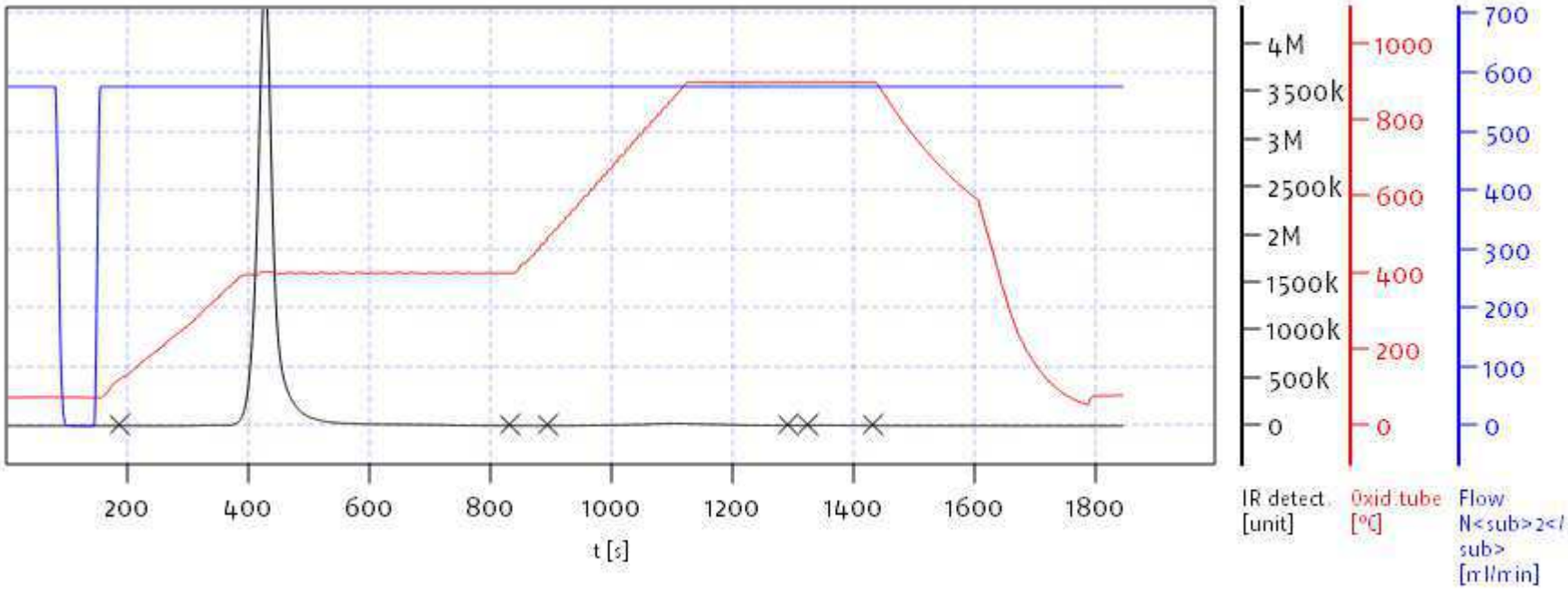
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
208	68	SJH0331-CCVH	20.30		1.00	CARBON	8/30/2021 3:12 AM	44.545	1.246	45.790	bl	5 554 990	161 382	15 856	0.9651	1.0000



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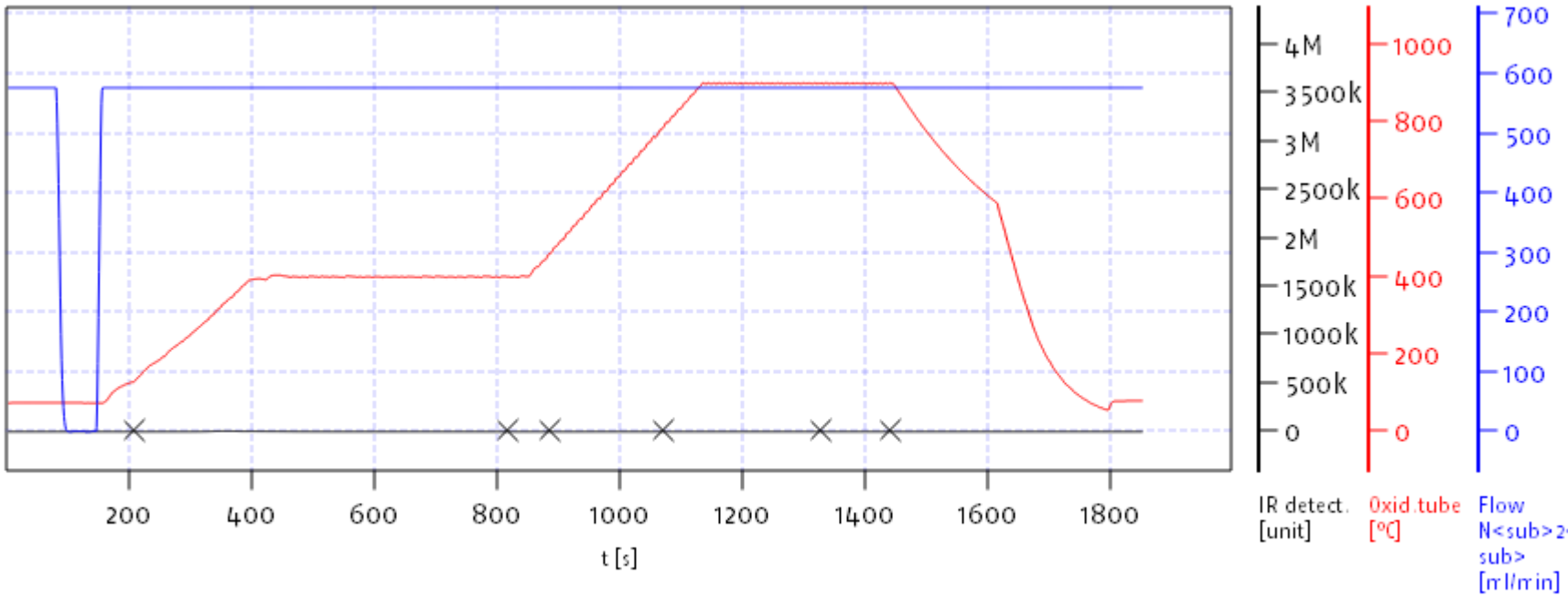
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
209	69	SJH0331-CCBH	513.70		1.00	CARBON	8/30/2021 3:43 AM	0.003	0.000	0.003	bl,C3u,C2u	22 555	212	386	0.9651	1.0000



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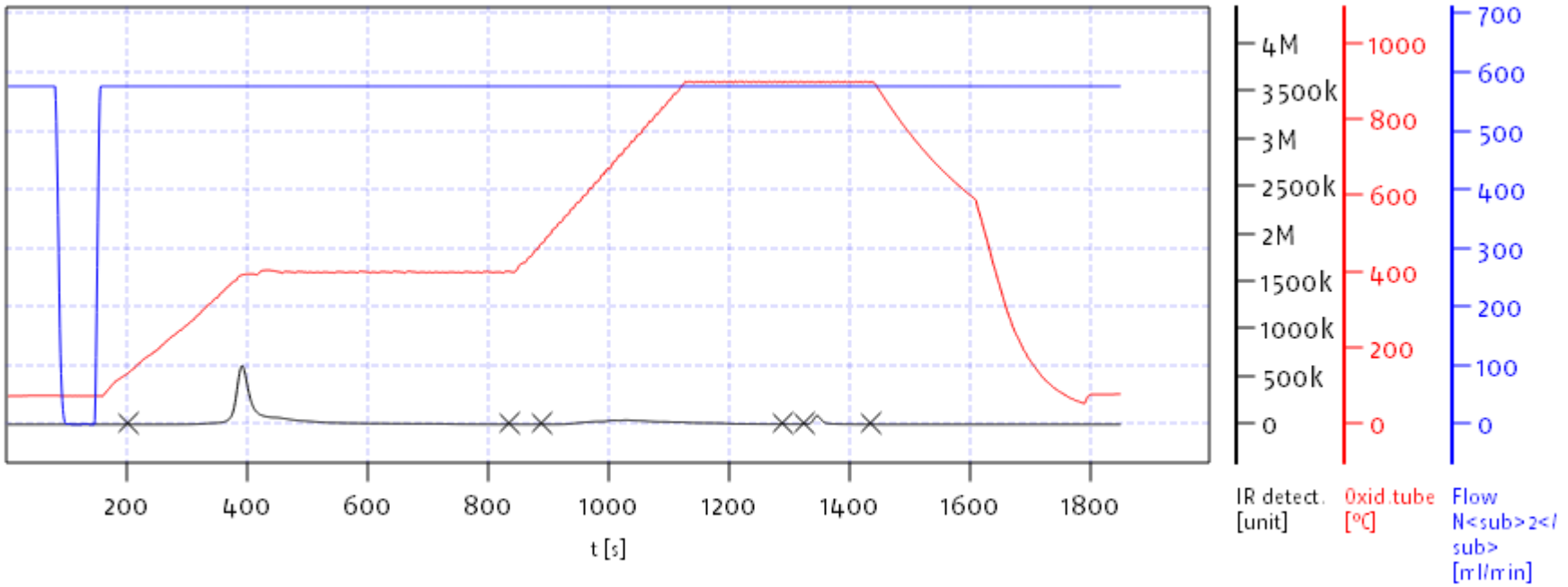
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
210	70	21H0224-09	213.30		1.00	CARBON	8/30/2021 4:14 AM	0.729	0.211	0.940	bl	915 310	278 071	60 869	0.9651	1.0000



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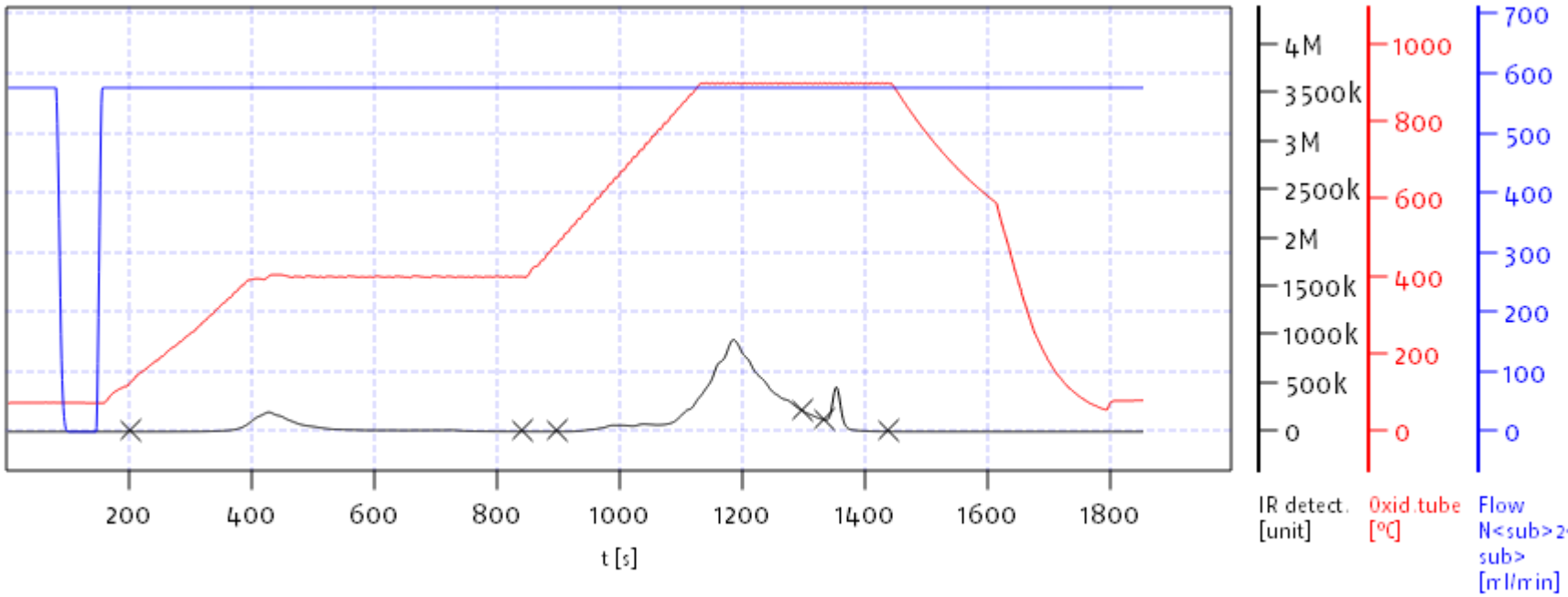
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
211	71	21H0234-01	219.50		1.00	CARBON	8/30/2021 4:46 AM	0.794	3.228	4.022	bl	744 062	4 207 200	336 945	0.9651	1.0000



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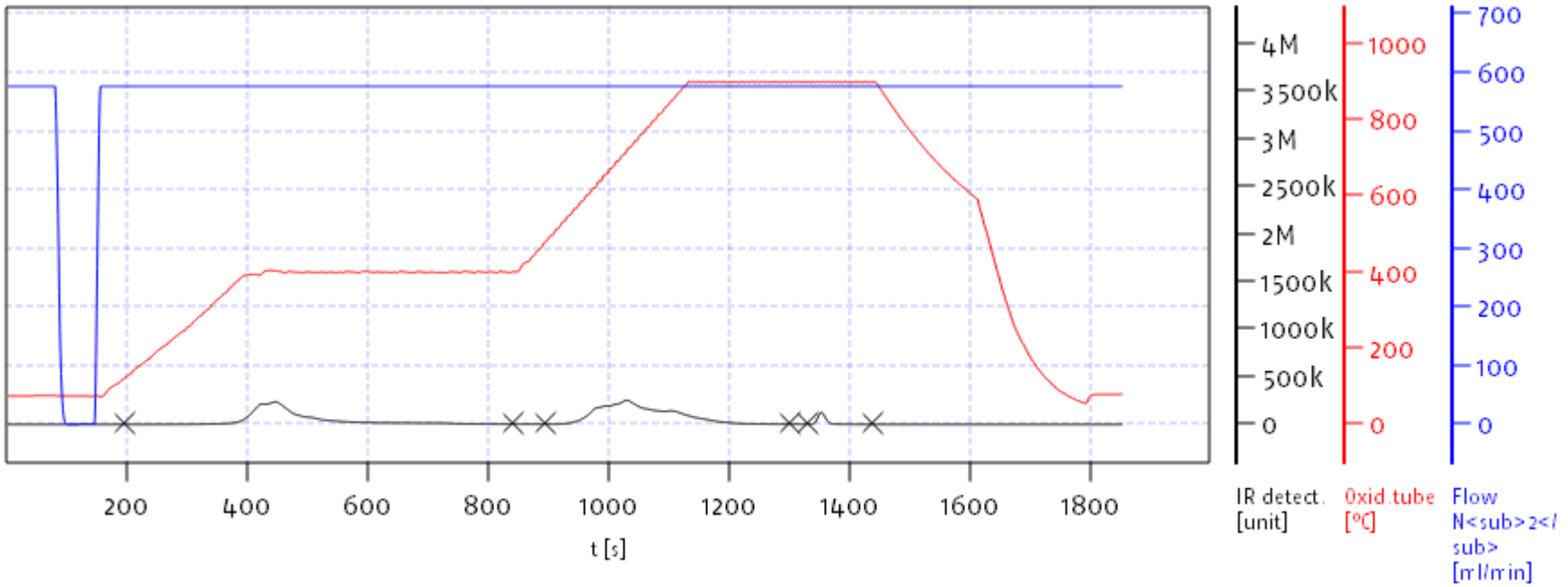
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
212	72	21H0234-04	517.90		1.00	CARBON	8/30/2021 5:17 AM	0.303	0.412	0.715	bl	907 251	1 275 550	76 254	0.9651	1.0000



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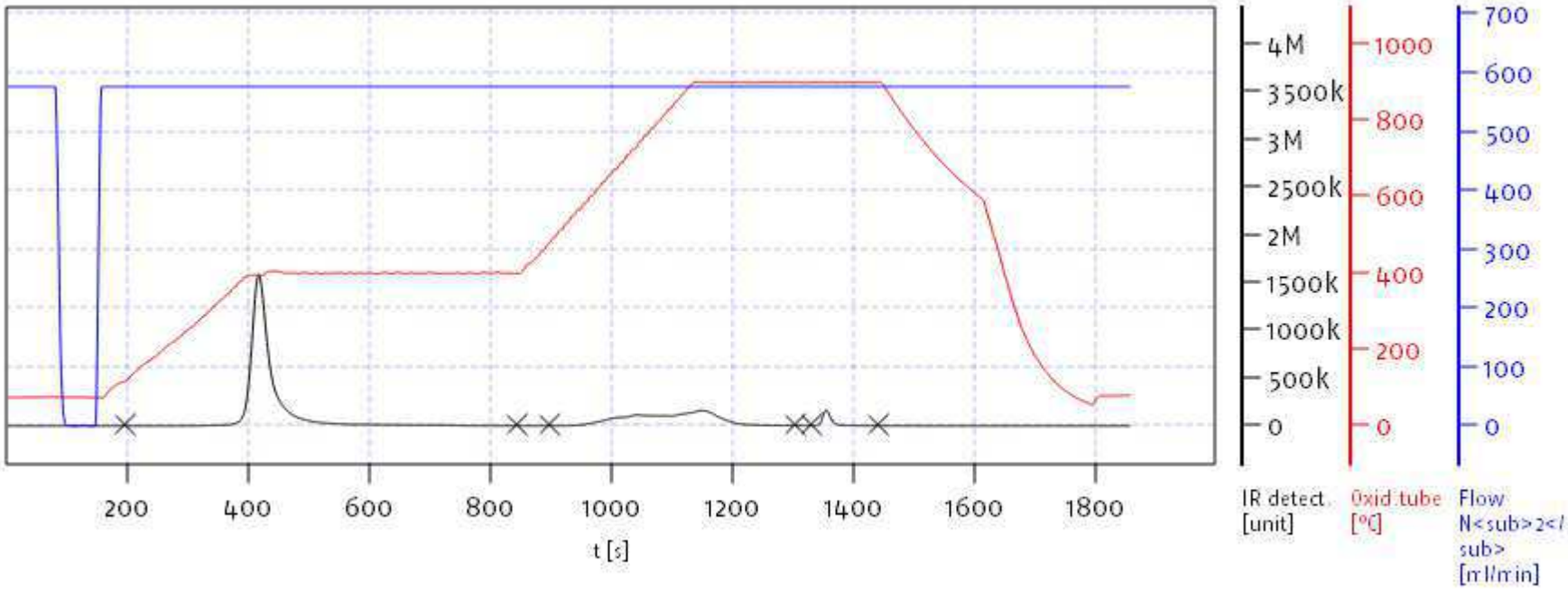
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
213	73	21H0234-06	373.10		1.00	CARBON	8/30/2021 5:49 AM	1.009	0.420	1.429	bl	2 225 290	939 624	104 534	0.9651	1.0000



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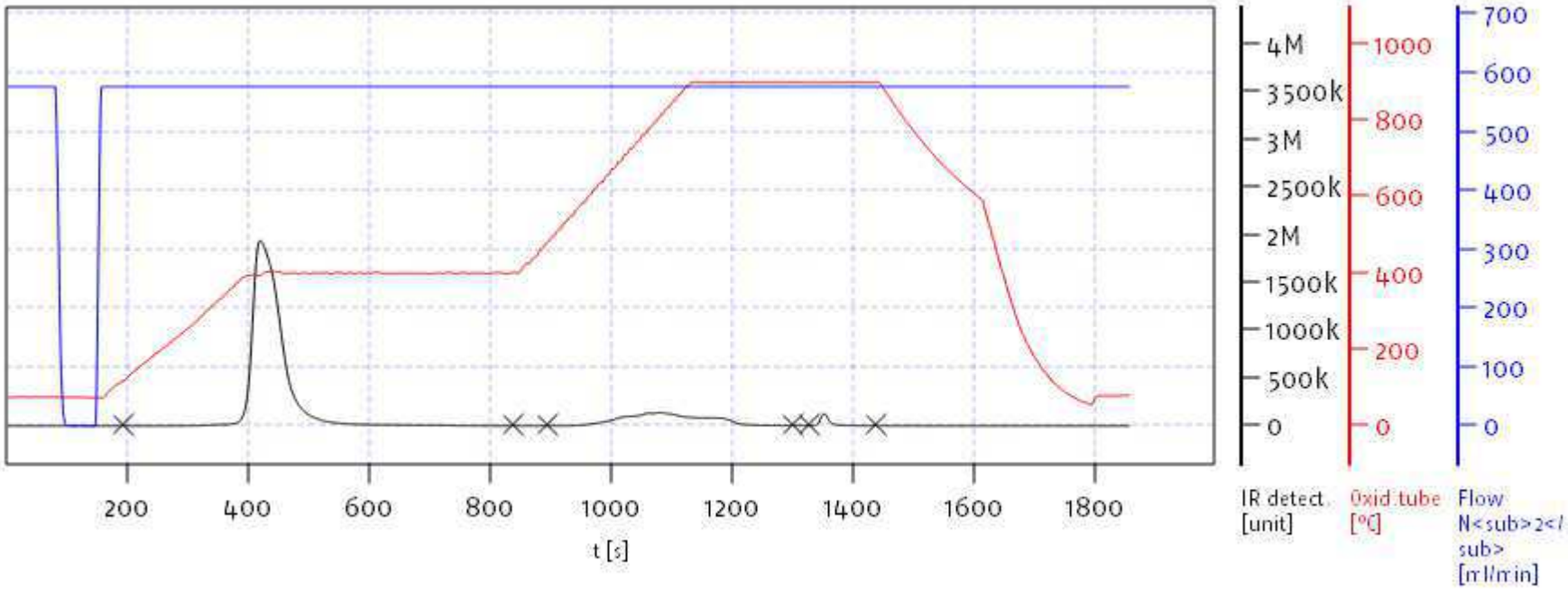
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
214	74	21H0234-09	556.70		1.00	CARBON	8/30/2021 6:20 AM	1.189	0.252	1.441	bl	3 997 190	841 290	83 898	0.9651	1.0000



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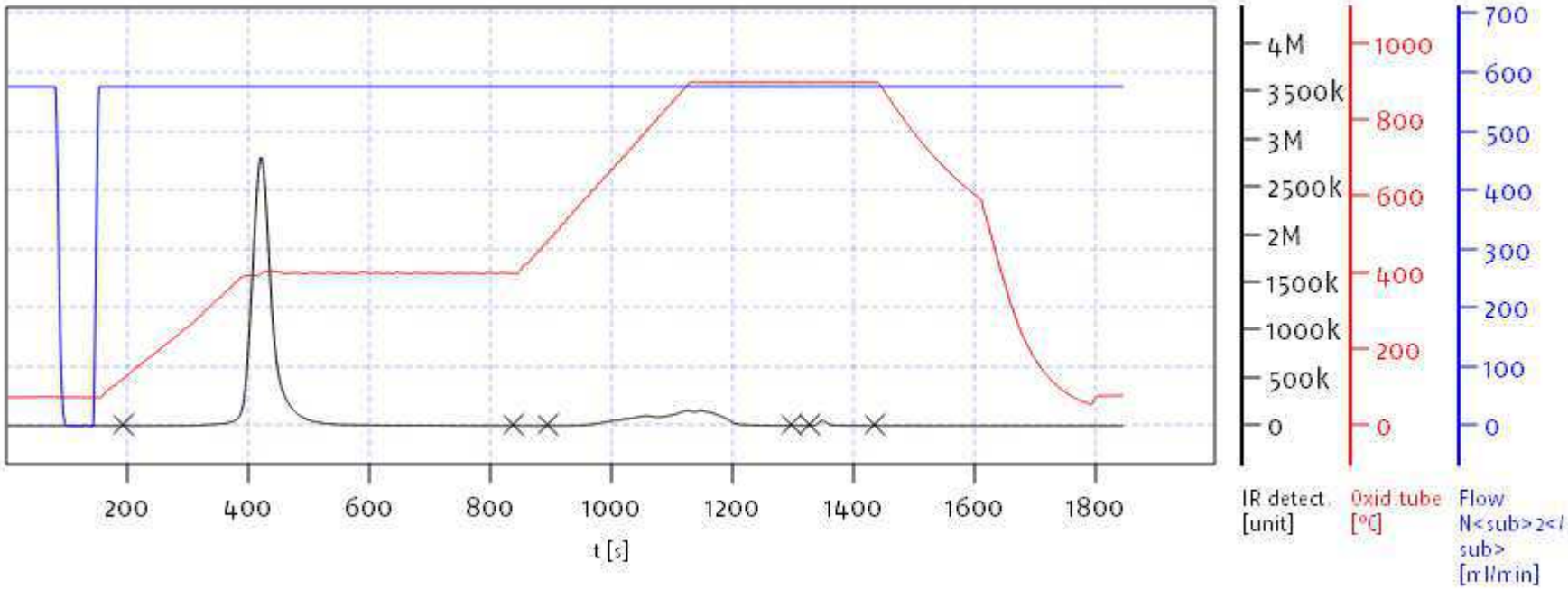
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
215	75	21H0281-01	468.50		1.00	CARBON	8/30/2021 6:51 AM	1.433	0.317	1.750	bl	4 098 100	890 549	42 629	0.9651	1.0000



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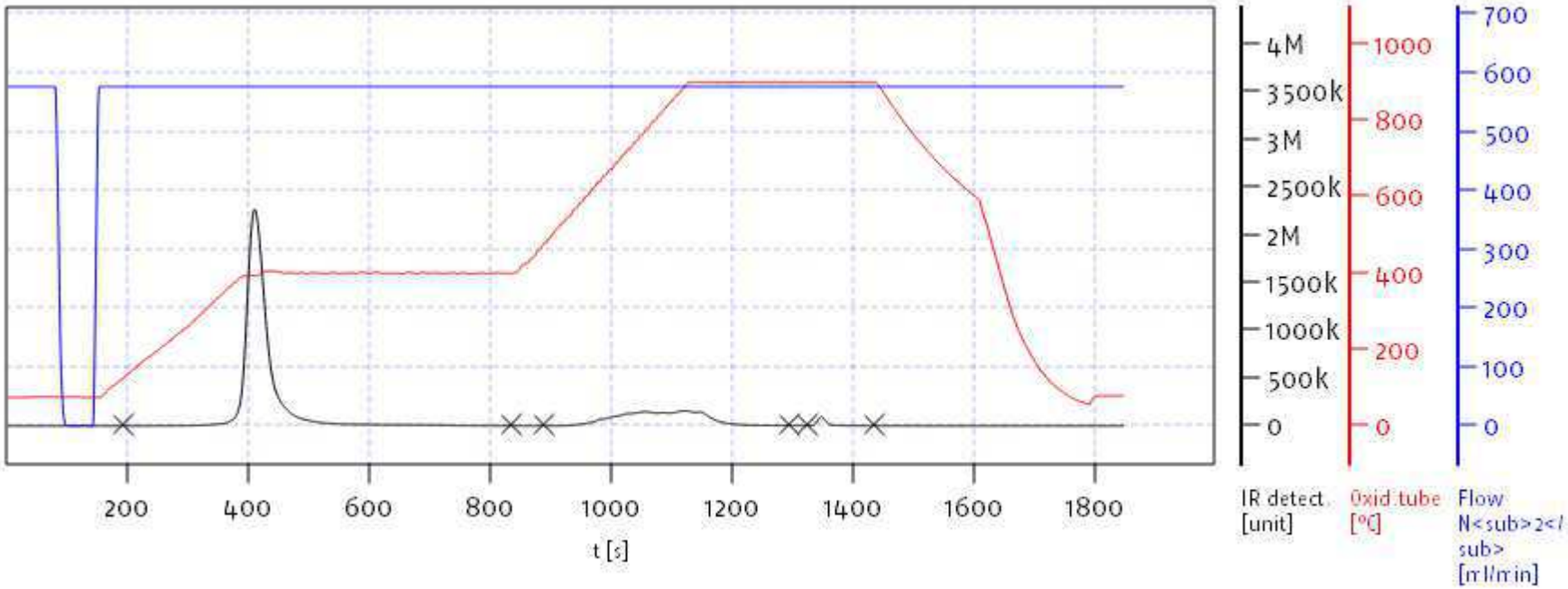
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
216	76	BJH0677-DUP2	454.40		1.00	CARBON	8/30/2021 7:22 AM	1.230	0.373	1.603	bl	3 387 130	1 014 720	63 796	0.9651	1.0000



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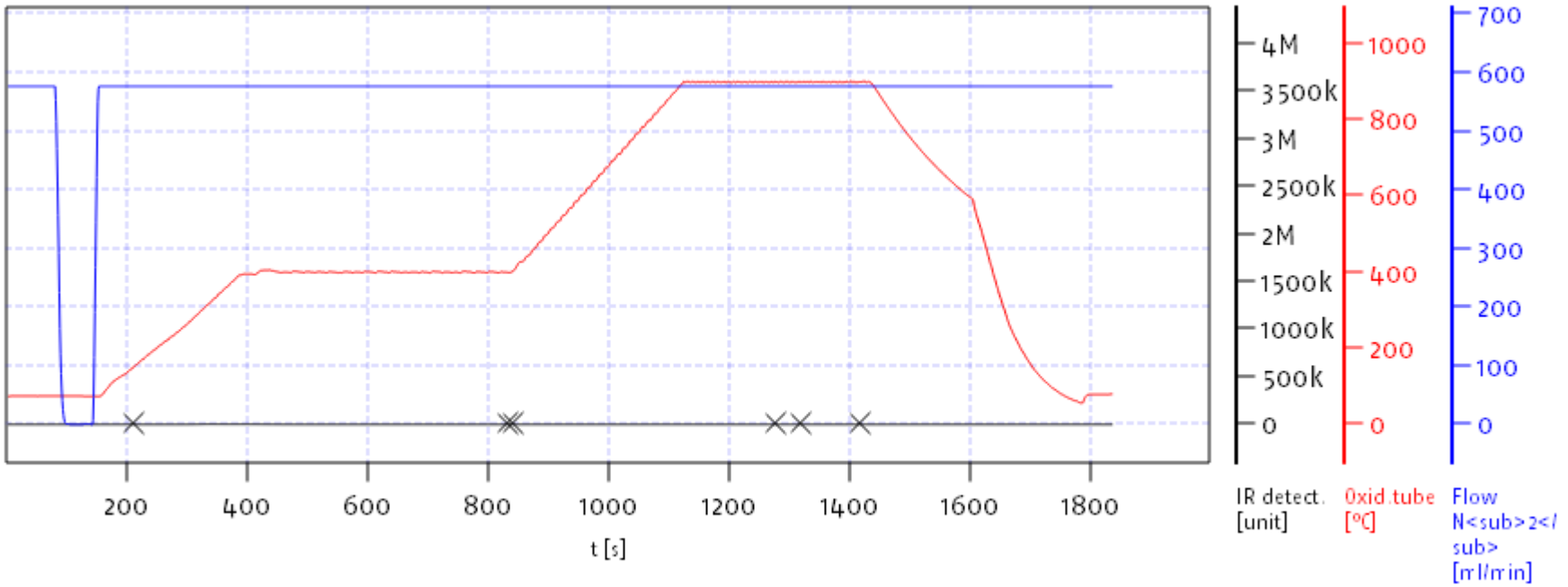
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
217	77	BLANK	1.00		1.00	CARBON	8/30/2021 7:53 AM	0.000	0.000	0.000	bl	11 607	1 004	451	0.9651	1.0000



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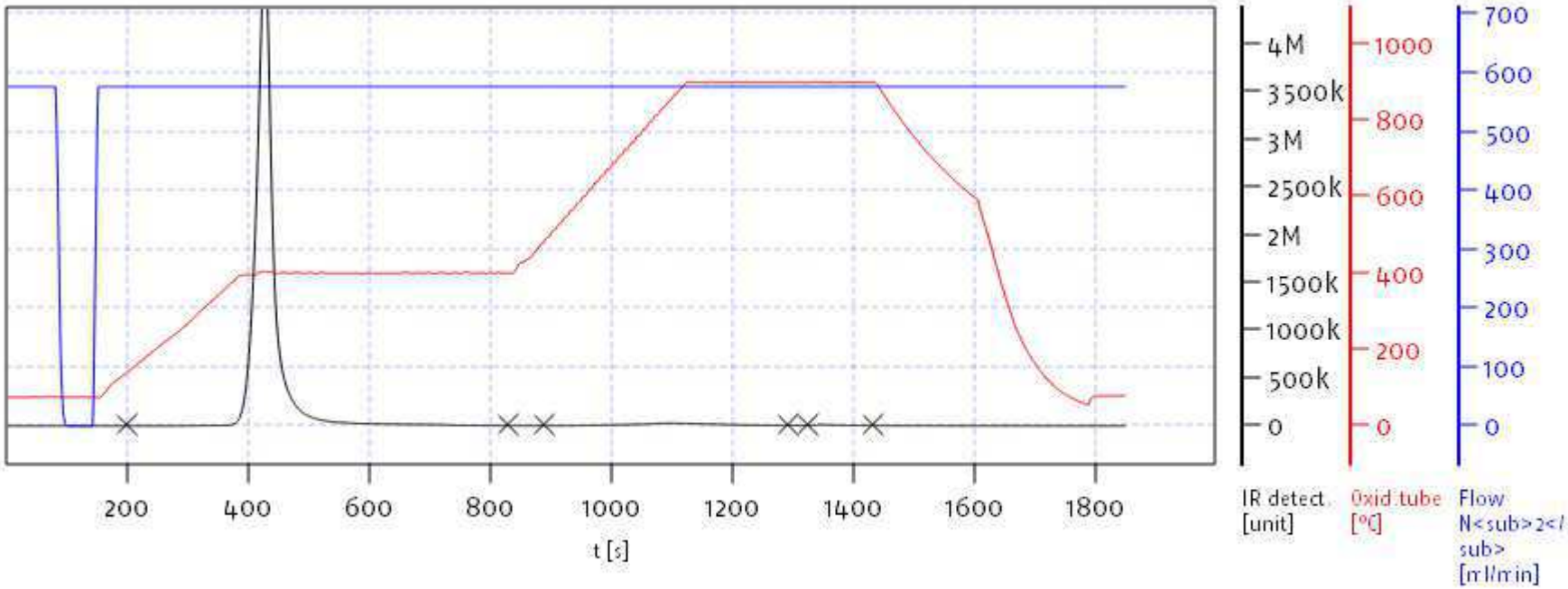
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
218	78	Dfactor	22.70		1.00	CARBON	8/30/2021 8:25 AM	44.555	1.284	45.839	bl	6 054 780	184 262	26 404	0.9886	1.0000



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Access: soliTOC superuser

Date: Tue Aug 31 14:32:59 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

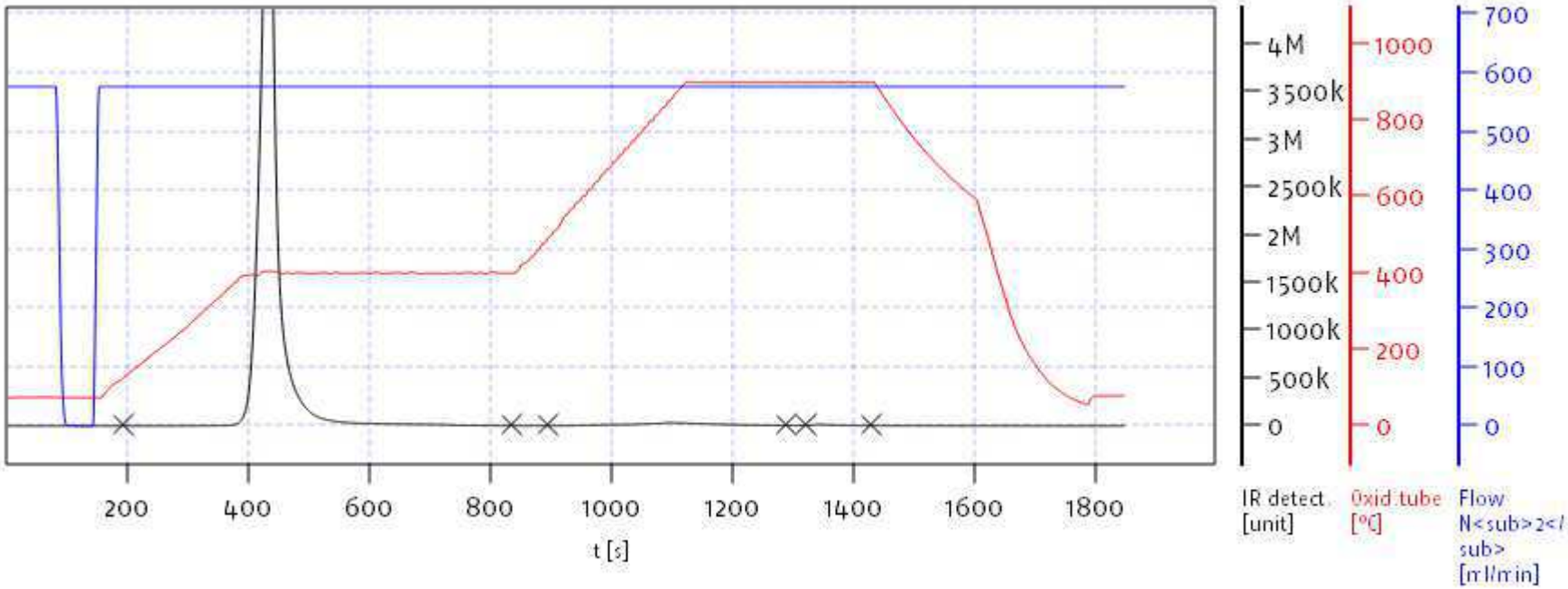
elementar
EXCELLENCE IN ELEMENTS

Document: 082521BFb from: 8/31/2021 10:17 AM

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
219	79	Dfactor	28.40		1.00	CARBON	8/30/2021 8:56 AM	44.533	1.142	45.676	bl	7 906 780	203 751	26 438	0.9467	1.0000



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Date: Tue Aug 31 14:32:59 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
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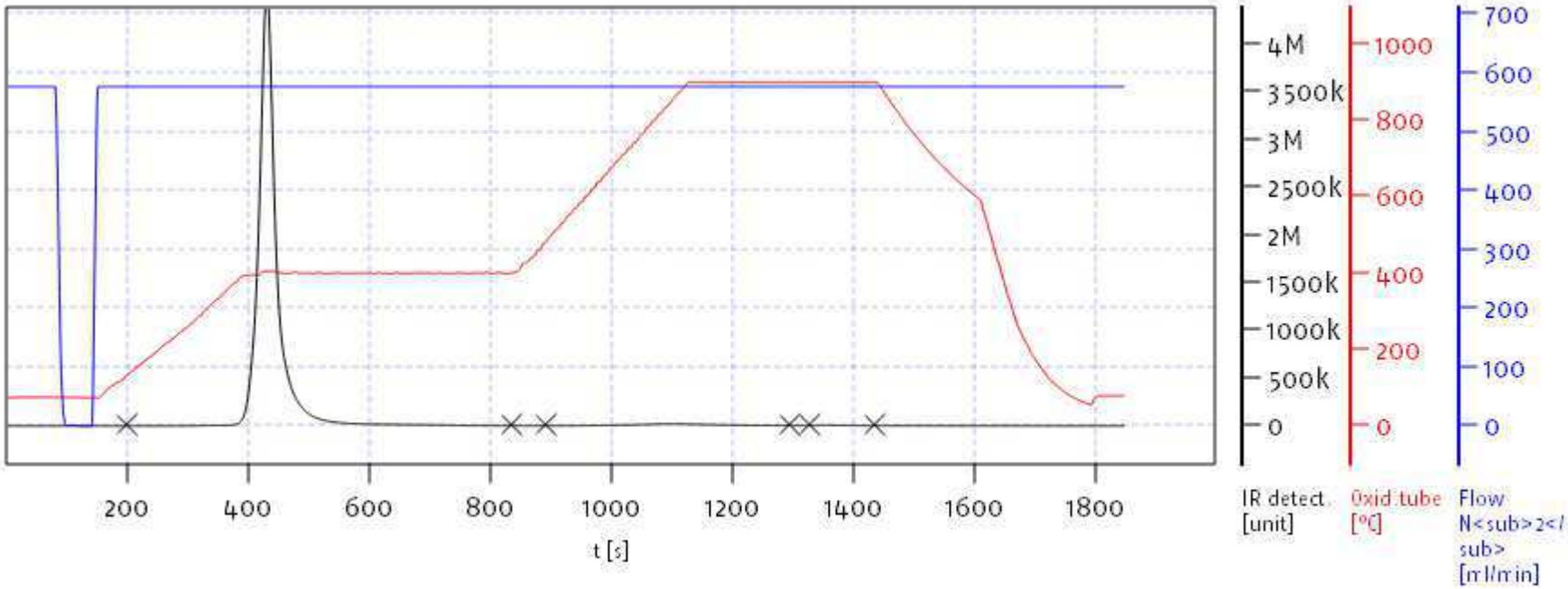
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
220	80	SJH0331-CCVI	21.40		1.00	CARBON	8/30/2021 9:27 AM	44.014	0.984	44.998	bl	5 769 520	136 407	17 400	0.9676	1.0000



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Soli TOC Cube, Carbon
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Analyst: BF

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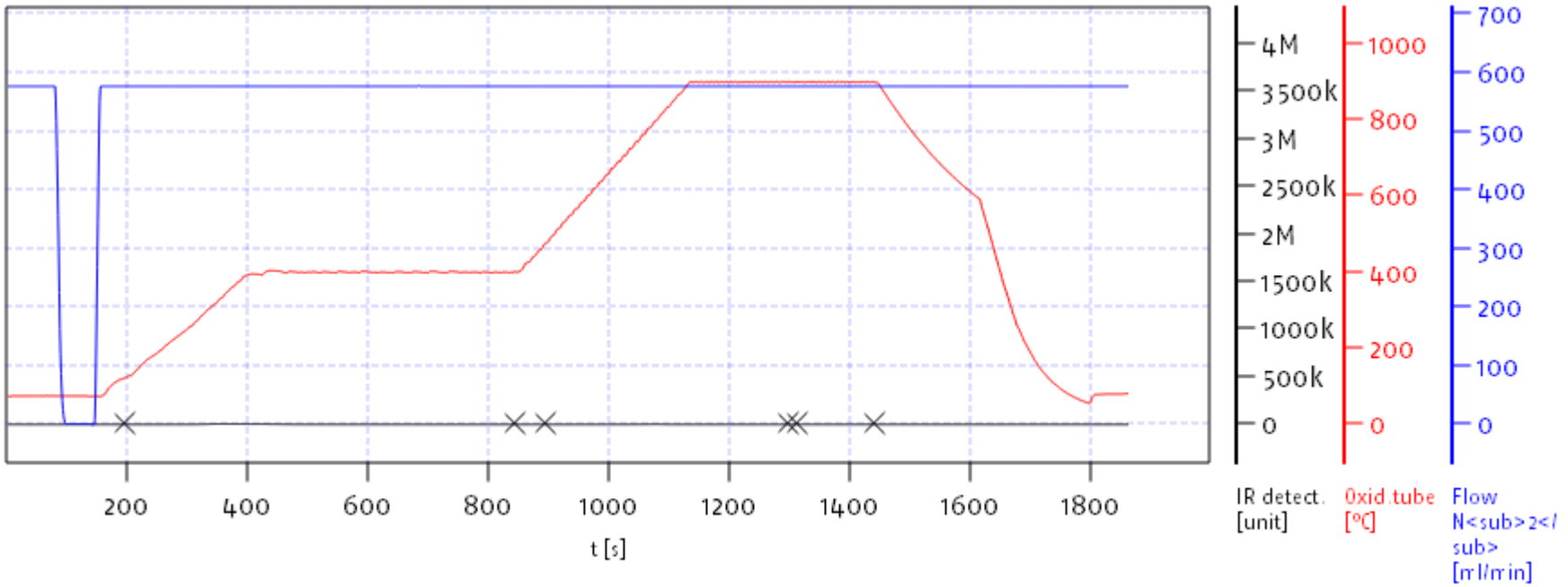
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
221	81	SJH0331-CCBI	586.00		1.00	CARBON	8/30/2021 9:59 AM	0.003	0.000	0.003	bl,C3u,C2u	23 563	4 985	576	0.9676	1.0000



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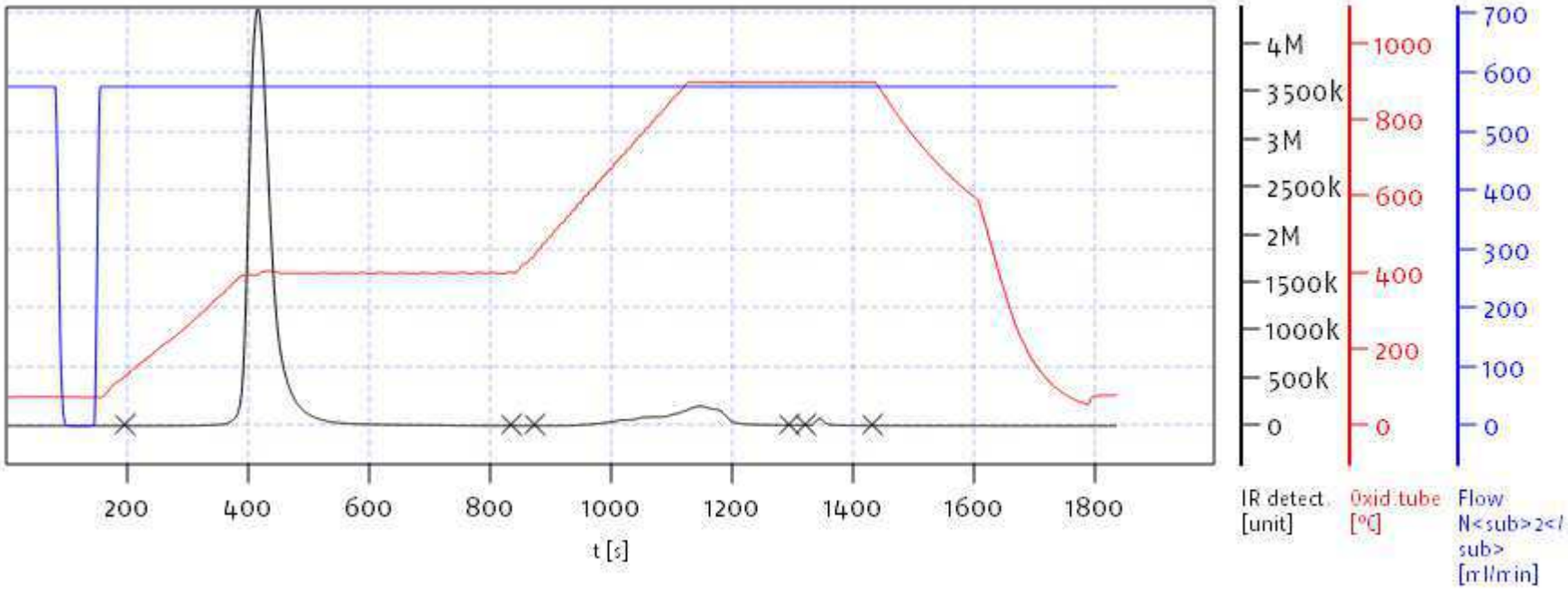
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
222	82	BJH0677-MS2	446.30	0.0141	1.00	CARBON	8/30/2021 10:30 AM	2.612	0.371	2.983	bl	7 093 380	992 173	61 344	0.9676	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
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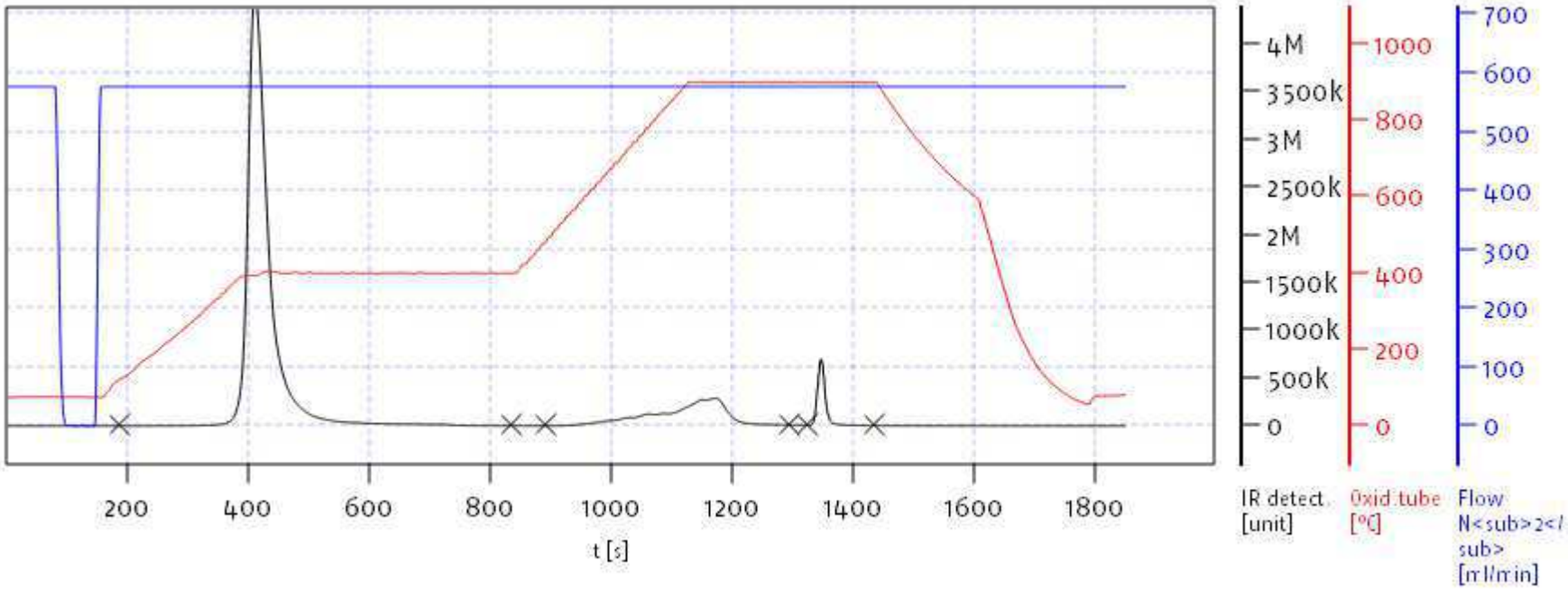
Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
223	83	BJH0677-MSD2	451.90	0.0146	1.00	CARBON	8/30/2021 11:01 AM	2.604	0.502	3.106	bl	6 813 400	1 355 300	397 860	0.9676	1.0000



Name:

Access: soliTOC superuser

Date: Tue Aug 31 14:32:59 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
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Mode CCC

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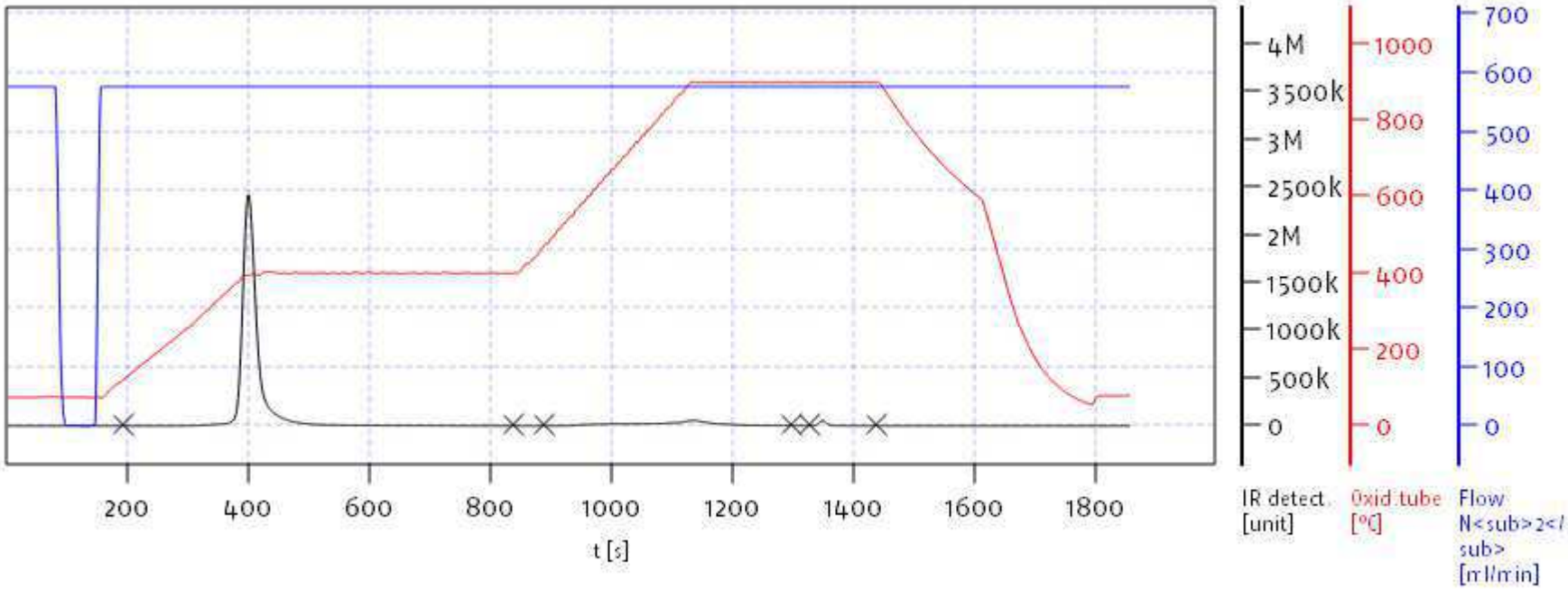
EXCELLENCE IN ELEMENTS

