Analytical Resources, Incorporated
Analytical Chemists and Consultants

25 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)
21G0064	N/A

Susan Dunnihoo
Digitally signed by Susan Dunnihoo
Date: 2021.08.25 16:50:24 -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

21G0064

1 of 1

CHAIN-OF-CUSTODY/TEST REQUEST FORM

№ 4155

Project/Client Name: Duwamish AOCU
Project Number: 160067-02.02
Contact Name: Amara Vanderwort
Sampled By: Windward

Ship to: ARI
Attn: Sue Dunnihoo
Shipper: Courier
Form filled out by: Brandi Quinlisk

Shipping Date: 7/6/2021
Airbill Number: —
Turnaround requested: STD

Sample Collection Date (m/d/y)	Time	Sample Identification	Volume of Sample / # of Containers	Matrix	PCBs	PCB/BBP	PCB/cPAH	TOC/Total Solids	Archive	Arsenic	Dioxin Furans	Comments / Instructions [Jar tag number(s)]
7/6/2021	10:40	LDW21-SC5B0	3	Sediment		X		X	X	X		
	11:00	LDW21-IT57B	3		X			X	X	X		
	11:00	LDW21-IT57BFD	3		X			X	X	X		
	11:21	LDW21-SC5B1B	3		X			X	X			
	11:21	LDW21-SC5B1C	3		X			X	X			
	11:21	LDW21-SC5B1E	3		X			X	X			
	11:45	LDW21-IT542	3		X			X	X			
	12:05	LDW21-IT51B	3		X			X	X	X		
	12:05	LDW21-IT51BFD	3		X			X	X	X		
7/6/2021	12:25	LDW21-IT507	4	Sediment			X	X	X	X	X	
	~~15:00~~	~~LDW21-IT697~~	~~3~~		~~X~~			~~X~~	~~X~~			~~bg 7/6/2021~~
		Total Number of Containers	31	Purchase Order / Statement of Work #	CLF-052021-ARI							

1) Released by:	1) Rec'd by:	2) Released by:	2) Rec'd by:
Print name: Cindy Fields		Print name:	
Signature:	Company:	Signature:	Company:
Company: AQEA	ARI	Company:	
Date/Time: 7/6/21 17:44	Date/Time: 07/06/2021 1744	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:

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

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Windward / Anchor

Project Name: Lower Duwamish AOC4

COC No(s): 4155 NA

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

Assigned ARI Job No: 21G0064

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 1801 1.9 ____ ____ ____ ____ ____

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

Temp Gun ID#: DOO5206

Cooler Accepted by: JS Date: 07/06/2021 Time: 1744

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: DL Date: 07/07/21 Time: 0841 Labels checked by: _____

*** 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	08/25/2021 16:40

ANALYTICAL REPORT FOR SAMPLES

Laboratory ID	Sample ID	Matrix	Date Sampled	Date Received
21G0064-01	LDW21-SC580	Solid	07/06/21 10:40	07/07/21 17:44
21G0064-02	LDW21-IT578	Solid	07/06/21 11:00	07/07/21 17:44
21G0064-03	LDW21-IT578FD	Solid	07/06/21 11:00	07/07/21 17:44
21G0064-04	LDW21-SC581B	Solid	07/06/21 11:21	07/07/21 17:44
21G0064-05	LDW21-SC581C	Solid	07/06/21 11:21	07/07/21 17:44
21G0064-06	LDW21-SC581E	Solid	07/06/21 11:21	07/07/21 17:44
21G0064-07	LDW21-IT542	Solid	07/06/21 11:45	07/07/21 17:44
21G0064-08	LDW21-IT518	Solid	07/06/21 12:05	07/07/21 17:44
21G0064-09	LDW21-IT518FD	Solid	07/06/21 12:05	07/07/21 17:44
21G0064-10	LDW21-IT507	Solid	07/06/21 12:25	07/07/21 17:44

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	25-Aug-2021 16:40

Case Narrative

Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Work Order: 21G0064

Sample receipt

Samples as listed on the preceding page were received 07-Jul-2021 17:44 under ARI work order 21G0064. For details regarding sample receipt, please refer to the Cooler Receipt Form. Mercury aliquots were frozen to meet QAPP requirements.

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.

Labeled internal standard areas were within limits.

The cleanup surrogate percent recoveries were within control limits.

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

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

The reference material (SRM) BJG0375-SRM1 percent recoveries were within control limits. The reference material (SRM) BJG0375-SRM2 percent recovery for 1,2,3,7,8-PeCDD (161%) was high of control limits (50-150%).

The batch BJG0375 duplicate (DUP2) relative percent difference (RPD) was high of advisory control limits for both the the HpCDFs, the HpCDD, OCDD and OCDF, reported under work order 21G0079.

QUALIFIERS AND NOTES

Qualifier	Definition
X	Indicates possible CDPE interference.
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
*	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-IT507

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

Laboratory:	Analytical Resources, Inc.			SDG:	21G0064
Client:	Anchor QEA, LLC				
Project:	Lower Duwamish AOC4				
Matrix:	Sediment	Laboratory ID:	21G0064-10 C	File ID:	21082311
Sampled:	07/06/21 12:25	Prepared:	07/21/21 16:18	Analyzed:	08/23/21 20:08
% Solids:	66.86	Preparation:	EPA 1613	Initial/Final:	14.96 g Wet / 20 uL
Result Basis:	Dry	Sequence:	SJH0288	Calibration:	EH00030
Batch:	BJG0375	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	0.706	0.655-0.886	0.374	1.00	3.31	ng/kg	X
1746-01-6	2,3,7,8-TCDD	1	0.764	0.655-0.886	0.311	1.00	0.696	ng/kg	J
57117-41-6	1,2,3,7,8-PeCDF	1	1.243	1.318-1.783	0.403	1.00	1.35	ng/kg	EMPC
57117-31-4	2,3,4,7,8-PeCDF	1	1.431	1.318-1.783	0.382	1.00	3.58	ng/kg	
40321-76-4	1,2,3,7,8-PeCDD	1	1.892	1.318-1.783	0.332	1.00	3.63	ng/kg	EMPC
70648-26-9	1,2,3,4,7,8-HxCDF	1	1.187	1.054-1.426	0.248	1.00	3.99	ng/kg	
57117-44-9	1,2,3,6,7,8-HxCDF	1	1.150	1.054-1.426	0.233	1.00	4.27	ng/kg	
60851-34-5	2,3,4,6,7,8-HxCDF	1	1.246	1.054-1.426	0.248	1.00	8.02	ng/kg	
72918-21-9	1,2,3,7,8,9-HxCDF	1	1.196	1.054-1.426	0.259	1.00	1.43	ng/kg	
39227-28-6	1,2,3,4,7,8-HxCDD	1	1.344	1.054-1.426	0.268	1.00	1.97	ng/kg	
57653-85-7	1,2,3,6,7,8-HxCDD	1	1.248	1.054-1.426	0.263	1.00	8.31	ng/kg	
19408-74-3	1,2,3,7,8,9-HxCDD	1	1.202	1.054-1.426	0.284	1.00	6.11	ng/kg	
67562-39-4	1,2,3,4,6,7,8-HpCDF	1	1.012	0.893-1.208	0.188	1.00	53.0	ng/kg	
55673-89-7	1,2,3,4,7,8,9-HpCDF	1	1.225	0.893-1.208	0.280	1.00	1.93	ng/kg	EMPC
35822-46-9	1,2,3,4,6,7,8-HpCDD	1	1.084	0.893-1.208	0.573	2.50	304	ng/kg	
39001-02-0	OCDF	1	0.872	0.757-1.024	0.413	2.50	44.0	ng/kg	
3268-87-9	OCDD	1	0.908	0.757-1.024	0.787	10.0	2380	ng/kg	

Homologue Groups

55722-27-5	Total TCDF	1	0.000			1.00	80.7	ng/kg
41903-57-5	Total TCDD	1	0.000			1.00	9.44	ng/kg
30402-15-4	Total PeCDF	1	0.000			1.00	190	ng/kg
36088-22-9	Total PeCDD	1	0.000			1.00	12.3	ng/kg
55684-94-1	Total HxCDF	1	0.000			1.00	115	ng/kg
34465-46-8	Total HxCDD	1	0.000			1.00	252	ng/kg
38998-75-3	Total HpCDF	1	0.000			1.00	115	ng/kg
37871-00-4	Total HpCDD	1	0.000			1.00	784	ng/kg

Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=0, Including EMPC): 13.50
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 13.50

Analytical Resources, Incorporated
Analytical Chemists and Consultants

LDW21-IT507

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

Laboratory:	Analytical Resources, Inc.			SDG:	21G0064
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Sediment	Laboratory ID:	21G0064-10	File ID:	21082311
Sampled:	07/06/21 12:25	Prepared:	07/21/21 16:18	Analyzed:	08/23/21 20:08
Solids Wt%:	66.86	Preparation:	EPA 1613	Initial/Final:	14.96 g / 20 uL
Result Basis:	Dry	Sequence:	SJH0288	Calibration:	EH00030
Batch:	BJG0375	Instrument:	AUTOSPEC01	Column:	RTX-Dioxin2

Labels	DF/Split	Ion Ratio	Ratio Limits	EDL	% REC	QC LIMITS	Q
13C12-2,3,7,8-TCDF		0.814	0.655-0.886	0.308	56.1	24 - 169 %	
13C12-2,3,7,8-TCDD		0.776	0.655-0.886	0.311	67.3	25 - 164 %	
13C12-1,2,3,7,8-PeCDF		1.583	1.318-1.783	0.258	84.7	24 - 185 %	
13C12-2,3,4,7,8-PeCDF		1.605	1.318-1.783	0.270	84.4	21 - 178 %	
13C12-1,2,3,7,8-PeCDD		1.564	1.318-1.783	0.277	87.7	25 - 181 %	
13C12-1,2,3,4,7,8-HxCDF		0.518	0.434-0.587	0.168	70.4	26 - 152 %	
13C12-1,2,3,6,7,8-HxCDF		0.523	0.434-0.587	0.155	66.2	26 - 123 %	
13C12-2,3,4,6,7,8-HxCDF		0.523	0.434-0.587	0.171	69.1	28 - 136 %	
13C12-1,2,3,7,8,9-HxCDF		0.501	0.434-0.587	0.207	75.7	29 - 147 %	
13C12-1,2,3,4,7,8-HxCDD		1.253	1.054-1.426	0.177	81.6	32 - 141 %	
13C12-1,2,3,6,7,8-HxCDD		1.271	1.054-1.426	0.163	76.5	28 - 130 %	
13C12-1,2,3,4,6,7,8-HpCDF		0.462	0.374-0.506	0.247	72.1	28 - 143 %	
13C12-1,2,3,4,7,8,9-HpCDF		0.458	0.374-0.506	0.301	73.6	26 - 138 %	
13C12-1,2,3,4,6,7,8-HpCDD		1.052	0.893-1.208	0.300	80.3	23 - 140 %	
13C12-OCDD		0.918	0.757-1.024	0.388	89.1	17 - 157 %	
37Cl4-2,3,7,8-TCDD		328.000		0.088	75.5	35 - 197 %	

* Values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:26:22 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: 21G0064-10, Name: 21082311, Date: 23-Aug-2021, Time: 20:08:42, 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	25.670	1.001	3.134e3	4.436e3	1.108	0.706	0.770	2368	1913	5.80e4	7.44e4	24.5	38.9	NO	bb	bb	1.657
12378-PeCDF	29.839	1.001	2.148e3	1.728e3	1.015	1.243	1.550	2530	3145	3.60e4	2.55e4	14.2	8.1	YES	bb	MM	0.674
23478-PeCDF	31.187	1.001	6.378e3	4.457e3	1.126	1.431	1.550	2530	3145	9.73e4	7.12e4	38.4	22.7	NO	dd	db	1.789
123478-HxCDF	34.831	1.001	5.316e3	4.479e3	1.017	1.187	1.240	1334	1691	8.63e4	6.93e4	64.7	41.0	NO	bd	bd	1.994
234678-HxCDF	35.811	0.999	1.087e4	8.719e3	1.052	1.246	1.240	1334	1691	9.83e4	8.47e4	73.7	50.1	NO	MM	MM	4.010
123678-HxCDF	34.975	1.001	5.818e3	5.059e3	1.037	1.150	1.240	1334	1691	8.99e4	7.25e4	67.4	42.9	NO	db	db	2.135
123789-HxCDF	36.836	1.000	1.694e3	1.416e3	1.030	1.196	1.240	1334	1691	2.81e4	1.77e4	21.1	10.5	NO	bb	bd	0.716
1234678-HpCDF	38.719	1.000	6.537e4	6.459e4	1.327	1.012	1.050	1271	1199	1.06e6	1.04e6	834.3	866.9	NO	bb	bb	26.513
1234789-HpCDF	40.958	1.000	2.098e3	1.713e3	1.283	1.225	1.050	1271	1199	3.02e4	2.58e4	23.8	21.5	YES	bb	bb	0.963
OCDF	45.187	1.005	3.678e4	4.220e4	1.447	0.872	0.890	1296	1653	4.26e5	4.81e5	329.0	291.2	NO	bb	bb	22.014
2378-TCDD	26.320	1.001	5.375e2	7.035e2	0.920	0.764	0.770	1463	1261	8.89e3	1.17e4	6.1	9.2	NO	bd	bd	0.348
12378-PeCDD	31.432	1.000	3.915e3	2.069e3	0.995	1.892	1.550	1608	1075	4.62e4	2.53e4	28.8	23.5	YES	bb	bb	1.816
123478-HxCDD	35.967	1.000	2.514e3	1.871e3	1.027	1.344	1.240	1512	1590	4.60e4	2.91e4	30.4	18.3	NO	bd	bd	0.987
123678-HxCDD	36.078	1.000	1.024e4	8.200e3	1.009	1.248	1.240	1512	1590	1.67e5	1.30e5	110.3	81.6	NO	db	dd	4.154
123789-HxCDD	36.468	1.011	6.922e3	5.757e3	0.950	1.202	1.240	1512	1590	1.13e5	8.71e4	74.6	54.8	NO	bb	bb	3.058
1234678-HpCDD	40.212	1.000	2.370e5	2.188e5	1.068	1.084	1.050	2343	1980	3.45e6	3.33e6	1473.3	1683.5	NO	bb	bb	151.999
OCDD	44.958	1.000	1.656e6	1.824e6	1.181	0.908	0.890	2568	2020	1.99e7	2.20e7	7747.8	10895.0	NO	bb	bb	1188.730
13C-2378-TCDF	25.655	1.007	1.852e5	2.274e5	1.427	0.814	0.770	3617	1993	2.78e6	3.36e6	768.3	1684.2	NO	bb	bb	56.073
13C-12378-PeCDF	29.817	1.171	3.473e5	2.194e5	1.297	1.583	1.550	2615	1661	5.10e6	3.28e6	1949.8	1974.0	NO	bd	bb	84.704
13C-23478-PeCDF	31.165	1.223	3.315e5	2.065e5	1.236	1.605	1.550	2615	1661	4.87e6	2.99e6	1863.9	1799.4	NO	bb	bb	84.370
13C-123478-HxCDF	34.808	0.955	1.649e5	3.182e5	1.242	0.518	0.510	1295	1718	2.46e6	4.80e6	1895.8	2795.2	NO	bd	bd	70.370
13C-123678-HxCDF	34.953	0.959	1.688e5	3.226e5	1.343	0.523	0.510	1295	1718	2.58e6	4.94e6	1988.9	2876.9	NO	db	db	66.202
13C-234678-HxCDF	35.833	0.983	1.594e5	3.046e5	1.215	0.523	0.510	1295	1718	2.38e6	4.70e6	1841.5	2734.5	NO	bb	bb	69.134
13C-123789-HxCDF	36.847	1.011	1.407e5	2.809e5	1.008	0.501	0.510	1295	1718	2.27e6	4.62e6	1755.7	2687.7	NO	bb	bb	75.740
13C-1234678-HpCDF	38.708	1.062	1.167e5	2.525e5	0.926	0.462	0.440	1759	1547	1.88e6	4.13e6	1066.8	2668.3	NO	bb	bb	72.143
13C-1234789-HpCDF	40.936	1.123	9.690e4	2.114e5	0.758	0.458	0.440	1759	1547	1.29e6	2.87e6	735.8	1857.5	NO	bb	bb	73.628
13C-1234-TCDD	25.473	0.000	2.223e5	2.934e5	1.000	0.757	0.770	2707	1741	3.31e6	4.34e6	1221.6	2493.2	NO	bb	bb	100.000
13C-2378-TCDD	26.290	1.032	1.692e5	2.181e5	1.116	0.776	0.770	2707	1741	2.49e6	3.23e6	921.4	1854.6	NO	bb	bb	67.266
13C-12378-PeCDD	31.421	1.234	2.020e5	1.292e5	0.732	1.564	1.550	1415	1176	2.97e6	1.95e6	2100.4	1659.5	NO	bb	bb	87.731
13C-123478-HxCDD	35.956	0.987	2.405e5	1.920e5	0.960	1.253	1.240	1296	1166	3.75e6	3.01e6	2895.4	2577.8	NO	bd	bd	81.563
13C-123678-HxCDD	36.067	0.990	2.462e5	1.937e5	1.041	1.271	1.240	1296	1166	3.93e6	3.11e6	3028.1	2665.3	NO	db	db	76.463
13C-1234678-HpCDD	40.201	1.103	1.440e5	1.368e5	0.632	1.052	1.050	1383	1366	2.17e6	2.03e6	1570.3	1485.7	NO	bb	bb	80.343
13C-OCDD	44.949	1.233	2.374e5	2.585e5	0.504	0.918	0.890	1316	1509	2.84e6	3.11e6	2155.4	2061.3	NO	bb	bb	178.177
13C-123789-HxCDD	36.446	0.000	3.080e5	2.445e5	1.000	1.260	1.240	1296	1166	4.84e6	3.90e6	3731.9	3345.2	NO	bb	bb	100.000
37CL-2378-TCDD	26.305	1.033	1.688e5		1.084			1213		2.42e6		1997.4			bb		30.214

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:26:22 Pacific Daylight Time

ID: 21G0064-10, Name: 21082311, Date: 23-Aug-2021, Time: 20:08:42, 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	22.147	0.863	1.216e3	1.340e3	1.425	0.908	0.770	2368	1913	1.73e4	2.12e4	7.3	11.1	YES	bb	db	0.435
1289-TCDF	27.106	1.057	7.867e2	7.768e2	1.043	1.013	0.770	2368	1913	8.95e3	9.07e3	3.8	4.7	YES	bb	bb	0.363
13468-PECDF					1.376		1.550	1062	1719								
12389-PECDF	32.123	1.077	1.161e3	5.142e2	1.000	2.257	1.550	2530	3145	2.02e4	9.00e3	8.0	2.9	YES	bd	bb	0.296
123468-HXCDF	33.159	0.953	1.373e4	1.083e4	1.087	1.268	1.240	1334	1691	2.11e5	1.52e5	158.4	89.6	NO	bb	bb	4.678
1368-TCDD	23.432	0.891	2.197e3	2.820e3	0.923	0.779	0.770	1463	1261	3.05e4	4.35e4	20.8	34.5	NO	bb	bb	1.403
1289-TCDD					0.794		0.770	1463	1261								
12479-PECDD	28.747	0.915	9.123e3	4.953e3	1.843	1.842	1.550	1608	1075	1.48e5	9.73e4	91.9	90.5	YES	db	db	2.306
12389-PECDD	31.822	1.013	7.503e2	4.040e2	1.154	1.857	1.550	1608	1075	1.11e4	8.44e3	6.9	7.8	YES	bb	bb	0.302
124679-HXCDD	33.939	0.944	2.130e5	1.708e5	1.125	1.247	1.240	1512	1590	3.24e6	2.57e6	2143.7	1616.9	NO	bb	bb	78.895
1234679-HPCDD	39.165	0.974	4.225e5	3.940e5	1.211	1.072	1.050	2343	1980	6.62e6	6.18e6	2827.1	3118.4	NO	bb	bb	240.194
Total-tetrafurans			8.475e4		1.192			2368		1.29e6							40.356
Total-penta1			1.682e5					1062		2.47e6							53.616
Total-pentafurans			1.469e5		1.047			2530		1.80e6							41.323
Total-hexafurans			1.539e5		1.045			1334		2.29e6							57.285
Total-heptafurans			1.344e5		1.305			1271		2.16e6							57.556
Total-Furans			7.249e5		1.158			2368		1.04e7							272.150
Total-tetradioxins			7.155e3		0.879			1463		1.01e5							4.720
Total-pentadioxins			1.689e4		1.331			1608		2.72e5							6.155
Total-hexadioxins			3.289e5		1.028			1512		4.61e6							126.272
Total-heptadioxins			6.595e5		1.140			2343		1.01e7							392.193
Total-Dioxins			2.669e6		1.092			1463		3.50e7							1718.070
Total-TEQ			3.394e6					1463		4.54e7							1990.220
FUNCTION1 PFK			6.734e5					558131		1.24e7							
FUNCTION2 PFK			3.865e5					417156		5.11e6							0.000
FUNCTION3 PFK			2.886e6					579940		4.19e6							0.000
FUNCTION4 PFK			2.984e5					406552		6.48e6							
FUNCTION5 PFK			1.406e5					351902		6.08e6							
FUNCTION1 HXCD...			8.717e3					976		1.40e5							0.000
FUNCTION1 HPCD...			2.015e3					1244		3.78e4							0.000
FUNCTION2 HPCD...			3.012e3					1273		5.28e4							0.000
FUNCTION3 OCDPE			6.375e2					768		1.15e4							0.000
FUNCTION4 NCDPE			2.563e3					1115		4.27e4							0.000
FUNCTION5 DCDPE			1.922e3					958		4.55e4							0.000

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	24.75	3.131e3	4.357e3	1.192	0.72	0.77	20.6	YES	NO	bb	bb	1.523
2	Total-tetrafurans	24.57	1.617e4	2.221e4	1.192	0.73	0.77	101.7	YES	NO	bb	db	7.806
3	Total-tetrafurans	24.34	3.330e3	4.538e3	1.192	0.73	0.77	19.9	YES	NO	bd	bd	1.600
4	Total-tetrafurans	23.90	1.703e3	2.096e3	1.192	0.81	0.77	12.2	YES	NO	db	db	0.773
5	Total-tetrafurans	23.64	1.427e4	1.884e4	1.192	0.76	0.77	92.3	YES	NO	bd	bd	6.734
6	Total-tetrafurans	23.40	5.120e3	7.133e3	1.192	0.72	0.77	31.5	YES	NO	db	dd	2.492
7	Total-tetrafurans	22.99	3.518e4	4.596e4	1.192	0.77	0.77	226.4	YES	NO	bb	bb	16.503
8	Total-tetrafurans	26.68	4.616e2	6.226e2	1.192	0.74	0.77	3.8	YES	NO	bb	bb	0.221
9	2378-TCDF	25.67	3.134e3	4.436e3	1.108	0.71	0.77	24.5	YES	NO	bb	bb	1.657
10	Total-tetrafurans	25.17	9.396e2	1.110e3	1.192	0.85	0.77	6.2	YES	NO	db	bb	0.417
11	Total-tetrafurans	24.99	1.300e3	1.803e3	1.192	0.72	0.77	7.3	YES	NO	bd	bb	0.631

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-penta1	27.11	1.682e5	1.104e5		1.52	1.55	2329.3	YES	NO	bb	bb	53.616

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-pentafurans	28.58	6.740e3	4.299e3	1.047	1.57	1.55	34.6	YES	NO	dd	dd	1.909
2	23478-PeCDF	31.19	6.378e3	4.457e3	1.126	1.43	1.55	38.4	YES	NO	dd	db	1.789
3	Total-pentafurans	31.03	1.940e4	1.223e4	1.047	1.59	1.55	114.5	YES	NO	dd	dd	5.471
4	Total-pentafurans	30.14	1.052e3	6.639e2	1.047	1.58	1.55	7.7	YES	NO	dd	db	0.297
5	Total-pentafurans	30.04	8.591e3	5.322e3	1.047	1.61	1.55	52.3	YES	NO	bd	bd	2.407
6	Total-pentafurans	29.47	2.379e4	1.398e4	1.047	1.70	1.55	128.7	YES	NO	db	dd	6.534
7	Total-pentafurans	29.36	2.901e3	2.039e3	1.047	1.42	1.55	20.0	YES	NO	dd	dd	0.855
8	Total-pentafurans	28.78	7.801e4	4.953e4	1.047	1.58	1.55	314.0	YES	NO	MM	MM	22.061

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HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	234678-HxCDF	35.81	1.087e4	8.719e3	1.052	1.25	1.24	73.7	YES	NO	MM	MM	4.010
2	123678-HxCDF	34.98	5.818e3	5.059e3	1.037	1.15	1.24	67.4	YES	NO	db	db	2.135
3	123478-HxCDF	34.83	5.316e3	4.479e3	1.017	1.19	1.24	64.7	YES	NO	bd	bd	1.994
4	Total-hexafurans	34.67	1.307e3	9.259e2	1.045	1.41	1.24	17.6	YES	NO	bb	bb	0.460
5	Total-hexafurans	34.21	5.116e4	4.293e4	1.045	1.19	1.24	596.5	YES	NO	bb	bb	19.371
6	Total-hexafurans	33.89	1.706e3	1.333e3	1.045	1.28	1.24	16.7	YES	NO	bb	bb	0.626
7	Total-hexafurans	33.37	6.227e4	5.090e4	1.045	1.22	1.24	698.6	YES	NO	bb	bb	23.296
8	123468-HXCDF	33.16	1.373e4	1.083e4	1.087	1.27	1.24	158.4	YES	NO	bb	bb	4.678
9	123789-HxCDF	36.84	1.694e3	1.416e3	1.030	1.20	1.24	21.1	YES	NO	bb	bd	0.716

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-heptafurans	39.38	6.769e4	6.679e4	1.305	1.01	1.05	849.4	YES	NO	bb	bb	30.408
2	Total-heptafurans	39.13	1.392e3	1.419e3	1.305	0.98	1.05	15.6	YES	NO	bd	bb	0.636
3	1234678-HpCDF	38.72	6.537e4	6.459e4	1.327	1.01	1.05	834.3	YES	NO	bb	bb	26.513

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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	24.75	3.131e3	4.357e3	1.192	0.72	0.77	20.6	YES	NO	bb	bb	1.523
2	Total-tetrafurans	24.57	1.617e4	2.221e4	1.192	0.73	0.77	101.7	YES	NO	bb	db	7.806
3	Total-tetrafurans	24.34	3.330e3	4.538e3	1.192	0.73	0.77	19.9	YES	NO	bd	bd	1.600
4	Total-tetrafurans	23.90	1.703e3	2.096e3	1.192	0.81	0.77	12.2	YES	NO	db	db	0.773
5	Total-tetrafurans	23.64	1.427e4	1.884e4	1.192	0.76	0.77	92.3	YES	NO	bd	bd	6.734
6	Total-tetrafurans	23.40	5.120e3	7.133e3	1.192	0.72	0.77	31.5	YES	NO	db	dd	2.492
7	Total-tetrafurans	22.99	3.518e4	4.596e4	1.192	0.77	0.77	226.4	YES	NO	bb	bb	16.503
8	Total-tetrafurans	26.68	4.616e2	6.226e2	1.192	0.74	0.77	3.8	YES	NO	bb	bb	0.221
9	2378-TCDF	25.67	3.134e3	4.436e3	1.108	0.71	0.77	24.5	YES	NO	bb	bb	1.657
10	Total-tetrafurans	25.17	9.396e2	1.110e3	1.192	0.85	0.77	6.2	YES	NO	db	bb	0.417
11	Total-tetrafurans	24.99	1.300e3	1.803e3	1.192	0.72	0.77	7.3	YES	NO	bd	bb	0.631
12	Total-pentafurans	28.58	6.740e3	4.299e3	1.047	1.57	1.55	34.6	YES	NO	dd	dd	1.909
13	23478-PeCDF	31.19	6.378e3	4.457e3	1.126	1.43	1.55	38.4	YES	NO	dd	db	1.789
14	Total-pentafurans	31.03	1.940e4	1.223e4	1.047	1.59	1.55	114.5	YES	NO	dd	dd	5.471
15	Total-pentafurans	30.14	1.052e3	6.639e2	1.047	1.58	1.55	7.7	YES	NO	dd	db	0.297
16	Total-pentafurans	30.04	8.591e3	5.322e3	1.047	1.61	1.55	52.3	YES	NO	bd	bd	2.407
17	Total-pentafurans	29.47	2.379e4	1.398e4	1.047	1.70	1.55	128.7	YES	NO	db	dd	6.534
18	Total-pentafurans	29.36	2.901e3	2.039e3	1.047	1.42	1.55	20.0	YES	NO	dd	dd	0.855
19	234678-HxCDF	35.81	1.087e4	8.719e3	1.052	1.25	1.24	73.7	YES	NO	MM	MM	4.010
20	123678-HxCDF	34.98	5.818e3	5.059e3	1.037	1.15	1.24	67.4	YES	NO	db	db	2.135
21	123478-HxCDF	34.83	5.316e3	4.479e3	1.017	1.19	1.24	64.7	YES	NO	bd	bd	1.994
22	Total-hexafurans	34.67	1.307e3	9.259e2	1.045	1.41	1.24	17.6	YES	NO	bb	bb	0.460
23	Total-hexafurans	34.21	5.116e4	4.293e4	1.045	1.19	1.24	596.5	YES	NO	bb	bb	19.371
24	Total-hexafurans	33.89	1.706e3	1.333e3	1.045	1.28	1.24	16.7	YES	NO	bb	bb	0.626
25	Total-hexafurans	33.37	6.227e4	5.090e4	1.045	1.22	1.24	698.6	YES	NO	bb	bb	23.296
26	123468-HXCDF	33.16	1.373e4	1.083e4	1.087	1.27	1.24	158.4	YES	NO	bb	bb	4.678
27	123789-HxCDF	36.84	1.694e3	1.416e3	1.030	1.20	1.24	21.1	YES	NO	bb	bd	0.716
28	Total-heptafurans	39.38	6.769e4	6.679e4	1.305	1.01	1.05	849.4	YES	NO	bb	bb	30.408
29	Total-heptafurans	39.13	1.392e3	1.419e3	1.305	0.98	1.05	15.6	YES	NO	bd	bb	0.636
30	1234678-HpCDF	38.72	6.537e4	6.459e4	1.327	1.01	1.05	834.3	YES	NO	bb	bb	26.513
31	OCDF	45.19	3.678e4	4.220e4	1.447	0.87	0.89	329.0	YES	NO	bb	bb	22.014
32	Total-penta1	27.11	1.682e5	1.104e5		1.52	1.55	2329.3	YES	NO	bb	bb	53.616
33	Total-pentafurans	28.78	7.801e4	4.953e4	1.047	1.58	1.55	314.0	YES	NO	MM	MM	22.061

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TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetradioxins	24.64	8.900e2	1.146e3	0.879	0.78	0.77	8.0	YES	NO	bb	bb	0.598
2	Total-tetradioxins	23.90	6.611e2	7.764e2	0.879	0.85	0.77	7.4	YES	NO	bb	db	0.422
3	Total-tetradioxins	23.70	2.376e3	3.139e3	0.879	0.76	0.77	22.2	YES	NO	bb	bd	1.620
4	1368-TCDD	23.43	2.197e3	2.820e3	0.923	0.78	0.77	20.8	YES	NO	bb	bb	1.403
5	Total-tetradioxins	26.43	4.934e2	6.255e2	0.879	0.79	0.77	4.5	YES	NO	dd	db	0.329
6	2378-TCDD	26.32	5.375e2	7.035e2	0.920	0.76	0.77	6.1	YES	NO	bd	bd	0.348

PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-pentadioxins	30.05	4.600e3	2.604e3	1.331	1.77	1.55	46.8	YES	NO	bd	bb	1.635
2	Total-pentadioxins	29.84	5.791e3	3.747e3	1.331	1.55	1.55	58.3	YES	NO	bb	bb	2.164
3	Total-pentadioxins	29.23	6.495e3	3.888e3	1.331	1.67	1.55	63.9	YES	NO	bb	bb	2.356

HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123789-HxCDD	36.47	6.922e3	5.757e3	0.950	1.20	1.24	74.6	YES	NO	bb	bb	3.058
2	123678-HxCDD	36.08	1.024e4	8.200e3	1.009	1.25	1.24	110.3	YES	NO	db	dd	4.154
3	123478-HxCDD	35.97	2.514e3	1.871e3	1.027	1.34	1.24	30.4	YES	NO	bd	bd	0.987
4	Total-hexadioxins	35.18	3.822e3	3.284e3	1.028	1.16	1.24	47.7	YES	NO	db	db	1.585
5	Total-hexadioxins	35.05	7.919e4	6.548e4	1.028	1.21	1.24	503.7	YES	NO	bd	bd	32.263
6	Total-hexadioxins	34.71	1.323e4	1.068e4	1.028	1.24	1.24	141.8	YES	NO	bb	bb	5.331
7	124679-HXCDD	33.94	2.130e5	1.708e5	1.125	1.25	1.24	2143.7	YES	NO	bb	bb	78.895

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDD	40.21	2.370e5	2.188e5	1.068	1.08	1.05	1473.3	YES	NO	bb	bb	151.999
2	1234679-HPCDD	39.16	4.225e5	3.940e5	1.211	1.07	1.05	2827.1	YES	NO	bb	bb	240.194

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
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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	24.64	8.900e2	1.146e3	0.879	0.78	0.77	8.0	YES	NO	bb	bb	0.598
2	Total-tetradioxins	23.90	6.611e2	7.764e2	0.879	0.85	0.77	7.4	YES	NO	bb	db	0.422
3	Total-tetradioxins	23.70	2.376e3	3.139e3	0.879	0.76	0.77	22.2	YES	NO	bb	bd	1.620
4	1368-TCDD	23.43	2.197e3	2.820e3	0.923	0.78	0.77	20.8	YES	NO	bb	bb	1.403
5	Total-tetradioxins	26.43	4.934e2	6.255e2	0.879	0.79	0.77	4.5	YES	NO	dd	db	0.329
6	2378-TCDD	26.32	5.375e2	7.035e2	0.920	0.76	0.77	6.1	YES	NO	bd	bd	0.348
7	Total-pentadioxins	30.05	4.600e3	2.604e3	1.331	1.77	1.55	46.8	YES	NO	bd	bb	1.635
8	Total-pentadioxins	29.84	5.791e3	3.747e3	1.331	1.55	1.55	58.3	YES	NO	bb	bb	2.164
9	Total-pentadioxins	29.23	6.495e3	3.888e3	1.331	1.67	1.55	63.9	YES	NO	bb	bb	2.356
10	123789-HxCDD	36.47	6.922e3	5.757e3	0.950	1.20	1.24	74.6	YES	NO	bb	bb	3.058
11	123678-HxCDD	36.08	1.024e4	8.200e3	1.009	1.25	1.24	110.3	YES	NO	db	dd	4.154
12	123478-HxCDD	35.97	2.514e3	1.871e3	1.027	1.34	1.24	30.4	YES	NO	bd	bd	0.987
13	Total-hexadioxins	35.18	3.822e3	3.284e3	1.028	1.16	1.24	47.7	YES	NO	db	db	1.585
14	Total-hexadioxins	35.05	7.919e4	6.548e4	1.028	1.21	1.24	503.7	YES	NO	bd	bd	32.263
15	Total-hexadioxins	34.71	1.323e4	1.068e4	1.028	1.24	1.24	141.8	YES	NO	bb	bb	5.331
16	124679-HXCDD	33.94	2.130e5	1.708e5	1.125	1.25	1.24	2143.7	YES	NO	bb	bb	78.895
17	1234678-HpCDD	40.21	2.370e5	2.188e5	1.068	1.08	1.05	1473.3	YES	NO	bb	bb	151.999
18	1234679-HPCDD	39.16	4.225e5	3.940e5	1.211	1.07	1.05	2827.1	YES	NO	bb	bb	240.194
19	OCDD	44.96	1.656e6	1.824e6	1.181	0.91	0.89	7747.8	YES	NO	bb	bb	1188.7...

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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	24.75	3.131e3	4.357e3	1.192	0.72	0.77	20.6	YES	NO	bb	bb	1.523
2	Total-tetrafurans	24.57	1.617e4	2.221e4	1.192	0.73	0.77	101.7	YES	NO	bb	db	7.806
3	Total-tetrafurans	24.34	3.330e3	4.538e3	1.192	0.73	0.77	19.9	YES	NO	bd	bd	1.600
4	Total-tetrafurans	23.90	1.703e3	2.096e3	1.192	0.81	0.77	12.2	YES	NO	db	db	0.773
5	Total-tetrafurans	23.64	1.427e4	1.884e4	1.192	0.76	0.77	92.3	YES	NO	bd	bd	6.734
6	Total-tetrafurans	23.40	5.120e3	7.133e3	1.192	0.72	0.77	31.5	YES	NO	db	dd	2.492
7	Total-tetrafurans	22.99	3.518e4	4.596e4	1.192	0.77	0.77	226.4	YES	NO	bb	bb	16.503
8	Total-tetrafurans	26.68	4.616e2	6.226e2	1.192	0.74	0.77	3.8	YES	NO	bb	bb	0.221
9	2378-TCDF	25.67	3.134e3	4.436e3	1.108	0.71	0.77	24.5	YES	NO	bb	bb	1.657
10	Total-tetrafurans	25.17	9.396e2	1.110e3	1.192	0.85	0.77	6.2	YES	NO	db	bb	0.417
11	Total-tetrafurans	24.99	1.300e3	1.803e3	1.192	0.72	0.77	7.3	YES	NO	bd	bb	0.631
12	Total-pentafurans	28.58	6.740e3	4.299e3	1.047	1.57	1.55	34.6	YES	NO	dd	dd	1.909
13	23478-PeCDF	31.19	6.378e3	4.457e3	1.126	1.43	1.55	38.4	YES	NO	dd	db	1.789
14	Total-pentafurans	31.03	1.940e4	1.223e4	1.047	1.59	1.55	114.5	YES	NO	dd	dd	5.471
15	Total-pentafurans	30.14	1.052e3	6.639e2	1.047	1.58	1.55	7.7	YES	NO	dd	db	0.297
16	Total-pentafurans	30.04	8.591e3	5.322e3	1.047	1.61	1.55	52.3	YES	NO	bd	bd	2.407
17	Total-pentafurans	29.47	2.379e4	1.398e4	1.047	1.70	1.55	128.7	YES	NO	db	dd	6.534
18	Total-pentafurans	29.36	2.901e3	2.039e3	1.047	1.42	1.55	20.0	YES	NO	dd	dd	0.855
19	234678-HxCDF	35.81	1.087e4	8.719e3	1.052	1.25	1.24	73.7	YES	NO	MM	MM	4.010
20	123678-HxCDF	34.98	5.818e3	5.059e3	1.037	1.15	1.24	67.4	YES	NO	db	db	2.135
21	123478-HxCDF	34.83	5.316e3	4.479e3	1.017	1.19	1.24	64.7	YES	NO	bd	bd	1.994
22	Total-hexafurans	34.67	1.307e3	9.259e2	1.045	1.41	1.24	17.6	YES	NO	bb	bb	0.460
23	Total-hexafurans	34.21	5.116e4	4.293e4	1.045	1.19	1.24	596.5	YES	NO	bb	bb	19.371
24	Total-hexafurans	33.89	1.706e3	1.333e3	1.045	1.28	1.24	16.7	YES	NO	bb	bb	0.626
25	Total-hexafurans	33.37	6.227e4	5.090e4	1.045	1.22	1.24	698.6	YES	NO	bb	bb	23.296
26	123468-HXCDF	33.16	1.373e4	1.083e4	1.087	1.27	1.24	158.4	YES	NO	bb	bb	4.678
27	123789-HxCDF	36.84	1.694e3	1.416e3	1.030	1.20	1.24	21.1	YES	NO	bb	bd	0.716
28	Total-heptafurans	39.38	6.769e4	6.679e4	1.305	1.01	1.05	849.4	YES	NO	bb	bb	30.408
29	Total-heptafurans	39.13	1.392e3	1.419e3	1.305	0.98	1.05	15.6	YES	NO	bd	bb	0.636
30	1234678-HpCDF	38.72	6.537e4	6.459e4	1.327	1.01	1.05	834.3	YES	NO	bb	bb	26.513
31	OCDF	45.19	3.678e4	4.220e4	1.447	0.87	0.89	329.0	YES	NO	bb	bb	22.014
32	Total-penta1	27.11	1.682e5	1.104e5		1.52	1.55	2329.3	YES	NO	bb	bb	53.616
33	Total-pentafurans	28.78	7.801e4	4.953e4	1.047	1.58	1.55	314.0	YES	NO	MM	MM	22.061
34	Total-tetradioxins	24.64	8.900e2	1.146e3	0.879	0.78	0.77	8.0	YES	NO	bb	bb	0.598
35	Total-tetradioxins	23.90	6.611e2	7.764e2	0.879	0.85	0.77	7.4	YES	NO	bb	db	0.422
36	Total-tetradioxins	23.70	2.376e3	3.139e3	0.879	0.76	0.77	22.2	YES	NO	bb	bd	1.620
37	1368-TCDD	23.43	2.197e3	2.820e3	0.923	0.78	0.77	20.8	YES	NO	bb	bb	1.403

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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	Total-tetradioxins	26.43	4.934e2	6.255e2	0.879	0.79	0.77	4.5	YES	NO	dd	db	0.329
39	2378-TCDD	26.32	5.375e2	7.035e2	0.920	0.76	0.77	6.1	YES	NO	bd	bd	0.348
40	Total-pentadioxins	30.05	4.600e3	2.604e3	1.331	1.77	1.55	46.8	YES	NO	bd	bb	1.635
41	Total-pentadioxins	29.84	5.791e3	3.747e3	1.331	1.55	1.55	58.3	YES	NO	bb	bb	2.164
42	Total-pentadioxins	29.23	6.495e3	3.888e3	1.331	1.67	1.55	63.9	YES	NO	bb	bb	2.356
43	123789-HxCDD	36.47	6.922e3	5.757e3	0.950	1.20	1.24	74.6	YES	NO	bb	bb	3.058
44	123678-HxCDD	36.08	1.024e4	8.200e3	1.009	1.25	1.24	110.3	YES	NO	db	dd	4.154
45	123478-HxCDD	35.97	2.514e3	1.871e3	1.027	1.34	1.24	30.4	YES	NO	bd	bd	0.987
46	Total-hexadioxins	35.18	3.822e3	3.284e3	1.028	1.16	1.24	47.7	YES	NO	db	db	1.585
47	Total-hexadioxins	35.05	7.919e4	6.548e4	1.028	1.21	1.24	503.7	YES	NO	bd	bd	32.263
48	Total-hexadioxins	34.71	1.323e4	1.068e4	1.028	1.24	1.24	141.8	YES	NO	bb	bb	5.331
49	124679-HXCDD	33.94	2.130e5	1.708e5	1.125	1.25	1.24	2143.7	YES	NO	bb	bb	78.895
50	1234678-HpCDD	40.21	2.370e5	2.188e5	1.068	1.08	1.05	1473.3	YES	NO	bb	bb	151.999
51	1234679-HPCDD	39.16	4.225e5	3.940e5	1.211	1.07	1.05	2827.1	YES	NO	bb	bb	240.194
52	OCDD	44.96	1.656e6	1.824e6	1.181	0.91	0.89	7747.8	YES	NO	bb	bb	1188.7...

PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	22.04	9.415e4					1.0	NO		bb		
2	FUNCTION1 PFK	21.89	1.774e5					4.6	YES		bb		
3	FUNCTION1 PFK	21.50	5.637e3					0.7	NO		bb		
4	FUNCTION1 PFK	21.27	1.070e4					1.0	NO		bb		
5	FUNCTION1 PFK	21.13	8.574e4					2.6	NO		bb		
6	FUNCTION1 PFK	27.15	6.689e4					2.0	NO		bb		
7	FUNCTION1 PFK	26.02	4.959e4					0.7	NO		bb		
8	FUNCTION1 PFK	24.63	3.847e4					1.7	NO		db		
9	FUNCTION1 PFK	24.57	3.522e4					1.7	NO		dd		
10	FUNCTION1 PFK	24.51	4.141e4					2.0	NO		bd		
11	FUNCTION1 PFK	24.05	5.344e3					0.6	NO		bb		
12	FUNCTION1 PFK	23.42	2.452e4					1.2	NO		bb		
13	FUNCTION1 PFK	22.96	2.379e4					1.2	NO		bb		
14	FUNCTION1 PFK	22.63	1.444e4					0.9	NO		bb		

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Printed: Tuesday, August 24, 2021 11:26:22 Pacific Daylight Time

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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	32.50	4.803e4					2.4	NO		bb		0.000
2	FUNCTION2 PFK	29.40	1.578e5					3.7	YES		bb		0.000
3	FUNCTION2 PFK	29.26	5.892e4					3.5	YES		bb		0.000
4	FUNCTION2 PFK	29.13	1.217e5					2.6	NO		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	36.54	1.300e6					4.7	YES		bb		0.000
2	FUNCTION3 PFK	37.16	1.586e6					2.6	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	42.22	6.962e3					0.9	NO		bb		
2	FUNCTION4 PFK	41.80	1.338e4					1.4	NO		bb		
3	FUNCTION4 PFK	40.65	1.108e4					0.9	NO		bb		
4	FUNCTION4 PFK	40.57	2.571e4					1.7	NO		bb		
5	FUNCTION4 PFK	40.21	6.083e4					1.5	NO		bb		
6	FUNCTION4 PFK	40.00	1.105e4					1.0	NO		bb		
7	FUNCTION4 PFK	39.74	8.086e3					1.1	NO		bb		
8	FUNCTION4 PFK	39.23	7.076e3					0.9	NO		bb		
9	FUNCTION4 PFK	38.01	1.960e4					1.8	NO		db		
10	FUNCTION4 PFK	37.93	4.201e4					2.1	NO		bd		
11	FUNCTION4 PFK	37.79	9.256e4					2.7	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	42.95	2.248e3					0.7	NO		bb		
2	FUNCTION5 PFK	42.92	1.509e4					1.7	NO		bb		
3	FUNCTION5 PFK	45.51	5.211e3					0.9	NO		bb		
4	FUNCTION5 PFK	45.48	2.022e3					0.6	NO		bb		
5	FUNCTION5 PFK	45.44	1.207e4					1.3	NO		bb		
6	FUNCTION5 PFK	45.39	2.067e3					0.6	NO		bb		
7	FUNCTION5 PFK	45.35	1.155e3					0.4	NO		bb		
8	FUNCTION5 PFK	45.32	1.014e4					1.2	NO		bb		
9	FUNCTION5 PFK	44.89	9.567e3					1.0	NO		bb		
10	FUNCTION5 PFK	44.86	7.398e3					1.0	NO		db		
11	FUNCTION5 PFK	44.81	1.344e4					1.4	NO		bd		
12	FUNCTION5 PFK	44.71	1.033e4					0.9	NO		bb		
13	FUNCTION5 PFK	44.54	1.010e4					1.6	NO		bb		
14	FUNCTION5 PFK	44.46	1.024e4					1.0	NO		bb		
15	FUNCTION5 PFK	44.30	4.180e3					0.6	NO		bb		
16	FUNCTION5 PFK	43.73	1.607e4					1.2	NO		bb		
17	FUNCTION5 PFK	43.55	8.135e3					0.8	NO		bb		
18	FUNCTION5 PFK	43.05	1.128e3					0.4	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	3.067e2					4.4	YES		bb		0.000
2	FUNCTION1 HXCD...	26.68	8.836e2					16.6	YES		bb		0.000
3	FUNCTION1 HXCD...	26.03	2.300e3					36.0	YES		bb		0.000
4	FUNCTION1 HXCD...	25.65	1.463e3					26.2	YES		bb		0.000
5	FUNCTION1 HXCD...	25.00	6.624e2					9.3	YES		db		0.000
6	FUNCTION1 HXCD...	24.75	2.295e2					2.8	NO		bd		0.000
7	FUNCTION1 HXCD...	23.64	2.608e3					43.0	YES		bb		0.000
8	FUNCTION1 HXCD...	22.63	2.636e2					4.8	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...	23.34	1.206e2					1.7	NO		bb		0.000
2	FUNCTION1 HPCD...	23.27	1.075e2					2.8	NO		db		0.000
3	FUNCTION1 HPCD...	23.22	2.853e2					3.7	YES		bd		0.000
4	FUNCTION1 HPCD...	22.46	1.534e2					2.5	NO		db		0.000
5	FUNCTION1 HPCD...	22.34	1.066e2					1.4	NO		bd		0.000
6	FUNCTION1 HPCD...	21.94	3.225e2					5.1	YES		bb		0.000
7	FUNCTION1 HPCD...	25.64	7.144e1					1.8	NO		bb		0.000
8	FUNCTION1 HPCD...	24.04	1.446e2					2.7	NO		bb		0.000
9	FUNCTION1 HPCD...	23.90	8.453e1					1.6	NO		bb		0.000
10	FUNCTION1 HPCD...	23.80	3.091e2					2.6	NO		db		0.000
11	FUNCTION1 HPCD...	23.66	1.604e2					1.9	NO		dd		0.000
12	FUNCTION1 HPCD...	23.55	1.491e2					2.6	NO		bd		0.000

ETHERS3

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 HPCD...	32.10	7.109e2					8.6	YES		bb		0.000
2	FUNCTION2 HPCD...	31.44	9.469e1					3.4	YES		bb		0.000
3	FUNCTION2 HPCD...	30.85	1.884e2					3.3	YES		bb		0.000
4	FUNCTION2 HPCD...	29.77	8.863e1					2.1	NO		bb		0.000
5	FUNCTION2 HPCD...	29.59	7.246e1					2.5	NO		bb		0.000
6	FUNCTION2 HPCD...	28.86	1.376e3					16.1	YES		bb		0.000
7	FUNCTION2 HPCD...	27.82	4.809e2					5.5	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	33.00	1.800e2					5.2	YES		bb		0.000
2	FUNCTION3 OCDPE	36.08	1.562e2					2.9	NO		bb		0.000
3	FUNCTION3 OCDPE	34.21	1.562e2					3.0	NO		db		0.000
4	FUNCTION3 OCDPE	34.12	1.452e2					4.0	YES		bd		0.000

ETHERS5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 NCDPE	39.11	8.256e1					3.2	YES		bb		0.000
2	FUNCTION4 NCDPE	38.34	2.480e3					35.1	YES		bb		0.000

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ETHERS6

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 DCDPE	45.49	2.415e2					4.5	YES		dd		0.000
2	FUNCTION5 DCDPE	45.47	8.015e1					3.9	YES		dd		0.000
3	FUNCTION5 DCDPE	45.40	1.796e2					3.6	YES		dd		0.000
4	FUNCTION5 DCDPE	45.35	1.352e2					3.6	YES		bd		0.000
5	FUNCTION5 DCDPE	44.99	1.142e2					2.4	NO		db		0.000
6	FUNCTION5 DCDPE	44.95	7.127e1					2.2	NO		bd		0.000
7	FUNCTION5 DCDPE	44.74	1.246e2					2.5	NO		bb		0.000
8	FUNCTION5 DCDPE	43.77	1.092e2					4.1	YES		bb		0.000
9	FUNCTION5 DCDPE	43.06	9.729e1					2.6	NO		bb		0.000
10	FUNCTION5 DCDPE	45.90	1.736e2					3.1	YES		db		0.000
11	FUNCTION5 DCDPE	45.79	1.428e2					3.2	YES		dd		0.000
12	FUNCTION5 DCDPE	45.73	1.846e2					3.7	YES		dd		0.000
13	FUNCTION5 DCDPE	45.66	1.117e2					3.3	YES		dd		0.000
14	FUNCTION5 DCDPE	45.63	7.804e1					2.2	NO		dd		0.000
15	FUNCTION5 DCDPE	45.57	7.821e1					2.5	NO		dd		0.000

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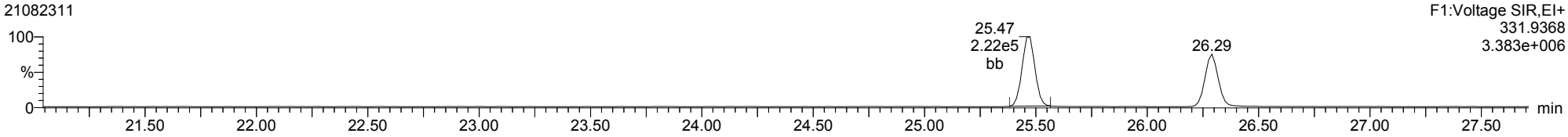

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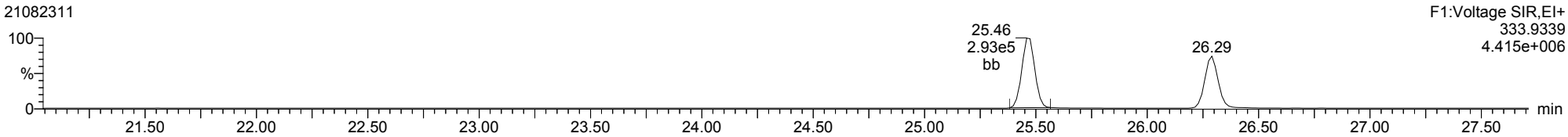

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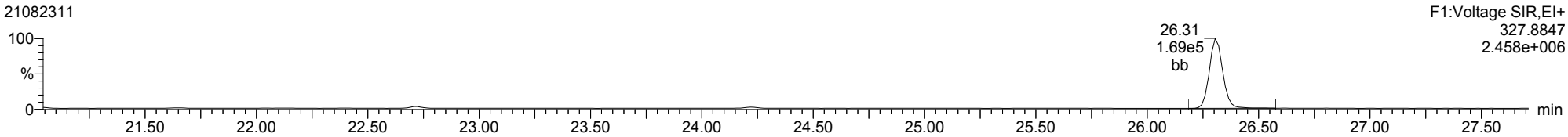
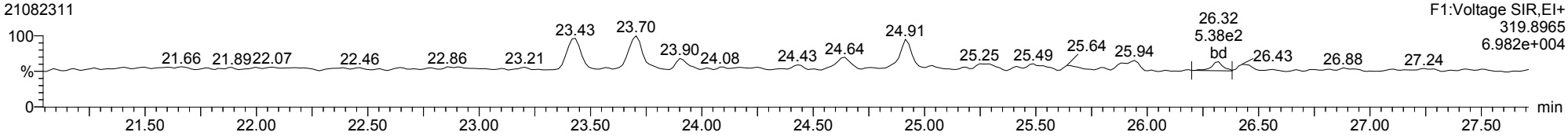
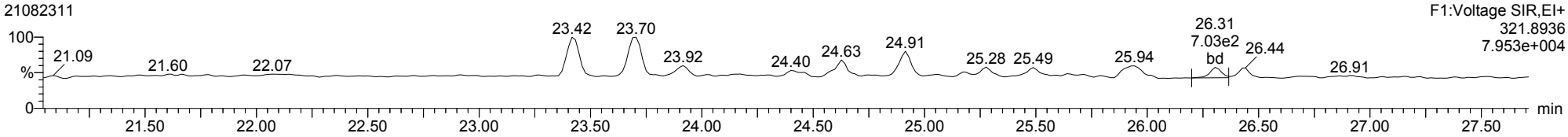


ID: 21G0064-10, Name: 21082311, Date: 23-Aug-2021, Time: 20:08:42, Conditions: AUTOSPEC01, User: pk

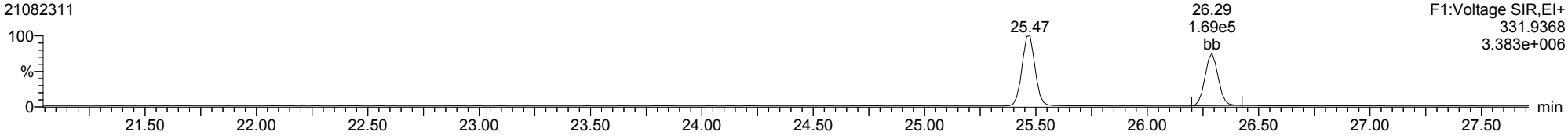
2378-TCDD



2378-TCDD



13C-2378-TCDD



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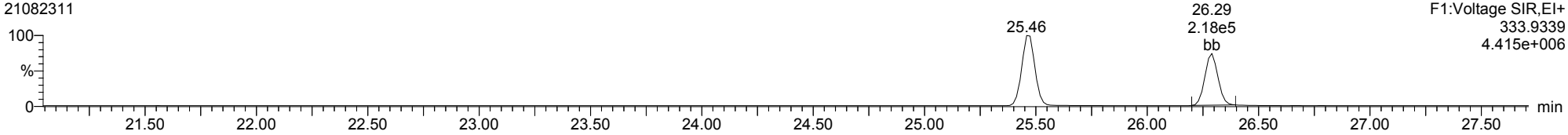

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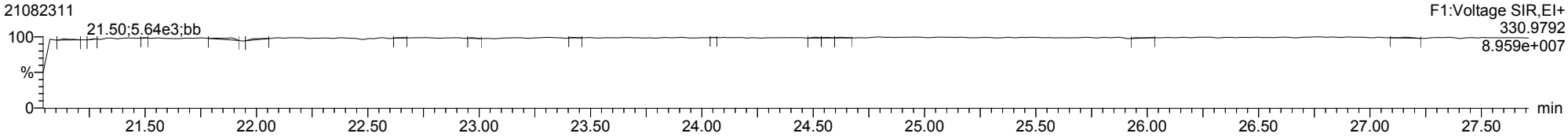
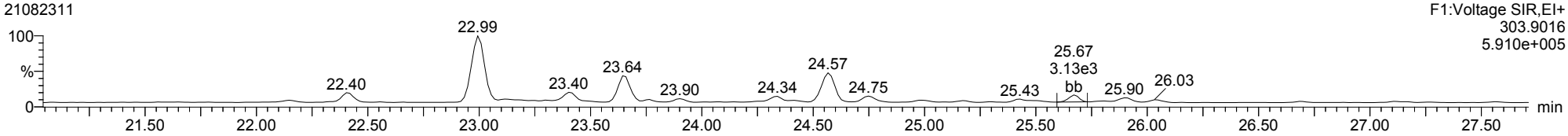


ID: 21G0064-10, Name: 21082311, Date: 23-Aug-2021, Time: 20:08:42, Conditions: AUTOSPEC01, User: pk

2378-TCDF



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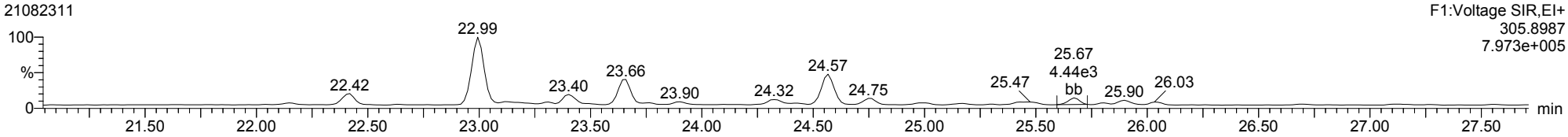

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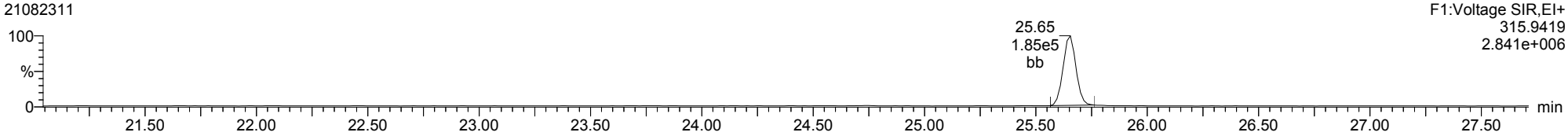

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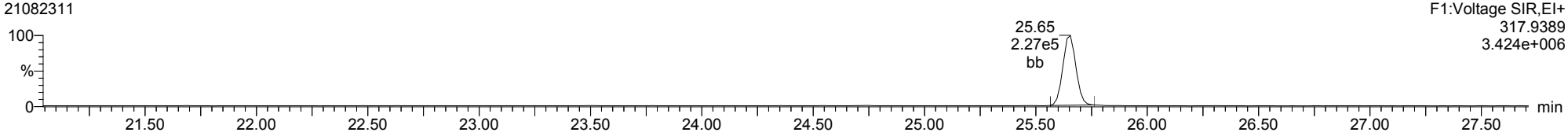

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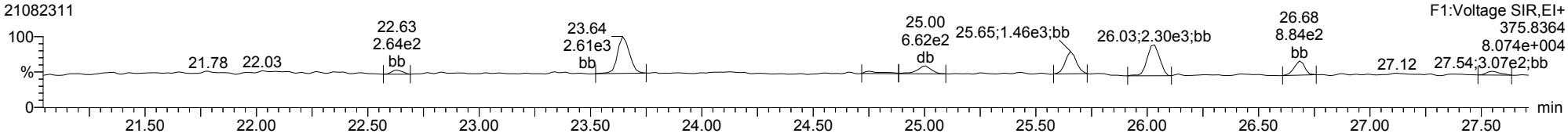

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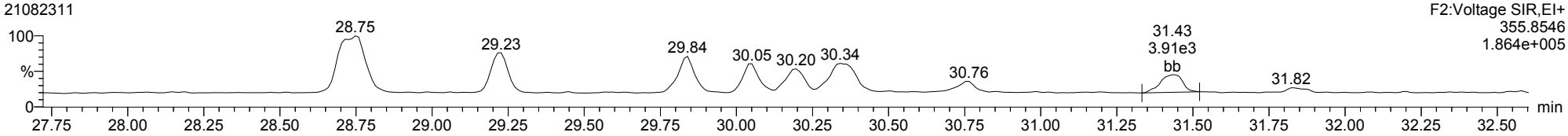
12378-PeCDD



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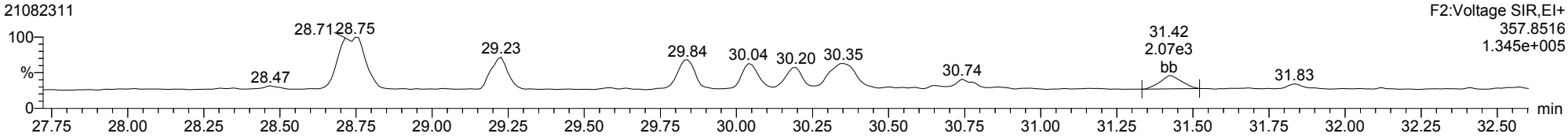

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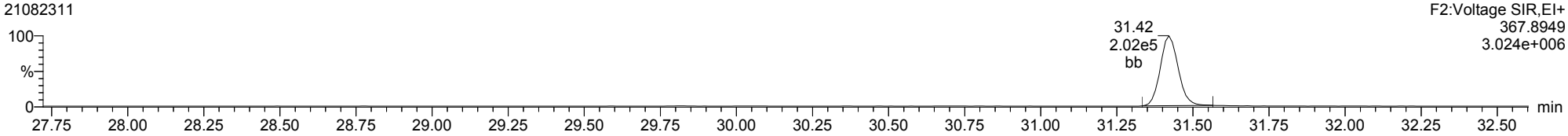

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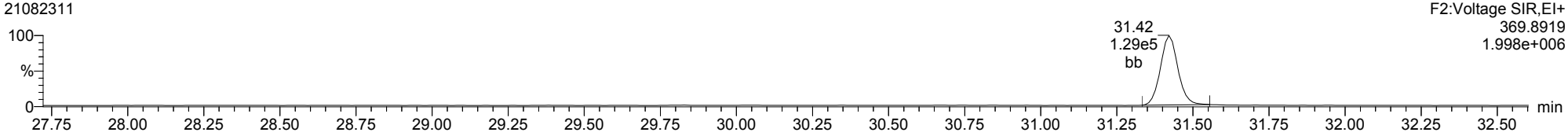
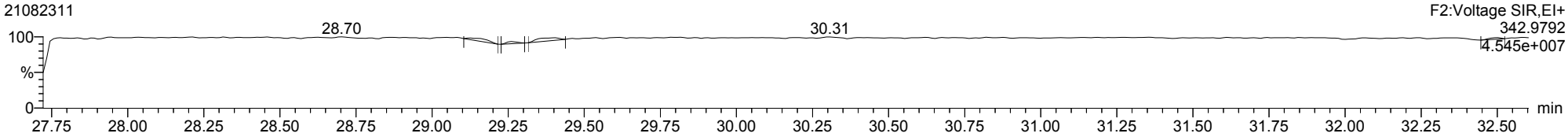


FUNCTION2 PFK



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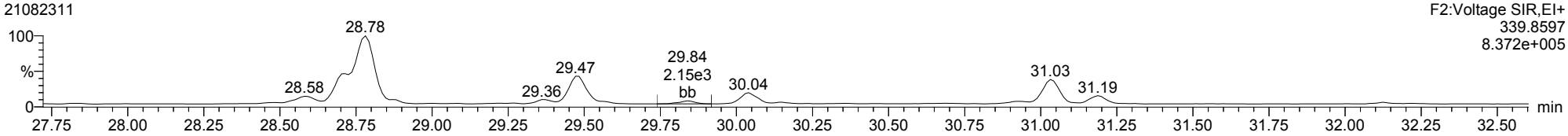

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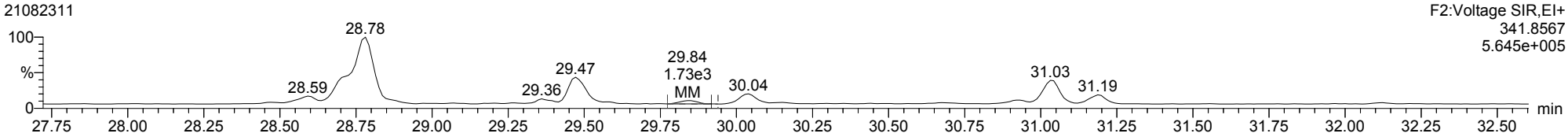

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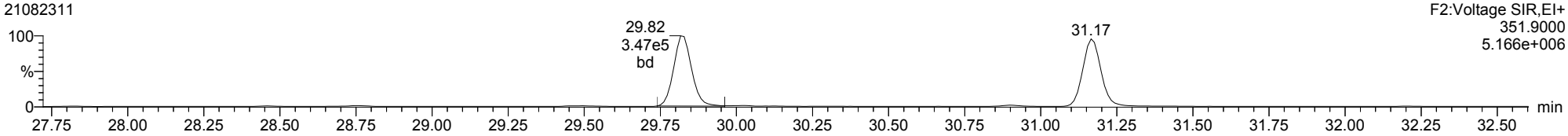

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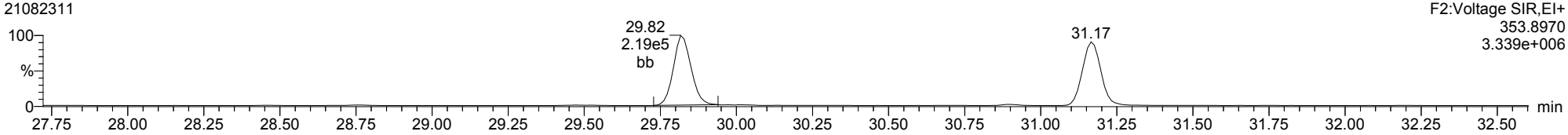
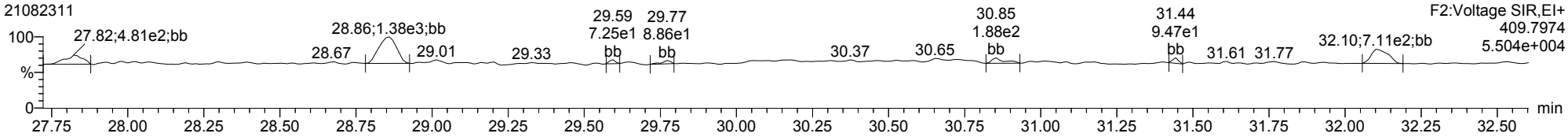


FUNCTION2 HPCDPE



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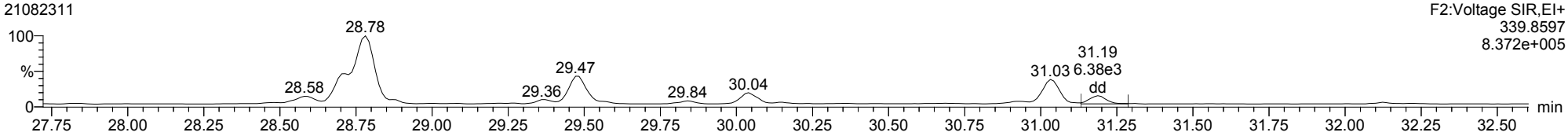
23478-PeCDF



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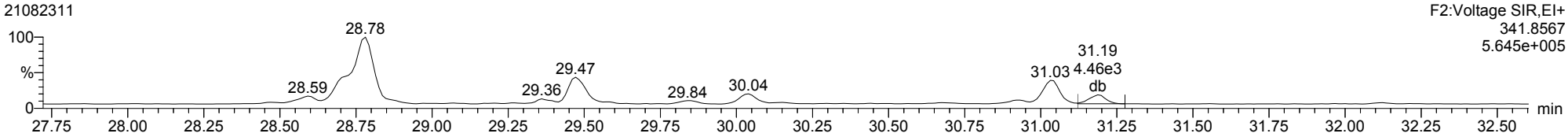

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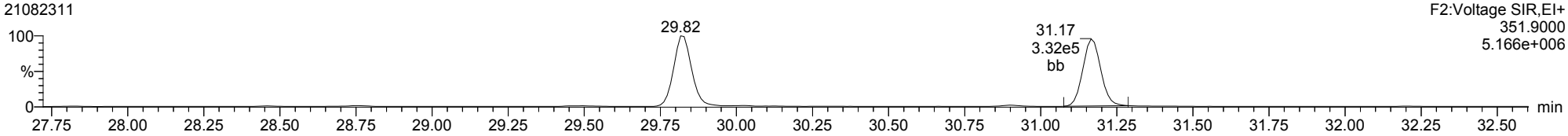

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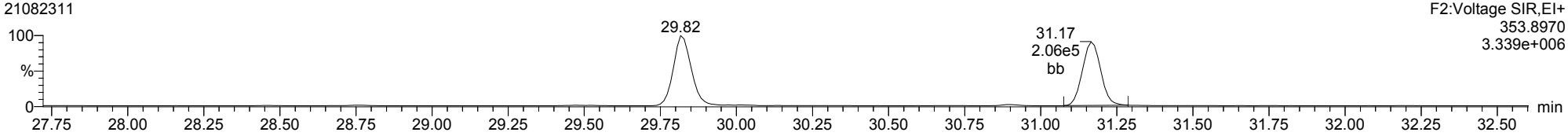
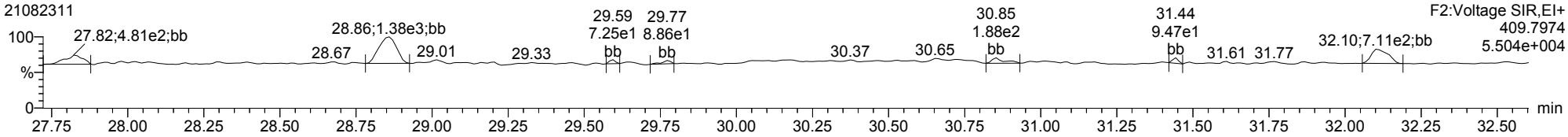


FUNCTION2 HPCDPE



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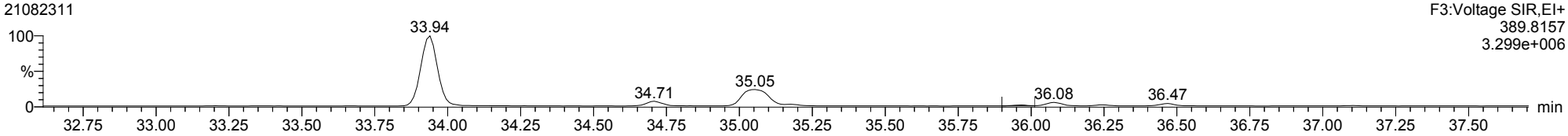
123478-HxCDD



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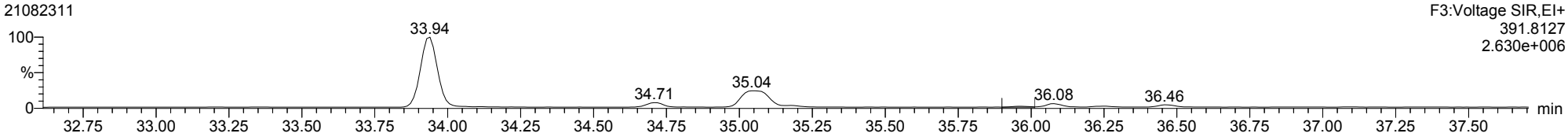

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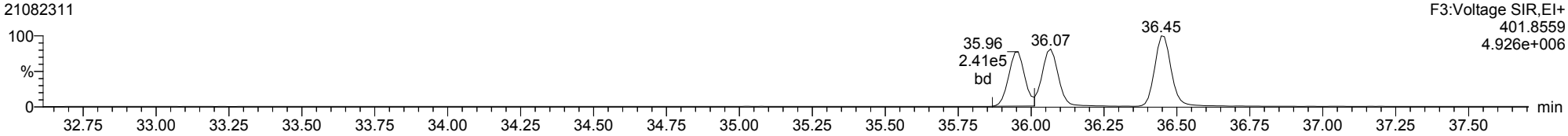

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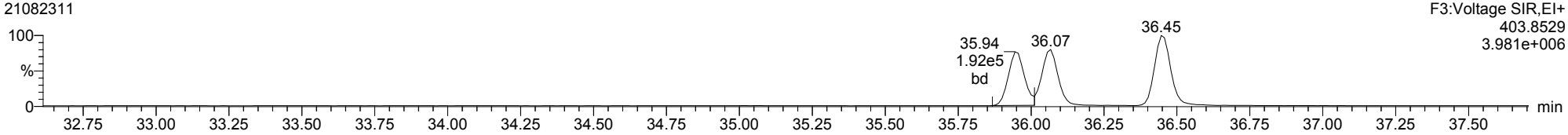
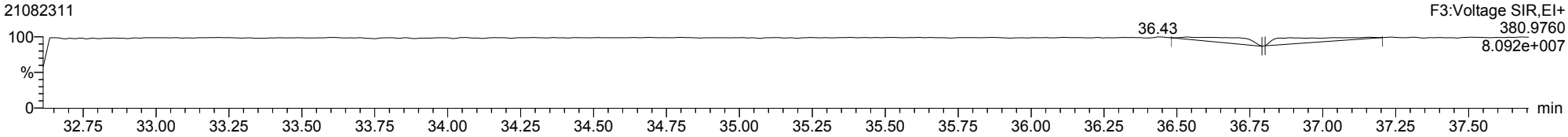


FUNCTION3 PFK



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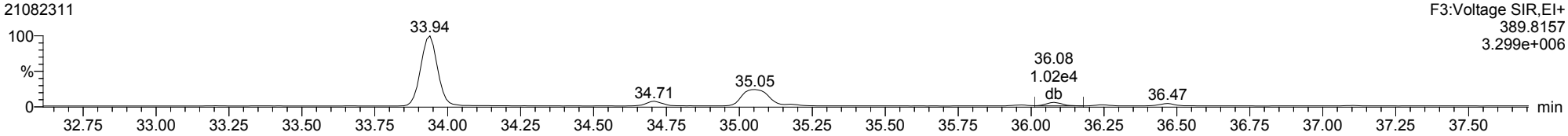
123678-HxCDD



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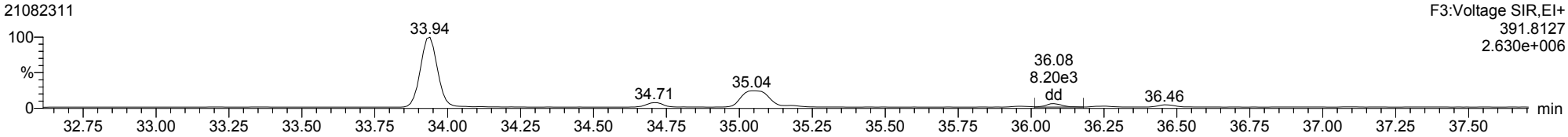

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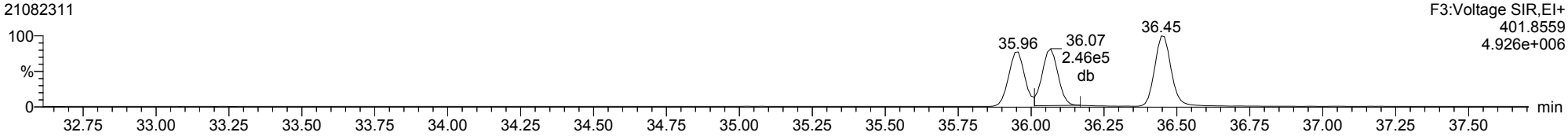

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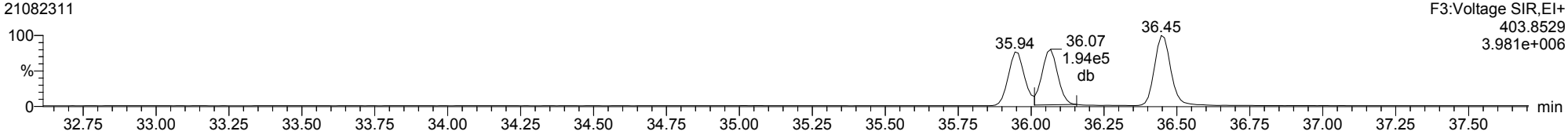

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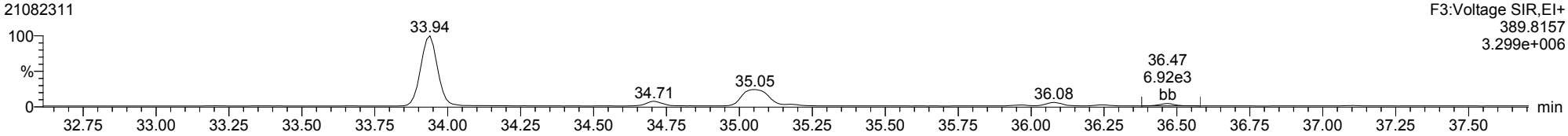

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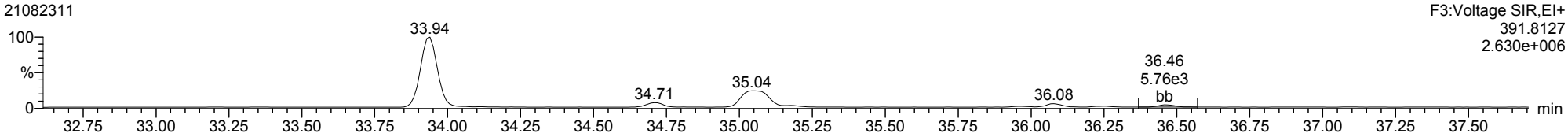

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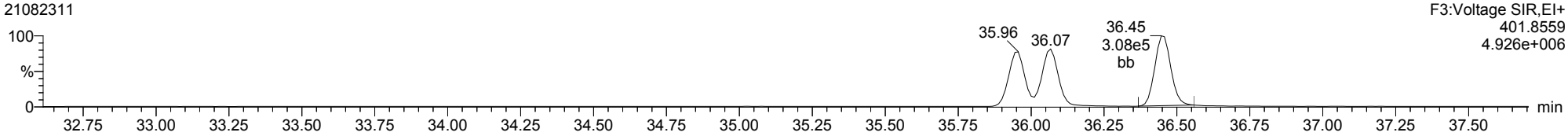

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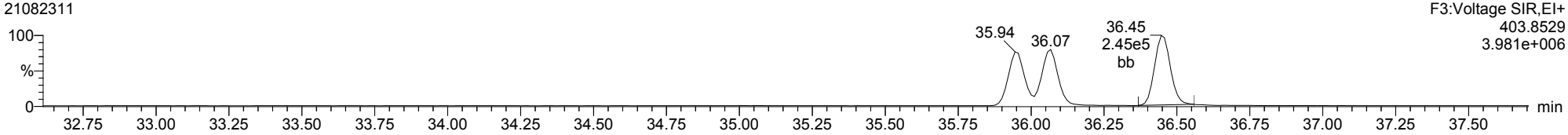

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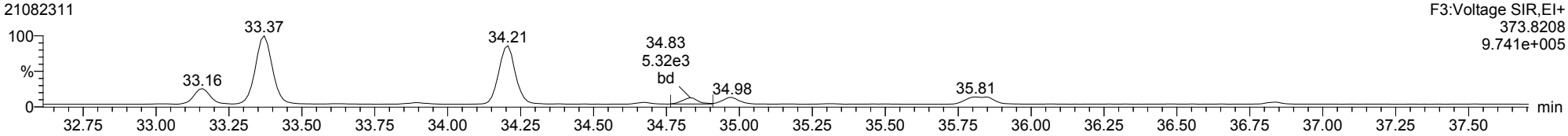
123478-HxCDF



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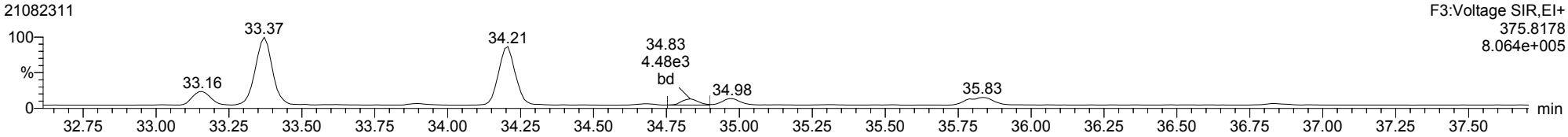

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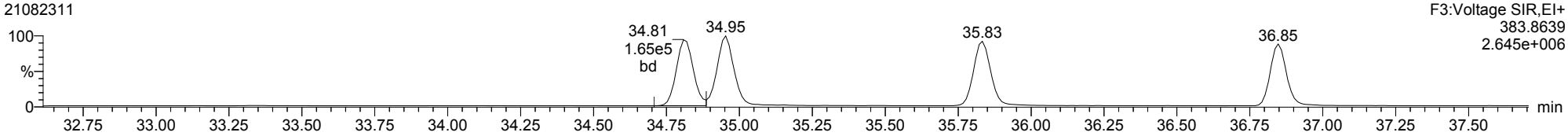

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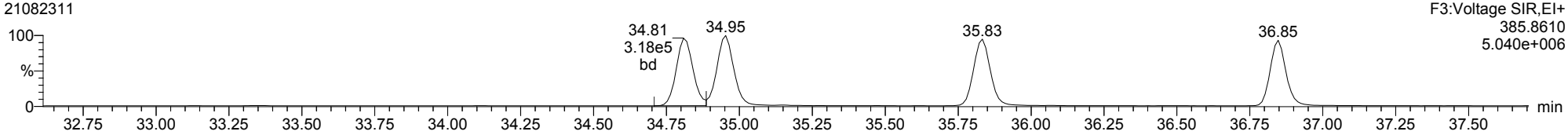
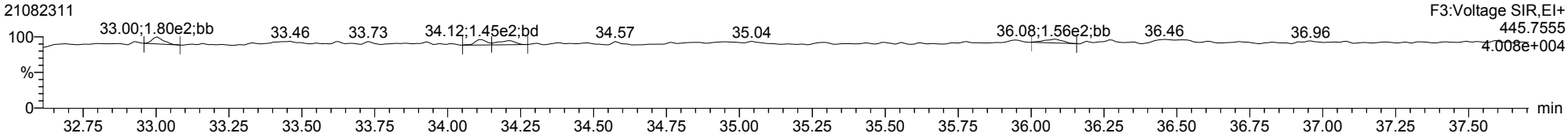
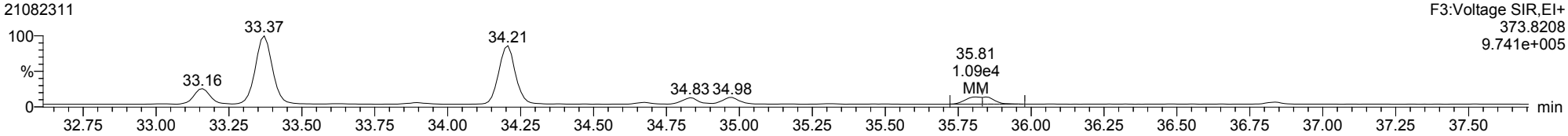


FUNCTION3 OCDPE



ID: 21G0064-10, Name: 21082311, Date: 23-Aug-2021, Time: 20:08:42, Conditions: AUTOSPEC01, User: pk

234678-HxCDF



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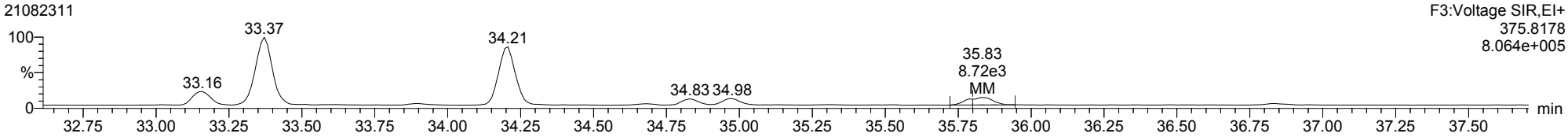

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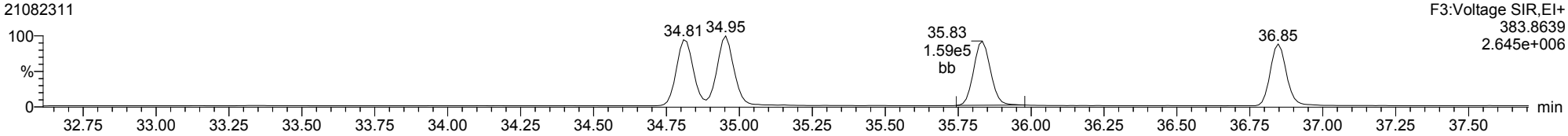

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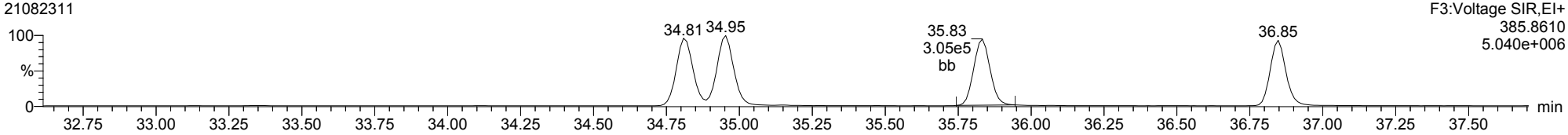
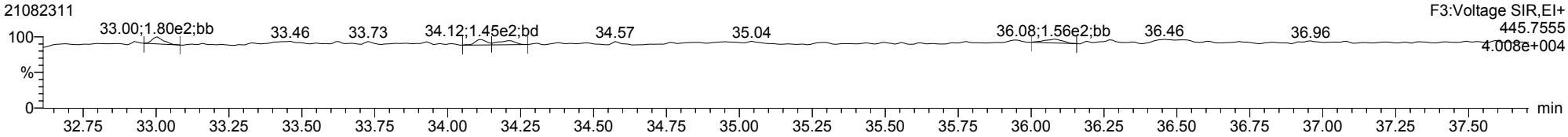


FUNCTION3 OCDPE



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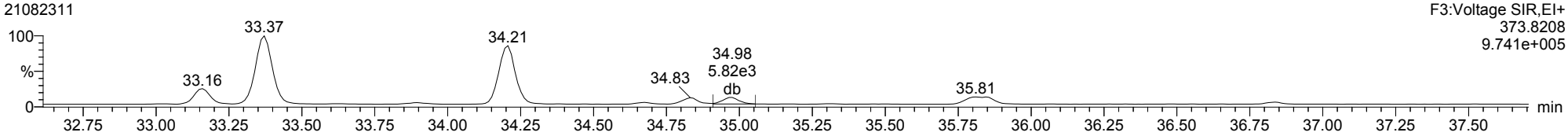
123678-HxCDF



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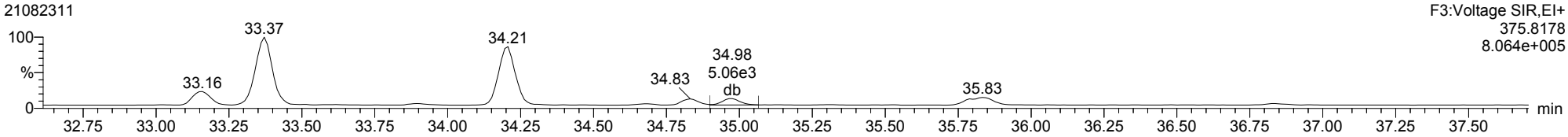

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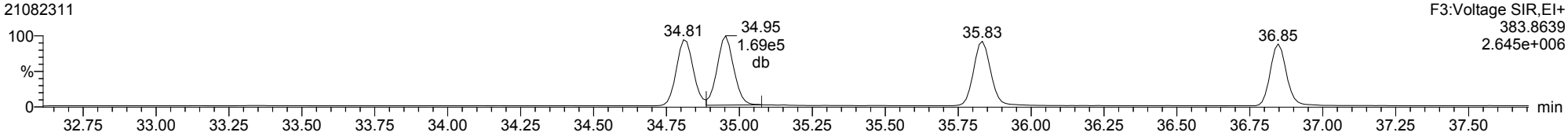

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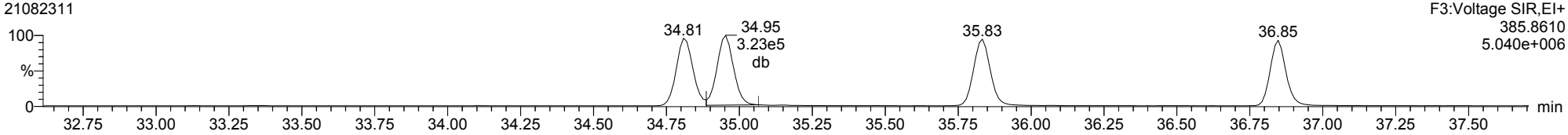

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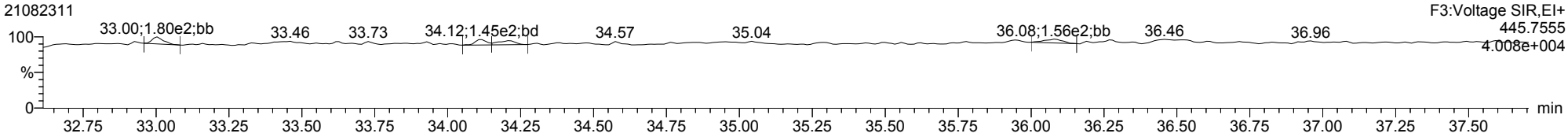

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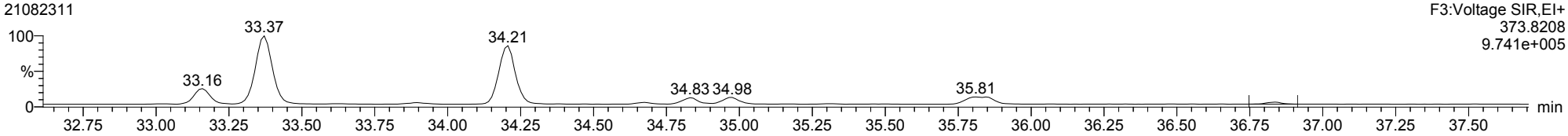
123789-HxCDF



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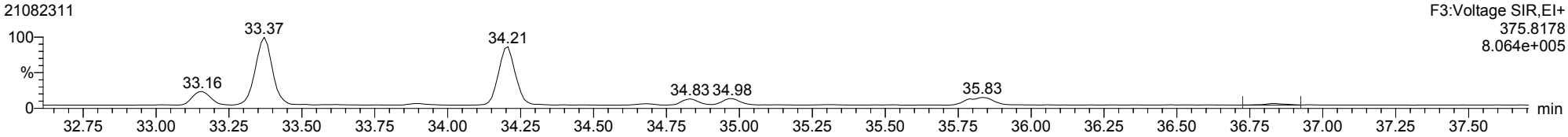

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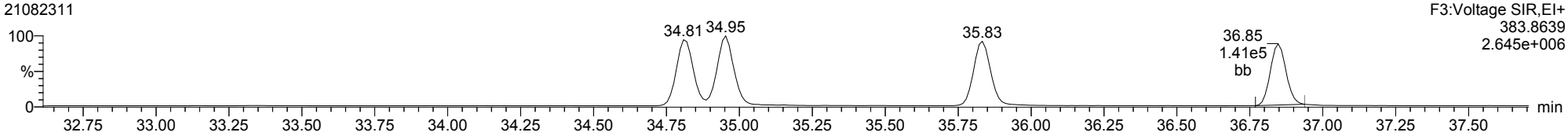

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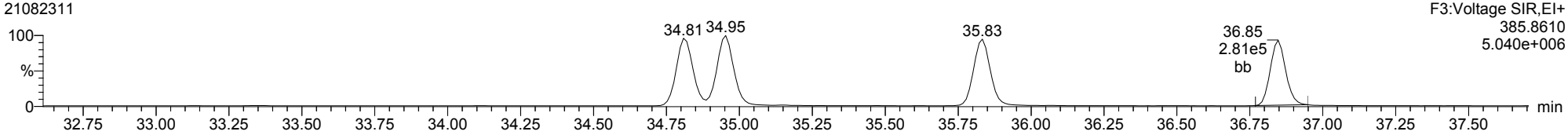
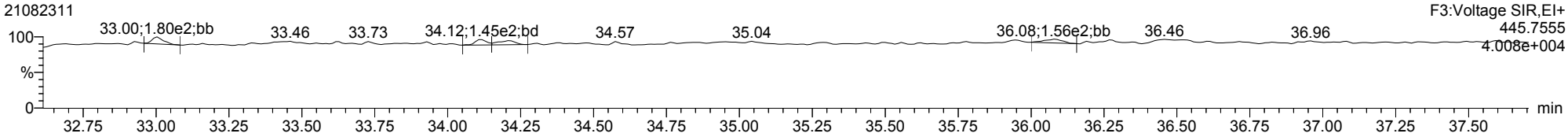


FUNCTION3 OCDPE



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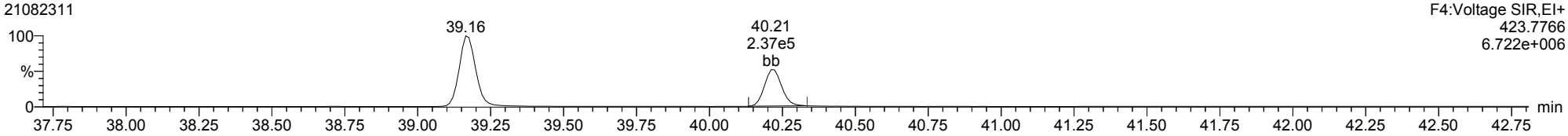

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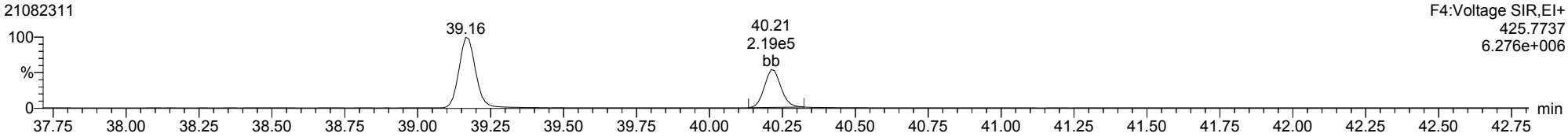

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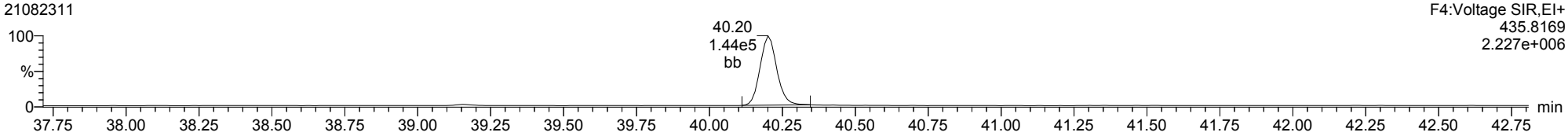

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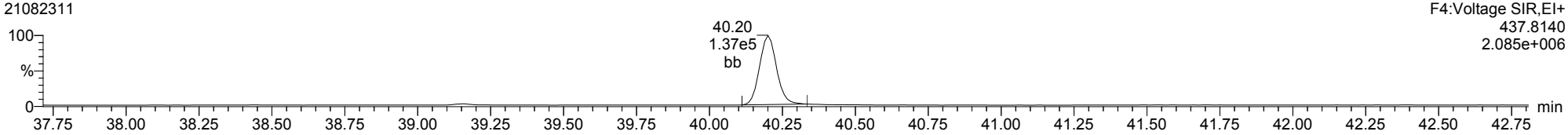

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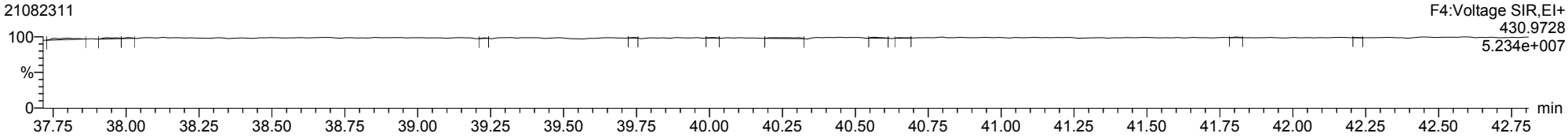

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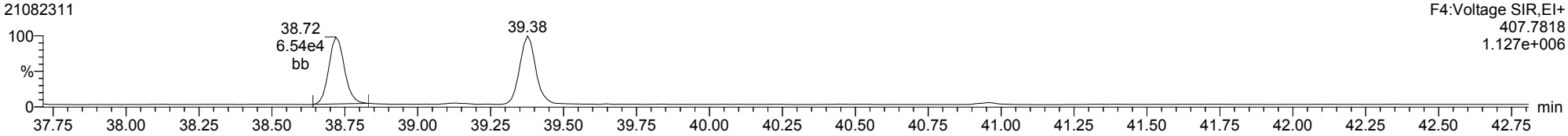

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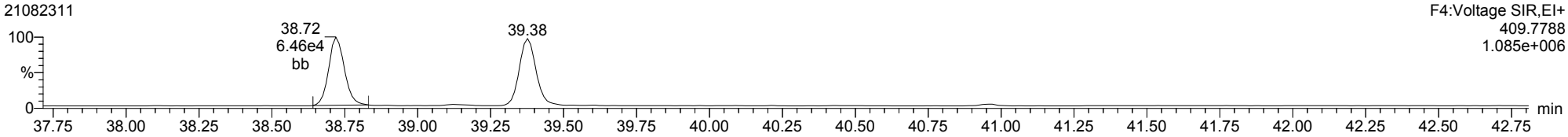

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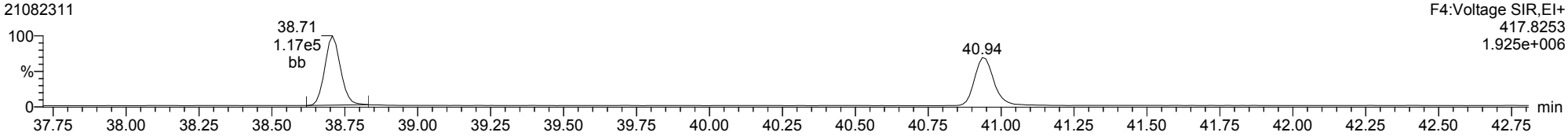

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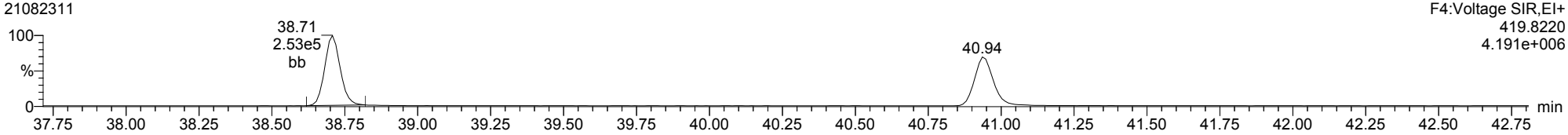

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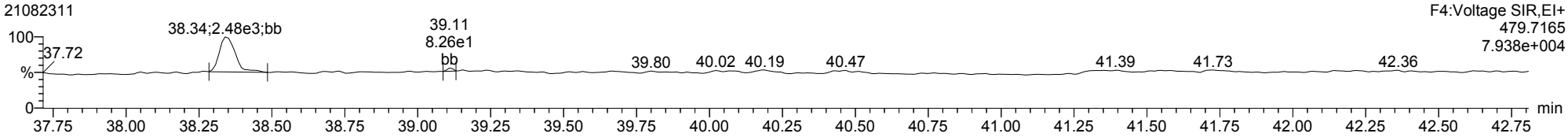

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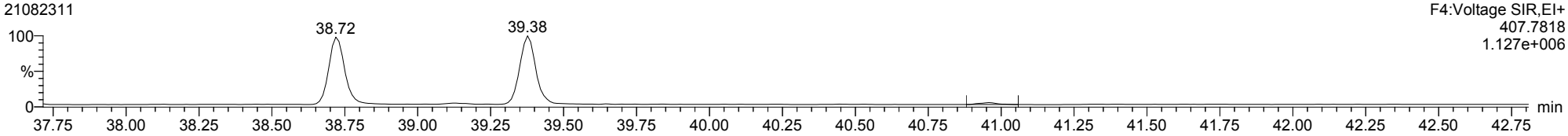
1234789-HpCDF



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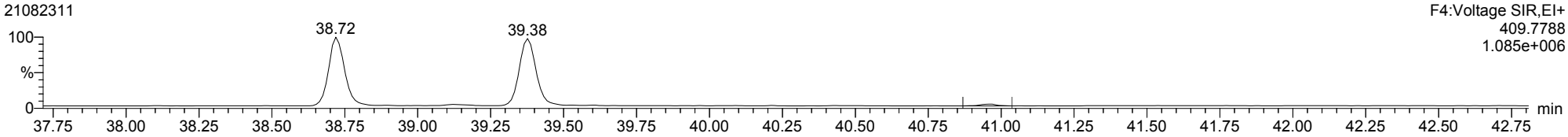

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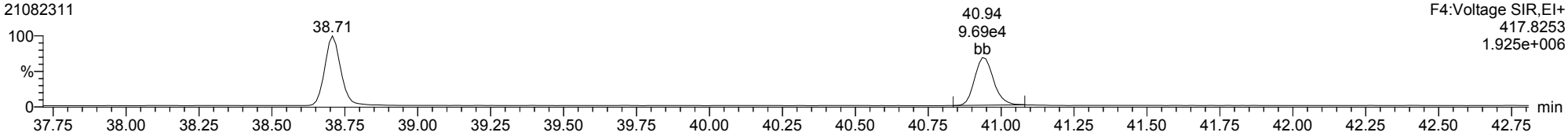

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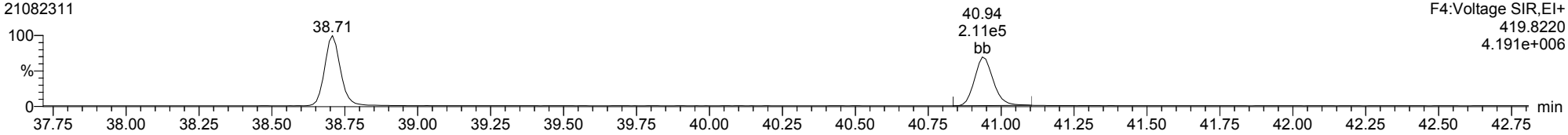
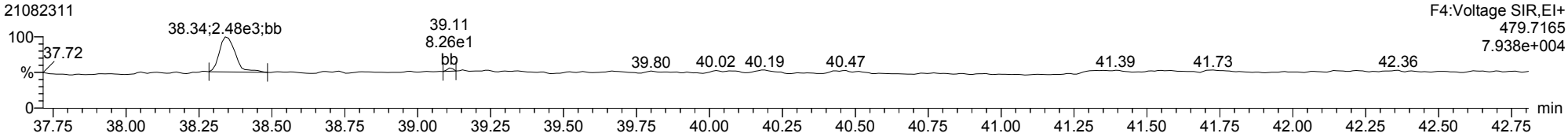


FUNCTION4 NCDPE



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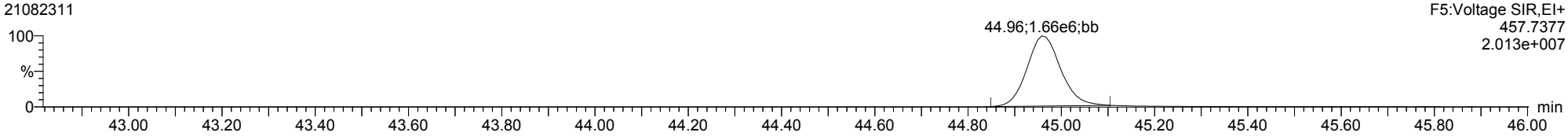
OCDD



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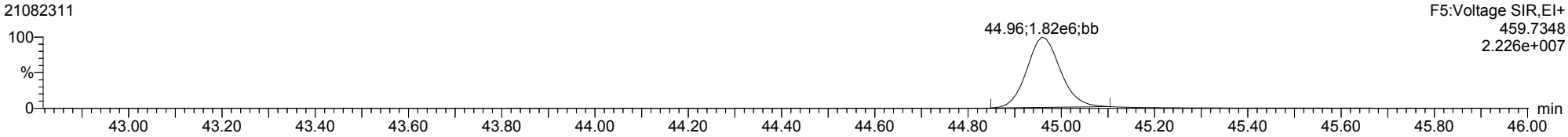

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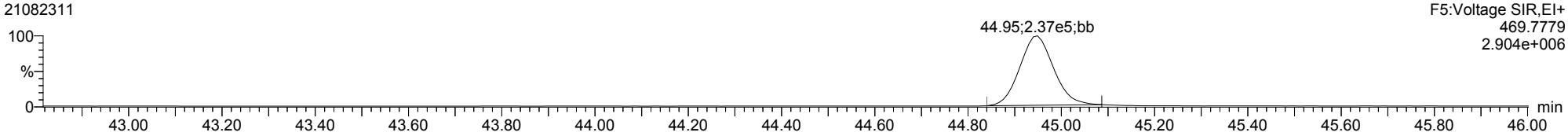

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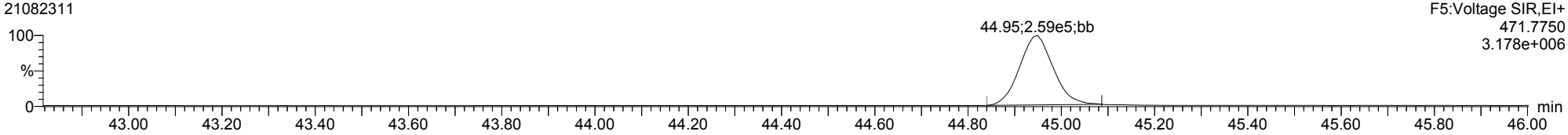
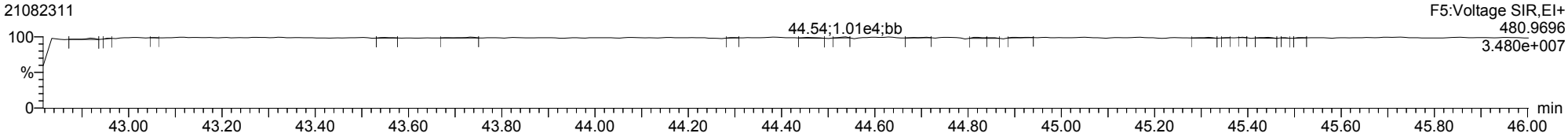


FUNCTION5 PFK



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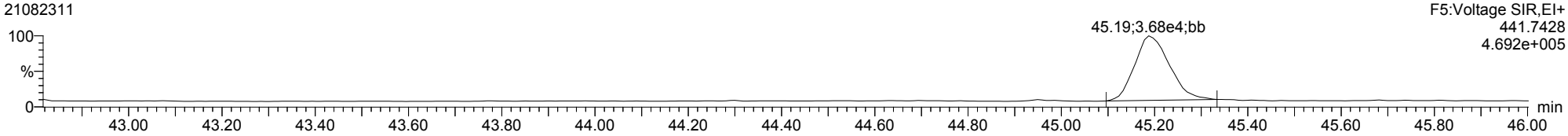

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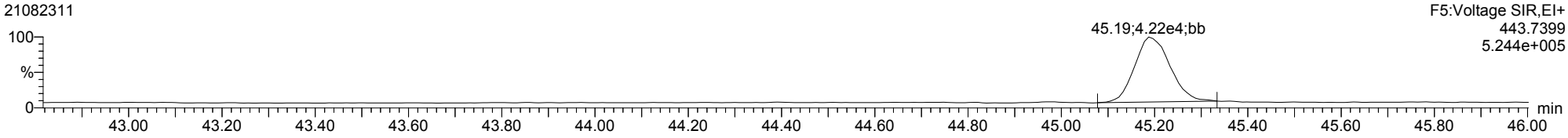

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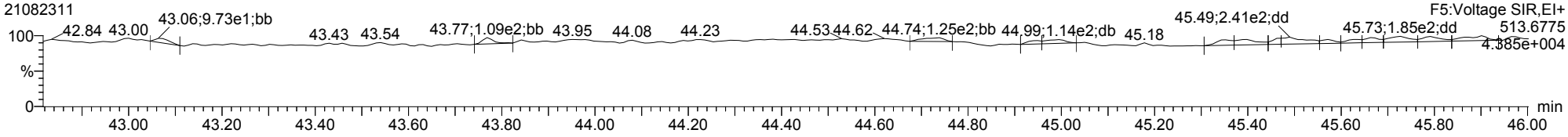

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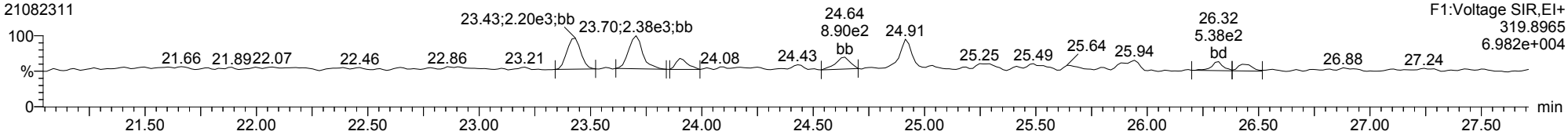
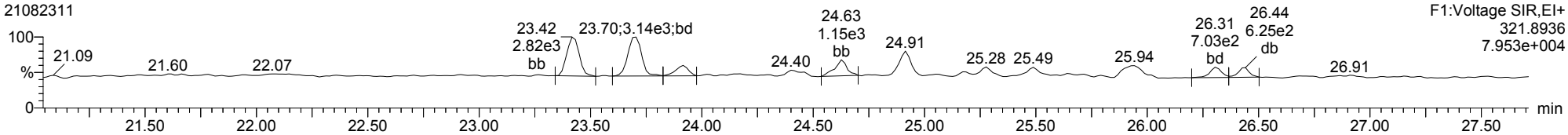
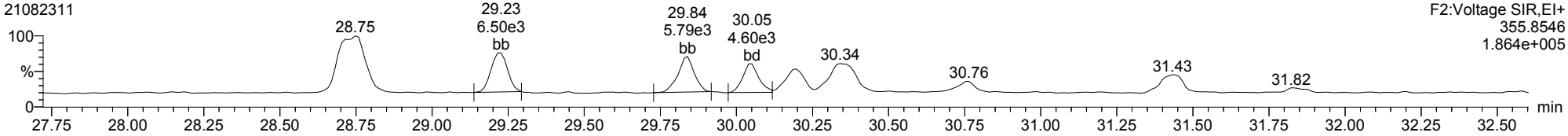
Total-tetradioxins



Total-tetradioxins



Total-pentadioxins



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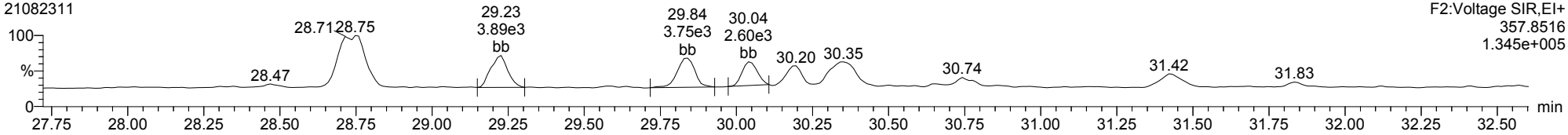

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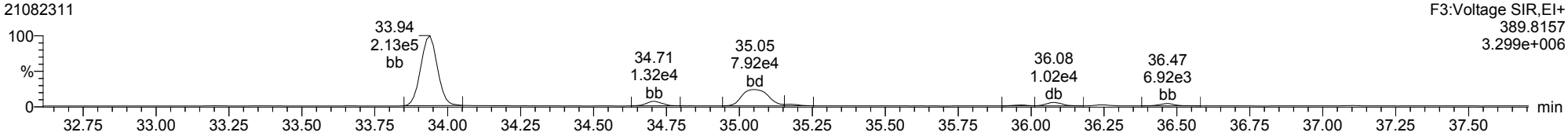

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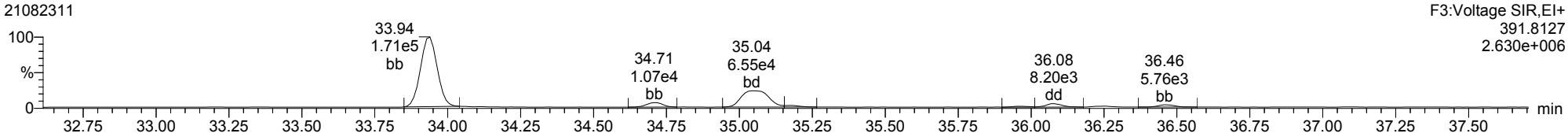

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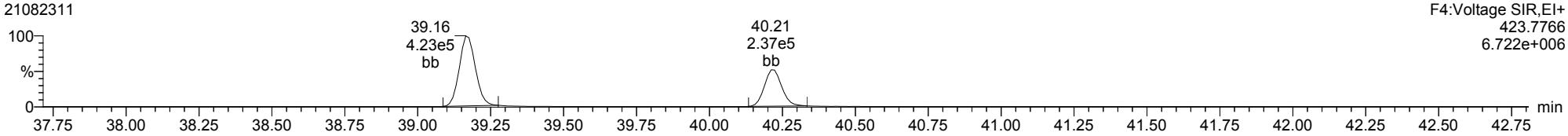

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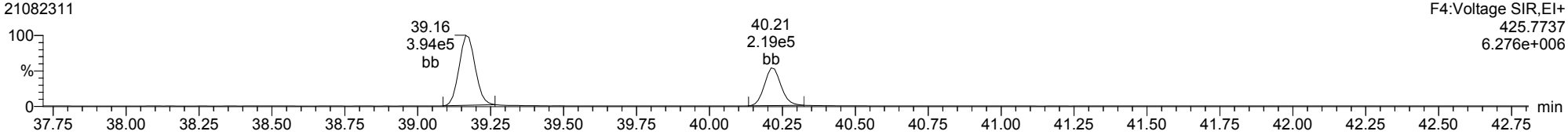

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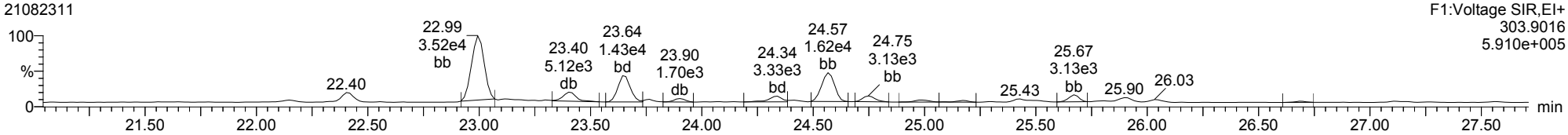
Total-tetrafurans



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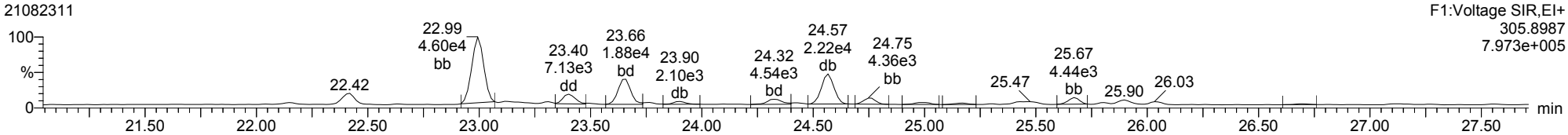

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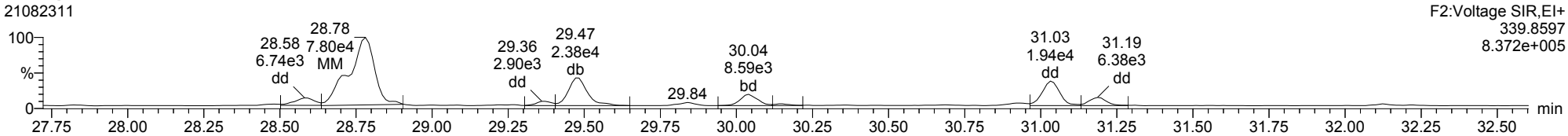

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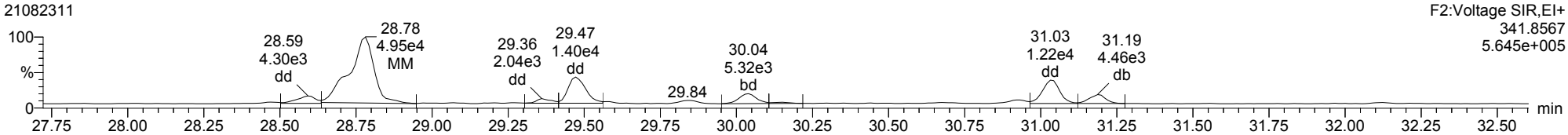

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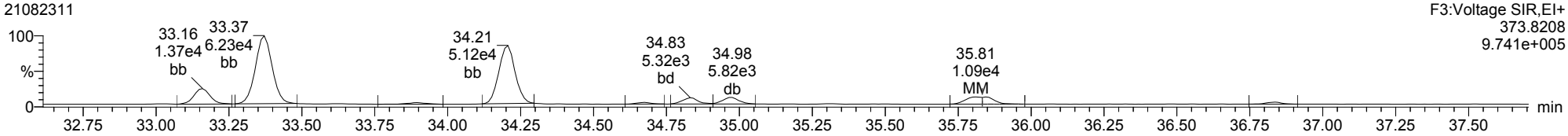
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:26:22 Pacific Daylight Time

ID: 21G0064-10, Name: 21082311, Date: 23-Aug-2021, Time: 20:08:42, Conditions: AUTOSPEC01, User: pk

Total-hexafurans



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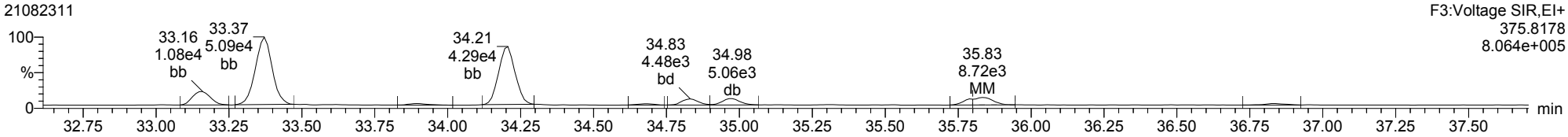

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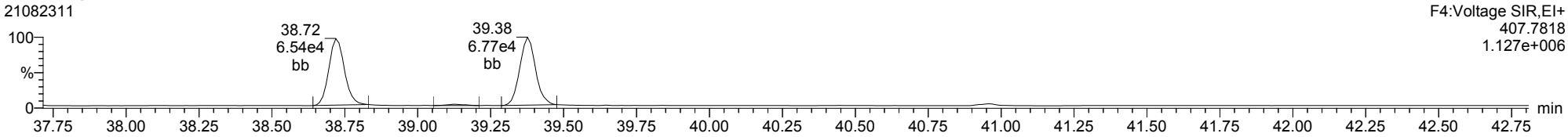

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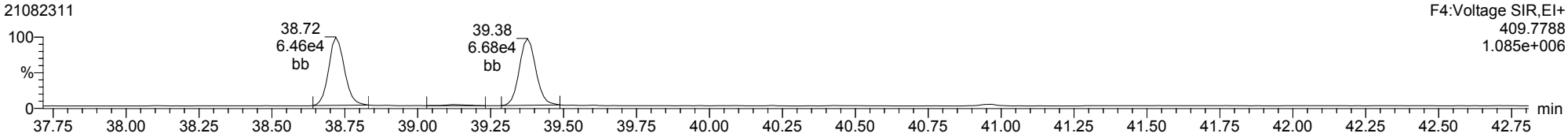

Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.			SDG:	21G0064
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Batch:	BJG0375	Batch Matrix:	Solid	Preparation:	EPA 1613

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-IT507	21G0064-10	21082311	07/21/21 16:18	
Blank	BJG0375-BLK2	21081911	07/21/21 16:18	
LCS	BJG0375-BS2	21081912	07/21/21 16:18	
Reference	BJG0375-SRM1	21082304	07/21/21 16:18	
Reference	BJG0375-SRM2	21082305	07/21/21 16:18	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BATCH SUMMARY

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Cleanup Batch:	CJG0296	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-IT507	21G0064-10	21082311	07/27/2021	
Reference	BJG0375-SRM1	21082304	07/26/2021	
Reference	BJG0375-SRM2	21082305	07/26/2021	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BENCH SHEET

CJG0296

Matrix: Solid **Cleanup using: HRGCMS - EPA 3665A Sulfuric Acid Cleanup** **Printed: 7/29/2021 2:13:24PM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
21G0094-15	C	LDW21-IT668	C 01	20	20	1613B Dioxin	7/27/2021	VB	
21G0094-10	C	LDW21-IT656	C 01	20	20	1613B Dioxin	7/27/2021	VB	
21G0082-12	C	LDW21-IT647	C 01	20	20	1613B Dioxin	7/27/2021	VB	
21G0082-13	C	LDW21-IT647-FD	C 01	20	20	1613B Dioxin	7/27/2021	VB	
21G0094-07	C	LDW21-IT651	C 01	20	20	1613B Dioxin	7/27/2021	VB	
21G0094-08	C	LDW21-IT651-FD	C 01	20	20	1613B Dioxin	7/27/2021	VB	
21G0016-02	A	BGE36	A 01	20	20	HRSM02.x	7/26/2021	VB	
21G0016-03	A	BGE40	A 01	20	20	HRSM02.x	7/26/2021	VB	
21G0081-03	A	F160 Stockpile	A 01	20	20	1613B Dioxin	7/27/2021	VB	
21G0038-01	A	BGE48	A 01	20	20	HRSM02.x	7/26/2021	VB	
21G0064-10	C	LDW21-IT507	C 01	20	20	1613B Dioxin	7/27/2021	VB	
21G0079-10	C	LDW21-IT603	C 01	20	20	1613B Dioxin	7/27/2021	VB	
21G0079-10	C	LDW21-IT603	C 01	20	20	8290 Dioxin	7/27/2021	VB	
21G0079-10	C	LDW21-IT603	C 01	20	20	HRSM02.x	7/27/2021	VB	
21G0016-01	A	BGE22	A 01	20	20	HRSM02.x	7/26/2021	VB	
21F0432-01	C	/WT21-COMF	C 01	20	20	8290 Dioxin	7/26/2021	VB	
21F0448-01	B	F160 Stockpile-1	B	20	20	1613B Dioxin	7/26/2021	VB	
21F0432-01	C	/WT21-COMF	C 01	20	20	1613B Dioxin	7/26/2021	VB	
21F0432-01	C	/WT21-COMF	C 01	20	20	HRSM02.x	7/26/2021	VB	
BJG0375-SRM2	-	Reference	-	20	20	-	7/26/2021	VB	
BJG0375-SRM1	-	Reference	-	20	20	-	7/26/2021	VB	
BJG0375-BSD1	-	DLCSD21	-	20	20	-	7/26/2021	VB	

Analytical Resources, Incorporated
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CLEANUP BENCH SHEET

CJG0296

Matrix: Solid **Cleanup using: HRGCMS - EPA 3665A Sulfuric Acid Cleanup** **Printed: 7/29/2021 2:13:24PM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
BJG0375-DUP1	-	Duplicate	-	20	20	-	7/26/2021	VB	
BJG0375-DUP2	-	Duplicate	-	20	20	-	7/26/2021	VB	
BJG0375-MS1	-	Matrix Spike	-	20	20	-	7/26/2021	VB	
BJG0375-BLK1	-	DBLK21	-	20	20	-	7/26/2021	VB	
BJG0375-BS1	-	DLCS21	-	20	20	-	7/26/2021	VB	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CLEANUP BATCH SUMMARY

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Cleanup Batch:	CJG0297	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-IT507	21G0064-10	21082311	07/28/2021	
Reference	BJG0375-SRM1	21082304	07/28/2021	
Reference	BJG0375-SRM2	21082305	07/28/2021	

Analytical Resources, Incorporated
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CLEANUP BENCH SHEET

CJG0297

Matrix: Solid **Cleanup using: HRGCMS - EPA 3630C Silica Gel Cleanup** **Printed: 7/29/2021 2:13:37PM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
21G0094-15	C	LDW21-IT668	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0094-10	C	LDW21-IT656	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0082-12	C	LDW21-IT647	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0082-13	C	LDW21-IT647-FD	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0094-07	C	LDW21-IT651	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0094-08	C	LDW21-IT651-FD	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0016-02	A	BGE36	A 01	20	20	HRSM02.x	7/28/2021	VB	
21G0016-03	A	BGE40	A 01	20	20	HRSM02.x	7/28/2021	VB	
21G0081-03	A	F160 Stockpile	A 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0038-01	A	BGE48	A 01	20	20	HRSM02.x	7/28/2021	VB	
21G0064-10	C	LDW21-IT507	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0079-10	C	LDW21-IT603	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0079-10	C	LDW21-IT603	C 01	20	20	8290 Dioxin	7/28/2021	VB	
21G0079-10	C	LDW21-IT603	C 01	20	20	HRSM02.x	7/28/2021	VB	
21G0016-01	A	BGE22	A 01	20	20	HRSM02.x	7/28/2021	VB	
21F0432-01	C	/WT21-COMF	C 01	20	20	8290 Dioxin	7/28/2021	VB	
21F0448-01	B	F160 Stockpile-1	B 02	20	20	1613B Dioxin	7/28/2021	VB	
21F0432-01	C	/WT21-COMF	C 01	20	20	1613B Dioxin	7/28/2021	NPL	
21F0432-01	C	/WT21-COMF	C 01	20	20	HRSM02.x	7/28/2021	VB	
BJG0375-SRM2	-	Reference	-	20	20	-	7/28/2021	VB	
BJG0375-SRM1	-	Reference	-	20	20	-	7/28/2021	VB	
BJG0375-BSD1	-	DLCSD21	-	20	20	-	7/28/2021	VB	

Analytical Resources, Incorporated
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CLEANUP BENCH SHEET

CJG0297

Matrix: Solid **Cleanup using: HRGCMS - EPA 3630C Silica Gel Cleanup** **Printed: 7/29/2021 2:13:37PM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
BJG0375-DUP1	-	Duplicate	-	20	20	-	7/28/2021	VB	
BJG0375-DUP2	-	Duplicate	-	20	20	-	7/28/2021	VB	
BJG0375-MS1	-	Matrix Spike	-	20	20	-	7/28/2021	VB	
BJG0375-BLK1	-	DBLK21	-	20	20	-	7/28/2021	VB	
BJG0375-BS1	-	DLCS21	-	20	20	-	7/28/2021	VB	

Analytical Resources, Incorporated
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CLEANUP BATCH SUMMARY

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Cleanup Batch:	CJG0298	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-IT507	21G0064-10	21082311	07/28/2021	
Reference	BJG0375-SRM1	21082304	07/28/2021	
Reference	BJG0375-SRM2	21082305	07/28/2021	

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CLEANUP BENCH SHEET

CJG0298

Matrix: Solid **Cleanup using: HRGCMS - EPA 3620B Florisil Cleanup (mL)** **Printed: 7/29/2021 2:13:47PM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
21G0094-15	C	LDW21-IT668	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0094-10	C	LDW21-IT656	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0082-12	C	LDW21-IT647	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0082-13	C	LDW21-IT647-FD	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0094-07	C	LDW21-IT651	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0094-08	C	LDW21-IT651-FD	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0016-02	A	BGE36	A 01	20	20	HRSM02.x	7/28/2021	VB	
21G0016-03	A	BGE40	A 01	20	20	HRSM02.x	7/28/2021	VB	
21G0081-03	A	F160 Stockpile	A 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0038-01	A	BGE48	A 01	20	20	HRSM02.x	7/28/2021	VB	
21G0064-10	C	LDW21-IT507	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0079-10	C	LDW21-IT603	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21G0079-10	C	LDW21-IT603	C 01	20	20	8290 Dioxin	7/28/2021	VB	
21G0079-10	C	LDW21-IT603	C 01	20	20	HRSM02.x	7/28/2021	VB	
21G0016-01	A	BGE22	A 01	20	20	HRSM02.x	7/28/2021	VB	
21F0432-01	C	/WT21-COMF	C 01	20	20	8290 Dioxin	7/28/2021	VB	
21F0448-01	B	F160 Stockpile-1	B 02	20	20	1613B Dioxin	7/28/2021	VB	
21F0432-01	C	/WT21-COMF	C 01	20	20	1613B Dioxin	7/28/2021	VB	
21F0432-01	C	/WT21-COMF	C 01	20	20	HRSM02.x	7/28/2021	VB	
BJG0375-SRM2	-	Reference	-	20	20	-	7/28/2021	VB	
BJG0375-SRM1	-	Reference	-	20	20	-	7/28/2021	VB	
BJG0375-BSD1	-	DLCSD21	-	20	20	-	7/28/2021	VB	

Analytical Resources, Incorporated
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CLEANUP BENCH SHEET

CJG0298

Matrix: Solid **Cleanup using: HRGCMS - EPA 3620B Florisil Cleanup (mL)** **Printed: 7/29/2021 2:13:47PM**

Lab Number	Sample Container	Sample Name	Extract Container	Initial (mL)	Final (mL)	Analysis	Clean Up Date	Cleaned By	Cleanup Comments
BJG0375-DUP1	-	Duplicate	-	20	20	-	7/28/2021	VB	
BJG0375-DUP2	-	Duplicate	-	20	20	-	7/28/2021	VB	
BJG0375-MS1	-	Matrix Spike	-	20	20	-	7/28/2021	VB	
BJG0375-BLK1	-	DBLK21	-	20	20	-	7/28/2021	VB	
BJG0375-BS1	-	DLCS21	-	20	20	-	7/28/2021	VB	

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

Laboratory:	Analytical Resources, Inc.			SDG:	21G0064
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Solid	Laboratory ID:	BJG0375-BLK2	File ID:	21081911
Sampled:	N/A	Prepared:	07/21/21 16:18	Analyzed:	08/18/21 18:22
Solids Wt%:		Preparation:	EPA 1613	Initial/Final:	10 g / 20 uL
Result Basis:	Dry	Sequence:	SJH0230	Calibration:	EH00030
Batch:	BJG0375	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	0.687	1.00	ND	ng/kg	U
1746-01-6	2,3,7,8-TCDD	1	0.000	0.655-0.886	0.667	1.00	ND	ng/kg	U
57117-41-6	1,2,3,7,8-PeCDF	1	0.000	1.318-1.783	0.343	1.00	ND	ng/kg	U
57117-31-4	2,3,4,7,8-PeCDF	1	0.000	1.318-1.783	0.317	1.00	ND	ng/kg	U
40321-76-4	1,2,3,7,8-PeCDD	1	0.000	1.318-1.783	0.456	1.00	ND	ng/kg	U
70648-26-9	1,2,3,4,7,8-HxCDF	1	0.000	1.054-1.426	0.306	1.00	ND	ng/kg	U
57117-44-9	1,2,3,6,7,8-HxCDF	1	0.000	1.054-1.426	0.286	1.00	ND	ng/kg	U
60851-34-5	2,3,4,6,7,8-HxCDF	1	0.000	1.054-1.426	0.302	1.00	ND	ng/kg	U
72918-21-9	1,2,3,7,8,9-HxCDF	1	0.000	1.054-1.426	0.349	1.00	ND	ng/kg	U
39227-28-6	1,2,3,4,7,8-HxCDD	1	0.000	1.054-1.426	0.316	1.00	ND	ng/kg	U
57653-85-7	1,2,3,6,7,8-HxCDD	1	0.000	1.054-1.426	0.312	1.00	ND	ng/kg	U
19408-74-3	1,2,3,7,8,9-HxCDD	1	0.000	1.054-1.426	0.336	1.00	ND	ng/kg	U
67562-39-4	1,2,3,4,6,7,8-HpCDF	1	0.000	0.893-1.208	0.270	1.00	ND	ng/kg	U
55673-89-7	1,2,3,4,7,8,9-HpCDF	1	0.000	0.893-1.208	0.361	1.00	ND	ng/kg	U
35822-46-9	1,2,3,4,6,7,8-HpCDD	1	0.000	0.893-1.208	0.539	2.50	ND	ng/kg	U
39001-02-0	OCDF	1	0.000	0.757-1.024	0.668	2.50	ND	ng/kg	U
3268-87-9	OCDD	1	0.000	0.757-1.024	0.941	10.0	ND	ng/kg	U

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): 0.000
Total 2,3,7,8-TCDD Equivalence (WHO2005, ND=1/2 EDL, Including EMPC): 0.765

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:	21G0064
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Matrix:	Solid	Laboratory ID:	BJG0375-BLK2	File ID:	21081911
Sampled:	N/A	Prepared:	07/21/21 16:18	Analyzed:	08/18/21 18:22
Solids Wt%:	0.00	Preparation:	EPA 1613	Initial/Final:	10 g / 20 uL
Result Basis:	Dry	Sequence:	SJH0230	Calibration:	EH00030
Batch:	BJG0375	Instrument:	AUTOSPEC01	Column:	RTX-Dioxin2

Labels	DF/Split	Ion Ratio	Ratio Limits	EDL	% REC	QC LIMITS	Q
13C12-2,3,7,8-TCDF	1	0.809	0.655-0.886	0.40	30.3	24 - 169 %	
13C12-2,3,7,8-TCDD	1	0.762	0.655-0.886	0.48	43.2	25 - 164 %	
13C12-1,2,3,7,8-PeCDF	1	1.601	1.318-1.783	0.44	68.5	24 - 185 %	
13C12-2,3,4,7,8-PeCDF	1	1.645	1.318-1.783	0.46	66.3	21 - 178 %	
13C12-1,2,3,7,8-PeCDD	1	1.545	1.318-1.783	0.44	76.0	25 - 181 %	
13C12-1,2,3,4,7,8-HxCDF	1	0.535	0.434-0.587	0.47	78.6	26 - 152 %	
13C12-1,2,3,6,7,8-HxCDF	1	0.523	0.434-0.587	0.44	77.5	26 - 123 %	
13C12-2,3,4,6,7,8-HxCDF	1	0.530	0.434-0.587	0.49	76.6	28 - 136 %	
13C12-1,2,3,7,8,9-HxCDF	1	0.521	0.434-0.587	0.59	81.6	29 - 147 %	
13C12-1,2,3,4,7,8-HxCDD	1	1.302	1.054-1.426	0.50	84.1	32 - 141 %	
13C12-1,2,3,6,7,8-HxCDD	1	1.228	1.054-1.426	0.46	79.8	28 - 130 %	
13C12-1,2,3,4,6,7,8-HpCDF	1	0.477	0.374-0.506	0.59	78.1	28 - 143 %	
13C12-1,2,3,4,7,8,9-HpCDF	1	0.460	0.374-0.506	0.72	81.3	26 - 138 %	
13C12-1,2,3,4,6,7,8-HpCDD	1	1.032	0.893-1.208	0.55	89.9	23 - 140 %	
13C12-OCDD	1	0.902	0.757-1.024	0.78	95.7	17 - 157 %	
37Cl4-2,3,7,8-TCDD	1	328.000		0.16	41.7	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 10:30:55 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: BJG0375-BLK2, Name: 21081911, Date: 18-Aug-2021, Time: 18:22:46, 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	761	1027								
12378-PeCDF					1.015		1.550	743	868								
23478-PeCDF					1.126		1.550	743	868								
123478-HxCDF					1.017		1.240	670	778								
234678-HxCDF					1.052		1.240	670	778								
123678-HxCDF					1.037		1.240	670	778								
123789-HxCDF					1.030		1.240	670	778								
1234678-HpCDF					1.327		1.050	690	533								
1234789-HpCDF					1.283		1.050	690	533								
OCDF					1.447		0.890	746	871								
2378-TCDD					0.920		0.770	949	717								
12378-PeCDD					0.995		1.550	859	473								
123478-HxCDD					1.027		1.240	636	693								
123678-HxCDD					1.009		1.240	636	693								
123789-HxCDD					0.950		1.240	636	693								
1234678-HpCDD					1.068		1.050	782	671								
OCDD					1.181		0.890	1164	696								
13C-2378-TCDF	25.640	1.007	4.288e4	5.300e4	1.427	0.809	0.770	1863	1273	6.31e5	7.67e5	338.6	602.9	NO	bb	bb	30.350
13C-12378-PeCDF	29.795	1.170	1.212e5	7.570e4	1.297	1.601	1.550	1659	1455	1.71e6	1.07e6	1029.2	737.7	NO	bb	bb	68.530
13C-23478-PeCDF	31.143	1.223	1.129e5	6.860e4	1.236	1.645	1.550	1659	1455	1.69e6	9.91e5	1016.3	681.1	NO	bb	bb	66.273
13C-123478-HxCDF	34.775	0.955	6.629e4	1.240e5	1.242	0.535	0.510	1578	1349	9.71e5	1.83e6	615.5	1354.4	NO	bd	bd	78.632
13C-123678-HxCDF	34.920	0.959	6.961e4	1.331e5	1.343	0.523	0.510	1578	1349	1.01e6	1.93e6	637.0	1428.8	NO	db	db	77.486
13C-234678-HxCDF	35.789	0.983	6.280e4	1.185e5	1.215	0.530	0.510	1578	1349	9.47e5	1.83e6	600.1	1356.1	NO	bb	bb	76.634
13C-123789-HxCDF	36.825	1.011	5.486e4	1.053e5	1.008	0.521	0.510	1578	1349	8.28e5	1.59e6	524.6	1179.4	NO	bb	bb	81.584
13C-1234678-HpCDF	38.674	1.062	4.553e4	9.545e4	0.926	0.477	0.440	1175	1522	6.61e5	1.42e6	562.0	932.3	NO	bd	bb	78.133
13C-1234789-HpCDF	40.914	1.124	3.782e4	8.225e4	0.758	0.460	0.440	1175	1522	4.98e5	1.10e6	424.0	720.3	NO	bb	bb	81.338
13C-1234-TCDD	25.458	0.000	9.640e4	1.251e5	1.000	0.771	0.770	1988	953	1.42e6	1.82e6	714.9	1912.9	NO	bb	bb	100.000
13C-2378-TCDD	26.275	1.032	4.622e4	6.062e4	1.116	0.762	0.770	1988	953	7.04e5	9.23e5	354.1	968.1	NO	bb	bb	43.212
13C-12378-PeCDD	31.399	1.233	7.477e4	4.840e4	0.732	1.545	1.550	889	855	1.07e6	6.84e5	1200.6	799.7	NO	bb	bb	75.980
13C-123478-HxCDD	35.911	0.986	8.887e4	6.828e4	0.960	1.302	1.240	1146	1247	1.39e6	1.05e6	1212.0	841.3	NO	bd	bd	84.067
13C-123678-HxCDD	36.023	0.989	8.921e4	7.263e4	1.041	1.228	1.240	1146	1247	1.40e6	1.09e6	1218.7	877.7	NO	db	dd	79.793
13C-1234678-HpCDD	40.178	1.103	5.623e4	5.450e4	0.632	1.032	1.050	930	797	7.68e5	7.47e5	826.6	938.1	NO	bb	bb	89.891
13C-OCDD	44.903	1.233	8.909e4	9.871e4	0.504	0.902	0.890	967	972	9.53e5	1.05e6	985.4	1083.1	NO	bb	bb	191.419
13C-123789-HxCDD	36.413	0.000	1.090e5	8.576e4	1.000	1.271	1.240	1146	1247	1.67e6	1.31e6	1455.1	1050.7	NO	bb	bb	100.000
37CL-2378-TCDD	26.290	1.033	4.005e4		1.084			966		5.79e5		599.1			bb		16.688

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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	761	1027								
1289-TCDF					1.043		0.770	761	1027								
13468-PECDF					1.376		1.550	774	1058								
12389-PECDF					1.000		1.550	743	868								
123468-HXCDF					1.087		1.240	670	778								
1368-TCDD					0.923		0.770	949	717								
1289-TCDD					0.794		0.770	949	717								
12479-PECDD					1.843		1.550	859	473								
12389-PECDD					1.154		1.550	859	473								
124679-HXCDD					1.125		1.240	636	693								
1234679-HPCDD					1.211		1.050	782	671								
Total-tetrafurans			0.000e0		1.192			761		0.00e0							
Total-penta1			0.000e0					774		0.00e0							
Total-pentafurans			0.000e0		1.047			743		0.00e0							
Total-hexafurans			0.000e0		1.045			670		0.00e0							
Total-heptafurans			0.000e0		1.305			690		0.00e0							
Total-Furans			0.000e0		1.158			761		0.00e0							
Total-tetradioxins			0.000e0		0.879			949		0.00e0							
Total-pentadioxins			0.000e0		1.331			859		0.00e0							
Total-hexadioxins			0.000e0		1.028			636		0.00e0							
Total-heptadioxins			0.000e0		1.140			782		0.00e0							
Total-Dioxins			0.000e0		1.092			949		0.00e0							
Total-TEQ			0.000e0					949		0.00e0							
FUNCTION1 PFK			3.340e7					456297		2.69e8							
FUNCTION2 PFK			2.671e7					348258		3.40e8							0.000
FUNCTION3 PFK			4.007e5					467370		7.52e6							0.000
FUNCTION4 PFK			8.697e6					255685		1.69e7							
FUNCTION5 PFK			1.855e4					197972		4.39e5							
FUNCTION1 HXCD...			4.610e2					785		6.22e3							0.000
FUNCTION1 HPCD...			1.662e3					1000		2.44e4							0.000
FUNCTION2 HPCD...			0.000e0					1003		0.00e0							
FUNCTION3 OCDPE			0.000e0					625		0.00e0							
FUNCTION4 NCDPE			7.884e1					700		1.72e3							0.000
FUNCTION5 DCDPE			1.452e2					625		2.75e3							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													

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													

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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													

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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	21.15	3.018e4					2.2	NO		bd		
2	FUNCTION1 PFK	23.66	2.621e6					25.4	YES		dd		
3	FUNCTION1 PFK	23.42	6.348e5					23.4	YES		dd		
4	FUNCTION1 PFK	23.28	3.373e6					25.6	YES		bd		
5	FUNCTION1 PFK	22.96	1.279e6					25.5	YES		db		
6	FUNCTION1 PFK	22.83	3.020e6					25.4	YES		dd		
7	FUNCTION1 PFK	22.59	1.051e6					20.7	YES		dd		
8	FUNCTION1 PFK	22.40	8.506e5					18.5	YES		dd		
9	FUNCTION1 PFK	22.33	6.481e5					15.7	YES		dd		
10	FUNCTION1 PFK	22.15	8.663e5					16.4	YES		dd		
11	FUNCTION1 PFK	22.09	8.896e5					15.8	YES		dd		
12	FUNCTION1 PFK	21.95	7.181e5					12.3	YES		dd		
13	FUNCTION1 PFK	21.74	4.296e5					9.0	YES		dd		
14	FUNCTION1 PFK	21.62	2.062e5					8.5	YES		dd		
15	FUNCTION1 PFK	21.56	9.386e5					9.3	YES		dd		
16	FUNCTION1 PFK	21.32	1.513e5					5.2	YES		dd		
17	FUNCTION1 PFK	21.21	5.062e4					2.7	NO		dd		
18	FUNCTION1 PFK	25.44	9.598e5					12.3	YES		db		
19	FUNCTION1 PFK	25.25	6.950e5					15.0	YES		dd		
20	FUNCTION1 PFK	25.22	6.368e5					14.3	YES		dd		
21	FUNCTION1 PFK	25.00	9.379e5					16.5	YES		dd		
22	FUNCTION1 PFK	24.94	3.362e5					16.5	YES		dd		
23	FUNCTION1 PFK	24.90	4.571e5					17.1	YES		dd		
24	FUNCTION1 PFK	24.84	6.813e5					17.6	YES		dd		
25	FUNCTION1 PFK	24.69	8.860e5					17.0	YES		dd		
26	FUNCTION1 PFK	24.63	7.330e5					17.1	YES		dd		
27	FUNCTION1 PFK	24.48	6.984e5					19.2	YES		dd		
28	FUNCTION1 PFK	24.46	8.869e5					19.0	YES		dd		
29	FUNCTION1 PFK	24.35	6.921e5					16.4	YES		dd		
30	FUNCTION1 PFK	24.11	1.621e6					22.0	YES		dd		
31	FUNCTION1 PFK	24.02	7.516e5					22.8	YES		dd		
32	FUNCTION1 PFK	23.81	2.214e6					24.6	YES		dd		
33	FUNCTION1 PFK	23.75	1.010e6					24.7	YES		dd		
34	FUNCTION1 PFK	27.68	6.503e4					0.4	NO		bb		
35	FUNCTION1 PFK	27.42	6.035e4					2.2	NO		db		
36	FUNCTION1 PFK	27.36	1.601e4					1.2	NO		bd		
37	FUNCTION1 PFK	27.26	6.065e4					2.4	NO		db		

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PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	FUNCTION1 PFK	27.20	5.793e4					2.4	NO		dd		
39	FUNCTION1 PFK	27.08	2.133e5					2.5	NO		bd		
40	FUNCTION1 PFK	26.76	1.145e5					2.3	NO		db		
41	FUNCTION1 PFK	26.65	6.358e4					1.7	NO		bd		
42	FUNCTION1 PFK	26.34	2.707e4					0.9	NO		bb		
43	FUNCTION1 PFK	26.14	3.467e4					0.9	NO		bb		
44	FUNCTION1 PFK	25.90	1.643e5					4.2	YES		db		
45	FUNCTION1 PFK	25.82	3.929e5					6.3	YES		dd		
46	FUNCTION1 PFK	25.72	1.700e5					7.4	YES		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	27.89	1.284e6					55.4	YES		dd		0.000
2	FUNCTION2 PFK	27.80	2.164e6					58.1	YES		bd		0.000
3	FUNCTION2 PFK	29.26	3.750e5					24.7	YES		dd		0.000
4	FUNCTION2 PFK	29.07	1.898e6					29.3	YES		dd		0.000
5	FUNCTION2 PFK	28.99	5.880e5					31.1	YES		dd		0.000
6	FUNCTION2 PFK	28.96	8.708e5					31.9	YES		dd		0.000
7	FUNCTION2 PFK	28.88	1.054e6					33.9	YES		dd		0.000
8	FUNCTION2 PFK	28.77	8.228e5					36.3	YES		dd		0.000
9	FUNCTION2 PFK	28.69	1.307e6					38.3	YES		dd		0.000
10	FUNCTION2 PFK	28.62	6.026e5					39.5	YES		dd		0.000
11	FUNCTION2 PFK	28.50	2.230e6					42.3	YES		dd		0.000
12	FUNCTION2 PFK	28.42	5.041e5					44.3	YES		dd		0.000
13	FUNCTION2 PFK	28.38	8.714e5					45.5	YES		dd		0.000
14	FUNCTION2 PFK	28.27	1.808e6					48.2	YES		dd		0.000
15	FUNCTION2 PFK	28.25	1.297e6					47.5	YES		dd		0.000
16	FUNCTION2 PFK	28.09	1.938e6					51.9	YES		dd		0.000
17	FUNCTION2 PFK	27.99	1.646e6					54.7	YES		dd		0.000
18	FUNCTION2 PFK	27.95	1.065e6					55.3	YES		dd		0.000
19	FUNCTION2 PFK	30.44	1.420e4					1.1	NO		dd		0.000
20	FUNCTION2 PFK	30.41	1.501e4					1.3	NO		bd		0.000
21	FUNCTION2 PFK	30.18	3.977e4					3.2	YES		db		0.000
22	FUNCTION2 PFK	30.13	7.826e4					4.5	YES		dd		0.000
23	FUNCTION2 PFK	30.08	5.671e4					5.3	YES		dd		0.000
24	FUNCTION2 PFK	30.03	1.369e5					6.5	YES		dd		0.000
25	FUNCTION2 PFK	29.98	1.405e5					7.7	YES		dd		0.000
26	FUNCTION2 PFK	29.86	4.559e5					10.7	YES		dd		0.000
27	FUNCTION2 PFK	29.75	3.730e5					13.2	YES		dd		0.000
28	FUNCTION2 PFK	29.69	3.685e5					14.5	YES		dd		0.000
29	FUNCTION2 PFK	29.63	1.703e5					15.4	YES		dd		0.000
30	FUNCTION2 PFK	29.59	3.735e5					16.5	YES		dd		0.000
31	FUNCTION2 PFK	29.53	3.258e5					18.0	YES		dd		0.000
32	FUNCTION2 PFK	29.42	6.643e5					20.8	YES		dd		0.000
33	FUNCTION2 PFK	29.34	5.100e5					23.1	YES		dd		0.000
34	FUNCTION2 PFK	29.30	3.650e5					24.0	YES		dd		0.000
35	FUNCTION2 PFK	31.99	1.051e4					0.9	NO		bb		0.000
36	FUNCTION2 PFK	31.90	2.677e4					1.3	NO		db		0.000
37	FUNCTION2 PFK	31.83	2.446e4					1.5	NO		bd		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	31.74	5.084e3					0.6	NO		bb		0.000
39	FUNCTION2 PFK	31.56	3.609e3					0.5	NO		bb		0.000
40	FUNCTION2 PFK	31.44	1.179e4					1.1	NO		db		0.000
41	FUNCTION2 PFK	31.40	9.949e3					1.0	NO		bd		0.000
42	FUNCTION2 PFK	31.34	7.567e3					1.2	NO		bb		0.000
43	FUNCTION2 PFK	31.28	3.575e4					2.0	NO		db		0.000
44	FUNCTION2 PFK	31.22	1.994e4					1.9	NO		dd		0.000
45	FUNCTION2 PFK	31.15	2.552e4					1.5	NO		bd		0.000
46	FUNCTION2 PFK	30.76	1.289e4					0.8	NO		bb		0.000
47	FUNCTION2 PFK	30.70	7.431e3					0.8	NO		db		0.000
48	FUNCTION2 PFK	30.65	6.769e3					0.6	NO		bd		0.000
49	FUNCTION2 PFK	30.60	1.813e4					1.3	NO		bb		0.000
50	FUNCTION2 PFK	30.50	1.567e4					1.6	NO		db		0.000
51	FUNCTION2 PFK	32.42	2.542e4					1.3	NO		bb		0.000
52	FUNCTION2 PFK	32.30	2.025e4					1.3	NO		bb		0.000
53	FUNCTION2 PFK	32.16	6.986e3					0.8	NO		bb		0.000
54	FUNCTION2 PFK	32.10	2.420e3					0.4	NO		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	37.48	1.912e4					1.7	NO		db		0.000
2	FUNCTION3 PFK	37.43	2.381e4					1.6	NO		bd		0.000
3	FUNCTION3 PFK	37.24	1.943e4					1.1	NO		bb		0.000
4	FUNCTION3 PFK	36.56	1.149e4					1.1	NO		bb		0.000
5	FUNCTION3 PFK	36.09	1.259e4					0.8	NO		bb		0.000
6	FUNCTION3 PFK	35.51	2.869e4					1.8	NO		bb		0.000
7	FUNCTION3 PFK	35.40	7.554e3					0.8	NO		bb		0.000
8	FUNCTION3 PFK	34.83	1.351e4					1.3	NO		bb		0.000
9	FUNCTION3 PFK	34.22	7.907e3					0.9	NO		bb		0.000
10	FUNCTION3 PFK	32.97	2.366e5					2.9	NO		bb		0.000
11	FUNCTION3 PFK	32.68	2.005e4					2.0	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	38.67	7.545e6					15.1	YES		db		
2	FUNCTION4 PFK	37.78	1.151e6					51.1	YES		bd		

PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	45.86	2.397e3					0.9	NO		bb		
2	FUNCTION5 PFK	43.77	1.615e4					1.4	NO		bb		

ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	24.90	7.341e1					1.4	NO		bb		0.000
2	FUNCTION1 HXCD...	22.77	1.432e2					2.3	NO		bb		0.000
3	FUNCTION1 HXCD...	21.42	7.547e1					2.4	NO		bb		0.000
4	FUNCTION1 HXCD...	21.18	1.689e2					1.9	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...	22.30	7.213e1					1.6	NO		bb		0.000
2	FUNCTION1 HPCD...	21.95	8.639e1					1.9	NO		bb		0.000
3	FUNCTION1 HPCD...	21.39	1.290e2					1.1	NO		db		0.000
4	FUNCTION1 HPCD...	21.15	3.102e2					3.0	YES		bd		0.000
5	FUNCTION1 HPCD...	27.47	9.778e1					1.8	NO		bb		0.000
6	FUNCTION1 HPCD...	27.00	1.076e2					1.0	NO		bb		0.000
7	FUNCTION1 HPCD...	26.53	1.017e2					2.1	NO		bb		0.000
8	FUNCTION1 HPCD...	24.90	1.517e2					1.9	NO		bb		0.000
9	FUNCTION1 HPCD...	24.35	7.484e1					1.0	NO		bb		0.000
10	FUNCTION1 HPCD...	23.92	8.455e1					1.3	NO		db		0.000
11	FUNCTION1 HPCD...	23.86	8.232e1					2.4	NO		bd		0.000
12	FUNCTION1 HPCD...	23.70	1.549e2					1.8	NO		bb		0.000
13	FUNCTION1 HPCD...	23.22	1.121e2					2.1	NO		bb		0.000
14	FUNCTION1 HPCD...	22.65	9.672e1					1.4	NO		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													

ETHERS4

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

ETHERS5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 NCDPE	40.77	7.884e1					2.5	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	43.02	7.446e1					2.2	NO		bb		0.000
2	FUNCTION5 DCDPE	44.52	7.074e1					2.2	NO		bb		0.000

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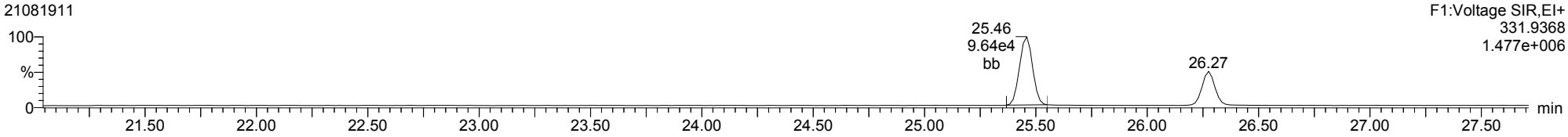
ID: BJG0375-BLK2, Name: 21081911, Date: 18-Aug-2021, Time: 18:22:46, Conditions: AUTOSPEC01, User: pk

13C-1234-TCDD



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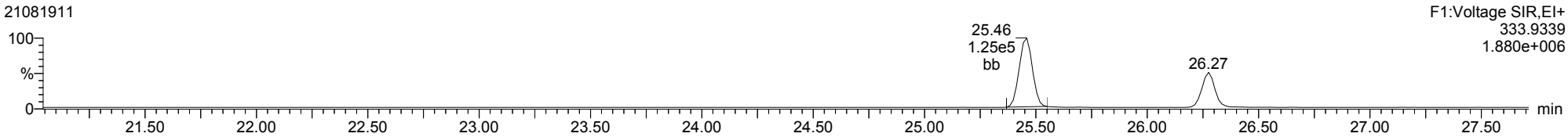
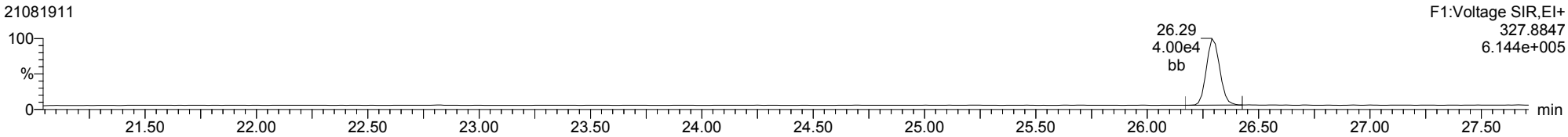


37CL-2378-TCDD



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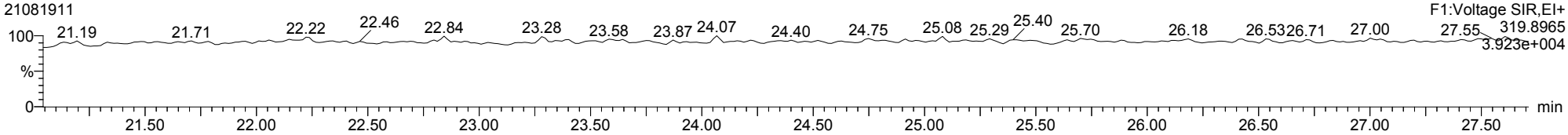
Printed: Thursday, August 19, 2021 10:30:55 Pacific Daylight Time

ID: BJG0375-BLK2, Name: 21081911, Date: 18-Aug-2021, Time: 18:22:46, Conditions: AUTOSPEC01, User: pk

2378-TCDD



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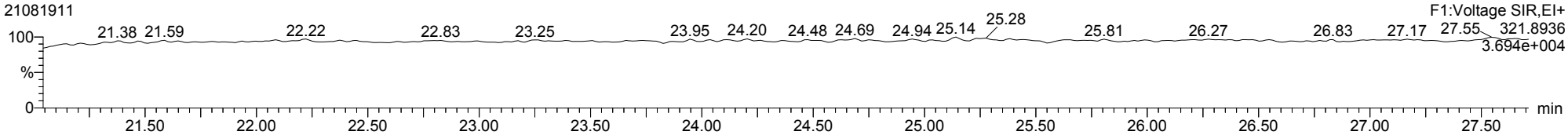

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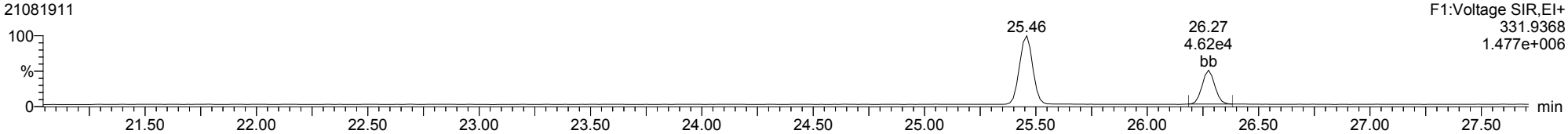

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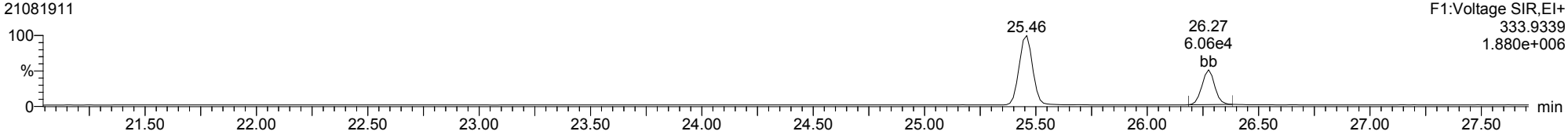

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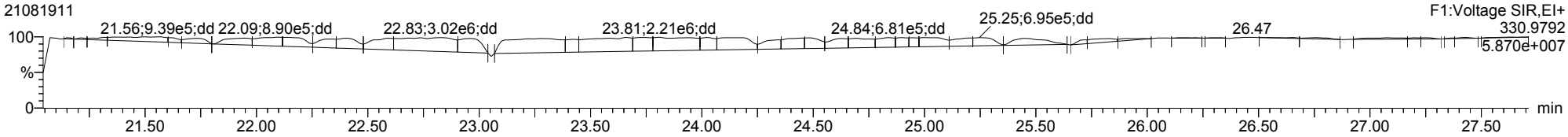

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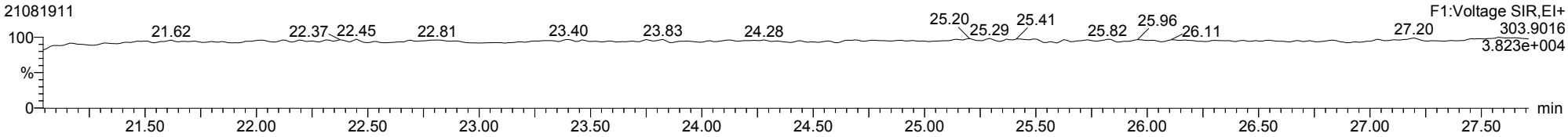

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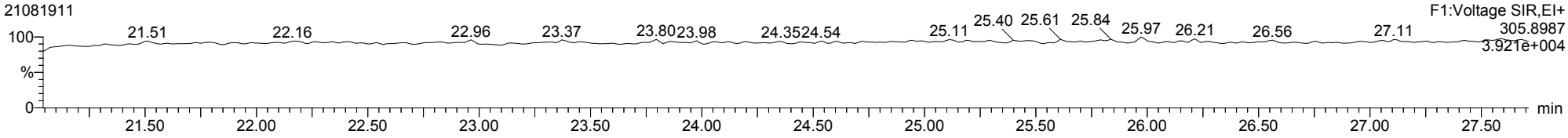

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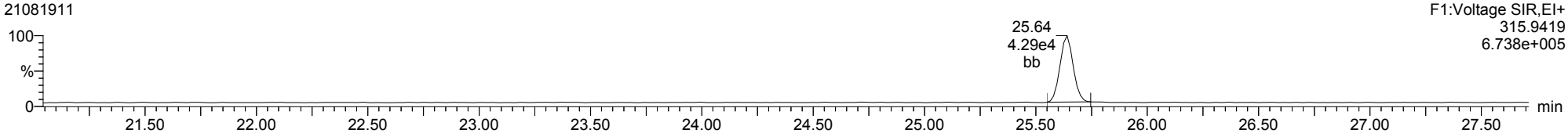

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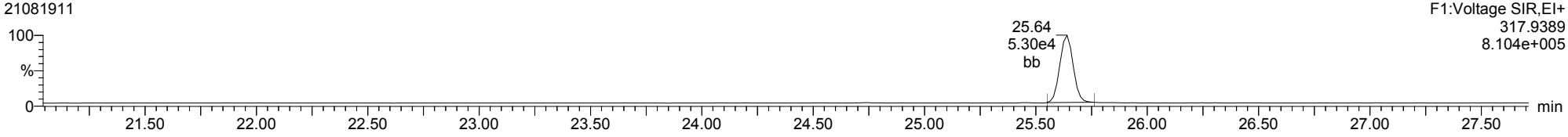
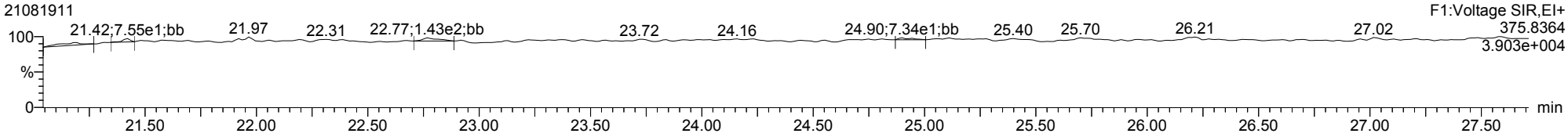


FUNCTION1 HXCDPE



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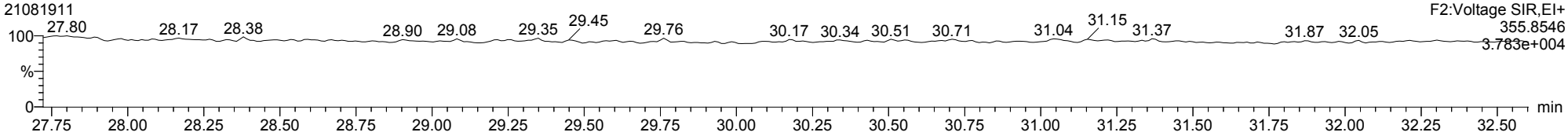
12378-PeCDD



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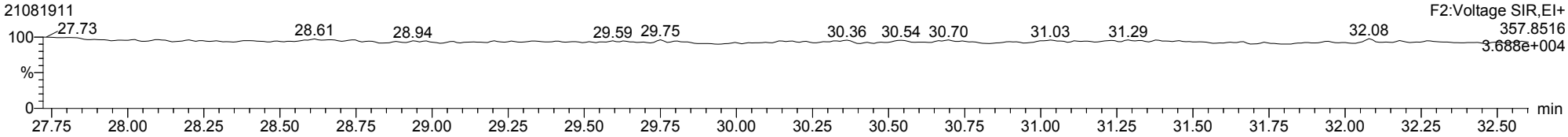

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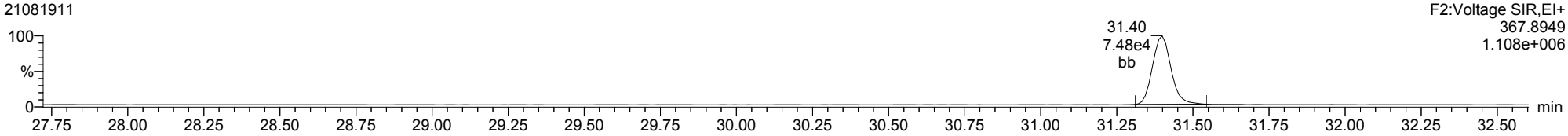

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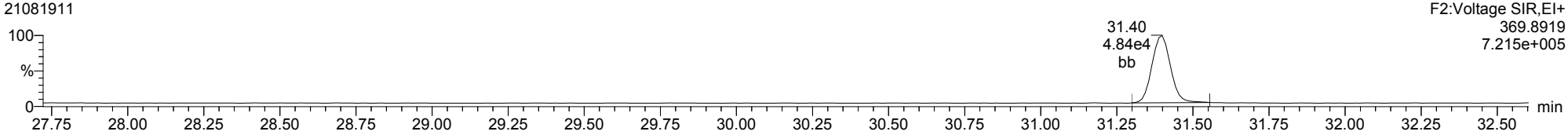
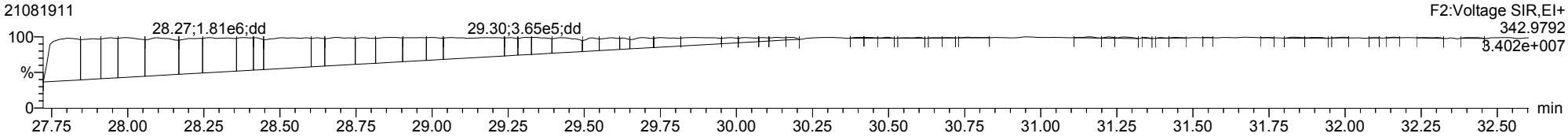


FUNCTION2 PFK



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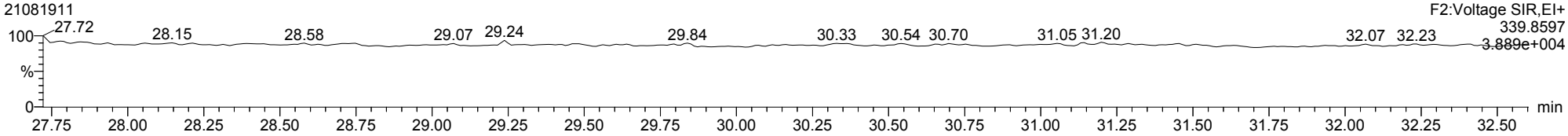

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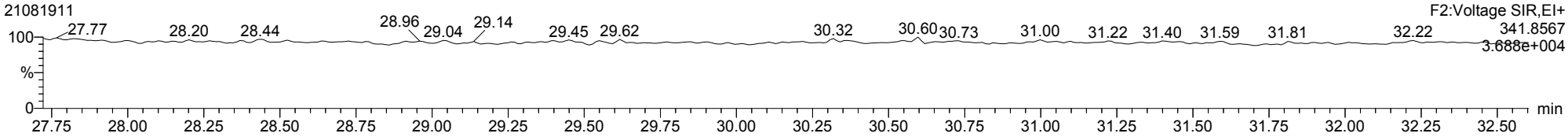

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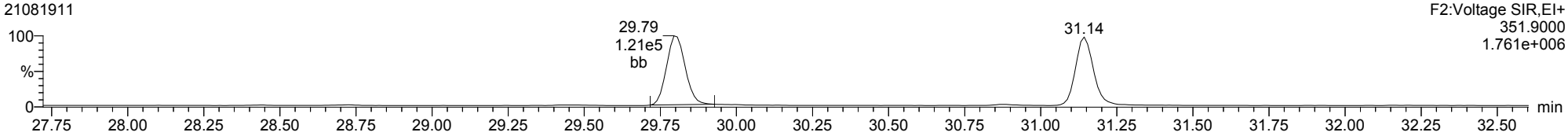

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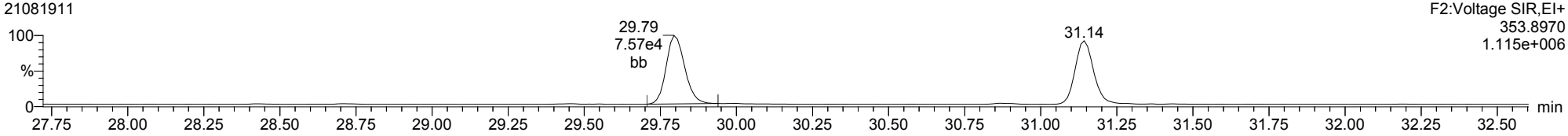
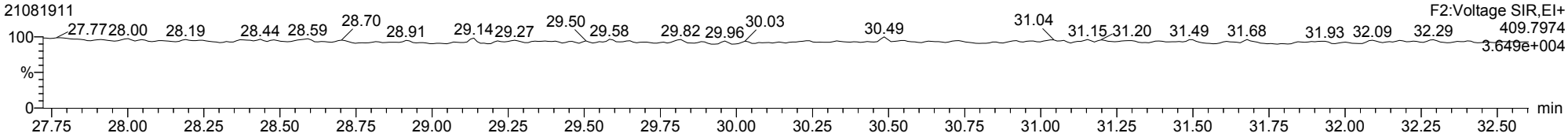


FUNCTION2 HPCDPE



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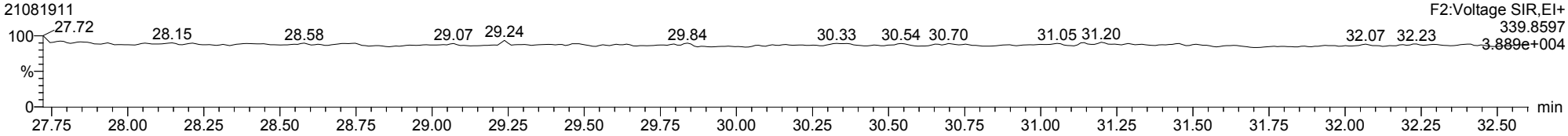
23478-PeCDF



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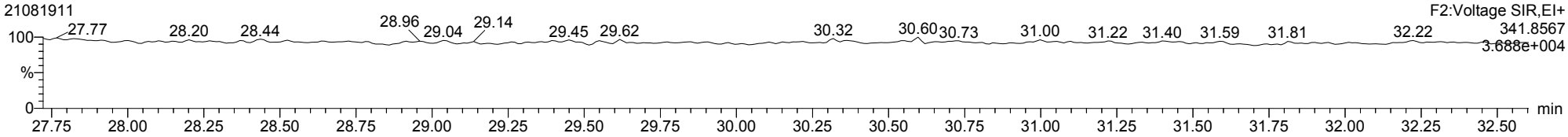

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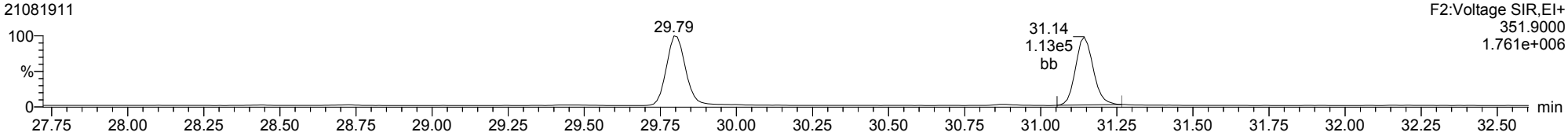

