Analytical Resources, Incorporated
Analytical Chemists and Consultants

30 August 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)
21G0111	N/A

Susan Dunnihoo
Digitally signed by Susan Dunnihoo
Date: 2021.08.30 16:43:24 -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

Accredited in accordance with nelac
Cert# 100006-012

21G0111

1 of 2

CHAIN-OF-CUSTODY/TEST REQUEST FORM

№ 4036

Project/Client Name: Duwamish AOC4
Project Number: 180067-02.02
Contact Name: Amara Vandervort
Sampled By: Windward

Ship to: ARI
Attn: Sue Dunnihoo
Shipper: courier
Form filled out by: K. McPeek

Shipping Date: 7/9/21
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	Metals	SMS SVOCs	Dioxins/ furans		Comments / Instructions [Jar tag number(s)]
7/9/21	1010	LDW21-55552	3	sediment	X	X	X					
	1030	-55508	3		X	X	X					
	1100	-55513	3		X	X	X					
	1110	-55514	3		X	X	X					
	1150	-55602	5		X	X	X	X	X			
	1200	-55603	5		X	X	X	X	X	X		
	1310	~~1300~~ KM -55578	3		X	X	X	X				+ BBP, As only (metals)
	1330	-55580	3		X	X	X	X				+ BBP, As only (metals)
	1355	-55590	3		X	X	X	X				+ BBP, PAHs; As + Zn only (metals)
	1445	-55542	3		X	X	X					
	1515	-55544	3		X	X	X					
	1535	-55661	4		X	X	X			X		+ phenol
		Total Number of Containers		Purchase Order / Statement of Work # CLF-052021-ARI								

1) Released by:	1) Rec'd by:	2) Released by:	2) Rec'd by:
Print name: Kate McPeek	Print name: [illegible]	Print name:	
Signature: [signature]	Company: ARI	Signature:	Company:
Company: Windward		Company:	
Date/Time: 7/9/21 ~~1530~~ KM 1730	Date/Time: 07/09/2021 1730	Date/Time:	Date/Time:

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

To be completed by Laboratory upon sample receipt:

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

Windward environmental LLC
200 1st Ave W, Suite 500
Seattle, WA 98119
206.378.1364

21G0111

2 of 2

CHAIN-OF-CUSTODY/TEST REQUEST FORM

№ 3180

Project/Client Name: Duwamish AOC4
Project Number: 180067-02.02
Contact Name: Amara Vandervort
Sampled By: Windward

Ship to: ARI
Attn: Sue Dunniboo
Shipper: Courier
Form filled out by: K. McPeek

Shipping Date: 7/9/21
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	Metals				Comments / Instructions [Jar tag number(s)]
					Test(s) Requested (check test(s) required)							
7/9/21	1605	LDW21-SS631	3	Sediment	X	X	X	X				+ BEHP, cPAHs; As only (metals)
		Total Number of Containers		Purchase Order / Statement of Work # CLF-052021-ARI								

Kate McPeek 7/9/21

1) Released by:	1) Rec'd by:	2) Released by:	2) Rec'd by:
Print name: Kate McPeek	Jacob Ventler	Print name:	
Signature:	Company: ARI	Signature:	Company:
Company: Windward		Company:	
Date/Time: 7/9/21 ~~1530~~ KM 1730	Date/Time: 07/09/2021 1730	Date/Time:	Date/Time:

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

Windward 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 Aqcy

COC No(s): 4036 & 3180 NA

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

Assigned ARI Job No: 21G0111

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 1809 4.4 4.8 ___ ___ ___ ___

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

Temp Gun ID#: DOO 8006

Cooler Accepted by: JSL Date: 07/09/2021 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: _____			
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: SC Date: 7/12/21 Time: 0852 Labels checked by: SC

***** 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	08/30/2021 15:53

ANALYTICAL REPORT FOR SAMPLES

Laboratory ID	Sample ID	Matrix	Date Sampled	Date Received
21G0111-01	LDW21-SS552	Solid	07/09/21 10:10	07/09/21 17:30
21G0111-02	LDW21-SS508	Solid	07/09/21 10:30	07/09/21 17:30
21G0111-03	LDW21-SS513	Solid	07/09/21 11:00	07/09/21 17:30
21G0111-04	LDW21-SS514	Solid	07/09/21 11:10	07/09/21 17:30
21G0111-05	LDW21-SS602	Solid	07/09/21 11:50	07/09/21 17:30
21G0111-06	LDW21-SS603	Solid	07/09/21 12:00	07/09/21 17:30
21G0111-07	LDW21-SS578	Solid	07/09/21 13:10	07/09/21 17:30
21G0111-08	LDW21-SS580	Solid	07/09/21 13:30	07/09/21 17:30
21G0111-09	LDW21-SS590	Solid	07/09/21 13:55	07/09/21 17:30
21G0111-10	LDW21-SS542	Solid	07/09/21 14:45	07/09/21 17:30
21G0111-11	LDW21-SS546	Solid	07/09/21 15:15	07/09/21 17:30
21G0111-12	LDW21-SS661	Solid	07/09/21 15:35	07/09/21 17:30
21G0111-13	LDW21-SS631	Solid	07/09/21 16:05	07/09/21 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	30-Aug-2021 15:53

Case Narrative

Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Work Order: 21G0111 - Dioxins

Sample receipt

Samples as listed on the preceding page were received 09-Jul-2021 17:30 under ARI work order 21G0111. For details regarding sample receipt, please refer to the Cooler Receipt Form. Mercury aliquots were frozen to meet QAPP requirements and additional sample aliquots were frozen to extend holding time as needed.

Dioxin/Furans - EPA Method 1613

The sample(s) were extracted and analyzed within the recommended holding times. Analysis was performed using an application specific column developed by Restek. The RTX-Dloxin2 column has unique isomer separation for the 2378-TCDF, eliminating the need for confirmation analysis.

Initial and continuing calibrations were within method requirements.

The labeled internal standard area for 13C12-2,3,7,8-TCDF was low of limits for the duplicate BJG0572-DUP1 and the standard reference material BJG0572-SRM1.

The cleanup surrogate percent recoveries were low of control limits for the duplicate BJG0572-DUP1 and the standard reference material BJG0572-SRM1. The low TCDFs were later tracked to florisil issues from multiple power outages in the laboratory.

The method blank(s) were clean at the reporting limits, with response for OCDD below the reporting limit and "J"-flagged. Associated positive results have been "B"-flagged.

The OPR (Ongoing Precision and Recovery) standard percent recoveries were within control limits.

The duplicate (DUP) relative percent difference (RPD) for 1,2,3,6,7,8-HxCF and 1,2,3,6,7,8-HxCDD were outside advisory limits and have been flagged on the summary sheet.

The standard reference material (SRM) has recoveries for some targets undetected and flagged as below advisory control limits, attributed to the lab using smaller sample aliquots.

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	30-Aug-2021 15:53

Case Narrative

QUALIFIERS AND NOTES

Qualifier	Definition
U	This analyte is not detected above the reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
J	Estimated concentration value detected below the reporting limit.
EMPC	Estimated Maximum Possible Concentration qualifier for HRGCMS Dioxin
B	This analyte was detected in the method blank.
*	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-SS603

Form 1
ORGANIC ANALYSIS DATA SHEET
EPA 1613B
Dioxins/Furans by HRGC/HRMS

Laboratory:	Analytical Resources, Inc.			SDG:	21G0111
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0111-06 A	File ID:	21081909
Sampled:	07/09/21 12:00	Prepared:	07/30/21 17:00	Analyzed:	08/18/21 16:44
% Solids:	69.86	Preparation:	EPA 1613	Initial/Final:	14.3 g Wet / 20 uL
Result Basis:	Dry	Sequence:	SJH0230	Calibration:	EH00030
Batch:	BJG0572	Instrument:	AUTOSPEC01	Column:	RTX-Dioxin2

CAS NO.	COMPOUND	DF/Split	Ion Ratio	Ratio Limits	EDL	RL	Result	Units	Q
51207-31-9	2,3,7,8-TCDF	1		0.655-0.886	0.742	1.00	ND	ng/kg	U
1746-01-6	2,3,7,8-TCDD	1		0.655-0.886	0.575	1.00	ND	ng/kg	U
57117-41-6	1,2,3,7,8-PeCDF	1	2.337	1.318-1.783	0.385	1.00	0.724	ng/kg	EMPC, J
57117-31-4	2,3,4,7,8-PeCDF	1	1.302	1.318-1.783	0.362	1.00	1.33	ng/kg	EMPC
40321-76-4	1,2,3,7,8-PeCDD	1		1.318-1.783	0.607	1.00	ND	ng/kg	U
70648-26-9	1,2,3,4,7,8-HxCDF	1	1.132	1.054-1.426	0.396	1.00	3.16	ng/kg	
57117-44-9	1,2,3,6,7,8-HxCDF	1	1.129	1.054-1.426	0.390	1.00	1.23	ng/kg	
60851-34-5	2,3,4,6,7,8-HxCDF	1	1.117	1.054-1.426	0.403	1.00	2.07	ng/kg	
72918-21-9	1,2,3,7,8,9-HxCDF	1		1.054-1.426	0.388	1.00	ND	ng/kg	U
39227-28-6	1,2,3,4,7,8-HxCDD	1	1.245	1.054-1.426	0.493	1.00	1.23	ng/kg	
57653-85-7	1,2,3,6,7,8-HxCDD	1	1.173	1.054-1.426	0.499	1.00	3.61	ng/kg	
19408-74-3	1,2,3,7,8,9-HxCDD	1	1.343	1.054-1.426	0.531	1.00	2.52	ng/kg	
67562-39-4	1,2,3,4,6,7,8-HpCDF	1	1.123	0.893-1.208	0.292	1.00	19.8	ng/kg	
55673-89-7	1,2,3,4,7,8,9-HpCDF	1	1.188	0.893-1.208	0.421	1.00	1.78	ng/kg	
35822-46-9	1,2,3,4,6,7,8-HpCDD	1	1.076	0.893-1.208	0.817	2.50	83.8	ng/kg	
39001-02-0	OCDF	1	0.851	0.757-1.024	0.612	2.50	36.7	ng/kg	
3268-87-9	OCDD	1	0.865	0.757-1.024	0.971	10.0	632	ng/kg	B

Homologue Groups

55722-27-5	Total TCDF	1	0.000			1.00	4.96	ng/kg
41903-57-5	Total TCDD	1	0.000			1.00	1.86	ng/kg
30402-15-4	Total PeCDF	1	0.000			1.00	3.02	ng/kg
36088-22-9	Total PeCDD	1	0.000			1.00	0.982	ng/kg
55684-94-1	Total HxCDF	1	0.000			1.00	31.9	ng/kg
34465-46-8	Total HxCDD	1	0.000			1.00	22.0	ng/kg
38998-75-3	Total HpCDF	1	0.000			1.00	57.7	ng/kg
37871-00-4	Total HpCDD	1	0.000			1.00	245	ng/kg

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 3.06
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 3.70

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS603

Form 2
ORGANIC ANALYSIS DATA SHEET
EPA 1613B
Dioxins/Furans by HRGC/HRMS

Laboratory:	Analytical Resources, Inc.			SDG:	21G0111
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Sediment	Laboratory ID:	21G0111-06	File ID:	21081909
Sampled:	07/09/21 12:00	Prepared:	07/30/21 17:00	Analyzed:	08/18/21 16:44
Solids Wt%:	69.86	Preparation:	EPA 1613	Initial/Final:	14.3 g / 20 uL
Result Basis:	Dry	Sequence:	SJH0230	Calibration:	EH00030
Batch:	BJG0572	Instrument:	AUTOSPEC01	Column:	RTX-Dioxin2

Labels	DF/Split	Ion Ratio	Ratio Limits	EDL	% REC	QC LIMITS	Q
13C12-2,3,7,8-TCDF		0.795	0.655-0.886	0.378	47.2	24 - 169 %	
13C12-2,3,7,8-TCDD		0.765	0.655-0.886	0.444	65.4	25 - 164 %	
13C12-1,2,3,7,8-PeCDF		1.661	1.318-1.783	0.371	73.0	24 - 185 %	
13C12-2,3,4,7,8-PeCDF		1.635	1.318-1.783	0.390	73.5	21 - 178 %	
13C12-1,2,3,7,8-PeCDD		1.576	1.318-1.783	0.466	79.2	25 - 181 %	
13C12-1,2,3,4,7,8-HxCDF		0.527	0.434-0.587	0.392	80.1	26 - 152 %	
13C12-1,2,3,6,7,8-HxCDF		0.522	0.434-0.587	0.362	77.3	26 - 123 %	
13C12-2,3,4,6,7,8-HxCDF		0.533	0.434-0.587	0.401	77.5	28 - 136 %	
13C12-1,2,3,7,8,9-HxCDF		0.523	0.434-0.587	0.483	83.0	29 - 147 %	
13C12-1,2,3,4,7,8-HxCDD		1.243	1.054-1.426	0.438	87.8	32 - 141 %	
13C12-1,2,3,6,7,8-HxCDD		1.252	1.054-1.426	0.404	81.0	28 - 130 %	
13C12-1,2,3,4,6,7,8-HpCDF		0.454	0.374-0.506	0.422	78.3	28 - 143 %	
13C12-1,2,3,4,7,8,9-HpCDF		0.464	0.374-0.506	0.516	81.6	26 - 138 %	
13C12-1,2,3,4,6,7,8-HpCDD		1.008	0.893-1.208	0.506	90.8	23 - 140 %	
13C12-OCDD		0.917	0.757-1.024	0.630	98.7	17 - 157 %	
37Cl4-2,3,7,8-TCDD		328.000		0.152	64.9	35 - 197 %	

* Values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:30:35 Pacific Daylight Time

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: 21G0111-06, Name: 21081909, Date: 18-Aug-2021, Time: 16:44:47, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
2378-TCDF					1.108		0.770	1457	1998								
12378-PeCDF	29.828	1.001	5.794e2	2.480e2	1.015	2.337	1.550	1183	1028	9.60e3	3.47e3	8.1	3.4	YES	bb	MM	0.362
23478-PeCDF	31.165	1.000	9.156e2	7.031e2	1.126	1.302	1.550	1183	1028	1.68e4	1.20e4	14.2	11.7	YES	db	bb	0.665
123478-HxCDF	34.830	1.001	1.729e3	1.528e3	1.017	1.132	1.240	928	1170	2.87e4	2.57e4	30.9	22.0	NO	dd	db	1.579
234678-HxCDF	35.855	1.000	1.103e3	9.879e2	1.052	1.117	1.240	928	1170	1.09e4	9.79e3	11.8	8.4	NO	MM	MM	1.035
123678-HxCDF	34.964	1.000	7.170e2	6.352e2	1.037	1.129	1.240	928	1170	1.29e4	1.31e4	13.9	11.2	NO	db	bb	0.616
123789-HxCDF					1.030		1.240	928	1170								
1234678-HpCDF	38.708	1.000	1.026e4	9.140e3	1.327	1.123	1.050	753	845	1.67e5	1.48e5	222.4	175.0	NO	bb	bb	9.881
1234789-HpCDF	40.936	1.000	7.801e2	6.567e2	1.283	1.188	1.050	753	845	1.29e4	9.55e3	17.1	11.3	NO	bb	bb	0.888
OCDF	45.168	1.005	1.236e4	1.453e4	1.447	0.851	0.890	817	972	1.33e5	1.67e5	163.1	171.7	NO	bb	bb	18.334
2378-TCDD					0.920		0.770	1399	909								
12378-PeCDD					0.995		1.550	1029	1089								
123478-HxCDD	35.967	1.000	6.009e2	4.825e2	1.027	1.245	1.240	1314	975	8.73e3	9.67e3	6.6	9.9	NO	bd	bd	0.613
123678-HxCDD	36.089	1.000	1.688e3	1.439e3	1.009	1.173	1.240	1314	975	2.86e4	2.25e4	21.7	23.1	NO	db	db	1.803
123789-HxCDD	36.468	1.011	1.181e3	8.789e2	0.950	1.343	1.240	1314	975	2.10e4	1.33e4	16.0	13.6	NO	bb	bb	1.261
1234678-HpCDD	40.200	1.000	2.712e4	2.522e4	1.068	1.076	1.050	1422	1172	4.14e5	3.95e5	291.3	336.9	NO	bb	bb	41.855
OCDD	44.940	1.000	1.752e5	2.024e5	1.181	0.865	0.890	1284	1034	2.08e6	2.36e6	1622.0	2280.3	NO	bb	bd	315.527
13C-2378-TCDF	25.640	1.007	7.105e4	8.941e4	1.427	0.795	0.770	1766	1508	1.12e6	1.40e6	633.4	927.0	NO	bb	bb	47.245
13C-12378-PeCDF	29.806	1.171	1.407e5	8.469e4	1.297	1.661	1.550	1627	1293	2.12e6	1.26e6	1302.8	977.9	NO	bb	bb	72.971
13C-23478-PeCDF	31.154	1.224	1.342e5	8.209e4	1.236	1.635	1.550	1627	1293	2.02e6	1.24e6	1241.2	960.5	NO	bb	bb	73.463
13C-123478-HxCDF	34.808	0.955	7.006e4	1.328e5	1.242	0.527	0.510	1221	1499	1.08e6	2.04e6	884.3	1362.9	NO	bd	bd	80.068
13C-123678-HxCDF	34.953	0.959	7.263e4	1.392e5	1.343	0.522	0.510	1221	1499	1.07e6	2.05e6	875.6	1365.0	NO	db	db	77.333
13C-234678-HxCDF	35.844	0.983	6.677e4	1.252e5	1.215	0.533	0.510	1221	1499	1.03e6	1.94e6	846.1	1296.0	NO	bb	bb	77.481
13C-123789-HxCDF	36.836	1.010	5.858e4	1.120e5	1.008	0.523	0.510	1221	1499	1.08e6	2.07e6	887.6	1379.3	NO	bb	bb	82.994
13C-1234678-HpCDF	38.696	1.061	4.616e4	1.018e5	0.926	0.454	0.440	812	1373	7.74e5	1.67e6	953.3	1214.5	NO	bb	bb	78.292
13C-1234789-HpCDF	40.924	1.122	4.000e4	8.613e4	0.758	0.464	0.440	812	1373	5.64e5	1.21e6	694.3	882.5	NO	bb	bd	81.605
13C-1234-TCDD	25.458	0.000	1.035e5	1.346e5	1.000	0.768	0.770	2060	946	1.58e6	2.08e6	768.2	2199.8	NO	bb	bb	100.000
13C-2378-TCDD	26.275	1.032	7.537e4	9.850e4	1.116	0.765	0.770	2060	946	1.13e6	1.48e6	551.0	1566.3	NO	bb	bb	65.412
13C-12378-PeCDD	31.410	1.234	8.442e4	5.358e4	0.732	1.576	1.550	1066	1001	1.29e6	8.07e5	1209.3	806.0	NO	bb	bb	79.193
13C-123478-HxCDD	35.956	0.986	9.527e4	7.662e4	0.960	1.243	1.240	1160	1190	1.51e6	1.20e6	1298.1	1005.1	NO	bd	bd	87.819
13C-123678-HxCDD	36.078	0.990	9.556e4	7.635e4	1.041	1.252	1.240	1160	1190	1.52e6	1.22e6	1309.8	1026.8	NO	db	db	80.950
13C-1234678-HpCDD	40.189	1.102	5.878e4	5.829e4	0.632	1.008	1.050	926	862	8.96e5	8.99e5	967.8	1043.6	NO	bb	bb	90.771
13C-OCDD	44.922	1.232	9.698e4	1.057e5	0.504	0.917	0.890	894	879	1.16e6	1.25e6	1299.9	1417.6	NO	bb	bb	197.308
13C-123789-HxCDD	36.457	0.000	1.134e5	9.058e4	1.000	1.251	1.240	1160	1190	1.87e6	1.53e6	1608.0	1288.7	NO	bb	bb	100.000
37CL-2378-TCDD	26.305	1.033	6.699e4		1.084			996		9.86e5		989.7			bb		25.968

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:30:35 Pacific Daylight Time

ID: 21G0111-06, Name: 21081909, Date: 18-Aug-2021, Time: 16:44:47, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
1368-TCDF					1.425		0.770	1457	1998								
1289-TCDF					1.043		0.770	1457	1998								
13468-PECDF					1.376		1.550	801	1156								
12389-PECDF					1.000		1.550	1183	1028								
123468-HXCDF	33.137	0.952	1.829e3	1.396e3	1.087	1.310	1.240	928	1170	2.72e4	2.31e4	29.3	19.7	NO	bb	bd	1.463
1368-TCDD	23.432	0.892	2.686e2	3.239e2	0.923	0.829	0.770	1399	909	4.48e3	5.12e3	3.2	5.6	NO	bb	bb	0.369
1289-TCDD					0.794		0.770	1399	909								
12479-PECDD	28.747	0.915	6.623e2	5.438e2	1.843	1.218	1.550	1029	1089	9.73e3	8.14e3	9.5	7.5	YES	bd	bd	0.474
12389-PECDD					1.154		1.550	1029	1089								
124679-HXCDD	33.928	0.944	5.669e3	5.514e3	1.125	1.028	1.240	1314	975	9.59e4	7.67e4	73.0	78.6	YES	bb	bd	5.783
1234679-HPCDD	39.153	0.974	5.877e4	5.506e4	1.211	1.067	1.050	1422	1172	9.66e5	8.99e5	679.2	767.3	NO	bb	bb	80.301
Total-tetrafurans			2.003e3		1.192			1457		2.73e4							2.478
Total-penta1			0.000e0					801		0.00e0							
Total-pentafurans			2.081e3		1.047			1183		3.91e4							1.507
Total-hexafurans			1.790e4		1.045			928		2.61e5							15.911
Total-heptafurans			2.755e4		1.305			753		4.48e5							28.820
Total-Furans			6.190e4		1.158			1457		9.08e5							67.050
Total-tetradioxins			6.484e2		0.879			1399		1.07e4							0.931
Total-pentadioxins			5.282e2		1.331			1029		9.12e3							0.491
Total-hexadioxins			1.047e4		1.028			1314		1.85e5							11.000
Total-heptadioxins			8.589e4		1.140			1422		1.38e6							122.156
Total-Dioxins			2.727e5		1.092			1399		3.67e6							450.106
Total-TEQ			3.346e5					1399		4.58e6							517.155
FUNCTION1 PFK			1.076e6					466084		1.92e7							
FUNCTION2 PFK			2.099e6					351243		7.87e6							0.000
FUNCTION3 PFK			6.366e6					434147		8.02e6							0.000
FUNCTION4 PFK			2.763e5					265203		7.78e6							
FUNCTION5 PFK			3.600e6					238064		3.25e7							
FUNCTION1 HXCD...			4.722e2					722		8.70e3							0.000
FUNCTION1 HPCD...			8.529e2					685		1.43e4							0.000
FUNCTION2 HPCD...			1.540e2					764		4.98e3							0.000
FUNCTION3 OCDPE			2.588e2					783		6.63e3							0.000
FUNCTION4 NCDPE			1.438e3					665		2.55e4							0.000
FUNCTION5 DCDPE			0.000e0					626		0.00e0							

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: 21G0111-06, Name: 21081909, Date: 18-Aug-2021, Time: 16:44:47, Conditions: AUTOSPEC01, User: pk

TF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetrafurans	24.31	1.130e3	1.507e3	1.192	0.75	0.77	9.2	YES	NO	bd	bd	1.378
2	Total-tetrafurans	27.27	8.736e2	1.229e3	1.192	0.71	0.77	9.6	YES	NO	bb	dd	1.099

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-pentafurans	28.73	9.739e2	6.664e2	1.047	1.46	1.55	17.3	YES	NO	bd	bd	0.710
2	Total-pentafurans	28.39	3.207e2	2.005e2	1.047	1.60	1.55	6.0	YES	NO	bb	bb	0.225
3	Total-pentafurans	31.03	4.226e2	2.932e2	1.047	1.44	1.55	5.2	YES	NO	dd	db	0.310
4	Total-pentafurans	29.55	3.643e2	2.408e2	1.047	1.51	1.55	4.6	YES	NO	db	db	0.262

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123478-HxCDF	34.83	1.729e3	1.528e3	1.017	1.13	1.24	30.9	YES	NO	dd	db	1.579
2	Total-hexafurans	34.20	6.388e3	5.221e3	1.045	1.22	1.24	101.0	YES	NO	bb	bb	5.720
3	Total-hexafurans	33.36	6.133e3	5.027e3	1.045	1.22	1.24	94.4	YES	NO	bb	db	5.499
4	123468-HXCDF	33.14	1.829e3	1.396e3	1.087	1.31	1.24	29.3	YES	NO	bb	bd	1.463
5	234678-HxCDF	35.86	1.103e3	9.879e2	1.052	1.12	1.24	11.8	YES	NO	MM	MM	1.035
6	123678-HxCDF	34.96	7.170e2	6.352e2	1.037	1.13	1.24	13.9	YES	NO	db	bb	0.616

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234789-HpCDF	40.94	7.801e2	6.567e2	1.283	1.19	1.05	17.1	YES	NO	bb	bb	0.888
2	Total-heptafurans	39.36	1.651e4	1.577e4	1.305	1.05	1.05	354.8	YES	NO	bb	bb	18.051
3	1234678-HpCDF	38.71	1.026e4	9.140e3	1.327	1.12	1.05	222.4	YES	NO	bb	bb	9.881

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Furans,TF,PP,PF,HF,HPF,OF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetrafurans	24.31	1.130e3	1.507e3	1.192	0.75	0.77	9.2	YES	NO	bd	bd	1.378
2	Total-tetrafurans	27.27	8.736e2	1.229e3	1.192	0.71	0.77	9.6	YES	NO	bb	dd	1.099
3	Total-pentafurans	28.73	9.739e2	6.664e2	1.047	1.46	1.55	17.3	YES	NO	bd	bd	0.710
4	Total-pentafurans	28.39	3.207e2	2.005e2	1.047	1.60	1.55	6.0	YES	NO	bb	bb	0.225
5	Total-pentafurans	31.03	4.226e2	2.932e2	1.047	1.44	1.55	5.2	YES	NO	dd	db	0.310
6	Total-pentafurans	29.55	3.643e2	2.408e2	1.047	1.51	1.55	4.6	YES	NO	db	db	0.262
7	123478-HxCDF	34.83	1.729e3	1.528e3	1.017	1.13	1.24	30.9	YES	NO	dd	db	1.579
8	Total-hexafurans	34.20	6.388e3	5.221e3	1.045	1.22	1.24	101.0	YES	NO	bb	bb	5.720
9	Total-hexafurans	33.36	6.133e3	5.027e3	1.045	1.22	1.24	94.4	YES	NO	bb	db	5.499
10	123468-HXCDF	33.14	1.829e3	1.396e3	1.087	1.31	1.24	29.3	YES	NO	bb	bd	1.463
11	234678-HxCDF	35.86	1.103e3	9.879e2	1.052	1.12	1.24	11.8	YES	NO	MM	MM	1.035
12	123678-HxCDF	34.96	7.170e2	6.352e2	1.037	1.13	1.24	13.9	YES	NO	db	bb	0.616
13	1234789-HpCDF	40.94	7.801e2	6.567e2	1.283	1.19	1.05	17.1	YES	NO	bb	bb	0.888
14	Total-heptafurans	39.36	1.651e4	1.577e4	1.305	1.05	1.05	354.8	YES	NO	bb	bb	18.051
15	1234678-HpCDF	38.71	1.026e4	9.140e3	1.327	1.12	1.05	222.4	YES	NO	bb	bb	9.881
16	OCDF	45.17	1.236e4	1.453e4	1.447	0.85	0.89	163.1	YES	NO	bb	bb	18.334

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetradioxins	23.69	3.798e2	4.799e2	0.879	0.79	0.77	4.4	YES	NO	bb	bb	0.562
2	1368-TCDD	23.43	2.686e2	3.239e2	0.923	0.83	0.77	3.2	YES	NO	bb	bb	0.369

PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-pentadioxins	29.82	5.282e2	3.730e2	1.331	1.42	1.55	8.9	YES	NO	bb	bb	0.491

HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123678-HxCDD	36.09	1.688e3	1.439e3	1.009	1.17	1.24	21.7	YES	NO	db	db	1.803
2	123478-HxCDD	35.97	6.009e2	4.825e2	1.027	1.25	1.24	6.6	YES	NO	bd	bd	0.613
3	Total-hexadioxins	35.08	3.469e3	3.164e3	1.028	1.10	1.24	40.9	YES	NO	dd	dd	3.754
4	Total-hexadioxins	35.04	2.111e3	1.618e3	1.028	1.30	1.24	36.6	YES	NO	bd	bd	2.110
5	Total-hexadioxins	34.71	1.422e3	1.157e3	1.028	1.23	1.24	18.8	YES	NO	bb	bb	1.459
6	123789-HxCDD	36.47	1.181e3	8.789e2	0.950	1.34	1.24	16.0	YES	NO	bb	bb	1.261

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
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HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDD	40.20	2.712e4	2.522e4	1.068	1.08	1.05	291.3	YES	NO	bb	bb	41.855
2	1234679-HPCDD	39.15	5.877e4	5.506e4	1.211	1.07	1.05	679.2	YES	NO	bb	bb	80.301

Dioxins,TD,PD,HD,HPD,OD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetradioxins	23.69	3.798e2	4.799e2	0.879	0.79	0.77	4.4	YES	NO	bb	bb	0.562
2	1368-TCDD	23.43	2.686e2	3.239e2	0.923	0.83	0.77	3.2	YES	NO	bb	bb	0.369
3	Total-pentadioxins	29.82	5.282e2	3.730e2	1.331	1.42	1.55	8.9	YES	NO	bb	bb	0.491
4	123678-HxCDD	36.09	1.688e3	1.439e3	1.009	1.17	1.24	21.7	YES	NO	db	db	1.803
5	123478-HxCDD	35.97	6.009e2	4.825e2	1.027	1.25	1.24	6.6	YES	NO	bd	bd	0.613
6	Total-hexadioxins	35.08	3.469e3	3.164e3	1.028	1.10	1.24	40.9	YES	NO	dd	dd	3.754
7	Total-hexadioxins	35.04	2.111e3	1.618e3	1.028	1.30	1.24	36.6	YES	NO	bd	bd	2.110
8	Total-hexadioxins	34.71	1.422e3	1.157e3	1.028	1.23	1.24	18.8	YES	NO	bb	bb	1.459
9	123789-HxCDD	36.47	1.181e3	8.789e2	0.950	1.34	1.24	16.0	YES	NO	bb	bb	1.261
10	1234678-HpCDD	40.20	2.712e4	2.522e4	1.068	1.08	1.05	291.3	YES	NO	bb	bb	41.855
11	1234679-HPCDD	39.15	5.877e4	5.506e4	1.211	1.07	1.05	679.2	YES	NO	bb	bb	80.301
12	OCDD	44.94	1.752e5	2.024e5	1.181	0.87	0.89	1622.0	YES	NO	bb	bd	315.527

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TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetrafurans	24.31	1.130e3	1.507e3	1.192	0.75	0.77	9.2	YES	NO	bd	bd	1.378
2	Total-tetrafurans	27.27	8.736e2	1.229e3	1.192	0.71	0.77	9.6	YES	NO	bb	dd	1.099
3	Total-pentafurans	28.73	9.739e2	6.664e2	1.047	1.46	1.55	17.3	YES	NO	bd	bd	0.710
4	Total-pentafurans	28.39	3.207e2	2.005e2	1.047	1.60	1.55	6.0	YES	NO	bb	bb	0.225
5	Total-pentafurans	31.03	4.226e2	2.932e2	1.047	1.44	1.55	5.2	YES	NO	dd	db	0.310
6	Total-pentafurans	29.55	3.643e2	2.408e2	1.047	1.51	1.55	4.6	YES	NO	db	db	0.262
7	123478-HxCDF	34.83	1.729e3	1.528e3	1.017	1.13	1.24	30.9	YES	NO	dd	db	1.579
8	Total-hexafurans	34.20	6.388e3	5.221e3	1.045	1.22	1.24	101.0	YES	NO	bb	bb	5.720
9	Total-hexafurans	33.36	6.133e3	5.027e3	1.045	1.22	1.24	94.4	YES	NO	bb	db	5.499
10	123468-HXCDF	33.14	1.829e3	1.396e3	1.087	1.31	1.24	29.3	YES	NO	bb	bd	1.463
11	234678-HxCDF	35.86	1.103e3	9.879e2	1.052	1.12	1.24	11.8	YES	NO	MM	MM	1.035
12	123678-HxCDF	34.96	7.170e2	6.352e2	1.037	1.13	1.24	13.9	YES	NO	db	bb	0.616
13	1234789-HpCDF	40.94	7.801e2	6.567e2	1.283	1.19	1.05	17.1	YES	NO	bb	bb	0.888
14	Total-heptafurans	39.36	1.651e4	1.577e4	1.305	1.05	1.05	354.8	YES	NO	bb	bb	18.051
15	1234678-HpCDF	38.71	1.026e4	9.140e3	1.327	1.12	1.05	222.4	YES	NO	bb	bb	9.881
16	OCDF	45.17	1.236e4	1.453e4	1.447	0.85	0.89	163.1	YES	NO	bb	bb	18.334
17	Total-tetradioxins	23.69	3.798e2	4.799e2	0.879	0.79	0.77	4.4	YES	NO	bb	bb	0.562
18	1368-TCDD	23.43	2.686e2	3.239e2	0.923	0.83	0.77	3.2	YES	NO	bb	bb	0.369
19	Total-pentadioxins	29.82	5.282e2	3.730e2	1.331	1.42	1.55	8.9	YES	NO	bb	bb	0.491
20	123678-HxCDD	36.09	1.688e3	1.439e3	1.009	1.17	1.24	21.7	YES	NO	db	db	1.803
21	123478-HxCDD	35.97	6.009e2	4.825e2	1.027	1.25	1.24	6.6	YES	NO	bd	bd	0.613
22	Total-hexadioxins	35.08	3.469e3	3.164e3	1.028	1.10	1.24	40.9	YES	NO	dd	dd	3.754
23	Total-hexadioxins	35.04	2.111e3	1.618e3	1.028	1.30	1.24	36.6	YES	NO	bd	bd	2.110
24	Total-hexadioxins	34.71	1.422e3	1.157e3	1.028	1.23	1.24	18.8	YES	NO	bb	bb	1.459
25	123789-HxCDD	36.47	1.181e3	8.789e2	0.950	1.34	1.24	16.0	YES	NO	bb	bb	1.261
26	1234678-HpCDD	40.20	2.712e4	2.522e4	1.068	1.08	1.05	291.3	YES	NO	bb	bb	41.855
27	1234679-HPCDD	39.15	5.877e4	5.506e4	1.211	1.07	1.05	679.2	YES	NO	bb	bb	80.301
28	OCDD	44.94	1.752e5	2.024e5	1.181	0.87	0.89	1622.0	YES	NO	bb	bd	315.527

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PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	21.81	8.332e4					2.3	NO		bd		
2	FUNCTION1 PFK	21.45	6.461e4					1.7	NO		bb		
3	FUNCTION1 PFK	21.29	1.600e4					0.7	NO		bb		
4	FUNCTION1 PFK	21.18	5.856e4					2.1	NO		bb		
5	FUNCTION1 PFK	25.50	3.651e4					1.3	NO		bb		
6	FUNCTION1 PFK	25.28	9.734e3					0.8	NO		bb		
7	FUNCTION1 PFK	24.99	2.451e4					1.6	NO		bb		
8	FUNCTION1 PFK	24.81	3.458e4					1.5	NO		db		
9	FUNCTION1 PFK	24.69	6.157e4					1.9	NO		bd		
10	FUNCTION1 PFK	23.73	4.052e4					1.3	NO		bb		
11	FUNCTION1 PFK	23.36	9.844e3					0.9	NO		bb		
12	FUNCTION1 PFK	23.24	2.887e4					1.1	NO		bb		
13	FUNCTION1 PFK	23.02	1.829e4					1.3	NO		bb		
14	FUNCTION1 PFK	22.92	1.153e5					2.3	NO		db		
15	FUNCTION1 PFK	22.81	2.528e4					1.2	NO		dd		
16	FUNCTION1 PFK	22.71	6.123e4					2.1	NO		dd		
17	FUNCTION1 PFK	22.65	3.817e4					2.0	NO		dd		
18	FUNCTION1 PFK	22.53	6.863e4					2.0	NO		bd		
19	FUNCTION1 PFK	22.21	1.455e4					0.9	NO		bb		
20	FUNCTION1 PFK	21.88	8.149e4					3.4	YES		db		
21	FUNCTION1 PFK	27.54	3.214e3					0.5	NO		bb		
22	FUNCTION1 PFK	27.50	2.872e3					0.4	NO		bb		
23	FUNCTION1 PFK	27.18	5.124e4					2.4	NO		db		
24	FUNCTION1 PFK	27.09	7.107e4					2.0	NO		bd		
25	FUNCTION1 PFK	26.99	1.243e4					0.7	NO		bb		
26	FUNCTION1 PFK	26.80	2.702e3					0.4	NO		bb		
27	FUNCTION1 PFK	26.32	2.139e4					1.2	NO		bb		
28	FUNCTION1 PFK	26.02	1.910e4					1.3	NO		bb		

PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 PFK	32.49	4.044e4					3.6	YES		bb		0.000
2	FUNCTION2 PFK	29.66	1.334e6					4.2	YES		bb		0.000
3	FUNCTION2 PFK	29.24	1.264e5					3.7	YES		db		0.000
4	FUNCTION2 PFK	29.11	5.981e5					10.9	YES		bd		0.000

ID: 21G0111-06, Name: 21081909, Date: 18-Aug-2021, Time: 16:44:47, Conditions: AUTOSPEC01, User: pk

PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 PFK	37.46	3.820e6					3.8	YES		bb		0.000
2	FUNCTION3 PFK	36.56	2.546e6					14.7	YES		bb		0.000

PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 PFK	40.19	1.408e4					1.5	NO		bb		
2	FUNCTION4 PFK	40.04	9.267e3					1.1	NO		bb		
3	FUNCTION4 PFK	39.98	1.675e4					1.7	NO		bb		
4	FUNCTION4 PFK	39.77	9.834e3					1.0	NO		bb		
5	FUNCTION4 PFK	39.53	1.095e3					0.4	NO		bb		
6	FUNCTION4 PFK	39.48	1.342e4					1.1	NO		bb		
7	FUNCTION4 PFK	39.36	2.305e4					1.7	NO		bb		
8	FUNCTION4 PFK	39.05	6.249e3					1.0	NO		bb		
9	FUNCTION4 PFK	38.36	1.155e4					1.6	NO		bb		
10	FUNCTION4 PFK	38.30	1.295e4					2.0	NO		bb		
11	FUNCTION4 PFK	38.25	1.769e3					0.6	NO		bb		
12	FUNCTION4 PFK	38.21	2.491e3					0.5	NO		db		
13	FUNCTION4 PFK	38.16	6.654e3					1.2	NO		bd		
14	FUNCTION4 PFK	37.94	3.323e4					2.5	NO		bb		
15	FUNCTION4 PFK	37.82	1.314e3					0.4	NO		bb		
16	FUNCTION4 PFK	42.74	1.402e3					0.5	NO		bb		
17	FUNCTION4 PFK	42.43	1.428e4					1.4	NO		bb		
18	FUNCTION4 PFK	42.35	5.147e3					0.9	NO		bb		
19	FUNCTION4 PFK	42.24	7.254e3					1.1	NO		bb		
20	FUNCTION4 PFK	41.45	1.766e4					1.8	NO		bb		
21	FUNCTION4 PFK	41.27	1.183e4					1.1	NO		bb		
22	FUNCTION4 PFK	40.72	2.195e3					0.7	NO		bb		
23	FUNCTION4 PFK	40.68	2.717e3					0.6	NO		bb		
24	FUNCTION4 PFK	40.49	4.974e3					0.8	NO		bb		
25	FUNCTION4 PFK	40.43	3.096e4					1.4	NO		bb		
26	FUNCTION4 PFK	40.24	1.420e4					0.8	NO		bb		

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PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	43.25	4.983e5					17.9	YES		dd		
2	FUNCTION5 PFK	43.18	1.354e5					21.4	YES		dd		
3	FUNCTION5 PFK	43.09	5.788e5					26.5	YES		dd		
4	FUNCTION5 PFK	43.03	1.930e6					29.5	YES		bd		
5	FUNCTION5 PFK	45.47	3.052e3					0.8	NO		bb		
6	FUNCTION5 PFK	45.28	1.027e3					0.5	NO		bb		
7	FUNCTION5 PFK	45.24	8.428e2					0.4	NO		bb		
8	FUNCTION5 PFK	45.11	1.027e4					1.5	NO		bb		
9	FUNCTION5 PFK	44.92	9.034e2					0.4	NO		bb		
10	FUNCTION5 PFK	44.43	1.362e3					0.6	NO		bb		
11	FUNCTION5 PFK	44.39	7.112e3					1.4	NO		db		
12	FUNCTION5 PFK	44.36	2.361e3					0.9	NO		bd		
13	FUNCTION5 PFK	44.33	1.027e4					1.9	NO		db		
14	FUNCTION5 PFK	44.29	8.715e3					1.5	NO		dd		
15	FUNCTION5 PFK	44.25	2.797e3					0.8	NO		bd		
16	FUNCTION5 PFK	43.85	4.919e3					1.0	NO		bb		
17	FUNCTION5 PFK	43.65	8.966e2					0.4	NO		bb		
18	FUNCTION5 PFK	43.61	8.428e2					0.4	NO		bb		
19	FUNCTION5 PFK	43.42	1.771e5					9.1	YES		db		
20	FUNCTION5 PFK	43.35	1.832e5					12.2	YES		dd		
21	FUNCTION5 PFK	45.96	2.194e3					1.0	NO		bb		
22	FUNCTION5 PFK	45.93	1.534e3					0.7	NO		bb		
23	FUNCTION5 PFK	45.89	1.028e4					1.2	NO		db		
24	FUNCTION5 PFK	45.84	8.797e3					1.5	NO		dd		
25	FUNCTION5 PFK	45.81	4.806e3					1.1	NO		bd		
26	FUNCTION5 PFK	45.75	9.632e2					0.4	NO		bb		
27	FUNCTION5 PFK	45.68	1.322e4					1.5	NO		bb		

ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	27.54	8.452e1					3.1	YES		bb		0.000
2	FUNCTION1 HXCD...	26.49	7.577e1					2.4	NO		bb		0.000
3	FUNCTION1 HXCD...	25.46	1.253e2					2.7	NO		db		0.000
4	FUNCTION1 HXCD...	25.41	8.111e1					1.8	NO		bd		0.000
5	FUNCTION1 HXCD...	22.90	1.055e2					2.0	NO		bb		0.000

ID: 21G0111-06, Name: 21081909, Date: 18-Aug-2021, Time: 16:44:47, Conditions: AUTOSPEC01, User: pk

ETHERS2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HPCD...	26.20	1.238e2					3.6	YES		bb		0.000
2	FUNCTION1 HPCD...	21.92	7.291e2					17.2	YES		bb		0.000

ETHERS3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 HPCD...	29.54	7.873e1					4.0	YES		bb		0.000
2	FUNCTION2 HPCD...	28.85	7.528e1					2.5	NO		bb		0.000

ETHERS4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 OCDPE	37.03	7.031e1					3.6	YES		bb		0.000
2	FUNCTION3 OCDPE	35.98	9.437e1					2.0	NO		bb		0.000
3	FUNCTION3 OCDPE	34.44	9.411e1					2.9	NO		bb		0.000

ETHERS5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 NCDPE	39.13	1.082e2					3.3	YES		bb		0.000
2	FUNCTION4 NCDPE	38.34	1.330e3					34.9	YES		bb		0.000

ETHERS6

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

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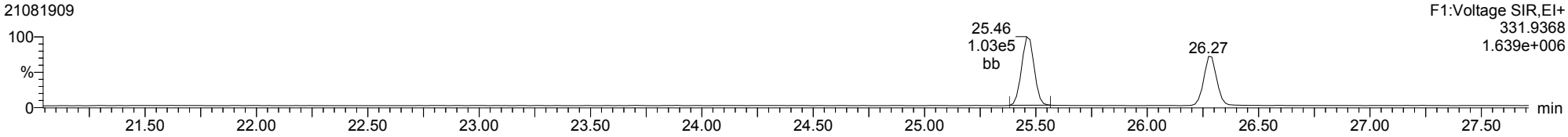

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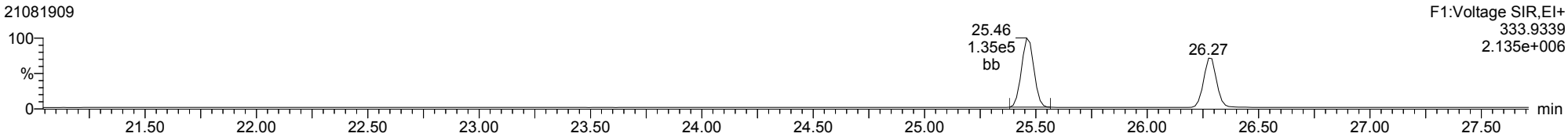

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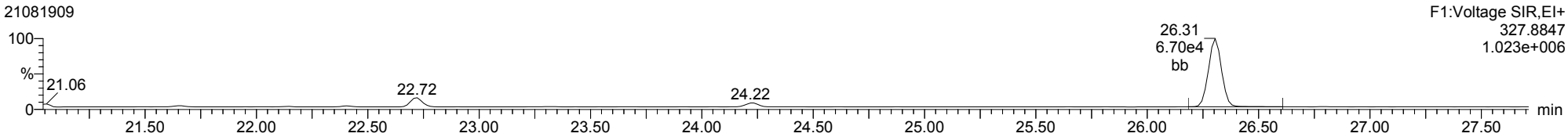

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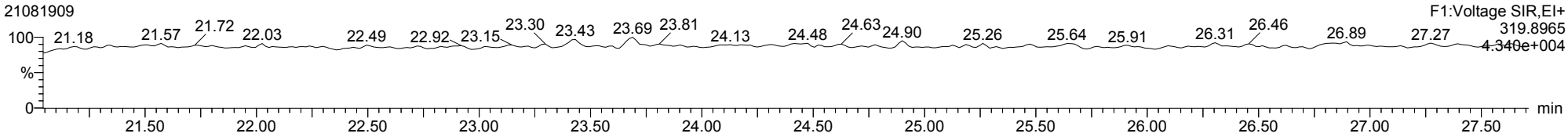

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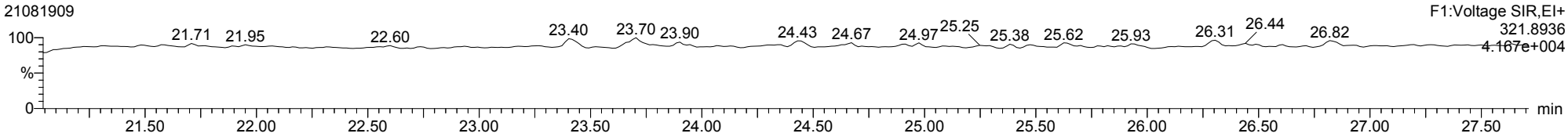

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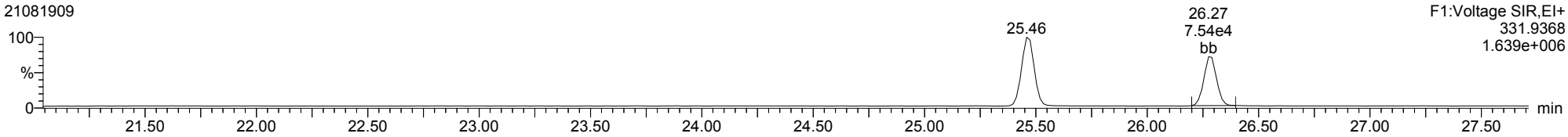

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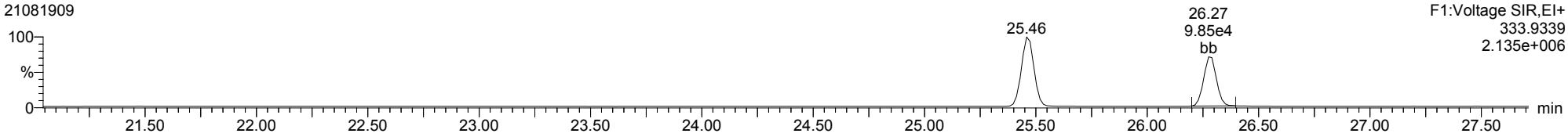

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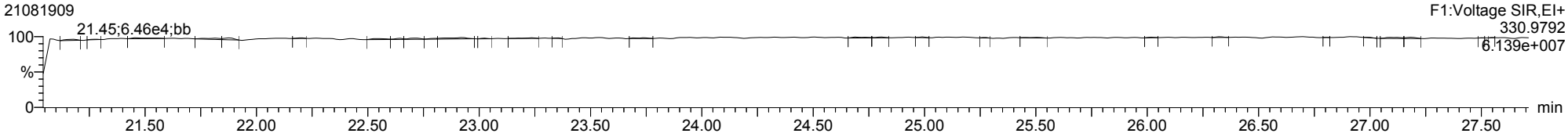

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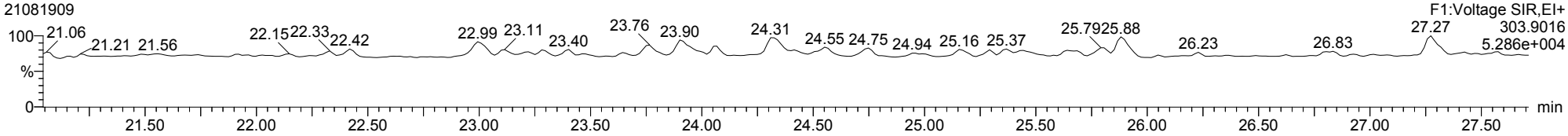

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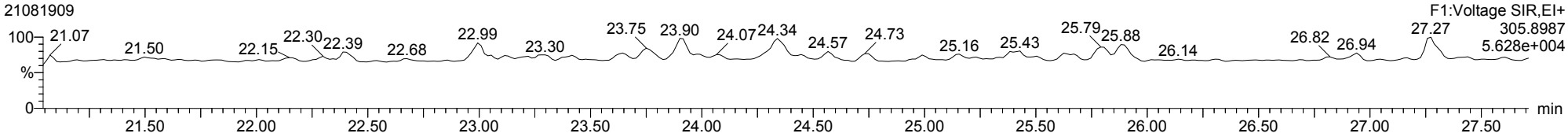

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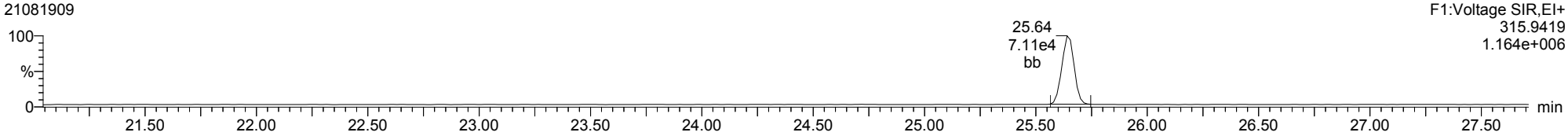

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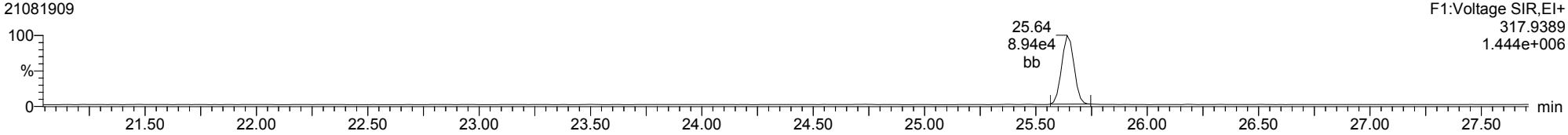

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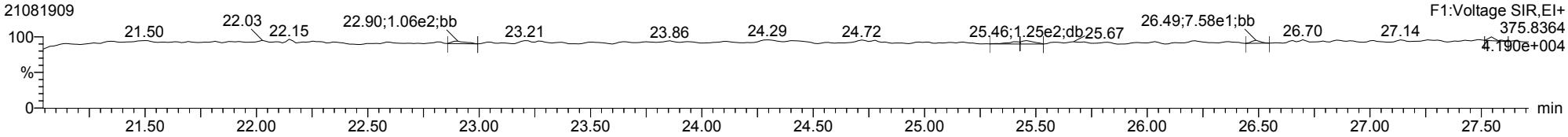

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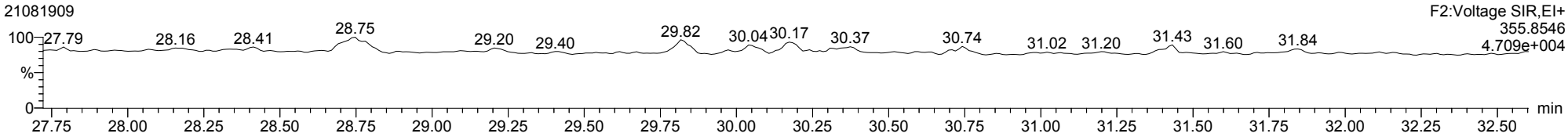

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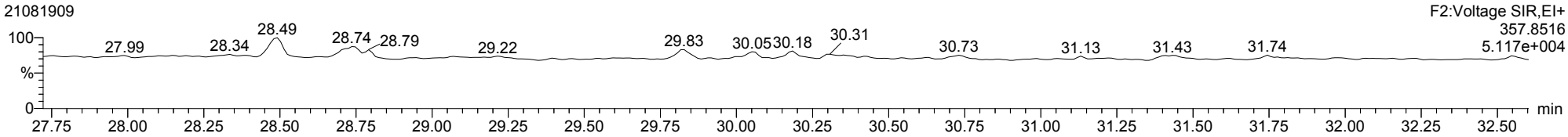

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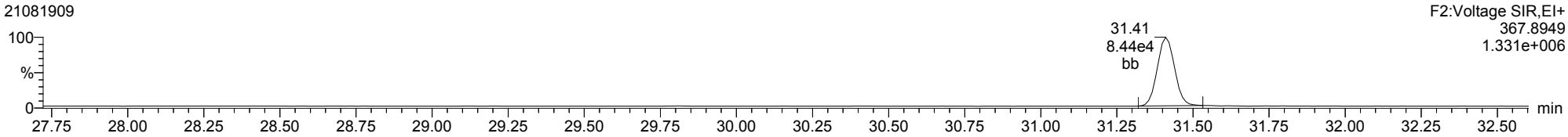

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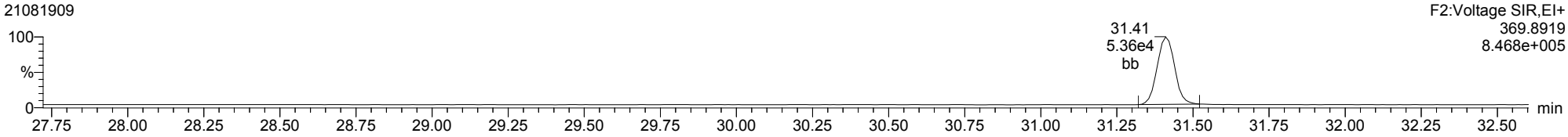

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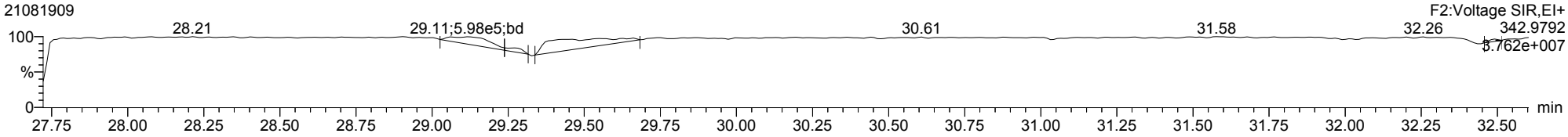

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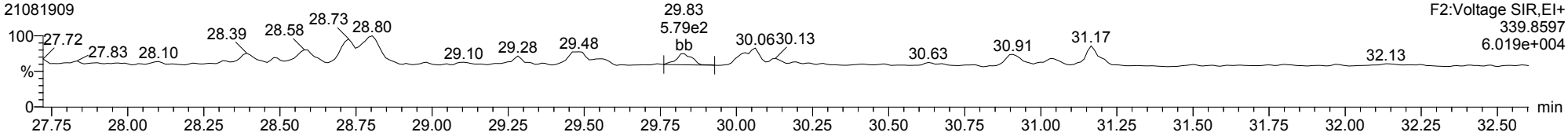

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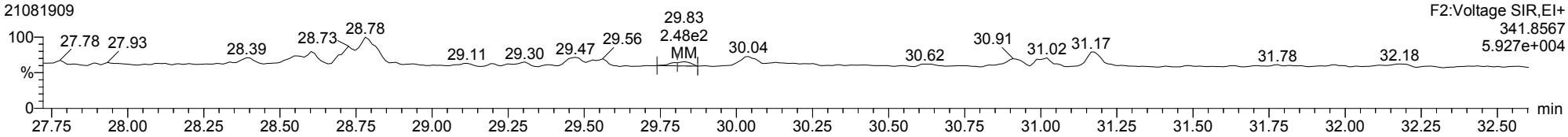

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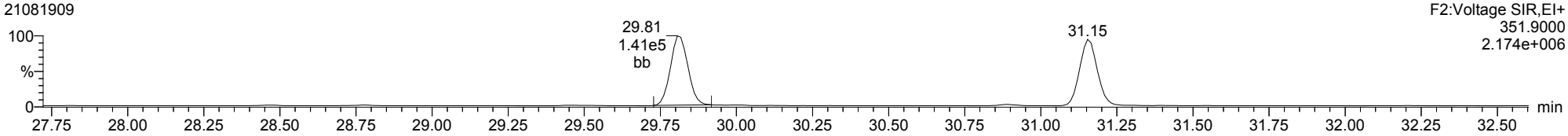

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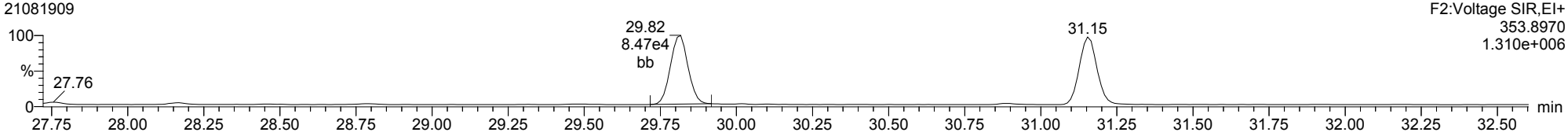

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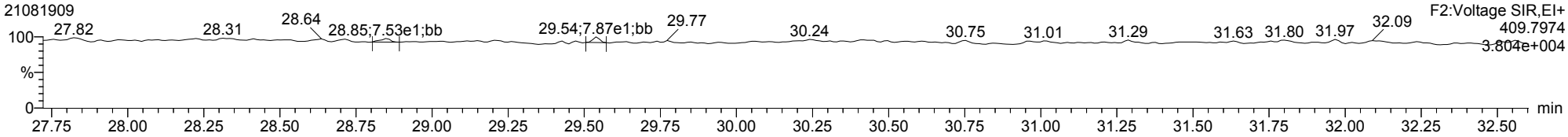

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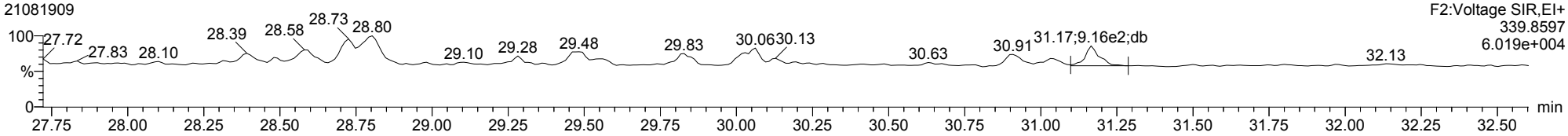
23478-PeCDF



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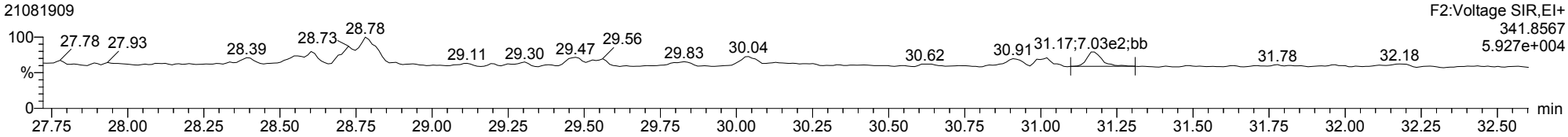

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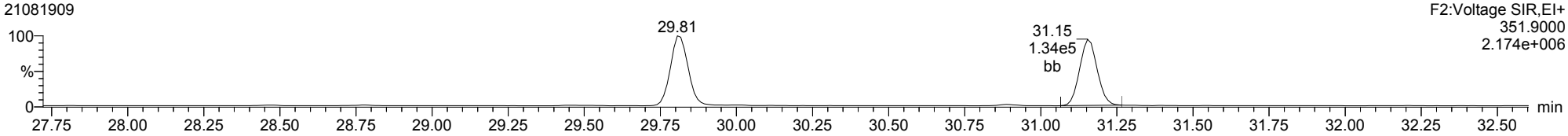

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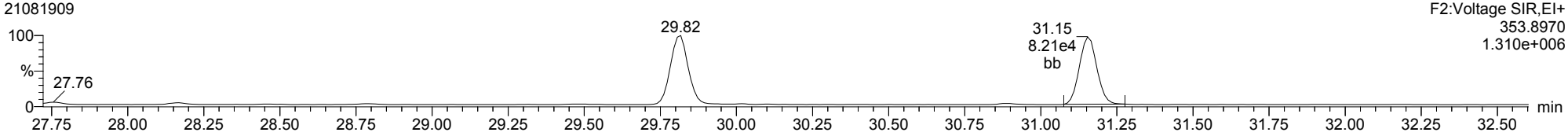
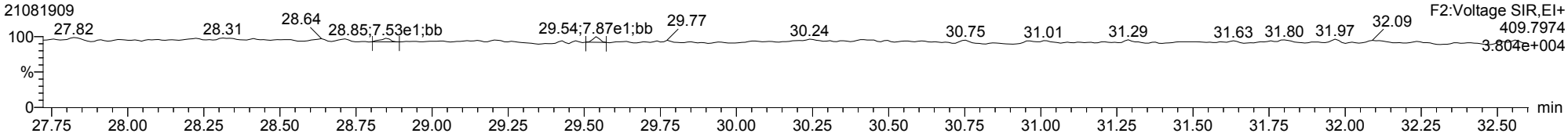


FUNCTION2 HPCDPE



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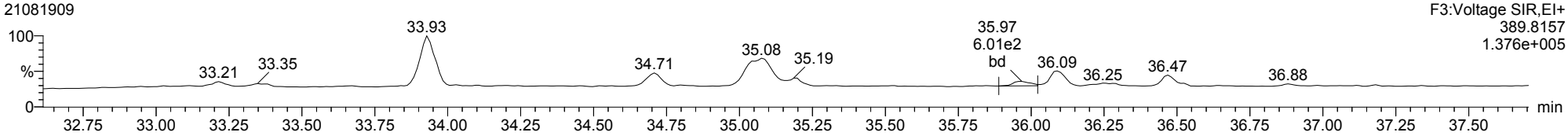

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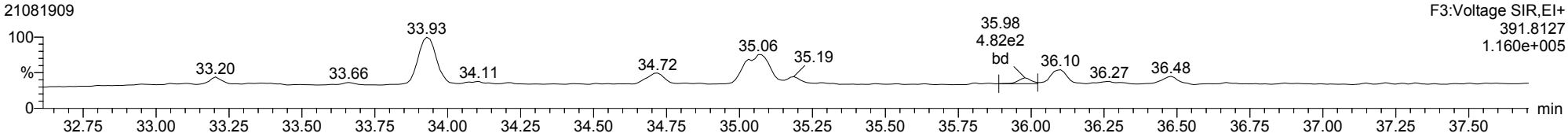

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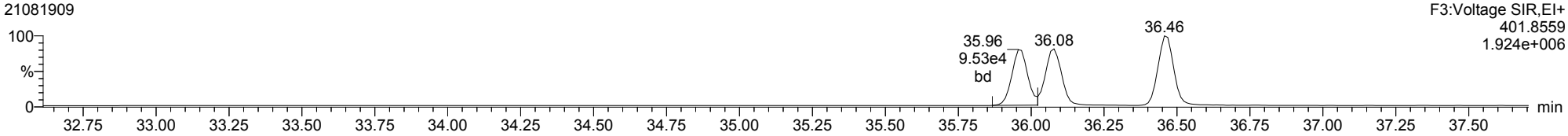

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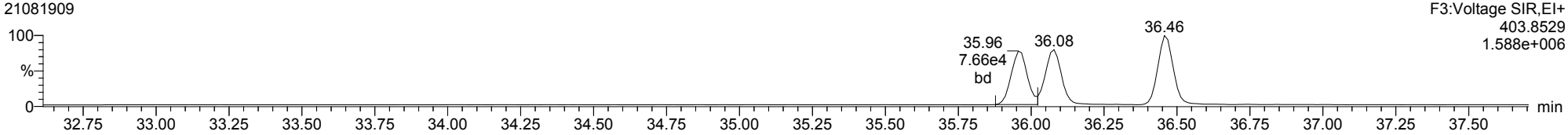

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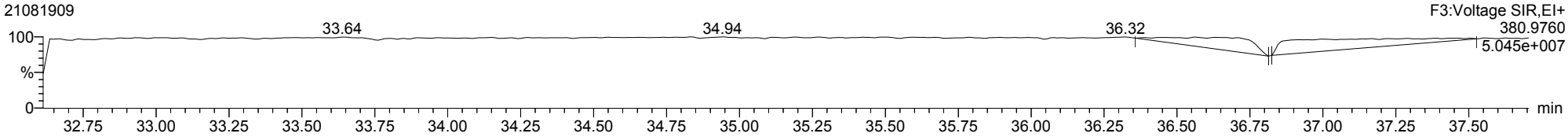

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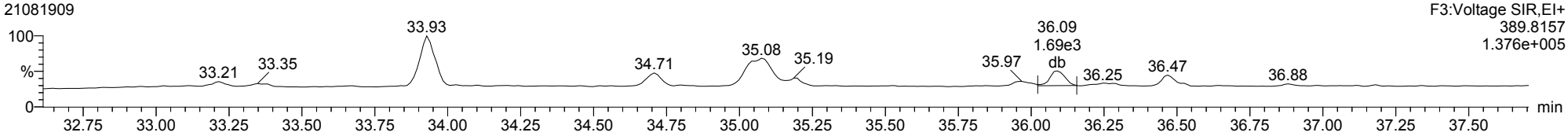

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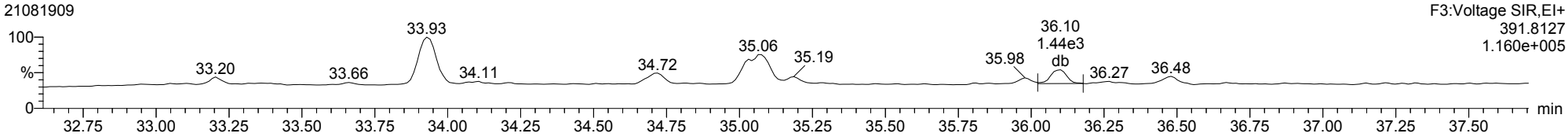

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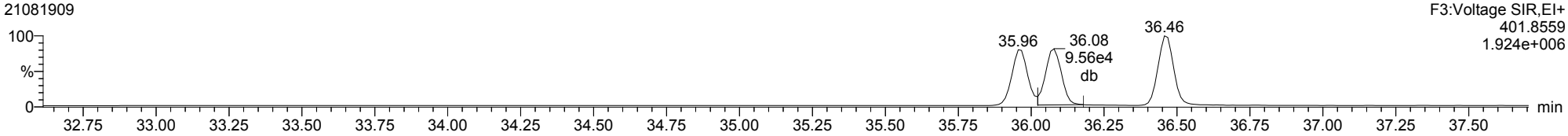

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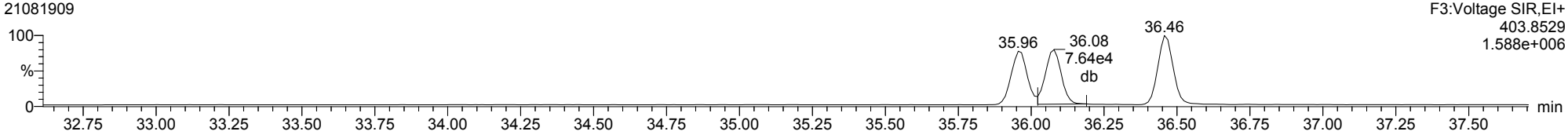

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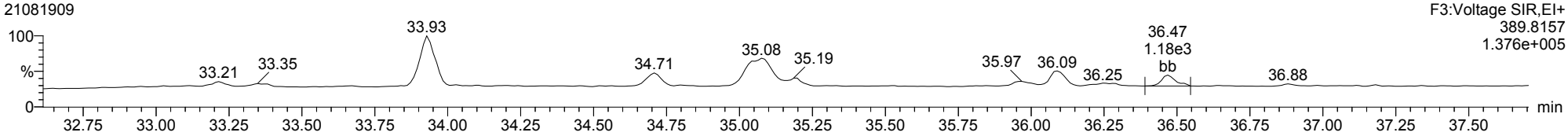

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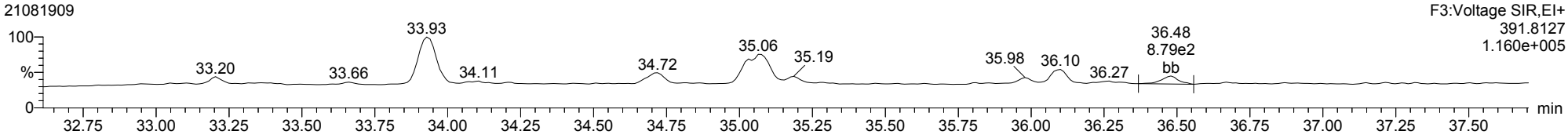

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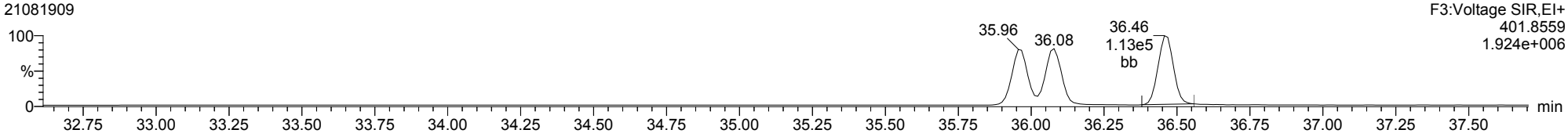

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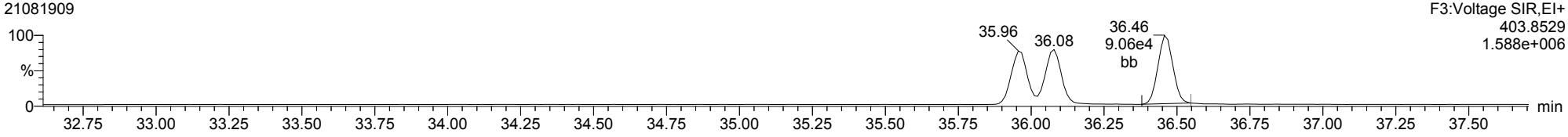

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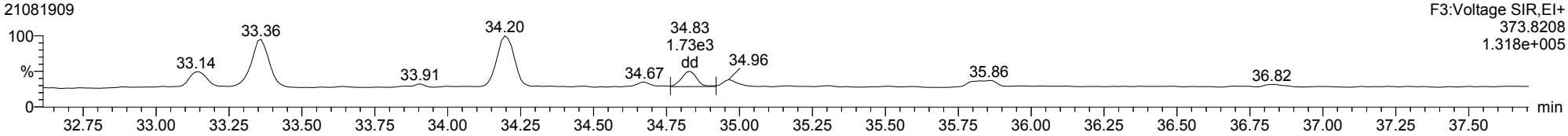

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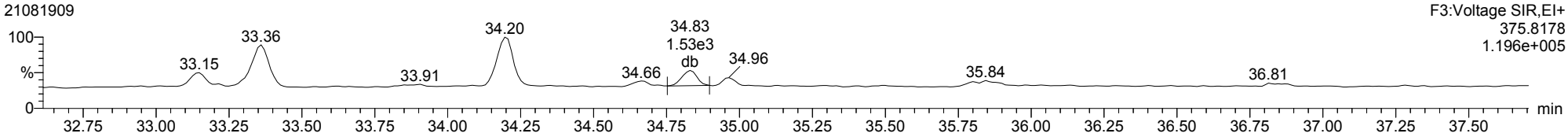

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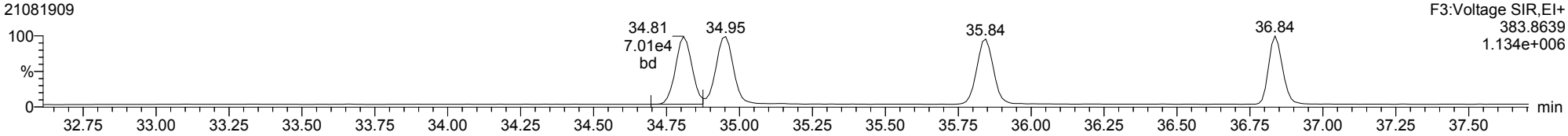

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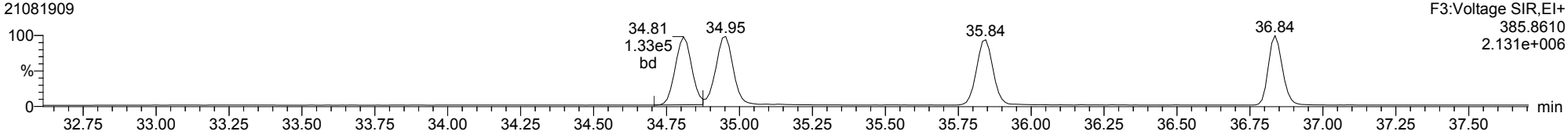

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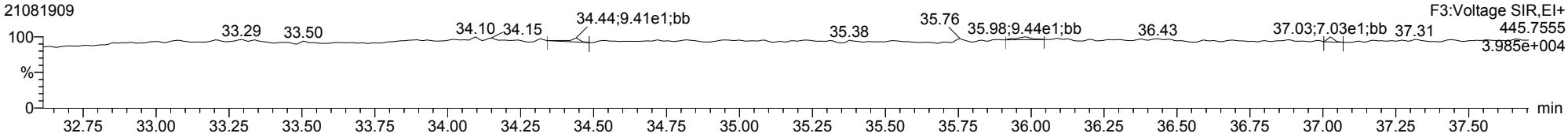

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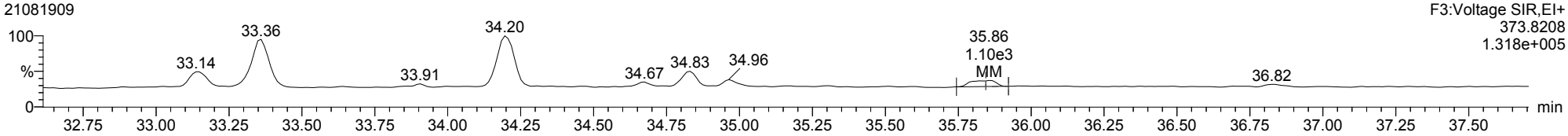

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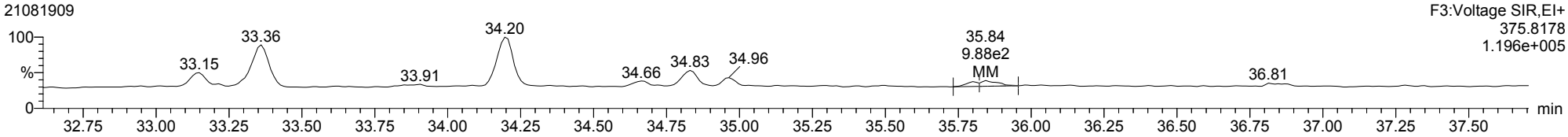

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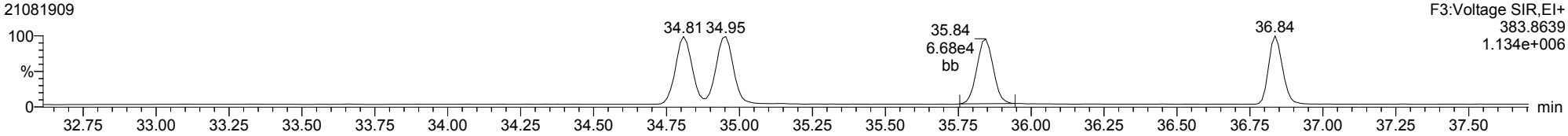

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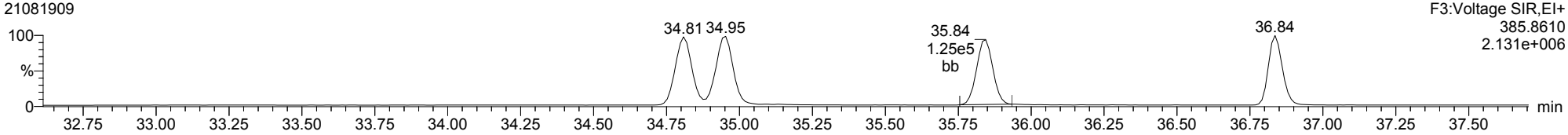

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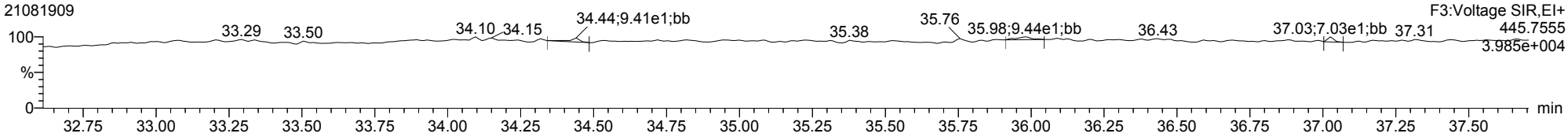

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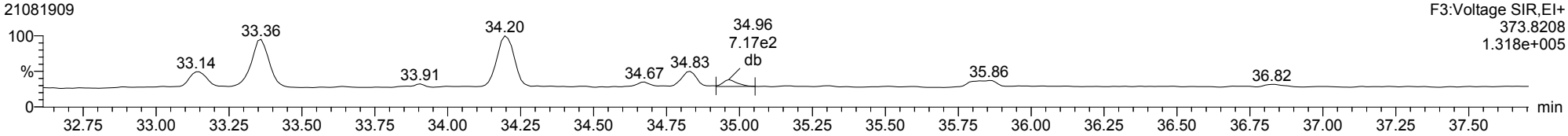

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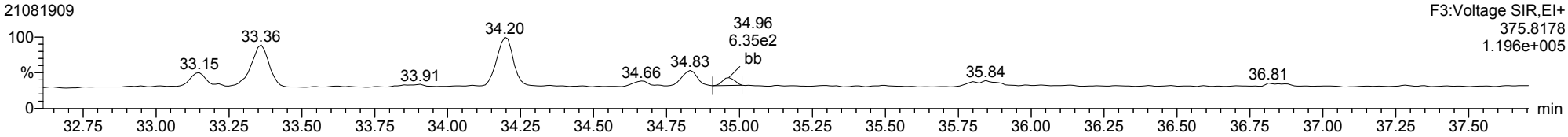

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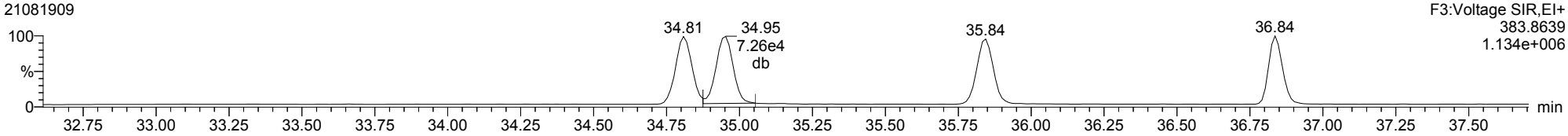

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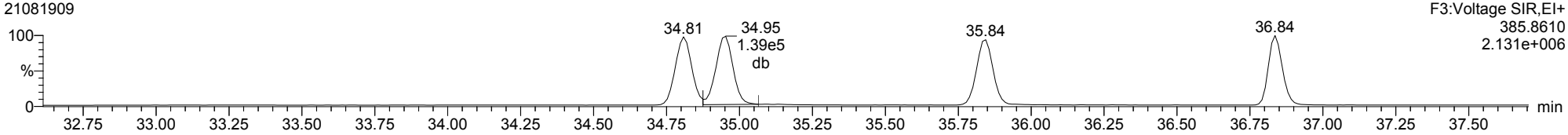

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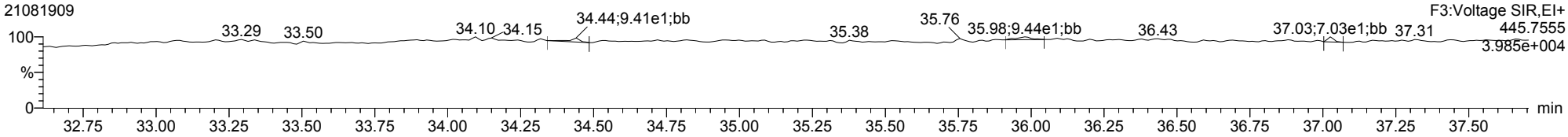

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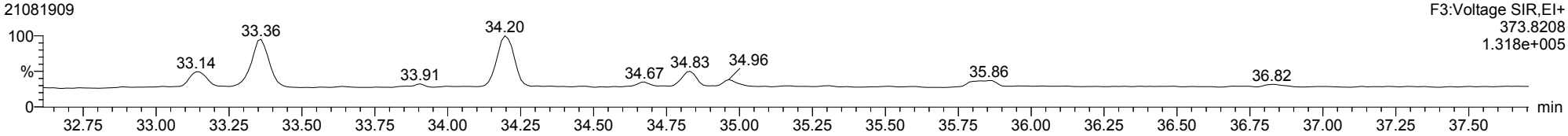

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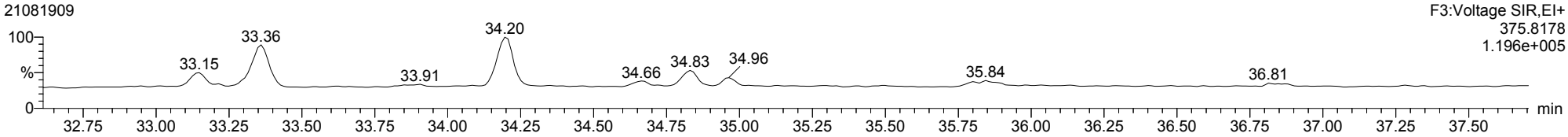

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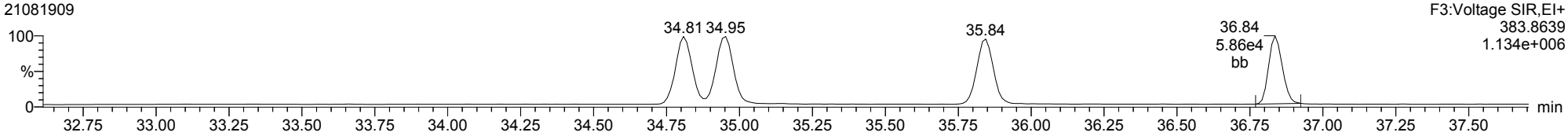

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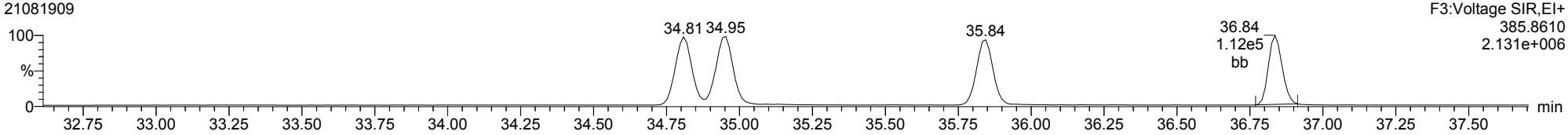

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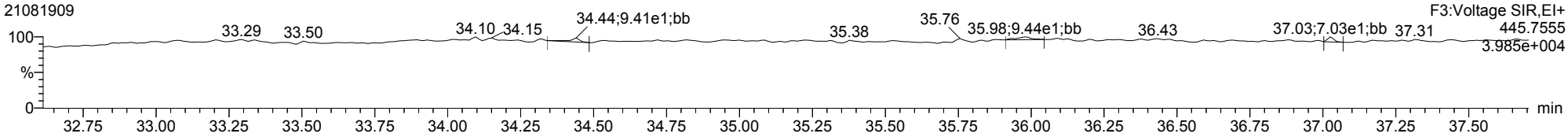

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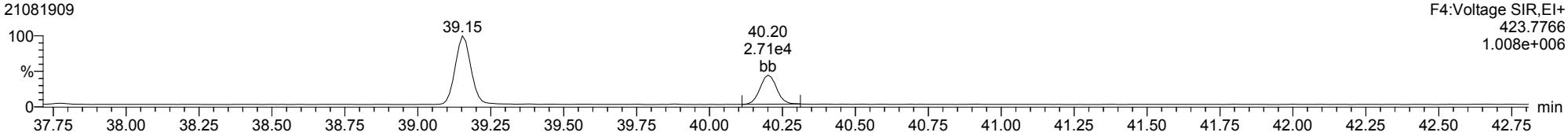

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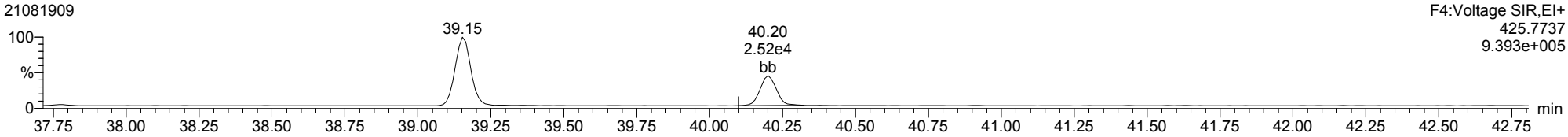

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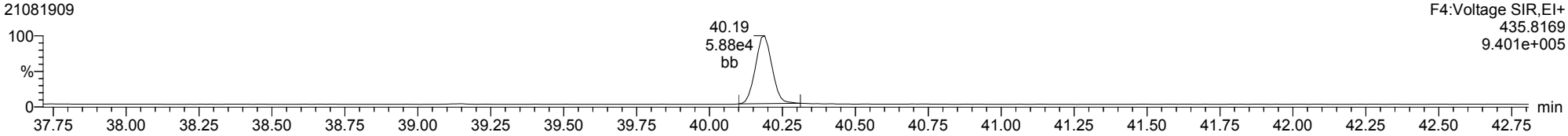

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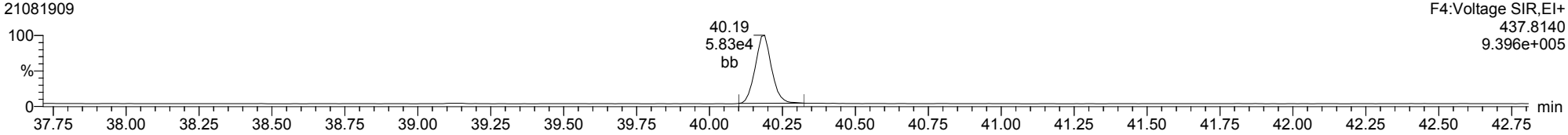
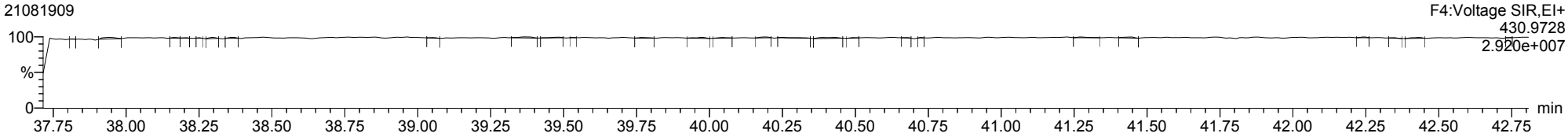


FUNCTION4 PFK



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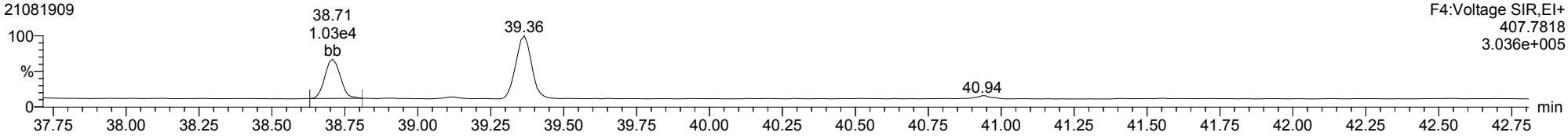

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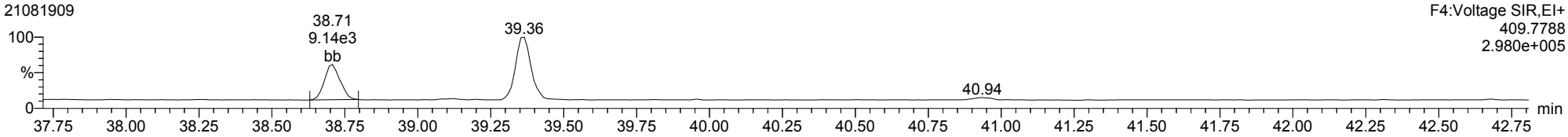

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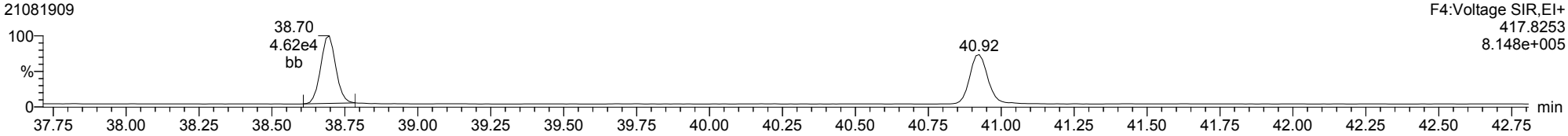

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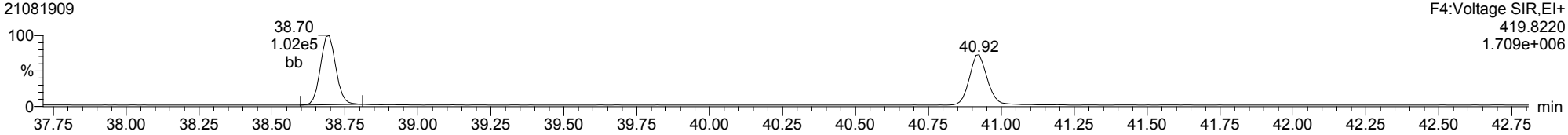

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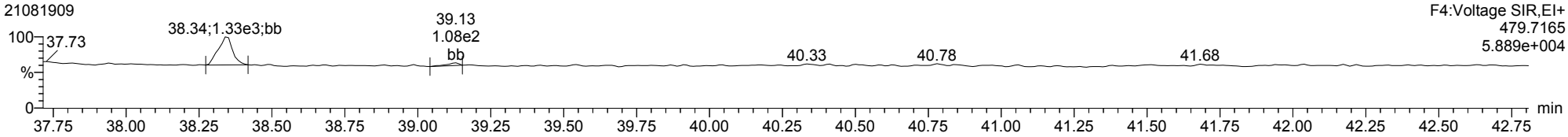

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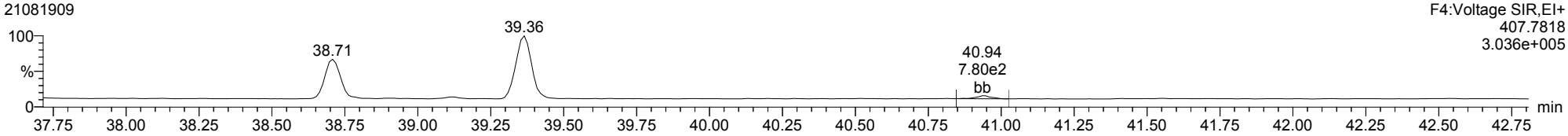

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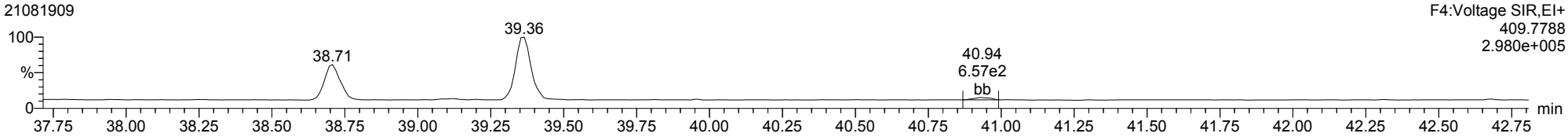

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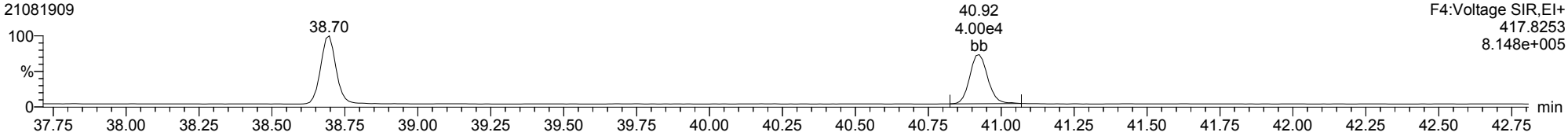

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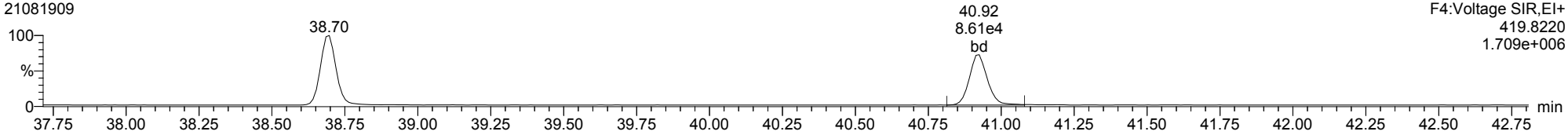

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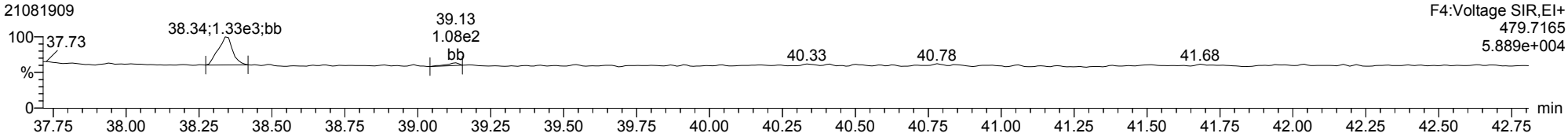

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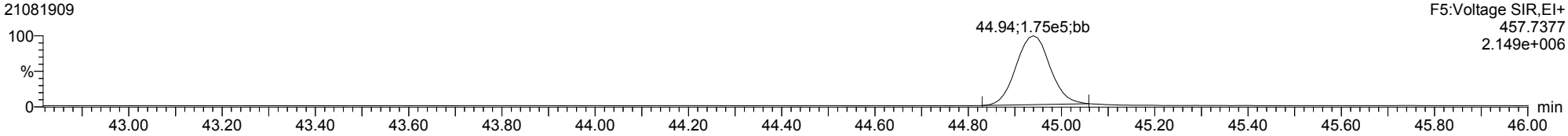
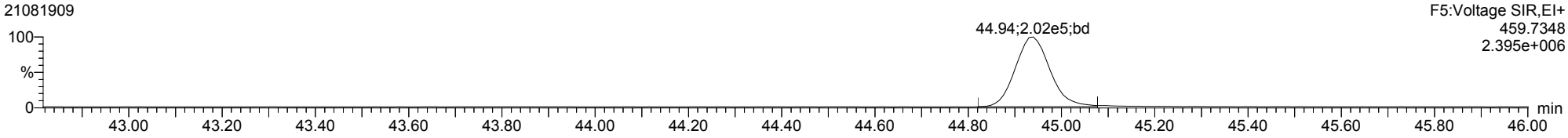
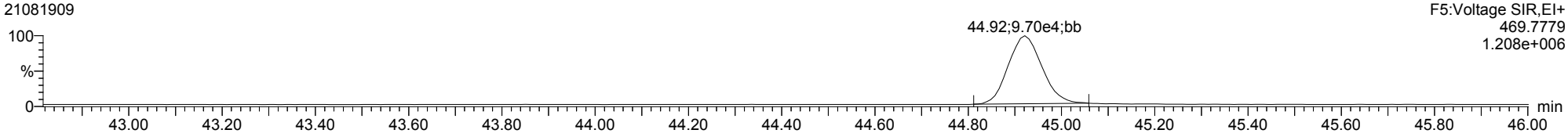
OCDD



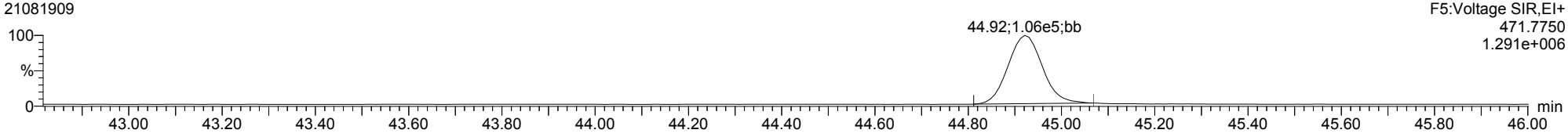
OCDD



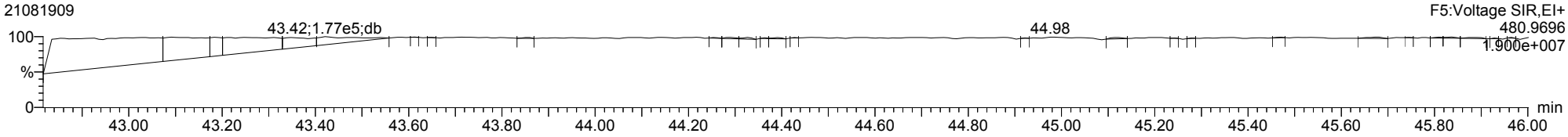
13C-OCDD



13C-OCDD

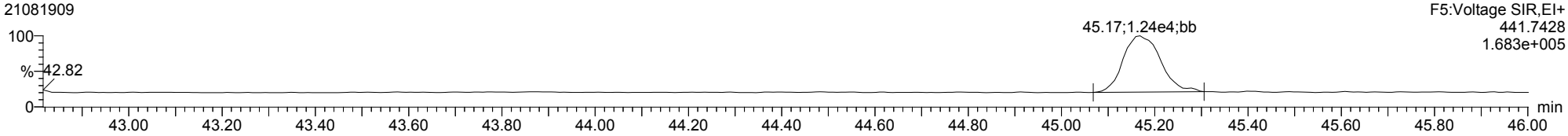


FUNCTION5 PFK

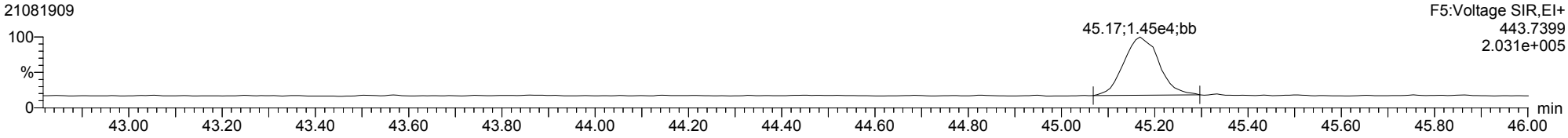


ID: 21G0111-06, Name: 21081909, Date: 18-Aug-2021, Time: 16:44:47, Conditions: AUTOSPEC01, User: pk

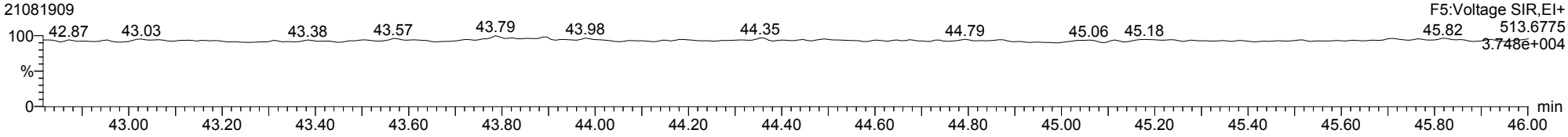
OCDF



OCDF

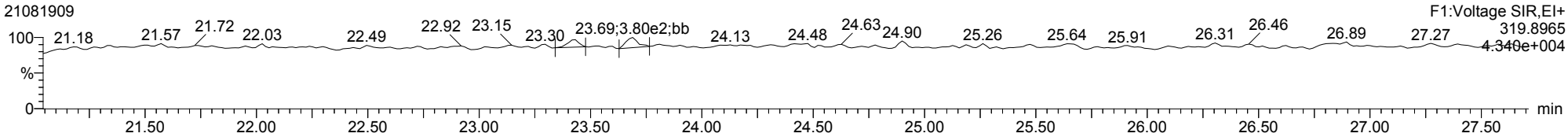


FUNCTION5 DCDPE

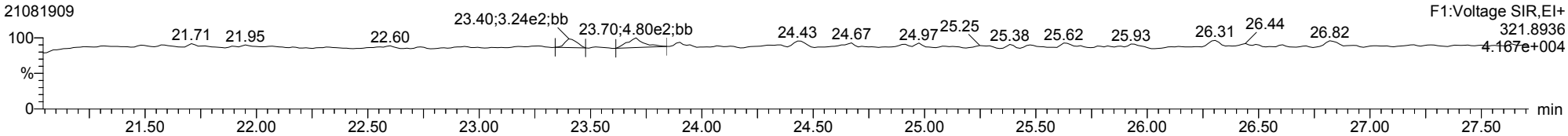


ID: 21G0111-06, Name: 21081909, Date: 18-Aug-2021, Time: 16:44:47, Conditions: AUTOSPEC01, User: pk

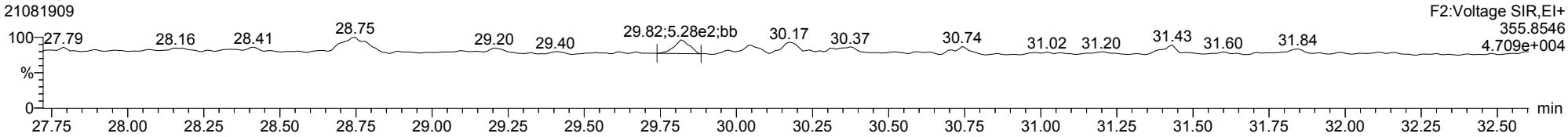
Total-tetradioxins



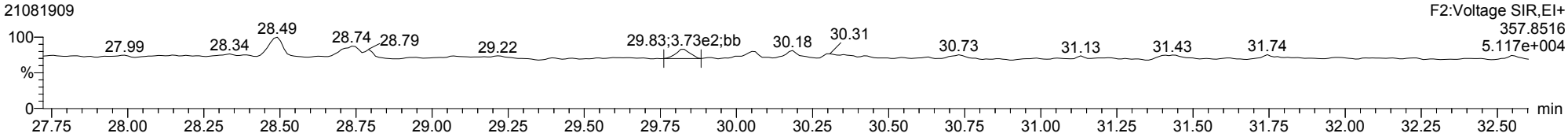
Total-tetradioxins



Total-pentadioxins

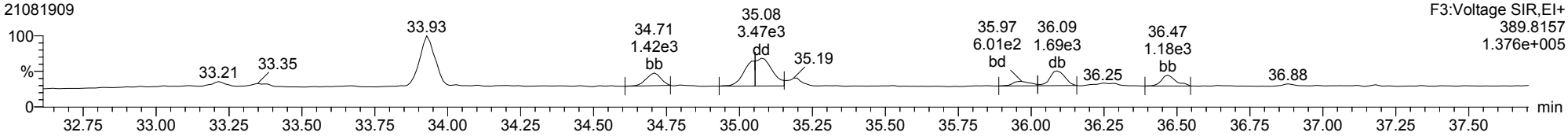


Total-pentadioxins

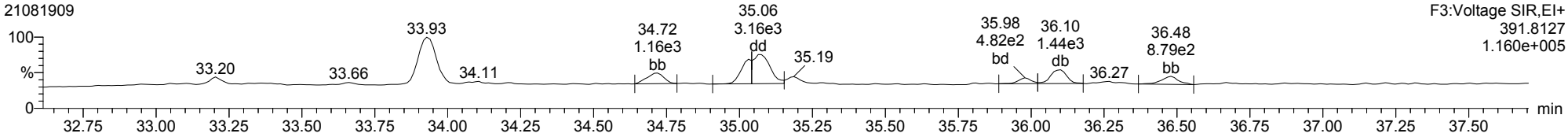


ID: 21G0111-06, Name: 21081909, Date: 18-Aug-2021, Time: 16:44:47, Conditions: AUTOSPEC01, User: pk

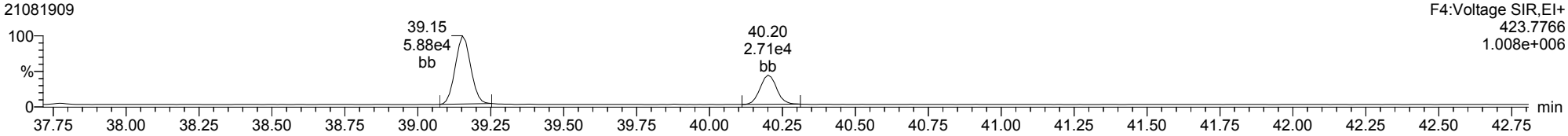
Total-hexadioxins



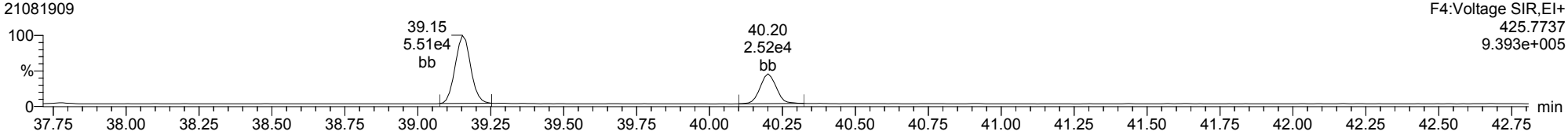
Total-hexadioxins



Total-heptadioxins

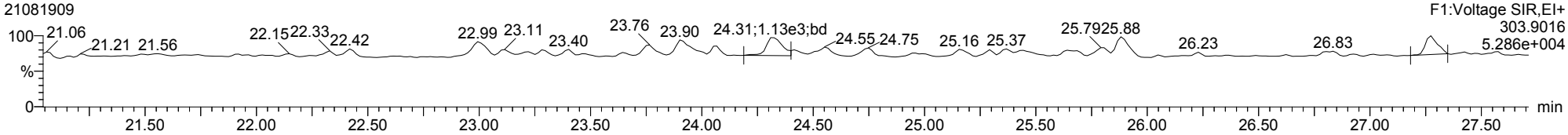


Total-heptadioxins

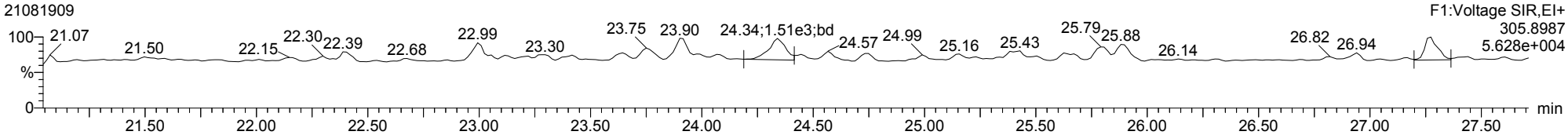


ID: 21G0111-06, Name: 21081909, Date: 18-Aug-2021, Time: 16:44:47, Conditions: AUTOSPEC01, User: pk

Total-tetrafurans



Total-tetrafurans



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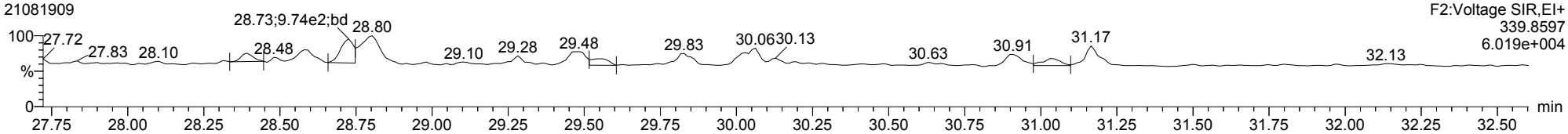
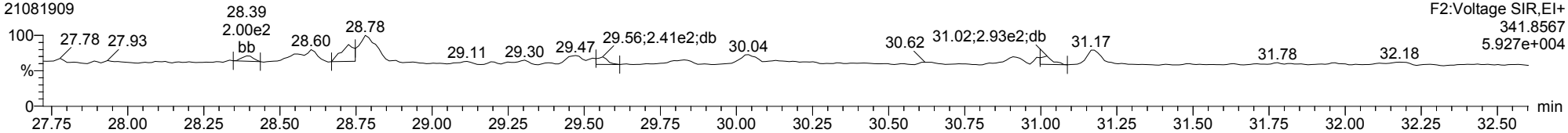
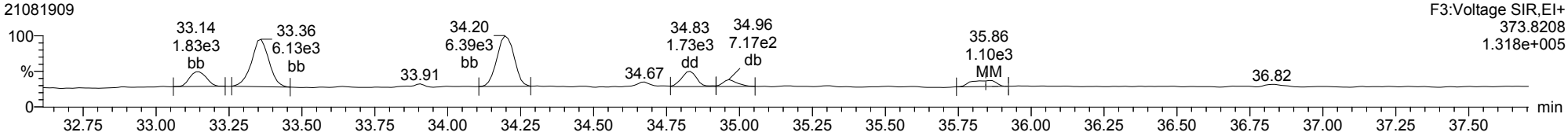


Total-pentafurans

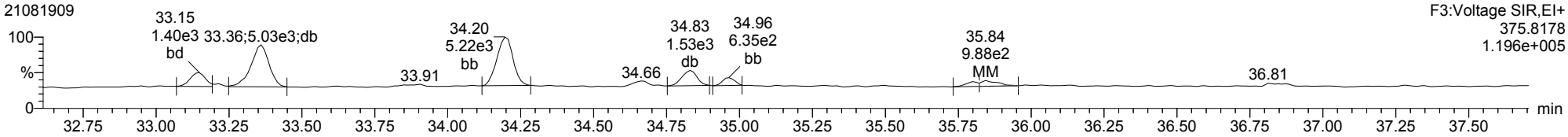


ID: 21G0111-06, Name: 21081909, Date: 18-Aug-2021, Time: 16:44:47, Conditions: AUTOSPEC01, User: pk

Total-hexafurans



Total-hexafurans



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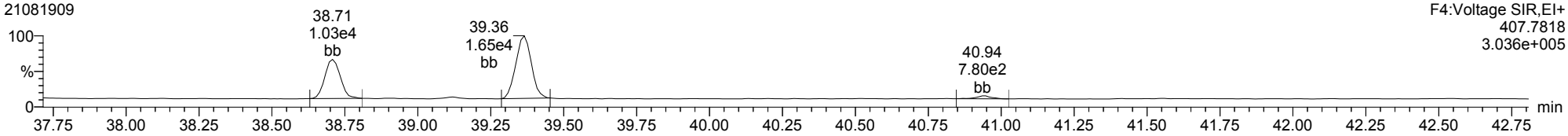

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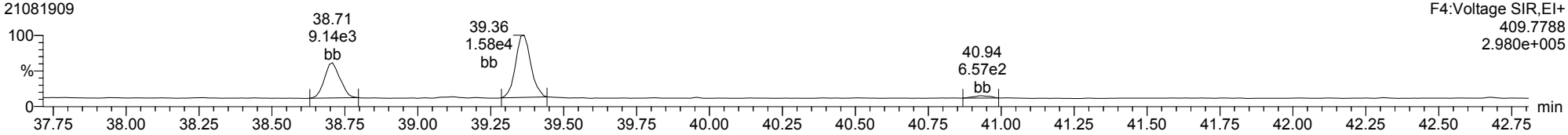

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS661

Form 1
ORGANIC ANALYSIS DATA SHEET
EPA 1613B
Dioxins/Furans by HRGC/HRMS

Laboratory:	Analytical Resources, Inc.			SDG:	21G0111
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0111-12 A	File ID:	21081910
Sampled:	07/09/21 15:35	Prepared:	07/30/21 17:00	Analyzed:	08/18/21 17:33
% Solids:	51.47	Preparation:	EPA 1613	Initial/Final:	19.43 g Wet / 20 uL
Result Basis:	Dry	Sequence:	SJH0230	Calibration:	EH00030
Batch:	BJG0572	Instrument:	AUTOSPEC01	Column:	RTX-Dioxin2

CAS NO.	COMPOUND	DF/Split	Ion Ratio	Ratio Limits	EDL	RL	Result	Units	Q
51207-31-9	2,3,7,8-TCDF	1		0.655-0.886	0.936	1.00	ND	ng/kg	U
1746-01-6	2,3,7,8-TCDD	1		0.655-0.886	0.815	1.00	ND	ng/kg	U
57117-41-6	1,2,3,7,8-PeCDF	1		1.318-1.783	0.489	1.00	ND	ng/kg	U
57117-31-4	2,3,4,7,8-PeCDF	1	1.990	1.318-1.783	0.458	1.00	0.732	ng/kg	EMPC, J
40321-76-4	1,2,3,7,8-PeCDD	1		1.318-1.783	0.629	1.00	ND	ng/kg	U
70648-26-9	1,2,3,4,7,8-HxCDF	1	1.233	1.054-1.426	0.401	1.00	2.32	ng/kg	
57117-44-9	1,2,3,6,7,8-HxCDF	1	1.296	1.054-1.426	0.379	1.00	0.985	ng/kg	J
60851-34-5	2,3,4,6,7,8-HxCDF	1	0.814	1.054-1.426	0.393	1.00	1.58	ng/kg	EMPC
72918-21-9	1,2,3,7,8,9-HxCDF	1	0.665	1.054-1.426	0.432	1.00	0.649	ng/kg	EMPC, J
39227-28-6	1,2,3,4,7,8-HxCDD	1	1.089	1.054-1.426	0.584	1.00	1.43	ng/kg	
57653-85-7	1,2,3,6,7,8-HxCDD	1	1.030	1.054-1.426	0.577	1.00	4.96	ng/kg	EMPC
19408-74-3	1,2,3,7,8,9-HxCDD	1	1.079	1.054-1.426	0.622	1.00	2.96	ng/kg	
67562-39-4	1,2,3,4,6,7,8-HpCDF	1	1.073	0.893-1.208	0.518	1.00	20.4	ng/kg	
55673-89-7	1,2,3,4,7,8,9-HpCDF	1	1.751	0.893-1.208	0.723	1.00	1.73	ng/kg	EMPC
35822-46-9	1,2,3,4,6,7,8-HpCDD	1	1.046	0.893-1.208	1.12	2.50	111	ng/kg	
39001-02-0	OCDF	1	0.892	0.757-1.024	1.02	2.50	56.9	ng/kg	
3268-87-9	OCDD	1	0.901	0.757-1.024	1.46	10.0	984	ng/kg	B

Homologue Groups

55722-27-5	Total TCDF	1	0.000			1.00	3.06	ng/kg
41903-57-5	Total TCDD	1	0.000			1.00	ND	ng/kg
30402-15-4	Total PeCDF	1	0.000			1.00	7.96	ng/kg
36088-22-9	Total PeCDD	1	0.000			1.00	1.26	ng/kg
55684-94-1	Total HxCDF	1	0.000			1.00	28.7	ng/kg
34465-46-8	Total HxCDD	1	0.000			1.00	17.8	ng/kg
38998-75-3	Total HpCDF	1	0.000			1.00	67.0	ng/kg
37871-00-4	Total HpCDD	1	0.000			1.00	278	ng/kg

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 3.35
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 4.13

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS661

Form 2
ORGANIC ANALYSIS DATA SHEET
EPA 1613B
Dioxins/Furans by HRGC/HRMS

Laboratory:	Analytical Resources, Inc.			SDG:	21G0111
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Sediment	Laboratory ID:	21G0111-12	File ID:	21081910
Sampled:	07/09/21 15:35	Prepared:	07/30/21 17:00	Analyzed:	08/18/21 17:33
Solids Wt%:	51.47	Preparation:	EPA 1613	Initial/Final:	19.43 g / 20 uL
Result Basis:	Dry	Sequence:	SJH0230	Calibration:	EH00030
Batch:	BJG0572	Instrument:	AUTOSPEC01	Column:	RTX-Dioxin2

Labels	DF/Split	Ion Ratio	Ratio Limits	EDL	% REC	QC LIMITS	Q
13C12-2,3,7,8-TCDF		0.768	0.655-0.886	0.505	28.4	24 - 169 %	
13C12-2,3,7,8-TCDD		0.779	0.655-0.886	0.526	43.1	25 - 164 %	
13C12-1,2,3,7,8-PeCDF		1.639	1.318-1.783	0.430	59.1	24 - 185 %	
13C12-2,3,4,7,8-PeCDF		1.635	1.318-1.783	0.451	58.9	21 - 178 %	
13C12-1,2,3,7,8-PeCDD		1.601	1.318-1.783	0.441	66.7	25 - 181 %	
13C12-1,2,3,4,7,8-HxCDF		0.522	0.434-0.587	0.406	70.4	26 - 152 %	
13C12-1,2,3,6,7,8-HxCDF		0.540	0.434-0.587	0.375	68.0	26 - 123 %	
13C12-2,3,4,6,7,8-HxCDF		0.506	0.434-0.587	0.415	70.6	28 - 136 %	
13C12-1,2,3,7,8,9-HxCDF		0.535	0.434-0.587	0.500	79.6	29 - 147 %	
13C12-1,2,3,4,7,8-HxCDD		1.264	1.054-1.426	0.499	75.0	32 - 141 %	
13C12-1,2,3,6,7,8-HxCDD		1.272	1.054-1.426	0.460	70.9	28 - 130 %	
13C12-1,2,3,4,6,7,8-HpCDF		0.455	0.374-0.506	0.495	66.9	28 - 143 %	
13C12-1,2,3,4,7,8,9-HpCDF		0.452	0.374-0.506	0.605	65.9	26 - 138 %	
13C12-1,2,3,4,6,7,8-HpCDD		1.043	0.893-1.208	0.557	76.2	23 - 140 %	
13C12-OCDD		0.882	0.757-1.024	0.729	72.5	17 - 157 %	
37Cl4-2,3,7,8-TCDD		328.000		0.132	42.8	35 - 197 %	

* Values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:30:45 Pacific Daylight Time

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: 21G0111-12, Name: 21081910, Date: 18-Aug-2021, Time: 17:33:39, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
2378-TCDF					1.108		0.770	959	1281								
12378-PeCDF					1.015		1.550	988	1081								
23478-PeCDF	31.198	1.001	4.258e2	2.140e2	1.126	1.990	1.550	988	1081	5.36e3	4.77e3	5.4	4.4	YES	MM	MM	0.366
123478-HxCDF	34.819	1.001	9.891e2	8.023e2	1.017	1.233	1.240	713	903	1.75e4	1.37e4	24.5	15.2	NO	bd	bb	1.162
234678-HxCDF	35.789	0.999	5.569e2	6.840e2	1.052	0.814	1.240	713	903	6.46e3	8.64e3	9.1	9.6	YES	bb	MM	0.792
123678-HxCDF	34.953	1.000	4.564e2	3.520e2	1.037	1.296	1.240	713	903	8.11e3	6.60e3	11.4	7.3	NO	db	bb	0.493
123789-HxCDF	36.825	1.000	1.857e2	2.793e2	1.030	0.665	1.240	713	903	4.03e3	4.07e3	5.7	4.5	YES	bb	MM	0.325
1234678-HpCDF	38.708	1.000	7.538e3	7.024e3	1.327	1.073	1.050	1185	789	1.24e5	1.08e5	105.1	136.4	NO	bb	bb	10.209
1234789-HpCDF	40.947	1.000	6.104e2	3.486e2	1.283	1.751	1.050	1185	789	1.12e4	8.96e3	9.5	11.3	YES	MM	bb	0.863
OCDF	45.160	1.005	1.228e4	1.377e4	1.447	0.892	0.890	896	973	1.55e5	1.57e5	173.0	161.3	NO	bb	bb	28.440
2378-TCDD					0.920		0.770	1156	803								
12378-PeCDD					0.995		1.550	785	875								
123478-HxCDD	35.956	1.001	4.790e2	4.398e2	1.027	1.089	1.240	1017	1043	8.01e3	1.03e4	7.9	9.9	NO	bd	bd	0.716
123678-HxCDD	36.056	1.000	1.626e3	1.578e3	1.009	1.030	1.240	1017	1043	2.80e4	2.65e4	27.6	25.4	YES	db	dd	2.481
123789-HxCDD	36.446	1.011	9.218e2	8.540e2	0.950	1.079	1.240	1017	1043	1.60e4	1.21e4	15.8	11.6	NO	bb	bb	1.478
1234678-HpCDD	40.201	1.000	2.524e4	2.415e4	1.068	1.046	1.050	1268	1264	4.01e5	3.91e5	316.1	309.5	NO	bb	bb	55.335
OCDD	44.931	1.000	1.743e5	1.934e5	1.181	0.901	0.890	1032	1166	2.11e6	2.30e6	2042.2	1974.5	NO	bb	bb	491.970
13C-2378-TCDF	25.655	1.007	3.750e4	4.882e4	1.427	0.768	0.770	2097	1861	5.64e5	7.33e5	268.7	394.0	NO	bb	bb	28.370
13C-12378-PeCDF	29.817	1.171	1.015e5	6.191e4	1.297	1.639	1.550	1444	1619	1.55e6	9.32e5	1075.0	575.8	NO	bb	bb	59.056
13C-23478-PeCDF	31.165	1.223	9.636e4	5.892e4	1.236	1.635	1.550	1444	1619	1.49e6	9.04e5	1033.8	558.1	NO	bb	bb	58.880
13C-123478-HxCDF	34.797	0.955	5.203e4	9.963e4	1.242	0.522	0.510	1079	1307	8.15e5	1.58e6	754.8	1205.6	NO	bd	bd	70.411
13C-123678-HxCDF	34.942	0.959	5.550e4	1.028e5	1.343	0.540	0.510	1079	1307	8.64e5	1.59e6	800.9	1218.4	NO	db	db	67.970
13C-234678-HxCDF	35.811	0.983	5.001e4	9.877e4	1.215	0.506	0.510	1079	1307	7.87e5	1.62e6	728.9	1242.8	NO	bb	bb	70.643
13C-123789-HxCDF	36.836	1.011	4.847e4	9.062e4	1.008	0.535	0.510	1079	1307	7.60e5	1.45e6	703.8	1111.1	NO	bb	bb	79.627
13C-1234678-HpCDF	38.696	1.062	3.359e4	7.387e4	0.926	0.455	0.440	877	1294	5.39e5	1.18e6	614.3	911.4	NO	bb	bb	66.906
13C-1234789-HpCDF	40.925	1.123	2.696e4	5.966e4	0.758	0.452	0.440	877	1294	3.98e5	8.52e5	453.2	658.7	NO	bb	bb	65.930
13C-1234-TCDD	25.473	0.000	9.298e4	1.203e5	1.000	0.773	0.770	2156	1068	1.44e6	1.87e6	666.1	1747.9	NO	bb	bb	100.000
13C-2378-TCDD	26.290	1.032	4.495e4	5.769e4	1.116	0.779	0.770	2156	1068	6.86e5	8.78e5	318.2	822.4	NO	bb	bb	43.103
13C-12378-PeCDD	31.410	1.233	6.408e4	4.002e4	0.732	1.601	1.550	837	935	9.79e5	6.19e5	1170.3	661.9	NO	bb	bb	66.683
13C-123478-HxCDD	35.933	0.986	6.970e4	5.514e4	0.960	1.264	1.240	1237	1033	1.15e6	9.12e5	929.5	883.3	NO	bd	bd	75.027
13C-123678-HxCDD	36.045	0.989	7.165e4	5.633e4	1.041	1.272	1.240	1237	1033	1.19e6	9.52e5	960.5	922.0	NO	db	db	70.891
13C-1234678-HpCDD	40.189	1.103	4.265e4	4.091e4	0.632	1.043	1.050	814	855	6.48e5	6.11e5	795.7	714.1	NO	bd	bd	76.217
13C-OCDD	44.922	1.233	5.934e4	6.724e4	0.504	0.882	0.890	885	854	7.15e5	7.90e5	808.3	924.7	NO	bb	bb	144.947
13C-123789-HxCDD	36.435	0.000	9.735e4	7.601e4	1.000	1.281	1.240	1237	1033	1.60e6	1.25e6	1290.1	1214.4	NO	bb	bb	100.000
37CL-2378-TCDD	26.305	1.033	3.958e4		1.084			788		6.20e5		786.9			bb		17.127

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:30:45 Pacific Daylight Time

ID: 21G0111-12, Name: 21081910, Date: 18-Aug-2021, Time: 17:33:39, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
1368-TCDF					1.425		0.770	959	1281								
1289-TCDF					1.043		0.770	959	1281								
13468-PECDF	26.986	0.905	3.324e2	8.211e1	1.376	4.048	1.550	746	920	5.68e3	2.14e3	7.6	2.3	YES	bd	bd	0.184
12389-PECDF					1.000		1.550	988	1081								
123468-HXCDF	33.137	0.952	1.235e3	9.232e2	1.087	1.338	1.240	713	903	2.06e4	1.84e4	28.9	20.4	NO	bb	bb	1.310
1368-TCDD	23.417	0.891	1.182e2	9.554e1	0.923	1.237	0.770	1156	803	3.11e3	1.77e3	2.7	2.2	YES	bb	bb	0.225
1289-TCDD					0.794		0.770	1156	803								
12479-PECDD	28.714	0.914	3.065e2	4.907e2	1.843	0.625	1.550	785	875	7.18e3	1.31e4	9.1	15.0	YES	bd	db	0.415
12389-PECDD					1.154		1.550	785	875								
124679-HXCDD	33.917	0.944	5.234e3	4.208e3	1.125	1.244	1.240	1017	1043	8.23e4	6.61e4	80.9	63.4	NO	bb	bb	6.724
1234679-HPCDD	39.153	0.974	4.342e4	4.118e4	1.211	1.054	1.050	1268	1264	7.16e5	6.79e5	564.6	537.2	NO	bb	bb	83.602
Total-tetrafurans			6.703e2		1.192			959		1.07e4							1.531
Total-penta1			2.807e3					746		4.25e4							3.090
Total-pentafurans			9.234e2		1.047			988		1.46e4							0.890
Total-hexafurans			1.203e4		1.045			713		1.92e5							14.360
Total-heptafurans			2.256e4		1.305			1185		3.73e5							33.501
Total-Furans			5.127e4		1.158			959		7.88e5							81.811
Total-tetradioxins			0.000e0		0.879			1156		0.00e0							
Total-pentadioxins			5.275e2		1.331			785		1.23e4							0.628
Total-hexadioxins			6.635e3		1.028			1017		1.06e5							8.918
Total-heptadioxins			6.866e4		1.140			1268		1.12e6							138.937
Total-Dioxins			2.501e5		1.092			1156		3.34e6							640.453
Total-TEQ			3.014e5					1156		4.13e6							722.264
FUNCTION1 PFK			2.142e7					347913		1.27e8							
FUNCTION2 PFK			0.000e0					298005		0.00e0							
FUNCTION3 PFK			3.563e5					482538		1.13e7							0.000
FUNCTION4 PFK			3.625e5					273234		1.01e7							
FUNCTION5 PFK			2.136e5					220496		8.14e6							
FUNCTION1 HXCD...			6.559e2					764		1.01e4							0.000
FUNCTION1 HPCD...			1.147e3					886		1.54e4							0.000
FUNCTION2 HPCD...			2.358e2					730		4.47e3							0.000
FUNCTION3 OCDPE			1.551e2					682		3.05e3							0.000
FUNCTION4 NCDPE			7.437e2					745		1.62e4							0.000
FUNCTION5 DCDPE			0.000e0					694		0.00e0							

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

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TF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetrafurans	24.32	4.353e2	5.747e2	1.192	0.76	0.77	7.0	YES	NO	dd	bd	0.982
2	Total-tetrafurans	23.76	2.350e2	3.296e2	1.192	0.71	0.77	4.2	YES	NO	db	db	0.549

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-penta1	27.09	2.807e3	1.823e3		1.54	1.55	57.0	YES	NO	db	db	3.090

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-pentafurans	28.76	9.234e2	5.609e2	1.047	1.65	1.55	14.7	YES	NO	db	bb	0.890

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123678-HxCDF	34.95	4.564e2	3.520e2	1.037	1.30	1.24	11.4	YES	NO	db	bb	0.493
2	123478-HxCDF	34.82	9.891e2	8.023e2	1.017	1.23	1.24	24.5	YES	NO	bd	bb	1.162
3	Total-hexafurans	34.20	5.280e3	4.768e3	1.045	1.11	1.24	110.2	YES	NO	bb	bb	6.436
4	Total-hexafurans	33.35	4.067e3	3.676e3	1.045	1.11	1.24	94.5	YES	NO	bb	bb	4.960
5	123468-HXCDF	33.14	1.235e3	9.232e2	1.087	1.34	1.24	28.9	YES	NO	bb	bb	1.310

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-heptafurans	39.36	1.503e4	1.448e4	1.305	1.04	1.05	210.0	YES	NO	bd	bb	23.292
2	1234678-HpCDF	38.71	7.538e3	7.024e3	1.327	1.07	1.05	105.1	YES	NO	bb	bb	10.209

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Furans,TF,PP,PF,HF,HPF,OF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetrafurans	24.32	4.353e2	5.747e2	1.192	0.76	0.77	7.0	YES	NO	dd	bd	0.982
2	Total-tetrafurans	23.76	2.350e2	3.296e2	1.192	0.71	0.77	4.2	YES	NO	db	db	0.549
3	Total-pentafurans	28.76	9.234e2	5.609e2	1.047	1.65	1.55	14.7	YES	NO	db	bb	0.890
4	123678-HxCDF	34.95	4.564e2	3.520e2	1.037	1.30	1.24	11.4	YES	NO	db	bb	0.493
5	123478-HxCDF	34.82	9.891e2	8.023e2	1.017	1.23	1.24	24.5	YES	NO	bd	bb	1.162
6	Total-hexafurans	34.20	5.280e3	4.768e3	1.045	1.11	1.24	110.2	YES	NO	bb	bb	6.436
7	Total-hexafurans	33.35	4.067e3	3.676e3	1.045	1.11	1.24	94.5	YES	NO	bb	bb	4.960
8	123468-HXCDF	33.14	1.235e3	9.232e2	1.087	1.34	1.24	28.9	YES	NO	bb	bb	1.310
9	Total-heptafurans	39.36	1.503e4	1.448e4	1.305	1.04	1.05	210.0	YES	NO	bd	bb	23.292
10	1234678-HpCDF	38.71	7.538e3	7.024e3	1.327	1.07	1.05	105.1	YES	NO	bb	bb	10.209
11	OCDF	45.16	1.228e4	1.377e4	1.447	0.89	0.89	173.0	YES	NO	bb	bb	28.440
12	Total-penta1	27.09	2.807e3	1.823e3		1.54	1.55	57.0	YES	NO	db	db	3.090

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-pentadioxins	30.05	2.803e2	1.918e2	1.331	1.46	1.55	8.5	YES	NO	bb	bb	0.341
2	Total-pentadioxins	29.81	2.473e2	1.512e2	1.331	1.64	1.55	7.2	YES	NO	bd	bd	0.288

HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	124679-HXCDD	33.92	5.234e3	4.208e3	1.125	1.24	1.24	80.9	YES	NO	bb	bb	6.724
2	123789-HxCDD	36.45	9.218e2	8.540e2	0.950	1.08	1.24	15.8	YES	NO	bb	bb	1.478
3	123478-HxCDD	35.96	4.790e2	4.398e2	1.027	1.09	1.24	7.9	YES	NO	bd	bd	0.716

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDD	40.20	2.524e4	2.415e4	1.068	1.05	1.05	316.1	YES	NO	bb	bb	55.335
2	1234679-HPCDD	39.15	4.342e4	4.118e4	1.211	1.05	1.05	564.6	YES	NO	bb	bb	83.602

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
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ID: 21G0111-12, Name: 21081910, Date: 18-Aug-2021, Time: 17:33:39, Conditions: AUTOSPEC01, User: pk

Dioxins,TD,PD,HD,HPD,OD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-pentadioxins	30.05	2.803e2	1.918e2	1.331	1.46	1.55	8.5	YES	NO	bb	bb	0.341
2	Total-pentadioxins	29.81	2.473e2	1.512e2	1.331	1.64	1.55	7.2	YES	NO	bd	bd	0.288
3	124679-HXCDD	33.92	5.234e3	4.208e3	1.125	1.24	1.24	80.9	YES	NO	bb	bb	6.724
4	123789-HxCDD	36.45	9.218e2	8.540e2	0.950	1.08	1.24	15.8	YES	NO	bb	bb	1.478
5	123478-HxCDD	35.96	4.790e2	4.398e2	1.027	1.09	1.24	7.9	YES	NO	bd	bd	0.716
6	1234678-HpCDD	40.20	2.524e4	2.415e4	1.068	1.05	1.05	316.1	YES	NO	bb	bb	55.335
7	1234679-HPCDD	39.15	4.342e4	4.118e4	1.211	1.05	1.05	564.6	YES	NO	bb	bb	83.602
8	OCDD	44.93	1.743e5	1.934e5	1.181	0.90	0.89	2042.2	YES	NO	bb	bb	491.970

TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetrafurans	24.32	4.353e2	5.747e2	1.192	0.76	0.77	7.0	YES	NO	dd	bd	0.982
2	Total-tetrafurans	23.76	2.350e2	3.296e2	1.192	0.71	0.77	4.2	YES	NO	db	db	0.549
3	Total-pentafurans	28.76	9.234e2	5.609e2	1.047	1.65	1.55	14.7	YES	NO	db	bb	0.890
4	123678-HxCDF	34.95	4.564e2	3.520e2	1.037	1.30	1.24	11.4	YES	NO	db	bb	0.493
5	123478-HxCDF	34.82	9.891e2	8.023e2	1.017	1.23	1.24	24.5	YES	NO	bd	bb	1.162
6	Total-hexafurans	34.20	5.280e3	4.768e3	1.045	1.11	1.24	110.2	YES	NO	bb	bb	6.436
7	Total-hexafurans	33.35	4.067e3	3.676e3	1.045	1.11	1.24	94.5	YES	NO	bb	bb	4.960
8	123468-HXCDF	33.14	1.235e3	9.232e2	1.087	1.34	1.24	28.9	YES	NO	bb	bb	1.310
9	Total-heptafurans	39.36	1.503e4	1.448e4	1.305	1.04	1.05	210.0	YES	NO	bd	bb	23.292
10	1234678-HpCDF	38.71	7.538e3	7.024e3	1.327	1.07	1.05	105.1	YES	NO	bb	bb	10.209
11	OCDF	45.16	1.228e4	1.377e4	1.447	0.89	0.89	173.0	YES	NO	bb	bb	28.440
12	Total-penta1	27.09	2.807e3	1.823e3		1.54	1.55	57.0	YES	NO	db	db	3.090
13	Total-pentadioxins	30.05	2.803e2	1.918e2	1.331	1.46	1.55	8.5	YES	NO	bb	bb	0.341
14	Total-pentadioxins	29.81	2.473e2	1.512e2	1.331	1.64	1.55	7.2	YES	NO	bd	bd	0.288
15	124679-HXCDD	33.92	5.234e3	4.208e3	1.125	1.24	1.24	80.9	YES	NO	bb	bb	6.724
16	123789-HxCDD	36.45	9.218e2	8.540e2	0.950	1.08	1.24	15.8	YES	NO	bb	bb	1.478
17	123478-HxCDD	35.96	4.790e2	4.398e2	1.027	1.09	1.24	7.9	YES	NO	bd	bd	0.716
18	1234678-HpCDD	40.20	2.524e4	2.415e4	1.068	1.05	1.05	316.1	YES	NO	bb	bb	55.335
19	1234679-HPCDD	39.15	4.342e4	4.118e4	1.211	1.05	1.05	564.6	YES	NO	bb	bb	83.602
20	OCDD	44.93	1.743e5	1.934e5	1.181	0.90	0.89	2042.2	YES	NO	bb	bb	491.970

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PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	21.12	3.817e6					77.2	YES		bd		
2	FUNCTION1 PFK	24.14	7.295e4					2.8	NO		db		
3	FUNCTION1 PFK	24.08	2.261e4					1.8	NO		dd		
4	FUNCTION1 PFK	23.99	6.476e4					2.5	NO		dd		
5	FUNCTION1 PFK	23.92	2.983e4					1.7	NO		bd		
6	FUNCTION1 PFK	23.66	2.746e4					1.6	NO		bb		
7	FUNCTION1 PFK	23.52	5.754e4					2.1	NO		bb		
8	FUNCTION1 PFK	22.99	9.783e4					3.8	YES		db		
9	FUNCTION1 PFK	22.86	1.197e5					3.9	YES		dd		
10	FUNCTION1 PFK	22.78	4.510e4					2.7	NO		dd		
11	FUNCTION1 PFK	22.72	7.568e4					2.3	NO		bd		
12	FUNCTION1 PFK	22.34	6.199e5					11.1	YES		db		
13	FUNCTION1 PFK	22.19	2.450e6					20.2	YES		dd		
14	FUNCTION1 PFK	21.86	1.558e6					36.6	YES		dd		
15	FUNCTION1 PFK	21.77	2.530e6					42.3	YES		dd		
16	FUNCTION1 PFK	21.44	5.297e6					61.0	YES		dd		
17	FUNCTION1 PFK	21.33	3.729e6					65.4	YES		dd		
18	FUNCTION1 PFK	27.64	5.987e4					2.7	NO		bb		
19	FUNCTION1 PFK	27.44	2.120e5					4.6	YES		bb		
20	FUNCTION1 PFK	27.32	3.574e3					0.7	NO		bb		
21	FUNCTION1 PFK	27.26	1.640e4					1.4	NO		bb		
22	FUNCTION1 PFK	27.02	1.665e4					1.3	NO		bb		
23	FUNCTION1 PFK	26.67	6.090e4					2.2	NO		bb		
24	FUNCTION1 PFK	25.96	1.901e4					1.4	NO		db		
25	FUNCTION1 PFK	25.90	1.665e4					1.3	NO		bd		
26	FUNCTION1 PFK	25.84	9.113e3					0.7	NO		bb		
27	FUNCTION1 PFK	25.61	2.973e5					4.3	YES		bb		
28	FUNCTION1 PFK	25.03	1.331e4					1.3	NO		bb		
29	FUNCTION1 PFK	24.72	6.169e3					0.7	NO		bb		
30	FUNCTION1 PFK	24.61	3.046e4					1.8	NO		bb		
31	FUNCTION1 PFK	24.43	4.403e3					0.6	NO		db		
32	FUNCTION1 PFK	24.38	4.339e4					1.3	NO		bd		

PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

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PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 PFK	35.57	5.977e4					2.0	NO		bb		0.000
2	FUNCTION3 PFK	35.45	6.290e3					0.5	NO		bb		0.000
3	FUNCTION3 PFK	35.35	6.915e3					0.6	NO		bb		0.000
4	FUNCTION3 PFK	35.15	1.145e4					1.1	NO		bb		0.000
5	FUNCTION3 PFK	34.32	2.685e3					0.5	NO		bb		0.000
6	FUNCTION3 PFK	34.25	1.041e4					0.5	NO		bb		0.000
7	FUNCTION3 PFK	33.87	1.403e4					1.1	NO		bb		0.000
8	FUNCTION3 PFK	33.82	8.171e3					0.9	NO		bb		0.000
9	FUNCTION3 PFK	33.72	6.583e3					0.7	NO		bb		0.000
10	FUNCTION3 PFK	33.67	3.709e3					0.5	NO		bb		0.000
11	FUNCTION3 PFK	33.50	1.867e4					1.3	NO		bb		0.000
12	FUNCTION3 PFK	33.13	2.278e4					1.2	NO		bb		0.000
13	FUNCTION3 PFK	33.08	4.828e3					0.6	NO		bb		0.000
14	FUNCTION3 PFK	32.71	2.061e4					1.7	NO		db		0.000
15	FUNCTION3 PFK	32.68	6.928e3					1.0	NO		bd		0.000
16	FUNCTION3 PFK	37.48	4.917e3					0.6	NO		bb		0.000
17	FUNCTION3 PFK	37.18	1.432e4					1.3	NO		bb		0.000
18	FUNCTION3 PFK	37.14	1.159e4					1.0	NO		db		0.000
19	FUNCTION3 PFK	37.09	1.100e4					0.9	NO		bd		0.000
20	FUNCTION3 PFK	36.89	6.784e4					1.5	NO		bb		0.000
21	FUNCTION3 PFK	36.58	1.592e4					1.0	NO		bb		0.000
22	FUNCTION3 PFK	36.43	4.632e3					0.5	NO		bb		0.000
23	FUNCTION3 PFK	36.29	5.096e3					0.6	NO		bb		0.000
24	FUNCTION3 PFK	35.89	8.983e3					1.1	NO		bb		0.000
25	FUNCTION3 PFK	35.84	8.189e3					0.8	NO		bb		0.000

ID: 21G0111-12, Name: 21081910, Date: 18-Aug-2021, Time: 17:33:39, Conditions: AUTOSPEC01, User: pk

PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 PFK	38.34	5.430e3					0.7	NO		db		
2	FUNCTION4 PFK	38.31	6.958e3					1.0	NO		bd		
3	FUNCTION4 PFK	38.11	1.113e4					0.9	NO		bb		
4	FUNCTION4 PFK	37.99	3.670e4					1.3	NO		bb		
5	FUNCTION4 PFK	37.79	2.519e3					0.8	NO		bb		
6	FUNCTION4 PFK	40.40	1.506e4					1.5	NO		dd		
7	FUNCTION4 PFK	40.36	2.854e4					1.7	NO		bd		
8	FUNCTION4 PFK	40.16	8.593e2					0.3	NO		bb		
9	FUNCTION4 PFK	40.01	1.191e4					1.3	NO		bb		
10	FUNCTION4 PFK	39.87	1.144e4					1.1	NO		db		
11	FUNCTION4 PFK	39.80	4.143e3					0.8	NO		bd		
12	FUNCTION4 PFK	39.75	1.884e4					1.7	NO		bb		
13	FUNCTION4 PFK	39.67	2.035e3					0.4	NO		bb		
14	FUNCTION4 PFK	39.51	1.308e4					1.6	NO		bb		
15	FUNCTION4 PFK	39.45	5.919e3					0.9	NO		bb		
16	FUNCTION4 PFK	39.31	6.295e3					0.9	NO		bb		
17	FUNCTION4 PFK	39.26	3.907e3					0.7	NO		bb		
18	FUNCTION4 PFK	38.99	6.706e3					0.8	NO		bb		
19	FUNCTION4 PFK	38.80	1.857e4					1.6	NO		bb		
20	FUNCTION4 PFK	38.65	2.302e4					1.7	NO		db		
21	FUNCTION4 PFK	38.54	1.841e4					1.6	NO		bd		
22	FUNCTION4 PFK	42.79	5.201e3					0.7	NO		bb		
23	FUNCTION4 PFK	42.73	4.931e3					0.8	NO		bb		
24	FUNCTION4 PFK	42.55	1.952e4					1.4	NO		bb		
25	FUNCTION4 PFK	42.41	4.739e3					0.7	NO		bb		
26	FUNCTION4 PFK	42.32	1.152e3					0.4	NO		bb		
27	FUNCTION4 PFK	42.21	9.459e3					1.3	NO		bb		
28	FUNCTION4 PFK	42.15	3.900e3					0.7	NO		bb		
29	FUNCTION4 PFK	41.56	6.358e3					1.0	NO		bb		
30	FUNCTION4 PFK	41.21	6.444e3					0.9	NO		bb		
31	FUNCTION4 PFK	41.10	5.420e3					0.7	NO		bb		
32	FUNCTION4 PFK	40.95	2.807e3					0.5	NO		bb		
33	FUNCTION4 PFK	40.86	4.025e3					0.7	NO		bb		
34	FUNCTION4 PFK	40.78	1.228e4					1.2	NO		bb		
35	FUNCTION4 PFK	40.50	4.451e3					1.0	NO		bb		
36	FUNCTION4 PFK	40.43	2.039e4					1.6	NO		db		

ID: 21G0111-12, Name: 21081910, Date: 18-Aug-2021, Time: 17:33:39, Conditions: AUTOSPEC01, User: pk

PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	44.40	8.048e2					0.4	NO		bb		
2	FUNCTION5 PFK	44.29	4.314e3					0.9	NO		db		
3	FUNCTION5 PFK	44.23	1.566e4					1.4	NO		dd		
4	FUNCTION5 PFK	44.13	6.461e3					1.2	NO		bd		
5	FUNCTION5 PFK	43.91	5.302e3					1.0	NO		db		
6	FUNCTION5 PFK	43.88	2.243e3					0.8	NO		bd		
7	FUNCTION5 PFK	43.84	6.710e2					0.3	NO		bb		
8	FUNCTION5 PFK	43.46	3.408e3					0.9	NO		bb		
9	FUNCTION5 PFK	43.40	8.392e3					1.4	NO		db		
10	FUNCTION5 PFK	43.37	7.572e3					1.1	NO		bd		
11	FUNCTION5 PFK	43.29	7.133e3					1.5	NO		bb		
12	FUNCTION5 PFK	43.24	2.801e3					0.9	NO		bb		
13	FUNCTION5 PFK	43.09	3.177e3					1.0	NO		bb		
14	FUNCTION5 PFK	43.05	4.801e3					1.1	NO		bb		
15	FUNCTION5 PFK	42.94	7.950e2					0.4	NO		bb		
16	FUNCTION5 PFK	42.88	1.169e4					1.5	NO		bb		
17	FUNCTION5 PFK	45.71	3.188e3					1.0	NO		bb		
18	FUNCTION5 PFK	45.67	1.017e4					1.3	NO		db		
19	FUNCTION5 PFK	45.59	1.004e4					1.4	NO		bd		
20	FUNCTION5 PFK	45.39	5.196e3					0.7	NO		bb		
21	FUNCTION5 PFK	45.27	1.408e3					0.5	NO		bb		
22	FUNCTION5 PFK	45.23	2.043e3					0.7	NO		db		
23	FUNCTION5 PFK	45.21	7.113e3					1.3	NO		dd		
24	FUNCTION5 PFK	45.17	5.218e3					1.1	NO		dd		
25	FUNCTION5 PFK	45.13	1.132e4					1.8	NO		dd		
26	FUNCTION5 PFK	45.09	6.040e3					1.1	NO		bd		
27	FUNCTION5 PFK	45.01	1.414e4					1.4	NO		bb		
28	FUNCTION5 PFK	44.87	3.346e3					0.8	NO		bb		
29	FUNCTION5 PFK	44.82	7.254e3					1.3	NO		db		
30	FUNCTION5 PFK	44.79	5.492e3					1.4	NO		bd		
31	FUNCTION5 PFK	44.61	4.959e3					0.9	NO		bb		
32	FUNCTION5 PFK	44.50	7.225e3					1.0	NO		bb		
33	FUNCTION5 PFK	45.97	5.502e3					1.0	NO		bb		
34	FUNCTION5 PFK	45.91	3.950e3					1.0	NO		db		
35	FUNCTION5 PFK	45.86	1.479e4					1.5	NO		bd		

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ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	26.65	1.093e2					1.9	NO		bb		0.000
2	FUNCTION1 HXCD...	25.84	1.502e2					2.7	NO		bb		0.000
3	FUNCTION1 HXCD...	23.78	1.099e2					2.8	NO		bb		0.000
4	FUNCTION1 HXCD...	23.64	8.322e1					2.4	NO		bb		0.000
5	FUNCTION1 HXCD...	22.36	1.245e2					1.7	NO		bb		0.000
6	FUNCTION1 HXCD...	21.66	7.869e1					1.8	NO		bb		0.000

ETHERS2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HPCD...	23.83	8.354e1					1.9	NO		db		0.000
2	FUNCTION1 HPCD...	23.70	2.212e2					1.6	NO		bd		0.000
3	FUNCTION1 HPCD...	23.16	1.392e2					2.2	NO		db		0.000
4	FUNCTION1 HPCD...	23.02	1.222e2					2.1	NO		bd		0.000
5	FUNCTION1 HPCD...	21.94	2.908e2					5.8	YES		bb		0.000
6	FUNCTION1 HPCD...	25.81	1.368e2					1.4	NO		bb		0.000
7	FUNCTION1 HPCD...	24.04	1.530e2					2.2	NO		bb		0.000

ETHERS3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 HPCD...	32.52	7.558e1					2.1	NO		db		0.000
2	FUNCTION2 HPCD...	32.45	7.564e1					2.1	NO		bd		0.000
3	FUNCTION2 HPCD...	27.86	8.458e1					2.0	NO		bb		0.000

ETHERS4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 OCDPE	36.85	7.930e1					2.6	NO		bb		0.000
2	FUNCTION3 OCDPE	34.12	7.580e1					1.9	NO		bb		0.000

ETHERS5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 NCDPE	38.34	7.437e2					21.8	YES		bb		0.000

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ID: 21G0111-12, Name: 21081910, Date: 18-Aug-2021, Time: 17:33:39, Conditions: AUTOSPEC01, User: pk

ETHERS6

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

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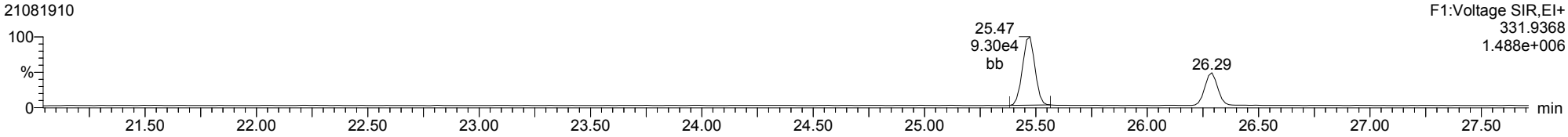

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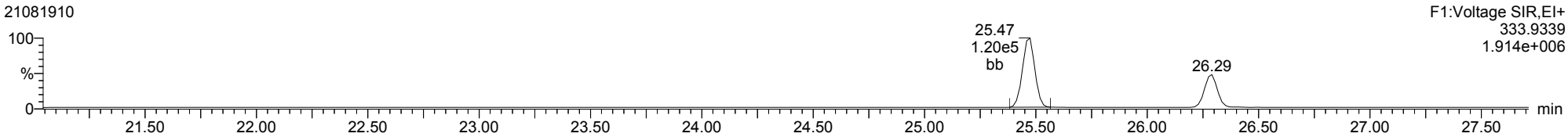

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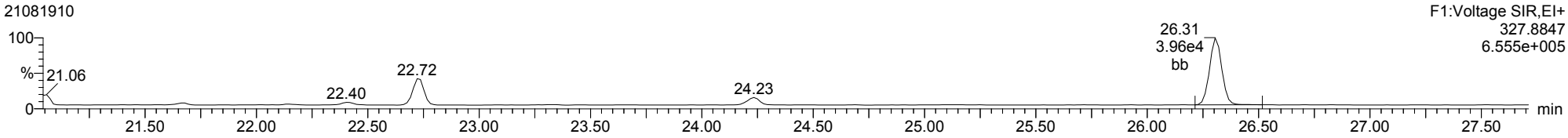

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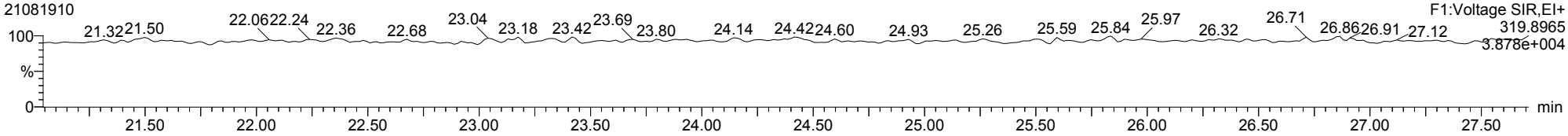

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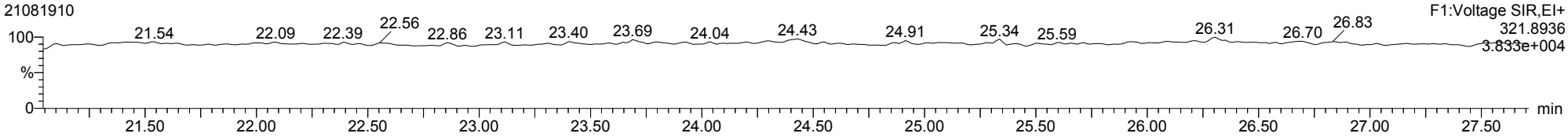

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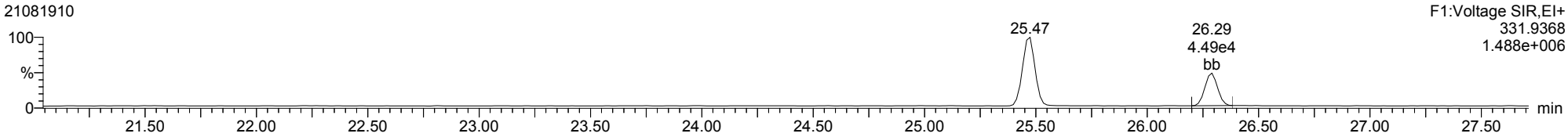

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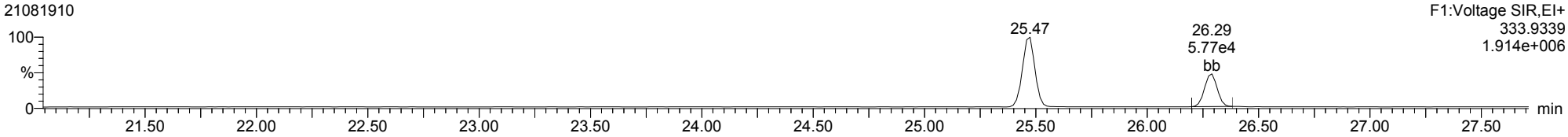

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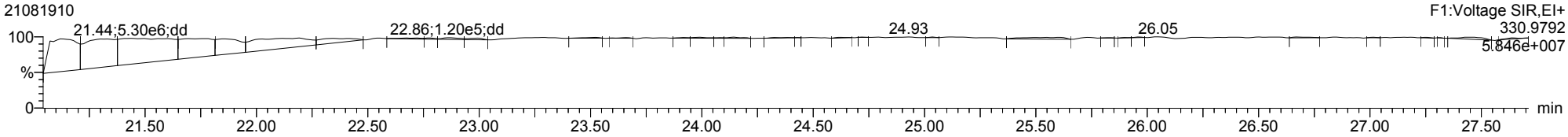

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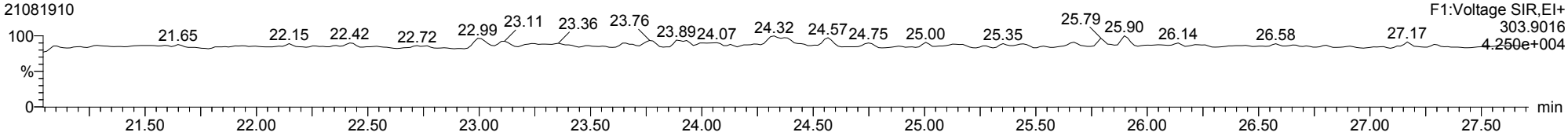

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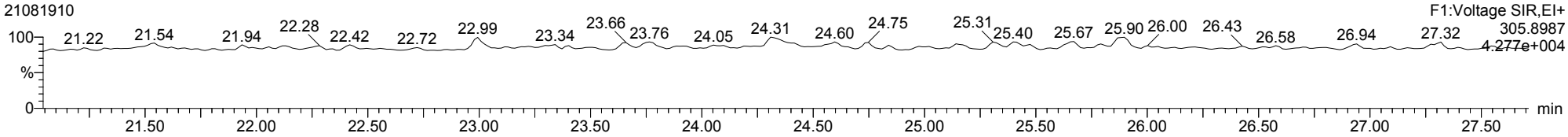

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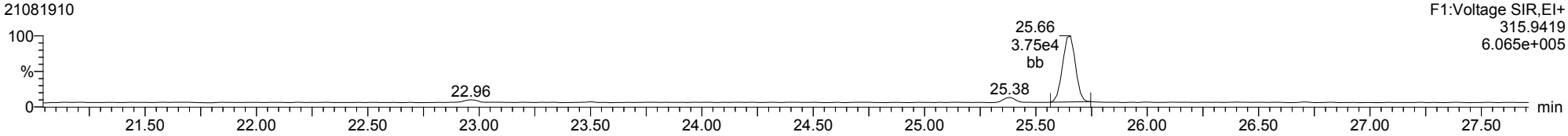

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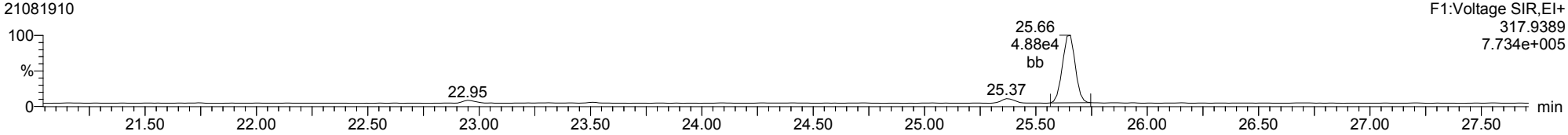

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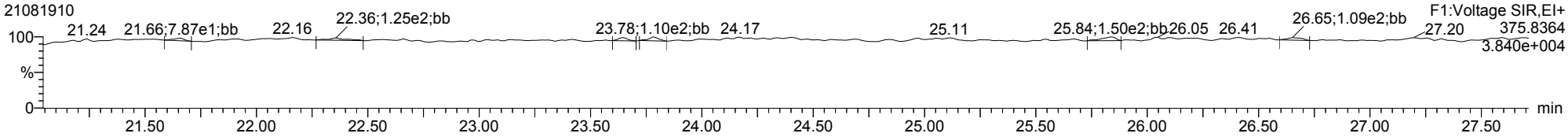

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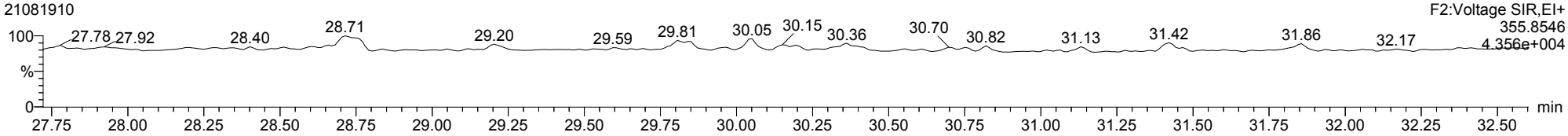
12378-PeCDD



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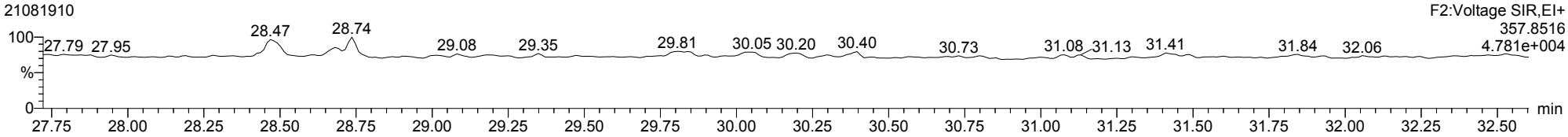

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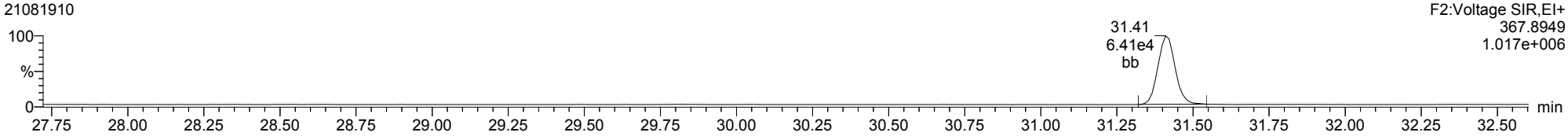

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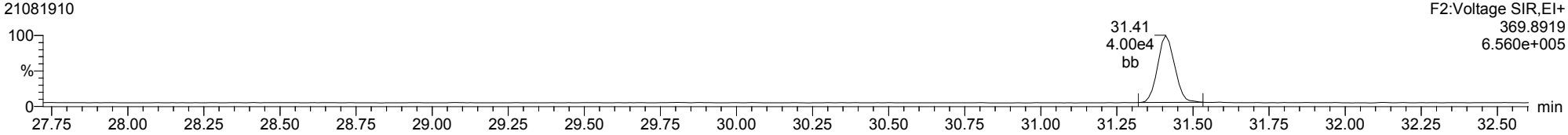
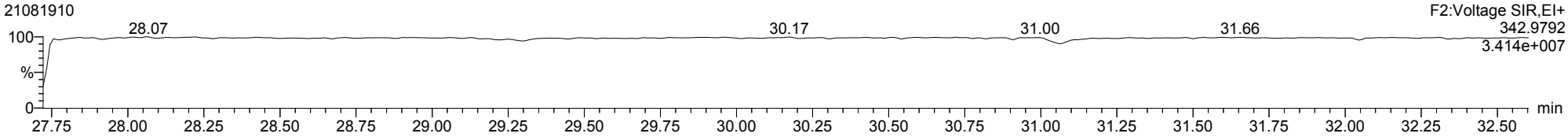


FUNCTION2 PFK



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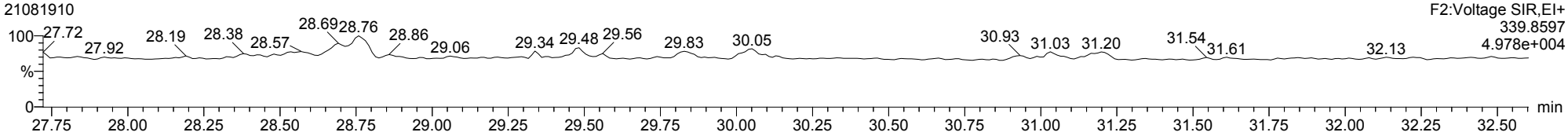
12378-PeCDF



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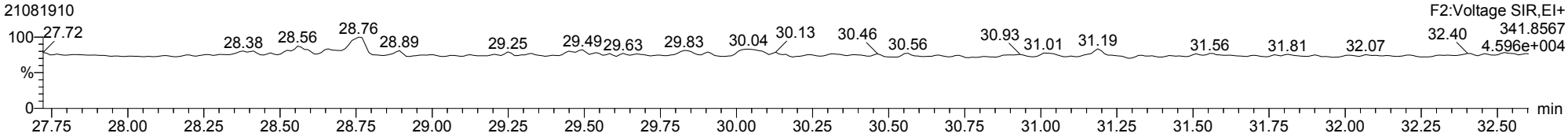

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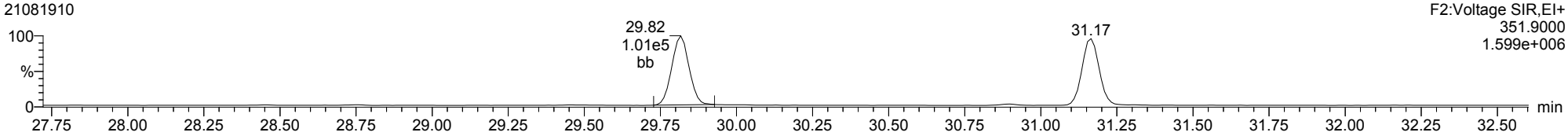

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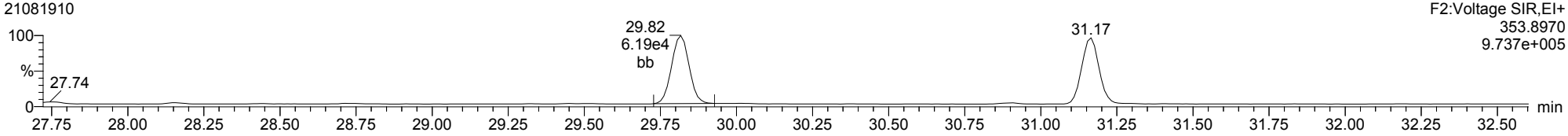
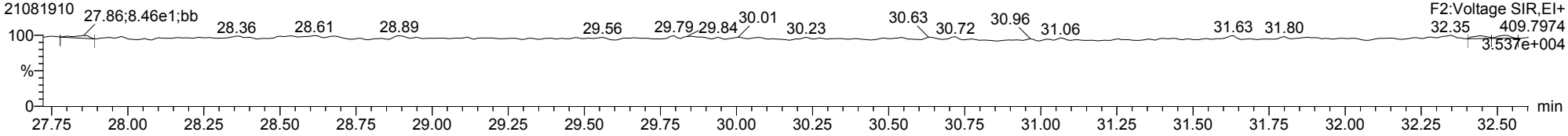


FUNCTION2 HPCDPE



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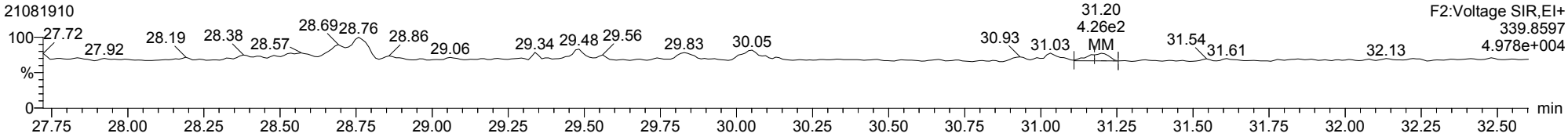
23478-PeCDF



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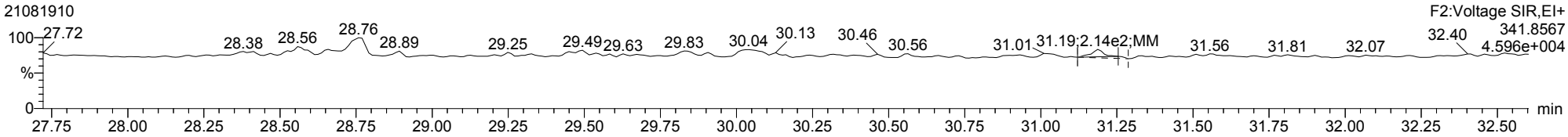

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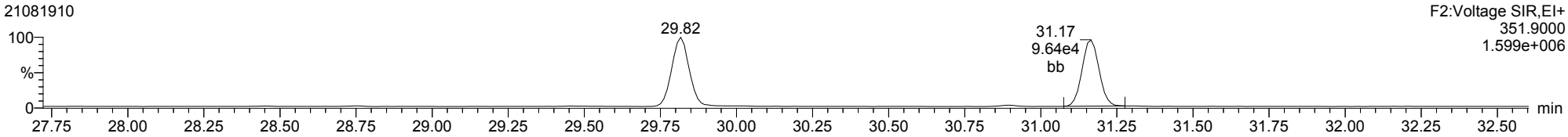

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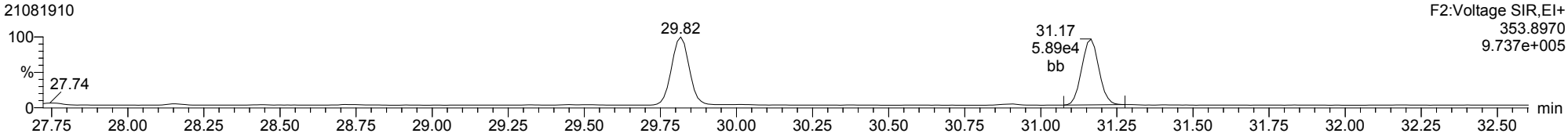

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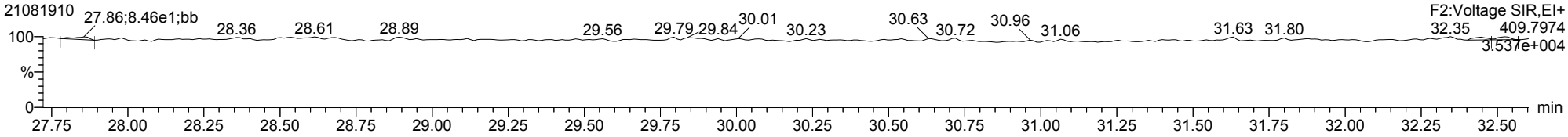

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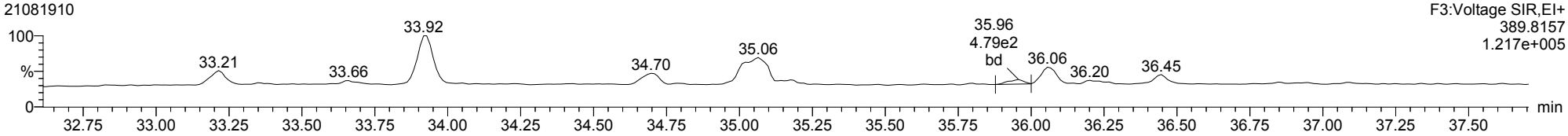

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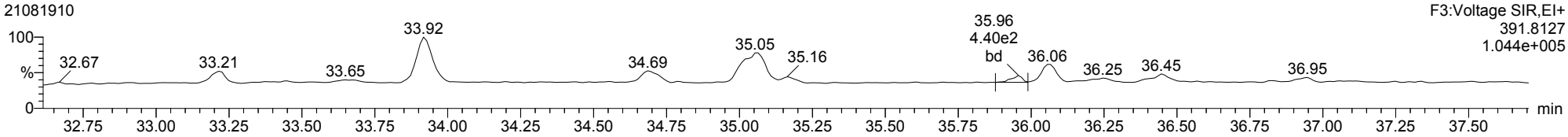

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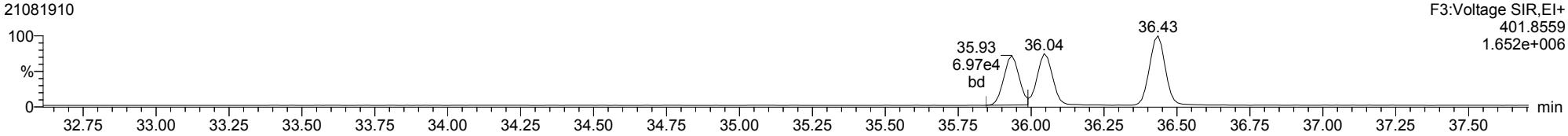

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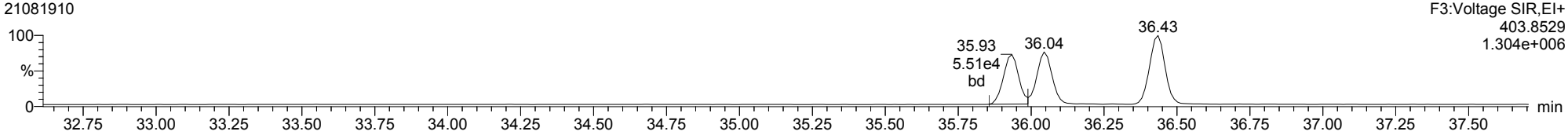

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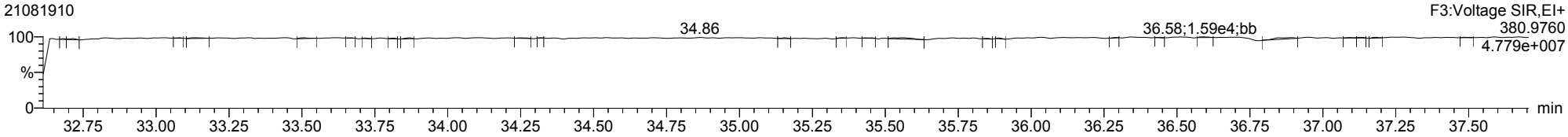

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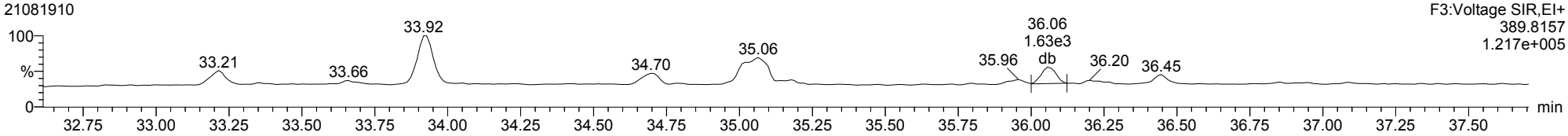

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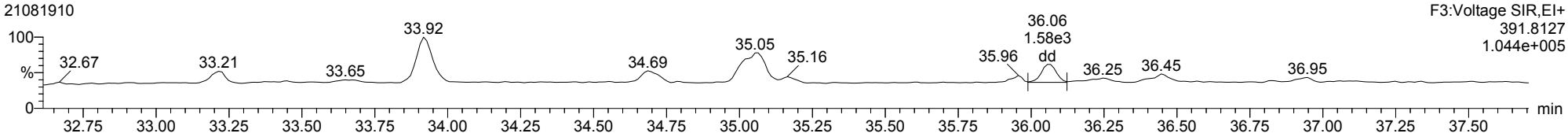

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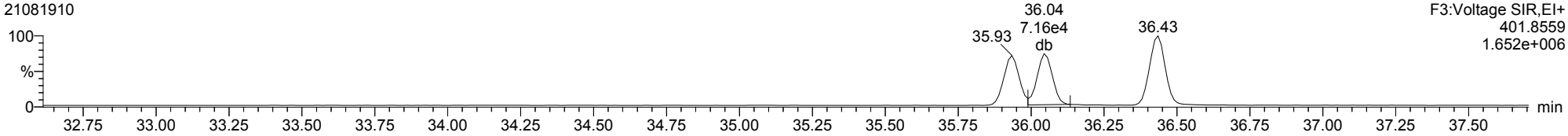

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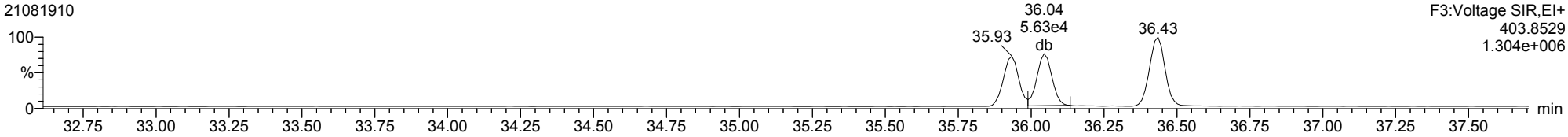

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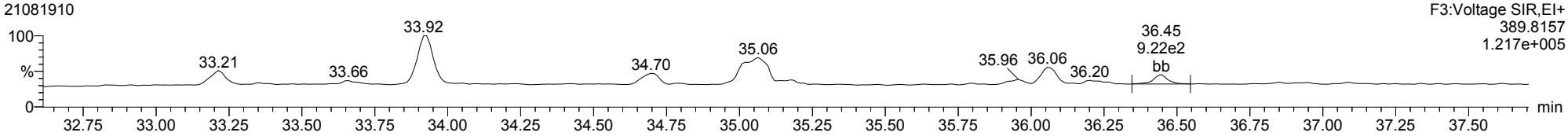

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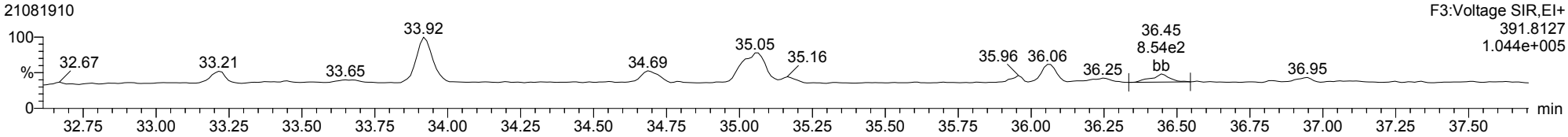

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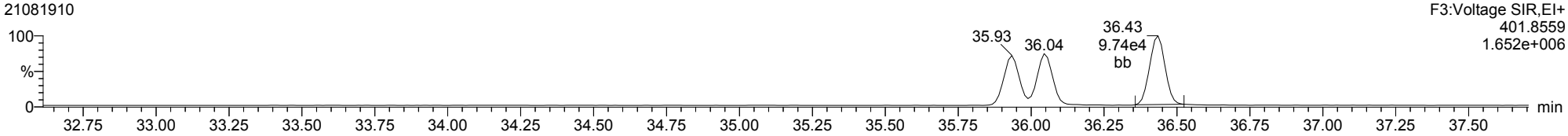

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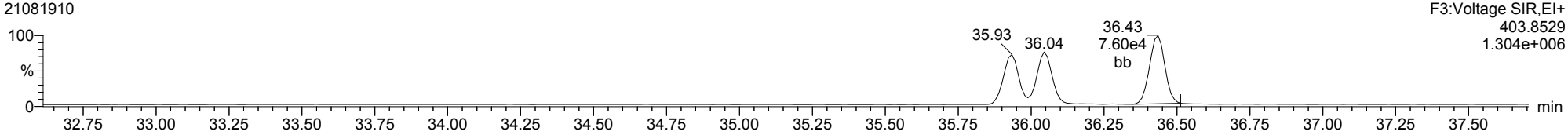

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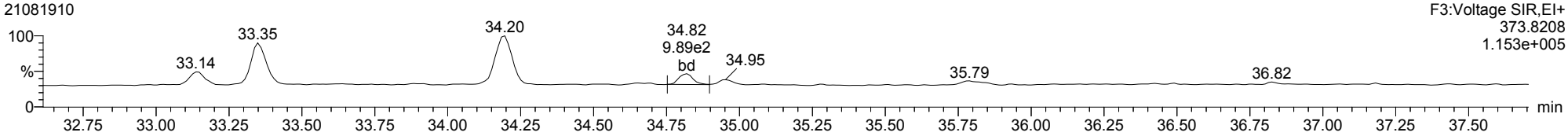

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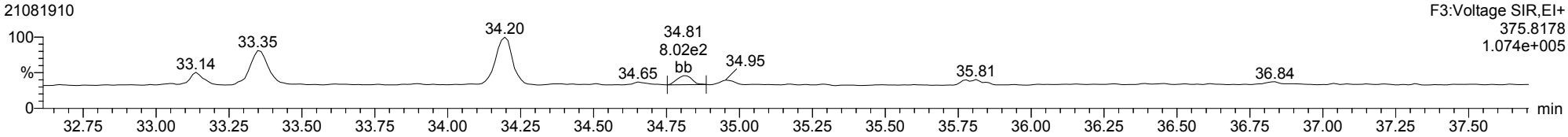

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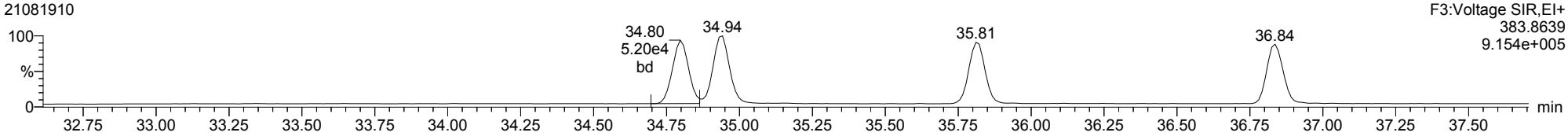

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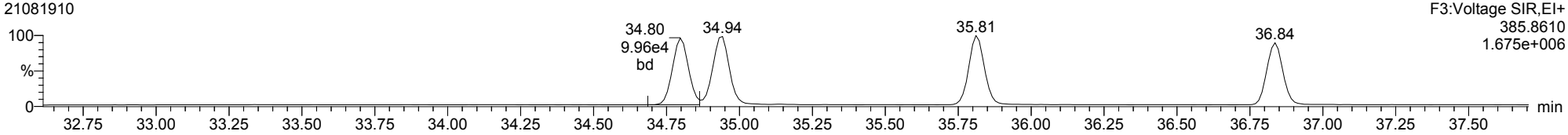

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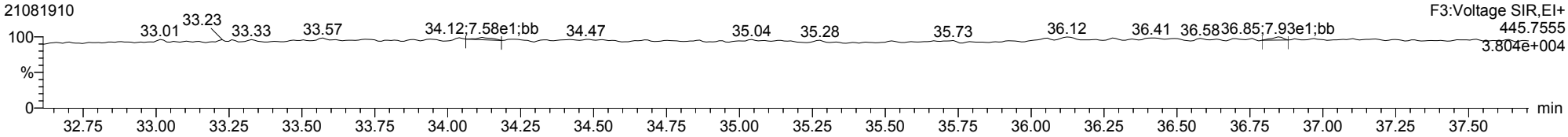

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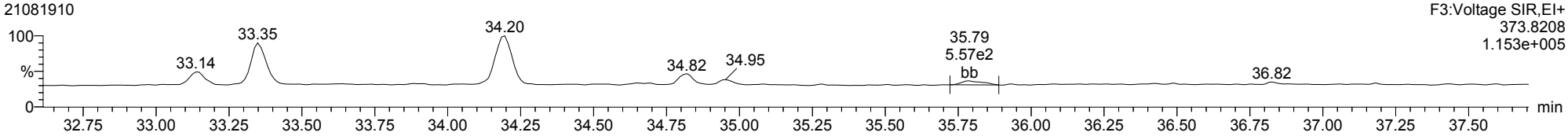

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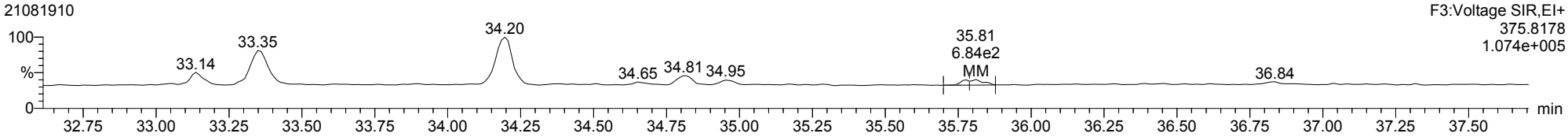

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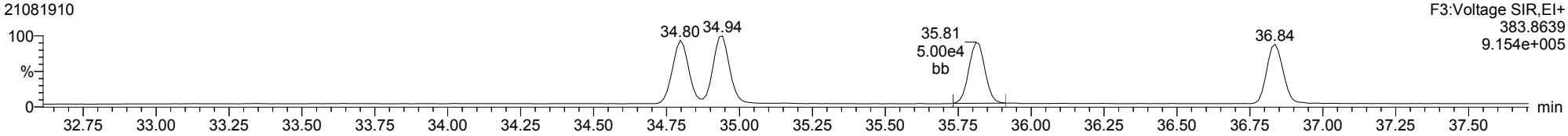

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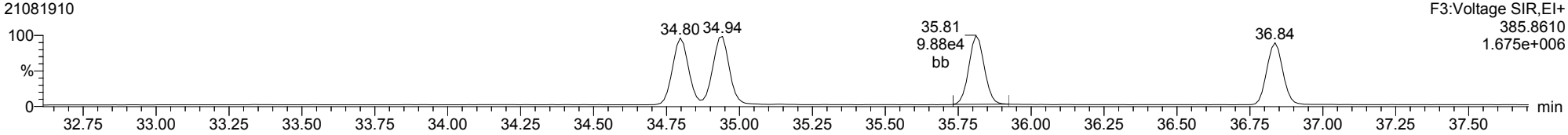

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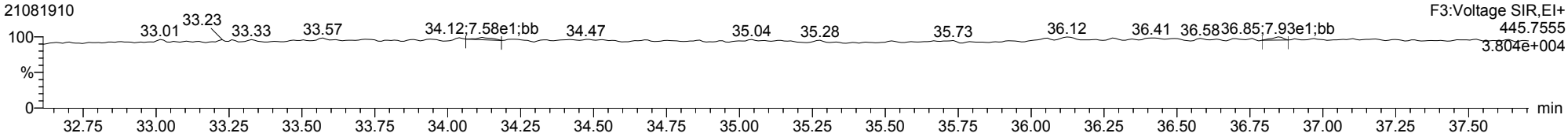

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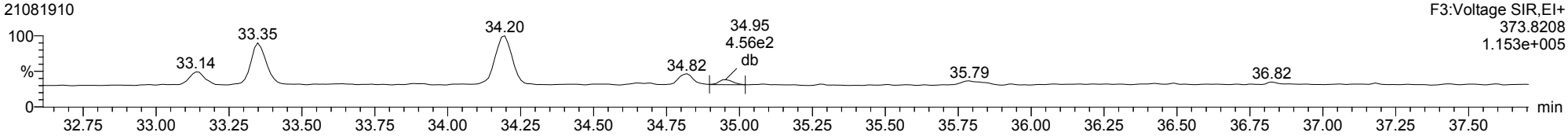

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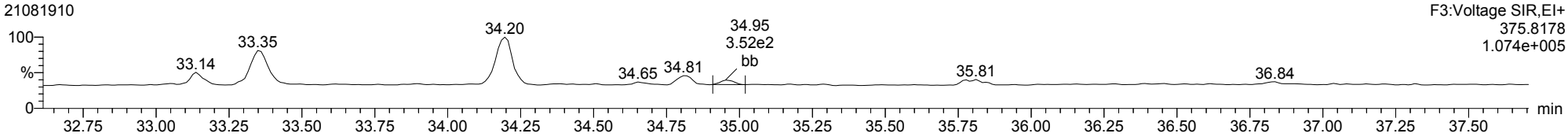

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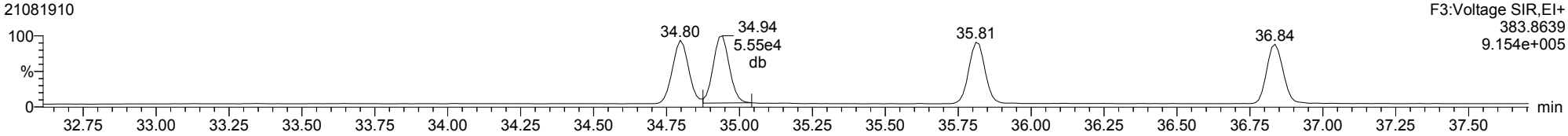

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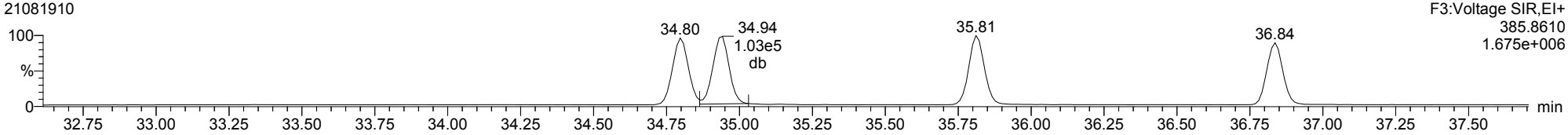

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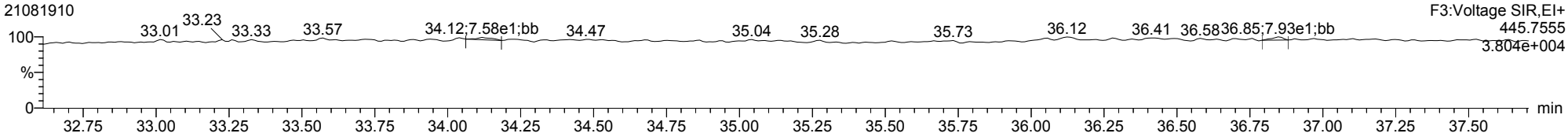

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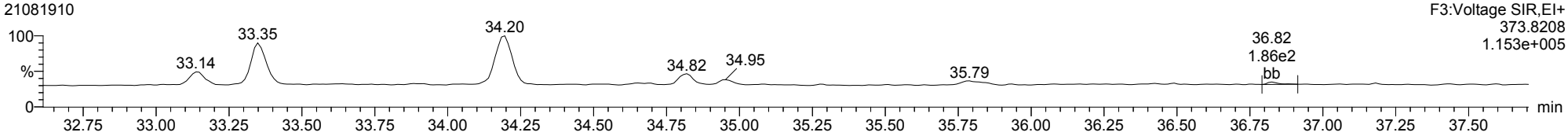

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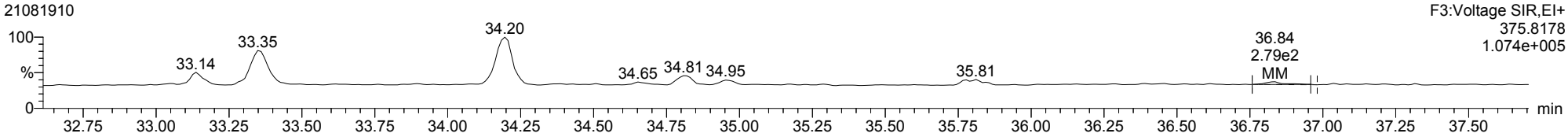

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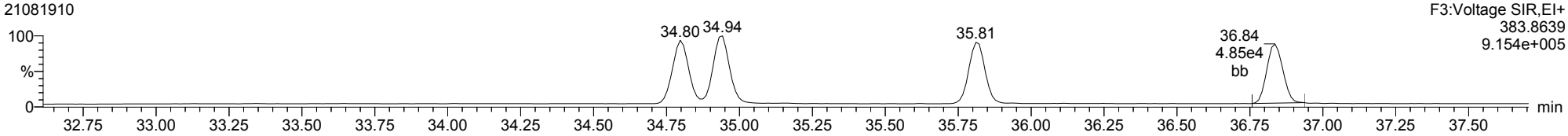

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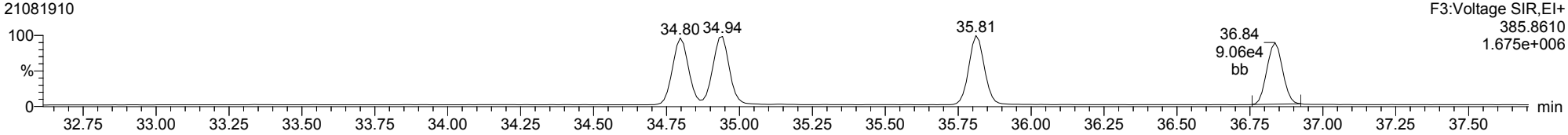

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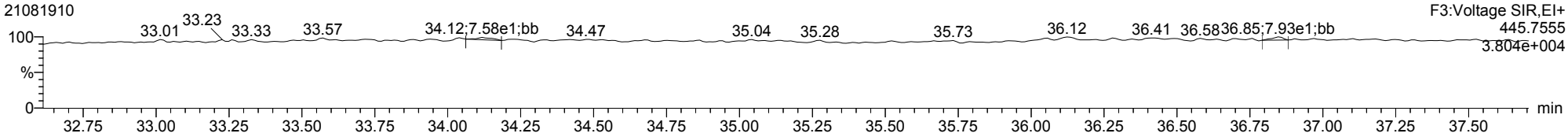

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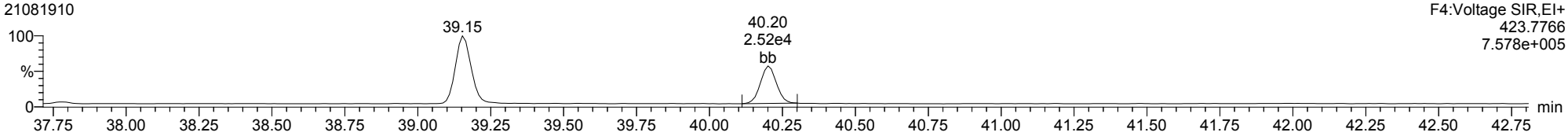
1234678-HpCDD



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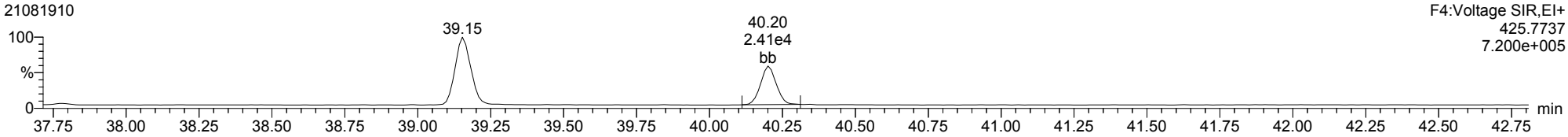

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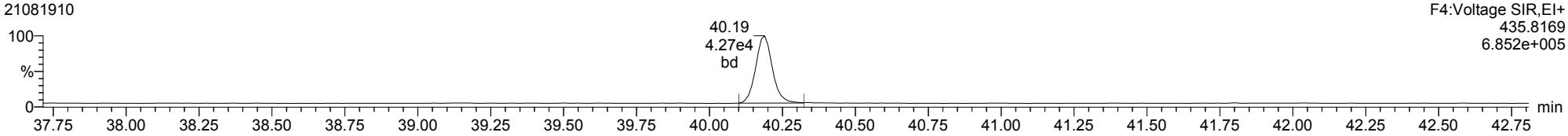

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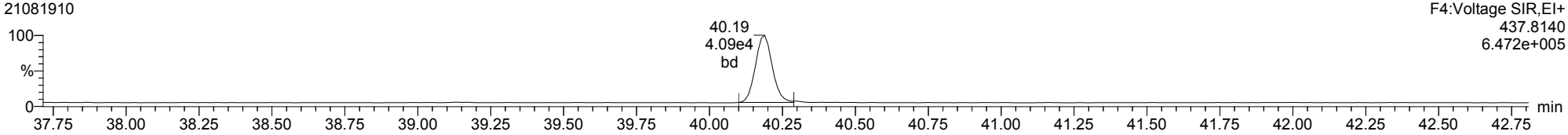
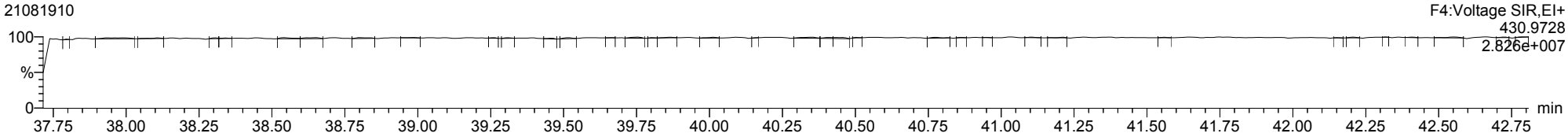


FUNCTION4 PFK



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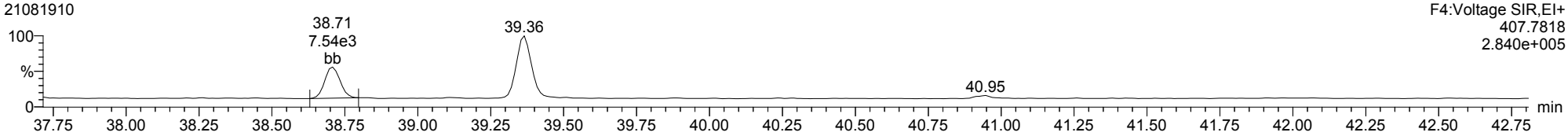

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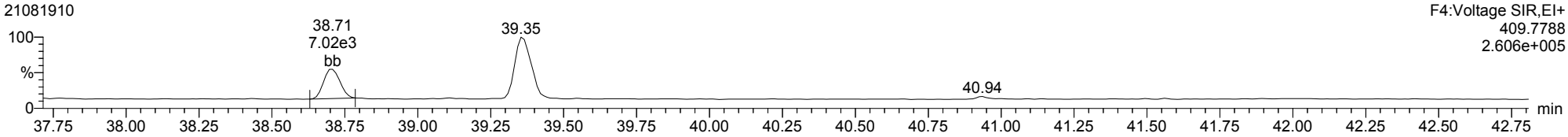

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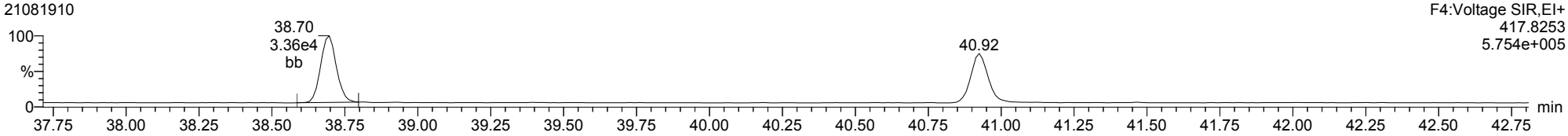

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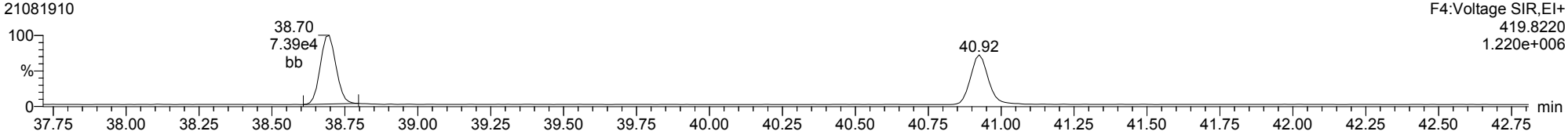

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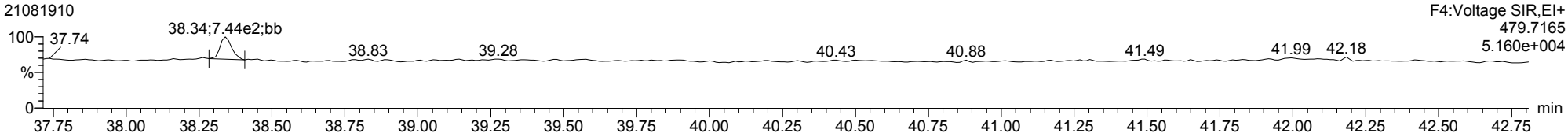

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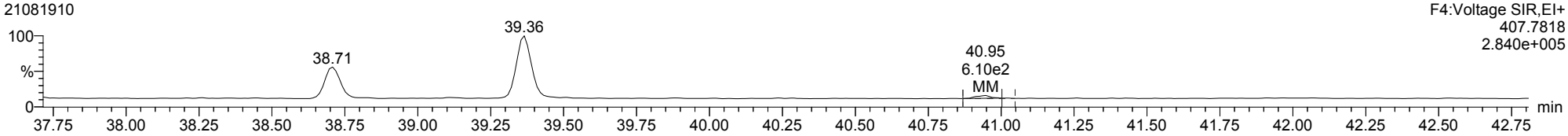
1234789-HpCDF



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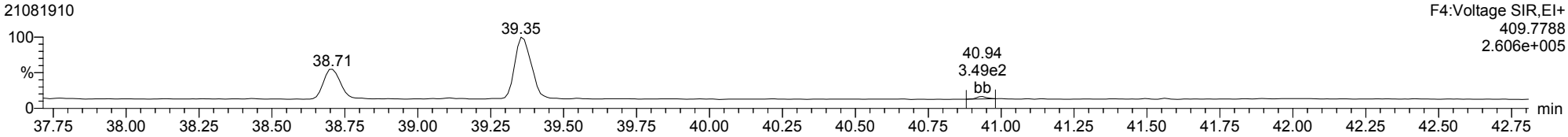

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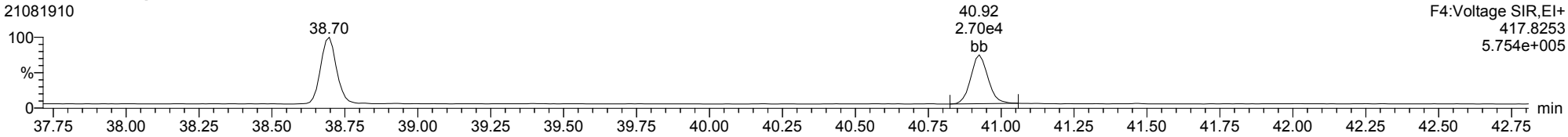

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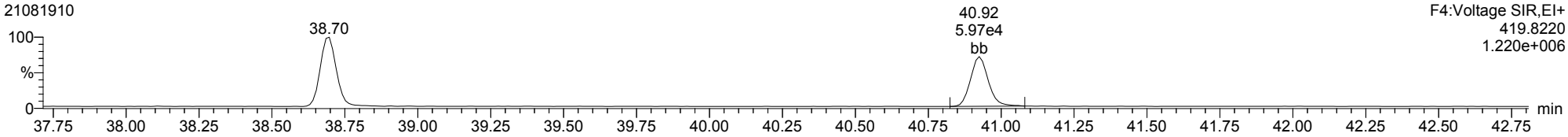

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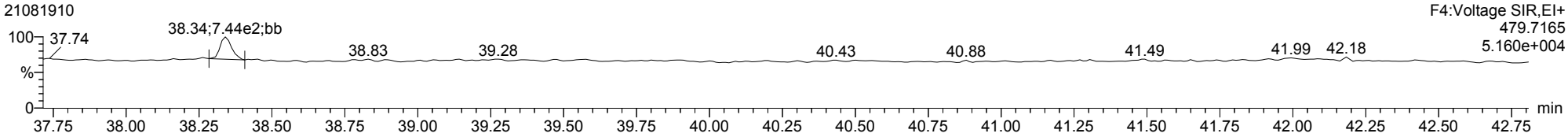