Document: 082521BFb from: 8/31/2021 10:17 AM

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
224	84	21H0281-04	255.10		1.00	CARBON	8/30/2021 11:33 AM	1.615	0.171	1.786	bl	2 511 560	270 300	32 476	0.9676	1.0000



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Access: soliTOC superuser

Date: Tue Aug 31 14:32:59 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

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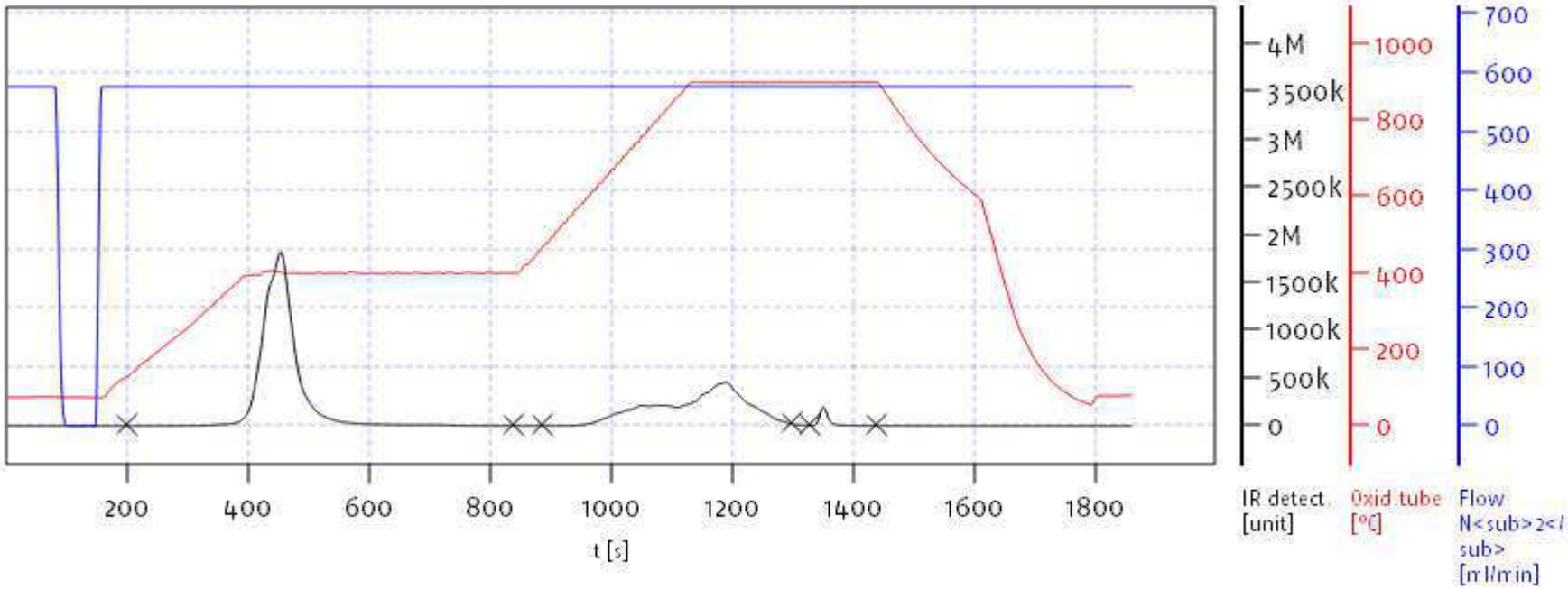
EXCELLENCE IN ELEMENTS

Document: 082521BFb from: 8/31/2021 10:17 AM

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
225	85	21H0281-11	770.90		1.00	CARBON	8/30/2021 12:04 PM	0.894	0.568	1.462	bl	4 111 100	2 604 340	125 164	0.9676	1.0000



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Date: Tue Aug 31 14:32:59 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
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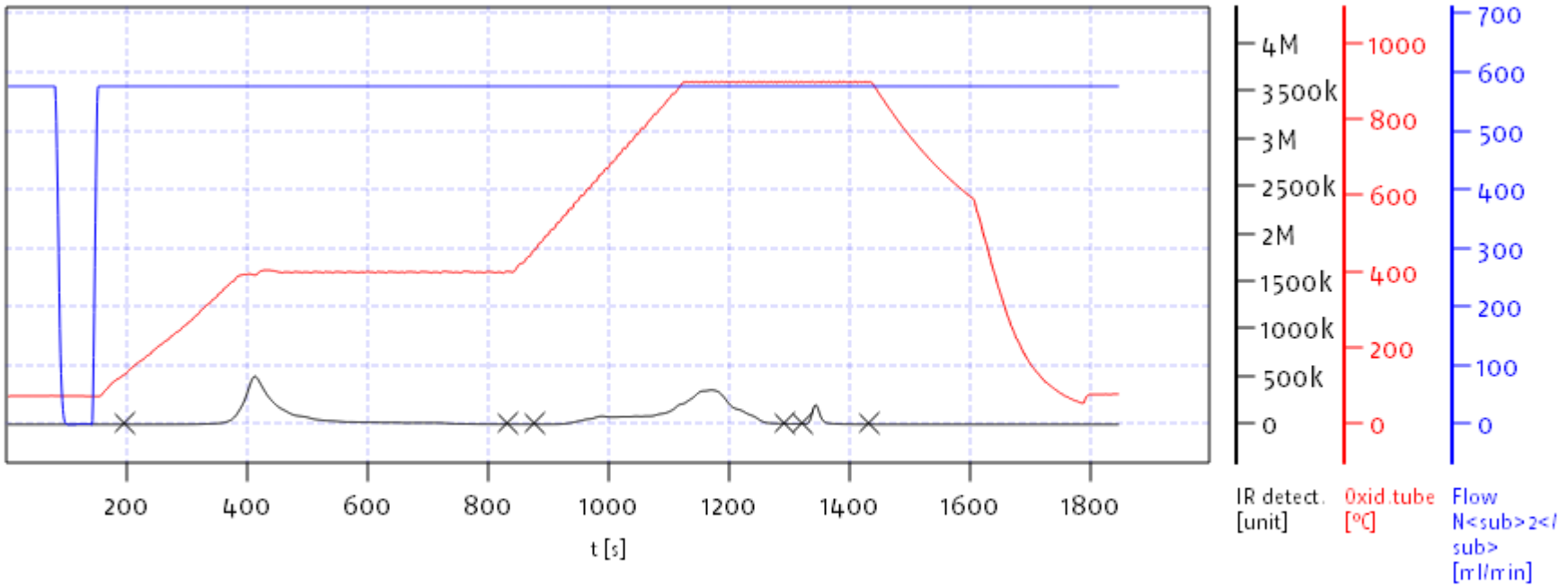
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
226	86	21H0281-14	315.70		1.00	CARBON	8/30/2021 12:35 PM	0.746	0.953	1.699	bl	1 332 770	1 792 890	127 280	0.9676	1.0000



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soliTOC V2.0.2 (31015f9) 2018-11-19
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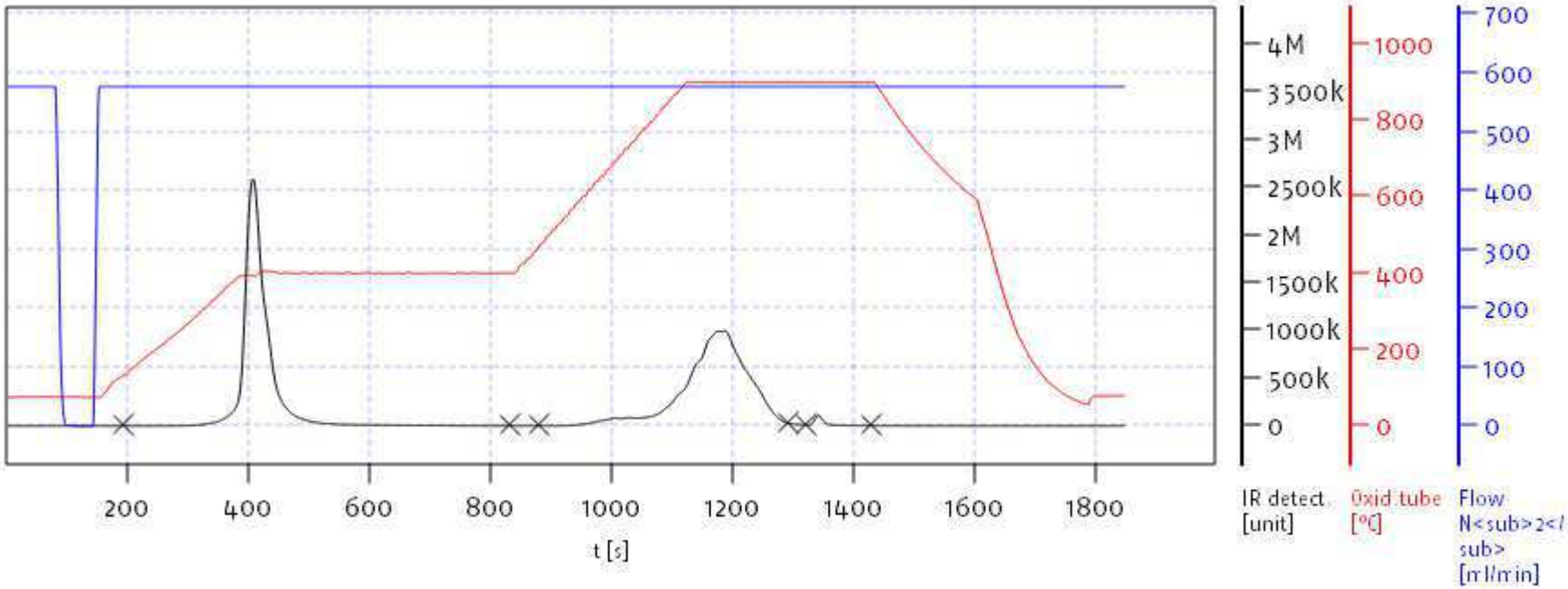
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
227	87	21H0281-15	369.40		1.00	CARBON	8/30/2021 1:07 PM	1.763	1.991	3.754	bl	3 926 950	4 365 750	79 254	0.9676	1.0000



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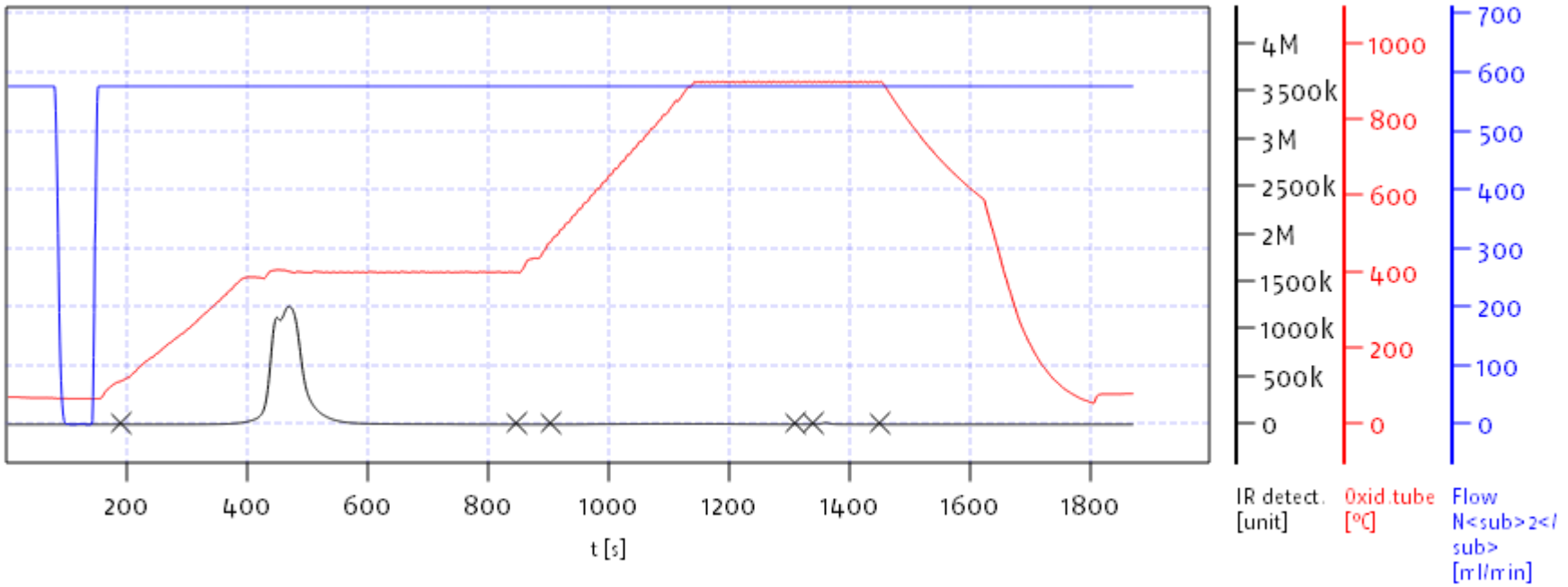
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
228	88	21G0303-02RE2	138.60		1.00	CARBON	8/30/2021 1:41 PM	3.374	0.053	3.427	bl	2 780 800	54 927	11 700	1.0000	1.0000



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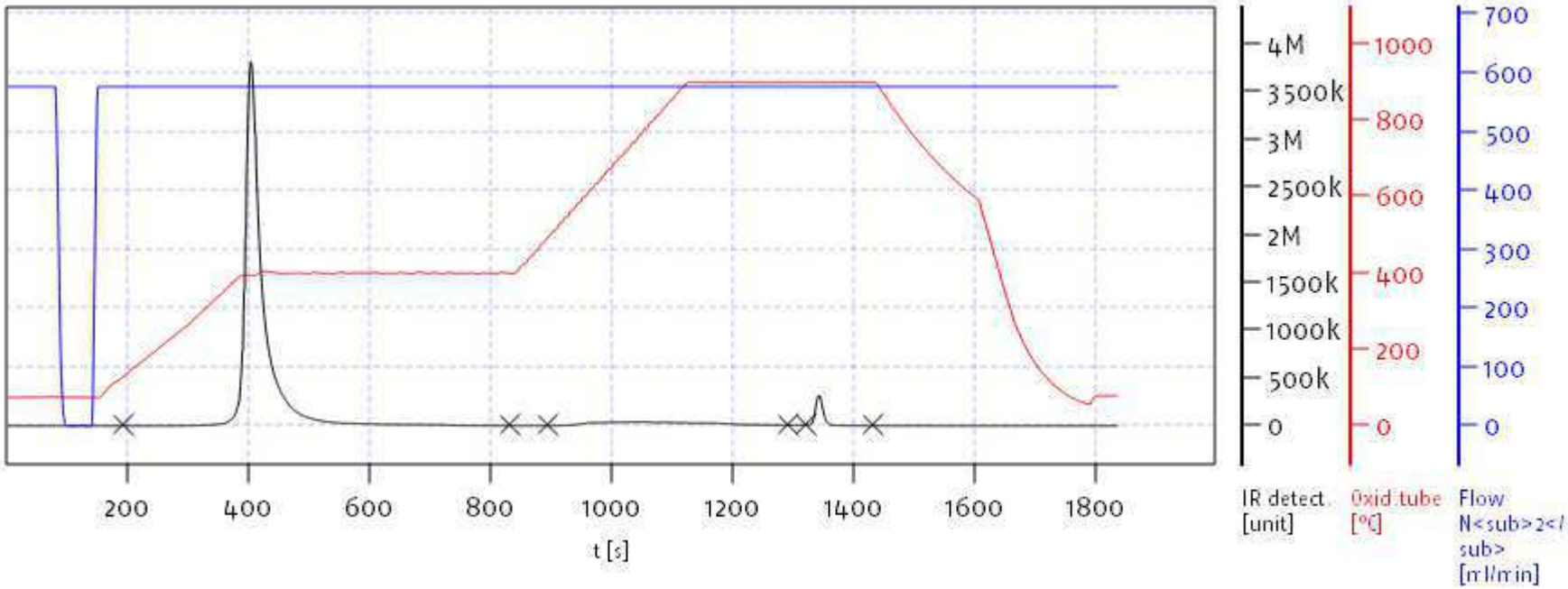
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
229	89	BJH0300-MS3	286.90	0.0132	1.00	CARBON	8/30/2021 2:12 PM	2.785	0.204	2.989	bl	4 726 410	358 091	180 107	0.9676	1.0000



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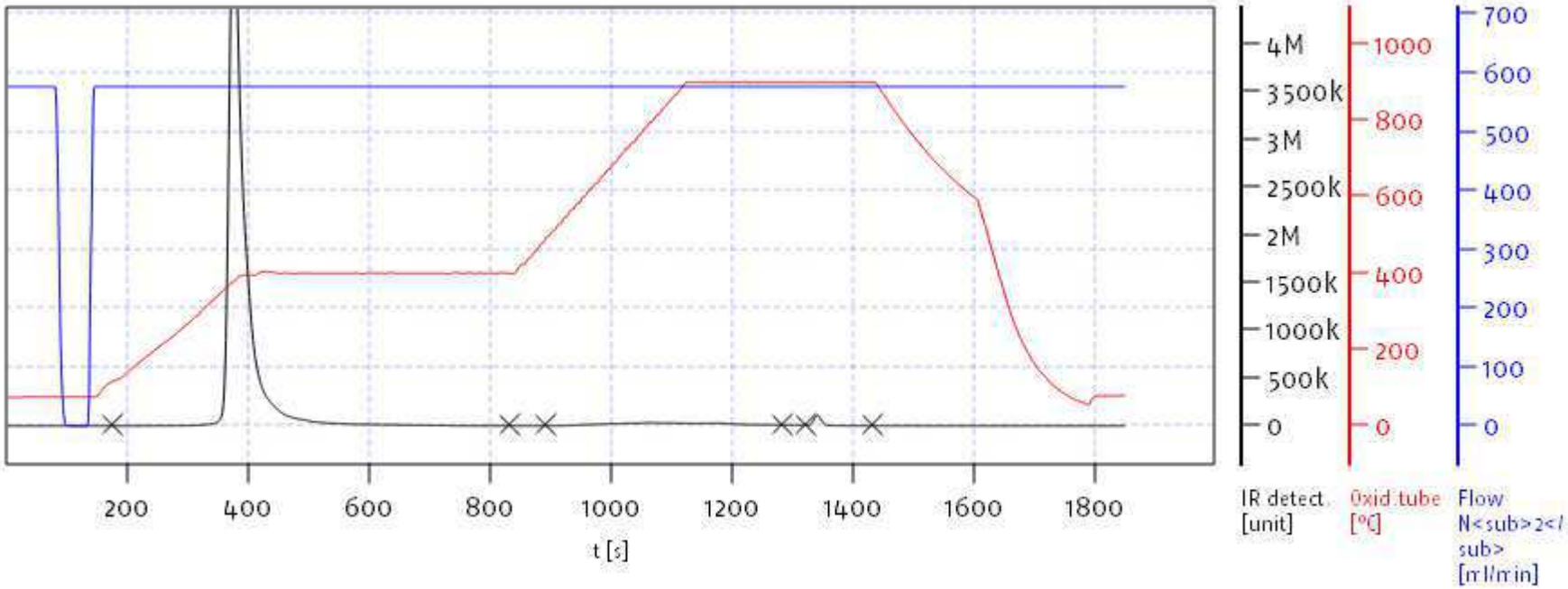
Document: 082521BFb from: 8/31/2021 10:17 AM

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
230	1	BJH0300-MS4	273.90	0.0102	1.00	CARBON	8/30/2021 2:43 PM	3.680	0.167	3.847	bl	6 122 540	281 811	67 609	0.9676	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
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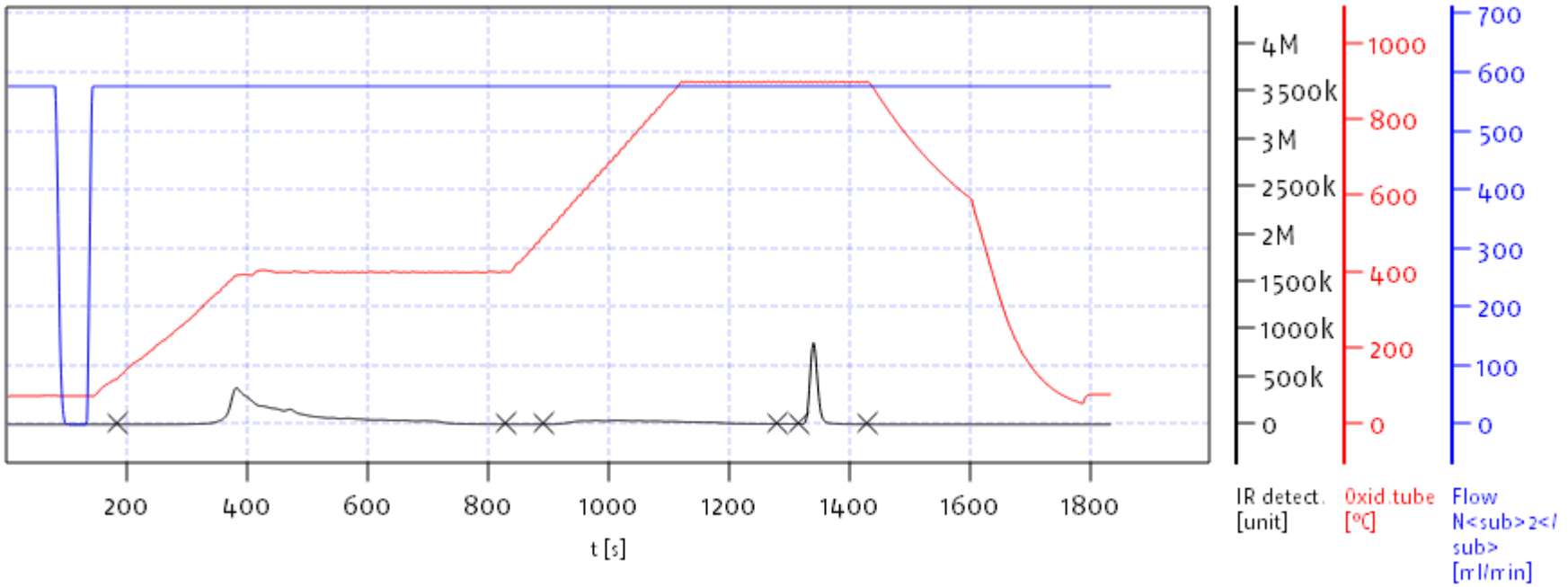
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
231	2	21G0305-02RE1	249.20		1.00	CARBON	8/30/2021 3:14 PM	1.304	0.222	1.527	bl	1 517 780	339 933	478 774	0.9676	1.0000



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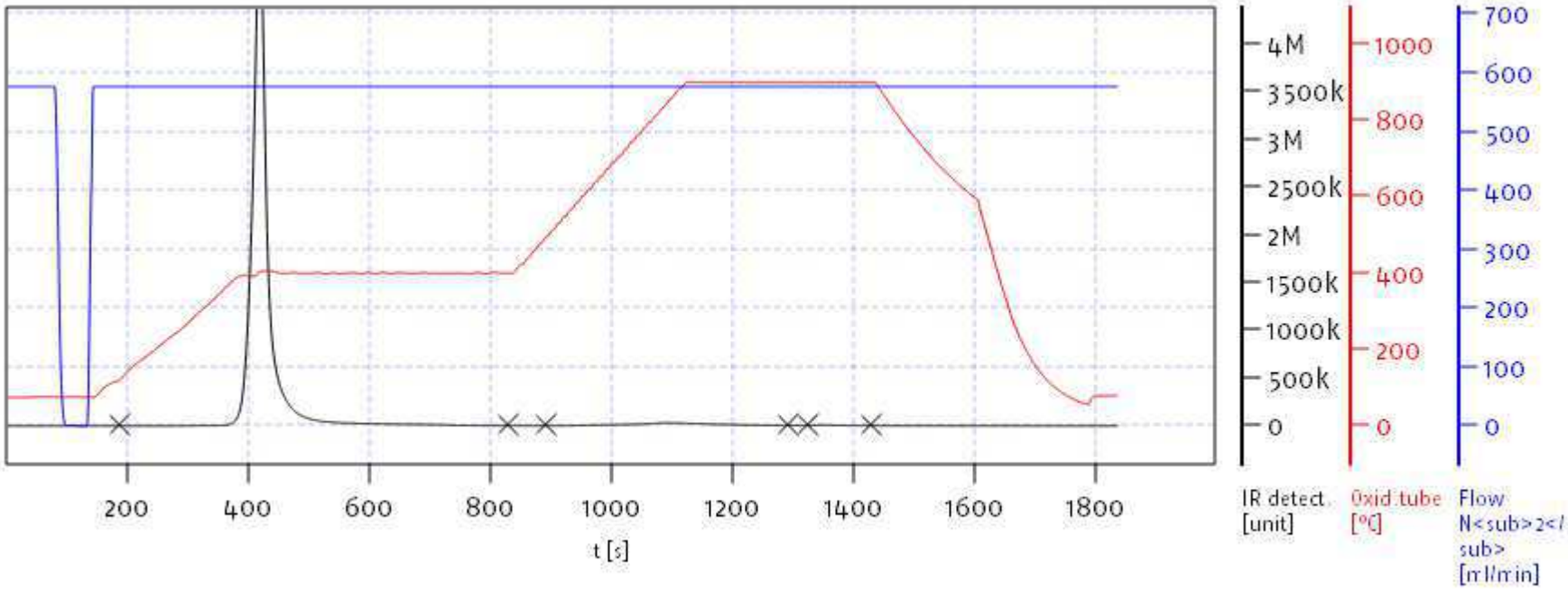
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
232	3	SJH0331-CCVJ	20.90		1.00	CARBON	8/30/2021 3:45 PM	45.536	1.533	47.069	bl	5 638 790	201 321	19 734	1.0000	1.0000



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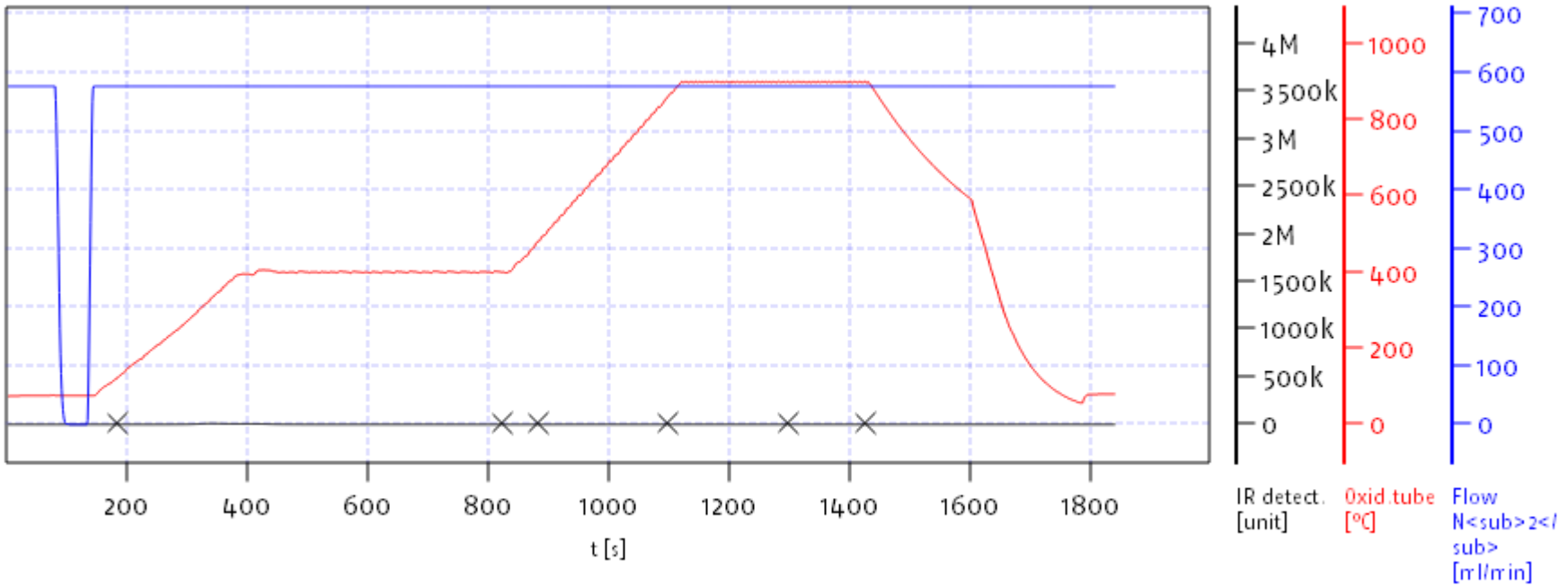
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
233	4	SJH0331-CCBJ	559.70		1.00	CARBON	8/30/2021 4:16 PM	0.007	0.000	0.007	bl,C3u,C2u	36 369	1 670	384	1.0000	1.0000



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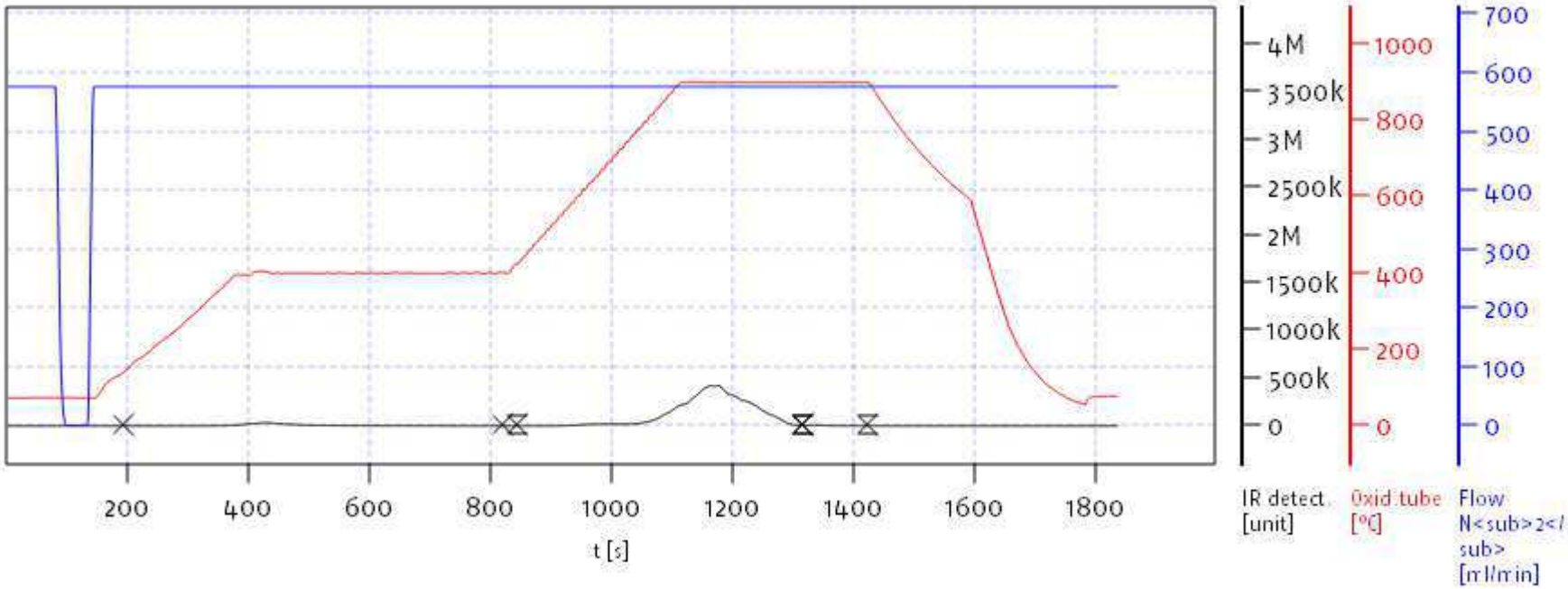
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
147	7	21G0310-03RE1	217.60		1.00	CARBON	9/1/2021 10:21 AM	0.083	1.269	1.352	bl	119 849	1 646 642	0	0.9913	1.0000



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Access: soliTOC superuser

Date: Wed Sep 1 10:22:45 2021

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Serial No: 0300.181017
Mode CCC

elementar
EXCELLENCE IN ELEMENTS

Document: 082521BFb from: 9/1/2021 10:22 AM

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 9060A m

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00021	Instrument:	TOC Cube
Calibration Date:	08/10/2021 12:39		

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Total Organic Carbon	0.008374	1136972	0.015851	1268816	0.020935	1128063	0.030804	1237761	0.04486	1233816	0.059515	1290515
Total Carbon	0.008374	1136972	0.015851	1268816	0.020935	1128063	0.030804	1237761	0.04486	1233816	0.059515	1290515
Total Inorganic Carbon	0.008374	1136972	0.015851	1268816	0.020935	1128063	0.030804	1237761	0.04486	1233816	0.059515	1290515
% Soot	0.008374	1136972	0.015851	1268816	0.020935	1128063	0.030804	1237761	0.04486	1233816	0.059515	1290515

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 9060A m

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00021	Instrument:	TOC Cube
Calibration Date:	08/10/2021 12:39		

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Total Organic Carbon	0.074169	1310642	0.090319	1267275	0.11873	1241877	0.14864	1216079	0.234	1269470	0.312	1255862
Total Carbon	0.074169	1310642	0.090319	1267275	0.11873	1241877	0.14864	1216079	0.234	1269470	0.312	1255862
Total Inorganic Carbon	0.074169	1310642	0.090319	1267275	0.11873	1241877	0.14864	1216079	0.234	1269470	0.312	1255862
% Soot	0.074169	1310642	0.090319	1267275	0.11873	1241877	0.14864	1216079	0.234	1269470	0.312	1255862

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 9060A m

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00021	Instrument:	TOC Cube
Calibration Date:	08/10/2021 12:39		

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
		RF		RF		RF		RF		RF		RF
Total Organic Carbon	0.432	1282236	0.588	1272976	0.9	1313973	1.218	1298577	1.506	1294082	1.824	1297751
Total Carbon	0.432	1282236	0.588	1272976	0.9	1313973	1.218	1298577	1.506	1294082	1.824	1297751
Total Inorganic Carbon	0.432	1282236	0.588	1272976	0.9	1313973	1.218	1298577	1.506	1294082	1.824	1297751
% Soot	0.432	1282236	0.588	1272976	0.9	1313973	1.218	1298577	1.506	1294082	1.824	1297751

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 9060A m

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00021	Instrument:	TOC Cube
Calibration Date:	08/10/2021 12:39		

Compound	Level 19		Level 20		Level 21		Level 22		Level 23		Level 24	
		RF		RF		RF		RF		RF		RF
Total Organic Carbon	2.394	1299464	3	1290681	4.194	1296753	4.806	1298028	5.418	1299159	7.188	1270865
Total Carbon	2.394	1299464	3	1290681	4.194	1296753	4.806	1298028	5.418	1299159	7.188	1270865
Total Inorganic Carbon	2.394	1299464	3	1290681	4.194	1296753	4.806	1298028	5.418	1299159	7.188	1270865
% Soot	2.394	1299464	3	1290681	4.194	1296753	4.806	1298028	5.418	1299159	7.188	1270865

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 9060A m

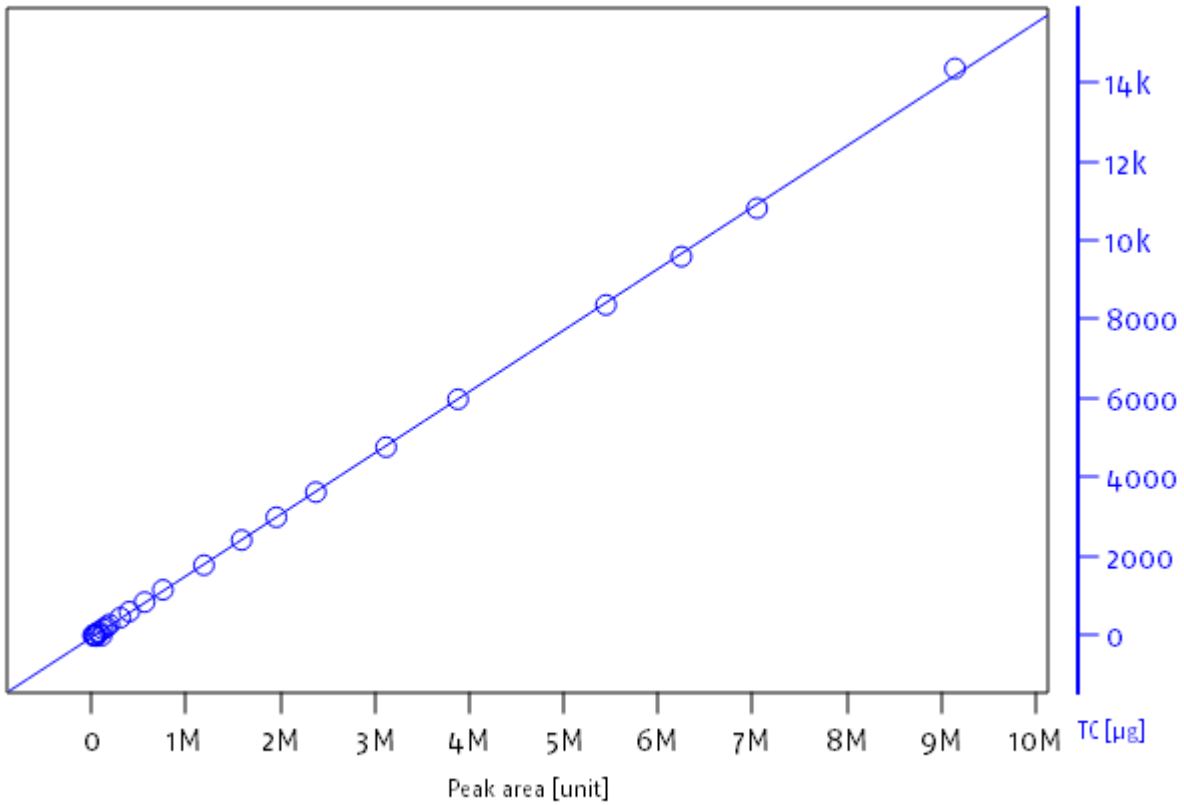
Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00021	Instrument:	TOC Cube
Calibration Date:	08/10/2021 12:39		

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	COD Limit	Q
Total Organic Carbon	1265487	3.8	0.9998			
Total Carbon	1265487	3.8	0.9998			
Total Inorganic Carbon	1265487	3.8	0.9998			
% Soot	1265487	3.8	0.9998			

Calibration parameters TC, Whole range

a	-1.664439e-02
b	+1.556221e-06
c	+0.000000e+00
d	+0.000000e+00
e	+0.000000e+00
r	0.999802
r_old	0.999802
Proc.-SD	57.257020 µg

Calibration graph TC, Whole range



Name:

Access: soliTOC superuser

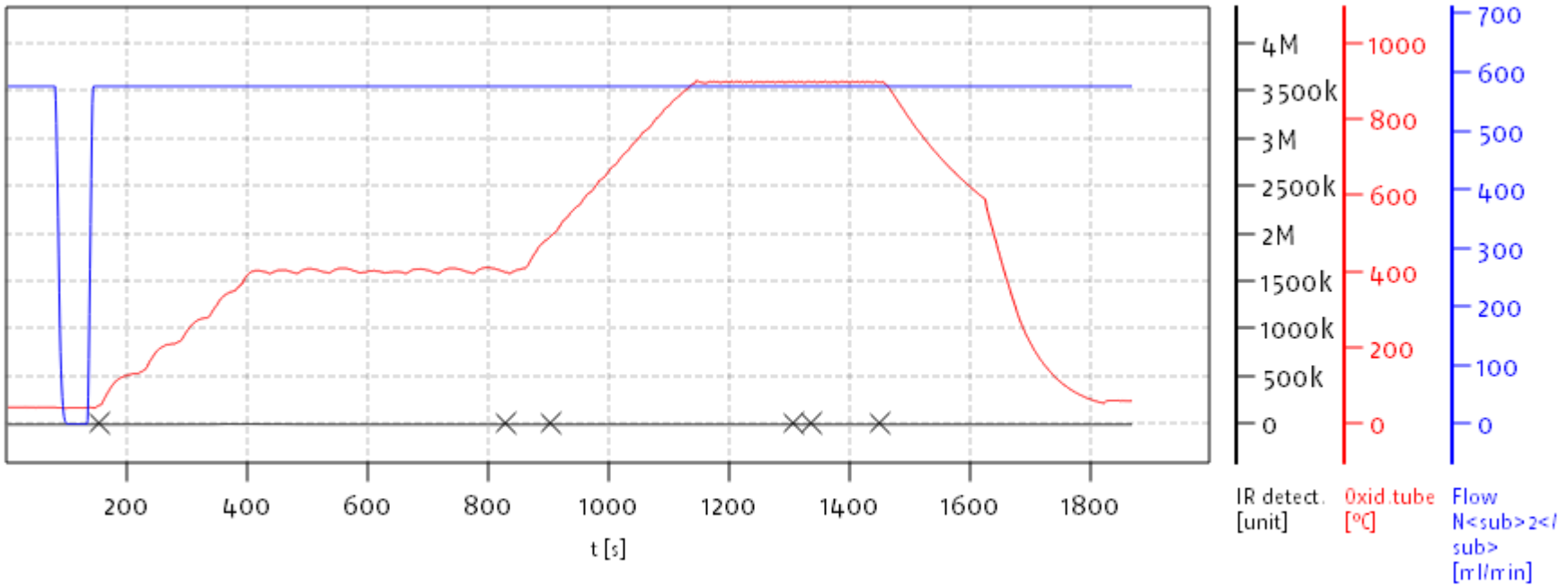
Date: Wed Aug 11 13:29:19 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
1	1	BLANK	1.00		1.00	CARBON	8/10/2021 1:17 PM	0.000	0.000	0.000	bl	22 805	4 168	1 160	1.0000	1.0000



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Access: soliTOC superuser

Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

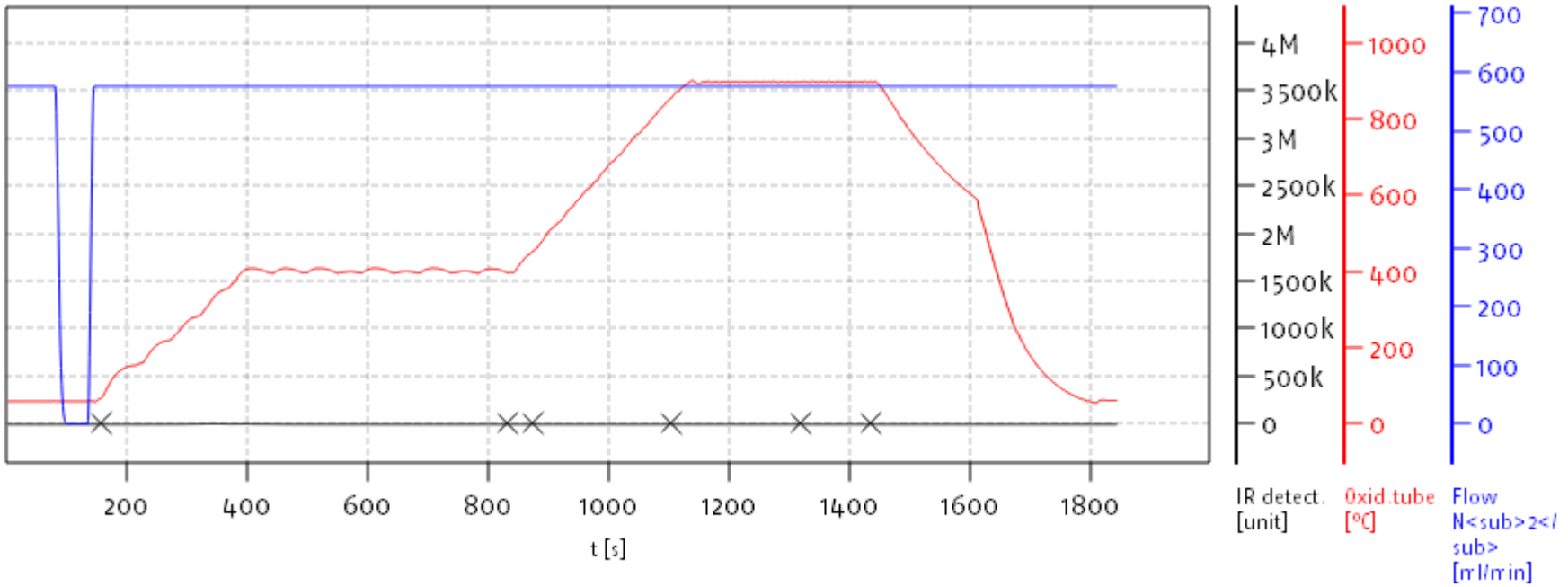
elementar
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00021 081021BF from: --.--.-- (modified)

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
2	2	BLANK	1.00		1.00	CARBON	8/10/2021 1:48 PM	0.000	0.000	0.000	bl	25 029	584	417	1.0000	1.0000



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Date: Wed Aug 11 13:04:23 2021

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Serial No: 0300.181017
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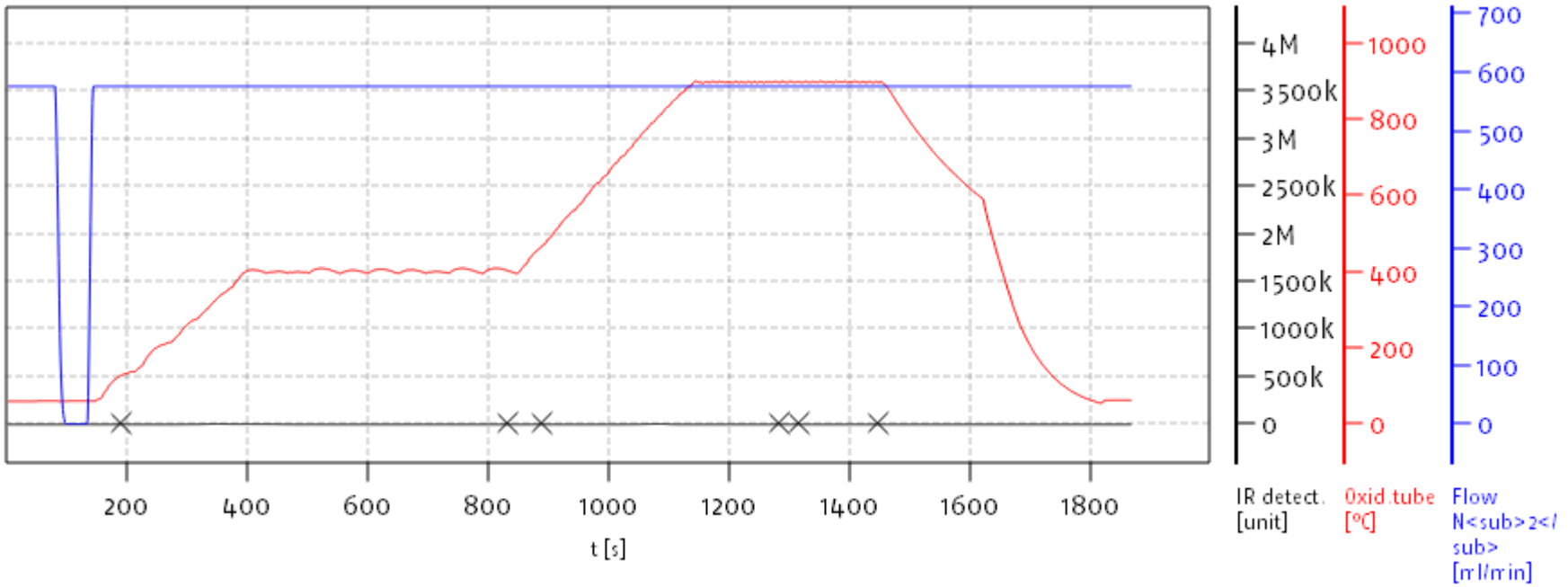
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
3	3	SJH0113-CAL1	200.00	0.0028	1.00	CARBON	8/10/2021 2:19 PM	0.022	0.010	0.032	bl,C2u	22 693	9 521	406	1.0000	1.0000



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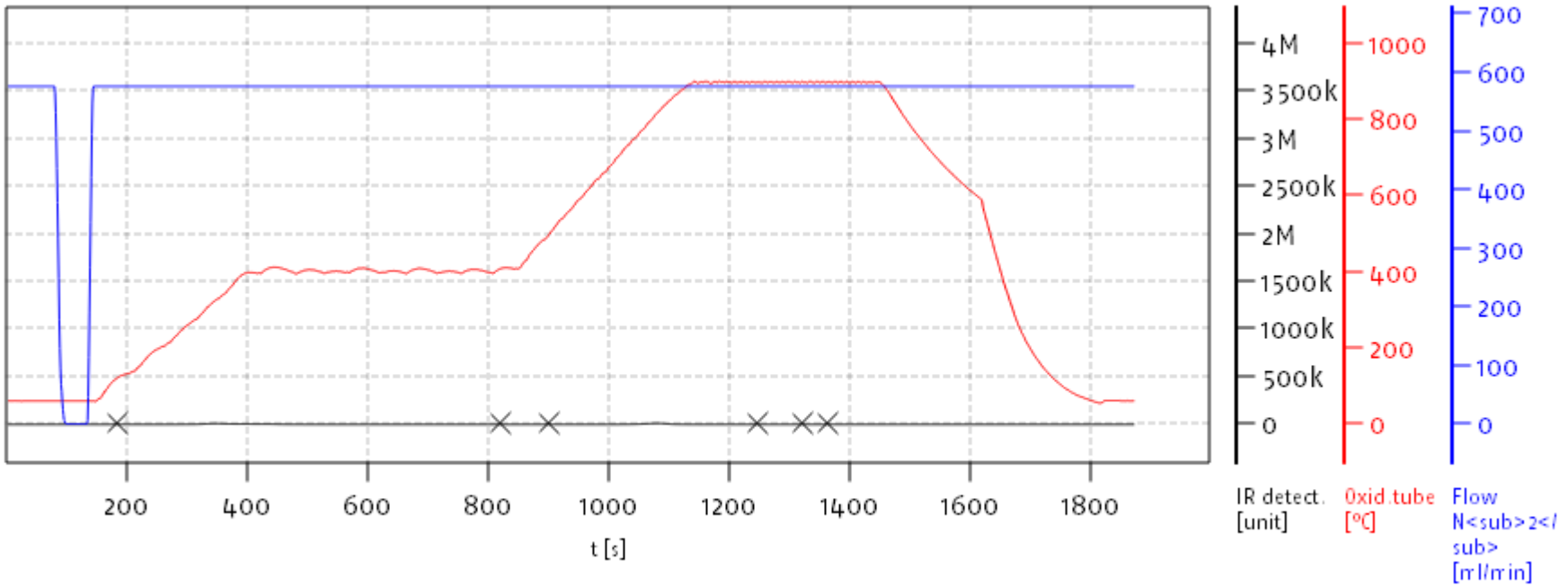
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
4	4	SJH0113-CAL2	200.00	0.0053	1.00	CARBON	8/10/2021 2:51 PM	0.029	0.018	0.046	bl,C2u	30 832	20 112	139	1.0000	1.0000