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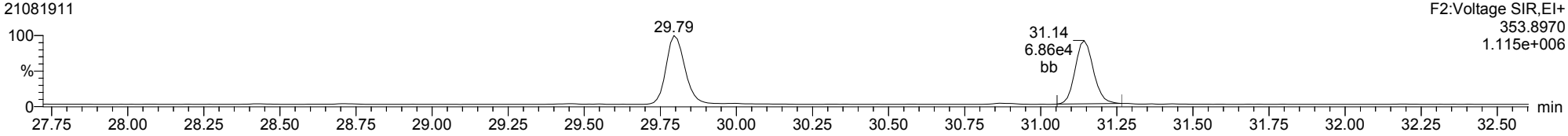

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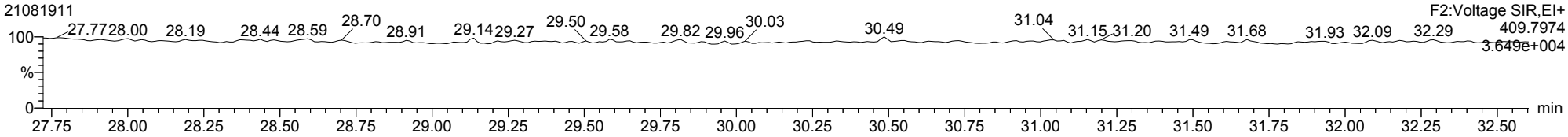

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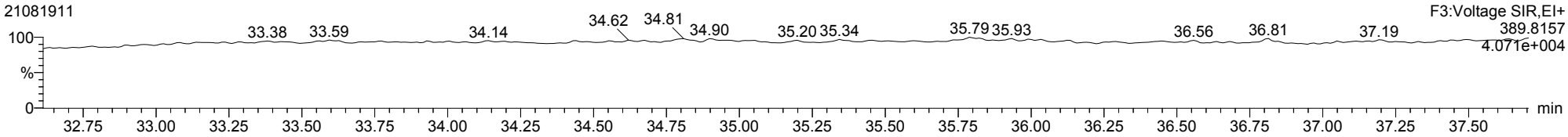

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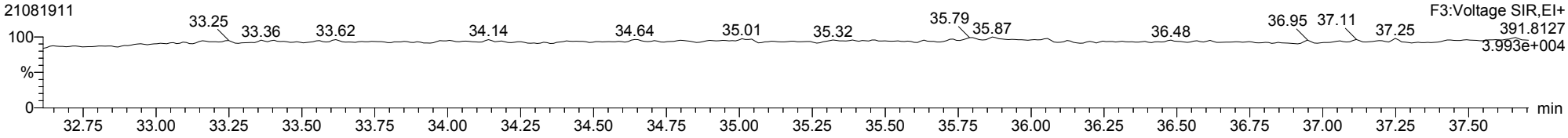

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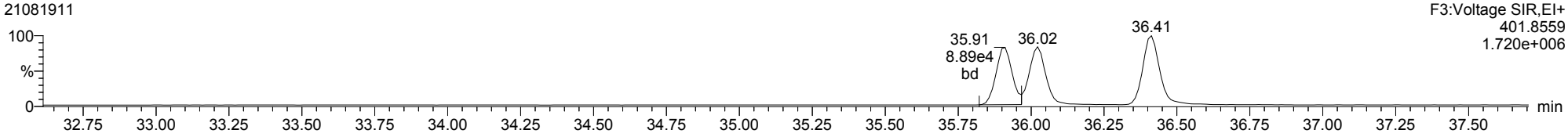

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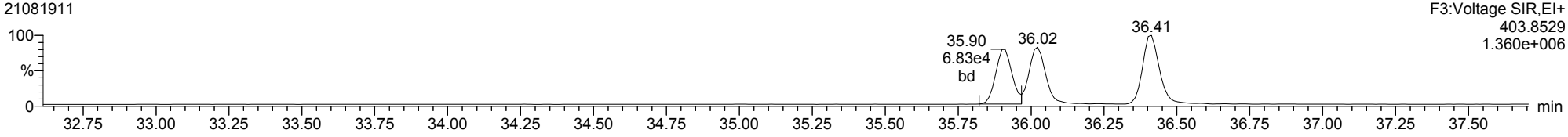

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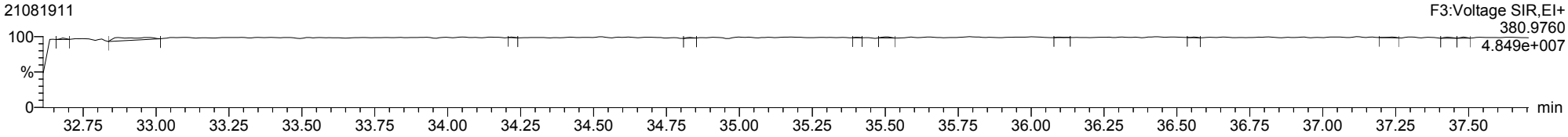

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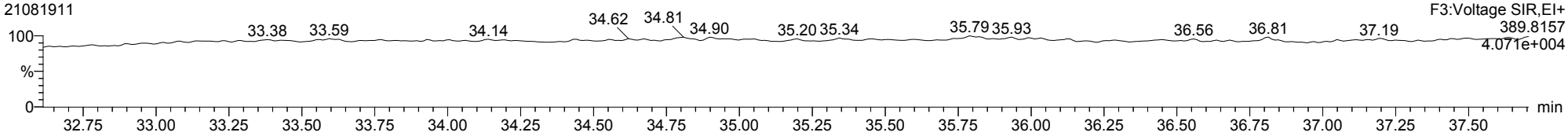

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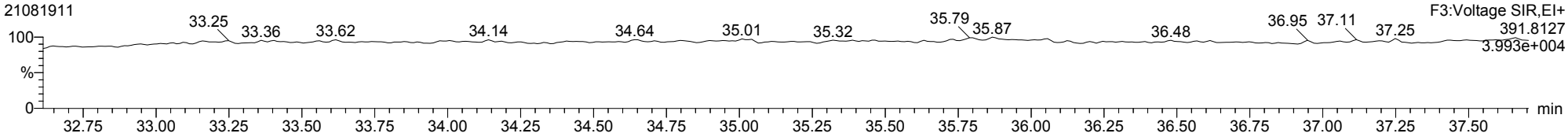

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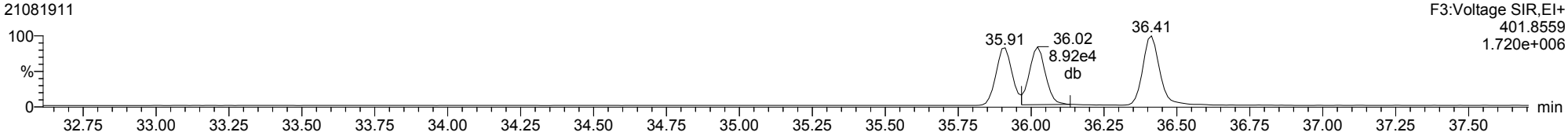

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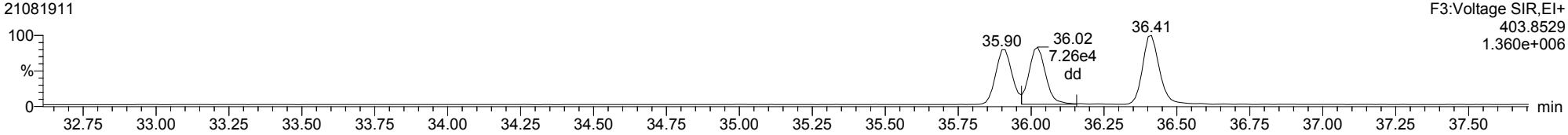

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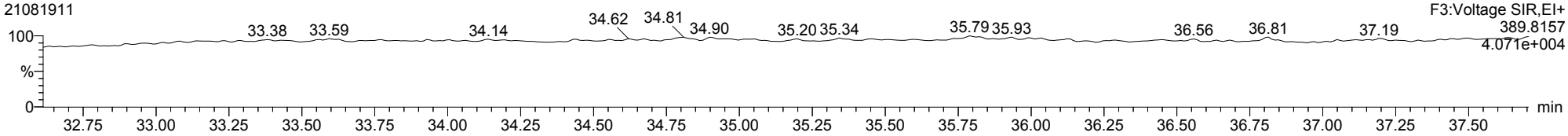

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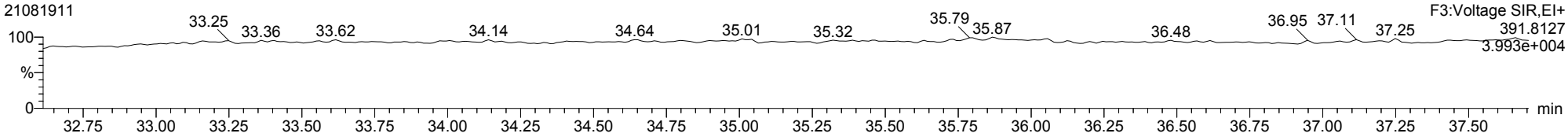

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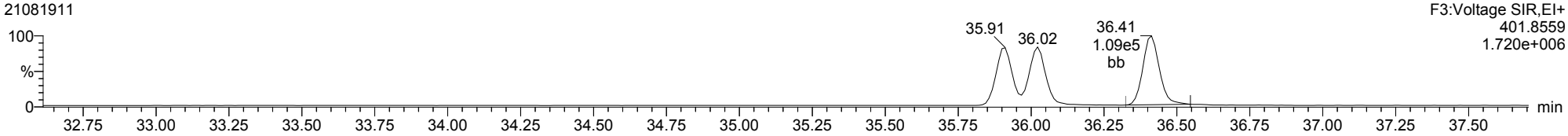

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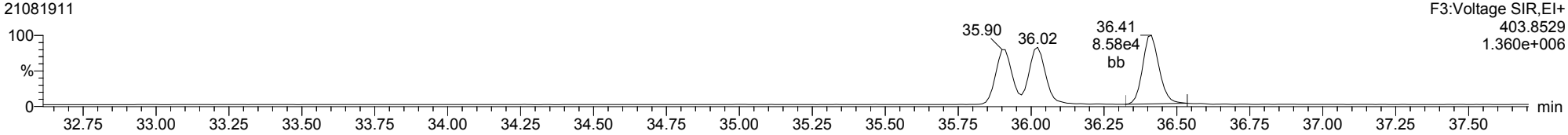

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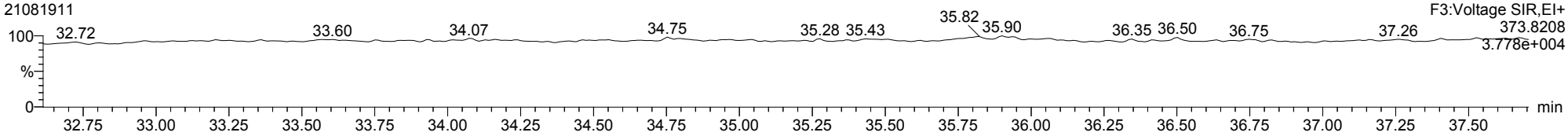

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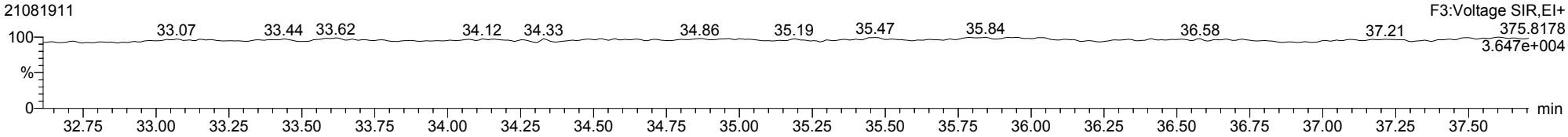

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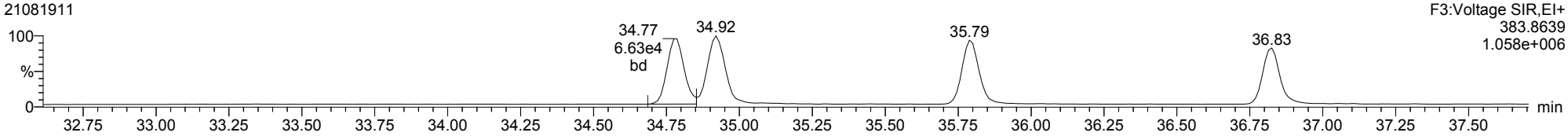

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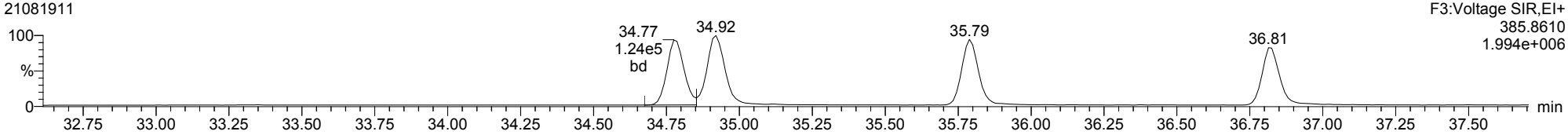
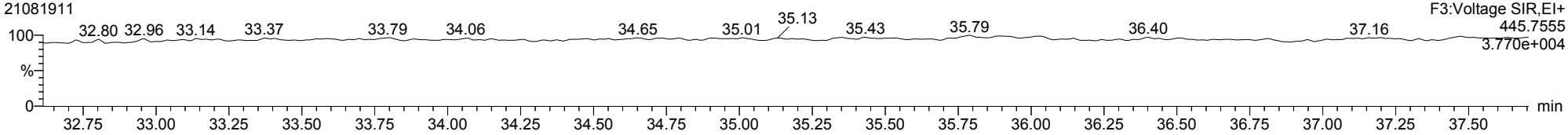


FUNCTION3 OCDPE



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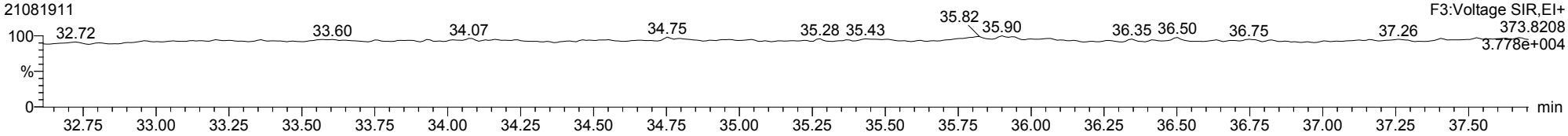
234678-HxCDF



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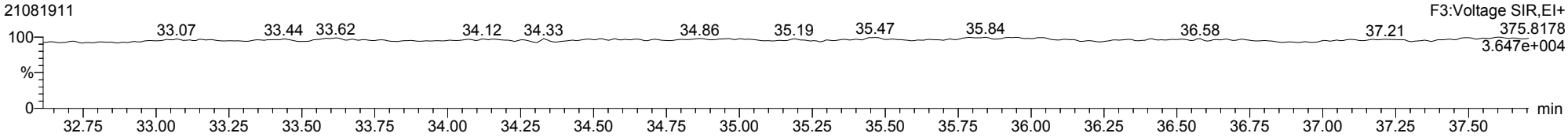

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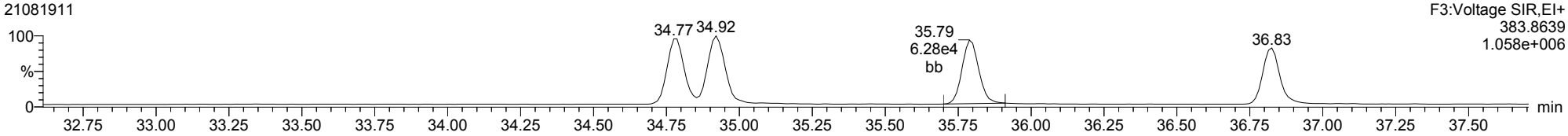

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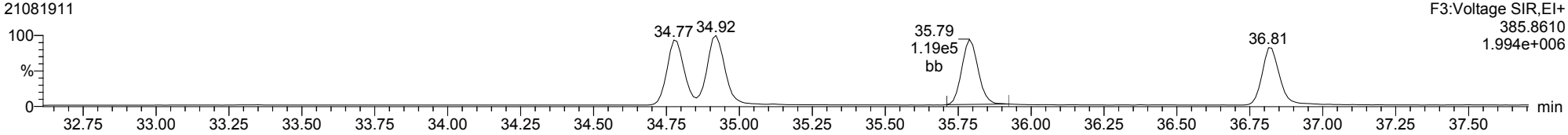

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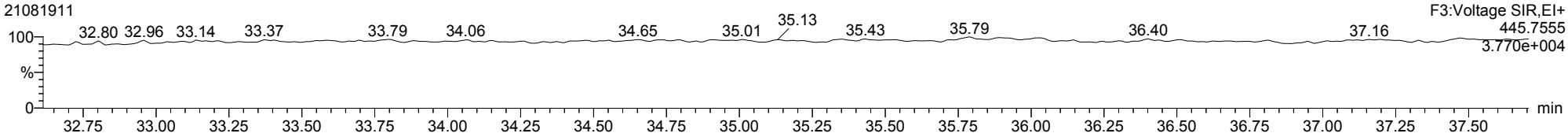

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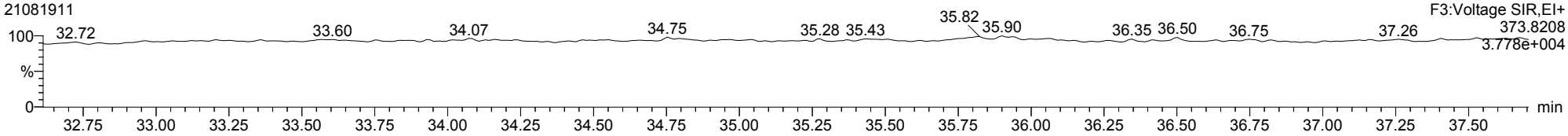

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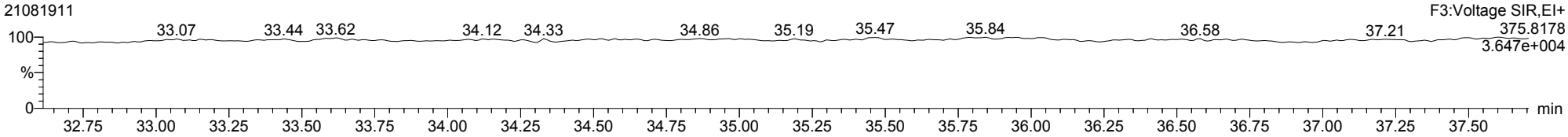

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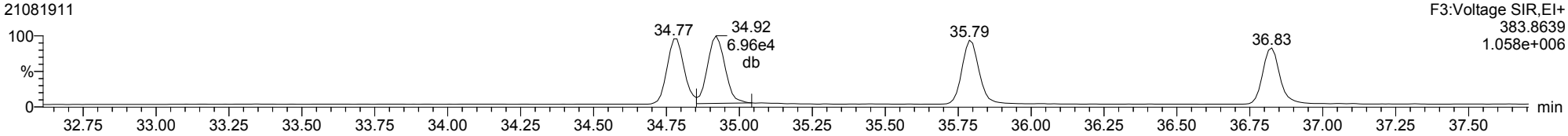

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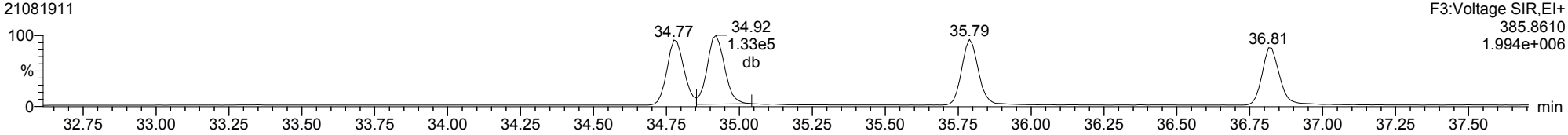

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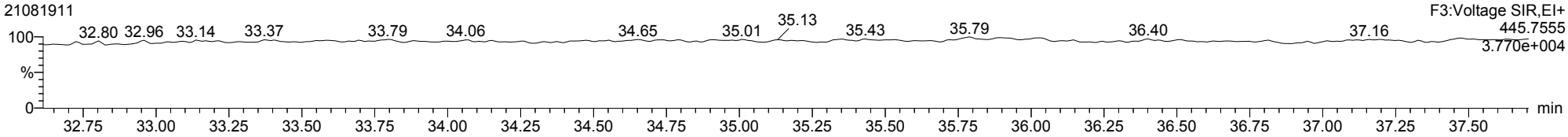

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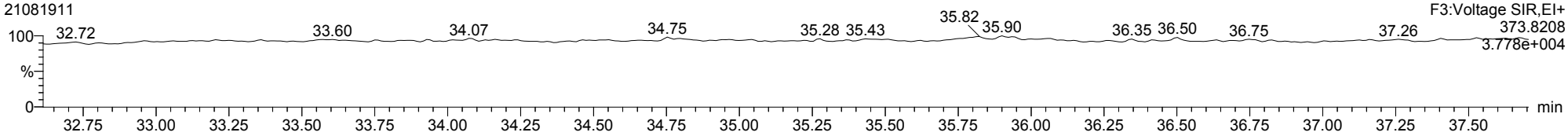

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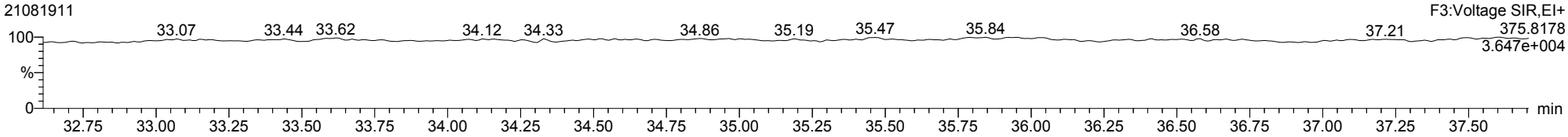

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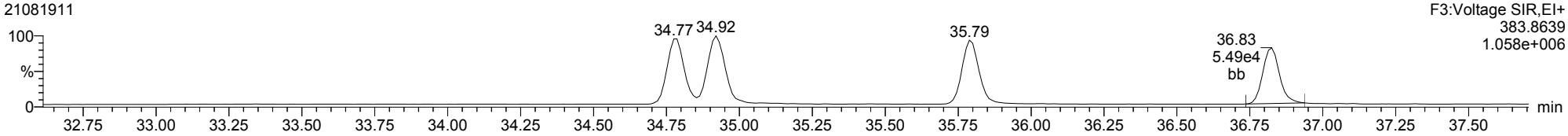

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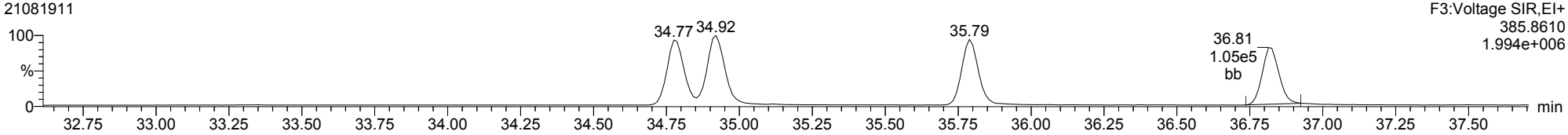

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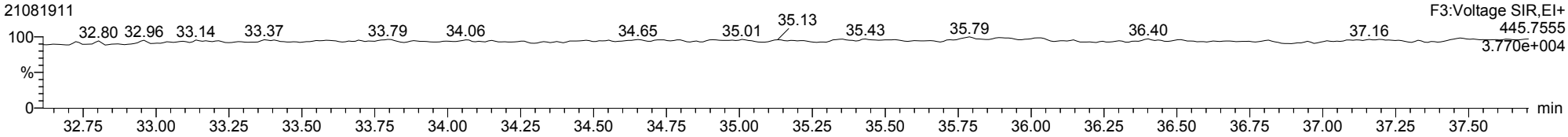

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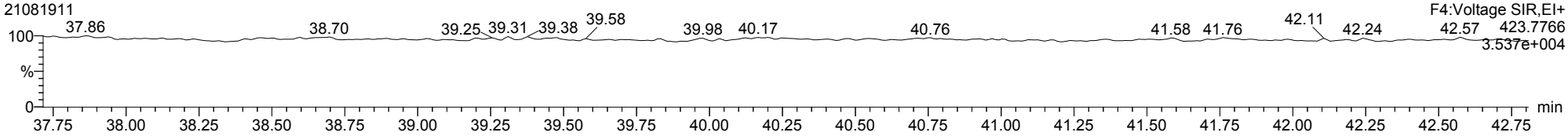

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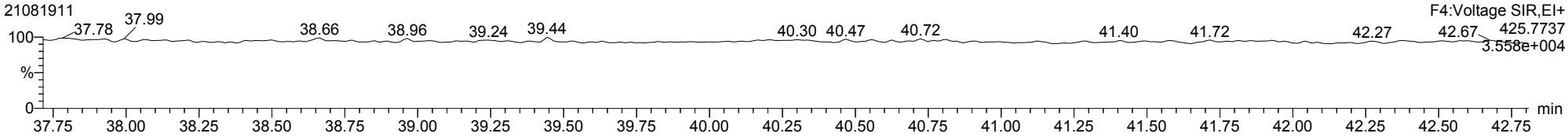

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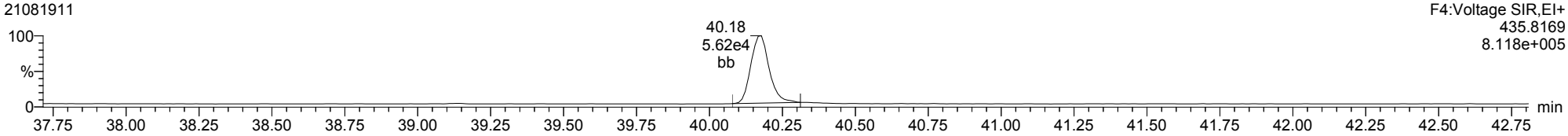

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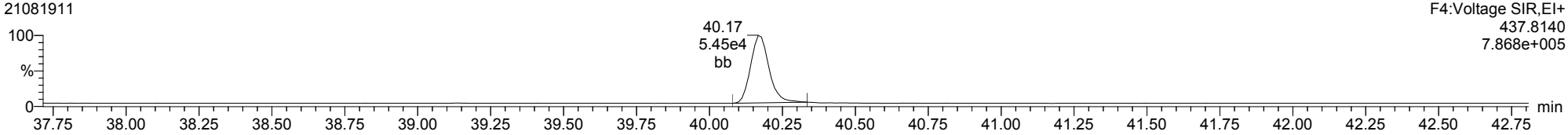

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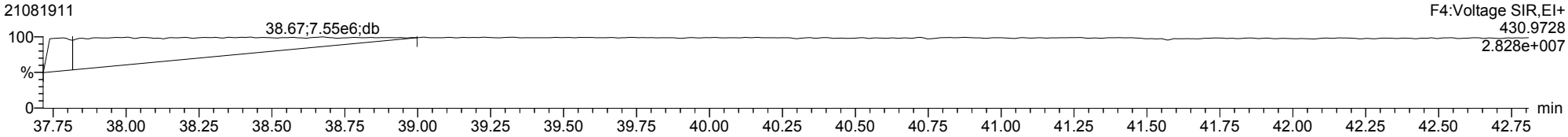

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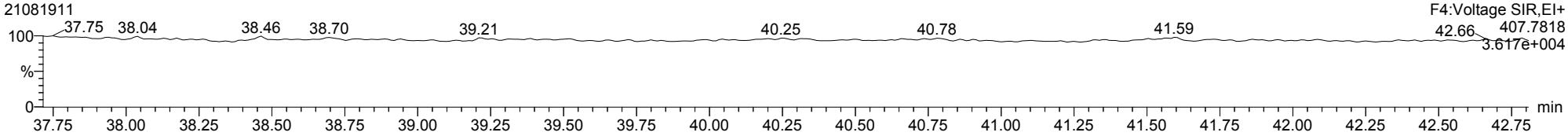

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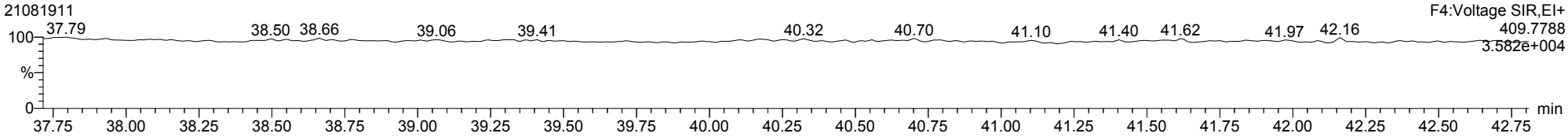

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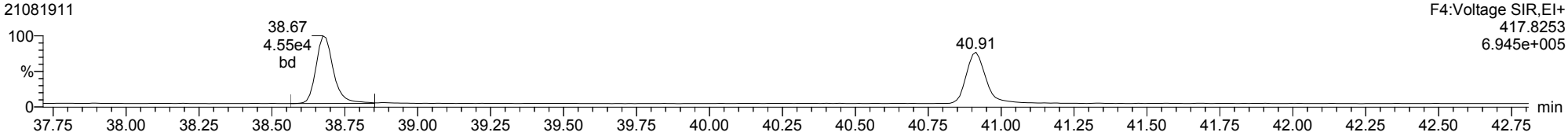

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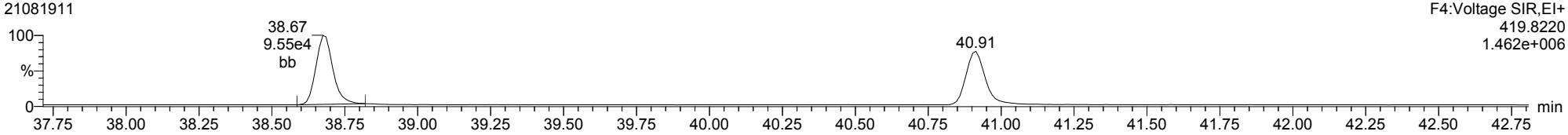

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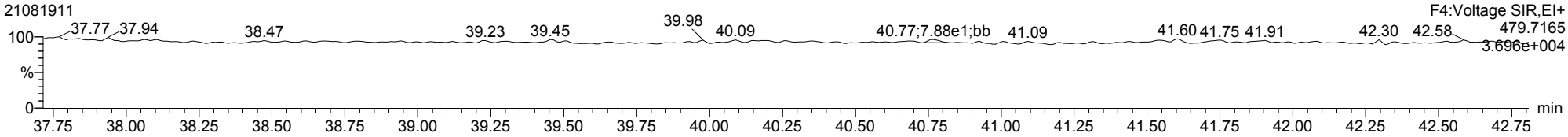

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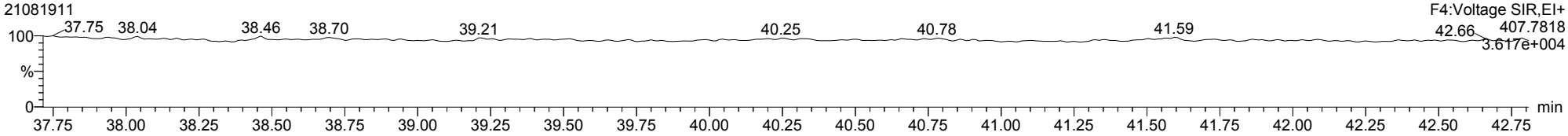

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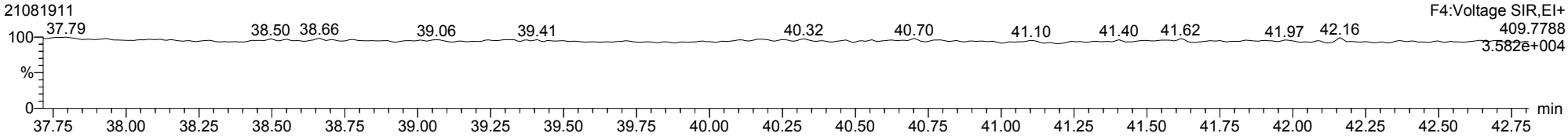

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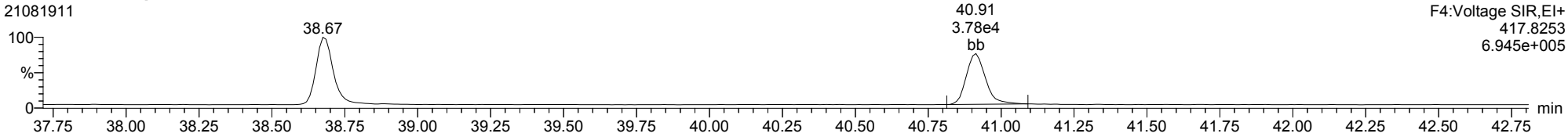

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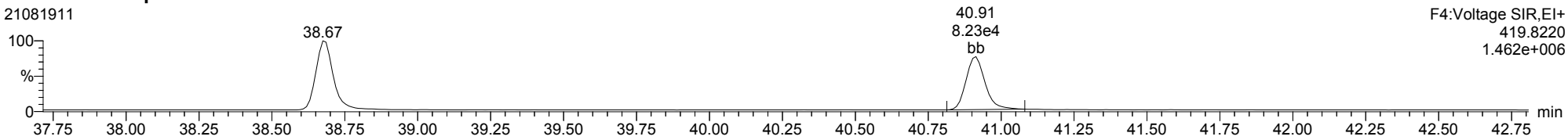

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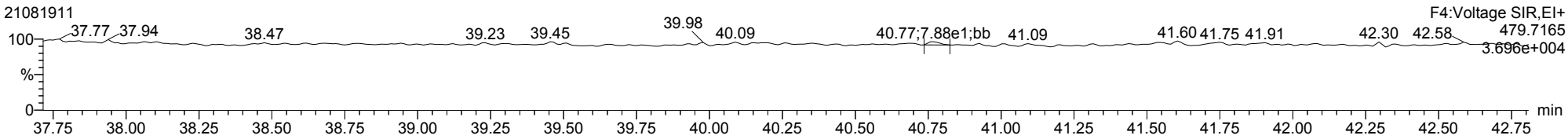

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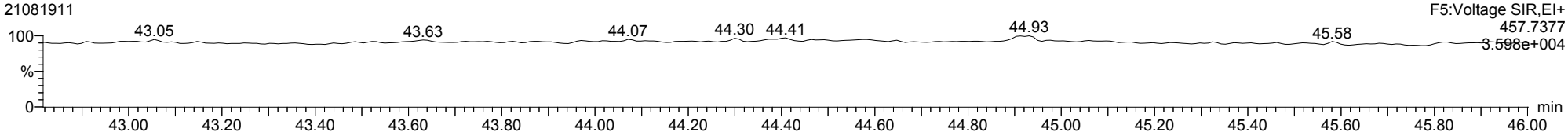

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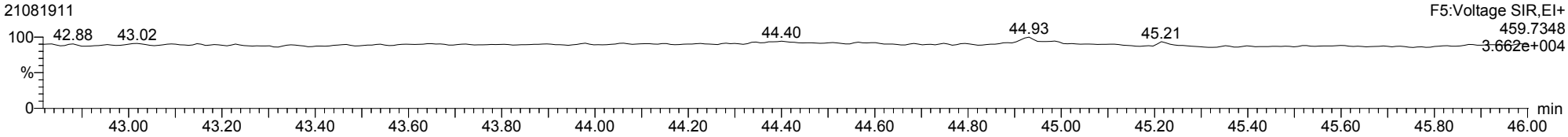

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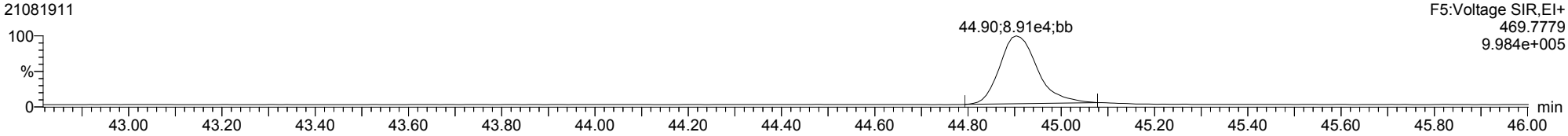

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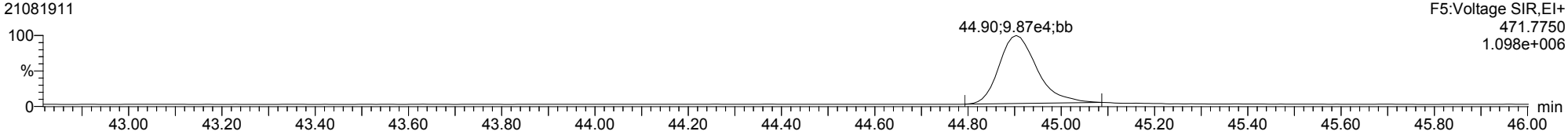

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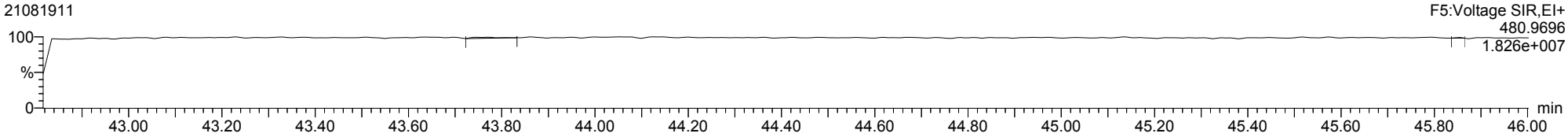

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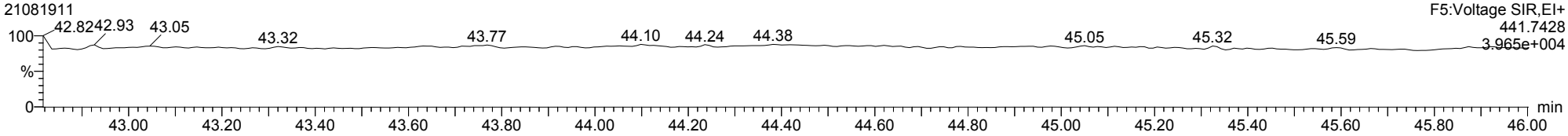

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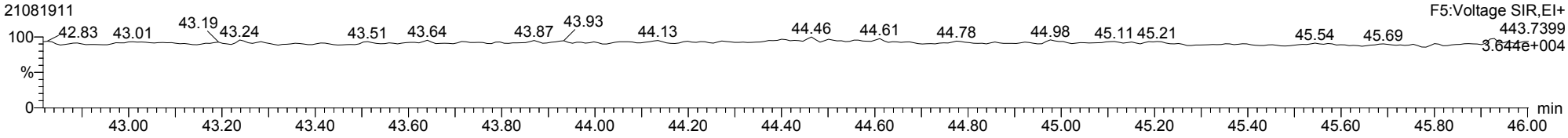

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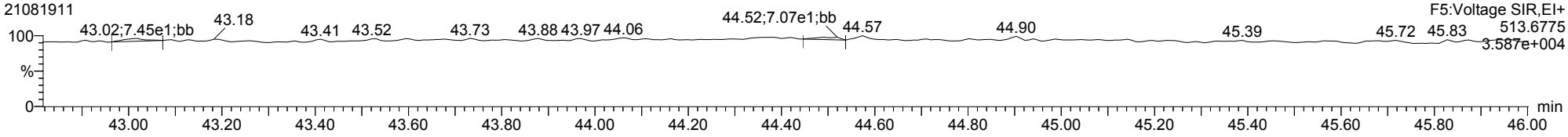

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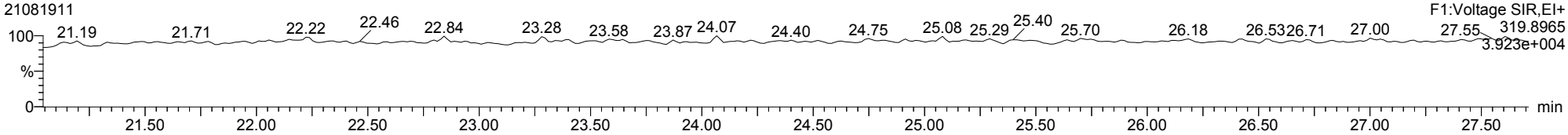

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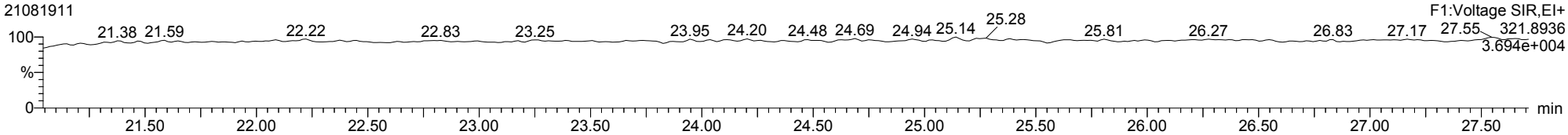

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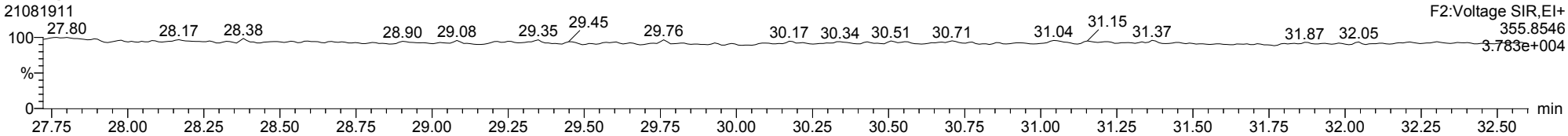

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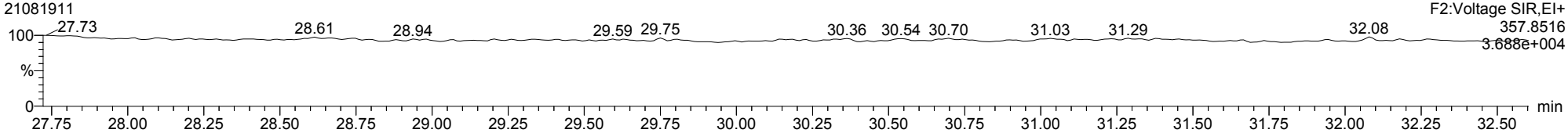

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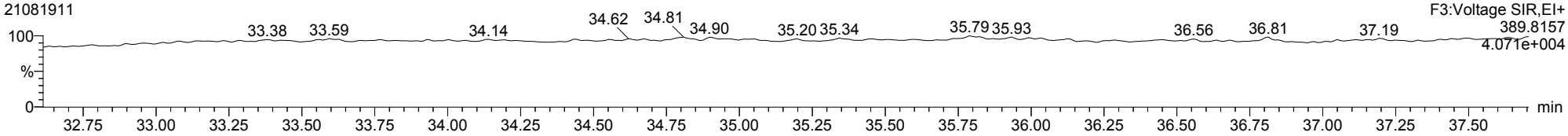
Total-hexadioxins



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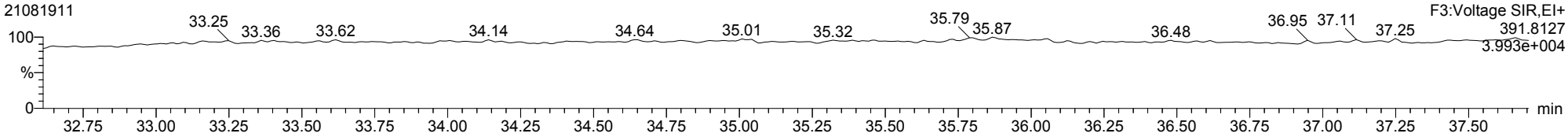

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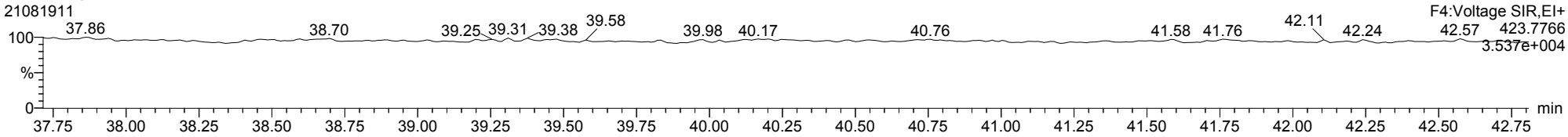

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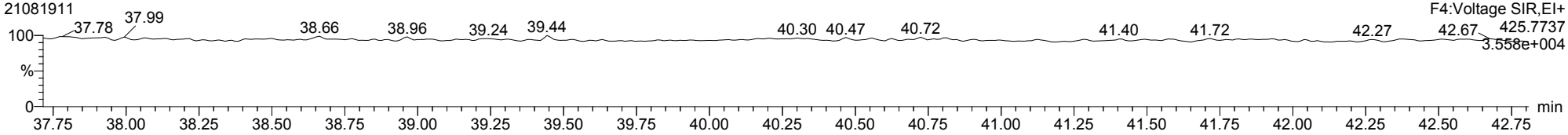

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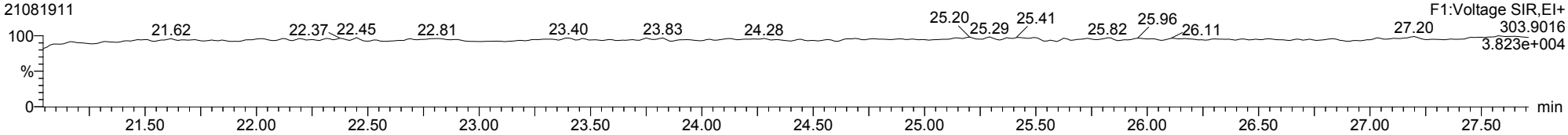
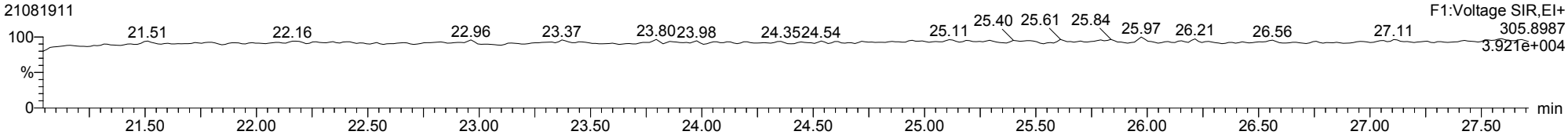
Total-tetrafurans



Total-tetrafurans



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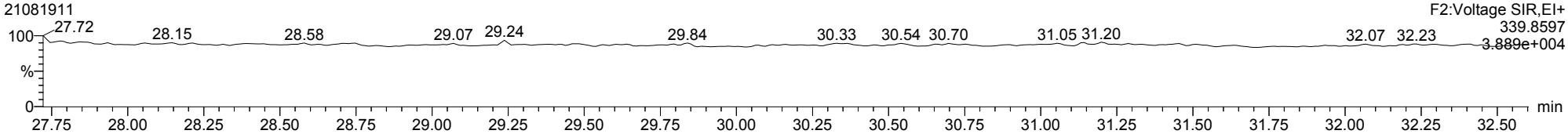

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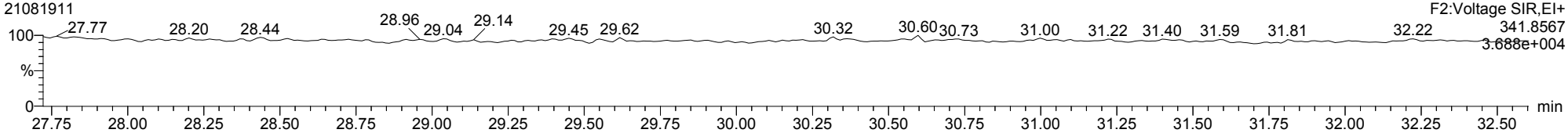

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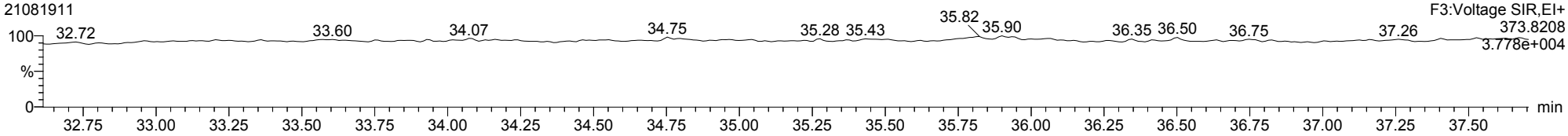

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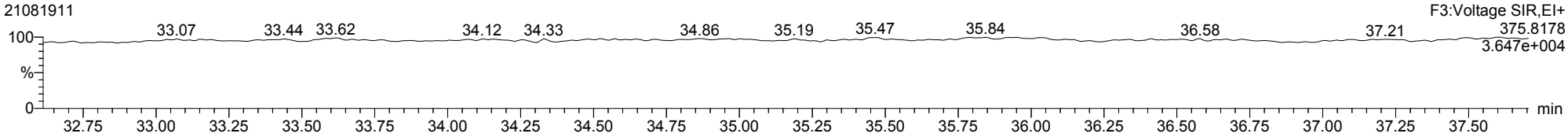
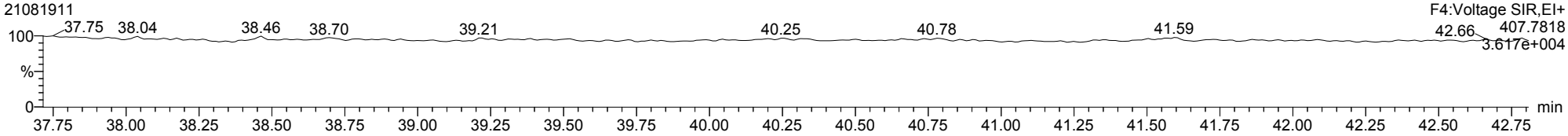
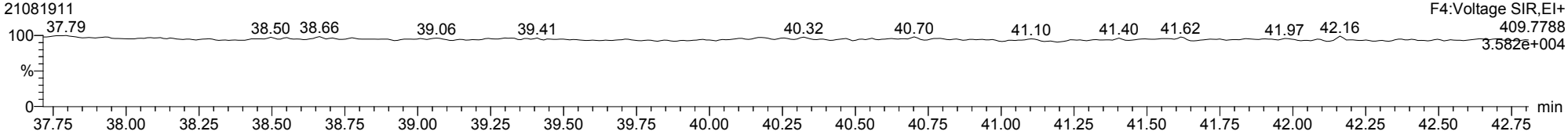


Total-heptafurans



Total-heptafurans



Analytical Resources, Incorporated
Analytical Chemists and Consultants

LCS RECOVERY
EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Matrix:	Solid	Analyzed:	08/18/21 19:11
Batch:	BJG0375	Laboratory ID:	BJG0375-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		92.9	75 - 158
2,3,7,8-TCDD	20.0	17.9		89.6	67 - 158
1,2,3,7,8-PeCDF	100	98.2		98.2	80 - 134
2,3,4,7,8-PeCDF	100	94.5		94.5	68 - 160
1,2,3,7,8-PeCDD	100	101		101	70 - 142
1,2,3,4,7,8-HxCDF	100	102		102	72 - 134
1,2,3,6,7,8-HxCDF	100	97.8		97.8	84 - 130
2,3,4,6,7,8-HxCDF	100	101		101	70 - 156
1,2,3,7,8,9-HxCDF	100	102		102	78 - 130
1,2,3,4,7,8-HxCDD	100	101		101	70 - 164
1,2,3,6,7,8-HxCDD	100	102		102	76 - 134
1,2,3,7,8,9-HxCDD	100	113		113	64 - 162
1,2,3,4,6,7,8-HpCDF	100	99.5		99.5	82 - 122
1,2,3,4,7,8,9-HpCDF	100	98.2		98.2	78 - 138
1,2,3,4,6,7,8-HpCDD	100	98.4		98.4	70 - 140
OCDF	200	163		81.3	63 - 170
OCDD	200	187		93.5	78 - 144

* Indicates 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 10:31:04 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: BJG0375-BS2, Name: 21081912, Date: 18-Aug-2021, Time: 19:11:38, 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	6.604e3	8.195e3	1.108	0.806	0.770	1255	1116	9.39e4	1.22e5	74.8	109.0	NO	bb	bb	9.292
12378-PeCDF	29.828	1.001	7.863e4	4.897e4	1.015	1.606	1.550	1337	1491	1.11e6	7.01e5	829.4	470.2	NO	bd	bb	49.079
23478-PeCDF	31.165	1.000	7.983e4	5.152e4	1.126	1.549	1.550	1337	1491	1.19e6	7.93e5	888.8	532.1	NO	bb	bb	47.241
123478-HxCDF	34.808	1.001	7.355e4	6.083e4	1.017	1.209	1.240	1726	1013	1.11e6	9.38e5	640.5	926.2	NO	bd	bd	50.789
234678-HxCDF	35.811	1.000	8.099e4	6.349e4	1.052	1.276	1.240	1726	1013	1.20e6	9.82e5	697.4	969.7	NO	bd	bb	50.622
123678-HxCDF	34.942	1.000	7.832e4	6.570e4	1.037	1.192	1.240	1726	1013	1.17e6	9.75e5	678.2	962.1	NO	db	db	48.901
123789-HxCDF	36.847	1.001	7.003e4	5.173e4	1.030	1.354	1.240	1726	1013	1.03e6	7.96e5	597.6	786.0	NO	bd	bb	50.801
1234678-HpCDF	38.697	1.000	7.157e4	6.846e4	1.327	1.045	1.050	1620	2040	1.09e6	1.04e6	674.3	510.0	NO	bb	bb	49.739
1234789-HpCDF	40.936	1.000	5.659e4	5.353e4	1.283	1.057	1.050	1620	2040	7.81e5	7.28e5	482.1	356.8	NO	bd	bb	49.112
OCDF	45.160	1.005	8.252e4	9.192e4	1.447	0.898	0.890	1397	1784	9.27e5	1.01e6	663.5	568.2	NO	bb	bb	81.257
2378-TCDD	26.290	1.001	5.372e3	7.143e3	0.920	0.752	0.770	1231	794	8.09e4	9.91e4	65.7	124.8	NO	bb	db	8.962
12378-PeCDD	31.421	1.001	5.082e4	3.077e4	0.995	1.652	1.550	966	705	7.41e5	4.78e5	767.3	677.3	NO	bb	bb	50.420
123478-HxCDD	35.933	1.001	6.139e4	4.822e4	1.027	1.273	1.240	1248	1399	9.77e5	7.59e5	782.7	542.3	NO	bd	bd	50.272
123678-HxCDD	36.045	1.000	6.531e4	5.213e4	1.009	1.253	1.240	1248	1399	9.85e5	8.23e5	789.7	587.9	NO	db	db	50.808
123789-HxCDD	36.435	1.011	6.385e4	5.413e4	0.950	1.179	1.240	1248	1399	9.92e5	8.36e5	795.3	597.2	NO	bb	bd	56.257
1234678-HpCDD	40.201	1.001	4.432e4	4.224e4	1.068	1.049	1.050	1011	1221	6.37e5	5.96e5	629.8	487.8	NO	bb	bb	49.212
OCDD	44.931	1.000	7.862e4	8.523e4	1.181	0.923	0.890	2208	1097	8.43e5	9.78e5	381.7	891.0	NO	bd	bb	93.519
13C-2378-TCDF	25.640	1.007	6.407e4	7.973e4	1.427	0.804	0.770	2008	1209	9.21e5	1.17e6	458.4	967.5	NO	bb	bb	34.511
13C-12378-PeCDF	29.806	1.171	1.569e5	9.925e4	1.297	1.581	1.550	1173	1240	2.31e6	1.42e6	1967.8	1147.6	NO	bb	bd	67.612
13C-23478-PeCDF	31.154	1.224	1.525e5	9.452e4	1.236	1.614	1.550	1173	1240	2.28e6	1.40e6	1940.9	1128.8	NO	bb	bd	68.403
13C-123478-HxCDF	34.786	0.955	8.844e4	1.718e5	1.242	0.515	0.510	1946	2289	1.33e6	2.59e6	681.2	1129.4	NO	bd	bd	78.090
13C-123678-HxCDF	34.931	0.959	9.827e4	1.858e5	1.343	0.529	0.510	1946	2289	1.43e6	2.72e6	733.8	1186.6	NO	db	db	78.838
13C-234678-HxCDF	35.800	0.983	9.735e4	1.738e5	1.215	0.560	0.510	1946	2289	1.46e6	2.69e6	749.4	1176.4	NO	bd	bb	83.236
13C-123789-HxCDF	36.825	1.011	8.079e4	1.519e5	1.008	0.532	0.510	1946	2289	1.25e6	2.36e6	643.1	1031.0	NO	bb	bb	86.105
13C-1234678-HpCDF	38.686	1.062	6.696e4	1.451e5	0.926	0.461	0.440	1201	1761	1.04e6	2.17e6	864.4	1231.9	NO	bb	bb	85.367
13C-1234789-HpCDF	40.914	1.123	5.550e4	1.192e5	0.758	0.465	0.440	1201	1761	7.75e5	1.67e6	645.0	950.1	NO	bb	bb	85.959
13C-1234-TCDD	25.458	0.000	1.268e5	1.653e5	1.000	0.767	0.770	2000	1003	1.93e6	2.54e6	963.5	2532.0	NO	bb	bb	100.000
13C-2378-TCDD	26.275	1.032	6.544e4	8.631e4	1.116	0.758	0.770	2000	1003	9.72e5	1.26e6	485.8	1260.7	NO	bb	bb	46.533
13C-12378-PeCDD	31.399	1.233	9.864e4	6.395e4	0.732	1.543	1.550	850	1019	1.44e6	9.26e5	1693.0	909.4	NO	bb	bb	76.045
13C-123478-HxCDD	35.911	0.986	1.191e5	9.314e4	0.960	1.279	1.240	1316	1172	1.95e6	1.49e6	1482.6	1267.8	NO	bd	bd	82.450
13C-123678-HxCDD	36.034	0.989	1.266e5	1.025e5	1.041	1.235	1.240	1316	1172	1.94e6	1.55e6	1475.6	1318.5	NO	db	db	82.028
13C-1234678-HpCDD	40.178	1.103	8.399e4	8.070e4	0.632	1.041	1.050	889	981	1.20e6	1.17e6	1350.0	1192.8	NO	bb	bb	97.102
13C-OCDD	44.913	1.233	1.376e5	1.591e5	0.504	0.865	0.890	1207	1275	1.53e6	1.70e6	1264.2	1332.0	NO	bb	bd	219.659
13C-123789-HxCDD	36.424	0.000	1.480e5	1.202e5	1.000	1.231	1.240	1316	1172	2.32e6	1.86e6	1763.4	1585.4	NO	bb	bb	100.000
37CL-2378-TCDD	26.305	1.033	5.622e4		1.084			931		7.87e5		845.4			bb		17.763

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 10:31:04 Pacific Daylight Time

ID: BJG0375-BS2, Name: 21081912, Date: 18-Aug-2021, Time: 19:11:38, 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	1255	1116								
1289-TCDF					1.043		0.770	1255	1116								
13468-PECDF					1.376		1.550	816	873								
12389-PECDF					1.000		1.550	1337	1491								
123468-HXCDF					1.087		1.240	1726	1013								
1368-TCDD					0.923		0.770	1231	794								
1289-TCDD					0.794		0.770	1231	794								
12479-PECDD					1.843		1.550	966	705								
12389-PECDD					1.154		1.550	966	705								
124679-HXCDD					1.125		1.240	1248	1399								
1234679-HPCDD	39.142	0.974	6.157e2	6.782e2	1.211	0.908	1.050	1011	1221	9.85e3	9.52e3	9.7	7.8	NO	bb	bb	0.649
Total-tetrafurans			6.604e3		1.192			1255		9.39e4							9.292
Total-penta1			0.000e0					816		0.00e0							
Total-pentafurans			1.585e5		1.047			1337		2.30e6							96.320
Total-hexafurans			3.029e5		1.045			1726		4.51e6							201.113
Total-heptafurans			1.282e5		1.305			1620		1.87e6							98.851
Total-Furans			6.786e5		1.158			1255		9.70e6							486.833
Total-tetradioxins			5.372e3		0.879			1231		8.09e4							8.962
Total-pentadioxins			5.082e4		1.331			966		7.41e5							50.420
Total-hexadioxins			1.905e5		1.028			1248		2.95e6							157.337
Total-heptadioxins			4.494e4		1.140			1011		6.47e5							49.861
Total-Dioxins			3.703e5		1.092			1231		5.27e6							360.099
Total-TEQ			1.049e6					1231		1.50e7							846.932
FUNCTION1 PFK			7.333e5					479672		1.02e6							
FUNCTION2 PFK			1.026e7					367220		5.28e7							0.000
FUNCTION3 PFK			8.043e5					460238		1.90e7							0.000
FUNCTION4 PFK			1.584e5					286138		4.91e6							
FUNCTION5 PFK			4.074e6					243397		3.16e7							
FUNCTION1 HXCD...			1.551e3					700		2.02e4							0.000
FUNCTION1 HPCD...			8.578e2					936		1.38e4							0.000
FUNCTION2 HPCD...			2.495e2					834		7.10e3							0.000
FUNCTION3 OCDPE			5.604e2					772		1.01e4							0.000
FUNCTION4 NCDPE			8.484e2					798		1.68e4							0.000
FUNCTION5 DCDPE			0.000e0					661		0.00e0							

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 10:31:04 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: BJG0375-BS2, Name: 21081912, Date: 18-Aug-2021, Time: 19:11:38, 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	25.66	6.604e3	8.195e3	1.108	0.81	0.77	74.8	YES	NO	bb	bb	9.292

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	7.983e4	5.152e4	1.126	1.55	1.55	888.8	YES	NO	bb	bb	47.241
2	12378-PeCDF	29.83	7.863e4	4.897e4	1.015	1.61	1.55	829.4	YES	NO	bd	bb	49.079

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123789-HxCDF	36.85	7.003e4	5.173e4	1.030	1.35	1.24	597.6	YES	NO	bd	bb	50.801
2	234678-HxCDF	35.81	8.099e4	6.349e4	1.052	1.28	1.24	697.4	YES	NO	bd	bb	50.622
3	123678-HxCDF	34.94	7.832e4	6.570e4	1.037	1.19	1.24	678.2	YES	NO	db	db	48.901
4	123478-HxCDF	34.81	7.355e4	6.083e4	1.017	1.21	1.24	640.5	YES	NO	bd	bd	50.789

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234789-HpCDF	40.94	5.659e4	5.353e4	1.283	1.06	1.05	482.1	YES	NO	bd	bb	49.112
2	1234678-HpCDF	38.70	7.157e4	6.846e4	1.327	1.05	1.05	674.3	YES	NO	bb	bb	49.739

ID: BJG0375-BS2, Name: 21081912, Date: 18-Aug-2021, Time: 19:11:38, 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	2378-TCDF	25.66	6.604e3	8.195e3	1.108	0.81	0.77	74.8	YES	NO	bb	bb	9.292
2	23478-PeCDF	31.17	7.983e4	5.152e4	1.126	1.55	1.55	888.8	YES	NO	bb	bb	47.241
3	12378-PeCDF	29.83	7.863e4	4.897e4	1.015	1.61	1.55	829.4	YES	NO	bd	bb	49.079
4	123789-HxCDF	36.85	7.003e4	5.173e4	1.030	1.35	1.24	597.6	YES	NO	bd	bb	50.801
5	234678-HxCDF	35.81	8.099e4	6.349e4	1.052	1.28	1.24	697.4	YES	NO	bd	bb	50.622
6	123678-HxCDF	34.94	7.832e4	6.570e4	1.037	1.19	1.24	678.2	YES	NO	db	db	48.901
7	123478-HxCDF	34.81	7.355e4	6.083e4	1.017	1.21	1.24	640.5	YES	NO	bd	bd	50.789
8	1234789-HpCDF	40.94	5.659e4	5.353e4	1.283	1.06	1.05	482.1	YES	NO	bd	bb	49.112
9	1234678-HpCDF	38.70	7.157e4	6.846e4	1.327	1.05	1.05	674.3	YES	NO	bb	bb	49.739
10	OCDF	45.16	8.252e4	9.192e4	1.447	0.90	0.89	663.5	YES	NO	bb	bb	81.257

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	2378-TCDD	26.29	5.372e3	7.143e3	0.920	0.75	0.77	65.7	YES	NO	bb	db	8.962

PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	12378-PeCDD	31.42	5.082e4	3.077e4	0.995	1.65	1.55	767.3	YES	NO	bb	bb	50.420

HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123789-HxCDD	36.43	6.385e4	5.413e4	0.950	1.18	1.24	795.3	YES	NO	bb	bd	56.257
2	123678-HxCDD	36.04	6.531e4	5.213e4	1.009	1.25	1.24	789.7	YES	NO	db	db	50.808
3	123478-HxCDD	35.93	6.139e4	4.822e4	1.027	1.27	1.24	782.7	YES	NO	bd	bd	50.272

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234679-HPCDD	39.14	6.157e2	6.782e2	1.211	0.91	1.05	9.7	YES	NO	bb	bb	0.649
2	1234678-HpCDD	40.20	4.432e4	4.224e4	1.068	1.05	1.05	629.8	YES	NO	bb	bb	49.212

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 10:31:04 Pacific Daylight Time

ID: BJG0375-BS2, Name: 21081912, Date: 18-Aug-2021, Time: 19:11:38, 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	6.385e4	5.413e4	0.950	1.18	1.24	795.3	YES	NO	bb	bd	56.257
2	123678-HxCDD	36.04	6.531e4	5.213e4	1.009	1.25	1.24	789.7	YES	NO	db	db	50.808
3	123478-HxCDD	35.93	6.139e4	4.822e4	1.027	1.27	1.24	782.7	YES	NO	bd	bd	50.272
4	12378-PeCDD	31.42	5.082e4	3.077e4	0.995	1.65	1.55	767.3	YES	NO	bb	bb	50.420
5	2378-TCDD	26.29	5.372e3	7.143e3	0.920	0.75	0.77	65.7	YES	NO	bb	db	8.962
6	1234679-HPCDD	39.14	6.157e2	6.782e2	1.211	0.91	1.05	9.7	YES	NO	bb	bb	0.649
7	OCDD	44.93	7.862e4	8.523e4	1.181	0.92	0.89	381.7	YES	NO	bd	bb	93.519
8	1234678-HpCDD	40.20	4.432e4	4.224e4	1.068	1.05	1.05	629.8	YES	NO	bb	bb	49.212

TotalTEQ,Furans,Dioxins

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	2378-TCDF	25.66	6.604e3	8.195e3	1.108	0.81	0.77	74.8	YES	NO	bb	bb	9.292
2	23478-PeCDF	31.17	7.983e4	5.152e4	1.126	1.55	1.55	888.8	YES	NO	bb	bb	47.241
3	12378-PeCDF	29.83	7.863e4	4.897e4	1.015	1.61	1.55	829.4	YES	NO	bd	bb	49.079
4	123789-HxCDF	36.85	7.003e4	5.173e4	1.030	1.35	1.24	597.6	YES	NO	bd	bb	50.801
5	234678-HxCDF	35.81	8.099e4	6.349e4	1.052	1.28	1.24	697.4	YES	NO	bd	bb	50.622
6	123678-HxCDF	34.94	7.832e4	6.570e4	1.037	1.19	1.24	678.2	YES	NO	db	db	48.901
7	123478-HxCDF	34.81	7.355e4	6.083e4	1.017	1.21	1.24	640.5	YES	NO	bd	bd	50.789
8	1234789-HpCDF	40.94	5.659e4	5.353e4	1.283	1.06	1.05	482.1	YES	NO	bd	bb	49.112
9	1234678-HpCDF	38.70	7.157e4	6.846e4	1.327	1.05	1.05	674.3	YES	NO	bb	bb	49.739
10	OCDF	45.16	8.252e4	9.192e4	1.447	0.90	0.89	663.5	YES	NO	bb	bb	81.257
11	123789-HxCDD	36.43	6.385e4	5.413e4	0.950	1.18	1.24	795.3	YES	NO	bb	bd	56.257
12	123678-HxCDD	36.04	6.531e4	5.213e4	1.009	1.25	1.24	789.7	YES	NO	db	db	50.808
13	123478-HxCDD	35.93	6.139e4	4.822e4	1.027	1.27	1.24	782.7	YES	NO	bd	bd	50.272
14	12378-PeCDD	31.42	5.082e4	3.077e4	0.995	1.65	1.55	767.3	YES	NO	bb	bb	50.420
15	2378-TCDD	26.29	5.372e3	7.143e3	0.920	0.75	0.77	65.7	YES	NO	bb	db	8.962
16	1234679-HPCDD	39.14	6.157e2	6.782e2	1.211	0.91	1.05	9.7	YES	NO	bb	bb	0.649
17	OCDD	44.93	7.862e4	8.523e4	1.181	0.92	0.89	381.7	YES	NO	bd	bb	93.519
18	1234678-HpCDD	40.20	4.432e4	4.224e4	1.068	1.05	1.05	629.8	YES	NO	bb	bb	49.212

PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	22.71	7.333e5					2.1	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	30.85	1.329e4					1.5	NO		bb		0.000
2	FUNCTION2 PFK	30.81	1.028e4					0.9	NO		bb		0.000
3	FUNCTION2 PFK	30.61	1.864e3					0.5	NO		bb		0.000
4	FUNCTION2 PFK	29.88	4.694e3					0.7	NO		bb		0.000
5	FUNCTION2 PFK	29.34	3.275e4					1.3	NO		bb		0.000
6	FUNCTION2 PFK	29.25	7.115e3					0.9	NO		bb		0.000
7	FUNCTION2 PFK	28.94	1.049e4					1.1	NO		bb		0.000
8	FUNCTION2 PFK	28.74	9.280e4					2.9	NO		db		0.000
9	FUNCTION2 PFK	27.99	6.036e6					41.4	YES		dd		0.000
10	FUNCTION2 PFK	27.95	7.019e5					43.4	YES		dd		0.000
11	FUNCTION2 PFK	27.92	3.276e6					43.8	YES		bd		0.000
12	FUNCTION2 PFK	32.46	1.767e4					1.0	NO		bb		0.000
13	FUNCTION2 PFK	32.41	7.780e3					1.0	NO		bb		0.000
14	FUNCTION2 PFK	32.26	3.378e3					0.6	NO		bb		0.000
15	FUNCTION2 PFK	32.21	3.130e4					1.6	NO		bb		0.000
16	FUNCTION2 PFK	31.39	1.786e4					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	33.77	4.588e4					1.3	NO		bb		0.000
2	FUNCTION3 PFK	33.62	5.257e3					0.6	NO		bb		0.000
3	FUNCTION3 PFK	33.52	7.076e3					0.7	NO		bb		0.000
4	FUNCTION3 PFK	33.38	1.782e4					1.1	NO		bb		0.000
5	FUNCTION3 PFK	33.26	1.083e4					0.8	NO		bb		0.000
6	FUNCTION3 PFK	33.04	1.447e4					0.7	NO		bb		0.000
7	FUNCTION3 PFK	32.89	6.131e4					2.0	NO		db		0.000
8	FUNCTION3 PFK	32.81	3.226e4					2.3	NO		dd		0.000
9	FUNCTION3 PFK	32.77	2.167e4					1.6	NO		bd		0.000
10	FUNCTION3 PFK	32.68	1.146e4					1.4	NO		bb		0.000
11	FUNCTION3 PFK	36.65	1.760e4					0.8	NO		bb		0.000
12	FUNCTION3 PFK	36.43	3.691e4					2.0	NO		db		0.000
13	FUNCTION3 PFK	36.31	7.951e4					1.8	NO		bd		0.000
14	FUNCTION3 PFK	36.09	1.949e4					1.9	NO		db		0.000
15	FUNCTION3 PFK	36.04	5.548e4					2.8	NO		dd		0.000
16	FUNCTION3 PFK	35.99	5.058e4					2.3	NO		dd		0.000
17	FUNCTION3 PFK	35.94	5.224e4					3.1	YES		bd		0.000
18	FUNCTION3 PFK	35.87	2.846e4					1.3	NO		db		0.000
19	FUNCTION3 PFK	35.81	1.124e4					0.9	NO		dd		0.000
20	FUNCTION3 PFK	35.77	1.421e4					1.1	NO		bd		0.000
21	FUNCTION3 PFK	35.57	4.106e4					1.4	NO		bb		0.000
22	FUNCTION3 PFK	35.10	1.934e4					1.3	NO		bb		0.000
23	FUNCTION3 PFK	34.49	1.593e4					0.6	NO		bb		0.000
24	FUNCTION3 PFK	34.04	2.168e4					1.3	NO		bb		0.000
25	FUNCTION3 PFK	33.97	1.699e4					1.3	NO		db		0.000
26	FUNCTION3 PFK	33.91	5.023e4					2.0	NO		bd		0.000
27	FUNCTION3 PFK	37.20	2.000e3					0.4	NO		bb		0.000
28	FUNCTION3 PFK	37.13	2.303e3					0.5	NO		bb		0.000
29	FUNCTION3 PFK	36.81	1.763e4					0.6	NO		bb		0.000
30	FUNCTION3 PFK	36.71	2.341e4					1.5	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	40.61	1.421e4					0.7	NO		bd		
2	FUNCTION4 PFK	40.38	1.372e3					0.4	NO		bb		
3	FUNCTION4 PFK	40.22	1.991e4					1.4	NO		db		
4	FUNCTION4 PFK	40.19	1.055e4					1.7	NO		bd		
5	FUNCTION4 PFK	40.12	1.513e4					1.1	NO		bb		
6	FUNCTION4 PFK	39.94	3.847e3					0.7	NO		bb		
7	FUNCTION4 PFK	39.59	7.195e3					0.6	NO		bb		
8	FUNCTION4 PFK	39.33	1.013e4					1.0	NO		bb		
9	FUNCTION4 PFK	38.99	1.669e4					1.9	NO		bb		
10	FUNCTION4 PFK	38.62	1.912e3					0.4	NO		bb		
11	FUNCTION4 PFK	38.09	3.200e3					0.6	NO		bb		
12	FUNCTION4 PFK	42.76	4.675e3					0.6	NO		bb		
13	FUNCTION4 PFK	42.54	4.079e3					0.7	NO		bb		
14	FUNCTION4 PFK	41.89	1.325e4					1.3	NO		bb		
15	FUNCTION4 PFK	41.54	5.523e3					0.9	NO		bb		
16	FUNCTION4 PFK	41.05	1.440e4					1.1	NO		bb		
17	FUNCTION4 PFK	40.75	4.435e3					0.7	NO		db		
18	FUNCTION4 PFK	40.69	7.852e3					1.0	NO		dd		

PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	44.23	1.119e4					1.6	NO		bb		
2	FUNCTION5 PFK	43.86	8.475e3					1.4	NO		bb		
3	FUNCTION5 PFK	43.63	4.258e4					4.0	YES		db		
4	FUNCTION5 PFK	43.49	2.672e5					10.1	YES		dd		
5	FUNCTION5 PFK	43.38	3.139e5					15.1	YES		dd		
6	FUNCTION5 PFK	43.13	2.187e6					25.1	YES		dd		
7	FUNCTION5 PFK	42.95	2.699e5					31.1	YES		dd		
8	FUNCTION5 PFK	42.86	9.006e5					35.2	YES		bd		
9	FUNCTION5 PFK	45.96	5.167e4					2.9	NO		bb		
10	FUNCTION5 PFK	45.70	4.167e3					0.8	NO		bb		
11	FUNCTION5 PFK	45.53	1.051e3					0.5	NO		bb		
12	FUNCTION5 PFK	45.36	1.119e4					1.2	NO		bb		
13	FUNCTION5 PFK	45.00	4.282e3					0.7	NO		bb		
14	FUNCTION5 PFK	44.29	1.010e3					0.5	NO		bb		

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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...	24.63	1.093e2					2.1	NO		bb		0.000
2	FUNCTION1 HXCD...	24.23	1.731e2					1.9	NO		bb		0.000
3	FUNCTION1 HXCD...	22.90	7.096e1					1.4	NO		bb		0.000
4	FUNCTION1 HXCD...	21.81	2.303e2					2.2	NO		db		0.000
5	FUNCTION1 HXCD...	21.60	9.738e1					2.1	NO		dd		0.000
6	FUNCTION1 HXCD...	21.47	1.455e2					2.8	NO		dd		0.000
7	FUNCTION1 HXCD...	21.38	1.788e2					3.3	YES		dd		0.000
8	FUNCTION1 HXCD...	21.32	1.139e2					2.5	NO		dd		0.000
9	FUNCTION1 HXCD...	21.22	8.328e1					1.8	NO		bd		0.000
10	FUNCTION1 HXCD...	27.39	9.669e1					1.5	NO		bb		0.000
11	FUNCTION1 HXCD...	25.50	1.435e2					3.1	YES		db		0.000
12	FUNCTION1 HXCD...	25.40	1.087e2					4.2	YES		bd		0.000

ETHERS2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HPCD...	27.18	9.542e1					1.5	NO		bb		0.000
2	FUNCTION1 HPCD...	26.91	9.558e1					1.9	NO		bb		0.000
3	FUNCTION1 HPCD...	26.29	7.773e1					1.2	NO		bb		0.000
4	FUNCTION1 HPCD...	25.00	1.616e2					2.8	NO		bb		0.000
5	FUNCTION1 HPCD...	24.16	7.018e1					1.0	NO		bb		0.000
6	FUNCTION1 HPCD...	23.39	8.350e1					1.4	NO		bb		0.000
7	FUNCTION1 HPCD...	22.18	2.738e2					5.0	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...	31.81	9.100e1					3.9	YES		bb		0.000
2	FUNCTION2 HPCD...	29.68	7.157e1					1.9	NO		bb		0.000
3	FUNCTION2 HPCD...	27.88	8.695e1					2.7	NO		bb		0.000

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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	37.28	7.678e1					2.4	NO		bb		0.000
2	FUNCTION3 OCDPE	36.04	1.487e2					3.2	YES		db		0.000
3	FUNCTION3 OCDPE	35.92	1.671e2					3.1	YES		bd		0.000
4	FUNCTION3 OCDPE	34.75	8.280e1					2.1	NO		bb		0.000
5	FUNCTION3 OCDPE	32.99	8.500e1					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	42.61	9.377e1					2.6	NO		bb		0.000
2	FUNCTION4 NCDPE	42.33	1.058e2					3.0	NO		bb		0.000
3	FUNCTION4 NCDPE	41.95	1.184e2					2.7	NO		bb		0.000
4	FUNCTION4 NCDPE	40.72	1.171e2					2.3	NO		db		0.000
5	FUNCTION4 NCDPE	40.62	9.168e1					2.0	NO		bd		0.000
6	FUNCTION4 NCDPE	39.42	8.865e1					2.8	NO		db		0.000
7	FUNCTION4 NCDPE	39.37	1.527e2					3.3	YES		bd		0.000
8	FUNCTION4 NCDPE	37.86	8.034e1					2.2	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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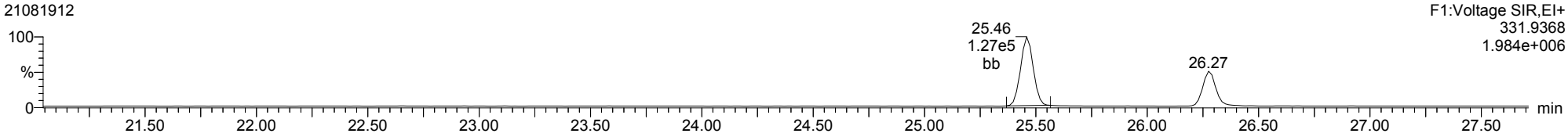
ID: BJG0375-BS2, Name: 21081912, Date: 18-Aug-2021, Time: 19:11:38, Conditions: AUTOSPEC01, User: pk

13C-1234-TCDD



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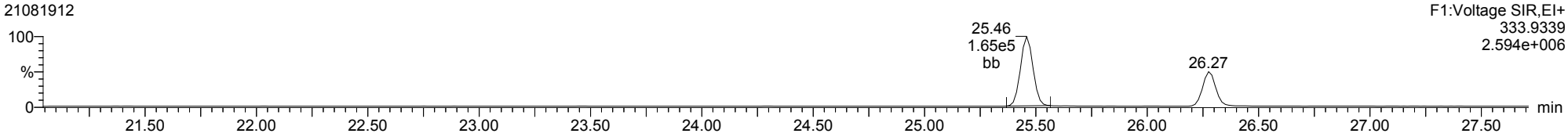
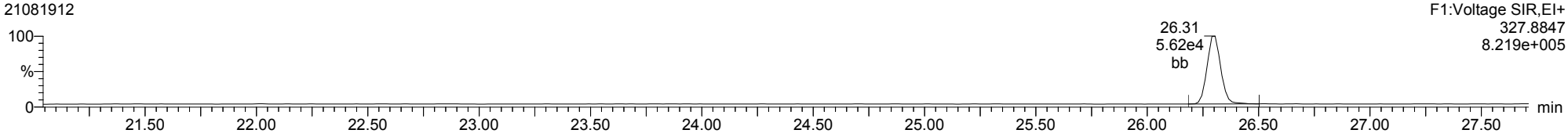


37CL-2378-TCDD



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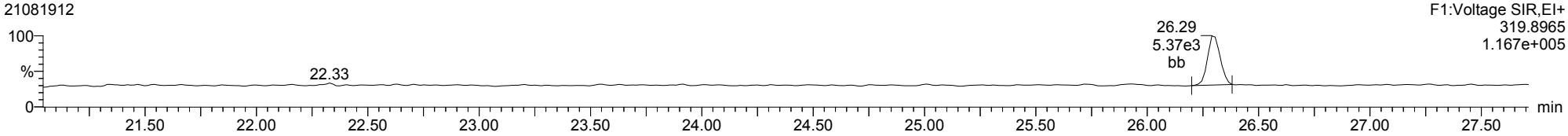
2378-TCDD



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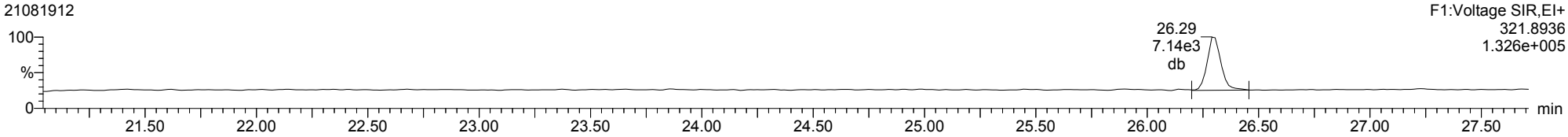

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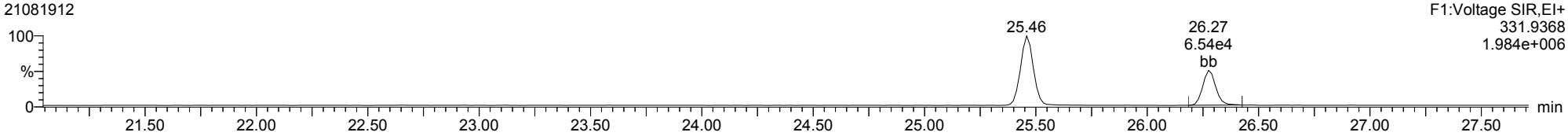

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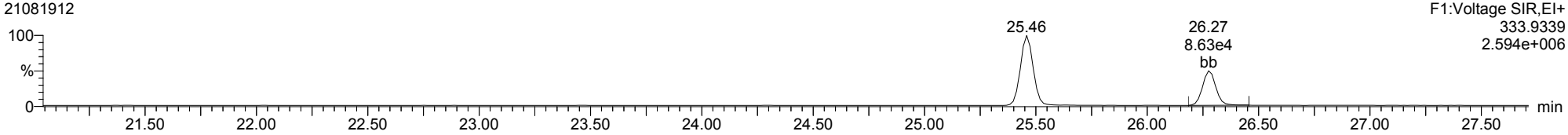
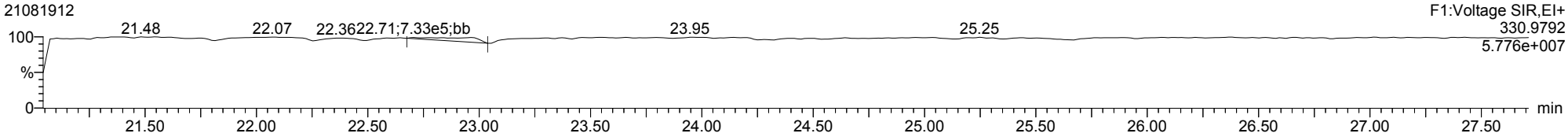


FUNCTION1 PFK



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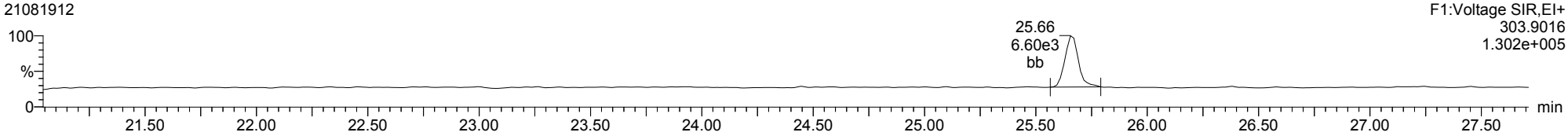
2378-TCDF



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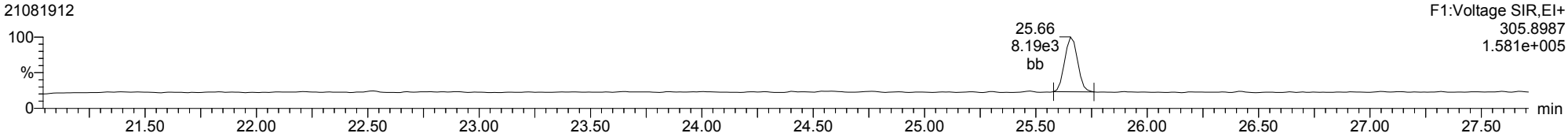

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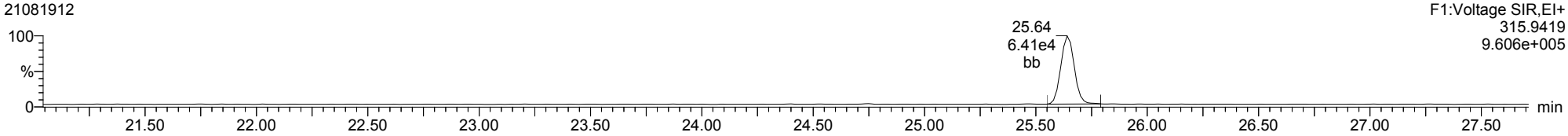

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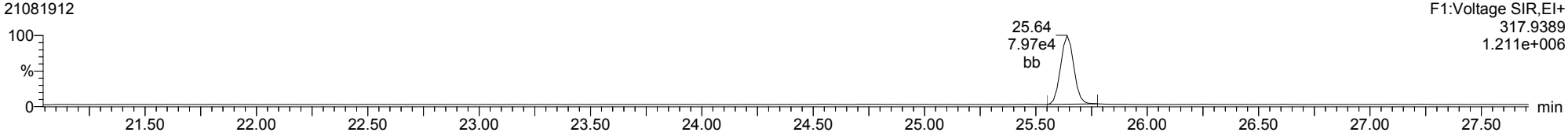

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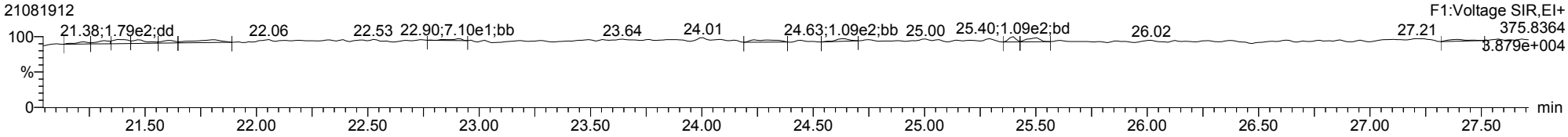

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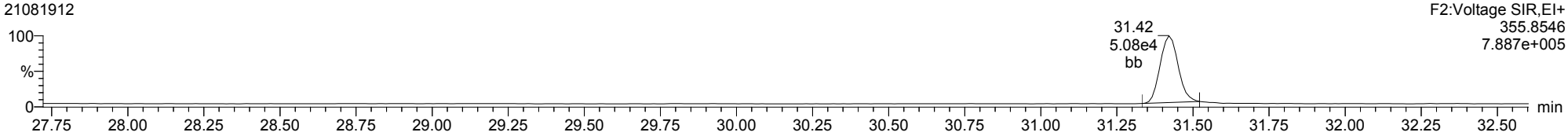
12378-PeCDD



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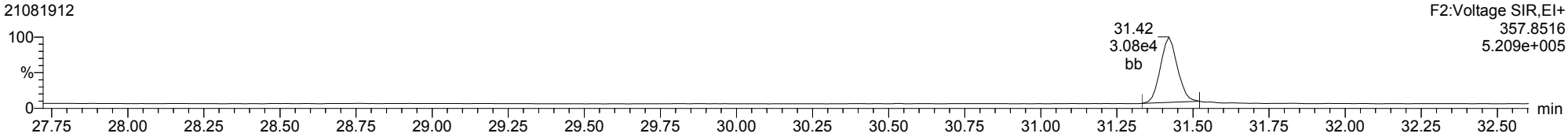

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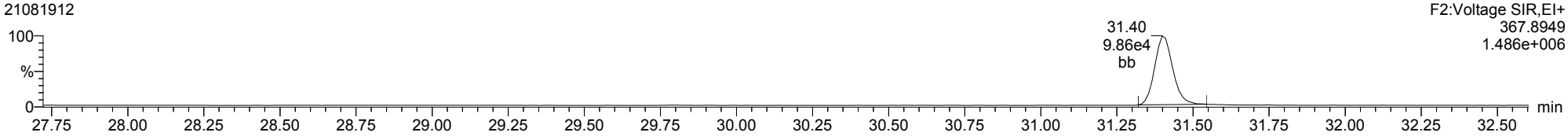

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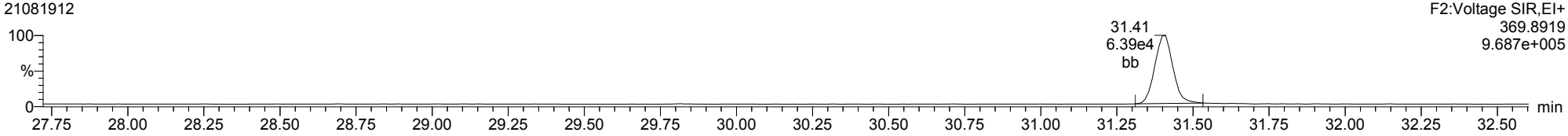

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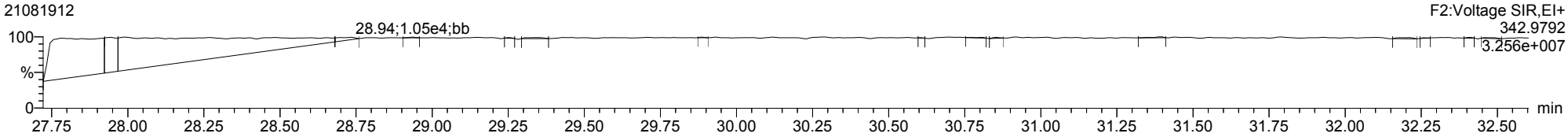

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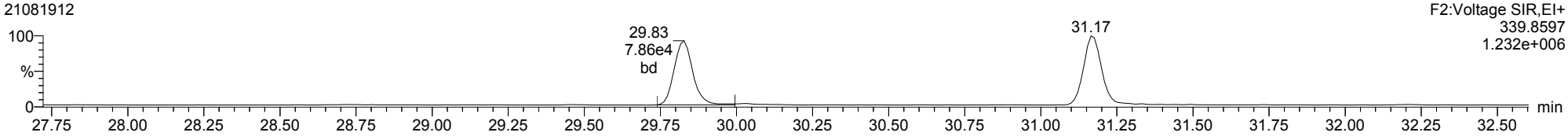

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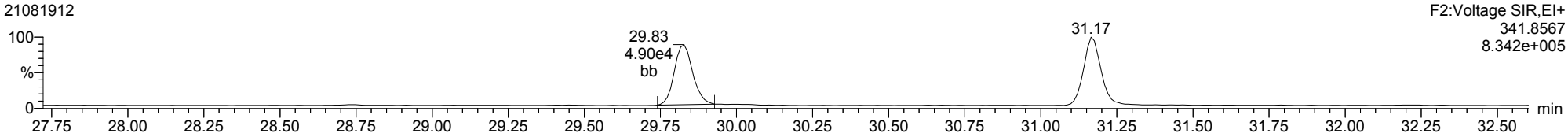

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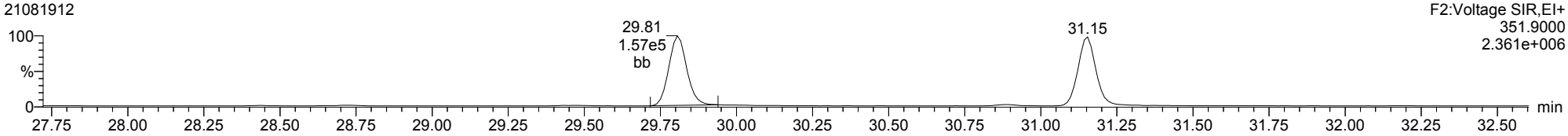

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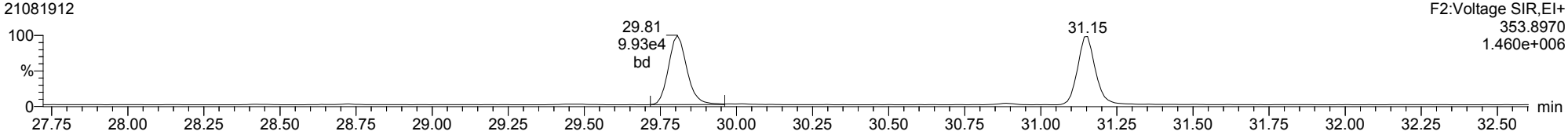

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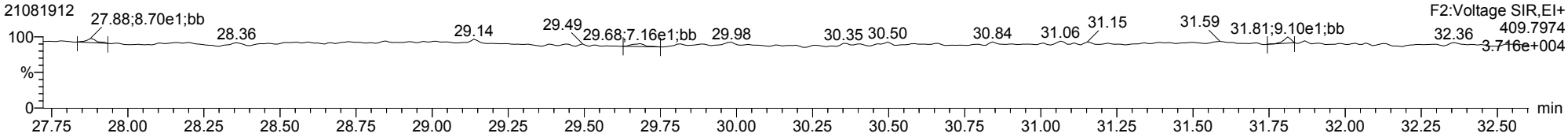

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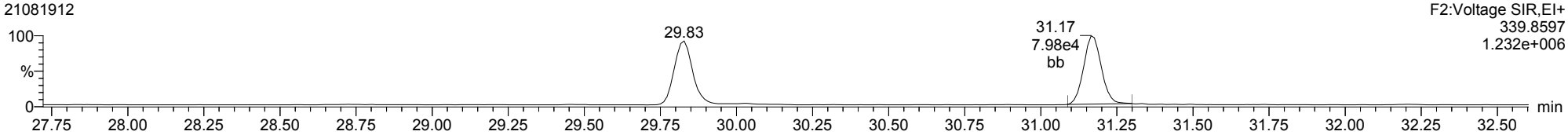

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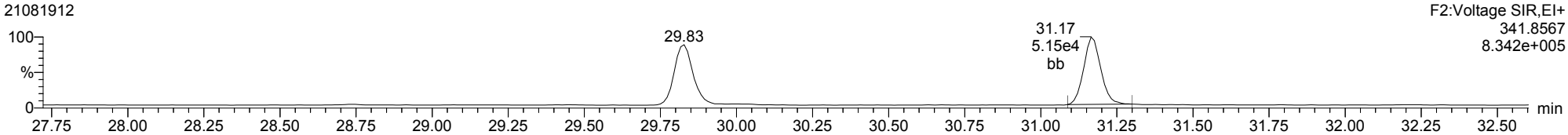

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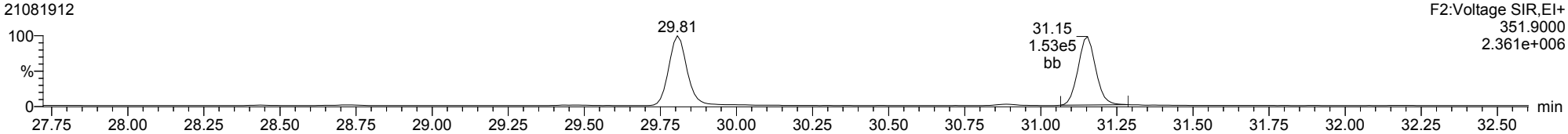

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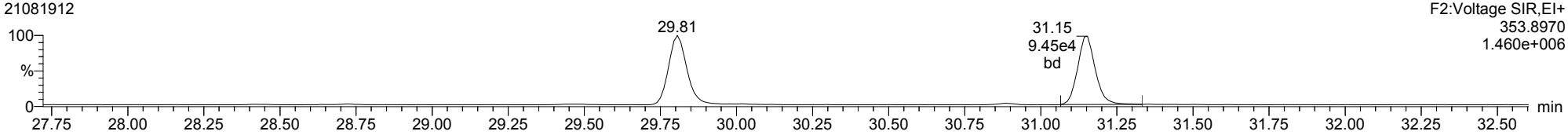

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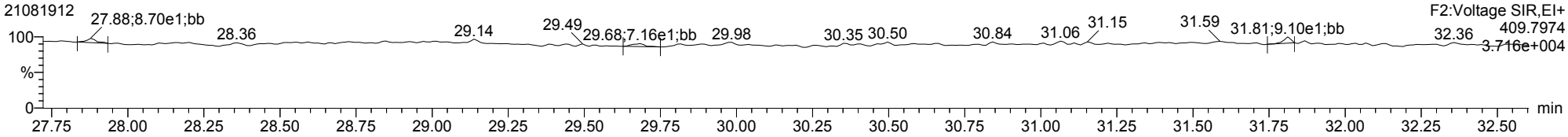

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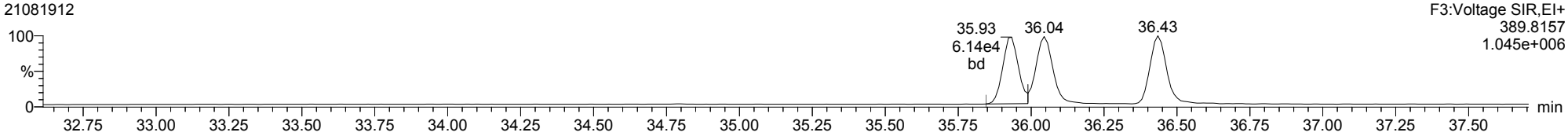

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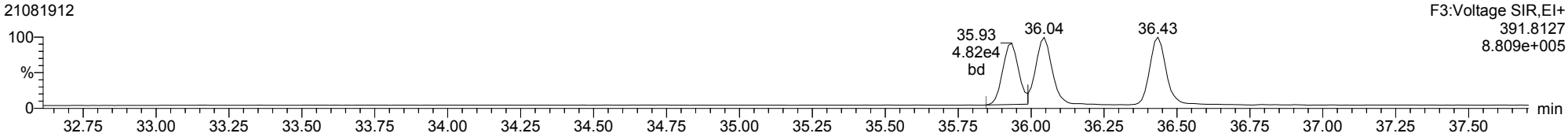

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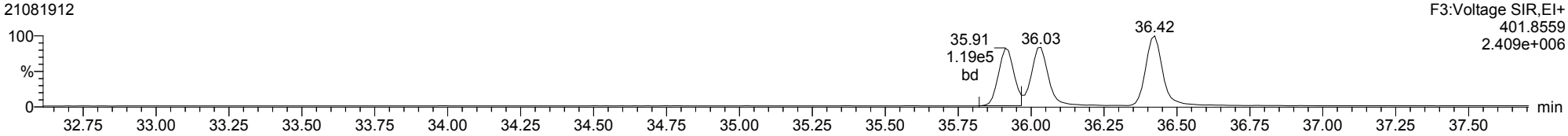

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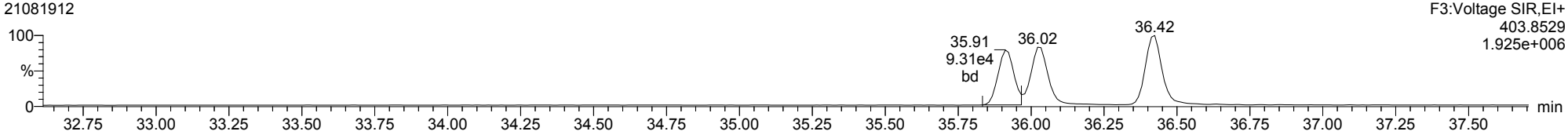

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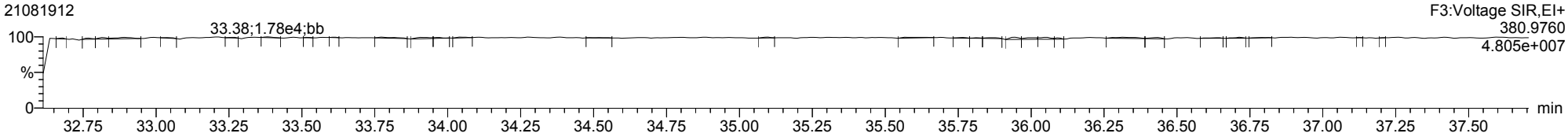

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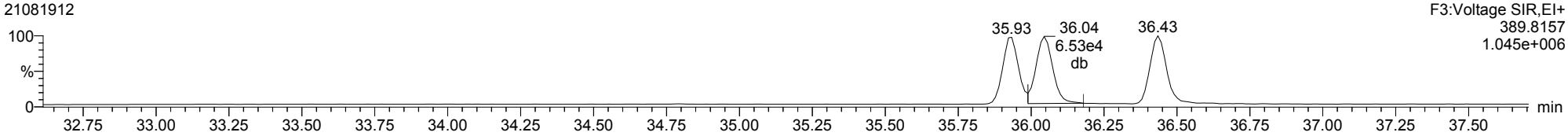

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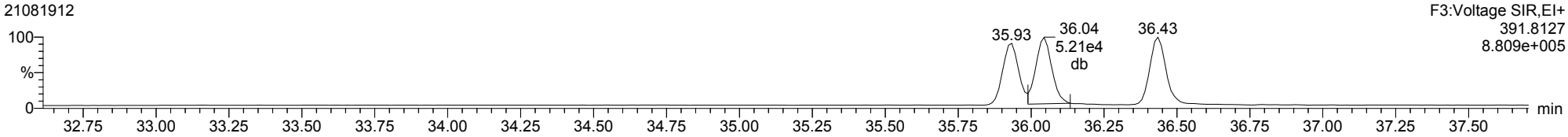

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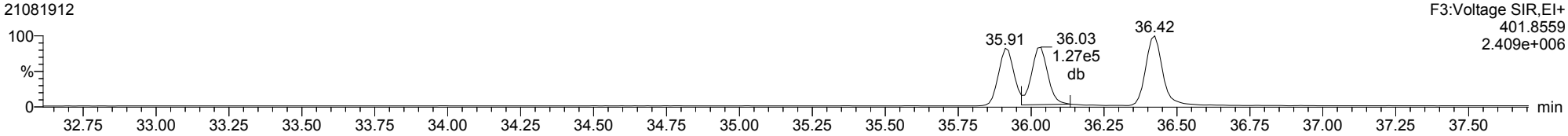

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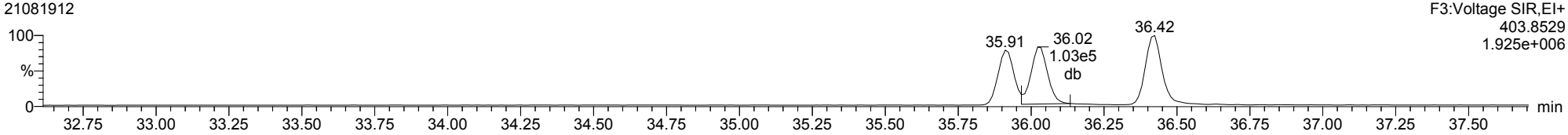

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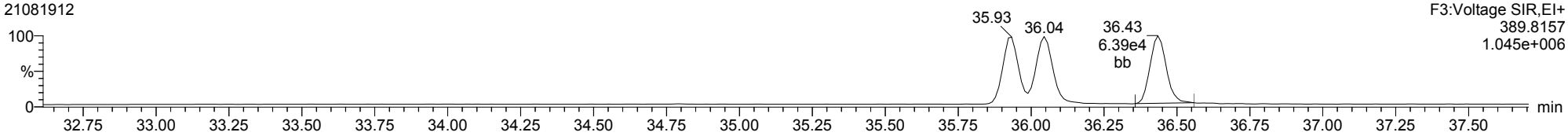

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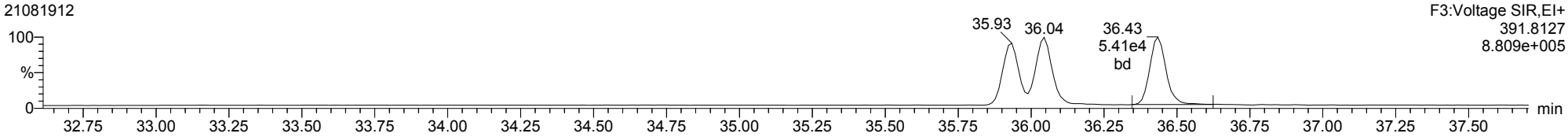

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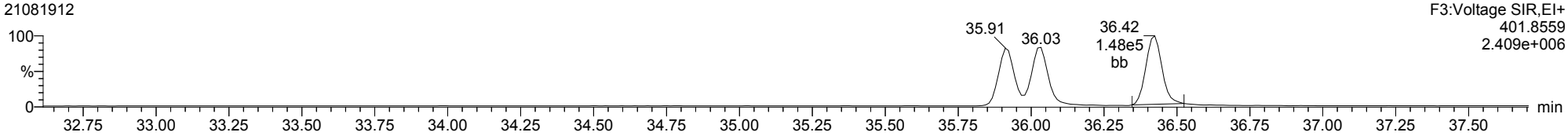

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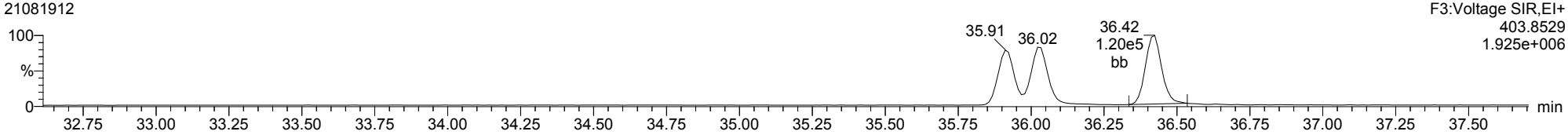

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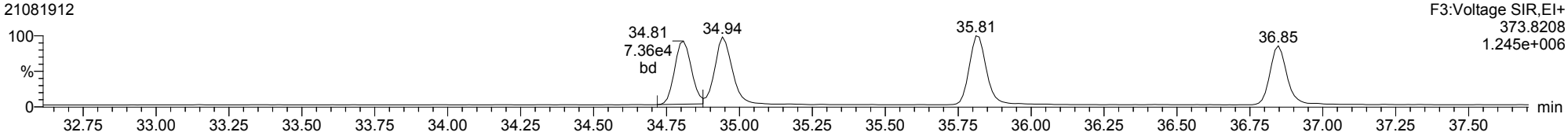

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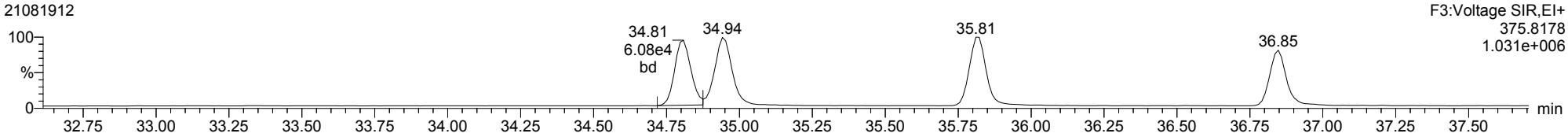

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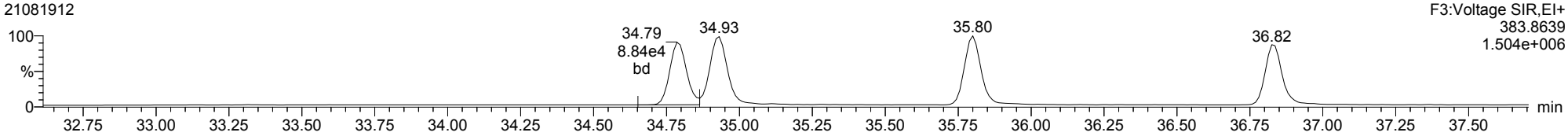

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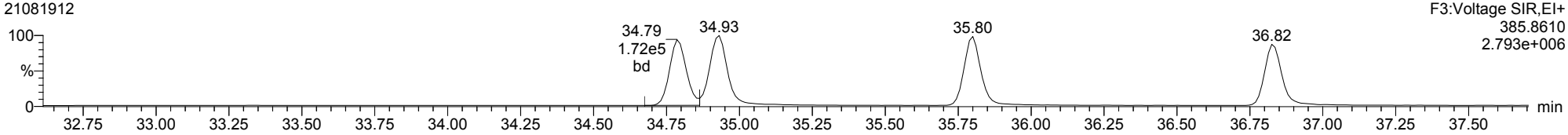

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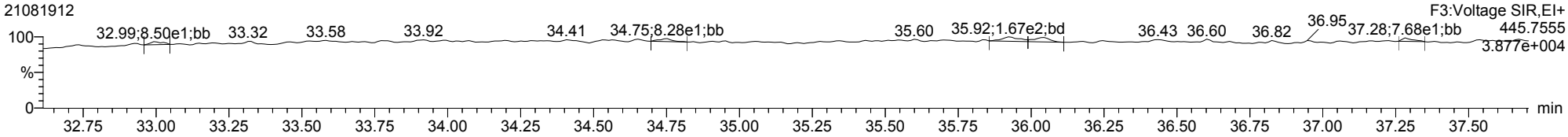

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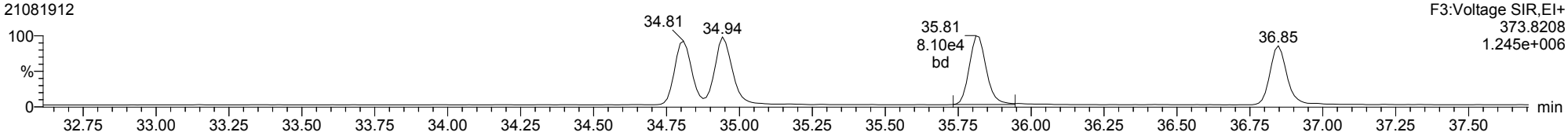
234678-HxCDF



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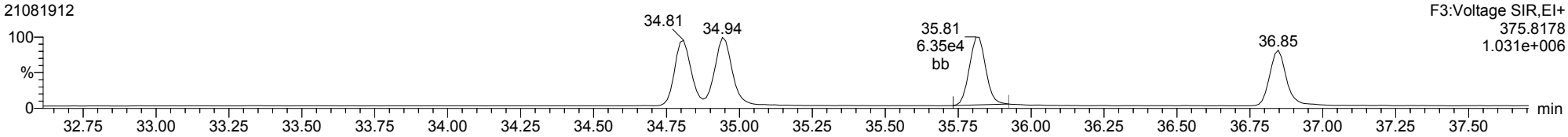

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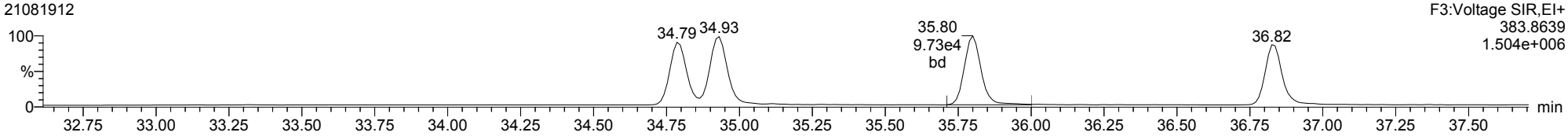

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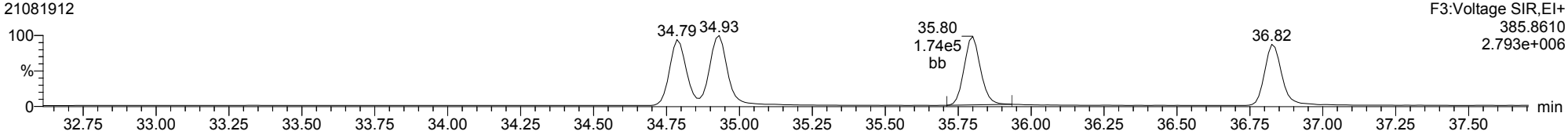

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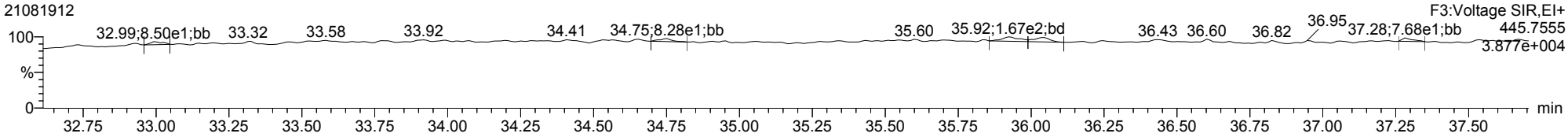

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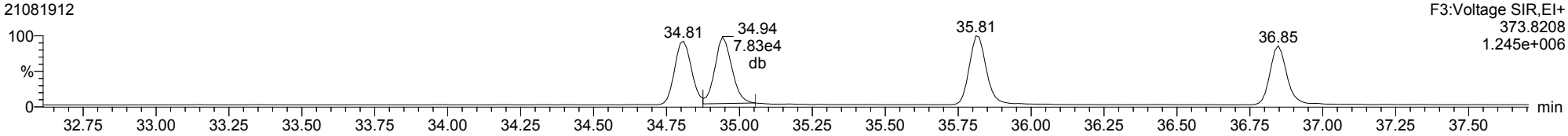

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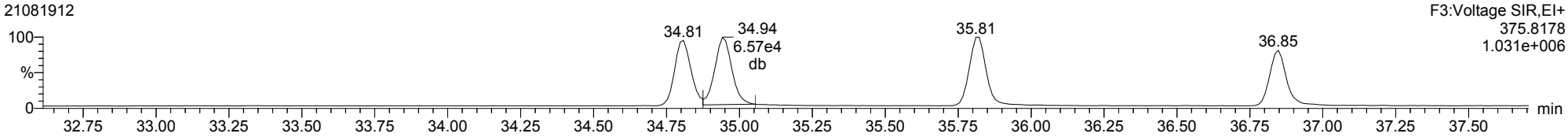

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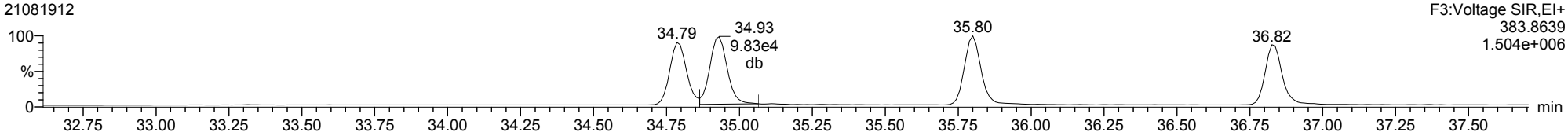

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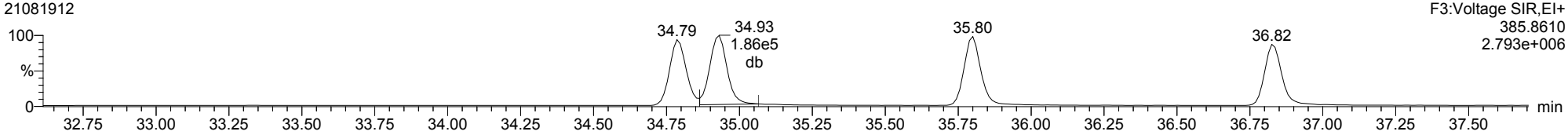

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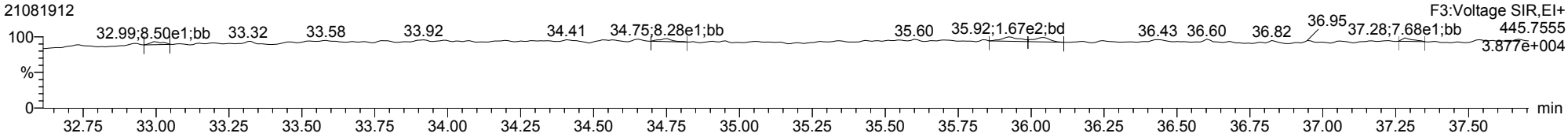

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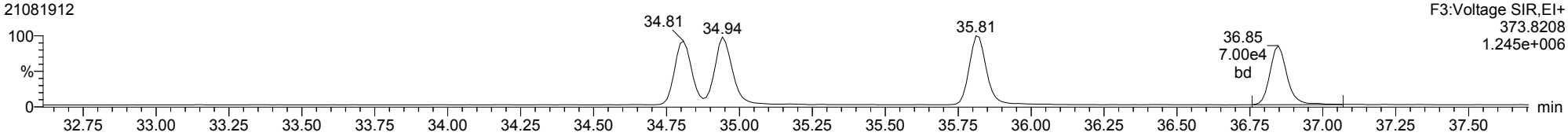
123789-HxCDF



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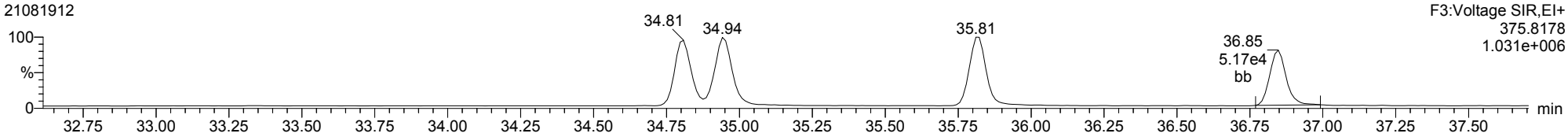

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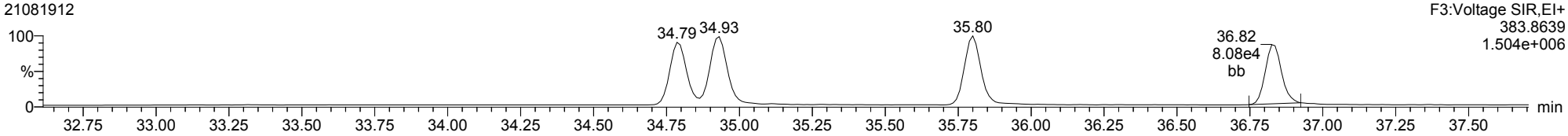

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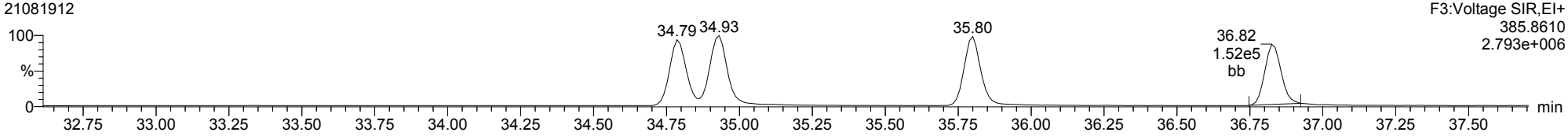

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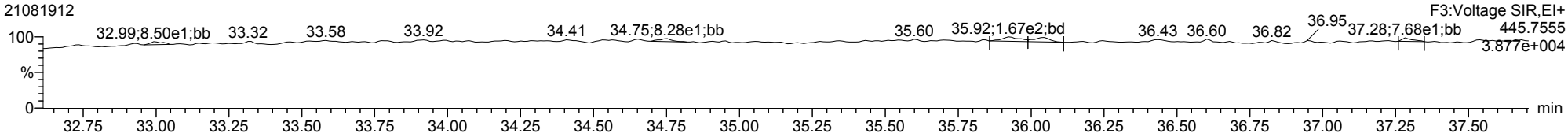

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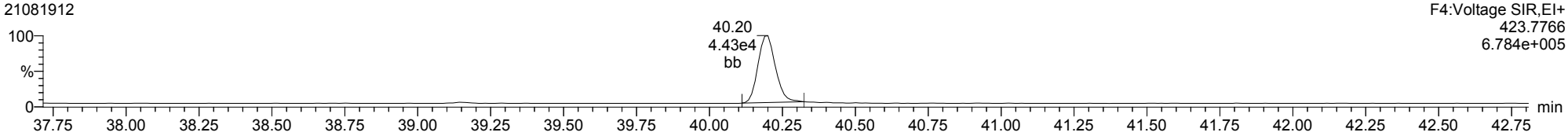

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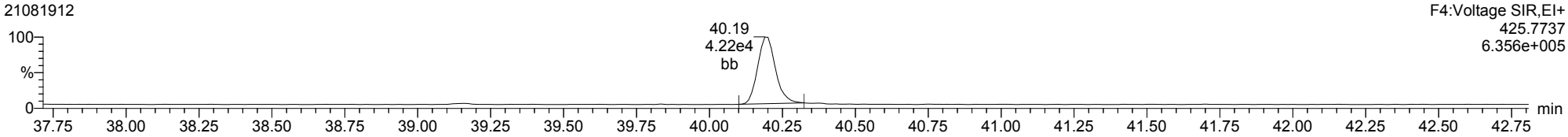
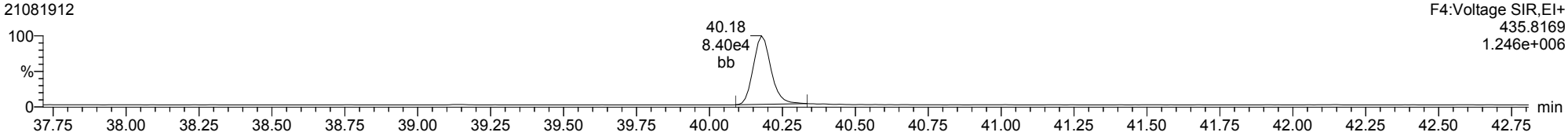


13C-1234678-HpCDD



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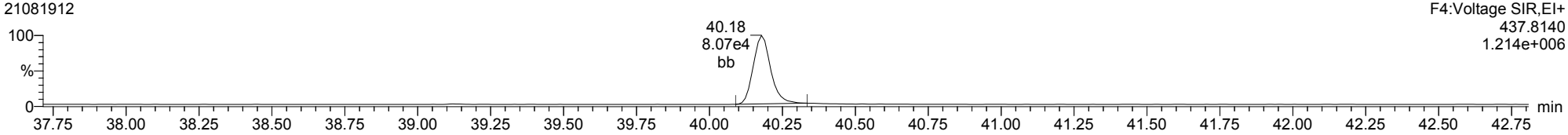
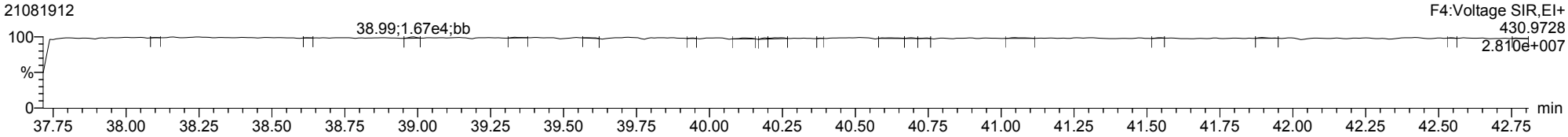
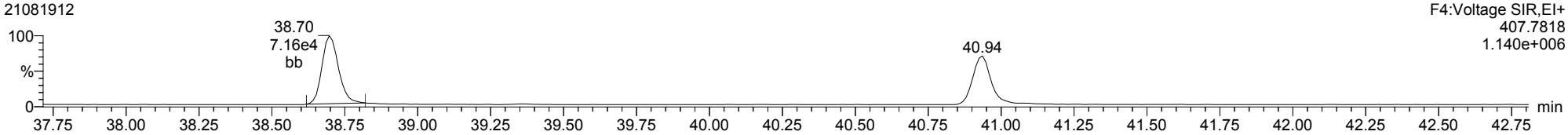


FUNCTION4 PFK



ID: BJG0375-BS2, Name: 21081912, Date: 18-Aug-2021, Time: 19:11:38, Conditions: AUTOSPEC01, User: pk

1234678-HpCDF



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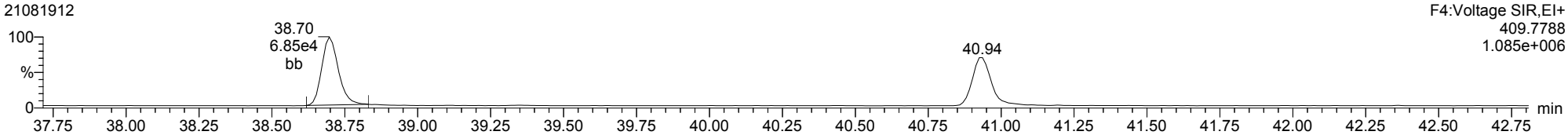

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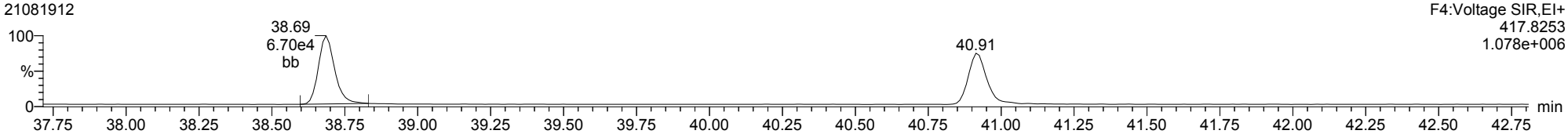

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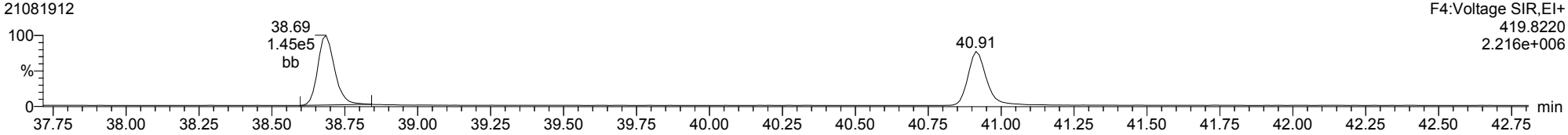
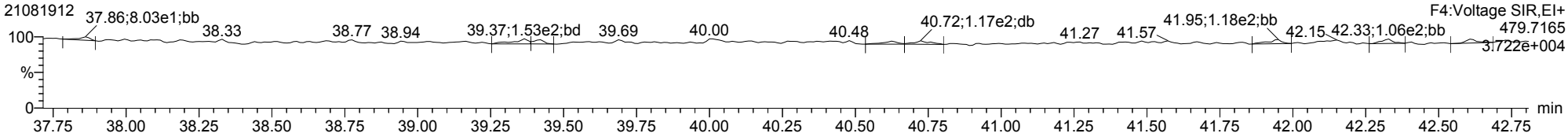


FUNCTION4 NCDPE



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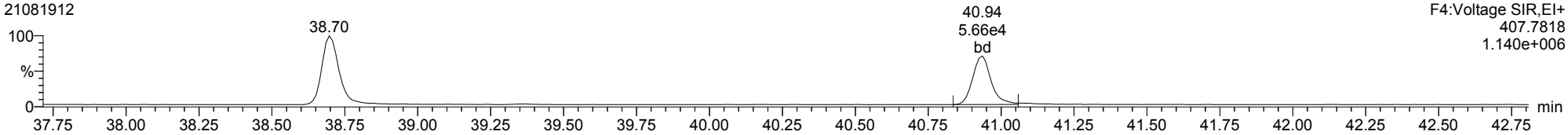

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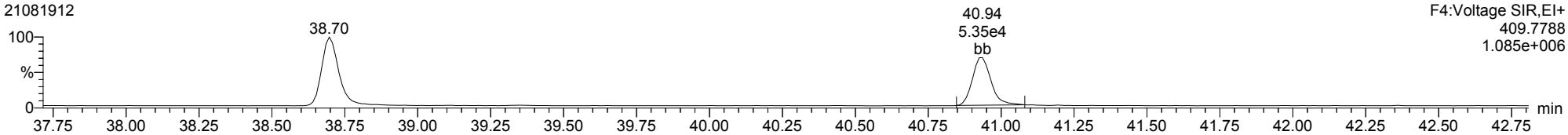

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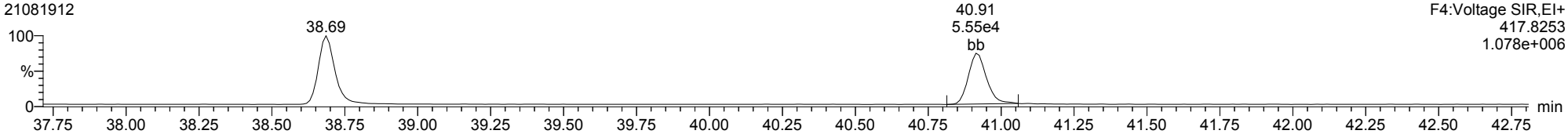

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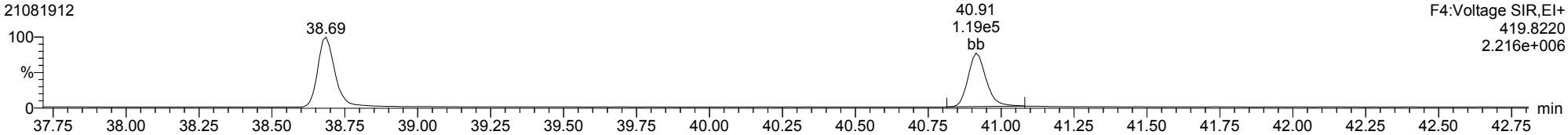
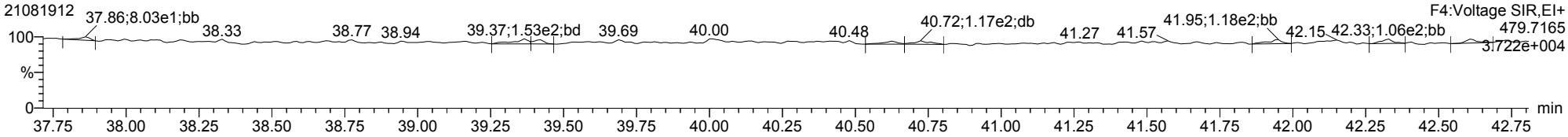


FUNCTION4 NCDPE



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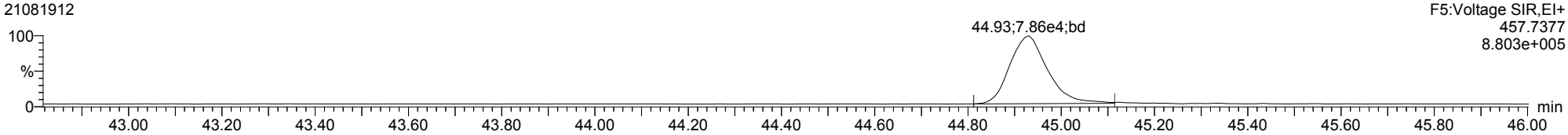
OCDD



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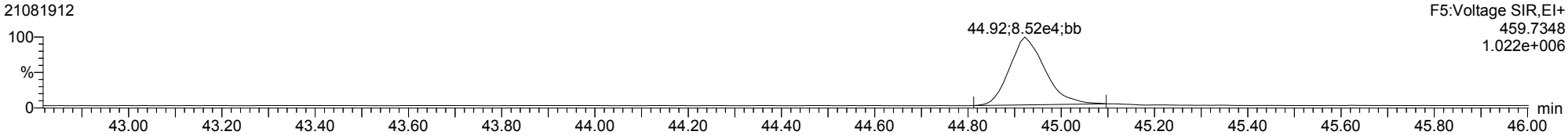

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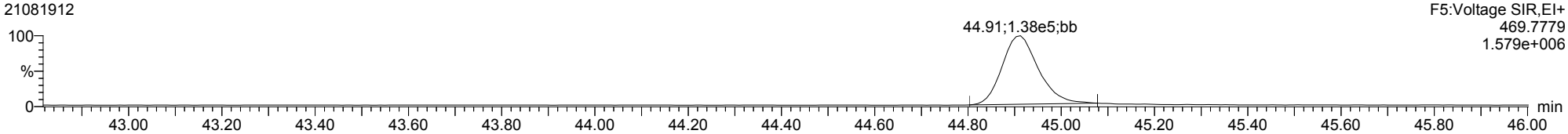

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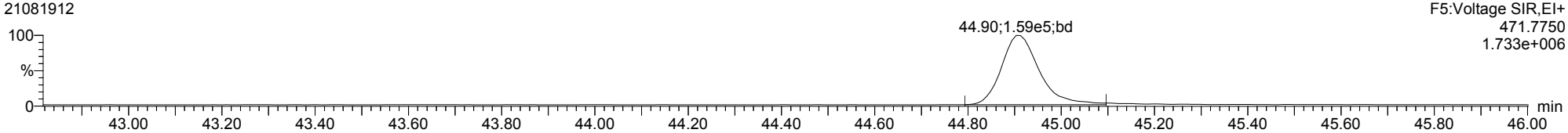
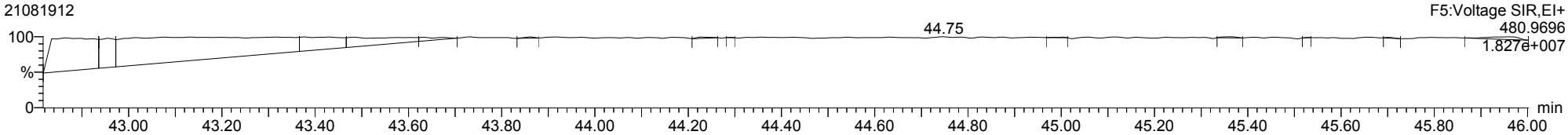


FUNCTION5 PFK



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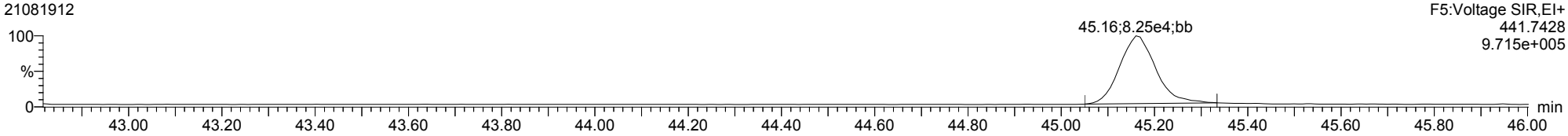
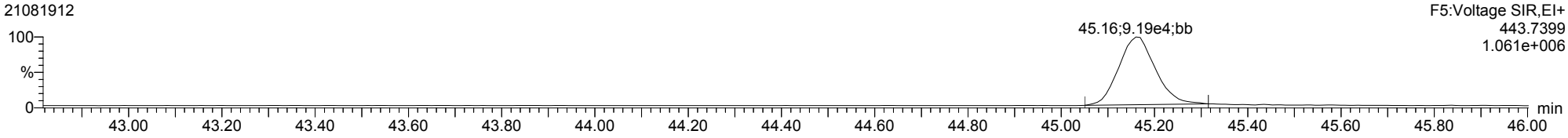
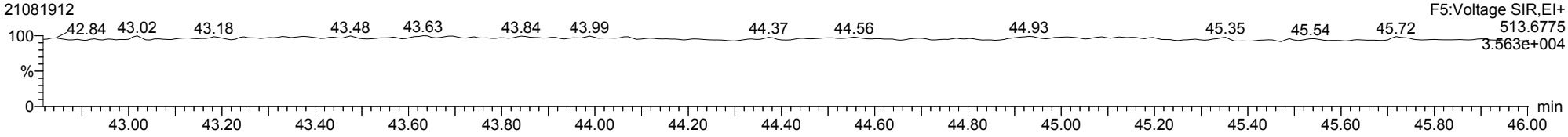


OCDF



FUNCTION5 DCDPE



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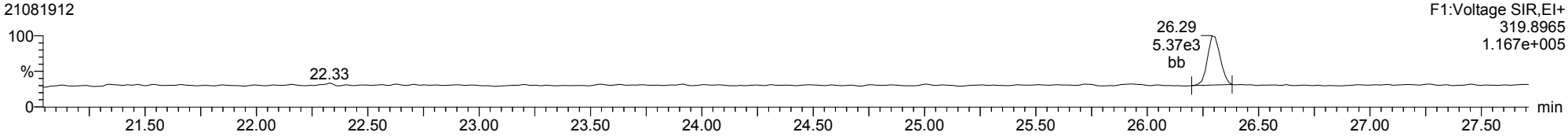
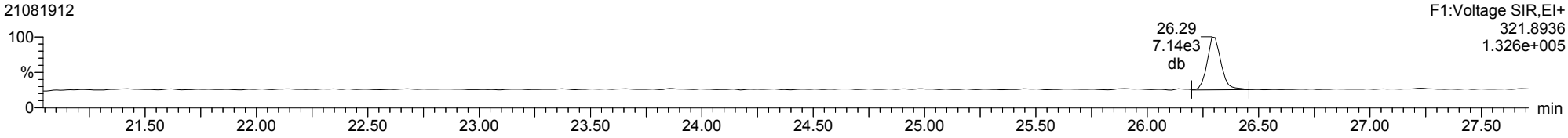
Printed: Thursday, August 19, 2021 10:31:04 Pacific Daylight Time

ID: BJG0375-BS2, Name: 21081912, Date: 18-Aug-2021, Time: 19:11:38, Conditions: AUTOSPEC01, User: pk

Total-tetradioxins



Total-tetradioxins



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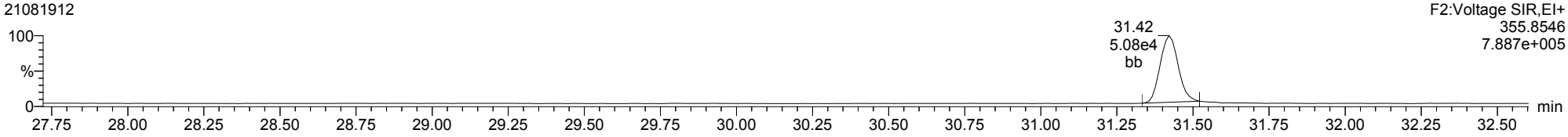

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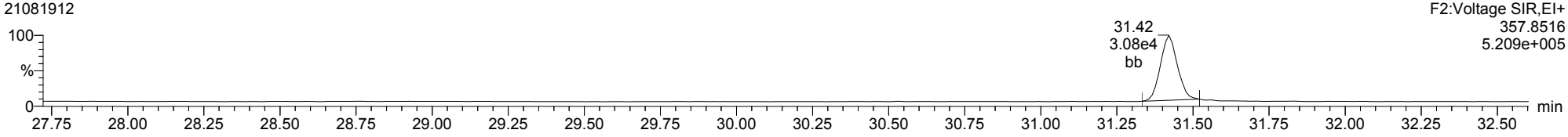

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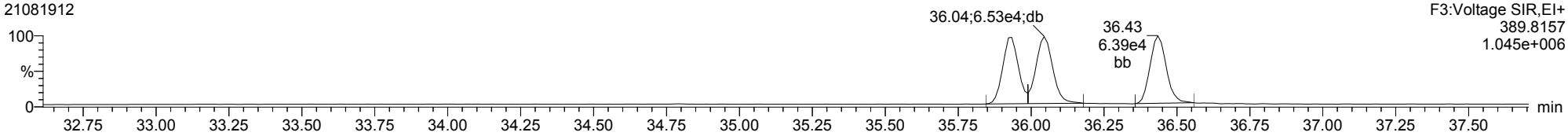

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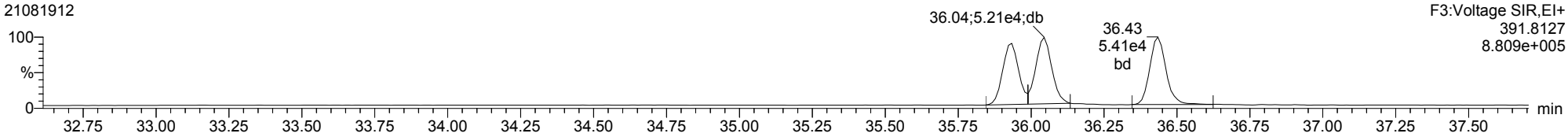

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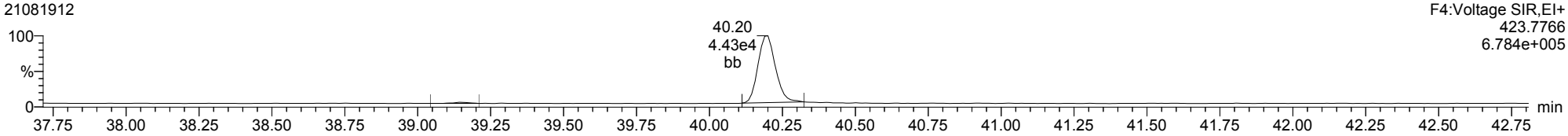

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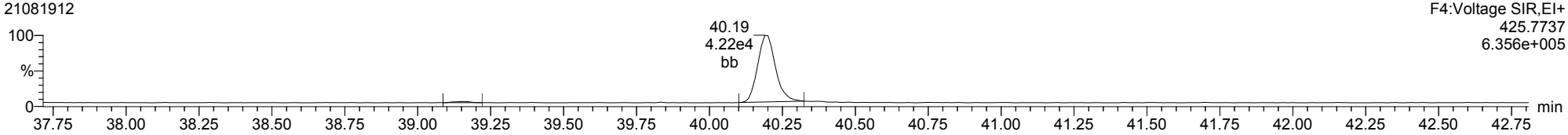

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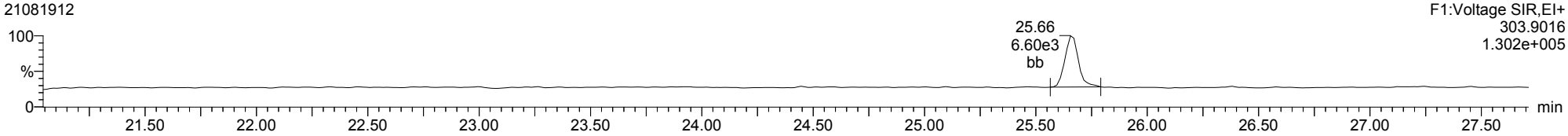
ID: BJG0375-BS2, Name: 21081912, Date: 18-Aug-2021, Time: 19:11:38, Conditions: AUTOSPEC01, User: pk

Total-tetrafurans



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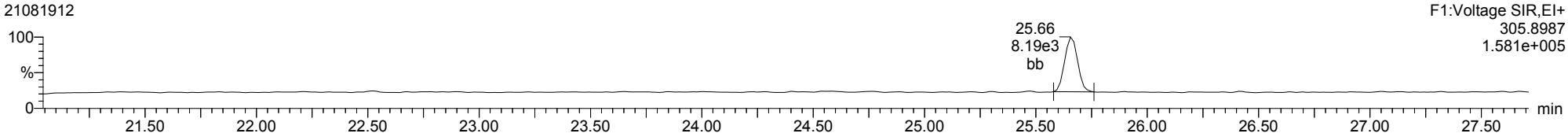

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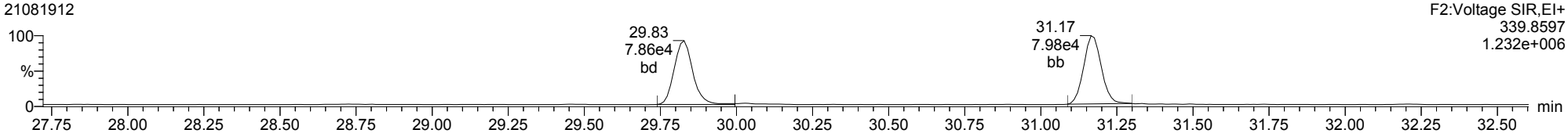

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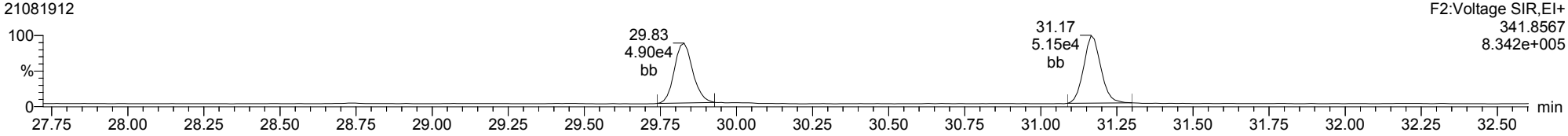

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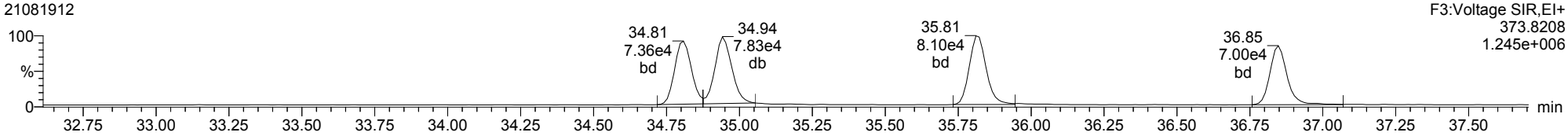
Total-hexafurans



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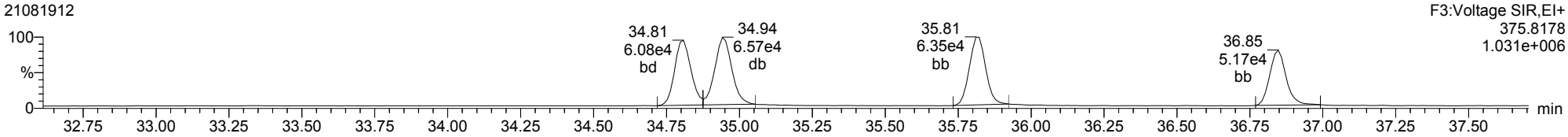

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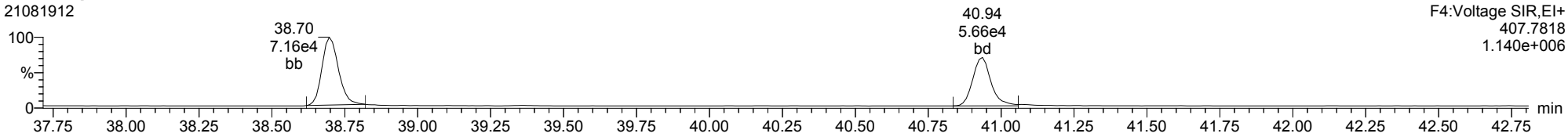

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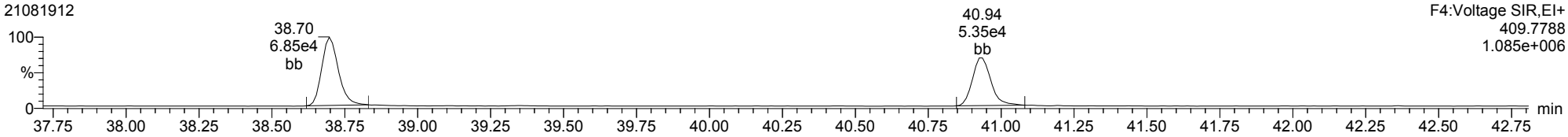

Analytical Resources, Incorporated
Analytical Chemists and Consultants

STANDARD REFERENCE MATERIAL RECOVERY

EPA 1613B

Laboratory: Analytical Resources, Inc.
SDG: 21G0064
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJG0375-SRM1
Batch: BJG0375
Initial/Final: 5 g / 20 uL
Preparation: EPA 1613
Analyzed: 08/23/2021 14:26
Standard ID: J006841
Expires: 12/28/2021
Standard Lot#: PSRM0135
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	0.974	0.795	2.00	J	87.7	50 - 150
2,3,7,8-TCDD	1.0500	1.30	0.874	2.00	J	124	50 - 150
1,2,3,7,8-PeCDF	1.2300	1.08	0.499	2.00	J	87.9	50 - 150
2,3,4,7,8-PeCDF	1.0700	0.956	0.467	2.00	EMPC, J	89.3	50 - 150
1,2,3,7,8-PeCDD	1.0800	1.33	0.811	2.00	EMPC, J	123	50 - 150
1,2,3,4,7,8-HxCDF	3.0200	2.86	0.560	2.00		94.7	50 - 150
1,2,3,6,7,8-HxCDF	1.0900	1.15	0.400	2.00	EMPC, J	106	50 - 150
2,3,4,6,7,8-HxCDF	1.8300	1.76	0.345	2.00	J	96.3	50 - 150
1,2,3,7,8,9-HxCDF	0.51100	0.695	0.380	2.00	J	136	50 - 150
1,2,3,4,7,8-HxCDD	1.5900	1.68	0.393	2.00	EMPC, J	106	50 - 150
1,2,3,6,7,8-HxCDD	3.8800	3.93	0.386	2.00		101	50 - 150
1,2,3,7,8,9-HxCDD	3.0400	2.88	0.440	2.00	EMPC	94.7	50 - 150
1,2,3,4,6,7,8-HpCDF	18.700	19.4	0.421	2.00		104	50 - 150
1,2,3,4,7,8,9-HpCDF	1.6300	2.03	0.578	2.00		125	50 - 150
1,2,3,4,6,7,8-HpCDD	90.600	106	1.12	5.00		117	50 - 150
OCDF	58.400	52.6	2.20	5.00		90.0	50 - 150
OCDD	811.00	808	9.20	20.0		99.7	50 - 150

* Values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
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Printed: Tuesday, August 24, 2021 10:50:44 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: BJG0375-SRM1, Name: 21082304, Date: 23-Aug-2021, Time: 14:26:26, 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	3.550e2	4.248e2	1.108	0.836	0.770	1316	1789	5.68e3	6.97e3	4.3	3.9	NO	MM	bb	0.243
12378-PeCDF	29.839	1.000	7.941e2	4.699e2	1.015	1.690	1.550	1373	1533	1.56e4	1.17e4	11.3	7.6	NO	MM	bb	0.270
23478-PeCDF	31.187	1.000	6.616e2	5.140e2	1.126	1.287	1.550	1373	1533	1.02e4	7.55e3	7.5	4.9	YES	db	db	0.239
123478-HxCDF	34.831	1.001	1.574e3	1.326e3	1.017	1.187	1.240	793	1047	2.24e4	1.96e4	28.3	18.7	NO	bd	bd	0.715
234678-HxCDF	35.833	1.000	9.727e2	8.203e2	1.052	1.186	1.240	793	1047	1.26e4	1.08e4	15.8	10.3	NO	bb	MM	0.441
123678-HxCDF	34.964	1.000	7.873e2	4.540e2	1.037	1.734	1.240	793	1047	1.21e4	8.44e3	15.2	8.1	YES	db	MM	0.288
123789-HxCDF	36.858	1.000	3.691e2	2.776e2	1.030	1.330	1.240	793	1047	5.28e3	3.77e3	6.7	3.6	NO	MM	MM	0.174
1234678-HpCDF	38.719	1.000	1.024e4	9.692e3	1.327	1.056	1.050	1251	1020	1.72e5	1.65e5	137.5	161.4	NO	bb	bb	4.839
1234789-HpCDF	40.958	1.001	9.369e2	7.777e2	1.283	1.205	1.050	1251	1020	1.01e4	9.97e3	8.1	9.8	NO	bb	bb	0.508
OCDF	45.187	1.006	1.806e4	2.040e4	1.447	0.885	0.890	853	1162	2.14e5	2.33e5	250.3	200.2	NO	bb	bd	13.141
2378-TCDD	26.320	1.001	3.808e2	4.611e2	0.920	0.826	0.770	1633	1086	5.68e3	6.40e3	3.5	5.9	NO	bd	bd	0.325
12378-PeCDD	31.432	1.000	4.845e2	4.105e2	0.995	1.180	1.550	1455	1233	7.16e3	6.48e3	4.9	5.3	YES	bb	bb	0.332
123478-HxCDD	35.956	1.000	7.668e2	7.486e2	1.027	1.024	1.240	992	907	1.31e4	1.21e4	13.2	13.3	YES	bd	bd	0.420
123678-HxCDD	36.067	1.000	1.879e3	1.644e3	1.009	1.143	1.240	992	907	2.92e4	2.62e4	29.5	28.8	NO	db	db	0.983
123789-HxCDD	36.468	1.011	1.439e3	9.779e2	0.950	1.472	1.240	992	907	2.32e4	1.48e4	23.4	16.3	YES	MM	bb	0.720
1234678-HpCDD	40.212	1.000	3.249e4	3.120e4	1.068	1.041	1.050	1340	999	4.78e5	4.56e5	356.7	456.5	NO	bb	bb	26.595
OCDD	44.949	1.000	2.263e5	2.564e5	1.181	0.882	0.890	1528	1541	2.72e6	3.09e6	1779.2	2003.5	NO	bb	bb	202.108
13C-2378-TCDF	25.655	1.007	1.301e5	1.591e5	1.427	0.818	0.770	4268	2252	1.90e6	2.40e6	446.2	1064.3	NO	bb	bb	46.978
13C-12378-PeCDF	29.828	1.171	2.834e5	1.771e5	1.297	1.600	1.550	1857	2087	4.24e6	2.61e6	2282.6	1249.8	NO	bb	bb	82.268
13C-23478-PeCDF	31.176	1.224	2.691e5	1.680e5	1.236	1.602	1.550	1857	2087	4.09e6	2.51e6	2201.7	1202.1	NO	bb	bb	81.919
13C-123478-HxCDF	34.808	0.955	1.355e5	2.634e5	1.242	0.515	0.510	1628	2998	2.06e6	4.12e6	1263.5	1375.1	NO	bd	bd	80.974
13C-123678-HxCDF	34.953	0.959	1.388e5	2.770e5	1.343	0.501	0.510	1628	2998	2.12e6	4.10e6	1302.4	1367.2	NO	db	db	78.053
13C-234678-HxCDF	35.822	0.983	1.311e5	2.555e5	1.215	0.513	0.510	1628	2998	2.06e6	4.08e6	1268.1	1360.6	NO	bb	bb	80.241
13C-123789-HxCDF	36.847	1.011	1.244e5	2.372e5	1.008	0.524	0.510	1628	2998	2.06e6	3.88e6	1263.6	1295.9	NO	bb	bb	90.487
13C-1234678-HpCDF	38.708	1.062	9.852e4	2.118e5	0.926	0.465	0.440	1346	1756	1.55e6	3.39e6	1151.2	1932.0	NO	bb	bb	84.454
13C-1234789-HpCDF	40.936	1.123	8.269e4	1.803e5	0.758	0.459	0.440	1346	1756	1.15e6	2.57e6	857.7	1463.0	NO	bb	bb	87.506
13C-1234-TCDD	25.473	0.000	1.880e5	2.436e5	1.000	0.772	0.770	3451	1577	2.78e6	3.64e6	806.3	2305.7	NO	bb	bb	100.000
13C-2378-TCDD	26.290	1.032	1.216e5	1.601e5	1.116	0.760	0.770	3451	1577	1.75e6	2.30e6	507.4	1460.9	NO	bb	bb	58.461
13C-12378-PeCDD	31.421	1.233	1.642e5	1.069e5	0.732	1.536	1.550	1218	1066	2.42e6	1.58e6	1986.9	1482.4	NO	bb	bb	85.832
13C-123478-HxCDD	35.944	0.986	1.980e5	1.533e5	0.960	1.292	1.240	2122	1364	3.19e6	2.41e6	1501.4	1764.5	NO	bd	bd	92.299
13C-123678-HxCDD	36.056	0.989	1.987e5	1.563e5	1.041	1.271	1.240	2122	1364	3.28e6	2.50e6	1544.0	1831.2	NO	db	db	85.980
13C-1234678-HpCDD	40.201	1.103	1.137e5	1.105e5	0.632	1.029	1.050	1211	1441	1.68e6	1.60e6	1386.7	1110.7	NO	bb	bd	89.392
13C-OCDD	44.940	1.233	1.909e5	2.136e5	0.504	0.893	0.890	1640	792	2.28e6	2.49e6	1391.4	3148.4	NO	bb	bb	202.521
13C-123789-HxCDD	36.446	0.000	2.185e5	1.781e5	1.000	1.227	1.240	2122	1364	3.53e6	2.88e6	1662.5	2110.2	NO	bb	bb	100.000
37CL-2378-TCDD	26.320	1.033	1.010e5		1.084			1592		1.50e6		943.3			bb		21.597

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ID: BJG0375-SRM1, Name: 21082304, Date: 23-Aug-2021, Time: 14:26:26, 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	1316	1789								
1289-TCDF					1.043		0.770	1316	1789								
13468-PECDF	27.000	0.905	5.867e2	6.053e2	1.376	0.969	1.550	980	1242	8.77e3	8.64e3	8.9	7.0	YES	bd	bd	0.188
12389-PECDF					1.000		1.550	1373	1533								
123468-HXCDF	33.159	0.953	1.643e3	1.392e3	1.087	1.181	1.240	793	1047	2.67e4	2.21e4	33.7	21.1	NO	bb	bb	0.700
1368-TCDD	23.462	0.892	1.055e2	2.840e2	0.923	0.371	0.770	1633	1086	2.17e3	5.39e3	1.3	5.0	YES	bb	bb	0.150
1289-TCDD	26.849	1.021	1.171e2	3.011e2	0.794	0.389	0.770	1633	1086	2.62e3	4.17e3	1.6	3.8	YES	bb	bd	0.187
12479-PECDD	28.770	0.916	3.051e2	2.649e2	1.843	1.152	1.550	1455	1233	8.58e3	4.45e3	5.9	3.6	YES	db	bb	0.114
12389-PECDD	31.833	1.013	3.748e2	1.812e2	1.154	2.069	1.550	1455	1233	5.21e3	3.55e3	3.6	2.9	YES	bb	bb	0.178
124679-HXCDD	33.939	0.944	5.030e3	4.275e3	1.125	1.177	1.240	992	907	8.01e4	6.60e4	80.7	72.8	NO	bb	bb	2.355
1234679-HPCDD	39.164	0.974	5.190e4	4.943e4	1.211	1.050	1.050	1340	999	7.96e5	7.88e5	594.3	789.4	NO	bb	bb	37.327
Total-tetrafurans			3.550e2		1.192			1316		5.68e3							0.243
Total-penta1			4.376e3					980		5.84e4							1.719
Total-pentafurans			1.632e3		1.047			1373		2.80e4							0.549
Total-hexafurans			1.528e4		1.045			793		2.26e5							6.967
Total-heptafurans			3.083e4		1.305			1251		4.93e5							15.699
Total-Furans			7.054e4		1.158			1316		1.02e6							38.319
Total-tetradioxins			3.808e2		0.879			1633		5.68e3							0.325
Total-pentadioxins			0.000e0		1.331			1455		0.00e0							
Total-hexadioxins			1.363e4		1.028			992		1.78e5							6.687
Total-heptadioxins			8.439e4		1.140			1340		1.27e6							63.923
Total-Dioxins			3.247e5		1.092			1633		4.18e6							273.043
Total-TEQ			3.952e5					1633		5.20e6							311.361
FUNCTION1 PFK			6.384e6					982021		7.97e7							
FUNCTION2 PFK			2.403e6					606841		3.70e7							0.000
FUNCTION3 PFK			1.289e6					738986		2.34e7							0.000
FUNCTION4 PFK			2.222e6					494138		4.21e6							
FUNCTION5 PFK			1.196e5					339081		4.21e6							
FUNCTION1 HXCD...			7.870e2					762		1.42e4							0.000
FUNCTION1 HPCD...			2.552e3					703		4.25e4							0.000
FUNCTION2 HPCD...			2.692e2					796		4.18e3							0.000
FUNCTION3 OCDPE			4.881e2					717		1.10e4							0.000
FUNCTION4 NCDPE			2.009e3					806		4.37e4							0.000
FUNCTION5 DCDPE			1.698e2					819		5.43e3							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: BJG0375-SRM1, Name: 21082304, Date: 23-Aug-2021, Time: 14:26:26, 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	25.67	3.550e2	4.248e2	1.108	0.84	0.77	4.3	YES	NO	MM	bb	0.243

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-penta1	27.11	4.376e3	2.883e3		1.52	1.55	59.5	YES	NO	db	db	1.719

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-pentafurans	30.05	8.378e2	4.728e2	1.047	1.77	1.55	9.0	YES	NO	bb	bb	0.279
2	12378-PeCDF	29.84	7.941e2	4.699e2	1.015	1.69	1.55	11.3	YES	NO	MM	bb	0.270

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123789-HxCDF	36.86	3.691e2	2.776e2	1.030	1.33	1.24	6.7	YES	NO	MM	MM	0.174
2	234678-HxCDF	35.83	9.727e2	8.203e2	1.052	1.19	1.24	15.8	YES	NO	bb	MM	0.441
3	123478-HxCDF	34.83	1.574e3	1.326e3	1.017	1.19	1.24	28.3	YES	NO	bd	bd	0.715
4	Total-hexafurans	34.21	5.758e3	5.138e3	1.045	1.12	1.24	112.2	YES	NO	bb	bb	2.670
5	Total-hexafurans	33.37	4.966e3	4.290e3	1.045	1.16	1.24	88.6	YES	NO	bb	bb	2.268
6	123468-HXCDF	33.16	1.643e3	1.392e3	1.087	1.18	1.24	33.7	YES	NO	bb	bb	0.700

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234789-HpCDF	40.96	9.369e2	7.777e2	1.283	1.20	1.05	8.1	YES	NO	bb	bb	0.508
2	Total-heptafurans	39.38	1.966e4	1.908e4	1.305	1.03	1.05	248.5	YES	NO	bb	bb	10.353
3	1234678-HpCDF	38.72	1.024e4	9.692e3	1.327	1.06	1.05	137.5	YES	NO	bb	bb	4.839

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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	25.67	3.550e2	4.248e2	1.108	0.84	0.77	4.3	YES	NO	MM	bb	0.243
2	Total-pentafurans	30.05	8.378e2	4.728e2	1.047	1.77	1.55	9.0	YES	NO	bb	bb	0.279
3	12378-PeCDF	29.84	7.941e2	4.699e2	1.015	1.69	1.55	11.3	YES	NO	MM	bb	0.270
4	123789-HxCDF	36.86	3.691e2	2.776e2	1.030	1.33	1.24	6.7	YES	NO	MM	MM	0.174
5	234678-HxCDF	35.83	9.727e2	8.203e2	1.052	1.19	1.24	15.8	YES	NO	bb	MM	0.441
6	123478-HxCDF	34.83	1.574e3	1.326e3	1.017	1.19	1.24	28.3	YES	NO	bd	bd	0.715
7	Total-hexafurans	34.21	5.758e3	5.138e3	1.045	1.12	1.24	112.2	YES	NO	bb	bb	2.670
8	Total-hexafurans	33.37	4.966e3	4.290e3	1.045	1.16	1.24	88.6	YES	NO	bb	bb	2.268
9	123468-HXCDF	33.16	1.643e3	1.392e3	1.087	1.18	1.24	33.7	YES	NO	bb	bb	0.700
10	OCDF	45.19	1.806e4	2.040e4	1.447	0.89	0.89	250.3	YES	NO	bb	bd	13.141
11	1234789-HpCDF	40.96	9.369e2	7.777e2	1.283	1.20	1.05	8.1	YES	NO	bb	bb	0.508
12	Total-heptafurans	39.38	1.966e4	1.908e4	1.305	1.03	1.05	248.5	YES	NO	bb	bb	10.353
13	1234678-HpCDF	38.72	1.024e4	9.692e3	1.327	1.06	1.05	137.5	YES	NO	bb	bb	4.839
14	Total-penta1	27.11	4.376e3	2.883e3		1.52	1.55	59.5	YES	NO	db	db	1.719

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	2378-TCDD	26.32	3.808e2	4.611e2	0.920	0.83	0.77	3.5	YES	NO	bd	bd	0.325

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	36.22	2.765e2	2.545e2	1.028	1.09	1.24	5.6	YES	NO	bb	bb	0.146
2	123678-HxCDD	36.07	1.879e3	1.644e3	1.009	1.14	1.24	29.5	YES	NO	db	db	0.983
3	Total-hexadioxins	35.08	6.444e3	5.183e3	1.028	1.24	1.24	63.6	YES	NO	bb	bb	3.203
4	124679-HXCDD	33.94	5.030e3	4.275e3	1.125	1.18	1.24	80.7	YES	NO	bb	bb	2.355

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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	40.21	3.249e4	3.120e4	1.068	1.04	1.05	356.7	YES	NO	bb	bb	26.595
2	1234679-HPCDD	39.16	5.190e4	4.943e4	1.211	1.05	1.05	594.3	YES	NO	bb	bb	37.327

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	26.32	3.808e2	4.611e2	0.920	0.83	0.77	3.5	YES	NO	bd	bd	0.325
2	Total-hexadioxins	36.22	2.765e2	2.545e2	1.028	1.09	1.24	5.6	YES	NO	bb	bb	0.146
3	123678-HxCDD	36.07	1.879e3	1.644e3	1.009	1.14	1.24	29.5	YES	NO	db	db	0.983
4	Total-hexadioxins	35.08	6.444e3	5.183e3	1.028	1.24	1.24	63.6	YES	NO	bb	bb	3.203
5	124679-HXCDD	33.94	5.030e3	4.275e3	1.125	1.18	1.24	80.7	YES	NO	bb	bb	2.355
6	1234678-HpCDD	40.21	3.249e4	3.120e4	1.068	1.04	1.05	356.7	YES	NO	bb	bb	26.595
7	1234679-HPCDD	39.16	5.190e4	4.943e4	1.211	1.05	1.05	594.3	YES	NO	bb	bb	37.327
8	OCDD	44.95	2.263e5	2.564e5	1.181	0.88	0.89	1779.2	YES	NO	bb	bb	202.108

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
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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	2378-TCDF	25.67	3.550e2	4.248e2	1.108	0.84	0.77	4.3	YES	NO	MM	bb	0.243
2	Total-pentafurans	30.05	8.378e2	4.728e2	1.047	1.77	1.55	9.0	YES	NO	bb	bb	0.279
3	12378-PeCDF	29.84	7.941e2	4.699e2	1.015	1.69	1.55	11.3	YES	NO	MM	bb	0.270
4	123789-HxCDF	36.86	3.691e2	2.776e2	1.030	1.33	1.24	6.7	YES	NO	MM	MM	0.174
5	234678-HxCDF	35.83	9.727e2	8.203e2	1.052	1.19	1.24	15.8	YES	NO	bb	MM	0.441
6	123478-HxCDF	34.83	1.574e3	1.326e3	1.017	1.19	1.24	28.3	YES	NO	bd	bd	0.715
7	Total-hexafurans	34.21	5.758e3	5.138e3	1.045	1.12	1.24	112.2	YES	NO	bb	bb	2.670
8	Total-hexafurans	33.37	4.966e3	4.290e3	1.045	1.16	1.24	88.6	YES	NO	bb	bb	2.268
9	123468-HXCDF	33.16	1.643e3	1.392e3	1.087	1.18	1.24	33.7	YES	NO	bb	bb	0.700
10	OCDF	45.19	1.806e4	2.040e4	1.447	0.89	0.89	250.3	YES	NO	bb	bd	13.141
11	1234789-HpCDF	40.96	9.369e2	7.777e2	1.283	1.20	1.05	8.1	YES	NO	bb	bb	0.508
12	Total-heptafurans	39.38	1.966e4	1.908e4	1.305	1.03	1.05	248.5	YES	NO	bb	bb	10.353
13	1234678-HpCDF	38.72	1.024e4	9.692e3	1.327	1.06	1.05	137.5	YES	NO	bb	bb	4.839
14	Total-penta1	27.11	4.376e3	2.883e3		1.52	1.55	59.5	YES	NO	db	db	1.719
15	2378-TCDD	26.32	3.808e2	4.611e2	0.920	0.83	0.77	3.5	YES	NO	bd	bd	0.325
16	Total-hexadioxins	36.22	2.765e2	2.545e2	1.028	1.09	1.24	5.6	YES	NO	bb	bb	0.146
17	123678-HxCDD	36.07	1.879e3	1.644e3	1.009	1.14	1.24	29.5	YES	NO	db	db	0.983
18	Total-hexadioxins	35.08	6.444e3	5.183e3	1.028	1.24	1.24	63.6	YES	NO	bb	bb	3.203
19	124679-HXCDD	33.94	5.030e3	4.275e3	1.125	1.18	1.24	80.7	YES	NO	bb	bb	2.355
20	1234678-HpCDD	40.21	3.249e4	3.120e4	1.068	1.04	1.05	356.7	YES	NO	bb	bb	26.595
21	1234679-HPCDD	39.16	5.190e4	4.943e4	1.211	1.05	1.05	594.3	YES	NO	bb	bb	37.327
22	OCDD	44.95	2.263e5	2.564e5	1.181	0.88	0.89	1779.2	YES	NO	bb	bb	202.108

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Printed: Tuesday, August 24, 2021 10:50:44 Pacific Daylight Time

ID: BJG0375-SRM1, Name: 21082304, Date: 23-Aug-2021, Time: 14:26:26, 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	23.73	8.386e3					0.6	NO		bb		
2	FUNCTION1 PFK	23.36	1.490e4					0.6	NO		db		
3	FUNCTION1 PFK	23.24	8.365e4					1.1	NO		bd		
4	FUNCTION1 PFK	23.02	7.755e4					1.7	NO		bb		
5	FUNCTION1 PFK	22.90	3.818e4					1.0	NO		bb		
6	FUNCTION1 PFK	22.43	7.906e4					0.8	NO		bb		
7	FUNCTION1 PFK	22.21	6.721e4					2.0	NO		db		
8	FUNCTION1 PFK	22.15	5.525e4					1.4	NO		dd		
9	FUNCTION1 PFK	22.01	1.855e5					1.9	NO		bd		
10	FUNCTION1 PFK	21.91	1.078e5					3.3	YES		db		
11	FUNCTION1 PFK	21.84	9.405e5					4.2	YES		dd		
12	FUNCTION1 PFK	21.56	8.084e5					7.0	YES		dd		
13	FUNCTION1 PFK	21.50	3.801e5					6.7	YES		dd		
14	FUNCTION1 PFK	21.42	6.720e5					8.1	YES		dd		
15	FUNCTION1 PFK	21.36	8.115e5					8.0	YES		bd		
16	FUNCTION1 PFK	21.16	1.829e5					3.4	YES		bb		
17	FUNCTION1 PFK	26.67	5.125e3					0.3	NO		bb		
18	FUNCTION1 PFK	26.61	8.703e4					1.8	NO		db		
19	FUNCTION1 PFK	26.53	6.387e4					1.4	NO		dd		
20	FUNCTION1 PFK	26.43	1.464e5					2.1	NO		dd		
21	FUNCTION1 PFK	26.35	8.637e4					1.1	NO		bd		
22	FUNCTION1 PFK	25.87	2.849e4					0.9	NO		bb		
23	FUNCTION1 PFK	25.79	7.533e3					0.5	NO		bb		
24	FUNCTION1 PFK	25.47	2.729e4					0.8	NO		bb		
25	FUNCTION1 PFK	25.29	5.152e4					1.3	NO		bb		
26	FUNCTION1 PFK	25.16	7.381e3					0.5	NO		bb		
27	FUNCTION1 PFK	24.94	1.764e4					0.6	NO		bb		
28	FUNCTION1 PFK	24.40	3.246e4					1.0	NO		bb		
29	FUNCTION1 PFK	24.31	6.619e4					1.6	NO		bb		
30	FUNCTION1 PFK	23.96	9.935e4					1.6	NO		bb		
31	FUNCTION1 PFK	23.87	4.259e4					1.0	NO		db		
32	FUNCTION1 PFK	23.80	1.700e4					0.6	NO		bd		
33	FUNCTION1 PFK	27.62	9.469e4					1.7	NO		db		
34	FUNCTION1 PFK	27.48	2.254e5					2.4	NO		dd		
35	FUNCTION1 PFK	27.38	3.435e4					1.0	NO		bd		
36	FUNCTION1 PFK	27.23	4.838e5					3.0	NO		db		
37	FUNCTION1 PFK	27.09	1.807e5					2.1	NO		dd		