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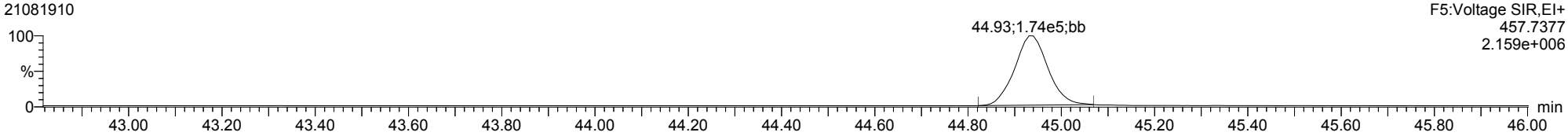
OCDD



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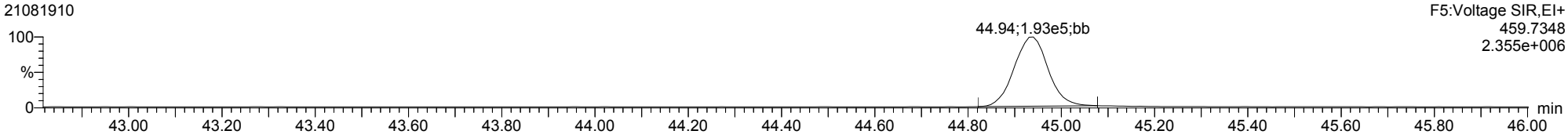
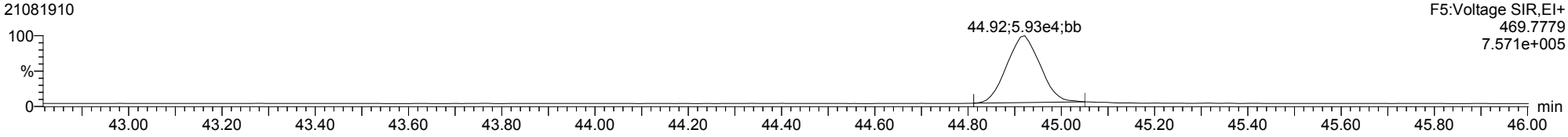


13C-OCDD



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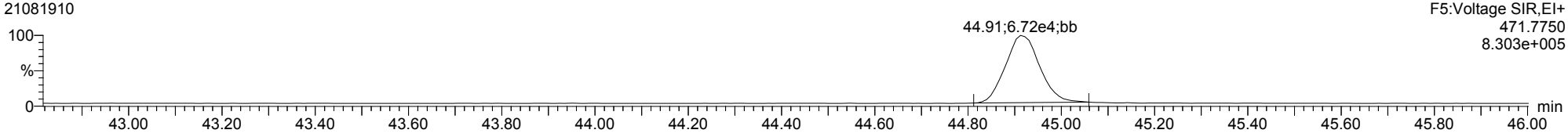

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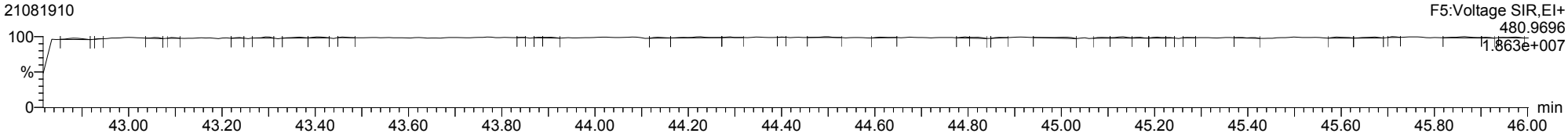

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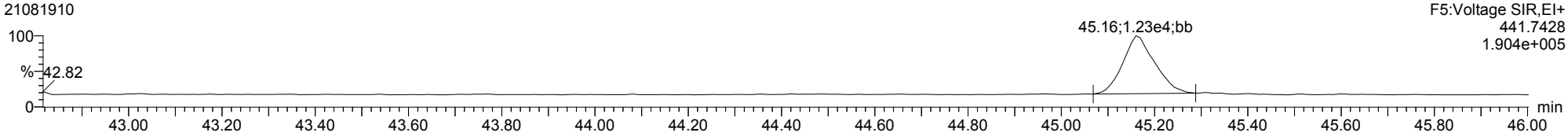
Printed: Thursday, August 19, 2021 10:30:45 Pacific Daylight Time

ID: 21G0111-12, Name: 21081910, Date: 18-Aug-2021, Time: 17:33:39, Conditions: AUTOSPEC01, User: pk

OCDF



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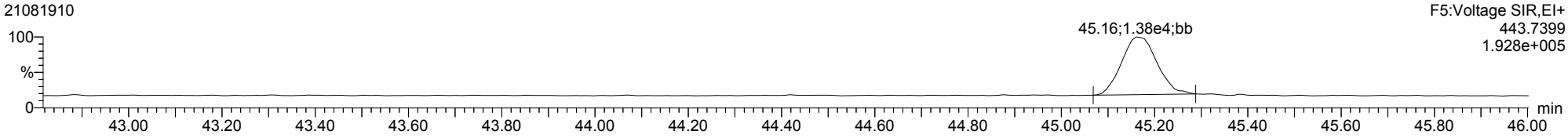
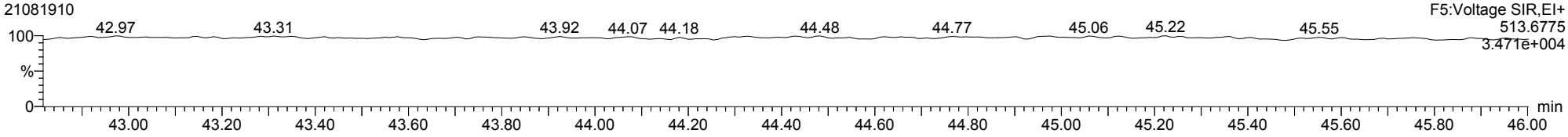
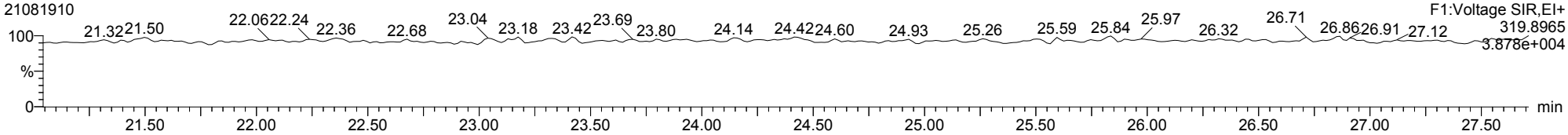


FUNCTION5 DCDPE

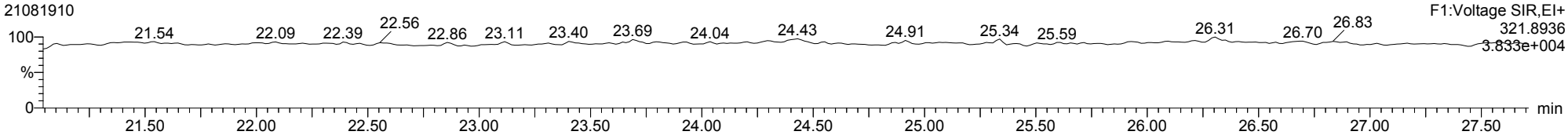


ID: 21G0111-12, Name: 21081910, Date: 18-Aug-2021, Time: 17:33:39, Conditions: AUTOSPEC01, User: pk

Total-tetradioxins



Total-tetradioxins



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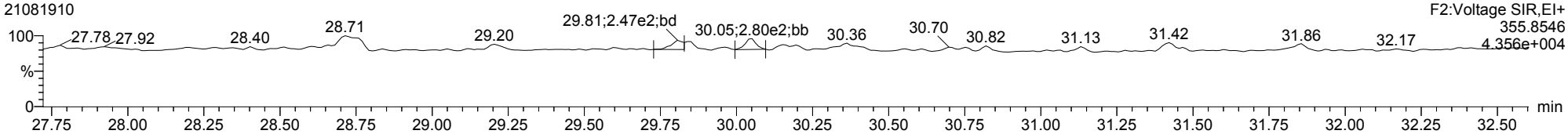
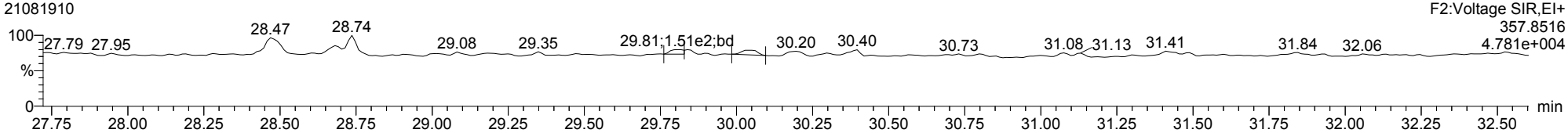


Total-pentadioxins



ID: 21G0111-12, Name: 21081910, Date: 18-Aug-2021, Time: 17:33:39, Conditions: AUTOSPEC01, User: pk

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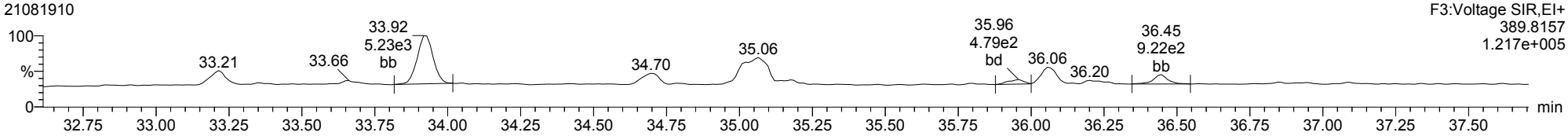

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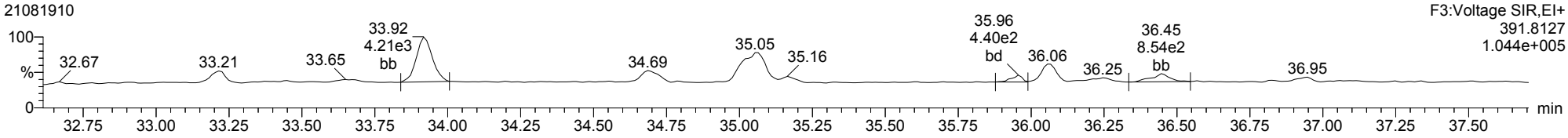

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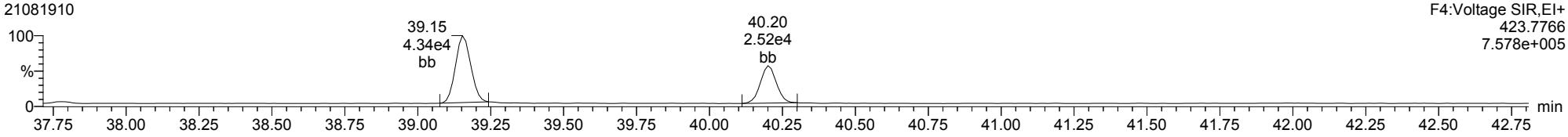
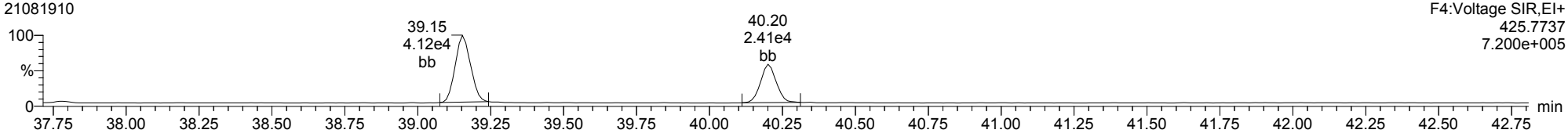
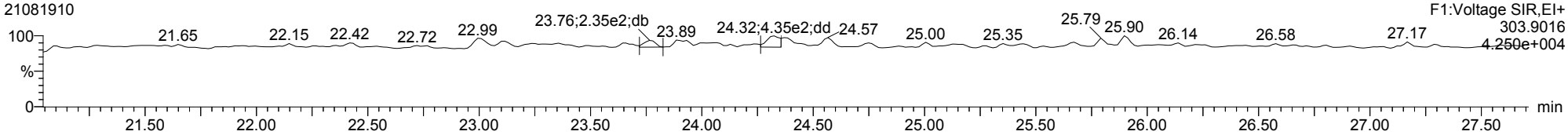


Total-heptadioxins



ID: 21G0111-12, Name: 21081910, Date: 18-Aug-2021, Time: 17:33:39, Conditions: AUTOSPEC01, User: pk

Total-tetrafurans



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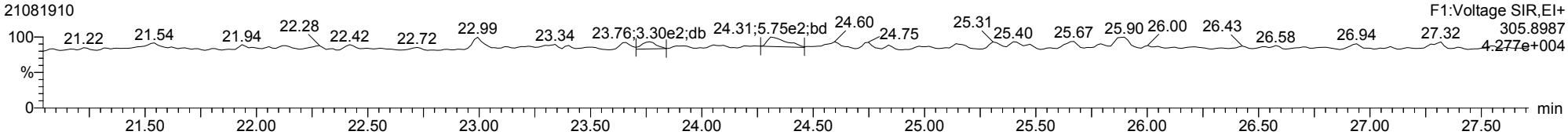

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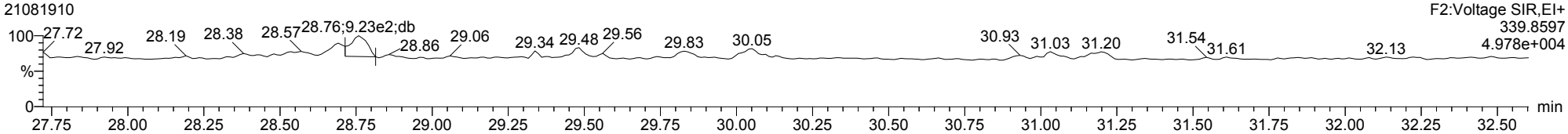

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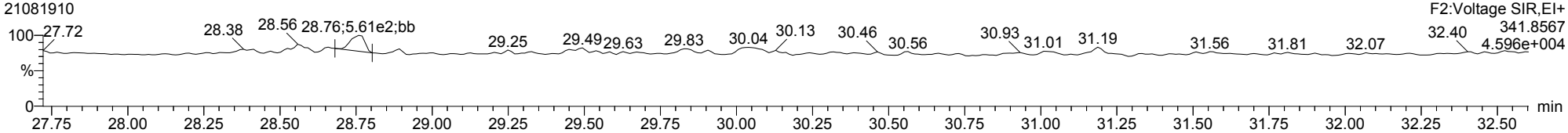

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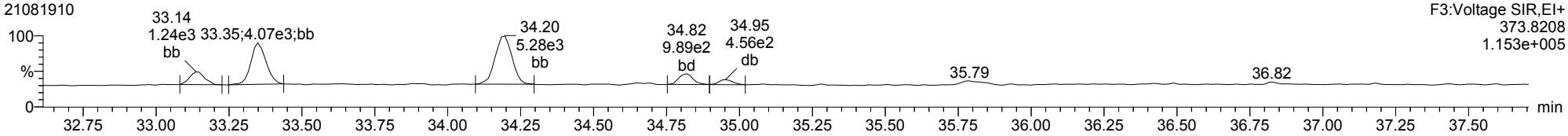
Total-hexafurans



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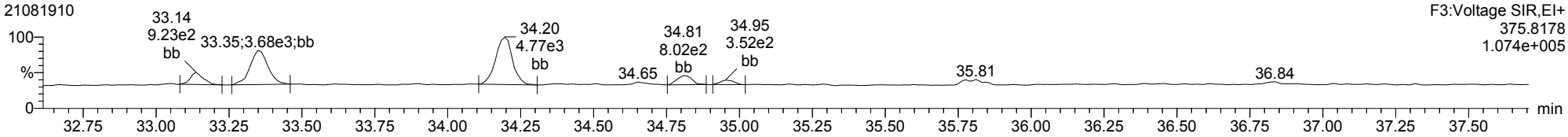

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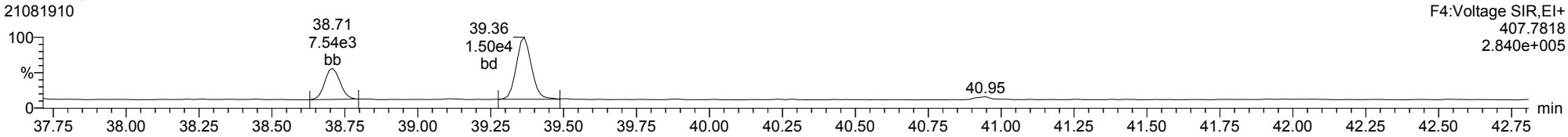

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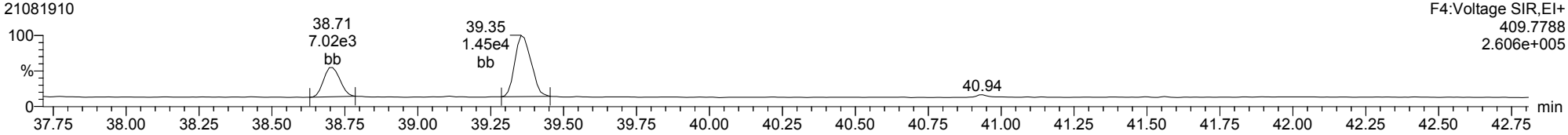

Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Batch:	BJG0572 Batch Matrix: Solid	Preparation:	EPA 1613

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS603	21G0111-06	21081909	07/30/21 17:00	
LDW21-SS661	21G0111-12	21081910	07/30/21 17:00	
Blank	BJG0572-BLK3	21081905	07/30/21 17:00	
LCS	BJG0572-BS2	21081906	07/30/21 17:00	
LDW21-SS603	BJG0572-DUP1	21081908	07/30/21 17:00	
Reference	BJG0572-SRM1	21081907	07/30/21 17:00	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HRGCMS Dioxin/Furan Preparation Bench Sheet EPA Methods 8290A & 1613B

Batch: BJG0572

Solid Samples

ARI Work Orders:	21F0352,21F0399,21F0410,21G0090,21G0111		
Matrix (circle one)	Soil	Sediment	Oil / Tissue
Extraction Method	Start Date/Time:	End Date/Time:	
Soxhlet SepF Shake out	7/30/21 17:00	7/31/21 10:23	

Reagents/Equipment Used	NA	ID / Lot Number	Initials	Date
Balance		24650344	ULB	7/30/21
Toluene		J0005598	ULB	7/30/21
Hexane		J0006422 / J0005194	ULB / WL	7/31/21 8/2/21
CH2Cl2		J0006423	M	8/4/21
H2SO4		F009222	M	8/2/21
Na2SO4		J0007778	ULB / M	7/30/21 / 8/2/21 / 8/4/21
Glasswool		J0006679	M	8/4/21
~~(98:2) Hex/DCM~~				
Basic Silica		J0002641	M	8/4/21
Acid Silica		J0005573	M	8/4/21
0% Silica		J0005622	ULB / NL	7/30/21 / 8/4/21
Activated Florisil		J0002451	M	8/4/21
Nonane		H006038	M	8/4/21
Other (RM)		J0006842	ULB	7/30/21

Lab Number & Container	Sample Name	% Solids	Sample Weight Equal to dry (g) (Target Dry)	Actual	RotoVap 45 °C	Water Trap Vol (mL)	Final Vol. (uL)
21F0352-01 A	BGDP3	81.27	(12.31)	12.35	1/2	~~5.0~~	20
21F0352-02 A	BGDQ3	44.29	(22.58)	22.60	1/2	ULB ~~18.0~~	20
21F0352-03 A	PBGDQ8	28.7	(34.84)	34.90	1/2	18.0	20
21F0399-01 A	BGDP7	37.01	(27.02)	27.07	1/2	8.0	20
21F0399-02 A	BGDW5	61.23	(16.33)	16.33	1/2	2.0	20
21F0399-03 B	BGDX3	48.55	(20.60)	20.61	1/2	5.5	20
21F0399-04 A	BGDX9	27.23	(36.72)	36.73	1/2	16.5	20
21F0399-05 A	BGDR4	89.73	(11.15)	11.17	1/2	1.5	20
21F0399-06 A	BGDR8	82.34	(12.15)	12.18	1/2	2.0	20
21F0399-07 A	BGDT1	67.83	(14.74)	14.75	1/2	3.5	20
21F0410-01 A	BGDY9	79.3	(12.61)	12.62	1/2	3.5	20
21F0410-02 A	BGDZ7	67.85	(14.74)	14.75	1/2	4.0	20
21F0410-03 A	BGE06	35.89	(27.86)	27.86	1/2	9.5	20
21G0090-01 A	BGE92	57.47	(17.40)	17.42	1/2	7.5	20
21G0111-06 A	LDW21-SS603	69.86	(14.31)	14.30	1/2	4.0	20
~~21G0111-06 A~~	~~LDW21-SS603~~	~~69.86~~	~~(14.31)~~		~~1/2~~		~~20~~ ULB 7/30/21
21G0111-12 A	LDW21-SS661	51.47	(19.43)	19.43	1/2	9.0	20
BJG0572-BLK1	Blank	100	()		1/2	0.0	20
BJG0572-BS1	LCS	100	()		1/2	0.0	20
BJG0572-BSD1	LCS Dup	100	()		1/2	0.0	20
BJG0572-DUP1	21G0111-06A Duplicate	69.86	(14.31)	14.36	1/2	4.0	20
BJG0572-SRM1	Reference	100	() 5.00	5.04	1/2	0.0	20
Prep Analyst / Date:	ULB 7/30/21				M 8/2/21 ULB 7/31/21	M 8/4/21	

Standards Used	Vol	ID / Lot Number	Concentration	Expiration Date	Analyst	Witness	Date
Recovery Standard	1.0 mL	J0007665	2/4 ng/mL	7/27/2022	ULB	DP	7/30/21
OPR	1.0 mL	J0001260	0.2/1.0/2.0 ng/mL	2/3/2022	ULB	DP	7/30/21
~~QLS Standard~~	~~1.0 mL~~		~~0.01/0.05/0.1 ng/mL ng/m~~				
Cleanu-up Standard	1.0 mL	J0007666	0.8 ng/mL	7/27/22	M	ULB	8/4/21

Verify Client ID

Analyst / Date: ULB 7/30/21

Acid Clean [Y] N

Analyst / Date: M 8/2/21

Silica-Florisil Clean [Y] N

Analyst / Date: M 8/4/21

Supervisor Review By 8/9/21 Date

Printed: 7/28/2021 7:03:50AM

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Dioxin Extraction Laboratory – Glasswa

Batch ID: B5G0572 Work Order: 21F0352, 21F0399, 21F0410, 21G0090, 21G0111 Extraction Parameter: Dioxin ARI Analyst

ARI Sample ID	300 mL Flat Bottom	Small Soxhlet	Large Soxhlet	250 mL Beaker	Funnel	Column	Florisil Column	Turbo Tube	Sep Funnel	Erlenmeyer Flask	Centrifuge Bottle	Turbo-Vap	Vortex Mixer	Element
B5G0572 - BLK1	38	107		2	8	189	2	12				4	4	A1
- BS1	68	80		14	72	20	164	2				4	4	A2
- BSD1	56	46		188	67	128	24	10				4	4	A3
- DUP1	51	89		116	6	121	123	36				4	4	A4
- SRM1	69	02		260	94	194	131	15				4	4	A5
21F0352 - 01A	31	111		29	40	208	115	75				4	4	A6
- 02A	16			50	92	229	138	48				4	4	B1
- 03A	22		33	261	61	72	147	46				4	4	B2
21F0399 - 01A	48		74	258	35	125	140	47				4	4	B3
- 02A	01		35	177	34	207	166	18				4	4	B4
- 03B	15		32	22	14	213	161	72				4	4	B5
- 04A	05		58	31	09	3	102	22				4	4	B6
- 05A	46	104		231	43	220	116	37				4	4	C1
- 06A	86	140		33	13	142	10	70				4	4	C2
- 07A	82	91		38	46	195	163	1				4	4	C3
21F0410 - 01A	42	03		24	44	212	135	81				4	4	C4
- 02A	59	67		20	73	203	92	4				4	4	C5
- 03A	17		25	40	50	220	103	30				4	4	C6
21G0090 - 01A	07		24	15	14	175	156	59				4	4	D1
21G0111 - 06A	60	79		6	15	162	120	23				4	4	D2
- 12A	83		52	194	29	217	140	45				4	4	D4
												4	4	
												4	4	

3095F
Dioxin Extraction Laboratory - Glassware Tracking

Revisior
1/

TOTAL SOLIDS BENCHSHEET

Method HRSM01.2

(dry at 110 C)

Batch:	BJG0632
Date:	
Analyst:	M
Drying Oven:	018
Analytical Balance:	2465044

Instrumentation

Batch drying time			Oven Temp, C
Record times as mm/dd/yy hh:mm			
Date/time in oven:	7/27/21	1353	108
Date/time out:	7/28/21	0530	109
Elapsed hrs:	0.0		

TS (%) calculated as:

Final dry wt (g) = (Dry Wt - Tare Wt)

TS = (Final Dry Wt X 100)/ (sample & dish -dish tare)

Oven Temps, °C	
Start Temp:	108
End Temp:	109

SAMPLE ID	Dish Tare Wt (g)	Dish with Sample (g)	Dry Wt (g)	Solids Wt (g)	TS (%)	Sample Decanted
21G0111-06	0.81	11.13	8.02			~~No~~ yes
21G0111-12	0.80	11.72	6.42			~~No~~ yes

TOTAL SOLIDS BENCHSHEET

Method HRSM01.2

(dry at 110 C)

Batch:	BJG0632
Date:	7/28/2021 5:30
Analyst:	NL
Drying Oven:	18
Analytical Balance:	24650344

Instrumentation

Batch drying time		
Record times as mm/dd/yy hh:mm		
Date/time in oven:	7/27/2021 13:53	
Date/time out:	7/28/2021 5:30	
Elapsed hrs:	15.6	

Oven Temp, C	TS (%) calculated as:
108	Final dry wt (g) = (Dry Wt - Tare Wt)
109	TS = (Final Dry Wt X 100)/ (sample & dish -dish tare)

Oven Temps, °C	
Start Temp:	108
End Temp:	108

SAMPLE ID	Dish Tare Wt (g)	Dish with Sample (g)	Dry Wt (g)	Solids Wt (g)	TS (%)	Sample Decanted
21G0111-06	0.8100	11.1300	8.0200	7.21	**69.86%**	Yes
21G0111-12	0.8000	11.7200	6.4200	5.62	**51.47%**	Yes

TOTAL SOLIDS BENCHSHEET

Method HRSM01.2

(dry at 110 C)

Batch:	BJG0031
Date:	7/2/21
Analyst:	DP
Drying Oven:	018
Analytical Balance:	24650344

Instrumentation

Batch drying time			
Record times as mm/dd/yy hh:mm		Oven Temp, C	TS (%) calculated as:
Date/time in oven:	7/1/21 16:13	109	Final dry wt (g) = (Dry Wt - Tare Wt)
Date/time out:	7/2/21 09:40	107	TS = (Final Dry Wt X 100)/ (sample & dish -dish tare)
Elapsed hrs:	0.0		

Oven Temps, °C	
Start Temp:	109
End Temp:	107

SAMPLE ID	Dish Tare Wt (g)	Dish with Sample (g)	Dry Wt (g)	Solids Wt (g)	TS (%)	Sample Decanted
21F0352-01	0.80	11.05	9.13			~~No~~ yes
21F0352-02	0.80	11.05	5.34			~~No~~ yes
21F0352-03	0.79	11.66	3.91			~~No~~ yes
21F0392-25	0.80	11.96	9.52			~~No~~ yes
21F0392-26	0.80	11.52	9.19			~~No~~ yes
21F0399-01	0.81	11.51	4.77			No
21F0399-02	0.81	11.23	7.19			~~No~~ yes
21F0399-03	0.82	11.14	5.83			~~No~~ yes
21F0399-04	0.77	11.20	3.61			~~No~~ yes
21F0399-05	0.79	11.01	9.96			No
21F0399-06	0.79	11.72	9.79			No
21F0399-07	0.79	11.95	8.36			~~No~~ yes
21F0410-01	0.80	11.43	9.23			~~No~~ yes
21F0410-02	0.80	11.50	8.06			No
21F0410-03	0.80	11.36	4.59			~~No~~ yes

TOTAL SOLIDS BENCHSHEET

Method HRSM01.2

(dry at 110 C)

Batch:	BJG0031
Date:	7/2/2021 9:40
Analyst:	DxP
Drying Oven:	18
Analytical Balance:	24650344

Instrumentation

Batch drying time		
Record times as mm/dd/yy hh:mm		Oven Temp, C
Date/time in oven:	7/1/2021 16:13	
Date/time out:	7/2/2021 9:40	
Elapsed hrs:	17.5	

TS (%) calculated as:

Final dry wt (g) = (Dry Wt - Tare Wt)

TS = (Final Dry Wt X 100)/ (sample & dish -dish tare)

Oven Temps, °C	
Start Temp:	109
End Temp:	107

SAMPLE ID	Dish Tare Wt (g)	Dish with Sample (g)	Dry Wt (g)	Solids Wt (g)	TS (%)	Sample Decanted
21F0352-01	0.8000	11.0500	9.1300	8.33	**81.27%**	Yes
21F0352-02	0.8000	11.0500	5.3400	4.54	**44.29%**	Yes
21F0352-03	0.7900	11.6600	3.9100	3.12	**28.70%**	Yes
21F0392-25	0.8000	11.9600	9.5200	8.72	**78.14%**	Yes
21F0392-26	0.8000	11.5200	9.1900	8.39	**78.26%**	Yes
21F0399-01	0.8100	11.5100	4.7700	3.96	**37.01%**	No
21F0399-02	0.8100	11.2300	7.1900	6.38	**61.23%**	Yes
21F0399-03	0.8200	11.1400	5.8300	5.01	**48.55%**	Yes
21F0399-04	0.7700	11.2000	3.6100	2.84	**27.23%**	Yes
21F0399-05	0.7900	11.0100	9.9600	9.17	**89.73%**	No
21F0399-06	0.7900	11.7200	9.7900	9.00	**82.34%**	No
21F0399-07	0.7900	11.9500	8.3600	7.57	**67.83%**	Yes
21F0410-01	0.8000	11.4300	9.2300	8.43	**79.30%**	Yes
21F0410-02	0.8000	11.5000	8.0600	7.26	**67.85%**	No
21F0410-03	0.8000	11.3600	4.5900	3.79	**35.89%**	Yes

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Organic Extractions Laboratory Analyst Notes

Extraction Parameter: Dioxin Extraction Batch BJG0572

Total Solids Batch: BJG0632 Work Order(s): 21G0111

Screens: Soil/Sediment/Solid/Other:	Analyst/Date
☒ No Anomalies (standard soil/wet sediment/sand/gravel)= 06A, 12A	M 7/27/21
☐ 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)= Sample 111-12 - During 45mL DCM drip process,	DP 8/4/21
after 15 mL of DCM was poured, DCM starts to leak out of the	
connector, had to wait for the 15mL to pour through, adjust, clean connector, and	
Aqueous: pour remaining 30mL of DCM.	
☐ 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).	
☐ Share Samples Y / N	
☐ Multiple Jars Y / N	
☐ 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: Dioxin Extraction Batch ~~BJG0039~~ BJG0187 M 7/15/21

Total Solids Batch: BJG0031 Work Order(s): 21F0352, 21F0392, 21F0399, 21F0410

Screens: Soil/Sediment/Solid/Other:	Analyst/Date
☒ No Anomalies (standard soil/wet sediment/sand/gravel)= 392-25,26, 410-1,2	DP 7/1/21
☒ Standing Water Decanted (Not shared)= 352-1,2,3, 392-25,26, 399-2,7,3,4	DP 7/1/21
☐ Standing Water Homogenized (Shared samples)=	
☐ Clay/Clumps (Difficult to homogenize)=	
☒ Rocks (%+size)? 95% ½" = 352-1 90% ¼" = 399-5,6	DP 7/1/21
☒ Organics (Leaves/sticks/grass)= 352-2,3, 399-1,2,3,4,7	DP 7/1/21
☐ Oily, obvious fuel/sulfur odors=	
☐ Received in 32oz jar(s)=Homogenized in Pyrex dish=	
☐ Previously Frozen =	
☒ Other (Details)= Also Standing water Decanted = 410-1,3	DP 7/1/21
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). 21F0352-01A; 21F0399-03A	M 8/2/21
Double Acid wash due to Sample color	
21F0399-07A = Double Scoop used on column, due to color.	M 8/4/21
☐ Share Samples Y / N	
☐ Multiple Jars Y / N	
☐ Sample Pre-Screens indicate analyte activity=	
☐ Sample weights/volumes reduced based on Pre-Screen=	

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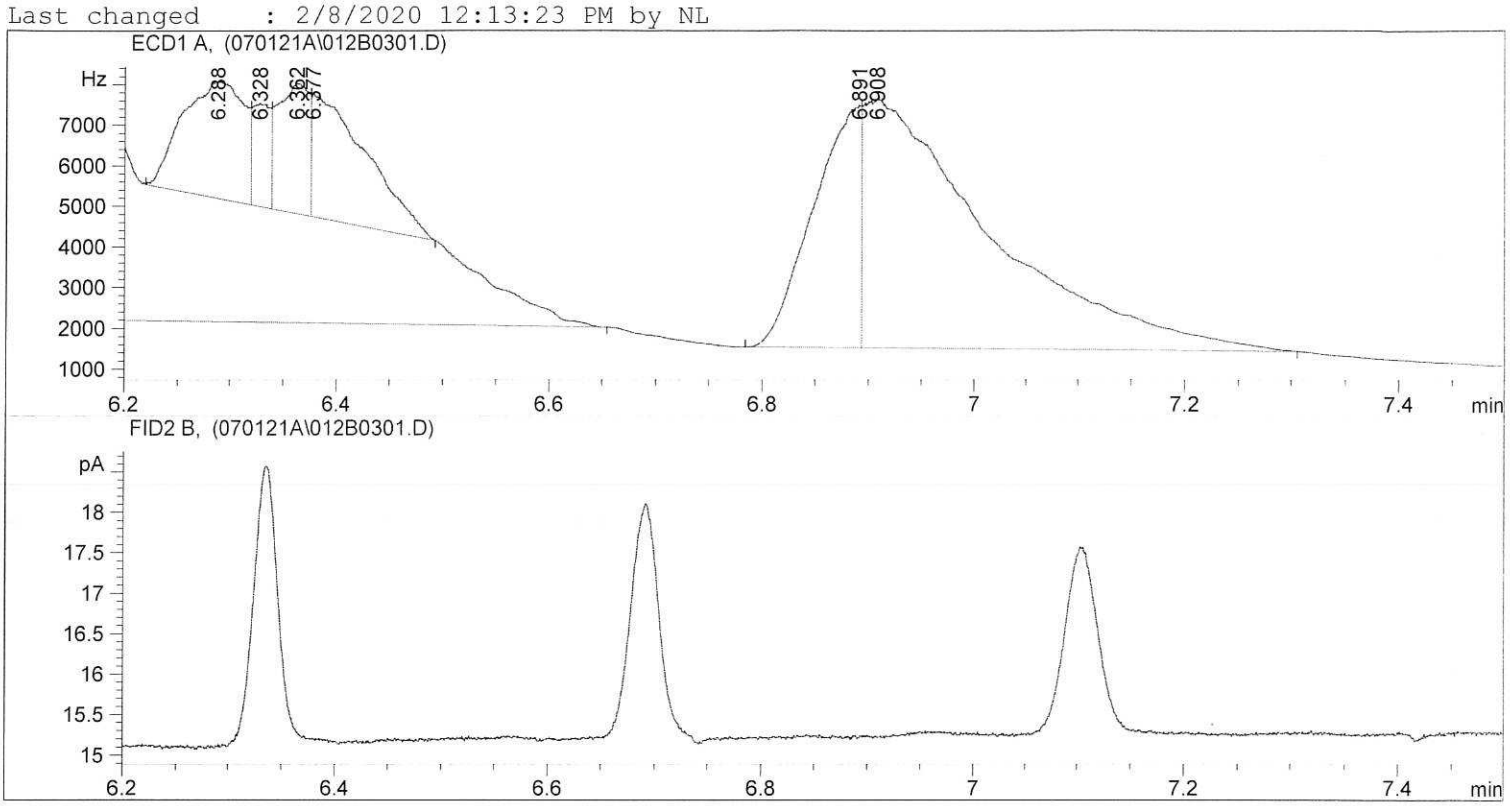
Injection Date : 7/1/2021 9:50:22 AM
Sample Name : CS4 STANDARD
Acq. Operator : DXP

Seq. Line : 3
Location : Vial 12
Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\070121.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.284	BP S	0.0626	6.34538e4	1.19730e4	8.40923
2	5.664	PV S	0.0494	8.16582e4	2.09321e4	10.82177
3	5.753	VV S	0.1245	2.92262e5	3.91135e4	38.73214
4	5.883	VV S	0.0907	9.41940e4	1.73145e4	12.48308
5	5.979	BB T	0.0121	168.95735	171.20346	0.02239
6	6.109	PB S	0.1304	1.21850e5	1.09656e4	16.14824
7	6.288	BV T	0.0482	1.17066e4	2903.17554	1.55142
8	6.328	PV T	0.0138	2871.41406	2545.48193	0.38053
9	6.362	PV T	0.0237	6410.19336	3203.34204	0.84951
10	6.377	PB T	0.0607	1.11083e4	3048.35889	1.47213
11	6.891	PV	0.0362	1.82465e4	5953.24805	2.41812
12	6.908	VB	0.0972	5.06427e4	6119.39600	6.71143

Totals : 7.54573e5 1.24243e5

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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==========================================================================
Injection Date  : 7/1/2021 10:23:35 AM          Seq. Line :   6
Sample Name     : 21F0352 01                     Location : Vial 13
Acq. Operator   : DXP                                 Inj :   1
                                               Inj Volume : 1 µl
Sequence File   : C:\HPCHEM\2\SEQUENCE\070121.S
Method          : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed    : 2/8/2020 12:13:23 PM by NL
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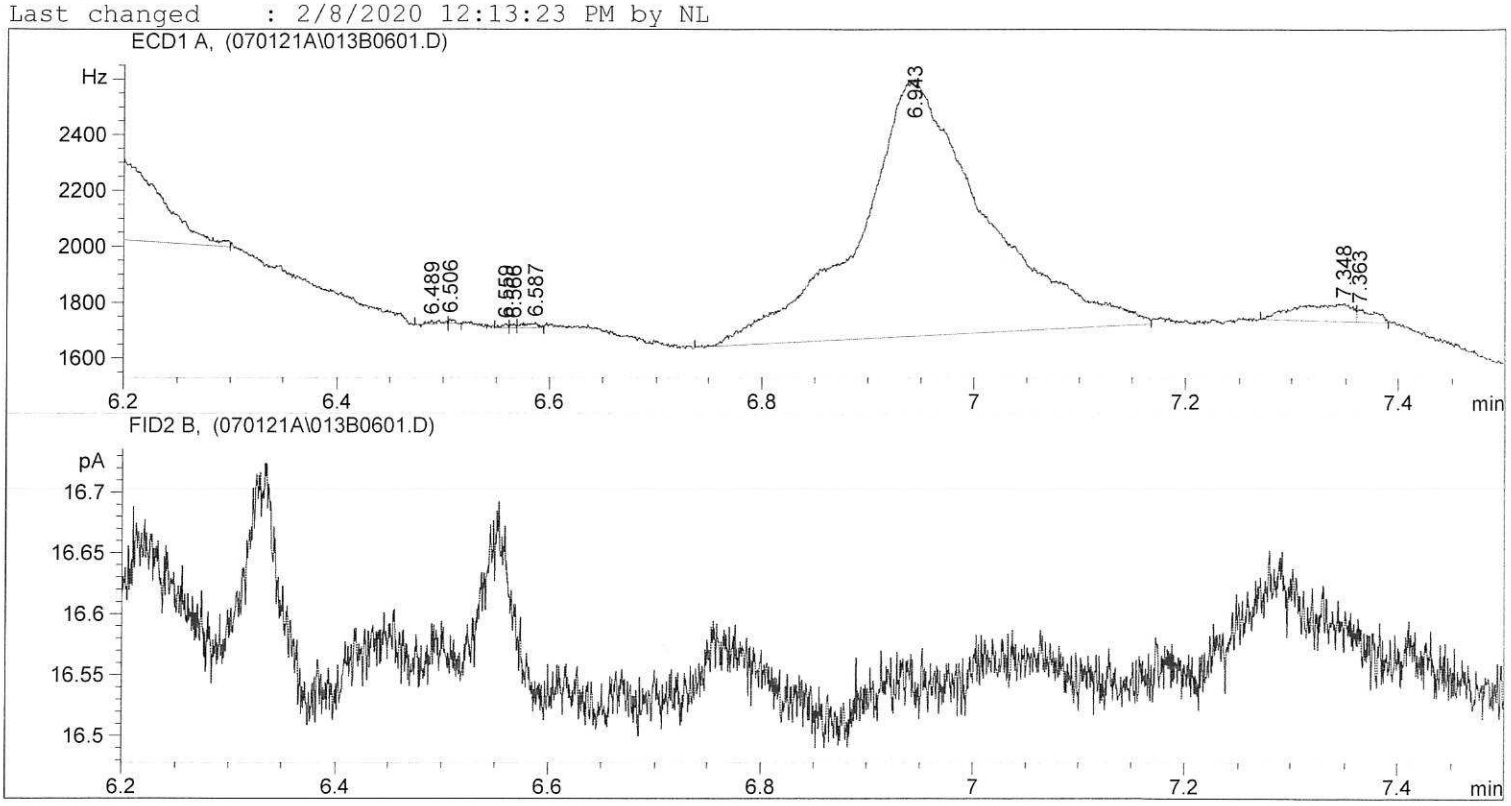


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==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
```

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.226	BV	2.49e-3	2.93911	18.09838	0.00756
2	5.231	VB	7.74e-3	12.63601	20.63885	0.03251
3	5.258	PP	0.0132	28.88980	36.41683	0.07433
4	5.334	VV	0.0248	748.46350	370.75262	1.92573
5	5.353	VV	4.14e-3	93.41098	326.67148	0.24034
6	5.391	VV	0.0299	1529.38501	621.92078	3.93497
7	5.410	VV	0.0271	1357.56067	598.01025	3.49288
8	5.481	VB	9.91e-3	39.47780	49.46479	0.10157
9	5.543	PV	0.0208	148.59528	87.62865	0.38232
10	5.583	VP	0.0272	429.39349	197.61247	1.10479
11	5.662	VV	0.0361	2959.65845	995.31549	7.61493
12	5.710	VV	0.0213	1200.68738	675.25543	3.08926
13	5.766	VV	0.0323	5946.43408	2245.97070	15.29963
14	5.829	VV	0.0458	5822.41846	1508.30798	14.98055
15	5.945	VV	0.0252	595.28558	282.20535	1.53162
16	6.035	VV	0.0349	3637.06274	1231.45667	9.35783
17	6.048	VV	0.0522	5333.11377	1209.83362	13.72161

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.181	VB	0.0388	1094.91467	336.42053	2.81712
19	6.489	PP	7.53e-3	7.96021	13.39828	0.02048
20	6.506	VP	3.58e-3	4.32419	16.93362	0.01113
21	6.559	PV	5.72e-3	5.47989	13.54648	0.01410
22	6.566	VV	4.16e-3	3.82374	13.29339	0.00984
23	6.587	VV	0.0106	15.07166	18.50433	0.03878
24	6.943	PV	0.0964	7563.05029	921.11877	19.45904
25	7.348	BV	0.0427	229.14384	63.49520	0.58957
26	7.363	VB	0.0146	55.17593	45.94962	0.14196
27	7.591	PB	2.37e-3	9.92844e-1	6.54126	0.00255
28	7.754	PP	0.0000	8.12542e-1	3.22618	0.00209
29	7.800	BBA	1.12e-3	3.56500e-1	5.28426	0.00092
Totals :				3.88665e4	1.19333e4	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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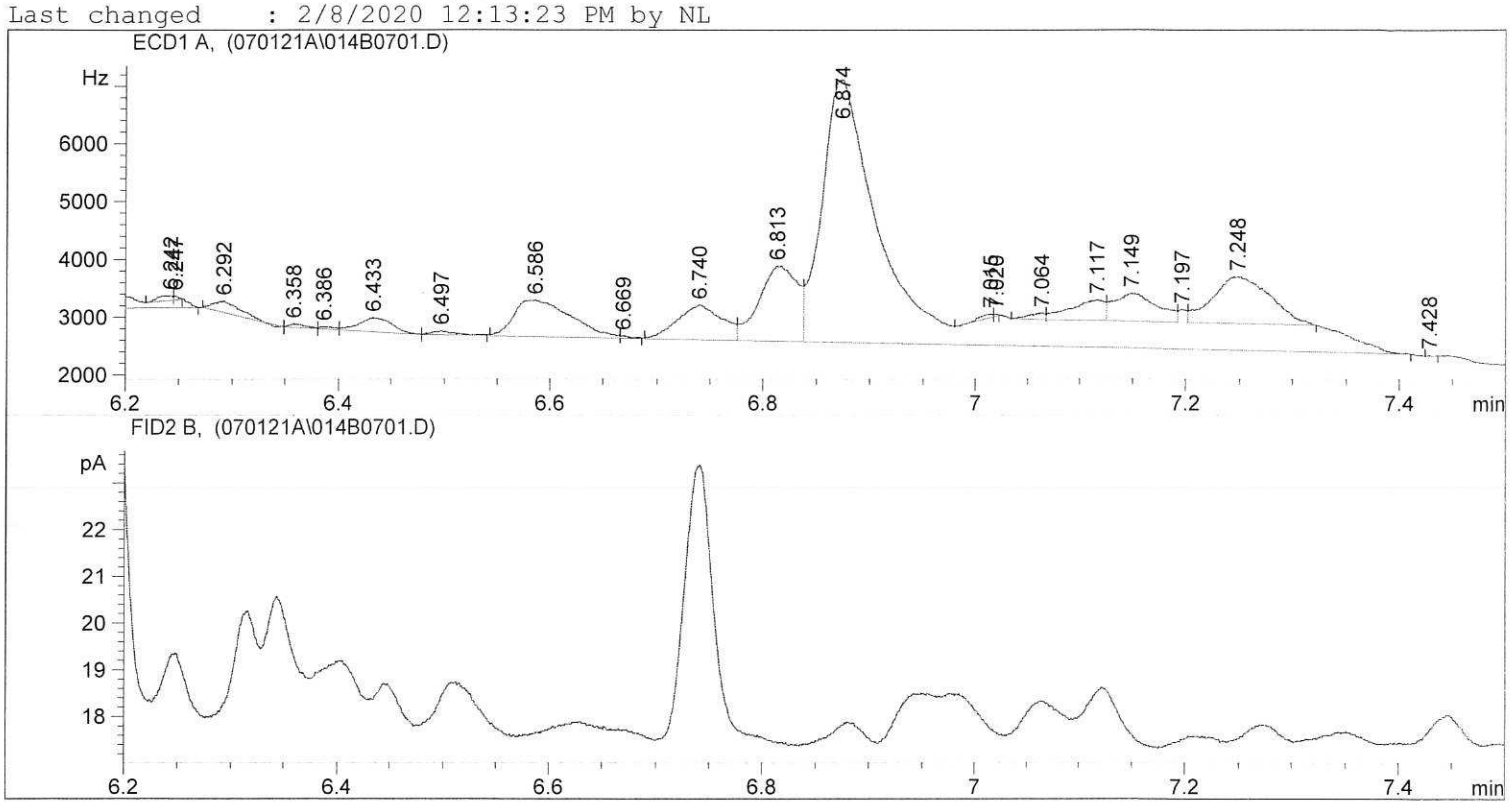
Injection Date : 7/1/2021 10:34:49 AM Seq. Line : 7
Sample Name : 21F0352 02 Location : Vial 14
Acq. Operator : DXP Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\070121.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.226	BV	0.0160	1708.26208	1386.61548	1.25978
2	5.258	VV	0.0152	1191.94397	940.29614	0.87901
3	5.296	VV	0.0225	2791.09351	1486.37146	2.05832
4	5.353	VV	0.0250	3939.47021	1982.60852	2.90521
5	5.375	VV	0.0244	3219.71631	1593.36328	2.37442
6	5.430	VV	0.0161	1989.11523	1496.68811	1.46690
7	5.468	VV	0.0189	746.16638	476.55701	0.55027
8	5.517	VV	0.0175	899.80621	614.76007	0.66357
9	5.560	VV	0.0196	779.94995	500.79153	0.57518
10	5.573	VP	0.0112	394.83478	426.25284	0.29118
11	5.636	VV S	0.0270	5915.52393	3074.48071	4.36247
12	5.696	VV S	0.0311	2594.36548	1389.59631	1.91324
13	5.747	VV S	0.0274	1.88577e4	9310.25879	13.90680
14	5.812	VV S	0.0401	1.76804e4	7346.72852	13.03864
15	5.888	BV X	0.0111	150.36452	171.06059	0.11089
16	5.986	VB S	0.0840	2.95189e4	5855.41504	21.76905
17	6.131	BB T	0.0323	2235.94214	823.24005	1.64892

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.242	BV T	0.0130	92.11773	88.24139	0.06793
19	6.247	PB T	4.82e-3	20.47056	70.71953	0.01510
20	6.292	BP	0.0204	335.35236	197.47704	0.24731
21	6.358	VV	0.0128	66.91224	64.21480	0.04935
22	6.386	VV	0.0107	41.33083	47.61495	0.03048
23	6.433	VP	0.0262	531.10095	249.63654	0.39167
24	6.497	VB	0.0174	108.33338	75.33480	0.07989
25	6.586	BV	0.0457	2385.37012	639.43951	1.75912
26	6.669	VB	9.21e-3	34.81036	49.47441	0.02567
27	6.740	BV	0.0350	1771.10095	607.77740	1.30612
28	6.813	VV	0.0296	3254.38232	1308.38757	2.39998
29	6.874	VB S	0.0698	2.66788e4	4549.63037	19.67459
30	7.015	BV T	0.0124	64.88124	64.34296	0.04785
31	7.020	PB T	3.90e-3	8.79810	37.59265	0.00649
32	7.064	BV T	0.0137	127.39376	114.82334	0.09395
33	7.117	PV T	0.0275	819.36951	360.36053	0.60425
34	7.149	VV T	0.0337	1375.42188	484.77905	1.01432
35	7.197	PV T	6.80e-3	122.78421	231.07338	0.09055
36	7.248	PB T	0.0444	3048.86450	812.02185	2.24842
37	7.428	PP	1.21e-3	1.10028	15.15013	0.00081
38	7.509	PV	4.05e-3	4.97405	16.83617	0.00367
39	7.527	VV	5.77e-3	11.21687	25.31396	0.00827
40	7.533	VB	4.91e-3	3.53958	12.00348	0.00261
41	7.593	PP	6.11e-4	8.11856e-3	8.42480	5.987e-6
42	7.629	BP	0.0213	42.24113	24.00313	0.03115
43	7.695	BV	3.85e-3	5.21088	19.91513	0.00384
44	7.702	VP	0.0103	19.82965	24.32330	0.01462
45	7.798	PBA	0.0000	11.02835	10.26603	0.00813
Totals :				1.35600e5	4.90843e4	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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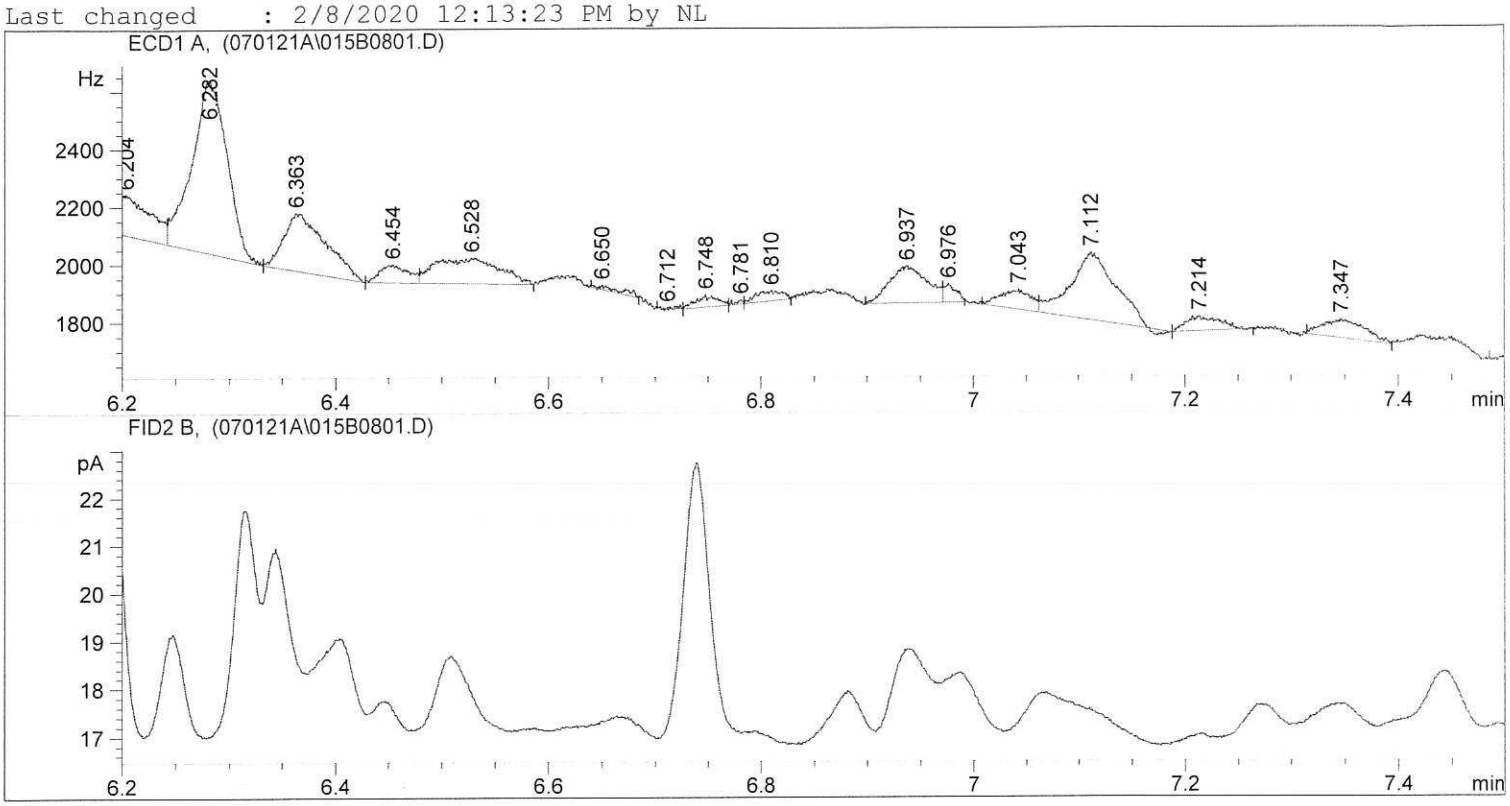
*** End of Report ***

Injection Date : 7/1/2021 10:45:50 AM Seq. Line : 8
Sample Name : 21F0352 03 Location : Vial 15
Acq. Operator : DXP Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\070121.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.225	BP	0.0183	140.80583	91.58002	0.74532
2	5.272	VV	0.0170	295.18649	226.44672	1.56249
3	5.294	VV	0.0146	186.89751	155.48674	0.98929
4	5.352	VV	0.0349	1222.62573	433.18002	6.47164
5	5.390	VB	0.0218	525.45148	288.97348	2.78133
6	5.435	BV	0.0242	695.67731	343.56738	3.68238
7	5.469	VP	0.0173	413.49863	293.20435	2.18874
8	5.540	VV	0.0261	662.45453	307.99585	3.50652
9	5.580	VV	0.0192	1566.63000	1115.12793	8.29253
10	5.608	VV	0.0181	512.68805	342.51373	2.71377
11	5.678	VV	0.0278	1292.51782	554.10315	6.84159
12	5.763	VV	0.0246	1564.35706	754.57562	8.28050
13	5.795	VV	0.0304	1939.94897	758.73279	10.26859
14	5.853	VV	0.0155	439.73541	339.36111	2.32762
15	5.888	VV	0.0200	423.70847	260.07391	2.24278
16	5.939	VP	0.0209	632.36792	398.88629	3.34727
17	5.975	VV	8.11e-3	16.64909	28.11359	0.08813

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.009	VV	0.0194	332.11856	203.53127	1.75798
19	6.050	VV	0.0111	42.03471	46.51591	0.22250
20	6.055	VB	7.08e-3	24.54508	45.56686	0.12992
21	6.120	PP	0.0265	1246.19128	570.22272	6.59637
22	6.204	VV	0.0301	336.34070	139.47664	1.78033
23	6.282	VP	0.0271	1366.69604	600.83057	7.23423
24	6.363	VP	0.0328	551.04065	199.47690	2.91678
25	6.454	VV	0.0220	116.55691	63.04476	0.61696
26	6.528	VP	0.0484	366.18054	89.35757	1.93828
27	6.650	PB	0.0193	24.30583	15.19416	0.12866
28	6.712	PP	8.30e-3	2.52094	3.72315	0.01334
29	6.748	VP	0.0160	56.53053	42.80957	0.29923
30	6.781	VV	6.54e-3	6.82170	15.73253	0.03611
31	6.810	VV	0.0212	61.27800	34.96487	0.32436
32	6.937	PV	0.0290	308.01602	127.28614	1.63040
33	6.976	VB	0.0104	51.08097	64.61763	0.27038
34	7.043	PV	0.0224	129.46568	68.75751	0.68529
35	7.112	VP	0.0348	671.32727	232.97174	3.55349
36	7.214	BB	0.0248	102.31878	50.11017	0.54160
37	7.347	BP	0.0315	168.82481	65.04794	0.89363
38	7.586	PV	0.0392	311.51999	94.12026	1.64895
39	7.695	BP	0.0188	41.91208	27.39527	0.22185
40	7.777	PV	0.0150	43.24096	35.62100	0.22888
Totals :				1.88921e4	9528.29782	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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==================================================================
Injection Date  : 7/1/2021 10:56:50 AM          Seq. Line :   9
Sample Name     : 21F0392 25                     Location : Vial 16
Acq. Operator   : DXP                                 Inj :   1
                                               Inj Volume : 1 µl
Sequence File   : C:\HPCHEM\2\SEQUENCE\070121.S
Method          : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed    : 2/8/2020 12:13:23 PM by NL
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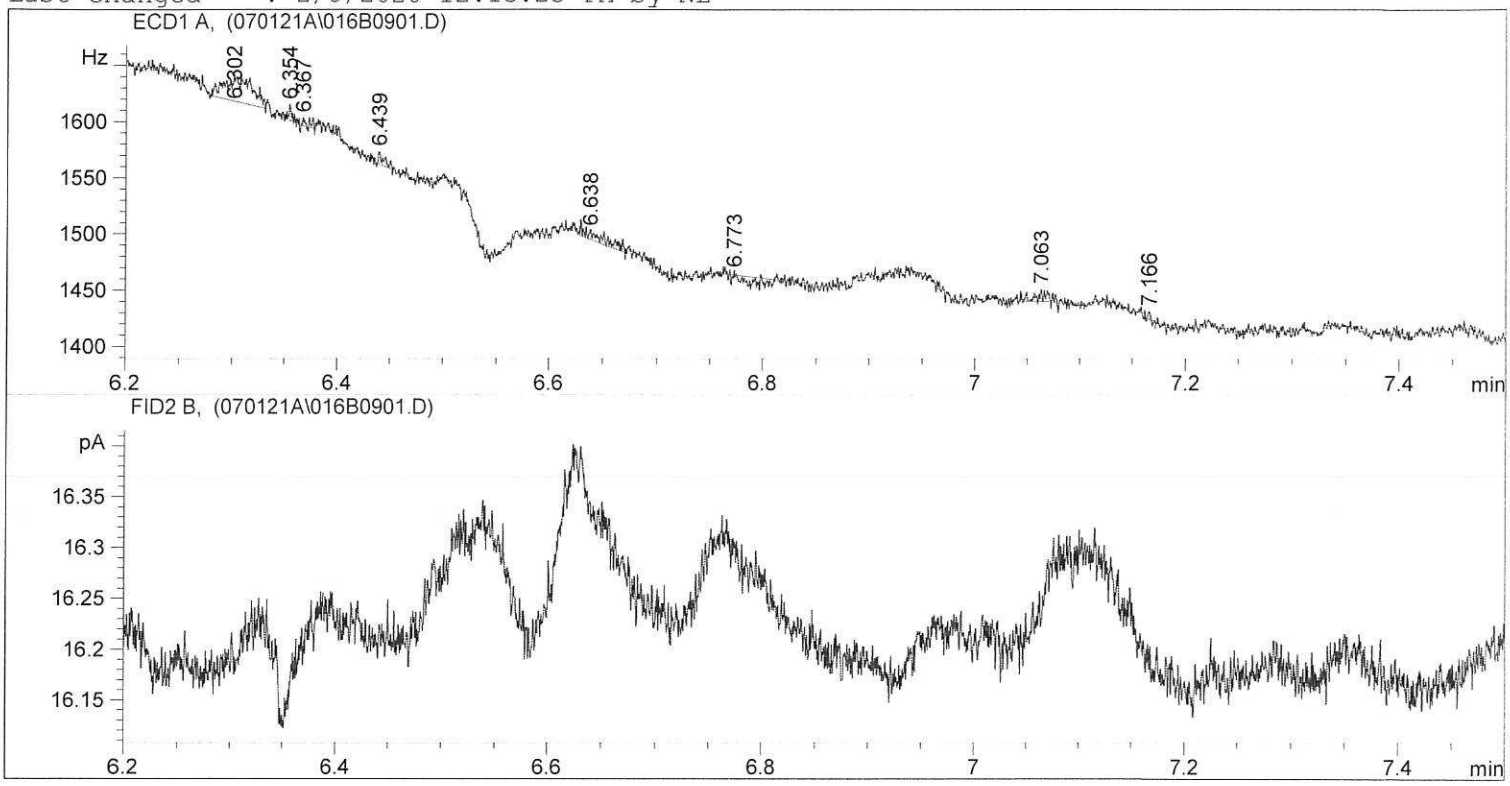


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==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
```

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.212	PP	3.93e-3	2.42750	8.49653	0.57264
2	5.287	PB	0.0180	48.33524	32.46531	11.40216
3	5.327	BP	4.53e-3	2.57771	7.64589	0.60807
4	5.455	BB	0.0106	17.56120	20.56652	4.14264
5	5.549	PV	0.0118	13.50098	15.72760	3.18485
6	5.562	VV	4.84e-3	5.87000	18.83718	1.38472
7	5.567	VV	3.69e-3	4.08123	16.48316	0.96275
8	5.654	PB	2.50e-3	1.68650	10.34773	0.39784
9	5.709	BV	0.0344	183.01639	63.25835	43.17310
10	5.835	BP	0.0170	42.98363	30.61480	10.13973
11	5.950	BB	0.0125	20.83539	20.51251	4.91502
12	6.302	PB	0.0217	39.63206	21.73530	9.34910
13	6.354	PB	2.75e-3	2.52698	13.72314	0.59611
14	6.367	PP	4.13e-3	2.05636	7.19818	0.48509
15	6.439	PB	5.39e-3	4.57121	11.13032	1.07834
16	6.638	BP	0.0204	12.28223	7.24783	2.89735
17	6.773	PB	0.0000	8.56543	2.06216	2.02056

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	7.063	BP	7.65e-3	6.70125	10.78302	1.58081
19	7.166	BB	1.58e-3	4.36808e-1	6.53160	0.10304
20	7.646	BP	3.09e-3	1.98622	9.31007	0.46854
21	7.719	BP	0.0000	2.27865	4.83864	0.53753

Totals : 423.91297 339.51584

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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==========================================================================
Injection Date  : 7/1/2021 11:08:02 AM          Seq. Line :  10
Sample Name     : 21F0392 26                     Location : Vial 17
Acq. Operator   : DXP                                Inj :   1
                                               Inj Volume : 1 µl
Sequence File   : C:\HPCHEM\2\SEQUENCE\070121.S
Method          : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed    : 2/8/2020 12:13:23 PM by NL
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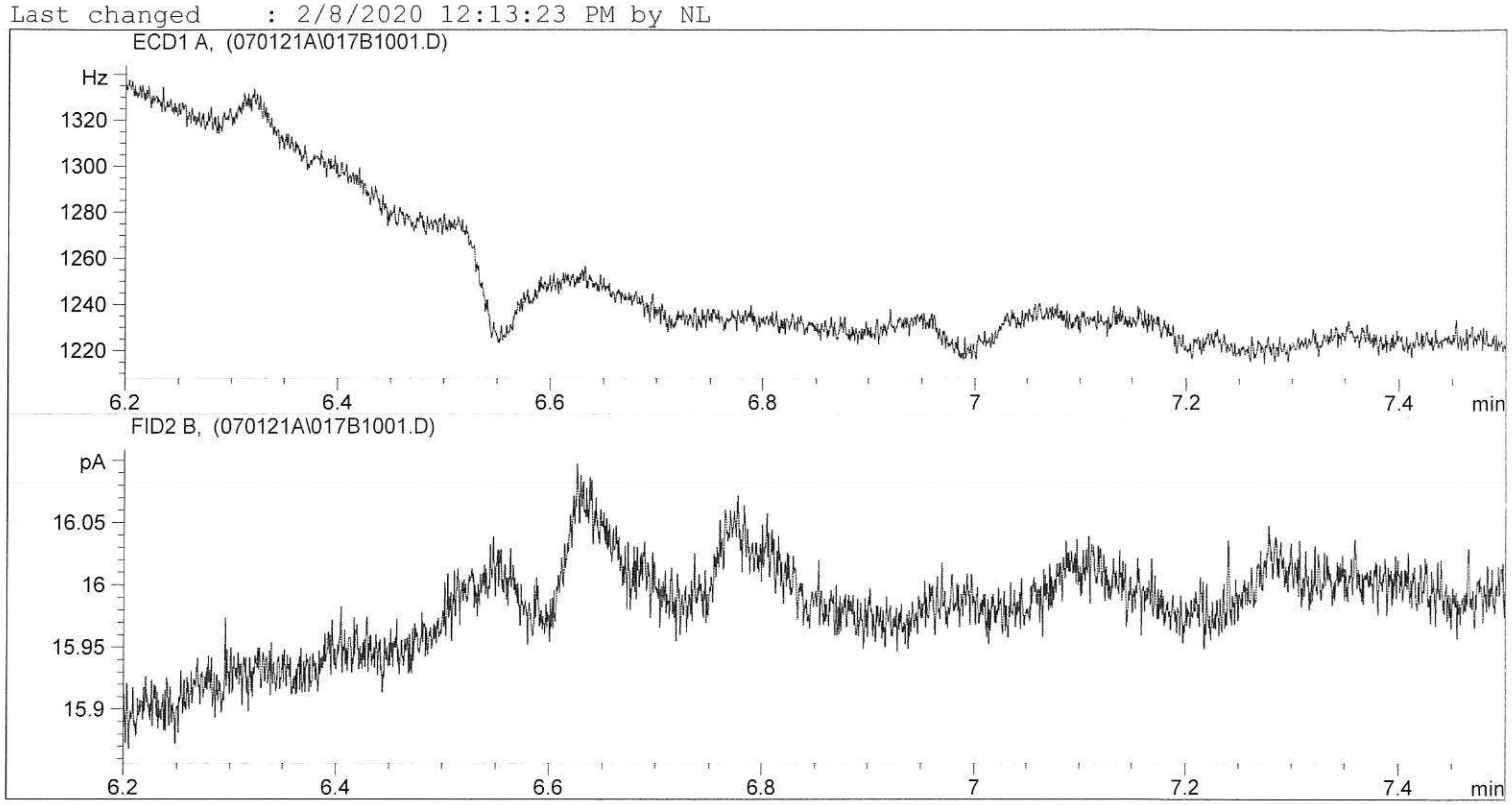


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==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000


Signal 1: ECD1 A,

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [Hz*s]      [Hz]        %
----|-------|----|-------|----------|----------|--------|
   1   6.018 BV   2.21e-3    1.80727   11.67239 36.62164
   2   6.024 VB   3.70e-3    3.12770   11.75482 63.37836

Totals :                     4.93497   23.42722

 Results obtained with enhanced integrator!

Signal 2: FID2 B,

==========================================================================
                        *** End of Report ***
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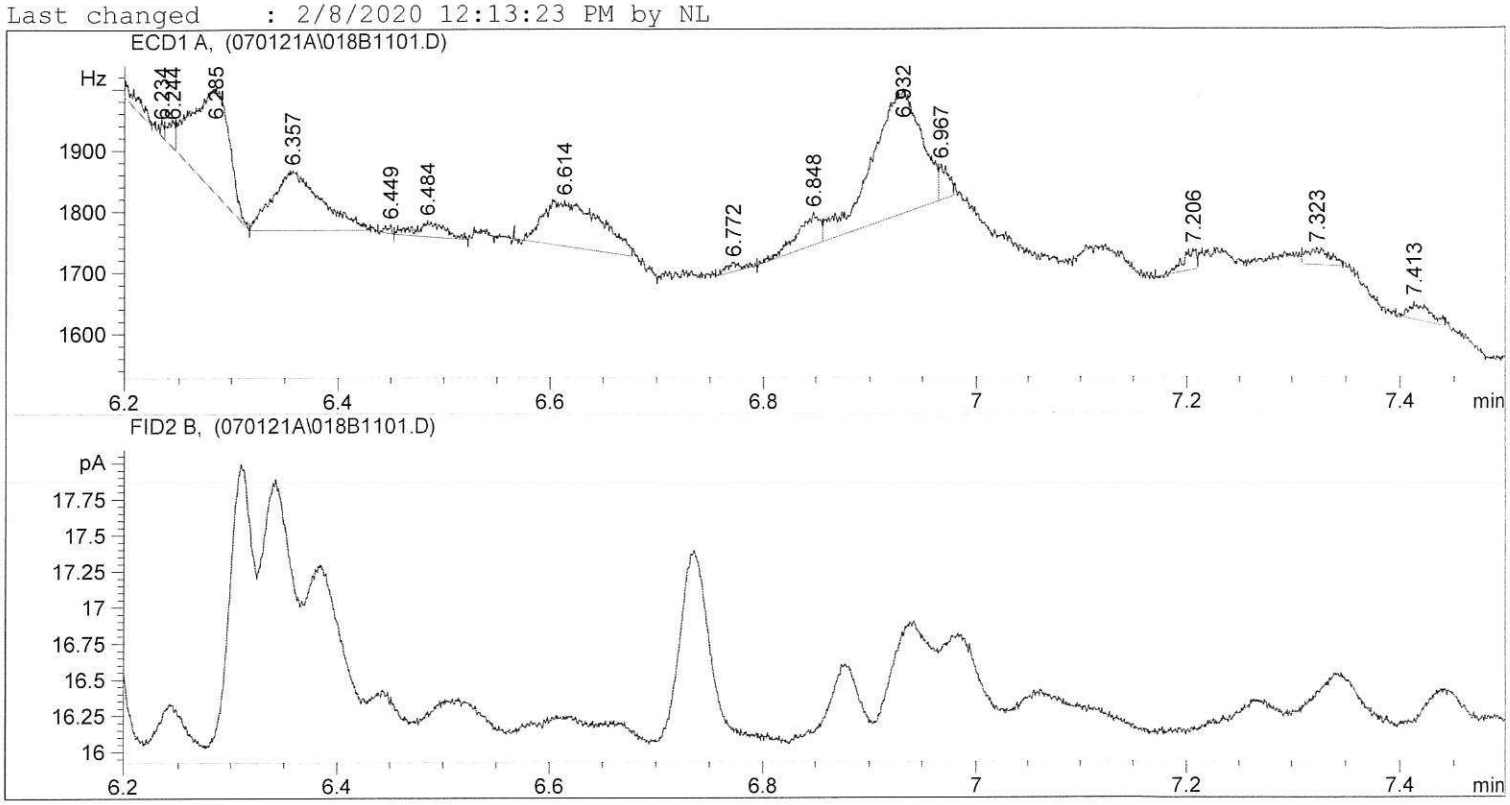
Injection Date : 7/1/2021 11:19:02 AM Seq. Line : 11
Sample Name : 21F0399 01 Location : Vial 18
Acq. Operator : DXP Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\070121.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.233	PV	0.0173	78.03256	54.60213	0.54664
2	5.263	VP	0.0175	71.13528	67.74026	0.49833
3	5.390	VV	0.0545	1910.59619	413.57654	13.38436
4	5.424	VV	0.0269	834.62695	375.91418	5.84684
5	5.479	VV	0.0168	211.20526	151.82545	1.47956
6	5.539	VV	0.0307	469.64224	183.01581	3.29000
7	5.577	VP	0.0235	446.82809	235.49554	3.13018
8	5.660	VV	0.0301	795.78735	326.19211	5.57476
9	5.698	VB	0.0153	239.77420	189.94969	1.67970
10	5.762	BV	0.0284	1844.19397	840.51953	12.91919
11	5.823	VV	0.0221	914.03809	504.95865	6.40314
12	5.846	VV	0.0170	480.19800	349.05496	3.36395
13	5.877	VB	7.69e-3	57.67634	92.26588	0.40404
14	5.936	BP	0.0122	125.20969	126.03048	0.87714
15	6.032	VV	0.0316	1750.20593	667.28619	12.26078
16	6.040	VB	0.0353	2016.98108	678.02875	14.12963
17	6.191	PB	0.0181	49.26217	32.91338	0.34510

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.234	BV	3.49e-3	6.42794	25.94736	0.04503
19	6.244	VV	5.96e-3	19.32376	44.45487	0.13537
20	6.285	VP	0.0285	398.93335	171.48819	2.79466
21	6.357	VB	0.0381	306.81198	97.07677	2.14932
22	6.449	PP	4.32e-3	4.57719	14.37085	0.03206
23	6.484	VP	0.0237	47.38592	25.24680	0.33195
24	6.614	BB	0.0447	279.06931	73.88802	1.95497
25	6.772	PP	0.0115	13.48043	14.75083	0.09443
26	6.848	BV	0.0179	78.16963	52.68031	0.54760
27	6.932	VV	0.0394	655.10461	200.04250	4.58923
28	6.967	VB	7.69e-3	34.37854	58.17772	0.24083
29	7.206	PV	9.51e-3	25.90641	33.17277	0.18148
30	7.323	BB	0.0176	38.15364	25.94863	0.26728
31	7.413	PB	0.0174	36.06617	28.75913	0.25266
32	7.557	BP	6.62e-3	3.60843	7.23703	0.02528
33	7.600	PP	4.91e-3	3.31878	8.97462	0.02325
34	7.704	BB	0.0166	28.72847	23.20319	0.20125
Totals :				1.42748e4	6194.78913	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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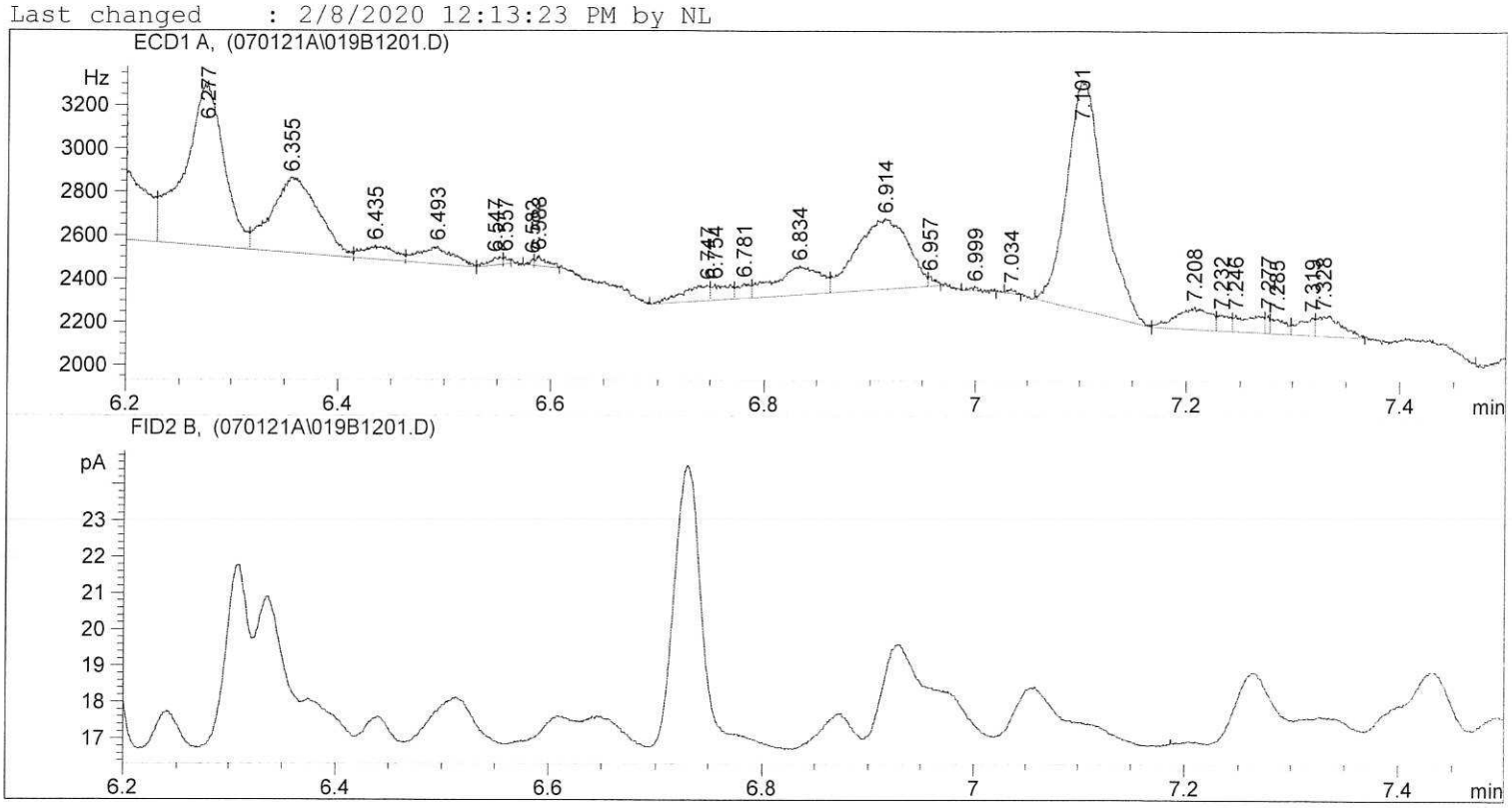
Injection Date : 7/1/2021 11:30:16 AM
Sample Name : 21F0399 02
Acq. Operator : DXP

Seq. Line : 12
Location : Vial 19
Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\070121.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.233	BV	0.0179	282.76120	188.17342	0.56864
2	5.296	VV	0.0168	845.71722	624.25342	1.70075
3	5.327	VV	0.0436	3696.64551	997.51178	7.43403
4	5.373	VV	4.17e-3	251.65471	779.66144	0.50608
5	5.403	VV	0.0345	2863.34521	1008.18292	5.75824
6	5.461	VP	0.0173	464.17285	321.18768	0.93346
7	5.537	VV	0.0275	832.89294	358.17422	1.67496
8	5.596	VV	0.0367	3380.70752	1129.65381	6.79867
9	5.648	VV	0.0312	2115.32788	832.62653	4.25397
10	5.702	VV	0.0225	1371.05798	744.09253	2.75722
11	5.754	VV	0.0294	4919.09326	1989.66040	9.89239
12	5.784	VV	0.0101	858.55121	1076.27075	1.72656
13	5.815	VV	0.0275	2715.41772	1225.25012	5.46076
14	5.850	VV	0.0193	1511.31616	986.75690	3.03929
15	5.879	VV	0.0216	1207.76526	703.89954	2.42884
16	5.931	VV	0.0269	2889.84595	1299.38623	5.81154
17	6.003	VV	0.0346	3070.78516	1047.92749	6.17541

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.035	VV	0.0388	2876.97070	893.55536	5.78564
19	6.111	VV	0.0286	2743.78418	1134.56787	5.51780
20	6.156	VV	0.0229	1064.73743	567.60571	2.14121
21	6.186	VV	8.46e-3	229.20901	340.09396	0.46094
22	6.194	VV	0.0214	595.85529	341.56744	1.19828
23	6.277	VV	0.0315	1954.33936	752.72766	3.93021
24	6.355	VV	0.0361	1039.26306	343.59045	2.08998
25	6.435	VV	0.0236	123.80355	62.22532	0.24897
26	6.493	VP	0.0273	173.67108	80.85699	0.34926
27	6.547	VV	0.0105	29.21827	35.12216	0.05876
28	6.557	VB	4.05e-3	9.71684	32.90613	0.01954
29	6.582	PV	3.70e-3	6.96065	30.06833	0.01400
30	6.588	VB	8.79e-3	32.95745	46.94262	0.06628
31	6.747	PV	0.0223	131.14265	71.01665	0.26373
32	6.754	VV	0.0134	79.03829	72.04597	0.15895
33	6.781	VV	0.0101	54.48916	69.72075	0.10958
34	6.834	VV	0.0356	397.78534	131.97194	0.79995
35	6.914	VV	0.0402	1101.57336	322.63351	2.21529
36	6.957	VB	5.67e-3	19.63091	45.18108	0.03948
37	6.999	PP	7.04e-3	10.00283	17.56240	0.02012
38	7.034	BB	7.64e-3	9.53908	20.82020	0.01918
39	7.101	BP	0.0288	2545.06445	1051.70679	5.11817
40	7.208	VV	0.0251	218.25113	103.75777	0.43891
41	7.232	VB	0.0106	61.69807	73.29778	0.12408
42	7.246	BV	0.0201	125.28487	74.85374	0.25195
43	7.277	VV	3.65e-3	22.57103	86.24045	0.04539
44	7.285	VB	0.0121	67.23067	69.30033	0.13520
45	7.319	BV	0.0129	83.81841	81.84656	0.16856
46	7.328	VB	0.0193	151.09076	94.02258	0.30385
47	7.527	PP	0.0383	285.15750	87.76045	0.57346
48	7.680	BP	0.0263	146.21671	67.39345	0.29404
49	7.766	VV	0.0178	58.89275	42.87407	0.11843
Totals :				4.97260e4	2.25585e4	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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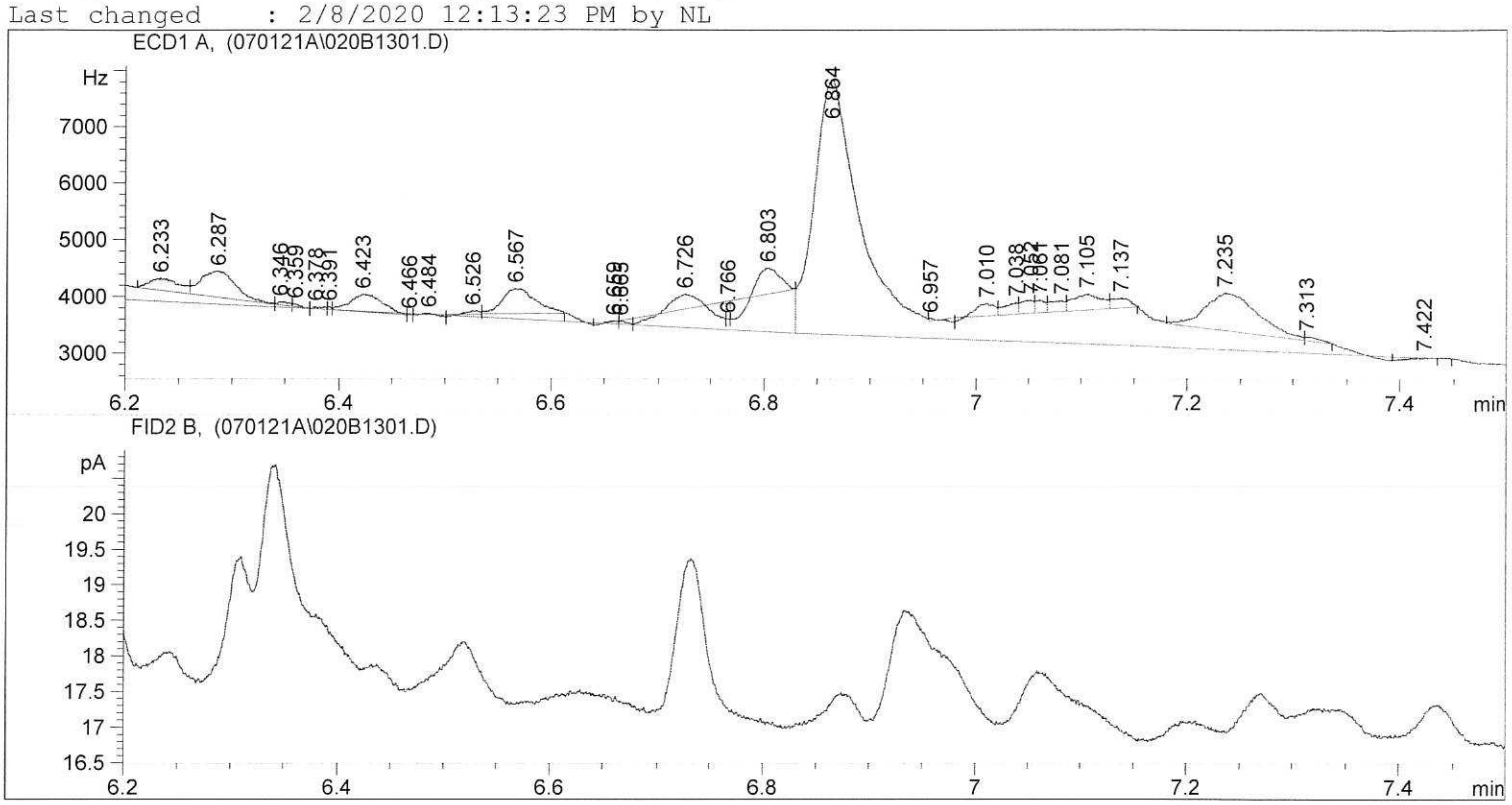
Injection Date : 7/1/2021 11:41:31 AM Seq. Line : 13
Sample Name : 21F0399 03 Location : Vial 20
Acq. Operator : DXP Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\070121.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.226	BV	0.0155	973.23328	774.18311	0.72567
2	5.263	VV	0.0175	763.04858	546.92401	0.56895
3	5.294	VV	0.0246	3531.91211	1757.46448	2.63351
4	5.348	VV	0.0233	4755.90479	2467.10303	3.54616
5	5.377	VV	0.0317	5510.69092	2109.07422	4.10895
6	5.469	VV	0.0188	517.26245	331.28619	0.38569
7	5.515	VV	0.0190	1040.70935	721.33429	0.77599
8	5.559	VV	0.0141	542.35162	470.08514	0.40439
9	5.574	VP	0.0132	537.34753	495.83316	0.40066
10	5.633	VV S	0.0249	6141.29639	3079.26489	4.57915
11	5.692	VV S	0.0332	2983.36108	1497.90198	2.22449
12	5.743	VV S	0.0250	1.51420e4	8581.21777	11.29036
13	5.807	VV S	0.0515	1.88010e4	6079.66016	14.01866
14	5.886	BV T	0.0000	78.48212	39.79588	0.05852
15	5.939	VV T	0.0000	768.07959	60.74978	0.57270
16	5.977	VV S	0.0581	3.86451e4	7845.83301	28.81500
17	6.124	BB T	0.0323	1618.92676	611.16827	1.20712

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.233	BV T	0.0235	411.21329	216.63535	0.30661
19	6.287	PV T	0.0276	1035.26660	460.67838	0.77193
20	6.346	PV T	0.0133	42.31988	53.15942	0.03156
21	6.359	PV T	7.37e-3	21.22446	48.01394	0.01583
22	6.378	PV T	7.87e-3	26.26365	40.99620	0.01958
23	6.391	PV T	3.33e-3	11.08384	55.41674	0.00826
24	6.423	PV T	0.0258	663.28455	309.46988	0.49457
25	6.466	PV T	9.94e-4	6.38427e-1	10.70142	0.00048
26	6.484	PV T	0.0000	2.85274	28.42084	0.00213
27	6.526	PV T	6.36e-3	29.70809	60.18150	0.02215
28	6.567	PB T	0.0263	962.06128	442.99011	0.71734
29	6.659	PV T	9.40e-3	13.15416	17.43198	0.00981
30	6.665	PV T	0.0994	37.89329	6.35388	0.02825
31	6.726	PV T	5.86e-3	114.82291	264.52563	0.08562
32	6.766	PV T	4.12e-3	76.05676	307.72281	0.05671
33	6.803	PV T	0.0104	373.98544	464.69766	0.27886
34	6.864	VB S	0.0623	2.35577e4	4499.53516	17.56534
35	6.957	BV T	0.0000	18.11413	50.01809	0.01351
36	7.010	PV T	0.0137	240.16533	216.55408	0.17908
37	7.038	PV T	0.0115	194.26797	207.39984	0.14485
38	7.052	PV T	0.0105	199.08606	230.56554	0.14844
39	7.061	PV T	8.16e-3	143.51711	221.56874	0.10701
40	7.081	PV T	0.0119	192.40881	194.45619	0.14347
41	7.105	PV T	0.0225	529.76746	279.68219	0.39501
42	7.137	PB T	0.0139	202.47408	175.59665	0.15097
43	7.235	BV T	0.0420	2316.83032	655.57397	1.72750
44	7.313	PB T	0.0175	68.55433	65.17006	0.05112
45	7.422	BB T	0.0178	44.16840	31.45919	0.03293
46	7.521	BV	0.0107	33.20055	37.43616	0.02476
47	7.540	VB	5.39e-3	8.54928	21.72253	0.00637
48	7.562	BP	0.0122	23.82429	25.30937	0.01776
49	7.632	BB	0.0117	33.18896	36.93035	0.02475
50	7.672	PP	7.96e-3	13.62104	21.59800	0.01016
51	7.764	PV	0.0111	32.69945	41.23220	0.02438
52	7.789	VBA	0.0180	89.74802	59.58129	0.06692
Totals :				1.34114e5	4.73277e4	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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==========================================================================
Injection Date  : 7/1/2021 11:52:34 AM          Seq. Line :  14
Sample Name     : 21F039904                      Location : Vial 21
Acq. Operator   : DXP                                 Inj :   1
                                                Inj Volume : 1 µl
Sequence File   : C:\HPCHEM\2\SEQUENCE\070121.S
Method          : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed    : 2/8/2020 12:13:23 PM by NL
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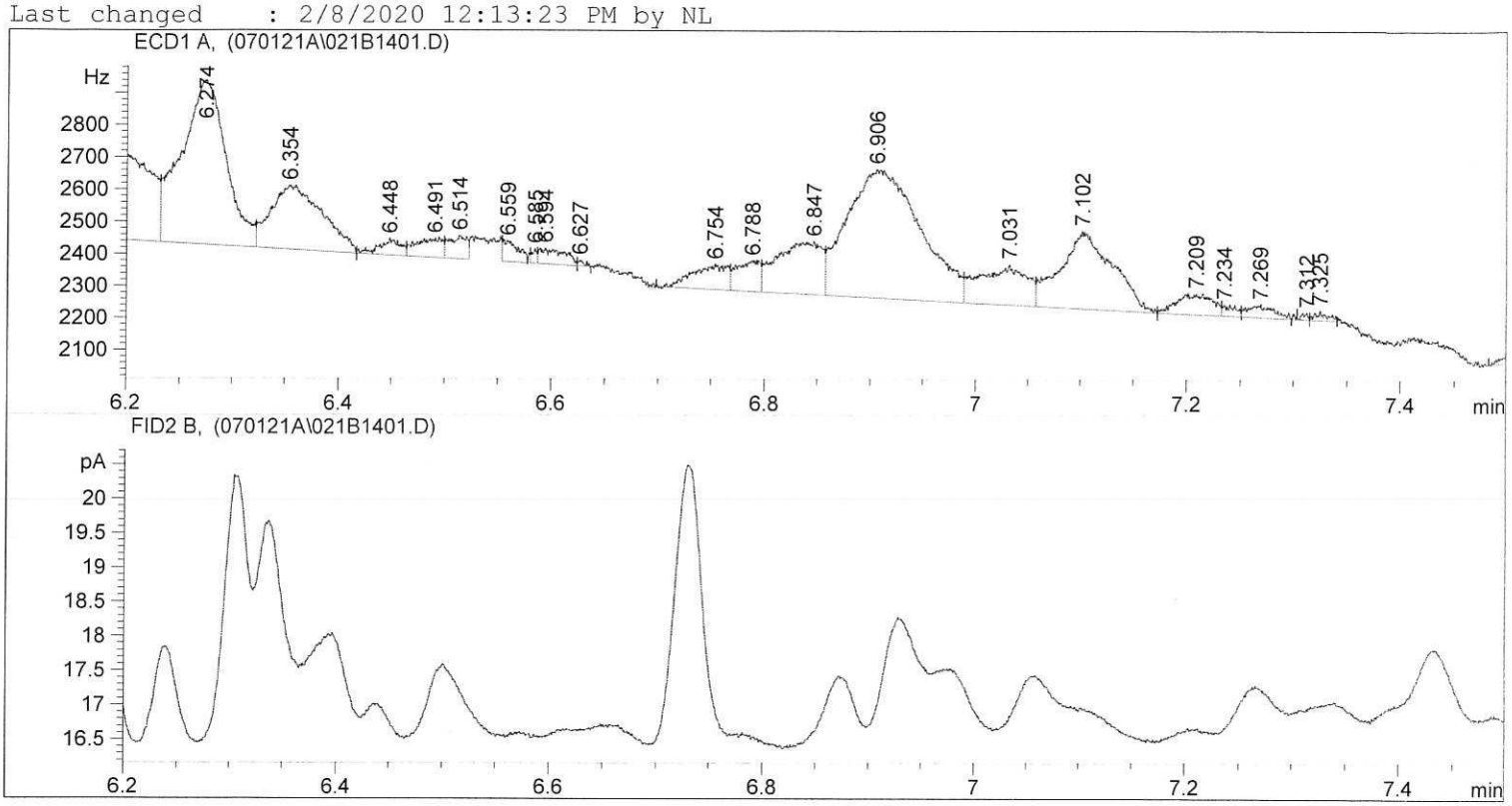


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==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
```

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.232	BP	0.0137	124.42408	110.81778	0.35672
2	5.270	VV	0.0128	170.10606	165.51588	0.48768
3	5.326	VV	0.0497	2374.15869	566.41943	6.80656
4	5.385	VV	0.0209	761.95251	475.64990	2.18447
5	5.434	VV	0.0302	973.58832	381.00244	2.79121
6	5.467	VP	0.0109	222.11630	261.17990	0.63679
7	5.536	VV	0.0252	725.26935	349.00912	2.07930
8	5.552	VV	3.35e-3	68.40411	290.67584	0.19611
9	5.576	VV	0.0271	1660.07117	765.84357	4.75932
10	5.652	VV	0.0206	990.52454	590.46808	2.83977
11	5.668	VV	0.0328	1479.87854	533.46442	4.24271
12	5.755	VV	0.0272	2820.04272	1276.54895	8.08488
13	5.787	VV	0.0169	1178.56348	865.25842	3.37886
14	5.817	VV	0.0332	2651.06567	953.34863	7.60043
15	5.879	VV	0.0243	1043.55493	509.43344	2.99180
16	5.905	VV	4.20e-3	139.75508	452.59549	0.40067
17	5.929	VV	0.0256	1251.27881	587.75818	3.58733

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.001	VV	0.0398	3465.42212	1031.52039	9.93514
19	6.034	VV	0.0323	2344.33105	858.27356	6.72104
20	6.109	VV	0.0408	2458.97534	716.97986	7.04972
21	6.191	VV	0.0348	870.95905	296.77924	2.49698
22	6.274	VV	0.0356	1520.62146	510.07959	4.35952
23	6.354	VP	0.0397	658.35272	197.43272	1.88745
24	6.448	VV	0.0171	67.42942	49.50040	0.19332
25	6.491	VV	0.0208	98.98065	58.90016	0.28377
26	6.514	VV	0.0139	81.72400	71.46294	0.23430
27	6.559	BB	0.0124	65.03072	64.23118	0.18644
28	6.585	BV	4.39e-3	13.85676	45.06401	0.03973
29	6.594	VV	0.0196	78.08875	48.00060	0.22388
30	6.627	VP	4.69e-3	6.29316	17.12397	0.01804
31	6.754	PV	0.0259	168.39987	76.90020	0.48279
32	6.788	VV	0.0178	142.20143	95.58040	0.40768
33	6.847	VV	0.0348	483.08350	164.71214	1.38497
34	6.906	VV	0.0577	1934.65149	399.33688	5.54652
35	7.031	VV	0.0363	384.24603	125.74400	1.10161
36	7.102	VP	0.0405	830.20380	241.32056	2.38014
37	7.209	VV	0.0272	145.84500	65.41061	0.41813
38	7.234	VV	0.0103	28.16754	33.91886	0.08075
39	7.269	VB	0.0215	66.46040	38.13568	0.19054
40	7.312	BV	5.40e-3	8.20096	19.94253	0.02351
41	7.325	VB	9.34e-3	21.39043	28.56579	0.06132
42	7.507	PV	9.68e-3	31.33375	43.10568	0.08983
43	7.520	VV	0.0134	47.01666	48.19124	0.13479
44	7.540	VV	7.50e-3	28.06540	47.45568	0.08046
45	7.548	VB	0.0105	40.93134	48.45497	0.11735
46	7.634	BB	5.60e-3	8.00664	19.45881	0.02295
47	7.689	BP	0.0244	82.32902	40.08128	0.23603
48	7.798	VBA	0.0612	65.10828	12.58463	0.18666
Totals :				3.48805e4	1.46492e4	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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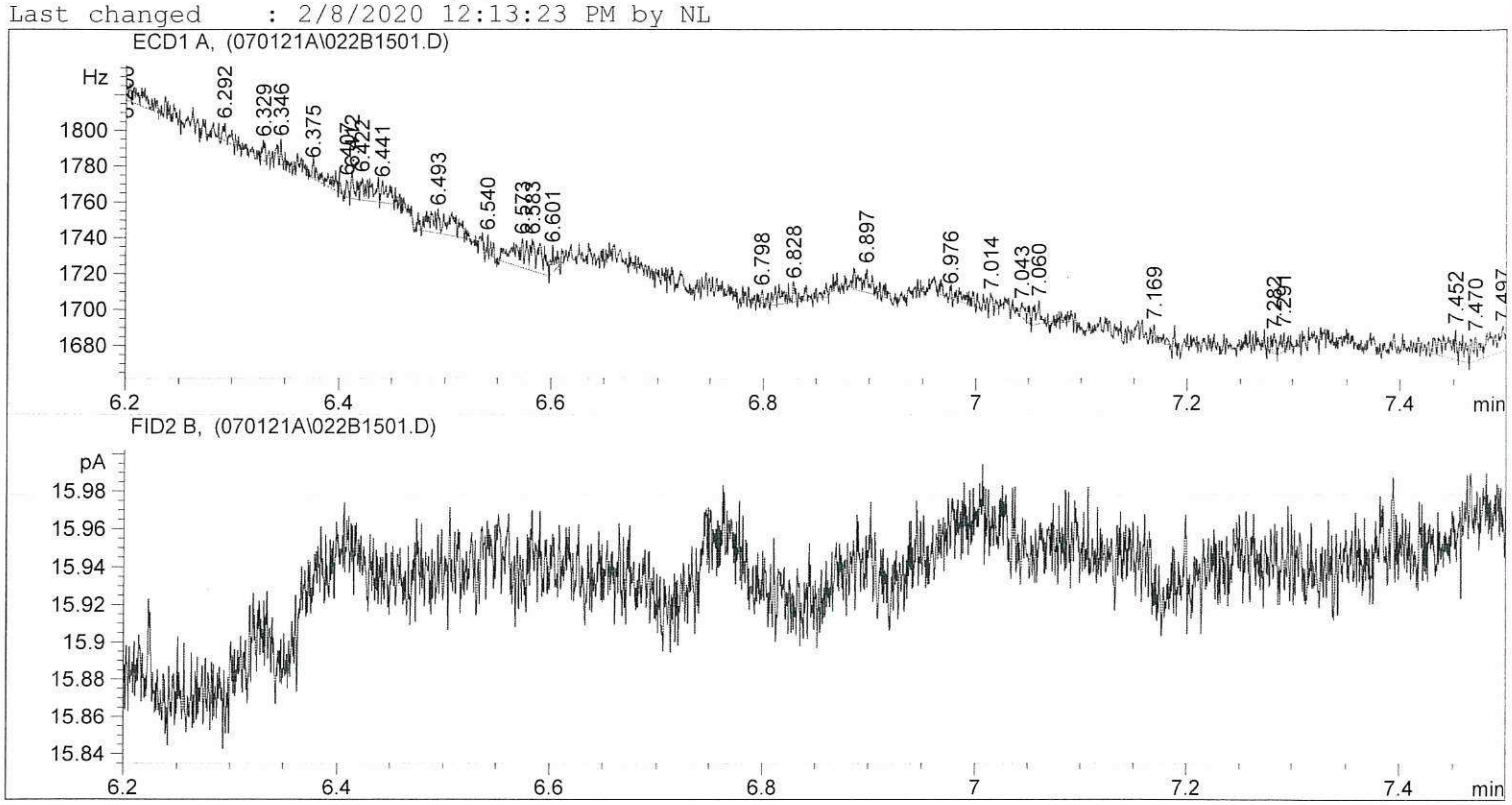
Injection Date : 7/1/2021 12:03:35 PM Seq. Line : 15
Sample Name : 21F0399 05 Location : Vial 22
Acq. Operator : DXP Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\070121.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.251	BV	0.0182	33.97732	23.30497	5.93413
2	5.347	BP	8.65e-3	9.73003	14.83639	1.69935
3	5.481	PV	6.42e-3	5.04903	13.10017	0.88181
4	5.536	BB	6.27e-3	4.50341	9.26504	0.78652
5	5.673	BP	8.27e-3	9.63337	14.65174	1.68246
6	5.773	PB	0.0218	88.73866	48.88026	15.49817
7	5.838	PP	0.0237	67.92950	34.58561	11.86386
8	5.940	BV	0.0277	48.03937	20.80098	8.39006
9	6.015	PP	3.47e-3	2.35658	11.14172	0.41158
10	6.047	BP	9.15e-3	6.28693	8.57588	1.09801
11	6.135	BP	7.05e-3	10.17429	18.39954	1.77694
12	6.147	VB	0.0118	9.70506	10.07199	1.69499
13	6.200	BP	0.0122	14.95395	15.07036	2.61170
14	6.292	BP	5.63e-3	3.59075	9.45321	0.62712
15	6.329	PP	3.61e-3	2.44453	10.14647	0.42694
16	6.346	BB	2.03e-3	1.57250	12.81511	0.27464
17	6.375	PB	9.70e-3	6.73901	8.64357	1.17696

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.407	BP	3.24e-3	1.86111	8.91411	0.32504
19	6.412	VB	3.33e-3	3.38742	14.50222	0.59161
20	6.422	BV	8.35e-3	8.00535	12.36982	1.39813
21	6.441	VB	6.49e-3	5.61170	11.10796	0.98008
22	6.493	PB	0.0179	18.20329	12.45442	3.17920
23	6.540	PP	2.04e-3	1.16883	9.44564	0.20414
24	6.573	BV	0.0103	12.84555	15.50254	2.24347
25	6.583	VP	0.0110	11.39646	17.33388	1.99039
26	6.601	VB	5.24e-3	4.18628	13.31833	0.73113
27	6.798	BB	1.94e-3	7.53028e-1	6.54636	0.13152
28	6.828	PP	0.0129	10.61895	9.90968	1.85460
29	6.897	BB	8.80e-3	9.05896	13.21199	1.58214
30	6.976	BP	0.0186	7.31293	4.74963	1.27720
31	7.014	VP	4.14e-3	2.26453	8.42620	0.39550
32	7.043	BP	6.94e-3	3.85459	7.09316	0.67320
33	7.060	VB	5.76e-3	3.60947	11.82410	0.63039
34	7.169	BP	4.76e-3	2.88968	8.10809	0.50468
35	7.282	BP	2.85e-3	1.78875	10.17876	0.31240
36	7.291	VB	4.14e-3	3.38101	10.56073	0.59049
37	7.452	BP	0.0112	14.81020	16.28288	2.58659
38	7.470	VB	6.00e-3	6.01420	12.99524	1.05038
39	7.497	BP	0.0161	17.24557	13.13427	3.01193
40	7.521	BB	5.80e-3	5.90438	14.35229	1.03120
41	7.570	PB	6.21e-3	4.63783	9.65214	0.81000
42	7.666	BP	8.89e-3	9.05956	12.44911	1.58225
43	7.688	VB	0.0133	19.40506	17.80121	3.38909
44	7.733	BV	0.0179	24.06812	16.63354	4.20349
45	7.772	VP	0.0197	28.84058	17.61322	5.03700
46	7.796	VBA	8.87e-3	4.96734	6.84024	0.86754
Totals :				572.57503	627.05477	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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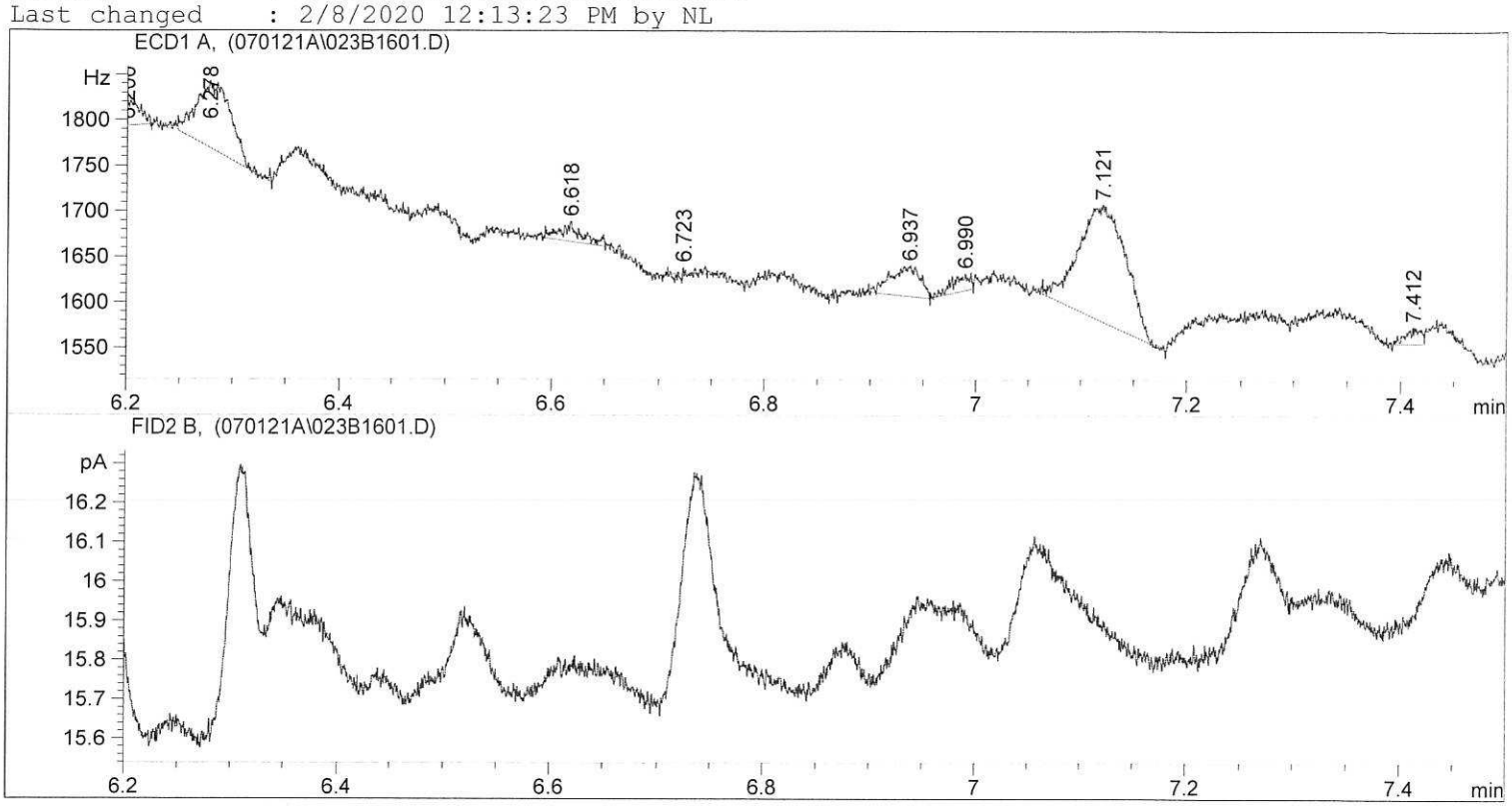
Injection Date : 7/1/2021 12:14:47 PM
Sample Name : 21F0399 06
Acq. Operator : DXP

Seq. Line : 16
Location : Vial 23
Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\070121.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.222	PP	0.0117	6.64804	7.09150	0.12914
2	5.278	PB	0.0169	80.92796	57.26324	1.57199
3	5.360	BB	0.0138	29.36849	29.95180	0.57047
4	5.438	PP	0.0451	326.75644	85.68832	6.34711
5	5.532	BV	8.84e-3	14.19518	20.10602	0.27574
6	5.581	VB	0.0218	166.49426	93.28590	3.23408
7	5.800	PV	0.0711	1109.41296	185.05934	21.54988
8	5.855	VV	0.0180	242.41522	166.37601	4.70881
9	5.880	VV	0.0233	309.45990	157.41196	6.01113
10	5.936	VV	0.0311	561.99420	214.97983	10.91650
11	6.001	VV	0.0315	432.89963	163.63350	8.40889
12	6.052	VV	0.0208	250.93950	144.62018	4.87439
13	6.071	VB	0.0222	246.83397	136.27333	4.79465
14	6.113	BV	0.0373	568.47644	182.74950	11.04242
15	6.190	VB	4.91e-3	14.22382	38.54148	0.27629
16	6.200	BB	0.0109	25.82557	29.36825	0.50165
17	6.278	BP	0.0276	167.73969	71.98685	3.25827

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.618	BB	0.0167	28.88858	21.71388	0.56115
19	6.723	PB	0.0000	8.81625e-1	6.33771	0.01713
20	6.937	BP	0.0232	62.88282	32.80689	1.22147
21	6.990	VV	0.0166	21.20274	17.94274	0.41185
22	7.121	BP	0.0369	394.69617	127.39006	7.66681
23	7.412	PV	0.0117	17.09829	17.66804	0.33213
24	7.692	BP	0.0243	67.85544	33.40788	1.31806

Totals : 5148.11696 2041.65419

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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Injection Date  : 7/1/2021 12:26:00 PM          Seq. Line :  17
Sample Name     : 21F0399 07                     Location : Vial 24
Acq. Operator   : DXP                                Inj :   1
                                               Inj Volume : 1 µl
Sequence File   : C:\HPCHEM\2\SEQUENCE\070121.S
Method          : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed    : 2/8/2020 12:13:23 PM by NL
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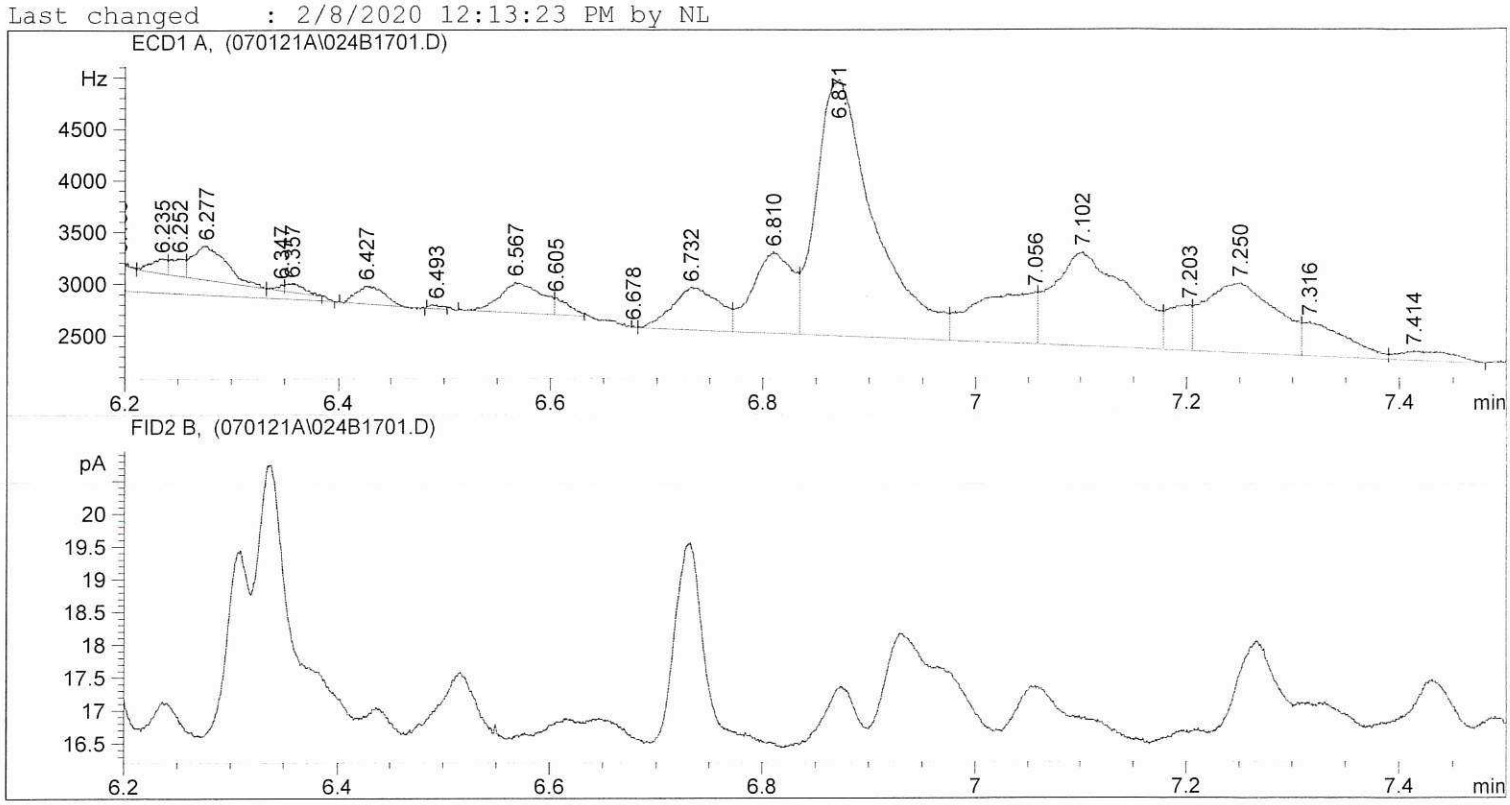


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==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
```

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.228	PV	0.0157	468.56046	382.92984	0.50942
2	5.267	VV	0.0164	514.81927	374.32971	0.55971
3	5.298	VV	0.0220	2162.17920	1165.23254	2.35074
4	5.354	VV	0.0254	3350.12085	1627.72656	3.64227
5	5.373	VV	0.0335	3962.55371	1405.98108	4.30811
6	5.467	VP	0.0163	433.03775	326.62439	0.47080
7	5.518	VV	0.0198	786.62408	484.28677	0.85522
8	5.574	VP	0.0252	886.23694	441.17026	0.96352
9	5.635	VV	0.0264	3537.40796	1761.67187	3.84589
10	5.692	VV	0.0237	2104.19458	1064.00513	2.28769
11	5.744	VV S	0.0260	9629.59863	5054.07031	10.46936
12	5.807	VV S	0.0553	1.32907e4	4002.50317	14.44972
13	5.876	BV T	0.0000	162.40338	73.15173	0.17657
14	5.934	PV T	0.0000	43.96034	166.83972	0.04779
15	5.982	VB S	0.0607	2.22002e4	4310.27832	24.13624
16	6.121	BV T	0.0337	1416.98083	514.97485	1.54055
17	6.195	PV T	8.88e-3	25.52397	47.88256	0.02775

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.235	PV T	0.0128	155.81950	147.01108	0.16941
19	6.252	PV T	0.0118	155.94141	171.37341	0.16954
20	6.277	PV T	0.0269	739.27240	329.84344	0.80374
21	6.347	PV T	6.08e-3	27.01228	59.67347	0.02937
22	6.357	PB T	0.0149	98.52244	86.14602	0.10711
23	6.427	BP	0.0226	317.45291	173.32220	0.34514
24	6.493	BB	9.47e-3	32.26414	41.49598	0.03508
25	6.567	BV	0.0318	789.42230	295.47934	0.85827
26	6.605	VB	0.0121	160.79251	166.27359	0.17481
27	6.678	PB	1.85e-3	1.98227	15.93468	0.00216
28	6.732	BV	0.0366	1270.68433	411.48184	1.38150
29	6.810	VV	0.0309	2045.54272	781.91565	2.22393
30	6.871	VV	0.0445	9354.91699	2484.41479	10.17073
31	7.056	VV	0.0476	2016.54749	503.90952	2.19240
32	7.102	VV	0.0586	4508.18164	906.48584	4.90132
33	7.203	VV	0.0187	687.63000	442.17010	0.74760
34	7.250	VV	0.0552	3148.22705	672.53979	3.42277
35	7.316	VV	0.0340	941.86786	328.99054	1.02400
36	7.414	VV	0.0432	328.97504	89.72396	0.35766
37	7.528	BB	0.0162	67.34156	49.76820	0.07321
38	7.616	BP	5.93e-3	13.74134	28.98735	0.01494
39	7.640	VB	0.0118	17.48788	18.24873	0.01901
40	7.678	PP	5.86e-3	11.36739	26.21756	0.01236
41	7.764	PV	0.0135	112.72953	100.45577	0.12256
Totals :				9.19788e4	3.15355e4	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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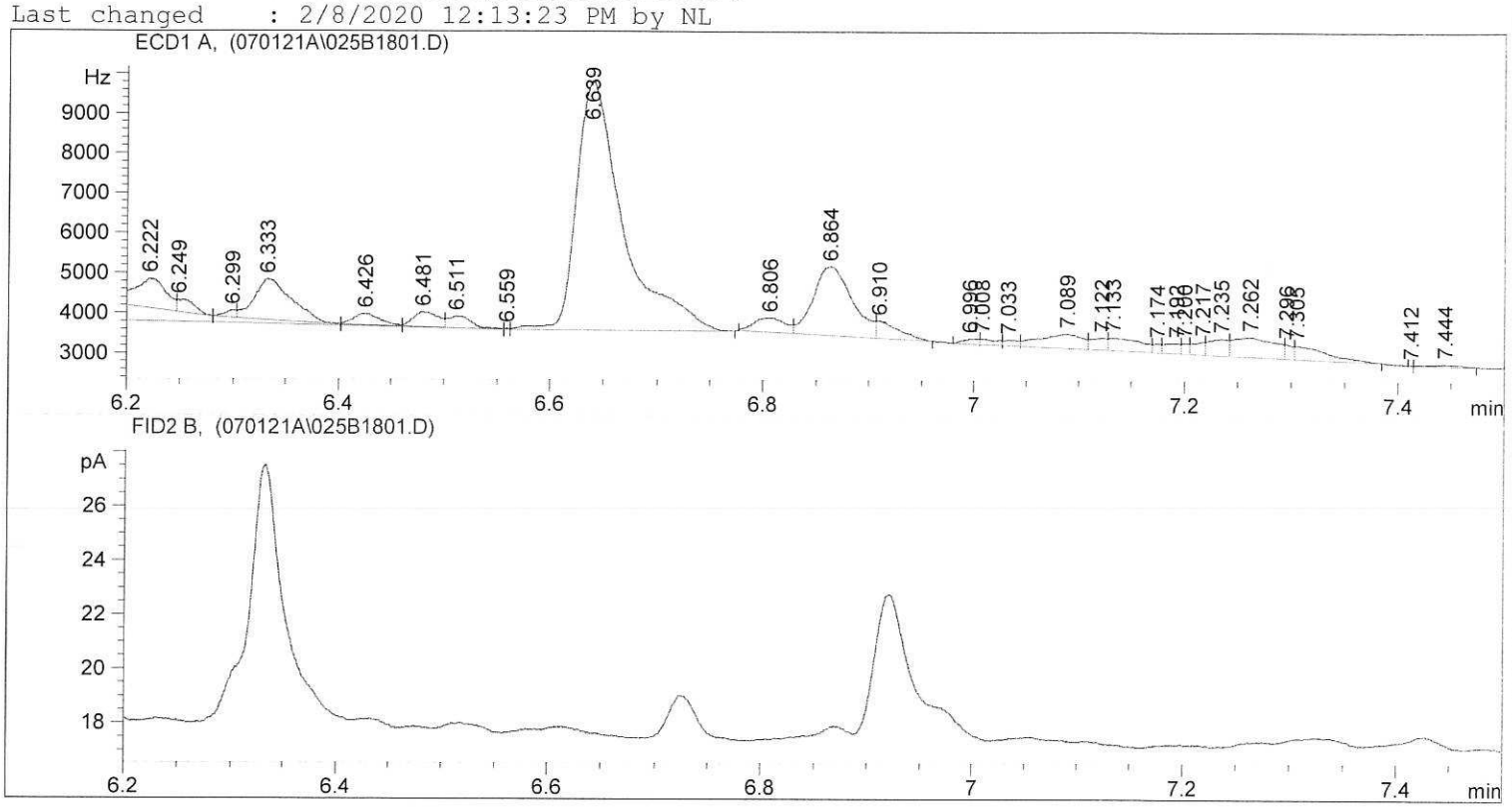
*** End of Report ***

Injection Date : 7/1/2021 12:37:14 PM
Sample Name : 21F0410 01
Acq. Operator : DXP

Seq. Line : 18
Location : Vial 25
Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\070121.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.225	BV	0.0161	559.50153	420.32999	0.41231
2	5.252	VV	0.0172	477.84937	335.85681	0.35214
3	5.295	VV	0.0217	2360.36841	1291.67554	1.73941
4	5.352	VV	0.0285	5299.20605	2463.51001	3.90510
5	5.383	VV	0.0325	3888.12134	1458.59937	2.86524
6	5.439	VV	7.36e-3	202.43330	349.11090	0.14918
7	5.447	VV	4.05e-3	94.72213	320.29013	0.06980
8	5.469	VV	0.0204	790.97260	471.70880	0.58288
9	5.514	VV	0.0278	1671.58899	744.63153	1.23183
10	5.556	VV	0.0128	811.96130	777.35931	0.59835
11	5.562	VV	0.0211	1380.55090	776.88330	1.01736
12	5.632	VV	0.0267	3925.55322	1794.60706	2.89283
13	5.685	VV	0.0348	3358.05078	1167.05481	2.47462
14	5.742	VV S	0.0264	9552.66406	4355.22266	7.03956
15	5.808	VV S	0.0515	9946.27441	3221.14429	7.32962
16	5.911	VV S	0.0339	1.97033e4	9672.88281	14.51977
17	5.979	VV S	0.0635	2.59148e4	6801.61035	19.09718

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.091	VV S	0.1223	6849.76172	933.23871	5.04774
19	6.182	BV T	3.22e-3	6.03110	31.24816	0.00444
20	6.222	PV T	0.0256	1595.69885	743.88208	1.17590
21	6.249	PV T	0.0188	355.60474	314.73480	0.26205
22	6.299	PV T	9.69e-3	135.52330	181.93198	0.09987
23	6.333	PV T	0.0298	2482.40552	1012.88043	1.82934
24	6.426	PV T	0.0215	488.36865	285.95908	0.35989
25	6.481	PV T	0.0192	599.55328	372.61316	0.44182
26	6.511	PP T	0.0179	443.49509	295.52969	0.32682
27	6.559	PV T	2.33e-3	4.64396	31.29832	0.00342
28	6.639	PB S	0.0362	1.88053e4	6241.19287	13.85803
29	6.806	BV	0.0242	716.53265	357.77292	0.52803
30	6.864	VV	0.0313	4443.30908	1709.76343	3.27437
31	6.910	VB	0.0246	641.86987	434.93121	0.47301
32	6.996	PV	0.0123	131.64349	130.85033	0.09701
33	7.008	VV	0.0131	156.09943	146.17091	0.11503
34	7.033	VB	0.0117	132.66830	141.65820	0.09777
35	7.089	BV	0.0331	1006.96600	363.50137	0.74206
36	7.122	VV	0.0132	318.54745	295.04816	0.23474
37	7.133	VV	0.0253	668.09125	315.02780	0.49233
38	7.174	VV	7.39e-3	118.73826	223.79695	0.08750
39	7.192	VV	0.0131	266.48587	257.14261	0.19638
40	7.200	VV	6.31e-3	127.56379	270.19662	0.09400
41	7.217	VV	9.79e-3	263.62338	327.45685	0.19427
42	7.235	VV	0.0152	531.32990	424.67664	0.39155
43	7.262	VV	0.0320	1335.35144	496.59152	0.98405
44	7.296	VV	6.86e-3	190.39778	366.63577	0.14031
45	7.305	VB	0.0261	757.96106	346.10602	0.55856
46	7.412	PV	2.08e-3	1.66575	13.12261	0.00123
47	7.444	VB	0.0225	102.41486	56.16387	0.07547
48	7.511	PB	1.41e-3	5.18863e-1	7.47918	0.00038
49	7.615	PV	0.0258	113.66141	52.64775	0.08376
50	7.681	VV	0.0391	1224.03259	371.09280	0.90202
51	7.735	VV	0.0292	719.17035	297.38309	0.52997
52	7.781	VV	4.67e-3	13.18050	36.00365	0.00971
53	7.787	VBA	5.74e-3	13.53764	30.71620	0.00998
Totals :				1.35700e5	5.43389e4	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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Injection Date  : 7/1/2021 12:48:29 PM          Seq. Line :  19
Sample Name     : 21F0410 02                     Location : Vial 26
Acq. Operator   : DXP                                Inj :   1
                                               Inj Volume : 1 µl
Sequence File   : C:\HPCHEM\2\SEQUENCE\070121.S
Method          : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed    : 2/8/2020 12:13:23 PM by NL
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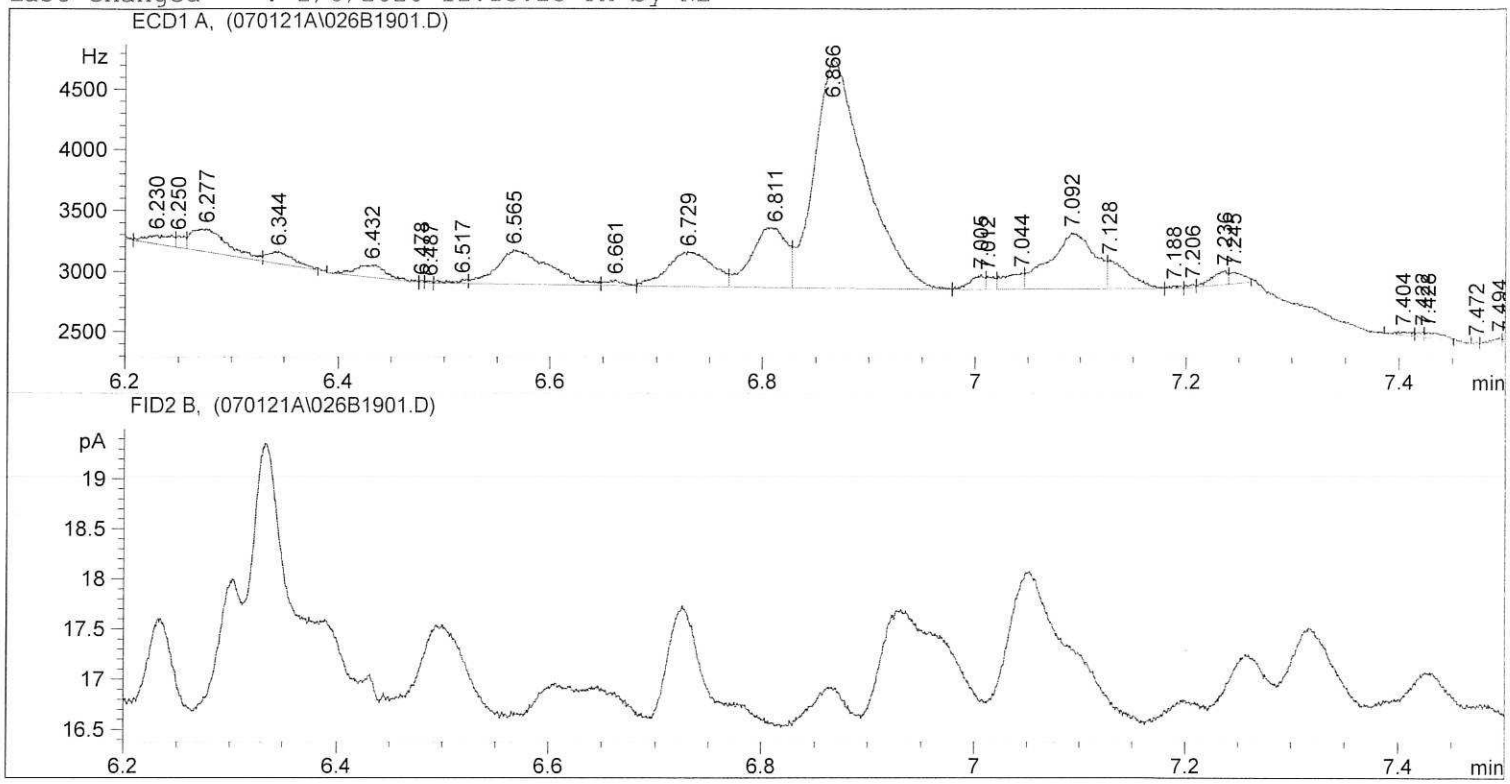


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==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
```

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.227	PV	0.0140	353.28882	303.38208	0.62801
2	5.264	VV	0.0137	274.74762	248.97054	0.48840
3	5.299	VV	0.0257	3874.60791	1879.35205	6.88756
4	5.353	VV	0.0246	2590.36060	1258.65869	4.60467
5	5.380	VV	0.0280	2406.13062	1049.27600	4.27717
6	5.422	VV	0.0199	885.65143	541.95587	1.57435
7	5.458	VV	5.90e-3	144.28813	329.88144	0.25649
8	5.467	VV	0.0138	388.95966	347.79727	0.69142
9	5.518	VV	0.0233	638.47784	340.47818	1.13497
10	5.571	VP	0.0217	844.02588	486.05029	1.50035
11	5.635	VV	0.0278	3989.66479	1712.64978	7.09209
12	5.693	VV	0.0224	1499.09045	801.38855	2.66481
13	5.743	VV S	0.0255	6810.25439	3587.62695	12.10601
14	5.807	VP S	0.0384	5050.05127	2193.38843	8.97705
15	5.876	VB S	9.25e-3	25.43920	45.83638	0.04522
16	5.905	PP	3.97e-3	8.58723	33.75211	0.01526
17	5.930	VV	0.0140	281.70462	241.25583	0.50076

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	5.980	VV	0.0446	1.10494e4	3043.02344	19.64162
19	6.074	VV	5.60e-3	165.42259	438.57709	0.29406
20	6.080	VV	0.0130	352.74527	452.29968	0.62705
21	6.105	VP	0.0389	1582.90576	485.27945	2.81380
22	6.230	VV	0.0203	126.61793	74.93768	0.22508
23	6.250	VV	7.76e-3	56.67927	97.84675	0.10075
24	6.277	VV	0.0296	448.35410	191.10045	0.79700
25	6.344	VB	0.0221	169.97534	101.52985	0.30215
26	6.432	PP	0.0240	212.18022	104.98125	0.37717
27	6.478	VV	3.48e-3	4.16547	19.57841	0.00740
28	6.487	VP	5.89e-3	6.42594	14.71498	0.01142
29	6.517	VV	0.0105	33.43419	39.40797	0.05943
30	6.565	VV	0.0400	958.63837	282.71045	1.70409
31	6.661	VP	0.0127	47.18774	46.23548	0.08388
32	6.729	VV	0.0351	843.84155	284.05859	1.50003
33	6.811	VV	0.0276	1143.69055	490.80542	2.03304
34	6.866	VP	0.0408	6326.65479	1893.66113	11.24636
35	7.005	VV	0.0112	111.25607	120.44949	0.19777
36	7.012	VV	7.11e-3	62.85134	109.35535	0.11173
37	7.044	VV	0.0156	169.47697	133.64131	0.30126
38	7.092	VV	0.0351	1364.36853	458.45071	2.42532
39	7.128	VP	0.0225	316.52005	233.99261	0.56265
40	7.188	VP	8.07e-3	14.36971	23.82932	0.02554
41	7.206	VV	6.22e-3	12.18659	27.23235	0.02166
42	7.236	VV	0.0125	114.63483	111.96887	0.20378
43	7.245	VB	0.0125	88.55640	93.44967	0.15742
44	7.404	PV	0.0115	28.75064	31.41217	0.05111
45	7.422	VV	5.52e-3	18.91055	46.70295	0.03362
46	7.428	VB	0.0140	56.29089	49.04230	0.10006
47	7.472	PP	2.19e-3	1.52540	15.01157	0.00271
48	7.494	VV	7.57e-3	21.34982	35.71141	0.03795
49	7.504	VB	0.0197	33.93333	28.68077	0.06032
50	7.569	PB	8.18e-3	10.42367	19.05886	0.01853
51	7.607	PV	5.67e-3	10.17885	22.55395	0.01809
52	7.620	VB	0.0103	23.32825	27.51964	0.04147
53	7.655	PB	4.25e-3	2.68892	10.53547	0.00478
54	7.676	PB	0.0112	24.61654	27.02093	0.04376
55	7.786	PV	0.0301	175.24754	70.31538	0.31152
Totals :				5.62551e4	2.51584e4	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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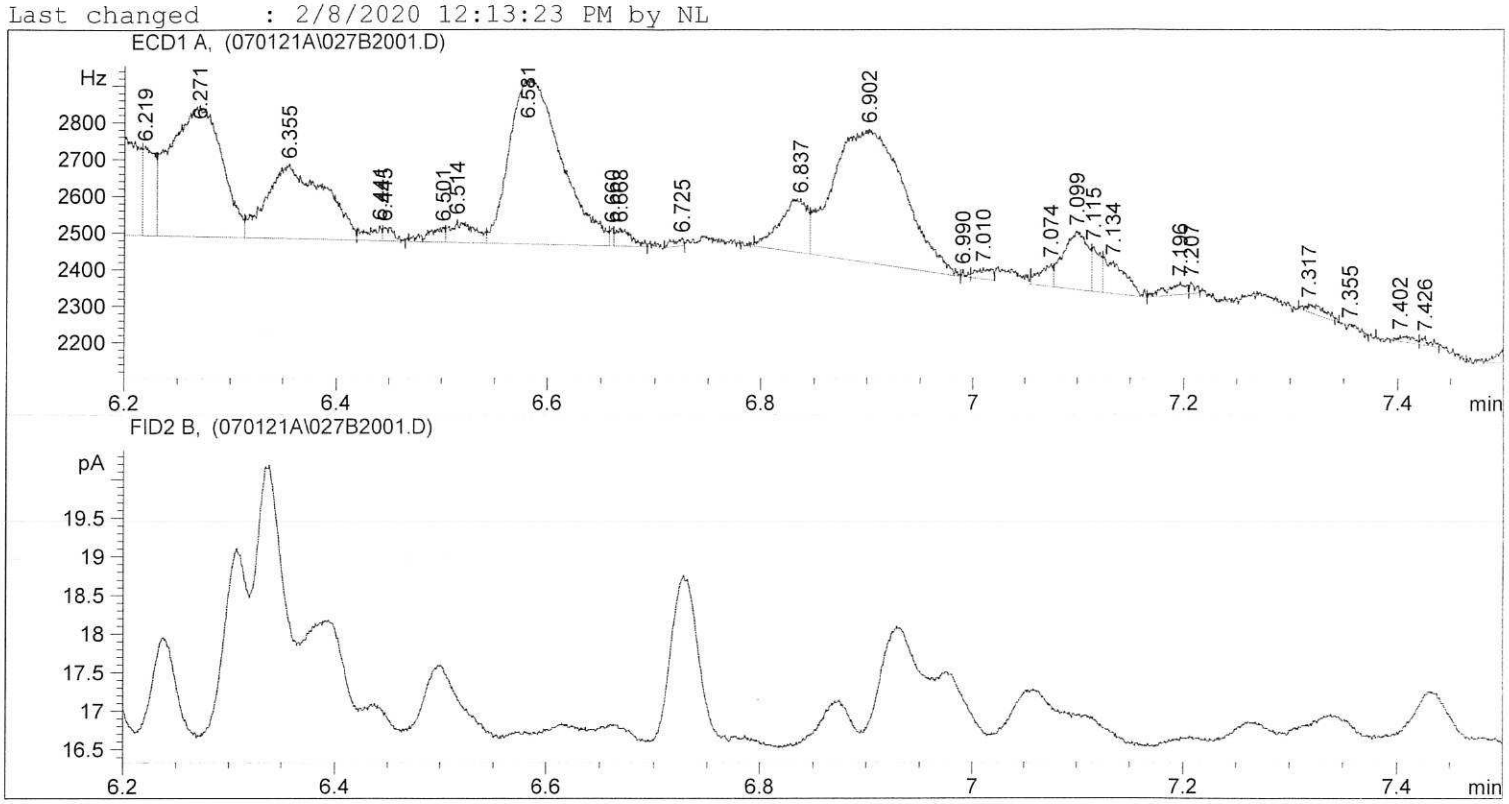
Injection Date : 7/1/2021 12:59:42 PM Seq. Line : 20
Sample Name : 21F0410 03 Location : Vial 27
Acq. Operator : DXP Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\070121.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.225	PV	6.03e-3	47.97141	103.11655	0.13843
2	5.233	VP	9.64e-3	80.07100	110.66063	0.23107
3	5.268	VV	0.0122	193.07887	193.59891	0.55718
4	5.332	VV	0.0218	817.81299	454.23169	2.36002
5	5.357	VV	0.0262	1188.38220	546.05695	3.42940
6	5.384	VV	0.0235	870.83301	447.74466	2.51303
7	5.424	VV	0.0239	690.88800	343.02908	1.99375
8	5.460	VV	5.03e-3	69.44569	182.72353	0.20040
9	5.469	VP	0.0137	222.40277	200.39386	0.64180
10	5.537	VV	0.0297	709.70746	288.87708	2.04805
11	5.576	VV	0.0276	1100.79712	497.40427	3.17665
12	5.650	VV	0.0219	924.66046	501.79108	2.66836
13	5.671	VV	0.0132	465.07642	437.88898	1.34211
14	5.691	VV	5.53e-3	148.79747	401.16599	0.42940
15	5.696	VV	0.0155	506.52808	397.73694	1.46173
16	5.755	VV	0.0256	2692.08374	1258.67346	7.76874
17	5.788	VV	0.0132	740.51324	709.62671	2.13695

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	5.818	VV	0.0354	3014.70483	1028.41064	8.69975
19	5.897	VV	0.0229	1096.78613	585.59381	3.16508
20	5.927	VV	0.0276	1945.70642	846.53265	5.61487
21	6.000	VV	0.0647	7363.31250	1335.70898	21.24885
22	6.108	VV	0.0426	2138.72485	594.27332	6.17188
23	6.193	VV	0.0293	705.17523	290.66467	2.03498
24	6.219	VV	0.0133	192.66466	241.35927	0.55599
25	6.271	VV	0.0398	1201.48657	357.74057	3.46722
26	6.355	VV	0.0452	763.77393	201.54816	2.20408
27	6.441	VV	0.0112	35.77720	40.13084	0.10324
28	6.445	VP	8.83e-3	25.39009	37.82269	0.07327
29	6.501	BV	0.0133	44.44374	40.93629	0.12825
30	6.514	VV	0.0179	89.19235	60.29677	0.25739
31	6.581	VV	0.0405	1527.99756	447.27374	4.40945
32	6.660	VV	3.21e-3	10.49913	46.99169	0.03030
33	6.668	VP	0.0120	48.17492	48.38916	0.13902
34	6.725	PV	7.73e-3	13.09330	21.42105	0.03778
35	6.837	BV	0.0208	254.28139	146.97354	0.73380
36	6.902	VP	0.0553	1684.70386	364.53201	4.86167
37	6.990	VB	3.09e-3	4.02077	18.84488	0.01160
38	7.010	BV	0.0119	29.75360	30.72020	0.08586
39	7.074	BV	0.0101	51.87249	62.64342	0.14969
40	7.099	VV	0.0193	253.14572	157.71240	0.73052
41	7.115	VB	7.31e-3	67.95213	121.84605	0.19609
42	7.134	BP	0.0176	127.83672	87.77593	0.36891
43	7.196	VV	0.0144	40.41176	34.17631	0.11662
44	7.207	VB	5.51e-3	11.09215	30.05836	0.03201
45	7.317	BB	0.0230	31.62867	22.95704	0.09127
46	7.355	BP	0.0000	2.85758e-1	5.76005	0.00082
47	7.402	BV	0.0116	14.00420	15.44617	0.04041
48	7.426	VB	7.42e-3	12.74906	21.82450	0.03679
49	7.510	PV	0.0181	68.10235	45.87914	0.19653
50	7.536	VP	0.0184	66.97987	47.57322	0.19329
51	7.622	PV	0.0153	35.77800	27.96386	0.10325
52	7.631	VB	5.89e-3	11.15779	27.74413	0.03220
53	7.649	BP	7.45e-3	4.77789	8.14096	0.01379
54	7.687	VV	0.0231	110.22253	57.15277	0.31808
55	7.750	VV	0.0169	86.04591	60.68148	0.24831
Totals :				3.46528e4	1.46962e4	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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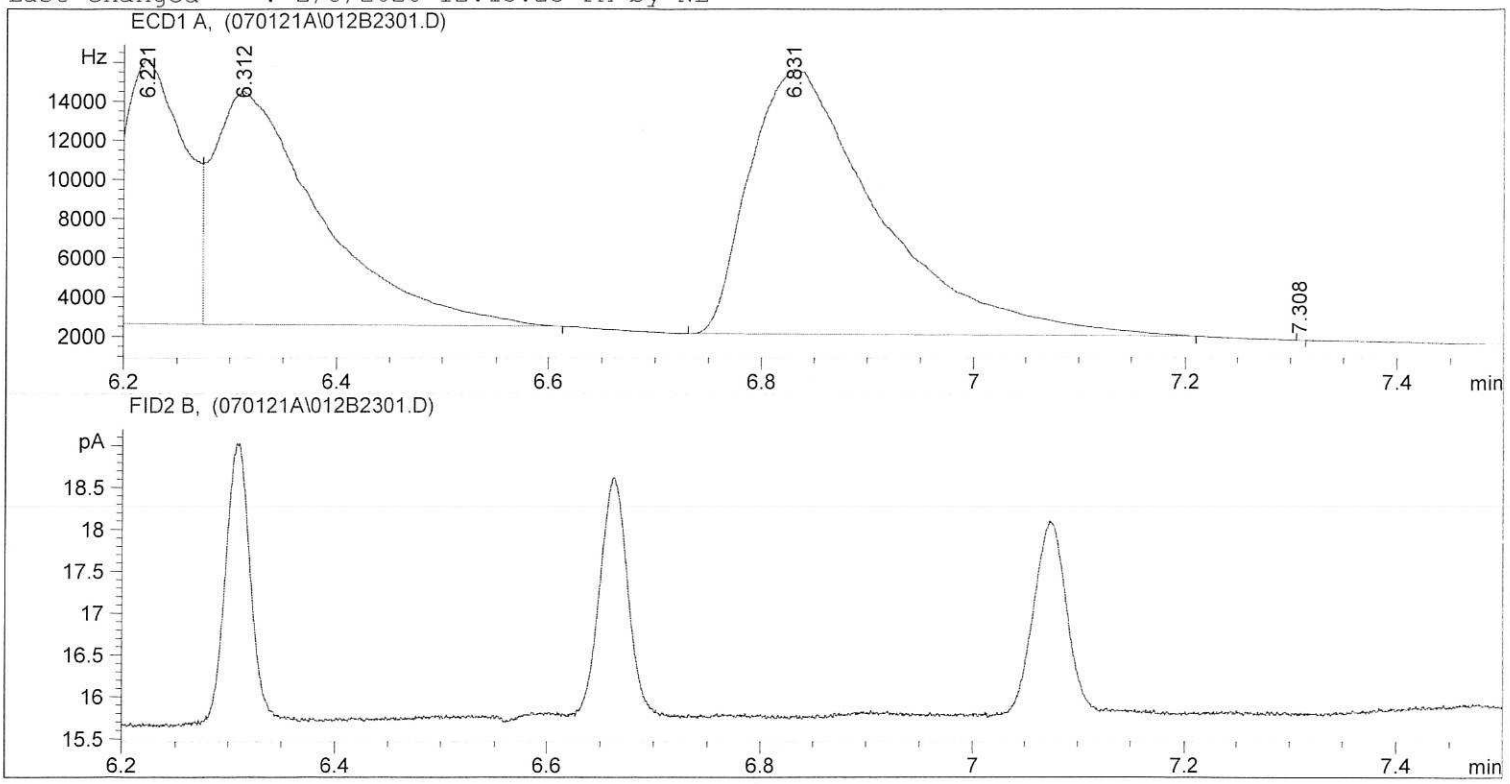
Injection Date : 7/1/2021 1:32:42 PM Seq. Line : 23
Sample Name : CS4 STANDARD Location : Vial 12
Acq. Operator : DXP Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\070121.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.247	BP S	0.0000	5.56760e4	9823.45801	4.72223
2	5.616	PV S	0.0408	1.60466e5	5.05334e4	13.61016
3	5.709	PV S	0.0634	2.96922e5	7.80593e4	25.18377
4	5.757	VV S	0.1129	3.06002e5	4.51928e4	25.95396
5	6.056	PV S	0.0584	1.04454e5	2.14372e4	8.85936
6	6.221	PV S	0.0515	5.79243e4	1.35492e4	4.91292
7	6.312	PB S	0.0819	8.31211e4	1.19230e4	7.05002
8	6.831	PB S	0.0996	1.14450e5	1.35197e4	9.70723
9	7.308	PP	1.28e-3	3.52040e-1	6.03764	2.986e-5
10	7.519	BP	3.42e-3	1.71011	7.07449	0.00015
11	7.528	BB	3.18e-3	2.04948	10.02846	0.00017

Totals : 1.17902e6 2.44061e5

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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Injection Date  : 7/27/2021 8:52:56 PM          Seq. Line :  15
Sample Name     : CS4 STD                        Location : Vial 27
Acq. Operator   : DXP                                Inj :   1
                                               Inj Volume : 1 µl
Sequence File   : C:\HPCHEM\2\SEQUENCE\072721B.S
Method          : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed    : 2/8/2020 12:13:23 PM by NL
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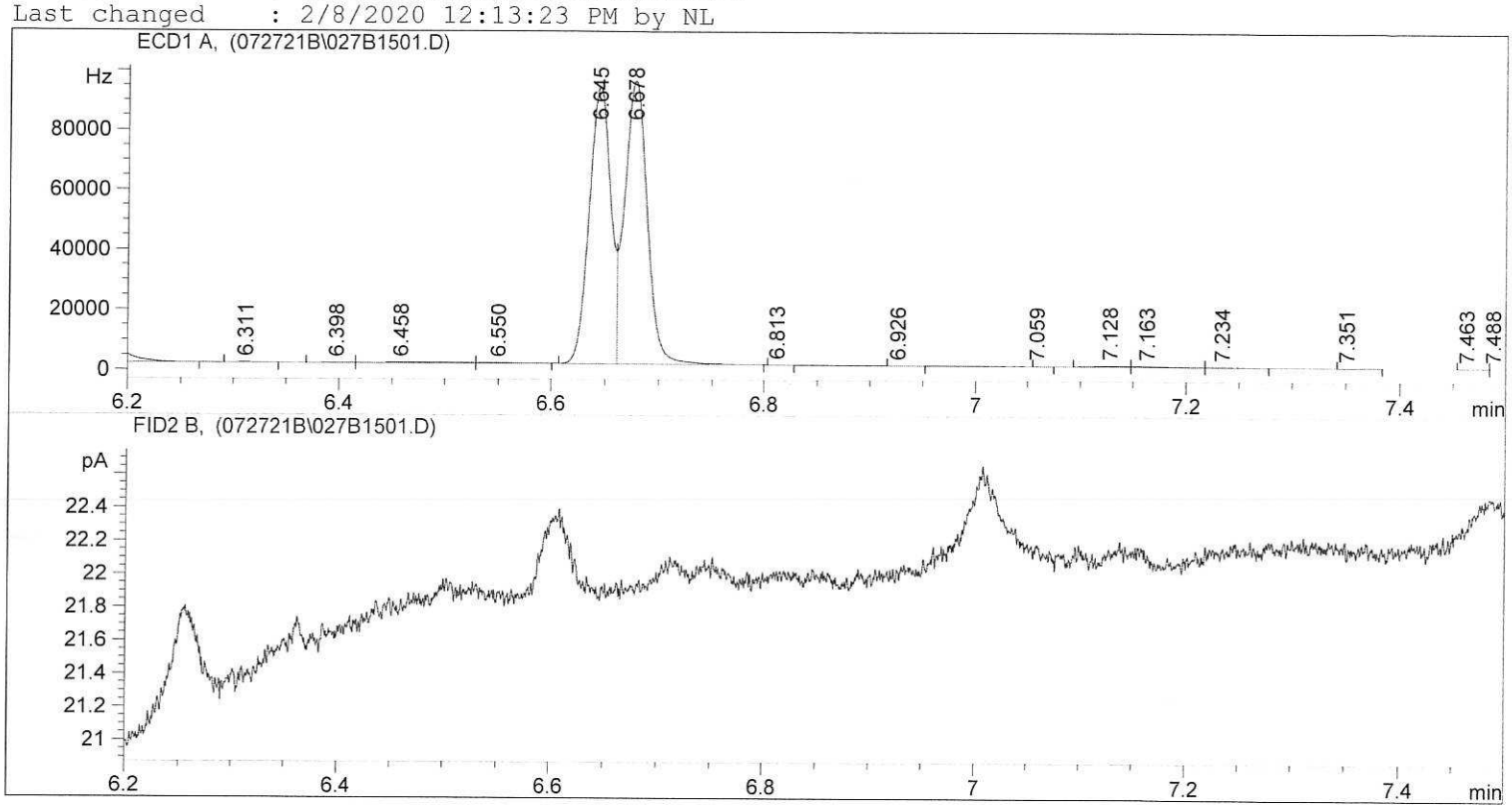


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==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
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Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.214	BP	0.0137	302.23270	276.84769	0.02862
2	5.301	BP	8.88e-3	23.33050	32.09575	0.00221
3	5.332	VV	0.0139	109.99000	98.31005	0.01042
4	5.350	VV	0.0100	53.34491	67.58152	0.00505
5	5.393	VP	0.0239	221.79341	111.83168	0.02100
6	5.495	VV S	0.0252	1.44838e5	7.90263e4	13.71650
7	5.593	VV S	0.0373	2.36440e5	1.05561e5	22.39150
8	5.652	VV S	0.0190	8.50789e4	7.44679e4	8.05718
9	5.698	VV S	0.0210	8.00679e4	6.34795e4	7.58263
10	5.808	VB S	0.0228	217.08438	158.62106	0.02056
11	5.853	BP	0.0120	64.70889	68.33245	0.00613
12	5.893	VV	0.0106	27.49998	32.13985	0.00260
13	5.942	VP S	0.0173	8.81144e4	7.71453e4	8.34465
14	6.092	VV S	0.0182	7.31148e4	6.17798e4	6.92415
15	6.172	VB S	0.0213	7.79860e4	6.09351e4	7.38547
16	6.311	BB	0.0143	146.45271	122.52381	0.01387
17	6.398	PV	0.0185	180.91223	122.00410	0.01713

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.458	VV	0.0595	1291.25500	258.53760	0.12229
19	6.550	VB	0.0371	716.85870	229.25163	0.06789
20	6.645	BV S	0.0214	1.28097e5	9.23563e4	12.13114
21	6.678	VB S	0.0243	1.37349e5	9.43954e4	13.00729
22	6.813	BP	0.0000	1.65606	4.26934	0.00016
23	6.926	BP	4.91e-3	3.12383	8.46517	0.00030
24	7.059	PB	2.19e-3	9.18598e-1	7.72863	8.699e-5
25	7.128	BV	0.0224	496.34262	267.75793	0.04700
26	7.163	VB	0.0280	511.74316	217.96828	0.04846
27	7.234	BP	0.0250	72.32908	34.89993	0.00685
28	7.351	PB	4.30e-3	1.52752	4.57507	0.00014
29	7.463	BP	7.49e-3	8.97085	15.19574	0.00085
30	7.488	BB	8.50e-3	10.08252	14.53101	0.00095
31	7.522	BB	7.41e-3	7.84322	14.27685	0.00074
32	7.640	BB	2.44e-3	2.48434	14.21223	0.00024
33	7.702	BB	0.0289	379.28217	155.16476	0.03592
Totals :				1.05594e6	7.11484e5	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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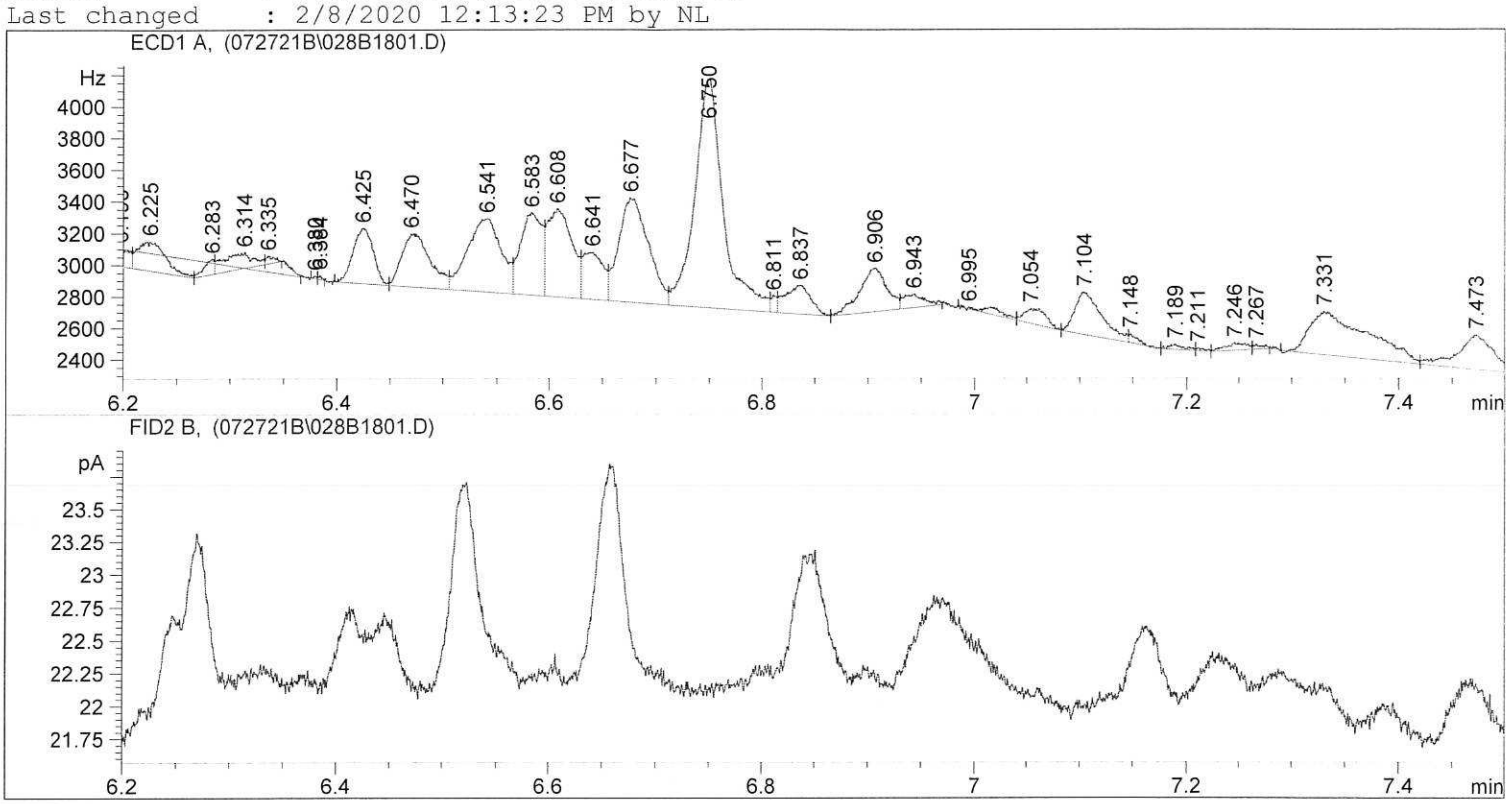
Injection Date : 7/27/2021 9:26:06 PM Seq. Line : 18
Sample Name : 21G0111 06 Location : Vial 28
Acq. Operator : DXP Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\072721B.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.220	BB S	0.0000	1.20983e4	2196.23877	28.15667
2	5.281	BV T	0.0141	300.15726	263.37357	0.69856
3	5.308	PV T	0.0102	54.76804	66.70009	0.12746
4	5.340	PV T	7.87e-3	66.11208	106.14354	0.15386
5	5.382	PV T	0.0267	1064.23486	480.02762	2.47682
6	5.424	PV T	0.0145	298.67545	251.33391	0.69512
7	5.441	PV T	0.0147	122.98822	139.01009	0.28623
8	5.485	PV T	0.0181	1331.46240	1032.05066	3.09875
9	5.530	PV T	0.0135	891.35059	803.11615	2.07446
10	5.557	PV T	0.0189	2460.96509	1618.41492	5.72747
11	5.583	VV T	0.0163	1207.46899	906.10144	2.81017
12	5.616	PV T	0.0172	1185.12415	832.16388	2.75817
13	5.670	PV T	0.0193	2874.46338	1791.39343	6.68981
14	5.738	PV T	0.0134	181.57852	171.11613	0.42259
15	5.765	PV T	0.0153	520.18903	417.94882	1.21065
16	5.794	PV T	0.0190	388.02258	254.23900	0.90305
17	5.817	PV T	0.0163	261.62259	267.45401	0.60888

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	5.868	PV T	0.0187	1811.53418	1292.88818	4.21603
19	5.885	VV T	0.0143	1195.62476	1002.59027	2.78261
20	5.953	PV T	0.0201	723.97180	466.18488	1.68492
21	5.976	PB T	0.0156	470.44580	360.96857	1.09488
22	6.028	BV T	0.0107	35.98570	42.28098	0.08375
23	6.067	PV T	9.84e-3	33.50579	45.26527	0.07798
24	6.086	PV T	2.16e-3	4.12914	30.97053	0.00961
25	6.091	PB T	4.58e-3	9.92538	27.71576	0.02310
26	6.119	BV T	4.26e-3	9.10091	28.97225	0.02118
27	6.126	PV T	0.0141	27.47908	32.57668	0.06395
28	6.170	PV T	0.0232	392.62546	206.44955	0.91377
29	6.198	PV T	0.0102	91.08071	112.63033	0.21197
30	6.225	PV T	0.0228	334.08133	185.71898	0.77752
31	6.283	PV T	8.88e-3	65.21652	96.56254	0.15178
32	6.314	PV T	0.0239	197.15959	98.72793	0.45885
33	6.335	PB T	8.89e-3	26.22991	49.20166	0.06105
34	6.380	BV	3.17e-3	3.71033	18.26976	0.00864
35	6.384	VB	3.14e-3	6.01096	27.61016	0.01399
36	6.425	BV	0.0166	455.56226	349.02640	1.06024
37	6.470	VV	0.0226	634.22015	336.59537	1.47604
38	6.541	VV	0.0272	1012.55487	465.36148	2.35654
39	6.583	VV	0.0174	755.37225	518.35895	1.75800
40	6.608	VV	0.0194	898.82660	557.69611	2.09186
41	6.641	VV	0.0159	394.94046	300.20786	0.91916
42	6.677	VV	0.0233	1281.79541	659.68359	2.98316
43	6.750	VV	0.0241	2678.44702	1442.44080	6.23362
44	6.811	VV	4.83e-3	39.25710	103.46128	0.09136
45	6.837	VP	0.0214	303.69748	182.61375	0.70680
46	6.906	VV	0.0222	493.29712	273.58820	1.14806
47	6.943	VB	0.0169	117.77572	85.55493	0.27410
48	6.995	BV	0.0528	64.85791	14.50722	0.15095
49	7.054	VP	0.0178	138.30772	95.79289	0.32189
50	7.104	VV	0.0220	482.15775	268.33551	1.12214
51	7.148	VP	7.12e-3	32.04060	57.36877	0.07457
52	7.189	BV	0.0106	29.34761	34.25506	0.06830
53	7.211	VP	8.71e-3	9.46480	18.11350	0.02203
54	7.246	VV	0.0164	62.17200	47.08731	0.14469
55	7.267	VB	9.39e-3	17.91923	31.79909	0.04170
56	7.331	PV	0.0453	1038.75391	275.01971	2.41752
57	7.473	VV	0.0324	583.17078	219.26648	1.35723
58	7.538	VV	5.30e-3	29.65329	73.66732	0.06901
59	7.553	VB	0.0229	213.73335	110.99281	0.49743
60	7.592	BP	0.0159	55.62304	58.36544	0.12945
61	7.659	PV	0.0126	113.31270	115.96697	0.26372
62	7.675	VV	0.0162	143.24289	106.02209	0.33337
63	7.690	VB	0.0155	102.81256	81.84129	0.23928
64	7.736	PP	5.99e-3	6.62397	14.90139	0.01542
65	7.777	BV	4.97e-3	11.33712	30.25289	0.02639
66	7.785	VBA	8.24e-3	22.19863	38.98472	0.05166
Totals :				4.29678e4	2.26895e4	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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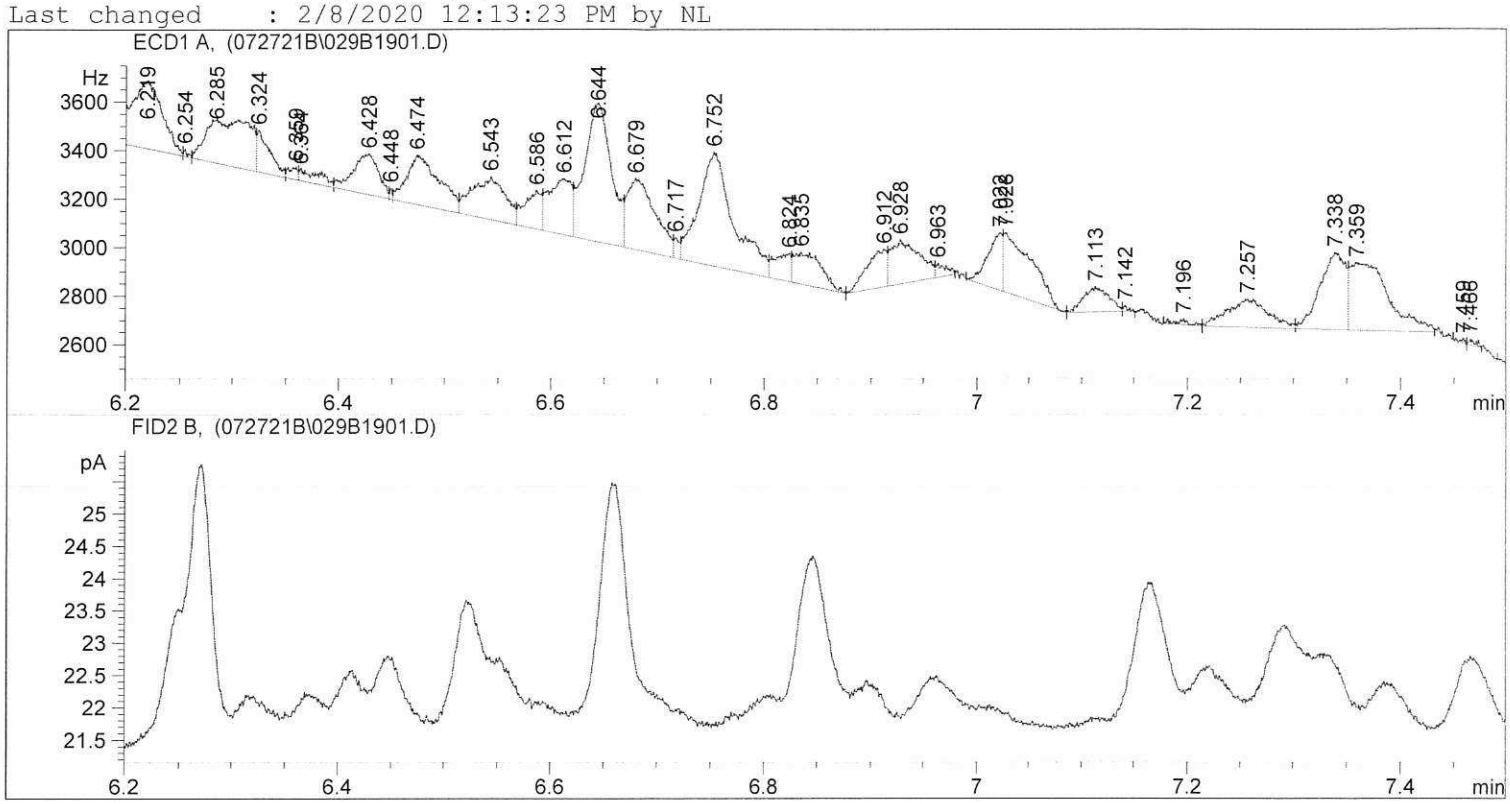
Injection Date : 7/27/2021 9:37:04 PM Seq. Line : 19
Sample Name : 21G0111 12 Location : Vial 29
Acq. Operator : DXP Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\072721B.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.220	BP	0.0164	2091.08667	1799.14563	6.93729
2	5.283	VV	0.0134	129.86043	120.46948	0.43082
3	5.308	VV	0.0120	72.22136	79.39069	0.23960
4	5.334	VV	0.0165	241.53497	175.38744	0.80131
5	5.378	VV	0.0274	1247.48169	564.15784	4.13859
6	5.418	VV	0.0166	363.98529	265.89682	1.20754
7	5.443	VV	0.0184	419.08182	275.43976	1.39033
8	5.484	VV	0.0211	1310.45215	801.46173	4.34749
9	5.515	VV	3.16e-3	51.63979	235.71616	0.17132
10	5.532	VV	0.0169	966.88599	707.60498	3.20770
11	5.558	VV	0.0209	1114.74622	679.88123	3.69823
12	5.589	VV	0.0151	506.45221	420.17072	1.68018
13	5.618	VV	0.0268	1049.09412	485.41833	3.48043
14	5.670	VV	0.0192	1113.71802	699.50562	3.69482
15	5.705	VV	0.0181	751.30676	495.53769	2.49250
16	5.737	VV	0.0135	335.94220	312.30371	1.11451
17	5.767	VV	0.0207	1385.62573	836.80835	4.59689

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	5.797	VV	7.26e-3	235.68942	412.80212	0.78191
19	5.805	VV	6.70e-3	179.81250	411.41730	0.59654
20	5.820	VV	0.0199	925.70453	565.22986	3.07107
21	5.886	VV	0.0336	2554.31934	912.92975	8.47409
22	5.952	VV	0.0206	994.17633	579.07397	3.29823
23	5.978	VV	0.0326	1418.99463	524.03363	4.70759
24	6.067	VV	0.0229	662.11426	343.25504	2.19660
25	6.094	VV	0.0195	403.84015	257.69601	1.33976
26	6.130	VV	4.47e-3	28.67487	82.22726	0.09513
27	6.167	VV	0.0277	337.22214	154.06522	1.11875
28	6.219	VV	0.0245	578.39514	282.80417	1.91886
29	6.254	VV	3.33e-3	6.94182	29.69305	0.02303
30	6.285	VV	0.0350	542.23547	183.00194	1.79889
31	6.324	VV	0.0105	142.18570	171.40875	0.47171
32	6.359	VV	7.02e-3	28.86253	52.48379	0.09575
33	6.364	VV	0.0263	71.21163	45.06172	0.23625
34	6.428	VV	0.0197	276.10657	168.65431	0.91600
35	6.448	VV	2.35e-3	6.82652	45.41605	0.02265
36	6.474	VV	0.0261	446.07352	204.31628	1.47987
37	6.543	VV	0.0252	372.83841	178.27748	1.23691
38	6.586	VV	0.0134	174.03242	158.50574	0.57736
39	6.612	VV	0.0178	340.54422	231.39861	1.12977
40	6.644	VV	0.0222	994.68915	568.49017	3.29993
41	6.679	VV	0.0220	540.48431	291.76169	1.79309
42	6.717	VV	4.67e-3	28.08331	84.63049	0.09317
43	6.752	VV	0.0267	1059.74536	469.28928	3.51576
44	6.824	VV	0.0127	121.80369	117.13511	0.40409
45	6.835	VP	0.0216	240.13864	132.08632	0.79667
46	6.912	VV	0.0166	206.55051	154.74358	0.68524
47	6.928	VV	0.0222	330.23355	181.42699	1.09557
48	6.963	VB	0.0109	37.33722	57.30696	0.12387
49	7.022	PV	0.0122	224.94641	234.36519	0.74627
50	7.028	VP	0.0234	470.51535	244.83150	1.56096
51	7.113	VV	0.0197	169.21724	102.23509	0.56139
52	7.142	VP	3.60e-3	5.47629	22.81834	0.01817
53	7.196	PP	8.30e-3	16.51745	24.38395	0.05480
54	7.257	VV	0.0312	306.33646	115.98289	1.01629
55	7.338	VV	0.0203	524.35486	315.60052	1.73957
56	7.359	VB	0.0300	692.23981	276.54785	2.29654
57	7.459	PP	4.08e-3	3.59249	15.65427	0.01192
58	7.466	VB	5.50e-3	11.02615	25.23609	0.03658
59	7.508	PV	7.20e-3	13.63438	24.09216	0.04523
60	7.532	VV	5.95e-3	11.86578	25.85510	0.03937
61	7.555	VB	0.0231	118.95324	61.60113	0.39463
62	7.670	PV	0.0218	137.04089	81.64256	0.45464
Totals :				3.01427e4	1.85758e4	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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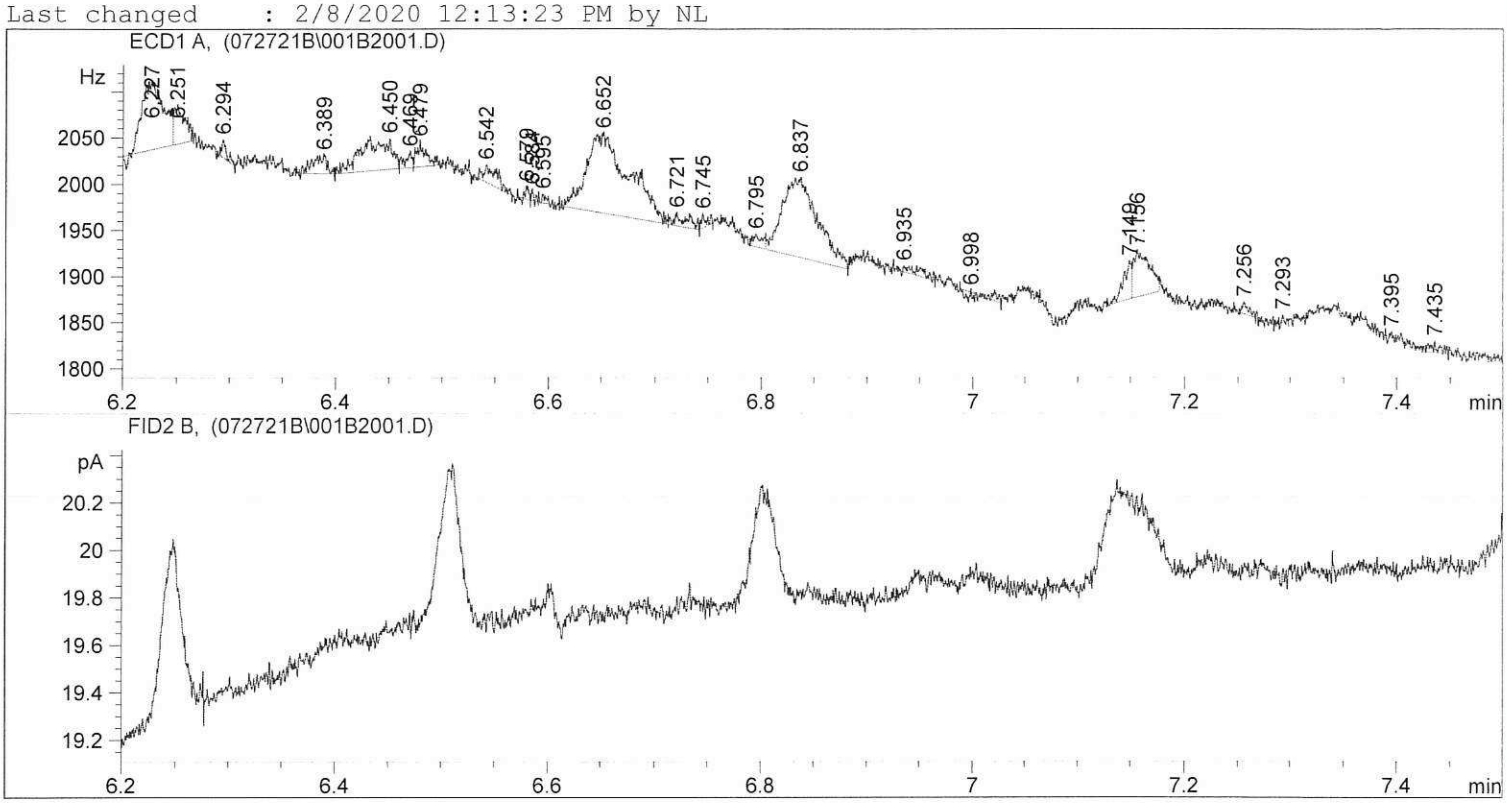
Injection Date : 7/27/2021 9:48:18 PM Seq. Line : 20
Sample Name : DCM Location : Vial 1
Acq. Operator : DXP Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\072721B.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.222	PP	0.0138	24.72971	29.84751	0.41889
2	5.294	VV	0.0316	294.89990	111.57254	4.99528
3	5.337	VV	0.0208	483.82541	284.61826	8.19547
4	5.395	VV	0.0282	669.23016	281.18451	11.33603
5	5.467	VV	0.0248	215.66441	109.56435	3.65312
6	5.503	VV	0.0209	279.72952	160.65353	4.73831
7	5.547	VV	0.0218	441.17606	247.60217	7.47304
8	5.597	VB	0.0194	96.22537	59.79499	1.62995
9	5.726	PV	0.0193	89.05319	60.83791	1.50846
10	5.790	VB	0.0312	2126.80493	918.52234	36.02575
11	5.888	BV	0.0140	75.27812	65.62785	1.27513
12	5.926	VV	0.0214	77.28292	43.81893	1.30909
13	5.948	VV	0.0161	96.78728	75.61873	1.63947
14	5.969	VB	0.0110	29.88965	33.54138	0.50630
15	6.003	PB	6.31e-3	9.91718	20.25124	0.16799
16	6.049	BB	0.0130	40.67244	38.18601	0.68895
17	6.100	PP	0.0107	16.26494	20.03691	0.27551

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.170	BB	6.97e-3	7.46700	13.66702	0.12648
19	6.227	PV	0.0159	99.81109	75.26207	1.69069
20	6.251	VB	0.0118	29.23334	41.19187	0.49518
21	6.294	BP	5.11e-3	5.84342	19.05993	0.09898
22	6.389	PP	0.0120	19.35558	19.82889	0.32786
23	6.450	VV	0.0236	64.91418	32.88477	1.09958
24	6.469	VV	5.95e-3	7.50223	16.98874	0.12708
25	6.479	VB	0.0107	17.25987	26.83467	0.29236
26	6.542	BP	0.0114	17.03729	18.69601	0.28859
27	6.579	BP	3.63e-3	3.02615	13.43027	0.05126
28	6.584	VB	2.60e-3	2.05715	11.97537	0.03485
29	6.595	BB	3.69e-3	2.37208	8.95624	0.04018
30	6.652	BB	0.0330	236.87270	85.71488	4.01236
31	6.721	BP	0.0108	12.26747	13.98587	0.20780
32	6.745	VB	4.56e-3	5.17737	15.26644	0.08770
33	6.795	PB	8.29e-3	8.25798	13.57947	0.13988
34	6.837	BP	0.0277	197.57527	86.22264	3.34671
35	6.935	BP	0.0166	8.77810	6.40663	0.14869
36	6.998	PP	0.0000	8.29785e-1	1.88043	0.01406
37	7.149	PV	6.88e-3	21.18432	40.66356	0.35884
38	7.156	VB	0.0125	50.59840	49.62685	0.85708
39	7.256	BP	6.53e-3	6.12456	12.05257	0.10374
40	7.293	PB	1.66e-3	5.88870e-1	8.03233	0.00997
41	7.395	PB	2.57e-3	1.11941	6.02754	0.01896
42	7.435	PP	7.26e-3	6.24159	12.00893	0.10573
43	7.562	BP	4.62e-3	3.83945	12.37402	0.06504
44	7.651	PP	0.0000	8.02333e-1	7.53221	0.01359
Totals :				5903.56821	3231.42938	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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Injection Date  : 7/27/2021 9:59:16 PM          Seq. Line :  21
Sample Name     : HEXANE                         Location : Vial 2
Acq. Operator   : DXP                                 Inj :   1
                                               Inj Volume : 1 µl
Sequence File   : C:\HPCHEM\2\SEQUENCE\072721B.S
Method          : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed    : 2/8/2020 12:13:23 PM by NL
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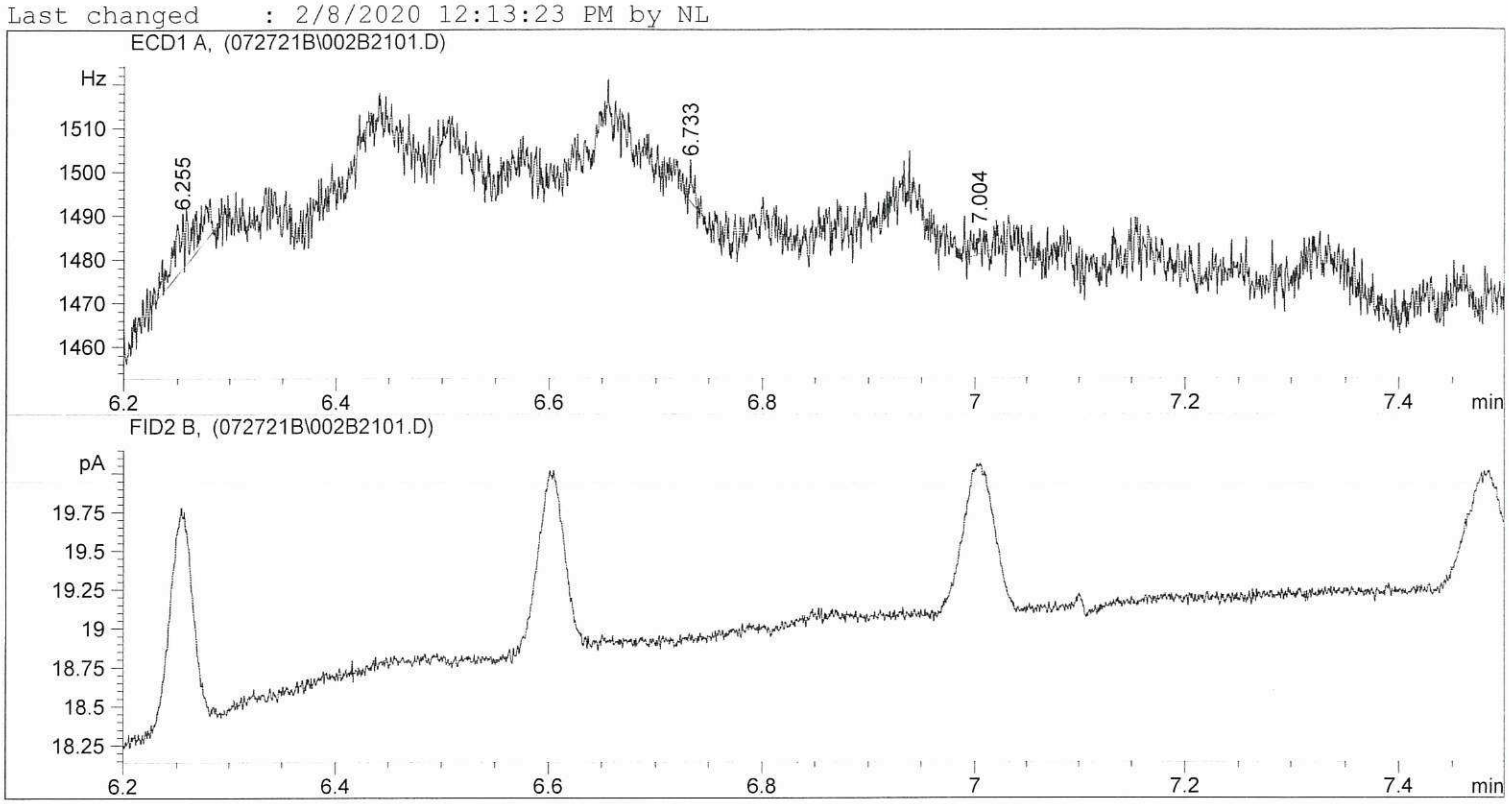


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==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
```

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.335	PP	0.0176	79.62646	58.73872	15.90747
2	5.395	VP	0.0250	148.10878	75.88604	29.58861
3	5.499	PP	0.0164	49.84707	38.74892	9.95826
4	5.545	VV	0.0196	135.32184	83.25874	27.03408
5	5.593	VP	0.0159	22.60498	17.00168	4.51594
6	5.975	BV	0.0180	37.55296	25.53023	7.50219
7	6.255	BB	0.0181	16.91022	12.23493	3.37826
8	6.733	BB	3.37e-3	1.85101	9.16045	0.36979
9	7.004	PP	7.10e-3	3.06579	5.50354	0.61247
10	7.529	BP	2.66e-3	7.47361e-1	4.22314	0.14930
11	7.777	BB	4.66e-3	2.95017	8.47465	0.58937
12	7.797	PV	3.23e-3	1.97349	9.72441	0.39426
Totals :				500.56015	348.48546	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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Injection Date  : 7/27/2021 10:10:28 PM          Seq. Line :  22
Sample Name     : CS4 STD                         Location : Vial 27
Acq. Operator   : DXP                                  Inj :   1
                                                Inj Volume : 1 µl
Sequence File   : C:\HPCHEM\2\SEQUENCE\072721B.S
Method          : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed    : 2/8/2020 12:13:23 PM by NL
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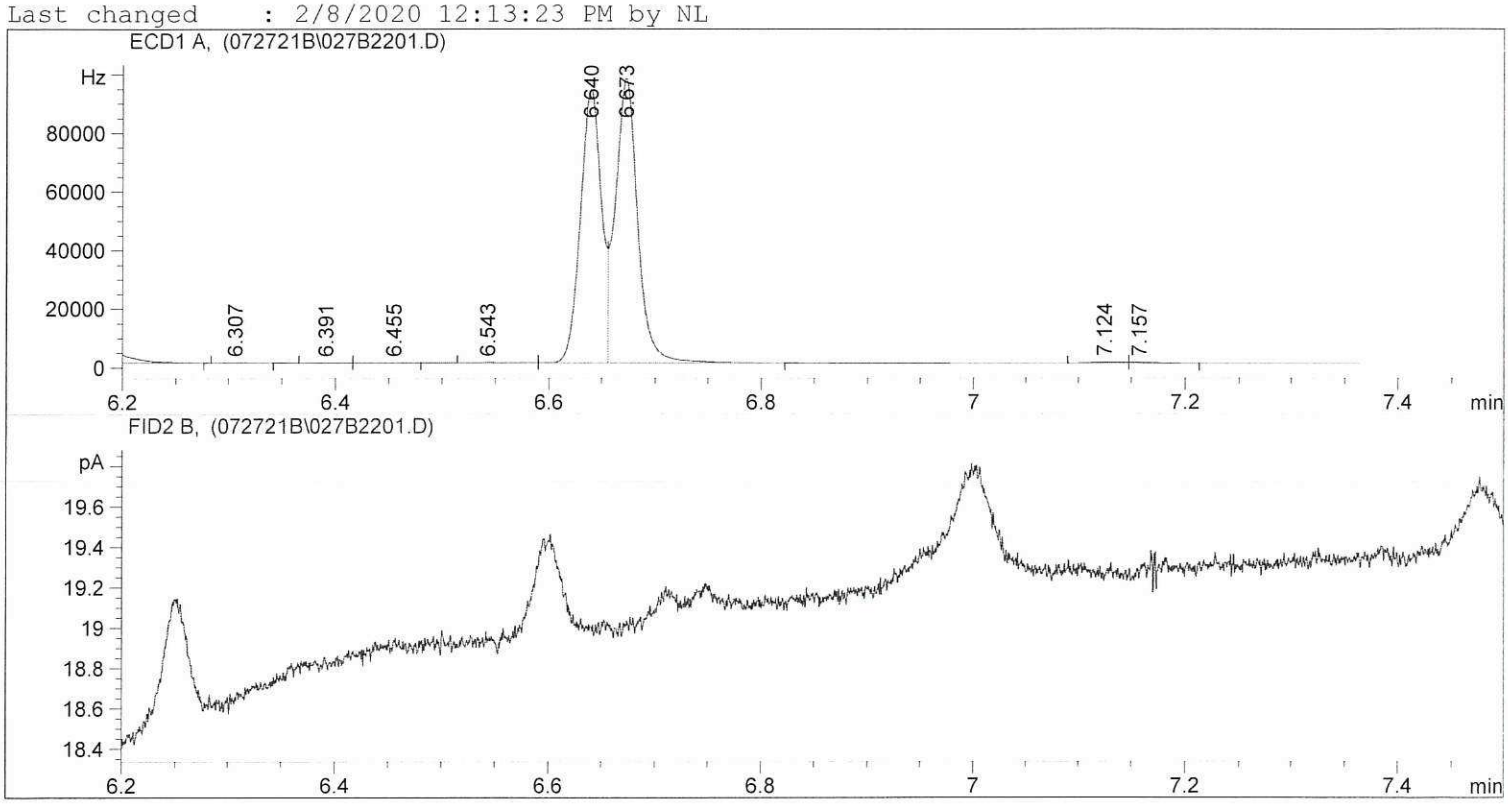


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==================================================================
                        Area Percent Report
==================================================================