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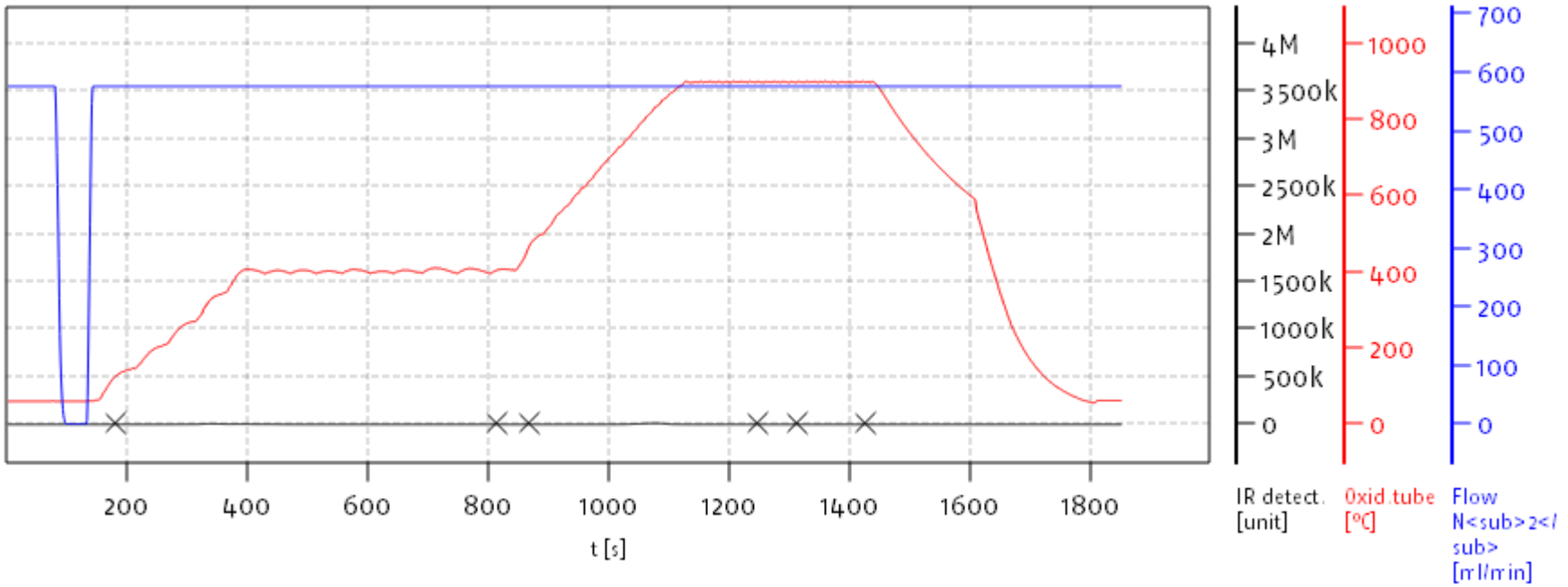
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
5	5	SJH0113-CAL3	200.00	0.0070	1.00	CARBON	8/10/2021 3:22 PM	0.022	0.021	0.043	bl,C2u	22 146	23 616	314	1.0000	1.0000



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Balance: BAL3
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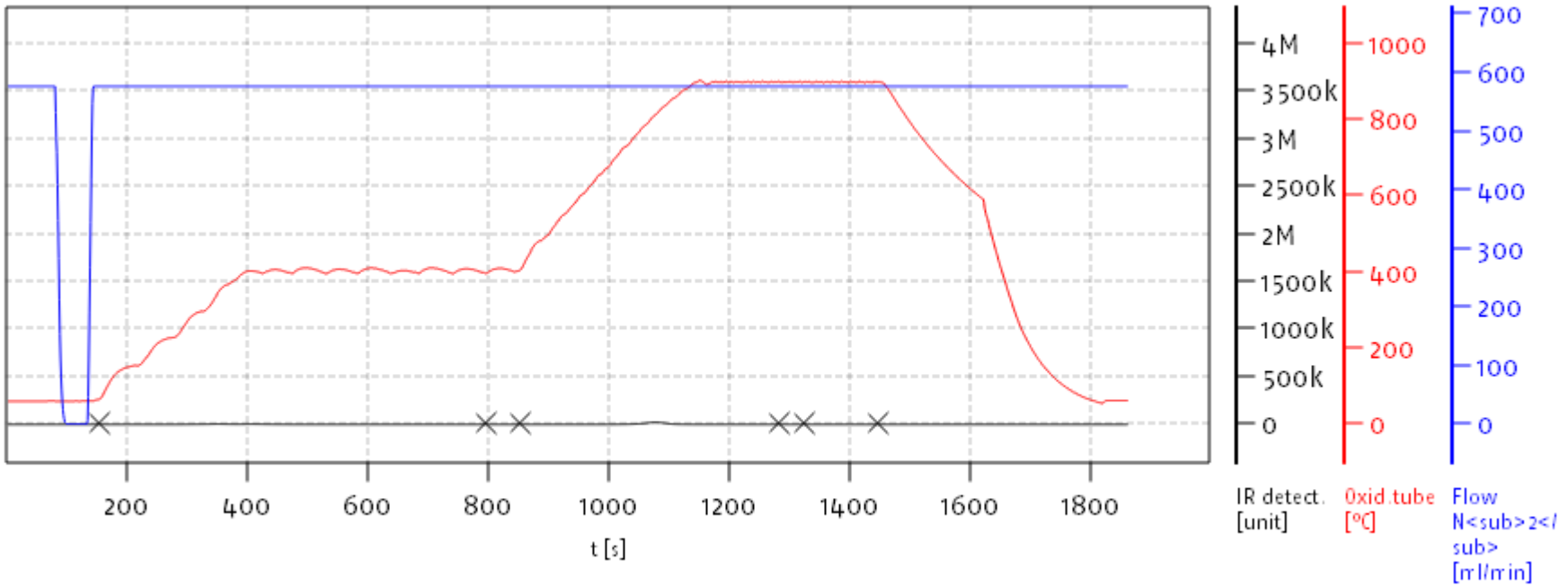
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
6	6	SJH0113-CAL4	200.00	0.0103	1.00	CARBON	8/10/2021 3:54 PM	0.018	0.032	0.050	bl,C2u	17 342	38 128	280	1.0000	1.0000



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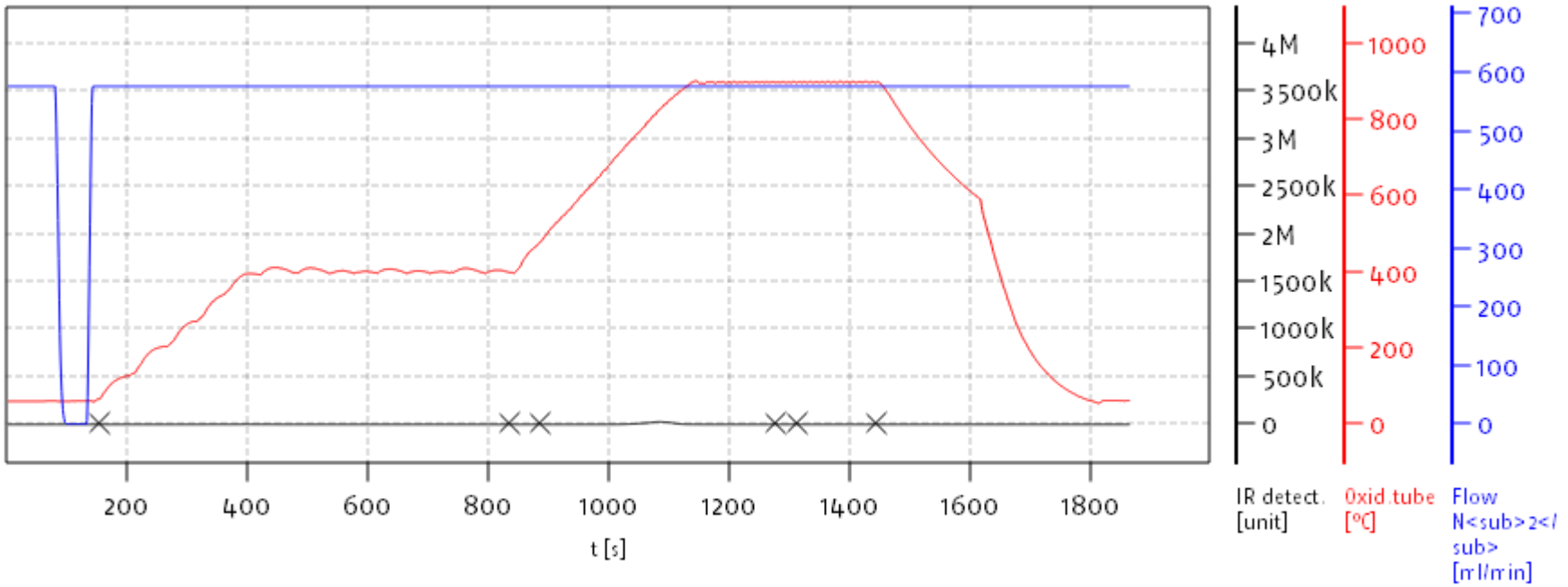
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
7	7	SJH0113-CAL5	200.00	0.0150	1.00	CARBON	8/10/2021 4:25 PM	0.009	0.046	0.055	bl,C1u,C2u	6 405	55 349	275	1.0000	1.0000



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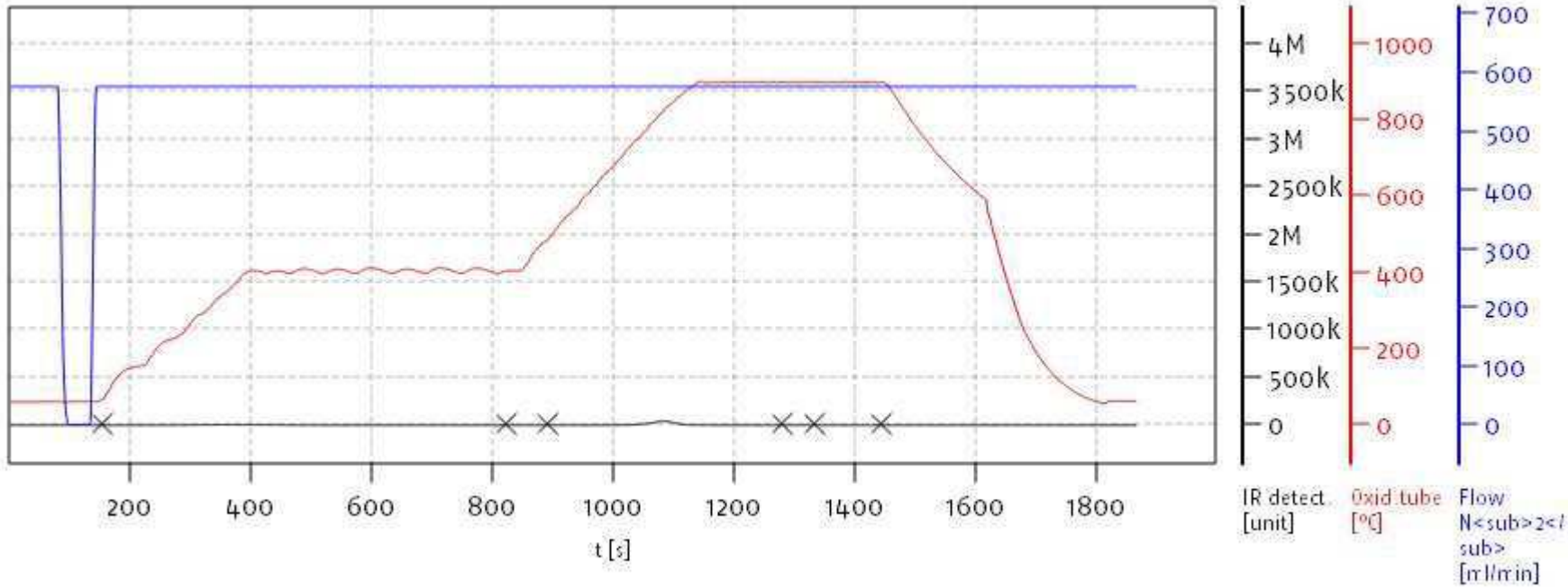
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
8	8	SJH0113-CAL6	200.00	0.0199	1.00	CARBON	8/10/2021 4:57 PM	0.024	0.063	0.087	bl,C2u	25 078	76 805	308	1.0000	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
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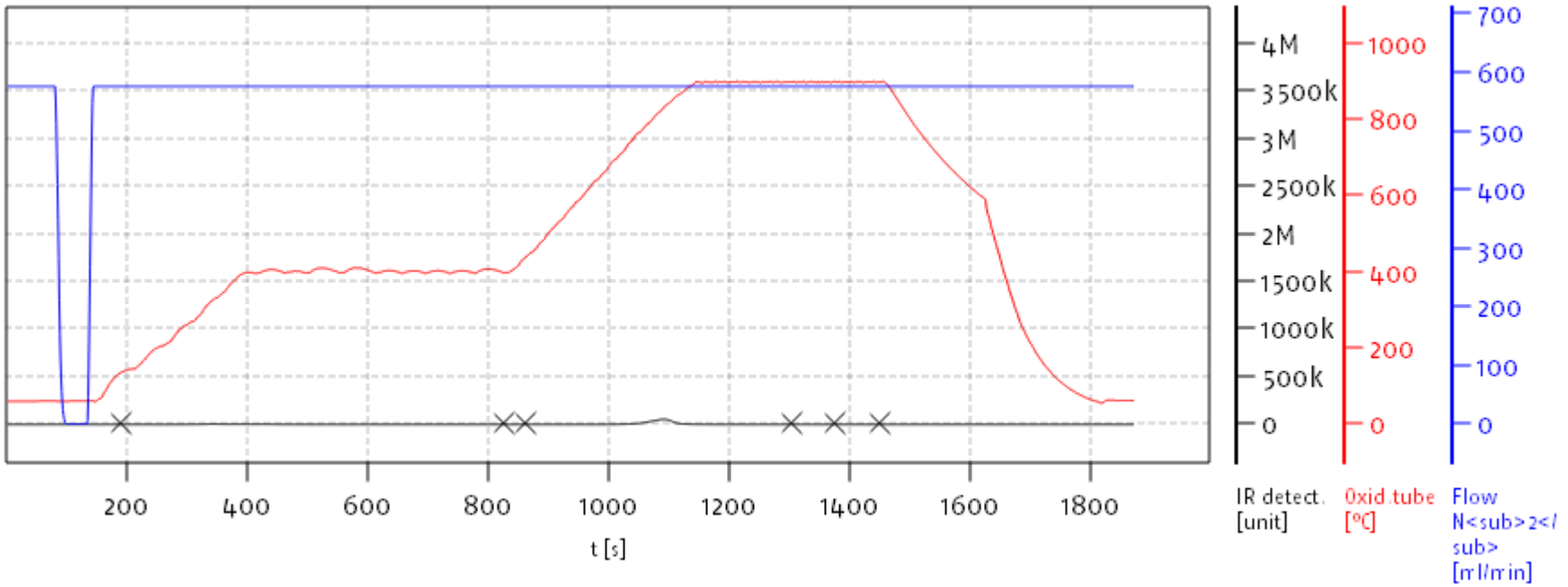
Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
9	9	SJH0113-CAL7	200.00	0.0248	1.00	CARBON	8/10/2021 5:28 PM	0.017	0.079	0.096	bl,C2u	16 608	97 209	190	1.0000	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
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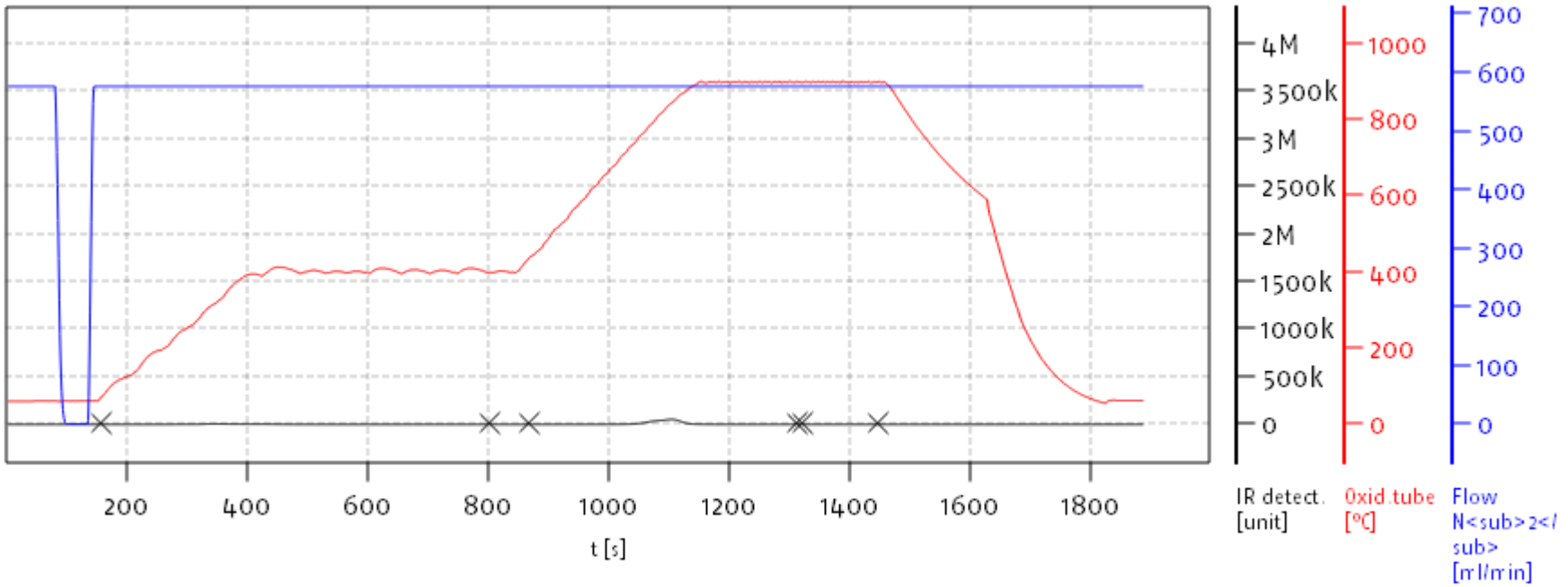
Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
10	10	SJH0113-CAL8	200.00	0.0302	1.00	CARBON	8/10/2021 6:00 PM	0.024	0.092	0.116	bl,C2u	24 582	114 459	270	1.0000	1.0000



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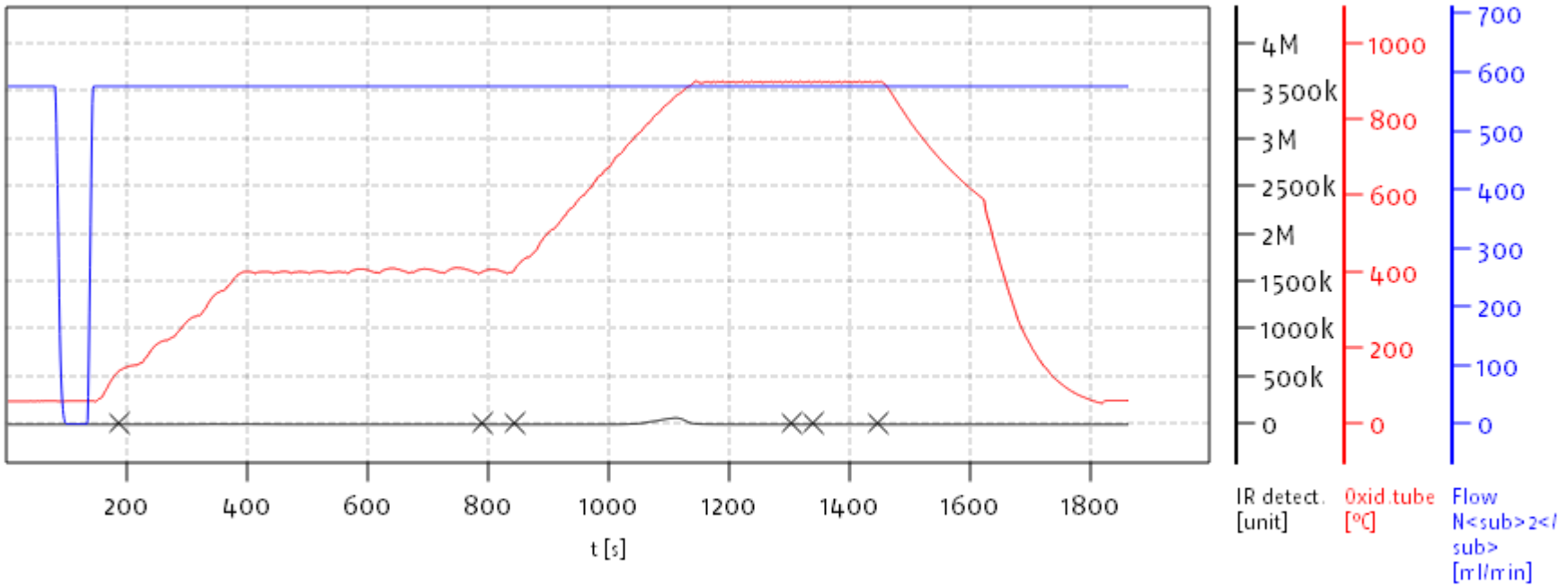
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
11	11	SJH0113-CAL9	200.00	0.0397	1.00	CARBON	8/10/2021 6:32 PM	0.014	0.118	0.132	bl,C2u	12 556	147 448	246	1.0000	1.0000



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Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
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Mode CCC

elementar
EXCELLENCE IN ELEMENTS

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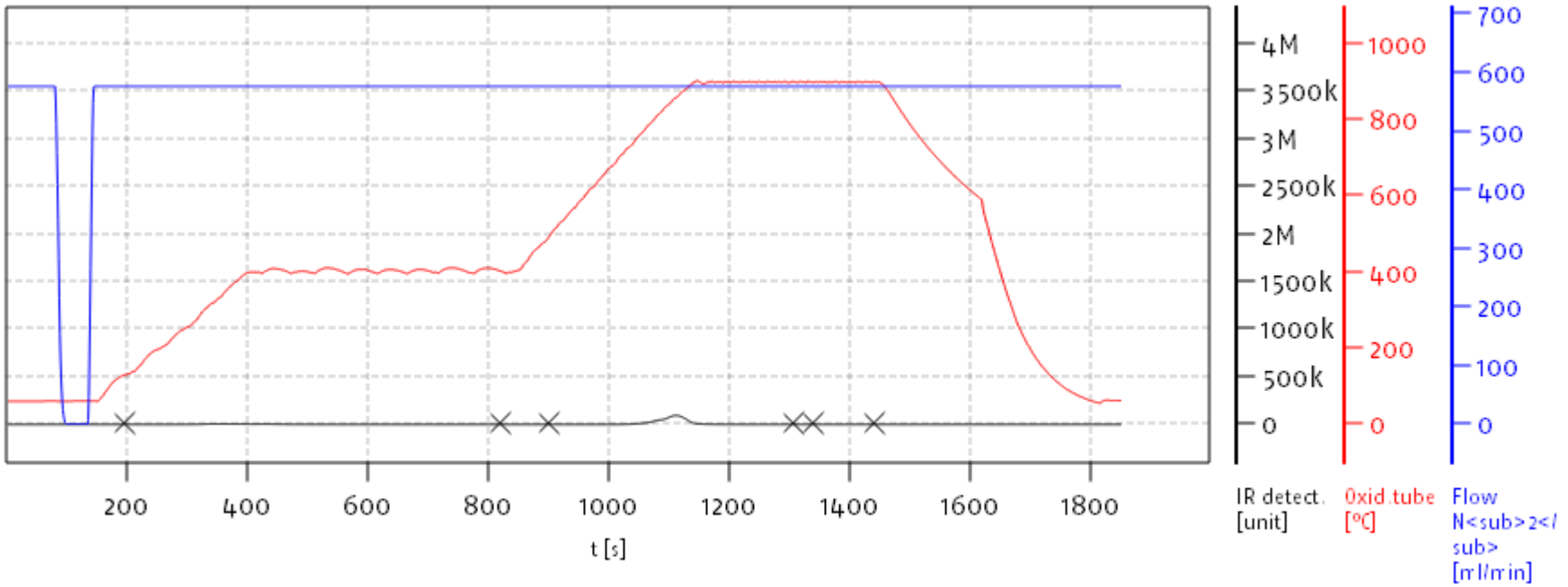
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
12	12	SJH0113-CALA	200.00	0.0497	1.00	CARBON	8/10/2021 7:03 PM	0.024	0.145	0.168	bl,C2u	24 575	180 758	227	1.0000	1.0000



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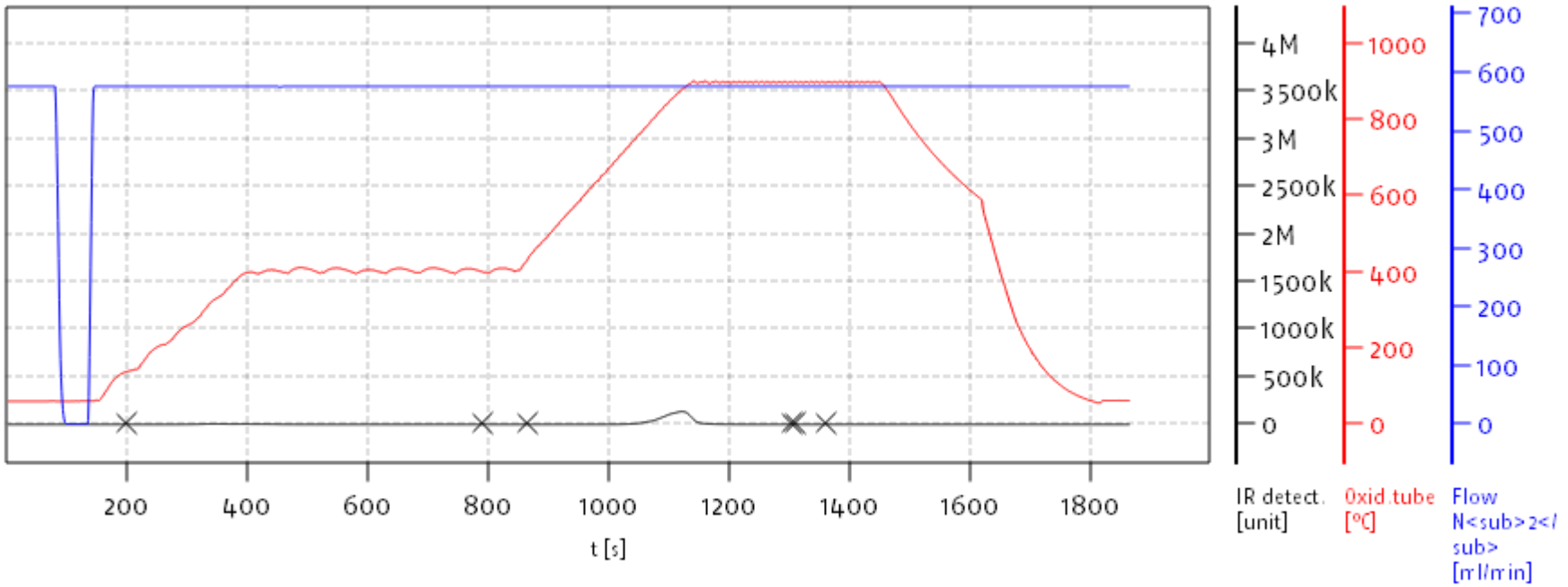
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
13	13	SJH0113-CALB	200.00	0.0039	1.00	CARBON	8/10/2021 7:34 PM	0.023	0.236	0.260	bl,C2u	24 401	297 056	121	1.0000	1.0000



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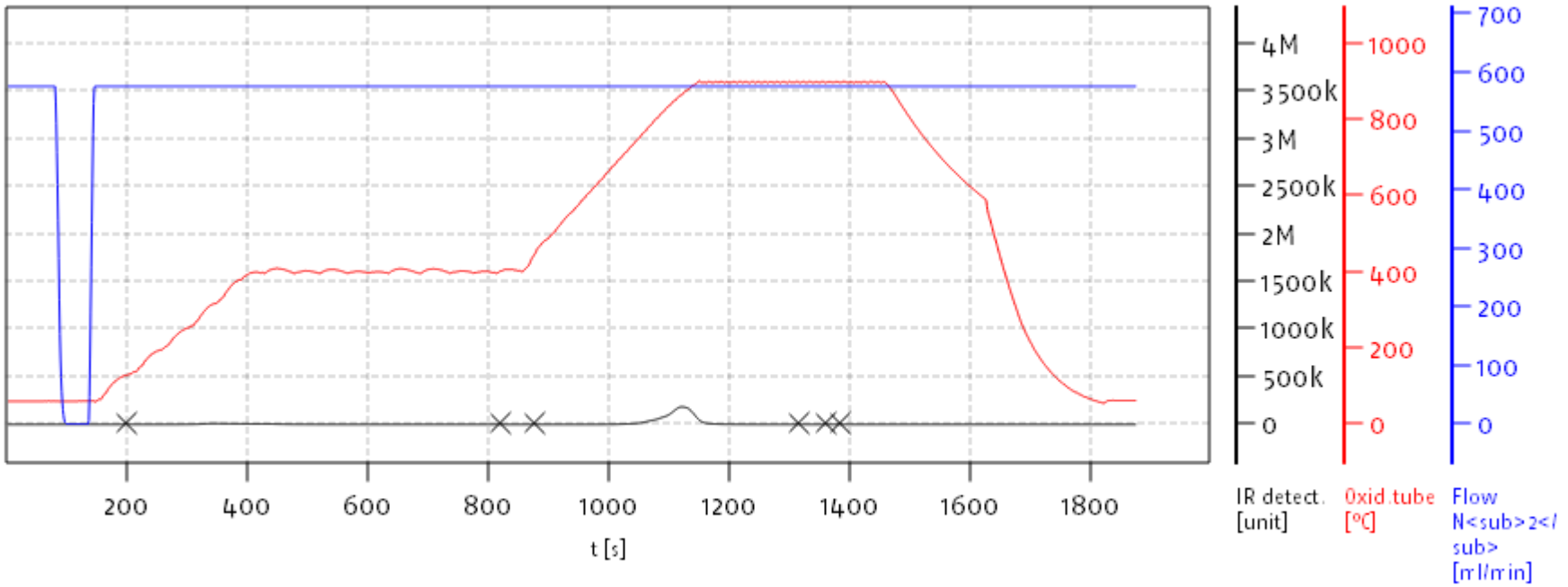
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
14	14	SJH0113-CALC	200.00	0.0052	1.00	CARBON	8/10/2021 8:06 PM	0.036	0.311	0.347	bl,C2u	40 501	391 829	67	1.0000	1.0000



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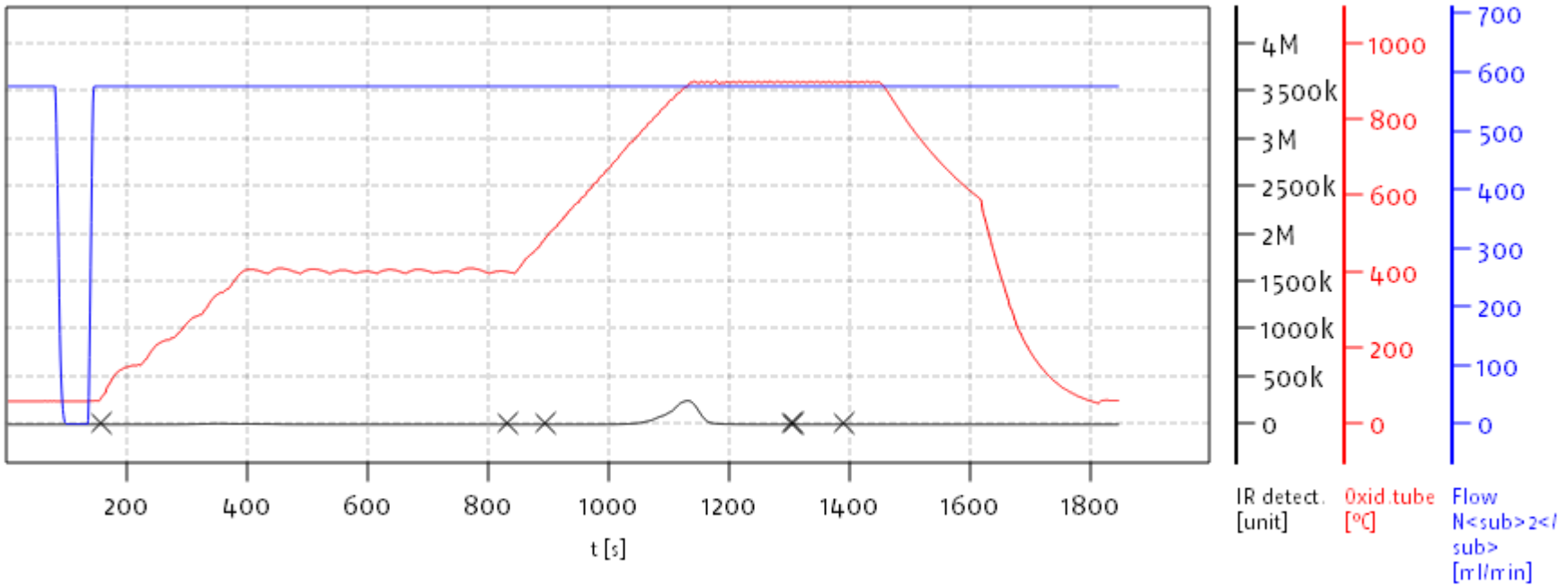
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
15	15	SJH0113-CALD	200.00	0.0072	1.00	CARBON	8/10/2021 8:37 PM	0.032	0.439	0.470	bl,C2u	34 638	553 926	294	1.0000	1.0000



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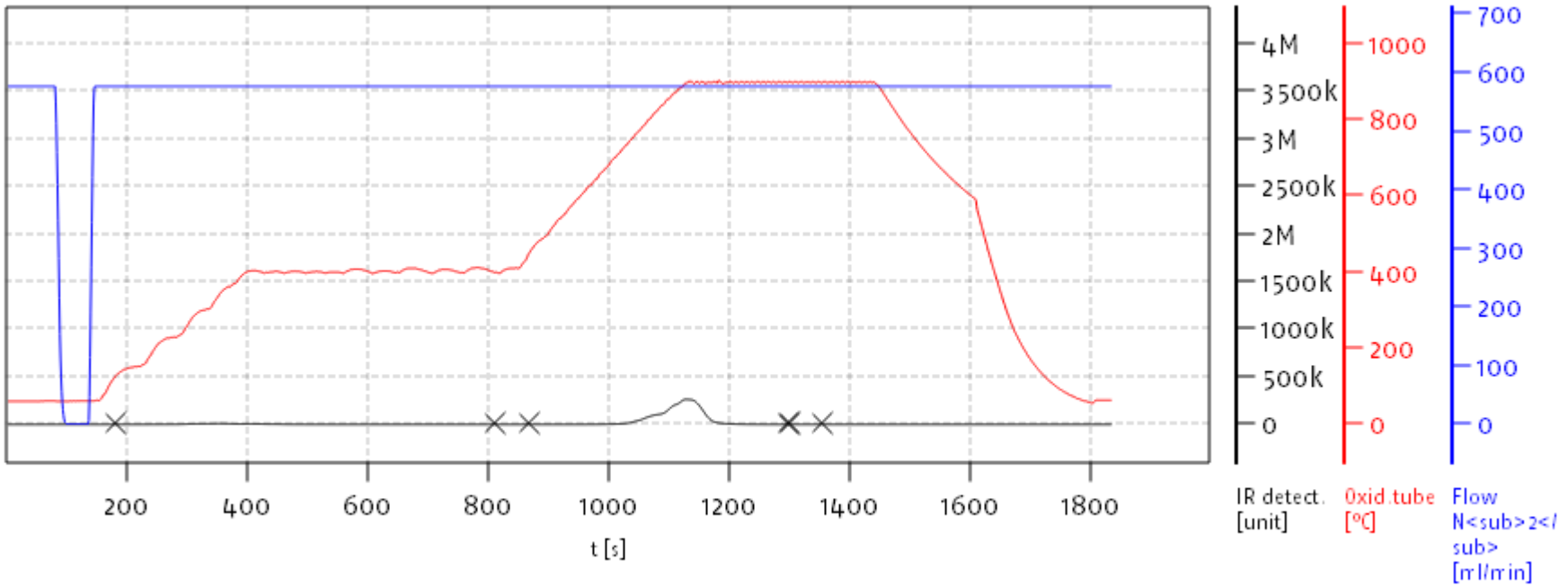
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
16	16	SJH0113-CALE	200.00	0.0098	1.00	CARBON	8/10/2021 9:08 PM	0.037	0.592	0.630	bl,C2u	42 067	748 510	251	1.0000	1.0000



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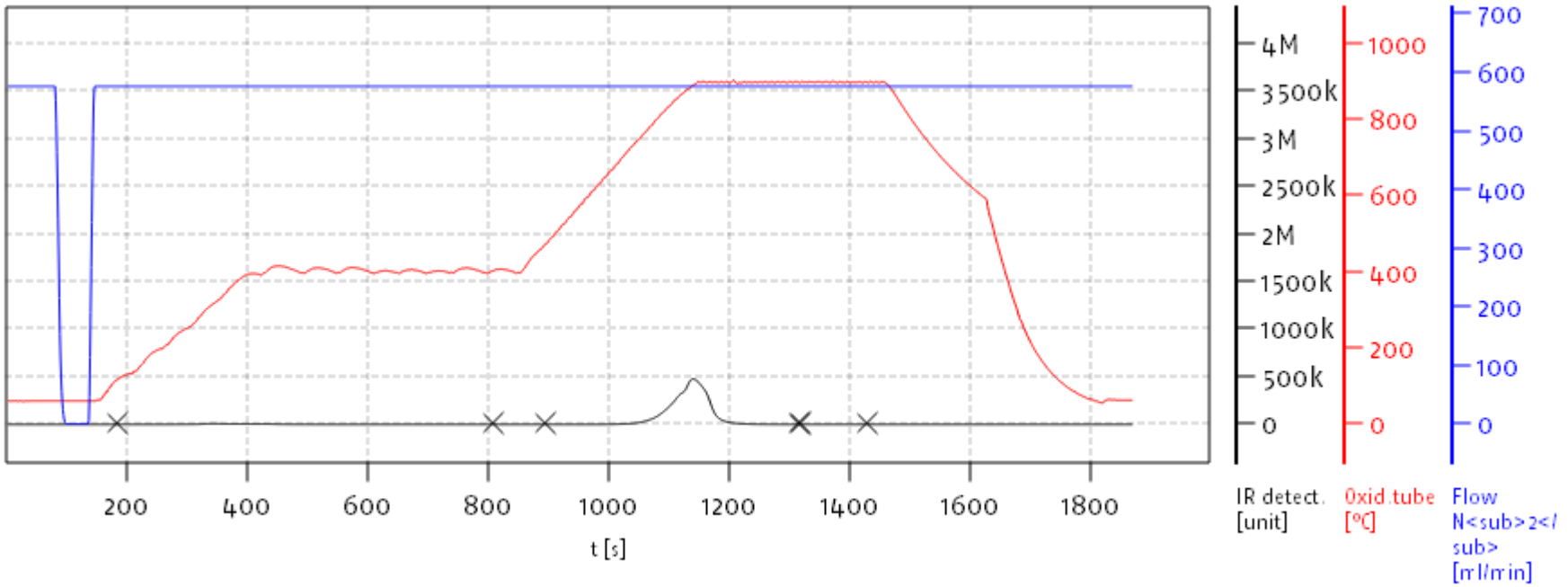
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
17	17	SJH0113-CALF	200.00	0.0150	1.00	CARBON	8/10/2021 9:40 PM	0.030	0.934	0.964	bl,C2u	32 751	1 182 576	479	1.0000	1.0000



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Access: soliTOC superuser

Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

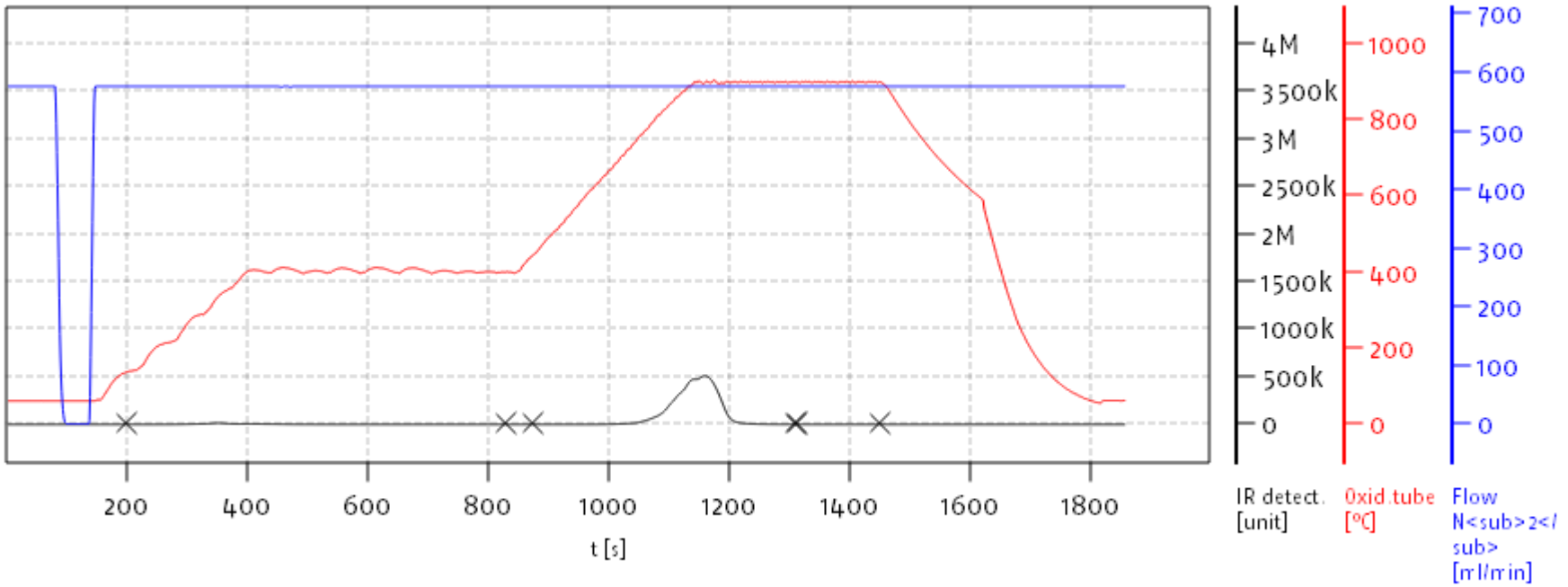
elementar
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00021 081021BF from: --.--.-- (modified)

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
18	18	SJH0113-CALG	200.00	0.0203	1.00	CARBON	8/10/2021 10:11 PM	0.039	1.249	1.287	bl,C2u	42 932	1 581 667	955	1.0000	1.0000



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Access: soliTOC superuser

Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

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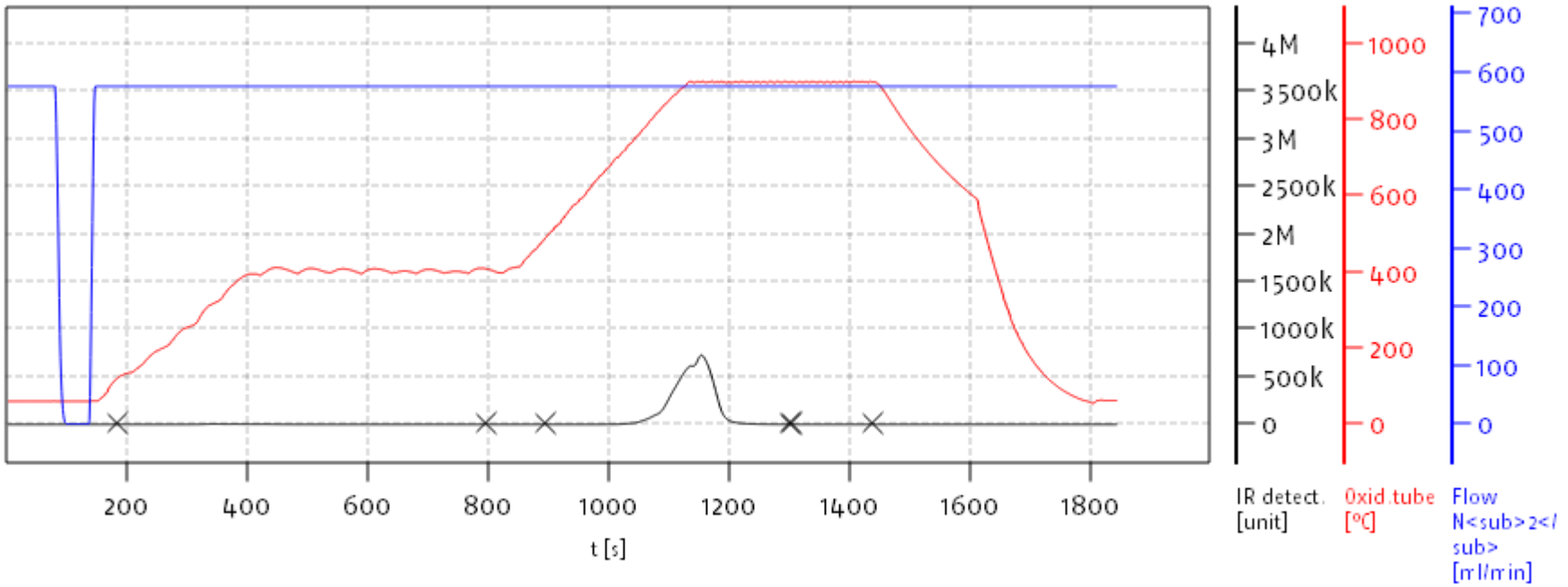
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
19	19	SJH0113-CALH	200.00	0.0251	1.00	CARBON	8/10/2021 10:42 PM	0.019	1.538	1.557	bl,C2u	17 895	1 948 888	1 191	1.0000	1.0000



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soliTOC V2.0.2 (31015f9) 2018-11-19
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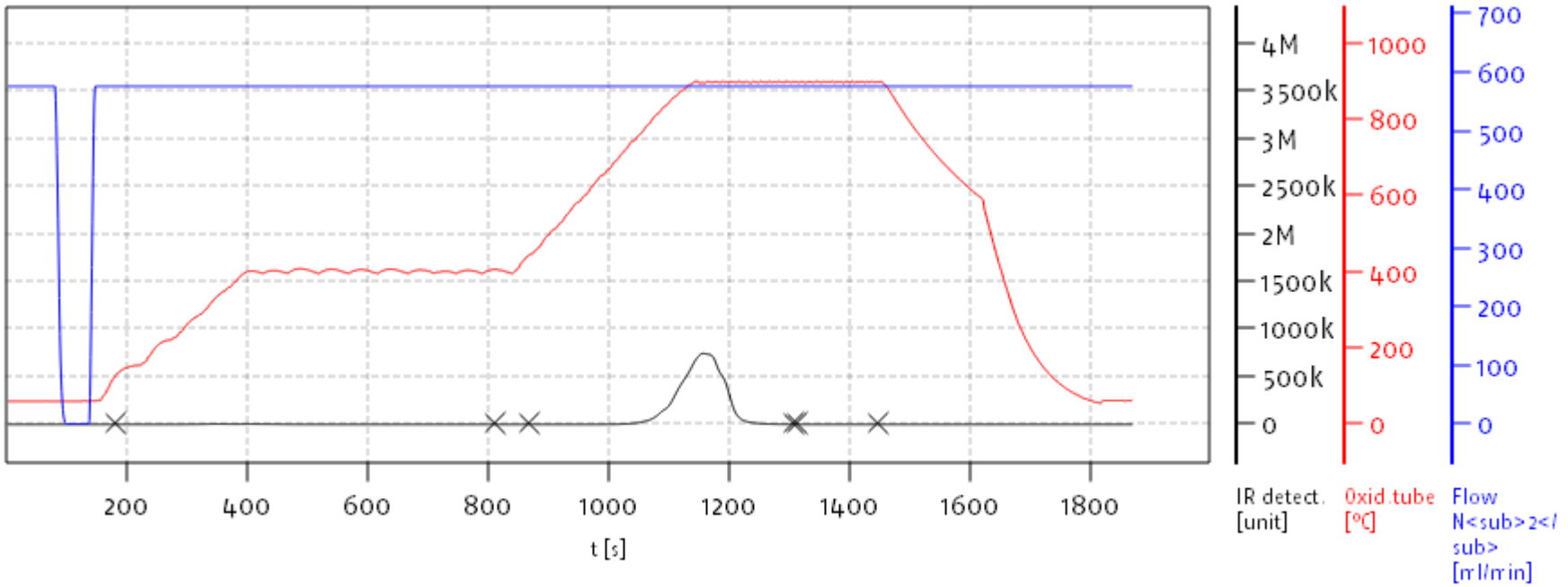
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
20	20	SJH0113-CALI	200.00	0.0304	1.00	CARBON	8/10/2021 11:14 PM	0.024	1.868	1.892	bl,C2u	23 738	2 367 098	1 836	1.0000	1.0000



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Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
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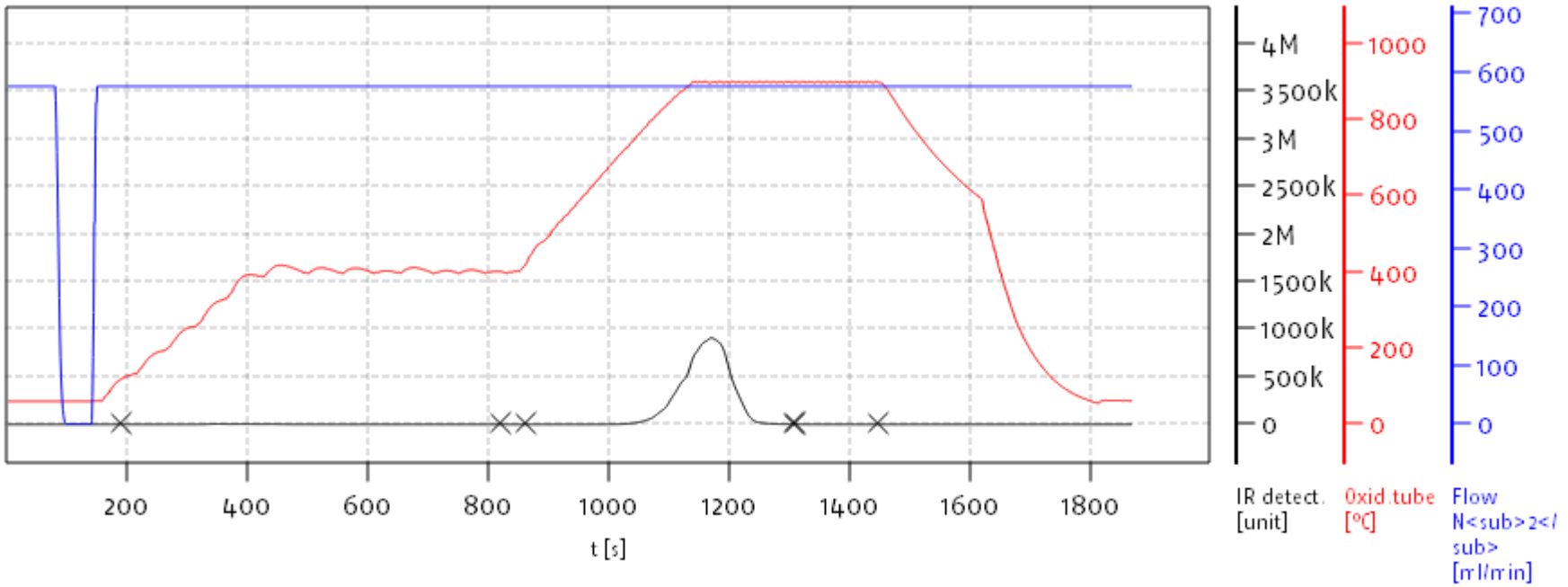
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
21	21	SJH0113-CALJ	200.00	0.0399	1.00	CARBON	8/10/2021 11:45 PM	0.023	2.454	2.477	bl,C2u	21 349	3 110 916	2 579	1.0000	1.0000