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PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	FUNCTION1 PFK	26.97	4.300e4					1.1	NO		bd		
39	FUNCTION1 PFK	26.82	1.713e4					0.6	NO		bb		
40	FUNCTION1 PFK	26.76	6.005e3					0.4	NO		bb		

PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 PFK	29.56	1.062e4					0.8	NO		bb		0.000
2	FUNCTION2 PFK	29.42	5.155e4					1.5	NO		db		0.000
3	FUNCTION2 PFK	29.36	5.957e4					2.2	NO		bd		0.000
4	FUNCTION2 PFK	28.06	7.834e5					5.8	YES		db		0.000
5	FUNCTION2 PFK	27.90	1.891e5					9.5	YES		dd		0.000
6	FUNCTION2 PFK	27.82	7.331e5					13.8	YES		dd		0.000
7	FUNCTION2 PFK	27.76	2.682e5					13.5	YES		bd		0.000
8	FUNCTION2 PFK	32.48	3.872e4					1.6	NO		bb		0.000
9	FUNCTION2 PFK	32.38	6.474e4					2.1	NO		bb		0.000
10	FUNCTION2 PFK	31.86	9.782e3					0.8	NO		bb		0.000
11	FUNCTION2 PFK	31.80	2.520e4					1.4	NO		bb		0.000
12	FUNCTION2 PFK	31.57	5.170e3					0.5	NO		bb		0.000
13	FUNCTION2 PFK	31.32	2.902e4					1.2	NO		bb		0.000
14	FUNCTION2 PFK	30.94	3.440e3					0.5	NO		bb		0.000
15	FUNCTION2 PFK	30.88	5.649e4					2.1	NO		bb		0.000
16	FUNCTION2 PFK	30.61	2.102e4					1.0	NO		bb		0.000
17	FUNCTION2 PFK	30.33	8.238e3					0.7	NO		bb		0.000
18	FUNCTION2 PFK	30.01	3.902e4					1.1	NO		bb		0.000
19	FUNCTION2 PFK	29.86	2.890e3					0.4	NO		bb		0.000
20	FUNCTION2 PFK	29.82	3.610e3					0.5	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	32.71	1.911e5					4.5	YES		db		0.000
2	FUNCTION3 PFK	32.66	1.948e5					5.3	YES		bd		0.000
3	FUNCTION3 PFK	37.66	4.087e4					1.9	NO		bb		0.000
4	FUNCTION3 PFK	37.38	9.026e4					1.9	NO		db		0.000
5	FUNCTION3 PFK	37.26	1.754e5					2.1	NO		bd		0.000
6	FUNCTION3 PFK	37.00	3.408e3					0.4	NO		bb		0.000
7	FUNCTION3 PFK	36.96	3.725e3					0.5	NO		bb		0.000
8	FUNCTION3 PFK	36.65	3.289e5					3.1	YES		db		0.000
9	FUNCTION3 PFK	36.61	5.220e4					2.5	NO		bd		0.000
10	FUNCTION3 PFK	35.49	1.975e4					1.2	NO		bb		0.000
11	FUNCTION3 PFK	35.02	2.873e4					1.2	NO		bb		0.000
12	FUNCTION3 PFK	34.63	7.290e3					0.6	NO		bb		0.000
13	FUNCTION3 PFK	34.45	2.797e4					0.8	NO		bb		0.000
14	FUNCTION3 PFK	34.32	1.752e4					1.0	NO		bb		0.000
15	FUNCTION3 PFK	33.99	9.429e3					0.7	NO		bb		0.000
16	FUNCTION3 PFK	33.35	7.566e3					0.9	NO		bb		0.000
17	FUNCTION3 PFK	33.08	3.554e4					1.2	NO		bb		0.000
18	FUNCTION3 PFK	32.86	5.437e4					1.7	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	37.98	2.222e6					8.5	YES		bb		

PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	45.43	1.952e4					1.1	NO		bb		
2	FUNCTION5 PFK	44.83	1.050e4					1.6	NO		bb		
3	FUNCTION5 PFK	44.45	1.104e4					1.1	NO		bb		
4	FUNCTION5 PFK	44.33	1.781e4					1.4	NO		bb		
5	FUNCTION5 PFK	44.28	3.963e3					0.8	NO		bb		
6	FUNCTION5 PFK	44.22	1.529e4					1.6	NO		bb		
7	FUNCTION5 PFK	43.59	2.172e4					2.1	NO		bb		
8	FUNCTION5 PFK	43.44	4.422e3					0.8	NO		bb		
9	FUNCTION5 PFK	42.94	1.534e4					1.9	NO		bb		

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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...	25.52	7.097e1					1.8	NO		bb		0.000
2	FUNCTION1 HXCD...	24.08	1.080e2					1.8	NO		bb		0.000
3	FUNCTION1 HXCD...	23.49	7.006e1					1.6	NO		bb		0.000
4	FUNCTION1 HXCD...	27.48	1.631e2					1.8	NO		bb		0.000
5	FUNCTION1 HXCD...	27.27	1.083e2					4.3	YES		bb		0.000
6	FUNCTION1 HXCD...	26.02	1.029e2					2.8	NO		bb		0.000
7	FUNCTION1 HXCD...	25.82	1.636e2					4.5	YES		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...	27.12	8.726e1					2.1	NO		bb		0.000
2	FUNCTION1 HPCD...	26.43	8.288e1					1.6	NO		db		0.000
3	FUNCTION1 HPCD...	26.32	1.504e2					2.0	NO		bd		0.000
4	FUNCTION1 HPCD...	23.25	3.620e2					7.9	YES		bb		0.000
5	FUNCTION1 HPCD...	21.95	1.651e3					41.9	YES		bb		0.000
6	FUNCTION1 HPCD...	21.56	9.570e1					2.1	NO		bb		0.000
7	FUNCTION1 HPCD...	21.13	1.223e2					2.8	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...	30.59	8.299e1					2.2	NO		bb		0.000
2	FUNCTION2 HPCD...	30.24	8.267e1					1.2	NO		bb		0.000
3	FUNCTION2 HPCD...	29.87	1.035e2					1.9	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	36.46	1.599e2					2.8	NO		db		0.000
2	FUNCTION3 OCDPE	36.38	7.299e1					2.2	NO		bd		0.000
3	FUNCTION3 OCDPE	36.28	7.247e1					1.7	NO		bb		0.000
4	FUNCTION3 OCDPE	33.82	7.395e1					1.7	NO		bb		0.000
5	FUNCTION3 OCDPE	33.74	1.088e2					7.0	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	41.30	9.814e1					3.5	YES		db		0.000
2	FUNCTION4 NCDPE	41.26	7.695e1					2.1	NO		bd		0.000
3	FUNCTION4 NCDPE	39.26	9.344e1					2.7	NO		bb		0.000
4	FUNCTION4 NCDPE	38.70	8.403e1					3.0	NO		bb		0.000
5	FUNCTION4 NCDPE	38.41	1.227e2					4.7	YES		db		0.000
6	FUNCTION4 NCDPE	38.34	1.428e3					36.0	YES		bd		0.000
7	FUNCTION4 NCDPE	38.15	1.061e2					2.1	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	45.12	7.633e1					3.0	YES		bb		0.000
2	FUNCTION5 DCDPE	45.36	9.350e1					3.6	YES		bb		0.000

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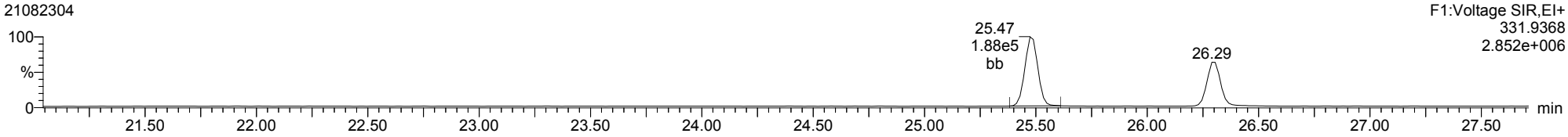

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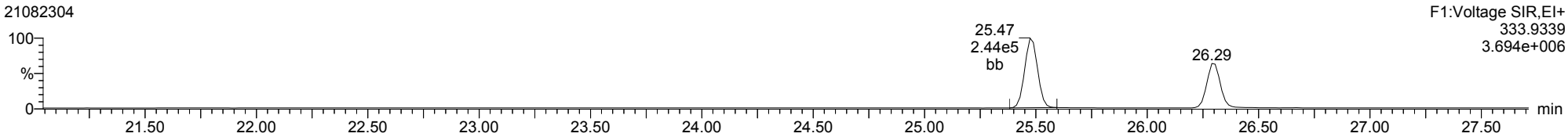

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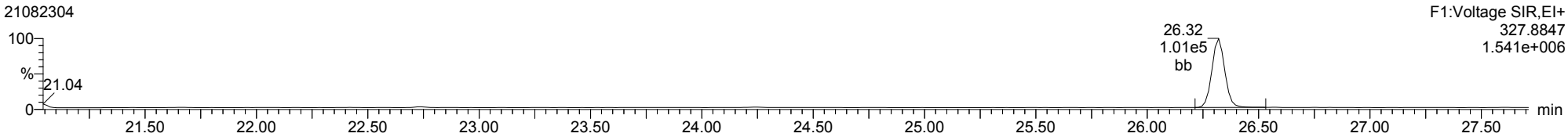

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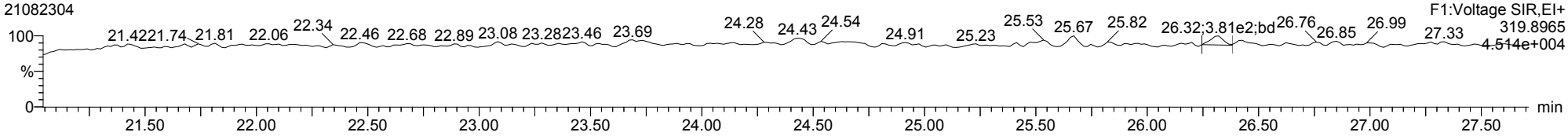
2378-TCDD



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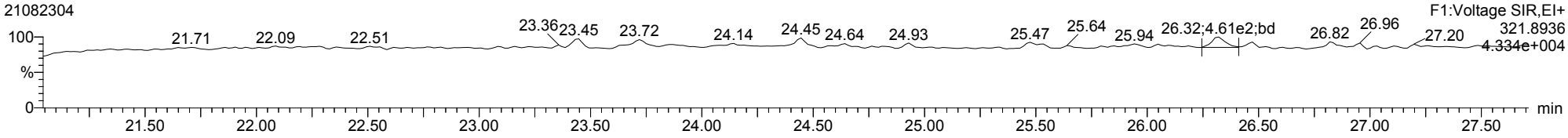

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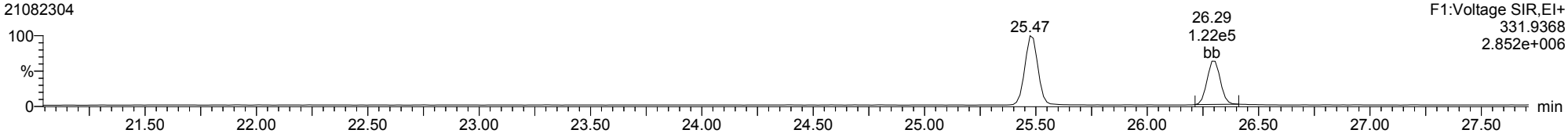

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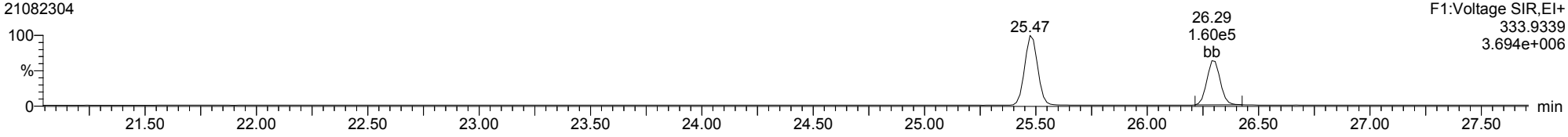
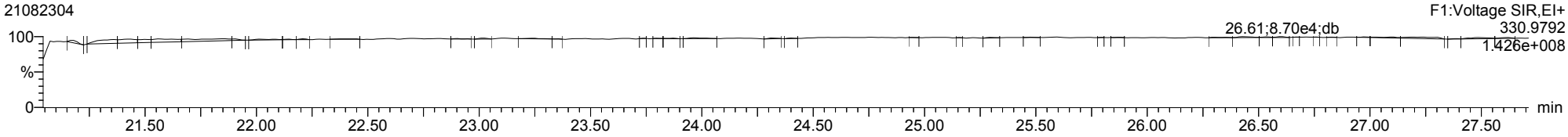


FUNCTION1 PFK



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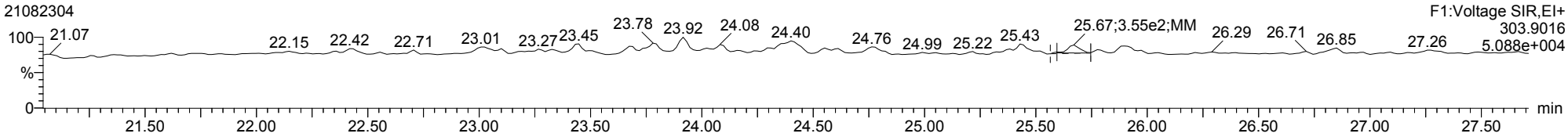
2378-TCDF



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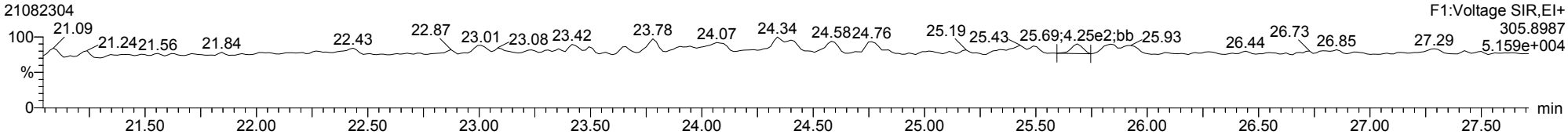

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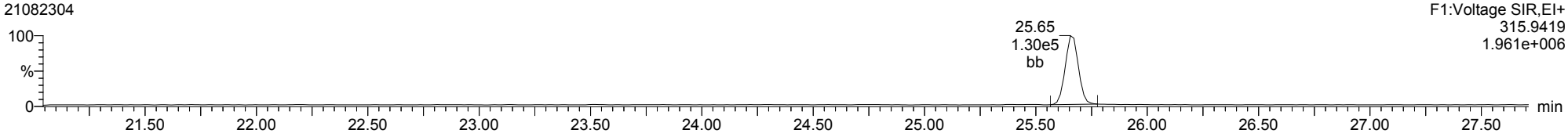

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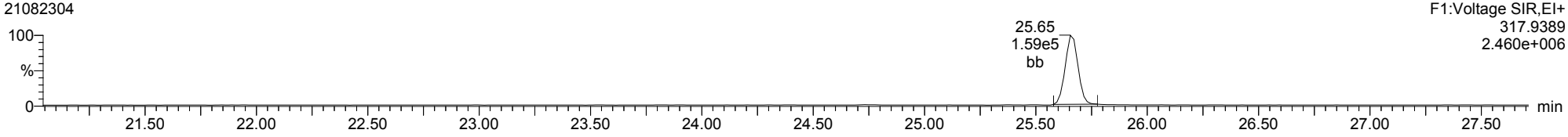

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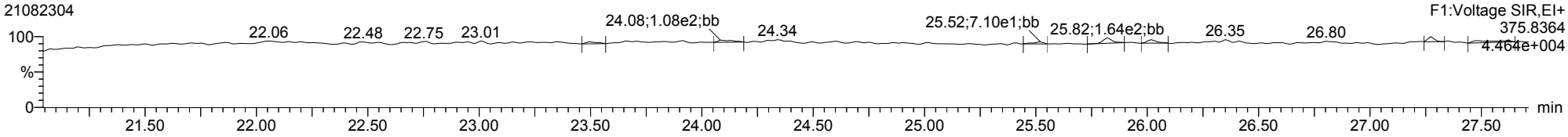

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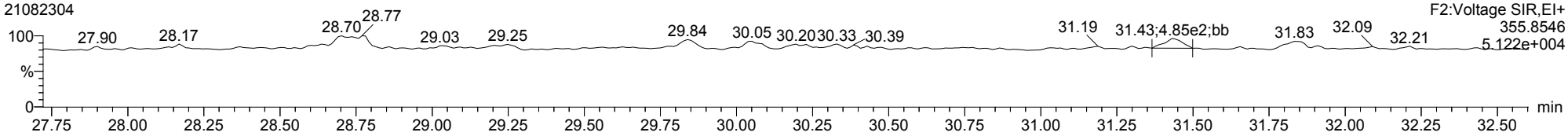
12378-PeCDD



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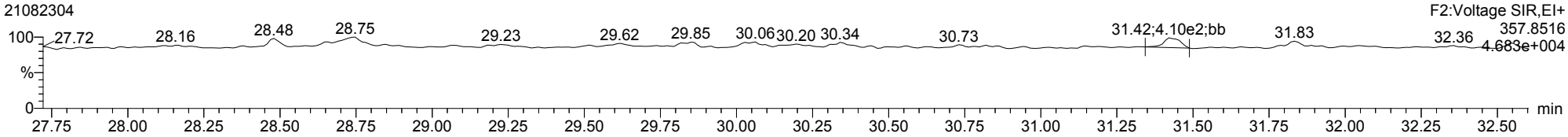

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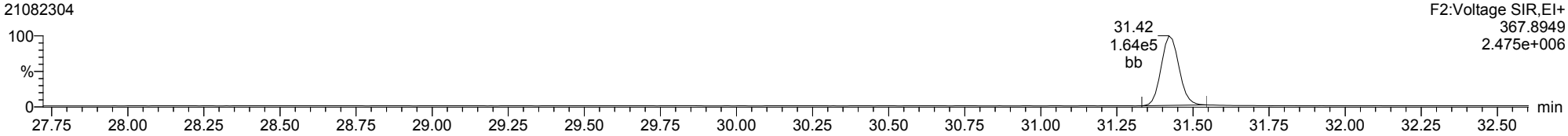

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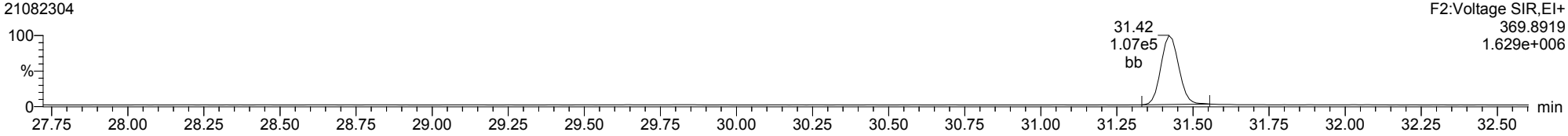
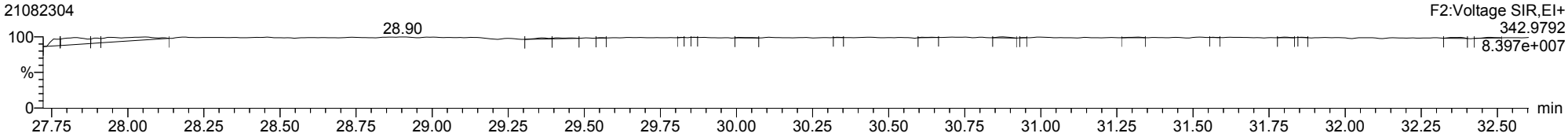


FUNCTION2 PFK



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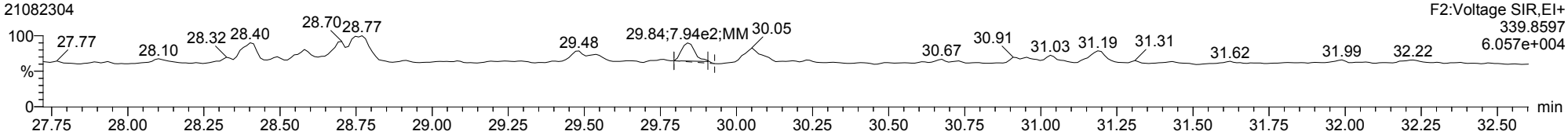
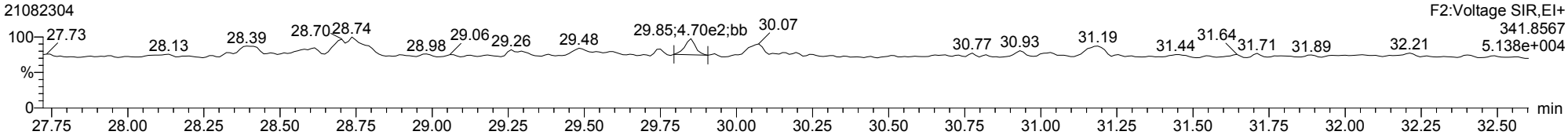
12378-PeCDF



12378-PeCDF



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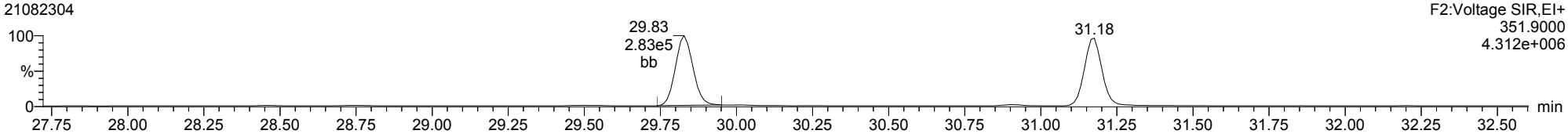

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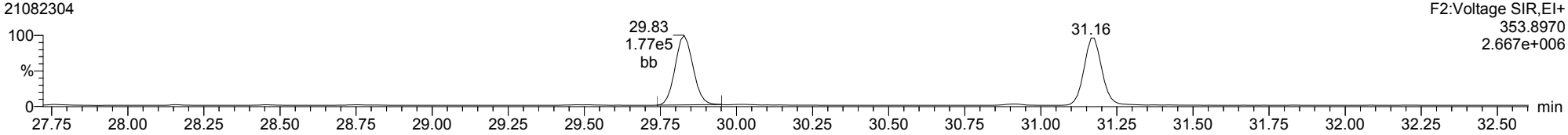

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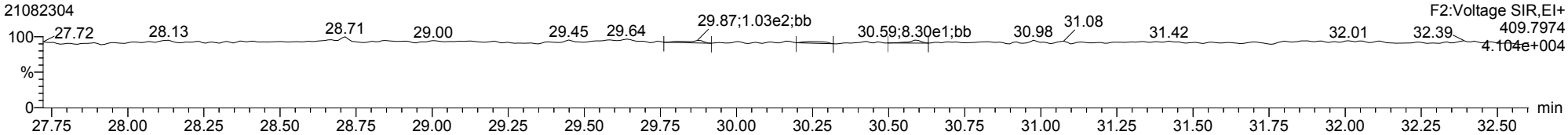

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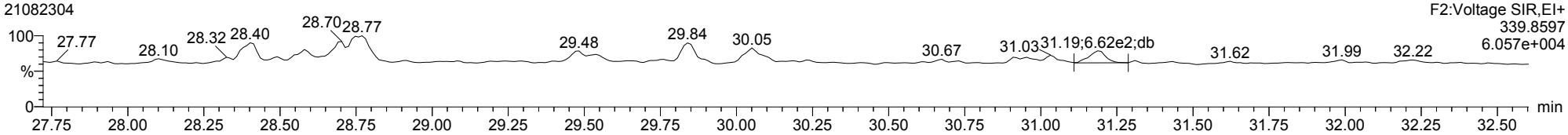

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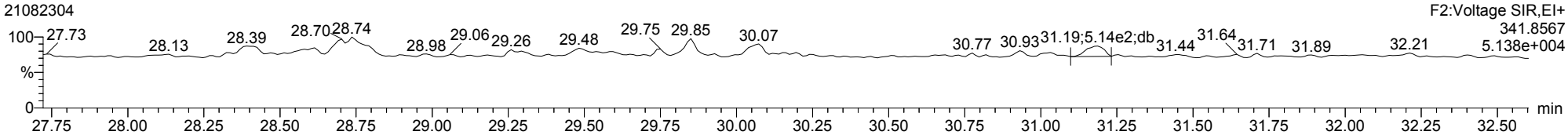

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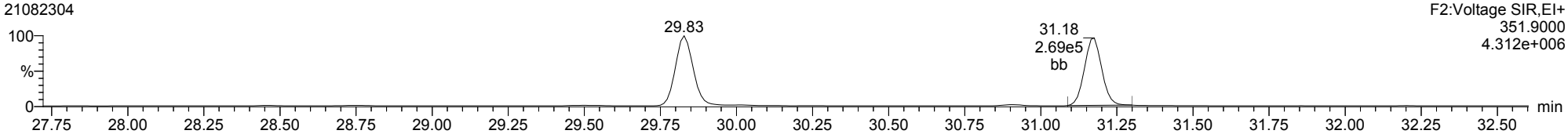

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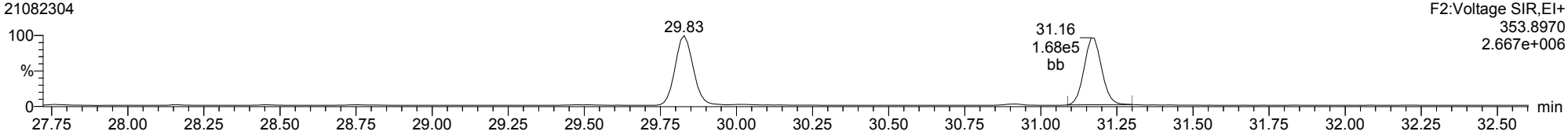

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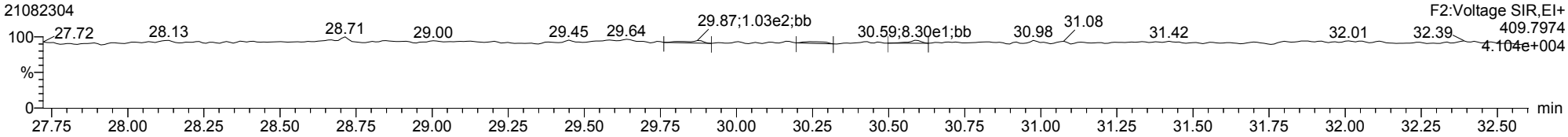

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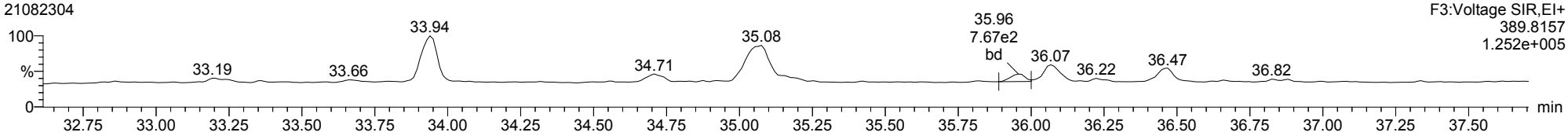

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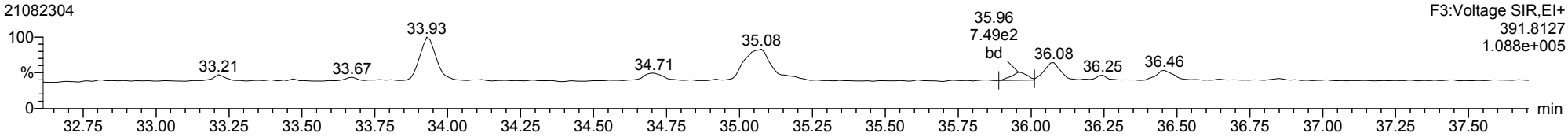

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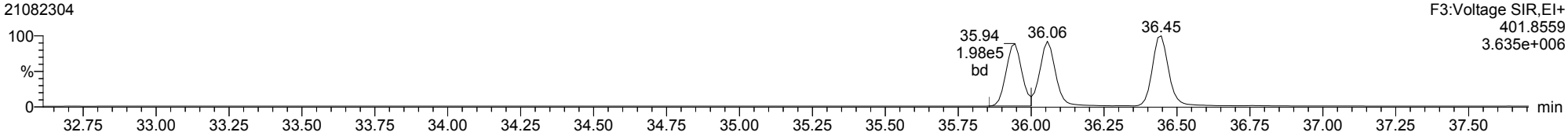

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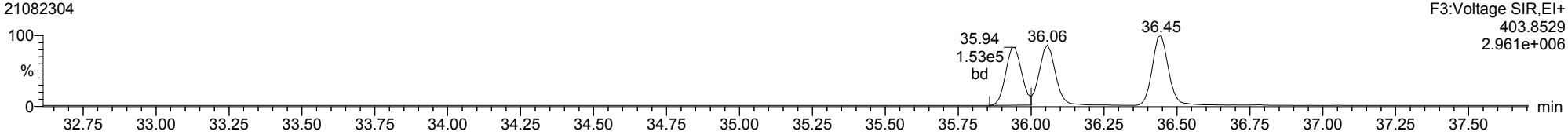

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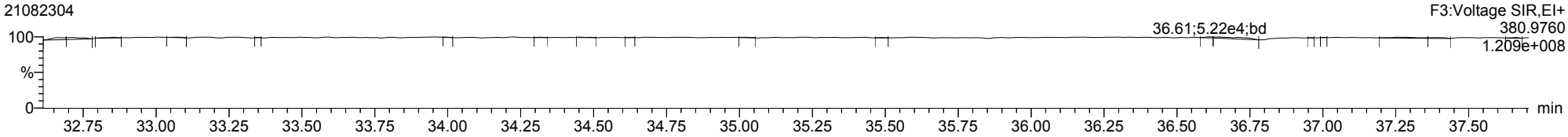

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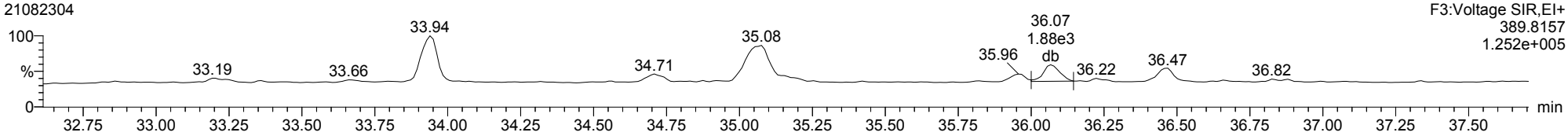

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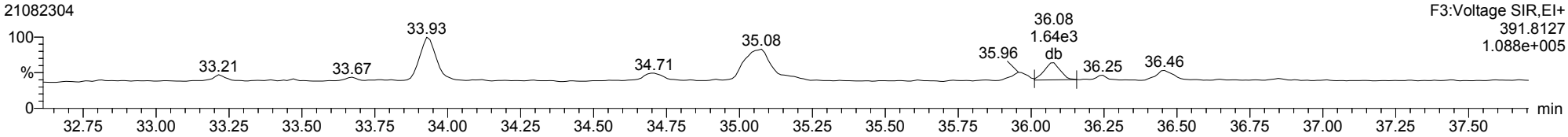

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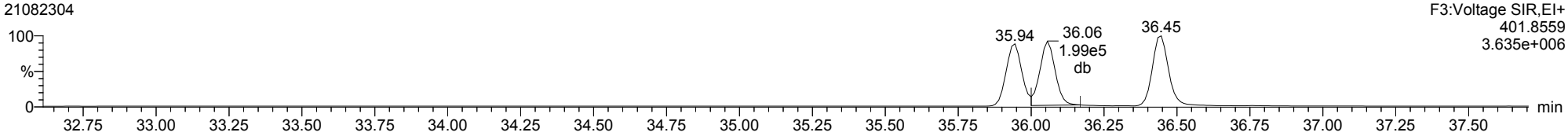

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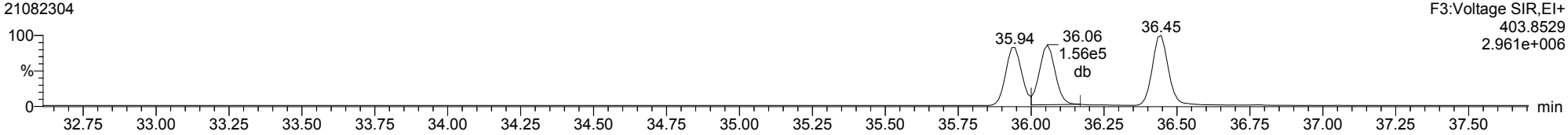

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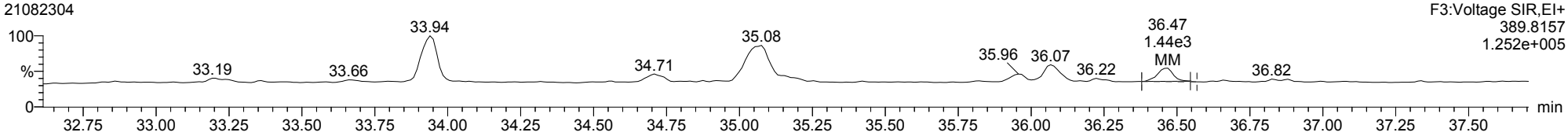

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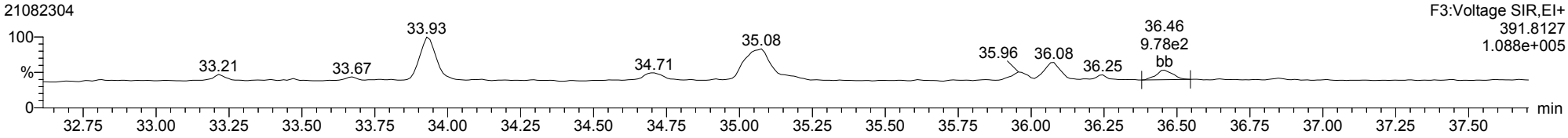

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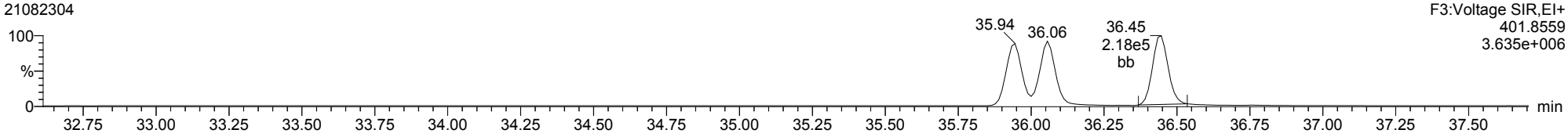

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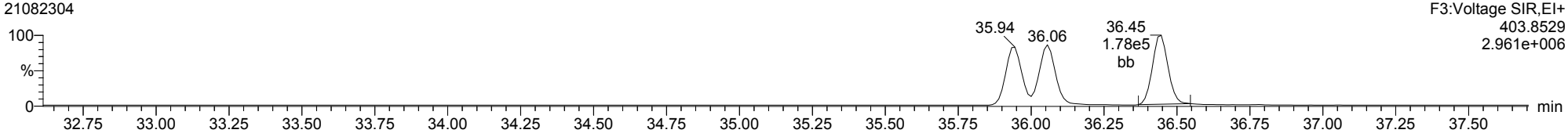

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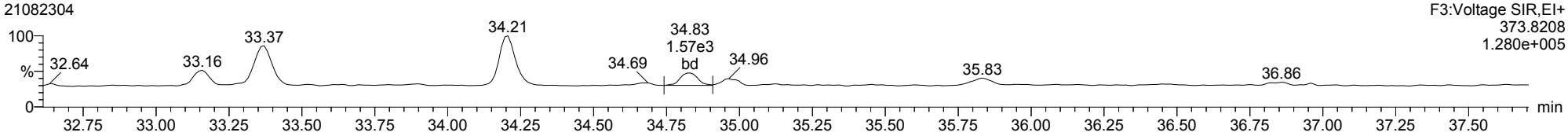

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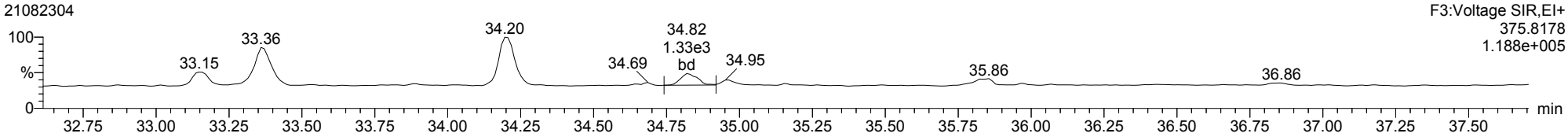

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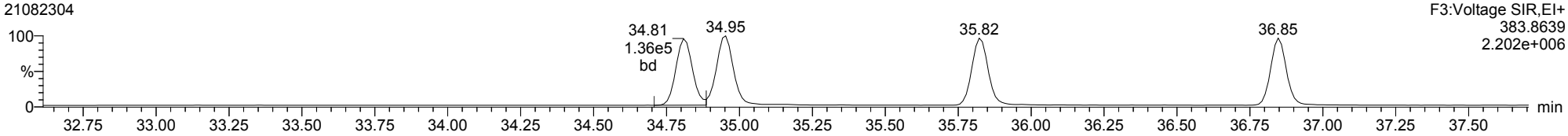

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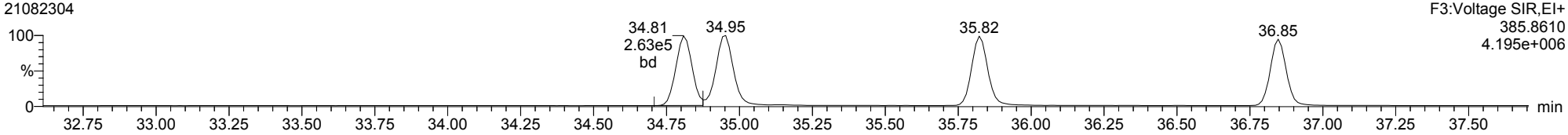

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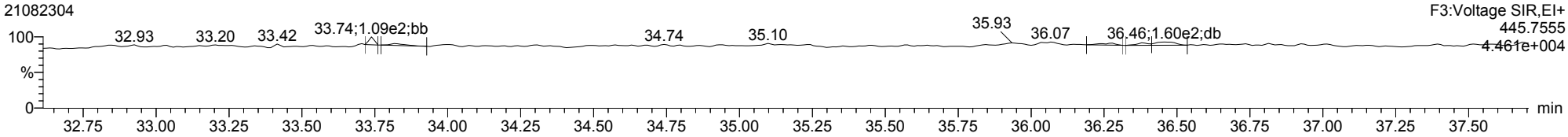

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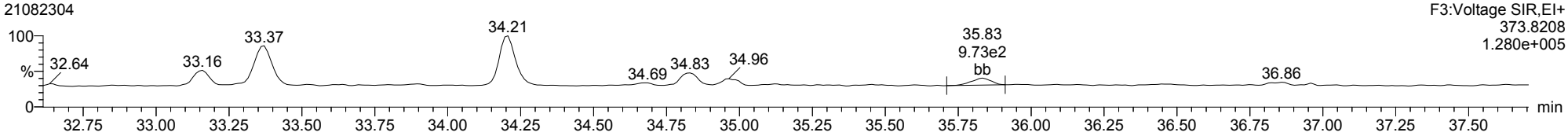

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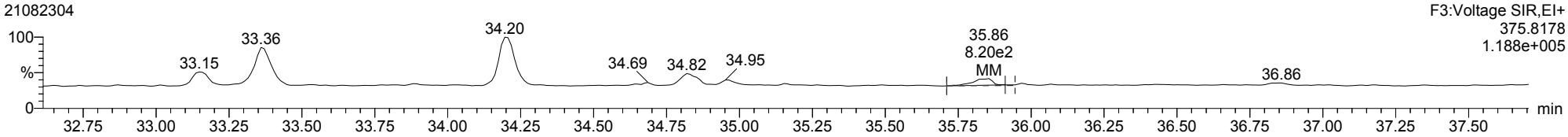

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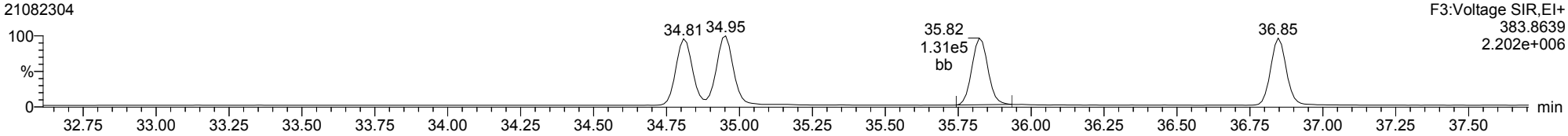

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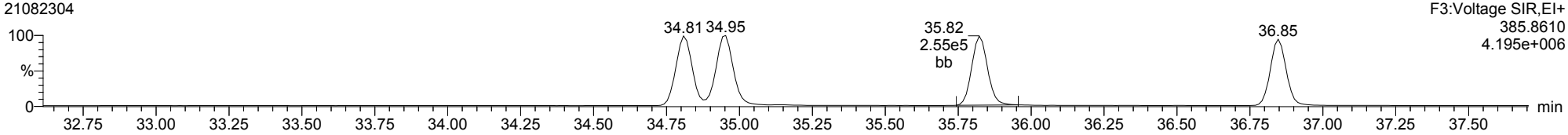

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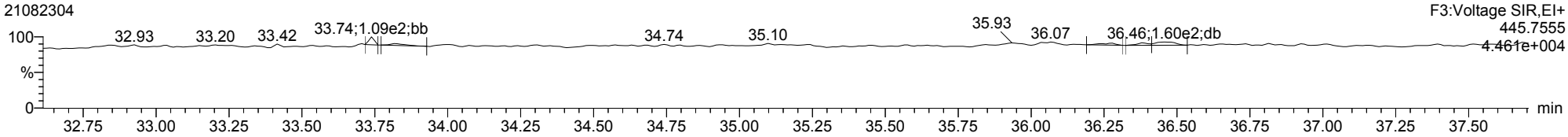

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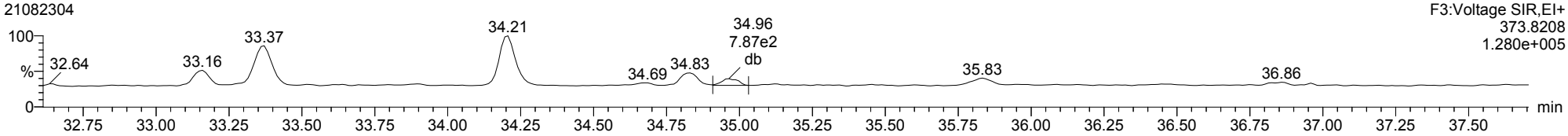

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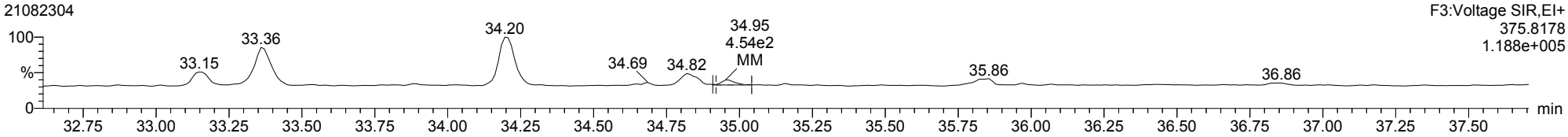

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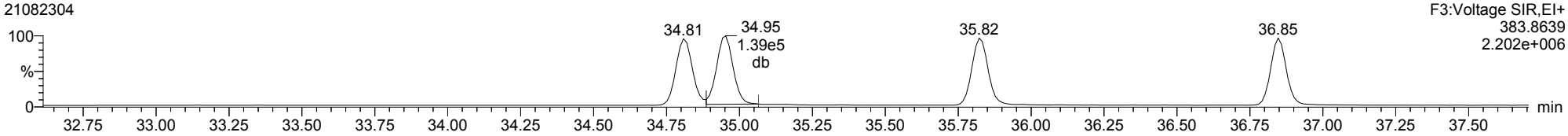

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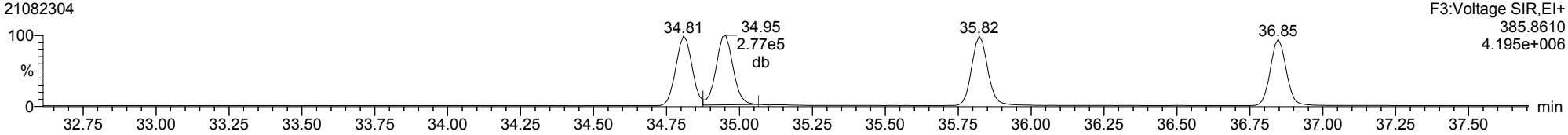

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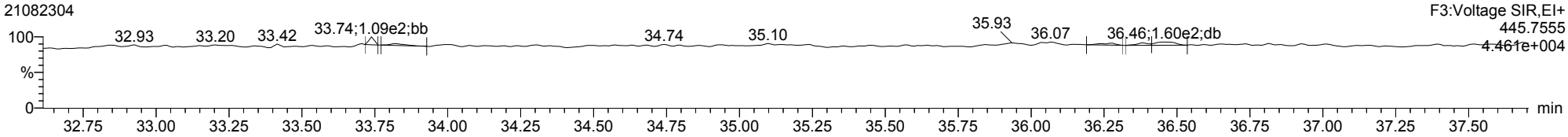

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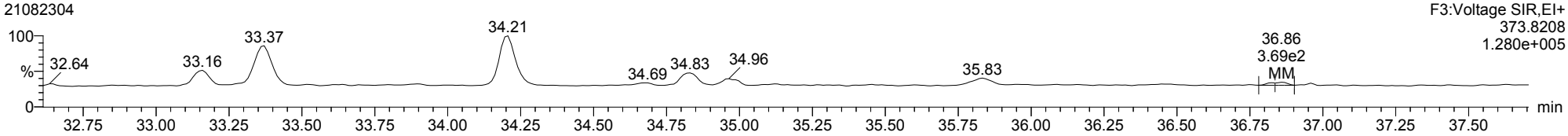

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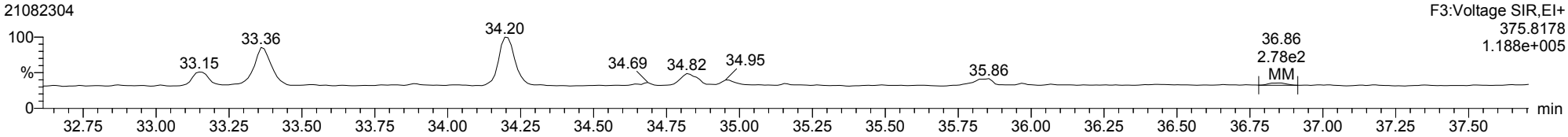

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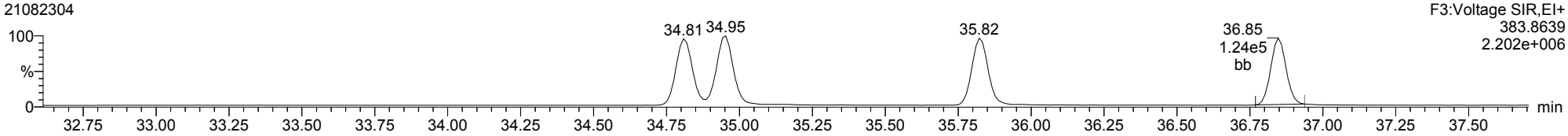

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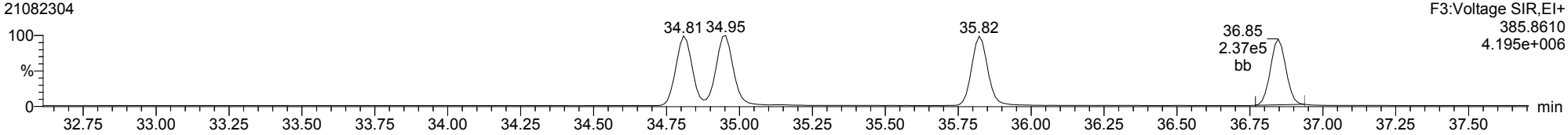

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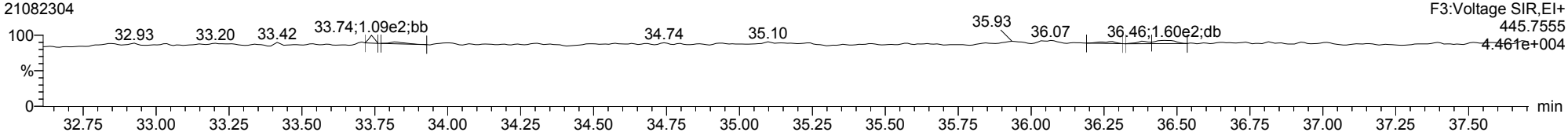

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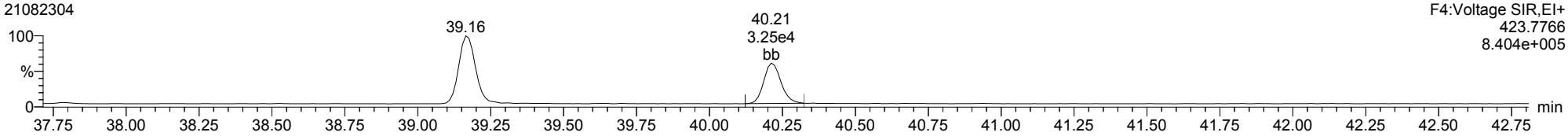

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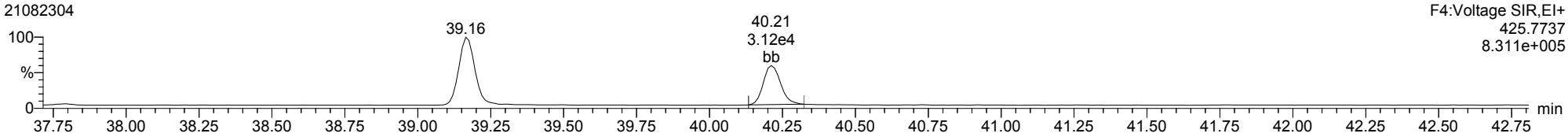

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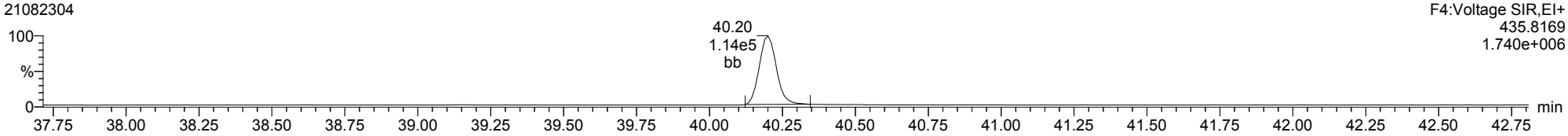

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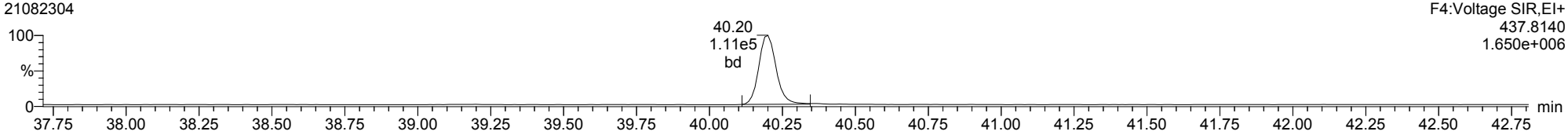

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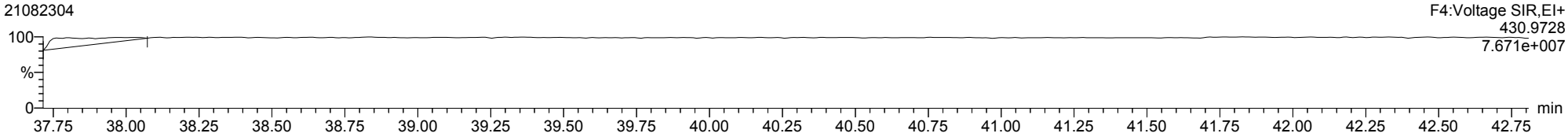

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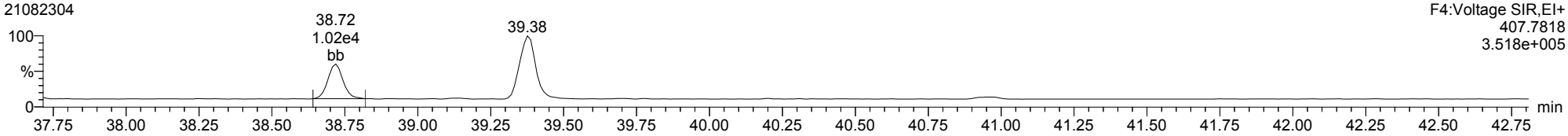

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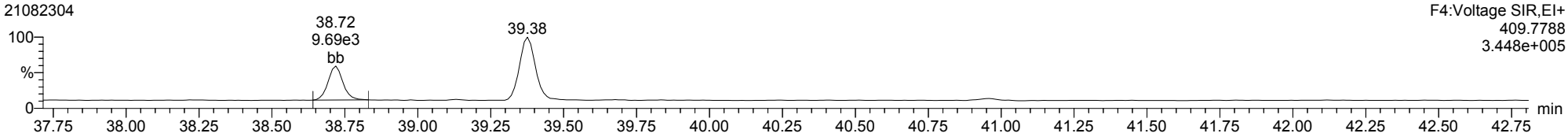

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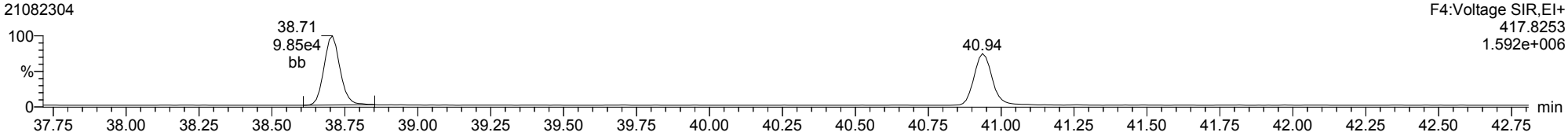

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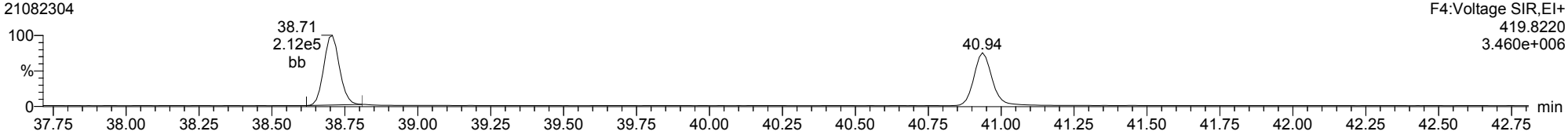
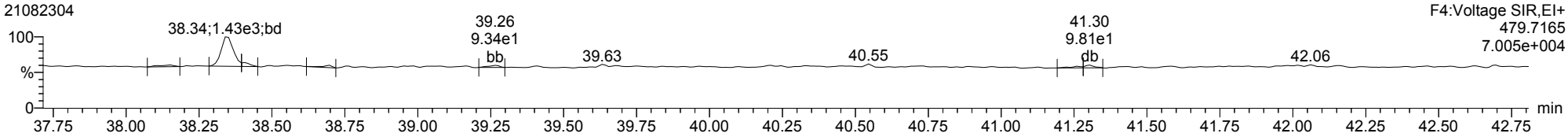
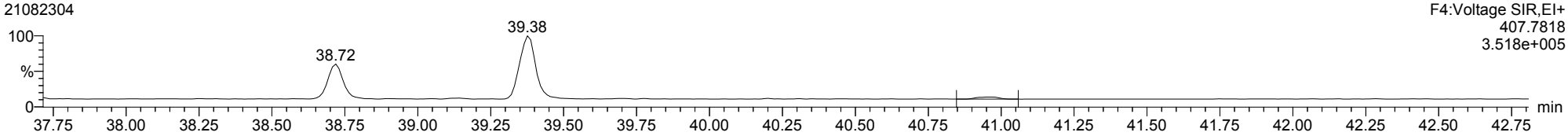


FUNCTION4 NCDPE

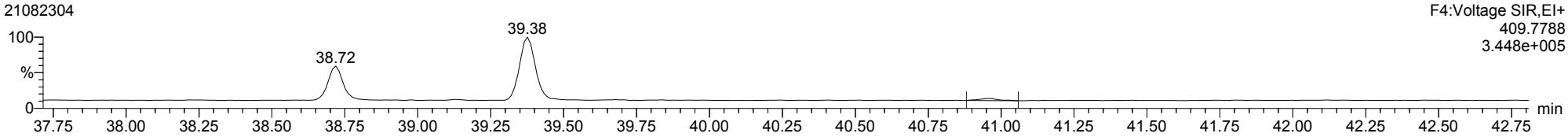


ID: BJG0375-SRM1, Name: 21082304, Date: 23-Aug-2021, Time: 14:26:26, Conditions: AUTOSPEC01, User: pk

1234789-HpCDF



1234789-HpCDF



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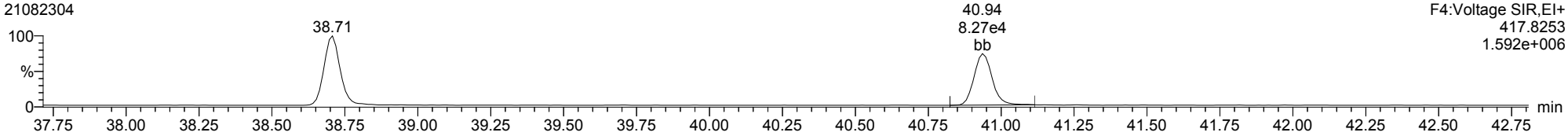

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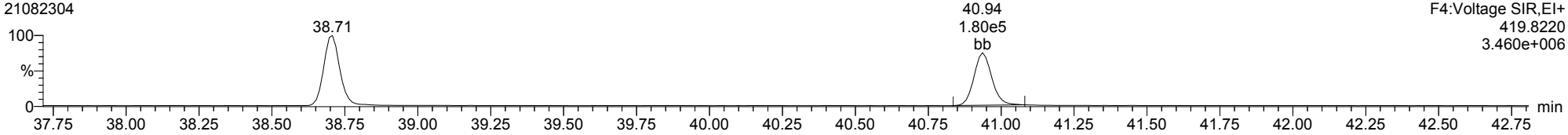
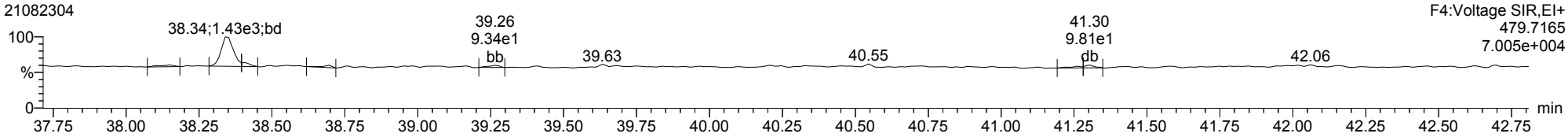


FUNCTION4 NCDPE



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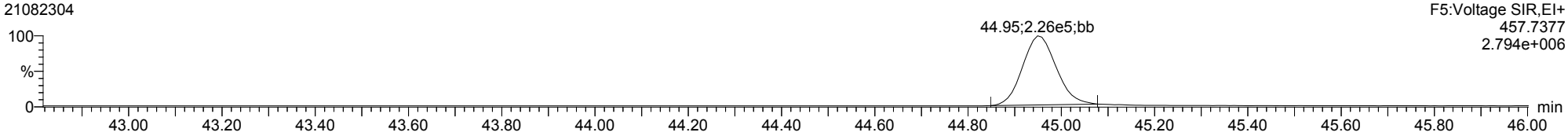
OCDD



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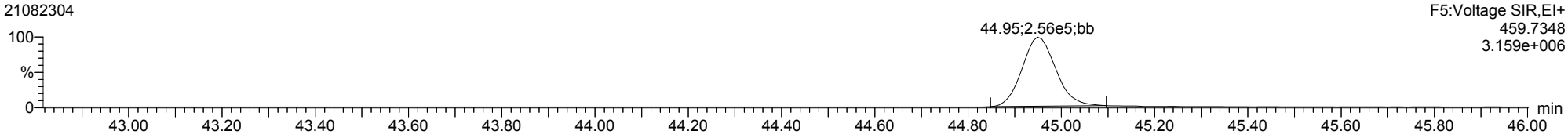

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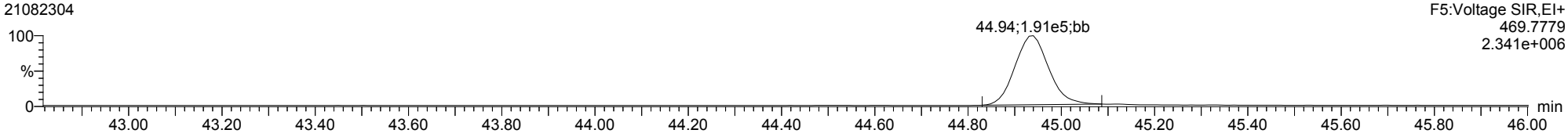

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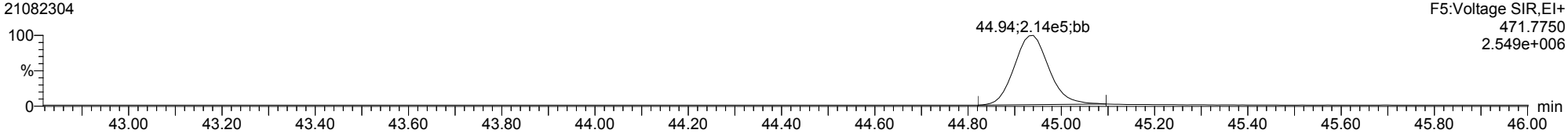
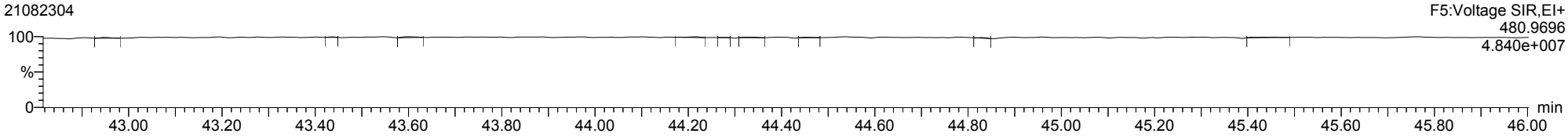


FUNCTION5 PFK



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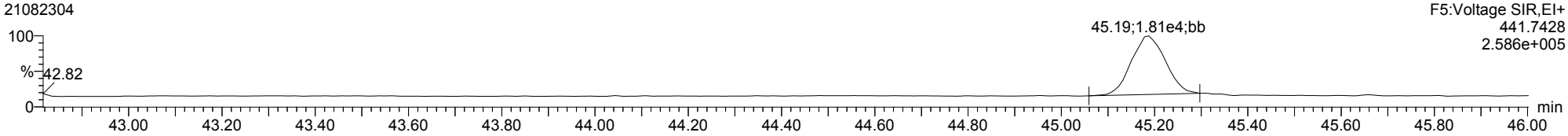
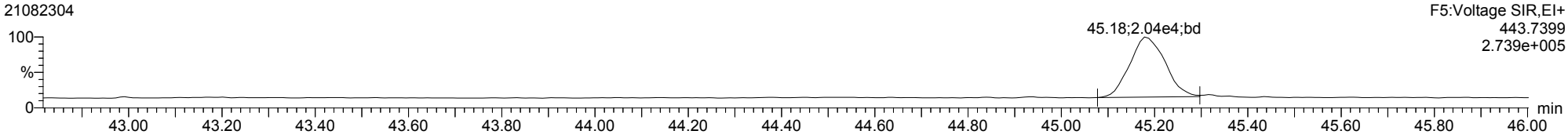
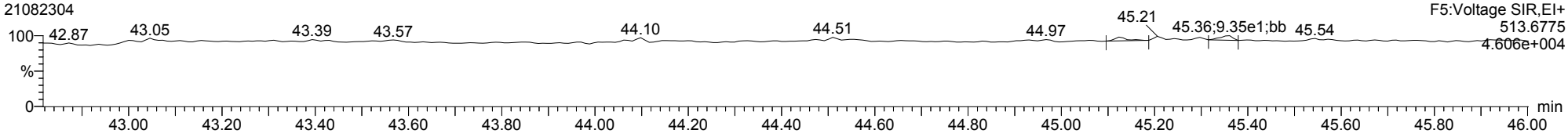
OCDF



OCDF



FUNCTION5 DCDPE



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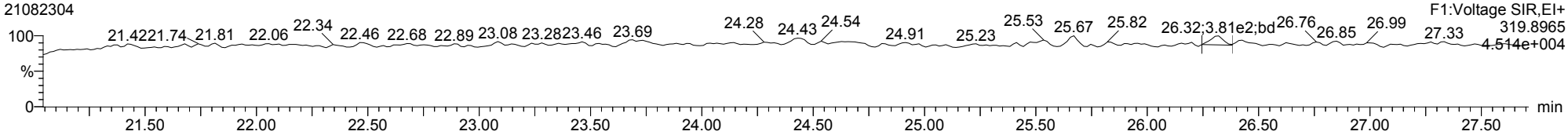
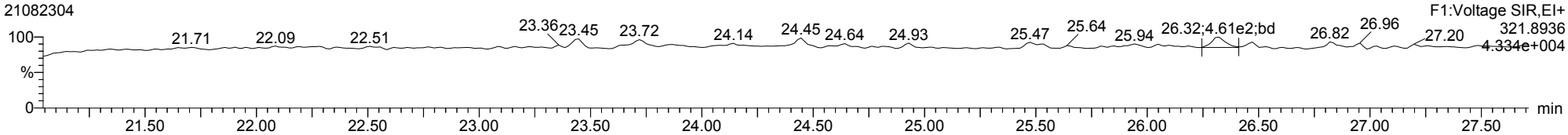
ID: BJG0375-SRM1, Name: 21082304, Date: 23-Aug-2021, Time: 14:26:26, Conditions: AUTOSPEC01, User: pk

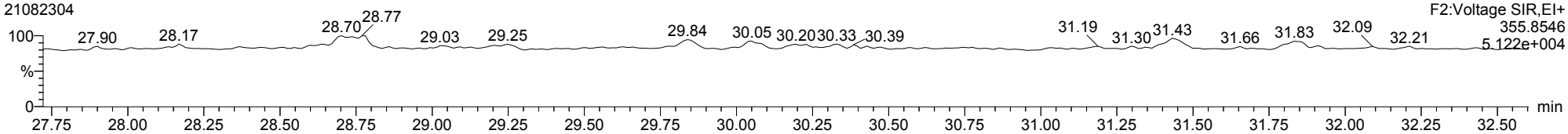
Total-tetradioxins



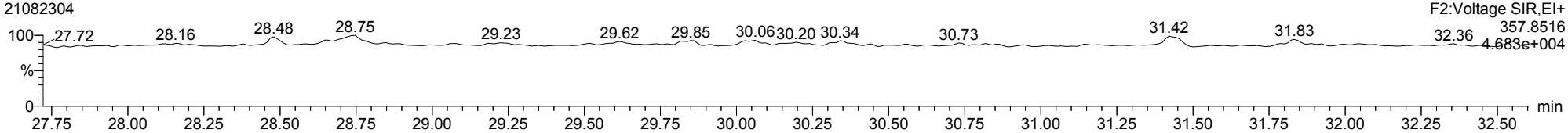
Total-tetradioxins



Total-pentadioxins

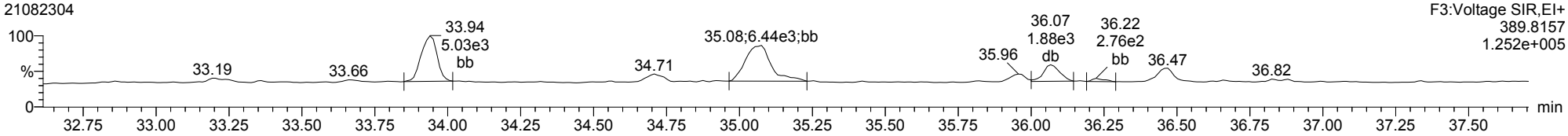


Total-pentadioxins

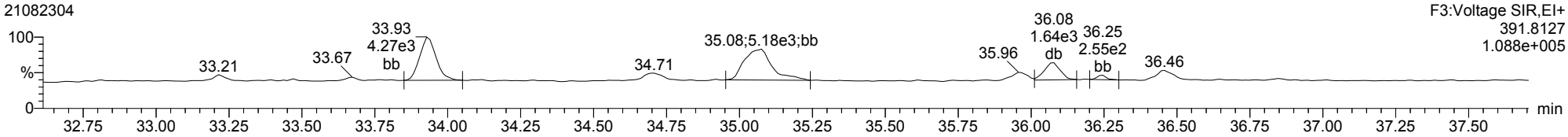


ID: BJG0375-SRM1, Name: 21082304, Date: 23-Aug-2021, Time: 14:26:26, Conditions: AUTOSPEC01, User: pk

Total-hexadioxins



Total-hexadioxins



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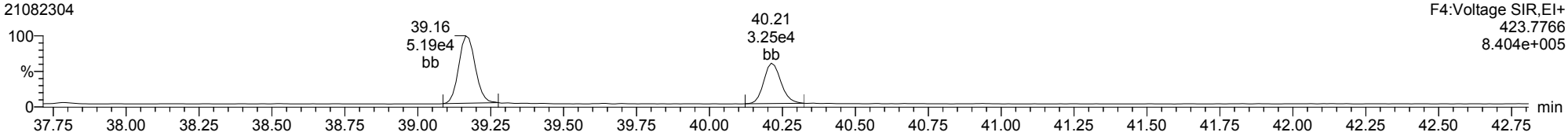

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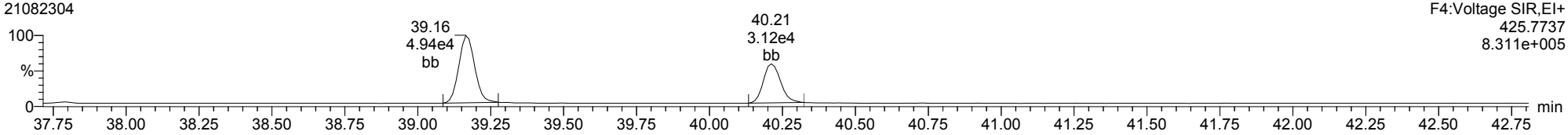

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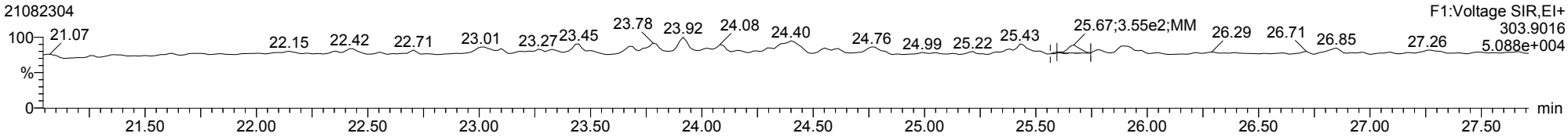
ID: BJG0375-SRM1, Name: 21082304, Date: 23-Aug-2021, Time: 14:26:26, Conditions: AUTOSPEC01, User: pk

Total-tetrafurans



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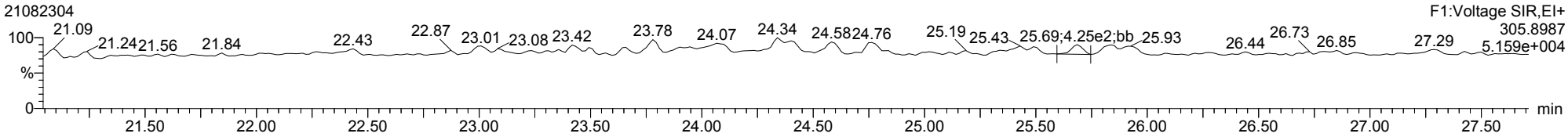

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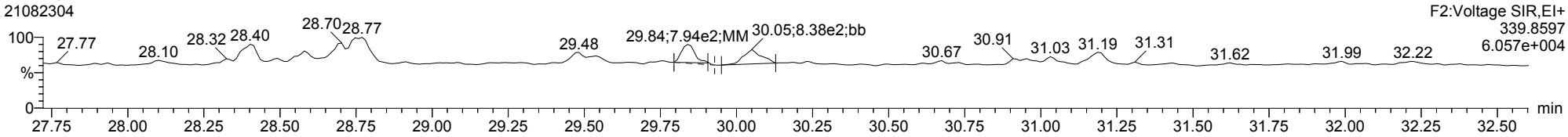
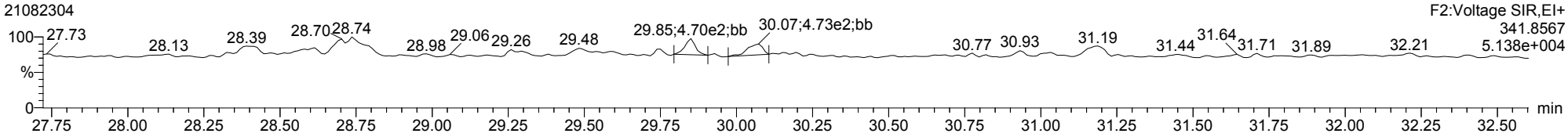


Total-pentafurans



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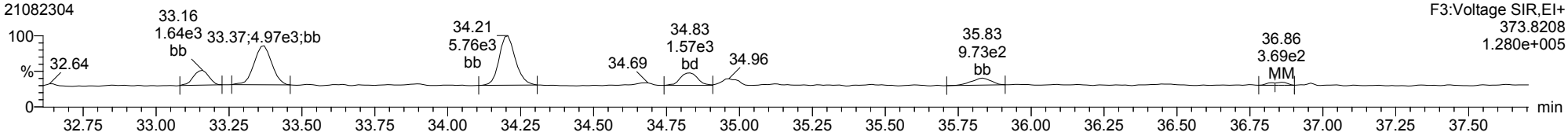
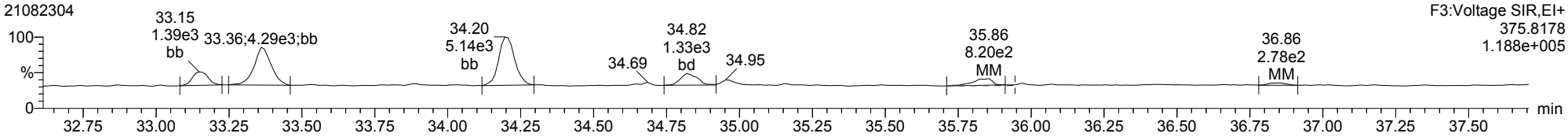
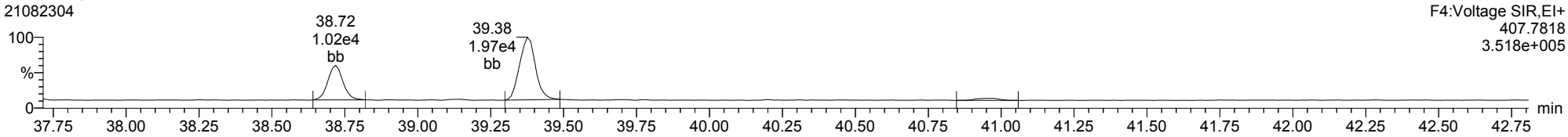
Total-hexafurans



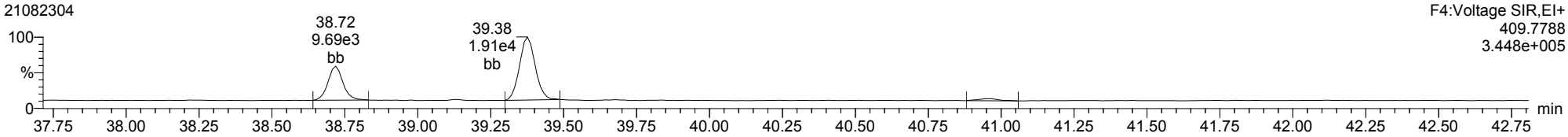
Total-hexafurans



Total-heptafurans



Total-heptafurans



Analytical Resources, Incorporated
Analytical Chemists and Consultants

STANDARD REFERENCE MATERIAL RECOVERY

EPA 1613B

Laboratory: Analytical Resources, Inc.
SDG: 21G0064
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Laboratory ID: BJG0375-SRM2
Batch: BJG0375
Initial/Final: 5 g / 20 uL
Preparation: EPA 1613
Analyzed: 08/23/2021 15:14
Standard ID: I009344
Expires: 03/31/2027
Standard Lot#: NIST 1944
Description: NIST 1944 New York/New Jersey Sediment

ANALYTE	TRUE (ng/kg wet)	FOUND (ng/kg wet)	MDL	MRL	Q	SRM % REC.	QC LIMITS REC.
2,3,7,8-TCDF	39.000	43.5	2.06	2.00		112	50 - 150
2,3,7,8-TCDD	133.00	115	2.47	2.00		86.6	50 - 150
1,2,3,7,8-PeCDF	45.000	46.8	0.926	2.00		104	50 - 150
2,3,4,7,8-PeCDF	45.000	41.2	0.909	2.00		91.6	50 - 150
1,2,3,7,8-PeCDD	19.000	30.5	1.51	2.00	*	161 *	50 - 150
1,2,3,4,7,8-HxCDF	220.00	194	1.05	2.00		88.2	50 - 150
1,2,3,6,7,8-HxCDF	90.000	92.5	0.922	2.00		103	50 - 150
2,3,4,6,7,8-HxCDF	54.000	61.8	1.03	2.00		114	50 - 150
1,2,3,4,7,8-HxCDD	26.000	27.2	1.11	2.00		104	50 - 150
1,2,3,6,7,8-HxCDD	56.000	58.8	1.19	2.00		105	50 - 150
1,2,3,7,8,9-HxCDD	53.000	48.0	1.23	2.00		90.5	50 - 150
1,2,3,4,6,7,8-HpCDF	1000.0	1040	0.810	2.00		104	50 - 150
1,2,3,4,7,8,9-HpCDF	40.000	45.8	1.14	2.00		115	50 - 150
1,2,3,4,6,7,8-HpCDD	800.00	903	1.91	5.00		113	50 - 150
OCDF	1000.0	988	2.20	5.00		98.8	50 - 150
OCDD	5800.0	5460	9.20	20.0		94.1	50 - 150

* Values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
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Calibration: T:\Autospec\Curves\210811ICIH.cdb 13 Aug 2021 13:44:39

ID: BJG0375-SRM2, Name: 21082305, Date: 23-Aug-2021, Time: 15:14:40, 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	25.761	1.001	8.093e3	1.116e4	1.108	0.725	0.770	2028	2216	9.85e4	1.41e5	48.6	63.8	NO	dd	dd	10.878
12378-PeCDF	29.951	1.001	2.454e4	1.569e4	1.015	1.565	1.550	2210	1716	3.60e5	2.35e5	163.0	136.9	NO	bb	bb	11.690
23478-PeCDF	31.299	1.001	2.219e4	1.561e4	1.126	1.422	1.550	2210	1716	3.08e5	2.20e5	139.4	128.0	NO	db	db	10.303
123478-HxCDF	34.998	1.001	7.201e4	5.941e4	1.017	1.212	1.240	1941	1443	1.03e6	8.73e5	529.8	604.9	NO	dd	dd	48.514
234678-HxCDF	36.056	1.000	2.316e4	1.865e4	1.052	1.242	1.240	1941	1443	2.64e5	2.14e5	135.9	148.1	NO	bb	bb	15.453
123678-HxCDF	35.131	1.000	3.547e4	3.016e4	1.037	1.176	1.240	1941	1443	5.56e5	4.63e5	286.2	320.9	NO	db	db	23.119
123789-HxCDF	36.981	1.000	2.527e3	1.920e3	1.030	1.316	1.240	1941	1443	6.66e4	5.12e4	34.3	35.5	NO	bb	bb	3.857
1234678-HpCDF	38.797	1.000	3.067e5	2.967e5	1.327	1.034	1.050	1489	1174	5.24e6	5.12e6	3518.7	4357.3	NO	bb	bb	260.816
1234789-HpCDF	41.014	1.000	1.066e4	1.120e4	1.283	0.952	1.050	1489	1174	1.52e5	1.71e5	102.2	145.9	NO	bb	bb	11.453
OCDF	45.260	1.005	1.616e5	1.847e5	1.447	0.875	0.890	962	1310	2.02e6	2.38e6	2104.4	1819.3	NO	bb	bb	246.932
2378-TCDD	26.411	1.001	2.027e4	2.507e4	0.920	0.809	0.770	2419	1757	2.49e5	3.17e5	103.0	180.2	NO	bd	bd	28.779
12378-PeCDD	31.555	1.000	1.026e4	6.040e3	0.995	1.699	1.550	1594	2254	1.17e5	6.81e4	73.5	30.2	NO	bb	bb	7.629
123478-HxCDD	36.156	1.000	8.744e3	6.862e3	1.027	1.274	1.240	1305	2054	1.29e5	1.07e5	98.8	52.2	NO	bd	bd	6.790
123678-HxCDD	36.279	1.000	1.899e4	1.526e4	1.009	1.245	1.240	1305	2054	2.78e5	2.36e5	213.0	114.7	NO	db	db	14.709
123789-HxCDD	36.680	1.011	1.402e4	1.188e4	0.950	1.180	1.240	1305	2054	2.20e5	1.94e5	168.8	94.4	NO	bb	bb	11.988
1234678-HpCDD	40.278	1.001	1.652e5	1.545e5	1.068	1.069	1.050	1801	1867	2.68e6	2.53e6	1488.7	1354.7	NO	bb	bb	225.867
OCDD	45.032	1.000	7.382e5	8.234e5	1.181	0.897	0.890	1679	1534	8.98e6	9.87e6	5350.3	6434.1	NO	bb	bb	1364.526
13C-2378-TCDF	25.746	1.008	7.165e4	8.811e4	1.427	0.813	0.770	3814	2022	1.00e6	1.19e6	262.5	588.9	NO	bb	bb	26.608
13C-12378-PeCDF	29.928	1.171	2.108e5	1.283e5	1.297	1.643	1.550	1497	1589	3.11e6	1.89e6	2081.0	1187.4	NO	bb	bb	62.104
13C-23478-PeCDF	31.276	1.224	2.010e5	1.250e5	1.236	1.609	1.550	1497	1589	2.84e6	1.79e6	1896.7	1128.8	NO	bb	bb	62.635
13C-123478-HxCDF	34.975	0.954	9.009e4	1.763e5	1.242	0.511	0.510	1237	1510	1.28e6	2.56e6	1037.0	1697.6	NO	bd	bd	76.692
13C-123678-HxCDF	35.120	0.958	9.374e4	1.800e5	1.343	0.521	0.510	1237	1510	1.45e6	2.81e6	1176.4	1858.5	NO	db	db	72.889
13C-234678-HxCDF	36.045	0.983	8.564e4	1.715e5	1.215	0.500	0.510	1237	1510	1.24e6	2.50e6	1005.0	1658.2	NO	bb	bb	75.692
13C-123789-HxCDF	36.981	1.008	3.825e4	7.367e4	1.008	0.519	0.510	1237	1510	1.15e6	2.25e6	926.7	1490.1	NO	bb	bb	39.728
13C-1234678-HpCDF	38.786	1.058	5.539e4	1.189e5	0.926	0.466	0.440	1078	1401	9.45e5	2.06e6	877.2	1470.0	NO	bb	bb	67.283
13C-1234789-HpCDF	40.992	1.118	4.776e4	1.009e5	0.758	0.473	0.440	1078	1401	7.02e5	1.51e6	651.1	1081.0	NO	bb	bb	70.173
13C-1234-TCDD	25.549	0.000	1.831e5	2.378e5	1.000	0.770	0.770	3348	1469	2.79e6	3.66e6	833.5	2488.6	NO	bb	bb	100.000
13C-2378-TCDD	26.381	1.033	7.284e4	9.837e4	1.116	0.740	0.770	3348	1469	9.40e5	1.26e6	280.7	859.7	NO	bb	bb	36.436
13C-12378-PeCDD	31.544	1.235	1.309e5	8.378e4	0.732	1.563	1.550	963	1292	1.87e6	1.19e6	1944.1	919.1	NO	bb	bb	69.692
13C-123478-HxCDD	36.145	0.986	1.249e5	9.885e4	0.960	1.263	1.240	985	1307	1.98e6	1.58e6	2010.9	1211.8	NO	bd	bd	83.362
13C-123678-HxCDD	36.268	0.989	1.286e5	1.022e5	1.041	1.258	1.240	985	1307	1.87e6	1.52e6	1899.6	1164.4	NO	db	db	79.269
13C-1234678-HpCDD	40.256	1.098	6.797e4	6.454e4	0.632	1.053	1.050	825	834	1.11e6	1.06e6	1340.6	1273.9	NO	MM	MM	74.937
13C-OCDD	45.013	1.228	9.209e4	1.017e5	0.504	0.905	0.890	1102	960	1.11e6	1.25e6	1011.5	1305.0	NO	bb	bb	137.630
13C-123789-HxCDD	36.669	0.000	1.550e5	1.246e5	1.000	1.245	1.240	985	1307	2.45e6	1.94e6	2490.1	1482.7	NO	MM	MM	100.000
37CL-2378-TCDD	26.411	1.034	6.200e4		1.084			1246		8.03e5		644.8			dd		13.594

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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	22.268	0.865	2.478e3	3.094e3	1.425	0.801	0.770	2028	2216	3.70e4	4.37e4	18.2	19.7	NO	dd	dd	2.447
1289-TCDF	27.273	1.059	1.046e3	1.869e3	1.043	0.559	0.770	2028	2216	1.54e4	2.11e4	7.6	9.5	YES	db	bb	1.749
13468-PECDF	27.182	0.908	1.938e4	1.388e4	1.376	1.397	1.550	1439	1296	4.13e5	2.94e5	286.6	227.1	NO	bd	bd	7.127
12389-PECDF	32.335	1.080	1.705e3	1.230e3	1.000	1.386	1.550	2210	1716	2.34e4	1.41e4	10.6	8.2	NO	db	db	0.866
123468-HXCDF	33.304	0.952	3.755e4	3.152e4	1.087	1.191	1.240	1941	1443	5.78e5	4.78e5	297.7	331.3	NO	bd	bd	23.863
1368-TCDD	23.508	0.891	3.695e3	4.288e3	0.923	0.862	0.770	2419	1757	5.83e4	7.15e4	24.1	40.7	NO	bb	bb	5.050
1289-TCDD					0.794		0.770	2419	1757								
12479-PECDD	28.736	0.911	3.017e2	3.574e2	1.843	0.844	1.550	1594	2254	6.18e3	6.62e3	3.9	2.9	YES	bb	dd	0.167
12389-PECDD	31.978	1.014	3.676e3	2.409e3	1.154	1.526	1.550	1594	2254	6.38e4	3.75e4	40.1	16.7	NO	bb	bb	2.457
124679-HXCDD	34.084	0.943	4.506e4	3.771e4	1.125	1.195	1.240	1305	2054	7.05e5	5.81e5	540.4	283.0	NO	bb	bb	32.890
1234679-HPCDD	39.242	0.975	1.992e5	1.857e5	1.211	1.072	1.050	1801	1867	3.48e6	3.18e6	1930.1	1702.2	NO	bb	bb	239.873
Total-tetrafurans			1.509e5		1.192			2028		2.12e6							182.435
Total-penta1			9.428e4					1439		1.46e6							47.417
Total-pentafurans			2.793e5		1.047			2210		3.90e6							133.210
Total-hexafurans			3.910e5		1.045			1941		5.23e6							284.121
Total-heptafurans			4.187e5		1.305			1489		7.10e6							365.745
Total-Furans			1.496e6		1.158			2028		2.18e7							1260.370
Total-tetradioxins			4.292e4		0.879			2419		5.76e5							62.883
Total-pentadioxins			8.418e4		1.331			1594		1.15e6							50.308
Total-hexadioxins			2.187e5		1.028			1305		2.90e6							170.018
Total-heptadioxins			3.643e5		1.140			1801		6.16e6							465.740
Total-Dioxins			1.448e6		1.092			2419		1.98e7							2113.475
Total-TEQ			2.945e6					2419		4.16e7							3373.845
FUNCTION1 PFK			1.512e7					1021834		1.44e8							
FUNCTION2 PFK			2.293e7					439324		1.22e8							0.000
FUNCTION3 PFK			5.349e7					658141		2.63e8							0.000
FUNCTION4 PFK			1.551e6					484302		1.83e7							
FUNCTION5 PFK			2.139e5					304057		6.67e6							
FUNCTION1 HXCD...			3.166e4					1574		4.87e5							0.000
FUNCTION1 HPCD...			2.210e4					1539		3.55e5							0.000
FUNCTION2 HPCD...			3.661e3					792		6.43e4							0.000
FUNCTION3 OCDPE			8.594e2					895		1.52e4							0.000
FUNCTION4 NCDPE			8.724e2					1103		1.89e4							0.000
FUNCTION5 DCDPE			2.488e2					778		4.06e3							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	Total-tetrafurans	23.51	6.003e3	8.585e3	1.192	0.70	0.77	46.8	YES	NO	dd	dd	7.661
2	Total-tetrafurans	23.10	1.407e4	1.691e4	1.192	0.83	0.77	93.9	YES	NO	bd	bd	16.265
3	Total-tetrafurans	22.53	5.680e3	7.691e3	1.192	0.74	0.77	49.4	YES	NO	bb	db	7.022
4	1368-TCDF	22.27	2.478e3	3.094e3	1.425	0.80	0.77	18.2	YES	NO	dd	dd	2.447
5	Total-tetrafurans	25.90	1.006e4	1.317e4	1.192	0.76	0.77	66.2	YES	NO	dd	dd	12.197
6	2378-TCDF	25.76	8.093e3	1.116e4	1.108	0.73	0.77	48.6	YES	NO	dd	dd	10.878
7	Total-tetrafurans	25.58	2.260e4	3.076e4	1.192	0.73	0.77	123.3	YES	NO	dd	dd	28.021
8	Total-tetrafurans	25.25	1.134e4	1.538e4	1.192	0.74	0.77	79.3	YES	NO	bd	bd	14.035
9	Total-tetrafurans	24.82	8.406e3	9.897e3	1.192	0.85	0.77	56.5	YES	NO	bb	db	9.612
10	Total-tetrafurans	24.64	9.164e3	1.288e4	1.192	0.71	0.77	62.4	YES	NO	db	dd	11.576
11	Total-tetrafurans	24.51	9.628e3	1.119e4	1.192	0.86	0.77	73.6	YES	NO	dd	dd	10.932
12	Total-tetrafurans	24.42	1.250e4	1.507e4	1.192	0.83	0.77	105.8	YES	NO	bd	bd	14.478
13	Total-tetrafurans	23.98	4.761e3	5.759e3	1.192	0.83	0.77	32.7	YES	NO	dd	db	5.525
14	Total-tetrafurans	23.84	6.722e3	8.622e3	1.192	0.78	0.77	45.8	YES	NO	dd	dd	8.058
15	Total-tetrafurans	23.73	5.352e3	6.761e3	1.192	0.79	0.77	42.3	YES	NO	dd	dd	6.362
16	Total-tetrafurans	26.77	6.617e2	7.890e2	1.192	0.84	0.77	4.3	YES	NO	bd	bb	0.762
17	Total-tetrafurans	26.09	1.874e3	2.161e3	1.192	0.87	0.77	15.3	YES	NO	db	db	2.119
18	Total-tetrafurans	25.99	1.156e4	1.603e4	1.192	0.72	0.77	82.2	YES	NO	dd	dd	14.487

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-penta1	27.26	7.490e4	5.038e4		1.49	1.55	724.9	YES	NO	db	db	40.290
2	13468-PECDF	27.18	1.938e4	1.388e4	1.376	1.40	1.55	286.6	YES	NO	bd	bd	7.127

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PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-pentafurans	31.02	2.416e4	1.497e4	1.047	1.61	1.55	156.1	YES	NO	bd	bd	11.244
2	Total-pentafurans	30.76	1.529e3	1.137e3	1.047	1.34	1.55	8.9	YES	NO	bb	bb	0.766
3	Total-pentafurans	30.24	7.691e3	5.126e3	1.047	1.50	1.55	56.6	YES	NO	db	db	3.683
4	Total-pentafurans	30.13	1.786e4	1.152e4	1.047	1.55	1.55	124.7	YES	NO	bd	bd	8.443
5	12378-PeCDF	29.95	2.454e4	1.569e4	1.015	1.56	1.55	163.0	YES	NO	bb	bb	11.690
6	Total-pentafurans	29.58	5.573e4	3.726e4	1.047	1.50	1.55	313.1	YES	NO	db	db	26.717
7	Total-pentafurans	29.35	7.522e2	5.486e2	1.047	1.37	1.55	6.6	YES	NO	bb	bb	0.374
8	Total-pentafurans	29.05	3.468e4	2.324e4	1.047	1.49	1.55	274.2	YES	NO	db	db	16.640
9	Total-pentafurans	28.98	6.490e4	4.363e4	1.047	1.49	1.55	355.2	YES	NO	dd	dd	31.182
10	Total-pentafurans	28.73	1.665e4	1.135e4	1.047	1.47	1.55	106.8	YES	NO	bd	bd	8.045
11	12389-PECDF	32.33	1.705e3	1.230e3	1.000	1.39	1.55	10.6	YES	NO	db	db	0.866
12	23478-PeCDF	31.30	2.219e4	1.561e4	1.126	1.42	1.55	139.4	YES	NO	db	db	10.303
13	Total-pentafurans	31.12	6.888e3	4.451e3	1.047	1.55	1.55	49.1	YES	NO	dd	dd	3.258

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-hexafurans	34.03	5.773e3	4.905e3	1.045	1.18	1.24	47.3	YES	NO	bb	bb	4.497
2	Total-hexafurans	33.78	2.891e3	2.212e3	1.045	1.31	1.24	23.7	YES	NO	bb	bb	2.149
3	Total-hexafurans	33.50	1.467e5	1.206e5	1.045	1.22	1.24	828.8	YES	NO	db	db	112.599
4	123468-HXCDF	33.30	3.755e4	3.152e4	1.087	1.19	1.24	297.7	YES	NO	bd	bd	23.863
5	123789-HxCDF	36.98	2.527e3	1.920e3	1.030	1.32	1.24	34.3	YES	NO	bb	bb	3.857
6	234678-HxCDF	36.06	2.316e4	1.865e4	1.052	1.24	1.24	135.9	YES	NO	bb	bb	15.453
7	Total-hexafurans	35.68	2.873e3	2.472e3	1.045	1.16	1.24	19.7	YES	NO	bb	bb	2.251
8	Total-hexafurans	35.47	3.212e3	2.542e3	1.045	1.26	1.24	26.4	YES	NO	db	db	2.423
9	Total-hexafurans	35.32	1.551e3	1.437e3	1.045	1.08	1.24	12.9	YES	NO	bd	bd	1.258
10	123678-HxCDF	35.13	3.547e4	3.016e4	1.037	1.18	1.24	286.2	YES	NO	db	db	23.119
11	123478-HxCDF	35.00	7.201e4	5.941e4	1.017	1.21	1.24	529.8	YES	NO	dd	dd	48.514
12	Total-hexafurans	34.82	2.475e4	2.067e4	1.045	1.20	1.24	194.1	YES	NO	bd	bd	19.129
13	Total-hexafurans	34.34	3.254e4	2.684e4	1.045	1.21	1.24	259.5	YES	NO	bb	bb	25.008

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HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234789-HpCDF	41.01	1.066e4	1.120e4	1.283	0.95	1.05	102.2	YES	NO	bb	bb	11.453
2	Total-heptafurans	39.44	8.450e4	7.954e4	1.305	1.06	1.05	945.5	YES	NO	bb	bb	77.819
3	Total-heptafurans	39.20	1.683e4	1.617e4	1.305	1.04	1.05	199.4	YES	NO	bb	bb	15.656
4	1234678-HpCDF	38.80	3.067e5	2.967e5	1.327	1.03	1.05	3518.7	YES	NO	bb	bb	260.816

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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	23.51	6.003e3	8.585e3	1.192	0.70	0.77	46.8	YES	NO	dd	dd	7.661
2	Total-tetrafurans	23.10	1.407e4	1.691e4	1.192	0.83	0.77	93.9	YES	NO	bd	bd	16.265
3	Total-tetrafurans	22.53	5.680e3	7.691e3	1.192	0.74	0.77	49.4	YES	NO	bb	db	7.022
4	1368-TCDF	22.27	2.478e3	3.094e3	1.425	0.80	0.77	18.2	YES	NO	dd	dd	2.447
5	Total-tetrafurans	25.90	1.006e4	1.317e4	1.192	0.76	0.77	66.2	YES	NO	dd	dd	12.197
6	2378-TCDF	25.76	8.093e3	1.116e4	1.108	0.73	0.77	48.6	YES	NO	dd	dd	10.878
7	Total-tetrafurans	25.58	2.260e4	3.076e4	1.192	0.73	0.77	123.3	YES	NO	dd	dd	28.021
8	Total-tetrafurans	25.25	1.134e4	1.538e4	1.192	0.74	0.77	79.3	YES	NO	bd	bd	14.035
9	Total-tetrafurans	24.82	8.406e3	9.897e3	1.192	0.85	0.77	56.5	YES	NO	bb	db	9.612
10	Total-tetrafurans	24.64	9.164e3	1.288e4	1.192	0.71	0.77	62.4	YES	NO	db	dd	11.576
11	Total-tetrafurans	24.51	9.628e3	1.119e4	1.192	0.86	0.77	73.6	YES	NO	dd	dd	10.932
12	Total-tetrafurans	24.42	1.250e4	1.507e4	1.192	0.83	0.77	105.8	YES	NO	bd	bd	14.478
13	Total-tetrafurans	23.98	4.761e3	5.759e3	1.192	0.83	0.77	32.7	YES	NO	dd	db	5.525
14	Total-tetrafurans	23.84	6.722e3	8.622e3	1.192	0.78	0.77	45.8	YES	NO	dd	dd	8.058
15	Total-tetrafurans	23.73	5.352e3	6.761e3	1.192	0.79	0.77	42.3	YES	NO	dd	dd	6.362
16	Total-Furans	27.62	4.169e2	5.260e2	1.158	0.79	0.77	2.5	NO	NO	bb	bb	0.510
17	Total-tetrafurans	26.77	6.617e2	7.890e2	1.192	0.84	0.77	4.3	YES	NO	bd	bb	0.762
18	Total-tetrafurans	26.09	1.874e3	2.161e3	1.192	0.87	0.77	15.3	YES	NO	db	db	2.119
19	Total-tetrafurans	25.99	1.156e4	1.603e4	1.192	0.72	0.77	82.2	YES	NO	dd	dd	14.487
20	Total-pentafurans	31.02	2.416e4	1.497e4	1.047	1.61	1.55	156.1	YES	NO	bd	bd	11.244
21	Total-pentafurans	30.76	1.529e3	1.137e3	1.047	1.34	1.55	8.9	YES	NO	bb	bb	0.766
22	Total-pentafurans	30.24	7.691e3	5.126e3	1.047	1.50	1.55	56.6	YES	NO	db	db	3.683
23	Total-pentafurans	30.13	1.786e4	1.152e4	1.047	1.55	1.55	124.7	YES	NO	bd	bd	8.443
24	12378-PeCDF	29.95	2.454e4	1.569e4	1.015	1.56	1.55	163.0	YES	NO	bb	bb	11.690
25	Total-pentafurans	29.58	5.573e4	3.726e4	1.047	1.50	1.55	313.1	YES	NO	db	db	26.717
26	Total-pentafurans	29.35	7.522e2	5.486e2	1.047	1.37	1.55	6.6	YES	NO	bb	bb	0.374
27	Total-pentafurans	29.05	3.468e4	2.324e4	1.047	1.49	1.55	274.2	YES	NO	db	db	16.640
28	Total-pentafurans	28.98	6.490e4	4.363e4	1.047	1.49	1.55	355.2	YES	NO	dd	dd	31.182
29	Total-pentafurans	28.73	1.665e4	1.135e4	1.047	1.47	1.55	106.8	YES	NO	bd	bd	8.045
30	12389-PECDF	32.33	1.705e3	1.230e3	1.000	1.39	1.55	10.6	YES	NO	db	db	0.866
31	23478-PeCDF	31.30	2.219e4	1.561e4	1.126	1.42	1.55	139.4	YES	NO	db	db	10.303
32	Total-pentafurans	31.12	6.888e3	4.451e3	1.047	1.55	1.55	49.1	YES	NO	dd	dd	3.258
33	Total-hexafurans	34.03	5.773e3	4.905e3	1.045	1.18	1.24	47.3	YES	NO	bb	bb	4.497
34	Total-hexafurans	33.78	2.891e3	2.212e3	1.045	1.31	1.24	23.7	YES	NO	bb	bb	2.149
35	Total-hexafurans	33.50	1.467e5	1.206e5	1.045	1.22	1.24	828.8	YES	NO	db	db	112.599
36	123468-HXCDF	33.30	3.755e4	3.152e4	1.087	1.19	1.24	297.7	YES	NO	bd	bd	23.863
37	123789-HxCDF	36.98	2.527e3	1.920e3	1.030	1.32	1.24	34.3	YES	NO	bb	bb	3.857

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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
38	234678-HxCDF	36.06	2.316e4	1.865e4	1.052	1.24	1.24	135.9	YES	NO	bb	bb	15.453
39	Total-hexafurans	35.68	2.873e3	2.472e3	1.045	1.16	1.24	19.7	YES	NO	bb	bb	2.251
40	Total-hexafurans	35.47	3.212e3	2.542e3	1.045	1.26	1.24	26.4	YES	NO	db	db	2.423
41	Total-hexafurans	35.32	1.551e3	1.437e3	1.045	1.08	1.24	12.9	YES	NO	bd	bd	1.258
42	123678-HxCDF	35.13	3.547e4	3.016e4	1.037	1.18	1.24	286.2	YES	NO	db	db	23.119
43	123478-HxCDF	35.00	7.201e4	5.941e4	1.017	1.21	1.24	529.8	YES	NO	dd	dd	48.514
44	Total-hexafurans	34.82	2.475e4	2.067e4	1.045	1.20	1.24	194.1	YES	NO	bd	bd	19.129
45	Total-hexafurans	34.34	3.254e4	2.684e4	1.045	1.21	1.24	259.5	YES	NO	bb	bb	25.008
46	1234789-HpCDF	41.01	1.066e4	1.120e4	1.283	0.95	1.05	102.2	YES	NO	bb	bb	11.453
47	Total-heptafurans	39.44	8.450e4	7.954e4	1.305	1.06	1.05	945.5	YES	NO	bb	bb	77.819
48	Total-heptafurans	39.20	1.683e4	1.617e4	1.305	1.04	1.05	199.4	YES	NO	bb	bb	15.656
49	1234678-HpCDF	38.80	3.067e5	2.967e5	1.327	1.03	1.05	3518.7	YES	NO	bb	bb	260.816
50	OCDF	45.26	1.616e5	1.847e5	1.447	0.88	0.89	2104.4	YES	NO	bb	bb	246.932
51	Total-penta1	27.26	7.490e4	5.038e4		1.49	1.55	724.9	YES	NO	db	db	40.290
52	13468-PECDF	27.18	1.938e4	1.388e4	1.376	1.40	1.55	286.6	YES	NO	bd	bd	7.127

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-tetradioxins	26.02	5.741e3	7.528e3	0.879	0.76	0.77	29.8	YES	NO	bb	bb	8.814
2	Total-tetradioxins	25.56	7.005e2	8.940e2	0.879	0.78	0.77	4.4	YES	NO	bb	db	1.059
3	Total-tetradioxins	25.00	3.104e3	3.603e3	0.879	0.86	0.77	17.7	YES	NO	bb	bb	4.456
4	Total-tetradioxins	24.70	1.593e3	2.353e3	0.879	0.68	0.77	9.2	YES	NO	bb	db	2.622
5	Total-tetradioxins	23.78	5.057e3	6.857e3	0.879	0.74	0.77	30.8	YES	NO	bb	bd	7.915
6	1368-TCDD	23.51	3.695e3	4.288e3	0.923	0.86	0.77	24.1	YES	NO	bb	bb	5.050
7	Total-tetradioxins	26.89	2.753e3	3.552e3	0.879	0.77	0.77	19.0	YES	NO	bb	bd	4.188
8	2378-TCDD	26.41	2.027e4	2.507e4	0.920	0.81	0.77	103.0	YES	NO	bd	bd	28.779

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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	31.98	3.676e3	2.409e3	1.154	1.53	1.55	40.1	YES	NO	bb	bb	2.457
2	12378-PeCDD	31.55	1.026e4	6.040e3	0.995	1.70	1.55	73.5	YES	NO	bb	bb	7.629
3	Total-pentadioxins	30.85	6.856e3	4.168e3	1.331	1.64	1.55	56.9	YES	NO	bb	bb	3.858
4	Total-pentadioxins	30.30	1.302e4	9.059e3	1.331	1.44	1.55	136.5	YES	NO	bb	MM	7.728
5	Total-pentadioxins	30.15	5.998e3	4.059e3	1.331	1.48	1.55	62.7	YES	NO	bb	bd	3.520
6	Total-pentadioxins	29.94	1.525e4	9.578e3	1.331	1.59	1.55	151.7	YES	NO	bb	bb	8.690
7	Total-pentadioxins	29.42	1.698e3	1.020e3	1.331	1.66	1.55	24.7	YES	NO	bb	bb	0.951
8	Total-pentadioxins	29.00	2.742e4	1.680e4	1.331	1.63	1.55	176.8	YES	NO	bb	dd	15.475

HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123789-HxCDD	36.68	1.402e4	1.188e4	0.950	1.18	1.24	168.8	YES	NO	bb	bb	11.988
2	Total-hexadioxins	36.46	7.299e3	6.228e3	1.028	1.17	1.24	85.1	YES	NO	bb	bb	5.791
3	123678-HxCDD	36.28	1.899e4	1.526e4	1.009	1.24	1.24	213.0	YES	NO	db	db	14.709
4	123478-HxCDD	36.16	8.744e3	6.862e3	1.027	1.27	1.24	98.8	YES	NO	bd	bd	6.790
5	Total-hexadioxins	35.23	7.634e4	6.533e4	1.028	1.17	1.24	564.9	YES	NO	bd	bd	60.650
6	Total-hexadioxins	34.86	4.823e4	3.867e4	1.028	1.25	1.24	552.0	YES	NO	bb	bb	37.200
7	124679-HXCDD	34.08	4.506e4	3.771e4	1.125	1.19	1.24	540.4	YES	NO	bb	bb	32.890

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDD	40.28	1.652e5	1.545e5	1.068	1.07	1.05	1488.7	YES	NO	bb	bb	225.867
2	1234679-HPCDD	39.24	1.992e5	1.857e5	1.211	1.07	1.05	1930.1	YES	NO	bb	bb	239.873

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:25:19 Pacific Daylight Time

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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	26.02	5.741e3	7.528e3	0.879	0.76	0.77	29.8	YES	NO	bb	bb	8.814
2	Total-tetradioxins	25.56	7.005e2	8.940e2	0.879	0.78	0.77	4.4	YES	NO	bb	db	1.059
3	Total-tetradioxins	25.00	3.104e3	3.603e3	0.879	0.86	0.77	17.7	YES	NO	bb	bb	4.456
4	Total-tetradioxins	24.70	1.593e3	2.353e3	0.879	0.68	0.77	9.2	YES	NO	bb	db	2.622
5	Total-tetradioxins	23.78	5.057e3	6.857e3	0.879	0.74	0.77	30.8	YES	NO	bb	bd	7.915
6	1368-TCDD	23.51	3.695e3	4.288e3	0.923	0.86	0.77	24.1	YES	NO	bb	bb	5.050
7	Total-tetradioxins	26.89	2.753e3	3.552e3	0.879	0.77	0.77	19.0	YES	NO	bb	bd	4.188
8	2378-TCDD	26.41	2.027e4	2.507e4	0.920	0.81	0.77	103.0	YES	NO	bd	bd	28.779
9	12389-PECDD	31.98	3.676e3	2.409e3	1.154	1.53	1.55	40.1	YES	NO	bb	bb	2.457
10	12378-PeCDD	31.55	1.026e4	6.040e3	0.995	1.70	1.55	73.5	YES	NO	bb	bb	7.629
11	Total-pentadioxins	30.85	6.856e3	4.168e3	1.331	1.64	1.55	56.9	YES	NO	bb	bb	3.858
12	Total-pentadioxins	30.30	1.302e4	9.059e3	1.331	1.44	1.55	136.5	YES	NO	bb	MM	7.728
13	Total-pentadioxins	30.15	5.998e3	4.059e3	1.331	1.48	1.55	62.7	YES	NO	bb	bd	3.520
14	Total-pentadioxins	29.94	1.525e4	9.578e3	1.331	1.59	1.55	151.7	YES	NO	bb	bb	8.690
15	Total-pentadioxins	29.42	1.698e3	1.020e3	1.331	1.66	1.55	24.7	YES	NO	bb	bb	0.951
16	Total-pentadioxins	29.00	2.742e4	1.680e4	1.331	1.63	1.55	176.8	YES	NO	bb	dd	15.475
17	123789-HxCDD	36.68	1.402e4	1.188e4	0.950	1.18	1.24	168.8	YES	NO	bb	bb	11.988
18	Total-hexadioxins	36.46	7.299e3	6.228e3	1.028	1.17	1.24	85.1	YES	NO	bb	bb	5.791
19	123678-HxCDD	36.28	1.899e4	1.526e4	1.009	1.24	1.24	213.0	YES	NO	db	db	14.709
20	123478-HxCDD	36.16	8.744e3	6.862e3	1.027	1.27	1.24	98.8	YES	NO	bd	bd	6.790
21	Total-hexadioxins	35.23	7.634e4	6.533e4	1.028	1.17	1.24	564.9	YES	NO	bd	bd	60.650
22	Total-hexadioxins	34.86	4.823e4	3.867e4	1.028	1.25	1.24	552.0	YES	NO	bb	bb	37.200
23	124679-HXCDD	34.08	4.506e4	3.771e4	1.125	1.19	1.24	540.4	YES	NO	bb	bb	32.890
24	1234678-HpCDD	40.28	1.652e5	1.545e5	1.068	1.07	1.05	1488.7	YES	NO	bb	bb	225.867
25	1234679-HPCDD	39.24	1.992e5	1.857e5	1.211	1.07	1.05	1930.1	YES	NO	bb	bb	239.873
26	OCDD	45.03	7.382e5	8.234e5	1.181	0.90	0.89	5350.3	YES	NO	bb	bb	1364.5...

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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	23.51	6.003e3	8.585e3	1.192	0.70	0.77	46.8	YES	NO	dd	dd	7.661
2	Total-tetrafurans	23.10	1.407e4	1.691e4	1.192	0.83	0.77	93.9	YES	NO	bd	bd	16.265
3	Total-tetrafurans	22.53	5.680e3	7.691e3	1.192	0.74	0.77	49.4	YES	NO	bb	db	7.022
4	1368-TCDF	22.27	2.478e3	3.094e3	1.425	0.80	0.77	18.2	YES	NO	dd	dd	2.447
5	Total-tetrafurans	25.90	1.006e4	1.317e4	1.192	0.76	0.77	66.2	YES	NO	dd	dd	12.197
6	2378-TCDF	25.76	8.093e3	1.116e4	1.108	0.73	0.77	48.6	YES	NO	dd	dd	10.878
7	Total-tetrafurans	25.58	2.260e4	3.076e4	1.192	0.73	0.77	123.3	YES	NO	dd	dd	28.021
8	Total-tetrafurans	25.25	1.134e4	1.538e4	1.192	0.74	0.77	79.3	YES	NO	bd	bd	14.035
9	Total-tetrafurans	24.82	8.406e3	9.897e3	1.192	0.85	0.77	56.5	YES	NO	bb	db	9.612
10	Total-tetrafurans	24.64	9.164e3	1.288e4	1.192	0.71	0.77	62.4	YES	NO	db	dd	11.576
11	Total-tetrafurans	24.51	9.628e3	1.119e4	1.192	0.86	0.77	73.6	YES	NO	dd	dd	10.932
12	Total-tetrafurans	24.42	1.250e4	1.507e4	1.192	0.83	0.77	105.8	YES	NO	bd	bd	14.478
13	Total-tetrafurans	23.98	4.761e3	5.759e3	1.192	0.83	0.77	32.7	YES	NO	dd	db	5.525
14	Total-tetrafurans	23.84	6.722e3	8.622e3	1.192	0.78	0.77	45.8	YES	NO	dd	dd	8.058
15	Total-tetrafurans	23.73	5.352e3	6.761e3	1.192	0.79	0.77	42.3	YES	NO	dd	dd	6.362
16	Total-Furans	27.62	4.169e2	5.260e2	1.158	0.79	0.77	2.5	NO	NO	bb	bb	0.510
17	Total-tetrafurans	26.77	6.617e2	7.890e2	1.192	0.84	0.77	4.3	YES	NO	bd	bb	0.762
18	Total-tetrafurans	26.09	1.874e3	2.161e3	1.192	0.87	0.77	15.3	YES	NO	db	db	2.119
19	Total-tetrafurans	25.99	1.156e4	1.603e4	1.192	0.72	0.77	82.2	YES	NO	dd	dd	14.487
20	Total-pentafurans	31.02	2.416e4	1.497e4	1.047	1.61	1.55	156.1	YES	NO	bd	bd	11.244
21	Total-pentafurans	30.76	1.529e3	1.137e3	1.047	1.34	1.55	8.9	YES	NO	bb	bb	0.766
22	Total-pentafurans	30.24	7.691e3	5.126e3	1.047	1.50	1.55	56.6	YES	NO	db	db	3.683
23	Total-pentafurans	30.13	1.786e4	1.152e4	1.047	1.55	1.55	124.7	YES	NO	bd	bd	8.443
24	12378-PeCDF	29.95	2.454e4	1.569e4	1.015	1.56	1.55	163.0	YES	NO	bb	bb	11.690
25	Total-pentafurans	29.58	5.573e4	3.726e4	1.047	1.50	1.55	313.1	YES	NO	db	db	26.717
26	Total-pentafurans	29.35	7.522e2	5.486e2	1.047	1.37	1.55	6.6	YES	NO	bb	bb	0.374
27	Total-pentafurans	29.05	3.468e4	2.324e4	1.047	1.49	1.55	274.2	YES	NO	db	db	16.640
28	Total-pentafurans	28.98	6.490e4	4.363e4	1.047	1.49	1.55	355.2	YES	NO	dd	dd	31.182
29	Total-pentafurans	28.73	1.665e4	1.135e4	1.047	1.47	1.55	106.8	YES	NO	bd	bd	8.045
30	12389-PECDF	32.33	1.705e3	1.230e3	1.000	1.39	1.55	10.6	YES	NO	db	db	0.866
31	23478-PeCDF	31.30	2.219e4	1.561e4	1.126	1.42	1.55	139.4	YES	NO	db	db	10.303
32	Total-pentafurans	31.12	6.888e3	4.451e3	1.047	1.55	1.55	49.1	YES	NO	dd	dd	3.258
33	Total-hexafurans	34.03	5.773e3	4.905e3	1.045	1.18	1.24	47.3	YES	NO	bb	bb	4.497
34	Total-hexafurans	33.78	2.891e3	2.212e3	1.045	1.31	1.24	23.7	YES	NO	bb	bb	2.149
35	Total-hexafurans	33.50	1.467e5	1.206e5	1.045	1.22	1.24	828.8	YES	NO	db	db	112.599
36	123468-HXCDF	33.30	3.755e4	3.152e4	1.087	1.19	1.24	297.7	YES	NO	bd	bd	23.863
37	123789-HxCDF	36.98	2.527e3	1.920e3	1.030	1.32	1.24	34.3	YES	NO	bb	bb	3.857

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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	234678-HxCDF	36.06	2.316e4	1.865e4	1.052	1.24	1.24	135.9	YES	NO	bb	bb	15.453
39	Total-hexafurans	35.68	2.873e3	2.472e3	1.045	1.16	1.24	19.7	YES	NO	bb	bb	2.251
40	Total-hexafurans	35.47	3.212e3	2.542e3	1.045	1.26	1.24	26.4	YES	NO	db	db	2.423
41	Total-hexafurans	35.32	1.551e3	1.437e3	1.045	1.08	1.24	12.9	YES	NO	bd	bd	1.258
42	123678-HxCDF	35.13	3.547e4	3.016e4	1.037	1.18	1.24	286.2	YES	NO	db	db	23.119
43	123478-HxCDF	35.00	7.201e4	5.941e4	1.017	1.21	1.24	529.8	YES	NO	dd	dd	48.514
44	Total-hexafurans	34.82	2.475e4	2.067e4	1.045	1.20	1.24	194.1	YES	NO	bd	bd	19.129
45	Total-hexafurans	34.34	3.254e4	2.684e4	1.045	1.21	1.24	259.5	YES	NO	bb	bb	25.008
46	1234789-HpCDF	41.01	1.066e4	1.120e4	1.283	0.95	1.05	102.2	YES	NO	bb	bb	11.453
47	Total-heptafurans	39.44	8.450e4	7.954e4	1.305	1.06	1.05	945.5	YES	NO	bb	bb	77.819
48	Total-heptafurans	39.20	1.683e4	1.617e4	1.305	1.04	1.05	199.4	YES	NO	bb	bb	15.656
49	1234678-HpCDF	38.80	3.067e5	2.967e5	1.327	1.03	1.05	3518.7	YES	NO	bb	bb	260.816
50	OCDF	45.26	1.616e5	1.847e5	1.447	0.88	0.89	2104.4	YES	NO	bb	bb	246.932
51	Total-penta1	27.26	7.490e4	5.038e4		1.49	1.55	724.9	YES	NO	db	db	40.290
52	13468-PECDF	27.18	1.938e4	1.388e4	1.376	1.40	1.55	286.6	YES	NO	bd	bd	7.127
53	Total-tetradioxins	26.02	5.741e3	7.528e3	0.879	0.76	0.77	29.8	YES	NO	bb	bb	8.814
54	Total-tetradioxins	25.56	7.005e2	8.940e2	0.879	0.78	0.77	4.4	YES	NO	bb	db	1.059
55	Total-tetradioxins	25.00	3.104e3	3.603e3	0.879	0.86	0.77	17.7	YES	NO	bb	bb	4.456
56	Total-tetradioxins	24.70	1.593e3	2.353e3	0.879	0.68	0.77	9.2	YES	NO	bb	db	2.622
57	Total-tetradioxins	23.78	5.057e3	6.857e3	0.879	0.74	0.77	30.8	YES	NO	bb	bd	7.915
58	1368-TCDD	23.51	3.695e3	4.288e3	0.923	0.86	0.77	24.1	YES	NO	bb	bb	5.050
59	Total-tetradioxins	26.89	2.753e3	3.552e3	0.879	0.77	0.77	19.0	YES	NO	bb	bd	4.188
60	2378-TCDD	26.41	2.027e4	2.507e4	0.920	0.81	0.77	103.0	YES	NO	bd	bd	28.779
61	12389-PECDD	31.98	3.676e3	2.409e3	1.154	1.53	1.55	40.1	YES	NO	bb	bb	2.457
62	12378-PeCDD	31.55	1.026e4	6.040e3	0.995	1.70	1.55	73.5	YES	NO	bb	bb	7.629
63	Total-pentadioxins	30.85	6.856e3	4.168e3	1.331	1.64	1.55	56.9	YES	NO	bb	bb	3.858
64	Total-pentadioxins	30.30	1.302e4	9.059e3	1.331	1.44	1.55	136.5	YES	NO	bb	MM	7.728
65	Total-pentadioxins	30.15	5.998e3	4.059e3	1.331	1.48	1.55	62.7	YES	NO	bb	bd	3.520
66	Total-pentadioxins	29.94	1.525e4	9.578e3	1.331	1.59	1.55	151.7	YES	NO	bb	bb	8.690
67	Total-pentadioxins	29.42	1.698e3	1.020e3	1.331	1.66	1.55	24.7	YES	NO	bb	bb	0.951
68	Total-pentadioxins	29.00	2.742e4	1.680e4	1.331	1.63	1.55	176.8	YES	NO	bb	dd	15.475
69	123789-HxCDD	36.68	1.402e4	1.188e4	0.950	1.18	1.24	168.8	YES	NO	bb	bb	11.988
70	Total-hexadioxins	36.46	7.299e3	6.228e3	1.028	1.17	1.24	85.1	YES	NO	bb	bb	5.791
71	123678-HxCDD	36.28	1.899e4	1.526e4	1.009	1.24	1.24	213.0	YES	NO	db	db	14.709
72	123478-HxCDD	36.16	8.744e3	6.862e3	1.027	1.27	1.24	98.8	YES	NO	bd	bd	6.790
73	Total-hexadioxins	35.23	7.634e4	6.533e4	1.028	1.17	1.24	564.9	YES	NO	bd	bd	60.650
74	Total-hexadioxins	34.86	4.823e4	3.867e4	1.028	1.25	1.24	552.0	YES	NO	bb	bb	37.200

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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
75	124679-HXCDD	34.08	4.506e4	3.771e4	1.125	1.19	1.24	540.4	YES	NO	bb	bb	32.890
76	1234678-HpCDD	40.28	1.652e5	1.545e5	1.068	1.07	1.05	1488.7	YES	NO	bb	bb	225.867
77	1234679-HPCDD	39.24	1.992e5	1.857e5	1.211	1.07	1.05	1930.1	YES	NO	bb	bb	239.873
78	OCDD	45.03	7.382e5	8.234e5	1.181	0.90	0.89	5350.3	YES	NO	bb	bb	1364.5...

PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 PFK	27.41	1.334e6					12.7	YES		bb		
2	FUNCTION1 PFK	27.21	2.330e6					18.3	YES		bb		
3	FUNCTION1 PFK	27.03	4.517e6					18.4	YES		bb		
4	FUNCTION1 PFK	23.52	4.707e5					7.7	YES		bb		
5	FUNCTION1 PFK	22.78	1.218e6					12.4	YES		bb		
6	FUNCTION1 PFK	22.63	9.058e5					15.4	YES		bb		
7	FUNCTION1 PFK	22.45	1.591e5					4.2	YES		bb		
8	FUNCTION1 PFK	21.94	1.857e6					20.7	YES		bb		
9	FUNCTION1 PFK	21.77	1.660e6					19.2	YES		bb		
10	FUNCTION1 PFK	21.39	6.706e5					11.6	YES		bb		

PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 PFK	32.60	2.302e5					0.0	NO		bb		0.000
2	FUNCTION2 PFK	32.37	2.606e6					40.7	YES		db		0.000
3	FUNCTION2 PFK	32.26	1.231e6					38.0	YES		dd		0.000
4	FUNCTION2 PFK	32.17	4.836e5					24.4	YES		bd		0.000
5	FUNCTION2 PFK	29.91	3.545e6					28.2	YES		db		0.000
6	FUNCTION2 PFK	29.65	2.972e6					51.5	YES		bd		0.000
7	FUNCTION2 PFK	29.23	3.911e6					51.0	YES		db		0.000
8	FUNCTION2 PFK	28.69	6.414e6					20.5	YES		bd		0.000
9	FUNCTION2 PFK	27.81	1.536e6					23.9	YES		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	33.47	1.151e6					26.2	YES		dd		0.000
2	FUNCTION3 PFK	33.29	2.208e6					27.5	YES		dd		0.000
3	FUNCTION3 PFK	33.09	3.106e6					25.2	YES		dd		0.000
4	FUNCTION3 PFK	32.93	1.083e6					20.0	YES		bd		0.000
5	FUNCTION3 PFK	32.79	9.035e5					15.3	YES		db		0.000
6	FUNCTION3 PFK	32.64	4.730e5					8.2	YES		bd		0.000
7	FUNCTION3 PFK	37.39	1.394e7					37.8	YES		db		0.000
8	FUNCTION3 PFK	37.04	1.844e6					51.4	YES		bd		0.000
9	FUNCTION3 PFK	36.46	1.611e7					34.1	YES		bb		0.000
10	FUNCTION3 PFK	35.65	3.979e5					5.7	YES		bb		0.000
11	FUNCTION3 PFK	35.16	3.650e5					6.1	YES		bb		0.000
12	FUNCTION3 PFK	34.88	1.699e6					10.0	YES		bb		0.000
13	FUNCTION3 PFK	34.50	1.186e6					7.6	YES		bb		0.000
14	FUNCTION3 PFK	34.13	2.758e5					8.4	YES		db		0.000
15	FUNCTION3 PFK	33.95	2.895e6					23.5	YES		bd		0.000
16	FUNCTION3 PFK	33.73	1.651e6					30.3	YES		db		0.000
17	FUNCTION3 PFK	33.69	1.315e6					31.4	YES		dd		0.000
18	FUNCTION3 PFK	33.62	2.888e6					30.4	YES		dd		0.000

PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 PFK	38.09	1.983e5					7.2	YES		dd		
2	FUNCTION4 PFK	38.05	6.366e5					8.0	YES		bd		
3	FUNCTION4 PFK	37.79	4.989e4					0.0	NO		bb		
4	FUNCTION4 PFK	42.19	4.716e4					1.5	NO		bb		
5	FUNCTION4 PFK	42.14	2.484e4					2.2	NO		bb		
6	FUNCTION4 PFK	41.44	6.144e4					2.8	NO		bb		
7	FUNCTION4 PFK	39.88	1.776e5					4.1	YES		bb		
8	FUNCTION4 PFK	39.72	4.133e4					1.6	NO		bb		
9	FUNCTION4 PFK	38.55	2.179e5					6.9	YES		bb		
10	FUNCTION4 PFK	38.21	9.602e4					3.5	YES		db		

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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	44.18	1.036e4					1.7	NO		bb		
2	FUNCTION5 PFK	43.90	5.108e4					1.7	NO		bb		
3	FUNCTION5 PFK	43.78	3.988e3					0.9	NO		bb		
4	FUNCTION5 PFK	43.74	5.727e3					0.7	NO		bb		
5	FUNCTION5 PFK	43.26	1.570e3					0.6	NO		bb		
6	FUNCTION5 PFK	42.99	3.515e3					1.3	NO		bb		
7	FUNCTION5 PFK	42.90	8.901e3					1.8	NO		bb		
8	FUNCTION5 PFK	42.86	5.898e3					1.1	NO		bb		
9	FUNCTION5 PFK	45.88	1.202e4					1.5	NO		bb		
10	FUNCTION5 PFK	45.82	1.480e3					0.5	NO		bb		
11	FUNCTION5 PFK	45.73	7.126e3					0.9	NO		bb		
12	FUNCTION5 PFK	45.45	9.754e3					1.5	NO		bb		
13	FUNCTION5 PFK	45.26	1.009e4					1.3	NO		bb		
14	FUNCTION5 PFK	45.04	7.952e3					1.1	NO		bb		
15	FUNCTION5 PFK	44.86	1.192e4					1.4	NO		bb		
16	FUNCTION5 PFK	44.80	5.782e4					3.0	YES		bb		
17	FUNCTION5 PFK	44.22	4.759e3					0.8	NO		bb		

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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...	21.92	7.273e1					1.7	NO		db		0.000
2	FUNCTION1 HXCD...	21.88	2.407e2					3.3	YES		bd		0.000
3	FUNCTION1 HXCD...	21.63	2.100e2					1.7	NO		db		0.000
4	FUNCTION1 HXCD...	21.39	5.640e2					3.5	YES		dd		0.000
5	FUNCTION1 HXCD...	21.35	2.761e2					2.7	NO		dd		0.000
6	FUNCTION1 HXCD...	21.19	4.014e2					1.6	NO		bd		0.000
7	FUNCTION1 HXCD...	25.58	1.135e2					1.5	NO		dd		0.000
8	FUNCTION1 HXCD...	25.52	1.215e2					2.1	NO		bd		0.000
9	FUNCTION1 HXCD...	25.05	2.587e2					3.3	YES		db		0.000
10	FUNCTION1 HXCD...	24.91	7.597e1					1.1	NO		bd		0.000
11	FUNCTION1 HXCD...	24.78	1.391e3					11.5	YES		db		0.000
12	FUNCTION1 HXCD...	24.58	3.121e2					2.5	NO		bd		0.000
13	FUNCTION1 HXCD...	24.19	1.718e2					1.8	NO		db		0.000
14	FUNCTION1 HXCD...	24.01	5.130e2					5.2	YES		dd		0.000
15	FUNCTION1 HXCD...	23.92	9.744e1					1.4	NO		bd		0.000
16	FUNCTION1 HXCD...	23.70	3.138e3					32.0	YES		db		0.000
17	FUNCTION1 HXCD...	23.55	6.559e3					70.6	YES		bd		0.000
18	FUNCTION1 HXCD...	23.43	2.502e2					1.8	NO		bb		0.000
19	FUNCTION1 HXCD...	22.71	3.112e2					3.2	YES		bb		0.000
20	FUNCTION1 HXCD...	22.42	4.269e2					2.9	NO		db		0.000
21	FUNCTION1 HXCD...	22.27	3.057e3					26.4	YES		dd		0.000
22	FUNCTION1 HXCD...	22.12	6.533e3					64.8	YES		bd		0.000
23	FUNCTION1 HXCD...	27.61	1.800e2					1.9	NO		bb		0.000
24	FUNCTION1 HXCD...	27.08	1.412e2					1.8	NO		db		0.000
25	FUNCTION1 HXCD...	27.00	2.252e2					2.9	NO		dd		0.000
26	FUNCTION1 HXCD...	26.92	7.263e1					1.2	NO		bd		0.000
27	FUNCTION1 HXCD...	26.76	1.095e3					10.5	YES		bb		0.000
28	FUNCTION1 HXCD...	26.08	3.423e3					28.3	YES		bb		0.000
29	FUNCTION1 HXCD...	25.72	1.427e3					16.0	YES		db		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...	23.43	3.681e2					5.6	YES		db		0.000
2	FUNCTION1 HPCD...	23.30	1.023e4					105.8	YES		bd		0.000
3	FUNCTION1 HPCD...	22.99	7.336e2					6.5	YES		bb		0.000
4	FUNCTION1 HPCD...	22.39	2.651e2					2.7	NO		db		0.000
5	FUNCTION1 HPCD...	22.27	2.705e3					27.0	YES		bd		0.000
6	FUNCTION1 HPCD...	22.00	5.402e3					54.9	YES		db		0.000
7	FUNCTION1 HPCD...	21.88	2.109e2					2.9	NO		bd		0.000
8	FUNCTION1 HPCD...	21.30	2.144e2					2.9	NO		bb		0.000
9	FUNCTION1 HPCD...	27.17	1.666e2					1.2	NO		bb		0.000
10	FUNCTION1 HPCD...	26.17	1.611e2					2.0	NO		bb		0.000
11	FUNCTION1 HPCD...	25.88	1.758e2					2.1	NO		bb		0.000
12	FUNCTION1 HPCD...	25.05	8.669e1					1.4	NO		bb		0.000
13	FUNCTION1 HPCD...	24.66	1.252e2					2.2	NO		db		0.000
14	FUNCTION1 HPCD...	24.57	9.264e1					1.2	NO		dd		0.000
15	FUNCTION1 HPCD...	24.46	1.644e2					1.3	NO		bd		0.000
16	FUNCTION1 HPCD...	24.01	2.095e2					2.5	NO		bb		0.000
17	FUNCTION1 HPCD...	23.84	9.900e1					1.2	NO		db		0.000
18	FUNCTION1 HPCD...	23.76	2.186e2					3.0	YES		bd		0.000
19	FUNCTION1 HPCD...	23.55	4.708e2					4.3	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...	32.17	3.392e2					12.0	YES		bd		0.000
2	FUNCTION2 HPCD...	31.09	1.958e2					4.9	YES		bb		0.000
3	FUNCTION2 HPCD...	28.99	1.841e3					35.4	YES		bb		0.000
4	FUNCTION2 HPCD...	27.88	8.502e2					15.4	YES		bb		0.000
5	FUNCTION2 HPCD...	32.41	1.056e2					4.9	YES		bb		0.000
6	FUNCTION2 HPCD...	32.21	3.288e2					8.7	YES		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	34.17	3.005e2					6.7	YES		bb		0.000
2	FUNCTION3 OCDPE	33.08	4.706e2					8.0	YES		bb		0.000
3	FUNCTION3 OCDPE	32.80	8.827e1					2.2	NO		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	42.63	1.202e2					2.0	NO		bb		0.000
2	FUNCTION4 NCDPE	41.66	8.491e1					2.2	NO		bb		0.000
3	FUNCTION4 NCDPE	40.77	9.160e1					2.0	NO		bb		0.000
4	FUNCTION4 NCDPE	40.12	1.557e2					3.2	YES		bb		0.000
5	FUNCTION4 NCDPE	38.40	4.201e2					7.7	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	45.02	1.007e2					3.8	YES		bb		0.000
2	FUNCTION5 DCDPE	43.07	1.481e2					1.4	NO		bb		0.000

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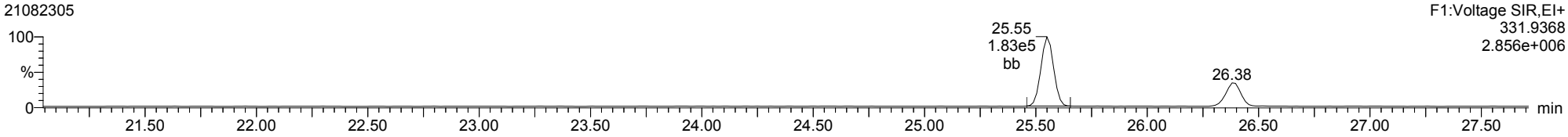

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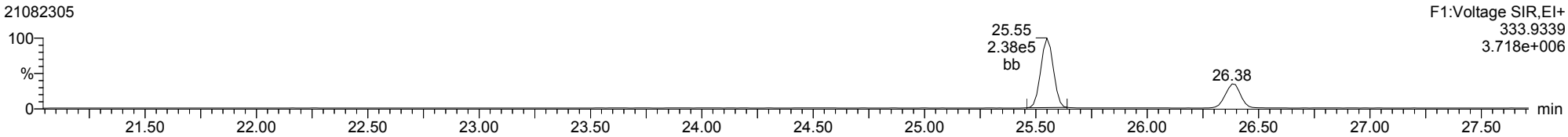
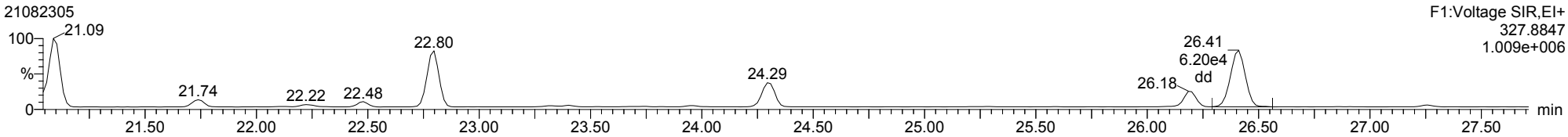


37CL-2378-TCDD



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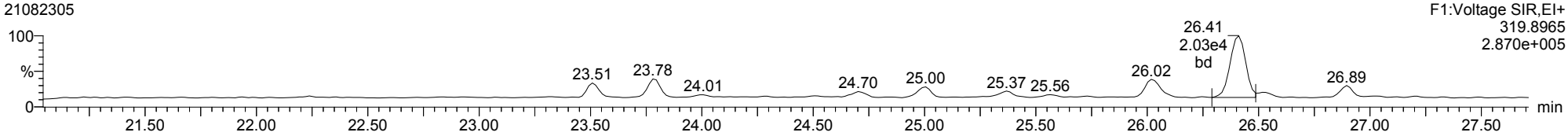

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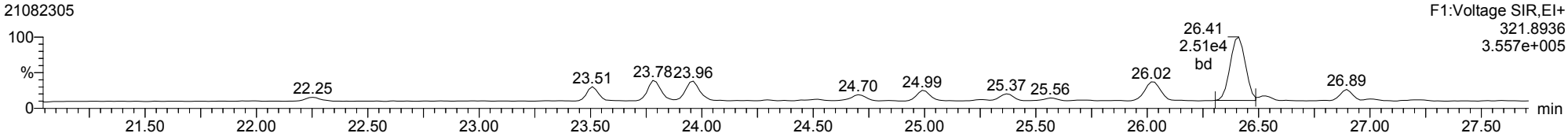

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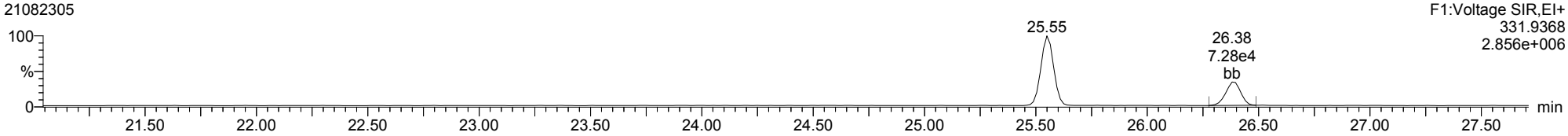

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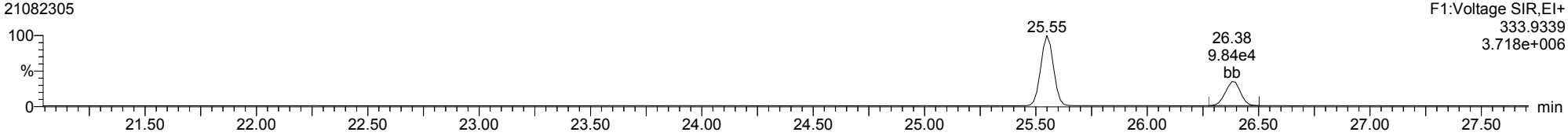

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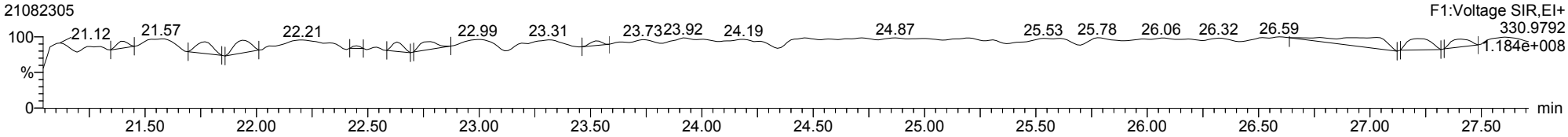

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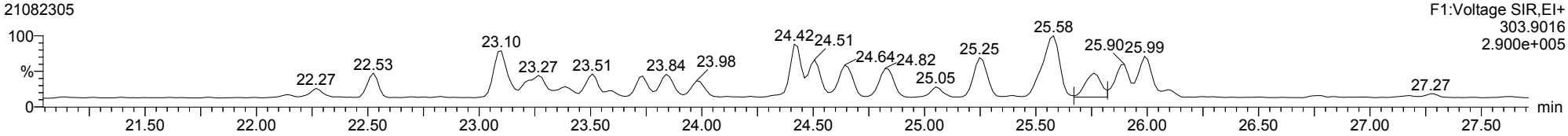
2378-TCDF



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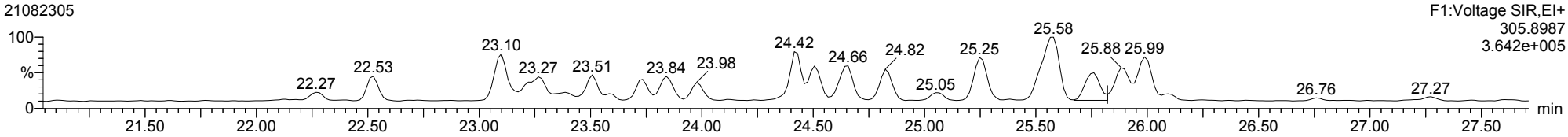

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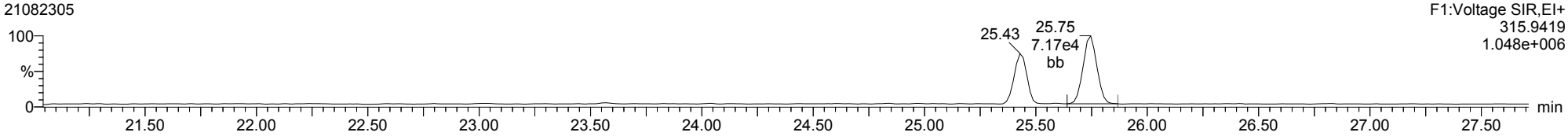

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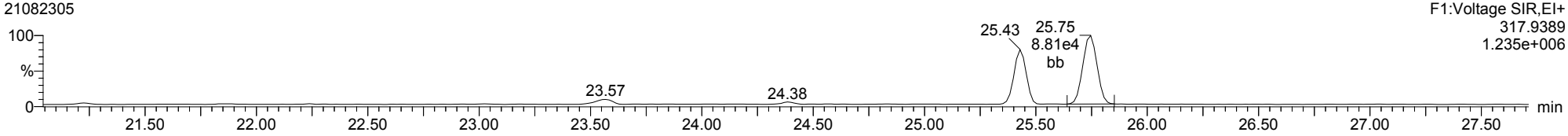

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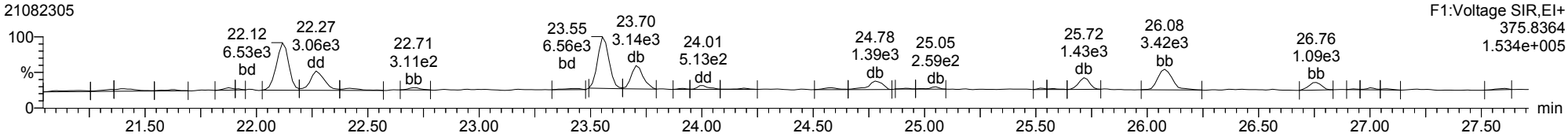

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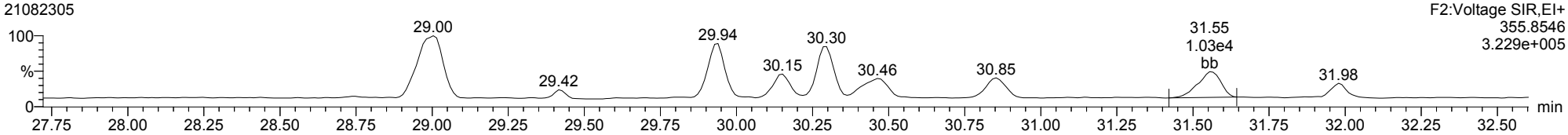
12378-PeCDD



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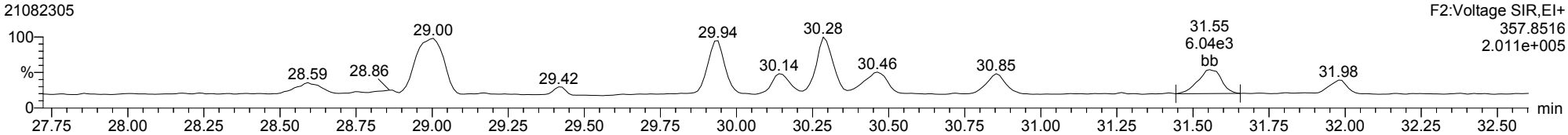

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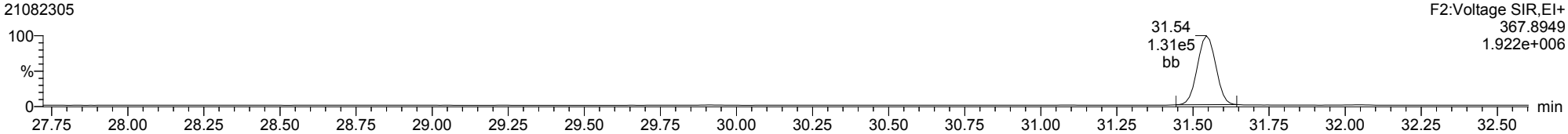

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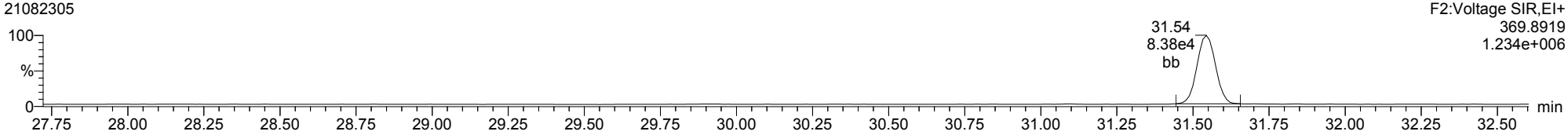
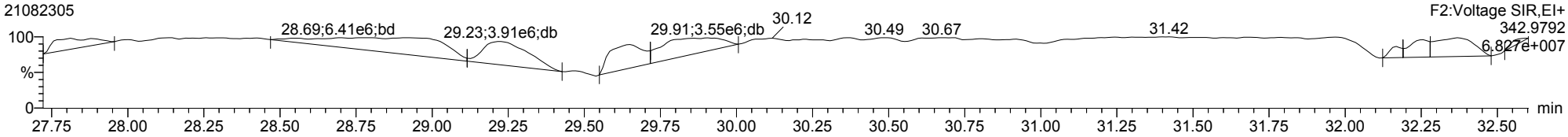


FUNCTION2 PFK



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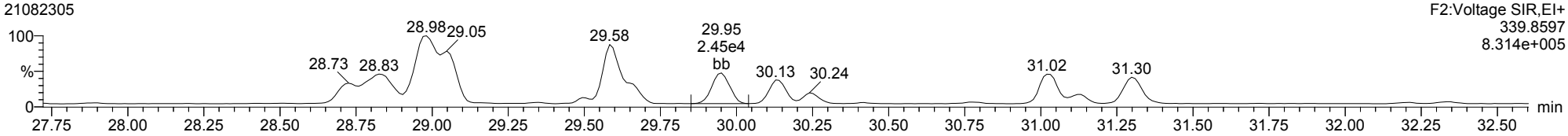
12378-PeCDF



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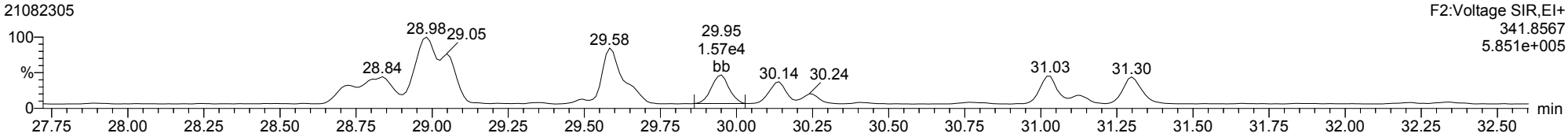

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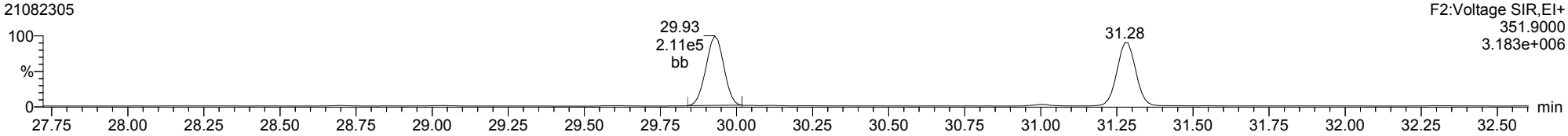

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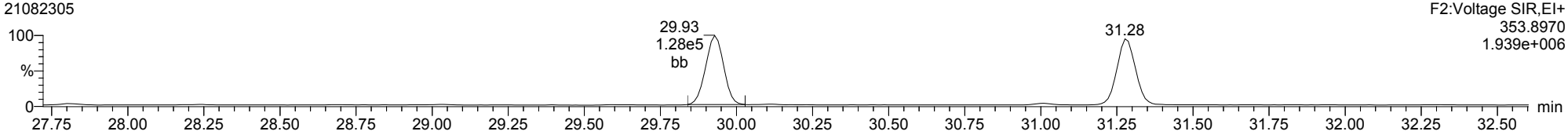
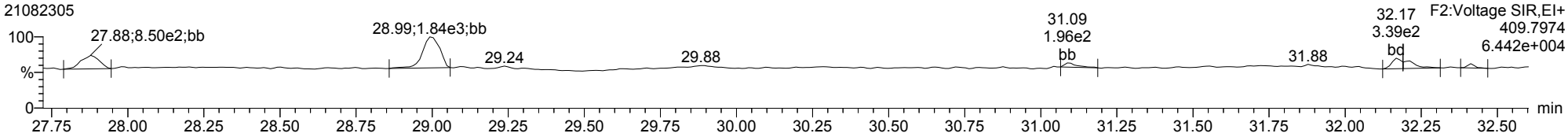


FUNCTION2 HPCDPE



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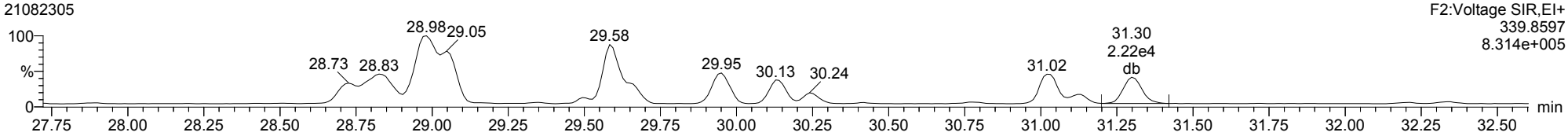
23478-PeCDF



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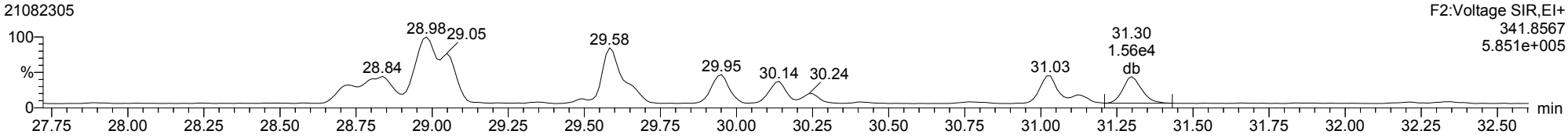

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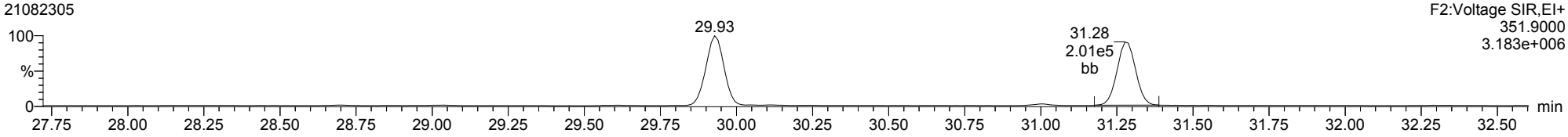

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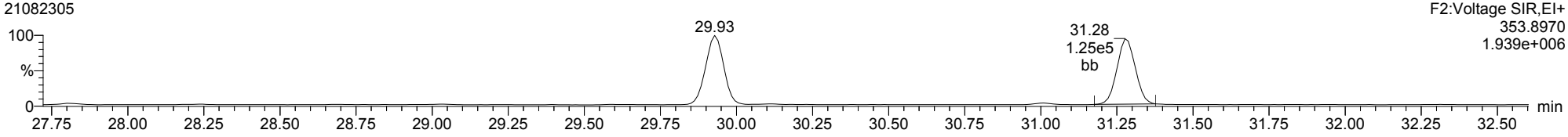

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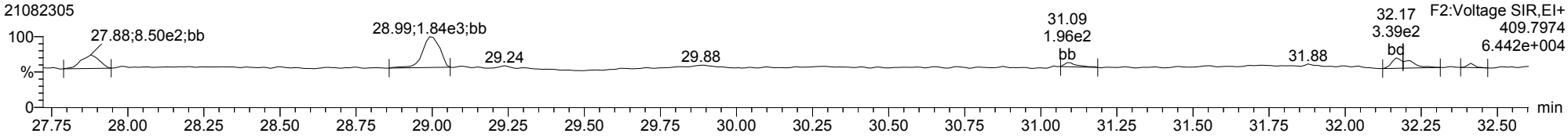

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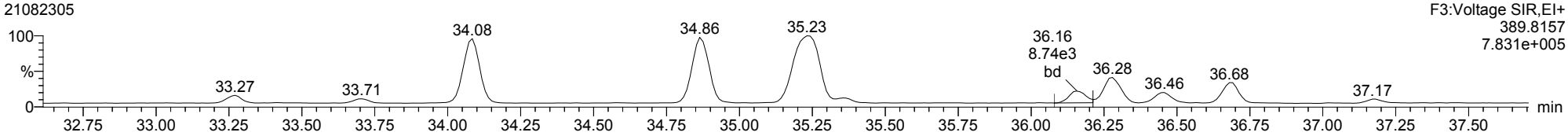

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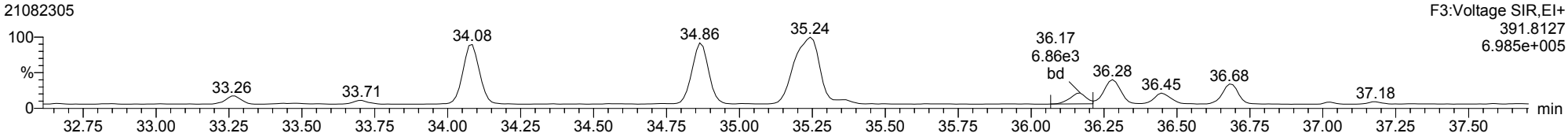

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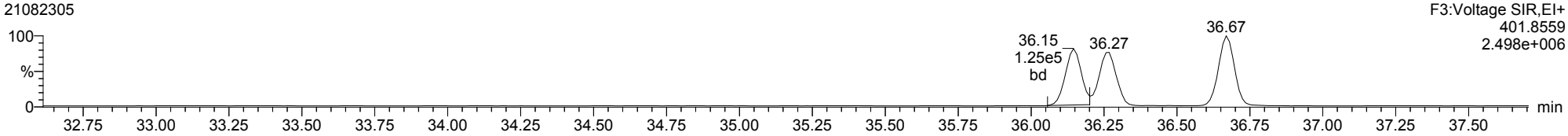

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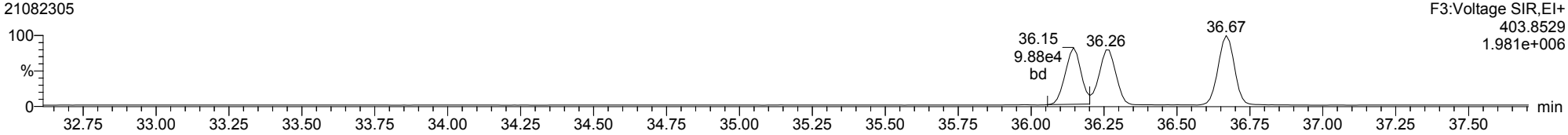
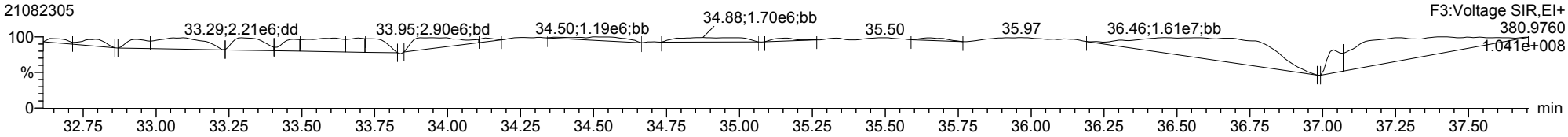


FUNCTION3 PFK



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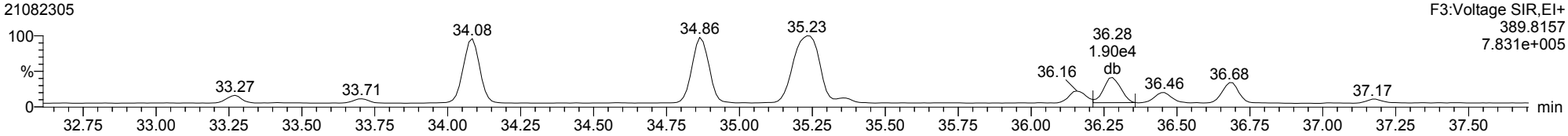
123678-HxCDD



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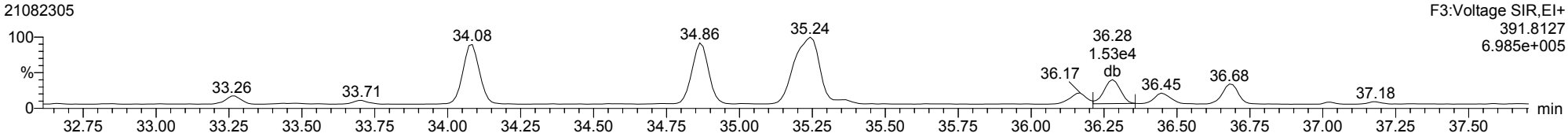

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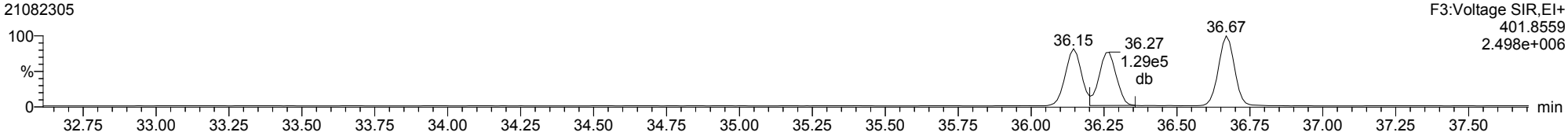

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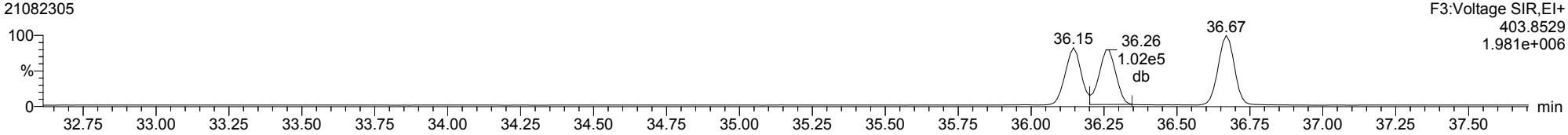

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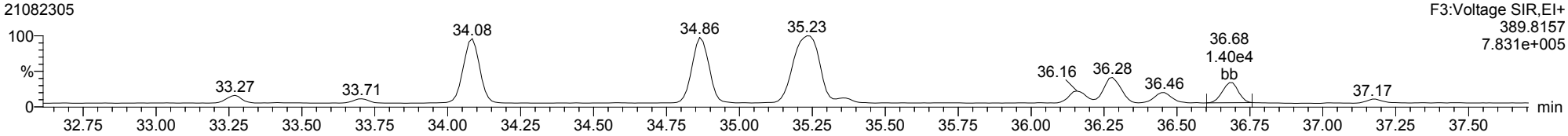
123789-HxCDD



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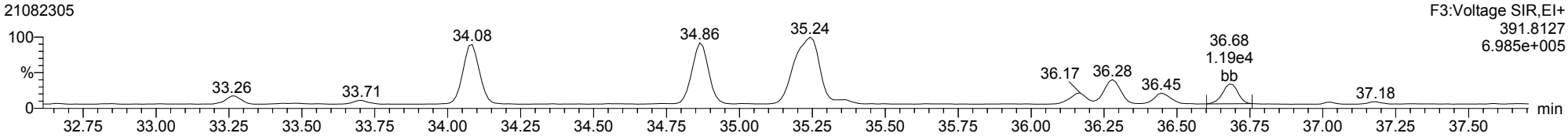

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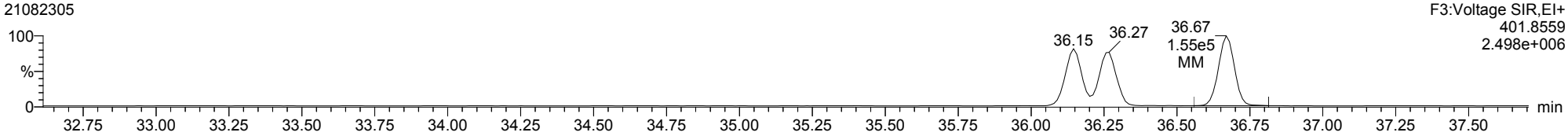

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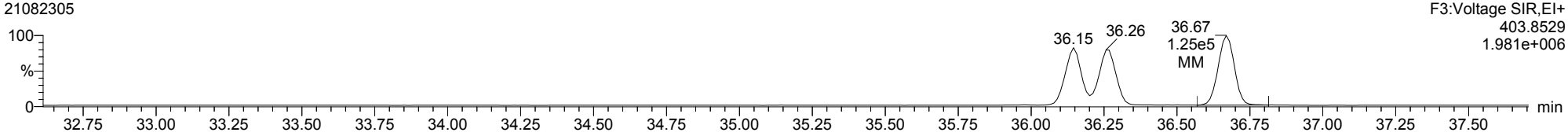

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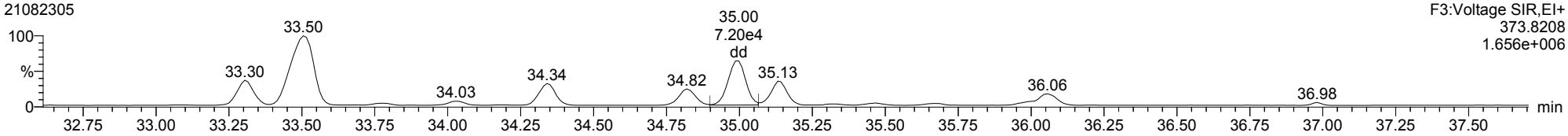

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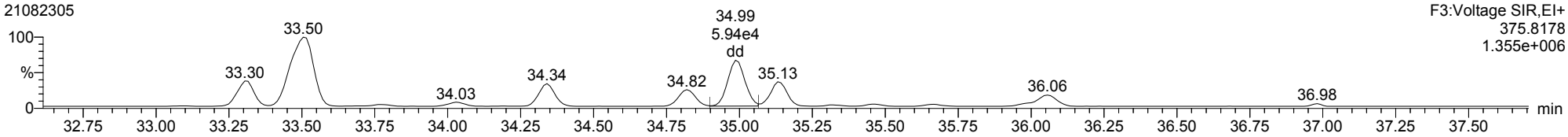

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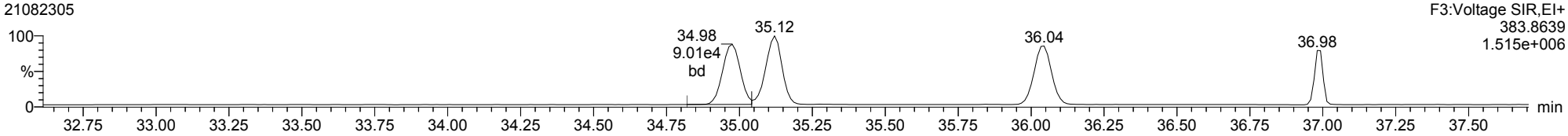

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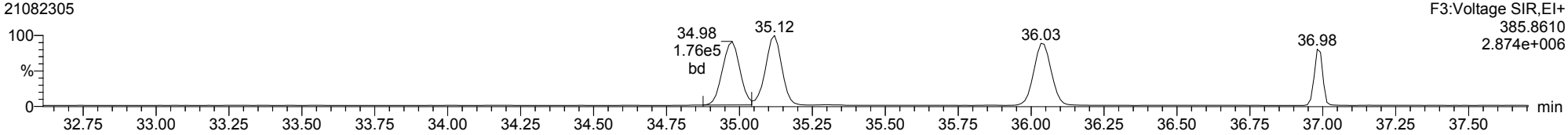
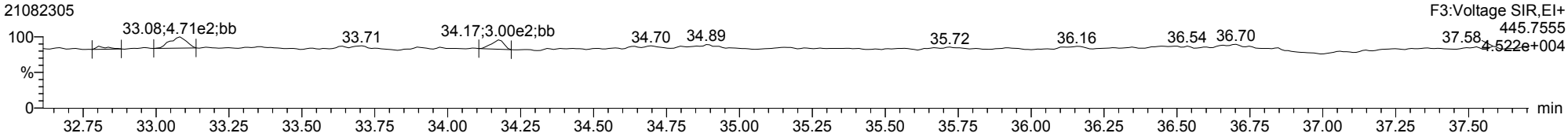


FUNCTION3 OCDPE



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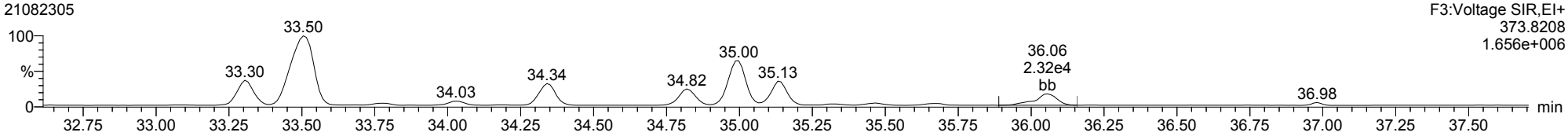
234678-HxCDF



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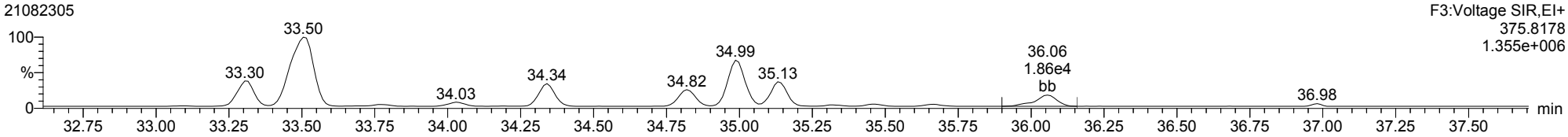

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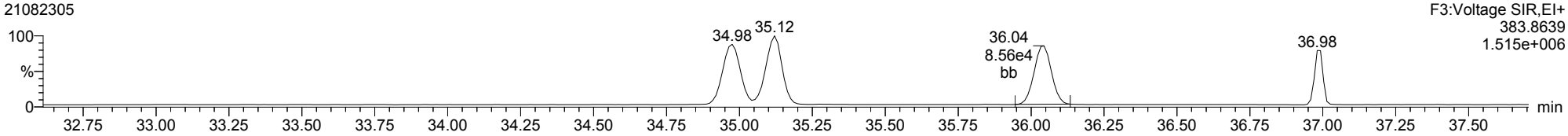

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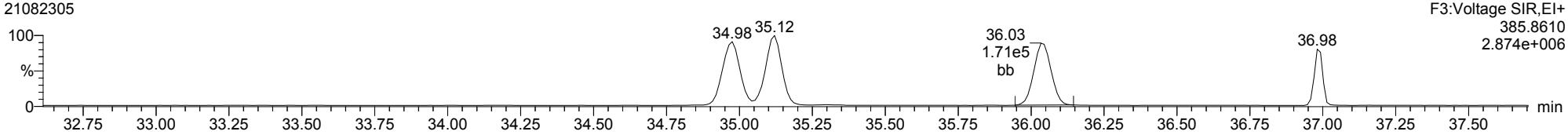
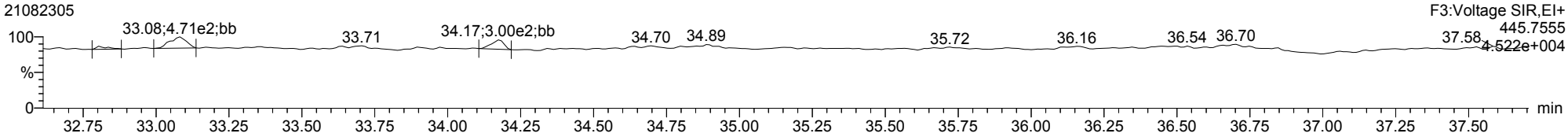


FUNCTION3 OCDPE



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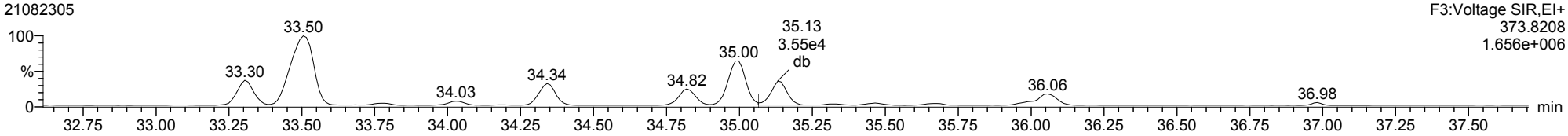
123678-HxCDF



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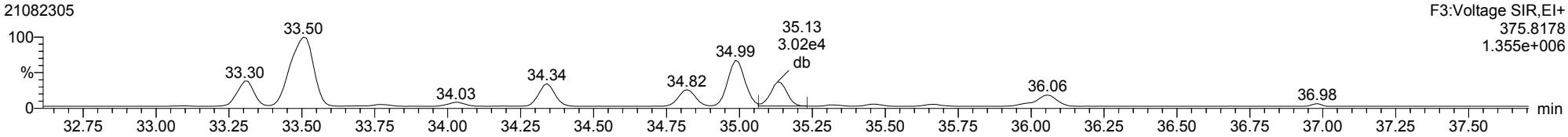

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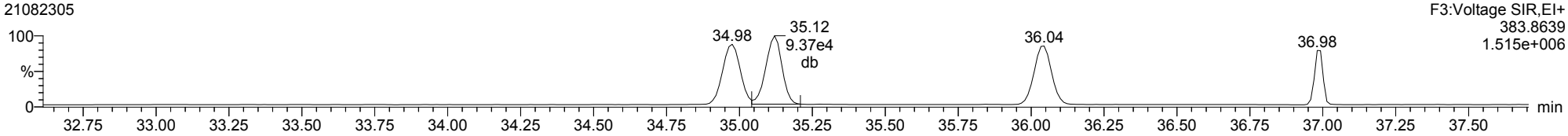

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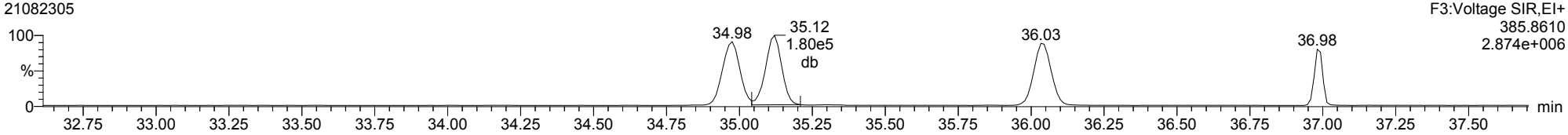
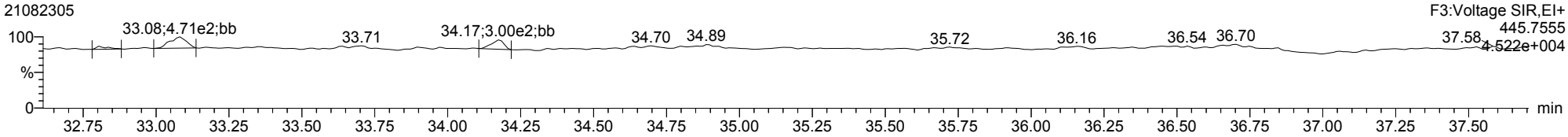


FUNCTION3 OCDPE



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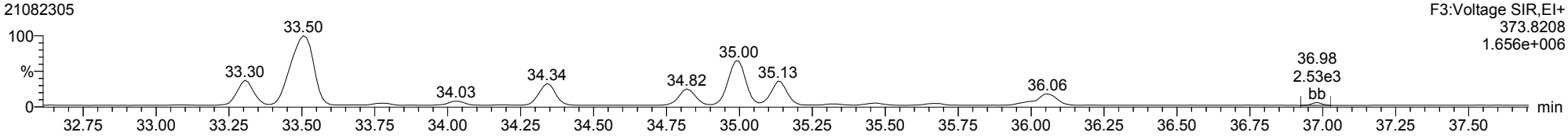

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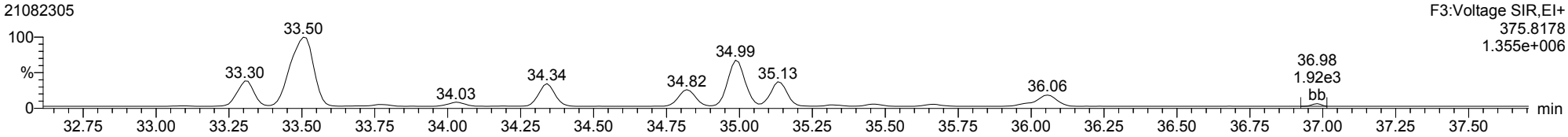