Sorted By             :      Signal
Multiplier            :      1.0000
Dilution              :      1.0000
```

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.214	BP	0.0154	287.26846	284.07742	0.02629
2	5.350	PV	0.0218	91.75556	50.57895	0.00840
3	5.391	VP	0.0230	120.21902	62.63607	0.01100
4	5.493	VV S	0.0246	1.51375e5	8.48982e4	13.85092
5	5.593	VV S	0.0378	2.43192e5	1.07219e5	22.25223
6	5.650	VV S	0.0197	8.81235e4	7.46071e4	8.06336
7	5.696	VV S	0.0226	8.35164e4	6.16302e4	7.64182
8	5.805	VV S	0.0307	580.45850	315.24149	0.05311
9	5.849	VB S	0.0259	237.84949	140.87323	0.02176
10	5.937	BP S	0.0179	8.89241e4	7.65680e4	8.13662
11	6.088	VV S	0.0182	7.89388e4	6.66882e4	7.22296
12	6.168	VB S	0.0224	8.39032e4	6.24154e4	7.67720
13	6.307	BB	0.0160	201.59216	150.46913	0.01845
14	6.391	PV	0.0195	143.90004	88.76994	0.01317
15	6.455	VV	0.0288	297.24637	122.22919	0.02720
16	6.543	BV	0.0365	506.89319	167.67500	0.04638
17	6.640	VV S	0.0208	1.29091e5	9.31497e4	11.81189

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.673	VB S	0.0244	1.41875e5	9.69095e4	12.98164
19	7.124	BV	0.0249	530.34882	258.92282	0.04853
20	7.157	VB	0.0236	431.35303	216.85400	0.03947
21	7.624	PP	5.11e-3	3.75243	9.29118	0.00034
22	7.698	BP	0.0281	516.67883	223.73053	0.04728
Totals :				1.09289e6	7.26176e5	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Organic Extractions Laboratory Analyst Notes

Extraction Parameter: Dioxin Extraction Batch: BJG0572

Total Solids Batch: BJG0275 Work Order(s): 21G0082, 21G0016, 21G0038, 21G0090, 21G0081, 21G0079, 21G0064, 21G0094

Screens: Soil/Sediment/Solid/Other:	Analyst/Date
☒ No Anomalies (standard soil/wet sediment/sand/gravel)= 0081-3, 0064-10 0082-12,13	DLP 7/13/21
☒ Standing Water Decanted (Not shared)= 0094-7,8,10 0082-12,13 0090-3	DLP 7/13/21
☐ Standing Water Homogenized (Shared samples)=	
☒ Clay/Clumps (Difficult to homogenize)= 0094-15 0090-1,2	DLP 7/13/21
☒ Rocks (%+size)? 20%, 1/3" = 0079-10 40%, 1/3" = 0090-01 40%, 1/2" = 0038-1	DLP 7/13/21
☒ Organics (Leaves/sticks/grass)= 0090-2,3 0016-3,1	DLP 7/13/21
☐ Oily, obvious fuel/sulfur odors=	
☐ Received in 32oz jar(s)=Homogenized in Pyrex dish=	
☐ Previously Frozen =	
☒ Other (Details)= Also decanted = 0016-3,2,1, 0038-1	DLP 7/13/21
Also Rocks 80%, 1/4" - 1/2" = 0016-2	
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).	
☐ Share Samples Y / N	
☐ Multiple Jars Y / N	
☐ Sample Pre-Screens indicate analyte activity=	
☐ Sample weights/volumes reduced based on Pre-Screen=	

3056F

Revision 15
07/01/19

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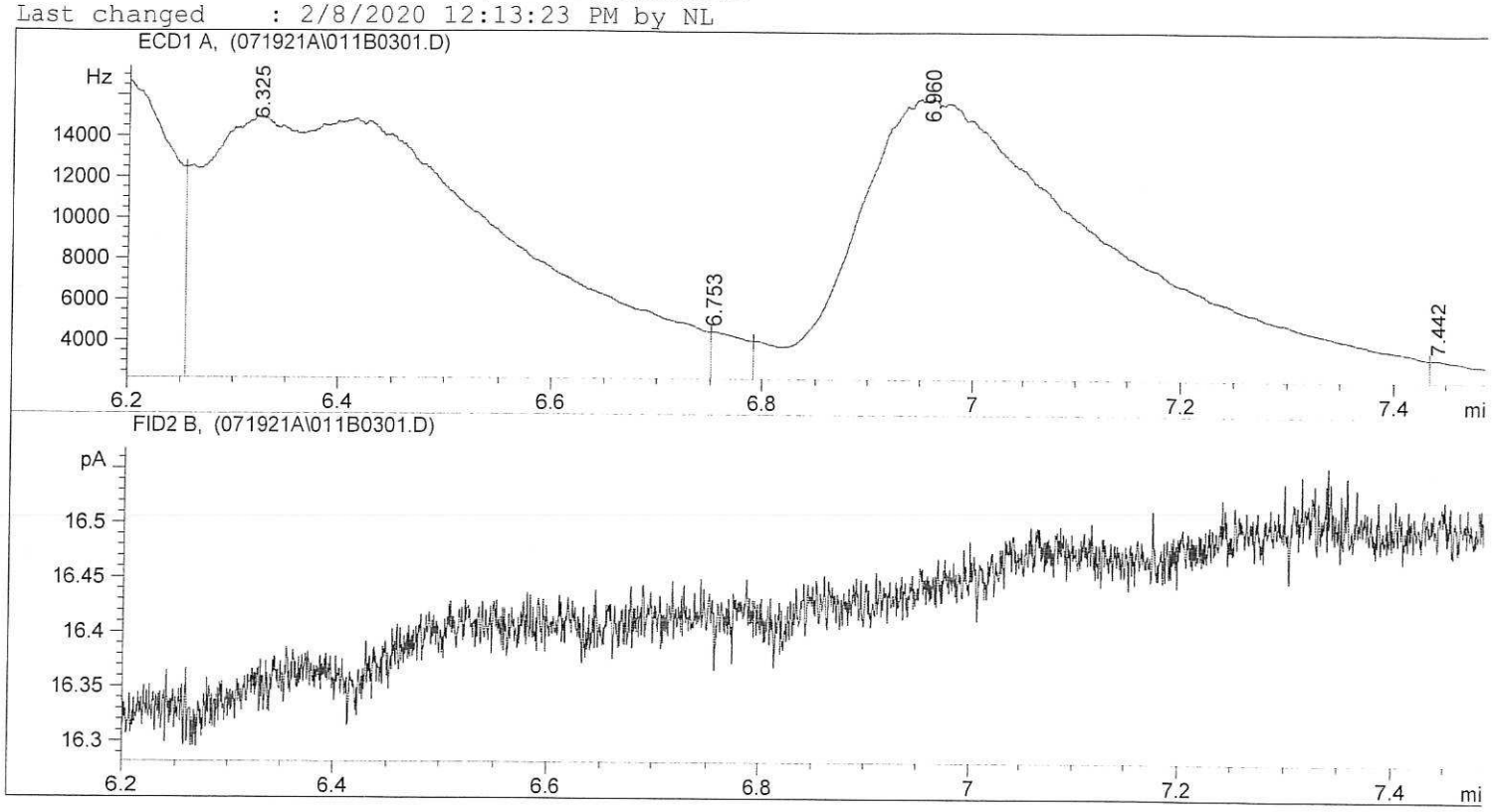
Injection Date : 7/19/2021 12:23:29 PM
Sample Name : CS4 STANDARD
Acq. Operator : DXP

Seq. Line : 3
Location : Vial 11
Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\071921A.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.358	BV S	0.1595	1.88971e5	1.39799e4	12.93533
2	5.814	VV S	0.1389	4.42181e5	3.85208e4	30.26789
3	5.931	VV S	0.1147	1.80123e5	2.61784e4	12.32969
4	6.155	VV S	0.1289	1.45347e5	1.87985e4	9.94921
5	6.325	VV S	0.2652	2.55098e5	1.30479e4	17.46180
6	6.753	VV S	0.0376	5608.57178	2488.57178	0.38391
7	6.960	VV S	0.2103	2.37435e5	1.38783e4	16.25273
8	7.442	VB S	0.0890	6127.49854	1148.05322	0.41944
Totals :				1.46089e6	1.28040e5	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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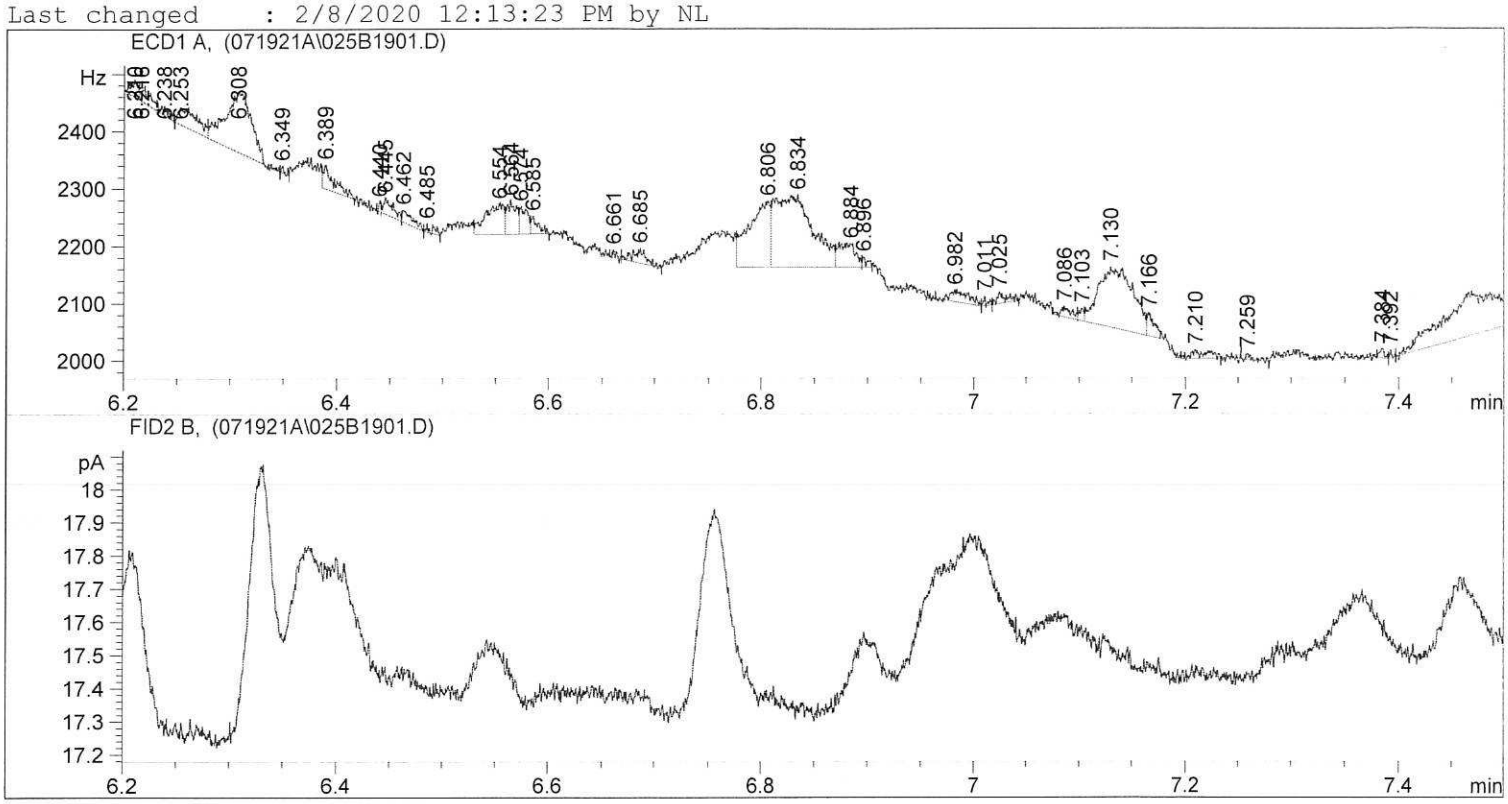
Injection Date : 7/19/2021 3:21:42 PM Seq. Line : 19
Sample Name : 21G0090 01 Location : Vial 25
Acq. Operator : DXP Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\071921A.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.213	PB	7.90e-3	7.93644	13.03968	0.13141
2	5.250	PV	6.58e-3	10.45406	20.38582	0.17310
3	5.284	VV	0.0203	281.19806	166.34059	4.65602
4	5.314	VV	8.61e-3	37.24291	54.22322	0.61666
5	5.330	VV	8.15e-3	32.24635	54.13249	0.53393
6	5.348	VV	9.70e-3	33.27921	42.64870	0.55103
7	5.363	VV	8.61e-3	24.82605	38.05644	0.41107
8	5.383	VP	7.62e-3	7.40227	17.20900	0.12257
9	5.430	VV	0.0165	69.05965	50.80451	1.14348
10	5.441	VV	4.38e-3	10.98007	32.14794	0.18181
11	5.452	VV	7.21e-3	24.22840	42.79375	0.40117
12	5.466	VV	0.0110	40.50069	45.63710	0.67060
13	5.591	VV	0.0525	654.02167	147.05173	10.82917
14	5.634	VB	6.97e-3	24.37293	46.07681	0.40356
15	5.664	BV	7.61e-3	18.75975	31.21556	0.31062
16	5.683	VV	0.0106	34.41795	40.84446	0.56989
17	5.692	VB	9.51e-3	25.85926	36.28423	0.42817

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	5.708	BB	9.28e-3	22.83590	30.00319	0.37811
19	5.781	PV	0.0176	70.66402	52.17667	1.17004
20	5.834	VV	0.0339	301.49249	107.67611	4.99206
21	5.878	VV	0.0190	209.07115	132.48547	3.46176
22	5.903	VV	0.0215	192.51805	116.27868	3.18768
23	5.958	VV	0.0309	296.06384	114.07873	4.90217
24	6.029	VV	0.0286	456.88171	190.25249	7.56496
25	6.067	VV	0.0360	619.72919	206.51688	10.26136
26	6.130	VV	6.43e-3	14.93153	32.06627	0.24723
27	6.142	VB	5.63e-3	9.36379	22.59963	0.15504
28	6.210	BV	5.47e-3	12.10014	30.20107	0.20035
29	6.216	VB	6.55e-3	18.55966	35.19643	0.30731
30	6.238	BP	7.58e-3	7.63320	16.79288	0.12639
31	6.253	VB	0.0173	43.18657	30.25745	0.71508
32	6.308	BP	0.0206	177.15778	103.55164	2.93335
33	6.349	VV	2.83e-3	2.18016	11.41999	0.03610
34	6.389	BB	8.96e-3	28.80242	41.18346	0.47691
35	6.440	PV	2.04e-3	1.94373	15.73781	0.03218
36	6.445	VV	8.32e-3	18.41404	27.82904	0.30490
37	6.462	VP	9.00e-3	15.03328	20.88302	0.24892
38	6.485	BP	6.63e-3	5.45424	13.71520	0.09031
39	6.554	BV	0.0152	64.43732	51.52742	1.06694
40	6.564	VV	7.60e-3	35.11895	56.94324	0.58149
41	6.574	VV	6.80e-3	25.13737	47.30344	0.41622
42	6.585	VP	6.08e-3	13.81615	30.53344	0.22877
43	6.661	PB	3.02e-3	2.49354	13.08764	0.04129
44	6.685	BP	0.0104	20.30033	25.13256	0.33613
45	6.806	BV	0.0178	162.72771	114.63170	2.69441
46	6.834	VV	0.0303	307.30923	124.93031	5.08837
47	6.884	VV	0.0143	46.14563	40.36612	0.76407
48	6.896	VB	4.48e-3	5.73278	17.22226	0.09492
49	6.982	PP	0.0146	24.00928	19.74546	0.39754
50	7.011	VP	2.93e-3	3.42352	15.79028	0.05669
51	7.025	VP	7.25e-3	10.74445	18.86387	0.17790
52	7.086	PB	9.16e-3	12.20721	18.34537	0.20212
53	7.103	BV	4.02e-3	6.38832	21.81685	0.10578
54	7.130	VV	0.0280	239.12952	104.96659	3.95946
55	7.166	VB	6.00e-3	17.84466	40.04891	0.29547
56	7.210	PP	0.0123	15.00742	14.75355	0.24849
57	7.259	BP	4.96e-3	3.60593	10.11953	0.05971
58	7.384	BP	3.95e-3	4.44209	16.46971	0.07355
59	7.392	VB	1.98e-3	1.60667	13.54542	0.02660
60	7.509	BV	0.0665	306.90027	54.35249	5.08160
61	7.550	VV	0.0187	81.05553	51.56010	1.34210
62	7.564	VP	5.22e-3	10.57601	27.94369	0.17512
63	7.576	VP	3.56e-3	2.54153	11.56657	0.04208
64	7.653	VV	0.0356	341.37418	119.13965	5.65241
65	7.677	VV	4.17e-3	28.70809	99.36106	0.47534
66	7.682	VV	7.29e-3	53.55951	90.69325	0.88683
67	7.693	VV	3.67e-3	22.25099	84.65263	0.36843
68	7.722	VV	0.0327	310.04803	113.24902	5.13372
Totals :				6039.44485	3698.45624	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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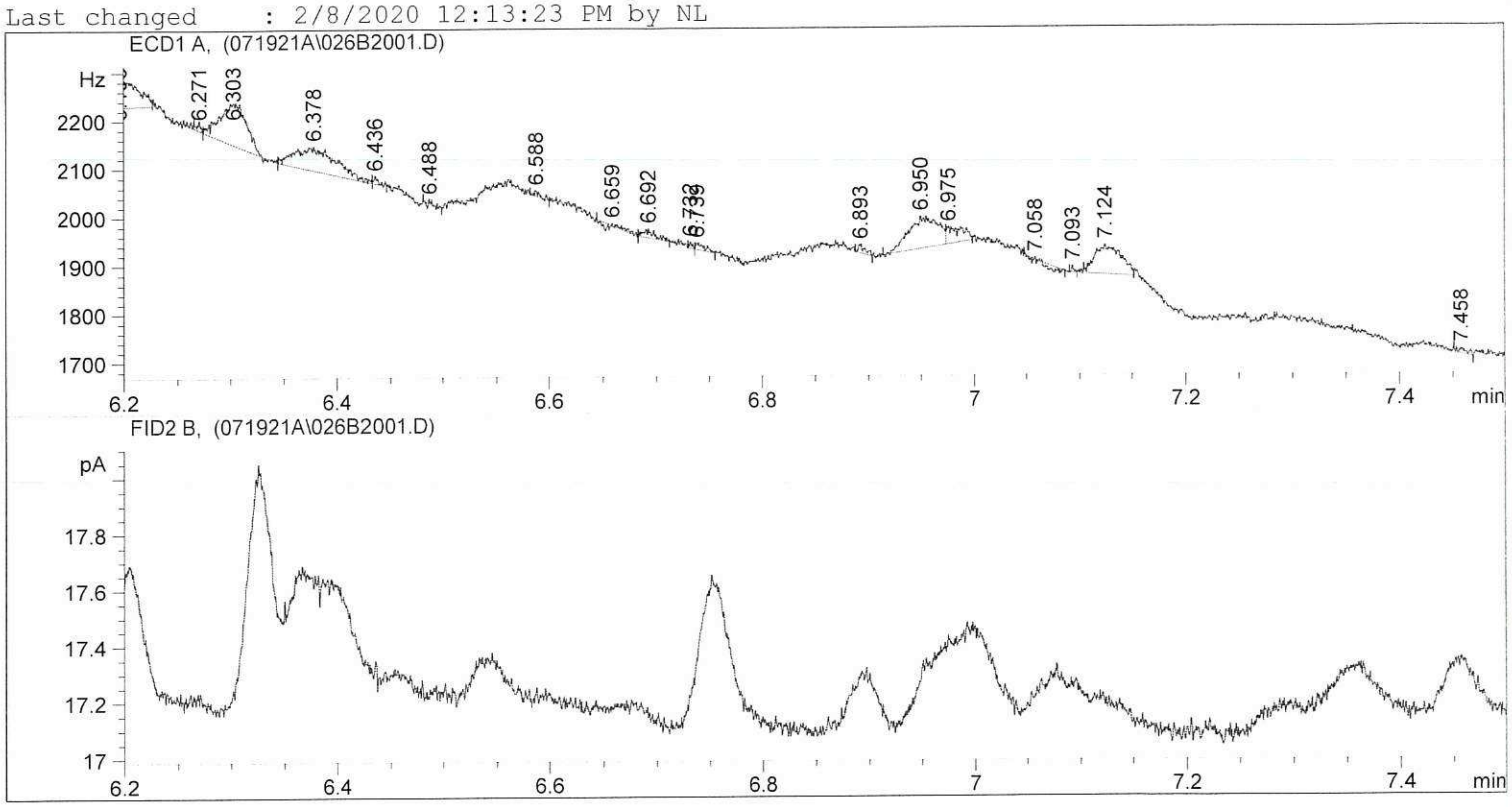
Injection Date : 7/19/2021 3:32:54 PM Seq. Line : 20
Sample Name : 21G0090 02 Location : Vial 26
Acq. Operator : DXP Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\071921A.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.280	PP	0.0195	210.64204	132.67976	2.07387
2	5.442	VV	0.0857	964.38263	132.15565	9.49479
3	5.549	VV	0.0366	416.17862	137.01579	4.09747
4	5.591	VB	0.0297	385.46420	154.70862	3.79507
5	5.659	BV	0.0170	115.66422	85.40434	1.13877
6	5.691	VV	0.0227	371.08884	196.02113	3.65354
7	5.707	VV	8.61e-3	103.24654	199.75369	1.01651
8	5.725	VV	9.52e-3	140.91273	193.04068	1.38735
9	5.818	VV	0.0614	1666.14307	319.78375	16.40394
10	5.840	VV	0.0103	241.03152	297.25906	2.37307
11	5.870	VV	0.0335	930.31500	333.79898	9.15937
12	5.909	VB	0.0119	249.17441	252.73441	2.45324
13	5.930	BV	0.0103	201.69287	243.36298	1.98576
14	5.953	VV	0.0297	608.29333	249.10851	5.98892
15	5.986	VV	7.88e-3	130.73909	203.94888	1.28719
16	6.022	VV	0.0242	663.53485	330.49805	6.53280
17	6.058	VV	0.0629	1986.70386	372.10834	19.56000

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.196	VB	0.0180	88.56069	59.90915	0.87192
19	6.271	BP	4.01e-3	4.62781	19.25656	0.04556
20	6.303	VP	0.0205	151.05513	87.75513	1.48721
21	6.378	VB	0.0325	130.91473	49.76561	1.28892
22	6.436	BB	5.24e-3	4.66816	14.85880	0.04596
23	6.488	PP	0.0000	7.54899e-1	6.46923	0.00743
24	6.588	PP	4.40e-3	3.53062	10.85373	0.03476
25	6.659	PP	0.0000	1.33142	4.33996	0.01311
26	6.692	VB	0.0105	12.58301	18.69039	0.12389
27	6.732	PP	2.42e-3	2.20275	12.75143	0.02169
28	6.739	VP	7.50e-3	7.65332	12.57021	0.07535
29	6.893	PP	6.03e-3	7.40973	17.19380	0.07295
30	6.950	BV	0.0215	119.39222	66.55025	1.17547
31	6.975	VB	0.0127	35.41662	34.59644	0.34869
32	7.058	PP	0.0000	9.41404	2.88435	0.09269
33	7.093	PB	2.40e-3	1.97808	12.82934	0.01948
34	7.124	BB	0.0214	103.51402	60.51806	1.01914
35	7.458	BP	8.30e-3	6.17839	10.15488	0.06083
36	7.606	PV	0.0135	14.72621	13.13364	0.14499
37	7.651	VP	0.0198	49.44629	30.02289	0.48682
38	7.795	PBA	0.0135	16.40496	15.03355	0.16151

Totals : 1.01570e4 4393.52001

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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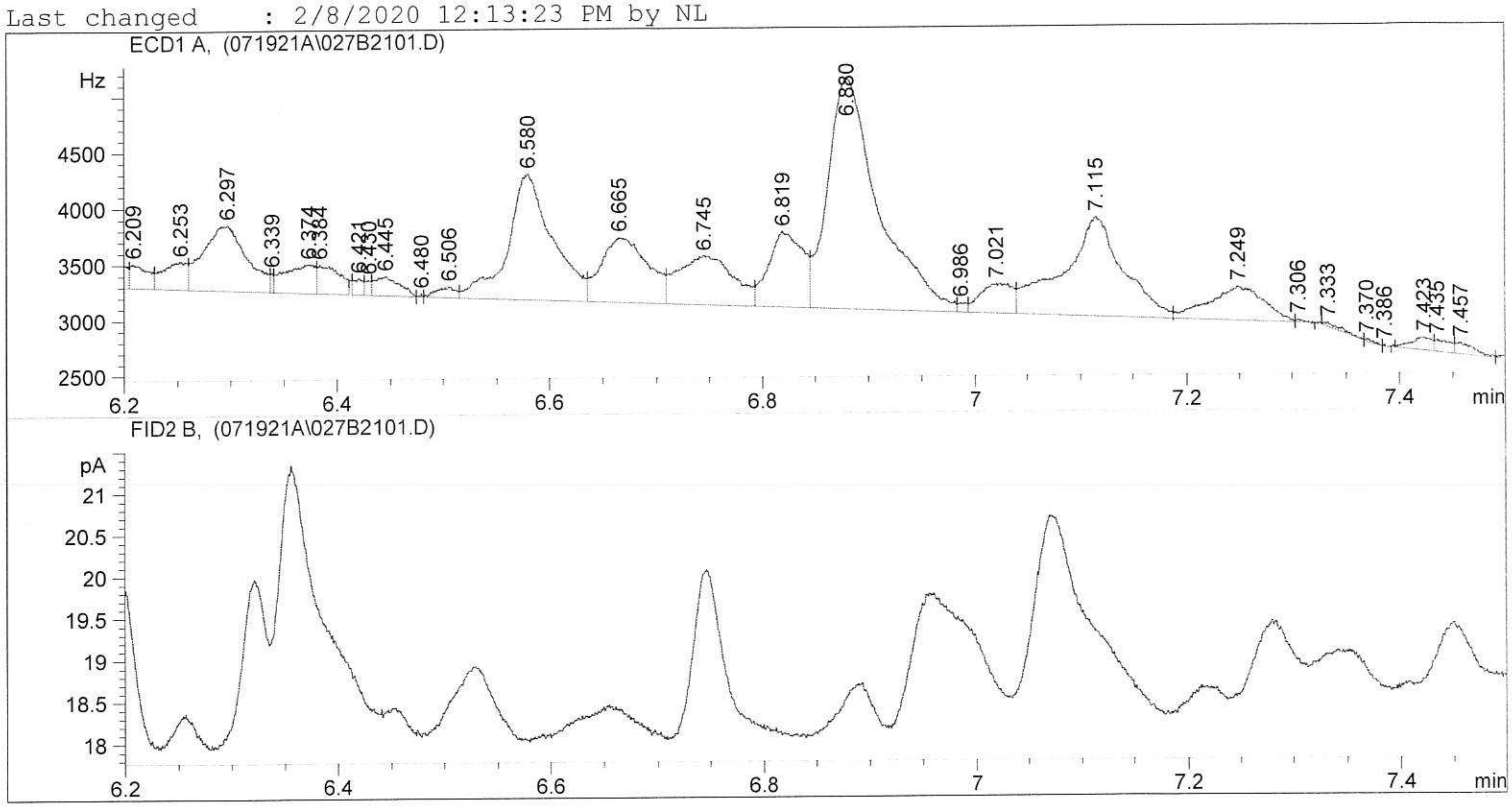
*** End of Report ***

Injection Date : 7/19/2021 3:44:08 PM
Sample Name : 21G0090 03
Acq. Operator : DXP

Seq. Line : 21
Location : Vial 27
Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\071921A.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



Area Percent Report

Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.226	PV	5.60e-3	42.62638	103.42541	0.06595
2	5.234	VV	6.10e-3	65.96468	139.87999	0.10206
3	5.269	VV	0.0181	1394.40894	1052.35876	2.15747
4	5.314	VV	0.0288	2319.00537	958.99463	3.58804
5	5.362	VV	0.0214	1277.51868	711.14417	1.97662
6	5.394	VV	0.0211	851.32214	478.87756	1.31719
7	5.429	VV	0.0243	781.82190	394.39899	1.20966
8	5.476	VP	0.0148	244.24324	200.16145	0.37790
9	5.539	VV	0.0277	795.56488	344.92325	1.23092
10	5.581	VV	0.0252	1473.49194	741.73999	2.27983
11	5.654	VV	0.0326	2044.84644	741.04944	3.16385
12	5.707	VV	0.0271	1553.31372	678.89514	2.40334
13	5.760	VV	0.0339	4512.09717	1601.26392	6.98126
14	5.829	VV	0.0383	4729.04639	1472.20581	7.31693
15	5.896	VV	0.0194	905.61713	627.18463	1.40120
16	5.943	VV	0.0326	2979.19629	1084.98572	4.60951
17	6.006	VV	0.0417	8495.84082	2484.76147	13.14503

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
18	6.055	VV	0.0269	2405.10791	1065.84985	3.72126
19	6.121	VV	0.0398	2345.47241	712.77167	3.62899
20	6.192	VV	0.0110	212.93758	238.82401	0.32946
21	6.209	VV	0.0145	242.73549	213.31181	0.37557
22	6.253	VV	0.0198	401.96481	246.58026	0.62193
23	6.297	VV	0.0343	1686.84741	584.42578	2.60994
24	6.339	VV	2.72e-3	31.75148	174.87076	0.04913
25	6.374	VV	0.0247	519.81317	256.12955	0.80427
26	6.384	VB	0.0173	370.45789	255.34071	0.57318
27	6.421	BV	8.25e-3	93.37473	146.28470	0.14447
28	6.430	VV	4.83e-3	49.20563	135.72989	0.07613
29	6.445	VP	0.0196	275.21188	171.12285	0.42582
30	6.480	VV	2.03e-3	3.18489	26.06312	0.00493
31	6.506	VV	0.0145	115.83183	97.29163	0.17922
32	6.580	VV	0.0351	3295.52124	1119.58276	5.09893
33	6.665	VV	0.0364	1761.51306	580.17041	2.72547
34	6.745	VV	0.0434	1588.58276	434.79514	2.45790
35	6.819	VV	0.0271	1530.14233	672.95673	2.36748
36	6.880	VV	0.0396	6852.14990	2071.81348	10.60186
37	6.986	VV	7.29e-3	49.03211	85.48436	0.07586
38	7.021	VV	0.0276	581.72748	263.19650	0.90007
39	7.115	VV	0.0468	3484.59595	882.87683	5.39148
40	7.249	VV	0.0425	1082.11279	302.45093	1.67428
41	7.306	VP	4.42e-3	8.74681	26.68492	0.01353
42	7.333	BP	0.0139	43.28860	37.97786	0.06698
43	7.370	VP	9.49e-3	12.37422	21.72529	0.01915
44	7.386	VB	2.16e-3	1.88892	14.13896	0.00292
45	7.423	BV	0.0164	156.41335	122.01020	0.24201
46	7.435	VB	0.0124	111.06441	109.53170	0.17184
47	7.457	BP	0.0150	126.57831	105.60688	0.19585
48	7.545	VV	0.0247	361.43518	176.52304	0.55922
49	7.557	VP	0.0159	218.22379	176.01572	0.33764
50	7.641	BP	0.0234	129.01700	65.32184	0.19962
51	7.680	VP	8.77e-3	17.34742	24.77788	0.02684
Totals :				6.46316e4	2.54345e4	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

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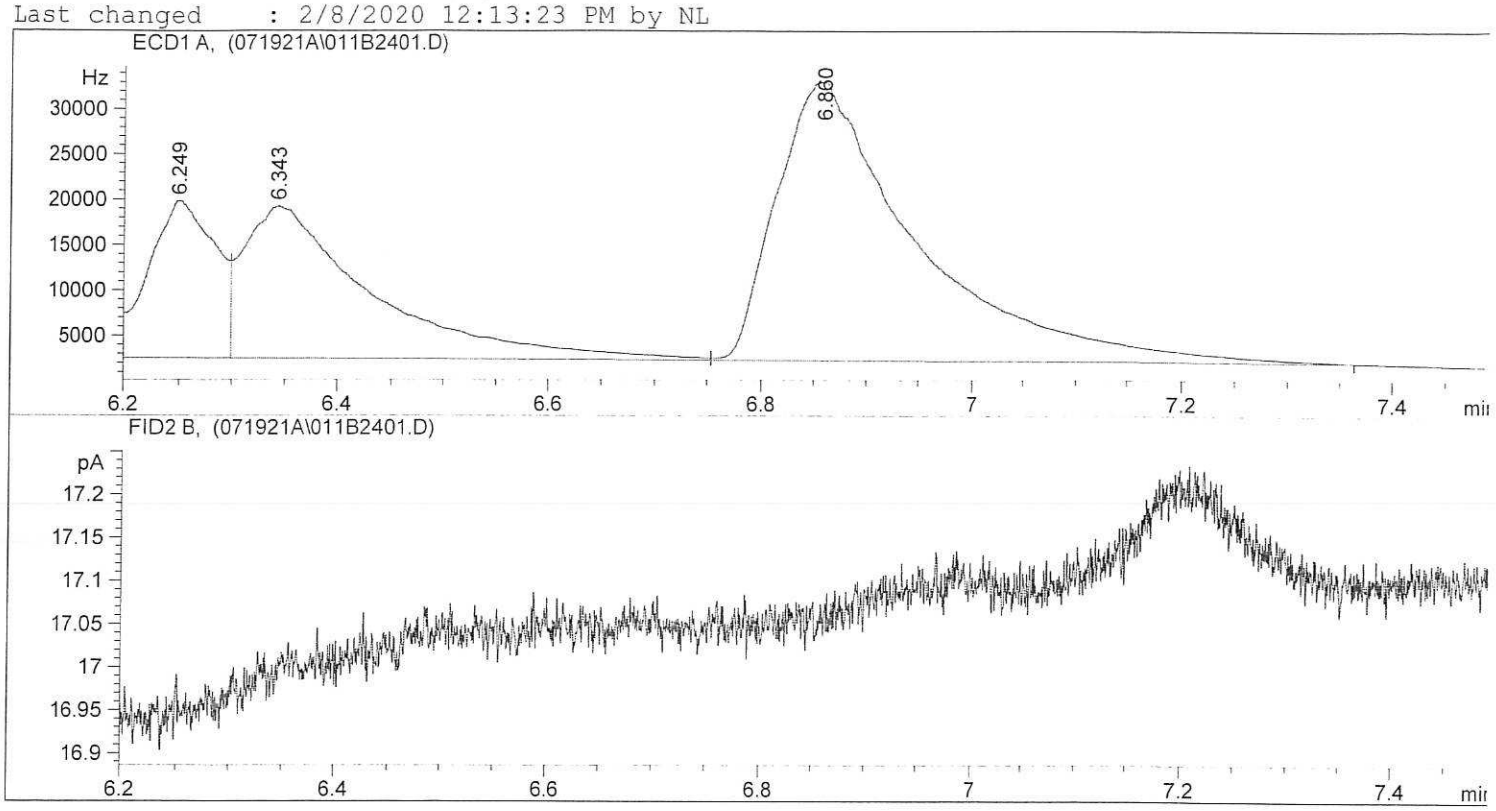
Injection Date : 7/19/2021 4:17:24 PM
Sample Name : CS4 STANDARD
Acq. Operator : DXP

Seq. Line : 24
Location : Vial 11
Inj : 1
Inj Volume : 1 µl

Sequence File : C:\HPCHEM\2\SEQUENCE\071921A.S
Method : C:\HPCHEM\2\METHODS\DIOXIN.M
Last changed : 2/8/2020 12:13:23 PM by NL



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Area Percent Report

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Sorted By : Signal
Multiplier : 1.0000
Dilution : 1.0000

Signal 1: ECD1 A,

Peak #	RetTime [min]	Type	Width [min]	Area [Hz*s]	Height [Hz]	Area %
1	5.280	BP S	0.1000	6.50142e4	1.08333e4	5.00116
2	5.648	PV S	0.0430	1.10667e5	3.08896e4	8.51297
3	5.737	VV S	0.0720	2.25498e5	5.22010e4	17.34623
4	5.797	VV S	0.0502	1.09636e5	3.64187e4	8.43367
5	5.855	VV S	0.1099	1.74415e5	2.64404e4	13.41667
6	6.088	VV S	0.0617	1.17263e5	2.24787e4	9.02033
7	6.249	PV S	0.0515	7.37679e4	1.73288e4	5.67453
8	6.343	VV S	0.1391	1.40215e5	1.67973e4	10.78589
9	6.860	PB S	0.1078	2.83506e5	3.08610e4	21.80842
10	7.504	PB	2.43e-3	1.62613	10.37042	0.00013
Totals :				1.29998e6	2.44259e5	

Results obtained with enhanced integrator!

Signal 2: FID2 B,

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*** End of Report ***

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BATCH SUMMARY

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Cleanup Batch:	CJH0044	Cleanup Type:	Sulfuric Acid
Cleanup Method:	EPA 3665A Sulfuric Acid Cleanup	Analysis:	EPA 1613B

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS603	21G0111-06	21081909	08/02/2021	
LDW21-SS661	21G0111-12	21081910	08/02/2021	
Duplicate	BJG0572-DUP1	21081908	08/02/2021	
Reference	BJG0572-SRM1	21081907	08/02/2021	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BENCH SHEET

CJH0044

Matrix: Solid **Cleanup using: HRGCMS - EPA 3665A Sulfuric Acid Cleanup** **Printed: 8/5/2021 10:18:53AM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
21G0111-12	A	LDW21-SS661	A 01	20	20	1613B Dioxin	8/2/2021	NPL	
21G0111-06	A	LDW21-SS603	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21F0410-02	A	BGDZ7	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21F0410-03	A	BGE06	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21G0090-01	A	BGE92	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21G0111-06	A	LDW21-SS603	A 01	20	20	1613B Dioxin	8/2/2021	NPL	
21F0399-04	A	BGDX9	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21F0399-05	A	BGDR4	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21F0410-01	A	BGDY9	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21F0399-01	A	BGDP7	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21F0399-02	A	BGDW5	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21F0399-03	B	BGDX3	B 01	20	20	HRSM02.x	8/2/2021	NPL	
21F0399-06	A	BGDR8	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21F0399-07	A	BGDT1	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21F0352-01	A	BGDP3	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21F0352-02	A	BGDQ3	A 01	20	20	HRSM02.x	8/2/2021	NPL	
21F0352-03	A	PBGDQ8	A 01	20	20	HRSM02.x	8/2/2021	NPL	
BJG0572-SRM1	-	Reference	-	20	20	-	8/2/2021	NPL	
BJG0572-DUP1	-	Duplicate	-	20	20	-	8/2/2021	NPL	
BJG0572-BLK1	-	Blank	-	20	20	-	8/2/2021	NPL	
BJG0572-BS1	-	LCS	-	20	20	-	8/2/2021	NPL	
BJG0572-BSD1	-	LCS Dup	-	20	20	-	8/2/2021	NPL	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BENCH SHEET

CJH0044

Matrix: Solid **Cleanup using: HRGCMS - EPA 3665A Sulfuric Acid Cleanup** **Printed: 8/5/2021 10:18:53AM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BATCH SUMMARY

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Cleanup Batch:	CJH0045	Cleanup Type:	Silica Gel
Cleanup Method:	EPA 3630C Silica Gel Cleanup	Analysis:	EPA 1613B

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS603	21G0111-06	21081909	08/04/2021	
LDW21-SS661	21G0111-12	21081910	08/04/2021	
Duplicate	BJG0572-DUP1	21081908	08/04/2021	
Reference	BJG0572-SRM1	21081907	08/04/2021	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BENCH SHEET

CJH0045

Matrix: Solid **Cleanup using: HRGCMS - EPA 3630C Silica Gel Cleanup** **Printed: 8/5/2021 10:19:06AM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
21G0111-12	A	LDW21-SS661	A 01	20	20	1613B Dioxin	8/4/2021	NPL	
21G0111-06	A	LDW21-SS603	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0410-02	A	BGDZ7	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0410-03	A	BGE06	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21G0090-01	A	BGE92	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21G0111-06	A	LDW21-SS603	A 01	20	20	1613B Dioxin	8/4/2021	NPL	
21F0399-04	A	BGDX9	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0399-05	A	BGDR4	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0410-01	A	BGDY9	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0399-01	A	BGDP7	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0399-02	A	BGDW5	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0399-03	B	BGDX3	B 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0399-06	A	BGDR8	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0399-07	A	BGDT1	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0352-01	A	BGDP3	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0352-02	A	BGDQ3	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0352-03	A	PBGDQ8	A 01	20	20	HRSM02.x	8/4/2021	NPL	
BJG0572-SRM1	-	Reference	-	20	20	-	8/4/2021	NPL	
BJG0572-DUP1	-	Duplicate	-	20	20	-	8/4/2021	NPL	
BJG0572-BLK1	-	Blank	-	20	20	-	8/4/2021	NPL	
BJG0572-BS1	-	LCS	-	20	20	-	8/4/2021	NPL	
BJG0572-BSD1	-	LCS Dup	-	20	20	-	8/4/2021	NPL	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BENCH SHEET

CJH0045

Matrix: Solid **Cleanup using: HRGCMS - EPA 3630C Silica Gel Cleanup** **Printed: 8/5/2021 10:19:06AM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BATCH SUMMARY

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Cleanup Batch:	CJH0046	Cleanup Type:	Florisil
Cleanup Method:	EPA 3620B Florisil Cleanup (mL)	Analysis:	EPA 1613B

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-SS603	21G0111-06	21081909	08/04/2021	
LDW21-SS661	21G0111-12	21081910	08/04/2021	
Duplicate	BJG0572-DUP1	21081908	08/04/2021	
Reference	BJG0572-SRM1	21081907	08/04/2021	

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CLEANUP BENCH SHEET

CJH0046

Matrix: Solid **Cleanup using: HRGCMS - EPA 3620B Florisil Cleanup (mL)** **Printed: 8/5/2021 10:19:19AM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
21G0111-12	A	LDW21-SS661	A 01	20	20	1613B Dioxin	8/4/2021	NPL	
21G0111-06	A	LDW21-SS603	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0410-02	A	BGDZ7	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0410-03	A	BGE06	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21G0090-01	A	BGE92	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21G0111-06	A	LDW21-SS603	A 01	20	20	1613B Dioxin	8/4/2021	NPL	
21F0399-04	A	BGDX9	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0399-05	A	BGDR4	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0410-01	A	BGDY9	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0399-01	A	BGDP7	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0399-02	A	BGDW5	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0399-03	B	BGDX3	B 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0399-06	A	BGDR8	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0399-07	A	BGDT1	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0352-01	A	BGDP3	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0352-02	A	BGDQ3	A 01	20	20	HRSM02.x	8/4/2021	NPL	
21F0352-03	A	PBGDQ8	A 01	20	20	HRSM02.x	8/4/2021	NPL	
BJG0572-SRM1	-	Reference	-	20	20	-	8/4/2021	NPL	
BJG0572-DUP1	-	Duplicate	-	20	20	-	8/4/2021	NPL	
BJG0572-BLK1	-	Blank	-	20	20	-	8/4/2021	NPL	
BJG0572-BS1	-	LCS	-	20	20	-	8/4/2021	NPL	
BJG0572-BSD1	-	LCS Dup	-	20	20	-	8/4/2021	NPL	

Analytical Resources, Incorporated
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CLEANUP BENCH SHEET

CJH0046

Matrix: Solid **Cleanup using: HRGCMS - EPA 3620B Florisil Cleanup (mL)** **Printed: 8/5/2021 10:19:19AM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Blank

Form 1
METHOD BLANK DATA SHEET
EPA 1613B
Dioxins/Furans by HRGC/HRMS

Laboratory:	Analytical Resources, Inc.			SDG:	21G0111
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Solid	Laboratory ID:	BJG0572-BLK3	File ID:	21081905
Sampled:	N/A	Prepared:	07/30/21 17:00	Analyzed:	08/18/21 13:28
Solids Wt%:		Preparation:	EPA 1613	Initial/Final:	10 g / 20 uL
Result Basis:	Dry	Sequence:	SJH0230	Calibration:	EH00030
Batch:	BJG0572	Instrument:	AUTOSPEC01	Column:	RTX-Dioxin2

CAS NO.	COMPOUND	DF/Split	Ion Ratio	Ratio Limits	EDL	RL	Result	Units	Q
51207-31-9	2,3,7,8-TCDF	1	0.000	0.655-0.886	1.03	1.00	ND	ng/kg	U
1746-01-6	2,3,7,8-TCDD	1	0.000	0.655-0.886	1.19	1.00	ND	ng/kg	U
57117-41-6	1,2,3,7,8-PeCDF	1	0.000	1.318-1.783	0.775	1.00	ND	ng/kg	U
57117-31-4	2,3,4,7,8-PeCDF	1	0.000	1.318-1.783	0.707	1.00	ND	ng/kg	U
40321-76-4	1,2,3,7,8-PeCDD	1	0.000	1.318-1.783	1.17	1.00	ND	ng/kg	U
70648-26-9	1,2,3,4,7,8-HxCDF	1	0.000	1.054-1.426	0.762	1.00	ND	ng/kg	U
57117-44-9	1,2,3,6,7,8-HxCDF	1	0.000	1.054-1.426	0.709	1.00	ND	ng/kg	U
60851-34-5	2,3,4,6,7,8-HxCDF	1	0.000	1.054-1.426	0.743	1.00	ND	ng/kg	U
72918-21-9	1,2,3,7,8,9-HxCDF	1	0.000	1.054-1.426	0.891	1.00	ND	ng/kg	U
39227-28-6	1,2,3,4,7,8-HxCDD	1	0.000	1.054-1.426	0.992	1.00	ND	ng/kg	U
57653-85-7	1,2,3,6,7,8-HxCDD	1	0.000	1.054-1.426	0.960	1.00	ND	ng/kg	U
19408-74-3	1,2,3,7,8,9-HxCDD	1	0.000	1.054-1.426	1.04	1.00	ND	ng/kg	U
67562-39-4	1,2,3,4,6,7,8-HpCDF	1	0.000	0.893-1.208	0.960	1.00	ND	ng/kg	U
55673-89-7	1,2,3,4,7,8,9-HpCDF	1	0.000	0.893-1.208	1.42	1.00	ND	ng/kg	U
35822-46-9	1,2,3,4,6,7,8-HpCDD	1	0.000	0.893-1.208	1.27	2.50	ND	ng/kg	U
39001-02-0	OCDF	1	0.000	0.757-1.024	1.64	2.50	ND	ng/kg	U
3268-87-9	OCDD	1	0.656	0.757-1.024	3.45	10.0	7.14	ng/kg	J

Homologue Groups

55722-27-5	Total TCDF	1	0.000			1.00	ND	ng/kg
41903-57-5	Total TCDD	1	0.000			1.00	ND	ng/kg
30402-15-4	Total PeCDF	1	0.000			1.00	ND	ng/kg
36088-22-9	Total PeCDD	1	0.000			1.00	ND	ng/kg
55684-94-1	Total HxCDF	1	0.000			1.00	ND	ng/kg
34465-46-8	Total HxCDD	1	0.000			1.00	ND	ng/kg
38998-75-3	Total HpCDF	1	0.000			1.00	ND	ng/kg
37871-00-4	Total HpCDD	1	0.000			1.00	ND	ng/kg

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 0.002
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 1.68

Analytical Resources, Incorporated
Analytical Chemists and Consultants

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Form 2
METHOD BLANK DATA SHEET
EPA 1613B
Dioxins/Furans by HRGC/HRMS

Laboratory:	Analytical Resources, Inc.			SDG:	21G0111
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Solid	Laboratory ID:	BJG0572-BLK3	File ID:	21081905
Sampled:	N/A	Prepared:	07/30/21 17:00	Analyzed:	08/18/21 13:28
Solids Wt%:	0.00	Preparation:	EPA 1613	Initial/Final:	10 g / 20 uL
Result Basis:	Dry	Sequence:	SJH0230	Calibration:	EH00030
Batch:	BJG0572	Instrument:	AUTOSPEC01	Column:	RTX-Dioxin2

Labels	DF/Split	Ion Ratio	Ratio Limits	EDL	% REC	QC LIMITS	Q
13C12-2,3,7,8-TCDF	1	0.781	0.655-0.886	1.19	66.7	24 - 169 %	
13C12-2,3,7,8-TCDD	1	0.764	0.655-0.886	1.55	85.1	25 - 164 %	
13C12-1,2,3,7,8-PeCDF	1	1.585	1.318-1.783	1.09	83.1	24 - 185 %	
13C12-2,3,4,7,8-PeCDF	1	1.654	1.318-1.783	1.15	80.0	21 - 178 %	
13C12-1,2,3,7,8-PeCDD	1	1.441	1.318-1.783	1.30	89.0	25 - 181 %	
13C12-1,2,3,4,7,8-HxCDF	1	0.530	0.434-0.587	1.56	87.1	26 - 152 %	
13C12-1,2,3,6,7,8-HxCDF	1	0.558	0.434-0.587	1.44	85.9	26 - 123 %	
13C12-2,3,4,6,7,8-HxCDF	1	0.539	0.434-0.587	1.59	87.6	28 - 136 %	
13C12-1,2,3,7,8,9-HxCDF	1	0.545	0.434-0.587	1.92	89.4	29 - 147 %	
13C12-1,2,3,4,7,8-HxCDD	1	1.285	1.054-1.426	1.42	93.6	32 - 141 %	
13C12-1,2,3,6,7,8-HxCDD	1	1.203	1.054-1.426	1.31	96.8	28 - 130 %	
13C12-1,2,3,4,6,7,8-HpCDF	1	0.458	0.374-0.506	1.29	92.1	28 - 143 %	
13C12-1,2,3,4,7,8,9-HpCDF	1	0.462	0.374-0.506	1.58	91.9	26 - 138 %	
13C12-1,2,3,4,6,7,8-HpCDD	1	1.038	0.893-1.208	1.85	105	23 - 140 %	
13C12-OCDD	1	0.850	0.757-1.024	2.38	116	17 - 157 %	
37Cl4-2,3,7,8-TCDD	1	328.000		0.38	83.9	35 - 197 %	

* Values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:29:56 Pacific Daylight Time

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: BJG0572-BLK2, Name: 21081905, Date: 18-Aug-2021, Time: 13:28:52, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
2378-TCDF					1.108		0.770	719	1404								
12378-PeCDF					1.015		1.550	655	947								
23478-PeCDF					1.126		1.550	655	947								
123478-HxCDF					1.017		1.240	833	656								
234678-HxCDF					1.052		1.240	833	656								
123678-HxCDF					1.037		1.240	833	656								
123789-HxCDF					1.030		1.240	833	656								
1234678-HpCDF					1.327		1.050	775	1128								
1234789-HpCDF					1.283		1.050	775	1128								
OCDF					1.447		0.890	763	1024								
2378-TCDD					0.920		0.770	1442	659								
12378-PeCDD					0.995		1.550	878	696								
123478-HxCDD					1.027		1.240	758	1001								
123678-HxCDD					1.009		1.240	758	1001								
123789-HxCDD					0.950		1.240	758	1001								
1234678-HpCDD					1.068		1.050	684	765								
OCDD	44.912	1.000	7.208e2	1.098e3	1.181	0.656	0.890	2424	638	1.19e4	1.31e4	4.9	20.5	YES	bb	bd	3.571
13C-2378-TCDF	25.625	1.007	3.711e4	4.750e4	1.427	0.781	0.770	2505	1224	4.88e5	6.51e5	194.9	532.0	NO	bb	bb	66.668
13C-12378-PeCDF	29.806	1.171	5.883e4	3.712e4	1.297	1.585	1.550	1280	1833	7.49e5	4.76e5	585.3	259.6	NO	bd	bd	83.129
13C-23478-PeCDF	31.143	1.223	5.486e4	3.316e4	1.236	1.654	1.550	1280	1833	7.53e5	4.65e5	588.0	253.7	NO	bb	bb	80.011
13C-123478-HxCDF	34.786	0.955	2.761e4	5.204e4	1.242	0.530	0.510	1217	2176	4.00e5	7.42e5	328.5	341.0	NO	bd	bd	87.055
13C-123678-HxCDF	34.919	0.959	3.045e4	5.455e4	1.343	0.558	0.510	1217	2176	4.35e5	7.99e5	357.5	367.0	NO	db	db	85.917
13C-234678-HxCDF	35.788	0.983	2.746e4	5.094e4	1.215	0.539	0.510	1217	2176	4.00e5	7.25e5	328.6	333.2	NO	bb	bb	87.636
13C-123789-HxCDF	36.825	1.011	2.340e4	4.294e4	1.008	0.545	0.510	1217	2176	3.43e5	6.48e5	282.1	297.8	NO	bb	bb	89.409
13C-1234678-HpCDF	38.685	1.062	1.972e4	4.310e4	0.926	0.458	0.440	964	1137	2.81e5	5.94e5	291.8	522.4	NO	bd	bd	92.084
13C-1234789-HpCDF	40.914	1.124	1.621e4	3.507e4	0.758	0.462	0.440	964	1137	1.98e5	4.34e5	205.8	381.6	NO	bd	bb	91.900
13C-1234-TCDD	25.458	0.000	3.846e4	5.051e4	1.000	0.762	0.770	2745	1067	5.70e5	7.50e5	207.5	702.9	NO	bb	bb	100.000
13C-2378-TCDD	26.275	1.032	3.663e4	4.795e4	1.116	0.764	0.770	2745	1067	4.97e5	6.58e5	181.0	617.0	NO	bb	bb	85.149
13C-12378-PeCDD	31.399	1.233	3.422e4	2.374e4	0.732	1.441	1.550	1011	1074	4.77e5	3.19e5	471.3	296.7	NO	bb	bd	89.007
13C-123478-HxCDD	35.911	0.986	3.718e4	2.894e4	0.960	1.285	1.240	1010	1377	5.82e5	4.62e5	576.6	335.3	NO	bd	bd	93.566
13C-123678-HxCDD	36.022	0.989	4.052e4	3.368e4	1.041	1.203	1.240	1010	1377	5.95e5	4.88e5	589.1	354.2	NO	db	db	96.769
13C-1234678-HpCDD	40.178	1.103	2.492e4	2.401e4	0.632	1.038	1.050	1089	962	3.26e5	3.19e5	299.4	332.2	NO	bd	bd	105.062
13C-OCDD	44.903	1.233	3.964e4	4.665e4	0.504	0.850	0.890	1042	1065	4.14e5	4.79e5	397.5	449.7	NO	bd	bd	232.639
13C-123789-HxCDD	36.412	0.000	3.925e4	3.438e4	1.000	1.141	1.240	1010	1377	5.61e5	4.86e5	555.9	352.8	NO	bb	bb	100.000
37CL-2378-TCDD	26.290	1.033	3.234e4		1.084			915		4.28e5		467.2			bd		33.549

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:29:56 Pacific Daylight Time

ID: BJG0572-BLK2, Name: 21081905, Date: 18-Aug-2021, Time: 13:28:52, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
1368-TCDF					1.425		0.770	719	1404								
1289-TCDF					1.043		0.770	719	1404								
13468-PECDF					1.376		1.550	636	1069								
12389-PECDF					1.000		1.550	655	947								
123468-HXCDF					1.087		1.240	833	656								
1368-TCDD					0.923		0.770	1442	659								
1289-TCDD					0.794		0.770	1442	659								
12479-PECDD					1.843		1.550	878	696								
12389-PECDD					1.154		1.550	878	696								
124679-HXCDD					1.125		1.240	758	1001								
1234679-HPCDD	39.153	0.975	8.578e1	1.344e2	1.211	0.638	1.050	684	765	2.31e3	2.01e3	3.4	2.6	YES	bb	bb	0.372
Total-tetrafurans			0.000e0		1.192			719		0.00e0							
Total-penta1			0.000e0					636		0.00e0							
Total-pentafurans			0.000e0		1.047			655		0.00e0							
Total-hexafurans			0.000e0		1.045			833		0.00e0							
Total-heptafurans			0.000e0		1.305			775		0.00e0							
Total-Furans			0.000e0		1.158			719		0.00e0							
Total-tetradioxins			0.000e0		0.879			1442		0.00e0							
Total-pentadioxins			0.000e0		1.331			878		0.00e0							
Total-hexadioxins			0.000e0		1.028			758		0.00e0							
Total-heptadioxins			0.000e0		1.140			684		0.00e0							
Total-Dioxins			0.000e0		1.092			1442		0.00e0							
Total-TEQ			0.000e0					1442		0.00e0							
FUNCTION1 PFK			4.751e5					451076		8.25e6							
FUNCTION2 PFK			1.063e6					430365		2.71e7							0.000
FUNCTION3 PFK			3.757e5					538372		1.24e7							0.000
FUNCTION4 PFK			6.959e5					292580		1.99e7							
FUNCTION5 PFK			6.215e3					284424		4.18e5							
FUNCTION1 HXCD...			1.221e3					579		1.81e4							0.000
FUNCTION1 HPCD...			8.453e2					960		1.34e4							0.000
FUNCTION2 HPCD...			1.258e2					723		2.84e3							0.000
FUNCTION3 OCDPE			2.835e2					584		7.80e3							0.000
FUNCTION4 NCDPE			2.581e2					763		4.64e3							0.000
FUNCTION5 DCDPE			2.755e2					705		6.18e3							0.000

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:29:56 Pacific Daylight Time

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: BJG0572-BLK2, Name: 21081905, Date: 18-Aug-2021, Time: 13:28:52, Conditions: AUTOSPEC01, User: pk

TF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

Furans,TF,PP,PF,HF,HPF,OF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:29:56 Pacific Daylight Time

ID: BJG0572-BLK2, Name: 21081905, Date: 18-Aug-2021, Time: 13:28:52, Conditions: AUTOSPEC01, User: pk

HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

Dioxins,TD,PD,HD,HPD,OD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	22.78	3.396e4					1.3	NO		bb		
2	FUNCTION1 PFK	21.66	8.184e4					1.7	NO		bb		
3	FUNCTION1 PFK	21.21	8.524e3					1.2	NO		bb		
4	FUNCTION1 PFK	27.65	1.017e4					0.8	NO		bb		
5	FUNCTION1 PFK	27.15	4.459e4					1.1	NO		bb		
6	FUNCTION1 PFK	27.00	8.306e4					1.8	NO		bb		
7	FUNCTION1 PFK	26.68	4.594e4					1.8	NO		bb		
8	FUNCTION1 PFK	26.50	8.748e3					0.7	NO		bb		
9	FUNCTION1 PFK	25.68	1.549e4					1.2	NO		bb		
10	FUNCTION1 PFK	24.52	3.634e4					1.7	NO		bb		
11	FUNCTION1 PFK	24.42	5.342e4					1.7	NO		bb		
12	FUNCTION1 PFK	24.28	3.056e4					1.8	NO		db		
13	FUNCTION1 PFK	24.22	2.249e4					1.3	NO		bd		

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PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 PFK	28.20	1.002e4					1.0	NO		bd		0.000
2	FUNCTION2 PFK	28.09	3.192e4					1.0	NO		bb		0.000
3	FUNCTION2 PFK	27.95	3.172e4					1.1	NO		bb		0.000
4	FUNCTION2 PFK	27.83	6.721e3					0.7	NO		bb		0.000
5	FUNCTION2 PFK	27.79	5.118e3					1.1	NO		bb		0.000
6	FUNCTION2 PFK	29.46	9.930e3					1.0	NO		dd		0.000
7	FUNCTION2 PFK	29.39	1.200e4					0.8	NO		bd		0.000
8	FUNCTION2 PFK	29.35	3.883e3					0.8	NO		bb		0.000
9	FUNCTION2 PFK	29.27	4.254e3					0.5	NO		bb		0.000
10	FUNCTION2 PFK	29.18	5.360e4					2.5	NO		bb		0.000
11	FUNCTION2 PFK	29.09	2.939e4					1.8	NO		db		0.000
12	FUNCTION2 PFK	29.06	4.325e4					1.9	NO		dd		0.000
13	FUNCTION2 PFK	28.98	4.785e4					2.5	NO		dd		0.000
14	FUNCTION2 PFK	28.89	4.247e4					1.9	NO		bd		0.000
15	FUNCTION2 PFK	28.81	3.987e3					0.5	NO		bb		0.000
16	FUNCTION2 PFK	28.64	1.737e4					1.2	NO		bb		0.000
17	FUNCTION2 PFK	28.57	1.674e4					1.2	NO		bb		0.000
18	FUNCTION2 PFK	28.52	4.149e3					0.6	NO		bb		0.000
19	FUNCTION2 PFK	28.39	5.951e3					0.6	NO		bb		0.000
20	FUNCTION2 PFK	28.32	4.614e4					1.6	NO		db		0.000
21	FUNCTION2 PFK	28.23	2.020e4					1.3	NO		dd		0.000
22	FUNCTION2 PFK	30.96	4.651e4					2.0	NO		bd		0.000
23	FUNCTION2 PFK	30.79	9.047e3					1.0	NO		bb		0.000
24	FUNCTION2 PFK	30.67	8.204e3					0.7	NO		bb		0.000
25	FUNCTION2 PFK	30.42	3.628e3					0.4	NO		db		0.000
26	FUNCTION2 PFK	30.37	1.009e4					0.8	NO		dd		0.000
27	FUNCTION2 PFK	30.33	1.590e4					1.3	NO		dd		0.000
28	FUNCTION2 PFK	30.28	8.899e3					0.8	NO		bd		0.000
29	FUNCTION2 PFK	30.23	1.653e4					1.6	NO		db		0.000
30	FUNCTION2 PFK	30.14	3.647e4					1.5	NO		bd		0.000
31	FUNCTION2 PFK	29.95	2.118e4					1.4	NO		bb		0.000
32	FUNCTION2 PFK	29.86	2.644e4					1.1	NO		bb		0.000
33	FUNCTION2 PFK	29.79	7.951e3					1.0	NO		db		0.000
34	FUNCTION2 PFK	29.74	1.974e4					1.1	NO		bd		0.000
35	FUNCTION2 PFK	29.65	2.687e4					1.1	NO		db		0.000
36	FUNCTION2 PFK	29.54	3.910e4					1.8	NO		bd		0.000
37	FUNCTION2 PFK	29.48	1.124e4					1.1	NO		db		0.000

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PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	FUNCTION2 PFK	32.32	4.094e3					0.9	NO		bb		0.000
39	FUNCTION2 PFK	32.27	2.531e4					1.8	NO		bb		0.000
40	FUNCTION2 PFK	32.18	2.066e4					1.4	NO		db		0.000
41	FUNCTION2 PFK	32.11	3.239e4					1.5	NO		dd		0.000
42	FUNCTION2 PFK	32.04	2.024e4					1.3	NO		bd		0.000
43	FUNCTION2 PFK	31.89	1.632e4					1.2	NO		bb		0.000
44	FUNCTION2 PFK	31.81	1.627e4					0.8	NO		bb		0.000
45	FUNCTION2 PFK	31.69	1.225e4					1.0	NO		bb		0.000
46	FUNCTION2 PFK	31.61	6.412e3					0.6	NO		bb		0.000
47	FUNCTION2 PFK	31.49	1.391e4					1.2	NO		bb		0.000
48	FUNCTION2 PFK	31.42	6.938e3					0.8	NO		bb		0.000
49	FUNCTION2 PFK	31.33	1.684e4					1.0	NO		bb		0.000
50	FUNCTION2 PFK	31.19	1.679e3					0.3	NO		bb		0.000
51	FUNCTION2 PFK	31.15	1.294e3					0.3	NO		bb		0.000
52	FUNCTION2 PFK	31.09	8.382e3					0.7	NO		bb		0.000
53	FUNCTION2 PFK	31.04	1.848e4					1.4	NO		db		0.000
54	FUNCTION2 PFK	32.52	7.201e4					1.3	NO		bb		0.000
55	FUNCTION2 PFK	32.37	1.528e4					1.1	NO		bb		0.000

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PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 PFK	34.90	4.516e3					0.5	NO		bb		0.000
2	FUNCTION3 PFK	34.35	2.699e3					0.4	NO		bb		0.000
3	FUNCTION3 PFK	34.28	7.606e3					0.7	NO		bb		0.000
4	FUNCTION3 PFK	34.21	3.006e4					1.0	NO		bb		0.000
5	FUNCTION3 PFK	33.74	1.235e4					0.8	NO		bb		0.000
6	FUNCTION3 PFK	33.58	7.136e3					0.6	NO		bb		0.000
7	FUNCTION3 PFK	33.30	3.558e4					1.3	NO		db		0.000
8	FUNCTION3 PFK	33.27	2.546e4					1.0	NO		bd		0.000
9	FUNCTION3 PFK	33.19	9.447e3					0.9	NO		bb		0.000
10	FUNCTION3 PFK	33.14	2.769e3					0.5	NO		bb		0.000
11	FUNCTION3 PFK	33.06	1.271e4					1.0	NO		bb		0.000
12	FUNCTION3 PFK	32.89	1.120e4					0.7	NO		bb		0.000
13	FUNCTION3 PFK	32.84	3.143e4					1.5	NO		bb		0.000
14	FUNCTION3 PFK	37.49	3.439e3					0.6	NO		bb		0.000
15	FUNCTION3 PFK	37.07	1.093e4					0.9	NO		bb		0.000
16	FUNCTION3 PFK	36.79	3.485e4					1.9	NO		db		0.000
17	FUNCTION3 PFK	36.75	9.548e3					0.8	NO		bd		0.000
18	FUNCTION3 PFK	36.16	1.841e4					1.1	NO		bb		0.000
19	FUNCTION3 PFK	36.08	1.846e4					1.1	NO		bb		0.000
20	FUNCTION3 PFK	35.89	6.634e3					0.7	NO		bb		0.000
21	FUNCTION3 PFK	35.70	4.407e4					1.7	NO		bb		0.000
22	FUNCTION3 PFK	35.52	2.593e3					0.4	NO		bb		0.000
23	FUNCTION3 PFK	35.35	1.555e4					0.8	NO		bb		0.000
24	FUNCTION3 PFK	35.31	1.502e4					1.4	NO		bb		0.000
25	FUNCTION3 PFK	35.08	3.275e3					0.5	NO		bb		0.000

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PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 PFK	37.93	1.852e4					2.2	NO		bd		
2	FUNCTION4 PFK	37.86	2.449e4					1.8	NO		db		
3	FUNCTION4 PFK	37.79	9.763e3					1.5	NO		bd		
4	FUNCTION4 PFK	39.10	9.216e3					1.4	NO		bd		
5	FUNCTION4 PFK	38.92	2.620e4					1.9	NO		db		
6	FUNCTION4 PFK	38.87	5.434e3					1.1	NO		bd		
7	FUNCTION4 PFK	38.83	2.840e3					0.7	NO		bb		
8	FUNCTION4 PFK	38.73	1.403e4					1.2	NO		bb		
9	FUNCTION4 PFK	38.64	6.206e3					0.8	NO		db		
10	FUNCTION4 PFK	38.60	8.240e3					1.1	NO		bd		
11	FUNCTION4 PFK	38.40	8.815e3					0.6	NO		bb		
12	FUNCTION4 PFK	38.33	8.988e3					1.4	NO		db		
13	FUNCTION4 PFK	38.30	2.359e4					1.8	NO		dd		
14	FUNCTION4 PFK	38.23	1.649e4					1.5	NO		dd		
15	FUNCTION4 PFK	38.17	1.942e4					2.5	NO		bd		
16	FUNCTION4 PFK	38.13	4.947e3					0.9	NO		bb		
17	FUNCTION4 PFK	38.07	2.175e3					0.7	NO		bb		
18	FUNCTION4 PFK	38.03	2.452e3					0.8	NO		bb		
19	FUNCTION4 PFK	37.96	2.592e4					2.5	NO		db		
20	FUNCTION4 PFK	40.74	1.673e4					1.1	NO		db		
21	FUNCTION4 PFK	40.69	1.682e4					1.5	NO		dd		
22	FUNCTION4 PFK	40.63	6.251e3					1.0	NO		bd		
23	FUNCTION4 PFK	40.47	2.002e4					1.4	NO		db		
24	FUNCTION4 PFK	40.41	9.214e3					1.2	NO		bd		
25	FUNCTION4 PFK	40.31	1.874e4					1.4	NO		bb		
26	FUNCTION4 PFK	40.16	3.894e3					0.6	NO		db		
27	FUNCTION4 PFK	40.12	1.139e4					1.2	NO		dd		
28	FUNCTION4 PFK	40.04	3.119e4					2.0	NO		bd		
29	FUNCTION4 PFK	39.89	1.795e4					1.1	NO		bb		
30	FUNCTION4 PFK	39.81	1.320e3					0.4	NO		bb		
31	FUNCTION4 PFK	39.47	3.711e3					0.7	NO		bb		
32	FUNCTION4 PFK	39.42	1.325e4					1.5	NO		db		
33	FUNCTION4 PFK	39.39	8.309e3					1.2	NO		bd		
34	FUNCTION4 PFK	39.26	4.322e4					1.8	NO		bb		
35	FUNCTION4 PFK	39.13	1.188e4					1.4	NO		db		
36	FUNCTION4 PFK	42.46	5.900e3					0.8	NO		bb		
37	FUNCTION4 PFK	42.31	1.732e4					1.9	NO		db		

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PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	FUNCTION4 PFK	42.26	2.501e4					2.3	NO		dd		
39	FUNCTION4 PFK	42.23	2.267e4					1.7	NO		bd		
40	FUNCTION4 PFK	42.15	8.956e3					1.0	NO		bb		
41	FUNCTION4 PFK	42.08	6.402e3					0.8	NO		bb		
42	FUNCTION4 PFK	41.86	1.019e4					1.3	NO		db		
43	FUNCTION4 PFK	41.82	8.320e3					1.0	NO		bd		
44	FUNCTION4 PFK	41.76	1.369e4					1.6	NO		bb		
45	FUNCTION4 PFK	41.57	3.929e3					0.6	NO		bb		
46	FUNCTION4 PFK	41.53	1.762e4					1.9	NO		bb		
47	FUNCTION4 PFK	41.45	1.294e4					1.1	NO		bb		
48	FUNCTION4 PFK	41.37	2.822e4					2.1	NO		bb		
49	FUNCTION4 PFK	41.25	1.274e4					1.6	NO		bb		
50	FUNCTION4 PFK	40.92	1.031e4					1.1	NO		db		
51	FUNCTION4 PFK	40.86	2.005e4					1.6	NO		bd		

PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	45.97	4.784e3					0.9	NO		bb		
2	FUNCTION5 PFK	45.63	1.431e3					0.5	NO		bb		

ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	27.35	7.182e1					2.4	NO		bb		0.000
2	FUNCTION1 HXCD...	25.93	1.608e2					2.2	NO		db		0.000
3	FUNCTION1 HXCD...	25.67	1.523e2					2.6	NO		bd		0.000
4	FUNCTION1 HXCD...	25.10	1.195e2					2.5	NO		bb		0.000
5	FUNCTION1 HXCD...	24.70	1.487e2					2.7	NO		db		0.000
6	FUNCTION1 HXCD...	24.63	8.822e1					3.0	NO		bd		0.000
7	FUNCTION1 HXCD...	23.18	8.563e1					4.3	YES		bb		0.000
8	FUNCTION1 HXCD...	22.60	9.185e1					3.4	YES		bb		0.000
9	FUNCTION1 HXCD...	22.33	8.296e1					2.8	NO		bb		0.000
10	FUNCTION1 HXCD...	21.91	1.355e2					2.6	NO		bb		0.000
11	FUNCTION1 HXCD...	21.78	8.367e1					2.8	NO		bb		0.000

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ETHERS2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HPCD...	26.94	8.033e1					1.4	NO		bb		0.000
2	FUNCTION1 HPCD...	25.90	9.187e1					1.4	NO		bb		0.000
3	FUNCTION1 HPCD...	24.78	1.927e2					3.2	YES		bb		0.000
4	FUNCTION1 HPCD...	24.04	8.462e1					1.2	NO		bb		0.000
5	FUNCTION1 HPCD...	23.75	1.102e2					1.3	NO		bb		0.000
6	FUNCTION1 HPCD...	23.05	1.048e2					1.8	NO		db		0.000
7	FUNCTION1 HPCD...	22.93	1.069e2					1.8	NO		bd		0.000
8	FUNCTION1 HPCD...	22.54	7.394e1					1.9	NO		bb		0.000

ETHERS3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 HPCD...	32.12	1.258e2					3.9	YES		bb		0.000

ETHERS4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 OCDPE	35.83	1.217e2					5.3	YES		bb		0.000
2	FUNCTION3 OCDPE	34.93	7.351e1					5.4	YES		bb		0.000
3	FUNCTION3 OCDPE	34.46	8.827e1					2.6	NO		bb		0.000

ETHERS5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 NCDPE	38.82	1.300e2					3.0	NO		bb		0.000
2	FUNCTION4 NCDPE	41.46	1.281e2					3.1	YES		bb		0.000

ETHERS6

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 DCDPE	45.63	8.118e1					2.1	NO		bb		0.000
2	FUNCTION5 DCDPE	45.49	7.243e1					2.1	NO		bb		0.000
3	FUNCTION5 DCDPE	44.90	1.219e2					4.6	YES		bb		0.000

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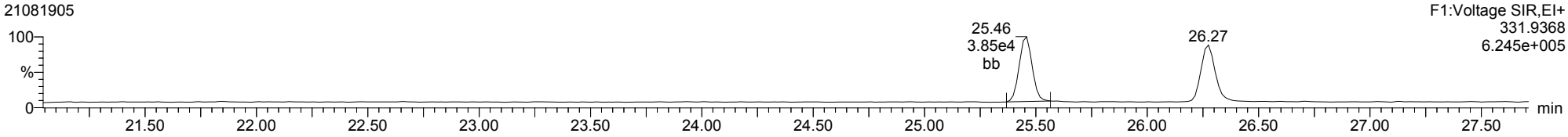
13C-1234-TCDD



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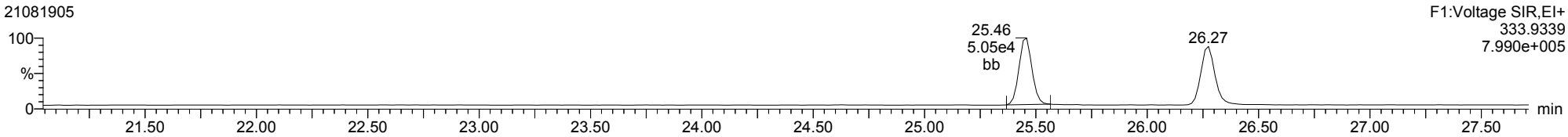

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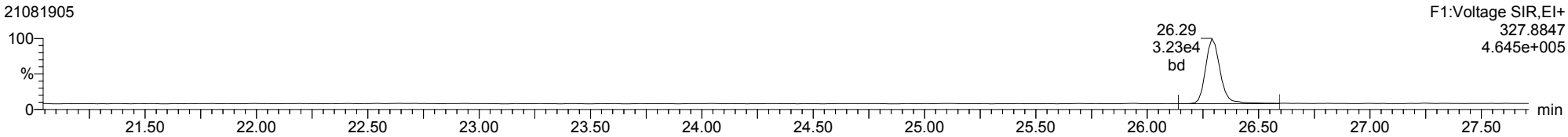

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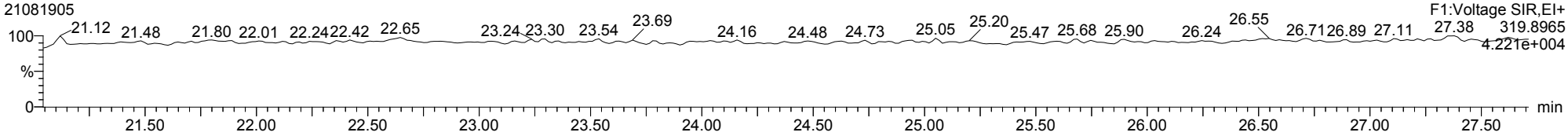
2378-TCDD



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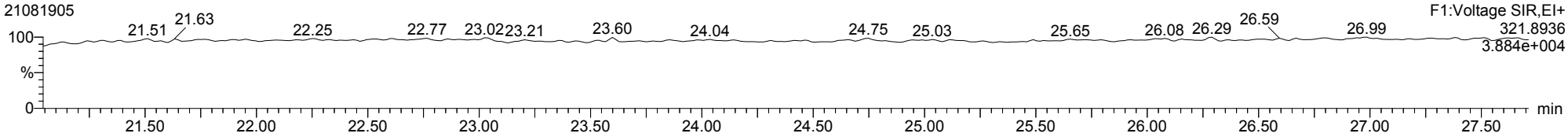

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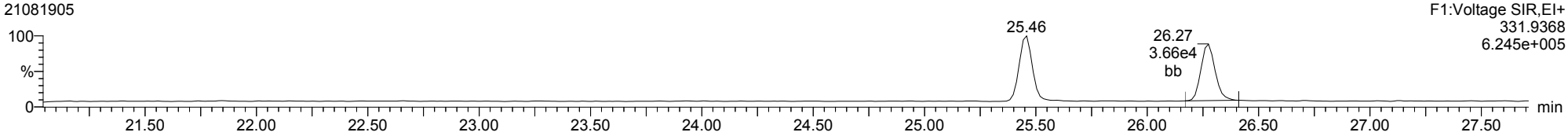

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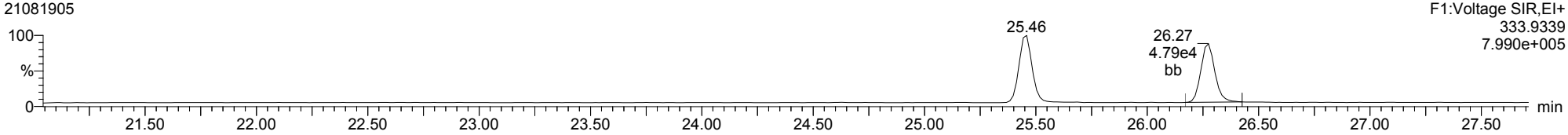

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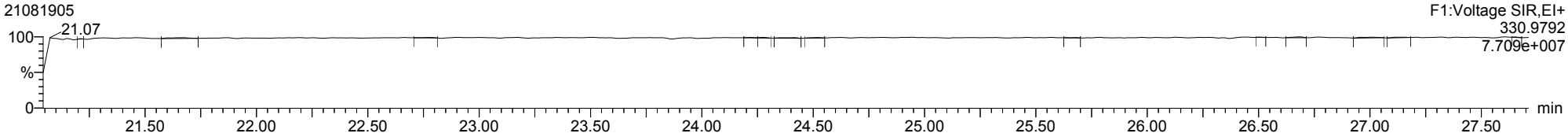

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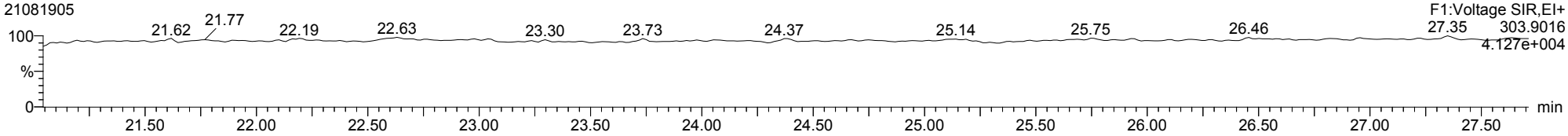
ID: BJG0572-BLK2, Name: 21081905, Date: 18-Aug-2021, Time: 13:28:52, Conditions: AUTOSPEC01, User: pk

2378-TCDF



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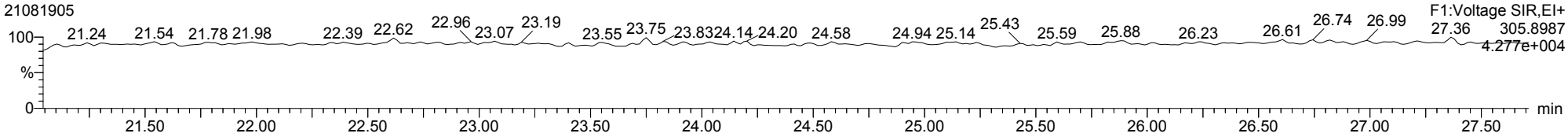
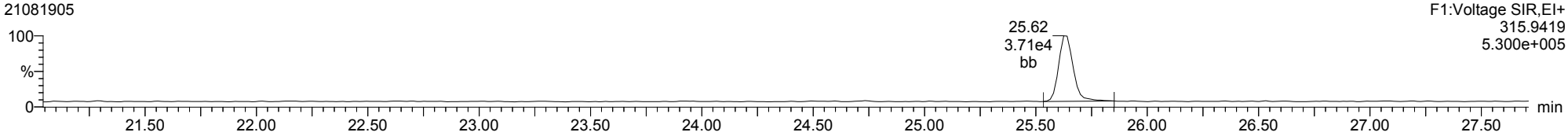


13C-2378-TCDF



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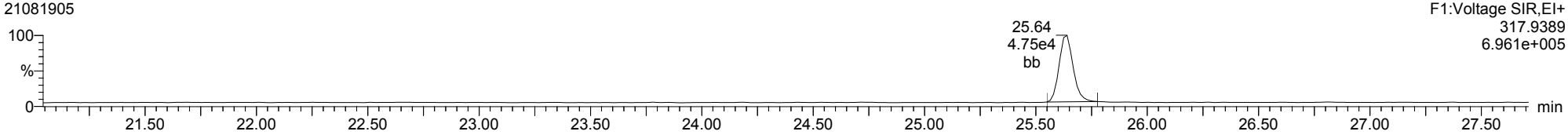
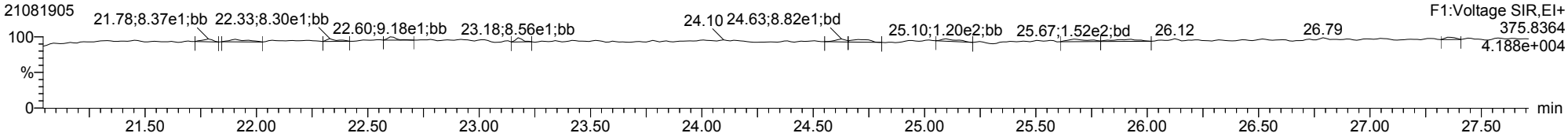


FUNCTION1 HXCDPE



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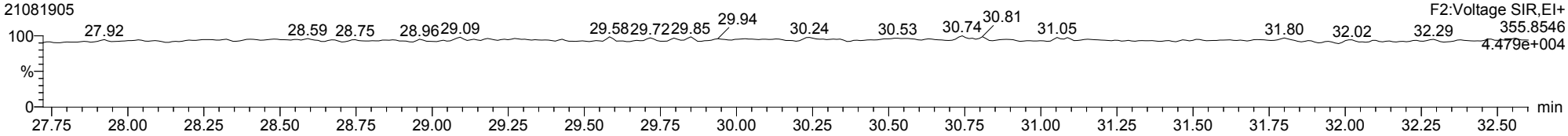
12378-PeCDD



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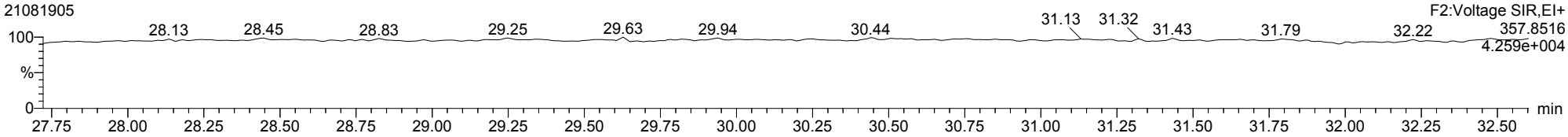

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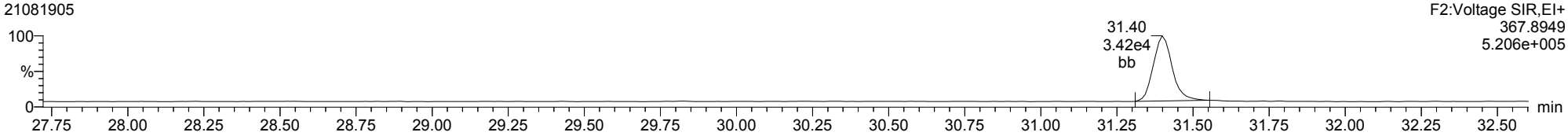

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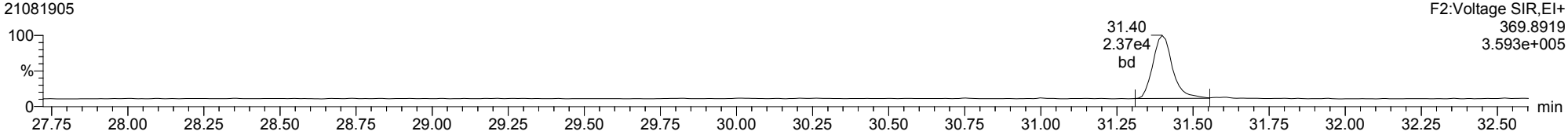

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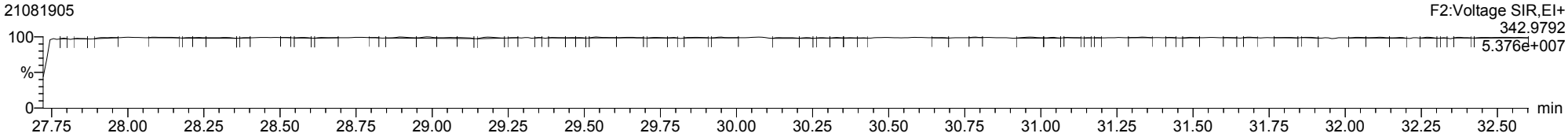

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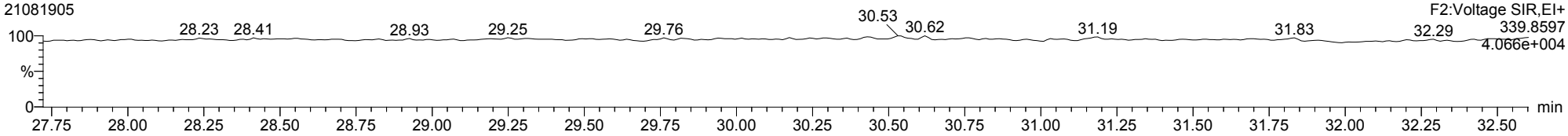

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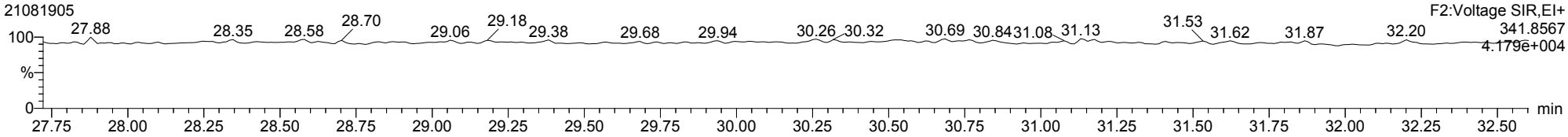

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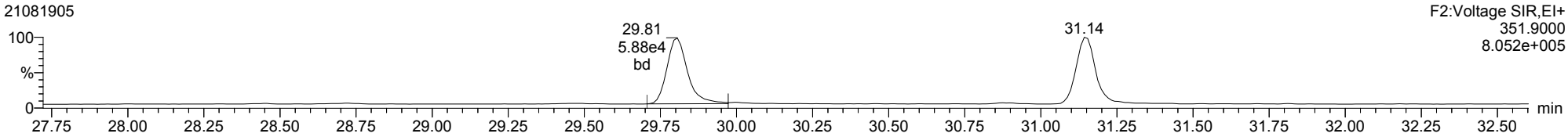

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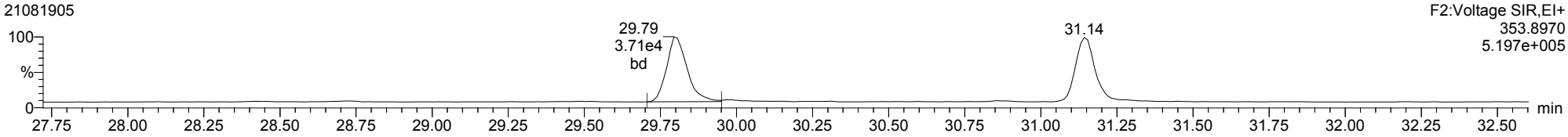
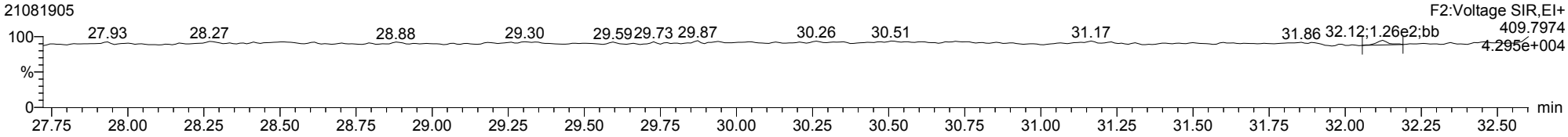


FUNCTION2 HPCDPE



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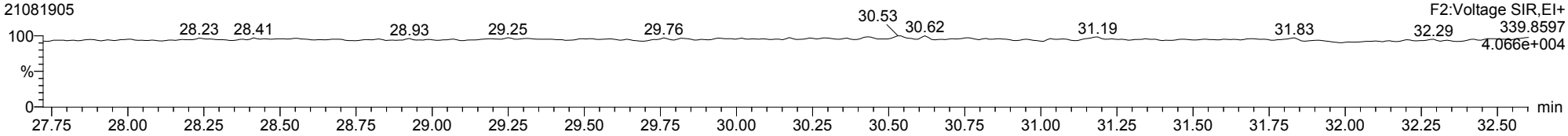

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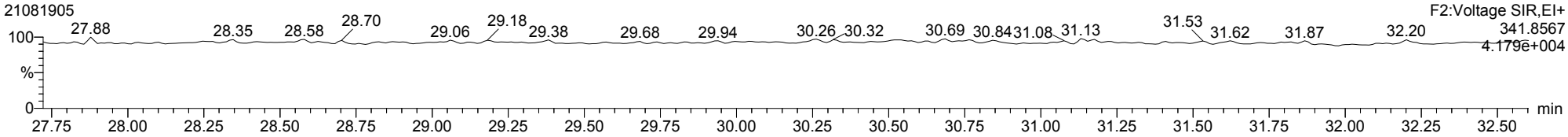

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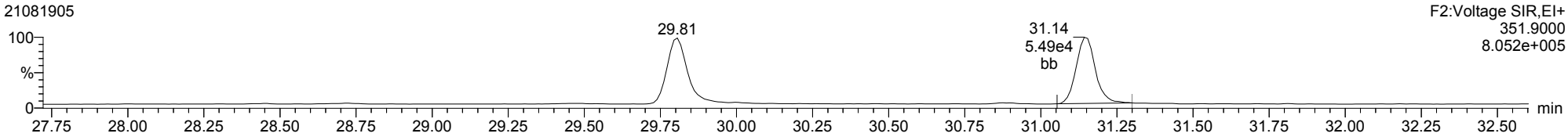

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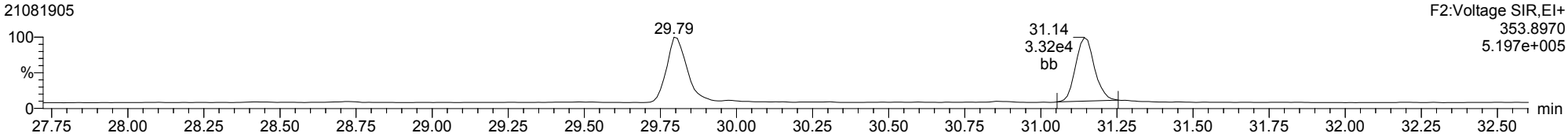

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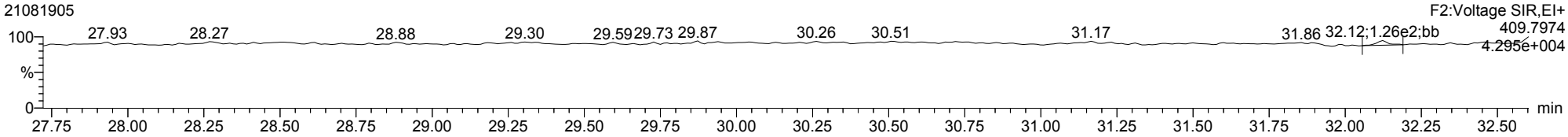

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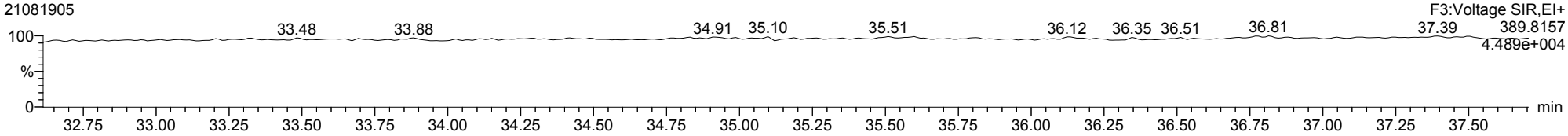

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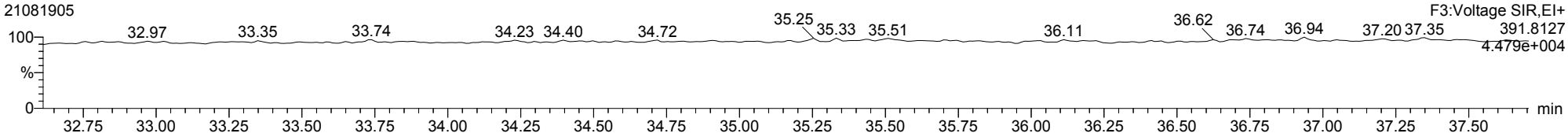

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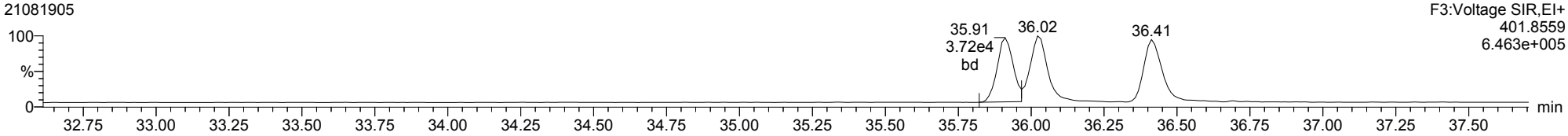

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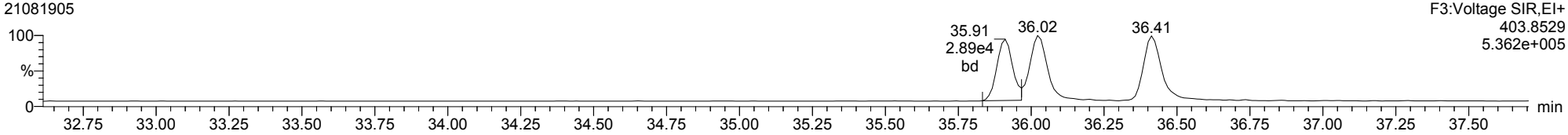
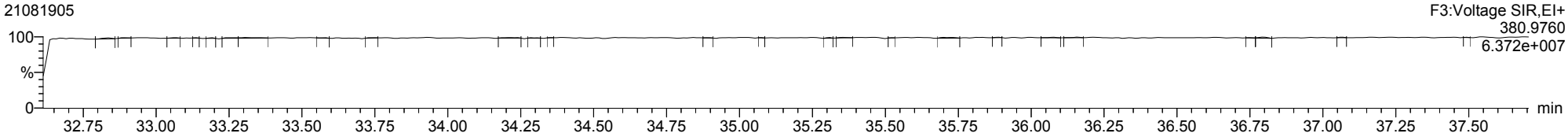


FUNCTION3 PFK



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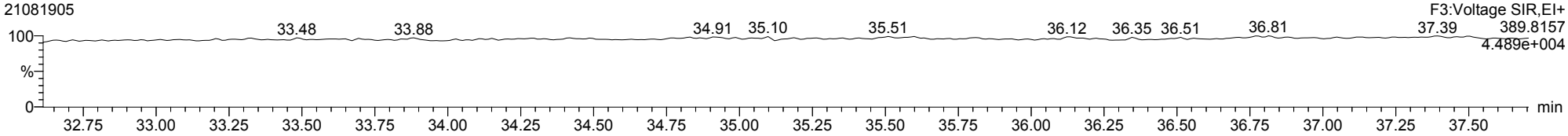

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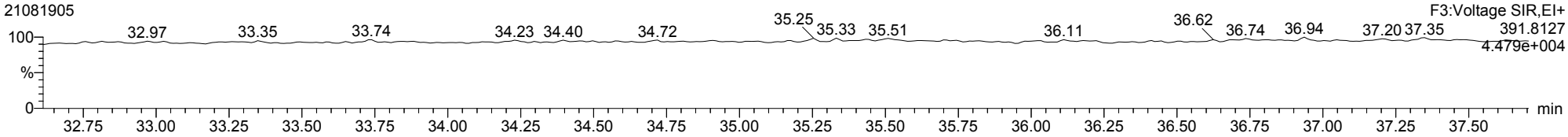

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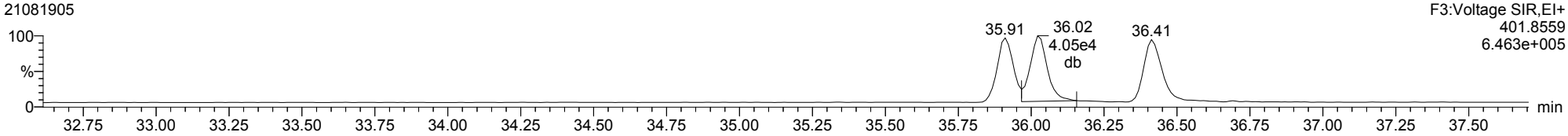

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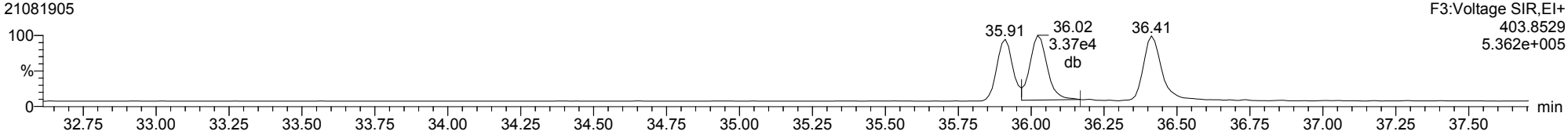

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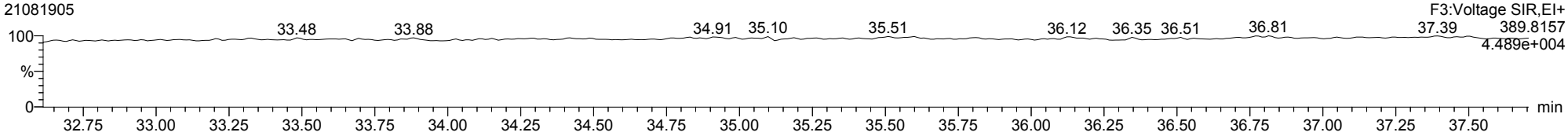

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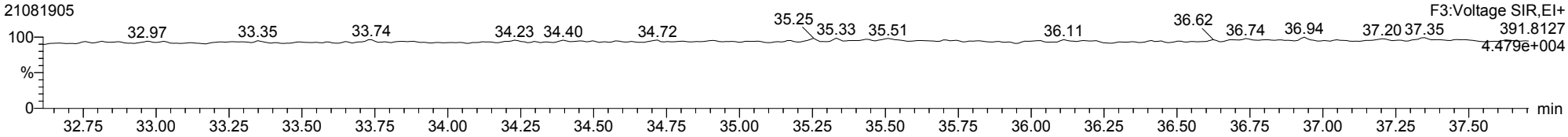

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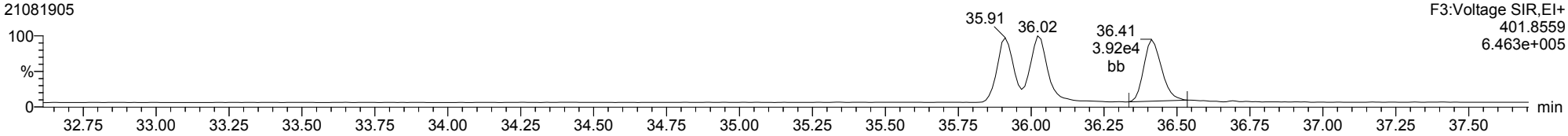

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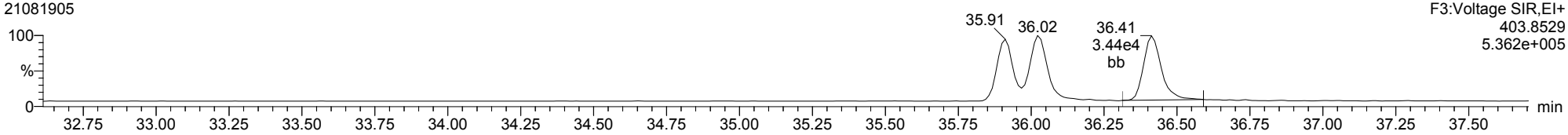

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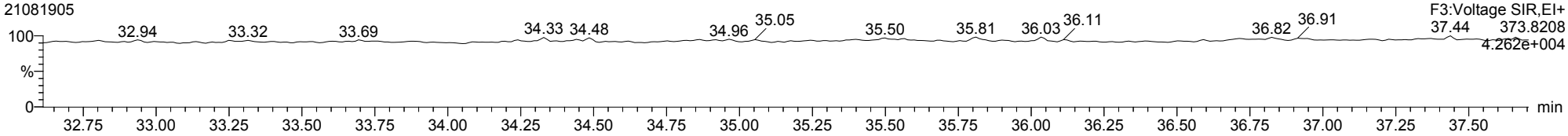
123478-HxCDF



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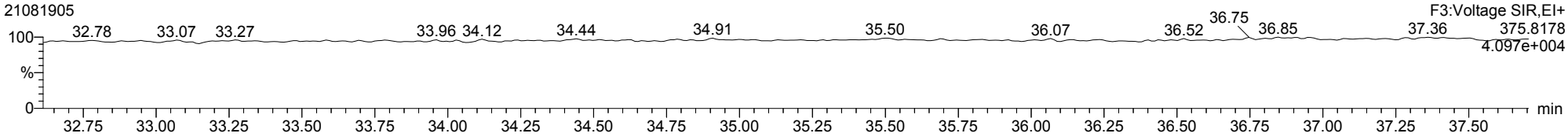

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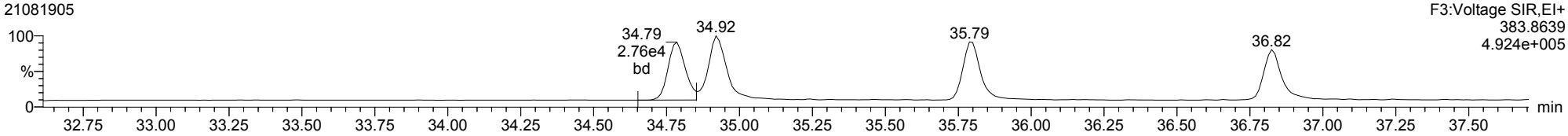

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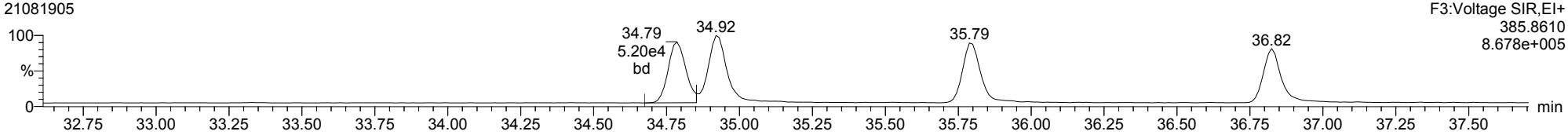
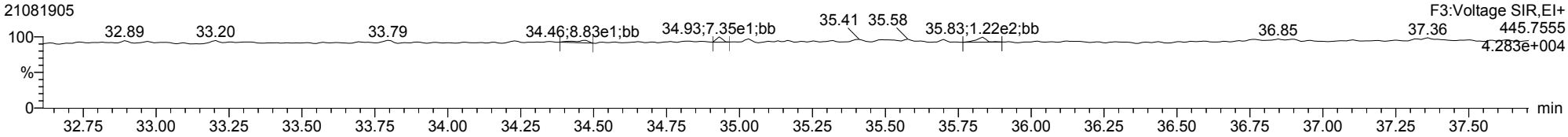


FUNCTION3 OCDPE



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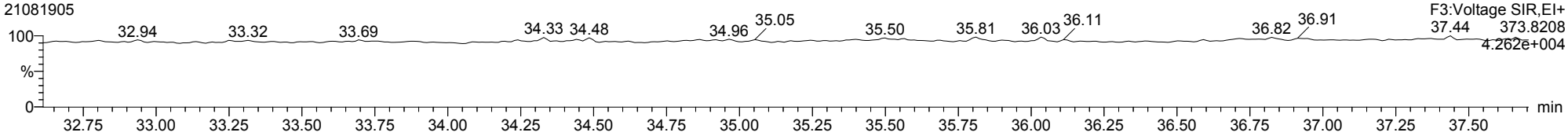
234678-HxCDF



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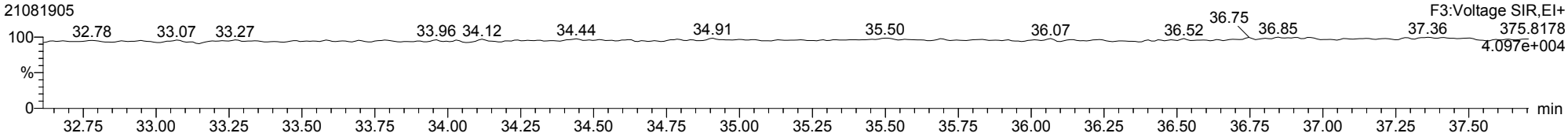

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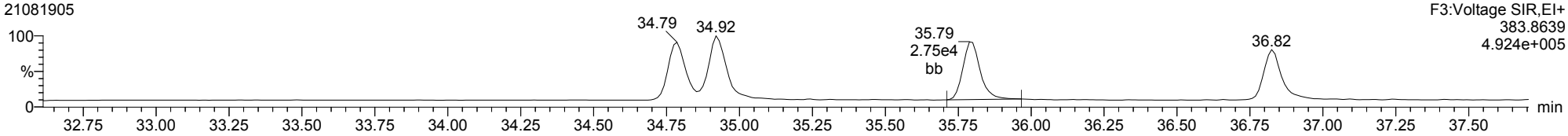

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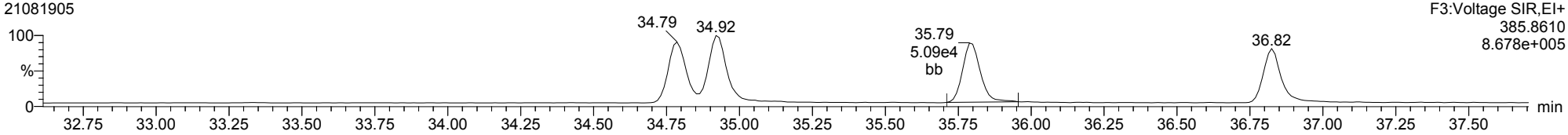
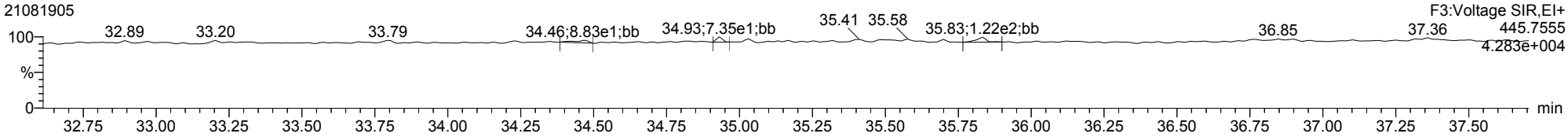


FUNCTION3 OCDPE



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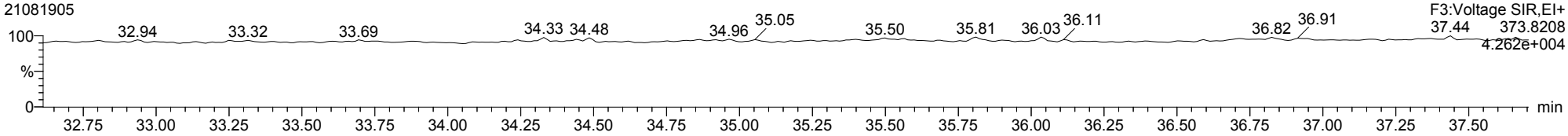

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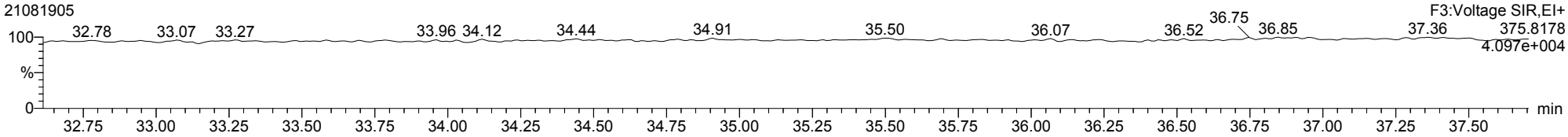

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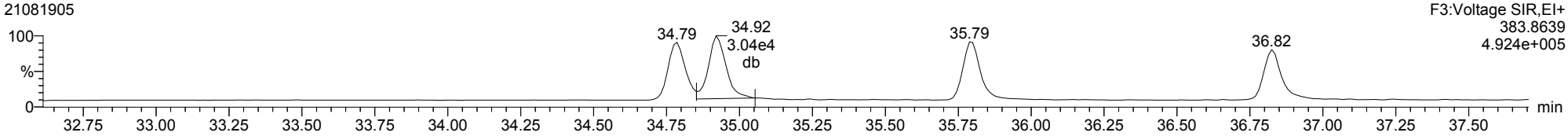

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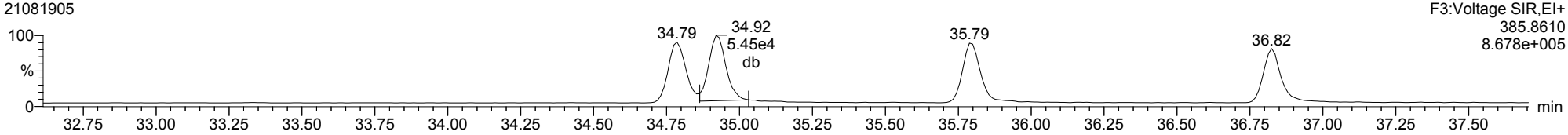
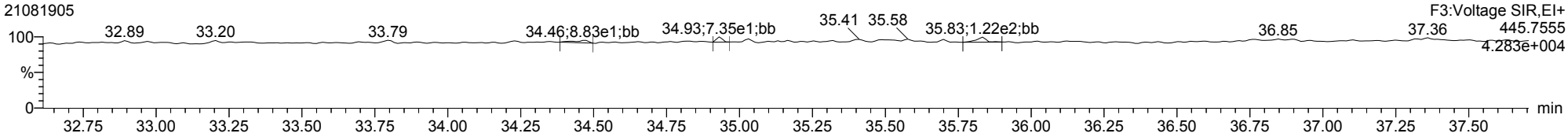


FUNCTION3 OCDPE



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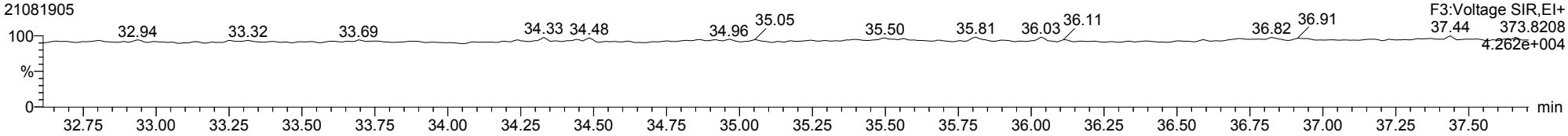
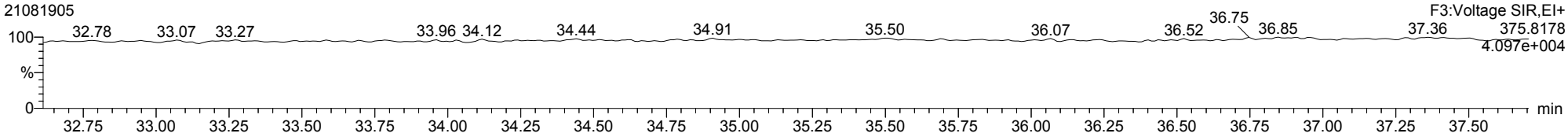


123789-HxCDF



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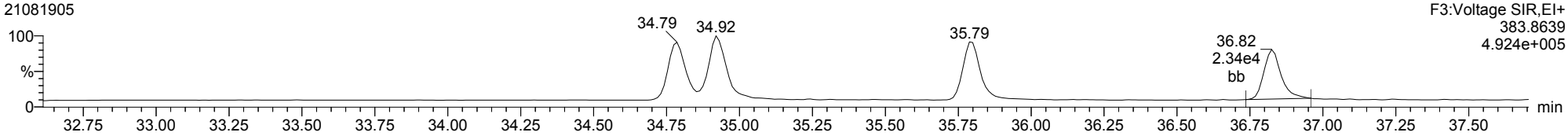

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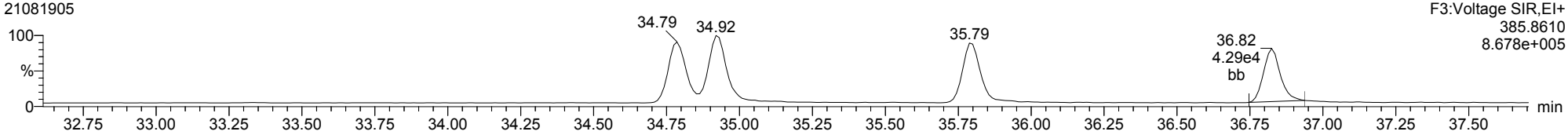
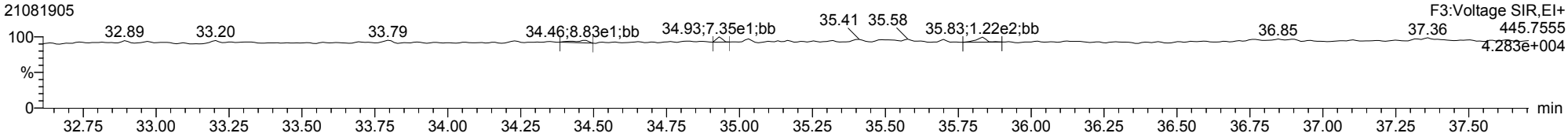
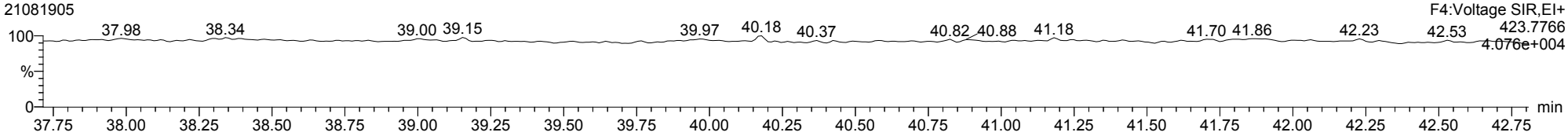


FUNCTION3 OCDPE



ID: BJG0572-BLK2, Name: 21081905, Date: 18-Aug-2021, Time: 13:28:52, Conditions: AUTOSPEC01, User: pk

1234678-HpCDD



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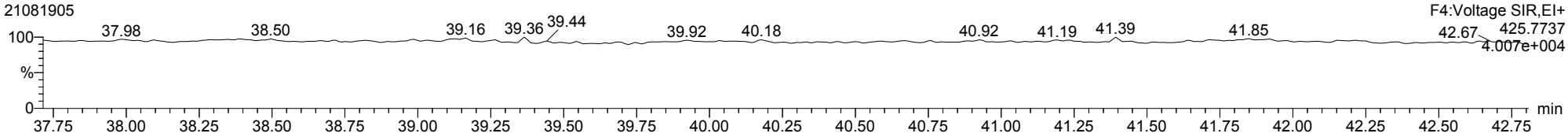

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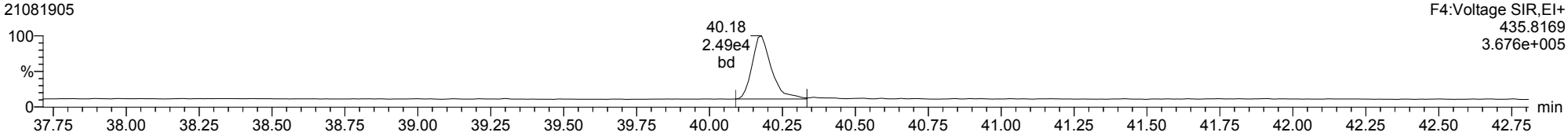

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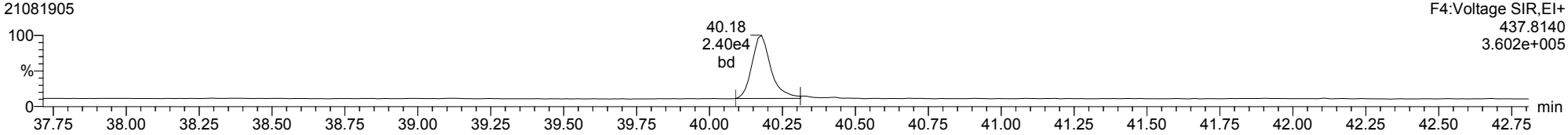

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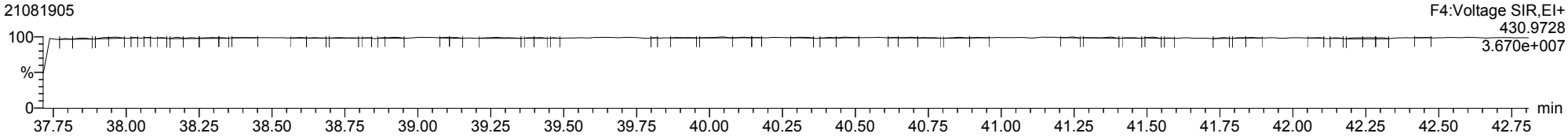

ID: BJG0572-BLK2, Name: 21081905, Date: 18-Aug-2021, Time: 13:28:52, Conditions: AUTOSPEC01, User: pk

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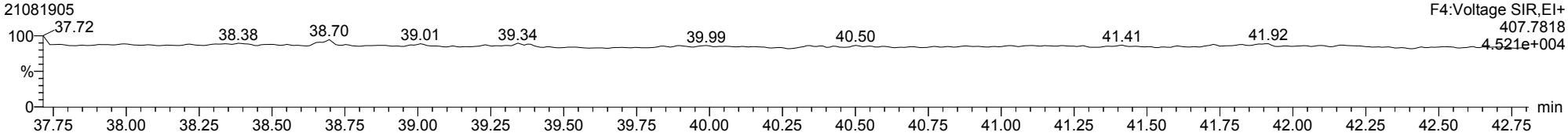

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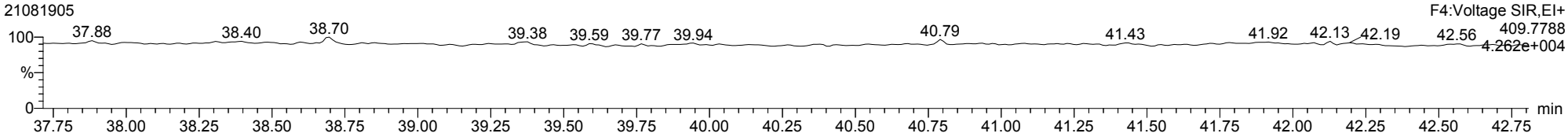

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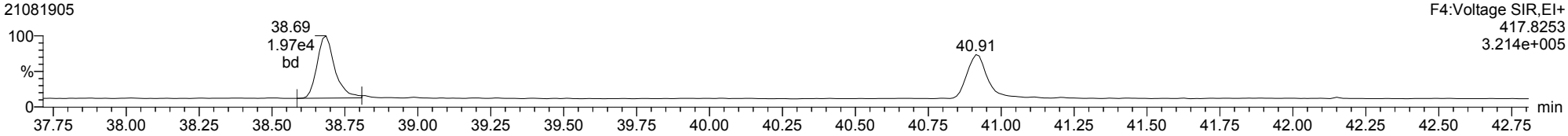

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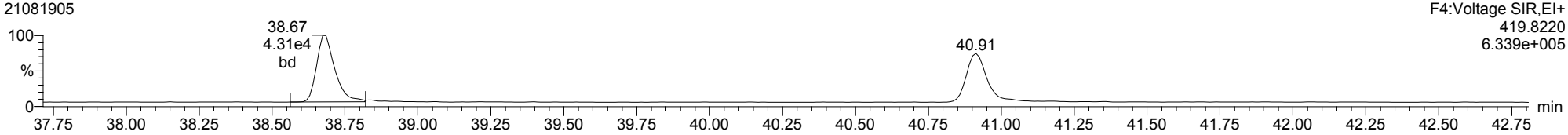
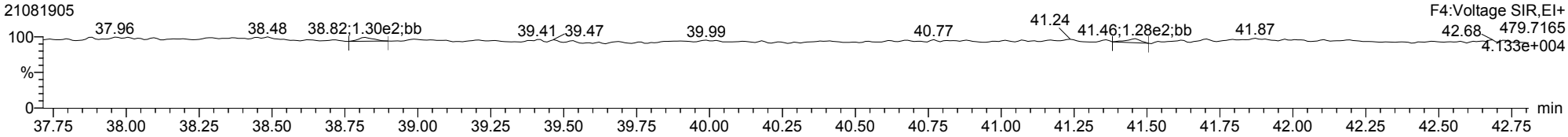


FUNCTION4 NCDPE



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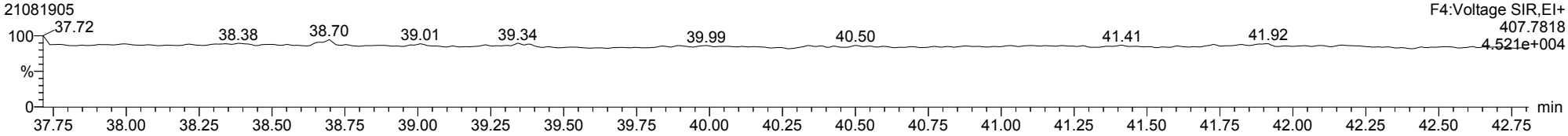

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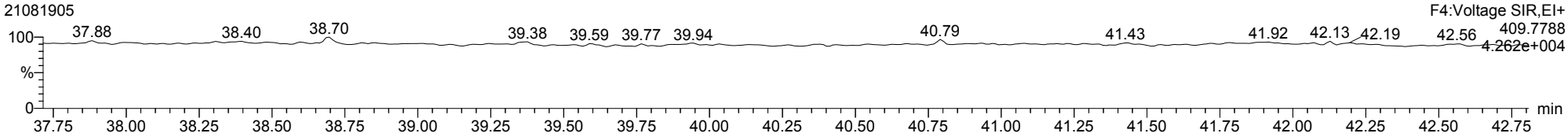

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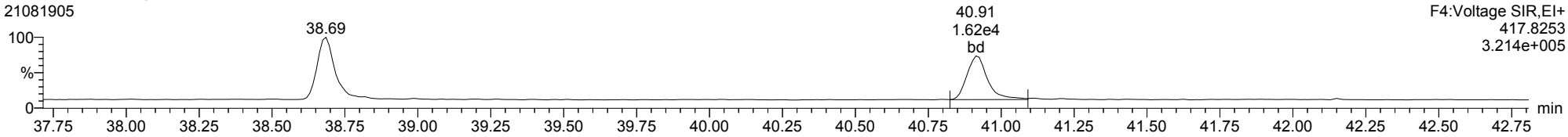

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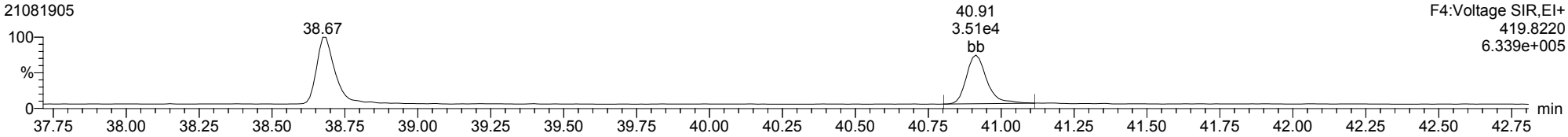
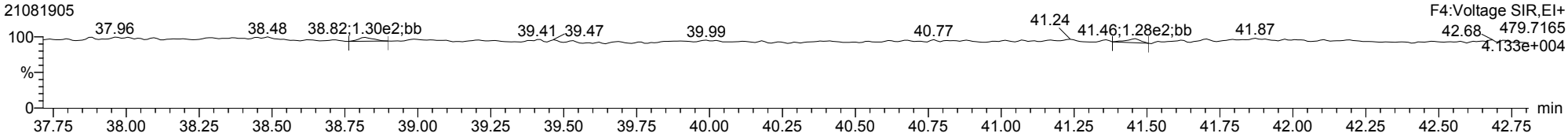
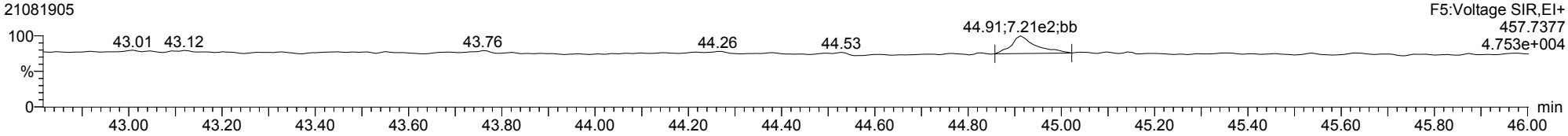


FUNCTION4 NCDPE



ID: BJG0572-BLK2, Name: 21081905, Date: 18-Aug-2021, Time: 13:28:52, Conditions: AUTOSPEC01, User: pk

OCDD



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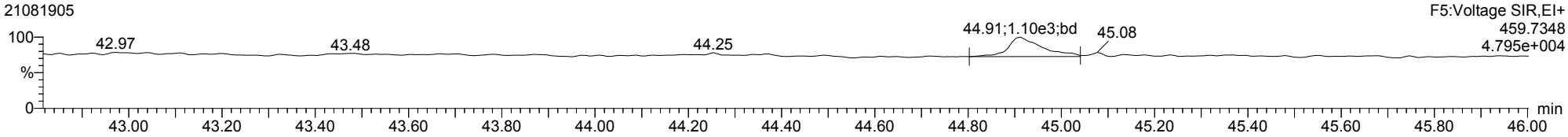

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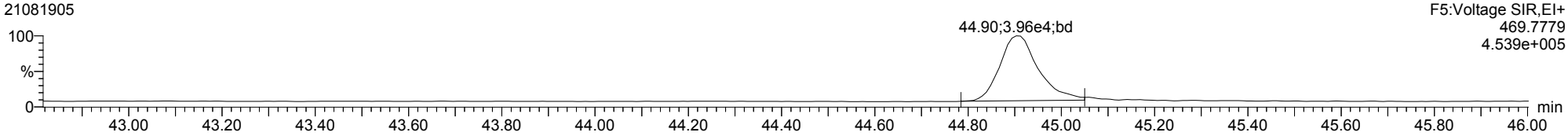

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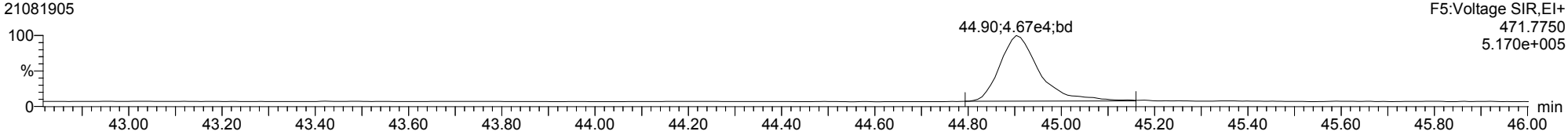
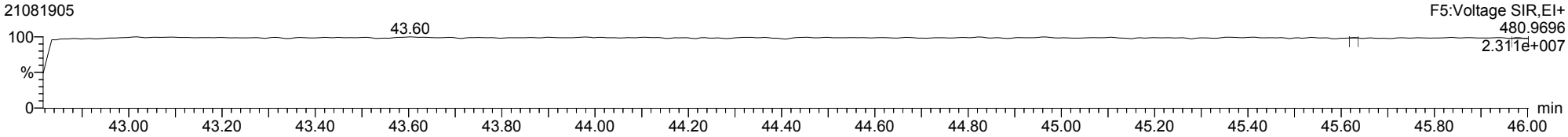


FUNCTION5 PFK



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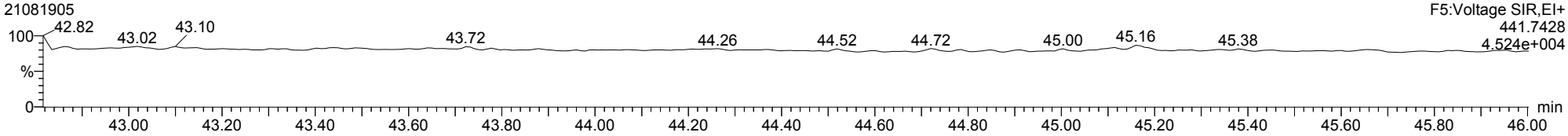
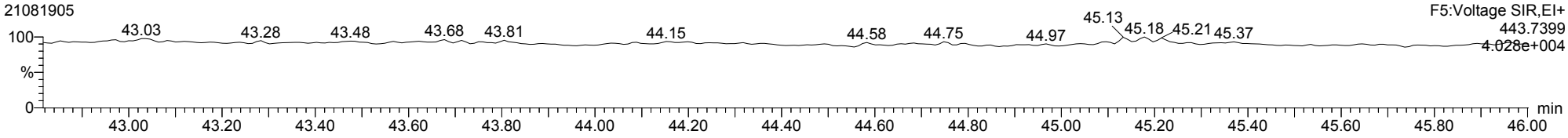
OCDF



OCDF



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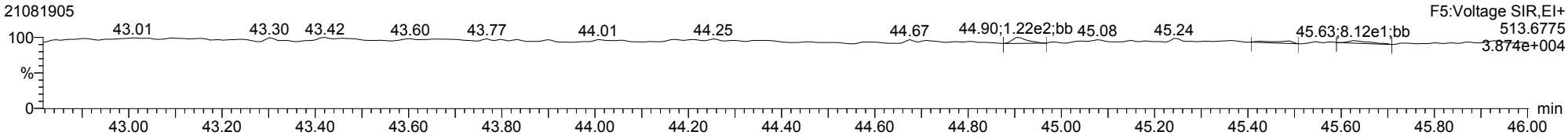

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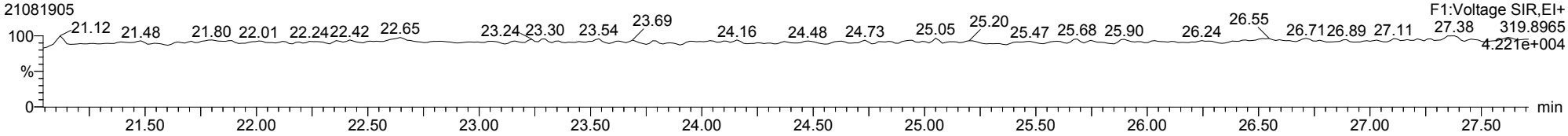
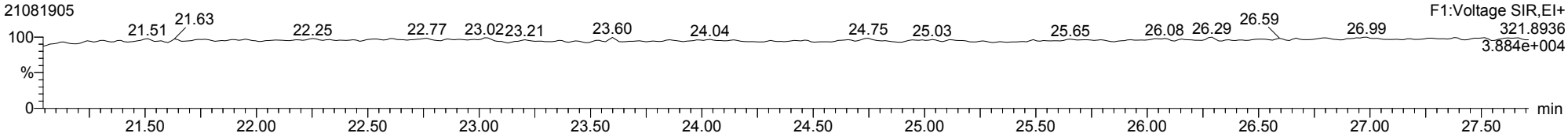
Printed: Thursday, August 19, 2021 10:29:56 Pacific Daylight Time

ID: BJG0572-BLK2, Name: 21081905, Date: 18-Aug-2021, Time: 13:28:52, Conditions: AUTOSPEC01, User: pk

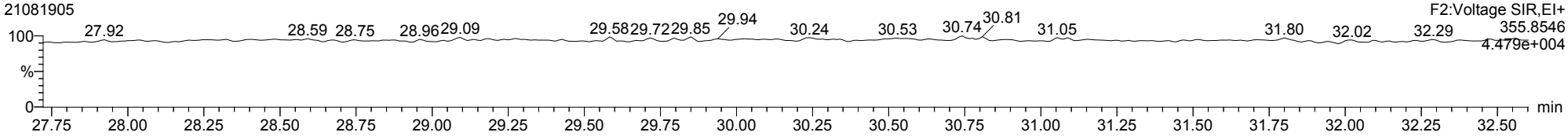
Total-tetradioxins



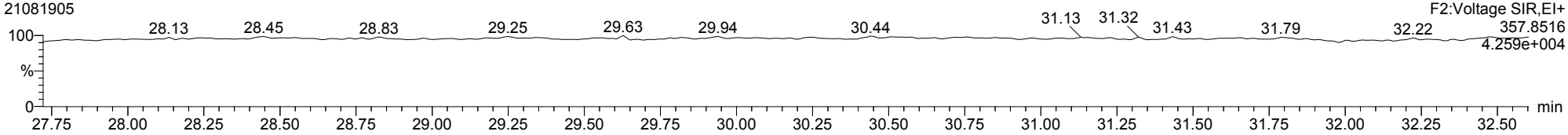
Total-tetradioxins



Total-pentadioxins



Total-pentadioxins



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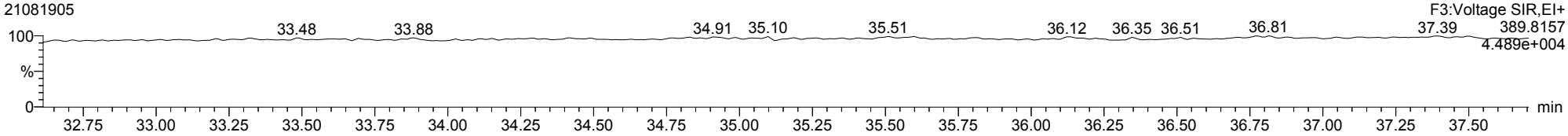
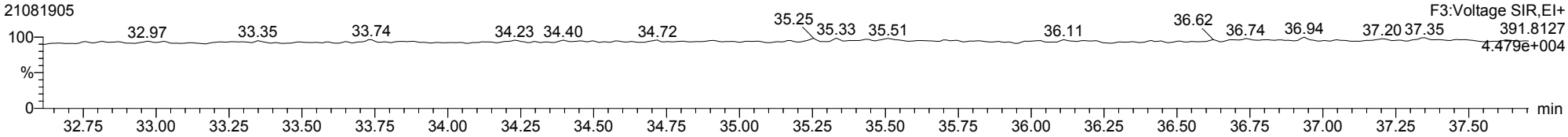
Total-hexadioxins



Total-hexadioxins



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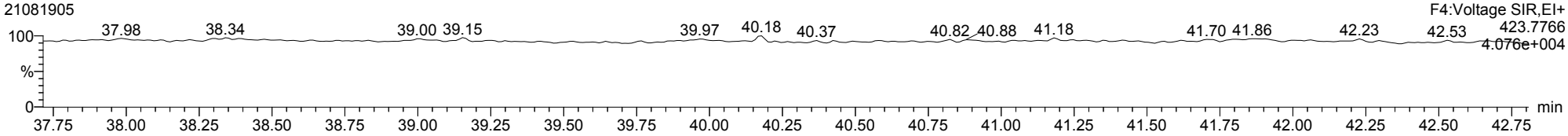
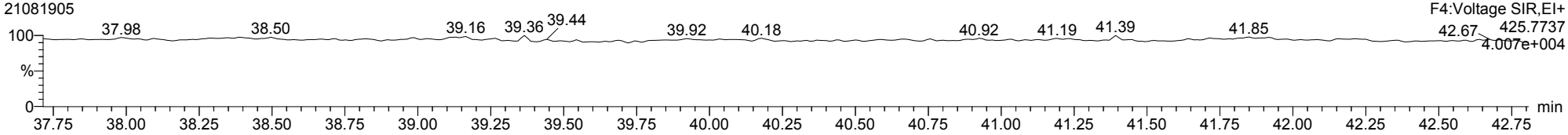


Total-heptadioxins



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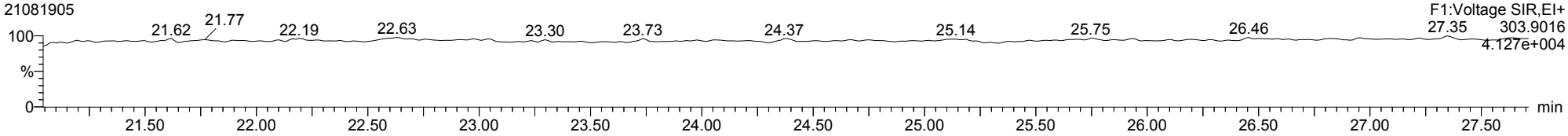
ID: BJG0572-BLK2, Name: 21081905, Date: 18-Aug-2021, Time: 13:28:52, Conditions: AUTOSPEC01, User: pk

Total-tetrafurans



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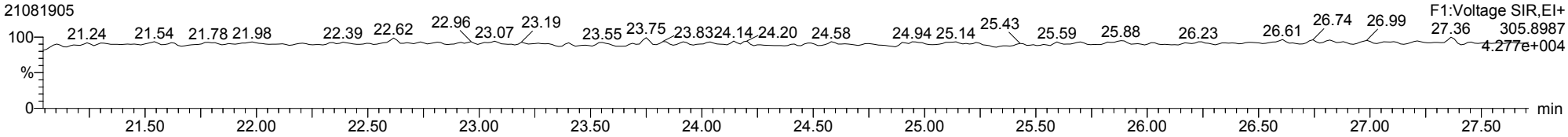

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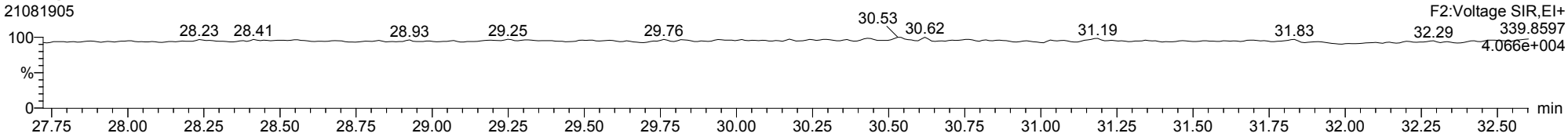
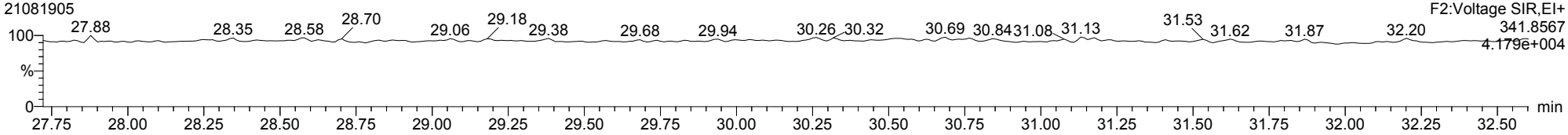


Total-pentafurans



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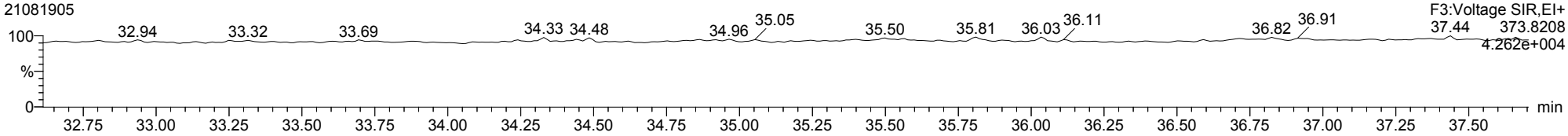
Total-hexafurans



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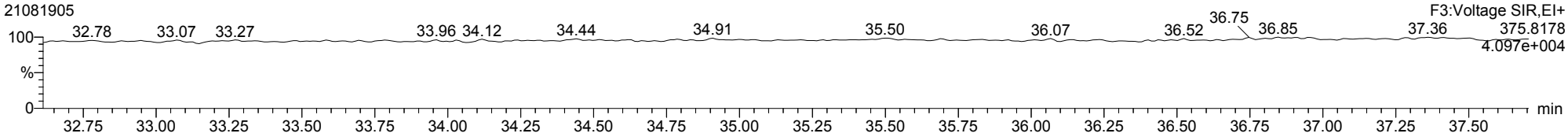

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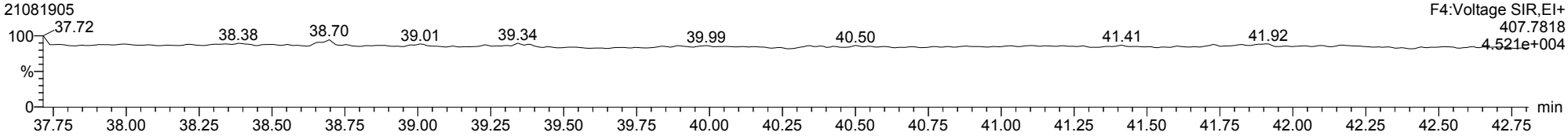
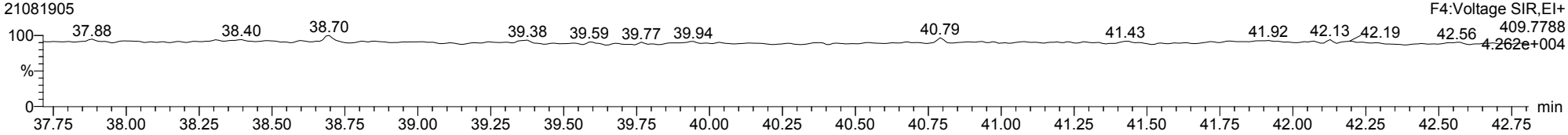


Total-heptafurans



Analytical Resources, Incorporated
Analytical Chemists and Consultants

LCS RECOVERY
EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/18/21 14:17
Batch:	BJG0572	Laboratory ID:	BJG0572-BS2
Preparation:	EPA 1613	Sequence Name:	LCS
Initial/Final:	10 g / 20 uL		

COMPOUND	SPIKE ADDED (ng/kg wet)	LCS CONCENTRATION (ng/kg wet)	Q	LCS % REC. #	QC LIMITS REC.
2,3,7,8-TCDF	20.0	18.6		93.0	75 - 158
2,3,7,8-TCDD	20.0	18.9		94.5	67 - 158
1,2,3,7,8-PeCDF	100	93.4		93.4	80 - 134
2,3,4,7,8-PeCDF	100	97.6		97.6	68 - 160
1,2,3,7,8-PeCDD	100	95.1		95.1	70 - 142
1,2,3,4,7,8-HxCDF	100	101		101	72 - 134
1,2,3,6,7,8-HxCDF	100	95.9		95.9	84 - 130
2,3,4,6,7,8-HxCDF	100	97.2		97.2	70 - 156
1,2,3,7,8,9-HxCDF	100	95.3		95.3	78 - 130
1,2,3,4,7,8-HxCDD	100	95.8		95.8	70 - 164
1,2,3,6,7,8-HxCDD	100	99.7		99.7	76 - 134
1,2,3,7,8,9-HxCDD	100	106		106	64 - 162
1,2,3,4,6,7,8-HpCDF	100	93.7		93.7	82 - 122
1,2,3,4,7,8,9-HpCDF	100	94.6		94.6	78 - 138
1,2,3,4,6,7,8-HpCDD	100	95.8		95.8	70 - 140
OCDF	200	170		85.2	63 - 170
OCDD	200	185	B	92.6	78 - 144

* Indicates values outside of QC limits

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Printed: Thursday, August 19, 2021 10:30:06 Pacific Daylight Time

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: BJG0572-BS2, Name: 21081906, Date: 18-Aug-2021, Time: 14:17:44, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
2378-TCDF	25.655	1.001	4.525e3	6.439e3	1.108	0.703	0.770	766	1199	6.84e4	9.68e4	89.4	80.7	NO	bb	bb	9.298
12378-PeCDF	29.817	1.001	5.107e4	3.132e4	1.015	1.630	1.550	1173	1524	7.13e5	4.64e5	608.1	304.5	NO	bd	bb	46.709
23478-PeCDF	31.165	1.001	5.442e4	3.612e4	1.126	1.507	1.550	1173	1524	7.78e5	5.03e5	663.2	330.0	NO	bd	bd	48.776
123478-HxCDF	34.797	1.000	4.527e4	3.886e4	1.017	1.165	1.240	1321	1720	6.88e5	5.99e5	520.5	348.1	NO	bd	bd	50.363
234678-HxCDF	35.811	1.001	4.582e4	3.884e4	1.052	1.179	1.240	1321	1720	7.17e5	5.81e5	543.0	338.0	NO	bb	bd	48.579
123678-HxCDF	34.942	1.001	5.004e4	3.981e4	1.037	1.257	1.240	1321	1720	7.20e5	5.73e5	544.6	333.1	NO	db	db	47.937
123789-HxCDF	36.836	1.000	3.887e4	3.205e4	1.030	1.213	1.240	1321	1720	5.76e5	4.89e5	436.2	284.5	NO	bb	bb	47.674
1234678-HpCDF	38.697	1.001	4.334e4	4.031e4	1.327	1.075	1.050	1422	1006	6.32e5	5.96e5	444.0	593.0	NO	bb	bb	46.850
1234789-HpCDF	40.925	1.000	3.373e4	3.469e4	1.283	0.972	1.050	1422	1006	4.41e5	4.52e5	309.8	449.4	NO	bb	bd	47.303
OCDF	45.151	1.005	5.324e4	6.188e4	1.447	0.860	0.890	1504	1540	5.82e5	6.90e5	386.9	447.8	NO	bb	bd	85.224
2378-TCDD	26.290	1.001	4.218e3	5.483e3	0.920	0.769	0.770	1459	726	5.87e4	7.71e4	40.2	106.2	NO	bb	bb	9.454
12378-PeCDD	31.421	1.001	3.171e4	1.949e4	0.995	1.627	1.550	1121	759	4.50e5	2.80e5	401.2	369.2	NO	bb	bb	47.538
123478-HxCDD	35.923	1.000	3.753e4	2.933e4	1.027	1.280	1.240	1020	1159	5.84e5	4.77e5	572.5	411.9	NO	bd	bd	47.891
123678-HxCDD	36.034	1.000	4.153e4	3.167e4	1.009	1.311	1.240	1020	1159	6.16e5	4.82e5	604.3	415.8	NO	db	db	49.856
123789-HxCDD	36.424	1.011	3.937e4	3.123e4	0.950	1.260	1.240	1020	1159	6.08e5	4.71e5	596.1	406.0	NO	bb	bd	52.790
1234678-HpCDD	40.189	1.001	2.776e4	2.583e4	1.068	1.074	1.050	1032	1163	3.84e5	3.63e5	372.1	311.8	NO	bd	bb	47.879
OCDD	44.922	1.000	4.776e4	5.428e4	1.181	0.880	0.890	1154	966	5.60e5	5.95e5	485.1	616.0	NO	bb	bb	92.561
13C-2378-TCDF	25.640	1.007	4.667e4	5.980e4	1.427	0.780	0.770	2376	1573	6.89e5	8.59e5	289.8	546.2	NO	bb	bb	37.891
13C-12378-PeCDF	29.795	1.170	1.086e5	6.524e4	1.297	1.664	1.550	1522	1364	1.51e6	9.07e5	990.6	664.9	NO	bd	bb	68.025
13C-23478-PeCDF	31.143	1.223	1.023e5	6.259e4	1.236	1.635	1.550	1522	1364	1.48e6	8.94e5	971.4	655.3	NO	bb	bb	67.720
13C-123478-HxCDF	34.786	0.955	5.575e4	1.085e5	1.242	0.514	0.510	1580	1642	8.46e5	1.63e6	535.5	989.9	NO	bd	bd	76.861
13C-123678-HxCDF	34.920	0.959	6.515e4	1.156e5	1.343	0.563	0.510	1580	1642	8.98e5	1.70e6	568.1	1035.3	NO	dd	db	78.230
13C-234678-HxCDF	35.789	0.983	5.683e4	1.087e5	1.215	0.523	0.510	1580	1642	8.40e5	1.63e6	531.3	990.3	NO	bd	bd	79.233
13C-123789-HxCDF	36.825	1.011	5.032e4	9.409e4	1.008	0.535	0.510	1580	1642	7.49e5	1.40e6	473.7	853.8	NO	bb	bb	83.317
13C-1234678-HpCDF	38.674	1.062	4.114e4	9.337e4	0.926	0.441	0.440	1243	1406	6.17e5	1.34e6	496.4	951.4	NO	bb	bd	84.403
13C-1234789-HpCDF	40.903	1.123	3.505e4	7.766e4	0.758	0.451	0.440	1243	1406	4.60e5	1.03e6	369.7	729.4	NO	bd	bd	86.450
13C-1234-TCDD	25.458	0.000	8.567e4	1.113e5	1.000	0.770	0.770	1782	1174	1.28e6	1.68e6	721.0	1426.6	NO	bb	bb	100.000
13C-2378-TCDD	26.275	1.032	4.865e4	6.285e4	1.116	0.774	0.770	1782	1174	7.06e5	9.21e5	396.4	784.0	NO	bb	bb	50.703
13C-12378-PeCDD	31.399	1.233	6.575e4	4.245e4	0.732	1.549	1.550	936	949	9.00e5	5.81e5	961.3	612.1	NO	bb	bb	75.049
13C-123478-HxCDD	35.911	0.986	7.542e4	6.047e4	0.960	1.247	1.240	1575	1227	1.16e6	9.12e5	735.3	742.8	NO	bd	bd	82.305
13C-123678-HxCDD	36.023	0.989	8.094e4	6.458e4	1.041	1.253	1.240	1575	1227	1.20e6	9.55e5	759.4	777.9	NO	db	db	81.235
13C-1234678-HpCDD	40.167	1.103	5.247e4	5.232e4	0.632	1.003	1.050	1209	964	7.40e5	7.19e5	612.2	745.9	NO	bb	bd	96.324
13C-OCDD	44.904	1.233	9.014e4	9.658e4	0.504	0.933	0.890	1289	978	9.79e5	1.10e6	759.6	1120.8	NO	bb	bb	215.488
13C-123789-HxCDD	36.413	0.000	9.775e4	7.427e4	1.000	1.316	1.240	1575	1227	1.52e6	1.16e6	967.8	941.4	NO	bb	bb	100.000
37CL-2378-TCDD	26.290	1.033	4.518e4		1.084			1062		6.51e5		612.9			bb		21.171

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
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Printed: Thursday, August 19, 2021 10:30:06 Pacific Daylight Time

ID: BJG0572-BS2, Name: 21081906, Date: 18-Aug-2021, Time: 14:17:44, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
1368-TCDF					1.425		0.770	766	1199								
1289-TCDF					1.043		0.770	766	1199								
13468-PECDF					1.376		1.550	700	1101								
12389-PECDF					1.000		1.550	1173	1524								
123468-HXCDF					1.087		1.240	1321	1720								
1368-TCDD					0.923		0.770	1459	726								
1289-TCDD					0.794		0.770	1459	726								
12479-PECDD					1.843		1.550	1121	759								
12389-PECDD					1.154		1.550	1121	759								
124679-HXCDD					1.125		1.240	1020	1159								
1234679-HPCDD	39.142	0.975	3.034e2	3.277e2	1.211	0.926	1.050	1032	1163	6.48e3	4.61e3	6.3	4.0	NO	bb	bb	0.497
Total-tetrafurans			4.525e3		1.192			766		6.84e4							9.298
Total-penta1			0.000e0					700		0.00e0							
Total-pentafurans			1.055e5		1.047			1173		1.49e6							95.486
Total-hexafurans			1.800e5		1.045			1321		2.70e6							194.553
Total-heptafurans			7.707e4		1.305			1422		1.07e6							94.152
Total-Furans			4.203e5		1.158			766		5.91e6							478.713
Total-tetradioxins			4.218e3		0.879			1459		5.87e4							9.454
Total-pentadioxins			3.171e4		1.331			1121		4.50e5							47.538
Total-hexadioxins			1.184e5		1.028			1020		1.81e6							150.536
Total-heptadioxins			2.806e4		1.140			1032		3.90e5							48.376
Total-Dioxins			2.302e5		1.092			1459		3.27e6							348.464
Total-TEQ			6.505e5					1459		9.18e6							827.177
FUNCTION1 PFK			1.276e5					577816		1.98e6							
FUNCTION2 PFK			1.196e5					455412		2.97e6							0.000
FUNCTION3 PFK			6.987e5					478821		1.81e7							0.000
FUNCTION4 PFK			2.824e5					281042		8.34e6							
FUNCTION5 PFK			1.725e5					224896		4.49e6							
FUNCTION1 HXCD...			1.298e3					737		1.91e4							0.000
FUNCTION1 HPCD...			9.835e2					899		1.82e4							0.000
FUNCTION2 HPCD...			3.847e2					798		7.43e3							0.000
FUNCTION3 OCDPE			2.022e2					733		4.71e3							0.000
FUNCTION4 NCDPE			4.380e2					925		8.83e3							0.000
FUNCTION5 DCDPE			0.000e0					584		0.00e0							

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
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Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: BJG0572-BS2, Name: 21081906, Date: 18-Aug-2021, Time: 14:17:44, Conditions: AUTOSPEC01, User: pk

TF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	2378-TCDF	25.65	4.525e3	6.439e3	1.108	0.70	0.77	89.4	YES	NO	bb	bb	9.298

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	23478-PeCDF	31.17	5.442e4	3.612e4	1.126	1.51	1.55	663.2	YES	NO	bd	bd	48.776
2	12378-PeCDF	29.82	5.107e4	3.132e4	1.015	1.63	1.55	608.1	YES	NO	bd	bb	46.709

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123789-HxCDF	36.84	3.887e4	3.205e4	1.030	1.21	1.24	436.2	YES	NO	bb	bb	47.674
2	234678-HxCDF	35.81	4.582e4	3.884e4	1.052	1.18	1.24	543.0	YES	NO	bb	bd	48.579
3	123678-HxCDF	34.94	5.004e4	3.981e4	1.037	1.26	1.24	544.6	YES	NO	db	db	47.937
4	123478-HxCDF	34.80	4.527e4	3.886e4	1.017	1.16	1.24	520.5	YES	NO	bd	bd	50.363

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDF	38.70	4.334e4	4.031e4	1.327	1.08	1.05	444.0	YES	NO	bb	bb	46.850
2	1234789-HpCDF	40.92	3.373e4	3.469e4	1.283	0.97	1.05	309.8	YES	NO	bb	bd	47.303

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Furans,TF,PP,PF,HF,HPF,OF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	2378-TCDF	25.65	4.525e3	6.439e3	1.108	0.70	0.77	89.4	YES	NO	bb	bb	9.298
2	23478-PeCDF	31.17	5.442e4	3.612e4	1.126	1.51	1.55	663.2	YES	NO	bd	bd	48.776
3	12378-PeCDF	29.82	5.107e4	3.132e4	1.015	1.63	1.55	608.1	YES	NO	bd	bb	46.709
4	123789-HxCDF	36.84	3.887e4	3.205e4	1.030	1.21	1.24	436.2	YES	NO	bb	bb	47.674
5	234678-HxCDF	35.81	4.582e4	3.884e4	1.052	1.18	1.24	543.0	YES	NO	bb	bd	48.579
6	123678-HxCDF	34.94	5.004e4	3.981e4	1.037	1.26	1.24	544.6	YES	NO	db	db	47.937
7	123478-HxCDF	34.80	4.527e4	3.886e4	1.017	1.16	1.24	520.5	YES	NO	bd	bd	50.363
8	1234678-HpCDF	38.70	4.334e4	4.031e4	1.327	1.08	1.05	444.0	YES	NO	bb	bb	46.850
9	1234789-HpCDF	40.92	3.373e4	3.469e4	1.283	0.97	1.05	309.8	YES	NO	bb	bd	47.303
10	OCDF	45.15	5.324e4	6.188e4	1.447	0.86	0.89	386.9	YES	NO	bb	bd	85.224

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	2378-TCDD	26.29	4.218e3	5.483e3	0.920	0.77	0.77	40.2	YES	NO	bb	bb	9.454

PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	12378-PeCDD	31.42	3.171e4	1.949e4	0.995	1.63	1.55	401.2	YES	NO	bb	bb	47.538

HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123789-HxCDD	36.42	3.937e4	3.123e4	0.950	1.26	1.24	596.1	YES	NO	bb	bd	52.790
2	123678-HxCDD	36.03	4.153e4	3.167e4	1.009	1.31	1.24	604.3	YES	NO	db	db	49.856
3	123478-HxCDD	35.92	3.753e4	2.933e4	1.027	1.28	1.24	572.5	YES	NO	bd	bd	47.891

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDD	40.19	2.776e4	2.583e4	1.068	1.07	1.05	372.1	YES	NO	bd	bb	47.879
2	1234679-HPCDD	39.14	3.034e2	3.277e2	1.211	0.93	1.05	6.3	YES	NO	bb	bb	0.497

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Dioxins,TD,PD,HD,HPD,OD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	2378-TCDD	26.29	4.218e3	5.483e3	0.920	0.77	0.77	40.2	YES	NO	bb	bb	9.454
2	123789-HxCDD	36.42	3.937e4	3.123e4	0.950	1.26	1.24	596.1	YES	NO	bb	bd	52.790
3	123678-HxCDD	36.03	4.153e4	3.167e4	1.009	1.31	1.24	604.3	YES	NO	db	db	49.856
4	123478-HxCDD	35.92	3.753e4	2.933e4	1.027	1.28	1.24	572.5	YES	NO	bd	bd	47.891
5	12378-PeCDD	31.42	3.171e4	1.949e4	0.995	1.63	1.55	401.2	YES	NO	bb	bb	47.538
6	1234678-HpCDD	40.19	2.776e4	2.583e4	1.068	1.07	1.05	372.1	YES	NO	bd	bb	47.879
7	1234679-HPCDD	39.14	3.034e2	3.277e2	1.211	0.93	1.05	6.3	YES	NO	bb	bb	0.497
8	OCDD	44.92	4.776e4	5.428e4	1.181	0.88	0.89	485.1	YES	NO	bb	bb	92.561

TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	2378-TCDF	25.65	4.525e3	6.439e3	1.108	0.70	0.77	89.4	YES	NO	bb	bb	9.298
2	23478-PeCDF	31.17	5.442e4	3.612e4	1.126	1.51	1.55	663.2	YES	NO	bd	bd	48.776
3	12378-PeCDF	29.82	5.107e4	3.132e4	1.015	1.63	1.55	608.1	YES	NO	bd	bb	46.709
4	123789-HxCDF	36.84	3.887e4	3.205e4	1.030	1.21	1.24	436.2	YES	NO	bb	bb	47.674
5	234678-HxCDF	35.81	4.582e4	3.884e4	1.052	1.18	1.24	543.0	YES	NO	bb	bd	48.579
6	123678-HxCDF	34.94	5.004e4	3.981e4	1.037	1.26	1.24	544.6	YES	NO	db	db	47.937
7	123478-HxCDF	34.80	4.527e4	3.886e4	1.017	1.16	1.24	520.5	YES	NO	bd	bd	50.363
8	1234678-HpCDF	38.70	4.334e4	4.031e4	1.327	1.08	1.05	444.0	YES	NO	bb	bb	46.850
9	1234789-HpCDF	40.92	3.373e4	3.469e4	1.283	0.97	1.05	309.8	YES	NO	bb	bd	47.303
10	OCDF	45.15	5.324e4	6.188e4	1.447	0.86	0.89	386.9	YES	NO	bb	bd	85.224
11	2378-TCDD	26.29	4.218e3	5.483e3	0.920	0.77	0.77	40.2	YES	NO	bb	bb	9.454
12	123789-HxCDD	36.42	3.937e4	3.123e4	0.950	1.26	1.24	596.1	YES	NO	bb	bd	52.790
13	123678-HxCDD	36.03	4.153e4	3.167e4	1.009	1.31	1.24	604.3	YES	NO	db	db	49.856
14	123478-HxCDD	35.92	3.753e4	2.933e4	1.027	1.28	1.24	572.5	YES	NO	bd	bd	47.891
15	12378-PeCDD	31.42	3.171e4	1.949e4	0.995	1.63	1.55	401.2	YES	NO	bb	bb	47.538
16	1234678-HpCDD	40.19	2.776e4	2.583e4	1.068	1.07	1.05	372.1	YES	NO	bd	bb	47.879
17	1234679-HPCDD	39.14	3.034e2	3.277e2	1.211	0.93	1.05	6.3	YES	NO	bb	bb	0.497
18	OCDD	44.92	4.776e4	5.428e4	1.181	0.88	0.89	485.1	YES	NO	bb	bb	92.561

PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	21.74	1.276e5					3.4	YES		bb		

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PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 PFK	28.10	2.772e4					2.0	NO		bb		0.000
2	FUNCTION2 PFK	27.95	3.984e3					0.8	NO		bb		0.000
3	FUNCTION2 PFK	27.82	8.787e4					3.8	YES		bb		0.000

PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 PFK	35.65	1.945e4					1.4	NO		dd		0.000
2	FUNCTION3 PFK	35.60	2.372e4					1.2	NO		bd		0.000
3	FUNCTION3 PFK	35.34	6.041e3					0.8	NO		bb		0.000
4	FUNCTION3 PFK	35.19	1.015e4					0.9	NO		bb		0.000
5	FUNCTION3 PFK	34.81	9.865e3					1.0	NO		bb		0.000
6	FUNCTION3 PFK	34.36	2.647e4					1.3	NO		db		0.000
7	FUNCTION3 PFK	34.32	1.429e4					1.0	NO		bd		0.000
8	FUNCTION3 PFK	34.16	1.190e4					1.1	NO		bb		0.000
9	FUNCTION3 PFK	33.55	1.814e4					1.1	NO		db		0.000
10	FUNCTION3 PFK	33.49	1.929e4					1.3	NO		bd		0.000
11	FUNCTION3 PFK	33.43	1.810e3					0.3	NO		bb		0.000
12	FUNCTION3 PFK	33.26	3.178e4					1.1	NO		bb		0.000
13	FUNCTION3 PFK	33.09	9.715e3					0.8	NO		bb		0.000
14	FUNCTION3 PFK	32.80	1.020e4					1.2	NO		bb		0.000
15	FUNCTION3 PFK	32.76	1.395e4					1.3	NO		db		0.000
16	FUNCTION3 PFK	32.70	1.052e4					1.1	NO		bd		0.000
17	FUNCTION3 PFK	37.59	7.398e4					1.3	NO		db		0.000
18	FUNCTION3 PFK	37.48	2.814e4					1.7	NO		dd		0.000
19	FUNCTION3 PFK	37.44	3.001e4					1.8	NO		dd		0.000
20	FUNCTION3 PFK	37.39	4.262e4					2.3	NO		bd		0.000
21	FUNCTION3 PFK	37.33	1.467e4					1.1	NO		bb		0.000
22	FUNCTION3 PFK	37.17	2.033e4					1.1	NO		bb		0.000
23	FUNCTION3 PFK	37.05	5.109e3					0.5	NO		bb		0.000
24	FUNCTION3 PFK	36.26	3.087e4					1.4	NO		bb		0.000
25	FUNCTION3 PFK	36.19	1.008e5					3.0	NO		bb		0.000
26	FUNCTION3 PFK	35.99	3.703e4					1.5	NO		bb		0.000
27	FUNCTION3 PFK	35.89	4.008e4					2.3	NO		db		0.000
28	FUNCTION3 PFK	35.84	1.623e4					1.2	NO		dd		0.000
29	FUNCTION3 PFK	35.80	1.409e4					1.0	NO		bd		0.000
30	FUNCTION3 PFK	35.70	7.430e3					0.7	NO		db		0.000

ID: BJG0572-BS2, Name: 21081906, Date: 18-Aug-2021, Time: 14:17:44, Conditions: AUTOSPEC01, User: pk

PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 PFK	38.02	3.145e3					0.4	NO		bb		
2	FUNCTION4 PFK	40.80	4.820e3					0.8	NO		bb		
3	FUNCTION4 PFK	40.70	8.140e3					1.2	NO		bb		
4	FUNCTION4 PFK	40.31	1.486e4					1.4	NO		bb		
5	FUNCTION4 PFK	40.10	9.548e3					1.2	NO		bb		
6	FUNCTION4 PFK	40.03	4.163e3					0.7	NO		bb		
7	FUNCTION4 PFK	39.86	5.549e3					0.8	NO		bb		
8	FUNCTION4 PFK	39.81	5.835e3					0.9	NO		bb		
9	FUNCTION4 PFK	39.70	2.199e4					1.4	NO		bb		
10	FUNCTION4 PFK	39.54	2.445e4					1.7	NO		db		
11	FUNCTION4 PFK	39.44	2.135e4					1.6	NO		bd		
12	FUNCTION4 PFK	39.39	7.948e3					1.0	NO		bb		
13	FUNCTION4 PFK	39.19	9.027e3					0.7	NO		bb		
14	FUNCTION4 PFK	38.98	9.859e3					1.3	NO		db		
15	FUNCTION4 PFK	38.92	2.163e4					2.0	NO		bd		
16	FUNCTION4 PFK	38.72	4.410e3					1.0	NO		bb		
17	FUNCTION4 PFK	38.59	1.316e4					1.6	NO		bb		
18	FUNCTION4 PFK	42.67	3.263e3					0.5	NO		bb		
19	FUNCTION4 PFK	42.61	1.293e4					1.3	NO		bb		
20	FUNCTION4 PFK	42.46	1.638e3					0.5	NO		bb		
21	FUNCTION4 PFK	42.04	6.500e3					1.0	NO		bb		
22	FUNCTION4 PFK	41.81	5.091e3					1.0	NO		bb		
23	FUNCTION4 PFK	41.76	5.699e3					1.0	NO		bb		
24	FUNCTION4 PFK	41.40	6.895e3					1.1	NO		db		
25	FUNCTION4 PFK	41.34	3.610e4					1.5	NO		bd		
26	FUNCTION4 PFK	41.13	9.371e3					1.2	NO		bb		
27	FUNCTION4 PFK	41.01	4.998e3					1.0	NO		bb		

ID: BJG0572-BS2, Name: 21081906, Date: 18-Aug-2021, Time: 14:17:44, Conditions: AUTOSPEC01, User: pk

PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	44.05	2.196e4					1.7	NO		bb		
2	FUNCTION5 PFK	43.58	1.836e4					1.6	NO		bb		
3	FUNCTION5 PFK	42.95	1.625e3					0.8	NO		bb		
4	FUNCTION5 PFK	42.93	3.412e3					0.9	NO		db		
5	FUNCTION5 PFK	42.90	5.857e3					1.6	NO		bd		
6	FUNCTION5 PFK	45.94	5.819e3					1.3	NO		bb		
7	FUNCTION5 PFK	45.82	1.317e4					1.7	NO		bb		
8	FUNCTION5 PFK	45.66	8.729e3					1.1	NO		bb		
9	FUNCTION5 PFK	45.62	1.911e3					0.9	NO		bb		
10	FUNCTION5 PFK	44.67	1.163e3					0.6	NO		bb		
11	FUNCTION5 PFK	44.49	1.173e4					1.8	NO		bb		
12	FUNCTION5 PFK	44.44	6.085e4					3.4	YES		db		
13	FUNCTION5 PFK	44.31	1.789e4					2.6	NO		bd		

ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	25.22	1.317e2					5.9	YES		bb		0.000
2	FUNCTION1 HXCD...	24.87	1.036e2					1.7	NO		bb		0.000
3	FUNCTION1 HXCD...	24.01	8.894e1					2.2	NO		db		0.000
4	FUNCTION1 HXCD...	23.89	9.496e1					1.9	NO		bd		0.000
5	FUNCTION1 HXCD...	22.93	1.422e2					2.1	NO		bb		0.000
6	FUNCTION1 HXCD...	22.52	7.642e1					1.6	NO		bb		0.000
7	FUNCTION1 HXCD...	21.19	7.998e1					3.4	YES		bb		0.000
8	FUNCTION1 HXCD...	26.23	2.762e2					2.5	NO		bb		0.000