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soliTOC V2.0.2 (31015f9) 2018-11-19
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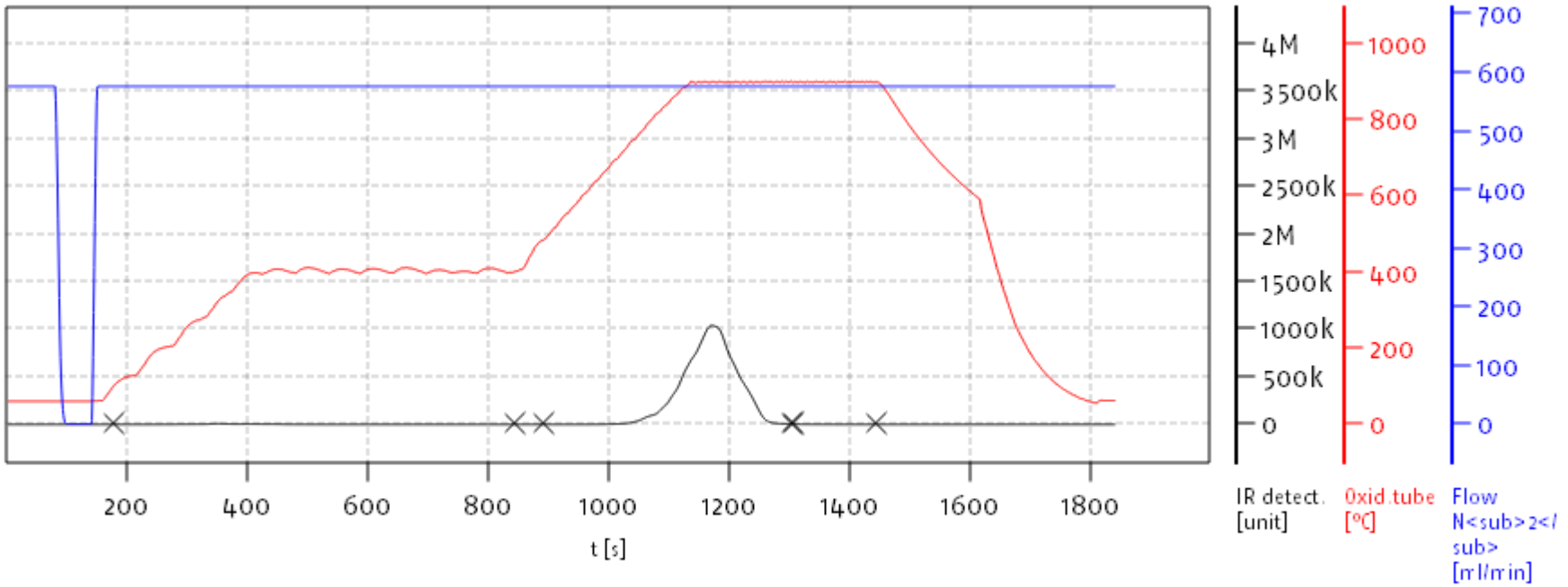
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
22	22	SJH0113-CALK	200.00	0.0500	1.00	CARBON	8/11/2021 12:16 AM	0.030	3.054	3.084	bl,C2u	29 231	3 872 043	4 133	1.0000	1.0000



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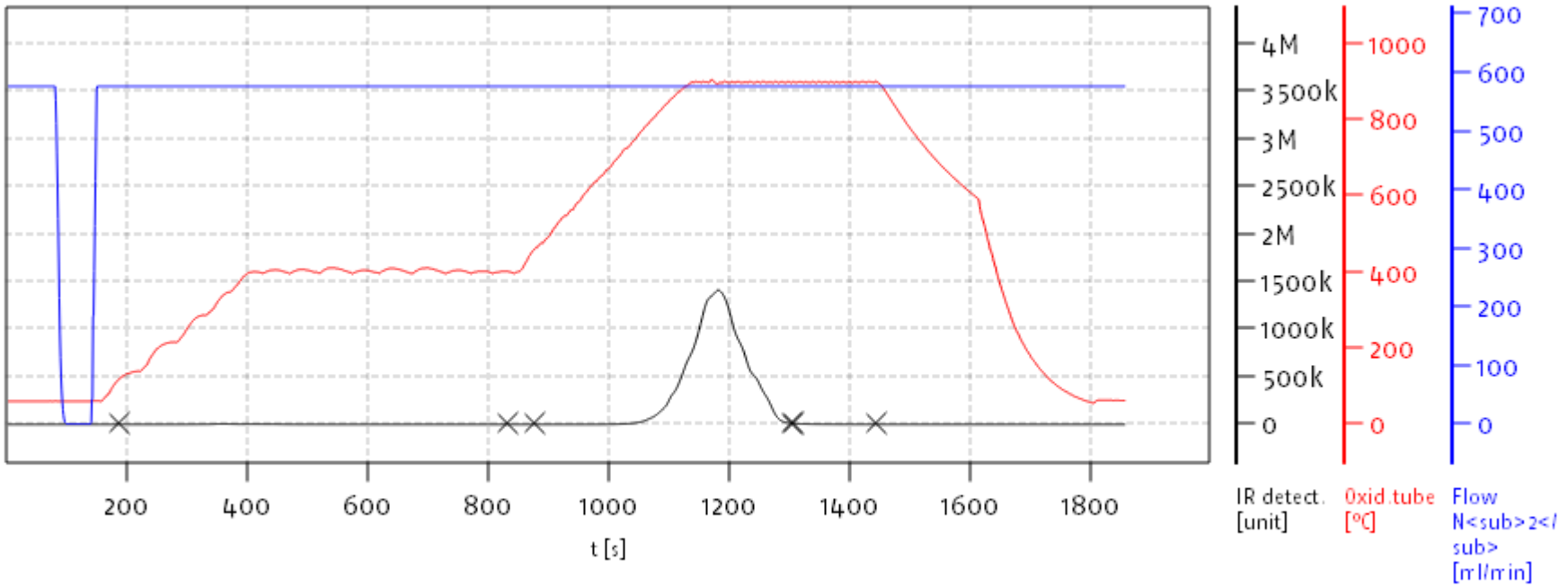
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
23	23	SJH0113-CALL	200.00	0.0699	1.00	CARBON	8/11/2021 12:48 AM	0.028	4.289	4.317	bl	19 838	5 438 583	10 830	1.0000	1.0000



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soliTOC V2.0.2 (31015f9) 2018-11-19
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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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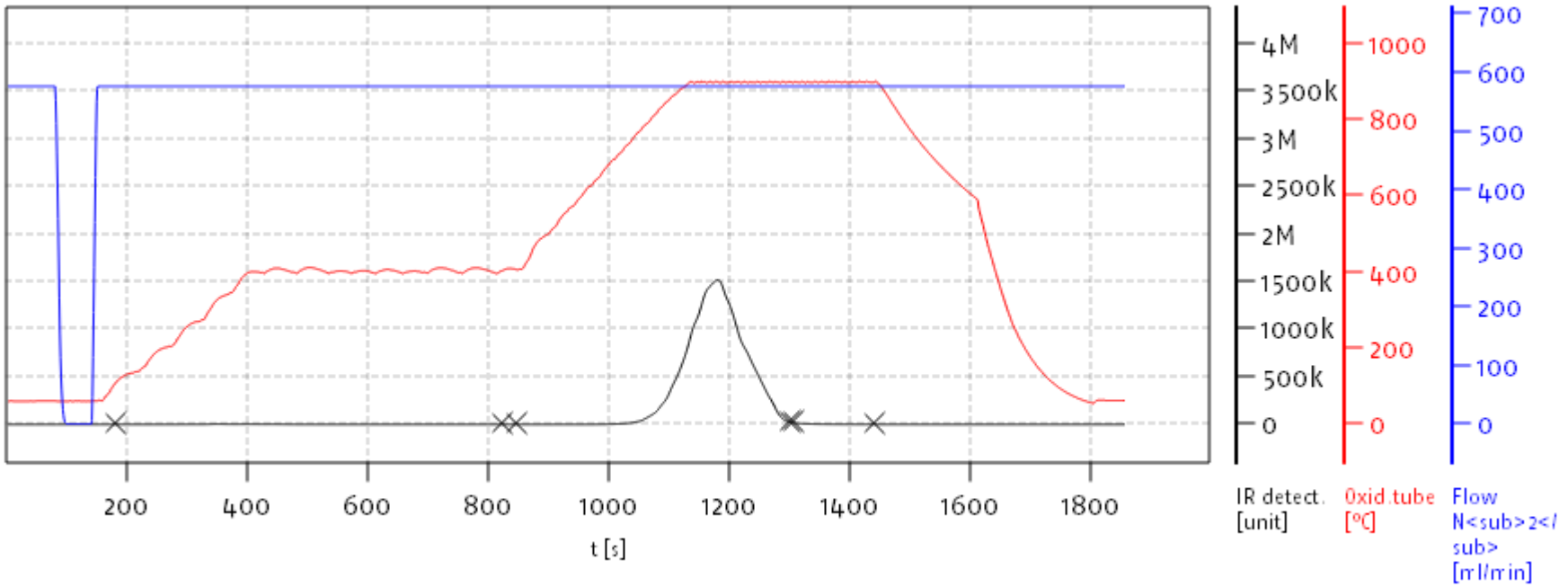
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
24	24	SJH0113-CALM	200.00	0.0801	1.00	CARBON	8/11/2021 1:19 AM	0.030	4.919	4.949	bl	16 438	6 238 324	16 703	1.0000	1.0000



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Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
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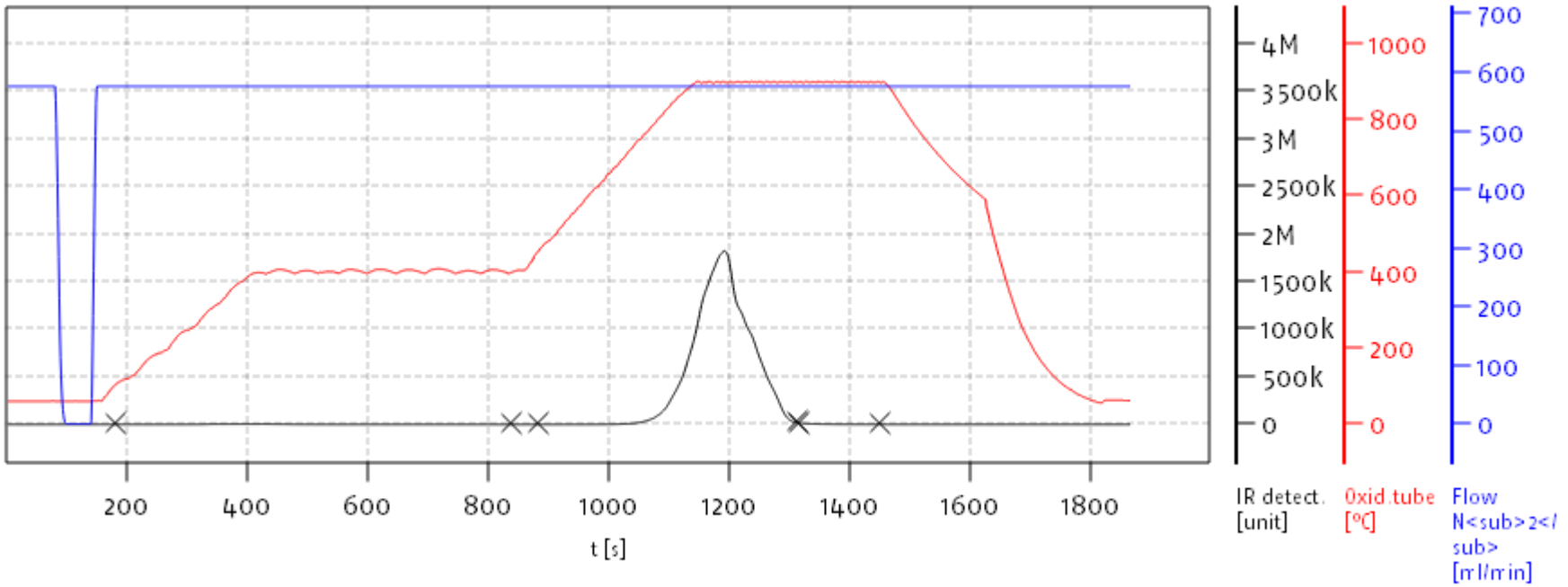
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
25	25	SJH0113-CALN	200.00	0.0903	1.00	CARBON	8/11/2021 1:50 AM	0.035	5.550	5.585	bl	23 597	7 038 842	15 761	1.0000	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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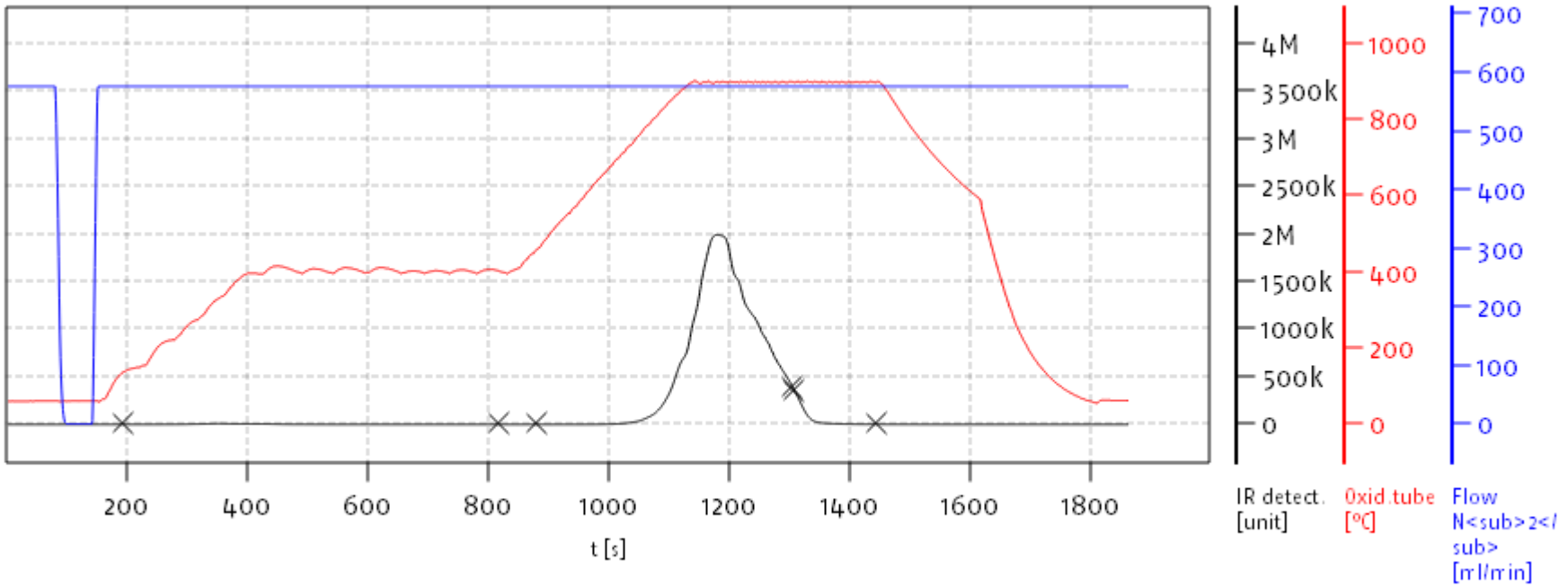
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
26	26	SJH0113-CALO	200.00	0.1198	1.00	CARBON	8/11/2021 2:22 AM	0.206	7.202	7.408	bl,C3o	38 020	9 134 974	218 134	1.0000	1.0000



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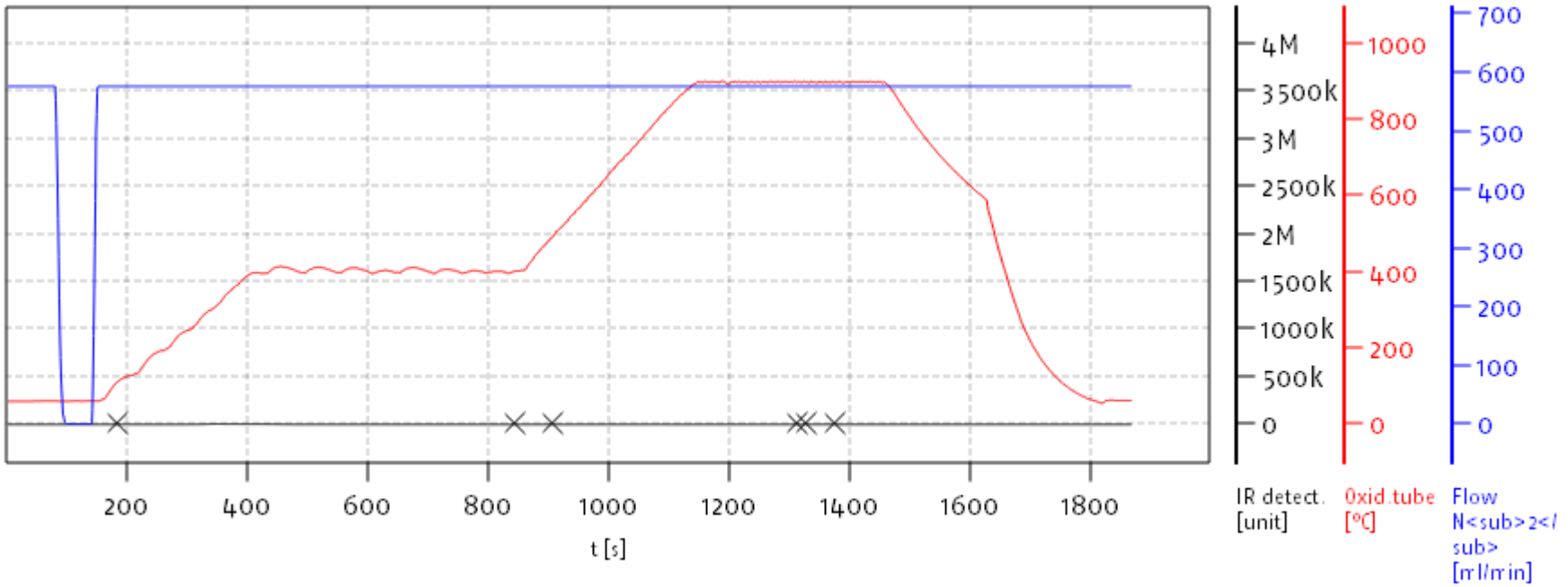
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
27	27	BLANK	1.00		1.00	CARBON	8/11/2021 2:53 AM	0.000	0.000	0.000	bl	19 335	23	0	1.0000	1.0000



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Soli TOC Cube, Carbon
Balance: BAL3
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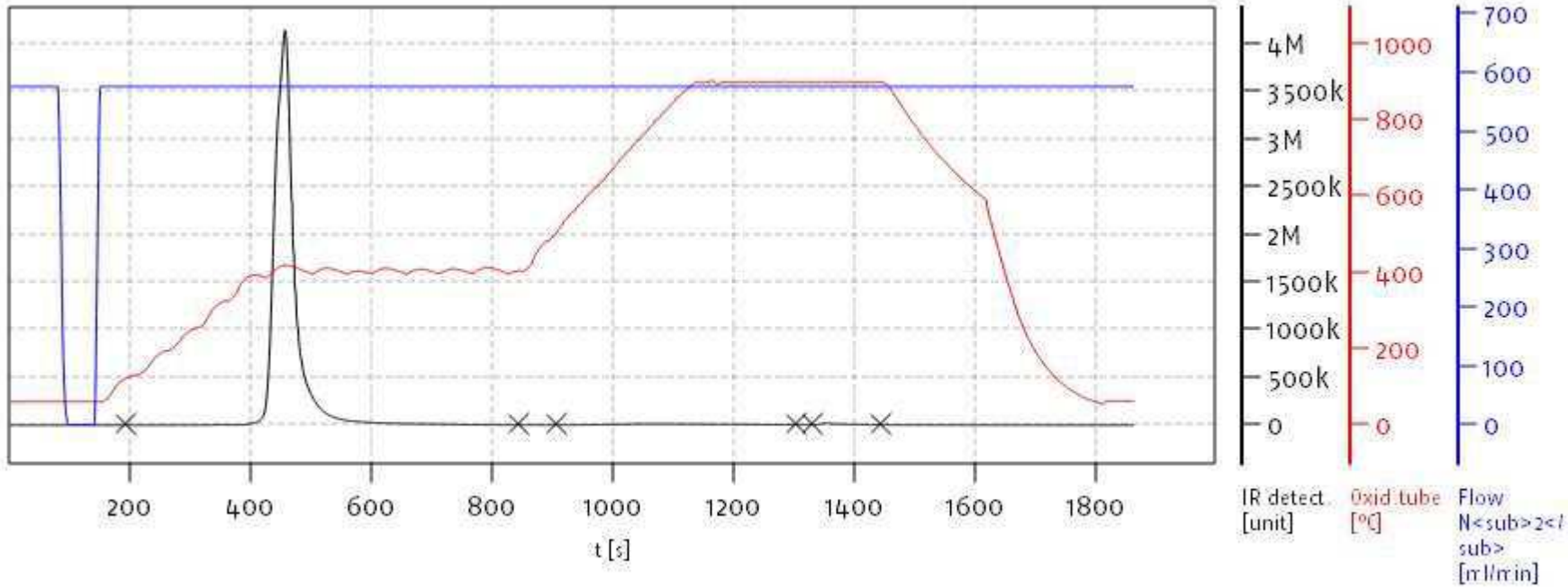
Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
28	28	Dfactor	20.90		1.00	CARBON	8/11/2021 3:25 AM	44.744	0.921	45.666	bl	5 800 620	119 521	37 001	1.0154	1.0000



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Date: Wed Aug 11 13:04:23 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
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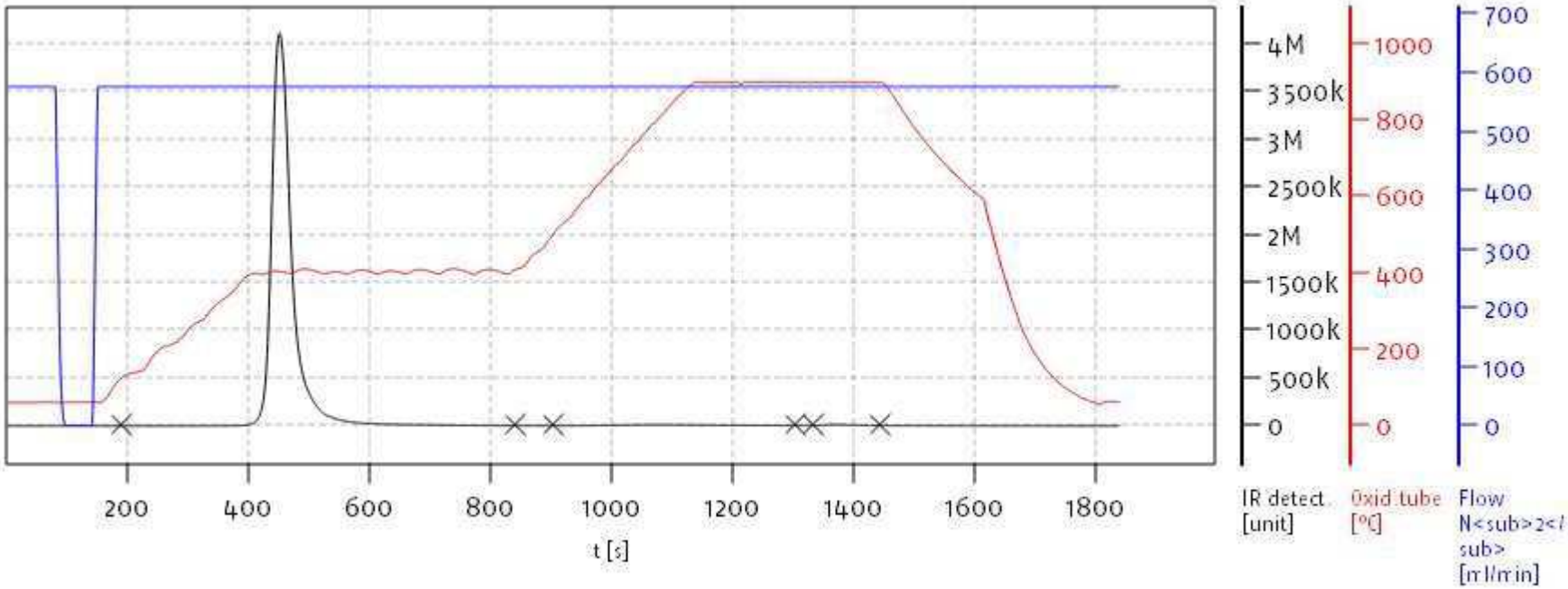
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
29	29	Dfactor	21.50		1.00	CARBON	8/11/2021 3:56 AM	44.697	0.738	45.435	bl	5 956 386	98 039	31 649	1.0173	1.0000



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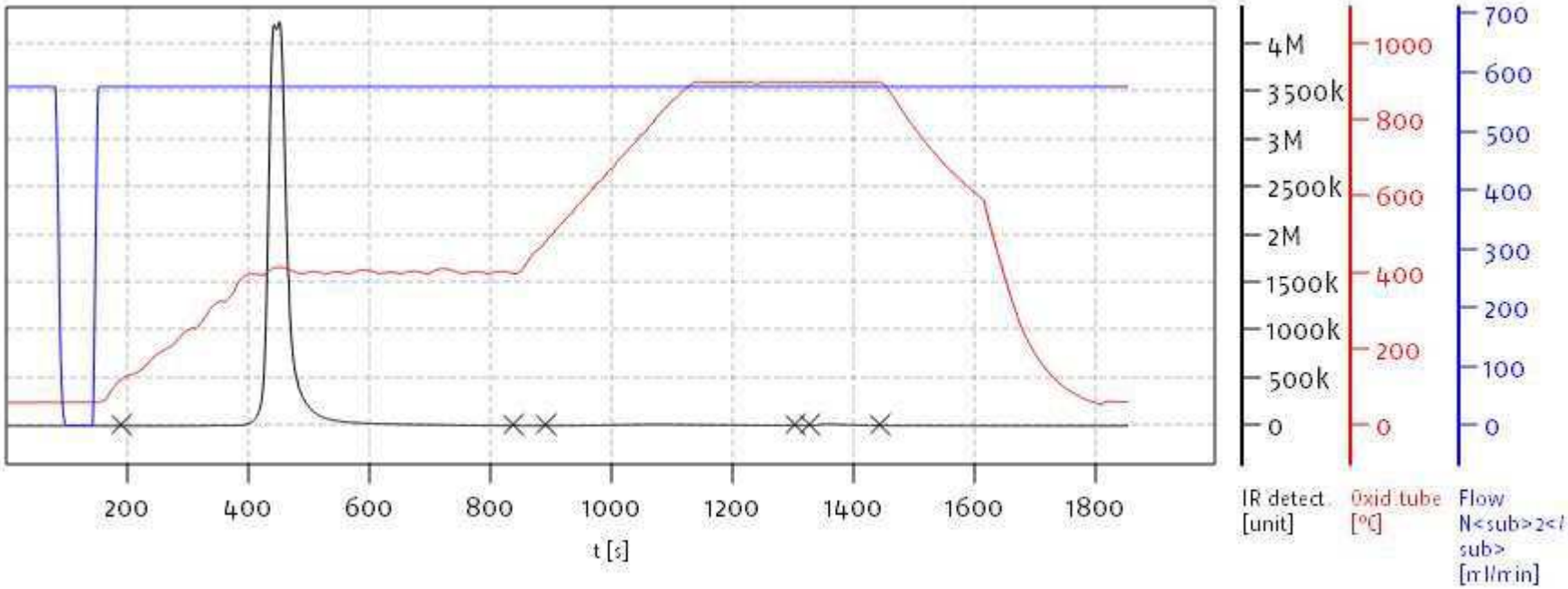
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
30	30	SJH0113-ICV1	21.40		1.00	CARBON	8/11/2021 4:27 AM	44.407	0.930	45.337	bl	5 886 637	123 684	40 335	1.0163	1.0000



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Serial No: 0300.181017
Mode CCC

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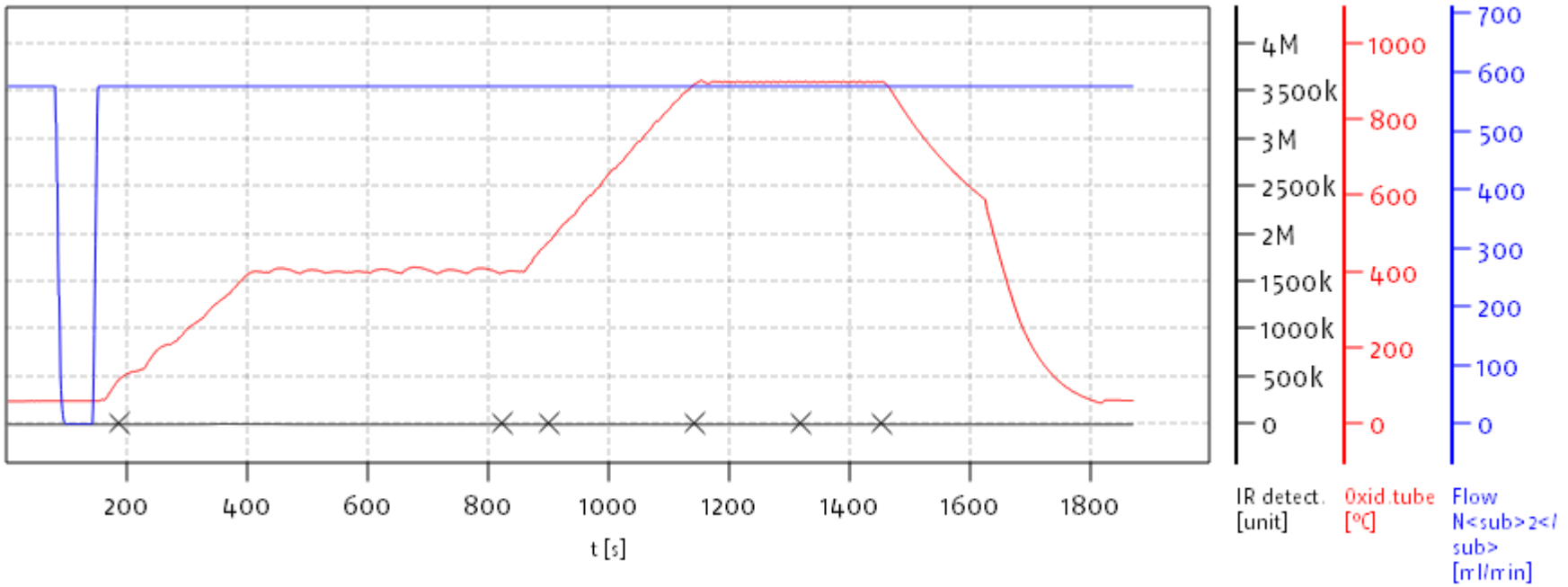
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
31	31	SJH0113-ICB1	613.30		1.00	CARBON	8/11/2021 4:59 AM	0.007	0.001	0.008	bl,C3u,C2u	20 520	1 826	970	1.0163	1.0000



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EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00021 081021BF from: --.--.-- (modified)

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 9060A m

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00065	Instrument:	TOC Cube
Calibration Date:	08/24/2021 17:16		

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RF		RF		RF		RF		RF		RF
Total Organic Carbon	0.005112	1267041	0.01624	1156589	0.020451	1208352	0.030375	1027852	0.045412	1355038	0.060149	1226039
Total Carbon	0.005112	1267041	0.01624	1156589	0.020451	1208352	0.030375	1027852	0.045412	1355038	0.060149	1226039
Total Inorganic Carbon	0.005112	1267041	0.01624	1156589	0.020451	1208352	0.030375	1027852	0.045412	1355038	0.060149	1226039
% Soot	0.005112	1267041	0.01624	1156589	0.020451	1208352	0.030375	1027852	0.045412	1355038	0.060149	1226039

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 9060A m

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00065	Instrument:	TOC Cube
Calibration Date:	08/24/2021 17:16		

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
		RF		RF		RF		RF		RF		RF
Total Organic Carbon	0.076991	1301360	0.091126	1300200	0.1191	1370840	0.14977	1231288	0.252	1210857	0.336	1231923
Total Carbon	0.076991	1301360	0.091126	1300200	0.1191	1370840	0.14977	1231288	0.252	1210857	0.336	1231923
Total Inorganic Carbon	0.076991	1301360	0.091126	1300200	0.1191	1370840	0.14977	1231288	0.252	1210857	0.336	1231923
% Soot	0.076991	1301360	0.091126	1300200	0.1191	1370840	0.14977	1231288	0.252	1210857	0.336	1231923

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 9060A m

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00065	Instrument:	TOC Cube
Calibration Date:	08/24/2021 17:16		

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
		RF		RF		RF		RF		RF		RF
Total Organic Carbon	0.414	1268309	0.582	1278292	0.882	1265125	1.194	1264020	1.518	1271667	1.812	1261887
Total Carbon	0.414	1268309	0.582	1278292	0.882	1265125	1.194	1264020	1.518	1271667	1.812	1261887
Total Inorganic Carbon	0.414	1268309	0.582	1278292	0.882	1265125	1.194	1264020	1.518	1271667	1.812	1261887
% Soot	0.414	1268309	0.582	1278292	0.882	1265125	1.194	1264020	1.518	1271667	1.812	1261887

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA

EPA 9060A m

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00065	Instrument:	TOC Cube
Calibration Date:	08/24/2021 17:16		

Compound	Level 19		Level 20		Level 21		Level 22		Level 23		Level 24	
		RF		RF		RF		RF		RF		RF
Total Organic Carbon	2.4	1255529	2.988	1141805	4.194	1173122	4.818	1173843	5.412	1191617	7.224	1189552
Total Carbon	2.4	1255529	2.988	1141805	4.194	1173122	4.818	1173843	5.412	1191617	7.224	892723
Total Inorganic Carbon	2.4	1255529	2.988	1141805	4.194	1173122	4.818	1173843	5.412	1191617	7.224	892723
% Soot	2.4	1255529	2.988	1141805	4.194	1173122	4.818	1173843	5.412	1191617	7.224	892723

Analytical Resources, Incorporated
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INITIAL CALIBRATION DATA

EPA 9060A m

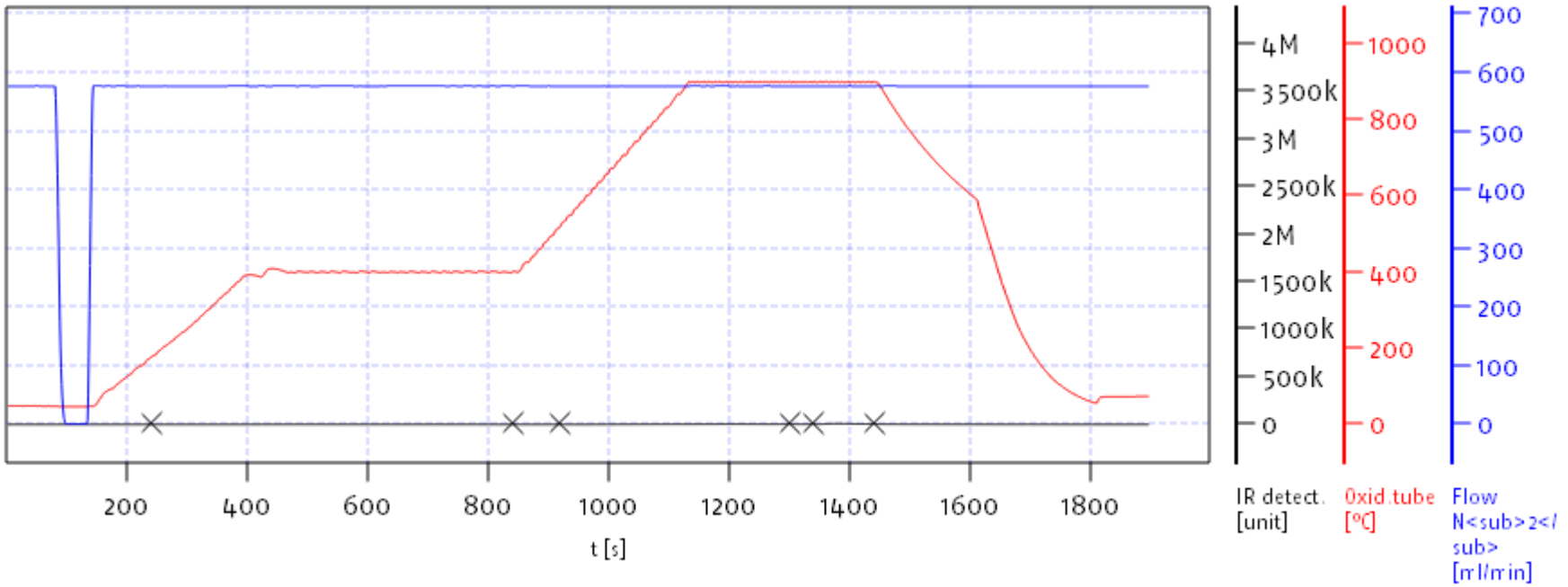
Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00065	Instrument:	TOC Cube
Calibration Date:	08/24/2021 17:16		

COMPOUND	Mean RF	RF RSD	Linear COD	Quad COD	COD Limit	Q
Total Organic Carbon	1234256	5.9	0.9993			
Total Carbon	1221888	8.2	0.9742			
Total Inorganic Carbon	1221888	8.2	0.9742			
% Soot	1221888	8.2	0.9742			

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
1	9	BLANK	1.00		1.00	CARBON	8/24/2021 6:00 PM	0.000	0.000	0.000	bl	13 861	33 454	21 567	1.0000	1.0000



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soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

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Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

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	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
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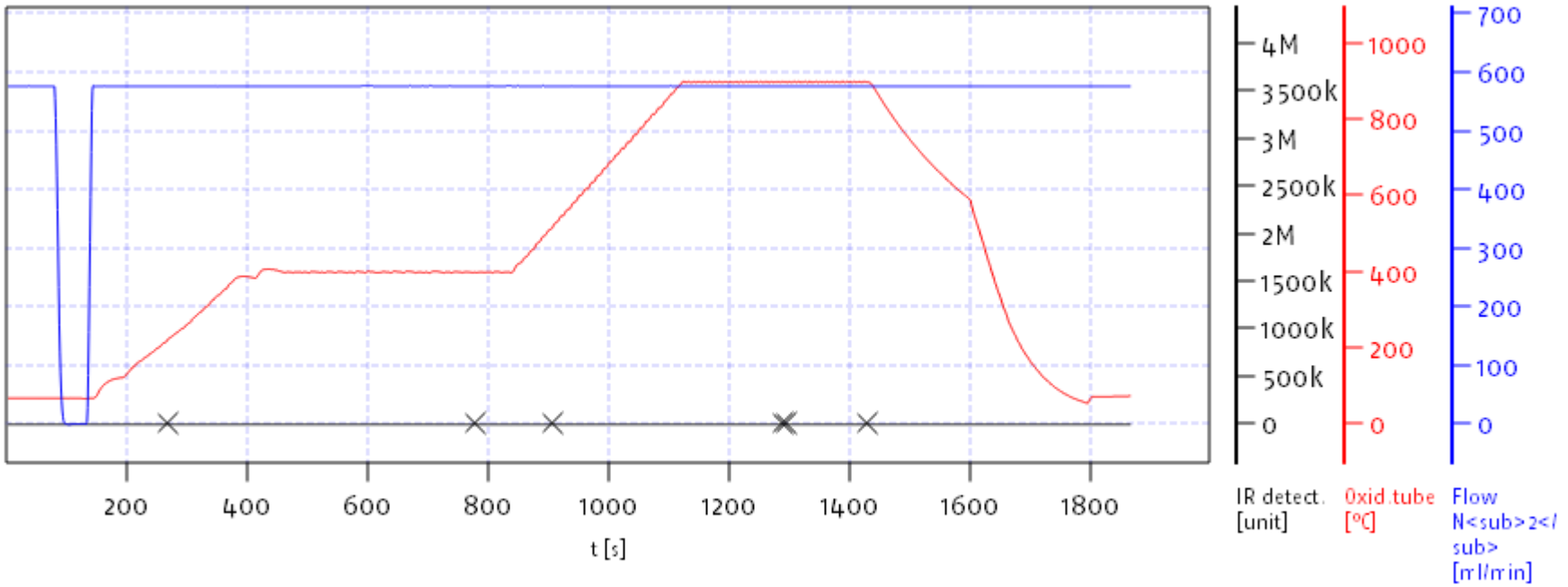

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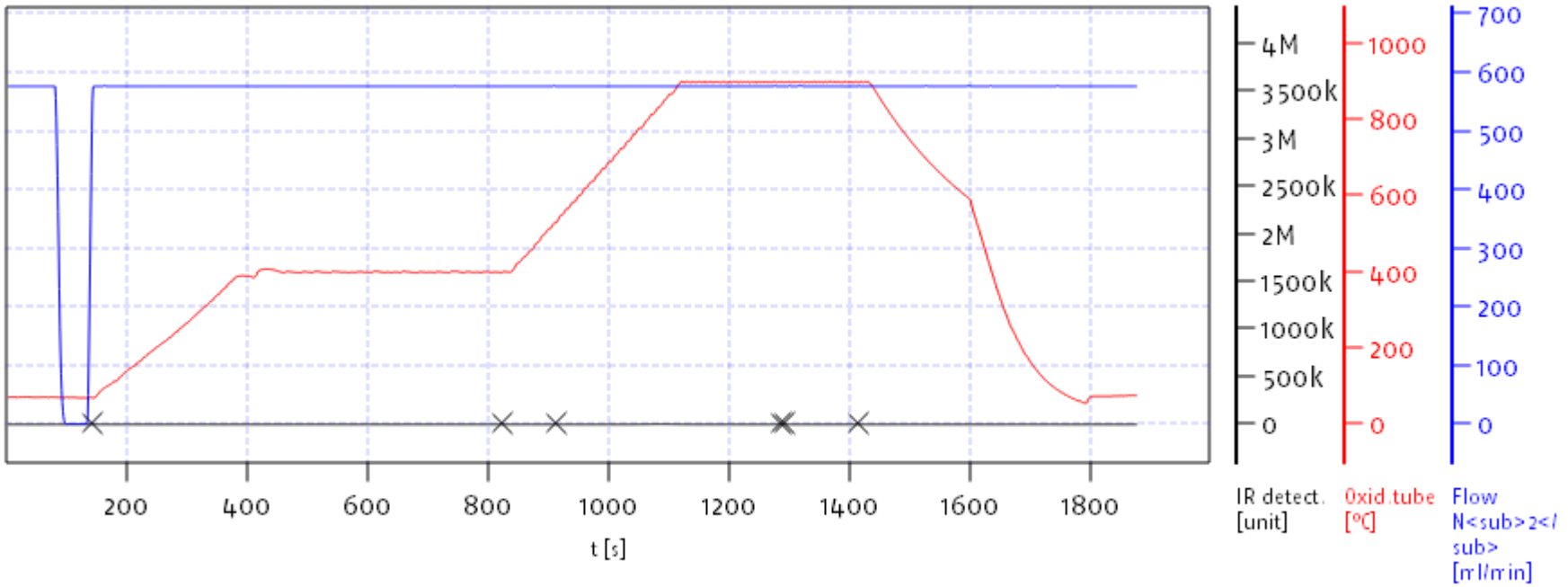
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
3	11	SEQ-CAL1	200.00	0.0017	1.00	CARBON	8/24/2021 7:03 PM	0.000	0.008	0.008	bl,C1u,C3u,C2u	1 070	6 478	141	1.0000	1.1719



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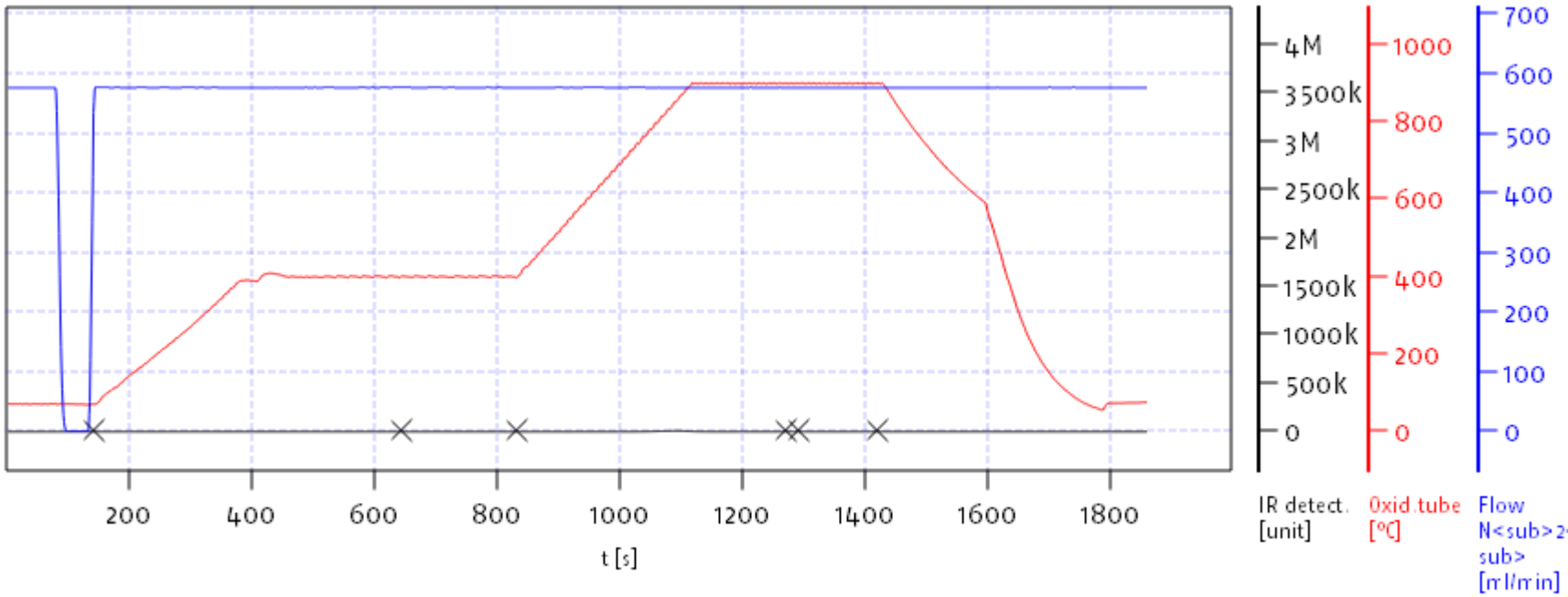
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
4	12	SEQ-CAL2	200.00	0.0054	1.00	CARBON	8/24/2021 7:34 PM	0.000	0.015	0.015	bl,C1u,C2u	660	18 783	85	1.0000	0.9072



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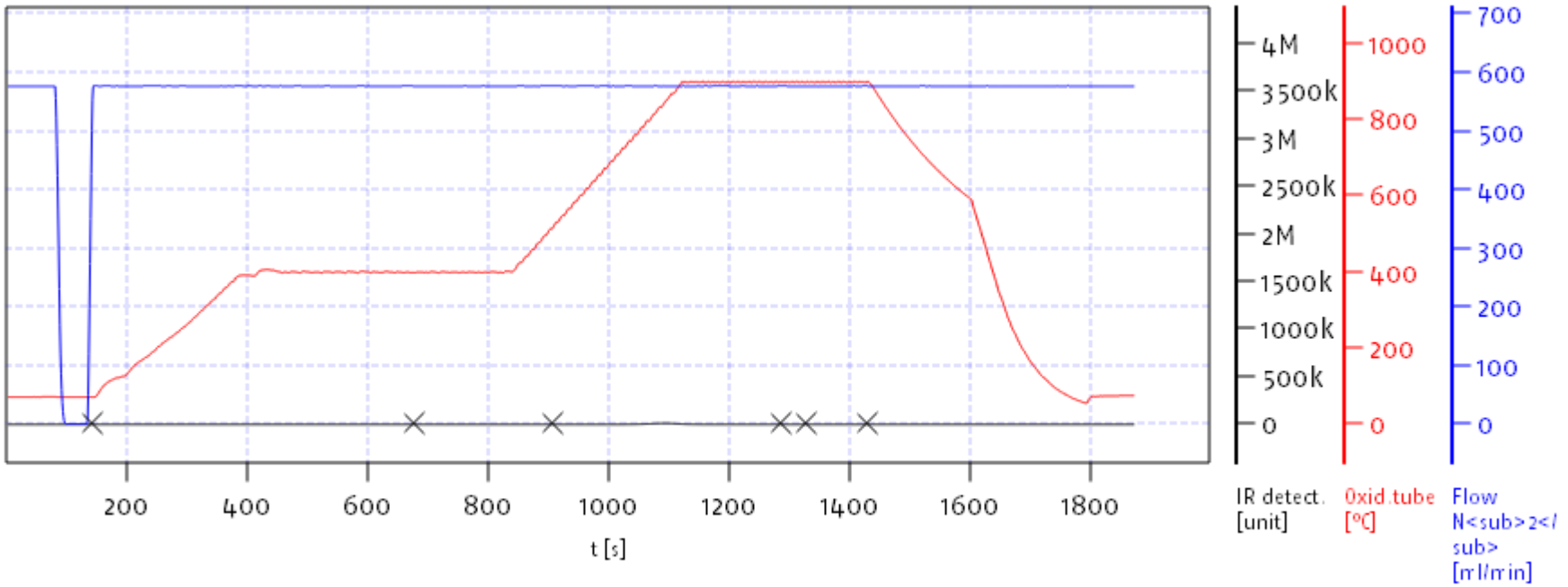
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
5	13	SEQ-CAL3	200.00	0.0068	1.00	CARBON	8/24/2021 8:06 PM	0.000	0.022	0.022	bl,C1u,C2u	889	24 712	60	1.0000	1.0307



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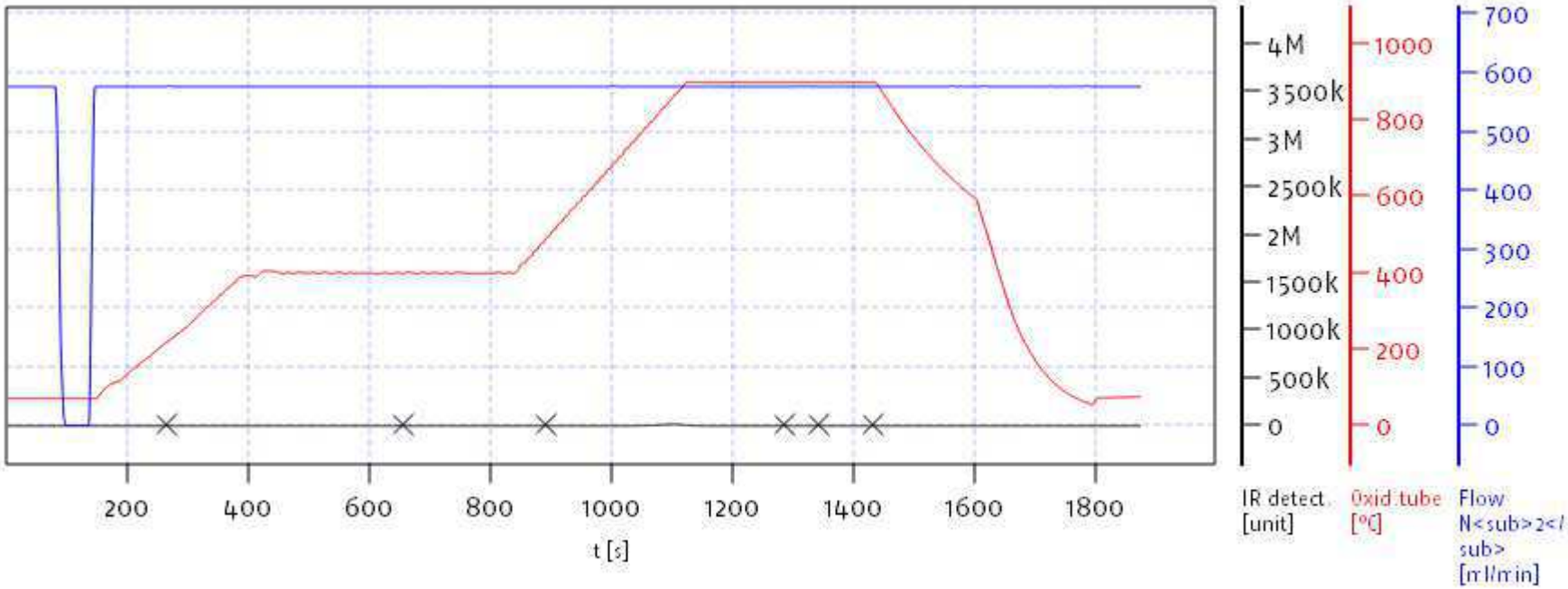
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
6	14	SEQ-CAL4	200.00	0.0101	1.00	CARBON	8/24/2021 8:38 PM	0.000	0.030	0.030	bl,C1u,C2u	1 503	31 221	84	1.0000	1.1361