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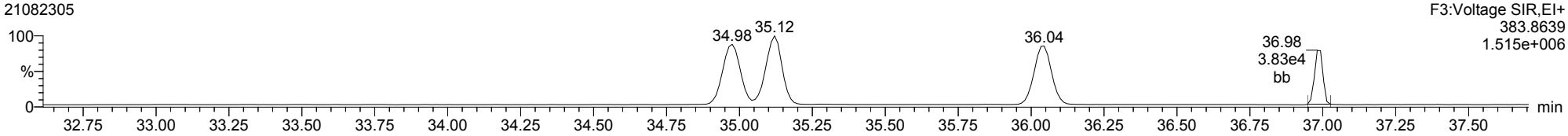

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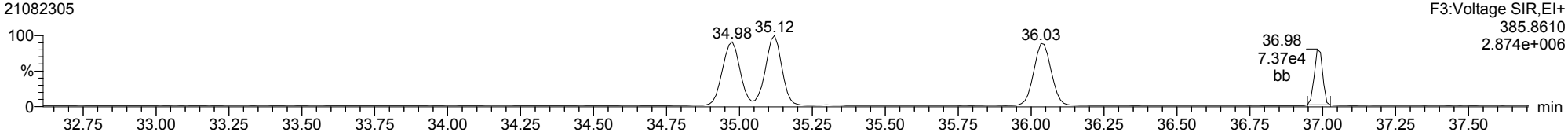
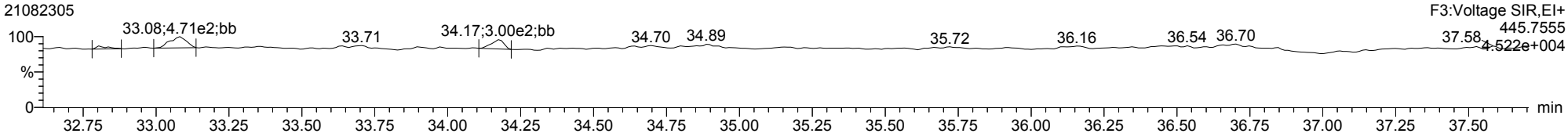


FUNCTION3 OCDPE



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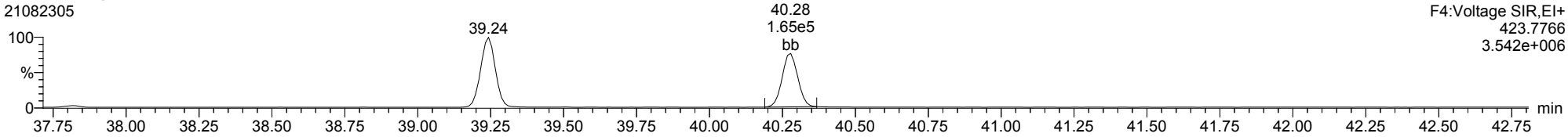
1234678-HpCDD



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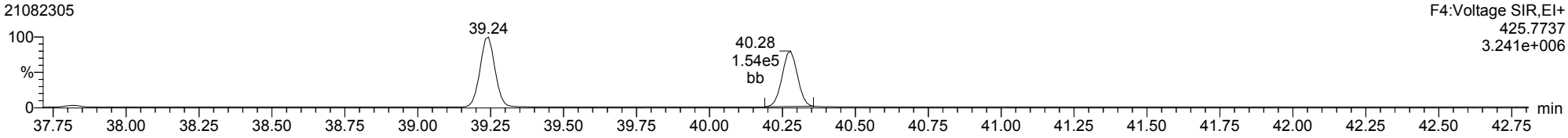

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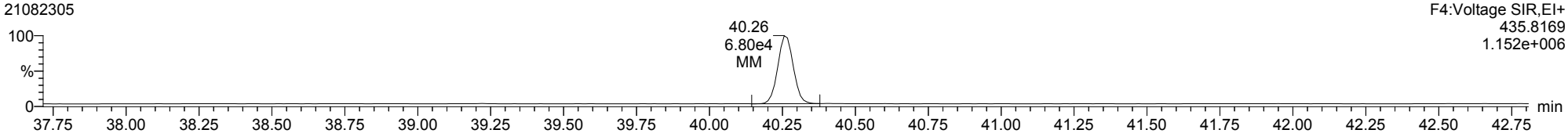

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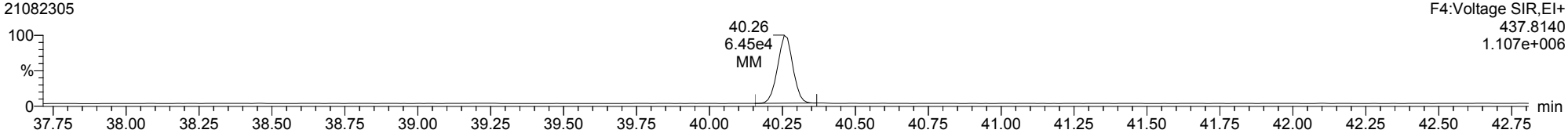
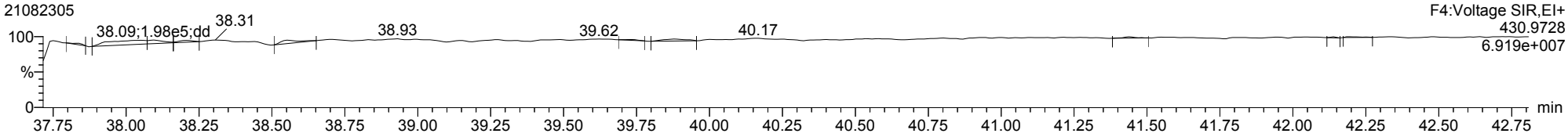
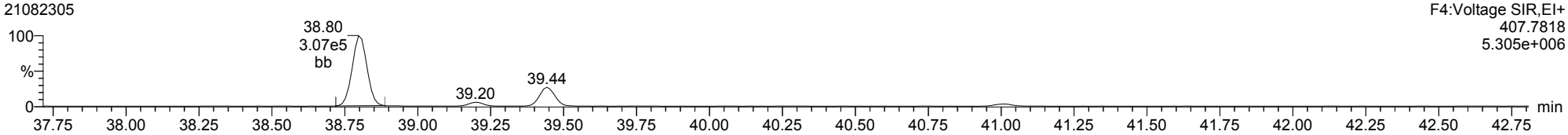


FUNCTION4 PFK

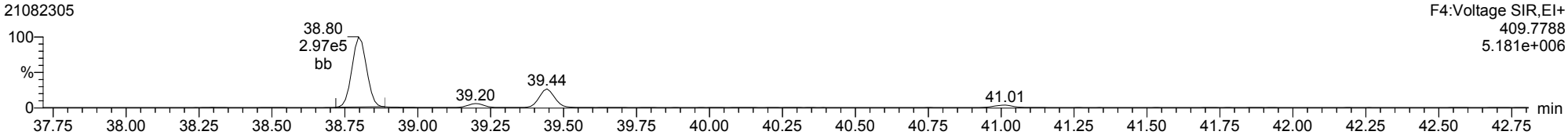


ID: BJG0375-SRM2, Name: 21082305, Date: 23-Aug-2021, Time: 15:14:40, Conditions: AUTOSPEC01, User: pk

1234678-HpCDF



1234678-HpCDF



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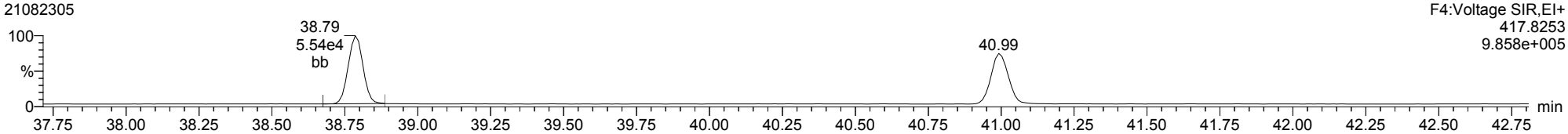

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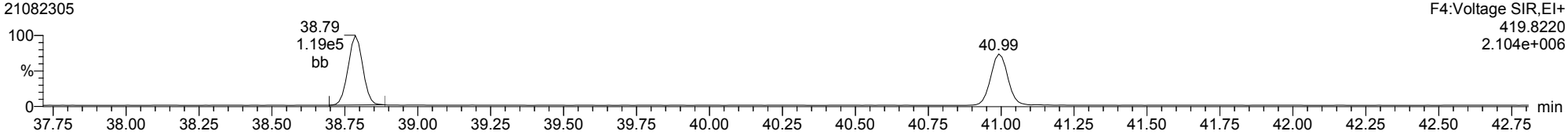
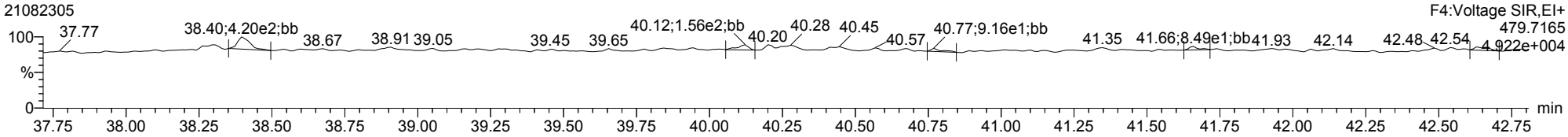
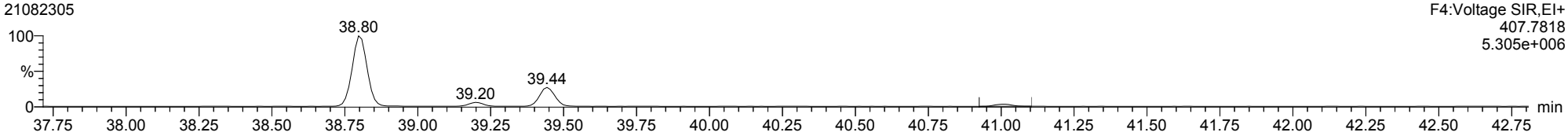


FUNCTION4 NCDPE

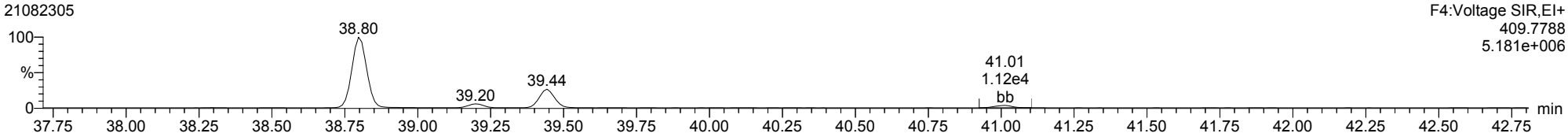


ID: BJG0375-SRM2, Name: 21082305, Date: 23-Aug-2021, Time: 15:14:40, Conditions: AUTOSPEC01, User: pk

1234789-HpCDF



1234789-HpCDF



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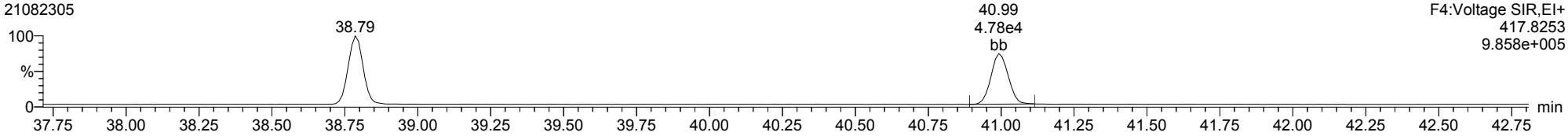

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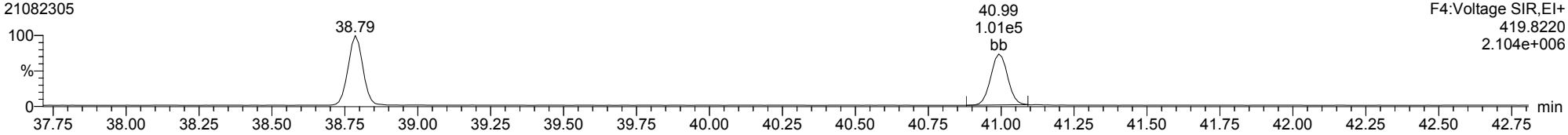
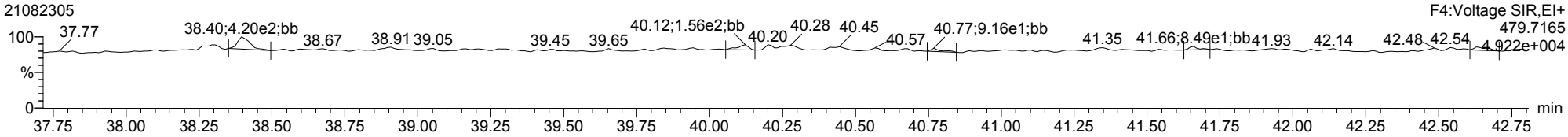
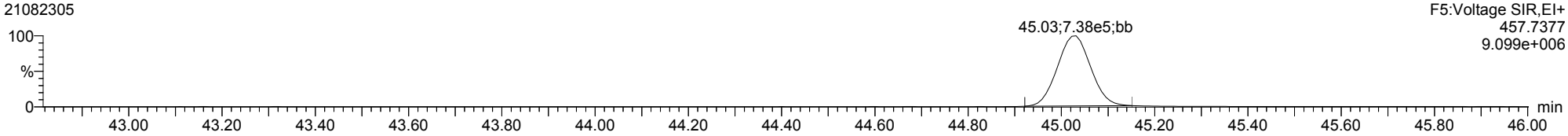


FUNCTION4 NCDPE

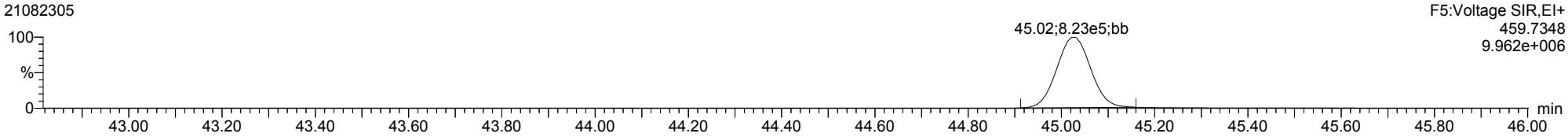


ID: BJG0375-SRM2, Name: 21082305, Date: 23-Aug-2021, Time: 15:14:40, Conditions: AUTOSPEC01, User: pk

OCDD



OCDD



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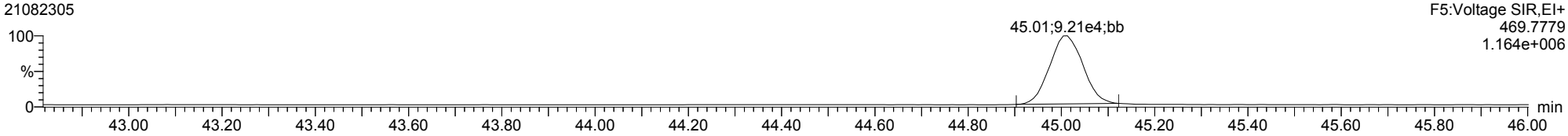

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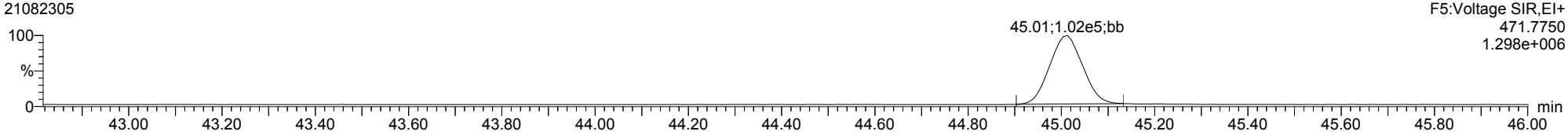
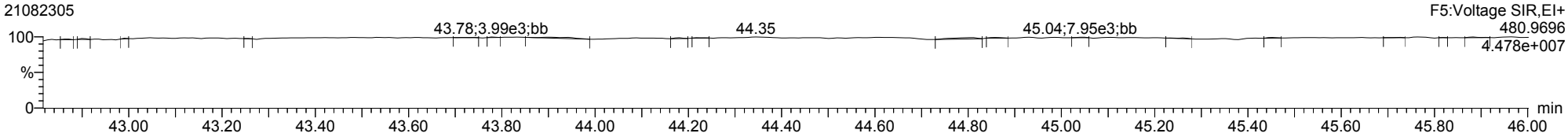
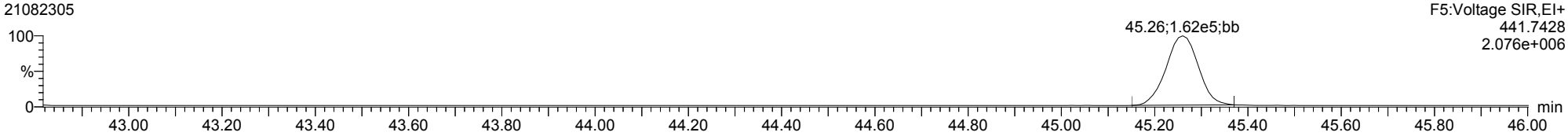


FUNCTION5 PFK

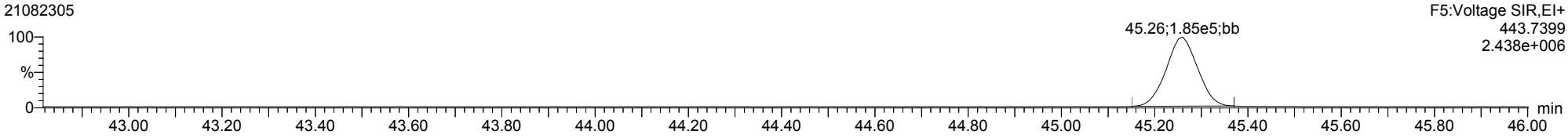


ID: BJG0375-SRM2, Name: 21082305, Date: 23-Aug-2021, Time: 15:14:40, Conditions: AUTOSPEC01, User: pk

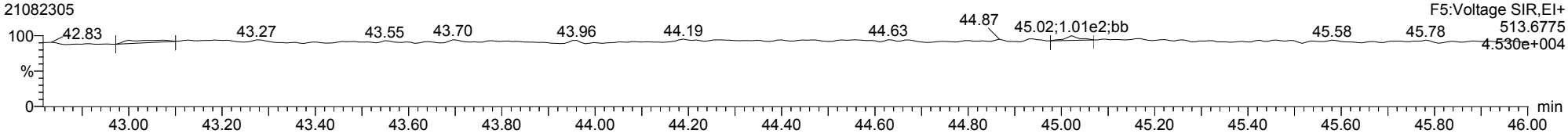
OCDF



OCDF

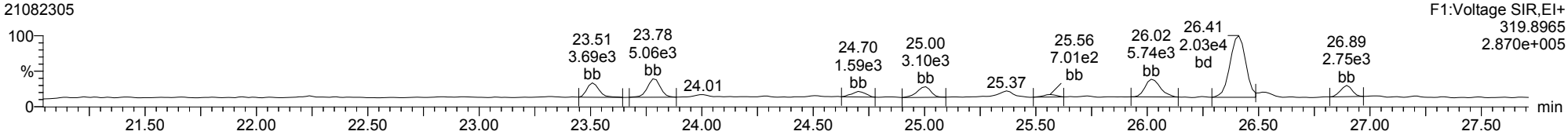


FUNCTION5 DCDPE

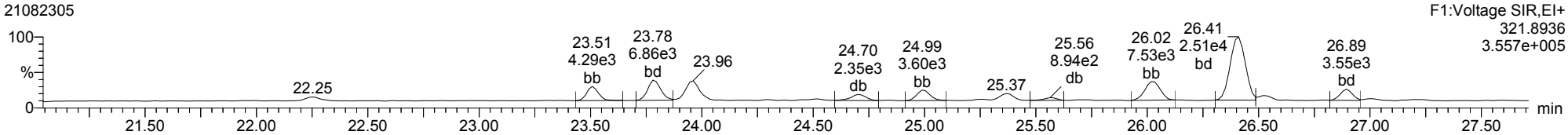


ID: BJG0375-SRM2, Name: 21082305, Date: 23-Aug-2021, Time: 15:14:40, Conditions: AUTOSPEC01, User: pk

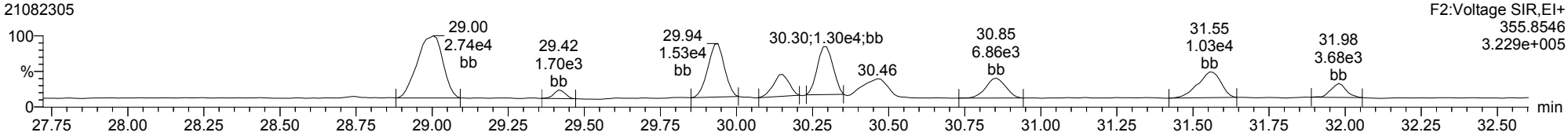
Total-tetradioxins



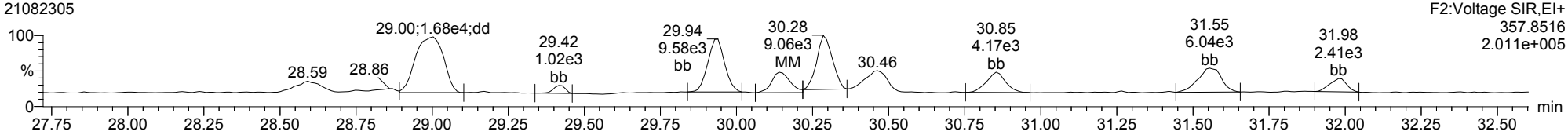
Total-tetradioxins



Total-pentadioxins

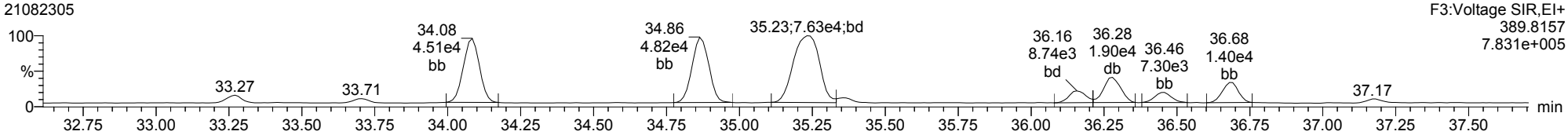


Total-pentadioxins

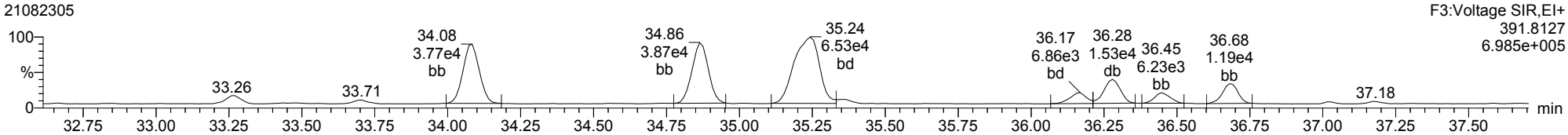


ID: BJG0375-SRM2, Name: 21082305, Date: 23-Aug-2021, Time: 15:14:40, Conditions: AUTOSPEC01, User: pk

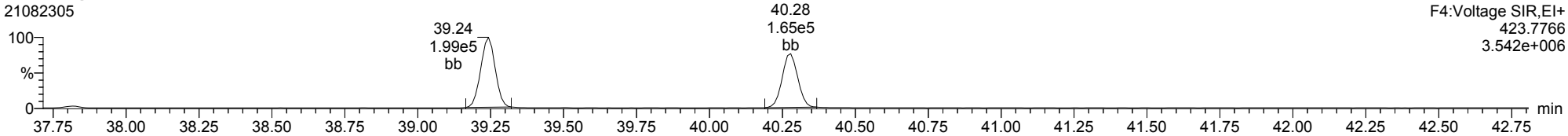
Total-hexadioxins



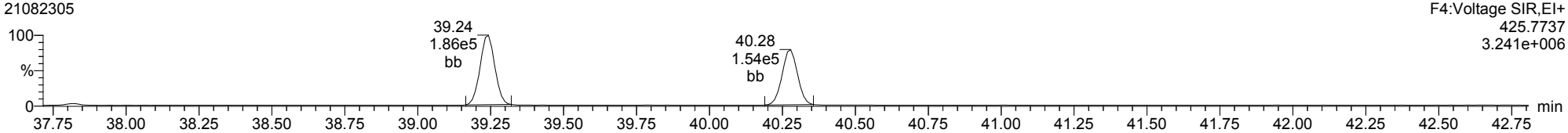
Total-hexadioxins



Total-heptadioxins



Total-heptadioxins



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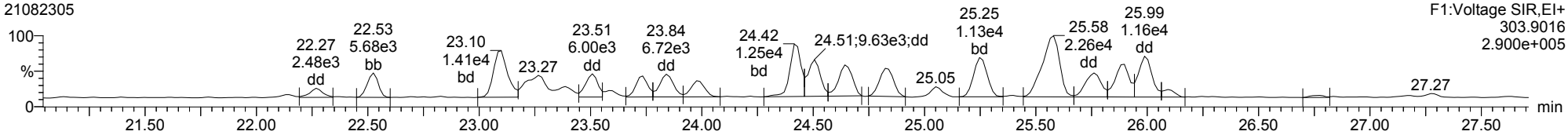
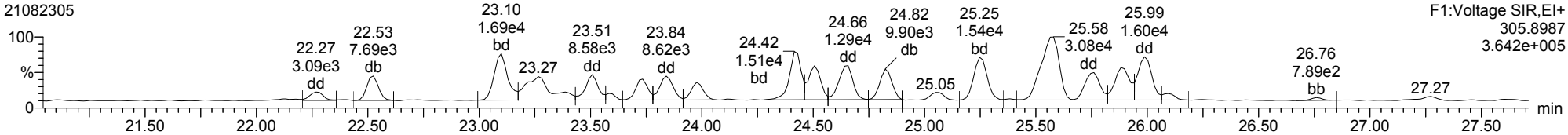
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:25:19 Pacific Daylight Time

ID: BJG0375-SRM2, Name: 21082305, Date: 23-Aug-2021, Time: 15:14:40, Conditions: AUTOSPEC01, User: pk

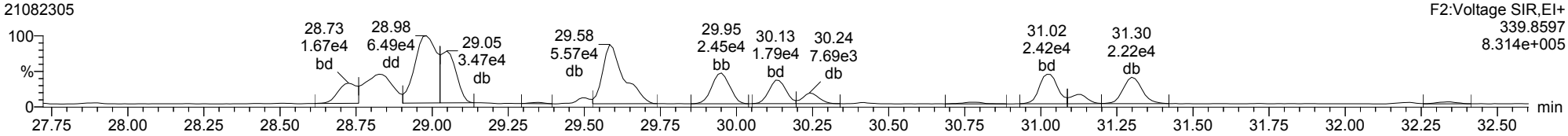
Total-tetrafurans



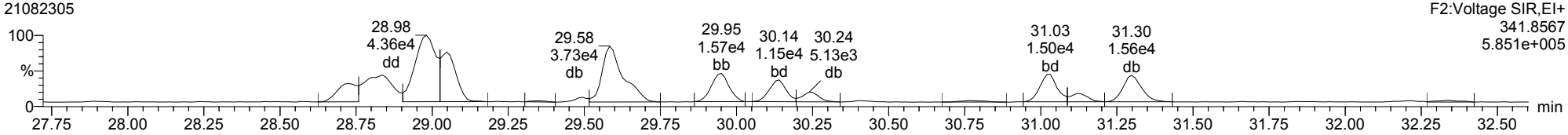
Total-tetrafurans



Total-pentafurans



Total-pentafurans



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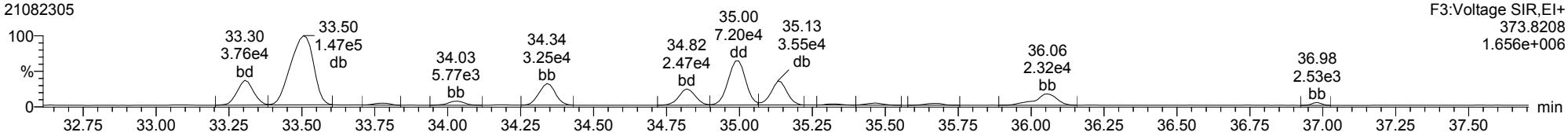
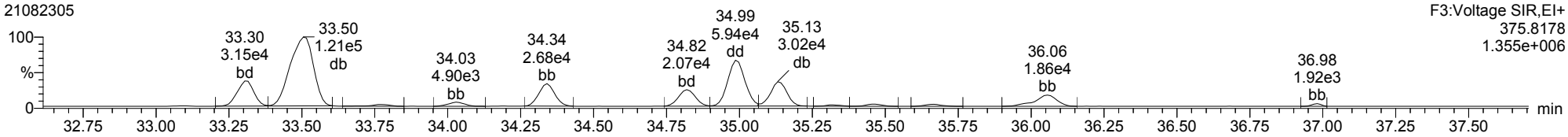
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:25:19 Pacific Daylight Time

ID: BJG0375-SRM2, Name: 21082305, Date: 23-Aug-2021, Time: 15:14:40, Conditions: AUTOSPEC01, User: pk

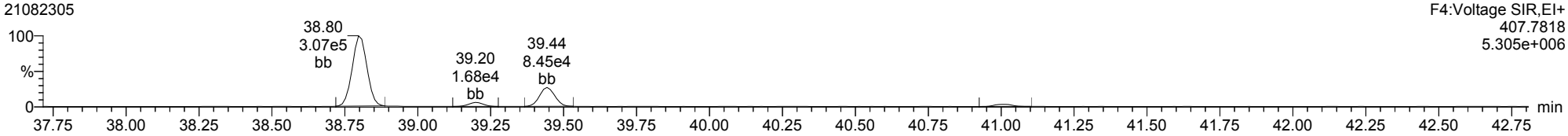
Total-hexafurans



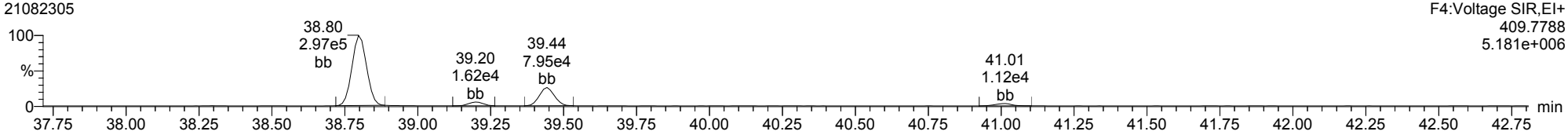
Total-hexafurans



Total-heptafurans



Total-heptafurans



Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION DATA
EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
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:	21G0064
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:	21G0064
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:	21G0064
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: 21G0064
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

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

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

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

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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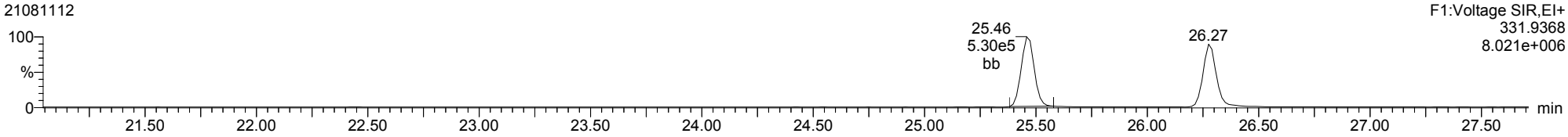

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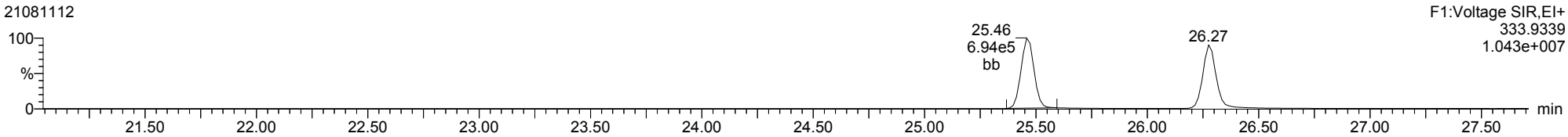

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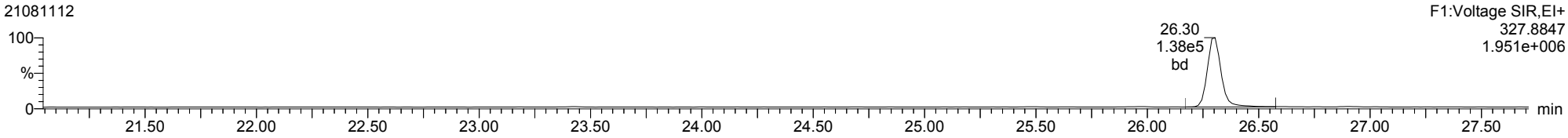

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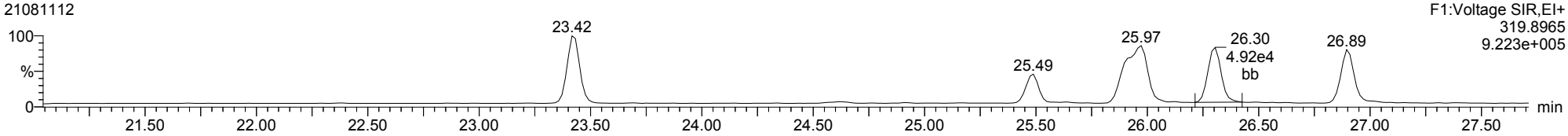

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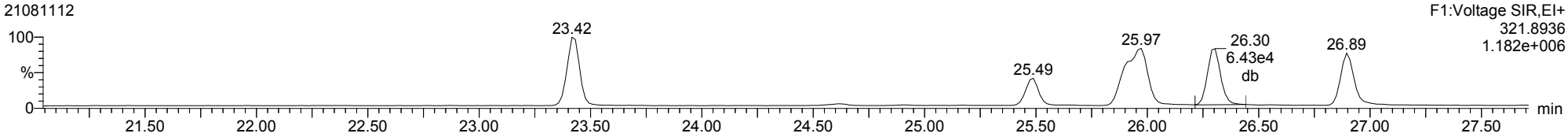

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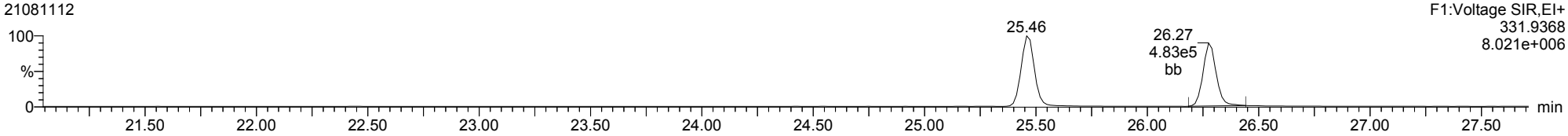

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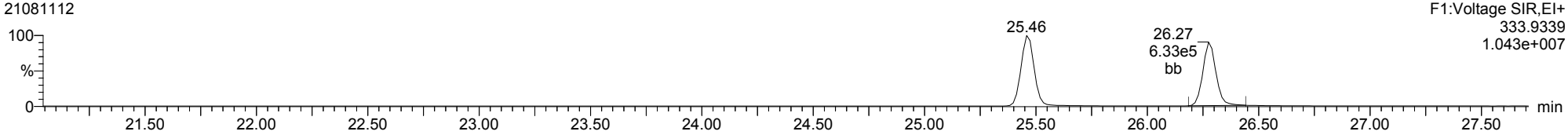

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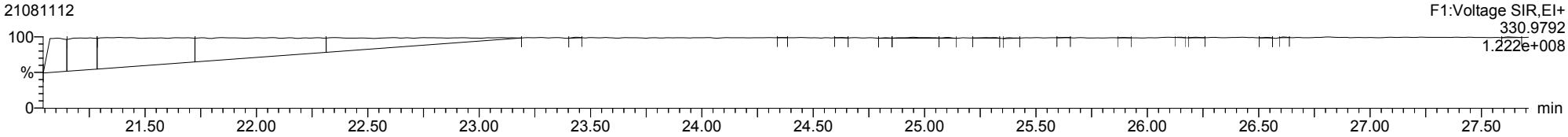

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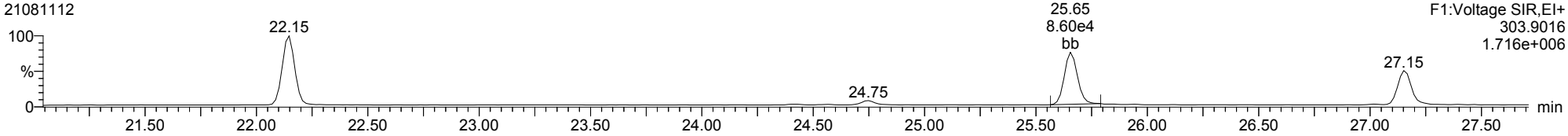

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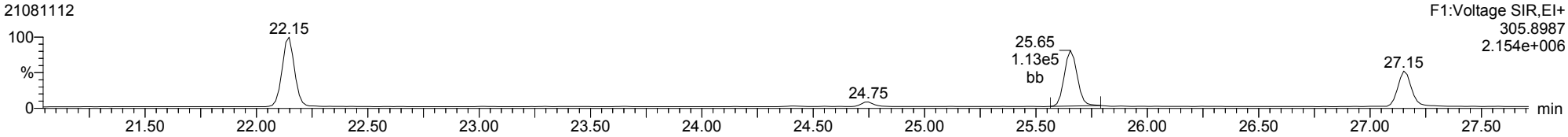

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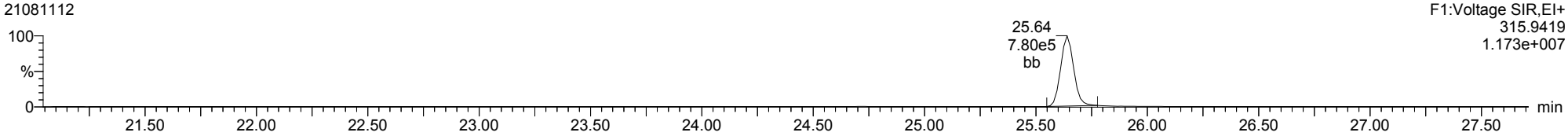

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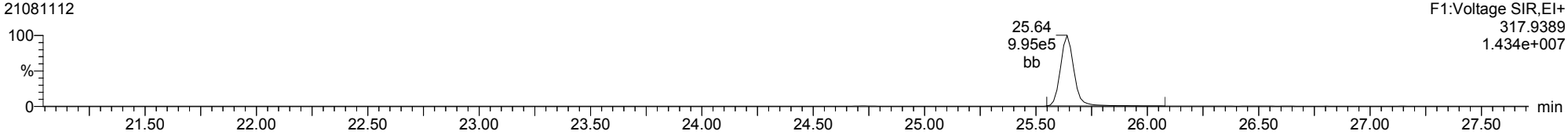

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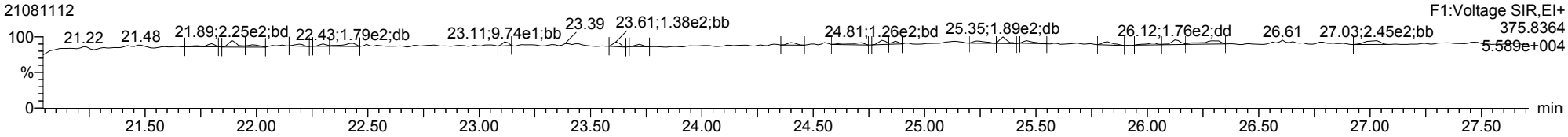

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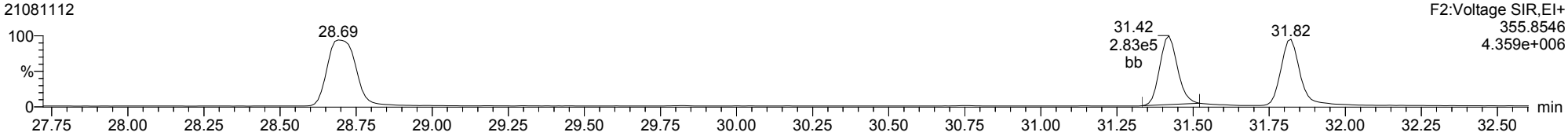

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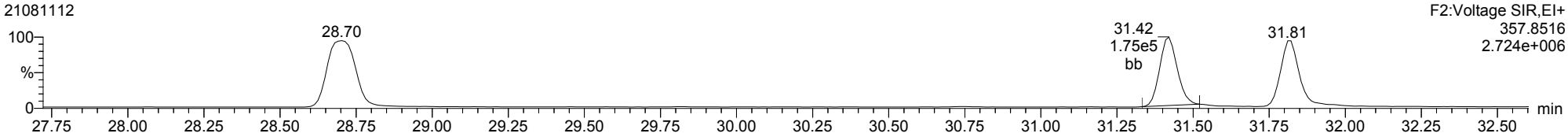

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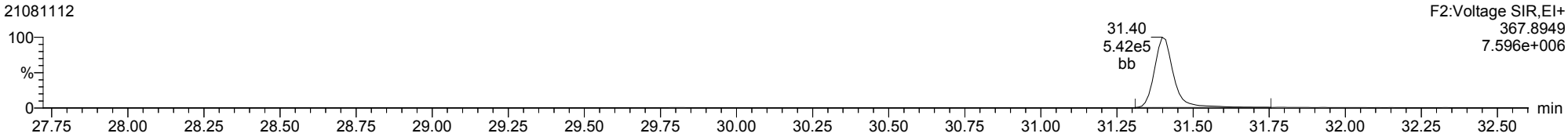

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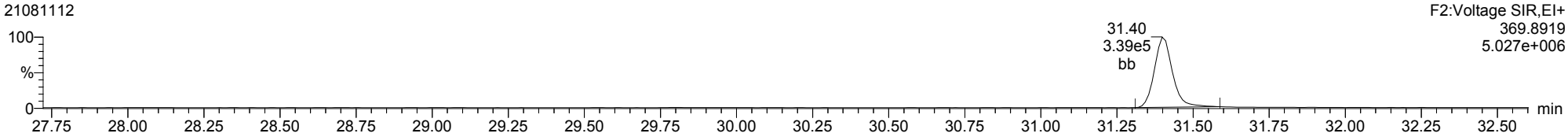

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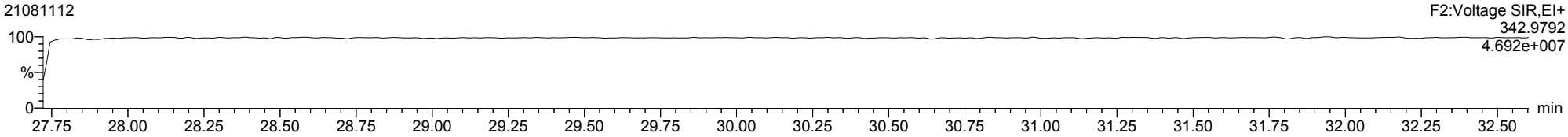

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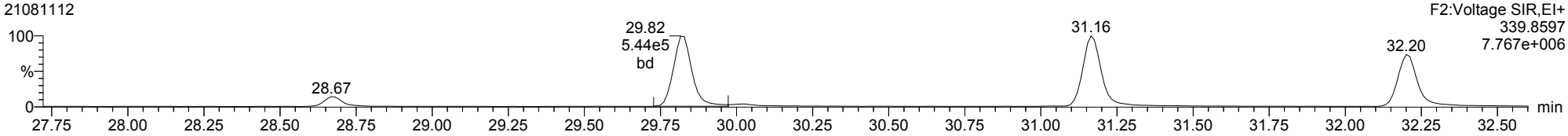

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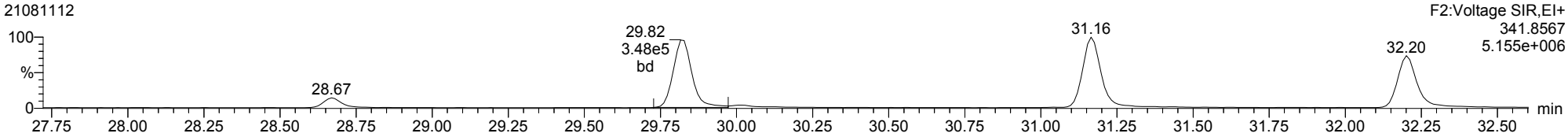

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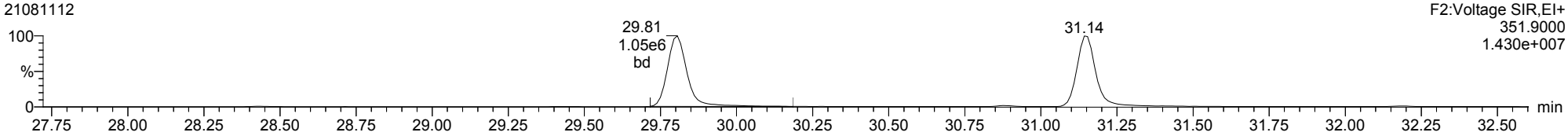

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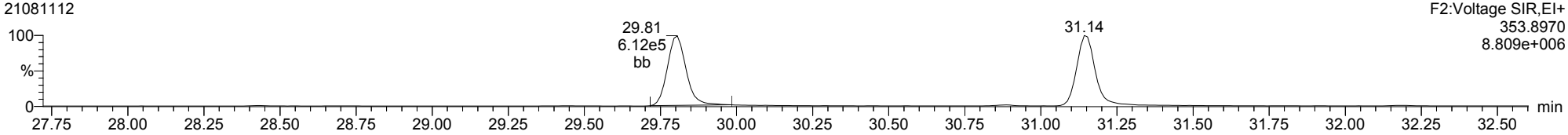

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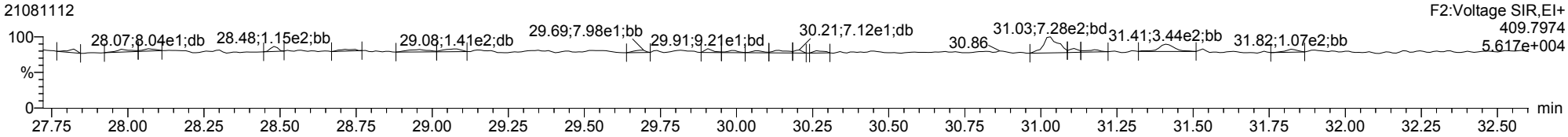

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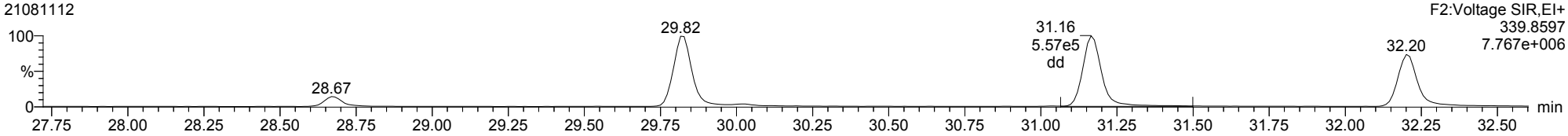

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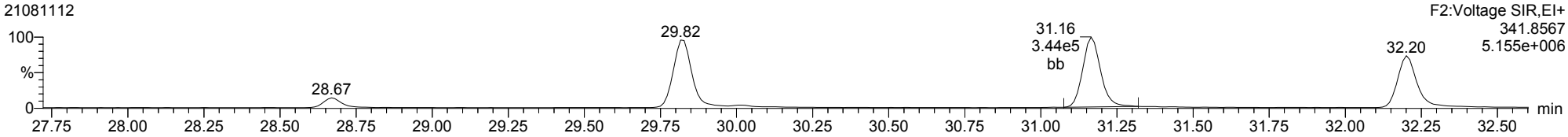

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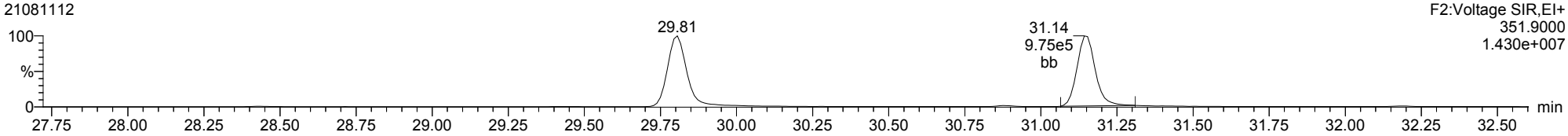

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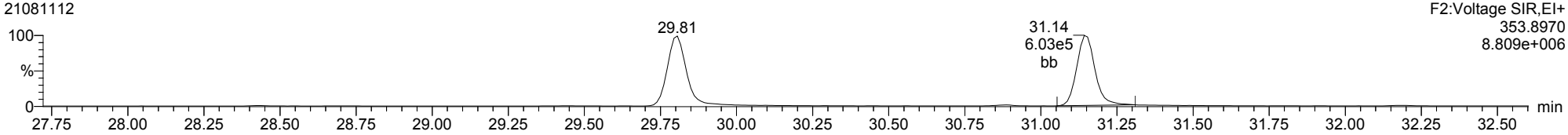

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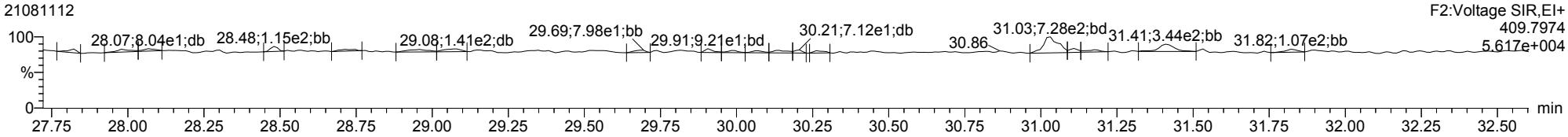

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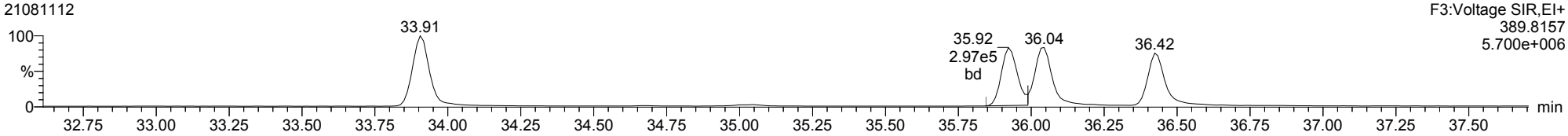

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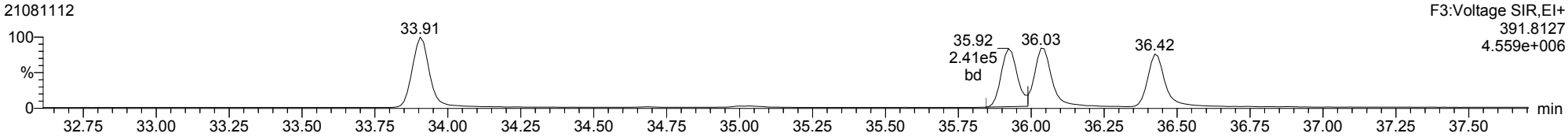

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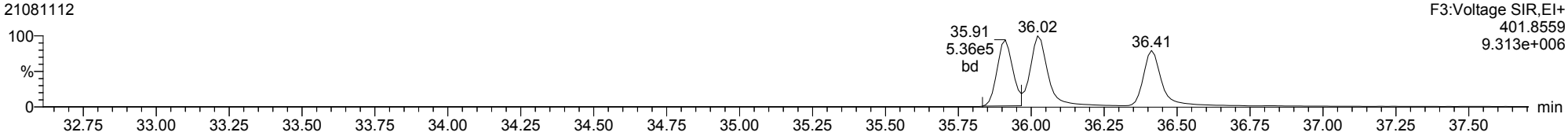

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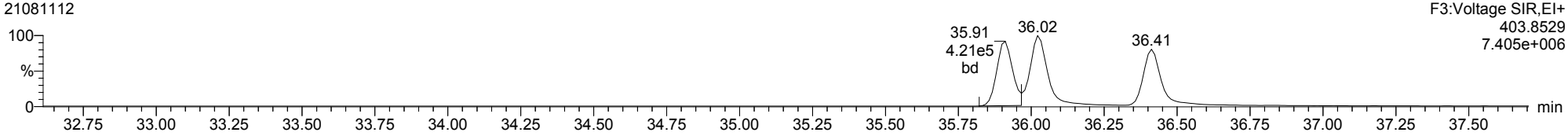

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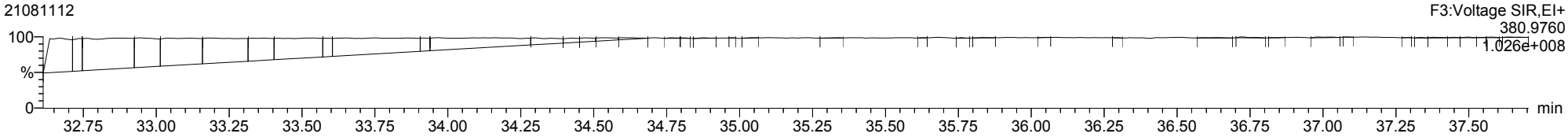

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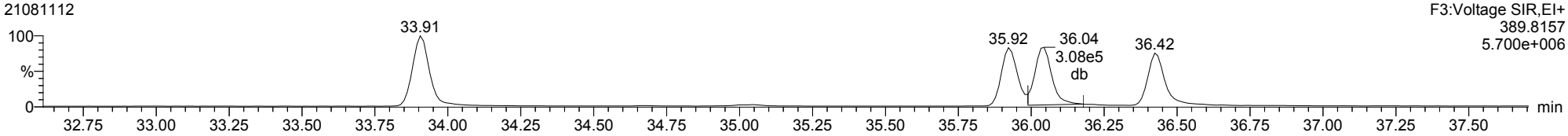

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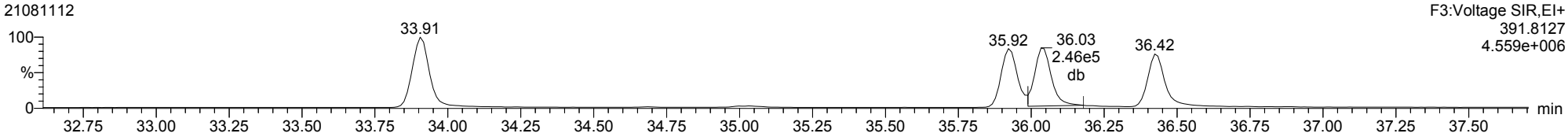

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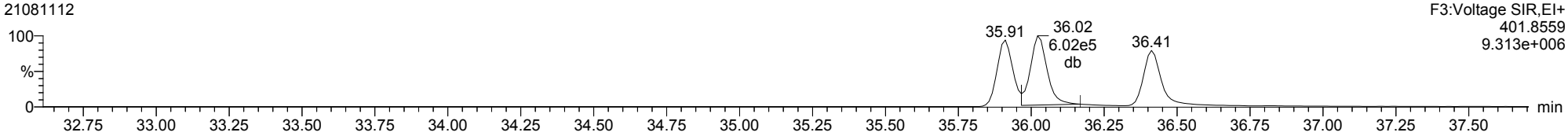

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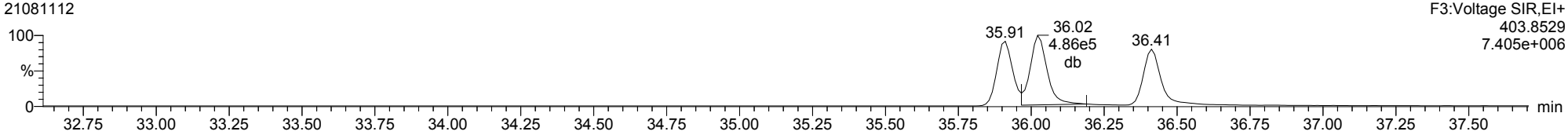

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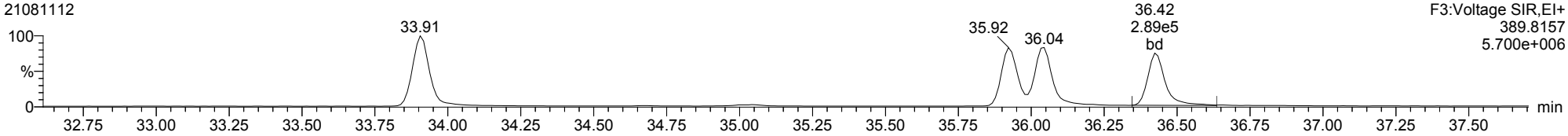

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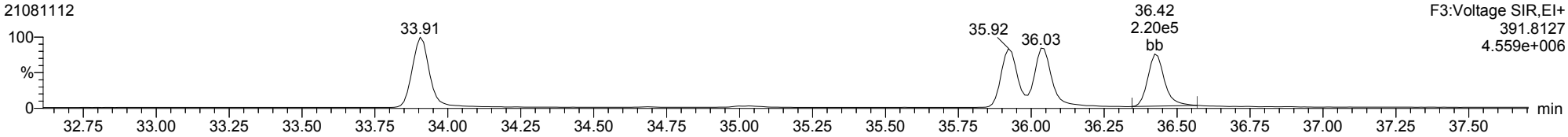

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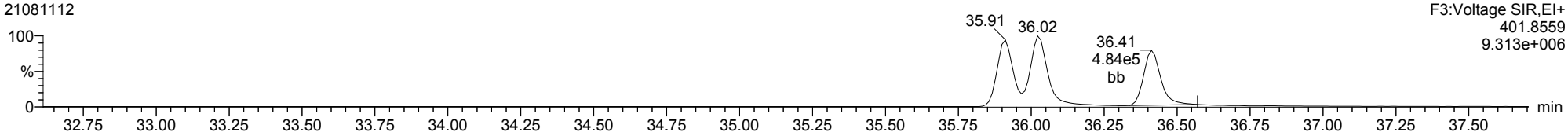

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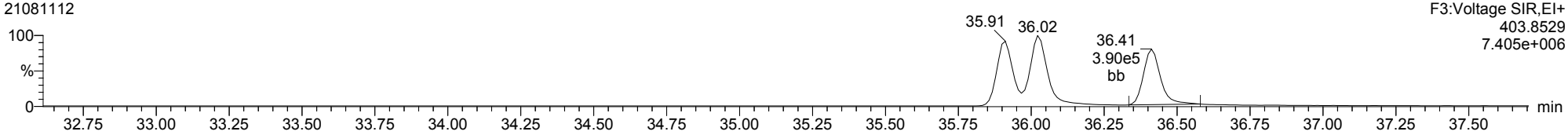

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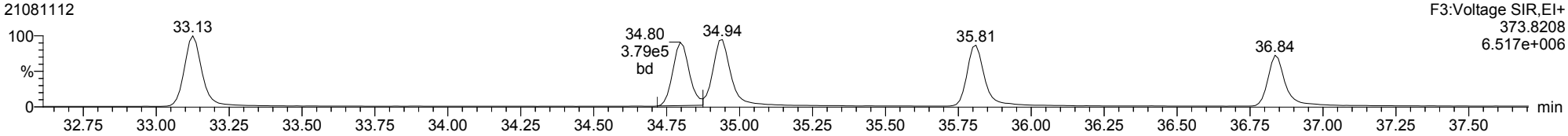

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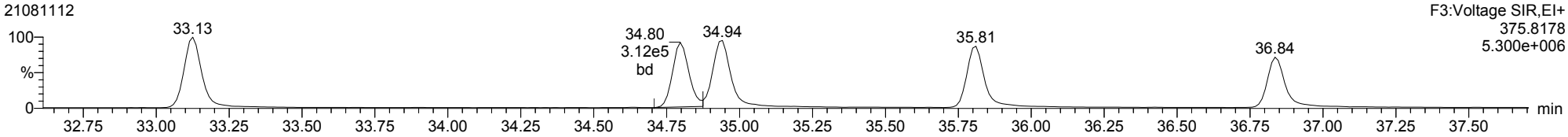

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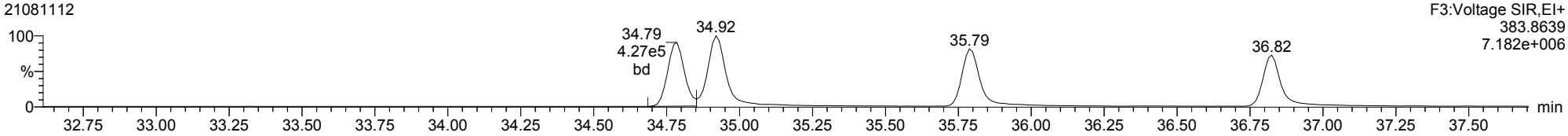

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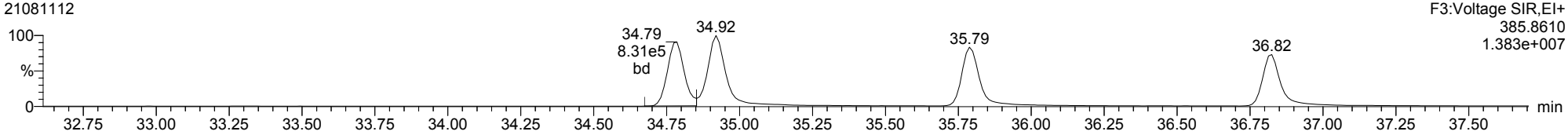

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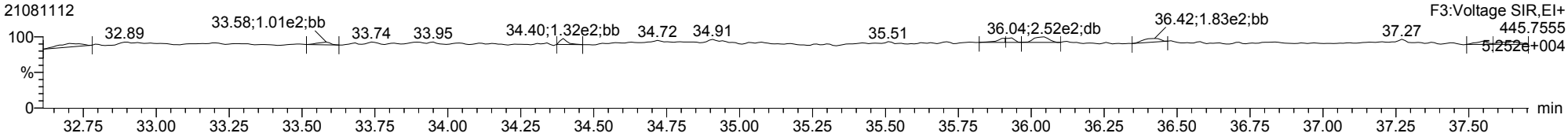

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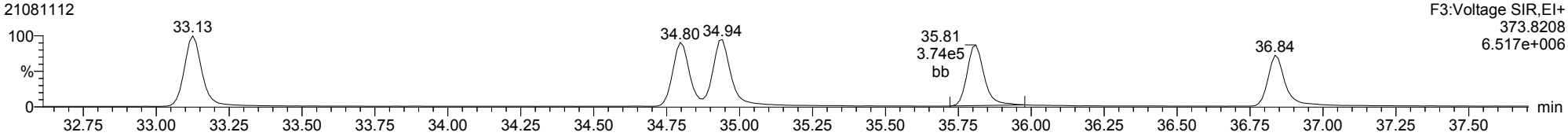

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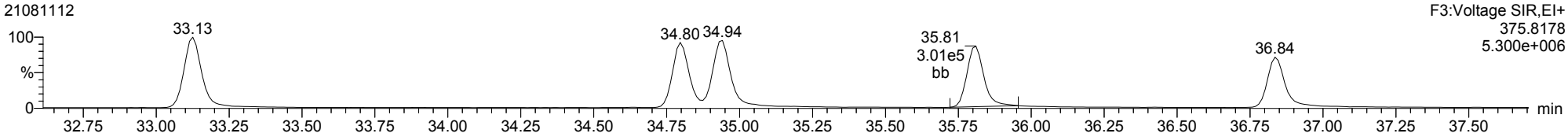

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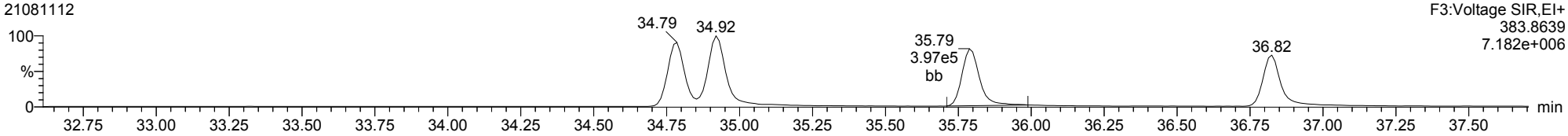

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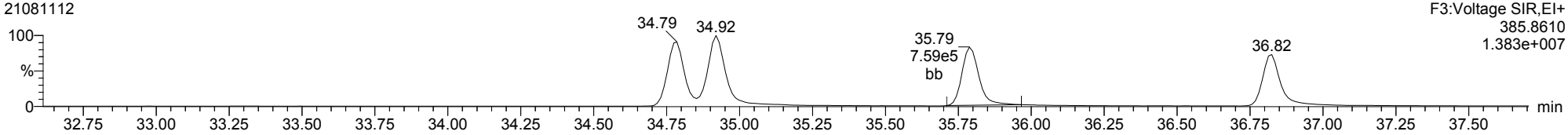

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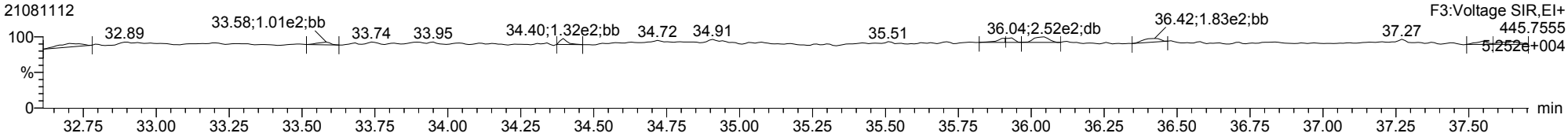

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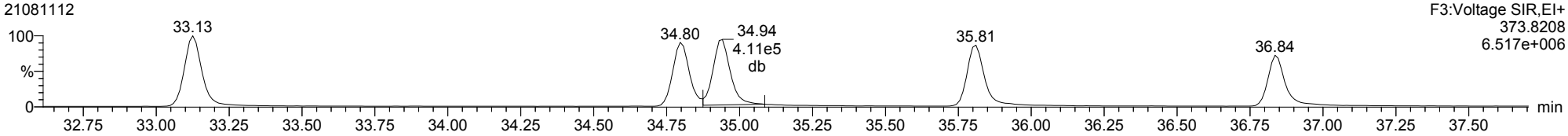

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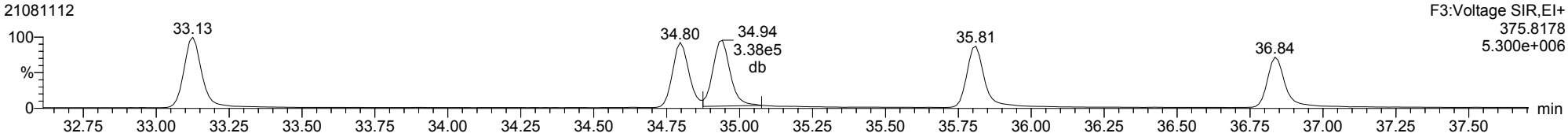

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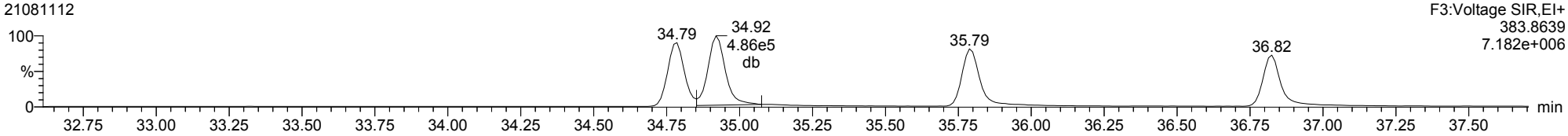

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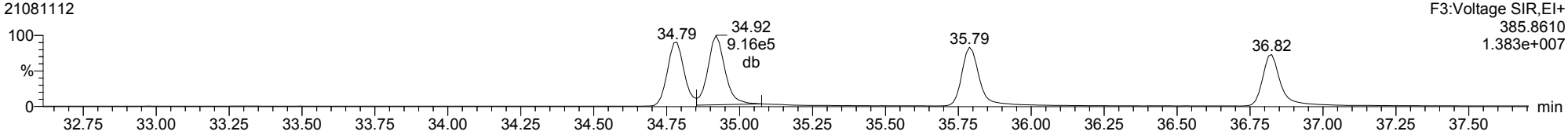

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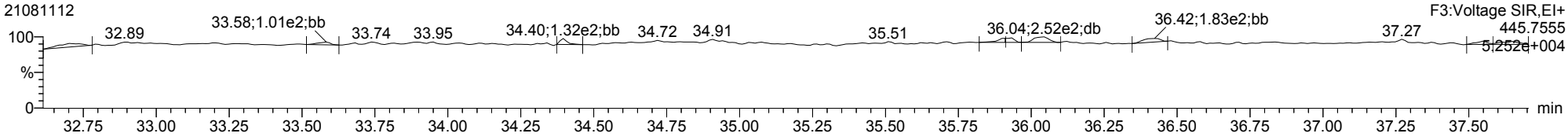

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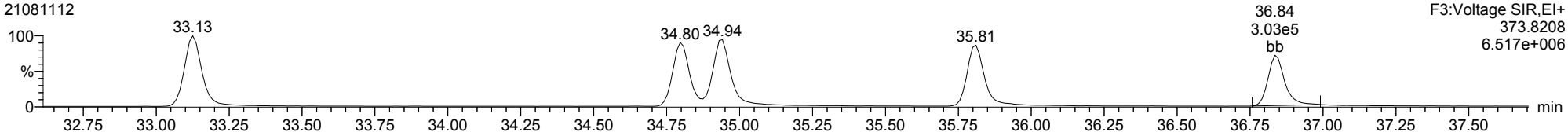

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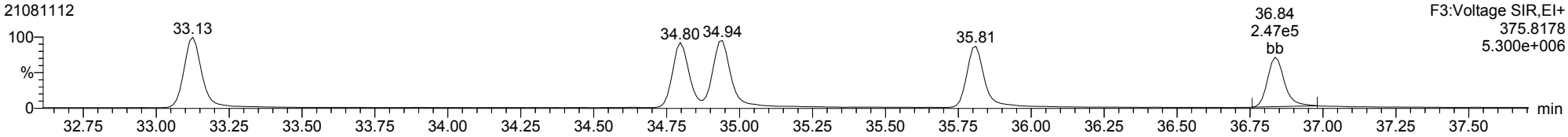

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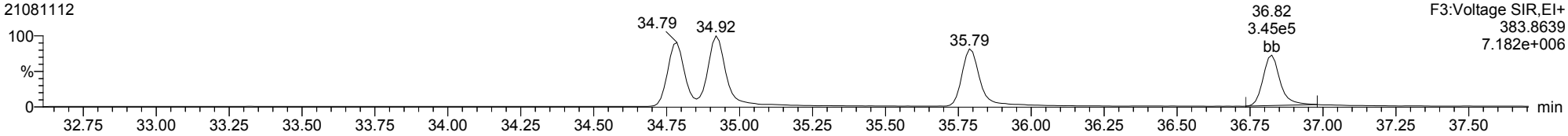

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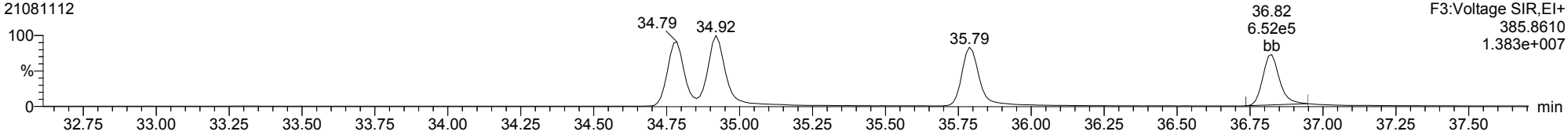

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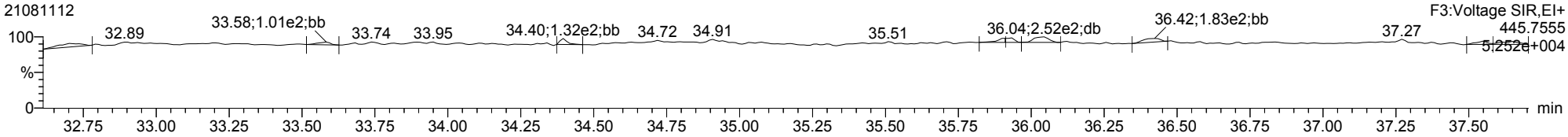

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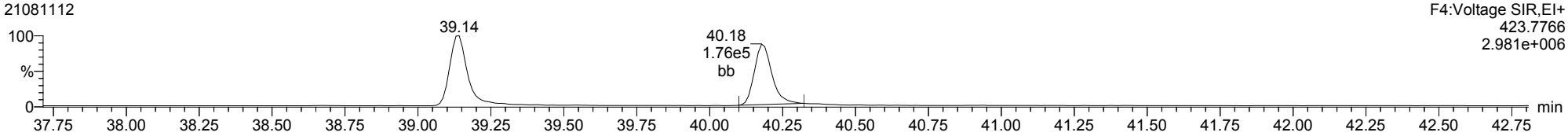

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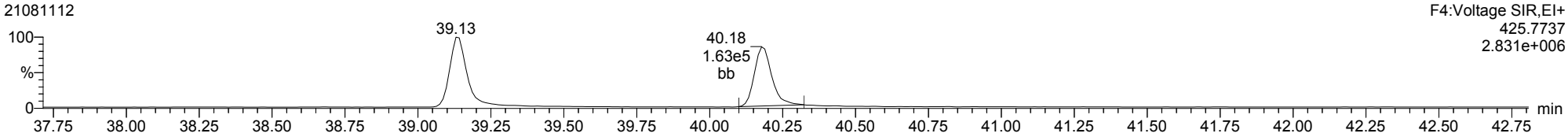

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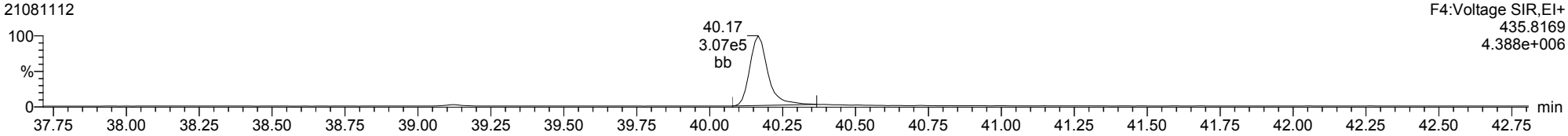

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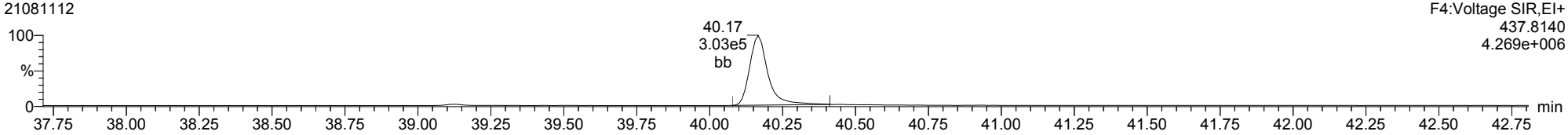
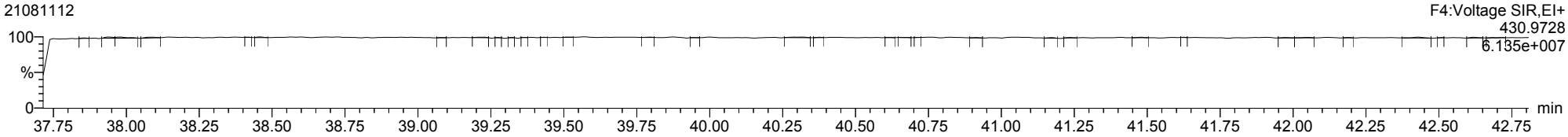


FUNCTION4 PFK



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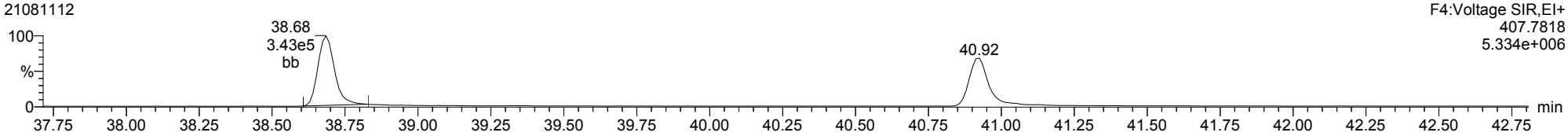
1234678-HpCDF



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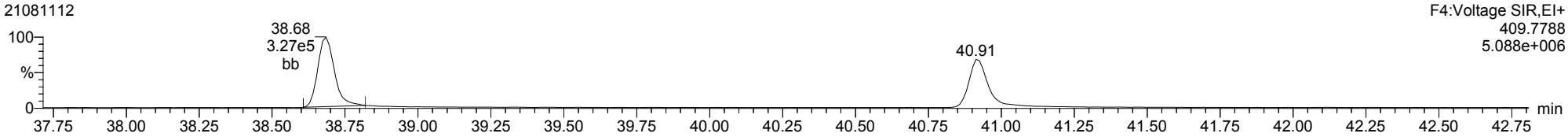

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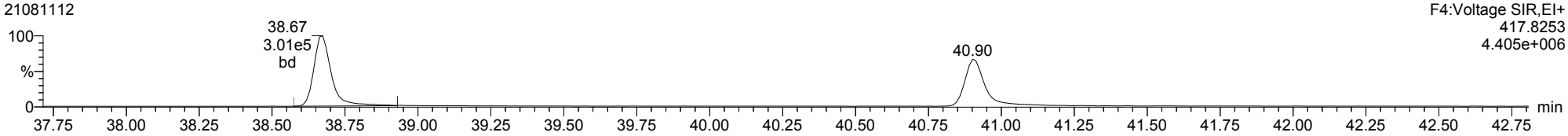

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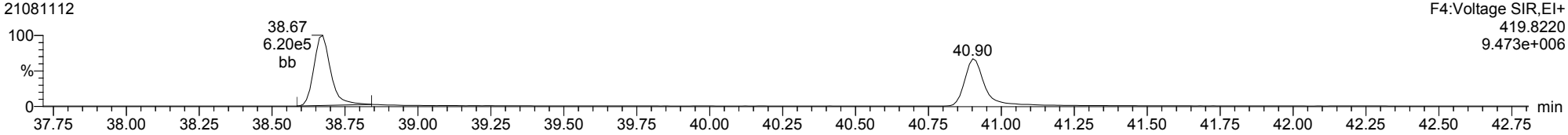
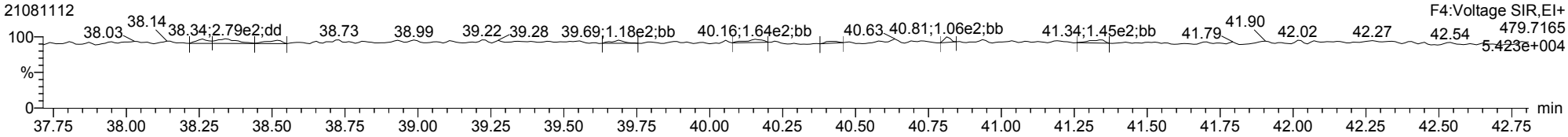


FUNCTION4 NCDPE



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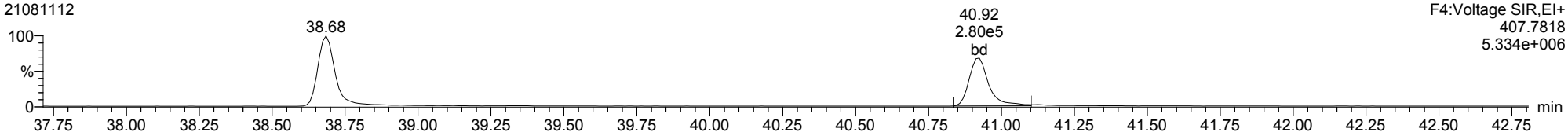
1234789-HpCDF



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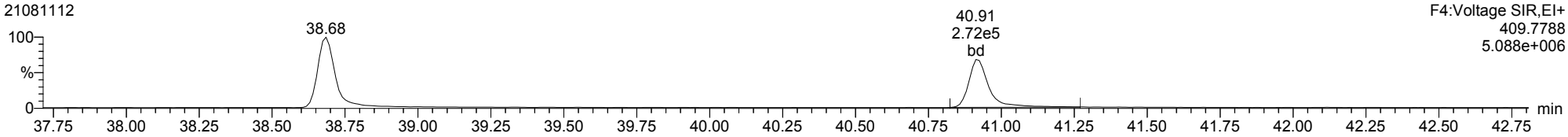

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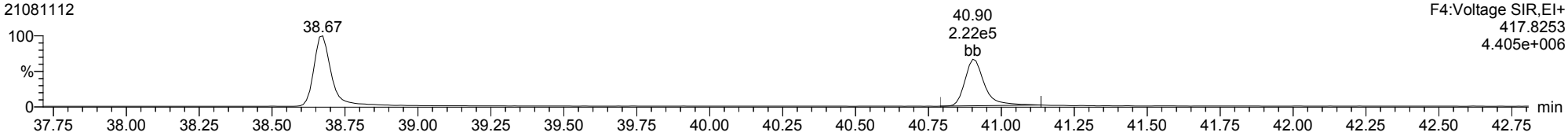

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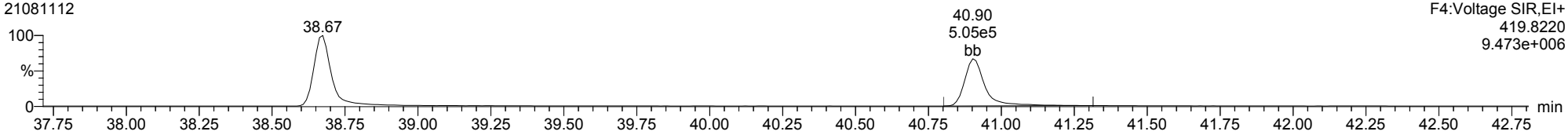
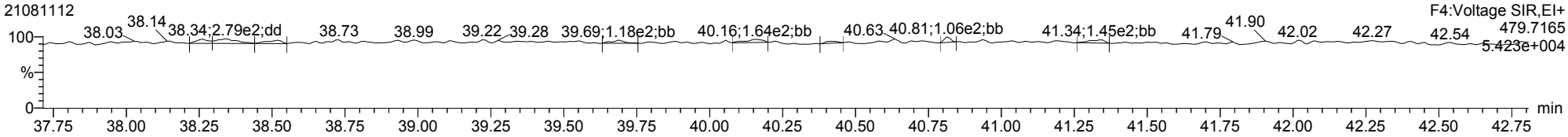


FUNCTION4 NCDPE



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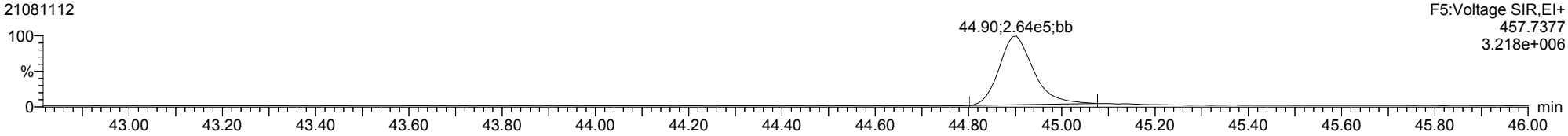
OCDD



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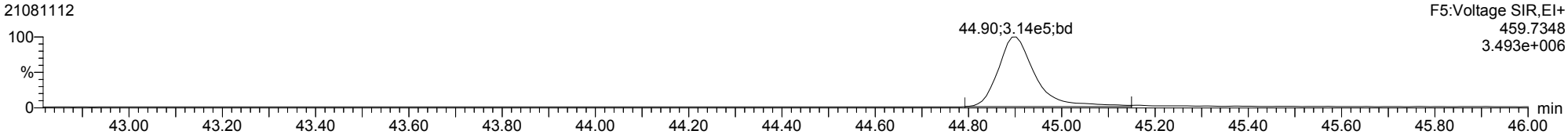

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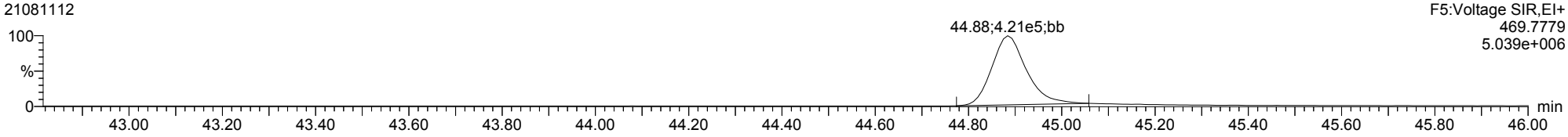

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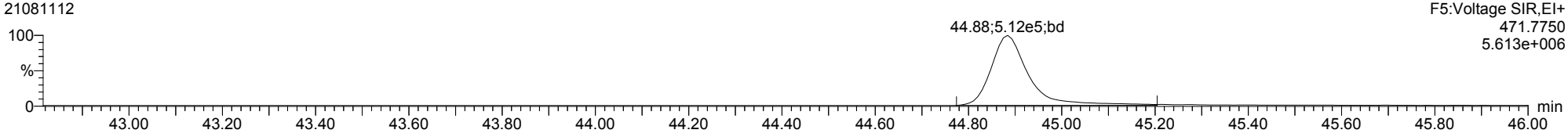
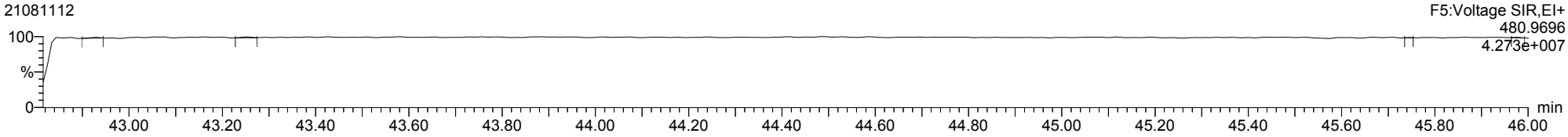
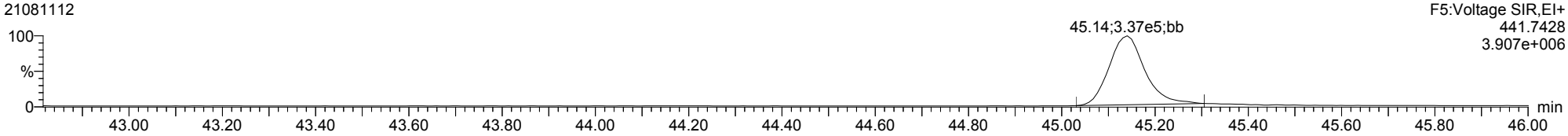


FUNCTION5 PFK



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

OCDF



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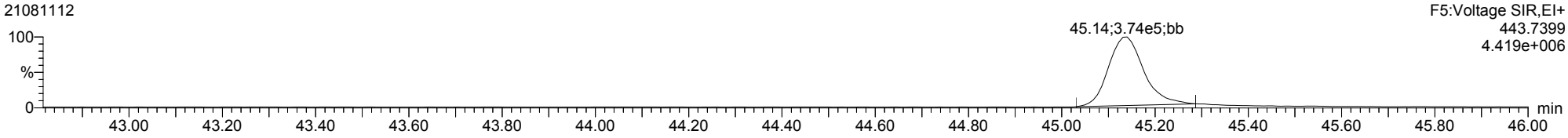
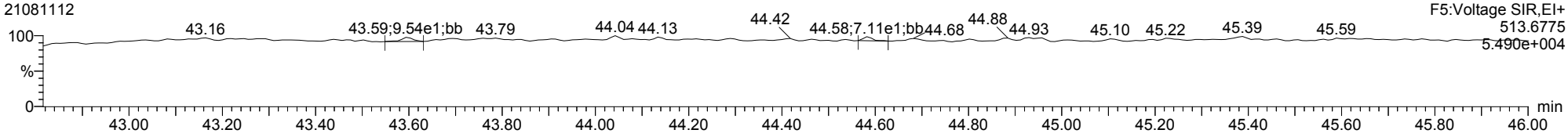


FUNCTION5 DCDPE



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

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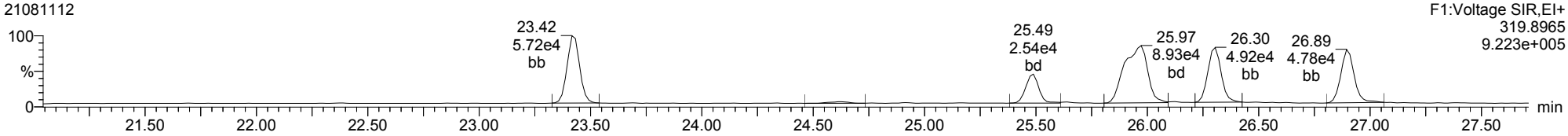
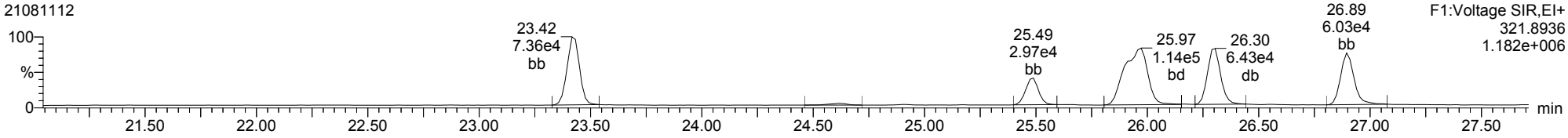


Total-tetradioxins



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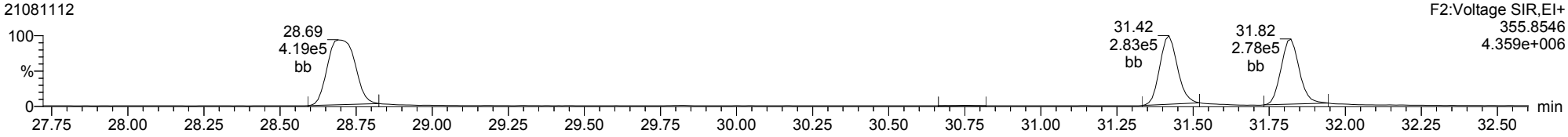
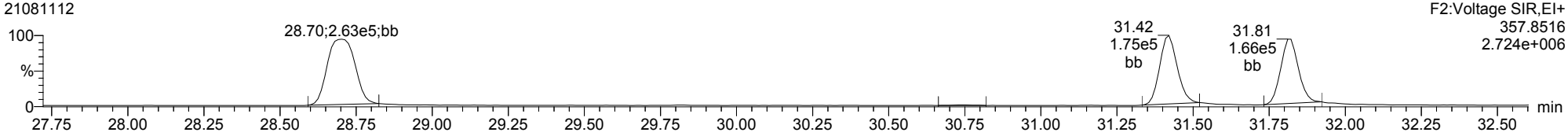


Total-pentadioxins



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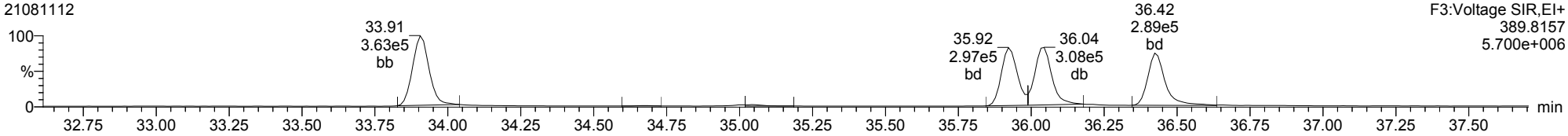
Total-hexadioxins



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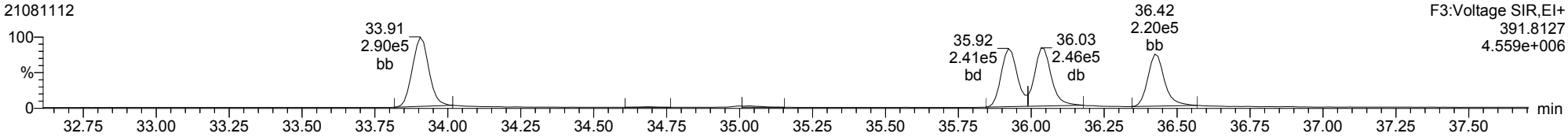

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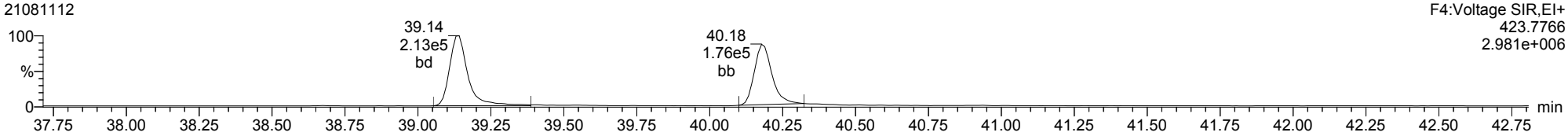

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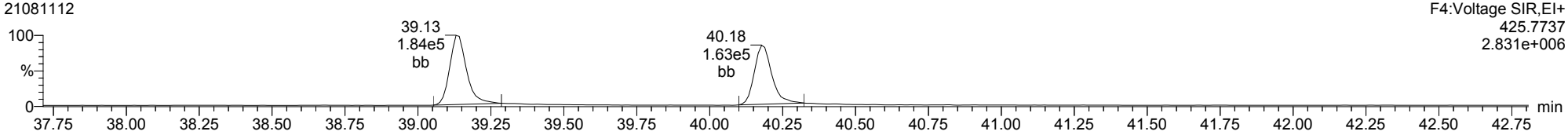
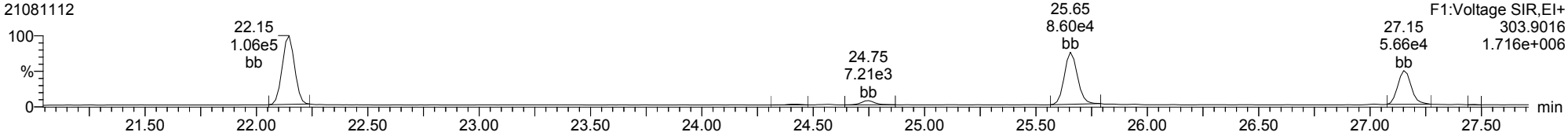


ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

Total-tetrafurans



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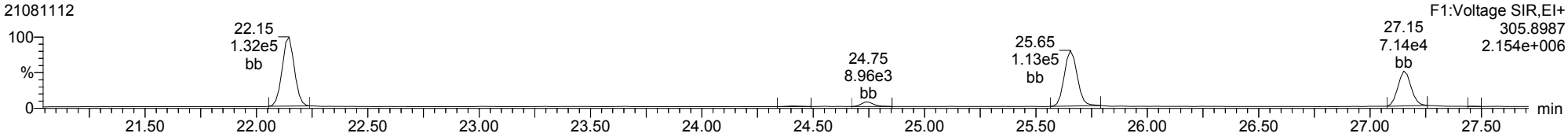

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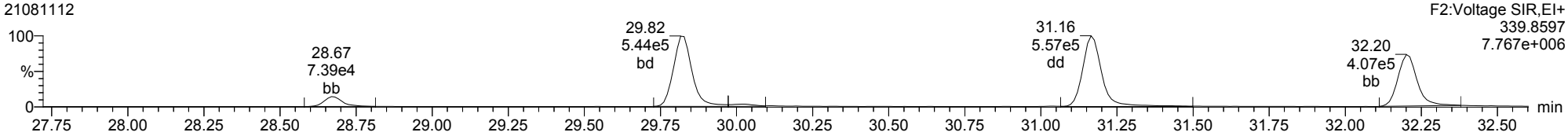

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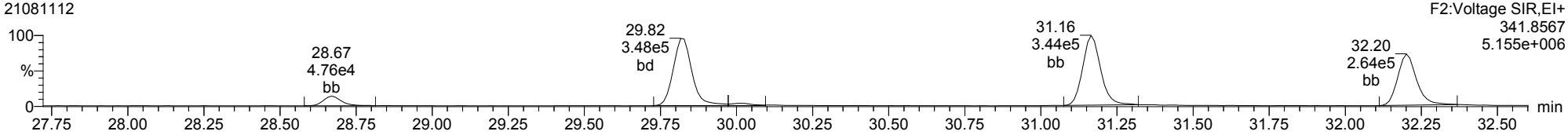

ID: ICVCZ, Name: 21081112, Date: 12-Aug-2021, Time: 00:00:03, Conditions: AUTOSPEC01, User: pk

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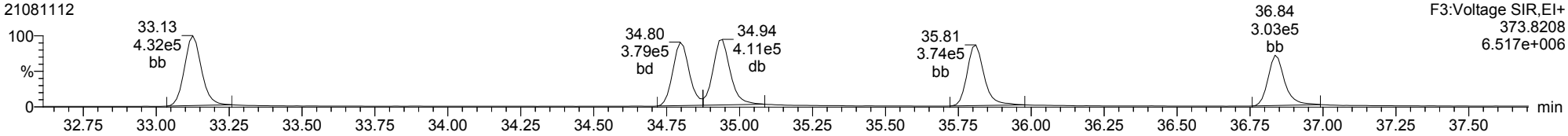

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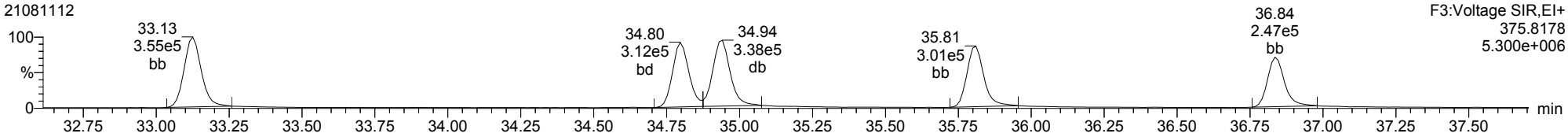

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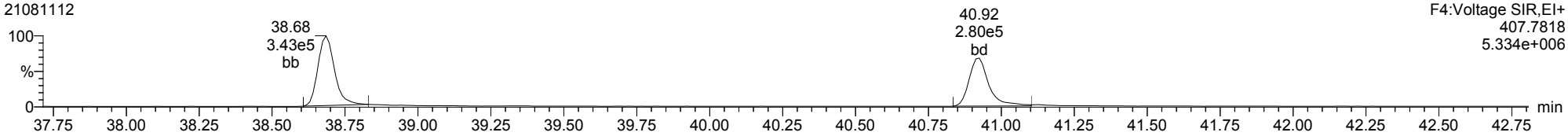

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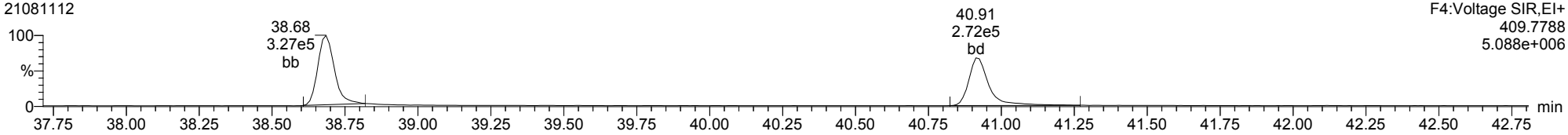

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 1613B

Laboratory: Analytical Resources, Inc.
SDG: 21G0064
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

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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

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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

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

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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

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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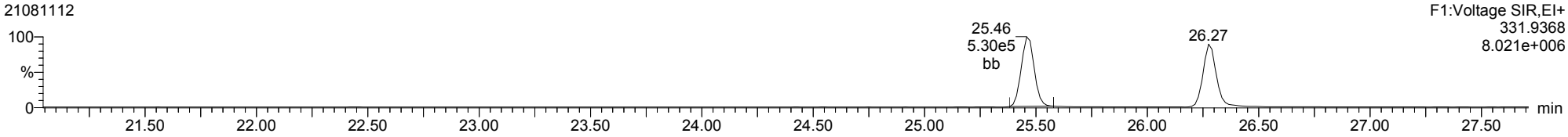

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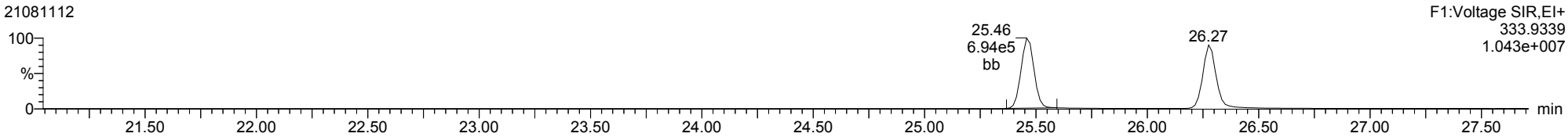
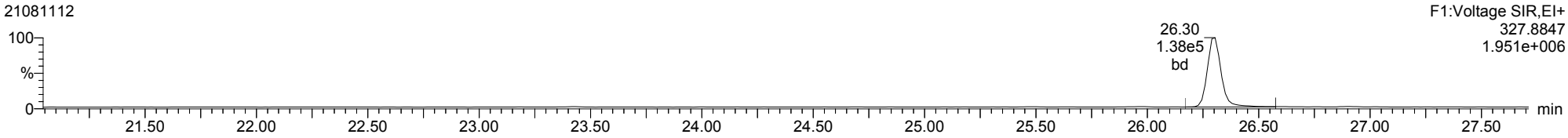


37CL-2378-TCDD



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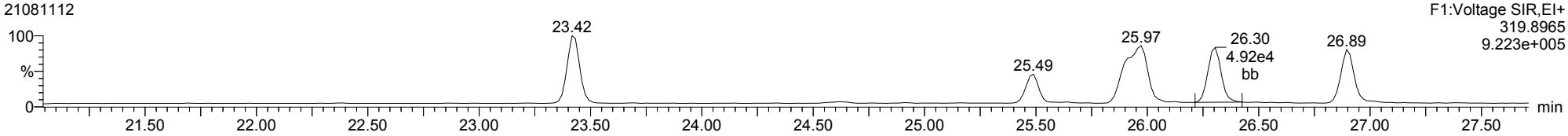

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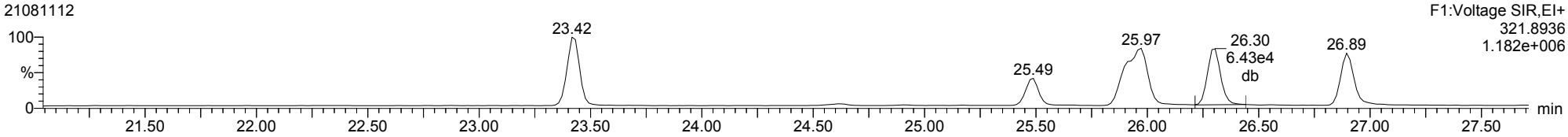

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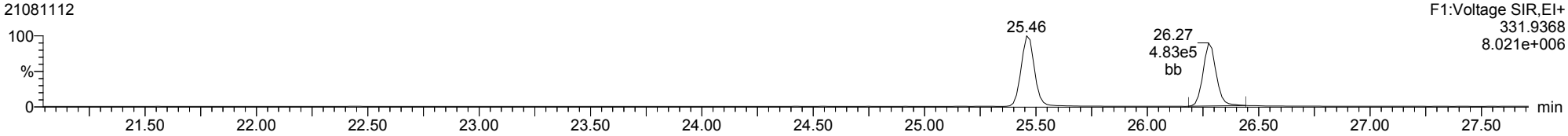

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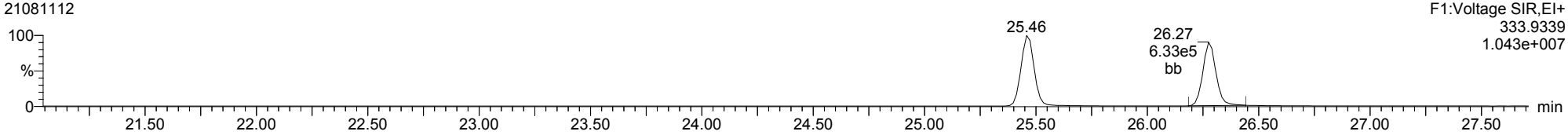

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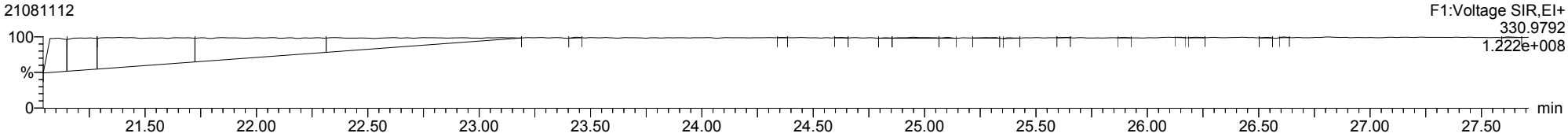

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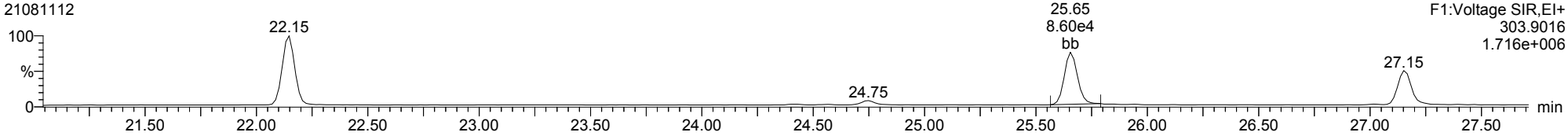
2378-TCDF



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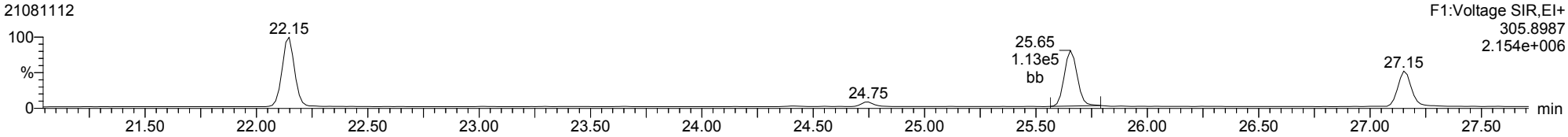

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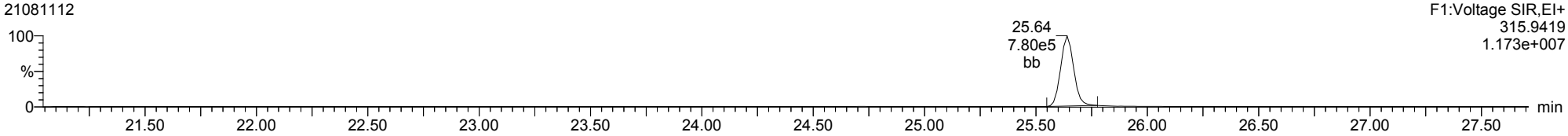

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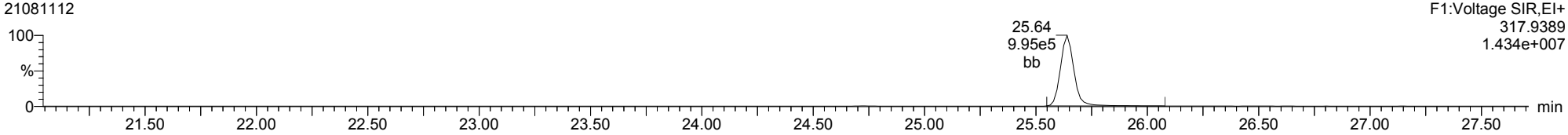

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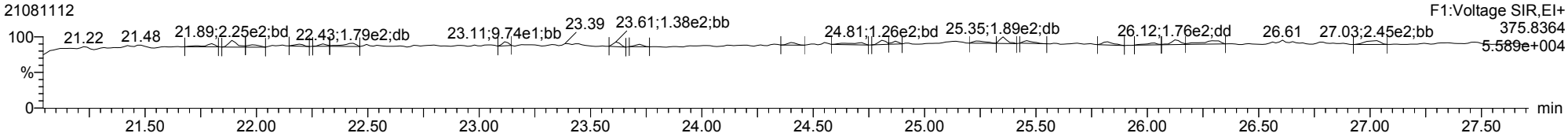

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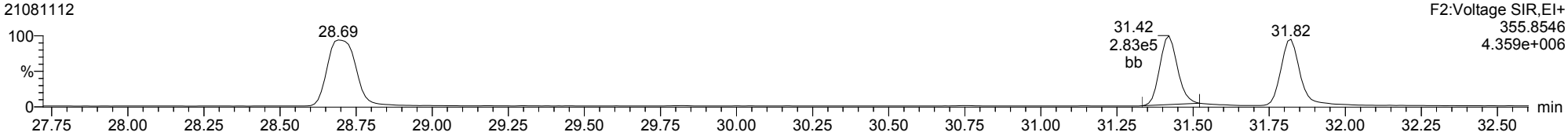
12378-PeCDD



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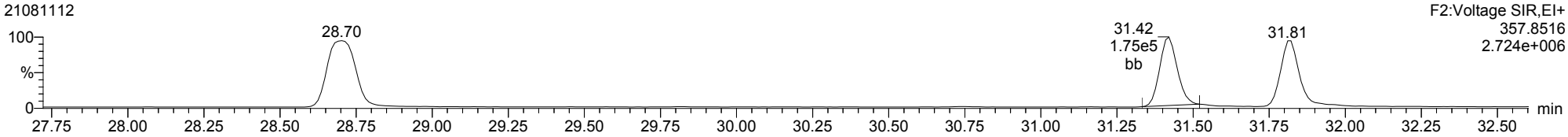

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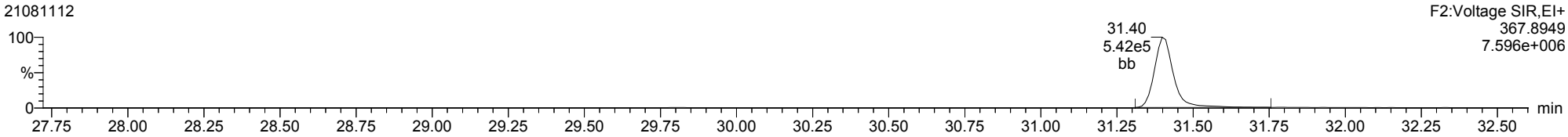

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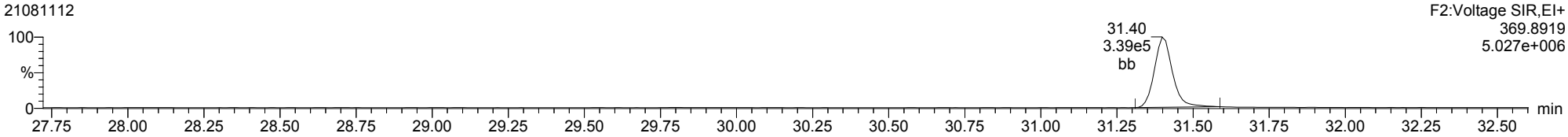

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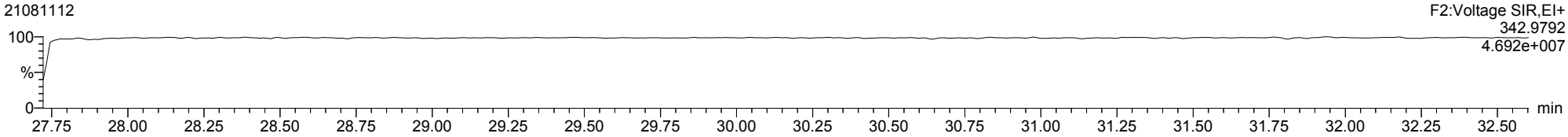

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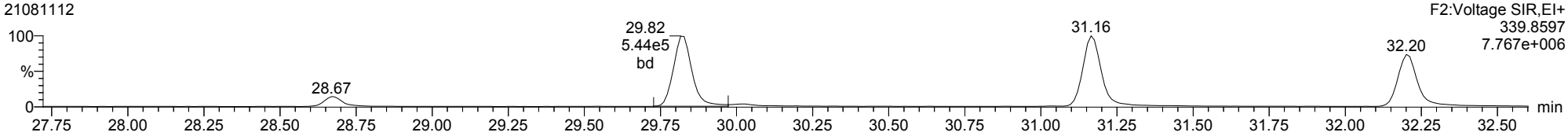

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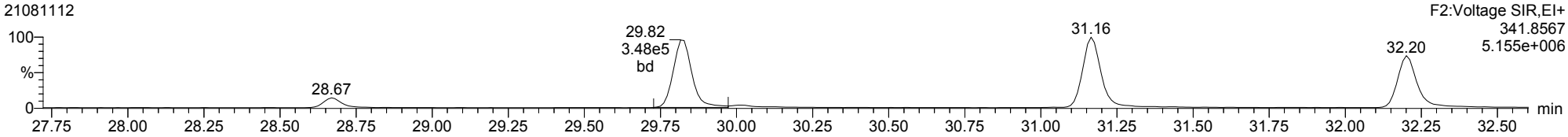

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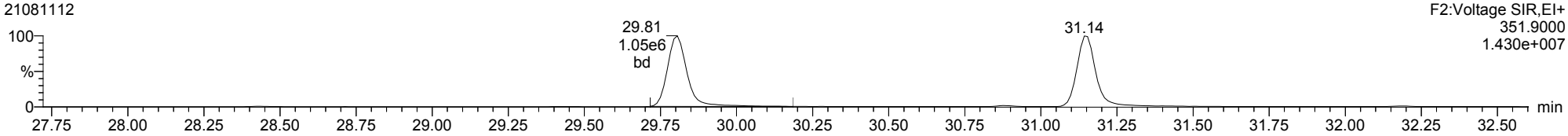

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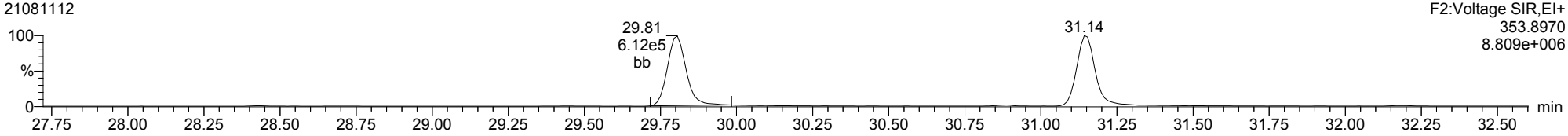

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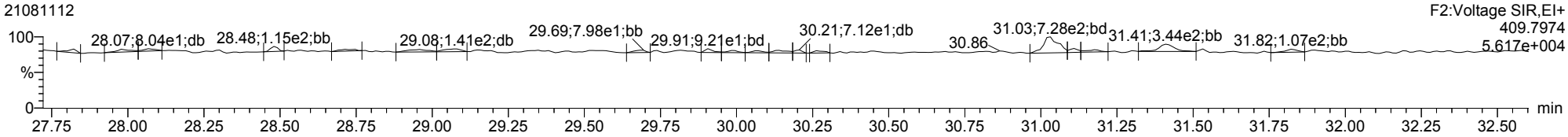

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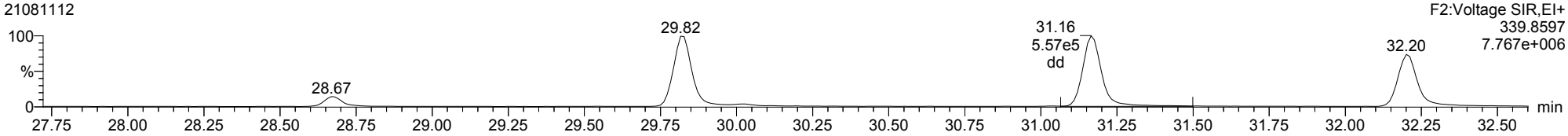

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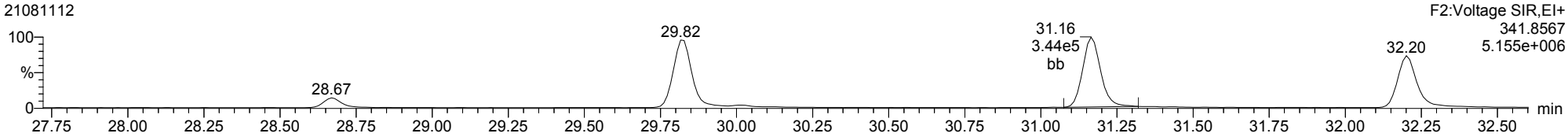

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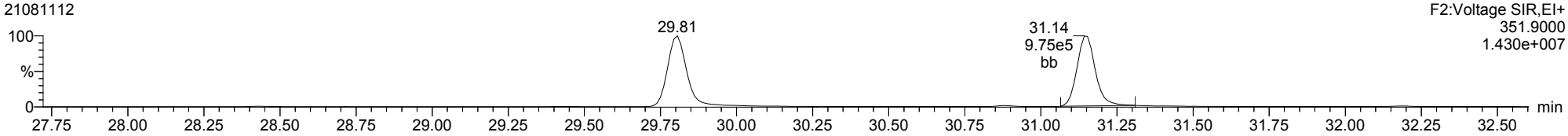

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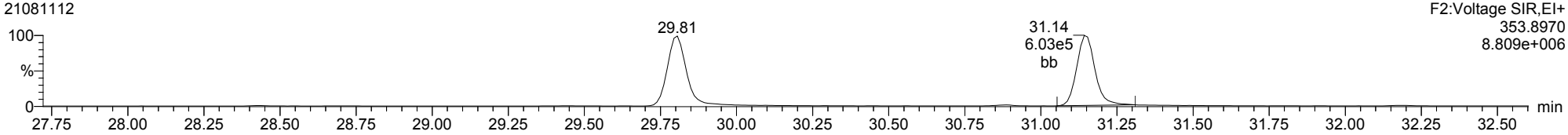

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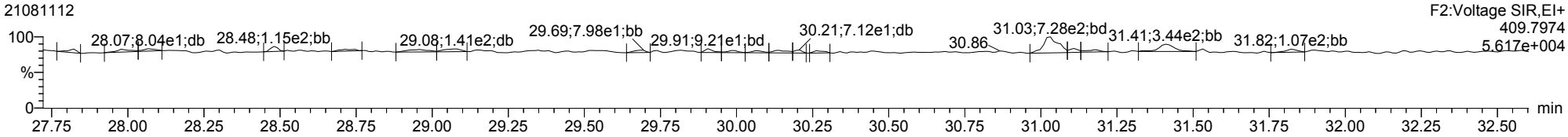

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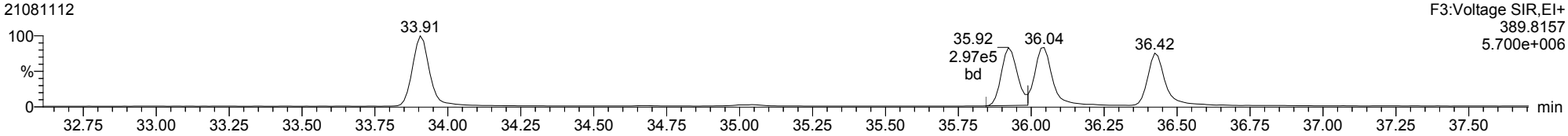

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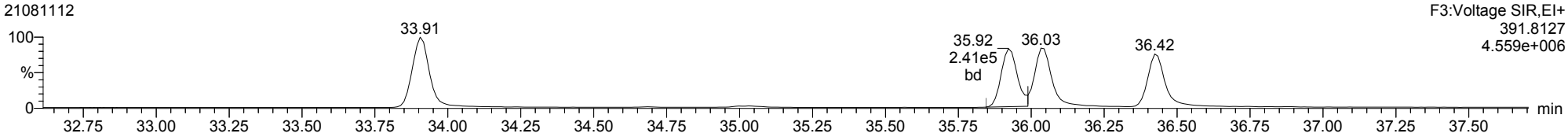

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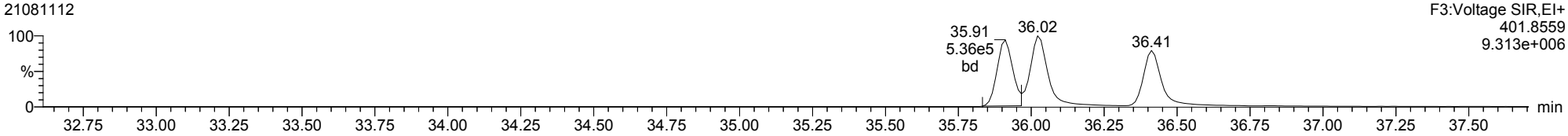

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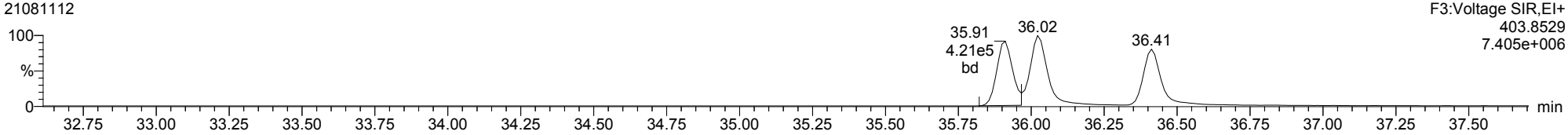

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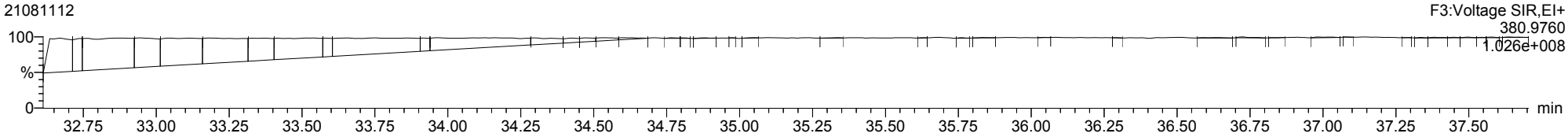

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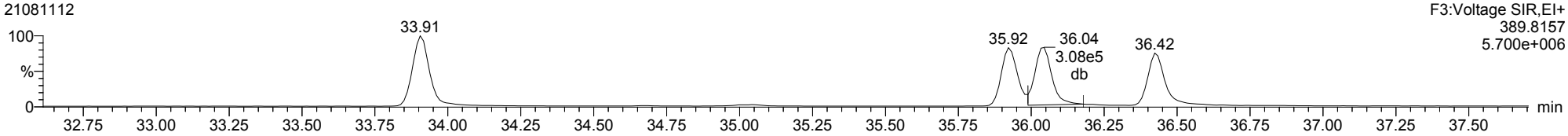

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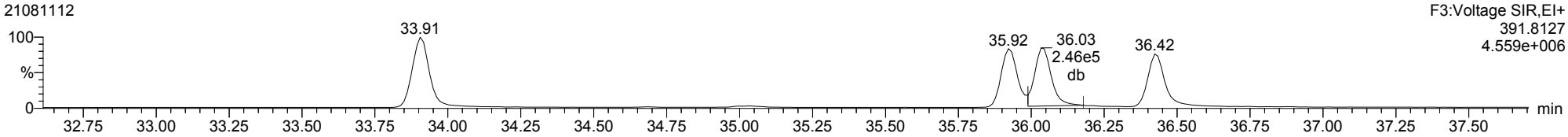

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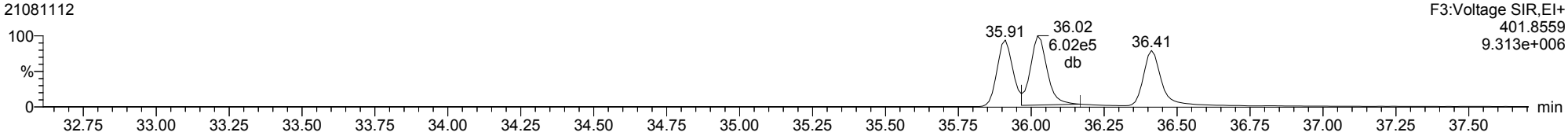

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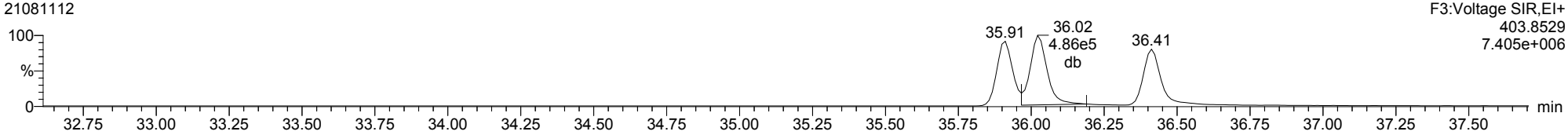

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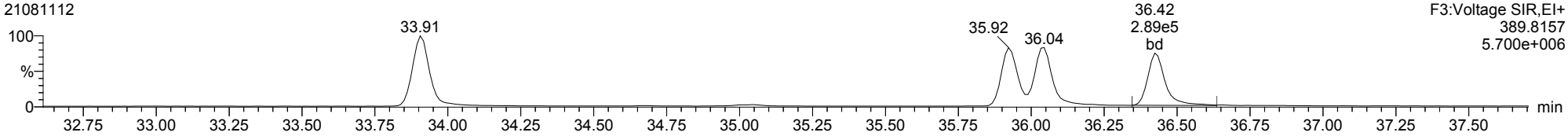

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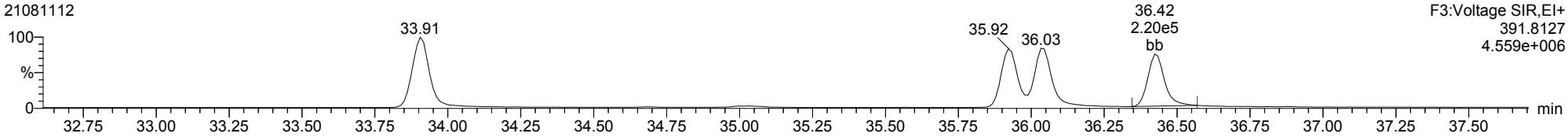

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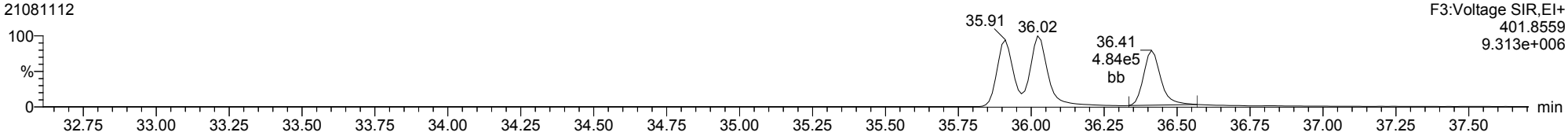

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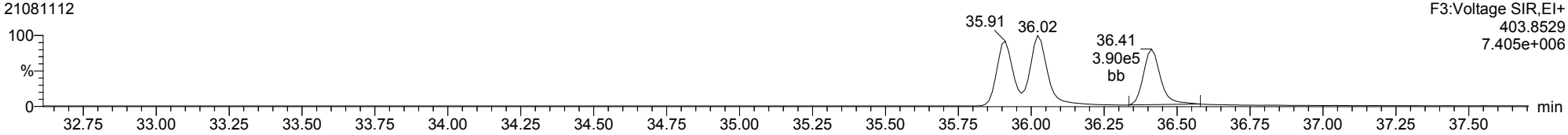

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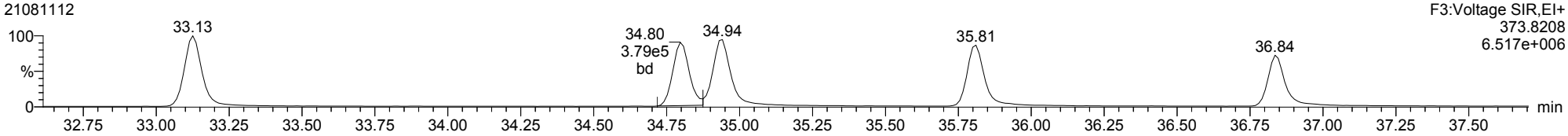

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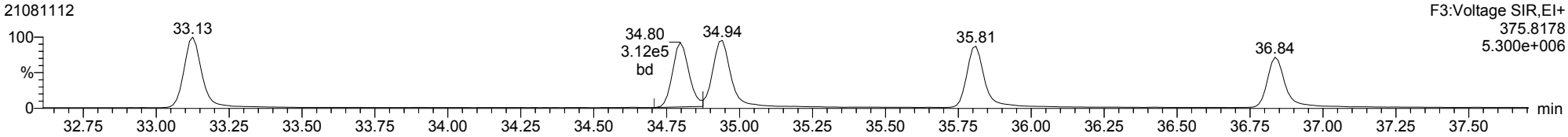

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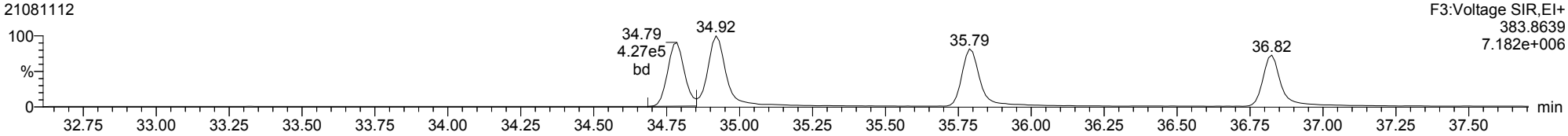

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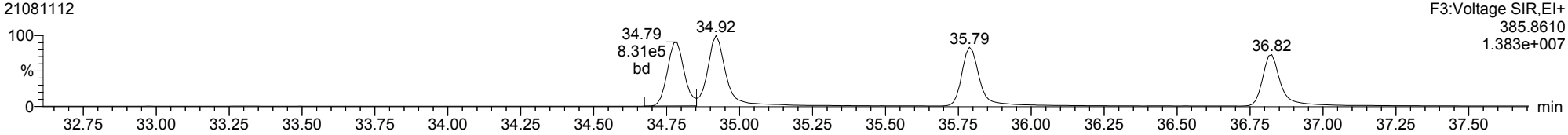

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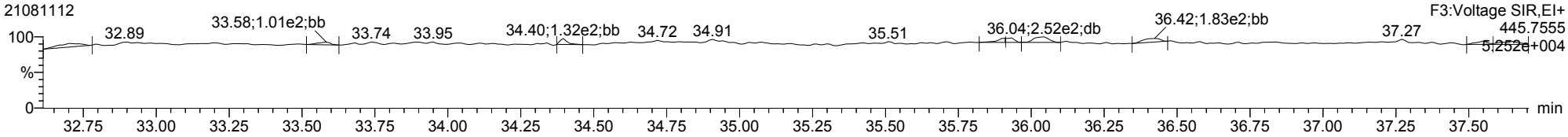

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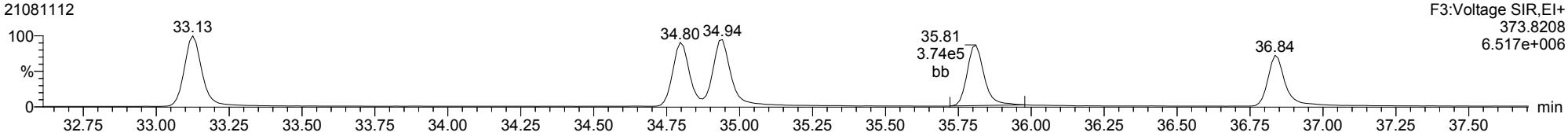

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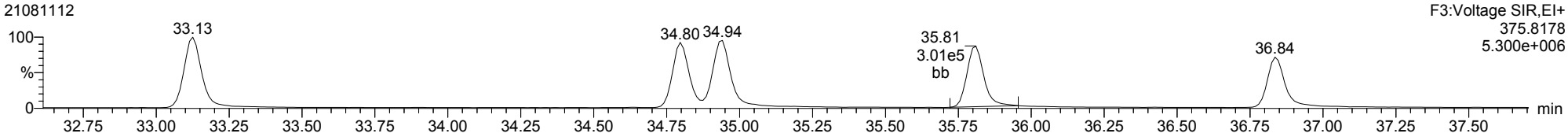

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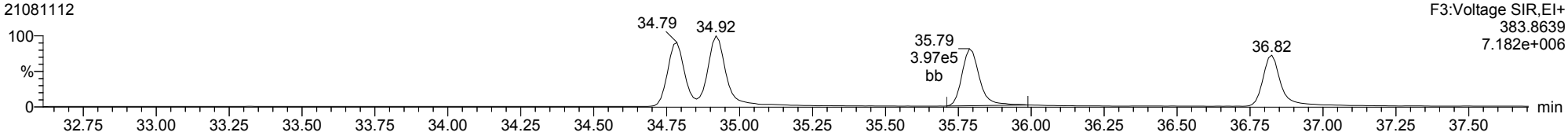

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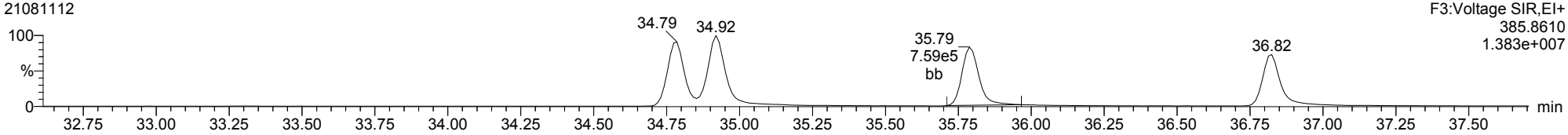

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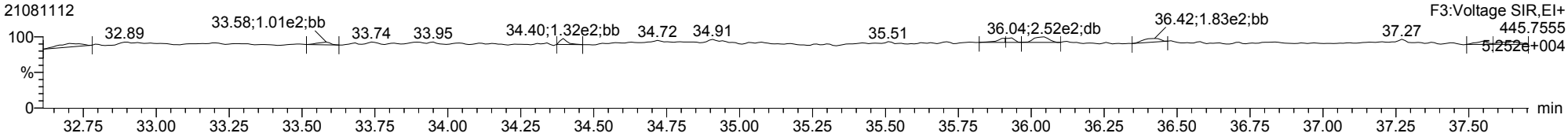

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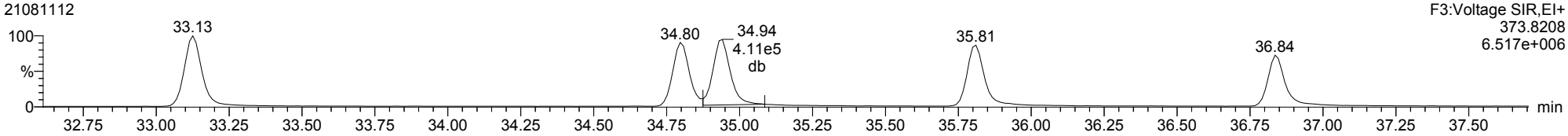

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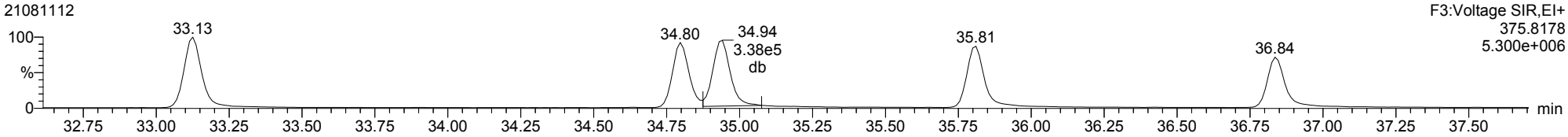

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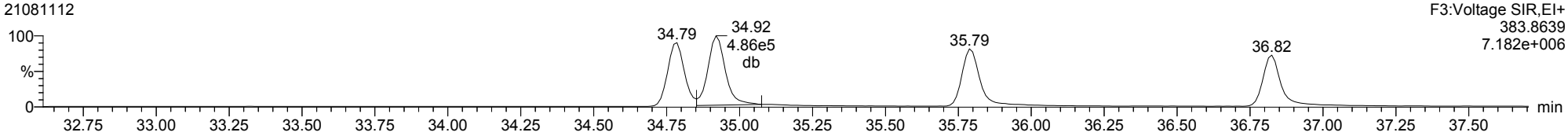

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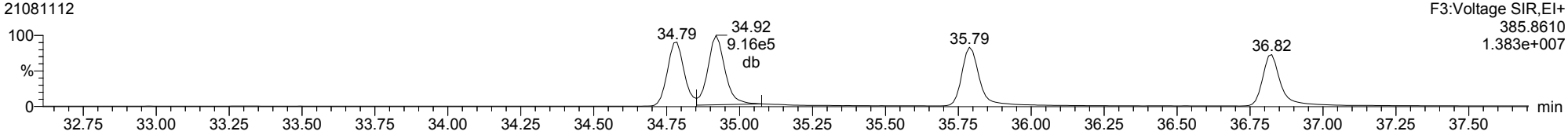

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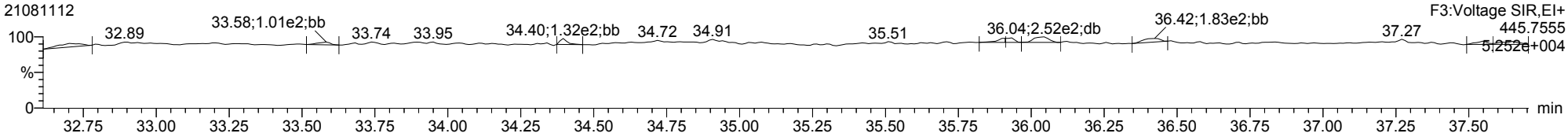

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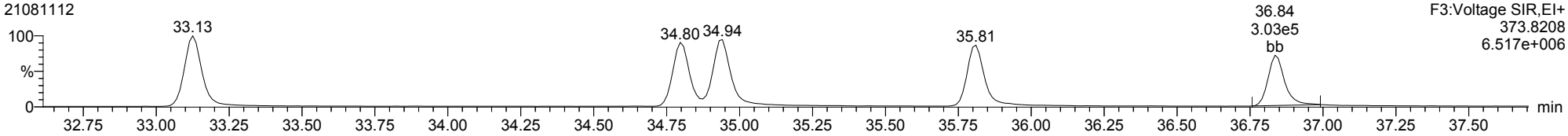

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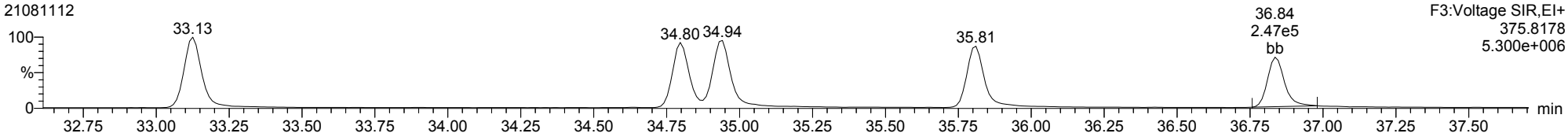

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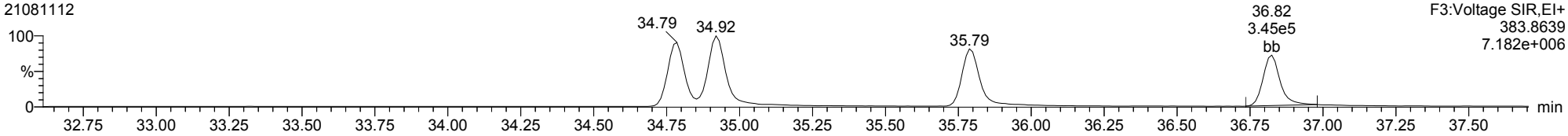

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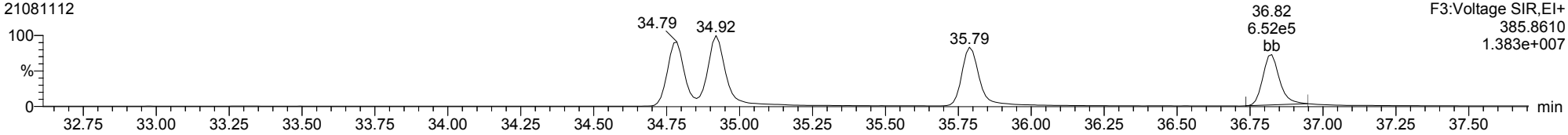

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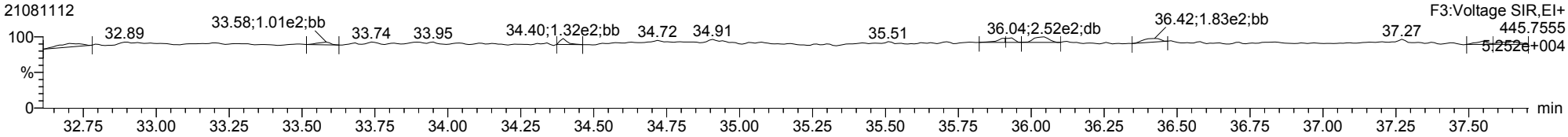

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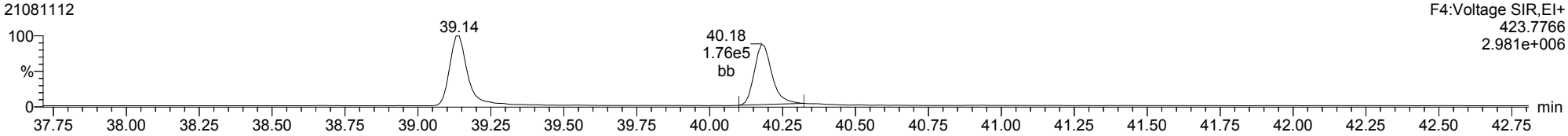

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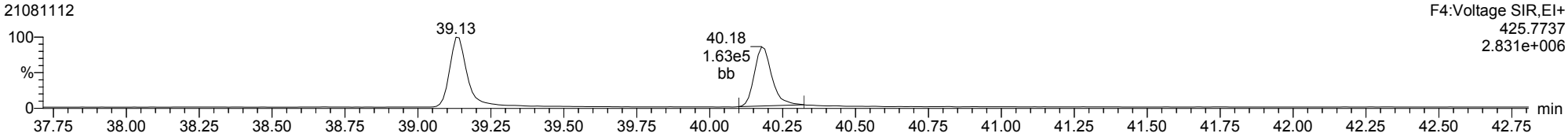

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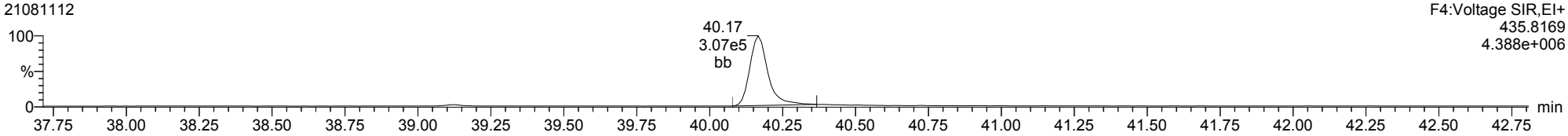

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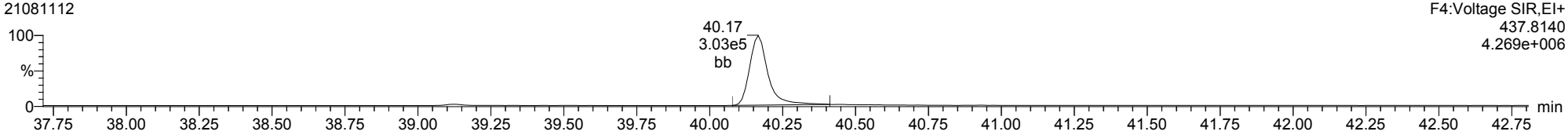

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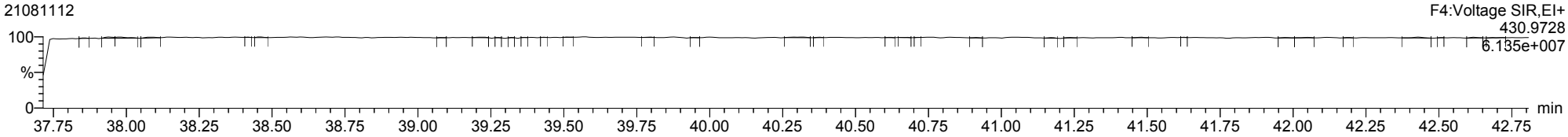

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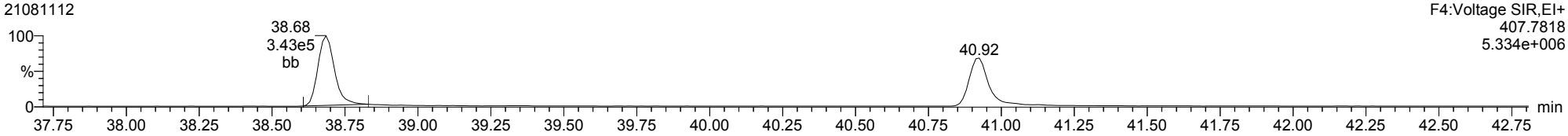

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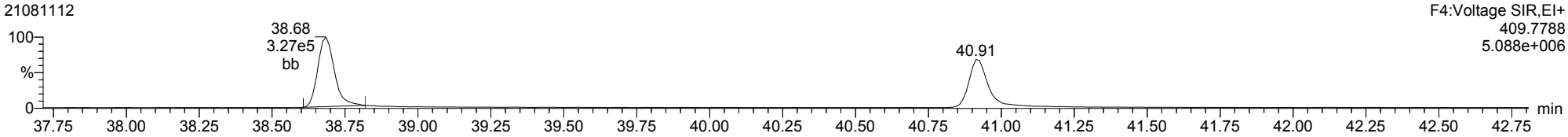

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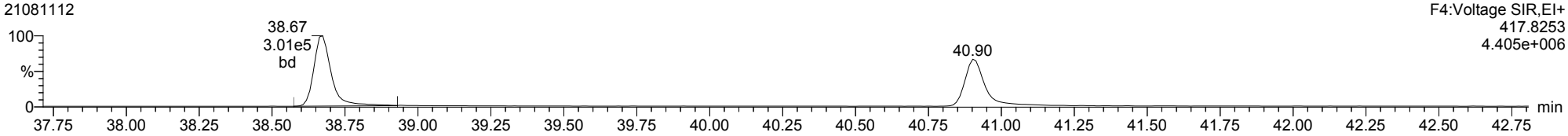

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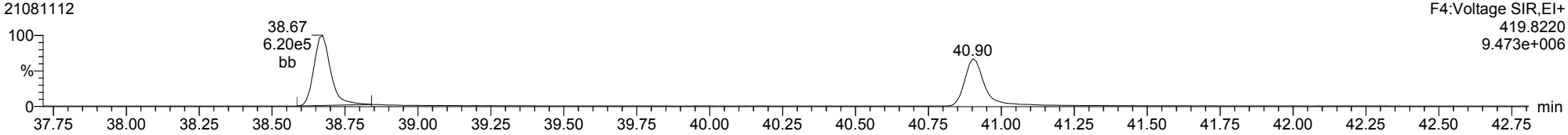

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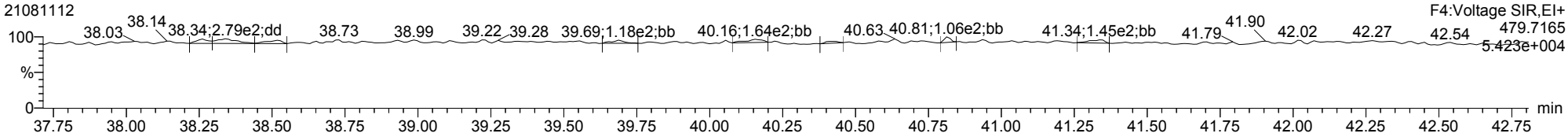

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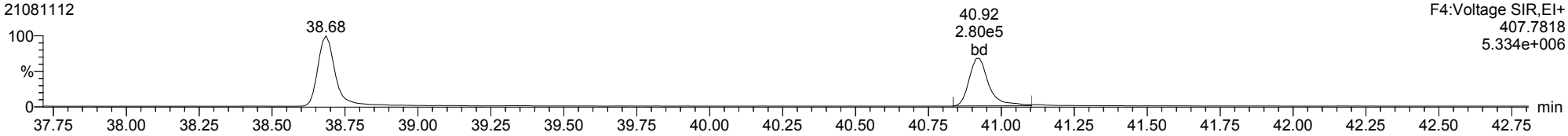

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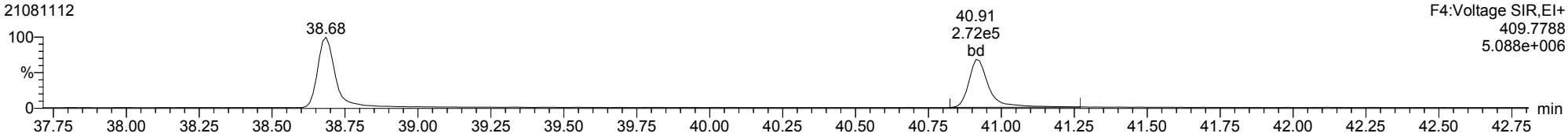

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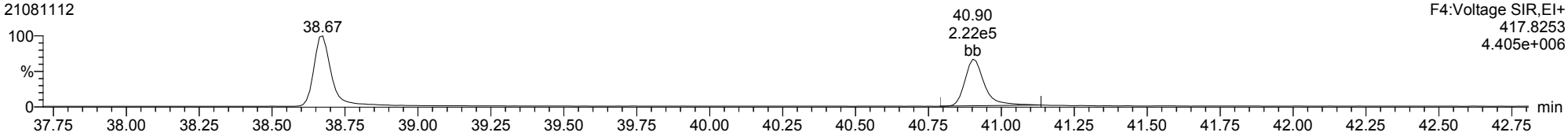

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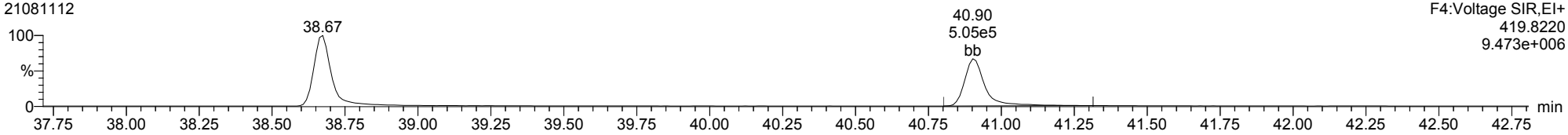

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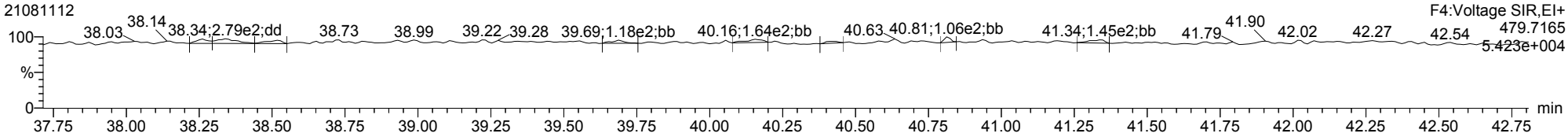

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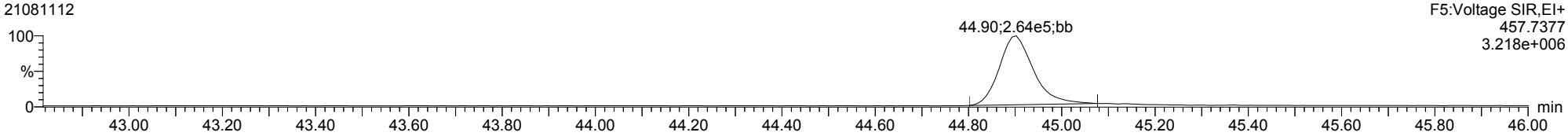

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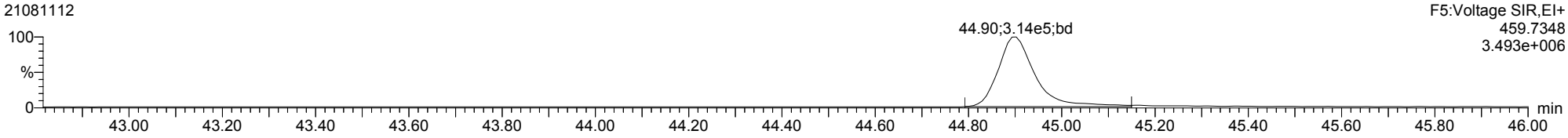

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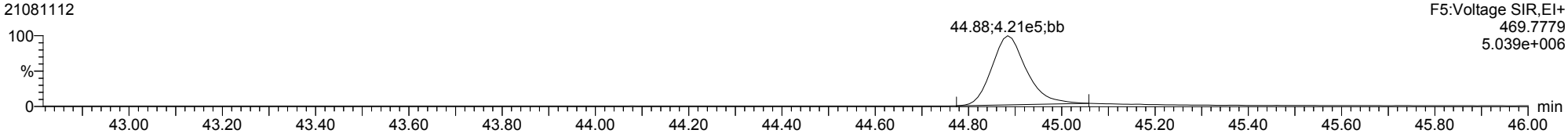

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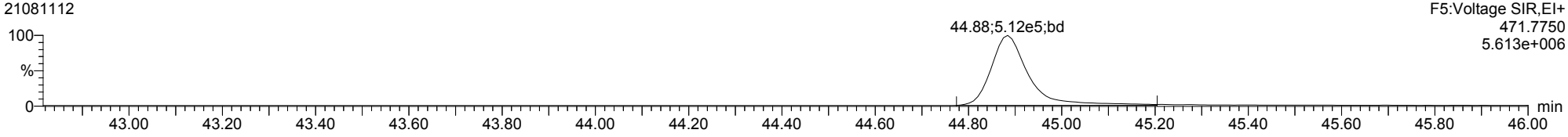
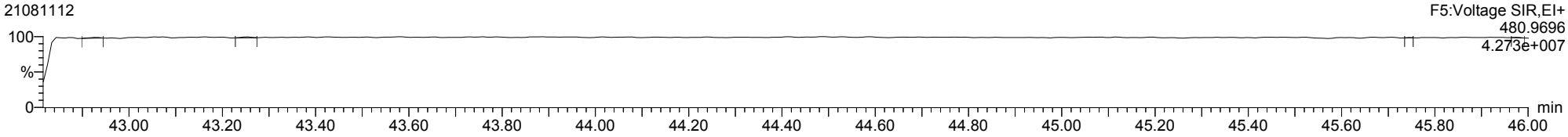


FUNCTION5 PFK



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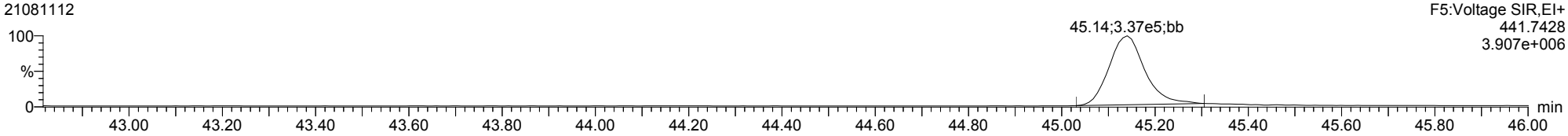

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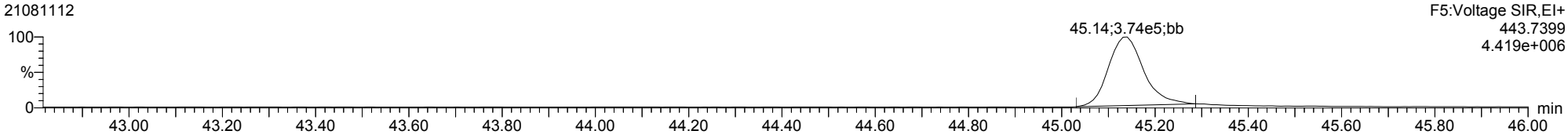

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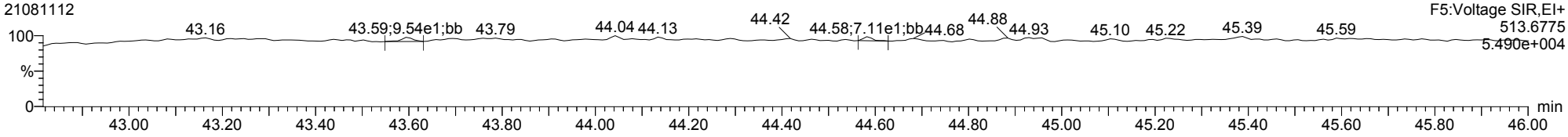

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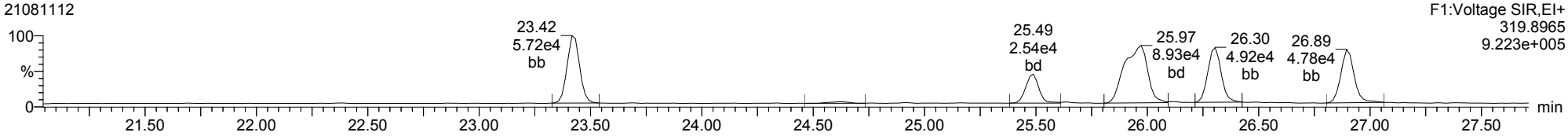

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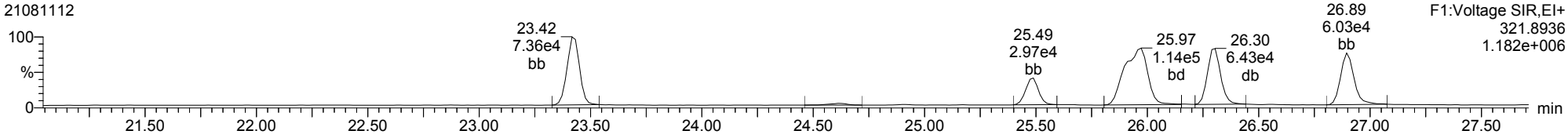

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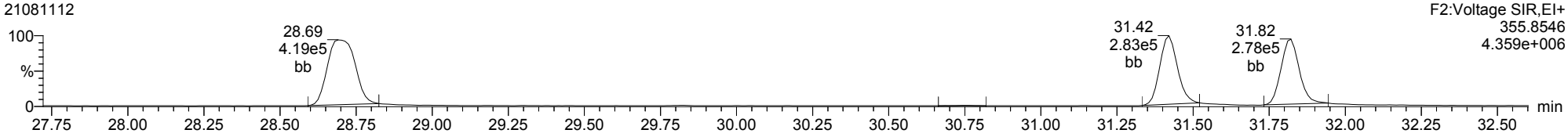

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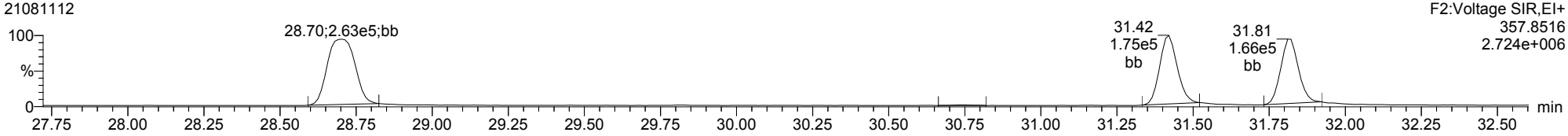

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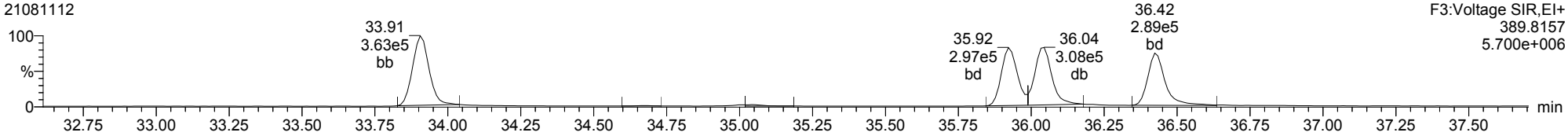

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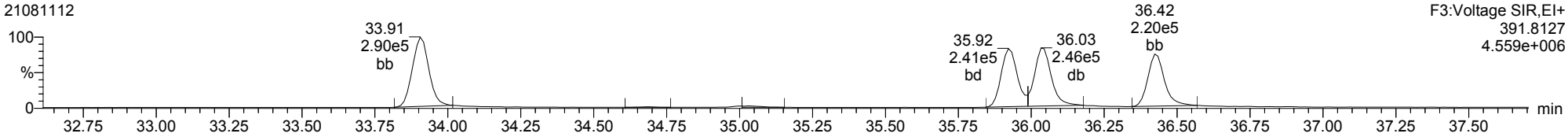

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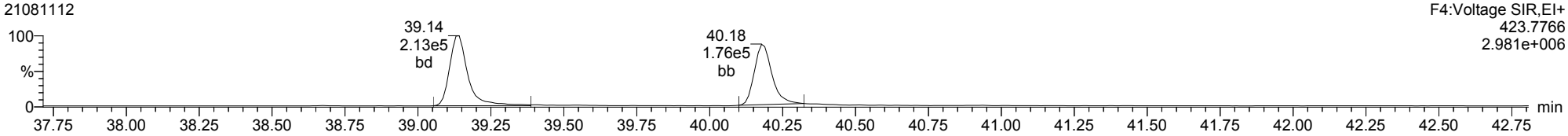

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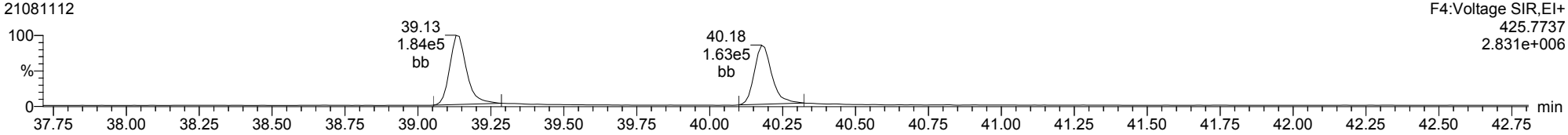

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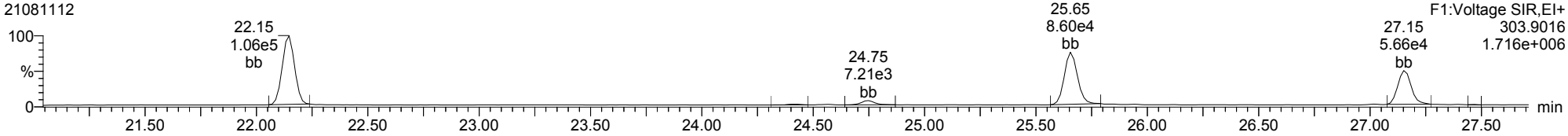
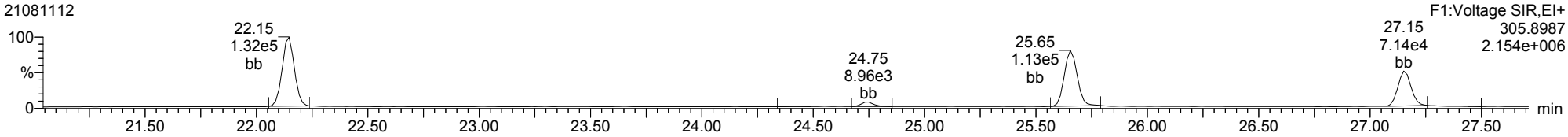
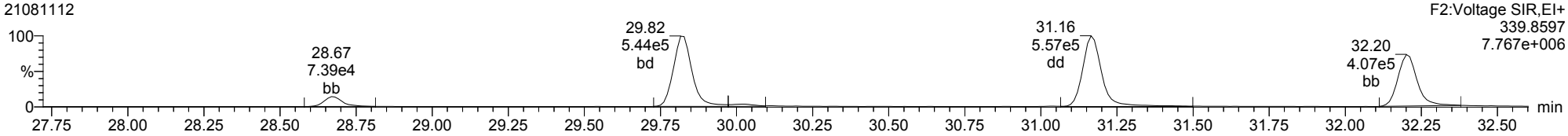
Total-tetrafurans



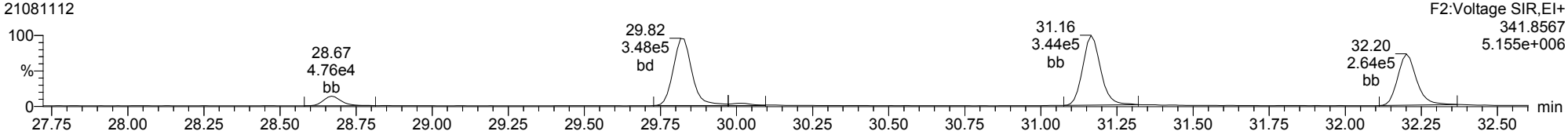
Total-tetrafurans



Total-pentafurans



Total-pentafurans



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

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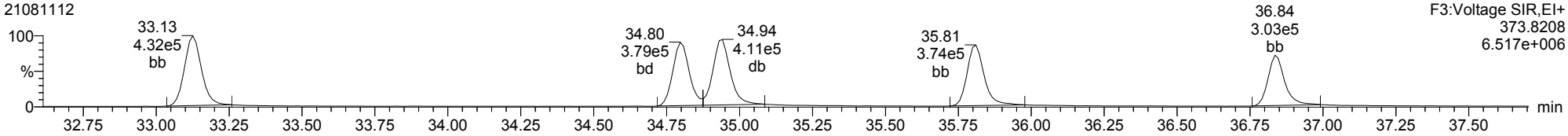

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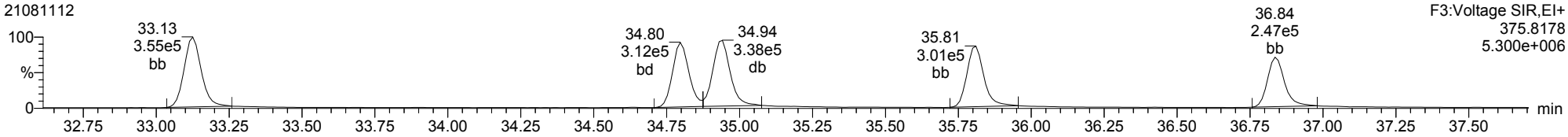

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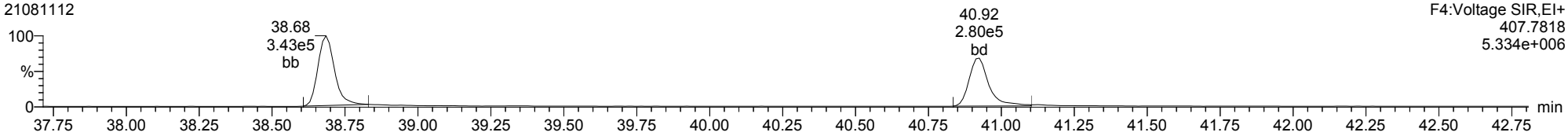

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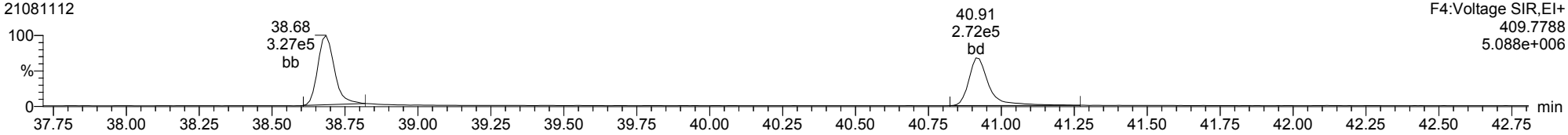

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION CHECK

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
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
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:	21G0064
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

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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

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

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

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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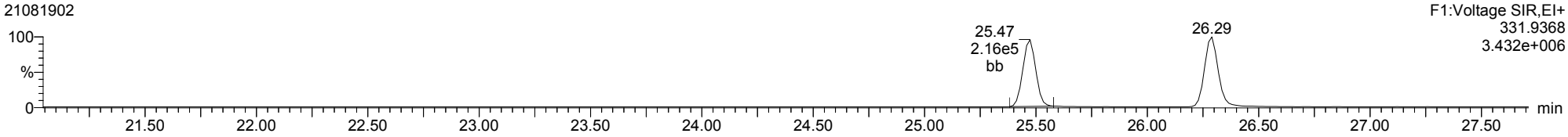

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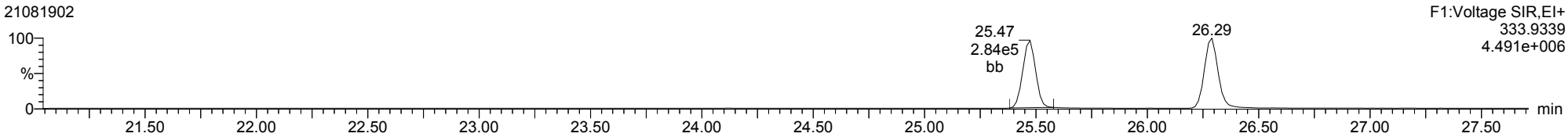

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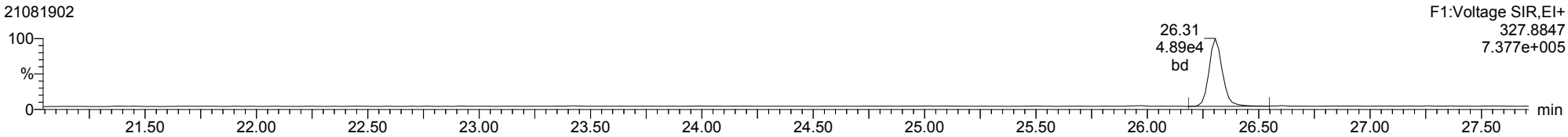

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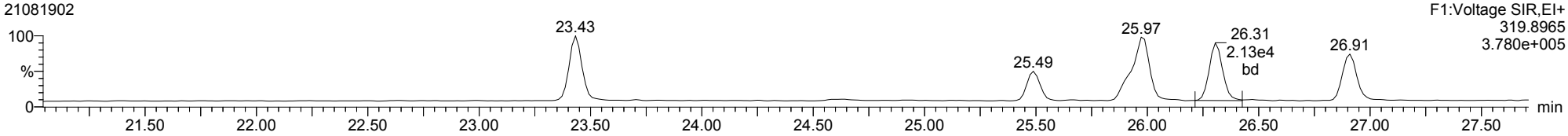

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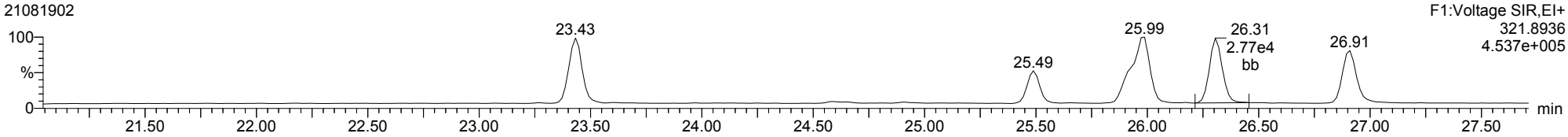

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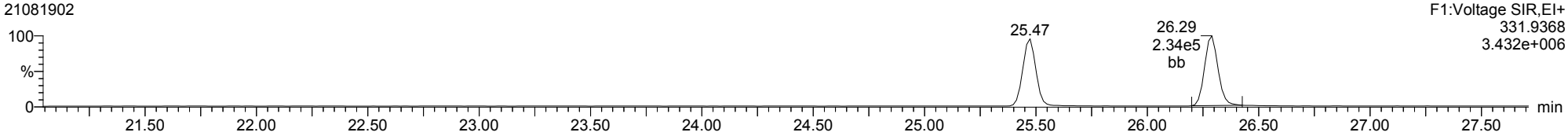

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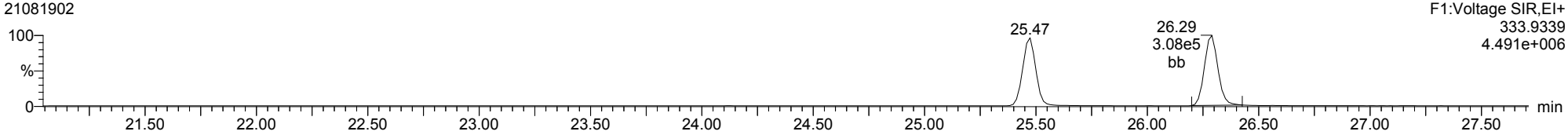