9	FUNCTION1 HXCD...	26.03	7.811e1					1.8	NO		db		0.000
10	FUNCTION1 HXCD...	25.87	2.257e2					2.8	NO		bd		0.000

ID: BJG0572-BS2, Name: 21081906, Date: 18-Aug-2021, Time: 14:17:44, Conditions: AUTOSPEC01, User: pk

ETHERS2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HPCD...	27.06	7.547e1					1.9	NO		bb		0.000
2	FUNCTION1 HPCD...	26.32	8.675e1					1.6	NO		db		0.000
3	FUNCTION1 HPCD...	26.26	7.589e1					2.1	NO		bd		0.000
4	FUNCTION1 HPCD...	25.87	1.022e2					1.6	NO		bb		0.000
5	FUNCTION1 HPCD...	24.34	7.052e1					1.4	NO		bb		0.000
6	FUNCTION1 HPCD...	24.22	1.432e2					1.5	NO		bb		0.000
7	FUNCTION1 HPCD...	23.61	1.260e2					3.5	YES		bb		0.000
8	FUNCTION1 HPCD...	23.36	8.663e1					1.8	NO		bb		0.000
9	FUNCTION1 HPCD...	22.93	1.368e2					2.4	NO		bb		0.000
10	FUNCTION1 HPCD...	21.10	8.000e1					2.4	NO		bb		0.000

ETHERS3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 HPCD...	28.37	1.152e2					3.0	YES		bb		0.000
2	FUNCTION2 HPCD...	31.99	9.361e1					1.9	NO		db		0.000
3	FUNCTION2 HPCD...	31.82	7.730e1					2.1	NO		bd		0.000
4	FUNCTION2 HPCD...	30.28	9.859e1					2.3	NO		bb		0.000

ETHERS4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 OCDPE	35.10	7.322e1					2.0	NO		bb		0.000
2	FUNCTION3 OCDPE	33.13	1.290e2					4.4	YES		bb		0.000

ETHERS5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 NCDPE	40.62	9.344e1					1.7	NO		bb		0.000
2	FUNCTION4 NCDPE	39.71	1.004e2					1.8	NO		bb		0.000
3	FUNCTION4 NCDPE	39.43	9.250e1					2.4	NO		bb		0.000
4	FUNCTION4 NCDPE	38.14	7.980e1					1.6	NO		db		0.000
5	FUNCTION4 NCDPE	38.07	7.186e1					2.1	NO		bd		0.000

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ID: BJG0572-BS2, Name: 21081906, Date: 18-Aug-2021, Time: 14:17:44, Conditions: AUTOSPEC01, User: pk

ETHERS6

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

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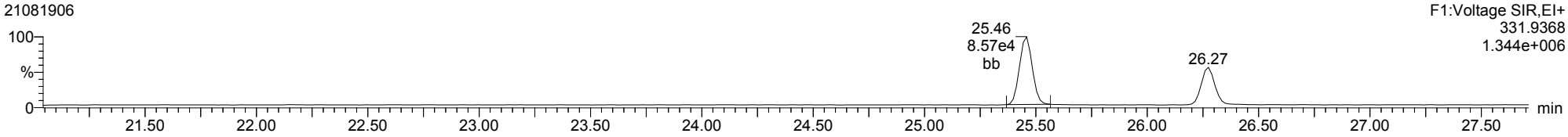

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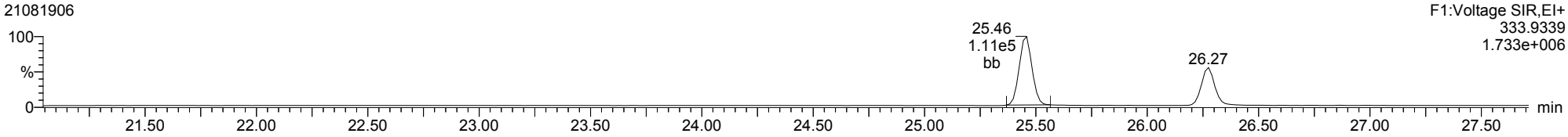

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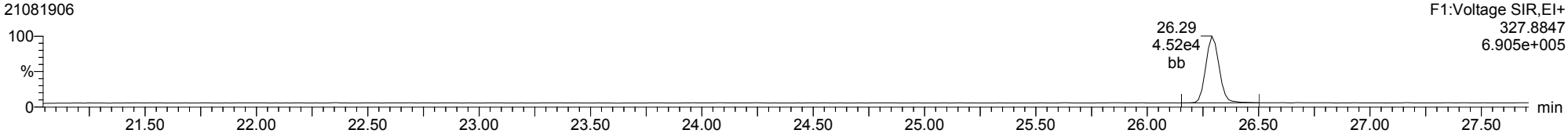

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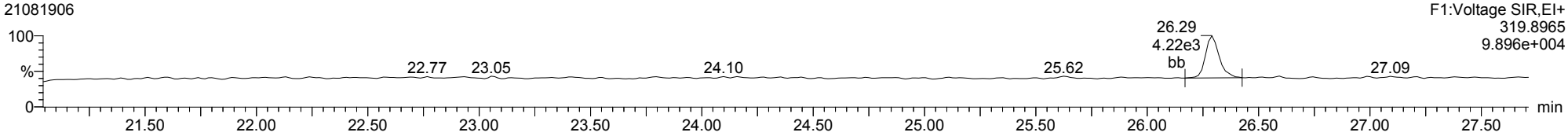

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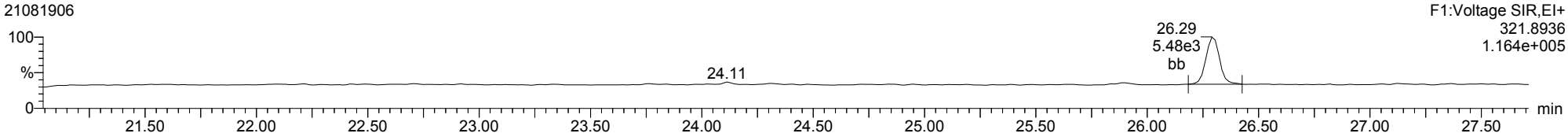

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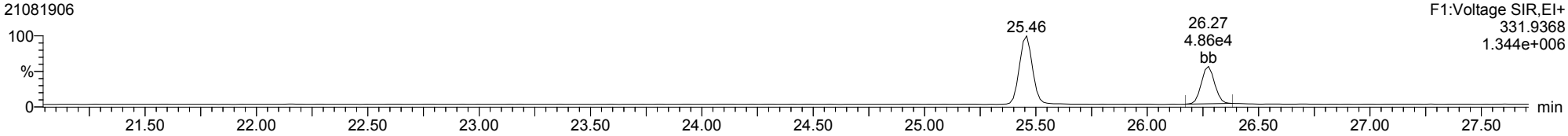

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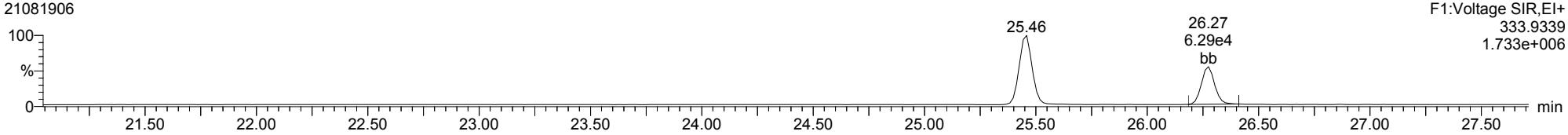

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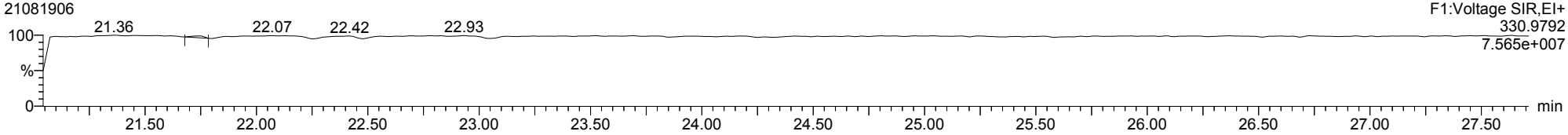

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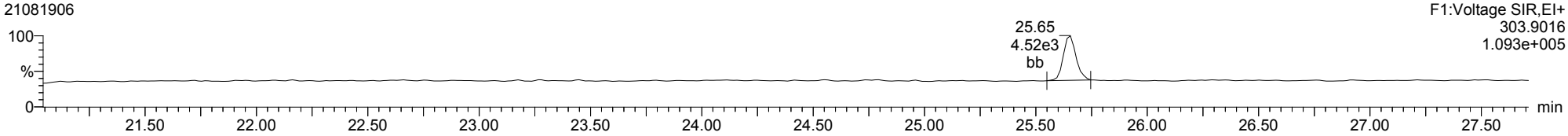

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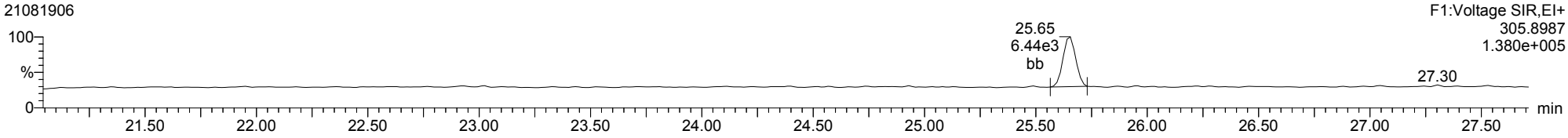

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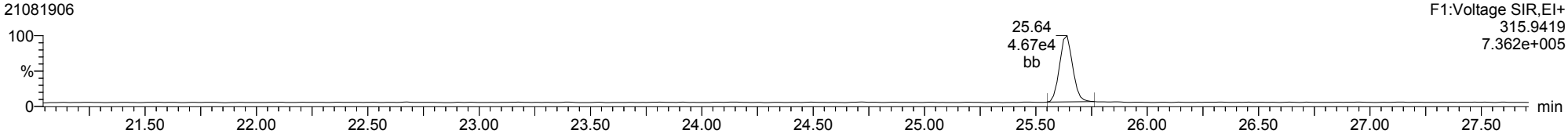

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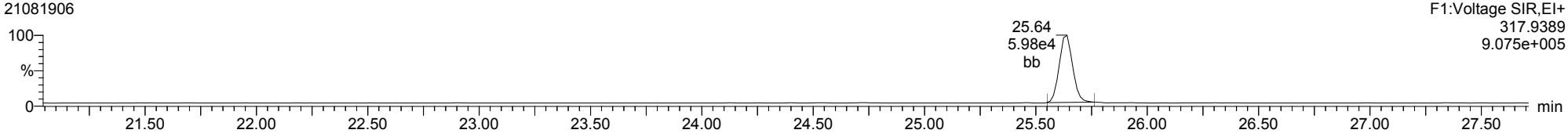

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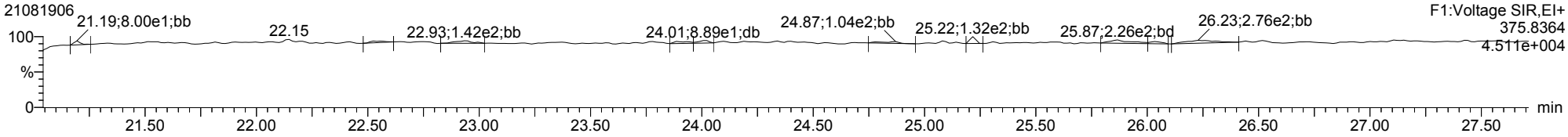

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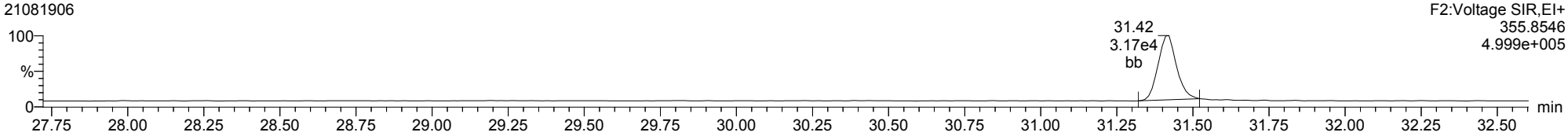

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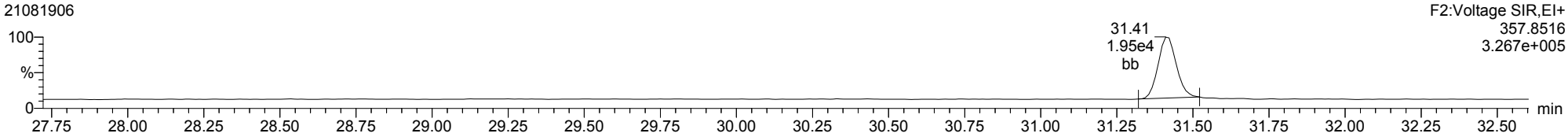

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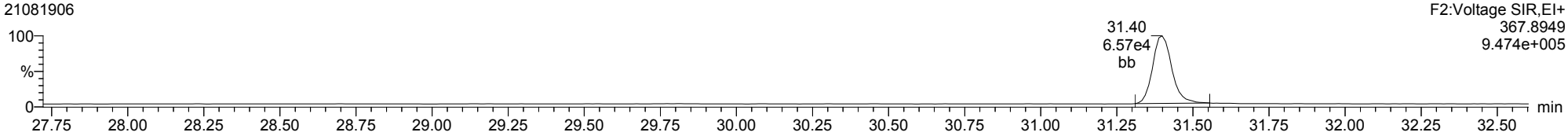

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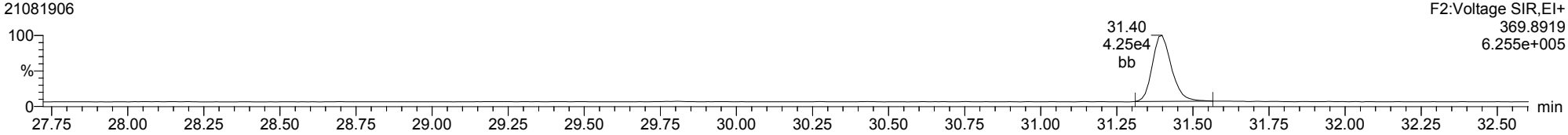

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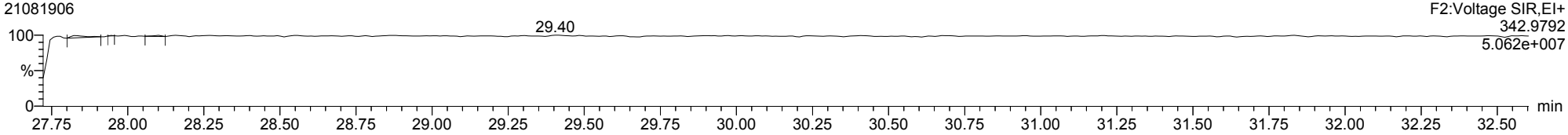

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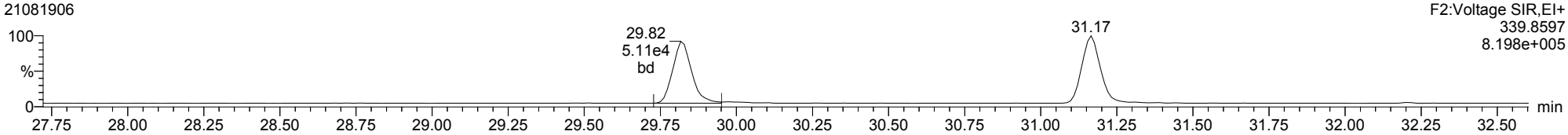
12378-PeCDF



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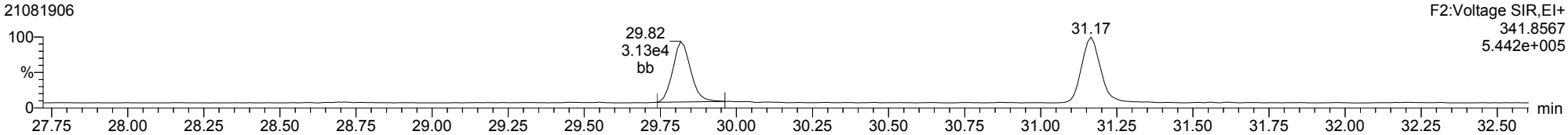

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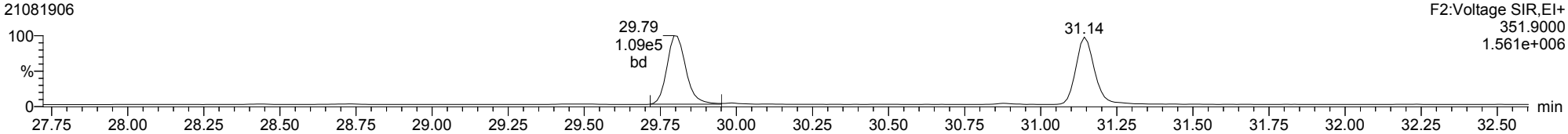

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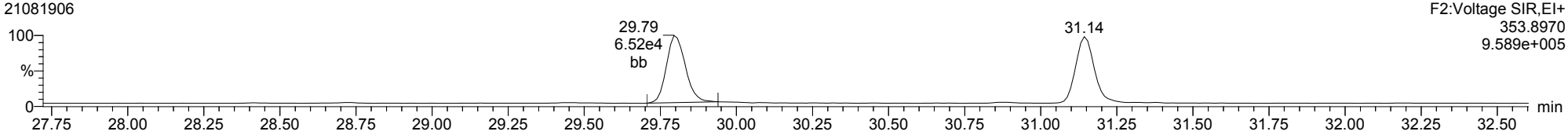

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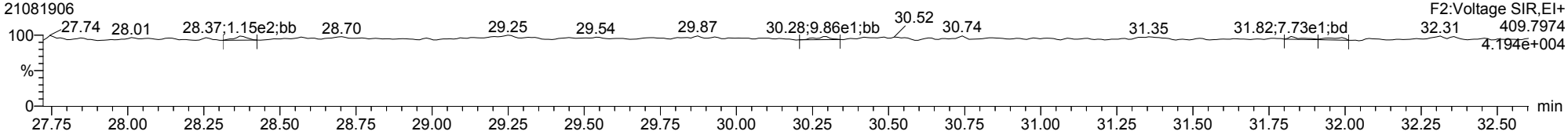

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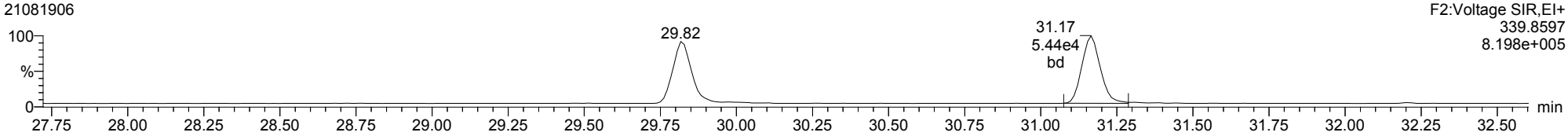
23478-PeCDF



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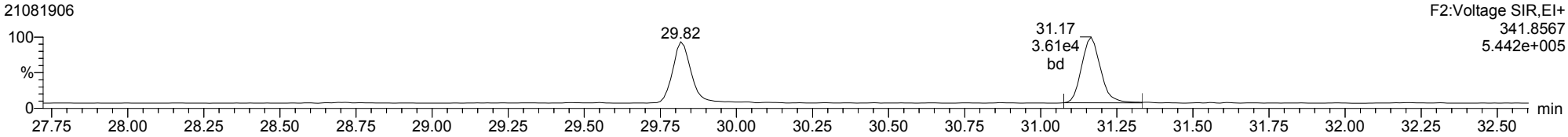

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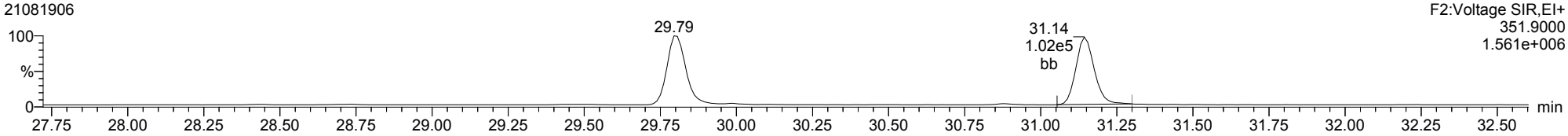

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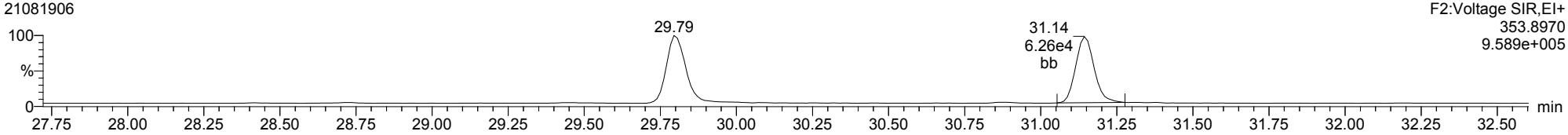

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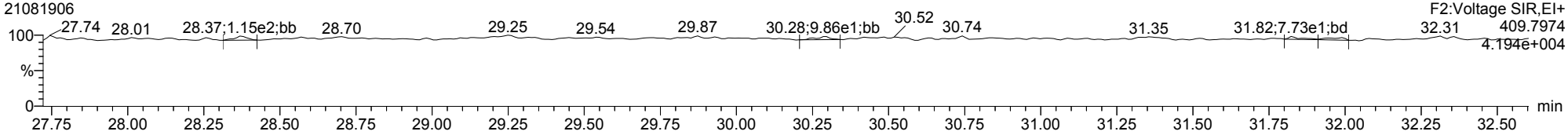

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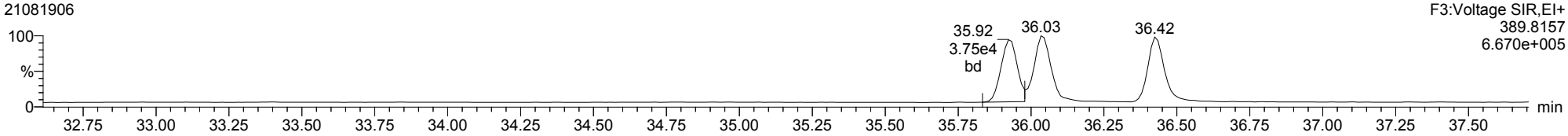

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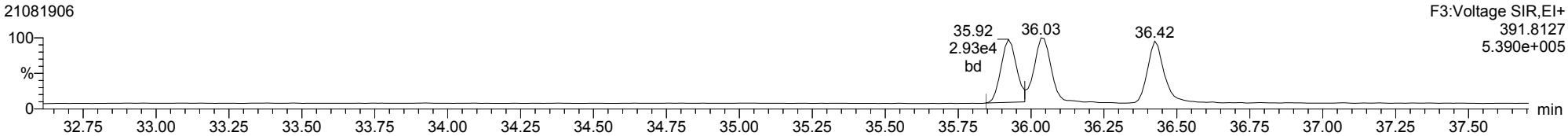

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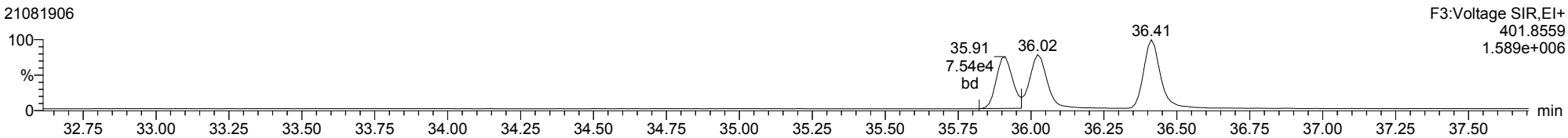

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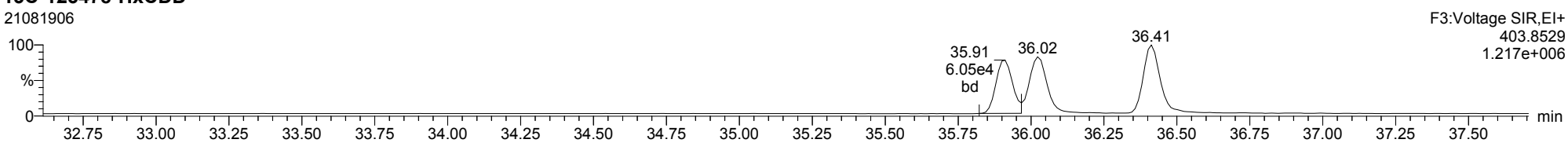

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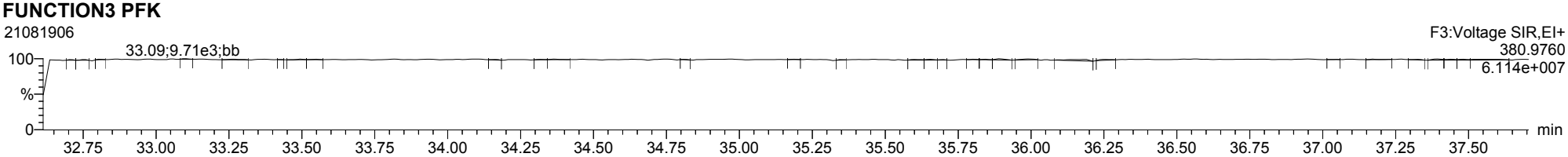

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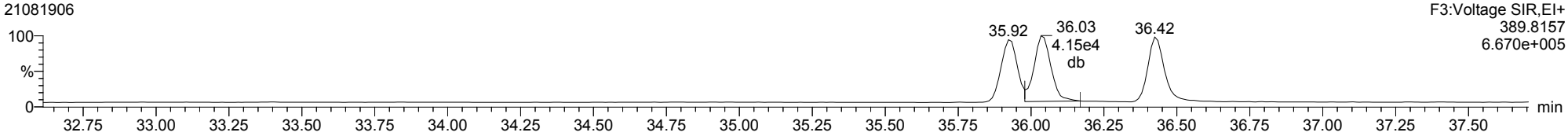

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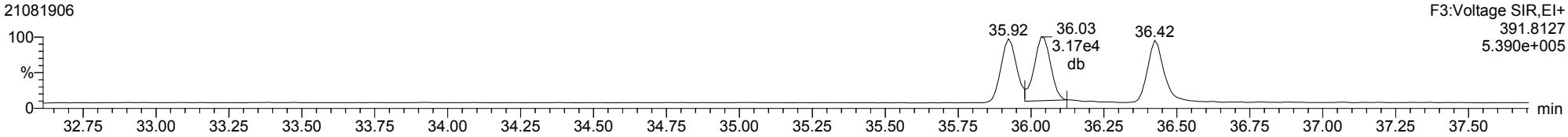

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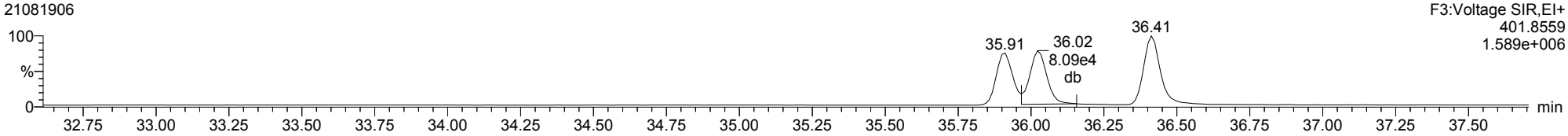

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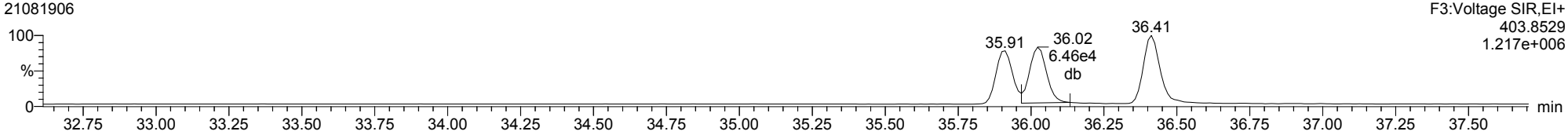

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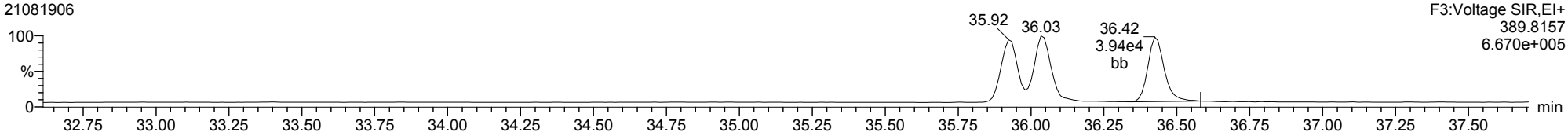

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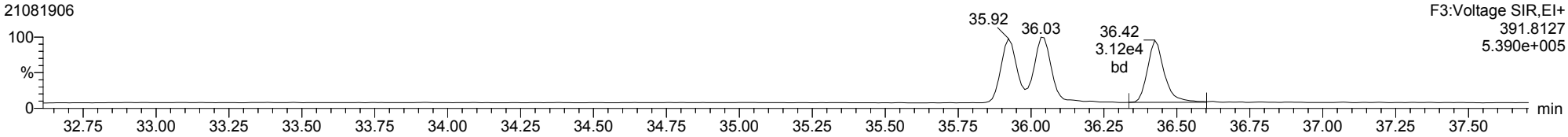

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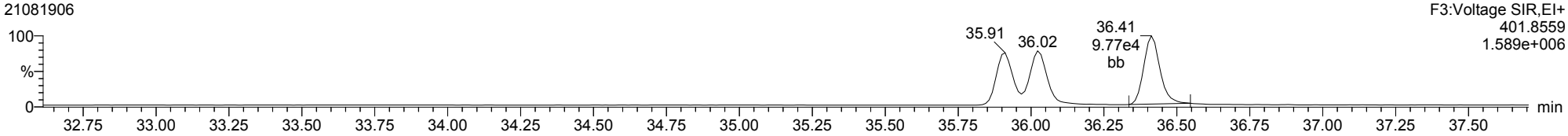

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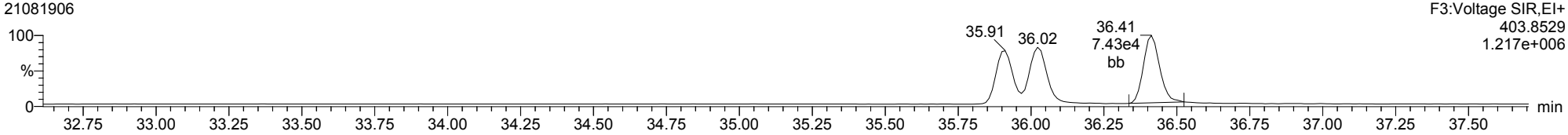

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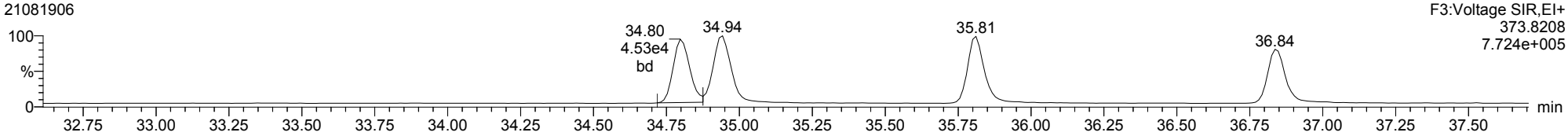

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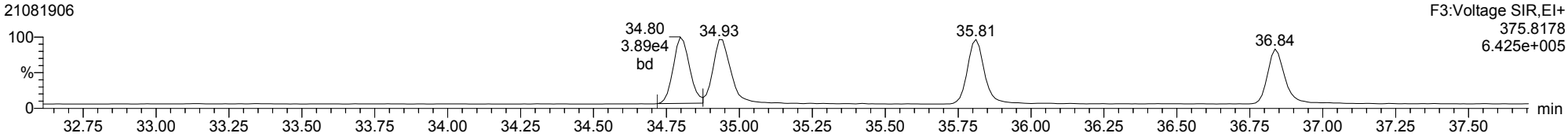

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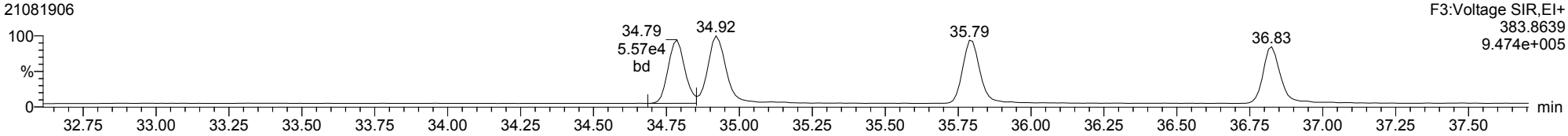

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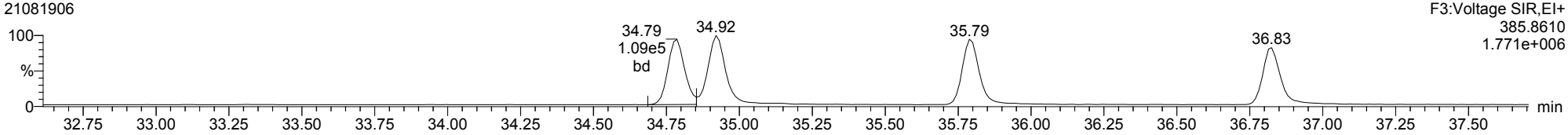

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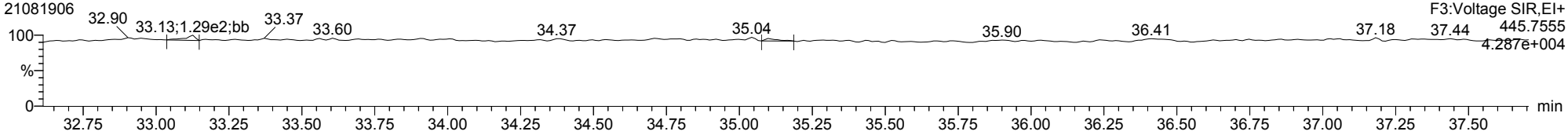

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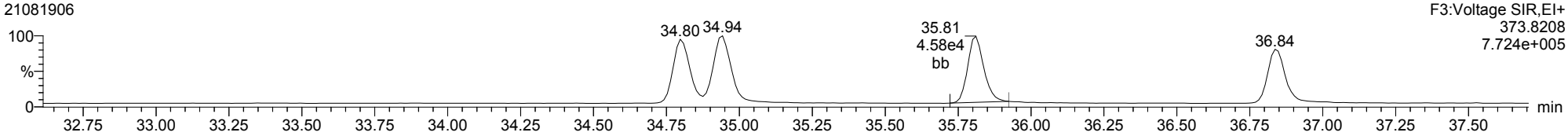
234678-HxCDF



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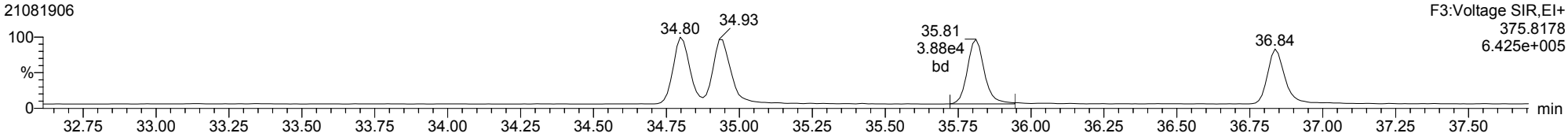

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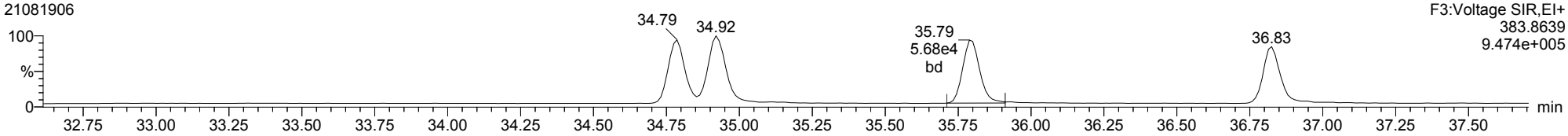

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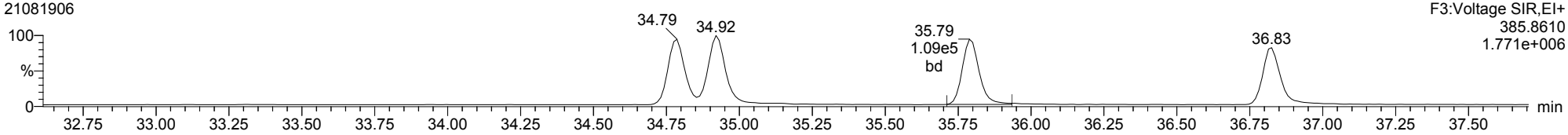

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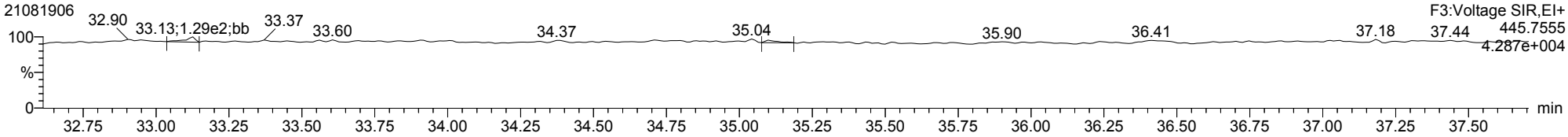

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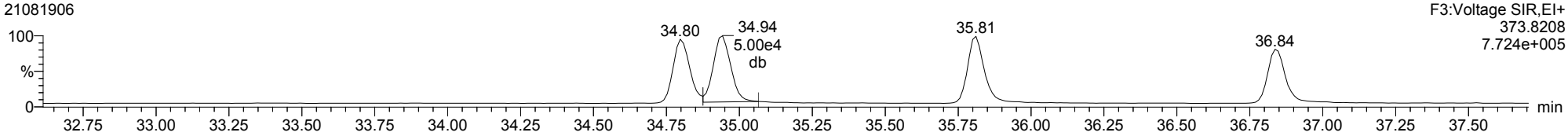

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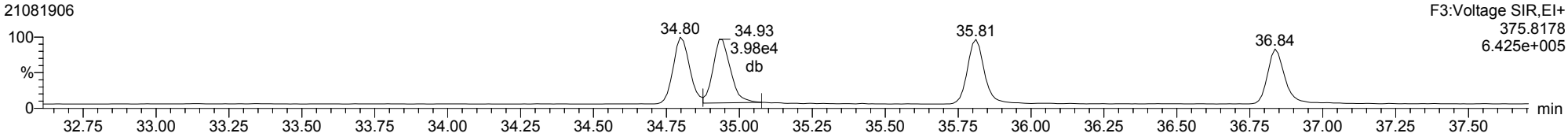

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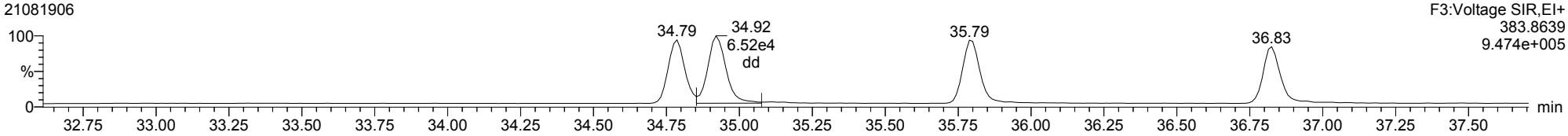

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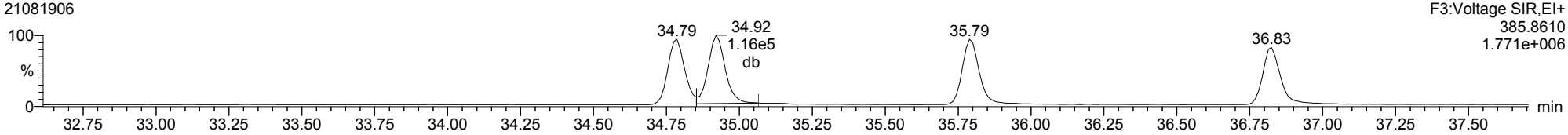

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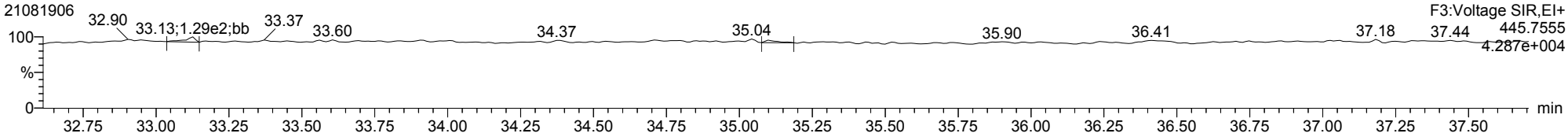

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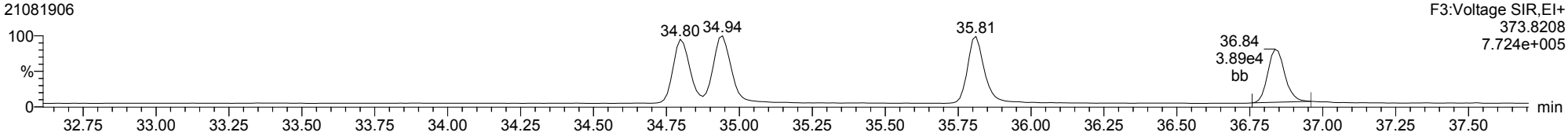

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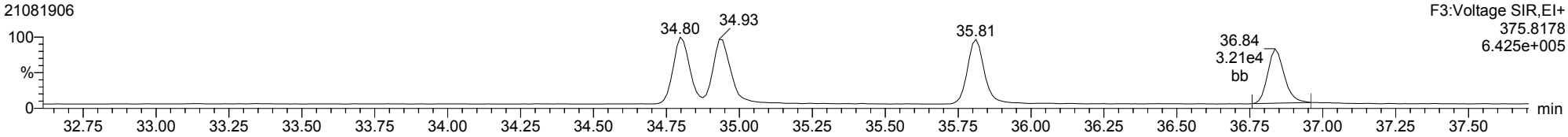

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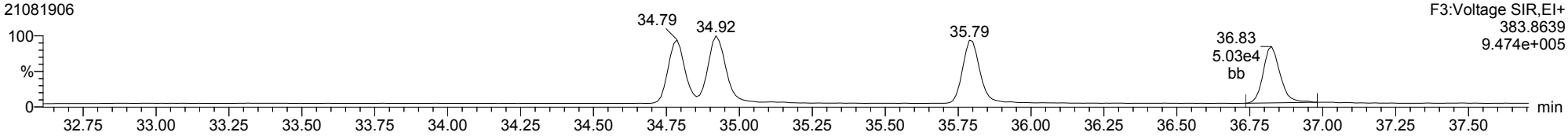

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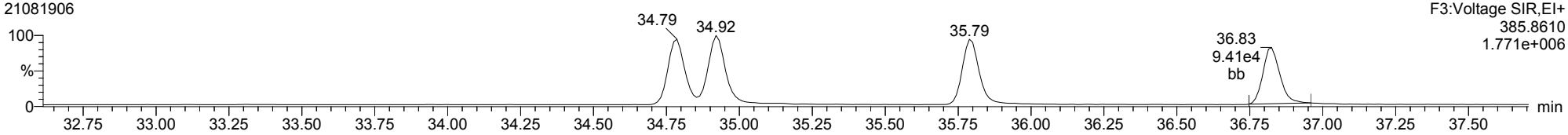

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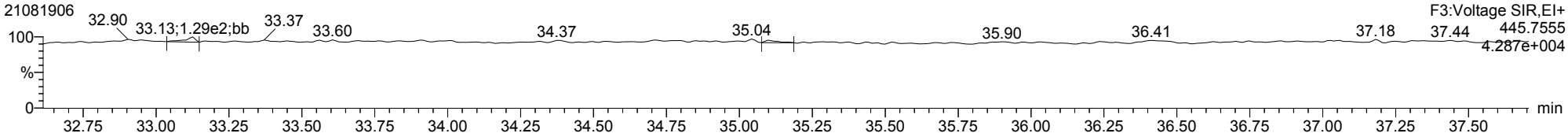

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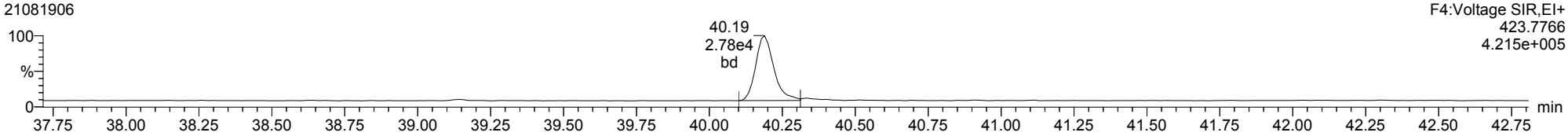

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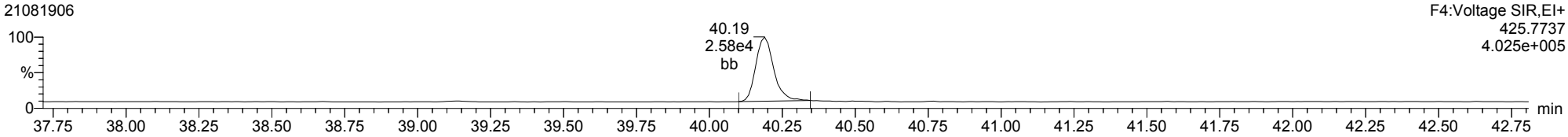

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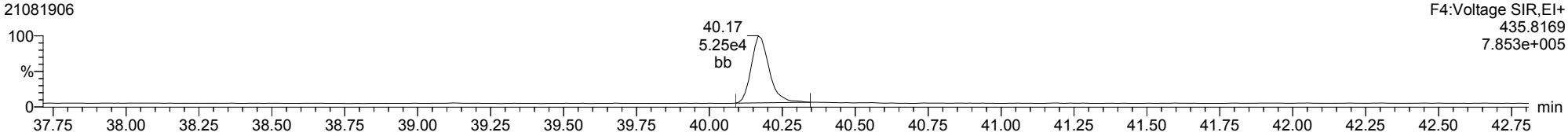

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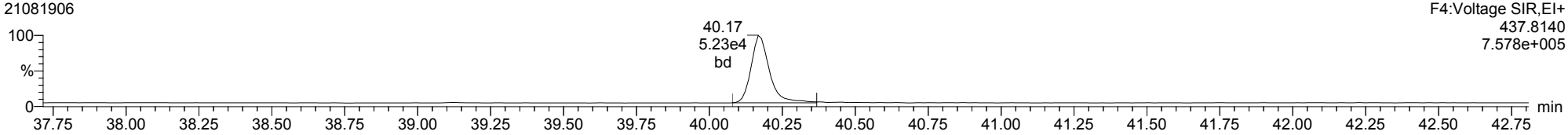

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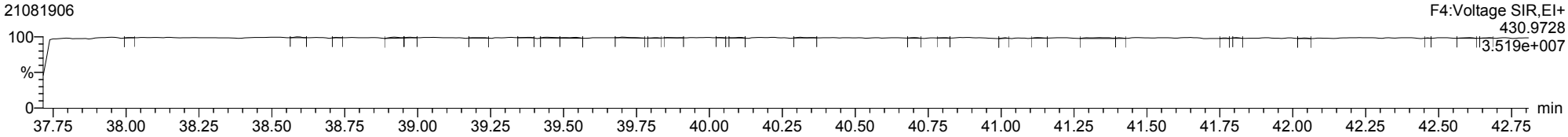

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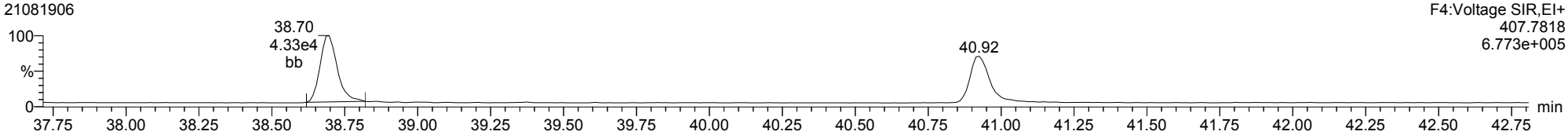

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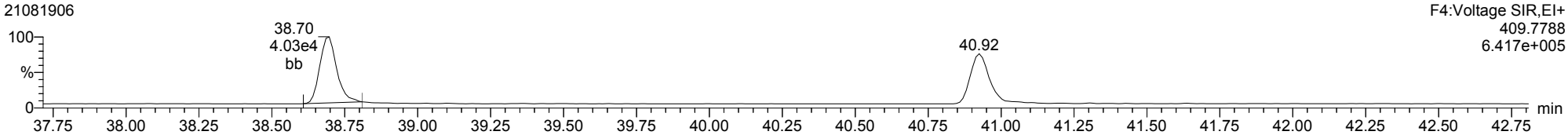

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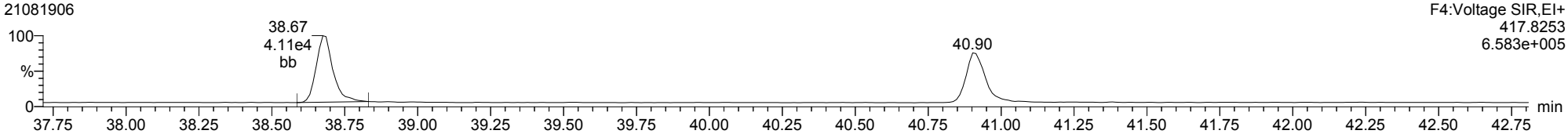

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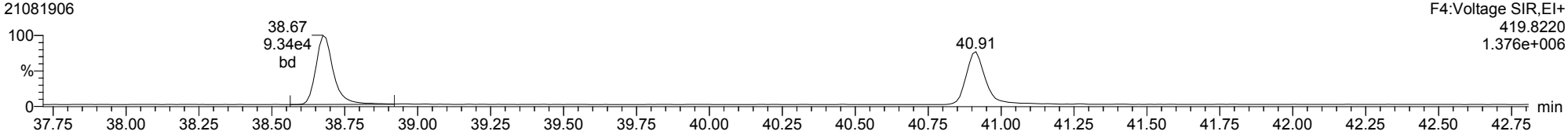

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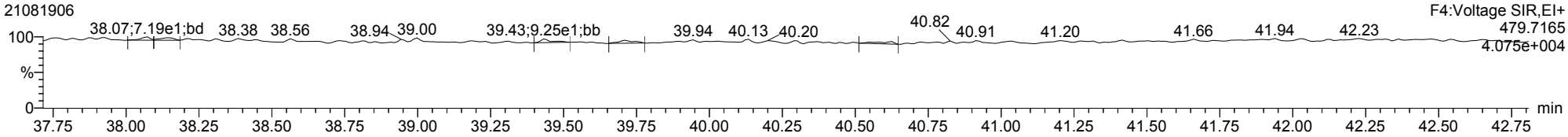

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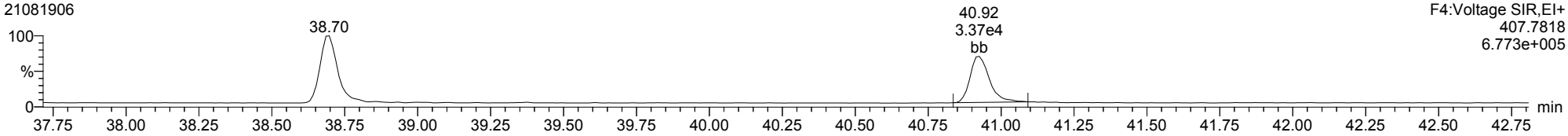

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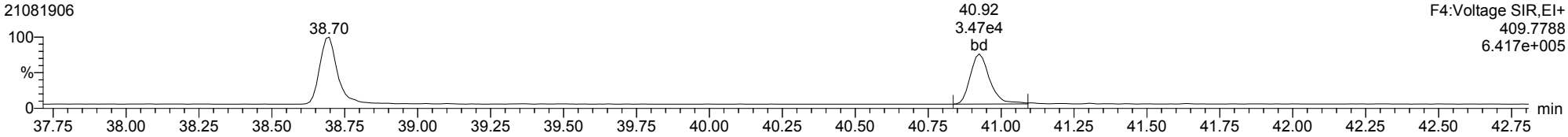

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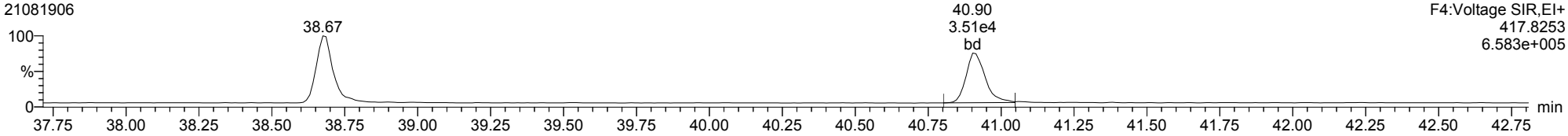

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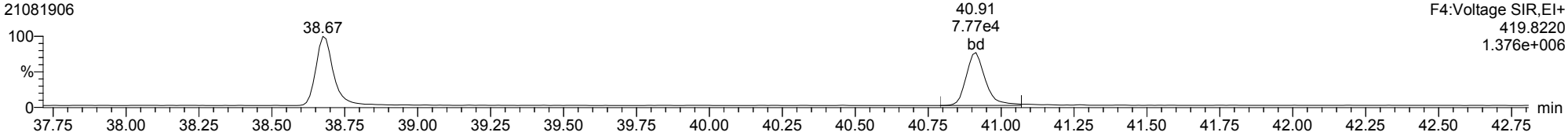
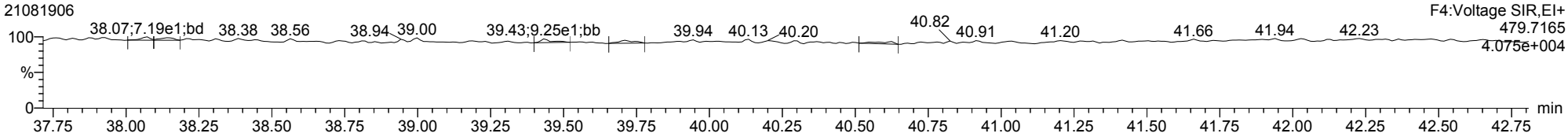


FUNCTION4 NCDPE



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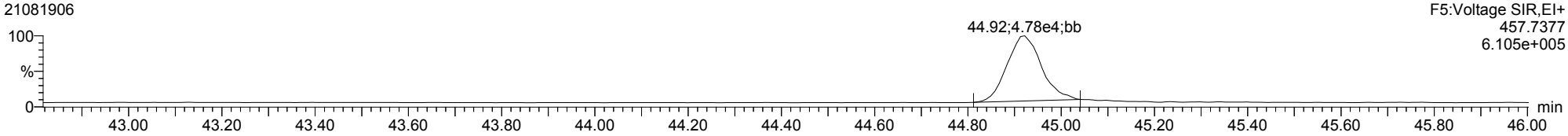
OCDD



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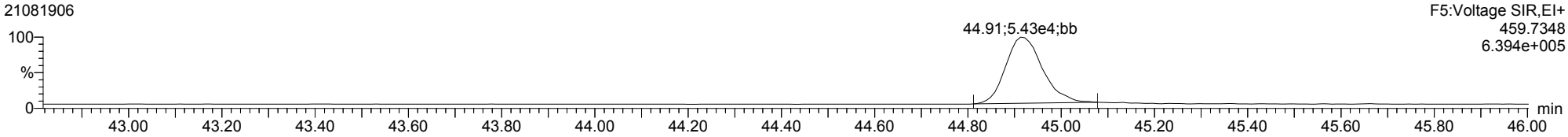

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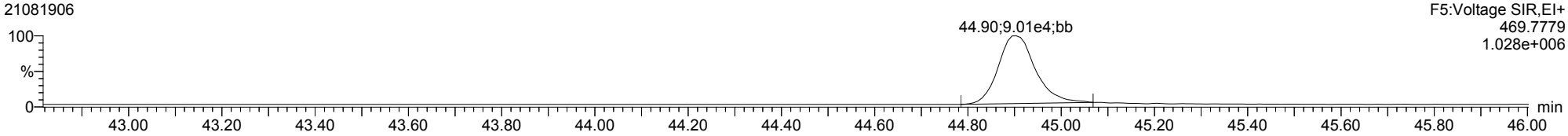

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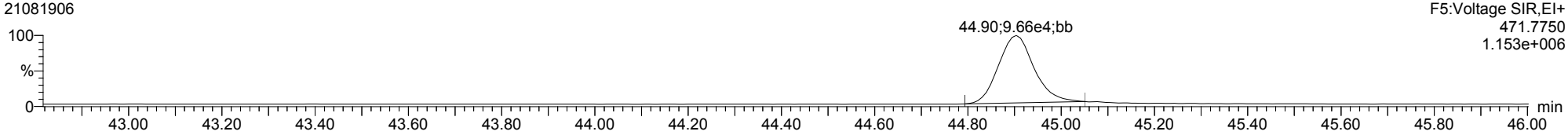
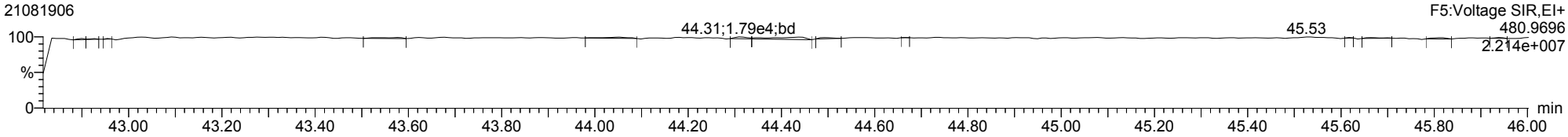


FUNCTION5 PFK



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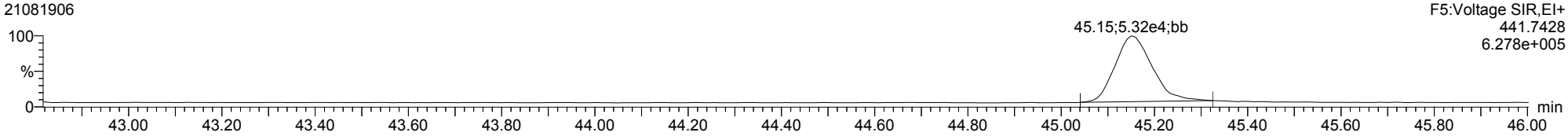
OCDF



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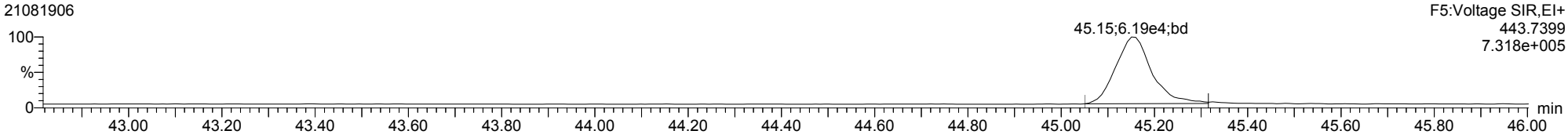
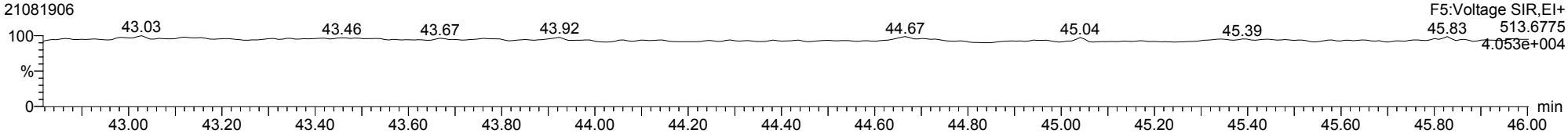


FUNCTION5 DCDPE



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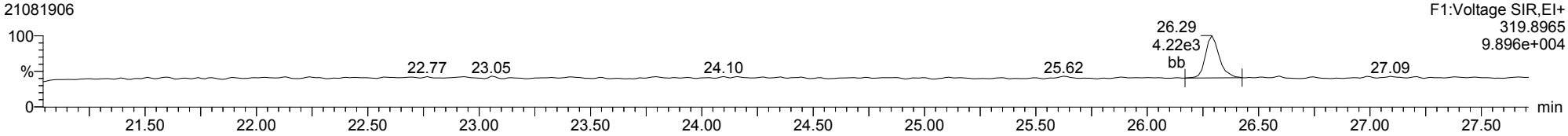

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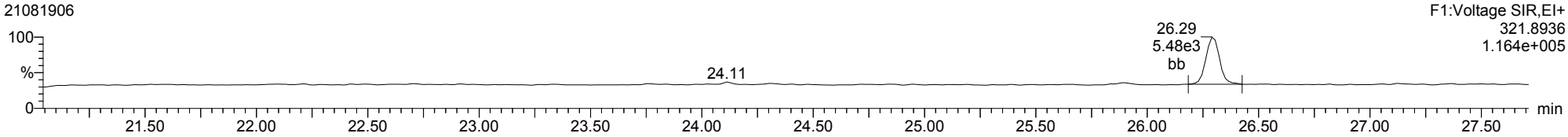

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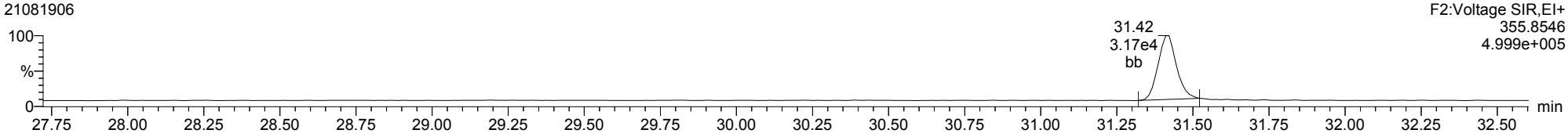
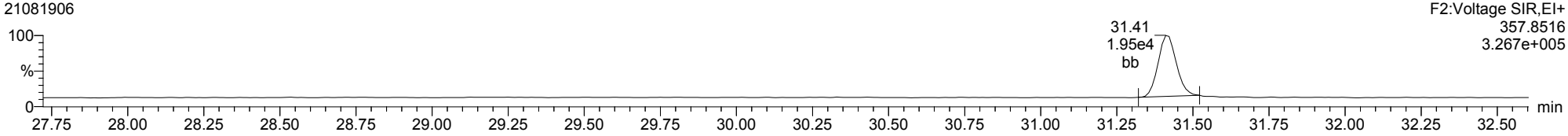


Total-pentadioxins



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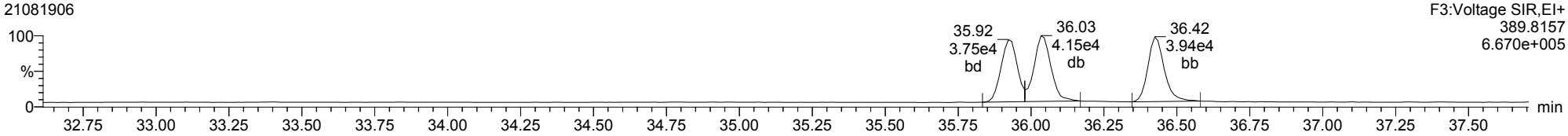
Total-hexadioxins



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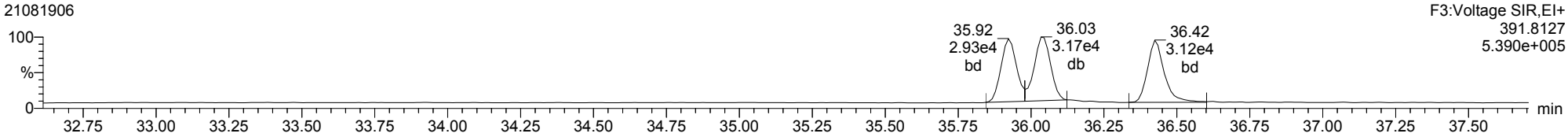

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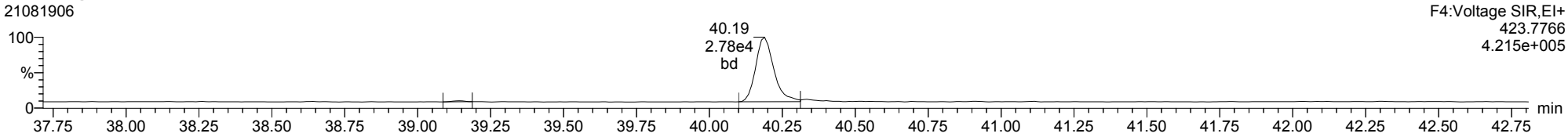

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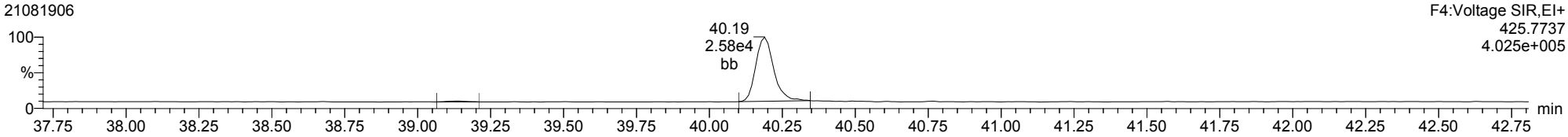

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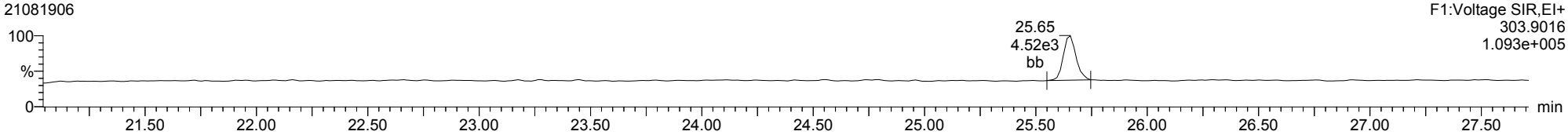
Total-tetrafurans



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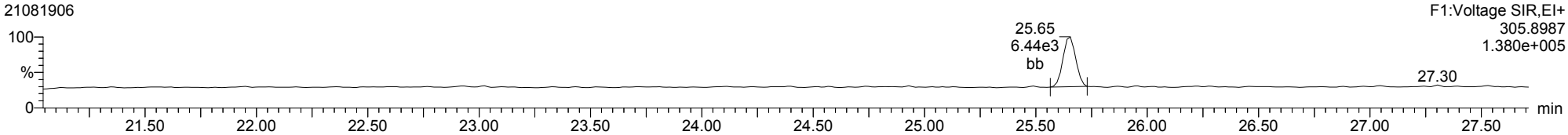

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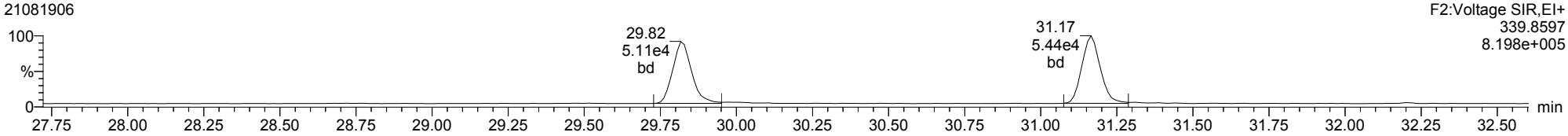

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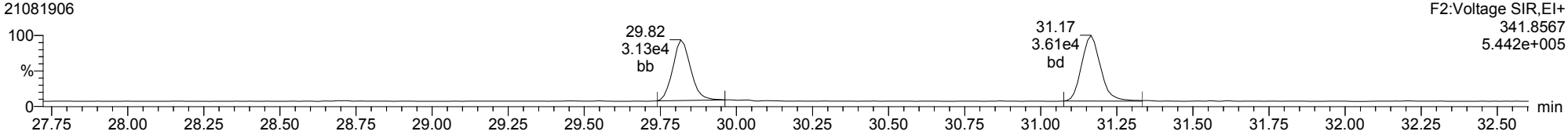

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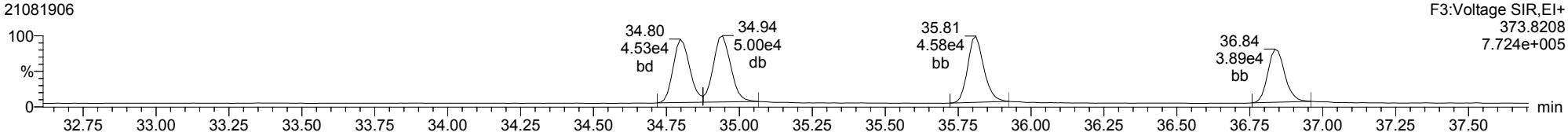

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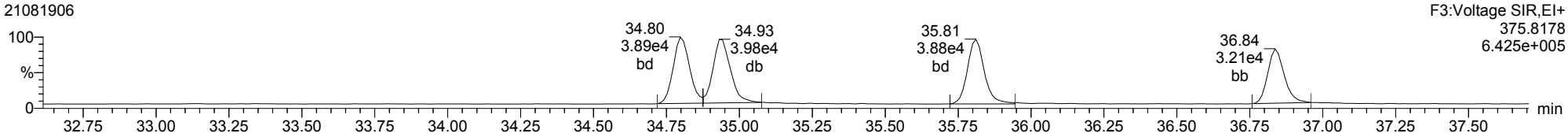

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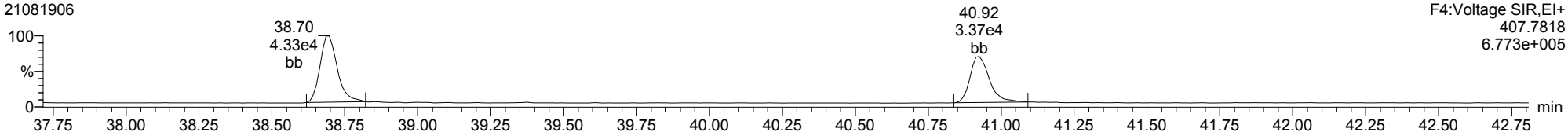

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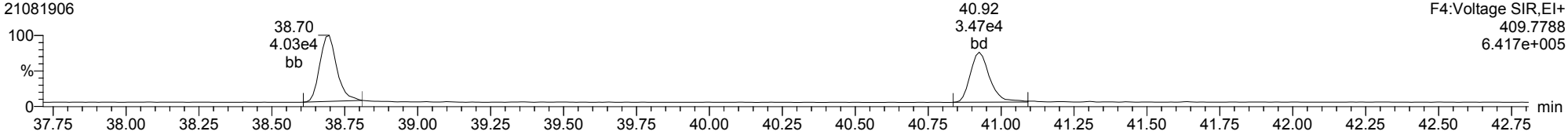

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS603

DUPLICATES
EPA 1613B

Laboratory: Analytical Resources, Inc.
SDG: 21G0111
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJG0572-DUP1
Batch: BJG0572
Lab Source ID: 21G0111-06
Preparation: EPA 1613
Initial/Final: 14.36 g / 20 uL
Source Sample Name: LDW21-SS603
% Solids: 69.86

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION	DUPLICATE CONCENTRATION	RPD %	Q
2,3,7,8-TCDF	25	ND	ND		
2,3,7,8-TCDD	25	ND	ND		
1,2,3,7,8-PeCDF	25	0.724	ND		
2,3,4,7,8-PeCDF	25	1.33	ND		
1,2,3,7,8-PeCDD	25	ND	ND		
1,2,3,4,7,8-HxCDF	25	3.16	3.30	4.35	
1,2,3,6,7,8-HxCDF	25	1.23	1.77	35.7	*
2,3,4,6,7,8-HxCDF	25	2.07	1.80	14.3	
1,2,3,7,8,9-HxCDF	25	ND	ND		
1,2,3,4,7,8-HxCDD	25	1.23	ND		
1,2,3,6,7,8-HxCDD	25	3.61	2.74	27.4	*
1,2,3,7,8,9-HxCDD	25	2.52	2.21	13.1	
1,2,3,4,6,7,8-HpCDF	25	19.8	17.5	12.4	
1,2,3,4,7,8,9-HpCDF	25	1.78	1.82	2.65	
1,2,3,4,6,7,8-HpCDD	25	83.8	77.0	8.46	
OCDF	25	36.7	37.5	2.07	
OCDD	25	632	595	5.97	
Total TCDF	200	4.96	ND		
Total TCDD	200	1.86	ND		
Total PeCDF	200	3.02	7.65	86.8	
Total PeCDD	200	0.982	ND		
Total HxCDF	200	31.9	24.9	24.5	
Total HxCDD	200	22.0	14.2	43.3	
Total HpCDF	200	57.7	54.0	6.55	
Total HpCDD	200	245	211	14.7	
13C12-2,3,7,8-TCDF		94.6	45.7		*
13C12-2,3,7,8-TCDD		131	65.4		

* Values outside of QC limits
L Analyte concentration is <=5 times the reporting limit and the replicate control limit defaults to +/- RL instead of 20% RPD

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-SS603

DUPLICATES
EPA 1613B

Laboratory: Analytical Resources, Inc.
SDG: 21G0111
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJG0572-DUP1
Batch: BJG0572
Lab Source ID: 21G0111-06
Preparation: EPA 1613
Initial/Final: 14.36 g / 20 uL
Source Sample Name: LDW21-SS603
% Solids: 69.86

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION	DUPLICATE CONCENTRATION	RPD %	Q
13C12-1,2,3,7,8-PeCDF		146	71.3		
13C12-2,3,4,7,8-PeCDF		147	71.0		
13C12-1,2,3,7,8-PeCDD		159	73.8		
13C12-1,2,3,4,7,8-HxCDF		160	77.4		
13C12-1,2,3,6,7,8-HxCDF		155	74.8		
13C12-2,3,4,6,7,8-HxCDF		155	75.0		
13C12-1,2,3,7,8,9-HxCDF		166	90.3		
13C12-1,2,3,4,7,8-HxCDD		176	85.2		
13C12-1,2,3,6,7,8-HxCDD		162	78.2		
13C12-1,2,3,4,6,7,8-HpCDF		157	76.5		
13C12-1,2,3,4,7,8,9-HpCDF		163	79.4		
13C12-1,2,3,4,6,7,8-HpCDD		182	87.4		
13C12-OCDD		395	191		
37Cl4-2,3,7,8-TCDD		52.0	27.5		*

*: 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

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Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: BJG0572-DUP1, Name: 21081908, Date: 18-Aug-2021, Time: 15:55:42, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
2378-TCDF					1.108		0.770	1868	1742								
12378-PeCDF					1.015		1.550	1542	1371								
23478-PeCDF					1.126		1.550	1542	1371								
123478-HxCDF	34.797	1.000	9.055e2	9.677e2	1.017	0.936	1.240	843	1094	1.64e4	1.31e4	19.5	12.0	YES	bd	bd	1.656
234678-HxCDF	35.800	1.000	4.837e2	5.158e2	1.052	0.938	1.240	843	1094	6.74e3	5.34e3	8.0	4.9	YES	MM	bb	0.901
123678-HxCDF	34.953	1.001	6.439e2	4.250e2	1.037	1.515	1.240	843	1094	1.18e4	7.19e3	14.0	6.6	YES	db	db	0.886
123789-HxCDF					1.030		1.240	843	1094								
1234678-HpCDF	38.696	1.000	4.538e3	5.006e3	1.327	0.906	1.050	710	786	6.97e4	7.45e4	98.2	94.7	NO	bd	bb	8.768
1234789-HpCDF	40.936	1.001	4.810e2	3.369e2	1.283	1.428	1.050	710	786	7.87e3	4.63e3	11.1	5.9	YES	bb	bb	0.915
OCDF	45.160	1.006	7.130e3	8.035e3	1.447	0.887	0.890	871	1151	7.54e4	9.80e4	86.6	85.1	NO	bd	bb	18.796
2378-TCDD					0.920		0.770	1448	929								
12378-PeCDD					0.995		1.550	998	810								
123478-HxCDD					1.027		1.240	586	1376								
123678-HxCDD	36.045	1.000	8.735e2	4.342e2	1.009	2.012	1.240	586	1376	1.56e4	8.72e3	26.6	6.3	YES	db	bb	1.375
123789-HxCDD	36.435	1.011	6.908e2	3.058e2	0.950	2.259	1.240	586	1376	1.28e4	4.77e3	21.9	3.5	YES	bb	MM	1.111
1234678-HpCDD	40.189	1.000	1.346e4	1.292e4	1.068	1.042	1.050	760	931	2.01e5	1.85e5	264.8	199.2	NO	bb	bb	38.621
OCDD	44.922	1.000	9.276e4	1.038e5	1.181	0.894	0.890	1112	877	1.09e6	1.21e6	977.6	1378.6	NO	bb	bb	298.487
13C-2378-TCDF	25.625	1.007	4.065e4	5.119e4	1.427	0.794	0.770	2282	1562	5.87e5	7.27e5	257.3	465.0	NO	bb	bb	22.935
13C-12378-PeCDF	29.806	1.171	8.106e4	4.918e4	1.297	1.648	1.550	1236	1010	1.20e6	7.12e5	968.7	704.8	NO	bb	bd	35.763
13C-23478-PeCDF	31.143	1.223	7.580e4	4.782e4	1.236	1.585	1.550	1236	1010	1.12e6	6.80e5	909.7	673.4	NO	bb	bd	35.617
13C-123478-HxCDF	34.786	0.955	3.811e4	7.312e4	1.242	0.521	0.510	1169	1569	5.80e5	1.12e6	495.7	710.6	NO	bd	bd	38.815
13C-123678-HxCDF	34.920	0.959	4.006e4	7.624e4	1.343	0.525	0.510	1169	1569	5.96e5	1.12e6	509.8	712.7	NO	db	db	37.529
13C-234678-HxCDF	35.800	0.983	3.581e4	6.957e4	1.215	0.515	0.510	1169	1569	5.77e5	1.10e6	493.3	699.3	NO	bb	bb	37.608
13C-123789-HxCDF	36.825	1.011	3.606e4	6.925e4	1.008	0.521	0.510	1169	1569	5.70e5	1.10e6	487.3	699.8	NO	bb	bb	45.313
13C-1234678-HpCDF	38.685	1.062	2.576e4	5.625e4	0.926	0.458	0.440	986	1046	4.21e5	8.79e5	427.1	840.5	NO	bb	bb	38.377
13C-1234789-HpCDF	40.903	1.123	2.179e4	4.784e4	0.758	0.456	0.440	986	1046	3.03e5	6.58e5	306.8	628.6	NO	bb	bd	39.832
13C-1234-TCDD	25.458	0.000	1.223e5	1.584e5	1.000	0.772	0.770	2049	823	1.85e6	2.36e6	904.1	2872.3	NO	bb	bb	100.000
13C-2378-TCDD	26.275	1.032	4.430e4	5.859e4	1.116	0.756	0.770	2049	823	6.53e5	8.48e5	318.9	1031.5	NO	bb	bb	32.829
13C-12378-PeCDD	31.399	1.233	4.608e4	2.994e4	0.732	1.539	1.550	881	841	6.97e5	4.51e5	790.9	536.8	NO	bb	bb	37.003
13C-123478-HxCDD	35.911	0.986	5.437e4	4.019e4	0.960	1.353	1.240	1055	2338	8.39e5	6.38e5	795.5	272.8	NO	bd	bd	42.712
13C-123678-HxCDD	36.034	0.989	5.162e4	4.265e4	1.041	1.211	1.240	1055	2338	8.10e5	6.82e5	768.3	291.8	NO	db	dd	39.246
13C-1234678-HpCDD	40.178	1.103	3.229e4	3.168e4	0.632	1.019	1.050	1093	811	4.67e5	4.33e5	426.9	534.1	NO	bd	bd	43.849
13C-OCDD	44.903	1.233	5.223e4	5.930e4	0.504	0.881	0.890	878	1176	5.82e5	6.63e5	662.9	564.3	NO	bb	bb	95.985
13C-123789-HxCDD	36.424	0.000	1.286e5	1.020e5	1.000	1.261	1.240	1055	2338	2.04e6	1.63e6	1937.5	696.3	NO	bb	bb	100.000
37CL-2378-TCDD	26.290	1.033	4.202e4		1.084			1134		6.23e5		549.1			bd		13.816

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:30:26 Pacific Daylight Time

ID: BJG0572-DUP1, Name: 21081908, Date: 18-Aug-2021, Time: 15:55:42, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
1368-TCDF	22.132	0.864	1.912e2	1.197e2	1.425	1.597	0.770	1868	1742	2.52e3	1.34e3	1.3	0.8	YES	bd	bb	0.238
1289-TCDF					1.043		0.770	1868	1742								
13468-PECDF	27.076	0.908	2.421e3	1.753e3	1.376	1.380	1.550	667	1268	3.50e4	2.08e4	52.5	16.4	NO	db	bb	2.329
12389-PECDF					1.000		1.550	1542	1371								
123468-HXCDF	33.126	0.952	7.986e2	6.308e2	1.087	1.266	1.240	843	1094	1.25e4	1.11e4	14.8	10.1	NO	bb	bb	1.183
1368-TCDD	23.402	0.891	2.814e2	2.630e2	0.923	1.070	0.770	1448	929	4.64e3	4.46e3	3.2	4.8	YES	bb	bd	0.573
1289-TCDD					0.794		0.770	1448	929								
12479-PECDD	28.692	0.914	2.364e2	4.535e2	1.843	0.521	1.550	998	810	5.17e3	5.85e3	5.2	7.2	YES	bd	bd	0.492
12389-PECDD					1.154		1.550	998	810								
124679-HXCDD	33.917	0.945	3.109e3	2.340e3	1.125	1.329	1.240	586	1376	4.32e4	3.51e4	73.7	25.5	NO	bb	bb	5.122
1234679-HPCDD	39.142	0.974	2.679e4	2.531e4	1.211	1.058	1.050	760	931	4.23e5	3.96e5	556.0	425.1	NO	bb	bb	67.260
Total-tetrafurans			0.000e0		1.192			1868		0.00e0							
Total-penta1			2.421e3					667		3.50e4							2.329
Total-pentafurans			1.280e3		1.047			1542		2.14e4							1.506
Total-hexafurans			7.847e3		1.045			843		1.14e5							12.490
Total-heptafurans			1.379e4		1.305			710		2.17e5							27.104
Total-Furans			3.264e4		1.158			1868		4.64e5							62.582
Total-tetradioxins			0.000e0		0.879			1448		0.00e0							
Total-pentadioxins			0.000e0		1.331			998		0.00e0							
Total-hexadioxins			4.189e3		1.028			586		6.33e4							7.117
Total-heptadioxins			4.025e4		1.140			760		6.24e5							105.881
Total-Dioxins			1.372e5		1.092			1448		1.77e6							411.485
Total-TEQ			1.698e5					1448		2.24e6							474.067
FUNCTION1 PFK			4.269e5					674625		9.79e6							
FUNCTION2 PFK			3.827e4					460513		9.98e5							0.000
FUNCTION3 PFK			7.191e5					430741		1.66e7							0.000
FUNCTION4 PFK			2.166e5					272779		5.72e6							
FUNCTION5 PFK			5.081e6					207792		3.20e7							
FUNCTION1 HXCD...			5.237e2					596		9.67e3							0.000
FUNCTION1 HPCD...			5.898e2					635		8.45e3							0.000
FUNCTION2 HPCD...			3.789e2					860		7.75e3							0.000
FUNCTION3 OCDPE			5.084e2					564		9.23e3							0.000
FUNCTION4 NCDPE			8.437e2					738		1.68e4							0.000
FUNCTION5 DCDPE			0.000e0					744		0.00e0							

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

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TF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	13468-PECDF	27.08	2.421e3	1.753e3	1.376	1.38	1.55	52.5	YES	NO	db	bb	2.329

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-pentafurans	28.76	1.280e3	7.208e2	1.047	1.78	1.55	13.9	YES	NO	db	db	1.506

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-hexafurans	34.17	3.865e3	3.043e3	1.045	1.27	1.24	69.6	YES	NO	bb	bb	6.036
2	Total-hexafurans	33.33	3.184e3	2.849e3	1.045	1.12	1.24	50.5	YES	NO	bb	bb	5.272
3	123468-HXCDF	33.13	7.986e2	6.308e2	1.087	1.27	1.24	14.8	YES	NO	bb	bb	1.183

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-heptafurans	39.35	9.249e3	8.900e3	1.305	1.04	1.05	207.2	YES	NO	bb	bd	18.337
2	1234678-HpCDF	38.70	4.538e3	5.006e3	1.327	0.91	1.05	98.2	YES	NO	bd	bb	8.768

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Furans,TF,PP,PF,HF,HPF,OF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-Furans	21.56	1.738e2	2.050e2	1.158	0.85	0.77	1.2	NO	NO	bb	dd	0.356
2	Total-pentafurans	28.76	1.280e3	7.208e2	1.047	1.78	1.55	13.9	YES	NO	db	db	1.506
3	Total-hexafurans	34.17	3.865e3	3.043e3	1.045	1.27	1.24	69.6	YES	NO	bb	bb	6.036
4	Total-hexafurans	33.33	3.184e3	2.849e3	1.045	1.12	1.24	50.5	YES	NO	bb	bb	5.272
5	123468-HXCDF	33.13	7.986e2	6.308e2	1.087	1.27	1.24	14.8	YES	NO	bb	bb	1.183
6	Total-heptafurans	39.35	9.249e3	8.900e3	1.305	1.04	1.05	207.2	YES	NO	bb	bd	18.337
7	1234678-HpCDF	38.70	4.538e3	5.006e3	1.327	0.91	1.05	98.2	YES	NO	bd	bb	8.768
8	OCDF	45.16	7.130e3	8.035e3	1.447	0.89	0.89	86.6	YES	NO	bd	bb	18.796
9	13468-PECDF	27.08	2.421e3	1.753e3	1.376	1.38	1.55	52.5	YES	NO	db	bb	2.329

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-hexadioxins	34.69	7.658e2	6.360e2	1.028	1.20	1.24	23.4	YES	NO	bb	bb	1.444
2	124679-HXCDD	33.92	3.109e3	2.340e3	1.125	1.33	1.24	73.7	YES	NO	bb	bb	5.122
3	Total-hexadioxins	33.66	3.137e2	2.203e2	1.028	1.42	1.24	10.8	YES	NO	bb	bb	0.550

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDD	40.19	1.346e4	1.292e4	1.068	1.04	1.05	264.8	YES	NO	bb	bb	38.621
2	1234679-HPCDD	39.14	2.679e4	2.531e4	1.211	1.06	1.05	556.0	YES	NO	bb	bb	67.260

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Dioxins,TD,PD,HD,HPD,OD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-hexadioxins	34.69	7.658e2	6.360e2	1.028	1.20	1.24	23.4	YES	NO	bb	bb	1.444
2	124679-HXCDD	33.92	3.109e3	2.340e3	1.125	1.33	1.24	73.7	YES	NO	bb	bb	5.122
3	Total-hexadioxins	33.66	3.137e2	2.203e2	1.028	1.42	1.24	10.8	YES	NO	bb	bb	0.550
4	OCDD	44.92	9.276e4	1.038e5	1.181	0.89	0.89	977.6	YES	NO	bb	bb	298.487
5	1234678-HpCDD	40.19	1.346e4	1.292e4	1.068	1.04	1.05	264.8	YES	NO	bb	bb	38.621
6	1234679-HPCDD	39.14	2.679e4	2.531e4	1.211	1.06	1.05	556.0	YES	NO	bb	bb	67.260

TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-Furans	21.56	1.738e2	2.050e2	1.158	0.85	0.77	1.2	NO	NO	bb	dd	0.356
2	Total-pentafurans	28.76	1.280e3	7.208e2	1.047	1.78	1.55	13.9	YES	NO	db	db	1.506
3	Total-hexafurans	34.17	3.865e3	3.043e3	1.045	1.27	1.24	69.6	YES	NO	bb	bb	6.036
4	Total-hexafurans	33.33	3.184e3	2.849e3	1.045	1.12	1.24	50.5	YES	NO	bb	bb	5.272
5	123468-HXCDF	33.13	7.986e2	6.308e2	1.087	1.27	1.24	14.8	YES	NO	bb	bb	1.183
6	Total-heptafurans	39.35	9.249e3	8.900e3	1.305	1.04	1.05	207.2	YES	NO	bb	bd	18.337
7	1234678-HpCDF	38.70	4.538e3	5.006e3	1.327	0.91	1.05	98.2	YES	NO	bd	bb	8.768
8	OCDF	45.16	7.130e3	8.035e3	1.447	0.89	0.89	86.6	YES	NO	bd	bb	18.796
9	13468-PECDF	27.08	2.421e3	1.753e3	1.376	1.38	1.55	52.5	YES	NO	db	bb	2.329
10	Total-hexadioxins	34.69	7.658e2	6.360e2	1.028	1.20	1.24	23.4	YES	NO	bb	bb	1.444
11	124679-HXCDD	33.92	3.109e3	2.340e3	1.125	1.33	1.24	73.7	YES	NO	bb	bb	5.122
12	Total-hexadioxins	33.66	3.137e2	2.203e2	1.028	1.42	1.24	10.8	YES	NO	bb	bb	0.550
13	OCDD	44.92	9.276e4	1.038e5	1.181	0.89	0.89	977.6	YES	NO	bb	bb	298.487
14	1234678-HpCDD	40.19	1.346e4	1.292e4	1.068	1.04	1.05	264.8	YES	NO	bb	bb	38.621
15	1234679-HPCDD	39.14	2.679e4	2.531e4	1.211	1.06	1.05	556.0	YES	NO	bb	bb	67.260

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PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	26.23	1.682e4					0.9	NO		bb		
2	FUNCTION1 PFK	25.07	4.900e4					1.5	NO		bb		
3	FUNCTION1 PFK	24.63	3.955e3					0.4	NO		bb		
4	FUNCTION1 PFK	24.57	1.097e4					0.7	NO		bb		
5	FUNCTION1 PFK	24.48	1.410e4					0.7	NO		bb		
6	FUNCTION1 PFK	23.90	1.241e4					0.7	NO		bb		
7	FUNCTION1 PFK	23.73	1.194e4					0.7	NO		bb		
8	FUNCTION1 PFK	23.25	2.173e4					1.0	NO		bb		
9	FUNCTION1 PFK	22.89	5.261e3					0.5	NO		bb		
10	FUNCTION1 PFK	22.56	4.460e3					0.4	NO		bb		
11	FUNCTION1 PFK	21.66	1.223e4					0.8	NO		bb		
12	FUNCTION1 PFK	21.29	1.111e4					0.6	NO		bb		
13	FUNCTION1 PFK	21.22	1.496e4					1.0	NO		bb		
14	FUNCTION1 PFK	27.54	5.613e3					0.6	NO		bb		
15	FUNCTION1 PFK	27.08	4.503e3					0.4	NO		bb		
16	FUNCTION1 PFK	26.62	4.363e4					1.6	NO		bb		
17	FUNCTION1 PFK	26.34	1.843e5					2.2	NO		bb		

PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 PFK	28.95	3.827e4					2.2	NO		bb		0.000

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PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 PFK	34.36	7.887e3					0.9	NO		bb		0.000
2	FUNCTION3 PFK	33.94	1.231e4					0.9	NO		bb		0.000
3	FUNCTION3 PFK	33.77	3.792e3					0.6	NO		bb		0.000
4	FUNCTION3 PFK	33.73	7.675e3					0.9	NO		bb		0.000
5	FUNCTION3 PFK	33.57	3.620e3					0.8	NO		bb		0.000
6	FUNCTION3 PFK	33.50	5.051e4					2.3	NO		bb		0.000
7	FUNCTION3 PFK	33.17	1.194e4					0.8	NO		bb		0.000
8	FUNCTION3 PFK	32.98	4.823e4					1.4	NO		bb		0.000
9	FUNCTION3 PFK	32.69	6.424e4					3.7	YES		bb		0.000
10	FUNCTION3 PFK	37.66	1.453e4					1.5	NO		bb		0.000
11	FUNCTION3 PFK	37.56	7.368e3					0.7	NO		bb		0.000
12	FUNCTION3 PFK	37.15	3.697e4					1.0	NO		bb		0.000
13	FUNCTION3 PFK	37.05	2.538e3					0.5	NO		bb		0.000
14	FUNCTION3 PFK	36.84	2.160e3					0.5	NO		bb		0.000
15	FUNCTION3 PFK	36.70	5.418e4					3.5	YES		db		0.000
16	FUNCTION3 PFK	36.67	7.924e4					3.8	YES		dd		0.000
17	FUNCTION3 PFK	36.62	4.513e4					3.3	YES		dd		0.000
18	FUNCTION3 PFK	36.58	5.062e4					2.3	NO		bd		0.000
19	FUNCTION3 PFK	36.17	1.228e4					1.2	NO		bb		0.000
20	FUNCTION3 PFK	35.54	2.432e3					0.5	NO		bb		0.000
21	FUNCTION3 PFK	35.47	2.569e4					1.8	NO		bb		0.000
22	FUNCTION3 PFK	35.34	8.377e4					2.1	NO		bb		0.000
23	FUNCTION3 PFK	35.03	1.869e4					1.2	NO		bb		0.000
24	FUNCTION3 PFK	34.41	7.330e4					2.4	NO		bb		0.000

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PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 PFK	42.28	4.040e3					0.8	NO		bb		
2	FUNCTION4 PFK	41.93	1.411e3					0.5	NO		bb		
3	FUNCTION4 PFK	41.62	3.616e4					2.0	NO		bb		
4	FUNCTION4 PFK	41.10	7.988e3					1.2	NO		bb		
5	FUNCTION4 PFK	41.06	3.050e4					1.6	NO		bb		
6	FUNCTION4 PFK	40.86	5.017e3					0.9	NO		bb		
7	FUNCTION4 PFK	40.78	6.729e3					0.6	NO		bb		
8	FUNCTION4 PFK	40.43	2.223e4					2.2	NO		bb		
9	FUNCTION4 PFK	39.92	3.435e4					2.8	NO		bb		
10	FUNCTION4 PFK	39.62	9.738e3					1.1	NO		bb		
11	FUNCTION4 PFK	39.54	1.410e4					1.5	NO		bb		
12	FUNCTION4 PFK	39.04	9.910e3					1.4	NO		bb		
13	FUNCTION4 PFK	38.89	4.540e3					0.9	NO		bb		
14	FUNCTION4 PFK	38.84	6.614e3					1.1	NO		bb		
15	FUNCTION4 PFK	38.28	3.485e3					0.7	NO		bb		
16	FUNCTION4 PFK	38.08	1.977e4					1.7	NO		bb		

PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	45.53	1.038e3					0.5	NO		bb		
2	FUNCTION5 PFK	44.87	4.033e3					0.9	NO		bb		
3	FUNCTION5 PFK	44.46	2.748e3					1.0	NO		bb		
4	FUNCTION5 PFK	43.51	5.570e5					16.3	YES		db		
5	FUNCTION5 PFK	43.48	3.963e5					18.1	YES		dd		
6	FUNCTION5 PFK	43.27	2.540e6					28.7	YES		dd		
7	FUNCTION5 PFK	42.99	1.051e6					41.1	YES		dd		
8	FUNCTION5 PFK	42.86	5.295e5					47.2	YES		bd		

ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	25.46	1.157e2					3.8	YES		bb		0.000
2	FUNCTION1 HXCD...	24.10	8.416e1					2.7	NO		bb		0.000
3	FUNCTION1 HXCD...	21.84	7.184e1					3.2	YES		db		0.000
4	FUNCTION1 HXCD...	21.80	7.480e1					2.3	NO		bd		0.000
5	FUNCTION1 HXCD...	21.12	1.772e2					4.3	YES		bb		0.000

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ETHERS2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HPCD...	26.52	9.074e1					2.1	NO		bb		0.000
2	FUNCTION1 HPCD...	26.32	7.644e1					3.0	YES		bb		0.000
3	FUNCTION1 HPCD...	25.32	1.119e2					2.3	NO		bb		0.000
4	FUNCTION1 HPCD...	24.05	1.369e2					2.2	NO		bb		0.000
5	FUNCTION1 HPCD...	23.48	1.001e2					2.2	NO		bb		0.000
6	FUNCTION1 HPCD...	21.48	7.381e1					1.6	NO		bb		0.000

ETHERS3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 HPCD...	32.29	9.849e1					1.5	NO		bb		0.000
2	FUNCTION2 HPCD...	31.01	7.317e1					2.5	NO		bb		0.000
3	FUNCTION2 HPCD...	30.95	9.743e1					2.4	NO		bb		0.000
4	FUNCTION2 HPCD...	27.80	1.099e2					2.7	NO		bb		0.000

ETHERS4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 OCDPE	34.28	9.245e1					3.9	YES		bb		0.000
2	FUNCTION3 OCDPE	34.06	1.011e2					3.7	YES		db		0.000
3	FUNCTION3 OCDPE	34.02	1.499e2					2.9	NO		bd		0.000
4	FUNCTION3 OCDPE	33.03	8.100e1					3.3	YES		bb		0.000
5	FUNCTION3 OCDPE	36.70	8.406e1					2.6	NO		bb		0.000

ETHERS5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 NCDPE	40.88	1.209e2					5.1	YES		bb		0.000
2	FUNCTION4 NCDPE	40.55	7.601e1					2.4	NO		bb		0.000
3	FUNCTION4 NCDPE	38.33	5.589e2					13.7	YES		bb		0.000
4	FUNCTION4 NCDPE	37.95	8.795e1					1.6	NO		bb		0.000

ETHERS6

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

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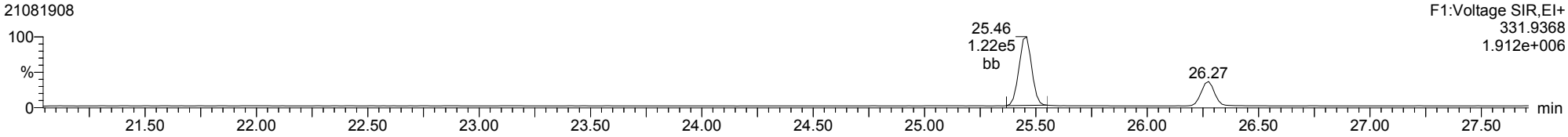
ID: BJG0572-DUP1, Name: 21081908, Date: 18-Aug-2021, Time: 15:55:42, Conditions: AUTOSPEC01, User: pk

13C-1234-TCDD



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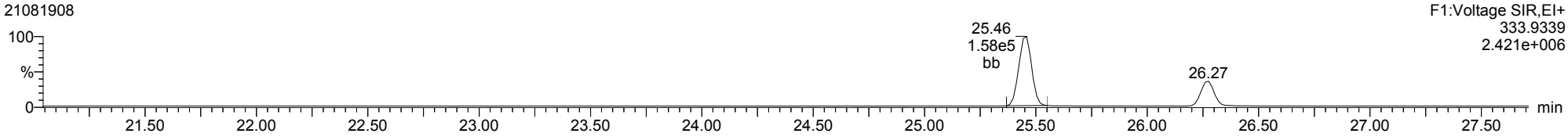

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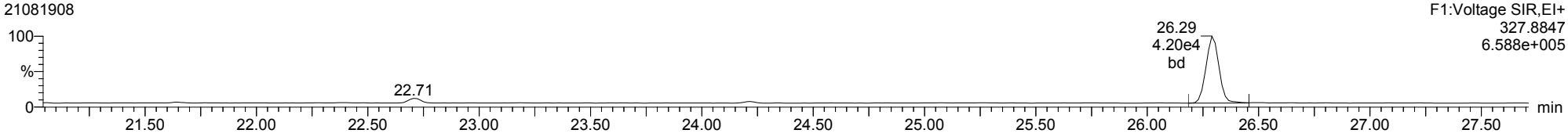

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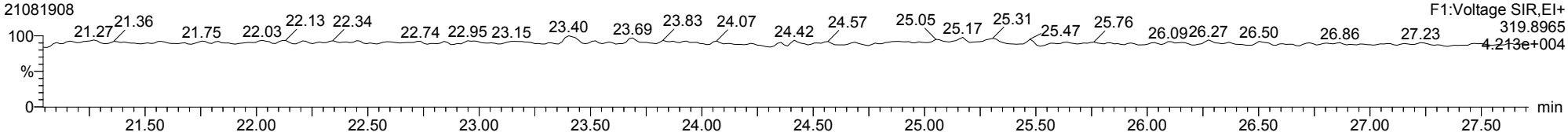

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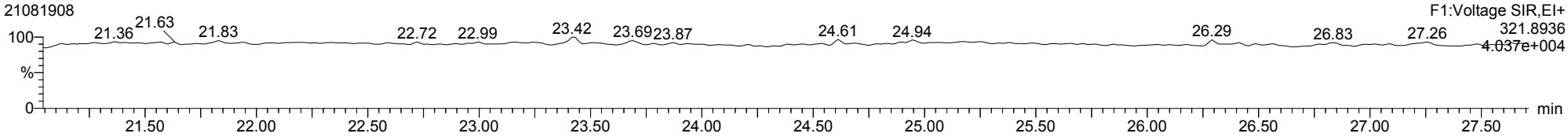

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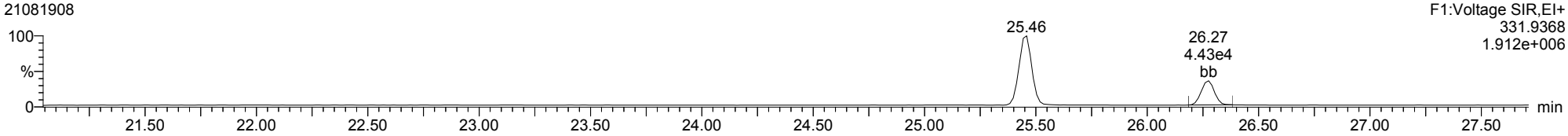

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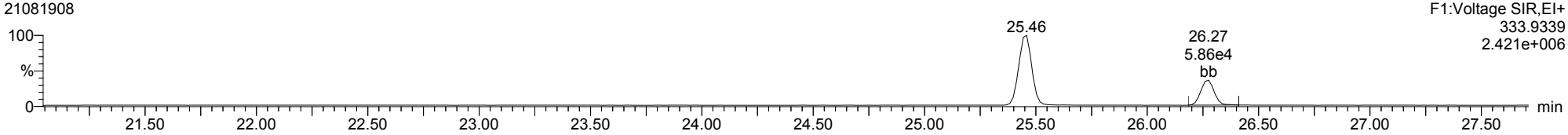

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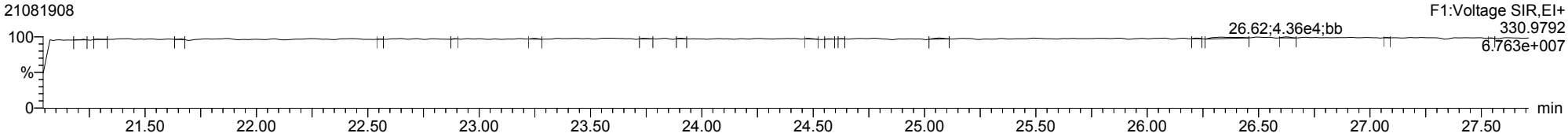

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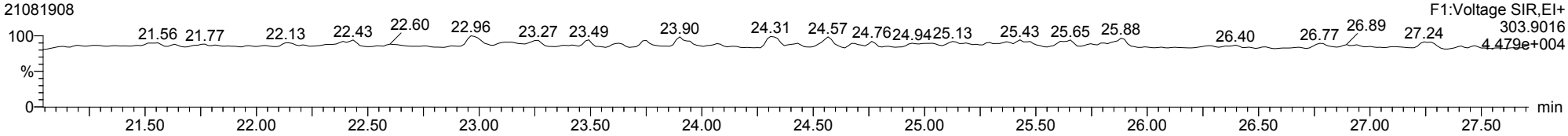

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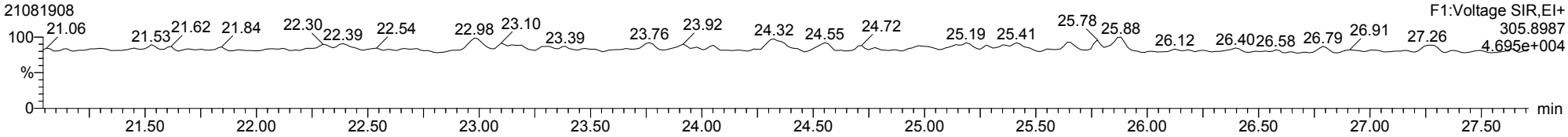

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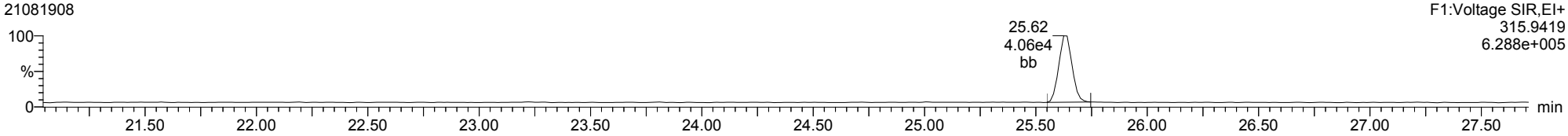

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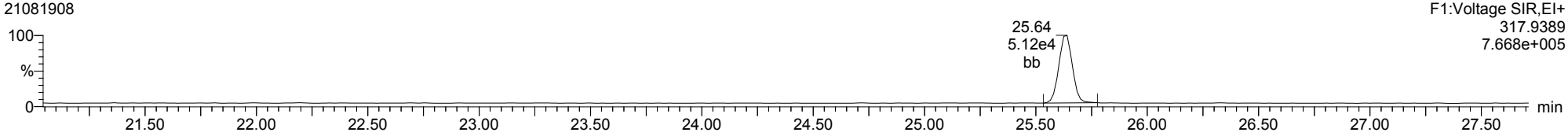

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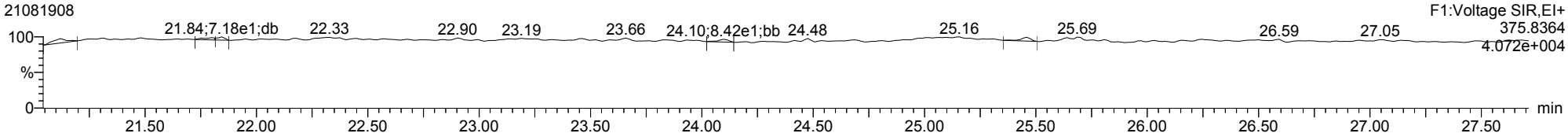

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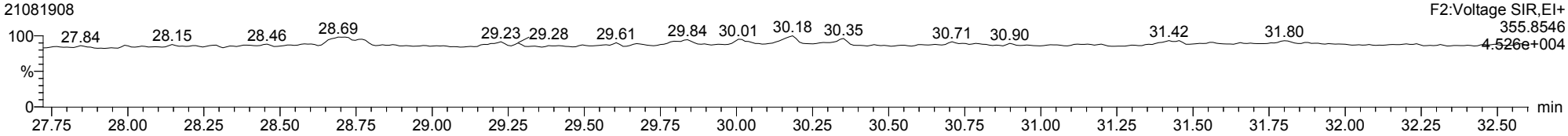

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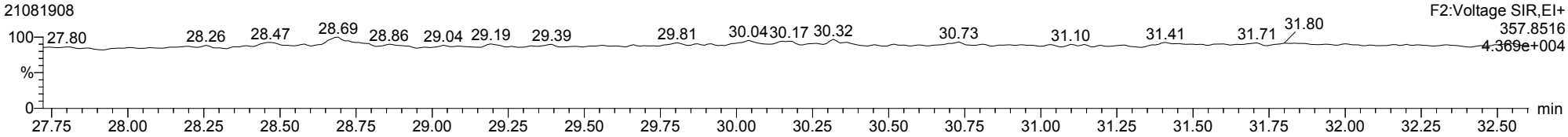

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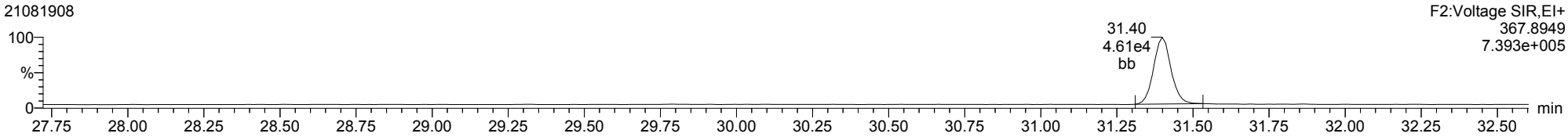

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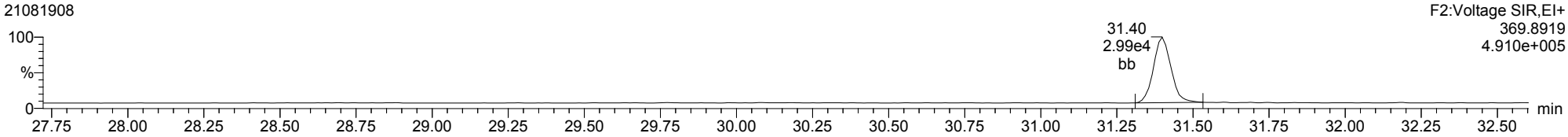

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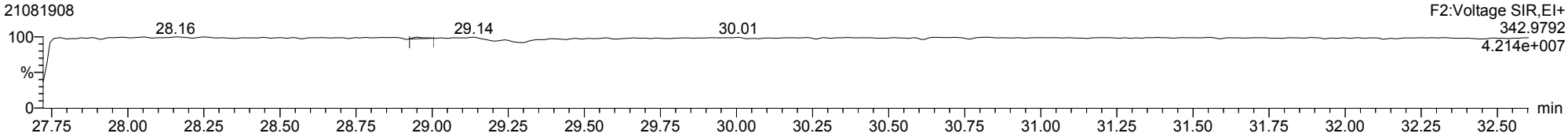

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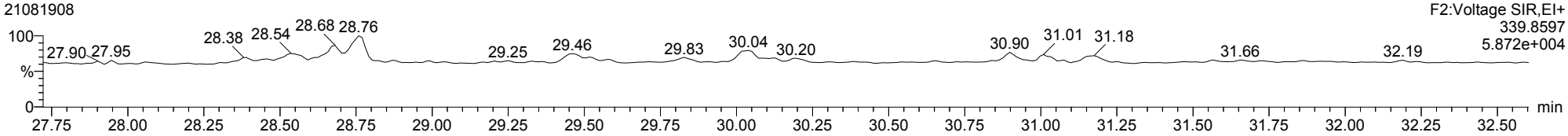

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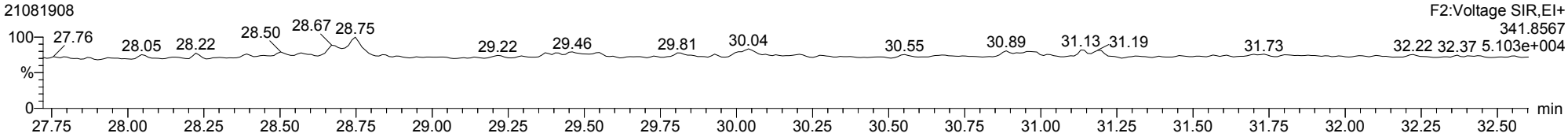

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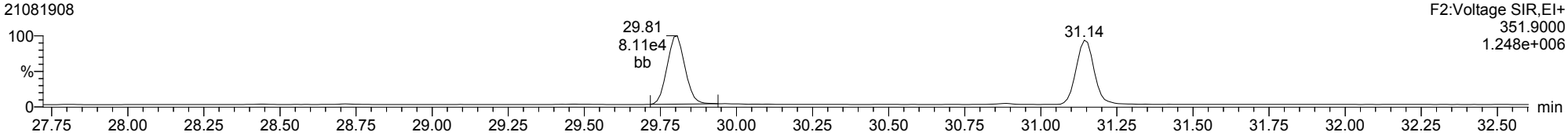

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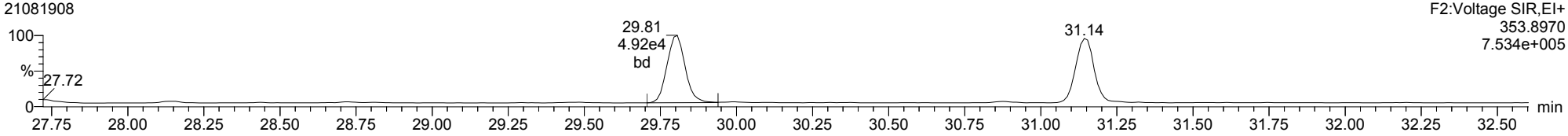
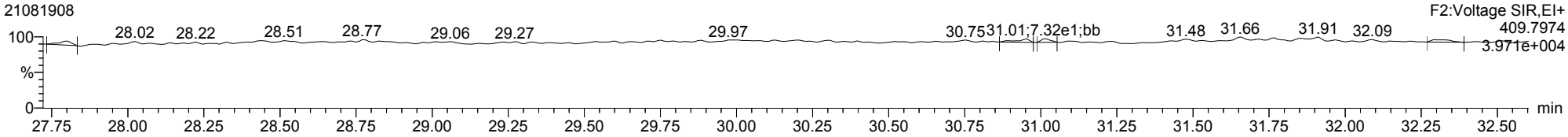


FUNCTION2 HPCDPE



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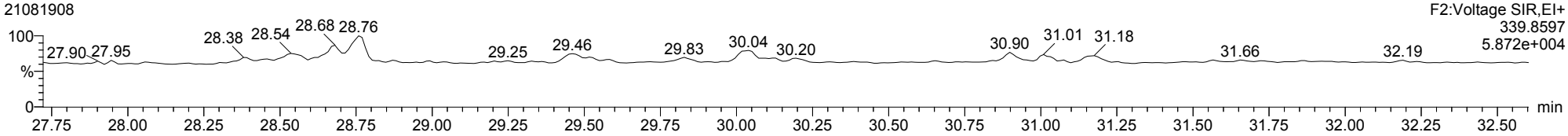

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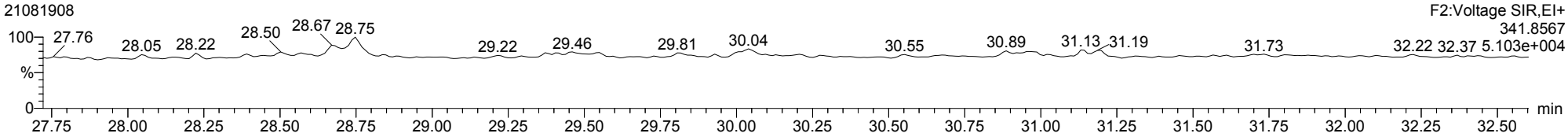

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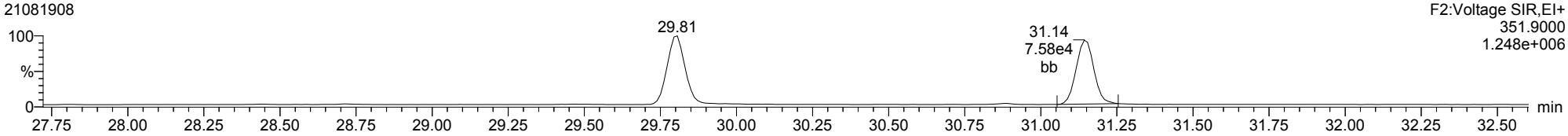

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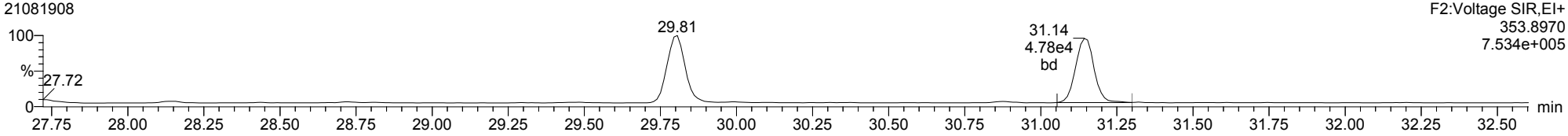

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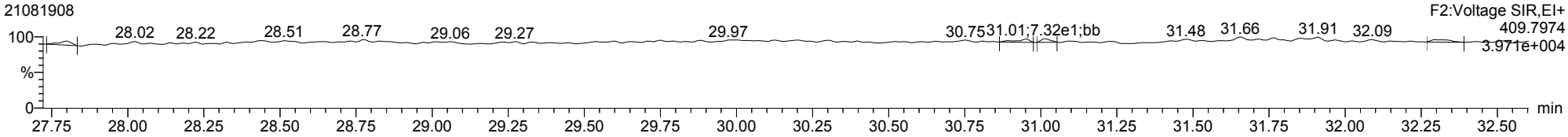

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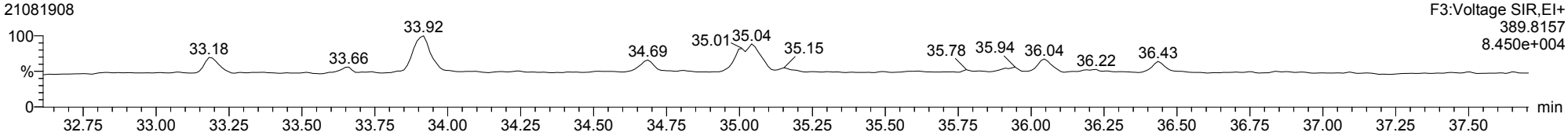

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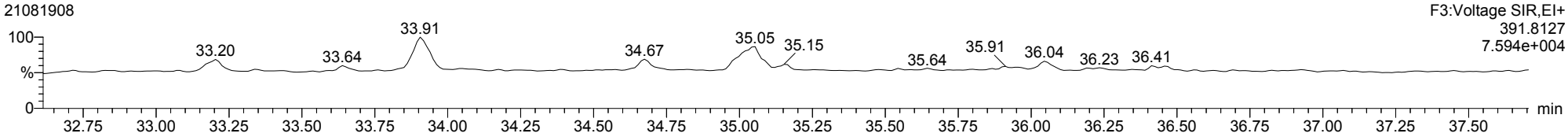

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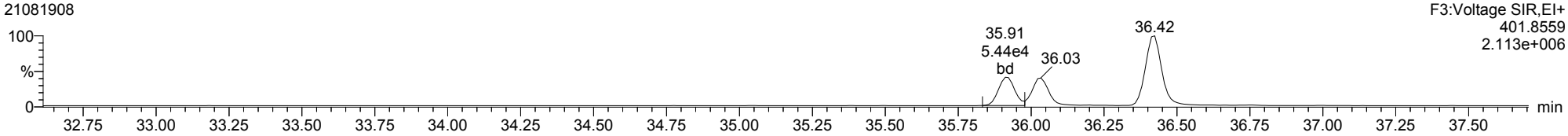

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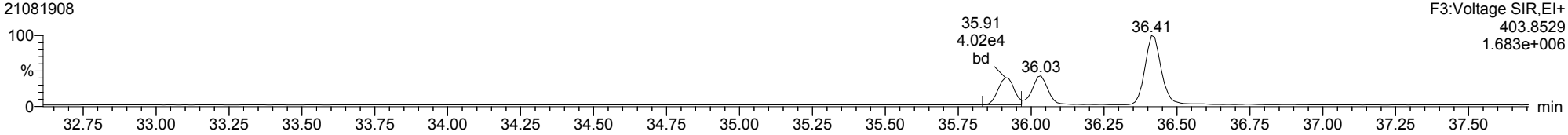

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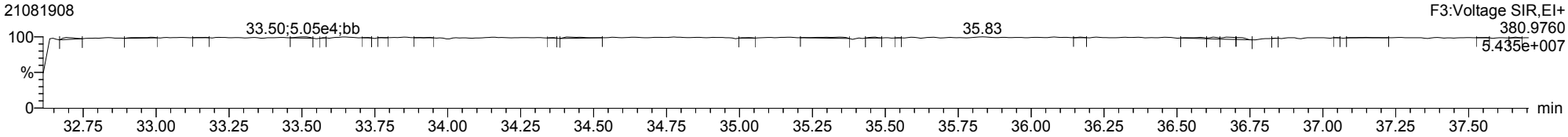

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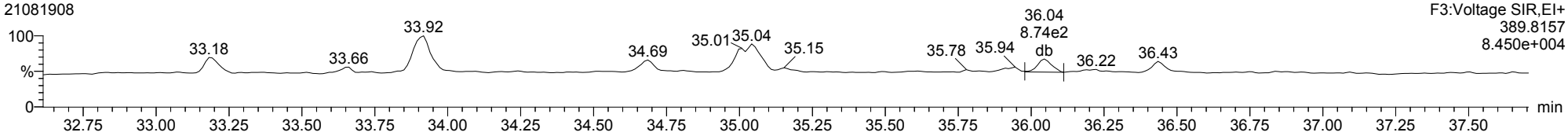

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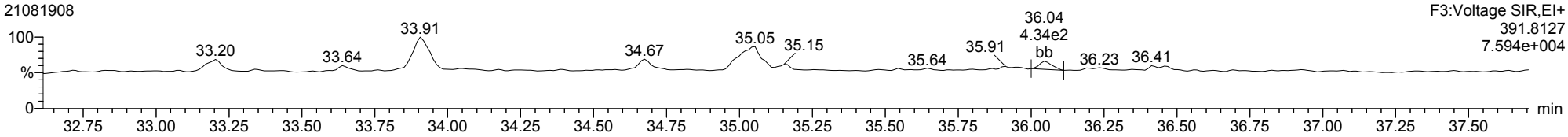

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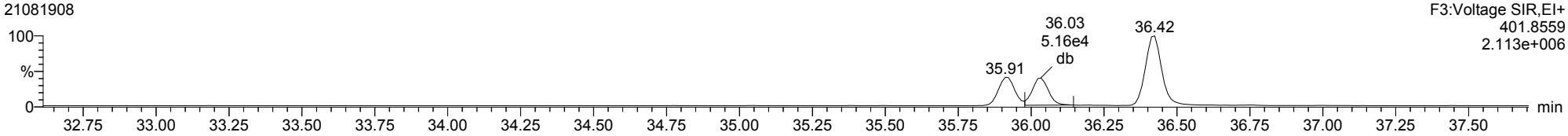

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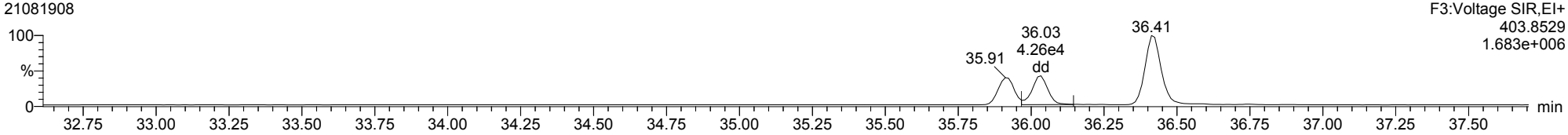

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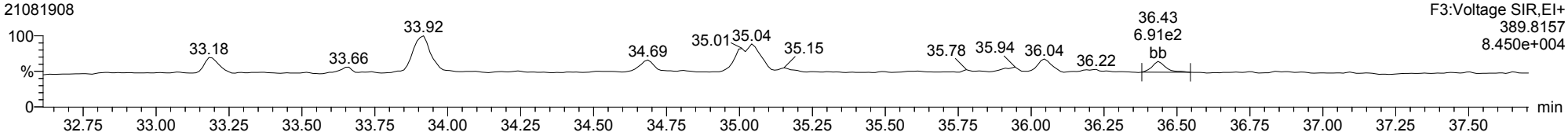

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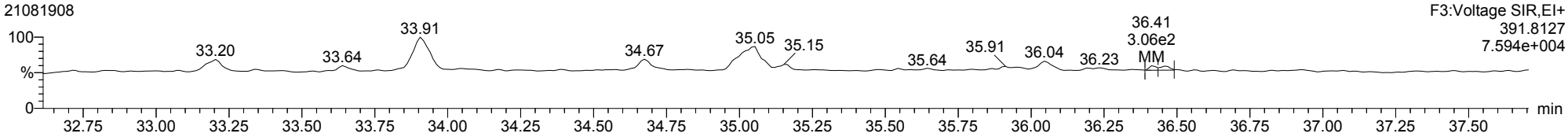

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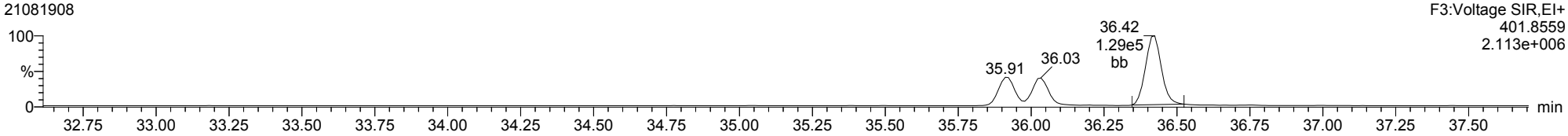

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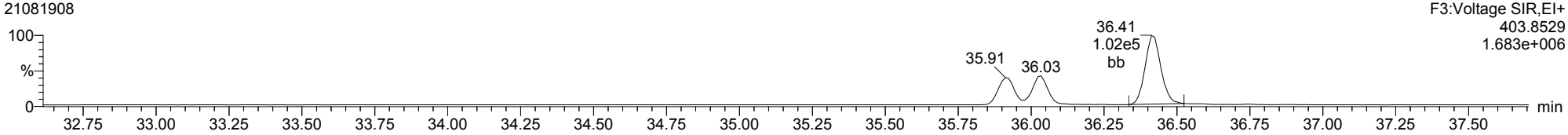

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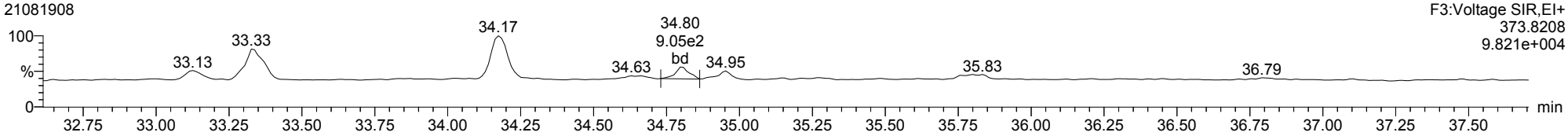

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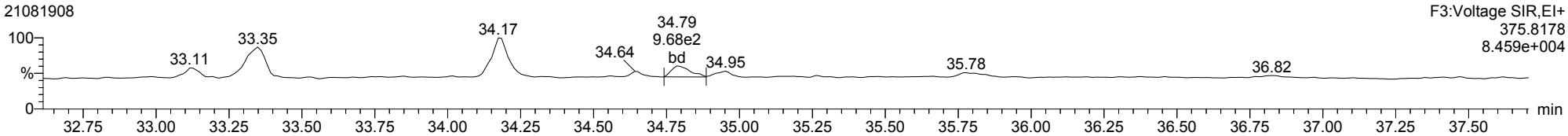

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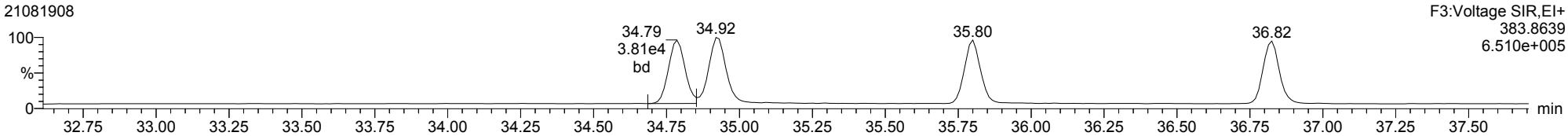

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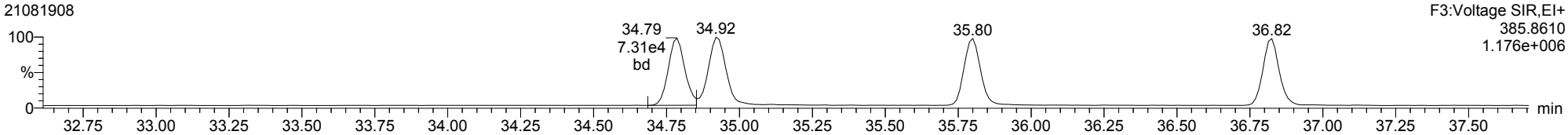

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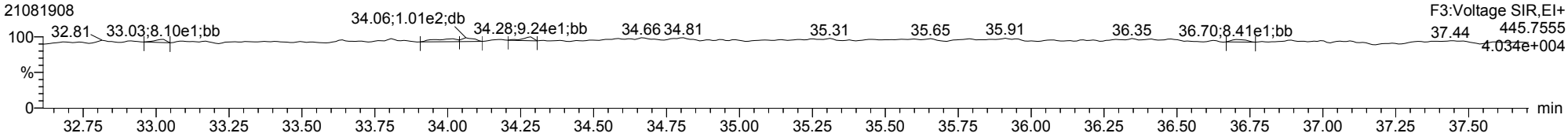

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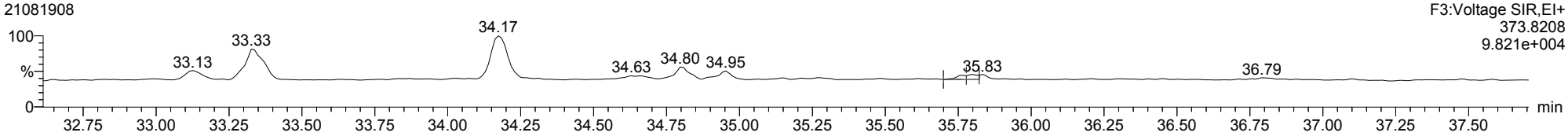
234678-HxCDF



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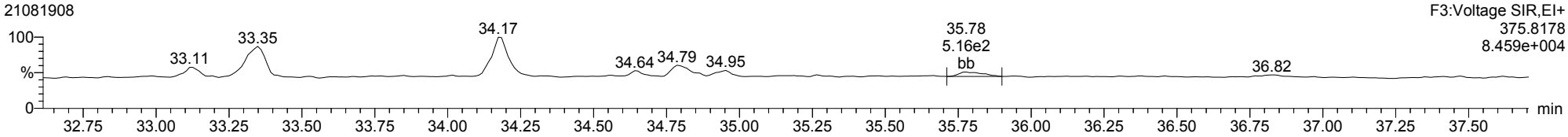

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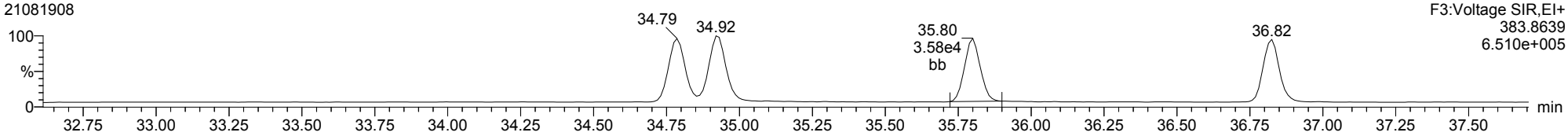

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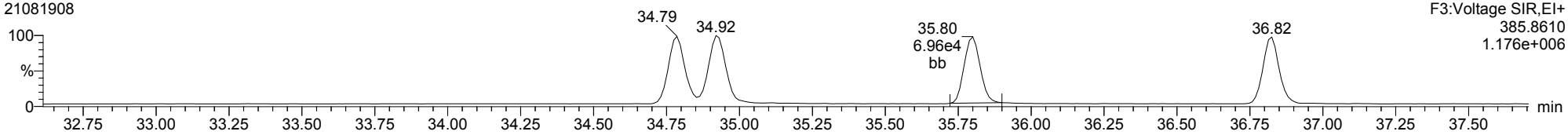

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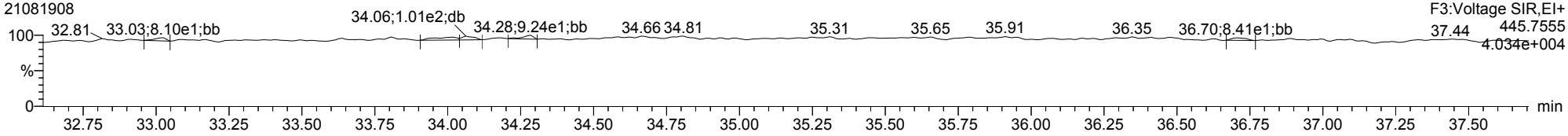

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ID: BJG0572-DUP1, Name: 21081908, Date: 18-Aug-2021, Time: 15:55:42, Conditions: AUTOSPEC01, User: pk

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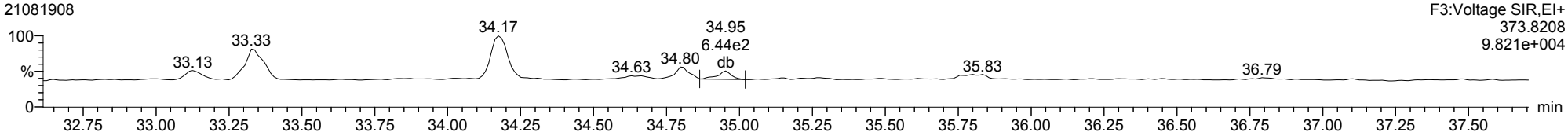

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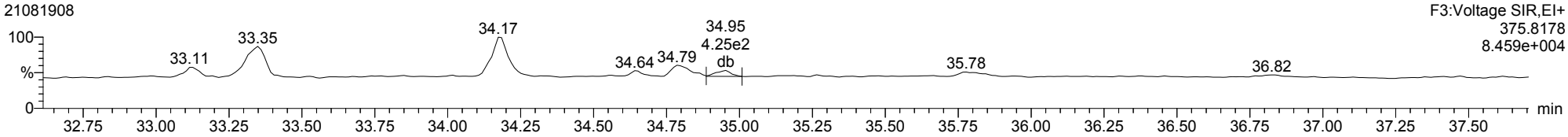

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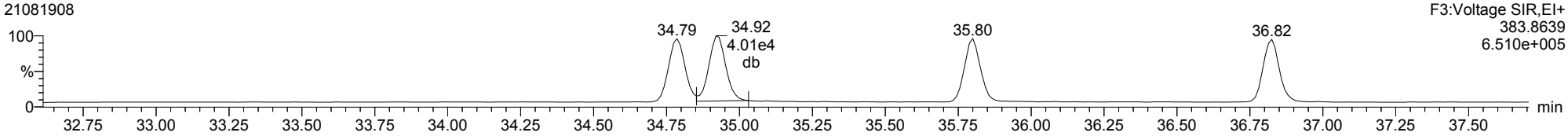

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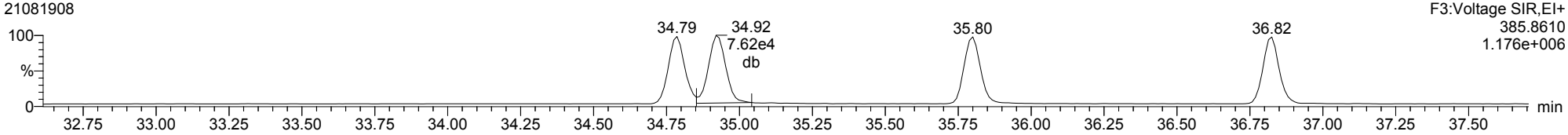

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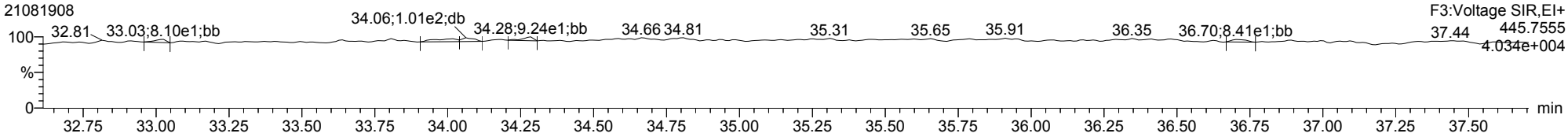

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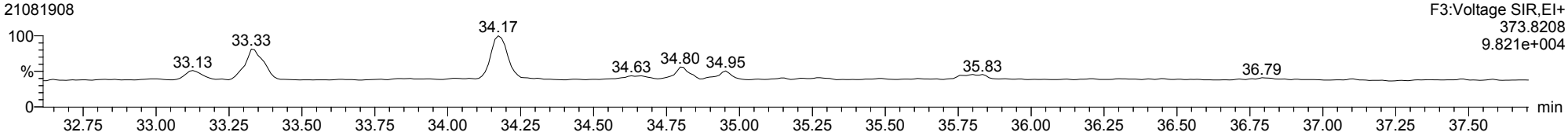

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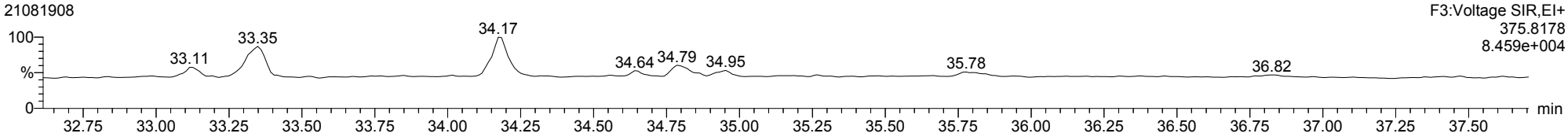

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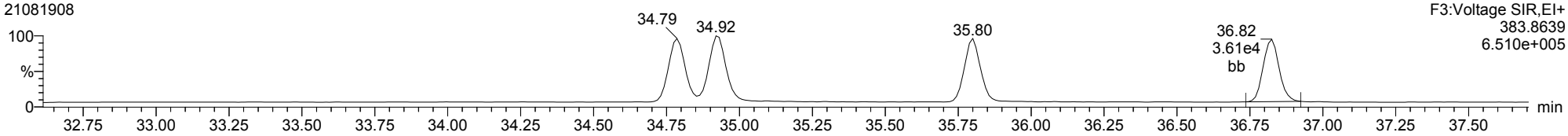

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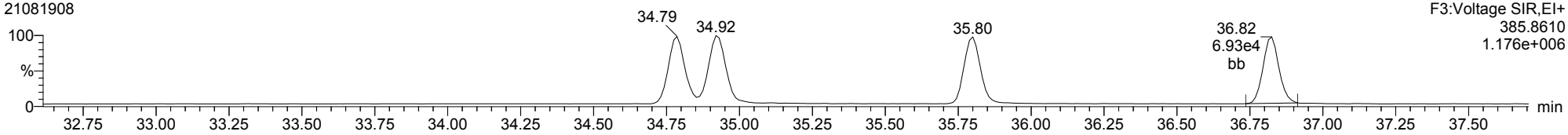
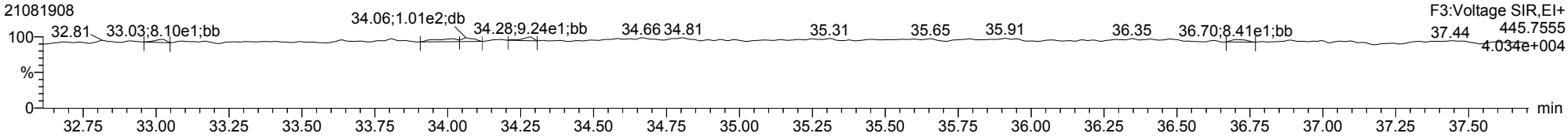


FUNCTION3 OCDPE



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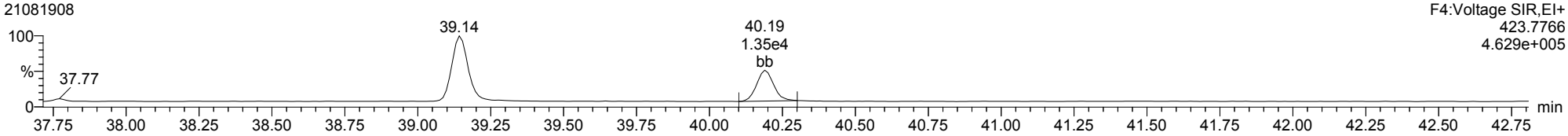

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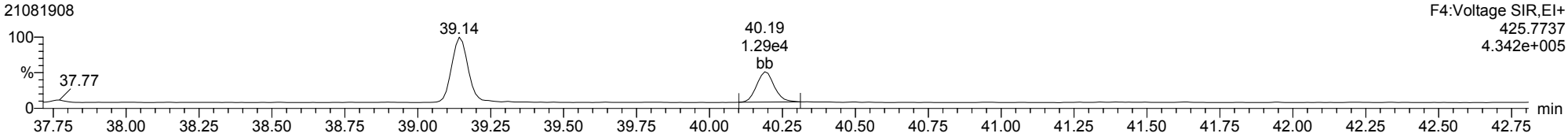

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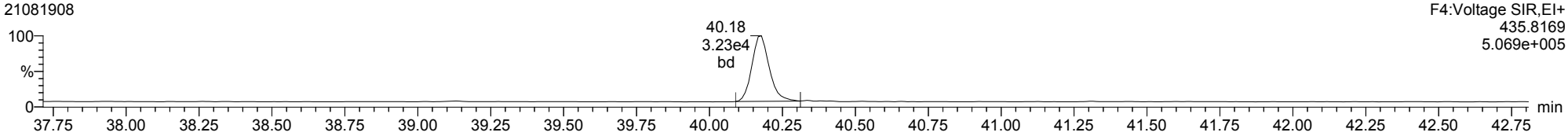

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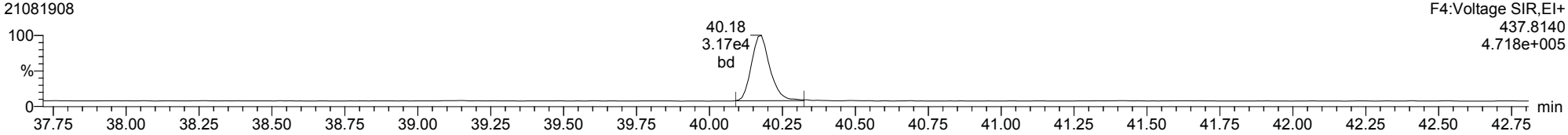
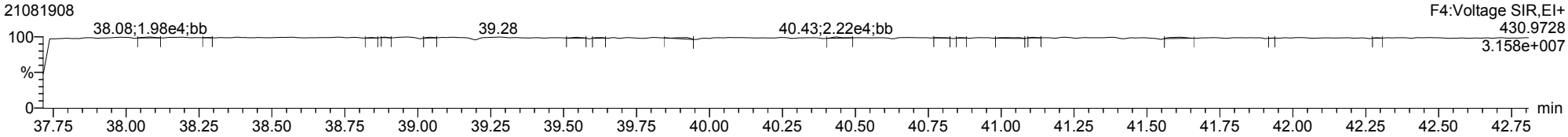


FUNCTION4 PFK



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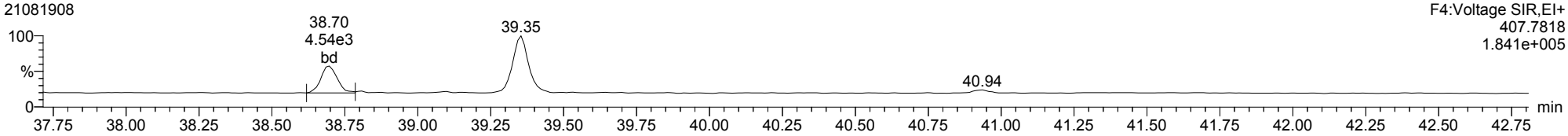

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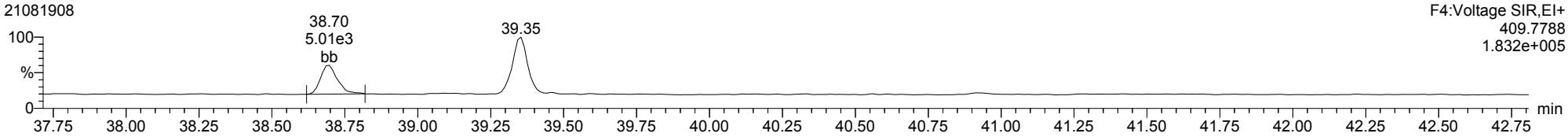

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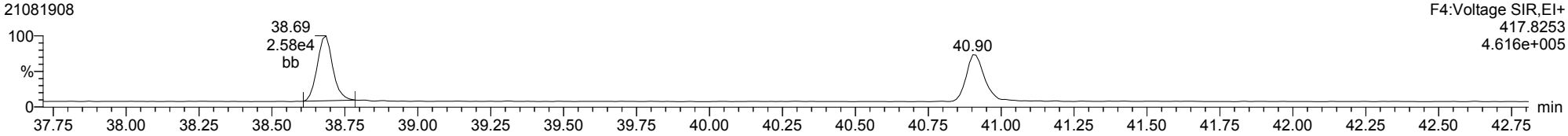

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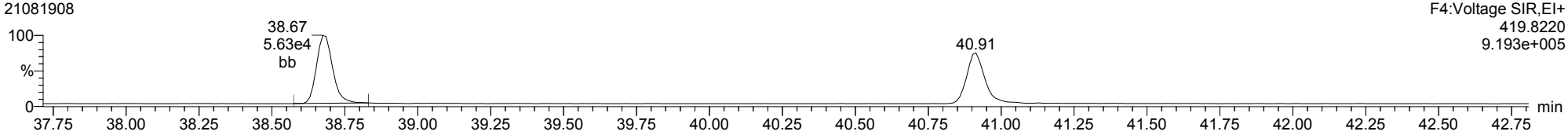

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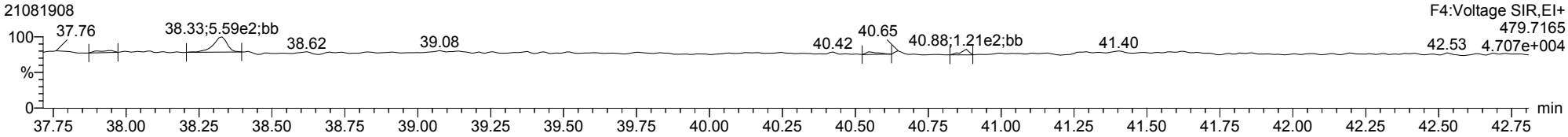

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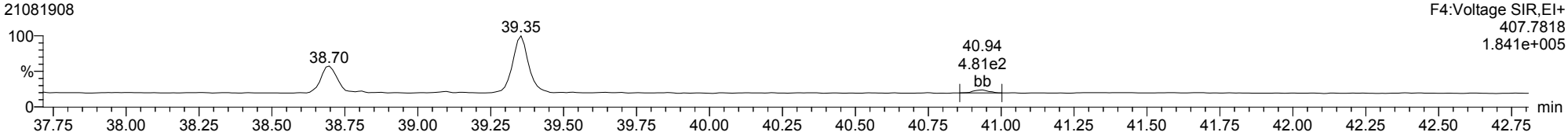

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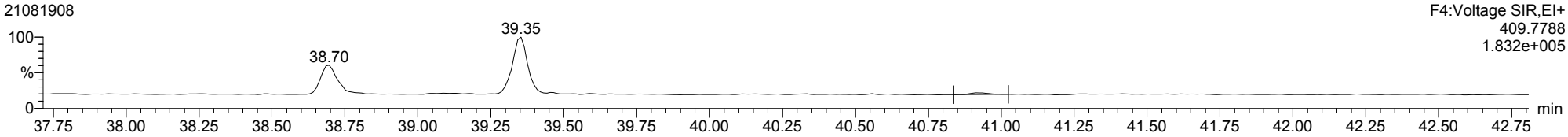

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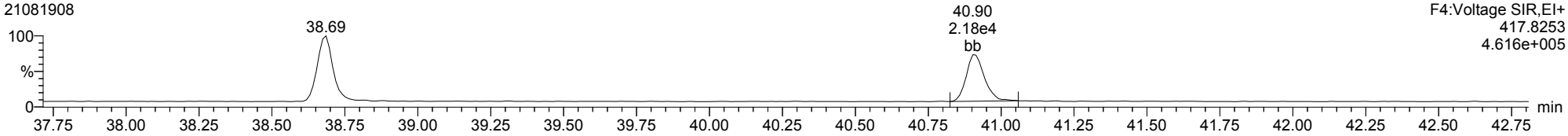

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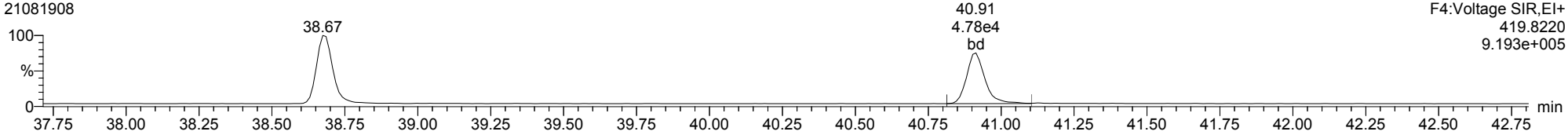

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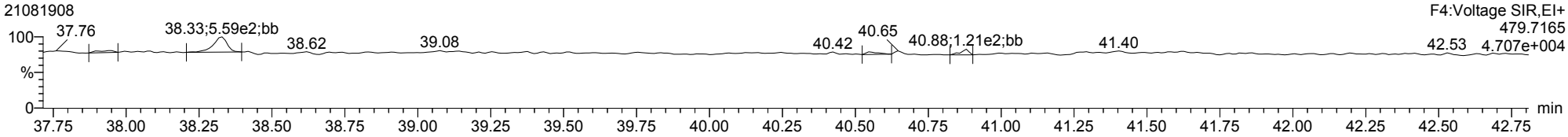

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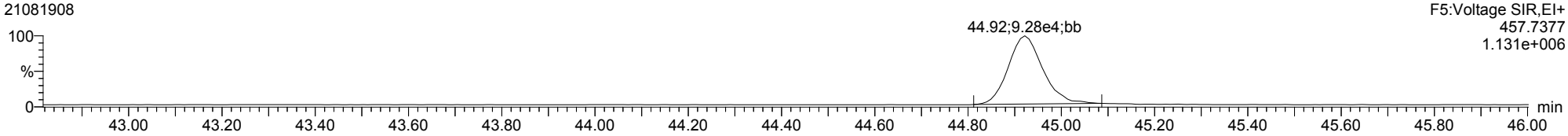

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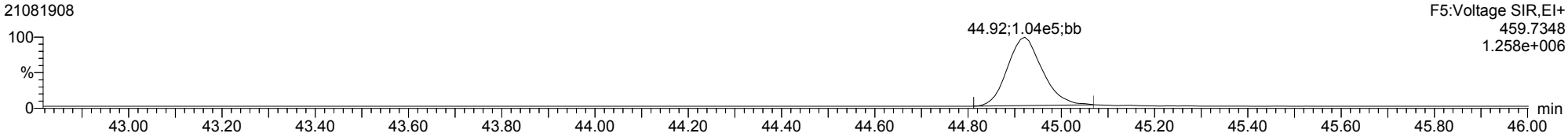

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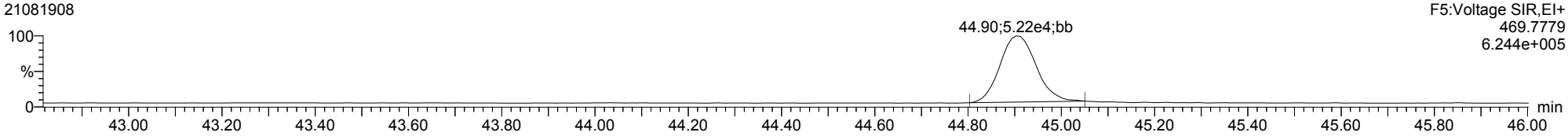

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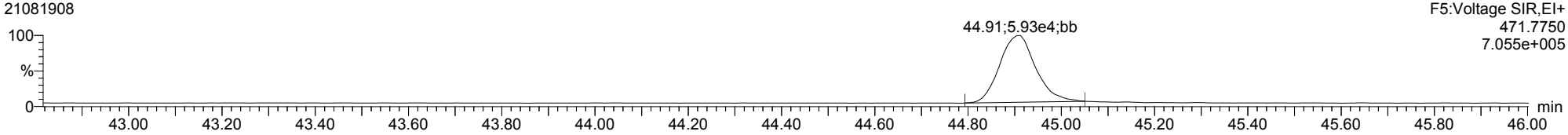
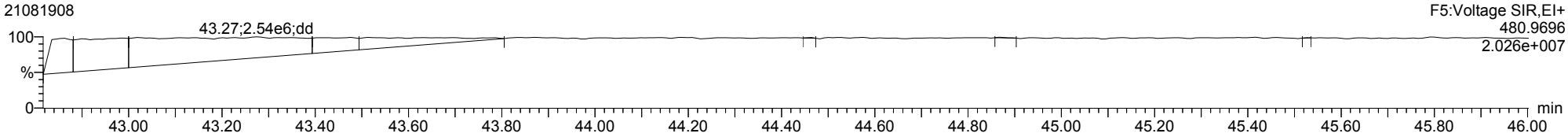


FUNCTION5 PFK



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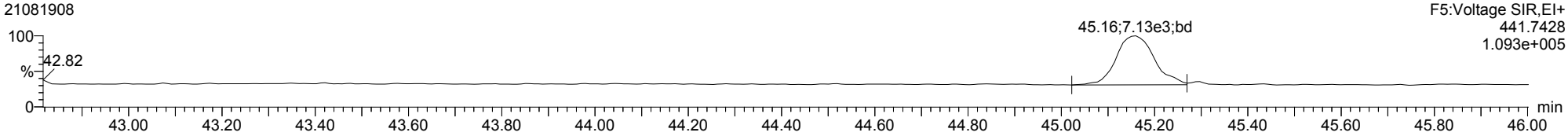

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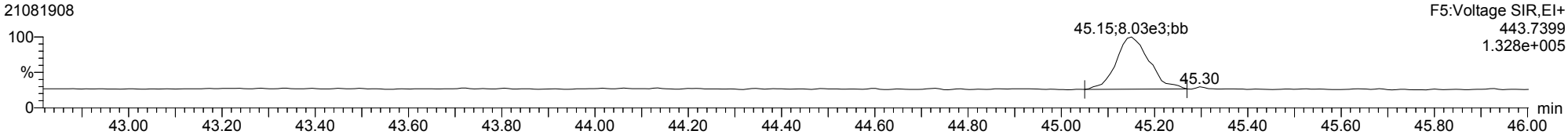

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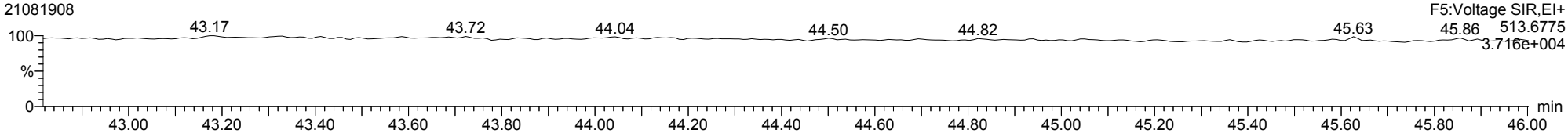

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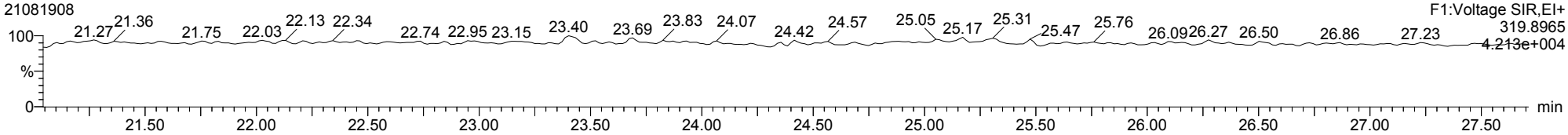

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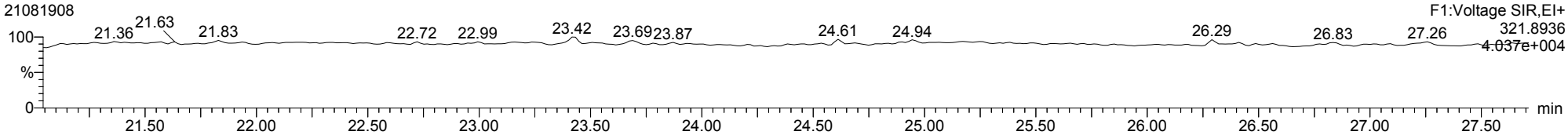

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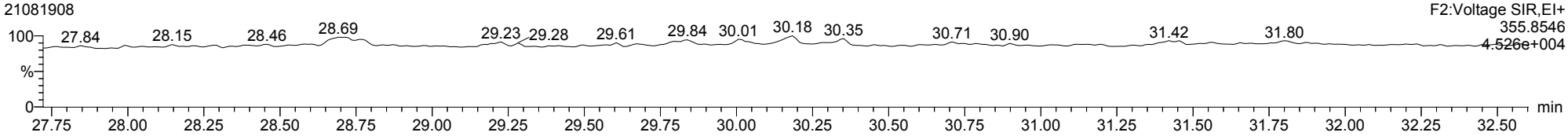

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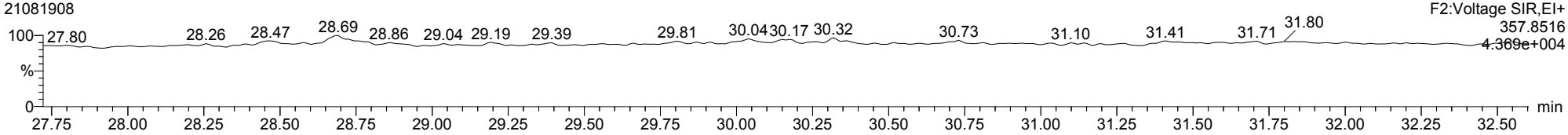

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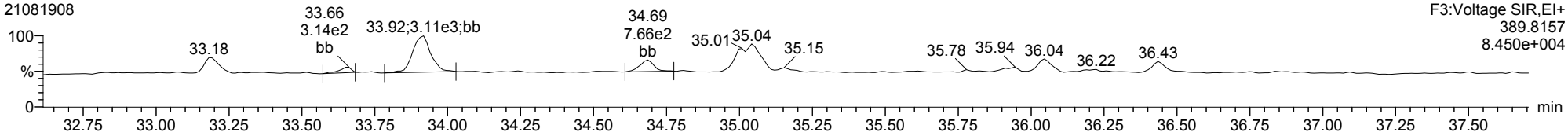

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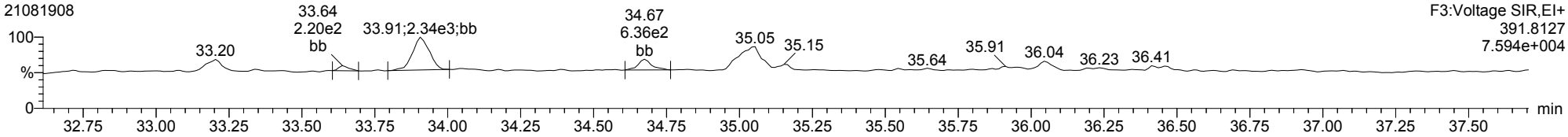

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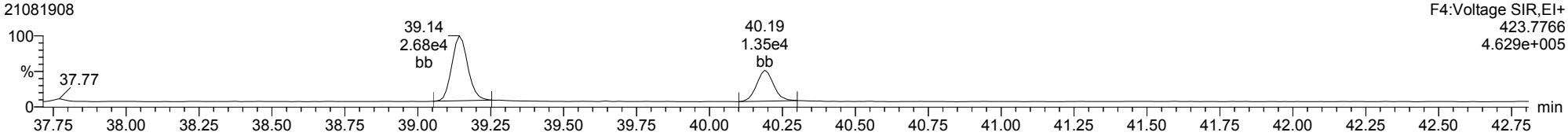

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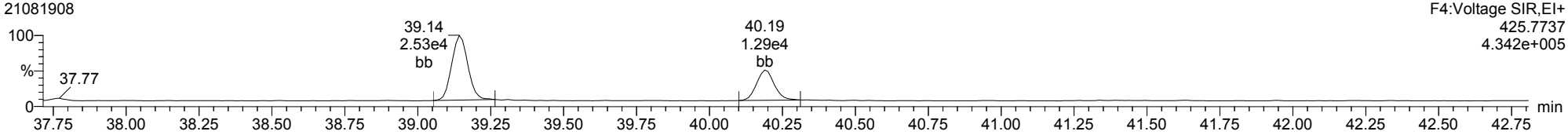

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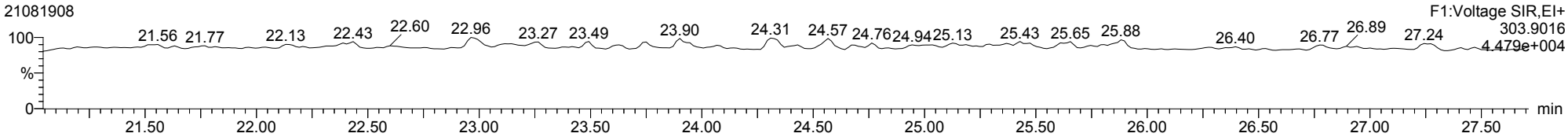
Total-tetrafurans



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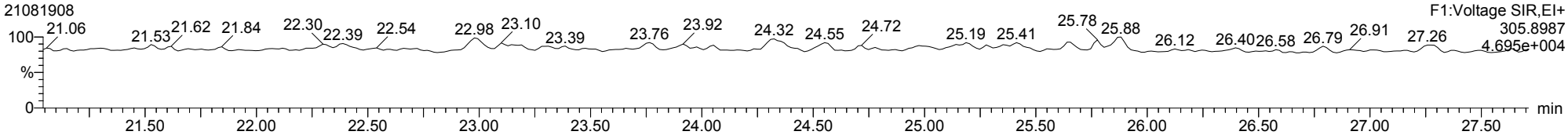

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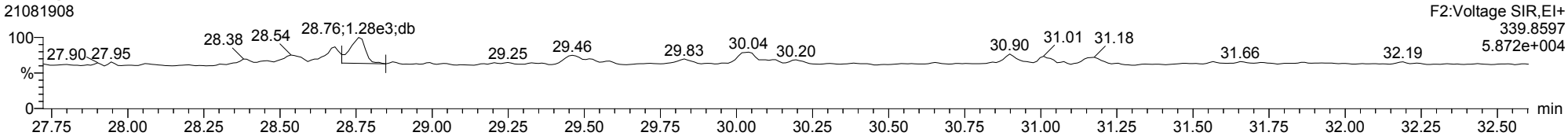

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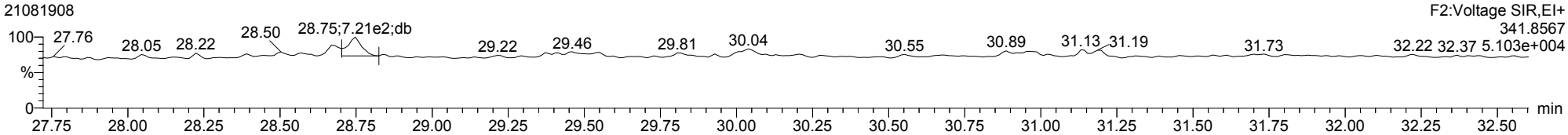
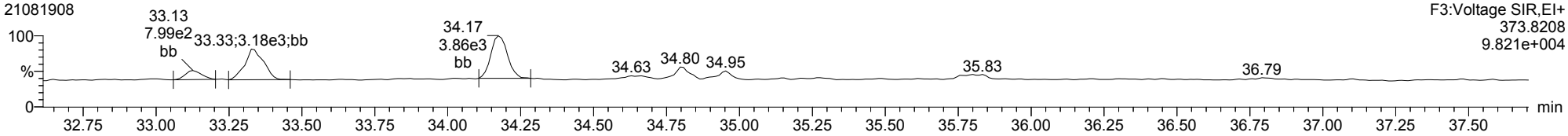
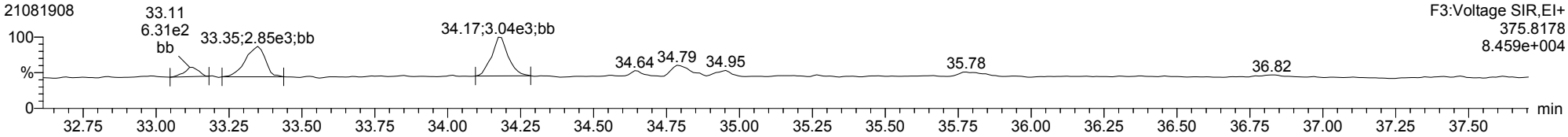


ID: BJG0572-DUP1, Name: 21081908, Date: 18-Aug-2021, Time: 15:55:42, Conditions: AUTOSPEC01, User: pk

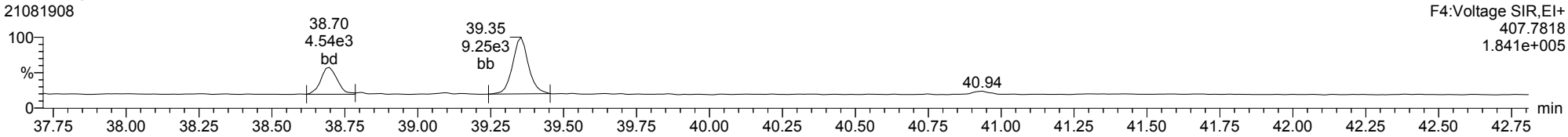
Total-hexafurans



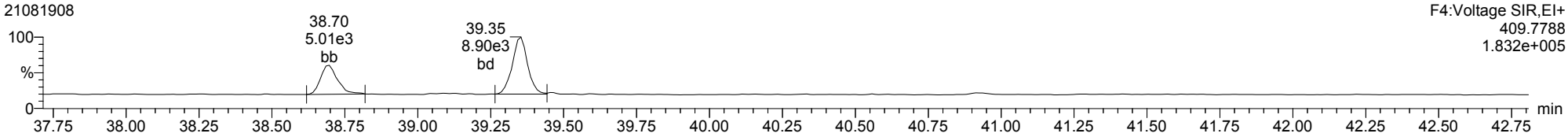
Total-hexafurans



Total-heptafurans



Total-heptafurans



Analytical Resources, Incorporated
Analytical Chemists and Consultants

STANDARD REFERENCE MATERIAL RECOVERY

EPA 1613B

Laboratory: Analytical Resources, Inc.
SDG: 21G0111
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJG0572-SRM1
Batch: BJG0572
Initial/Final: 5.04 g / 20 uL
Preparation: EPA 1613
Analyzed: 08/18/2021 15:06
Standard ID: J006842
Expires: 12/28/2021
Standard Lot#: PSRM0136
Description: Puget Sound reference-SRM

ANALYTE	TRUE (ng/kg wet)	FOUND (ng/kg wet)	MDL	MRL	Q	SRM % REC.	QC LIMITS REC.
2,3,7,8-TCDF	1.1100	ND	1.96	1.98	*, U		50 - 150
2,3,7,8-TCDD	1.0500	ND	1.65	1.98	*, U		50 - 150
1,2,3,7,8-PeCDF	1.2300	ND	1.10	1.98	*, U		50 - 150
2,3,4,7,8-PeCDF	1.0700	ND	1.04	1.98	*, U		50 - 150
1,2,3,7,8-PeCDD	1.0800	ND	1.72	1.98	U		50 - 150
1,2,3,4,7,8-HxCDF	3.0200	3.00	1.08	1.98		99.3	50 - 150
1,2,3,6,7,8-HxCDF	1.0900	1.92	1.04	1.98	*, J	176 *	50 - 150
2,3,4,6,7,8-HxCDF	1.8300	ND	1.06	1.98	*, U		50 - 150
1,2,3,7,8,9-HxCDF	0.51100	ND	1.11	1.98	*, U		50 - 150
1,2,3,4,7,8-HxCDD	1.5900	1.75	0.998	1.98	J	110	50 - 150
1,2,3,6,7,8-HxCDD	3.8800	3.90	0.987	1.98		101	50 - 150
1,2,3,7,8,9-HxCDD	3.0400	4.15	1.06	1.98		137	50 - 150
1,2,3,4,6,7,8-HpCDF	18.700	25.7	0.786	1.98		137	50 - 150
1,2,3,4,7,8,9-HpCDF	1.6300	1.57	1.17	1.98	J	96.2	50 - 150
1,2,3,4,6,7,8-HpCDD	90.600	116	1.75	4.96		128	50 - 150
OCDF	58.400	68.2	2.18	4.96		117	50 - 150
OCDD	811.00	947	9.13	19.8	B	117	50 - 150

* Values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:30:15 Pacific Daylight Time

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
2378-TCDF					1.108		0.770	919	1608								
12378-PeCDF					1.015		1.550	953	1221								
23478-PeCDF					1.126		1.550	953	1221								
123478-HxCDF	34.808	1.001	5.936e2	5.088e2	1.017	1.166	1.240	750	1206	1.06e4	9.27e3	14.2	7.7	NO	bd	bb	0.755
234678-HxCDF					1.052		1.240	750	1206								
123678-HxCDF	34.931	1.000	4.137e2	3.253e2	1.037	1.272	1.240	750	1206	5.73e3	5.32e3	7.6	4.4	NO	dd	bb	0.484
123789-HxCDF					1.030		1.240	750	1206								
1234678-HpCDF	38.685	1.000	4.644e3	4.457e3	1.327	1.042	1.050	804	650	7.38e4	6.08e4	91.8	93.6	NO	bb	bb	6.479
1234789-HpCDF	40.903	1.000	1.986e2	2.400e2	1.283	0.827	1.050	804	650	4.73e3	4.05e3	5.9	6.2	YES	bb	bb	0.395
OCDF	45.141	1.005	7.899e3	9.572e3	1.447	0.825	0.890	878	951	9.73e4	1.19e5	110.7	125.0	NO	bb	bb	17.189
2378-TCDD					0.920		0.770	1174	867								
12378-PeCDD					0.995		1.550	1053	937								
123478-HxCDD	35.933	1.001	2.953e2	2.340e2	1.027	1.262	1.240	809	838	5.49e3	5.13e3	6.8	6.1	NO	bd	bb	0.440
123678-HxCDD	36.034	1.000	6.282e2	5.923e2	1.009	1.061	1.240	809	838	1.24e4	1.19e4	15.4	14.2	NO	db	bb	0.983
123789-HxCDD	36.435	1.011	6.303e2	5.644e2	0.950	1.117	1.240	809	838	1.25e4	7.96e3	15.5	9.5	NO	bb	bb	1.047
1234678-HpCDD	40.189	1.001	1.279e4	1.280e4	1.068	0.999	1.050	926	902	1.78e5	1.84e5	192.5	204.1	NO	bb	bd	29.323
OCDD	44.922	1.000	9.323e4	1.048e5	1.181	0.890	0.890	1144	1422	1.11e6	1.23e6	971.6	862.8	NO	bb	bb	238.736
13C-2378-TCDF	25.625	1.007	4.228e4	5.160e4	1.427	0.819	0.770	1957	1756	6.25e5	7.73e5	319.1	440.1	NO	bb	bb	22.108
13C-12378-PeCDF	29.795	1.171	9.625e4	5.860e4	1.297	1.642	1.550	1323	1267	1.44e6	8.69e5	1086.0	685.8	NO	bb	bb	40.102
13C-23478-PeCDF	31.142	1.224	9.323e4	5.636e4	1.236	1.654	1.550	1323	1267	1.38e6	8.38e5	1041.5	661.8	NO	bb	bb	40.645
13C-123478-HxCDF	34.786	0.955	4.917e4	9.434e4	1.242	0.521	0.510	1282	1532	7.25e5	1.39e6	565.5	906.8	NO	bd	bd	45.810
13C-123678-HxCDF	34.919	0.959	5.009e4	9.718e4	1.343	0.516	0.510	1282	1532	7.34e5	1.46e6	572.8	955.7	NO	db	db	43.475
13C-234678-HxCDF	35.789	0.983	4.614e4	8.905e4	1.215	0.518	0.510	1282	1532	7.14e5	1.39e6	556.5	904.5	NO	bb	bb	44.131
13C-123789-HxCDF	36.813	1.011	4.459e4	8.675e4	1.008	0.514	0.510	1282	1532	6.89e5	1.37e6	537.3	895.7	NO	bb	bb	51.695
13C-1234678-HpCDF	38.674	1.062	3.443e4	7.139e4	0.926	0.482	0.440	940	1320	5.40e5	1.11e6	573.9	842.8	NO	bb	bb	45.299
13C-1234789-HpCDF	40.903	1.123	2.681e4	5.970e4	0.758	0.449	0.440	940	1320	3.57e5	8.10e5	379.5	613.7	NO	bb	bb	45.265
13C-1234-TCDD	25.443	0.000	1.311e5	1.666e5	1.000	0.787	0.770	2300	1390	1.97e6	2.53e6	856.7	1818.3	NO	bb	bb	100.000
13C-2378-TCDD	26.260	1.032	4.735e4	6.343e4	1.116	0.747	0.770	2300	1390	6.84e5	9.29e5	297.2	668.2	NO	bb	bb	33.336
13C-12378-PeCDD	31.399	1.234	6.022e4	3.556e4	0.732	1.693	1.550	1182	1037	8.68e5	5.44e5	733.8	524.5	NO	bb	bb	43.959
13C-123478-HxCDD	35.911	0.986	6.710e4	5.000e4	0.960	1.342	1.240	838	1413	1.10e6	8.01e5	1308.0	566.6	NO	bd	bd	48.383
13C-123678-HxCDD	36.022	0.989	6.847e4	5.461e4	1.041	1.254	1.240	838	1413	1.10e6	8.74e5	1307.9	618.0	NO	db	db	46.875
13C-1234678-HpCDD	40.167	1.103	4.148e4	4.023e4	0.632	1.031	1.050	792	1071	5.91e5	5.92e5	745.4	552.5	NO	bd	bb	51.236
13C-OCDD	44.903	1.233	6.597e4	7.453e4	0.504	0.885	0.890	863	1026	7.60e5	8.44e5	881.7	823.1	NO	bb	bb	110.613
13C-123789-HxCDD	36.412	0.000	1.383e5	1.139e5	1.000	1.215	1.240	838	1413	2.29e6	1.87e6	2735.9	1322.8	NO	bb	bb	100.000
37CL-2378-TCDD	26.290	1.033	4.012e4		1.084			990		6.06e5		611.5			bb		12.440

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:30:15 Pacific Daylight Time

ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
1368-TCDF					1.425		0.770	919	1608								
1289-TCDF					1.043		0.770	919	1608								
13468-PECDF					1.376		1.550	657	886								
12389-PECDF					1.000		1.550	953	1221								
123468-HXCDF	33.104	0.952	5.875e2	6.212e2	1.087	0.946	1.240	750	1206	8.39e3	8.48e3	11.2	7.0	YES	bb	bb	0.775
1368-TCDD					0.923		0.770	1174	867								
1289-TCDD					0.794		0.770	1174	867								
12479-PECDD	28.725	0.915	1.176e2	2.051e2	1.843	0.573	1.550	1053	937	2.30e3	2.51e3	2.2	2.7	YES	bb	db	0.183
12389-PECDD					1.154		1.550	1053	937								
124679-HXCDD	33.906	0.944	1.812e3	1.245e3	1.125	1.455	1.240	809	838	2.77e4	2.04e4	34.2	24.4	YES	bb	bb	2.321
1234679-HPCDD	39.142	0.975	1.680e4	1.651e4	1.211	1.018	1.050	926	902	2.53e5	2.52e5	273.9	279.2	NO	bb	bb	33.673
Total-tetrafurans			0.000e0		1.192			919		0.00e0							
Total-penta1			1.603e3					657		2.52e4							1.772
Total-pentafurans			0.000e0		1.047			953		0.00e0							
Total-hexafurans			5.959e3		1.045			750		8.93e4							7.366
Total-heptafurans			1.328e4		1.305			804		2.05e5							20.278
Total-Furans			2.874e4		1.158			919		4.17e5							46.604
Total-tetradioxins			0.000e0		0.879			1174		0.00e0							
Total-pentadioxins			0.000e0		1.331			1053		0.00e0							
Total-hexadioxins			1.554e3		1.028			809		3.04e4							2.469
Total-heptadioxins			2.959e4		1.140			926		4.32e5							62.997
Total-Dioxins			1.244e5		1.092			1174		1.57e6							304.202
Total-TEQ			1.531e5					1174		1.99e6							350.806
FUNCTION1 PFK			7.328e5					565420		1.53e7							
FUNCTION2 PFK			1.194e6					390805		2.78e7							0.000
FUNCTION3 PFK			0.000e0					432805		0.00e0							
FUNCTION4 PFK			5.200e5					254238		1.26e7							
FUNCTION5 PFK			5.794e6					202147		5.23e7							
FUNCTION1 HXCD...			7.369e2					907		9.77e3							0.000
FUNCTION1 HPCD...			1.349e3					839		2.14e4							0.000
FUNCTION2 HPCD...			2.532e2					792		3.71e3							0.000
FUNCTION3 OCDPE			8.299e1					744		1.66e3							0.000
FUNCTION4 NCDPE			7.264e2					831		1.39e4							0.000
FUNCTION5 DCDPE			1.751e2					669		4.81e3							0.000

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:30:15 Pacific Daylight Time

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

TF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-penta1	27.08	1.603e3	9.127e2		1.76	1.55	38.4	YES	NO	dd	bb	1.772

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123678-HxCDF	34.93	4.137e2	3.253e2	1.037	1.27	1.24	7.6	YES	NO	dd	bb	0.484
2	123478-HxCDF	34.81	5.936e2	5.088e2	1.017	1.17	1.24	14.2	YES	NO	bd	bb	0.755
3	Total-hexafurans	34.17	2.822e3	2.333e3	1.045	1.21	1.24	55.6	YES	NO	bb	bb	3.542
4	Total-hexafurans	33.33	2.131e3	1.631e3	1.045	1.31	1.24	41.6	YES	NO	bb	bb	2.585

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-heptafurans	39.34	8.640e3	8.682e3	1.305	1.00	1.05	163.7	YES	NO	bb	bb	13.799
2	1234678-HpCDF	38.69	4.644e3	4.457e3	1.327	1.04	1.05	91.8	YES	NO	bb	bb	6.479

ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

Furans,TF,PP,PF,HF,HPF,OF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123678-HxCDF	34.93	4.137e2	3.253e2	1.037	1.27	1.24	7.6	YES	NO	dd	bb	0.484
2	123478-HxCDF	34.81	5.936e2	5.088e2	1.017	1.17	1.24	14.2	YES	NO	bd	bb	0.755
3	Total-hexafurans	34.17	2.822e3	2.333e3	1.045	1.21	1.24	55.6	YES	NO	bb	bb	3.542
4	Total-hexafurans	33.33	2.131e3	1.631e3	1.045	1.31	1.24	41.6	YES	NO	bb	bb	2.585
5	Total-heptafurans	39.34	8.640e3	8.682e3	1.305	1.00	1.05	163.7	YES	NO	bb	bb	13.799
6	1234678-HpCDF	38.69	4.644e3	4.457e3	1.327	1.04	1.05	91.8	YES	NO	bb	bb	6.479
7	OCDF	45.14	7.899e3	9.572e3	1.447	0.83	0.89	110.7	YES	NO	bb	bb	17.189
8	Total-penta1	27.08	1.603e3	9.127e2		1.76	1.55	38.4	YES	NO	dd	bb	1.772

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123789-HxCDD	36.43	6.303e2	5.644e2	0.950	1.12	1.24	15.5	YES	NO	bb	bb	1.047
2	123678-HxCDD	36.03	6.282e2	5.923e2	1.009	1.06	1.24	15.4	YES	NO	db	bb	0.983
3	123478-HxCDD	35.93	2.953e2	2.340e2	1.027	1.26	1.24	6.8	YES	NO	bd	bb	0.440

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDD	40.19	1.279e4	1.280e4	1.068	1.00	1.05	192.5	YES	NO	bb	bd	29.323
2	1234679-HPCDD	39.14	1.680e4	1.651e4	1.211	1.02	1.05	273.9	YES	NO	bb	bb	33.673

ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

Dioxins,TD,PD,HD,HPD,OD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123789-HxCDD	36.43	6.303e2	5.644e2	0.950	1.12	1.24	15.5	YES	NO	bb	bb	1.047
2	123678-HxCDD	36.03	6.282e2	5.923e2	1.009	1.06	1.24	15.4	YES	NO	db	bb	0.983
3	123478-HxCDD	35.93	2.953e2	2.340e2	1.027	1.26	1.24	6.8	YES	NO	bd	bb	0.440
4	1234678-HpCDD	40.19	1.279e4	1.280e4	1.068	1.00	1.05	192.5	YES	NO	bb	bd	29.323
5	1234679-HPCDD	39.14	1.680e4	1.651e4	1.211	1.02	1.05	273.9	YES	NO	bb	bb	33.673
6	OCDD	44.92	9.323e4	1.048e5	1.181	0.89	0.89	971.6	YES	NO	bb	bb	238.736

TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123678-HxCDF	34.93	4.137e2	3.253e2	1.037	1.27	1.24	7.6	YES	NO	dd	bb	0.484
2	123478-HxCDF	34.81	5.936e2	5.088e2	1.017	1.17	1.24	14.2	YES	NO	bd	bb	0.755
3	Total-hexafurans	34.17	2.822e3	2.333e3	1.045	1.21	1.24	55.6	YES	NO	bb	bb	3.542
4	Total-hexafurans	33.33	2.131e3	1.631e3	1.045	1.31	1.24	41.6	YES	NO	bb	bb	2.585
5	Total-heptafurans	39.34	8.640e3	8.682e3	1.305	1.00	1.05	163.7	YES	NO	bb	bb	13.799
6	1234678-HpCDF	38.69	4.644e3	4.457e3	1.327	1.04	1.05	91.8	YES	NO	bb	bb	6.479
7	OCDF	45.14	7.899e3	9.572e3	1.447	0.83	0.89	110.7	YES	NO	bb	bb	17.189
8	Total-penta1	27.08	1.603e3	9.127e2		1.76	1.55	38.4	YES	NO	dd	bb	1.772
9	123789-HxCDD	36.43	6.303e2	5.644e2	0.950	1.12	1.24	15.5	YES	NO	bb	bb	1.047
10	123678-HxCDD	36.03	6.282e2	5.923e2	1.009	1.06	1.24	15.4	YES	NO	db	bb	0.983
11	123478-HxCDD	35.93	2.953e2	2.340e2	1.027	1.26	1.24	6.8	YES	NO	bd	bb	0.440
12	1234678-HpCDD	40.19	1.279e4	1.280e4	1.068	1.00	1.05	192.5	YES	NO	bb	bd	29.323
13	1234679-HPCDD	39.14	1.680e4	1.651e4	1.211	1.02	1.05	273.9	YES	NO	bb	bb	33.673
14	OCDD	44.92	9.323e4	1.048e5	1.181	0.89	0.89	971.6	YES	NO	bb	bb	238.736

ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	24.42	2.912e4					1.1	NO		bb		
2	FUNCTION1 PFK	24.23	1.352e4					0.9	NO		db		
3	FUNCTION1 PFK	24.19	2.709e4					1.2	NO		dd		
4	FUNCTION1 PFK	24.13	1.756e4					0.8	NO		bd		
5	FUNCTION1 PFK	23.52	9.858e3					0.7	NO		bb		
6	FUNCTION1 PFK	23.46	1.341e4					0.8	NO		bb		
7	FUNCTION1 PFK	23.30	2.222e4					0.9	NO		bb		
8	FUNCTION1 PFK	23.13	4.632e4					1.2	NO		bb		
9	FUNCTION1 PFK	22.31	9.270e4					1.8	NO		bb		
10	FUNCTION1 PFK	21.72	2.821e4					0.8	NO		bb		
11	FUNCTION1 PFK	21.66	3.352e3					0.4	NO		bb		
12	FUNCTION1 PFK	21.33	1.335e4					0.9	NO		db		
13	FUNCTION1 PFK	21.27	7.324e4					2.4	NO		bd		
14	FUNCTION1 PFK	21.15	2.796e4					1.3	NO		db		
15	FUNCTION1 PFK	21.12	2.912e4					1.4	NO		bd		
16	FUNCTION1 PFK	27.47	2.351e4					1.2	NO		bb		
17	FUNCTION1 PFK	27.26	5.659e4					1.7	NO		bb		
18	FUNCTION1 PFK	26.73	3.680e3					0.4	NO		bb		
19	FUNCTION1 PFK	25.85	1.086e4					0.7	NO		bb		
20	FUNCTION1 PFK	25.50	3.890e4					1.5	NO		bb		
21	FUNCTION1 PFK	25.44	1.697e4					0.9	NO		db		
22	FUNCTION1 PFK	25.38	2.782e4					1.3	NO		bd		
23	FUNCTION1 PFK	24.93	2.659e4					1.3	NO		db		
24	FUNCTION1 PFK	24.81	8.083e4					1.5	NO		bd		

ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 PFK	28.09	7.160e4					2.4	NO		dd		0.000
2	FUNCTION2 PFK	28.05	2.985e4					1.6	NO		dd		0.000
3	FUNCTION2 PFK	27.96	6.165e4					2.6	NO		dd		0.000
4	FUNCTION2 PFK	27.90	5.153e3					0.8	NO		dd		0.000
5	FUNCTION2 PFK	27.86	2.194e4					1.9	NO		dd		0.000
6	FUNCTION2 PFK	27.82	3.625e4					2.6	NO		bd		0.000
7	FUNCTION2 PFK	29.54	2.529e4					1.7	NO		dd		0.000
8	FUNCTION2 PFK	29.46	5.868e4					2.3	NO		bd		0.000
9	FUNCTION2 PFK	29.36	7.147e4					2.8	NO		db		0.000
10	FUNCTION2 PFK	29.30	2.136e4					1.7	NO		bd		0.000
11	FUNCTION2 PFK	29.11	1.664e4					1.7	NO		db		0.000
12	FUNCTION2 PFK	29.07	2.339e4					2.0	NO		dd		0.000
13	FUNCTION2 PFK	29.03	1.292e4					1.0	NO		bd		0.000
14	FUNCTION2 PFK	28.94	9.176e3					0.9	NO		bb		0.000
15	FUNCTION2 PFK	28.77	1.983e4					1.3	NO		db		0.000
16	FUNCTION2 PFK	28.73	1.127e4					1.1	NO		dd		0.000
17	FUNCTION2 PFK	28.67	2.445e4					1.2	NO		bd		0.000
18	FUNCTION2 PFK	28.58	8.579e3					0.9	NO		bb		0.000
19	FUNCTION2 PFK	28.42	4.508e3					0.7	NO		db		0.000
20	FUNCTION2 PFK	28.38	1.020e4					0.9	NO		bd		0.000
21	FUNCTION2 PFK	28.27	5.825e3					0.8	NO		bb		0.000
22	FUNCTION2 PFK	28.22	8.910e3					1.0	NO		db		0.000
23	FUNCTION2 PFK	30.96	4.551e4					1.5	NO		bb		0.000
24	FUNCTION2 PFK	30.83	5.372e3					0.8	NO		bb		0.000
25	FUNCTION2 PFK	30.75	5.435e3					0.8	NO		bb		0.000
26	FUNCTION2 PFK	30.71	4.147e3					0.6	NO		bb		0.000
27	FUNCTION2 PFK	30.61	3.206e4					1.4	NO		bb		0.000
28	FUNCTION2 PFK	30.33	2.999e4					1.8	NO		db		0.000
29	FUNCTION2 PFK	30.25	3.728e3					0.4	NO		bd		0.000
30	FUNCTION2 PFK	30.15	5.490e3					0.7	NO		bb		0.000
31	FUNCTION2 PFK	30.11	1.907e3					0.4	NO		bb		0.000
32	FUNCTION2 PFK	30.04	1.543e4					1.4	NO		db		0.000
33	FUNCTION2 PFK	30.00	1.297e4					1.1	NO		dd		0.000
34	FUNCTION2 PFK	29.88	6.050e4					1.7	NO		dd		0.000
35	FUNCTION2 PFK	29.81	3.805e4					1.8	NO		dd		0.000
36	FUNCTION2 PFK	29.71	4.980e4					2.2	NO		bd		0.000
37	FUNCTION2 PFK	29.65	3.051e4					2.0	NO		db		0.000

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PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	FUNCTION2 PFK	29.59	2.530e4					1.9	NO		dd		0.000
39	FUNCTION2 PFK	32.52	4.538e3					0.5	NO		bb		0.000
40	FUNCTION2 PFK	32.47	4.825e3					0.6	NO		db		0.000
41	FUNCTION2 PFK	32.40	2.856e4					0.9	NO		dd		0.000
42	FUNCTION2 PFK	32.29	3.888e4					1.3	NO		bd		0.000
43	FUNCTION2 PFK	32.10	4.119e3					0.6	NO		bb		0.000
44	FUNCTION2 PFK	32.03	6.741e3					0.7	NO		bb		0.000
45	FUNCTION2 PFK	31.84	1.648e4					0.8	NO		bb		0.000
46	FUNCTION2 PFK	31.73	4.469e4					2.6	NO		bb		0.000
47	FUNCTION2 PFK	31.68	1.772e4					1.4	NO		db		0.000
48	FUNCTION2 PFK	31.61	2.205e4					1.2	NO		bd		0.000
49	FUNCTION2 PFK	31.48	1.862e4					0.9	NO		bb		0.000
50	FUNCTION2 PFK	31.37	1.144e4					1.1	NO		db		0.000
51	FUNCTION2 PFK	31.31	3.328e4					1.8	NO		bd		0.000
52	FUNCTION2 PFK	31.23	1.857e3					0.4	NO		bb		0.000
53	FUNCTION2 PFK	31.19	5.768e3					0.8	NO		bb		0.000
54	FUNCTION2 PFK	31.10	8.821e3					1.0	NO		bb		0.000

PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

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PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 PFK	39.39	1.422e3					0.5	NO		bb		
2	FUNCTION4 PFK	39.34	8.886e3					1.0	NO		bb		
3	FUNCTION4 PFK	39.14	2.086e4					1.5	NO		bb		
4	FUNCTION4 PFK	39.09	1.398e4					1.7	NO		db		
5	FUNCTION4 PFK	39.03	2.735e4					2.5	NO		dd		
6	FUNCTION4 PFK	38.96	1.837e4					1.9	NO		dd		
7	FUNCTION4 PFK	38.91	1.861e4					1.8	NO		dd		
8	FUNCTION4 PFK	38.86	1.104e4					1.3	NO		dd		
9	FUNCTION4 PFK	38.83	6.929e3					1.3	NO		bd		
10	FUNCTION4 PFK	38.45	2.787e3					0.6	NO		bb		
11	FUNCTION4 PFK	38.27	6.447e3					0.6	NO		bb		
12	FUNCTION4 PFK	38.14	2.180e3					0.3	NO		bb		
13	FUNCTION4 PFK	37.96	2.118e4					1.5	NO		bb		
14	FUNCTION4 PFK	37.82	2.901e4					2.9	NO		bb		
15	FUNCTION4 PFK	40.96	9.744e3					1.1	NO		bb		
16	FUNCTION4 PFK	40.81	3.250e4					1.7	NO		bb		
17	FUNCTION4 PFK	40.67	1.733e4					1.8	NO		db		
18	FUNCTION4 PFK	40.58	4.643e3					0.8	NO		dd		
19	FUNCTION4 PFK	40.52	8.834e3					1.3	NO		dd		
20	FUNCTION4 PFK	40.48	3.414e4					1.9	NO		bd		
21	FUNCTION4 PFK	40.28	1.628e4					1.8	NO		db		
22	FUNCTION4 PFK	40.23	1.382e4					1.3	NO		bd		
23	FUNCTION4 PFK	40.10	1.010e4					1.4	NO		db		
24	FUNCTION4 PFK	40.07	5.582e3					1.0	NO		bd		
25	FUNCTION4 PFK	39.99	7.972e3					0.9	NO		bb		
26	FUNCTION4 PFK	39.82	1.022e4					1.3	NO		bb		
27	FUNCTION4 PFK	39.74	2.540e4					1.7	NO		db		
28	FUNCTION4 PFK	39.67	2.355e4					1.9	NO		dd		
29	FUNCTION4 PFK	39.60	1.164e4					1.3	NO		dd		
30	FUNCTION4 PFK	39.54	2.041e4					1.8	NO		bd		
31	FUNCTION4 PFK	42.57	7.771e3					1.3	NO		bb		
32	FUNCTION4 PFK	42.05	2.149e4					1.1	NO		bb		
33	FUNCTION4 PFK	41.93	2.149e4					1.5	NO		bb		
34	FUNCTION4 PFK	41.69	9.042e3					0.8	NO		bb		
35	FUNCTION4 PFK	41.53	7.214e3					0.7	NO		bb		
36	FUNCTION4 PFK	41.47	9.111e2					0.3	NO		bb		
37	FUNCTION4 PFK	41.26	2.420e3					0.5	NO		bb		

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PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	FUNCTION4 PFK	41.01	8.400e3					1.0	NO		bb		

PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	43.60	3.802e5					16.6	YES		dd		
2	FUNCTION5 PFK	43.52	1.381e6					20.7	YES		dd		
3	FUNCTION5 PFK	43.27	2.251e5					30.9	YES		dd		
4	FUNCTION5 PFK	43.24	1.764e5					32.4	YES		dd		
5	FUNCTION5 PFK	43.14	1.197e6					36.9	YES		dd		
6	FUNCTION5 PFK	42.94	1.268e6					46.0	YES		dd		
7	FUNCTION5 PFK	42.89	8.743e5					47.8	YES		bd		
8	FUNCTION5 PFK	45.94	3.614e3					1.1	NO		bb		
9	FUNCTION5 PFK	45.74	4.575e3					1.1	NO		db		
10	FUNCTION5 PFK	45.70	1.695e4					1.7	NO		bd		
11	FUNCTION5 PFK	45.44	1.115e3					0.6	NO		bb		
12	FUNCTION5 PFK	44.64	3.523e3					0.9	NO		bb		
13	FUNCTION5 PFK	44.57	3.134e3					0.9	NO		bb		
14	FUNCTION5 PFK	44.23	4.825e3					0.9	NO		bb		
15	FUNCTION5 PFK	44.02	8.994e3					1.3	NO		bb		
16	FUNCTION5 PFK	43.92	1.075e4					2.0	NO		db		
17	FUNCTION5 PFK	43.83	6.440e4					5.9	YES		dd		
18	FUNCTION5 PFK	43.74	1.702e5					10.7	YES		dd		

ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	26.46	8.506e1					2.6	NO		bb		0.000
2	FUNCTION1 HXCD...	25.81	2.426e2					2.0	NO		bb		0.000
3	FUNCTION1 HXCD...	25.46	1.499e2					1.9	NO		db		0.000
4	FUNCTION1 HXCD...	25.26	1.737e2					2.7	NO		bd		0.000
5	FUNCTION1 HXCD...	26.67	8.574e1					1.6	NO		bb		0.000

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ETHERS2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HPCD...	27.29	8.564e1					2.7	NO		bb		0.000
2	FUNCTION1 HPCD...	27.12	9.941e1					2.0	NO		bb		0.000
3	FUNCTION1 HPCD...	26.20	1.526e2					2.9	NO		bb		0.000
4	FUNCTION1 HPCD...	25.43	1.010e2					1.4	NO		bb		0.000
5	FUNCTION1 HPCD...	24.72	8.238e1					1.8	NO		bb		0.000
6	FUNCTION1 HPCD...	24.55	1.204e2					2.4	NO		bb		0.000
7	FUNCTION1 HPCD...	24.13	9.508e1					1.7	NO		bb		0.000
8	FUNCTION1 HPCD...	23.22	9.795e1					1.0	NO		bb		0.000
9	FUNCTION1 HPCD...	22.87	7.285e1					1.1	NO		bb		0.000
10	FUNCTION1 HPCD...	21.92	2.976e2					4.9	YES		db		0.000
11	FUNCTION1 HPCD...	21.81	7.252e1					2.1	NO		bd		0.000
12	FUNCTION1 HPCD...	21.09	7.143e1					1.4	NO		bb		0.000

ETHERS3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 HPCD...	28.11	7.308e1					2.3	NO		bb		0.000
2	FUNCTION2 HPCD...	30.13	1.801e2					2.4	NO		bb		0.000

ETHERS4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 OCDPE	33.00	8.299e1					2.2	NO		bb		0.000

ETHERS5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 NCDPE	40.69	1.776e2					1.7	NO		bb		0.000
2	FUNCTION4 NCDPE	38.33	5.488e2					15.1	YES		bb		0.000

ETHERS6

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 DCDPE	45.53	8.568e1					1.9	NO		bb		0.000
2	FUNCTION5 DCDPE	43.11	8.943e1					5.3	YES		bb		0.000

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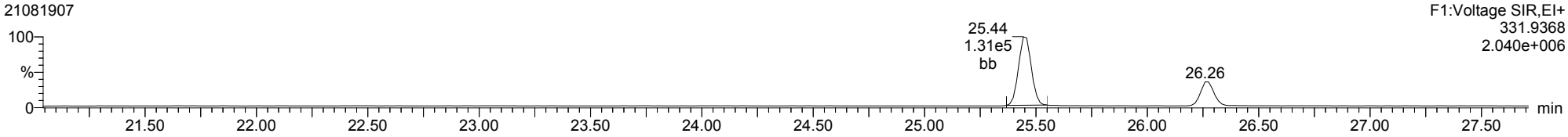

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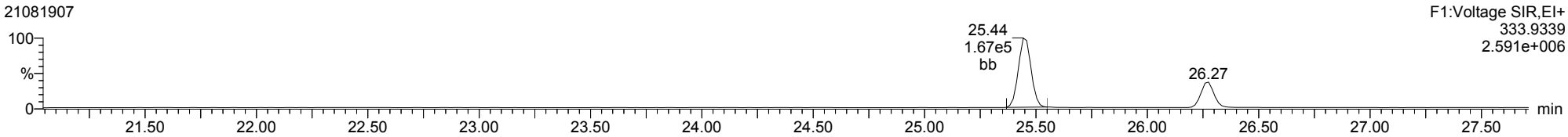

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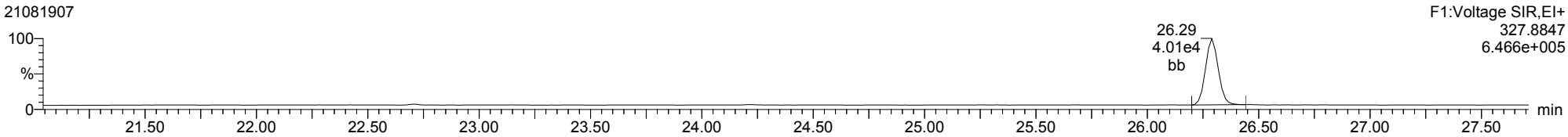

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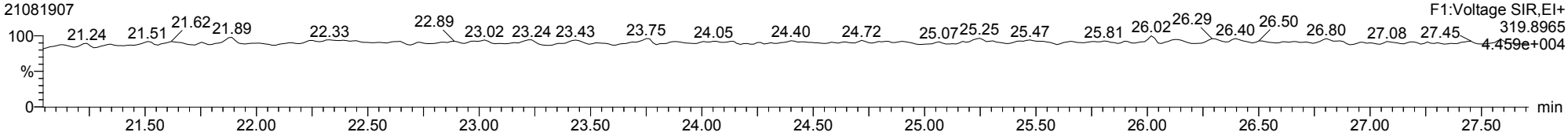

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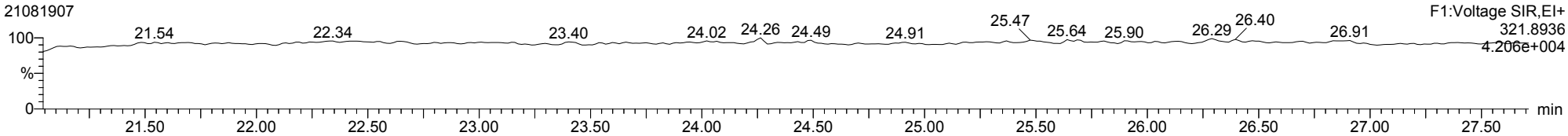

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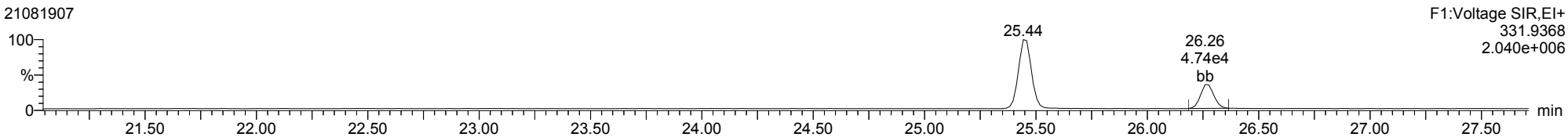

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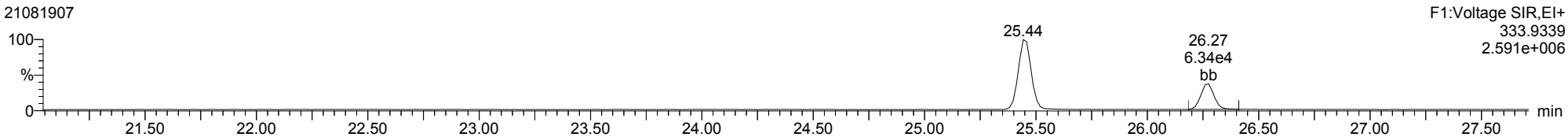

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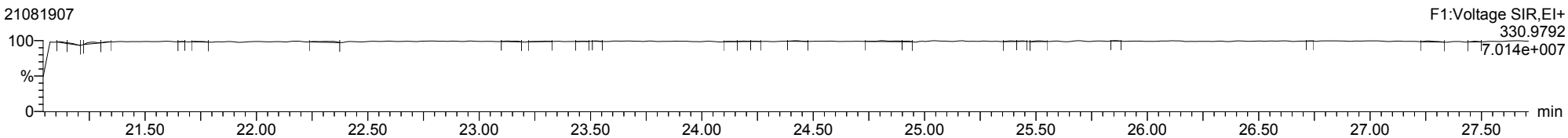

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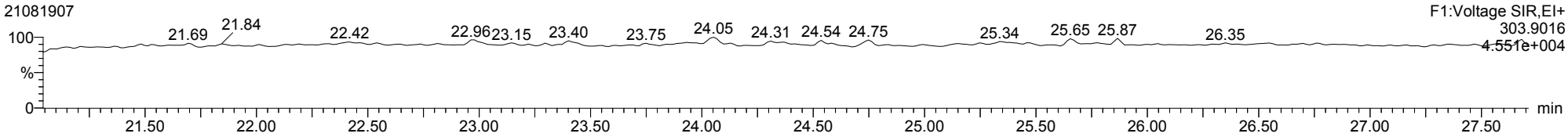
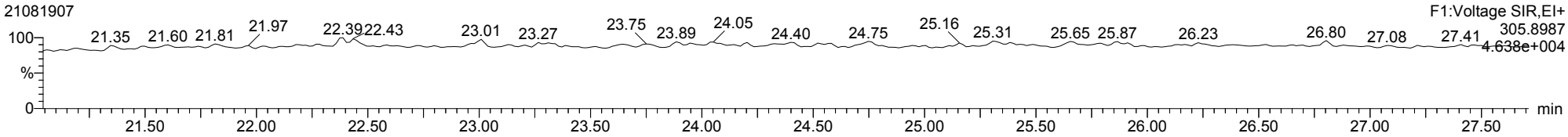
2378-TCDF



2378-TCDF



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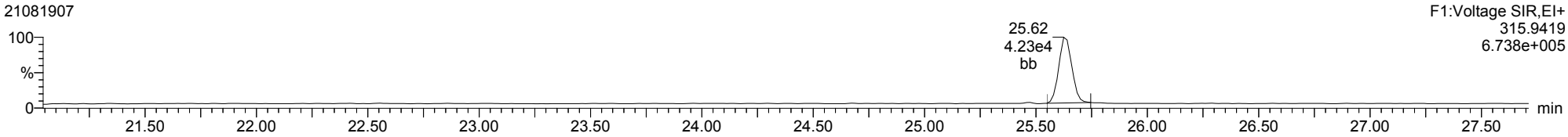

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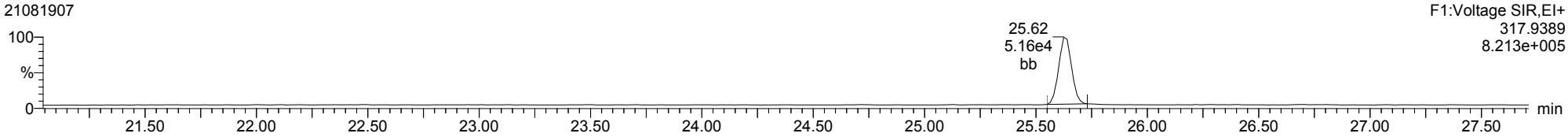

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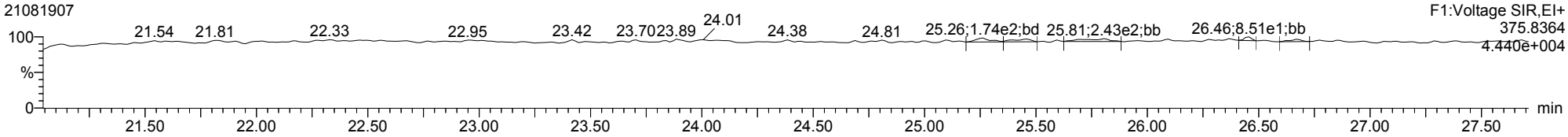
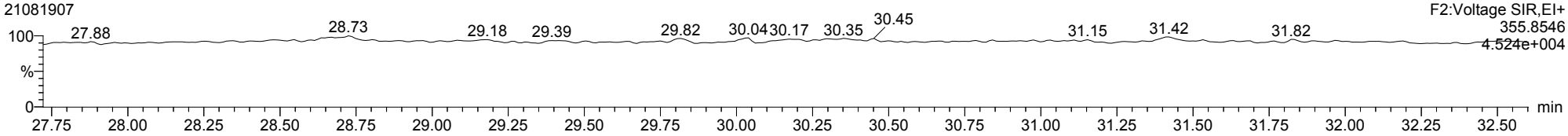


ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

12378-PeCDD



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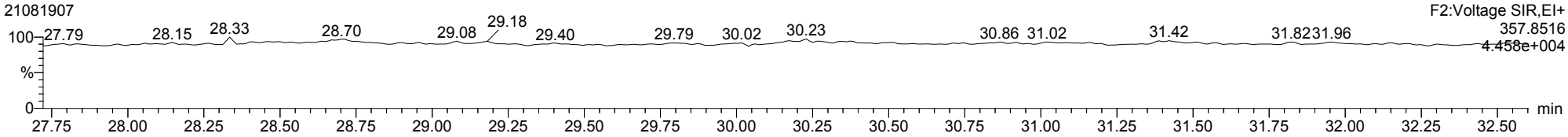

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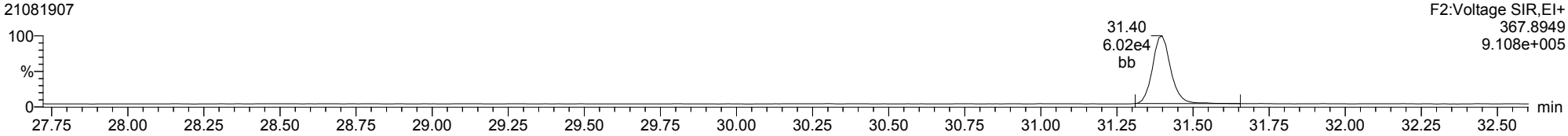

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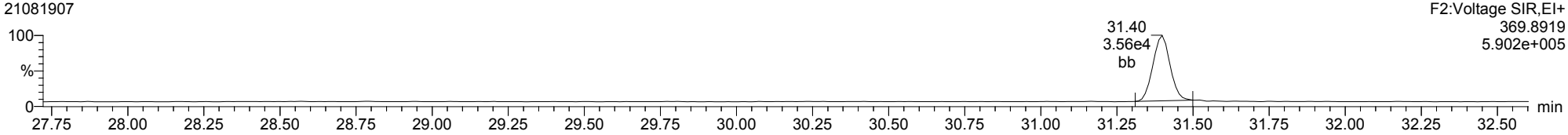
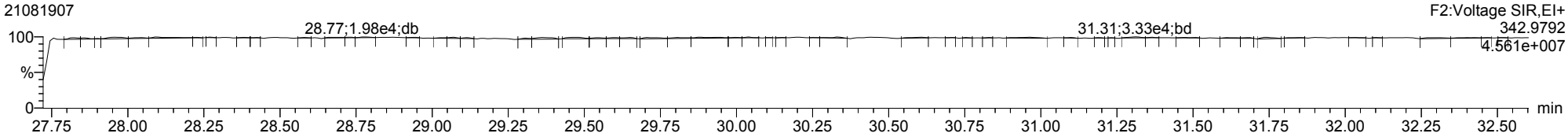


FUNCTION2 PFK



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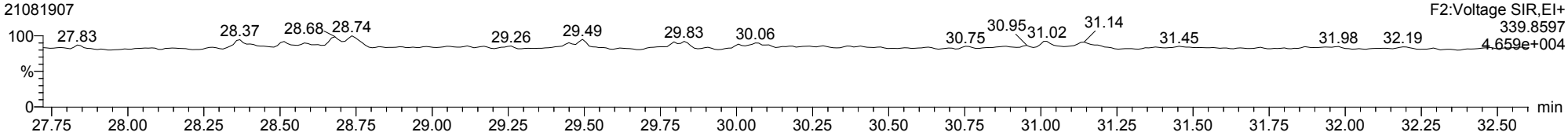

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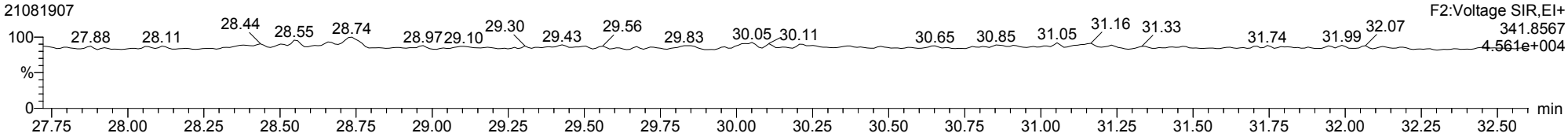

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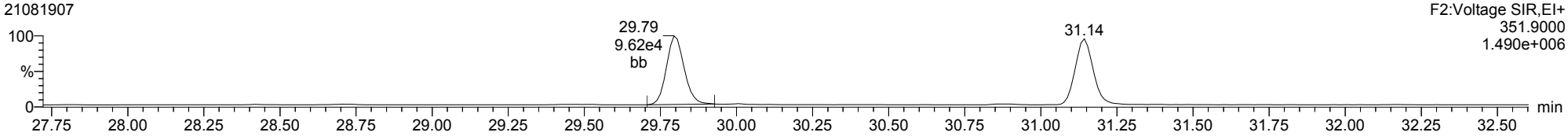

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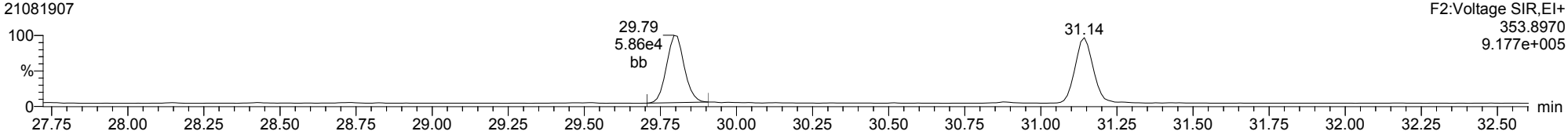
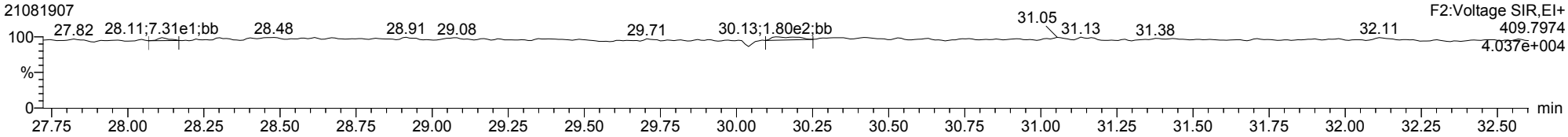


FUNCTION2 HPCDPE



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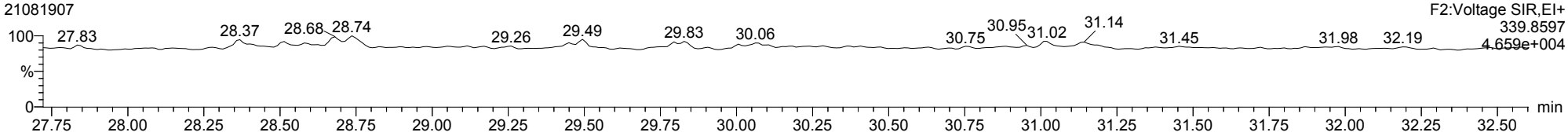
23478-PeCDF



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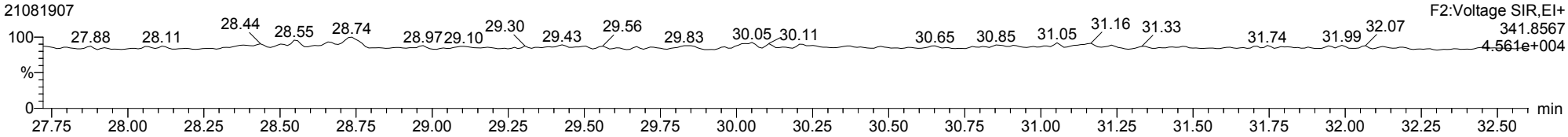

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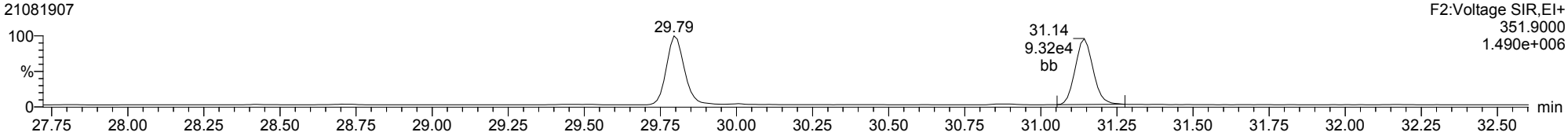

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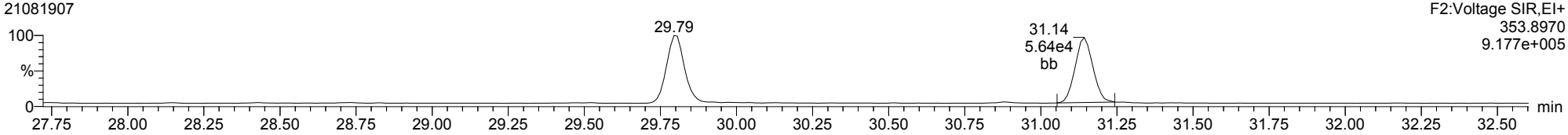
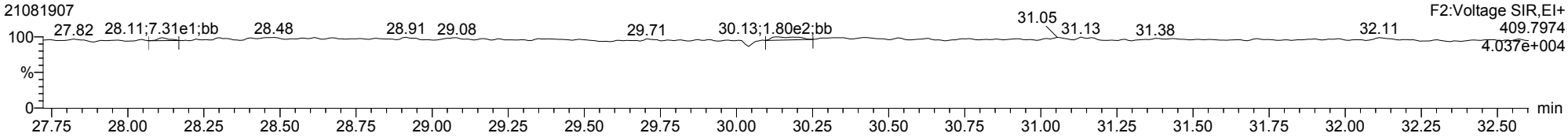


FUNCTION2 HPCDPE



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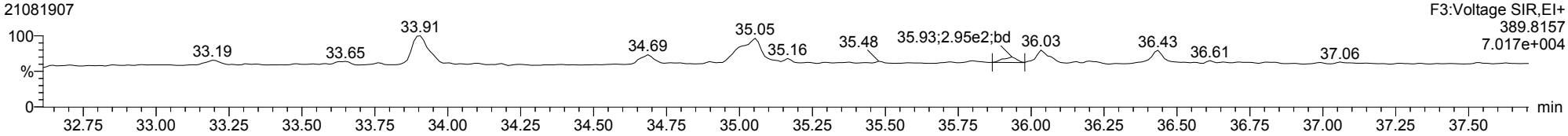
123478-HxCDD



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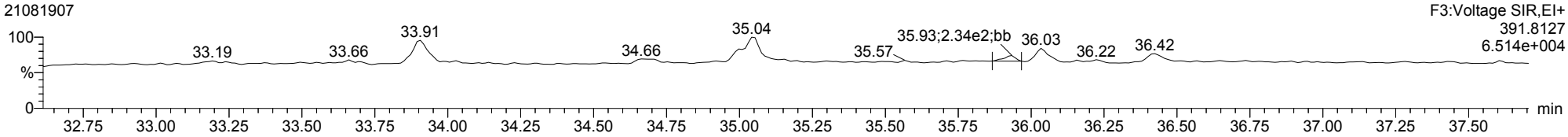

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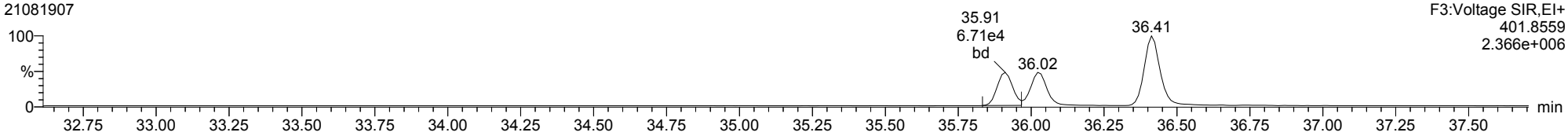

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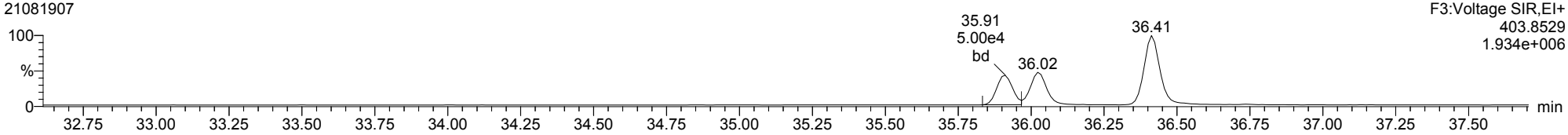
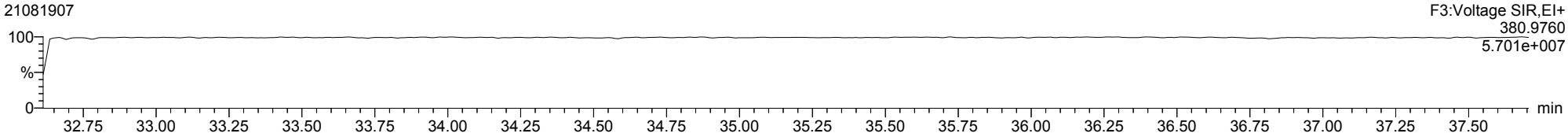


FUNCTION3 PFK



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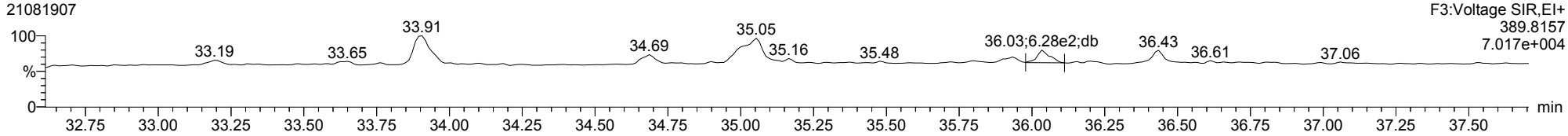

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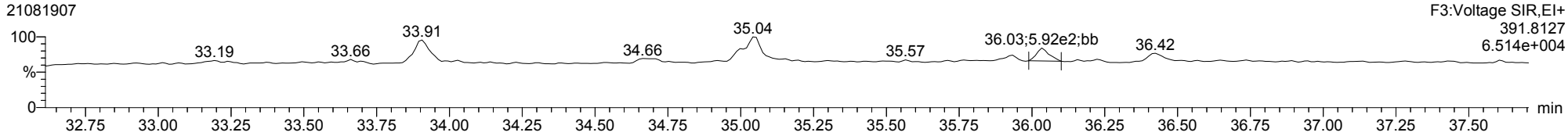

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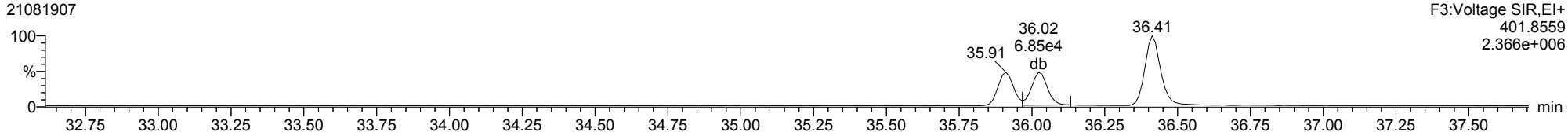

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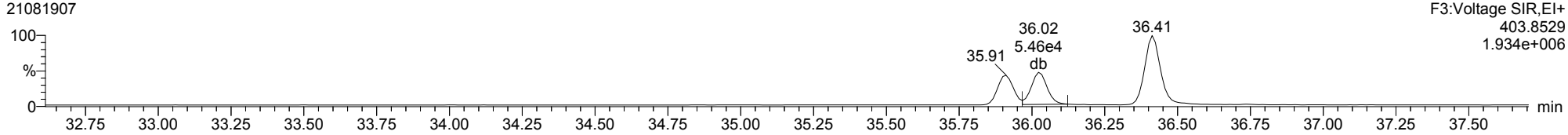

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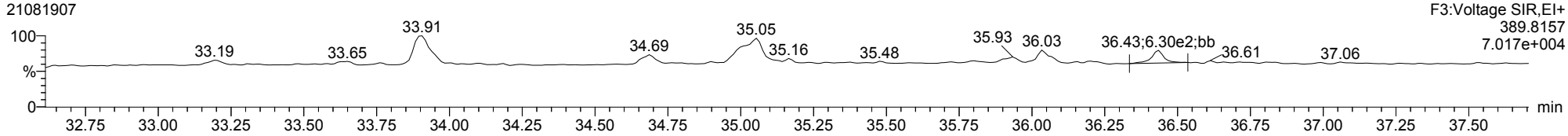

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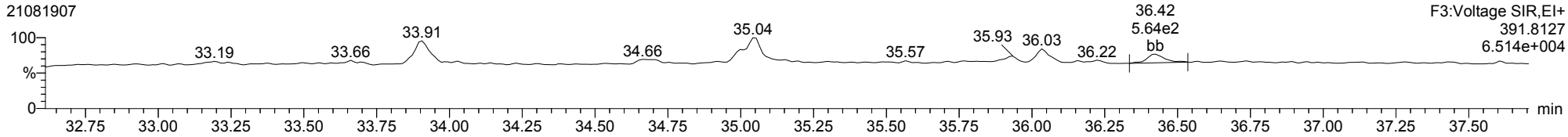

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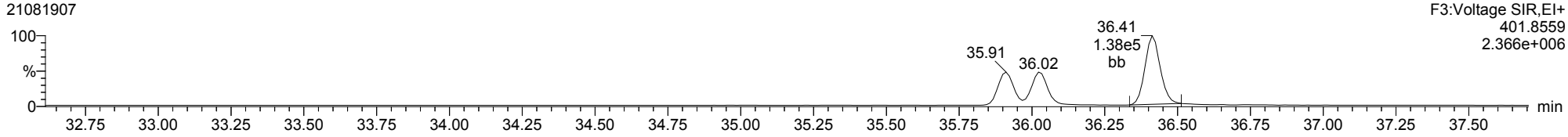

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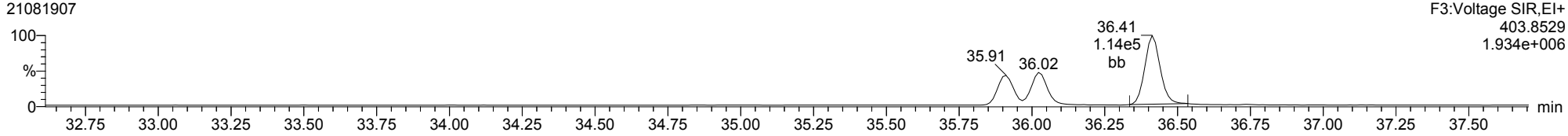

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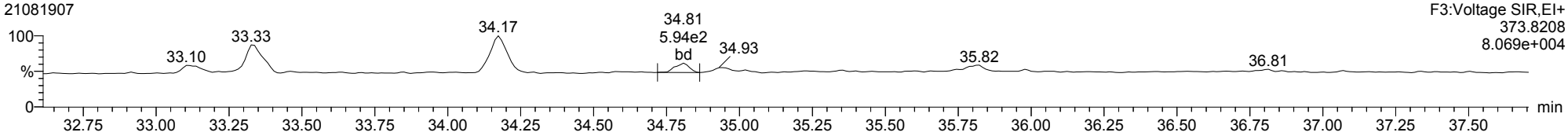
123478-HxCDF



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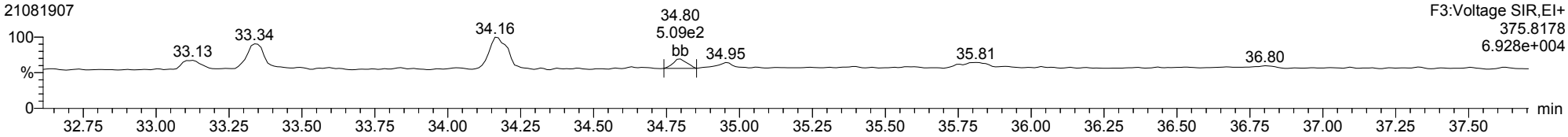

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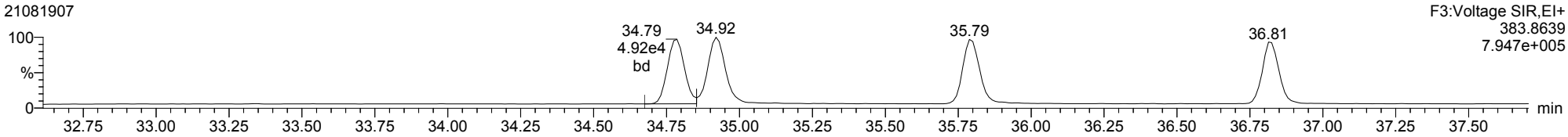

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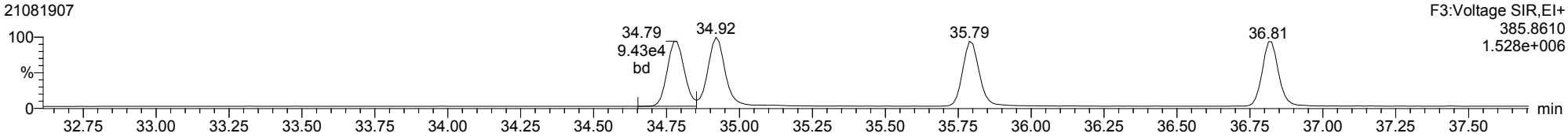
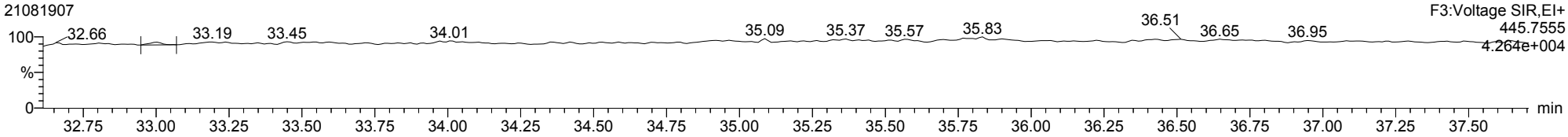


FUNCTION3 OCDPE



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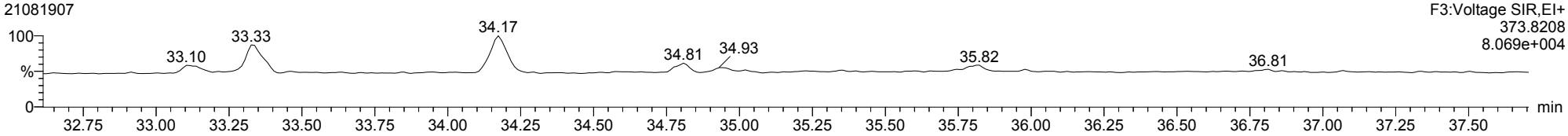
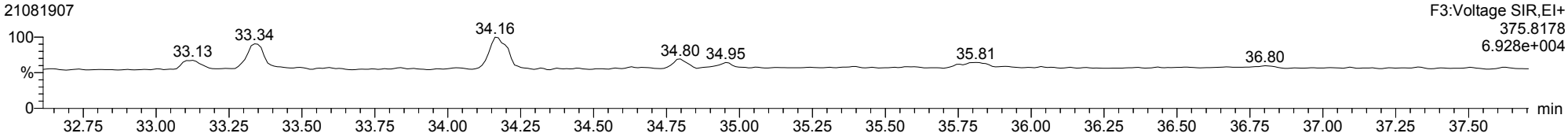
234678-HxCDF



234678-HxCDF



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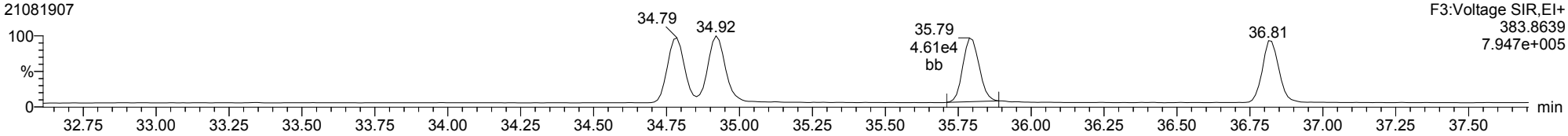

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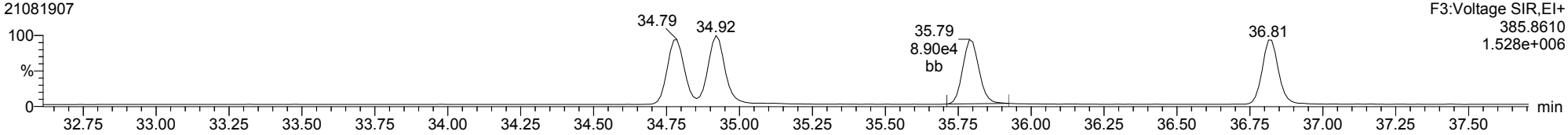
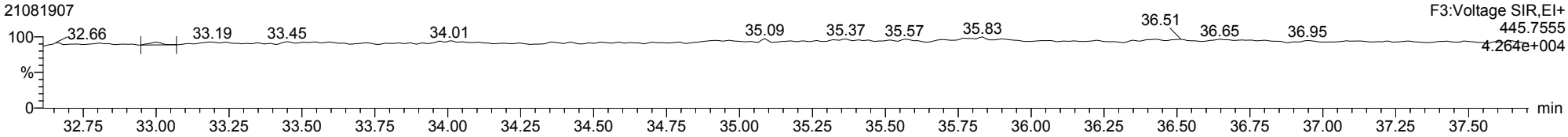


FUNCTION3 OCDPE



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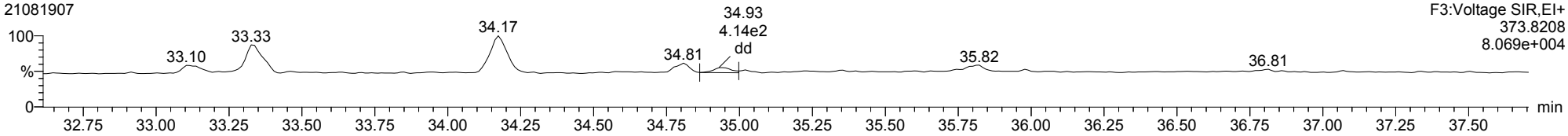
123678-HxCDF



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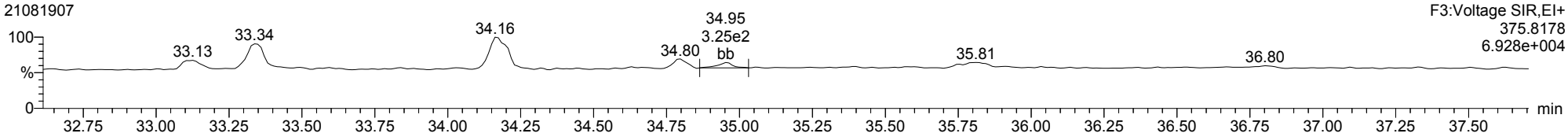

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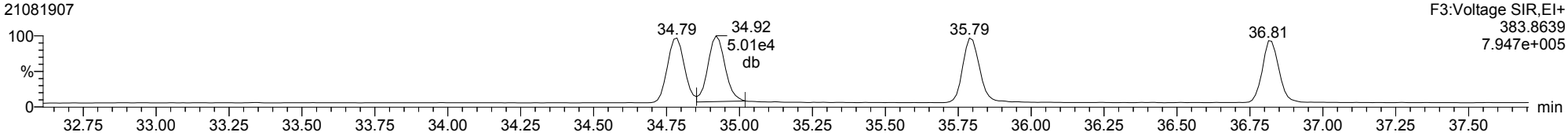

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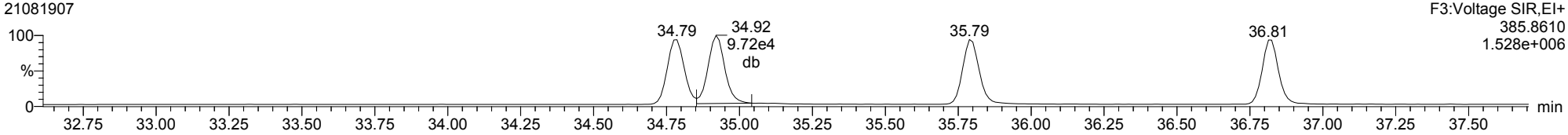
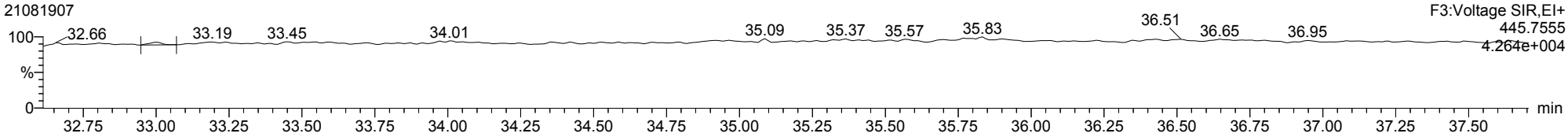


FUNCTION3 OCDPE



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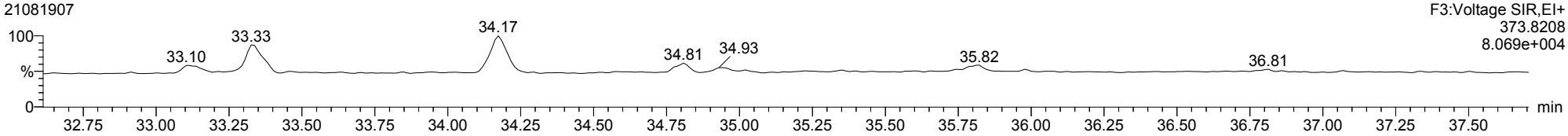
123789-HxCDF



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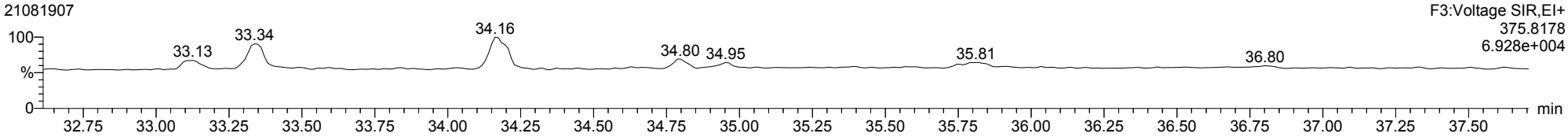

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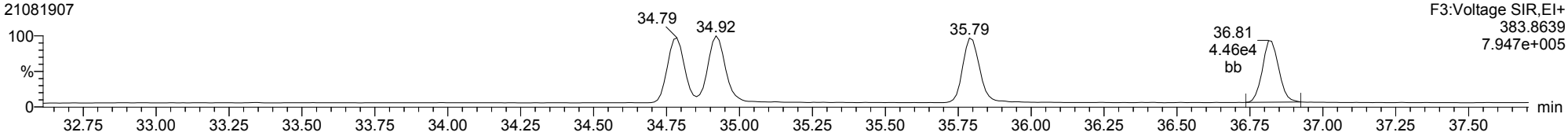

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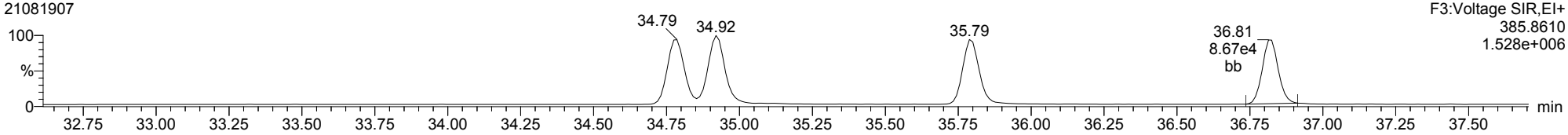

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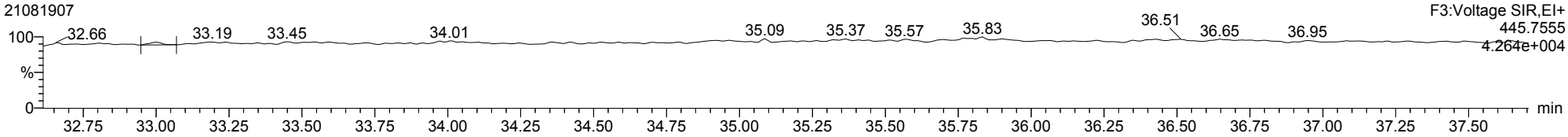
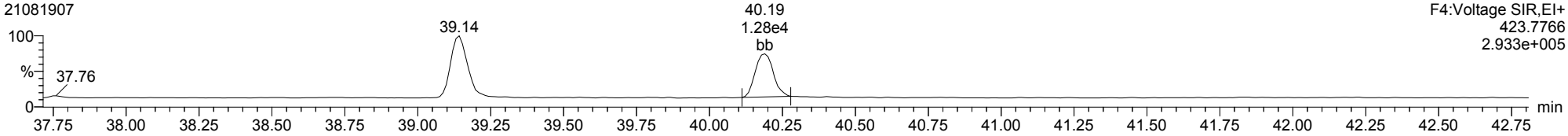


ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

1234678-HpCDD



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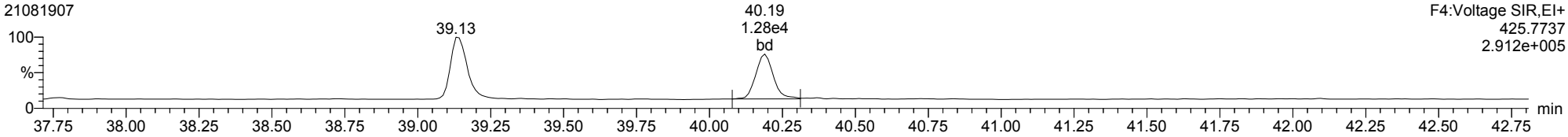

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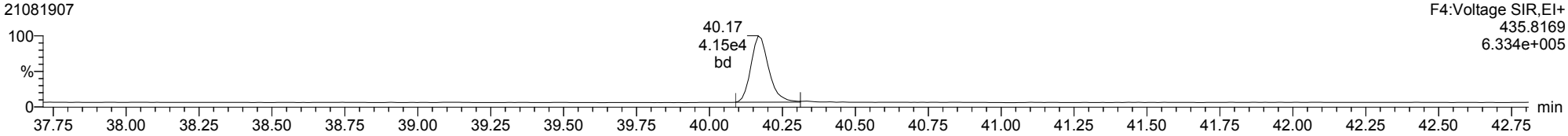

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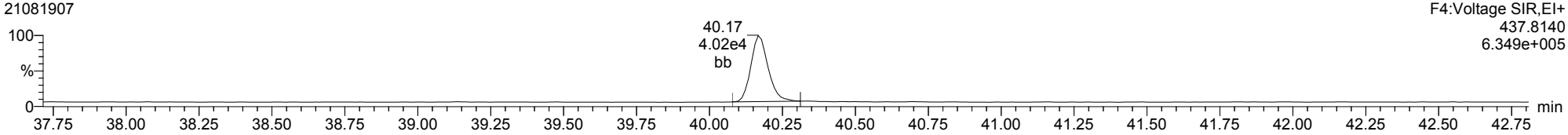
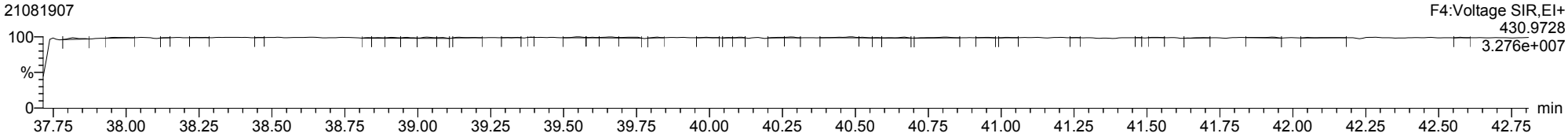


FUNCTION4 PFK



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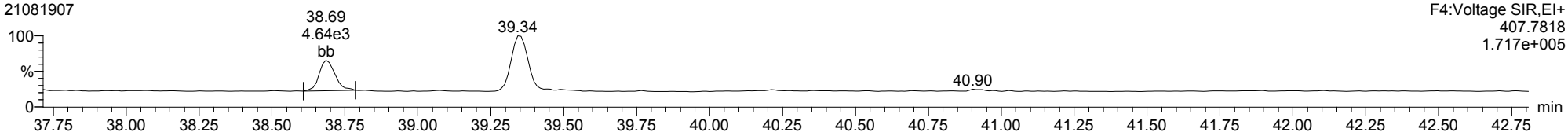

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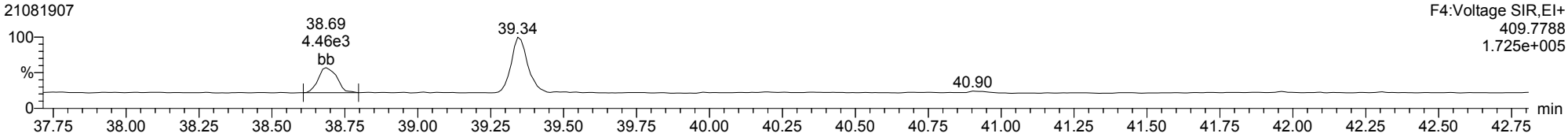

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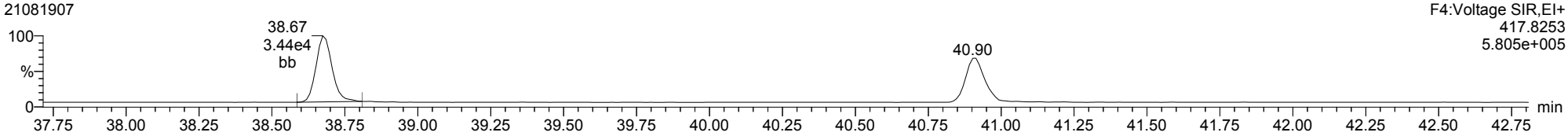

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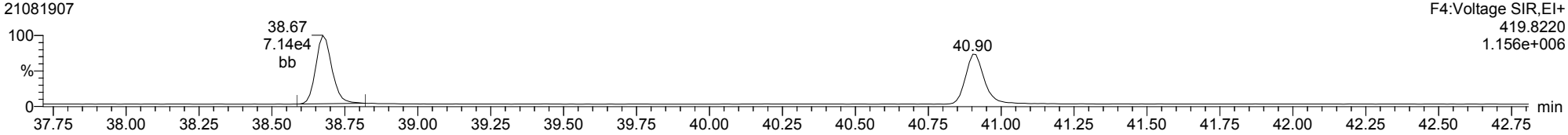
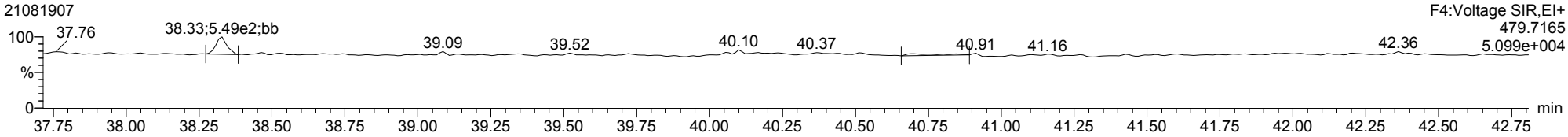


FUNCTION4 NCDPE



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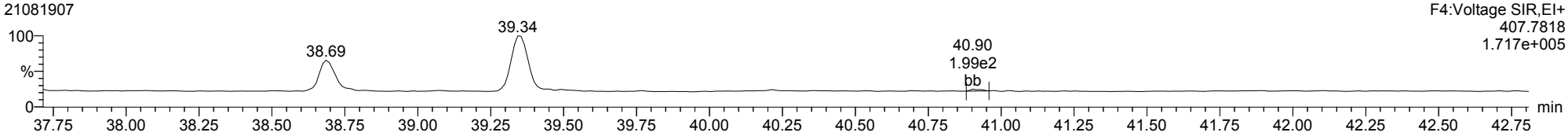

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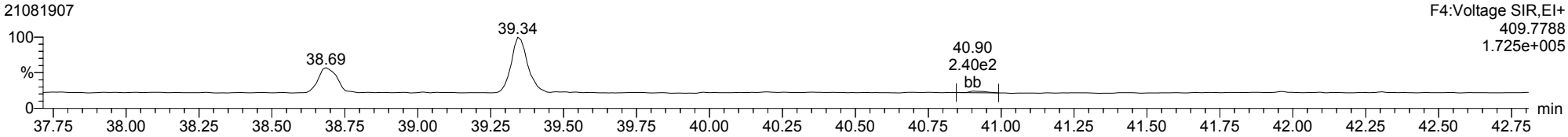

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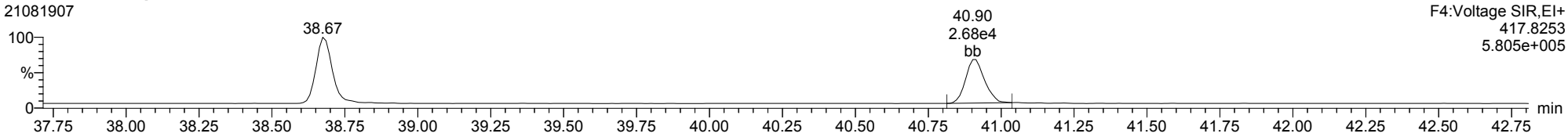

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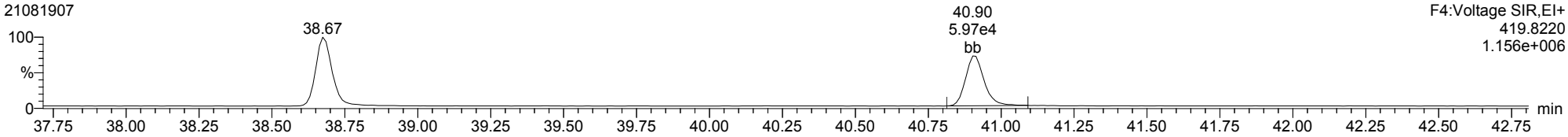
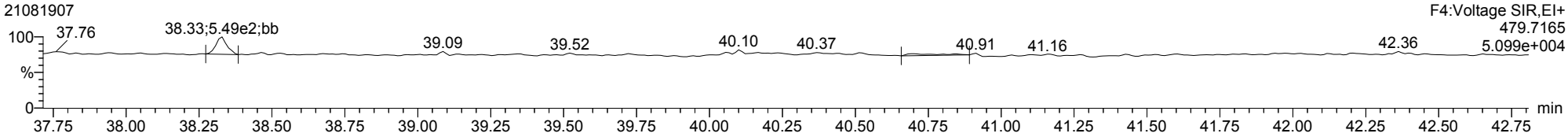


FUNCTION4 NCDPE



ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

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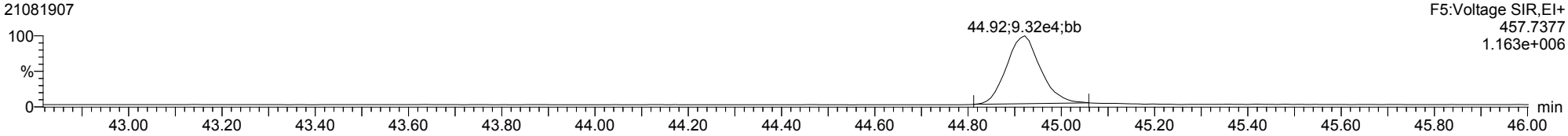

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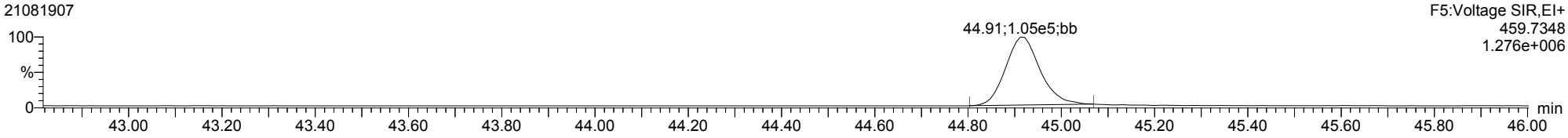

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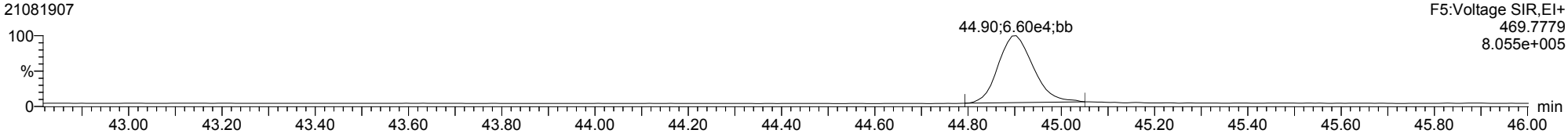

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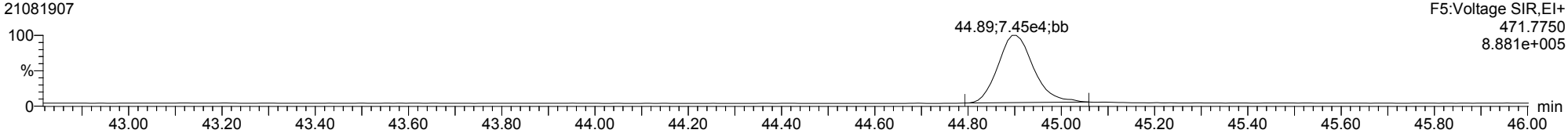
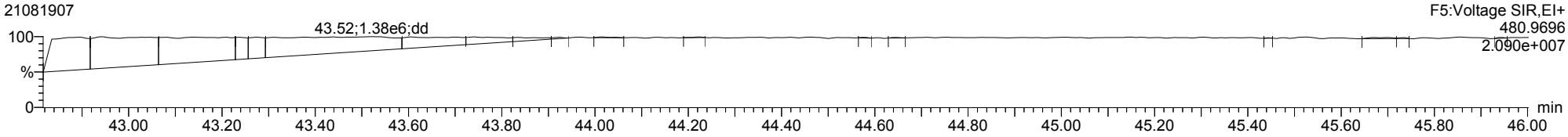


FUNCTION5 PFK



ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

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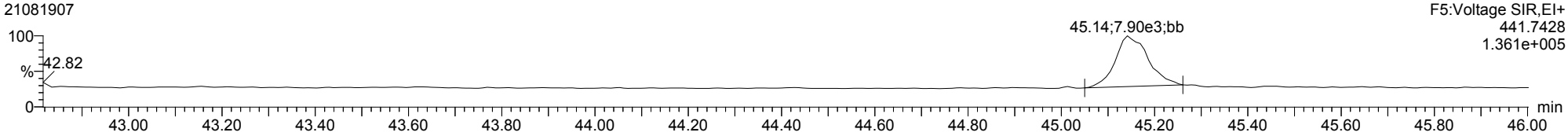

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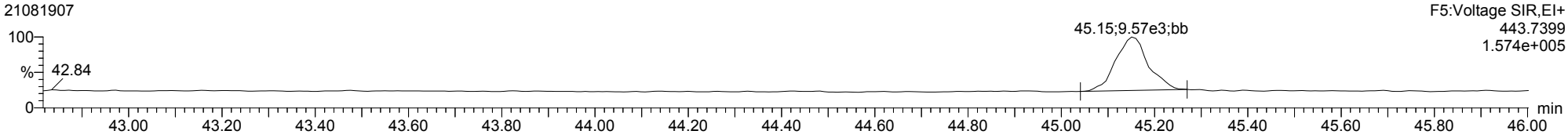
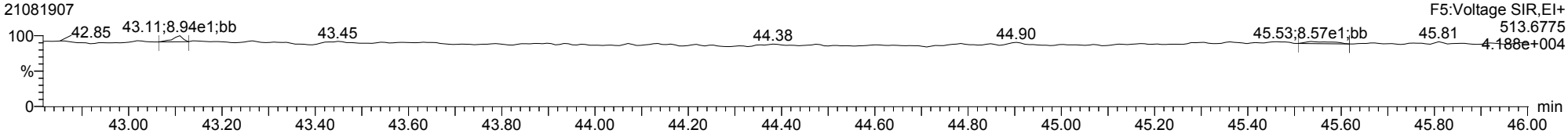


FUNCTION5 DCDPE



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Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
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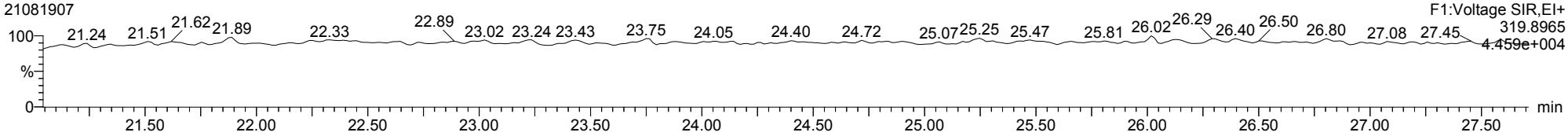