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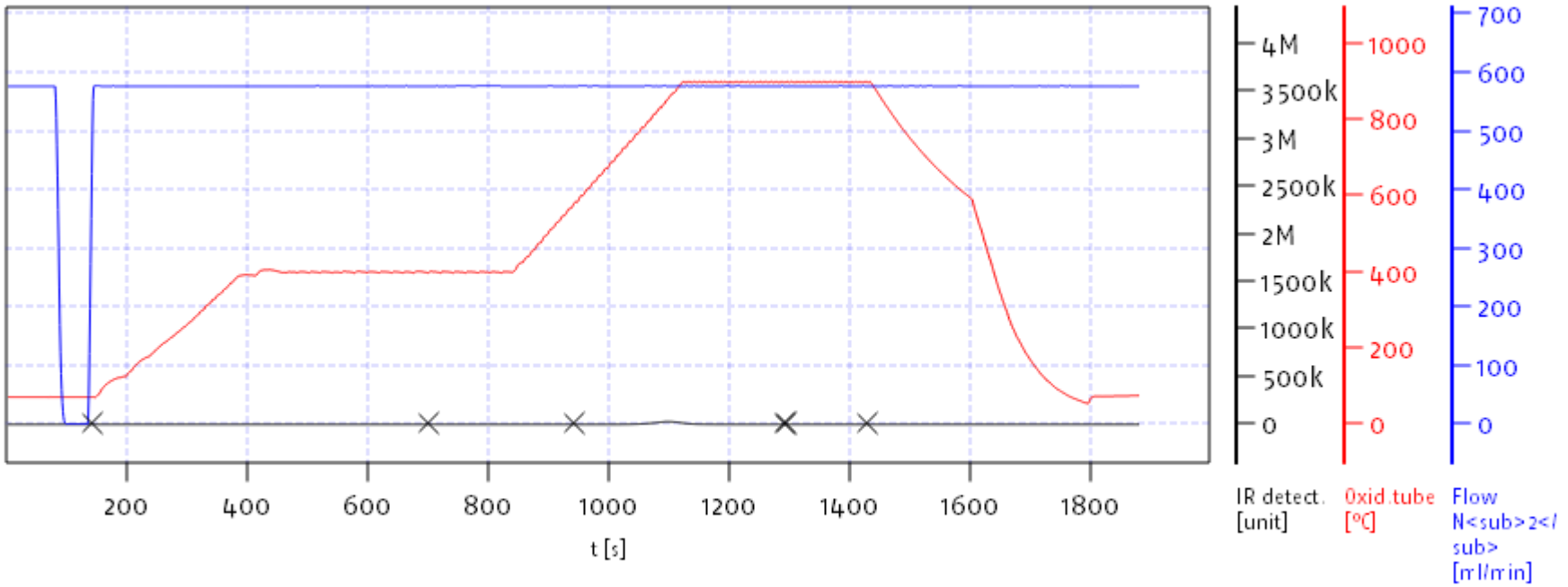
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
7	15	SEQ-CAL5	200.00	0.0151	1.00	CARBON	8/24/2021 9:10 PM	0.000	0.045	0.045	bl,C1u,C2u	776	61 535	62	1.0000	0.8900



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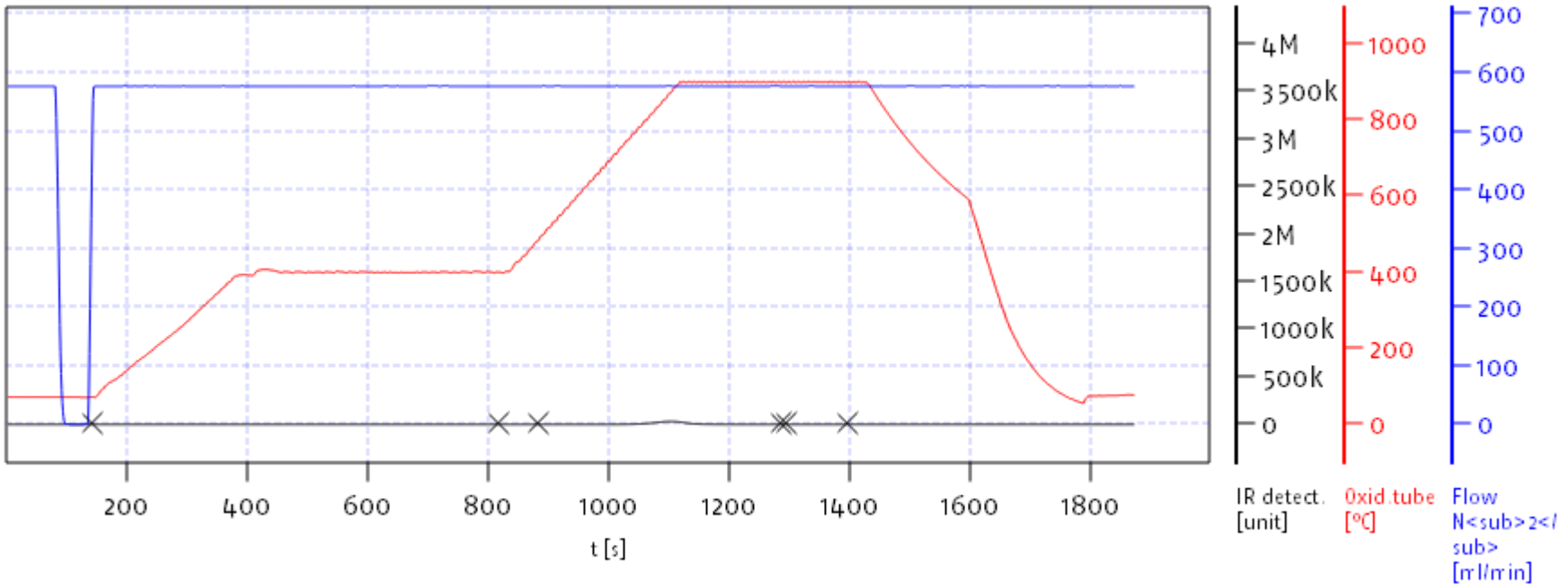
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
8	16	SEQ-CAL6	200.00	0.0200	1.00	CARBON	8/24/2021 9:41 PM	0.000	0.061	0.061	bl,C1u,C2u	1 086	73 745	55	1.0000	1.0168



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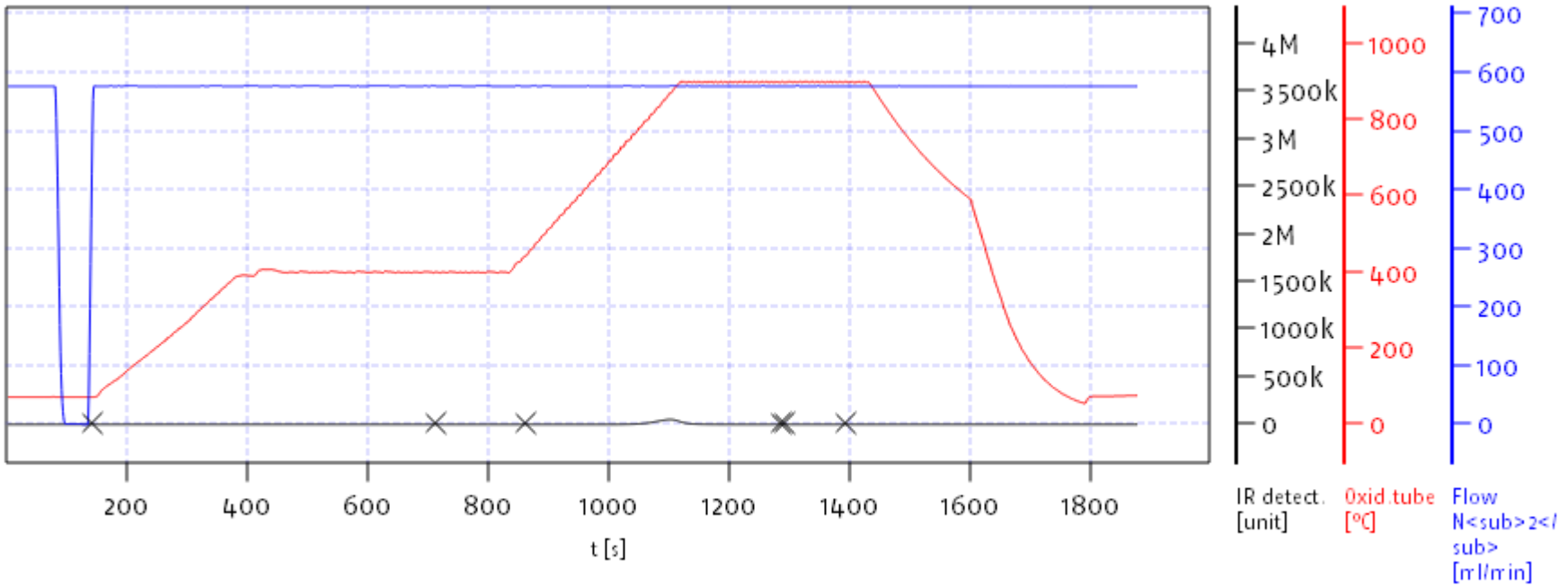
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
9	17	SEQ-CAL7	200.00	0.0256	1.00	CARBON	8/24/2021 10:13 PM	0.000	0.075	0.075	bl,C1u,C2u	1 149	100 193	99	1.0000	0.9293



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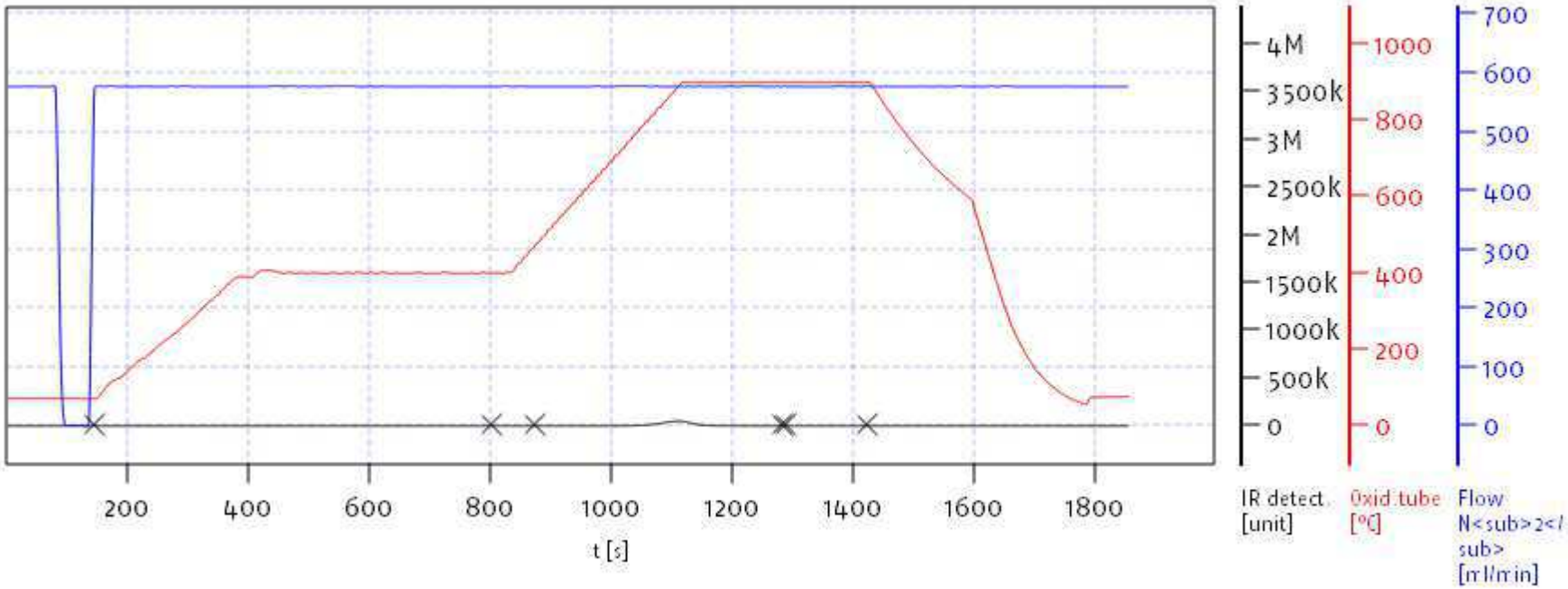
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
10	18	SEQ-CAL8	200.00	0.0303	1.00	CARBON	8/24/2021 10:44 PM	0.000	0.091	0.091	bl,C1u,C2u	779	118 482	109	1.0000	0.9492



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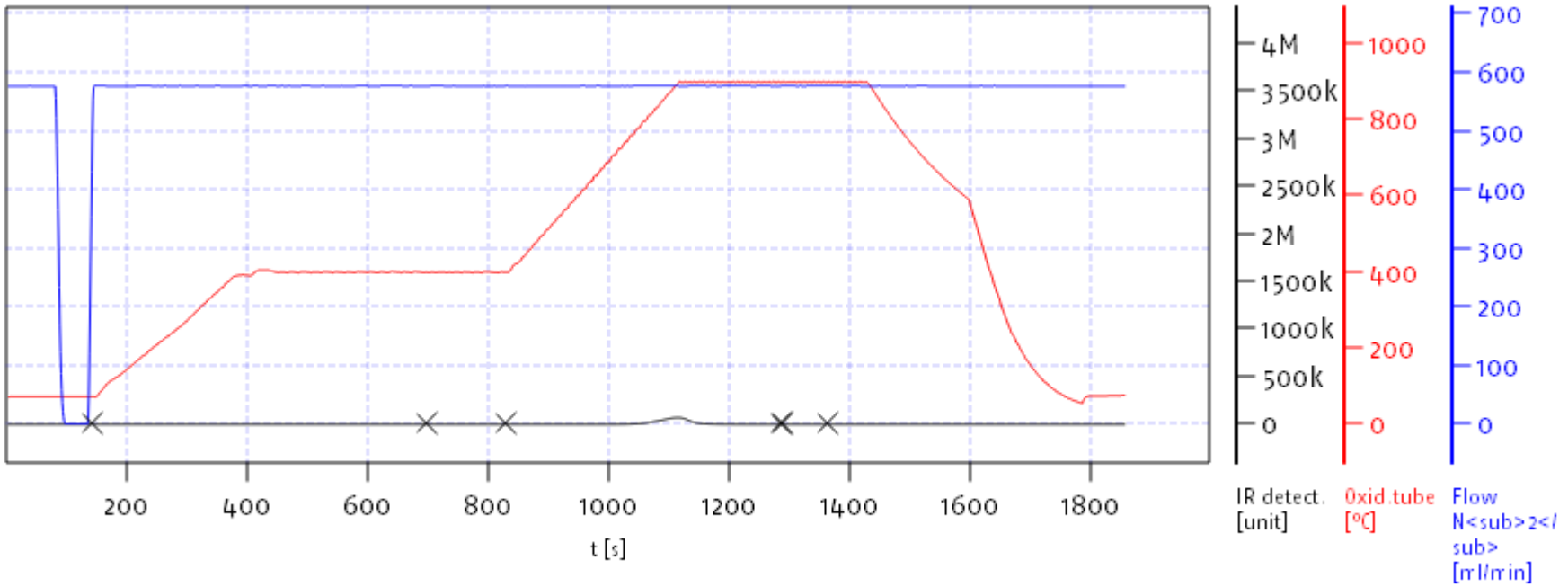
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
11	19	SEQ-CAL9	200.00	0.0396	1.00	CARBON	8/24/2021 11:16 PM	0.000	0.120	0.120	bl,C1u,C2u	848	163 267	93	1.0000	0.9178



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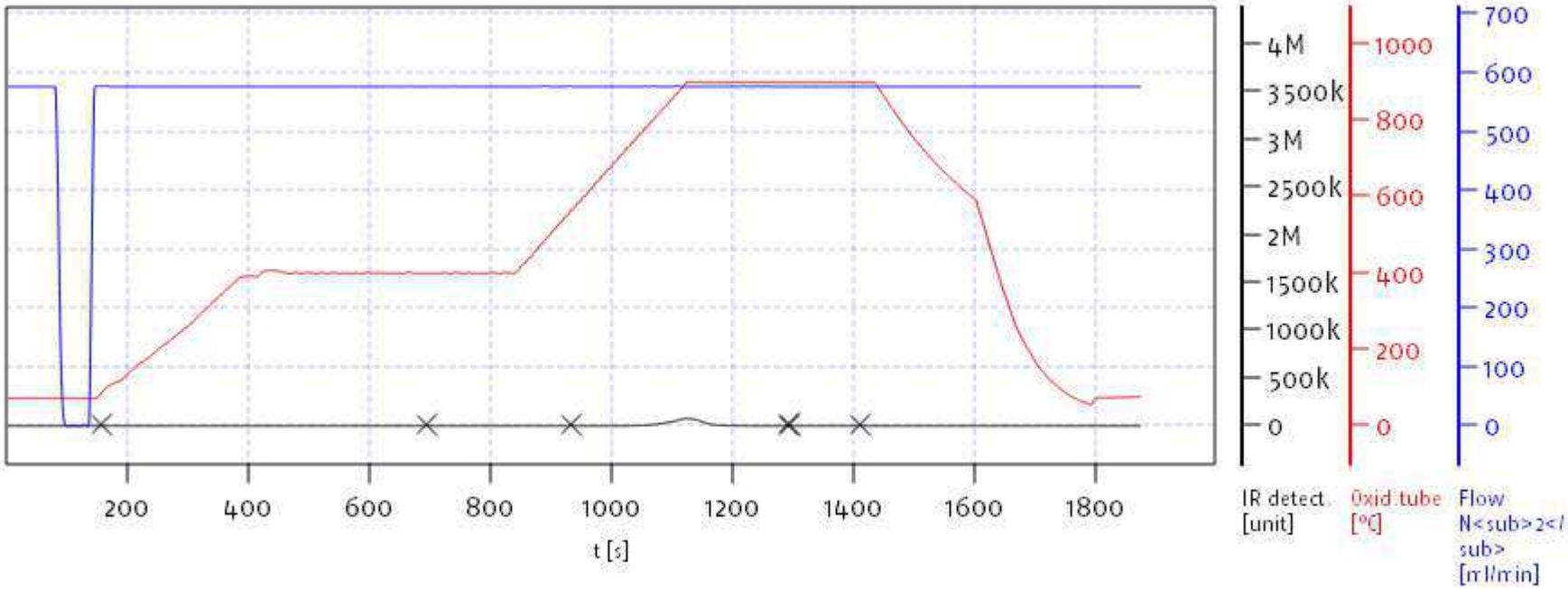
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
12	20	SEQ-CALA	200.00	0.0498	1.00	CARBON	8/24/2021 11:48 PM	0.000	0.151	0.151	bl,C1u,C2u	1 818	184 410	146	1.0000	1.0237



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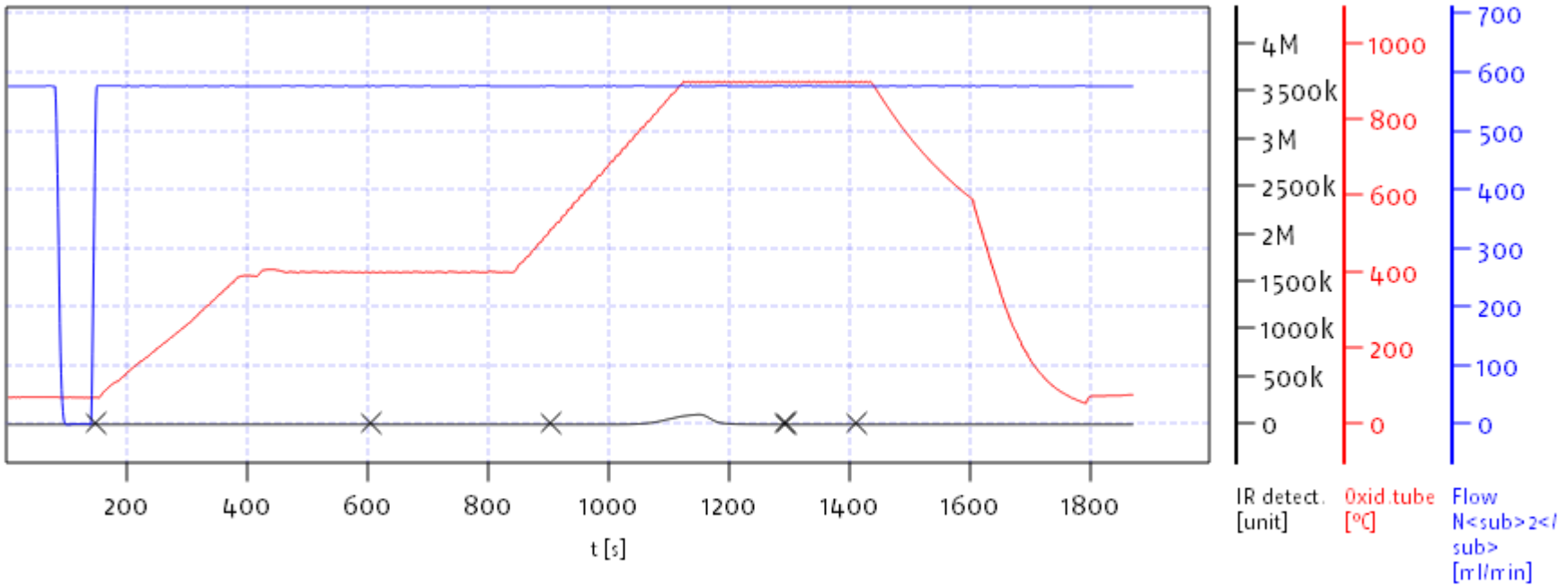
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
13	21	SEQ-CALB	200.00	0.0042	1.00	CARBON	8/25/2021 12:19 AM	0.000	0.258	0.258	bl,C1u,C2u	972	305 136	284	1.0000	1.0636



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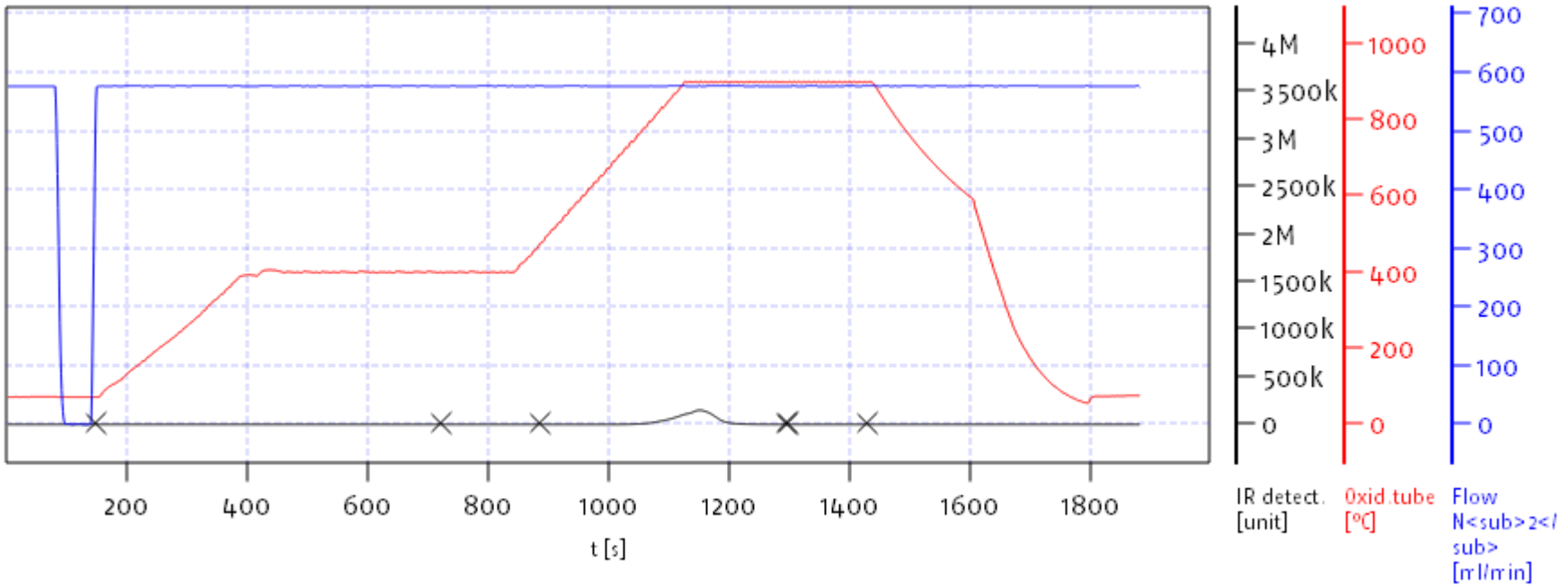
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
14	22	SEQ-CALC	200.00	0.0056	1.00	CARBON	8/25/2021 12:51 AM	0.000	0.324	0.324	bl,C1u,C2u	925	413 926	393	1.0000	0.9869



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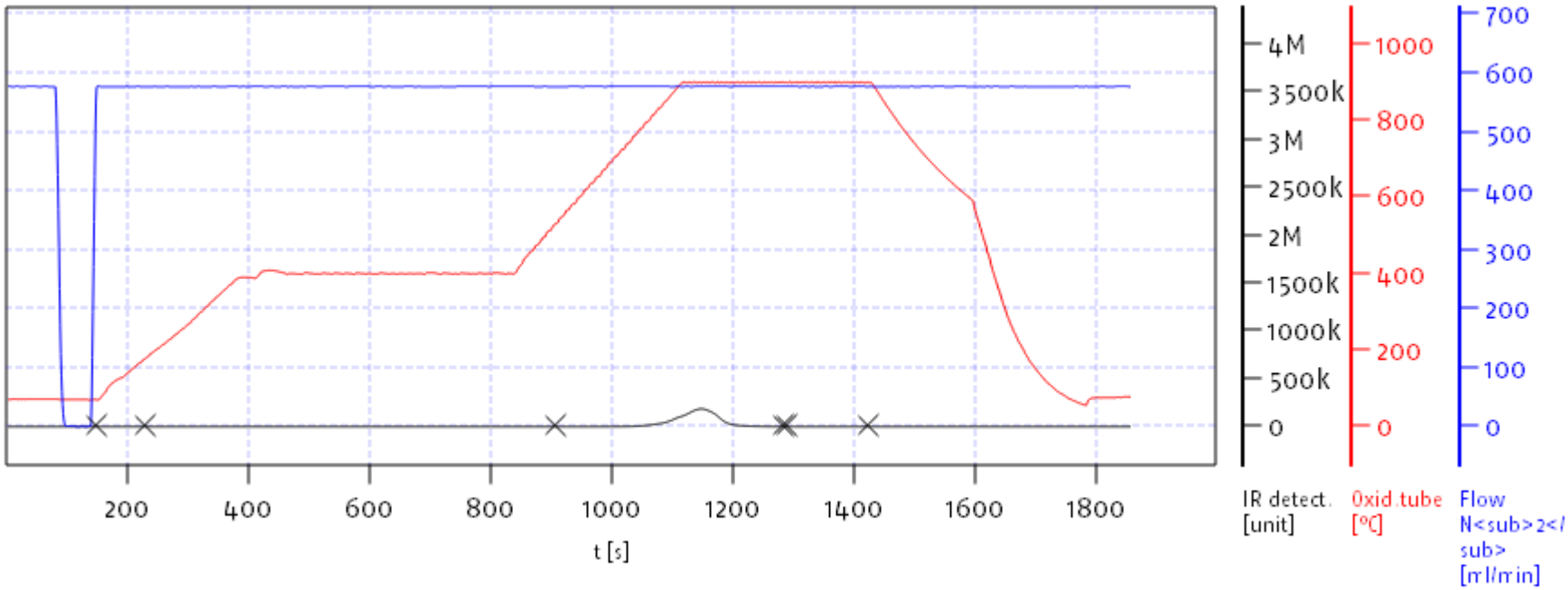
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
15	23	SEQ-CALD	200.00	0.0069	1.00	CARBON	8/25/2021 1:22 AM	0.000	0.444	0.444	bl,C1u,C2u	172	525 080	677	1.0000	1.0675



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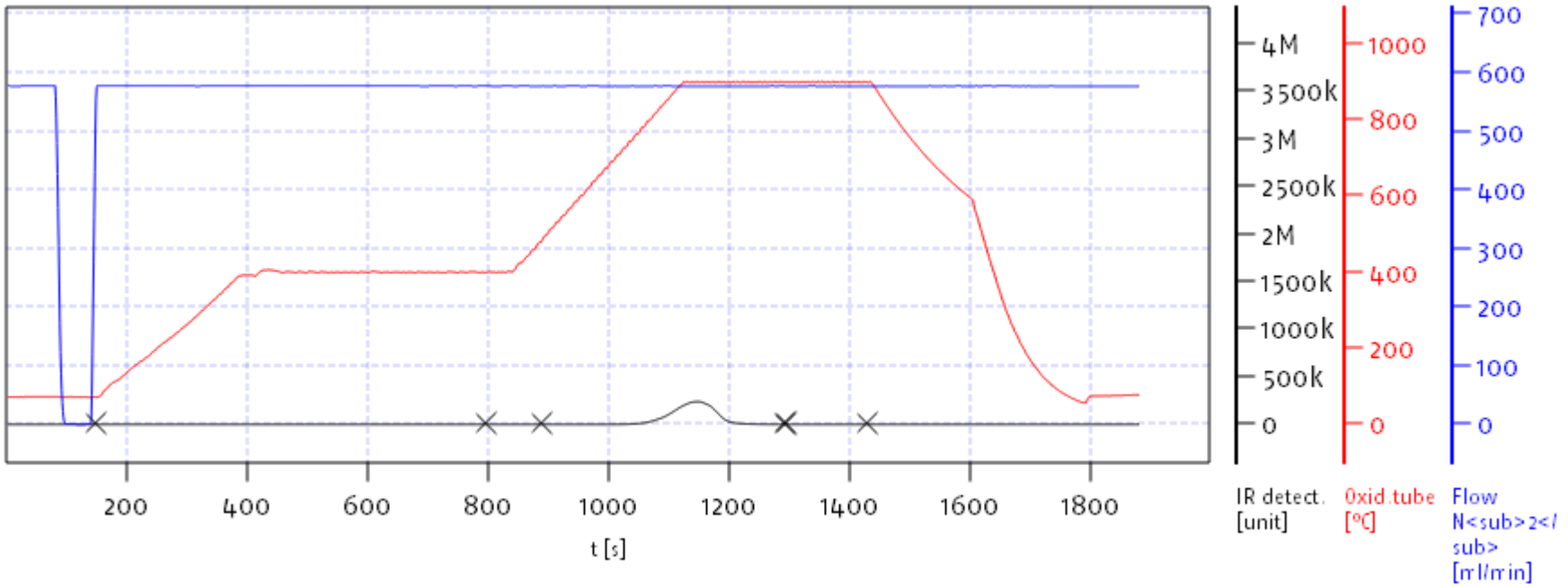
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
16	24	SEQ-CALE	200.00	0.0097	1.00	CARBON	8/25/2021 1:54 AM	0.000	0.600	0.600	bl,C1u,C2u	989	743 966	687	1.0000	1.0196



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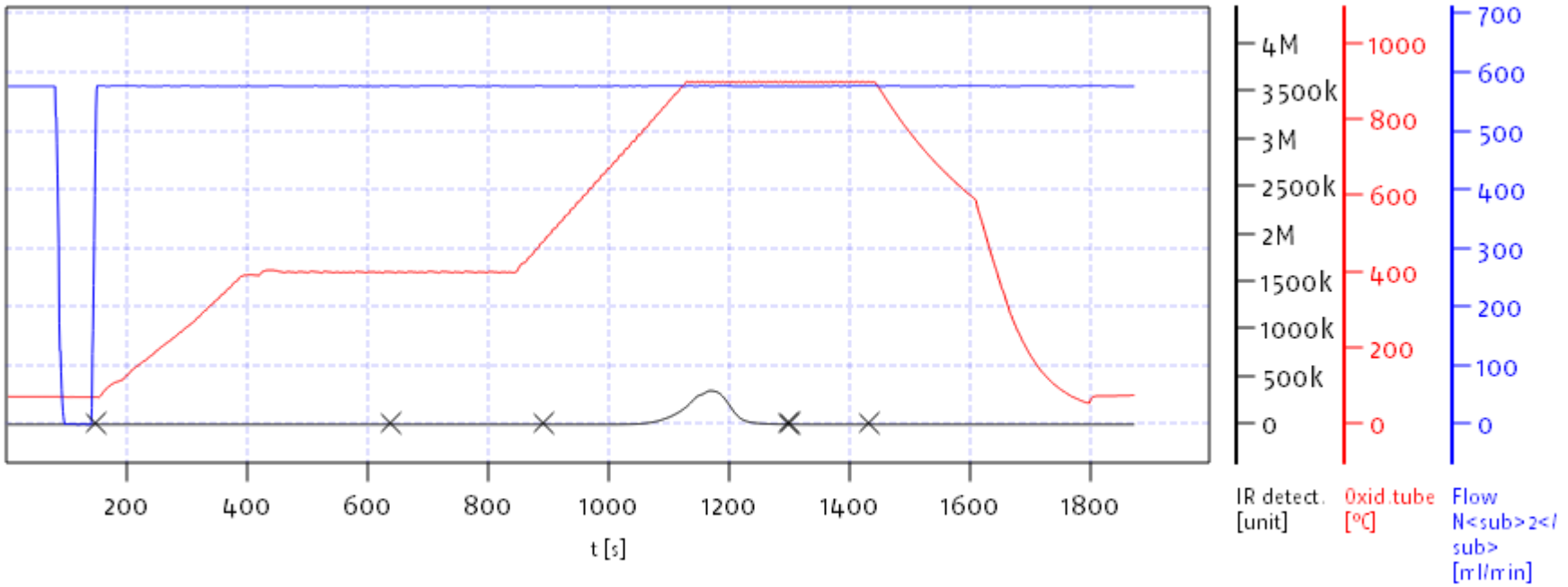
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
17	25	SEQ-CALF	200.00	0.0147	1.00	CARBON	8/25/2021 2:26 AM	0.000	0.906	0.906	bl,C1u,C2u	925	1 115 840	1 898	1.0000	1.0277



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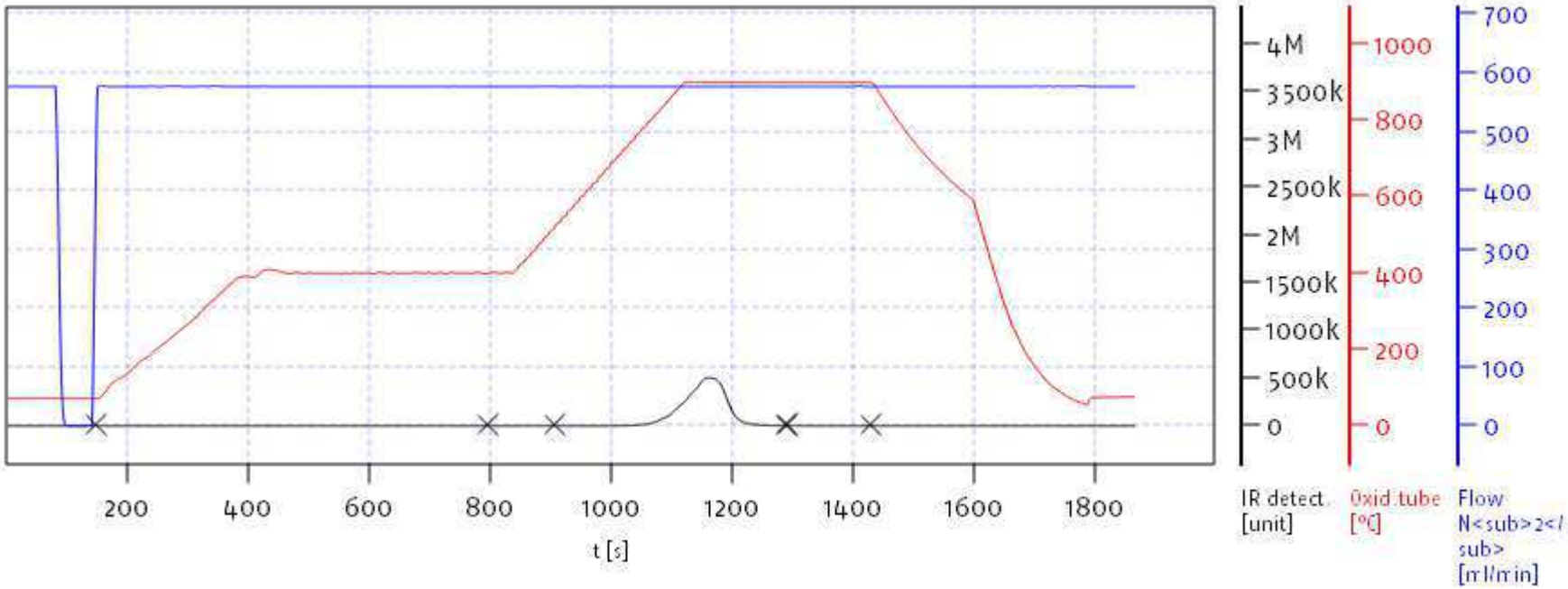
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
18	26	SEQ-CALG	200.00	0.0199	1.00	CARBON	8/25/2021 2:58 AM	0.000	1.206	1.206	bl,C1u,C2u	1 253	1 509 240	2 258	1.0000	1.0121



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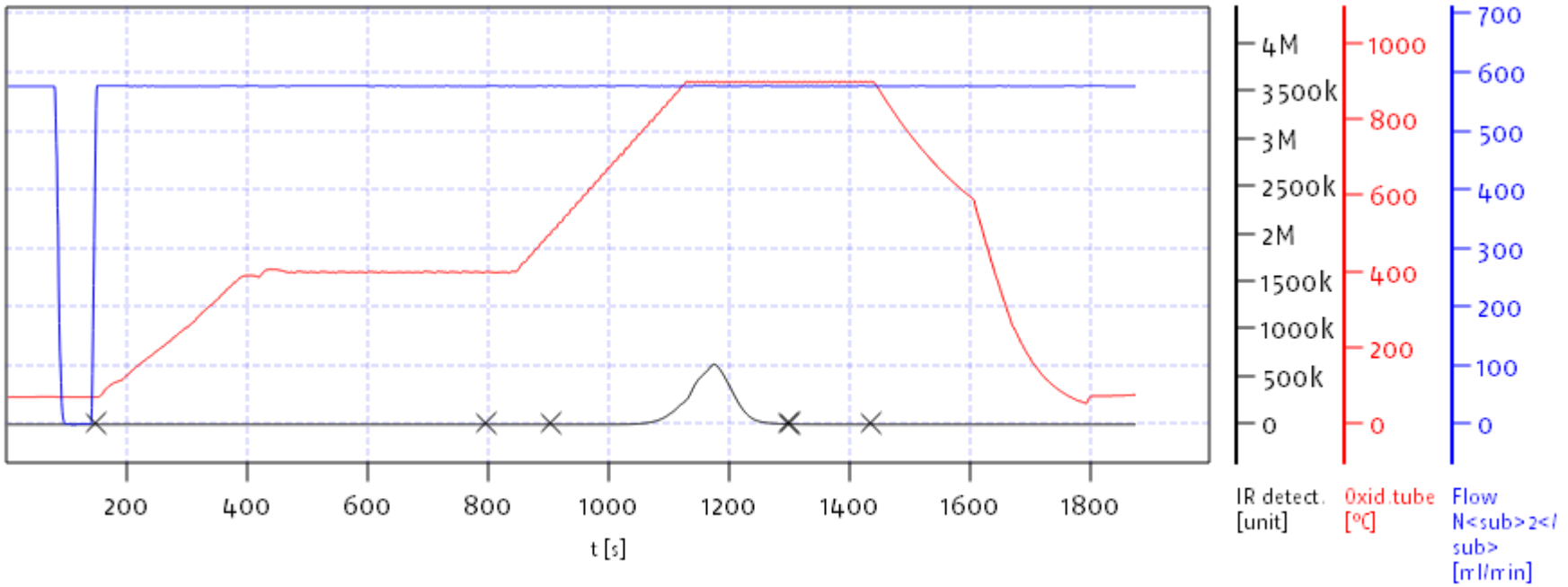
	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
19	27	SEQ-CALH	200.00	0.0253	1.00	CARBON	8/25/2021 3:29 AM	0.000	1.524	1.524	bl,C1u,C2u	1 233	1 930 390	4 311	1.0000	1.0003



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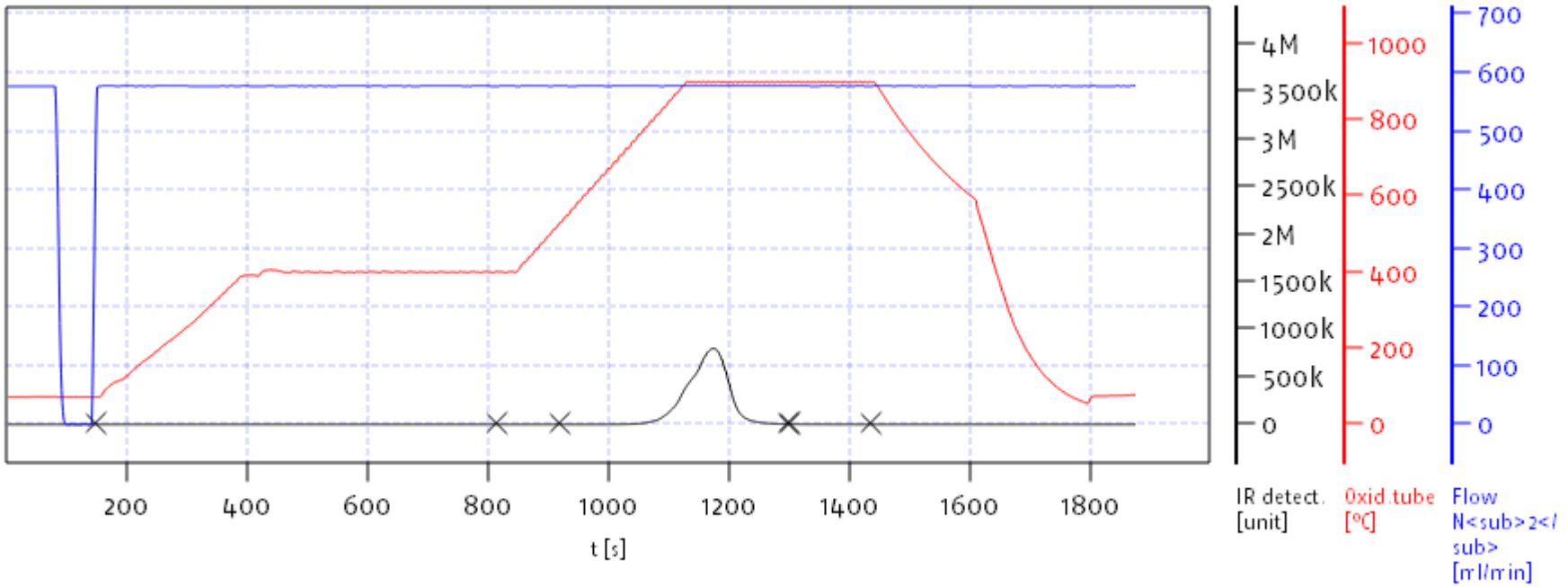
Document: TOC Calibration EH00065 082421BFb from: 8/25/2021 11:47 AM

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
20	28	SEQ-CALI	200.00	0.0302	1.00	CARBON	8/25/2021 4:01 AM	0.000	1.800	1.800	bl,C1u,C2u	1 600	2 286 540	3 907	1.0000	0.9976



Name:

Access: soliTOC superuser

Date: Wed Aug 25 11:48:01 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

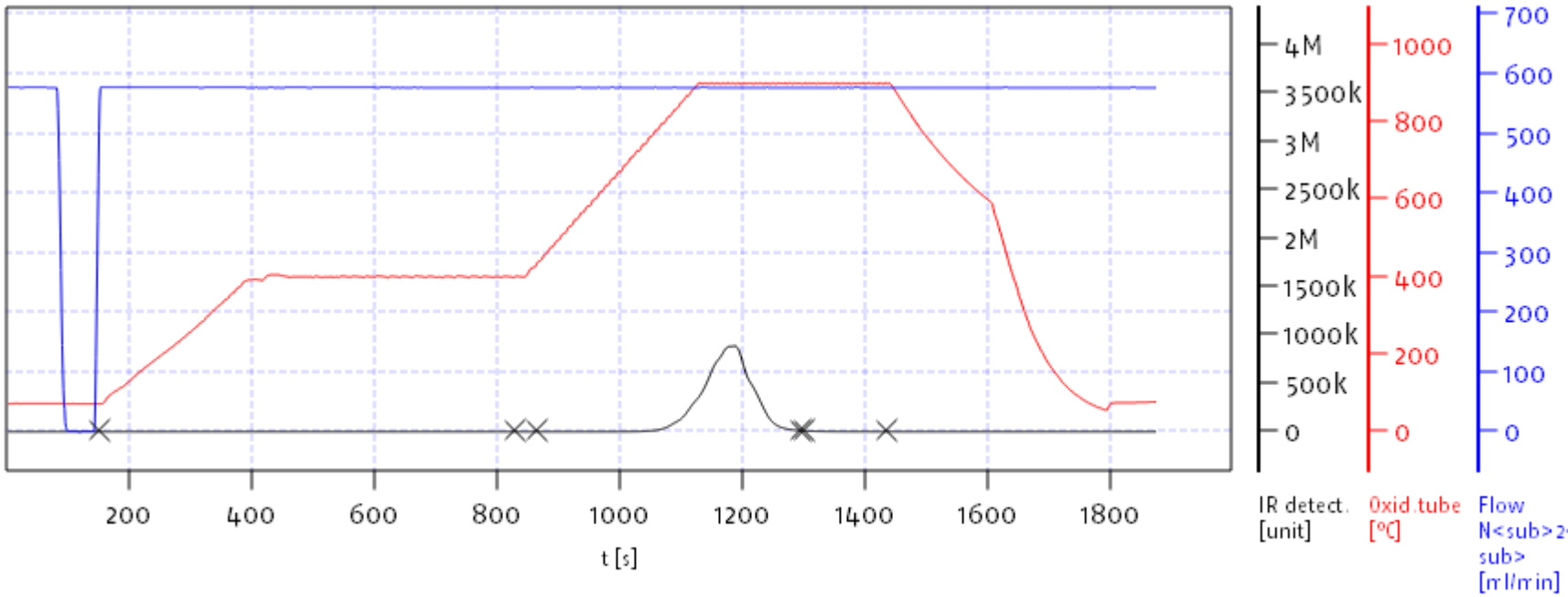
elementar
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00065 082421BFb from: 8/25/2021 11:47 AM

Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
21	29	SEQ-CALJ	200.00	0.0400	1.00	CARBON	8/25/2021 4:33 AM	0.000	2.400	2.400	bl,C1u	1 589	**3 013 270**	**9 826**	1.0000	1.0096



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Balance: BAL3
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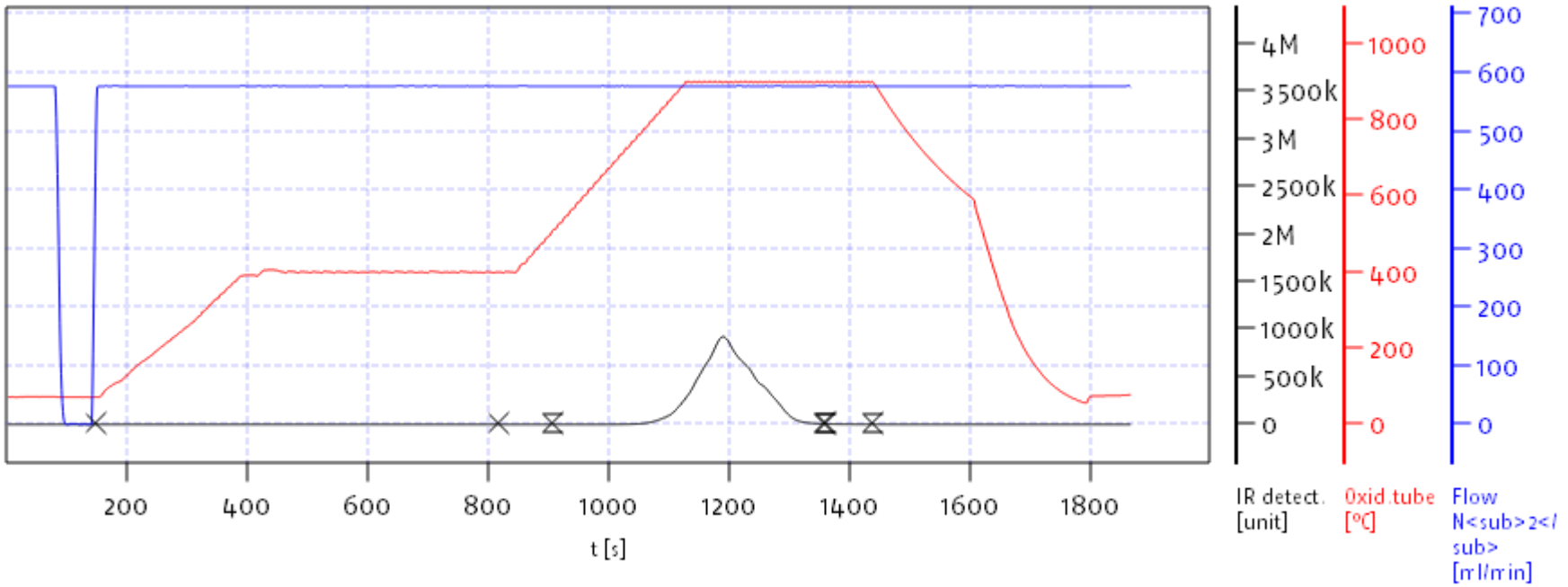
Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
22	30	SEQ-CALK	200.00	0.0498	1.00	CARBON	8/25/2021 11:41 AM	0.000	3.012	3.012	bl,C1u	2 117	**3 411 713**	**0**	1.0000	1.0310



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Serial No: 0300.181017
Mode CCC

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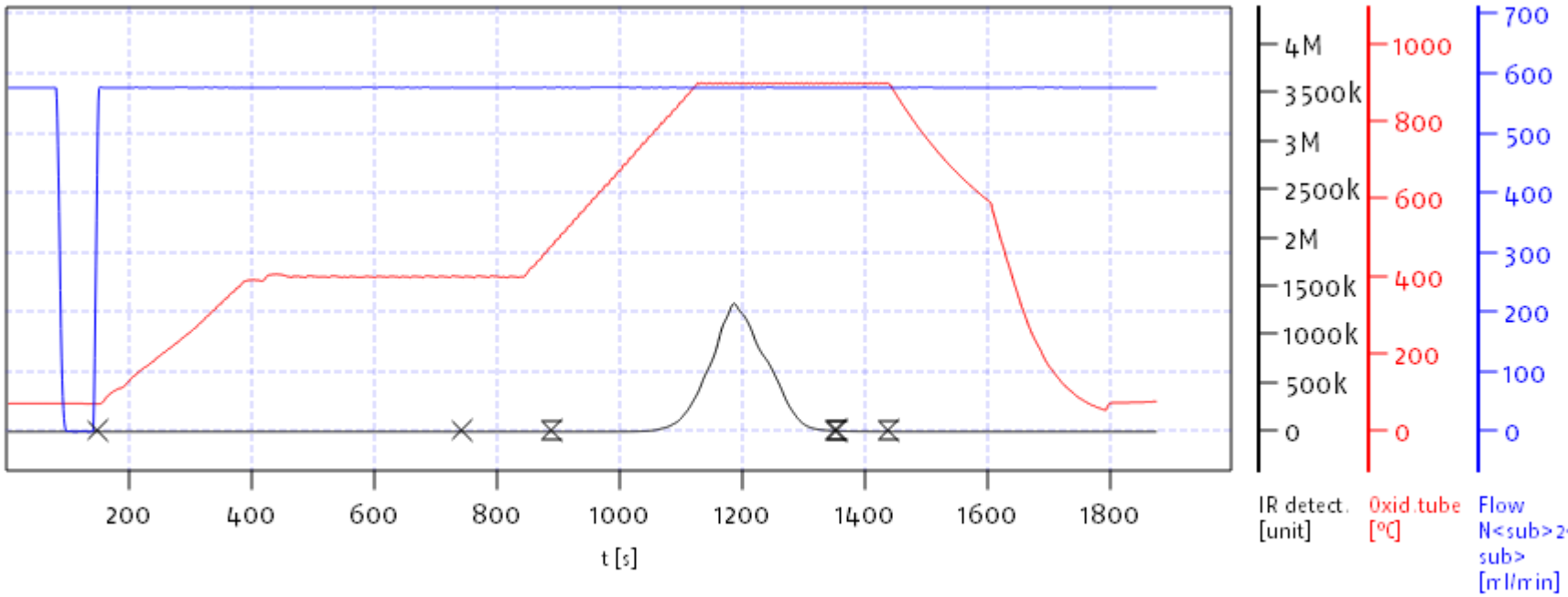
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
23	31	SEQ-CALL	200.00	0.0699	1.00	CARBON	8/25/2021 11:42 AM	0.000	4.206	4.206	bl,C1u	1 285	**4 920 073**	**0**	1.0000	1.0206