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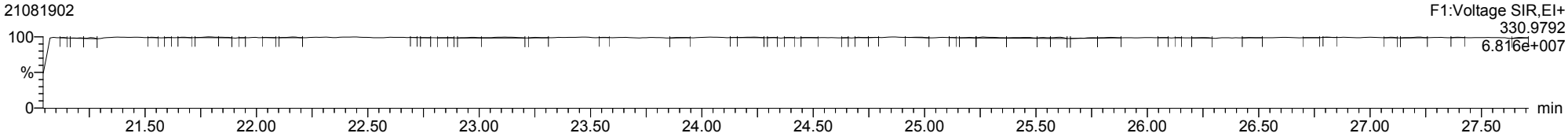

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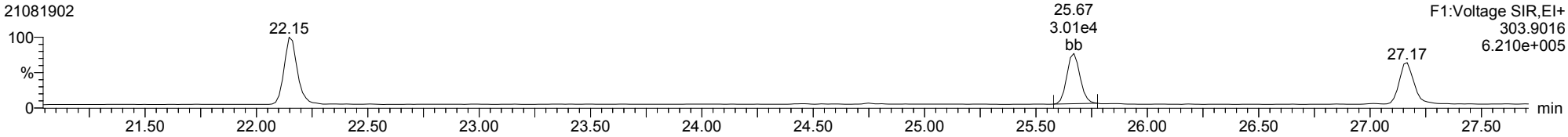

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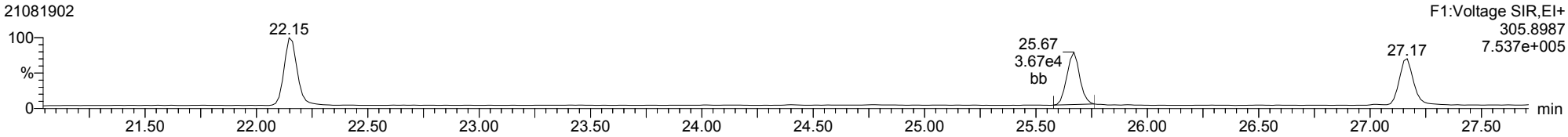

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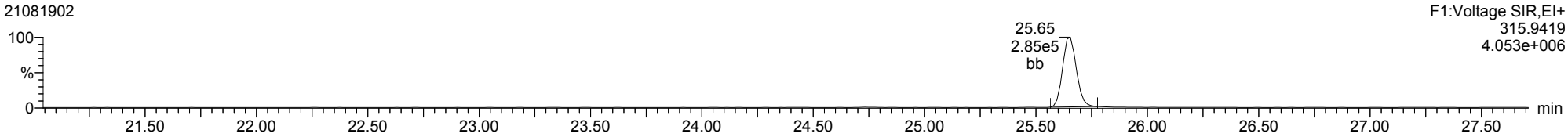

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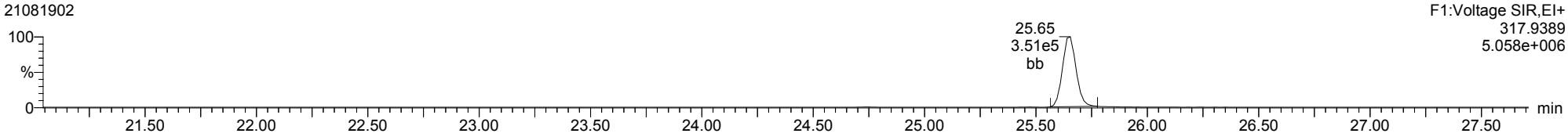

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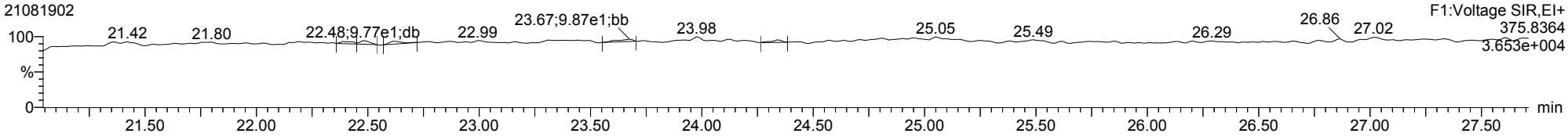

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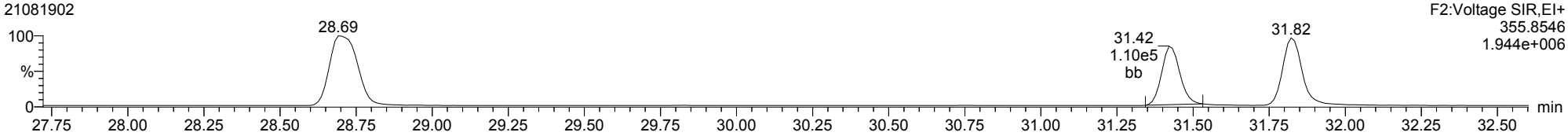

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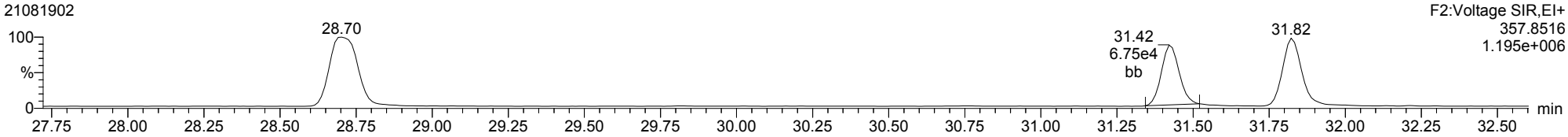

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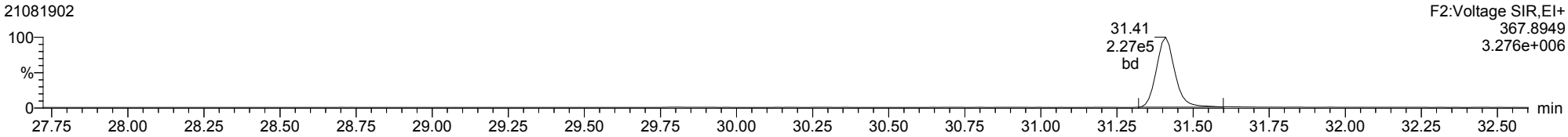

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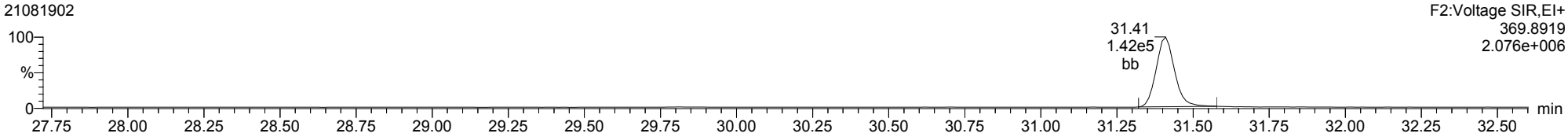

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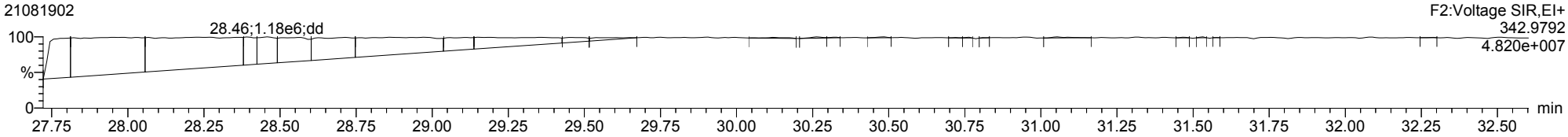

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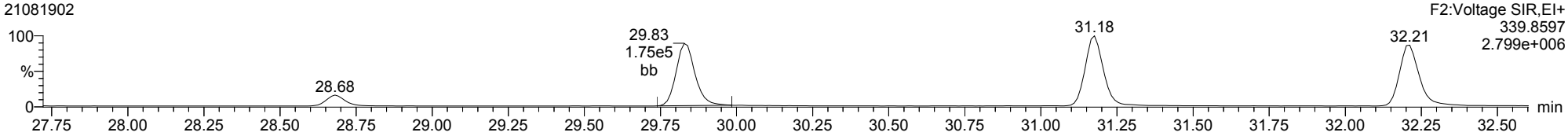

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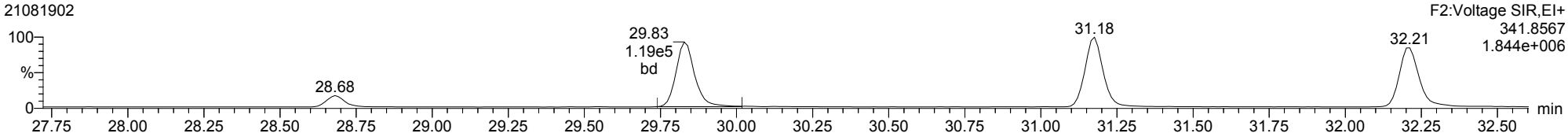

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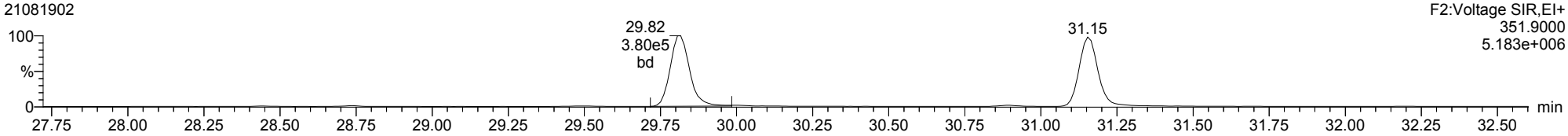

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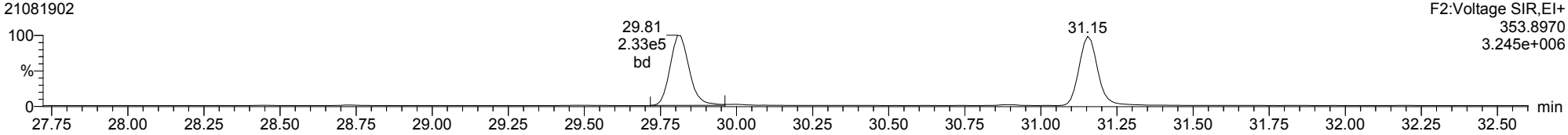

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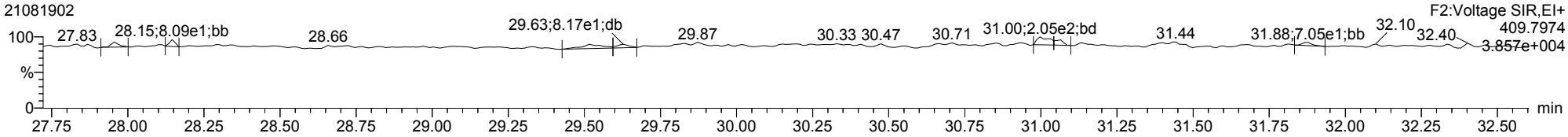

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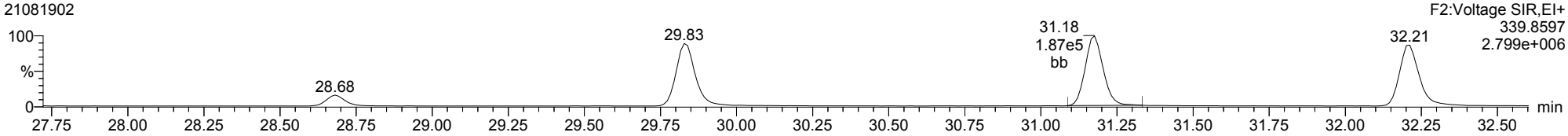

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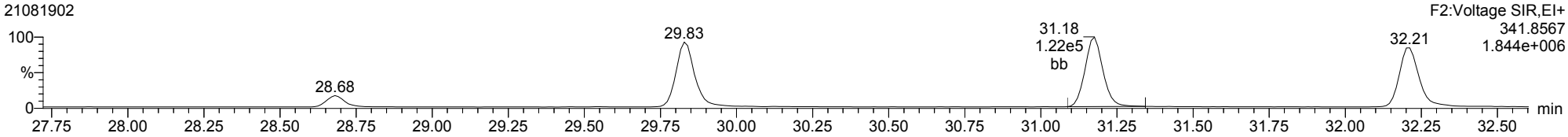

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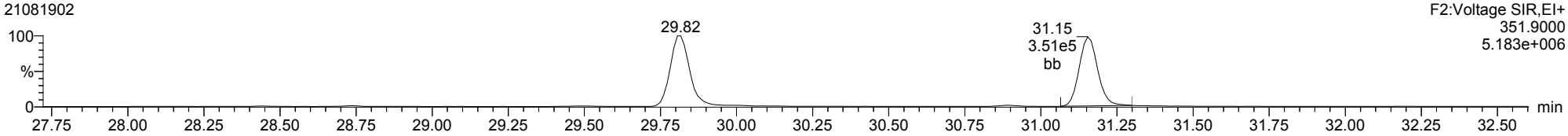

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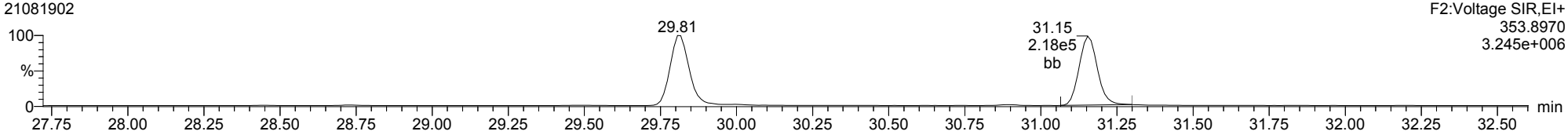

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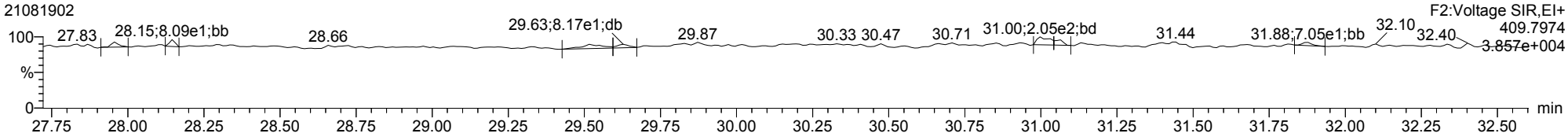

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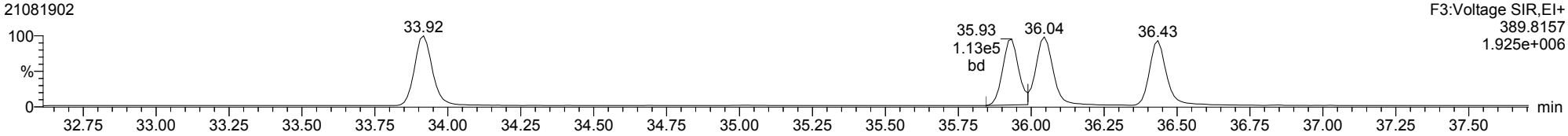

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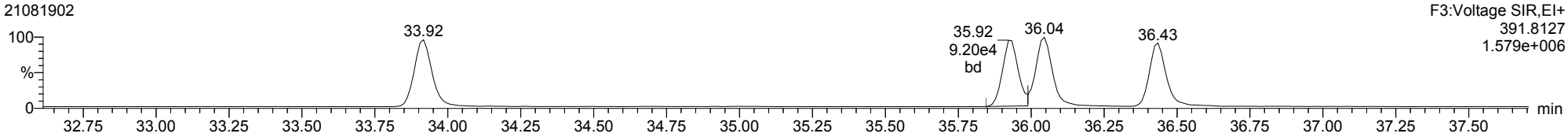

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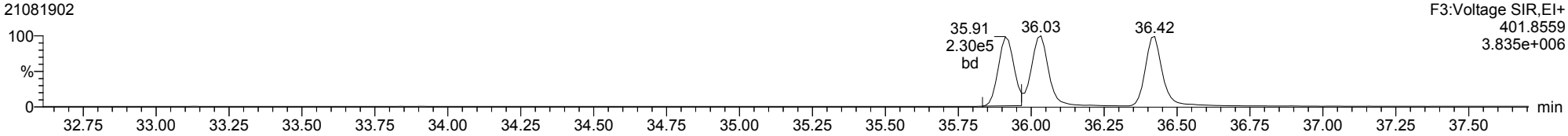

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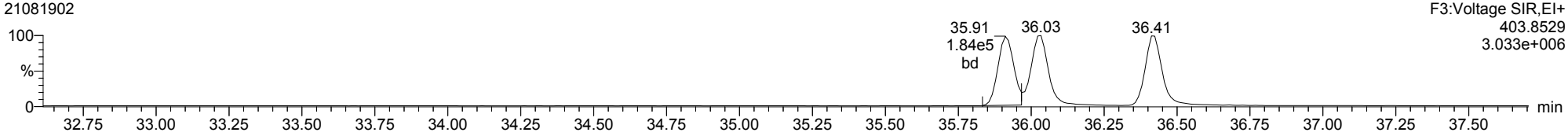

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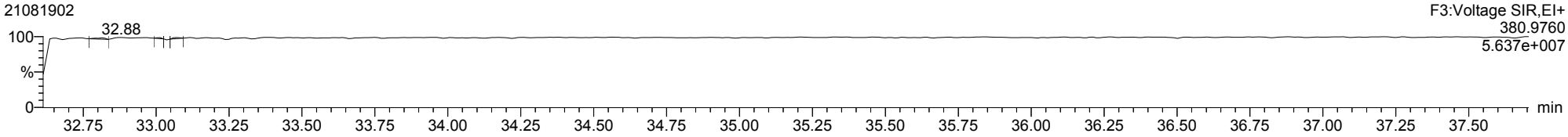

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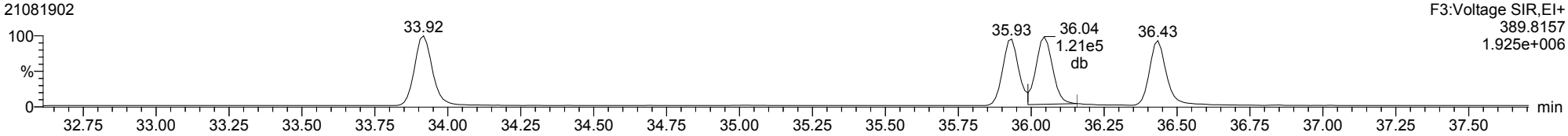

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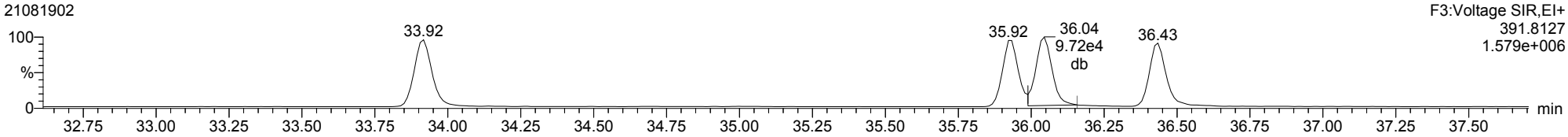

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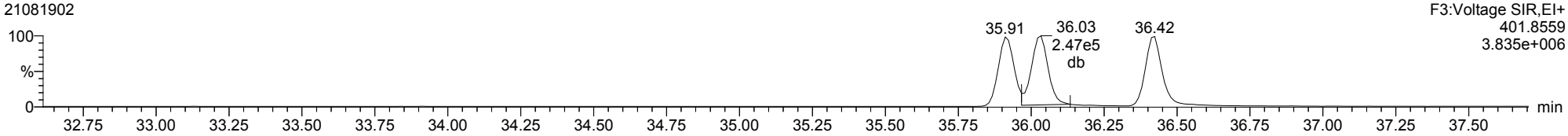

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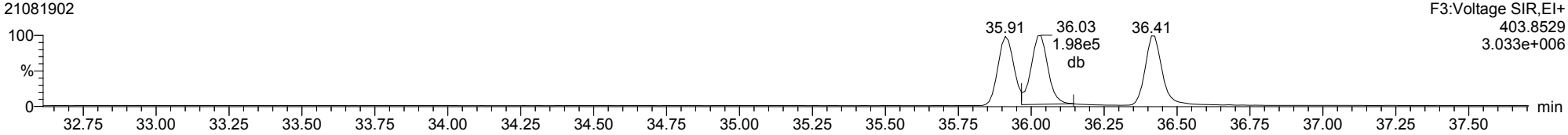

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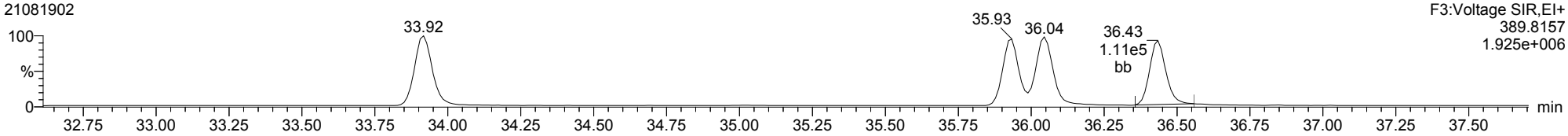

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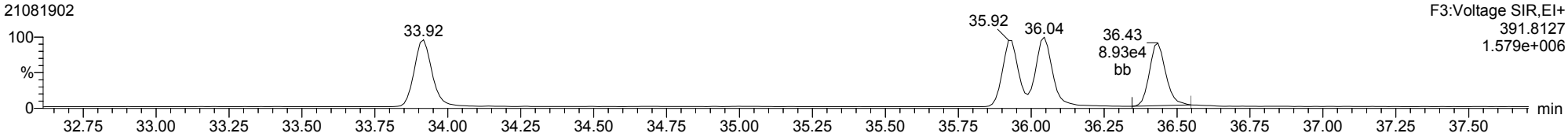

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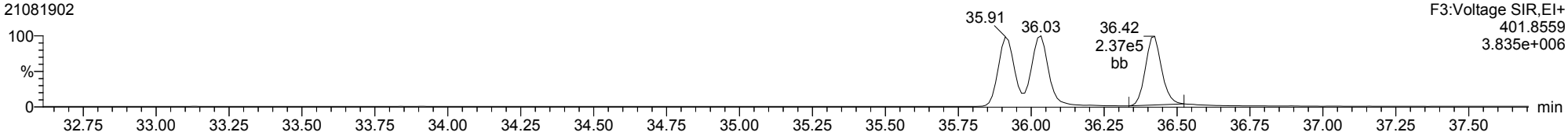

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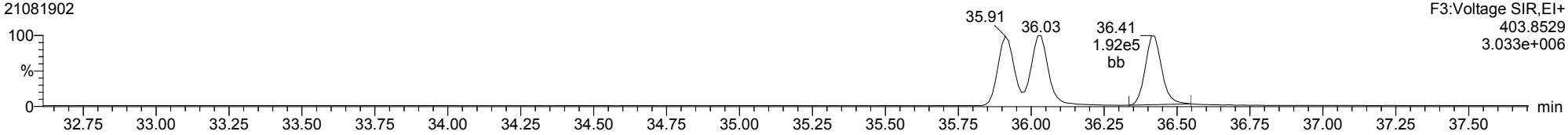

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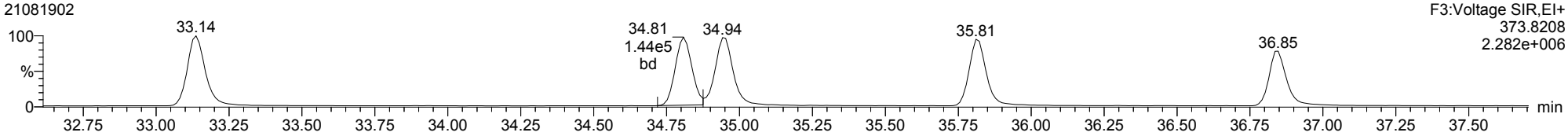

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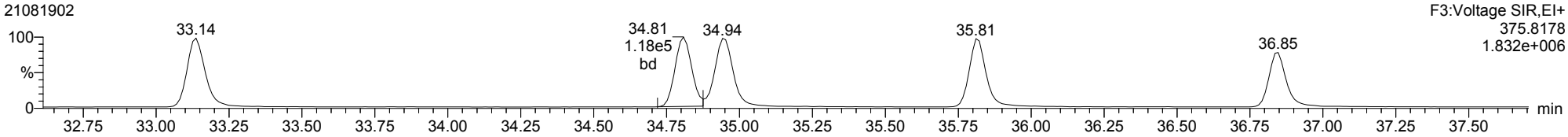

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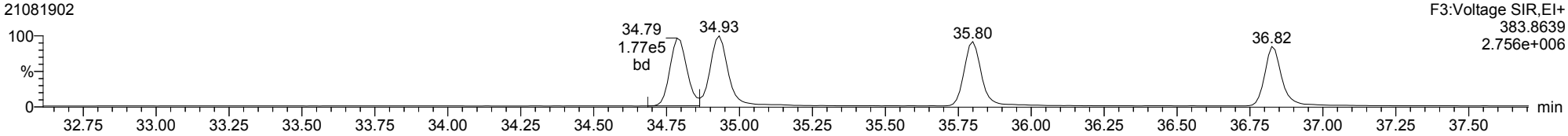

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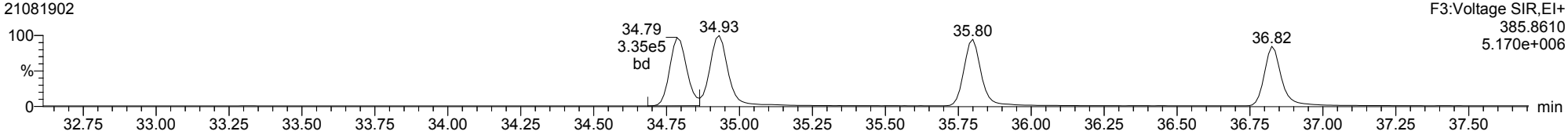

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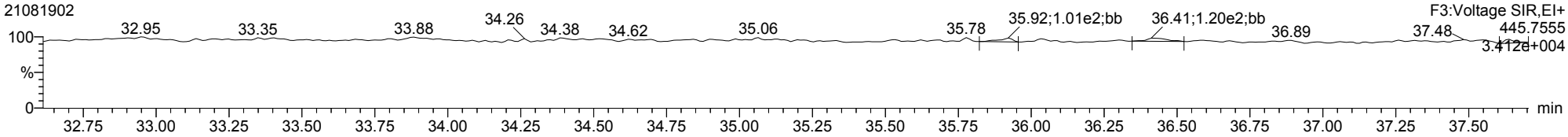

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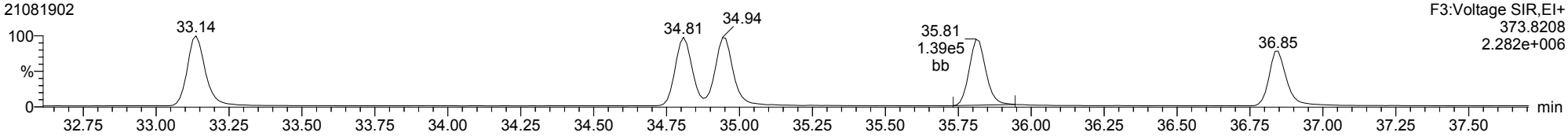

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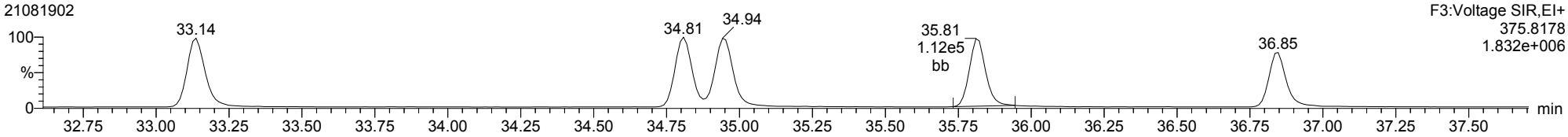

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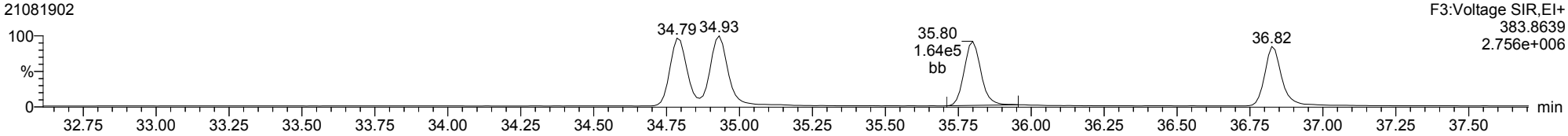

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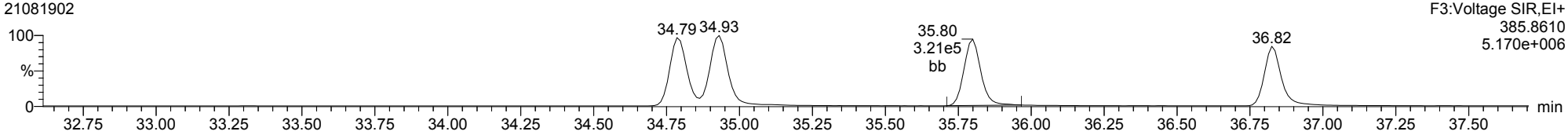

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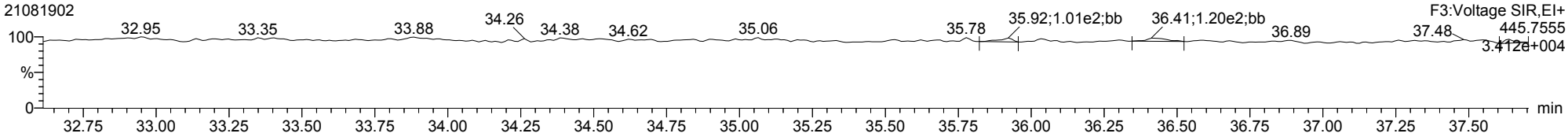

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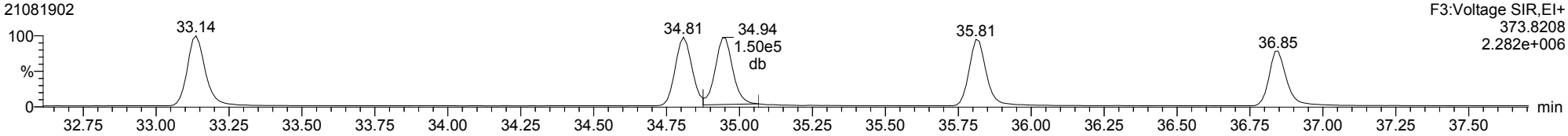

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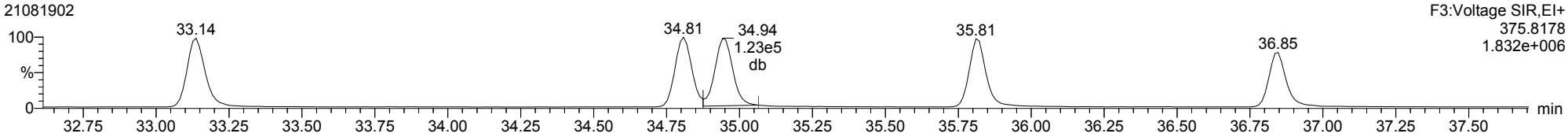

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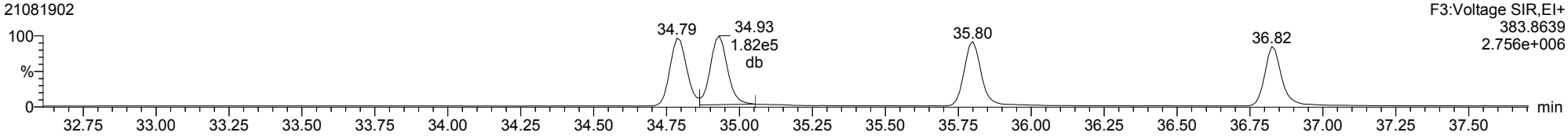

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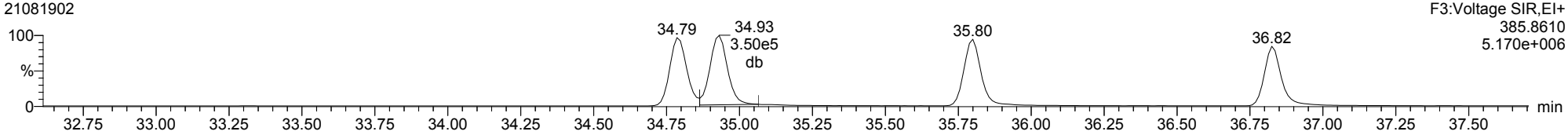

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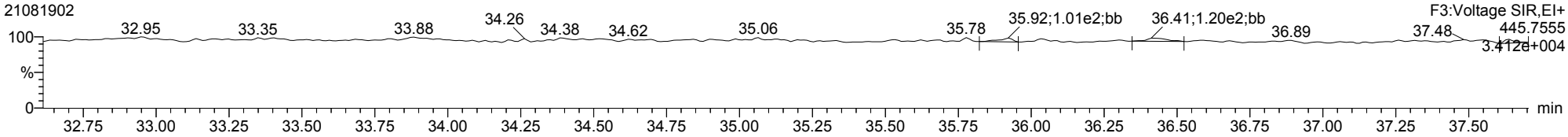

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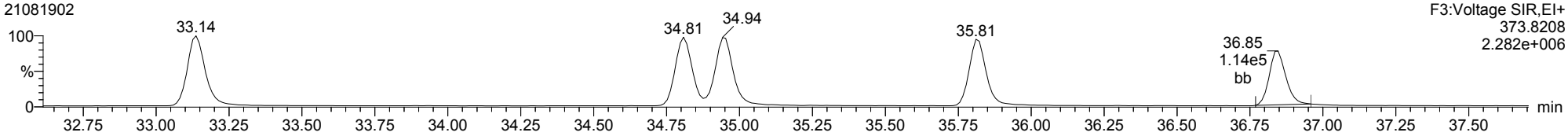

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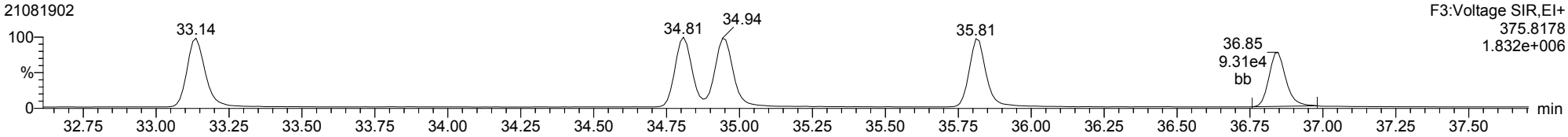

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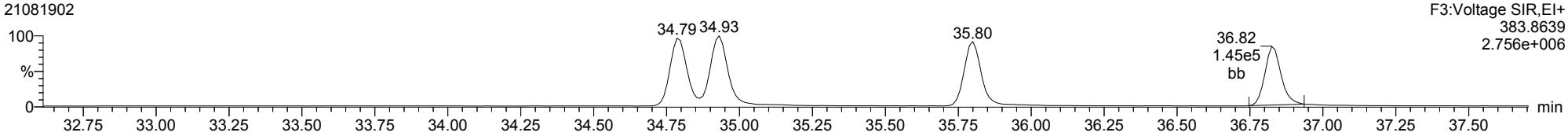

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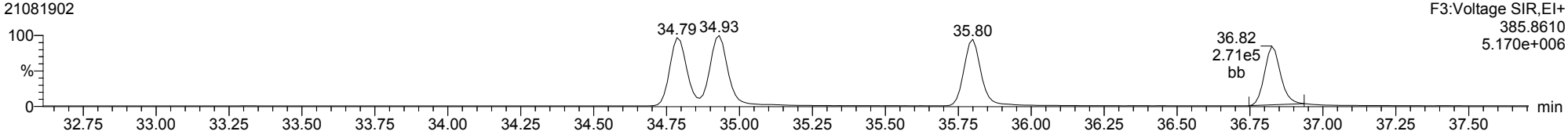

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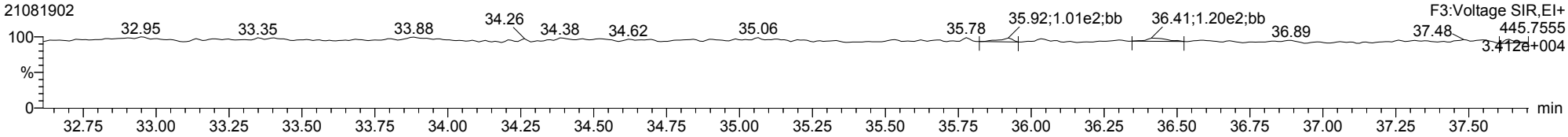

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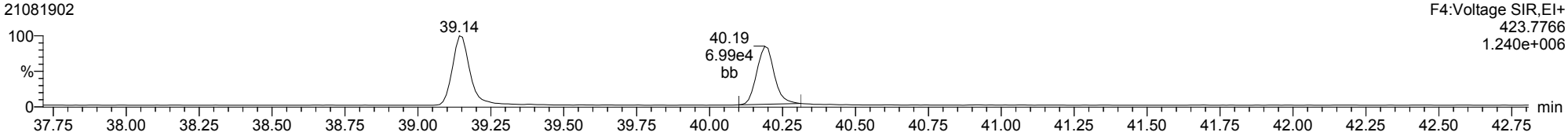

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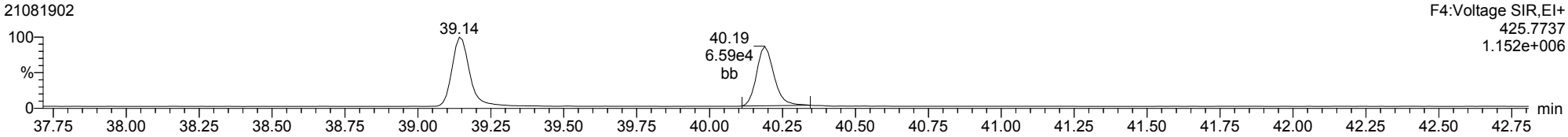

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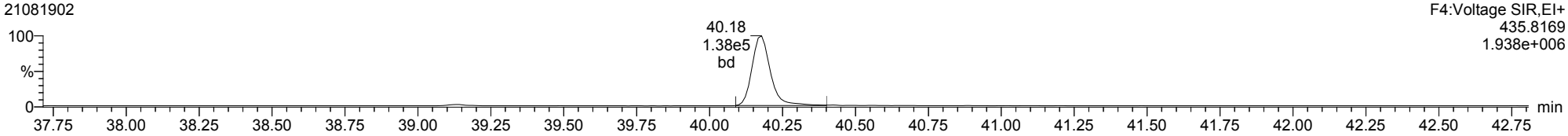

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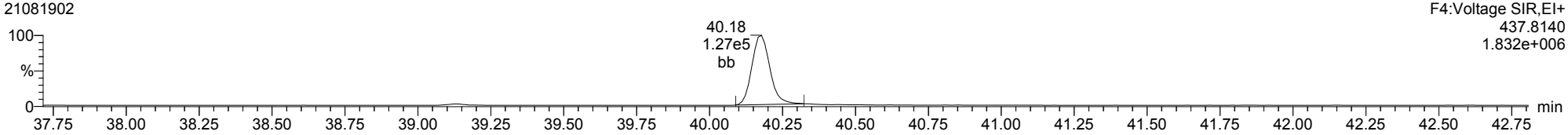

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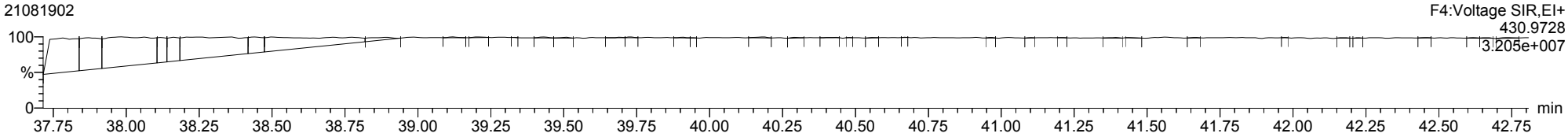

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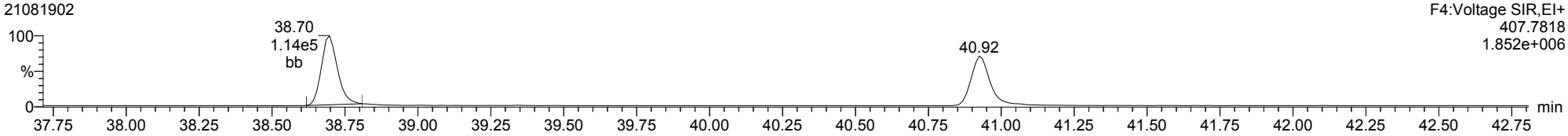

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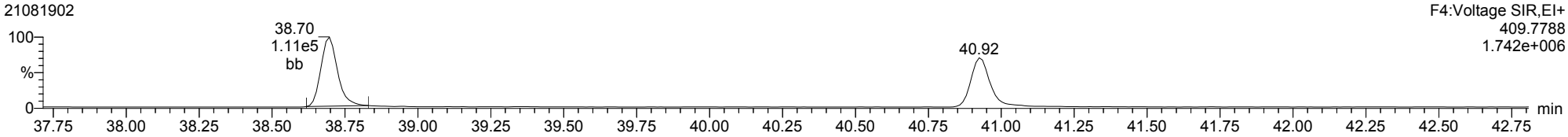

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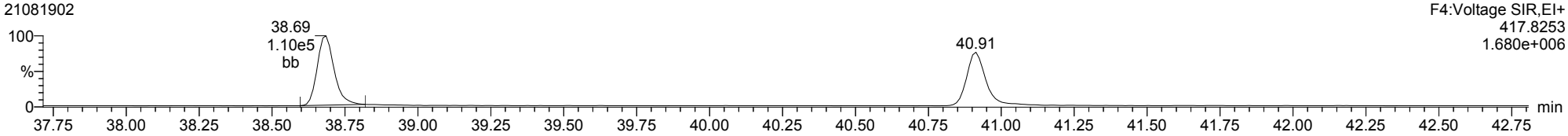

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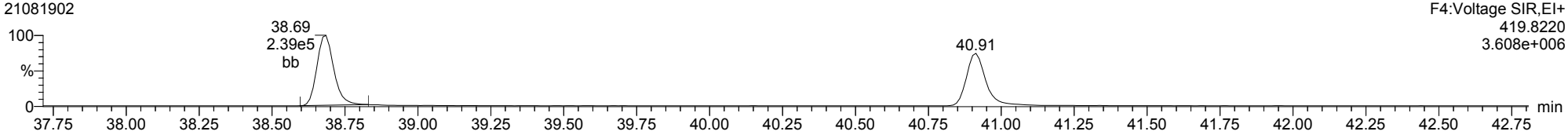

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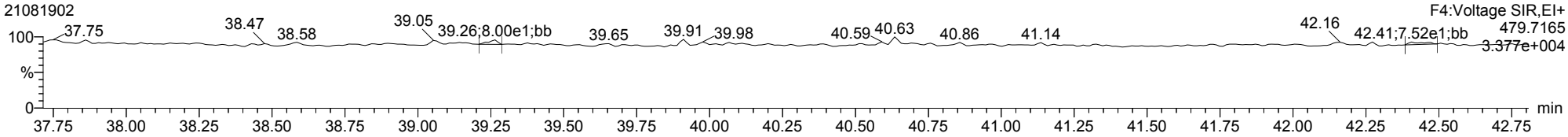

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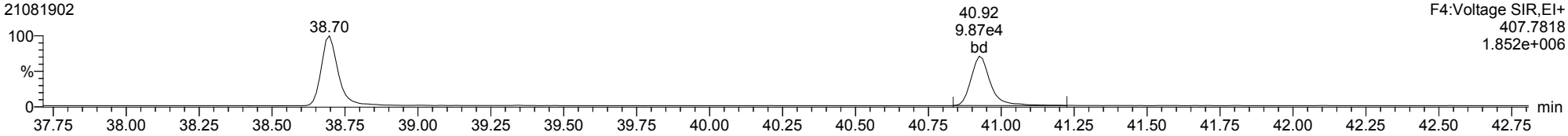

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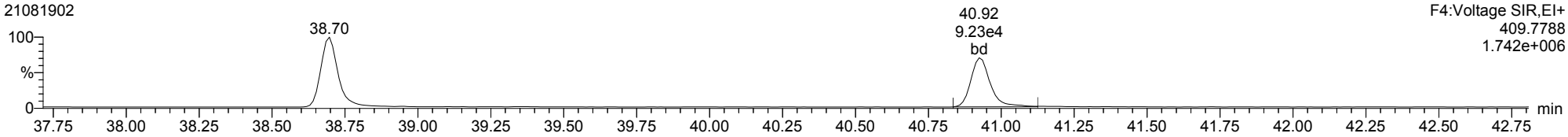

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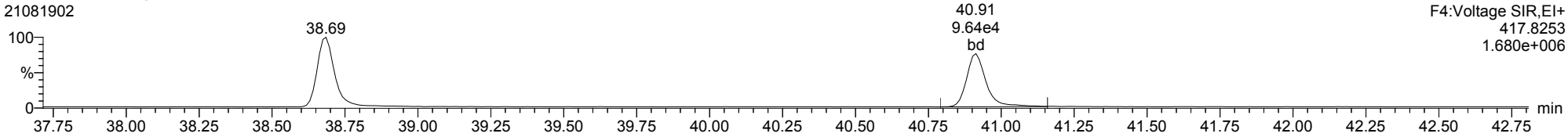

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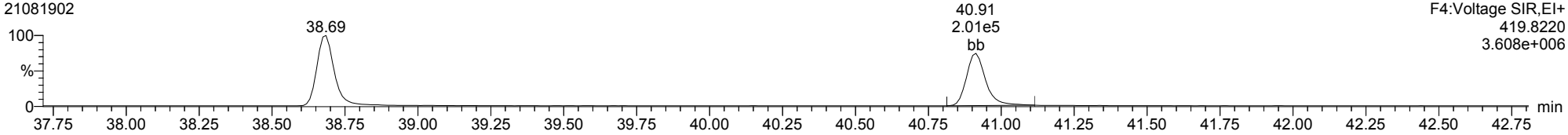

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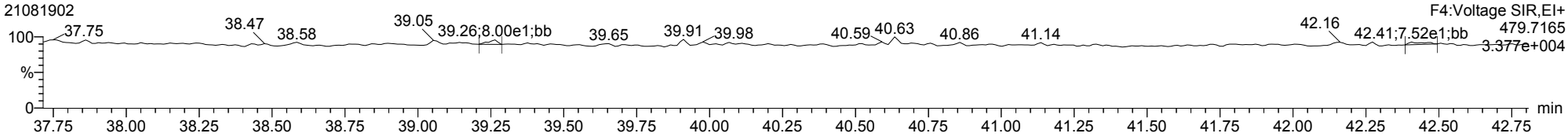

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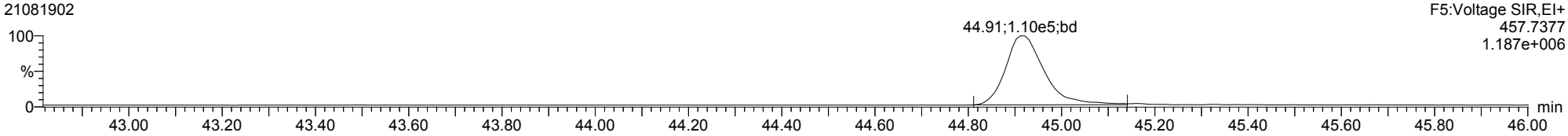

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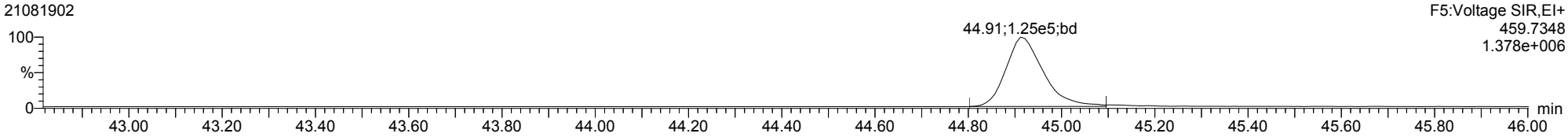

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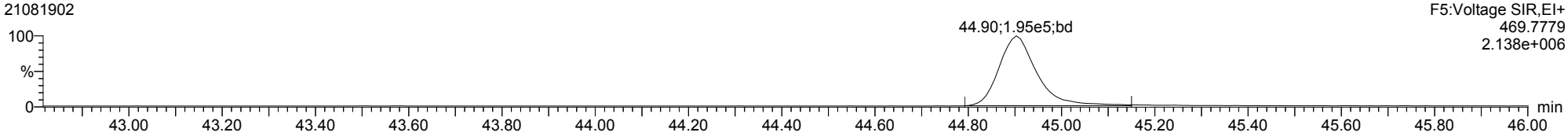

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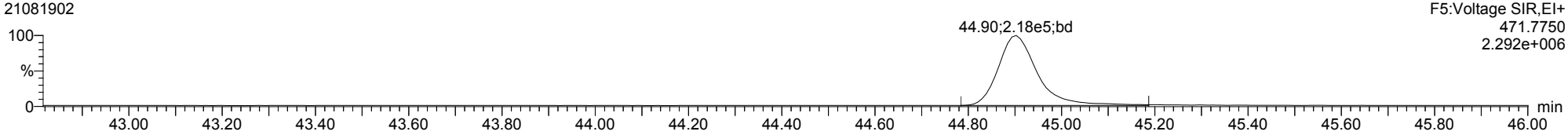
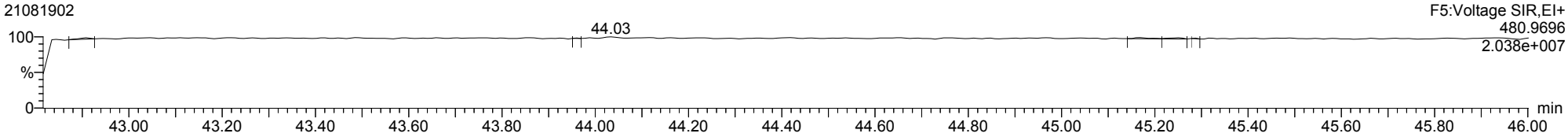


FUNCTION5 PFK



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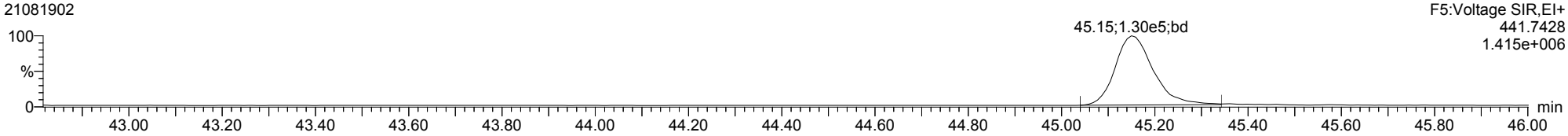

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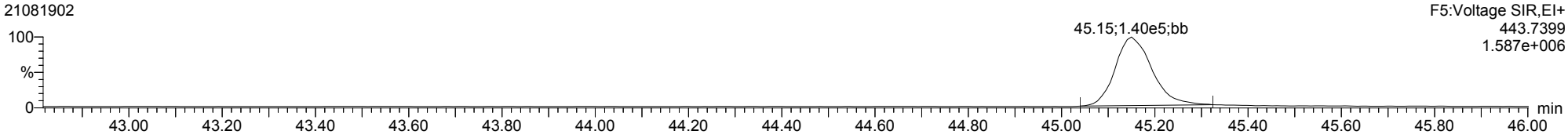

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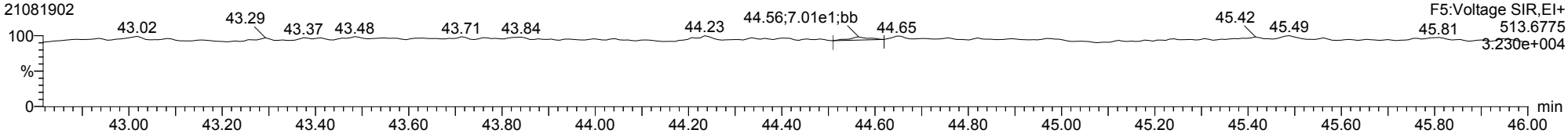

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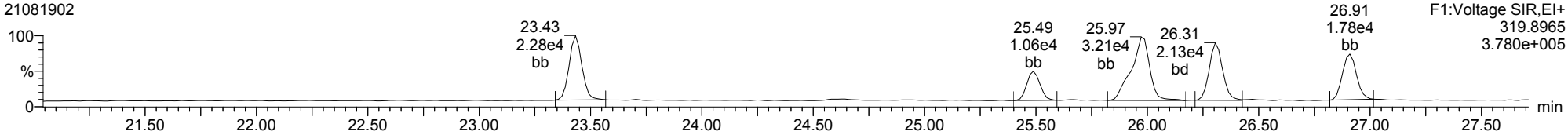

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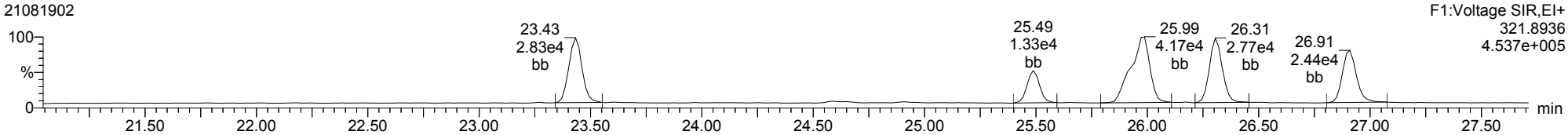

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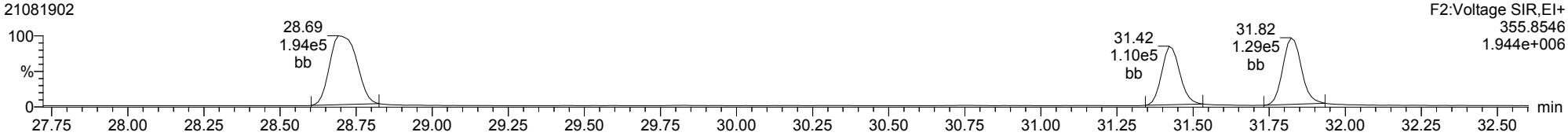

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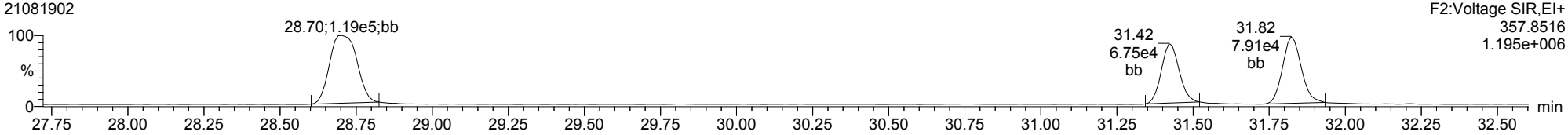

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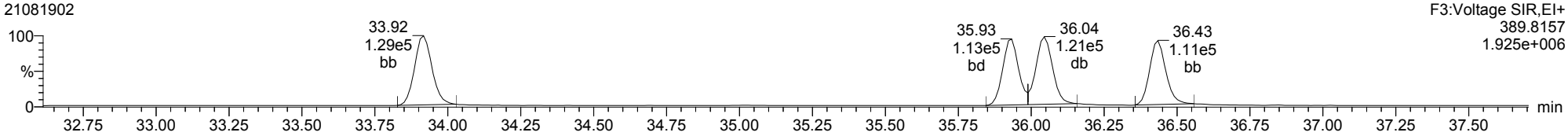

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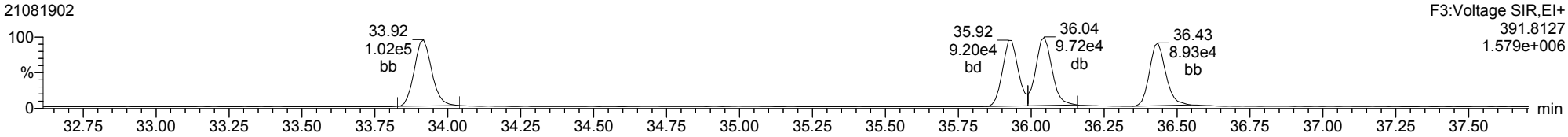

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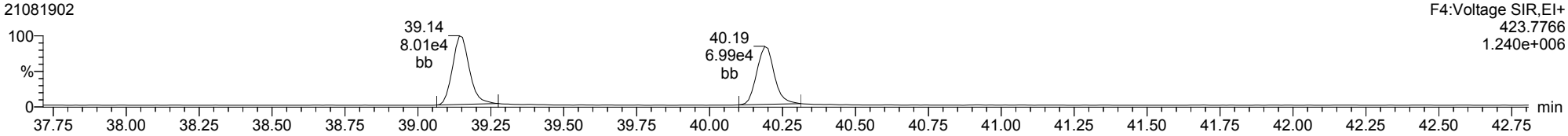

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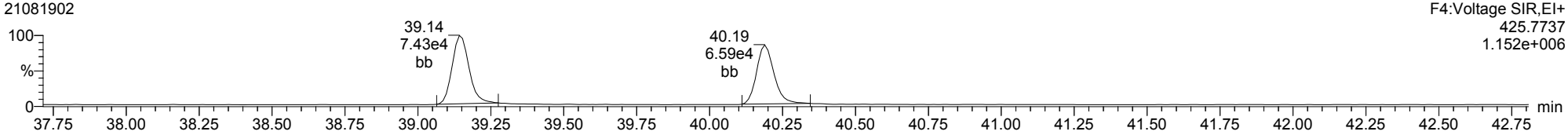

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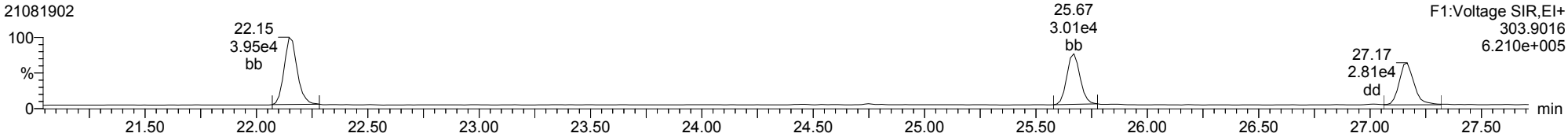
Total-tetrafurans



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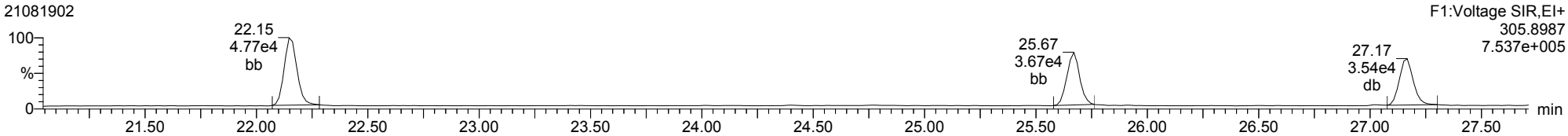

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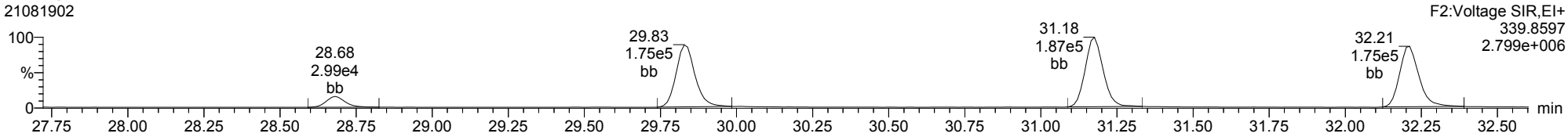

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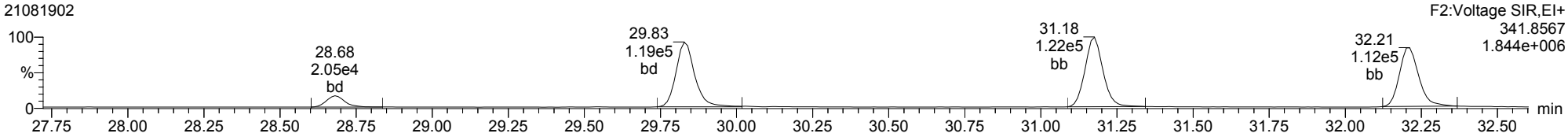

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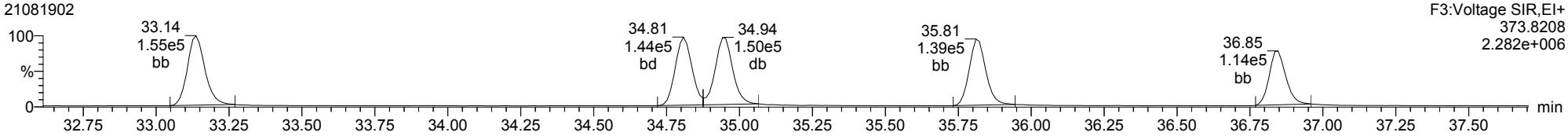
Total-hexafurans



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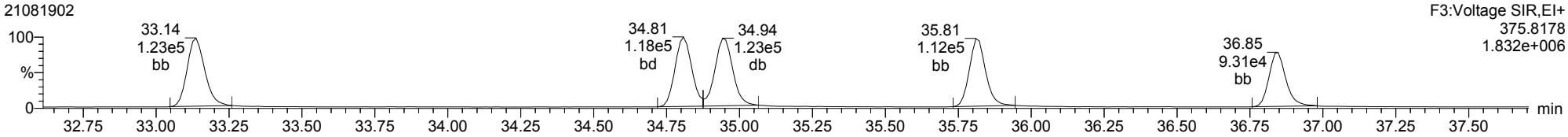

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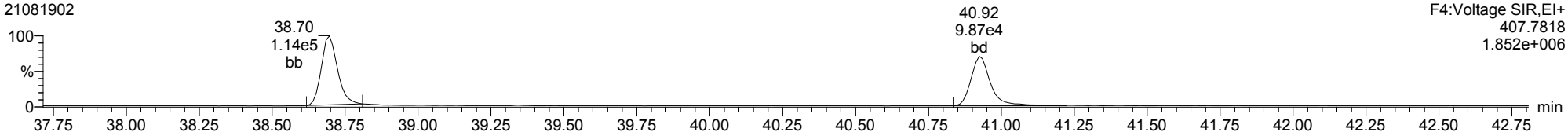

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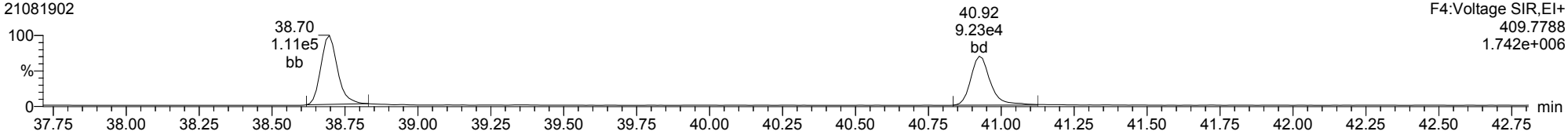

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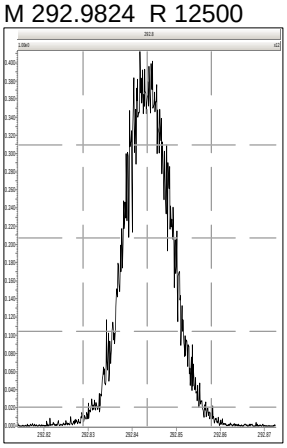

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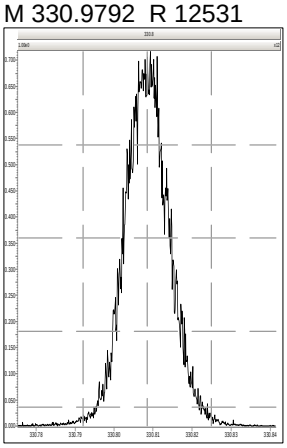

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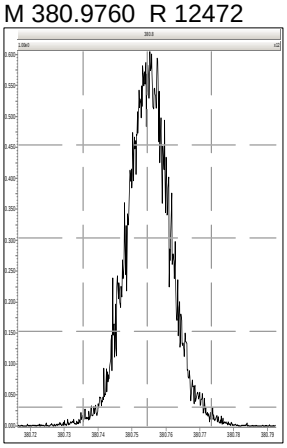

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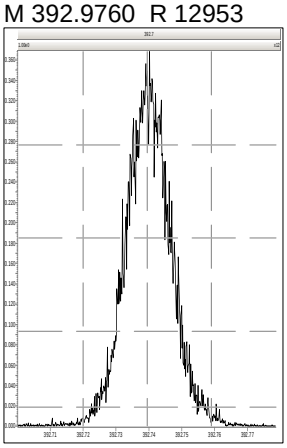

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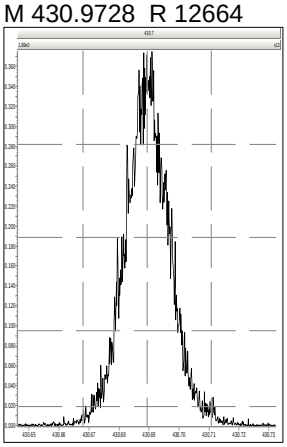

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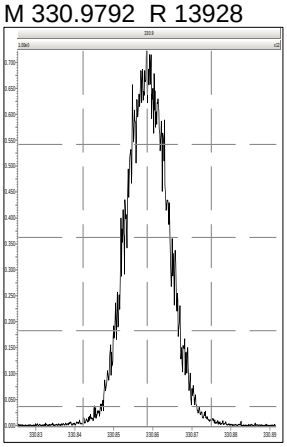

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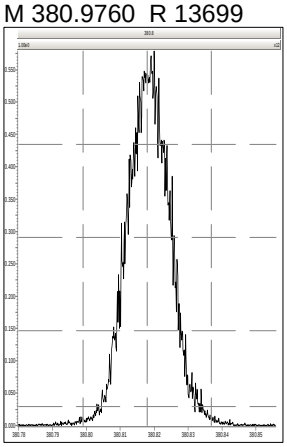

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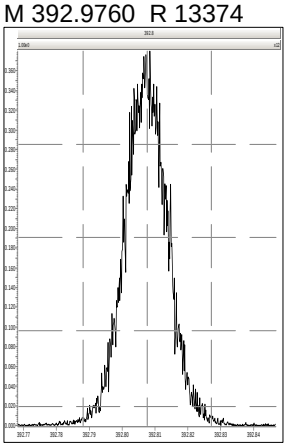

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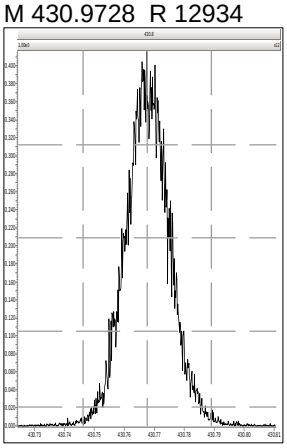

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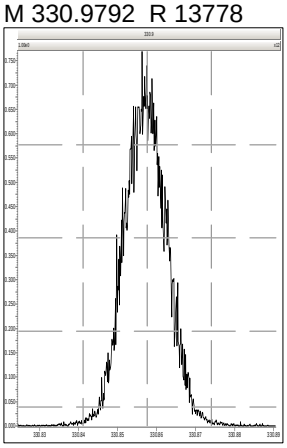

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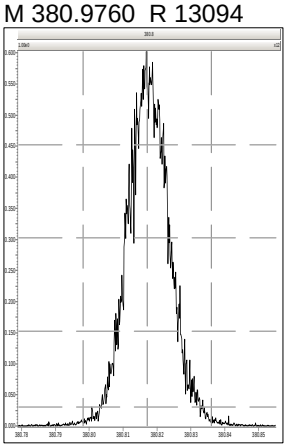

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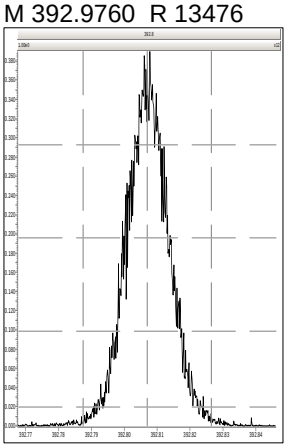

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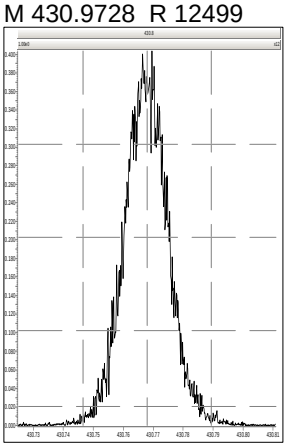

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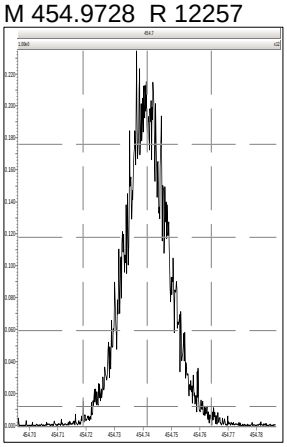

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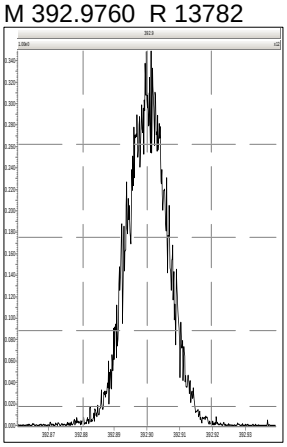

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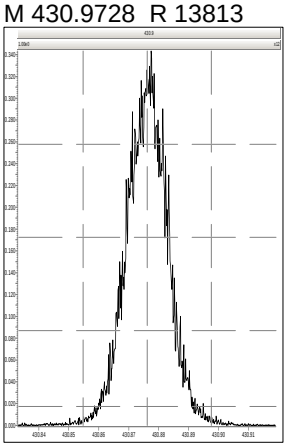

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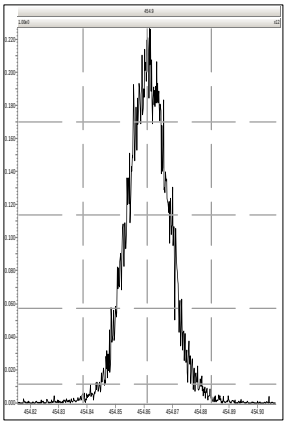

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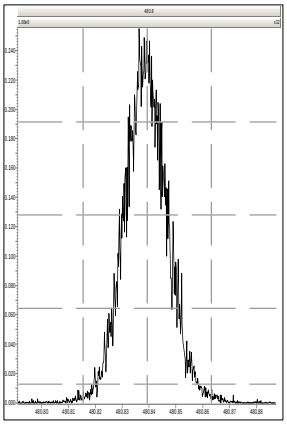

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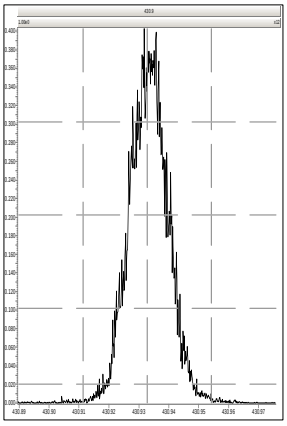

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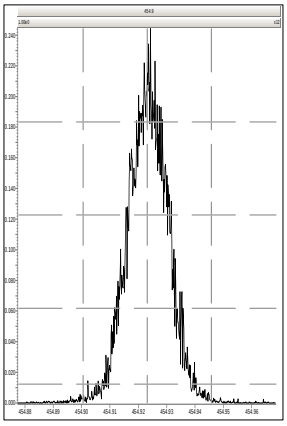

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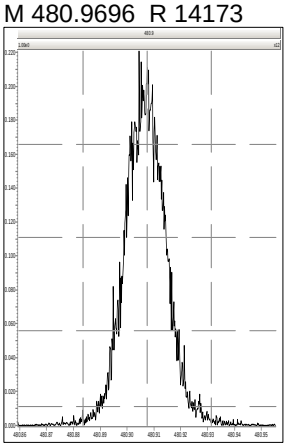

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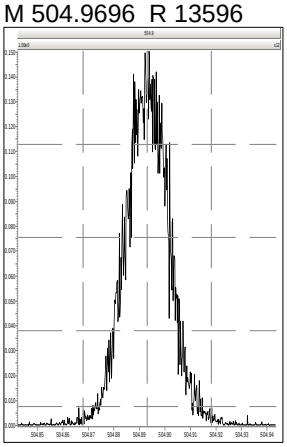

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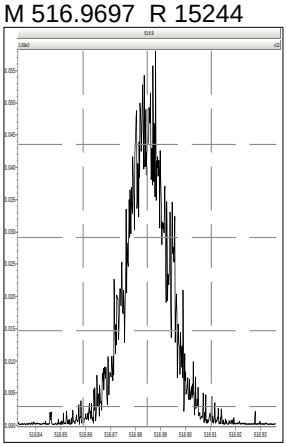
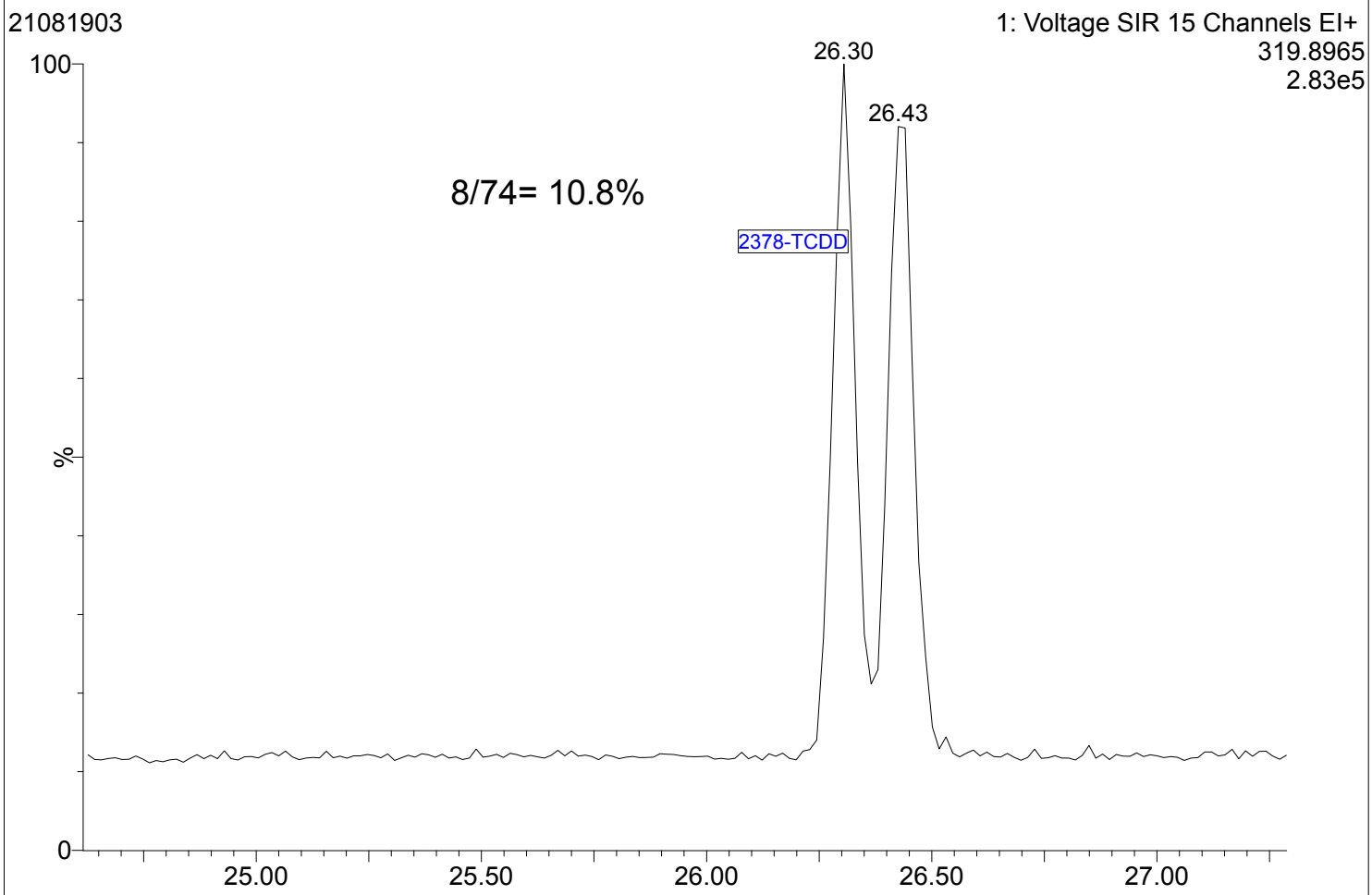
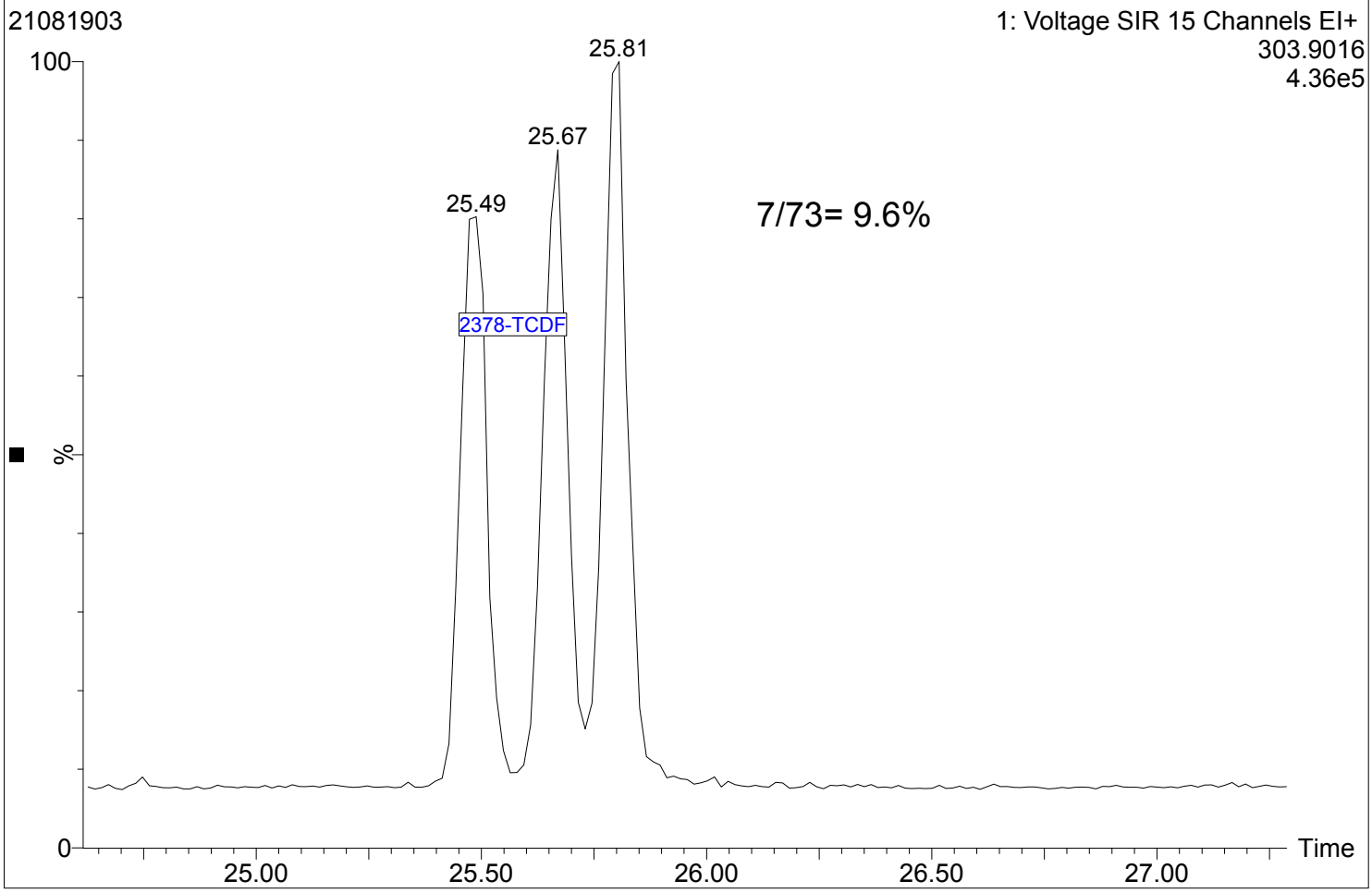



21081903
1: Voltage SIR 15 Channels EI+
319.8965
2.83e5
100
%
0
26.30
26.43
8/74= 10.8%
2378-TCDD
25.00
25.50
26.00
26.50
27.00


21081903
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4.36e5
100
%
0
25.81
25.67
25.49
7/73= 9.6%
2378-TCDF
Time
25.00
25.50
26.00
26.50
27.00

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION CHECK

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	AUTOSPEC01	Calibration:	EH00030
Lab File ID:	21082302	Calibration Date:	08/11/2021
Sequence:	SJH0288	Injection Date:	08/23/21
Lab Sample ID:	SJH0288-ICV1	Injection Time:	12:04
Sequence Name:	CS3L1		

		CONC. (ng/mL)		RESPONSE FACTOR			% DRIFT/DIFF	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
2,3,7,8-TCDF	A	10.000	9.28	1.1075930	1.0283930		-7.2	+/-16
2,3,7,8-TCDD	A	10.000	10.5	0.9202875	0.9681144		5.2	+/-22
1,2,3,7,8-PeCDF	A	50.000	46.5	1.0148670	0.9443329		-7.0	+/-18
2,3,4,7,8-PeCDF	A	50.000	46.4	1.1255490	1.0438550		-7.3	+/-18
1,2,3,7,8-PeCDD	A	50.000	52.8	0.9953229	1.0516500		5.7	+/-22
1,2,3,4,7,8-HxCDF	A	50.000	49.2	1.0168930	1.0008560		-1.6	+/-10
1,2,3,6,7,8-HxCDF	A	50.000	47.1	1.0368310	0.9772055		-5.8	+/-12
2,3,4,6,7,8-HxCDF	A	50.000	48.8	1.0524660	1.0274630		-2.4	+/-12
1,2,3,7,8,9-HxCDF	A	50.000	48.5	1.0301540	0.9991285		-3.0	+/-10
1,2,3,4,7,8-HxCDD	A	50.000	49.1	1.0273630	1.0079230		-1.9	+/-22
1,2,3,6,7,8-HxCDD	A	50.000	49.9	1.0089800	1.0069920		-0.2	+/-22
1,2,3,7,8,9-HxCDD	A	50.000	49.5	0.9504865	0.9407291		-1.0	+/-18
1,2,3,4,6,7,8-HpCDF	A	50.000	45.7	1.3273500	1.2145100		-8.5	+/-10
1,2,3,4,7,8,9-HpCDF	A	50.000	46.1	1.2833380	1.1838180		-7.8	+/-14
1,2,3,4,6,7,8-HpCDD	A	50.000	54.8	1.0680880	1.1708180		9.6	+/-14
OCDF	A	100.00	95.3	1.4469010	1.3789640		-4.7	+/-37
OCDD	A	100.00	100	1.1808230	1.1856070		0.4	+/-21
13C12-2,3,7,8-TCDF	A	100.00	102	1.4265830	1.4618713		2.5	+/-29
13C12-2,3,7,8-TCDD	A	100.00	96.3	1.1164910	1.0754023		-3.7	+/-18
13C12-1,2,3,7,8-PeCDF	A	100.00	105	1.2973130	1.3568269		4.6	+/-24
13C12-2,3,4,7,8-PeCDF	A	100.00	104	1.2364800	1.2832625		3.8	+/-23
13C12-1,2,3,7,8-PeCDD	A	100.00	101	0.7319833	0.7374042		0.7	+/-38
13C12-1,2,3,4,7,8-HxCDF	A	100.00	93.2	1.2424560	1.1578910		-6.8	+/-24
13C12-1,2,3,6,7,8-HxCDF	A	100.00	94.0	1.3434760	1.2635221		-6.0	+/-30
13C12-2,3,4,6,7,8-HxCDF	A	100.00	90.6	1.2148550	1.1005315		-9.4	+/-27
13C12-1,2,3,7,8,9-HxCDF	A	100.00	94.2	1.0076370	0.9487361		-5.8	+/-26
13C12-1,2,3,4,7,8-HxCDD	A	100.00	100	0.9598233	0.9623394		0.3	+/-15
13C12-1,2,3,6,7,8-HxCDD	A	100.00	101	1.0413850	1.0513837		1.0	+/-15
13C12-1,2,3,4,6,7,8-HpCDF	A	100.00	107	0.9264704	0.9897209		6.8	+/-22
13C12-1,2,3,4,7,8,9-HpCDF	A	100.00	109	0.7579160	0.8224801		8.5	+/-23
13C12-1,2,3,4,6,7,8-HpCDD	A	100.00	105	0.6324476	0.6656046		5.2	+/-28

* Values outside of QC limits

Analytical Resources, Incorporated
Analytical Chemists and Consultants

INITIAL CALIBRATION CHECK

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	AUTOSPEC01	Calibration:	EH00030
Lab File ID:	21082302	Calibration Date:	08/11/2021
Sequence:	SJH0288	Injection Date:	08/23/21
Lab Sample ID:	SJH0288-ICV1	Injection Time:	12:04
Sequence Name:	CS3L1		

		CONC. (ng/mL)		RESPONSE FACTOR			% DRIFT/DIFF	
COMPOUND	TYPE	STD	ICV	ICAL	ICV	MIN	ICV	LIMIT
13C12-OCDD	A	200.00	236	0.5037432	0.5933580		17.8	+/-52
37Cl4-2,3,7,8-TCDD	A	10.000	9.18	1.0835930	0.9948266		-8.2	

* Values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210823OP.qld
Last Altered: Monday, August 23, 2021 14:30:14 Pacific Daylight Time
Printed: Monday, August 23, 2021 14:31:12 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: CS3L1, Name: 21082302, Date: 23-Aug-2021, Time: 12:04:42, 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	25.685	1.001	2.316e4	2.990e4	1.108	0.774	0.770	1057	1676	3.26e5	4.29e5	308.0	256.2	NO	bb	bb	9.285
12378-PeCDF	29.850	1.001	1.368e5	8.933e4	1.015	1.531	1.550	1899	1562	1.89e6	1.24e6	994.8	794.4	NO	bb	bb	46.525
23478-PeCDF	31.198	1.001	1.437e5	9.265e4	1.126	1.551	1.550	1899	1562	2.01e6	1.31e6	1059.7	841.5	NO	bb	bb	46.371
123478-HxCDF	34.830	1.001	1.055e5	8.800e4	1.017	1.199	1.240	1832	1873	1.54e6	1.30e6	838.4	696.0	NO	bd	bd	49.211
234678-HxCDF	35.833	1.000	1.013e5	8.753e4	1.052	1.157	1.240	1832	1873	1.46e6	1.25e6	796.5	669.4	NO	bb	bb	48.812
123678-HxCDF	34.964	1.000	1.127e5	9.340e4	1.037	1.207	1.240	1832	1873	1.55e6	1.29e6	845.0	688.2	NO	db	db	47.125
123789-HxCDF	36.869	1.001	8.806e4	7.020e4	1.030	1.254	1.240	1832	1873	1.25e6	1.02e6	681.5	543.8	NO	bb	bb	48.494
1234678-HpCDF	38.718	1.000	1.019e5	9.880e4	1.327	1.031	1.050	1769	1643	1.49e6	1.41e6	843.8	857.7	NO	bb	bb	45.749
1234789-HpCDF	40.958	1.001	8.253e4	8.002e4	1.283	1.031	1.050	1769	1643	1.05e6	1.04e6	596.1	630.8	NO	bb	bb	46.123
OCDF	45.196	1.006	1.295e5	1.437e5	1.447	0.901	0.890	1224	1287	1.38e6	1.54e6	1123.0	1193.6	NO	bb	bb	95.305
2378-TCDD	26.320	1.001	1.647e4	2.027e4	0.920	0.812	0.770	1606	828	2.36e5	2.84e5	146.9	342.7	NO	bb	bb	10.520
12378-PeCDD	31.443	1.000	8.505e4	5.179e4	0.995	1.642	1.550	1543	1720	1.21e6	7.61e5	784.0	442.7	NO	bb	bb	52.830
123478-HxCDD	35.944	1.000	9.002e4	7.192e4	1.027	1.252	1.240	1598	1913	1.35e6	1.08e6	843.6	566.9	NO	bd	bd	49.054
123678-HxCDD	36.067	1.001	9.875e4	7.801e4	1.009	1.266	1.240	1598	1913	1.39e6	1.12e6	870.9	586.1	NO	dd	dd	49.901
123789-HxCDD	36.457	1.011	8.831e4	6.983e4	0.950	1.265	1.240	1598	1913	1.27e6	1.01e6	796.6	529.6	NO	bd	bb	49.487
1234678-HpCDD	40.211	1.000	6.782e4	6.229e4	1.068	1.089	1.050	1847	1848	9.02e5	8.38e5	488.4	453.5	NO	bb	bd	54.809
OCDD	44.949	1.000	1.150e5	1.199e5	1.181	0.959	0.890	1220	870	1.20e6	1.29e6	982.4	1482.7	NO	bd	bb	100.405
13C-2378-TCDF	25.670	1.007	2.289e5	2.870e5	1.427	0.798	0.770	3076	2362	3.24e6	4.00e6	1052.6	1695.3	NO	bb	bb	102.474
13C-12378-PeCDF	29.828	1.170	2.996e5	1.793e5	1.297	1.671	1.550	2502	2297	4.00e6	2.44e6	1600.0	1063.3	NO	bd	bb	104.587
13C-23478-PeCDF	31.176	1.223	2.770e5	1.759e5	1.236	1.575	1.550	2502	2297	3.89e6	2.43e6	1554.1	1056.7	NO	bb	bb	103.783
13C-123478-HxCDF	34.808	0.955	1.318e5	2.549e5	1.242	0.517	0.510	1522	2498	1.88e6	3.68e6	1234.9	1472.1	NO	bd	bd	93.194
13C-123678-HxCDF	34.953	0.959	1.397e5	2.823e5	1.343	0.495	0.510	1522	2498	1.93e6	3.75e6	1265.2	1501.4	NO	db	dd	94.049
13C-234678-HxCDF	35.822	0.983	1.255e5	2.420e5	1.215	0.519	0.510	1522	2498	1.80e6	3.51e6	1181.6	1406.0	NO	bb	bb	90.590
13C-123789-HxCDF	36.847	1.011	1.074e5	2.094e5	1.008	0.513	0.510	1522	2498	1.54e6	3.07e6	1014.1	1229.4	NO	bb	bb	94.155
13C-1234678-HpCDF	38.707	1.062	1.040e5	2.265e5	0.926	0.459	0.440	1380	1684	1.46e6	3.07e6	1056.9	1824.7	NO	bd	bd	106.827
13C-1234789-HpCDF	40.936	1.124	8.269e4	1.919e5	0.758	0.431	0.440	1380	1684	1.08e6	2.37e6	781.3	1407.3	NO	bb	bd	108.519
13C-1234-TCDD	25.489	0.000	1.541e5	1.988e5	1.000	0.775	0.770	2617	1632	2.24e6	2.91e6	853.9	1784.2	NO	bb	bb	100.000
13C-2378-TCDD	26.305	1.032	1.613e5	2.182e5	1.116	0.739	0.770	2617	1632	2.30e6	3.04e6	876.9	1860.8	NO	bb	bb	96.320
13C-12378-PeCDD	31.432	1.233	1.588e5	1.015e5	0.732	1.565	1.550	1143	1344	2.19e6	1.39e6	1918.7	1036.7	NO	bb	bb	100.741
13C-123478-HxCDD	35.933	0.986	1.799e5	1.414e5	0.960	1.272	1.240	1857	1418	2.80e6	2.23e6	1509.0	1569.8	NO	bd	bd	100.262
13C-123678-HxCDD	36.045	0.989	1.941e5	1.570e5	1.041	1.237	1.240	1857	1418	2.81e6	2.29e6	1512.5	1613.5	NO	db	db	100.960
13C-1234678-HpCDD	40.200	1.103	1.116e5	1.107e5	0.632	1.008	1.050	1395	1096	1.56e6	1.46e6	1115.9	1327.0	NO	bb	bd	105.243
13C-OCDD	44.940	1.233	1.912e5	2.051e5	0.504	0.932	0.890	1228	927	2.05e6	2.21e6	1668.1	2382.5	NO	bb	bb	235.580
13C-123789-HxCDD	36.435	0.000	1.858e5	1.481e5	1.000	1.255	1.240	1857	1418	2.70e6	2.17e6	1454.9	1527.1	NO	bb	bb	100.000
37CL-2378-TCDD	26.320	1.033	3.511e4		1.084			1436		4.85e5		337.4			bb		9.181

Dataset: T:\Autospec\Processed Data Batch\210823OP.qld
Last Altered: Monday, August 23, 2021 14:30:14 Pacific Daylight Time
Printed: Monday, August 23, 2021 14:31:12 Pacific Daylight Time

ID: CS3L1, Name: 21082302, Date: 23-Aug-2021, Time: 12:04:42, 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	22.162	0.863	3.156e4	3.992e4	1.425	0.791	0.770	1057	1676	4.37e5	5.40e5	413.5	321.9	NO	bb	bb	9.723
1289-TCDF	27.182	1.059	2.178e4	2.864e4	1.043	0.760	0.770	1057	1676	3.05e5	3.72e5	288.3	222.1	NO	bb	bb	9.371
13468-PECDF	27.046	0.907	1.928e5	1.274e5	1.376	1.514	1.550	1006	1103	2.64e6	1.74e6	2625.2	1579.9	NO	bb	bb	48.579
12389-PECDF	32.234	1.081	1.373e5	8.856e4	1.000	1.550	1.550	1899	1562	1.75e6	1.17e6	922.0	746.5	NO	bd	bb	47.190
123468-HXCDF	33.159	0.953	1.120e5	9.061e4	1.087	1.236	1.240	1832	1873	1.56e6	1.25e6	850.1	664.7	NO	bb	bb	48.236
1368-TCDD	23.447	0.891	1.751e4	2.295e4	0.923	0.763	0.770	1606	828	2.51e5	3.25e5	156.3	392.9	NO	bb	bb	11.545
1289-TCDD	26.925	1.024	1.465e4	1.798e4	0.794	0.815	0.770	1606	828	2.05e5	2.55e5	127.5	307.8	NO	bb	bd	10.830
12479-PECDD	28.725	0.914	1.616e5	9.761e4	1.843	1.655	1.550	1543	1720	1.51e6	9.24e5	980.9	537.6	NO	bb	bb	54.027
12389-PECDD	31.844	1.013	1.019e5	6.329e4	1.154	1.609	1.550	1543	1720	1.44e6	8.81e5	932.8	512.1	NO	bb	bb	55.011
124679-HXCDD	33.939	0.945	1.015e5	8.029e4	1.125	1.264	1.240	1598	1913	1.46e6	1.12e6	910.7	585.8	NO	bb	bb	50.291
1234679-HPCDD	39.164	0.974	7.310e4	7.062e4	1.211	1.035	1.050	1847	1848	1.02e6	9.75e5	553.0	527.6	NO	bb	bd	53.400
Total-tetrafurans			7.650e4		1.192			1057		1.07e6							28.378
Total-penta1			1.929e5					1006		2.64e6							48.620
Total-pentafurans			4.412e5		1.047			1899		5.99e6							148.047
Total-hexafurans			5.196e5		1.045			1832		7.35e6							241.879
Total-heptafurans			1.844e5		1.305			1769		2.55e6							91.872
Total-Furans			1.544e6		1.158			1057		2.10e7							654.101
Total-tetradioxins			8.287e4		0.879			1606		1.06e6							55.664
Total-pentadioxins			3.485e5		1.331			1543		4.16e6							161.867
Total-hexadioxins			3.788e5		1.028			1598		5.47e6							198.836
Total-heptadioxins			1.410e5		1.140			1847		1.93e6							108.278
Total-Dioxins			1.066e6		1.092			1606		1.38e7							625.050
Total-TEQ			2.610e6					1606		3.48e7							1279.150
FUNCTION1 PFK			8.301e5					1061389		1.92e7							
FUNCTION2 PFK			3.356e6					871986		7.23e7							0.000
FUNCTION3 PFK			2.710e6					963737		6.28e7							0.000
FUNCTION4 PFK			1.209e4					443458		6.60e5							
FUNCTION5 PFK			3.318e6					279536		2.86e7							
FUNCTION1 HXCD...			1.834e3					727		2.73e4							0.000
FUNCTION1 HPCD...			1.358e3					839		2.17e4							0.000
FUNCTION2 HPCD...			7.932e2					641		1.10e4							0.000
FUNCTION3 OCDPE			1.746e3					878		4.30e4							0.000
FUNCTION4 NCDPE			3.934e2					1009		9.57e3							0.000
FUNCTION5 DCDPE			0.000e0					685		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: CS3L1, Name: 21082302, Date: 23-Aug-2021, Time: 12:04:42, 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	27.18	2.178e4	2.864e4	1.043	0.76	0.77	288.3	YES	NO	bb	bb	9.371
2	2378-TCDF	25.68	2.316e4	2.990e4	1.108	0.77	0.77	308.0	YES	NO	bb	bb	9.285
3	1368-TCDF	22.16	3.156e4	3.992e4	1.425	0.79	0.77	413.5	YES	NO	bb	bb	9.723

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-penta1	27.44	1.056e2	7.524e1		1.40	1.55	2.1	NO	NO	bb	bb	0.041
2	13468-PECDF	27.05	1.928e5	1.274e5	1.376	1.51	1.55	2625.2	YES	NO	bb	bb	48.579

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	12389-PECDF	32.23	1.373e5	8.856e4	1.000	1.55	1.55	922.0	YES	NO	bd	bb	47.190
2	23478-PeCDF	31.20	1.437e5	9.265e4	1.126	1.55	1.55	1059.7	YES	NO	bb	bb	46.371
3	Total-pentafurans	30.07	1.644e2	1.028e2	1.047	1.60	1.55	3.7	NO	NO	bb	bb	0.055
4	12378-PeCDF	29.85	1.368e5	8.933e4	1.015	1.53	1.55	994.8	YES	NO	bb	bb	46.525
5	Total-pentafurans	28.70	2.325e4	1.530e4	1.047	1.52	1.55	174.7	YES	NO	bb	bb	7.907

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	123789-HxCDF	36.87	8.806e4	7.020e4	1.030	1.25	1.24	681.5	YES	NO	bb	bb	48.494
2	234678-HxCDF	35.83	1.013e5	8.753e4	1.052	1.16	1.24	796.5	YES	NO	bb	bb	48.812
3	123678-HxCDF	34.96	1.127e5	9.340e4	1.037	1.21	1.24	845.0	YES	NO	db	db	47.125
4	123478-HxCDF	34.83	1.055e5	8.800e4	1.017	1.20	1.24	838.4	YES	NO	bd	bd	49.211
5	123468-HXCDF	33.16	1.120e5	9.061e4	1.087	1.24	1.24	850.1	YES	NO	bb	bb	48.236

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234789-HpCDF	40.96	8.253e4	8.002e4	1.283	1.03	1.05	596.1	YES	NO	bb	bb	46.123
2	1234678-HpCDF	38.72	1.019e5	9.880e4	1.327	1.03	1.05	843.8	YES	NO	bb	bb	45.749

ID: CS3L1, Name: 21082302, Date: 23-Aug-2021, Time: 12:04:42, 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	27.18	2.178e4	2.864e4	1.043	0.76	0.77	288.3	YES	NO	bb	bb	9.371
2	2378-TCDF	25.68	2.316e4	2.990e4	1.108	0.77	0.77	308.0	YES	NO	bb	bb	9.285
3	1368-TCDF	22.16	3.156e4	3.992e4	1.425	0.79	0.77	413.5	YES	NO	bb	bb	9.723
4	12389-PECDF	32.23	1.373e5	8.856e4	1.000	1.55	1.55	922.0	YES	NO	bd	bb	47.190
5	23478-PeCDF	31.20	1.437e5	9.265e4	1.126	1.55	1.55	1059.7	YES	NO	bb	bb	46.371
6	Total-pentafurans	30.07	1.644e2	1.028e2	1.047	1.60	1.55	3.7	NO	NO	bb	bb	0.055
7	12378-PeCDF	29.85	1.368e5	8.933e4	1.015	1.53	1.55	994.8	YES	NO	bb	bb	46.525
8	Total-pentafurans	28.70	2.325e4	1.530e4	1.047	1.52	1.55	174.7	YES	NO	bb	bb	7.907
9	123789-HxCDF	36.87	8.806e4	7.020e4	1.030	1.25	1.24	681.5	YES	NO	bb	bb	48.494
10	234678-HxCDF	35.83	1.013e5	8.753e4	1.052	1.16	1.24	796.5	YES	NO	bb	bb	48.812
11	123678-HxCDF	34.96	1.127e5	9.340e4	1.037	1.21	1.24	845.0	YES	NO	db	db	47.125
12	123478-HxCDF	34.83	1.055e5	8.800e4	1.017	1.20	1.24	838.4	YES	NO	bd	bd	49.211
13	123468-HXCDF	33.16	1.120e5	9.061e4	1.087	1.24	1.24	850.1	YES	NO	bb	bb	48.236
14	1234789-HpCDF	40.96	8.253e4	8.002e4	1.283	1.03	1.05	596.1	YES	NO	bb	bb	46.123
15	1234678-HpCDF	38.72	1.019e5	9.880e4	1.327	1.03	1.05	843.8	YES	NO	bb	bb	45.749
16	OCDF	45.20	1.295e5	1.437e5	1.447	0.90	0.89	1123.0	YES	NO	bb	bb	95.305
17	Total-penta1	27.44	1.056e2	7.524e1		1.40	1.55	2.1	NO	NO	bb	bb	0.041
18	13468-PECDF	27.05	1.928e5	1.274e5	1.376	1.51	1.55	2625.2	YES	NO	bb	bb	48.579

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDD	26.92	1.465e4	1.798e4	0.794	0.82	0.77	127.5	YES	NO	bb	bd	10.830
2	2378-TCDD	26.32	1.647e4	2.027e4	0.920	0.81	0.77	146.9	YES	NO	bb	bb	10.520
3	Total-tetradioxins	26.00	2.587e4	3.147e4	0.879	0.82	0.77	153.9	YES	NO	bb	bd	17.185
4	Total-tetradioxins	25.50	8.365e3	1.027e4	0.879	0.81	0.77	77.1	YES	NO	bb	bb	5.585
5	1368-TCDD	23.45	1.751e4	2.295e4	0.923	0.76	0.77	156.3	YES	NO	bb	bb	11.545

PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	12479-PECDD	28.72	1.616e5	9.761e4	1.843	1.66	1.55	980.9	YES	NO	bb	bb	54.027
2	12389-PECDD	31.84	1.019e5	6.329e4	1.154	1.61	1.55	932.8	YES	NO	bb	bb	55.011
3	12378-PeCDD	31.44	8.505e4	5.179e4	0.995	1.64	1.55	784.0	YES	NO	bb	bb	52.830

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HD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	124679-HXCDD	33.94	1.015e5	8.029e4	1.125	1.26	1.24	910.7	YES	NO	bb	bb	50.291
2	Total-hexadioxins	36.84	1.980e2	1.595e2	1.028	1.24	1.24	4.0	NO	NO	db	db	0.103
3	123789-HxCDD	36.46	8.831e4	6.983e4	0.950	1.26	1.24	796.6	YES	NO	bd	bb	49.487
4	123678-HxCDD	36.07	9.875e4	7.801e4	1.009	1.27	1.24	870.9	YES	NO	dd	dd	49.901
5	123478-HxCDD	35.94	9.002e4	7.192e4	1.027	1.25	1.24	843.6	YES	NO	bd	bd	49.054

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234678-HpCDD	40.21	6.782e4	6.229e4	1.068	1.09	1.05	488.4	YES	NO	bb	bd	54.809
2	Total-heptadioxins	39.84	8.650e1	8.749e1	1.140	0.99	1.05	1.9	NO	NO	bb	bb	0.069
3	1234679-HPCDD	39.16	7.310e4	7.062e4	1.211	1.04	1.05	553.0	YES	NO	bb	bd	53.400

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	26.92	1.465e4	1.798e4	0.794	0.82	0.77	127.5	YES	NO	bb	bd	10.830
2	2378-TCDD	26.32	1.647e4	2.027e4	0.920	0.81	0.77	146.9	YES	NO	bb	bb	10.520
3	Total-tetradioxins	26.00	2.587e4	3.147e4	0.879	0.82	0.77	153.9	YES	NO	bb	bd	17.185
4	Total-tetradioxins	25.50	8.365e3	1.027e4	0.879	0.81	0.77	77.1	YES	NO	bb	bb	5.585
5	1368-TCDD	23.45	1.751e4	2.295e4	0.923	0.76	0.77	156.3	YES	NO	bb	bb	11.545
6	12479-PECDD	28.72	1.616e5	9.761e4	1.843	1.66	1.55	980.9	YES	NO	bb	bb	54.027
7	124679-HXCDD	33.94	1.015e5	8.029e4	1.125	1.26	1.24	910.7	YES	NO	bb	bb	50.291
8	12389-PECDD	31.84	1.019e5	6.329e4	1.154	1.61	1.55	932.8	YES	NO	bb	bb	55.011
9	12378-PeCDD	31.44	8.505e4	5.179e4	0.995	1.64	1.55	784.0	YES	NO	bb	bb	52.830
10	Total-hexadioxins	36.84	1.980e2	1.595e2	1.028	1.24	1.24	4.0	NO	NO	db	db	0.103
11	123789-HxCDD	36.46	8.831e4	6.983e4	0.950	1.26	1.24	796.6	YES	NO	bd	bb	49.487
12	123678-HxCDD	36.07	9.875e4	7.801e4	1.009	1.27	1.24	870.9	YES	NO	dd	dd	49.901
13	123478-HxCDD	35.94	9.002e4	7.192e4	1.027	1.25	1.24	843.6	YES	NO	bd	bd	49.054
14	1234678-HpCDD	40.21	6.782e4	6.229e4	1.068	1.09	1.05	488.4	YES	NO	bb	bd	54.809
15	Total-heptadioxins	39.84	8.650e1	8.749e1	1.140	0.99	1.05	1.9	NO	NO	bb	bb	0.069
16	1234679-HPCDD	39.16	7.310e4	7.062e4	1.211	1.04	1.05	553.0	YES	NO	bb	bd	53.400
17	OCDD	44.95	1.150e5	1.199e5	1.181	0.96	0.89	982.4	YES	NO	bd	bb	100.405

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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	27.18	2.178e4	2.864e4	1.043	0.76	0.77	288.3	YES	NO	bb	bb	9.371
2	2378-TCDF	25.68	2.316e4	2.990e4	1.108	0.77	0.77	308.0	YES	NO	bb	bb	9.285
3	1368-TCDF	22.16	3.156e4	3.992e4	1.425	0.79	0.77	413.5	YES	NO	bb	bb	9.723
4	12389-PECDF	32.23	1.373e5	8.856e4	1.000	1.55	1.55	922.0	YES	NO	bd	bb	47.190
5	23478-PeCDF	31.20	1.437e5	9.265e4	1.126	1.55	1.55	1059.7	YES	NO	bb	bb	46.371
6	Total-pentafurans	30.07	1.644e2	1.028e2	1.047	1.60	1.55	3.7	NO	NO	bb	bb	0.055
7	12378-PeCDF	29.85	1.368e5	8.933e4	1.015	1.53	1.55	994.8	YES	NO	bb	bb	46.525
8	Total-pentafurans	28.70	2.325e4	1.530e4	1.047	1.52	1.55	174.7	YES	NO	bb	bb	7.907
9	123789-HxCDF	36.87	8.806e4	7.020e4	1.030	1.25	1.24	681.5	YES	NO	bb	bb	48.494
10	234678-HxCDF	35.83	1.013e5	8.753e4	1.052	1.16	1.24	796.5	YES	NO	bb	bb	48.812
11	123678-HxCDF	34.96	1.127e5	9.340e4	1.037	1.21	1.24	845.0	YES	NO	db	db	47.125
12	123478-HxCDF	34.83	1.055e5	8.800e4	1.017	1.20	1.24	838.4	YES	NO	bd	bd	49.211
13	123468-HXCDF	33.16	1.120e5	9.061e4	1.087	1.24	1.24	850.1	YES	NO	bb	bb	48.236
14	1234789-HpCDF	40.96	8.253e4	8.002e4	1.283	1.03	1.05	596.1	YES	NO	bb	bb	46.123
15	1234678-HpCDF	38.72	1.019e5	9.880e4	1.327	1.03	1.05	843.8	YES	NO	bb	bb	45.749
16	OCDF	45.20	1.295e5	1.437e5	1.447	0.90	0.89	1123.0	YES	NO	bb	bb	95.305
17	Total-penta1	27.44	1.056e2	7.524e1		1.40	1.55	2.1	NO	NO	bb	bb	0.041
18	13468-PECDF	27.05	1.928e5	1.274e5	1.376	1.51	1.55	2625.2	YES	NO	bb	bb	48.579
19	1289-TCDD	26.92	1.465e4	1.798e4	0.794	0.82	0.77	127.5	YES	NO	bb	bd	10.830
20	2378-TCDD	26.32	1.647e4	2.027e4	0.920	0.81	0.77	146.9	YES	NO	bb	bb	10.520
21	Total-tetradioxins	26.00	2.587e4	3.147e4	0.879	0.82	0.77	153.9	YES	NO	bb	bd	17.185
22	Total-tetradioxins	25.50	8.365e3	1.027e4	0.879	0.81	0.77	77.1	YES	NO	bb	bb	5.585
23	1368-TCDD	23.45	1.751e4	2.295e4	0.923	0.76	0.77	156.3	YES	NO	bb	bb	11.545
24	12479-PECDD	28.72	1.616e5	9.761e4	1.843	1.66	1.55	980.9	YES	NO	bb	bb	54.027
25	124679-HXCDD	33.94	1.015e5	8.029e4	1.125	1.26	1.24	910.7	YES	NO	bb	bb	50.291
26	12389-PECDD	31.84	1.019e5	6.329e4	1.154	1.61	1.55	932.8	YES	NO	bb	bb	55.011
27	12378-PeCDD	31.44	8.505e4	5.179e4	0.995	1.64	1.55	784.0	YES	NO	bb	bb	52.830
28	Total-hexadioxins	36.84	1.980e2	1.595e2	1.028	1.24	1.24	4.0	NO	NO	db	db	0.103
29	123789-HxCDD	36.46	8.831e4	6.983e4	0.950	1.26	1.24	796.6	YES	NO	bd	bb	49.487
30	123678-HxCDD	36.07	9.875e4	7.801e4	1.009	1.27	1.24	870.9	YES	NO	dd	dd	49.901
31	123478-HxCDD	35.94	9.002e4	7.192e4	1.027	1.25	1.24	843.6	YES	NO	bd	bd	49.054
32	1234678-HpCDD	40.21	6.782e4	6.229e4	1.068	1.09	1.05	488.4	YES	NO	bb	bd	54.809
33	Total-heptadioxins	39.84	8.650e1	8.749e1	1.140	0.99	1.05	1.9	NO	NO	bb	bb	0.069
34	1234679-HPCDD	39.16	7.310e4	7.062e4	1.211	1.04	1.05	553.0	YES	NO	bb	bd	53.400
35	OCDD	44.95	1.150e5	1.199e5	1.181	0.96	0.89	982.4	YES	NO	bd	bb	100.405

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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	22.25	3.174e4					0.8	NO		bb		
2	FUNCTION1 PFK	21.83	8.156e3					0.5	NO		bb		
3	FUNCTION1 PFK	21.68	6.069e4					1.8	NO		bb		
4	FUNCTION1 PFK	21.22	3.819e4					1.4	NO		bb		
5	FUNCTION1 PFK	21.15	1.113e4					0.7	NO		bb		
6	FUNCTION1 PFK	27.65	2.030e5					1.3	NO		bb		
7	FUNCTION1 PFK	27.18	2.540e4					0.9	NO		bb		
8	FUNCTION1 PFK	26.97	8.012e3					0.5	NO		bb		
9	FUNCTION1 PFK	26.02	1.045e4					0.6	NO		bb		
10	FUNCTION1 PFK	25.76	1.115e5					2.1	NO		bb		
11	FUNCTION1 PFK	24.94	1.432e5					2.0	NO		bb		
12	FUNCTION1 PFK	24.37	1.621e4					0.7	NO		bb		
13	FUNCTION1 PFK	24.22	3.770e4					1.0	NO		bb		
14	FUNCTION1 PFK	24.14	3.191e4					0.9	NO		bb		
15	FUNCTION1 PFK	23.57	3.291e4					1.2	NO		bb		
16	FUNCTION1 PFK	22.84	5.998e4					1.6	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	27.87	2.930e5					8.6	YES		dd		0.000
2	FUNCTION2 PFK	27.82	3.512e5					9.6	YES		dd		0.000
3	FUNCTION2 PFK	27.79	3.770e5					10.4	YES		dd		0.000
4	FUNCTION2 PFK	27.76	2.410e5					10.2	YES		bd		0.000
5	FUNCTION2 PFK	30.67	2.109e4					1.1	NO		db		0.000
6	FUNCTION2 PFK	30.64	2.936e4					1.1	NO		bd		0.000
7	FUNCTION2 PFK	30.51	7.136e4					1.2	NO		bb		0.000
8	FUNCTION2 PFK	30.36	4.726e3					0.5	NO		bb		0.000
9	FUNCTION2 PFK	30.26	8.543e3					0.6	NO		bb		0.000
10	FUNCTION2 PFK	30.18	1.359e4					0.8	NO		bb		0.000
11	FUNCTION2 PFK	29.95	4.065e3					0.4	NO		bb		0.000
12	FUNCTION2 PFK	29.71	5.082e4					1.6	NO		bb		0.000
13	FUNCTION2 PFK	29.32	1.014e4					0.6	NO		bb		0.000
14	FUNCTION2 PFK	29.28	3.777e3					0.4	NO		bb		0.000
15	FUNCTION2 PFK	29.15	3.969e3					0.4	NO		bb		0.000
16	FUNCTION2 PFK	28.96	1.047e4					0.6	NO		bb		0.000
17	FUNCTION2 PFK	28.22	1.010e5					2.6	NO		db		0.000
18	FUNCTION2 PFK	28.16	1.757e5					4.0	YES		dd		0.000
19	FUNCTION2 PFK	28.07	4.429e5					5.8	YES		dd		0.000
20	FUNCTION2 PFK	27.93	8.110e5					8.4	YES		dd		0.000
21	FUNCTION2 PFK	32.57	1.056e4					0.6	NO		bb		0.000
22	FUNCTION2 PFK	32.30	3.303e3					0.3	NO		bb		0.000
23	FUNCTION2 PFK	32.26	1.233e4					0.7	NO		db		0.000
24	FUNCTION2 PFK	32.21	1.641e4					0.9	NO		bd		0.000
25	FUNCTION2 PFK	32.17	4.073e4					1.6	NO		db		0.000
26	FUNCTION2 PFK	32.13	2.773e4					1.4	NO		bd		0.000
27	FUNCTION2 PFK	32.01	1.769e4					0.9	NO		bb		0.000
28	FUNCTION2 PFK	31.88	1.695e4					0.8	NO		bb		0.000
29	FUNCTION2 PFK	31.80	6.172e4					1.8	NO		db		0.000
30	FUNCTION2 PFK	31.73	4.249e4					1.6	NO		dd		0.000
31	FUNCTION2 PFK	31.68	4.400e4					1.2	NO		bd		0.000
32	FUNCTION2 PFK	31.26	1.513e4					0.5	NO		bb		0.000
33	FUNCTION2 PFK	31.01	6.650e3					0.4	NO		bb		0.000
34	FUNCTION2 PFK	30.94	9.950e3					0.6	NO		bb		0.000
35	FUNCTION2 PFK	30.72	5.594e3					0.6	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	33.82	1.256e4					0.7	NO		bb		0.000
2	FUNCTION3 PFK	33.71	1.835e4					0.6	NO		bb		0.000
3	FUNCTION3 PFK	33.62	3.515e4					1.1	NO		db		0.000
4	FUNCTION3 PFK	33.58	2.383e4					1.1	NO		bd		0.000
5	FUNCTION3 PFK	33.50	1.289e4					0.9	NO		db		0.000
6	FUNCTION3 PFK	33.47	4.767e3					0.4	NO		bd		0.000
7	FUNCTION3 PFK	33.43	2.801e3					0.3	NO		bb		0.000
8	FUNCTION3 PFK	33.29	2.577e4					0.9	NO		bb		0.000
9	FUNCTION3 PFK	33.19	8.565e3					0.4	NO		bb		0.000
10	FUNCTION3 PFK	32.97	1.583e4					0.6	NO		bb		0.000
11	FUNCTION3 PFK	32.91	4.296e4					1.3	NO		db		0.000
12	FUNCTION3 PFK	32.87	5.868e4					1.6	NO		dd		0.000
13	FUNCTION3 PFK	32.82	4.965e4					1.2	NO		bd		0.000
14	FUNCTION3 PFK	32.76	6.297e3					0.5	NO		db		0.000
15	FUNCTION3 PFK	32.72	2.427e4					1.1	NO		dd		0.000
16	FUNCTION3 PFK	32.70	1.545e4					1.0	NO		bd		0.000
17	FUNCTION3 PFK	35.41	7.887e4					1.2	NO		bd		0.000
18	FUNCTION3 PFK	35.32	2.252e4					1.0	NO		bb		0.000
19	FUNCTION3 PFK	35.12	7.826e4					1.4	NO		bb		0.000
20	FUNCTION3 PFK	35.03	1.497e5					1.7	NO		db		0.000
21	FUNCTION3 PFK	34.90	1.386e4					0.7	NO		bd		0.000
22	FUNCTION3 PFK	34.69	1.082e4					0.5	NO		bb		0.000
23	FUNCTION3 PFK	34.64	4.428e3					0.4	NO		bb		0.000
24	FUNCTION3 PFK	34.60	8.658e4					1.6	NO		db		0.000
25	FUNCTION3 PFK	34.53	1.098e4					0.7	NO		bd		0.000
26	FUNCTION3 PFK	34.45	7.425e4					1.6	NO		bb		0.000
27	FUNCTION3 PFK	34.40	7.214e3					0.4	NO		bb		0.000
28	FUNCTION3 PFK	34.32	8.993e3					0.3	NO		bb		0.000
29	FUNCTION3 PFK	34.20	4.657e3					0.4	NO		bb		0.000
30	FUNCTION3 PFK	34.15	4.619e4					1.2	NO		db		0.000
31	FUNCTION3 PFK	34.06	8.469e4					1.5	NO		bd		0.000
32	FUNCTION3 PFK	34.02	5.343e3					0.3	NO		bb		0.000
33	FUNCTION3 PFK	36.61	1.143e5					1.6	NO		bd		0.000
34	FUNCTION3 PFK	36.49	3.280e4					1.3	NO		db		0.000
35	FUNCTION3 PFK	36.48	6.919e4					1.6	NO		dd		0.000
36	FUNCTION3 PFK	36.40	3.471e4					1.0	NO		dd		0.000
37	FUNCTION3 PFK	36.37	2.515e4					0.9	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	36.30	1.500e4					0.4	NO		bd		0.000
39	FUNCTION3 PFK	36.16	1.612e4					0.7	NO		db		0.000
40	FUNCTION3 PFK	36.12	2.351e4					0.7	NO		bd		0.000
41	FUNCTION3 PFK	36.06	1.226e4					0.7	NO		bb		0.000
42	FUNCTION3 PFK	35.97	3.742e4					0.8	NO		bb		0.000
43	FUNCTION3 PFK	35.88	3.349e4					0.9	NO		db		0.000
44	FUNCTION3 PFK	35.78	5.952e4					1.1	NO		bd		0.000
45	FUNCTION3 PFK	35.70	4.092e4					1.3	NO		db		0.000
46	FUNCTION3 PFK	35.67	5.024e4					1.5	NO		bd		0.000
47	FUNCTION3 PFK	35.55	1.817e5					1.7	NO		db		0.000
48	FUNCTION3 PFK	35.48	4.426e4					1.3	NO		dd		0.000
49	FUNCTION3 PFK	37.63	1.206e5					1.6	NO		db		0.000
50	FUNCTION3 PFK	37.53	8.581e4					1.8	NO		bd		0.000
51	FUNCTION3 PFK	37.47	4.085e4					1.8	NO		db		0.000
52	FUNCTION3 PFK	37.45	5.495e4					1.8	NO		dd		0.000
53	FUNCTION3 PFK	37.37	1.334e5					2.3	NO		dd		0.000
54	FUNCTION3 PFK	37.30	4.295e4					1.2	NO		dd		0.000
55	FUNCTION3 PFK	37.23	7.171e4					1.4	NO		dd		0.000
56	FUNCTION3 PFK	37.18	5.828e4					1.3	NO		bd		0.000
57	FUNCTION3 PFK	37.10	1.296e4					0.7	NO		bb		0.000
58	FUNCTION3 PFK	37.06	5.680e3					0.4	NO		bb		0.000
59	FUNCTION3 PFK	37.01	2.576e3					0.2	NO		bb		0.000
60	FUNCTION3 PFK	36.96	5.381e4					0.7	NO		bb		0.000
61	FUNCTION3 PFK	36.82	1.053e5					1.4	NO		db		0.000
62	FUNCTION3 PFK	36.71	4.118e4					1.1	NO		dd		0.000
63	FUNCTION3 PFK	36.66	4.464e4					1.4	NO		dd		0.000

PFK4

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION4 PFK	42.12	1.209e4					1.5	NO		bb		

ID: CS3L1, Name: 21082302, Date: 23-Aug-2021, Time: 12:04:42, 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	45.45	3.372e3					0.8	NO		bb		
2	FUNCTION5 PFK	44.77	3.497e3					0.8	NO		bb		
3	FUNCTION5 PFK	44.49	1.201e4					1.2	NO		bb		
4	FUNCTION5 PFK	44.43	2.102e3					0.8	NO		bb		
5	FUNCTION5 PFK	44.34	3.170e3					0.8	NO		bb		
6	FUNCTION5 PFK	44.30	4.221e3					0.7	NO		bb		
7	FUNCTION5 PFK	43.75	1.363e3					0.5	NO		bb		
8	FUNCTION5 PFK	43.58	2.100e4					2.3	NO		db		
9	FUNCTION5 PFK	43.53	3.229e4					4.1	YES		dd		
10	FUNCTION5 PFK	43.49	1.532e5					5.8	YES		dd		
11	FUNCTION5 PFK	43.34	3.257e5					11.9	YES		dd		
12	FUNCTION5 PFK	43.23	1.754e6					15.8	YES		dd		
13	FUNCTION5 PFK	42.93	3.824e5					26.2	YES		dd		
14	FUNCTION5 PFK	42.87	6.008e5					27.5	YES		bd		
15	FUNCTION5 PFK	45.91	9.403e3					1.3	NO		bb		
16	FUNCTION5 PFK	45.87	2.124e3					0.6	NO		bb		
17	FUNCTION5 PFK	45.76	7.453e3					1.0	NO		bb		

ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	27.12	7.999e1					1.8	NO		bb		0.000
2	FUNCTION1 HXCD...	25.85	1.512e2					4.2	YES		bb		0.000
3	FUNCTION1 HXCD...	25.55	2.009e2					3.0	YES		bb		0.000
4	FUNCTION1 HXCD...	24.85	7.388e1					1.4	NO		db		0.000
5	FUNCTION1 HXCD...	24.76	1.439e2					4.6	YES		bd		0.000
6	FUNCTION1 HXCD...	24.11	1.525e2					2.4	NO		db		0.000
7	FUNCTION1 HXCD...	24.05	7.301e1					2.0	NO		bd		0.000
8	FUNCTION1 HXCD...	23.52	2.025e2					3.3	YES		db		0.000
9	FUNCTION1 HXCD...	23.45	1.326e2					4.0	YES		bd		0.000
10	FUNCTION1 HXCD...	22.98	2.534e2					4.4	YES		bb		0.000
11	FUNCTION1 HXCD...	22.42	9.627e1					2.1	NO		bb		0.000
12	FUNCTION1 HXCD...	22.18	1.413e2					2.4	NO		bb		0.000
13	FUNCTION1 HXCD...	27.59	1.327e2					1.9	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...	27.61	1.559e2					2.2	NO		bb		0.000
2	FUNCTION1 HPCD...	27.15	7.452e1					2.3	NO		bb		0.000
3	FUNCTION1 HPCD...	26.86	1.542e2					2.9	NO		bb		0.000
4	FUNCTION1 HPCD...	25.82	8.016e1					1.7	NO		bb		0.000
5	FUNCTION1 HPCD...	25.55	7.743e1					2.1	NO		bb		0.000
6	FUNCTION1 HPCD...	24.85	1.056e2					2.1	NO		db		0.000
7	FUNCTION1 HPCD...	24.76	1.636e2					2.5	NO		bd		0.000
8	FUNCTION1 HPCD...	23.43	1.474e2					2.5	NO		bb		0.000
9	FUNCTION1 HPCD...	22.98	1.346e2					2.8	NO		db		0.000
10	FUNCTION1 HPCD...	22.93	9.017e1					2.6	NO		bd		0.000
11	FUNCTION1 HPCD...	21.38	1.743e2					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...	31.03	3.028e2					6.1	YES		bb		0.000
2	FUNCTION2 HPCD...	29.84	1.452e2					2.3	NO		bb		0.000
3	FUNCTION2 HPCD...	32.28	7.834e1					1.9	NO		bb		0.000
4	FUNCTION2 HPCD...	31.93	1.117e2					2.1	NO		db		0.000
5	FUNCTION2 HPCD...	31.86	7.373e1					2.3	NO		bd		0.000
6	FUNCTION2 HPCD...	31.43	8.139e1					2.6	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	37.63	8.284e1					2.4	NO		dd		0.000
2	FUNCTION3 OCDPE	37.52	1.552e2					3.8	YES		dd		0.000
3	FUNCTION3 OCDPE	37.44	1.676e2					3.5	YES		dd		0.000
4	FUNCTION3 OCDPE	37.37	9.729e1					2.9	NO		bd		0.000
5	FUNCTION3 OCDPE	37.14	8.177e1					4.0	YES		db		0.000
6	FUNCTION3 OCDPE	37.07	1.494e2					4.2	YES		dd		0.000
7	FUNCTION3 OCDPE	37.01	1.264e2					3.9	YES		dd		0.000
8	FUNCTION3 OCDPE	36.90	8.470e1					2.2	NO		bd		0.000
9	FUNCTION3 OCDPE	36.84	1.705e2					6.8	YES		db		0.000
10	FUNCTION3 OCDPE	36.78	4.180e2					8.1	YES		bd		0.000
11	FUNCTION3 OCDPE	35.74	7.093e1					2.2	NO		bb		0.000
12	FUNCTION3 OCDPE	37.67	1.417e2					5.1	YES		db		0.000

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ID: CS3L1, Name: 21082302, Date: 23-Aug-2021, Time: 12:04:42, 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	40.45	1.114e2					3.5	YES		bb		0.000
2	FUNCTION4 NCDPE	38.52	2.819e2					6.0	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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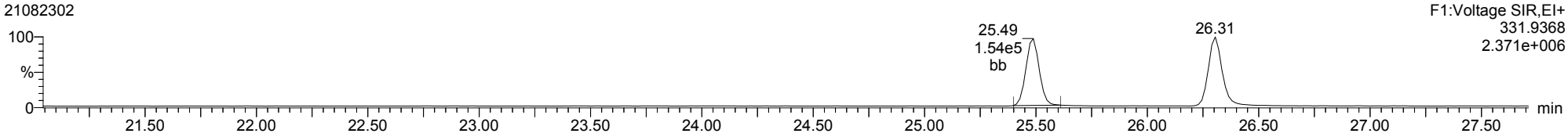

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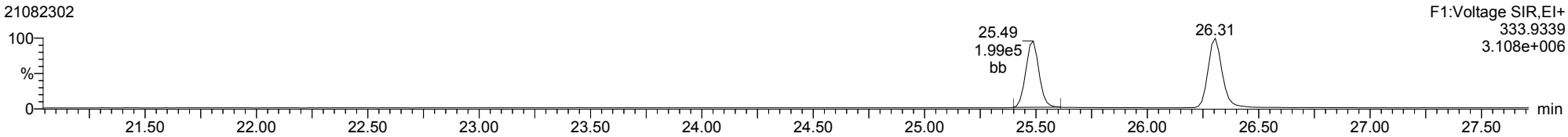

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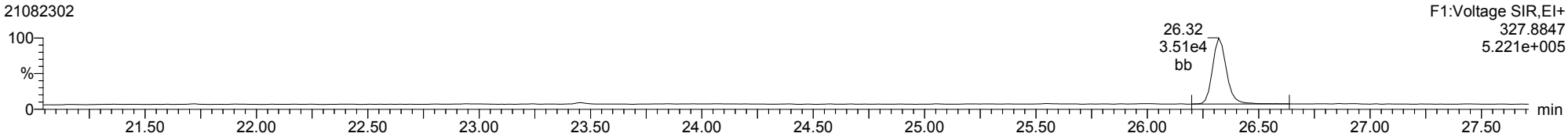

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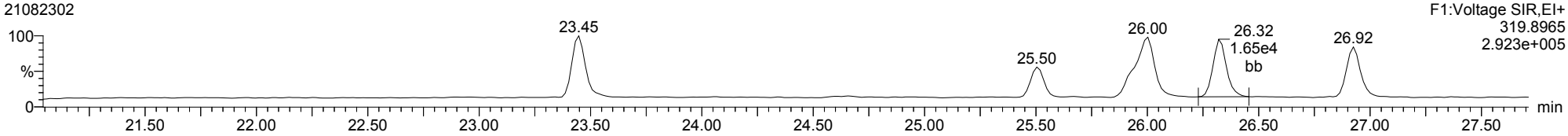

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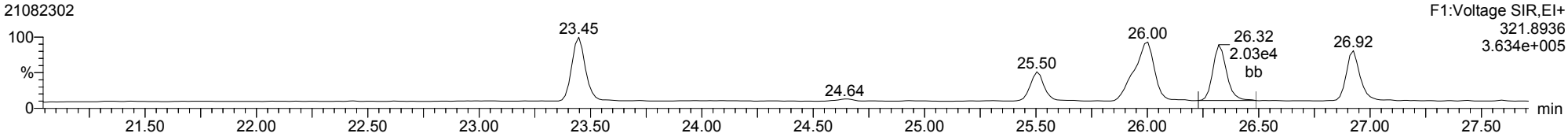

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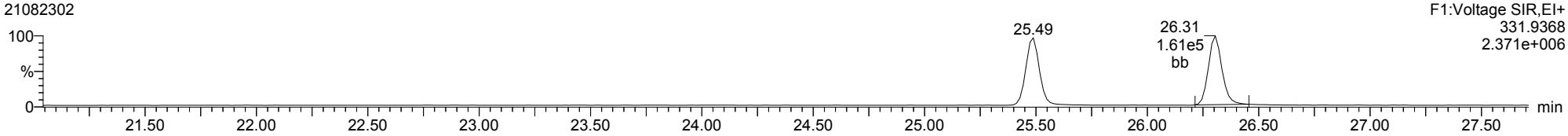

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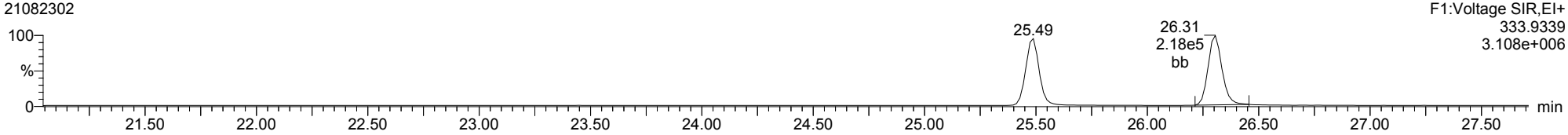

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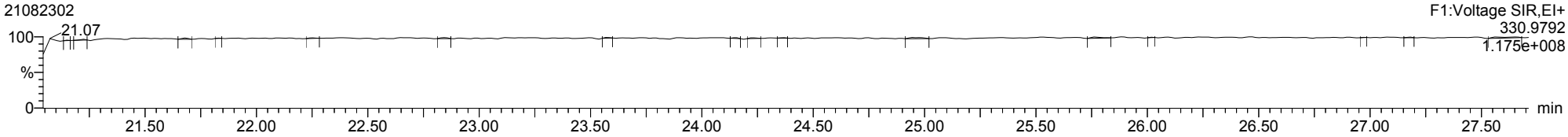

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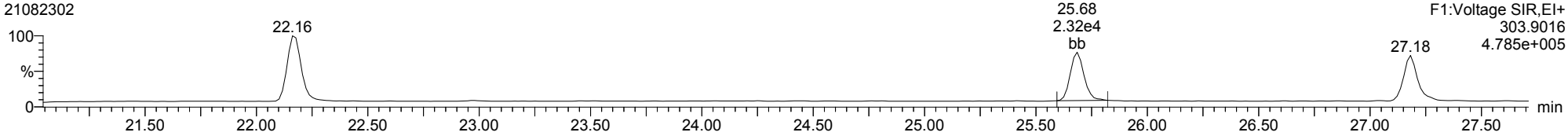

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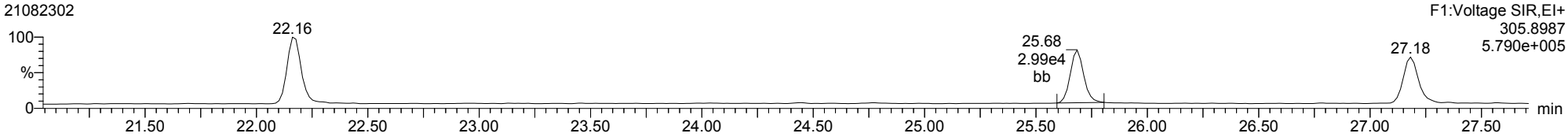

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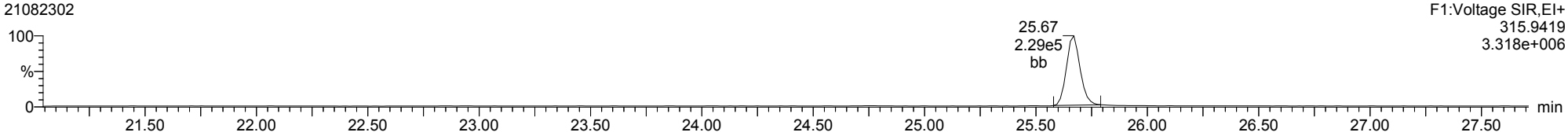

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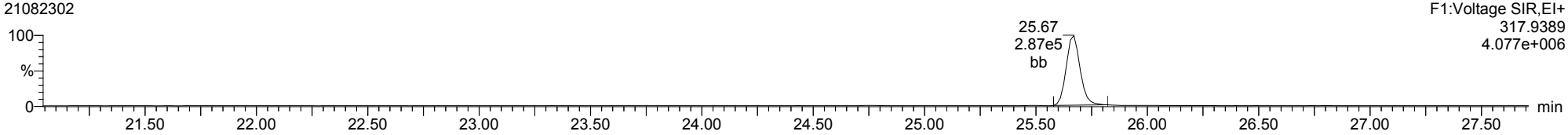

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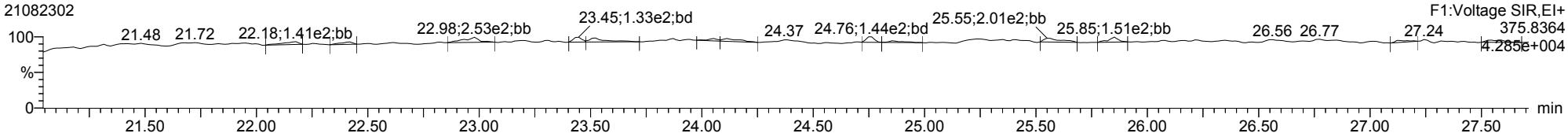

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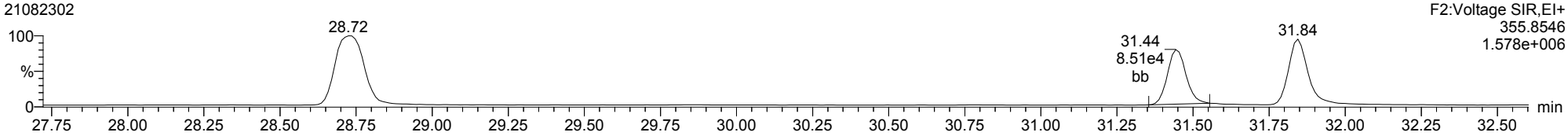

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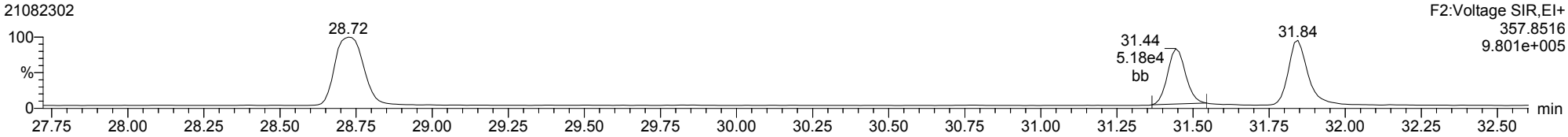

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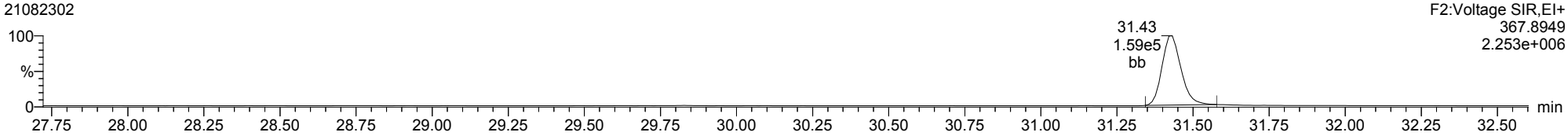

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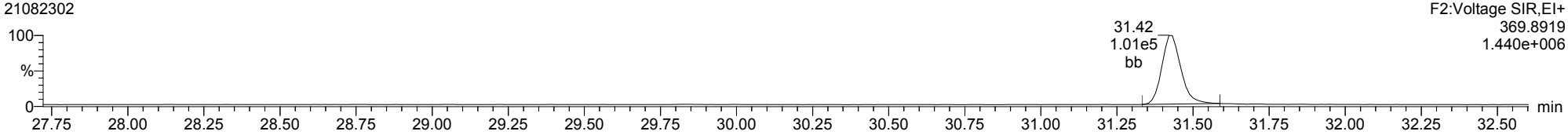

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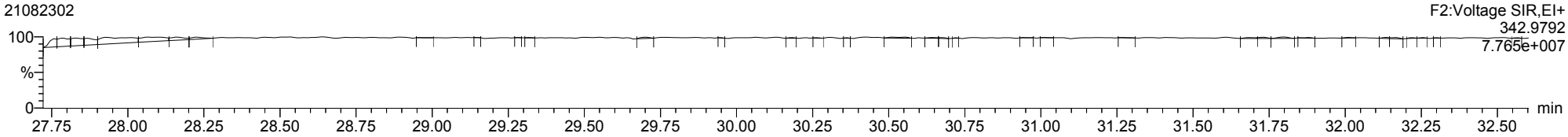

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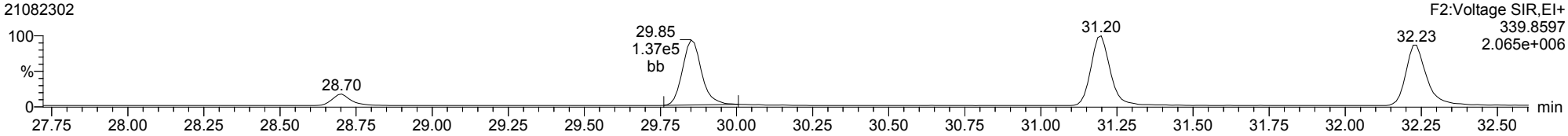

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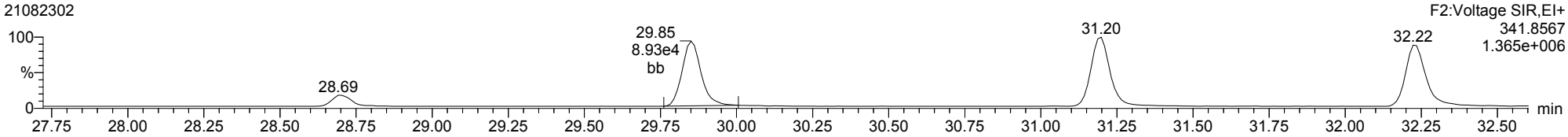

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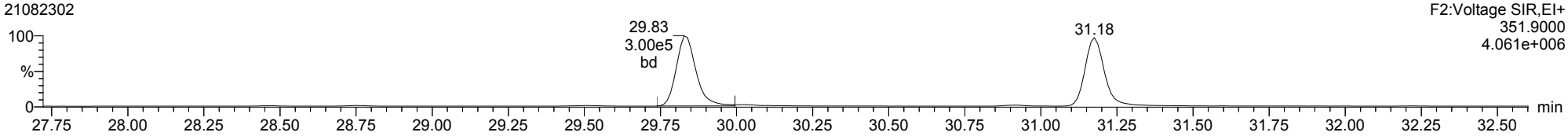

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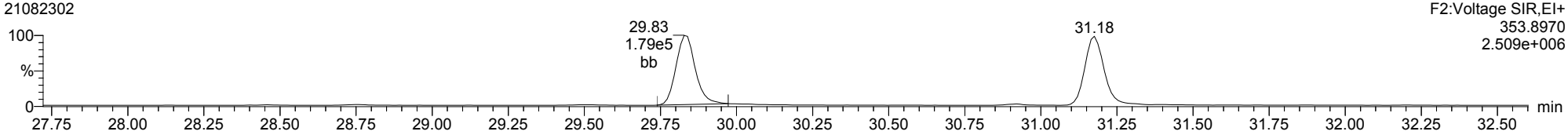

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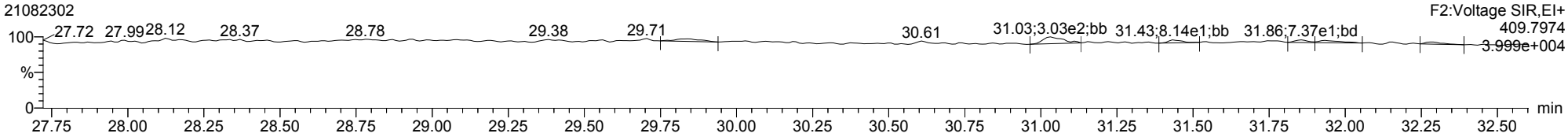

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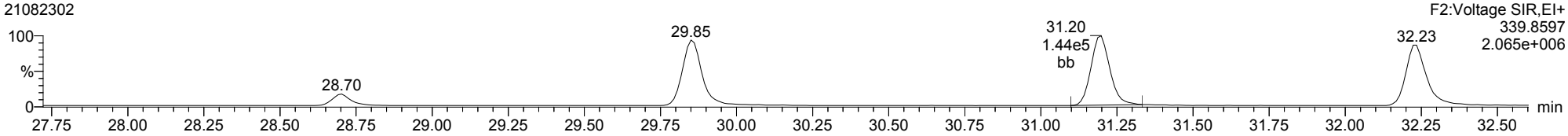
23478-PeCDF



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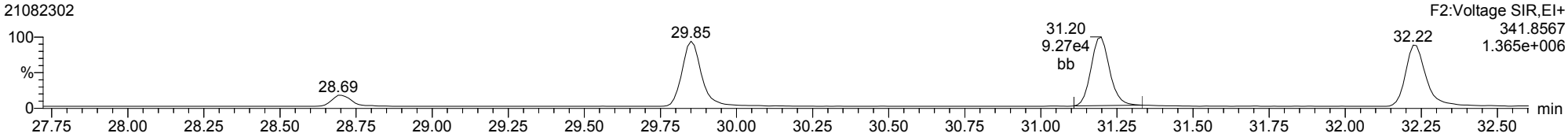

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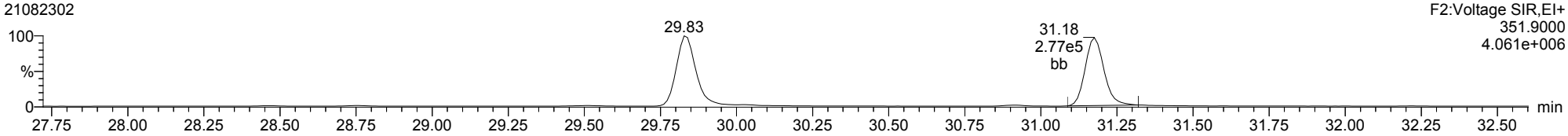

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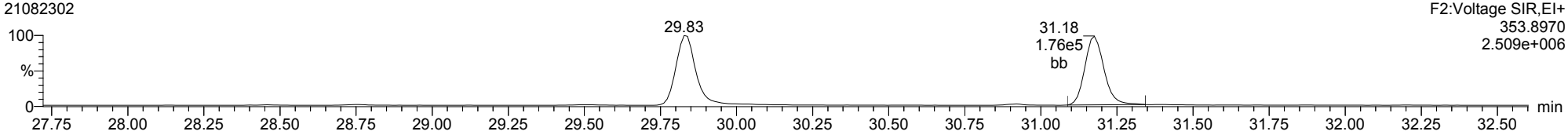

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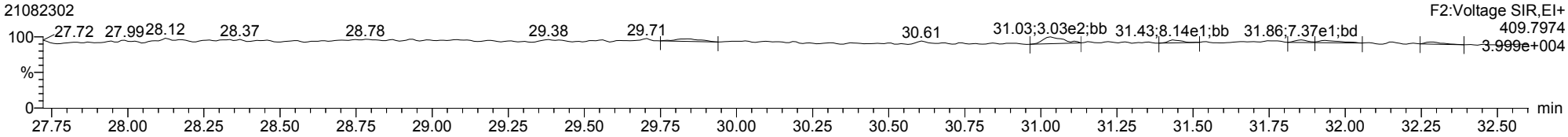

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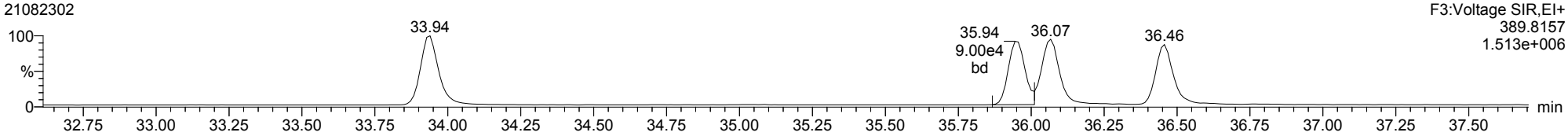

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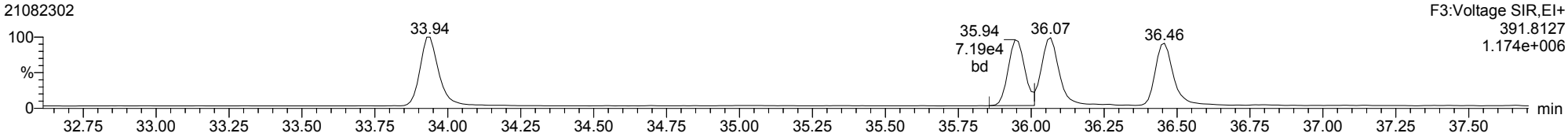

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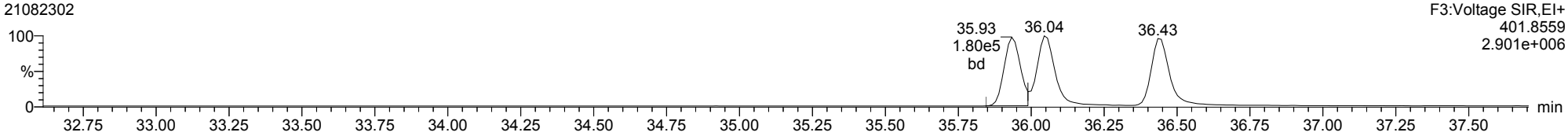

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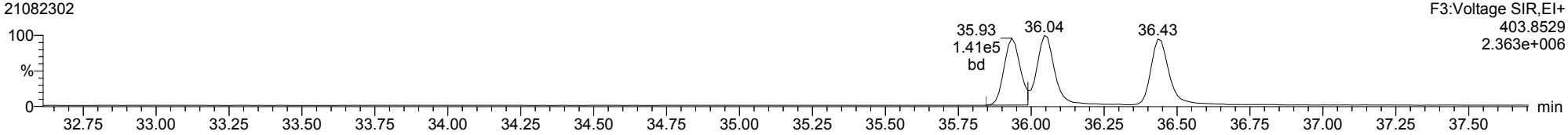

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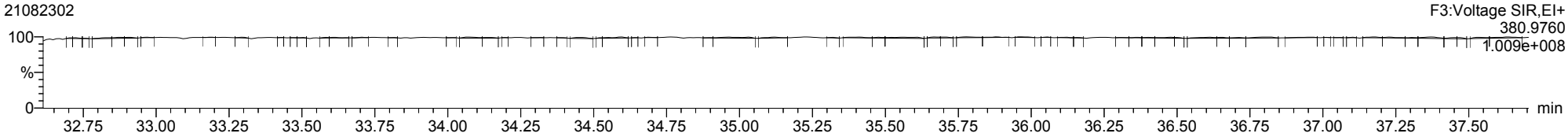

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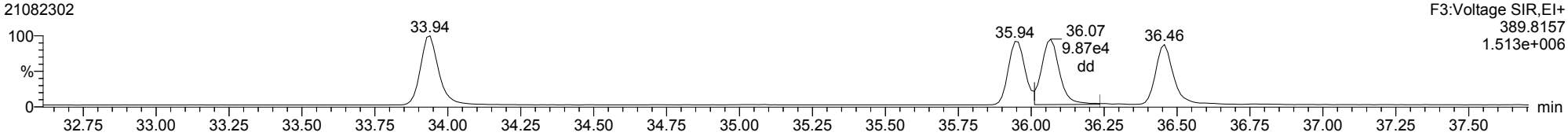

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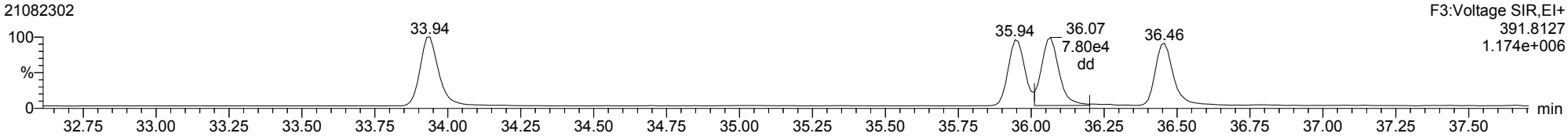

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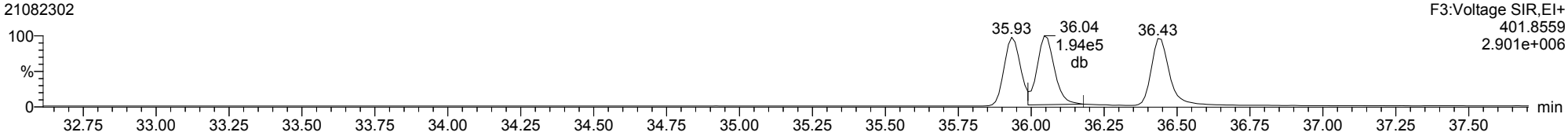

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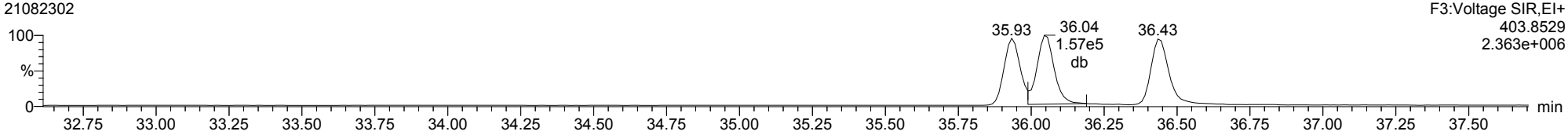

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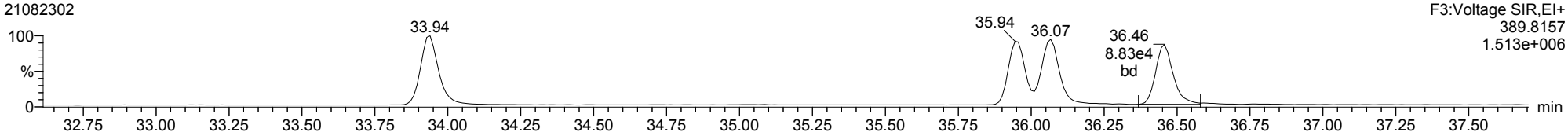

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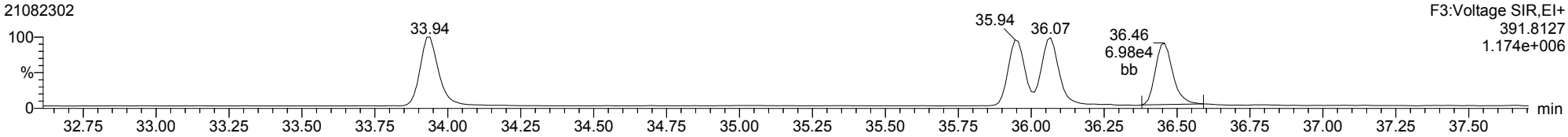

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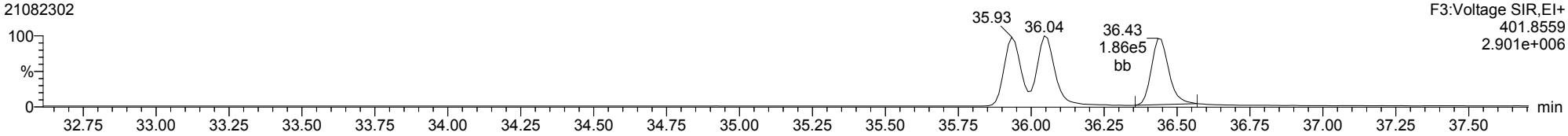

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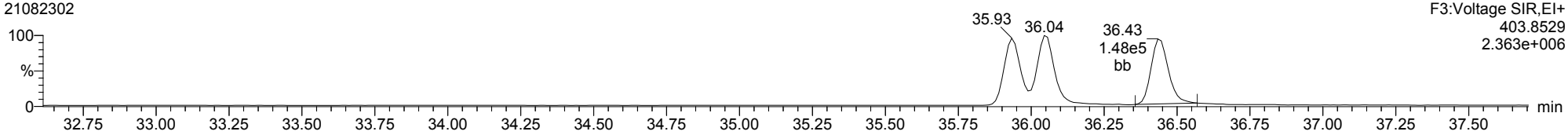

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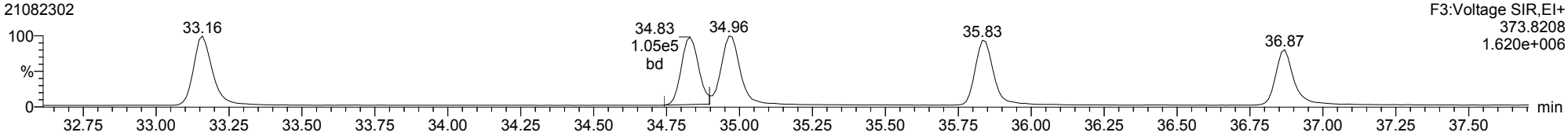

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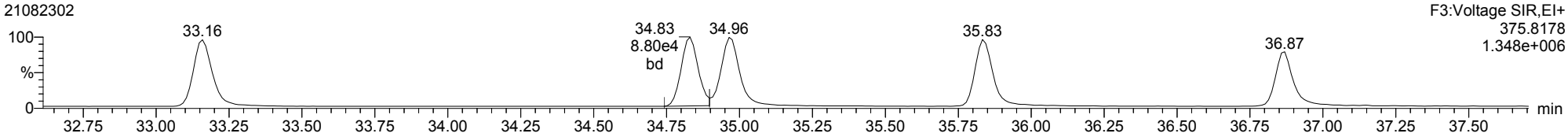

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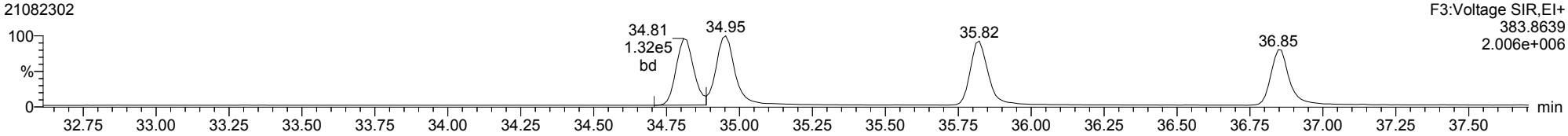

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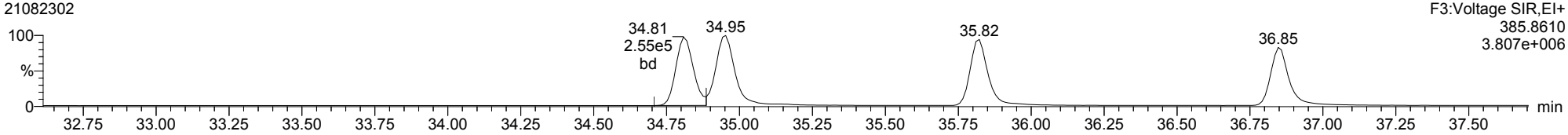

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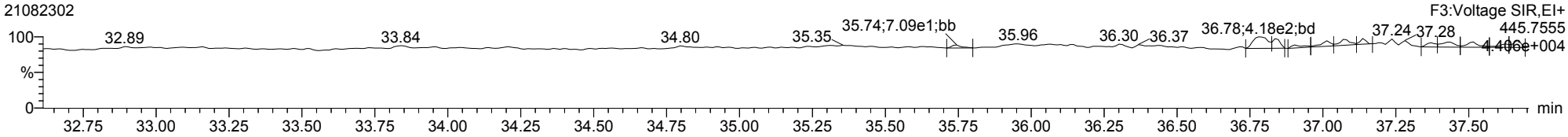

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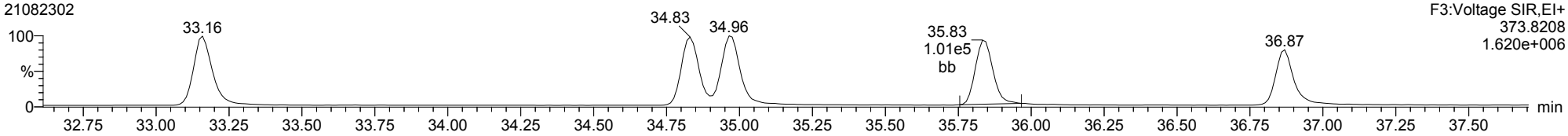

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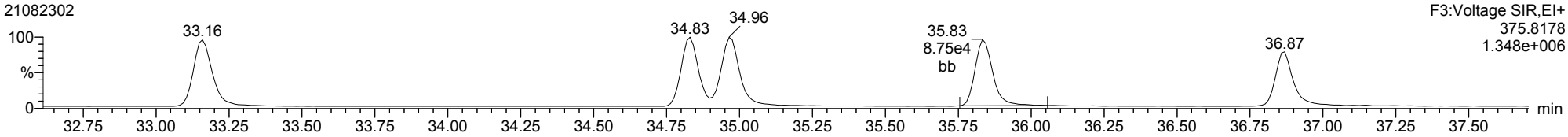

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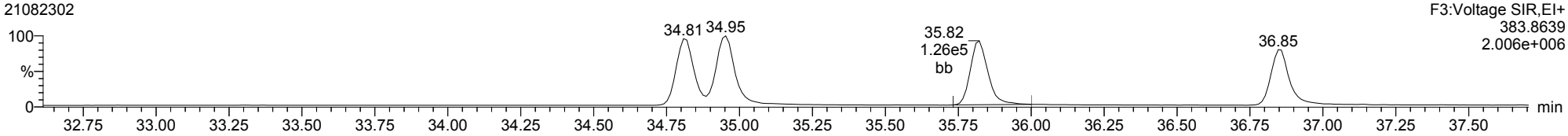

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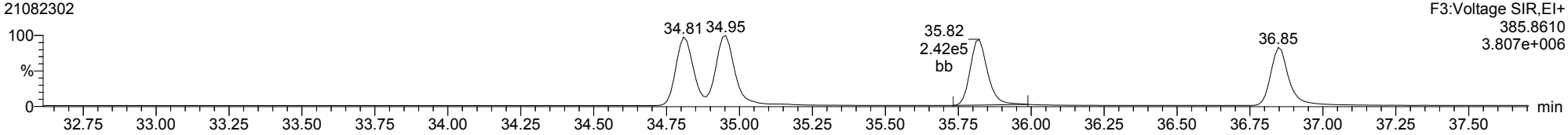

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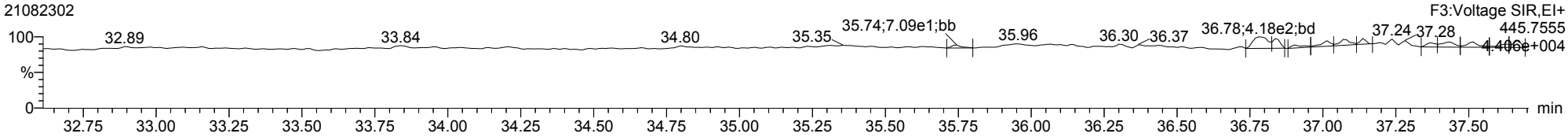

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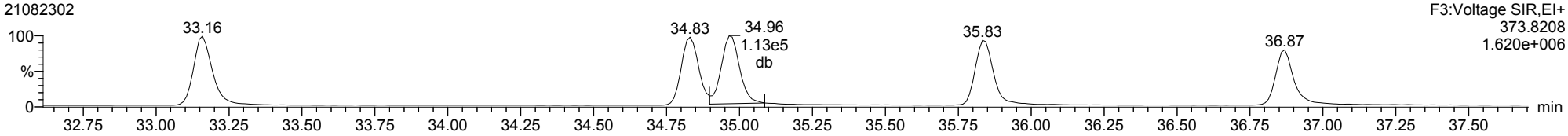

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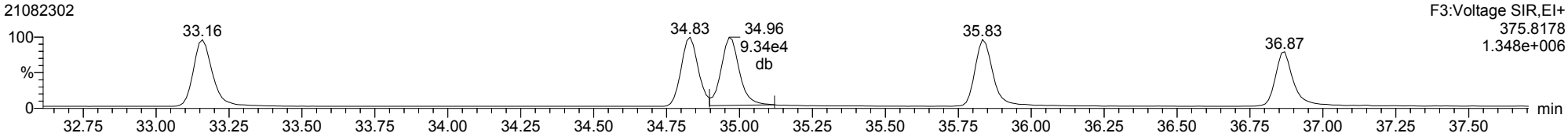

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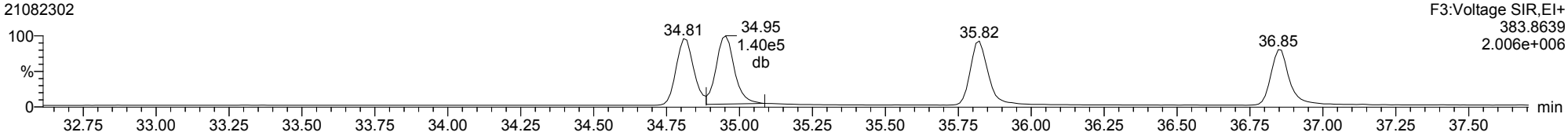

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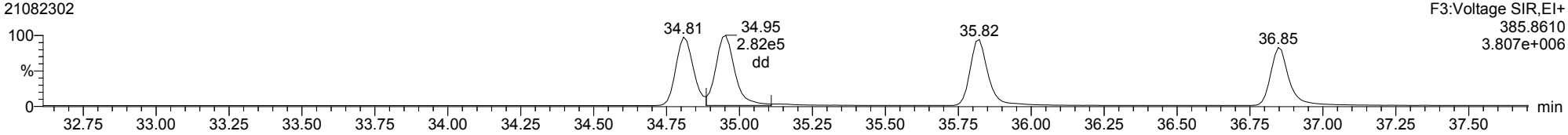

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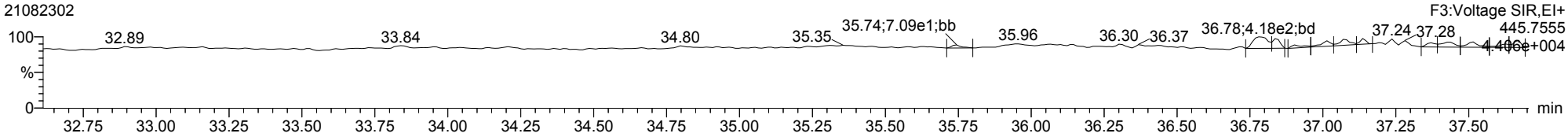

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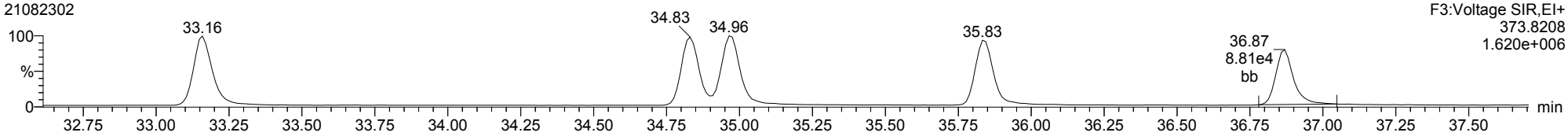

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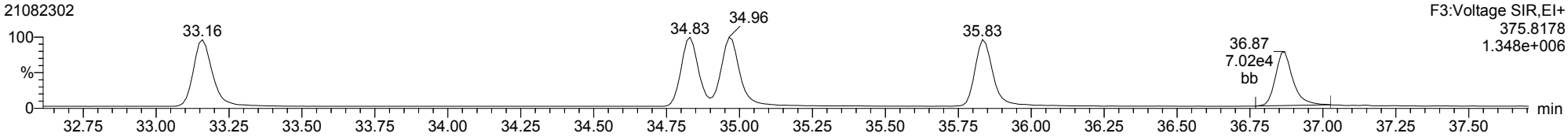

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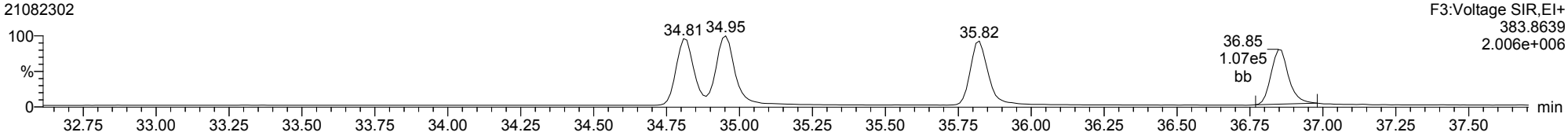

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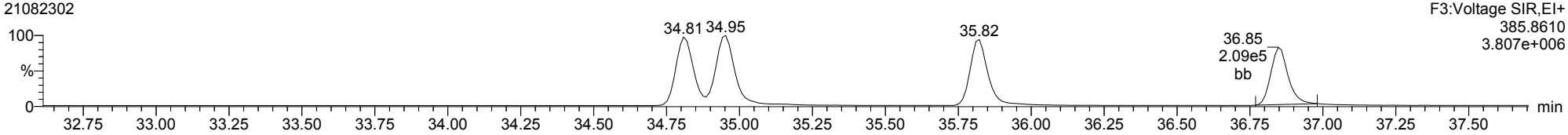

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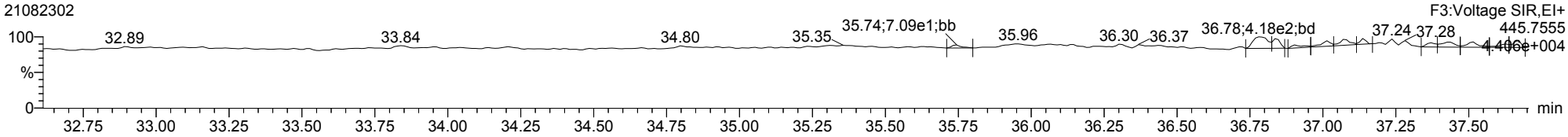

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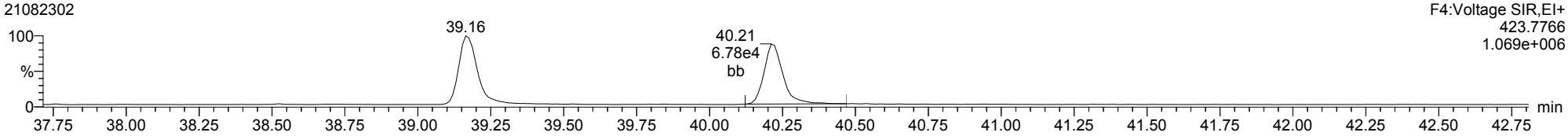

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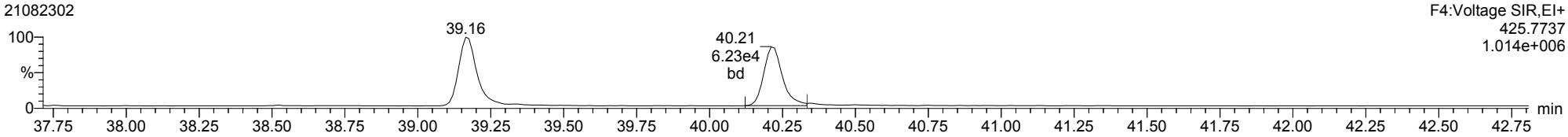

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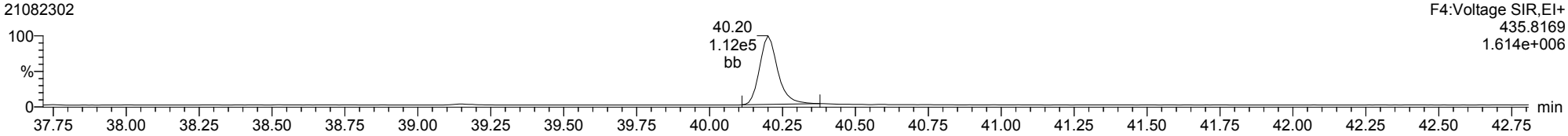

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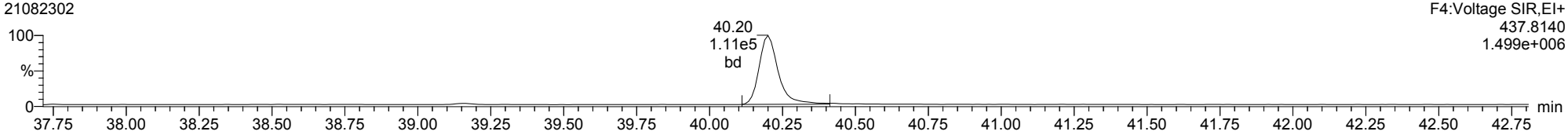

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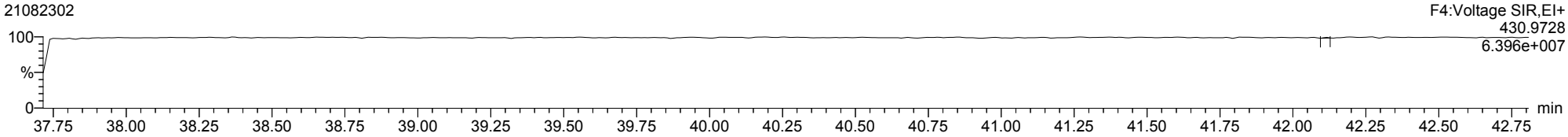

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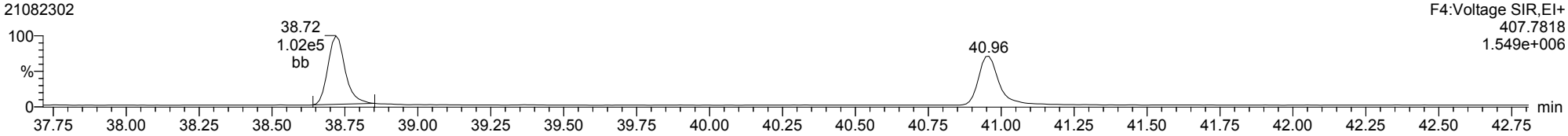