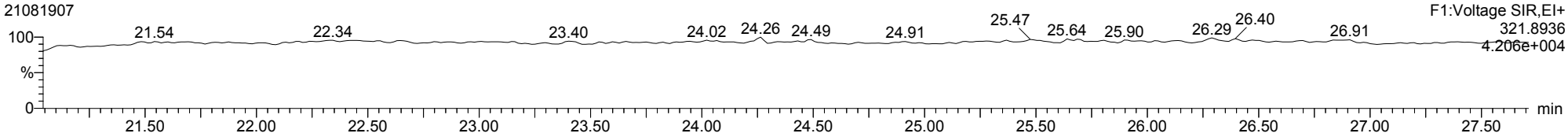
ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

Total-tetradioxins



Total-tetradioxins



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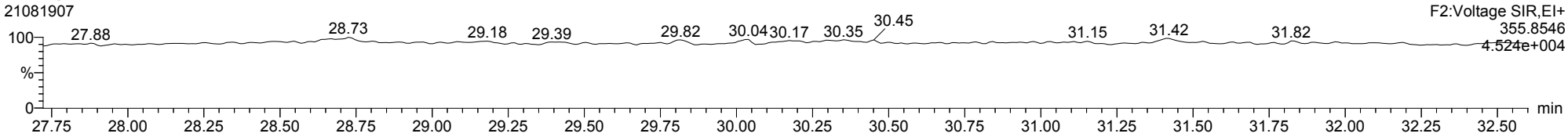

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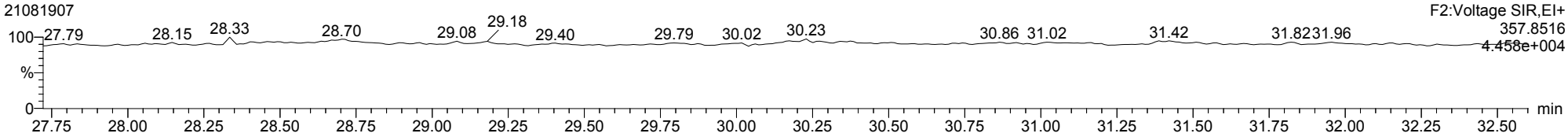

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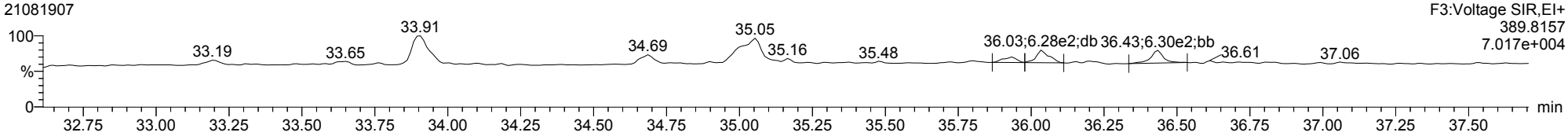

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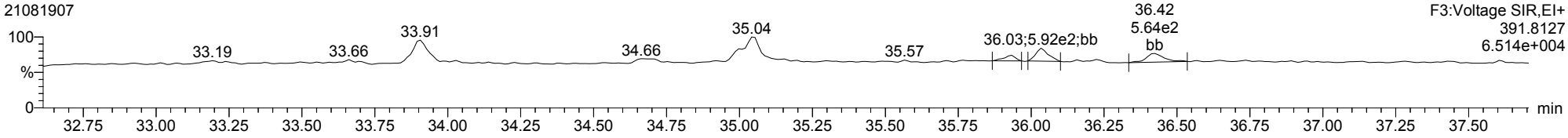

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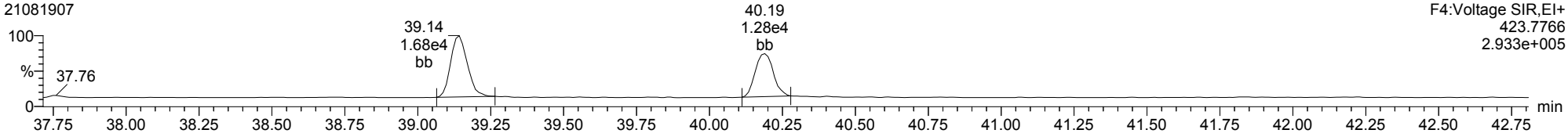

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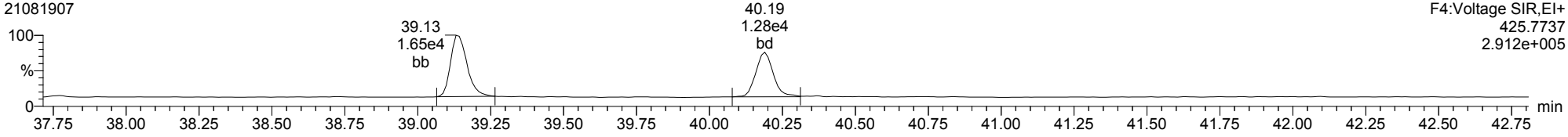
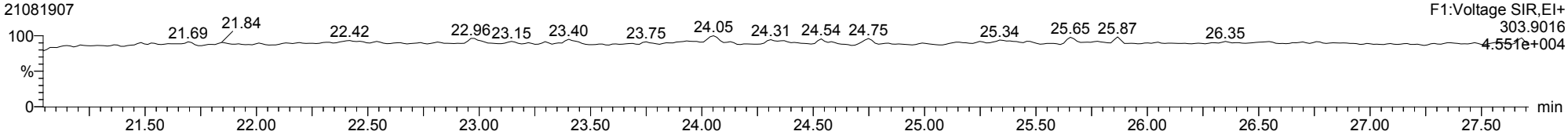


ID: BJG0572-SRM1, Name: 21081907, Date: 18-Aug-2021, Time: 15:06:50, Conditions: AUTOSPEC01, User: pk

Total-tetrafurans



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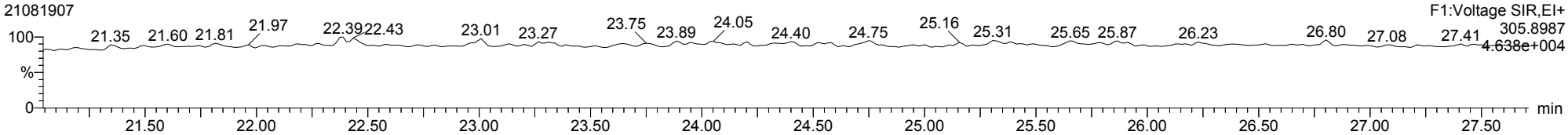

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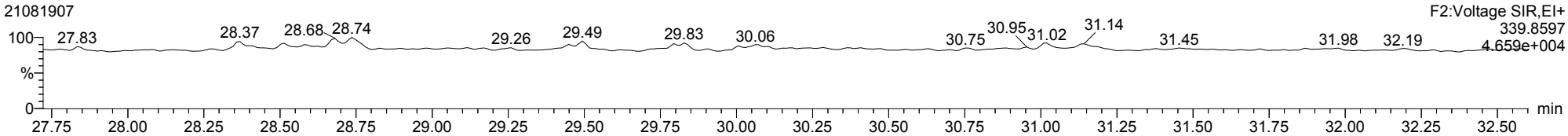

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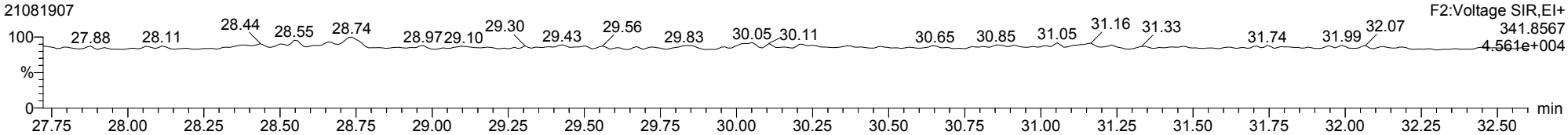

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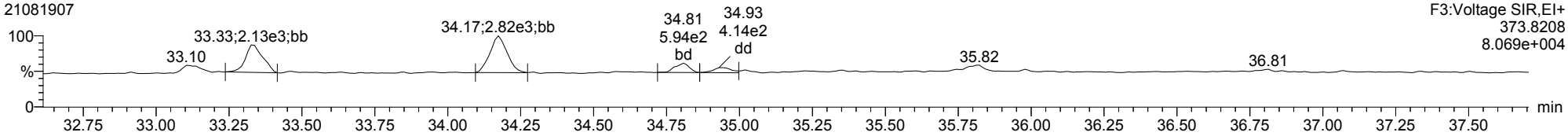

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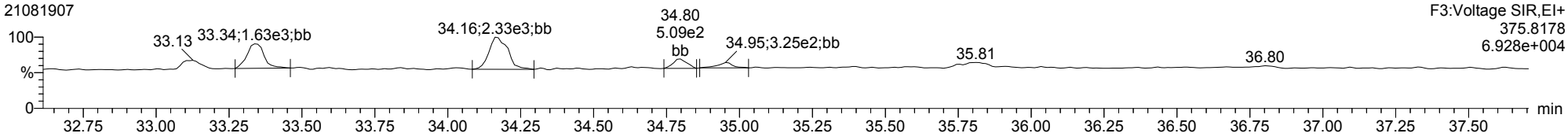

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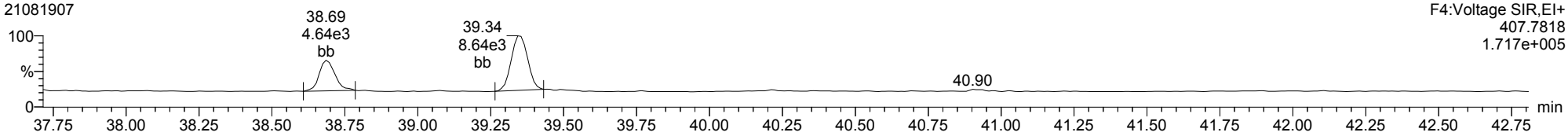
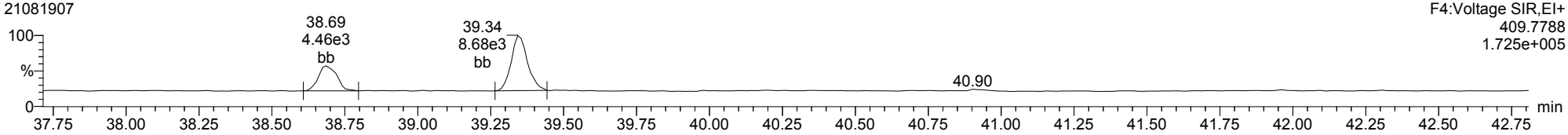


Total-heptafurans



Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00030	Instrument:	AUTOSPEC01
Calibration Date:	08/11/2021	Column (1):	RTX-Dioxin2

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RRF		RRF		RRF		RRF		RRF		RRF
2,3,7,8-TCDF			0.5	1.177779	2	1.089564	10	1.083206	40	1.09573	200	1.091684
2,3,7,8-TCDD			0.5	0.9055873	2	0.9678062	10	0.9085186	40	0.8960008	200	0.9235243
1,2,3,7,8-PeCDF	0.5	1.055376	2.5	0.9749948	10	0.9890582	50	1.04064	200	1.01544	1000	1.013695
2,3,4,7,8-PeCDF	0.5	1.154709	2.5	1.162487	10	1.08879	50	1.108527	200	1.12263	1000	1.116149
1,2,3,7,8-PeCDD	0.5	1.042847	2.5	0.9347965	10	1.000426	50	1.023433	200	0.967595	1000	1.00284
1,2,3,4,7,8-HxCDF	0.5	0.9510236	2.5	1.043616	10	1.027461	50	1.004481	200	1.030496	1000	1.044283
1,2,3,6,7,8-HxCDF	0.5	1.146121	2.5	1.02211	10	1.074838	50	0.9512592	200	1.003115	1000	1.02354
2,3,4,6,7,8-HxCDF	0.5	1.127526	2.5	1.070857	10	1.079018	50	1.043215	200	1.009624	1000	0.9845533
1,2,3,7,8,9-HxCDF	0.5	1.098409	2.5	1.018068	10	1.023691	50	1.015326	200	1.012664	1000	1.012763
1,2,3,4,7,8-HxCDD	0.5	1.061437	2.5	1.066813	10	1.04129	50	0.9862893	200	0.988471	1000	1.019875
1,2,3,6,7,8-HxCDD	0.5	0.9987812	2.5	1.00345	10	1.014563	50	1.005616	200	1.025933	1000	1.005535
1,2,3,7,8,9-HxCDD	0.5	0.9340398	2.5	0.9232118	10	0.9937847	50	0.9399502	200	0.9446474	1000	0.9672851
1,2,3,4,6,7,8-HpCDF	0.5	1.389904	2.5	1.344079	10	1.329355	50	1.296772	200	1.274981	1000	1.329007
1,2,3,4,7,8,9-HpCDF	0.5	1.296099	2.5	1.298231	10	1.306049	50	1.250104	200	1.264967	1000	1.284581
1,2,3,4,6,7,8-HpCDD	0.5	1.188982	2.5	0.9715609	10	1.075415	50	1.051009	200	1.0446	1000	1.076963
OCDF	1	1.386229	5	1.321192	20	1.473428	100	1.440564	400	1.519487	2000	1.540503
OCDD			5	1.230403	20	1.209327	100	1.133227	400	1.156307	2000	1.174851
13C12-2,3,7,8-TCDF	100	1.368644	100	1.423872	100	1.423929	100	1.432983	100	1.427899	100	1.482172
13C12-2,3,7,8-TCDD	100	1.085201	100	1.102248	100	1.115748	100	1.11594	100	1.126097	100	1.153713
13C12-1,2,3,7,8-PeCDF	100	1.199089	100	1.277562	100	1.315098	100	1.301019	100	1.280476	100	1.410636
13C12-2,3,4,7,8-PeCDF	100	1.157138	100	1.217571	100	1.208288	100	1.25174	100	1.225075	100	1.35907
13C12-1,2,3,7,8-PeCDD	100	0.6771591	100	0.7210236	100	0.7142954	100	0.7228749	100	0.7511038	100	0.805443
13C12-1,2,3,4,7,8-HxCDF	100	1.286327	100	1.201751	100	1.230613	100	1.269148	100	1.245045	100	1.221854
13C12-1,2,3,6,7,8-HxCDF	100	1.339141	100	1.30779	100	1.316908	100	1.430696	100	1.354788	100	1.311536
13C12-2,3,4,6,7,8-HxCDF	100	1.24279	100	1.168157	100	1.194712	100	1.212905	100	1.242651	100	1.227916
13C12-1,2,3,7,8,9-HxCDF	100	1.031792	100	0.9827749	100	0.9825353	100	1.01982	100	0.9970797	100	1.03182
13C12-1,2,3,4,7,8-HxCDD	100	0.9931736	100	0.9197633	100	0.9354684	100	0.9847809	100	0.9652949	100	0.9604585
13C12-1,2,3,6,7,8-HxCDD	100	1.065671	100	1.027995	100	1.028764	100	1.057951	100	1.039041	100	1.028891

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00030	Instrument:	AUTOSPEC01
Calibration Date:	08/11/2021	Column (1):	RTX-Dioxin2

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
		RRF		RRF		RRF		RRF		RRF		RRF
13C12-1,2,3,4,6,7,8-HpCDF	100	0.9372866	100	0.9086205	100	0.9102718	100	0.922368	100	0.9442818	100	0.9359936
13C12-1,2,3,4,7,8,9-HpCDF	100	0.7416153	100	0.7182342	100	0.7567011	100	0.7658258	100	0.7723607	100	0.7927589
13C12-1,2,3,4,6,7,8-HpCDD	100	0.6435664	100	0.6169459	100	0.6151049	100	0.6260609	100	0.6432814	100	0.6497259
13C12-OCDD	200	0.4894078	200	0.4833068	200	0.4662427	200	0.5014182	200	0.5191023	200	0.5629814
37Cl4-2,3,7,8-TCDD	0.1	1.029849	0.5	1.178508	2	1.088624	10	1.009798	40	1.061277	200	1.133499
13C12-1,2,3,4-TCDD	100	1	100	1	100	1	100	1	100	1	100	1
13C12-1,2,3,7,8,9-HxCDD	100	1	100	1	100	1	100	1	100	1	100	1

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00030	Instrument:	AUTOSPEC01
Calibration Date:	08/11/2021	Column (1):	RTX-Dioxin2

COMPOUND	Mean RRF	RRF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
2,3,7,8-TCDF	1.107593	3.6			RSD ()	
2,3,7,8-TCDD	0.9202875	3.1			RSD ()	
1,2,3,7,8-PeCDF	1.014867	3.0			RSD ()	
2,3,4,7,8-PeCDF	1.125549	2.5			RSD ()	
1,2,3,7,8-PeCDD	0.9953229	3.9			RSD ()	
1,2,3,4,7,8-HxCDF	1.016893	3.5			RSD ()	
1,2,3,6,7,8-HxCDF	1.036831	6.4			RSD ()	
2,3,4,6,7,8-HxCDF	1.052466	4.9			RSD ()	
1,2,3,7,8,9-HxCDF	1.030154	3.3			RSD ()	
1,2,3,4,7,8-HxCDD	1.027363	3.4			RSD ()	
1,2,3,6,7,8-HxCDD	1.00898	1.0			RSD ()	
1,2,3,7,8,9-HxCDD	0.9504865	2.7			RSD ()	
1,2,3,4,6,7,8-HpCDF	1.32735	3.0			RSD ()	
1,2,3,4,7,8,9-HpCDF	1.283338	1.7			RSD ()	
1,2,3,4,6,7,8-HpCDD	1.068088	6.6			RSD ()	
OCDF	1.446901	5.7			RSD ()	
OCDD	1.180823	3.3			RSD ()	
13C12-2,3,7,8-TCDF	1.426583	2.5			RSD ()	
13C12-2,3,7,8-TCDD	1.116491	2.1			RSD ()	
13C12-1,2,3,7,8-PeCDF	1.297313	5.3			RSD ()	
13C12-2,3,4,7,8-PeCDF	1.23648	5.5			RSD ()	
13C12-1,2,3,7,8-PeCDD	0.7319833	5.9			RSD ()	
13C12-1,2,3,4,7,8-HxCDF	1.242456	2.5			RSD ()	
13C12-1,2,3,6,7,8-HxCDF	1.343476	3.5			RSD ()	
13C12-2,3,4,6,7,8-HxCDF	1.214855	2.4			RSD ()	
13C12-1,2,3,7,8,9-HxCDF	1.007637	2.3			RSD ()	
13C12-1,2,3,4,7,8-HxCDD	0.9598233	2.9			RSD ()	
13C12-1,2,3,6,7,8-HxCDD	1.041385	1.6			RSD ()	
13C12-1,2,3,4,6,7,8-HpCDF	0.9264704	1.6			RSD ()	
13C12-1,2,3,4,7,8,9-HpCDF	0.757916	3.4			RSD ()	
13C12-1,2,3,4,6,7,8-HpCDD	0.6324476	2.4			RSD ()	

Analytical Resources, Incorporated
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INITIAL CALIBRATION DATA
EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Calibration:	EH00030	Instrument:	AUTOSPEC01
Calibration Date:	08/11/2021	Column (1):	RTX-Dioxin2

COMPOUND	Mean RRF	RRF RSD	Linear COD	Quad COD	Limit Type & Limit	Q
13C12-OCDD	0.5037432	6.7			RSD ()	
37Cl4-2,3,7,8-TCDD	1.083593	5.9			RSD ()	
13C12-1,2,3,4-TCDD	1	0.0			RSD ()	
13C12-1,2,3,7,8,9-HxCDD	1	0.0			RSD ()	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 1613B

Laboratory: Analytical Resources, Inc.
Client: Anchor QEA, LLC
Calibration: UNASSIGNED
Sequence: SJH0117

SDG: 21G0111
Project: Lower Duwamish AOC4
Laboratory ID: SJH0117-SCV1
Sequence Name: ICVCV
Standard ID: G001361

ANALYTE	EXPECTED (ng/mL)	FOUND (ng/mL)	% DRIFT	QC LIMIT
2,3,7,8-TCDF	10.000	10.1	1.1	
2,3,7,8-TCDD	10.000	11.1	10.6	
1,2,3,7,8-PeCDF	50.000	52.8	5.7	
2,3,4,7,8-PeCDF	50.000	50.7	1.4	
1,2,3,7,8-PeCDD	50.000	52.2	4.4	
1,2,3,4,7,8-HxCDF	50.000	54.0	8.0	
1,2,3,6,7,8-HxCDF	50.000	51.5	3.0	
2,3,4,6,7,8-HxCDF	50.000	55.5	11.0	
1,2,3,7,8,9-HxCDF	50.000	53.6	7.2	
1,2,3,4,7,8-HxCDD	50.000	54.6	9.3	
1,2,3,6,7,8-HxCDD	50.000	50.6	1.1	
1,2,3,7,8,9-HxCDD	50.000	52.3	4.7	
1,2,3,4,6,7,8-HpCDF	50.000	54.8	9.6	
1,2,3,4,7,8,9-HpCDF	50.000	59.1	18.3	
1,2,3,4,6,7,8-HpCDD	50.000	51.9	3.7	
OCDF	100.00	105	5.4	
OCDD	100.00	105	5.0	
13C12-2,3,7,8-TCDF	100.00	102	1.7	
13C12-2,3,7,8-TCDD	100.00	81.6	-18.4	
13C12-1,2,3,7,8-PeCDF	100.00	105	4.8	
13C12-2,3,4,7,8-PeCDF	100.00	104	4.3	
13C12-1,2,3,7,8-PeCDD	100.00	98.4	-1.6	
13C12-1,2,3,4,7,8-HxCDF	100.00	116	15.9	
13C12-1,2,3,6,7,8-HxCDF	100.00	119	19.4	
13C12-2,3,4,6,7,8-HxCDF	100.00	109	8.8	
13C12-1,2,3,7,8,9-HxCDF	100.00	113	13.2	
13C12-1,2,3,4,7,8-HxCDD	100.00	114	14.1	
13C12-1,2,3,6,7,8-HxCDD	100.00	119	19.5	
13C12-1,2,3,4,6,7,8-HpCDF	100.00	114	13.7	
13C12-1,2,3,4,7,8,9-HpCDF	100.00	110	9.8	
13C12-1,2,3,4,6,7,8-HpCDD	100.00	110	10.5	
13C12-OCDD	200.00	212	5.9	
37Cl4-2,3,7,8-TCDD	10.000	10.4	4.0	

* Indicates values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210811ICVIH.qld
Last Altered: Friday, August 13, 2021 13:47:27 Pacific Daylight Time
Printed: Friday, August 13, 2021 13:51:56 Pacific Daylight Time

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
2378-TCDF	25.655	1.001	8.598e4	1.128e5	1.108	0.762	0.770	1727	2357	1.26e6	1.68e6	728.4	713.0	NO	bb	bb	10.110
12378-PeCDF	29.816	1.000	5.436e5	3.483e5	1.015	1.561	1.550	6428	5298	7.67e6	4.88e6	1193.2	921.9	NO	bd	bd	52.831
23478-PeCDF	31.165	1.001	5.567e5	3.442e5	1.126	1.617	1.550	6428	5298	7.71e6	5.06e6	1200.0	955.7	NO	dd	bb	50.709
123478-HxCDF	34.797	1.000	3.790e5	3.119e5	1.017	1.215	1.240	6025	4489	5.81e6	4.80e6	963.5	1070.0	NO	bd	bd	54.003
234678-HxCDF	35.810	1.001	3.741e5	3.010e5	1.052	1.243	1.240	6025	4489	5.56e6	4.51e6	922.2	1004.3	NO	bb	bb	55.515
123678-HxCDF	34.941	1.001	4.107e5	3.376e5	1.037	1.217	1.240	6025	4489	5.99e6	4.89e6	994.0	1090.0	NO	db	db	51.475
123789-HxCDF	36.835	1.000	3.029e5	2.474e5	1.030	1.224	1.240	6025	4489	4.62e6	3.69e6	767.5	821.7	NO	bb	bb	53.582
1234678-HpCDF	38.685	1.000	3.428e5	3.268e5	1.327	1.049	1.050	5528	5142	5.22e6	4.97e6	945.1	966.6	NO	bb	bb	54.784
1234789-HpCDF	40.924	1.000	2.799e5	2.719e5	1.283	1.029	1.050	5528	5142	3.60e6	3.43e6	650.7	667.0	NO	bd	bd	59.145
OCDF	45.140	1.006	3.368e5	3.743e5	1.447	0.900	0.890	5198	2808	3.79e6	4.27e6	729.8	1522.4	NO	bb	bb	105.415
2378-TCDD	26.305	1.001	4.924e4	6.425e4	0.920	0.766	0.770	2440	1603	7.12e5	9.28e5	291.6	579.2	NO	bb	db	11.057
12378-PeCDD	31.421	1.001	2.834e5	1.748e5	0.995	1.621	1.550	4032	3115	4.22e6	2.62e6	1046.5	841.2	NO	bb	bb	52.211
123478-HxCDD	35.922	1.000	2.965e5	2.407e5	1.027	1.232	1.240	4241	3010	4.65e6	3.73e6	1096.7	1237.9	NO	bd	bd	54.629
123678-HxCDD	36.044	1.001	3.082e5	2.464e5	1.009	1.251	1.240	4241	3010	4.61e6	3.72e6	1085.9	1237.1	NO	db	db	50.555
123789-HxCDD	36.423	1.011	2.887e5	2.199e5	0.950	1.313	1.240	4241	3010	4.19e6	3.34e6	989.1	1108.9	NO	bd	bb	52.339
1234678-HpCDD	40.178	1.000	1.757e5	1.625e5	1.068	1.081	1.050	3111	3083	2.53e6	2.35e6	814.6	763.1	NO	bb	bb	51.865
OCDD	44.903	1.000	2.642e5	3.138e5	1.181	0.842	0.890	2972	3108	3.12e6	3.44e6	1050.3	1105.9	NO	bb	bd	104.997
13C-2378-TCDF	25.640	1.007	7.798e5	9.953e5	1.427	0.784	0.770	3469	3089	1.16e7	1.43e7	3339.4	4613.3	NO	bb	bb	101.689
13C-12378-PeCDF	29.806	1.171	1.051e6	6.125e5	1.297	1.716	1.550	4922	3645	1.42e7	8.62e6	2881.8	2364.6	NO	bd	bb	104.785
13C-23478-PeCDF	31.142	1.223	9.754e5	6.030e5	1.236	1.617	1.550	4922	3645	1.41e7	8.69e6	2860.8	2384.9	NO	bb	bb	104.321
13C-123478-HxCDF	34.785	0.955	4.274e5	8.307e5	1.242	0.514	0.510	5265	6298	6.41e6	1.24e7	1218.4	1973.2	NO	bd	bd	115.885
13C-123678-HxCDF	34.919	0.959	4.860e5	9.161e5	1.343	0.530	0.510	5265	6298	7.00e6	1.35e7	1330.1	2144.5	NO	db	db	119.442
13C-234678-HxCDF	35.788	0.983	3.967e5	7.587e5	1.215	0.523	0.510	5265	6298	5.75e6	1.13e7	1091.4	1799.0	NO	bb	bb	108.848
13C-123789-HxCDF	36.824	1.011	3.447e5	6.522e5	1.008	0.529	0.510	5265	6298	5.11e6	9.81e6	969.9	1558.1	NO	bb	bb	113.229
13C-1234678-HpCDF	38.674	1.062	3.005e5	6.203e5	0.926	0.484	0.440	3480	6125	4.35e6	9.34e6	1249.4	1525.5	NO	bd	bb	113.744
13C-1234789-HpCDF	40.902	1.123	2.223e5	5.047e5	0.758	0.440	0.440	3480	6125	2.90e6	6.30e6	833.4	1029.2	NO	bb	bb	109.773
13C-1234-TCDD	25.458	0.000	5.298e5	6.938e5	1.000	0.764	0.770	5513	2305	7.87e6	1.03e7	1428.2	4481.1	NO	bb	bb	100.000
13C-2378-TCDD	26.275	1.032	4.826e5	6.328e5	1.116	0.763	0.770	5513	2305	7.09e6	9.32e6	1285.5	4044.7	NO	bb	bb	81.637
13C-12378-PeCDD	31.399	1.233	5.423e5	3.395e5	0.732	1.598	1.550	2388	2135	7.53e6	4.95e6	3154.4	2319.5	NO	bb	bb	98.449
13C-123478-HxCDD	35.911	0.986	5.361e5	4.211e5	0.960	1.273	1.240	3574	5521	8.65e6	6.70e6	2421.3	1213.6	NO	bd	bd	114.124
13C-123678-HxCDD	36.022	0.989	6.017e5	4.857e5	1.041	1.239	1.240	3574	5521	9.06e6	7.24e6	2535.4	1311.0	NO	db	db	119.499
13C-1234678-HpCDD	40.167	1.103	3.074e5	3.031e5	0.632	1.014	1.050	3260	2760	4.30e6	4.19e6	1318.4	1519.0	NO	bb	bb	110.470
13C-OCDD	44.884	1.233	4.208e5	5.116e5	0.504	0.822	0.890	2744	3477	4.92e6	5.55e6	1792.3	1596.9	NO	bb	bd	211.835
13C-123789-HxCDD	36.412	0.000	4.843e5	3.895e5	1.000	1.243	1.240	3574	5521	7.18e6	5.79e6	2010.2	1047.9	NO	bb	bb	100.000
37CL-2378-TCDD	26.305	1.033	1.379e5		1.084			1849		1.90e6		1029.2			bd		10.397

Dataset: T:\Autospec\Processed Data Batch\210811ICVIH.qld
Last Altered: Friday, August 13, 2021 13:47:27 Pacific Daylight Time
Printed: Friday, August 13, 2021 13:51:56 Pacific Daylight Time

ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
1368-TCDF	22.147	0.864	1.063e5	1.324e5	1.425	0.802	0.770	1727	2357	1.66e6	2.09e6	959.0	886.5	NO	bb	bb	9.436
1289-TCDF	27.152	1.059	5.661e4	7.137e4	1.043	0.793	0.770	1727	2357	8.15e5	1.06e6	472.0	447.8	NO	bb	bb	6.913
13468-PECDF	27.015	0.906	5.743e5	3.714e5	1.376	1.546	1.550	1557	1759	8.45e6	5.45e6	5425.9	3099.7	NO	bb	bb	41.310
12389-PECDF	32.201	1.080	4.075e5	2.638e5	1.000	1.544	1.550	6428	5298	5.63e6	3.72e6	875.5	702.7	NO	bb	bb	40.376
123468-HXCDF	33.125	0.952	4.315e5	3.546e5	1.087	1.217	1.240	6025	4489	6.40e6	5.20e6	1061.8	1158.1	NO	bb	bb	57.507
1368-TCDD	23.417	0.891	5.716e4	7.362e4	0.923	0.776	0.770	2440	1603	8.73e5	1.13e6	357.6	706.6	NO	bb	bb	12.700
1289-TCDD	26.895	1.024	4.776e4	6.026e4	0.794	0.793	0.770	2440	1603	6.91e5	8.63e5	283.1	538.1	NO	bb	bb	12.197
12479-PECDD	28.691	0.914	4.186e5	2.632e5	1.843	1.590	1.550	4032	3115	3.99e6	2.51e6	988.7	804.5	NO	bb	bb	41.945
12389-PECDD	31.822	1.013	2.780e5	1.664e5	1.154	1.671	1.550	4032	3115	4.00e6	2.46e6	992.1	791.3	NO	bb	bb	43.683
124679-HXCDD	33.905	0.944	3.632e5	2.896e5	1.125	1.254	1.240	4241	3010	5.57e6	4.44e6	1314.1	1475.1	NO	bb	bb	60.629
1234679-HPCDD	39.141	0.975	2.129e5	1.840e5	1.211	1.157	1.050	3111	3083	2.93e6	2.75e6	941.5	893.1	NO	bd	bb	53.689
Total-tetrafurans			2.574e5		1.192			1727		3.86e6							27.363
Total-penta1			5.743e5					1557		8.45e6							41.310
Total-pentafurans			1.602e6		1.047			6428		2.23e7							153.079
Total-hexafurans			1.898e6		1.045			6025		2.84e7							272.082
Total-heptafurans			6.227e5		1.305			5528		8.82e6							113.929
Total-Furans			5.291e6		1.158			1727		7.56e7							713.177
Total-tetradioxins			2.709e5		0.879			2440		3.41e6							62.800
Total-pentadioxins			9.817e5		1.331			4032		1.22e7							138.087
Total-hexadioxins			1.266e6		1.028			4241		1.92e7							219.741
Total-heptadioxins			3.886e5		1.140			3111		5.46e6							105.554
Total-Dioxins			3.171e6		1.092			2440		4.34e7							631.178
Total-TEQ			8.462e6					2440		1.19e8							1344.355
FUNCTION1 PFK			6.450e7					839971		2.37e8							
FUNCTION2 PFK			0.000e0					483349		0.00e0							
FUNCTION3 PFK			5.184e7					675979		4.54e8							0.000
FUNCTION4 PFK			3.964e5					425264		1.39e7							
FUNCTION5 PFK			3.414e4					345829		1.67e6							
FUNCTION1 HXCD...			2.903e3					1258		5.64e4							0.000
FUNCTION1 HPCD...			2.863e3					1421		5.44e4							0.000
FUNCTION2 HPCD...			2.720e3					1471		5.70e4							0.000
FUNCTION3 OCDPE			1.392e3					890		2.72e4							0.000
FUNCTION4 NCDPE			1.187e3					1520		2.23e4							0.000
FUNCTION5 DCDPE			1.665e2					1065		6.42e3							0.000

Dataset: T:\Autospec\Processed Data Batch\210811ICVIH.qld
Last Altered: Friday, August 13, 2021 13:47:27 Pacific Daylight Time
Printed: Friday, August 13, 2021 13:51:56 Pacific Daylight Time

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

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TF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDF	27.15	5.661e4	7.137e4	1.043	0.79	0.77	472.0	YES	NO	bb	bb	6.913
2	2378-TCDF	25.65	8.598e4	1.128e5	1.108	0.76	0.77	728.4	YES	NO	bb	bb	10.110
3	Total-tetrafurans	24.75	7.210e3	8.958e3	1.192	0.80	0.77	60.0	YES	NO	bb	bb	0.764
4	Total-tetrafurans	24.42	1.138e3	1.365e3	1.192	0.83	0.77	9.8	YES	NO	bb	bb	0.118
5	1368-TCDF	22.15	1.063e5	1.324e5	1.425	0.80	0.77	959.0	YES	NO	bb	bb	9.436
6	Total-tetrafurans	27.47	1.965e2	2.354e2	1.192	0.83	0.77	3.7	YES	NO	db	bb	0.020

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	13468-PECDF	27.02	5.743e5	3.714e5	1.376	1.55	1.55	5425.9	YES	NO	bb	bb	41.310

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-pentafurans	28.67	7.393e4	4.763e4	1.047	1.55	1.55	167.4	YES	NO	bb	bb	7.165
2	12389-PECDF	32.20	4.075e5	2.638e5	1.000	1.54	1.55	875.5	YES	NO	bb	bb	40.376
3	23478-PeCDF	31.16	5.567e5	3.442e5	1.126	1.62	1.55	1200.0	YES	NO	dd	bb	50.709
4	Total-pentafurans	30.02	2.035e4	1.353e4	1.047	1.50	1.55	37.7	YES	NO	dd	dd	1.997
5	12378-PeCDF	29.82	5.436e5	3.483e5	1.015	1.56	1.55	1193.2	YES	NO	bd	bd	52.831

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123468-HXCDF	33.13	4.315e5	3.546e5	1.087	1.22	1.24	1061.8	YES	NO	bb	bb	57.507
2	123789-HxCDF	36.84	3.029e5	2.474e5	1.030	1.22	1.24	767.5	YES	NO	bb	bb	53.582
3	234678-HxCDF	35.81	3.741e5	3.010e5	1.052	1.24	1.24	922.2	YES	NO	bb	bb	55.515
4	123678-HxCDF	34.94	4.107e5	3.376e5	1.037	1.22	1.24	994.0	YES	NO	db	db	51.475
5	123478-HxCDF	34.80	3.790e5	3.119e5	1.017	1.22	1.24	963.5	YES	NO	bd	bd	54.003

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDF	38.68	3.428e5	3.268e5	1.327	1.05	1.05	945.1	YES	NO	bb	bb	54.784
2	1234789-HpCDF	40.92	2.799e5	2.719e5	1.283	1.03	1.05	650.7	YES	NO	bd	bd	59.145

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Furans,TF,PP,PF,HF,HPF,OF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDF	27.15	5.661e4	7.137e4	1.043	0.79	0.77	472.0	YES	NO	bb	bb	6.913
2	2378-TCDF	25.65	8.598e4	1.128e5	1.108	0.76	0.77	728.4	YES	NO	bb	bb	10.110
3	Total-tetrafurans	24.75	7.210e3	8.958e3	1.192	0.80	0.77	60.0	YES	NO	bb	bb	0.764
4	Total-tetrafurans	24.42	1.138e3	1.365e3	1.192	0.83	0.77	9.8	YES	NO	bb	bb	0.118
5	1368-TCDF	22.15	1.063e5	1.324e5	1.425	0.80	0.77	959.0	YES	NO	bb	bb	9.436
6	Total-tetrafurans	27.47	1.965e2	2.354e2	1.192	0.83	0.77	3.7	YES	NO	db	bb	0.020
7	Total-pentafurans	28.67	7.393e4	4.763e4	1.047	1.55	1.55	167.4	YES	NO	bb	bb	7.165
8	12389-PECDF	32.20	4.075e5	2.638e5	1.000	1.54	1.55	875.5	YES	NO	bb	bb	40.376
9	23478-PeCDF	31.16	5.567e5	3.442e5	1.126	1.62	1.55	1200.0	YES	NO	dd	bb	50.709
10	Total-pentafurans	30.02	2.035e4	1.353e4	1.047	1.50	1.55	37.7	YES	NO	dd	dd	1.997
11	12378-PeCDF	29.82	5.436e5	3.483e5	1.015	1.56	1.55	1193.2	YES	NO	bd	bd	52.831
12	123468-HXCDF	33.13	4.315e5	3.546e5	1.087	1.22	1.24	1061.8	YES	NO	bb	bb	57.507
13	123789-HxCDF	36.84	3.029e5	2.474e5	1.030	1.22	1.24	767.5	YES	NO	bb	bb	53.582
14	234678-HxCDF	35.81	3.741e5	3.010e5	1.052	1.24	1.24	922.2	YES	NO	bb	bb	55.515
15	123678-HxCDF	34.94	4.107e5	3.376e5	1.037	1.22	1.24	994.0	YES	NO	db	db	51.475
16	123478-HxCDF	34.80	3.790e5	3.119e5	1.017	1.22	1.24	963.5	YES	NO	bd	bd	54.003
17	1234678-HpCDF	38.68	3.428e5	3.268e5	1.327	1.05	1.05	945.1	YES	NO	bb	bb	54.784
18	1234789-HpCDF	40.92	2.799e5	2.719e5	1.283	1.03	1.05	650.7	YES	NO	bd	bd	59.145
19	OCDF	45.14	3.368e5	3.743e5	1.447	0.90	0.89	729.8	YES	NO	bb	bb	105.415
20	13468-PECDF	27.02	5.743e5	3.714e5	1.376	1.55	1.55	5425.9	YES	NO	bb	bb	41.310

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetradioxins	25.97	8.932e4	1.141e5	0.879	0.78	0.77	303.9	YES	NO	bd	bd	20.744
2	Total-tetradioxins	25.49	2.543e4	2.972e4	0.879	0.86	0.77	154.2	YES	NO	bd	bb	5.625
3	Total-tetradioxins	24.63	2.020e3	2.647e3	0.879	0.76	0.77	8.0	YES	NO	bd	bb	0.476
4	1368-TCDD	23.42	5.716e4	7.362e4	0.923	0.78	0.77	357.6	YES	NO	bb	bb	12.700
5	1289-TCDD	26.89	4.776e4	6.026e4	0.794	0.79	0.77	283.1	YES	NO	bb	bb	12.197
6	2378-TCDD	26.30	4.924e4	6.425e4	0.920	0.77	0.77	291.6	YES	NO	bb	db	11.057

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PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	12389-PECDD	31.82	2.780e5	1.664e5	1.154	1.67	1.55	992.1	YES	NO	bb	bb	43.683
2	12378-PeCDD	31.42	2.834e5	1.748e5	0.995	1.62	1.55	1046.5	YES	NO	bb	bb	52.211
3	Total-pentadioxins	30.75	1.739e3	1.177e3	1.331	1.48	1.55	6.0	YES	NO	bb	bb	0.249
4	12479-PECDD	28.69	4.186e5	2.632e5	1.843	1.59	1.55	988.7	YES	NO	bb	bb	41.945

HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	124679-HXCDD	33.91	3.632e5	2.896e5	1.125	1.25	1.24	1314.1	YES	NO	bb	bb	60.629
2	123789-HxCDD	36.42	2.887e5	2.199e5	0.950	1.31	1.24	989.1	YES	NO	bd	bb	52.339
3	123678-HxCDD	36.04	3.082e5	2.464e5	1.009	1.25	1.24	1085.9	YES	NO	db	db	50.555
4	123478-HxCDD	35.92	2.965e5	2.407e5	1.027	1.23	1.24	1096.7	YES	NO	bd	bd	54.629
5	Total-hexadioxins	35.04	7.156e3	6.136e3	1.028	1.17	1.24	26.9	YES	NO	db	db	1.265
6	Total-hexadioxins	34.67	1.781e3	1.631e3	1.028	1.09	1.24	7.7	YES	NO	bb	bb	0.325

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDD	40.18	1.757e5	1.625e5	1.068	1.08	1.05	814.6	YES	NO	bb	bb	51.865
2	1234679-HPCDD	39.14	2.129e5	1.840e5	1.211	1.16	1.05	941.5	YES	NO	bd	bb	53.689

Dataset: T:\Autospec\Processed Data Batch\210811ICVIH.qld
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Dioxins,TD,PD,HD,HPD,OD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetradioxins	25.97	8.932e4	1.141e5	0.879	0.78	0.77	303.9	YES	NO	bd	bd	20.744
2	Total-tetradioxins	25.49	2.543e4	2.972e4	0.879	0.86	0.77	154.2	YES	NO	bd	bb	5.625
3	Total-tetradioxins	24.63	2.020e3	2.647e3	0.879	0.76	0.77	8.0	YES	NO	bd	bb	0.476
4	1368-TCDD	23.42	5.716e4	7.362e4	0.923	0.78	0.77	357.6	YES	NO	bb	bb	12.700
5	1289-TCDD	26.89	4.776e4	6.026e4	0.794	0.79	0.77	283.1	YES	NO	bb	bb	12.197
6	2378-TCDD	26.30	4.924e4	6.425e4	0.920	0.77	0.77	291.6	YES	NO	bb	db	11.057
7	12389-PECDD	31.82	2.780e5	1.664e5	1.154	1.67	1.55	992.1	YES	NO	bb	bb	43.683
8	12378-PeCDD	31.42	2.834e5	1.748e5	0.995	1.62	1.55	1046.5	YES	NO	bb	bb	52.211
9	Total-pentadioxins	30.75	1.739e3	1.177e3	1.331	1.48	1.55	6.0	YES	NO	bb	bb	0.249
10	12479-PECDD	28.69	4.186e5	2.632e5	1.843	1.59	1.55	988.7	YES	NO	bb	bb	41.945
11	124679-HXCDD	33.91	3.632e5	2.896e5	1.125	1.25	1.24	1314.1	YES	NO	bb	bb	60.629
12	123789-HxCDD	36.42	2.887e5	2.199e5	0.950	1.31	1.24	989.1	YES	NO	bd	bb	52.339
13	123678-HxCDD	36.04	3.082e5	2.464e5	1.009	1.25	1.24	1085.9	YES	NO	db	db	50.555
14	123478-HxCDD	35.92	2.965e5	2.407e5	1.027	1.23	1.24	1096.7	YES	NO	bd	bd	54.629
15	Total-hexadioxins	35.04	7.156e3	6.136e3	1.028	1.17	1.24	26.9	YES	NO	db	db	1.265
16	Total-hexadioxins	34.67	1.781e3	1.631e3	1.028	1.09	1.24	7.7	YES	NO	bb	bb	0.325
17	1234678-HpCDD	40.18	1.757e5	1.625e5	1.068	1.08	1.05	814.6	YES	NO	bb	bb	51.865
18	1234679-HPCDD	39.14	2.129e5	1.840e5	1.211	1.16	1.05	941.5	YES	NO	bd	bb	53.689
19	OCDD	44.90	2.642e5	3.138e5	1.181	0.84	0.89	1050.3	YES	NO	bb	bd	104.997

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TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDF	27.15	5.661e4	7.137e4	1.043	0.79	0.77	472.0	YES	NO	bb	bb	6.913
2	2378-TCDF	25.65	8.598e4	1.128e5	1.108	0.76	0.77	728.4	YES	NO	bb	bb	10.110
3	Total-tetrafurans	24.75	7.210e3	8.958e3	1.192	0.80	0.77	60.0	YES	NO	bb	bb	0.764
4	Total-tetrafurans	24.42	1.138e3	1.365e3	1.192	0.83	0.77	9.8	YES	NO	bb	bb	0.118
5	1368-TCDF	22.15	1.063e5	1.324e5	1.425	0.80	0.77	959.0	YES	NO	bb	bb	9.436
6	Total-tetrafurans	27.47	1.965e2	2.354e2	1.192	0.83	0.77	3.7	YES	NO	db	bb	0.020
7	Total-pentafurans	28.67	7.393e4	4.763e4	1.047	1.55	1.55	167.4	YES	NO	bb	bb	7.165
8	12389-PECDF	32.20	4.075e5	2.638e5	1.000	1.54	1.55	875.5	YES	NO	bb	bb	40.376
9	23478-PeCDF	31.16	5.567e5	3.442e5	1.126	1.62	1.55	1200.0	YES	NO	dd	bb	50.709
10	Total-pentafurans	30.02	2.035e4	1.353e4	1.047	1.50	1.55	37.7	YES	NO	dd	dd	1.997
11	12378-PeCDF	29.82	5.436e5	3.483e5	1.015	1.56	1.55	1193.2	YES	NO	bd	bd	52.831
12	123468-HXCDF	33.13	4.315e5	3.546e5	1.087	1.22	1.24	1061.8	YES	NO	bb	bb	57.507
13	123789-HxCDF	36.84	3.029e5	2.474e5	1.030	1.22	1.24	767.5	YES	NO	bb	bb	53.582
14	234678-HxCDF	35.81	3.741e5	3.010e5	1.052	1.24	1.24	922.2	YES	NO	bb	bb	55.515
15	123678-HxCDF	34.94	4.107e5	3.376e5	1.037	1.22	1.24	994.0	YES	NO	db	db	51.475
16	123478-HxCDF	34.80	3.790e5	3.119e5	1.017	1.22	1.24	963.5	YES	NO	bd	bd	54.003
17	1234678-HpCDF	38.68	3.428e5	3.268e5	1.327	1.05	1.05	945.1	YES	NO	bb	bb	54.784
18	1234789-HpCDF	40.92	2.799e5	2.719e5	1.283	1.03	1.05	650.7	YES	NO	bd	bd	59.145
19	OCDF	45.14	3.368e5	3.743e5	1.447	0.90	0.89	729.8	YES	NO	bb	bb	105.415
20	13468-PECDF	27.02	5.743e5	3.714e5	1.376	1.55	1.55	5425.9	YES	NO	bb	bb	41.310
21	Total-tetradioxins	25.97	8.932e4	1.141e5	0.879	0.78	0.77	303.9	YES	NO	bd	bd	20.744
22	Total-tetradioxins	25.49	2.543e4	2.972e4	0.879	0.86	0.77	154.2	YES	NO	bd	bb	5.625
23	Total-tetradioxins	24.63	2.020e3	2.647e3	0.879	0.76	0.77	8.0	YES	NO	bd	bb	0.476
24	1368-TCDD	23.42	5.716e4	7.362e4	0.923	0.78	0.77	357.6	YES	NO	bb	bb	12.700
25	1289-TCDD	26.89	4.776e4	6.026e4	0.794	0.79	0.77	283.1	YES	NO	bb	bb	12.197
26	2378-TCDD	26.30	4.924e4	6.425e4	0.920	0.77	0.77	291.6	YES	NO	bb	db	11.057
27	12389-PECDD	31.82	2.780e5	1.664e5	1.154	1.67	1.55	992.1	YES	NO	bb	bb	43.683
28	12378-PeCDD	31.42	2.834e5	1.748e5	0.995	1.62	1.55	1046.5	YES	NO	bb	bb	52.211
29	Total-pentadioxins	30.75	1.739e3	1.177e3	1.331	1.48	1.55	6.0	YES	NO	bb	bb	0.249
30	12479-PECDD	28.69	4.186e5	2.632e5	1.843	1.59	1.55	988.7	YES	NO	bb	bb	41.945
31	124679-HXCDD	33.91	3.632e5	2.896e5	1.125	1.25	1.24	1314.1	YES	NO	bb	bb	60.629
32	123789-HxCDD	36.42	2.887e5	2.199e5	0.950	1.31	1.24	989.1	YES	NO	bd	bb	52.339
33	123678-HxCDD	36.04	3.082e5	2.464e5	1.009	1.25	1.24	1085.9	YES	NO	db	db	50.555
34	123478-HxCDD	35.92	2.965e5	2.407e5	1.027	1.23	1.24	1096.7	YES	NO	bd	bd	54.629
35	Total-hexadioxins	35.04	7.156e3	6.136e3	1.028	1.17	1.24	26.9	YES	NO	db	db	1.265
36	Total-hexadioxins	34.67	1.781e3	1.631e3	1.028	1.09	1.24	7.7	YES	NO	bb	bb	0.325
37	1234678-HpCDD	40.18	1.757e5	1.625e5	1.068	1.08	1.05	814.6	YES	NO	bb	bb	51.865

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TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	1234679-HPCDD	39.14	2.129e5	1.840e5	1.211	1.16	1.05	941.5	YES	NO	bd	bb	53.689
39	OCDD	44.90	2.642e5	3.138e5	1.181	0.84	0.89	1050.3	YES	NO	bb	bd	104.997

PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	22.34	1.094e7					29.2	YES		db		
2	FUNCTION1 PFK	22.07	1.938e7					38.3	YES		dd		
3	FUNCTION1 PFK	21.38	2.077e7					61.6	YES		dd		
4	FUNCTION1 PFK	21.25	7.452e6					64.7	YES		dd		
5	FUNCTION1 PFK	21.10	5.199e6					69.3	YES		bd		
6	FUNCTION1 PFK	27.62	5.202e4					1.5	NO		bb		
7	FUNCTION1 PFK	26.61	3.088e4					1.4	NO		bb		
8	FUNCTION1 PFK	26.53	3.772e4					1.3	NO		bb		
9	FUNCTION1 PFK	26.21	4.215e4					1.3	NO		bb		
10	FUNCTION1 PFK	26.14	2.091e4					0.7	NO		bb		
11	FUNCTION1 PFK	25.90	2.782e4					1.0	NO		bb		
12	FUNCTION1 PFK	25.64	2.244e4					0.9	NO		bb		
13	FUNCTION1 PFK	25.38	4.475e4					1.3	NO		bb		
14	FUNCTION1 PFK	25.32	8.085e4					1.5	NO		bb		
15	FUNCTION1 PFK	25.10	6.333e4					1.7	NO		db		
16	FUNCTION1 PFK	24.94	2.192e5					2.0	NO		dd		
17	FUNCTION1 PFK	24.82	2.857e4					1.1	NO		bd		
18	FUNCTION1 PFK	24.63	2.787e4					1.0	NO		bb		
19	FUNCTION1 PFK	24.35	1.463e4					0.7	NO		bb		
20	FUNCTION1 PFK	23.43	4.951e4					1.7	NO		bb		

PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

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PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 PFK	34.47	2.892e5					8.3	YES		dd		0.000
2	FUNCTION3 PFK	34.42	3.441e5					9.9	YES		dd		0.000
3	FUNCTION3 PFK	34.30	9.123e5					14.6	YES		dd		0.000
4	FUNCTION3 PFK	33.96	4.870e6					27.1	YES		dd		0.000
5	FUNCTION3 PFK	33.92	6.208e5					27.9	YES		dd		0.000
6	FUNCTION3 PFK	33.75	6.775e6					34.2	YES		dd		0.000
7	FUNCTION3 PFK	33.58	8.843e5					39.8	YES		dd		0.000
8	FUNCTION3 PFK	33.52	4.828e6					42.2	YES		dd		0.000
9	FUNCTION3 PFK	33.37	2.844e6					47.3	YES		dd		0.000
10	FUNCTION3 PFK	33.18	5.432e6					54.3	YES		dd		0.000
11	FUNCTION3 PFK	33.04	5.575e6					59.2	YES		dd		0.000
12	FUNCTION3 PFK	32.95	3.680e6					62.9	YES		dd		0.000
13	FUNCTION3 PFK	32.86	7.904e6					65.6	YES		dd		0.000
14	FUNCTION3 PFK	32.74	1.549e6					69.1	YES		dd		0.000
15	FUNCTION3 PFK	32.67	4.268e6					72.4	YES		bd		0.000
16	FUNCTION3 PFK	36.86	8.449e3					0.3	NO		bb		0.000
17	FUNCTION3 PFK	36.72	6.925e4					2.0	NO		bb		0.000
18	FUNCTION3 PFK	36.59	5.799e4					1.2	NO		bb		0.000
19	FUNCTION3 PFK	36.30	7.563e3					0.7	NO		bb		0.000
20	FUNCTION3 PFK	36.04	6.922e3					0.5	NO		bb		0.000
21	FUNCTION3 PFK	35.83	2.532e4					1.1	NO		bb		0.000
22	FUNCTION3 PFK	35.75	1.516e4					0.9	NO		bb		0.000
23	FUNCTION3 PFK	35.63	1.004e4					0.7	NO		bb		0.000
24	FUNCTION3 PFK	35.33	1.433e4					0.8	NO		bb		0.000
25	FUNCTION3 PFK	35.04	1.089e4					0.6	NO		bb		0.000
26	FUNCTION3 PFK	34.97	5.517e3					0.7	NO		bb		0.000
27	FUNCTION3 PFK	34.89	3.001e4					1.0	NO		bb		0.000
28	FUNCTION3 PFK	34.81	1.594e4					1.0	NO		db		0.000
29	FUNCTION3 PFK	34.76	3.092e4					1.3	NO		bd		0.000
30	FUNCTION3 PFK	34.60	1.659e5					4.5	YES		db		0.000
31	FUNCTION3 PFK	34.53	2.985e5					6.7	YES		dd		0.000
32	FUNCTION3 PFK	37.64	2.742e4					1.1	NO		bb		0.000
33	FUNCTION3 PFK	37.58	2.711e4					1.4	NO		db		0.000
34	FUNCTION3 PFK	37.54	1.758e4					0.9	NO		dd		0.000
35	FUNCTION3 PFK	37.49	3.447e4					1.6	NO		dd		0.000
36	FUNCTION3 PFK	37.45	2.646e4					1.5	NO		dd		0.000
37	FUNCTION3 PFK	37.38	4.745e4					1.5	NO		dd		0.000

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PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	FUNCTION3 PFK	37.34	2.452e4					1.6	NO		bd		0.000
39	FUNCTION3 PFK	37.29	9.653e3					0.8	NO		bb		0.000
40	FUNCTION3 PFK	37.08	5.064e3					0.5	NO		bb		0.000
41	FUNCTION3 PFK	36.98	6.612e4					1.7	NO		bb		0.000

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PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 PFK	38.42	2.469e3					0.5	NO		bb		
2	FUNCTION4 PFK	38.08	2.954e4					1.7	NO		bb		
3	FUNCTION4 PFK	37.98	4.856e4					2.3	NO		db		
4	FUNCTION4 PFK	37.94	3.614e4					2.6	NO		bd		
5	FUNCTION4 PFK	37.85	8.390e3					1.0	NO		bb		
6	FUNCTION4 PFK	40.91	1.035e4					1.0	NO		bb		
7	FUNCTION4 PFK	40.71	1.742e3					0.4	NO		bb		
8	FUNCTION4 PFK	40.68	3.176e3					0.5	NO		bb		
9	FUNCTION4 PFK	40.61	6.362e3					0.7	NO		bb		
10	FUNCTION4 PFK	40.38	7.075e3					0.8	NO		bb		
11	FUNCTION4 PFK	40.32	3.115e4					1.2	NO		bb		
12	FUNCTION4 PFK	39.94	4.461e3					0.6	NO		bb		
13	FUNCTION4 PFK	39.80	5.746e3					0.6	NO		bb		
14	FUNCTION4 PFK	39.51	2.799e3					0.4	NO		bb		
15	FUNCTION4 PFK	39.43	1.949e3					0.4	NO		bb		
16	FUNCTION4 PFK	39.36	2.879e3					0.6	NO		bb		
17	FUNCTION4 PFK	39.32	5.365e3					1.1	NO		bb		
18	FUNCTION4 PFK	39.28	3.621e3					0.8	NO		bb		
19	FUNCTION4 PFK	39.21	1.666e4					1.0	NO		bb		
20	FUNCTION4 PFK	39.07	6.512e3					0.8	NO		bb		
21	FUNCTION4 PFK	38.46	1.263e4					1.2	NO		bb		
22	FUNCTION4 PFK	42.68	1.445e4					0.9	NO		bb		
23	FUNCTION4 PFK	42.62	2.052e4					1.7	NO		bb		
24	FUNCTION4 PFK	42.51	2.321e3					0.5	NO		bb		
25	FUNCTION4 PFK	42.43	3.121e4					1.9	NO		bb		
26	FUNCTION4 PFK	42.18	7.742e3					0.8	NO		bb		
27	FUNCTION4 PFK	42.05	1.748e4					1.2	NO		db		
28	FUNCTION4 PFK	41.97	1.470e4					1.2	NO		bd		
29	FUNCTION4 PFK	41.63	2.487e3					0.5	NO		bb		
30	FUNCTION4 PFK	41.48	1.442e4					1.2	NO		bb		
31	FUNCTION4 PFK	41.24	1.211e4					1.0	NO		bb		
32	FUNCTION4 PFK	41.17	1.136e4					1.2	NO		bb		

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PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	45.97	5.710e3					1.0	NO		bb		
2	FUNCTION5 PFK	45.74	1.859e3					0.6	NO		bb		
3	FUNCTION5 PFK	43.26	1.526e4					1.8	NO		bb		
4	FUNCTION5 PFK	42.93	1.131e4					1.5	NO		bb		

ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	25.35	1.892e2					4.2	YES		db		0.000
2	FUNCTION1 HXCD...	25.23	1.187e2					1.3	NO		bd		0.000
3	FUNCTION1 HXCD...	24.87	7.961e1					1.9	NO		db		0.000
4	FUNCTION1 HXCD...	24.81	1.259e2					2.7	NO		bd		0.000
5	FUNCTION1 HXCD...	24.72	1.584e2					1.4	NO		bb		0.000
6	FUNCTION1 HXCD...	24.40	9.113e1					1.6	NO		bb		0.000
7	FUNCTION1 HXCD...	23.72	7.480e1					1.5	NO		bb		0.000
8	FUNCTION1 HXCD...	23.61	1.381e2					2.9	NO		bb		0.000
9	FUNCTION1 HXCD...	23.11	9.740e1					2.5	NO		bb		0.000
10	FUNCTION1 HXCD...	22.43	1.791e2					2.1	NO		db		0.000
11	FUNCTION1 HXCD...	22.30	7.125e1					1.5	NO		bd		0.000
12	FUNCTION1 HXCD...	22.19	7.195e1					1.3	NO		bb		0.000
13	FUNCTION1 HXCD...	21.98	1.102e2					1.5	NO		db		0.000
14	FUNCTION1 HXCD...	21.89	2.251e2					4.2	YES		bd		0.000
15	FUNCTION1 HXCD...	21.80	1.414e2					2.0	NO		bb		0.000
16	FUNCTION1 HXCD...	27.03	2.453e2					2.4	NO		bb		0.000
17	FUNCTION1 HXCD...	26.29	2.686e2					2.1	NO		db		0.000
18	FUNCTION1 HXCD...	26.12	1.763e2					2.9	NO		dd		0.000
19	FUNCTION1 HXCD...	26.03	9.387e1					1.2	NO		bd		0.000
20	FUNCTION1 HXCD...	25.82	1.399e2					2.0	NO		bb		0.000
21	FUNCTION1 HXCD...	25.46	1.064e2					1.7	NO		bb		0.000

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ETHERS2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HPCD...	22.51	7.992e1					1.4	NO		bb		0.000
2	FUNCTION1 HPCD...	22.07	1.029e2					2.1	NO		bb		0.000
3	FUNCTION1 HPCD...	21.98	1.510e2					1.6	NO		db		0.000
4	FUNCTION1 HPCD...	21.88	1.949e2					3.5	YES		bd		0.000
5	FUNCTION1 HPCD...	21.75	2.528e2					1.8	NO		bb		0.000
6	FUNCTION1 HPCD...	21.47	1.508e2					2.1	NO		bb		0.000
7	FUNCTION1 HPCD...	21.25	1.018e2					1.3	NO		db		0.000
8	FUNCTION1 HPCD...	21.16	1.149e2					1.6	NO		dd		0.000
9	FUNCTION1 HPCD...	21.09	2.200e2					3.0	NO		bd		0.000
10	FUNCTION1 HPCD...	27.00	1.586e2					1.8	NO		bb		0.000
11	FUNCTION1 HPCD...	26.83	9.159e1					0.8	NO		bb		0.000
12	FUNCTION1 HPCD...	26.59	1.663e2					2.5	NO		bb		0.000
13	FUNCTION1 HPCD...	26.32	1.753e2					1.6	NO		db		0.000
14	FUNCTION1 HPCD...	26.14	2.616e2					2.2	NO		bd		0.000
15	FUNCTION1 HPCD...	25.59	8.230e1					1.9	NO		bb		0.000
16	FUNCTION1 HPCD...	25.44	8.713e1					1.0	NO		bb		0.000
17	FUNCTION1 HPCD...	25.16	7.125e1					1.1	NO		db		0.000
18	FUNCTION1 HPCD...	25.05	1.030e2					1.1	NO		bd		0.000
19	FUNCTION1 HPCD...	24.07	1.494e2					2.5	NO		bb		0.000
20	FUNCTION1 HPCD...	23.83	1.478e2					3.3	YES		bb		0.000

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ETHERS3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 HPCD...	28.48	1.146e2					2.7	NO		bb		0.000
2	FUNCTION2 HPCD...	28.07	8.040e1					1.2	NO		db		0.000
3	FUNCTION2 HPCD...	27.98	1.117e2					1.5	NO		bd		0.000
4	FUNCTION2 HPCD...	27.82	9.308e1					2.0	NO		bb		0.000
5	FUNCTION2 HPCD...	31.82	1.073e2					1.6	NO		bb		0.000
6	FUNCTION2 HPCD...	31.41	3.440e2					4.0	YES		bb		0.000
7	FUNCTION2 HPCD...	31.18	9.044e1					1.2	NO		db		0.000
8	FUNCTION2 HPCD...	31.11	9.781e1					2.1	NO		dd		0.000
9	FUNCTION2 HPCD...	31.03	7.279e2					8.6	YES		bd		0.000
10	FUNCTION2 HPCD...	30.26	7.257e1					1.3	NO		bb		0.000
11	FUNCTION2 HPCD...	30.21	7.122e1					1.7	NO		db		0.000
12	FUNCTION2 HPCD...	30.14	1.157e2					1.5	NO		dd		0.000
13	FUNCTION2 HPCD...	30.06	7.412e1					1.1	NO		dd		0.000
14	FUNCTION2 HPCD...	29.98	7.219e1					1.2	NO		dd		0.000
15	FUNCTION2 HPCD...	29.91	9.212e1					2.0	NO		bd		0.000
16	FUNCTION2 HPCD...	29.69	7.977e1					1.3	NO		bb		0.000
17	FUNCTION2 HPCD...	29.08	1.408e2					1.5	NO		db		0.000
18	FUNCTION2 HPCD...	28.96	1.497e2					1.4	NO		bd		0.000
19	FUNCTION2 HPCD...	28.71	8.490e1					1.0	NO		bb		0.000

ETHERS4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 OCDPE	37.65	1.580e2					2.6	NO		db		0.000
2	FUNCTION3 OCDPE	37.55	1.150e2					2.8	NO		bd		0.000
3	FUNCTION3 OCDPE	36.42	1.835e2					2.9	NO		bb		0.000
4	FUNCTION3 OCDPE	36.04	2.520e2					4.7	YES		db		0.000
5	FUNCTION3 OCDPE	35.93	1.106e2					3.8	YES		dd		0.000
6	FUNCTION3 OCDPE	35.90	1.018e2					3.4	YES		bd		0.000
7	FUNCTION3 OCDPE	34.40	1.321e2					5.0	YES		bb		0.000
8	FUNCTION3 OCDPE	33.58	1.010e2					2.3	NO		bb		0.000
9	FUNCTION3 OCDPE	32.70	2.382e2					3.1	YES		bb		0.000

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ETHERS5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 NCDPE	40.42	7.136e1					0.9	NO		bb		0.000
2	FUNCTION4 NCDPE	40.16	1.641e2					1.6	NO		bb		0.000
3	FUNCTION4 NCDPE	39.69	1.182e2					1.5	NO		bb		0.000
4	FUNCTION4 NCDPE	38.52	1.487e2					1.6	NO		db		0.000
5	FUNCTION4 NCDPE	38.34	2.790e2					2.3	NO		dd		0.000
6	FUNCTION4 NCDPE	38.26	1.556e2					2.2	NO		bd		0.000
7	FUNCTION4 NCDPE	41.34	1.448e2					1.6	NO		bb		0.000
8	FUNCTION4 NCDPE	40.81	1.056e2					2.8	NO		bb		0.000

ETHERS6

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 DCDPE	44.58	7.112e1					3.0	NO		bb		0.000
2	FUNCTION5 DCDPE	43.59	9.542e1					3.1	YES		bb		0.000

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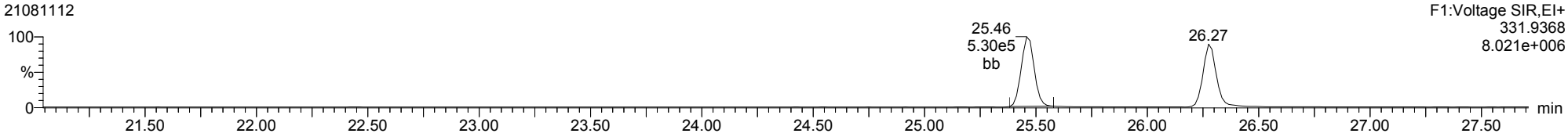

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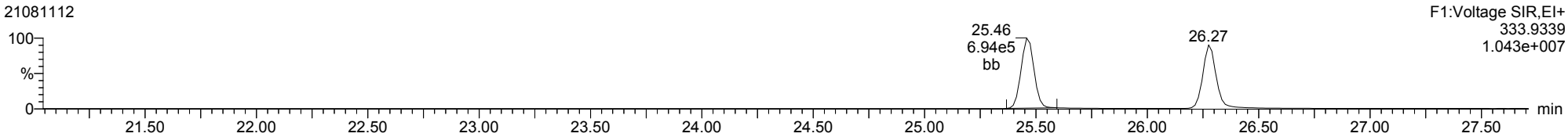

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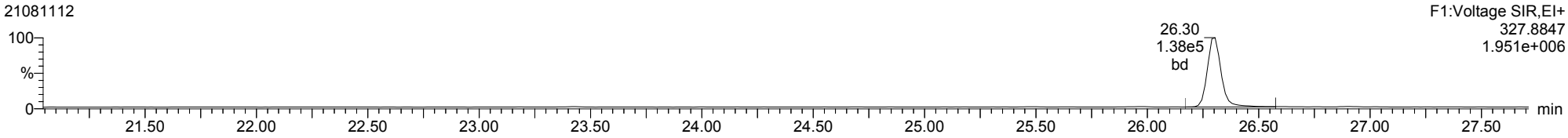

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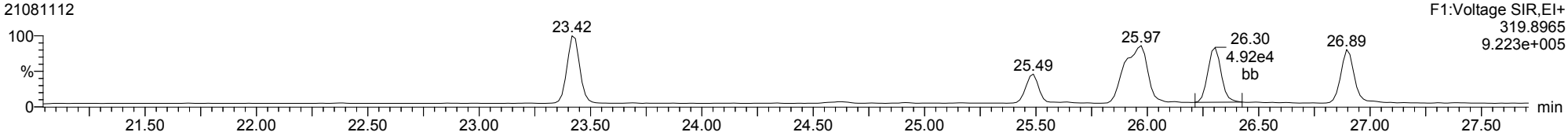

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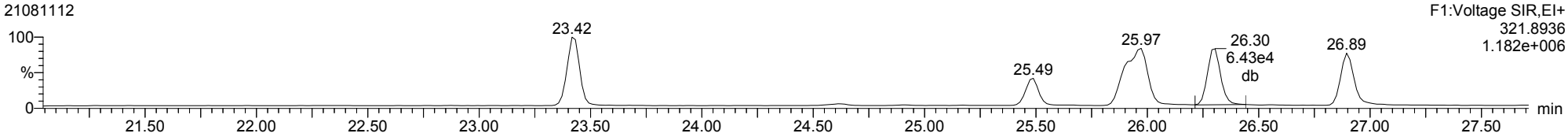

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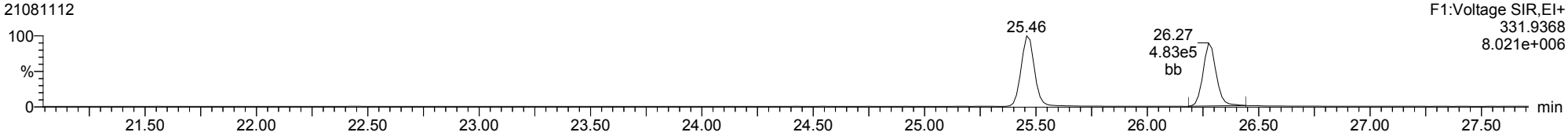

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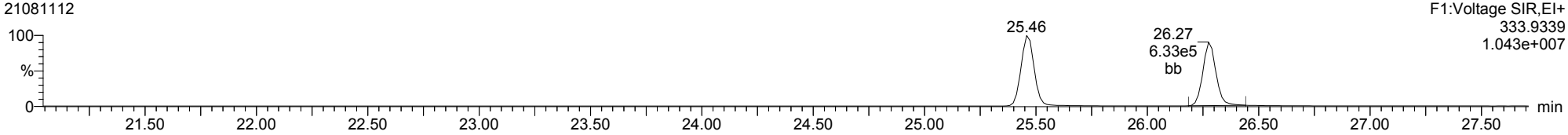

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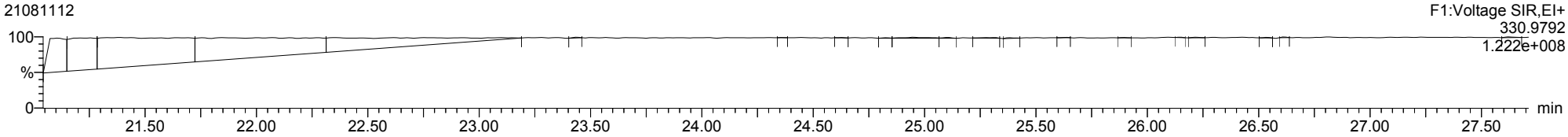

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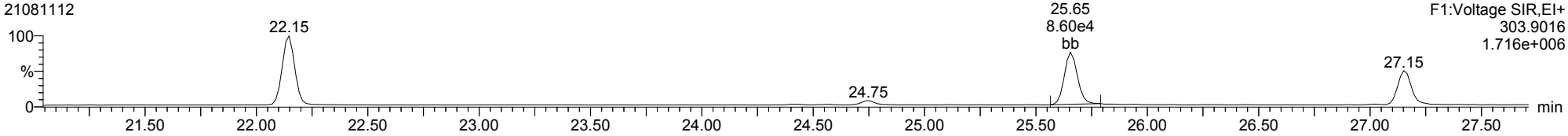
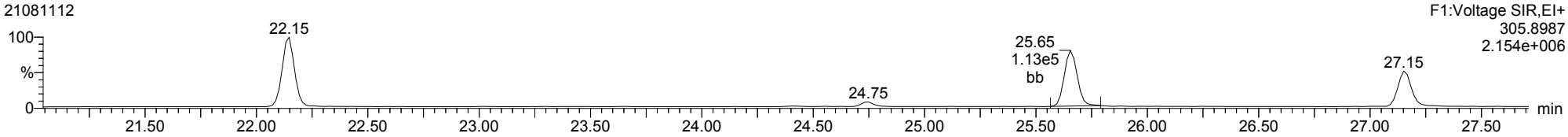


2378-TCDF



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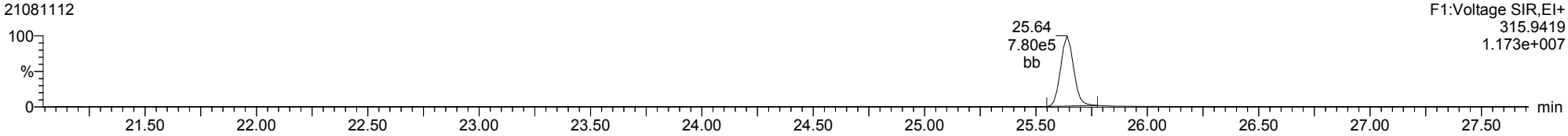

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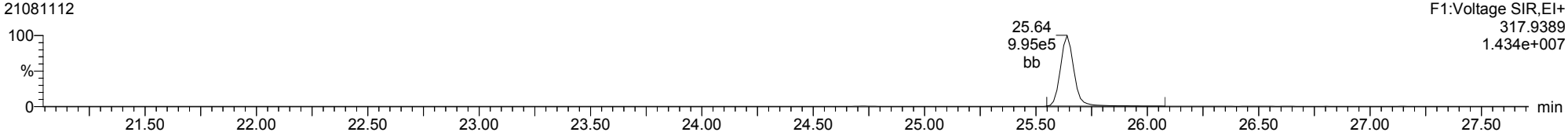

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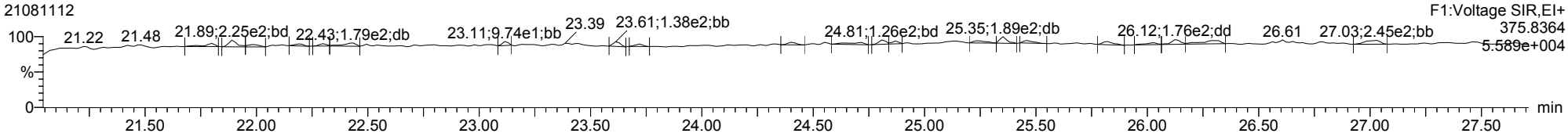

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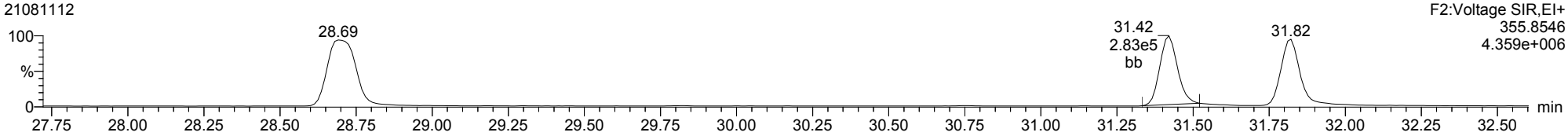

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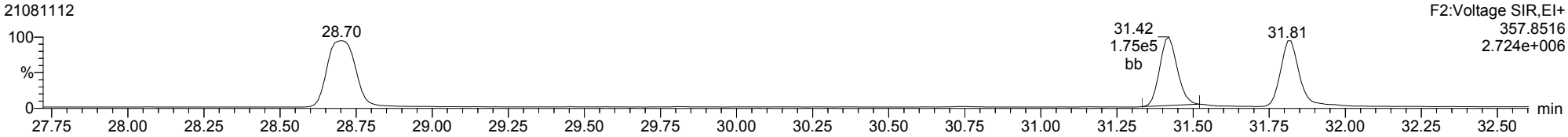

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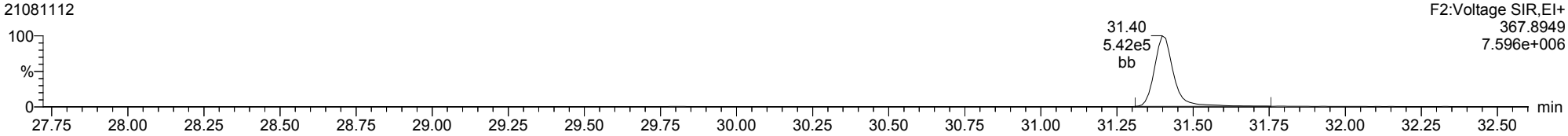

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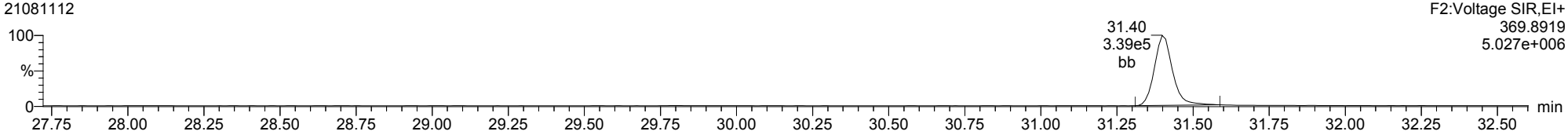

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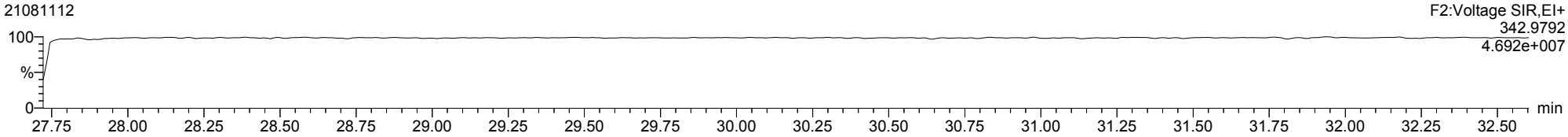

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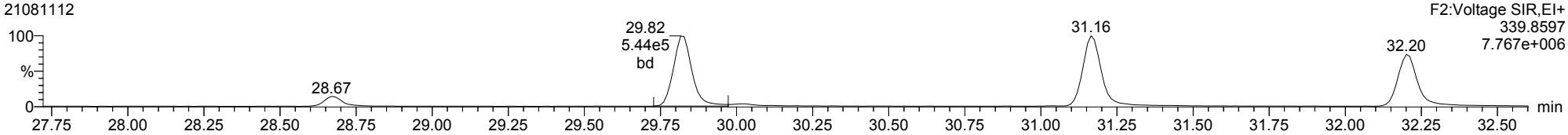

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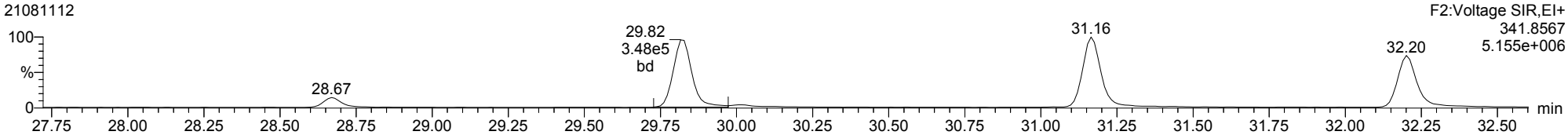

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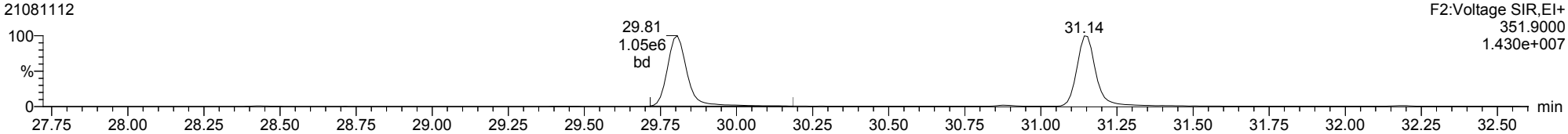

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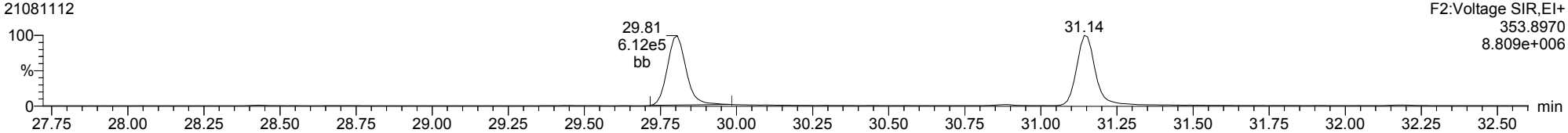

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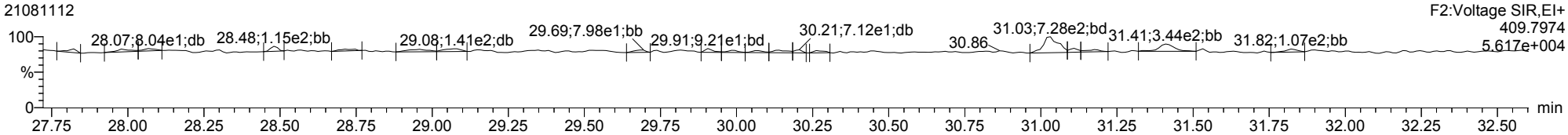

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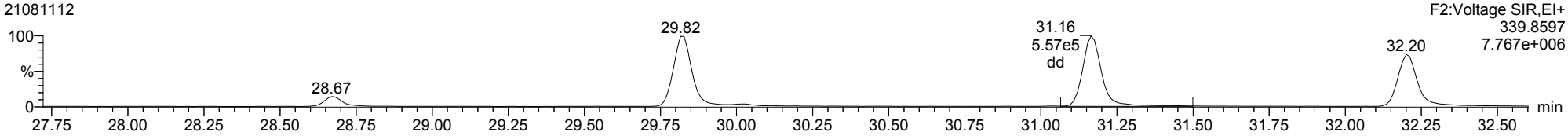

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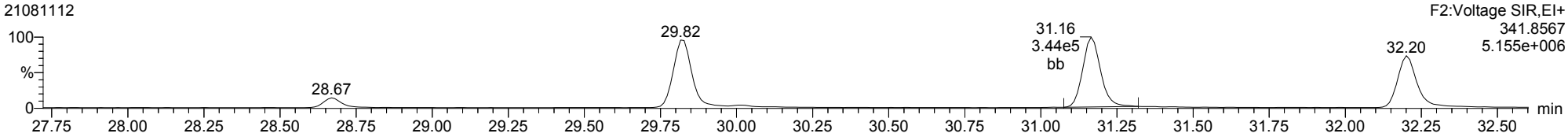

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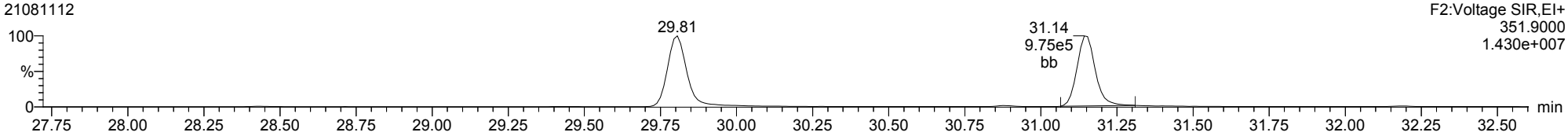

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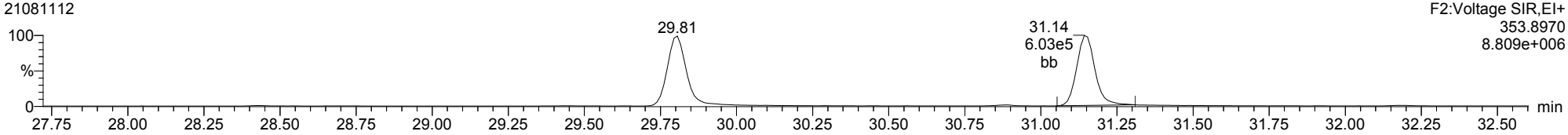

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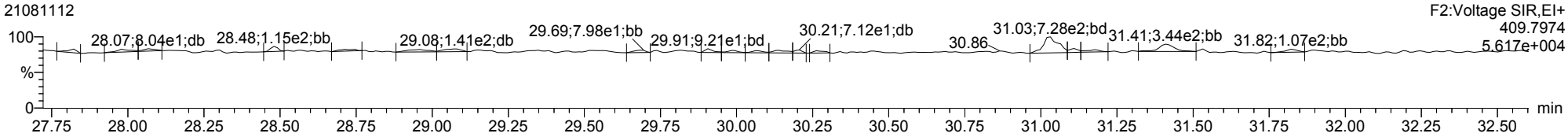

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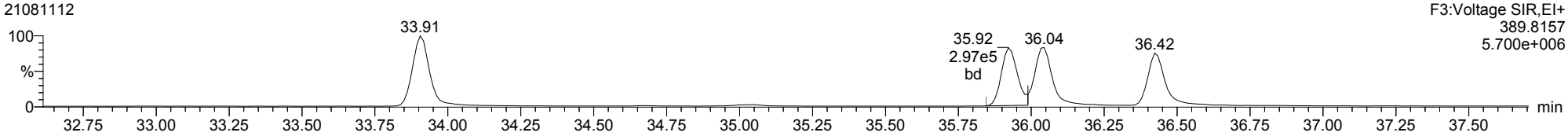

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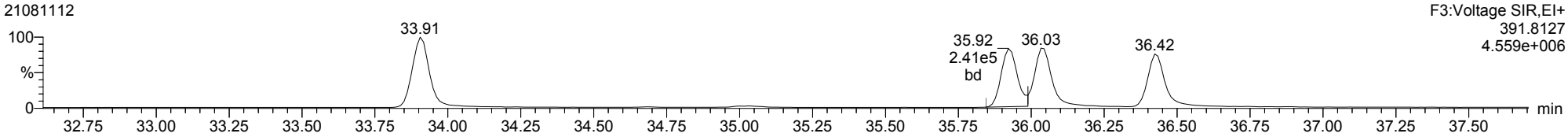

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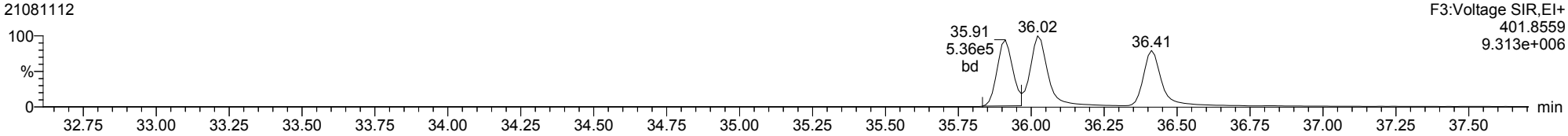

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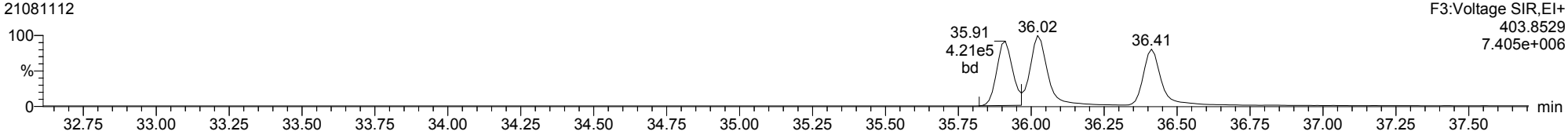

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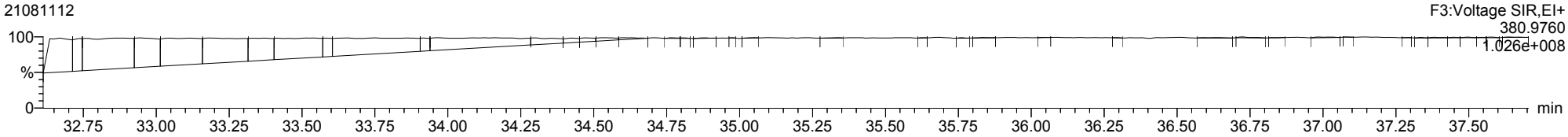

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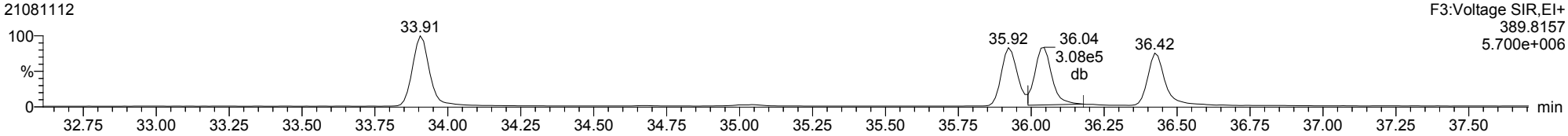

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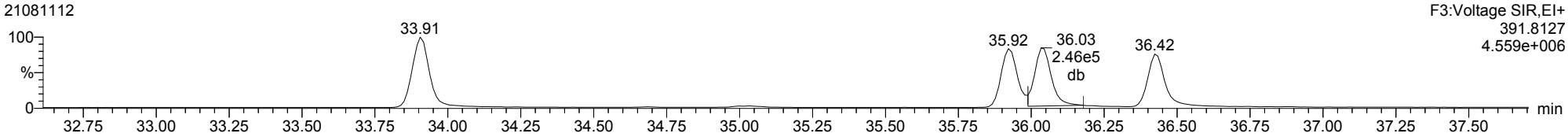

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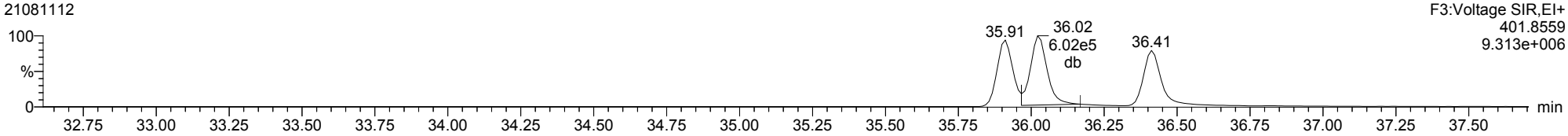

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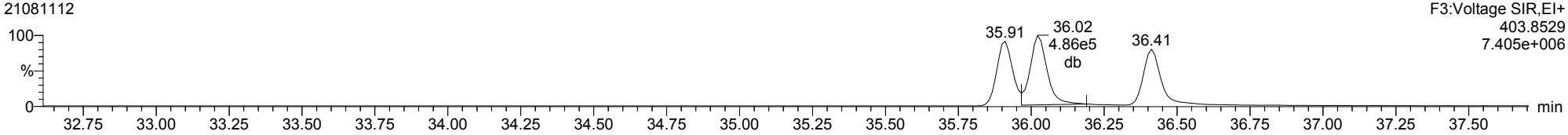

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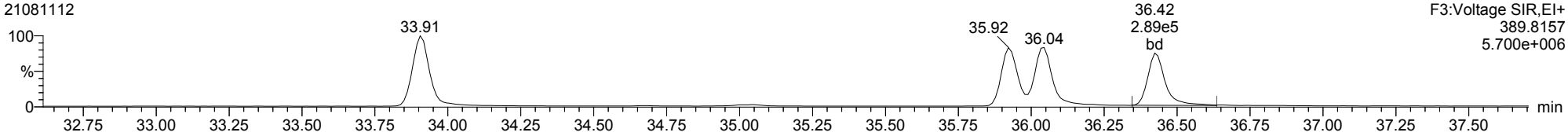

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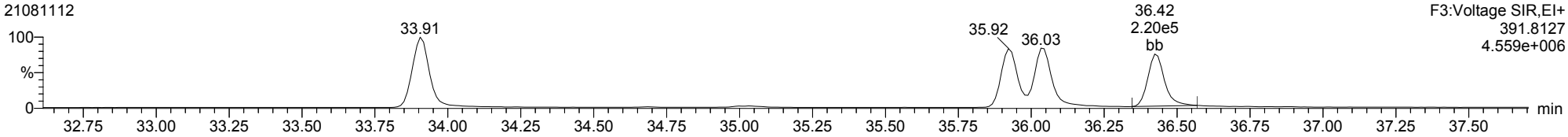

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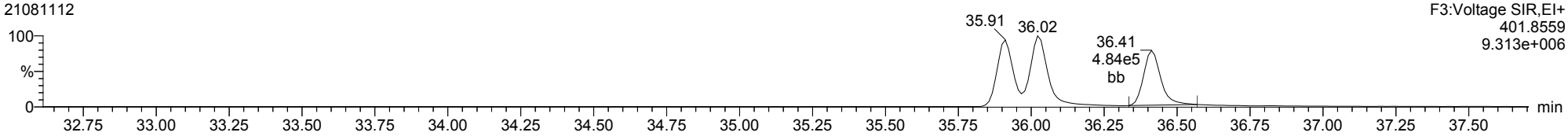

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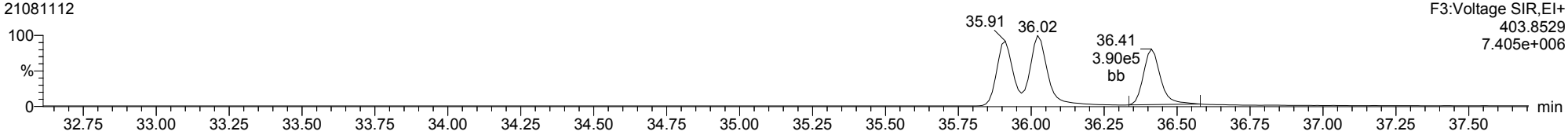

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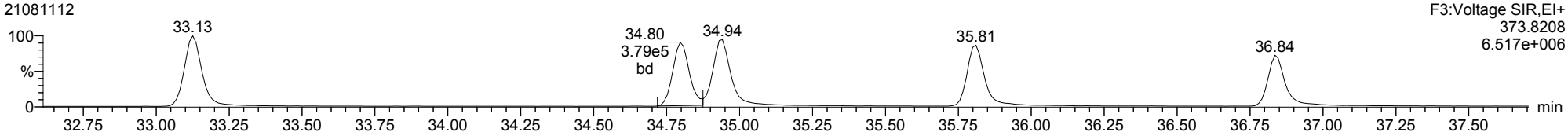

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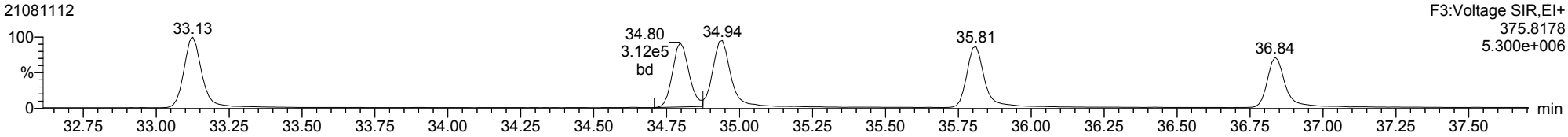

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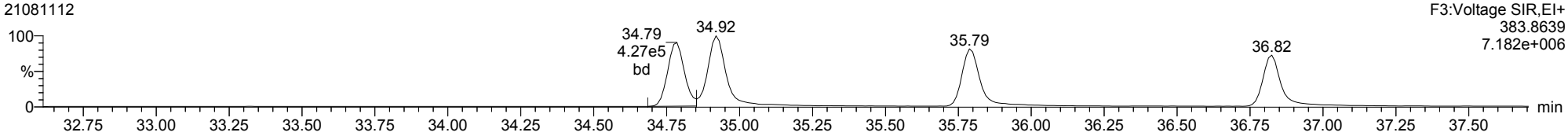

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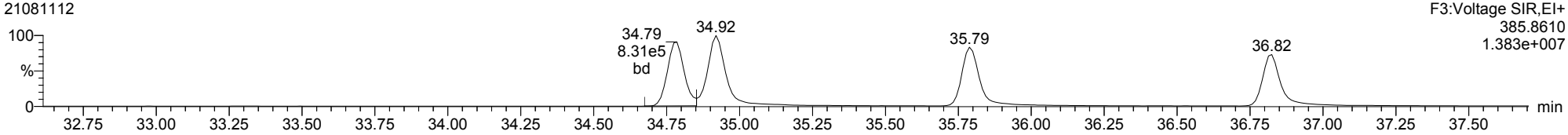

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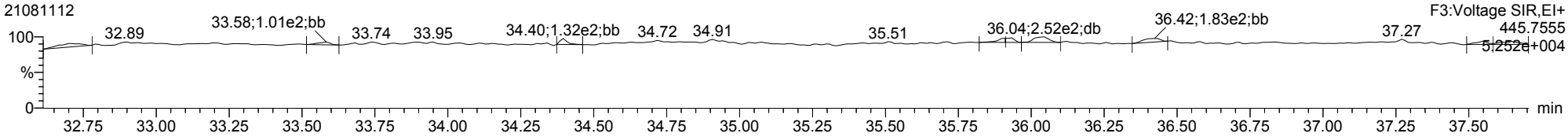

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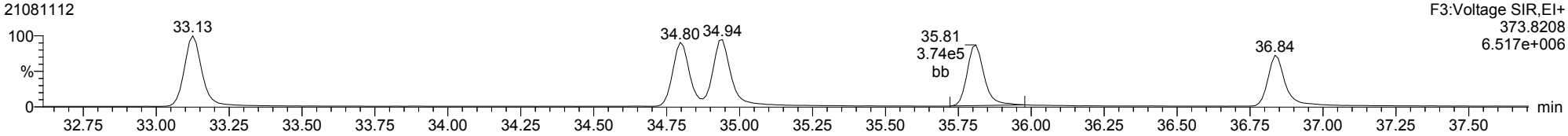

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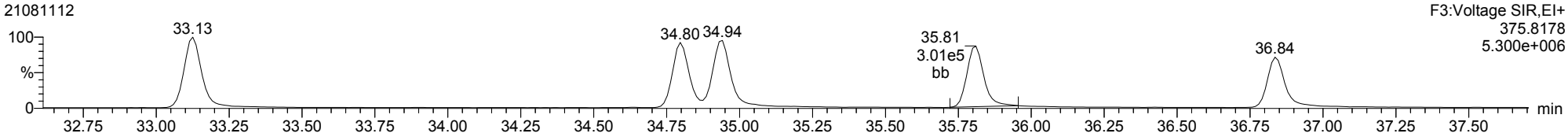

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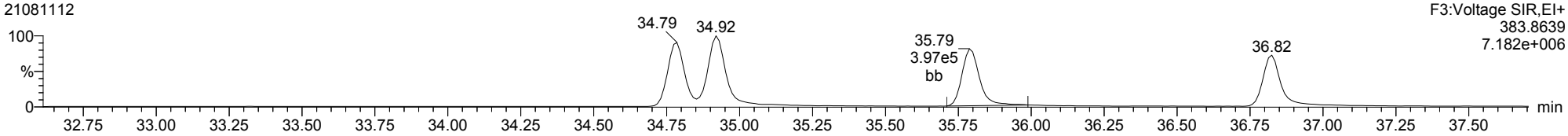

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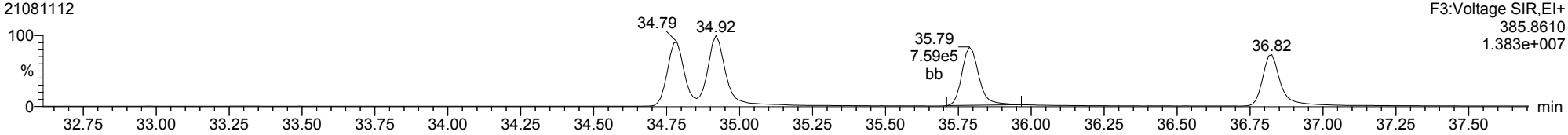
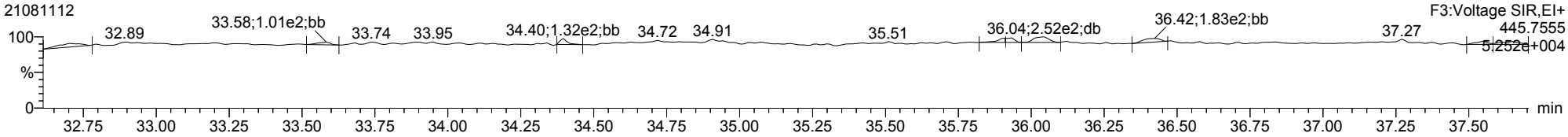


FUNCTION3 OCDPE



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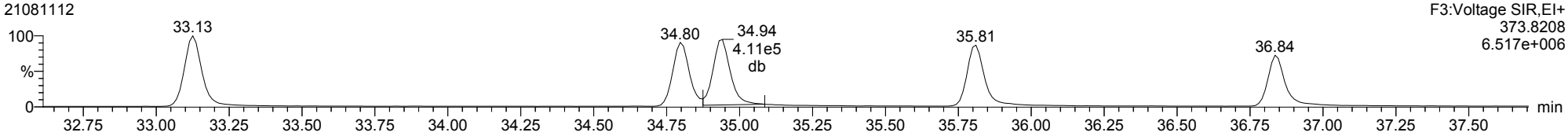

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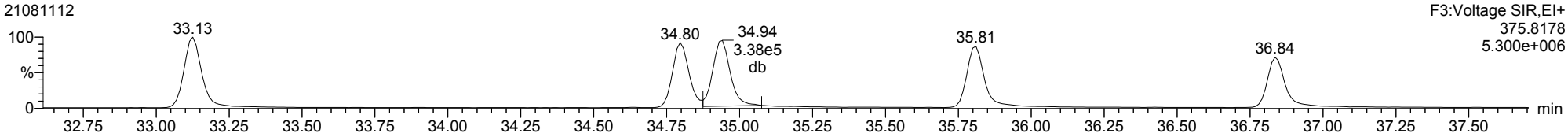

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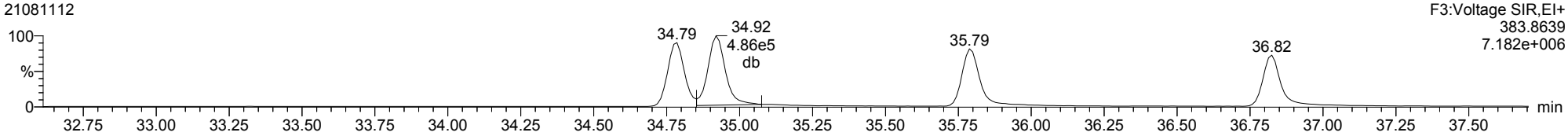

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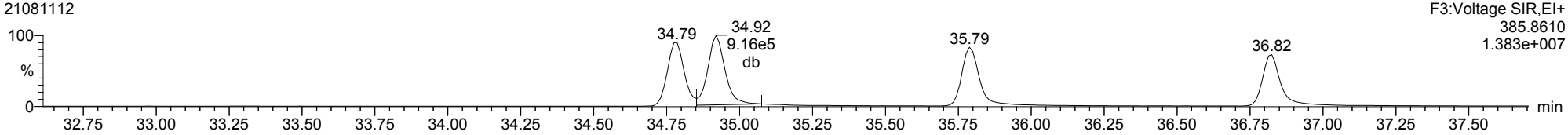

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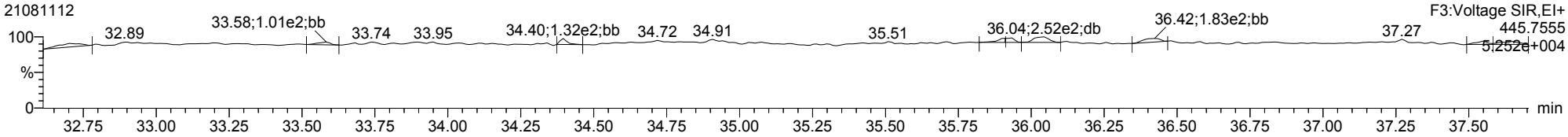

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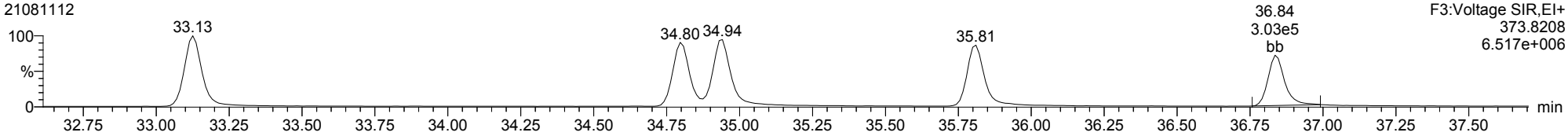

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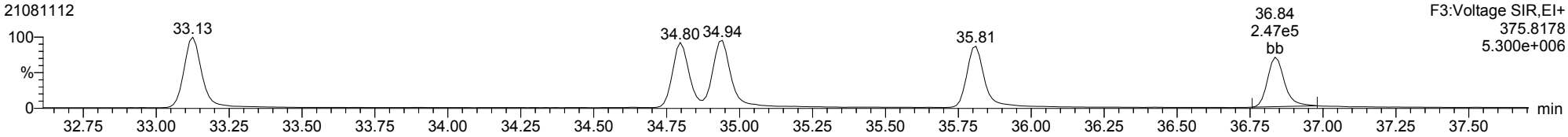

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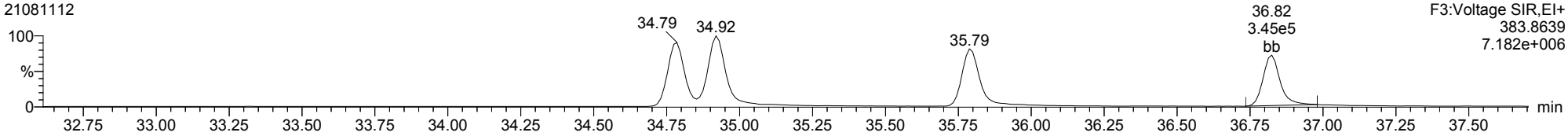

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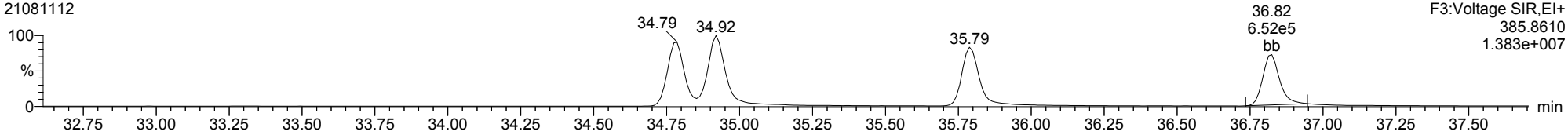
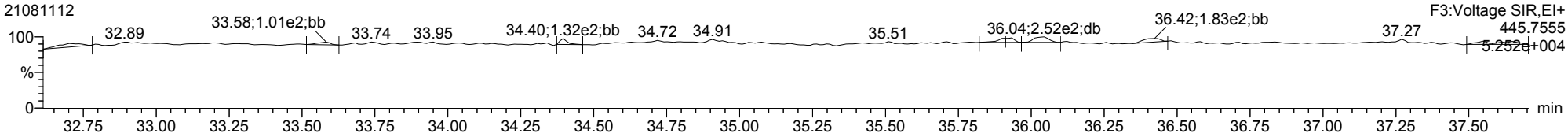
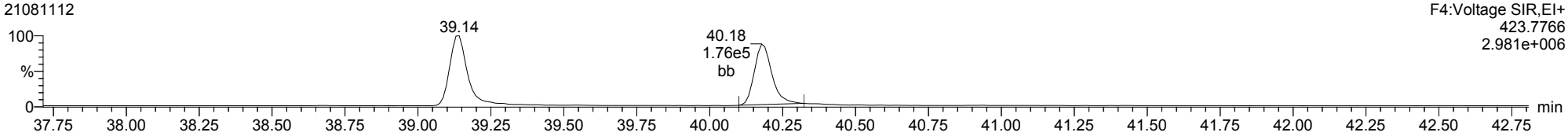


FUNCTION3 OCDPE



ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

1234678-HpCDD



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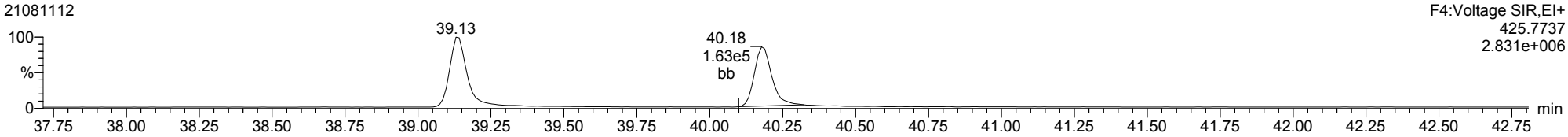

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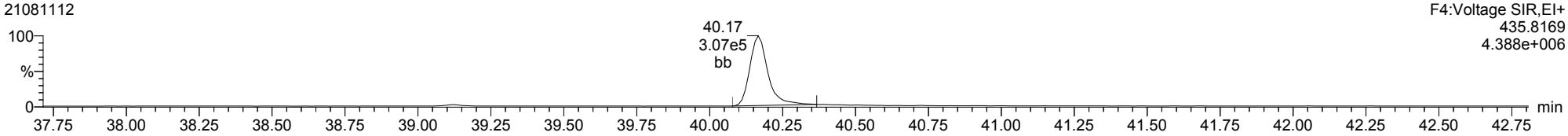

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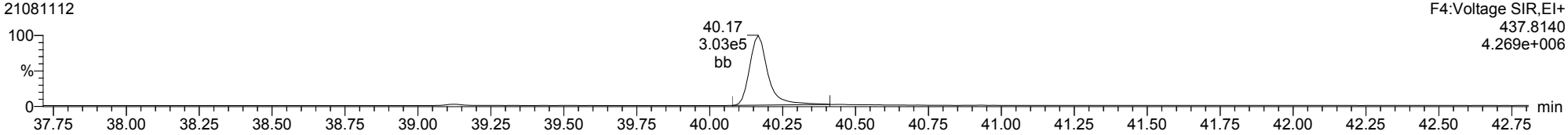
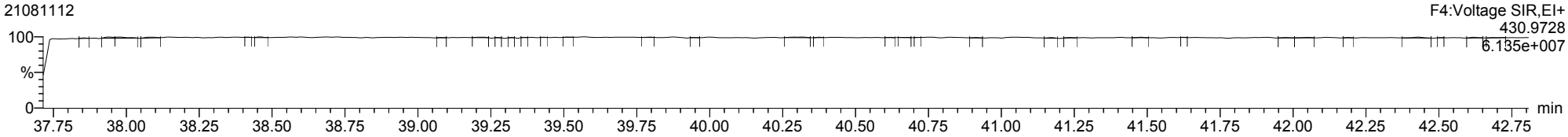


FUNCTION4 PFK



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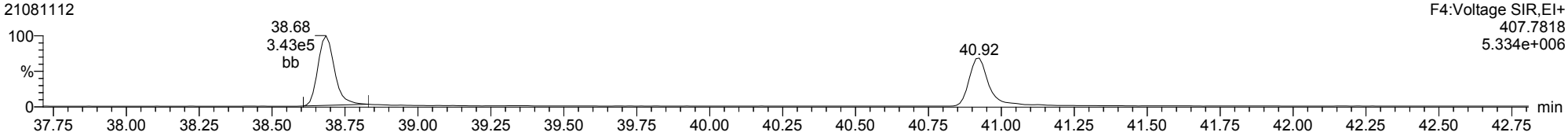

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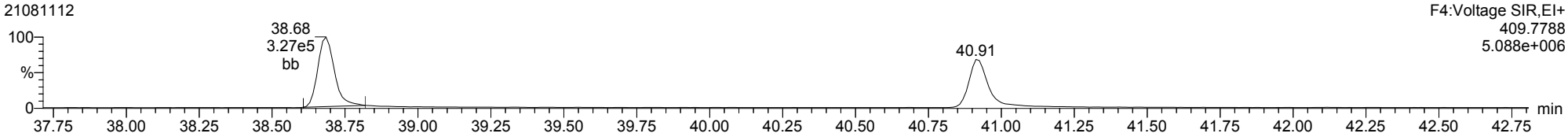

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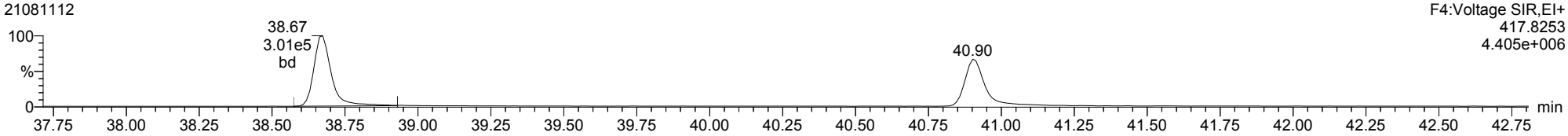

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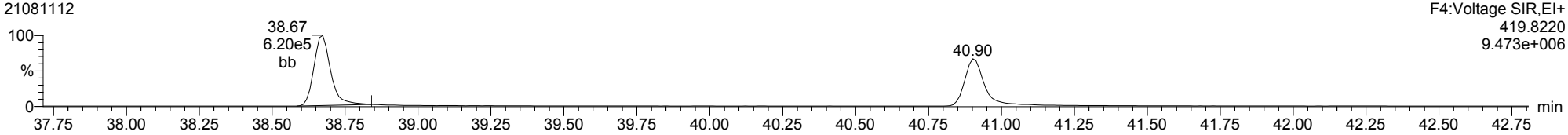
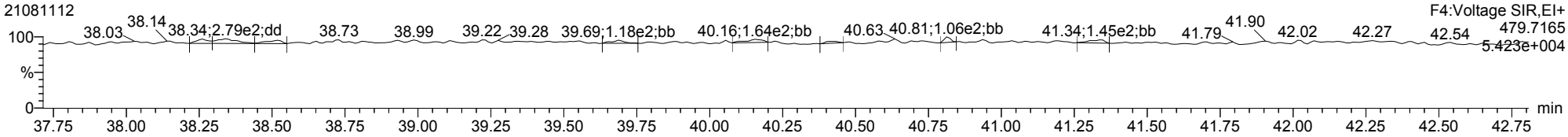


FUNCTION4 NCDPE



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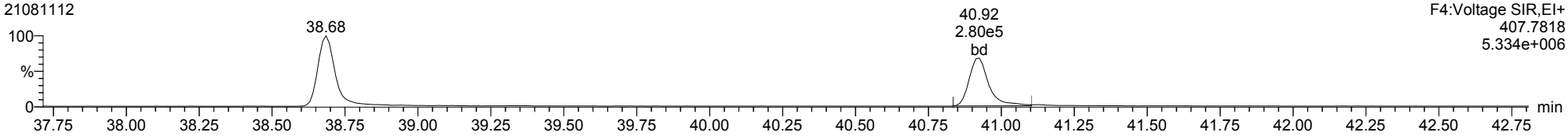

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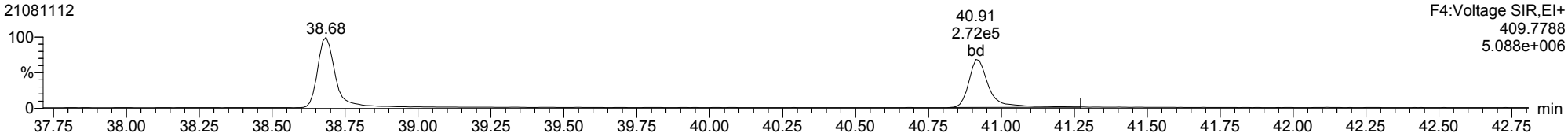

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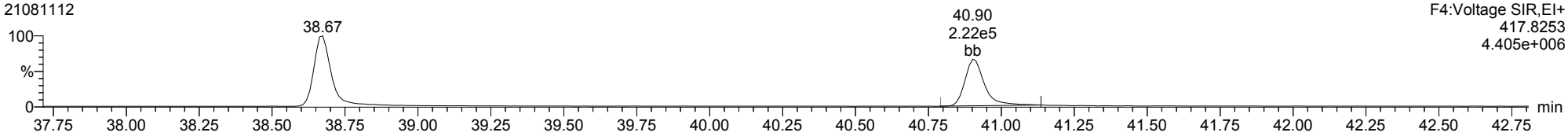

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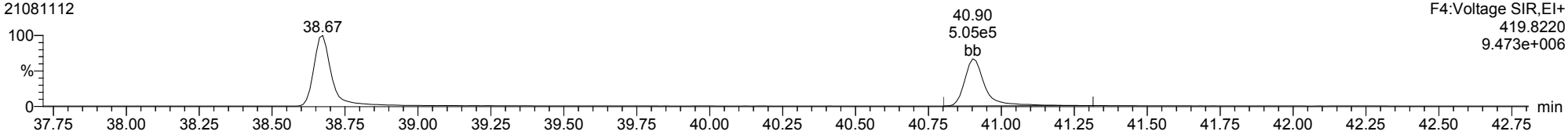
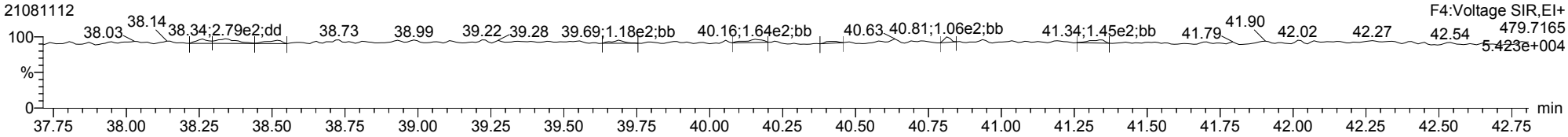


FUNCTION4 NCDPE



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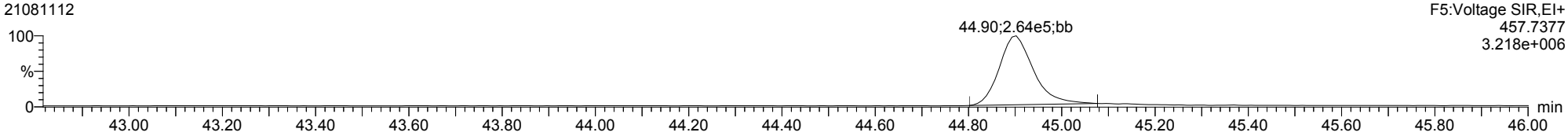
OCDD



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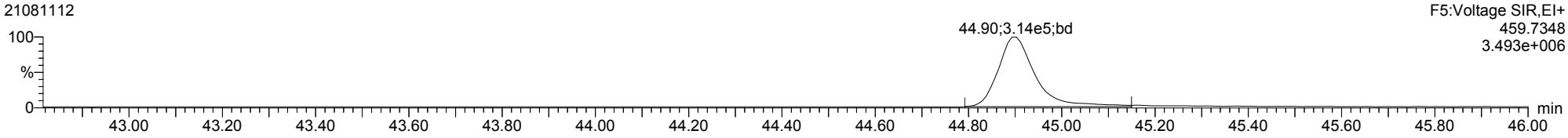

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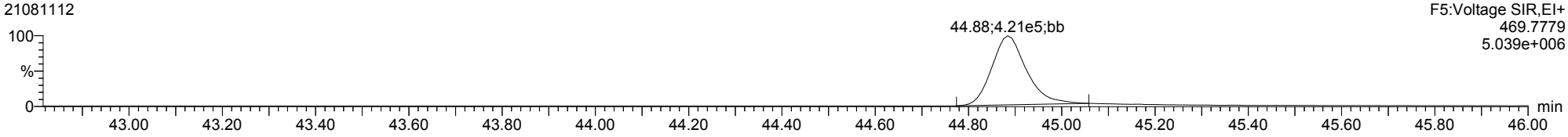

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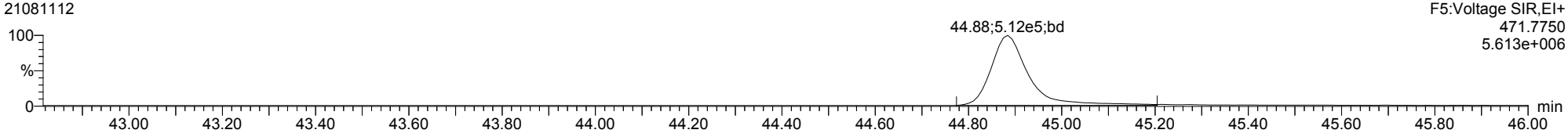
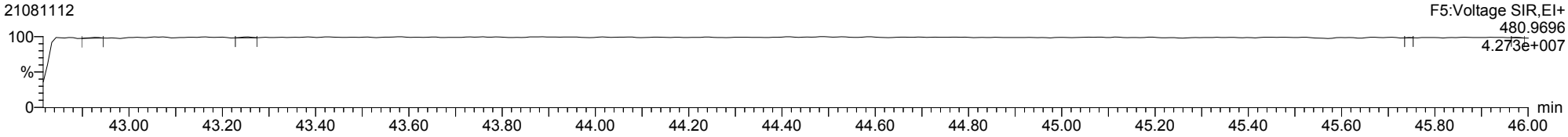


FUNCTION5 PFK



ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

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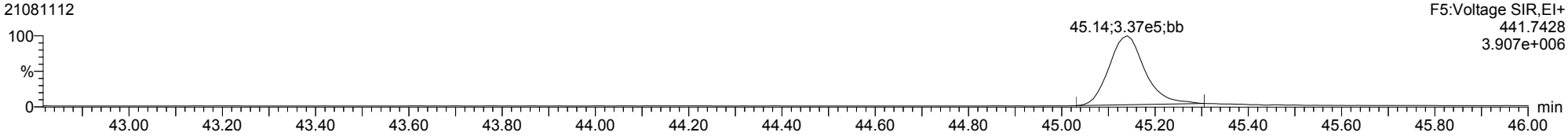

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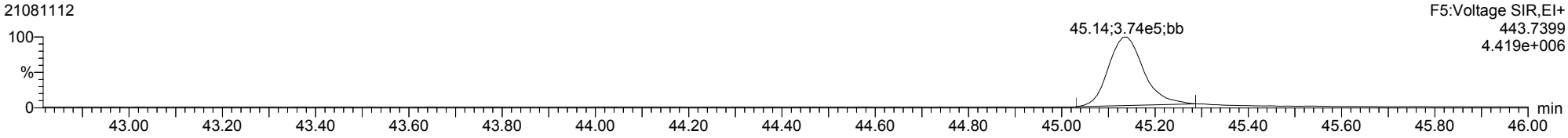
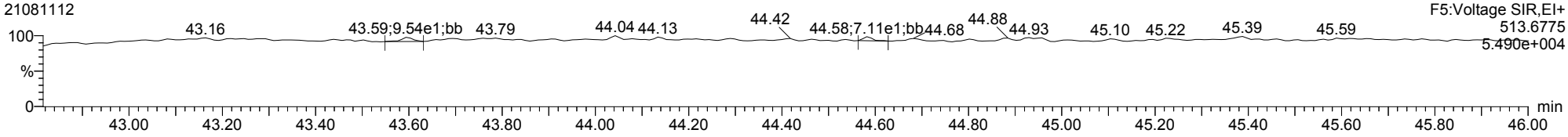


FUNCTION5 DCDPE



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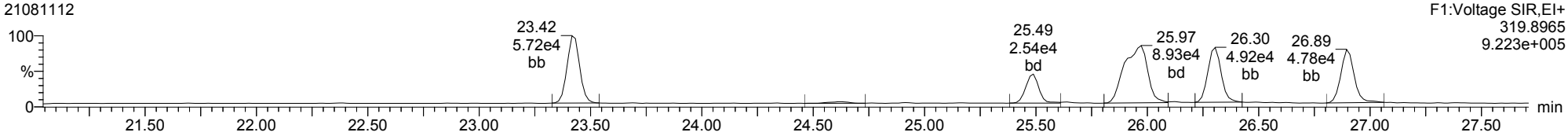
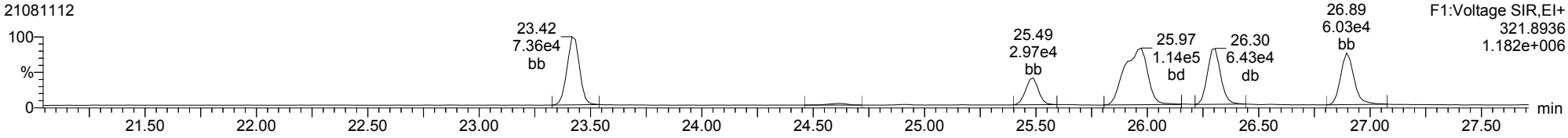
Total-tetradioxins



Total-tetradioxins



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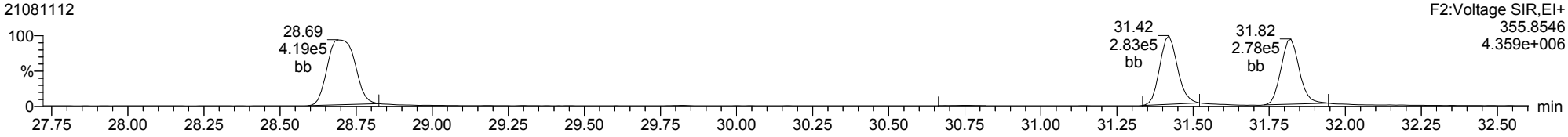
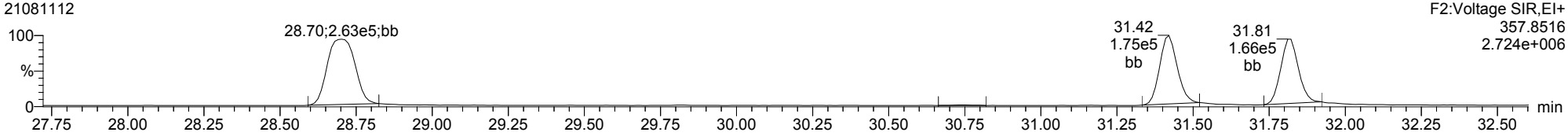
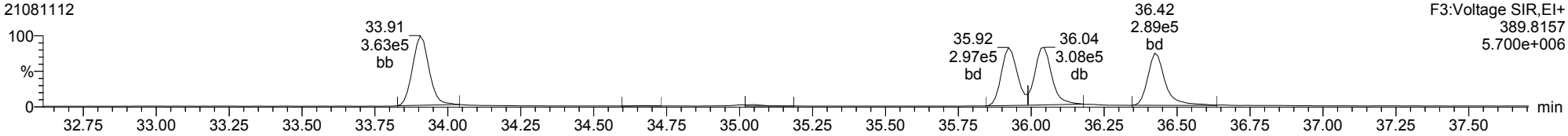


Total-pentadioxins



ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

Total-hexadioxins



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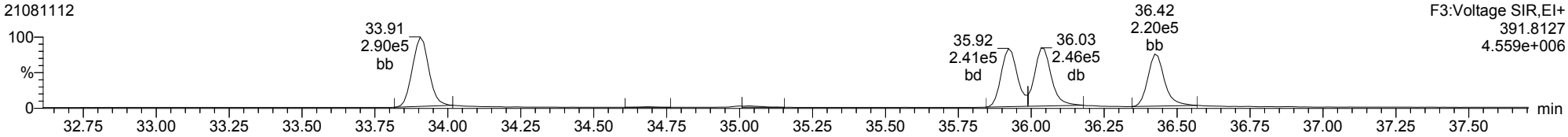
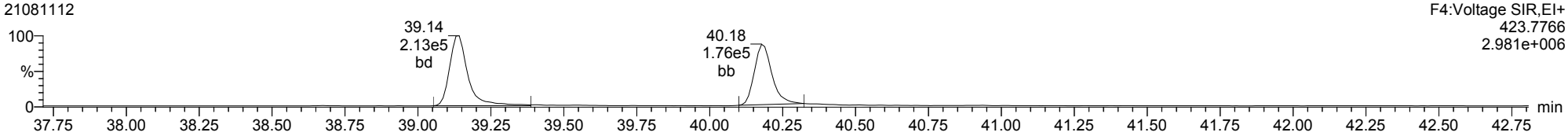


Total-heptadioxins



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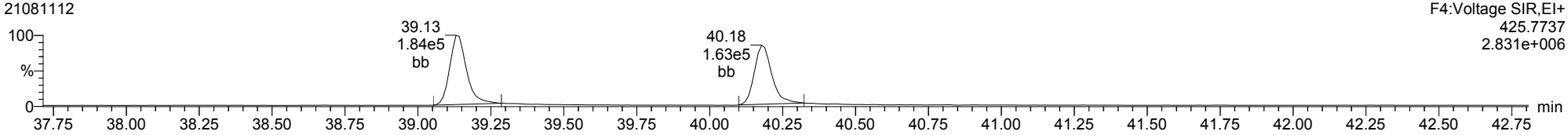
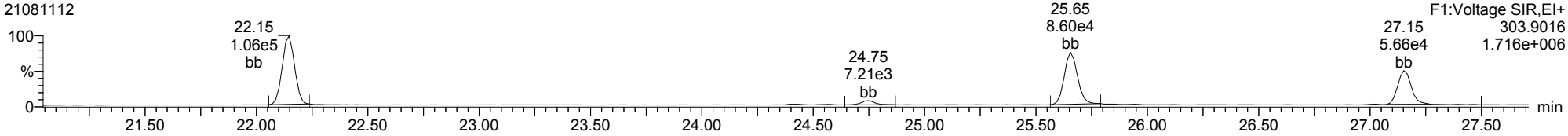


ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

Total-tetrafurans



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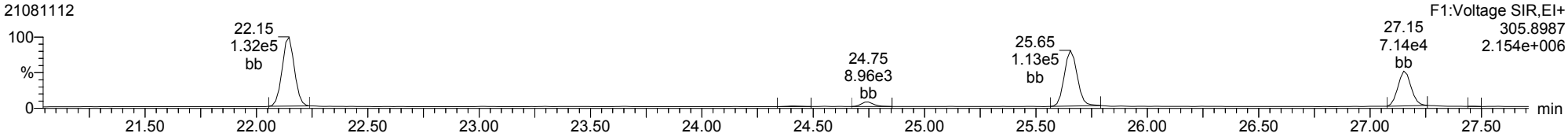

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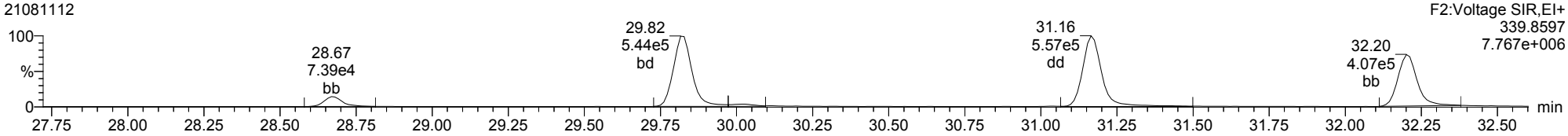

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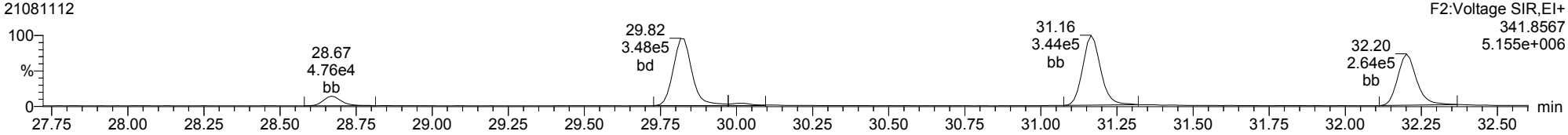

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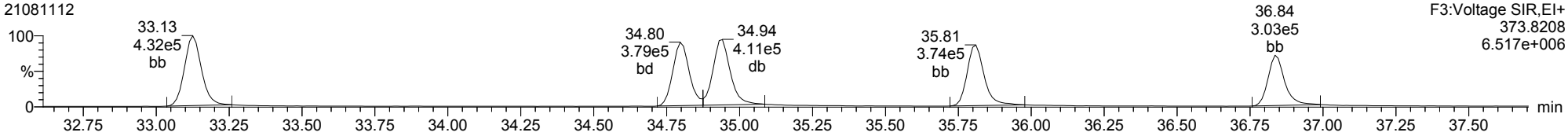
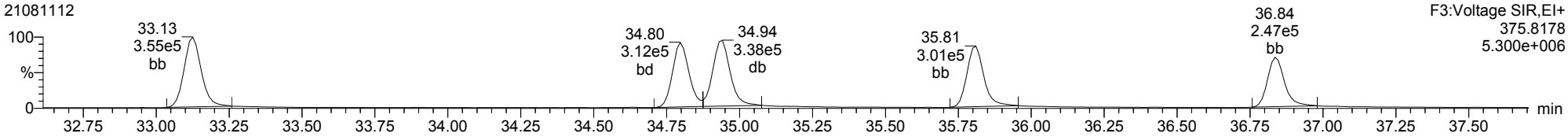
Last Altered: Friday, August 13, 2021 13:47:27 Pacific Daylight Time
Printed: Friday, August 13, 2021 13:51:56 Pacific Daylight Time

ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

Total-hexafurans



Total-hexafurans



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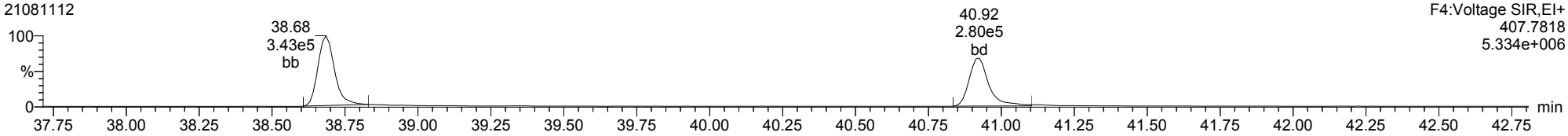
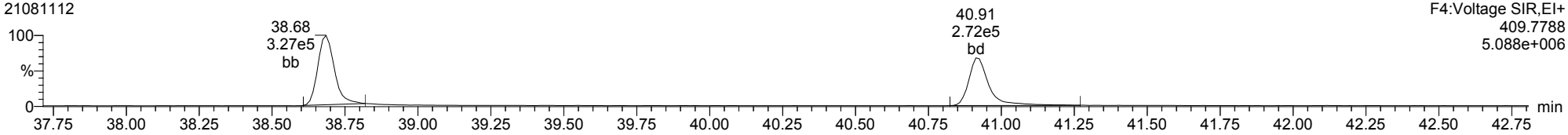


Total-heptafurans



Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 1613B

Laboratory: Analytical Resources, Inc.
SDG: 21G0111
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Calibration: UNASSIGNED
Laboratory ID: SJH0117-SCV1
Sequence: SJH0117
Standard ID: G001361

ANALYTE	EXPECTED (ng/mL)	FOUND (ng/mL)	% DRIFT	QC LIMIT
OCDF	100.00	105	5.4	
OCDD	100.00	105	5.0	
13C12-2,3,7,8-TCDF	100.00	102	1.7	
13C12-2,3,7,8-TCDD	100.00	81.6	-18.4	
13C12-1,2,3,7,8-PeCDF	100.00	105	4.8	
13C12-2,3,4,7,8-PeCDF	100.00	104	4.3	
13C12-1,2,3,7,8-PeCDD	100.00	98.4	-1.6	
13C12-1,2,3,4,7,8-HxCDF	100.00	116	15.9	
13C12-1,2,3,6,7,8-HxCDF	100.00	119	19.4	
13C12-2,3,4,6,7,8-HxCDF	100.00	109	8.8	
13C12-1,2,3,7,8,9-HxCDF	100.00	113	13.2	
13C12-1,2,3,4,7,8-HxCDD	100.00	114	14.1	
13C12-1,2,3,6,7,8-HxCDD	100.00	119	19.5	
13C12-1,2,3,4,6,7,8-HpCDF	100.00	114	13.7	
13C12-1,2,3,4,7,8,9-HpCDF	100.00	110	9.8	
13C12-1,2,3,4,6,7,8-HpCDD	100.00	110	10.5	
13C12-OCDD	200.00	212	5.9	
37Cl4-2,3,7,8-TCDD	10.000	10.4	4.0	

* Values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210811ICVIH.qld
Last Altered: Friday, August 13, 2021 13:47:27 Pacific Daylight Time
Printed: Friday, August 13, 2021 13:51:56 Pacific Daylight Time

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
2378-TCDF	25.655	1.001	8.598e4	1.128e5	1.108	0.762	0.770	1727	2357	1.26e6	1.68e6	728.4	713.0	NO	bb	bb	10.110
12378-PeCDF	29.816	1.000	5.436e5	3.483e5	1.015	1.561	1.550	6428	5298	7.67e6	4.88e6	1193.2	921.9	NO	bd	bd	52.831
23478-PeCDF	31.165	1.001	5.567e5	3.442e5	1.126	1.617	1.550	6428	5298	7.71e6	5.06e6	1200.0	955.7	NO	dd	bb	50.709
123478-HxCDF	34.797	1.000	3.790e5	3.119e5	1.017	1.215	1.240	6025	4489	5.81e6	4.80e6	963.5	1070.0	NO	bd	bd	54.003
234678-HxCDF	35.810	1.001	3.741e5	3.010e5	1.052	1.243	1.240	6025	4489	5.56e6	4.51e6	922.2	1004.3	NO	bb	bb	55.515
123678-HxCDF	34.941	1.001	4.107e5	3.376e5	1.037	1.217	1.240	6025	4489	5.99e6	4.89e6	994.0	1090.0	NO	db	db	51.475
123789-HxCDF	36.835	1.000	3.029e5	2.474e5	1.030	1.224	1.240	6025	4489	4.62e6	3.69e6	767.5	821.7	NO	bb	bb	53.582
1234678-HpCDF	38.685	1.000	3.428e5	3.268e5	1.327	1.049	1.050	5528	5142	5.22e6	4.97e6	945.1	966.6	NO	bb	bb	54.784
1234789-HpCDF	40.924	1.000	2.799e5	2.719e5	1.283	1.029	1.050	5528	5142	3.60e6	3.43e6	650.7	667.0	NO	bd	bd	59.145
OCDF	45.140	1.006	3.368e5	3.743e5	1.447	0.900	0.890	5198	2808	3.79e6	4.27e6	729.8	1522.4	NO	bb	bb	105.415
2378-TCDD	26.305	1.001	4.924e4	6.425e4	0.920	0.766	0.770	2440	1603	7.12e5	9.28e5	291.6	579.2	NO	bb	db	11.057
12378-PeCDD	31.421	1.001	2.834e5	1.748e5	0.995	1.621	1.550	4032	3115	4.22e6	2.62e6	1046.5	841.2	NO	bb	bb	52.211
123478-HxCDD	35.922	1.000	2.965e5	2.407e5	1.027	1.232	1.240	4241	3010	4.65e6	3.73e6	1096.7	1237.9	NO	bd	bd	54.629
123678-HxCDD	36.044	1.001	3.082e5	2.464e5	1.009	1.251	1.240	4241	3010	4.61e6	3.72e6	1085.9	1237.1	NO	db	db	50.555
123789-HxCDD	36.423	1.011	2.887e5	2.199e5	0.950	1.313	1.240	4241	3010	4.19e6	3.34e6	989.1	1108.9	NO	bd	bb	52.339
1234678-HpCDD	40.178	1.000	1.757e5	1.625e5	1.068	1.081	1.050	3111	3083	2.53e6	2.35e6	814.6	763.1	NO	bb	bb	51.865
OCDD	44.903	1.000	2.642e5	3.138e5	1.181	0.842	0.890	2972	3108	3.12e6	3.44e6	1050.3	1105.9	NO	bb	bd	104.997
13C-2378-TCDF	25.640	1.007	7.798e5	9.953e5	1.427	0.784	0.770	3469	3089	1.16e7	1.43e7	3339.4	4613.3	NO	bb	bb	101.689
13C-12378-PeCDF	29.806	1.171	1.051e6	6.125e5	1.297	1.716	1.550	4922	3645	1.42e7	8.62e6	2881.8	2364.6	NO	bd	bb	104.785
13C-23478-PeCDF	31.142	1.223	9.754e5	6.030e5	1.236	1.617	1.550	4922	3645	1.41e7	8.69e6	2860.8	2384.9	NO	bb	bb	104.321
13C-123478-HxCDF	34.785	0.955	4.274e5	8.307e5	1.242	0.514	0.510	5265	6298	6.41e6	1.24e7	1218.4	1973.2	NO	bd	bd	115.885
13C-123678-HxCDF	34.919	0.959	4.860e5	9.161e5	1.343	0.530	0.510	5265	6298	7.00e6	1.35e7	1330.1	2144.5	NO	db	db	119.442
13C-234678-HxCDF	35.788	0.983	3.967e5	7.587e5	1.215	0.523	0.510	5265	6298	5.75e6	1.13e7	1091.4	1799.0	NO	bb	bb	108.848
13C-123789-HxCDF	36.824	1.011	3.447e5	6.522e5	1.008	0.529	0.510	5265	6298	5.11e6	9.81e6	969.9	1558.1	NO	bb	bb	113.229
13C-1234678-HpCDF	38.674	1.062	3.005e5	6.203e5	0.926	0.484	0.440	3480	6125	4.35e6	9.34e6	1249.4	1525.5	NO	bd	bb	113.744
13C-1234789-HpCDF	40.902	1.123	2.223e5	5.047e5	0.758	0.440	0.440	3480	6125	2.90e6	6.30e6	833.4	1029.2	NO	bb	bb	109.773
13C-1234-TCDD	25.458	0.000	5.298e5	6.938e5	1.000	0.764	0.770	5513	2305	7.87e6	1.03e7	1428.2	4481.1	NO	bb	bb	100.000
13C-2378-TCDD	26.275	1.032	4.826e5	6.328e5	1.116	0.763	0.770	5513	2305	7.09e6	9.32e6	1285.5	4044.7	NO	bb	bb	81.637
13C-12378-PeCDD	31.399	1.233	5.423e5	3.395e5	0.732	1.598	1.550	2388	2135	7.53e6	4.95e6	3154.4	2319.5	NO	bb	bb	98.449
13C-123478-HxCDD	35.911	0.986	5.361e5	4.211e5	0.960	1.273	1.240	3574	5521	8.65e6	6.70e6	2421.3	1213.6	NO	bd	bd	114.124
13C-123678-HxCDD	36.022	0.989	6.017e5	4.857e5	1.041	1.239	1.240	3574	5521	9.06e6	7.24e6	2535.4	1311.0	NO	db	db	119.499
13C-1234678-HpCDD	40.167	1.103	3.074e5	3.031e5	0.632	1.014	1.050	3260	2760	4.30e6	4.19e6	1318.4	1519.0	NO	bb	bb	110.470
13C-OCDD	44.884	1.233	4.208e5	5.116e5	0.504	0.822	0.890	2744	3477	4.92e6	5.55e6	1792.3	1596.9	NO	bb	bd	211.835
13C-123789-HxCDD	36.412	0.000	4.843e5	3.895e5	1.000	1.243	1.240	3574	5521	7.18e6	5.79e6	2010.2	1047.9	NO	bb	bb	100.000
37CL-2378-TCDD	26.305	1.033	1.379e5		1.084			1849		1.90e6		1029.2			bd		10.397

Dataset: T:\Autospec\Processed Data Batch\210811ICVIH.qld
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ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
1368-TCDF	22.147	0.864	1.063e5	1.324e5	1.425	0.802	0.770	1727	2357	1.66e6	2.09e6	959.0	886.5	NO	bb	bb	9.436
1289-TCDF	27.152	1.059	5.661e4	7.137e4	1.043	0.793	0.770	1727	2357	8.15e5	1.06e6	472.0	447.8	NO	bb	bb	6.913
13468-PECDF	27.015	0.906	5.743e5	3.714e5	1.376	1.546	1.550	1557	1759	8.45e6	5.45e6	5425.9	3099.7	NO	bb	bb	41.310
12389-PECDF	32.201	1.080	4.075e5	2.638e5	1.000	1.544	1.550	6428	5298	5.63e6	3.72e6	875.5	702.7	NO	bb	bb	40.376
123468-HXCDF	33.125	0.952	4.315e5	3.546e5	1.087	1.217	1.240	6025	4489	6.40e6	5.20e6	1061.8	1158.1	NO	bb	bb	57.507
1368-TCDD	23.417	0.891	5.716e4	7.362e4	0.923	0.776	0.770	2440	1603	8.73e5	1.13e6	357.6	706.6	NO	bb	bb	12.700
1289-TCDD	26.895	1.024	4.776e4	6.026e4	0.794	0.793	0.770	2440	1603	6.91e5	8.63e5	283.1	538.1	NO	bb	bb	12.197
12479-PECDD	28.691	0.914	4.186e5	2.632e5	1.843	1.590	1.550	4032	3115	3.99e6	2.51e6	988.7	804.5	NO	bb	bb	41.945
12389-PECDD	31.822	1.013	2.780e5	1.664e5	1.154	1.671	1.550	4032	3115	4.00e6	2.46e6	992.1	791.3	NO	bb	bb	43.683
124679-HXCDD	33.905	0.944	3.632e5	2.896e5	1.125	1.254	1.240	4241	3010	5.57e6	4.44e6	1314.1	1475.1	NO	bb	bb	60.629
1234679-HPCDD	39.141	0.975	2.129e5	1.840e5	1.211	1.157	1.050	3111	3083	2.93e6	2.75e6	941.5	893.1	NO	bd	bb	53.689
Total-tetrafurans			2.574e5		1.192			1727		3.86e6							27.363
Total-penta1			5.743e5					1557		8.45e6							41.310
Total-pentafurans			1.602e6		1.047			6428		2.23e7							153.079
Total-hexafurans			1.898e6		1.045			6025		2.84e7							272.082
Total-heptafurans			6.227e5		1.305			5528		8.82e6							113.929
Total-Furans			5.291e6		1.158			1727		7.56e7							713.177
Total-tetradioxins			2.709e5		0.879			2440		3.41e6							62.800
Total-pentadioxins			9.817e5		1.331			4032		1.22e7							138.087
Total-hexadioxins			1.266e6		1.028			4241		1.92e7							219.741
Total-heptadioxins			3.886e5		1.140			3111		5.46e6							105.554
Total-Dioxins			3.171e6		1.092			2440		4.34e7							631.178
Total-TEQ			8.462e6					2440		1.19e8							1344.355
FUNCTION1 PFK			6.450e7					839971		2.37e8							
FUNCTION2 PFK			0.000e0					483349		0.00e0							
FUNCTION3 PFK			5.184e7					675979		4.54e8							0.000
FUNCTION4 PFK			3.964e5					425264		1.39e7							
FUNCTION5 PFK			3.414e4					345829		1.67e6							
FUNCTION1 HXCD...			2.903e3					1258		5.64e4							0.000
FUNCTION1 HPCD...			2.863e3					1421		5.44e4							0.000
FUNCTION2 HPCD...			2.720e3					1471		5.70e4							0.000
FUNCTION3 OCDPE			1.392e3					890		2.72e4							0.000
FUNCTION4 NCDPE			1.187e3					1520		2.23e4							0.000
FUNCTION5 DCDPE			1.665e2					1065		6.42e3							0.000

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Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

TF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDF	27.15	5.661e4	7.137e4	1.043	0.79	0.77	472.0	YES	NO	bb	bb	6.913
2	2378-TCDF	25.65	8.598e4	1.128e5	1.108	0.76	0.77	728.4	YES	NO	bb	bb	10.110
3	Total-tetrafurans	24.75	7.210e3	8.958e3	1.192	0.80	0.77	60.0	YES	NO	bb	bb	0.764
4	Total-tetrafurans	24.42	1.138e3	1.365e3	1.192	0.83	0.77	9.8	YES	NO	bb	bb	0.118
5	1368-TCDF	22.15	1.063e5	1.324e5	1.425	0.80	0.77	959.0	YES	NO	bb	bb	9.436
6	Total-tetrafurans	27.47	1.965e2	2.354e2	1.192	0.83	0.77	3.7	YES	NO	db	bb	0.020

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	13468-PECDF	27.02	5.743e5	3.714e5	1.376	1.55	1.55	5425.9	YES	NO	bb	bb	41.310

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-pentafurans	28.67	7.393e4	4.763e4	1.047	1.55	1.55	167.4	YES	NO	bb	bb	7.165
2	12389-PECDF	32.20	4.075e5	2.638e5	1.000	1.54	1.55	875.5	YES	NO	bb	bb	40.376
3	23478-PeCDF	31.16	5.567e5	3.442e5	1.126	1.62	1.55	1200.0	YES	NO	dd	bb	50.709
4	Total-pentafurans	30.02	2.035e4	1.353e4	1.047	1.50	1.55	37.7	YES	NO	dd	dd	1.997
5	12378-PeCDF	29.82	5.436e5	3.483e5	1.015	1.56	1.55	1193.2	YES	NO	bd	bd	52.831

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123468-HXCDF	33.13	4.315e5	3.546e5	1.087	1.22	1.24	1061.8	YES	NO	bb	bb	57.507
2	123789-HxCDF	36.84	3.029e5	2.474e5	1.030	1.22	1.24	767.5	YES	NO	bb	bb	53.582
3	234678-HxCDF	35.81	3.741e5	3.010e5	1.052	1.24	1.24	922.2	YES	NO	bb	bb	55.515
4	123678-HxCDF	34.94	4.107e5	3.376e5	1.037	1.22	1.24	994.0	YES	NO	db	db	51.475
5	123478-HxCDF	34.80	3.790e5	3.119e5	1.017	1.22	1.24	963.5	YES	NO	bd	bd	54.003

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDF	38.68	3.428e5	3.268e5	1.327	1.05	1.05	945.1	YES	NO	bb	bb	54.784
2	1234789-HpCDF	40.92	2.799e5	2.719e5	1.283	1.03	1.05	650.7	YES	NO	bd	bd	59.145

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Furans,TF,PP,PF,HF,HPF,OF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDF	27.15	5.661e4	7.137e4	1.043	0.79	0.77	472.0	YES	NO	bb	bb	6.913
2	2378-TCDF	25.65	8.598e4	1.128e5	1.108	0.76	0.77	728.4	YES	NO	bb	bb	10.110
3	Total-tetrafurans	24.75	7.210e3	8.958e3	1.192	0.80	0.77	60.0	YES	NO	bb	bb	0.764
4	Total-tetrafurans	24.42	1.138e3	1.365e3	1.192	0.83	0.77	9.8	YES	NO	bb	bb	0.118
5	1368-TCDF	22.15	1.063e5	1.324e5	1.425	0.80	0.77	959.0	YES	NO	bb	bb	9.436
6	Total-tetrafurans	27.47	1.965e2	2.354e2	1.192	0.83	0.77	3.7	YES	NO	db	bb	0.020
7	Total-pentafurans	28.67	7.393e4	4.763e4	1.047	1.55	1.55	167.4	YES	NO	bb	bb	7.165
8	12389-PECDF	32.20	4.075e5	2.638e5	1.000	1.54	1.55	875.5	YES	NO	bb	bb	40.376
9	23478-PeCDF	31.16	5.567e5	3.442e5	1.126	1.62	1.55	1200.0	YES	NO	dd	bb	50.709
10	Total-pentafurans	30.02	2.035e4	1.353e4	1.047	1.50	1.55	37.7	YES	NO	dd	dd	1.997
11	12378-PeCDF	29.82	5.436e5	3.483e5	1.015	1.56	1.55	1193.2	YES	NO	bd	bd	52.831
12	123468-HXCDF	33.13	4.315e5	3.546e5	1.087	1.22	1.24	1061.8	YES	NO	bb	bb	57.507
13	123789-HxCDF	36.84	3.029e5	2.474e5	1.030	1.22	1.24	767.5	YES	NO	bb	bb	53.582
14	234678-HxCDF	35.81	3.741e5	3.010e5	1.052	1.24	1.24	922.2	YES	NO	bb	bb	55.515
15	123678-HxCDF	34.94	4.107e5	3.376e5	1.037	1.22	1.24	994.0	YES	NO	db	db	51.475
16	123478-HxCDF	34.80	3.790e5	3.119e5	1.017	1.22	1.24	963.5	YES	NO	bd	bd	54.003
17	1234678-HpCDF	38.68	3.428e5	3.268e5	1.327	1.05	1.05	945.1	YES	NO	bb	bb	54.784
18	1234789-HpCDF	40.92	2.799e5	2.719e5	1.283	1.03	1.05	650.7	YES	NO	bd	bd	59.145
19	OCDF	45.14	3.368e5	3.743e5	1.447	0.90	0.89	729.8	YES	NO	bb	bb	105.415
20	13468-PECDF	27.02	5.743e5	3.714e5	1.376	1.55	1.55	5425.9	YES	NO	bb	bb	41.310

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetradioxins	25.97	8.932e4	1.141e5	0.879	0.78	0.77	303.9	YES	NO	bd	bd	20.744
2	Total-tetradioxins	25.49	2.543e4	2.972e4	0.879	0.86	0.77	154.2	YES	NO	bd	bb	5.625
3	Total-tetradioxins	24.63	2.020e3	2.647e3	0.879	0.76	0.77	8.0	YES	NO	bd	bb	0.476
4	1368-TCDD	23.42	5.716e4	7.362e4	0.923	0.78	0.77	357.6	YES	NO	bb	bb	12.700
5	1289-TCDD	26.89	4.776e4	6.026e4	0.794	0.79	0.77	283.1	YES	NO	bb	bb	12.197
6	2378-TCDD	26.30	4.924e4	6.425e4	0.920	0.77	0.77	291.6	YES	NO	bb	db	11.057

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PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	12389-PECDD	31.82	2.780e5	1.664e5	1.154	1.67	1.55	992.1	YES	NO	bb	bb	43.683
2	12378-PeCDD	31.42	2.834e5	1.748e5	0.995	1.62	1.55	1046.5	YES	NO	bb	bb	52.211
3	Total-pentadioxins	30.75	1.739e3	1.177e3	1.331	1.48	1.55	6.0	YES	NO	bb	bb	0.249
4	12479-PECDD	28.69	4.186e5	2.632e5	1.843	1.59	1.55	988.7	YES	NO	bb	bb	41.945

HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	124679-HXCDD	33.91	3.632e5	2.896e5	1.125	1.25	1.24	1314.1	YES	NO	bb	bb	60.629
2	123789-HxCDD	36.42	2.887e5	2.199e5	0.950	1.31	1.24	989.1	YES	NO	bd	bb	52.339
3	123678-HxCDD	36.04	3.082e5	2.464e5	1.009	1.25	1.24	1085.9	YES	NO	db	db	50.555
4	123478-HxCDD	35.92	2.965e5	2.407e5	1.027	1.23	1.24	1096.7	YES	NO	bd	bd	54.629
5	Total-hexadioxins	35.04	7.156e3	6.136e3	1.028	1.17	1.24	26.9	YES	NO	db	db	1.265
6	Total-hexadioxins	34.67	1.781e3	1.631e3	1.028	1.09	1.24	7.7	YES	NO	bb	bb	0.325

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDD	40.18	1.757e5	1.625e5	1.068	1.08	1.05	814.6	YES	NO	bb	bb	51.865
2	1234679-HPCDD	39.14	2.129e5	1.840e5	1.211	1.16	1.05	941.5	YES	NO	bd	bb	53.689

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ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

Dioxins,TD,PD,HD,HPD,OD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetradioxins	25.97	8.932e4	1.141e5	0.879	0.78	0.77	303.9	YES	NO	bd	bd	20.744
2	Total-tetradioxins	25.49	2.543e4	2.972e4	0.879	0.86	0.77	154.2	YES	NO	bd	bb	5.625
3	Total-tetradioxins	24.63	2.020e3	2.647e3	0.879	0.76	0.77	8.0	YES	NO	bd	bb	0.476
4	1368-TCDD	23.42	5.716e4	7.362e4	0.923	0.78	0.77	357.6	YES	NO	bb	bb	12.700
5	1289-TCDD	26.89	4.776e4	6.026e4	0.794	0.79	0.77	283.1	YES	NO	bb	bb	12.197
6	2378-TCDD	26.30	4.924e4	6.425e4	0.920	0.77	0.77	291.6	YES	NO	bb	db	11.057
7	12389-PECDD	31.82	2.780e5	1.664e5	1.154	1.67	1.55	992.1	YES	NO	bb	bb	43.683
8	12378-PeCDD	31.42	2.834e5	1.748e5	0.995	1.62	1.55	1046.5	YES	NO	bb	bb	52.211
9	Total-pentadioxins	30.75	1.739e3	1.177e3	1.331	1.48	1.55	6.0	YES	NO	bb	bb	0.249
10	12479-PECDD	28.69	4.186e5	2.632e5	1.843	1.59	1.55	988.7	YES	NO	bb	bb	41.945
11	124679-HXCDD	33.91	3.632e5	2.896e5	1.125	1.25	1.24	1314.1	YES	NO	bb	bb	60.629
12	123789-HxCDD	36.42	2.887e5	2.199e5	0.950	1.31	1.24	989.1	YES	NO	bd	bb	52.339
13	123678-HxCDD	36.04	3.082e5	2.464e5	1.009	1.25	1.24	1085.9	YES	NO	db	db	50.555
14	123478-HxCDD	35.92	2.965e5	2.407e5	1.027	1.23	1.24	1096.7	YES	NO	bd	bd	54.629
15	Total-hexadioxins	35.04	7.156e3	6.136e3	1.028	1.17	1.24	26.9	YES	NO	db	db	1.265
16	Total-hexadioxins	34.67	1.781e3	1.631e3	1.028	1.09	1.24	7.7	YES	NO	bb	bb	0.325
17	1234678-HpCDD	40.18	1.757e5	1.625e5	1.068	1.08	1.05	814.6	YES	NO	bb	bb	51.865
18	1234679-HPCDD	39.14	2.129e5	1.840e5	1.211	1.16	1.05	941.5	YES	NO	bd	bb	53.689
19	OCDD	44.90	2.642e5	3.138e5	1.181	0.84	0.89	1050.3	YES	NO	bb	bd	104.997

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TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDF	27.15	5.661e4	7.137e4	1.043	0.79	0.77	472.0	YES	NO	bb	bb	6.913
2	2378-TCDF	25.65	8.598e4	1.128e5	1.108	0.76	0.77	728.4	YES	NO	bb	bb	10.110
3	Total-tetrafurans	24.75	7.210e3	8.958e3	1.192	0.80	0.77	60.0	YES	NO	bb	bb	0.764
4	Total-tetrafurans	24.42	1.138e3	1.365e3	1.192	0.83	0.77	9.8	YES	NO	bb	bb	0.118
5	1368-TCDF	22.15	1.063e5	1.324e5	1.425	0.80	0.77	959.0	YES	NO	bb	bb	9.436
6	Total-tetrafurans	27.47	1.965e2	2.354e2	1.192	0.83	0.77	3.7	YES	NO	db	bb	0.020
7	Total-pentafurans	28.67	7.393e4	4.763e4	1.047	1.55	1.55	167.4	YES	NO	bb	bb	7.165
8	12389-PECDF	32.20	4.075e5	2.638e5	1.000	1.54	1.55	875.5	YES	NO	bb	bb	40.376
9	23478-PeCDF	31.16	5.567e5	3.442e5	1.126	1.62	1.55	1200.0	YES	NO	dd	bb	50.709
10	Total-pentafurans	30.02	2.035e4	1.353e4	1.047	1.50	1.55	37.7	YES	NO	dd	dd	1.997
11	12378-PeCDF	29.82	5.436e5	3.483e5	1.015	1.56	1.55	1193.2	YES	NO	bd	bd	52.831
12	123468-HXCDF	33.13	4.315e5	3.546e5	1.087	1.22	1.24	1061.8	YES	NO	bb	bb	57.507
13	123789-HxCDF	36.84	3.029e5	2.474e5	1.030	1.22	1.24	767.5	YES	NO	bb	bb	53.582
14	234678-HxCDF	35.81	3.741e5	3.010e5	1.052	1.24	1.24	922.2	YES	NO	bb	bb	55.515
15	123678-HxCDF	34.94	4.107e5	3.376e5	1.037	1.22	1.24	994.0	YES	NO	db	db	51.475
16	123478-HxCDF	34.80	3.790e5	3.119e5	1.017	1.22	1.24	963.5	YES	NO	bd	bd	54.003
17	1234678-HpCDF	38.68	3.428e5	3.268e5	1.327	1.05	1.05	945.1	YES	NO	bb	bb	54.784
18	1234789-HpCDF	40.92	2.799e5	2.719e5	1.283	1.03	1.05	650.7	YES	NO	bd	bd	59.145
19	OCDF	45.14	3.368e5	3.743e5	1.447	0.90	0.89	729.8	YES	NO	bb	bb	105.415
20	13468-PECDF	27.02	5.743e5	3.714e5	1.376	1.55	1.55	5425.9	YES	NO	bb	bb	41.310
21	Total-tetradioxins	25.97	8.932e4	1.141e5	0.879	0.78	0.77	303.9	YES	NO	bd	bd	20.744
22	Total-tetradioxins	25.49	2.543e4	2.972e4	0.879	0.86	0.77	154.2	YES	NO	bd	bb	5.625
23	Total-tetradioxins	24.63	2.020e3	2.647e3	0.879	0.76	0.77	8.0	YES	NO	bd	bb	0.476
24	1368-TCDD	23.42	5.716e4	7.362e4	0.923	0.78	0.77	357.6	YES	NO	bb	bb	12.700
25	1289-TCDD	26.89	4.776e4	6.026e4	0.794	0.79	0.77	283.1	YES	NO	bb	bb	12.197
26	2378-TCDD	26.30	4.924e4	6.425e4	0.920	0.77	0.77	291.6	YES	NO	bb	db	11.057
27	12389-PECDD	31.82	2.780e5	1.664e5	1.154	1.67	1.55	992.1	YES	NO	bb	bb	43.683
28	12378-PeCDD	31.42	2.834e5	1.748e5	0.995	1.62	1.55	1046.5	YES	NO	bb	bb	52.211
29	Total-pentadioxins	30.75	1.739e3	1.177e3	1.331	1.48	1.55	6.0	YES	NO	bb	bb	0.249
30	12479-PECDD	28.69	4.186e5	2.632e5	1.843	1.59	1.55	988.7	YES	NO	bb	bb	41.945
31	124679-HXCDD	33.91	3.632e5	2.896e5	1.125	1.25	1.24	1314.1	YES	NO	bb	bb	60.629
32	123789-HxCDD	36.42	2.887e5	2.199e5	0.950	1.31	1.24	989.1	YES	NO	bd	bb	52.339
33	123678-HxCDD	36.04	3.082e5	2.464e5	1.009	1.25	1.24	1085.9	YES	NO	db	db	50.555
34	123478-HxCDD	35.92	2.965e5	2.407e5	1.027	1.23	1.24	1096.7	YES	NO	bd	bd	54.629
35	Total-hexadioxins	35.04	7.156e3	6.136e3	1.028	1.17	1.24	26.9	YES	NO	db	db	1.265
36	Total-hexadioxins	34.67	1.781e3	1.631e3	1.028	1.09	1.24	7.7	YES	NO	bb	bb	0.325
37	1234678-HpCDD	40.18	1.757e5	1.625e5	1.068	1.08	1.05	814.6	YES	NO	bb	bb	51.865

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TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	1234679-HPCDD	39.14	2.129e5	1.840e5	1.211	1.16	1.05	941.5	YES	NO	bd	bb	53.689
39	OCDD	44.90	2.642e5	3.138e5	1.181	0.84	0.89	1050.3	YES	NO	bb	bd	104.997

PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	22.34	1.094e7					29.2	YES		db		
2	FUNCTION1 PFK	22.07	1.938e7					38.3	YES		dd		
3	FUNCTION1 PFK	21.38	2.077e7					61.6	YES		dd		
4	FUNCTION1 PFK	21.25	7.452e6					64.7	YES		dd		
5	FUNCTION1 PFK	21.10	5.199e6					69.3	YES		bd		
6	FUNCTION1 PFK	27.62	5.202e4					1.5	NO		bb		
7	FUNCTION1 PFK	26.61	3.088e4					1.4	NO		bb		
8	FUNCTION1 PFK	26.53	3.772e4					1.3	NO		bb		
9	FUNCTION1 PFK	26.21	4.215e4					1.3	NO		bb		
10	FUNCTION1 PFK	26.14	2.091e4					0.7	NO		bb		
11	FUNCTION1 PFK	25.90	2.782e4					1.0	NO		bb		
12	FUNCTION1 PFK	25.64	2.244e4					0.9	NO		bb		
13	FUNCTION1 PFK	25.38	4.475e4					1.3	NO		bb		
14	FUNCTION1 PFK	25.32	8.085e4					1.5	NO		bb		
15	FUNCTION1 PFK	25.10	6.333e4					1.7	NO		db		
16	FUNCTION1 PFK	24.94	2.192e5					2.0	NO		dd		
17	FUNCTION1 PFK	24.82	2.857e4					1.1	NO		bd		
18	FUNCTION1 PFK	24.63	2.787e4					1.0	NO		bb		
19	FUNCTION1 PFK	24.35	1.463e4					0.7	NO		bb		
20	FUNCTION1 PFK	23.43	4.951e4					1.7	NO		bb		

PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

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PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 PFK	34.47	2.892e5					8.3	YES		dd		0.000
2	FUNCTION3 PFK	34.42	3.441e5					9.9	YES		dd		0.000
3	FUNCTION3 PFK	34.30	9.123e5					14.6	YES		dd		0.000
4	FUNCTION3 PFK	33.96	4.870e6					27.1	YES		dd		0.000
5	FUNCTION3 PFK	33.92	6.208e5					27.9	YES		dd		0.000
6	FUNCTION3 PFK	33.75	6.775e6					34.2	YES		dd		0.000
7	FUNCTION3 PFK	33.58	8.843e5					39.8	YES		dd		0.000
8	FUNCTION3 PFK	33.52	4.828e6					42.2	YES		dd		0.000
9	FUNCTION3 PFK	33.37	2.844e6					47.3	YES		dd		0.000
10	FUNCTION3 PFK	33.18	5.432e6					54.3	YES		dd		0.000
11	FUNCTION3 PFK	33.04	5.575e6					59.2	YES		dd		0.000
12	FUNCTION3 PFK	32.95	3.680e6					62.9	YES		dd		0.000
13	FUNCTION3 PFK	32.86	7.904e6					65.6	YES		dd		0.000
14	FUNCTION3 PFK	32.74	1.549e6					69.1	YES		dd		0.000
15	FUNCTION3 PFK	32.67	4.268e6					72.4	YES		bd		0.000
16	FUNCTION3 PFK	36.86	8.449e3					0.3	NO		bb		0.000
17	FUNCTION3 PFK	36.72	6.925e4					2.0	NO		bb		0.000
18	FUNCTION3 PFK	36.59	5.799e4					1.2	NO		bb		0.000
19	FUNCTION3 PFK	36.30	7.563e3					0.7	NO		bb		0.000
20	FUNCTION3 PFK	36.04	6.922e3					0.5	NO		bb		0.000
21	FUNCTION3 PFK	35.83	2.532e4					1.1	NO		bb		0.000