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Serial No: 0300.181017
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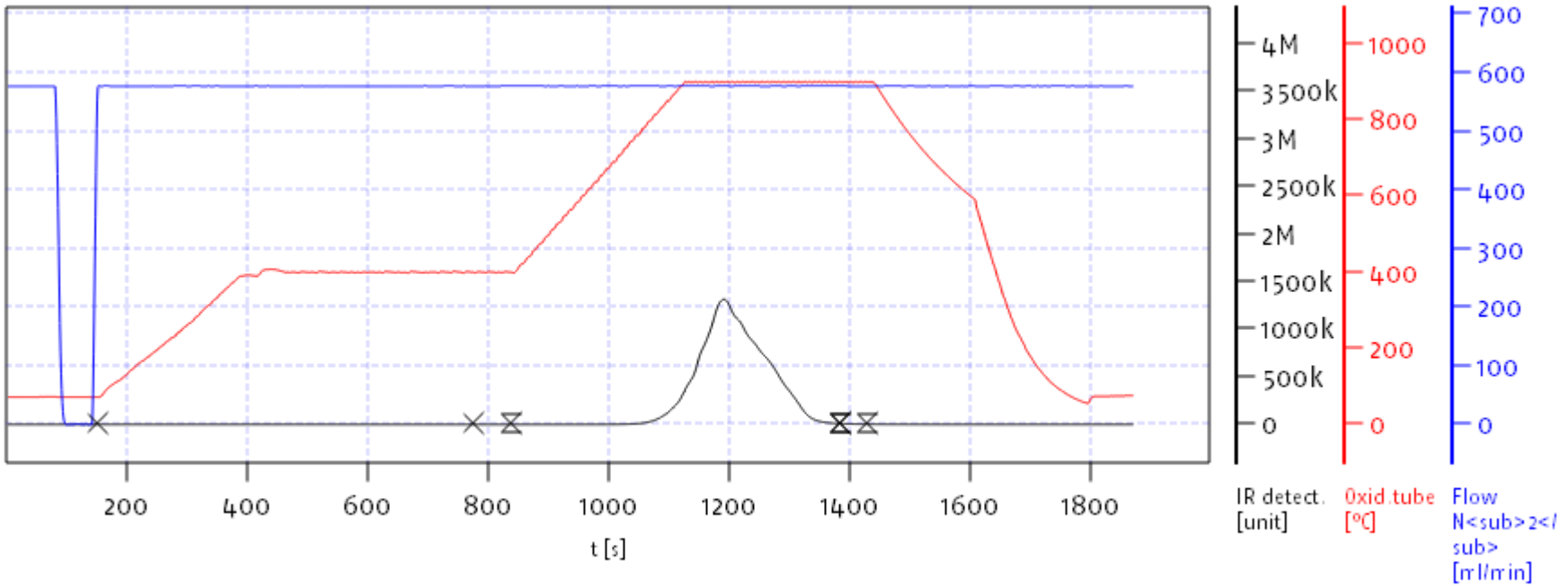
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
24	32	SEQ-CALM	200.00	0.0803	1.00	CARBON	8/25/2021 11:43 AM	0.000	4.812	4.812	bl,C1u	1 537	**5 655 573**	**0**	1.0000	1.0683



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Serial No: 0300.181017
Mode CCC

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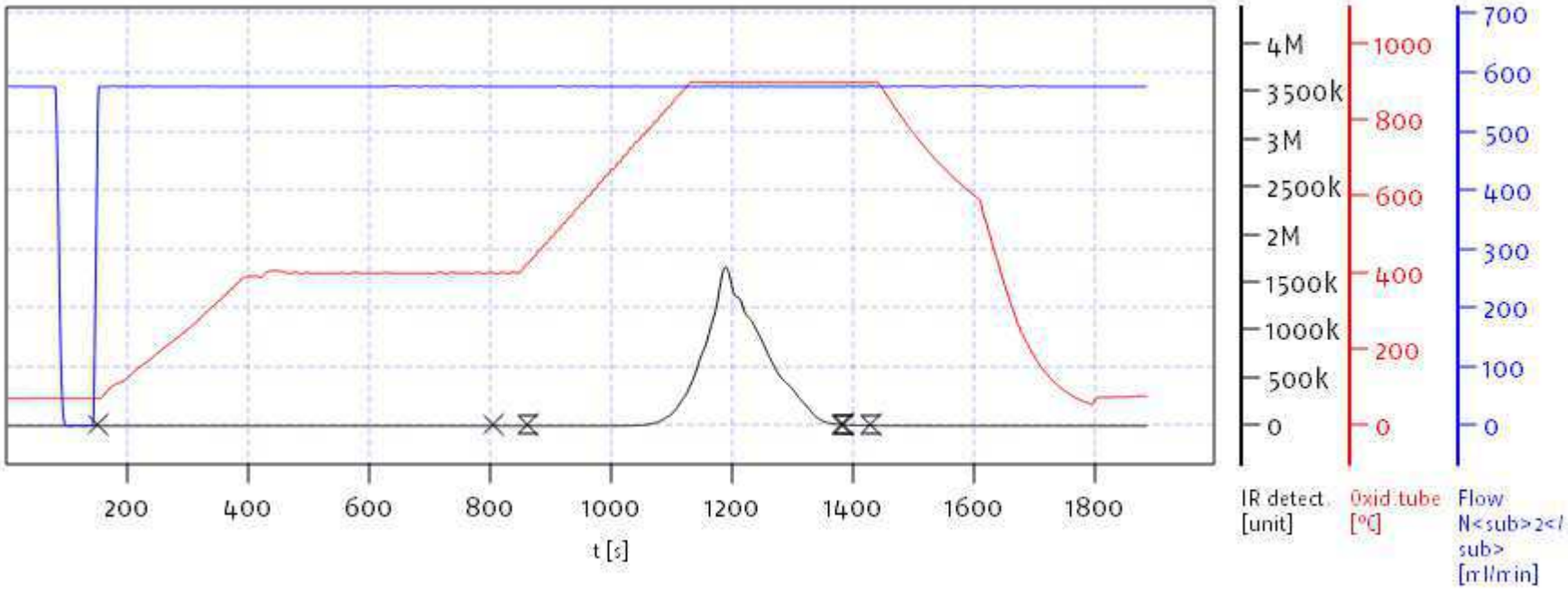
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
25	33	SEQ-CALN	200.00	0.0902	1.00	CARBON	8/25/2021 11:45 AM	0.000	5.406	5.406	bl,C1u	1 694	**6 449 031**	**0**	1.0000	1.0610



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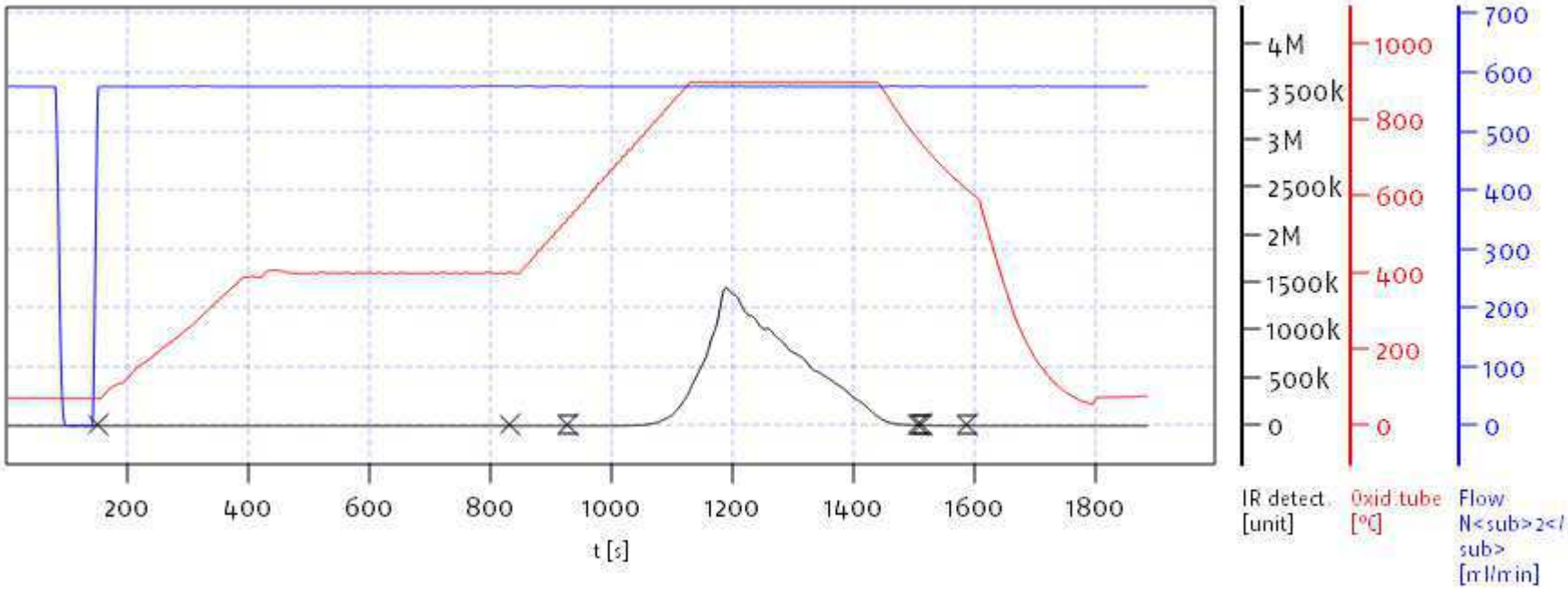
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
26	34	SEQ-CALO	200.00	0.1204	1.00	CARBON	8/25/2021 11:46 AM	0.000	7.218	7.218	bl,C1u,C3o	1 658	8 593 324	0	1.0000	1.3657



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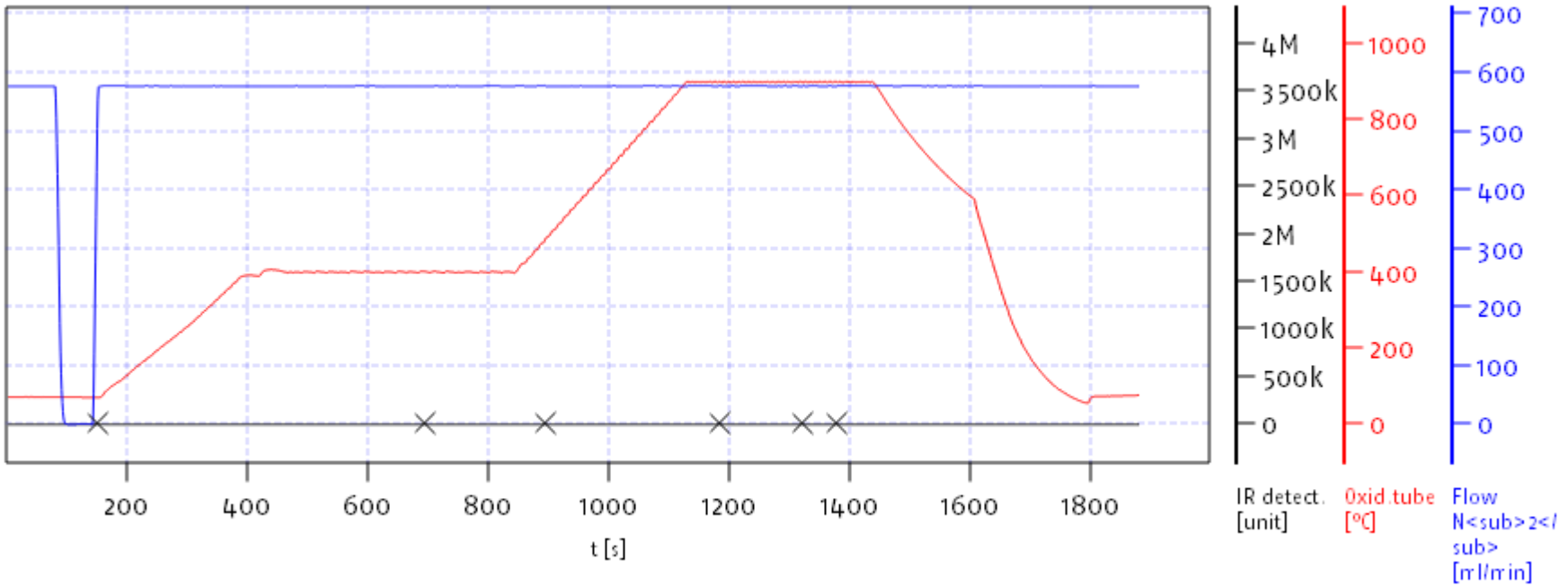
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
27	35	BLANK	1.00		1.00	CARBON	8/25/2021 7:43 AM	0.000	0.000	0.000	bl	708	0	0	1.0000	1.0293



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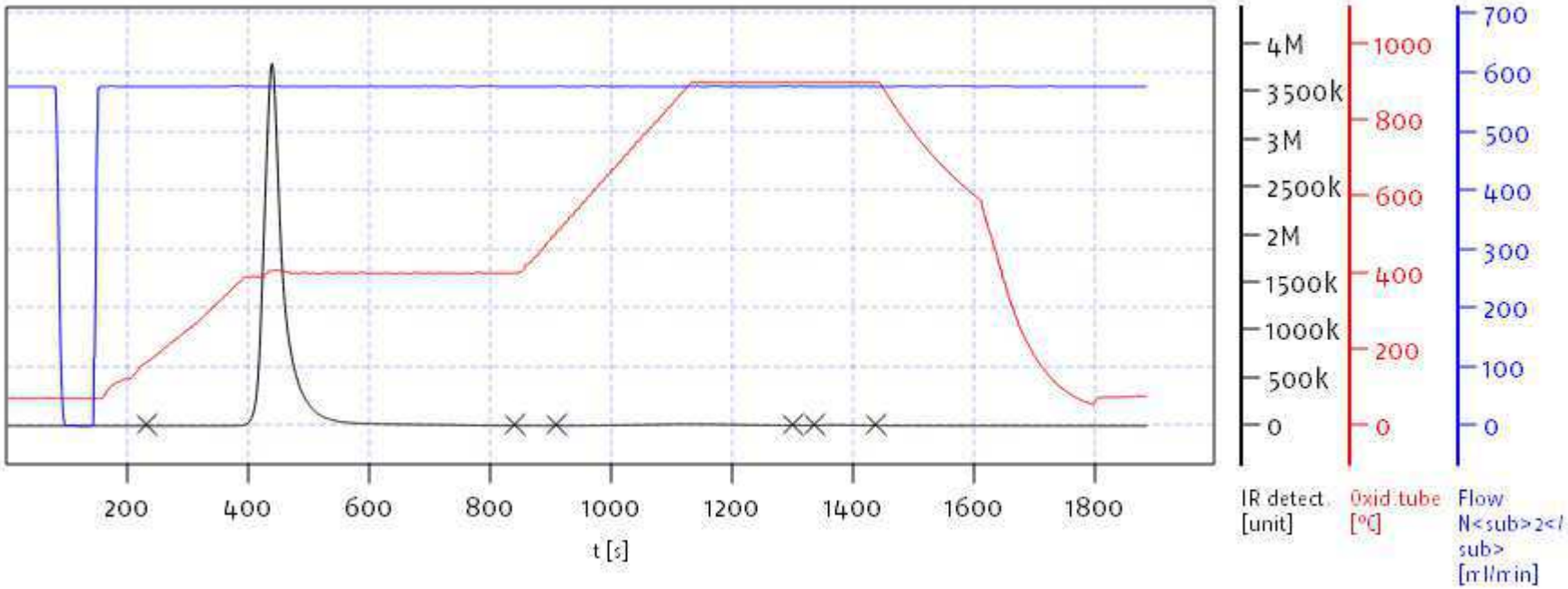
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
28	36	Dfactor	20.30		1.00	CARBON	8/25/2021 8:15 AM	44.446	0.000	44.446	bl	5 319 150	136 410	24 452	1.0755	1.0000



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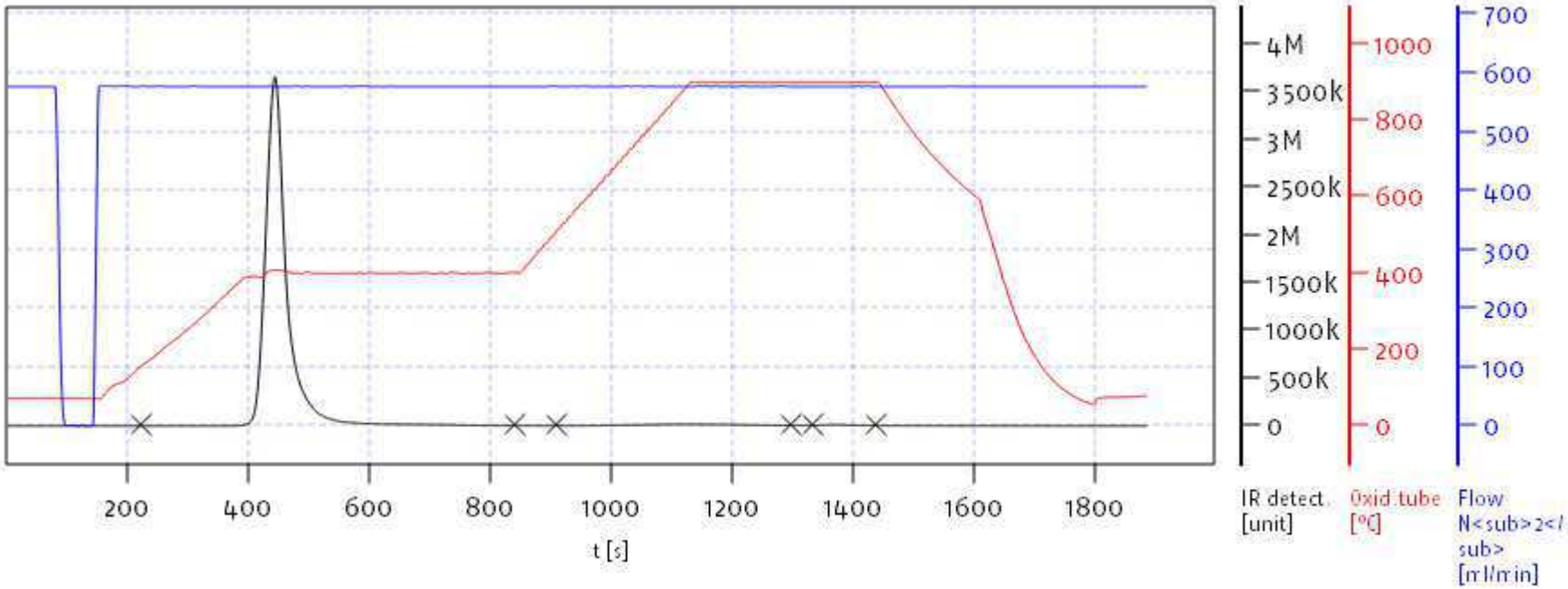
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
29	37	Dfactor	21.00		1.00	CARBON	8/25/2021 8:47 AM	44.446	0.000	44.446	bl	5 524 800	134 598	27 280	1.0712	1.0000



Name:

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Date: Wed Aug 25 11:48:01 2021

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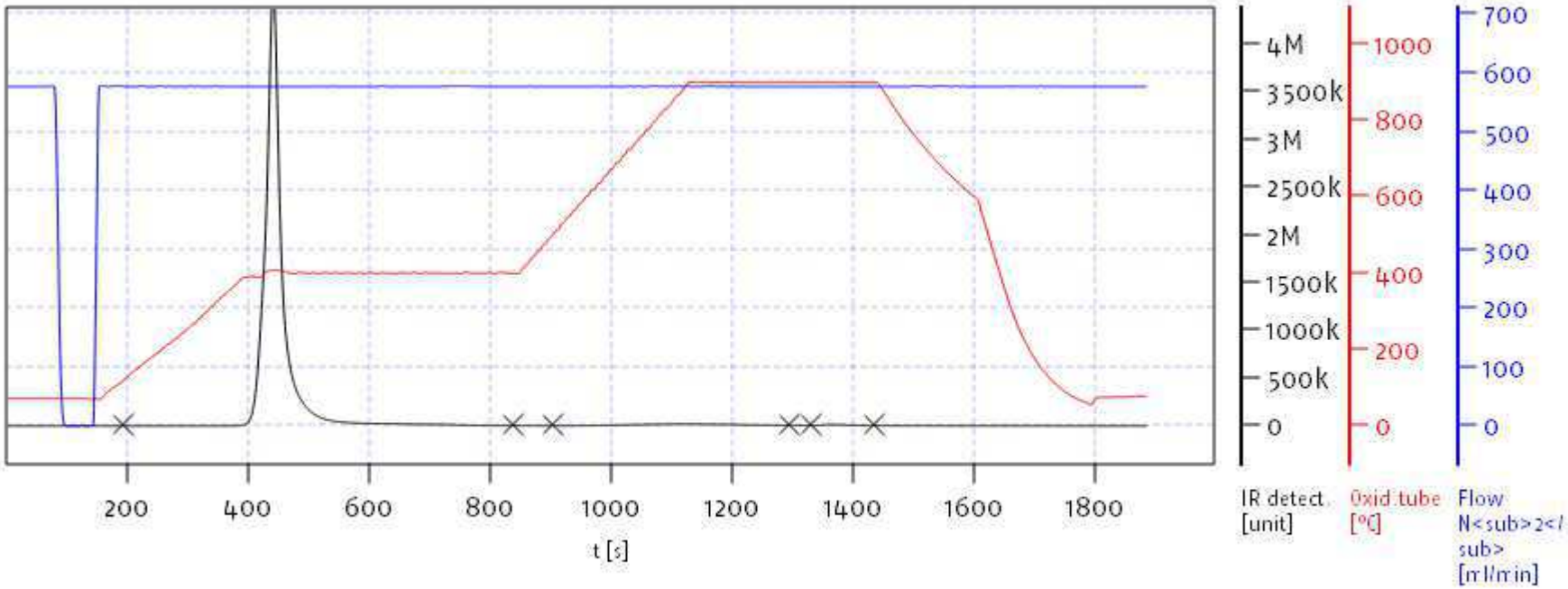
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
30	38	SEQ-ICV1	20.50		1.00	CARBON	8/25/2021 9:19 AM	47.154	1.091	48.245	bl	5 328 380	151 538	28 760	1.0733	1.0293



Name:

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Date: Wed Aug 25 11:48:01 2021

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Serial No: 0300.181017
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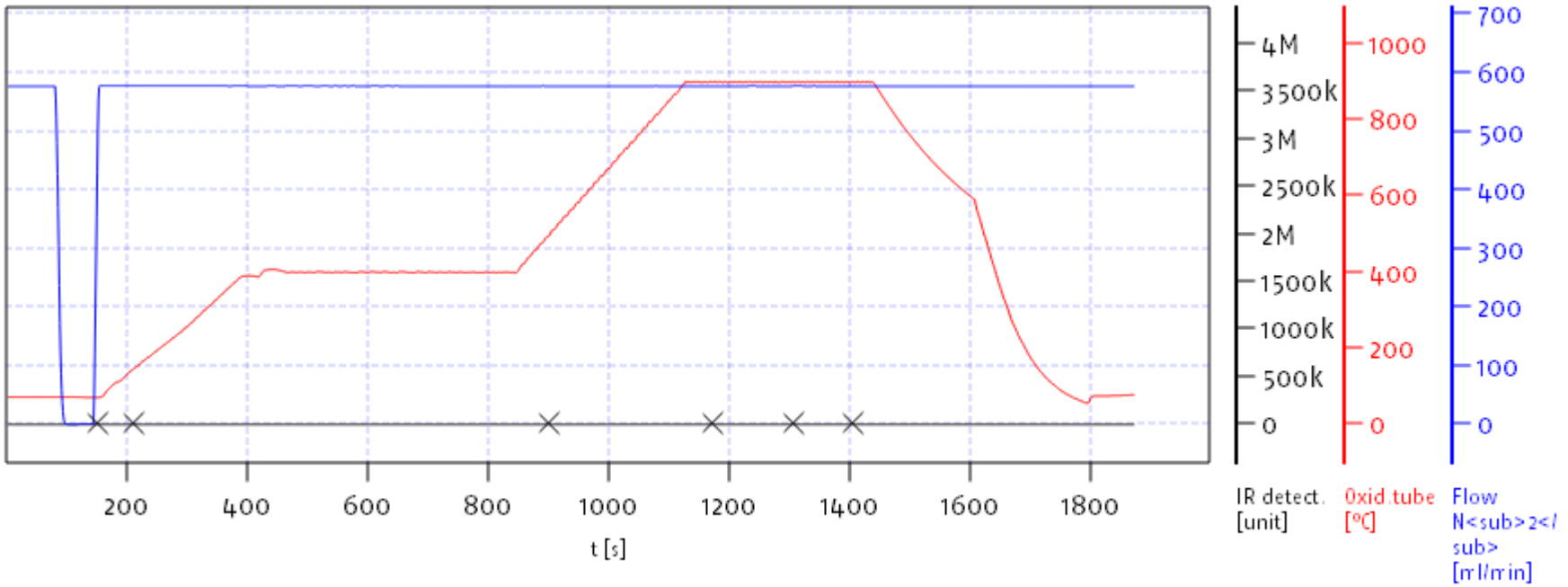
Soli TOC Cube, Carbon
Balance: BAL3
Analyst: BF

Analytical Resources, Incorporated
Analytical Chemists and Consultants

	Pos.	Name	Weight [mg]	Memo	Dilut. Factor	Method	Date Time	TOC [%]	TIC900 [%]	TC [%]	Info	TOC400 Area	TIC900 Area	ROC Area	TOC400 Factor	TIC900 Factor
31	39	SEQ-ICB1	599.20		1.00	CARBON	8/25/2021 9:51 AM	0.000	0.000	0.000	bl,C1u,C3u,C2u	172	1 307	338	1.0733	1.0293



Name:

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Date: Wed Aug 25 11:48:01 2021

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Serial No: 0300.181017
Mode CCC

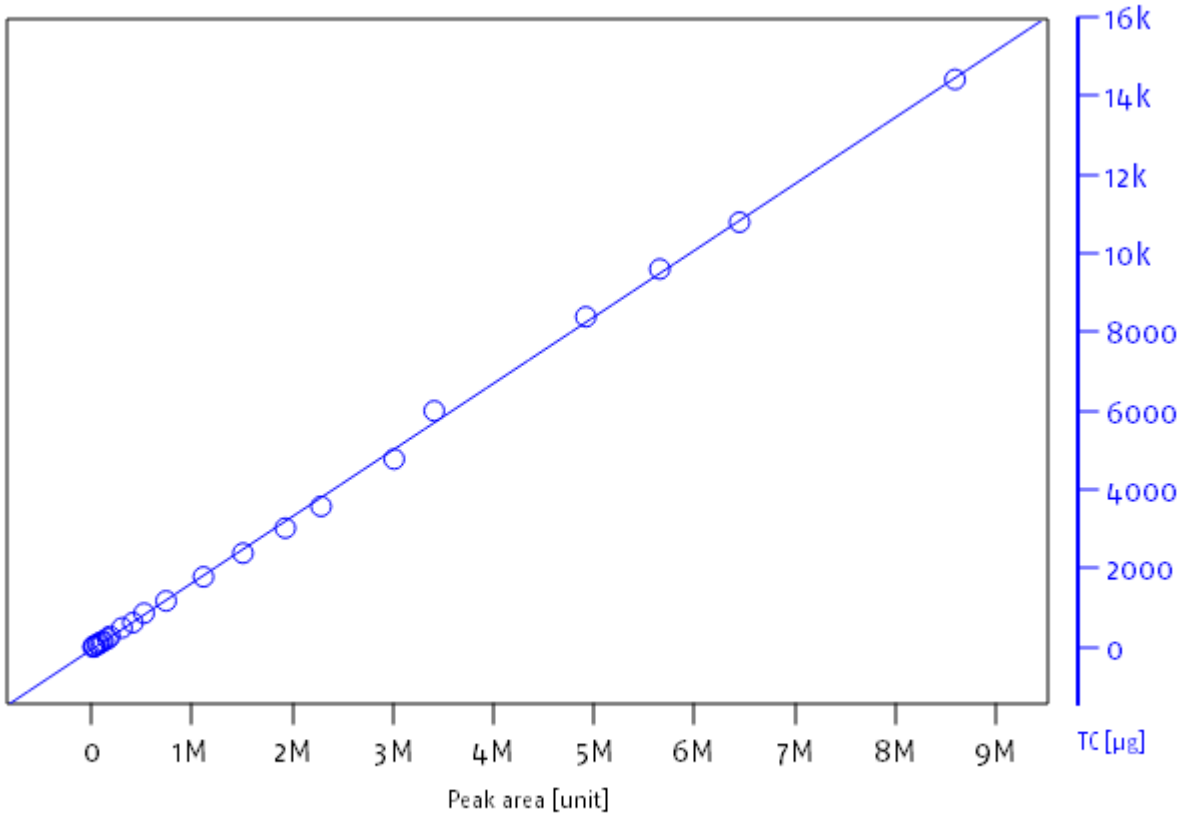
elementar
EXCELLENCE IN ELEMENTS

Document: TOC Calibration EH00065 082421BFb from: 8/25/2021 11:47 AM

Calibration parameters TC, Whole range

a	-1.970923e-02
b	+1.688862e-06
c	+0.000000e+00
d	+0.000000e+00
e	+0.000000e+00
r	0.999218
r_old	0.999218
Proc.-SD	115.145985 µg

Calibration graph TC, Whole range



Name:

Access: soliTOC superuser

Date: Wed Aug 25 11:48:57 2021

soliTOC V2.0.2 (31015f9) 2018-11-19
Serial No: 0300.181017
Mode CCC

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INSTRUMENT BLANKS
EPA 9060A m

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: TOC Cube
Calibration: EH00021
Sequence: SJH0113
Date Analyzed: 08/11/21 04:59

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SJH0113-ICB1	Total Organic Carbon	0.007	0.02	0.02	%	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INSTRUMENT BLANKS
EPA 9060A m

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: TOC Cube
Calibration: EH00021
Sequence: SJH0136
Date Analyzed: 08/12/21 14:39

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SJH0136-ICB1	Total Organic Carbon	0.005	0.02	0.02	%	
SJH0136-CCB1	Total Organic Carbon	0.001	0.02	0.02	%	
SJH0136-CCB2	Total Organic Carbon	0.003	0.02	0.02	%	
SJH0136-CCB3	Total Organic Carbon	0.003	0.02	0.02	%	
SJH0136-CCB4	Total Organic Carbon	0.002	0.02	0.02	%	
SJH0136-CCB5	Total Organic Carbon	0.007	0.02	0.02	%	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INSTRUMENT BLANKS
EPA 9060A m

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: TOC Cube
Calibration: EH00065
Sequence: SJH0323
Date Analyzed: 08/25/21 09:51

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SJH0323-ICB1	Total Organic Carbon	0.00	0.02	0.02	%	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INSTRUMENT BLANKS
EPA 9060A m

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: TOC Cube
Calibration: EH00065
Sequence: SJH0331
Date Analyzed: 08/25/21 16:40

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SJH0331-ICB1	Total Organic Carbon	0.003	0.02	0.02	%	
SJH0331-CCB1	Total Organic Carbon	0.00	0.02	0.02	%	
SJH0331-CCB2	Total Organic Carbon	0.00	0.02	0.02	%	
SJH0331-CCB3	Total Organic Carbon	0.00	0.02	0.02	%	
SJH0331-CCB4	Total Organic Carbon	0.00	0.02	0.02	%	
SJH0331-CCB5	Total Organic Carbon	0.001	0.02	0.02	%	
SJH0331-CCB6	Total Organic Carbon	0.00	0.02	0.02	%	
SJH0331-CCB7	Total Organic Carbon	0.00	0.02	0.02	%	
SJH0331-CCB8	Total Organic Carbon	0.001	0.02	0.02	%	
SJH0331-CCB9	Total Organic Carbon	0.00	0.02	0.02	%	
SJH0331-CCBA	Total Organic Carbon	0.00	0.02	0.02	%	
SJH0331-CCBB	Total Organic Carbon	0.00	0.02	0.02	%	
SJH0331-CCBC	Total Organic Carbon	0.00	0.02	0.02	%	
SJH0331-CCBD	Total Organic Carbon	0.004	0.02	0.02	%	
SJH0331-CCBE	Total Organic Carbon	0.00	0.02	0.02	%	
SJH0331-CCBF	Total Organic Carbon	0.004	0.02	0.02	%	
SJH0331-CCBG	Total Organic Carbon	0.00	0.02	0.02	%	
SJH0331-CCBH	Total Organic Carbon	0.003	0.02	0.02	%	
SJH0331-CCBI	Total Organic Carbon	0.003	0.02	0.02	%	
SJH0331-CCBJ	Total Organic Carbon	0.007	0.02	0.02	%	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 9060A m

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: TOC Cube
Calibration: EH00021
Control Limt: +/- 10.00%
Sequence: SJH0113

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SJH0113-ICV1	Total Organic Carbon	44.446	44.4	99.9	%	EPA 9060A m
	Total Carbon	44.446	45.3	102	%	EPA 9060A m
	Total Inorganic Carbon	0.0000	0.93		%	EPA 9060A m
	% Soot	0.0000	0.32		%	EPA 9060A m

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 9060A m

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: TOC Cube
Calibration: EH00021
Control Limt: +/- 10.00%
Sequence: SJH0136

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SJH0136-ICV1	Total Organic Carbon	44.446	43.7	98.4	%	EPA 9060A m
SJH0136-CCV1	Total Organic Carbon	44.446	44.5	100	%	EPA 9060A m
SJH0136-CCV2	Total Organic Carbon	44.446	44.6	100	%	EPA 9060A m
SJH0136-CCV3	Total Organic Carbon	44.446	43.7	98.2	%	EPA 9060A m
SJH0136-CCV4	Total Organic Carbon	44.446	44.6	100	%	EPA 9060A m
SJH0136-CCV5	Total Organic Carbon	44.446	45.2	102	%	EPA 9060A m

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 9060A m

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: TOC Cube
Calibration: EH00065
Control Limt: +/- 10.00%
Sequence: SJH0323

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SJH0323-ICV1	Total Organic Carbon	44.446	47.2	106	%	EPA 9060A m
	Total Carbon	44.446	48.2	109	%	EPA 9060A m
	Total Inorganic Carbon	0.0000	1.09		%	EPA 9060A m
	% Soot	0.0000	0.14		%	EPA 9060A m

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL AND CONTINUING CALIBRATION CHECK

EPA 9060A m

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: TOC Cube
Calibration: EH00065
Control Limt: +/- 10.00%
Sequence: SJH0331

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SJH0331-ICV1	Total Organic Carbon	44.446	43.9	98.7	%	EPA 9060A m
SJH0331-CCV1	Total Organic Carbon	44.446	43.8	98.4	%	EPA 9060A m
SJH0331-CCV2	Total Organic Carbon	44.446	44.4	100	%	EPA 9060A m
SJH0331-CCV3	Total Organic Carbon	44.446	44.4	100	%	EPA 9060A m
SJH0331-CCV4	Total Organic Carbon	44.446	45.1	101	%	EPA 9060A m
SJH0331-CCV5	Total Organic Carbon	44.446	44.7	100	%	EPA 9060A m
SJH0331-CCV6	Total Organic Carbon	44.446	44.0	99.1	%	EPA 9060A m
SJH0331-CCV7	Total Organic Carbon	44.446	44.8	101	%	EPA 9060A m
SJH0331-CCV8	Total Organic Carbon	44.446	45.6	103	%	EPA 9060A m
SJH0331-CCV9	Total Organic Carbon	44.446	43.2	97.1	%	EPA 9060A m
SJH0331-CCVA	Total Organic Carbon	44.446	45.2	102	%	EPA 9060A m
SJH0331-CCVB	Total Organic Carbon	44.446	44.6	100	%	EPA 9060A m
SJH0331-CCVC	Total Organic Carbon	44.446	44.7	101	%	EPA 9060A m
SJH0331-CCVD	Total Organic Carbon	44.446	45.6	103	%	EPA 9060A m
SJH0331-CCVE	Total Organic Carbon	44.446	43.5	97.9	%	EPA 9060A m
SJH0331-CCVF	Total Organic Carbon	44.446	44.8	101	%	EPA 9060A m
SJH0331-CCVG	Total Organic Carbon	44.446	45.4	102	%	EPA 9060A m
SJH0331-CCVH	Total Organic Carbon	44.446	44.5	100	%	EPA 9060A m
SJH0331-CCVI	Total Organic Carbon	44.446	44.0	99.0	%	EPA 9060A m
SJH0331-CCVJ	Total Organic Carbon	44.446	45.5	102	%	EPA 9060A m

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

STANDARD REFERENCE MATERIAL RECOVERY

EPA 9060A m

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJH0300-SRM1
Batch: BJH0300
Initial/Final: 0.0395 g / 0.0395 mL
Preparation: PSEP 1986 (modified)
Analyzed: 08/13/2021 1:38
Standard ID: H003424
Expires: 12/31/2079
Standard Lot#: 1941b
Description: 1941B- Organics in Marine Sediment (Conv)

ANALYTE	TRUE (% wet)	FOUND (% wet)	MDL	MRL	Q	SRM % REC.	QC LIMITS REC.
Total Organic Carbon	2.9900	2.42	0.02	0.02		81.0	80 - 120

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HOLDING TIME SUMMARY

Analysis: EPA 9060A m

Laboratory: Analytical Resources, Inc. SDG: 21G0286

Client: Anchor QEA, LLC Project: Lower Duwamish AOC4

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LDW21-SS687 21G0286-01	07/22/21 06:45	07/22/21 17:30	08/11/21 14:09	20	180	08/13/21 12:41			
LDW21-SS625 21G0286-02	07/22/21 07:50	07/22/21 17:30	08/11/21 14:09	20	180	08/13/21 13:13			
LDW21-IT625 21G0286-03	07/22/21 07:50	07/22/21 17:30	08/11/21 14:09	20	180	08/13/21 16:23			
LDW21-SS627 21G0286-04	07/22/21 08:10	07/22/21 17:30	08/11/21 14:09	20	180	08/13/21 16:55			
LDW21-SS646 21G0286-05	07/22/21 11:50	07/22/21 17:30	08/11/21 14:09	20	180	08/13/21 17:26			

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

EPA 9060A m

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument: TOC Cube

Analyte	MDL	RL	Units
Total Organic Carbon	0.02	0.02	%

H001822

MP Biomedicals, LLC
29525 Fountain Parkway
Solon, Ohio 44139
Telephone: 440/337-1200
Toll Free: 800/854-0530
Fax: 440/337-1180
web: www.mpbio.com

Certificate of Analysis

Product Description: Microcrystalline Cellulose Powder
Catalog Number: 191499
Lot: Q9483

Formula: $(C_6H_{10}O_5)n$
CAS #: 9004-34-6
Physical Description: White Powder

Formula Weight: N/A
Storage: 15 - 30°C

Test	Specification	Result
Identity Test	Passes	Passes
Purity	97.0 - 102.0%	97.0 - 102.0%
Moisture	<5.0%	3.4%
Particle Size/Mesh +60 mesh +200 mesh	Wt % <8% >45%	 <1% 55%
pH	5 - 7	6.73
Residue on Ignition	<0.05%	<0.05%
Water Soluble Substances	<12.0 mg/5 g	4.5 mg/5 g
Heavy Metals	<10 ppm	<10 ppm

Identification A & B: Passes
Bulk Density: 0.29 g/ml
Bulk Density (graduated cylinder): 0.31 g/ml
Conductivity: 18 µS/cm
Starch: Negative
Ether Soluble Substances: 0.01%
Total Aerobic microbial Count: 100 cfu/g
Total Mold and Yeast Count: 20 cfu/g
Staphylococcus aureus: Absent/1 g
Pseudomonas aeruginosa: Absent/1 g
E. coli: Absent/1 g
Salmonella: Absent/10 g
Particle size:
- 450 mesh: 77%
- d10: 37 um
- d50: 139 um
- d90: 271 um
TUP: <9/600 cm^2
Degree of brightness: >88%
Powder flow-angle of repose: <42°
Recommended Retest Date: 11/30/2022

07/26/2018 - John Huang, PhD
MP Biomedicals, LLC.
Quality Control Manager

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National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material® 1941b

Organics in Marine Sediment

This Standard Reference Material (SRM) is marine sediment collected at the mouth of the Baltimore (MD) Harbor. SRM 1941b is intended for use in evaluating analytical methods for the determination of selected polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, and chlorinated pesticides in marine sediment and similar matrices. Information values are also provided for total organic carbon (TOC), total carbon, hydrogen, and nitrogen. All of the constituents for which certified, reference, and information values are provided in SRM 1941b were naturally present in the sediment before processing. A unit of SRM 1941b consists of a bottle containing 50 g of radiation-sterilized, freeze-dried sediment.

Certified Mass Fraction Values: Certified mass fraction values for PAHs, PCB congeners, and chlorinated pesticides are provided in Table 1 through Table 3. The certified values for the PAHs, PCB congeners, and chlorinated pesticides are based on the agreement of results obtained at NIST from two or more chemically independent analytical techniques along with results from an interlaboratory comparison study [1]. A NIST certified value is a value for which NIST has the highest confidence in its accuracy in that all known or suspected sources of bias have been investigated or taken into account [1].

Reference Mass Fraction Values: Reference mass fraction values for additional PAHs (some in combination), additional PCB congeners, and additional chlorinated pesticides are provided in Table 4 through Table 7. Reference values for alkylated PAH groups are provided in Table 8 and for selected hopanes and steranes in Table 9. A reference value for total organic carbon is provided in Table 10. Reference values are noncertified values that are the best estimate of the true value; however, the values do not meet the NIST criteria for certification and are provided with associated uncertainties that may reflect only measurement precision, may not include all sources of uncertainty, or may reflect a lack of sufficient statistical agreement among multiple analytical methods [1].

Information Mass Fraction Values: Information mass fraction values are provided in Table 11 for carbon, hydrogen, and nitrogen. An information value is considered to be a value that will be of use to the SRM user, but insufficient information is available to assess the uncertainty associated with the value [1]. Information values cannot be used to establish metrological traceability.

Expiration of Certification: The certification of **SRM 1941b** is valid, within the measurement uncertainty specified, until **01 October 2020**, provided the SRM is handled and stored in accordance with the instructions given in this certificate (see "Instructions for Handling, Storage, and Use"). This certification is nullified if the SRM is damaged, contaminated, or otherwise modified.

Maintenance of SRM Certification: NIST will monitor this SRM over the period of its certification. If substantive technical changes occur that affect the certification before the expiration of this certificate, NIST will notify the purchaser. Registration (see attached sheet or register online) will facilitate notification.

Coordination of the technical measurements leading to the certification of this material was under the leadership of M.M. Schantz and S.A. Wise of the NIST Chemical Sciences Division.

Analytical measurements for the certification of SRM 1941b were performed at NIST by J.R. Kucklick, B.J. Porter, D.L. Poster, M.M. Schantz, P. Schubert, S. Tutschku, and L.L. Yu of the NIST Chemical Sciences Division.

Carlos A. Gonzalez, Chief
Chemical Sciences Division

Robert L. Watters, Jr., Director
Office of Reference Materials

Gaithersburg, MD 20899
Certificate Issue Date: 16 January 2015

Measurements for TOC were provided by a commercial laboratory and T.L. Wade of the Geochemical and Environmental Research Group, Texas A&M University (College Station, TX). The carbon, hydrogen, and nitrogen data were provided by a commercial laboratory. Results for the PAHs, PCBs, and chlorinated pesticides from 38 laboratories (see Appendix A) that participated in an interlaboratory comparison exercise coordinated by NIST were used. Results for the alkylated PAH groups, hopanes, and steranes from 33 laboratories (see Appendix B) that participated in another interlaboratory comparison exercise coordinated by NIST were also used.

Collection and preparation of SRM 1941b were performed by M.P. Cronise and C.N. Fales of the NIST Office of Reference Materials and B.J. Porter and M.M. Schantz of the NIST Chemical Sciences Division. The sediment material was collected with the assistance of G.G. Lauenstein, J. Collier, and J. Lewis (National Oceanic and Atmospheric Administration, Silver Spring, MD).

Consultation on the statistical design of the experimental work and evaluation of the data were provided by S.D. Leigh and J.H. Yen of the NIST Statistical Engineering Division.

Support aspects involved in the issuance of this SRM were coordinated through the NIST Office of Reference Materials.

INSTRUCTIONS FOR HANDLING, STORAGE, AND USE

Handling: This material is naturally occurring marine sediment from an urban area and may contain constituents of unknown toxicities; therefore, caution and care should be exercised during its handling and use.

Storage: SRM 1941b must be stored in its original bottle at temperatures less than 30 °C and away from direct sunlight.

Use: Prior to removal of subsamples for analysis, the contents of the bottle should be mixed. The mass fractions of constituents in SRM 1941b are reported on a dry-mass basis. The SRM, as received, contains a mass fraction of approximately 2.4 % moisture (see "Conversion to Dry-Mass Basis"). The sediment sample should be dried to a constant mass before weighing for analysis; or a separate subsample of the sediment should be removed from the bottle at the time of analysis and dried to determine the mass fraction on a dry-mass basis. If the constituents of interest are volatile, then the moisture must be determined with a separate subsample.

PREPARATION AND ANALYSIS[1]

Sample Collection and Preparation: The sediment used to prepare this SRM was collected from the Chesapeake Bay at the mouth of the Baltimore (MD) Harbor near the Francis Scott Key Bridge (39°12.3'N and 76°31.4'W). This location is very near the site where SRM 1941 and SRM 1941a were collected. The sediment was collected using a Kynar-coated modified Van Veen-type grab sampler. A total of approximately 3300 kg of wet sediment was collected from the site. The sediment was freeze-dried, sieved at 150 µm (100 % passing), homogenized in a cone blender, radiation sterilized (^{60}Co), and then packaged in screw-capped amber glass bottles each containing approximately 50 g.

Conversion to Dry-Mass Basis: The results for the constituents in SRM 1941b are reported on a dry-mass basis; however, the material "as received" contains residual moisture. The amount of moisture in SRM 1941b was determined by measuring the mass loss after freeze-drying subsamples of 1.1 g to 1.3 g for four days at 1 Pa with a –10 °C shelf temperature and a –50 °C condenser temperature. The moisture content in SRM 1941b at the time of the certification analyses was 2.39 % ± 0.08 % (95 % confidence level). Analytical results for the organic constituents were determined on an as-received basis and then converted to a dry-mass basis by dividing by the conversion factor of 0.9761 (gram dry mass per gram as-received mass).

Polycyclic Aromatic Hydrocarbons: The general approach used for the value assignment of the PAHs in SRM 1941b was similar to that reported in detail elsewhere [2]. The approach consisted of combining results from analyses using various combinations of different extraction techniques and solvents, clean-up/isolation procedures, and chromatographic separation and detection techniques: Soxhlet extraction and pressurized-fluid extraction (PFE) using dichloromethane (DCM) or a hexane/acetone mixture, cleanup of the extracts using solid-phase extraction (SPE) or normal-phase liquid chromatography (LC), followed by analysis using the following techniques: (1) reversed-phase liquid chromatography with fluorescence detection (LC-FL) analysis of the total PAH fraction, (2) reversed-phase

[1] Certain commercial equipment, instruments or materials are identified in this certificate to adequately specify the experimental procedure. Such identification does not imply recommendation or endorsement by the National Institute of Standards

LC-FL analysis of isomeric PAH fractions isolated by normal-phase LC (i.e., multidimensional LC), (3) gas chromatography/mass spectrometry (GC/MS) analysis of the PAH fraction on three stationary phases of different selectivity, i.e., a 5 % (all column compositions are given as mole fractions in %) phenyl-substituted methylpolysiloxane phase, a 50 % phenyl-substituted methylpolysiloxane phase, and a relatively non-polar proprietary phase.

Three sets of GC/MS results, designated as GC/MS (I), GC/MS (II), and GC/MS (III), were obtained using three columns with different selectivities for the separation of PAHs. For GC/MS (I) analyses, duplicate subsamples of approximately 1 g from ten bottles of SRM 1941b were extracted using PFE with DCM. Copper powder was added to the extract to remove elemental sulfur. The concentrated extract was passed through an aminopropyl SPE cartridge and eluted with 2 % DCM in hexane (all solvent concentrations are given as volume fractions in %). The processed extract was then analyzed by GC/MS using a 0.25 mm i.d. × 60 m fused silica capillary column with a 5 % phenyl-substituted methylpolysiloxane phase (0.25 µm film thickness; DB-5 MS, J&W Scientific, Folsom, CA). The GC/MS (II) analyses were performed using 5 g subsamples from six bottles of SRM 1941b. These samples were extracted using PFE with DCM. The high molecular mass compounds were removed from the extracts using size exclusion chromatography (SEC) with a preparative-scale divinylbenzene-polystyrene column (10 µm particle size with 10 nm diameter pores), and the sulfur was removed from the extracts by adding copper powder. The concentrated extract was passed through an aminopropyl SPE cartridge and eluted with 10 % DCM in hexane. The analysis was by GC/MS using a 0.25 mm i.d. × 60 m fused silica capillary column with a 50 % phenyl-substituted methylpolysiloxane phase (0.25 µm film thickness; DB-17 MS, J&W Scientific). For the GC/MS (III), 9 g subsamples from six bottles of SRM 1941b were Soxhlet-extracted for 18 h with 250 mL of a mixture of 50 % hexane/50 % acetone. Copper powder was added to the extract to remove elemental sulfur, and the concentrated extract was passed through a silica SPE cartridge and eluted with 10 % DCM in hexane. The processed extract was then analyzed by GC/MS using a 0.25 mm i.d. × 60 m fused silica capillary column with a relatively non-polar proprietary phase (0.25 µm film thickness; DB-XLB, J&W Scientific).

Two sets of LC-FL results, designated as LC-FL (total) and LC-FL (isomer), were used in the certification process. For the LC-FL (total), subsamples of approximately 1 g from six bottles of SRM 1941b were extracted using PFE with a mixture of 50 % hexane/50 % acetone. The extracts were concentrated and then processed through an aminopropylsilane SPE cartridge using 2 % DCM in hexane to obtain the total PAH fraction. For the LC-FL (isomer), a 5 g subsample from the six bottles was extracted using PFE with DCM and processed through an aminopropylsilane SPE cartridge using 10 % DCM in hexane; the PAH fraction was then fractionated further on a semi-preparative aminopropylsilane column (µBondapak NH_2, 9 mm i.d. × 30 cm, Waters Associates, Milford, MA) to isolate isomeric PAH fractions as described previously [3–6]. The total PAH fraction and the isomeric PAH fractions were analyzed using a 5 µm particle-size polymeric octadecylsilane (C_{18}) column (4.6 mm i.d. × 25 cm, Hypersil-PAH, Keystone Scientific, Inc., Bellefonte, PA) with wavelength-programmed fluorescence detection [4,5].

For the GC/MS and LC-FL measurements described above, selected perdeuterated PAHs were added to the sediment prior to solvent extraction for use as internal standards for quantification purposes.