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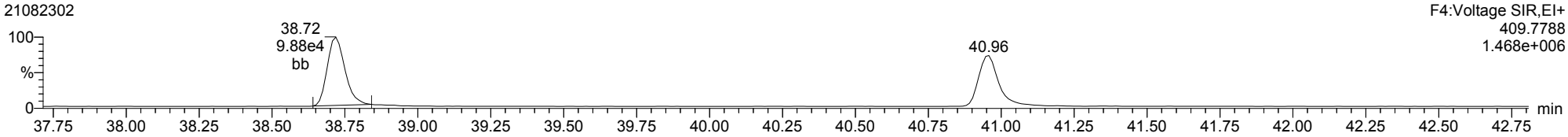

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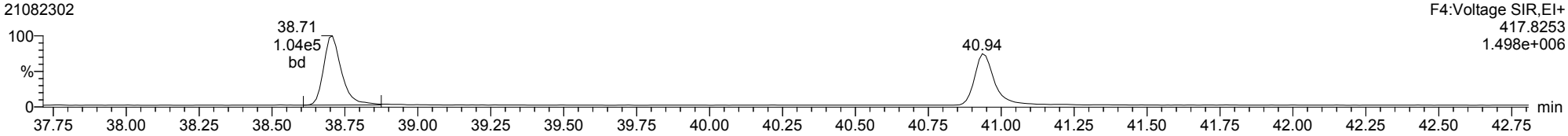

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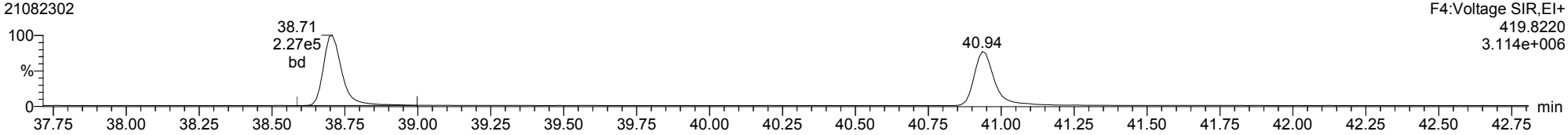

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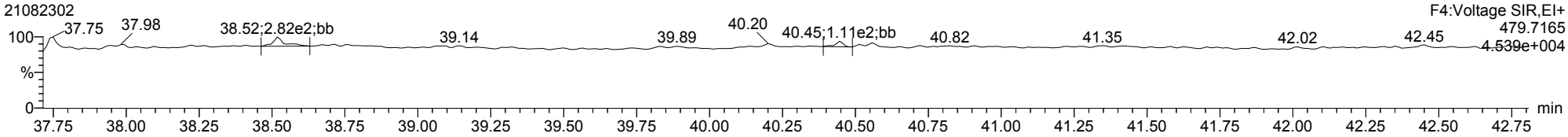

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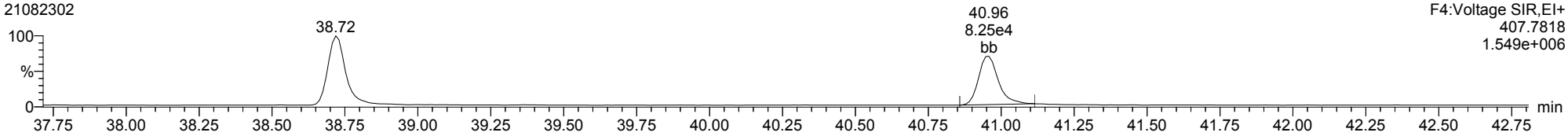

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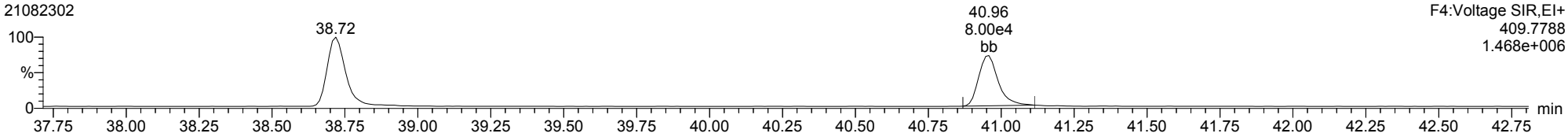

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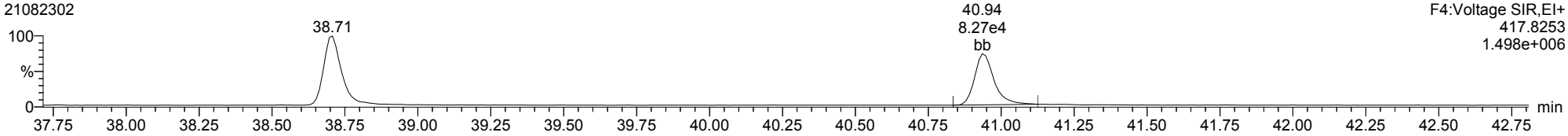

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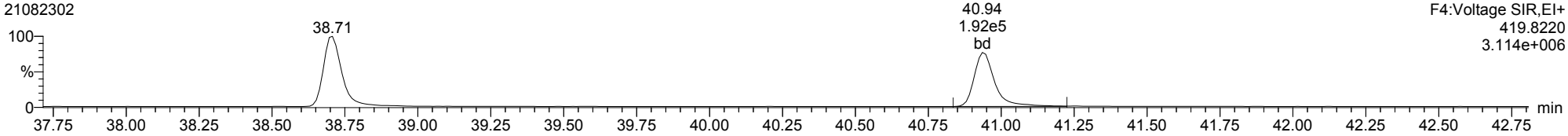

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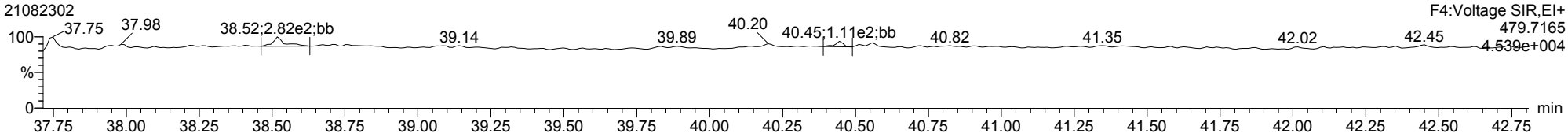

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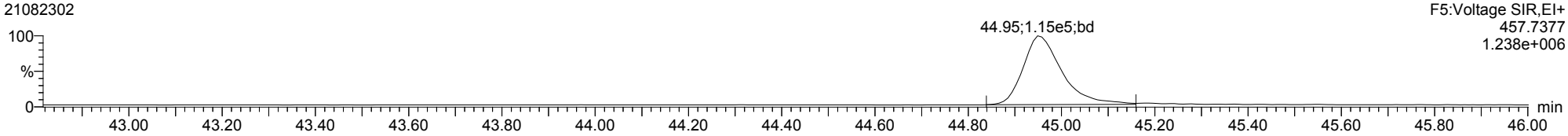

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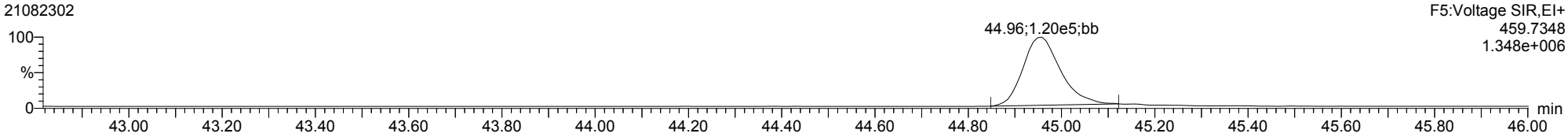

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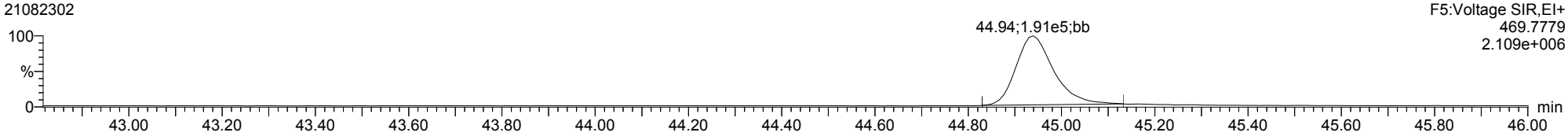
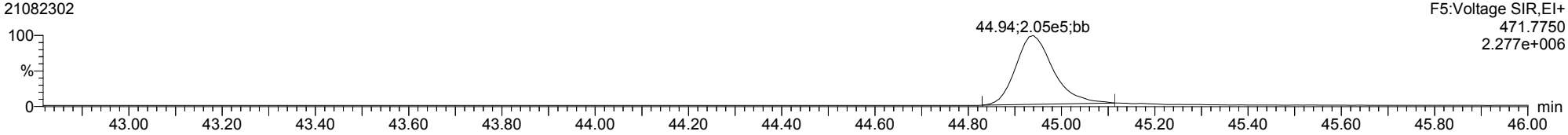


13C-OCDD



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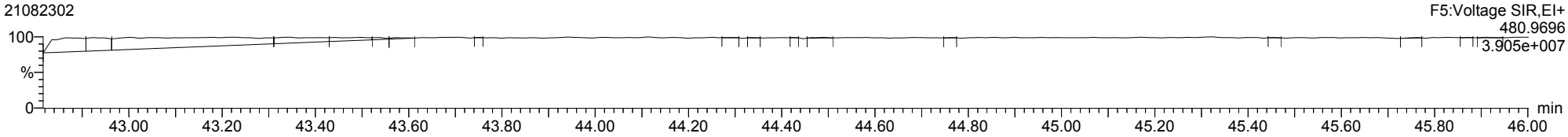

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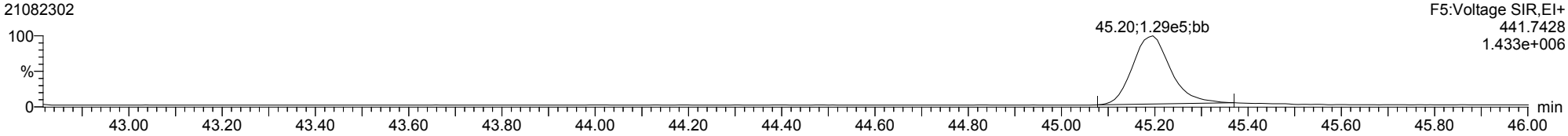

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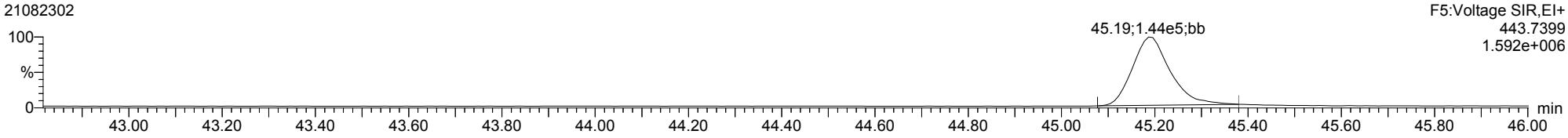

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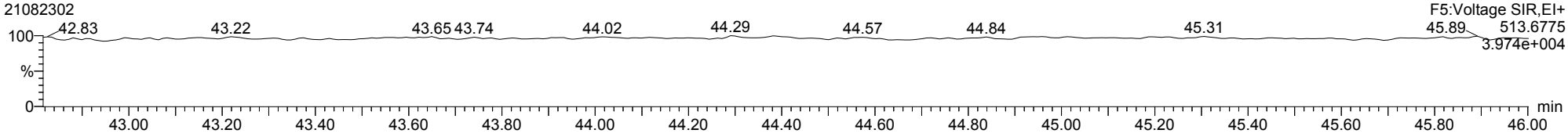

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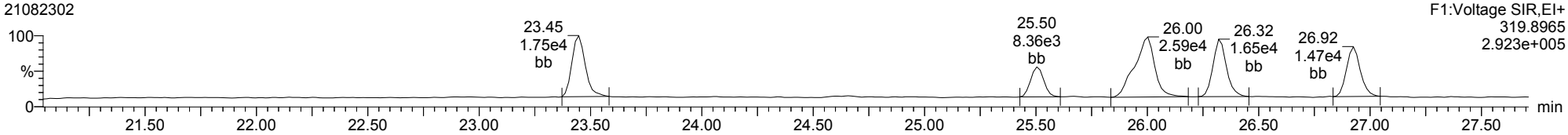

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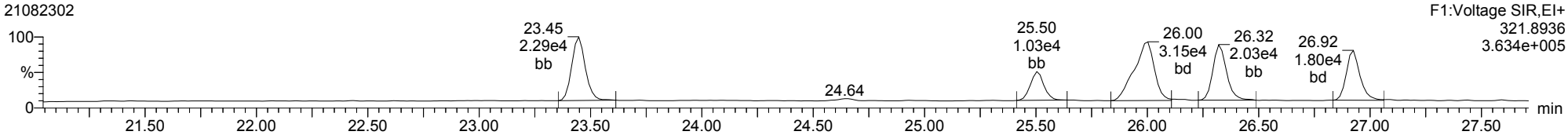

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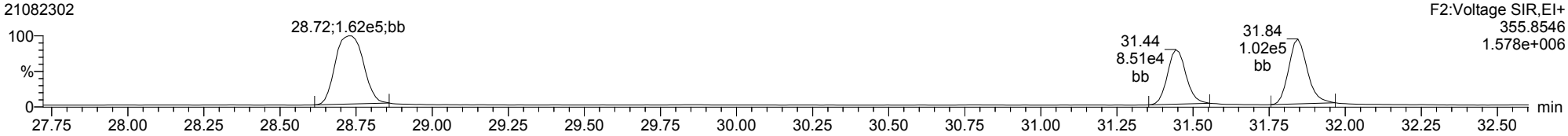

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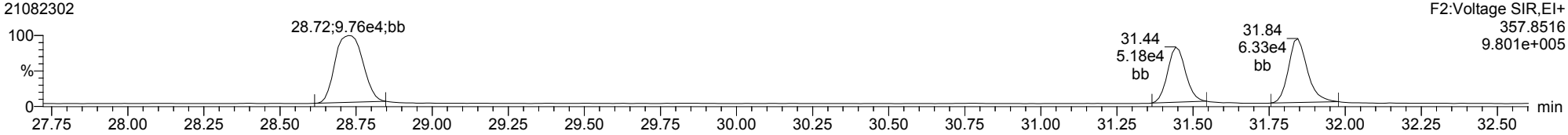

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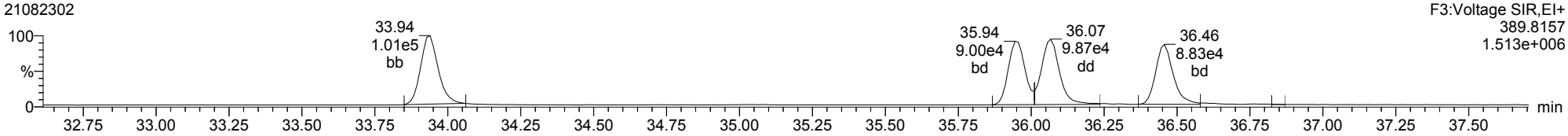

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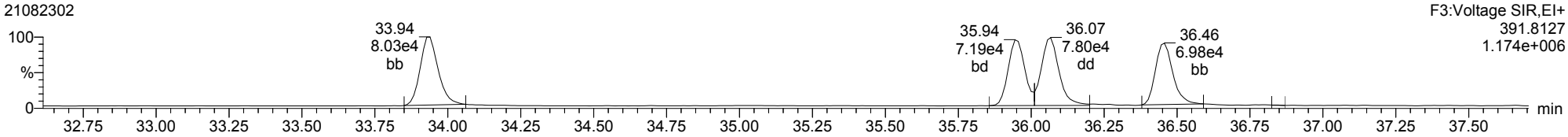

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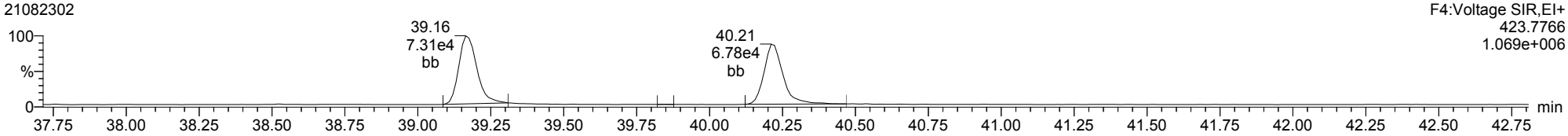

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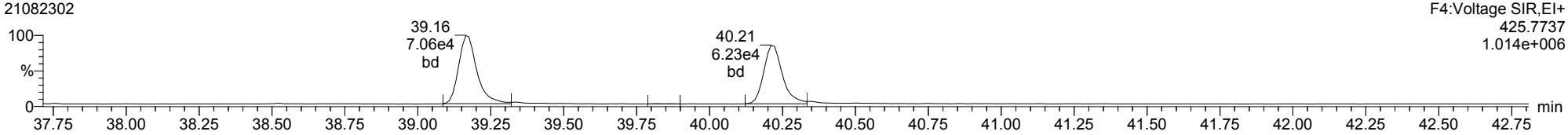

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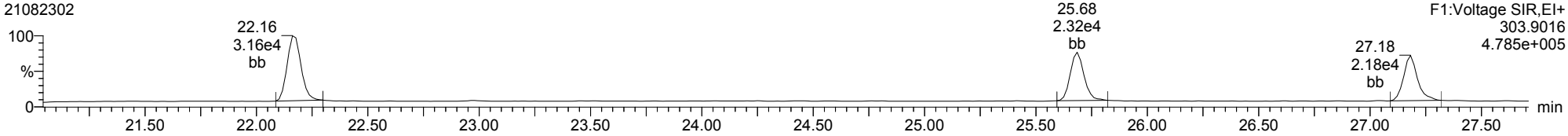
Total-tetrafurans



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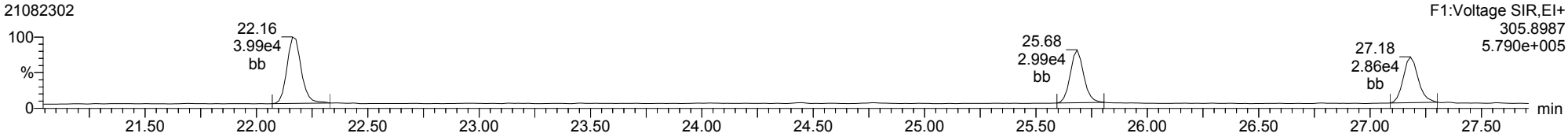

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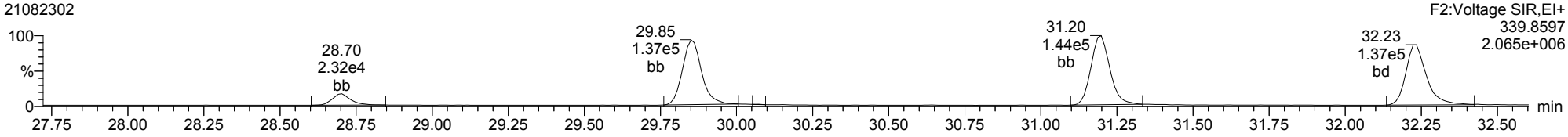
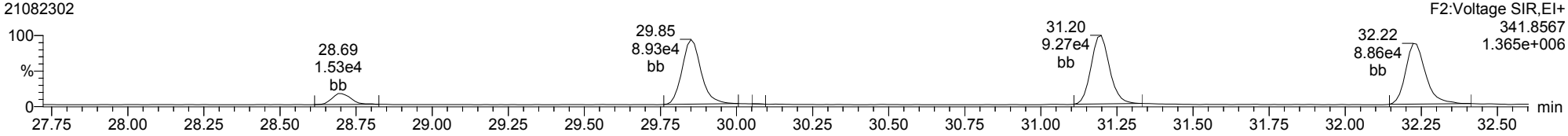


Total-pentafurans



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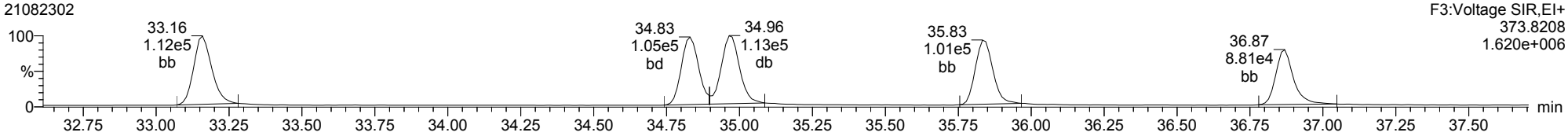

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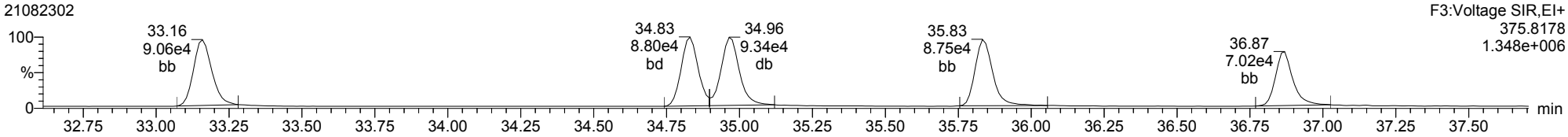

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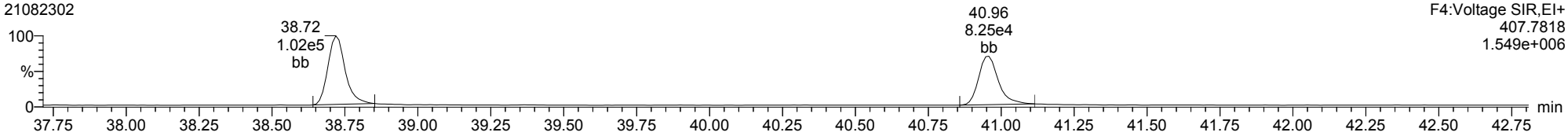

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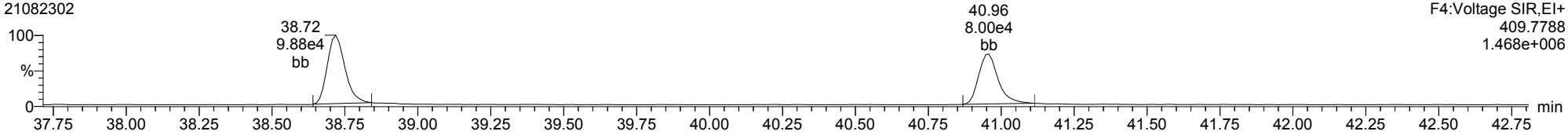

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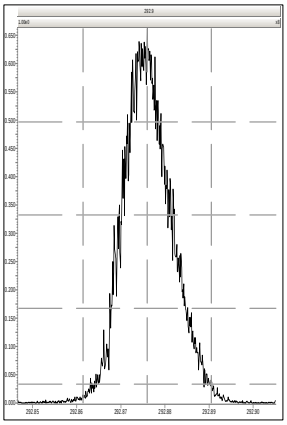

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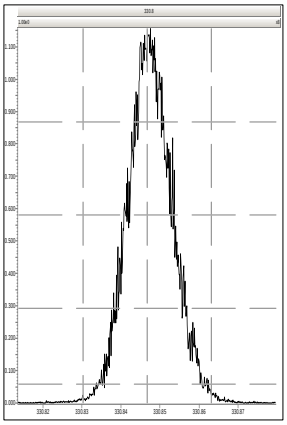

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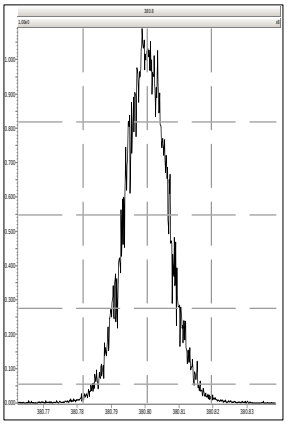

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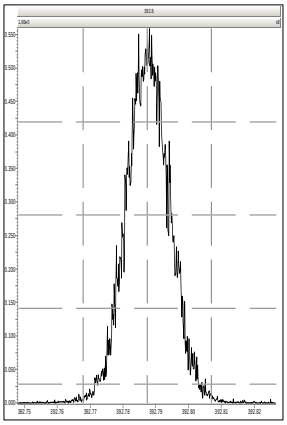

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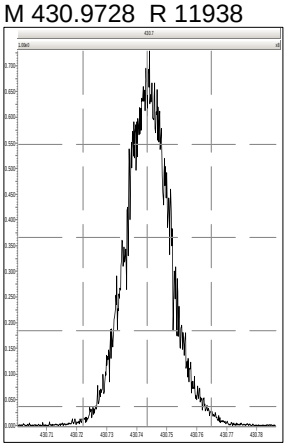

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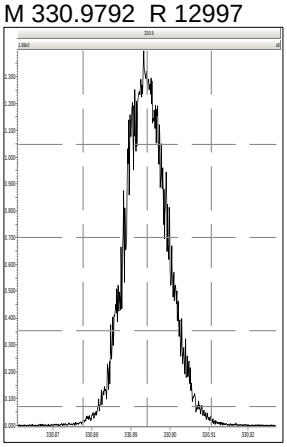

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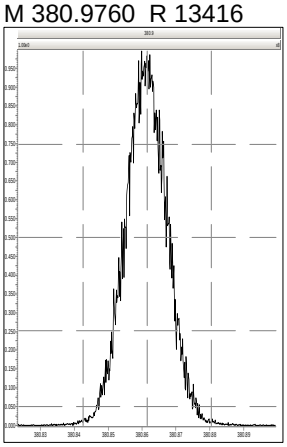

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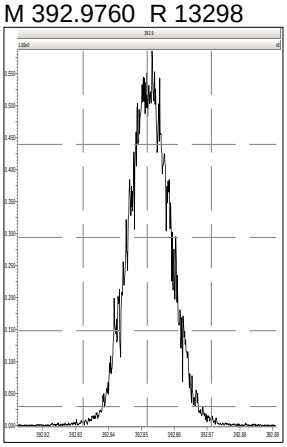

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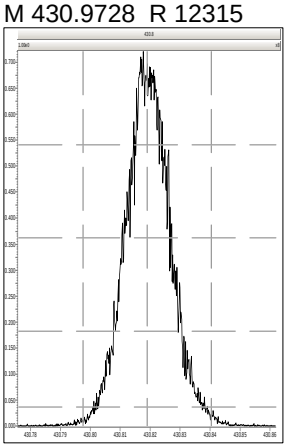

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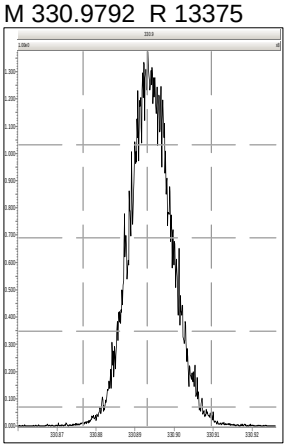

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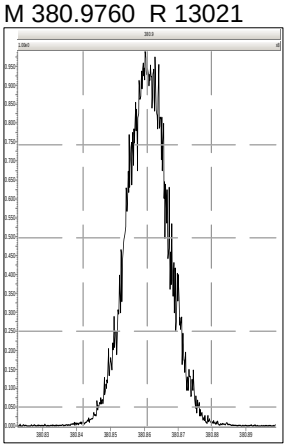

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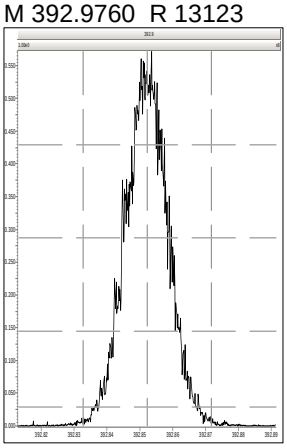

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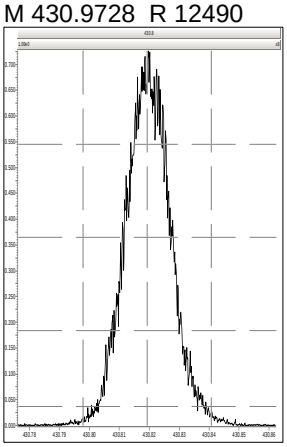

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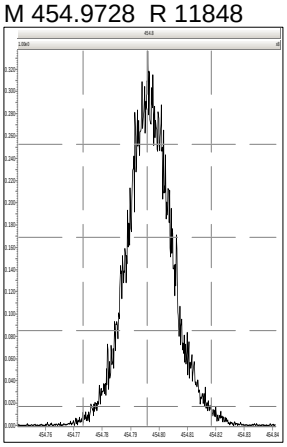

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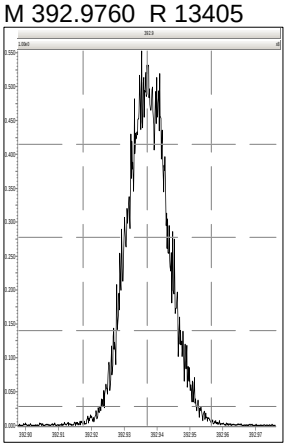

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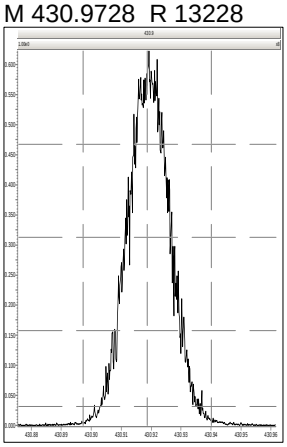

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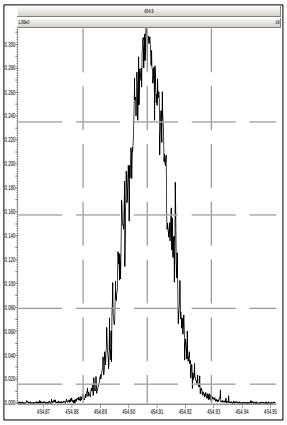

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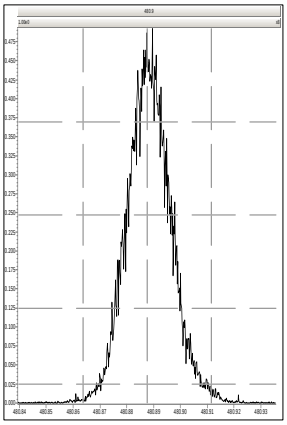

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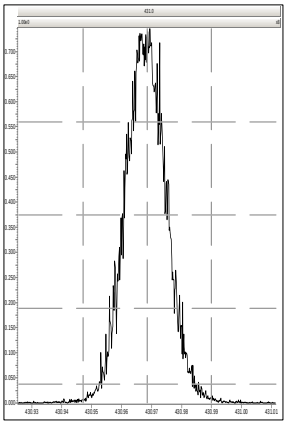

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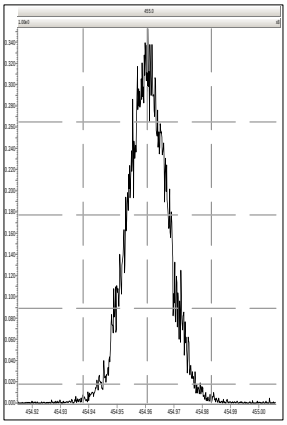

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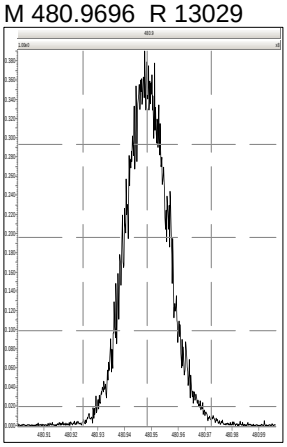

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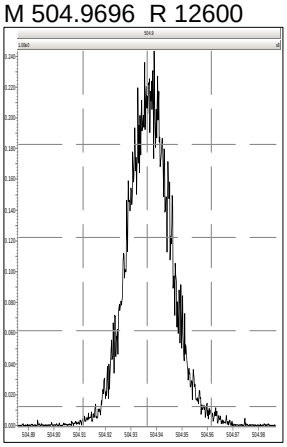

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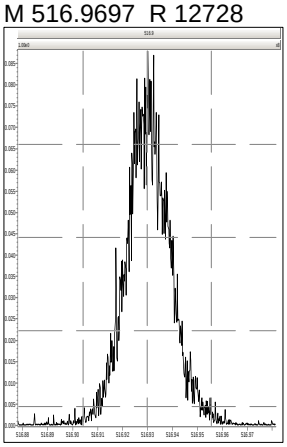

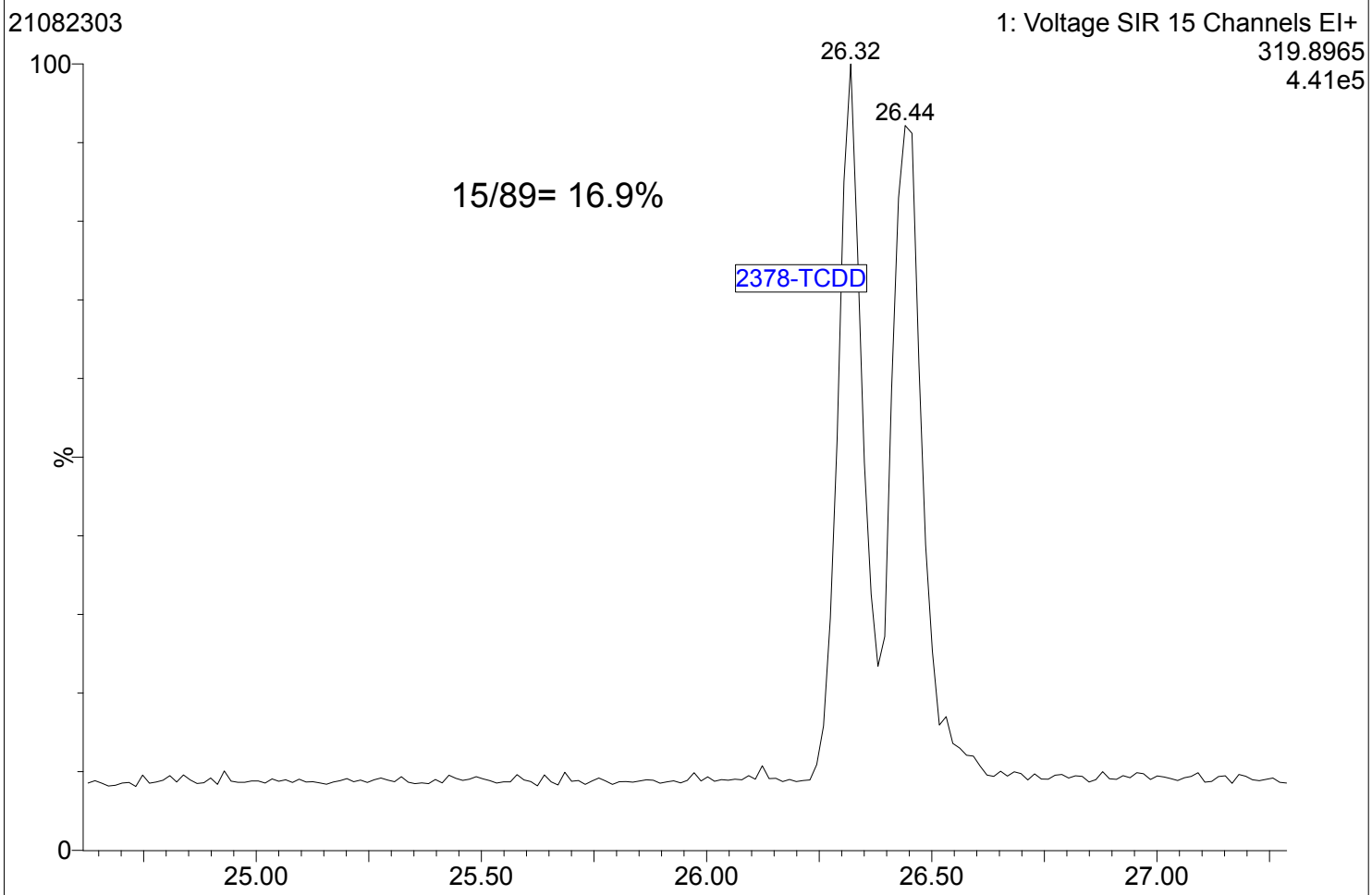
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1: Voltage SIR 15 Channels EI+
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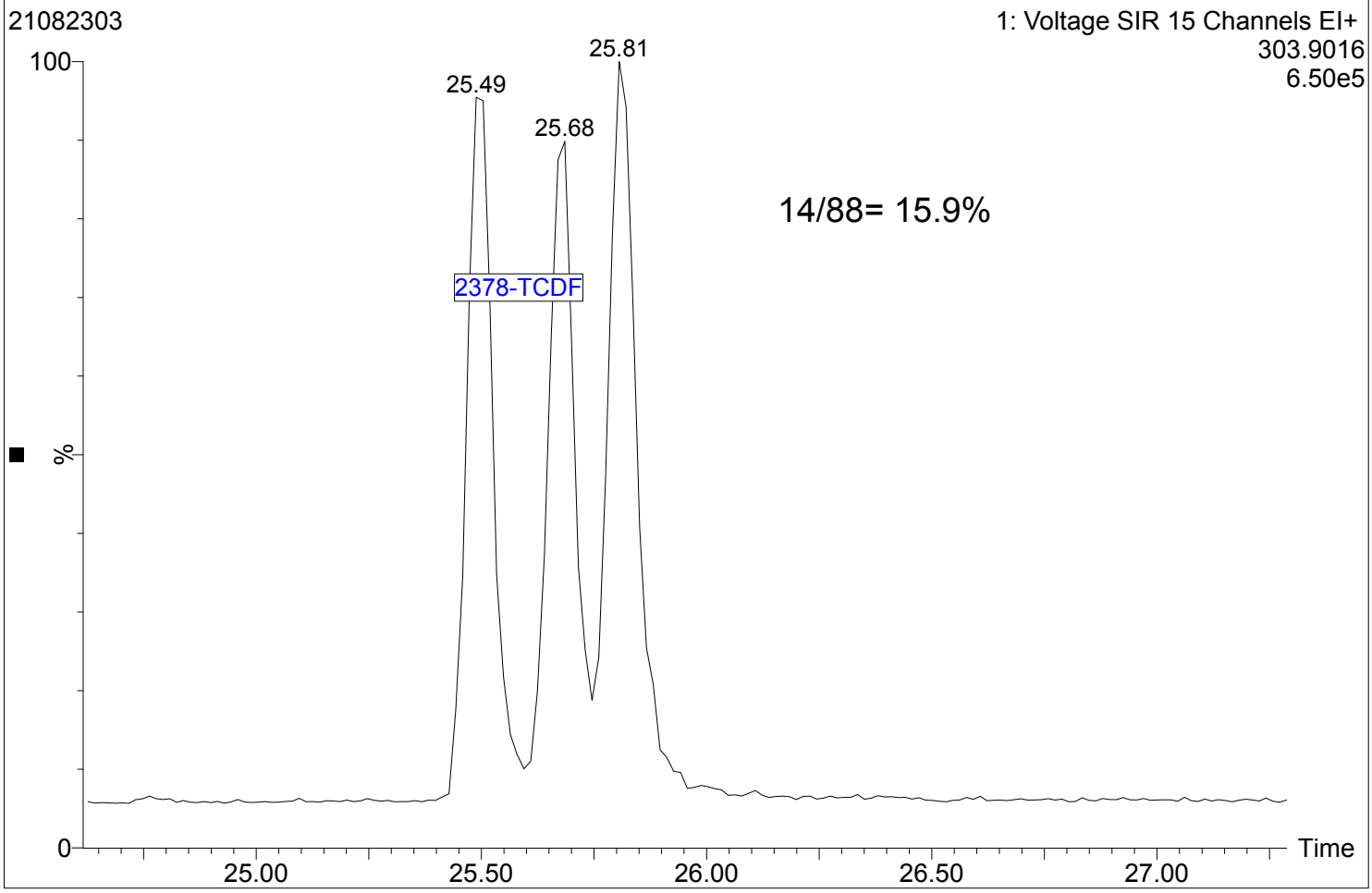
4.41e5
26.32
26.44
15/89= 16.9%
2378-TCDD
100
%
0
25.00
25.50
26.00
26.50
27.00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25.68
14/88= 15.9%
2378-TCDF
100
%
0
Time
25.00
25.50
26.00
26.50
27.00

Analytical Resources, Incorporated
Analytical Chemists and Consultants

CONTINUING CALIBRATION CHECK
EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
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
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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

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

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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

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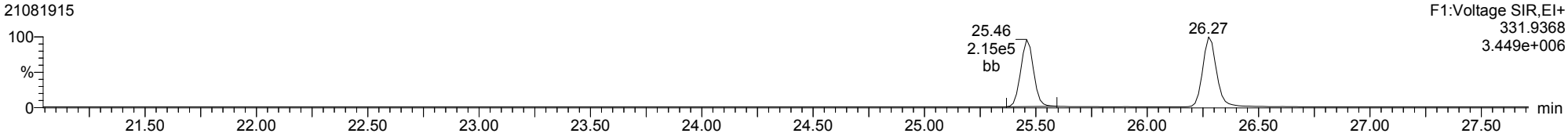
ID: CS3K2, Name: 21081915, Date: 18-Aug-2021, Time: 21:38:40, Conditions: AUTOSPEC01, User: pk

13C-1234-TCDD



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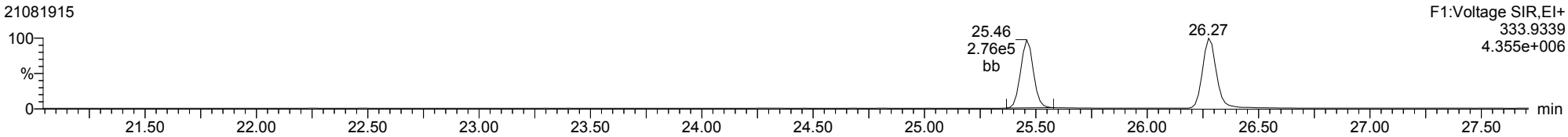

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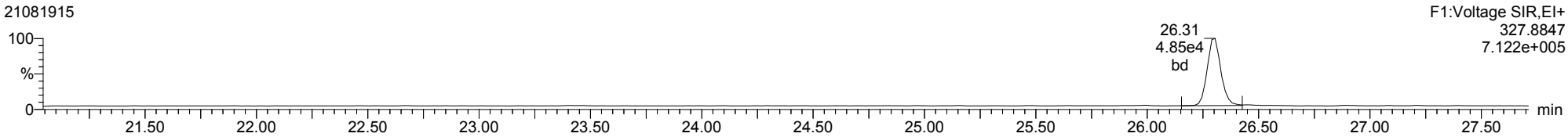

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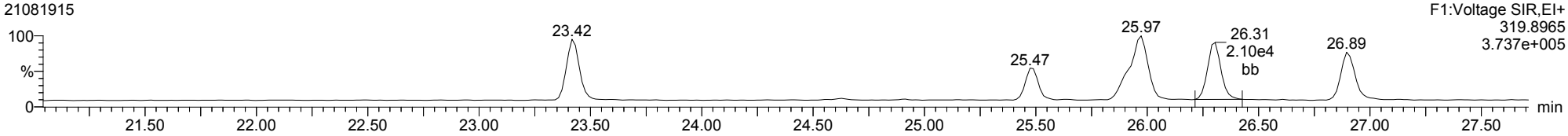

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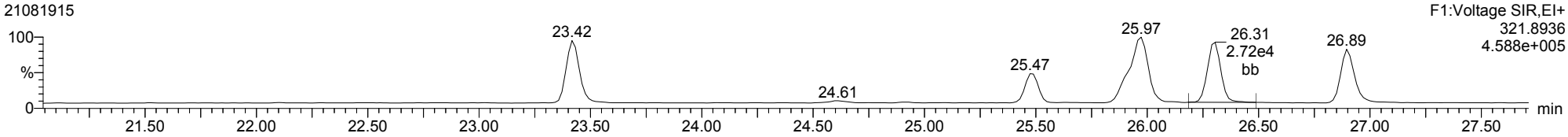

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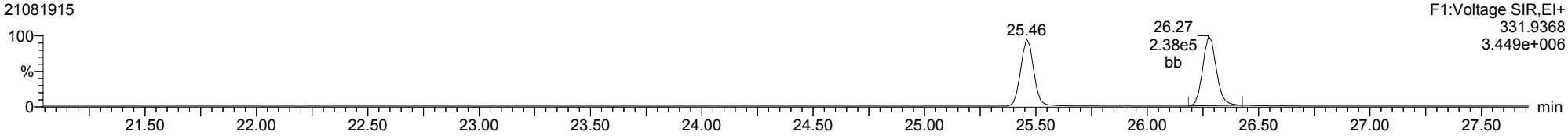

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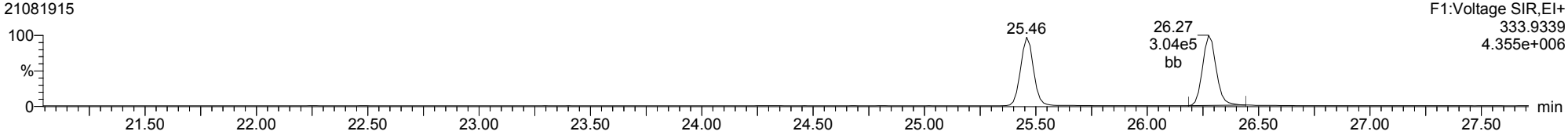

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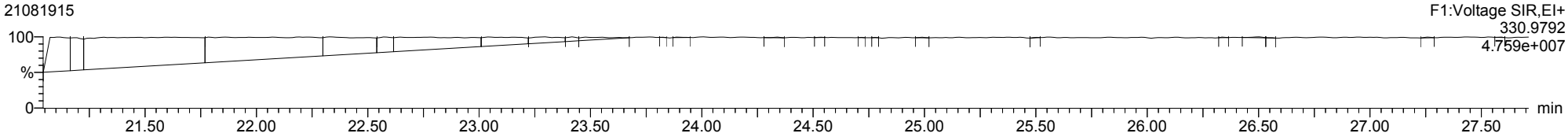

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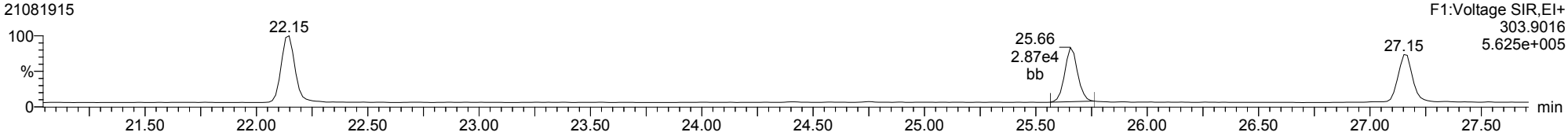
2378-TCDF



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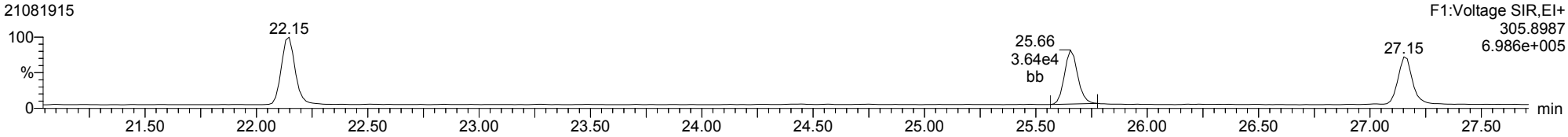

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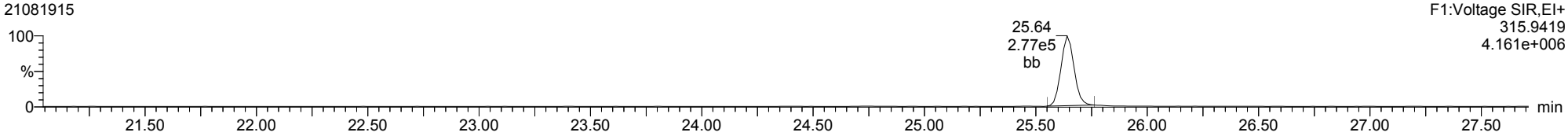

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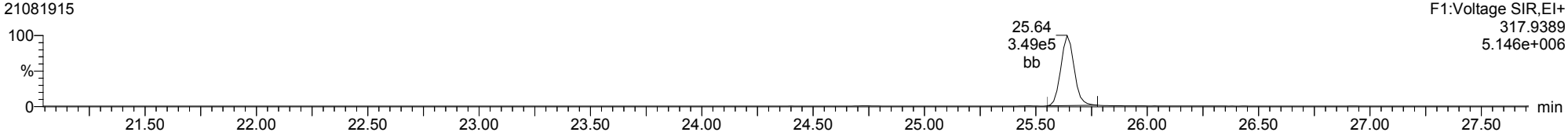
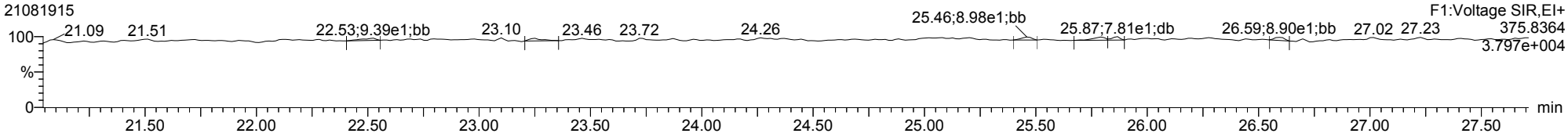


FUNCTION1 HXCDPE



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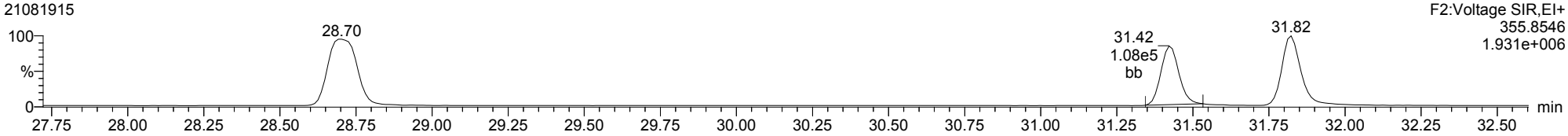

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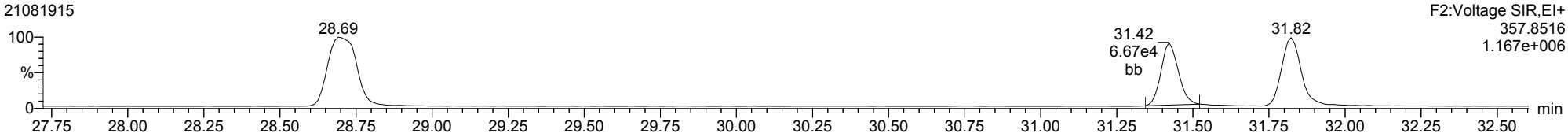

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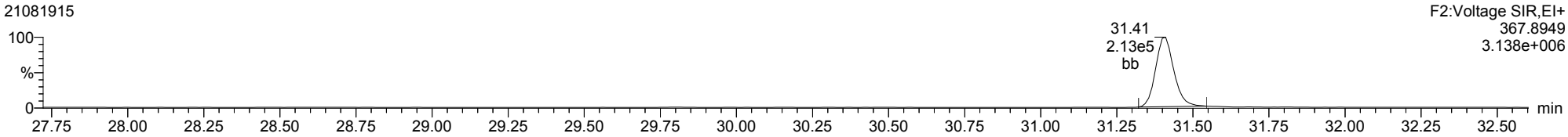

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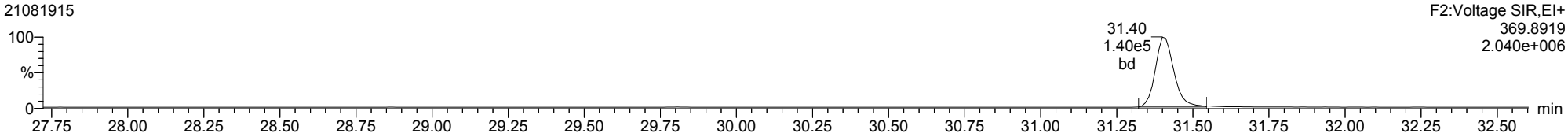

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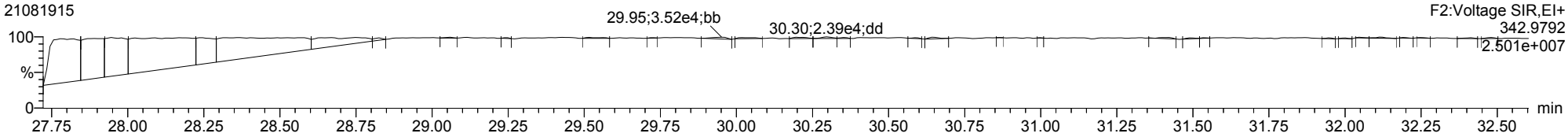

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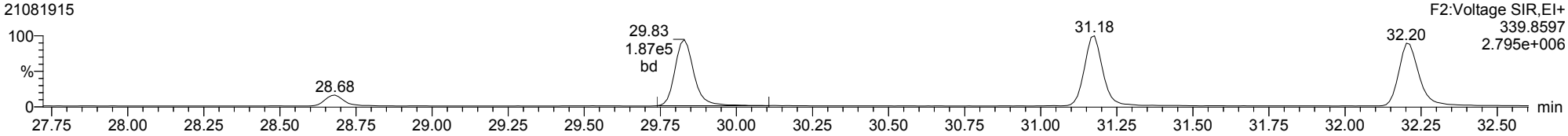

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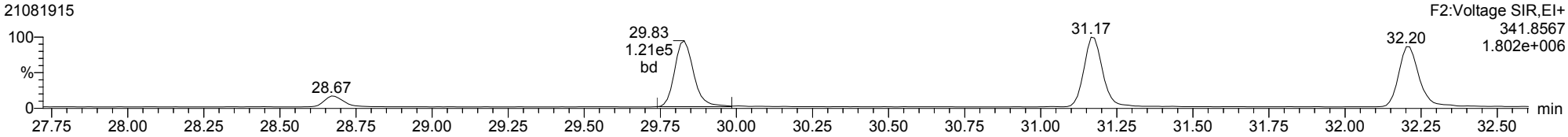

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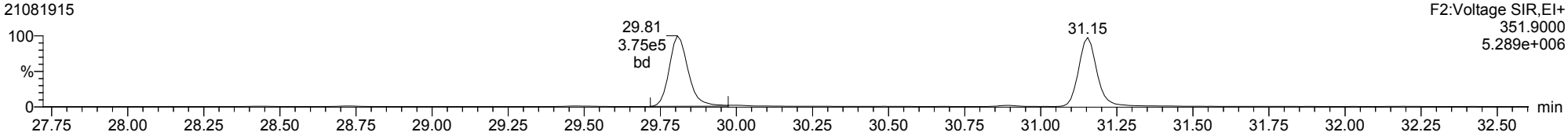

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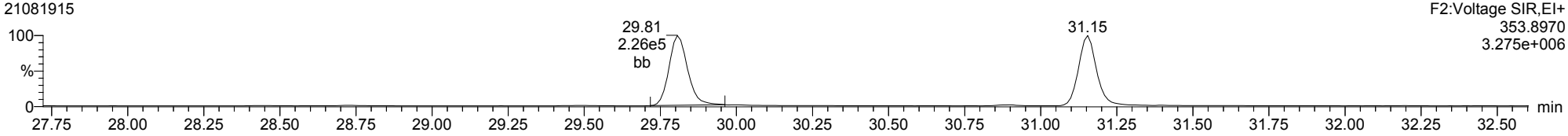
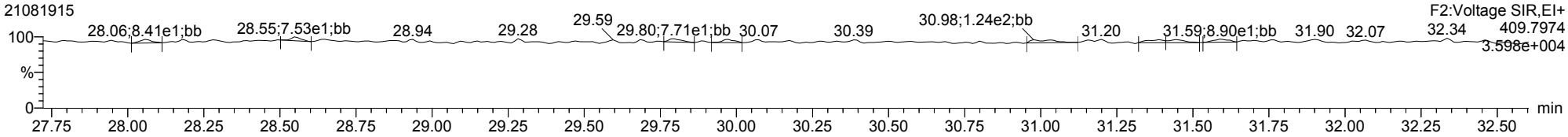


FUNCTION2 HPCDPE



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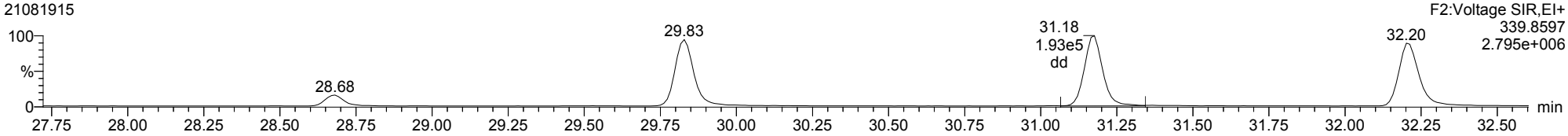
23478-PeCDF



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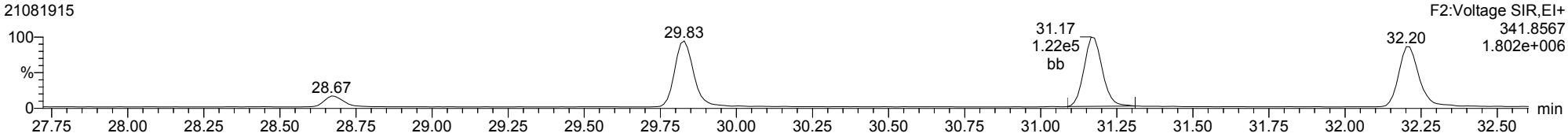

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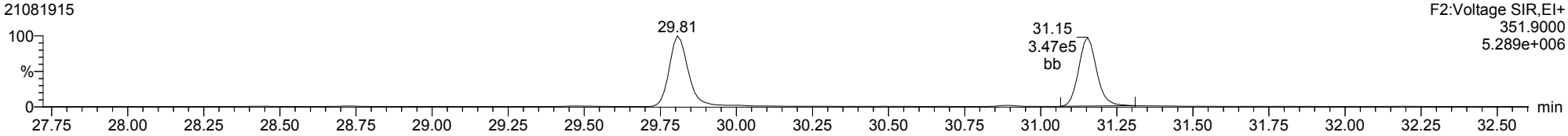

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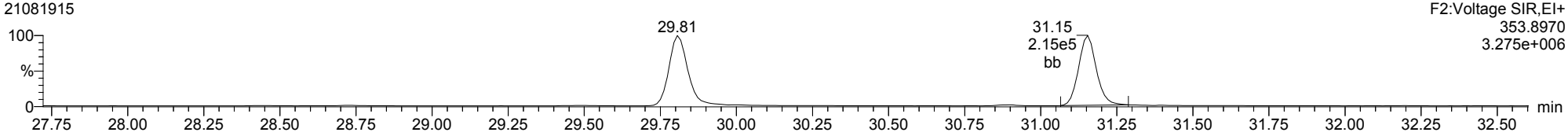
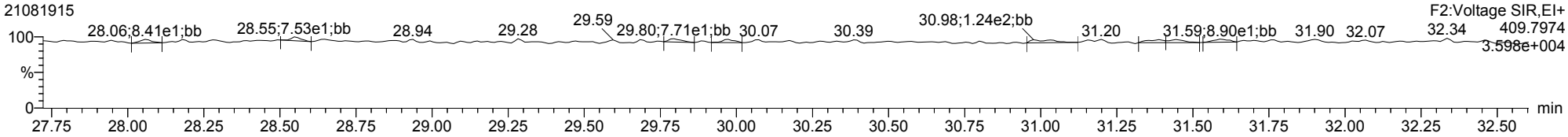


FUNCTION2 HPCDPE



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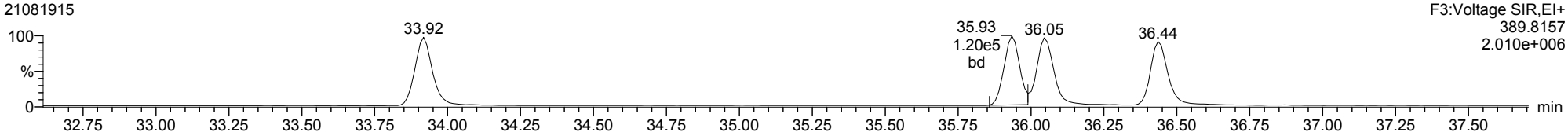
123478-HxCDD



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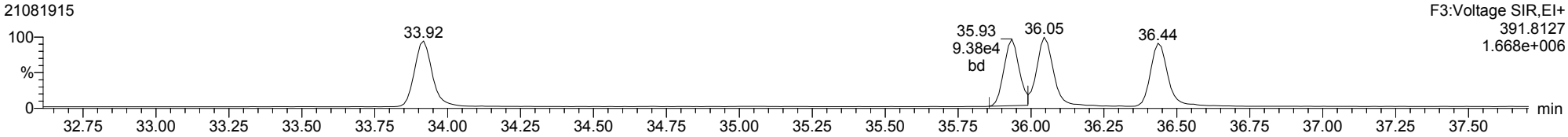

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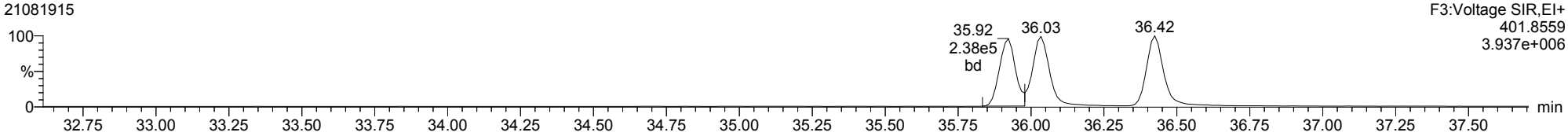

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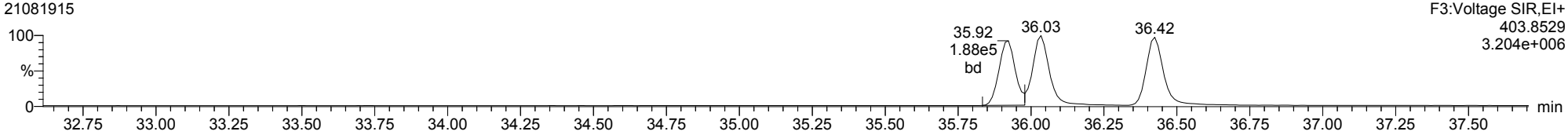

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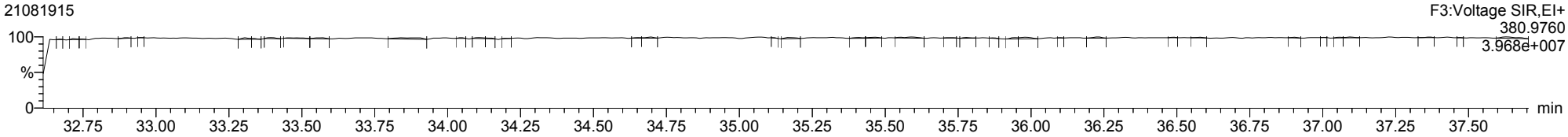

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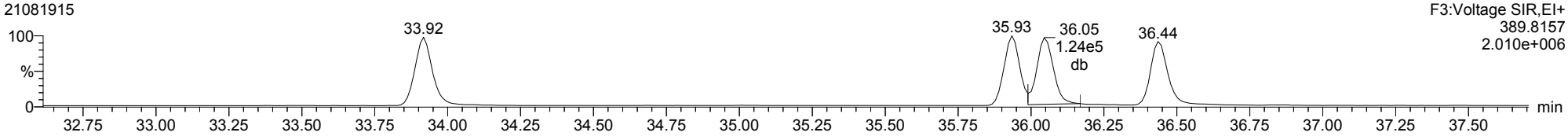

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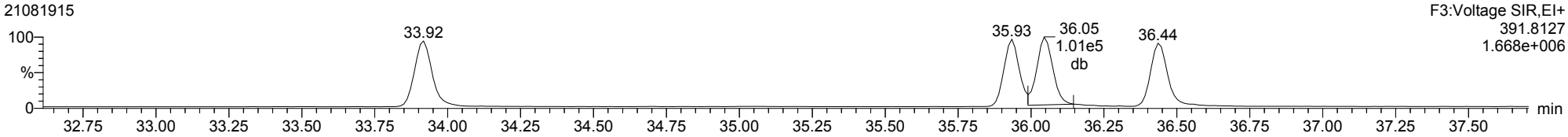

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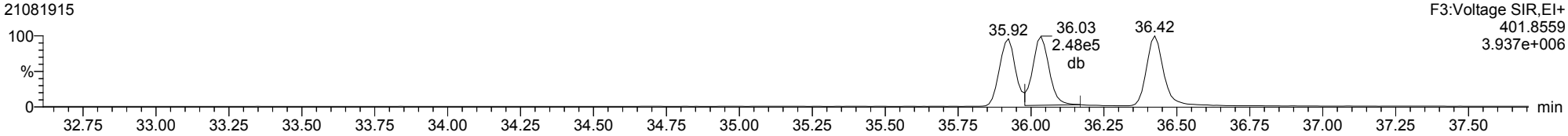

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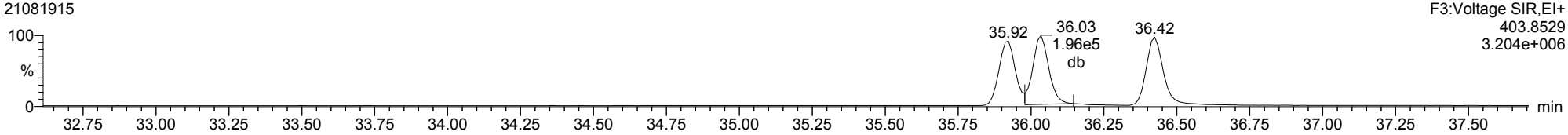

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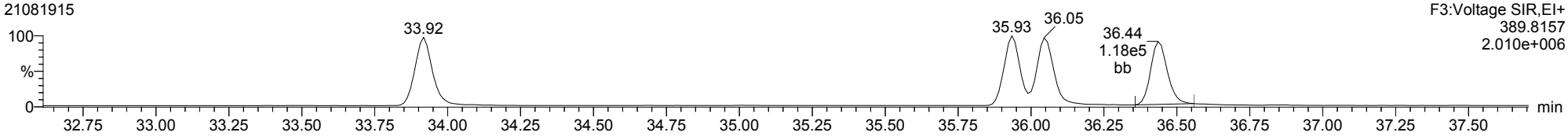

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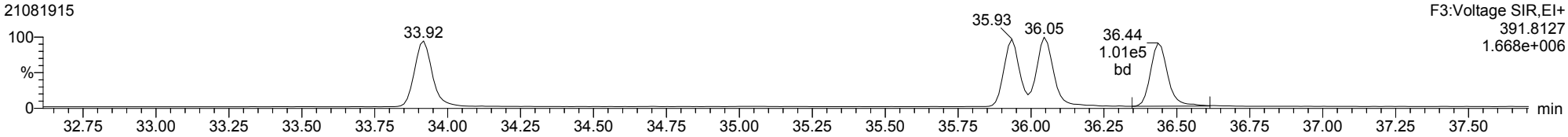

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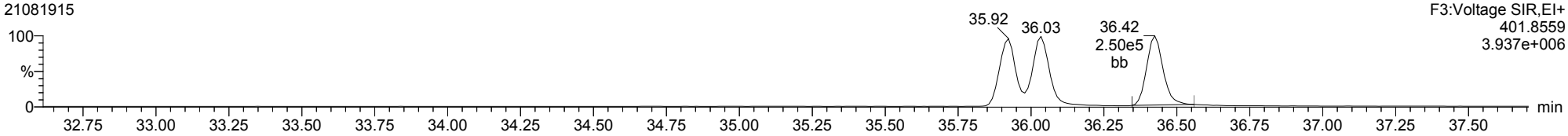

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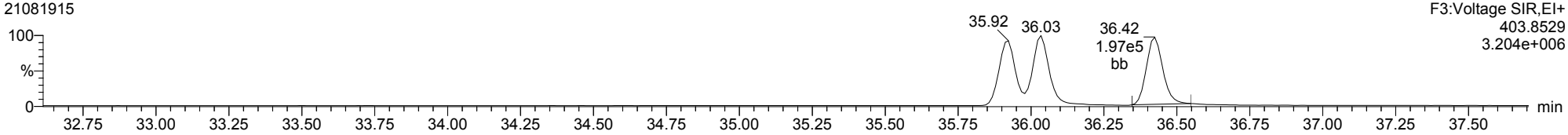

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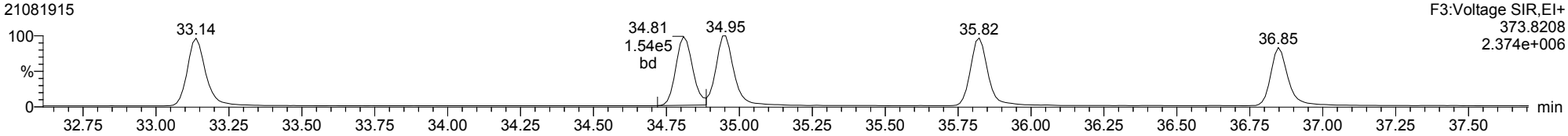

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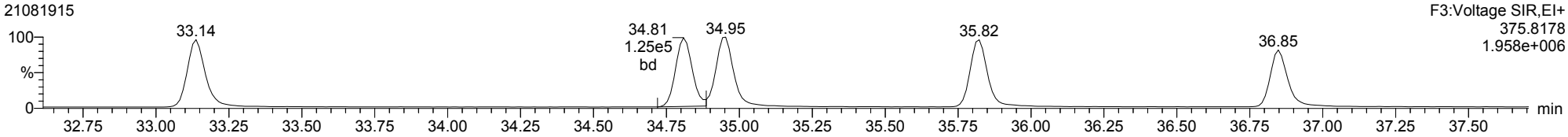

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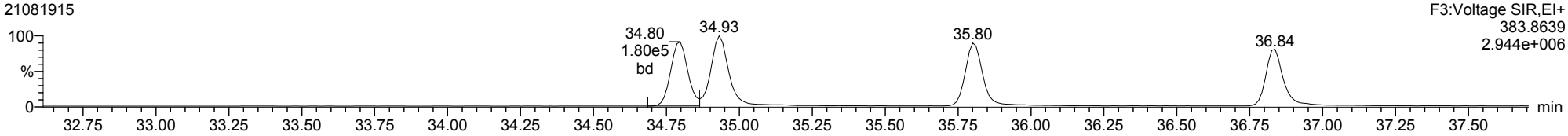

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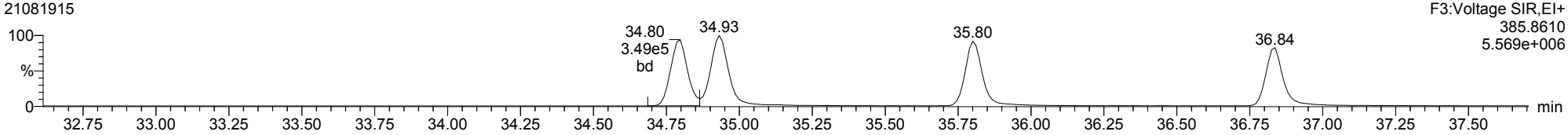

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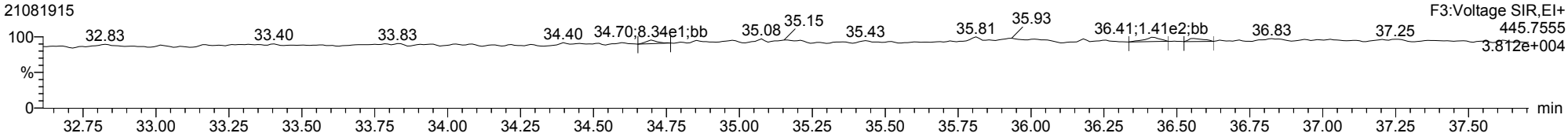

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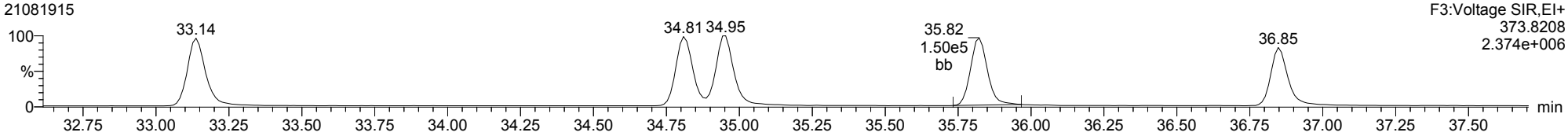

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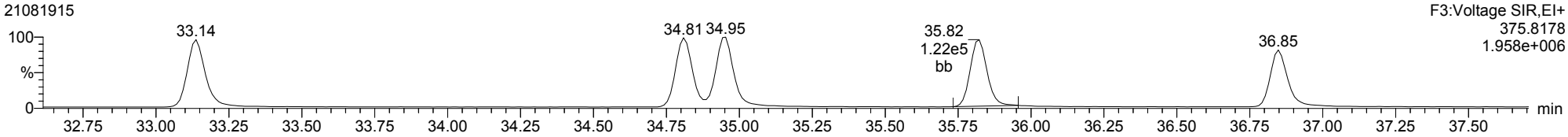

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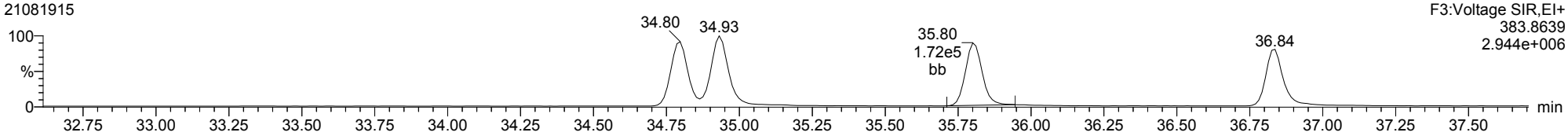

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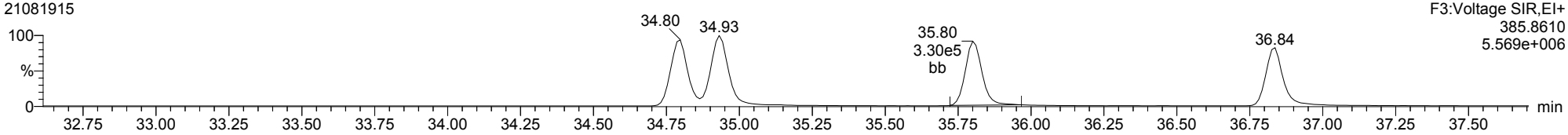

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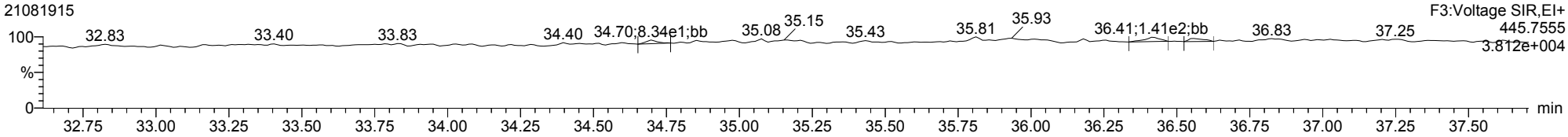

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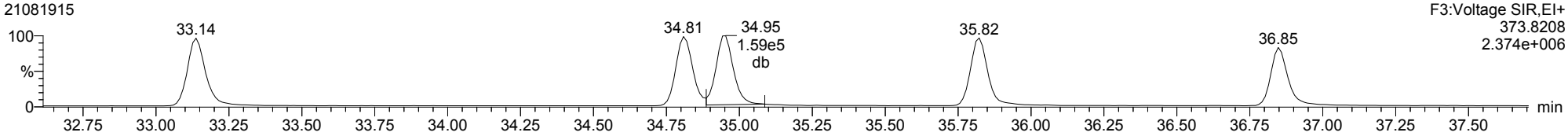

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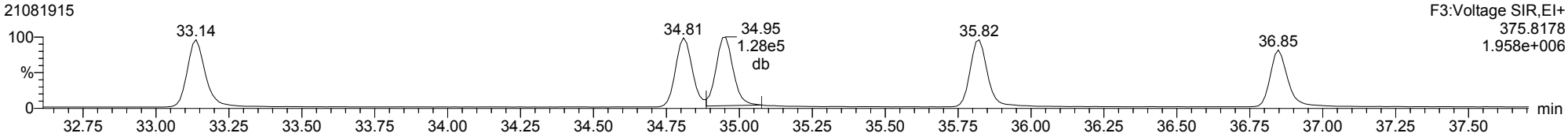

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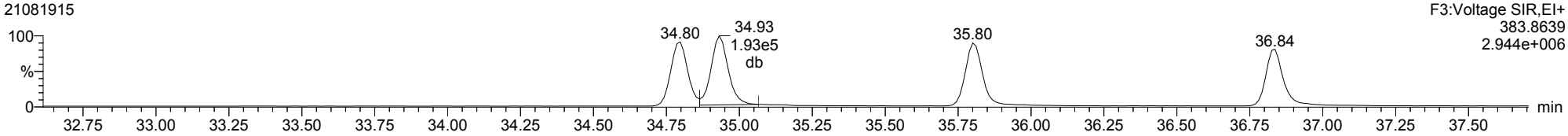

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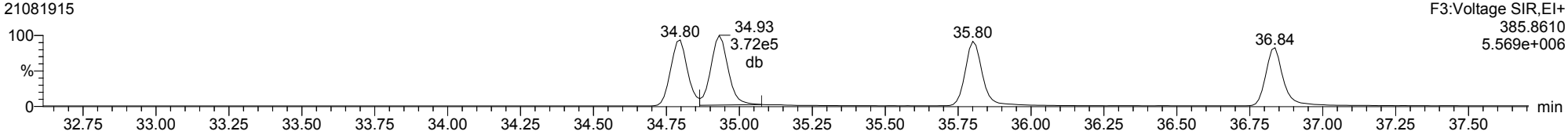

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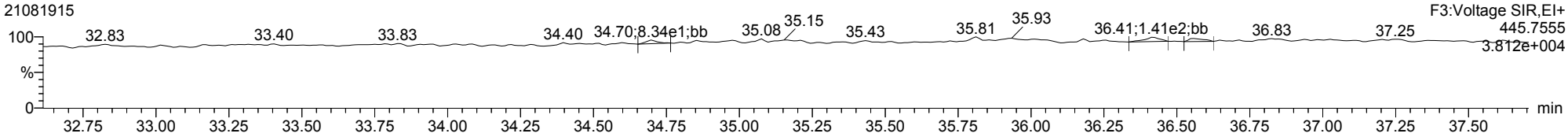

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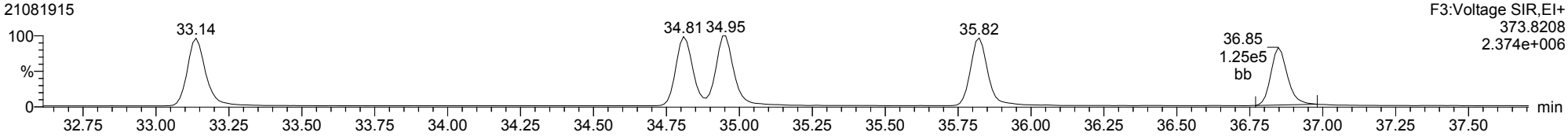

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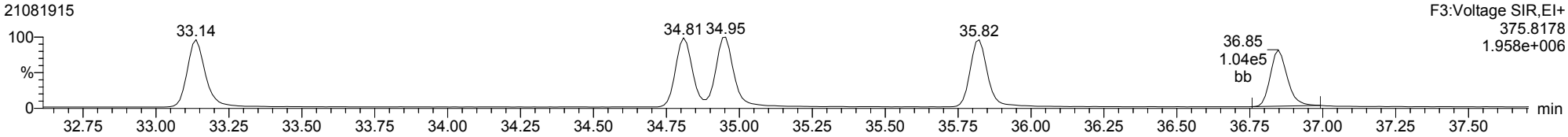

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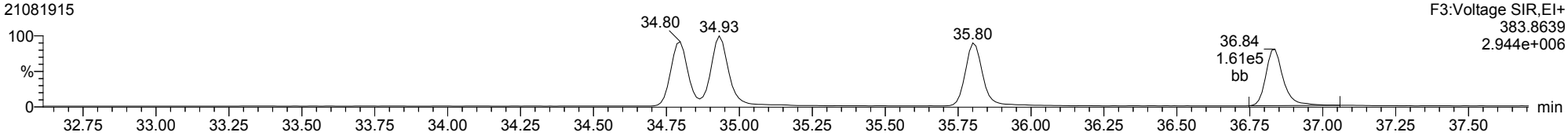

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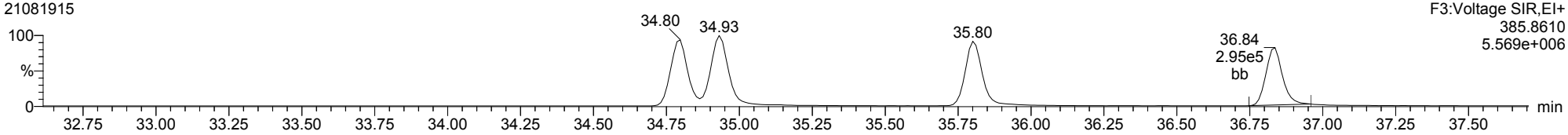

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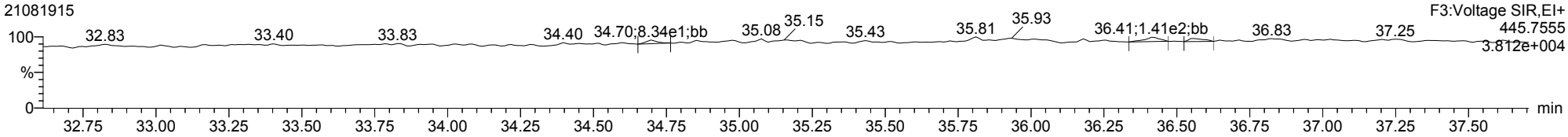

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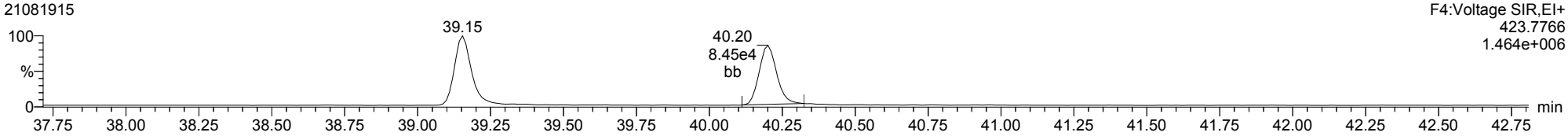

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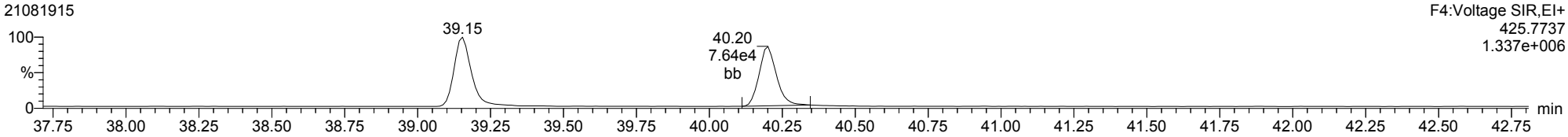

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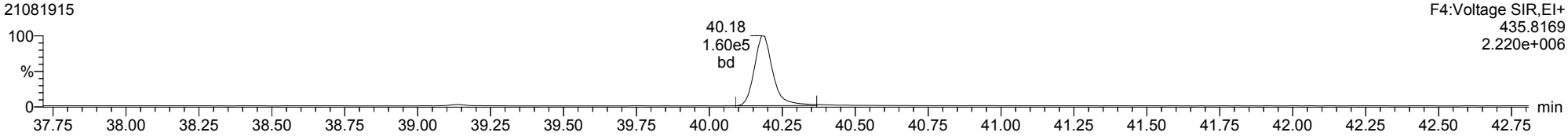

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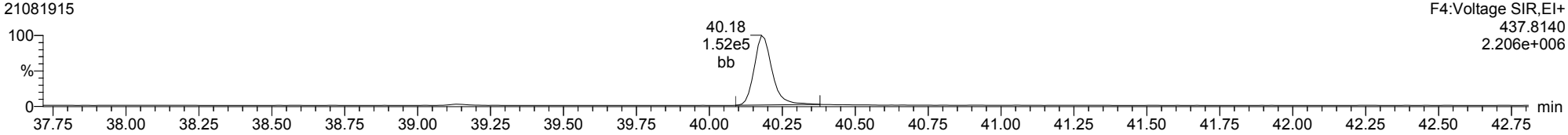

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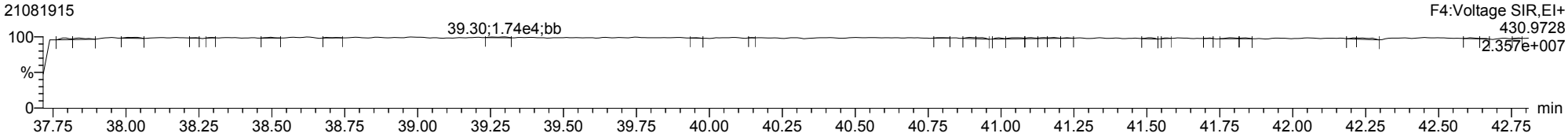

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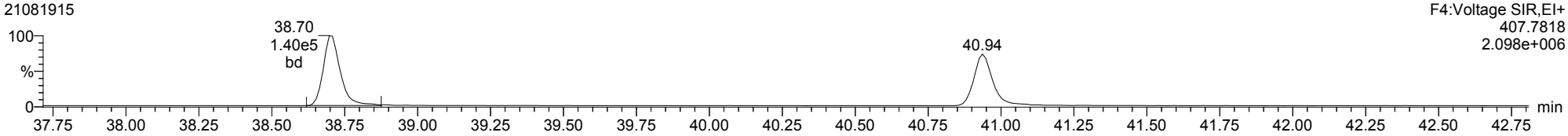

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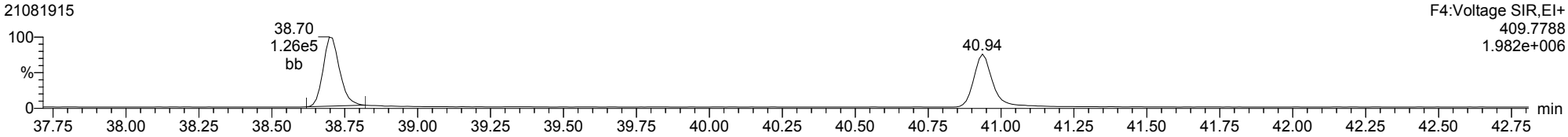

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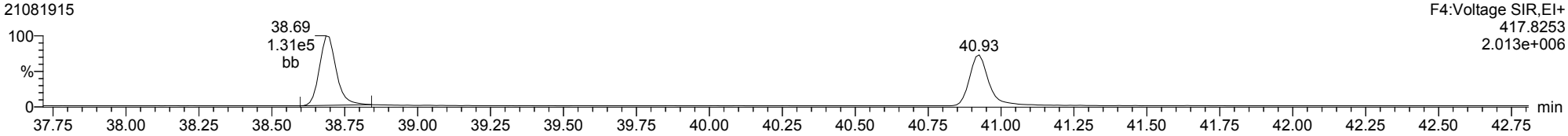

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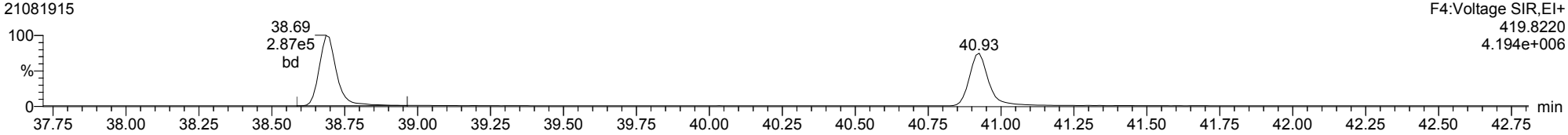

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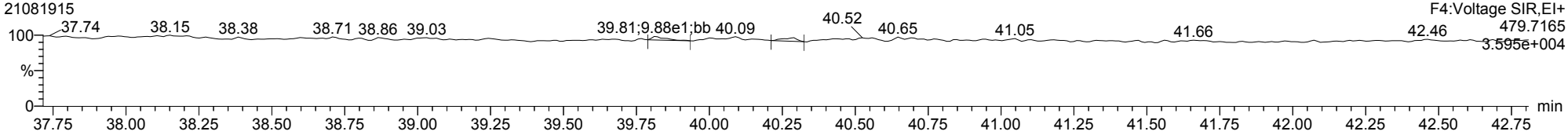

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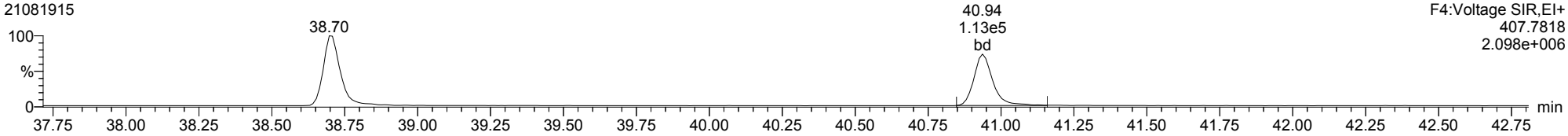

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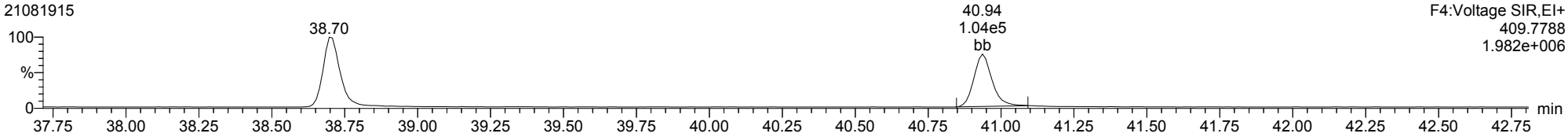

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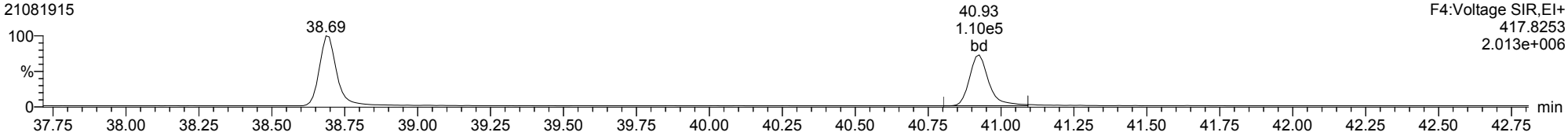

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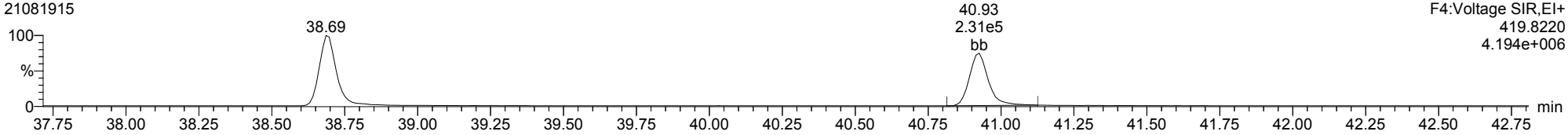

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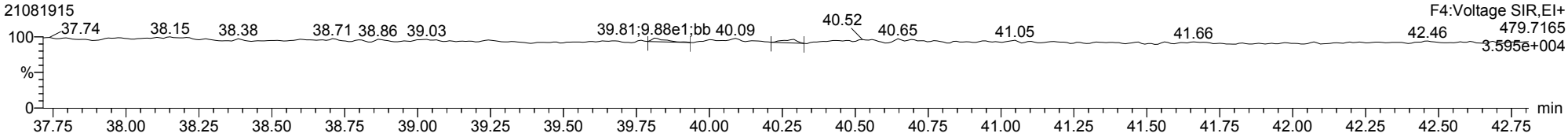

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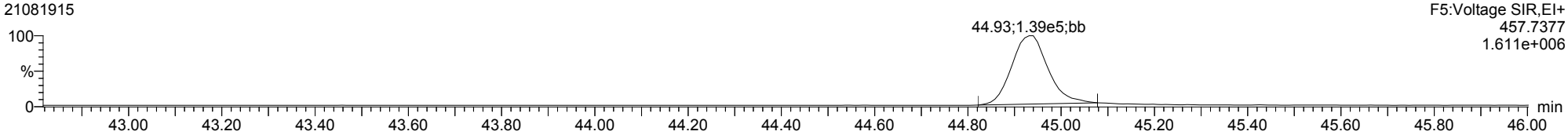

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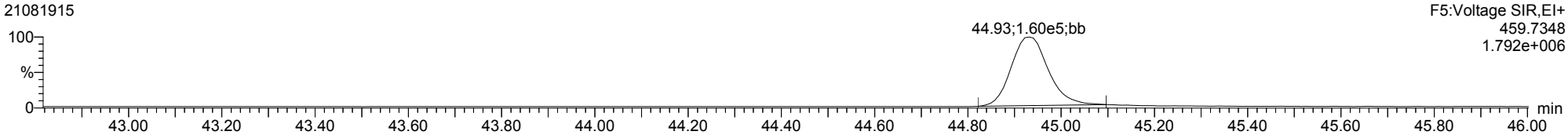

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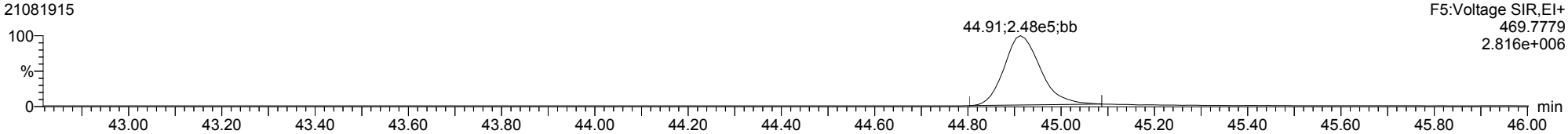

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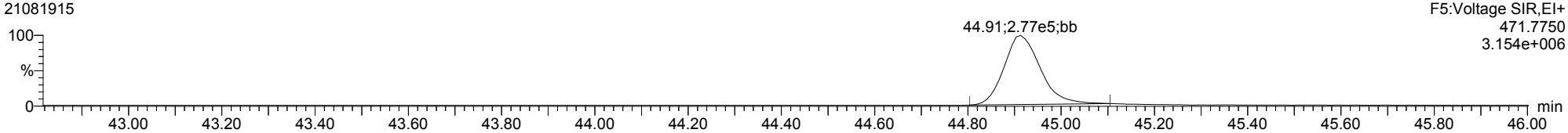

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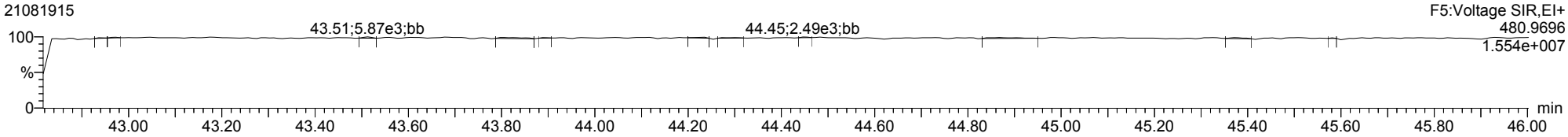

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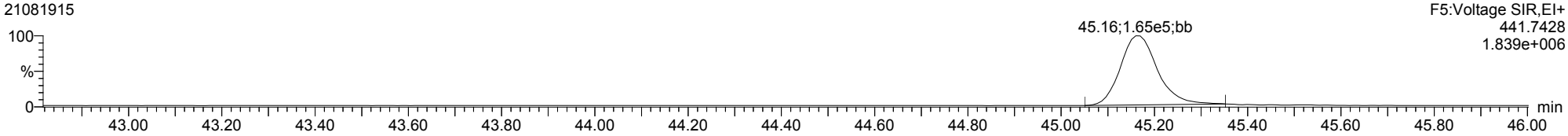

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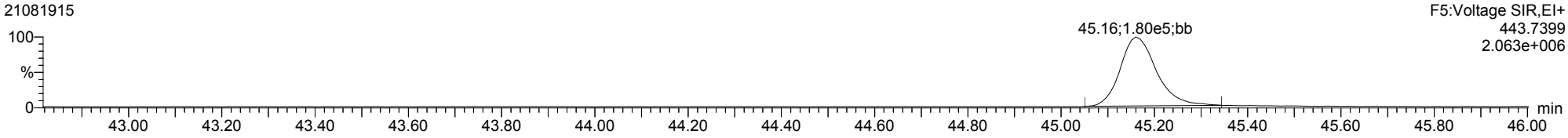

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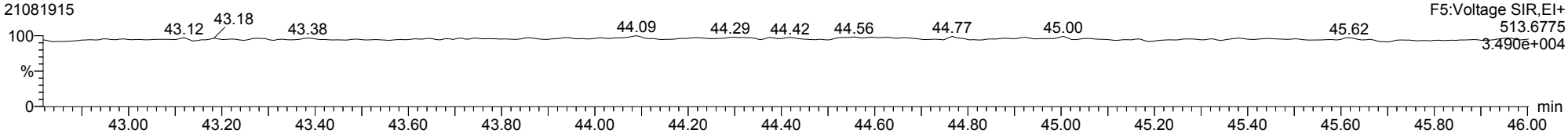

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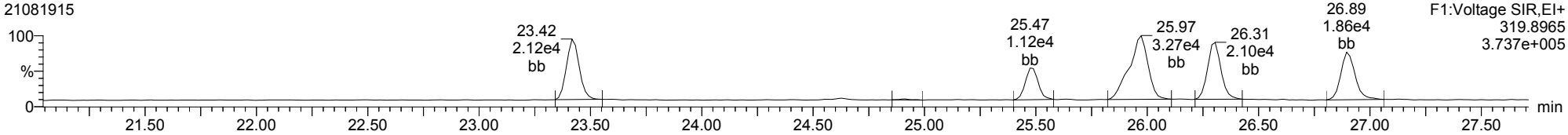
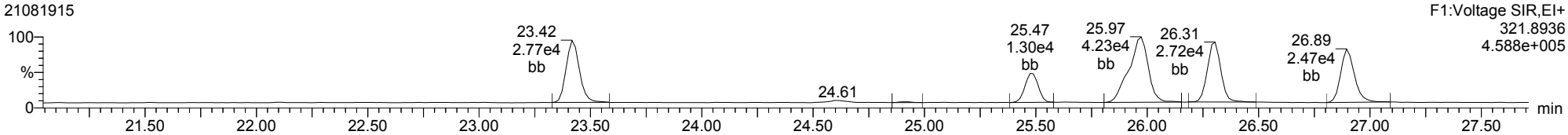
Total-tetradioxins



Total-tetradioxins



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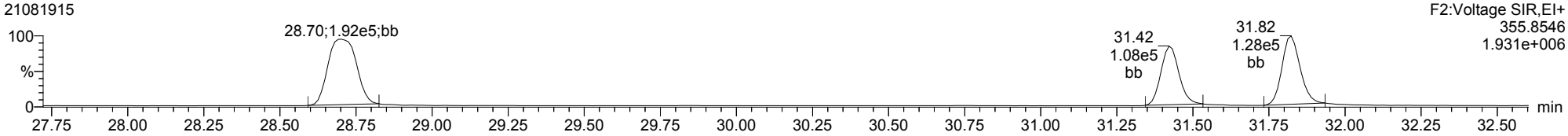
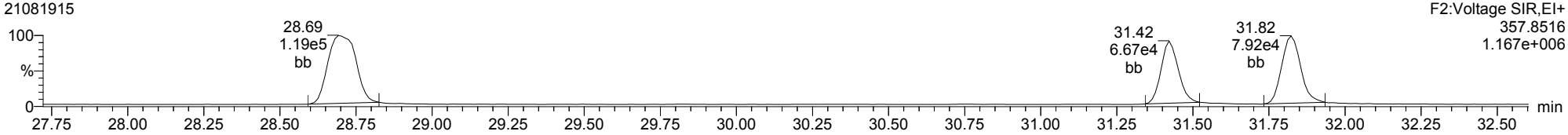


Total-pentadioxins



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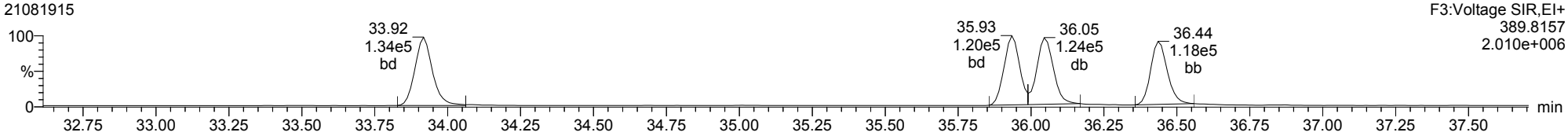
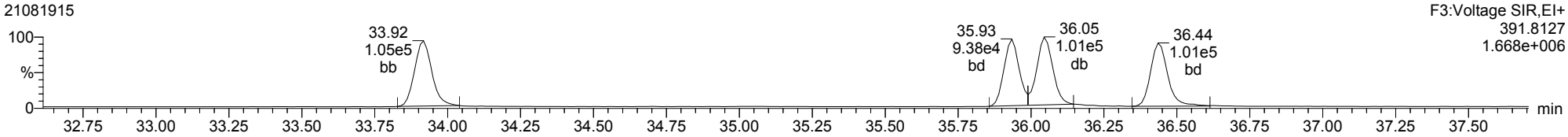
Total-hexadioxins



Total-hexadioxins



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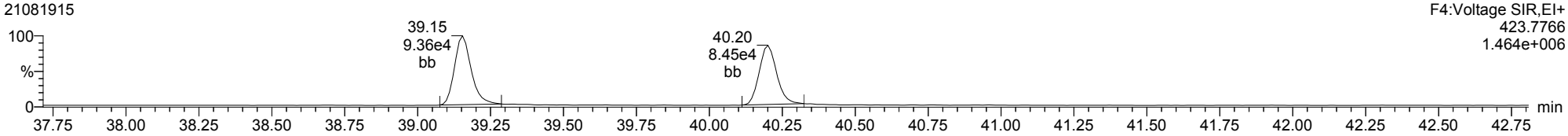
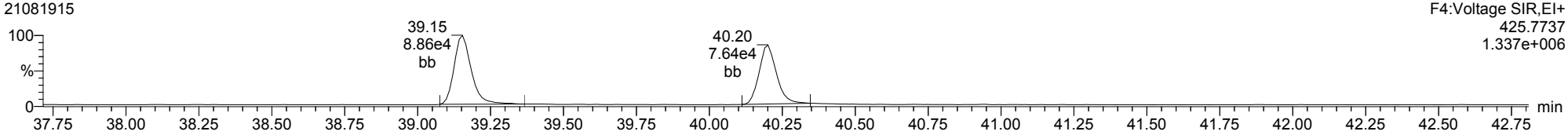


Total-heptadioxins



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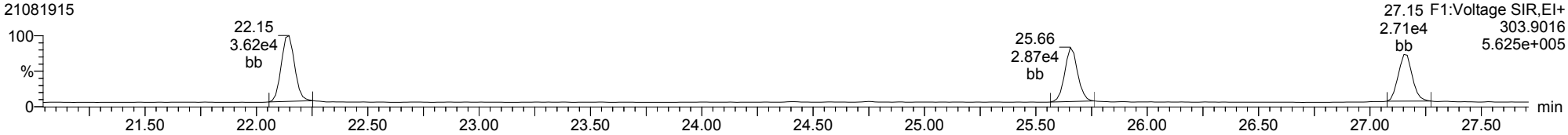
Printed: Thursday, August 19, 2021 10:31:34 Pacific Daylight Time

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

Total-tetrafurans



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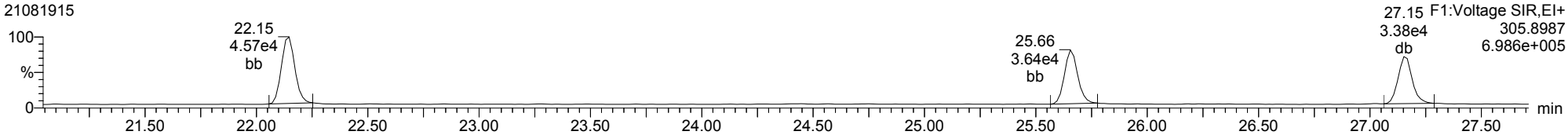

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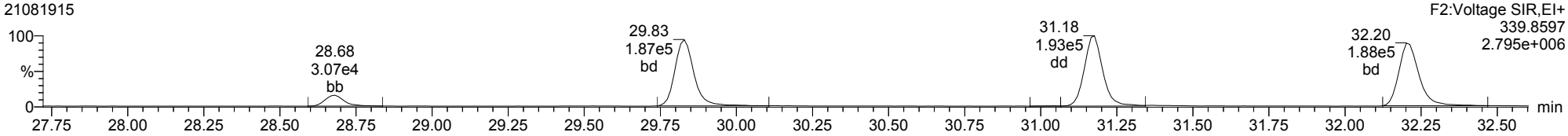

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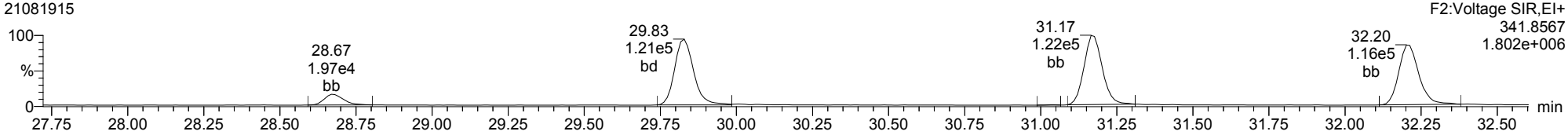

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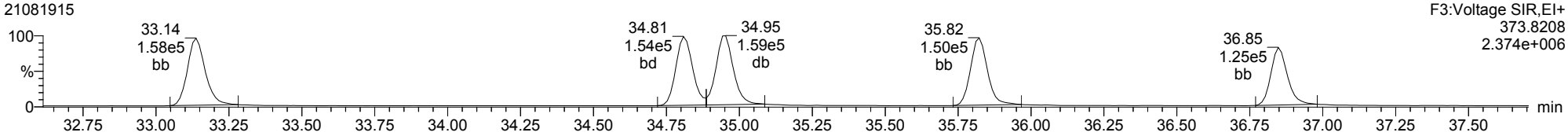
Total-hexafurans



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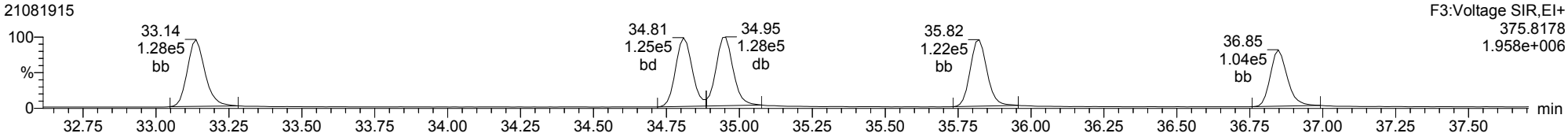

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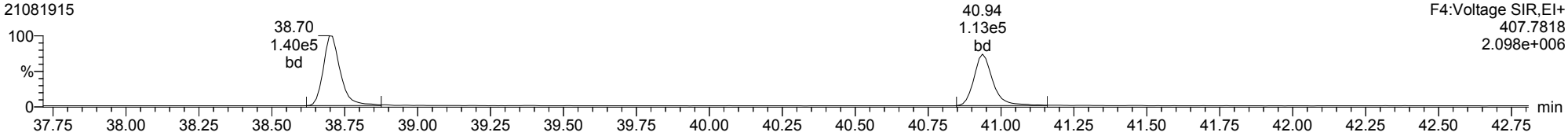

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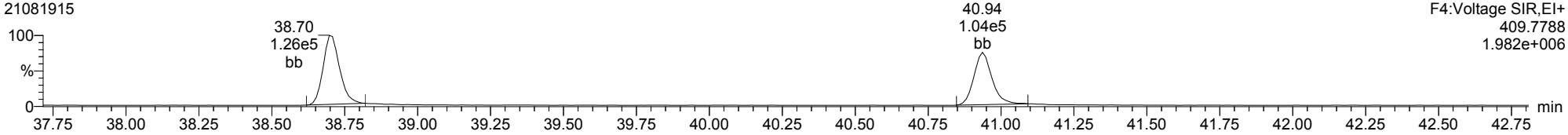

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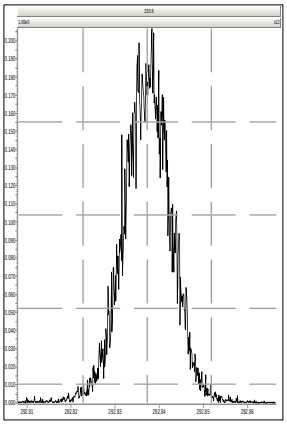
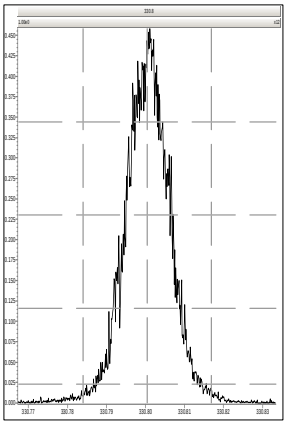


M 330.9792 R 12319



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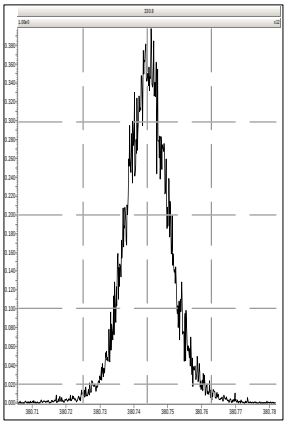

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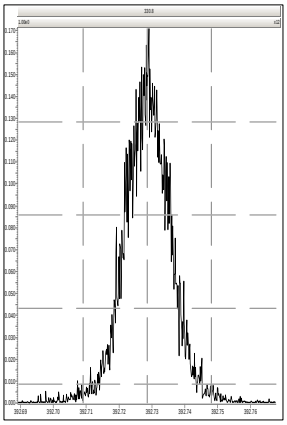
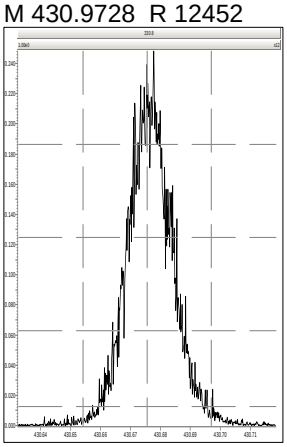


M 430.9728 R 12452



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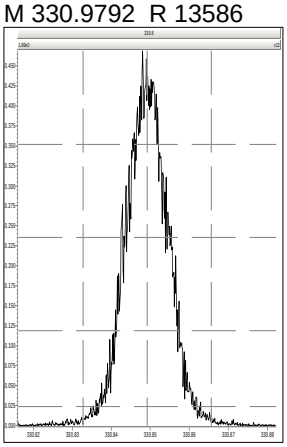

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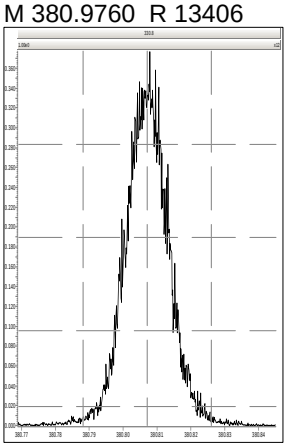
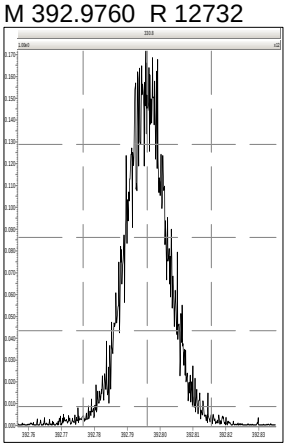
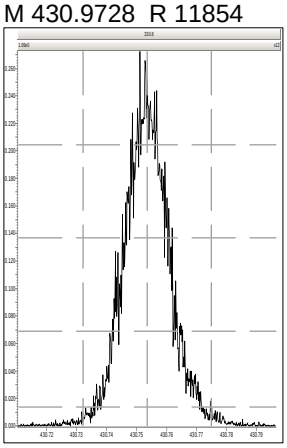


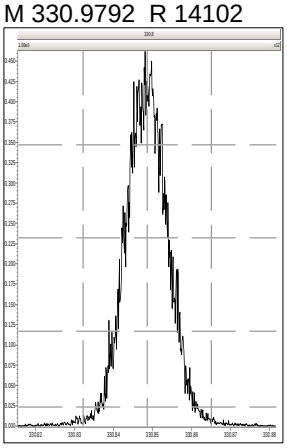
M 392.9760 R 12732



M 430.9728 R 11854



M 330.9792 R 14102



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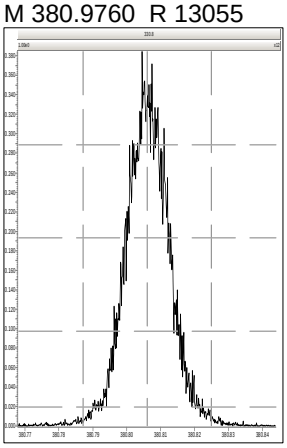

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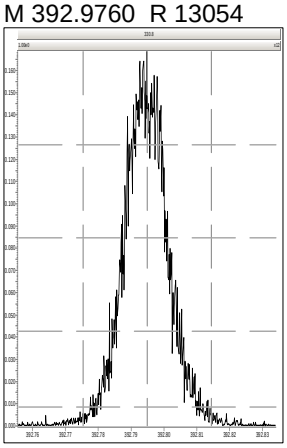
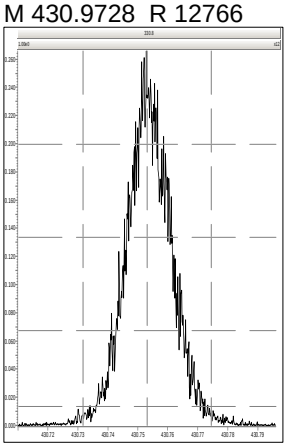


M 430.9728 R 12766



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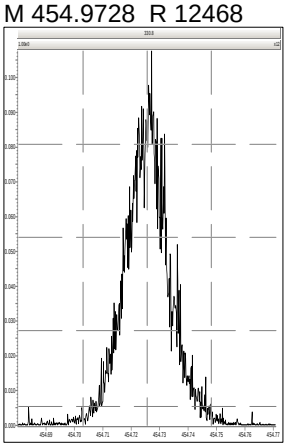
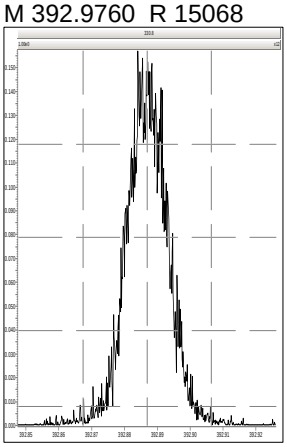
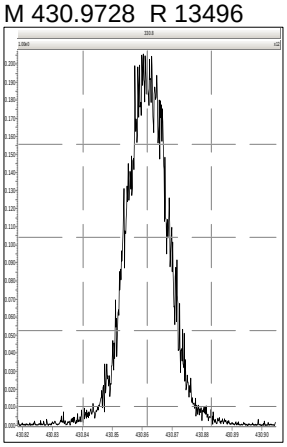


M 392.9760 R 15068



M 430.9728 R 13496



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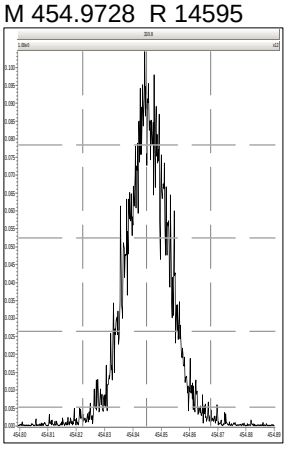
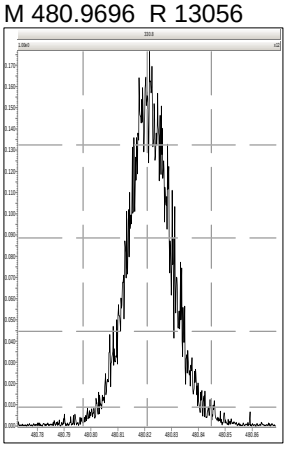
M 454.9728 R 14595



M 480.9696 R 13056



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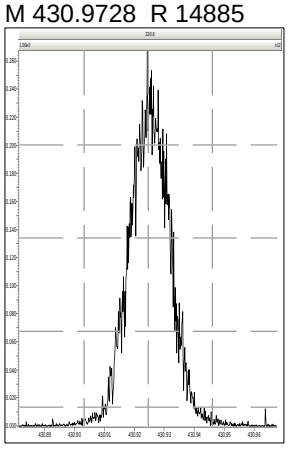
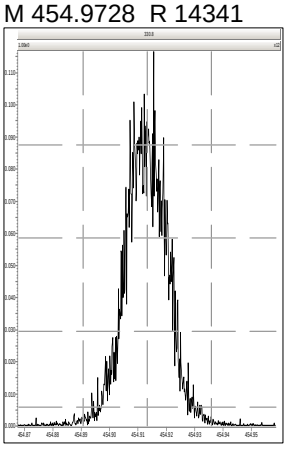
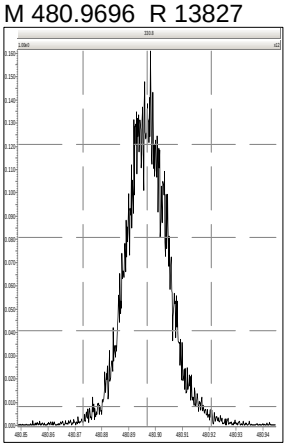


M 454.9728 R 14341



M 480.9696 R 13827



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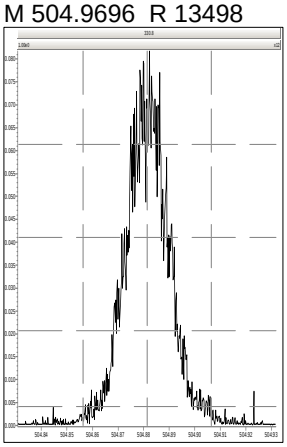
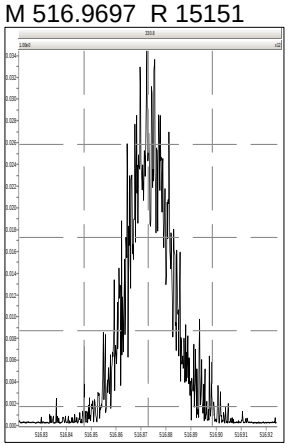
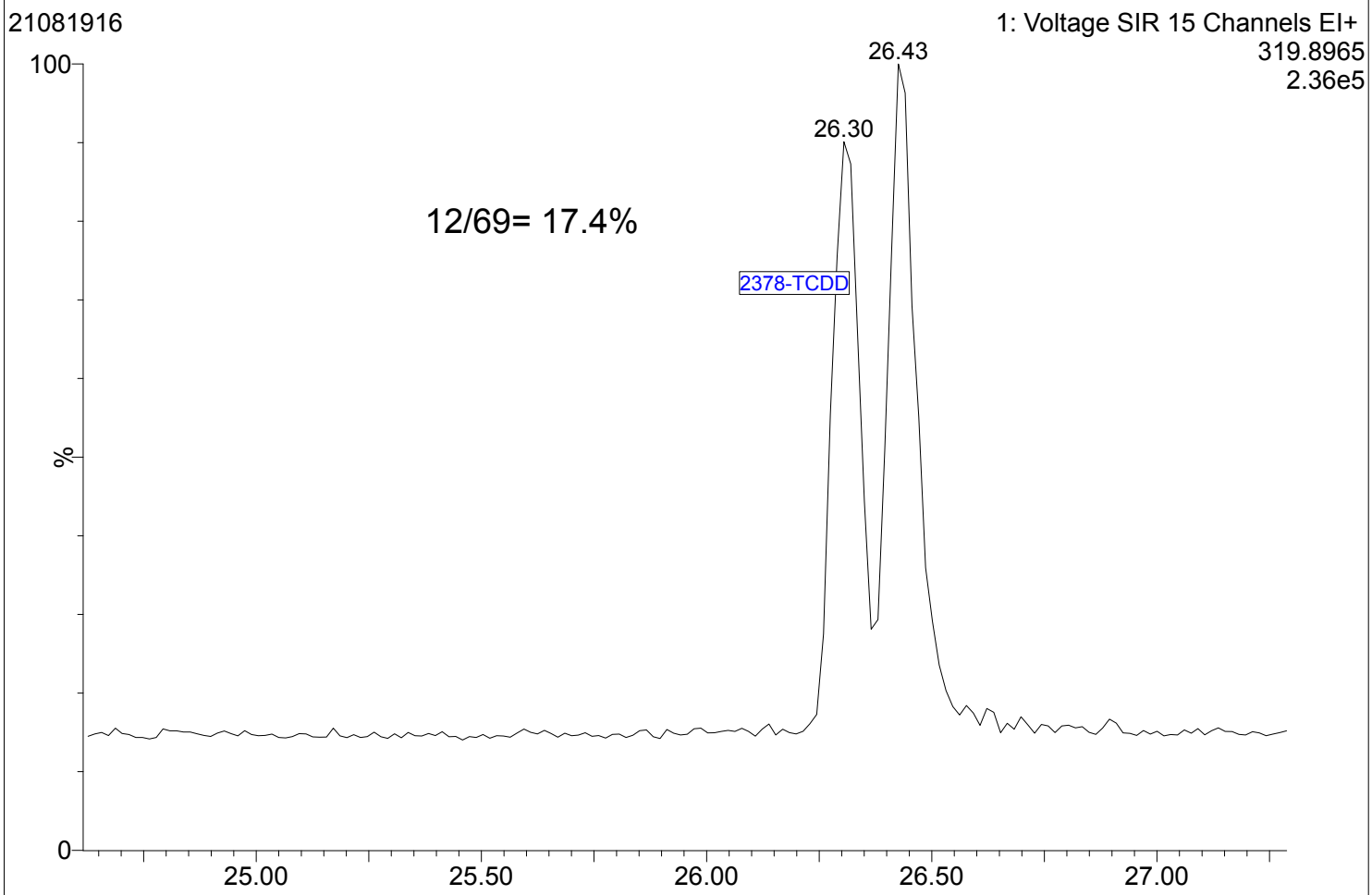
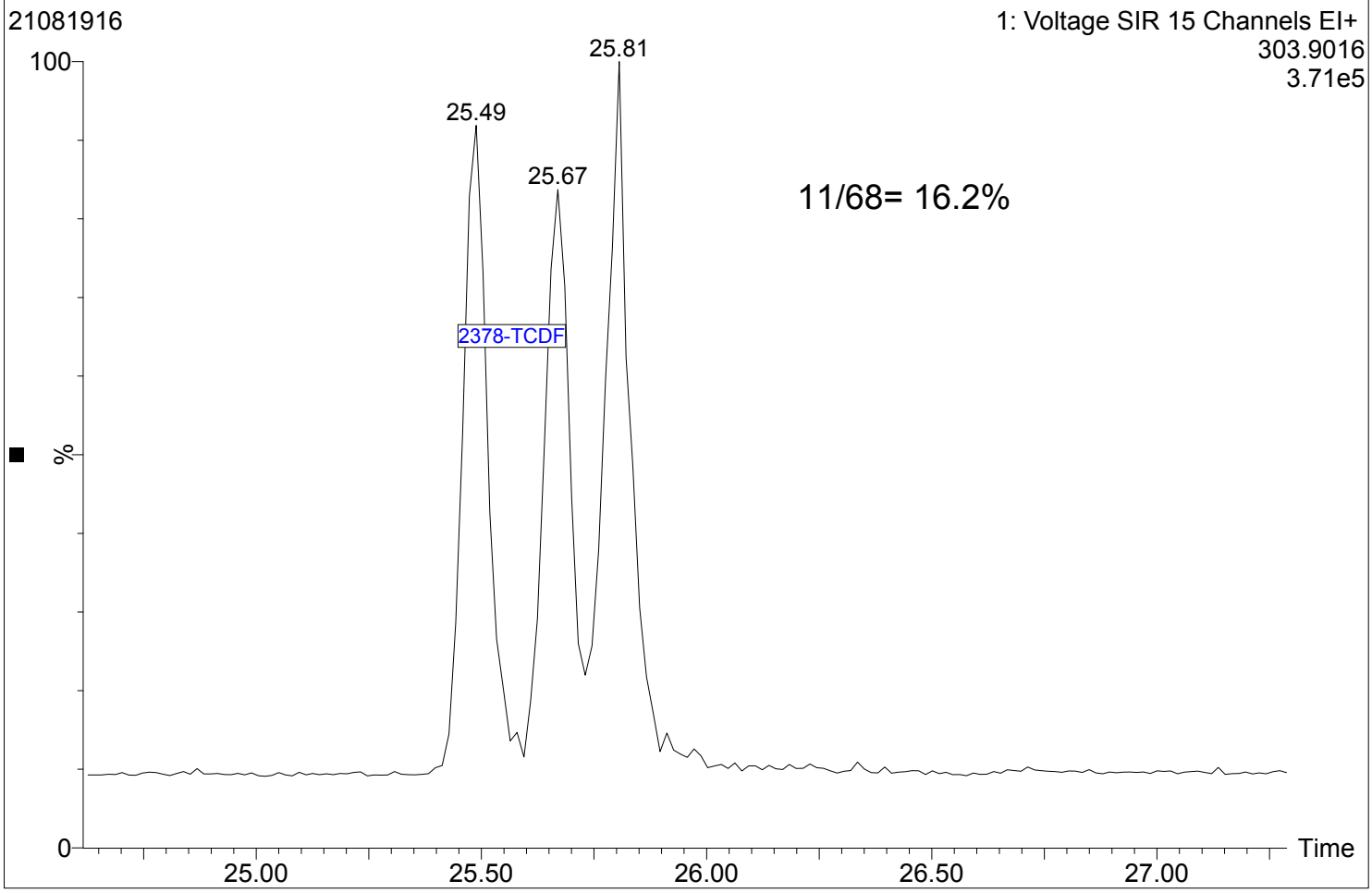


M 516.9697 R 15151




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+
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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

CONTINUING CALIBRATION CHECK
EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Instrument ID:	AUTOSPEC01	Calibration:	EH00030
Lab File ID:	21082315	Calibration Date:	08/11/2021
Sequence:	SJH0288	Injection Date:	08/23/21
Lab Sample ID:	SJH0288-CCV1	Injection Time:	23:25
Sequence Name:	CS3L2		

		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	8.98	1.1075930	0.9951077		-10.2	+/-16
2,3,7,8-TCDD	A	10.000	9.83	0.9202875	0.9048404		-1.7	+/-22
1,2,3,7,8-PeCDF	A	50.000	46.8	1.0148670	0.9492492		-6.5	+/-18
2,3,4,7,8-PeCDF	A	50.000	46.2	1.1255490	1.0389390		-7.7	+/-18
1,2,3,7,8-PeCDD	A	50.000	52.4	0.9953229	1.0428000		4.8	+/-22
1,2,3,4,7,8-HxCDF	A	50.000	49.3	1.0168930	1.0025000		-1.4	+/-10
1,2,3,6,7,8-HxCDF	A	50.000	45.6	1.0368310	0.9460966		-8.8	+/-12
2,3,4,6,7,8-HxCDF	A	50.000	48.5	1.0524660	1.0215470		-2.9	+/-12
1,2,3,7,8,9-HxCDF	A	50.000	51.4	1.0301540	1.0582070		2.7	+/-10
1,2,3,4,7,8-HxCDD	A	50.000	45.9	1.0273630	0.9423421		-8.3	+/-22
1,2,3,6,7,8-HxCDD	A	50.000	50.7	1.0089800	1.0221010		1.3	+/-22
1,2,3,7,8,9-HxCDD	A	50.000	50.3	0.9504865	0.9560113		0.6	+/-18
1,2,3,4,6,7,8-HpCDF	A	50.000	47.8	1.3273500	1.2688730		-4.4	+/-10
1,2,3,4,7,8,9-HpCDF	A	50.000	48.0	1.2833380	1.2322480		-4.0	+/-14
1,2,3,4,6,7,8-HpCDD	A	50.000	51.1	1.0680880	1.0916430		2.2	+/-14
OCDF	A	100.00	88.1	1.4469010	1.2742820		-11.9	+/-37
OCDD	A	100.00	97.0	1.1808230	1.1455960		-3.0	+/-21
13C12-2,3,7,8-TCDF	A	100.00	96.2	1.4265830	1.3719532		-3.8	+/-29
13C12-2,3,7,8-TCDD	A	100.00	93.7	1.1164910	1.0459357		-6.3	+/-18
13C12-1,2,3,7,8-PeCDF	A	100.00	113	1.2973130	1.4623712		12.7	+/-24
13C12-2,3,4,7,8-PeCDF	A	100.00	106	1.2364800	1.3150984		6.4	+/-23
13C12-1,2,3,7,8-PeCDD	A	100.00	107	0.7319833	0.7806410		6.6	+/-38
13C12-1,2,3,4,7,8-HxCDF	A	100.00	82.0	1.2424560	1.0188335		-18.0	+/-24
13C12-1,2,3,6,7,8-HxCDF	A	100.00	95.7	1.3434760	1.2860428		-4.3	+/-30
13C12-2,3,4,6,7,8-HxCDF	A	100.00	86.0	1.2148550	1.0447395		-14.0	+/-27
13C12-1,2,3,7,8,9-HxCDF	A	100.00	87.5	1.0076370	0.8815673		-12.5	+/-26
13C12-1,2,3,4,7,8-HxCDD	A	100.00	98.2	0.9598233	0.9429694		-1.8	+/-15
13C12-1,2,3,6,7,8-HxCDD	A	100.00	99.6	1.0413850	1.0371024		-0.4	+/-15
13C12-1,2,3,4,6,7,8-HpCDF	A	100.00	99.0	0.9264704	0.9169412		-1.0	+/-22
13C12-1,2,3,4,7,8,9-HpCDF	A	100.00	101	0.7579160	0.7692329		1.5	+/-23
13C12-1,2,3,4,6,7,8-HpCDD	A	100.00	106	0.6324476	0.6688428		5.8	+/-28
13C12-OCDD	A	200.00	250	0.5037432	0.6298956		25.0	+/-52
37Cl4-2,3,7,8-TCDD	A	10.000	9.04	1.0835930	0.9791830		-9.6	

* Values outside of QC limits

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:27:06 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: CS3L2, Name: 21082315, Date: 23-Aug-2021, Time: 23:25:09, 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	3.751e4	4.886e4	1.108	0.768	0.770	2548	2122	4.40e5	5.63e5	172.7	265.5	NO	bd	bb	8.984
12378-PeCDF	29.839	1.001	2.667e5	1.724e5	1.015	1.548	1.550	2827	3699	2.88e6	1.87e6	1020.3	506.9	NO	bb	bd	46.767
23478-PeCDF	31.176	1.000	2.613e5	1.709e5	1.126	1.530	1.550	2827	3699	3.16e6	2.12e6	1117.7	573.6	NO	bb	bb	46.153
123478-HxCDF	34.819	1.001	2.084e5	1.671e5	1.017	1.247	1.240	2764	2314	2.81e6	2.32e6	1017.3	1003.6	NO	bd	bd	49.292
234678-HxCDF	35.833	1.001	2.145e5	1.778e5	1.052	1.206	1.240	2764	2314	2.86e6	2.31e6	1035.1	998.7	NO	bb	bb	48.531
123678-HxCDF	34.953	1.000	2.436e5	2.038e5	1.037	1.195	1.240	2764	2314	3.03e6	2.48e6	1097.8	1070.0	NO	db	db	45.624
123789-HxCDF	36.858	1.000	1.853e5	1.577e5	1.030	1.174	1.240	2764	2314	2.38e6	1.91e6	860.4	823.5	NO	bd	bd	51.362
1234678-HpCDF	38.718	1.001	2.237e5	2.040e5	1.327	1.096	1.050	2530	2843	2.85e6	2.73e6	1126.6	960.6	NO	bd	bb	47.797
1234789-HpCDF	40.947	1.000	1.711e5	1.774e5	1.283	0.964	1.050	2530	2843	2.01e6	1.98e6	794.2	696.1	NO	bb	bb	48.009
OCDF	45.187	1.006	2.785e5	3.117e5	1.447	0.894	0.890	1979	1949	2.84e6	3.21e6	1437.0	1647.8	NO	bb	bb	88.070
2378-TCDD	26.305	1.001	2.624e4	3.364e4	0.920	0.780	0.770	2275	1689	3.29e5	4.33e5	144.8	256.6	NO	MM	MM	9.832
12378-PeCDD	31.432	1.001	1.572e5	1.003e5	0.995	1.567	1.550	3785	1716	2.04e6	1.30e6	539.2	756.1	NO	bb	bb	52.385
123478-HxCDD	35.944	1.001	1.824e5	1.443e5	1.027	1.264	1.240	3329	2187	2.66e6	2.11e6	799.0	965.0	NO	bd	bd	45.862
123678-HxCDD	36.056	1.000	2.202e5	1.695e5	1.009	1.300	1.240	3329	2187	2.80e6	2.30e6	842.2	1050.2	NO	db	db	50.650
123789-HxCDD	36.446	1.011	1.877e5	1.602e5	0.950	1.171	1.240	3329	2187	2.59e6	2.10e6	777.6	962.2	NO	bb	bb	50.291
1234678-HpCDD	40.211	1.001	1.372e5	1.313e5	1.068	1.045	1.050	1541	1690	1.77e6	1.61e6	1147.6	955.6	NO	bb	bb	51.103
OCDD	44.949	1.000	2.463e5	2.843e5	1.181	0.866	0.890	2290	1905	2.56e6	2.90e6	1116.5	1524.4	NO	bb	bd	97.017
13C-2378-TCDF	25.640	1.007	3.924e5	4.756e5	1.427	0.825	0.770	3117	2238	4.40e6	5.46e6	1412.6	2439.8	NO	bb	bb	96.171
13C-12378-PeCDF	29.817	1.171	5.704e5	3.547e5	1.297	1.608	1.550	3562	2874	6.23e6	3.90e6	1749.0	1357.6	NO	bb	bb	112.723
13C-23478-PeCDF	31.165	1.224	5.065e5	3.255e5	1.236	1.556	1.550	3562	2874	6.21e6	3.87e6	1743.0	1345.3	NO	bb	bb	106.358
13C-123478-HxCDF	34.797	0.955	2.522e5	4.970e5	1.242	0.507	0.510	3006	2769	3.44e6	6.76e6	1144.9	2441.6	NO	bd	bd	82.002
13C-123678-HxCDF	34.942	0.959	3.106e5	6.350e5	1.343	0.489	0.510	3006	2769	3.87e6	7.44e6	1288.5	2685.8	NO	db	db	95.725
13C-234678-HxCDF	35.811	0.983	2.603e5	5.079e5	1.215	0.513	0.510	3006	2769	3.36e6	6.62e6	1118.2	2392.6	NO	bb	bb	85.997
13C-123789-HxCDF	36.847	1.011	2.211e5	4.271e5	1.008	0.518	0.510	3006	2769	2.94e6	5.67e6	979.1	2048.1	NO	bb	bb	87.489
13C-1234678-HpCDF	38.696	1.062	2.197e5	4.545e5	0.926	0.484	0.440	2113	2965	2.73e6	5.97e6	1291.1	2013.5	NO	bd	bb	98.971
13C-1234789-HpCDF	40.936	1.123	1.788e5	3.868e5	0.758	0.462	0.440	2113	2965	2.00e6	4.37e6	947.0	1474.0	NO	bd	bb	101.493
13C-1234-TCDD	25.458	0.000	2.740e5	3.587e5	1.000	0.764	0.770	2975	1672	3.54e6	4.63e6	1188.9	2772.3	NO	bb	bb	100.000
13C-2378-TCDD	26.290	1.033	2.865e5	3.752e5	1.116	0.764	0.770	2975	1672	3.32e6	4.34e6	1114.3	2594.6	NO	bb	bb	93.681
13C-12378-PeCDD	31.410	1.234	3.028e5	1.910e5	0.732	1.585	1.550	1035	1411	3.70e6	2.34e6	3575.8	1656.9	NO	bb	bb	106.647
13C-123478-HxCDD	35.922	0.986	3.873e5	3.061e5	0.960	1.265	1.240	2162	1313	5.48e6	4.42e6	2534.0	3369.6	NO	bd	bd	98.244
13C-123678-HxCDD	36.044	0.989	4.226e5	3.400e5	1.041	1.243	1.240	2162	1313	5.65e6	4.50e6	2615.8	3429.9	NO	db	db	99.589
13C-1234678-HpCDD	40.189	1.103	2.512e5	2.407e5	0.632	1.044	1.050	1389	1375	3.10e6	2.93e6	2232.8	2127.7	NO	bb	bb	105.755
13C-OCDD	44.930	1.233	4.418e5	4.846e5	0.504	0.912	0.890	1898	2235	4.44e6	4.80e6	2338.1	2146.5	NO	bd	bd	250.086
13C-123789-HxCDD	36.435	0.000	4.078e5	3.275e5	1.000	1.245	1.240	2162	1313	5.63e6	4.46e6	2602.7	3395.4	NO	bb	bb	100.000
37CL-2378-TCDD	26.305	1.033	6.195e4		1.084			1996		6.85e5		343.0			bb		9.036

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:27:06 Pacific Daylight Time

ID: CS3L2, Name: 21082315, Date: 23-Aug-2021, Time: 23:25:09, 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	4.512e4	5.918e4	1.425	0.762	0.770	2548	2122	5.85e5	7.38e5	229.6	347.6	NO	bb	bb	8.432
1289-TCDF	27.167	1.060	3.429e4	4.936e4	1.043	0.695	0.770	2548	2122	3.98e5	5.29e5	156.2	249.5	NO	bd	bd	9.241
13468-PECDF	27.015	0.906	3.498e5	2.299e5	1.376	1.521	1.550	927	1587	4.13e6	2.73e6	4448.3	1719.3	NO	bd	bb	45.534
12389-PECDF	32.212	1.080	2.551e5	1.634e5	1.000	1.561	1.550	2827	3699	2.67e6	1.75e6	943.8	472.4	NO	bb	bd	45.251
123468-HXCDF	33.148	0.953	2.190e5	1.929e5	1.087	1.135	1.240	2764	2314	2.71e6	2.24e6	981.9	967.9	NO	bb	bd	50.612
1368-TCDD	23.417	0.891	3.099e4	3.938e4	0.923	0.787	0.770	2275	1689	3.49e5	4.37e5	153.6	258.9	NO	bb	bd	11.518
1289-TCDD	26.910	1.024	2.388e4	3.110e4	0.794	0.768	0.770	2275	1689	2.81e5	3.43e5	123.4	202.9	NO	bd	bd	10.464
12479-PECDD	28.702	0.914	2.880e5	1.735e5	1.843	1.660	1.550	3785	1716	2.52e6	1.56e6	664.5	909.8	NO	bb	bb	50.689
12389-PECDD	31.833	1.013	2.055e5	1.295e5	1.154	1.587	1.550	3785	1716	2.40e6	1.51e6	633.8	881.8	NO	bd	bb	58.814
124679-HXCDD	33.928	0.945	2.173e5	1.643e5	1.125	1.322	1.240	3329	2187	2.55e6	2.06e6	765.0	939.9	NO	bb	bb	48.924
1234679-HPCDD	39.164	0.975	1.534e5	1.438e5	1.211	1.066	1.050	1541	1690	2.08e6	1.92e6	1351.3	1139.0	NO	bb	bb	49.896
Total-tetrafurans			1.172e5		1.192			2548		1.43e6							26.715
Total-penta1			3.498e5					927		4.13e6							45.534
Total-pentafurans			8.257e5		1.047			2827		9.20e6							145.701
Total-hexafurans			1.071e6		1.045			2764		1.38e7							245.421
Total-heptafurans			3.948e5		1.305			2530		4.86e6							95.807
Total-Furans			3.037e6		1.158			2548		3.63e7							647.247
Total-tetradioxins			1.385e5		0.879			2275		1.53e6							54.298
Total-pentadioxins			6.507e5		1.331			3785		6.96e6							161.888
Total-hexadioxins			8.076e5		1.028			3329		1.06e7							195.727
Total-heptadioxins			2.908e5		1.140			1541		3.86e6							101.079
Total-Dioxins			2.134e6		1.092			2275		2.55e7							610.009
Total-TEQ			5.171e6					2275		6.18e7							1257.256
FUNCTION1 PFK			1.339e6					692938		2.91e7							
FUNCTION2 PFK			1.300e7					390076		7.30e7							0.000
FUNCTION3 PFK			2.239e7					575274		1.55e8							0.000
FUNCTION4 PFK			8.564e4					374832		2.93e6							
FUNCTION5 PFK			6.130e6					265685		3.35e7							
FUNCTION1 HXCD...			2.542e3					902		3.84e4							0.000
FUNCTION1 HPCD...			3.927e3					1302		5.93e4							0.000
FUNCTION2 HPCD...			1.601e3					1395		3.09e4							0.000
FUNCTION3 OCDPE			9.777e2					1029		1.80e4							0.000
FUNCTION4 NCDPE			8.915e2					1024		1.80e4							0.000
FUNCTION5 DCDPE			4.109e2					1154		1.09e4							0.000

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:27:06 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: CS3L2, Name: 21082315, Date: 23-Aug-2021, Time: 23:25:09, 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	27.17	3.429e4	4.936e4	1.043	0.69	0.77	156.2	YES	NO	bd	bd	9.241
2	2378-TCDF	25.67	3.751e4	4.886e4	1.108	0.77	0.77	172.7	YES	NO	bd	bb	8.984
3	Total-tetrafurans	22.43	2.768e2	3.239e2	1.192	0.85	0.77	2.3	NO	NO	bb	db	0.058
4	1368-TCDF	22.15	4.512e4	5.918e4	1.425	0.76	0.77	229.6	YES	NO	bb	bb	8.432

PP

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	13468-PECDF	27.02	3.498e5	2.299e5	1.376	1.52	1.55	4448.3	YES	NO	bd	bb	45.534

PF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	12389-PECDF	32.21	2.551e5	1.634e5	1.000	1.56	1.55	943.8	YES	NO	bb	bd	45.251
2	23478-PeCDF	31.18	2.613e5	1.709e5	1.126	1.53	1.55	1117.7	YES	NO	bb	bb	46.153
3	12378-PeCDF	29.84	2.667e5	1.724e5	1.015	1.55	1.55	1020.3	YES	NO	bb	bd	46.767
4	Total-pentafurans	28.68	4.251e4	2.674e4	1.047	1.59	1.55	171.7	YES	NO	bb	bb	7.530

HF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	234678-HxCDF	35.83	2.145e5	1.778e5	1.052	1.21	1.24	1035.1	YES	NO	bb	bb	48.531
2	123678-HxCDF	34.95	2.436e5	2.038e5	1.037	1.20	1.24	1097.8	YES	NO	db	db	45.624
3	123478-HxCDF	34.82	2.084e5	1.671e5	1.017	1.25	1.24	1017.3	YES	NO	bd	bd	49.292
4	123468-HXCDF	33.15	2.190e5	1.929e5	1.087	1.14	1.24	981.9	YES	NO	bb	bd	50.612
5	123789-HxCDF	36.86	1.853e5	1.577e5	1.030	1.17	1.24	860.4	YES	NO	bd	bd	51.362

HPF

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1234789-HpCDF	40.95	1.711e5	1.774e5	1.283	0.96	1.05	794.2	YES	NO	bb	bb	48.009
2	1234678-HpCDF	38.72	2.237e5	2.040e5	1.327	1.10	1.05	1126.6	YES	NO	bd	bb	47.797

ID: CS3L2, Name: 21082315, Date: 23-Aug-2021, Time: 23:25:09, 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	27.17	3.429e4	4.936e4	1.043	0.69	0.77	156.2	YES	NO	bd	bd	9.241
2	2378-TCDF	25.67	3.751e4	4.886e4	1.108	0.77	0.77	172.7	YES	NO	bd	bb	8.984
3	Total-tetrafurans	22.43	2.768e2	3.239e2	1.192	0.85	0.77	2.3	NO	NO	bb	db	0.058
4	1368-TCDF	22.15	4.512e4	5.918e4	1.425	0.76	0.77	229.6	YES	NO	bb	bb	8.432
5	12389-PECDF	32.21	2.551e5	1.634e5	1.000	1.56	1.55	943.8	YES	NO	bb	bd	45.251
6	23478-PeCDF	31.18	2.613e5	1.709e5	1.126	1.53	1.55	1117.7	YES	NO	bb	bb	46.153
7	12378-PeCDF	29.84	2.667e5	1.724e5	1.015	1.55	1.55	1020.3	YES	NO	bb	bd	46.767
8	Total-pentafurans	28.68	4.251e4	2.674e4	1.047	1.59	1.55	171.7	YES	NO	bb	bb	7.530
9	234678-HxCDF	35.83	2.145e5	1.778e5	1.052	1.21	1.24	1035.1	YES	NO	bb	bb	48.531
10	123678-HxCDF	34.95	2.436e5	2.038e5	1.037	1.20	1.24	1097.8	YES	NO	db	db	45.624
11	123478-HxCDF	34.82	2.084e5	1.671e5	1.017	1.25	1.24	1017.3	YES	NO	bd	bd	49.292
12	123468-HXCDF	33.15	2.190e5	1.929e5	1.087	1.14	1.24	981.9	YES	NO	bb	bd	50.612
13	123789-HxCDF	36.86	1.853e5	1.577e5	1.030	1.17	1.24	860.4	YES	NO	bd	bd	51.362
14	1234789-HpCDF	40.95	1.711e5	1.774e5	1.283	0.96	1.05	794.2	YES	NO	bb	bb	48.009
15	1234678-HpCDF	38.72	2.237e5	2.040e5	1.327	1.10	1.05	1126.6	YES	NO	bd	bb	47.797
16	OCDF	45.19	2.785e5	3.117e5	1.447	0.89	0.89	1437.0	YES	NO	bb	bb	88.070
17	13468-PECDF	27.02	3.498e5	2.299e5	1.376	1.52	1.55	4448.3	YES	NO	bd	bb	45.534

TD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	1289-TCDD	26.91	2.388e4	3.110e4	0.794	0.77	0.77	123.4	YES	NO	bd	bd	10.464
2	2378-TCDD	26.31	2.624e4	3.364e4	0.920	0.78	0.77	144.8	YES	NO	MM	MM	9.832
3	Total-tetradioxins	25.97	4.367e4	5.502e4	0.879	0.79	0.77	170.7	YES	NO	bd	bd	16.964
4	Total-tetradioxins	25.49	1.356e4	1.817e4	0.879	0.75	0.77	79.9	YES	NO	bb	bb	5.454
5	Total-tetradioxins	23.90	1.716e2	2.100e2	0.879	0.82	0.77	1.5	NO	NO	bb	db	0.066
6	1368-TCDD	23.42	3.099e4	3.938e4	0.923	0.79	0.77	153.6	YES	NO	bb	bd	11.518

PD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	12479-PECDD	28.70	2.880e5	1.735e5	1.843	1.66	1.55	664.5	YES	NO	bb	bb	50.689
2	12389-PECDD	31.83	2.055e5	1.295e5	1.154	1.59	1.55	633.8	YES	NO	bd	bb	58.814
3	12378-PeCDD	31.43	1.572e5	1.003e5	0.995	1.57	1.55	539.2	YES	NO	bb	bb	52.385

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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	36.45	1.877e5	1.602e5	0.950	1.17	1.24	777.6	YES	NO	bb	bb	50.291
2	123678-HxCDD	36.06	2.202e5	1.695e5	1.009	1.30	1.24	842.2	YES	NO	db	db	50.650
3	123478-HxCDD	35.94	1.824e5	1.443e5	1.027	1.26	1.24	799.0	YES	NO	bd	bd	45.862
4	124679-HXCDD	33.93	2.173e5	1.643e5	1.125	1.32	1.24	765.0	YES	NO	bb	bb	48.924

HPD

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	Total-heptadioxins	40.51	7.867e1	7.181e1	1.140	1.10	1.05	2.8	NO	NO	bb	bb	0.027
2	1234678-HpCDD	40.21	1.372e5	1.313e5	1.068	1.05	1.05	1147.6	YES	NO	bb	bb	51.103
3	Total-heptadioxins	39.42	1.497e2	1.521e2	1.140	0.98	1.05	4.1	NO	NO	bb	bd	0.054
4	1234679-HPCDD	39.16	1.534e5	1.438e5	1.211	1.07	1.05	1351.3	YES	NO	bb	bb	49.896

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	2.388e4	3.110e4	0.794	0.77	0.77	123.4	YES	NO	bd	bd	10.464
2	2378-TCDD	26.31	2.624e4	3.364e4	0.920	0.78	0.77	144.8	YES	NO	MM	MM	9.832
3	Total-tetradioxins	25.97	4.367e4	5.502e4	0.879	0.79	0.77	170.7	YES	NO	bd	bd	16.964
4	Total-tetradioxins	25.49	1.356e4	1.817e4	0.879	0.75	0.77	79.9	YES	NO	bb	bb	5.454
5	Total-tetradioxins	23.90	1.716e2	2.100e2	0.879	0.82	0.77	1.5	NO	NO	bb	db	0.066
6	1368-TCDD	23.42	3.099e4	3.938e4	0.923	0.79	0.77	153.6	YES	NO	bb	bd	11.518
7	12479-PECDD	28.70	2.880e5	1.735e5	1.843	1.66	1.55	664.5	YES	NO	bb	bb	50.689
8	12389-PECDD	31.83	2.055e5	1.295e5	1.154	1.59	1.55	633.8	YES	NO	bd	bb	58.814
9	12378-PeCDD	31.43	1.572e5	1.003e5	0.995	1.57	1.55	539.2	YES	NO	bb	bb	52.385
10	123789-HxCDD	36.45	1.877e5	1.602e5	0.950	1.17	1.24	777.6	YES	NO	bb	bb	50.291
11	123678-HxCDD	36.06	2.202e5	1.695e5	1.009	1.30	1.24	842.2	YES	NO	db	db	50.650
12	123478-HxCDD	35.94	1.824e5	1.443e5	1.027	1.26	1.24	799.0	YES	NO	bd	bd	45.862
13	124679-HXCDD	33.93	2.173e5	1.643e5	1.125	1.32	1.24	765.0	YES	NO	bb	bb	48.924
14	Total-heptadioxins	40.51	7.867e1	7.181e1	1.140	1.10	1.05	2.8	NO	NO	bb	bb	0.027
15	1234678-HpCDD	40.21	1.372e5	1.313e5	1.068	1.05	1.05	1147.6	YES	NO	bb	bb	51.103
16	Total-heptadioxins	39.42	1.497e2	1.521e2	1.140	0.98	1.05	4.1	NO	NO	bb	bd	0.054
17	1234679-HPCDD	39.16	1.534e5	1.438e5	1.211	1.07	1.05	1351.3	YES	NO	bb	bb	49.896
18	OCDD	44.95	2.463e5	2.843e5	1.181	0.87	0.89	1116.5	YES	NO	bb	bd	97.017

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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	3.429e4	4.936e4	1.043	0.69	0.77	156.2	YES	NO	bd	bd	9.241
2	2378-TCDF	25.67	3.751e4	4.886e4	1.108	0.77	0.77	172.7	YES	NO	bd	bb	8.984
3	Total-tetrafurans	22.43	2.768e2	3.239e2	1.192	0.85	0.77	2.3	NO	NO	bb	db	0.058
4	1368-TCDF	22.15	4.512e4	5.918e4	1.425	0.76	0.77	229.6	YES	NO	bb	bb	8.432
5	12389-PECDF	32.21	2.551e5	1.634e5	1.000	1.56	1.55	943.8	YES	NO	bb	bd	45.251
6	23478-PeCDF	31.18	2.613e5	1.709e5	1.126	1.53	1.55	1117.7	YES	NO	bb	bb	46.153
7	12378-PeCDF	29.84	2.667e5	1.724e5	1.015	1.55	1.55	1020.3	YES	NO	bb	bd	46.767
8	Total-pentafurans	28.68	4.251e4	2.674e4	1.047	1.59	1.55	171.7	YES	NO	bb	bb	7.530
9	234678-HxCDF	35.83	2.145e5	1.778e5	1.052	1.21	1.24	1035.1	YES	NO	bb	bb	48.531
10	123678-HxCDF	34.95	2.436e5	2.038e5	1.037	1.20	1.24	1097.8	YES	NO	db	db	45.624
11	123478-HxCDF	34.82	2.084e5	1.671e5	1.017	1.25	1.24	1017.3	YES	NO	bd	bd	49.292
12	123468-HXCDF	33.15	2.190e5	1.929e5	1.087	1.14	1.24	981.9	YES	NO	bb	bd	50.612
13	123789-HxCDF	36.86	1.853e5	1.577e5	1.030	1.17	1.24	860.4	YES	NO	bd	bd	51.362
14	1234789-HpCDF	40.95	1.711e5	1.774e5	1.283	0.96	1.05	794.2	YES	NO	bb	bb	48.009
15	1234678-HpCDF	38.72	2.237e5	2.040e5	1.327	1.10	1.05	1126.6	YES	NO	bd	bb	47.797
16	OCDF	45.19	2.785e5	3.117e5	1.447	0.89	0.89	1437.0	YES	NO	bb	bb	88.070
17	13468-PECDF	27.02	3.498e5	2.299e5	1.376	1.52	1.55	4448.3	YES	NO	bd	bb	45.534
18	1289-TCDD	26.91	2.388e4	3.110e4	0.794	0.77	0.77	123.4	YES	NO	bd	bd	10.464
19	2378-TCDD	26.31	2.624e4	3.364e4	0.920	0.78	0.77	144.8	YES	NO	MM	MM	9.832
20	Total-tetradioxins	25.97	4.367e4	5.502e4	0.879	0.79	0.77	170.7	YES	NO	bd	bd	16.964
21	Total-tetradioxins	25.49	1.356e4	1.817e4	0.879	0.75	0.77	79.9	YES	NO	bb	bb	5.454
22	Total-tetradioxins	23.90	1.716e2	2.100e2	0.879	0.82	0.77	1.5	NO	NO	bb	db	0.066
23	1368-TCDD	23.42	3.099e4	3.938e4	0.923	0.79	0.77	153.6	YES	NO	bb	bd	11.518
24	12479-PECDD	28.70	2.880e5	1.735e5	1.843	1.66	1.55	664.5	YES	NO	bb	bb	50.689
25	12389-PECDD	31.83	2.055e5	1.295e5	1.154	1.59	1.55	633.8	YES	NO	bd	bb	58.814
26	12378-PeCDD	31.43	1.572e5	1.003e5	0.995	1.57	1.55	539.2	YES	NO	bb	bb	52.385
27	123789-HxCDD	36.45	1.877e5	1.602e5	0.950	1.17	1.24	777.6	YES	NO	bb	bb	50.291
28	123678-HxCDD	36.06	2.202e5	1.695e5	1.009	1.30	1.24	842.2	YES	NO	db	db	50.650
29	123478-HxCDD	35.94	1.824e5	1.443e5	1.027	1.26	1.24	799.0	YES	NO	bd	bd	45.862
30	124679-HXCDD	33.93	2.173e5	1.643e5	1.125	1.32	1.24	765.0	YES	NO	bb	bb	48.924
31	Total-heptadioxins	40.51	7.867e1	7.181e1	1.140	1.10	1.05	2.8	NO	NO	bb	bb	0.027
32	1234678-HpCDD	40.21	1.372e5	1.313e5	1.068	1.05	1.05	1147.6	YES	NO	bb	bb	51.103
33	Total-heptadioxins	39.42	1.497e2	1.521e2	1.140	0.98	1.05	4.1	NO	NO	bb	bd	0.054
34	1234679-HPCDD	39.16	1.534e5	1.438e5	1.211	1.07	1.05	1351.3	YES	NO	bb	bb	49.896
35	OCDD	44.95	2.463e5	2.843e5	1.181	0.87	0.89	1116.5	YES	NO	bb	bd	97.017

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
Last Altered: Tuesday, August 24, 2021 10:49:21 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	21.33	3.443e4					1.0	NO		bd		
2	FUNCTION1 PFK	21.16	3.881e4					1.1	NO		bb		
3	FUNCTION1 PFK	23.39	2.218e4					1.0	NO		bb		
4	FUNCTION1 PFK	23.05	6.120e4					1.7	NO		db		
5	FUNCTION1 PFK	22.98	8.036e4					1.7	NO		dd		
6	FUNCTION1 PFK	22.89	2.790e4					1.2	NO		bd		
7	FUNCTION1 PFK	22.83	3.154e4					1.3	NO		bb		
8	FUNCTION1 PFK	22.69	1.331e4					0.6	NO		bb		
9	FUNCTION1 PFK	22.56	5.245e4					1.1	NO		bb		
10	FUNCTION1 PFK	22.42	4.220e3					0.4	NO		bb		
11	FUNCTION1 PFK	22.36	5.368e3					0.5	NO		bb		
12	FUNCTION1 PFK	22.30	8.530e3					0.6	NO		bb		
13	FUNCTION1 PFK	22.10	8.109e4					1.3	NO		db		
14	FUNCTION1 PFK	21.98	3.326e4					1.0	NO		bd		
15	FUNCTION1 PFK	21.89	6.216e4					2.0	NO		bb		
16	FUNCTION1 PFK	21.80	1.003e4					0.5	NO		bb		
17	FUNCTION1 PFK	21.50	3.153e4					1.1	NO		db		
18	FUNCTION1 PFK	21.44	8.595e4					2.0	NO		dd		
19	FUNCTION1 PFK	26.06	3.763e4					1.6	NO		bb		
20	FUNCTION1 PFK	25.93	1.129e4					0.7	NO		bb		
21	FUNCTION1 PFK	25.62	1.659e4					0.8	NO		db		
22	FUNCTION1 PFK	25.58	2.323e4					0.9	NO		bd		
23	FUNCTION1 PFK	25.50	4.210e3					0.4	NO		bb		
24	FUNCTION1 PFK	25.44	1.940e4					0.8	NO		bb		
25	FUNCTION1 PFK	24.90	7.773e4					1.2	NO		bb		
26	FUNCTION1 PFK	24.79	2.260e4					0.8	NO		bb		
27	FUNCTION1 PFK	24.57	2.138e4					0.9	NO		bb		
28	FUNCTION1 PFK	24.38	2.267e4					0.9	NO		bb		
29	FUNCTION1 PFK	24.05	2.168e4					1.1	NO		db		
30	FUNCTION1 PFK	23.99	5.067e4					1.4	NO		bd		
31	FUNCTION1 PFK	23.86	5.389e4					1.2	NO		db		
32	FUNCTION1 PFK	23.80	1.724e4					0.7	NO		bd		
33	FUNCTION1 PFK	23.70	7.607e4					1.8	NO		db		
34	FUNCTION1 PFK	23.66	2.311e4					1.2	NO		bd		
35	FUNCTION1 PFK	27.08	1.208e4					0.6	NO		bb		
36	FUNCTION1 PFK	26.74	1.158e4					0.6	NO		bb		
37	FUNCTION1 PFK	26.29	3.513e4					0.7	NO		bb		

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PFK1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
38	FUNCTION1 PFK	26.23	6.336e4					1.9	NO		db		
39	FUNCTION1 PFK	26.14	3.341e4					1.3	NO		bd		

PFK2

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION2 PFK	29.72	3.139e3					0.7	NO		bb		0.000
2	FUNCTION2 PFK	29.54	3.706e3					0.5	NO		bb		0.000
3	FUNCTION2 PFK	29.35	1.635e3					0.4	NO		bb		0.000
4	FUNCTION2 PFK	29.03	2.795e4					2.1	NO		db		0.000
5	FUNCTION2 PFK	28.86	3.249e5					8.1	YES		dd		0.000
6	FUNCTION2 PFK	28.69	8.036e5					14.7	YES		dd		0.000
7	FUNCTION2 PFK	28.40	2.291e6					25.9	YES		dd		0.000
8	FUNCTION2 PFK	28.21	1.987e6					32.1	YES		dd		0.000
9	FUNCTION2 PFK	27.96	5.953e6					42.0	YES		dd		0.000
10	FUNCTION2 PFK	27.78	1.405e6					47.7	YES		bd		0.000
11	FUNCTION2 PFK	32.25	5.545e3					0.7	NO		bb		0.000
12	FUNCTION2 PFK	32.07	2.267e4					1.4	NO		bb		0.000
13	FUNCTION2 PFK	31.62	2.144e4					1.6	NO		bb		0.000
14	FUNCTION2 PFK	31.55	1.803e4					1.3	NO		bb		0.000
15	FUNCTION2 PFK	31.29	4.451e4					2.2	NO		db		0.000
16	FUNCTION2 PFK	31.23	3.273e4					1.9	NO		bd		0.000
17	FUNCTION2 PFK	30.81	1.227e4					1.3	NO		bb		0.000
18	FUNCTION2 PFK	30.67	1.490e4					1.0	NO		bb		0.000
19	FUNCTION2 PFK	30.44	2.660e4					0.9	NO		bb		0.000
20	FUNCTION2 PFK	30.31	1.906e3					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	33.57	5.523e5					18.5	YES		dd		0.000
2	FUNCTION3 PFK	33.29	5.330e6					29.0	YES		dd		0.000
3	FUNCTION3 PFK	33.14	3.100e6					34.5	YES		dd		0.000
4	FUNCTION3 PFK	32.84	7.095e6					45.4	YES		dd		0.000
5	FUNCTION3 PFK	32.75	3.472e6					48.0	YES		bd		0.000
6	FUNCTION3 PFK	35.23	7.395e4					1.6	NO		bd		0.000
7	FUNCTION3 PFK	35.14	1.675e4					0.7	NO		bb		0.000
8	FUNCTION3 PFK	34.93	9.330e3					0.7	NO		bb		0.000
9	FUNCTION3 PFK	34.66	1.022e5					2.0	NO		bb		0.000
10	FUNCTION3 PFK	34.61	2.337e4					1.4	NO		db		0.000
11	FUNCTION3 PFK	34.56	3.534e4					1.1	NO		dd		0.000
12	FUNCTION3 PFK	34.46	3.605e4					1.7	NO		bd		0.000
13	FUNCTION3 PFK	34.38	3.332e3					0.5	NO		bb		0.000
14	FUNCTION3 PFK	34.04	2.177e4					1.6	NO		db		0.000
15	FUNCTION3 PFK	33.99	8.609e4					3.6	YES		dd		0.000
16	FUNCTION3 PFK	33.95	1.072e5					4.6	YES		dd		0.000
17	FUNCTION3 PFK	33.91	1.488e5					6.3	YES		dd		0.000
18	FUNCTION3 PFK	33.85	2.007e5					8.8	YES		dd		0.000
19	FUNCTION3 PFK	33.75	7.103e5					12.8	YES		dd		0.000
20	FUNCTION3 PFK	33.71	3.503e5					14.3	YES		dd		0.000
21	FUNCTION3 PFK	33.64	5.917e5					16.8	YES		dd		0.000
22	FUNCTION3 PFK	37.54	7.099e3					0.6	NO		bb		0.000
23	FUNCTION3 PFK	37.41	6.439e4					2.0	NO		bb		0.000
24	FUNCTION3 PFK	37.04	3.189e3					0.5	NO		bb		0.000
25	FUNCTION3 PFK	36.67	1.132e4					0.8	NO		bb		0.000
26	FUNCTION3 PFK	36.57	5.305e4					1.6	NO		db		0.000
27	FUNCTION3 PFK	36.43	2.610e4					0.9	NO		bd		0.000
28	FUNCTION3 PFK	36.39	4.360e4					1.6	NO		bb		0.000
29	FUNCTION3 PFK	35.99	7.810e3					0.6	NO		bb		0.000
30	FUNCTION3 PFK	35.91	3.506e3					0.5	NO		bb		0.000
31	FUNCTION3 PFK	35.65	4.144e3					0.5	NO		bb		0.000
32	FUNCTION3 PFK	35.45	1.234e4					0.9	NO		bb		0.000
33	FUNCTION3 PFK	35.39	3.909e4					1.8	NO		db		0.000
34	FUNCTION3 PFK	35.35	1.945e4					1.5	NO		dd		0.000
35	FUNCTION3 PFK	35.31	2.708e4					1.5	NO		dd		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	37.95	4.372e4					1.8	NO		bb		
2	FUNCTION4 PFK	42.60	6.896e3					1.0	NO		bb		
3	FUNCTION4 PFK	41.29	7.839e3					1.1	NO		bb		
4	FUNCTION4 PFK	41.12	7.406e3					1.1	NO		bb		
5	FUNCTION4 PFK	40.47	2.480e3					0.6	NO		bb		
6	FUNCTION4 PFK	39.43	6.387e3					0.9	NO		bb		
7	FUNCTION4 PFK	38.86	1.091e4					1.3	NO		bb		

PFK5

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 PFK	43.22	4.624e6					30.4	YES		db		
2	FUNCTION5 PFK	42.93	4.440e5					46.2	YES		dd		
3	FUNCTION5 PFK	42.86	1.062e6					49.5	YES		bd		

ETHERS1

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION1 HXCD...	23.15	1.529e2					2.2	NO		db		0.000
2	FUNCTION1 HXCD...	23.05	1.193e2					2.4	NO		bd		0.000
3	FUNCTION1 HXCD...	22.81	1.278e2					2.6	NO		bb		0.000
4	FUNCTION1 HXCD...	22.60	8.831e1					1.5	NO		bb		0.000
5	FUNCTION1 HXCD...	22.24	1.674e2					3.0	YES		bb		0.000
6	FUNCTION1 HXCD...	27.23	8.532e1					2.1	NO		db		0.000
7	FUNCTION1 HXCD...	27.18	9.658e1					2.4	NO		dd		0.000
8	FUNCTION1 HXCD...	27.03	1.221e2					1.7	NO		bd		0.000
9	FUNCTION1 HXCD...	26.29	1.966e2					2.1	NO		db		0.000
10	FUNCTION1 HXCD...	26.08	1.526e2					1.8	NO		dd		0.000
11	FUNCTION1 HXCD...	25.93	1.640e2					2.6	NO		dd		0.000
12	FUNCTION1 HXCD...	25.84	1.151e2					2.1	NO		dd		0.000
13	FUNCTION1 HXCD...	25.76	8.852e1					2.0	NO		dd		0.000
14	FUNCTION1 HXCD...	25.62	1.826e2					3.1	YES		dd		0.000
15	FUNCTION1 HXCD...	25.52	2.099e2					3.1	YES		dd		0.000
16	FUNCTION1 HXCD...	25.41	2.609e2					2.8	NO		bd		0.000
17	FUNCTION1 HXCD...	23.54	1.355e2					3.3	YES		bb		0.000
18	FUNCTION1 HXCD...	23.31	7.664e1					1.7	NO		bb		0.000

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:27:06 Pacific Daylight Time

ID: CS3L2, Name: 21082315, Date: 23-Aug-2021, Time: 23:25:09, 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...	21.19	9.899e1					2.1	NO		db		0.000
2	FUNCTION1 HPCD...	21.13	1.265e2					2.1	NO		bd		0.000
3	FUNCTION1 HPCD...	24.88	9.991e1					1.6	NO		bb		0.000
4	FUNCTION1 HPCD...	24.55	8.902e1					1.3	NO		bb		0.000
5	FUNCTION1 HPCD...	24.35	2.450e2					2.2	NO		db		0.000
6	FUNCTION1 HPCD...	24.25	1.085e2					1.3	NO		bd		0.000
7	FUNCTION1 HPCD...	23.89	3.595e2					2.0	NO		bb		0.000
8	FUNCTION1 HPCD...	23.55	1.707e2					1.8	NO		bb		0.000
9	FUNCTION1 HPCD...	23.16	2.220e2					2.2	NO		db		0.000
10	FUNCTION1 HPCD...	23.05	1.510e2					1.6	NO		bd		0.000
11	FUNCTION1 HPCD...	22.93	1.483e2					2.4	NO		bb		0.000
12	FUNCTION1 HPCD...	22.81	1.660e2					2.0	NO		db		0.000
13	FUNCTION1 HPCD...	22.62	3.553e2					1.9	NO		bd		0.000
14	FUNCTION1 HPCD...	22.24	1.316e2					1.5	NO		bb		0.000
15	FUNCTION1 HPCD...	21.98	1.650e2					1.9	NO		db		0.000
16	FUNCTION1 HPCD...	21.86	1.274e2					1.8	NO		bd		0.000
17	FUNCTION1 HPCD...	21.68	1.120e2					2.0	NO		db		0.000
18	FUNCTION1 HPCD...	21.57	2.146e2					1.5	NO		bd		0.000
19	FUNCTION1 HPCD...	27.23	1.298e2					1.2	NO		db		0.000
20	FUNCTION1 HPCD...	27.02	1.376e2					1.8	NO		dd		0.000
21	FUNCTION1 HPCD...	26.94	7.403e1					1.1	NO		bd		0.000
22	FUNCTION1 HPCD...	26.80	1.210e2					1.9	NO		bb		0.000
23	FUNCTION1 HPCD...	26.09	7.238e1					1.4	NO		bb		0.000
24	FUNCTION1 HPCD...	25.84	8.404e1					1.4	NO		bb		0.000
25	FUNCTION1 HPCD...	25.52	1.244e2					1.7	NO		db		0.000
26	FUNCTION1 HPCD...	25.40	9.266e1					1.8	NO		bd		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...	30.79	9.659e1					1.2	NO		bb		0.000
2	FUNCTION2 HPCD...	29.86	9.102e1					1.1	NO		bb		0.000
3	FUNCTION2 HPCD...	29.50	7.175e1					2.3	NO		bb		0.000
4	FUNCTION2 HPCD...	29.09	9.627e1					1.5	NO		bb		0.000
5	FUNCTION2 HPCD...	28.84	1.128e2					1.3	NO		db		0.000
6	FUNCTION2 HPCD...	28.66	3.789e2					2.5	NO		dd		0.000
7	FUNCTION2 HPCD...	28.55	8.886e1					1.5	NO		bd		0.000
8	FUNCTION2 HPCD...	32.36	8.832e1					2.8	NO		bb		0.000
9	FUNCTION2 HPCD...	31.97	1.273e2					1.4	NO		bb		0.000
10	FUNCTION2 HPCD...	31.43	1.482e2					1.2	NO		bb		0.000
11	FUNCTION2 HPCD...	31.03	3.014e2					5.4	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	36.81	9.705e1					1.3	NO		bb		0.000
2	FUNCTION3 OCDPE	36.46	1.456e2					3.0	YES		db		0.000
3	FUNCTION3 OCDPE	36.41	1.588e2					3.3	YES		bd		0.000
4	FUNCTION3 OCDPE	36.03	1.504e2					2.4	NO		db		0.000
5	FUNCTION3 OCDPE	35.92	1.661e2					2.5	NO		bd		0.000
6	FUNCTION3 OCDPE	35.26	8.492e1					1.3	NO		bb		0.000
7	FUNCTION3 OCDPE	33.57	7.969e1					1.9	NO		bb		0.000
8	FUNCTION3 OCDPE	32.68	9.520e1					1.7	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	38.67	8.203e1					1.8	NO		dd		0.000
2	FUNCTION4 NCDPE	38.60	9.545e1					2.3	NO		bd		0.000
3	FUNCTION4 NCDPE	42.73	1.469e2					1.9	NO		db		0.000
4	FUNCTION4 NCDPE	42.58	7.776e1					1.9	NO		dd		0.000
5	FUNCTION4 NCDPE	42.55	8.452e1					2.2	NO		bd		0.000
6	FUNCTION4 NCDPE	42.19	8.865e1					1.5	NO		bb		0.000
7	FUNCTION4 NCDPE	40.31	7.593e1					1.3	NO		bb		0.000
8	FUNCTION4 NCDPE	39.60	7.427e1					1.8	NO		bb		0.000
9	FUNCTION4 NCDPE	38.74	1.659e2					2.8	NO		db		0.000

ID: CS3L2, Name: 21082315, Date: 23-Aug-2021, Time: 23:25:09, Conditions: AUTOSPEC01, User: pk