22	FUNCTION3 PFK	35.75	1.516e4					0.9	NO		bb		0.000
23	FUNCTION3 PFK	35.63	1.004e4					0.7	NO		bb		0.000
24	FUNCTION3 PFK	35.33	1.433e4					0.8	NO		bb		0.000
25	FUNCTION3 PFK	35.04	1.089e4					0.6	NO		bb		0.000
26	FUNCTION3 PFK	34.97	5.517e3					0.7	NO		bb		0.000
27	FUNCTION3 PFK	34.89	3.001e4					1.0	NO		bb		0.000
28	FUNCTION3 PFK	34.81	1.594e4					1.0	NO		db		0.000
29	FUNCTION3 PFK	34.76	3.092e4					1.3	NO		bd		0.000
30	FUNCTION3 PFK	34.60	1.659e5					4.5	YES		db		0.000
31	FUNCTION3 PFK	34.53	2.985e5					6.7	YES		dd		0.000
32	FUNCTION3 PFK	37.64	2.742e4					1.1	NO		bb		0.000
33	FUNCTION3 PFK	37.58	2.711e4					1.4	NO		db		0.000
34	FUNCTION3 PFK	37.54	1.758e4					0.9	NO		dd		0.000
35	FUNCTION3 PFK	37.49	3.447e4					1.6	NO		dd		0.000
36	FUNCTION3 PFK	37.45	2.646e4					1.5	NO		dd		0.000
37	FUNCTION3 PFK	37.38	4.745e4					1.5	NO		dd		0.000

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PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	FUNCTION3 PFK	37.34	2.452e4					1.6	NO		bd		0.000
39	FUNCTION3 PFK	37.29	9.653e3					0.8	NO		bb		0.000
40	FUNCTION3 PFK	37.08	5.064e3					0.5	NO		bb		0.000
41	FUNCTION3 PFK	36.98	6.612e4					1.7	NO		bb		0.000

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PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 PFK	38.42	2.469e3					0.5	NO		bb		
2	FUNCTION4 PFK	38.08	2.954e4					1.7	NO		bb		
3	FUNCTION4 PFK	37.98	4.856e4					2.3	NO		db		
4	FUNCTION4 PFK	37.94	3.614e4					2.6	NO		bd		
5	FUNCTION4 PFK	37.85	8.390e3					1.0	NO		bb		
6	FUNCTION4 PFK	40.91	1.035e4					1.0	NO		bb		
7	FUNCTION4 PFK	40.71	1.742e3					0.4	NO		bb		
8	FUNCTION4 PFK	40.68	3.176e3					0.5	NO		bb		
9	FUNCTION4 PFK	40.61	6.362e3					0.7	NO		bb		
10	FUNCTION4 PFK	40.38	7.075e3					0.8	NO		bb		
11	FUNCTION4 PFK	40.32	3.115e4					1.2	NO		bb		
12	FUNCTION4 PFK	39.94	4.461e3					0.6	NO		bb		
13	FUNCTION4 PFK	39.80	5.746e3					0.6	NO		bb		
14	FUNCTION4 PFK	39.51	2.799e3					0.4	NO		bb		
15	FUNCTION4 PFK	39.43	1.949e3					0.4	NO		bb		
16	FUNCTION4 PFK	39.36	2.879e3					0.6	NO		bb		
17	FUNCTION4 PFK	39.32	5.365e3					1.1	NO		bb		
18	FUNCTION4 PFK	39.28	3.621e3					0.8	NO		bb		
19	FUNCTION4 PFK	39.21	1.666e4					1.0	NO		bb		
20	FUNCTION4 PFK	39.07	6.512e3					0.8	NO		bb		
21	FUNCTION4 PFK	38.46	1.263e4					1.2	NO		bb		
22	FUNCTION4 PFK	42.68	1.445e4					0.9	NO		bb		
23	FUNCTION4 PFK	42.62	2.052e4					1.7	NO		bb		
24	FUNCTION4 PFK	42.51	2.321e3					0.5	NO		bb		
25	FUNCTION4 PFK	42.43	3.121e4					1.9	NO		bb		
26	FUNCTION4 PFK	42.18	7.742e3					0.8	NO		bb		
27	FUNCTION4 PFK	42.05	1.748e4					1.2	NO		db		
28	FUNCTION4 PFK	41.97	1.470e4					1.2	NO		bd		
29	FUNCTION4 PFK	41.63	2.487e3					0.5	NO		bb		
30	FUNCTION4 PFK	41.48	1.442e4					1.2	NO		bb		
31	FUNCTION4 PFK	41.24	1.211e4					1.0	NO		bb		
32	FUNCTION4 PFK	41.17	1.136e4					1.2	NO		bb		

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PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	45.97	5.710e3					1.0	NO		bb		
2	FUNCTION5 PFK	45.74	1.859e3					0.6	NO		bb		
3	FUNCTION5 PFK	43.26	1.526e4					1.8	NO		bb		
4	FUNCTION5 PFK	42.93	1.131e4					1.5	NO		bb		

ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	25.35	1.892e2					4.2	YES		db		0.000
2	FUNCTION1 HXCD...	25.23	1.187e2					1.3	NO		bd		0.000
3	FUNCTION1 HXCD...	24.87	7.961e1					1.9	NO		db		0.000
4	FUNCTION1 HXCD...	24.81	1.259e2					2.7	NO		bd		0.000
5	FUNCTION1 HXCD...	24.72	1.584e2					1.4	NO		bb		0.000
6	FUNCTION1 HXCD...	24.40	9.113e1					1.6	NO		bb		0.000
7	FUNCTION1 HXCD...	23.72	7.480e1					1.5	NO		bb		0.000
8	FUNCTION1 HXCD...	23.61	1.381e2					2.9	NO		bb		0.000
9	FUNCTION1 HXCD...	23.11	9.740e1					2.5	NO		bb		0.000
10	FUNCTION1 HXCD...	22.43	1.791e2					2.1	NO		db		0.000
11	FUNCTION1 HXCD...	22.30	7.125e1					1.5	NO		bd		0.000
12	FUNCTION1 HXCD...	22.19	7.195e1					1.3	NO		bb		0.000
13	FUNCTION1 HXCD...	21.98	1.102e2					1.5	NO		db		0.000
14	FUNCTION1 HXCD...	21.89	2.251e2					4.2	YES		bd		0.000
15	FUNCTION1 HXCD...	21.80	1.414e2					2.0	NO		bb		0.000
16	FUNCTION1 HXCD...	27.03	2.453e2					2.4	NO		bb		0.000
17	FUNCTION1 HXCD...	26.29	2.686e2					2.1	NO		db		0.000
18	FUNCTION1 HXCD...	26.12	1.763e2					2.9	NO		dd		0.000
19	FUNCTION1 HXCD...	26.03	9.387e1					1.2	NO		bd		0.000
20	FUNCTION1 HXCD...	25.82	1.399e2					2.0	NO		bb		0.000
21	FUNCTION1 HXCD...	25.46	1.064e2					1.7	NO		bb		0.000

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ETHERS2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HPCD...	22.51	7.992e1					1.4	NO		bb		0.000
2	FUNCTION1 HPCD...	22.07	1.029e2					2.1	NO		bb		0.000
3	FUNCTION1 HPCD...	21.98	1.510e2					1.6	NO		db		0.000
4	FUNCTION1 HPCD...	21.88	1.949e2					3.5	YES		bd		0.000
5	FUNCTION1 HPCD...	21.75	2.528e2					1.8	NO		bb		0.000
6	FUNCTION1 HPCD...	21.47	1.508e2					2.1	NO		bb		0.000
7	FUNCTION1 HPCD...	21.25	1.018e2					1.3	NO		db		0.000
8	FUNCTION1 HPCD...	21.16	1.149e2					1.6	NO		dd		0.000
9	FUNCTION1 HPCD...	21.09	2.200e2					3.0	NO		bd		0.000
10	FUNCTION1 HPCD...	27.00	1.586e2					1.8	NO		bb		0.000
11	FUNCTION1 HPCD...	26.83	9.159e1					0.8	NO		bb		0.000
12	FUNCTION1 HPCD...	26.59	1.663e2					2.5	NO		bb		0.000
13	FUNCTION1 HPCD...	26.32	1.753e2					1.6	NO		db		0.000
14	FUNCTION1 HPCD...	26.14	2.616e2					2.2	NO		bd		0.000
15	FUNCTION1 HPCD...	25.59	8.230e1					1.9	NO		bb		0.000
16	FUNCTION1 HPCD...	25.44	8.713e1					1.0	NO		bb		0.000
17	FUNCTION1 HPCD...	25.16	7.125e1					1.1	NO		db		0.000
18	FUNCTION1 HPCD...	25.05	1.030e2					1.1	NO		bd		0.000
19	FUNCTION1 HPCD...	24.07	1.494e2					2.5	NO		bb		0.000
20	FUNCTION1 HPCD...	23.83	1.478e2					3.3	YES		bb		0.000

ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

ETHERS3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 HPCD...	28.48	1.146e2					2.7	NO		bb		0.000
2	FUNCTION2 HPCD...	28.07	8.040e1					1.2	NO		db		0.000
3	FUNCTION2 HPCD...	27.98	1.117e2					1.5	NO		bd		0.000
4	FUNCTION2 HPCD...	27.82	9.308e1					2.0	NO		bb		0.000
5	FUNCTION2 HPCD...	31.82	1.073e2					1.6	NO		bb		0.000
6	FUNCTION2 HPCD...	31.41	3.440e2					4.0	YES		bb		0.000
7	FUNCTION2 HPCD...	31.18	9.044e1					1.2	NO		db		0.000
8	FUNCTION2 HPCD...	31.11	9.781e1					2.1	NO		dd		0.000
9	FUNCTION2 HPCD...	31.03	7.279e2					8.6	YES		bd		0.000
10	FUNCTION2 HPCD...	30.26	7.257e1					1.3	NO		bb		0.000
11	FUNCTION2 HPCD...	30.21	7.122e1					1.7	NO		db		0.000
12	FUNCTION2 HPCD...	30.14	1.157e2					1.5	NO		dd		0.000
13	FUNCTION2 HPCD...	30.06	7.412e1					1.1	NO		dd		0.000
14	FUNCTION2 HPCD...	29.98	7.219e1					1.2	NO		dd		0.000
15	FUNCTION2 HPCD...	29.91	9.212e1					2.0	NO		bd		0.000
16	FUNCTION2 HPCD...	29.69	7.977e1					1.3	NO		bb		0.000
17	FUNCTION2 HPCD...	29.08	1.408e2					1.5	NO		db		0.000
18	FUNCTION2 HPCD...	28.96	1.497e2					1.4	NO		bd		0.000
19	FUNCTION2 HPCD...	28.71	8.490e1					1.0	NO		bb		0.000

ETHERS4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 OCDPE	37.65	1.580e2					2.6	NO		db		0.000
2	FUNCTION3 OCDPE	37.55	1.150e2					2.8	NO		bd		0.000
3	FUNCTION3 OCDPE	36.42	1.835e2					2.9	NO		bb		0.000
4	FUNCTION3 OCDPE	36.04	2.520e2					4.7	YES		db		0.000
5	FUNCTION3 OCDPE	35.93	1.106e2					3.8	YES		dd		0.000
6	FUNCTION3 OCDPE	35.90	1.018e2					3.4	YES		bd		0.000
7	FUNCTION3 OCDPE	34.40	1.321e2					5.0	YES		bb		0.000
8	FUNCTION3 OCDPE	33.58	1.010e2					2.3	NO		bb		0.000
9	FUNCTION3 OCDPE	32.70	2.382e2					3.1	YES		bb		0.000

ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

ETHERS5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 NCDPE	40.42	7.136e1					0.9	NO		bb		0.000
2	FUNCTION4 NCDPE	40.16	1.641e2					1.6	NO		bb		0.000
3	FUNCTION4 NCDPE	39.69	1.182e2					1.5	NO		bb		0.000
4	FUNCTION4 NCDPE	38.52	1.487e2					1.6	NO		db		0.000
5	FUNCTION4 NCDPE	38.34	2.790e2					2.3	NO		dd		0.000
6	FUNCTION4 NCDPE	38.26	1.556e2					2.2	NO		bd		0.000
7	FUNCTION4 NCDPE	41.34	1.448e2					1.6	NO		bb		0.000
8	FUNCTION4 NCDPE	40.81	1.056e2					2.8	NO		bb		0.000

ETHERS6

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 DCDPE	44.58	7.112e1					3.0	NO		bb		0.000
2	FUNCTION5 DCDPE	43.59	9.542e1					3.1	YES		bb		0.000

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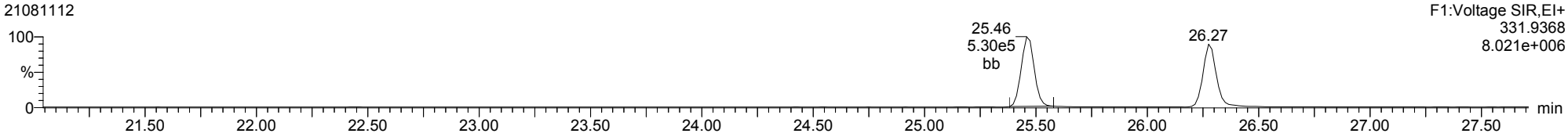
13C-1234-TCDD



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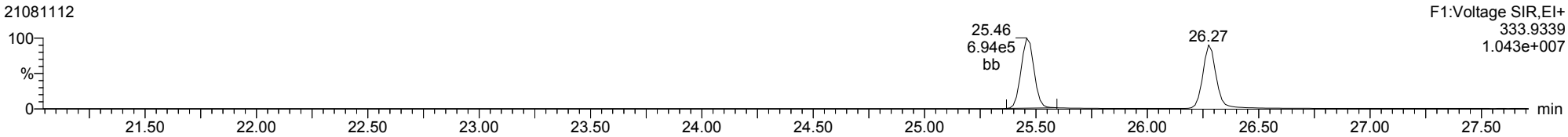

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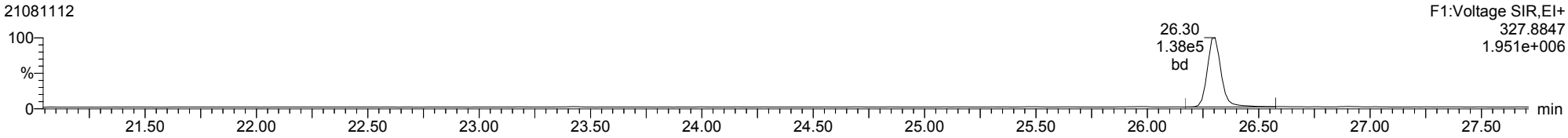

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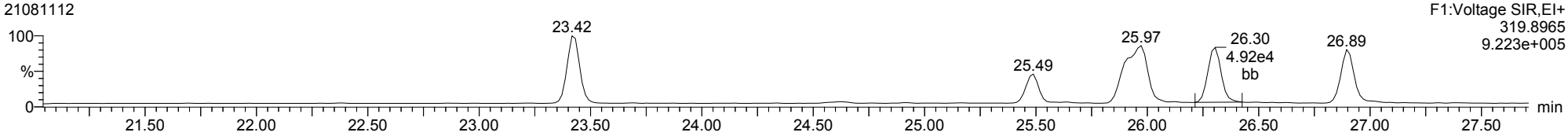

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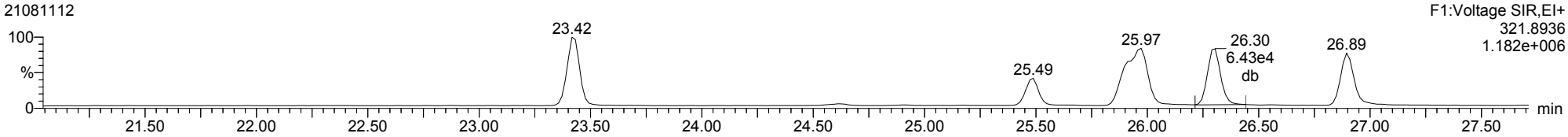

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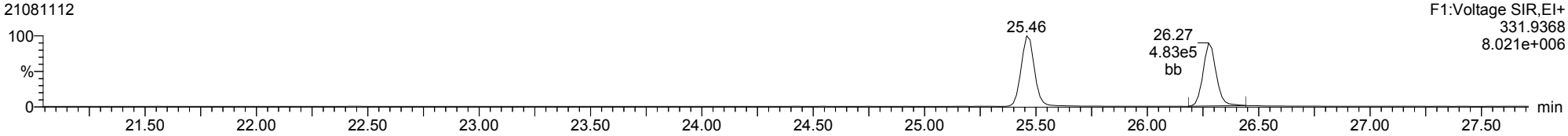

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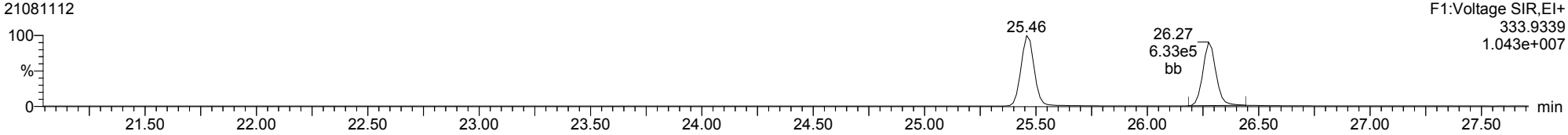

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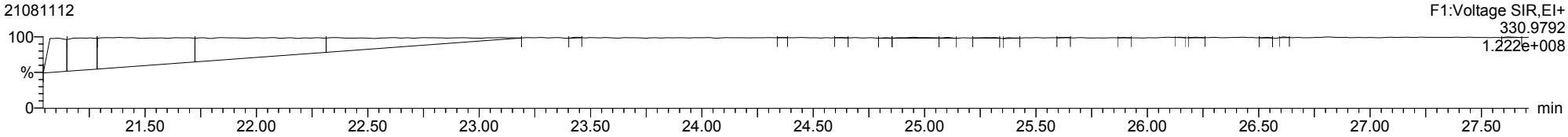

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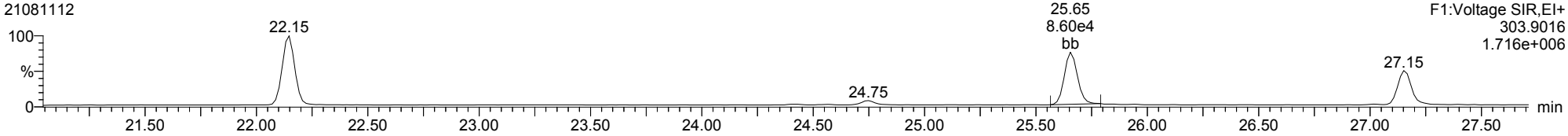
2378-TCDF



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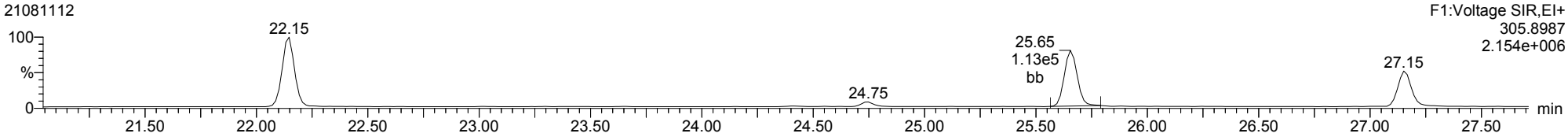

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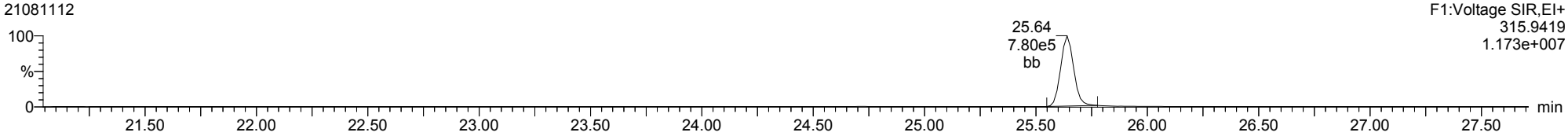

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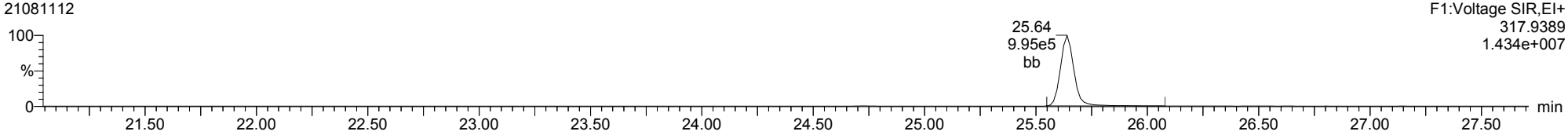

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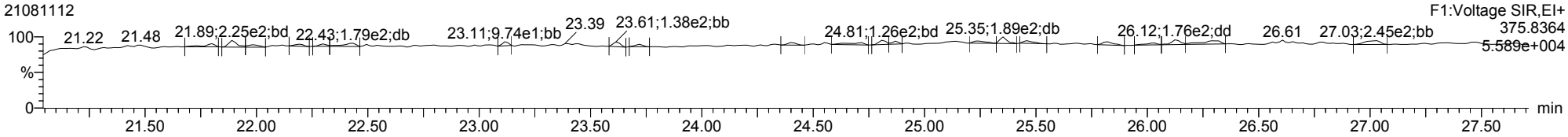

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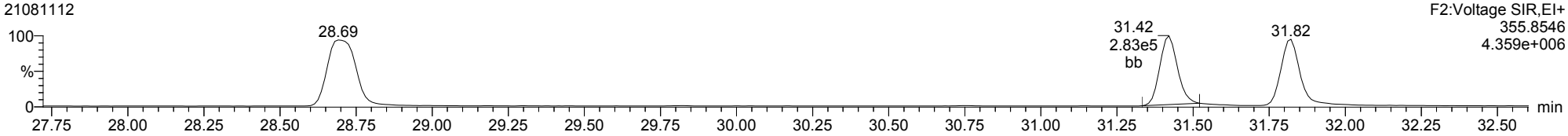
12378-PeCDD



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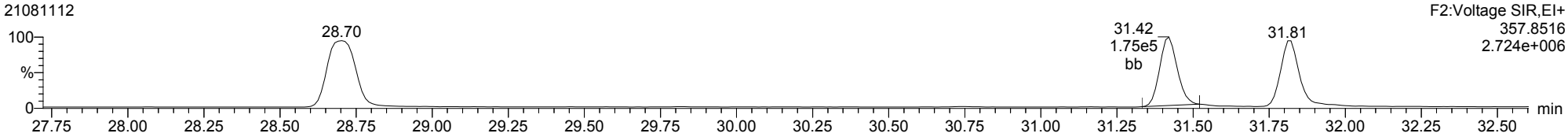

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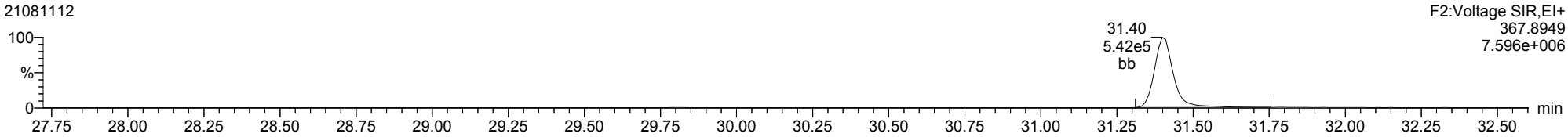

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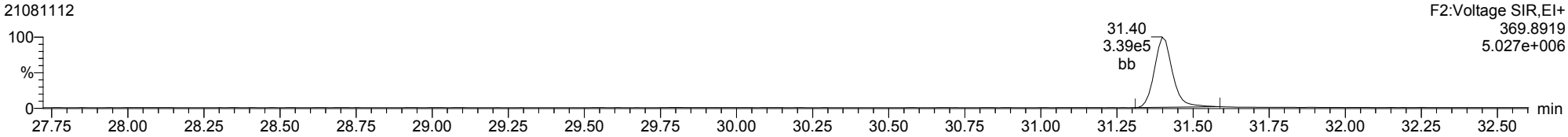

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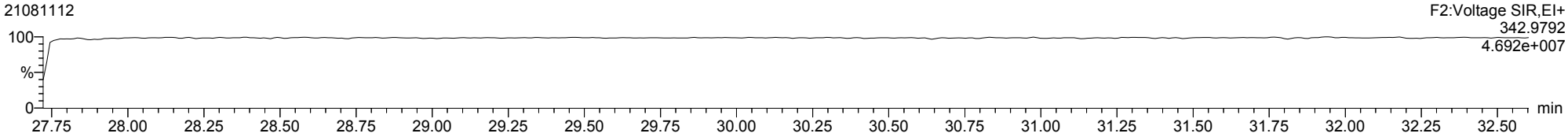

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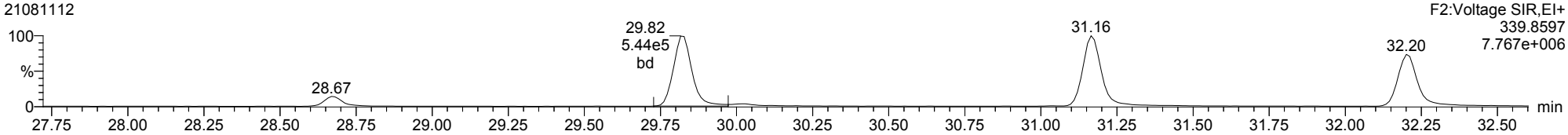

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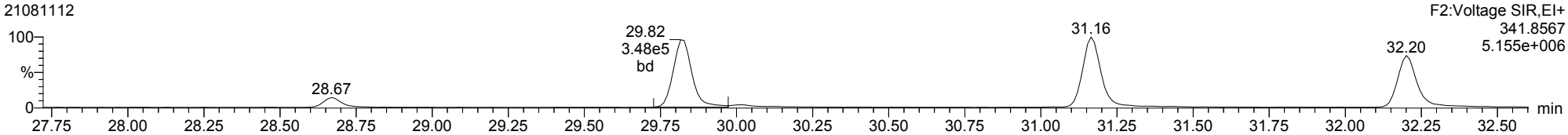

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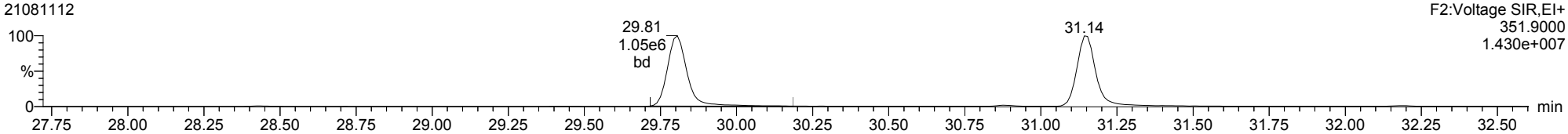

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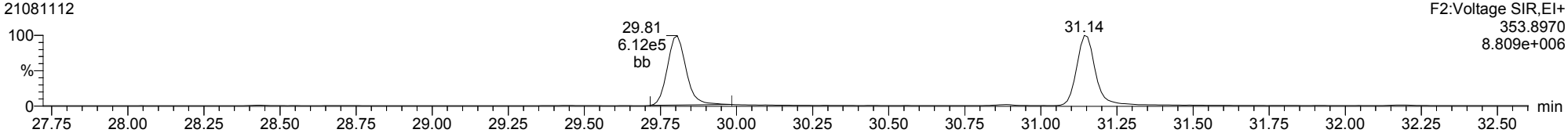
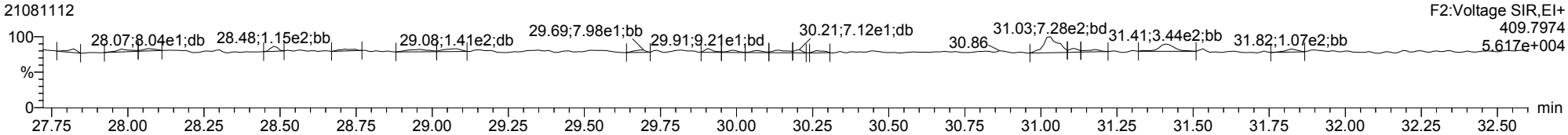


FUNCTION2 HPCDPE



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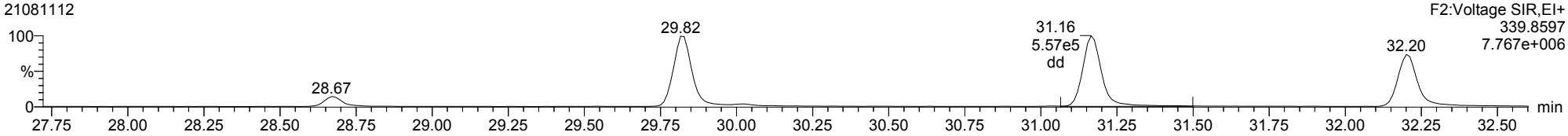
23478-PeCDF



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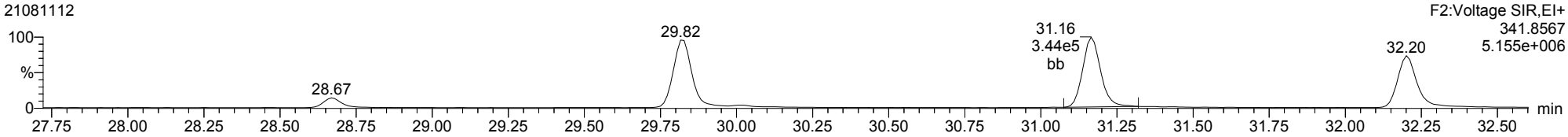

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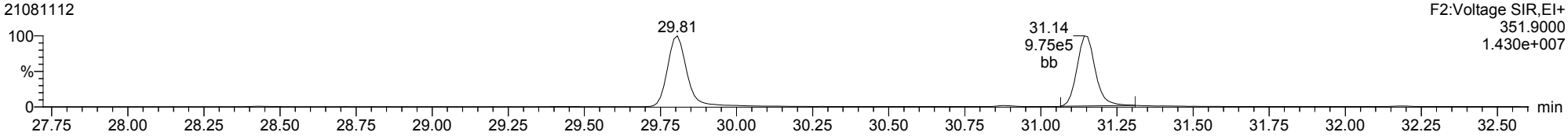

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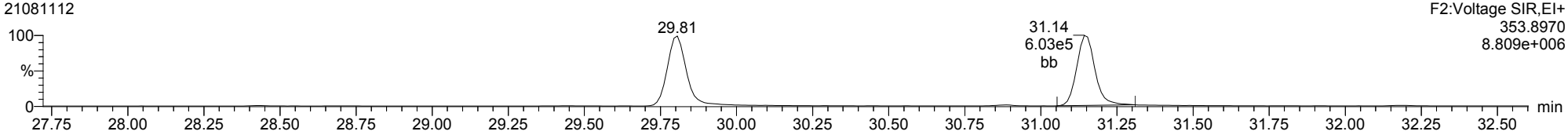

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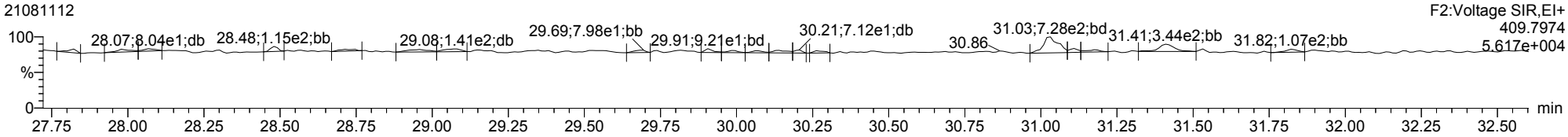

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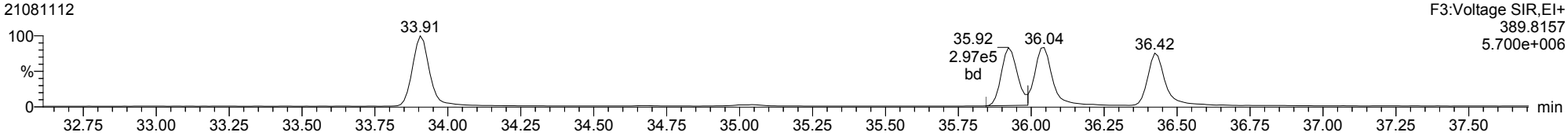
123478-HxCDD



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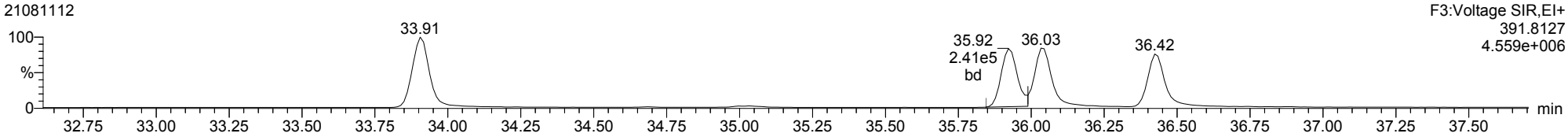

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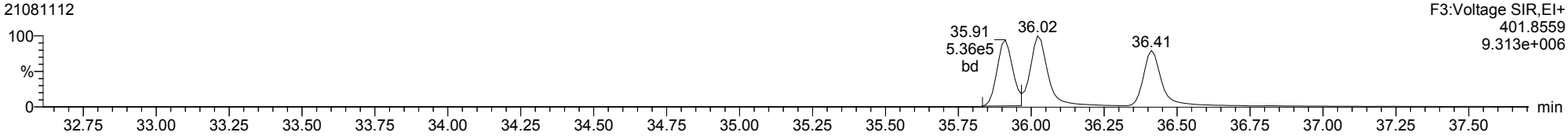

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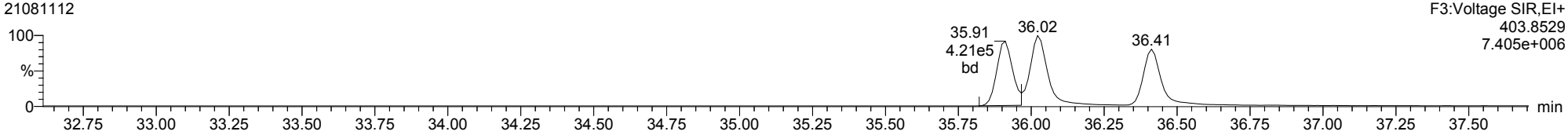

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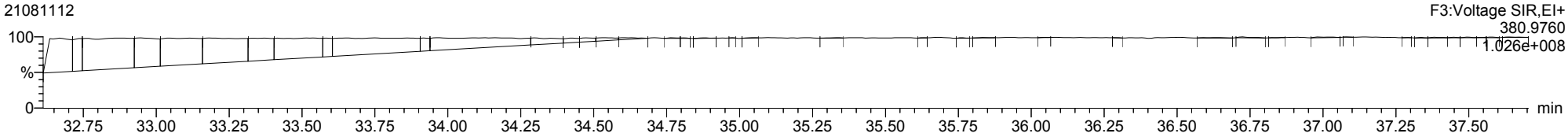

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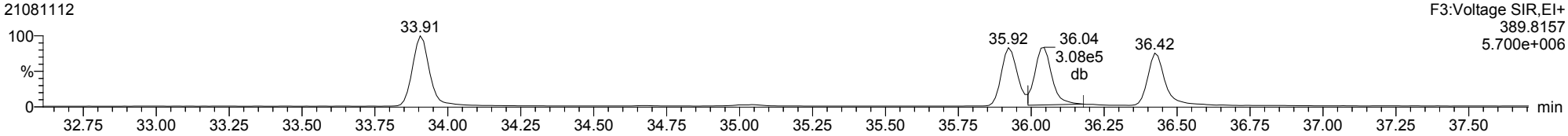
123678-HxCDD



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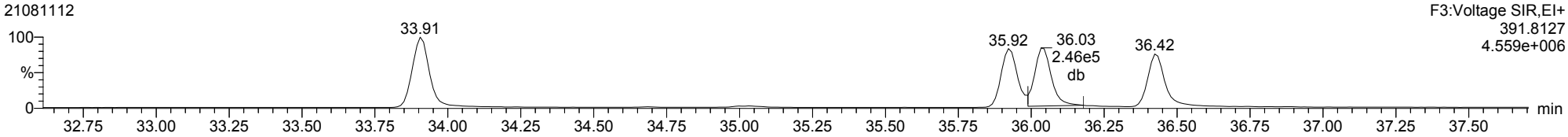

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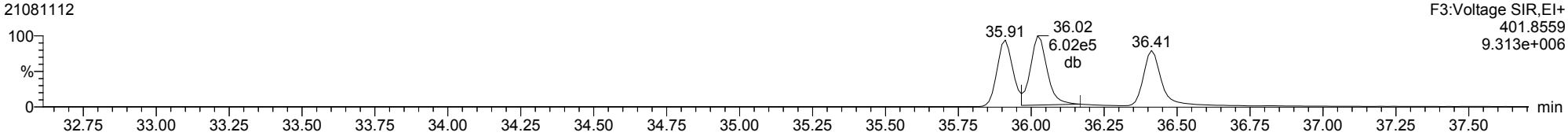

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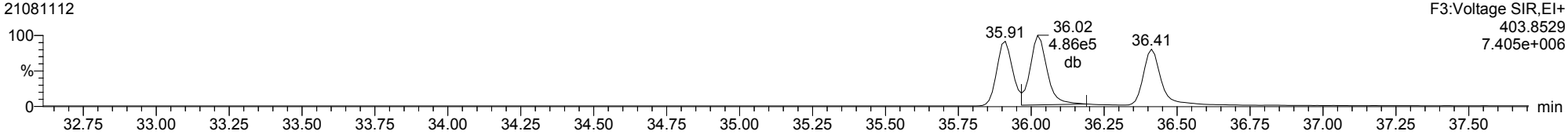

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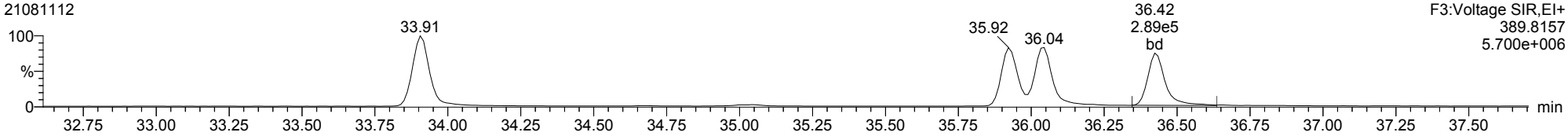

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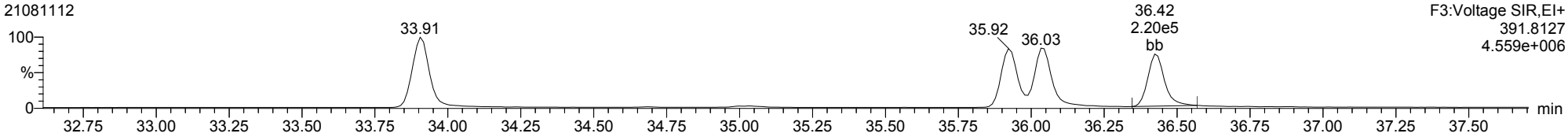

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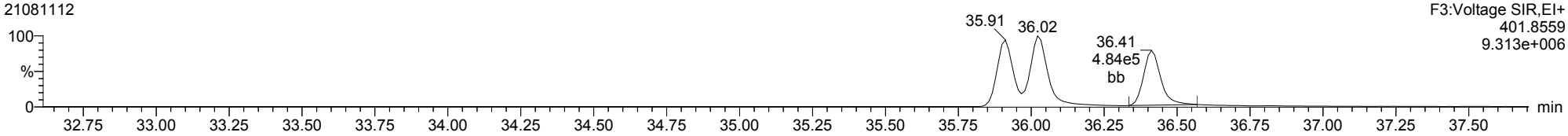

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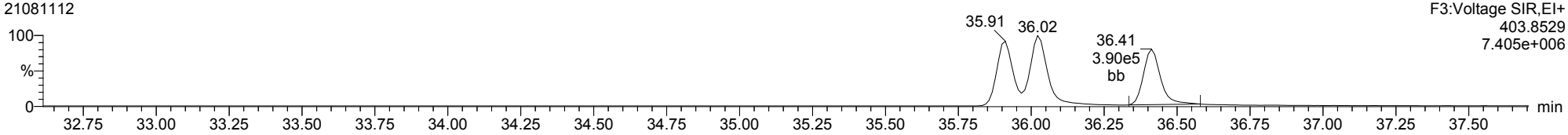

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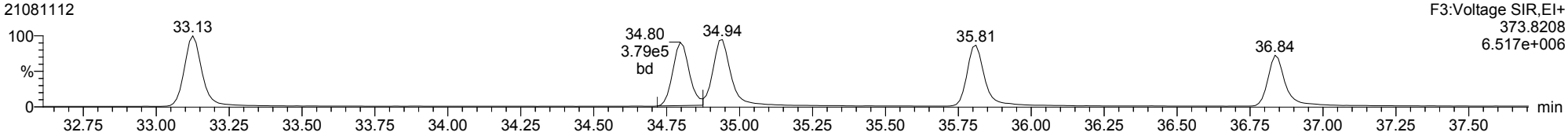

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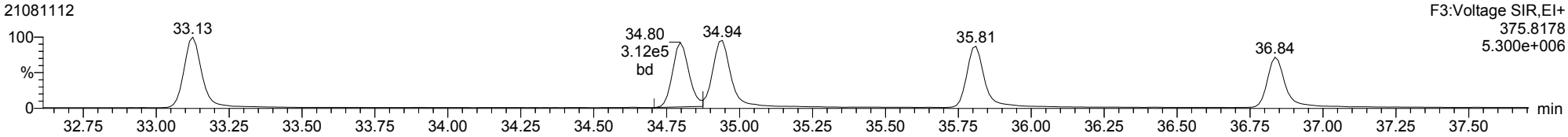

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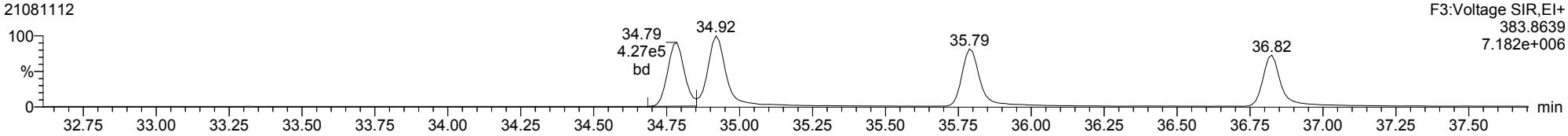

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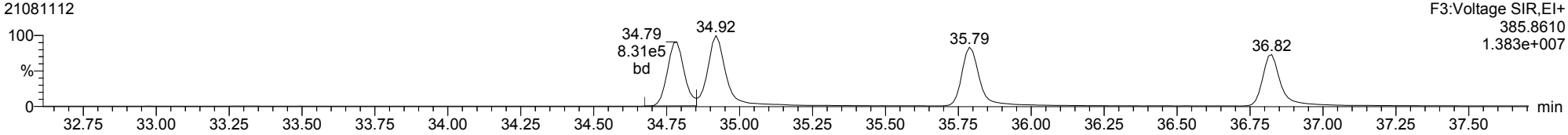

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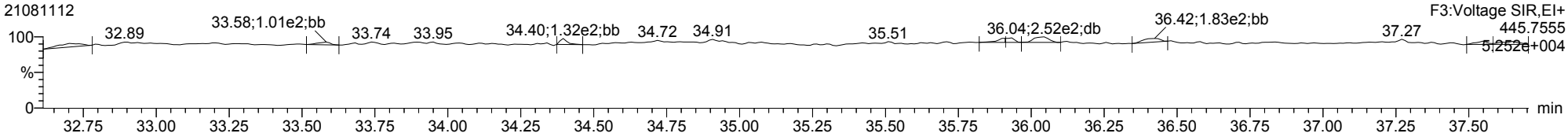

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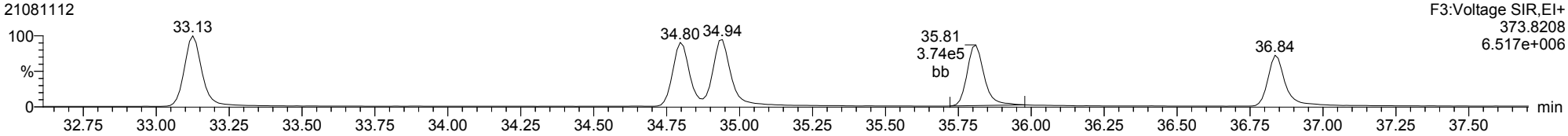

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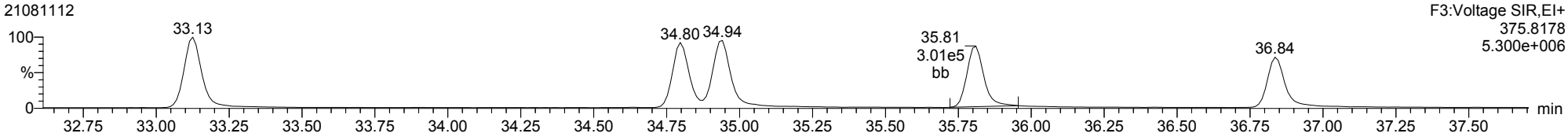

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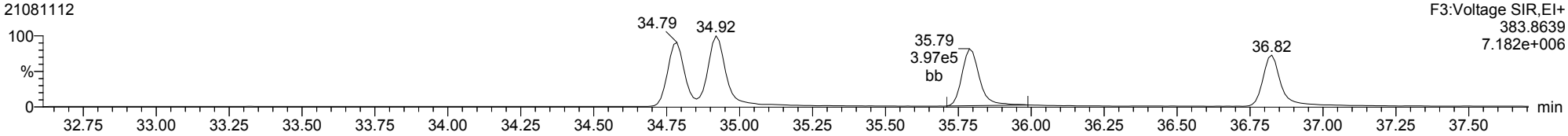

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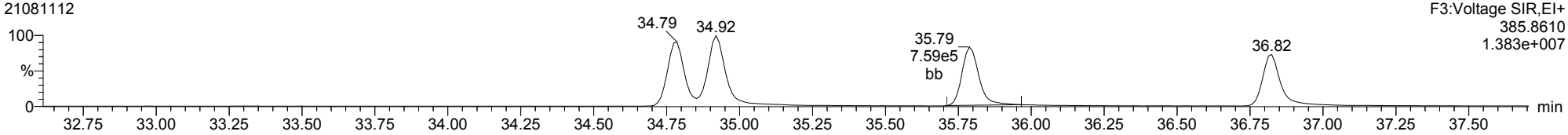

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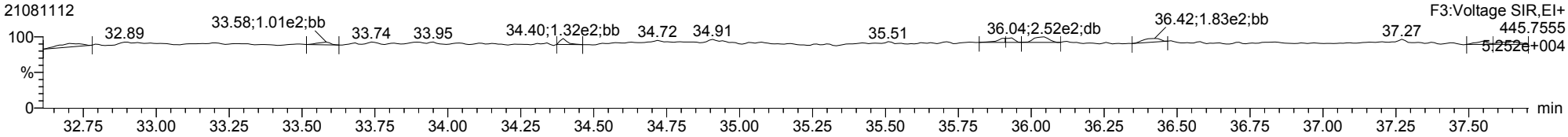

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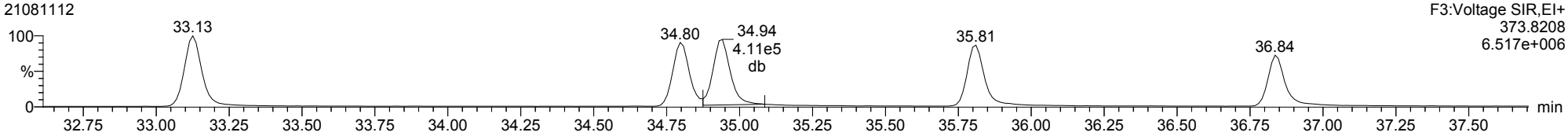

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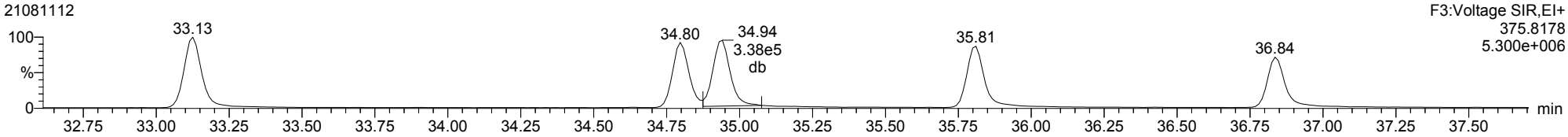

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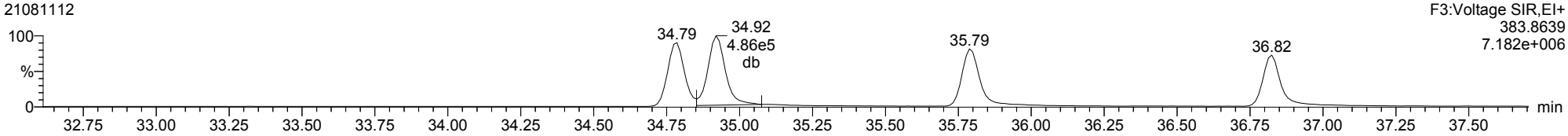

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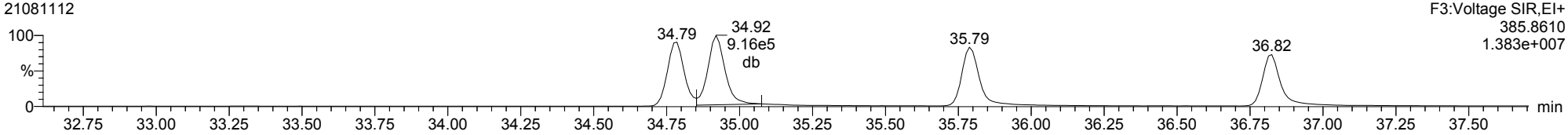

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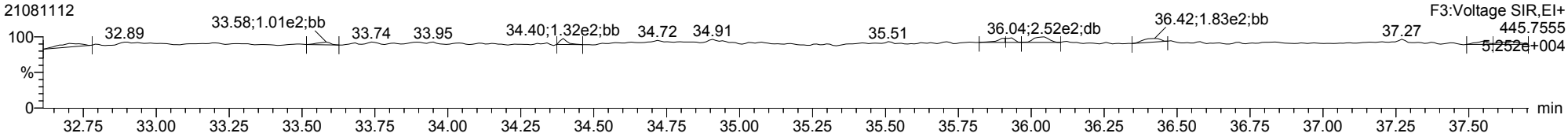

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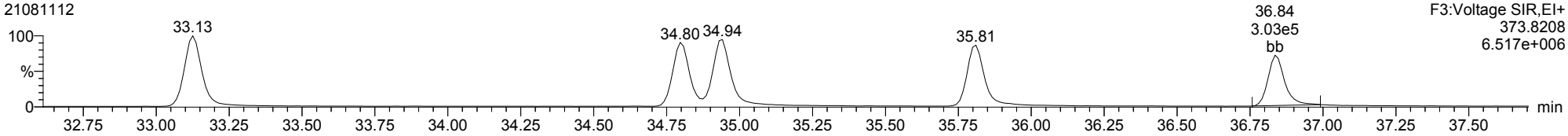

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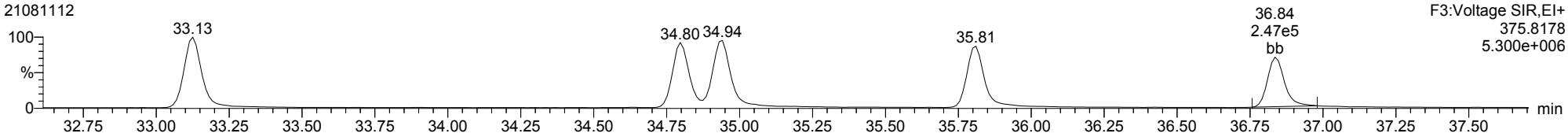

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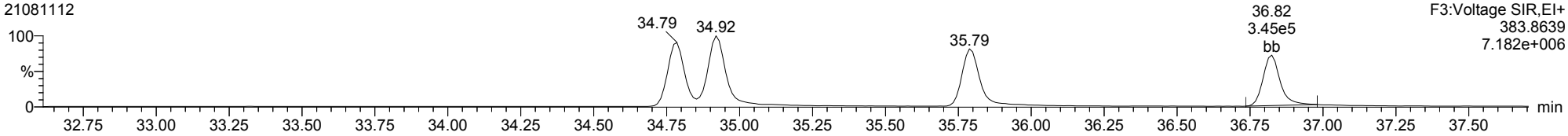

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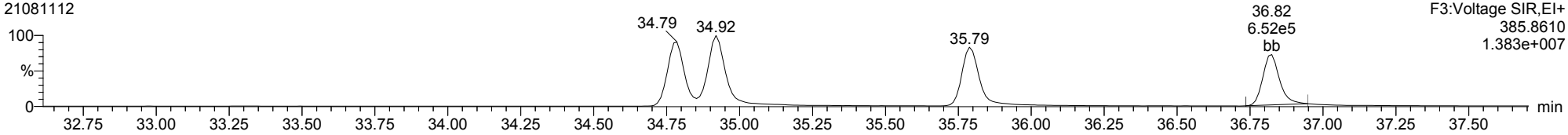

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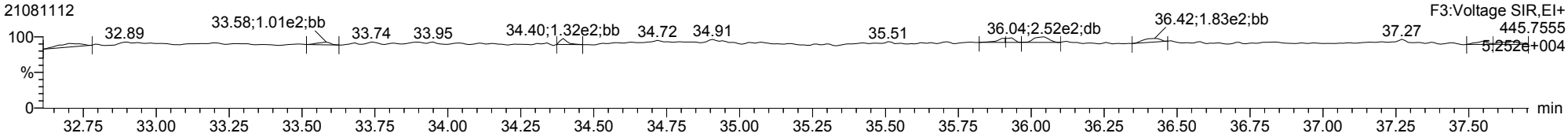

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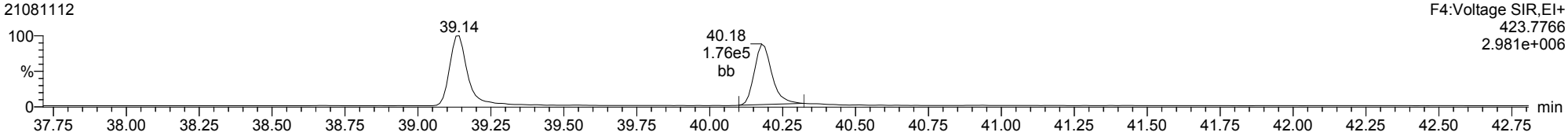

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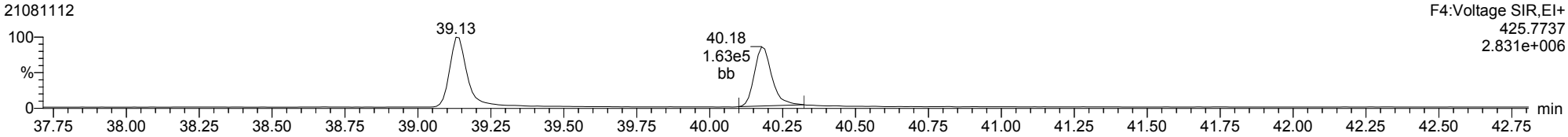

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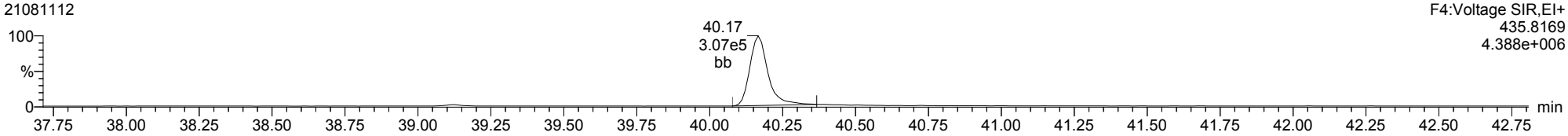

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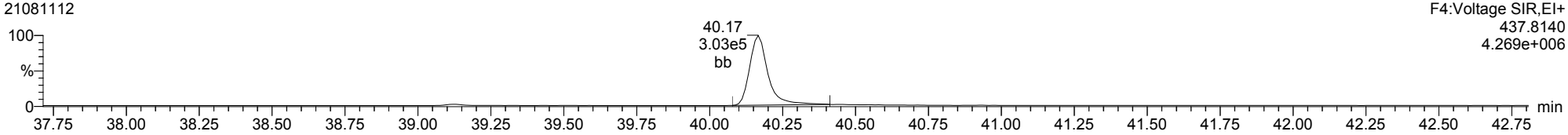

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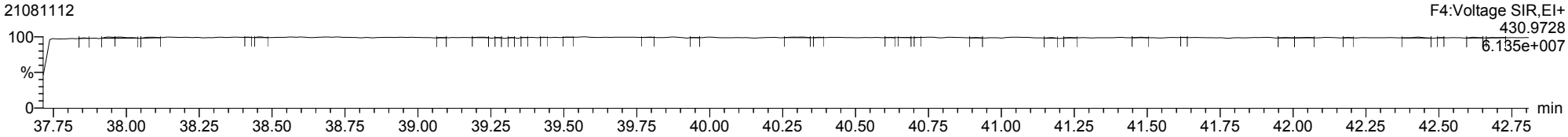

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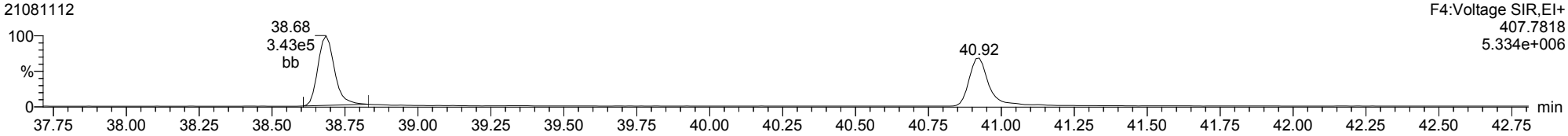

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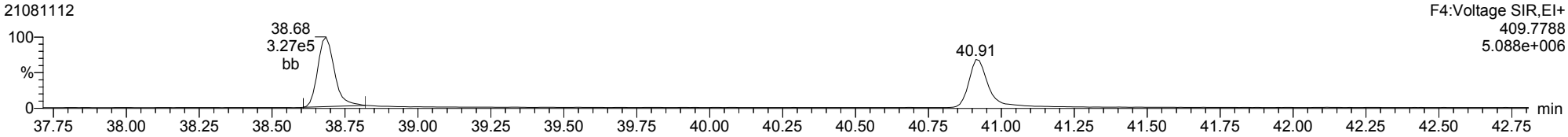

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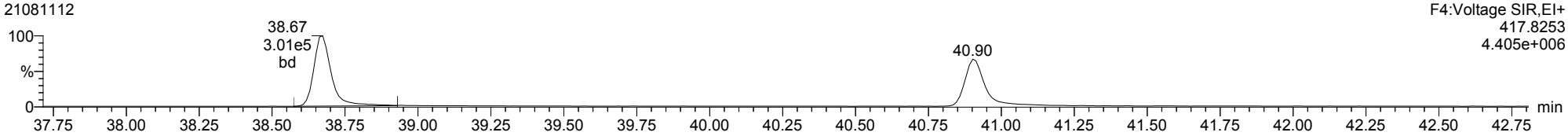

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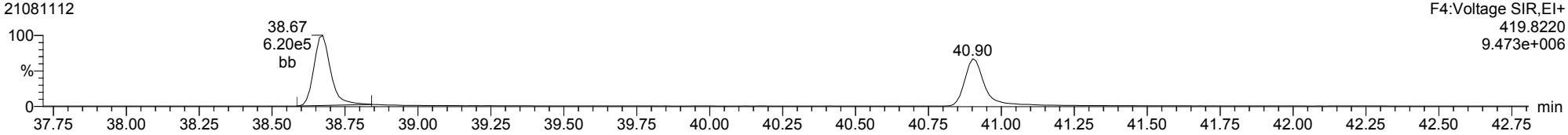

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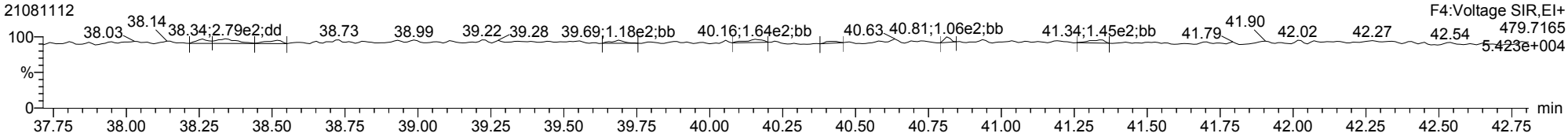

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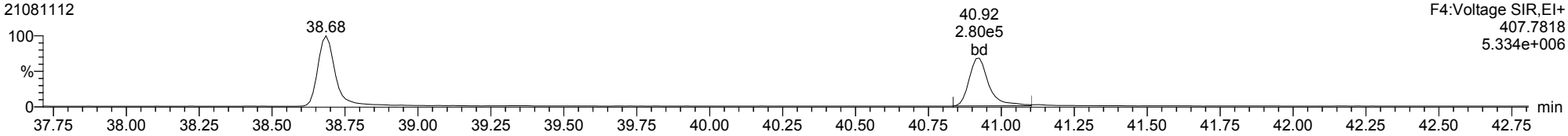

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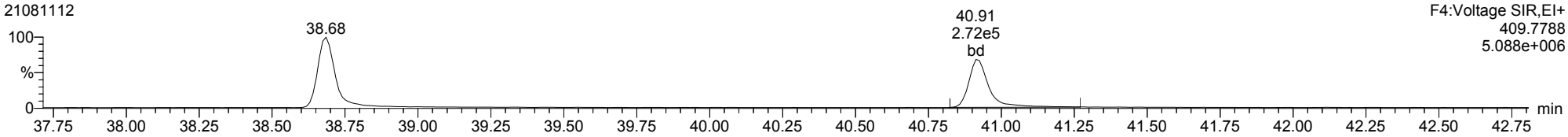

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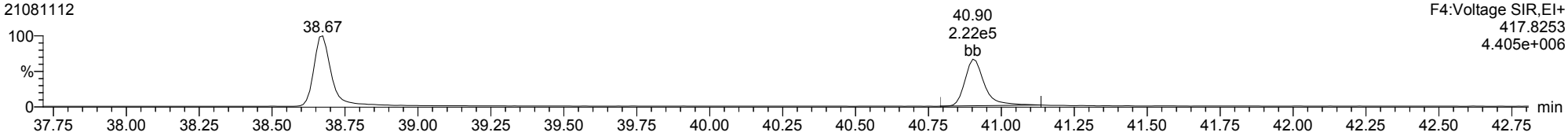

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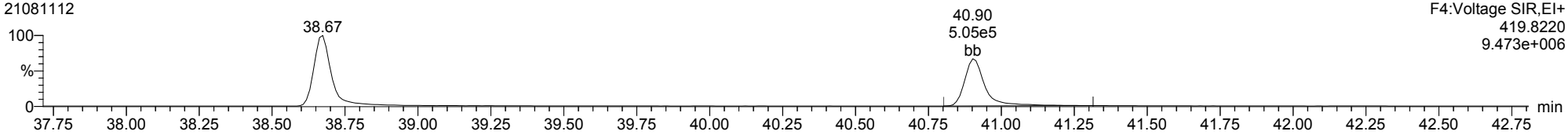

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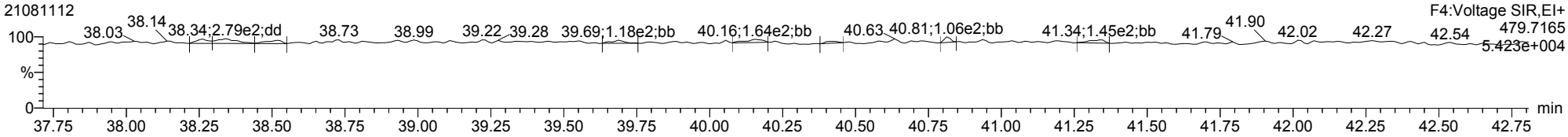

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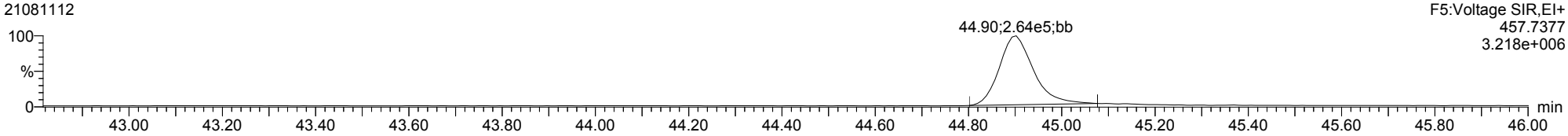

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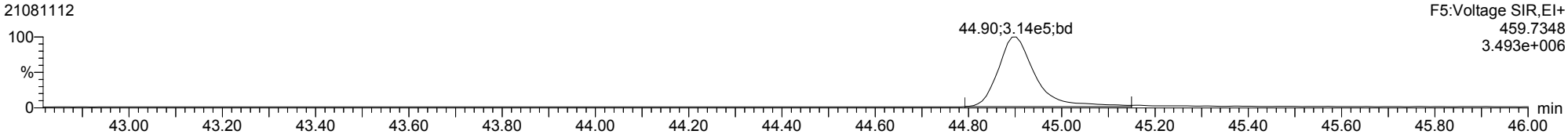

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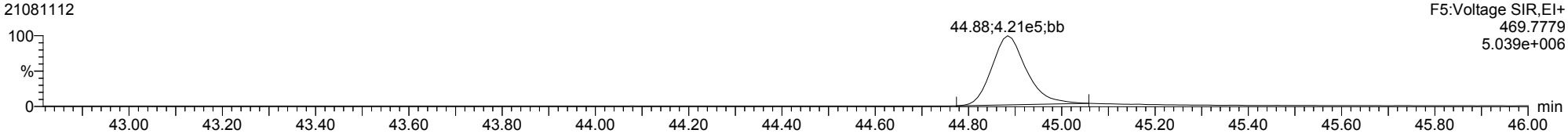

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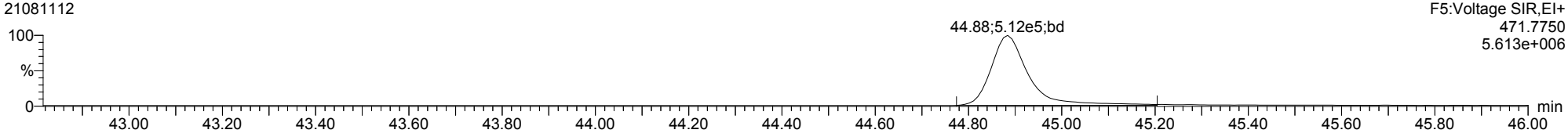

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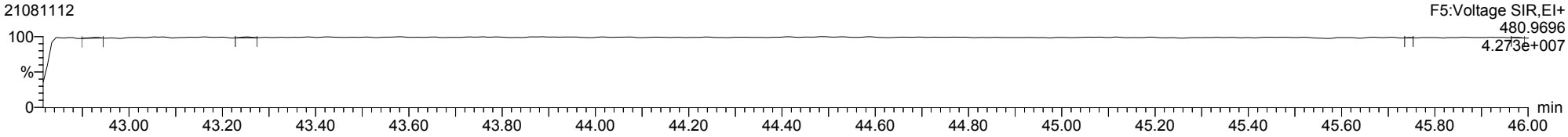

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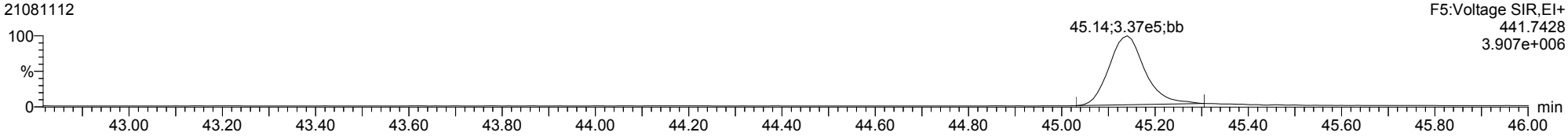

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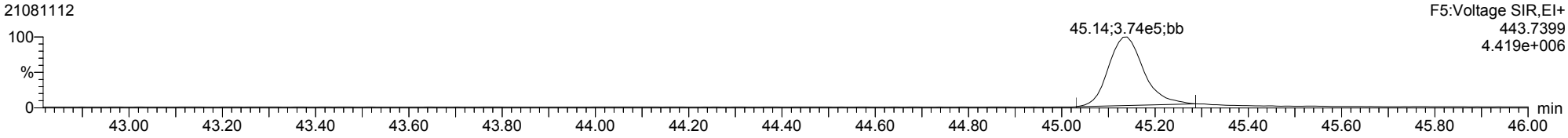

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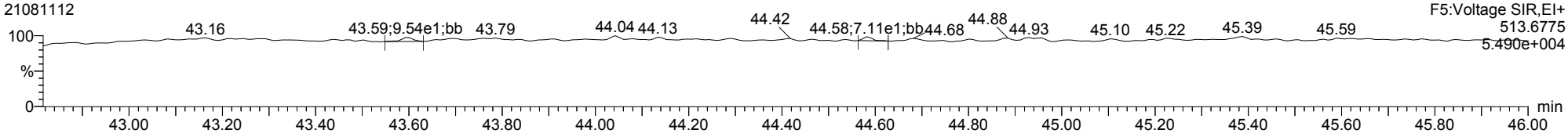

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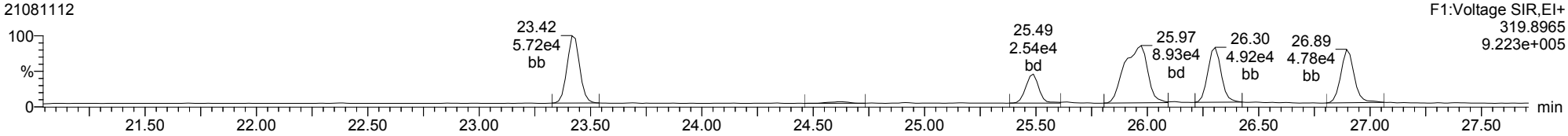

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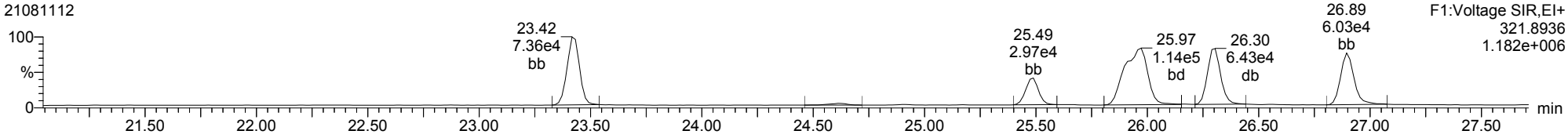

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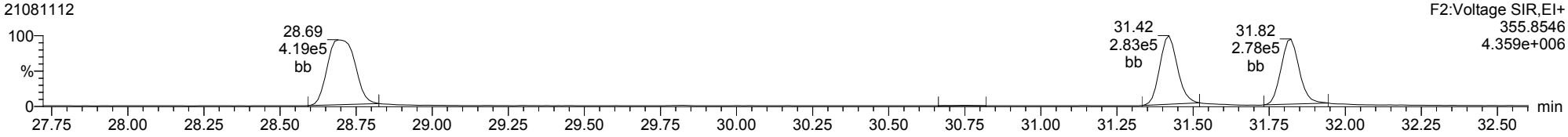

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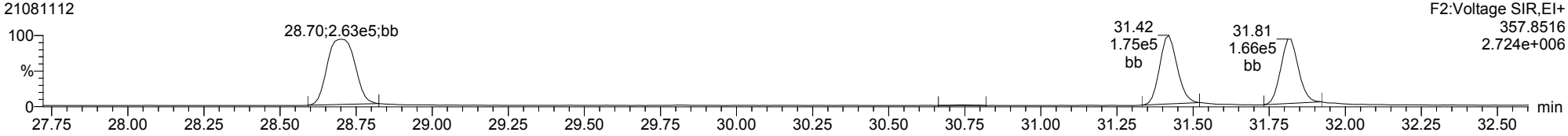

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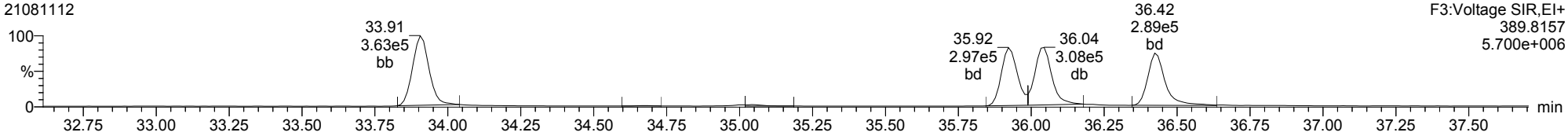
Total-hexadioxins



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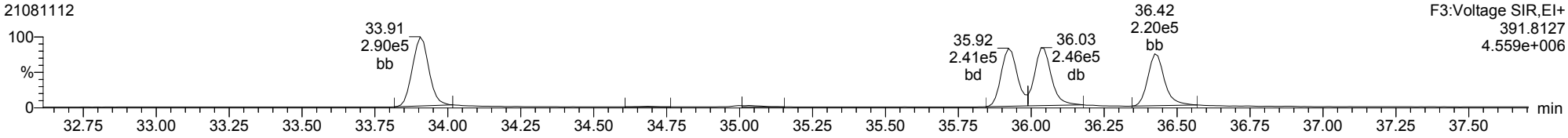

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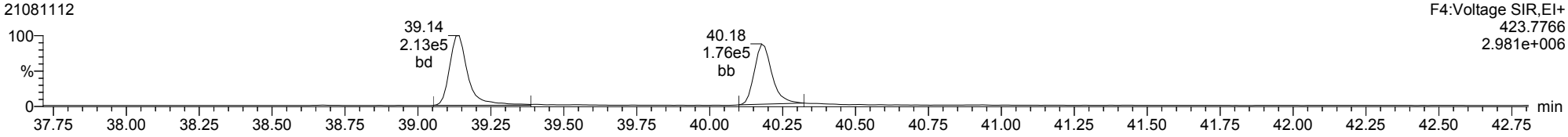

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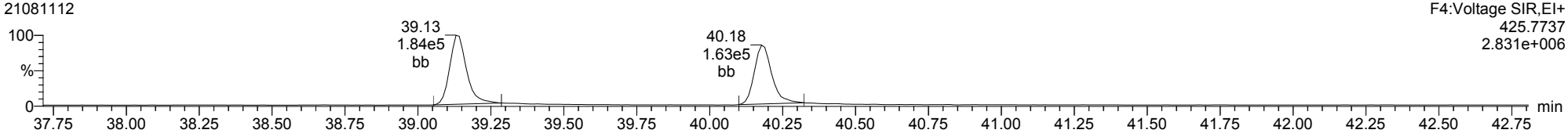
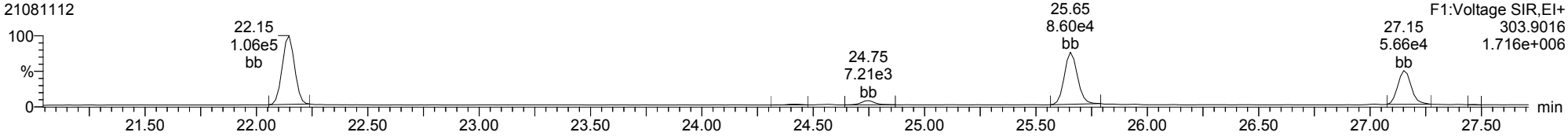


ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

Total-tetrafurans



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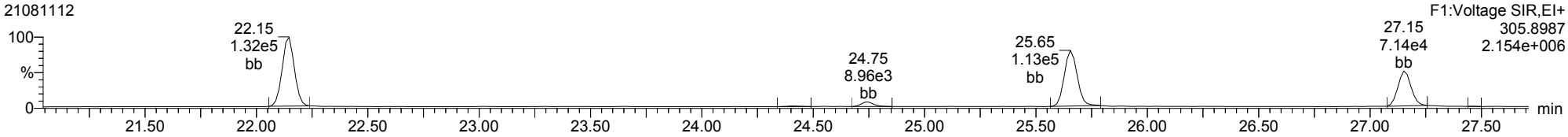

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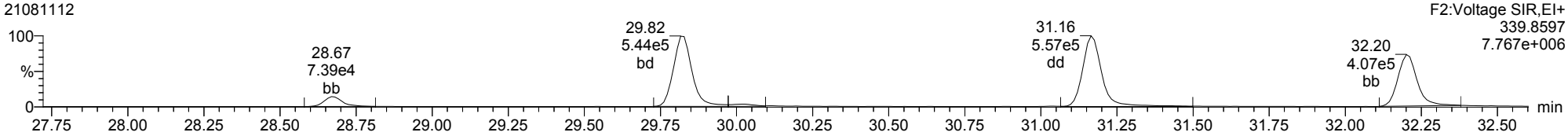

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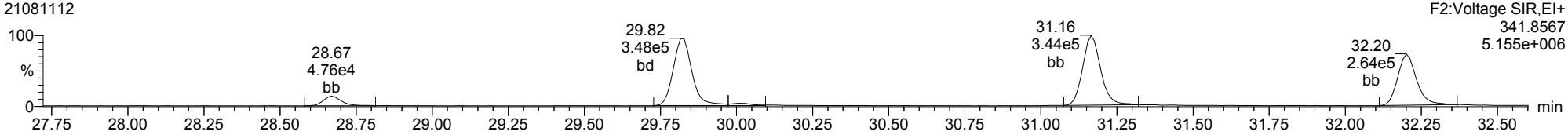

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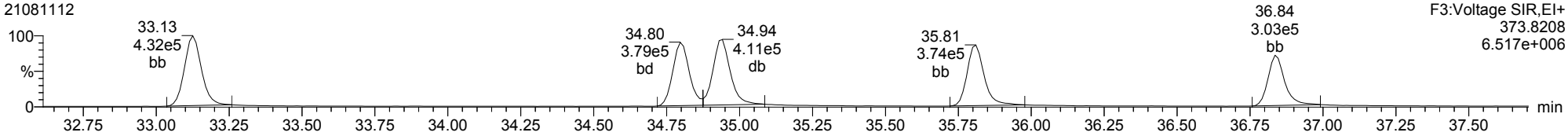

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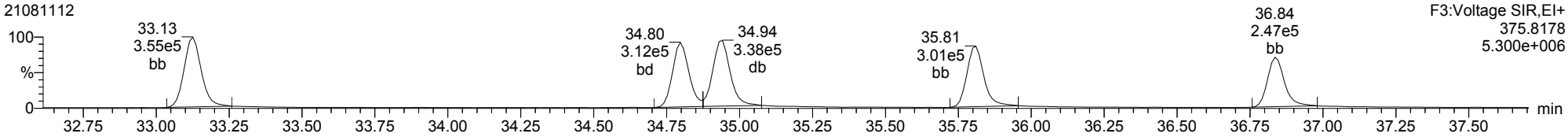

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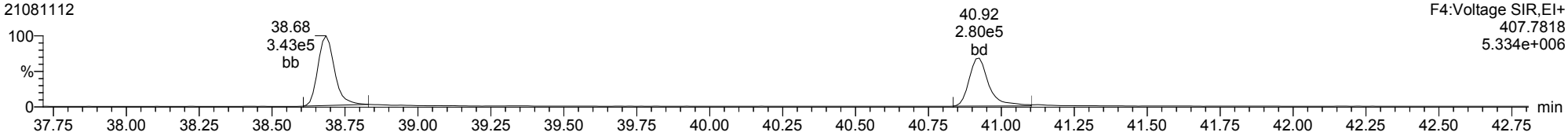

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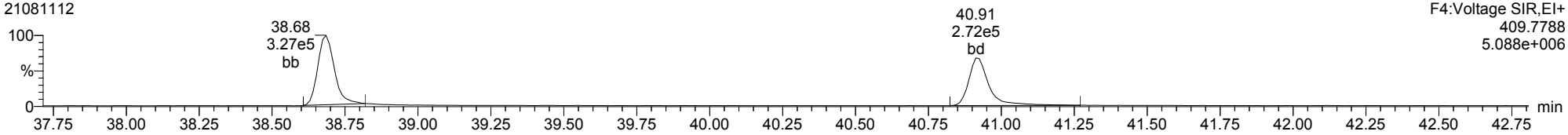

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION CHECK

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	AUTOSPEC01	Calibration:	EH00030
Lab File ID:	21081902	Calibration Date:	08/11/2021
Sequence:	SJH0230	Injection Date:	08/18/21
Lab Sample ID:	SJH0230-ICV1	Injection Time:	10:16
Sequence Name:	CS3K1		

		CONC. (ng/mL)		RESPONSE FACTOR			% DRIFT/DIFF	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
2,3,7,8-TCDF	A	10.000	9.47	1.1075930	1.0491930		-5.3	+/-16
2,3,7,8-TCDD	A	10.000	9.82	0.9202875	0.9032984		-1.8	+/-22
1,2,3,7,8-PeCDF	A	50.000	47.3	1.0148670	0.9593569		-5.5	+/-18
2,3,4,7,8-PeCDF	A	50.000	48.4	1.1255490	1.0886930		-3.3	+/-18
1,2,3,7,8-PeCDD	A	50.000	48.4	0.9953229	0.9626718		-3.3	+/-22
1,2,3,4,7,8-HxCDF	A	50.000	50.2	1.0168930	1.0214850		0.5	+/-10
1,2,3,6,7,8-HxCDF	A	50.000	49.4	1.0368310	1.0244190		-1.2	+/-12
2,3,4,6,7,8-HxCDF	A	50.000	49.1	1.0524660	1.0337250		-1.8	+/-12
1,2,3,7,8,9-HxCDF	A	50.000	48.3	1.0301540	0.9957577		-3.3	+/-10
1,2,3,4,7,8-HxCDD	A	50.000	48.2	1.0273630	0.9902009		-3.6	+/-22
1,2,3,6,7,8-HxCDD	A	50.000	48.5	1.0089800	0.9790880		-3.0	+/-22
1,2,3,7,8,9-HxCDD	A	50.000	49.0	0.9504865	4005.2260000		-1.9	+/-18
1,2,3,4,6,7,8-HpCDF	A	50.000	48.8	1.3273500	1.2946830		-2.5	+/-10
1,2,3,4,7,8,9-HpCDF	A	50.000	50.1	1.2833380	1.2850700		0.1	+/-14
1,2,3,4,6,7,8-HpCDD	A	50.000	48.0	1.0680880	1.0244770		-4.1	+/-14
OCDF	A	100.00	90.2	1.4469010	1.3057000		-9.8	+/-37
OCDD	A	100.00	96.4	1.1808230	1.1387880		-3.6	+/-21
13C12-2,3,7,8-TCDF	A	100.00	89.2	1.4265830	1.2724585		-10.8	+/-29
13C12-2,3,7,8-TCDD	A	100.00	97.2	1.1164910	1.0857770		-2.8	+/-18
13C12-1,2,3,7,8-PeCDF	A	100.00	94.5	1.2973130	1.2263769		-5.5	+/-24
13C12-2,3,4,7,8-PeCDF	A	100.00	92.0	1.2364800	1.1379874		-8.0	+/-23
13C12-1,2,3,7,8-PeCDD	A	100.00	101	0.7319833	0.7378713		0.8	+/-38
13C12-1,2,3,4,7,8-HxCDF	A	100.00	96.0	1.2424560	1.1933135		-4.0	+/-24
13C12-1,2,3,6,7,8-HxCDF	A	100.00	92.3	1.3434760	1.2397499		-7.7	+/-30
13C12-2,3,4,6,7,8-HxCDF	A	100.00	93.1	1.2148550	1.1311501		-6.9	+/-27
13C12-1,2,3,7,8,9-HxCDF	A	100.00	96.2	1.0076370	0.9690663		-3.8	+/-26
13C12-1,2,3,4,7,8-HxCDD	A	100.00	101	0.9598233	0.9666964		0.7	+/-15
13C12-1,2,3,6,7,8-HxCDD	A	100.00	99.6	1.0413850	1.0369355		-0.4	+/-15
13C12-1,2,3,4,6,7,8-HpCDF	A	100.00	87.7	0.9264704	0.8121912		-12.3	+/-22
13C12-1,2,3,4,7,8,9-HpCDF	A	100.00	91.4	0.7579160	0.6930580		-8.6	+/-23
13C12-1,2,3,4,6,7,8-HpCDD	A	100.00	97.7	0.6324476	0.6181069		-2.3	+/-18

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION CHECK

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	AUTOSPEC01	Calibration:	EH00030
Lab File ID:	21081902	Calibration Date:	08/11/2021
Sequence:	SJH0230	Injection Date:	08/18/21
Lab Sample ID:	SJH0230-ICV1	Injection Time:	10:16
Sequence Name:	CS3K1		

COMPOUND	TYPE	CONC. (ng/mL)		RESPONSE FACTOR			% DRIFT/DIFF	
		STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
13C12-OCDD	A	200.00	191	0.5037432	0.4807921		-4.6	+/-52
37Cl4-2,3,7,8-TCDD	A	10.000	9.02	1.0835930	0.9777786		-9.8	+/-21

* Values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
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Printed: Thursday, August 19, 2021 10:29:16 Pacific Daylight Time

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Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: CS3K1, Name: 21081902, Date: 18-Aug-2021, Time: 10:16:21, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
2378-TCDF	25.670	1.001	3.008e4	3.666e4	1.108	0.820	0.770	918	1316	4.41e5	5.57e5	479.7	423.1	NO	bb	bb	9.473
12378-PeCDF	29.828	1.000	1.752e5	1.188e5	1.015	1.475	1.550	3048	1840	2.45e6	1.68e6	803.9	910.6	NO	bb	bd	47.265
23478-PeCDF	31.176	1.001	1.873e5	1.224e5	1.126	1.531	1.550	3048	1840	2.75e6	1.80e6	901.3	979.3	NO	bb	bb	48.363
123478-HxCDF	34.808	1.001	1.437e5	1.177e5	1.017	1.220	1.240	2601	1589	2.18e6	1.78e6	839.2	1122.3	NO	bd	bd	50.226
234678-HxCDF	35.811	1.000	1.391e5	1.116e5	1.052	1.246	1.240	2601	1589	2.12e6	1.74e6	816.3	1094.2	NO	bb	bb	49.110
123678-HxCDF	34.942	1.000	1.497e5	1.227e5	1.037	1.220	1.240	2601	1589	2.15e6	1.73e6	826.8	1090.6	NO	db	db	49.401
123789-HxCDF	36.847	1.001	1.138e5	9.309e4	1.030	1.223	1.240	2601	1589	1.72e6	1.39e6	662.9	874.2	NO	bb	bb	48.331
1234678-HpCDF	38.696	1.000	1.143e5	1.112e5	1.327	1.029	1.050	1729	2716	1.80e6	1.69e6	1039.7	623.1	NO	bb	bb	48.769
1234789-HpCDF	40.924	1.000	9.872e4	9.228e4	1.283	1.070	1.050	1729	2716	1.29e6	1.20e6	745.9	442.1	NO	bd	bd	50.067
OCDF	45.150	1.005	1.297e5	1.396e5	1.447	0.929	0.890	1023	1744	1.38e6	1.54e6	1346.5	880.9	NO	bd	bb	90.241
2378-TCDD	26.305	1.001	2.131e4	2.772e4	0.920	0.769	0.770	1431	1226	3.06e5	4.12e5	213.8	336.0	NO	bd	bb	9.815
12378-PeCDD	31.421	1.000	1.100e5	6.755e4	0.995	1.629	1.550	1409	1427	1.60e6	1.00e6	1134.9	704.2	NO	bb	bb	48.360
123478-HxCDD	35.933	1.001	1.133e5	9.196e4	1.027	1.232	1.240	1716	1272	1.79e6	1.46e6	1041.2	1146.3	NO	bd	bd	48.191
123678-HxCDD	36.045	1.000	1.205e5	9.722e4	1.009	1.240	1.240	1716	1272	1.83e6	1.52e6	1065.9	1193.7	NO	db	db	48.519
123789-HxCDD	36.435	1.011	1.110e5	8.930e4	0.950	1.243	1.240	1716	1272	1.73e6	1.39e6	1009.6	1092.0	NO	bb	bb	49.036
1234678-HpCDD	40.189	1.000	6.989e4	6.590e4	1.068	1.061	1.050	1287	1060	1.01e6	9.58e5	784.3	904.5	NO	bb	bb	47.958
OCDD	44.912	1.000	1.102e5	1.246e5	1.181	0.884	0.890	1174	1939	1.15e6	1.35e6	982.7	694.1	NO	bd	bd	96.440
13C-2378-TCDF	25.655	1.007	2.848e5	3.513e5	1.427	0.811	0.770	2459	1535	3.98e6	4.98e6	1620.2	3241.8	NO	bb	bb	89.196
13C-12378-PeCDF	29.817	1.171	3.800e5	2.331e5	1.297	1.630	1.550	3182	1906	5.13e6	3.20e6	1612.3	1677.3	NO	bd	bd	94.532
13C-23478-PeCDF	31.154	1.223	3.512e5	2.177e5	1.236	1.613	1.550	3182	1906	5.03e6	3.15e6	1580.9	1653.6	NO	bb	bb	92.034
13C-123478-HxCDF	34.786	0.955	1.766e5	3.353e5	1.242	0.527	0.510	2072	1919	2.63e6	4.97e6	1268.0	2591.4	NO	bd	bd	96.045
13C-123678-HxCDF	34.931	0.959	1.815e5	3.502e5	1.343	0.518	0.510	2072	1919	2.67e6	5.05e6	1287.7	2632.1	NO	db	db	92.279
13C-234678-HxCDF	35.799	0.983	1.643e5	3.209e5	1.215	0.512	0.510	2072	1919	2.48e6	4.83e6	1196.6	2514.0	NO	bb	bb	93.110
13C-123789-HxCDF	36.825	1.011	1.450e5	2.707e5	1.008	0.536	0.510	2072	1919	2.28e6	4.27e6	1099.5	2223.1	NO	bb	bb	96.172
13C-1234678-HpCDF	38.685	1.062	1.097e5	2.387e5	0.926	0.460	0.440	1715	2037	1.64e6	3.55e6	954.8	1743.4	NO	bb	bb	87.665
13C-1234789-HpCDF	40.913	1.123	9.635e4	2.009e5	0.758	0.480	0.440	1715	2037	1.26e6	2.66e6	736.4	1307.5	NO	bd	bb	91.443
13C-1234-TCDD	25.473	0.000	2.156e5	2.843e5	1.000	0.758	0.770	1803	1712	3.23e6	4.28e6	1791.9	2498.4	NO	bb	bb	100.000
13C-2378-TCDD	26.290	1.032	2.343e5	3.085e5	1.116	0.760	0.770	1803	1712	3.37e6	4.42e6	1867.1	2583.3	NO	bb	bb	97.249
13C-12378-PeCDD	31.410	1.233	2.269e5	1.420e5	0.732	1.598	1.550	1452	1039	3.23e6	2.03e6	2226.2	1952.6	NO	bd	bb	100.804
13C-123478-HxCDD	35.911	0.986	2.304e5	1.842e5	0.960	1.250	1.240	1314	1927	3.73e6	2.94e6	2833.8	1526.8	NO	bd	bd	100.716
13C-123678-HxCDD	36.034	0.989	2.471e5	1.977e5	1.041	1.250	1.240	1314	1927	3.72e6	2.94e6	2832.2	1526.9	NO	db	db	99.573
13C-1234678-HpCDD	40.178	1.103	1.381e5	1.270e5	0.632	1.087	1.050	1128	1261	1.90e6	1.78e6	1684.2	1413.2	NO	bd	bb	97.733
13C-OCDD	44.903	1.233	1.948e5	2.176e5	0.504	0.895	0.890	1294	1572	2.10e6	2.26e6	1623.4	1437.4	NO	bd	bd	190.888
13C-123789-HxCDD	36.424	0.000	2.365e5	1.924e5	1.000	1.230	1.240	1314	1927	3.69e6	2.94e6	2806.5	1527.1	NO	bb	bb	100.000
37CL-2378-TCDD	26.305	1.033	4.888e4		1.084			1378		7.06e5		512.4			bd		9.023

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:29:16 Pacific Daylight Time

ID: CS3K1, Name: 21081902, Date: 18-Aug-2021, Time: 10:16:21, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
1368-TCDF	22.147	0.863	3.948e4	4.774e4	1.425	0.827	0.770	918	1316	5.84e5	7.15e5	636.3	543.6	NO	bb	bb	9.621
1289-TCDF	27.167	1.059	2.809e4	3.539e4	1.043	0.794	0.770	918	1316	3.64e5	4.91e5	396.3	372.8	NO	dd	db	9.568
13468-PECDF	27.015	0.906	2.570e5	1.655e5	1.376	1.552	1.550	824	1161	3.70e6	2.36e6	4491.4	2029.4	NO	bb	bb	50.076
12389-PECDF	32.212	1.080	1.753e5	1.118e5	1.000	1.567	1.550	3048	1840	2.38e6	1.52e6	780.9	824.7	NO	bb	bb	46.853
123468-HXCDF	33.137	0.953	1.555e5	1.234e5	1.087	1.260	1.240	2601	1589	2.23e6	1.75e6	857.1	1103.4	NO	bb	bb	50.142
1368-TCDD	23.432	0.891	2.277e4	2.834e4	0.923	0.804	0.770	1431	1226	3.43e5	4.14e5	239.3	337.5	NO	bb	bb	10.199
1289-TCDD	26.910	1.024	1.779e4	2.439e4	0.794	0.730	0.770	1431	1226	2.44e5	3.33e5	170.5	271.5	NO	bb	bb	9.787
12479-PECDD	28.691	0.914	1.942e5	1.185e5	1.843	1.638	1.550	1409	1427	1.88e6	1.14e6	1337.1	799.7	NO	bb	bb	46.000
12389-PECDD	31.822	1.013	1.289e5	7.907e4	1.154	1.630	1.550	1409	1427	1.82e6	1.13e6	1291.7	788.4	NO	bb	bb	48.871
124679-HXCDD	33.917	0.945	1.291e5	1.015e5	1.125	1.272	1.240	1716	1272	1.87e6	1.47e6	1090.1	1155.9	NO	bb	bb	49.450
1234679-HPCDD	39.142	0.974	8.005e4	7.427e4	1.211	1.078	1.050	1287	1060	1.20e6	1.11e6	930.4	1046.6	NO	bb	bb	48.073
Total-tetrafurans			9.764e4		1.192			918		1.39e6							28.662
Total-penta1			2.570e5					824		3.70e6							50.076
Total-pentafurans			5.677e5		1.047			3048		8.01e6							150.614
Total-hexafurans			7.018e5		1.045			2601		1.04e7							247.209
Total-heptafurans			2.131e5		1.305			1729		3.09e6							98.837
Total-Furans			1.967e6		1.158			918		2.80e7							665.640
Total-tetradioxins			1.046e5		0.879			1431		1.39e6							50.295
Total-pentadioxins			4.331e5		1.331			1409		5.30e6							143.231
Total-hexadioxins			4.739e5		1.028			1716		7.22e6							195.196
Total-heptadioxins			1.499e5		1.140			1287		2.21e6							96.031
Total-Dioxins			1.272e6		1.092			1431		1.73e7							581.193
Total-TEQ			3.239e6					1431		4.52e7							1246.833
FUNCTION1 PFK			1.145e6					504827		2.23e7							
FUNCTION2 PFK			2.728e7					413676		1.78e8							0.000
FUNCTION3 PFK			7.610e4					418865		2.62e6							0.000
FUNCTION4 PFK			1.026e7					312098		9.56e7							
FUNCTION5 PFK			3.527e4					208734		1.37e6							
FUNCTION1 HXCD...			4.363e2					677		7.17e3							0.000
FUNCTION1 HPCD...			4.461e2					803		7.03e3							0.000
FUNCTION2 HPCD...			7.843e2					1005		1.97e4							0.000
FUNCTION3 OCDPE			2.944e2					639		5.26e3							0.000
FUNCTION4 NCDPE			1.551e2					746		3.50e3							0.000
FUNCTION5 DCDPE			7.009e1					688		1.51e3							0.000

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Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

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TF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDF	27.17	2.809e4	3.539e4	1.043	0.79	0.77	396.3	YES	NO	dd	db	9.568
2	2378-TCDF	25.67	3.008e4	3.666e4	1.108	0.82	0.77	479.7	YES	NO	bb	bb	9.473
3	1368-TCDF	22.15	3.948e4	4.774e4	1.425	0.83	0.77	636.3	YES	NO	bb	bb	9.621

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	13468-PECDF	27.02	2.570e5	1.655e5	1.376	1.55	1.55	4491.4	YES	NO	bb	bb	50.076

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	12389-PECDF	32.21	1.753e5	1.118e5	1.000	1.57	1.55	780.9	YES	NO	bb	bb	46.853
2	23478-PeCDF	31.18	1.873e5	1.224e5	1.126	1.53	1.55	901.3	YES	NO	bb	bb	48.363
3	12378-PeCDF	29.83	1.752e5	1.188e5	1.015	1.47	1.55	803.9	YES	NO	bb	bd	47.265
4	Total-pentafurans	28.68	2.986e4	2.045e4	1.047	1.46	1.55	140.3	YES	NO	bb	bd	8.133

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123678-HxCDF	34.94	1.497e5	1.227e5	1.037	1.22	1.24	826.8	YES	NO	db	db	49.401
2	123478-HxCDF	34.81	1.437e5	1.177e5	1.017	1.22	1.24	839.2	YES	NO	bd	bd	50.226
3	123468-HXCDF	33.14	1.555e5	1.234e5	1.087	1.26	1.24	857.1	YES	NO	bb	bb	50.142
4	123789-HxCDF	36.85	1.138e5	9.309e4	1.030	1.22	1.24	662.9	YES	NO	bb	bb	48.331
5	234678-HxCDF	35.81	1.391e5	1.116e5	1.052	1.25	1.24	816.3	YES	NO	bb	bb	49.110

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDF	38.70	1.143e5	1.112e5	1.327	1.03	1.05	1039.7	YES	NO	bb	bb	48.769
2	1234789-HpCDF	40.92	9.872e4	9.228e4	1.283	1.07	1.05	745.9	YES	NO	bd	bd	50.067

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Furans,TF,PP,PF,HF,HPF,OF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDF	27.17	2.809e4	3.539e4	1.043	0.79	0.77	396.3	YES	NO	dd	db	9.568
2	2378-TCDF	25.67	3.008e4	3.666e4	1.108	0.82	0.77	479.7	YES	NO	bb	bb	9.473
3	1368-TCDF	22.15	3.948e4	4.774e4	1.425	0.83	0.77	636.3	YES	NO	bb	bb	9.621
4	12389-PECDF	32.21	1.753e5	1.118e5	1.000	1.57	1.55	780.9	YES	NO	bb	bb	46.853
5	23478-PeCDF	31.18	1.873e5	1.224e5	1.126	1.53	1.55	901.3	YES	NO	bb	bb	48.363
6	12378-PeCDF	29.83	1.752e5	1.188e5	1.015	1.47	1.55	803.9	YES	NO	bb	bd	47.265
7	Total-pentafurans	28.68	2.986e4	2.045e4	1.047	1.46	1.55	140.3	YES	NO	bb	bd	8.133
8	123678-HxCDF	34.94	1.497e5	1.227e5	1.037	1.22	1.24	826.8	YES	NO	db	db	49.401
9	123478-HxCDF	34.81	1.437e5	1.177e5	1.017	1.22	1.24	839.2	YES	NO	bd	bd	50.226
10	123468-HXCDF	33.14	1.555e5	1.234e5	1.087	1.26	1.24	857.1	YES	NO	bb	bb	50.142
11	123789-HxCDF	36.85	1.138e5	9.309e4	1.030	1.22	1.24	662.9	YES	NO	bb	bb	48.331
12	234678-HxCDF	35.81	1.391e5	1.116e5	1.052	1.25	1.24	816.3	YES	NO	bb	bb	49.110
13	1234678-HpCDF	38.70	1.143e5	1.112e5	1.327	1.03	1.05	1039.7	YES	NO	bb	bb	48.769
14	1234789-HpCDF	40.92	9.872e4	9.228e4	1.283	1.07	1.05	745.9	YES	NO	bd	bd	50.067
15	OCDF	45.15	1.297e5	1.396e5	1.447	0.93	0.89	1346.5	YES	NO	bd	bb	90.241
16	13468-PECDF	27.02	2.570e5	1.655e5	1.376	1.55	1.55	4491.4	YES	NO	bb	bb	50.076

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDD	26.91	1.779e4	2.439e4	0.794	0.73	0.77	170.5	YES	NO	bb	bb	9.787
2	2378-TCDD	26.31	2.131e4	2.772e4	0.920	0.77	0.77	213.8	YES	NO	bd	bb	9.815
3	Total-tetradioxins	25.97	3.211e4	4.175e4	0.879	0.77	0.77	236.2	YES	NO	bb	bb	15.478
4	Total-tetradioxins	25.49	1.059e4	1.334e4	0.879	0.79	0.77	108.9	YES	NO	bb	bb	5.016
5	1368-TCDD	23.43	2.277e4	2.834e4	0.923	0.80	0.77	239.3	YES	NO	bb	bb	10.199

PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	12389-PECDD	31.82	1.289e5	7.907e4	1.154	1.63	1.55	1291.7	YES	NO	bb	bb	48.871
2	12378-PeCDD	31.42	1.100e5	6.755e4	0.995	1.63	1.55	1134.9	YES	NO	bb	bb	48.360
3	12479-PECDD	28.69	1.942e5	1.185e5	1.843	1.64	1.55	1337.1	YES	NO	bb	bb	46.000

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HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123478-HxCDD	35.93	1.133e5	9.196e4	1.027	1.23	1.24	1041.2	YES	NO	bd	bd	48.191
2	124679-HXCDD	33.92	1.291e5	1.015e5	1.125	1.27	1.24	1090.1	YES	NO	bb	bb	49.450
3	123789-HxCDD	36.43	1.110e5	8.930e4	0.950	1.24	1.24	1009.6	YES	NO	bb	bb	49.036
4	123678-HxCDD	36.04	1.205e5	9.722e4	1.009	1.24	1.24	1065.9	YES	NO	db	db	48.519

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDD	40.19	6.989e4	6.590e4	1.068	1.06	1.05	784.3	YES	NO	bb	bb	47.958
2	1234679-HPCDD	39.14	8.005e4	7.427e4	1.211	1.08	1.05	930.4	YES	NO	bb	bb	48.073

Dioxins,TD,PD,HD,HPD,OD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDD	26.91	1.779e4	2.439e4	0.794	0.73	0.77	170.5	YES	NO	bb	bb	9.787
2	2378-TCDD	26.31	2.131e4	2.772e4	0.920	0.77	0.77	213.8	YES	NO	bd	bb	9.815
3	Total-tetradioxins	25.97	3.211e4	4.175e4	0.879	0.77	0.77	236.2	YES	NO	bb	bb	15.478
4	Total-tetradioxins	25.49	1.059e4	1.334e4	0.879	0.79	0.77	108.9	YES	NO	bb	bb	5.016
5	1368-TCDD	23.43	2.277e4	2.834e4	0.923	0.80	0.77	239.3	YES	NO	bb	bb	10.199
6	12389-PECDD	31.82	1.289e5	7.907e4	1.154	1.63	1.55	1291.7	YES	NO	bb	bb	48.871
7	12378-PeCDD	31.42	1.100e5	6.755e4	0.995	1.63	1.55	1134.9	YES	NO	bb	bb	48.360
8	12479-PECDD	28.69	1.942e5	1.185e5	1.843	1.64	1.55	1337.1	YES	NO	bb	bb	46.000
9	123478-HxCDD	35.93	1.133e5	9.196e4	1.027	1.23	1.24	1041.2	YES	NO	bd	bd	48.191
10	124679-HXCDD	33.92	1.291e5	1.015e5	1.125	1.27	1.24	1090.1	YES	NO	bb	bb	49.450
11	123789-HxCDD	36.43	1.110e5	8.930e4	0.950	1.24	1.24	1009.6	YES	NO	bb	bb	49.036
12	123678-HxCDD	36.04	1.205e5	9.722e4	1.009	1.24	1.24	1065.9	YES	NO	db	db	48.519
13	OCDD	44.91	1.102e5	1.246e5	1.181	0.88	0.89	982.7	YES	NO	bd	bd	96.440
14	1234678-HpCDD	40.19	6.989e4	6.590e4	1.068	1.06	1.05	784.3	YES	NO	bb	bb	47.958
15	1234679-HPCDD	39.14	8.005e4	7.427e4	1.211	1.08	1.05	930.4	YES	NO	bb	bb	48.073

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TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDF	27.17	2.809e4	3.539e4	1.043	0.79	0.77	396.3	YES	NO	dd	db	9.568
2	2378-TCDF	25.67	3.008e4	3.666e4	1.108	0.82	0.77	479.7	YES	NO	bb	bb	9.473
3	1368-TCDF	22.15	3.948e4	4.774e4	1.425	0.83	0.77	636.3	YES	NO	bb	bb	9.621
4	12389-PECDF	32.21	1.753e5	1.118e5	1.000	1.57	1.55	780.9	YES	NO	bb	bb	46.853
5	23478-PeCDF	31.18	1.873e5	1.224e5	1.126	1.53	1.55	901.3	YES	NO	bb	bb	48.363
6	12378-PeCDF	29.83	1.752e5	1.188e5	1.015	1.47	1.55	803.9	YES	NO	bb	bd	47.265
7	Total-pentafurans	28.68	2.986e4	2.045e4	1.047	1.46	1.55	140.3	YES	NO	bb	bd	8.133
8	123678-HxCDF	34.94	1.497e5	1.227e5	1.037	1.22	1.24	826.8	YES	NO	db	db	49.401
9	123478-HxCDF	34.81	1.437e5	1.177e5	1.017	1.22	1.24	839.2	YES	NO	bd	bd	50.226
10	123468-HXCDF	33.14	1.555e5	1.234e5	1.087	1.26	1.24	857.1	YES	NO	bb	bb	50.142
11	123789-HxCDF	36.85	1.138e5	9.309e4	1.030	1.22	1.24	662.9	YES	NO	bb	bb	48.331
12	234678-HxCDF	35.81	1.391e5	1.116e5	1.052	1.25	1.24	816.3	YES	NO	bb	bb	49.110
13	1234678-HpCDF	38.70	1.143e5	1.112e5	1.327	1.03	1.05	1039.7	YES	NO	bb	bb	48.769
14	1234789-HpCDF	40.92	9.872e4	9.228e4	1.283	1.07	1.05	745.9	YES	NO	bd	bd	50.067
15	OCDF	45.15	1.297e5	1.396e5	1.447	0.93	0.89	1346.5	YES	NO	bd	bb	90.241
16	13468-PECDF	27.02	2.570e5	1.655e5	1.376	1.55	1.55	4491.4	YES	NO	bb	bb	50.076
17	1289-TCDD	26.91	1.779e4	2.439e4	0.794	0.73	0.77	170.5	YES	NO	bb	bb	9.787
18	2378-TCDD	26.31	2.131e4	2.772e4	0.920	0.77	0.77	213.8	YES	NO	bd	bb	9.815
19	Total-tetradioxins	25.97	3.211e4	4.175e4	0.879	0.77	0.77	236.2	YES	NO	bb	bb	15.478
20	Total-tetradioxins	25.49	1.059e4	1.334e4	0.879	0.79	0.77	108.9	YES	NO	bb	bb	5.016
21	1368-TCDD	23.43	2.277e4	2.834e4	0.923	0.80	0.77	239.3	YES	NO	bb	bb	10.199
22	12389-PECDD	31.82	1.289e5	7.907e4	1.154	1.63	1.55	1291.7	YES	NO	bb	bb	48.871
23	12378-PeCDD	31.42	1.100e5	6.755e4	0.995	1.63	1.55	1134.9	YES	NO	bb	bb	48.360
24	12479-PECDD	28.69	1.942e5	1.185e5	1.843	1.64	1.55	1337.1	YES	NO	bb	bb	46.000
25	123478-HxCDD	35.93	1.133e5	9.196e4	1.027	1.23	1.24	1041.2	YES	NO	bd	bd	48.191
26	124679-HXCDD	33.92	1.291e5	1.015e5	1.125	1.27	1.24	1090.1	YES	NO	bb	bb	49.450
27	123789-HxCDD	36.43	1.110e5	8.930e4	0.950	1.24	1.24	1009.6	YES	NO	bb	bb	49.036
28	123678-HxCDD	36.04	1.205e5	9.722e4	1.009	1.24	1.24	1065.9	YES	NO	db	db	48.519
29	OCDD	44.91	1.102e5	1.246e5	1.181	0.88	0.89	982.7	YES	NO	bd	bd	96.440
30	1234678-HpCDD	40.19	6.989e4	6.590e4	1.068	1.06	1.05	784.3	YES	NO	bb	bb	47.958
31	1234679-HPCDD	39.14	8.005e4	7.427e4	1.211	1.08	1.05	930.4	YES	NO	bb	bb	48.073

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PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	22.04	1.037e4					0.7	NO		bb		
2	FUNCTION1 PFK	21.94	1.961e3					0.3	NO		bb		
3	FUNCTION1 PFK	21.83	2.627e4					1.0	NO		db		
4	FUNCTION1 PFK	21.78	5.216e4					1.6	NO		bd		
5	FUNCTION1 PFK	21.68	1.339e4					0.8	NO		bb		
6	FUNCTION1 PFK	21.60	3.246e3					0.4	NO		bb		
7	FUNCTION1 PFK	21.53	9.728e3					0.7	NO		bb		
8	FUNCTION1 PFK	21.25	3.354e4					2.0	NO		db		
9	FUNCTION1 PFK	21.21	1.401e4					0.9	NO		bd		
10	FUNCTION1 PFK	21.13	5.466e3					0.7	NO		bb		
11	FUNCTION1 PFK	24.64	2.322e3					0.3	NO		bb		
12	FUNCTION1 PFK	24.49	1.685e4					0.6	NO		bb		
13	FUNCTION1 PFK	24.38	8.969e3					0.7	NO		bb		
14	FUNCTION1 PFK	24.32	1.171e4					0.9	NO		bb		
15	FUNCTION1 PFK	24.23	4.773e4					1.2	NO		db		
16	FUNCTION1 PFK	24.14	5.004e3					0.4	NO		bd		
17	FUNCTION1 PFK	23.93	2.765e4					0.7	NO		bb		
18	FUNCTION1 PFK	23.57	6.247e3					0.5	NO		bb		
19	FUNCTION1 PFK	23.25	2.435e4					1.2	NO		bb		
20	FUNCTION1 PFK	23.11	1.062e5					1.7	NO		db		
21	FUNCTION1 PFK	22.98	4.777e4					1.5	NO		bd		
22	FUNCTION1 PFK	22.87	5.813e3					0.6	NO		db		
23	FUNCTION1 PFK	22.83	6.264e3					0.4	NO		bd		
24	FUNCTION1 PFK	22.75	3.341e3					0.3	NO		bb		
25	FUNCTION1 PFK	22.71	1.798e3					0.2	NO		bb		
26	FUNCTION1 PFK	22.16	4.317e4					1.6	NO		bb		
27	FUNCTION1 PFK	26.74	1.049e4					0.4	NO		bb		
28	FUNCTION1 PFK	26.46	2.281e4					0.9	NO		bb		
29	FUNCTION1 PFK	26.26	2.562e4					1.1	NO		bb		
30	FUNCTION1 PFK	26.14	3.215e3					0.4	NO		bb		
31	FUNCTION1 PFK	26.06	6.538e3					0.4	NO		bb		
32	FUNCTION1 PFK	25.84	4.192e4					1.3	NO		db		
33	FUNCTION1 PFK	25.75	2.776e4					1.1	NO		bd		
34	FUNCTION1 PFK	25.61	6.518e4					2.5	NO		db		
35	FUNCTION1 PFK	25.53	4.432e4					1.9	NO		dd		
36	FUNCTION1 PFK	25.46	8.212e4					1.6	NO		dd		
37	FUNCTION1 PFK	25.26	8.344e4					1.9	NO		dd		

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Printed: Thursday, August 19, 2021 10:29:16 Pacific Daylight Time

ID: CS3K1, Name: 21081902, Date: 18-Aug-2021, Time: 10:16:21, Conditions: AUTOSPEC01, User: pk

PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	FUNCTION1 PFK	25.20	2.290e4					1.1	NO		bd		
39	FUNCTION1 PFK	25.13	1.972e3					0.3	NO		bb		
40	FUNCTION1 PFK	24.97	3.016e4					1.0	NO		bb		
41	FUNCTION1 PFK	24.78	3.753e3					0.3	NO		db		
42	FUNCTION1 PFK	24.70	8.843e3					0.8	NO		bd		
43	FUNCTION1 PFK	27.68	3.284e4					1.3	NO		bb		
44	FUNCTION1 PFK	27.39	1.467e4					0.9	NO		bb		
45	FUNCTION1 PFK	27.21	5.373e4					1.5	NO		bb		
46	FUNCTION1 PFK	27.09	1.892e4					1.1	NO		bb		
47	FUNCTION1 PFK	26.80	8.569e3					0.6	NO		bb		

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PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 PFK	29.15	1.670e6					19.2	YES		dd		0.000
2	FUNCTION2 PFK	29.10	8.469e5					20.3	YES		dd		0.000
3	FUNCTION2 PFK	28.86	3.272e6					29.3	YES		dd		0.000
4	FUNCTION2 PFK	28.71	2.060e6					34.0	YES		dd		0.000
5	FUNCTION2 PFK	28.57	1.786e6					39.0	YES		dd		0.000
6	FUNCTION2 PFK	28.46	1.181e6					43.7	YES		dd		0.000
7	FUNCTION2 PFK	28.39	8.275e5					46.0	YES		dd		0.000
8	FUNCTION2 PFK	28.22	6.775e6					51.3	YES		dd		0.000
9	FUNCTION2 PFK	27.99	6.132e6					59.3	YES		dd		0.000
10	FUNCTION2 PFK	27.81	2.044e6					64.2	YES		bd		0.000
11	FUNCTION2 PFK	32.29	7.597e3					0.6	NO		bb		0.000
12	FUNCTION2 PFK	31.58	1.731e3					0.4	NO		bb		0.000
13	FUNCTION2 PFK	31.53	1.125e4					1.4	NO		bb		0.000
14	FUNCTION2 PFK	31.47	1.243e4					1.2	NO		bb		0.000
15	FUNCTION2 PFK	31.05	5.034e4					1.9	NO		bb		0.000
16	FUNCTION2 PFK	30.81	5.805e3					0.9	NO		bb		0.000
17	FUNCTION2 PFK	30.76	1.063e4					1.3	NO		db		0.000
18	FUNCTION2 PFK	30.72	8.726e3					0.9	NO		bd		0.000
19	FUNCTION2 PFK	30.49	2.355e4					1.4	NO		bb		0.000
20	FUNCTION2 PFK	30.32	1.440e4					1.1	NO		db		0.000
21	FUNCTION2 PFK	30.26	4.046e4					2.2	NO		bd		0.000
22	FUNCTION2 PFK	30.12	5.243e4					1.6	NO		bb		0.000
23	FUNCTION2 PFK	29.65	1.819e5					1.2	NO		db		0.000
24	FUNCTION2 PFK	29.45	2.647e5					8.4	YES		dd		0.000

PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 PFK	32.81	3.881e4					2.6	NO		bb		0.000
2	FUNCTION3 PFK	33.07	2.384e4					2.0	NO		bb		0.000
3	FUNCTION3 PFK	33.01	1.344e4					1.7	NO		bb		0.000

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PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 PFK	39.43	1.704e4					1.5	NO		bd		
2	FUNCTION4 PFK	39.33	1.043e3					0.3	NO		bb		
3	FUNCTION4 PFK	39.20	1.309e4					1.1	NO		bb		
4	FUNCTION4 PFK	39.12	1.360e4					1.2	NO		bb		
5	FUNCTION4 PFK	38.89	1.178e5					3.5	YES		db		
6	FUNCTION4 PFK	38.50	1.432e6					20.7	YES		dd		
7	FUNCTION4 PFK	38.44	3.902e5					23.1	YES		dd		
8	FUNCTION4 PFK	38.36	2.071e6					26.5	YES		dd		
9	FUNCTION4 PFK	38.16	4.719e5					34.6	YES		dd		
10	FUNCTION4 PFK	38.12	3.721e5					36.3	YES		dd		
11	FUNCTION4 PFK	37.98	2.400e6					42.8	YES		dd		
12	FUNCTION4 PFK	37.87	1.105e6					46.2	YES		dd		
13	FUNCTION4 PFK	37.78	1.688e6					49.8	YES		bd		
14	FUNCTION4 PFK	41.44	3.187e3					0.4	NO		bb		
15	FUNCTION4 PFK	41.39	1.004e4					1.0	NO		bb		
16	FUNCTION4 PFK	41.21	2.865e3					0.5	NO		bb		
17	FUNCTION4 PFK	41.10	3.917e3					0.6	NO		bb		
18	FUNCTION4 PFK	40.97	5.673e3					0.8	NO		bb		
19	FUNCTION4 PFK	40.67	1.331e3					0.4	NO		bb		
20	FUNCTION4 PFK	40.56	5.919e3					0.8	NO		bb		
21	FUNCTION4 PFK	40.48	1.628e3					0.5	NO		bb		
22	FUNCTION4 PFK	40.43	7.492e3					0.7	NO		bb		
23	FUNCTION4 PFK	40.29	9.284e3					1.1	NO		bb		
24	FUNCTION4 PFK	40.18	1.952e4					1.4	NO		bb		
25	FUNCTION4 PFK	39.94	1.874e3					0.4	NO		db		
26	FUNCTION4 PFK	39.91	9.128e3					1.1	NO		bd		
27	FUNCTION4 PFK	39.73	9.559e3					1.1	NO		db		
28	FUNCTION4 PFK	39.69	7.518e3					0.8	NO		bd		
29	FUNCTION4 PFK	39.51	1.217e4					1.3	NO		db		
30	FUNCTION4 PFK	42.74	1.731e4					1.0	NO		bb		
31	FUNCTION4 PFK	42.66	7.578e3					0.8	NO		db		
32	FUNCTION4 PFK	42.62	7.817e3					0.9	NO		bd		
33	FUNCTION4 PFK	42.45	5.792e3					0.7	NO		bb		
34	FUNCTION4 PFK	42.23	3.931e3					0.6	NO		bb		
35	FUNCTION4 PFK	42.17	6.969e3					0.8	NO		bb		
36	FUNCTION4 PFK	41.97	1.384e3					0.4	NO		bb		
37	FUNCTION4 PFK	41.67	6.163e3					0.7	NO		bb		

ID: CS3K1, Name: 21081902, Date: 18-Aug-2021, Time: 10:16:21, Conditions: AUTOSPEC01, User: pk

PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	45.29	1.437e3					0.8	NO		bb		
2	FUNCTION5 PFK	45.25	1.118e4					1.7	NO		db		
3	FUNCTION5 PFK	45.17	1.073e4					1.6	NO		bd		
4	FUNCTION5 PFK	43.96	1.117e3					0.6	NO		bb		
5	FUNCTION5 PFK	42.91	1.080e4					1.9	NO		bb		

ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	22.39	7.397e1					1.7	NO		bd		0.000
2	FUNCTION1 HXCD...	24.34	7.336e1					2.0	NO		bb		0.000
3	FUNCTION1 HXCD...	23.67	9.865e1					1.8	NO		bb		0.000
4	FUNCTION1 HXCD...	22.62	9.267e1					2.2	NO		bb		0.000
5	FUNCTION1 HXCD...	22.48	9.766e1					2.8	NO		db		0.000

ETHERS2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HPCD...	27.26	7.769e1					1.8	NO		bb		0.000
2	FUNCTION1 HPCD...	26.64	8.072e1					1.5	NO		bb		0.000
3	FUNCTION1 HPCD...	26.27	1.481e2					3.6	YES		bb		0.000
4	FUNCTION1 HPCD...	21.16	1.396e2					1.8	NO		bb		0.000

ETHERS3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 HPCD...	31.06	8.874e1					2.9	NO		db		0.000
2	FUNCTION2 HPCD...	31.00	2.047e2					4.3	YES		bd		0.000
3	FUNCTION2 HPCD...	29.63	8.171e1					1.9	NO		db		0.000
4	FUNCTION2 HPCD...	29.52	1.738e2					2.3	NO		bd		0.000
5	FUNCTION2 HPCD...	28.15	8.089e1					3.7	YES		bb		0.000
6	FUNCTION2 HPCD...	27.96	8.393e1					2.8	NO		bb		0.000
7	FUNCTION2 HPCD...	31.88	7.054e1					1.8	NO		bb		0.000

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Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:29:16 Pacific Daylight Time

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ETHERS4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 OCDPE	37.64	7.399e1					3.0	NO		bb		0.000
2	FUNCTION3 OCDPE	36.41	1.197e2					2.3	NO		bb		0.000
3	FUNCTION3 OCDPE	35.92	1.007e2					3.0	NO		bb		0.000

ETHERS5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 NCDPE	42.41	7.519e1					1.8	NO		bb		0.000
2	FUNCTION4 NCDPE	39.26	7.995e1					2.9	NO		bb		0.000

ETHERS6

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 DCDPE	44.56	7.009e1					2.2	NO		bb		0.000

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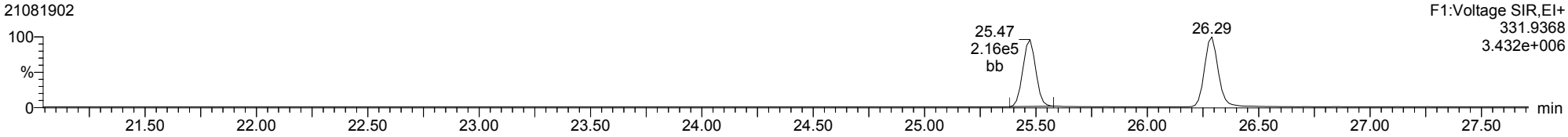

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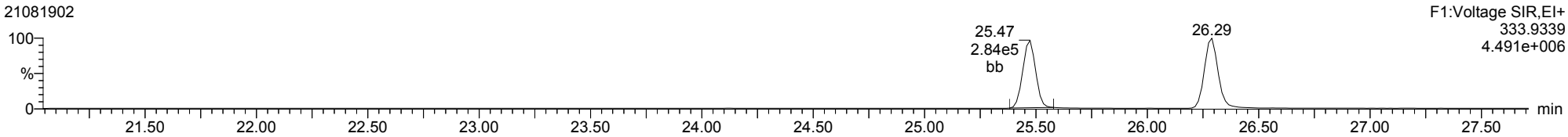

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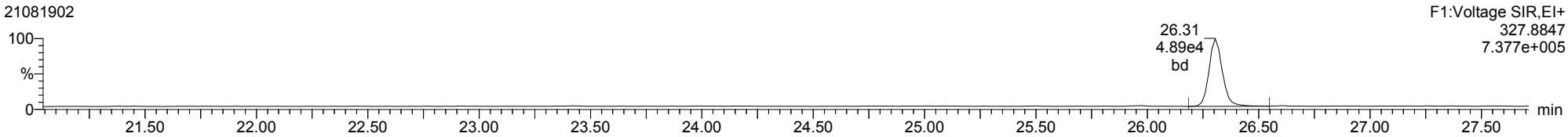

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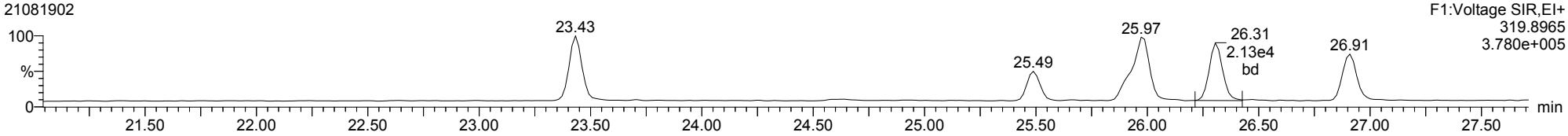

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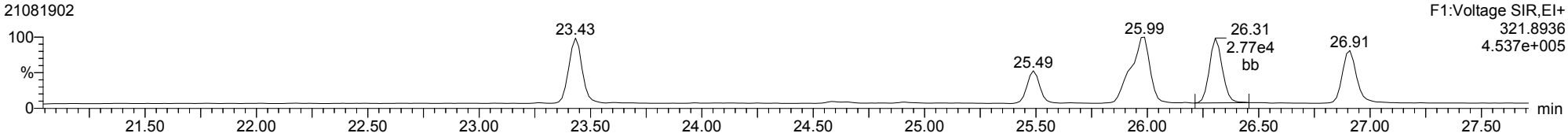

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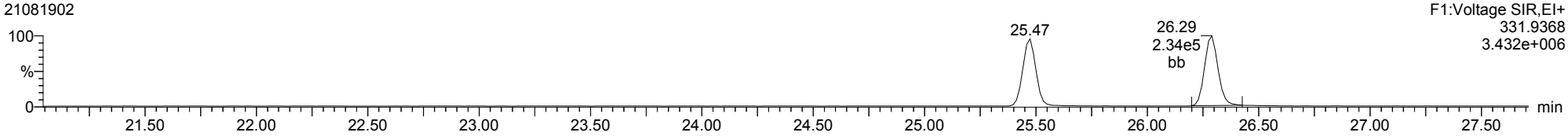

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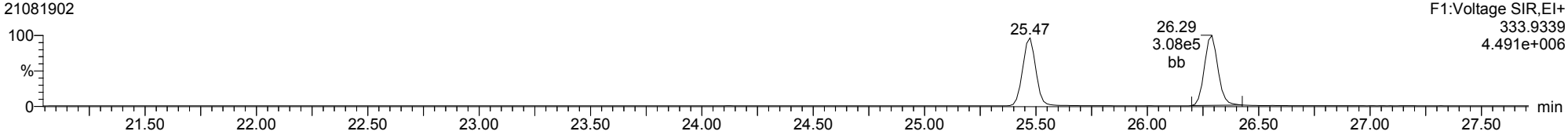

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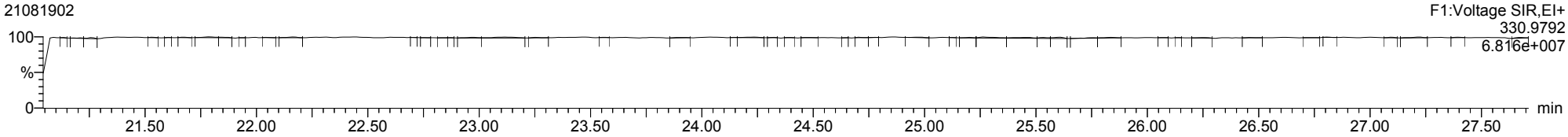

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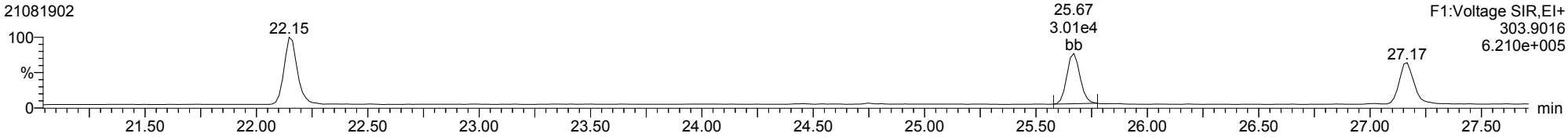

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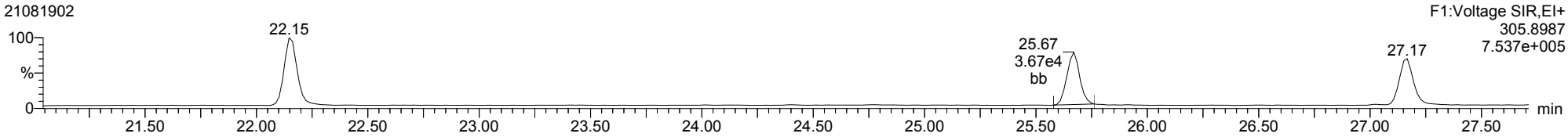

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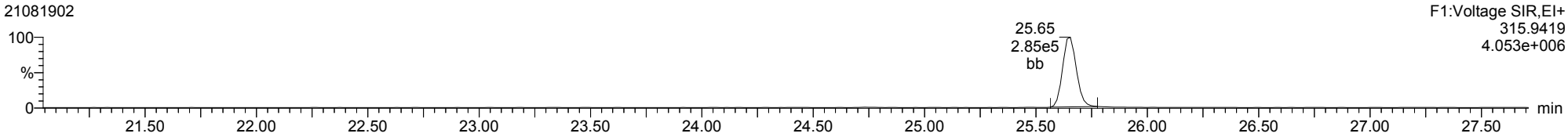

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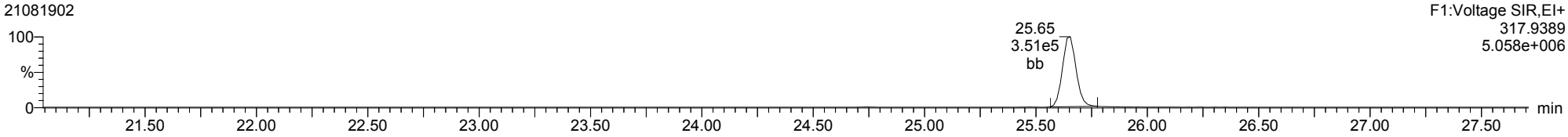

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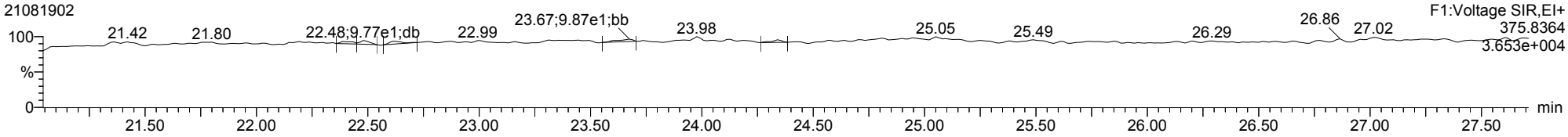

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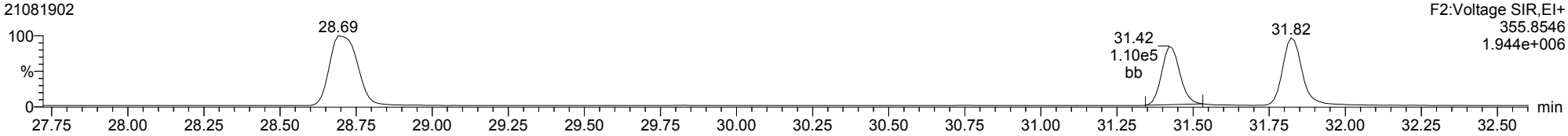
12378-PeCDD



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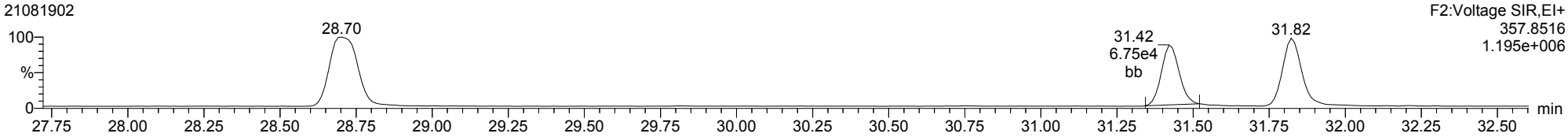

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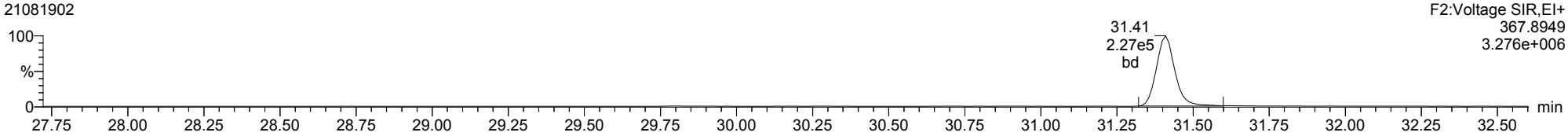

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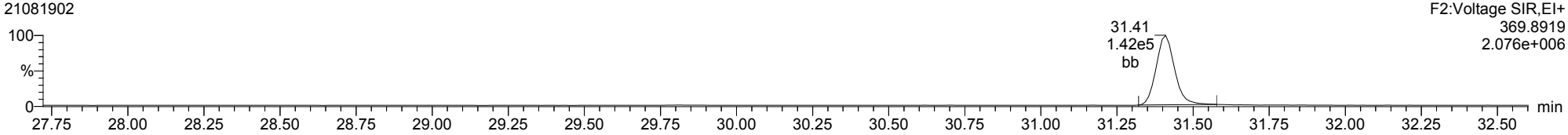

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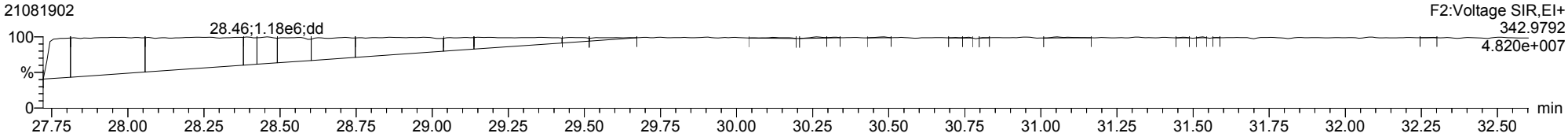

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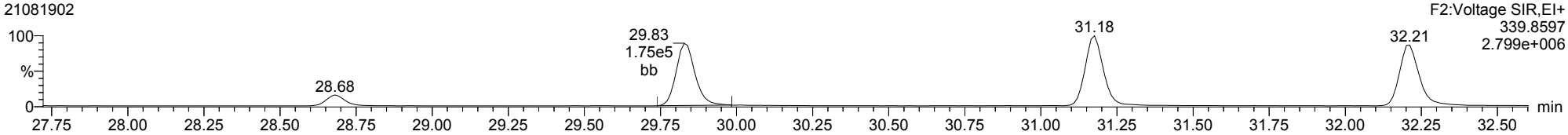
12378-PeCDF



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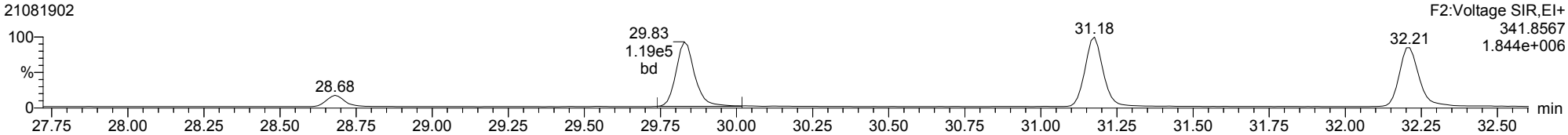

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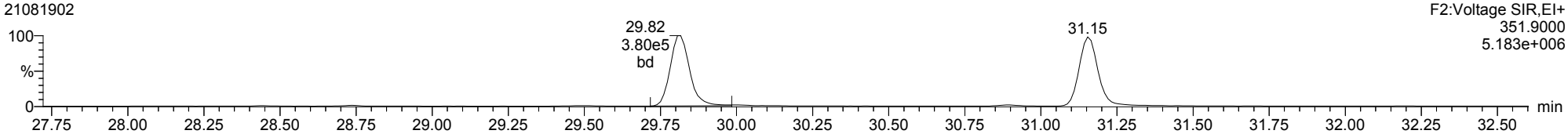

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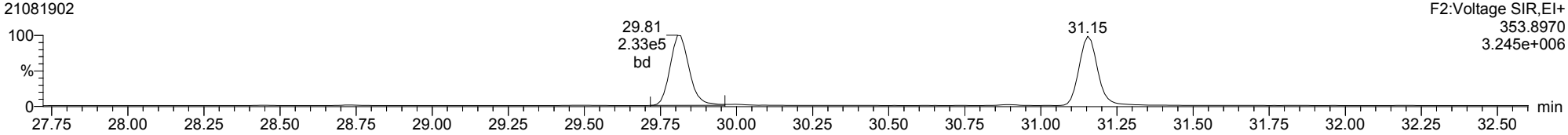

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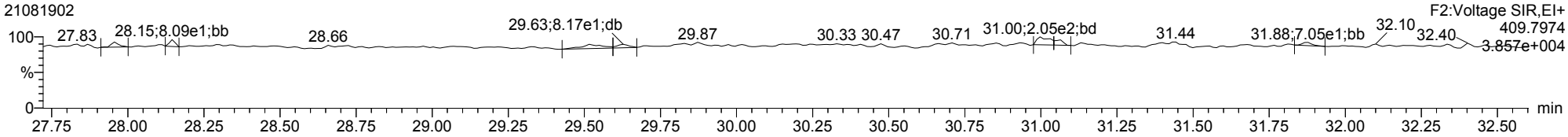

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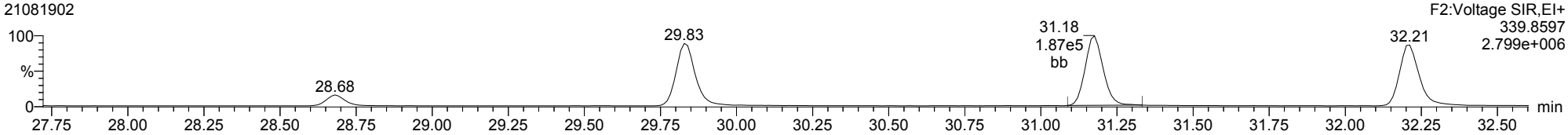
23478-PeCDF



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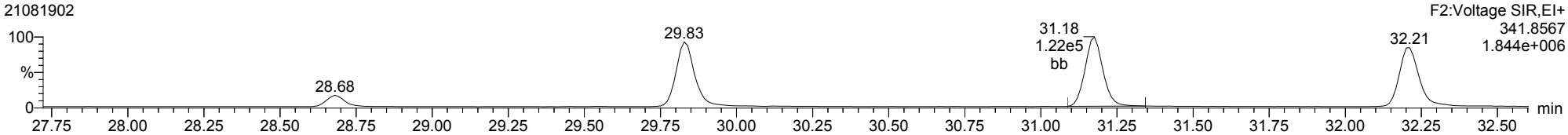

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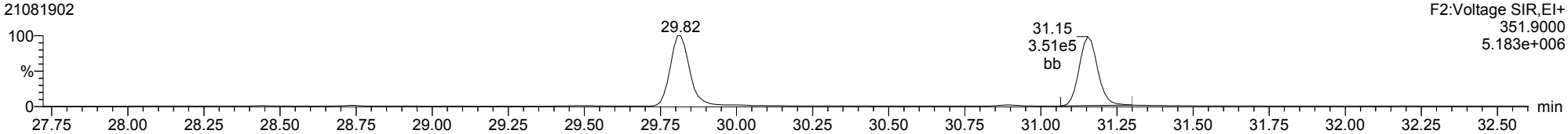

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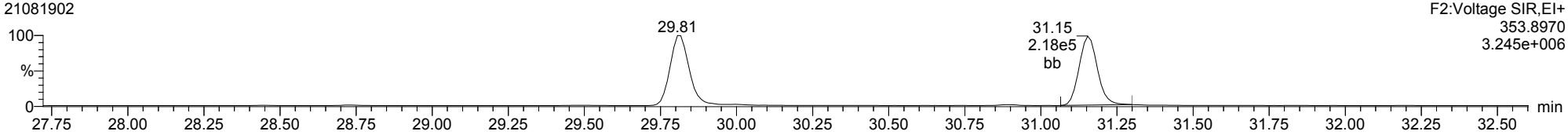

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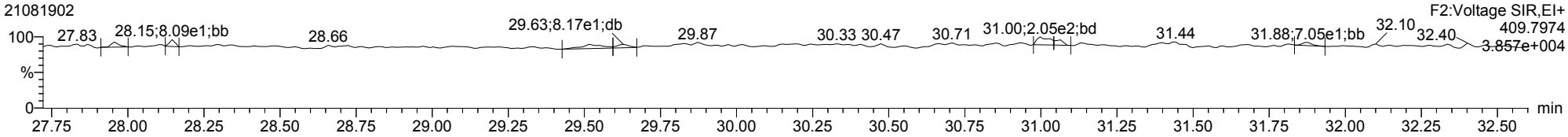

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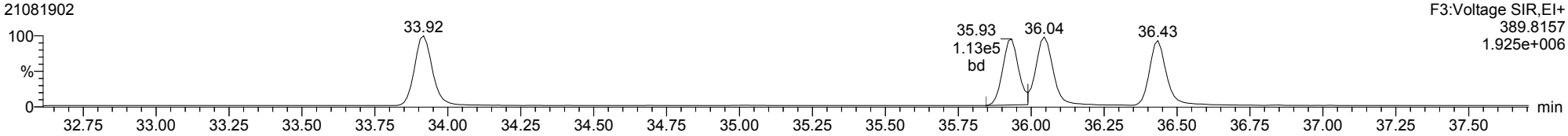

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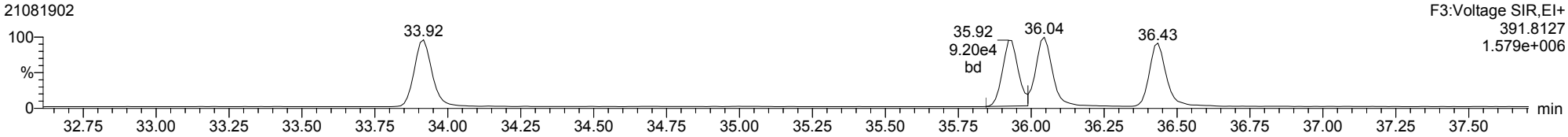

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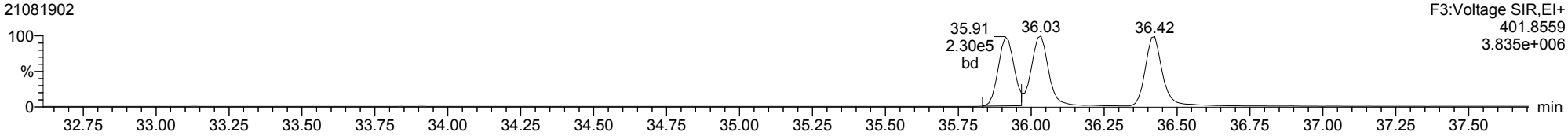

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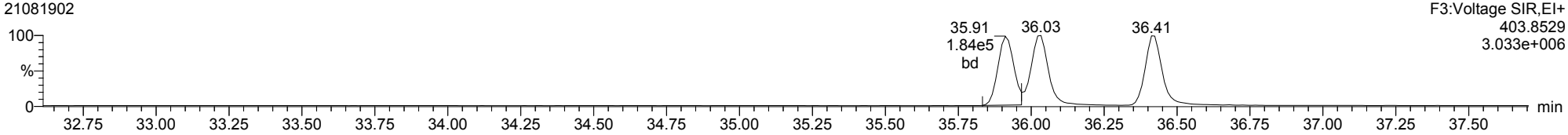

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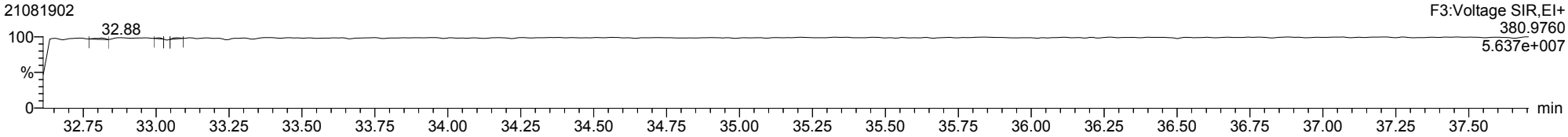

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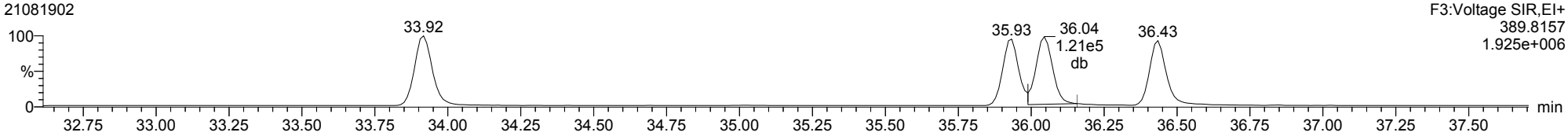

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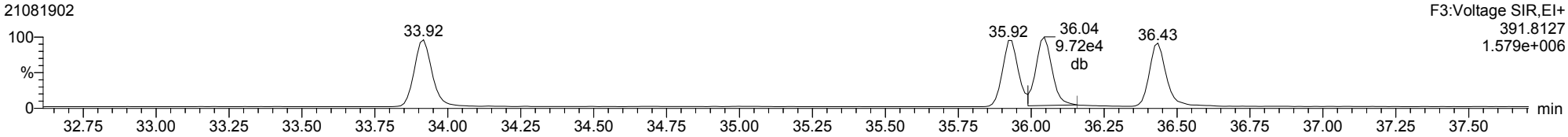

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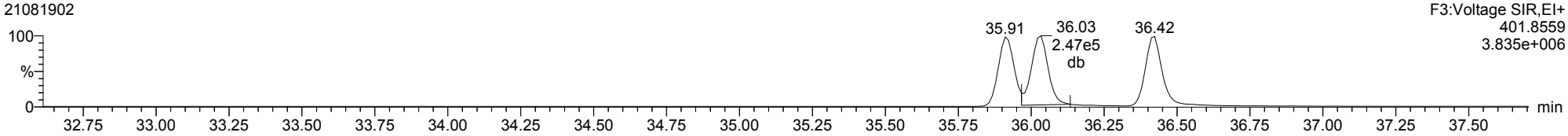

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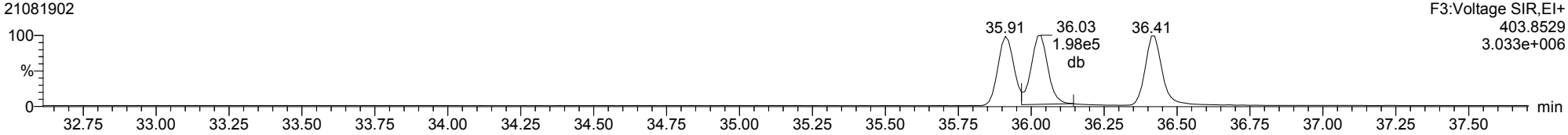

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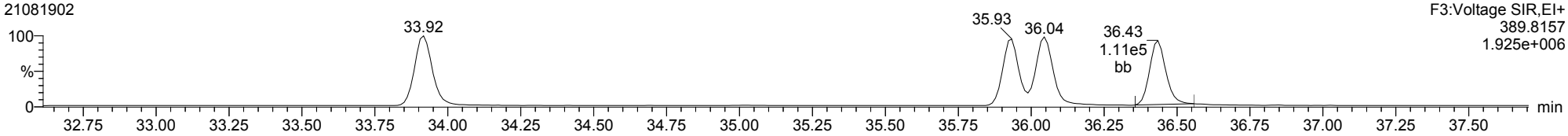

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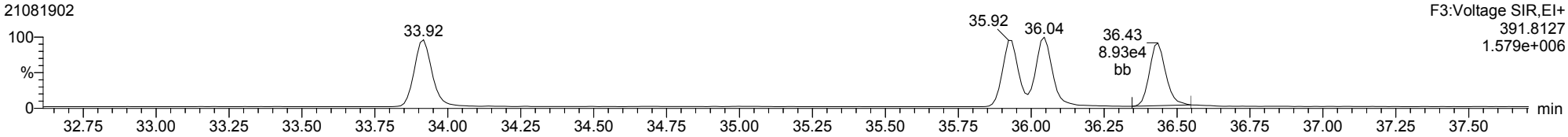

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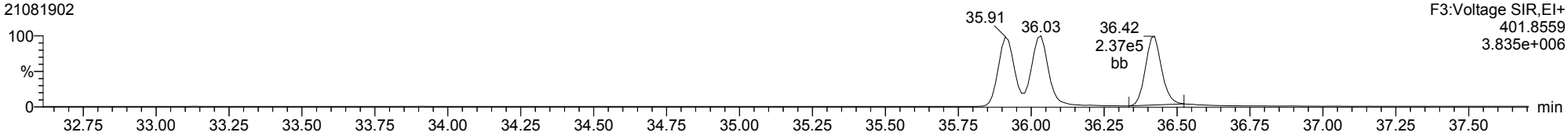

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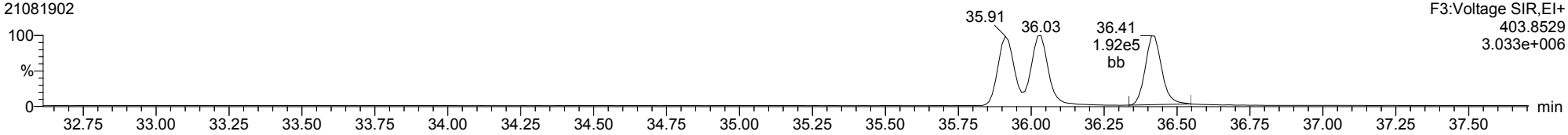

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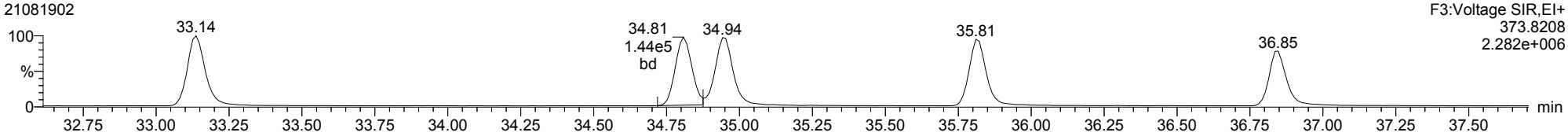

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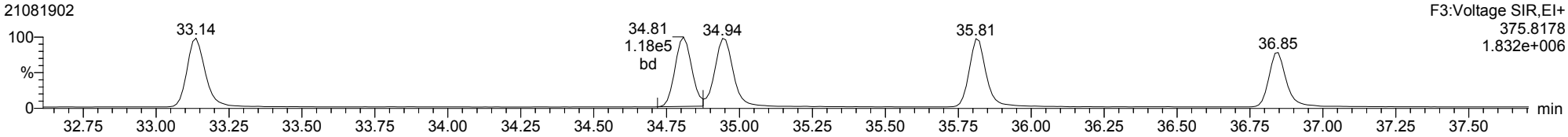

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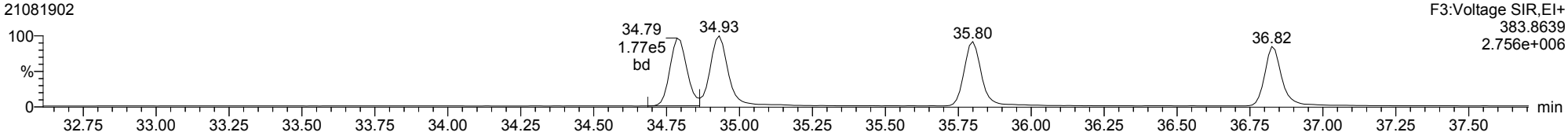

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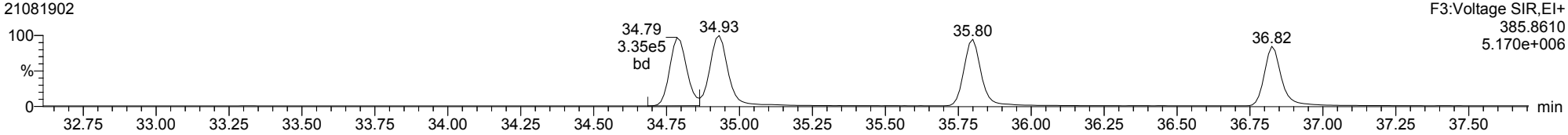

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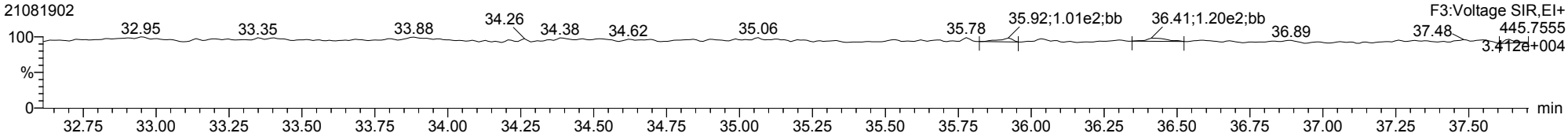

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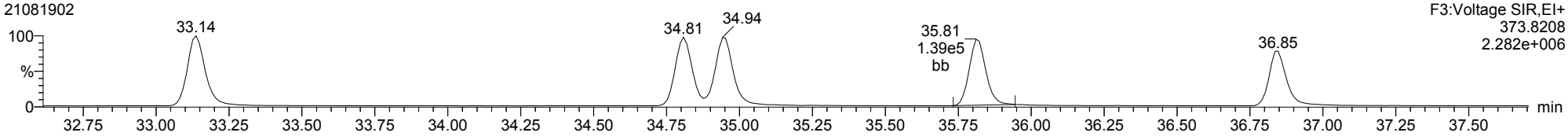
234678-HxCDF



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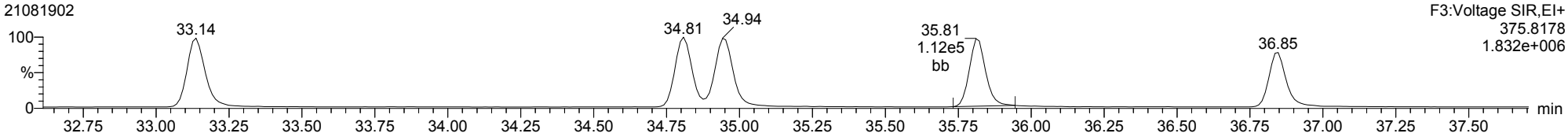

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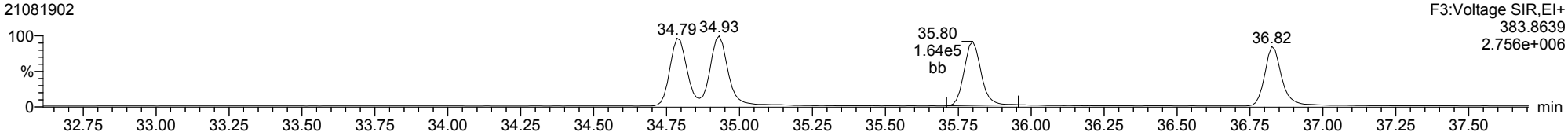

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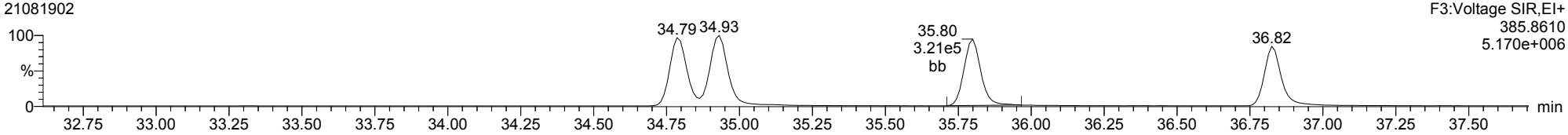
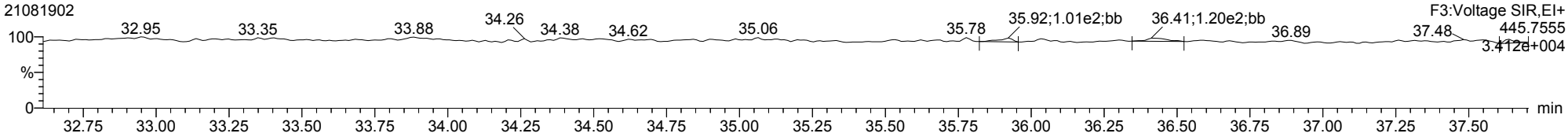


FUNCTION3 OCDPE



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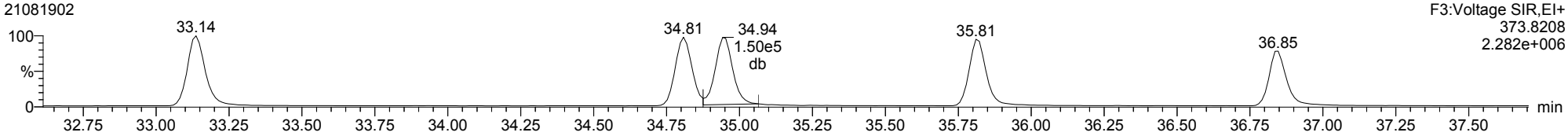
123678-HxCDF



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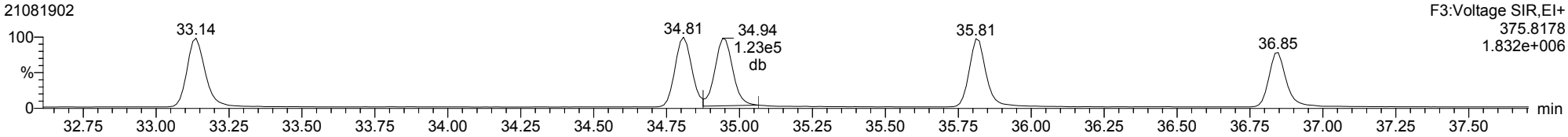

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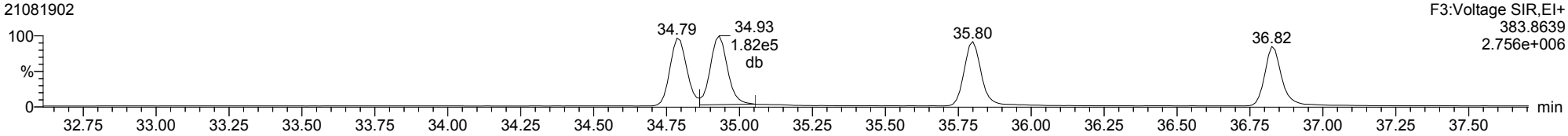

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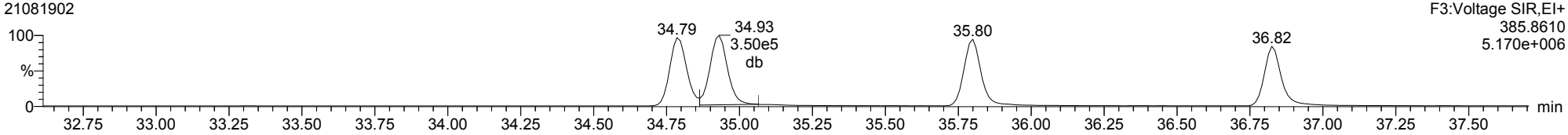
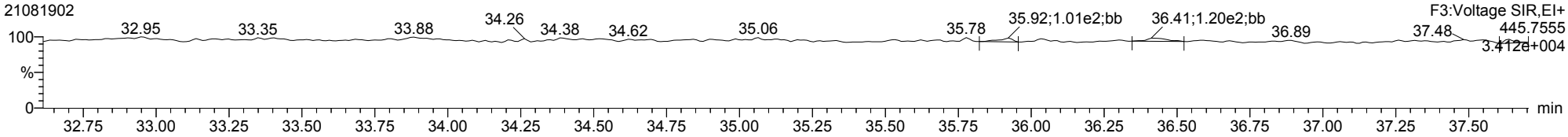


FUNCTION3 OCDPE



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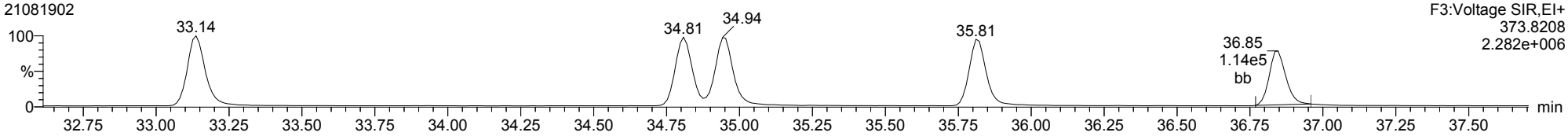
123789-HxCDF



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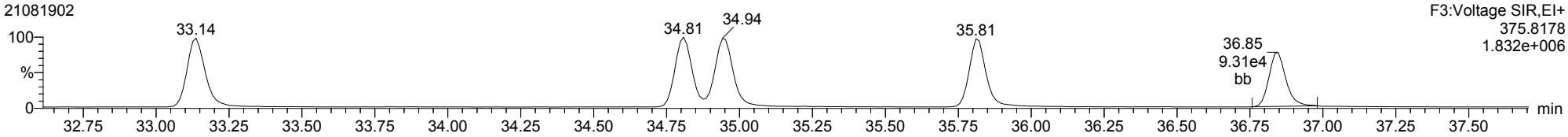

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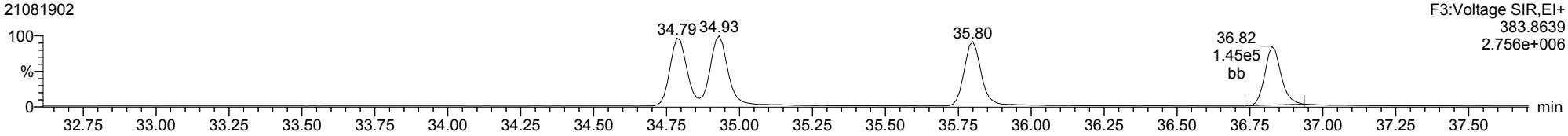

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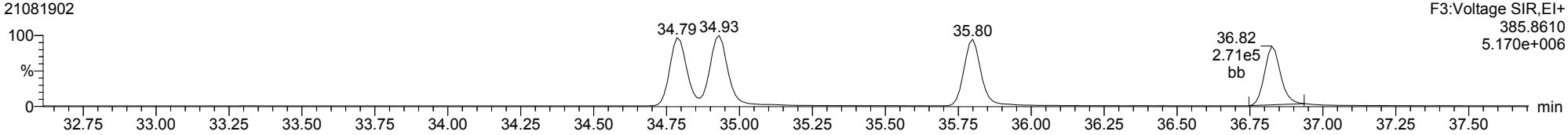
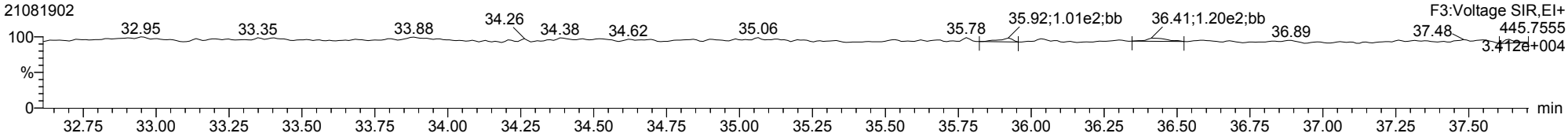


FUNCTION3 OCDPE



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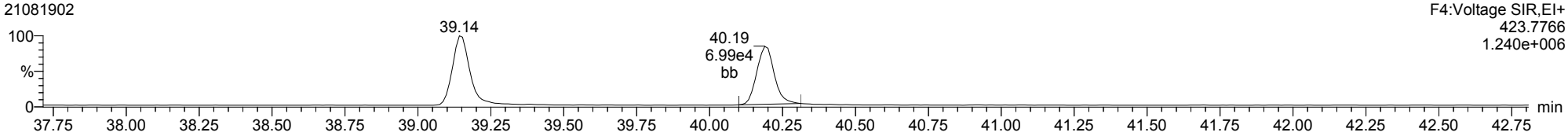
1234678-HpCDD



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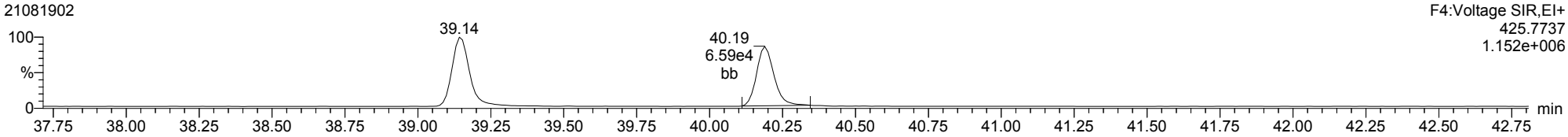

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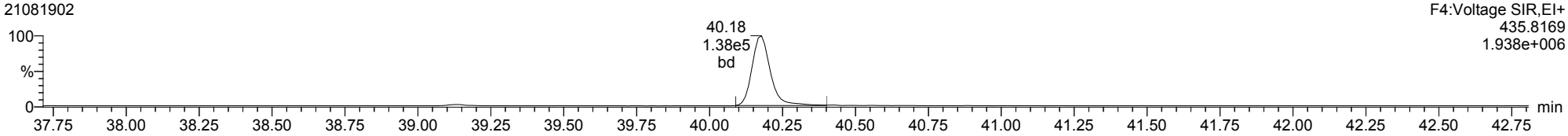

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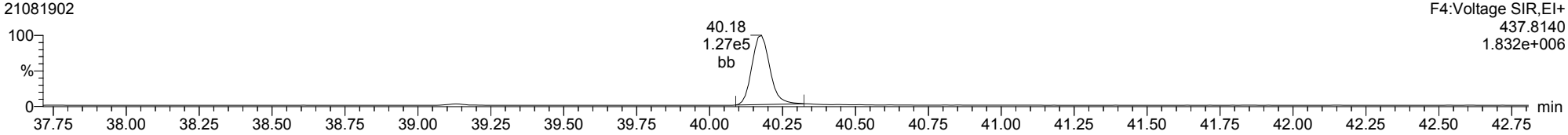
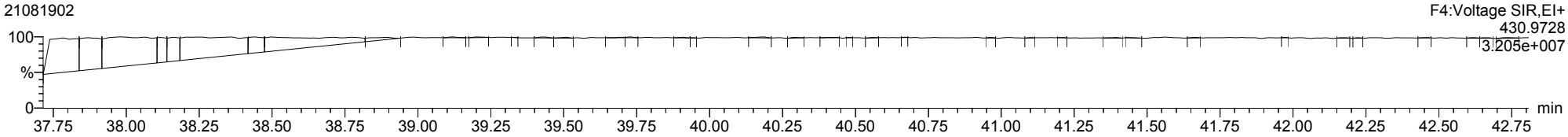


FUNCTION4 PFK



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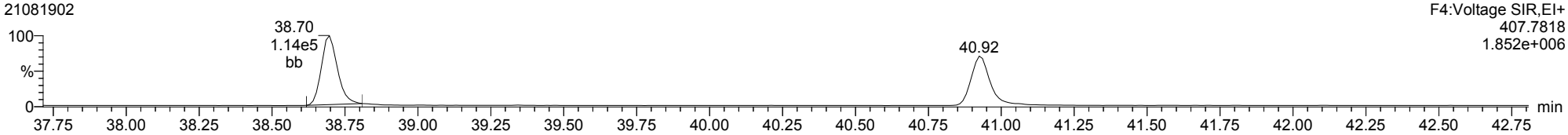

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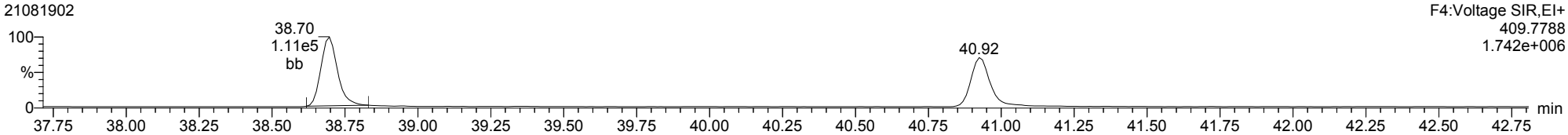

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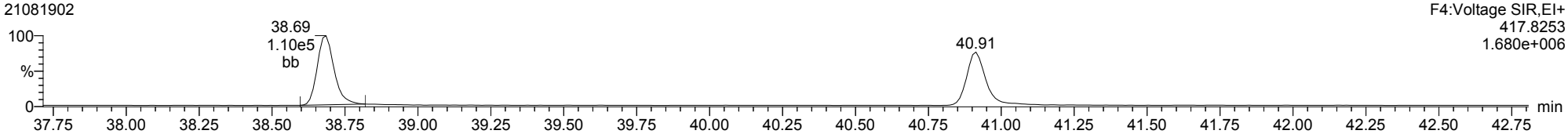

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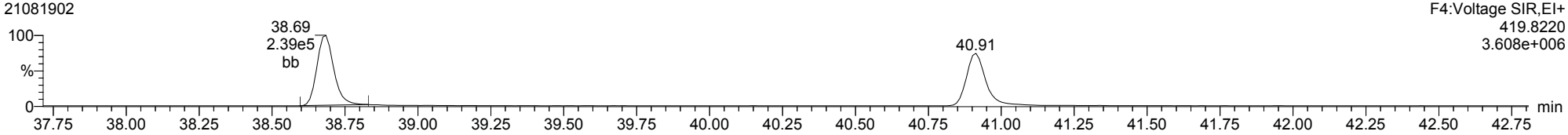
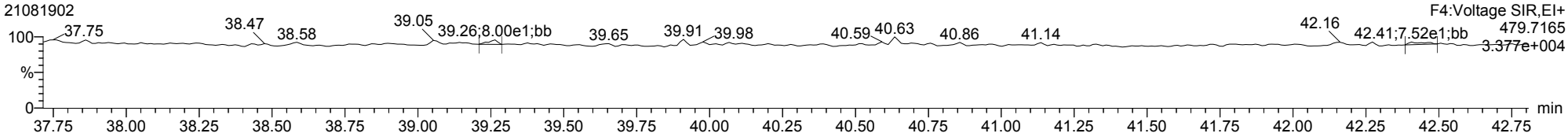


FUNCTION4 NCDPE



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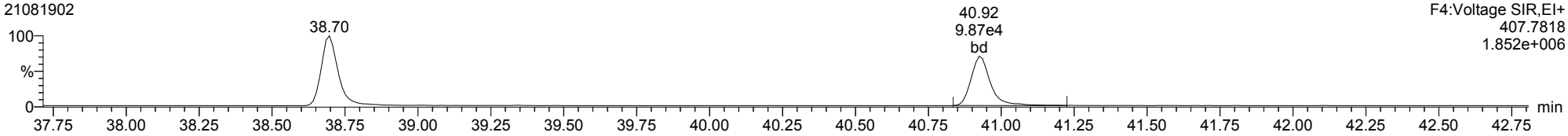
1234789-HpCDF



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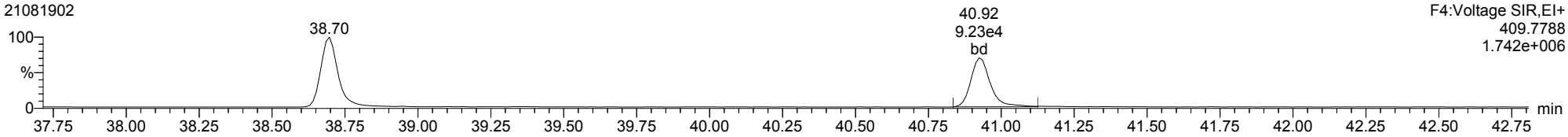

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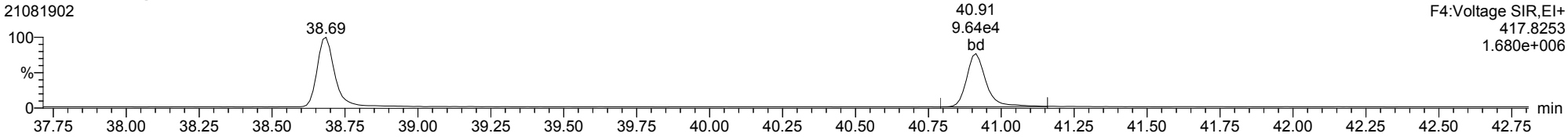

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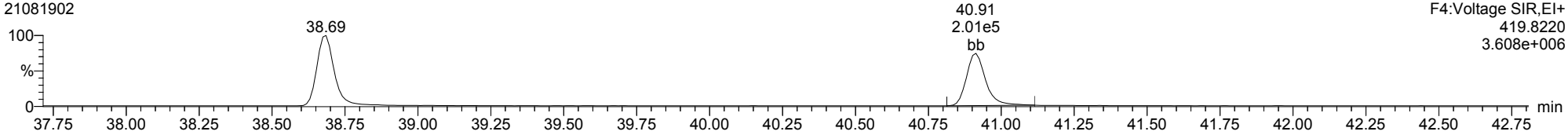
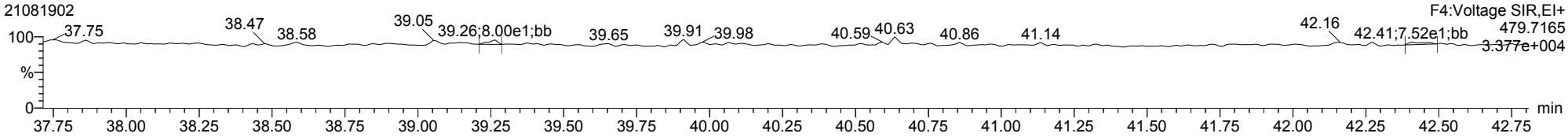


FUNCTION4 NCDPE



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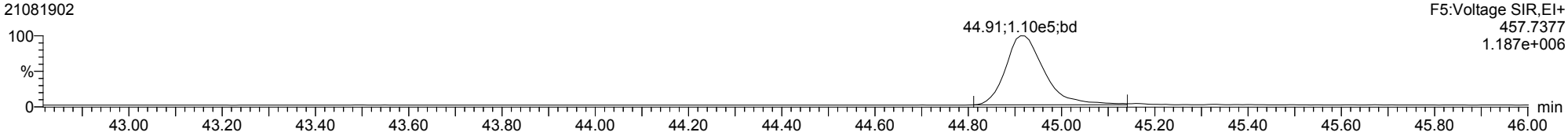

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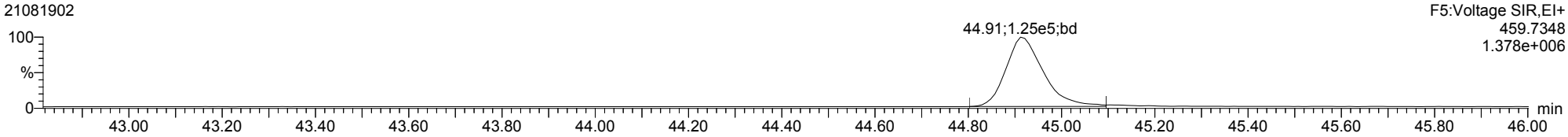

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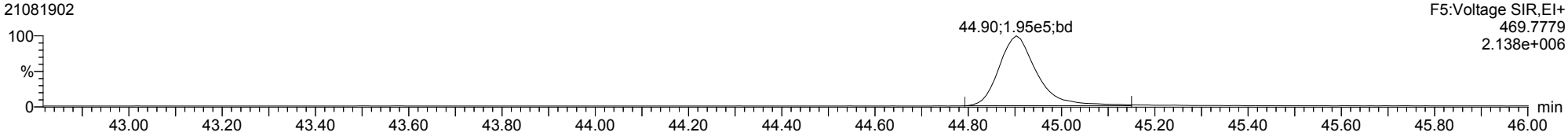

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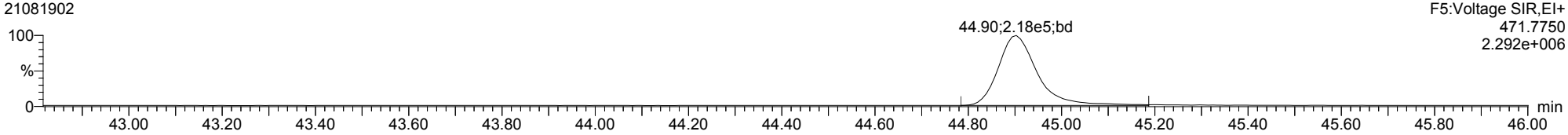

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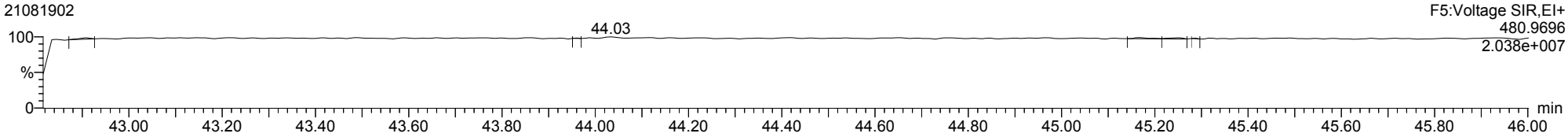

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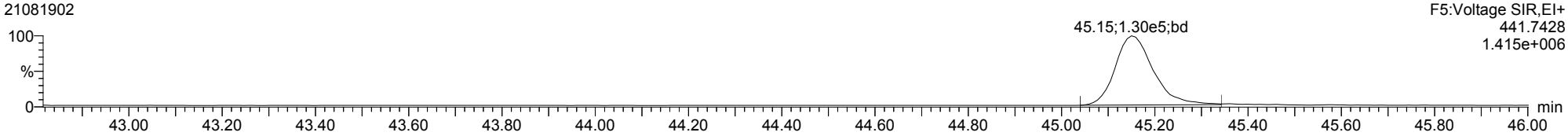

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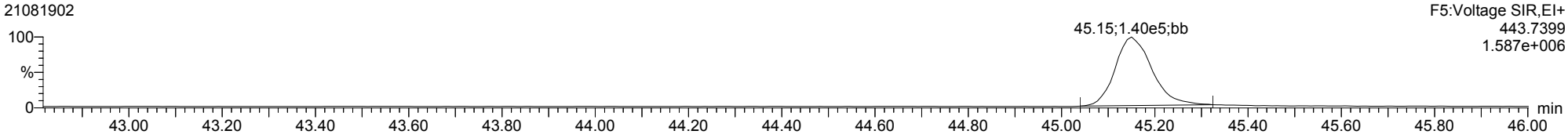

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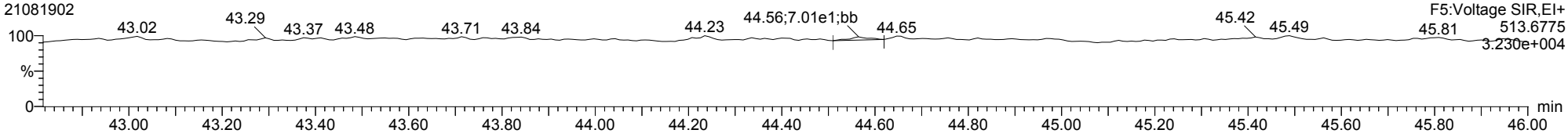

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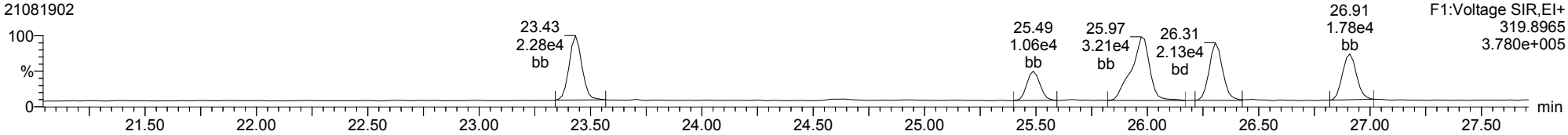

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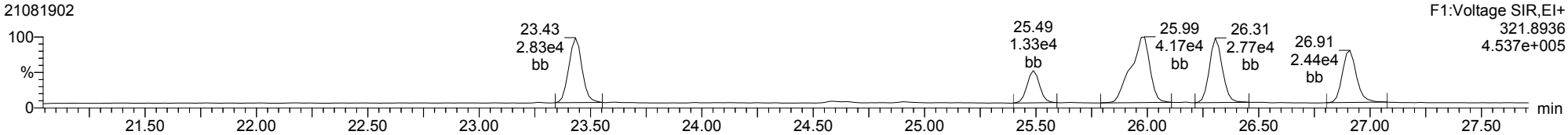

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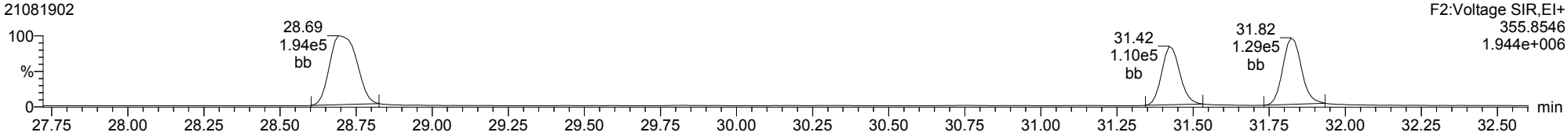

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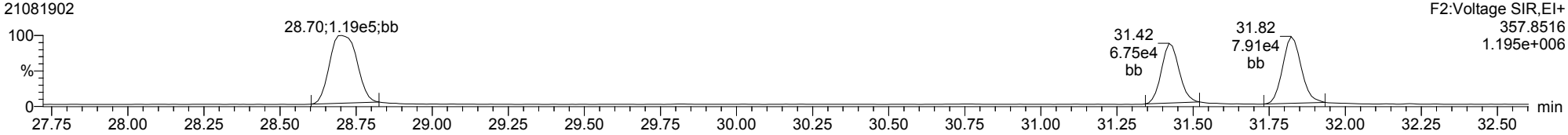

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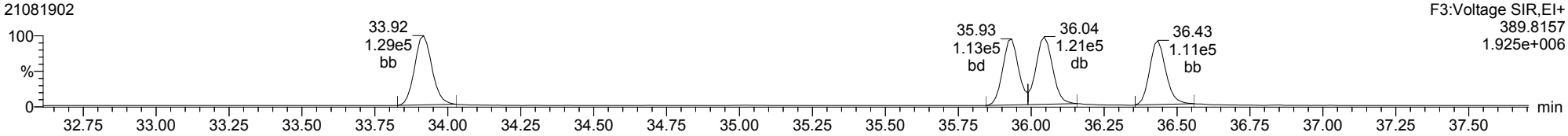

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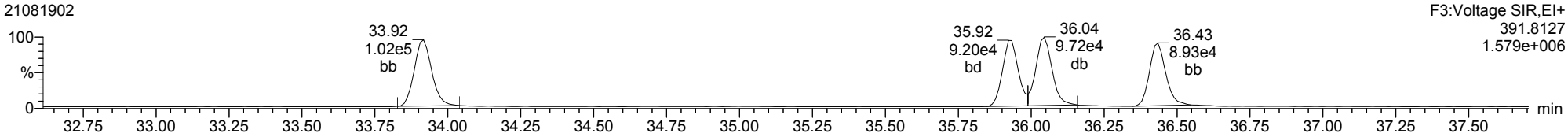

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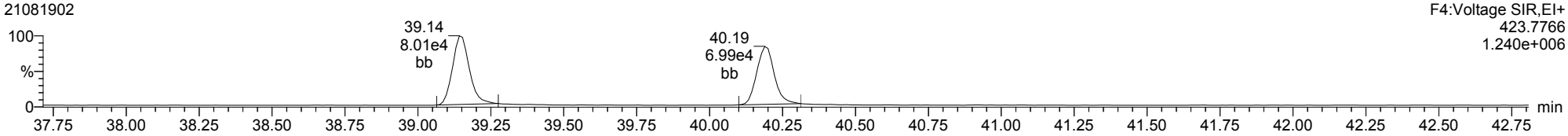

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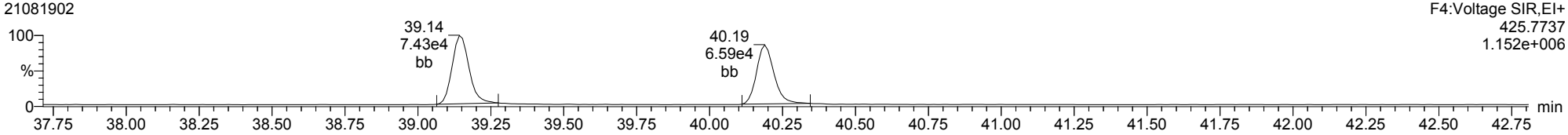

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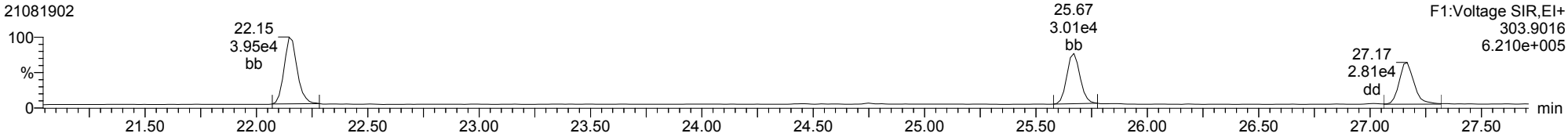

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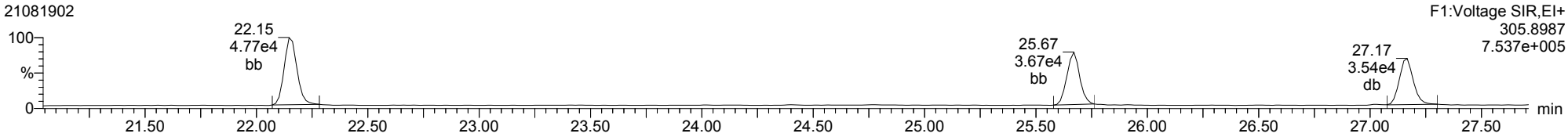

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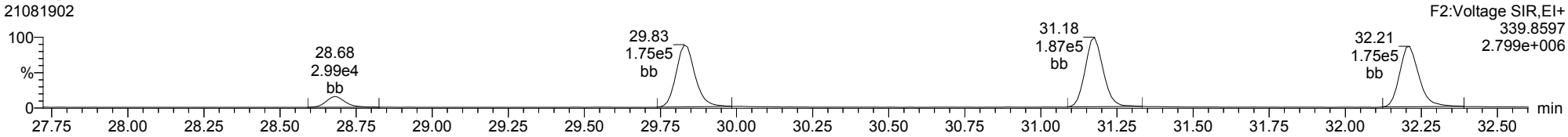

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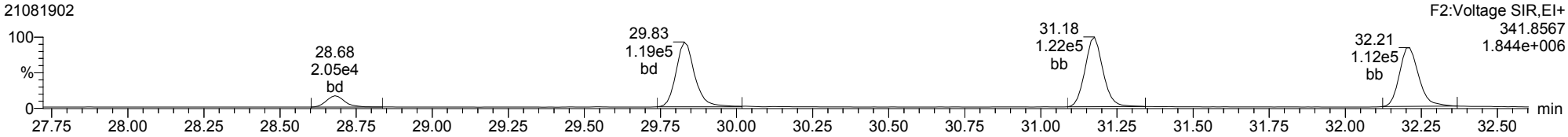

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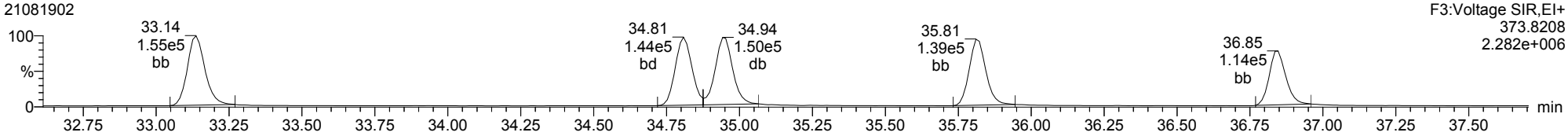

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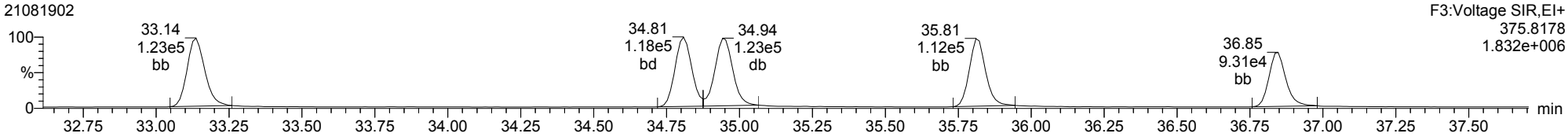

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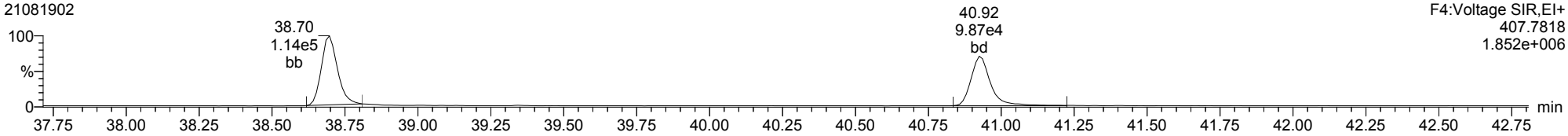

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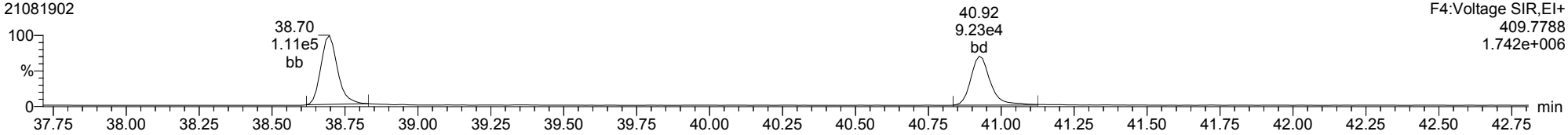

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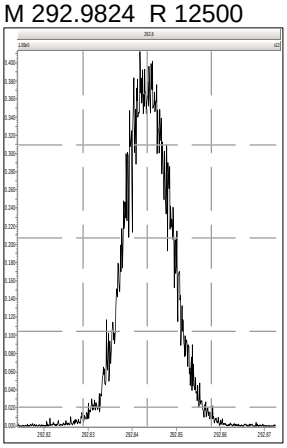

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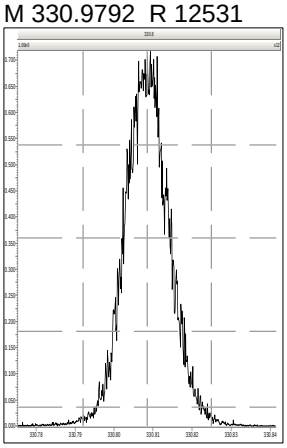

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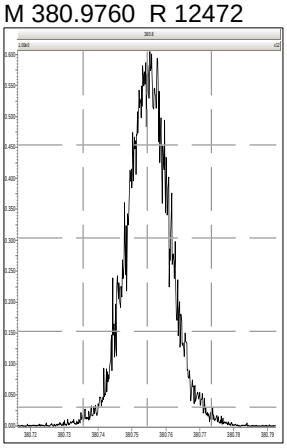

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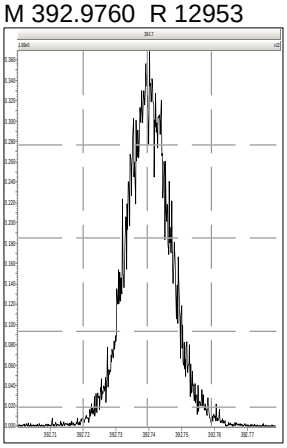

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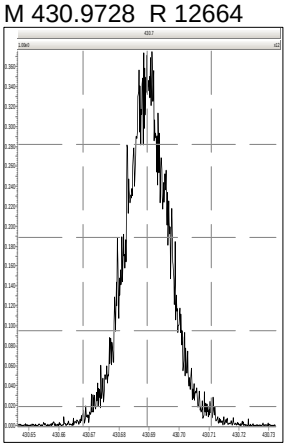

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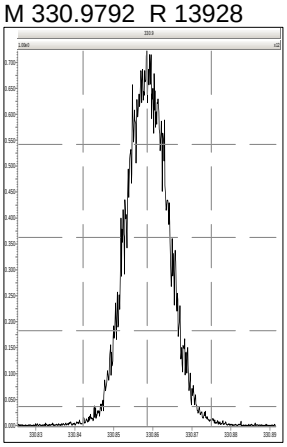

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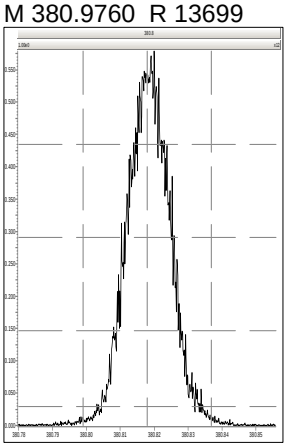

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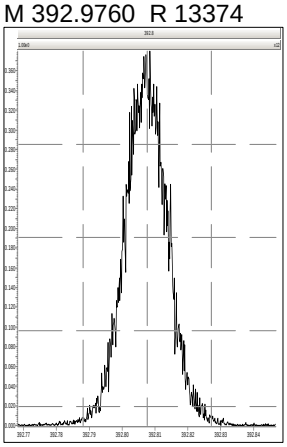

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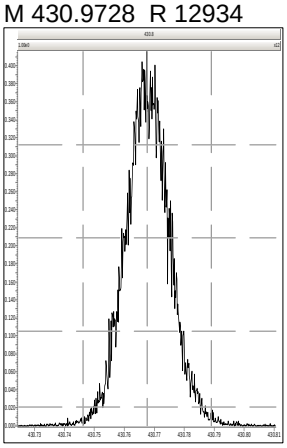

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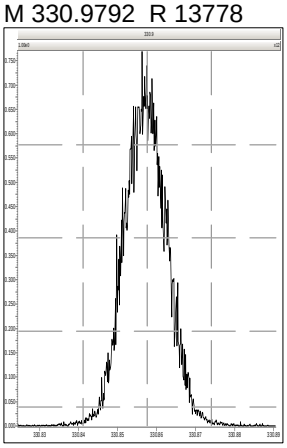

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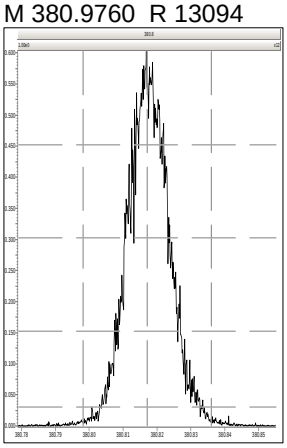

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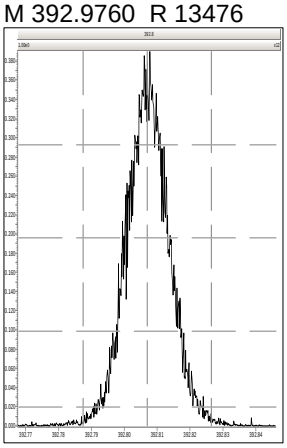

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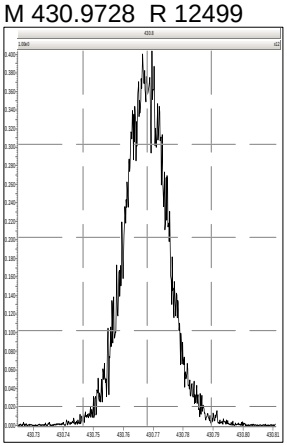

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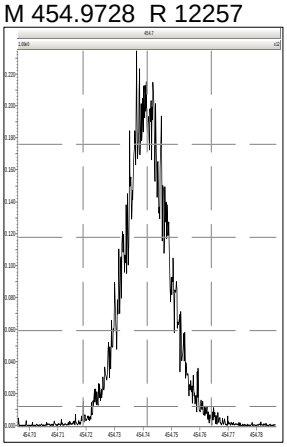

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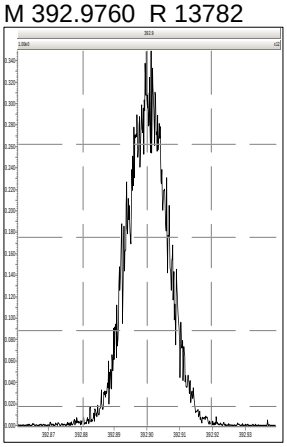

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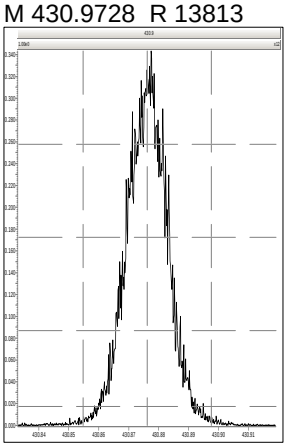

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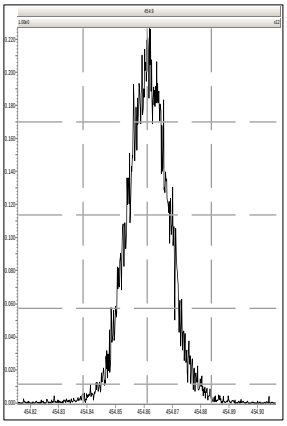

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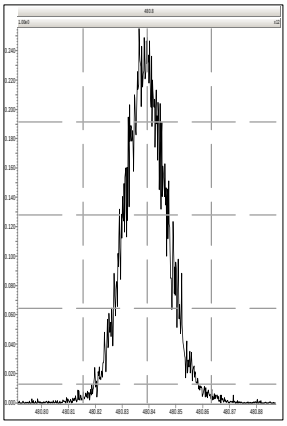

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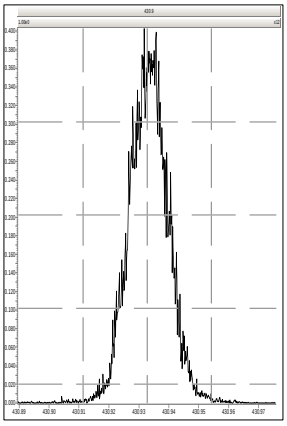

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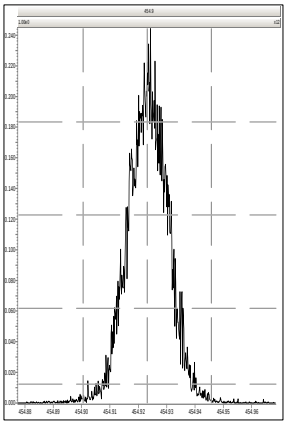

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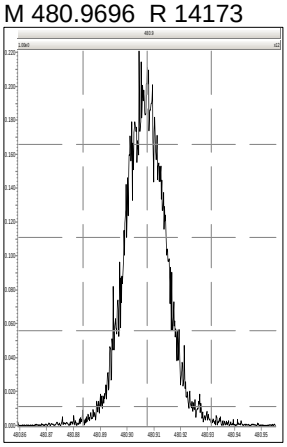

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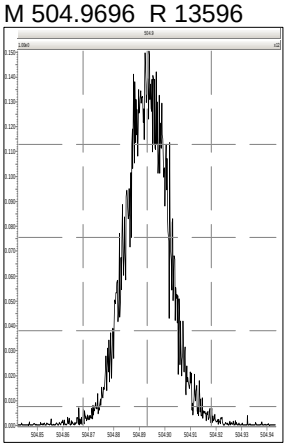

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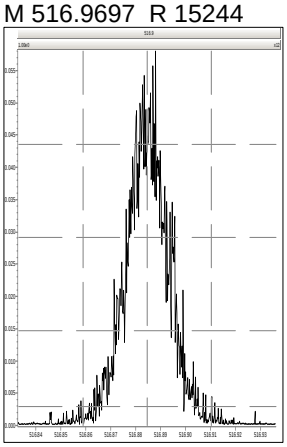

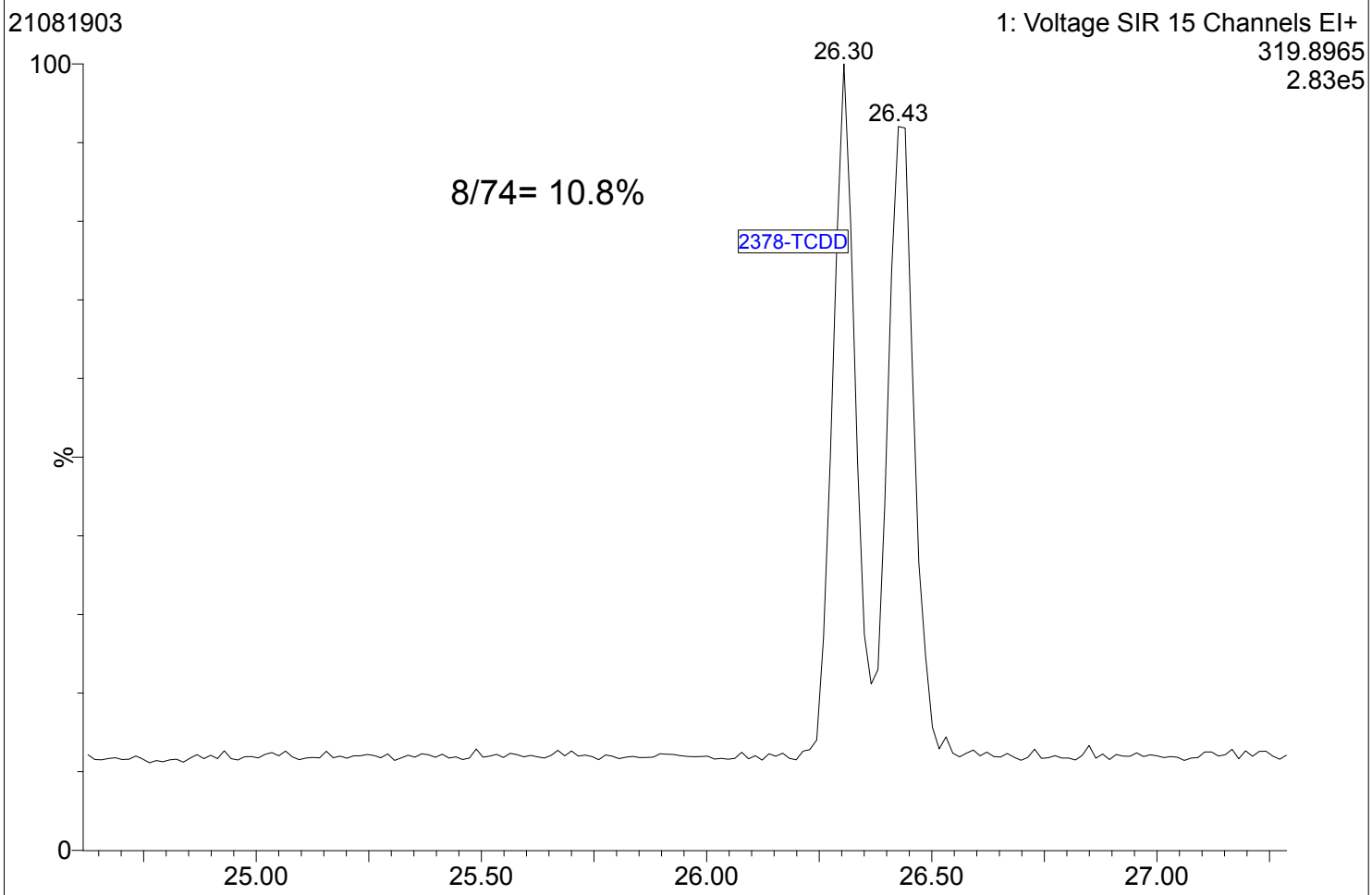
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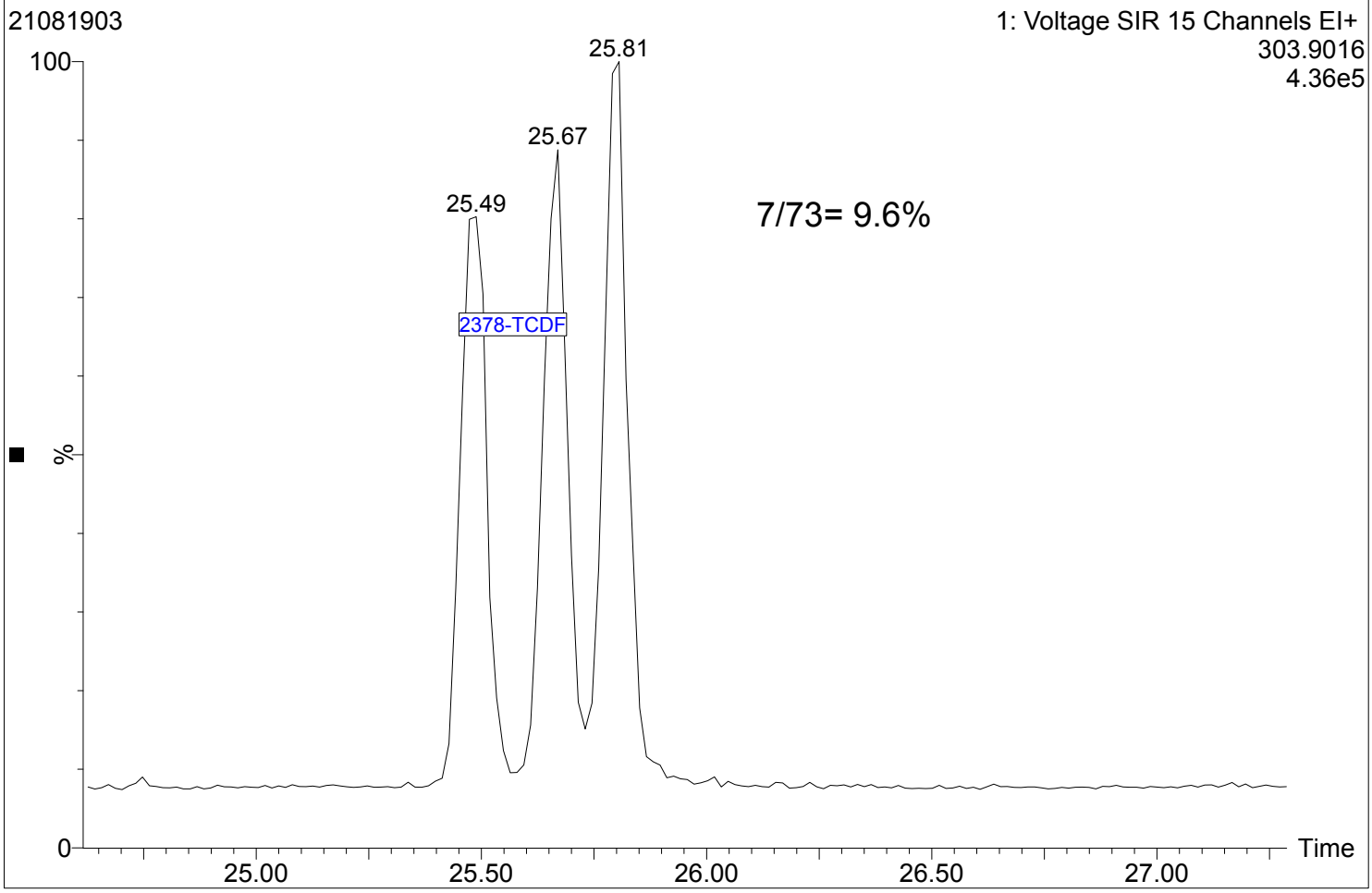
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%
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25.67
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2378-TCDF
Time
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25.50
26.00
26.50
27.00

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	AUTOSPEC01	Calibration:	EH00030
Lab File ID:	21081915	Calibration Date:	08/11/2021
Sequence:	SJH0230	Injection Date:	08/18/21
Lab Sample ID:	SJH0230-CCV1	Injection Time:	21:38
Sequence Name:	CS3K2		

		CONC. (ng/mL)		RESPONSE FACTOR (RRF)			% DRIFT/DIFF	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN	CCV	LIMIT
2,3,7,8-TCDF	A	10.000	9.38	1.1075930	1.0392170		-6.2	+/-16
2,3,7,8-TCDD	A	10.000	9.69	0.9202875	0.8914164		-3.1	+/-22
1,2,3,7,8-PeCDF	A	50.000	50.4	1.0148670	1.0225430		0.8	+/-18
2,3,4,7,8-PeCDF	A	50.000	49.8	1.1255490	1.1212620		-0.4	+/-18
1,2,3,7,8-PeCDD	A	50.000	49.9	0.9953229	0.9926490		-0.3	+/-22
1,2,3,4,7,8-HxCDF	A	50.000	51.9	1.0168930	1.0548030		3.7	+/-10
1,2,3,6,7,8-HxCDF	A	50.000	49.0	1.0368310	1.0158710		-2.0	+/-12
2,3,4,6,7,8-HxCDF	A	50.000	51.6	1.0524660	1.0859140		3.2	+/-12
1,2,3,7,8,9-HxCDF	A	50.000	48.7	1.0301540	1.0043650		-2.5	+/-10
1,2,3,4,7,8-HxCDD	A	50.000	48.8	1.0273630	1.0033140		-2.3	+/-22
1,2,3,6,7,8-HxCDD	A	50.000	50.2	1.0089800	1.0125000		0.3	+/-22
1,2,3,7,8,9-HxCDD	A	50.000	52.8	0.9504865	4368.72		5.7	+/-18
1,2,3,4,6,7,8-HpCDF	A	50.000	47.8	1.3273500	1.2700560		-4.3	+/-10
1,2,3,4,7,8,9-HpCDF	A	50.000	49.6	1.2833380	1.2740640		-0.7	+/-14
1,2,3,4,6,7,8-HpCDD	A	50.000	48.3	1.0680880	1.0308160		-3.5	+/-14
OCDF	A	100.00	90.8	1.4469010	1.3131680		-9.2	+/-37
OCDD	A	100.00	96.4	1.1808230	1.1382430		-3.6	+/-21
13C12-2,3,7,8-TCDF	A	100.00	89.4	1.4265830	1.2747632		-10.6	+/-29
13C12-2,3,7,8-TCDD	A	100.00	98.7	1.1164910	1.1019961		-1.3	+/-18
13C12-1,2,3,7,8-PeCDF	A	100.00	94.4	1.2973130	1.2241052		-5.6	+/-24
13C12-2,3,4,7,8-PeCDF	A	100.00	92.6	1.2364800	1.1448896		-7.4	+/-23
13C12-1,2,3,7,8-PeCDD	A	100.00	98.2	0.7319833	0.7185044		-1.8	+/-38
13C12-1,2,3,4,7,8-HxCDF	A	100.00	95.1	1.2424560	1.1820198		-4.9	+/-24
13C12-1,2,3,6,7,8-HxCDF	A	100.00	94.0	1.3434760	1.2635006		-6.0	+/-30
13C12-2,3,4,6,7,8-HxCDF	A	100.00	92.4	1.2148550	1.1220900		-7.6	+/-27
13C12-1,2,3,7,8,9-HxCDF	A	100.00	101	1.0076370	1.0208008		1.3	+/-26
13C12-1,2,3,4,7,8-HxCDD	A	100.00	99.4	0.9598233	0.9538853		-0.6	+/-15
13C12-1,2,3,6,7,8-HxCDD	A	100.00	95.3	1.0413850	0.9921827		-4.7	+/-15
13C12-1,2,3,4,6,7,8-HpCDF	A	100.00	101	0.9264704	0.9364581		1.1	+/-22
13C12-1,2,3,4,7,8,9-HpCDF	A	100.00	101	0.7579160	0.7619987		0.5	+/-23
13C12-1,2,3,4,6,7,8-HpCDD	A	100.00	110	0.6324476	0.6984908		10.4	+/-18
13C12-OCDD	A	200.00	233	0.5037432	0.5870655		16.5	+/-52
37Cl4-2,3,7,8-TCDD	A	10.000	9.11	1.0835930	0.9868901		-8.9	+/-21

* Values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
Printed: Thursday, August 19, 2021 10:31:34 Pacific Daylight Time

Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: CS3K2, Name: 21081915, Date: 18-Aug-2021, Time: 21:38:40, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
2378-TCDF	25.655	1.001	2.865e4	3.641e4	1.108	0.787	0.770	849	2173	4.30e5	5.30e5	506.3	243.8	NO	bb	bb	9.383
12378-PeCDF	29.828	1.001	1.869e5	1.205e5	1.015	1.551	1.550	1848	2377	2.60e6	1.67e6	1407.1	701.7	NO	bd	bd	50.378
23478-PeCDF	31.177	1.001	1.932e5	1.220e5	1.126	1.584	1.550	1848	2377	2.76e6	1.75e6	1493.0	738.2	NO	dd	bb	49.810
123478-HxCDF	34.808	1.000	1.536e5	1.250e5	1.017	1.229	1.240	3016	2144	2.30e6	1.89e6	761.8	881.5	NO	bd	bd	51.864
234678-HxCDF	35.822	1.001	1.505e5	1.219e5	1.052	1.235	1.240	3016	2144	2.25e6	1.83e6	744.8	851.6	NO	bb	bb	51.589
123678-HxCDF	34.953	1.001	1.585e5	1.284e5	1.037	1.235	1.240	3016	2144	2.30e6	1.89e6	763.1	880.6	NO	db	db	48.989
123789-HxCDF	36.847	1.000	1.253e5	1.038e5	1.030	1.207	1.240	3016	2144	1.92e6	1.55e6	636.9	723.2	NO	bb	bb	48.748
1234678-HpCDF	38.697	1.000	1.396e5	1.262e5	1.327	1.105	1.050	2236	2139	2.06e6	1.93e6	920.8	900.1	NO	bd	bb	47.842
1234789-HpCDF	40.936	1.000	1.130e5	1.040e5	1.283	1.086	1.050	2236	2139	1.52e6	1.46e6	680.6	683.5	NO	bd	bb	49.639
OCDF	45.160	1.005	1.647e5	1.799e5	1.447	0.915	0.890	2108	1703	1.79e6	2.01e6	849.0	1180.4	NO	bb	bb	90.757
2378-TCDD	26.305	1.001	2.105e4	2.720e4	0.920	0.774	0.770	1146	928	2.99e5	3.86e5	261.0	415.7	NO	bb	bb	9.686
12378-PeCDD	31.421	1.000	1.084e5	6.673e4	0.995	1.625	1.550	1668	1435	1.59e6	1.02e6	954.4	712.9	NO	bb	bb	49.866
123478-HxCDD	35.934	1.000	1.201e5	9.378e4	1.027	1.281	1.240	1976	1988	1.95e6	1.56e6	988.3	784.2	NO	bd	bd	48.830
123678-HxCDD	36.045	1.000	1.240e5	1.005e5	1.009	1.233	1.240	1976	1988	1.88e6	1.59e6	951.6	798.5	NO	db	db	50.174
123789-HxCDD	36.435	1.011	1.176e5	1.008e5	0.950	1.166	1.240	1976	1988	1.78e6	1.48e6	899.1	743.0	NO	bb	bd	52.841
1234678-HpCDD	40.201	1.001	8.448e4	7.643e4	1.068	1.105	1.050	1707	1641	1.22e6	1.11e6	713.2	677.7	NO	bb	bb	48.255
OCDD	44.931	1.000	1.391e5	1.595e5	1.181	0.872	0.890	1163	1622	1.55e6	1.74e6	1333.5	1069.7	NO	bb	bb	96.394
13C-2378-TCDF	25.640	1.007	2.771e5	3.490e5	1.427	0.794	0.770	1739	1282	4.09e6	5.08e6	2350.0	3959.2	NO	bb	bb	89.358
13C-12378-PeCDF	29.806	1.171	3.751e5	2.261e5	1.297	1.659	1.550	2480	1598	5.24e6	3.21e6	2112.2	2012.0	NO	bd	bb	94.357
13C-23478-PeCDF	31.154	1.224	3.468e5	2.155e5	1.236	1.610	1.550	2480	1598	5.11e6	3.21e6	2059.1	2012.1	NO	bb	bb	92.593
13C-123478-HxCDF	34.797	0.955	1.798e5	3.485e5	1.242	0.516	0.510	1819	2466	2.66e6	5.17e6	1460.7	2097.5	NO	bd	bd	95.136
13C-123678-HxCDF	34.931	0.959	1.928e5	3.720e5	1.343	0.518	0.510	1819	2466	2.86e6	5.45e6	1570.8	2211.7	NO	db	db	94.047
13C-234678-HxCDF	35.800	0.983	1.717e5	3.298e5	1.215	0.521	0.510	1819	2466	2.59e6	5.02e6	1423.9	2036.7	NO	bb	bb	92.364
13C-123789-HxCDF	36.836	1.011	1.612e5	2.951e5	1.008	0.546	0.510	1819	2466	2.33e6	4.50e6	1283.1	1823.3	NO	bb	bb	101.306
13C-1234678-HpCDF	38.686	1.062	1.313e5	2.873e5	0.926	0.457	0.440	1405	1805	1.97e6	4.16e6	1400.2	2303.4	NO	bb	bd	101.078
13C-1234789-HpCDF	40.925	1.124	1.097e5	2.309e5	0.758	0.475	0.440	1405	1805	1.44e6	3.10e6	1026.5	1717.6	NO	bd	bb	100.539
13C-1234-TCDD	25.458	0.000	2.151e5	2.761e5	1.000	0.779	0.770	1827	1352	3.26e6	4.18e6	1782.5	3093.8	NO	bb	bb	100.000
13C-2378-TCDD	26.275	1.032	2.375e5	3.037e5	1.116	0.782	0.770	1827	1352	3.39e6	4.29e6	1853.3	3175.4	NO	bb	bb	98.702
13C-12378-PeCDD	31.410	1.234	2.128e5	1.401e5	0.732	1.519	1.550	914	1057	3.07e6	2.00e6	3365.9	1891.0	NO	bb	bd	98.159
13C-123478-HxCDD	35.923	0.986	2.379e5	1.884e5	0.960	1.263	1.240	1582	2055	3.73e6	2.91e6	2359.4	1413.7	NO	bd	bd	99.381
13C-123678-HxCDD	36.034	0.989	2.477e5	1.958e5	1.041	1.265	1.240	1582	2055	3.82e6	3.11e6	2415.5	1511.5	NO	db	db	95.275
13C-1234678-HpCDD	40.179	1.103	1.598e5	1.524e5	0.632	1.048	1.050	1365	1512	2.18e6	2.16e6	1597.3	1429.2	NO	bd	bb	110.442
13C-OCDD	44.913	1.233	2.477e5	2.771e5	0.504	0.894	0.890	1074	2572	2.75e6	3.09e6	2559.9	1200.0	NO	bb	bb	233.081
13C-123789-HxCDD	36.424	0.000	2.497e5	1.973e5	1.000	1.266	1.240	1582	2055	3.83e6	3.03e6	2424.8	1472.9	NO	bb	bb	100.000
37CL-2378-TCDD	26.305	1.033	4.847e4		1.084			1162		6.76e5		581.3			bd		9.108

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ID: CS3K2, Name: 21081915, Date: 18-Aug-2021, Time: 21:38:40, Conditions: AUTOSPEC01, User: pk

Compound	RT	RRT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	Noise 1	Noise 2	Height 1	Height 2	S/N 1	S/N 2	EMPC	Int.1	Int.2	pg
1368-TCDF	22.147	0.864	3.622e4	4.575e4	1.425	0.792	0.770	849	2173	5.20e5	6.55e5	612.7	301.4	NO	bb	bb	9.186
1289-TCDF	27.152	1.059	2.705e4	3.384e4	1.043	0.799	0.770	849	2173	3.70e5	4.64e5	436.0	213.3	NO	bb	db	9.325
13468-PECDF	27.016	0.906	2.501e5	1.624e5	1.376	1.541	1.550	752	968	3.51e6	2.31e6	4674.2	2387.6	NO	bb	bb	49.848
12389-PECDF	32.201	1.080	1.880e5	1.160e5	1.000	1.620	1.550	1848	2377	2.46e6	1.52e6	1331.3	638.7	NO	bd	bb	50.591
123468-HXCDF	33.137	0.952	1.583e5	1.283e5	1.087	1.233	1.240	3016	2144	2.24e6	1.84e6	742.8	856.2	NO	bb	bb	49.922
1368-TCDD	23.417	0.891	2.123e4	2.771e4	0.923	0.766	0.770	1146	928	3.18e5	4.01e5	277.4	432.1	NO	bb	bb	9.792
1289-TCDD	26.895	1.024	1.862e4	2.469e4	0.794	0.754	0.770	1146	928	2.51e5	3.45e5	218.8	371.1	NO	bb	bb	10.080
12479-PECDD	28.703	0.914	1.919e5	1.185e5	1.843	1.619	1.550	1668	1435	1.78e6	1.12e6	1065.5	777.9	NO	bb	bb	47.715
12389-PECDD	31.823	1.013	1.277e5	7.922e4	1.154	1.611	1.550	1668	1435	1.86e6	1.11e6	1113.8	770.4	NO	bb	bb	50.822
124679-HXCDD	33.917	0.944	1.337e5	1.050e5	1.125	1.274	1.240	1976	1988	1.93e6	1.53e6	976.4	768.1	NO	bd	bb	49.773
1234679-HPCDD	39.154	0.975	9.362e4	8.861e4	1.211	1.056	1.050	1707	1641	1.42e6	1.30e6	830.1	790.1	NO	bb	bb	48.200
Total-tetrafurans			9.192e4		1.192			849		1.32e6							27.894
Total-penta1			2.501e5					752		3.51e6							49.848
Total-pentafurans			5.992e5		1.047			1848		8.26e6							159.182
Total-hexafurans			7.462e5		1.045			3016		1.10e7							251.112
Total-heptafurans			2.525e5		1.305			2236		3.58e6							97.480
Total-Furans			2.105e6		1.158			849		2.95e7							676.274
Total-tetradioxins			1.050e5		0.879			1146		1.37e6							50.498
Total-pentadioxins			4.279e5		1.331			1668		5.23e6							148.402
Total-hexadioxins			4.954e5		1.028			1976		7.54e6							201.617
Total-heptadioxins			1.781e5		1.140			1707		2.63e6							96.455
Total-Dioxins			1.346e6		1.092			1146		1.83e7							593.367
Total-TEQ			3.450e6					1146		4.78e7							1269.641
FUNCTION1 PFK			3.079e7					314400		1.29e8							
FUNCTION2 PFK			9.568e6					253818		8.16e7							0.000
FUNCTION3 PFK			5.817e5					348349		1.65e7							0.000
FUNCTION4 PFK			2.960e5					216850		8.65e6							
FUNCTION5 PFK			5.893e4					202472		2.00e6							
FUNCTION1 HXCD...			5.523e2					817		9.54e3							0.000
FUNCTION1 HPCD...			5.222e2					853		8.16e3							0.000
FUNCTION2 HPCD...			7.133e2					922		1.35e4							0.000
FUNCTION3 OCDPE			3.212e2					585		5.84e3							0.000
FUNCTION4 NCDPE			1.993e2					625		3.64e3							0.000
FUNCTION5 DCDPE			0.000e0					602		0.00e0							

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
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Method: T:\Autospec\Methods\Dioxin210720.mdb 11 Aug 2021 14:23:13
Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: CS3K2, Name: 21081915, Date: 18-Aug-2021, Time: 21:38:40, Conditions: AUTOSPEC01, User: pk

TF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDF	27.15	2.705e4	3.384e4	1.043	0.80	0.77	436.0	YES	NO	bb	db	9.325
2	2378-TCDF	25.66	2.865e4	3.641e4	1.108	0.79	0.77	506.3	YES	NO	bb	bb	9.383
3	1368-TCDF	22.15	3.622e4	4.575e4	1.425	0.79	0.77	612.7	YES	NO	bb	bb	9.186

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	13468-PECDF	27.02	2.501e5	1.624e5	1.376	1.54	1.55	4674.2	YES	NO	bb	bb	49.848

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	12389-PECDF	32.20	1.880e5	1.160e5	1.000	1.62	1.55	1331.3	YES	NO	bd	bb	50.591
2	23478-PeCDF	31.18	1.932e5	1.220e5	1.126	1.58	1.55	1493.0	YES	NO	dd	bb	49.810