In addition to the analyses performed at NIST, SRM 1941b was used in an interlaboratory comparison exercise in 1999 as part of the NIST Intercomparison Exercise Program for Organic Contaminants in the Marine Environment [7]. Results from 38 laboratories that participated in this exercise were used as the sixth data set in the determination of the certified values for PAHs in SRM 1941b. The laboratories participating in this exercise used the analytical procedures routinely used in their laboratories to measure the analytes of interest.

Homogeneity Assessment for PAHs: The homogeneity of SRM 1941b was assessed by analyzing duplicate samples of approximately 1 g from ten bottles selected by stratified random sampling. Samples were extracted, processed, and analyzed as described above for GC/MS (I). No statistically significant differences among bottles were observed for the PAHs at this sample size.

PAH Isomers of Molecular Mass 300 and 302: For the determination of the molecular mass 300 and 302 isomers, three subsamples of approximately 5 g each were extracted using PFE with DCM. The extracts were then concentrated with a solvent change to hexane and passed through an aminopropyl SPE cartridge and eluted with 10 % DCM in hexane. The processed extract was then analyzed by GC/MS using a 0.25 mm i.d. × 60 m fused silica capillary column with a 50 % phenyl-substituted methylpolysiloxane phase (0.25 µm film thickness; DB-17MS, J&W Scientific). Perdeuterated dibenzo[*a,i*]pyrene was added to the sediment prior to extraction for use as an internal standard [8].

PCBs and Chlorinated Pesticides: The general approach used for the determination of PCBs and chlorinated pesticides in SRM 1941b consisted of combining results from analyses using various combinations of different extraction techniques and solvents, cleanup/isolation procedures, and chromatographic separation and detection techniques. Techniques and solvents included Soxhlet extraction and PFE using DCM or a hexane/acetone mixture,

clean-up/isolation using SPE or LC, followed by analysis using GC/MS and gas chromatography with electron capture detection (GC-ECD) on two columns with different selectivity for the separation of PCBs and chlorinated pesticides. The analytical methods are described in detail elsewhere [2].

Six sets of results were obtained and designated as GC-ECD (I) A and B, GC/MS (I) A and B, GC/MS (II), and Interlaboratory Comparison Exercise. For the GC-ECD (I) analyses, approximately 10 g subsamples from six bottles of SRM 1941b were extracted using PFE with DCM. Copper powder was added to the extract to remove elemental sulfur, and SEC, as described above, was used to remove the high molecular mass compounds. The concentrated extract was then fractionated on a semi-preparative aminopropylsilane column to isolate two fractions containing: (1) the PCBs and lower-polarity pesticides and (2) the more polar pesticides. GC-ECD analyses of the two fractions were performed on two columns of different selectivities for PCB separations: 0.25 mm × 60 m fused silica capillary column with a 5 % phenyl-substituted methylpolysiloxane phase (0.25 μm film thickness; DB-5, J&W Scientific), and a 0.25 mm × 60 m fused silica capillary column with a non-polar proprietary phase (0.25 μm film thickness; DB-XLB, J&W Scientific). The results from the 5 % phenyl phase are designated as GC-ECD (IA) and the results from the proprietary phase are designated as GC-ECD (IB). For the GC-ECD analyses, two PCB congeners that are not significantly present in the sediment extract (PCB 103 and PCB 198 [9,10]) and endosulfan I-d_4, 4,4'-DDE-d_8, 4,4'-DD-d_8, and 4,4'-DDT-d_8 were added to the sediment prior to extraction for use as internal standards for quantification purposes.

Two sets of results were obtained by GC/MS. For GC/MS (I), approximately 9 g subsamples from six bottles were Soxhlet- extracted with a mixture of 50 % hexane/50 % acetone for approximately 18 h. Copper powder was added to the extract to remove elemental sulfur, and the concentrated extract was passed through a silica SPE cartridge and eluted with 10 % DCM in hexane. The processed extract was then analyzed by GC/MS with two ionization modes, electron impact (EI) and negative ion chemical ionization (NICI). The GC/MS EI method, GC/MS (IA), used a 0.25 mm i.d. × 60 m fused silica capillary column with a relatively non-polar proprietary phase (0.25 μm film thickness; DB-XLB, J&W Scientific). The GC/MS NICI method, GC/MS (IB), used a 0.25 mm i.d. × 60 m fused silica capillary column with a 5 % phenyl-substituted methylpolysiloxane phase (0.25 μm film thickness; DB-5MS, J&W Scientific). The GC/MS (II) results were obtained in the same manner as the GC/MS (IA) analyses except that three subsamples were Soxhlet-extracted with DCM for approximately 18 h. For the GC/MS analyses, selected carbon-13 labeled PCB congeners and chlorinated pesticides were added to the sediment prior to extraction for use as internal standards for quantification purposes.

In addition to the analyses performed at NIST, SRM 1941b was used in an interlaboratory comparison exercise in 1999 as part of the NIST Intercomparison Exercise Program for Organic Contaminants in the Marine Environment [7]. Results from 38 laboratories that participated in this exercise were used as the sixth data set in the determination of the certified values for PCB congeners and chlorinated pesticides in SRM 1941b. The laboratories participating in this exercise used the analytical procedures routinely used in their laboratories to measure the analytes of interest.

The reference value for PCB 77 was determined from a separate fraction. The samples were extracted and processed as for GC-ECD (I) above. The first (PCB and lower-polarity pesticide) fraction from the semi-preparative aminopropylsilane column was further fractionated using a Cosmosil PYE (pyrenylethyl group bonded) column (5 μm particle size, 4.6 mm i.d. × 25 cm ; Phenomenex, Torrance, CA) [11]. Three fractions were collected: the first fraction contained the pesticides and multi-*ortho* PCBs, the second fraction contained the polychlorinated naphthalenes, non-*ortho* PCB congeners, and some mono-*ortho* PCB congeners, and the third fraction removed the residual planar compounds from the column. The second fraction was analyzed by GC/MS NICI using the same column as GC/MS (IB) above. Carbon-13 labeled PCB 77 was used as an internal standard for quantification purposes.

Alkylated PAH Groups, Hopanes, and Steranes: SRM 1941b was used in an interlaboratory comparison exercise in 2011 [12]. Results from 33 laboratories that participated in this exercise were used in the determination of the reference values for alkylated PAH groups, hopanes, and steranes in SRM 1941b. Note that not all laboratories returned data for each analyte. The laboratories participating in this exercise used the analytical procedures routinely used in their laboratories to measure the analytes of interest. For the alkylated PAHs, the majority of the laboratories (>90 %) used the parent PAH for determination of the response factor for the corresponding alkylated group.

Total Organic Carbon (TOC): Two laboratories provided results for TOC using similar procedures. Briefly, subsamples of approximately 200 mg were reacted with 6 mol/L hydrochloric acid and rinsed with deionized water prior to combustion in a gas fusion furnace. The carbon monoxide and carbon dioxide produced were measured and compared to a blank for calculation of the percent TOC. Each laboratory analyzed subsamples from three bottles of SRM 1941b. One of the laboratories also analyzed three subsamples from three bottles of SRM 1941b for carbon, hydrogen, and nitrogen.

Table 1. Certified Mass Fraction Values for PAHs in SRM 1941b

PAHs	Mass Fractions[a] (µg/kg)		
Naphthalene[b,c,d,e,f,g]	848	±	95[h]
Fluorene[b,c,d,e,f,g]	85	±	15[h]
Phenanthrene[b,c,d,e,f,g]	406	±	44[h]
Anthracene[b,c,d,e,f,g]	184	±	18[h]
3-Methylphenanthrene[b,c,d]	105	±	13[h]
2-Methylphenathrene[b,c,d]	128	±	14[h]
1-Methylphenanthrene[b,c,d,g]	73.2	±	5.9[h]
Fluoranthene[b,c,d,e,f,g]	651	±	50[h]
Pyrene[b,c,d,e,f,g]	581	±	39[h]
Benz[*a*]anthracene[b,c,d,e,f,g]	335	±	25[h]
Chrysene[d,f]	291	±	31[h]
Triphenylene[d,f]	108	±	5[i]
Benzo[*b*]fluoranthene[c,e]	453	±	21[h]
Benzo[*k*]fluoranthene[b,c,d,e]	225	±	18[h]
Benzo[*e*]pyrene[b,c,d,g]	325	±	25[h]
Benzo[*a*]pyrene[b,c,d,f,g]	358	±	17[h]
Perylene[b,c,d,f,g]	397	±	45[h]
Benzo[*ghi*]perylene[b,c,d,f,g]	307	±	45[h]
Indeno[1,2,3-*cd*]pyrene[b,c,d,f,g]	341	±	57[h]
Dibenz[*a,j*]anthracene[b,c,d,f]	48.9	±	4.6[h]
Dibenz[*a,c*]anthracene[c,f]	36.7	±	5.2[h]
Dibenz[*a,h*]anthracene[c,f]	53	±	10[h]
Benzo[*b*]chrysene[b,c,d,f]	53	±	12[h]
Picene[b,c,d]	46.6	±	4.7[h]

[a] Mass fractions reported on dry-mass basis; material as received contains approximately 2.4 % moisture.
[b] GC/MS (I) on 5 % phenyl-substituted methylpolysiloxane phase after PFE with DCM.
[c] GC/MS (II) on 50 % phenyl-substituted methylpolysiloxane phase after PFE with DCM.
[d] GC/MS (III) on a relatively non-polar proprietary phase after Soxhlet extraction with 50 % hexane/50 % acetone mixture.
[e] LC-FL (total) of total PAH fraction after PFE with DCM.
[f] LC-FL (isomer) of isomeric PAH fractions after PFE with DCM.
[g] 1999 Interlaboratory Comparison Study [7] with 21 to 29 laboratories submitting data for each PAH.
[h] Certified values are weighted means of the results from two to six analytical methods [13]. The uncertainty listed with each value is an expanded uncertainty about the mean, with coverage factor 2 (approximately 95 % confidence), calculated by combining a between-method variance incorporating inter-method bias with a pooled within-method variance following the ISO/JCGM Guide [14,15]. The measurand is the total mass fraction of the constituent listed and the values are metrologically traceable to the SI unit of mass, expressed as micrograms per kilogram on a dry-mass basis.
[i] The certified value is an unweighted mean of the results from two analytical methods. The uncertainty listed with the value is an expanded uncertainty about the mean, with coverage factor 2, calculated by combining a between-method variance [16] with a pooled, within-method variance following the ISO/JCGM Guide [14,15]. The measurand is the total mass fraction of the constituent listed and the value is metrologically traceable to the SI unit of mass, expressed as micrograms per kilogram on a dry-mass basis.

Table 2. Certified Mass Fraction Values for PCB Congeners[a] in SRM 1941b

PCB Congeners			Mass Fractions[b] (µg/kg)		
PCB	8	(2,4'-Dichlorobiphenyl)[c,d,e,f,g]	1.65	±	0.19[h]
PCB	18	(2,2',5-Trichlorobiphenyl)[c,d,e,f,g]	2.39	±	0.29[h]
PCB	28	(2,4,4'-Trichlorobiphenyl)[c,d,e,f,g]	4.52	±	0.57[h]
PCB	31	(2,4',5-Trichlorobiphenyl)[c,e,f]	3.18	±	0.41[h]
PCB	44	(2,2'3,5'-Tetrachlorobiphenyl)[c,d,e,f,g]	3.85	±	0.20[i]
PCB	49	(2,2'4,5'-Tetrachlorobiphenyl)[c,d,e,f]	4.34	±	0.28[i]
PCB	52	(2,2',5,5'-Tetrachlorobiphenyl)[c,d,e,f,g]	5.24	±	0.28[i]
PCB	66	(2,3',4,4'-Tetrachlorobiphenyl)[c,e,f,g,j]	4.96	±	0.53[i]
PCB	87	(2,2',3,4,5'-Pentachlorobiphenyl)[c,d,f,j]	1.14	±	0.16[h]
PCB	95	(2,2',3,5',6-Pentachlorobiphenyl)[c,e,f,g]	3.93	±	0.62[i]
PCB	99	(2,2',4,4',5-Pentachlorobiphenyl)[c,d,e,f,g]	2.90	±	0.36[i]
PCB	101	(2,2',4,5,5'-Pentachlorobiphenyl)[c,e,f,g,j]	5.11	±	0.34[i]
PCB	105	(2,3,3',4,4'-Pentachlorobiphenyl)[c,d,e,f,g,j]	1.43	±	0.10[i]
PCB	110	(2,3,3',4',6-Pentachlorobiphenyl)[c,e,f,j]	4.62	±	0.36[i]
PCB	118	(2,3',4,4',5-Pentachlorobiphenyl)[c,d,e,f,g,j]	4.23	±	0.19[i]
PCB	128	(2,2',3,3',4,4'-Hexachlorobiphenyl)[c,d,e,f,g,j]	0.696	±	0.044[i]
PCB	138	(2,2',3,4,4',5'-Hexachlorobiphenyl)[c,e,f,j]	3.60	±	0.28[i]
PCB	149	(2,2',3,4',5',6-Hexachlorobiphenyl)[c,d,e,j]	4.35	±	0.26[h]
PCB	153	(2,2',4,4',5,5'-Hexachlorobiphenyl)[c,d,e,f,g,j]	5.47	±	0.32[i]
PCB	156	(2,3,3',4,4',5-Hexachlorobiphenyl)[c,d,e,f,j]	0.507	±	0.090[h]
PCB	170	(2,2',3,3',4,4',5-Heptachlorobiphenyl)[c,d,e,f,g,j]	1.35	±	0.09[i]
PCB	180	(2,2',3,4,4',5,5'-Heptachlorobiphenyl)[c,d,e,f,g,j]	3.24	±	0.51[i]
PCB	183	(2,2',3,4,4',5',6-Heptachlorobiphenyl)[c,d,e,j]	0.979	±	0.087[h]
PCB	187	(2,2',3,4',5,5',6-Heptachlorobiphenyl)[c,d,e,f,g,j]	2.17	±	0.22[i]
PCB	194	(2,2',3,3',4,4',5,5'-Octachlorobiphenyl)[c,d,e,j]	1.04	±	0.06[h]
PCB	195	(2,2',3,3',4,4',5,6-Octachlorbiphenyl)[c,e,g,j]	0.645	±	0.060[i]
PCB	201	(2,2',3,3',4,5',6,6'-Octachlorobiphenyl)[c,e,j]	0.777	±	0.034[h]
PCB	206	(2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl)[c,e,f,g,j]	2.42	±	0.19[i]
PCB	209	Decachlorobiphenyl[c,d,e,f,g,j]	4.86	±	0.45[i]

[a] PCB congeners are numbered according to the scheme proposed by Ballschmiter and Zell [9] and later revised by Schulte and Malisch [10] to conform to IUPAC rules, except PCB 201. Under the Ballschmiter and Zell numbering system, the IUPAC PCB 201 is listed as PCB 200.

[b] Mass fractions reported on dry-mass basis; material as received contains approximately 2.4 % moisture.

[c] GC/MS (IA) on a relatively non-polar proprietary phase after Soxhlet extraction with 50 % hexane/50 % acetone mixture.

[d] GC-ECD (IA) on 5 % phenyl-substituted methylpolysiloxane phase after PFE extraction with DCM.

[e] GC-ECD (IB) on a relatively non-polar proprietary phase; same extracts analyzed as in GC-ECD (IA).

[f] GC/MS (II) on a relatively non-polar proprietary phase after Soxhlet extraction with DCM.

[g] 1999 Interlaboratory Comparison Study [7] with 13 to 31 laboratories submitting data for each PCB congener.

[h] Certified values are unweighted means of the results from three to five analytical methods. The uncertainty listed with each value is an expanded uncertainty about the mean, with coverage factor 2, calculated by combining a between-method variance [16] with a pooled, within method variance following the ISO/JCGM Guide [14,15]. The measurand is the total mass fraction of the constituent listed and the values are metrologically traceable to the SI unit of mass, expressed as micrograms per kilogram on a dry-mass basis.

[i] Certified values are weighted means of the results from three to six analytical methods [13]. The uncertainty listed with each value is an expanded uncertainty about the mean, with coverage factor 2 (approximately 95 % confidence), calculated by combining a between-method variance incorporating inter-method bias with a pooled within-method variance following the ISO/JCGM Guide [14,15]. The measurand is the total mass fraction of the constituent listed and the values are metrologically traceable to the SI unit of mass, expressed as micrograms per kilogram on a dry-mass basis.

[j] GC/MS (IB) on 5 % phenyl-substituted methylpolysiloxane phase; same extracts analyzed as in GC/MS (IA).

Table 3. Certified Mass Fraction Values for Chlorinated Pesticides in SRM 1941b

Chlorinated Pesticides	Mass Fractions[a] (µg/kg)
Hexachlorobenzene[b,c,d,e]	5.83 ± 0.38[f]
cis-Chlordane[b,c,d,e,g]	0.85 ± 0.11[h]
trans-Chlordane[b,c,e]	0.566 ± 0.093[f]
cis-Nonachlor[b,e,g]	0.378 ± 0.053[h]
trans-Nonachlor[b,c,d,e,g]	0.438 ± 0.073[f]
4,4'-DDE[b,d,e,g]	3.22 ± 0.28[h]
4,4'-DDD[b,d,e,g]	4.66 ± 0.46[h]

[a] Mass fractions reported on dry-mass basis; material as received contains approximately 2.4 % moisture.
[b] GC/MS (IA) on a relatively non-polar proprietary phase after Soxhlet extraction with 50 % hexane/50 % acetone mixture.
[c] GC/MS (IB) on 5 % phenyl-substituted methylpolysiloxane phase; same extracts analyzed as in GC/MS (IA).
[d] GC/MS (II) on a relatively non-polar proprietary phase after Soxhlet extraction with DCM.
[e] 1999 Interlaboratory Comparison Study [7] with 13 to 31 laboratories submitting data for each pesticide.
[f] Certified values are unweighted means of the results from three to five analytical methods. The uncertainty listed with each value is an expanded uncertainty about the mean, with coverage factor 2, calculated by combining a between-method variance [16] with a pooled, within-method variance following the ISO/JCGM Guide [14,15]. The measurand is the total mass fraction of the constituent listed and the values are metrologically traceable to the SI unit of mass, expressed as micrograms per kilogram on a dry-mass basis.
[g] GC-ECD (IA) on 5 % phenyl-substituted methylpolysiloxane phase after PFE extraction with DCM.
[h] Certified values are weighted means of the results from three to five analytical methods [13]. The uncertainty listed with each value is an expanded uncertainty about the mean, with coverage factor 2 (approximately 95 % confidence), calculated by combining a between-method variance incorporating inter-method bias with a pooled within-method variance following the ISO/JCGM Guide [14,15]. The measurand is the total mass fraction of the chlorinated pesticides listed and the values listed are metrologically traceable to the SI unit of mass, expressed as micrograms per kilogram on a dry-mass basis.

Table 4. Reference Mass Fraction Values for PAHs in SRM 1941b

PAHs	Mass Fractions[a] (µg/kg)		
1-Methylnaphthalene[b,c,d,e]	127	±	14[f]
2-Methylnaphthalene[b,c,d,e]	276	±	53[f]
2,6-Dimethylnaphthalene[b,c,d,e]	75.9	±	4.5[f]
2,3,5-Trimethylnaphthalene[b,c,d,e]	25.5	±	5.1[f]
Biphenyl[b,c,d,e]	74.0	±	8.0[f]
Acenaphthylene[b,c,d,e]	53.3	±	6.4[f]
Acenaphthene[b,c,d,e]	38.4	±	5.2[f]
9-Methylphenanthrene[c]	63.5	±	2.5[g]
4-Methylphenanthrene and 9-Methylphenanthrene[b,d]	80.1	±	4.8[f]
2-Methylanthracene[c,d]	36	±	15[f]
8-Methylfluoranthene[b]	49.5	±	2.7[g]
7-Methylfluoranthene[b]	45.4	±	1.5[g]
1-Methylfluoranthene[b]	42.4	±	2.1[g]
3-Methylfluoranthene[b]	28.8	±	1.3[g]
2-Methylpyrene[b]	78.7	±	4.0[g]
4-Methylpyrene[b]	66.4	±	2.6[g]
1-Methylpyrene[b]	52.5	±	2.3[g]
Acephenanthrene[d]	30.5	±	1.9[g]
Benzo[*c*]phenanthrene[b,c,d]	58	±	15[f]
Benzo[*a*]fluoranthene[b,c,d]	73	±	18[f]
Benzo[*j*]fluoranthene[c]	217	±	5[g]
Indeno[1,2,3-*cd*]fluoranthene[d]	9.63	±	0.34[g]
Pentaphene[d]	25.3	±	1.0[g]

[a] Mass fractions reported on dry-mass basis; material as received contains approximately 2.4 % moisture.
[b] GC/MS (I) on 5 % phenyl-substituted methylpolysiloxane phase after PFE with DCM.
[c] GC/MS (II) on 50 % phenyl-substituted methylpolysiloxane phase after PFE with DCM.
[d] GC/MS (III) on a relatively non-polar proprietary phase after Soxhlet extraction with 50 % hexane/50 % acetone mixture.
[e] 1999 Interlaboratory Comparison Study [7] with 14 to 26 laboratories submitting data for each PAH.
[f] Reference values are weighted means of the results from two to four analytical methods [13]. The uncertainty listed with each value is an expanded uncertainty about the mean, with coverage factor 2 (approximately 95 % confidence), calculated by combining a between-method variance incorporating inter-method bias with a pooled within-method variance following the ISO/JCGM Guide [14,15]. The measurand is the total mass fraction of PAHs listed as determined by the methods indicted. The values are metrologically traceable to the SI unit of mass, expressed as micrograms per kilogram on a dry-mass basis.
[g] Reference values are the means of results obtained by NIST using one analytical technique. The expanded uncertainty, U, is calculated as $U = ku_c$, where u_c is one standard deviation of the analyte mean, and the coverage factor, k, is determined from the Student's t-distribution for the associated degrees of freedom (19 for footnote b and 5 for footnotes c and d) and 95 % confidence level for each analyte. The measurand is the total mass fraction of the PAHs listed as determined by the method indicted. The values listed are metrologically traceable to the SI unit of mass, expressed as micrograms per kilogram on a dry-mass basis.

Table 5. Reference Mass Fraction Values for PAHs of Molecular Mass 300 and 302 in SRM 1941b

PAHs of Molecular Mass 300 and 302	Mass Fractions[a,b,c] (µg/kg)		
Coronene	72.6	±	4.7
Dibenzo[*b,e*]fluoranthene	10.3	±	0.3
Naphtho[1,2-*b*]fluoranthene	91.0	±	3.1
Naphtho[1,2-*k*]fluoranthene and Naphtho[2,3-*j*]fluoranthene	79.8	±	2.5
Naphtho[2,3-*b*]fluoranthene	23.5	±	0.3
Dibenzo[*b,k*]fluoranthene	95.6	±	3.1
Dibenzo[*a,k*]fluoranthene	26.6	±	0.4
Dibenzo[*j,l*]fluoranthene	63.8	±	1.8
Dibenzo[*a,l*]pyrene	11.1	±	1.0
Naphtho[2,3-*k*]fluoranthene	10.7	±	0.6
Naphtho[1,2-*a*]pyrene	16.7	±	1.4
Naphtho[2,3-*e*]pyrene	33.2	±	2.3
Dibenzo[*a,e*]pyrene	76.1	±	3.6
Naphtho[2,1-*a*]pyrene	59.2	±	1.8
Dibenzo[*e,i*]pyrene	35.0	±	2.4
Naphtho[2,3-*a*]pyrene	16.5	±	0.6
Benzo[*b*]perylene	38.2	±	1.2
Dibenzo[*a,i*]pyrene	25.5	±	1.0
Dibenzo[*a,h*]pyrene	6.94	±	0.29

[a] Mass fractions reported on dry-mass basis; material as received contains approximately 2.4 % moisture.

[b] Reference values are the means of results obtained by NIST using one analytical technique. The expanded uncertainty, U, is calculated as $U = ku_c$, where u_c is one standard deviation of the analyte mean, and the coverage factor, k, is determined from the Student's t-distribution for two degrees of freedom and 95 % confidence level for each analyte. The measurand is the total mass fraction of the constituent listed as determined by the method indicted. The values are metrologically traceable to the SI unit of mass, expressed as micrograms per kilogram on a dry-mass basis.

[c] GC/MS on 50 % phenyl-substituted methylpolysiloxane phase after PFE with DCM [8].

Table 6. Reference Mass Fraction Values for PCB Congeners[a] in SRM 1941b

PCB Congeners			Mass Fractions[b,c] (µg/kg)		
PCB	45	(2,2',3,6-Tetrachlorobiphenyl)[d,e]	0.73	±	0.12
PCB	56	(2,3,3',4'-Tetrachlorobiphenyl)[d,f,g]	1.21	±	0.11
PCB	63	(2,3,4',5-Tetrachlorobiphenyl)[e,f,g]	0.213	±	0.040
PCB	70	(2,3',4',5-Tetrachlorobiphenyl)[e,f,g]	4.99	±	0.29
PCB	74	(2,4,4',5-Tetrachlorobiphenyl)[e,f,g]	2.04	±	0.15
PCB	77	(3,3',4,4'-Tetrachlorobiphenyl)[h]	0.31	±	0.03
PCB	107	(2,3,3',4',5-Pentachlorobiphenyl)[d,e,f,g]	0.628	±	0.028
PCB	132	(2,2',3,3',4,6'-Hexachlorobiphenyl)[d,f,g]	1.28	±	0.27
PCB	146	(2,2',3,4',5,5'-Hexachlorobiphenyl)[e,f,g]	1.22	±	0.12
PCB	158	(2,3,3',4,4',6-Hexachlorobiphenyl)[d,e,f,g]	0.65	±	0.15
PCB	163	(2,3,3',4',5,6-Hexachlorobiphenyl)[e,f,g]	1.28	±	0.06
PCB	174	(2,2',3,3',4,5,6'-Heptachlorobiphenyl)[d,e,f,g]	1.51	±	0.39
PCB	193	(2,3,3',4',5,5',6-Heptachlorobiphenyl)[d,e,f,g]	0.292	±	0.075

[a] PCB congeners are numbered according to the scheme proposed by Ballschmiter and Zell [9] and later revised by Schulte and Malisch [10] to conform with IUPAC rules, except PCB 107. Under the Ballschmiter and Zell numbering system, the IUPAC PCB 107 is listed as PCB 108.

[b] Mass fractions reported on dry-mass basis; material as received contains approximately 2.4 % moisture.

[c] For these PCB congeners except PCB 77, the reference values are unweighted means of the results from two to four analytical methods. The uncertainty listed with each value is an expanded uncertainty about the mean, with coverage factor 2, calculated by combining a between-method variance [16] with a pooled within-method variance following the ISO/JCGM Guide [14,15]. For PCB 77, the reference value is the mean of results obtained by NIST using one analytical technique. The expanded uncertainty, U, is calculated as $U = ku_c$, where u_c is one standard deviation of the analyte mean, and the coverage factor, k, is determined from the Student's t-distribution corresponding to two degrees of freedom and 95 % confidence level for PCB 77. The measurand is the total mass fraction of the PCB Congeners listed as determined by the method or methods indicted. The values listed are metrologically traceable to the SI unit of mass, expressed as microgram per kilogram on a dry-mass basis.

[d] GC-ECD (IA) on 5 % phenyl-substituted methylpolysiloxane phase after PFE extraction with DCM.

[e] GC-ECD (IB) on a relatively non-polar proprietary phase; same extracts analyzed as in GC-ECD (IA).

[f] GC/MS (IA) on a relatively non-polar proprietary phase after Soxhlet extraction with 50 % hexane/50 % acetone mixture.

[g] GC/MS (IB) on 5 % phenyl-substituted methylpolysiloxane phase; same extracts analyzed as in GC/MS (IA).

[h] GC/MS NICI on a 5 % phenyl-substituted methylpolysiloxane phase; same extracts analyzed as in GC-ECD (I) fractionated using a PYE column.

Table 7. Reference Mass Fraction Values for Selected Chlorinated Pesticides in SRM 1941b

Chlorinated Pesticides	Mass Fractions[a,b] (µg/kg)		
2,4'-DDE[c,d]	0.38	±	0.12
4,4'-DDT[e,f]	1.12	±	0.42

[a] Mass Fractions reported on dry-mass basis; material as received contains approximately 2.4 % moisture.
[b] The reference values are unweighted means of the results from two analytical methods. The uncertainty listed with each value is an expanded uncertainty about the mean, with coverage factor 2, calculated by combining a between-method variance [16] with a pooled, within-method variance following the ISO/JCGM Guide [14,15]. The measurand is the total mass fraction of the chlorinated pesticides listed as determined by the methods indicted. The values listed are metrologically traceable to the SI unit of mass, expressed as micrograms per kilogram on a dry-mass basis.
[c] GC/MS (IB) on 5 % phenyl-substituted methylpolysiloxane phase; same extracts analyzed as in GC/MS (IA).
[d] GC-ECD (IB) on a relatively non-polar proprietary phase; same extracts analyzed as in GC-ECD (IA).
[e] GC/MS (II) on a relatively non-polar proprietary phase after Soxhlet extraction with DCM.
[f] 1999 Interlaboratory Comparison Study [7] with 10 laboratories submitting data for 4,4'-DDT.

Table 8. Reference Mass Fraction Values for Alkylated PAH Groups in SRM 1941b

Alkylated PAH Group	Mass Fraction[a,b] (µg/kg)		
C2-decalins	18	±	5
C4-decalins	41	±	4
C2-naphthalenes	187	±	53
C3-naphthalenes	158	±	42
C1-benzothiophenes	25	±	14
C2-benzothiophenes	20	±	11
C3-benzothiophenes	22	±	13
C4-benzothiophenes	18	±	5
C1-fluorenes	57	±	18
C2-fluorenes	122	±	43
C3-fluorenes	128	±	31
C1-phenanthrenes/anthracenes	313	±	99
C2-phenanthrenes/anthracenes	247	±	62
C3-phenanthrenes/anthracenes	165	±	46
C4-phenanthrenes/anthracenes	87	±	36
C1-dibenzothiophenes	54	±	13
C2-dibenzothiophenes	91	±	18
C3-dibenzothiophenes	84	±	15
C4-dibenzothiophenes	57	±	13
C1-fluoranthenes/pyrenes	252	±	48
C2-fluoranthenes/pyrenes	205	±	38
C3-fluoranthenes/pyrenes	102	±	22
C4-fluoranthenes/pyrenes	121	±	59
C1-benzanthraces/chrysenes/triphenylenes	208	±	43
C2-benzanthraces/chrysenes/triphenylenes	120	±	24
C3-benzanthraces/chrysenes/triphenylenes	73	±	31
C4-benzanthraces/chrysenes/triphenylenes	41	±	11

[a] The reference mass fraction value reported on a dry-mass basis is the median of results using one analytical technique. The expanded uncertainty, U, is calculated as $U = ku_c$, where u_c is one standard deviation of the median, and the coverage factor, $k = 2$. The measurand is the total mass fraction of the alkylated PAH groups listed as determined by the interlaboratory study methods. The values listed are metrologically traceable to the SI unit of mass fraction, expressed as micrograms per kilogram on a dry-mass basis.
[b] Data from the interlaboratory study [12].

Table 9. Reference Mass Fraction Values for Hopanes and Steranes in SRM 1941b

Hopane or Sterane	Mass Fraction[a,b] (µg/kg)		
17α(H)-22,29,30-Trisnorhopane	54	±	18
17α(H)-21β(H)-30-Norhopane	137	±	21
17α(H)-21β(H)-30-Hopane	215	±	44
17α(H)-21β(H)-22R-Homohopane	44	±	10
17α(H)-21β(H)-22S-Homohopane	48	±	13
5α(H)-14α(H),17α(H)-Cholestane 20R	41	±	11
5α(H)-14β(H),17β(H)-Cholestane 20R	27	±	6
5α(H)-14β(H),17β(H)-24-Methylcholestane 20R	21	±	8
5α(H)-14α(H),17α(H)-24-Ethylcholestane 20R	19	±	5
5α(H)-14β(H),17β(H)-24-Ethylcholestane 20R	41	±	9

[a] The reference mass fraction value reported on a dry-mass basis is the median of results using one analytical technique. The expanded uncertainty, U, is calculated as $U = ku_c$, where u_c is one standard deviation of the median, and the coverage factor, $k = 2$. The measurand is the total mass fraction of the constituent listed as determined by the methods used during the interlaboratory study. The values are metrologically traceable to the SI unit of mass, expressed as micrograms per kilogram on a dry-mass basis.
[b] Data from the interlaboratory study [12].

Table 10. Reference Mass Fraction Value for Total Organic Carbon in SRM 1941b

Total Organic Carbon (TOC)	2.99 % ± 0.24 %[a,b]

[a] Mass fraction is reported on a dry-mass basis; material as received contains approximately 2.4 % moisture.
[b] The reference value for total organic carbon is a weighted mean value from routine measurements made by two laboratories [21]. The uncertainty listed is an expanded uncertainty about the mean, with coverage factor 2 (approximately 95 % confidence), calculated by combining a between-method variance incorporating inter-method bias with a pooled within-method variance. The reporting follows the ISO/JCGM Guides [2]. The measurand is the total mass fraction of TOC listed as determined by the methods indicted. The values listed are metrologically traceable to the SI unit of mass, expressed as a percent on a dry-mass basis.

Table 11. Information Mass Fraction Values for Carbon, Hydrogen, and Nitrogen in SRM 1941b

Elements	Mass Fractions[a] (%)
Carbon	3.3
Hydrogen	1.2
Nitrogen	<0.5

[a] Mass fraction is reported on a dry-mass basis; material as received contains approximately 2.4 % moisture.

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[15] JCGM 101:2008; *Evaluation of measurement data – Supplement 1 to the "Guide to the expression of uncertainty in measurement" - Propagation of distributions using a Monte Carlo method*; JCGM (2008); available at http://www.bipm.org/utils/common/documents/jcgm/JCGM_101_2008_E.pdf (accessed Jan 2015).

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Certificate Revision History: 16 January 2015 (Corrected IUPAC name for PCB-56 and PCB-107; editorial changes); 10 June 2014 (Units corrected from mg/kg to µg/kg in Tables 8 and 9; editorial changes); 10 April 2012 (Reference value added for alkylated PAH groups, hopanes, and steranes; extension of certification period; editorial changes); 16 August 2004 (Reference values for the butyl tins removed; editorial changes); 15 July 2002 (Original certificate date).

Users of this SRM should ensure that the Certificate of Analysis in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srminfo@nist.gov; or via the Internet at http://www.nist.gov/srm.

APPENDIX A

The laboratories listed below performed measurements that contributed to the certification of PAHs, PCBs, and chlorinated pesticides in SRM 1941b Organics in Marine Sediment.

Arthur D. Little, Inc; Cambridge, MA
Axys Analytical Services; Sidney, BC, Canada
B & B Laboratories; College Station, TX
Battelle Ocean Sciences; Duxbury, MA
Bedford Institute of Oceanography; Dartmouth, NS, Canada
California Department of Fish and Game; Rancho Cordova, CA
Central Contra Costa Sanitary District; Martinez, CA
Chesapeake Biological Laboratory; Solomons, MD
Centro de Investigacionies Energeticas Medioambientales y Tecnologicas; Madrid, Spain
City of Los Angeles Environmental Monitoring Division; Playa del Rey, CA
City of San Jose Environmental Services Department; San Jose, CA
Columbia Analytical Services; Kelso, WA
East Bay Municipal Utility District; Oakland, CA
Florida Department of Environmental Protection; Tallahassee, FL
Manchester Environmental Laboratory; Port Orchard, WA
Murray State University; Murray, KY
Massachusetts Water Resources Authority Central Lab; Winthrop, MA
National Research Council of Canada; Ottawa, Ontario, Canada
National Oceanic and Atmospheric Association (NOAA), National Marine Fisheries Service (NMFS), Auke Bay Laboratory; Juneau, AK
NOAA, National Ocean Service/Center for Coastal Environmental Health and Biomolecular Research; Charleston, SC
NOAA, NMFS, Sandy Hook Marine Laboratory; Highlands, NJ
NOAA, NMFS, Northwest Fisheries Science Center; Seattle, WA
Orange County Sanitation District; Fountain Valley, CA
Philip Analytical Services; Burlington, Ontario, Canada
Serv de Hidrografia Naval; Buenos Aires, Argentina
Skidaway Institute of Technology; Savannah, GA
Southwest Laboratory of Oklahoma; Broken Arrow, OK
Severn Trent Knoxville Laboratory; Knoxville, TN
Texas A&M University, Geochemical and Environmental Research Group; College Station, TX
Texas Parks and Wildlife Department; San Marcos, TX
University of California at Los Angeles, Institute of Geophysics and Planetary Physics; Los Angeles, CA
University of Connecticut, Environmental Research Institute; Storrs, CT
University of Rhode Island, Graduate School of Oceanography; Narragansett, RI
US Department of Agriculture, Environmental Chemistry Laboratory; Beltsville, MD
US Environmental Protection Agency, Atlantic Ecology Division; Narragansett, RI
US Geological Survey, National Water Quality Laboratory; Denver, CO
Woods Hole Group Environmental Lab; Raynham, MA
Wright State University; Dayton, OH

APPENDIX B

The laboratories listed below performed measurements that contributed to the certification of alkylated PAH groups, hopanes, and steranes in SRM 1941b Organics in Marine Sediment.

Alpha Analytical, Inc.; Mansfield, MA
Analytical Resources, Inc.; Tukwila, WA
Axys Analytical Services; Sydney, BC, Canada
Battelle Analytical & Environmental Chemistry Laboratory; Duxbury, MA
Center for Laboratory Sciences; Pasco, WA
Columbia Analytical Services; Jacksonville, FL
Columbia Analytical Services; Rochester, NY
Columbia Analytical Services, Kelso, WA
Florida Department of Environmental Protection; Tallahassee, FL
Florida International University; North Miami, FL
Michigan Department of Natural Resources and Environment; Lansing, MI
Mississippi State Chemical Laboratory; Mississippi State, MS
NIST; Charleston, SC
NIST; Gaithersburg, MD
NOAA/NCCOS/NOS; Charleston, SC
NOAA/NMFS/Alaska Fisheries Science Center; Juneau, AK
NY State Department of Health; Albany, NY
Pace Analytical Services, Inc. Minneapolis; Minneapolis, MN
RJ Lee Group, Inc; Monroeville, PA
TDI/B&B Laboratories, Inc.; College Station, TX
TestAmerica Laboratories; Mobile, AL
TestAmerica Laboratories; West Sacramento, CA
TestAmerica Laboratories; University Park, IL
TestAmerica Laboratories; Schriever, LA
TestAmerica Laboratories; Edison, NJ
TestAmerica Laboratories; Knoxville, TN
TestAmerica Laboratories; Pittsburgh, PA
TestAmerica Laboratories; South Burlington, VT
TestAmerica Laboratories; Tacoma, WA
US Army Engineer Research and Development Center; Vicksburg, MS
USGS Columbia Environmental Research Center; Columbia, MO
University of Iowa, State Hygienic Laboratory; Iowa City, IO
Washington State Public Health Laboratories; Shoreline, WA

NIST

Date of Issue:
31 March 2014

SAFETY DATA SHEET

1. Substance and Source Identification

Product Identifier

SRM Number: 1941b
SRM Name: Organics in Marine Sediment
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Standard Reference Material (SRM) is marine sediment collected at the mouth of the Baltimore (MD) Harbor. SRM 1941b is intended for use in evaluating analytical methods for the determination of selected polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, and chlorinated pesticides in marine sediment and similar matrices. All of the constituents for which certified, reference, and information values are provided in SRM 1941b were naturally present in the sediment before processing. A unit of SRM 1941b consists of a bottle containing 50 g of radiation-sterilized, freeze-dried sediment.

Company Information

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

Telephone: 301-975-2200
FAX: 301-948-3730
E-mail: SRMMSDS@nist.gov
Website: http://www.nist.gov/srm

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

2. Hazards Identification

Classification

Physical Hazard: Not classified.
Health Hazard: Not classified.

Label Elements
Symbol
No Symbol/Pictogram

Signal Word
Not applicable.

Hazard Statement(s): Not applicable.

Precautionary Statement(s): Not applicable.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. Composition and Information on Hazardous Ingredients

Substance: Marine sediment

Other Designations: Sediment.

This material is naturally occurring marine sediment from an urban area. The material contains trace amounts of polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, and should be handled with care. Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Marine Sediment	Not available	Not available	100

4. First Aid Measures

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water.

Eye Contact: Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

Ingestion: If adverse effects occur after ingestion, seek medical treatment.

Most Important Symptoms/Effects, Acute and Delayed: May cause irritation.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek medical attention if needed.

5. Fire Fighting Measures

Fire and Explosion Hazards: Negligible fire hazard. Avoid generating dust. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:
Suitable: Use extinguishing media appropriate for surrounding fire.
Unsuitable: None listed.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1 Fire = 0 Reactivity = 0

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Any accumulated material on surfaces should be removed and properly disposed of. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Collect spilled material in appropriate container for disposal. Keep out of water supplies and sewers. Keep unnecessary people away, isolate hazard area and deny entry.

7. Handling and Storage

Safe Handling Precautions: Minimize dust generation and accumulation on surfaces. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. See Section 8, "Exposure Controls and Personal Protection".

Storage: Store and handling in accordance with all current regulations and standards.

8. Exposure Controls and Personal Protection

Exposure Limits: No occupational exposure limits have been established for marine sediment. This material is a particulate matter and adequate inhalation/respiratory protection should be used to minimize exposure. The exposure limits for Particulates Not Otherwise Regulated (PNOR) are applicable.

OSHA (PEL): 15 mg/m^3 (TWA, total particulates not otherwise regulated)
OSHA (PEL) 5 mg/m^3 (TWA, respirable particulates not otherwise regulated)

NIOSH (REL): 10 mg/m^3 (TWA, total particulates not otherwise regulated, 8 h)
NIOSH (REL): 5 mg/m^3 (TWA, respirable particulates not otherwise regulated)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eye wash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. Physical and Chemical Properties

Descriptive Properties:

Appearance (physical state, color, etc.):	amorphous powder
Molecular Formula:	not applicable
Molar Mass (g/mol):	not applicable
Odor:	not available
Odor threshold:	not available
pH:	not available
Evaporation rate:	not applicable
Melting point/freezing point (°C):	not available
Specific Gravity (water=1)	not available
Vapor Pressure (mmHg):	not applicable
Vapor Density (air = 1):	not applicable
Viscosity (cP):	not applicable
Solubility(ies):	not available
Partition coefficient (n-octanol/water):	not available
Particle Size:	<150 µm

Thermal Stability Properties:

Autoignition Temperature (°C):	not available
Thermal Decomposition (°C):	not available
Initial boiling point and boiling range (°C):	not available
Explosive Limits, LEL (Volume %):	not available
Explosive Limits, UEL (Volume %):	not available
Flash Point (°C):	not available
Flammability (solid, gas):	not available

10. Stability and Reactivity

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid generating dust.

Incompatible Materials: None listed.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition will produce oxides of carbon.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin _____ Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Generated dust may cause irritation if inhaled.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Generated dust may cause irritation.

Skin Contact: May cause mechanical irritation.

Eye Contact: May cause mechanical irritation.

Ingestion: No data available.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified; no data available.

Skin Corrosion/Irritation: Not classified; no data available.

Serious Eye damage/ Eye irritation: Not classified; no data available.

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified; no data available.

Germ Cell Mutagenicity: Not classified; no data available.

Carcinogenicity: Not classified.

Listed as a Carcinogen/Potential Carcinogen _____ Yes X No
Marine sediment is not listed by NTP, IARC or OSHA as a carcinogen.

Reproductive Toxicity: Not classified; no data available.

Specific Target Organ Toxicity, Single Exposure: Not classified; no data available.

Specific Target Organ Toxicity, Repeated Exposure: Not classified; no data available.

Aspiration Hazard: Not classified; no data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No data available.

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	No.
CHRONIC HEALTH:	No.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	No.

State Regulations:
California Proposition 65: Not listed.

U.S. TSCA Inventory: Not listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations:
WHMIS Information: Not provided for this material.

16. OTHER INFORMATION

Issue Date: 31 March 2014

Sources: 29 CFR Occupational Health and Safety Office (OSHA) 1910.1000, *Limits for Air Contaminants*, Table Z-1; available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9992 (accessed Mar 2014).

Center for Disease Control (CDC) NIOSH Pocket Guide to Chemical Hazards, *Particulates not otherwise regulated*; available at http://www.cdc.gov/niosh/npg/npgd0480.html (accessed Mar 2014).

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50 %	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transportation Agency	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at http://www.nist.gov/srm.

Bill to: 68455	Ship to: 68456
DAVE MITCHELL ANALYTICAL RESOURCES INC 4611 S 134TH PLACE SUITE 100 TUKWILA, WA 98168-3240 1 (206)695-6205	DAVE MITCHELL ANALYTICAL RESOURCES INC 4611 S 134TH PLACE SUITE 100 TUKWILA, WA 98168-3240 1 (206)695-6205

21G0286 CLPLIKE (Rev0) - Page 2/55 of 2606

Ship via	UPS Ground	Description		Ship from	
Salesmen	MCMIDM2	Instructions		Blanket	
Contact	DAVE MITCHELL	Pro#		Truck#	

Order discrepancies (other than back ordered items) must be reported to our Customer Relations Department at 301-975-6776 within 5 days of receipt of shipment or this order will be considered complete. NIST SRMs/RMs are generally not returnable - with the exception of defective goods or shipments made in error by NIST. To return a SRM/RM, please call for instructions and a Return SRM/RM Authorization Number before shipment. Returns WILL NOT BE ACCEPTED without prior authorization.

Order	UOM	Ship	UOM	B/O	UOM	Item	Description
1	EACH	1	EACH	0	EACH	1941B	Organics in Marine Sediment
						Total qty:	1 / EACH
							NOT FOR HUMAN CONSUMPTION, LABORATORY USE ONLY.

9/21/16
04:04 PM

Picked by	
Packed by	
# of pieces	
Weight	

1700101

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
PSEP 1986

LDW21-SS687

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-01 H	SDG:	21G0286
Sampled:	07/22/21 06:45	Prepared:	07/27/21 14:22	File ID:	
% Solids:	74.81	Preparation:	No Prep Wet Chem	Analyzed:	07/27/21 14:23
Batch:	BJG0638	Sequence:		Initial/Final:	5 g Wet / 5 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids, Sulfide	74.55	1	0.04	0.04	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

PSEP 1986

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Batch:	BJG0638	Batch Matrix:	Solid	Preparation:	No Prep Wet Chem

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS687	21G0286-01		07/27/21 14:22	
Blank	BJG0638-BLK1		07/27/21 14:22	

TOTAL SOLIDS/VOLATILE SOLIDS (TS / TVS) BENCHSHEET for Solid samples

Method: PSEP 1986, SM2540, EPA 160.1

(dry at 104 (12-24 hr) then combust at 550 (30 min))

PRESERVED

Batch:	BJG0638
Date:	7/27/2021 14:23
Analyst:	DOE

Instrumentation

Drying Ovens:	12	**Analytical Balance:**	BAL2
Muffle Furnace:	2		

Batch drying time					
record times as mm/dd/yy hh:mm		TS (%) calculated as:	**Oven Temps, °C**		TVS (mg/kg dry wt) calculated as:
date/time in oven:	7/27/2021 14:35	Final dry wt (g) = (Dry Wt - Tare Wt)	Start Temp	104	Final ash wt (g) = (min ash wt - tare wt)
date/time out:	7/28/2021 10:05	TS = (Final Dry Wt)/ (grams Sample-Tare)	Dry Cycle 1	104	TVS (mg/kg) = [(Dry wt-Ash wt)/ (dry weight)] *1,000,000
elapsed hrs =	19.5 OK		Dry Cycle 2		if ash wt > dry wt, "Chk for Err"
			Dry Cycle 3		if dry wt-ash wt < 0.001 g, "< (1/dry wt)*1,000,000

Balance Calibration Check

Record weights to 4 places											
	Cal Weight ID:	CV-02	CV-02	CV-02	CV-02	CV-02		CV-02	CV-02	CV-02	
	Date & Time:	7/27/21 14:25	7/27/21 14:30	7/28/21 10:40							
	Cal Wt (g):	10.0000	9.9999	9.9999	9.9999						
			Cal OK!	Cal OK!	Cal OK!						

Sample ID	**Dish #**	**Tare Wt. (g)**	**Dish & Sample (g)**	**Dry Wt 104C (grams) 1**	**2**	**3**	**dry Wt (g)**	**TS (%)**	**Notes**	**ASH WT 550C (grams) 1**	**2**	**3**	**Ash Wt (g)**	**TVS (mg/kg)**	**(%)**	**Notes**	**Fixed (%)**
BJG0638-BLK1	68	0.7823	0.0000	0.7823			0.0000	0.00%									
21G0269-08	69	0.7830	4.9818	3.1442			2.3612	56.24%									
BJG0638-DUP1	70	0.8079	5.0054	3.1264			2.3185	55.24%	RPD=1.8								
21G0286-01	71	0.8023	6.1224	4.7683			3.9660	74.55%									

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I

METHOD BLANK DATA SHEET

PSEP 1986

TotalAnalytes

Blank

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Batch: BJG0638
Laboratory ID: BJG0638-BLK1
Prepared: 07/27/21 14:22
Matrix: Solid
Preparation: No Prep Wet Chem
Analyzed: 07/27/21 14:23
Sequence:
Calibration:
Instrument: BAL2

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids, Sulfide	ND	1	0.04	0.04	U

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HOLDING TIME SUMMARY

Analysis: PSEP 1986

Laboratory: Analytical Resources, Inc. SDG: 21G0286

Client: Anchor QEA, LLC Project: Lower Duwamish AOC4

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LDW21-SS687 21G0286-01	07/22/21 06:45	07/22/21 17:30	07/27/21 14:22	5	28	07/27/21 14:23	5	28	

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

PSEP 1986

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument:

Analyte	MDL	RL	Units
Total Solids, Sulfide	0.04	0.04	%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 2540 G-97

LDW21-SS687

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-01 F	SDG:	21G0286
Sampled:	07/22/21 06:45	Prepared:	07/27/21 11:38	File ID:	
% Solids:	74.81	Preparation:	No Prep Wet Chem	Analyzed:	07/27/21 11:43
Batch:	BJG0626	Sequence:		Initial/Final:	5 g Wet / 5 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	74.81	1	0.04	0.04	

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Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 2540 G-97

LDW21-SS625

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-02 D	SDG:	21G0286
Sampled:	07/22/21 07:50	Prepared:	07/27/21 11:38	File ID:	
% Solids:	73.19	Preparation:	No Prep Wet Chem	Analyzed:	07/27/21 11:43
Batch:	BJG0626	Sequence:		Initial/Final:	5 g Wet / 5 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	73.19	1	0.04	0.04	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 2540 G-97

LDW21-IT625

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-03 C	SDG:	21G0286
Sampled:	07/22/21 07:50	Prepared:	07/27/21 11:38	File ID:	
% Solids:	88.19	Preparation:	No Prep Wet Chem	Analyzed:	07/27/21 11:43
Batch:	BJG0626	Sequence:		Initial/Final:	5 g Wet / 5 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	88.19	1	0.04	0.04	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 2540 G-97

LDW21-SS627

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-04 D	SDG:	21G0286
Sampled:	07/22/21 08:10	Prepared:	07/27/21 11:38	File ID:	
% Solids:	54.79	Preparation:	No Prep Wet Chem	Analyzed:	07/27/21 11:43
Batch:	BJG0626	Sequence:		Initial/Final:	5 g Wet / 5 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	54.79	1	0.04	0.04	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 2540 G-97

LDW21-SS646

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-05 D	SDG:	21G0286
Sampled:	07/22/21 11:50	Prepared:	07/27/21 11:38	File ID:	
% Solids:	65.53	Preparation:	No Prep Wet Chem	Analyzed:	07/27/21 11:43
Batch:	BJG0626	Sequence:		Initial/Final:	5 g Wet / 5 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	65.53	1	0.04	0.04	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

SM 2540 G-97

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Batch:	BJG0626 Batch Matrix: Solid	Preparation:	No Prep Wet Chem

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS687	21G0286-01		07/27/21 11:38	
LDW21-SS625	21G0286-02		07/27/21 11:38	
LDW21-IT625	21G0286-03		07/27/21 11:38	
LDW21-SS627	21G0286-04		07/27/21 11:38	
LDW21-SS646	21G0286-05		07/27/21 11:38	
Blank	BJG0626-BLK1		07/27/21 11:38	

TOTAL SOLIDS/VOLATILE SOLIDS (TS / TVS) BENCHSHEET for Solid samples

Method: PSEP 1986, SM2540, EPA 160.1

(dry at 104 (12-24 hr) then combust at 550 (30 min))

Batch:	BJG0626
Date:	7/27/2021 11:43
Analyst:	DOE

Instrumentation

Drying Ovens:	12	**Analytical Balance:**	BAL2
Muffle Furnace:	2		

Batch drying time				**Oven Temps, °C**	
record times as mm/dd/yy hh:mm			TS (%) calculated as:	Start Temp	106
date/time in oven:	7/27/2021 12:20		Final dry wt (g) = (Dry Wt - Tare Wt)	Dry Cycle 1	104
date/time out:	7/28/2021 10:05		TS = (Final Dry Wt)/ (grams Sample-Tare)	Dry Cycle 2	
elapsed hrs =	21.8	OK		Dry Cycle 3	

TVS (mg/kg dry wt) calculated as:
Final ash wt (g) = (min ash wt - tare wt)
TVS (mg/kg) = [(Dry wt-Ash wt)/ (dry weight)] *1,000,000
if ash wt > dry wt, "Chk for Err"
if dry wt-ash wt < 0.001 g, "< (1/dry wt)*1,000,000

Balance Calibration Check

Record weights to 4 places											
	Cal Weight ID:	CV-02	CV-02	CV-02	CV-02	CV-02		CV-02	CV-02	CV-02	
	Date & Time:	7/27/21 11:45	7/27/21 11:50	7/28/21 10:20							
Cal Wt (g):	10.0000	9.9999	9.9999	9.9999							
		Cal OK!	Cal OK!	Cal OK!							