ETHERS6

	Compound	RT	Ion1Area	Ion2Area	RRF	Ratio	Pred R	S/N 1	SNFlag	EMPC	Int.1	Int.2	pg
1	FUNCTION5 DCDPE	45.20	7.813e1					1.5	NO		bb		0.000
2	FUNCTION5 DCDPE	44.61	7.420e1					2.3	NO		db		0.000
3	FUNCTION5 DCDPE	44.57	7.413e1					2.2	NO		bd		0.000
4	FUNCTION5 DCDPE	43.60	7.794e1					1.7	NO		db		0.000
5	FUNCTION5 DCDPE	43.51	1.065e2					1.8	NO		bd		0.000

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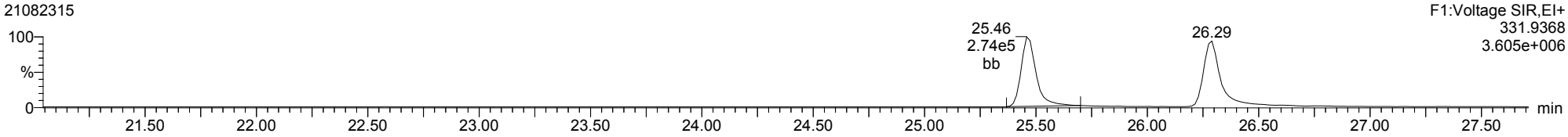
13C-1234-TCDD



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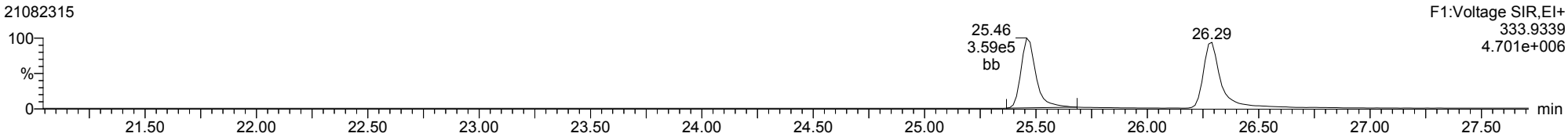

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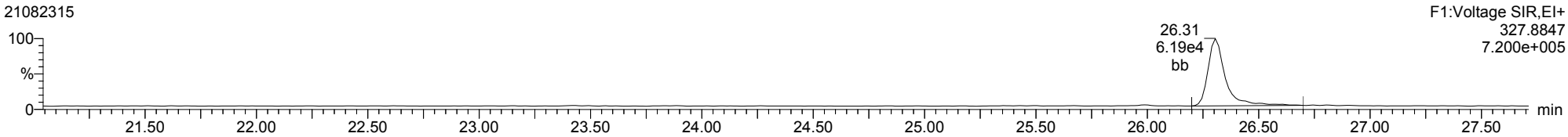

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Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
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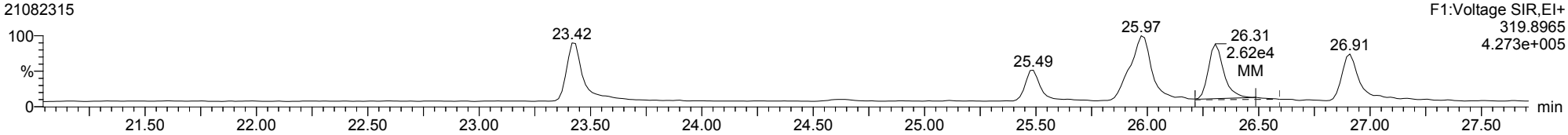

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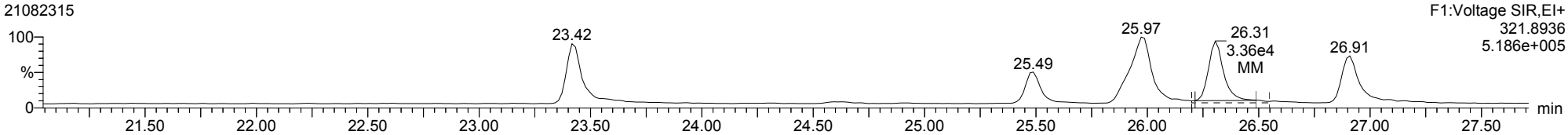

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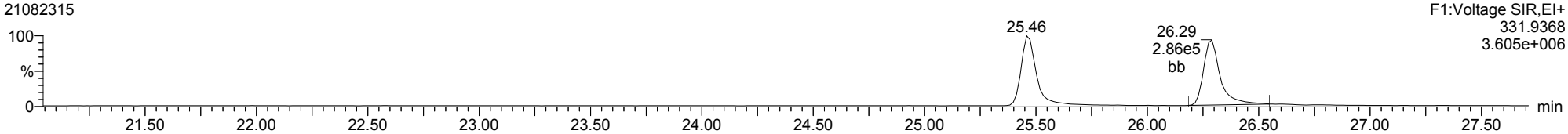

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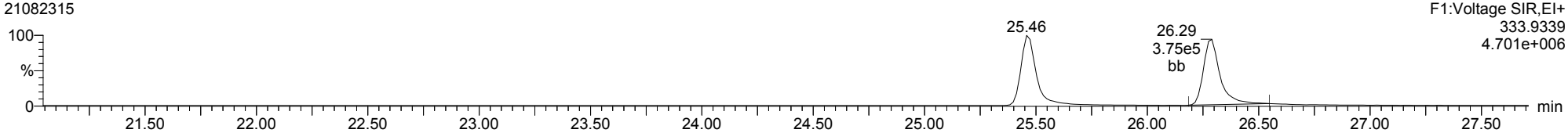

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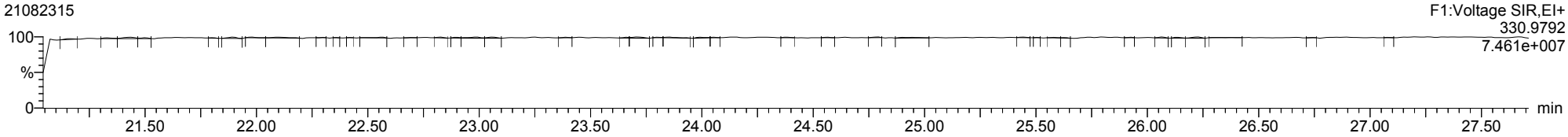

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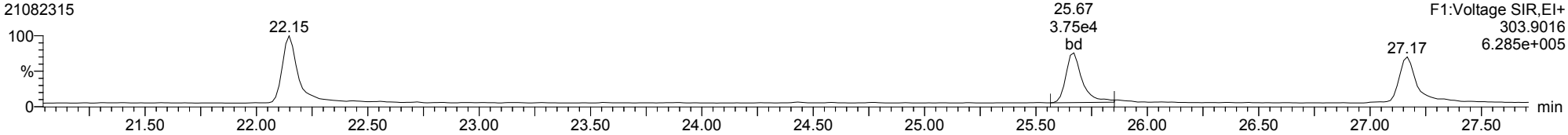

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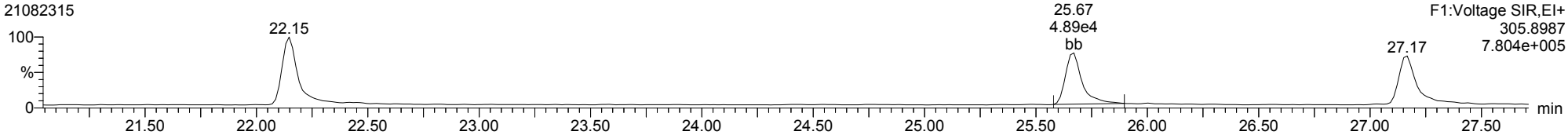

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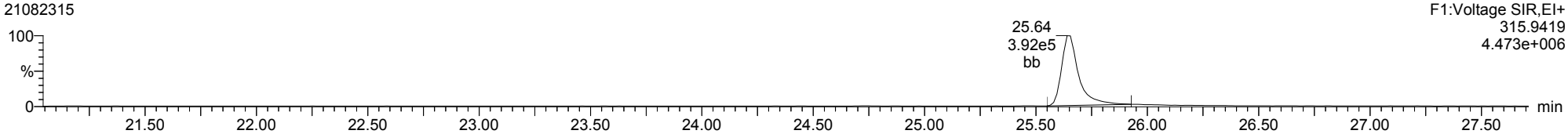

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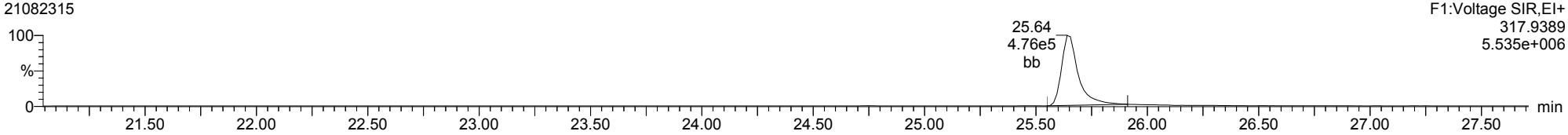

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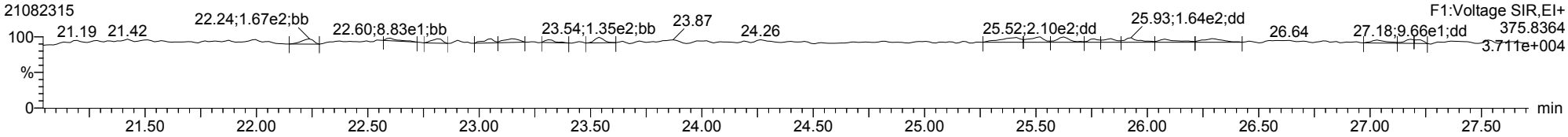

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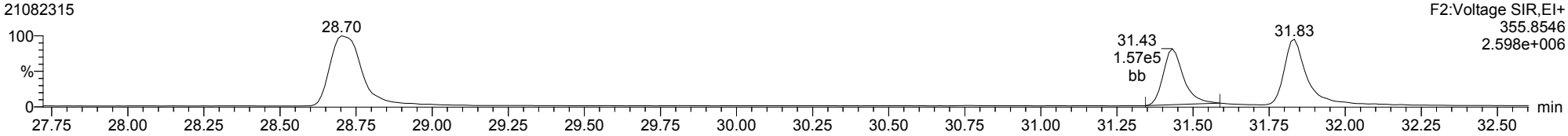
12378-PeCDD



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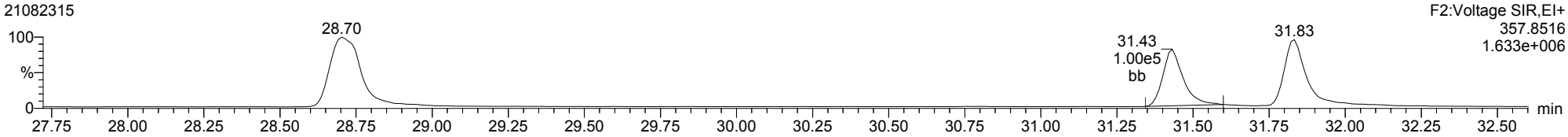

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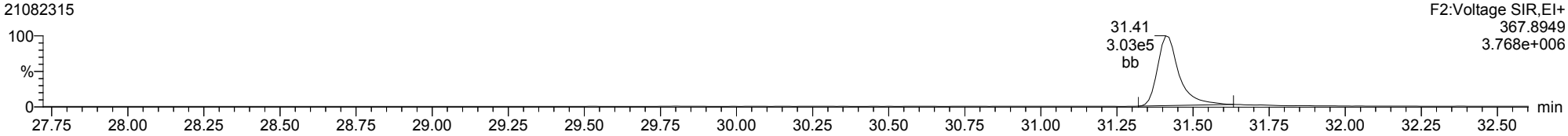

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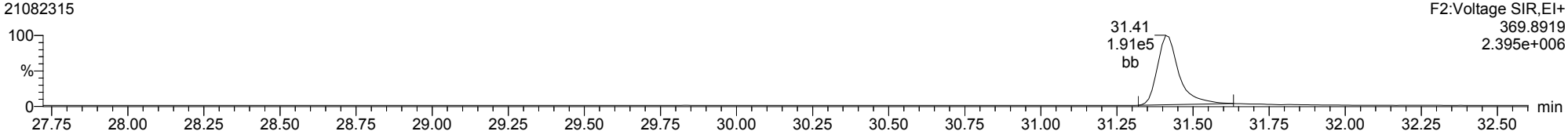

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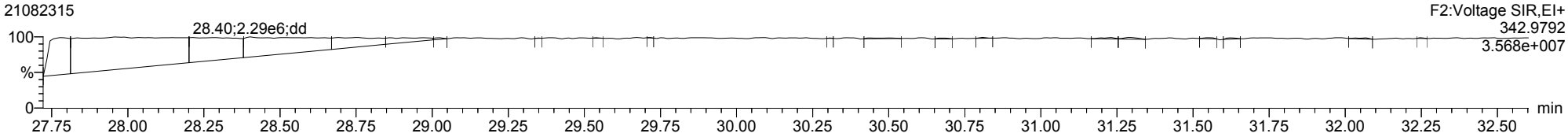

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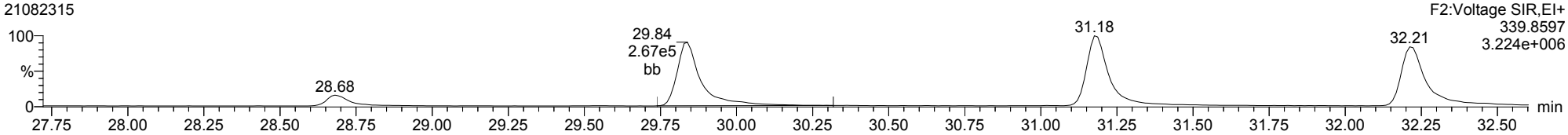

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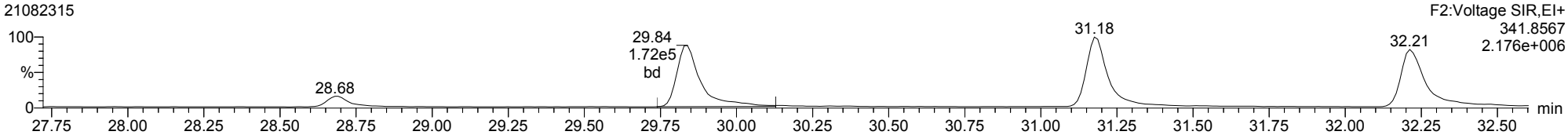

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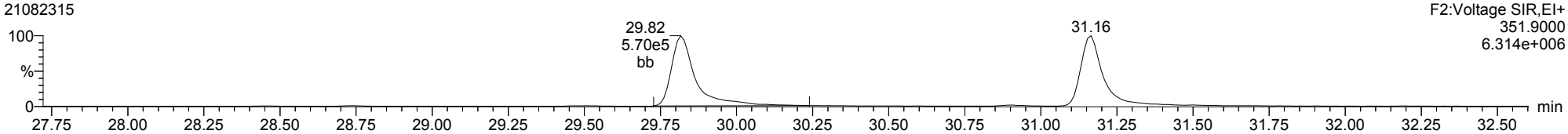

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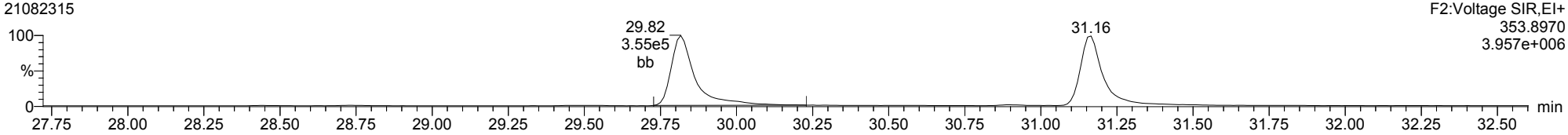

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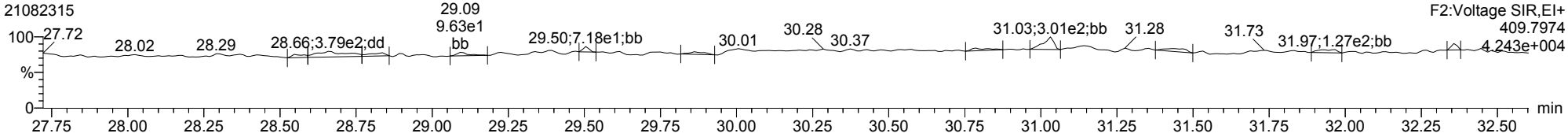

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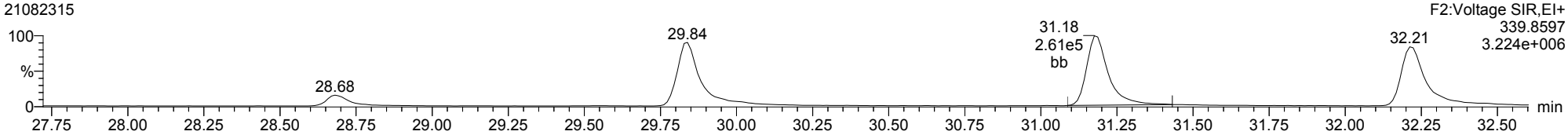
23478-PeCDF



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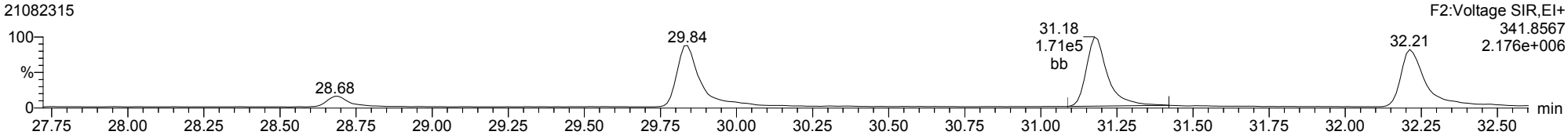

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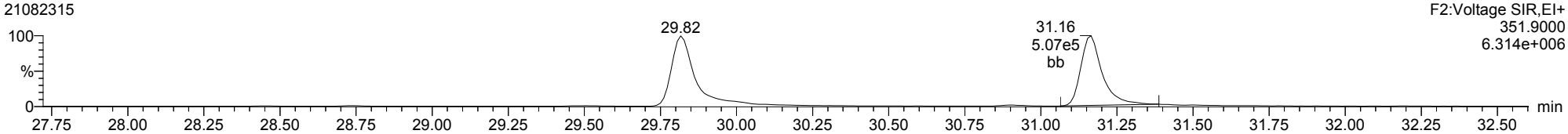

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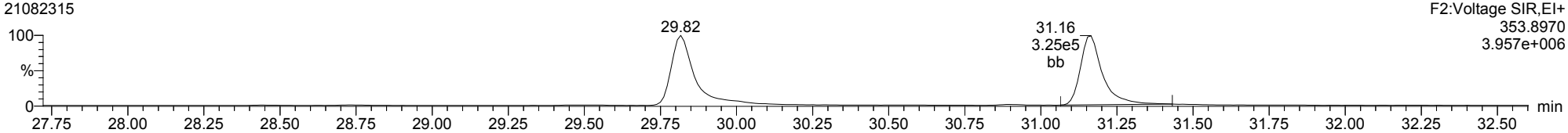

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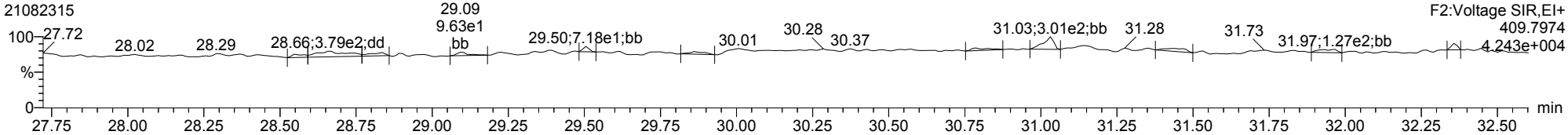

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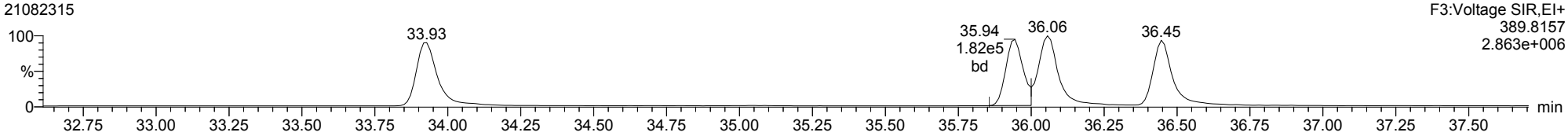
123478-HxCDD



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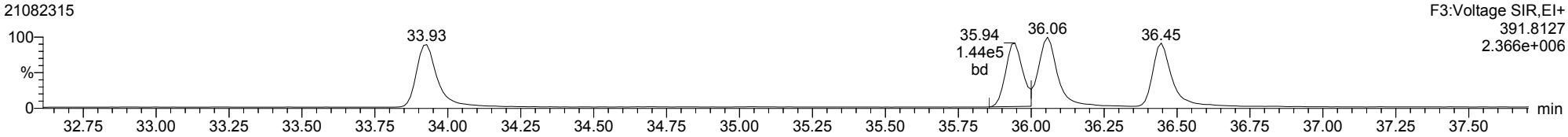

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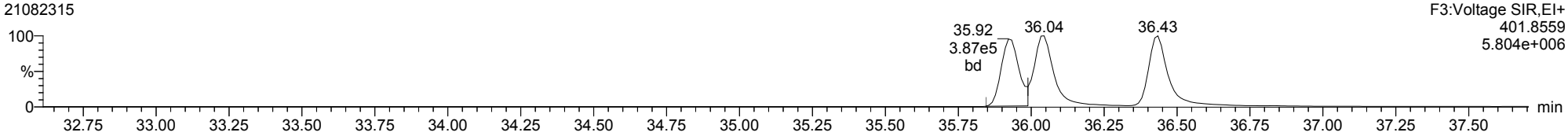

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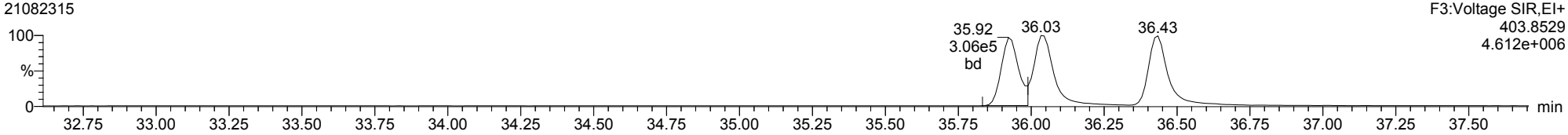

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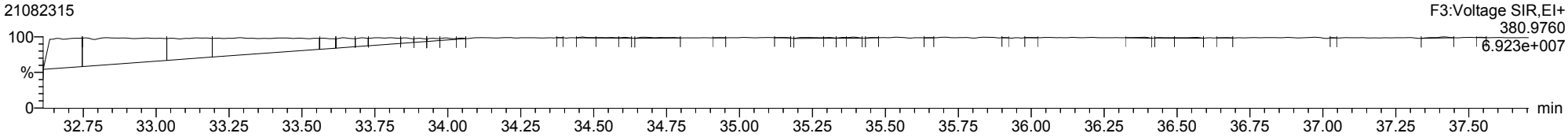

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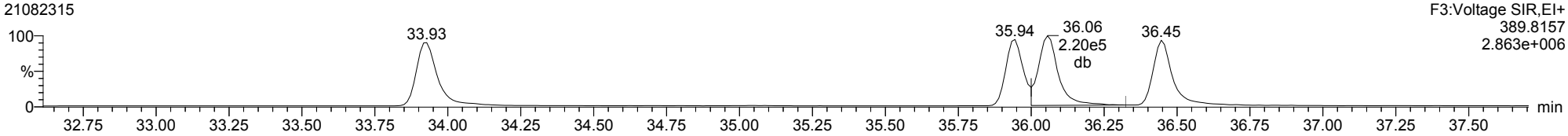
123678-HxCDD



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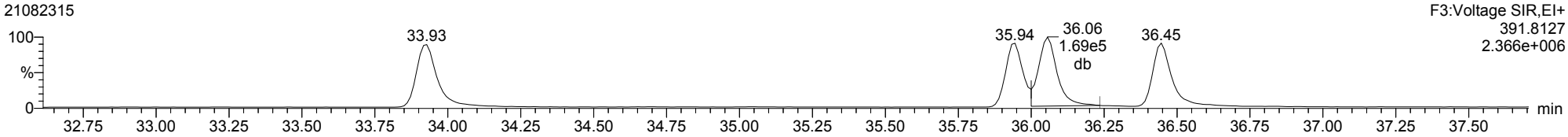

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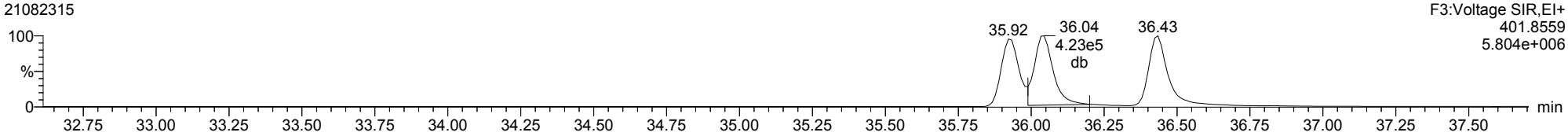

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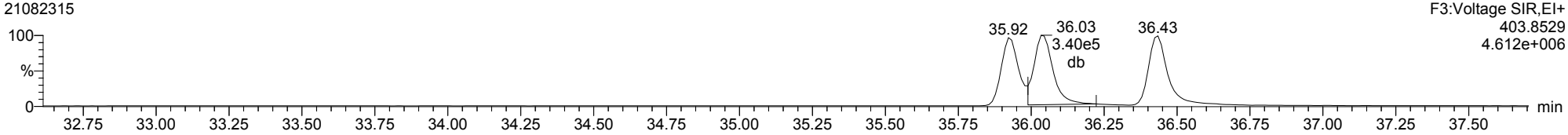

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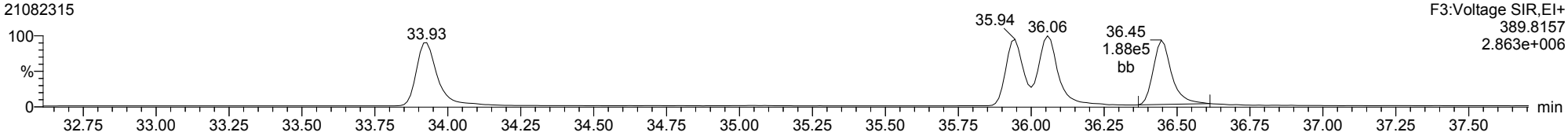

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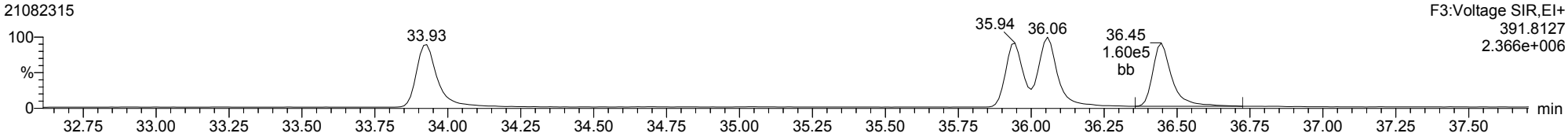

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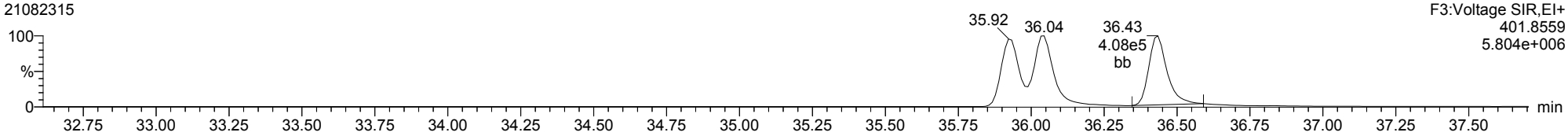

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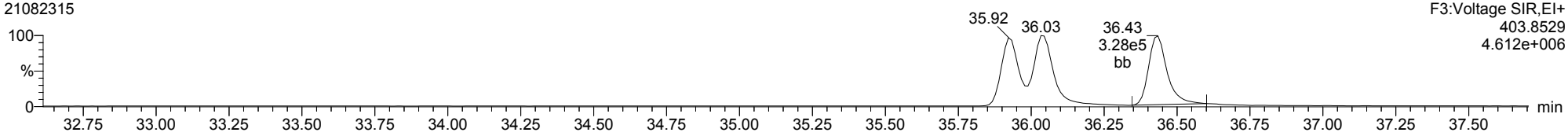

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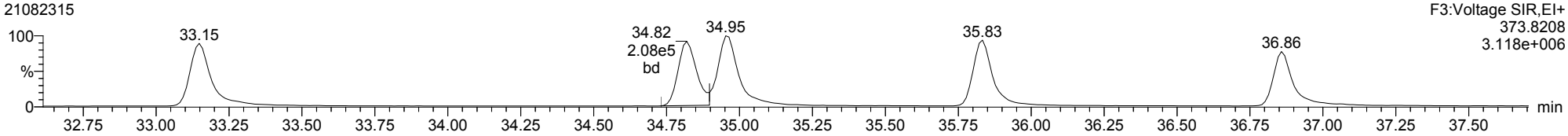

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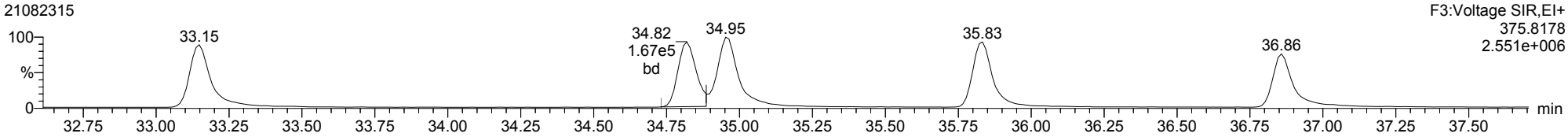

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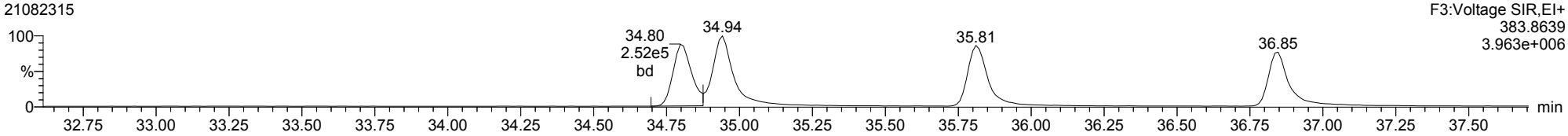

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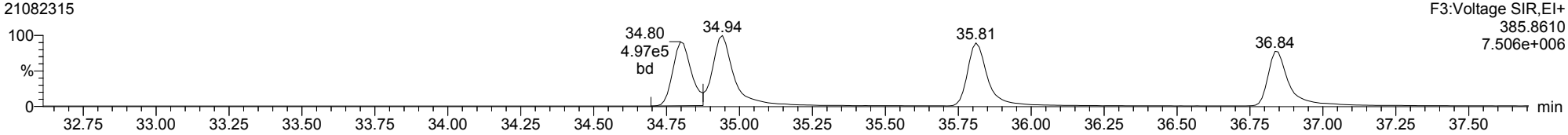

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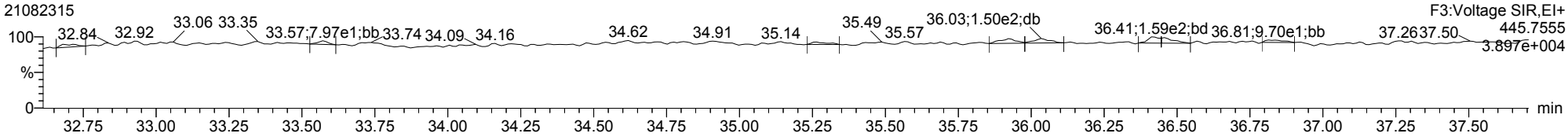

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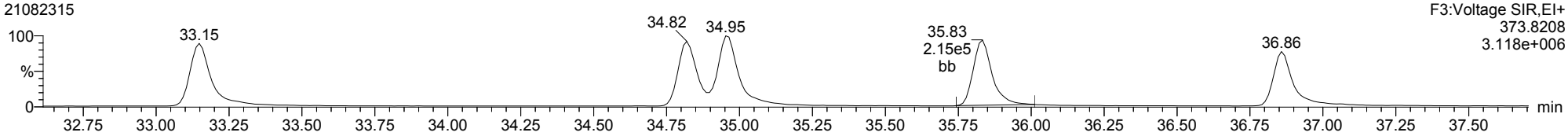

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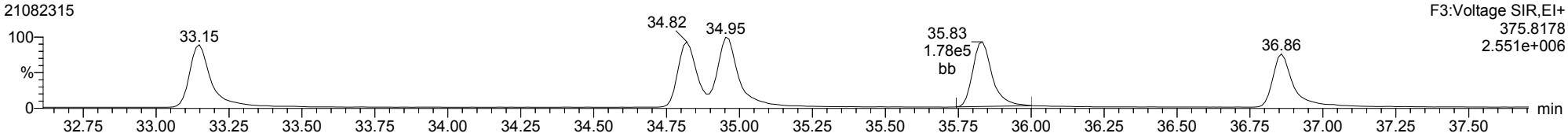

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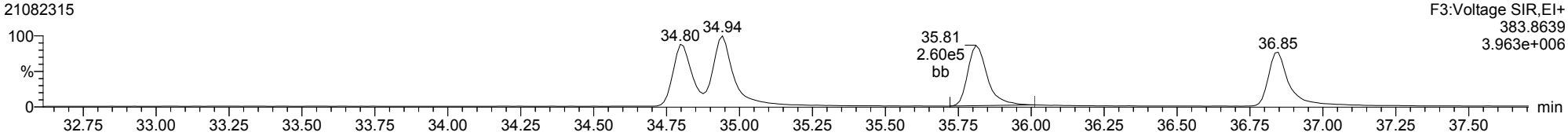

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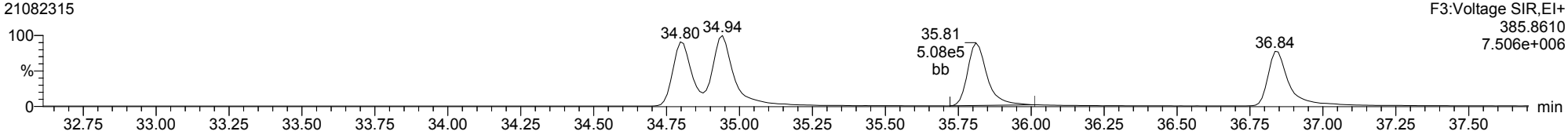

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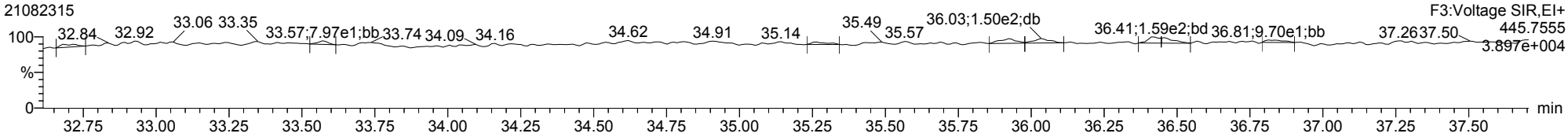

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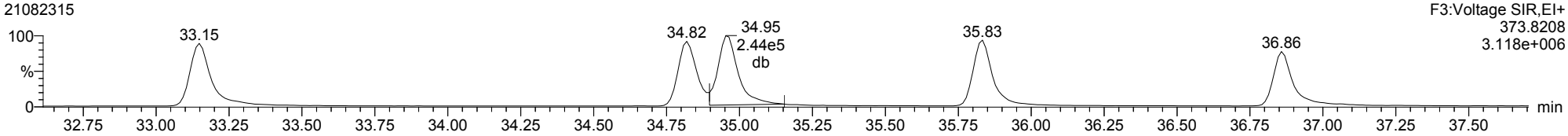

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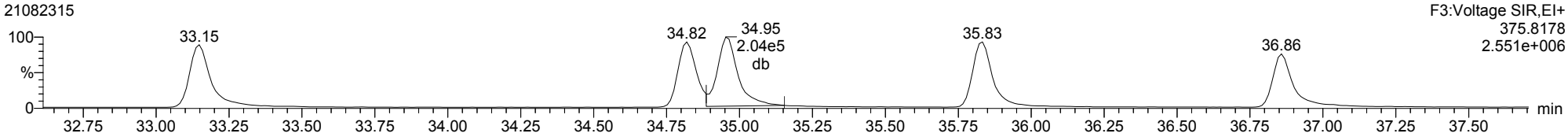

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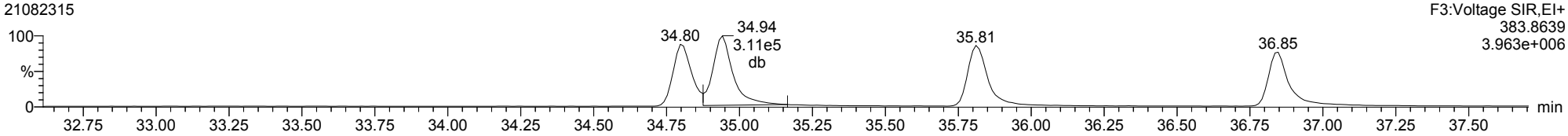

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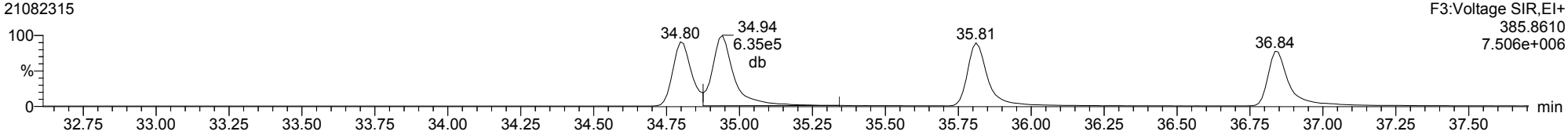

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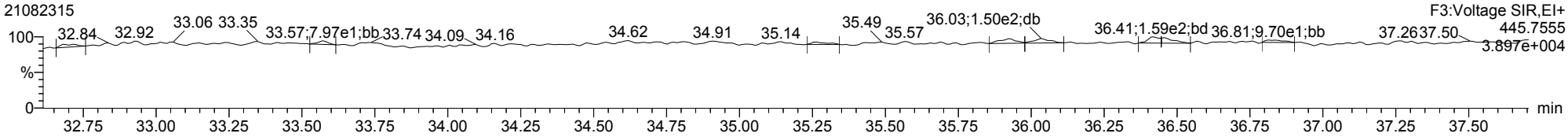

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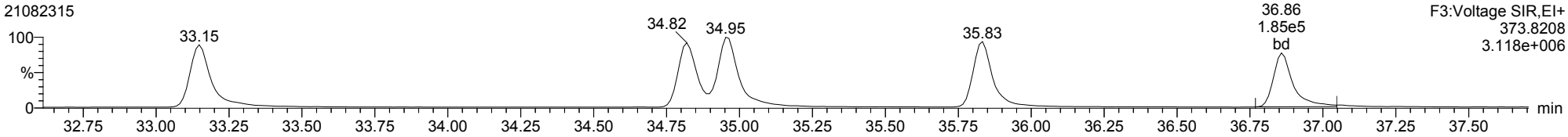

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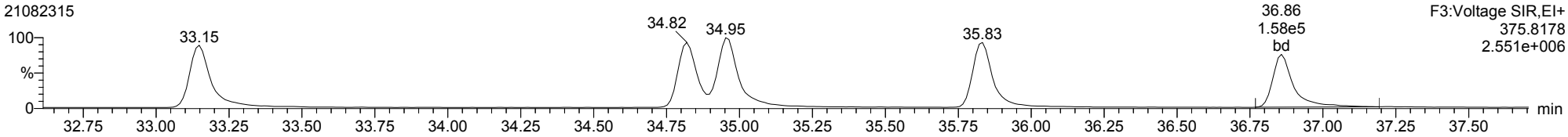

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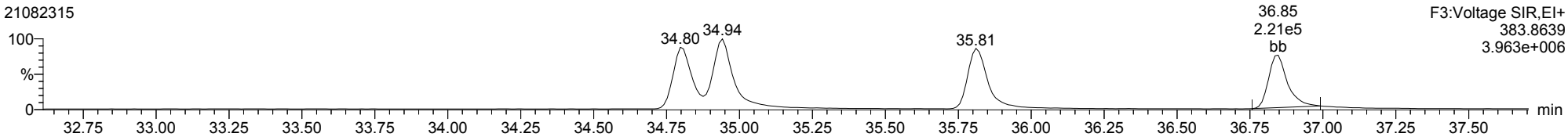

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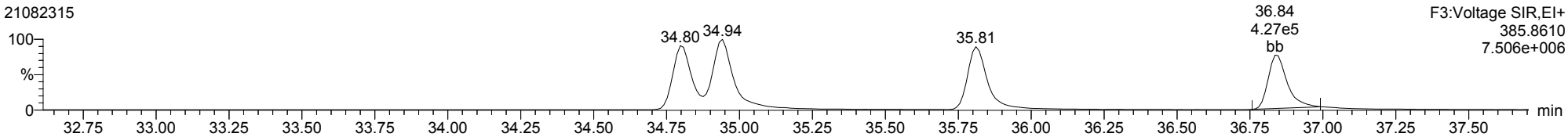

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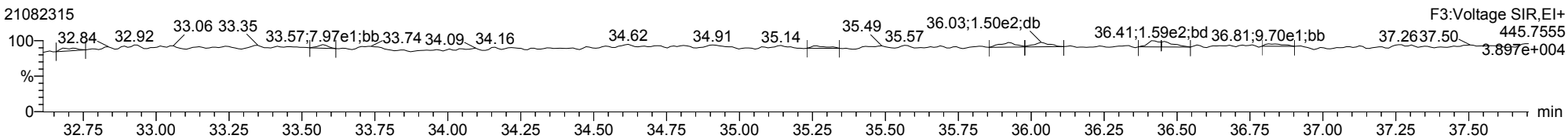

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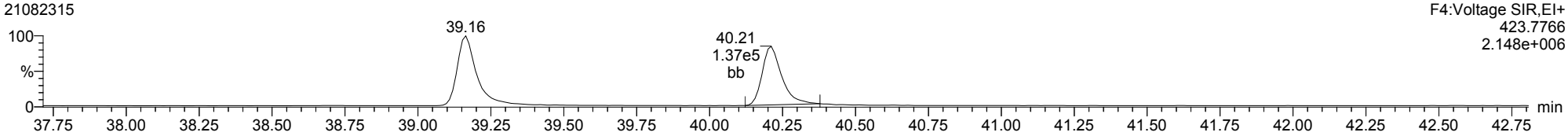

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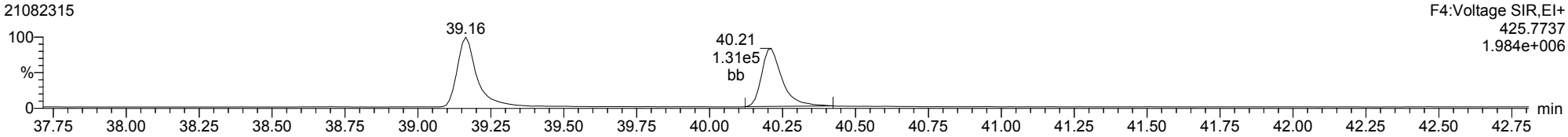

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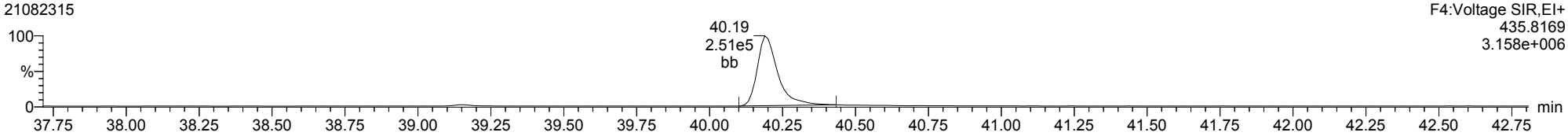

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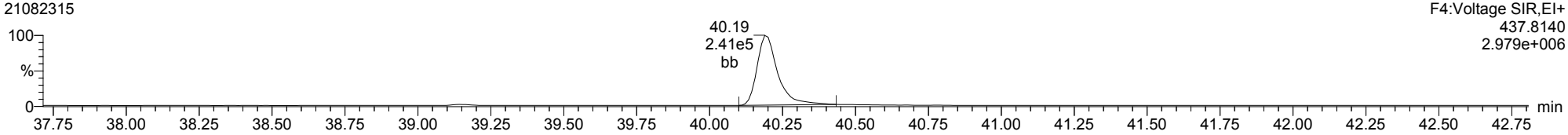
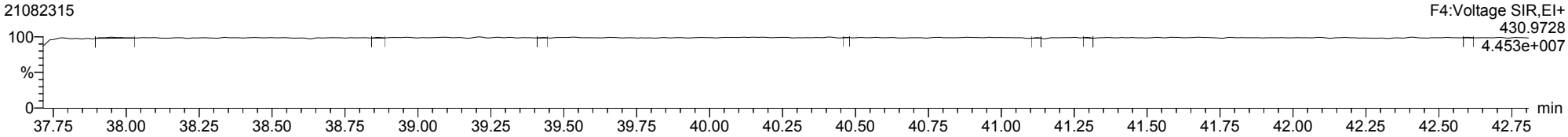


FUNCTION4 PFK



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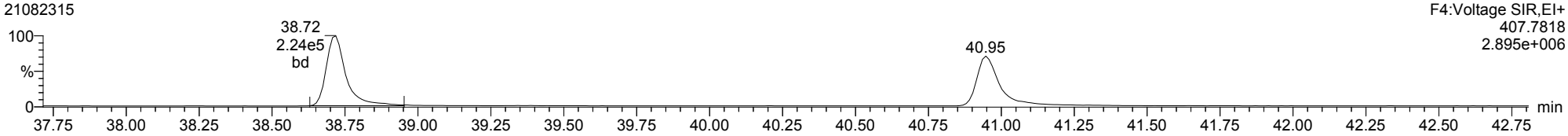

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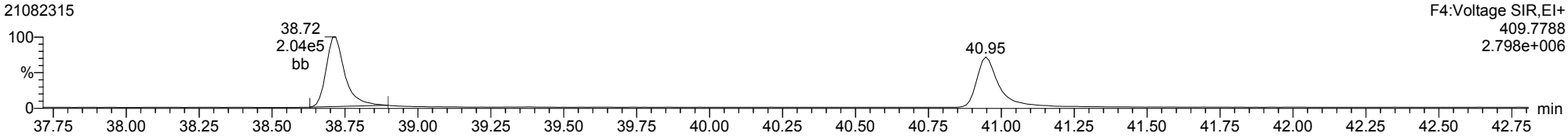

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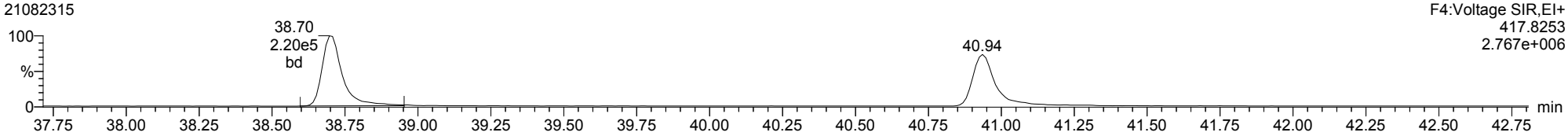

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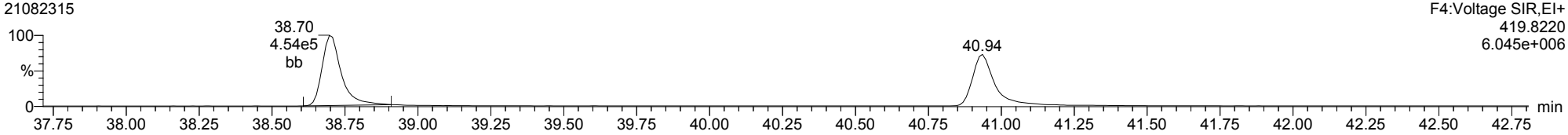

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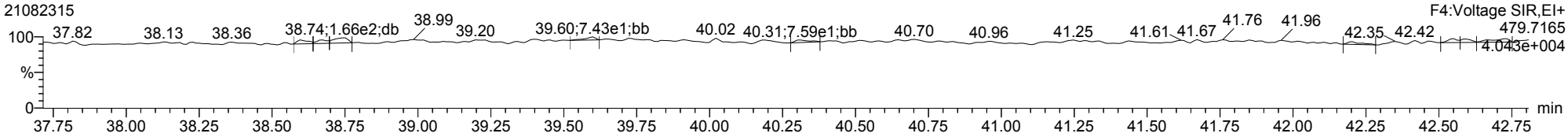

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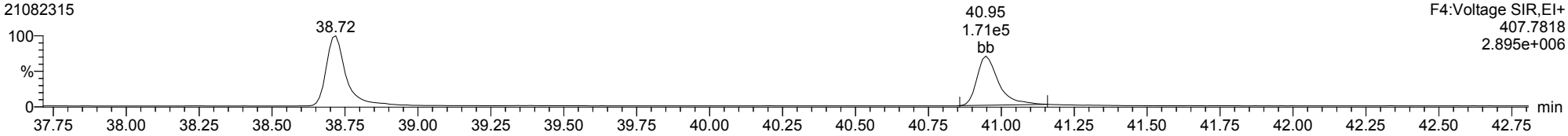

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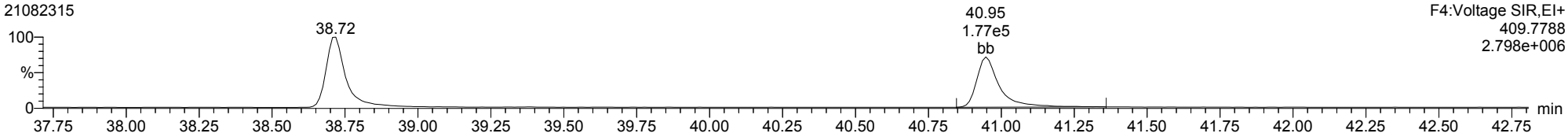

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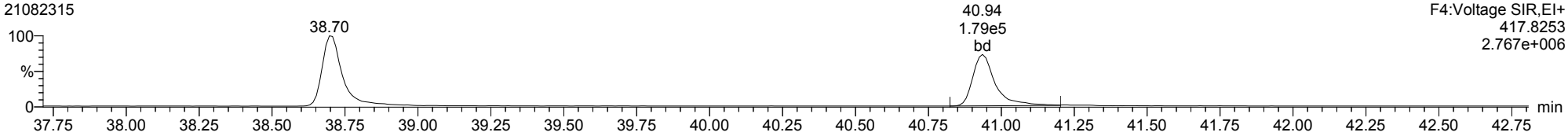

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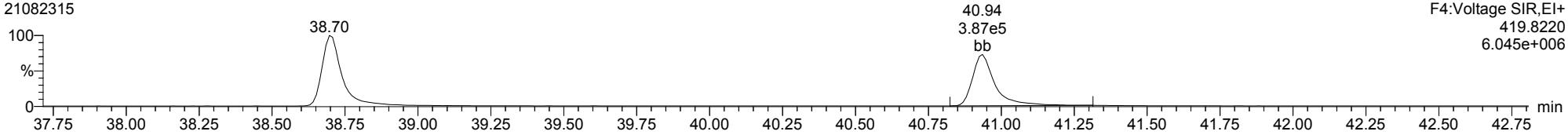

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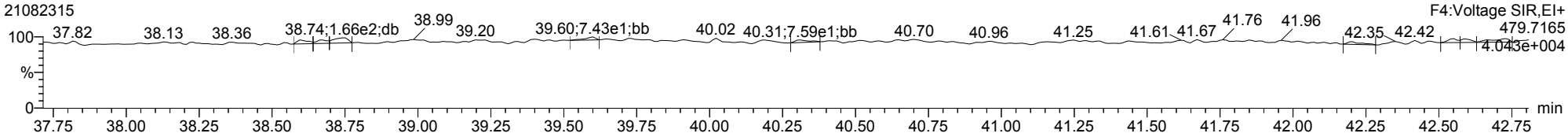

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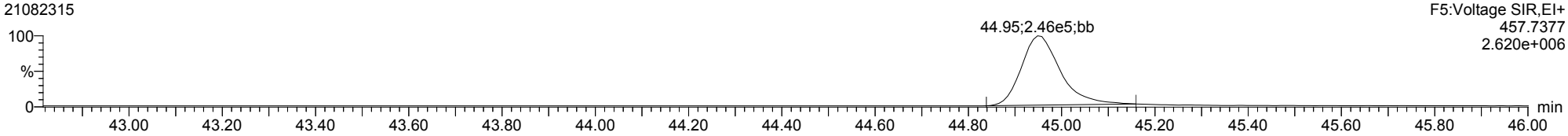

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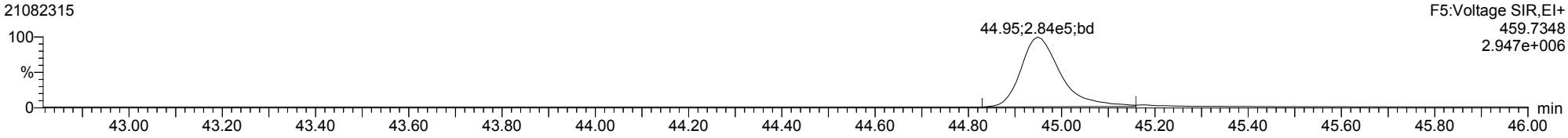

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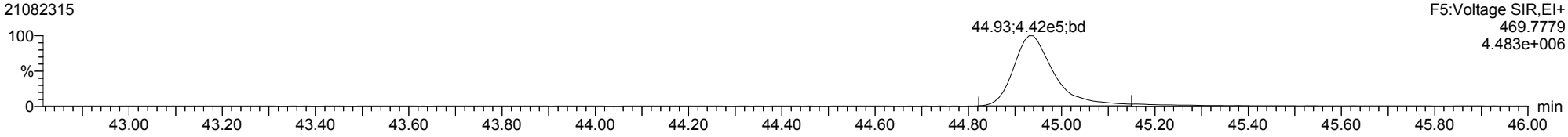

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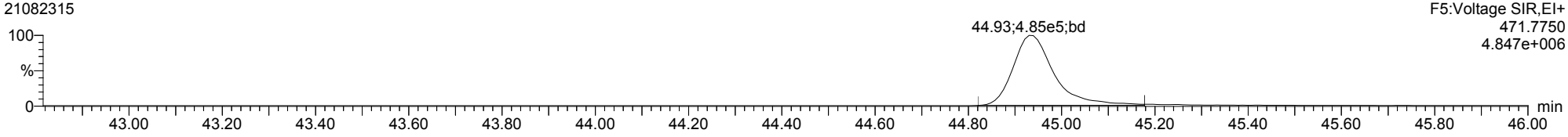

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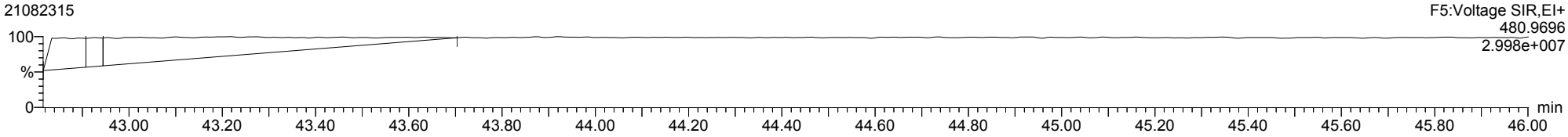

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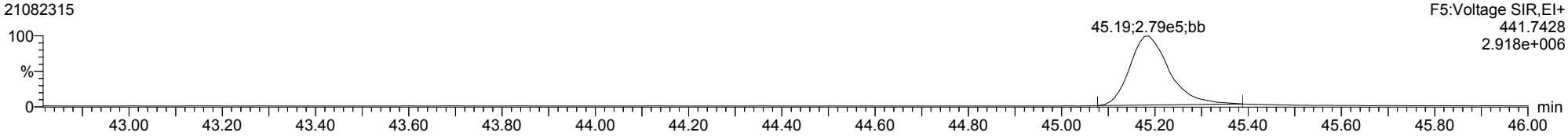
OCDF



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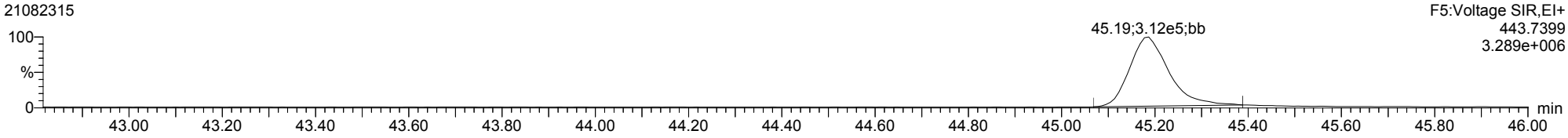
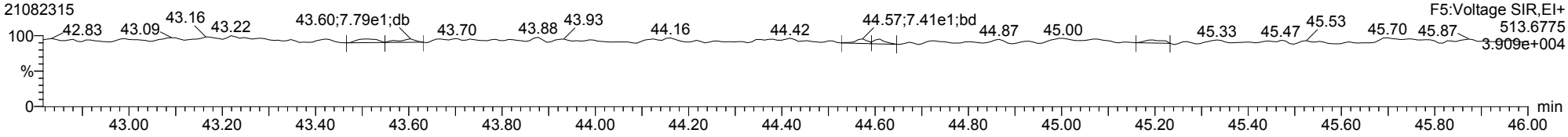


FUNCTION5 DCDPE



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ID: CS3L2, Name: 21082315, Date: 23-Aug-2021, Time: 23:25:09, Conditions: AUTOSPEC01, User: pk

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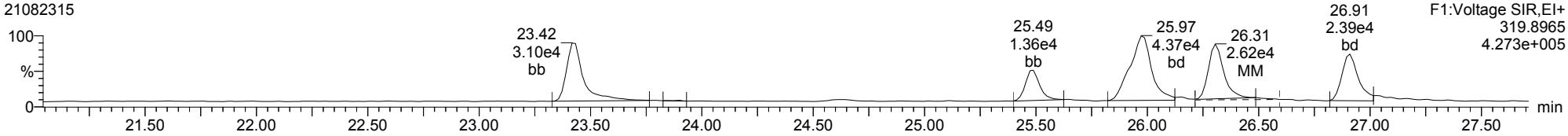
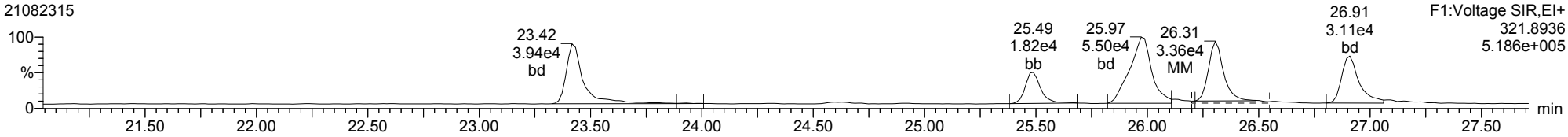


Total-tetradioxins



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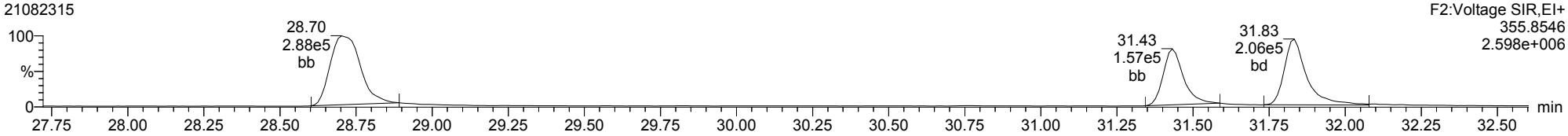

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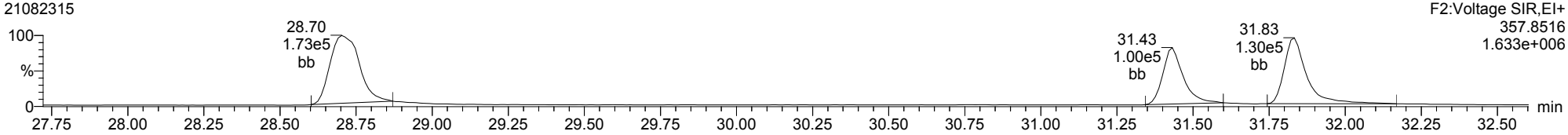

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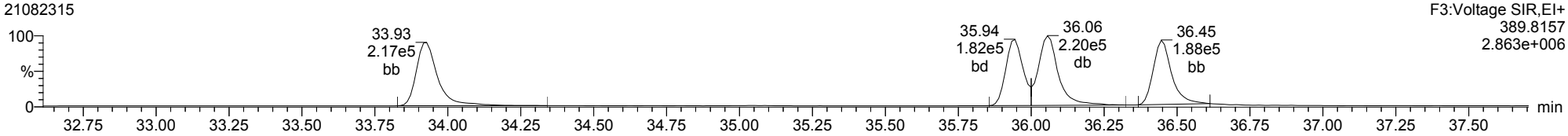
Total-hexadioxins



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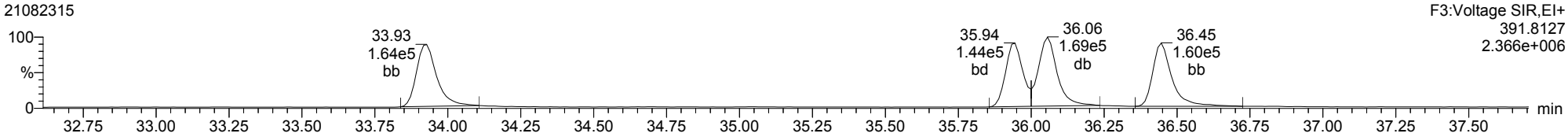

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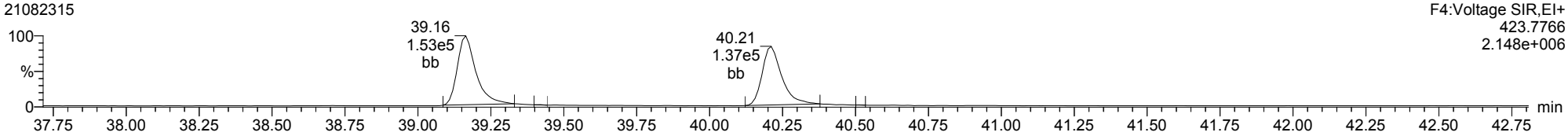

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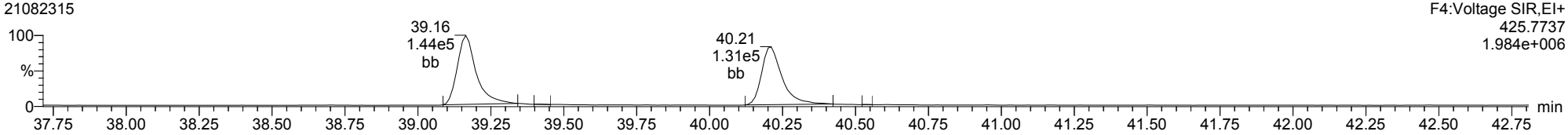
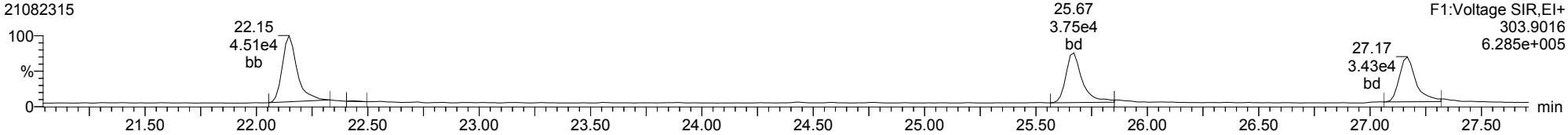


ID: CS3L2, Name: 21082315, Date: 23-Aug-2021, Time: 23:25:09, Conditions: AUTOSPEC01, User: pk

Total-tetrafurans



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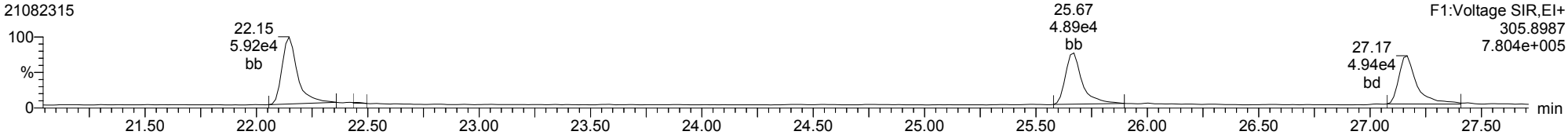

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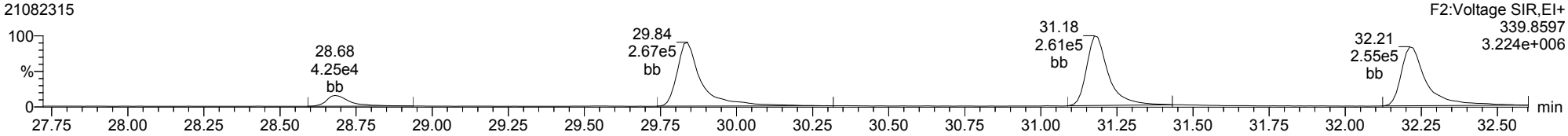
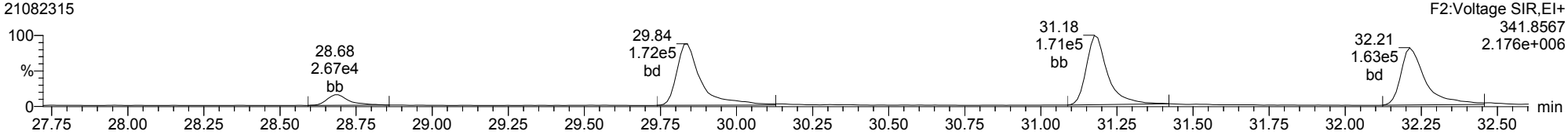


Total-pentafurans



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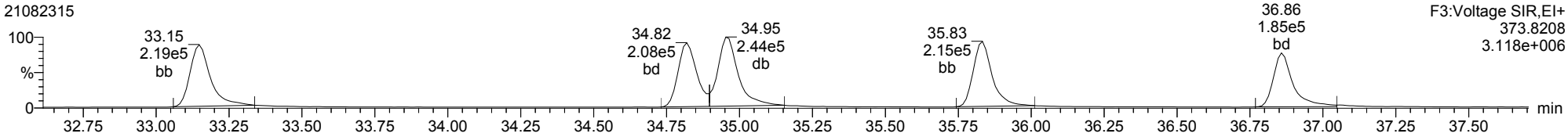
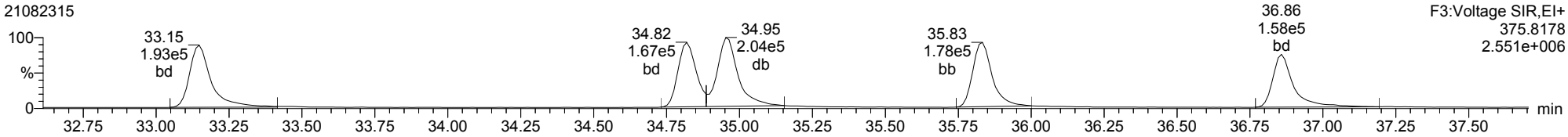
Printed: Tuesday, August 24, 2021 11:27:06 Pacific Daylight Time

ID: CS3L2, Name: 21082315, Date: 23-Aug-2021, Time: 23:25:09, Conditions: AUTOSPEC01, User: pk

Total-hexafurans



Total-hexafurans



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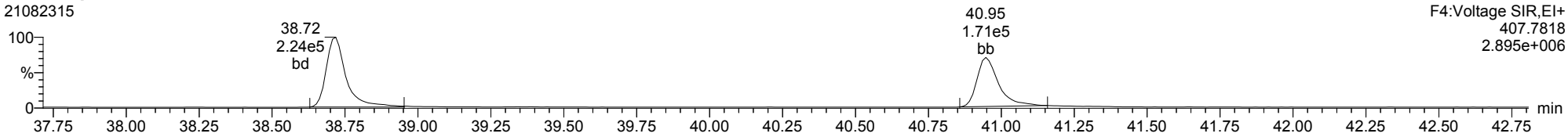
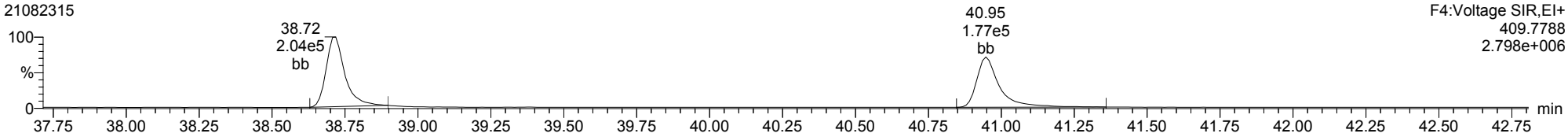


Total-heptafurans



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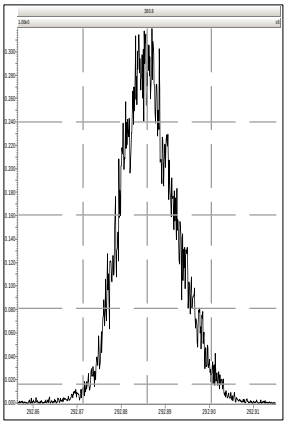

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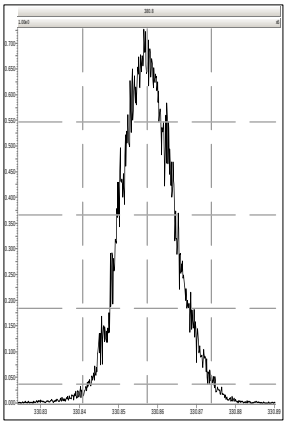
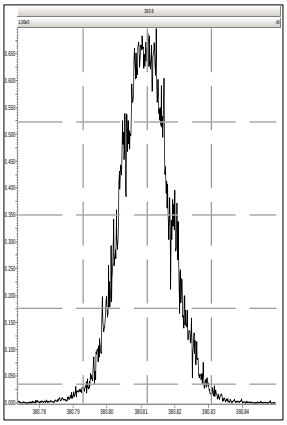
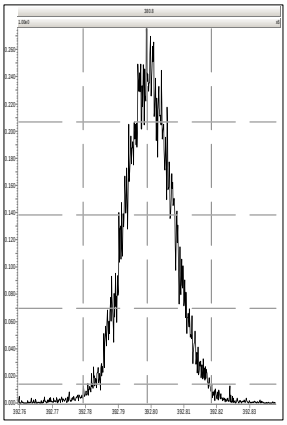


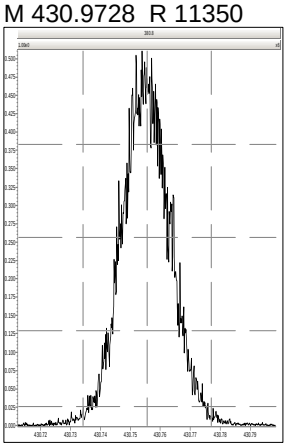
M 380.9760 R 11389



M 392.9760 R 11560



M 430.9728 R 11350



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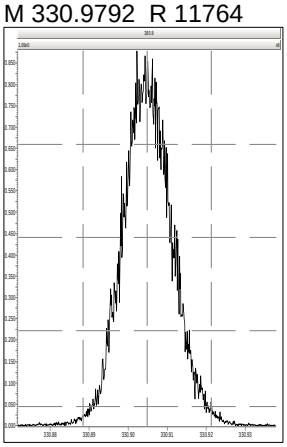

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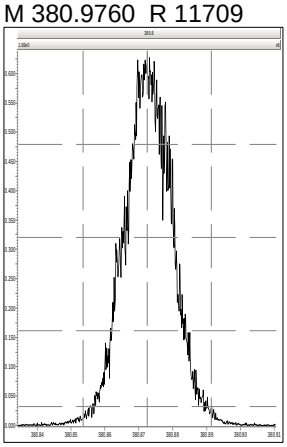
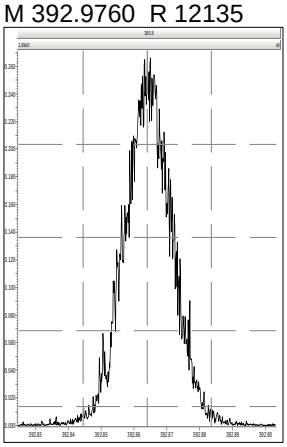
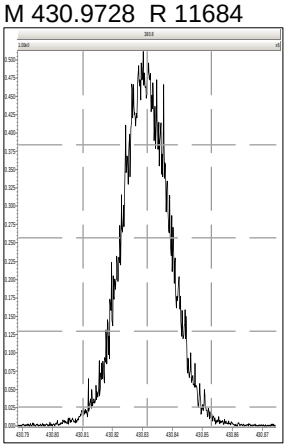


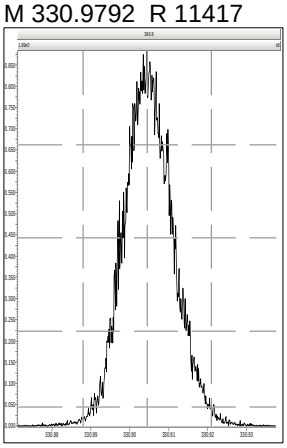
M 392.9760 R 12135



M 430.9728 R 11684



M 330.9792 R 11417



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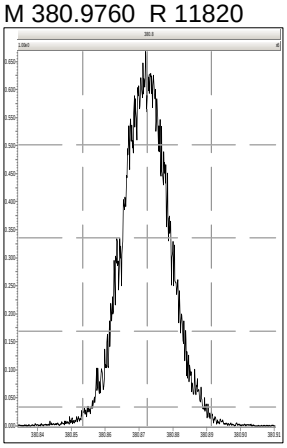
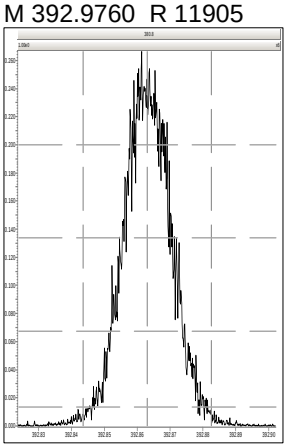
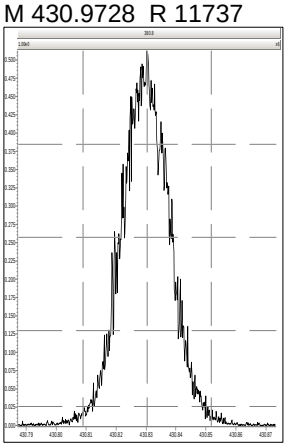


M 392.9760 R 11905



M 430.9728 R 11737



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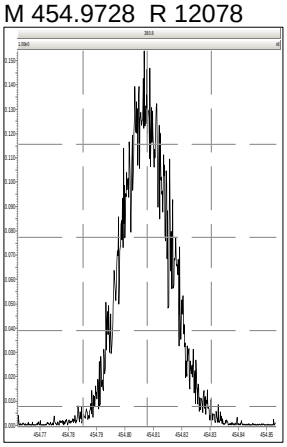
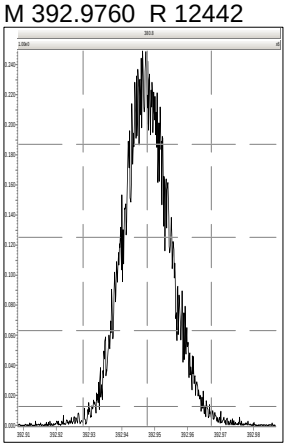
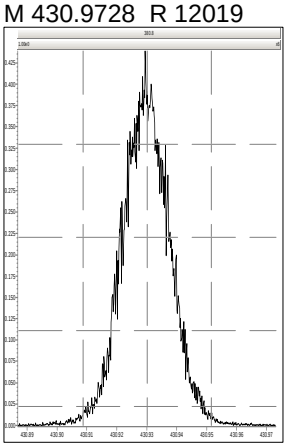


M 392.9760 R 12442



M 430.9728 R 12019



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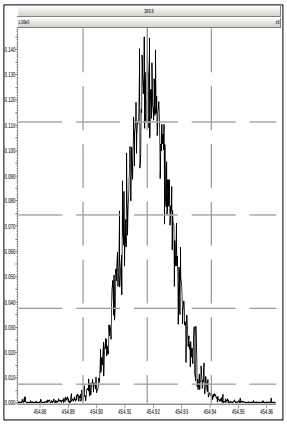
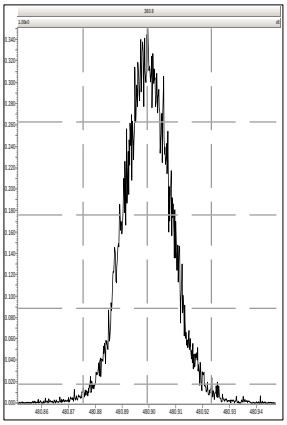
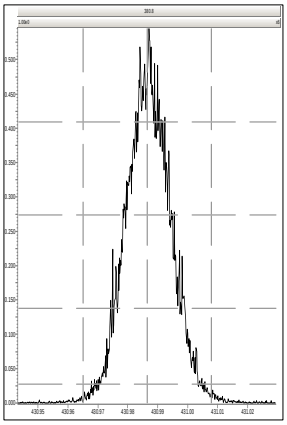
M 454.9728 R 12794



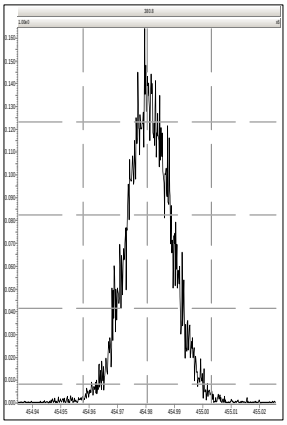
M 480.9696 R 12437



M 430.9728 R 12574



M 454.9728 R 13054



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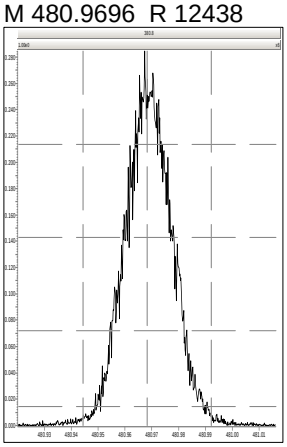
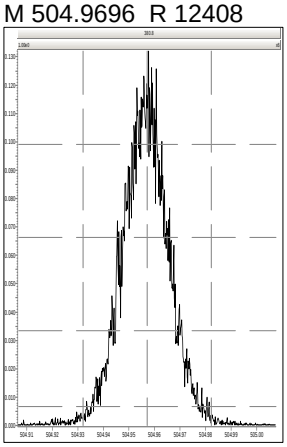
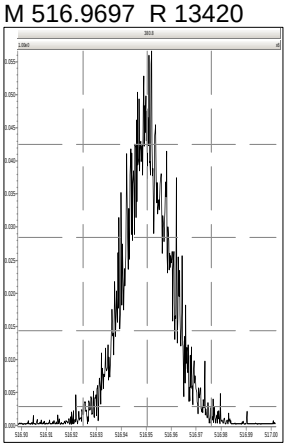


M 504.9696 R 12408



M 516.9697 R 13420



Analytical Resources, Incorporated
Analytical Chemists and Consultants

CDD/CDF CHROMATOGRAPHIC RESOLUTION SUMMARY
EPA 1613B

Lab Name: Analytical Resources, Inc.
SDG: 21G0064
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
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CDD/CDF CHROMATOGRAPHIC RESOLUTION SUMMARY
EPA 1613B

Lab Name: Analytical Resources, Inc.
SDG: 21G0064
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
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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
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CDD/CDF CHROMATOGRAPHIC RESOLUTION SUMMARY
EPA 1613B

Lab Name: Analytical Resources, Inc.
SDG: 21G0064
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
BJG0375-BLK2	Blank	21081911	08/18/2021	18:22
BJG0375-BS2	LCS	21081912	08/18/2021	19:11
SJH0230-CCV1	CS3K2	21081915	08/18/2021	21:38
SJH0230-RES2	ISCK2	21081916	08/18/2021	22:32

Analytical Resources, Incorporated
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CDD/CDF CHROMATOGRAPHIC RESOLUTION SUMMARY
EPA 1613B

Lab Name: Analytical Resources, Inc.
SDG: 21G0064
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
BJG0375-BLK2	Blank	21081911	08/18/2021	18:22
BJG0375-BS2	LCS	21081912	08/18/2021	19:11
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: 21G0064
Instrument .ID: AUTOSPEC01
Lab File ID: 21082303
Date Analyzed: 08/23/21
Time Analyzed: 13:30
Lab Sample ID: SJH0288-RES1
Sequence: SJH0288

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

1278-TCDD/2378-TCDD: 16.9

3467-TCDF/2378-TCDF: 15.9

Quality Control (QC) Limits: ≤ 25%

Lab Sample ID	Sample Name	Lab File ID	Data Analyzed	Time Analyzed
SJH0288-ICV1	CS3L1	21082302	08/23/2021	12:04
SJH0288-RES1	ISCL1	21082303	08/23/2021	13:30
BJG0375-SRM1	Reference	21082304	08/23/2021	14:26
BJG0375-SRM2	Reference	21082305	08/23/2021	15:14
21G0064-10	LDW21-IT507	21082311	08/23/2021	20:08
SJH0288-CCV1	CS3L2	21082315	08/23/2021	23:25

Analytical Resources, Incorporated
Analytical Chemists and Consultants

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
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:	21G0064
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	BJG0375-BLK2	21081911	Solid	08/18/21 18:22
LCS	BJG0375-BS2	21081912	Solid	08/18/21 19:11
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

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0288	Instrument:	AUTOSPEC01
		Calibration:	EH00030

Sample Name	Lab Sample ID	Lab File ID	Matrix	Analysis Date/Time
CS3L1	SJH0288-ICV1	21082302	NA	08/23/21 12:04
ISCL1	SJH0288-RES1	21082303	NA	08/23/21 13:30
Reference	BJG0375-SRM1	21082304	Solid	08/23/21 14:26
Reference	BJG0375-SRM2	21082305	Solid	08/23/21 15:14
LDW21-IT507	21G0064-10	21082311	Solid	08/23/21 20:08
CS3L2	SJH0288-CCV1	21082315	NA	08/23/21 23:25

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Printed: 8/24/2021 12:24:56PM

ANALYSIS SEQUENCE

SJH0288

Instrument: AUTOSPEC01 Element Column ID: J6459
Calibration ID: EH00030 Tune File: AUG2021_1
EM Voltage: 370 Resolution check times : 12:04, 00:18

Lab Number	Sample Name	Analysis	Container	Order	STD ID	ISTD ID	Analyzed	File ID	Analyst	Comments
SJH0288-ICV1	CS3L1	QC		1	J001522		08/23/2021 12:04	21082302	PK	
SJH0288-RES1	ISCL1	QC		2	J005595		08/23/2021 13:30	21082303	PK	
BJG0375-SRM1	Reference	QC		3		J005741	08/23/2021 14:26	21082304	PK	
BJG0375-SRM2	Reference	QC		4		J005741	08/23/2021 15:14	21082305	PK	
BJG0375-DUP1	Duplicate	QC		5		J005741	08/23/2021 16:03	21082306	PK	
BJG0375-DUP2	Duplicate	QC		6		J005741	08/23/2021 16:52	21082307	PK	
21G0133-01	REF21-Comp	8290 Dioxin	C 01	7		J005741	08/23/2021 17:41	21082308	PK	
21F0432-01	WWT21-COMP	8290 Dioxin	C 01	8		J005741	08/23/2021 18:30	21082309	PK	
21F0448-01	F160 Stockpile-1	1613B Dioxin	B 02	9		J005741	08/23/2021 19:19	21082310	PK	
21G0064-10	LDW21-IT507	1613B Dioxin	C 01	10		J005741	08/23/2021 20:08	21082311	PK	
21G0079-10	LDW21-IT603	1613B Dioxin	C 01	11		J005741	08/23/2021 20:57	21082312	PK	
21G0081-03	F160 Stockpile	1613B Dioxin	A 01	12		J005741	08/23/2021 21:46	21082313	PK	
21G0082-12	LDW21-IT647	1613B Dioxin	C 01	13		J005741	08/23/2021 22:36	21082314	PK	
SJH0288-CCV1	CS3L2	QC		14	J001522		08/23/2021 23:25	21082315	PK	

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:10:05 Pacific Daylight Time 8/24/21 pk

Event	Details	Sample ID
Process Extract		
Process Integrate		
Process Quantify		
Dataset Created		
Peak deleted	Sample:21082304, Compound:HD, RT:33.672	1
Pre modification peak	Sample:21082304, Compound:HD, RT:36.468	1
Peak modified	Sample:21082304, Compound:HD, RT:36.468	1
Pre modification peak	Sample:21082304, Compound:HF, RT:34.953	1
Peak modified	Sample:21082304, Compound:HF, RT:34.953	1
Pre modification peak	Sample:21082304, Compound:HF, RT:35.855	1
Peak modified	Sample:21082304, Compound:HF, RT:35.855	1
Peak added	Sample:21082304, Compound:HF, RT:36.858	1
Peak added	Sample:21082304, Compound:HF, RT:36.858	1
Pre modification peak	Sample:21082304, Compound:HF, RT:36.858	1
Peak modified	Sample:21082304, Compound:HF, RT:36.858	1
Peak modified	Sample:21082304, Compound:HF, RT:36.858	1
Peak deleted	Sample:21082304, Compound:HPD, RT:40.568	1
Peak deleted	Sample:21082304, Compound:PF, RT:28.703	1
Peak deleted	Sample:21082304, Compound:PF, RT:29.483	1
Pre modification peak	Sample:21082304, Compound:PF, RT:29.839	1
Peak modified	Sample:21082304, Compound:PF, RT:29.839	1
Peak deleted	Sample:21082304, Compound:PF, RT:31.031	1
Peak deleted	Sample:21082304, Compound:TD, RT:25.534	1
Peak deleted	Sample:21082304, Compound:TF, RT:22.434	1
Peak deleted	Sample:21082304, Compound:TF, RT:23.009	1
Peak deleted	Sample:21082304, Compound:TF, RT:23.417	1
Peak deleted	Sample:21082304, Compound:TF, RT:25.186	1
Pre modification peak	Sample:21082304, Compound:TF, RT:25.670	1
Peak modified	Sample:21082304, Compound:TF, RT:25.670	1
Peak deleted	Sample:21082304, Compound:TF, RT:27.288	1
Peak added	Sample:21082305, Compound:13C-1234678-HpCDD, RT:40.256	2
Peak added	Sample:21082305, Compound:13C-1234678-HpCDD, RT:40.256	2
Peak added	Sample:21082305, Compound:13C-123789-HxCDD, RT:36.669	2
Peak added	Sample:21082305, Compound:13C-123789-HxCDD, RT:36.669	2
Peak added	Sample:21082305, Compound:13C-123789-HxCDD, RT:36.669	2
Peak added	Sample:21082305, Compound:13C-123789-HxCDD, RT:36.669	2
Peak deleted	Sample:21082305, Compound:HD, RT:33.705	2
Peak deleted	Sample:21082305, Compound:HPD, RT:39.855	2
Peak added	Sample:21082305, Compound:PD, RT:30.285	2
Peak added	Sample:21082305, Compound:PD, RT:30.296	2
Peak deleted	Sample:21082306, Compound:HF, RT:32.836	3
Peak deleted	Sample:21082306, Compound:HF, RT:34.953	3
Pre modification peak	Sample:21082306, Compound:OF, RT:45.206	3
Peak modified	Sample:21082306, Compound:OF, RT:45.206	3
Pre modification peak	Sample:21082306, Compound:PD, RT:30.363	3
Peak modified	Sample:21082306, Compound:PD, RT:30.363	3
Pre modification peak	Sample:21082306, Compound:PD, RT:30.374	3
Peak modified	Sample:21082306, Compound:PD, RT:30.374	3
Peak deleted	Sample:21082306, Compound:PF, RT:29.817	3
Peak deleted	Sample:21082306, Compound:PF, RT:29.850	3
Peak deleted	Sample:21082307, Compound:HPF, RT:39.699	4
Pre modification peak	Sample:21082307, Compound:PD, RT:31.432	4
Peak modified	Sample:21082307, Compound:PD, RT:31.432	4
Pre modification peak	Sample:21082307, Compound:TD, RT:26.320	4
Peak modified	Sample:21082307, Compound:TD, RT:26.320	4

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:10:05 Pacific Daylight Time

Event	Details	Sample ID
Pre modification peak	Sample:21082307, Compound:TF, RT:25.443	4
Peak modified	Sample:21082307, Compound:TF, RT:25.443	4
Pre modification peak	Sample:21082307, Compound:TF, RT:25.473	4
Peak modified	Sample:21082307, Compound:TF, RT:25.473	4
Peak deleted	Sample:21082308, Compound:OF, RT:45.169	5
Peak deleted	Sample:21082308, Compound:OF, RT:45.178	5
Peak deleted	Sample:21082308, Compound:TD, RT:24.249	5
Peak deleted	Sample:21082308, Compound:TD, RT:25.111	5
Peak deleted	Sample:21082309, Compound:HF, RT:34.808	6
Peak deleted	Sample:21082309, Compound:HF, RT:35.811	6
Peak deleted	Sample:21082309, Compound:HPF, RT:38.908	6
Peak deleted	Sample:21082309, Compound:HPF, RT:39.354	6
Peak deleted	Sample:21082309, Compound:OF, RT:45.160	6
Peak deleted	Sample:21082309, Compound:TF, RT:23.946	6
Peak deleted	Sample:21082309, Compound:TF, RT:24.264	6
Peak deleted	Sample:21082310, Compound:HD, RT:36.412	7
Peak deleted	Sample:21082310, Compound:HF, RT:34.808	7
Peak deleted	Sample:21082310, Compound:HF, RT:35.810	7
Pre modification peak	Sample:21082310, Compound:HPD, RT:40.244	7
Peak modified	Sample:21082310, Compound:HPD, RT:40.244	7
Pre modification peak	Sample:21082310, Compound:OD, RT:44.958	7
Peak modified	Sample:21082310, Compound:OD, RT:44.958	7
Pre modification peak	Sample:21082310, Compound:OF, RT:45.205	7
Peak modified	Sample:21082310, Compound:OF, RT:45.205	7
Peak deleted	Sample:21082310, Compound:PF, RT:31.187	7
Peak modified	Sample:21082311, Compound:HF, RT:35.811	8
Pre modification peak	Sample:21082311, Compound:HF, RT:35.833	8
Peak modified	Sample:21082311, Compound:HF, RT:35.833	8
Pre modification peak	Sample:21082311, Compound:HF, RT:35.844	8
Peak modified	Sample:21082311, Compound:HF, RT:35.844	8
Peak deleted	Sample:21082311, Compound:HPD, RT:40.412	8
Peak added	Sample:21082311, Compound:PF, RT:28.781	8
Peak added	Sample:21082311, Compound:PF, RT:28.781	8
Pre modification peak	Sample:21082311, Compound:PF, RT:29.839	8
Peak modified	Sample:21082311, Compound:PF, RT:29.839	8
Peak added	Sample:21082312, Compound:PF, RT:29.493	9
Peak modified	Sample:21082312, Compound:PF, RT:29.493	9
Peak added	Sample:21082312, Compound:PF, RT:29.505	9
Pre modification peak	Sample:21082312, Compound:PF, RT:29.505	9
Peak modified	Sample:21082312, Compound:PF, RT:29.505	9
Pre modification peak	Sample:21082312, Compound:PF, RT:29.549	9
Peak modified	Sample:21082312, Compound:PF, RT:29.549	9
Pre modification peak	Sample:21082312, Compound:PF, RT:29.572	9
Peak modified	Sample:21082312, Compound:PF, RT:29.572	9
Peak deleted	Sample:21082312, Compound:TD, RT:26.335	9
Peak deleted	Sample:21082312, Compound:TF, RT:22.283	9
Peak deleted	Sample:21082313, Compound:HD, RT:36.379	10
Peak deleted	Sample:21082313, Compound:HD, RT:36.457	10
Peak deleted	Sample:21082313, Compound:HF, RT:34.752	10
Pre modification peak	Sample:21082313, Compound:OD, RT:44.949	10
Peak modified	Sample:21082313, Compound:OD, RT:44.949	10
Peak deleted	Sample:21082313, Compound:OF, RT:44.939	10
Peak deleted	Sample:21082313, Compound:OF, RT:45.022	10
Peak deleted	Sample:21082313, Compound:OF, RT:45.049	10
Peak deleted	Sample:21082313, Compound:OF, RT:45.049	10

Dataset: T:\Autospec\Processed Data Batch\210823D.qld
Last Altered: Tuesday, August 24, 2021 10:49:21 Pacific Daylight Time
Printed: Tuesday, August 24, 2021 11:10:05 Pacific Daylight Time

Event	Details	Sample ID
Peak deleted	Sample:21082313, Compound:OF, RT:45.104	10
Peak deleted	Sample:21082313, Compound:OF, RT:45.196	10
Peak deleted	Sample:21082313, Compound:TD, RT:26.154	10
Peak deleted	Sample:21082313, Compound:TD, RT:26.275	10
Pre modification peak	Sample:21082314, Compound:HF, RT:35.800	11
Peak modified	Sample:21082314, Compound:HF, RT:35.800	11
Pre modification peak	Sample:21082314, Compound:PF, RT:29.828	11
Peak modified	Sample:21082314, Compound:PF, RT:29.828	11
Pre modification peak	Sample:21082314, Compound:PF, RT:29.861	11
Peak modified	Sample:21082314, Compound:PF, RT:29.861	11
Pre modification peak	Sample:21082314, Compound:PF, RT:31.198	11
Peak modified	Sample:21082314, Compound:PF, RT:31.198	11
Peak deleted	Sample:21082314, Compound:TD, RT:23.417	11
Peak deleted	Sample:21082314, Compound:TD, RT:24.188	11
Peak deleted	Sample:21082314, Compound:TD, RT:25.186	11
Peak deleted	Sample:21082314, Compound:TD, RT:25.307	11
Peak deleted	Sample:21082314, Compound:TD, RT:26.305	11
Peak deleted	Sample:21082314, Compound:TF, RT:22.283	11
Peak deleted	Sample:21082314, Compound:TF, RT:22.631	11
Peak deleted	Sample:21082314, Compound:TF, RT:23.221	11
Peak deleted	Sample:21082314, Compound:TF, RT:24.022	11
Peak deleted	Sample:21082314, Compound:TF, RT:24.975	11
Peak deleted	Sample:21082314, Compound:TF, RT:25.292	11
Peak deleted	Sample:21082314, Compound:TF, RT:27.273	11
Pre modification peak	Sample:21082315, Compound:TD, RT:26.305	12
Peak modified	Sample:21082315, Compound:TD, RT:26.305	12
Pre modification peak	Sample:21082315, Compound:TD, RT:26.305	12
Peak modified	Sample:21082315, Compound:TD, RT:26.305	12
Dataset Saved	Saved to 'T:\Autospec\Processed Data Batch\210823D.qld'	
Dataset Saved	Saved to 'T:\Autospec\Processed Data Batch\210823D.qld'	
Dataset Saved	Saved to 'T:\Autospec\Processed Data Batch\210823D.qld'	

Analytical Resources, Incorporated
Analytical Chemists and Consultants

SURROGATE RECOVERY AND RT SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
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:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0230	Instrument:	AUTOSPEC01
Sample ID:	BJG0375-BLK2	Calibration:	EH00030
File ID:	21081911	Analyzed:	08/18/21 18:22

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	30.3	24 - 169	25.6398	25.63973	0.0001	N/A	
13C12-2,3,7,8-TCDD	200.00	43.2	25 - 164	26.2748	26.27478	0.0000	N/A	
13C12-1,2,3,7,8-PeCDF	200.00	68.5	24 - 185	29.7947	29.80383	-0.0091	N/A	
13C12-2,3,4,7,8-PeCDF	200.00	66.3	21 - 178	31.1427	31.14815	-0.0054	N/A	
13C12-1,2,3,7,8-PeCDD	200.00	76.0	25 - 181	31.399	31.40067	-0.0017	N/A	
13C12-1,2,3,4,7,8-HxCDF	200.00	78.6	26 - 152	34.7748	34.782	-0.0072	N/A	
13C12-1,2,3,6,7,8-HxCDF	200.00	77.5	26 - 123	34.9197	34.91943	0.0003	N/A	
13C12-2,3,4,6,7,8-HxCDF	200.00	76.6	28 - 136	35.7887	35.7884	0.0003	N/A	
13C12-1,2,3,7,8,9-HxCDF	200.00	81.6	29 - 147	36.825	36.8227	0.0023	N/A	
13C12-1,2,3,4,7,8-HxCDD	200.00	84.1	32 - 141	35.9112	35.90912	0.0021	N/A	
13C12-1,2,3,6,7,8-HxCDD	200.00	79.8	28 - 130	36.0227	36.0242	-0.0015	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	200.00	78.1	28 - 143	38.6745	38.67025	0.0042	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	200.00	81.3	26 - 138	40.9137	40.90587	0.0078	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	200.00	89.9	23 - 140	40.1783	40.16678	0.0115	N/A	
13C12-OCDD	400.00	95.7	17 - 157	44.9035	44.88763	0.0159	N/A	
37Cl4-2,3,7,8-TCDD	80.000	41.7	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:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0230	Instrument:	AUTOSPEC01
Sample ID:	BJG0375-BS2	Calibration:	EH00030
File ID:	21081912	Analyzed:	08/18/21 19:11

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	34.5	24 - 169	25.6398	25.63973	0.0001	N/A	
13C12-2,3,7,8-TCDD	200.00	46.5	25 - 164	26.2748	26.27478	0.0000	N/A	
13C12-1,2,3,7,8-PeCDF	200.00	67.6	24 - 185	29.8058	29.80383	0.0020	N/A	
13C12-2,3,4,7,8-PeCDF	200.00	68.4	21 - 178	31.1538	31.14815	0.0056	N/A	
13C12-1,2,3,7,8-PeCDD	200.00	76.0	25 - 181	31.3988	31.40067	-0.0019	N/A	
13C12-1,2,3,4,7,8-HxCDF	200.00	78.1	26 - 152	34.786	34.782	0.0040	N/A	
13C12-1,2,3,6,7,8-HxCDF	200.00	78.8	26 - 123	34.9308	34.91943	0.0114	N/A	
13C12-2,3,4,6,7,8-HxCDF	200.00	83.2	28 - 136	35.7998	35.7884	0.0114	N/A	
13C12-1,2,3,7,8,9-HxCDF	200.00	86.1	29 - 147	36.8248	36.8227	0.0021	N/A	
13C12-1,2,3,4,7,8-HxCDD	200.00	82.4	32 - 141	35.9112	35.90912	0.0021	N/A	
13C12-1,2,3,6,7,8-HxCDD	200.00	82.0	28 - 130	36.0337	36.0242	0.0095	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	200.00	85.4	28 - 143	38.6855	38.67025	0.0152	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	200.00	86.0	26 - 138	40.9137	40.90587	0.0078	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	200.00	97.1	23 - 140	40.1783	40.16678	0.0115	N/A	
13C12-OCDD	400.00	110	17 - 157	44.9128	44.88763	0.0252	N/A	
37Cl4-2,3,7,8-TCDD	80.000	44.4	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:	21G0064
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

SURROGATE RECOVERY AND RT SUMMARY

EPA 1613B

Laboratory:	Analytical Resources, Inc.	SDG:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0288	Instrument:	AUTOSPEC01
Sample ID:	SJH0288-ICV1	Calibration:	EH00030
File ID:	21082302	Analyzed:	08/23/21 12:04

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	102	71 - 129	25.6698	25.63973	0.0301	N/A	
13C12-2,3,7,8-TCDD	100.00	96.3	82 - 118	26.305	26.27478	0.0302	N/A	
13C12-1,2,3,7,8-PeCDF	100.00	105	76 - 124	29.8278	29.80383	0.0240	N/A	
13C12-2,3,4,7,8-PeCDF	100.00	104	77 - 123	31.1758	31.14815	0.0276	N/A	
13C12-1,2,3,7,8-PeCDD	100.00	101	62 - 138	31.4322	31.40067	0.0315	N/A	
13C12-1,2,3,4,7,8-HxCDF	100.00	93.2	76 - 124	34.808	34.782	0.0260	N/A	
13C12-1,2,3,6,7,8-HxCDF	100.00	94.0	70 - 130	34.9528	34.91943	0.0334	N/A	
13C12-2,3,4,6,7,8-HxCDF	100.00	90.6	73 - 127	35.8218	35.7884	0.0334	N/A	
13C12-1,2,3,7,8,9-HxCDF	100.00	94.2	74 - 126	36.8468	36.8227	0.0241	N/A	
13C12-1,2,3,4,7,8-HxCDD	100.00	100	85 - 115	35.9332	35.90912	0.0241	N/A	
13C12-1,2,3,6,7,8-HxCDD	100.00	101	85 - 115	36.0447	36.0242	0.0205	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	100.00	107	78 - 122	38.7073	38.67025	0.0370	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	100.00	109	77 - 123	40.9355	40.90587	0.0296	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	100.00	105	72 - 128	40.2002	40.16678	0.0334	N/A	
13C12-OCDD	200.00	118	48 - 152	44.9397	44.88763	0.0521	N/A	
37Cl4-2,3,7,8-TCDD	10.000	91.8	0 - 200	26.32	26.30253	0.0175	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:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0288	Instrument:	AUTOSPEC01
Sample ID:	BJG0375-SRM1	Calibration:	EH00030
File ID:	21082304	Analyzed:	08/23/21 14:26

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	400.00	47.0	24 - 169	25.6548	25.63973	0.0151	N/A	
13C12-2,3,7,8-TCDD	400.00	58.5	25 - 164	26.29	26.27478	0.0152	N/A	
13C12-1,2,3,7,8-PeCDF	400.00	82.3	24 - 185	29.828	29.80383	0.0242	N/A	
13C12-2,3,4,7,8-PeCDF	400.00	81.9	21 - 178	31.176	31.14815	0.0278	N/A	
13C12-1,2,3,7,8-PeCDD	400.00	85.8	25 - 181	31.421	31.40067	0.0203	N/A	
13C12-1,2,3,4,7,8-HxCDF	400.00	81.0	26 - 152	34.8082	34.782	0.0262	N/A	
13C12-1,2,3,6,7,8-HxCDF	400.00	78.1	26 - 123	34.953	34.91943	0.0336	N/A	
13C12-2,3,4,6,7,8-HxCDF	400.00	80.2	28 - 136	35.8218	35.7884	0.0334	N/A	
13C12-1,2,3,7,8,9-HxCDF	400.00	90.5	29 - 147	36.847	36.8227	0.0243	N/A	
13C12-1,2,3,4,7,8-HxCDD	400.00	92.3	32 - 141	35.9445	35.90912	0.0354	N/A	
13C12-1,2,3,6,7,8-HxCDD	400.00	86.0	28 - 130	36.0558	36.0242	0.0316	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	400.00	84.5	28 - 143	38.7075	38.67025	0.0373	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	400.00	87.5	26 - 138	40.9358	40.90587	0.0299	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	400.00	89.4	23 - 140	40.2005	40.16678	0.0337	N/A	
13C12-OCDD	800.00	101	17 - 157	44.94	44.88763	0.0524	N/A	
37Cl4-2,3,7,8-TCDD	160.00	54.0	35 - 197	26.3202	26.30253	0.0177	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:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0288	Instrument:	AUTOSPEC01
Sample ID:	BJG0375-SRM2	Calibration:	EH00030
File ID:	21082305	Analyzed:	08/23/21 15:14

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	400.00	26.6	24 - 169	25.7457	25.63973	0.1060	N/A	
13C12-2,3,7,8-TCDD	400.00	36.4	25 - 164	26.3807	26.27478	0.1059	N/A	
13C12-1,2,3,7,8-PeCDF	400.00	62.1	24 - 185	29.9283	29.80383	0.1245	N/A	
13C12-2,3,4,7,8-PeCDF	400.00	62.6	21 - 178	31.2763	31.14815	0.1281	N/A	
13C12-1,2,3,7,8-PeCDD	400.00	69.7	25 - 181	31.5437	31.40067	0.1430	N/A	
13C12-1,2,3,4,7,8-HxCDF	400.00	76.7	26 - 152	34.9753	34.782	0.1933	N/A	
13C12-1,2,3,6,7,8-HxCDF	400.00	72.9	26 - 123	35.1202	34.91943	0.2008	N/A	
13C12-2,3,4,6,7,8-HxCDF	400.00	75.7	28 - 136	36.0448	35.7884	0.2564	N/A	
13C12-1,2,3,7,8,9-HxCDF	400.00	39.7	29 - 147	36.9808	36.8227	0.1581	N/A	
13C12-1,2,3,4,7,8-HxCDD	400.00	83.4	32 - 141	36.1452	35.90912	0.2361	N/A	
13C12-1,2,3,6,7,8-HxCDD	400.00	79.3	28 - 130	36.2677	36.0242	0.2435	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	400.00	67.3	28 - 143	38.7857	38.67025	0.1154	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	400.00	70.2	26 - 138	40.9915	40.90587	0.0856	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	400.00	74.9	23 - 140	40.2562	40.16678	0.0894	N/A	
13C12-OCDD	800.00	68.8	17 - 157	45.0132	44.88763	0.1256	N/A	
37Cl4-2,3,7,8-TCDD	160.00	34.0	35 - 197	26.4108	26.30253	0.1083	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:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0288	Instrument:	AUTOSPEC01
Sample ID:	21G0064-10	Calibration:	EH00030
File ID:	21082311	Analyzed:	08/23/21 20:08

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	199.95	56.1	24 - 169	25.6548	25.63973	0.0151	N/A	
13C12-2,3,7,8-TCDD	199.95	67.3	25 - 164	26.29	26.27478	0.0152	N/A	
13C12-1,2,3,7,8-PeCDF	199.95	84.7	24 - 185	29.8168	29.80383	0.0130	N/A	
13C12-2,3,4,7,8-PeCDF	199.95	84.4	21 - 178	31.165	31.14815	0.0168	N/A	
13C12-1,2,3,7,8-PeCDD	199.95	87.7	25 - 181	31.4212	31.40067	0.0205	N/A	
13C12-1,2,3,4,7,8-HxCDF	199.95	70.4	26 - 152	34.8083	34.782	0.0263	N/A	
13C12-1,2,3,6,7,8-HxCDF	199.95	66.2	26 - 123	34.9532	34.91943	0.0338	N/A	
13C12-2,3,4,6,7,8-HxCDF	199.95	69.1	28 - 136	35.8332	35.7884	0.0448	N/A	
13C12-1,2,3,7,8,9-HxCDF	199.95	75.7	29 - 147	36.8472	36.8227	0.0245	N/A	
13C12-1,2,3,4,7,8-HxCDD	199.95	81.6	32 - 141	35.9557	35.90912	0.0466	N/A	
13C12-1,2,3,6,7,8-HxCDD	199.95	76.5	28 - 130	36.0672	36.0242	0.0430	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	199.95	72.1	28 - 143	38.7077	38.67025	0.0374	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	199.95	73.6	26 - 138	40.9358	40.90587	0.0299	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	199.95	80.3	23 - 140	40.2005	40.16678	0.0337	N/A	
13C12-OCDD	399.91	89.1	17 - 157	44.9492	44.88763	0.0616	N/A	
37Cl4-2,3,7,8-TCDD	79.982	75.5	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:	21G0064
Client:	Anchor QEA, LLC	Project:	Lower Duwamish AOC4
Sequence:	SJH0288	Instrument:	AUTOSPEC01
Sample ID:	SJH0288-CCV1	Calibration:	EH00030
File ID:	21082315	Analyzed:	08/23/21 23:25

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	96.2	71 - 129	25.6397	25.63973	0.0000	N/A	
13C12-2,3,7,8-TCDD	100.00	93.7	82 - 118	26.2898	26.27478	0.0150	N/A	
13C12-1,2,3,7,8-PeCDF	100.00	113	76 - 124	29.8167	29.80383	0.0129	N/A	
13C12-2,3,4,7,8-PeCDF	100.00	106	77 - 123	31.1647	31.14815	0.0165	N/A	
13C12-1,2,3,7,8-PeCDD	100.00	107	62 - 138	31.4098	31.40067	0.0091	N/A	
13C12-1,2,3,4,7,8-HxCDF	100.00	82.0	76 - 124	34.7968	34.782	0.0148	N/A	
13C12-1,2,3,6,7,8-HxCDF	100.00	95.7	70 - 130	34.9415	34.91943	0.0221	N/A	
13C12-2,3,4,6,7,8-HxCDF	100.00	86.0	73 - 127	35.8105	35.7884	0.0221	N/A	
13C12-1,2,3,7,8,9-HxCDF	100.00	87.5	74 - 126	36.8467	36.8227	0.0240	N/A	
13C12-1,2,3,4,7,8-HxCDD	100.00	98.2	85 - 115	35.922	35.90912	0.0129	N/A	
13C12-1,2,3,6,7,8-HxCDD	100.00	99.6	85 - 115	36.0445	36.0242	0.0203	N/A	
13C12-1,2,3,4,6,7,8-HpCDF	100.00	99.0	78 - 122	38.6962	38.67025	0.0259	N/A	
13C12-1,2,3,4,7,8,9-HpCDF	100.00	101	77 - 123	40.9355	40.90587	0.0296	N/A	
13C12-1,2,3,4,6,7,8-HpCDD	100.00	106	72 - 128	40.189	40.16678	0.0222	N/A	
13C12-OCDD	200.00	125	48 - 152	44.9302	44.88763	0.0426	N/A	
37Cl4-2,3,7,8-TCDD	10.000	90.4	0 - 200	26.305	26.30253	0.0025	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: 21G0064

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-IT507 21G0064-10	07/06/21 12:25	07/07/21 17:44	07/21/21 16:18	15	365	08/23/21 20:08	33	365	

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

EPA 1613B

Laboratory: Analytical Resources, Inc.
SDG: 21G0064
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: 21G0064
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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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

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

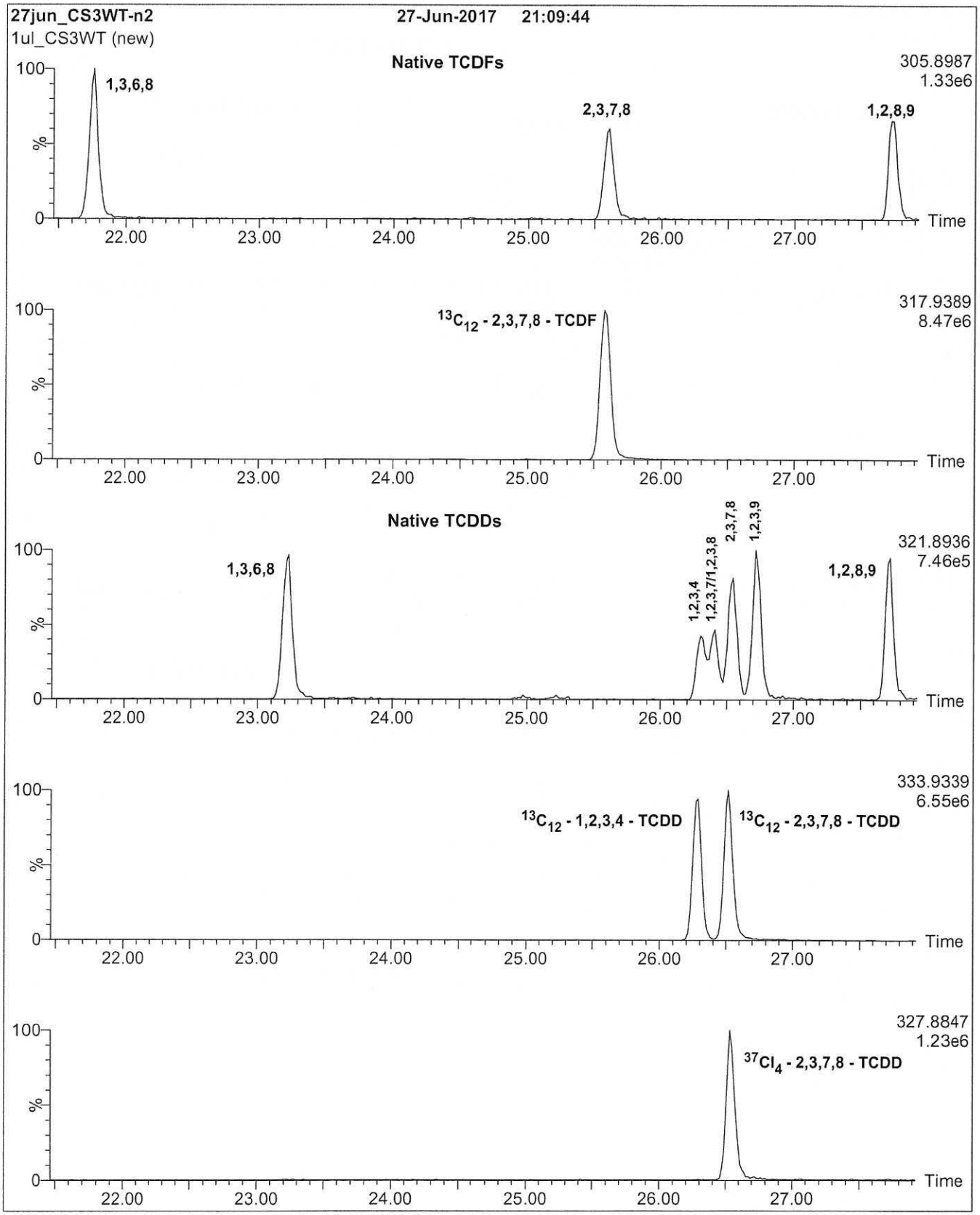


Figure 1: **CS3WT; HRGC/HRMS Data (60 m DB-5 Column)**

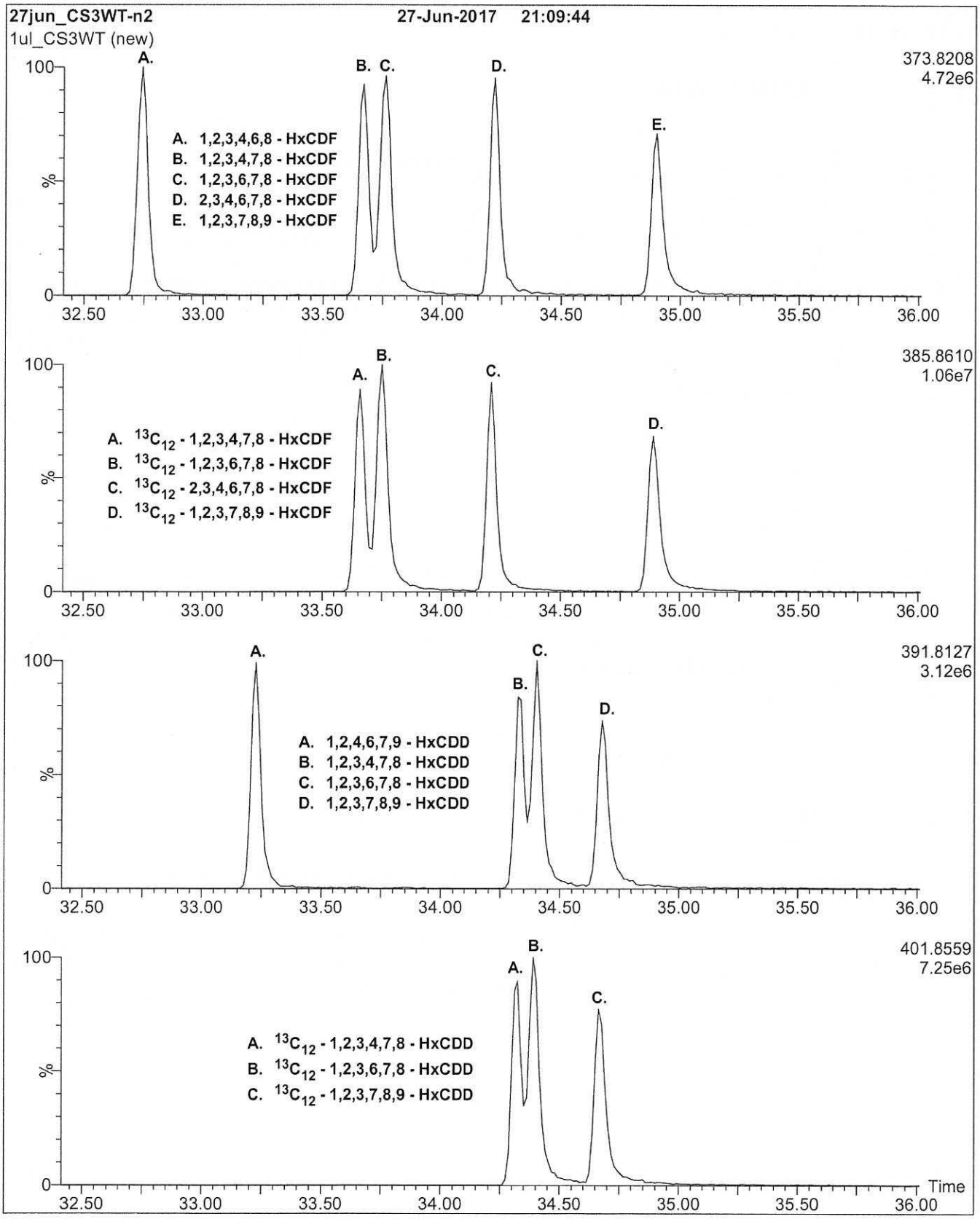
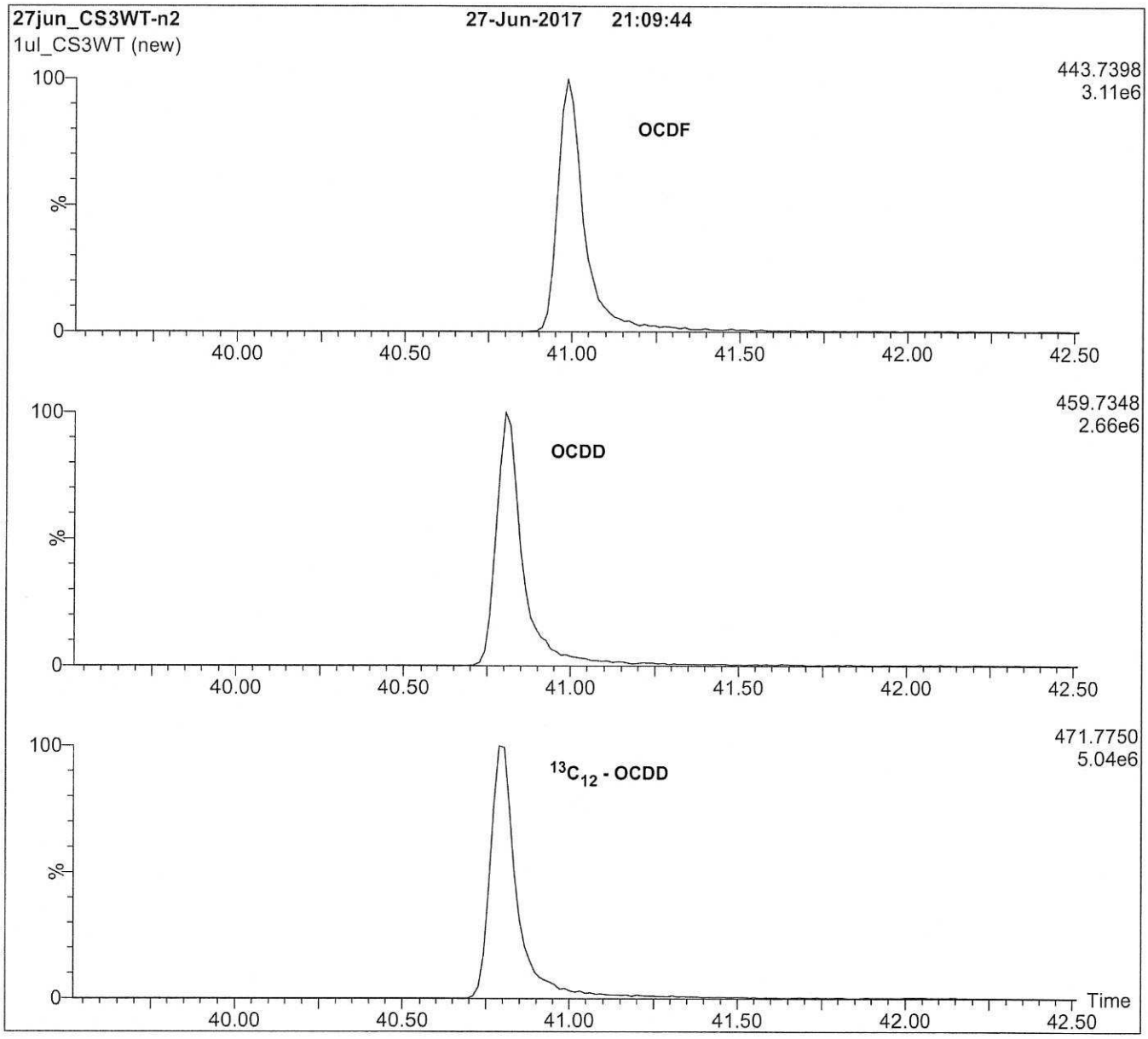


Figure 1: **CS3WT; HRGC/HRMS Data (60 m DB-5 Column)**



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.

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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

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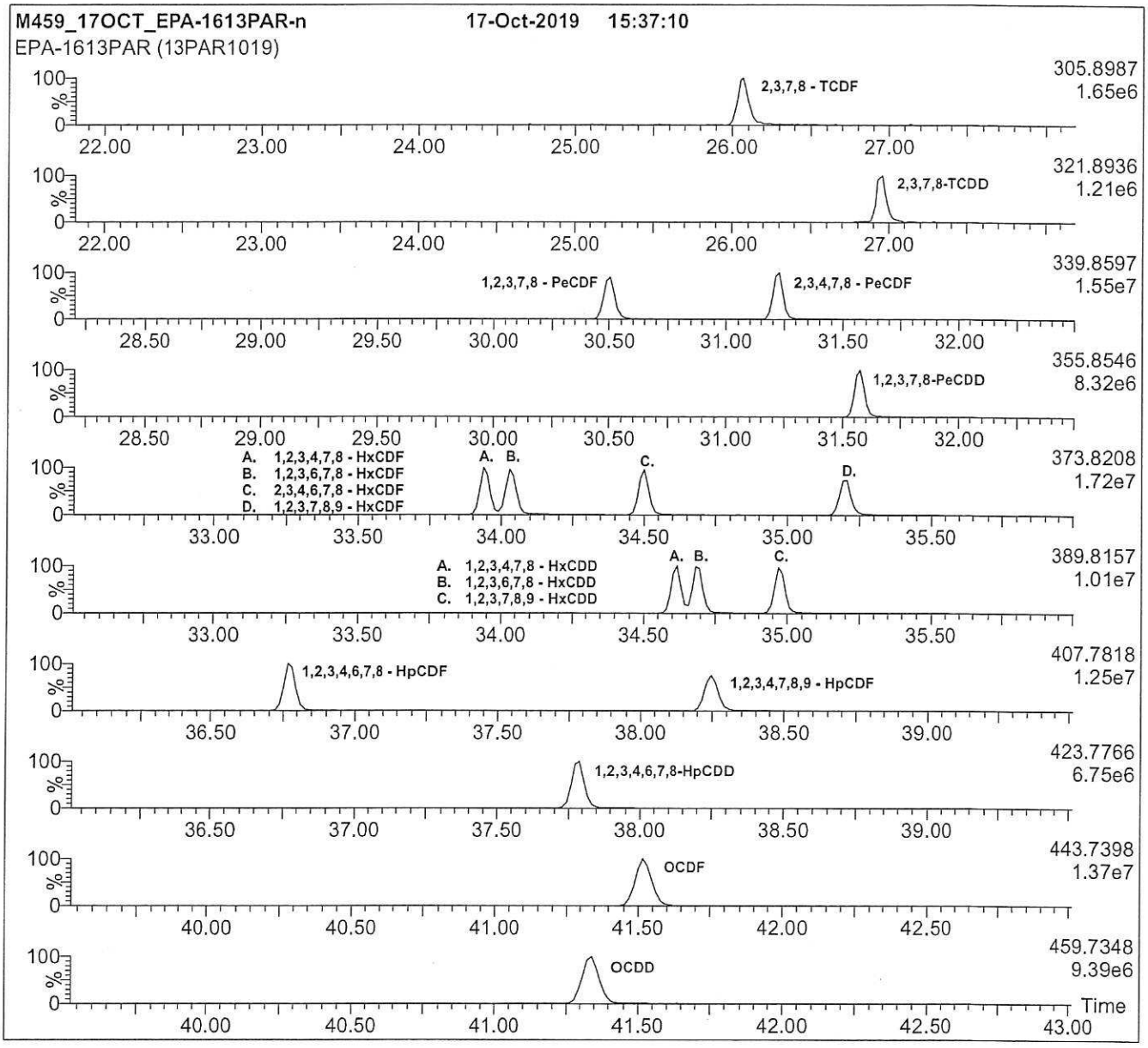
Table A: **EPA-1613PAR; Components and Concentrations (ng/ml, ± 5% in nonane/ 2.4% toluene)**

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%.

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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

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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)

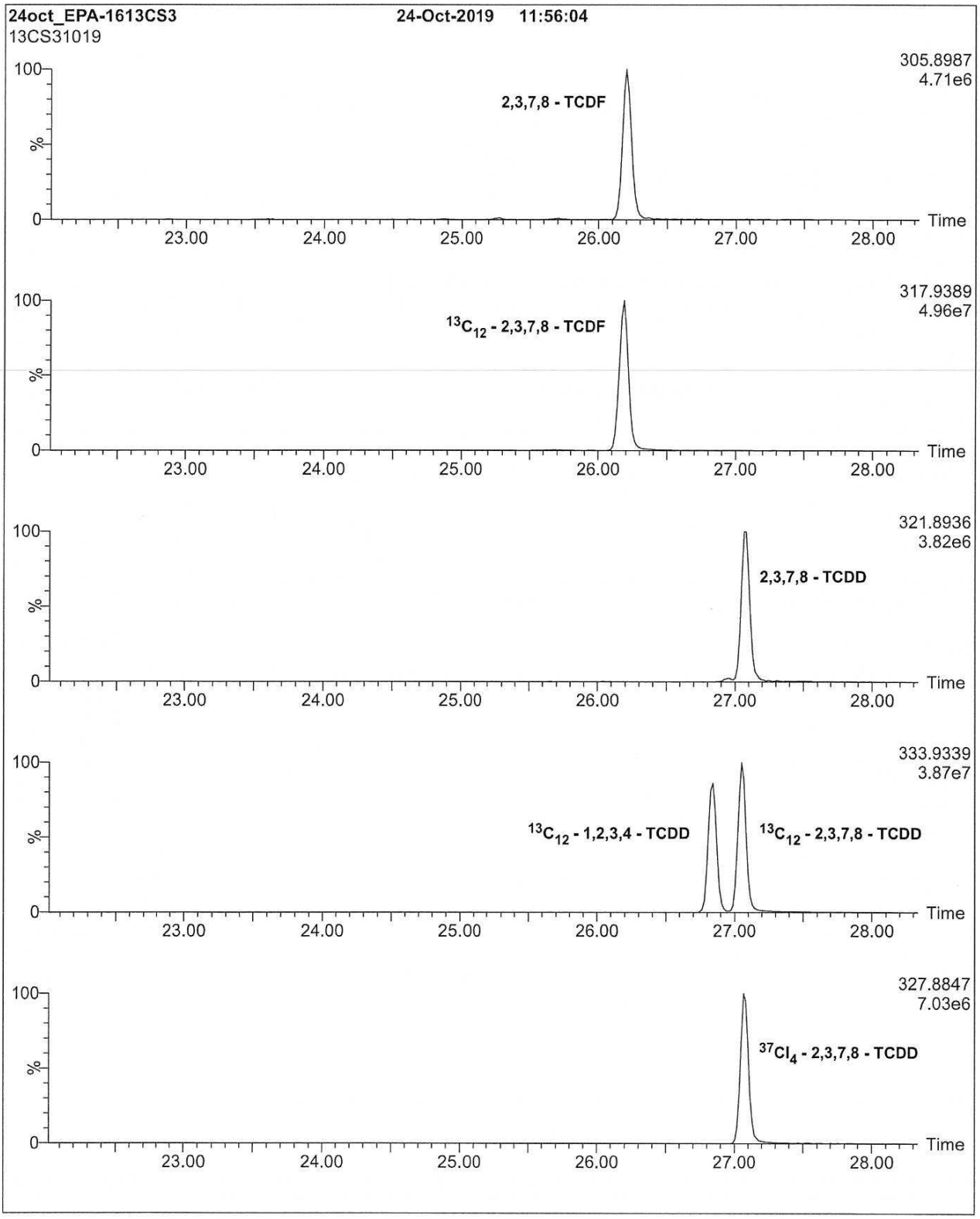


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

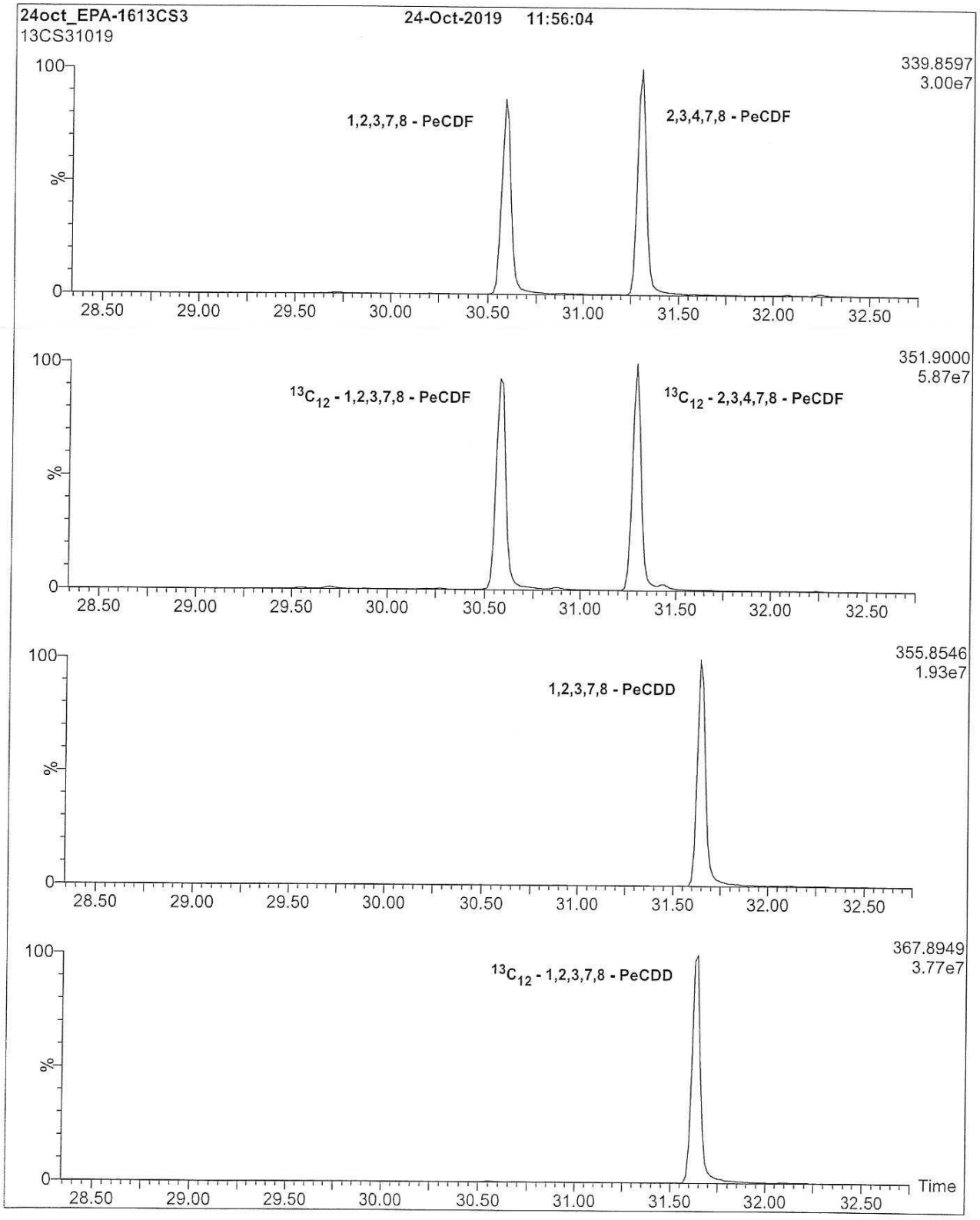


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

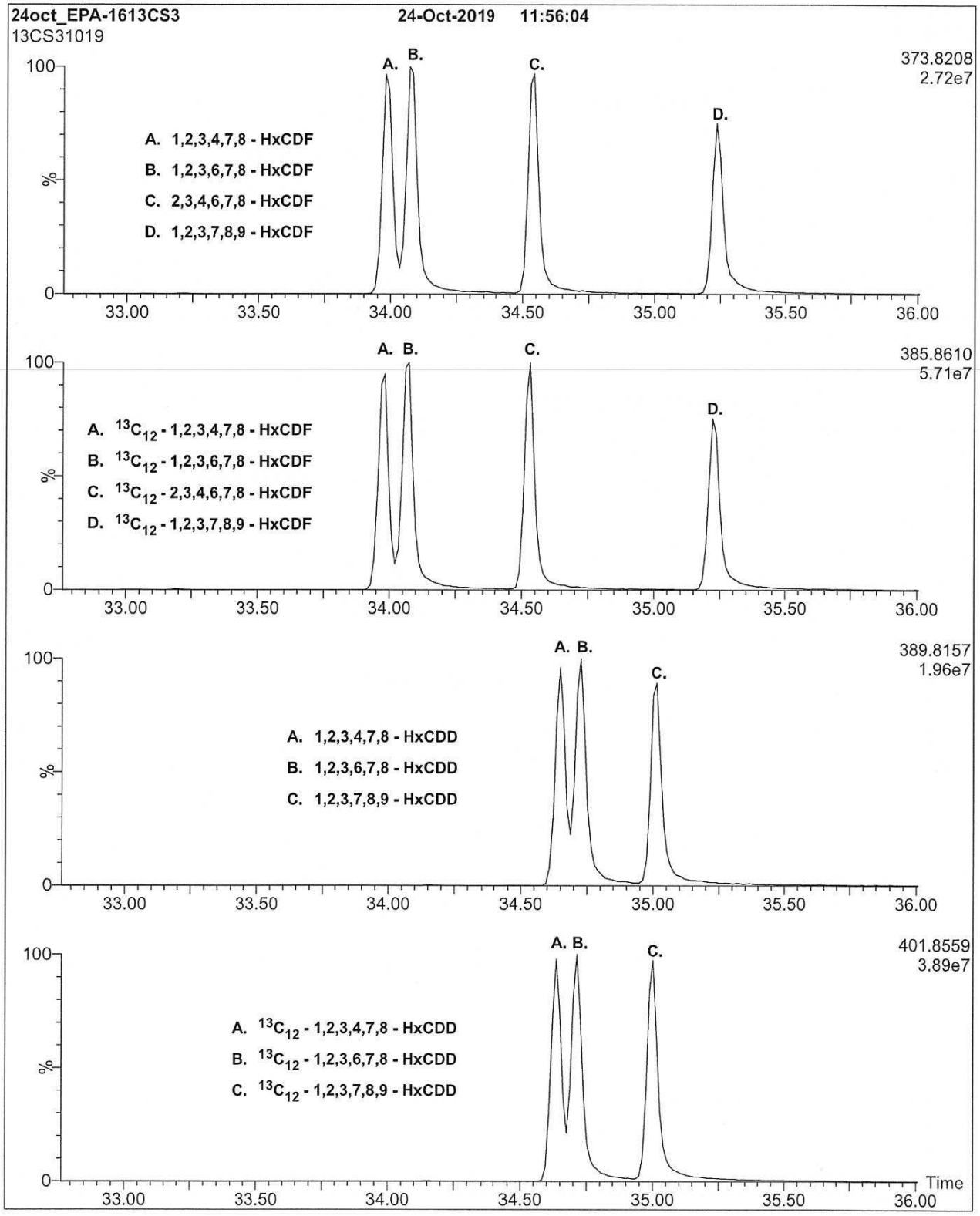


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

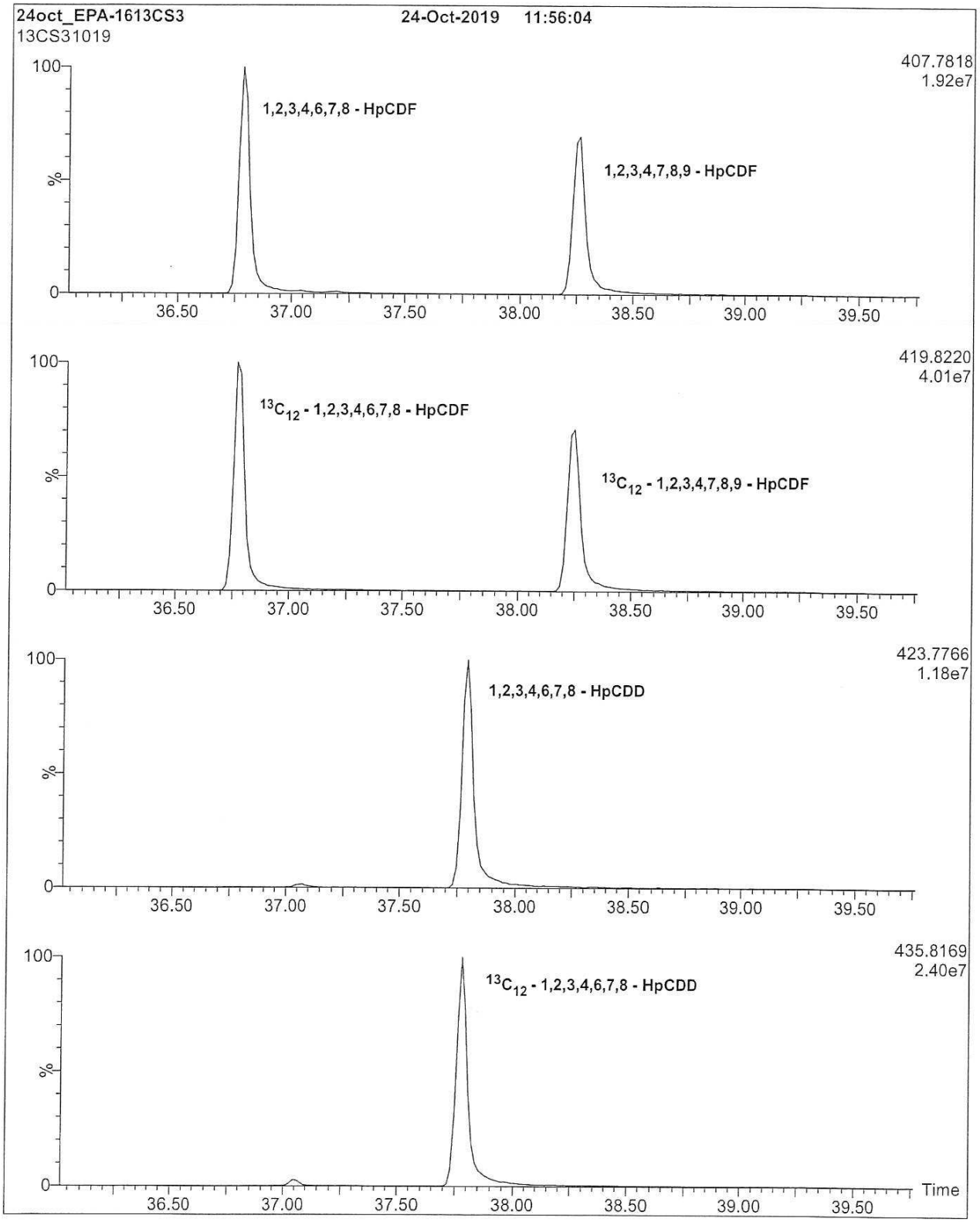
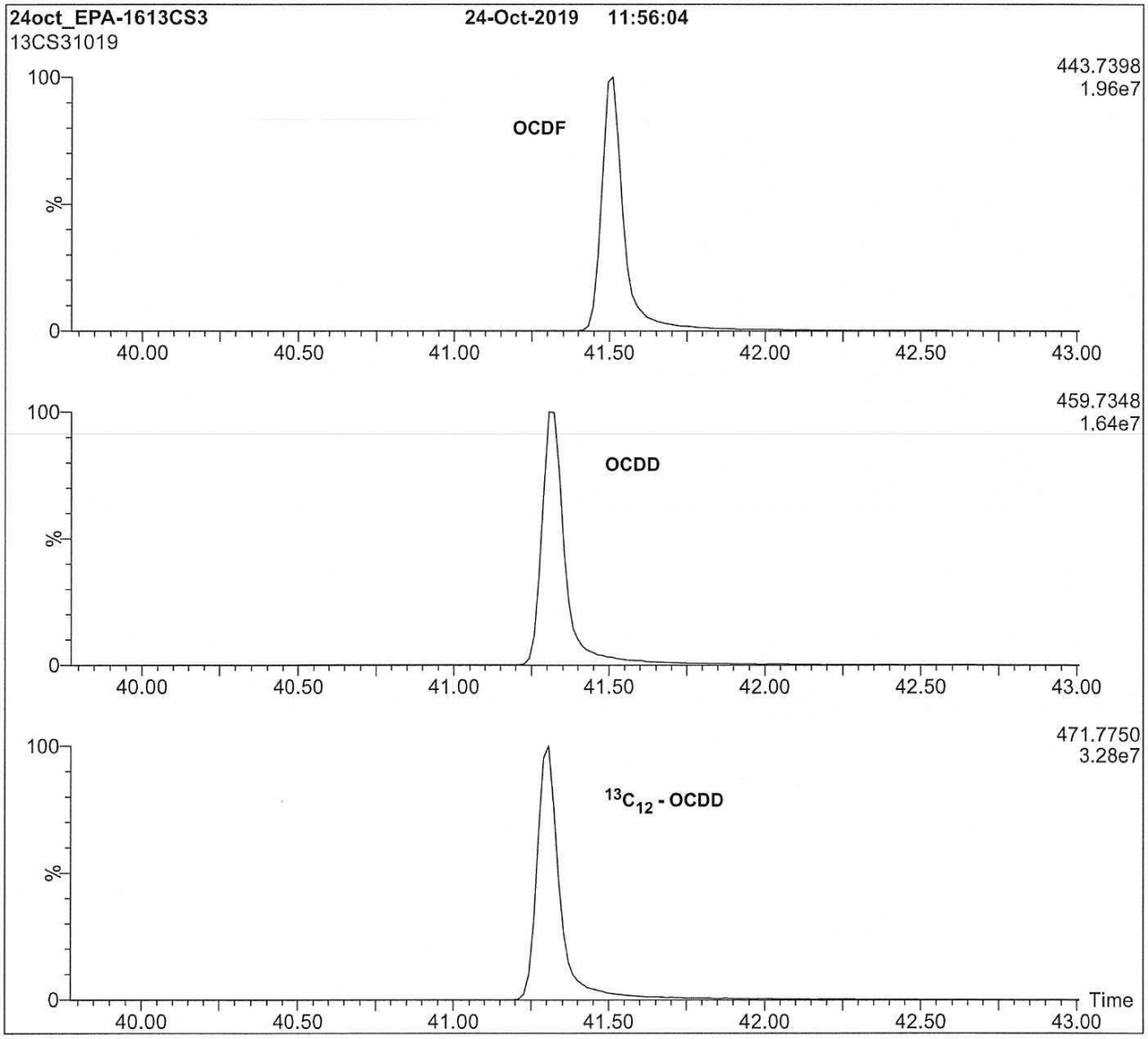


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)



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

06/23/20

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)

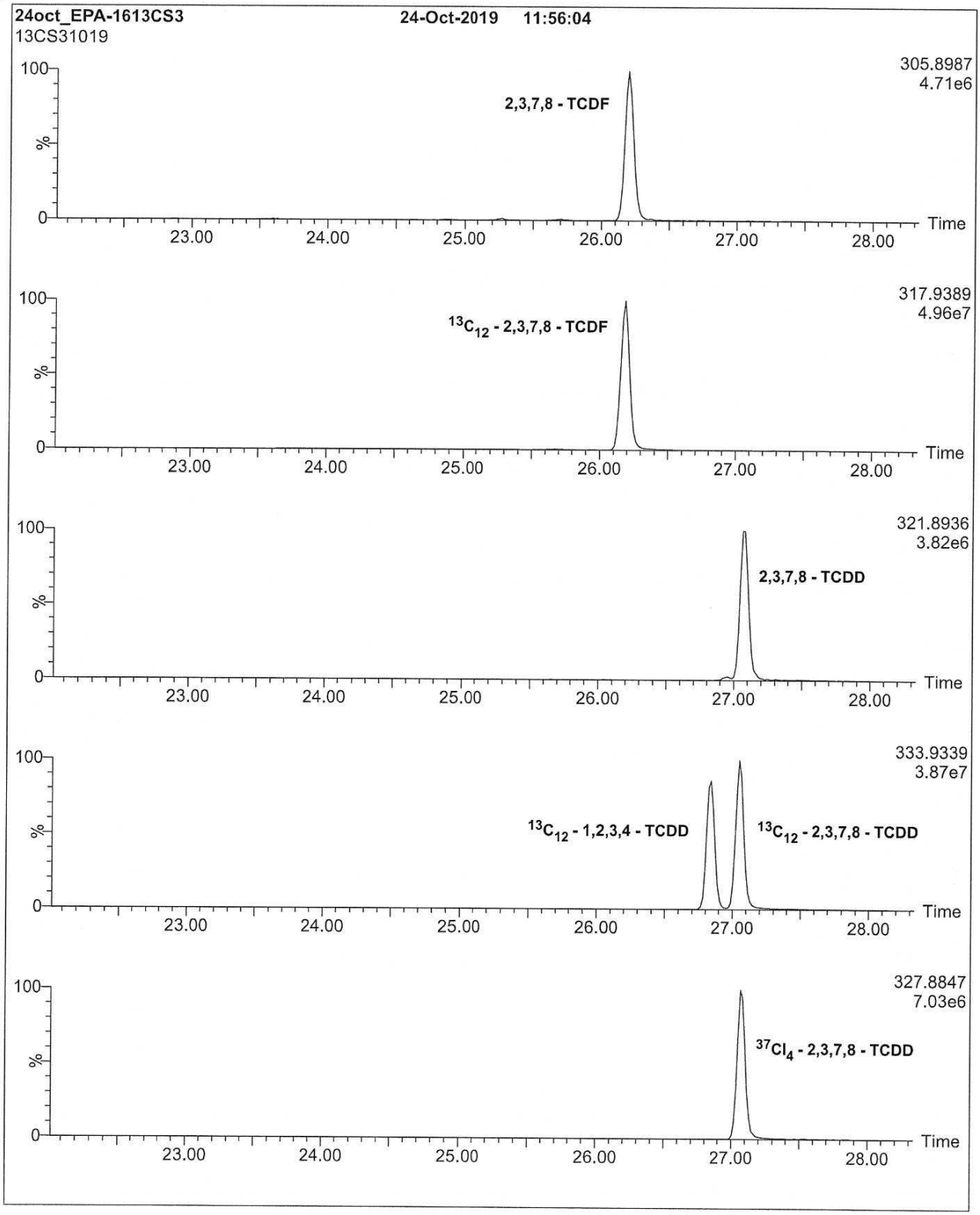


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

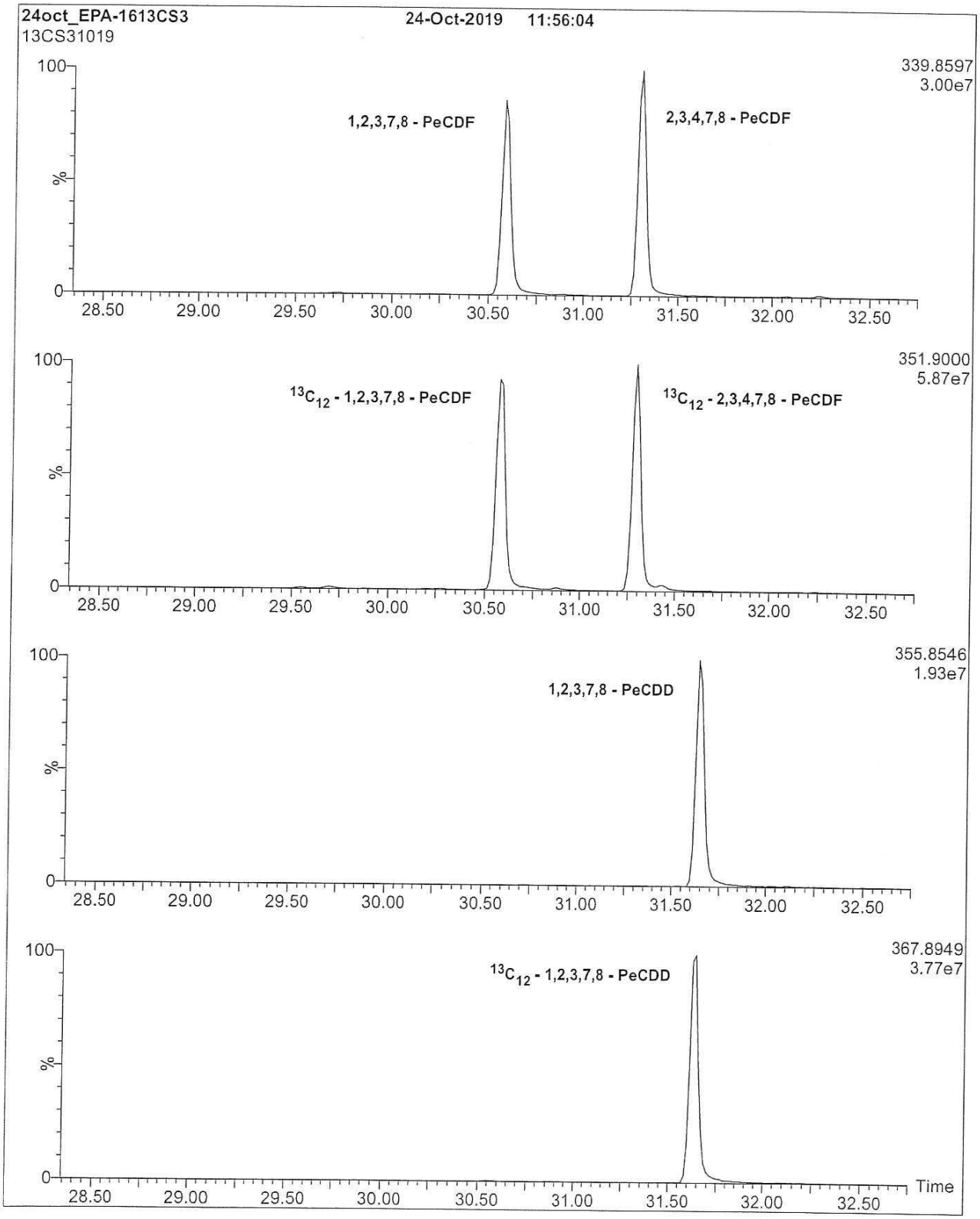


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

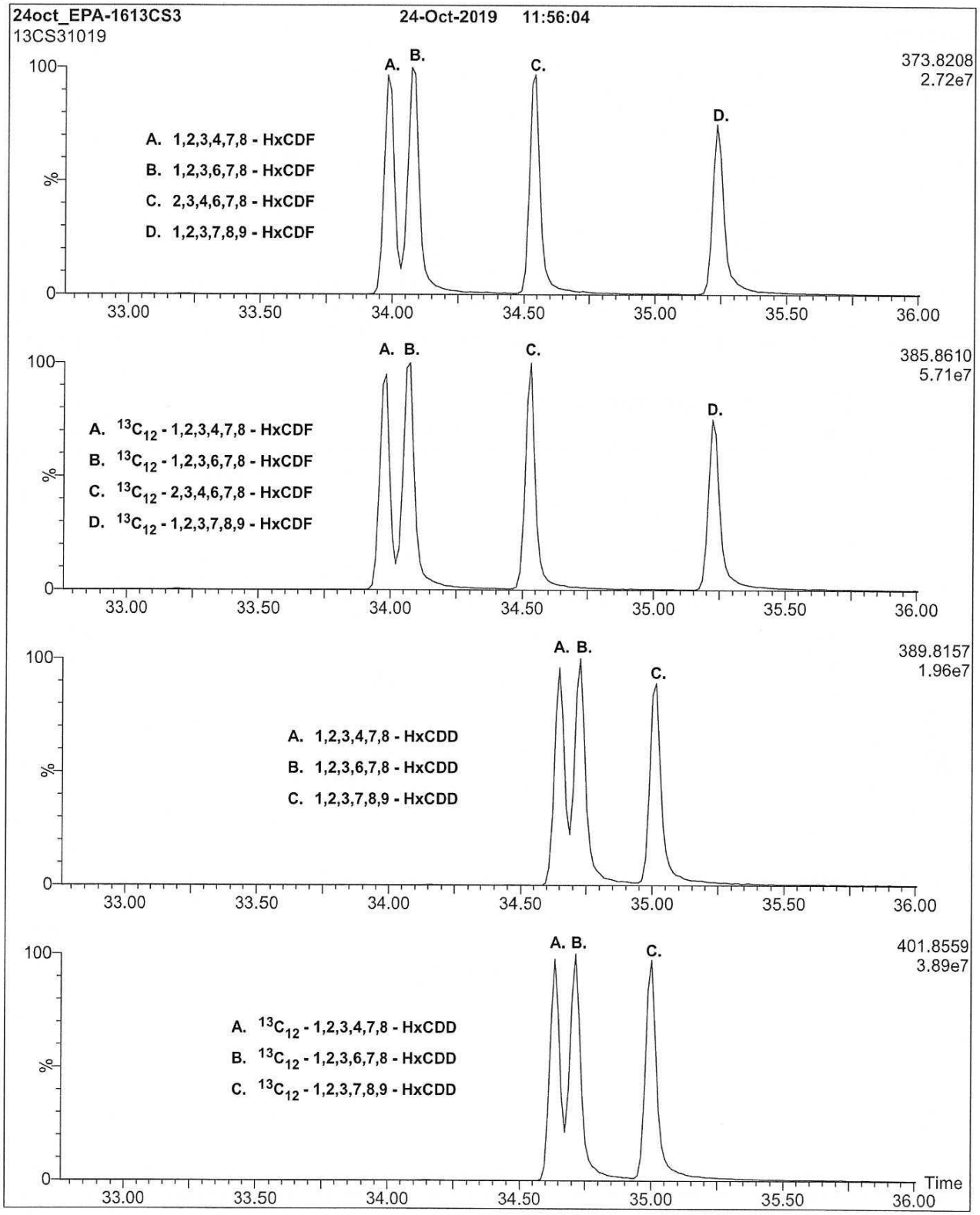


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

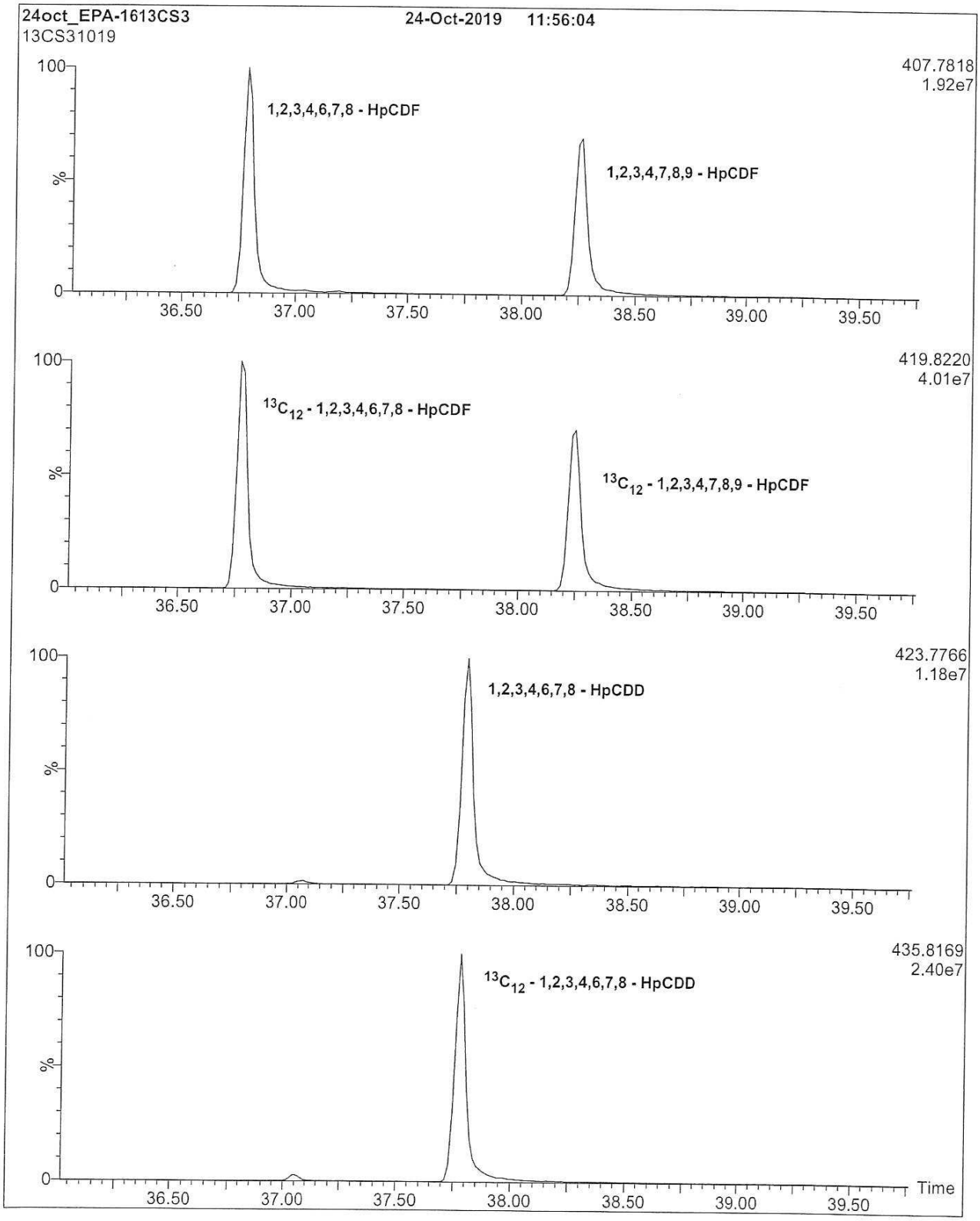
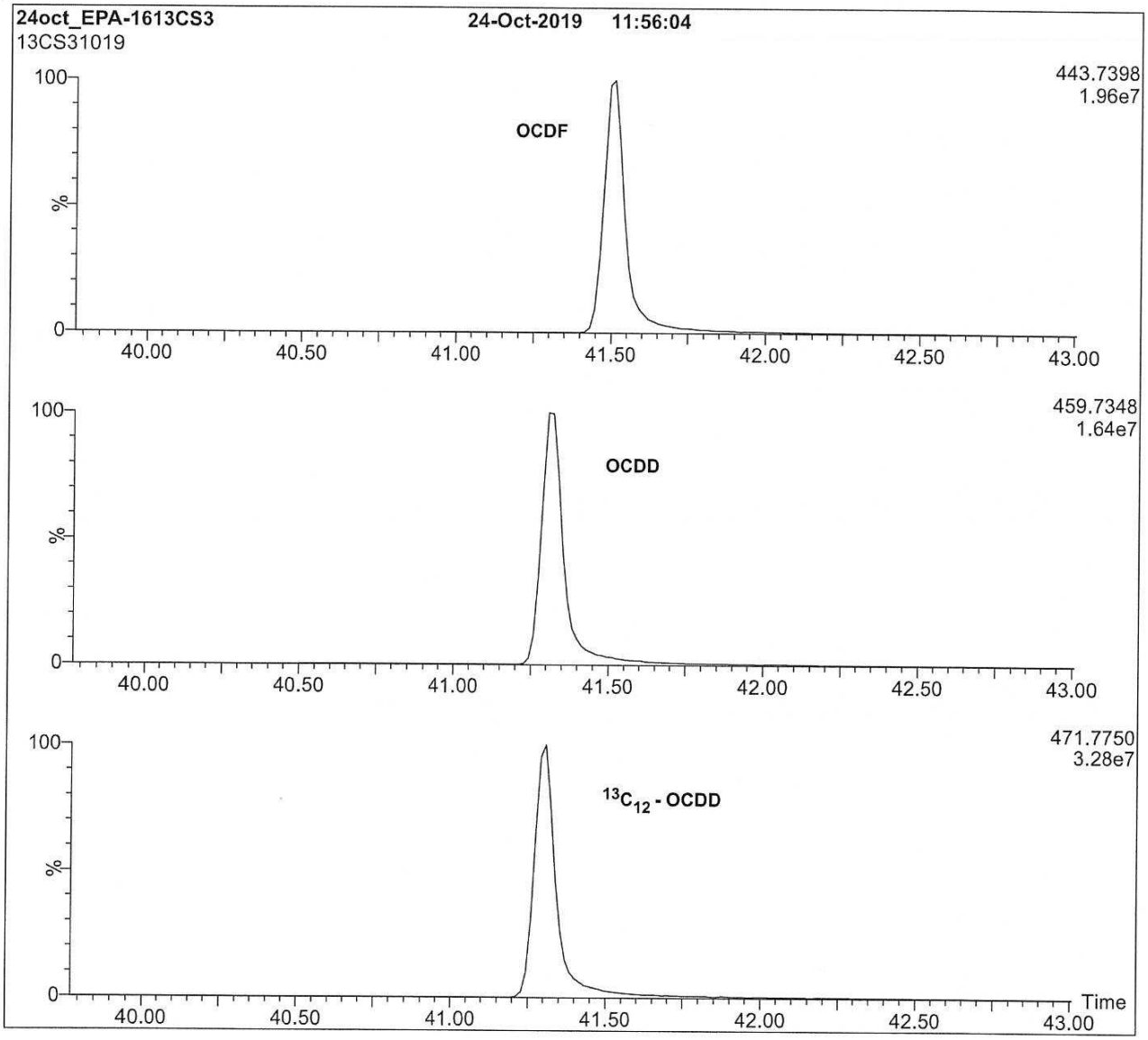


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)



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	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)

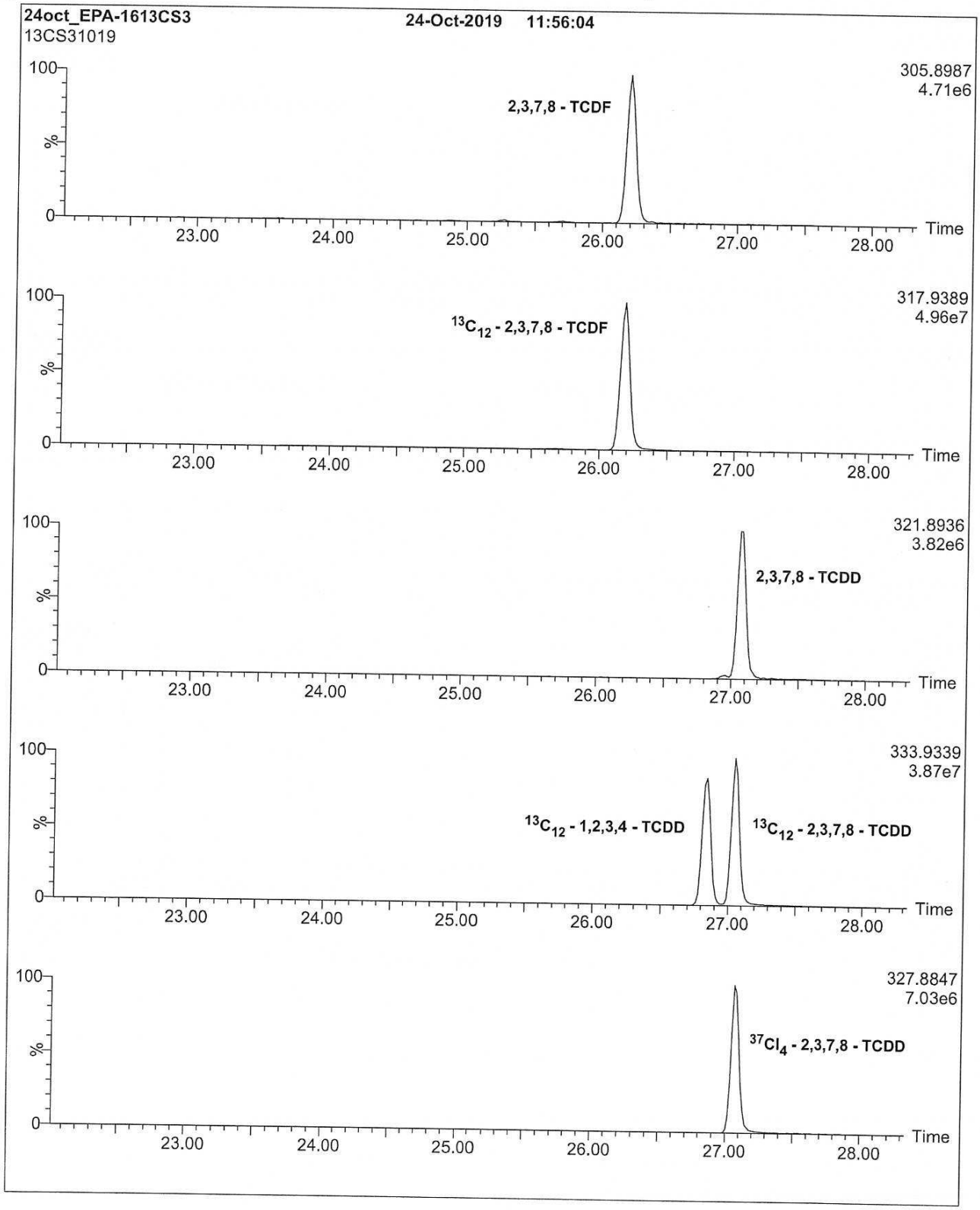


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

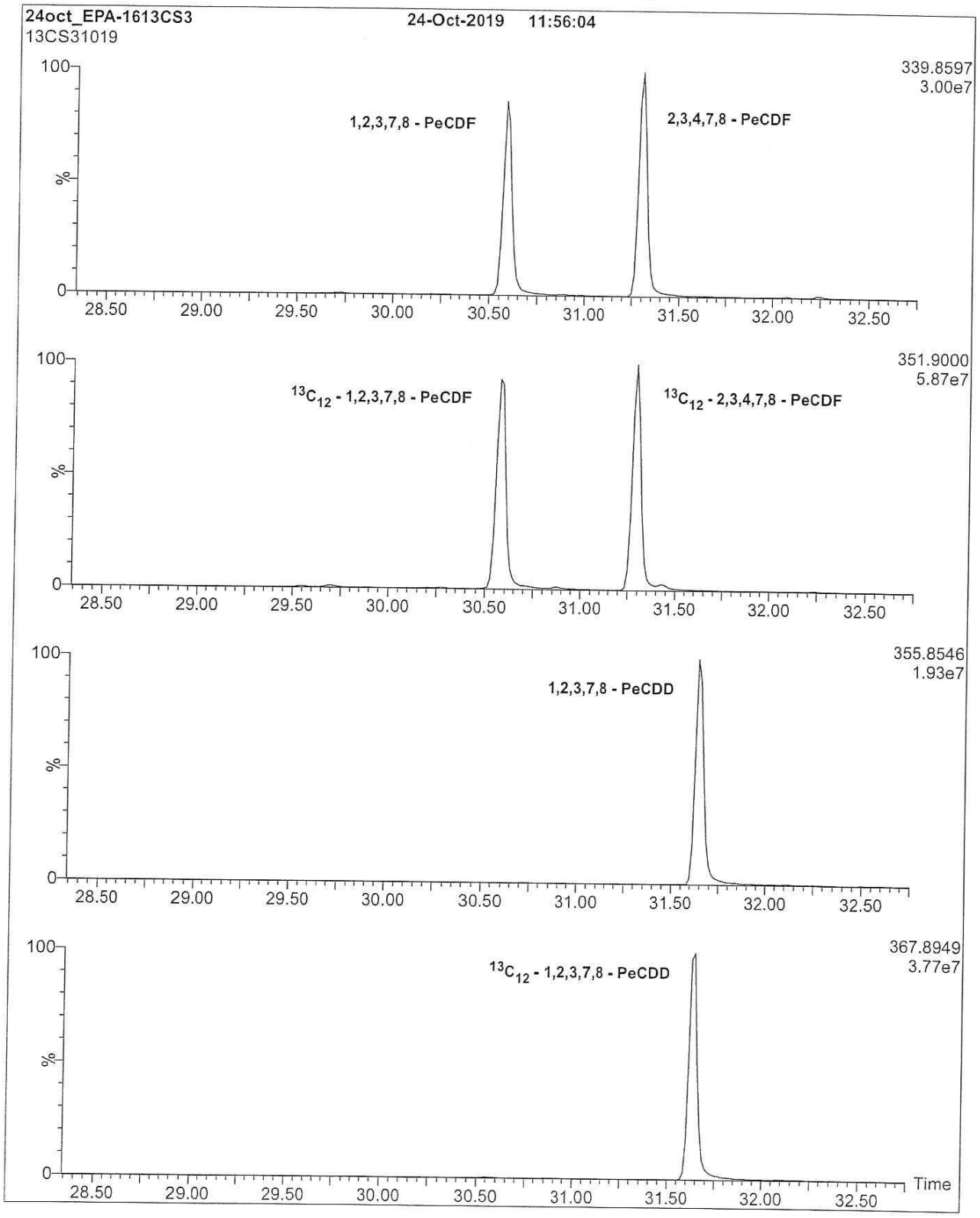


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

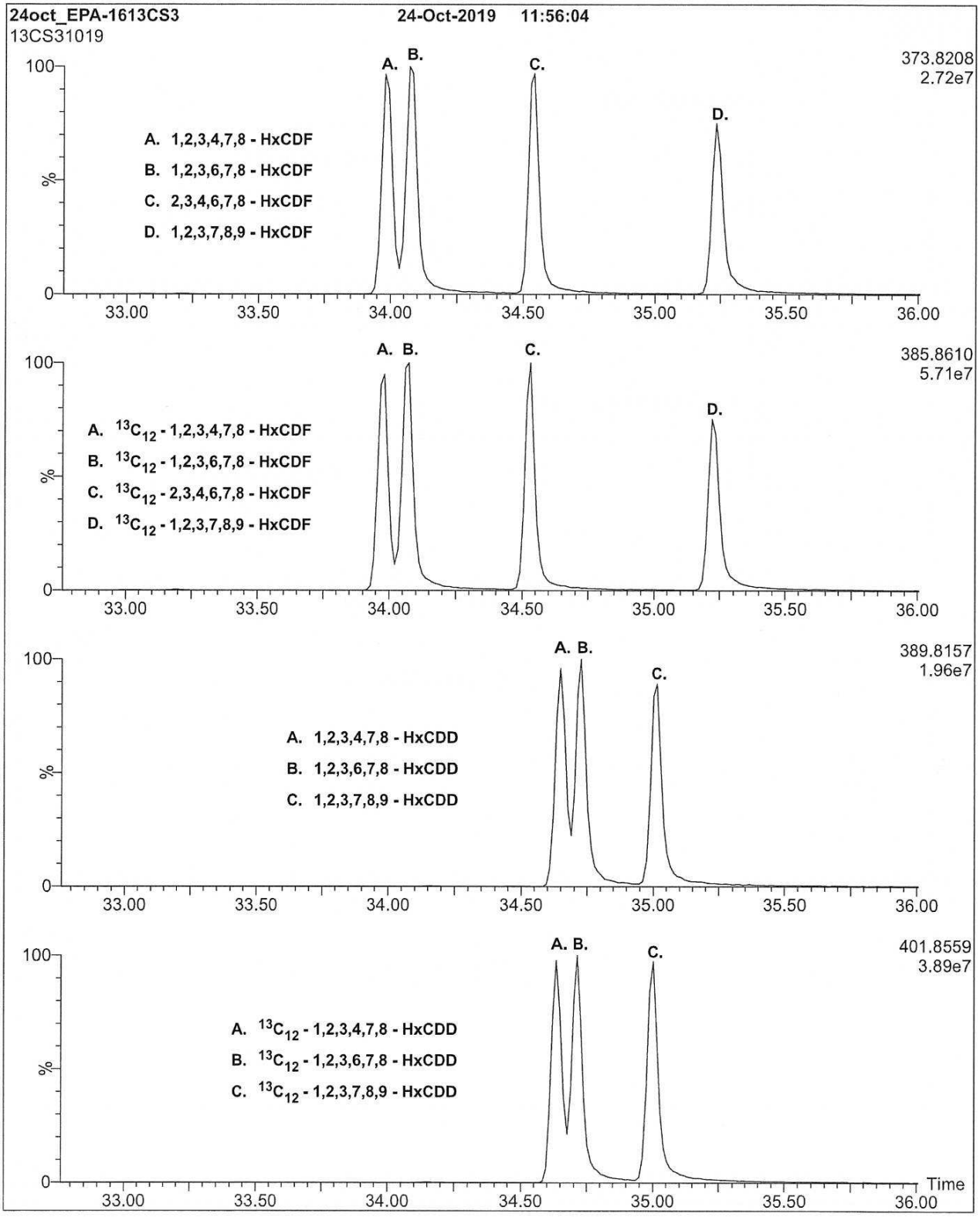


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

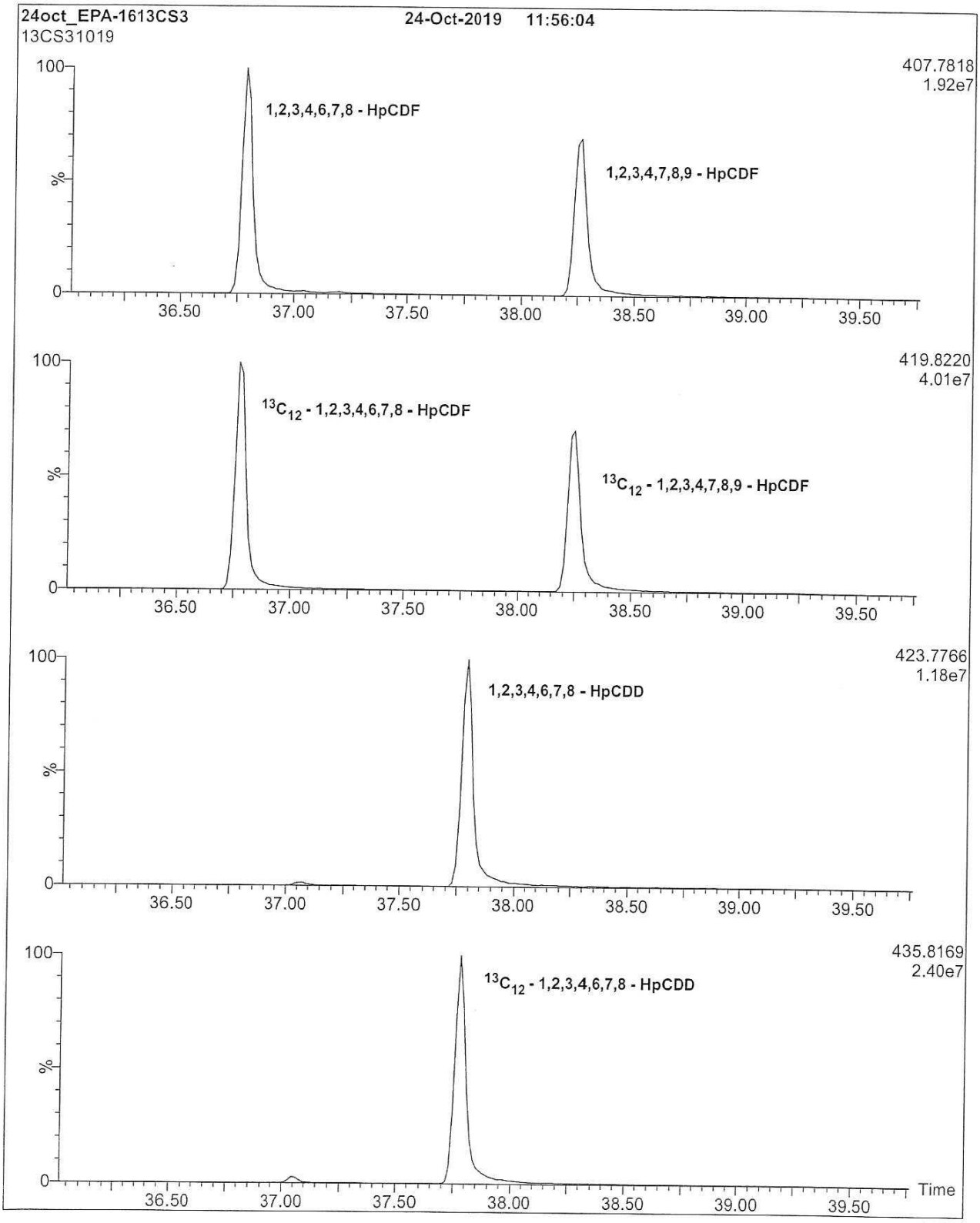
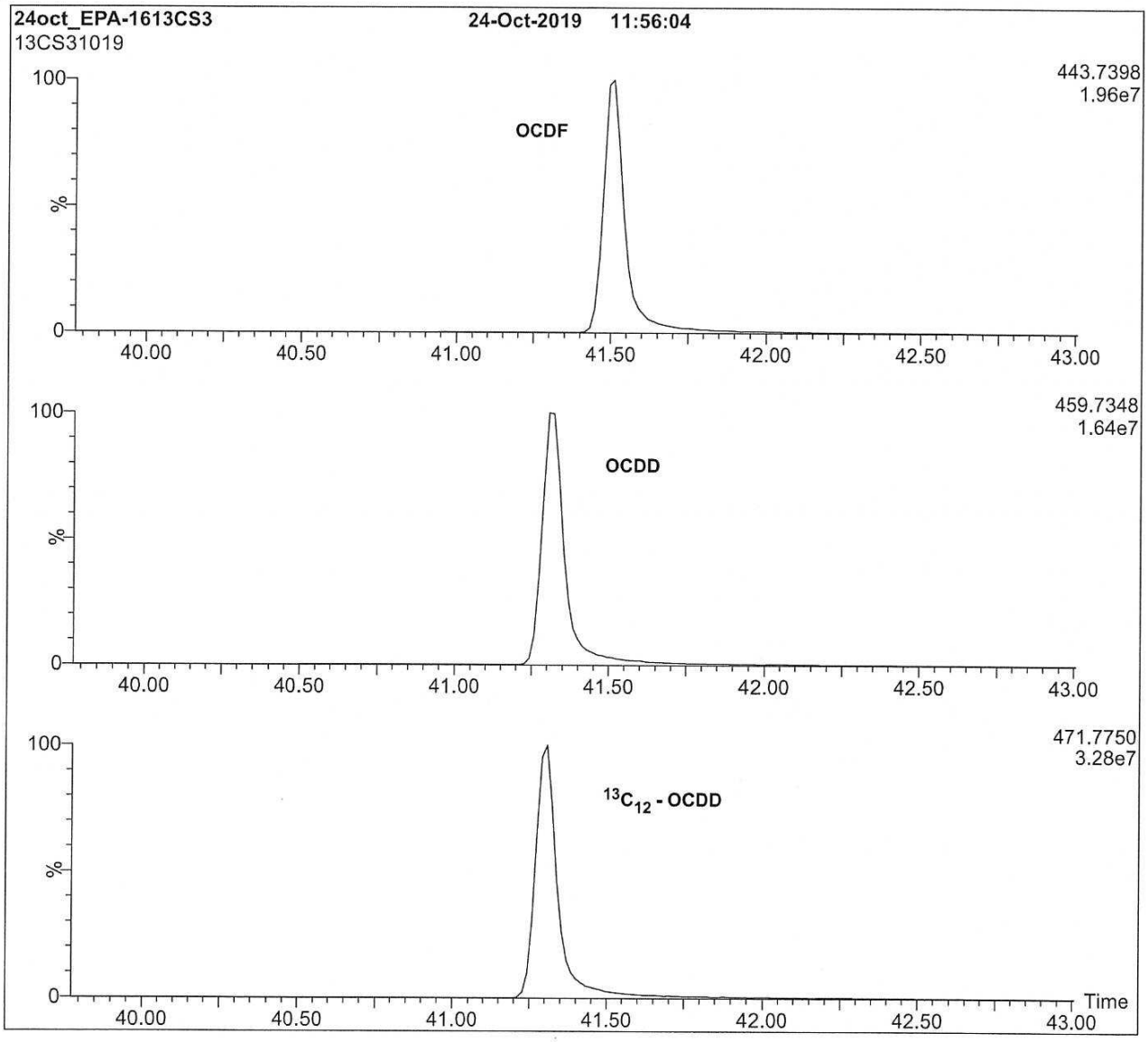