3	Total-pentafurans	31.04	4.837e2	3.012e2	1.047	1.61	1.55	5.3	NO	NO	bd	bb	0.129
4	12378-PeCDF	29.83	1.869e5	1.205e5	1.015	1.55	1.55	1407.1	YES	NO	bd	bd	50.378
5	Total-pentafurans	28.68	3.068e4	1.971e4	1.047	1.56	1.55	231.8	YES	NO	bb	bb	8.275

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123468-HXCDF	33.14	1.583e5	1.283e5	1.087	1.23	1.24	742.8	YES	NO	bb	bb	49.922
2	123789-HxCDF	36.85	1.253e5	1.038e5	1.030	1.21	1.24	636.9	YES	NO	bb	bb	48.748
3	234678-HxCDF	35.82	1.505e5	1.219e5	1.052	1.23	1.24	744.8	YES	NO	bb	bb	51.589
4	123678-HxCDF	34.95	1.585e5	1.284e5	1.037	1.23	1.24	763.1	YES	NO	db	db	48.989
5	123478-HxCDF	34.81	1.536e5	1.250e5	1.017	1.23	1.24	761.8	YES	NO	bd	bd	51.864

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDF	38.70	1.396e5	1.262e5	1.327	1.11	1.05	920.8	YES	NO	bd	bb	47.842
2	1234789-HpCDF	40.94	1.130e5	1.040e5	1.283	1.09	1.05	680.6	YES	NO	bd	bb	49.639

ID: CS3K2, Name: 21081915, Date: 18-Aug-2021, Time: 21:38:40, Conditions: AUTOSPEC01, User: pk

Furans,TF,PP,PF,HF,HPF,OF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDF	27.15	2.705e4	3.384e4	1.043	0.80	0.77	436.0	YES	NO	bb	db	9.325
2	2378-TCDF	25.66	2.865e4	3.641e4	1.108	0.79	0.77	506.3	YES	NO	bb	bb	9.383
3	1368-TCDF	22.15	3.622e4	4.575e4	1.425	0.79	0.77	612.7	YES	NO	bb	bb	9.186
4	12389-PECDF	32.20	1.880e5	1.160e5	1.000	1.62	1.55	1331.3	YES	NO	bd	bb	50.591
5	23478-PeCDF	31.18	1.932e5	1.220e5	1.126	1.58	1.55	1493.0	YES	NO	dd	bb	49.810
6	Total-pentafurans	31.04	4.837e2	3.012e2	1.047	1.61	1.55	5.3	NO	NO	bd	bb	0.129
7	12378-PeCDF	29.83	1.869e5	1.205e5	1.015	1.55	1.55	1407.1	YES	NO	bd	bd	50.378
8	Total-pentafurans	28.68	3.068e4	1.971e4	1.047	1.56	1.55	231.8	YES	NO	bb	bb	8.275
9	123468-HXCDF	33.14	1.583e5	1.283e5	1.087	1.23	1.24	742.8	YES	NO	bb	bb	49.922
10	123789-HxCDF	36.85	1.253e5	1.038e5	1.030	1.21	1.24	636.9	YES	NO	bb	bb	48.748
11	234678-HxCDF	35.82	1.505e5	1.219e5	1.052	1.23	1.24	744.8	YES	NO	bb	bb	51.589
12	123678-HxCDF	34.95	1.585e5	1.284e5	1.037	1.23	1.24	763.1	YES	NO	db	db	48.989
13	123478-HxCDF	34.81	1.536e5	1.250e5	1.017	1.23	1.24	761.8	YES	NO	bd	bd	51.864
14	1234678-HpCDF	38.70	1.396e5	1.262e5	1.327	1.11	1.05	920.8	YES	NO	bd	bb	47.842
15	1234789-HpCDF	40.94	1.130e5	1.040e5	1.283	1.09	1.05	680.6	YES	NO	bd	bb	49.639
16	OCDF	45.16	1.647e5	1.799e5	1.447	0.92	0.89	849.0	YES	NO	bb	bb	90.757
17	13468-PECDF	27.02	2.501e5	1.624e5	1.376	1.54	1.55	4674.2	YES	NO	bb	bb	49.848

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDD	26.89	1.862e4	2.469e4	0.794	0.75	0.77	218.8	YES	NO	bb	bb	10.080
2	2378-TCDD	26.31	2.105e4	2.720e4	0.920	0.77	0.77	261.0	YES	NO	bb	bb	9.686
3	Total-tetradioxins	25.97	3.266e4	4.227e4	0.879	0.77	0.77	292.5	YES	NO	bb	bb	15.745
4	Total-tetradioxins	25.47	1.118e4	1.299e4	0.879	0.86	0.77	145.3	YES	NO	bb	bb	5.080
5	Total-tetradioxins	24.91	2.410e2	3.028e2	0.879	0.80	0.77	4.2	YES	NO	bb	bb	0.114
6	1368-TCDD	23.42	2.123e4	2.771e4	0.923	0.77	0.77	277.4	YES	NO	bb	bb	9.792

PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	12389-PECDD	31.82	1.277e5	7.922e4	1.154	1.61	1.55	1113.8	YES	NO	bb	bb	50.822
2	12378-PeCDD	31.42	1.084e5	6.673e4	0.995	1.62	1.55	954.4	YES	NO	bb	bb	49.866
3	12479-PECDD	28.70	1.919e5	1.185e5	1.843	1.62	1.55	1065.5	YES	NO	bb	bb	47.715

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HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123789-HxCDD	36.44	1.176e5	1.008e5	0.950	1.17	1.24	899.1	YES	NO	bb	bd	52.841
2	123678-HxCDD	36.05	1.240e5	1.005e5	1.009	1.23	1.24	951.6	YES	NO	db	db	50.174
3	123478-HxCDD	35.93	1.201e5	9.378e4	1.027	1.28	1.24	988.3	YES	NO	bd	bd	48.830
4	124679-HXCDD	33.92	1.337e5	1.050e5	1.125	1.27	1.24	976.4	YES	NO	bd	bb	49.773

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDD	40.20	8.448e4	7.643e4	1.068	1.11	1.05	713.2	YES	NO	bb	bb	48.255
2	1234679-HPCDD	39.15	9.362e4	8.861e4	1.211	1.06	1.05	830.1	YES	NO	bb	bb	48.200

Dioxins,TD,PD,HD,HPD,OD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDD	26.89	1.862e4	2.469e4	0.794	0.75	0.77	218.8	YES	NO	bb	bb	10.080
2	2378-TCDD	26.31	2.105e4	2.720e4	0.920	0.77	0.77	261.0	YES	NO	bb	bb	9.686
3	Total-tetradioxins	25.97	3.266e4	4.227e4	0.879	0.77	0.77	292.5	YES	NO	bb	bb	15.745
4	Total-tetradioxins	25.47	1.118e4	1.299e4	0.879	0.86	0.77	145.3	YES	NO	bb	bb	5.080
5	Total-tetradioxins	24.91	2.410e2	3.028e2	0.879	0.80	0.77	4.2	YES	NO	bb	bb	0.114
6	1368-TCDD	23.42	2.123e4	2.771e4	0.923	0.77	0.77	277.4	YES	NO	bb	bb	9.792
7	12389-PECDD	31.82	1.277e5	7.922e4	1.154	1.61	1.55	1113.8	YES	NO	bb	bb	50.822
8	12378-PeCDD	31.42	1.084e5	6.673e4	0.995	1.62	1.55	954.4	YES	NO	bb	bb	49.866
9	12479-PECDD	28.70	1.919e5	1.185e5	1.843	1.62	1.55	1065.5	YES	NO	bb	bb	47.715
10	123789-HxCDD	36.44	1.176e5	1.008e5	0.950	1.17	1.24	899.1	YES	NO	bb	bd	52.841
11	123678-HxCDD	36.05	1.240e5	1.005e5	1.009	1.23	1.24	951.6	YES	NO	db	db	50.174
12	123478-HxCDD	35.93	1.201e5	9.378e4	1.027	1.28	1.24	988.3	YES	NO	bd	bd	48.830
13	124679-HXCDD	33.92	1.337e5	1.050e5	1.125	1.27	1.24	976.4	YES	NO	bd	bb	49.773
14	1234678-HpCDD	40.20	8.448e4	7.643e4	1.068	1.11	1.05	713.2	YES	NO	bb	bb	48.255
15	1234679-HPCDD	39.15	9.362e4	8.861e4	1.211	1.06	1.05	830.1	YES	NO	bb	bb	48.200
16	OCDD	44.93	1.391e5	1.595e5	1.181	0.87	0.89	1333.5	YES	NO	bb	bb	96.394

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TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDF	27.15	2.705e4	3.384e4	1.043	0.80	0.77	436.0	YES	NO	bb	db	9.325
2	2378-TCDF	25.66	2.865e4	3.641e4	1.108	0.79	0.77	506.3	YES	NO	bb	bb	9.383
3	1368-TCDF	22.15	3.622e4	4.575e4	1.425	0.79	0.77	612.7	YES	NO	bb	bb	9.186
4	12389-PECDF	32.20	1.880e5	1.160e5	1.000	1.62	1.55	1331.3	YES	NO	bd	bb	50.591
5	23478-PeCDF	31.18	1.932e5	1.220e5	1.126	1.58	1.55	1493.0	YES	NO	dd	bb	49.810
6	Total-pentafurans	31.04	4.837e2	3.012e2	1.047	1.61	1.55	5.3	NO	NO	bd	bb	0.129
7	12378-PeCDF	29.83	1.869e5	1.205e5	1.015	1.55	1.55	1407.1	YES	NO	bd	bd	50.378
8	Total-pentafurans	28.68	3.068e4	1.971e4	1.047	1.56	1.55	231.8	YES	NO	bb	bb	8.275
9	123468-HXCDF	33.14	1.583e5	1.283e5	1.087	1.23	1.24	742.8	YES	NO	bb	bb	49.922
10	123789-HxCDF	36.85	1.253e5	1.038e5	1.030	1.21	1.24	636.9	YES	NO	bb	bb	48.748
11	234678-HxCDF	35.82	1.505e5	1.219e5	1.052	1.23	1.24	744.8	YES	NO	bb	bb	51.589
12	123678-HxCDF	34.95	1.585e5	1.284e5	1.037	1.23	1.24	763.1	YES	NO	db	db	48.989
13	123478-HxCDF	34.81	1.536e5	1.250e5	1.017	1.23	1.24	761.8	YES	NO	bd	bd	51.864
14	1234678-HpCDF	38.70	1.396e5	1.262e5	1.327	1.11	1.05	920.8	YES	NO	bd	bb	47.842
15	1234789-HpCDF	40.94	1.130e5	1.040e5	1.283	1.09	1.05	680.6	YES	NO	bd	bb	49.639
16	OCDF	45.16	1.647e5	1.799e5	1.447	0.92	0.89	849.0	YES	NO	bb	bb	90.757
17	13468-PECDF	27.02	2.501e5	1.624e5	1.376	1.54	1.55	4674.2	YES	NO	bb	bb	49.848
18	1289-TCDD	26.89	1.862e4	2.469e4	0.794	0.75	0.77	218.8	YES	NO	bb	bb	10.080
19	2378-TCDD	26.31	2.105e4	2.720e4	0.920	0.77	0.77	261.0	YES	NO	bb	bb	9.686
20	Total-tetradioxins	25.97	3.266e4	4.227e4	0.879	0.77	0.77	292.5	YES	NO	bb	bb	15.745
21	Total-tetradioxins	25.47	1.118e4	1.299e4	0.879	0.86	0.77	145.3	YES	NO	bb	bb	5.080
22	Total-tetradioxins	24.91	2.410e2	3.028e2	0.879	0.80	0.77	4.2	YES	NO	bb	bb	0.114
23	1368-TCDD	23.42	2.123e4	2.771e4	0.923	0.77	0.77	277.4	YES	NO	bb	bb	9.792
24	12389-PECDD	31.82	1.277e5	7.922e4	1.154	1.61	1.55	1113.8	YES	NO	bb	bb	50.822
25	12378-PeCDD	31.42	1.084e5	6.673e4	0.995	1.62	1.55	954.4	YES	NO	bb	bb	49.866
26	12479-PECDD	28.70	1.919e5	1.185e5	1.843	1.62	1.55	1065.5	YES	NO	bb	bb	47.715
27	123789-HxCDD	36.44	1.176e5	1.008e5	0.950	1.17	1.24	899.1	YES	NO	bb	bd	52.841
28	123678-HxCDD	36.05	1.240e5	1.005e5	1.009	1.23	1.24	951.6	YES	NO	db	db	50.174
29	123478-HxCDD	35.93	1.201e5	9.378e4	1.027	1.28	1.24	988.3	YES	NO	bd	bd	48.830
30	124679-HXCDD	33.92	1.337e5	1.050e5	1.125	1.27	1.24	976.4	YES	NO	bd	bb	49.773
31	1234678-HpCDD	40.20	8.448e4	7.643e4	1.068	1.11	1.05	713.2	YES	NO	bb	bb	48.255
32	1234679-HPCDD	39.15	9.362e4	8.861e4	1.211	1.06	1.05	830.1	YES	NO	bb	bb	48.200
33	OCDD	44.93	1.391e5	1.595e5	1.181	0.87	0.89	1333.5	YES	NO	bb	bb	96.394

Dataset: T:\Autospec\Processed Data Batch\210818D1.qld
Last Altered: Thursday, August 19, 2021 09:22:57 Pacific Daylight Time
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PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	23.89	1.080e4					0.9	NO		bb		
2	FUNCTION1 PFK	23.83	3.423e3					0.7	NO		bb		
3	FUNCTION1 PFK	23.48	2.717e5					7.1	YES		db		
4	FUNCTION1 PFK	23.42	1.572e5					9.2	YES		dd		
5	FUNCTION1 PFK	23.30	5.943e5					12.5	YES		dd		
6	FUNCTION1 PFK	23.04	1.108e6					19.5	YES		dd		
7	FUNCTION1 PFK	22.65	3.072e6					30.4	YES		dd		
8	FUNCTION1 PFK	22.57	7.478e5					32.6	YES		dd		
9	FUNCTION1 PFK	22.33	2.714e6					39.6	YES		dd		
10	FUNCTION1 PFK	22.19	7.781e6					43.1	YES		dd		
11	FUNCTION1 PFK	21.59	1.050e7					59.6	YES		dd		
12	FUNCTION1 PFK	21.19	1.302e6					69.6	YES		dd		
13	FUNCTION1 PFK	21.12	2.405e6					72.9	YES		bd		
14	FUNCTION1 PFK	27.59	5.384e3					0.7	NO		bb		
15	FUNCTION1 PFK	27.26	1.603e4					1.6	NO		bb		
16	FUNCTION1 PFK	26.56	8.331e3					0.9	NO		db		
17	FUNCTION1 PFK	26.50	3.209e4					2.0	NO		bd		
18	FUNCTION1 PFK	26.34	7.883e3					1.1	NO		bb		
19	FUNCTION1 PFK	25.50	8.931e3					1.0	NO		bb		
20	FUNCTION1 PFK	24.99	1.424e4					1.4	NO		bb		
21	FUNCTION1 PFK	24.78	2.934e3					0.6	NO		bb		
22	FUNCTION1 PFK	24.72	2.637e3					0.6	NO		bb		
23	FUNCTION1 PFK	24.54	5.056e3					0.7	NO		bb		
24	FUNCTION1 PFK	24.34	1.725e4					1.4	NO		bb		

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PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 PFK	28.17	2.444e6					40.6	YES		dd		0.000
2	FUNCTION2 PFK	27.95	1.026e6					53.9	YES		dd		0.000
3	FUNCTION2 PFK	27.89	1.096e6					55.5	YES		dd		0.000
4	FUNCTION2 PFK	27.78	1.645e6					61.5	YES		bd		0.000
5	FUNCTION2 PFK	30.86	1.276e3					0.5	NO		bb		0.000
6	FUNCTION2 PFK	30.64	2.038e4					2.3	NO		bb		0.000
7	FUNCTION2 PFK	30.59	6.899e3					1.1	NO		bb		0.000
8	FUNCTION2 PFK	30.35	1.036e4					1.6	NO		db		0.000
9	FUNCTION2 PFK	30.30	2.394e4					2.4	NO		dd		0.000
10	FUNCTION2 PFK	30.20	2.375e4					1.9	NO		bd		0.000
11	FUNCTION2 PFK	30.02	2.227e4					1.5	NO		bb		0.000
12	FUNCTION2 PFK	29.95	3.519e4					2.5	NO		bb		0.000
13	FUNCTION2 PFK	29.72	3.559e3					0.7	NO		bb		0.000
14	FUNCTION2 PFK	29.52	2.015e4					1.5	NO		bb		0.000
15	FUNCTION2 PFK	29.24	5.227e3					0.9	NO		bb		0.000
16	FUNCTION2 PFK	29.06	8.732e3					1.3	NO		bb		0.000
17	FUNCTION2 PFK	28.83	2.701e4					3.2	YES		db		0.000
18	FUNCTION2 PFK	28.75	5.056e5					8.2	YES		dd		0.000
19	FUNCTION2 PFK	28.36	1.948e6					30.2	YES		dd		0.000
20	FUNCTION2 PFK	28.24	5.939e5					37.1	YES		dd		0.000
21	FUNCTION2 PFK	32.48	1.123e4					1.5	NO		bb		0.000
22	FUNCTION2 PFK	32.41	9.586e3					1.2	NO		bb		0.000
23	FUNCTION2 PFK	32.25	3.640e3					0.6	NO		bb		0.000
24	FUNCTION2 PFK	32.19	3.845e3					0.8	NO		bb		0.000
25	FUNCTION2 PFK	32.11	1.754e4					1.6	NO		db		0.000
26	FUNCTION2 PFK	32.05	5.994e3					1.0	NO		bd		0.000
27	FUNCTION2 PFK	32.00	6.152e3					1.0	NO		bb		0.000
28	FUNCTION2 PFK	31.95	6.526e3					1.1	NO		bb		0.000
29	FUNCTION2 PFK	31.53	4.934e3					0.9	NO		db		0.000
30	FUNCTION2 PFK	31.49	1.158e4					1.4	NO		bd		0.000
31	FUNCTION2 PFK	31.42	1.901e4					1.9	NO		bb		0.000
32	FUNCTION2 PFK	31.00	1.230e3					0.4	NO		bb		0.000

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PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 PFK	32.75	3.465e3					0.7	NO		db		0.000
2	FUNCTION3 PFK	32.71	9.718e3					1.4	NO		bd		0.000
3	FUNCTION3 PFK	32.67	2.303e3					0.6	NO		bb		0.000
4	FUNCTION3 PFK	35.17	2.943e4					2.1	NO		bb		0.000
5	FUNCTION3 PFK	35.12	2.592e3					0.7	NO		bb		0.000
6	FUNCTION3 PFK	34.70	2.126e4					1.9	NO		db		0.000
7	FUNCTION3 PFK	34.65	9.161e3					1.1	NO		bd		0.000
8	FUNCTION3 PFK	34.20	2.825e3					0.6	NO		bb		0.000
9	FUNCTION3 PFK	34.13	9.423e3					0.9	NO		db		0.000
10	FUNCTION3 PFK	34.11	1.734e4					1.5	NO		bd		0.000
11	FUNCTION3 PFK	34.05	7.779e3					1.2	NO		bb		0.000
12	FUNCTION3 PFK	33.84	6.825e4					1.7	NO		bb		0.000
13	FUNCTION3 PFK	33.57	2.262e4					1.6	NO		db		0.000
14	FUNCTION3 PFK	33.48	2.090e4					1.0	NO		bd		0.000
15	FUNCTION3 PFK	33.39	1.831e4					1.7	NO		bb		0.000
16	FUNCTION3 PFK	33.34	8.366e3					1.1	NO		db		0.000
17	FUNCTION3 PFK	33.30	2.280e4					2.3	NO		bd		0.000
18	FUNCTION3 PFK	32.95	1.940e3					0.5	NO		bb		0.000
19	FUNCTION3 PFK	32.90	8.035e3					0.8	NO		bb		0.000
20	FUNCTION3 PFK	37.09	1.371e4					1.3	NO		db		0.000
21	FUNCTION3 PFK	37.06	9.925e3					1.2	NO		bd		0.000
22	FUNCTION3 PFK	37.00	1.374e3					0.4	NO		bb		0.000
23	FUNCTION3 PFK	36.90	9.264e3					1.1	NO		bb		0.000
24	FUNCTION3 PFK	36.58	1.120e4					1.1	NO		bb		0.000
25	FUNCTION3 PFK	36.49	5.423e3					0.8	NO		bb		0.000
26	FUNCTION3 PFK	36.22	2.386e4					2.0	NO		bb		0.000
27	FUNCTION3 PFK	36.10	1.808e3					0.5	NO		bb		0.000
28	FUNCTION3 PFK	35.98	4.058e4					2.7	NO		db		0.000
29	FUNCTION3 PFK	35.94	1.910e4					2.1	NO		bd		0.000
30	FUNCTION3 PFK	35.87	5.444e3					0.6	NO		bb		0.000
31	FUNCTION3 PFK	35.78	1.155e4					1.3	NO		bb		0.000
32	FUNCTION3 PFK	35.73	6.561e3					0.7	NO		bb		0.000
33	FUNCTION3 PFK	35.59	3.561e4					1.9	NO		bb		0.000
34	FUNCTION3 PFK	35.47	2.081e4					1.4	NO		db		0.000
35	FUNCTION3 PFK	35.41	1.630e4					1.4	NO		bd		0.000
36	FUNCTION3 PFK	37.63	5.395e4					2.3	NO		bb		0.000
37	FUNCTION3 PFK	37.47	1.721e3					0.4	NO		bb		0.000

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PFK3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	FUNCTION3 PFK	37.36	7.011e3					0.8	NO		bb		0.000

PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 PFK	40.89	1.376e4					1.9	NO		bd		
2	FUNCTION4 PFK	40.78	5.766e3					0.8	NO		bb		
3	FUNCTION4 PFK	40.15	1.128e3					0.5	NO		bb		
4	FUNCTION4 PFK	39.96	3.573e3					0.8	NO		bb		
5	FUNCTION4 PFK	39.30	1.736e4					1.5	NO		bb		
6	FUNCTION4 PFK	38.69	7.524e3					1.0	NO		bb		
7	FUNCTION4 PFK	38.50	7.767e3					1.2	NO		bb		
8	FUNCTION4 PFK	38.30	4.373e3					0.9	NO		bb		
9	FUNCTION4 PFK	38.24	2.438e3					0.7	NO		bb		
10	FUNCTION4 PFK	38.04	1.771e4					1.6	NO		bb		
11	FUNCTION4 PFK	37.84	2.138e4					2.2	NO		db		
12	FUNCTION4 PFK	37.79	1.964e4					2.5	NO		bd		
13	FUNCTION4 PFK	42.66	4.251e3					0.8	NO		db		
14	FUNCTION4 PFK	42.61	9.491e3					1.2	NO		bd		
15	FUNCTION4 PFK	42.24	2.822e4					2.1	NO		db		
16	FUNCTION4 PFK	42.21	7.658e3					1.7	NO		bd		
17	FUNCTION4 PFK	41.84	8.261e3					1.3	NO		db		
18	FUNCTION4 PFK	41.78	1.185e4					1.4	NO		bd		
19	FUNCTION4 PFK	41.72	2.418e3					0.7	NO		bb		
20	FUNCTION4 PFK	41.56	4.164e3					1.0	NO		bb		
21	FUNCTION4 PFK	41.52	1.291e4					1.9	NO		bb		
22	FUNCTION4 PFK	41.23	5.031e3					0.9	NO		db		
23	FUNCTION4 PFK	41.18	1.051e4					1.6	NO		dd		
24	FUNCTION4 PFK	41.15	9.172e3					1.6	NO		dd		
25	FUNCTION4 PFK	41.10	1.194e4					1.7	NO		dd		
26	FUNCTION4 PFK	41.06	2.012e4					1.8	NO		dd		
27	FUNCTION4 PFK	40.99	1.047e4					1.8	NO		bd		
28	FUNCTION4 PFK	40.94	1.440e4					2.2	NO		db		
29	FUNCTION4 PFK	42.77	2.737e3					0.6	NO		bb		

ID: CS3K2, Name: 21081915, Date: 18-Aug-2021, Time: 21:38:40, Conditions: AUTOSPEC01, User: pk

PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	45.58	1.062e3					0.6	NO		bb		
2	FUNCTION5 PFK	45.37	6.496e3					1.1	NO		bb		
3	FUNCTION5 PFK	44.87	1.313e4					1.0	NO		bb		
4	FUNCTION5 PFK	44.45	2.490e3					0.8	NO		bb		
5	FUNCTION5 PFK	44.27	4.959e3					0.7	NO		bb		
6	FUNCTION5 PFK	44.24	5.411e3					1.0	NO		bb		
7	FUNCTION5 PFK	43.89	1.986e3					0.7	NO		bb		
8	FUNCTION5 PFK	43.81	1.251e4					1.1	NO		bb		
9	FUNCTION5 PFK	43.51	5.873e3					1.4	NO		bb		
10	FUNCTION5 PFK	42.97	2.882e3					0.8	NO		db		
11	FUNCTION5 PFK	42.94	2.130e3					0.7	NO		bd		

ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	23.25	9.066e1					1.7	NO		bb		0.000
2	FUNCTION1 HXCD...	22.53	9.390e1					1.4	NO		bb		0.000
3	FUNCTION1 HXCD...	26.59	8.900e1					2.0	NO		bb		0.000
4	FUNCTION1 HXCD...	25.87	7.813e1					2.3	NO		db		0.000
5	FUNCTION1 HXCD...	25.79	1.108e2					2.2	NO		bd		0.000
6	FUNCTION1 HXCD...	25.46	8.976e1					2.0	NO		bb		0.000

ETHERS2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HPCD...	27.03	1.238e2					2.2	NO		bb		0.000
2	FUNCTION1 HPCD...	25.70	7.649e1					1.7	NO		bb		0.000
3	FUNCTION1 HPCD...	23.73	9.196e1					3.3	YES		bb		0.000
4	FUNCTION1 HPCD...	22.42	2.299e2					2.3	NO		bb		0.000

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Printed: Thursday, August 19, 2021 10:31:34 Pacific Daylight Time

ID: CS3K2, Name: 21081915, Date: 18-Aug-2021, Time: 21:38:40, Conditions: AUTOSPEC01, User: pk

ETHERS3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 HPCD...	31.39	9.399e1					1.7	NO		bd		0.000
2	FUNCTION2 HPCD...	30.98	1.237e2					1.7	NO		bb		0.000
3	FUNCTION2 HPCD...	29.97	7.651e1					1.8	NO		bb		0.000
4	FUNCTION2 HPCD...	29.80	7.714e1					1.7	NO		bb		0.000
5	FUNCTION2 HPCD...	28.55	7.534e1					2.2	NO		bb		0.000
6	FUNCTION2 HPCD...	28.06	8.406e1					2.0	NO		bb		0.000
7	FUNCTION2 HPCD...	31.59	8.899e1					1.7	NO		bb		0.000
8	FUNCTION2 HPCD...	31.44	9.360e1					1.8	NO		db		0.000

ETHERS4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION3 OCDPE	36.56	9.623e1					2.7	NO		bb		0.000
2	FUNCTION3 OCDPE	36.41	1.415e2					4.0	YES		bb		0.000
3	FUNCTION3 OCDPE	34.70	8.344e1					3.3	YES		bb		0.000

ETHERS5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 NCDPE	40.29	1.005e2					3.0	YES		bb		0.000
2	FUNCTION4 NCDPE	39.81	9.884e1					2.8	NO		bb		0.000

ETHERS6

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1													

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ID: CS3K2, Name: 21081915, Date: 18-Aug-2021, Time: 21:38:40, Conditions: AUTOSPEC01, User: pk

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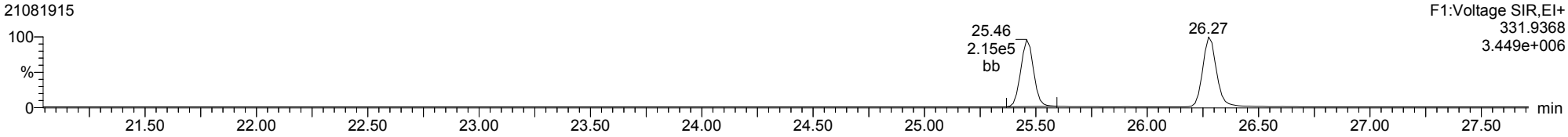

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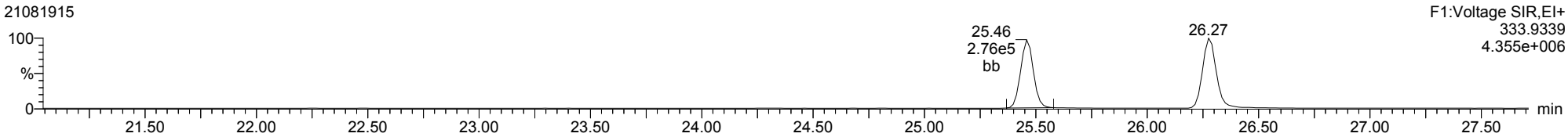

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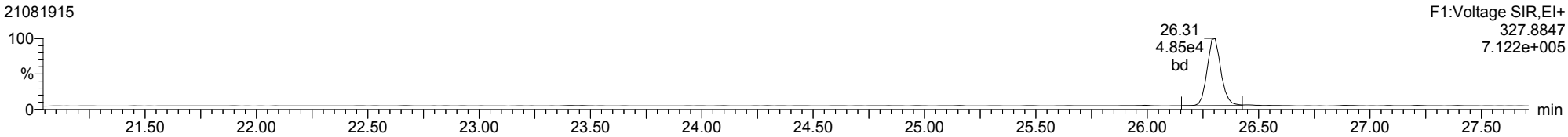

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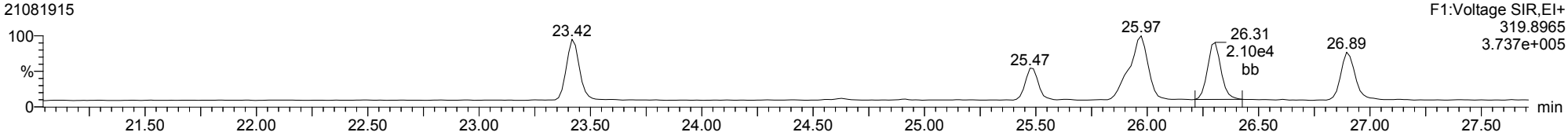

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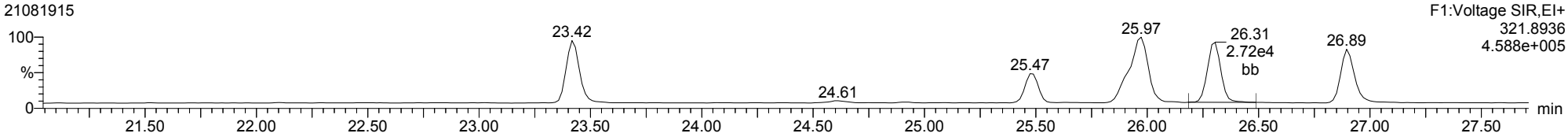

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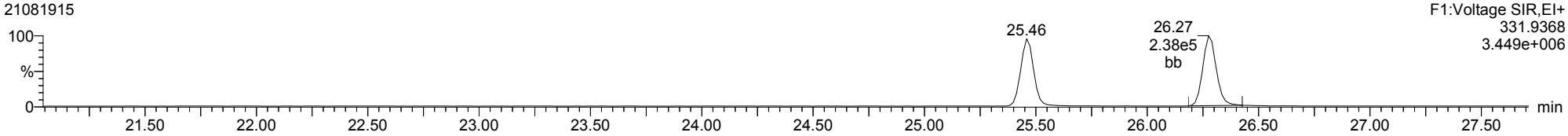

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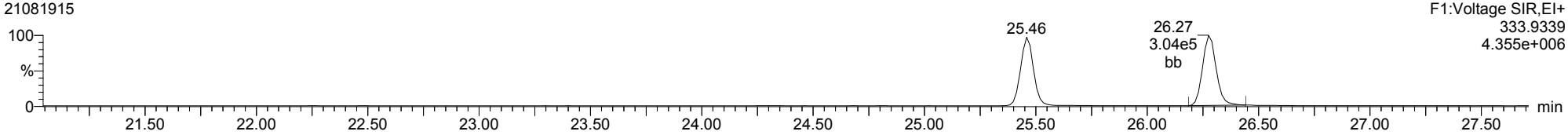

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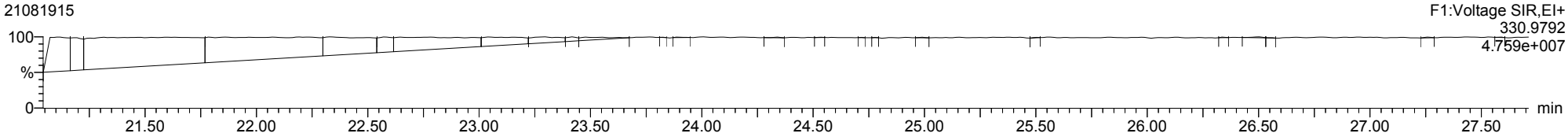

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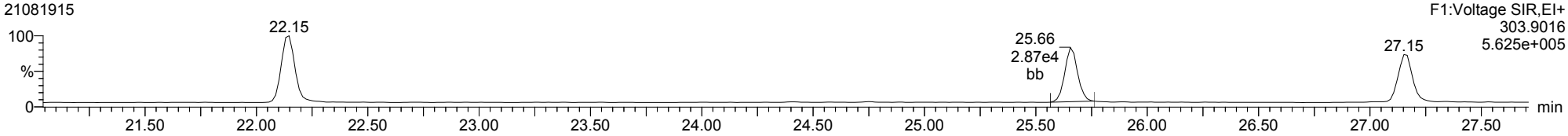

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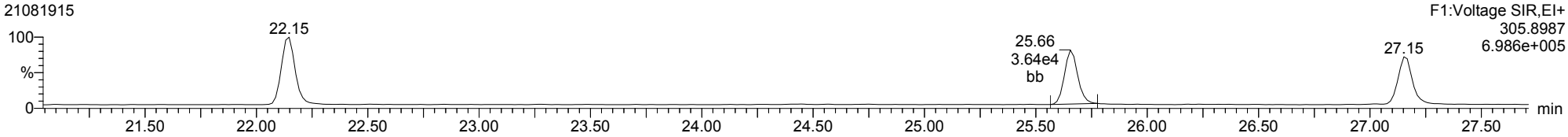

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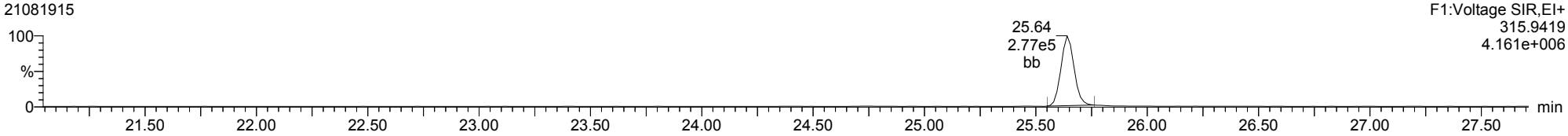

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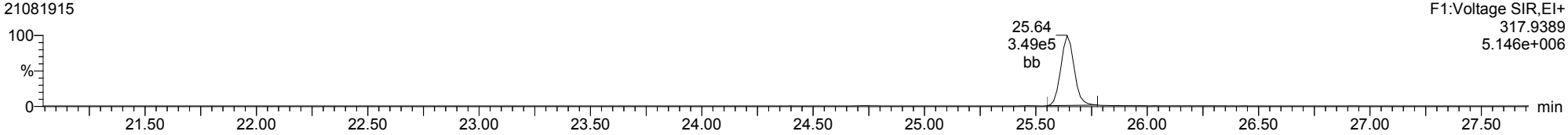

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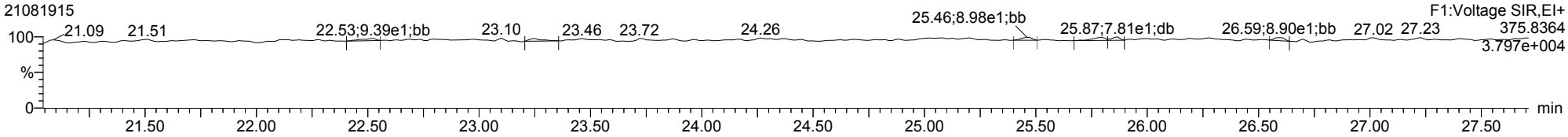

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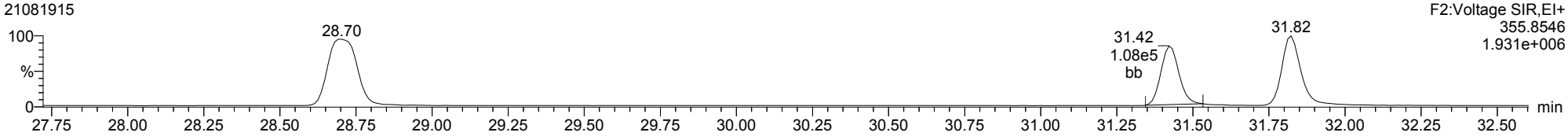
12378-PeCDD



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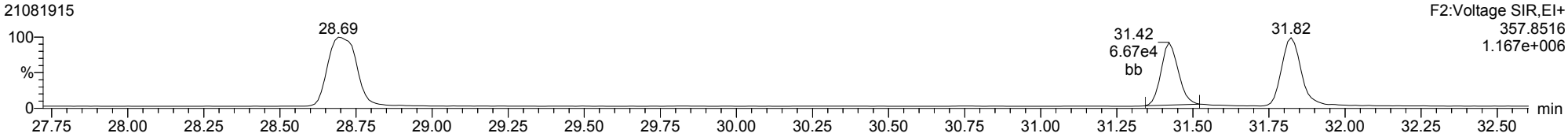

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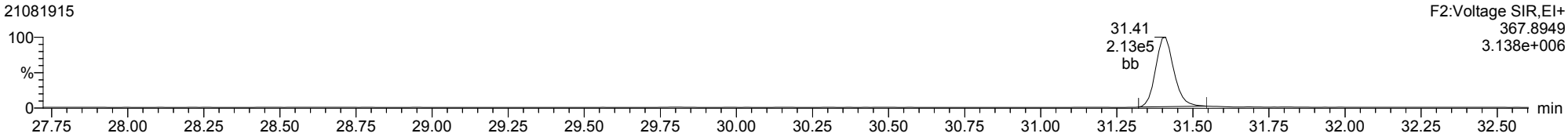

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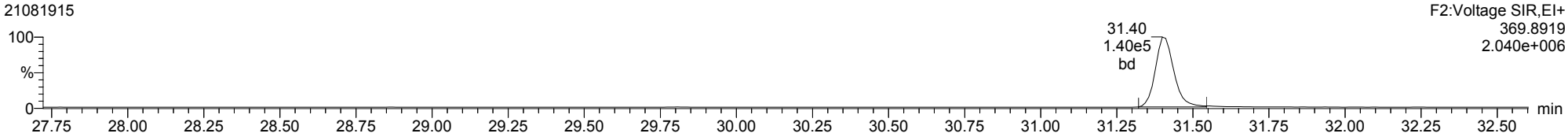

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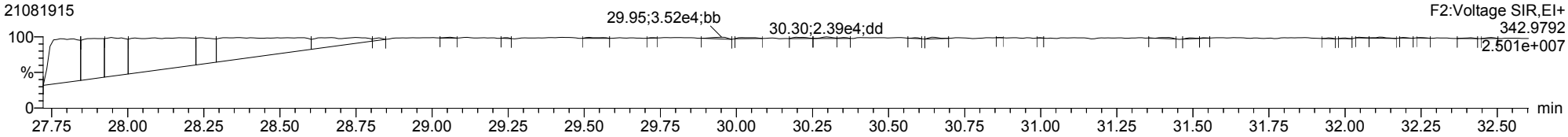

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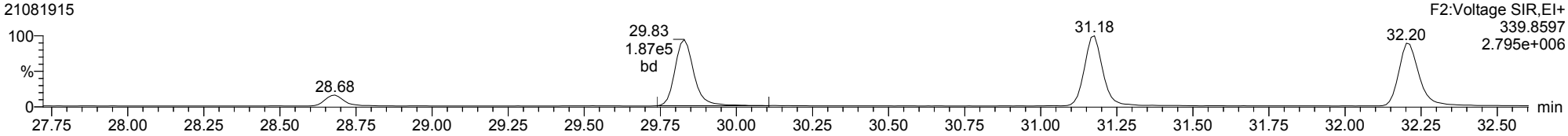

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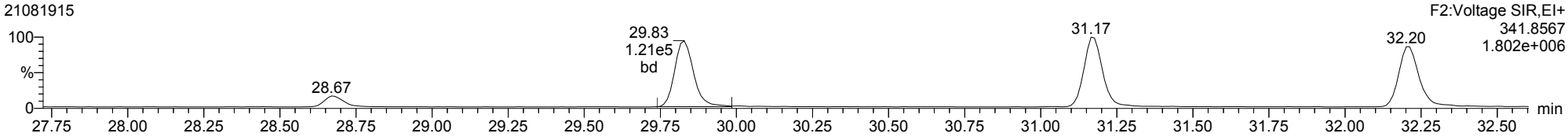

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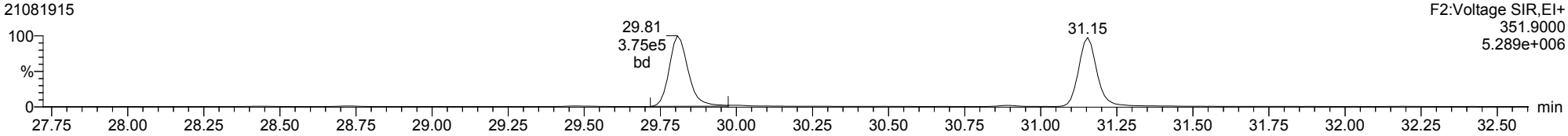

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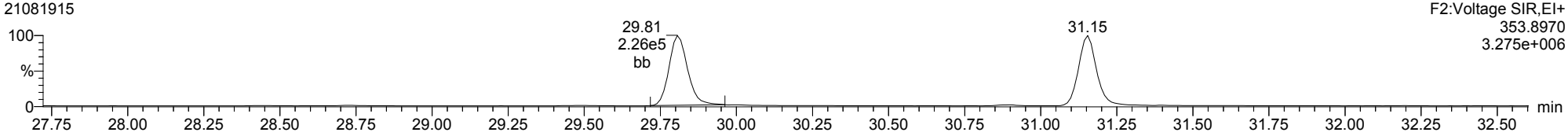
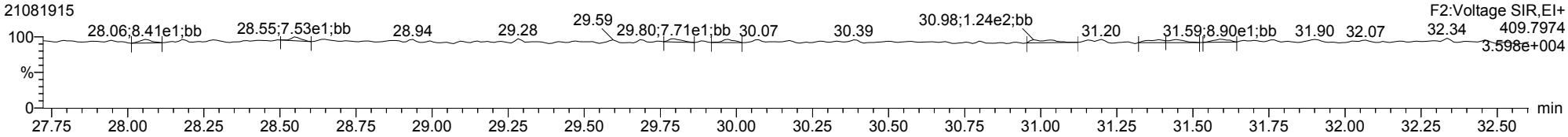


FUNCTION2 HPCDPE



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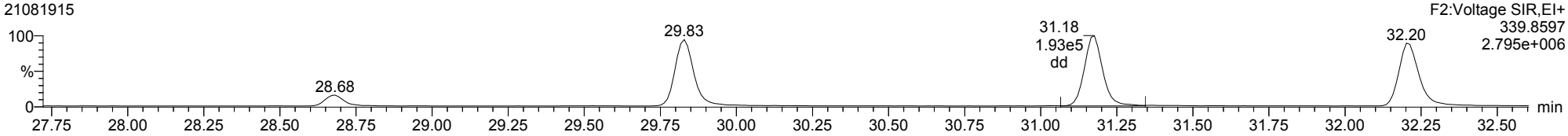
23478-PeCDF



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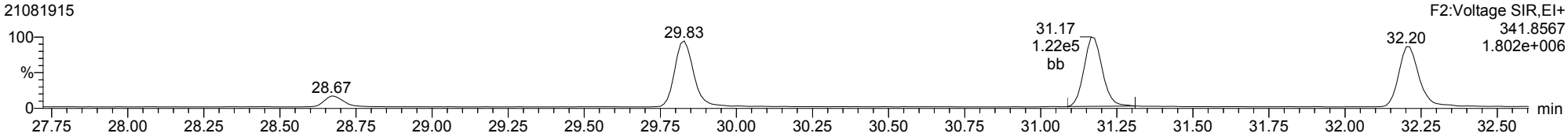

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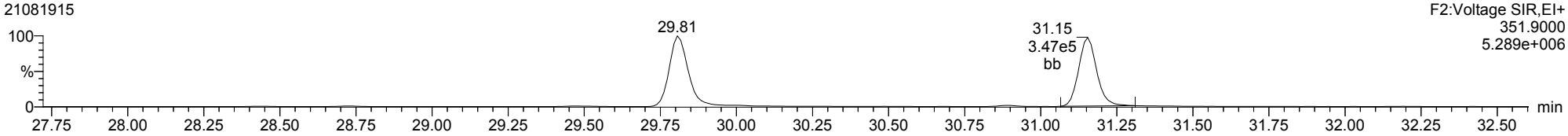

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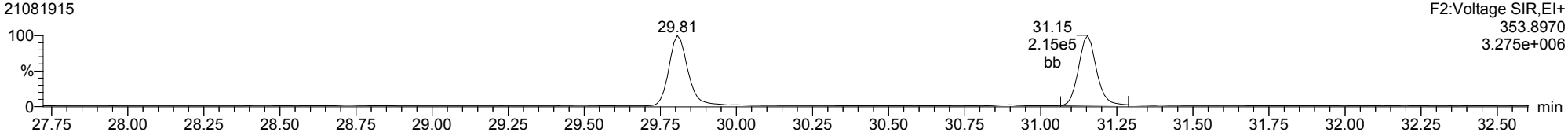

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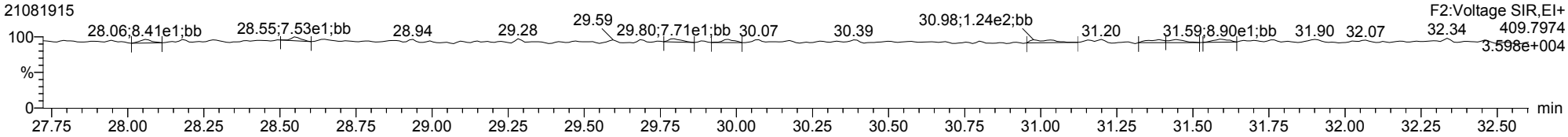

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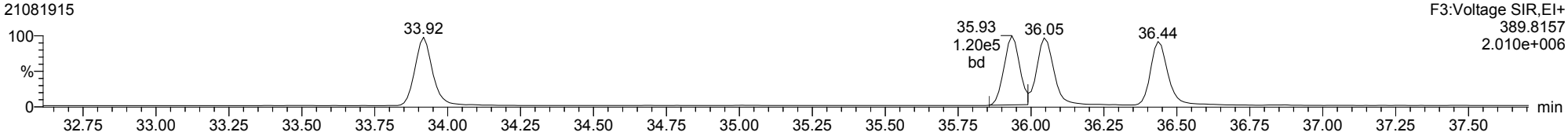
123478-HxCDD



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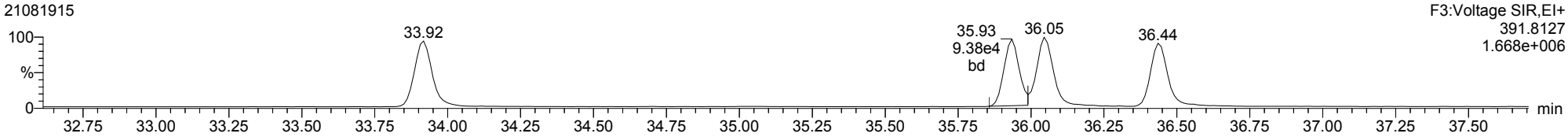

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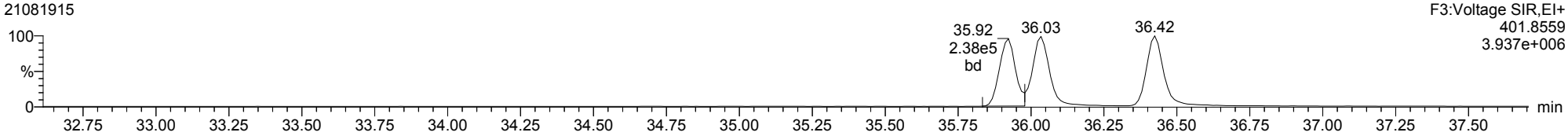

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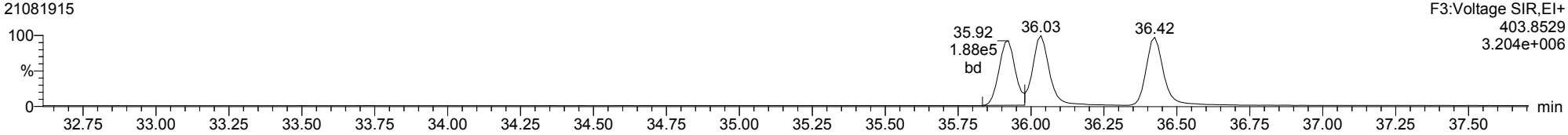

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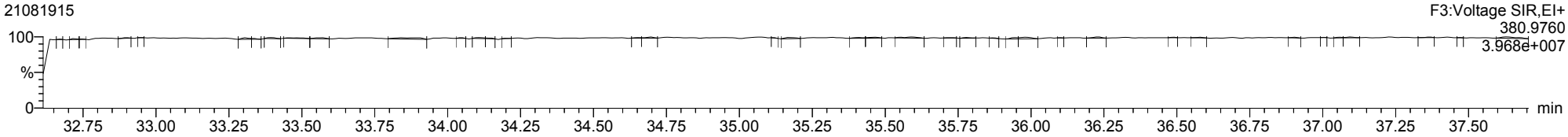

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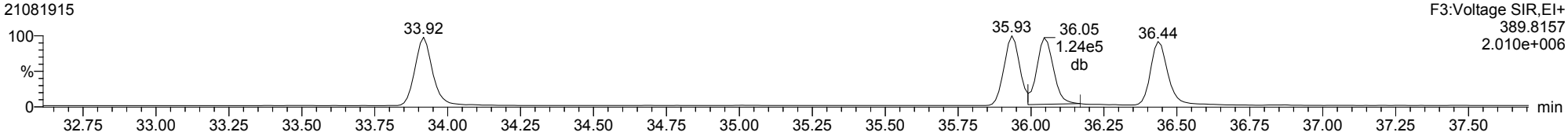

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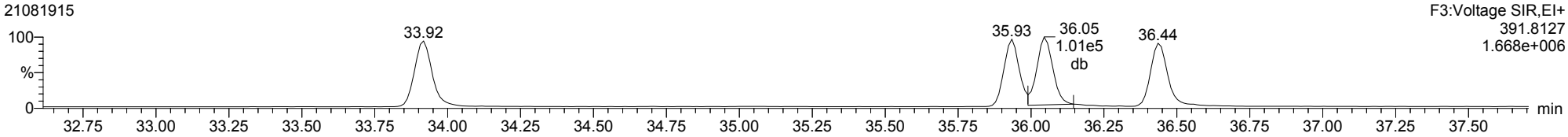

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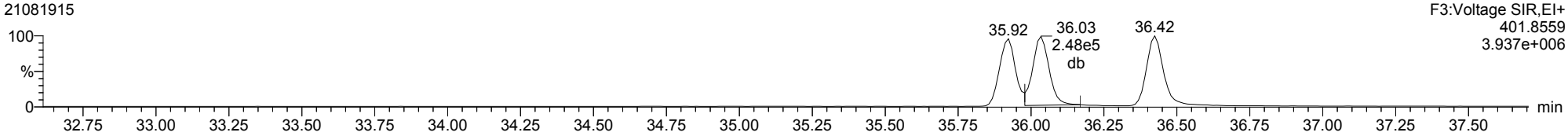

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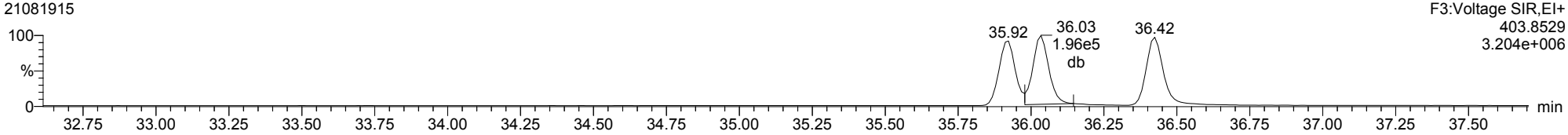

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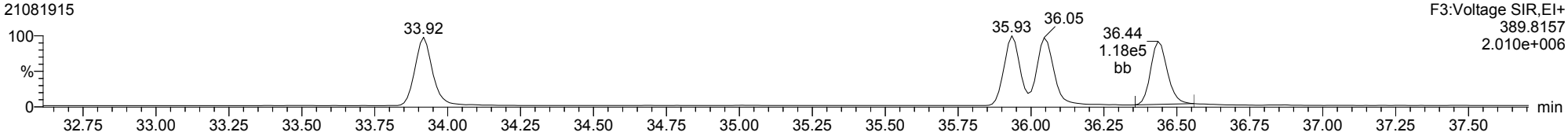

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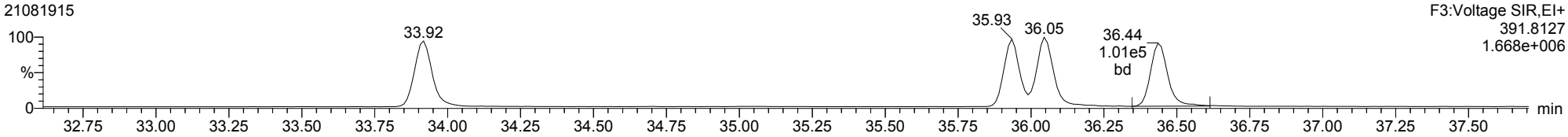

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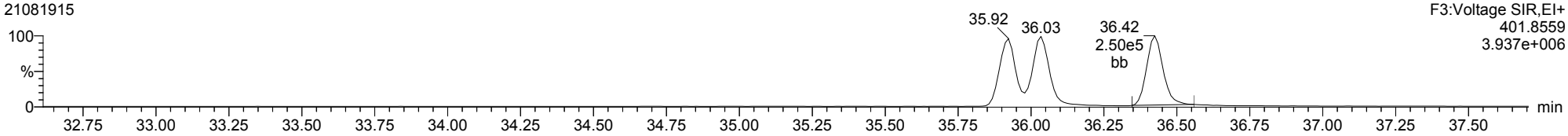

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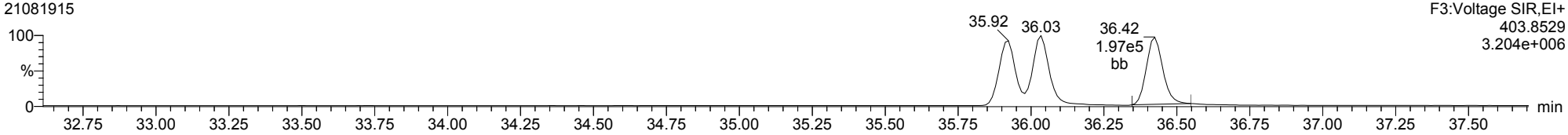

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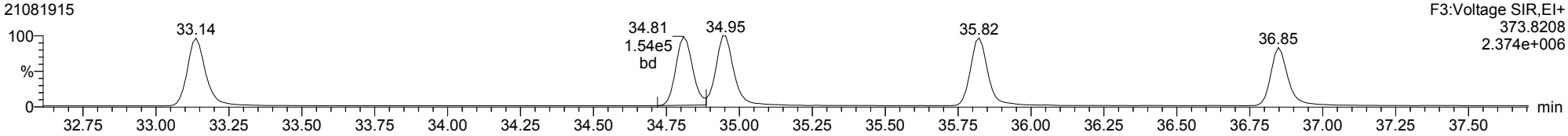

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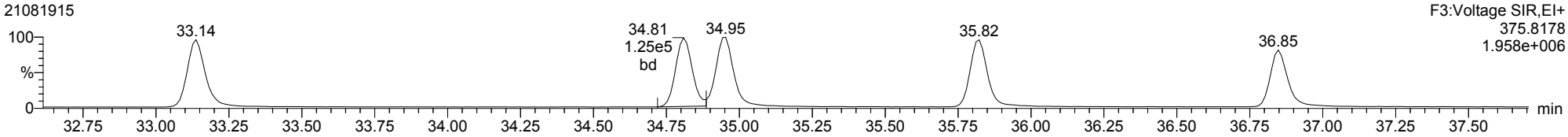

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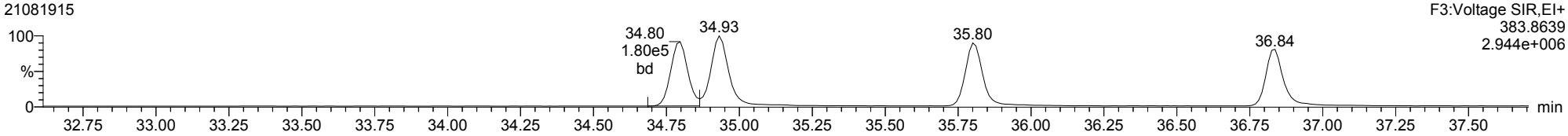

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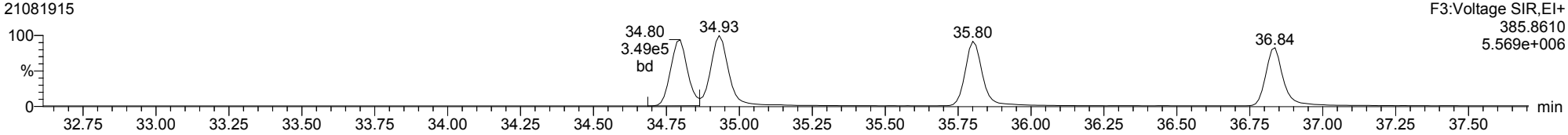

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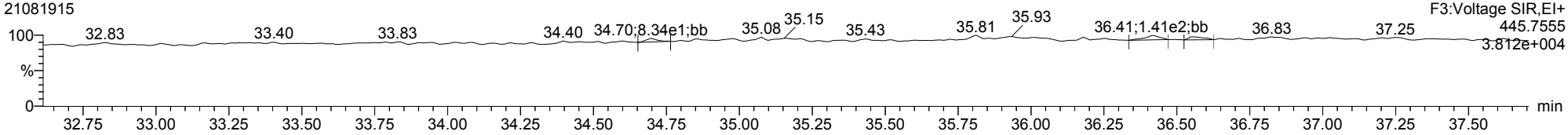

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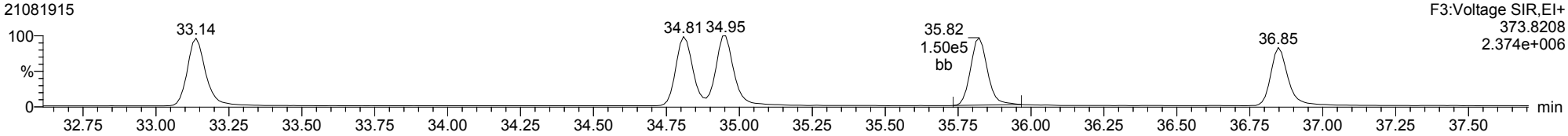
234678-HxCDF



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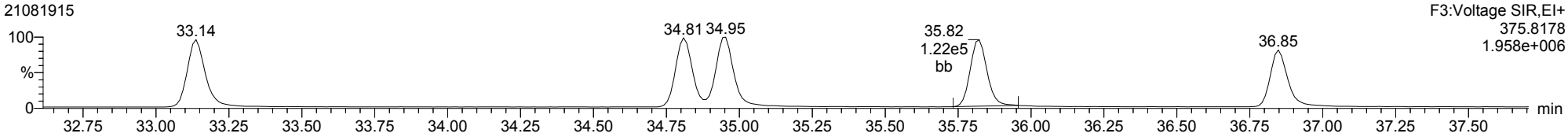

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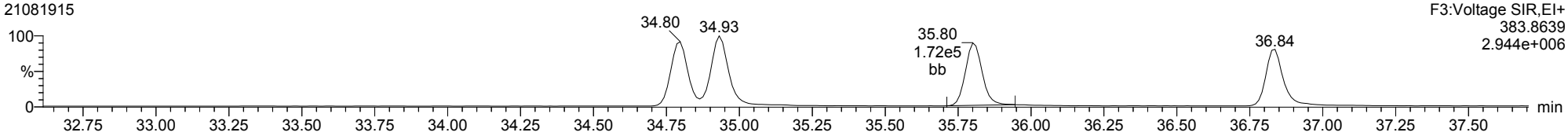

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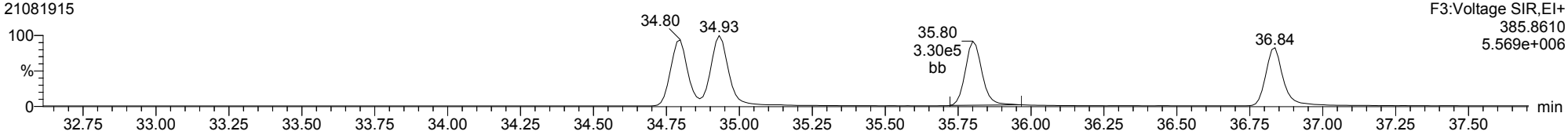

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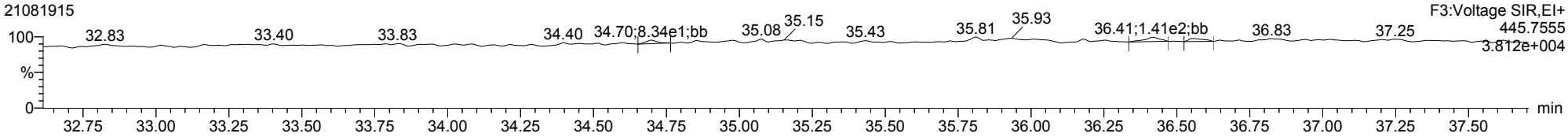

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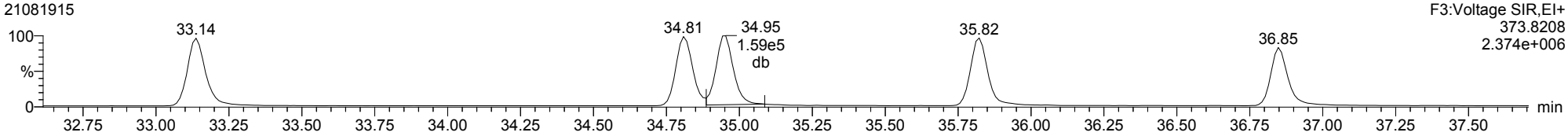

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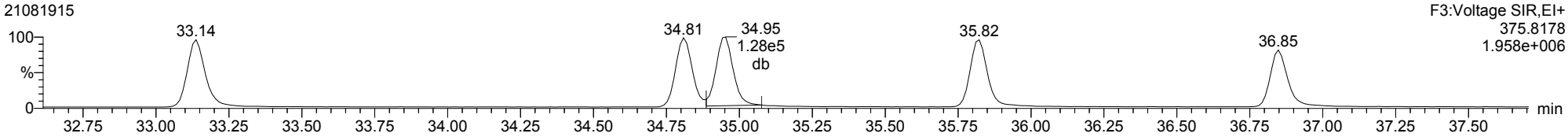

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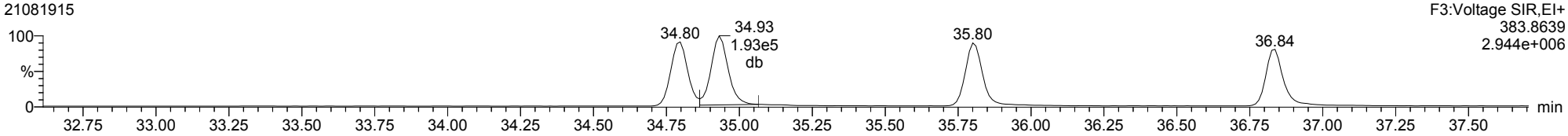

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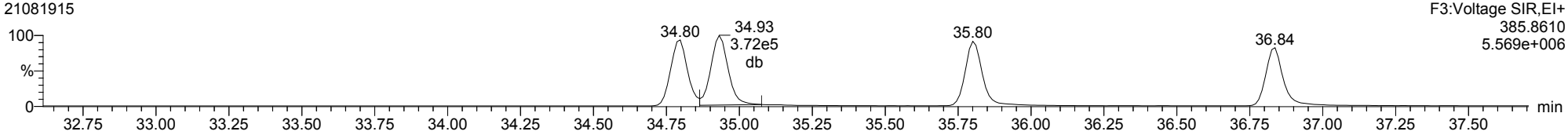

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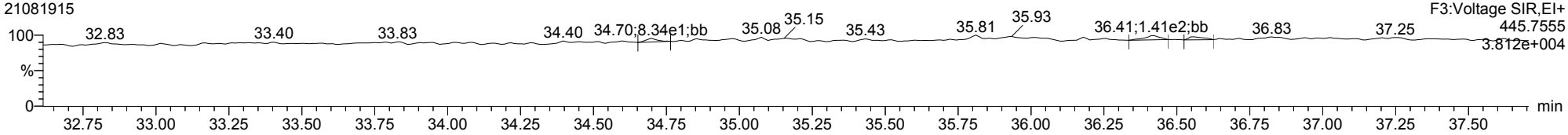

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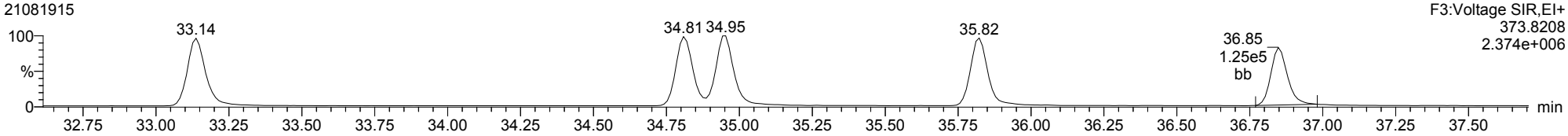

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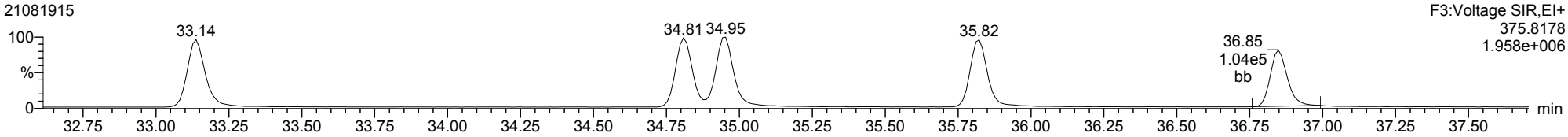

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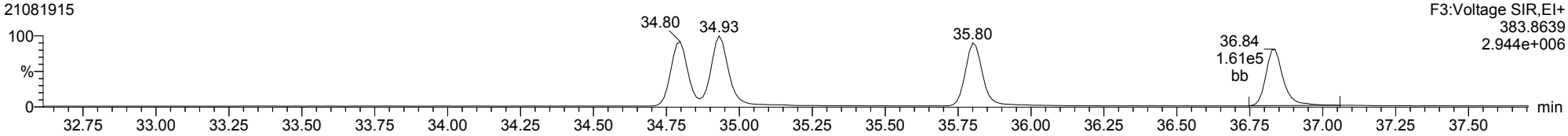

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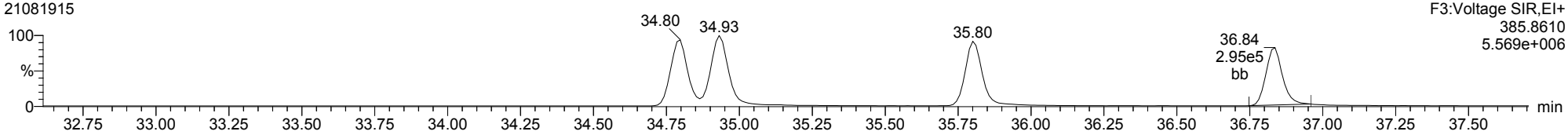

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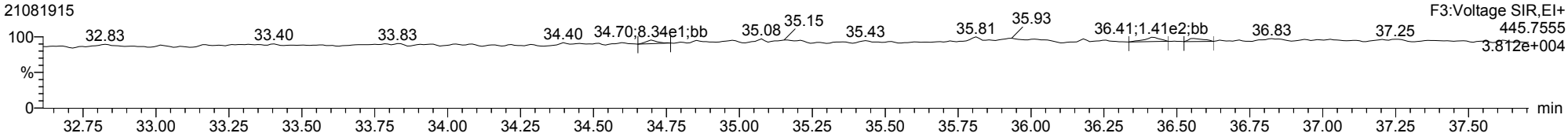

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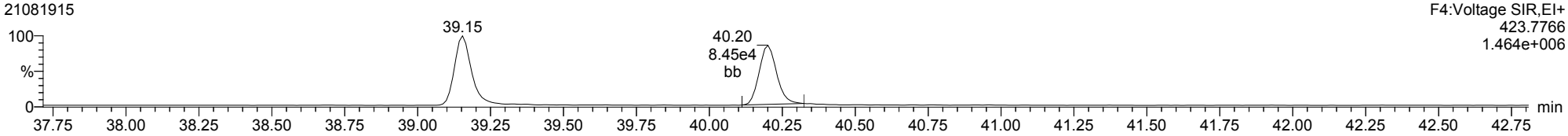

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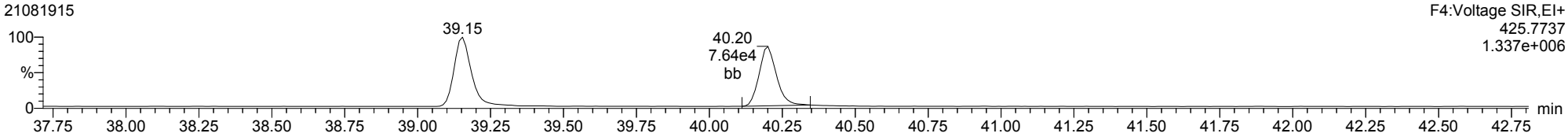

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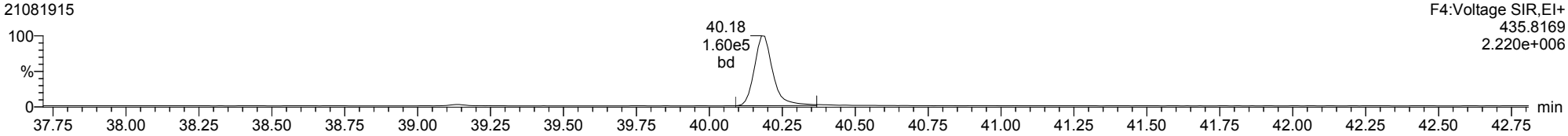

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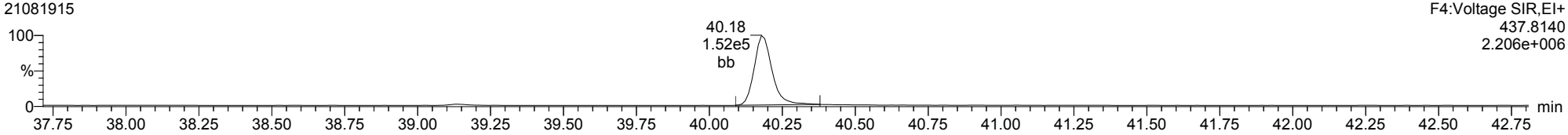

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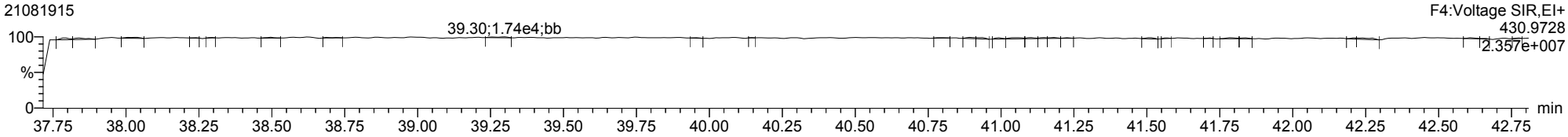

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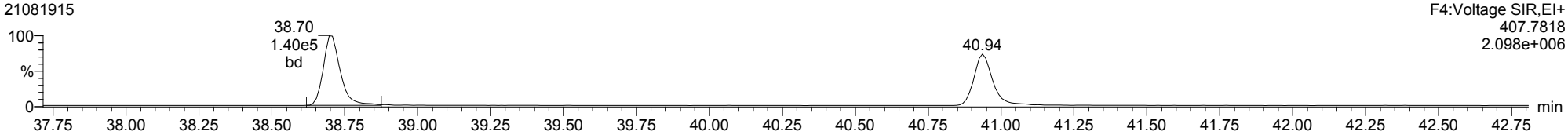

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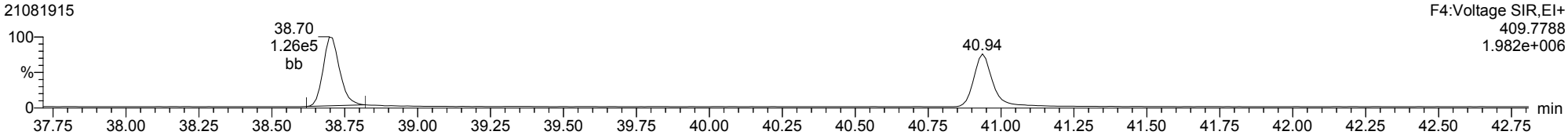

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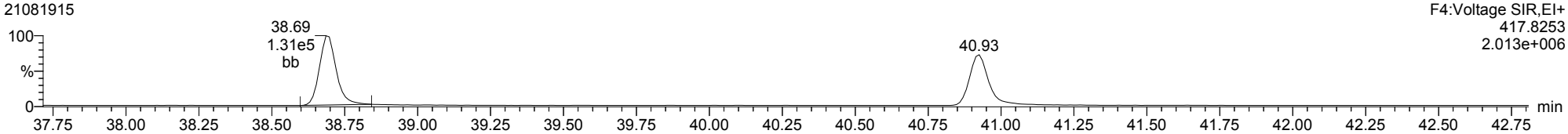

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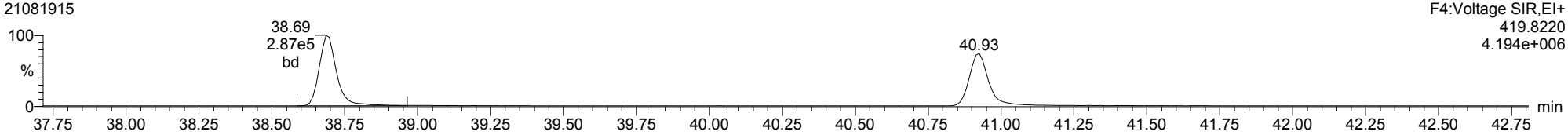

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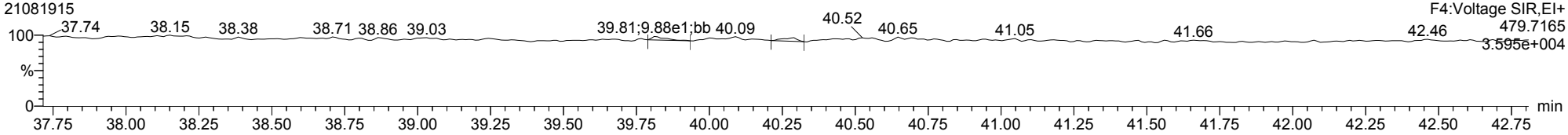

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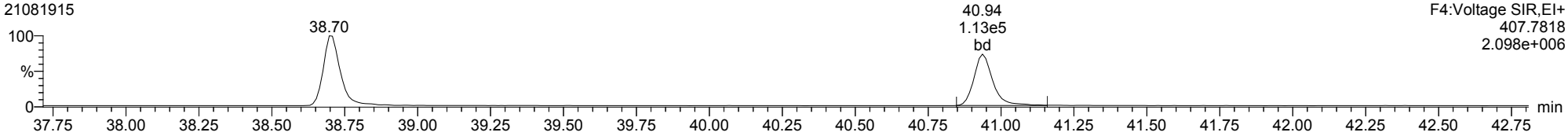

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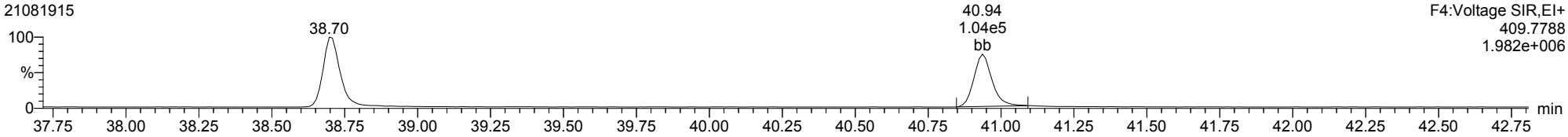

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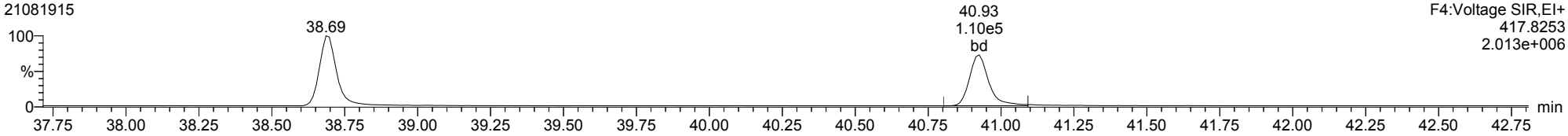

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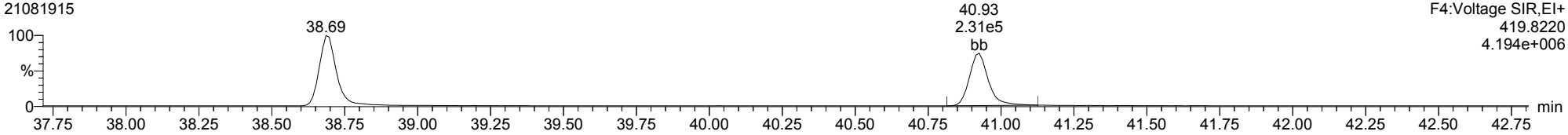

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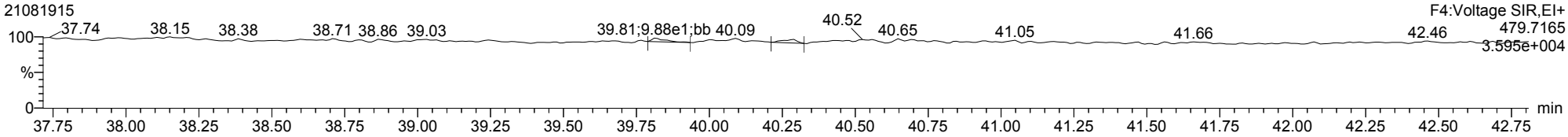

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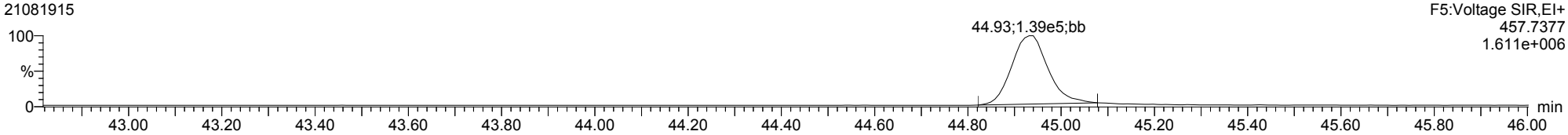

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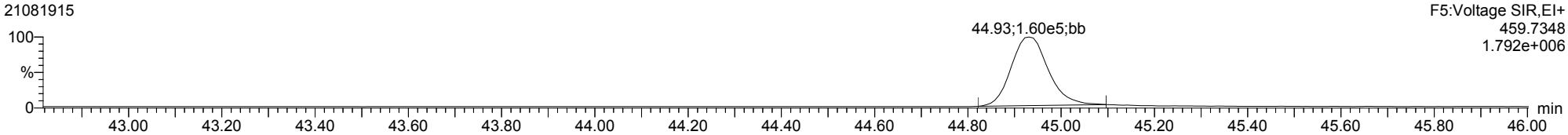

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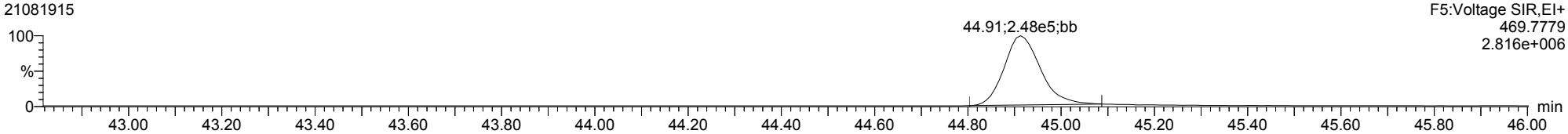

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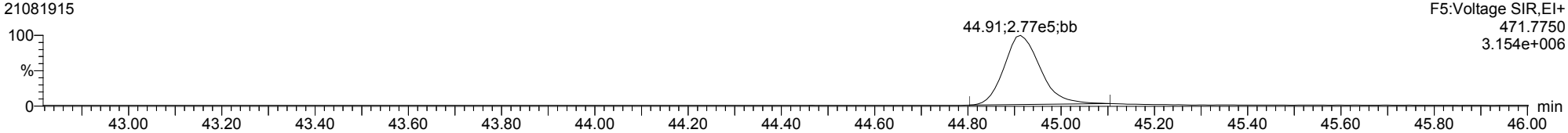

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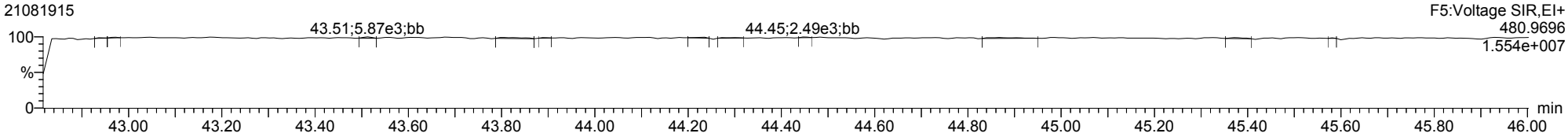

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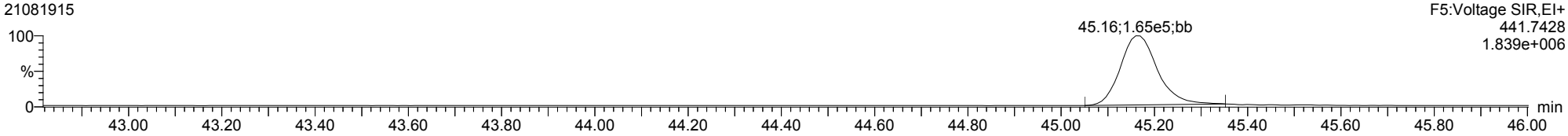
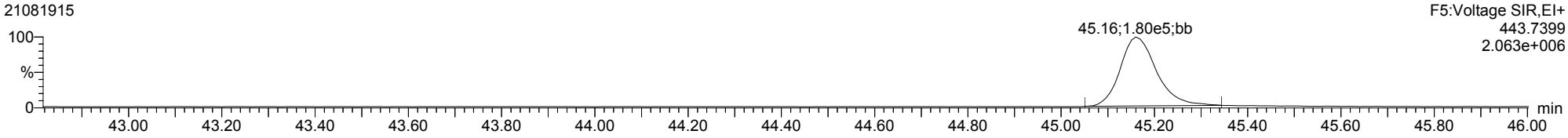
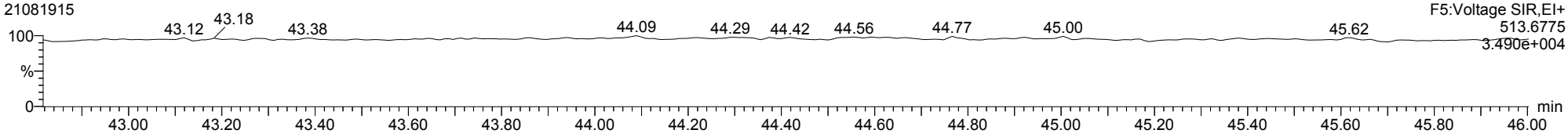


OCDF



FUNCTION5 DCDPE



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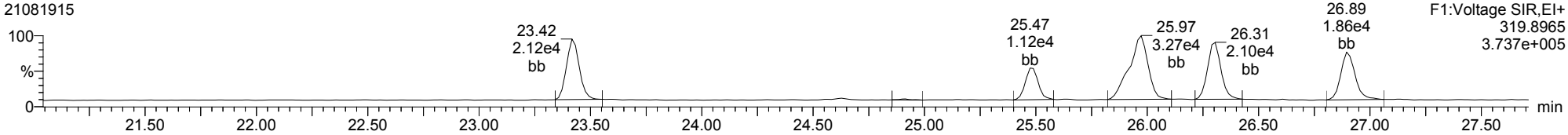
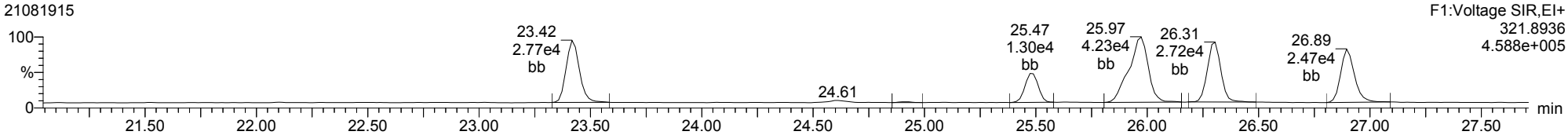
Total-tetradioxins



Total-tetradioxins



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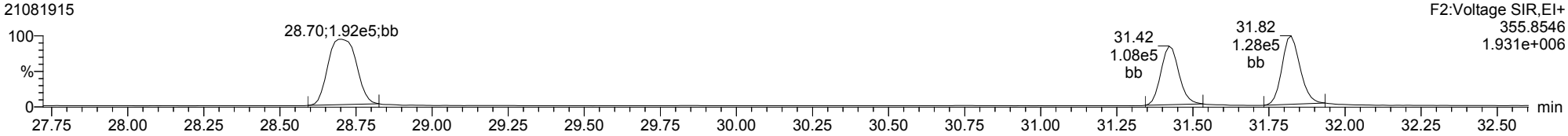
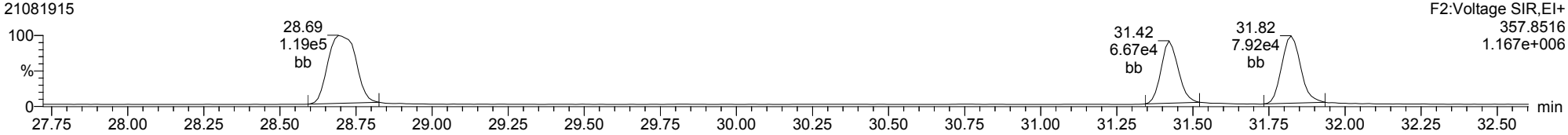


Total-pentadioxins



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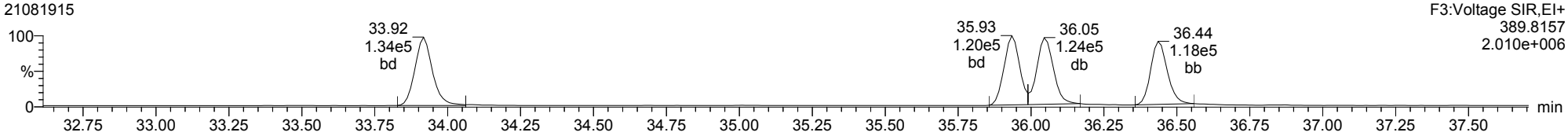

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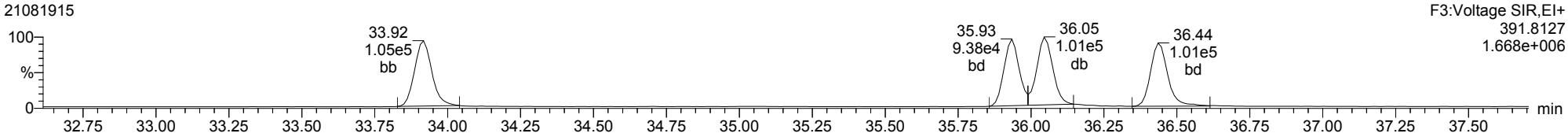

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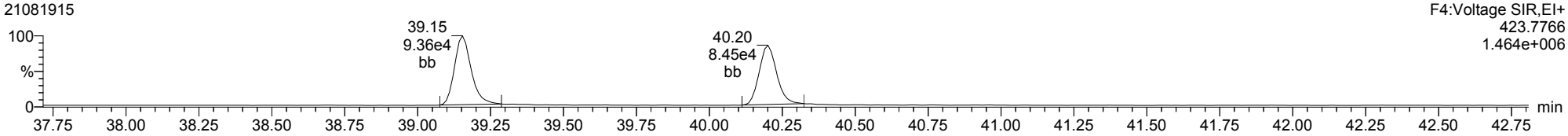

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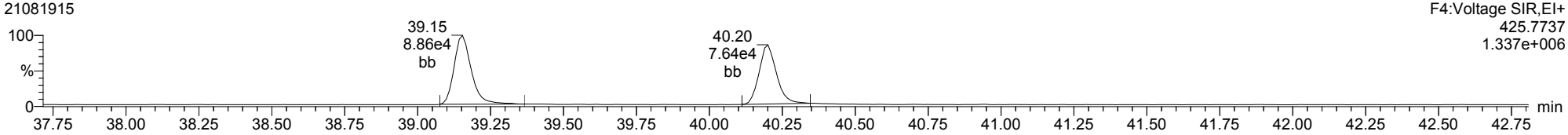

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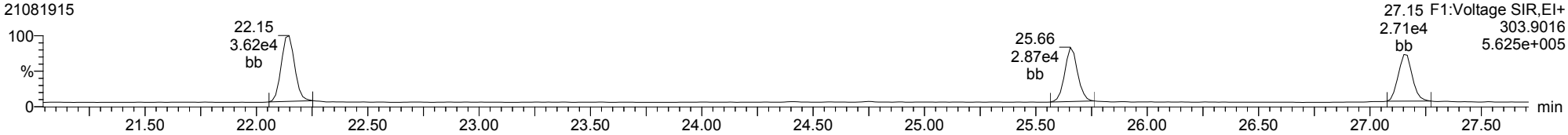
Printed: Thursday, August 19, 2021 10:31:34 Pacific Daylight Time

ID: CS3K2, Name: 21081915, Date: 18-Aug-2021, Time: 21:38:40, Conditions: AUTOSPEC01, User: pk

Total-tetrafurans



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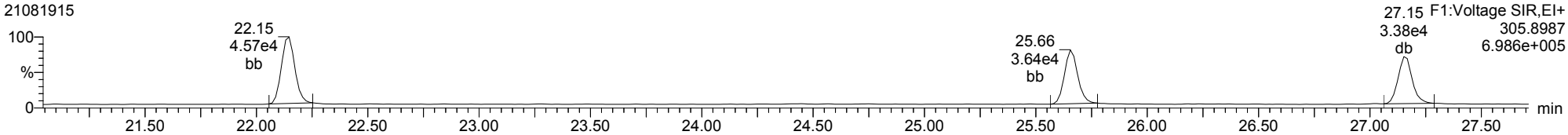

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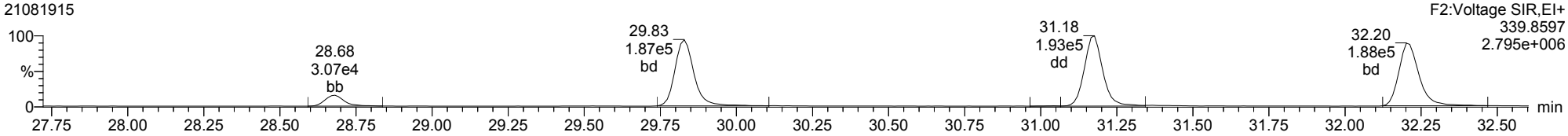
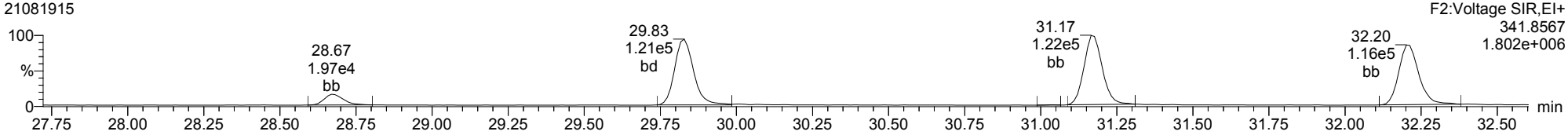


Total-pentafurans



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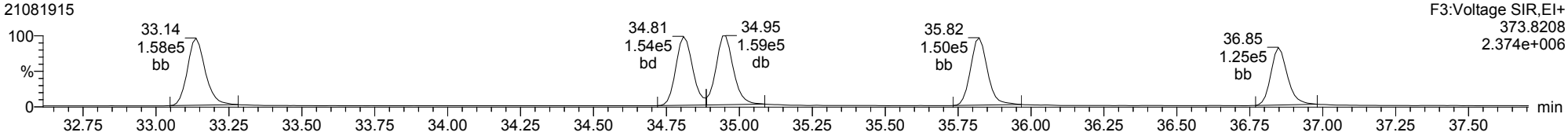
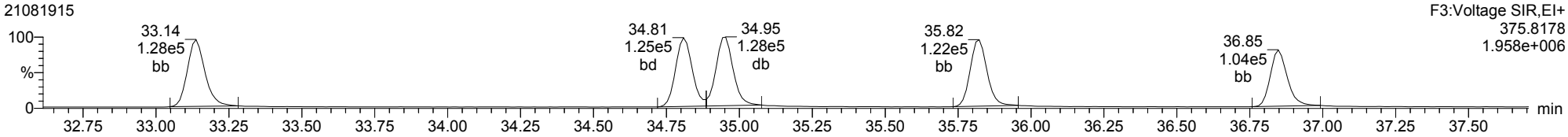
ID: CS3K2, Name: 21081915, Date: 18-Aug-2021, Time: 21:38:40, Conditions: AUTOSPEC01, User: pk

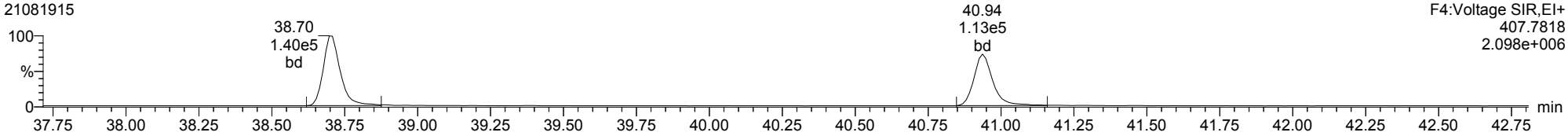
Total-hexafurans



Total-hexafurans



Total-heptafurans



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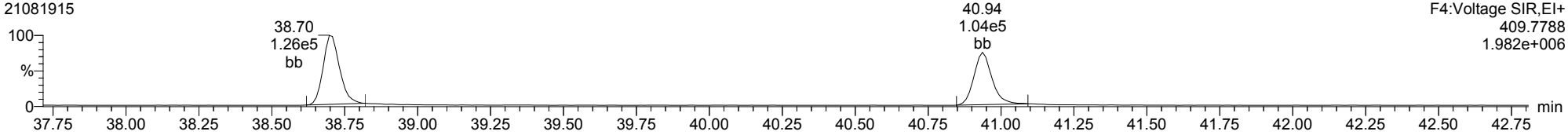

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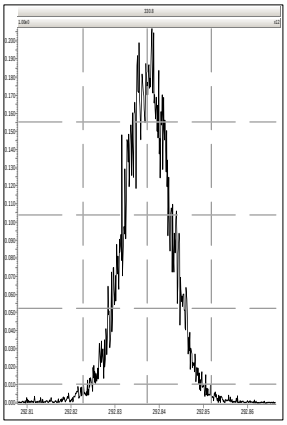
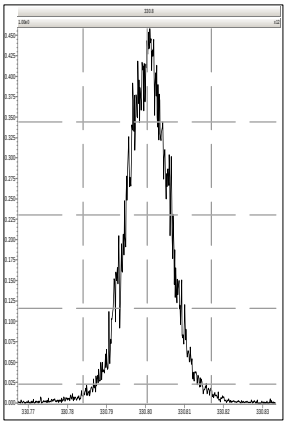
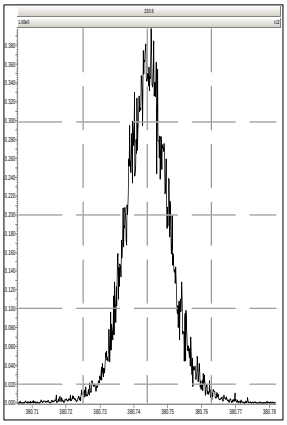


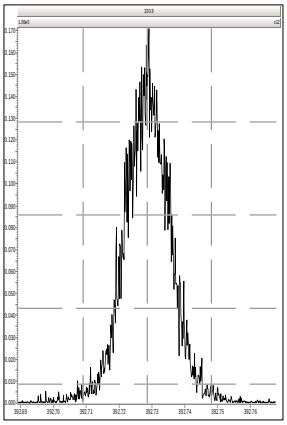
M 330.9792 R 12319



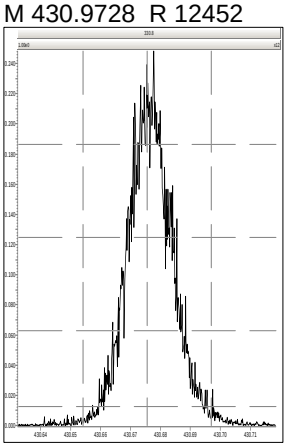
M 380.9760 R 12691



M 392.9760 R 13404



M 430.9728 R 12452



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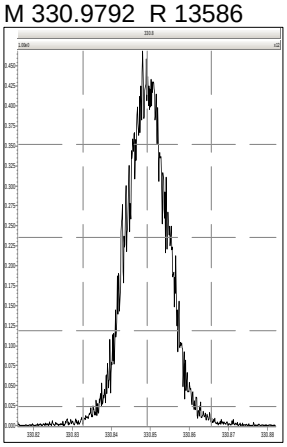
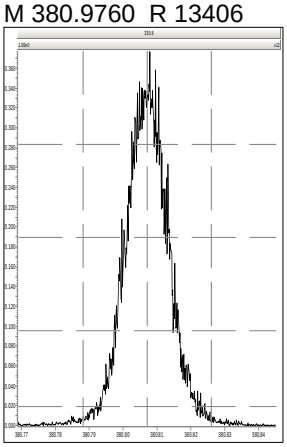


M 380.9760 R 13406



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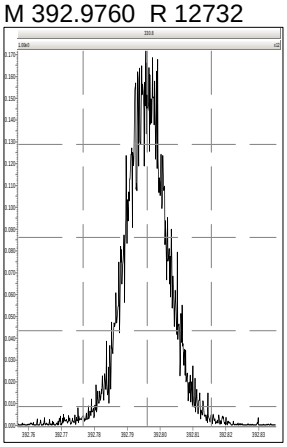
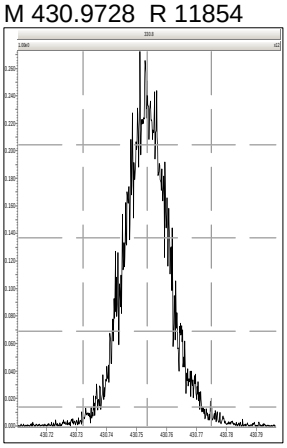
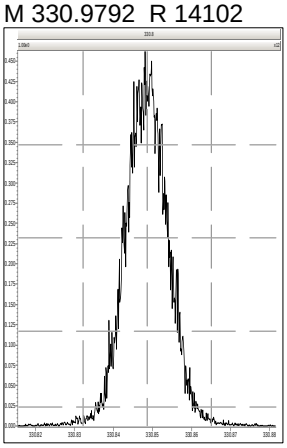


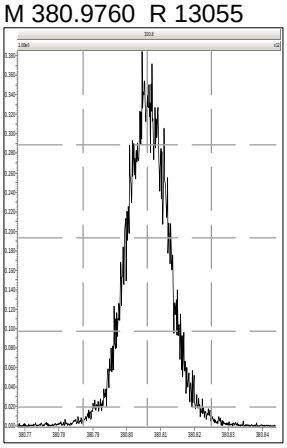
M 430.9728 R 11854



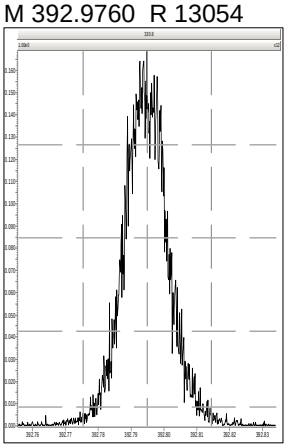
M 330.9792 R 14102



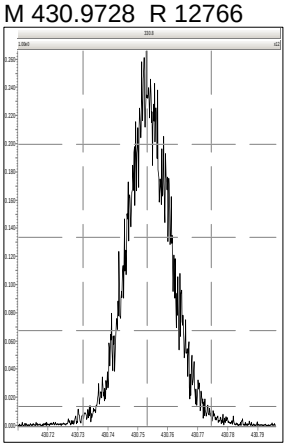
M 380.9760 R 13055



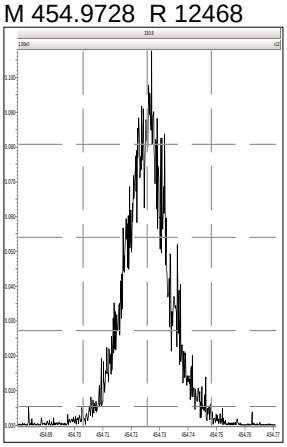
M 392.9760 R 13054



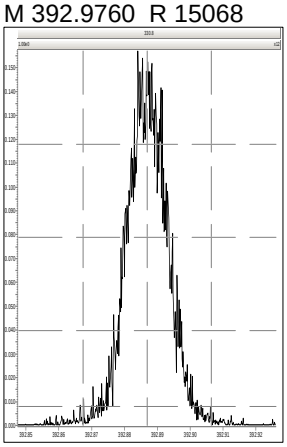
M 430.9728 R 12766



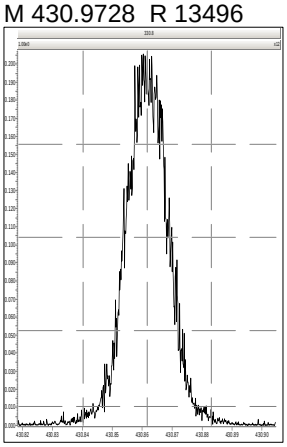
M 454.9728 R 12468



M 392.9760 R 15068



M 430.9728 R 13496



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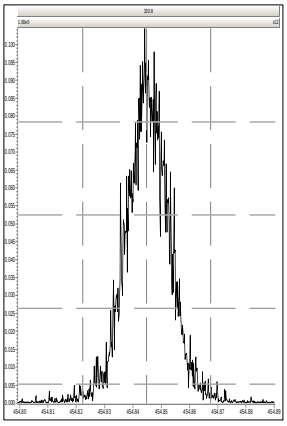
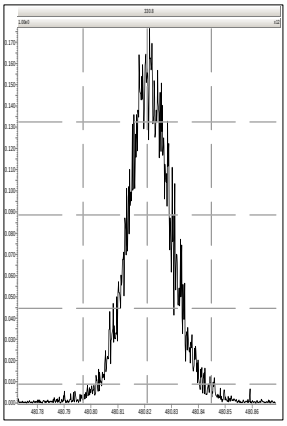
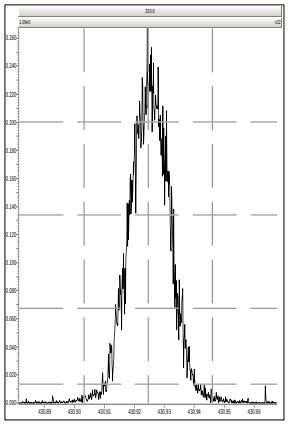


M 480.9696 R 13056



M 430.9728 R 14885



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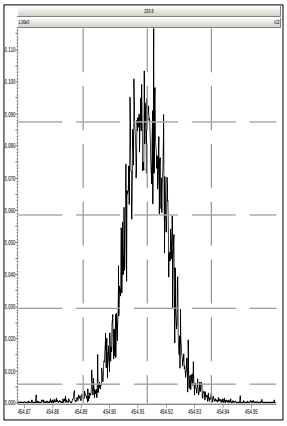

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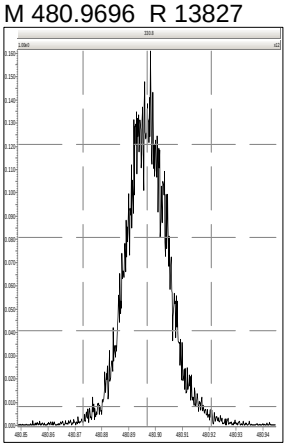

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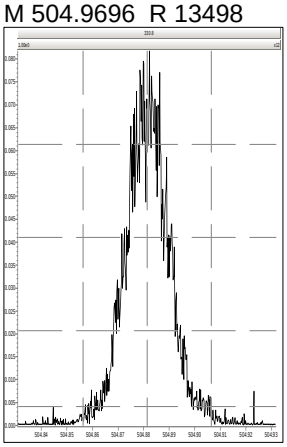

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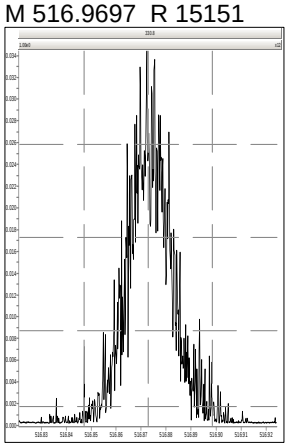
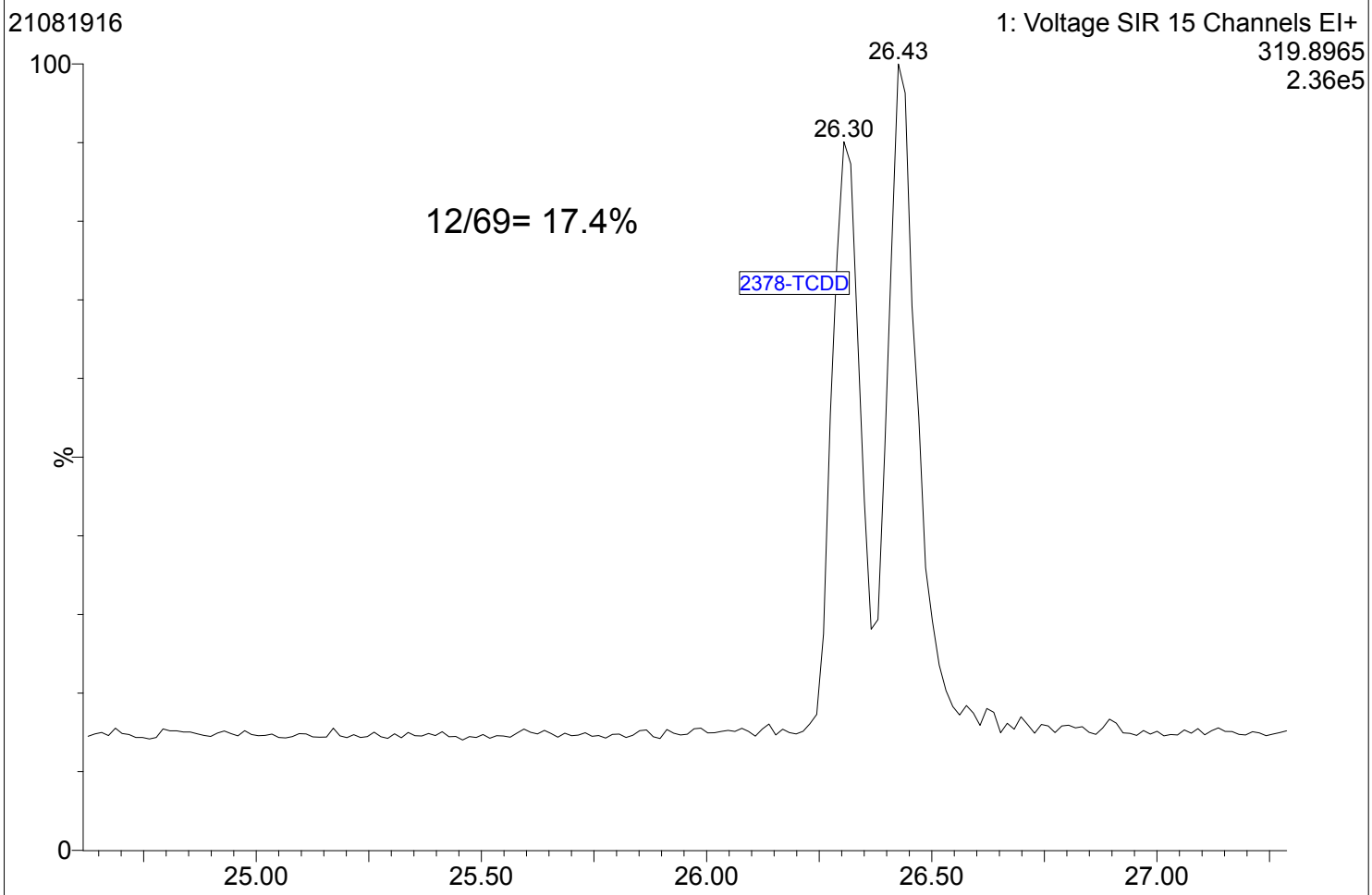
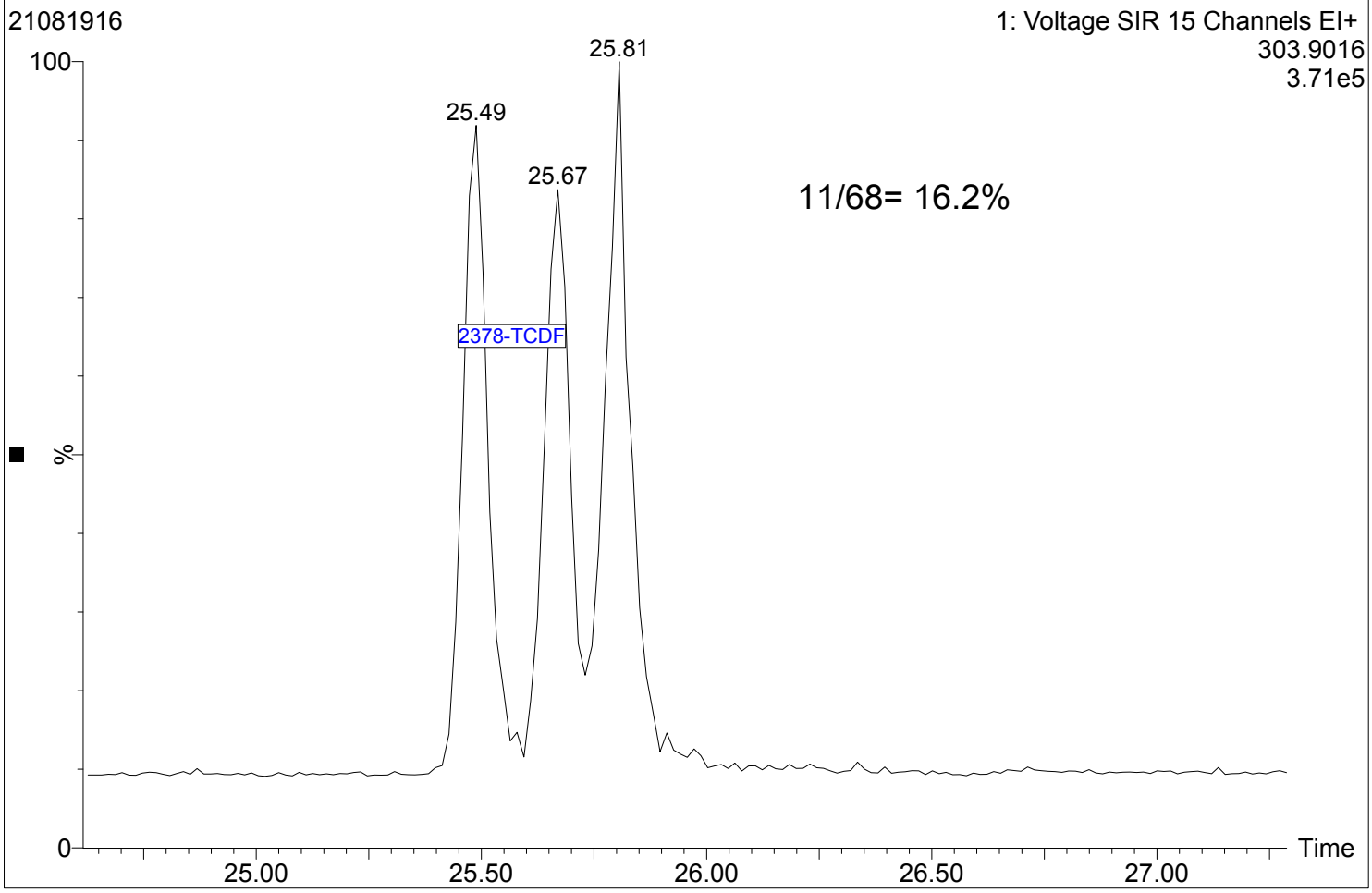



21081916
1: Voltage SIR 15 Channels EI+
319.8965
2.36e5
26.43
26.30
12/69= 17.4%
2378-TCDD
100
%
0
25.00
25.50
26.00
26.50
27.00


21081916
1: Voltage SIR 15 Channels EI+
303.9016
3.71e5
25.81
25.49
25.67
11/68= 16.2%
2378-TCDF
100
%
0
Time
25.00
25.50
26.00
26.50
27.00

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CDD/CDF CHROMATOGRAPHIC RESOLUTION SUMMARY
EPA 1613B

Lab Name: Analytical Resources, Inc.
SDG: 21G0111
Instrument .ID: AUTOSPEC01
Lab File ID: 21081103
Date Analyzed: 08/11/21
Time Analyzed: 16:41
Lab Sample ID: SJH0117-RES1
Sequence: SJH0117

Percent Valley Determination for Column: RTX-Dioxin2 ID: 0.25 (mm)

1278-TCDD/2378-TCDD: 9

3467-TCDF/2378-TCDF: 9

Quality Control (QC) Limits: ≤ 25%

Lab Sample ID	Sample Name	Lab File ID	Data Analyzed	Time Analyzed
SJH0117-ICV1	CS3Z1	21081102A	08/11/2021	15:52
SJH0117-RES1	ISCZ1	21081103	08/11/2021	16:41
SJH0117-CAL1	CSLCV	21081104A	08/11/2021	17:30
SJH0117-CAL2	CS1CV	21081107A	08/11/2021	19:56
SJH0117-CAL3	CS2CV	21081108A	08/11/2021	20:45
SJH0117-CAL4	CS3CV	21081109A	08/11/2021	21:34
SJH0117-CAL5	CS4CV	21081110A	08/11/2021	22:22
SJH0117-CAL6	CS5CV	21081111A	08/11/2021	23:11
SJH0117-SCV1	ICVCV	21081112A	08/12/2021	00:00
SJH0117-CCV1	CS3Z2	21081113B	08/12/2021	00:48
SJH0117-RES2	ISCZ2	21081114	08/12/2021	01:42

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CDD/CDF CHROMATOGRAPHIC RESOLUTION SUMMARY
EPA 1613B

Lab Name: Analytical Resources, Inc.
SDG: 21G0111
Instrument .ID: AUTOSPEC01
Lab File ID: 21081114
Date Analyzed: 08/12/21
Time Analyzed: 01:42
Lab Sample ID: SJH0117-RES2
Sequence: SJH0117

Percent Valley Determination for Column: RTX-Dioxin2 ID: 0.25 (mm)

1278-TCDD/2378-TCDD: 10.6

3467-TCDF/2378-TCDF: 11.1

Quality Control (QC) Limits: ≤ 25%

Lab Sample ID	Sample Name	Lab File ID	Data Analyzed	Time Analyzed
SJH0117-ICV1	CS3Z1	21081102A	08/11/2021	15:52
SJH0117-RES1	ISCZ1	21081103	08/11/2021	16:41
SJH0117-CAL1	CSLCV	21081104A	08/11/2021	17:30
SJH0117-CAL2	CS1CV	21081107A	08/11/2021	19:56
SJH0117-CAL3	CS2CV	21081108A	08/11/2021	20:45
SJH0117-CAL4	CS3CV	21081109A	08/11/2021	21:34
SJH0117-CAL5	CS4CV	21081110A	08/11/2021	22:22
SJH0117-CAL6	CS5CV	21081111A	08/11/2021	23:11
SJH0117-SCV1	ICVCV	21081112A	08/12/2021	00:00
SJH0117-CCV1	CS3Z2	21081113B	08/12/2021	00:48
SJH0117-RES2	ISCZ2	21081114	08/12/2021	01:42

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CDD/CDF CHROMATOGRAPHIC RESOLUTION SUMMARY
EPA 1613B

Lab Name: Analytical Resources, Inc.
SDG: 21G0111
Instrument .ID: AUTOSPEC01
Lab File ID: 21081903
Date Analyzed: 08/18/21
Time Analyzed: 11:50
Lab Sample ID: SJH0230-RES1
Sequence: SJH0230

Percent Valley Determination for Column: RTX-Dioxin2 ID: 0.25 (mm)

1278-TCDD/2378-TCDD:

3467-TCDF/2378-TCDF:

Quality Control (QC) Limits: ≤ 25%

Lab Sample ID	Sample Name	Lab File ID	Data Analyzed	Time Analyzed
SJH0230-ICV1	CS3K1	21081902	08/18/2021	10:16
SJH0230-RES1	ISCK1	21081903	08/18/2021	11:50
BJG0572-BLK3	DBLK30RE2	21081905	08/18/2021	13:28
BJG0572-BS2	LCS	21081906	08/18/2021	14:17
BJG0572-SRM1	Reference	21081907	08/18/2021	15:06
BJG0572-DUP1	Duplicate	21081908	08/18/2021	15:55
21G0111-06	LDW21-SS603	21081909	08/18/2021	16:44
21G0111-12	LDW21-SS661	21081910	08/18/2021	17:33
SJH0230-CCV1	CS3K2	21081915	08/18/2021	21:38
SJH0230-RES2	ISCK2	21081916	08/18/2021	22:32

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CDD/CDF CHROMATOGRAPHIC RESOLUTION SUMMARY
EPA 1613B

Lab Name: Analytical Resources, Inc.
SDG: 21G0111
Instrument .ID: AUTOSPEC01
Lab File ID: 21081916
Date Analyzed: 08/18/21
Time Analyzed: 22:32
Lab Sample ID: SJH0230-RES2
Sequence: SJH0230

Percent Valley Determination for Column: RTX-Dioxin2 ID: 0.25 (mm)

1278-TCDD/2378-TCDD:

3467-TCDF/2378-TCDF:

Quality Control (QC) Limits: ≤ 25%

Lab Sample ID	Sample Name	Lab File ID	Data Analyzed	Time Analyzed
SJH0230-ICV1	CS3K1	21081902	08/18/2021	10:16
SJH0230-RES1	ISCK1	21081903	08/18/2021	11:50
BJG0572-BLK3	DBLK30RE2	21081905	08/18/2021	13:28
BJG0572-BS2	LCS	21081906	08/18/2021	14:17
BJG0572-SRM1	Reference	21081907	08/18/2021	15:06
BJG0572-DUP1	Duplicate	21081908	08/18/2021	15:55
21G0111-06	LDW21-SS603	21081909	08/18/2021	16:44
21G0111-12	LDW21-SS661	21081910	08/18/2021	17:33
SJH0230-CCV1	CS3K2	21081915	08/18/2021	21:38
SJH0230-RES2	ISCK2	21081916	08/18/2021	22:32

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0117	Instrument:	AUTOSPEC01
		Calibration:	UNASSIGNED

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
CS3Z1	SJH0117-ICV1	21081102A	NA	08/11/21 15:52
ISCZ1	SJH0117-RES1	21081103	NA	08/11/21 16:41
CSLCV	SJH0117-CAL1	21081104A	NA	08/11/21 17:30
CS1CV	SJH0117-CAL2	21081107A	NA	08/11/21 19:56
CS2CV	SJH0117-CAL3	21081108A	NA	08/11/21 20:45
CS3CV	SJH0117-CAL4	21081109A	NA	08/11/21 21:34
CS4CV	SJH0117-CAL5	21081110A	NA	08/11/21 22:22
CS5CV	SJH0117-CAL6	21081111A	NA	08/11/21 23:11
ICVCV	SJH0117-SCV1	21081112A	NA	08/12/21 00:00
CS3Z2	SJH0117-CCV1	21081113B	NA	08/12/21 00:48
ISCZ2	SJH0117-RES2	21081114	NA	08/12/21 01:42

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0230	Instrument:	AUTOSPEC01
		Calibration:	EH00030

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
CS3K1	SJH0230-ICV1	21081902	NA	08/18/21 10:16
ISCK1	SJH0230-RES1	21081903	NA	08/18/21 11:50
Blank	BJG0572-BLK3	21081905	Solid	08/18/21 13:28
LCS	BJG0572-BS2	21081906	Solid	08/18/21 14:17
Reference	BJG0572-SRM1	21081907	Solid	08/18/21 15:06
LDW21-SS603	BJG0572-DUP1	21081908	Solid	08/18/21 15:55
LDW21-SS603	21G0111-06	21081909	Solid	08/18/21 16:44
LDW21-SS661	21G0111-12	21081910	Solid	08/18/21 17:33
CS3K2	SJH0230-CCV1	21081915	NA	08/18/21 21:38
ISCK2	SJH0230-RES2	21081916	NA	08/18/21 22:32

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0230	Instrument:	AUTOSPEC01
Sample ID:	SJH0230-ICV1	Calibration:	EH00030
File ID:	21081902	Analyzed:	08/18/21 10:16

Surrogate Compound	Spike Level ng/mL	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
13C12-2,3,7,8-TCDF	100.00	89.2	71 - 129	25.6548	25.63973	0.0151	N/A	
13C12-2,3,7,8-TCDD	100.00	97.2	82 - 118	26.2898	26.27478	0.0150	N/A	
13C12-1,2,3,7,8-PeCDF	100.00	94.5	76 - 124	29.8168	29.80383	0.0130	N/A	
13C12-2,3,4,7,8-PeCDF	100.00	92.0	77 - 123	31.1537	31.14815	0.0055	N/A	
13C12-1,2,3,7,8-PeCDD	100.00	101	62 - 138	31.4098	31.40067	0.0091	N/A	
13C12-1,2,3,4,7,8-HxCDF	100.00	96.0	76 - 124	34.7857	34.782	0.0037	N/A	
13C12-1,2,3,6,7,8-HxCDF	100.00	92.3	70 - 130	34.9305	34.91943	0.0111	N/A	
13C12-2,3,4,6,7,8-HxCDF	100.00	93.1	73 - 127	35.7995	35.7884	0.0111	N/A	
13C12-1,2,3,7,8,9-HxCDF	100.00	96.2	74 - 126	36.8245	36.8227	0.0018	N/A	
13C12-1,2,3,4,7,8-HxCDD	100.00	101	85 - 115	35.9108	35.90912	0.0017	N/A	
13C12-1,2,3,6,7,8-HxCDD	100.00	99.6	85 - 115	36.0335	36.0242	0.0093	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	100.00	87.7	78 - 122	38.6852	38.67025	0.0149	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	100.00	91.4	77 - 123	40.9132	40.90587	0.0073	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	100.00	97.7	82 - 118	40.178	40.16678	0.0112	N/A	
13C12-OCDD	200.00	95.4	48 - 152	44.903	44.88763	0.0154	N/A	
37Cl4-2,3,7,8-TCDD	10.000	90.2	79 - 121	26.305	26.30253	0.0025	N/A	

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0230	Instrument:	AUTOSPEC01
Sample ID:	BJG0572-BLK3	Calibration:	EH00030
File ID:	21081905	Analyzed:	08/18/21 13:28

Surrogate Compound	Spike Level ng/kg wet	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
13C12-2,3,7,8-TCDF	200.00	66.7	24 - 169	25.6247	25.63973	-0.0150	N/A	
13C12-2,3,7,8-TCDD	200.00	85.1	25 - 164	26.2747	26.27478	-0.0001	N/A	
13C12-1,2,3,7,8-PeCDF	200.00	83.1	24 - 185	29.8057	29.80383	0.0019	N/A	
13C12-2,3,4,7,8-PeCDF	200.00	80.0	21 - 178	31.1427	31.14815	-0.0054	N/A	
13C12-1,2,3,7,8-PeCDD	200.00	89.0	25 - 181	31.3988	31.40067	-0.0019	N/A	
13C12-1,2,3,4,7,8-HxCDF	200.00	87.1	26 - 152	34.7857	34.782	0.0037	N/A	
13C12-1,2,3,6,7,8-HxCDF	200.00	85.9	26 - 123	34.9193	34.91943	-0.0001	N/A	
13C12-2,3,4,6,7,8-HxCDF	200.00	87.6	28 - 136	35.7883	35.7884	-0.0001	N/A	
13C12-1,2,3,7,8,9-HxCDF	200.00	89.4	29 - 147	36.8245	36.8227	0.0018	N/A	
13C12-1,2,3,4,7,8-HxCDD	200.00	93.6	32 - 141	35.9108	35.90912	0.0017	N/A	
13C12-1,2,3,6,7,8-HxCDD	200.00	96.8	28 - 130	36.0223	36.0242	-0.0019	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	200.00	92.1	28 - 143	38.6852	38.67025	0.0149	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	200.00	91.9	26 - 138	40.9135	40.90587	0.0076	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	200.00	105	23 - 140	40.1782	40.16678	0.0114	N/A	
13C12-OCDD	400.00	116	17 - 157	44.9035	44.88763	0.0159	N/A	
37Cl4-2,3,7,8-TCDD	80.000	83.9	35 - 197	26.2898	26.30253	-0.0127	N/A	

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0230	Instrument:	AUTOSPEC01
Sample ID:	BJG0572-BS2	Calibration:	EH00030
File ID:	21081906	Analyzed:	08/18/21 14:17

Surrogate Compound	Spike Level ng/kg wet	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
13C12-2,3,7,8-TCDF	200.00	37.9	24 - 169	25.6397	25.63973	0.0000	N/A	
13C12-2,3,7,8-TCDD	200.00	50.7	25 - 164	26.2747	26.27478	-0.0001	N/A	
13C12-1,2,3,7,8-PeCDF	200.00	68.0	24 - 185	29.7947	29.80383	-0.0091	N/A	
13C12-2,3,4,7,8-PeCDF	200.00	67.7	21 - 178	31.1428	31.14815	-0.0053	N/A	
13C12-1,2,3,7,8-PeCDD	200.00	75.0	25 - 181	31.399	31.40067	-0.0017	N/A	
13C12-1,2,3,4,7,8-HxCDF	200.00	76.9	26 - 152	34.786	34.782	0.0040	N/A	
13C12-1,2,3,6,7,8-HxCDF	200.00	78.2	26 - 123	34.9197	34.91943	0.0003	N/A	
13C12-2,3,4,6,7,8-HxCDF	200.00	79.2	28 - 136	35.7887	35.7884	0.0003	N/A	
13C12-1,2,3,7,8,9-HxCDF	200.00	83.3	29 - 147	36.825	36.8227	0.0023	N/A	
13C12-1,2,3,4,7,8-HxCDD	200.00	82.3	32 - 141	35.9113	35.90912	0.0022	N/A	
13C12-1,2,3,6,7,8-HxCDD	200.00	81.2	28 - 130	36.0227	36.0242	-0.0015	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	200.00	84.4	28 - 143	38.6745	38.67025	0.0042	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	200.00	86.4	26 - 138	40.9027	40.90587	-0.0032	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	200.00	96.3	23 - 140	40.1673	40.16678	0.0005	N/A	
13C12-OCDD	400.00	108	17 - 157	44.9037	44.88763	0.0161	N/A	
37Cl4-2,3,7,8-TCDD	80.000	52.9	35 - 197	26.2898	26.30253	-0.0127	N/A	

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0230	Instrument:	AUTOSPEC01
Sample ID:	BJG0572-SRM1	Calibration:	EH00030
File ID:	21081907	Analyzed:	08/18/21 15:06

Surrogate Compound	Spike Level ng/kg wet	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
13C12-2,3,7,8-TCDF	396.83	22.1	24 - 169	25.6247	25.63973	-0.0150	N/A	*
13C12-2,3,7,8-TCDD	396.83	33.3	25 - 164	26.2597	26.27478	-0.0151	N/A	
13C12-1,2,3,7,8-PeCDF	396.83	40.1	24 - 185	29.7945	29.80383	-0.0093	N/A	
13C12-2,3,4,7,8-PeCDF	396.83	40.6	21 - 178	31.1425	31.14815	-0.0057	N/A	
13C12-1,2,3,7,8-PeCDD	396.83	44.0	25 - 181	31.3987	31.40067	-0.0020	N/A	
13C12-1,2,3,4,7,8-HxCDF	396.83	45.8	26 - 152	34.7858	34.782	0.0038	N/A	
13C12-1,2,3,6,7,8-HxCDF	396.83	43.5	26 - 123	34.9195	34.91943	0.0001	N/A	
13C12-2,3,4,6,7,8-HxCDF	396.83	44.1	28 - 136	35.7885	35.7884	0.0001	N/A	
13C12-1,2,3,7,8,9-HxCDF	396.83	51.7	29 - 147	36.8135	36.8227	-0.0092	N/A	
13C12-1,2,3,4,7,8-HxCDD	396.83	48.4	32 - 141	35.911	35.90912	0.0019	N/A	
13C12-1,2,3,6,7,8-HxCDD	396.83	46.9	28 - 130	36.0225	36.0242	-0.0017	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	396.83	45.3	28 - 143	38.6742	38.67025	0.0039	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	396.83	45.3	26 - 138	40.9025	40.90587	-0.0034	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	396.83	51.2	23 - 140	40.1672	40.16678	0.0004	N/A	
13C12-OCDD	793.65	55.3	17 - 157	44.9035	44.88763	0.0159	N/A	
37Cl4-2,3,7,8-TCDD	158.73	31.1	35 - 197	26.2898	26.30253	-0.0127	N/A	*

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0230	Instrument:	AUTOSPEC01
Sample ID:	BJG0572-DUP1	Calibration:	EH00030
File ID:	21081908	Analyzed:	08/18/21 15:55

Surrogate Compound	Spike Level ng/kg dry	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
13C12-2,3,7,8-TCDF	199.36	22.9	24 - 169	25.6247	25.63973	-0.0150	N/A	*
13C12-2,3,7,8-TCDD	199.36	32.8	25 - 164	26.2748	26.27478	0.0000	N/A	
13C12-1,2,3,7,8-PeCDF	199.36	35.8	24 - 185	29.8058	29.80383	0.0020	N/A	
13C12-2,3,4,7,8-PeCDF	199.36	35.6	21 - 178	31.1427	31.14815	-0.0054	N/A	
13C12-1,2,3,7,8-PeCDD	199.36	37.0	25 - 181	31.3988	31.40067	-0.0019	N/A	
13C12-1,2,3,4,7,8-HxCDF	199.36	38.8	26 - 152	34.7858	34.782	0.0038	N/A	
13C12-1,2,3,6,7,8-HxCDF	199.36	37.5	26 - 123	34.9197	34.91943	0.0003	N/A	
13C12-2,3,4,6,7,8-HxCDF	199.36	37.6	28 - 136	35.7998	35.7884	0.0114	N/A	
13C12-1,2,3,7,8,9-HxCDF	199.36	45.3	29 - 147	36.8248	36.8227	0.0021	N/A	
13C12-1,2,3,4,7,8-HxCDD	199.36	42.7	32 - 141	35.9112	35.90912	0.0021	N/A	
13C12-1,2,3,6,7,8-HxCDD	199.36	39.2	28 - 130	36.0338	36.0242	0.0096	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	199.36	38.4	28 - 143	38.6853	38.67025	0.0150	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	199.36	39.8	26 - 138	40.9025	40.90587	-0.0034	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	199.36	43.8	23 - 140	40.1782	40.16678	0.0114	N/A	
13C12-OCDD	398.73	48.0	17 - 157	44.9035	44.88763	0.0159	N/A	
37Cl4-2,3,7,8-TCDD	79.746	34.5	35 - 197	26.29	26.30253	-0.0125	N/A	*

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0230	Instrument:	AUTOSPEC01
Sample ID:	21G0111-06	Calibration:	EH00030
File ID:	21081909	Analyzed:	08/18/21 16:44

Surrogate Compound	Spike Level ng/kg dry	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
13C12-2,3,7,8-TCDF	200.20	47.2	24 - 169	25.6398	25.63973	0.0001	N/A	
13C12-2,3,7,8-TCDD	200.20	65.4	25 - 164	26.2748	26.27478	0.0000	N/A	
13C12-1,2,3,7,8-PeCDF	200.20	73.0	24 - 185	29.8058	29.80383	0.0020	N/A	
13C12-2,3,4,7,8-PeCDF	200.20	73.5	21 - 178	31.1538	31.14815	0.0056	N/A	
13C12-1,2,3,7,8-PeCDD	200.20	79.2	25 - 181	31.41	31.40067	0.0093	N/A	
13C12-1,2,3,4,7,8-HxCDF	200.20	80.1	26 - 152	34.808	34.782	0.0260	N/A	
13C12-1,2,3,6,7,8-HxCDF	200.20	77.3	26 - 123	34.9528	34.91943	0.0334	N/A	
13C12-2,3,4,6,7,8-HxCDF	200.20	77.5	28 - 136	35.8442	35.7884	0.0558	N/A	
13C12-1,2,3,7,8,9-HxCDF	200.20	83.0	29 - 147	36.8357	36.8227	0.0130	N/A	
13C12-1,2,3,4,7,8-HxCDD	200.20	87.8	32 - 141	35.9557	35.90912	0.0466	N/A	
13C12-1,2,3,6,7,8-HxCDD	200.20	81.0	28 - 130	36.0782	36.0242	0.0540	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	200.20	78.3	28 - 143	38.6963	38.67025	0.0260	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	200.20	81.6	26 - 138	40.9243	40.90587	0.0184	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	200.20	90.8	23 - 140	40.1892	40.16678	0.0224	N/A	
13C12-OCDD	400.40	98.7	17 - 157	44.9215	44.88763	0.0339	N/A	
37Cl4-2,3,7,8-TCDD	80.080	64.9	35 - 197	26.305	26.30253	0.0025	N/A	

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0230	Instrument:	AUTOSPEC01
Sample ID:	21G0111-12	Calibration:	EH00030
File ID:	21081910	Analyzed:	08/18/21 17:33

Surrogate Compound	Spike Level ng/kg dry	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
13C12-2,3,7,8-TCDF	199.99	28.4	24 - 169	25.655	25.63973	0.0153	N/A	
13C12-2,3,7,8-TCDD	199.99	43.1	25 - 164	26.29	26.27478	0.0152	N/A	
13C12-1,2,3,7,8-PeCDF	199.99	59.1	24 - 185	29.817	29.80383	0.0132	N/A	
13C12-2,3,4,7,8-PeCDF	199.99	58.9	21 - 178	31.165	31.14815	0.0168	N/A	
13C12-1,2,3,7,8-PeCDD	199.99	66.7	25 - 181	31.4102	31.40067	0.0095	N/A	
13C12-1,2,3,4,7,8-HxCDF	199.99	70.4	26 - 152	34.797	34.782	0.0150	N/A	
13C12-1,2,3,6,7,8-HxCDF	199.99	68.0	26 - 123	34.9418	34.91943	0.0224	N/A	
13C12-2,3,4,6,7,8-HxCDF	199.99	70.6	28 - 136	35.8108	35.7884	0.0224	N/A	
13C12-1,2,3,7,8,9-HxCDF	199.99	79.6	29 - 147	36.836	36.8227	0.0133	N/A	
13C12-1,2,3,4,7,8-HxCDD	199.99	75.0	32 - 141	35.9335	35.90912	0.0244	N/A	
13C12-1,2,3,6,7,8-HxCDD	199.99	70.9	28 - 130	36.0448	36.0242	0.0206	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	199.99	66.9	28 - 143	38.6965	38.67025	0.0262	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	199.99	65.9	26 - 138	40.9247	40.90587	0.0188	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	199.99	76.2	23 - 140	40.1893	40.16678	0.0225	N/A	
13C12-OCDD	399.98	72.5	17 - 157	44.9218	44.88763	0.0342	N/A	
37Cl4-2,3,7,8-TCDD	79.995	42.8	35 - 197	26.305	26.30253	0.0025	N/A	

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0111
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0230	Instrument:	AUTOSPEC01
Sample ID:	SJH0230-CCV1	Calibration:	EH00030
File ID:	21081915	Analyzed:	08/18/21 21:38

Surrogate Compound	Spike Level ng/mL	% Recovery	Recovery Limits	RT	Calibration Mean RT	RT Diff	RT Diff Limit	Q
13C12-2,3,7,8-TCDF	100.00	89.4	71 - 129	25.64	25.63973	0.0003	N/A	
13C12-2,3,7,8-TCDD	100.00	98.7	82 - 118	26.275	26.27478	0.0002	N/A	
13C12-1,2,3,7,8-PeCDF	100.00	94.4	76 - 124	29.806	29.80383	0.0022	N/A	
13C12-2,3,4,7,8-PeCDF	100.00	92.6	77 - 123	31.1542	31.14815	0.0060	N/A	
13C12-1,2,3,7,8-PeCDD	100.00	98.2	62 - 138	31.4103	31.40067	0.0096	N/A	
13C12-1,2,3,4,7,8-HxCDF	100.00	95.1	76 - 124	34.7973	34.782	0.0153	N/A	
13C12-1,2,3,6,7,8-HxCDF	100.00	94.0	70 - 130	34.931	34.91943	0.0116	N/A	
13C12-2,3,4,6,7,8-HxCDF	100.00	92.4	73 - 127	35.8002	35.7884	0.0118	N/A	
13C12-1,2,3,7,8,9-HxCDF	100.00	101	74 - 126	36.8363	36.8227	0.0136	N/A	
13C12-1,2,3,4,7,8-HxCDD	100.00	99.4	85 - 115	35.9227	35.90912	0.0136	N/A	
13C12-1,2,3,6,7,8-HxCDD	100.00	95.3	85 - 115	36.034	36.0242	0.0098	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	100.00	101	78 - 122	38.6858	38.67025	0.0155	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	100.00	101	77 - 123	40.9252	40.90587	0.0193	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	100.00	110	82 - 118	40.1787	40.16678	0.0119	N/A	
13C12-OCDD	200.00	117	48 - 152	44.913	44.88763	0.0254	N/A	
37Cl4-2,3,7,8-TCDD	10.000	91.1	79 - 121	26.3052	26.30253	0.0027	N/A	

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HOLDING TIME SUMMARY

Analysis: EPA 1613B

Laboratory: Analytical Resources, Inc. SDG: 21G0111

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-SS603 21G0111-06	07/09/21 12:00	07/09/21 17:30	07/30/21 17:00	21	365	08/18/21 16:44	19	365	
LDW21-SS661 21G0111-12	07/09/21 15:35	07/09/21 17:30	07/30/21 17:00	21	365	08/18/21 17:33	19	365	
Duplicate BJG0572-DUP1	07/09/21 12:00	07/09/21 17:30	07/30/21 17:00	21	365	08/18/21 15:55	19	365	

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

EPA 1613B

Laboratory: Analytical Resources, Inc.
SDG: 21G0111
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument: AUTOSPEC01

Analyte	MDL	RL	Units
2,3,7,8-TCDF	0.058	1.00	ng/kg
2,3,7,8-TCDD	0.150	1.00	ng/kg
1,2,3,7,8-PeCDF	0.240	1.00	ng/kg
2,3,4,7,8-PeCDF	0.220	1.00	ng/kg
1,2,3,7,8-PeCDD	0.170	1.00	ng/kg
1,2,3,4,7,8-HxCDF	0.280	1.00	ng/kg
1,2,3,6,7,8-HxCDF	0.200	1.00	ng/kg
2,3,4,6,7,8-HxCDF	0.170	1.00	ng/kg
1,2,3,7,8,9-HxCDF	0.190	1.00	ng/kg
1,2,3,4,7,8-HxCDD	0.170	1.00	ng/kg
1,2,3,6,7,8-HxCDD	0.180	1.00	ng/kg
1,2,3,7,8,9-HxCDD	0.220	1.00	ng/kg
1,2,3,4,6,7,8-HpCDF	0.210	1.00	ng/kg
1,2,3,4,7,8,9-HpCDF	0.240	1.00	ng/kg
1,2,3,4,6,7,8-HpCDD	0.560	2.50	ng/kg
OCDF	1.10	2.50	ng/kg
OCDD	4.60	10.0	ng/kg
Total TCDF		1.00	ng/kg
Total TCDD		1.00	ng/kg
Total PeCDF		1.00	ng/kg
Total PeCDD		1.00	ng/kg
Total HxCDF		1.00	ng/kg
Total HxCDD		1.00	ng/kg
Total HpCDF		1.00	ng/kg
Total HpCDD		1.00	ng/kg

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

EPA 1613B

Laboratory: Analytical Resources, Inc.
SDG: 21G0111
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Water
Instrument: AUTOSPEC01

Analyte	MDL	RL	Units
2,3,7,8-TCDF	1.20	10.0	pg/L
2,3,7,8-TCDD	1.30	10.0	pg/L
1,2,3,7,8-PeCDF	4.20	10.0	pg/L
2,3,4,7,8-PeCDF	4.00	10.0	pg/L
1,2,3,7,8-PeCDD	4.00	10.0	pg/L
1,2,3,4,7,8-HxCDF	3.80	10.0	pg/L
1,2,3,6,7,8-HxCDF	3.90	10.0	pg/L
2,3,4,6,7,8-HxCDF	3.50	10.0	pg/L
1,2,3,7,8,9-HxCDF	3.60	10.0	pg/L
1,2,3,4,7,8-HxCDD	4.10	10.0	pg/L
1,2,3,6,7,8-HxCDD	3.80	10.0	pg/L
1,2,3,7,8,9-HxCDD	3.40	10.0	pg/L
1,2,3,4,6,7,8-HpCDF	11.0	20.0	pg/L
1,2,3,4,7,8,9-HpCDF	3.60	10.0	pg/L
1,2,3,4,6,7,8-HpCDD	6.00	10.0	pg/L
OCDF	16.0	20.0	pg/L
OCDD	39.0	50.0	pg/L

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

CS3WT

Calibration and Verification Solution (EPA-1613CS3) combined with Window Defining and 2,3,7,8-TCDD Resolution Testing Congeners

G 00136 Recd. 02/13/18

PRODUCT CODE:	CS3WT
LOT NUMBER:	CS3WT0617
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	06/27/2017
LAST TESTED: (mm/dd/yyyy)	06/27/2017
EXPIRY DATE: (mm/dd/yyyy)	06/27/2024
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

CS3WT is a solution/mixture of native and $^{13}C_{12}$-labelled chlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs). The components and their concentrations are given in Table A.

CS3WT was designed and prepared to be used as a HRMS calibration standard according to U.S. EPA Method 1613B.

It is to be used for calibration verification in place of EPA-1613CS3 (Lot: 13CS30617). It also contains the PCDD and PCDF window defining congeners for a DB-5 (or equivalent) capillary column as well as the TCDD isomers required to test and confirm the resolution of 2,3,7,8-TCDD.

The individual ^{13}C-labelled PCDDs and PCDFs all have chemical purities of >98% and isotopic purities of ≥99%. The 2,3,7,8-$^{37}Cl_4$-tetrachlorodibenzo-p-dioxin has a chemical purity of >98% and an isotopic (^{37}Cl) purity of ≥95%. The individual native 2,3,7,8-substituted PCDD and PCDF congeners all have chemical purities of >98%; the other congeners (window defining and resolution testing) should only be considered semi-quantitative.

This current lot of CS3WT (CS3WT0617) is to be used with the 1613 calibration solutions having the following lot numbers:

PRODUCT CODE	LOT NUMBER
EPA-1613CS1	13CS10617
EPA-1613CS2	13CS20617
EPA-1613CS3	13CS30617
EPA-1613CS4	13CS40617
EPA-1613CS5	13CS50617
EPA-1613CSL	13CSL0617
EPA-1613CS0.5	13CS0.50617

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Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HAZARDS:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Where possible, all of our products are synthesized using single-product unambiguous routes. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner, which further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) has been assigned to the quantitative analytes in this mixture. Conversely, semi-quantitative analytes have been assigned an uncertainty of ±20%.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly tested by an external ISO/IEC 17025 accredited calibration company. In addition, their calibration is verified prior to each weighing using calibrated NIST and/or NRC traceable external weights. All volumetric glassware used is calibrated, of Class A tolerance, and has been tested according to the appropriate ASTM procedures, which are ultimately traceable to NIST. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO GUIDE 34 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO GUIDE 34 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **CS3WT; HRGC/HRMS Data (60 m DB-5 Column)**

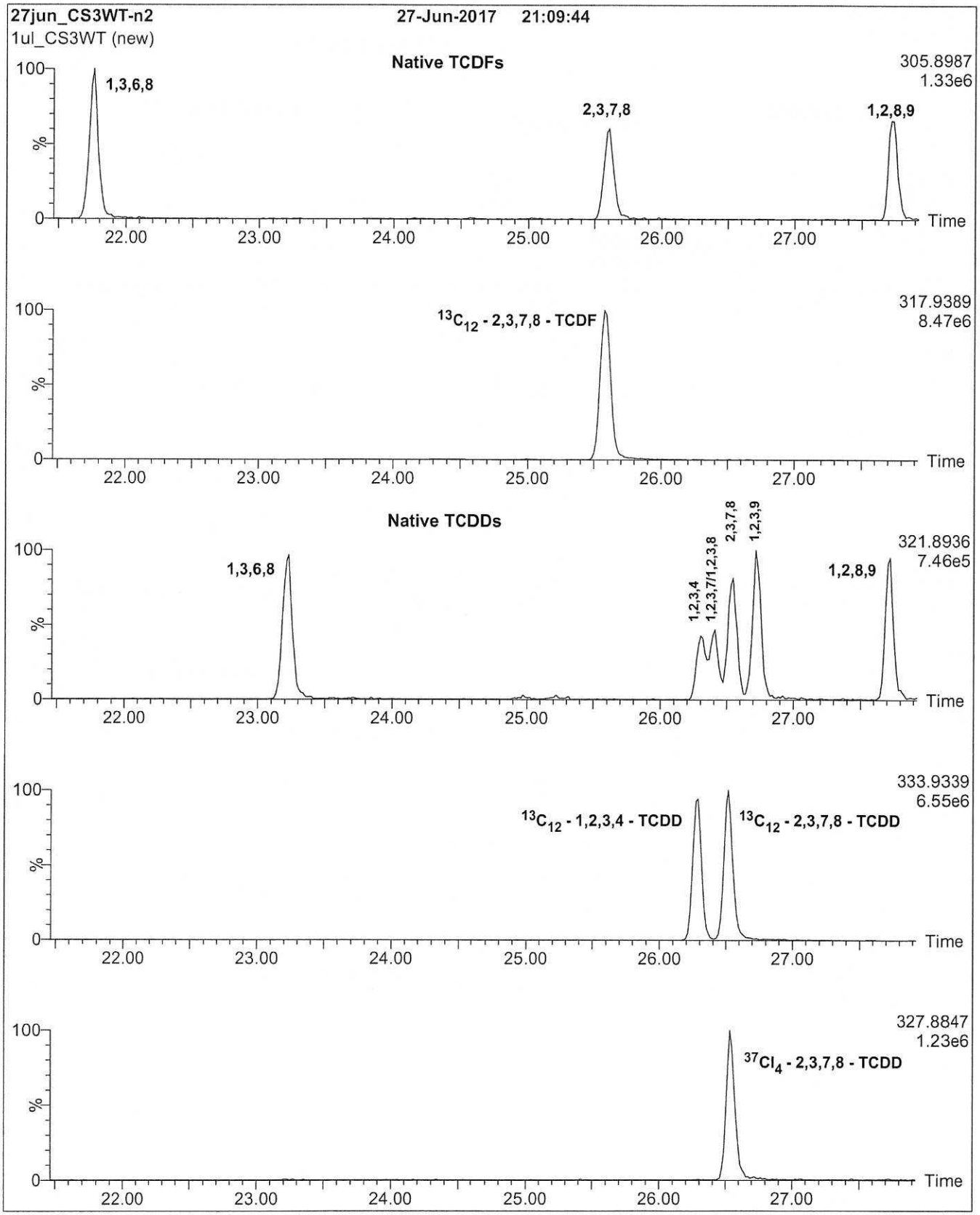


Figure 1: **CS3WT; HRGC/HRMS Data (60 m DB-5 Column)**

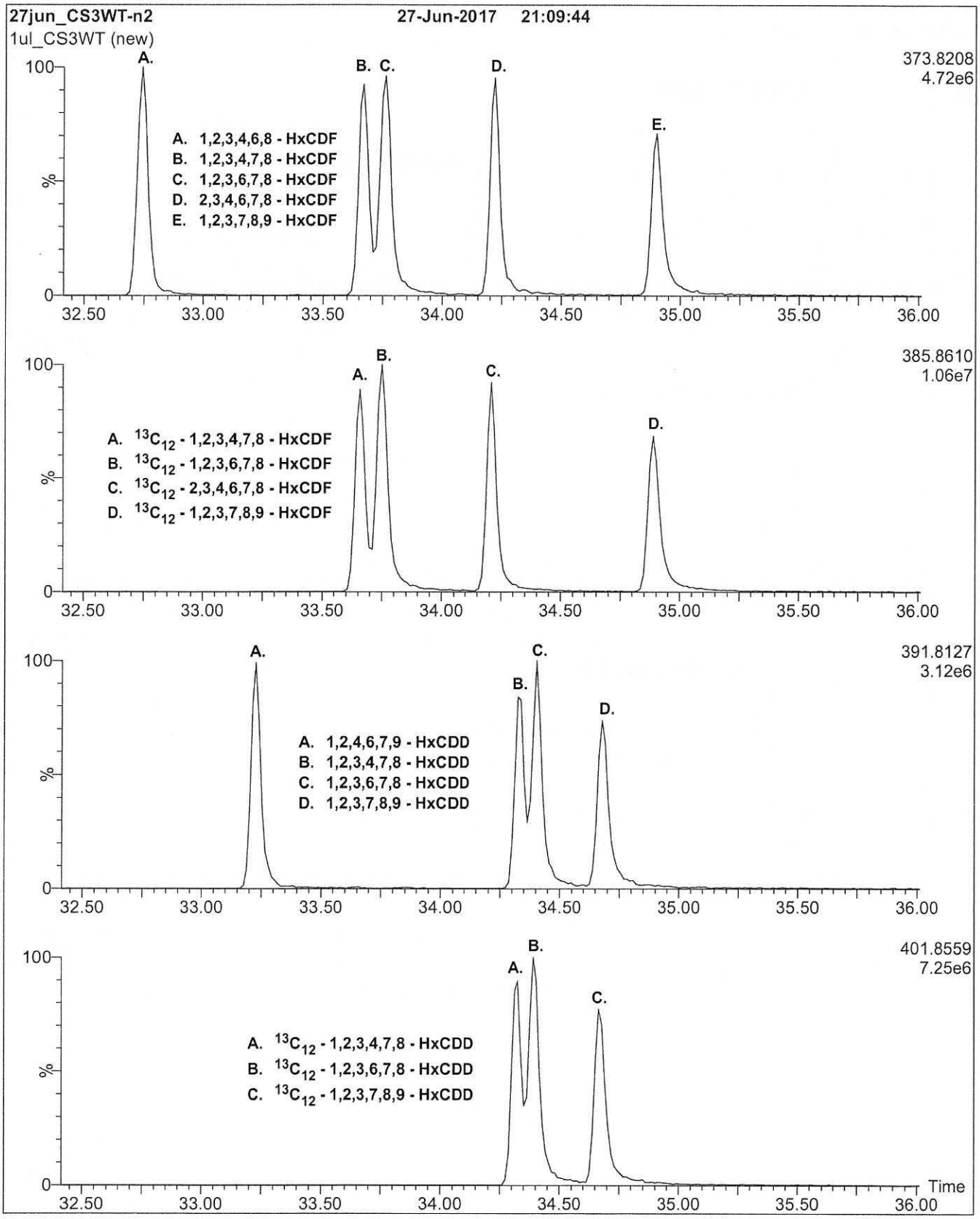
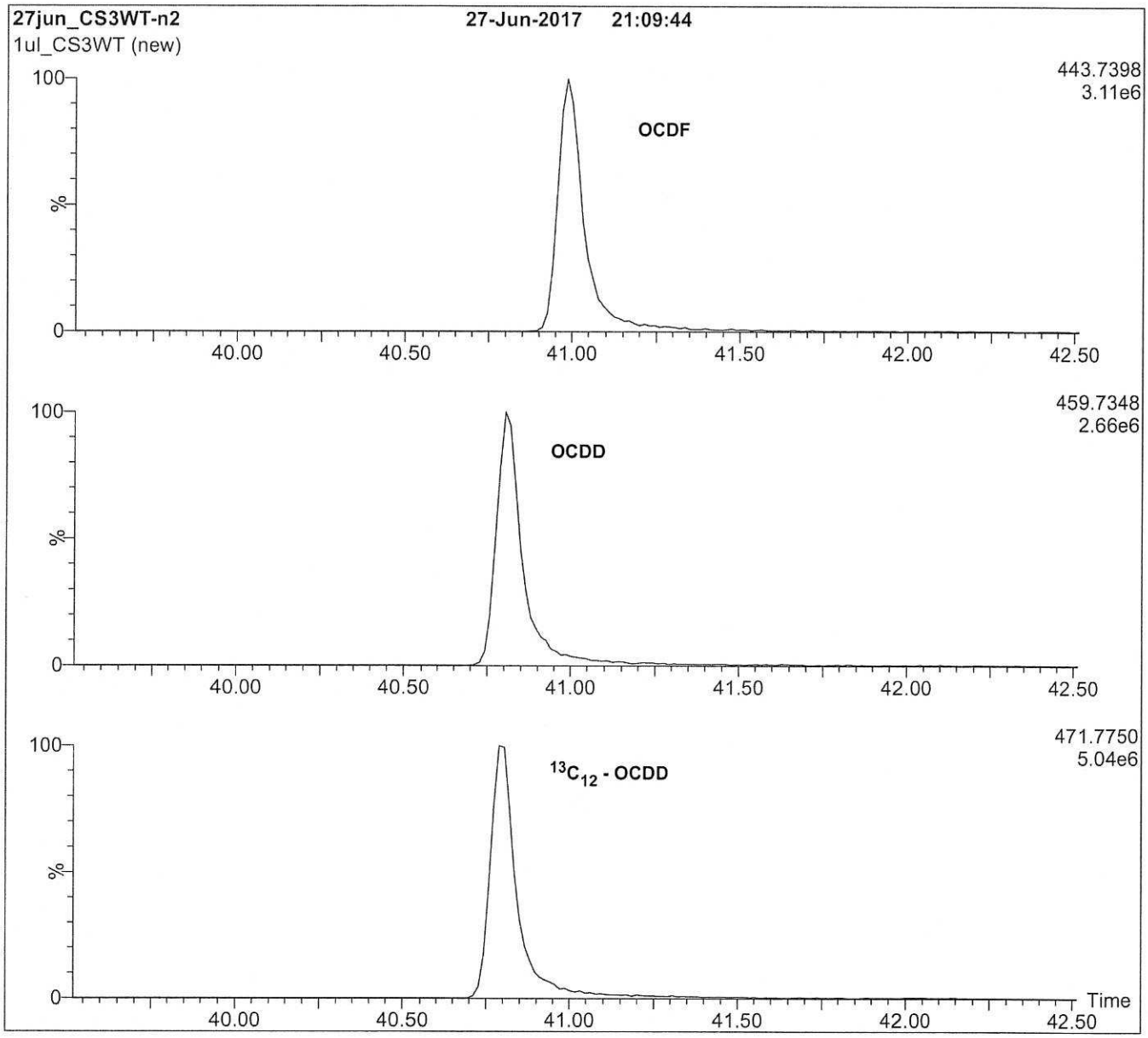


Figure 1: **CS3WT; HRGC/HRMS Data (60 m DB-5 Column)**



HRGC/HRMS:

Agilent 6890N (HRGC)
Autospec Ultima (HRMS)

Chromatographic Conditions:

Column: 60 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W

Flow:	Constant at 1 ml/min	Oven:	150 °C (1 min)
Injector:	280 °C (Splitless Injection)		12 °C/min to 200 °C
Ionization:	EI+		3 °C/min to 235 °C
Detector:	280 °C		235 °C (8 min)
	SIR at 10,000 mass resolving power		8 °C/min to 310 °C
			310 °C (8 min)

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

EPA-1613PAR

U.S. EPA Method 1613 Native PCDD/PCDF
Precision and Recovery Stock Solution

PRODUCT CODE:	EPA-1613PAR
LOT NUMBER:	13PAR1019
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	10/16/2019
LAST TESTED: (mm/dd/yyyy)	10/17/2019
EXPIRY DATE: (mm/dd/yyyy)	10/17/2026
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

I 000197

DESCRIPTION:

EPA-1613PAR is a solution/mixture of all the 2,3,7,8-substituted chlorinated dibenzo-p-dioxins (PCDDs) and 2,3,7,8-substituted dibenzofurans (PCDFs). The components and their concentrations are given in Table A.

EPA-1613PAR was designed for, and prepared to be used according to, U.S. EPA Method 1613 (Revision B).

The individual PCDDs and PCDFs all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

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519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

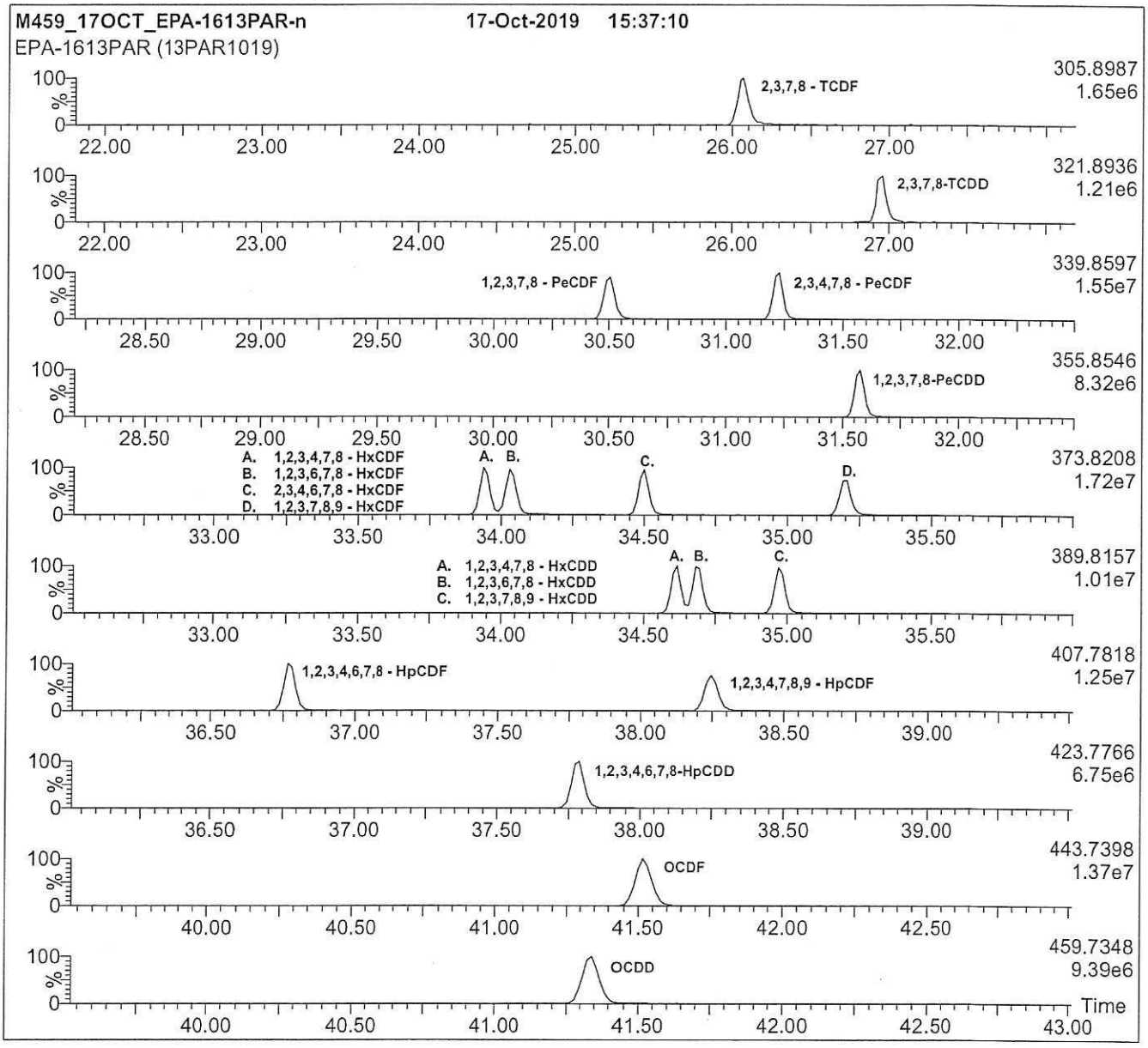
For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Table A: **EPA-1613PAR; Components and Concentrations (ng/ml, ± 5% in nonane/ 2.4% toluene)**

Component	Concentration (ng/ml)
PCDDs:	
2,3,7,8-Tetrachlorodibenzo-p-dioxin	40
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	200
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	200
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	200
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	200
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	200
Octachlorodibenzo-p-dioxin	400
PCDFs:	
2,3,7,8-Tetrachlorodibenzofuran	40
1,2,3,7,8-Pentachlorodibenzofuran	200
2,3,4,7,8-Pentachlorodibenzofuran	200
1,2,3,4,7,8-Hexachlorodibenzofuran	200
1,2,3,6,7,8-Hexachlorodibenzofuran	200
1,2,3,7,8,9-Hexachlorodibenzofuran	200
2,3,4,6,7,8-Hexachlorodibenzofuran	200
1,2,3,4,6,7,8-Heptachlorodibenzofuran	200
1,2,3,4,7,8,9-Heptachlorodibenzofuran	200
Octachlorodibenzofuran	400

Certified By: _____ **Date:** 11/07/2019
(mm/dd/yyyy)
B.G. Chittim, General Manager

Figure 1: **EPA-1613PAR; HRGC/HRMS Data (60 m DB-5 Column)**



HRGC/HRMS:

Agilent 6890N (HRGC)
Autospec Ultima (HRMS)

Chromatographic Conditions:

Column: 60 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W

Flow:	Constant at 1 ml/min	Oven:	150 °C (1 min)
Injector:	280 °C (Splitless Injection)		12 °C/min to 200 °C
Ionization:	EI+		3 °C/min to 235 °C
Detector:	280 °C		235 °C (8 min)
	SIR at 10,000 mass resolving power		8 °C/min to 310 °C
			310 °C (8 min)

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

EPA-1613CVS

U.S. EPA Method 1613 Calibration and Verification Solutions plus Supplemental Calibration Solutions EPA-1613CSL & EPA-1613CS0.5

PRODUCT CODES:	EPA-1613CVS	**LOT NUMBERS:**	(see below)
	EPA-1613CS1		13CS11019 I005456
	EPA-1613CS2		13CS21019 I005457
	EPA-1613CS3		13CS31019
	EPA-1613CS4		13CS41019 I005458
	EPA-1613CS5		13CS51019 I005459

Note: EPA-1613CSL and EPA-1613CS0.5 are lower level extensions to this calibration set that must be ordered separately.

EPA-1613CS0.5	13CS0.51019
EPA-1613CSL	13CSL1019

SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	10/22/2019
LAST TESTED: (mm/dd/yyyy)	10/24/2019
EXPIRY DATE: (mm/dd/yyyy)	10/24/2026 I005460
RECOMMENDED STORAGE:	Store ampoules in a cool, dark place

DESCRIPTION:

EPA-1613CVS is a series of 5 calibration solutions containing native ($^{12}C_{12}$) and mass-labelled ($^{13}C_{12}$ and $^{37}Cl_4$) chlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs). The components of each solution, and their concentrations, are given in Table A.

They were designed for, and prepared to be used according to, U.S. EPA Method 1613 (Revision B). They are to be used as received.

EPA-1613CSL and EPA-1613CS0.5 are lower level extensions to EPA-1613CVS. Neither is required by the method, but either or both can be used to extend the calibration to lower levels.

The individual native PCDDs and PCDFs all have chemical purities of >98%. The individual ^{13}C-labelled PCDDs and PCDFs all have chemical purities of >98% and isotopic purities of ≥99%. The 2,3,7,8-$^{37}Cl_4$-Tetrachlorodibenzo-p-dioxin has a chemical purity of >98% and an isotopic (^{37}Cl) purity of ≥95%.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations
Table B: 5-point HRGC/HRMS Calibration and RRF Summary
Table C: 7-point HRGC/HRMS Calibration and RRF Summary
Figure 1: HRGC/HRMS Data for EPA-1613CS3 (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 3 for further details.

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a series of standards for the identification and quantification of specific chemical compounds.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned values, and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analytes is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Table A: EPA-1613CVS (with EPA-1613CSL and EPA-1613CS0.5); Components and Concentrations (ng/ml, ± 5% in nonane/toluene)

Compound	Concentration (ng/ml)						
Native PCDDs and PCDFs:	**CS1**	**CS2**	**CS3**	**CS4**	**CS5**	**CSL**	**CS0.5**
2,3,7,8-TCDD	0.5	2	10	40	200	0.1	0.25
2,3,7,8-TCDF	0.5	2	10	40	200	0.1	0.25
1,2,3,7,8-PeCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8-PeCDF	2.5	10	50	200	1000	0.5	1.25
2,3,4,7,8-PeCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,6,7,8-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8,9-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,6,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8,9-HxCDF	2.5	10	50	200	1000	0.5	1.25
2,3,4,6,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,6,7,8-HpCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,6,7,8-HpCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8,9-HpCDF	2.5	10	50	200	1000	0.5	1.25
OCDD	5.0	20	100	400	2000	1.0	2.5
OCDF	5.0	20	100	400	2000	1.0	2.5
Labelled PCDDs and PCDFs:							
$^{13}C_{12}$-2,3,7,8-TCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,7,8-TCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-OCDD	200	200	200	200	200	200	200
Cleanup Standard:							
$^{37}Cl_4$-2,3,7,8-TCDD	0.5	2	10	40	200	0.1	0.25
Internal Standards:							
$^{13}C_{12}$-1,2,3,4-TCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	100	100	100	100	100	100	100
Percent toluene (v/v)	3.6%	3.7%	4.2%	6.1%	16.2%	3.6%	3.6%

Certified By: _____ **Date:** 10/25/2019 (mm/dd/yyyy)

B.G. Chittim, General Manager

Table B: **EPA-1613CVS; 5-point HRGC/HRMS Calibration and RRF Summary**

Calibration RRF Summary				Calibration Standard				
Calibration Filename: 24oct_EPA1613CVS-CAL.QLD				CS1	CS2	CS3	CS4	CS5
Name	Mean	S. D.	%RSD	RRF#1	RRF#2	RRF#3	RRF#4	RRF#5
2,3,7,8-TCDF	0.93	0.013	1.4	0.92	0.95	0.93	0.92	0.95
1,2,3,7,8-PeCDF	0.93	0.015	1.6	0.92	0.92	0.93	0.93	0.95
2,3,4,7,8-PeCDF	1.04	0.019	1.8	1.03	1.02	1.05	1.05	1.07
1,2,3,4,7,8-HxCDF	0.96	0.035	3.7	0.94	0.92	0.98	0.99	1.00
1,2,3,6,7,8-HxCDF	0.93	0.013	1.4	0.92	0.94	0.94	0.91	0.94
2,3,4,6,7,8-HxCDF	0.96	0.022	2.3	0.95	0.94	0.97	0.97	0.99
1,2,3,7,8,9-HxCDF	0.89	0.021	2.4	0.87	0.88	0.90	0.90	0.92
1,2,3,4,6,7,8-HpCDF	0.91	0.011	1.2	0.90	0.90	0.90	0.92	0.92
1,2,3,4,7,8,9-HpCDF	0.91	0.010	1.1	0.90	0.90	0.92	0.91	0.92
OCDF	1.19	0.056	4.7	1.11	1.17	1.19	1.23	1.26
2,3,7,8-TCDD	1.05	0.023	2.2	1.01	1.06	1.05	1.05	1.07
1,2,3,7,8-PeCDD	0.97	0.018	1.9	0.95	0.95	0.98	0.97	0.99
1,2,3,4,7,8-HxCDD	1.00	0.019	1.9	1.01	1.00	1.00	0.96	1.01
1,2,3,6,7,8-HxCDD	0.98	0.032	3.2	0.93	0.98	0.99	1.01	1.01
1,2,3,7,8,9-HxCDD	0.97	0.016	1.6	0.95	0.96	0.98	0.99	0.98
1,2,3,4,6,7,8-HpCDD	1.01	0.025	2.5	1.01	0.97	1.02	1.03	1.04
OCDD	1.00	0.013	1.3	1.00	0.99	1.02	1.02	1.00
$^{13}C_{12}$-2,3,7,8-TCDF	1.57	0.047	3.0	1.52	1.55	1.55	1.57	1.65
$^{13}C_{12}$-1,2,3,7,8-PeCDF	1.21	0.078	6.5	1.13	1.20	1.17	1.20	1.34
$^{13}C_{12}$-2,3,4,7,8-PeCDF	1.17	0.081	6.9	1.09	1.15	1.13	1.17	1.31
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	1.33	0.020	1.5	1.35	1.33	1.33	1.32	1.30
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	1.51	0.034	2.2	1.47	1.48	1.53	1.53	1.54
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	1.38	0.012	0.9	1.38	1.38	1.40	1.37	1.36
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	1.19	0.014	1.2	1.18	1.16	1.20	1.19	1.20
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	1.31	0.033	2.5	1.31	1.26	1.33	1.31	1.35
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	1.08	0.046	4.3	1.06	1.03	1.09	1.08	1.15
$^{13}C_{12}$-2,3,7,8-TCDD	1.13	0.036	3.2	1.10	1.11	1.11	1.13	1.19
$^{13}C_{12}$-1,2,3,7,8-PeCDD	0.79	0.047	5.9	0.74	0.78	0.75	0.79	0.86
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	0.87	0.027	3.1	0.85	0.83	0.89	0.88	0.89
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	1.04	0.010	1.0	1.05	1.05	1.04	1.05	1.03
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	0.81	0.017	2.1	0.81	0.80	0.80	0.81	0.84
$^{13}C_{12}$-OCDD	0.74	0.055	7.4	0.70	0.70	0.73	0.72	0.83
$^{13}C_{12}$-1,2,3,4-TCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00
$^{37}Cl_4$-2,3,7,8-TCDD	0.97	0.026	2.6	0.95	0.94	0.99	0.99	0.99

Table C: **EPA-1613CVS (with EPA-1613CSL and EPA-1613CS0.5); 7-point HRGC/HRMS Calibration and RRF Summary**

Calibration RRF Summary				Calibration Standard						
Calibration Filename: 24oct_EPA1613CVS-CAL.QLD				CSL	CS0.5	CS1	CS2	CS3	CS4	CS5
Name	Mean	S. D.	%RSD	RRF#1	RRF#2	RRF#3	RRF#4	RRF#5	RRF#6	RRF#7
2,3,7,8-TCDF	0.92	0.045	4.8	0.96	0.83	0.92	0.95	0.93	0.92	0.95
1,2,3,7,8-PeCDF	0.93	0.013	1.4	0.94	0.92	0.92	0.92	0.93	0.93	0.95
2,3,4,7,8-PeCDF	1.02	0.058	5.7	0.90	1.00	1.03	1.02	1.05	1.05	1.07
1,2,3,4,7,8-HxCDF	0.96	0.029	3.0	0.96	0.97	0.94	0.92	0.98	0.99	1.00
1,2,3,6,7,8-HxCDF	0.92	0.030	3.3	0.90	0.86	0.92	0.94	0.94	0.91	0.94
2,3,4,6,7,8-HxCDF	0.94	0.047	5.0	0.87	0.89	0.95	0.94	0.97	0.97	0.99
1,2,3,7,8,9-HxCDF	0.88	0.029	3.3	0.83	0.88	0.87	0.88	0.90	0.90	0.92
1,2,3,4,6,7,8-HpCDF	0.90	0.033	3.7	0.83	0.93	0.90	0.90	0.90	0.92	0.92
1,2,3,4,7,8,9-HpCDF	0.91	0.018	1.9	0.89	0.94	0.90	0.90	0.92	0.91	0.92
OCDF	1.18	0.052	4.4	1.15	1.14	1.11	1.17	1.19	1.23	1.26
2,3,7,8-TCDD	1.03	0.051	5.0	1.03	0.92	1.01	1.06	1.05	1.05	1.07
1,2,3,7,8-PeCDD	0.95	0.042	4.4	0.87	0.98	0.95	0.95	0.98	0.97	0.99
1,2,3,4,7,8-HxCDD	0.97	0.066	6.8	0.83	0.98	1.01	1.00	1.00	0.96	1.01
1,2,3,6,7,8-HxCDD	0.96	0.044	4.5	0.90	0.92	0.93	0.98	0.99	1.01	1.01
1,2,3,7,8,9-HxCDD	0.94	0.054	5.7	0.83	0.92	0.95	0.96	0.98	0.99	0.98
1,2,3,4,6,7,8-HpCDD	1.01	0.033	3.3	0.95	1.03	1.01	0.97	1.02	1.03	1.04
OCDD	1.00	0.023	2.3	0.95	1.00	1.00	0.99	1.02	1.02	1.00
$^{13}C_{12}$-2,3,7,8-TCDF	1.56	0.042	2.7	1.52	1.54	1.52	1.55	1.55	1.57	1.65
$^{13}C_{12}$-1,2,3,7,8-PeCDF	1.20	0.066	5.5	1.18	1.17	1.13	1.20	1.17	1.20	1.34
$^{13}C_{12}$-2,3,4,7,8-PeCDF	1.16	0.071	6.1	1.12	1.13	1.09	1.15	1.13	1.17	1.31
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	1.33	0.018	1.4	1.32	1.35	1.35	1.33	1.33	1.32	1.30
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	1.53	0.045	3.0	1.60	1.56	1.47	1.48	1.53	1.53	1.54
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	1.39	0.019	1.4	1.39	1.42	1.38	1.38	1.40	1.37	1.36
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	1.19	0.012	1.0	1.19	1.19	1.18	1.16	1.20	1.19	1.20
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	1.31	0.028	2.2	1.30	1.33	1.31	1.26	1.33	1.31	1.35
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	1.07	0.045	4.2	1.02	1.08	1.06	1.03	1.09	1.08	1.15
$^{13}C_{12}$-2,3,7,8-TCDD	1.12	0.033	3.0	1.09	1.11	1.10	1.11	1.11	1.13	1.19
$^{13}C_{12}$-1,2,3,7,8-PeCDD	0.78	0.040	5.1	0.75	0.78	0.74	0.78	0.75	0.79	0.86
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	0.87	0.025	2.9	0.86	0.90	0.85	0.83	0.89	0.88	0.89
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	1.05	0.015	1.5	1.08	1.06	1.05	1.05	1.04	1.05	1.03
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	0.81	0.016	2.0	0.79	0.81	0.81	0.80	0.80	0.81	0.84
$^{13}C_{12}$-OCDD	0.73	0.046	6.3	0.71	0.72	0.70	0.70	0.73	0.72	0.83
$^{13}C_{12}$-1,2,3,4-TCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
$^{37}Cl_4$-2,3,7,8-TCDD	0.97	0.053	5.4	0.90	1.07	0.95	0.94	0.99	0.99	0.99

Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

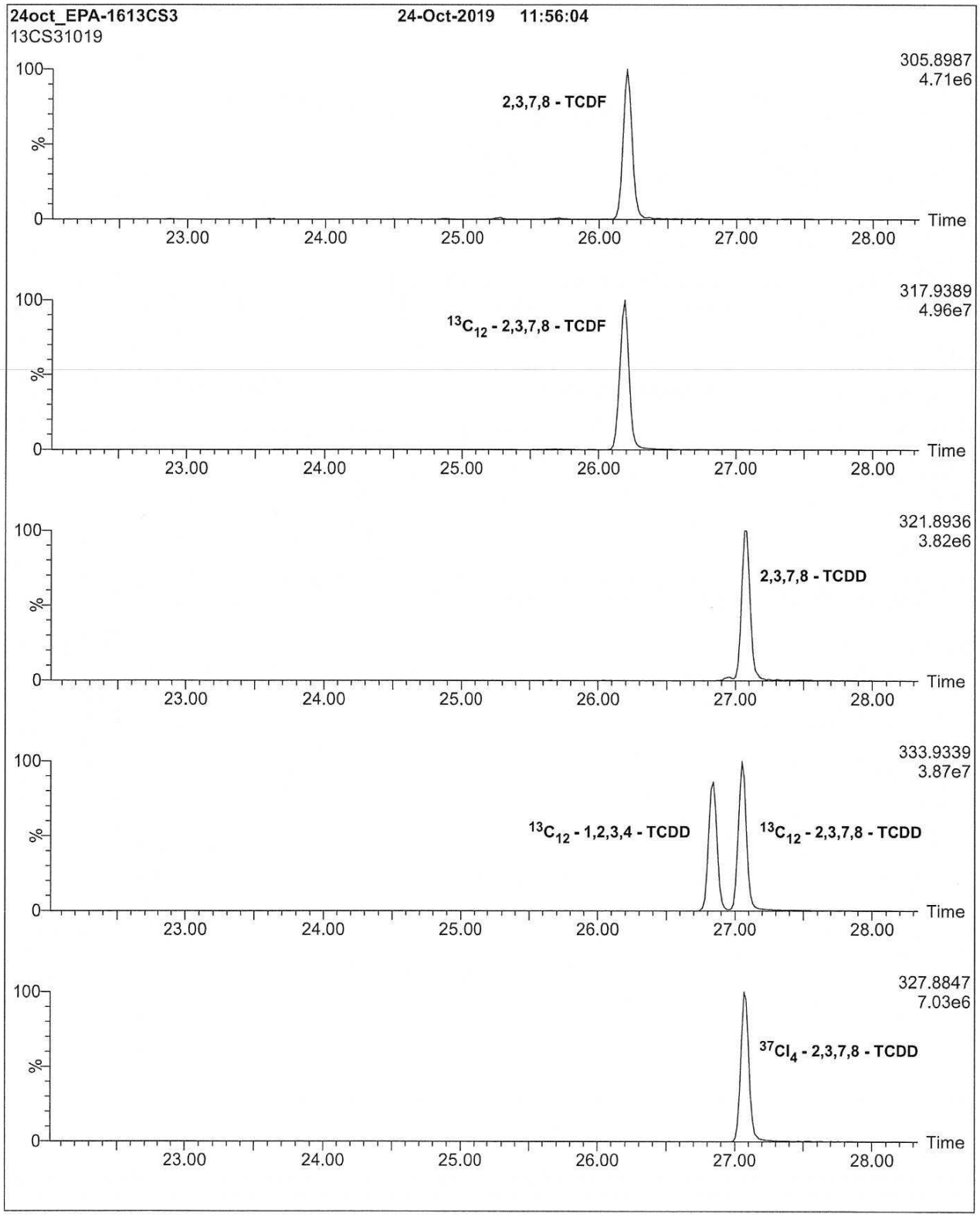


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

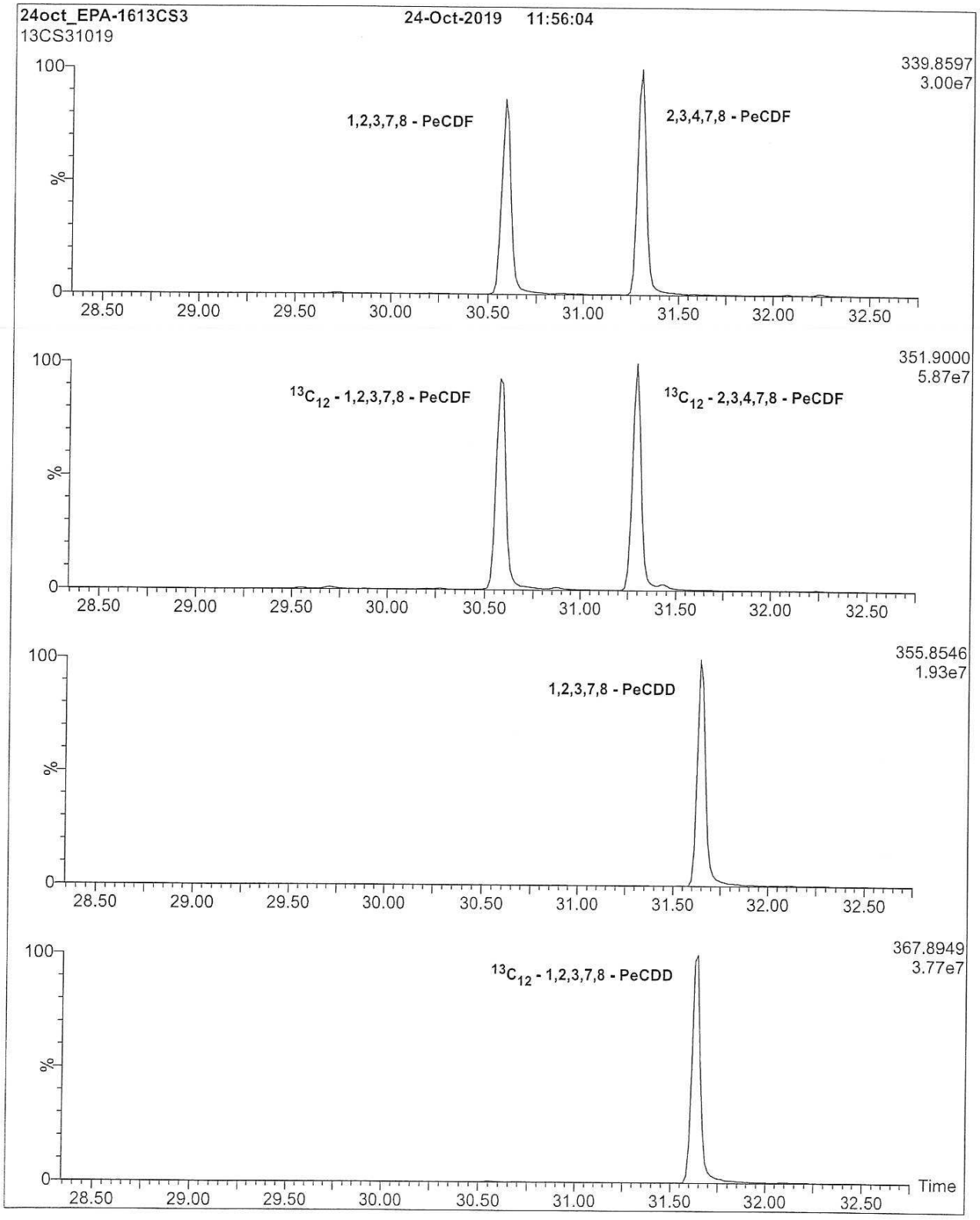


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

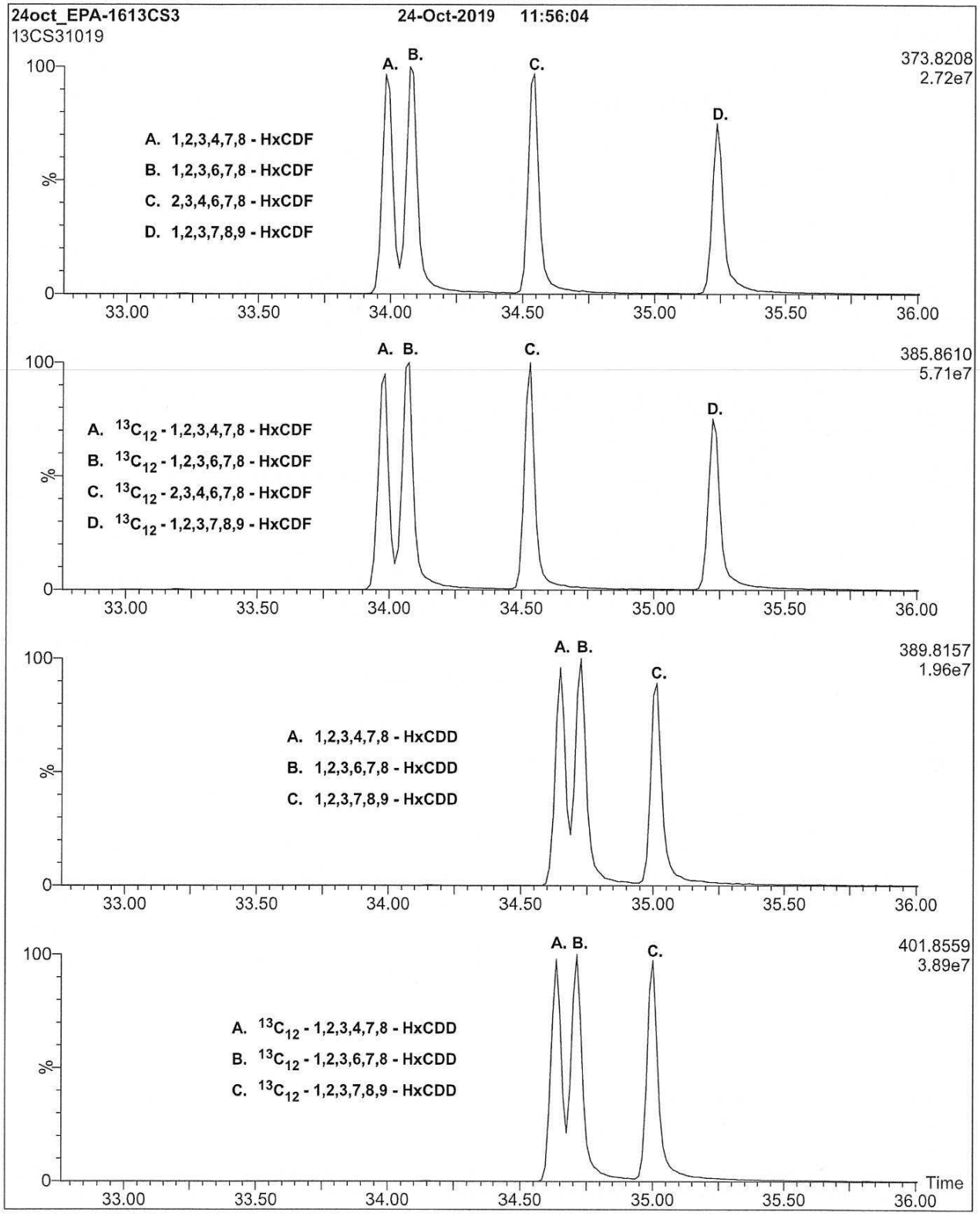


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

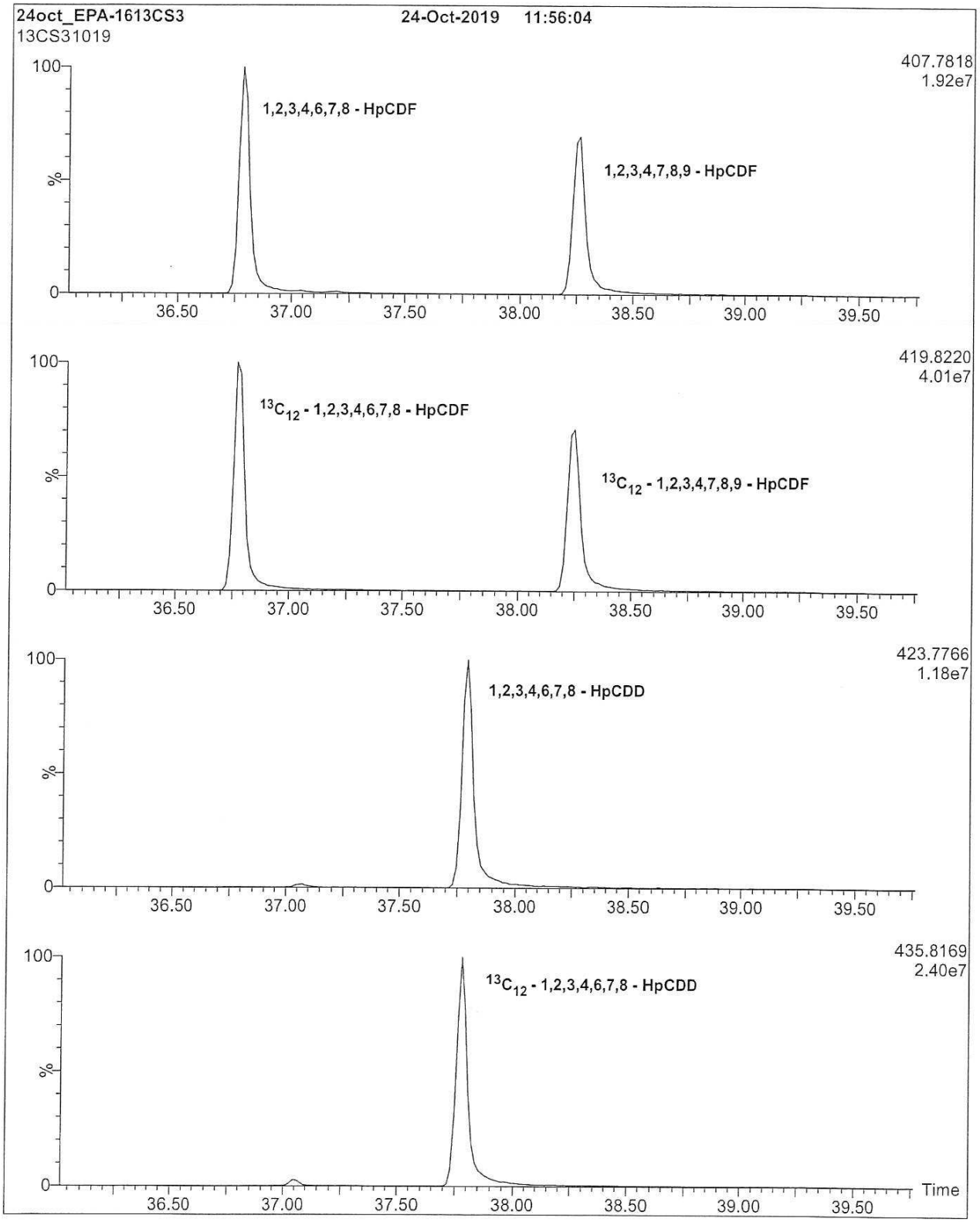
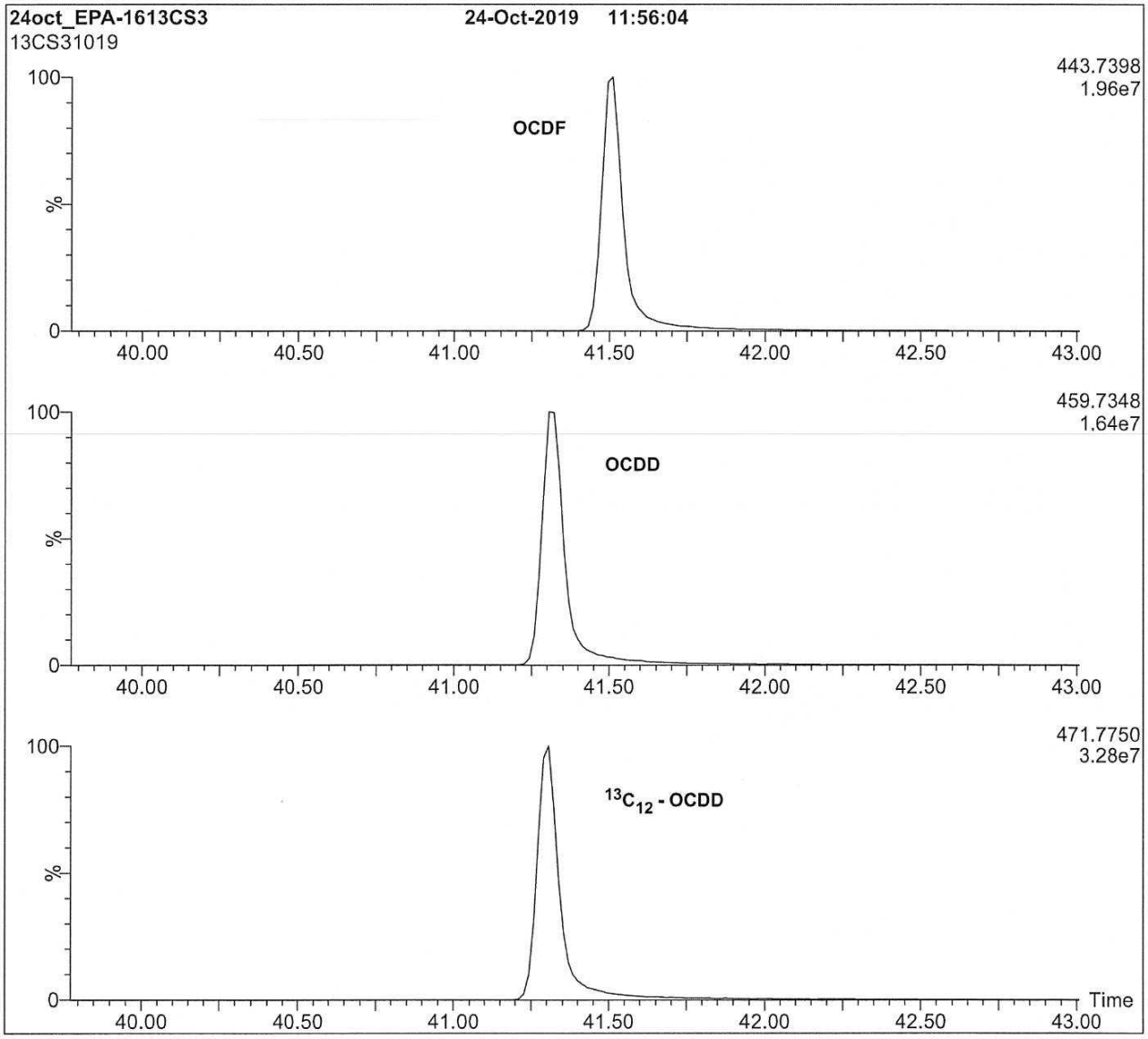


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)



HRGC/HRMS:

Agilent 6890N (HRGC)
Autospec Ultima (HRMS)

Chromatographic Conditions:

Column: 60 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W

Flow:	Constant at 1 ml/min	Oven:	150 °C (1 min)
Injector:	280 °C (Splitless Injection)		12 °C/min to 200 °C
Ionization:	EI+		3 °C/min to 235 °C
Detector:	280 °C		235 °C (8 min)
	SIR at 10,000 mass resolving power		8 °C/min to 310 °C
			310 °C (8 min)

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

EPA-1613CVS

U.S. EPA Method 1613 Calibration and Verification Solutions plus Supplemental Calibration Solutions EPA-1613CSL & EPA-1613CS0.5

PRODUCT CODES:	EPA-1613CVS	**LOT NUMBERS:**	(see below)	06/23/20
	EPA-1613CS1		13CS11019	I005456
	EPA-1613CS2		13CS21019	I005457
	EPA-1613CS3		13CS31019	
	EPA-1613CS4		13CS41019	I005458
	EPA-1613CS5		13CS51019	I005459

Note: EPA-1613CSL and EPA-1613CS0.5 are lower level extensions to this calibration set that must be ordered separately.

EPA-1613CS0.5	13CS0.51019
EPA-1613CSL	13CSL1019

SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	10/22/2019
LAST TESTED: (mm/dd/yyyy)	10/24/2019
EXPIRY DATE: (mm/dd/yyyy)	10/24/2026 I005460
RECOMMENDED STORAGE:	Store ampoules in a cool, dark place

DESCRIPTION: 06/23/20

EPA-1613CVS is a series of 5 calibration solutions containing native ($^{12}C_{12}$) and mass-labelled ($^{13}C_{12}$ and $^{37}Cl_4$) chlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs). The components of each solution, and their concentrations, are given in Table A.

They were designed for, and prepared to be used according to, U.S. EPA Method 1613 (Revision B). They are to be used as received.

EPA-1613CSL and EPA-1613CS0.5 are lower level extensions to EPA-1613CVS. Neither is required by the method, but either or both can be used to extend the calibration to lower levels.