Sample ID	Dish #	Tare Wt. (g)	Dish & Sample (g)	Dry Wt 104C (grams) 1	2	3	dry Wt (g)	TS (%)	Notes	ASH WT 550C (grams) 1	2	3	Ash Wt (g)	TVS (mg/kg)	TVS (%)	Notes	Fixed (%)
BJG0626-BLK1	24	0.7949	0.0000	0.7949			0.0000	0.00%									
21G0145-03	25	0.7972	4.4501	2.8345			2.0373	55.77%									
BJG0626-DUP1	26	0.7866	4.0016	2.5768			1.7902	55.68%	RPD=0.2								
BJG0626-DUP2	27	0.7848	4.8231	3.0394			2.2546	55.83%	RSD=0.1								
21G0286-01	28	0.8030	5.9909	4.6839			3.8809	74.81%									
21G0286-02	29	0.8087	4.2434	3.3226			2.5139	73.19%									
21G0286-03	30	0.7787	6.2840	5.6336			4.8549	88.19%									
21G0286-04	31	0.7918	5.3965	3.3145			2.5227	54.79%									
21G0286-05	32	0.7832	5.0639	3.5883			2.8051	65.53%									
21G0303-01	33	0.7916	6.0696	4.5626			3.7710	71.45%									
21G0303-02	34	0.8041	5.8266	4.3410			3.5369	70.42%									
21G0303-03	35	0.7833	7.2462	5.4422			4.6589	72.09%									
21G0303-04	36	0.7743	4.6232	3.8580			3.0837	80.12%									
21G0305-01	37	0.7924	4.8537	2.9648			2.1724	53.49%									
21G0305-02	38	0.8019	7.2929	4.8265			4.0246	62.00%									
21G0305-03	39	0.7782	5.2463	3.2125			2.4343	54.48%									
21G0305-04	40	0.7922	4.8488	3.3149			2.5227	62.19%									
21G0305-05	41	0.8149	5.3145	3.5035			2.6886	59.75%									
21G0305-06	42	0.7927	4.6397	3.0534			2.2607	58.77%									
21G0305-07	43	0.7969	6.5334	4.3807			3.5838	62.47%									
21G0305-08	44	0.7941	8.2977	5.7333			4.9392	65.82%									
21G0305-09	45	0.7814	4.8889	3.0948			2.3134	56.32%									
21G0305-10	46	0.8050	5.2435	3.3377			2.5327	57.06%									

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I

METHOD BLANK DATA SHEET

SM 2540 G-97

TotalAnalytes

Blank

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Batch: BJG0626
Laboratory ID: BJG0626-BLK1
Prepared: 07/27/21 11:38
Matrix: Solid
Preparation: No Prep Wet Chem
Analyzed: 07/27/21 11:43
Sequence:
Calibration:
Instrument: BAL2

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids	ND	1	0.04	0.04	U

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HOLDING TIME SUMMARY

Analysis: SM 2540 G-97

Laboratory: Analytical Resources, Inc. SDG: 21G0286

Client: Anchor QEA, LLC Project: Lower Duwamish AOC4

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LDW21-SS687 21G0286-01	07/22/21 06:45	07/22/21 17:30	07/27/21 11:38	5	180	07/27/21 11:43	5	180	
LDW21-SS625 21G0286-02	07/22/21 07:50	07/22/21 17:30	07/27/21 11:38	5	180	07/27/21 11:43	5	180	
LDW21-IT625 21G0286-03	07/22/21 07:50	07/22/21 17:30	07/27/21 11:38	5	180	07/27/21 11:43	5	180	
LDW21-SS627 21G0286-04	07/22/21 08:10	07/22/21 17:30	07/27/21 11:38	5	180	07/27/21 11:43	5	180	
LDW21-SS646 21G0286-05	07/22/21 11:50	07/22/21 17:30	07/27/21 11:38	4	180	07/27/21 11:43	5	180	

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

SM 2540 G-97

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument:

Analyte	MDL	RL	Units
Total Solids	0.04	0.04	%

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 4500-NH3 H-97

LDW21-SS687

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-01 G	SDG:	21G0286
Sampled:	07/22/21 06:45	Prepared:	07/27/21 13:48	File ID:	072821NH3A-016
% Solids:	74.81	Preparation:	MSA 33.3 (2M KCl)	Analyzed:	07/28/21 17:29
Batch:	BJG0629	Sequence:	SJG0367	Initial/Final:	4.19 g Wet / 40 mL
Instrument:	LACHAT1			Calibration:	UNASSIGNED

CAS NO.	Analyte	Concentration ng/kg NH3-N dry	Dilution Factor	MDL	MRL	Q
7664-41-7	Ammonia-N	4.19	1	0.51	0.51	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

SM 4500-NH3 H-97

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Batch:	BJG0629 Batch Matrix: Solid	Preparation:	MSA 33.3 (2M KCl)

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS687	21G0286-01	072821NH3A-016	07/27/21 13:48	
Blank	BJG0629-BLK1	072821NH3A-011	07/27/21 12:31	
LCS	BJG0629-BS1	072821NH3A-012	07/27/21 12:31	
MRL Check	BJG0629-MRL1	072821NH3A-010	07/27/21 12:31	

Analytical Resources, Incorporated

Method: ***Ammonia-N, SM 4500-NH3 H-97 Solid*** Analyst: RM

Batch ID: BJG0629 Prep Date, Time: 7/27/202

Revision Date & # : ***0*** ***6/29/2016*** Balance ID:

Sample Preparation Log

Reagents, Equipment

Notes

Lab Number	Sample Amount (g/mL)	Final Volume (mL)	Spike 1 ID	Spike 1 Volume (µL)	Spike 2 ID
21G0269-08	4.1	40			
21G0286-01	4.19	40			
BJG0629-BLK1	4	40			
BJG0629-BS1	4	40	J002956	400	
21G0269-08-DUP1	4.15	40			
BJG0629-MRL1	4	40	J007483	80	
BJG0629-MS1	4.15	40	J003698	400	

Revision: ***0*** ***6/29/2016***

IS

1 13:48

Spike 2 Volume (µL)

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I

METHOD BLANK DATA SHEET

SM 4500-NH3 H-97

TotalAnalytes

Blank

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Batch:	BJG0629	Laboratory ID:	BJG0629-BLK1	Prepared:	07/27/21 12:31
Matrix:	Solid	Preparation:	MSA 33.3 (2M KCl)	Analyzed:	07/28/21 17:23
Sequence:	SJG0367	Calibration:	N/A	Instrument:	LACHAT1

CAS NO.	Analyte	Concentration (mg/kg NH3-N wet)	Dilution Factor	MDL	MRL	Q
7664-41-7	Ammonia-N	ND	1	0.40	0.40	U

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LCS / LCS DUPLICATE RECOVERY
SM 4500-NH3 H-97

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	07/28/21 17:24
Batch:	BJG0629	Laboratory ID:	BJG0629-BS1
Preparation:	MSA 33.3 (2M KCl)	Sequence Name:	LCS
Initial/Final:	4 g / 40 mL		

COMPOUND	SPIKE ADDED (mg/kg NH3-N	LCS CONCENTRATION (mg/kg NH3-N wet)	Q	LCS % REC. #	QC LIMITS REC.
Ammonia-N	100	95.8	D	95.8	90 - 110

* Indicates values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

SM 4500-NH3 H-97

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJG0367	Instrument:	LACHAT1
		Calibration:	UNASSIGNED

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Cal Standard	SJG0367-CAL1	072821NH3A-001	NA	07/28/21 17:07
Cal Standard	SJG0367-CAL2	072821NH3A-002	NA	07/28/21 17:08
Cal Standard	SJG0367-CAL3	072821NH3A-003	NA	07/28/21 17:09
Cal Standard	SJG0367-CAL4	072821NH3A-004	NA	07/28/21 17:10
Cal Standard	SJG0367-CAL5	072821NH3A-005	NA	07/28/21 17:11
Cal Standard	SJG0367-CAL6	072821NH3A-006	NA	07/28/21 17:13
Cal Standard	SJG0367-CAL7	072821NH3A-007	NA	07/28/21 17:14
Initial Cal Check	SJG0367-ICV1	072821NH3A-008	NA	07/28/21 17:15
Initial Cal Blank	SJG0367-ICB1	072821NH3A-009	NA	07/28/21 17:18
MRL Check	BJG0629-MRL1	072821NH3A-010	Solid	07/28/21 17:22
Blank	BJG0629-BLK1	072821NH3A-011	Solid	07/28/21 17:23
LCS	BJG0629-BS1	072821NH3A-012	Solid	07/28/21 17:24
LDW21-SS687	21G0286-01	072821NH3A-016	Solid	07/28/21 17:29
Calibration Check	SJG0367-CCV1	072821NH3A-019	NA	07/28/21 17:35
Calibration Blank	SJG0367-CCB1	072821NH3A-020	NA	07/28/21 17:38

Author: RMS Date : 7/28/2021

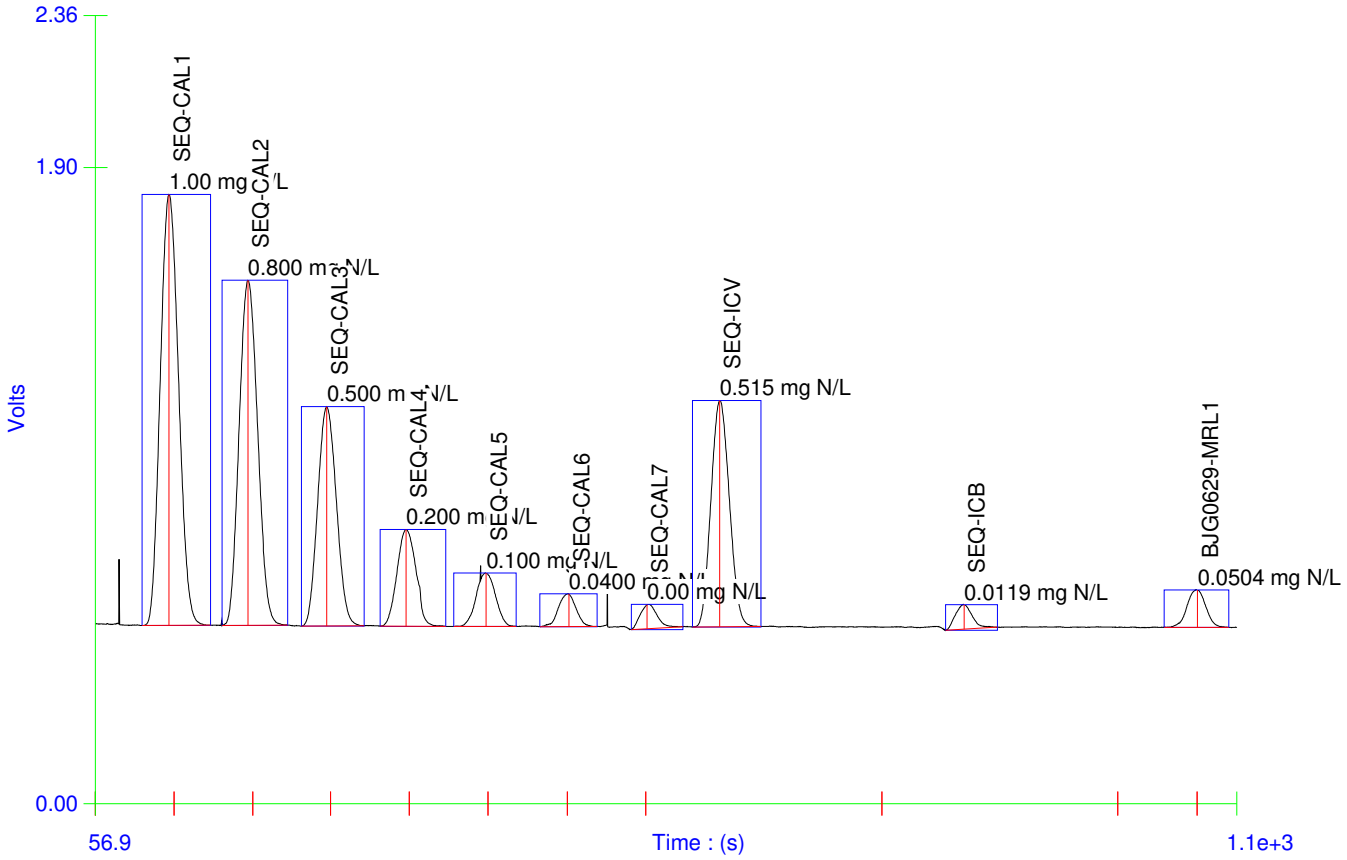
Original Run Filename: OM_7-28-2021_05-06-12PM.OMN Created: 7/28/2021 5:06:12 PM
Original Run Author's Signature: [RMS]
Current Run Filename: 072821NH3A.omn Last Modified: 7/28/2021 5:45:24 PM
Current Run Author's Signature: [RMS]
Description: Default New Run

Sample	Rep.	Cup No.	Channel 1 NH3			Detection Time	MDF
			Conc. (mg N/L)	Area (V.s)	Height (V)		
SEQ-CAL1	1	S1	1.00	24.4	1.29	7/28/2021@5:07:11 PM	
SEQ-CAL2	1	S2	0.800	19.7	1.03	7/28/2021@5:08:21 PM	
SEQ-CAL3	1	S3	0.500	12.7	0.656	7/28/2021@5:09:32 PM	
SEQ-CAL4	1	S4	0.200	5.70	0.289	7/28/2021@5:10:42 PM	
SEQ-CAL5	1	S5	0.100	3.20	0.160	7/28/2021@5:11:51 PM	
SEQ-CAL6	1	S6	0.0400	1.79	0.0980	7/28/2021@5:13:02 PM	
SEQ-CAL7	1	S7	0.00	1.25	0.0724	7/28/2021@5:14:13 PM	
SEQ-ICV	1	8	0.515	13.0	0.678	7/28/2021@5:15:23 PM	
		Known Conc:	0.500				
		Calibration:	Table/Fig. : 1				
SEQ-ICB	1	9	0.0119	1.28	0.0738	7/28/2021@5:18:54 PM	
		Known Conc:	0.00				
BJG0629-MRL1	1	10	0.0504	2.18	0.112	7/28/2021@5:22:26 PM	
BJG0629-BLK1	1	11	0.0148	1.35	0.0782	7/28/2021@5:23:37 PM	
BJG0629-BS1	1	12	0.479	12.2	0.631	7/28/2021@5:24:48 PM	20.00
21G0269-08	1	13	1.04	25.4	1.33	7/28/2021@5:25:58 PM	
BJG0629-DUP1	1	14	1.08	26.2	1.37	7/28/2021@5:27:09 PM	
BJG0629-MS1	1	15	0.554	13.9	0.723	7/28/2021@5:28:19 PM	20.00
21G0286-01	1	16	0.328	8.68	0.457	7/28/2021@5:29:30 PM	
21G0269-08RE1	1	13	0.524	13.2	0.688	7/28/2021@5:30:41 PM	2.00
BJG0629-DUP2	1	14	0.513	13.0	0.676	7/28/2021@5:31:51 PM	2.00
SEQ-CCV	1	8	0.514	13.0	0.676	7/28/2021@5:35:23 PM	
		Known Conc:	0.500				
SEQ-CCB	1	9	0.0102	1.24	0.0724	7/28/2021@5:38:54 PM	
		Known Conc:	0.00				

Author: RMS

Date : 7/28/2021

Channel 1 - Set: 1 / 2



Author: RMS

Date : 7/28/2021

Channel 1 - Set: 2 / 2

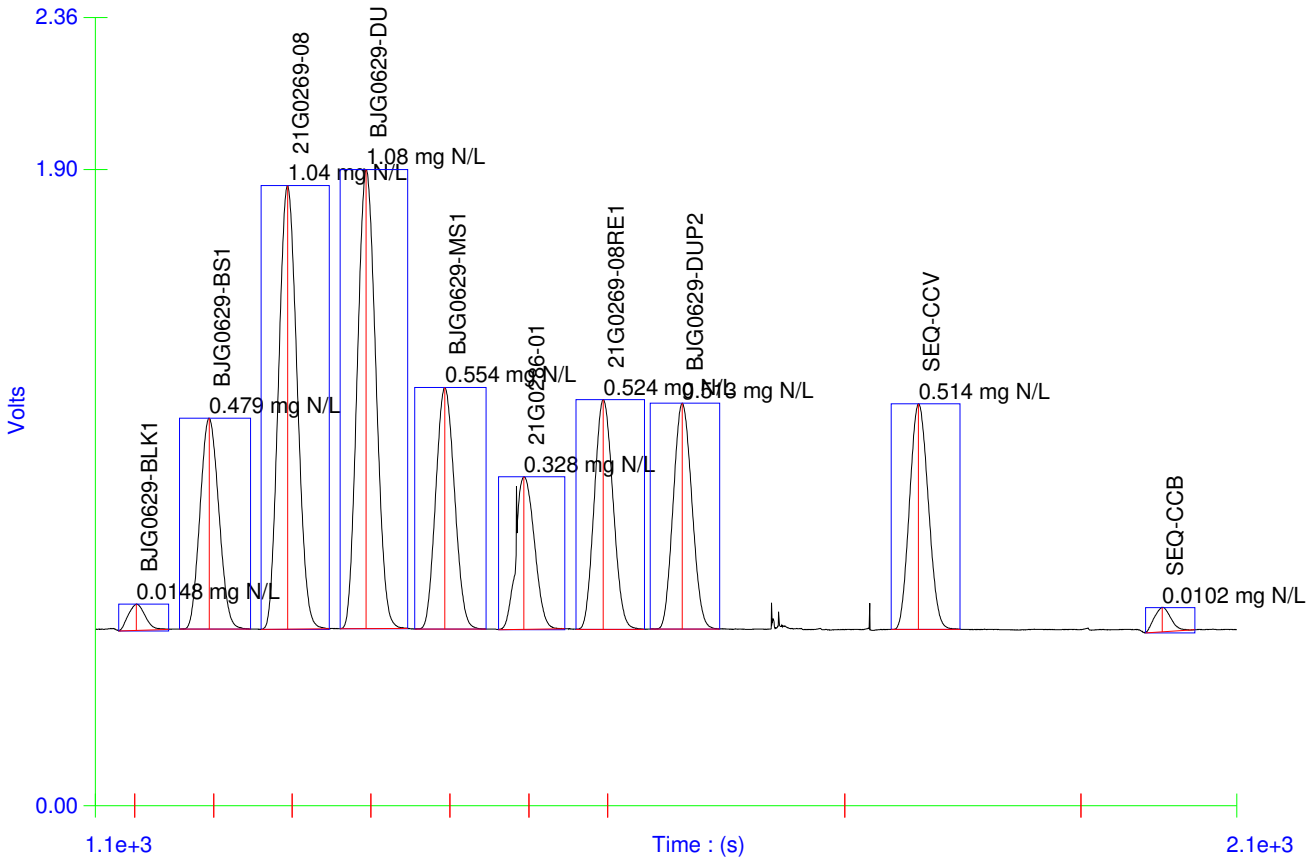


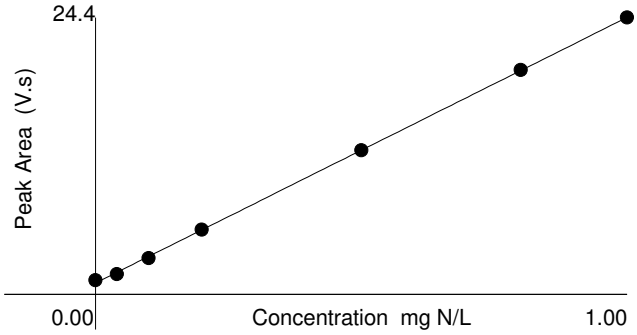
Table : 1 (NH3)

	Known Conc. (mg N/L)	Rep.	Peak Area (V.s)	Peak Height (V)	% RSD	% Residual	Det. Conc (mg N/L)	Detection Date	Detection Time
1	1.00	1	24.4	1.29	0.0	0.1	0.999	7/28/2021	5:07:11 PM
2	0.800	1	19.7	1.03	0.0	-0.2	0.802	7/28/2021	5:08:21 PM
3	0.500	1	12.7	0.656	0.0	0.2	0.499	7/28/2021	5:09:32 PM
4	0.200	1	5.70	0.289	0.0	-0.4	0.201	7/28/2021	5:10:42 PM
5	0.100	1	3.20	0.160	0.0	4.1	0.0942	7/28/2021	5:11:51 PM
6	0.0400	1	1.79	0.0980	0.0	7.5	0.0339	7/28/2021	5:13:02 PM
7	0.00	1	1.25	0.0724			0.0106	7/28/2021	5:14:13 PM

Author: RMS

Date : 7/28/2021

Figure : 1 (NH3)



Area = 23.4 * Conc + 1.00
Conc = 0.0428 * Area - 0.0428
Correlation Coefficient (r) = 0.99990

Weighting : None

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INSTRUMENT BLANKS
SM 4500-NH3 H-97

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Instrument ID: LACHAT1
Calibration: UNASSIGNED
Sequence: SJG0367
Date Analyzed: 07/28/21 17:18

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SJG0367-ICB1	Ammonia-N	0.01	0.04	0.04	mg/L NH3-N	
SJG0367-CCB1	Ammonia-N	0.01	0.04	0.04	mg/L NH3-N	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL AND CONTINUING CALIBRATION CHECK

SM 4500-NH3 H-97

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Instrument ID: LACHAT1
Control Limt: +/- 10.00%

SDG: 21G0286
Project: Lower Duwamish AOC4
Calibration: UNASSIGNED
Sequence: SJG0367

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SJG0367-ICV1	Ammonia-N	0.50000	0.52	103	mg/L NH3-N	SM 4500-NH3 H-97
SJG0367-CCV1	Ammonia-N	0.50000	0.51	103	mg/L NH3-N	SM 4500-NH3 H-97

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HOLDING TIME SUMMARY

Analysis: SM 4500-NH3 H-97

Laboratory: Analytical Resources, Inc. SDG: 21G0286

Client: Anchor QEA, LLC Project: Lower Duwamish AOC4

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LDW21-SS687 21G0286-01	07/22/21 06:45	07/22/21 17:30	07/27/21 13:48	5	7	07/28/21 17:29	1	7	

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

SM 4500-NH3 H-97

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument: LACHAT1

Analyte	MDL	RL	Units
Ammonia-N	0.40	0.40	mg/kg NH3-N

Fisher Scientific

1 Reagent Lane
Fair Lawn, NJ 07410
201.796.7100 tel
201.796.1329 fax

Certificate of Analysis

Fisher Scientific's Quality System has been found to conform to Quality Management System Standard ISO9001:2008 standard by SAI Global Certificate Number CERT - 0090918

This is to certify that units of the lot number below were tested and found to comply with the specifications of the grade listed. Certain data have been supplied by third parties. Fisher Scientific expressly disclaims all warranties, expressed or implied, including the implied warranties of merchantability and fitness for a particular purpose. Certain products (USP/FCC/NF/EP/BP/JP grades) are sold for use in food, drug, or medical device manufacturing. Fisher does not claim regulatory coverage under 21 CFR nor maintain DMF's with the FDA. The following are the actual analytical results obtained:

Catalog Number	**A649**	**Quality Test / Release Date**	**9/20/2017**
Lot Number	**174327**		
Description	**AMMONIUM CHLORIDE, USP/FCC**		
Country of Origin	**United States**	*** Suggested Retest Date**	**Sep-2020**
Chemical Origin	**Inorganic**		
BSE/TSE Comment	No animal products are used as starting raw material ingredients, or used in processing, including lubricants, processing aids, or any other material that might migrate to the finished product.		

USP Grade

Result name	Units	Specifications	Test Value
APPEARANCE		REPORT	White crystalline powder
ASSAY	%	Inclusive Between 99.5 - 100.5	99.7
HEAVY METALS (as Pb)	%	<= 0.001	<0.0010
IDENTIFICATION (ALL LISTED)	PASS/FAIL	= PASS TEST	PASS TEST
IGNITION RESIDUE	%	<= 0.1	<0.01
LIMIT OF THIOCYANATE	PASS/FAIL	= PASS TEST	PASS TEST
LOSS ON DRYING	%	<= 0.5	0.03
PH OF A 5% SOLUTION		Inclusive Between 4.6 - 6.0	4.7
RESIDUAL SOLVENTS	Meets Requirements	= MEETS REQUIREMENTS	MEETS REQUIREMENTS

FCC Grade

Result name	Units	Specifications	Test Value
APPEARANCE		REPORT	White crystalline powder
ASSAY	%	>= 99.0	99.7
IDENTIFICATION (ALL LISTED)	PASS/FAIL	= PASS TEST	PASS TEST
LEAD (Pb)	MG/KG	<= 4	<4.0
LOSS ON DRYING PER FCC	%	<= 0.5	0.03

Residual Solvents	No Class 1, Class 2, or Class 3 solvents are used in the manufacturing, processing, or subsequent handling of this product.

Teresa Bailey-Wyche

Quality Assurance Specialist - Certificate of Analysis Fair Lawn

Note: The data listed is valid for all package sizes of this lot of this product, expressed as a extension of this catalog number listed above. If there are any questions with this certificate, please call Chemical Services at (800) 227-6701.
*Based on suggested storage condition.

ERA

A Waters Company

J002956

Certified Reference Material

▪ Certificate of Analysis ▪

Product: 1000 mg/L Ammonia as N
Catalog Number: 045-125mL, 985-500mL
Lot No. 091120m
Starting Material: Ammonium Chloride (NH_4Cl)
Matrix: 18 megohm deionized water
Density: 0.9997 ± 0.0016 g/ml at 19.2 °C and 756 mm Hg
Verification Method: Ion Selective Electrode (ISE)
Certificate Issue Date: November 5, 2020
Expiration Date: November 3, 2022
Revision Number: Original

CERTIFICATION

Parameter	Certified Value[1]	Uncertainty[2]	NIST Traceability	
	mg/L	%	SRM Number[3]	Recovery %
Ammonia as N (NH_3-N)	1000	1.43	194a	99.5

16341 Table Mountain Pkwy ▪ Golden, CO 80403 ▪ 800.372.0122 ▪ 303.431.8454 ▪ fax 303.421.0159 ▪ www.eraqc.com

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I
INORGANIC ANALYSIS DATA SHEET
SM 4500-S2 D-00 (PSEP)

LDW21-SS687

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-01RE1 H	SDG:	21G0286
Sampled:	07/22/21 06:45	Prepared:	07/29/21 15:59	File ID:	S2 080321 CDE2-041
% Solids:	74.81	Preparation:	PSEP 1986	Analyzed:	08/03/21 18:09
Batch:	BJG0712	Sequence:	SJH0030	Initial/Final:	5.242 g Wet / 100 mL
Instrument:	UV1800-2			Calibration:	UNASSIGNED

CAS NO.	Analyte	Concentration (mg/kg dry)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	74.0	5	6.38	6.38	D

Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

SM 4500-S2 D-00 (PSEP)

Laboratory: Analytical Resources, Inc. SDG: 21G0286

Client: Anchor QEA, LLC Project: Lower Duwamish AOC4

Batch: BJG0712 Batch Matrix: Solid Preparation: PSEP 1986

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS687	21G0286-01RE1	S2 080321 CDE2-041	07/29/21 15:59	Added 8/4/2021 by CDE
Blank	BJG0712-BLK1	S2 080321 CDE2-021	07/29/21 16:18	
LCS	BJG0712-BS1	S2 080321 CDE2-022	07/29/21 16:18	
LDW21-SS687	BJG0712-DUP2	S2 080321 CDE2-042	07/29/21 15:59	Added 8/4/2021 by CDE
LDW21-SS687	BJG0712-MS1	S2 080321 CDE2-027	07/29/21 16:18	

Analytical Resources, Incorporated

Method:	***Sulfide, SM 4500-S2 D-0, Solid (PSEP)***	Analyst:	CDE
Matrix:	***Water***	Batch ID: BJG0712	Prep Date, Time: 7/29/2021 16:18
Revision Date & # :	***0***	***7/1/2015***	

Sample Preparation Log

Reagents, Equipment

HCl+Al:	***J005053***
pH Indicator:	J006204
0.2N ZnOAC:	J000600
Balance:	BAL9
Sulfide Stock:	J007452

Step By Step

5 grams sample
Fill traps to line with 0.2N ZnOAc
LCS and MS get 1mL S2 Stock
100mL dispersing water
~5mL HCl+Al to pH < 3 by
Bromophenol Blue Indicator
60 minutes at 90C
Decant to 100 mL with ZnOAc

Conc. ppm
0
50
100
250
500
1000

Revision: ***0*** ***7/1/2015***

Lab Number	Name		Sample Amount (g/mL)	Final Volume (mL)	Spike ID	Spike Volume (µL)
21G0286-01			5.242	100		
BJG0712-BLK1			5.000	100		
BJG0712-BS1			5.000	100	J007452	1000
21G0286-01-DUP1			5.040	100		
21G0286-01-MS1			5.300	100	J007452	1000

Date Printed: 8/3/2021

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Form I

METHOD BLANK DATA SHEET

SM 4500-S2 D-00 (PSEP)

TotalAnalytes

Blank

Laboratory:	Analytical Resources, Inc.			SDG:	21G0286
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Batch:	BJG0712	Laboratory ID:	BJG0712-BLK1	Prepared:	07/29/21 16:18
Matrix:	Solid	Preparation:	PSEP 1986	Analyzed:	08/03/21 17:47
Sequence:	SJH0030	Calibration:	N/A	Instrument:	UV1800-2

CAS NO.	Analyte	Concentration (mg/kg wet)	Dilution Factor	MDL	MRL	Q
18496-25-8	Sulfide	ND	1	1.00	1.00	U

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LCS / LCS DUPLICATE RECOVERY
SM 4500-S2 D-00 (PSEP)

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/03/21 17:47
Batch:	BJG0712	Laboratory ID:	BJG0712-BS1
Preparation:	PSEP 1986	Sequence Name:	LCS
Initial/Final:	5 g / 100 mL		

COMPOUND	SPIKE ADDED (mg/kg wet)	LCS CONCENTRATION (mg/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
Sulfide	146	134	D	91.3	75 - 125

* Indicates values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS687

DUPLICATES

SM 4500-S2 D-00 (PSEP)

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJG0712-DUP2
Batch: BJG0712
Lab Source ID: 21G0286-01RE1
Preparation: PSEP 1986
Initial/Final: 5.04 g / 100 mL
Source Sample Name: LDW21-SS687
% Solids: 74.81

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION	DUPLICATE CONCENTRATION	RPD %	Q
Sulfide	20	74.0	72.8	1.56	

*: Values outside of QC limits
L: Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to Dup = +/- RL instead of 20% RPD

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS687

MS / MS DUPLICATE RECOVERY
SM 4500-S2 D-00 (PSEP)

Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/03/21 17:51
Batch:	BJG0712	Laboratory ID:	BJG0712-MS1
Preparation:	PSEP 1986	Sequence Name:	Matrix Spike
Initial/Final:	5.3 g / 100 mL	Source Sample:	LDW21-SS687

COMPOUND	SPIKE ADDED (mg/kg dry)	SAMPLE CONCENTRATION (mg/kg dry)	Q	MS CONCENTRATION (mg/kg dry)	Q	MS % REC. #	QC LIMITS REC.
Sulfide	185	74.0	D	234	D	86.4	75 - 125

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

SM 4500-S2 D-00 (PSEP)

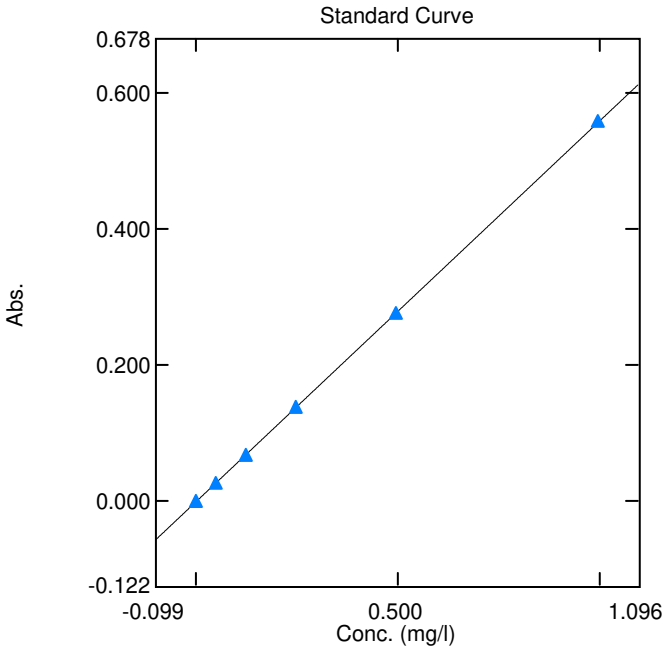
Laboratory:	Analytical Resources, Inc.	SDG:	21G0286
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0030	Instrument:	UV1800-2
		Calibration:	UNASSIGNED

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
Cal Standard	SJH0030-CAL1	S2 080321 CDE1-001	NA	08/03/21 17:23
Cal Standard	SJH0030-CAL2	S2 080321 CDE1-002	NA	08/03/21 17:24
Cal Standard	SJH0030-CAL3	S2 080321 CDE1-003	NA	08/03/21 17:24
Cal Standard	SJH0030-CAL4	S2 080321 CDE1-004	NA	08/03/21 17:24
Cal Standard	SJH0030-CAL5	S2 080321 CDE1-005	NA	08/03/21 17:25
Cal Standard	SJH0030-CAL6	S2 080321 CDE1-006	NA	08/03/21 17:25
Initial Cal Blank	SJH0030-ICB1	S2 080321 CDE2-001	NA	08/03/21 17:26
Initial Cal Check	SJH0030-ICV1	S2 080321 CDE2-002	NA	08/03/21 17:26
Calibration Blank	SJH0030-CCB1	S2 080321 CDE2-013	NA	08/03/21 17:33
Calibration Check	SJH0030-CCV1	S2 080321 CDE2-014	NA	08/03/21 17:33
Blank	BJG0712-BLK1	S2 080321 CDE2-021	Solid	08/03/21 17:47
LCS	BJG0712-BS1	S2 080321 CDE2-022	Solid	08/03/21 17:47
Calibration Blank	SJH0030-CCB2	S2 080321 CDE2-025	NA	08/03/21 17:48
Calibration Check	SJH0030-CCV2	S2 080321 CDE2-026	NA	08/03/21 17:49
LDW21-SS687	BJG0712-MS1	S2 080321 CDE2-027	Solid	08/03/21 17:51
Calibration Blank	SJH0030-CCB3	S2 080321 CDE2-037	NA	08/03/21 17:55
Calibration Check	SJH0030-CCV3	S2 080321 CDE2-038	NA	08/03/21 17:55
LDW21-SS687	21G0286-01RE1	S2 080321 CDE2-041	Solid	08/03/21 18:09
LDW21-SS687	BJG0712-DUP2	S2 080321 CDE2-042	Solid	08/03/21 18:09
Calibration Blank	SJH0030-CCB4	S2 080321 CDE2-043	NA	08/03/21 18:09
Calibration Check	SJH0030-CCV4	S2 080321 CDE2-044	NA	08/03/21 18:10
Calibration Blank	SJH0030-CCB5	S2 080321 CDE2-050	NA	08/03/21 18:39
Calibration Check	SJH0030-CCV6	S2 080321 CDE2-052	NA	08/03/21 18:50

Quantitative Measurement Report

Print Date: 08/03/2021 06:51:17 PM

Data set: \\ARI-File\Inorganics\Conventionals\Methods\Sulfide\Instrument Data\2021\S2 080321 CDE.pho



x = 1.78922 y + 0.00116191
r2 = 0.99999

Software Information
Software Name: UVProbe
Version: 2.70
Mode: Security Mode

Data Information
Filename: \\ARI-File\Inorganics\Conventionals\Methods\Sulfide\Instrument Data\2021\S2 080321 CDE.pho
Title:
Analyst: CDE
Date/Time: 08/03/2021 06:51:04 PM
Comments:

Instrument Information
Instrument Name: UV1800-2
Instrument Type: UV-1800 Series
Model (S/N): UV1800 (A11455350874)

Standard Table

	Sample ID	Date	Time	Conc	WL650.0	Comments
1	SEQ_CAL1	08/03/2021	05:23:58 PM	0.000	-0.000	
2	SEQ_CAL2	08/03/2021	05:24:16 PM	0.050	0.027	
3	SEQ_CAL3	08/03/2021	05:24:39 PM	0.124	0.068	
4	SEQ_CAL4	08/03/2021	05:24:58 PM	0.249	0.139	
5	SEQ_CAL5	08/03/2021	05:25:18 PM	0.498	0.276	
6	SEQ_CAL6	08/03/2021	05:25:39 PM	0.996	0.557	
7						

Quantitative Measurement Report

Print Date: 08/03/2021 06:51:18 PM

Data set: \\ARI-File\Inorganics\Conventionals\Methods\Sulfide\Instrument Data\2021\S2 080321 CDE.pho

Sample Table

	Sample ID	Date	Time	Conc	WL650.0	Dilution	DF	PreDF	
1	SEQ_ICB1	08/03/2021	05:26:03 PM	0.001	-0.000	1.000	1.000	1.000	
2	SEQ_ICV1	08/03/2021	05:26:23 PM	0.458	0.255	1.000	1.000	1.000	
3	BJH0075_MRL1	08/03/2021	05:30:14 PM	0.051	0.028	1.000	1.000	1.000	
4	BJH0075_BLK1	08/03/2021	05:30:43 PM	0.013	0.007	1.000	1.000	1.000	
5	BJH0075_BS1	08/03/2021	05:31:01 PM	0.494	0.276	1.000	1.000	1.000	
6	21G0339_02	08/03/2021	05:31:20 PM	-0.001	-0.001	1.000	1.000	1.000	
7	21G0357_03	08/03/2021	05:31:36 PM	0.006	0.003	1.000	1.000	1.000	
8	21G0374_01	08/03/2021	05:31:53 PM	-0.004	-0.003	1.000	1.000	1.000	
9	21G0375_01	08/03/2021	05:32:09 PM	-0.004	-0.003	1.000	1.000	1.000	
10	BJH0075_DUP1	08/03/2021	05:32:25 PM	-0.000	-0.001	1.000	1.000	1.000	
11	BJH0075_MS1	08/03/2021	05:32:41 PM	0.457	0.255	1.000	1.000	1.000	
12	21G0376_01	08/03/2021	05:33:12 PM	-0.006	-0.004	1.000	1.000	1.000	
13	SEQ_CCB1	08/03/2021	05:33:33 PM	0.007	0.003	1.000	1.000	1.000	
14	SEQ_CCV1	08/03/2021	05:33:49 PM	0.493	0.275	1.000	1.000	1.000	
15	21G0376_02	08/03/2021	05:34:08 PM	-0.005	-0.003	1.000	1.000	1.000	
16	BJG0664_BLK1	08/03/2021	05:44:56 PM	0.008	0.004	1.000	1.000	1.000	
17	BJG0664_BS1	08/03/2021	05:45:25 PM	0.282	0.157	20.000	20.000	1.000	
18	21G0269_08	08/03/2021	05:45:52 PM	0.098	0.054	100.000	100.000	1.000	
19	BJG0664_DUP1	08/03/2021	05:46:16 PM	0.175	0.097	100.000	100.000	1.000	
20	BJG0664_MS1	08/03/2021	05:46:34 PM	0.218	0.121	100.000	100.000	1.000	
21	BJG0712_BLK1	08/03/2021	05:47:00 PM	0.019	0.010	1.000	1.000	1.000	
22	BJG0712_BS1	08/03/2021	05:47:18 PM	0.334	0.186	20.000	20.000	1.000	
23	21G0286_01	08/03/2021	05:47:41 PM	2.587	1.446	1.000	1.000	1.000	
24	BJG0712_DUP1	08/03/2021	05:48:02 PM	2.548	1.424	1.000	1.000	1.000	
25	SEQ_CCB2	08/03/2021	05:48:25 PM	0.004	0.002	1.000	1.000	1.000	
26	SEQ_CCV2	08/03/2021	05:49:29 PM	0.465	0.259	1.000	1.000	1.000	
27	BJG0712_MS1	08/03/2021	05:51:07 PM	0.463	0.258	20.000	20.000	1.000	
28	BJH0025_BLK1	08/03/2021	05:51:28 PM	-0.013	-0.008	1.000	1.000	1.000	
29	BJH0025_BS1	08/03/2021	05:51:51 PM	0.363	0.202	20.000	20.000	1.000	
30	21H0010_02	08/03/2021	05:52:11 PM	0.017	0.009	1.000	1.000	1.000	
31	BJH0025_MS1	08/03/2021	05:53:07 PM	0.290	0.162	20.000	20.000	1.000	
32	BJH0047_BLK1	08/03/2021	05:53:29 PM	0.006	0.003	1.000	1.000	1.000	
33	BJH0047_BS1	08/03/2021	05:53:47 PM	0.312	0.174	20.000	20.000	1.000	
34	21F0277_01RE1	08/03/2021	05:54:11 PM	0.023	0.012	1.000	1.000	1.000	
35	21F0277_03RE2	08/03/2021	05:54:49 PM	0.692	0.386	1.000	1.000	1.000	
36	BJH0047_DUP1	08/03/2021	05:55:14 PM	0.644	0.359	1.000	1.000	1.000	
37	SEQ_CCB3	08/03/2021	05:55:35 PM	0.002	0.000	1.000	1.000	1.000	
38	SEQ_CCV3	08/03/2021	05:55:52 PM	0.459	0.256	1.000	1.000	1.000	
39	BJH0047_MS1	08/03/2021	05:56:19 PM	0.296	0.165	20.000	20.000	1.000	

Quantitative Measurement Report

Print Date: 08/03/2021 06:51:18 PM

Data set: \\ARI-File\Inorganics\Conventionals\Methods\Sulfide\Instrument Data\2021\S2 080321 CDE.pho

Sample Table

	Sample ID	Date	Time	Conc	WL650.0	Dilution	DF	PreDF	
40	BJH0047_MSD1	08/03/2021	05:56:36 PM	0.297	0.165	20.000	20.000	1.000	
41	21G0286_01RE1	08/03/2021	06:09:13 PM	0.580	0.323	5.000	5.000	1.000	
42	BJG0712_DUP2	08/03/2021	06:09:30 PM	0.549	0.306	5.000	5.000	1.000	
43	SEQ_CCB4	08/03/2021	06:09:47 PM	0.005	0.002	1.000	1.000	1.000	
44	SEQ_CCV4	08/03/2021	06:10:03 PM	0.481	0.268	1.000	1.000	1.000	
45	21F0277_03RE3	08/03/2021	06:38:00 PM	0.353	0.196	2.000	2.000	1.000	
46	BJH0047_DUP2	08/03/2021	06:38:17 PM	0.349	0.195	2.000	2.000	1.000	
47	BJH0025_MS2	08/03/2021	06:38:42 PM	0.583	0.325	10.000	10.000	1.000	
48	BJH0047_MS2	08/03/2021	06:38:58 PM	0.552	0.308	10.000	10.000	1.000	
49	BJH0047_MSD2	08/03/2021	06:39:16 PM	0.587	0.328	10.000	10.000	1.000	
50	SEQ_CCB5	08/03/2021	06:39:34 PM	0.007	0.003	1.000	1.000	1.000	
51	SEQ_CCV5	08/03/2021	06:39:51 PM	0.447	0.249	1.000	1.000	1.000	
52	SEQ_CCV6	08/03/2021	06:50:15 PM	0.476	0.265	1.000	1.000	1.000	
53									

Quantitative Measurement Report

Print Date: 08/03/2021 06:51:18 PM

Data set: \\ARI-File\Inorganics\Conventionals\Methods\Sulfide\Instrument Data\2021\S2 080321 CDE.pho

[Wavelengths]

Wavelength Name:	WL650.0
Wavelength:	650.00 nm

[Calibration Curve]

Column for Cal. Curve:	WL650.0
Cal. Curve Type:	Multi Point
Cal. Curve Unit:	mg/l
Selected Wavelength:	WL650.0
Calibration Equation:	Conc = K1*(Abs) + K0
Zero Interception:	Not Selected

[Measurement Parameters(Standard)]

Data Acquired by:	Instrument
Delay sample read:	Disabled
Repeat:	Disabled

[Measurement Parameters(Sample)]

Data Acquired by:	Instrument
Delay sample read:	Disabled
Repeat:	Disabled

[Equations]

Equation Name:	Dilution
Equation:	DF*PreDF
Units:	mg/l

[Pass Fail]

[Method Summary]

Title:	
Date/Time:	12/02/2016 05:08:48 PM
Comments:	
Sample Preparations:	

[Instrument Properties]

Instrument Type:	UV-1800 Series
Measuring Mode:	Absorbance
Slit Width:	1.0 nm
Light Source Change Wavelength:	340.0 nm
S/R Exchange:	Normal

[Attachment Properties]

Attachment:	None

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INSTRUMENT BLANKS
SM 4500-S2 D-00 (PSEP)

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Instrument ID: UV1800-2
Sequence: SJH0030

SDG: 21G0286
Project: Lower Duwamish AOC4
Calibration: UNASSIGNED
Date Analyzed: 08/03/21 17:26

Lab Sample ID	Analyte	Found	MDL	MRL	Units	C
SJH0030-ICB1	Sulfide	0.001	0.05	0.050	mg/L	
SJH0030-CCB1	Sulfide	0.007	0.05	0.050	mg/L	
SJH0030-CCB2	Sulfide	0.004	0.05	0.050	mg/L	
SJH0030-CCB3	Sulfide	0.002	0.05	0.050	mg/L	
SJH0030-CCB4	Sulfide	0.005	0.05	0.050	mg/L	
SJH0030-CCB5	Sulfide	0.007	0.05	0.050	mg/L	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL AND CONTINUING CALIBRATION CHECK

SM 4500-S2 D-00 (PSEP)

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Instrument ID: UV1800-2
Control Limt: +/- 10.00%

SDG: 21G0286
Project: Lower Duwamish AOC4
Calibration: UNASSIGNED
Sequence: SJH0030

Lab Sample ID	Analyte	True	Found	%R	Units	Method
SJH0030-ICV1	Sulfide	0.49778	0.458	92.0	mg/L	4500-S2 D-00 (PSI
SJH0030-CCV1	Sulfide	0.49778	0.493	99.0	mg/L	4500-S2 D-00 (PSI
SJH0030-CCV2	Sulfide	0.49778	0.465	93.4	mg/L	4500-S2 D-00 (PSI
SJH0030-CCV3	Sulfide	0.49778	0.459	92.2	mg/L	4500-S2 D-00 (PSI
SJH0030-CCV4	Sulfide	0.49778	0.481	96.6	mg/L	4500-S2 D-00 (PSI
SJH0030-CCV6	Sulfide	0.49778	0.476	95.6	mg/L	4500-S2 D-00 (PSI

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HOLDING TIME SUMMARY

Analysis: SM 4500-S2 D-00 (PSEP)

Laboratory: Analytical Resources, Inc. SDG: 21G0286

Client: Anchor QEA, LLC Project: Lower Duwamish AOC4

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LDW21-SS687 21G0286-01RE1	07/22/21 06:45	07/22/21 17:30	07/29/21 15:59	7	7	08/03/21 18:09			
Duplicate BJG0712-DUP2	07/22/21 06:45	07/22/21 17:30	07/29/21 15:59	7	7	08/03/21 18:09			
Matrix Spike BJG0712-MS1	07/22/21 06:45	07/22/21 17:30	07/29/21 16:18	7	7	08/03/21 17:51			

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

SM 4500-S2 D-00 (PSEP)

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument: UV1800-2

Analyte	MDL	RL	Units
Sulfide	1.00	1.00	mg/kg

SULFIDE TITRATION

Buret used for titrations: **S2**

Standardization of sodium thiosulfate titrant

Thiosulfate ID:	**H009583**			Analyst:	*CDE*
Bi-iodate ID:	**H000778**			Date & Time:	3/3/2021 9:40
Stock bi-iodate =	**0.8134**	*grams to*	1000	*mL*	
Normality =	**0.025**				
Titration of bi-iodate with thiosulfate					
mL bi-iodate =	3.00	3.00	3.00		
mL thiosulfate =	3.10	3.09	3.10	*nthio*	
Normality thiosulfate =	0.024	0.024	0.024	**0.024**	

*(mL bi-iodate*normbio) / mL thiosulfate*

Normality of Iodine

Iodine ID:	**H011991**			
Titration of Iodine with thiosulfate				
mL iodine =	3.00	3.00	3.00	
mL thiosulfate =	3.06	3.04	3.04	*ni*
Normality iodine =	0.025	0.025	0.025	**0.025**

*(mL thiosulfate*nthio) / mL iodine*

Standardization of Sodium Sulfide Stock

Stock ID =	**J006869**			Analyst:	*CDE*
				Date & Time:	8/3/2021 14:42
Approx conc in	*60*	*mL*			
g Na2S =	0.4844	*mg /mL =*	1.078		
Titration of standard with thiosulfate					
mL Standard =	1.00	1.00	1.00		
mL iodine =	3.00	3.00	3.00		
mL thiosulfate =	1.16	1.17	1.15	*stkconc (mg/mL)*	
Sulfide (mg/mL) =	0.732	0.728	0.736	**0.73203**	

*{[(mL iodine*ni)-(mL thio *nthio)]*16} / mL standard*

mL required for for 0.025 mg/mL 3.4

S2 072721 TITRATION

Date Printed: 8/3/2021

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Form I
INORGANIC ANALYSIS DATA SHEET
PSEP 1986

LDW21-SS687

Laboratory:	Analytical Resources, Inc.				
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0286-01 H	SDG:	21G0286
Sampled:	07/22/21 06:45	Prepared:	07/27/21 14:22	File ID:	
% Solids:	74.81	Preparation:	No Prep Wet Chem	Analyzed:	07/27/21 14:23
Batch:	BJG0638	Sequence:		Initial/Final:	5 g Wet / 5 g
Instrument:	BAL2			Calibration:	

CAS NO.	Analyte	Concentration (%)	Dilution Factor	MDL	MRL	Q
	Total Solids, Sulfide	74.55	1	0.04	0.04	

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HOLDING TIME SUMMARY

Analysis: PSEP 1986

Laboratory: Analytical Resources, Inc. SDG: 21G0286

Client: Anchor QEA, LLC Project: Lower Duwamish AOC4

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
LDW21-SS687 21G0286-01	07/22/21 06:45	07/22/21 17:30	07/27/21 14:22	5	28	07/27/21 14:23	5	28	

* Indicates hold time exceedance.

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METHOD DETECTION AND REPORTING LIMITS

PSEP 1986

Laboratory: Analytical Resources, Inc.
SDG: 21G0286
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument:

Analyte	MDL	RL	Units
Total Solids, Sulfide	0.04	0.04	%