Figure 1: **EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)**



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. 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)

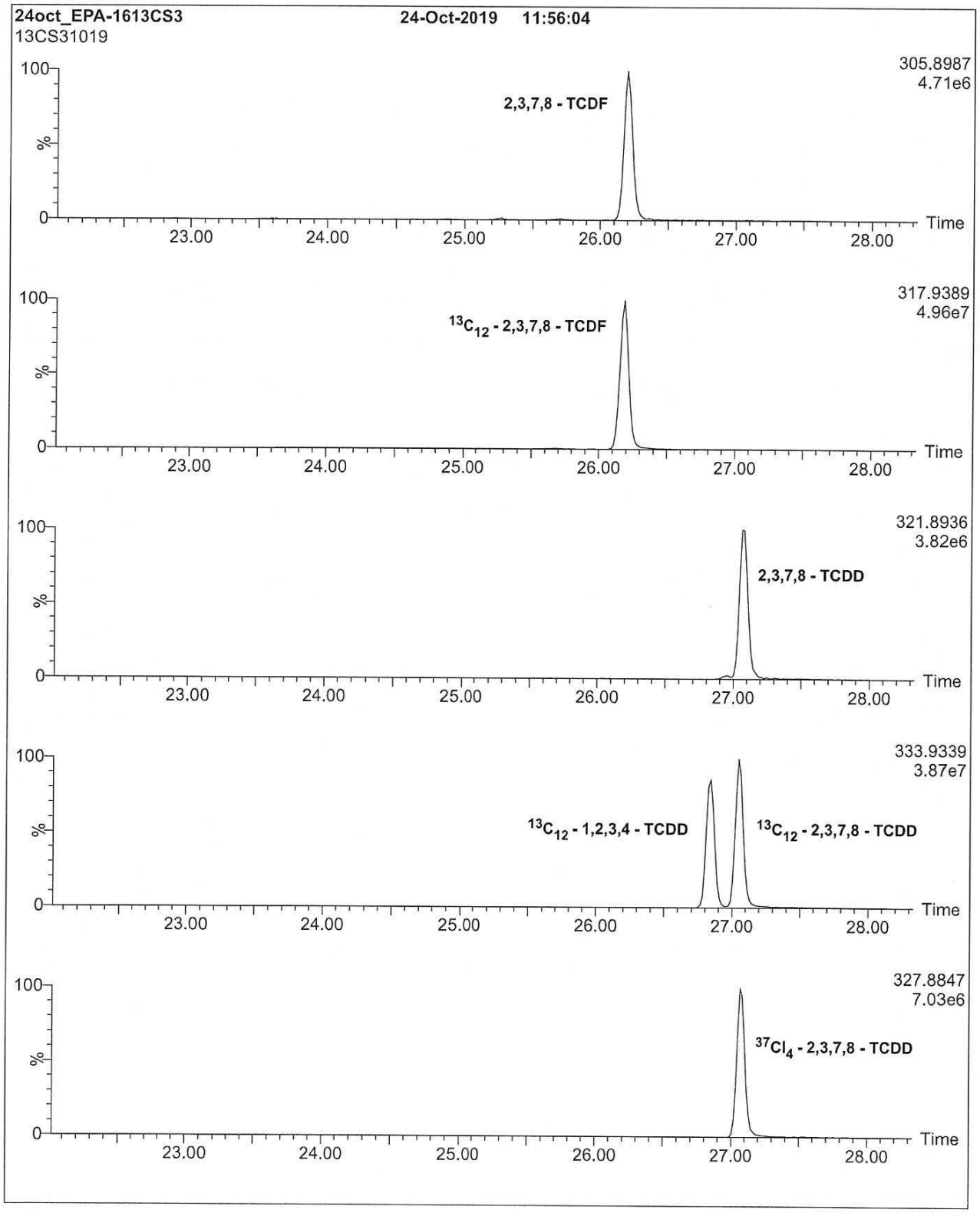


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

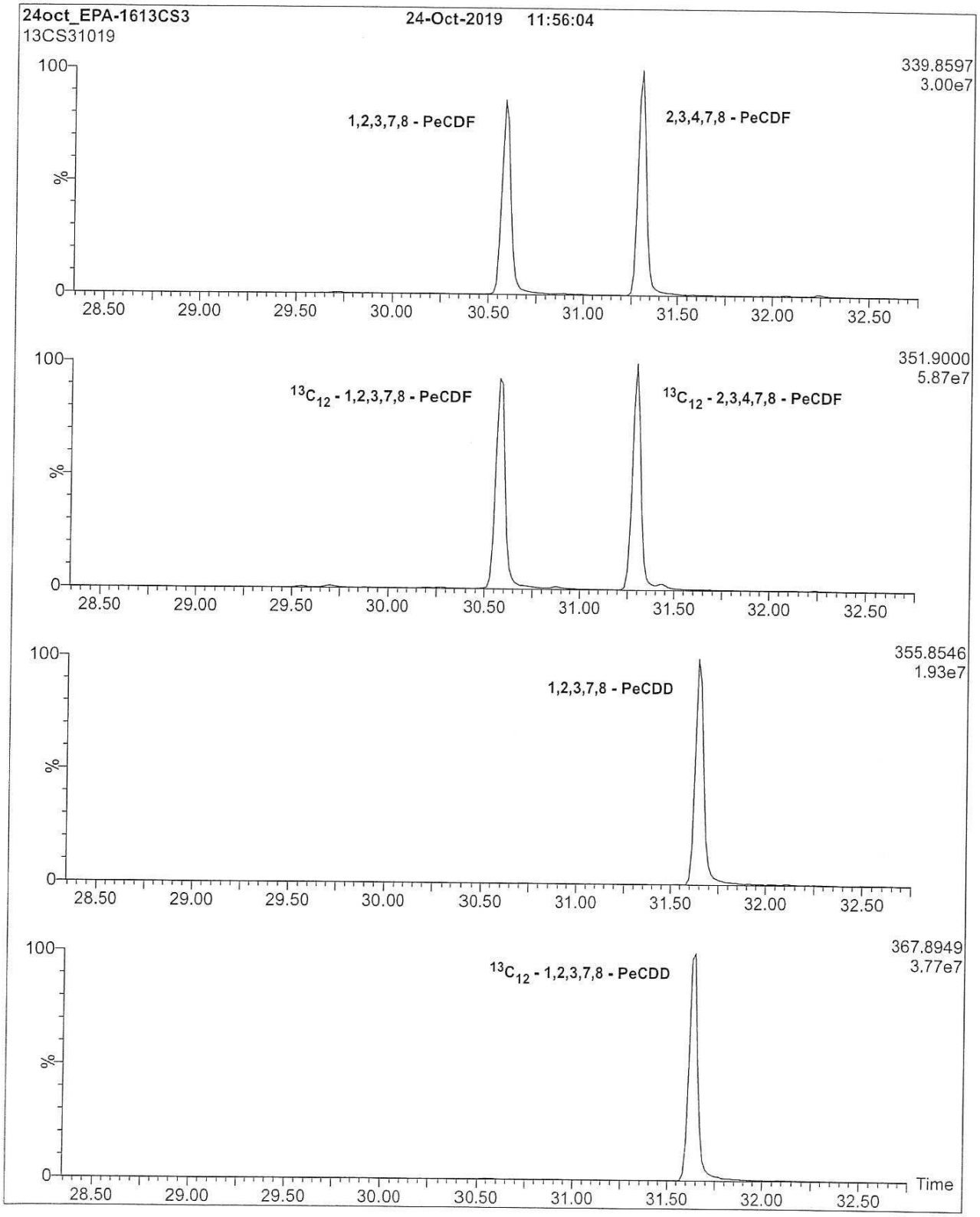


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

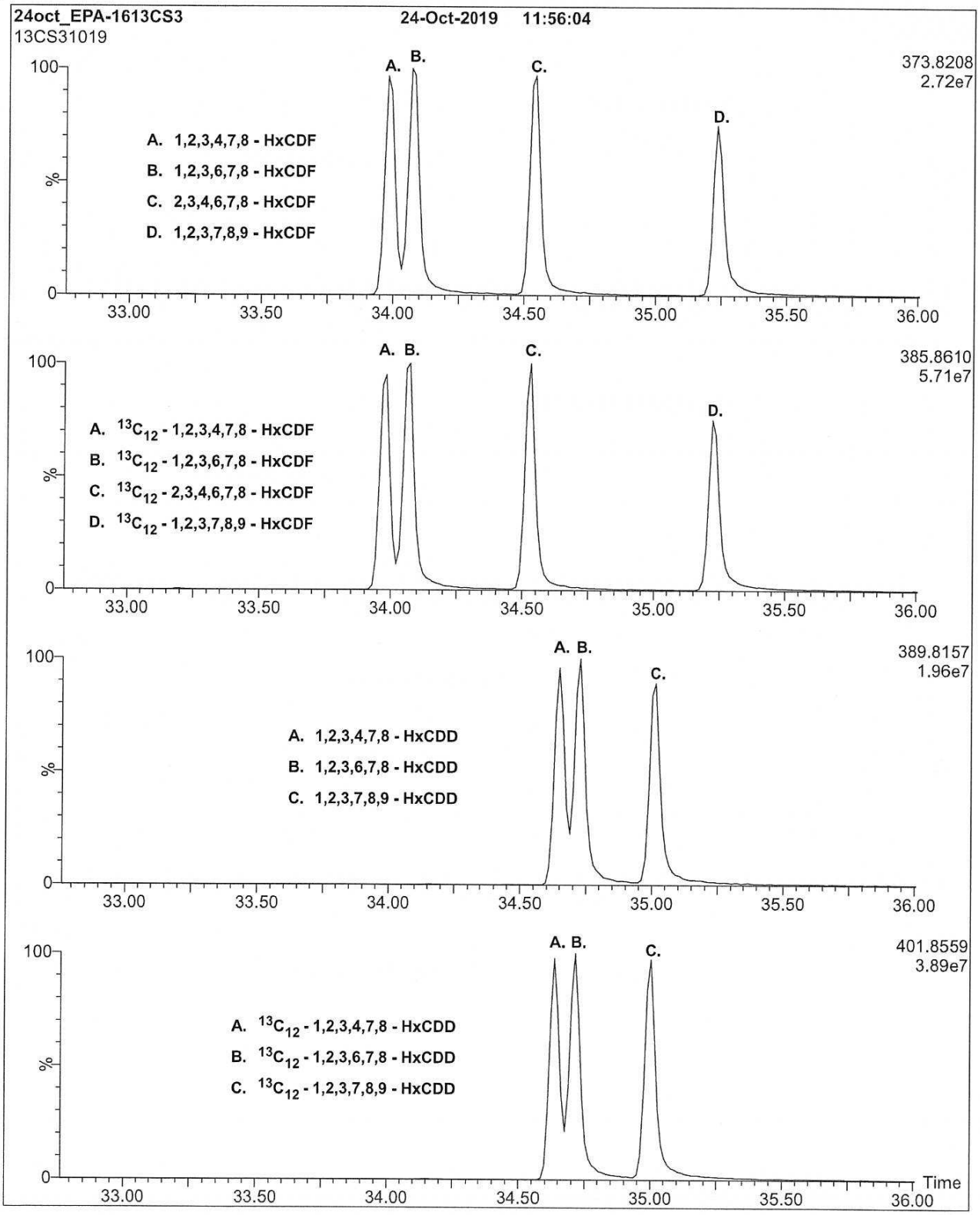


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

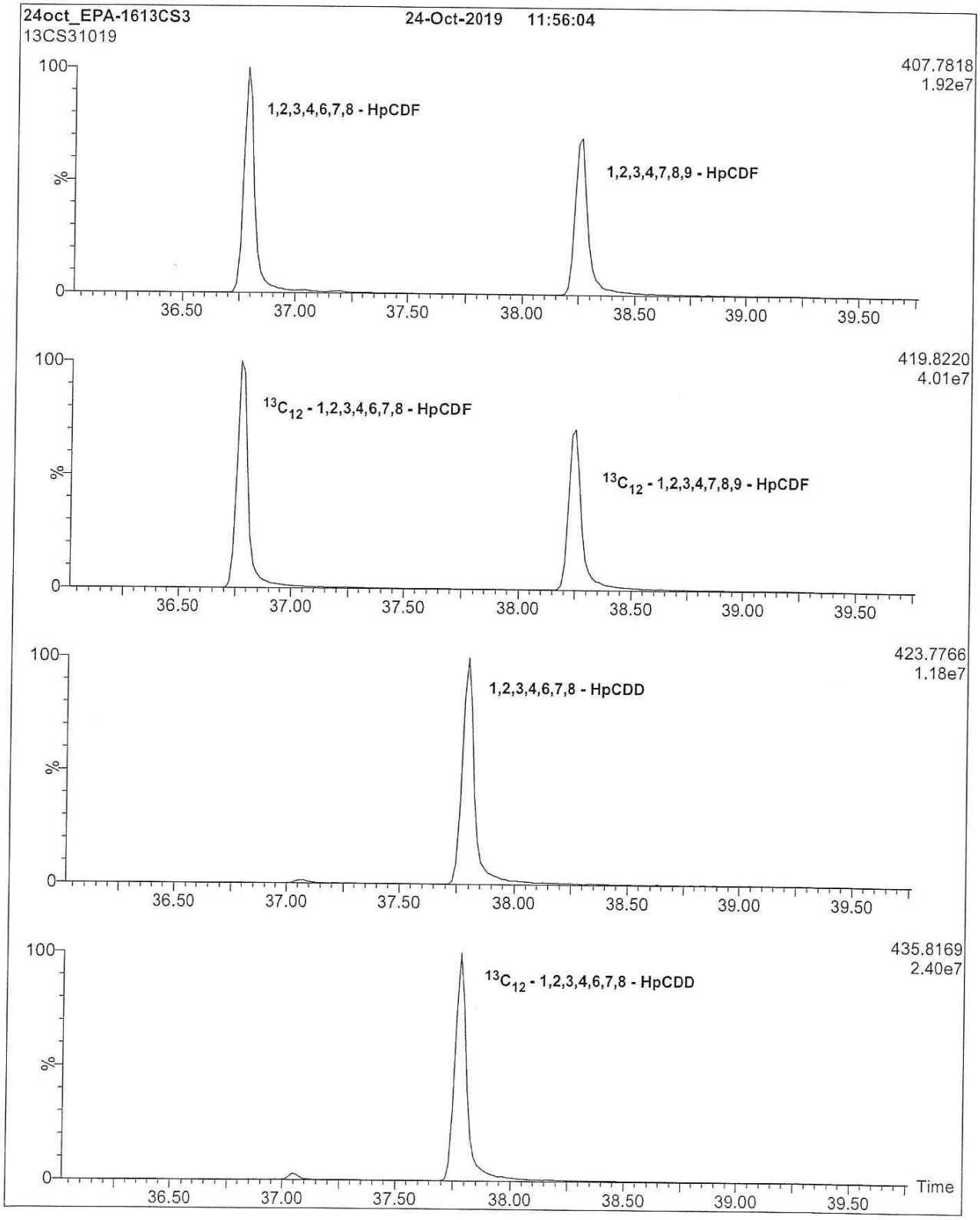
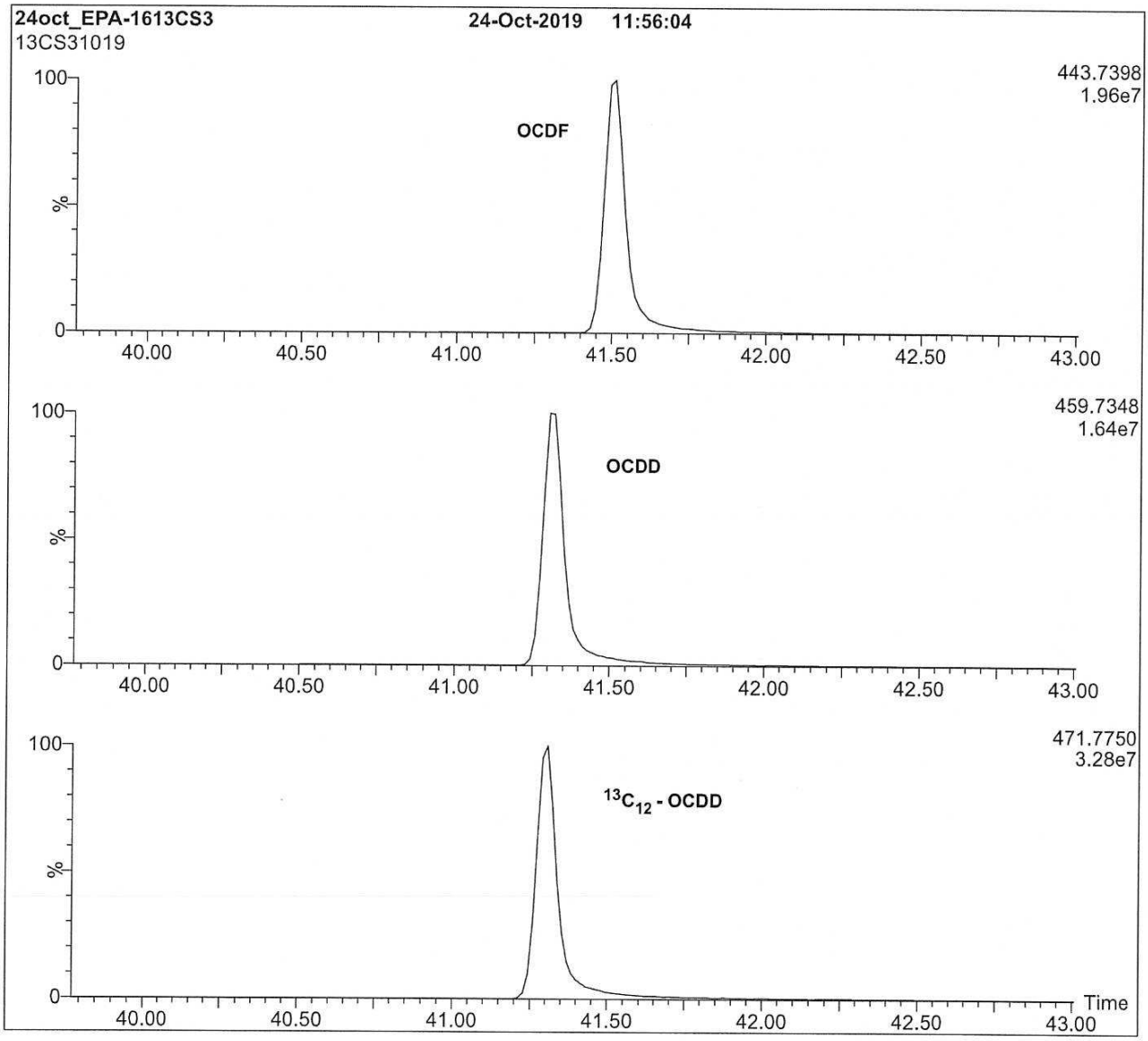


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)



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)

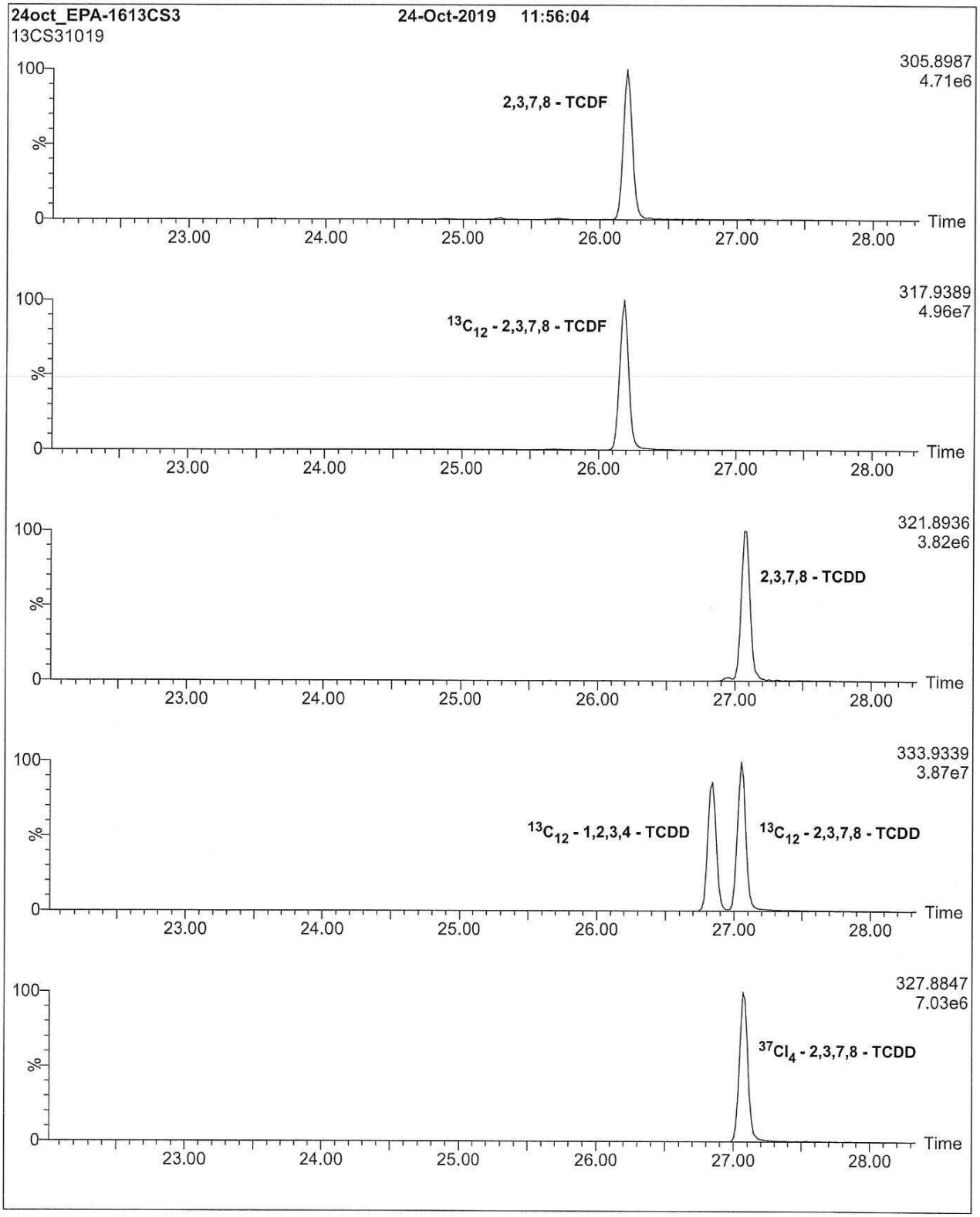


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

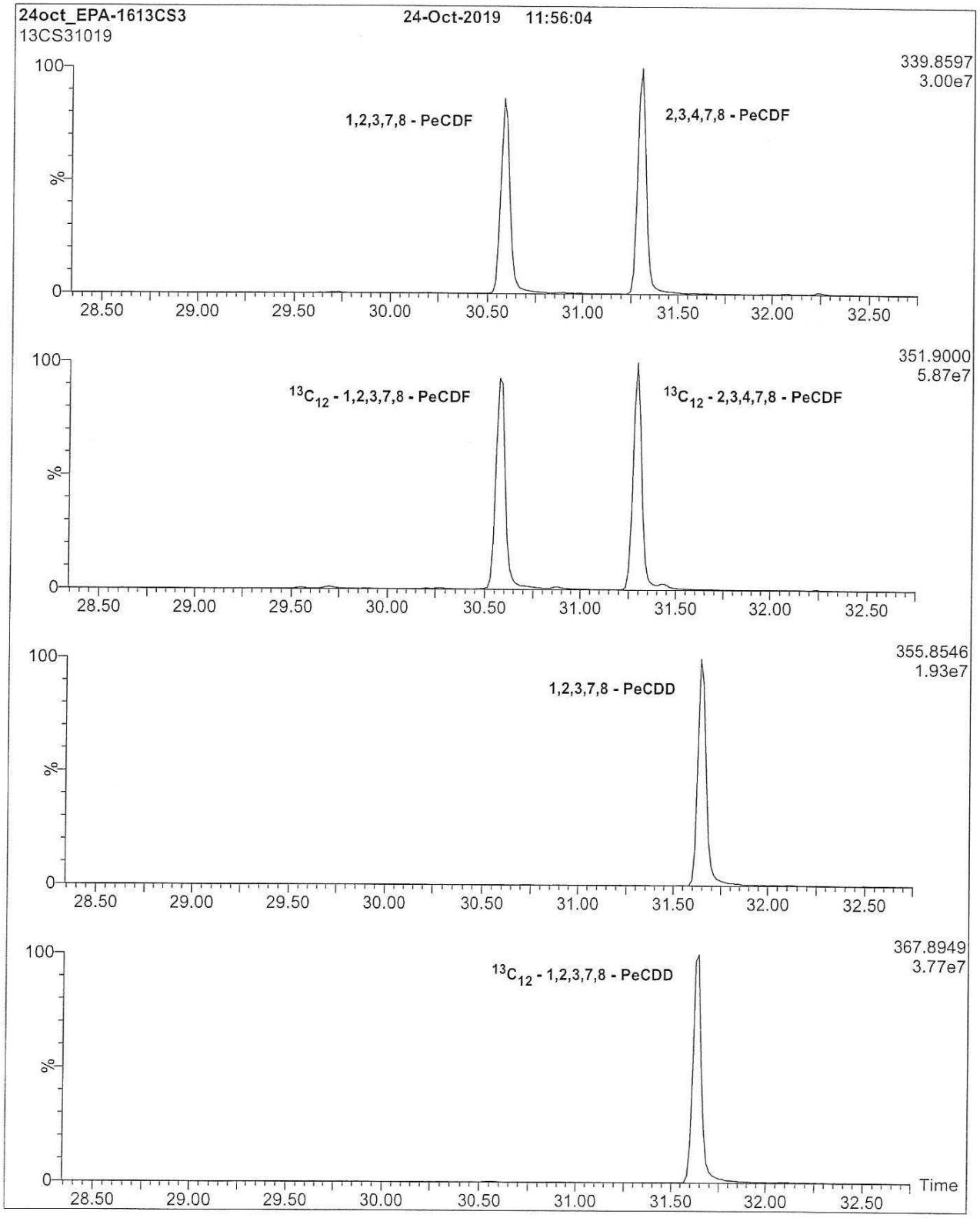


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

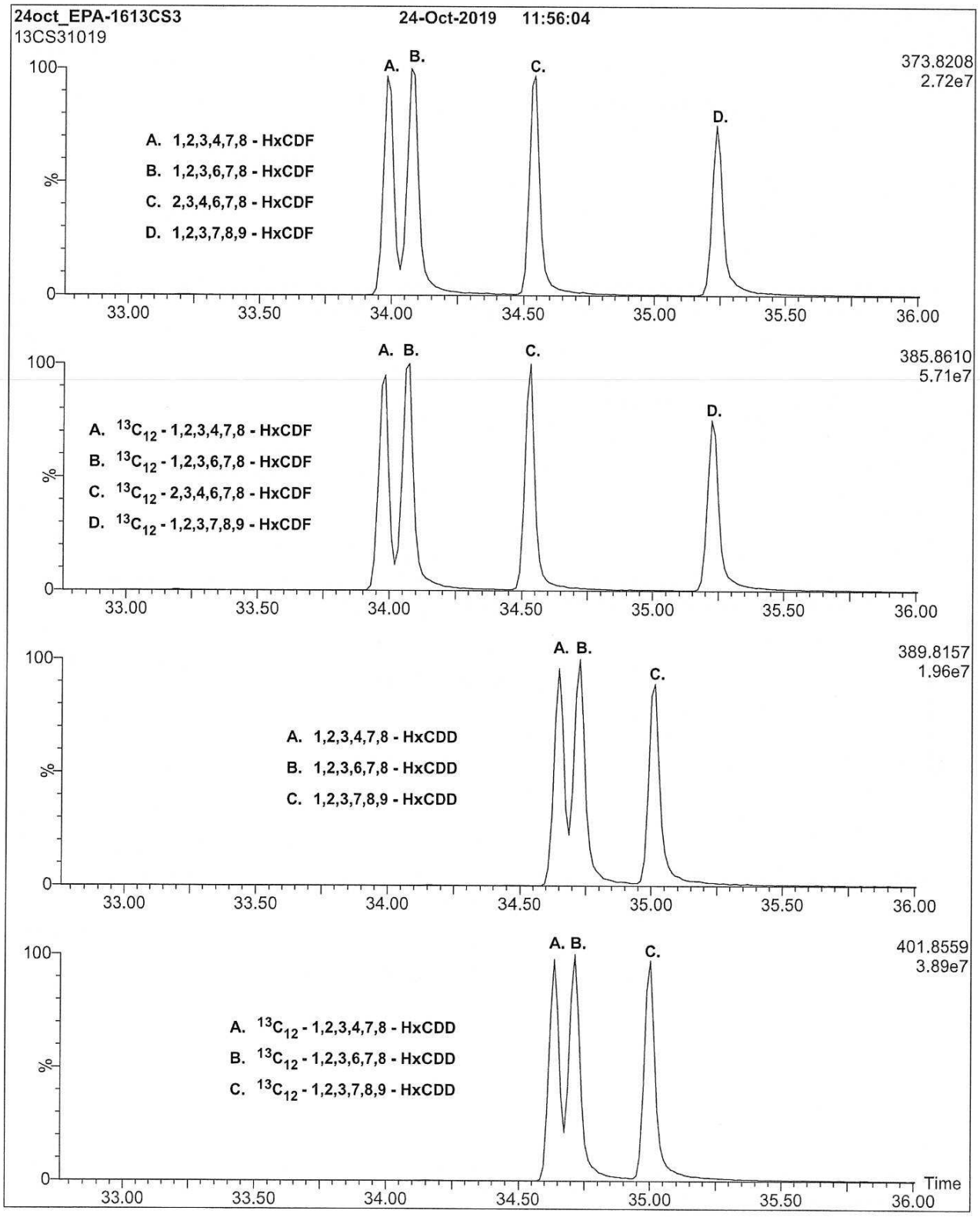


Figure 1: EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)

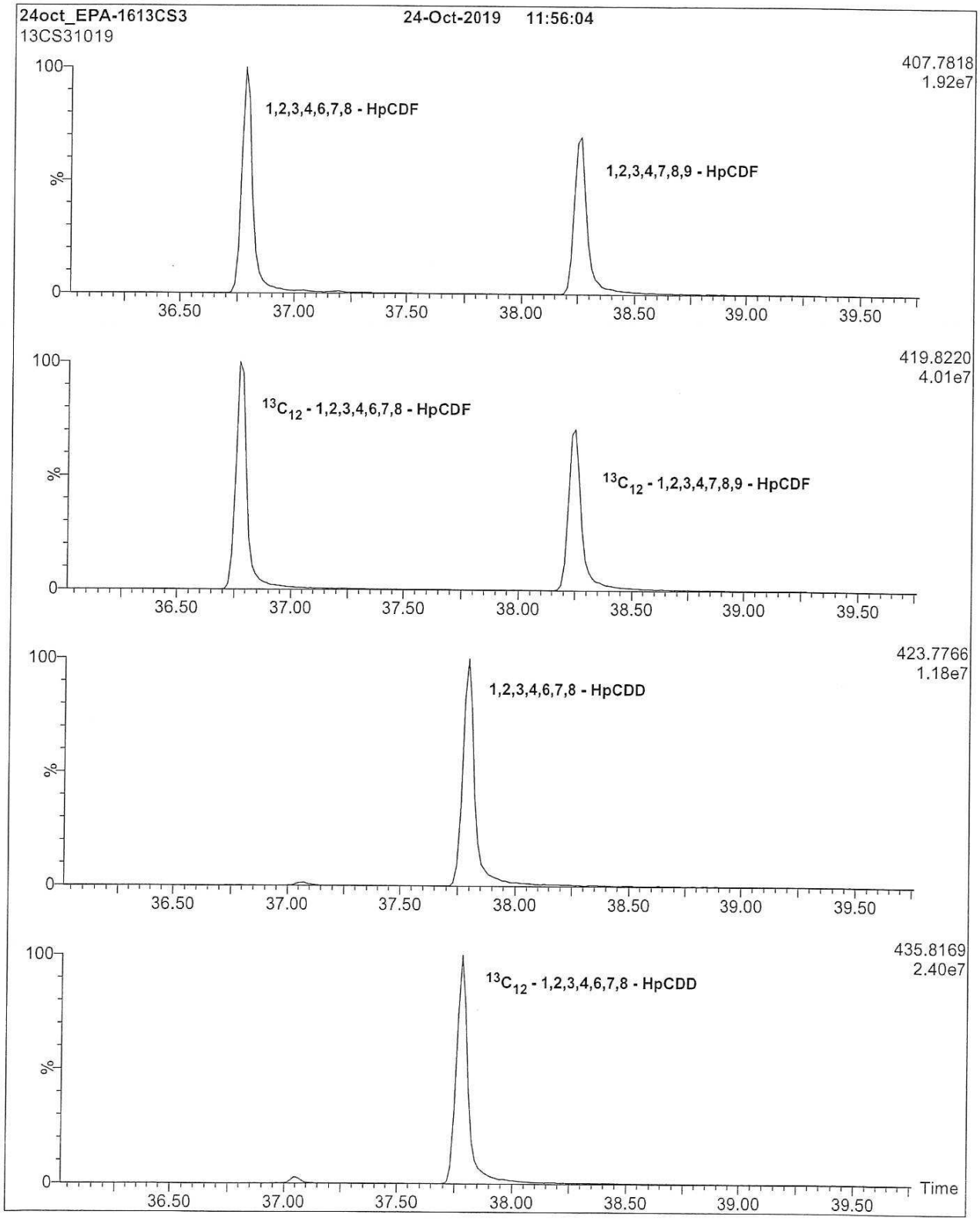
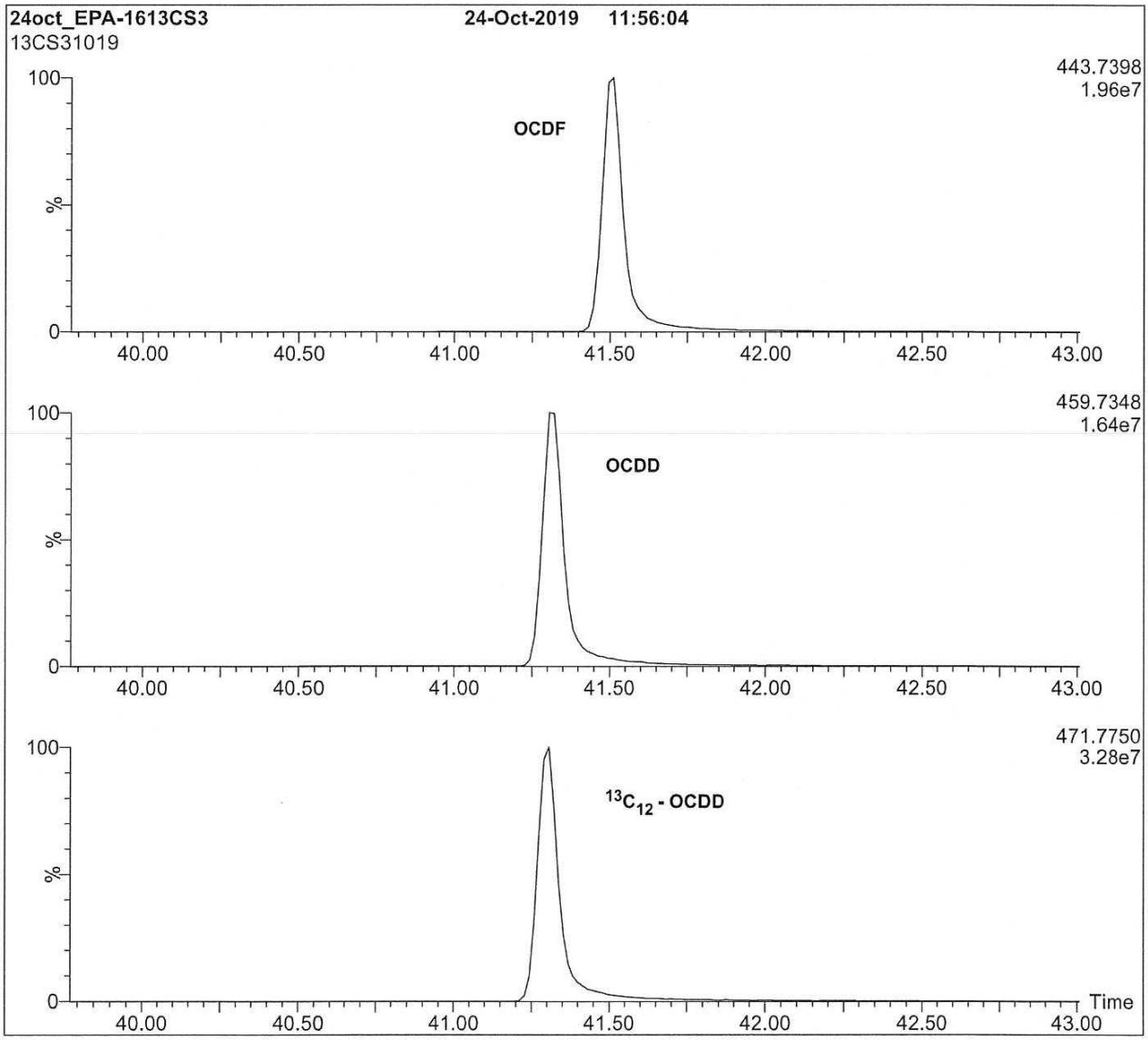


Figure 1: **EPA-1613CS3; HRGC/HRMS Data (60 m DB-5 Column)**



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)

National Institute of Standards & Technology

Certificate of Analysis

Standard Reference Material® 1944

New York/New Jersey Waterway Sediment

Standard Reference Material (SRM) 1944 is a mixture of marine sediment collected near urban areas in New York and New Jersey. SRM 1944 is intended for use in evaluating analytical methods for the determination of selected polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, chlorinated pesticides, and trace elements in marine sediment and similar matrices. Reference values are also provided for selected polybrominated diphenyl ether (PBDE) congeners, selected dibenzo-*p*-dioxin and dibenzofuran congeners, total organic carbon, total extractable material, and particle size characteristics. Information values are provided for selected polychlorinated naphthalenes (PCNs) and hexabromocyclododecanes (HBCDs). All of the constituents for which certified, reference, and information values are provided in SRM 1944 were naturally present in the sediment before processing. A unit of SRM 1944 consists of a bottle containing 50 g of radiation-sterilized, freeze-dried sediment.

Certified Mass Fraction Values: Certified values for mass fractions of PAHs, PCB congeners, chlorinated pesticides, and trace elements are provided in Tables 1 through 4. A NIST certified value is a value for which NIST has the highest confidence in its accuracy in that all known or suspected sources of bias have been investigated or taken into account [1]. The certified values for the PAHs, PCB congeners, and chlorinated pesticides are based on the agreement of results obtained at NIST using two or more chemically independent analytical techniques. The certified values for the trace elements are based on NIST measurements by one technique and additional results from several collaborating laboratories.

Reference Mass Fraction Values: Reference values are provided for mass fractions of additional PAHs (some in combination) in Tables 5 and 6, additional PCB congeners and chlorinated pesticides in Table 7, PBDE congeners in Table 8, and additional inorganic constituents in Tables 9 and 10. Reference values are provided in Table 11 for the 2,3,7,8-substituted polychlorinated dibenzo-*p*-dioxin and dibenzofuran congeners and total tetra-, penta-, hexa-, and hepta-congeners of polychlorinated dibenzo-*p*-dioxin and dibenzofuran. Reference values for particle size characteristics are provided in Table 12 and 13. Reference values for total organic carbon and percent extractable mass are provided in Table 14. Reference values are noncertified values that are the best estimate of the true value; however, the values do not meet the NIST criteria for certification and are provided with associated uncertainties that may reflect only measurement precision, may not include all sources of uncertainty, or may reflect a lack of sufficient statistical agreement among multiple analytical methods [1].

Information Mass Fraction Values: Information values are provided in Table 15 for mass fractions of additional trace elements, in Table 16 for PCN congeners (some in combination), and in Table 17 for HBCD isomers. An information value is considered to be a value that will be of interest and use to the SRM user, but insufficient information is available to assess the uncertainty associated with the value or only a limited number of analyses were performed [1]. Information values cannot be used to establish metrological traceability.

Expiration of Certification: The certification of **SRM 1944** is valid, within the measurement uncertainty specified, until **31 March 2027**, provided the SRM is handled and stored in accordance with the instructions given in this certificate (see "Instructions for Handling, Storage, and Use"). The certification is nullified if the SRM is damaged, contaminated, or otherwise modified.

Carlos A. Gonzalez, Chief
Chemical Sciences Division

Steven J. Choquette, Director
Office of Reference Materials

Gaithersburg, MD 20899
Certificate Issue Date: 17 February 2017
Certificate Revision History on Page 20

Maintenance of SRM Certification: NIST will monitor this SRM over the period of its certification. If substantive technical changes occur that affect the certification before the expiration of this certificate, NIST will notify the purchaser. Registration (see attached sheet or register online) will facilitate notification.

Coordination of the technical measurements leading to the certification was performed by M.M. Schantz and S.A. Wise of the NIST Chemical Sciences Division.

Consultation on the statistical design of the experimental work and evaluation of the data were provided by S.D. Leigh, M.G. Vangel, and M.S. Levenson of the NIST Statistical Engineering Division.

Support aspects involved in the issuance of this SRM were coordinated through the NIST Office of Reference Materials.

The sediment was collected with the assistance of the New York District of the U.S. Army Corp of Engineers (ACENYD), who provided the expertise in the site selection, the ship, sampling equipment, and personnel. L. Rosman of ACENYD and R. Parris (NIST) coordinated the collection of this sediment. Collection and preparation of SRM 1944 were performed by R. Parris, M. Cronise, and C. Fales (NIST); L. Rosman and P. Higgins (ACENYD), and the crew of the *Gelberman* from the ACE Caven Point facility in Caven Point, NJ.

Analytical measurements for the certification of SRM 1944 were performed at NIST by E.S. Beary, D.A. Becker, R.R. Greenberg, J.M. Keller, J.R. Kucklick, M. Lopez de Alda, K.E. Murphy, R. Olfaz, B.J. Porter, D.L. Poster, L.C. Sander, P. Schubert, M.M. Schantz, S.S. Vander Pol, and L. Walton of the Analytical Chemistry Division. Measurements for percent total organic carbon measurements were provided by three commercial laboratories and T.L. Wade of the Geochemical and Environmental Research Group, Texas A&M University (College Station, TX, USA). The particle-size distribution data were provided by Honeywell, Inc. (Clearwater, FL, USA). Additional results for PBDE congeners were used from ten laboratories (see Appendix A) that participated in an interlaboratory study specifically for PBDEs in Marine Sediment coordinated by H.M. Stapleton of the NIST Analytical Chemistry Division. M. LaGuardia of Virginia Institute of Marine Science (Gloucester Point, VA, USA) provided one set of measurements for the HBCDs.

Values for the polychlorinated dibenzo-*p*-dioxins and dibenzofurans were the results of an interlaboratory comparison study among fourteen laboratories (see Appendix B) coordinated by S.A. Wise of the NIST Analytical Chemistry Division and R. Turle and C. Chiu of Environment Canada Environmental Technology Centre, Analysis and Air Quality Division (Ottawa, ON, Canada). Analytical measurements for selected trace elements were provided by the International Atomic Energy Agency (IAEA, Seibersdorf, Austria) by M. Makarewicz and R. Zeisler. Results were also used from seven laboratories (see Appendix C) that participated in an intercomparison exercise coordinated by S. Willie of the Institute for National Measurement Standards, National Research Council Canada (NRCC; Ottawa, ON, Canada).

INSTRUCTIONS FOR HANDLING, STORAGE, AND USE

Handling: This material is naturally occurring marine sediment from an urban area and may contain constituents of unknown toxicities; therefore, caution and care should be exercised during its handling and use.

Storage: SRM 1944 must be stored in its original bottle at temperatures less than 30 °C away from direct sunlight.

Use: Prior to removal of test portions for analysis, the contents of the bottle should be mixed. The concentrations of constituents in SRM 1944 are reported on a dry-mass basis. The SRM, as received, contains a mass fraction of approximately 1.3 % moisture. The sediment sample should be dried to a constant mass before weighing for analysis or, if the constituents of interest are volatile, a separate test portion of the sediment should be removed from the bottle at the time of analysis and dried to determine the mass fraction on a dry-mass basis.

PREPARATION AND ANALYSIS[1]

Sample Collection and Preparation: The sediment used to prepare this SRM was collected from six sites in the vicinity of New York Bay and Newark Bay in October 1994. Site selection was based on contaminant levels measured in previous samples from these sites and was intended to provide relatively high concentrations for a variety of chemical classes of contaminants. The sediment was collected using an epoxy-coated modified Van Veen-type grab sampler designed to sample the sediment to a depth of 10 cm. A total of approximately 2100 kg of wet sediment was collected from the six sites. The sediment was freeze-dried, sieved (nominally 250 µm to 61 µm), homogenized in a cone blender, radiation sterilized at an estimated minimum dose of 32 kilograys (^{60}Co), and then packaged in screw-capped amber glass bottles.

Conversion to Dry-Mass Basis: The results for the constituents in SRM 1944 are reported on a dry-mass basis; however, the material as received contains residual moisture. The amount of moisture in SRM 1944 was determined by measuring the mass loss after freeze drying test portions of 1.6 g to 2.5 g for five days at 1 Pa with a –10 °C shelf temperature and a –50 °C condenser temperature. The mass fraction of moisture in SRM 1944 at the time of the certification analyses was 1.25 % ± 0.03 % (95 % confidence level).

Polycyclic Aromatic Hydrocarbons: The general approach used for the value assignment of the PAHs in SRM 1944 consisted of combining results from analyses using various combinations of different extraction techniques and solvents, cleanup/isolation procedures, and chromatographic separation and detection techniques [2]. Techniques and solvents involved were Soxhlet extraction and pressurized fluid extraction (PFE) using dichloromethane (DCM) or a hexane/acetone mixture, clean up of the extracts using solid-phase extraction (SPE), or normal-phase liquid chromatography (LC), followed by analysis using the following techniques: (1) reversed-phase liquid chromatography with fluorescence detection (LC-FL) analysis of the total PAH fraction, (2) reversed-phase LC-FL analysis of isomeric PAH fractions isolated by normal-phase LC (i.e., multidimensional LC), (3) gas chromatography/mass spectrometry (GC/MS) analysis of the PAH fraction on four stationary phases of different selectivity, i.e., a 5 % (mole fraction) phenyl-substituted methylpolysiloxane phase, a 50 % phenyl-substituted methylpolysiloxane phase, a proprietary non-polar polysiloxane phase, and a smectic liquid crystalline stationary phase.

Seven sets of GC/MS results, designated as GC/MS (I), GC/MS (II), GC/MS (III), GC/MS (IV), GC/MS (V), GC/MS (VI), and GC/MS (Sm), were obtained using four columns with different selectivities for the separation of PAHs. For GC/MS (I) analyses, duplicate test portions of 1 g from eight bottles of SRM 1944 were Soxhlet extracted for 24 h with DCM. Copper powder was added to the extract to remove elemental sulfur. The concentrated extract was passed through a silica SPE cartridge and eluted with 2 % DCM in hexane. (All extraction and LC solvent compositions are expressed as volume fractions unless otherwise noted.) The processed extract was then analyzed by GC/MS using a 0.25 mm i.d. × 60 m fused silica capillary column with a 5 % phenyl-substituted methylpolysiloxane phase (0.25 µm film thickness) (DB-5 MS, J&W Scientific, Folsom, CA). The GC/MS (II) analyses were performed using 1 g to 2 g test portions from three bottles of SRM 1944 and 2 g to 3 g test portions from three bottles of SRM 1944 that had been mixed with a similar amount of water (i.e., a wetted sediment). These test portions were Soxhlet extracted with DCM and processed through the silica SPE as described above; however, the extract was further fractionated using normal-phase LC on a semi-preparative aminopropylsilane column to isolate the PAH fraction. The PAH fraction was then analyzed using the same column as described above for GC/MS (I); however, the test portions were extracted, processed, and analyzed as part of three different sample sets at different times using different calibrations for each set. For the GC/MS (III), 1 g to 2 g test portions from six bottles of SRM 1944 were Soxhlet extracted for 18 h with 250 mL of a mixture of 50 % hexane/50 % acetone. The extracts were then processed and analyzed as described for GC/MS (II). For GC/MS (IV) analyses, 1 g to 2 g test portions from six bottles of SRM 1944 were extracted using PFE with a mixture of 50 % hexane/50 % acetone, and the extracts were processed as described above for GC/MS (II). The GC/MS (V) results were obtained by analyzing three of the same PAH fractions that were analyzed in GC/MS (III) and three of the PAH fractions that were analyzed in GC/MS (IV) using a 50 % (mole fraction) phenyl-substituted methylpolysiloxane stationary phase (0.25 mm i.d. × 60 m, 0.25 µm film thickness) (DB-17MS, J&W Scientific, Folsom, CA). For GC/MS (VI) analyses, three test portions of 0.7 g from one bottle of SRM 1944 were Soxhlet extracted for 24 h with DCM. Copper powder was added to the extract to remove elemental sulfur. The concentrated extract was passed through an aminopropyl SPE cartridge and eluted with 20 % DCM in hexane. The processed extract was then analyzed by GC/MS using a 0.25 mm i.d. × 60 m fused silica capillary column with a proprietary non-polar polysiloxane phase (0.25 µm film thickness) (DB-XLB, J&W Scientific). For GC/MS (Sm) 1 g to 2 g test portions from six bottles of SRM 1944 were Soxhlet extracted for 24 h

[1]Certain commercial equipment, instruments, or materials are identified in this report to adequately specify the experimental procedure. Such identification does not imply recommendation or endorsement by the National Institute of Standards and Technology, nor does it imply that the materials or equipment identified are necessarily the best available for the purpose.

with 250 mL of DCM. The extracts were processed as described above for GC/MS (I) using an aminopropylsilane SPE cartridge followed by GC/MS analysis using 0.2 mm i.d. × 25 m (0.15 μm film thickness) smectic liquid crystalline phase (SB-Smectic, Dionex, Lee Scientific Division, Salt Lake City, UT).

Two sets of LC-FL results, designated as LC-FL (Total) and LC-FL (Fraction), were used in the certification process. Test portions of approximately 1 g from six bottles of SRM 1944 were Soxhlet extracted for 20 h using 200 mL of 50 % hexane/50 % acetone. The extracts were concentrated and then processed through two aminopropylsilane SPE cartridges connected in series to obtain the total PAH fraction. A second 1 g test portion from the six bottles was Soxhlet extracted and processed as described above; the PAH fraction was then fractionated further on a semi-preparative aminopropylsilane column (μBondapak NH_2, 9 mm i.d. × 30 cm, Waters Associates, Milford, MA) to isolate isomeric PAH fractions. The total PAH fraction and the isomeric PAH fractions were analyzed using a 5-μm particle-size polymeric octadecylsilane (C_{18}) column (4.6 mm i.d. × 25 cm, Hypersil-PAH, Keystone Scientific, Inc., Bellefonte, PA) with wavelength-programmed fluorescence detection. For all of the GC/MS and LC-FL measurements described above, selected perdeuterated PAHs were added to the sediment prior to solvent extraction for use as internal standards for quantification purposes.

Homogeneity Assessment for PAHs: The homogeneity of SRM 1944 was assessed by analyzing duplicate test portions of 1 g from eight bottles selected by stratified random sampling. Test portions were extracted, processed, and analyzed as described above for GC/MS (I). No statistically significant differences among bottles were observed for the PAHs at the 1 g test portion size.

PAH Isomers of Molecular Mass 300 and 302: For the determination of the molecular mass 300 and 302 PAH isomers, three test portions of approximately 5 g each were extracted using PFE with DCM. The extracts were then concentrated with a solvent change to hexane and passed through an aminopropyl SPE cartridge and eluted with 10 % DCM in hexane. The processed extract was then analyzed by GC/MS using a 0.25 mm i.d. × 60 m fused silica capillary column with a 50 % phenyl-substitued methylpolysiloxane phase (0.25 μm film thickness; DB-17MS, J&W Scientific, Folsom, CA). Perdeuterated dibenzo[*a,i*]pyrene was added to the sediment prior to extraction for use as an internal standard.

PCBs and Chlorinated Pesticides: The general approach used for the determination of PCBs and chlorinated pesticides in SRM 1944 consisted of combining results from analyses using various combinations of different extraction techniques and solvents, cleanup/isolation procedures, and chromatographic separation and detection techniques [2]. This approach consisted of Soxhlet extraction and PFE using DCM or a hexane/acetone mixture, clean up/isolation using SPE or LC, followed by analysis using GC/MS and gas chromatography with electron capture detection (GC-ECD) on two columns with different selectivity.

Eight sets of results were obtained designated as GC-ECD (I) A and B, GC-ECD (II) A and B, GC/MS (I), GC/MS (II), GC/MS (III), and QA Exercise. For the GC-ECD (I) analyses, 1 g test portions from four bottles of SRM 1944 were Soxhlet extracted with DCM for 18 h. Copper powder was added to the extract to remove elemental sulfur. The concentrated extract was passed through a silica SPE cartridge and eluted with 10 % DCM in hexane. The concentrated eluant was then fractionated on a semi-preparative aminopropylsilane column to isolate two fractions containing: (1) the PCBs and lower polarity pesticides and, (2) the more polar pesticides. GC-ECD analyses of the two fractions were performed on two columns of different selectivities for PCB separations: 0.25 mm × 60 m fused silica capillary column with a 5 % phenyl-substituted methylpolysiloxane phase (0.25 μm film thickness) (DB-5, J&W Scientific, Folsom, CA) and a 0.32 mm × 100 m fused silica capillary column with a 50 % (mole fraction) octadecyl (C18) methylpolysiloxane phase (0.1 μm film thickness) (CPSil 5 C18 CB, Chrompack International, Middelburg, The Netherlands). The results from the 5 % phenyl phase are designated as GC-ECD (IA) and the results from the C18 phase are designated as GC-ECD (IB). A second set of samples was also analyzed by GC-ECD (i.e., GC-ECD IIA and IIB). Test portions of 1 g to 2 g from three bottles of SRM 1944 and 2 g to 3 g test portions from three bottles of SRM 1944 that had been mixed with a similar amount of water (i.e., a wetted sediment) were extracted, processed, and analyzed as described above for GC-ECD (I); however, the test portions were extracted, processed and analyzed as part of three different sample sets at different times using different calibrations for each set.

Three sets of results were obtained by GC/MS. For GC/MS (I), 1 g to 2 g test portions from six bottles were Soxhlet extracted with a mixture of 50 % hexane/50 % acetone. Copper powder was added to the extract to remove elemental sulfur. The concentrated extract was passed through a silica SPE cartridge and eluted with 10 % DCM in hexane. The extract was then analyzed by GC/MS using a 0.25 mm × 60 m fused silica capillary column with a 5 % phenyl-substituted methylpolysiloxane phase (0.25 µm film thickness). The GC/MS (II) results were obtained in the same manner as the GC/MS (I) analyses except that the six test portions were extracted using PFE. The GC/MS (III) analyses were performed on the same extract fractions analyzed in GC-ECD (II) using the 5 % phenyl-substituted methylpolysiloxane phase describe above for GC/MS (I). For both the GC-ECD and GC/MS analyses, two PCB congeners that are not significantly present in the sediment extract (PCB 103 and PCB 198 [3]), and 4,4'-DDT-d_8 were added to the sediment prior to extraction for use as internal standards for quantification purposes.

In addition to the analyses performed at NIST, SRM 1944 was used in an interlaboratory comparison exercise in 1995 as part of the NIST Intercomparison Exercise Program for Organic Contaminants in the Marine Environment [4]. Results from nineteen laboratories that participated in this exercise were used as the eighth data set in the determination of the certified values for PCB congeners and chlorinated pesticides in SRM 1944. The laboratories participating in this exercise used the analytical procedures routinely used in their laboratories to measure PCB congeners and chlorinated pesticides.

Polybrominated Diphenyl Ethers: Value assignment of the concentrations of eight PBDE congeners was based on the means of results from two interlaboratory studies [5,6] and two sets of data from NIST. The laboratories participating in the interlaboratory exercises (see Appendix A) employed the analytical procedures routinely used in their laboratories to measure PBDEs. For the two methods used at NIST, six test portions (between 1 g and 2 g) were extracted using PFE at 100 °C with DCM. The extracts were cleaned up using an alumina column (5 % deactivated) SPE column. Size exclusion chromatography (SEC) on a divinylbenzene-polystyrene column (10 µm particle size, 10 nm (100 angstrom) pore size, 7.5 mm i.d. × 300 mm, PL-Gel, Polymer Labs, Inc.) was then used to remove the sulfur. The PBDEs, as well as PCBs and pesticides, were quantified using GC/MS in the electron impact mode on a 0.18 mm i.d. × 30 m fused silica capillary column with a 5 % (mole fraction) phenyl methylpolysiloxane phase (0.18 µm film thickness; DB-5MS, Agilent Technologies). The PBDEs were also quantified using GC/MS in the negative chemical ionization mode on a 0.18 mm i.d. × 10 m fused silica capillary column with a 5 % (mole fraction) phenyl methylpolysiloxane phase (0.18 µm film thickness; DB-5MS, Agilent Technologies). Selected Carbon-13 labeled PBDE and PCB congeners were added to the sediment prior to extraction for use as internal standards for quantification purposes.

Polychlorinated Dibenzo-*p*-dioxins and Dibenzofurans: Value assignment of the concentrations of the polychlorinated dibenzo-*p*-dioxin and dibenzofuran congeners and the total tetra- through hepta- substituted polychlorinated dibenzo-*p*-dioxins and dibenzofurans was accomplished by combining results from the analysis of SRM 1944 by fourteen laboratories that participated in an interlaboratory comparison study (see Appendix B). Each laboratory analyzed three test portions (typically 1 g) of SRM 1944 using their routine analytical procedures and high resolution gas chromatography with high resolution mass spectrometry detection (GC-HRMS). The analytical procedures used by all of the laboratories included spiking with ^{13}C-labeled surrogates (internal standards); Soxhlet extraction with toluene; sample extract cleanup with acid/base silica, alumina, and carbon columns; and finally analysis of the cleaned up extract with GC-HRMS. Most of the laboratories used a 5 % phenyl-substituted methylpolysiloxane phase capillary column (DB-5), and about half of the laboratories confirmed 2,3,7,8-tetrachlorodibenzofuran using a 50 % cyanopropylphenyl-substituted methylpolysiloxane (DB-225, J&W Scientific, Folsom, CA) capillary column.

Analytical Approach for Inorganic Constituents: Value assignment for the concentrations of selected trace elements was accomplished by combining results of the analyses of SRM 1944 from NIST, NRCC, IAEA, and seven laboratories that participated in an interlaboratory comparison exercise coordinated by NRCC [7] (see Appendix C). The analytical methods used for the determination of each element are summarized in Table 18. For the certified concentration values listed in Table 4, results were combined from: (1) analyses at NIST using isotope dilution inductively coupled plasma mass spectrometry (ID-ICPMS) or instrumental neutron activation analysis (INAA), (2) analyses at NRCC using ID-ICPMS, graphite furnace atomic absorption spectrometry (GFAAS), and/or inductively coupled plasma optical emission spectroscopy (ICPOES), (3) analyses at IAEA using INAA, and (4) the mean of the results from seven laboratories that participated in the NRCC interlaboratory comparison exercise. The reference mass fraction values in Table 9 were determined by combining results from (1) analyses performed at NIST using INAA; (2) analyses at NRCC using ID-ICPMS, GFAAS, ICPOES, and/or cold vapor atomic absorption spectroscopy (CVAAS); (3) analyses at IAEA using INAA; and (4) the mean of the results from five to seven laboratories that participated in the NRCC interlaboratory comparison exercise. The information concentration values in Table 15 were determined by INAA at NIST and IAEA.

NIST Analyses using ID-ICPMS: Lead, cadmium, and nickel were determined by ID-ICPMS [8]. Test portions (0.4 g to 0.5 g) from six bottles of the SRM were spiked with ^{206}Pb, ^{111}Cd, and ^{62}Ni and wet ashed using a combination of nitric, hydrochloric, hydrofluoric, and perchloric acids. Lead and cadmium were determined in the same test portions; nickel was determined in a second sample set. A small amount of crystalline material remained after the acid dissolution. Lithium metaborate fusion was performed on this residue to confirm that the residue contained insignificant amounts of the analytes. Cadmium and nickel were separated from the matrix material to eliminate the possibility of spectral interferences, and concentrations were determined from the measurement of the $^{112}Cd/^{111}Cd$ and $^{62}Ni/^{60}Ni$ ratios, respectively. The $^{208}Pb/^{206}Pb$ ratios were measured directly because interferences at these masses are negligible.

NIST Analyses using INAA: Analyses were performed in two steps [9]. Elements with short-lived irradiation products (Al, Ca, Cl, K, Mg, Mn, Na, Ti, and V) were determined by measuring duplicate 300 mg test portions from each of ten bottles of SRM 1944. The samples, standards, and controls were packaged in clean polyethylene bags and were individually irradiated for 15 s in the NIST Reactor Pneumatic Facility RT-4. Reactor power was 20 MW, which corresponds to a neutron fluence rate of about 8×10^{13} $cm^{-2} \cdot s^{-1}$. After irradiation, the samples, controls, and standards were repackaged in clean polyethylene bags and counted (gamma-ray spectrometry) three times at different decay intervals. A sample-to-detector distance (counting geometry) of 20 cm was used. Elements with long-lived irradiation products (Ag, As, Br, Co, Cr, Cs, Fe, Rb, Sb, Sc, Se, Th, and Zn) were determined by measuring one 300 mg test portion from each of nine bottles of SRM 1944. The samples, standards, controls, and blank polyethylene bags were irradiated together for a total of 1 h at a reactor power of 20 MW. Approximately four days after irradiation, the polyethylene bags were removed, and each sample, standard, control, and blank was counted at 20 cm from the detector. The samples were then recounted at 10 cm from another detector. After an additional decay time of about one month, the samples, standards, controls, and blanks were counted a third time (at 10 cm) from the second detector.

Homogeneity Assessment for Inorganic Constitutents: For some of the trace elements, most notably Cd, Fe, Pb, Rb, Sb, Sc, and Th, the variations among the test portions measured at NIST (between 0.3 g and 0.5 g) were larger than expected from the measurement process. Based on experience, it was concluded that there is some material inhomogeneity for trace elements in the test portions used. Sample variations among the NIST measurements are used as slightly conservative estimates of the sample inhomogeneities.

Particle Size Information: Dry particle-size distribution measurements for SRM 1944 were obtained as part of a collaborative effort with Honeywell's Particle and Components Measurements Laboratory (Clearwater, FL). A Microtrac particle analyzer, which makes use of light-scattering techniques, was used to measure the particle-size distribution of SRM 1944. Briefly, a reference beam is used to penetrate a field of particles and the light that scatters in the forward direction from the field is measured and the particle-size as a volume distribution is derived via a computer-assisted analysis. From these data, the total volume, average size, and a characteristic width of the particle size distribution are calculated. The system has a working range from 0.7 μm to 700 μm.

Total Organic Carbon and Percent Extractable Mass: Four laboratories provided results for total organic carbon (TOC) using similar procedures. Briefly, test portions of approximately 200 mg were reacted with 6 mol/L hydrochloric acid and rinsed with deionized water prior to combustion in a gas fusion furnace. The carbon monoxide and carbon dioxide produced were measured and compared to a blank for calculation of the percent TOC. Each laboratory analyzed test portions from six bottles of SRM 1944. For the determination of percent extractable mass, six test portions of approximately 1 g to 2 g of SRM 1944 were extracted using Soxhlet extraction for 18 h with DCM. The extraction thimbles were allowed to air dry. After reaching constant mass, the difference in the mass before and after extraction was determined.

Polychlorinated Naphthalenes: Value assignment of PCN congener concentrations was accomplished by combining results from the analysis of SRM 1944 by six laboratories that participated in an interlaboratory comparison study (see Appendix D). Each laboratory analyzed three test portions (typically 1 g to 2 g) of SRM 1944 using their routine analytical procedures that included high-resolution gas chromatography with either high-resolution mass spectrometry detection (GC-HRMS) or low-resolution MS in the negative chemical ionization mode. Calibration mixtures included either Halowax mixtures with known volume fractions of individual congeners or individual PCN congeners.

HBCDs: Value assignment of the concentrations of three HBCD isomers was accomplished by combining results from the analysis of SRM 1944 in two sets from NIST and one set from Virginia Institute of Marine Science. For the two sets analyzed at NIST, the second fraction from an acidified silica SPE clean-up was analyzed by LC/MS/MS for the HBCDs using both electrospray ionization (ESI) and atmospheric pressurized photoionization (APPI). A C18 column (3.0 mm × 150 mm × 3.5 µm column, Eclipse Plus, Agilent Technologies) and YMC Carotenoid S5 C30 column (4.6 mm × 250 mm × 5 µm column) were used with a solvent gradient using 2.5 mmol/L ammonium acetate in 12.5 % water in methanol and acetonitrile at a flow rate of 0.3 mL/min. Carbon-13 labeled HBCDs were added to the sediment prior to solvent extraction for use as internal standards for quantification purposes.

The measurands for certified values are the total concentrations of the analytes listed in Tables 1-4. Metrological traceability is to the SI derived units for mass fraction, expressed as milligrams per kilogram, micrograms per kilogram or percentage, respectively.

Table 1. Certified Mass Fraction Values for Selected PAHs in SRM 1944 (Dry-Mass Basis)

	Mass Fraction[a,b] (mg/kg)		
Phenanthrene[c,d,e,f,g]	5.27	±	0.22
Fluoranthene[c,d,e,f,g]	8.92	±	0.32
Pyrene[c,d,e,f,g]	9.70	±	0.42
Benzo[*c*]phenathrene[c,d,e,f,h]	0.76	±	0.10
Benz[*a*]anthracene[c,d,e,f,g,h]	4.72	±	0.11
Chrysene[h,k]	4.86	±	0.10[i]
Triphenylene[h,k]	1.04	±	0.27
Benzo[*b*]fluoranthene[g,h,j]	3.87	±	0.42
Benzo[*j*]fluoranthene[h,j]	2.09	±	0.44
Benzo[*k*]fluoranthene[c,d,e,f,g,h,j]	2.30	±	0.20
Benzo[*a*]fluoranthene[c,d,e,f,h,,j]	0.78	±	0.12
Benzo[*e*]pyrene[c,d,e,f,h,j]	3.28	±	0.11
Benzo[*a*]pyrene[c,d,e,f,g,h,j]	4.30	±	0.13
Perylene[c,d,e,f,g,h,j]	1.17	±	0.24
Benzo[*ghi*]perylene[c,d,e,f,,j,k]	2.84	±	0.10
Indeno[1,2,3-*cd*]pyrene[c,d,e,f,j,k]	2.78	±	0.10
Dibenz[*a,j*]anthracene[c,d,e,f,,j,k]	0.500	±	0.044
Dibenz[*a,c*]anthracene[,j,k]	0.335	±	0.013
Dibenz[*a,h*]anthracene[j,k]	0.424	±	0.069
Pentaphene[c,d,e,f,,j,k]	0.288	±	0.026
Benzo[*b*]chrysene[c,d,e,f,j,k,h]	0.63	±	0.10
Picene[c,d,e,f,j,k]	0.518	±	0.093

[a] Mass fractions are reported on dry-mass basis; material as received contains approximately 1.3 % moisture.

[b] Each certified value is a mean of the means from two or more analytical methods, weighted as described in Paule and Mandel [10].
Each uncertainty, computed according to the Comité International des Poids et Mesures (CIPM) approach as described in the ISO/JCGM Guide [11,12], is an expanded uncertainty at the 95 % level of confidence, which includes random sources of uncertainty within each analytical method as well as uncertainty due to the drying study. The expanded uncertainty defines a range of values within which the true value is believed to lie, at a level of confidence of approximately 95 %.

[c] Gas chromatography/mass spectrometry (GC/MS) (I) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with DCM.

[d] GC/MS (II) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with DCM.

[e] GC/MS (III) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with 50 % hexane/50 % acetone mixture.

[f] GC/MS (IV) on 5 % phenyl-substituted methylpolysiloxane phase after PFE with 50 % hexane/50 % acetone mixture.

[g] LC-FL of total PAH fraction after Soxhlet extraction with 50 % hexane/50 % acetone mixture.

[h] GC/MS (Sm) using a smectic liquid crystalline phase after Soxhlet extraction with DCM.

[i] The uncertainty interval for chrysene was widened in accordance with expert consideration of the analytical procedures, along with the analysis of the data as a whole, which suggests that the half-widths of the expanded uncertainties should not be less than 2 %.

[j] GC/MS (V) on 50 % phenyl-substituted methylpolysiloxane phase of extracts from GC/MS (III) and GC/MS (IV).

[k] LC-FL of isomeric PAH fractions after Soxhlet extraction with 50 % hexane/50 % acetone mixture.

Table 2. Certified Mass Fraction Values for Selected PCB Congeners[a] in SRM 1944 (Dry-Mass Basis)

		Mass Fraction[b,c] (µg/kg)		
PCB 8	(2,4'-Dichlorobiphenyl)[d,e,f,g,h,i,j,k]	22.3	±	2.3
PCB 18	(2,2',5-Trichlorobiphenyl)[d,e,f,g,h,i,j,k]	51.0	±	2.6
PCB 28	(2,4,4'-Trichlorobiphenyl)[d,e,f,g,j,k]	80.8	±	2.7
PCB 31	(2,4',5-Trichlorobiphenyl)[d,e,f,g,j]	78.7	±	1.6[l]
PCB 44	(2,2'3,5'-Tetrachlorobiphenyl)[d,e,f,g,h,i,j,k]	60.2	±	2.0
PCB 49	(2,2'4,5'-Tetrachlorobiphenyl)[d,e,f,g,h,i,j,k]	53.0	±	1.7
PCB 52	(2,2',5,5'-Tetrachlorobiphenyl)[d,e,f,g,h,i,j,k]	79.4	±	2.0
PCB 66	(2,3',4,4'-Tetrachlorobiphenyl)[e,g,h,i,j]	71.9	±	4.3
PCB 95	(2,2',3,5',6-Pentachlorobiphenyl)[e,g,h,i,j]	65.0	±	8.9
PCB 87	(2,2',3,4,5'-Pentachlorobiphenyl)[d,e,f,g,h,i,j]	29.9	±	4.3
PCB 99	(2,2',4,4',5-Pentachlorobiphenyl)[d,e,f,g,h,i,j,k]	37.5	±	2.4
PCB 101	(2,2',4,5,5'-Pentachlorobiphenyl)[d,e,f,g,h,i,j,k]	73.4	±	2.5
PCB 105	(2,3,3',4,4'-Pentachlorobiphenyl)[e,f,g,h,i,j,k]	24.5	±	1.1
PCB 110	(2,3,3',4',6-Pentachlorobiphenyl)[g,h,i,j]	63.5	±	4.7
PCB 118	(2,3',4,4',5-Pentachlorobiphenyl)[d,e,f,g,h,i,j,k]	58.0	±	4.3
PCB 128	(2,2',3,3',4,4'-Hexachlorobiphenyl)[d,e,f,g,h,i,j,k]	8.47	±	0.28
PCB 138	(2,2',3,4,4',5'-Hexachlorobiphenyl)[d,e,f,g,h,i,j,k]	62.1	±	3.0
PCB 149	(2,2',3,4',5',6-Hexachlorobiphenyl)[d,e,f,g,h,i,j,k]	49.7	±	1.2
PCB 151	(2,2',3,5,5',6-Hexachlorobiphenyl)[d,e,f,g,h,i,j,k]	16.93	±	0.36
PCB 153	(2,2',4,4',5,5'-Hexachlorobiphenyl)[d,e,f,g,h,i,j,k]	74.0	±	2.9
PCB 156	(2,3,3',4,4',5-Hexachlorobiphenyl)[d,e,f,g,h,i,j]	6.52	±	0.66
PCB 170	(2,2',3,3',4,4',5-Heptachlorobiphenyl)[d,e,f,g,h,i,j,k]	22.6	±	1.4
PCB 180	(2,2',3,4,4',5,5'-Heptachlorobiphenyl)[d,e,f,g,h,i,j,k]	44.3	±	1.2
PCB 183	(2,2',3,4,4',5',6-Heptachlorobiphenyl)[d,e,f,g,h,i,j]	12.19	±	0.57
PCB 187	(2,2',3,4',5,5',6-Heptachlorobiphenyl)[d,e,f,g,h,i,j,k]	25.1	±	1.0
PCB 194	(2,2',3,3',4,4',5,5'-Octachlorobiphenyl)[d,e,f,g,h,i,j]	11.2	±	1.4
PCB 195	(2,2',3,3',4,4',5,6-Octachlorbiphenyl)[d,e,f,g,h,i,j,k]	3.75	±	0.39
PCB 206	(2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl)[d,e,f,g,h,i,j,k]	9.21	±	0.51
PCB 209	Decachlorobiphenyl[d,e,f,g,h,i,j,k]	6.81	±	0.33

[a] PCB congeners are numbered according to the scheme proposed by Ballschmiter and Zell [13] and later revised by Schulte and Malisch [3] to conform with IUPAC rules; for the specific congeners mentioned in this SRM, the Ballschmiter-Zell numbers correspond to those of Schulte and Malisch.

[b] Mass fractions are reported on dry-mass basis; material as received contains approximately 1.3 % moisture.

[c] Each certified value is a mean of the means from two or more analytical methods, weighted as described in Paule and Mandel [10].
Each uncertainty, computed according to the CIPM approach as described in the ISO/JCGM Guide [11,12], is an expanded uncertainty at the 95 % level of confidence, which includes random sources of uncertainty within each analytical method as well as uncertainty due to the drying study. The expanded uncertainty defines a range of values within which the true value is believed to lie, at a level of confidence of approximately 95 %.

[d] GC-ECD (IA) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with DCM.

[e] GC-ECD (IB) on the 50 % C-18 dimethylpolysiloxane phase; same extracts analyzed as in GC-ECD (IA).

[f] GC-ECD (IIA) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with DCM.

[g] GC-ECD (IIB) on the 50 % octadecyl (C-18) methylpolysiloxane phase; same extracts analyzed as in GC-ECD (IIA).

[h] GC/MS (I) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with 50 % hexane/50 % acetone mixture.

[i] GC/MS (II) on 5 % phenyl-substituted methylpolysiloxane phase after PFE extraction with 50 % hexane/50 % acetone mixture.

[j] GC/MS (III) on 5 % phenyl-substituted methylpolysiloxane phase; same extracts analyzed as in GC-ECD (IIA).

[k] Results from nineteen laboratories participating in an interlaboratory comparison exercise.

[l] The uncertainty interval for PCB 31 was widened in accordance with expert consideration of the analytical procedures, along with the analysis of the data as a whole, which suggests that the half-widths of the expanded uncertainties should not be less than 2 %.

Table 3. Certified Mass Fraction Values for Selected Chlorinated Pesticides in SRM 1944 (Dry-Mass Basis)

	Mass Fraction[a,b] (µg/kg)		
Hexachlorobenzene[e,f,g,h,i,j]	6.03	±	0.35
cis-Chlordane (α-Chlordane)[c,d,e,f,g,h,i,j]	16.51	±	0.83
trans-Nonachlor [c,d,e,f,g,h,i,j]	8.20	±	0.51

[a] Mass fractions are reported on dry-mass basis; material as received contains approximately 1.3 % moisture.
[b] Each certified value is a mean of the means from two or more analytical methods, weighted as described in Paule and Mandel [10].
Each uncertainty, computed according to the CIPM approach as described in the ISO/JCGM Guide [11,12], is an expanded uncertainty at the 95 % level of confidence, which includes random sources of uncertainty within each analytical method as well as uncertainty due to the drying study. The expanded uncertainty defines a range of values within which the true value is believed to lie, at a level of confidence of approximately 95 %.
[c] GC-ECD (IA) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with DCM.
[d] GC-ECD (IB) on the 50 % octadecyl (C-18) methylpolysiloxane phase; same extracts analyzed as in GC-ECD (IA).
[e] GC-ECD (IIA) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with DCM.
[f] GC-ECD (IIB) on the 50 % octadecyl (C-18) methylpolysiloxane phase; same extracts analyzed as in GC-ECD (IIA).
[g] GC/MS (I) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with 50 % hexane/50 % acetone mixture.
[h] GC/MS (II) on 5 % phenyl-substituted methylpolysiloxane phase after PFE extraction with 50 % hexane/50 % acetone mixture.
[i] GC/MS (III) on 5 % phenyl-substituted methylpolysiloxane phase; same extracts analyzed as in GC-ECD (IIA).
[j] Results from nineteen laboratories participating in an interlaboratory comparison exercise.

Table 4. Certified Mass Fraction Values for Selected Elements in SRM 1944 (Dry-Mass Basis)

	Degrees of Freedom	Mass Fractions[a,b] (%)		
Aluminum[c,d,e]	4	5.33	±	0.49
Iron[c,d,e]	6	3.53	±	0.16
		Mass Fractions[a,b] (mg/kg)		
Arsenic[c,d,e,f,g]	10	18.9	±	2.8
Cadmium[c,f,,h,i]	6	8.8	±	1.4
Chromium[c,d,f,g,i]	9	266	±	24
Lead[c,h,i]	5	330	±	48
Manganese[c,d,e]	8	505	±	25
Nickel[c,g,h,i]	6	76.1	±	5.6
Zinc[c,d,e,g,i]	9	656	±	75

[a] The certified value is the mean of four results: (1) the mean of NIST INAA or ID-ICPMS analyses, (2) the mean of two methods performed at NRCC, and (3) the mean of results from seven selected laboratories participating in the NRCC intercomparison exercise, and (4) the mean results from INAA analyses at IAEA. The expanded uncertainty in the certified value is equal to $U = ku_c$ where u_c is the combined standard uncertainty and k is the coverage factor, both calculated according to the ISO/JCGM Guide [11,12]. The value of u_c is intended to represent at the level of one standard deviation the combined effect of all the uncertainties in the certified value. Here u_c accounts for both possible method biases, within-method variation, and material inhomogeneity. The coverage factor, k, is the Student's t-value for a 95 % confidence interval with the corresponding degrees of freedom. Because of the material inhomogeneity, the variability among the measurements of multiple samples can be expected to be greater than that due to measurement variability alone.
[b] Mass fractions are reported on dry-mass basis; material as received contains approximately 1.3 % moisture.
[c] Results from five to seven laboratories participating in the NRCC interlaboratory comparison exercise.
[d] Measured at NIST using INAA.
[e] Measured at NRCC using ICPOES.
[f] Measured at NRCC using GFAAS.
[g] Measured at IAEA using INAA.
[h] Measured at NIST using ID-ICPMS.
[i] Measured at NRCC using ID-ICPMS.

The measurands for reference values are indicated in Tables 5-11, 14, 16-17; as determined by the indicated methods indicated in the text. Metrological traceability is to the SI derived units for mass fraction, expressed as milligrams per kilogram, micrograms per kilogram or percentage, respectively.

Table 5. Reference Mass Fraction Values for Selected PAHs in SRM 1944

	Mass Fractions[a] (mg/kg)		
Naphthalene[b]	1.28	±	0.04[c]
1-Methylnaphthalene[b]	0.47	±	0.02[c]
2-Methylnaphthalene[b]	0.74	±	0.06[c]
Biphenyl[b]	0.25	±	0.02[c]
Acenaphthene[b]	0.39	±	0.03[c]
Fluorene[b]	0.48	±	0.04[c]
Dibenzothiophene[b]	0.50	±	0.03[c]
Anthracene[b]	1.13	±	0.07[c]
1-Methylphenanthrene[d,e,f,g]	1.7	±	0.1[h]
2-Methylphenanthrene[d,e,f,g]	1.90	±	0.06[h]
3-Methylphenanthrene[d,e,f,g]	2.1	±	0.1[h]
4-Methylphenanthrene and 9-Methylphenanthrene[d,e,f,g]	1.6	±	0.2[h]
2-Methylanthracene[d,e,f,g]	0.58	±	0.04[h]
3,5-Dimethylphenanthrene[d]	1.31	±	0.04[h]
2,6-Dimethylphenanthrene[d]	0.79	±	0.02[h,i]
2,7-Dimethylphenanthrene[d]	0.67	±	0.02[h,i]
3,9-Dimethylphenanthrene[d]	2.42	±	0.05[h,i]
1,6-, 2,9-, and 2,5-Dimethylphenanthrene[d]	1.67	±	0.03[h,i]
1,7-Dimethylphenanthrene[d]	0.62	±	0.02[h,i]
1,9- and 4,9-Dimethylphenanthrene[d]	1.20	±	0.03[h,i]
1,8-Dimethylphenanthrene[d]	0.24	±	0.01[h,i]
1,2-Dimethylphenanthrene[d]	0.28	±	0.01[h,i]
8-Methylfluoranthene[d]	0.86	±	0.02[h,i]
7-Methylfluoranthene[d]	0.69	±	0.02[h]
1-Methylfluoranthene[b]	0.39	±	0.01[c]
3-Methylfluoranthene[b]	0.56	±	0.02[c]
2-Methylpyrene[d]	1.81	±	0.04[h,i]
4-Methylpyrene[d]	1.44	±	0.03[h,i]
1-Methylpyrene[d]	1.29	±	0.03[h]
Anthanthrene[j]	0.9	±	0.1[h]

[a] Mass fractions are reported on dry-mass basis; material as received contains approximately 1.3 % moisture.
[b] GC/MS (VI) on proprietary non-polar methylpolysiloxane phase after Soxhlet extraction with DCM.
[c] Reference values are the means of results obtained by NIST using one analytical technique. The expanded uncertainty, U, is calculated as $U = ku_c$, where u_c is one standard deviation of the analyte mean, and the coverage factor, k, is determined from the Student's t-distribution corresponding to the associated degrees of freedom (df = 2) and 95 % confidence level for each analyte.
[d] GC/MS (I) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with DCM.
[e] GC/MS (II) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with DCM.
[f] GC/MS (III) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with 50 % hexane/50 % acetone mixture.
[g] GC/MS (IV) on 5 % phenyl-substituted methylpolysiloxane phase after PFE with 50 % hexane/50 % acetone mixture.
[h] The reference value for each analyte is the equally-weighted mean of the means from two or more analytical methods or the mean from one analytical technique. The uncertainty in the reference value defines a range of values that is intended to function as an interval that contains the true value at a level of confidence of 95 %. This uncertainty includes sources of uncertainty within each analytical method, among methods, and from the drying study.
(i) The uncertainty interval for this compound was widened in accordance with expert consideration of the analytical procedures, along with the analysis of the data as a whole, which suggests that the half-widths of the expanded uncertainties should not be less than 2 %.
[j] LC-FL of isomeric PAH fractions after Soxhlet extraction with 50 % hexane/50 % acetone mixture.

Table 6. Reference Mass Fractions for Selected PAHs of Relative Molecular Mass 300 and 302 in SRM 1944 (Dry-Mass Basis)

	Mass Fraction[a,b,c] (mg/kg)		
Coronene	0.53	±	0.04
Dibenzo[*b,e*]fluoranthene	0.076	±	0.008
Naphtho[1,2-*b*]fluoranthene	0.70	±	0.06
Naphtho[1,2-*k*]fluoranthene and Naphtho[2,3-*j*]fluoranthene	0.66	±	0.05
Naphtho[2,3-*b*]fluoranthene	0.21	±	0.01
Dibenzo[*b,k*]fluoranthene	0.75	±	0.06
Dibenzo[*a,k*]fluoranthene	0.22	±	0.02
Dibenzo[*j,l*]fluoranthene	0.56	±	0.03
Dibenzo[*a,l*]pyrene	0.12	±	0.02
Naphtho[2,3-*k*]fluoranthene	0.11	±	0.01
Naphtho[2,3-*e*]pyrene	0.33	±	0.02
Dibenzo[*a,e*]pyrene	0.67	±	0.05
Naphtho[2,1-*a*]pyrene	0.76	±	0.05
Dibenzo[*e,l*]pyrene	0.28	±	0.02
Naphtho[2,3-*a*]pyrene	0.23	±	0.01
Benzo[*b*]perylene	0.43	±	0.04
Dibenzo[*a,i*]pyrene	0.30	±	0.03
Dibenzo[*a,h*]pyrene	0.11	±	0.01

[a] Mass fractions are reported on dry-mass basis; material as received contains approximately 1.3 % moisture.

[b] Reference values are the means of results obtained by NIST using one analytical technique. The expanded uncertainty, U, is calculated as $U = ku_c$, where u_c is one standard deviation of the analyte mean, and the coverage factor, k, is determined from the Student's t-distribution corresponding to the associated degrees of freedom (df = 2) and 95 % confidence level for each analyte.

[c] GC/MS on 50 % phenyl-substituted methylpolysiloxane phase after PFE with DCM.

Table 7. Reference Mass Fractions for Selected PCB Congeners[a] and Chlorinated Pesticides in SRM 1944 (Dry-Mass Basis)

	Mass Fraction[b] (µg/kg)		
PCB 45 (2,2',3,6-Tetrachlorobiphenyl)[c]	10.8	±	1.4[d]
PCB 146 (2,2',3,4',5,5'-Hexachlorobiphenyl)[c]	10.1	±	1.9[d]
PCB 163 (2,3,3',4',5,6-Hexachlorobiphenyl)[c]	14.4	±	2.0[d]
PCB 174 (2,2',3,3',4,5,6'-Heptachlorobiphenyl)[c]	16.0	±	0.6[d]
α-HCH[f,g,h,i]	2.0	±	0.3[e]
trans-Chlordane (γ-Chlordane)[c]	19.0	±	1.7[d]
cis-Nonachlor[g,h,i,l,m]	3.7	±	0.7[e]
2,4'-DDE[f,g,h,i,j,k,l,m]	19	±	3[e]
2,4'-DDD[h,j,k,l,m]	38	±	8[e]
4,4'-DDE[f,g,h,ihj,k,l,m]	86	±	12[e]
4,4'-DDD [f,g,h,I,j,k,l,m]	108	±	16[e]
4,4'-DDT[c]	170	±	32[d]

[a] PCB congeners are numbered according to the scheme proposed by Ballschmiter and Zell [13] and later revised by Schulte and Malisch [3] to conform with IUPAC rules; for the specific congeners mentioned in this SRM, the Ballschmiter-Zell numbers correspond to those of Schulte and Malisch.

[b] Mass fractions are reported on dry-mass basis; material as received contains approximately 1.3 % moisture.

[c] NIST participation in the 2007 interlaboratory study using GC/MS.

[d] Reference values are the means of results obtained by NIST using one analytical technique. The expanded uncertainty, U, is calculated as $U = ku_c$, where u_c is one standard deviation of the analyte mean, and the coverage factor, k, is determined from the Student's t-distribution corresponding to the associated degrees of freedom (df = 2) and 95 % confidence level for each analyte.

[e] The reference value for each analyte is the equally-weighted mean of the means from two or more analytical methods or he mean from one analytical technique. The uncertainty in the reference value defines a range of values that is intended to function as an interval that contains the true value at a level of confidence of 95 %. This uncertainty includes sources of uncertainty within each analytical method, among methods, and from the drying study.

[f] GC-ECD (IA) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with DCM.

[g] GC-ECD (IB) on the 50 % octadecyl (C-18) methylpolysiloxane phase; same extracts analyzed as in GC-ECD (IA).

[h] GC-ECD (IIA) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with DCM.

[i] GC-ECD (IIB) on the 50 % octadecyl (C-18) methylpolysiloxane phase; same extracts analyzed as in GC-ECD (IIA).

[j] GC/MS (I) on 5 % phenyl-substituted methylpolysiloxane phase after Soxhlet extraction with 50 % hexane/50 % acetone mixture.

[k] GC/MS (II) on 5 % phenyl-substituted methylpolysiloxane phase after PFE extraction with 50 % hexane/50 % acetone mixture.

[l] GC/MS (III) on 5 % phenyl-substituted methylpolysiloxane phase; same extracts anlayzed as in GC-ECD (IIA).

[m] Results from nineteen laboratories participating in an interlaboratory comparison exercise.

Table 8. Reference Mass Fraction Values for Selected PBDEs in SRM 1944 (Dry-Mass Basis)

	Mass Fractions[a] (µg/kg)
PBDE 47 (2,2',4,4'-Tetrabromodiphenyl ether)[c,d,e,f]	1.72 ± 0.28[b]
PBDE 99 (2,2',4,4',5-Pentabromodiphenyl ether)[c,d,f]	1.98 ± 0.26[b]
PBDE 100 (2,2',4,4',6-Pentabromodiphenyl ether)[c,d]	0.447 ± 0.027[b]
PBDE 153 (2,2',4,4',5,5'-Hexabromodiphenyl ether)[c,d,e,f]	6.44 ± 0.37[b]
PBDE 154 (2,2',4,4',5,6'-Hexabromodiphenyl ether)[c,d,f]	1.06 ± 0.08[b]
PBDE 183 (2,2',3,4,4',5',6-Heptabromodiphenyl ether)[c,d,e,f]	31.8 ± 0.1[b]
PBDE 206 (2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether)[d,e]	6.2 ± 1.0[b]
PBDE 209 (Decabromodiphenyl ether)[c,d,e,f]	93.5 ± 4.4[b]

[a] Mass fractions are reported on dry-mass basis; material as received contains approximately 1.3 % moisture.
[b] Reference values are weighted means of the results from two to four analytical methods [14]. The uncertainty listed with each value is an expanded uncertainty about the mean, with coverage factor 2 (approximately 95 % confidence), calculated by combining a between-method variance incorporating inter-method bias with a pooled within-source variance following the ISO/JCGM/NIST Guide to the Expression of Uncertainty in Measurements [11,12].
[c] Results from ten laboratories participating in an interlaboratory study for PBDEs in sediment [12].
[d] Results from four laboratories participating in the 2007 interlaboratory study [13].
[e] NIST participation in the 2007 interlaboratory study using GC/MS.
[f] Data set from NIST for PBDEs using GC/MS following PFE with alumina SPE and SEC clean-up.

Table 9. Reference Mass Fraction Values for Selected Elements in SRM 1944 (Dry-Mass Basis)

	Degrees of Freedom	Mass Fraction[a,b] (%)
Silicon[c,d]	81	31 ± 3
		Mass Fraction[a,b] (mg/kg)
Antimony[c,e,f,g]	18	4.6 ± 0.9
Beryllium[c,h]	17	1.6 ± 0.3
Copper[c,d,f]	101	380 ± 40
Mercury[c,i]	18	3.4 ± 0.5
Selenium[c,e,f]	24	1.4 ± 0.2
Silver[c,d,e,g]	8	6.4 ± 1.7
Thallium[c,f]	12	0.59 ± 0.1
Tin[c,f]	22	42 ± 6

[a] The reference value is the equally weighted mean of available results from: (1) NIST INAA analyses, (2) two methods performed at NRCC, (3) results from seven selected laboratories participating in the NRCC intercomparison exercise, and (4) results from INAA analyses at IAEA. The expanded uncertainty in the reference value is equal to $U = ku_c$ where u_c is the combined standard uncertainty and k is the coverage factor, both calculated according to the ISO/JCGM Guide [11,12]. The value of u_c is intended to represent at the level of one standard deviation the uncertainty in the value. Here u_c accounts for possible method differences, within-method variation, and material inhomogeneity. The coverage factor, k, is the Student's t-value for a 95 % confidence interval with the corresponding degrees of freedom. Because of material inhomogeneity, the variability among the measurements of multiple test portions can be expected to be greater than that due to measurement variability alone.
[b] Mass fractions are reported on dry-mass basis; material as received contains approximately 1.3 % moisture.
[c] Results from five to seven laboratories participating in the NRCC interlaboratory comparison exercise.
[d] Measured at NRCC using GFAAS.
[e] Measured at NIST using INAA.
[f] Measured at NRCC using ID-ICPMS.
[g] Measured at IAEA using INAA.
[h] Measured at NRCC using ICPOES.
[i] Measured at NRCC using cold vapor atomic absorption spectroscopy (CVAAS).

Table 10. Reference Mass Fraction Values for Elements in SRM 1944 as Determined by INAA (Dry-Mass Basis)

	Effective Degrees of Freedom	Mass Fraction[a,b] (%)		
Calcium	21	1.0	±	0.1
Chlorine	21	1.4	±	0.2
Potassium	21	1.6	±	0.2
Sodium	25	1.9	±	0.1
		Mass Fraction[a,b] (mg/kg)		
Bromine	10	86	±	10
Cesium	11	3.0	±	0.3
Cobalt	10	14	±	2
Rubidium	14	75	±	2
Scandium	37	10.2	±	0.2
Titanium	21	4300	±	300
Vanadium	21	100	±	9

[a] The reference value is based on the results from an INAA study. The associated uncertainty accounts for both random and systematic effects, but because only one method was used, the results should be used with caution. The expanded uncertainty in the reference value is equal to $U = ku_c$ where u_c is the combined standard uncertainty and k is the coverage factor, both calculated according to the ISO/JCGM Guide [11,12]. The value of u_c is intended to represent at the level of one standard deviation the uncertainty in the value. Here u_c accounts for possible method differences, within-method variation, and material inhomogeneity. The coverage factor, k, is the Student's t-value for a 95 % confidence interval with the corresponding degrees of freedom. Because of material inhomogeneity, the variability among the measurements of multiple test portions can be expected to be greater than that due to measurement variability alone.

[b] Mass fractions are reported on dry-mass basis; material as received contains approximately 1.3 % moisture.

Table 11. Reference Mass Fraction Values for
Selected Dibenzo-*p*-Dioxin and Dibenzofuran Congeners in SRM 1944 (Dry-Mass Basis)

	Mass Fraction[a,b] (µg/kg)		
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.133	±	0.009
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	0.019	±	0.002
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	0.026	±	0.003
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	0.056	±	0.006
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	0.053	±	0.007
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	0.80	±	0.07
Octachlorodibenzo-*p*-dioxin	5.8	±	0.7
2,3,7,8-Tetrachlorodibenzofuran[c]	0.039	±	0.015[d]
1,2,3,7,8-Pentachlorodibenzofuran	0.045	±	0.007
2,3,4,7,8-Pentachlorodibenzofuran	0.045	±	0.004
1,2,3,4,7,8-Hexachlorodibenzofuran	0.22	±	0.03
1,2,3,6,7,8-Hexachlorodibenzofuran	0.09	±	0.01
2,3,4,6,7,8-Hexachlorodibenzofuran	0.054	±	0.006[e]
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.0	±	0.1
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.040	±	0.006[e]
Octachlorodibenzofuran	1.0	±	0.1
Total Toxic Equivalents (TEQ)[f]	0.25	±	0.01
Total Tetrachlorodibenzo-*p*-dioxins	0.25	±	0.05[e]
Total Pentachlorodibenzo-*p*-dioxins	0.19	±	0.06
Total Hexachlorodibenzo-*p*-dioxins	0.63	±	0.09
Total Heptachlorodibenzo-*p*-dioxins	1.8	±	0.2
Total Tetrachlorodibenzofurans	0.7	±	0.2
Total Pentachlorodibenzofurans	0.74	±	0.07
Total Hexachlorodibenzofurans	1.0	±	0.1
Total Heptachlorodibenzofurans	1.5	±	0.1
Total Dibenzo-*p*-dioxins[g]	8.7	±	0.9
Total Dibenzofurans[g]	5.0	±	0.5

[a] Each reference value is the mean of the results from up to fourteen laboratories participating in an interlaboratory exercise. The expanded uncertainty in the reference value is equal to $U = ku_c$ where u_c is the combined standard uncertainty calculated according to the ISO/JCGM Guide [11,12] and k is the coverage factor. The value of u_c is intended to represent at the level of one standard deviation the combined effect of all the uncertainties in the reference value. Here u_c is the uncertainty in the mean arising from the variation among the laboratory results. The degrees of freedom is equal to the number of available results minus one (13 unless noted otherwise). The coverage factor, k, is the value from a Student's t-distribution for a 95 % confidence interval.

[b] Mass fractions are reported on dry-mass basis; material as received contains approximately 1.3 % moisture.

[c] Confirmation results using a 50 % cyanopropyl phenyl polysiloxane or 90 % *bis*-cyanopropyl 10 % cyanopropylphenyl polysiloxane phase columns.

[d] Degrees of freedom = 7 for this compound.

[e] Degrees of freedom = 12 for this compound.

[f] TEQ is the sum of the products of each of the 2,3,7,8-substituted congeners multiplied by their individual toxic equivalency factors (TEFs) recommended by the North Atlantic Treaty Organization (NATO) [15]. With regard to 2,3,7,8-tetrachlorodibenzofuran, the results of the confirmation column were used when available to calculate the TEQ.

[g] Total of tetra- through octachlorinated congeners.

The measurands for reference values are indicated in Tables 12-13; as determined by the methods indicated in the text. Metrological traceability is to the SI unit for length and the SI derived units of area and volume, expressed as micrometers, and square meters per cubic centimeters; respectively.

Table 12. Reference Values for Particle Size Characteristics for SRM 1944

Particle Measurement	Value[a]
Mean diameter (volume distribution, MV, μm)[b]	151.2 ± 0.4
Mean diameter (area distribution, μm)[c]	120.4 ± 0.1
Mean diameter (number distribution, μm)[d]	75.7 ± 0.3
Surface Area (m^2/cm^3)[e]	0.050 ± 0.013

[a] The reference value is the mean value of measurements from the analysis of test portions from four bottles. Each uncertainty, computed according to the CIPM approach as described in the ISO/JCGM Guide [11,12], is an expanded uncertainty at the 95 % level of confidence, which includes random sources of uncertainty. The expanded uncertainty defines a range of values for the reference value within which the true value is believed to lie, at a level of confidence of 95 %.

[b] The mean diameter of the volume distribution represents the center of gravity of the distribution and compensates for scattering efficiency and refractive index. This parameter is strongly influenced by coarse particles.

[c] The mean diameter of the area distribution, calculated from the volume distribution with less weighting by the presence of coarse particles than MV.

[d] The mean diameter of the number distribution, calculated using the volume distribution weighted to small particles.

[e] Calculated specific surface area assuming solid, spherical particles. This is a computation and should not be interchanged with an adsorption method of surface area determination as this value does not reflect porosity or topographical characteristics.

Table 13. Percentage of the Volume That is Smaller Than the Indicated Size

Percentile	Particle Diameter[a] (μm)
95	296 ± 5
90	247 ± 2
80	201 ± 1
70	174 ± 1
60	152 ± 1
50[b]	135 ± 1
40	120 ± 1
30	106 ± 1
20	91 ± 1
10	74 ± 1

[a] The reference value for particle diameter is the mean value of measurements from the analysis of test portions from four bottles. Each uncertainty, computed according to the CIPM approach as described in the ISO/JCGM Guide [11,12], is an expanded uncertainty at the 95 % level of confidence, which includes random sources of uncertainty. The expanded uncertainty defines a range of values for the reference value within which the true value is believed to lie, at a level of confidence of 95 %.

[b] Median diameter (50 % of the volume is less than 135 μm).

Table 14. Reference Values for Total Organic Carbon and Percent Extractable Mass in SRM 1944

	Mass Fraction (%)		
Total Organic Carbon (TOC)[a,b]	4.4	±	0.3
Extractable Mass[c,d]	1.15	±	0.04

[a] Mass fraction is reported on a dry-mass basis; material as received contains approximately 1.3 % moisture.
[b] The reference value for total organic carbon is an equally weighted mean value from routine measurements made by three laboratories. Each uncertainty, computed according to the CIPM approach as described in the ISO/JCGM Guide [11,12], is an expanded uncertainty at the 95 % level of confidence, which includes random sources of uncertainty. The expanded uncertainty defines a range of values for the reference value within which the true value is believed to lie, at a level of confidence of 95 %.
[c] Extractable mass as determined from Soxhlet extraction using DCM.
[d] The reference value for extractable mass is the mean value of six measurements. Each uncertainty, computed according to the CIPM approach as described in the ISO/JCGM Guide [11,12], is an expanded uncertainty at the 95 % level of confidence, which includes random sources of uncertainty. The expanded uncertainty defines a range of values for the reference value within which the true value is believed to lie, at a level of confidence of 95 %.

Table 15. Information Mass Fraction Values for Selected Elements in SRM 1944 as Determined by INAA (Dry-Mass Basis)

	Mass Fraction[a] (%)
Magnesium[b]	1.0

	Mass Fraction[a] (mg/kg)
Cerium[b]	65
Europium[b]	1.3
Gold[b]	0.10
Lanthanum[b]	39
Thorium[b]	13
Uranium[b]	3.1

[a] Mass fraction is reported on a dry-mass basis; material as received contains approximately 1.3 % moisture.
[b] Measured at IAEA using INAA

Table 16. Information Mass Fraction Values for
Selected Polychlorinated Naphthalenes in SRM 1944 (Dry-Mass Basis)

			Mass Fraction[a] (µg/kg)
PCN	19	(1,3,5-Trichloronaphthalene)	1.4
PCN	23	(1,4,5-Trichloronaphthalene)	2.4
PCN	42	(1,3,5,7-Tetrachloronaphthalene)	2.7
PCN	47	(1,4,6,7-Tetrachloronaphthalene)	3.5
PCN	52	(1,2,3,5,7-Pentachloronaphthalene)	2.5
	60	(1,2,4,6,7-Pentachloronaphthalene)	
PCN	50	(1,2,3,4,6-Pentachloronaphthalene)	1.0
PCN	66	(1,2,3,4,6,7-Hexachloronaphthalene)	0.63
	67	(1,2,3,5,6,7-Hexachloronaphthalene)	
PCN	69	(1,2,3,5,7,8-Hexachloronaphthalene)	1.6
PCN	73	(1,2,3,4,5,6,7-Heptachloronaphthalene)	0.51
PCN	75	(Octachloronaphthalene)	0.20

[a] Mass fractions reported on dry-mass basis; material as received contains approximately 1.3 % moisture. Information values are the median of the results from six laboratories participating in an interlaboratory comparison exercise (Appendix D).

Table 17. Information Mass Fraction Values for Three HBCD Isomers in SRM 1944 (Dry-Mass Basis)

	Mass Fraction[a,b] (µg/kg)
alpha-HBCD[b]	2.2
beta-HBCD[b]	1.0
gamma-HBCD[b]	18

[a] The information value is the median of the results from three analytical methods.
[b] Mass fractions are reported on dry-mass basis; material as received contains approximately 1.3 % moisture.

Table 18. Analytical Methods Used for the Measurement of Elements in SRM 1944

Elements	Analytical Methods
Aluminum	FAAS, ICPOES, INAA, XRF
Antimony	GFAAS, HGAAS, ICP-MS, ID-ICPMS, INAA
Arsenic	GFAAS, HGAAS, ICPMS, INAA, XRF
Beryllium	GFAAS, ICP-AES, ICPMS
Bromine	INAA
Cadmium	FAAS, GFAAS, ICPMS, ID-ICPMS
Calcium	INAA
Cerium	INAA
Cesium	INAA
Chlorine	INAA
Chromium	FAAS, GFAAS, ICPMS, ID-ICPMS, INAA, XRF
Cobalt	INAA
Copper	FAAS, GFAAS, ICPOES, ICPMS, ID-ICPMS, XRF
Europium	INAA
Gold	INAA
Iron	FAAS, ICPOES, ICPMS, ID-ICPMS, INAA, XRF
Lanthanum	INAA
Lead	FAAS, GFAAS, ICPMS, ID-ICPMS, XRF
Magnesium	INAA
Manganese	FAAS, ICPOES, ICPMS, INAA, XRF
Mercury	CVAAS, ICPMS
Nickel	GFAAS, ICPOES, ICPMS, ID-ICPMS, INAA, XRF
Potassium	INAA
Rubidium	INAA
Scandium	INAA
Selenium	GFAAS, HGAAS, ICPMS, INAA
Silicon	FAAS, ICPOES, XRF
Silver	FAAS, GFAAS, ICPMS, INAA
Sodium	INAA
Thallium	GFAAS, ICPOES, ICPMS, ID-ICPMS,
Thorium	INAA
Tin	GFAAS, ICPMS, ID-ICPMS
Titanium	INAA
Uranium	INAA
Vanadium	INAA
Zinc	FAAS, ICPOES, ICPMS, ID-ICPMS, XRF, INAA

Methods	
CVAAS	Cold vapor atomic absorption spectrometry
FAAS	Flame atomic absorption spectrometry
GFAAS	Graphite furnace atomic absorption spectrometry
HGAAS	Hydride generation atomic absorption spectrometry
ICPOES	Inductively coupled plasma optical emission spectrometry
ICPMS	Inductively coupled plasma mass spectrometry
ID-ICPMS	Isotope dilution inductively coupled plasma mass spectrometry
INAA	Instrumental neutron activation analysis
XRF	X-ray fluorescence spectrometry

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Certificate Revision History: 17 February 2017 (Change of expiration date; editorial changes); **27 September 2011** (Addition of mass fraction values for PBDE and PCN congeners; change of mass fraction reference values; editorial changes); **22 December 2008** (Extension of certification period); **14 May 1999** (Original certificate date).

Users of this SRM should ensure that the Certificate of Analysis in their possession is current. This can be accomplished by contacting the SRM Program at: telephone (301) 975-2200; fax (301) 948-3730; e-mail srminfo@nist.gov; or via the Internet at http://www.nist.gov/srm.

APPENDIX A

The analysts and laboratories listed below participated in the interlaboratory comparison exercise for the determination of PBDEs in SRM 1944 [4].

D. Hoover and C. Hamilton, AXYS Analytical, Sidney, BC, Canada
S. Klosterhaus and J. Baker, Chesapeake Biological Laboratory, Solomons, MD, USA
S. Backus, Environment Canada, Ecosystem Health Division, Burlington, ON, Canada
E. Sverko, Environment Canada, Canada Centre for Inland Waters, Burlington, ON, Canada
P. Lepom, Federal Environmental Agency, Berlin, Germany
R. Hites and L. Zhu, Indiana University, Bloomington, IN, USA
G. Jiang, Research Center for Eco-Environmental Sciences, Beijing, China
H. Takada, Tokyo University of Agriculture and Technology, Tokyo, Japan
A. Covaci and S. Vorspoels, University of Antwerp, Antwerp, Belgium
A. Li, Universtiy of Illinois at Chicago, Chicago, IL, USA

APPENDIX B

The analysts and laboratories listed below participated in the interlaboratory comparison exercise for the determination of polychlorinated dibenzo-*p*-dioxins and dibenzofurans in SRM 1944.

W.J. Luksemburg, Alta Analytical Laboratory, Inc., El Dorado Hills, CA, USA
L. Phillips, AXYS Analytical Services Ltd., Sidney, British Columbia, Canada
M.J. Armbruster, Battelle Columbus Laboratories, Columbus, OH, USA
G. Reuel, Canviro Analytical Laboratories Ltd., Waterloo, Ontario, Canada
C. Brochu, Environment Québec, Laval, Québec, Canada
G. Poole, Environment Canada Environmental Technology Centre, Ottawa, Ontario, Canada
B. Henkelmann, GSF National Research Center for Environment and Health, Neuherberg, Germany
R. Anderson, Institute of Environmental Chemistry, Umeå University, Umeå, Sweden
C. Lastoria, Maxxam Analytics Inc., Mississauga, Ontario, Canada
E. Reiner, Ontario Ministry of Environment and Energy, Etobicoke, Ontario, Canada
J. Macaulay, Research and Productivity Council, Fredericton, New Brunswick, Canada
T.L. Wade, Texas A&M University, College Station, TX, USA
C. Tashiro, Wellington Laboratories, Guelph, Ontario, Canada
T.O. Tiernan, Wright State University, Dayton, OH, USA

APPENDIX C

The analysts and laboratories listed below participated in the interlaboratory comparison exercise for the determination of trace elements in SRM 1944.

A. Abbgy, Applied Marine Research Laboratory, Old Dominion University, Norfolk, VA, USA
A. Scott, Australian Government Analytical Laboratories, Pymble, Australia
H. Mawhinney, Animal Research Institute, Queensland Department of Primary Industries, Queensland, Australia
E. Crecelius, Battelle Pacific Northwest, Sequim, WA, USA
M. Stephenson, California Department of Fish and Game, Moss Landing, CA, USA
B. Presley, Department of Oceanography, Texas A&M University, College Station, TX, USA
K. Elrick, U.S. Geological Survey, Atlanta, GA, USA

APPENDIX D

The analysts and laboratories listed below participated in the interlaboratory comparison exercise for the determination of polychlorinated naphthalenes in SRM 1944.

J. Kucklick, National Institute of Standards and Technology, Charleston, SC, USA
E. Sverko, Environment Canada, Canada Centre for Inland Waters, Burlington, ON, Canada
P. Helm, Ontario Ministry of the Environment, Etobicoke, ON, Canada
N. Yamashita, National Institute of Advanced Industrial Science and Technology (AIST), Tsukuba, Japan
T. Harner, Environment Canada, Meteorological Service of Canada, Toronto, ON, Canada
R. Lega, Ontario Ministry of the Environment, Etobicoke, ON, Canada

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Date of Issue:
17 February 2017

SAFETY DATA SHEET

1. Substance and Source Identification

Product Identifier

SRM Number: 1944
SRM Name: New York/New Jersey Waterway Sediment
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

Standard Reference Material (SRM) 1944 is a mixture of marine sediment collected near urban areas in New York and New Jersey. SRM 1944 is intended for use in evaluating analytical methods for the determination of selected polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, chlorinated pesticides, and trace elements in marine sediment and similar matrices. All of the constituents for which certified, reference, and information values are provided in SRM 1944 were naturally present in the sediment before processing. A unit of SRM 1944 consists of a bottle containing 50 g of radiation-sterilized, freeze-dried sediment.

Company Information

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

Telephone: 301-975-2200
FAX: 301-948-3730
E-mail: SRMMSDS@nist.gov
Website: http://www.nist.gov/srm

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

2. Hazards Identification

Classification

Physical Hazard: Not classified.
Health Hazard: Not classified.

Label Elements
Symbol
No Symbol/Pictogram

Signal Word
Not applicable.

Hazard Statement(s): Not applicable.

Precautionary Statement(s): Not applicable.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. Composition and Information on Hazardous Ingredients

Substance: Waterway sediment

Other Designations: Sediment.

This material is naturally occurring marine sediment collected near urban areas. The material contains trace amounts of polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, chlorinated pesticides, and trace elements. Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the Certificate of Analysis.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Waterway Sediment	Not available	Not available	100

4. First Aid Measures

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water.

Eye Contact: Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

Ingestion: If adverse effects occur after ingestion, seek medical treatment.

Most Important Symptoms/Effects, Acute and Delayed: May cause irritation.

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present, seek medical attention if needed.

5. Fire Fighting Measures

Fire and Explosion Hazards: Negligible fire hazard. Avoid generating dust. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:
Suitable: Use extinguishing media appropriate for surrounding fire.
Unsuitable: None listed.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1 Fire = 0 Reactivity = 0

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Any accumulated material on surfaces should be removed and properly disposed of. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Collect spilled material in appropriate container for disposal. Keep out of water supplies and sewers. Keep unnecessary people away, isolate hazard area and deny entry.

7. Handling and Storage

Safe Handling Precautions: Minimize dust generation and accumulation on surfaces. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. See Section 8, "Exposure Controls and Personal Protection".

Storage: Store and handling in accordance with all current regulations and standards.

8. Exposure Controls and Personal Protection

Exposure Limits: No occupational exposure limits have been established for waterway sediment. This material is a particulate matter and adequate inhalation/respiratory protection should be used to minimize exposure. The exposure limits for Particulates Not Otherwise Regulated (PNOR) are applicable.

OSHA (PEL): 15 mg/m^3 (TWA, total particulates not otherwise regulated)
OSHA (PEL) 5 mg/m^3 (TWA, respirable particulates not otherwise regulated)

NIOSH (REL): 10 mg/m^3 (TWA, total particulates not otherwise regulated, 8 h)
NIOSH (REL): 5 mg/m^3 (TWA, respirable particulates not otherwise regulated)

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: If workplace conditions warrant a respirator, a respiratory protection program that meets OSHA 29CFR 1910.134 must be followed. Refer to NIOSH 42 CFR 84 for applicable certified respirators.

Eye/Face Protection: Wear splash resistant safety goggles with a face shield. An eye wash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Chemical-resistant gloves should be worn at all times when handling chemicals.

9. Physical and Chemical Properties

Descriptive Properties:

Appearance (physical state, color, etc.):	amorphous powder
Molecular Formula:	not applicable
Molar Mass (g/mol):	not applicable
Odor:	not available
Odor threshold:	not available
pH:	not available
Evaporation rate:	not applicable
Melting point/freezing point (°C):	not available
Specific Gravity (water=1)	not available
Vapor Pressure (mmHg):	not applicable
Vapor Density (air = 1):	not applicable
Viscosity (cP):	not applicable
Solubility(ies):	not available
Partition coefficient (n-octanol/water):	not available
Particle Size:	not available

Thermal Stability Properties:

Autoignition Temperature (°C):	not available
Thermal Decomposition (°C):	not available
Initial boiling point and boiling range (°C):	not available
Explosive Limits, LEL (Volume %):	not available
Explosive Limits, UEL (Volume %):	not available
Flash Point (°C):	not available
Flammability (solid, gas):	not available

10. Stability and Reactivity

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: None listed.

Conditions to Avoid: Avoid generating dust.

Incompatible Materials: None listed.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition will produce oxides of carbon.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin ____ Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Generated dust may cause irritation if inhaled.

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Generated dust may cause irritation.

Skin Contact: May cause mechanical irritation.

Eye Contact: No data available.

Ingestion: No data available.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified, no data available.

Skin Corrosion/Irritation: Not classified; no data available.

Serious Eye damage/ Eye irritation: Not classified; no data available.

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified; no data available.

Germ Cell Mutagenicity: Not classified; no data available.

Carcinogenicity: Not classified.

Listed as a Carcinogen/Potential Carcinogen ____ Yes X No
Sediment is not listed by NTP, IARC or OSHA as a carcinogen.

Reproductive Toxicity: Not classified; no data available.

Specific Target Organ Toxicity, Single Exposure: Not classified; no data available.

Specific Target Organ Toxicity, Repeated Exposure: Not classified; no data available.

Aspiration Hazard: Not classified; no data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No data available.

Persistence and Degradability: No data available.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	No.
CHRONIC HEALTH:	No.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	No.

State Regulations:
California Proposition 65: Not listed.

U.S. TSCA Inventory: Not listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations:
WHMIS Information: Not provided for this material.

16. Other Information

Issue Date: 17 February 2017

Sources: 29 CFR Occupational Health and Safety Office (OSHA) 1910.1000, *Limits for Air Contaminants*, Table Z-1; available at http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=9992 (accessed Feb 2017).

Center for Disease Control (CDC) NIOSH Pocket Guide to Chemical Hazards, *Particulates not otherwise regulated*; available at http://www.cdc.gov/niosh/npg/npgd0480.html (accessed Feb 2017).

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NRC	Nuclear Regulatory Commission
ALI	Annual Limit on Intake	NTP	National Toxicology Program
CAS	Chemical Abstracts Service	OSHA	Occupational Safety and Health Administration
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PEL	Permissible Exposure Limit
CFR	Code of Federal Regulations	RCRA	Resource Conservation and Recovery Act
DOT	Department of Transportation	REL	Recommended Exposure Limit
EC50	Effective Concentration, 50 %	RM	Reference Material
EINECS	European Inventory of Existing Commercial Chemical Substances	RQ	Reportable Quantity
EPCRA	Emergency Planning and Community Right-to-Know Act	RTECS	Registry of Toxic Effects of Chemical Substances
IARC	International Agency for Research on Cancer	SARA	Superfund Amendments and Reauthorization Act
IATA	International Air Transport Association	SCBA	Self-Contained Breathing Apparatus
IDLH	Immediately Dangerous to Life and Health	SRM	Standard Reference Material
LC50	Lethal Concentration, 50 %	STEL	Short Term Exposure Limit
LD50	Lethal Dose, 50 %	TLV	Threshold Limit Value
LEL	Lower Explosive Limit	TPQ	Threshold Planning Quantity
MSDS	Material Safety Data Sheet	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not certify the data in the SDS. The certified values for this material are given in the NIST Certificate of Analysis.

Users of this SRM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at http://www.nist.gov/srm.

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:

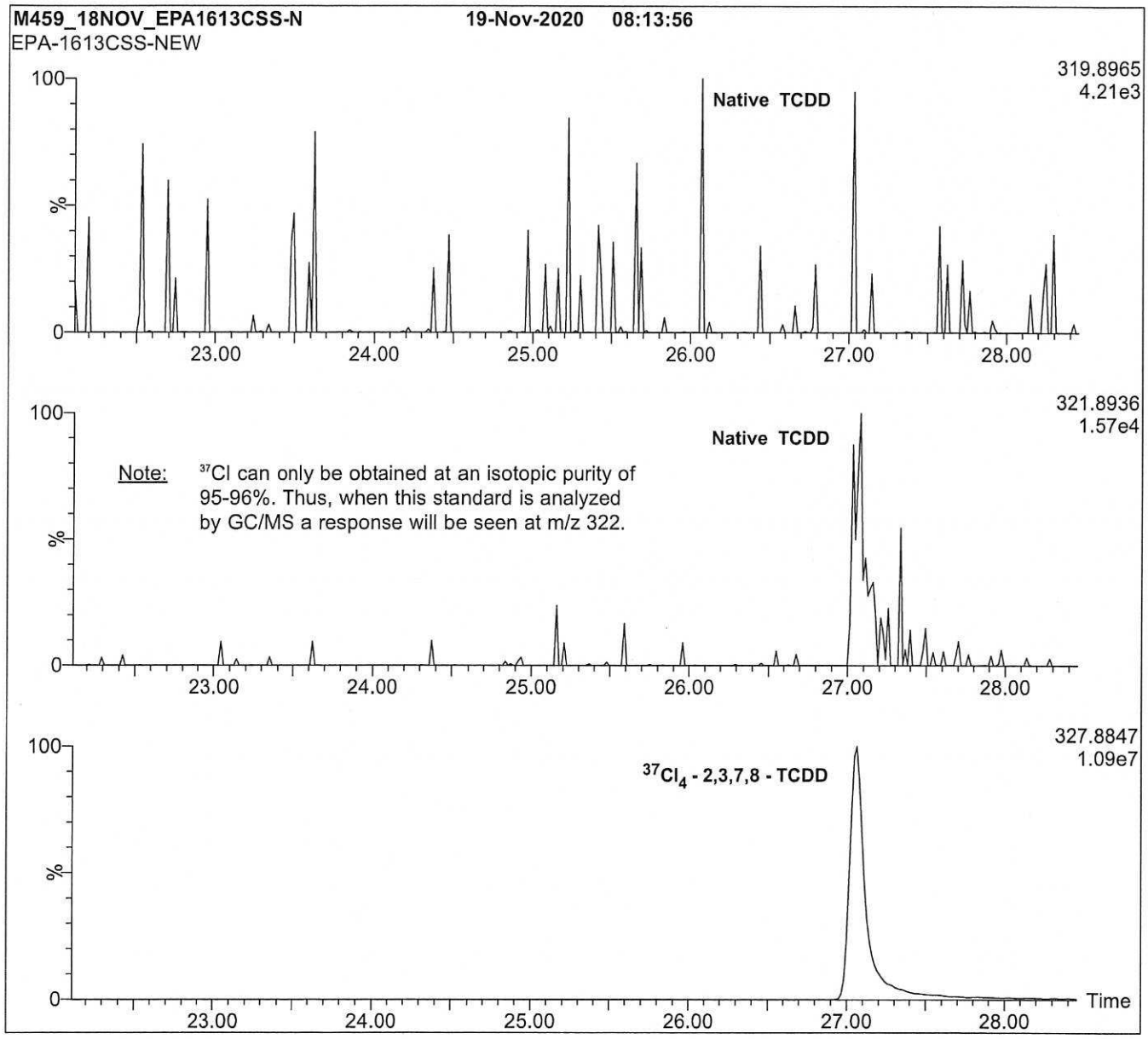
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI-ASQ National Accreditation Board (ANAB; AR-1523).

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

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)

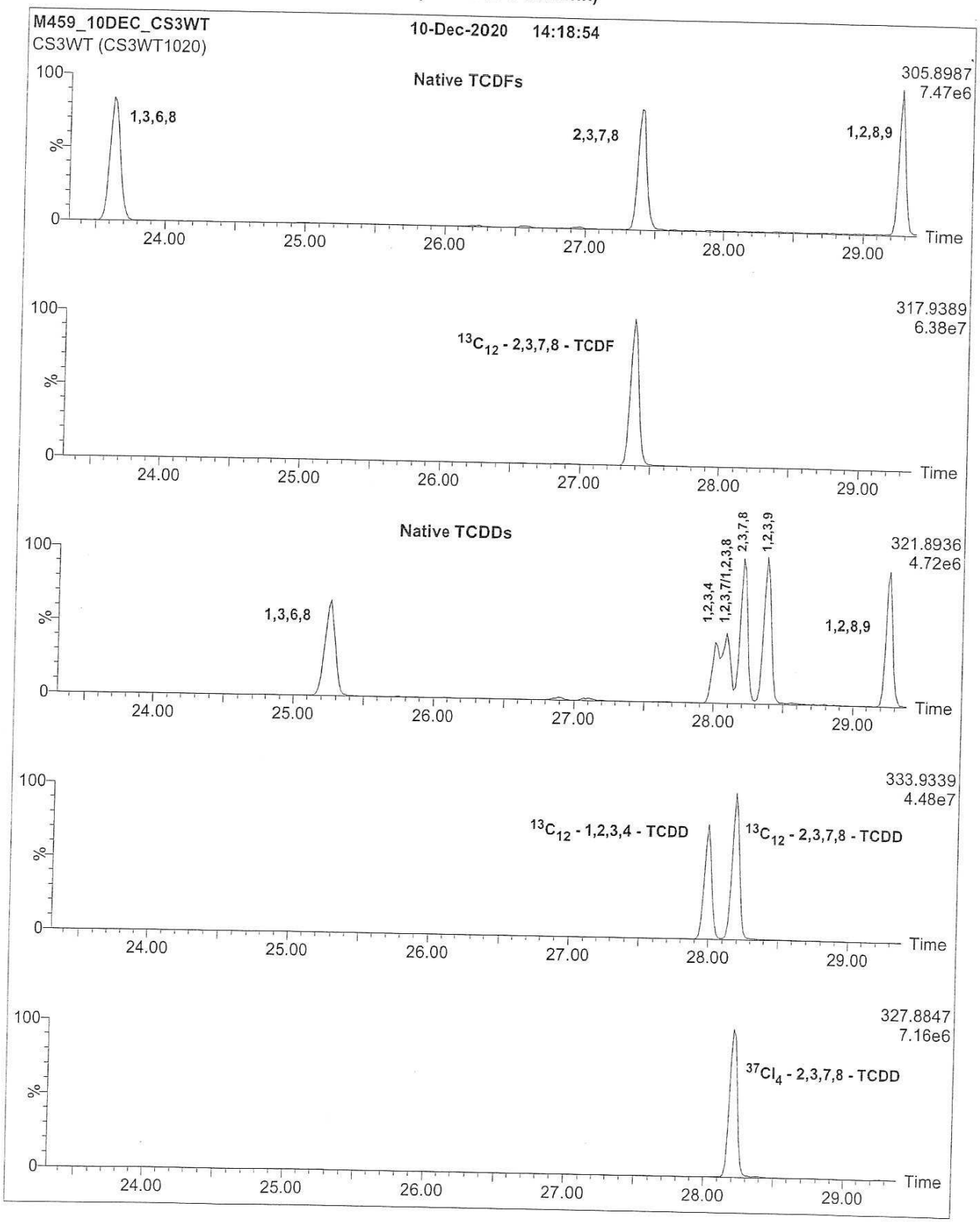


Figure 1: **CS3WT; HRGC/HRMS Data (60 m DB-5 Column)**

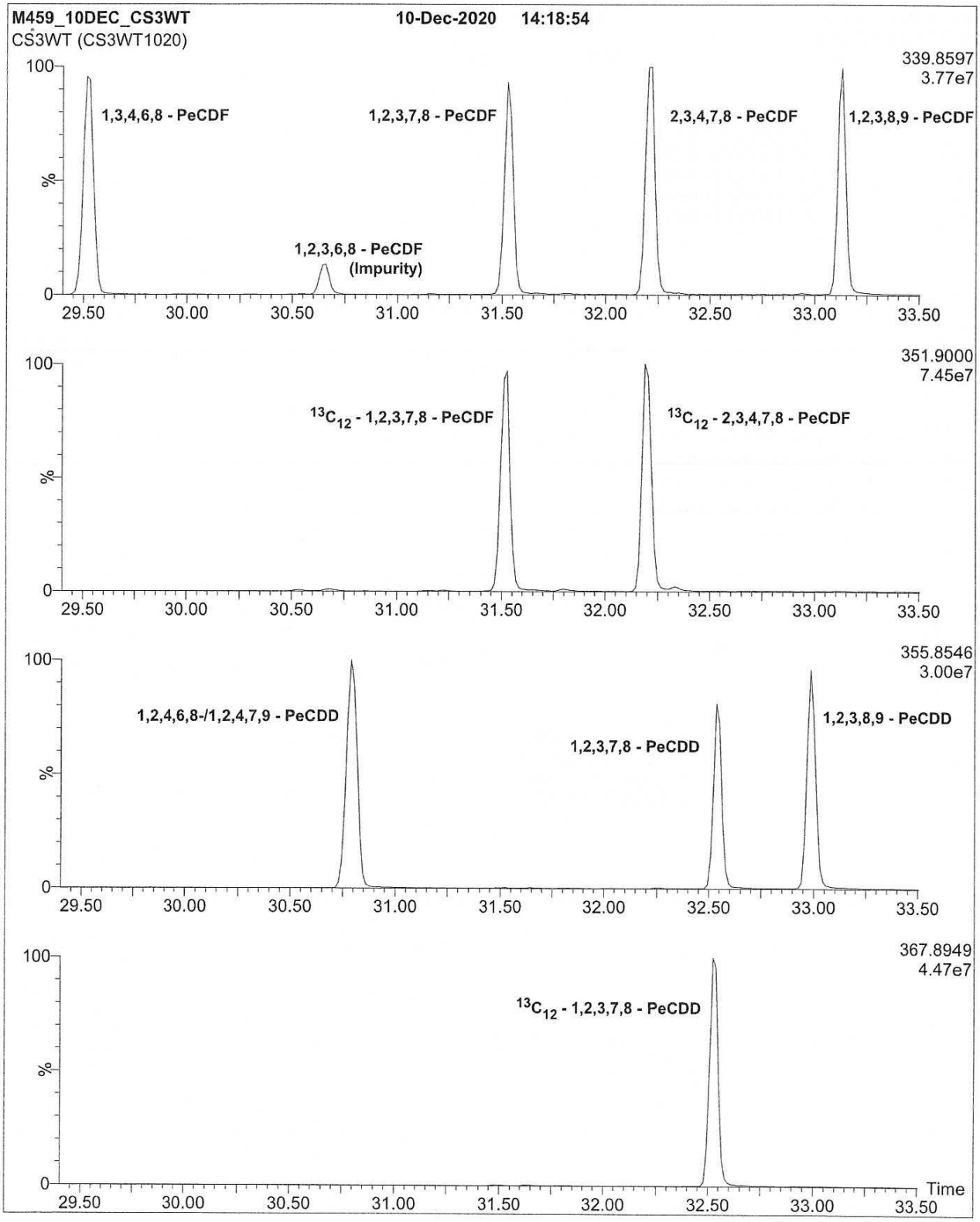


Figure 1: CS3WT; HRGC/HRMS Data (60 m DB-5 Column)

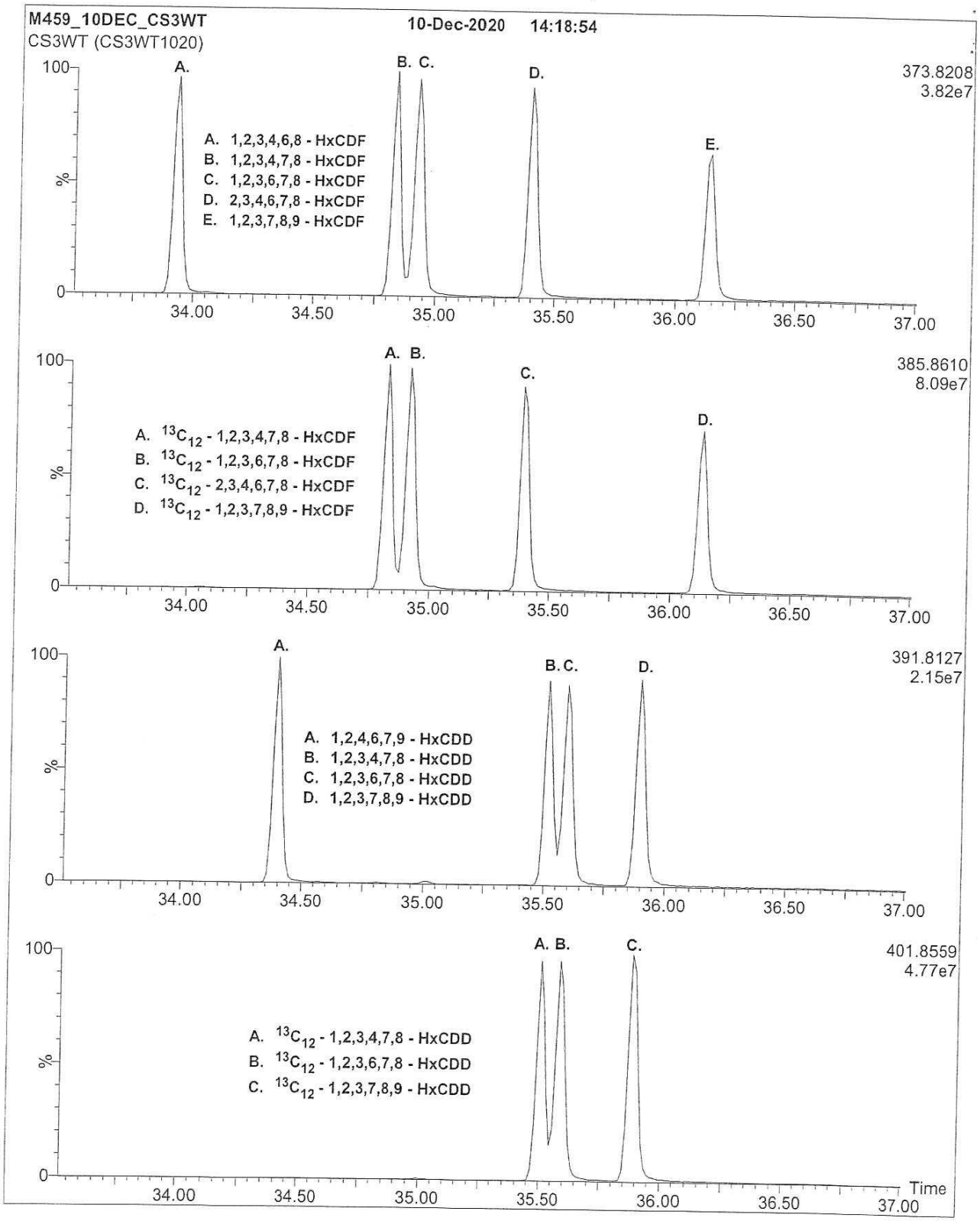


Figure 1: **CS3WT; HRGC/HRMS Data (60 m DB-5 Column)**

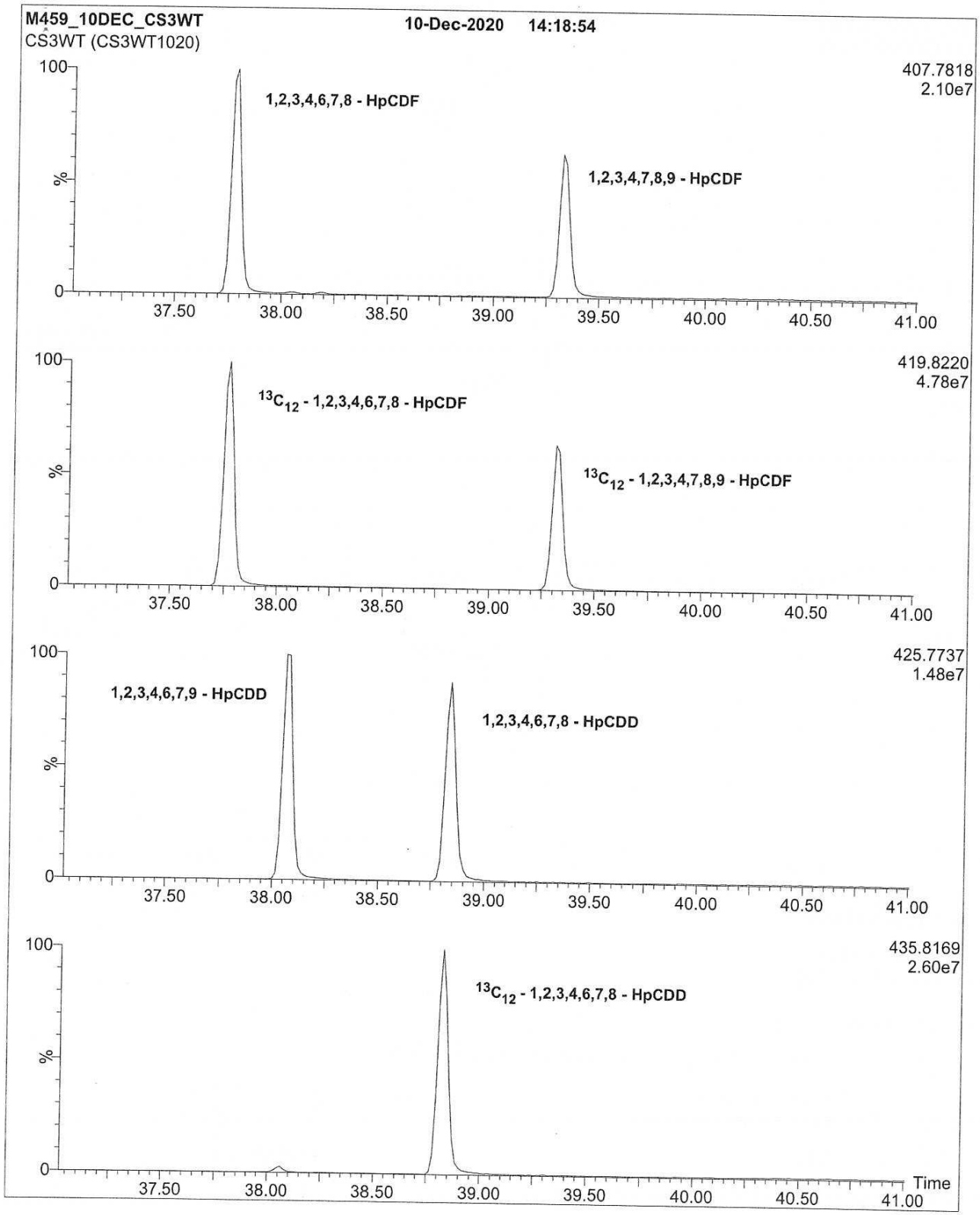
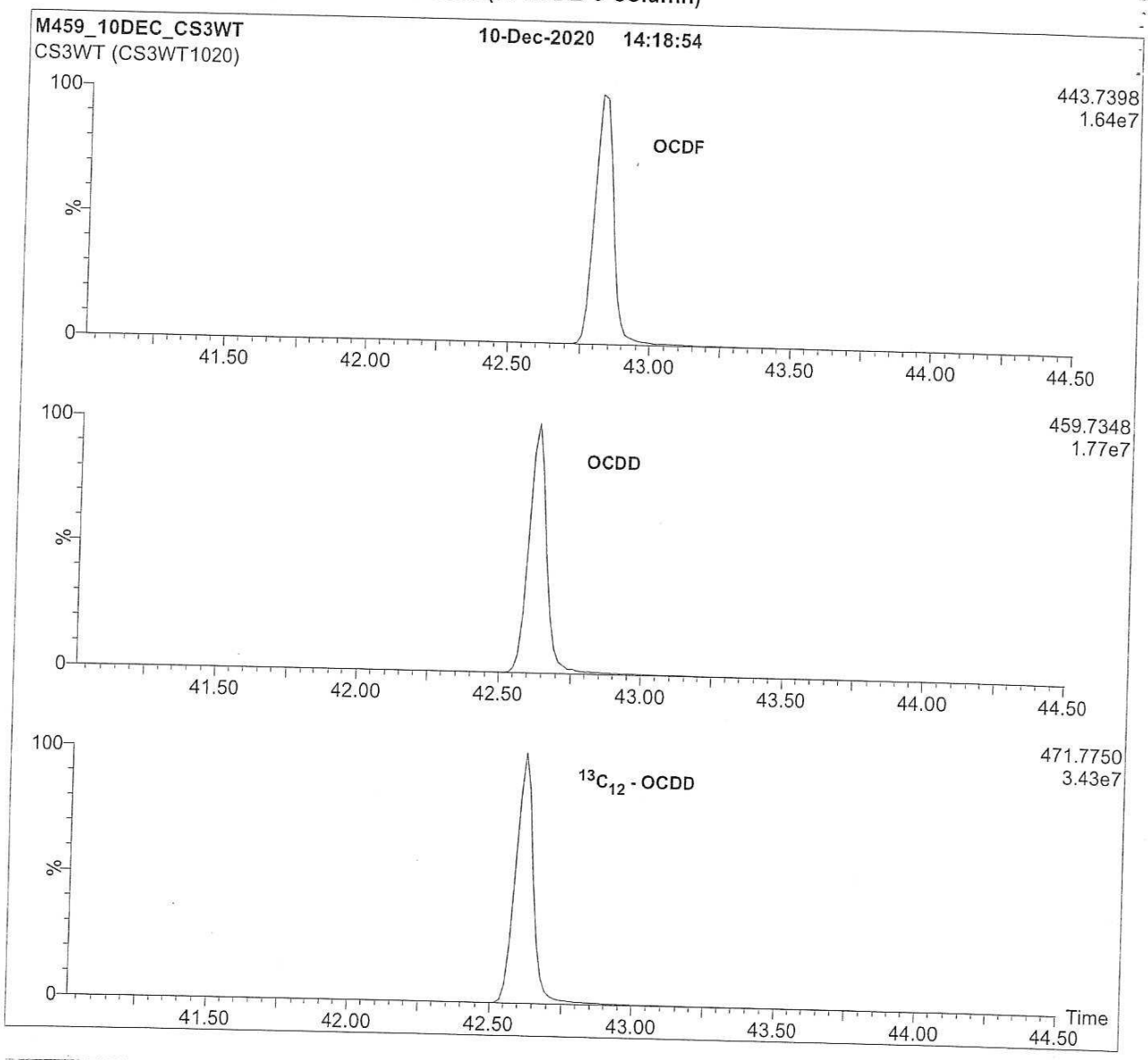


Figure 1: CS3WT; HRGC/HRMS Data (60 m DB-5 Column)



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)

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:

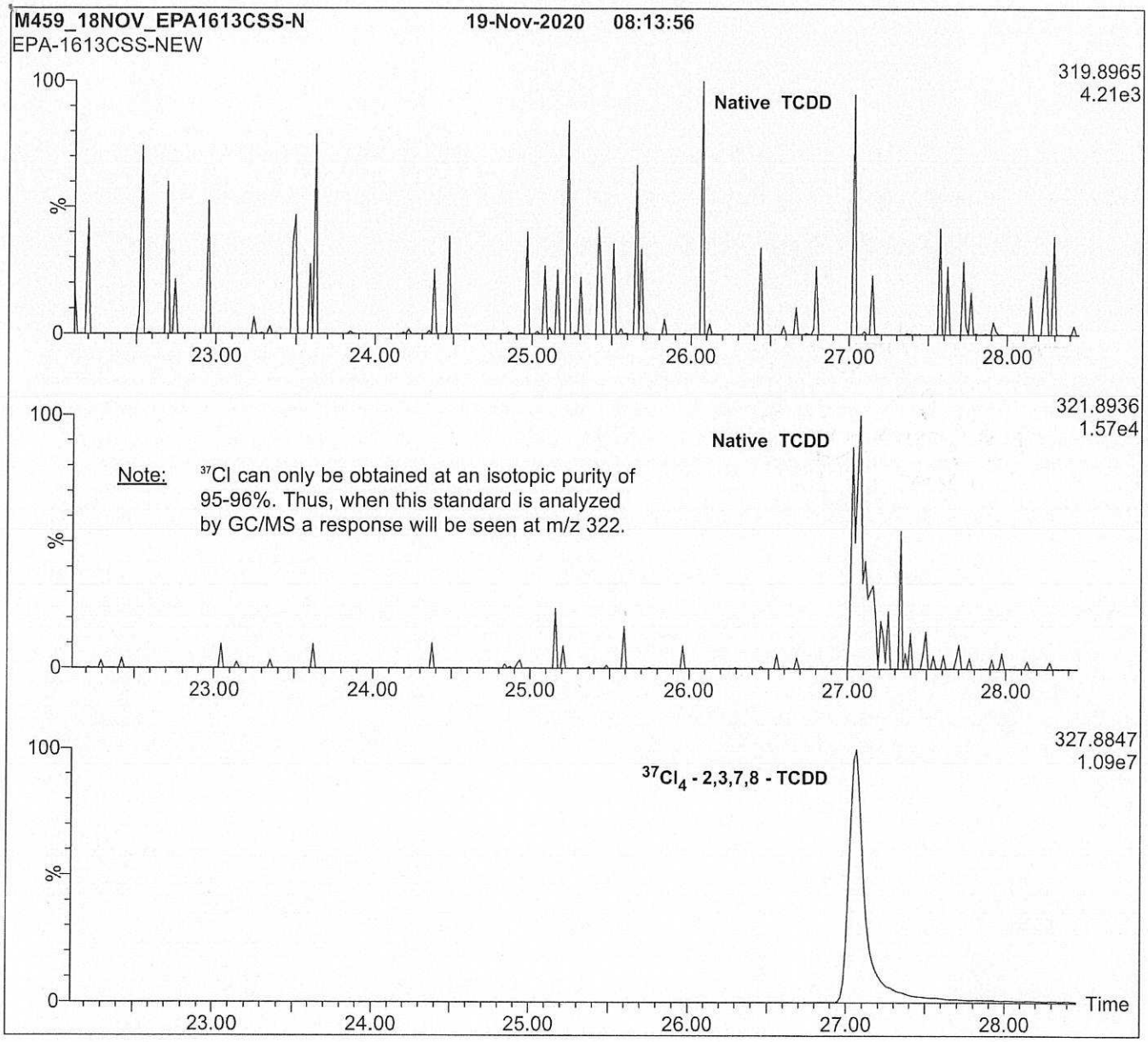
This product was produced using a Quality Management System registered to the latest versions of ISO 9001 by SAI Global, ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA; A1226), and ISO 17034 by ANSI National Accreditation Board (ANAB; AR-1523).

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

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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:

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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: **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)

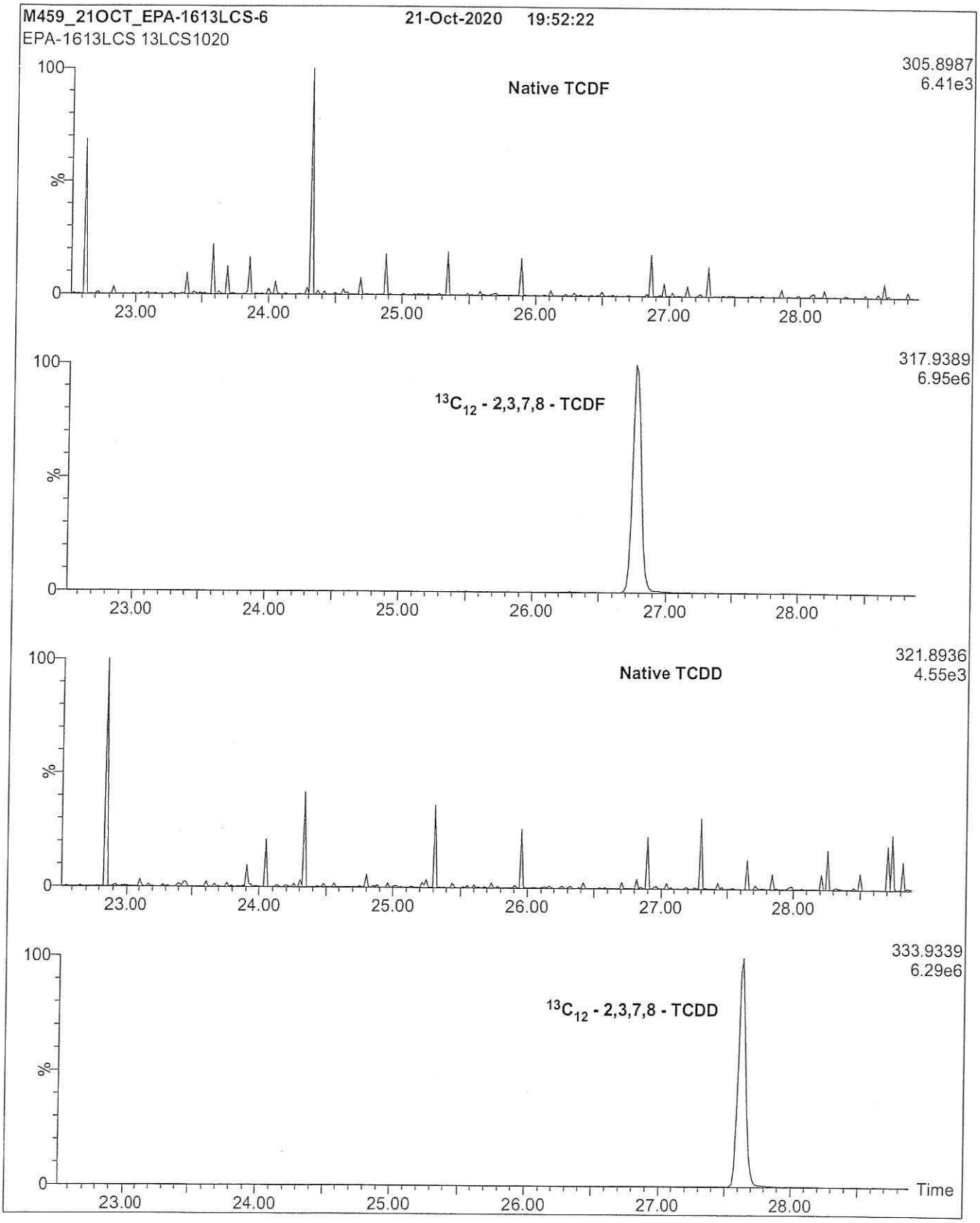


Figure 1: **EPA-1613LCS; HRGC/HRMS Data (60 m DB-5 Column)**

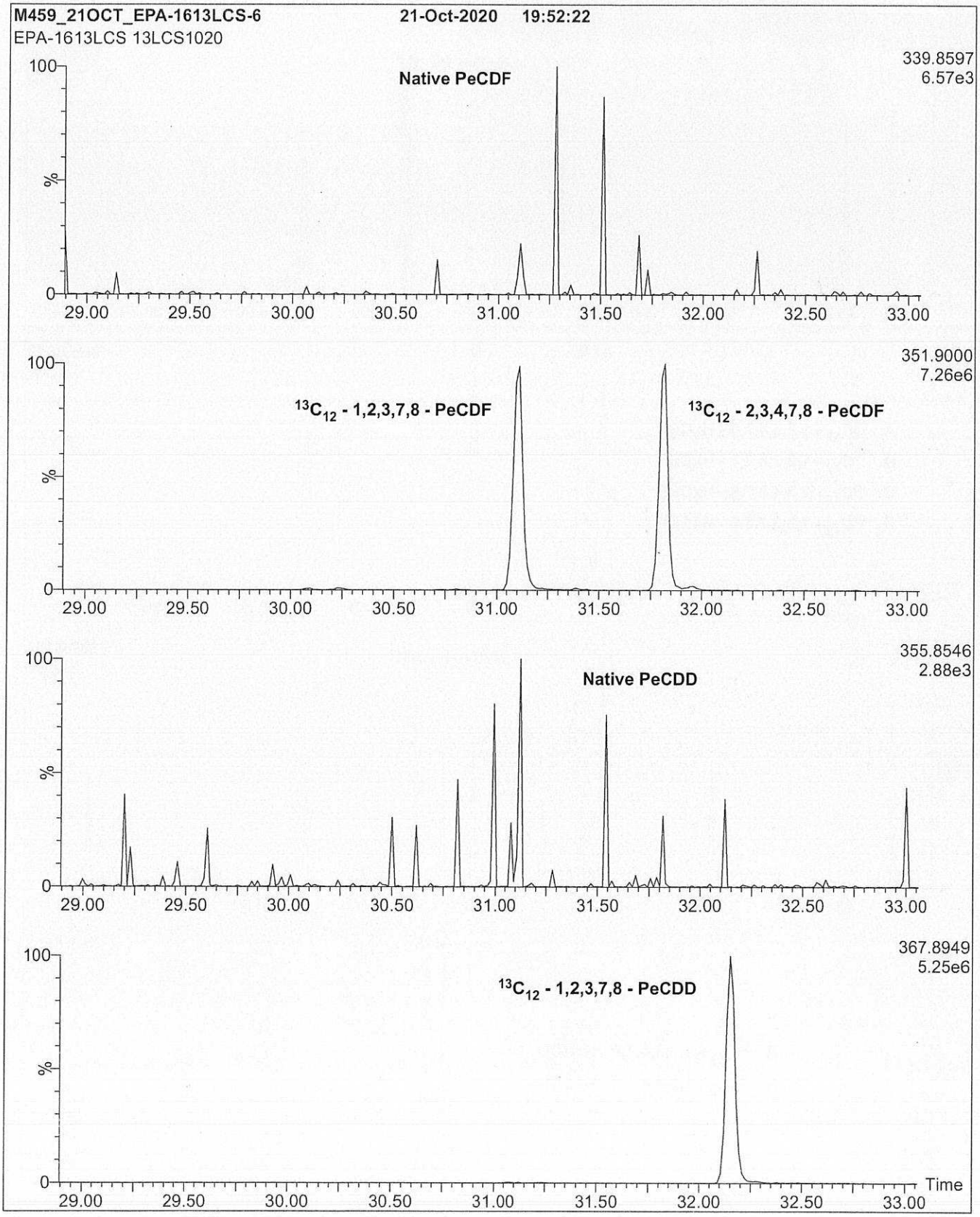


Figure 1: EPA-1613LCS; HRGC/HRMS Data (60 m DB-5 Column)

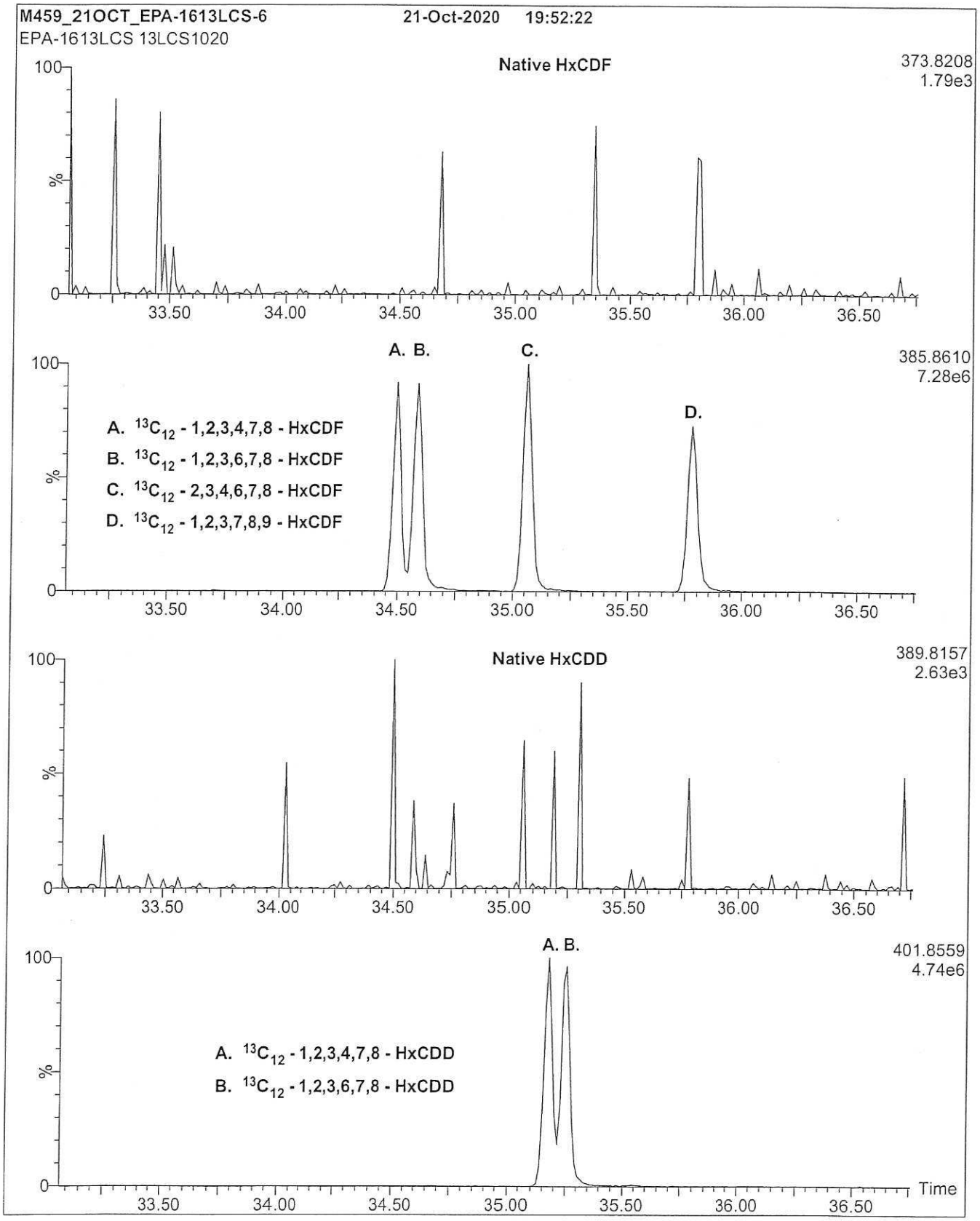


Figure 1: **EPA-1613LCS; HRGC/HRMS Data (60 m DB-5 Column)**

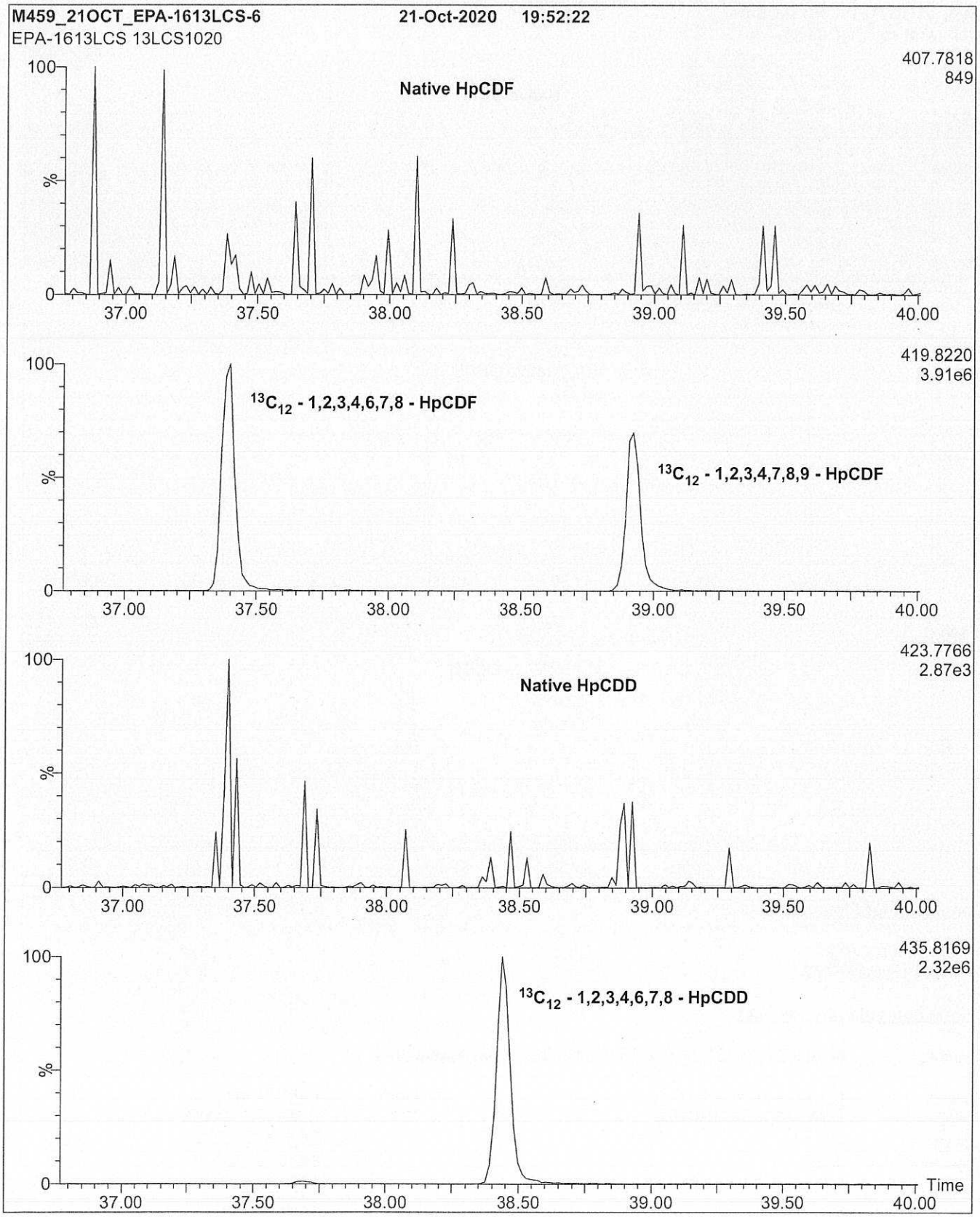
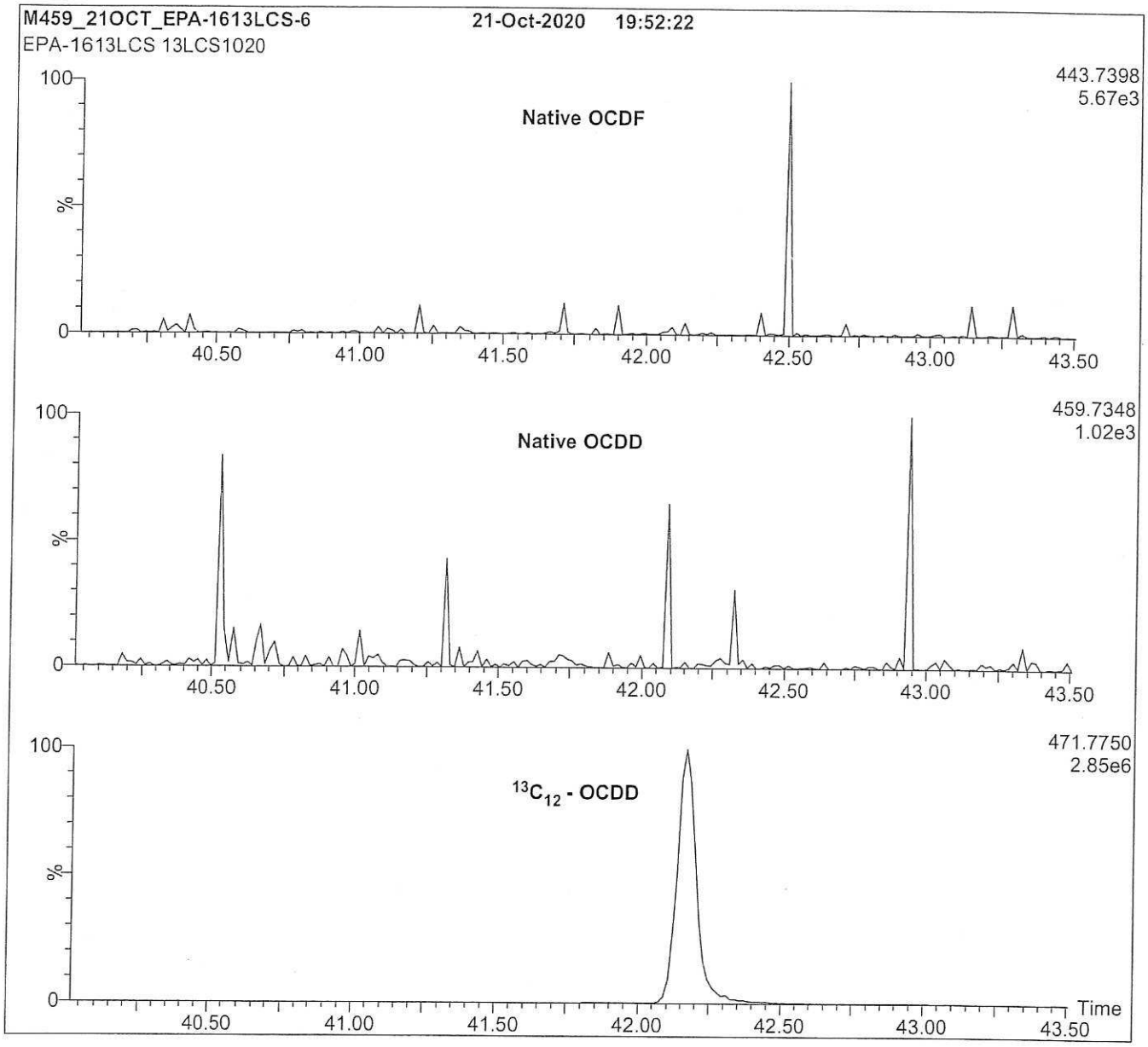


Figure 1: EPA-1613LCS; HRGC/HRMS Data (60 m DB-5 Column)



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)

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

Analytical Resources, Incorporated
Analytical Chemists and Consultants

PREPARATION BATCH SUMMARY

ASTM D2216

Laboratory:	Analytical Resources, Inc.			SDG:	21G0064
Client:	Anchor QEA, LLC			Project:	Lower Duwamish AOC4
Batch:	BJG0275	Batch Matrix:	Solid	Preparation:	No Prep-Organics

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
LDW21-IT507	21G0064-10		07/13/21 15:13	

TOTAL SOLIDS BENCHSHEET

Method HRSM01.2

(dry at 110 C)

Instrumentation

Batch:	BJG0275
Date:	7/14/21 5:35
Analyst:	DxP
Drying Oven:	18
Analytical Balance:	24650344

Batch drying time			
Record times as mm/dd/yy hh:mm		Oven Temp, C	TS (%) calculated as:
Date/time in oven:	7/13/21 15:13	108	Final dry wt (g) = (Dry Wt - Tare Wt)
Date/time out:	7/14/21 5:35	108	TS = (Final Dry Wt X 100)/ (sample & dish -dish tare)
Elapsed hrs:	0.0		

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
21F0448-01	0.81	11.49	11.16			No
21G0016-01	0.79	11.32	4.30			Yes
21G0016-02	0.81	11.24	9.24			Yes
21G0016-03	0.81	11.70	4.33			Yes
21G0038-01	0.79	11.81	8.28			Yes
21G0064-10	0.80	11.30	7.82			No
21G0079-10	0.80	11.34	8.01			No
21G0081-03	0.80	11.79	11.30			No
21G0082-12	0.78	11.71	6.57			Yes
21G0082-13	0.78	11.81	6.59			Yes
21G0090-01	0.80	11.64	7.03			No
21G0090-02	0.81	11.88	7.00			No
21G0090-03	0.80	11.55	5.20			Yes
21G0094-07	0.82	11.59	6.72			Yes
21G0094-08	0.81	11.04	6.46			Yes
21G0094-10	0.81	11.18	6.27			Yes
21G0094-15	0.80	11.48	7.43			No

Analytical Resources, Incorporated
Analytical Chemists and Consultants

HOLDING TIME SUMMARY

Analysis: ASTM D2216

Laboratory: Analytical Resources, Inc. SDG: 21G0064

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-IT507 21G0064-10	07/06/21 12:25	07/07/21 17:44	07/13/21 15:13	7	28	07/14/21 05:35	8	28	

* Indicates hold time exceedance.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

METHOD DETECTION AND REPORTING LIMITS

ASTM D2216

Laboratory: Analytical Resources, Inc.
SDG: 21G0064
Client: Anchor QEA, LLC
Project: Lower Duwamish AOC4
Matrix: Solid
Instrument:

Analyte	MDL	RL	Units
Total Solids		0.01	%