The individual native PCDDs and PCDFs all have chemical purities of >98%. The individual ^{13}C-labelled PCDDs and PCDFs all have chemical purities of >98% and isotopic purities of ≥99%. The 2,3,7,8-$^{37}Cl_4$-Tetrachlorodibenzo-p-dioxin has a chemical purity of >98% and an isotopic (^{37}Cl) purity of ≥95%.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations
Table B: 5-point HRGC/HRMS Calibration and RRF Summary
Table C: 7-point HRGC/HRMS Calibration and RRF Summary
Figure 1: HRGC/HRMS Data for EPA-1613CS3 (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 3 for further details.

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a series of standards for the identification and quantification of specific chemical compounds.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned values, and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analytes is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Table A: EPA-1613CVS (with EPA-1613CSL and EPA-1613CS0.5); Components and Concentrations (ng/ml, ± 5% in nonane/toluene)

Compound	Concentration (ng/ml)						
Native PCDDs and PCDFs:	**CS1**	**CS2**	**CS3**	**CS4**	**CS5**	**CSL**	**CS0.5**
2,3,7,8-TCDD	0.5	2	10	40	200	0.1	0.25
2,3,7,8-TCDF	0.5	2	10	40	200	0.1	0.25
1,2,3,7,8-PeCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8-PeCDF	2.5	10	50	200	1000	0.5	1.25
2,3,4,7,8-PeCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,6,7,8-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8,9-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,6,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8,9-HxCDF	2.5	10	50	200	1000	0.5	1.25
2,3,4,6,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,6,7,8-HpCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,6,7,8-HpCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8,9-HpCDF	2.5	10	50	200	1000	0.5	1.25
OCDD	5.0	20	100	400	2000	1.0	2.5
OCDF	5.0	20	100	400	2000	1.0	2.5
Labelled PCDDs and PCDFs:							
$^{13}C_{12}$-2,3,7,8-TCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,7,8-TCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-OCDD	200	200	200	200	200	200	200
Cleanup Standard:							
$^{37}Cl_4$-2,3,7,8-TCDD	0.5	2	10	40	200	0.1	0.25
Internal Standards:							
$^{13}C_{12}$-1,2,3,4-TCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	100	100	100	100	100	100	100
Percent toluene (v/v)	3.6%	3.7%	4.2%	6.1%	16.2%	3.6%	3.6%

Certified By: _____ **Date:** 10/25/2019 (mm/dd/yyyy)

B.G. Chittim, General Manager

Table B: **EPA-1613CVS; 5-point HRGC/HRMS Calibration and RRF Summary**

Calibration RRF Summary				Calibration Standard				
Calibration Filename: 24oct_EPA1613CVS-CAL.QLD				CS1	CS2	CS3	CS4	CS5
Name	Mean	S. D.	%RSD	RRF#1	RRF#2	RRF#3	RRF#4	RRF#5
2,3,7,8-TCDF	0.93	0.013	1.4	0.92	0.95	0.93	0.92	0.95
1,2,3,7,8-PeCDF	0.93	0.015	1.6	0.92	0.92	0.93	0.93	0.95
2,3,4,7,8-PeCDF	1.04	0.019	1.8	1.03	1.02	1.05	1.05	1.07
1,2,3,4,7,8-HxCDF	0.96	0.035	3.7	0.94	0.92	0.98	0.99	1.00
1,2,3,6,7,8-HxCDF	0.93	0.013	1.4	0.92	0.94	0.94	0.91	0.94
2,3,4,6,7,8-HxCDF	0.96	0.022	2.3	0.95	0.94	0.97	0.97	0.99
1,2,3,7,8,9-HxCDF	0.89	0.021	2.4	0.87	0.88	0.90	0.90	0.92
1,2,3,4,6,7,8-HpCDF	0.91	0.011	1.2	0.90	0.90	0.90	0.92	0.92
1,2,3,4,7,8,9-HpCDF	0.91	0.010	1.1	0.90	0.90	0.92	0.91	0.92
OCDF	1.19	0.056	4.7	1.11	1.17	1.19	1.23	1.26
2,3,7,8-TCDD	1.05	0.023	2.2	1.01	1.06	1.05	1.05	1.07
1,2,3,7,8-PeCDD	0.97	0.018	1.9	0.95	0.95	0.98	0.97	0.99
1,2,3,4,7,8-HxCDD	1.00	0.019	1.9	1.01	1.00	1.00	0.96	1.01
1,2,3,6,7,8-HxCDD	0.98	0.032	3.2	0.93	0.98	0.99	1.01	1.01
1,2,3,7,8,9-HxCDD	0.97	0.016	1.6	0.95	0.96	0.98	0.99	0.98
1,2,3,4,6,7,8-HpCDD	1.01	0.025	2.5	1.01	0.97	1.02	1.03	1.04
OCDD	1.00	0.013	1.3	1.00	0.99	1.02	1.02	1.00
$^{13}C_{12}$-2,3,7,8-TCDF	1.57	0.047	3.0	1.52	1.55	1.55	1.57	1.65
$^{13}C_{12}$-1,2,3,7,8-PeCDF	1.21	0.078	6.5	1.13	1.20	1.17	1.20	1.34
$^{13}C_{12}$-2,3,4,7,8-PeCDF	1.17	0.081	6.9	1.09	1.15	1.13	1.17	1.31
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	1.33	0.020	1.5	1.35	1.33	1.33	1.32	1.30
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	1.51	0.034	2.2	1.47	1.48	1.53	1.53	1.54
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	1.38	0.012	0.9	1.38	1.38	1.40	1.37	1.36
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	1.19	0.014	1.2	1.18	1.16	1.20	1.19	1.20
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	1.31	0.033	2.5	1.31	1.26	1.33	1.31	1.35
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	1.08	0.046	4.3	1.06	1.03	1.09	1.08	1.15
$^{13}C_{12}$-2,3,7,8-TCDD	1.13	0.036	3.2	1.10	1.11	1.11	1.13	1.19
$^{13}C_{12}$-1,2,3,7,8-PeCDD	0.79	0.047	5.9	0.74	0.78	0.75	0.79	0.86
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	0.87	0.027	3.1	0.85	0.83	0.89	0.88	0.89
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	1.04	0.010	1.0	1.05	1.05	1.04	1.05	1.03
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	0.81	0.017	2.1	0.81	0.80	0.80	0.81	0.84
$^{13}C_{12}$-OCDD	0.74	0.055	7.4	0.70	0.70	0.73	0.72	0.83
$^{13}C_{12}$-1,2,3,4-TCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00
$^{37}Cl_4$-2,3,7,8-TCDD	0.97	0.026	2.6	0.95	0.94	0.99	0.99	0.99

Table C: **EPA-1613CVS (with EPA-1613CSL and EPA-1613CS0.5); 7-point HRGC/HRMS Calibration and RRF Summary**

Calibration RRF Summary				Calibration Standard						
Calibration Filename: 24oct_EPA1613CVS-CAL.QLD				CSL	CS0.5	CS1	CS2	CS3	CS4	CS5
Name	Mean	S. D.	%RSD	RRF#1	RRF#2	RRF#3	RRF#4	RRF#5	RRF#6	RRF#7
2,3,7,8-TCDF	0.92	0.045	4.8	0.96	0.83	0.92	0.95	0.93	0.92	0.95
1,2,3,7,8-PeCDF	0.93	0.013	1.4	0.94	0.92	0.92	0.92	0.93	0.93	0.95
2,3,4,7,8-PeCDF	1.02	0.058	5.7	0.90	1.00	1.03	1.02	1.05	1.05	1.07
1,2,3,4,7,8-HxCDF	0.96	0.029	3.0	0.96	0.97	0.94	0.92	0.98	0.99	1.00
1,2,3,6,7,8-HxCDF	0.92	0.030	3.3	0.90	0.86	0.92	0.94	0.94	0.91	0.94
2,3,4,6,7,8-HxCDF	0.94	0.047	5.0	0.87	0.89	0.95	0.94	0.97	0.97	0.99
1,2,3,7,8,9-HxCDF	0.88	0.029	3.3	0.83	0.88	0.87	0.88	0.90	0.90	0.92
1,2,3,4,6,7,8-HpCDF	0.90	0.033	3.7	0.83	0.93	0.90	0.90	0.90	0.92	0.92
1,2,3,4,7,8,9-HpCDF	0.91	0.018	1.9	0.89	0.94	0.90	0.90	0.92	0.91	0.92
OCDF	1.18	0.052	4.4	1.15	1.14	1.11	1.17	1.19	1.23	1.26
2,3,7,8-TCDD	1.03	0.051	5.0	1.03	0.92	1.01	1.06	1.05	1.05	1.07
1,2,3,7,8-PeCDD	0.95	0.042	4.4	0.87	0.98	0.95	0.95	0.98	0.97	0.99
1,2,3,4,7,8-HxCDD	0.97	0.066	6.8	0.83	0.98	1.01	1.00	1.00	0.96	1.01
1,2,3,6,7,8-HxCDD	0.96	0.044	4.5	0.90	0.92	0.93	0.98	0.99	1.01	1.01
1,2,3,7,8,9-HxCDD	0.94	0.054	5.7	0.83	0.92	0.95	0.96	0.98	0.99	0.98
1,2,3,4,6,7,8-HpCDD	1.01	0.033	3.3	0.95	1.03	1.01	0.97	1.02	1.03	1.04
OCDD	1.00	0.023	2.3	0.95	1.00	1.00	0.99	1.02	1.02	1.00
$^{13}C_{12}$-2,3,7,8-TCDF	1.56	0.042	2.7	1.52	1.54	1.52	1.55	1.55	1.57	1.65
$^{13}C_{12}$-1,2,3,7,8-PeCDF	1.20	0.066	5.5	1.18	1.17	1.13	1.20	1.17	1.20	1.34
$^{13}C_{12}$-2,3,4,7,8-PeCDF	1.16	0.071	6.1	1.12	1.13	1.09	1.15	1.13	1.17	1.31
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	1.33	0.018	1.4	1.32	1.35	1.35	1.33	1.33	1.32	1.30
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	1.53	0.045	3.0	1.60	1.56	1.47	1.48	1.53	1.53	1.54
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	1.39	0.019	1.4	1.39	1.42	1.38	1.38	1.40	1.37	1.36
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	1.19	0.012	1.0	1.19	1.19	1.18	1.16	1.20	1.19	1.20
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	1.31	0.028	2.2	1.30	1.33	1.31	1.26	1.33	1.31	1.35
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	1.07	0.045	4.2	1.02	1.08	1.06	1.03	1.09	1.08	1.15
$^{13}C_{12}$-2,3,7,8-TCDD	1.12	0.033	3.0	1.09	1.11	1.10	1.11	1.11	1.13	1.19
$^{13}C_{12}$-1,2,3,7,8-PeCDD	0.78	0.040	5.1	0.75	0.78	0.74	0.78	0.75	0.79	0.86
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	0.87	0.025	2.9	0.86	0.90	0.85	0.83	0.89	0.88	0.89
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	1.05	0.015	1.5	1.08	1.06	1.05	1.05	1.04	1.05	1.03
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	0.81	0.016	2.0	0.79	0.81	0.81	0.80	0.80	0.81	0.84
$^{13}C_{12}$-OCDD	0.73	0.046	6.3	0.71	0.72	0.70	0.70	0.73	0.72	0.83
$^{13}C_{12}$-1,2,3,4-TCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
$^{37}Cl_4$-2,3,7,8-TCDD	0.97	0.053	5.4	0.90	1.07	0.95	0.94	0.99	0.99	0.99

Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

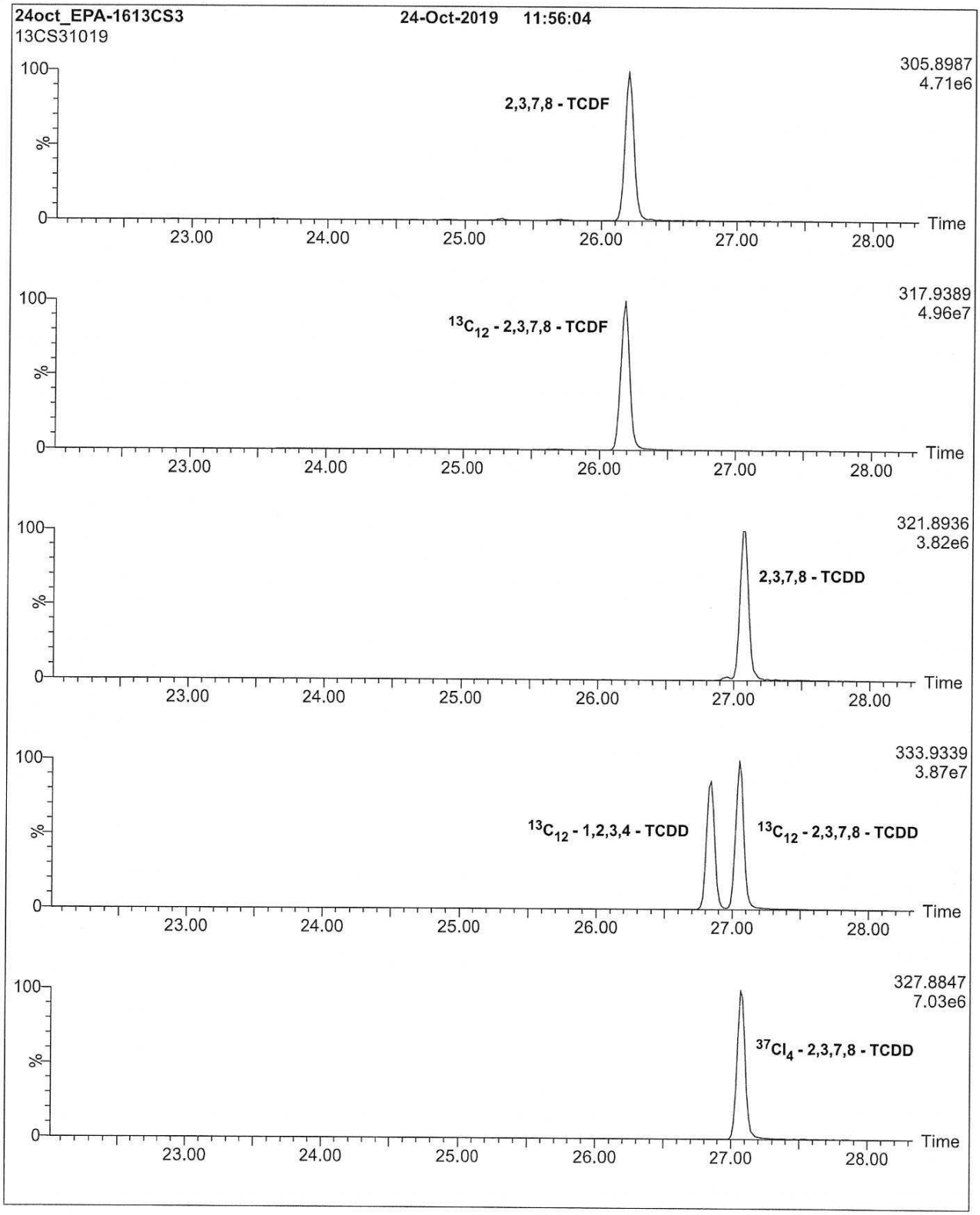


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

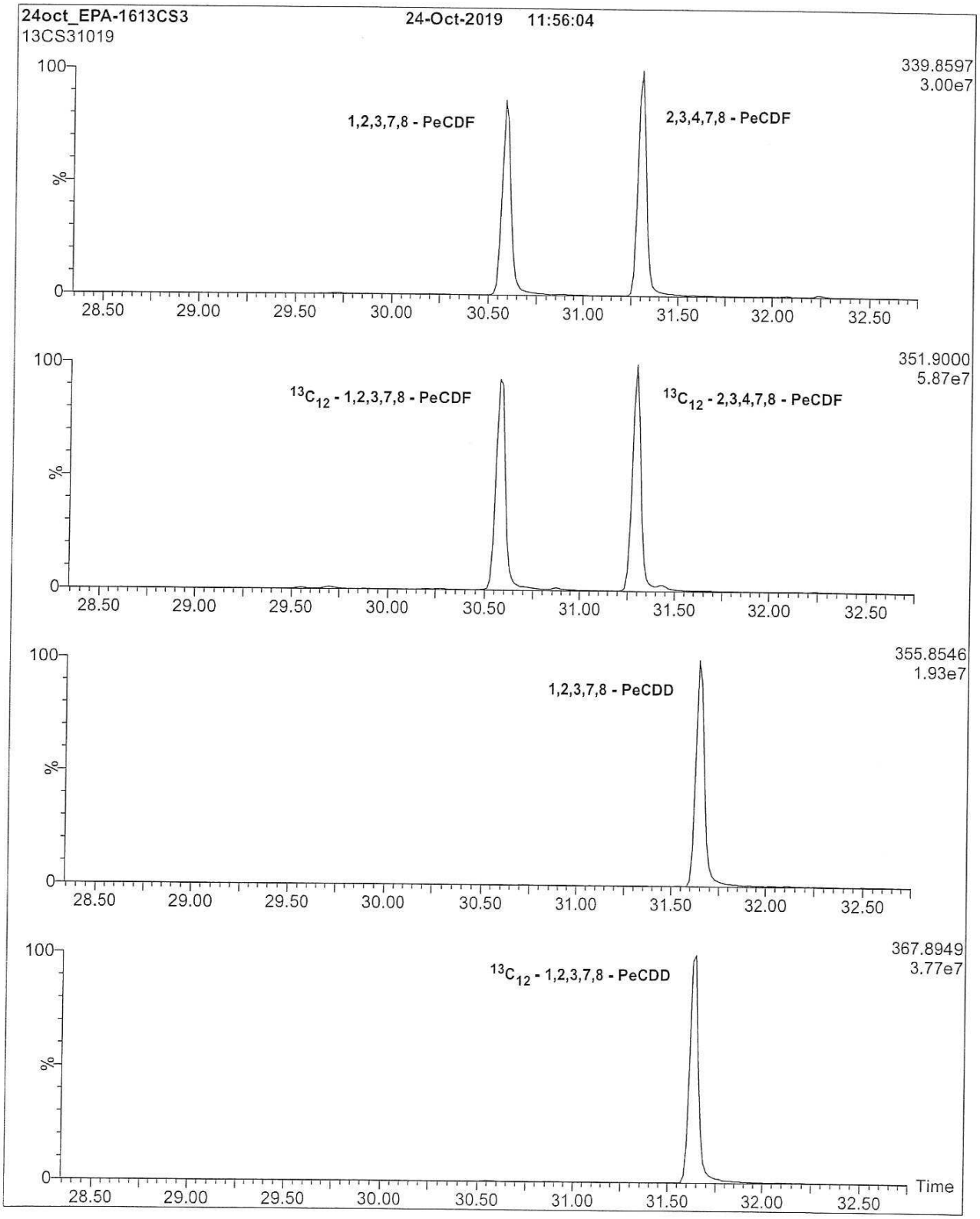


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

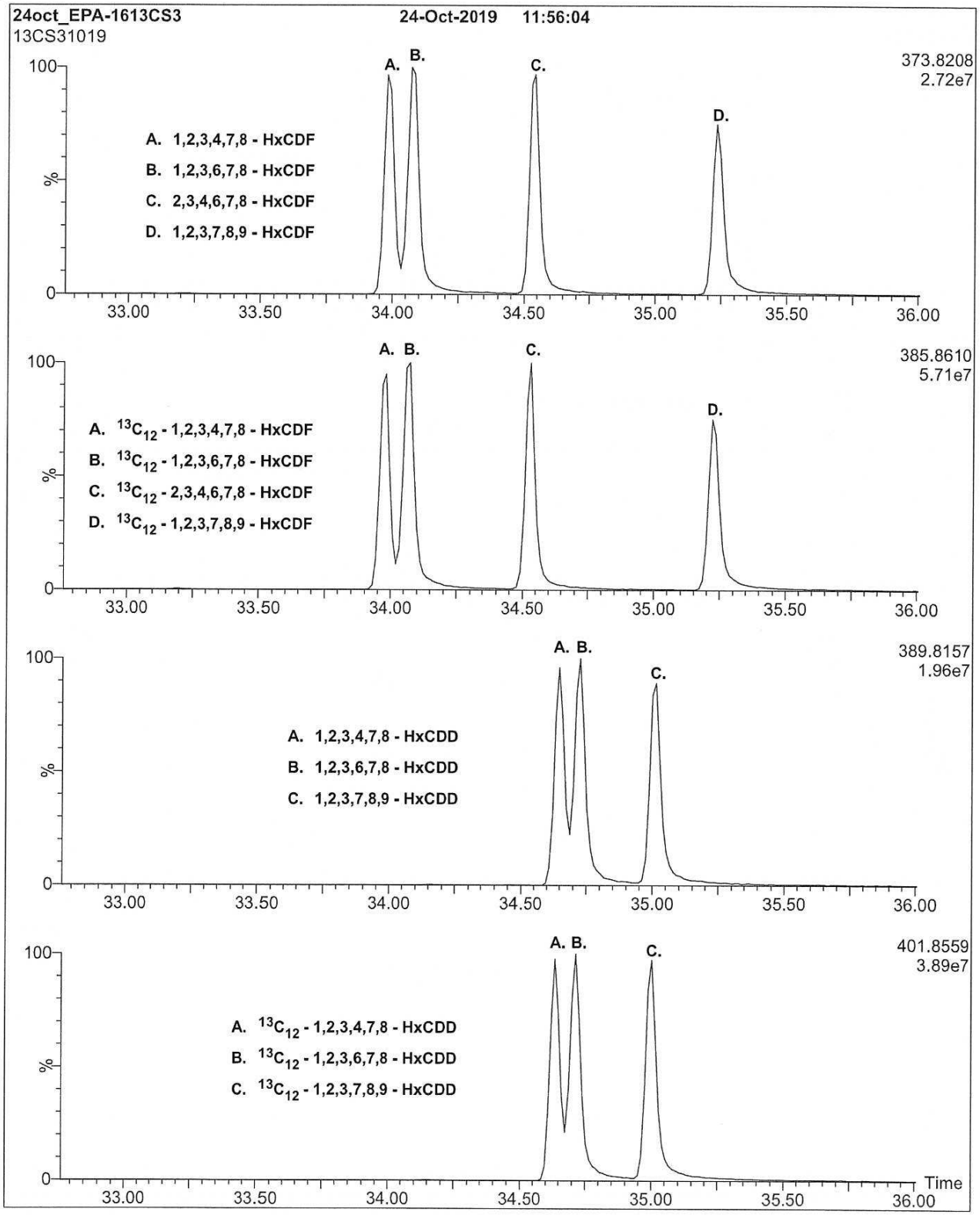


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

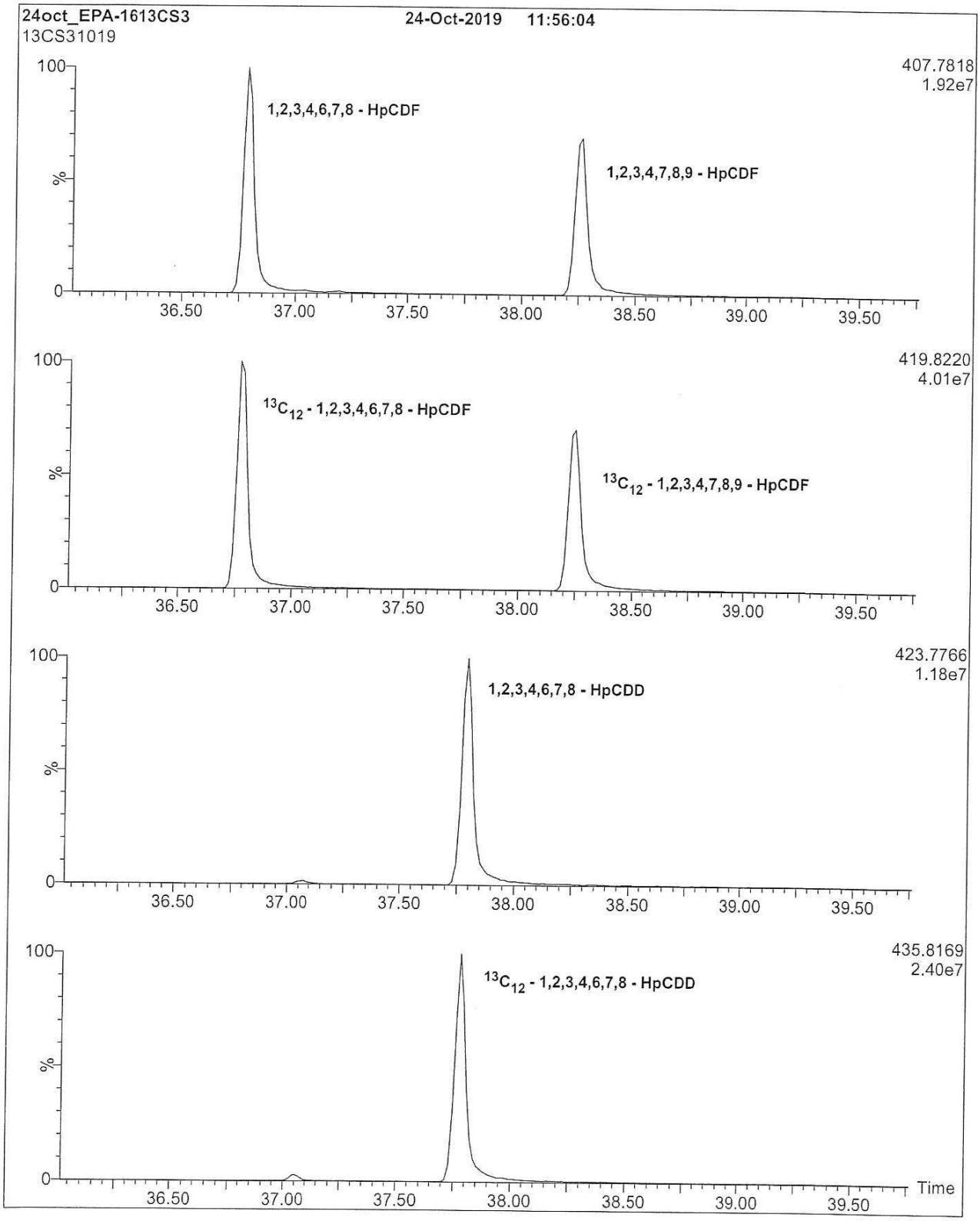
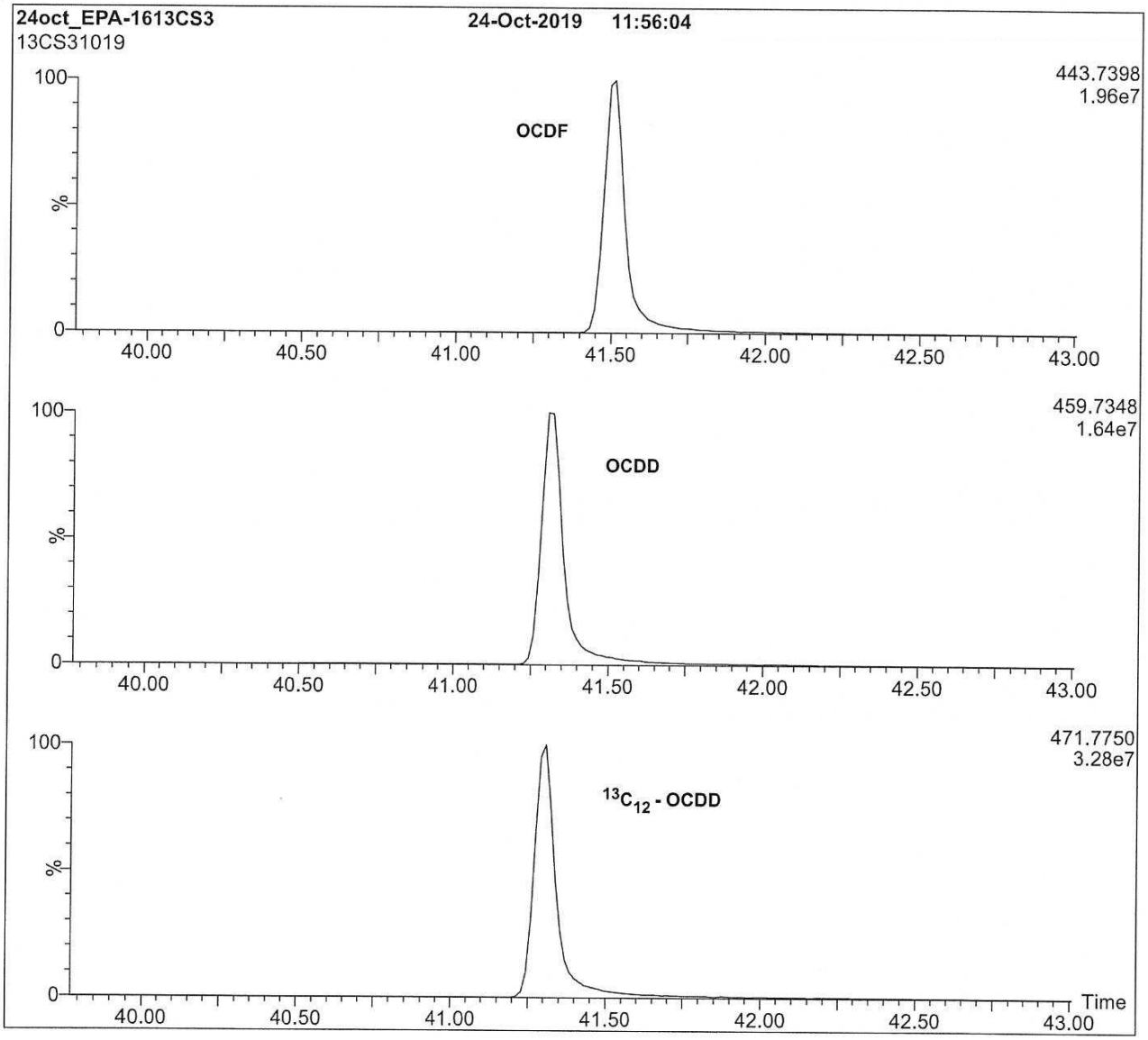


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)



HRGC/HRMS:

Agilent 6890N (HRGC)
Autospec Ultima (HRMS)

Chromatographic Conditions:

Column: 60 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W

Flow: Constant at 1 ml/min
Injector: 280 °C (Splitless Injection)
Ionization: EI+
Detector: 280 °C
SIR at 10,000 mass resolving power

Oven: 150 °C (1 min)
12 °C/min to 200 °C
3 °C/min to 235 °C
235 °C (8 min)
8 °C/min to 310 °C
310 °C (8 min)

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

EPA-1613CVS

U.S. EPA Method 1613 Calibration and Verification Solutions plus Supplemental Calibration Solutions EPA-1613CSL & EPA-1613CS0.5

PRODUCT CODES:	EPA-1613CVS	**LOT NUMBERS:**	(see below)
	EPA-1613CS1		13CS11019 I005456
	EPA-1613CS2		13CS21019 I005457
	EPA-1613CS3		13CS31019
	EPA-1613CS4		13CS41019 I005458
	EPA-1613CS5		13CS51019 I005459

Note: EPA-1613CSL and EPA-1613CS0.5 are lower level extensions to this calibration set that must be ordered separately.

EPA-1613CS0.5	13CS0.51019
EPA-1613CSL	13CSL1019

SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	10/22/2019
LAST TESTED: (mm/dd/yyyy)	10/24/2019
EXPIRY DATE: (mm/dd/yyyy)	10/24/2026 I005460
RECOMMENDED STORAGE:	Store ampoules in a cool, dark place

DESCRIPTION:

EPA-1613CVS is a series of 5 calibration solutions containing native ($^{12}C_{12}$) and mass-labelled ($^{13}C_{12}$ and $^{37}Cl_4$) chlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs). The components of each solution, and their concentrations, are given in Table A.

They were designed for, and prepared to be used according to, U.S. EPA Method 1613 (Revision B). They are to be used as received.

EPA-1613CSL and EPA-1613CS0.5 are lower level extensions to EPA-1613CVS. Neither is required by the method, but either or both can be used to extend the calibration to lower levels.

The individual native PCDDs and PCDFs all have chemical purities of >98%. The individual ^{13}C-labelled PCDDs and PCDFs all have chemical purities of >98% and isotopic purities of ≥99%. The 2,3,7,8-$^{37}Cl_4$-Tetrachlorodibenzo-p-dioxin has a chemical purity of >98% and an isotopic (^{37}Cl) purity of ≥95%.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations
Table B: 5-point HRGC/HRMS Calibration and RRF Summary
Table C: 7-point HRGC/HRMS Calibration and RRF Summary
Figure 1: HRGC/HRMS Data for EPA-1613CS3 (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 3 for further details.

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a series of standards for the identification and quantification of specific chemical compounds.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned values, and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analytes is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Table A: EPA-1613CVS (with EPA-1613CSL and EPA-1613CS0.5); Components and Concentrations (ng/ml, ± 5% in nonane/toluene)

Compound	Concentration (ng/ml)						
Native PCDDs and PCDFs:	CS1	CS2	CS3	CS4	CS5	CSL	CS0.5
2,3,7,8-TCDD	0.5	2	10	40	200	0.1	0.25
2,3,7,8-TCDF	0.5	2	10	40	200	0.1	0.25
1,2,3,7,8-PeCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8-PeCDF	2.5	10	50	200	1000	0.5	1.25
2,3,4,7,8-PeCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,6,7,8-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8,9-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,6,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8,9-HxCDF	2.5	10	50	200	1000	0.5	1.25
2,3,4,6,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,6,7,8-HpCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,6,7,8-HpCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8,9-HpCDF	2.5	10	50	200	1000	0.5	1.25
OCDD	5.0	20	100	400	2000	1.0	2.5
OCDF	5.0	20	100	400	2000	1.0	2.5
Labelled PCDDs and PCDFs:							
$^{13}C_{12}$-2,3,7,8-TCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,7,8-TCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-OCDD	200	200	200	200	200	200	200
Cleanup Standard:							
$^{37}Cl_4$-2,3,7,8-TCDD	0.5	2	10	40	200	0.1	0.25
Internal Standards:							
$^{13}C_{12}$-1,2,3,4-TCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	100	100	100	100	100	100	100
Percent toluene (v/v)	3.6%	3.7%	4.2%	6.1%	16.2%	3.6%	3.6%

Certified By: _____ **Date:** 10/25/2019 (mm/dd/yyyy)

B.G. Chittim, General Manager

Table B: **EPA-1613CVS; 5-point HRGC/HRMS Calibration and RRF Summary**

Calibration RRF Summary				Calibration Standard				
Calibration Filename: 24oct_EPA1613CVS-CAL.QLD				CS1	CS2	CS3	CS4	CS5
Name	Mean	S. D.	%RSD	RRF#1	RRF#2	RRF#3	RRF#4	RRF#5
2,3,7,8-TCDF	0.93	0.013	1.4	0.92	0.95	0.93	0.92	0.95
1,2,3,7,8-PeCDF	0.93	0.015	1.6	0.92	0.92	0.93	0.93	0.95
2,3,4,7,8-PeCDF	1.04	0.019	1.8	1.03	1.02	1.05	1.05	1.07
1,2,3,4,7,8-HxCDF	0.96	0.035	3.7	0.94	0.92	0.98	0.99	1.00
1,2,3,6,7,8-HxCDF	0.93	0.013	1.4	0.92	0.94	0.94	0.91	0.94
2,3,4,6,7,8-HxCDF	0.96	0.022	2.3	0.95	0.94	0.97	0.97	0.99
1,2,3,7,8,9-HxCDF	0.89	0.021	2.4	0.87	0.88	0.90	0.90	0.92
1,2,3,4,6,7,8-HpCDF	0.91	0.011	1.2	0.90	0.90	0.90	0.92	0.92
1,2,3,4,7,8,9-HpCDF	0.91	0.010	1.1	0.90	0.90	0.92	0.91	0.92
OCDF	1.19	0.056	4.7	1.11	1.17	1.19	1.23	1.26
2,3,7,8-TCDD	1.05	0.023	2.2	1.01	1.06	1.05	1.05	1.07
1,2,3,7,8-PeCDD	0.97	0.018	1.9	0.95	0.95	0.98	0.97	0.99
1,2,3,4,7,8-HxCDD	1.00	0.019	1.9	1.01	1.00	1.00	0.96	1.01
1,2,3,6,7,8-HxCDD	0.98	0.032	3.2	0.93	0.98	0.99	1.01	1.01
1,2,3,7,8,9-HxCDD	0.97	0.016	1.6	0.95	0.96	0.98	0.99	0.98
1,2,3,4,6,7,8-HpCDD	1.01	0.025	2.5	1.01	0.97	1.02	1.03	1.04
OCDD	1.00	0.013	1.3	1.00	0.99	1.02	1.02	1.00
$^{13}C_{12}$-2,3,7,8-TCDF	1.57	0.047	3.0	1.52	1.55	1.55	1.57	1.65
$^{13}C_{12}$-1,2,3,7,8-PeCDF	1.21	0.078	6.5	1.13	1.20	1.17	1.20	1.34
$^{13}C_{12}$-2,3,4,7,8-PeCDF	1.17	0.081	6.9	1.09	1.15	1.13	1.17	1.31
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	1.33	0.020	1.5	1.35	1.33	1.33	1.32	1.30
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	1.51	0.034	2.2	1.47	1.48	1.53	1.53	1.54
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	1.38	0.012	0.9	1.38	1.38	1.40	1.37	1.36
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	1.19	0.014	1.2	1.18	1.16	1.20	1.19	1.20
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	1.31	0.033	2.5	1.31	1.26	1.33	1.31	1.35
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	1.08	0.046	4.3	1.06	1.03	1.09	1.08	1.15
$^{13}C_{12}$-2,3,7,8-TCDD	1.13	0.036	3.2	1.10	1.11	1.11	1.13	1.19
$^{13}C_{12}$-1,2,3,7,8-PeCDD	0.79	0.047	5.9	0.74	0.78	0.75	0.79	0.86
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	0.87	0.027	3.1	0.85	0.83	0.89	0.88	0.89
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	1.04	0.010	1.0	1.05	1.05	1.04	1.05	1.03
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	0.81	0.017	2.1	0.81	0.80	0.80	0.81	0.84
$^{13}C_{12}$-OCDD	0.74	0.055	7.4	0.70	0.70	0.73	0.72	0.83
$^{13}C_{12}$-1,2,3,4-TCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00
$^{37}Cl_4$-2,3,7,8-TCDD	0.97	0.026	2.6	0.95	0.94	0.99	0.99	0.99

Table C: **EPA-1613CVS (with EPA-1613CSL and EPA-1613CS0.5); 7-point HRGC/HRMS Calibration and RRF Summary**

Calibration RRF Summary				Calibration Standard						
Calibration Filename: 24oct_EPA1613CVS-CAL.QLD				CSL	CS0.5	CS1	CS2	CS3	CS4	CS5
Name	Mean	S. D.	%RSD	RRF#1	RRF#2	RRF#3	RRF#4	RRF#5	RRF#6	RRF#7
2,3,7,8-TCDF	0.92	0.045	4.8	0.96	0.83	0.92	0.95	0.93	0.92	0.95
1,2,3,7,8-PeCDF	0.93	0.013	1.4	0.94	0.92	0.92	0.92	0.93	0.93	0.95
2,3,4,7,8-PeCDF	1.02	0.058	5.7	0.90	1.00	1.03	1.02	1.05	1.05	1.07
1,2,3,4,7,8-HxCDF	0.96	0.029	3.0	0.96	0.97	0.94	0.92	0.98	0.99	1.00
1,2,3,6,7,8-HxCDF	0.92	0.030	3.3	0.90	0.86	0.92	0.94	0.94	0.91	0.94
2,3,4,6,7,8-HxCDF	0.94	0.047	5.0	0.87	0.89	0.95	0.94	0.97	0.97	0.99
1,2,3,7,8,9-HxCDF	0.88	0.029	3.3	0.83	0.88	0.87	0.88	0.90	0.90	0.92
1,2,3,4,6,7,8-HpCDF	0.90	0.033	3.7	0.83	0.93	0.90	0.90	0.90	0.92	0.92
1,2,3,4,7,8,9-HpCDF	0.91	0.018	1.9	0.89	0.94	0.90	0.90	0.92	0.91	0.92
OCDF	1.18	0.052	4.4	1.15	1.14	1.11	1.17	1.19	1.23	1.26
2,3,7,8-TCDD	1.03	0.051	5.0	1.03	0.92	1.01	1.06	1.05	1.05	1.07
1,2,3,7,8-PeCDD	0.95	0.042	4.4	0.87	0.98	0.95	0.95	0.98	0.97	0.99
1,2,3,4,7,8-HxCDD	0.97	0.066	6.8	0.83	0.98	1.01	1.00	1.00	0.96	1.01
1,2,3,6,7,8-HxCDD	0.96	0.044	4.5	0.90	0.92	0.93	0.98	0.99	1.01	1.01
1,2,3,7,8,9-HxCDD	0.94	0.054	5.7	0.83	0.92	0.95	0.96	0.98	0.99	0.98
1,2,3,4,6,7,8-HpCDD	1.01	0.033	3.3	0.95	1.03	1.01	0.97	1.02	1.03	1.04
OCDD	1.00	0.023	2.3	0.95	1.00	1.00	0.99	1.02	1.02	1.00
$^{13}C_{12}$-2,3,7,8-TCDF	1.56	0.042	2.7	1.52	1.54	1.52	1.55	1.55	1.57	1.65
$^{13}C_{12}$-1,2,3,7,8-PeCDF	1.20	0.066	5.5	1.18	1.17	1.13	1.20	1.17	1.20	1.34
$^{13}C_{12}$-2,3,4,7,8-PeCDF	1.16	0.071	6.1	1.12	1.13	1.09	1.15	1.13	1.17	1.31
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	1.33	0.018	1.4	1.32	1.35	1.35	1.33	1.33	1.32	1.30
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	1.53	0.045	3.0	1.60	1.56	1.47	1.48	1.53	1.53	1.54
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	1.39	0.019	1.4	1.39	1.42	1.38	1.38	1.40	1.37	1.36
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	1.19	0.012	1.0	1.19	1.19	1.18	1.16	1.20	1.19	1.20
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	1.31	0.028	2.2	1.30	1.33	1.31	1.26	1.33	1.31	1.35
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	1.07	0.045	4.2	1.02	1.08	1.06	1.03	1.09	1.08	1.15
$^{13}C_{12}$-2,3,7,8-TCDD	1.12	0.033	3.0	1.09	1.11	1.10	1.11	1.11	1.13	1.19
$^{13}C_{12}$-1,2,3,7,8-PeCDD	0.78	0.040	5.1	0.75	0.78	0.74	0.78	0.75	0.79	0.86
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	0.87	0.025	2.9	0.86	0.90	0.85	0.83	0.89	0.88	0.89
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	1.05	0.015	1.5	1.08	1.06	1.05	1.05	1.04	1.05	1.03
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	0.81	0.016	2.0	0.79	0.81	0.81	0.80	0.80	0.81	0.84
$^{13}C_{12}$-OCDD	0.73	0.046	6.3	0.71	0.72	0.70	0.70	0.73	0.72	0.83
$^{13}C_{12}$-1,2,3,4-TCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
$^{37}Cl_4$-2,3,7,8-TCDD	0.97	0.053	5.4	0.90	1.07	0.95	0.94	0.99	0.99	0.99

Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

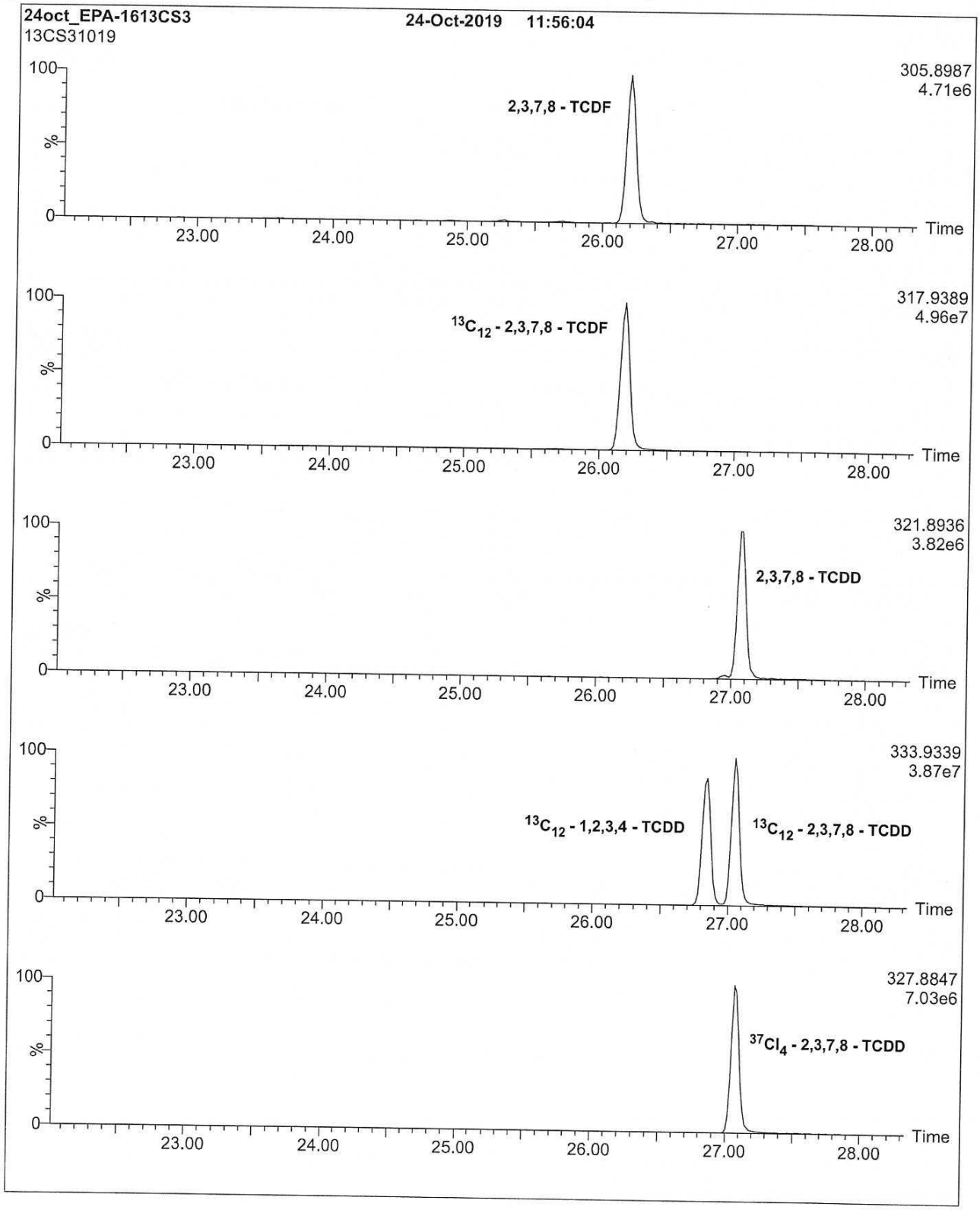


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

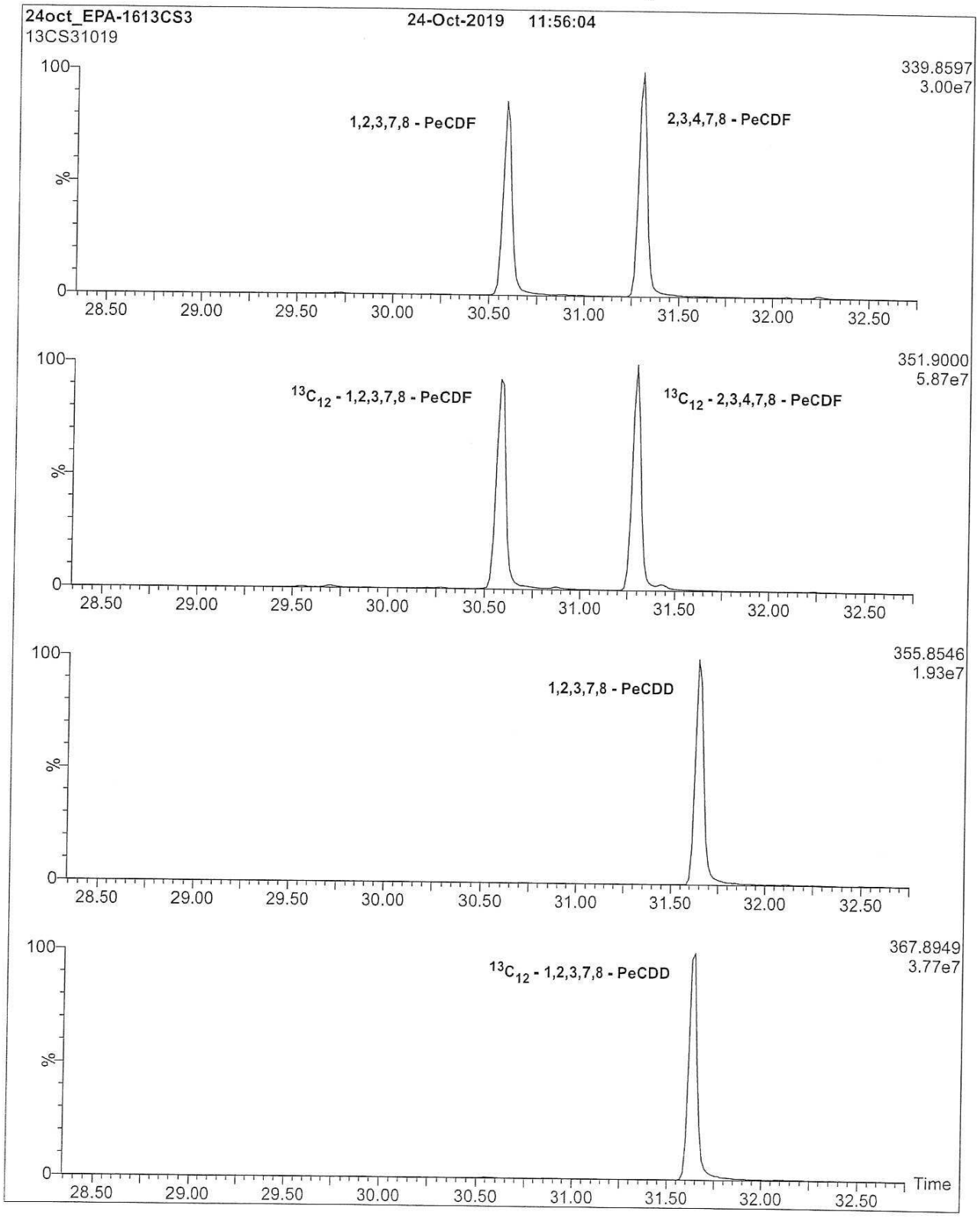


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

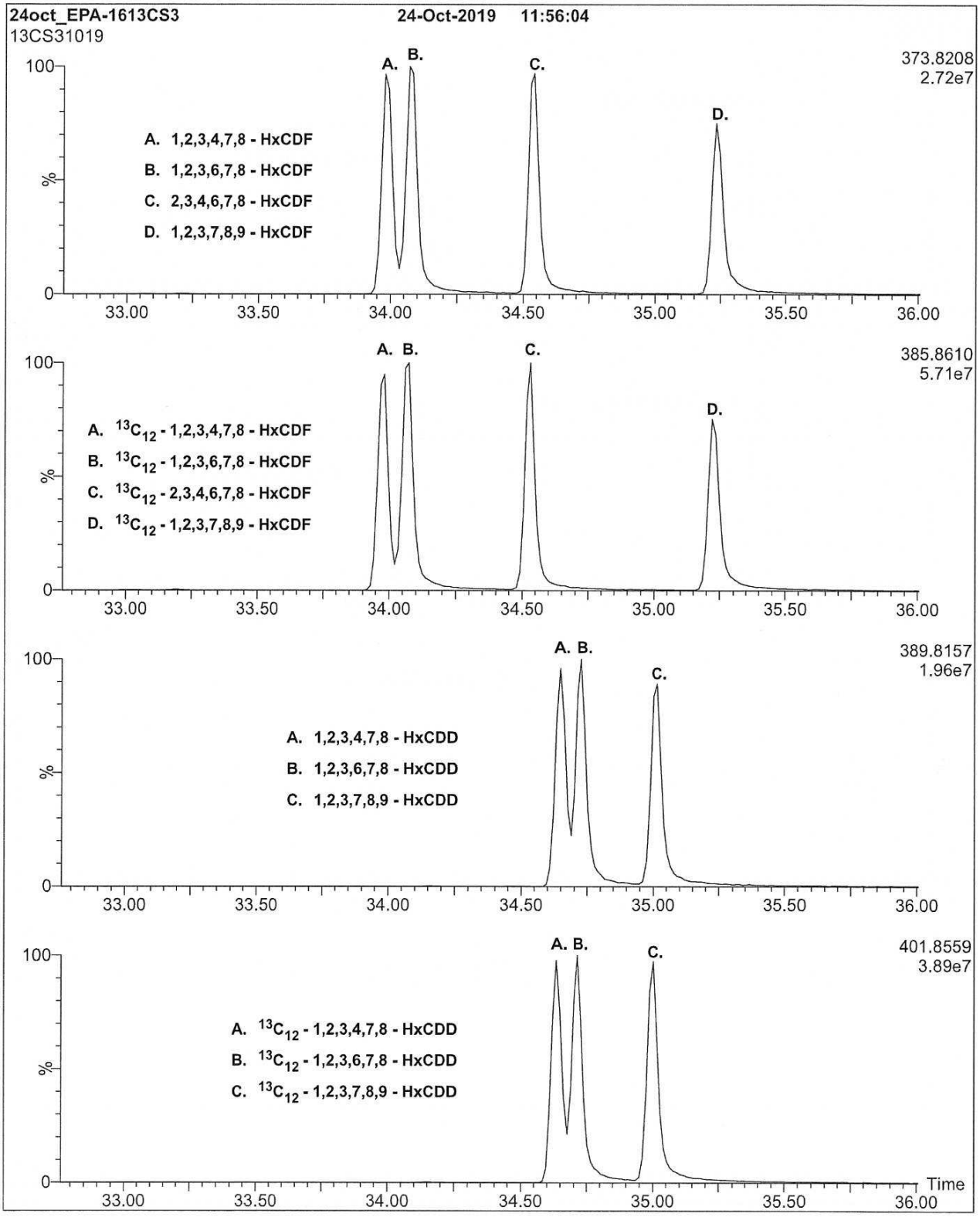


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

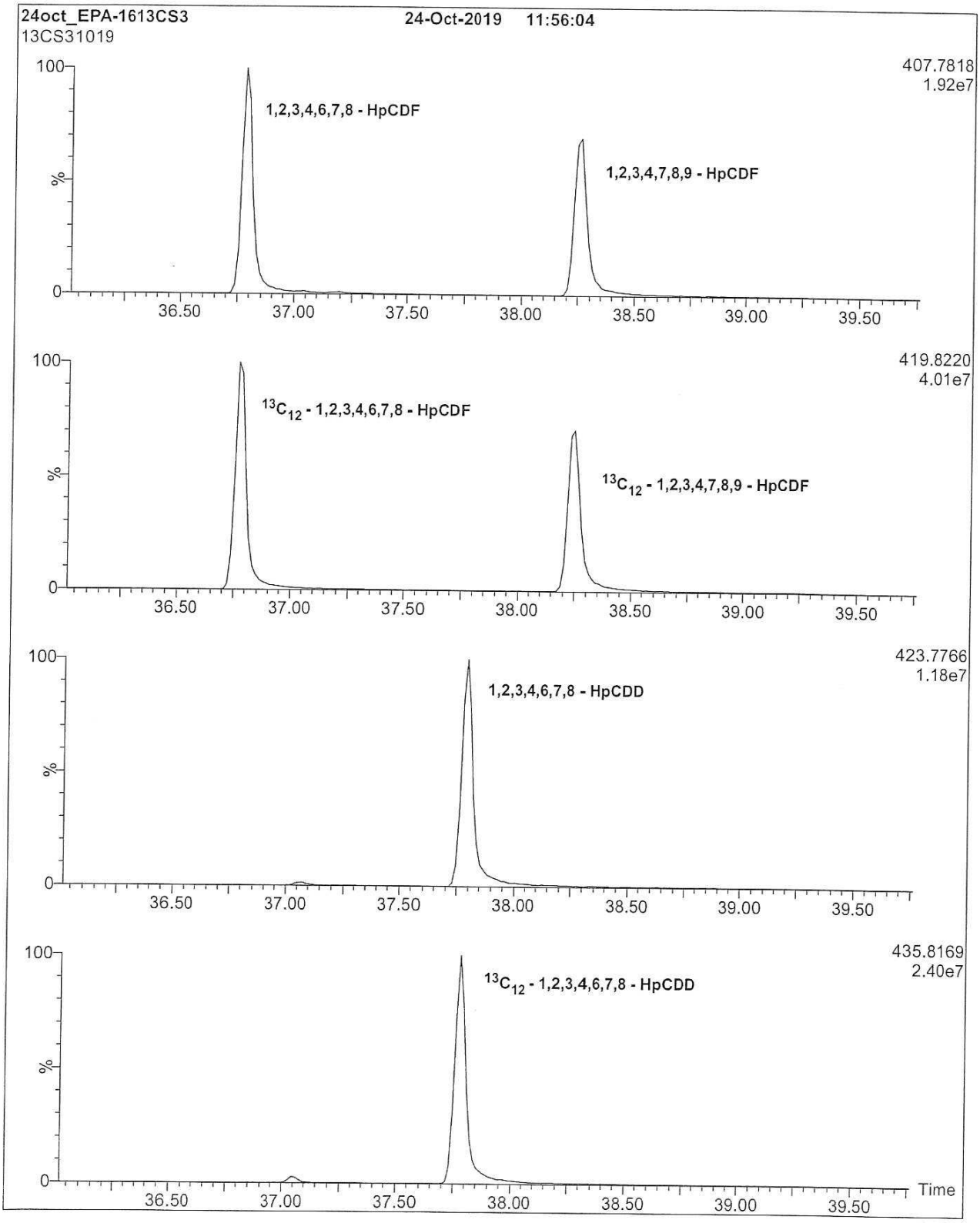
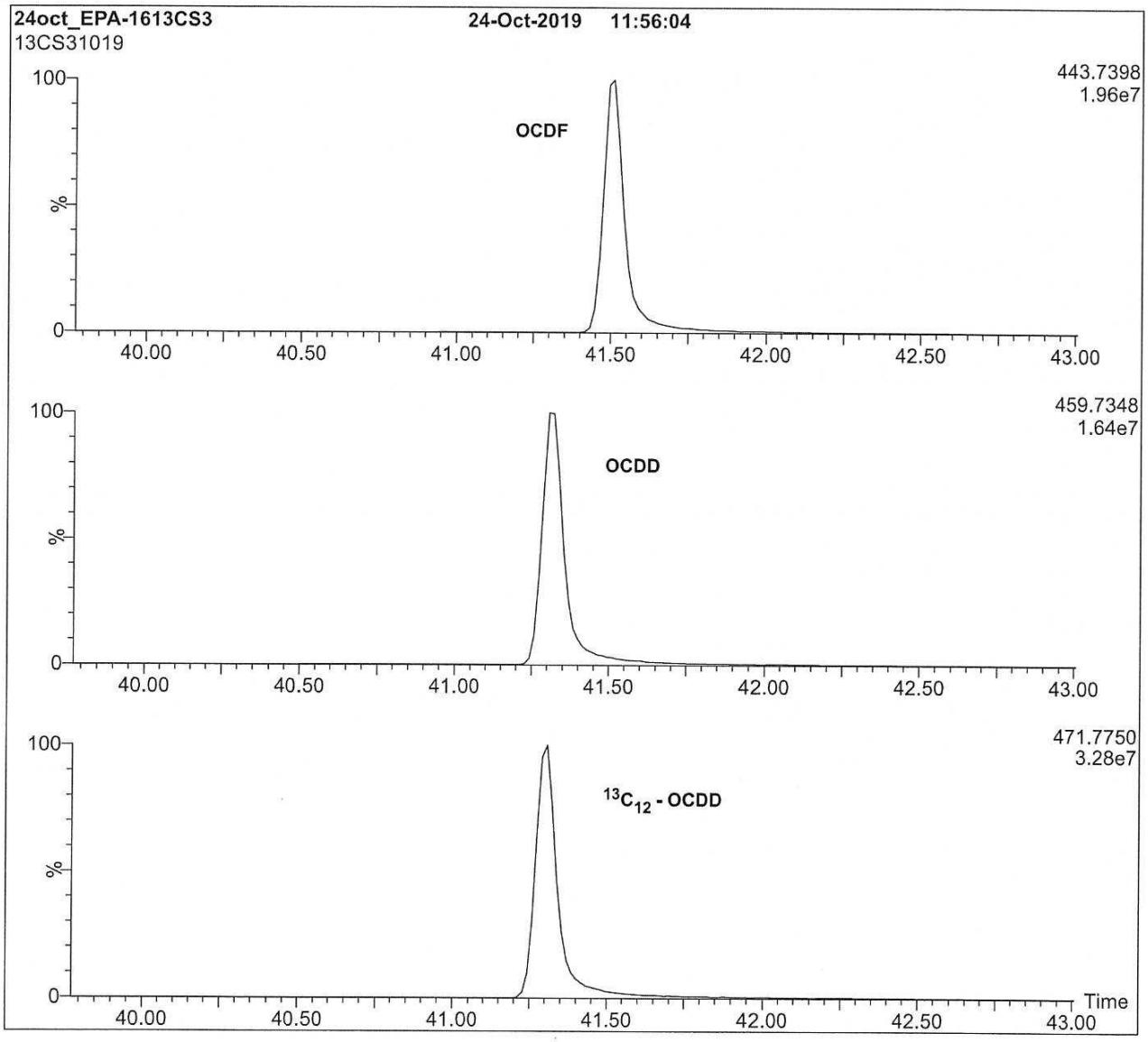


Figure 1: **EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)**



HRGC/HRMS:

Agilent 6890N (HRGC)
Autospec Ultima (HRMS)

Chromatographic Conditions:

Column: 60 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W

Flow:	Constant at 1 ml/min	Oven:	150 °C (1 min)
Injector:	280 °C (Splitless Injection)		12 °C/min to 200 °C
Ionization:	EI+		3 °C/min to 235 °C
Detector:	280 °C		235 °C (8 min)
	SIR at 10,000 mass resolving power		8 °C/min to 310 °C
			310 °C (8 min)

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

EPA-1613CVS

U.S. EPA Method 1613 Calibration and Verification Solutions plus Supplemental Calibration Solutions EPA-1613CSL & EPA-1613CS0.5

PRODUCT CODES:	EPA-1613CVS	**LOT NUMBERS:**	(see below)
	EPA-1613CS1		13CS11019 I005456
	EPA-1613CS2		13CS21019 I005457
	EPA-1613CS3		13CS31019
	EPA-1613CS4		13CS41019 I005458
	EPA-1613CS5		13CS51019 I005459

Note: EPA-1613CSL and EPA-1613CS0.5 are lower level extensions to this calibration set that must be ordered separately.

EPA-1613CS0.5	13CS0.51019
EPA-1613CSL	13CSL1019

SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	10/22/2019
LAST TESTED: (mm/dd/yyyy)	10/24/2019
EXPIRY DATE: (mm/dd/yyyy)	10/24/2026 I005460
RECOMMENDED STORAGE:	Store ampoules in a cool, dark place

DESCRIPTION:

EPA-1613CVS is a series of 5 calibration solutions containing native ($^{12}C_{12}$) and mass-labelled ($^{13}C_{12}$ and $^{37}Cl_4$) chlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs). The components of each solution, and their concentrations, are given in Table A.

They were designed for, and prepared to be used according to, U.S. EPA Method 1613 (Revision B). They are to be used as received.

EPA-1613CSL and EPA-1613CS0.5 are lower level extensions to EPA-1613CVS. Neither is required by the method, but either or both can be used to extend the calibration to lower levels.

The individual native PCDDs and PCDFs all have chemical purities of >98%. The individual ^{13}C-labelled PCDDs and PCDFs all have chemical purities of >98% and isotopic purities of ≥99%. The 2,3,7,8-$^{37}Cl_4$-Tetrachlorodibenzo-p-dioxin has a chemical purity of >98% and an isotopic (^{37}Cl) purity of ≥95%.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations
Table B: 5-point HRGC/HRMS Calibration and RRF Summary
Table C: 7-point HRGC/HRMS Calibration and RRF Summary
Figure 1: HRGC/HRMS Data for EPA-1613CS3 (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 3 for further details.

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a series of standards for the identification and quantification of specific chemical compounds.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned values, and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analytes is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A 1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Table A: EPA-1613CVS (with EPA-1613CSL and EPA-1613CS0.5); Components and Concentrations (ng/ml, ± 5% in nonane/toluene)

Compound	Concentration (ng/ml)						
Native PCDDs and PCDFs:	CS1	CS2	CS3	CS4	CS5	CSL	CS0.5
2,3,7,8-TCDD	0.5	2	10	40	200	0.1	0.25
2,3,7,8-TCDF	0.5	2	10	40	200	0.1	0.25
1,2,3,7,8-PeCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8-PeCDF	2.5	10	50	200	1000	0.5	1.25
2,3,4,7,8-PeCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,6,7,8-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8,9-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,6,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8,9-HxCDF	2.5	10	50	200	1000	0.5	1.25
2,3,4,6,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,6,7,8-HpCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,6,7,8-HpCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8,9-HpCDF	2.5	10	50	200	1000	0.5	1.25
OCDD	5.0	20	100	400	2000	1.0	2.5
OCDF	5.0	20	100	400	2000	1.0	2.5
Labelled PCDDs and PCDFs:							
$^{13}C_{12}$-2,3,7,8-TCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,7,8-TCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-OCDD	200	200	200	200	200	200	200
Cleanup Standard:							
$^{37}Cl_4$-2,3,7,8-TCDD	0.5	2	10	40	200	0.1	0.25
Internal Standards:							
$^{13}C_{12}$-1,2,3,4-TCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	100	100	100	100	100	100	100
Percent toluene (v/v)	3.6%	3.7%	4.2%	6.1%	16.2%	3.6%	3.6%

Certified By: _____ **Date:** 10/25/2019 (mm/dd/yyyy)

B.G. Chittim, General Manager

Table B: **EPA-1613CVS; 5-point HRGC/HRMS Calibration and RRF Summary**

Calibration RRF Summary				Calibration Standard				
Calibration Filename: 24oct_EPA1613CVS-CAL.QLD				CS1	CS2	CS3	CS4	CS5
Name	Mean	S. D.	%RSD	RRF#1	RRF#2	RRF#3	RRF#4	RRF#5
2,3,7,8-TCDF	0.93	0.013	1.4	0.92	0.95	0.93	0.92	0.95
1,2,3,7,8-PeCDF	0.93	0.015	1.6	0.92	0.92	0.93	0.93	0.95
2,3,4,7,8-PeCDF	1.04	0.019	1.8	1.03	1.02	1.05	1.05	1.07
1,2,3,4,7,8-HxCDF	0.96	0.035	3.7	0.94	0.92	0.98	0.99	1.00
1,2,3,6,7,8-HxCDF	0.93	0.013	1.4	0.92	0.94	0.94	0.91	0.94
2,3,4,6,7,8-HxCDF	0.96	0.022	2.3	0.95	0.94	0.97	0.97	0.99
1,2,3,7,8,9-HxCDF	0.89	0.021	2.4	0.87	0.88	0.90	0.90	0.92
1,2,3,4,6,7,8-HpCDF	0.91	0.011	1.2	0.90	0.90	0.90	0.92	0.92
1,2,3,4,7,8,9-HpCDF	0.91	0.010	1.1	0.90	0.90	0.92	0.91	0.92
OCDF	1.19	0.056	4.7	1.11	1.17	1.19	1.23	1.26
2,3,7,8-TCDD	1.05	0.023	2.2	1.01	1.06	1.05	1.05	1.07
1,2,3,7,8-PeCDD	0.97	0.018	1.9	0.95	0.95	0.98	0.97	0.99
1,2,3,4,7,8-HxCDD	1.00	0.019	1.9	1.01	1.00	1.00	0.96	1.01
1,2,3,6,7,8-HxCDD	0.98	0.032	3.2	0.93	0.98	0.99	1.01	1.01
1,2,3,7,8,9-HxCDD	0.97	0.016	1.6	0.95	0.96	0.98	0.99	0.98
1,2,3,4,6,7,8-HpCDD	1.01	0.025	2.5	1.01	0.97	1.02	1.03	1.04
OCDD	1.00	0.013	1.3	1.00	0.99	1.02	1.02	1.00
$^{13}C_{12}$-2,3,7,8-TCDF	1.57	0.047	3.0	1.52	1.55	1.55	1.57	1.65
$^{13}C_{12}$-1,2,3,7,8-PeCDF	1.21	0.078	6.5	1.13	1.20	1.17	1.20	1.34
$^{13}C_{12}$-2,3,4,7,8-PeCDF	1.17	0.081	6.9	1.09	1.15	1.13	1.17	1.31
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	1.33	0.020	1.5	1.35	1.33	1.33	1.32	1.30
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	1.51	0.034	2.2	1.47	1.48	1.53	1.53	1.54
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	1.38	0.012	0.9	1.38	1.38	1.40	1.37	1.36
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	1.19	0.014	1.2	1.18	1.16	1.20	1.19	1.20
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	1.31	0.033	2.5	1.31	1.26	1.33	1.31	1.35
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	1.08	0.046	4.3	1.06	1.03	1.09	1.08	1.15
$^{13}C_{12}$-2,3,7,8-TCDD	1.13	0.036	3.2	1.10	1.11	1.11	1.13	1.19
$^{13}C_{12}$-1,2,3,7,8-PeCDD	0.79	0.047	5.9	0.74	0.78	0.75	0.79	0.86
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	0.87	0.027	3.1	0.85	0.83	0.89	0.88	0.89
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	1.04	0.010	1.0	1.05	1.05	1.04	1.05	1.03
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	0.81	0.017	2.1	0.81	0.80	0.80	0.81	0.84
$^{13}C_{12}$-OCDD	0.74	0.055	7.4	0.70	0.70	0.73	0.72	0.83
$^{13}C_{12}$-1,2,3,4-TCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00
$^{37}Cl_4$-2,3,7,8-TCDD	0.97	0.026	2.6	0.95	0.94	0.99	0.99	0.99

Table C: **EPA-1613CVS (with EPA-1613CSL and EPA-1613CS0.5); 7-point HRGC/HRMS Calibration and RRF Summary**

Calibration RRF Summary				Calibration Standard						
Calibration Filename: 24oct_EPA1613CVS-CAL.QLD				CSL	CS0.5	CS1	CS2	CS3	CS4	CS5
Name	Mean	S. D.	%RSD	RRF#1	RRF#2	RRF#3	RRF#4	RRF#5	RRF#6	RRF#7
2,3,7,8-TCDF	0.92	0.045	4.8	0.96	0.83	0.92	0.95	0.93	0.92	0.95
1,2,3,7,8-PeCDF	0.93	0.013	1.4	0.94	0.92	0.92	0.92	0.93	0.93	0.95
2,3,4,7,8-PeCDF	1.02	0.058	5.7	0.90	1.00	1.03	1.02	1.05	1.05	1.07
1,2,3,4,7,8-HxCDF	0.96	0.029	3.0	0.96	0.97	0.94	0.92	0.98	0.99	1.00
1,2,3,6,7,8-HxCDF	0.92	0.030	3.3	0.90	0.86	0.92	0.94	0.94	0.91	0.94
2,3,4,6,7,8-HxCDF	0.94	0.047	5.0	0.87	0.89	0.95	0.94	0.97	0.97	0.99
1,2,3,7,8,9-HxCDF	0.88	0.029	3.3	0.83	0.88	0.87	0.88	0.90	0.90	0.92
1,2,3,4,6,7,8-HpCDF	0.90	0.033	3.7	0.83	0.93	0.90	0.90	0.90	0.92	0.92
1,2,3,4,7,8,9-HpCDF	0.91	0.018	1.9	0.89	0.94	0.90	0.90	0.92	0.91	0.92
OCDF	1.18	0.052	4.4	1.15	1.14	1.11	1.17	1.19	1.23	1.26
2,3,7,8-TCDD	1.03	0.051	5.0	1.03	0.92	1.01	1.06	1.05	1.05	1.07
1,2,3,7,8-PeCDD	0.95	0.042	4.4	0.87	0.98	0.95	0.95	0.98	0.97	0.99
1,2,3,4,7,8-HxCDD	0.97	0.066	6.8	0.83	0.98	1.01	1.00	1.00	0.96	1.01
1,2,3,6,7,8-HxCDD	0.96	0.044	4.5	0.90	0.92	0.93	0.98	0.99	1.01	1.01
1,2,3,7,8,9-HxCDD	0.94	0.054	5.7	0.83	0.92	0.95	0.96	0.98	0.99	0.98
1,2,3,4,6,7,8-HpCDD	1.01	0.033	3.3	0.95	1.03	1.01	0.97	1.02	1.03	1.04
OCDD	1.00	0.023	2.3	0.95	1.00	1.00	0.99	1.02	1.02	1.00
$^{13}C_{12}$-2,3,7,8-TCDF	1.56	0.042	2.7	1.52	1.54	1.52	1.55	1.55	1.57	1.65
$^{13}C_{12}$-1,2,3,7,8-PeCDF	1.20	0.066	5.5	1.18	1.17	1.13	1.20	1.17	1.20	1.34
$^{13}C_{12}$-2,3,4,7,8-PeCDF	1.16	0.071	6.1	1.12	1.13	1.09	1.15	1.13	1.17	1.31
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	1.33	0.018	1.4	1.32	1.35	1.35	1.33	1.33	1.32	1.30
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	1.53	0.045	3.0	1.60	1.56	1.47	1.48	1.53	1.53	1.54
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	1.39	0.019	1.4	1.39	1.42	1.38	1.38	1.40	1.37	1.36
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	1.19	0.012	1.0	1.19	1.19	1.18	1.16	1.20	1.19	1.20
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	1.31	0.028	2.2	1.30	1.33	1.31	1.26	1.33	1.31	1.35
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	1.07	0.045	4.2	1.02	1.08	1.06	1.03	1.09	1.08	1.15
$^{13}C_{12}$-2,3,7,8-TCDD	1.12	0.033	3.0	1.09	1.11	1.10	1.11	1.11	1.13	1.19
$^{13}C_{12}$-1,2,3,7,8-PeCDD	0.78	0.040	5.1	0.75	0.78	0.74	0.78	0.75	0.79	0.86
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	0.87	0.025	2.9	0.86	0.90	0.85	0.83	0.89	0.88	0.89
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	1.05	0.015	1.5	1.08	1.06	1.05	1.05	1.04	1.05	1.03
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	0.81	0.016	2.0	0.79	0.81	0.81	0.80	0.80	0.81	0.84
$^{13}C_{12}$-OCDD	0.73	0.046	6.3	0.71	0.72	0.70	0.70	0.73	0.72	0.83
$^{13}C_{12}$-1,2,3,4-TCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
$^{37}Cl_4$-2,3,7,8-TCDD	0.97	0.053	5.4	0.90	1.07	0.95	0.94	0.99	0.99	0.99

Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

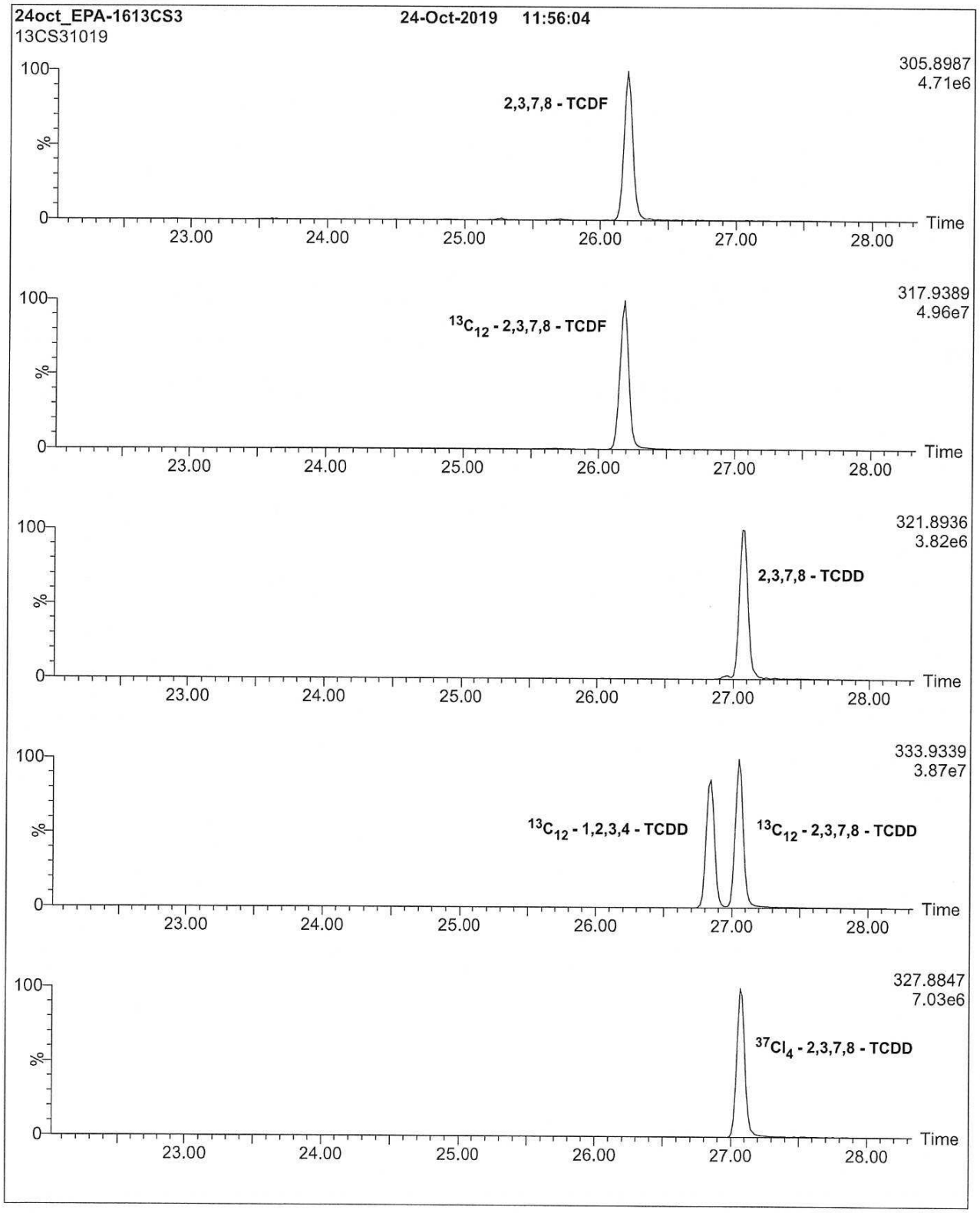


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

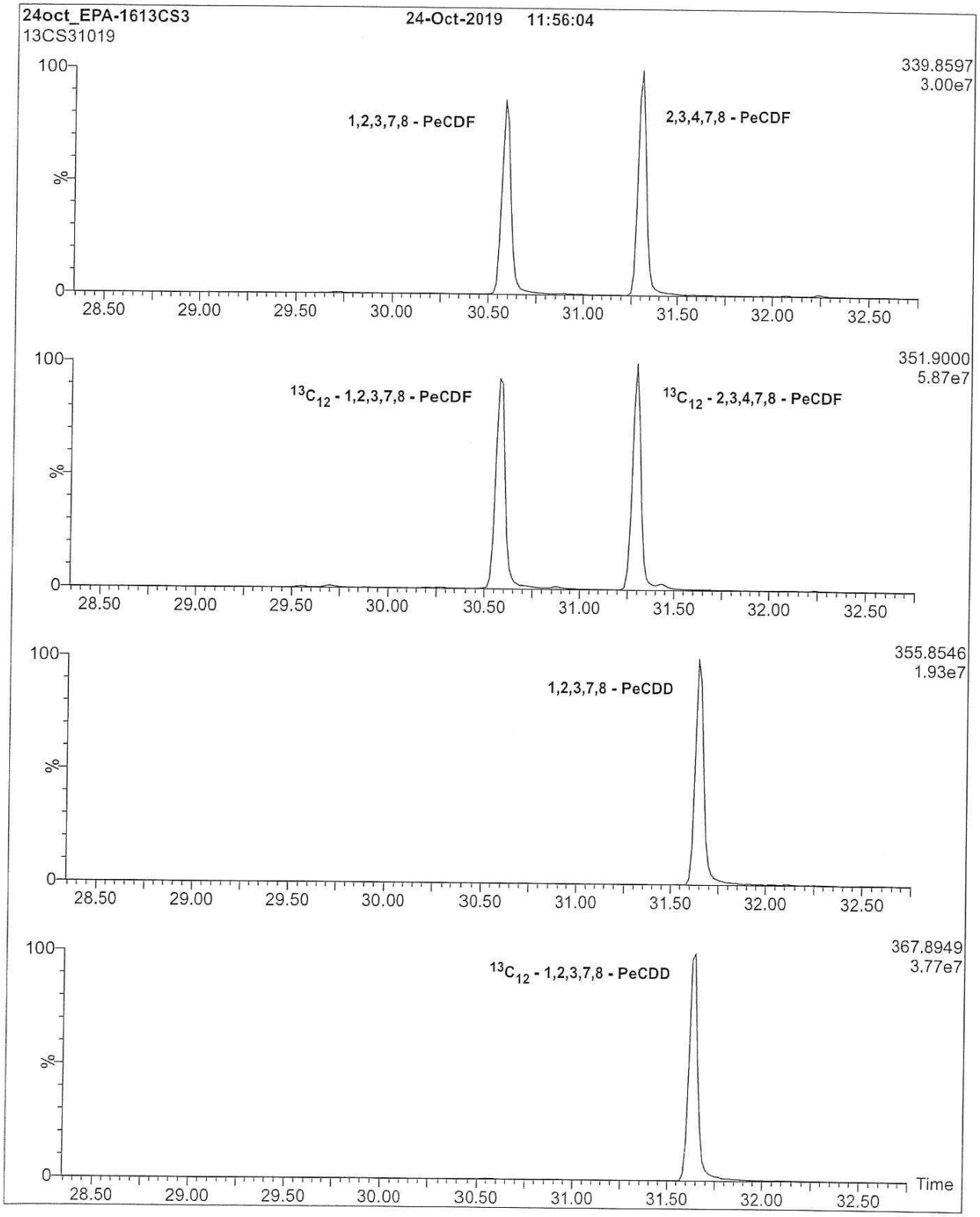


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

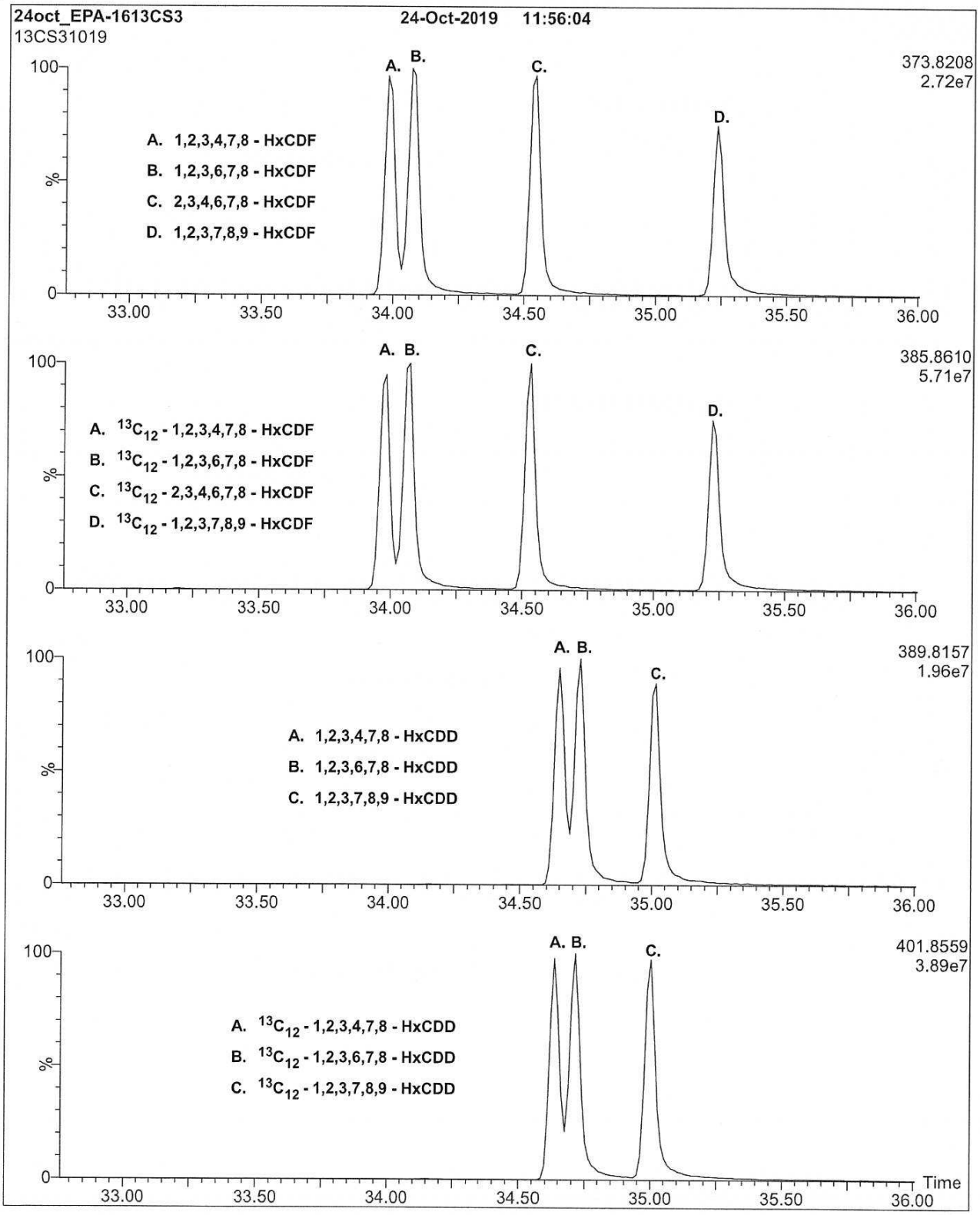


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

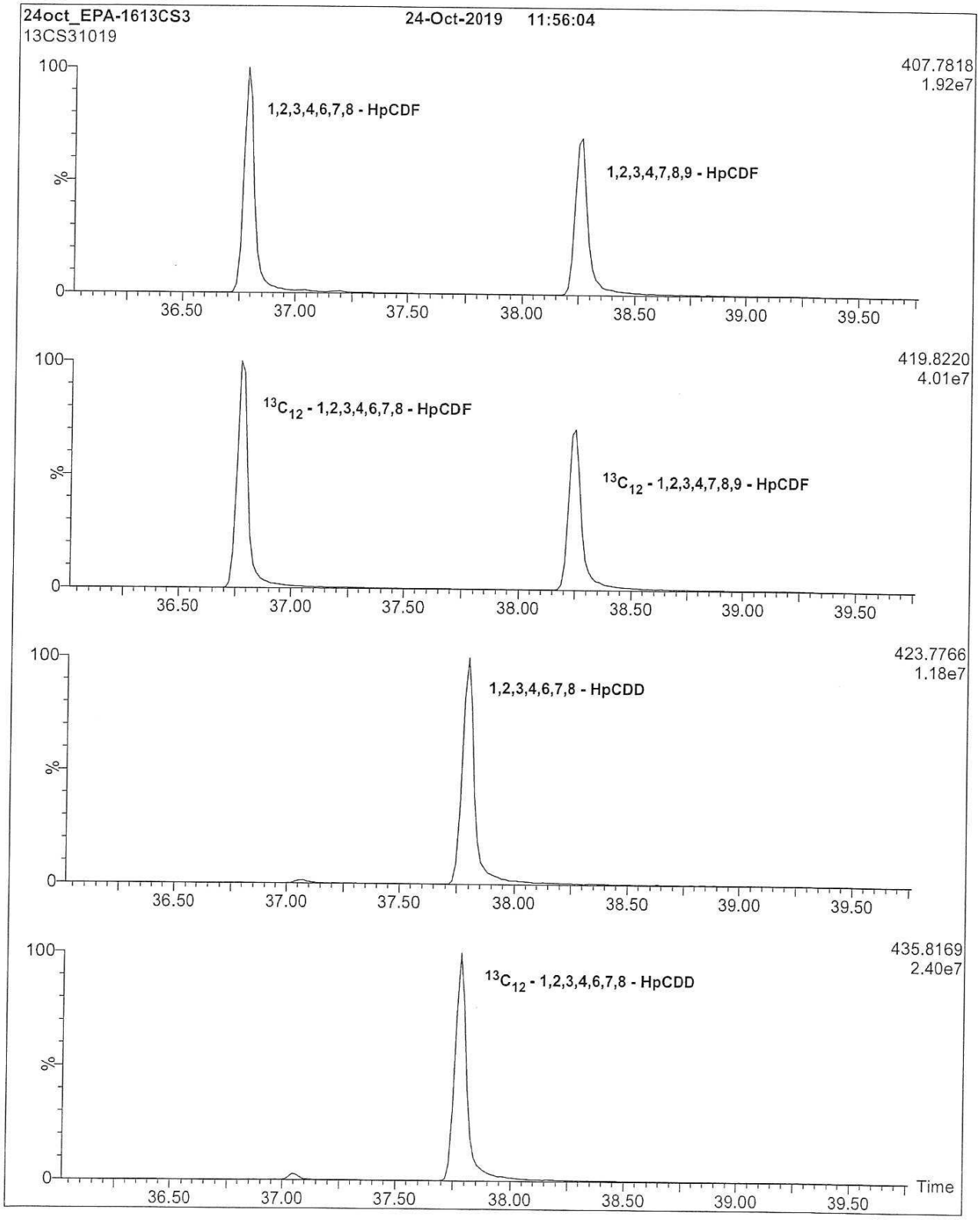
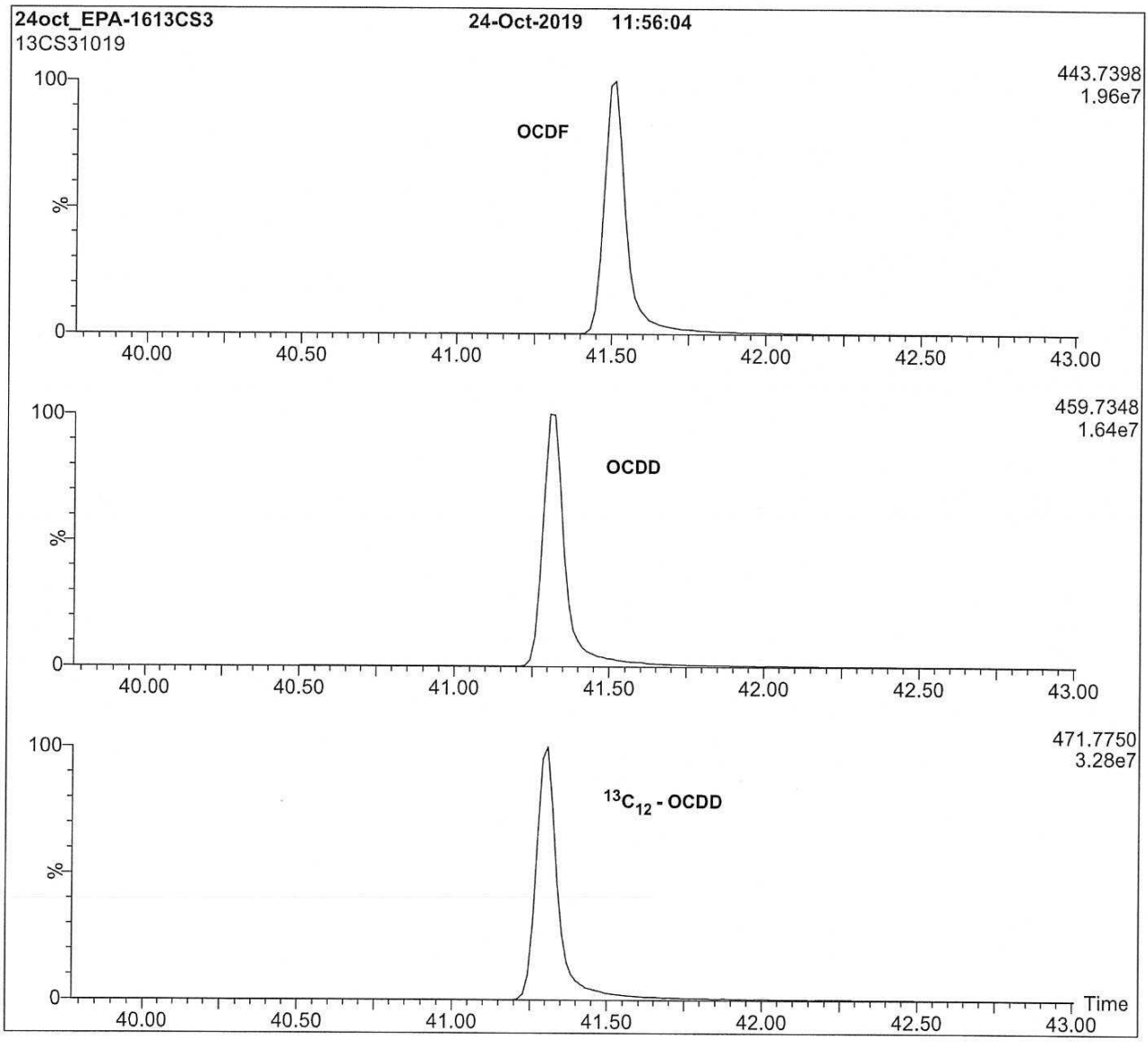


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)



HRGC/HRMS:

Agilent 6890N (HRGC)
Autospec Ultima (HRMS)

Chromatographic Conditions:

Column: 60 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W

Flow:	Constant at 1 ml/min	Oven:	150 °C (1 min)
Injector:	280 °C (Splitless Injection)		12 °C/min to 200 °C
Ionization:	EI+		3 °C/min to 235 °C
Detector:	280 °C		235 °C (8 min)
	SIR at 10,000 mass resolving power		8 °C/min to 310 °C
			310 °C (8 min)

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

EPA-1613CVS

U.S. EPA Method 1613 Calibration and Verification Solutions
plus Supplemental Calibration Solutions EPA-1613CSL & EPA-1613CS0.5

PRODUCT CODES:	EPA-1613CVS	**LOT NUMBERS:**	(see below)	06/23/20
	EPA-1613CS1		13CS11019	I005456
	EPA-1613CS2		13CS21019	I005457
	EPA-1613CS3		13CS31019	
	EPA-1613CS4		13CS41019	I005458
	EPA-1613CS5		13CS51019	I005459

Note: EPA-1613CSL and EPA-1613CS0.5 are lower level extensions to this calibration set that must be ordered separately.

EPA-1613CS0.5	13CS0.51019
EPA-1613CSL	13CSL1019

SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	10/22/2019
LAST TESTED: (mm/dd/yyyy)	10/24/2019
EXPIRY DATE: (mm/dd/yyyy)	10/24/2026 I005460
RECOMMENDED STORAGE:	Store ampoules in a cool, dark place

DESCRIPTION: 06/23/20

EPA-1613CVS is a series of 5 calibration solutions containing native ($^{12}C_{12}$) and mass-labelled ($^{13}C_{12}$ and $^{37}Cl_4$) chlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs). The components of each solution, and their concentrations, are given in Table A.

They were designed for, and prepared to be used according to, U.S. EPA Method 1613 (Revision B). They are to be used as received.

EPA-1613CSL and EPA-1613CS0.5 are lower level extensions to EPA-1613CVS. Neither is required by the method, but either or both can be used to extend the calibration to lower levels.

The individual native PCDDs and PCDFs all have chemical purities of >98%. The individual ^{13}C-labelled PCDDs and PCDFs all have chemical purities of >98% and isotopic purities of ≥99%. The 2,3,7,8-$^{37}Cl_4$-Tetrachlorodibenzo-p-dioxin has a chemical purity of >98% and an isotopic (^{37}Cl) purity of ≥95%.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations
Table B: 5-point HRGC/HRMS Calibration and RRF Summary
Table C: 7-point HRGC/HRMS Calibration and RRF Summary
Figure 1: HRGC/HRMS Data for EPA-1613CS3 (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 3 for further details.

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a series of standards for the identification and quantification of specific chemical compounds.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned values, and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analytes is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A 1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Table A: EPA-1613CVS (with EPA-1613CSL and EPA-1613CS0.5); Components and Concentrations (ng/ml, ± 5% in nonane/toluene)

Compound	Concentration (ng/ml)						
Native PCDDs and PCDFs:	CS1	CS2	CS3	CS4	CS5	CSL	CS0.5
2,3,7,8-TCDD	0.5	2	10	40	200	0.1	0.25
2,3,7,8-TCDF	0.5	2	10	40	200	0.1	0.25
1,2,3,7,8-PeCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8-PeCDF	2.5	10	50	200	1000	0.5	1.25
2,3,4,7,8-PeCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,6,7,8-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8,9-HxCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,6,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,7,8,9-HxCDF	2.5	10	50	200	1000	0.5	1.25
2,3,4,6,7,8-HxCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,6,7,8-HpCDD	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,6,7,8-HpCDF	2.5	10	50	200	1000	0.5	1.25
1,2,3,4,7,8,9-HpCDF	2.5	10	50	200	1000	0.5	1.25
OCDD	5.0	20	100	400	2000	1.0	2.5
OCDF	5.0	20	100	400	2000	1.0	2.5
Labelled PCDDs and PCDFs:							
$^{13}C_{12}$-2,3,7,8-TCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,7,8-TCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8-PeCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,4,7,8-PeCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	100	100	100	100	100	100	100
$^{13}C_{12}$-OCDD	200	200	200	200	200	200	200
Cleanup Standard:							
$^{37}Cl_4$-2,3,7,8-TCDD	0.5	2	10	40	200	0.1	0.25
Internal Standards:							
$^{13}C_{12}$-1,2,3,4-TCDD	100	100	100	100	100	100	100
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	100	100	100	100	100	100	100
Percent toluene (v/v)	3.6%	3.7%	4.2%	6.1%	16.2%	3.6%	3.6%

Certified By: _____ **Date:** 10/25/2019 (mm/dd/yyyy)

B.G. Chittim, General Manager

Form#:52, Issued 2010-07-26

Table B: **EPA-1613CVS; 5-point HRGC/HRMS Calibration and RRF Summary**

Calibration RRF Summary				Calibration Standard				
Calibration Filename: 24oct_EPA1613CVS-CAL.QLD				CS1	CS2	CS3	CS4	CS5
Name	Mean	S. D.	%RSD	RRF#1	RRF#2	RRF#3	RRF#4	RRF#5
2,3,7,8-TCDF	0.93	0.013	1.4	0.92	0.95	0.93	0.92	0.95
1,2,3,7,8-PeCDF	0.93	0.015	1.6	0.92	0.92	0.93	0.93	0.95
2,3,4,7,8-PeCDF	1.04	0.019	1.8	1.03	1.02	1.05	1.05	1.07
1,2,3,4,7,8-HxCDF	0.96	0.035	3.7	0.94	0.92	0.98	0.99	1.00
1,2,3,6,7,8-HxCDF	0.93	0.013	1.4	0.92	0.94	0.94	0.91	0.94
2,3,4,6,7,8-HxCDF	0.96	0.022	2.3	0.95	0.94	0.97	0.97	0.99
1,2,3,7,8,9-HxCDF	0.89	0.021	2.4	0.87	0.88	0.90	0.90	0.92
1,2,3,4,6,7,8-HpCDF	0.91	0.011	1.2	0.90	0.90	0.90	0.92	0.92
1,2,3,4,7,8,9-HpCDF	0.91	0.010	1.1	0.90	0.90	0.92	0.91	0.92
OCDF	1.19	0.056	4.7	1.11	1.17	1.19	1.23	1.26
2,3,7,8-TCDD	1.05	0.023	2.2	1.01	1.06	1.05	1.05	1.07
1,2,3,7,8-PeCDD	0.97	0.018	1.9	0.95	0.95	0.98	0.97	0.99
1,2,3,4,7,8-HxCDD	1.00	0.019	1.9	1.01	1.00	1.00	0.96	1.01
1,2,3,6,7,8-HxCDD	0.98	0.032	3.2	0.93	0.98	0.99	1.01	1.01
1,2,3,7,8,9-HxCDD	0.97	0.016	1.6	0.95	0.96	0.98	0.99	0.98
1,2,3,4,6,7,8-HpCDD	1.01	0.025	2.5	1.01	0.97	1.02	1.03	1.04
OCDD	1.00	0.013	1.3	1.00	0.99	1.02	1.02	1.00
$^{13}C_{12}$-2,3,7,8-TCDF	1.57	0.047	3.0	1.52	1.55	1.55	1.57	1.65
$^{13}C_{12}$-1,2,3,7,8-PeCDF	1.21	0.078	6.5	1.13	1.20	1.17	1.20	1.34
$^{13}C_{12}$-2,3,4,7,8-PeCDF	1.17	0.081	6.9	1.09	1.15	1.13	1.17	1.31
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	1.33	0.020	1.5	1.35	1.33	1.33	1.32	1.30
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	1.51	0.034	2.2	1.47	1.48	1.53	1.53	1.54
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	1.38	0.012	0.9	1.38	1.38	1.40	1.37	1.36
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	1.19	0.014	1.2	1.18	1.16	1.20	1.19	1.20
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	1.31	0.033	2.5	1.31	1.26	1.33	1.31	1.35
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	1.08	0.046	4.3	1.06	1.03	1.09	1.08	1.15
$^{13}C_{12}$-2,3,7,8-TCDD	1.13	0.036	3.2	1.10	1.11	1.11	1.13	1.19
$^{13}C_{12}$-1,2,3,7,8-PeCDD	0.79	0.047	5.9	0.74	0.78	0.75	0.79	0.86
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	0.87	0.027	3.1	0.85	0.83	0.89	0.88	0.89
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	1.04	0.010	1.0	1.05	1.05	1.04	1.05	1.03
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	0.81	0.017	2.1	0.81	0.80	0.80	0.81	0.84
$^{13}C_{12}$-OCDD	0.74	0.055	7.4	0.70	0.70	0.73	0.72	0.83
$^{13}C_{12}$-1,2,3,4-TCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00
$^{37}Cl_4$-2,3,7,8-TCDD	0.97	0.026	2.6	0.95	0.94	0.99	0.99	0.99

Table C: **EPA-1613CVS (with EPA-1613CSL and EPA-1613CS0.5); 7-point HRGC/HRMS Calibration and RRF Summary**

Calibration RRF Summary				Calibration Standard						
Calibration Filename: 24oct_EPA1613CVS-CAL.QLD				CSL	CS0.5	CS1	CS2	CS3	CS4	CS5
Name	Mean	S. D.	%RSD	RRF#1	RRF#2	RRF#3	RRF#4	RRF#5	RRF#6	RRF#7
2,3,7,8-TCDF	0.92	0.045	4.8	0.96	0.83	0.92	0.95	0.93	0.92	0.95
1,2,3,7,8-PeCDF	0.93	0.013	1.4	0.94	0.92	0.92	0.92	0.93	0.93	0.95
2,3,4,7,8-PeCDF	1.02	0.058	5.7	0.90	1.00	1.03	1.02	1.05	1.05	1.07
1,2,3,4,7,8-HxCDF	0.96	0.029	3.0	0.96	0.97	0.94	0.92	0.98	0.99	1.00
1,2,3,6,7,8-HxCDF	0.92	0.030	3.3	0.90	0.86	0.92	0.94	0.94	0.91	0.94
2,3,4,6,7,8-HxCDF	0.94	0.047	5.0	0.87	0.89	0.95	0.94	0.97	0.97	0.99
1,2,3,7,8,9-HxCDF	0.88	0.029	3.3	0.83	0.88	0.87	0.88	0.90	0.90	0.92
1,2,3,4,6,7,8-HpCDF	0.90	0.033	3.7	0.83	0.93	0.90	0.90	0.90	0.92	0.92
1,2,3,4,7,8,9-HpCDF	0.91	0.018	1.9	0.89	0.94	0.90	0.90	0.92	0.91	0.92
OCDF	1.18	0.052	4.4	1.15	1.14	1.11	1.17	1.19	1.23	1.26
2,3,7,8-TCDD	1.03	0.051	5.0	1.03	0.92	1.01	1.06	1.05	1.05	1.07
1,2,3,7,8-PeCDD	0.95	0.042	4.4	0.87	0.98	0.95	0.95	0.98	0.97	0.99
1,2,3,4,7,8-HxCDD	0.97	0.066	6.8	0.83	0.98	1.01	1.00	1.00	0.96	1.01
1,2,3,6,7,8-HxCDD	0.96	0.044	4.5	0.90	0.92	0.93	0.98	0.99	1.01	1.01
1,2,3,7,8,9-HxCDD	0.94	0.054	5.7	0.83	0.92	0.95	0.96	0.98	0.99	0.98
1,2,3,4,6,7,8-HpCDD	1.01	0.033	3.3	0.95	1.03	1.01	0.97	1.02	1.03	1.04
OCDD	1.00	0.023	2.3	0.95	1.00	1.00	0.99	1.02	1.02	1.00
$^{13}C_{12}$-2,3,7,8-TCDF	1.56	0.042	2.7	1.52	1.54	1.52	1.55	1.55	1.57	1.65
$^{13}C_{12}$-1,2,3,7,8-PeCDF	1.20	0.066	5.5	1.18	1.17	1.13	1.20	1.17	1.20	1.34
$^{13}C_{12}$-2,3,4,7,8-PeCDF	1.16	0.071	6.1	1.12	1.13	1.09	1.15	1.13	1.17	1.31
$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	1.33	0.018	1.4	1.32	1.35	1.35	1.33	1.33	1.32	1.30
$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	1.53	0.045	3.0	1.60	1.56	1.47	1.48	1.53	1.53	1.54
$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	1.39	0.019	1.4	1.39	1.42	1.38	1.38	1.40	1.37	1.36
$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	1.19	0.012	1.0	1.19	1.19	1.18	1.16	1.20	1.19	1.20
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	1.31	0.028	2.2	1.30	1.33	1.31	1.26	1.33	1.31	1.35
$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	1.07	0.045	4.2	1.02	1.08	1.06	1.03	1.09	1.08	1.15
$^{13}C_{12}$-2,3,7,8-TCDD	1.12	0.033	3.0	1.09	1.11	1.10	1.11	1.11	1.13	1.19
$^{13}C_{12}$-1,2,3,7,8-PeCDD	0.78	0.040	5.1	0.75	0.78	0.74	0.78	0.75	0.79	0.86
$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	0.87	0.025	2.9	0.86	0.90	0.85	0.83	0.89	0.88	0.89
$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	1.05	0.015	1.5	1.08	1.06	1.05	1.05	1.04	1.05	1.03
$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	0.81	0.016	2.0	0.79	0.81	0.81	0.80	0.80	0.81	0.84
$^{13}C_{12}$-OCDD	0.73	0.046	6.3	0.71	0.72	0.70	0.70	0.73	0.72	0.83
$^{13}C_{12}$-1,2,3,4-TCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	1.00	0.000	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
$^{37}Cl_4$-2,3,7,8-TCDD	0.97	0.053	5.4	0.90	1.07	0.95	0.94	0.99	0.99	0.99

Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

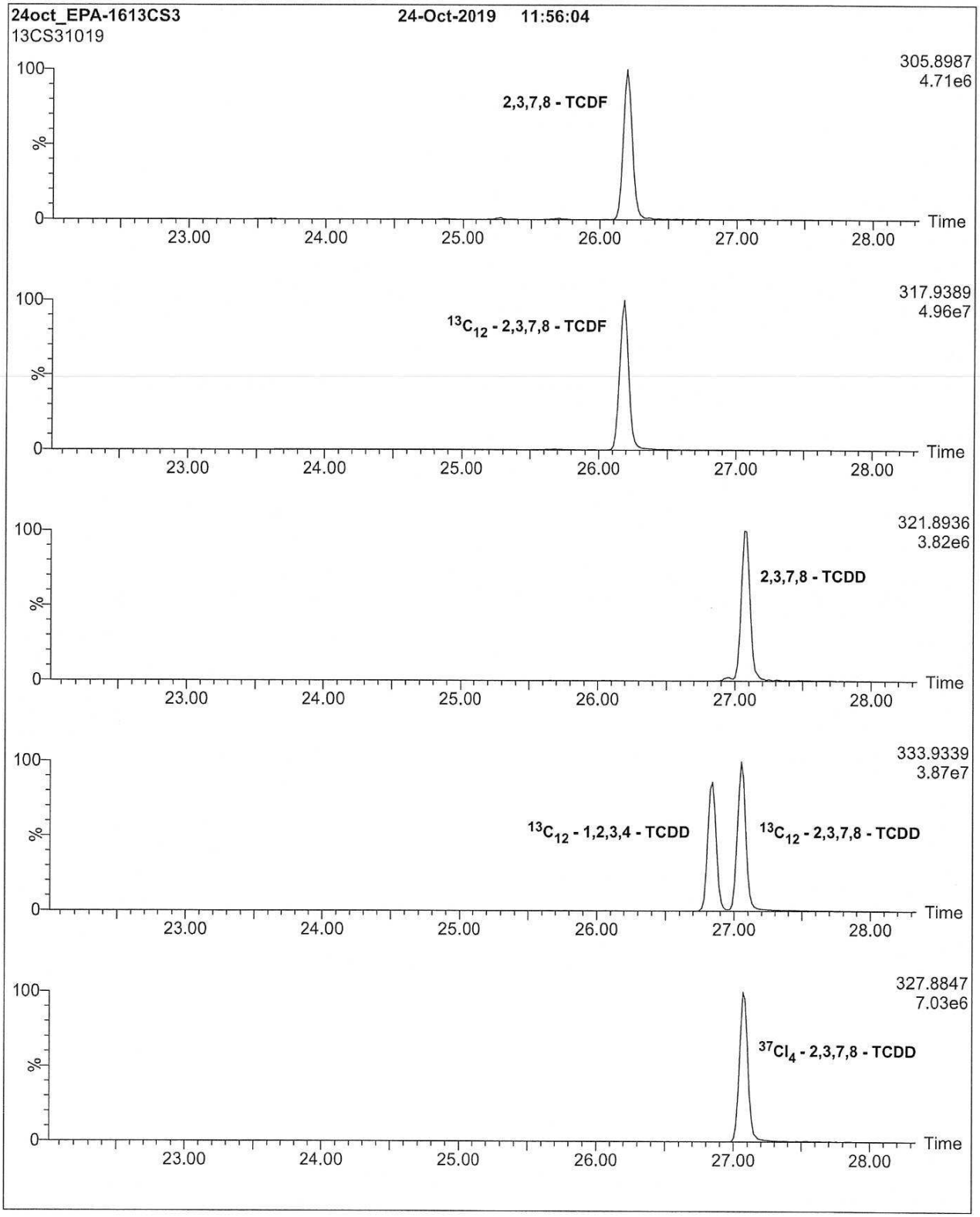


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

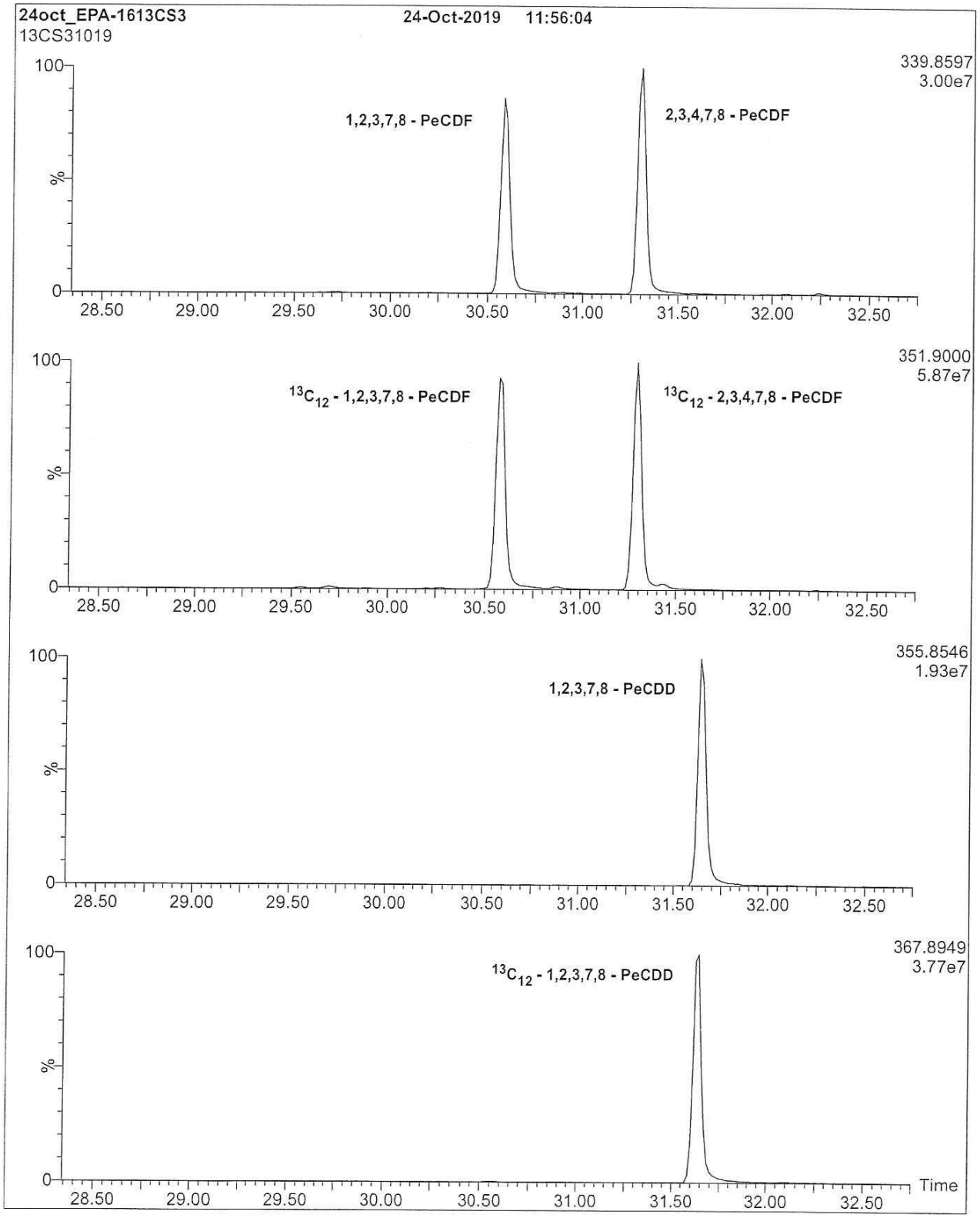


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

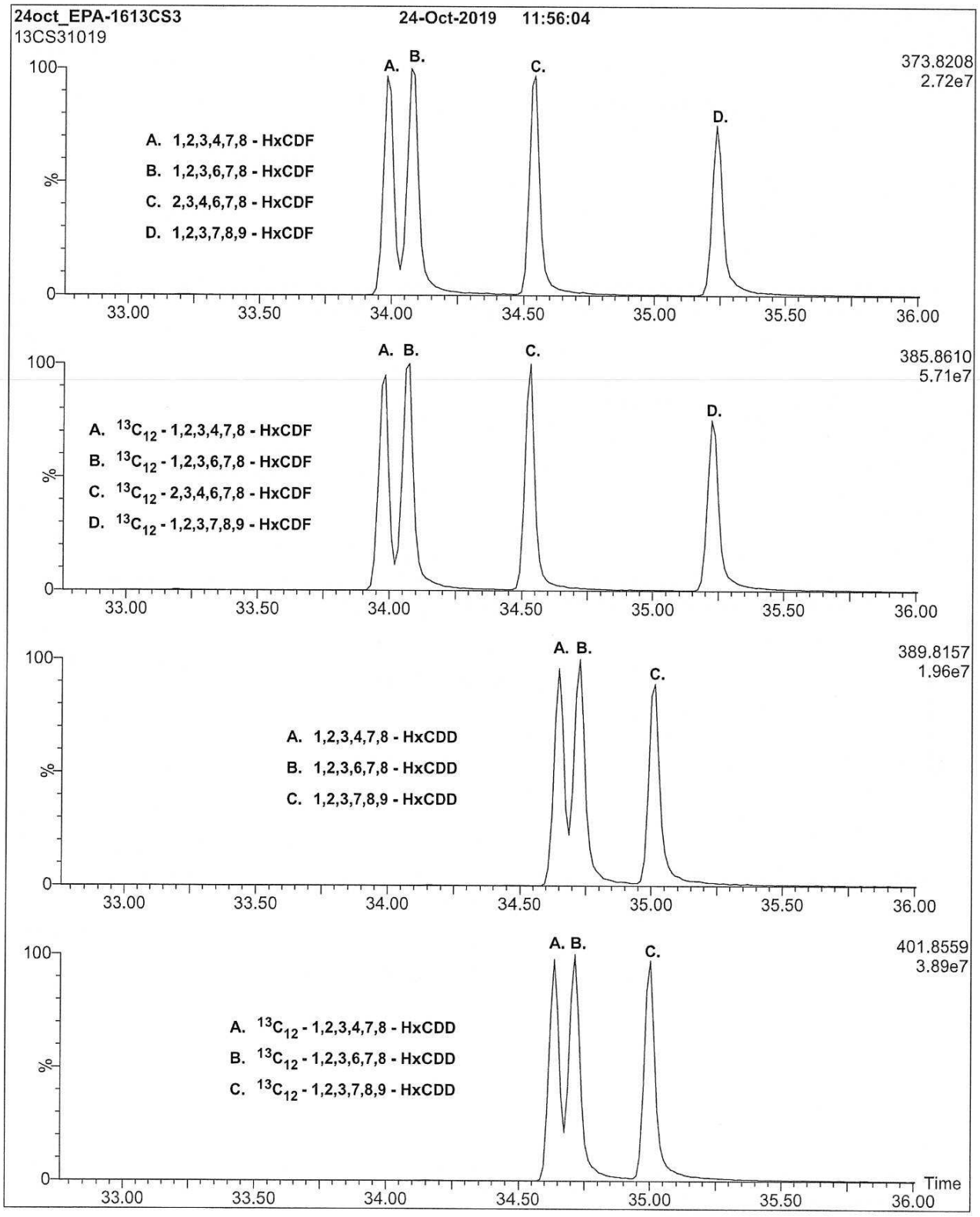


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

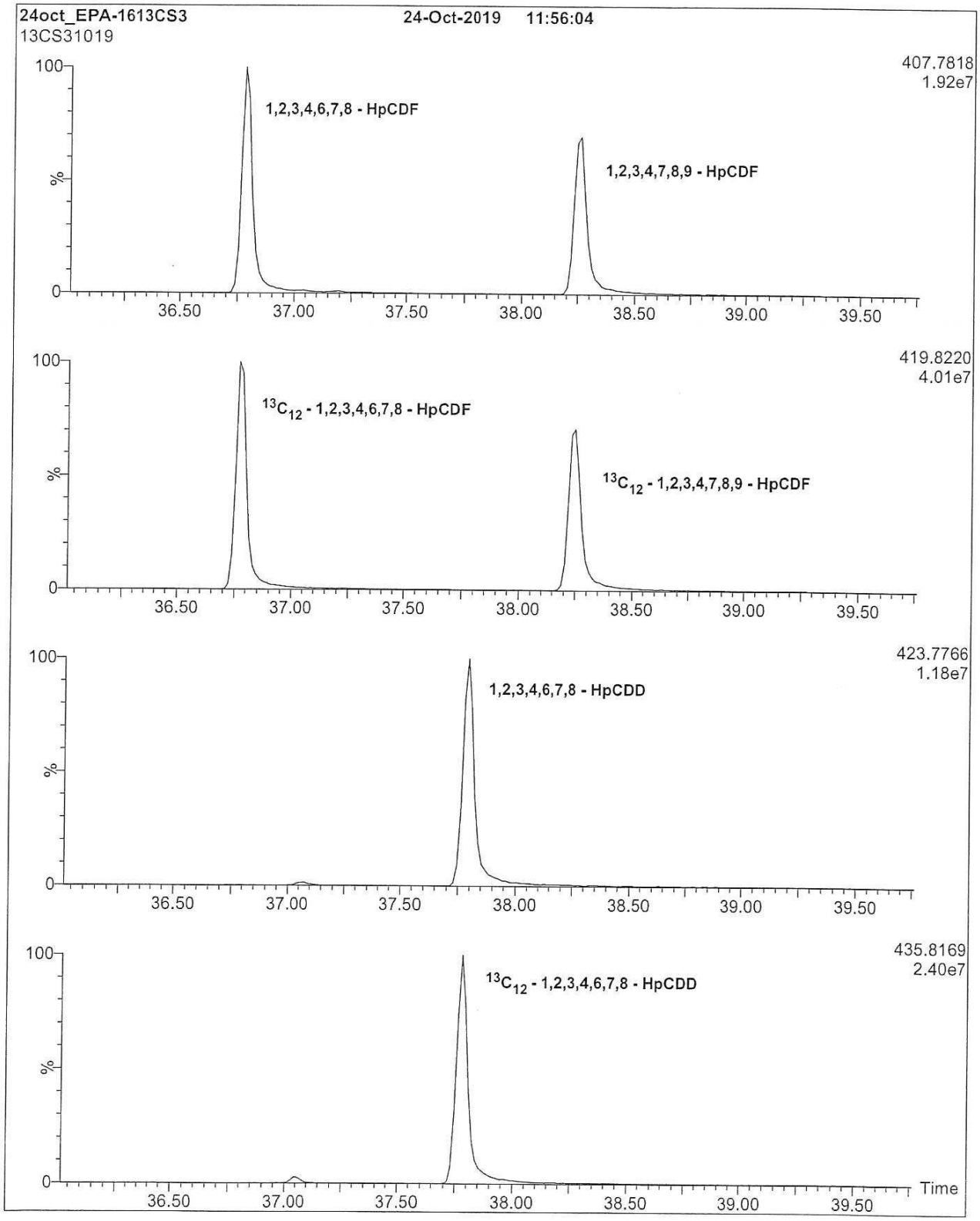
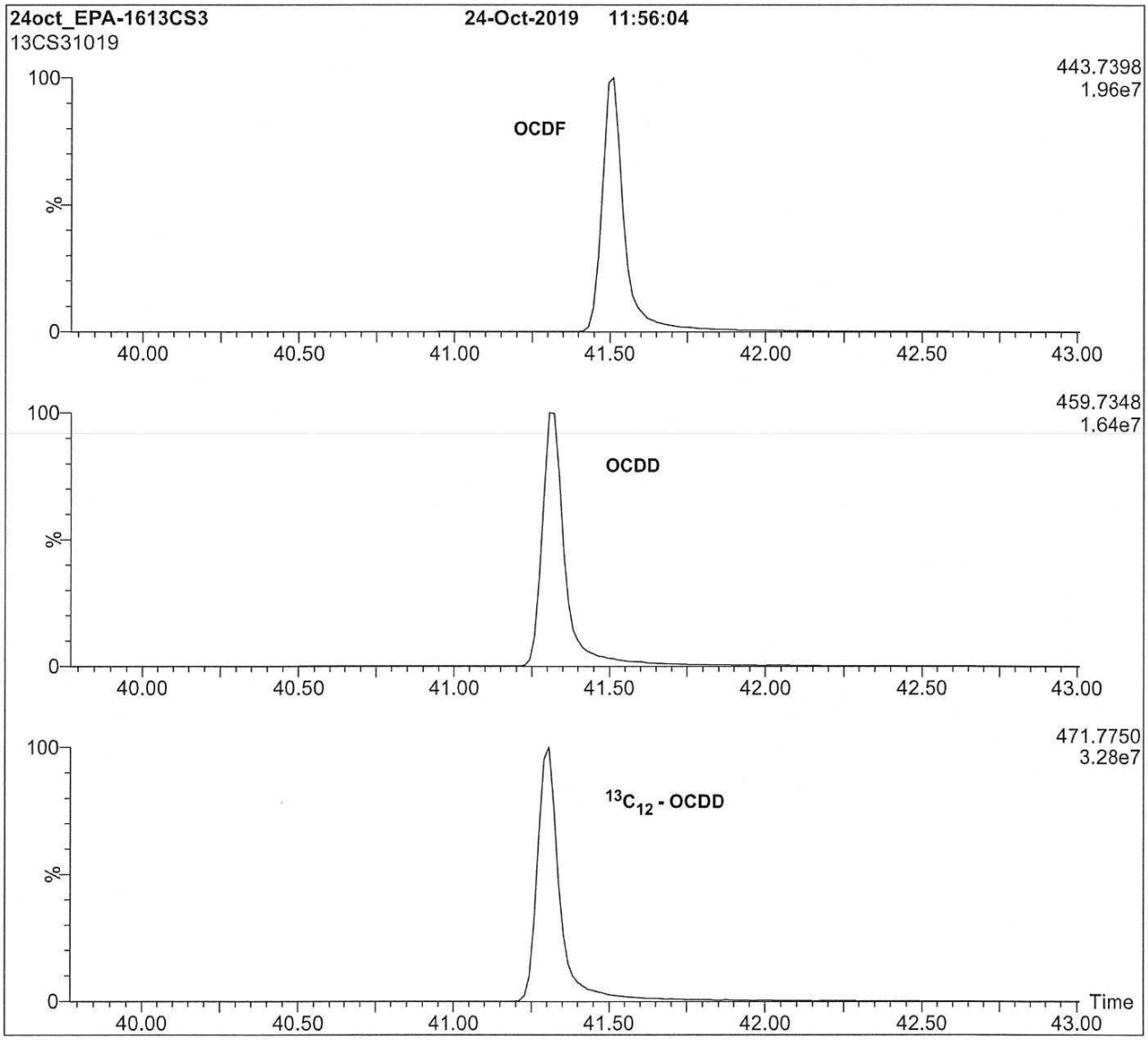


Figure 1: **EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)**



HRGC/HRMS:

Agilent 6890N (HRGC)
Autospec Ultima (HRMS)

Chromatographic Conditions:

Column: 60 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W

Flow:	Constant at 1 ml/min	Oven:	150 °C (1 min)
Injector:	280 °C (Splitless Injection)		12 °C/min to 200 °C
Ionization:	EI+		3 °C/min to 235 °C
Detector:	280 °C		235 °C (8 min)
	SIR at 10,000 mass resolving power		8 °C/min to 310 °C
			310 °C (8 min)

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

EPA-1613CSS

U.S. EPA Method 1613 Cleanup Standard Spiking Solution

PRODUCT CODE:	EPA-1613CSS
LOT NUMBER:	13CSS1020
SOLVENT(S):	Nonane
DATE PREPARED: (mm/dd/yyyy)	11/12/2020
LAST TESTED: (mm/dd/yyyy)	11/19/2020
EXPIRY DATE: (mm/dd/yyyy)	11/19/2027
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

I 11575

DESCRIPTION:

EPA-1613CSS contains 2,3,7,8-[$^{37}Cl_4$]-tetrachlorodibenzo-*p*-dioxin at the concentration given in Table A.

EPA-1613CSS was designed and prepared to be used according to U.S. EPA Method 1613, Revision B.

2,3,7,8-[$^{37}Cl_4$]-Tetrachlorodibenzo-*p*-dioxin has a chemical purity of >98% and an isotopic (^{37}Cl) purity of ≥95%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution
Figure 1: HRGC/HRMS Data (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

Table A: **EPA-1613CSS; Components and Concentrations (ng/mL, ± 5% in nonane)**

Compound	Acronym	CAS #	Concentration (ng/mL)
2,3,7,8-[$^{37}Cl_4$]-Tetrachlorodibenzo-*p*-dioxin	$^{37}Cl_4$-2,3,7,8-TCDD	85508-50-5	40.0

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 11/20/2020 (mm/dd/yyyy)

B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

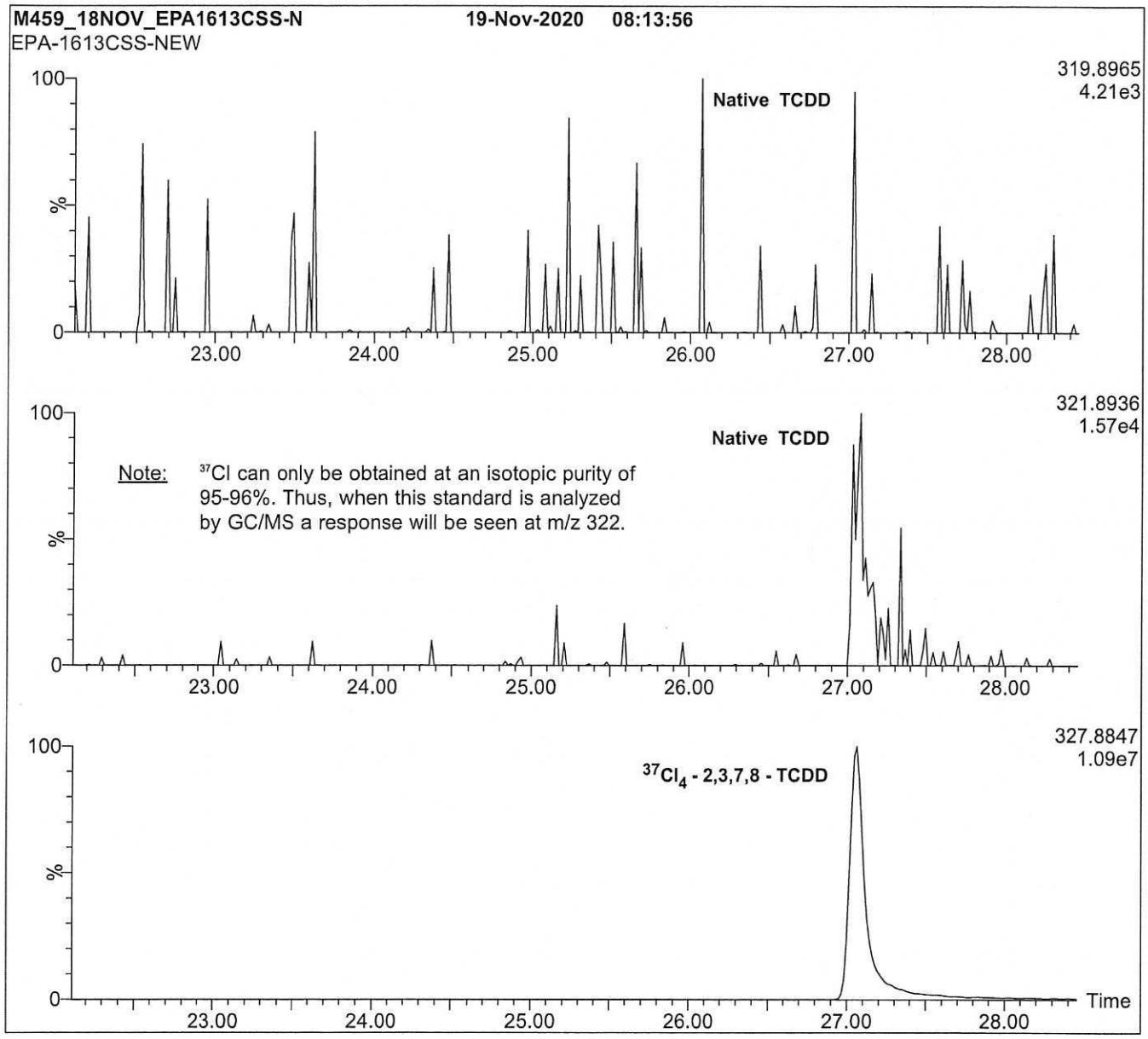
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ANSI National Accreditation Board ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **EPA-1613CSS; HRGC/HRMS Data (60 m DB-5 Column)**



Conditions for Figure 1:

Agilent 6890N HRGC
Autospec Ultima HRMS

Chromatographic Conditions:

Column: 60 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W

Flow:	Constant at 1 mL/min	Oven:	150°C (1 min)
Injector:	280°C (Splitless Injection)		12°C/min to 200°C
Ionization:	EI+		3°C/min to 235°C
Detector:	280°C		235°C (8 min)
	SIR at 10,000 mass resolving power		8°C/min to 310°C
			310°C (8 min)

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

EPA-1613LCS

U.S. EPA Method 1613
Labelled Compound Stock Solution

PRODUCT CODE:	EPA-1613LCS
LOT NUMBER:	13LCS1020
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	10/16/2020
LAST TESTED: (mm/dd/yyyy)	10/21/2020
EXPIRY DATE: (mm/dd/yyyy)	10/21/2027
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

I 11 576

DESCRIPTION:

EPA-1613LCS is a solution/mixture of mass-labelled ($^{13}C_{12}$) chlorinated dibenzo-*p*-dioxins (PCDDs) and dibenzofurans (PCDFs). The components and their concentrations are given in Table A.

EPA-1613LCS was designed and prepared to be used according to U.S. EPA Method 1613, Revision B.

The individual ^{13}C-labelled PCDDs and PCDFs all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations
Figure 1: HRGC/HRMS Data (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

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SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

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CALA Testing Accreditation No. A1226

ANAB ANSI National Accreditation Board ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

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Table A: **EPA-1613LCS; Components and Concentrations (ng/mL, ± 5% in nonane/3.2% toluene)**

Compound	Acronym	CAS #	Concentration (ng/mL)
Mass-Labelled PCDDs:			
2,3,7,8-Tetrachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin	$^{13}C_{12}$-2,3,7,8-TCDD	76523-40-5	100
1,2,3,7,8-Pentachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin	$^{13}C_{12}$-1,2,3,7,8-PeCDD	109719-79-1	100
1,2,3,4,7,8-Hexachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	109719-80-4	100
1,2,3,6,7,8-Hexachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	109719-81-5	100
1,2,3,4,6,7,8-Heptachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	109719-83-7	100
Octachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin	$^{13}C_{12}$-OCDD	114423-97-1	200
Mass-Labelled PCDFs:			
2,3,7,8-Tetrachloro[$^{13}C_{12}$]dibenzofuran	$^{13}C_{12}$-2,3,7,8-TCDF	89059-46-1	100
1,2,3,7,8-Pentachloro[$^{13}C_{12}$]dibenzofuran	$^{13}C_{12}$-1,2,3,7,8-PeCDF	109719-77-9	100
2,3,4,7,8-Pentachloro[$^{13}C_{12}$]dibenzofuran	$^{13}C_{12}$-2,3,4,7,8-PeCDF	116843-02-8	100
1,2,3,4,7,8-Hexachloro[$^{13}C_{12}$]dibenzofuran	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	114423-98-2	100
1,2,3,6,7,8-Hexachloro[$^{13}C_{12}$]dibenzofuran	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	116843-03-9	100
1,2,3,7,8,9-Hexachloro[$^{13}C_{12}$]dibenzofuran	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	116843-04-0	100
2,3,4,6,7,8-Hexachloro[$^{13}C_{12}$]dibenzofuran	$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	116843-05-1	100
1,2,3,4,6,7,8-Heptachloro[$^{13}C_{12}$]dibenzofuran	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	109719-84-8	100
1,2,3,4,7,8,9-Heptachloro[$^{13}C_{12}$]dibenzofuran	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	109719-94-0	100

Certified By: _____ **Date:** 11/09/2020 (mm/dd/yyyy)

B.G. Chittim, General Manager

Figure 1: EPA-1613LCS; HRGC/HRMS Data (60 m DB-5 Column)

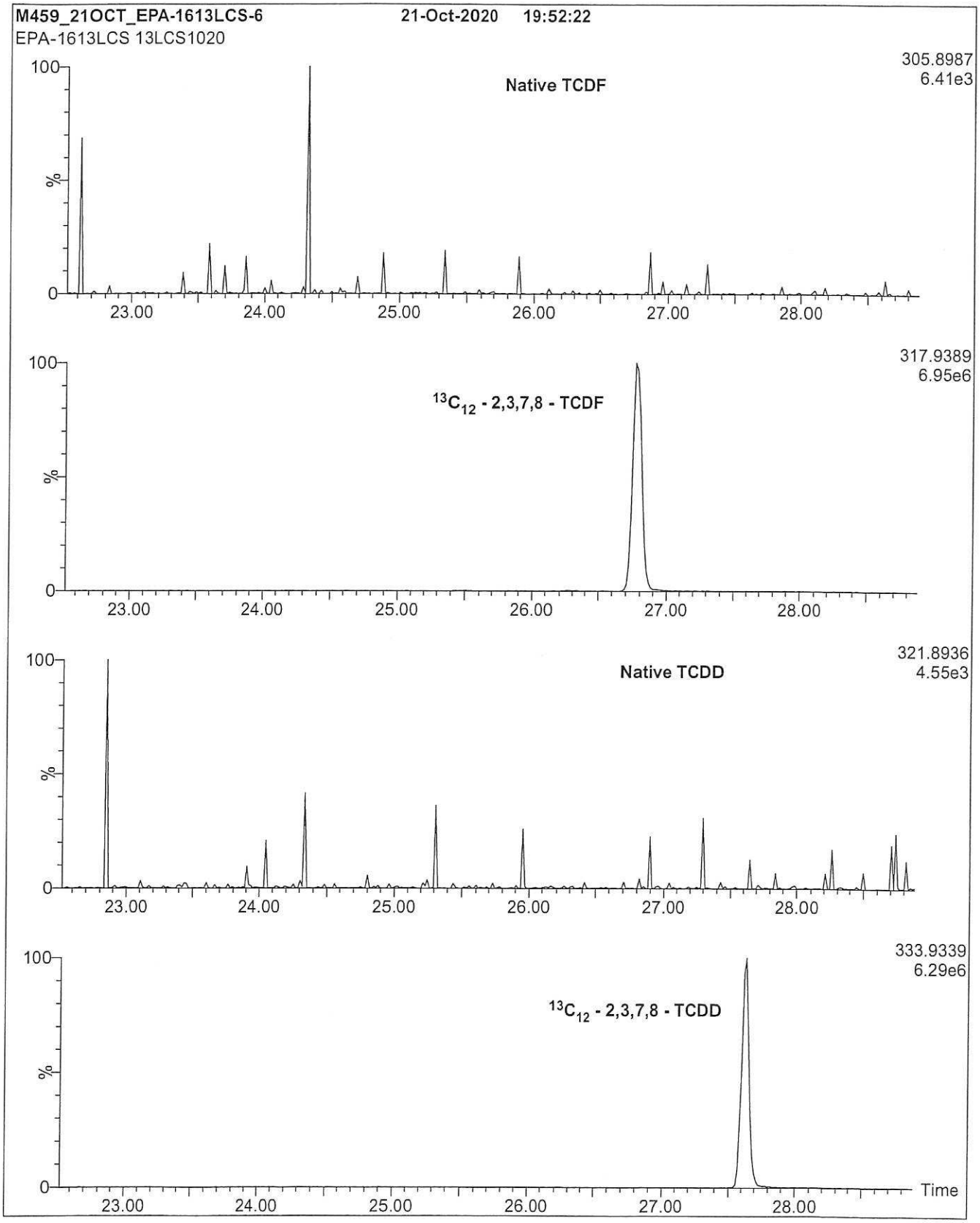


Figure 1: **EPA-1613LCS; HRGC/HRMS Data (60 m DB-5 Column)**

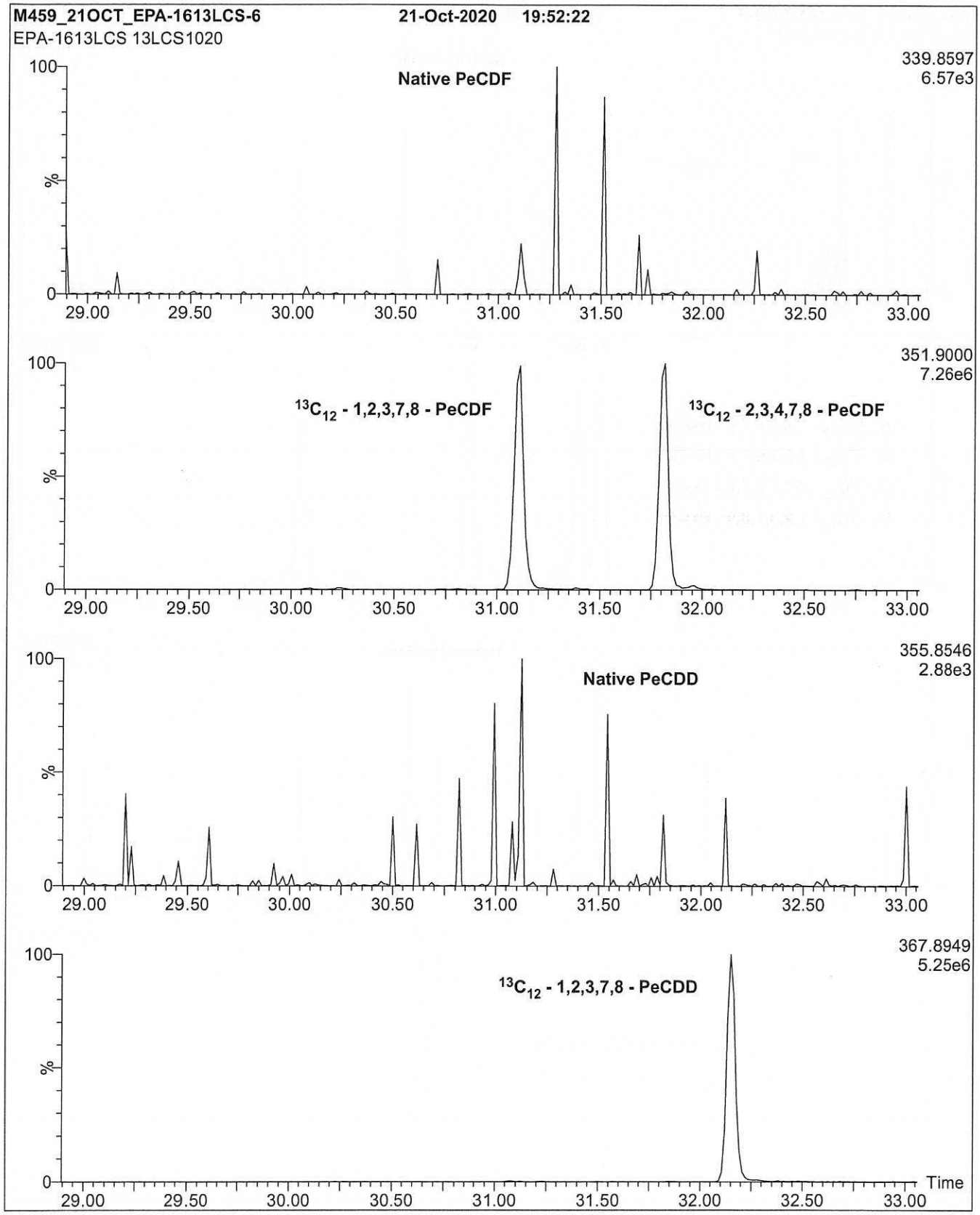


Figure 1: EPA-1613LCS; HRGC/HRMS Data (60 m DB-5 Column)

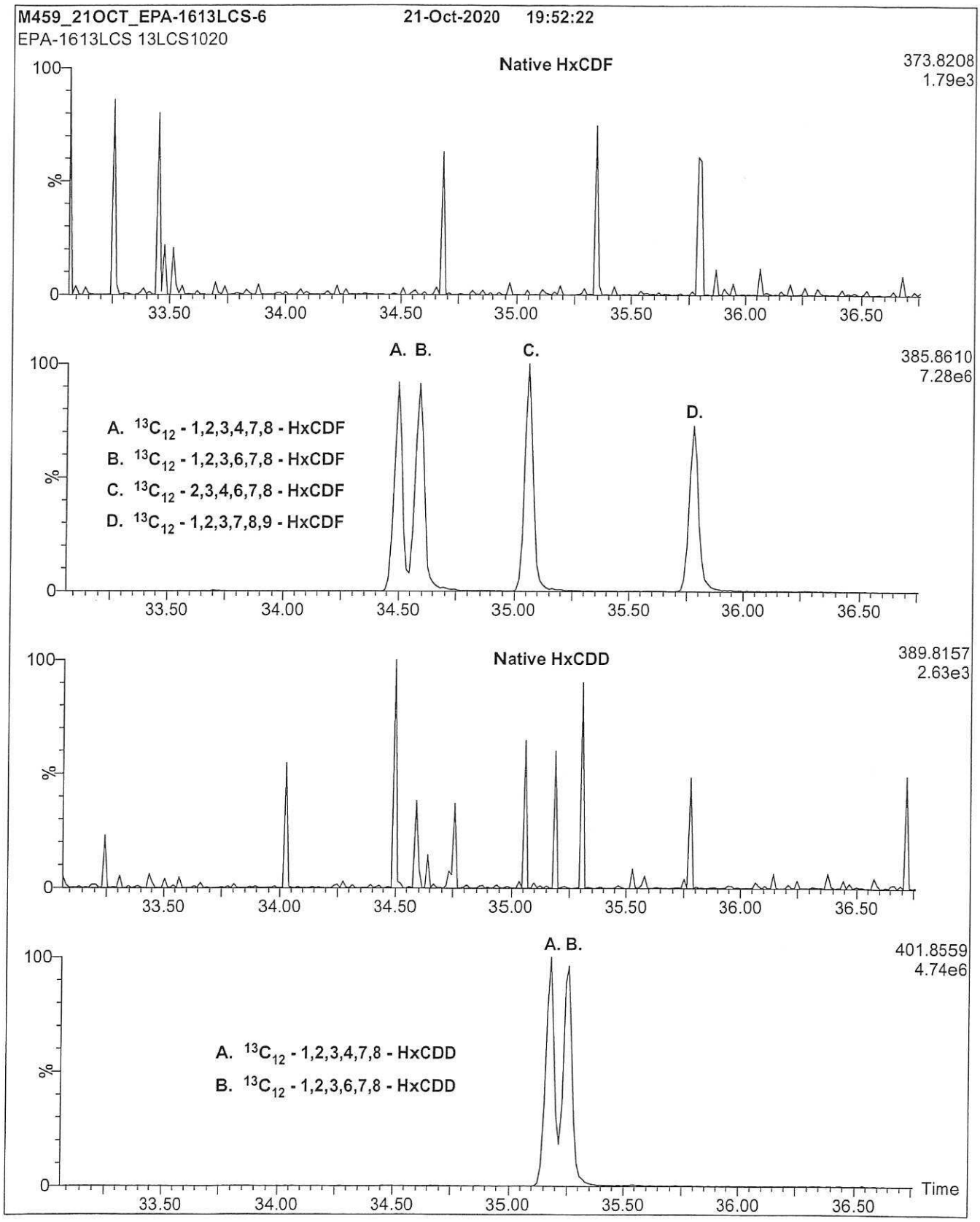


Figure 1: **EPA-1613LCS; HRGC/HRMS Data (60 m DB-5 Column)**

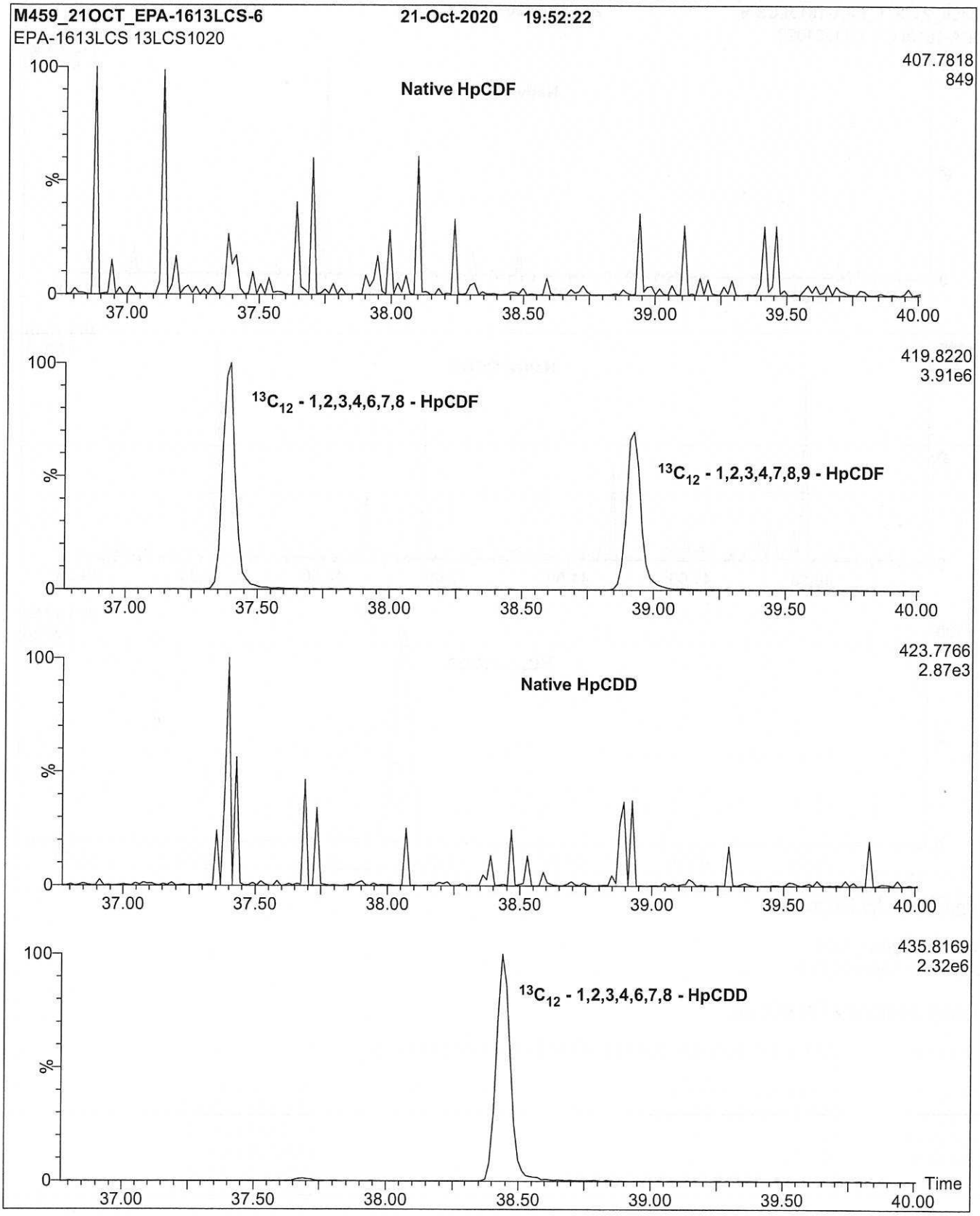
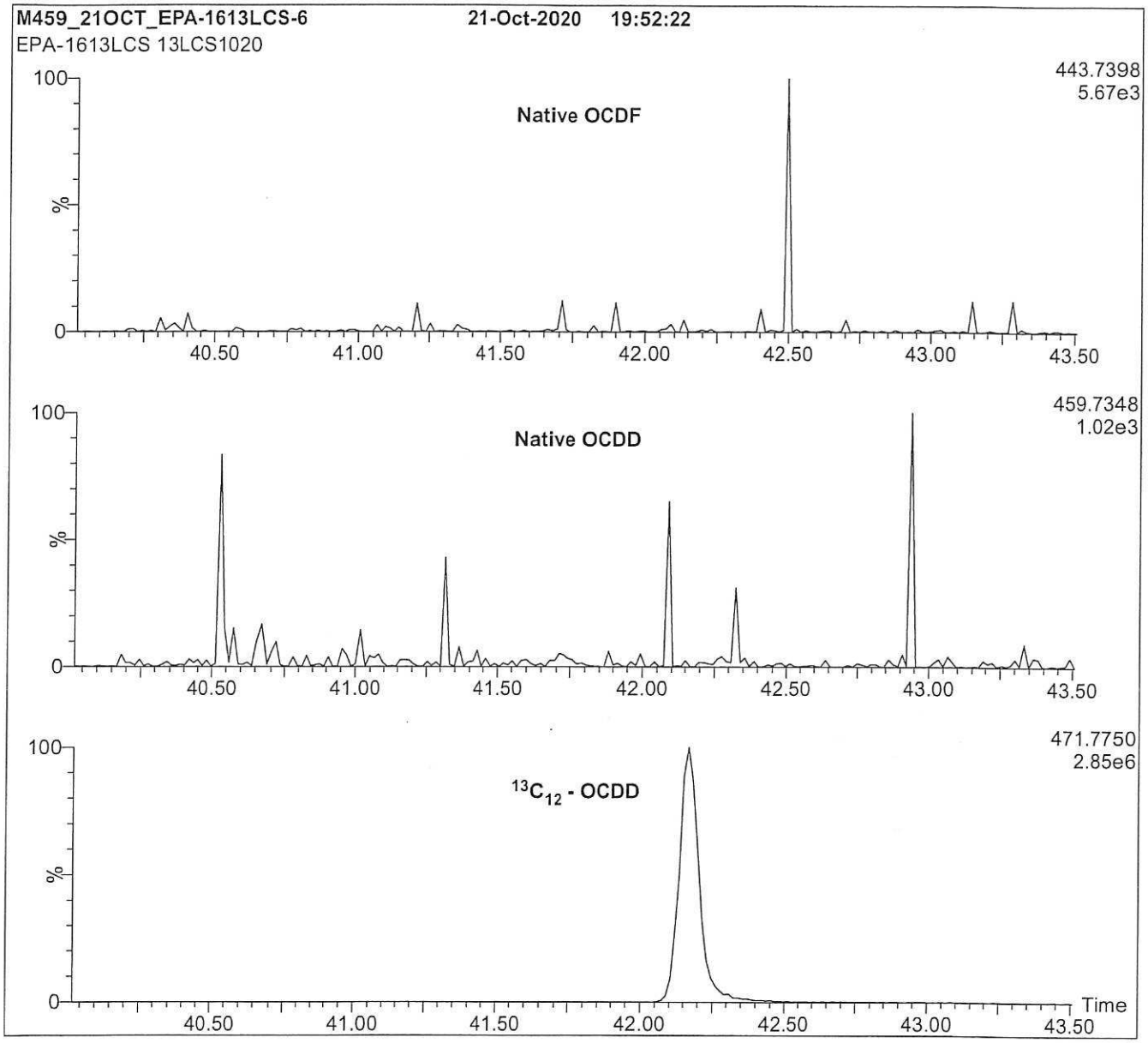


Figure 1: EPA-1613LCS; HRGC/HRMS Data (60 m DB-5 Column)



Conditions for Figure 1:

Agilent 6890N HRGC
Autospec Ultima HRMS

Chromatographic Conditions:

Column: 60 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W

Flow:	Constant at 1 mL/min	Oven:	150°C (1 min)
Injector:	280°C (Splitless Injection)		12°C/min to 200°C
Ionization:	EI+		3°C/min to 235°C
Detector:	300°C		235°C (8 min)
	SIR at 10,000 mass resolving power		8°C/min to 310°C
			310°C (8 min)

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

CS3WT

Calibration and Verification Solution (EPA-1613CS3) combined with Window Defining and 2,3,7,8-TCDD Resolution Testing Congeners

PRODUCT CODE:	CS3WT
LOT NUMBER:	CS3WT1020
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	12/02/2020
LAST TESTED: (mm/dd/yyyy)	12/10/2020
EXPIRY DATE: (mm/dd/yyyy)	12/10/2027
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

J001522

DESCRIPTION:

CS3WT is a solution/mixture of native ($^{12}C_{12}$) and mass-labelled ($^{13}C_{12}$) chlorinated dibenzo-*p*-dioxins (PCDDs) and dibenzofurans (PCDFs). The components and their concentrations are given in Tables A and B.

CS3WT is an HRGC/HRMS calibration solution that was designed and prepared to be used according to U.S. EPA Method 1613, Revision B, in place of EPA-1613CS3 (lot: 13CS31020). Additionally, it contains the PCDD and PCDF isomers required to set retention time windows as well as test and establish isomer specificity for 2,3,7,8-TCDD on a DB-5 (or equivalent) capillary column.

The individual ^{13}C-labelled PCDDs and PCDFs all have chemical purities of >98% and isotopic purities of ≥99%. The 2,3,7,8-[$^{37}Cl_4$]-tetrachlorodibenzo-*p*-dioxin has a chemical purity of >98% and an isotopic (^{37}Cl) purity of ≥95%. The individual native 2,3,7,8-substituted PCDD and PCDF congeners all have chemical purities of >98%; the other congeners (window defining and resolution testing) should only be considered semi-quantitative.

This current lot of CS3WT is to be used with the 1613 calibration solutions having the following lot numbers:

PRODUCT CODE	LOT NUMBER
EPA-1613CS1	13CS11020
EPA-1613CS2	13CS21020
EPA-1613CS3	13CS31020
EPA-1613CS4	13CS41020
EPA-1613CS5	13CS51020
EPA-1613CSL	13CSL1020
EPA-1613CS0.5	13CS0.51020

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

DOCUMENTATION/ DATA ATTACHED:

Table A: Quantitative Components and Concentrations of the Solution/Mixture
Table B: Semi-Quantitative Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 3 for further details.
- Only the 2,3,7,8-substituted PCDDs and PCDFs should be used for quantitation. The other congeners (window defining and 2,3,7,8-TCDD resolution testing) should be considered semi-quantitative (within ±20% of their design value). Impurities have been identified where possible.

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) has been assigned to the quantitative components in this product. A maximum combined percent relative uncertainty of ±20% has been assigned to the semi-quantitative components in this product.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ANSI National Accreditation Board ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Table A: **CS3WT; Quantitative Components and Concentrations (ng/mL, ± 5%, in nonane/4.5% toluene)**

Compound		Acronym	CAS #	Concentration (ng/mL)
Native PCDDs:	**Designation[a]**			
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin		2,3,7,8-TCDD	1746-01-6	10.0
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin		1,2,3,7,8-PeCDD	40321-76-4	50.0
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin		1,2,3,4,7,8-HxCDD	39227-28-6	50.0
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin		1,2,3,6,7,8-HxCDD	57653-85-7	50.0
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	Last HxCDD[b]	1,2,3,7,8,9-HxCDD	19408-74-3	50.0
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	Last HpCDD	1,2,3,4,6,7,8-HpCDD	35822-46-9	50.0
Octachlorodibenzo-*p*-dioxin		OCDD	3268-87-9	100
Native PCDFs:	**Designation[a]**			
2,3,7,8-Tetrachlorodibenzofuran		2,3,7,8-TCDF	51207-31-9	10.0
1,2,3,7,8-Pentachlorodibenzofuran		1,2,3,7,8-PeCDF	57117-41-6	50.0
2,3,4,7,8-Pentachlorodibenzofuran		2,3,4,7,8-PeCDF	57117-31-4	50.0
1,2,3,4,7,8-Hexachlorodibenzofuran		1,2,3,4,7,8-HxCDF	70648-26-9	50.0
1,2,3,6,7,8-Hexachlorodibenzofuran		1,2,3,6,7,8-HxCDF	57117-44-9	50.0
1,2,3,7,8,9-Hexachlorodibenzofuran		1,2,3,7,8,9-HxCDF	72918-21-9	50.0
2,3,4,6,7,8-Hexachlorodibenzofuran		2,3,4,6,7,8-HxCDF	60851-34-5	50.0
1,2,3,4,6,7,8-Heptachlorodibenzofuran	First HpCDF[c]	1,2,3,4,6,7,8-HpCDF	67562-39-4	50.0
1,2,3,4,7,8,9-Heptachlorodibenzofuran	Last HpCDF	1,2,3,4,7,8,9-HpCDF	55673-89-7	50.0
Octachlorodibenzofuran		OCDF	39001-02-0	100
Mass-Labelled PCDDs:				
2,3,7,8-Tetrachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin		$^{13}C_{12}$-2,3,7,8-TCDD	76523-40-5	100
1,2,3,7,8-Pentachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin		$^{13}C_{12}$-1,2,3,7,8-PeCDD	109719-79-1	100
1,2,3,4,7,8-Hexachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin		$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	109719-80-4	100
1,2,3,6,7,8-Hexachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin		$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	109719-81-5	100
1,2,3,4,6,7,8-Heptachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin		$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	109719-83-7	100
Octachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin		$^{13}C_{12}$-OCDD	114423-97-1	200
Mass-Labelled PCDFs:				
2,3,7,8-Tetrachloro[$^{13}C_{12}$]dibenzofuran		$^{13}C_{12}$-2,3,7,8-TCDF	89059-46-1	100
1,2,3,7,8-Pentachloro[$^{13}C_{12}$]dibenzofuran		$^{13}C_{12}$-1,2,3,7,8-PeCDF	109719-77-9	100
2,3,4,7,8-Pentachloro[$^{13}C_{12}$]dibenzofuran		$^{13}C_{12}$-2,3,4,7,8-PeCDF	116843-02-8	100
1,2,3,4,7,8-Hexachloro[$^{13}C_{12}$]dibenzofuran		$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	114423-98-2	100
1,2,3,6,7,8-Hexachloro[$^{13}C_{12}$]dibenzofuran		$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	116843-03-9	100
1,2,3,7,8,9-Hexachloro[$^{13}C_{12}$]dibenzofuran		$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	116843-04-0	100
2,3,4,6,7,8-Hexachloro[$^{13}C_{12}$]dibenzofuran		$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	116843-05-1	100
1,2,3,4,6,7,8-Heptachloro[$^{13}C_{12}$]dibenzofuran		$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	109719-84-8	100
1,2,3,4,7,8,9-Heptachloro[$^{13}C_{12}$]dibenzofuran		$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	109719-94-0	100
Cleanup Standard:				
2,3,7,8-[$^{37}Cl_4$]-Tetrachlorodibenzo-*p*-dioxin		$^{37}Cl_4$-2,3,7,8-TCDD	85508-50-5	10.0
Internal Standards:				
1,2,3,4-Tetrachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin		$^{13}C_{12}$-1,2,3,4-TCDD	114423-99-3	100
1,2,3,7,8,9-Hexachloro[$^{13}C_{12}$]dibenzo-*p*-dioxin		$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	109719-82-6	100

[a] First/Last eluting isomer for the specified homologue group (see Table B for additional Window Definers).
[b, c] – see Table B for footnote.

Table B: **CS3WT; Semi-Quantitative Components and Concentrations (ng/mL, ± 20%, in nonane/4.5% toluene)**

Compound		Acronym	CAS #	Concentration (ng/mL)
PCDD Window Definers:	**Designation[a]**			
1,3,6,8-Tetrachlorodibenzo-*p*-dioxin	First TCDD	1,3,6,8-TCDD	33423-92-6	10.0
1,2,8,9-Tetrachlorodibenzo-*p*-dioxin	Last TCDD	1,2,8,9-TCDD	62470-54-6	10.0
1,2,4,6,8-/1,2,4,7,9-Pentachlorodibenzo-*p*-dioxin	First PeCDD	1,2,4,6,8-PeCDD 1,2,4,7,9-PeCDD	71998-76-0 82291-37-0	50.0[d]
1,2,3,8,9-Pentachlorodibenzo-*p*-dioxin	Last PeCDD	1,2,3,8,9-PeCDD	71925-18-3	50.0
1,2,4,6,7,9-Hexachlorodibenzo-*p*-dioxin	First HxCDD	1,2,4,6,7,9-HxCDD	39227-62-8	50.0
1,2,3,4,6,7,9-Heptachlorodibenzo-*p*-dioxin	First HpCDD	1,2,3,4,6,7,9-HpCDD	58200-70-7	50.0
PCDF Window Definers:	**Designation[a]**			
1,3,6,8-Tetrachlorodibenzofuran	First TCDF	1,3,6,8-TCDF	71998-72-6	10.0
1,2,8,9-Tetrachlorodibenzofuran	Last TCDF	1,2,8,9-TCDF	70648-22-5	10.0
1,3,4,6,8-Pentachlorodibenzofuran	First PeCDF	1,3,4,6,8-PeCDF	83704-55-6	50.0
1,2,3,8,9-Pentachlorodibenzofuran	Last PeCDF	1,2,3,8,9-PeCDF	83704-54-5	50.0
1,2,3,4,6,8-Hexachlorodibenzofuran	First HxCDF	1,2,3,4,6,8-HxCDF	69698-60-8	50.0
2,3,7,8-TCDD Resolution Testing Isomers:				
1,2,3,4-Tetrachlorodibenzo-*p*-dioxin		1,2,3,4-TCDD	30746-58-8	5.00
1,2,3,7-/1,2,3,8-Tetrachlorodibenzo-*p*-dioxin		1,2,3,7-TCDD 1,2,3,8-TCDD	67028-18-6 53555-02-5	5.00[d]
1,2,3,9-Tetrachlorodibenzo-*p*-dioxin		1,2,3,9-TCDD	71669-26-6	10.0

[a] First/Last eluting isomer for the specified homologue group (see Table A for additional Window Definers).

[b] 1,2,3,4,6,7-HxCDD (last eluting HxCDD) not included; coelutes with 1,2,3,7,8,9-HxCDD on a 60 m DB-5 column. Use 1,2,3,7,8,9-HxCDD (see Table A) and 1,2,3,4,6,7,9-HpCDD to approximate the end of the HxCDD window.

[c] 1,2,3,4,8,9-HxCDF (last eluting HxCDF) not included; can interfere with 1,2,3,7,8,9-HxCDF on a 60 m DB-5 column. Use 1,2,3,4,6,7,8-HpCDF (see Table A) to approximate the end of the HxCDF window.

[d] Total concentration of isomers.

Certified By: _____ **Date:** 01/07/2020 (mm/dd/yyyy)

B.G. Chittim, General Manager

Figure 1: CS3WT; HRGC/HRMS Data (60 m DB-5 Column)

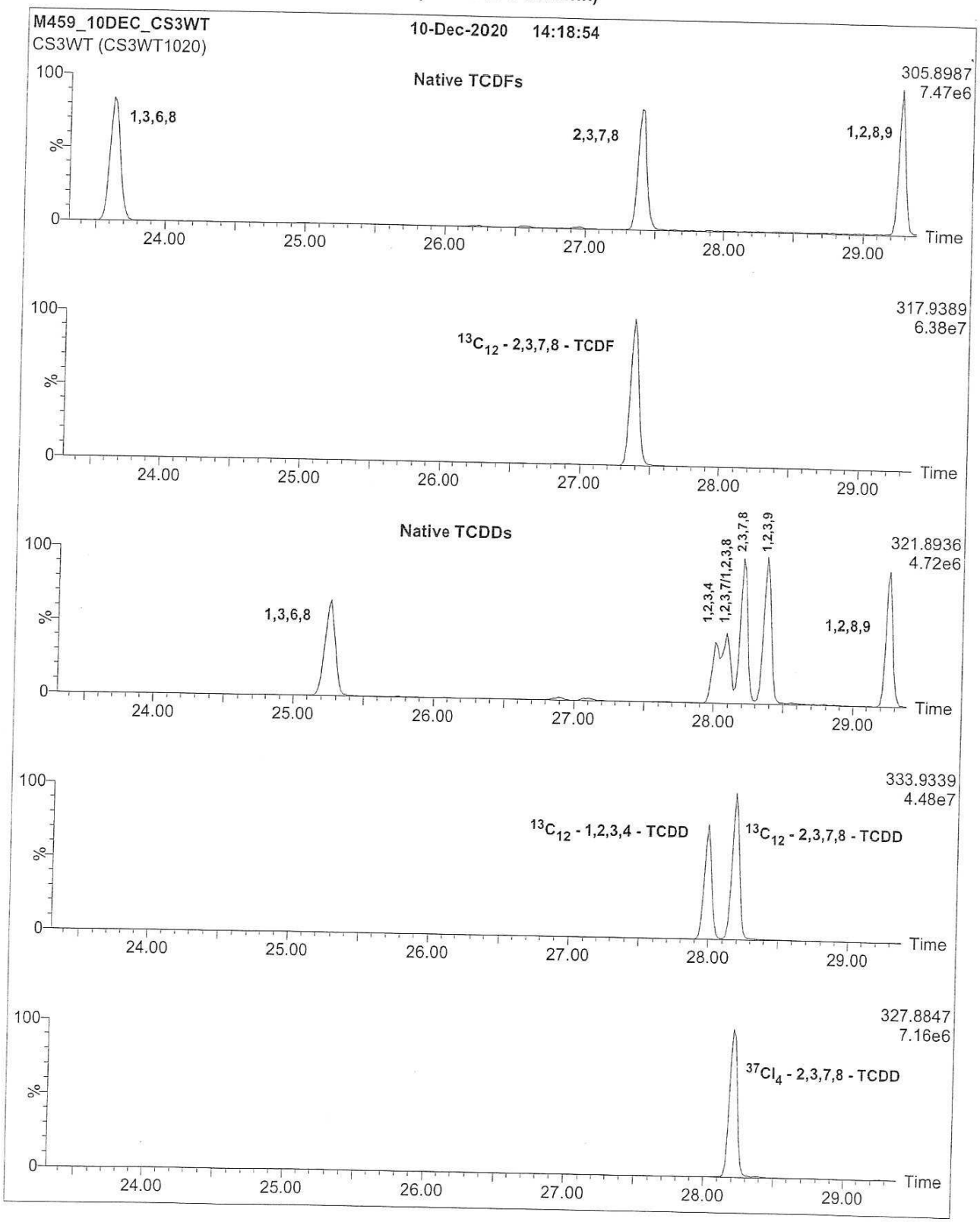


Figure 1: **CS3WT; HRGC/HRMS Data (60 m DB-5 Column)**

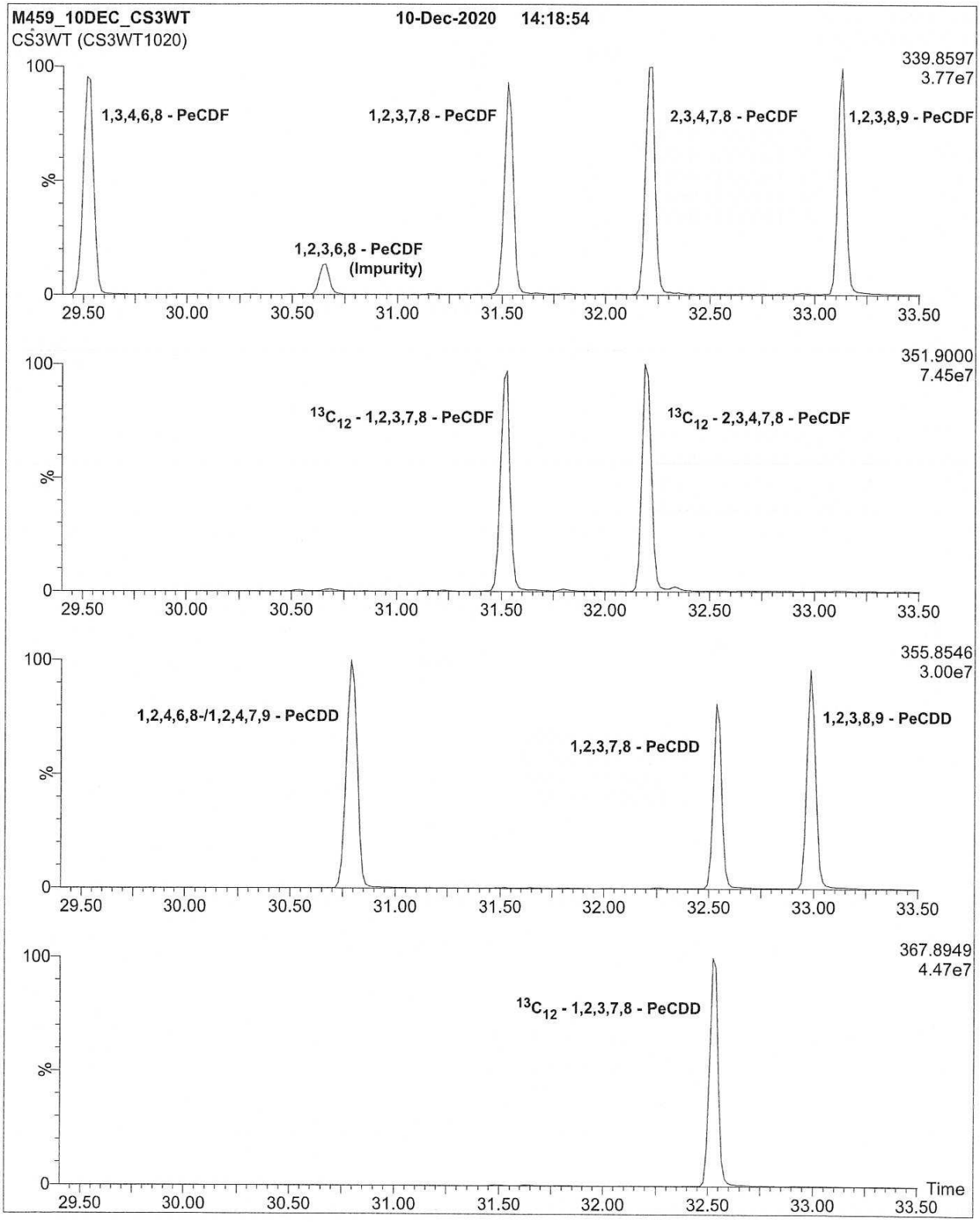


Figure 1: CS3WT; HRGC/HRMS Data (60 m DB-5 Column)

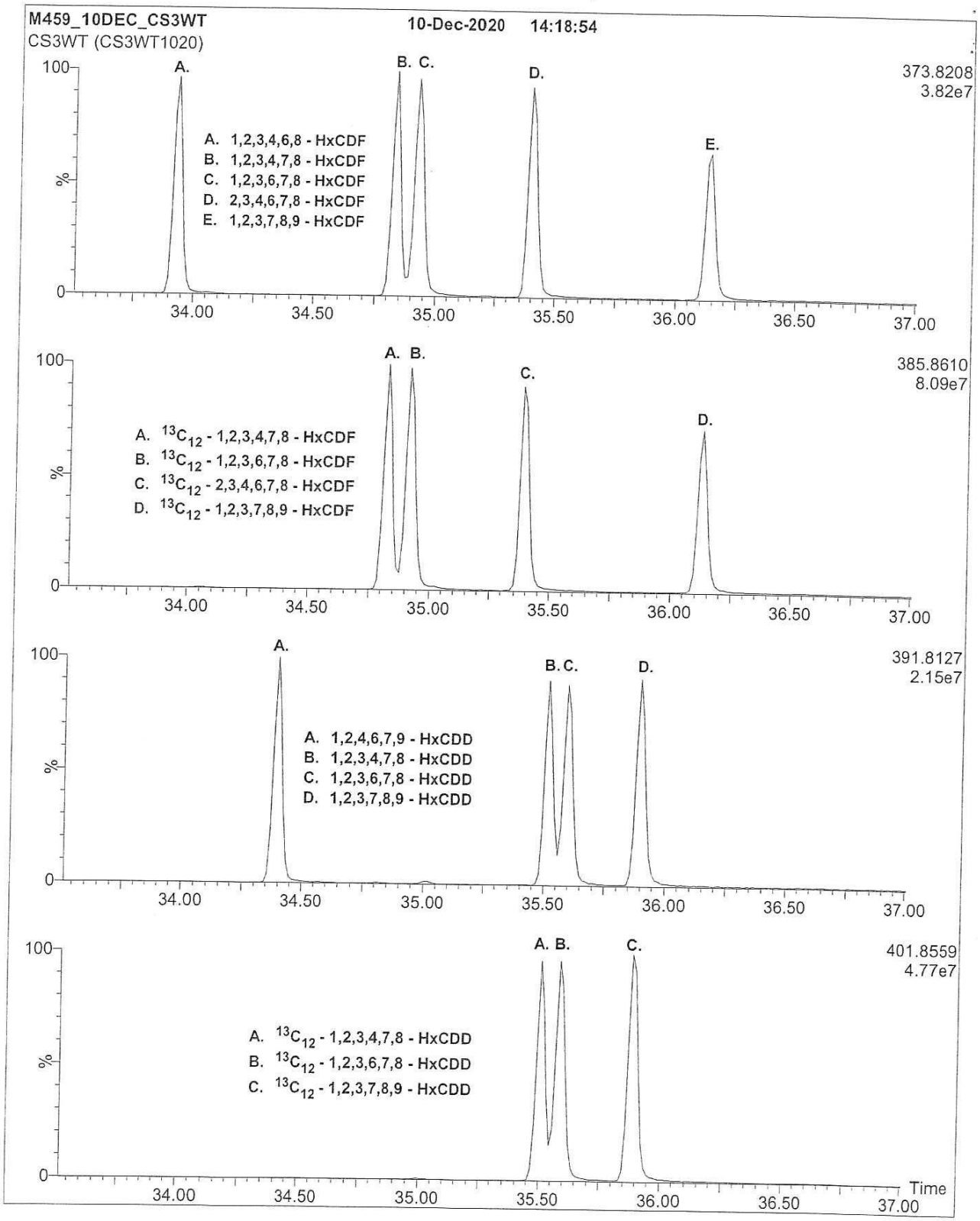


Figure 1: **CS3WT; HRGC/HRMS Data (60 m DB-5 Column)**

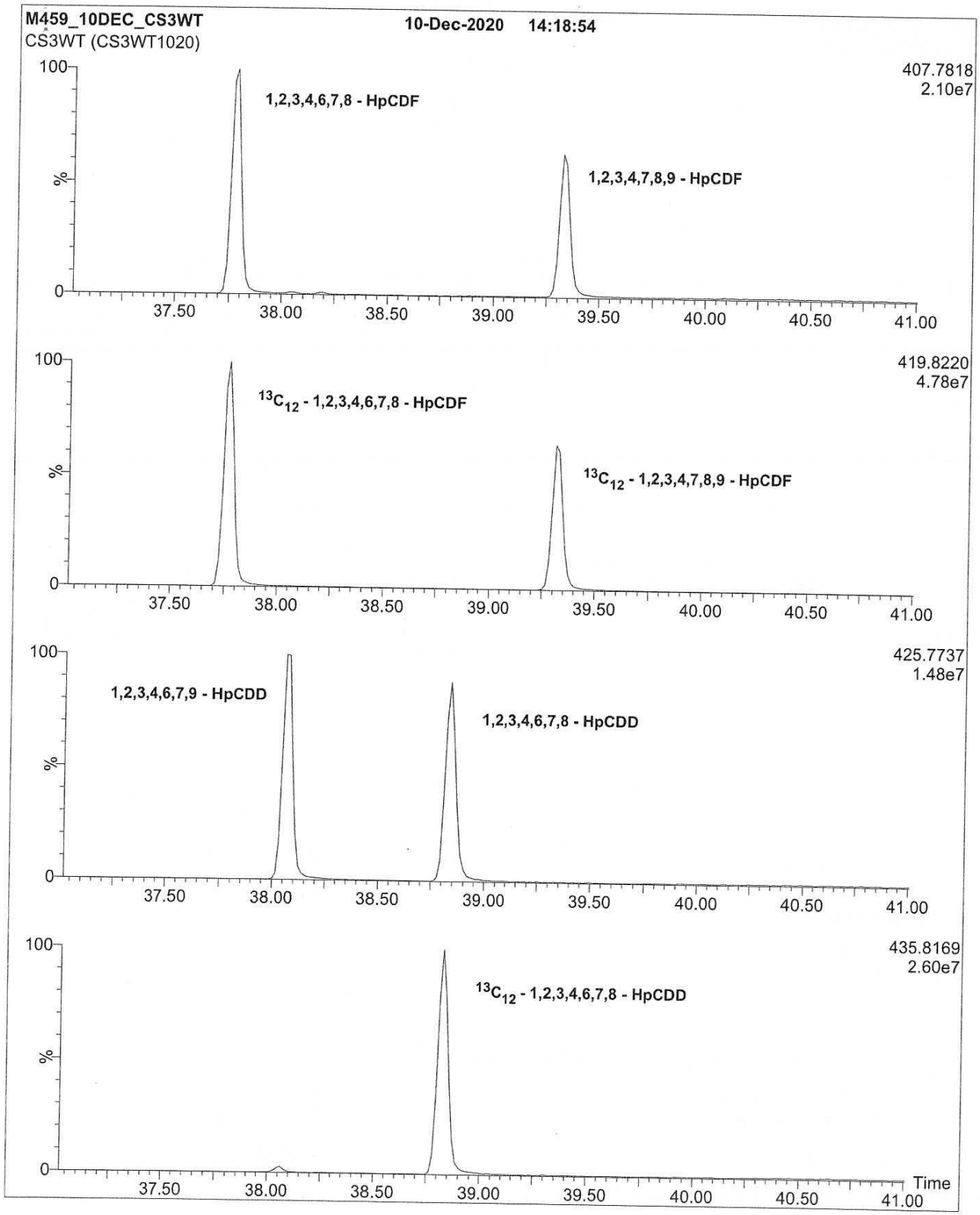
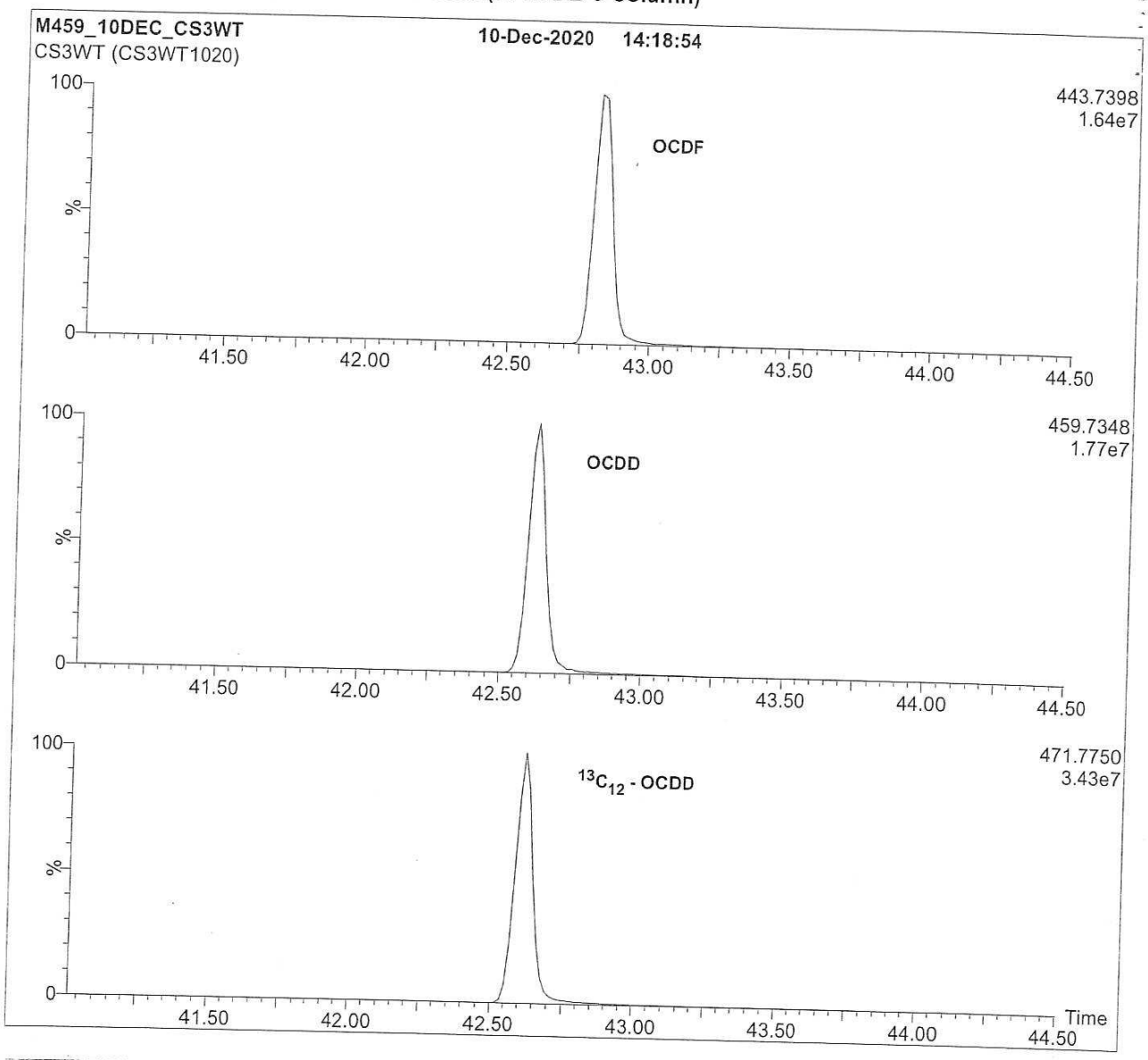


Figure 1: CS3WT; HRGC/HRMS Data (60 m DB-5 Column)



Conditions for Figure 1:

Agilent 6890N HRGC
Autospec Ultima HRMS

Chromatographic Conditions:

Column: 60 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W

Flow: Constant at 1 mL/min
Injector: 280°C (Splitless Injection)
Ionization: EI+
Detector: 280°C
SIR at 10,000 mass resolving power

Oven: 150°C (1 min)
12°C/min to 200°C
3°C/min to 235°C
235°C (8 min)
8°C/min to 310°C
310°C (8 min)

Form#:13, Issued 2004-11-10

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

EPA-1613CSS

U.S. EPA Method 1613 Cleanup Standard Spiking Solution

PRODUCT CODE:	EPA-1613CSS
LOT NUMBER:	13CSS1020
SOLVENT(S):	Nonane
DATE PREPARED: (mm/dd/yyyy)	11/12/2020
LAST TESTED: (mm/dd/yyyy)	01/30/2021
EXPIRY DATE: (mm/dd/yyyy)	11/19/2027
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

J004693 pr
Recd. 04/30/21

DESCRIPTION:

EPA-1613CSS contains 2,3,7,8-($^{37}Cl_4$)tetrachlorodibenzo-*p*-dioxin at the concentration given in Table A.

EPA-1613CSS was designed and prepared to be used according to U.S. EPA Method 1613, Revision B.

2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin has a chemical purity of >98% and an isotopic (^{37}Cl) purity of ≥95%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution
Figure 1: HRGC/HRMS Data (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

Table A: **EPA-1613CSS; Components and Concentrations (ng/mL, ± 5% in nonane)**

Compound	Acronym	CAS #	Concentration (ng/mL)
2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin	$^{37}Cl_4$-2,3,7,8-TCDD	85508-50-5	40.0

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 03/20/2021 (mm/dd/yyyy)
B.G. Chittim, General Manager

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

$$u_c(y(x_1, x_2, \ldots x_n)) = \sqrt{\sum_{i=1}^{n} u(y, x_i)^2}$$

where x is expressed as a relative standard uncertainty of the individual parameter.

The individual uncertainties taken into account include those associated with weights (calibration of the balance) and volumes (calibration of the volumetric glassware). An expanded maximum combined percent relative uncertainty of ±5% (calculated with a coverage factor of 2 and a level of confidence of 95%) is stated on the Certificate of Analysis for all of our products.

TRACEABILITY:

All reference standard solutions are traceable to specific crystalline lots. The microbalances used for solution preparation are regularly calibrated by an external ISO/IEC 17025 accredited laboratory. In addition, their calibration is verified prior to each weighing using calibrated external weights traceable to an ISO/IEC 17025 accredited laboratory. All volumetric glassware used is calibrated, of Class A tolerance, and traceable to an ISO/IEC 17025 accredited laboratory. For certain products, traceability to international interlaboratory studies has also been established.

EXPIRY DATE / PERIOD OF VALIDITY:

Ongoing stability studies of this product have demonstrated stability in its composition and concentration, until the specified expiry date, in the unopened ampoule. Monitoring for any degradation or change in concentration of the listed analyte(s) is performed on a routine basis.

LIMITED WARRANTY:

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the stated technical and purity specifications.

QUALITY MANAGEMENT:

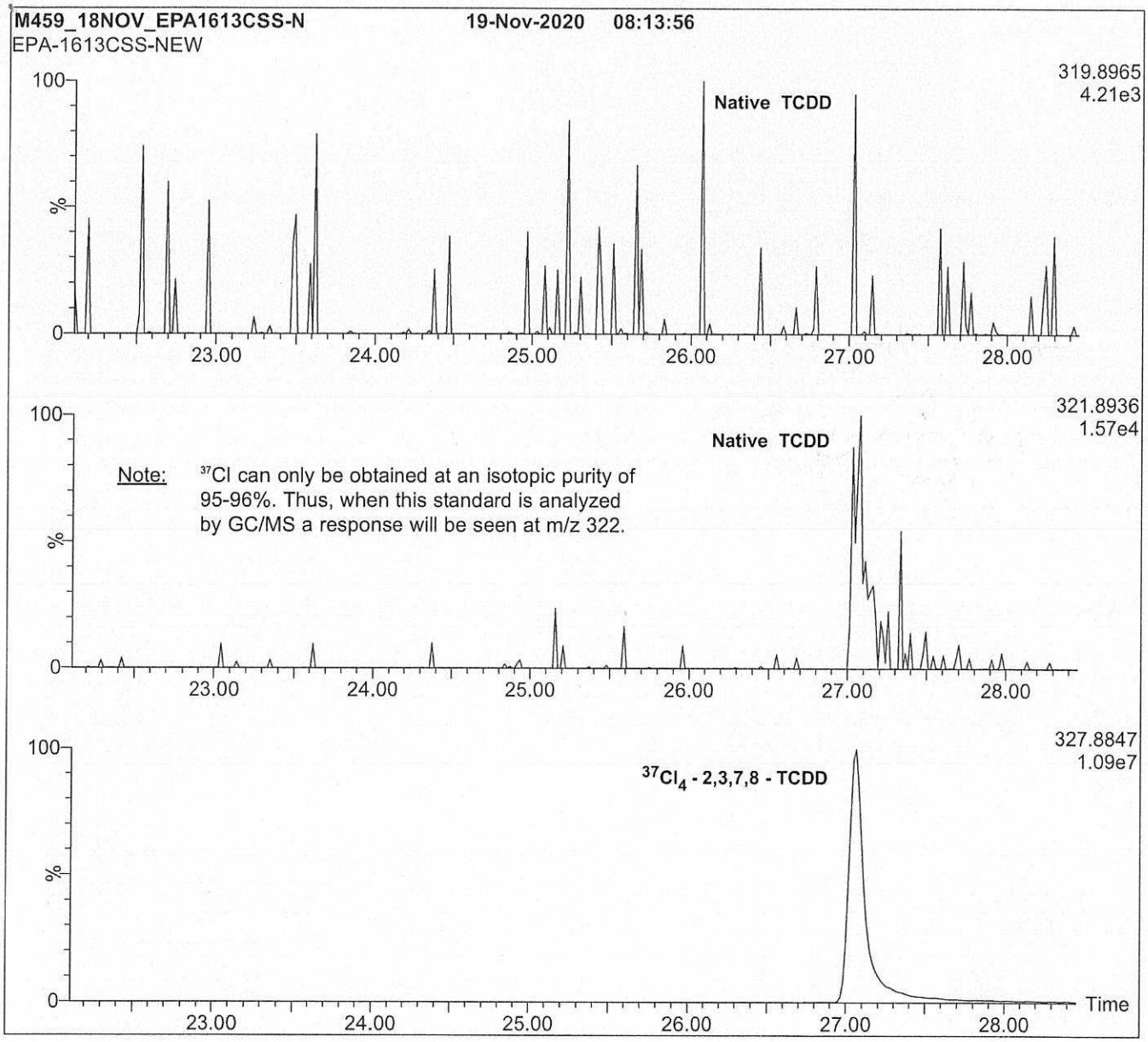
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).

CALA Testing Accreditation No. A1226

ANAB ANSI National Accreditation Board ACCREDITED ISO 17034 REFERENCE MATERIAL PRODUCER

For additional information or assistance concerning this or any other products from Wellington Laboratories Inc., please visit our website at www.well-labs.com or contact us directly at info@well-labs.com

Figure 1: **EPA-1613CSS; HRGC/HRMS Data (60 m DB-5 Column)**



Conditions for Figure 1:

Agilent 6890N HRGC
Autospec Ultima HRMS

Chromatographic Conditions:

Column: 60 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W

Flow:	Constant at 1 mL/min	Oven:	150°C (1 min)
Injector:	280°C (Splitless Injection)		12°C/min to 200°C
Ionization:	EI+		3°C/min to 235°C
Detector:	280°C		235°C (8 min)
	SIR at 10,000 mass resolving power		8°C/min to 310°C
			310°C (8 min)

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

EPA-1613LCS

U.S. EPA Method 1613
Labelled Compound Stock Solution

PRODUCT CODE:	EPA-1613LCS
LOT NUMBER:	13LCS1020
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	10/16/2020
LAST TESTED: (mm/dd/yyyy)	01/30/2021
EXPIRY DATE: (mm/dd/yyyy)	10/21/2027
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

J004694
Recd. JR
01/30/21

DESCRIPTION:

EPA-1613LCS is a solution/mixture of mass-labelled ($^{13}C_{12}$) polychlorinated dibenzo-*p*-dioxins (PCDDs) and dibenzofurans (PCDFs). The components and their concentrations are given in Table A.

EPA-1613LCS was designed and prepared to be used according to U.S. EPA Method 1613, Revision B.

The individual ^{13}C-labelled PCDDs and PCDFs all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations
Figure 1: HRGC/HRMS Data (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Wellington Laboratories Inc., 345 Southgate Dr. Guelph ON N1G 3M5 CANADA
519-822-2436 • Fax: 519-822-2849 • info@well-labs.com

INTENDED USE:

The products prepared by Wellington Laboratories Inc. are for laboratory use only. This certified reference material (CRM) was designed to be used as a standard for the identification and/or quantification of the specific chemical compounds it contains.

HANDLING:

This product should only be used by qualified personnel familiar with its potential hazards and trained in the handling of hazardous chemicals. Due care should be exercised to prevent unnecessary human contact or ingestion. All procedures should be carried out in a well-functioning fume hood and suitable gloves, eye protection, and clothing should be worn at all times. Waste should be disposed of according to national and regional regulations. Safety Data Sheets (SDSs) are available upon request.

SYNTHESIS / CHARACTERIZATION:

Our products are synthesized using single-product unambiguous routes whenever possible. They are then characterized, and their structures and purities confirmed, using a combination of the most relevant techniques, such as NMR, GC/MS, LC/MS/MS, SFC/UV/MS/MS, x-ray crystallography, and melting point. Isotopic purities of mass-labelled compounds are also confirmed using HRGC/HRMS and/or LC/MS/MS.

HOMOGENEITY:

Prior to solution preparation, crystalline material is tested for homogeneity using a variety of techniques (as stated above) and its solubility in a given diluent is taken into consideration. Duplicate solutions of a new product are prepared from the same crystalline lot and, after the addition of an appropriate internal standard, they are compared by GC/MS, LC/MS/MS, and/or SFC/UV/MS/MS. The relative response factors of the analyte of interest in each solution are required to be <5% RSD. New solution lots of existing products, as well as mixtures and calibration solutions, are compared to older lots in a similar manner. This further confirms the homogeneity of the crystalline material as well as the stability and homogeneity of the solutions in the storage containers. In order to maintain the integrity of the assigned value(s), and associated uncertainty, the dilution or injection of a subsample of this product should be performed using calibrated measuring equipment.

UNCERTAINTY:

The maximum combined relative standard uncertainty of our reference standard solutions is calculated using the following equation:

The combined relative standard uncertainty, $u_c(y)$, of a value y and the uncertainty of the independent parameters $x_1, x_2, \ldots x_n$ on which it depends is:

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CALA Testing Accreditation No. A1226

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Table A: **EPA-1613LCS; Components and Concentrations (ng/mL, ± 5% in nonane/3.2% toluene)**

Compound	Acronym	CAS #	Concentration (ng/mL)
Mass-Labelled PCDDs:			
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	$^{13}C_{12}$-2,3,7,8-TCDD	76523-40-5	100
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	$^{13}C_{12}$-1,2,3,7,8-PeCDD	109719-79-1	100
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	$^{13}C_{12}$-1,2,3,4,7,8-HxCDD	109719-80-4	100
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	$^{13}C_{12}$-1,2,3,6,7,8-HxCDD	109719-81-5	100
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDD	109719-83-7	100
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	$^{13}C_{12}$-OCDD	114423-97-1	200
Mass-Labelled PCDFs:			
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	$^{13}C_{12}$-2,3,7,8-TCDF	89059-46-1	100
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	$^{13}C_{12}$-1,2,3,7,8-PeCDF	109719-77-9	100
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	$^{13}C_{12}$-2,3,4,7,8-PeCDF	116843-02-8	100
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	$^{13}C_{12}$-1,2,3,4,7,8-HxCDF	114423-98-2	100
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	$^{13}C_{12}$-1,2,3,6,7,8-HxCDF	116843-03-9	100
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	$^{13}C_{12}$-1,2,3,7,8,9-HxCDF	116843-04-0	100
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	$^{13}C_{12}$-2,3,4,6,7,8-HxCDF	116843-05-1	100
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	$^{13}C_{12}$-1,2,3,4,6,7,8-HpCDF	109719-84-8	100
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	$^{13}C_{12}$-1,2,3,4,7,8,9-HpCDF	109719-94-0	100

Certified By: _____ **Date:** 04/19/2021 (mm/dd/yyyy)

B.G. Chittim, General Manager

Figure 1: EPA-1613LCS; HRGC/HRMS Data (60 m DB-5 Column)

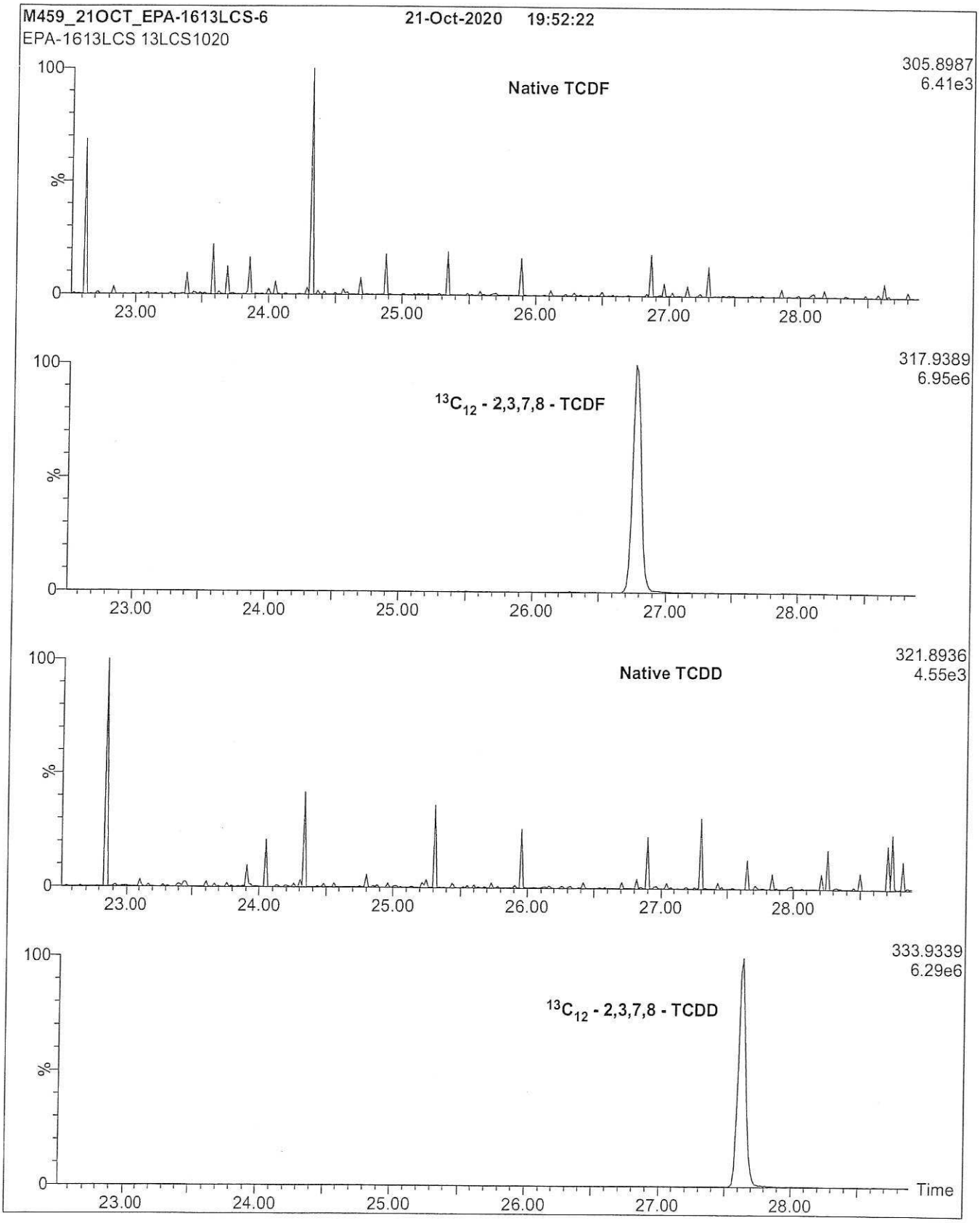
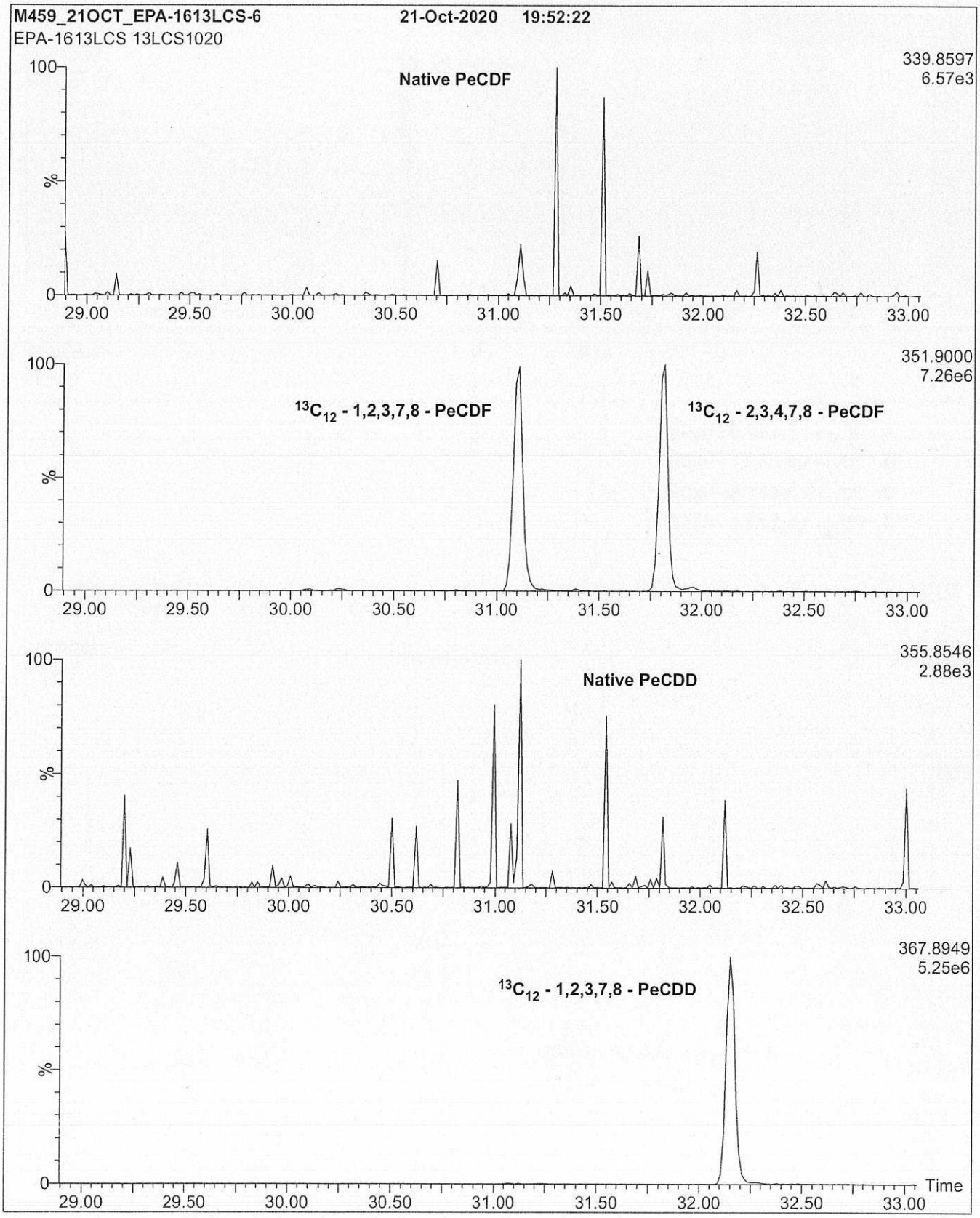


Figure 1: **EPA-1613LCS; HRGC/HRMS Data (60 m DB-5 Column)**



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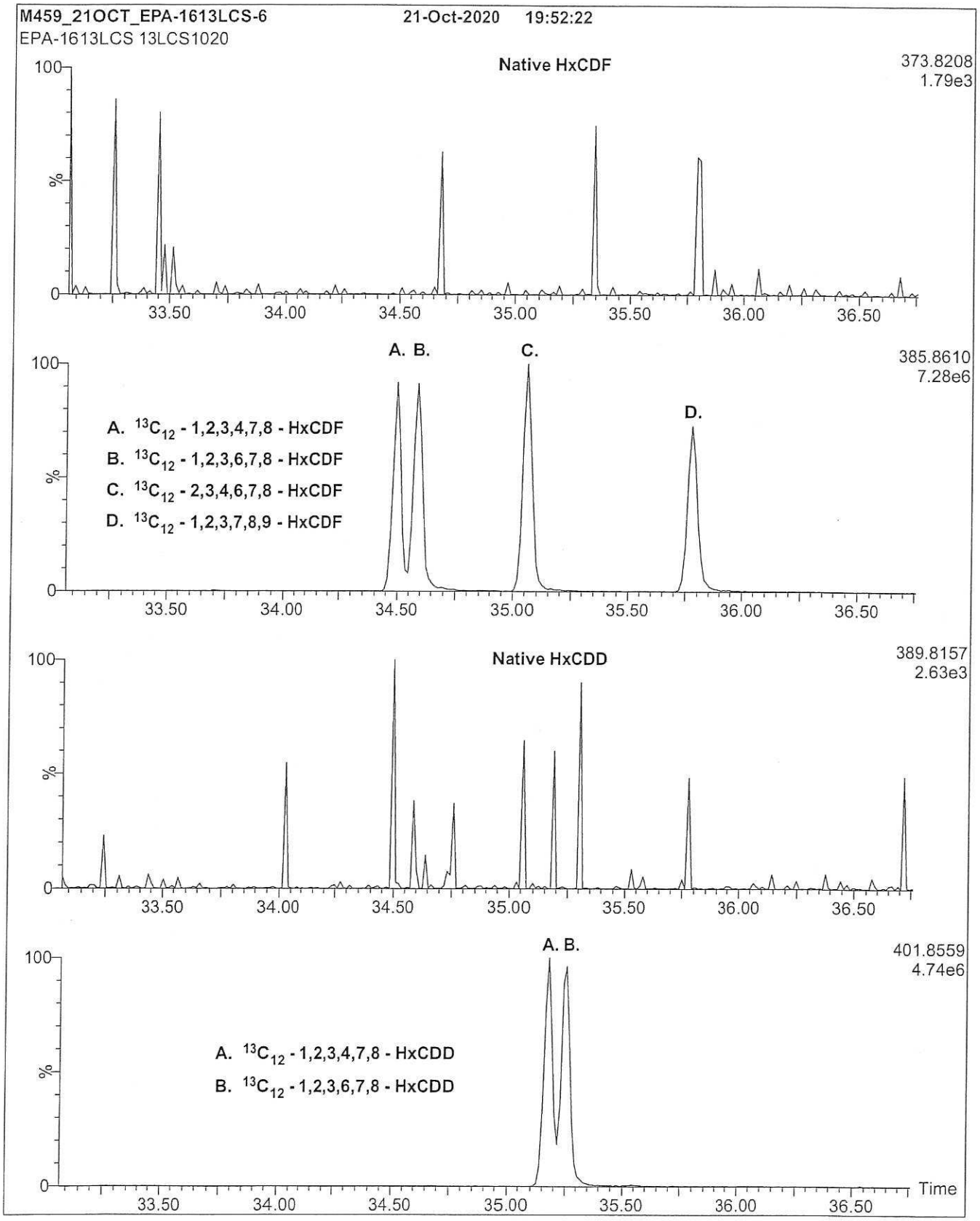

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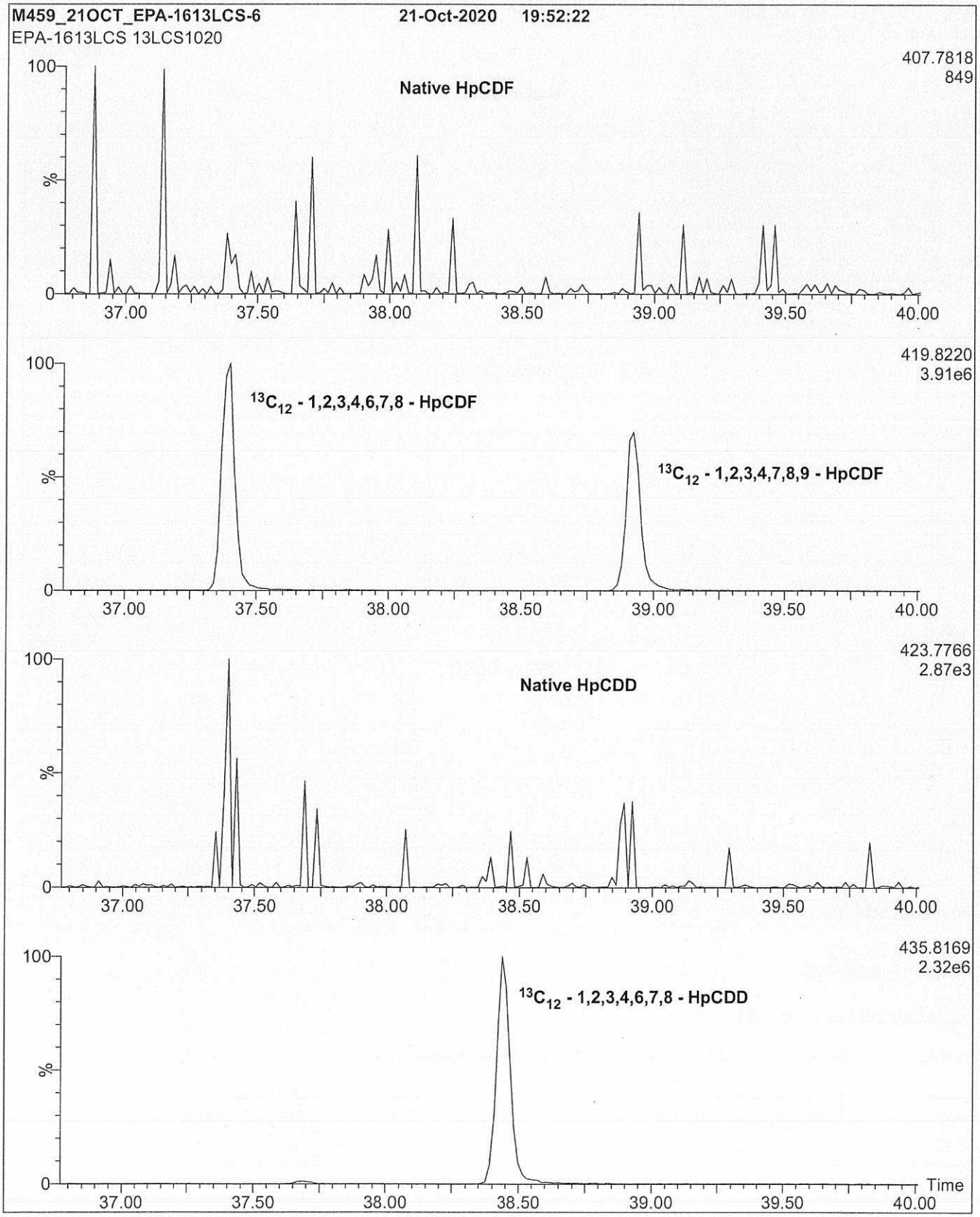

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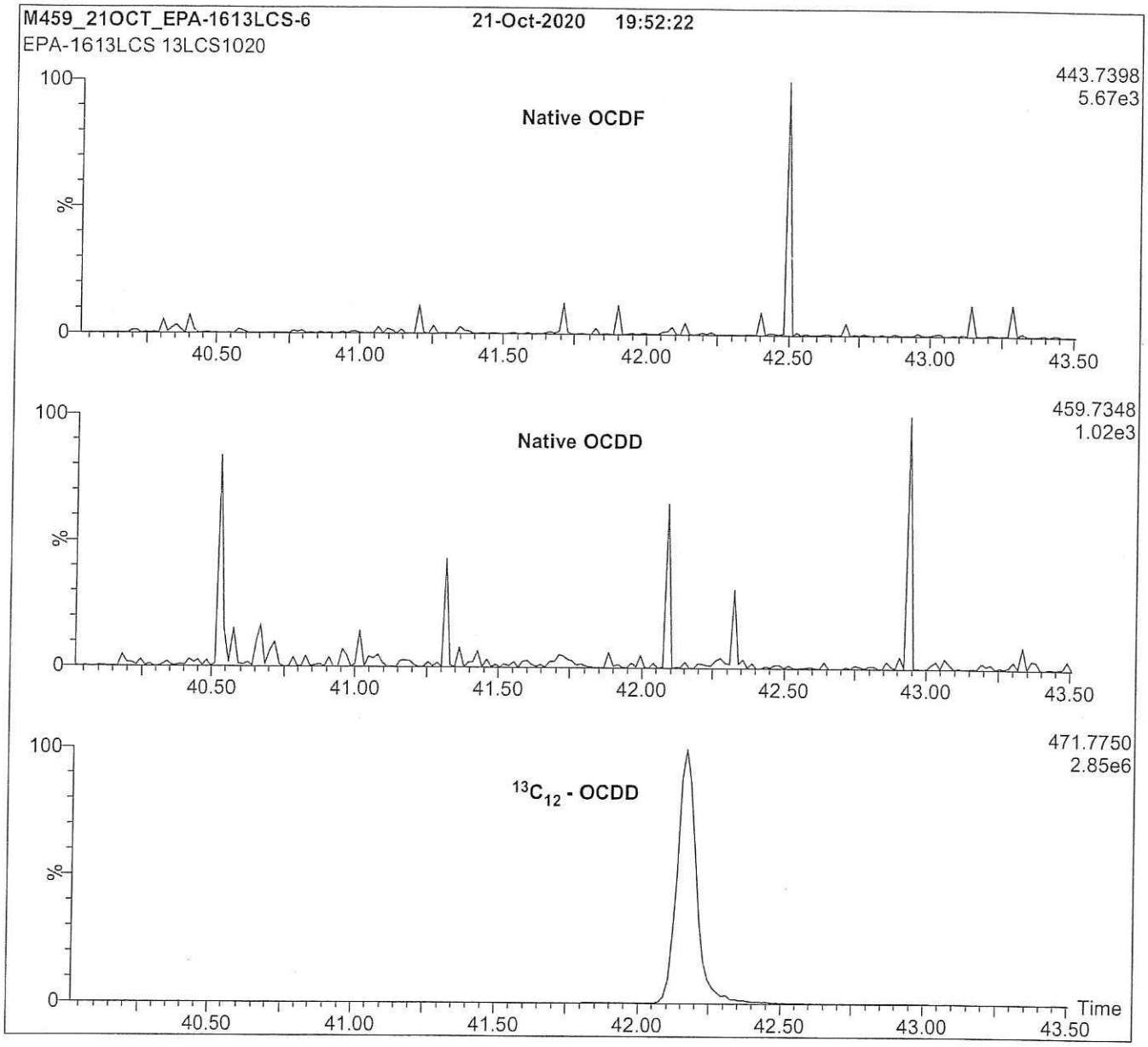

Conditions for Figure 1:

Agilent 6890N HRGC
Autospec Ultima HRMS

Chromatographic Conditions:

Column: 60 m DB-5 (0.25 mm id, 0.25 µm film thickness) Agilent J&W

Flow:	Constant at 1 mL/min	Oven:	150°C (1 min)
Injector:	280°C (Splitless Injection)		12°C/min to 200°C
Ionization:	EI+		3°C/min to 235°C
Detector:	300°C		235°C (8 min)
	SIR at 10,000 mass resolving power		8°C/min to 310°C
			310°C (8 min)

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Standard Record

Standard ID: J005595 **Printed: 5/26/2021 2:15:33PM**

Description:	Dioxin ISC Mix	Expires:	26-May-2022
Standard Type:	Other	Prepared:	26-May-2021
Solvent:	Nonane	Prepared By:	Peter Kepler
Final Volume (mls):	1	Department:	HRGCMS
Vials:	1	Last Edit:	26-May-2021 14:05 by PK
Vendor:		Lot #:	1234
Vendor Catalog #:			

Comments

Stock: H9902: 2378-TCDF, 3467-TCDF, 2348-TCDF, 1278-TCDD, 2378-TCDD. each @ 1000 ng/mL

10 ul to 1 mL FV in Nonane. Final Conc = 10 ng/mL. Analytes and units not available in Element.

Reviewed By Date

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