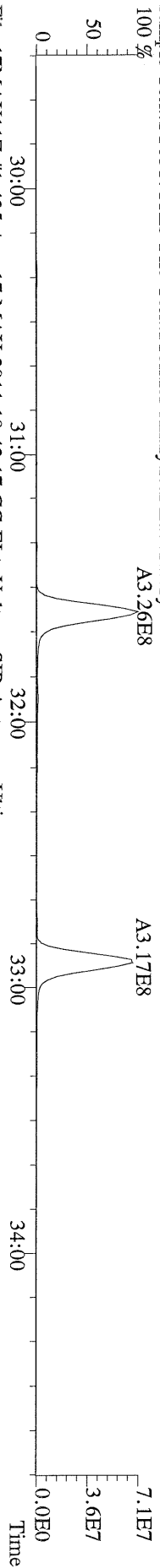
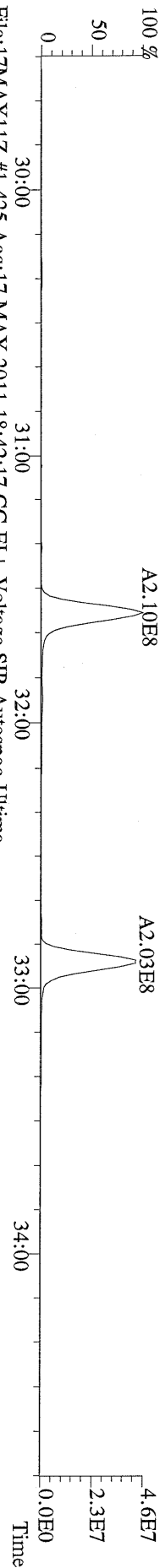


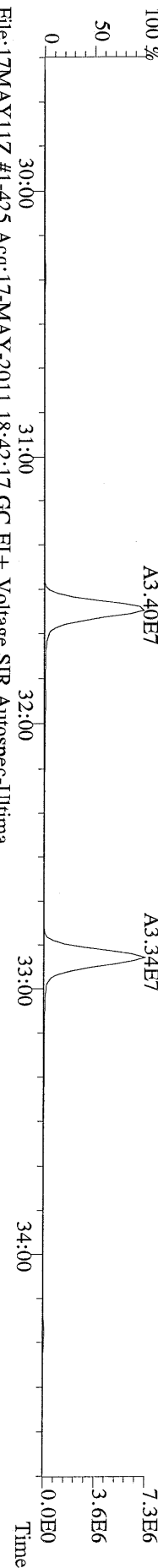
File:17MAY11Z #1-425 Acq:17-MAY-2011 18:42:17 GC EI+ Voltage SIR Autospec-Ultima
 339.8597 S:6 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:PCDD
 Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory
 100 %



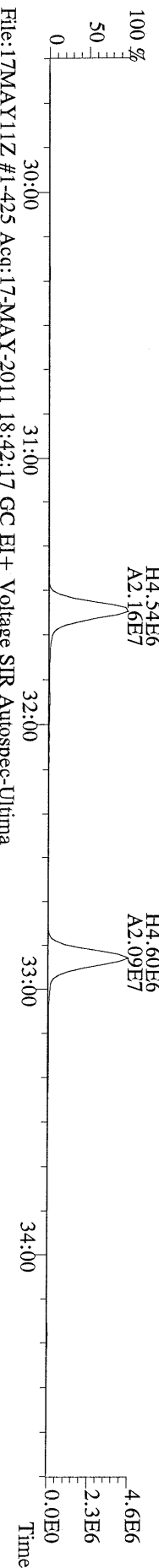
File:17MAY11Z #1-425 Acq:17-MAY-2011 18:42:17 GC EI+ Voltage SIR Autospec-Ultima
 341.8568 S:6 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:PCDD
 Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory
 100 %



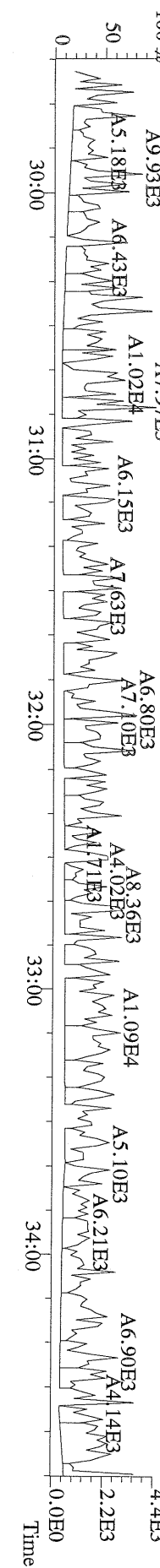
File:17MAY11Z #1-425 Acq:17-MAY-2011 18:42:17 GC EI+ Voltage SIR Autospec-Ultima
 351.9000 S:6 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:PCDD
 Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory
 100 %



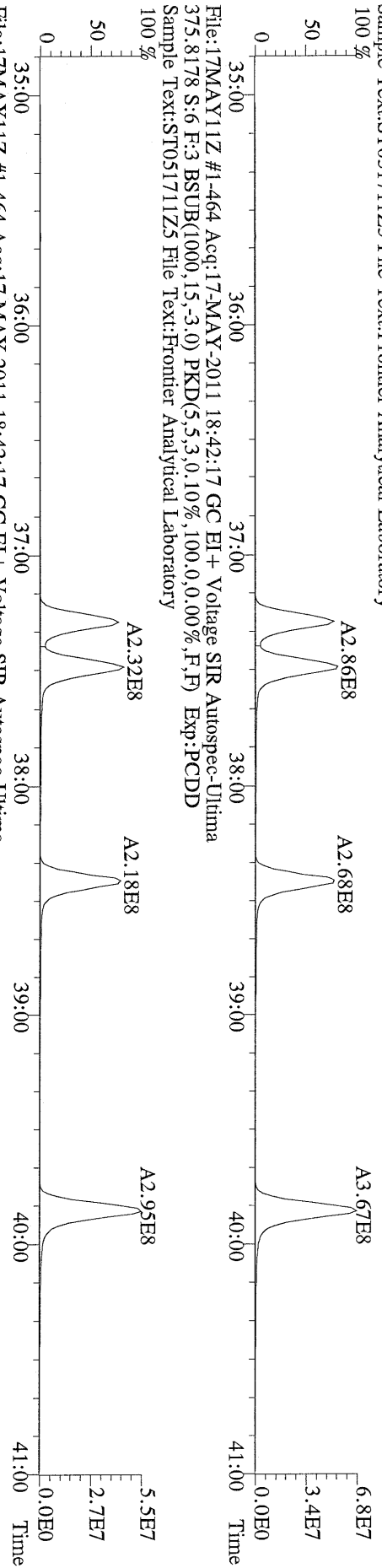
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 353.8970 S:6 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:PCDD
 Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory



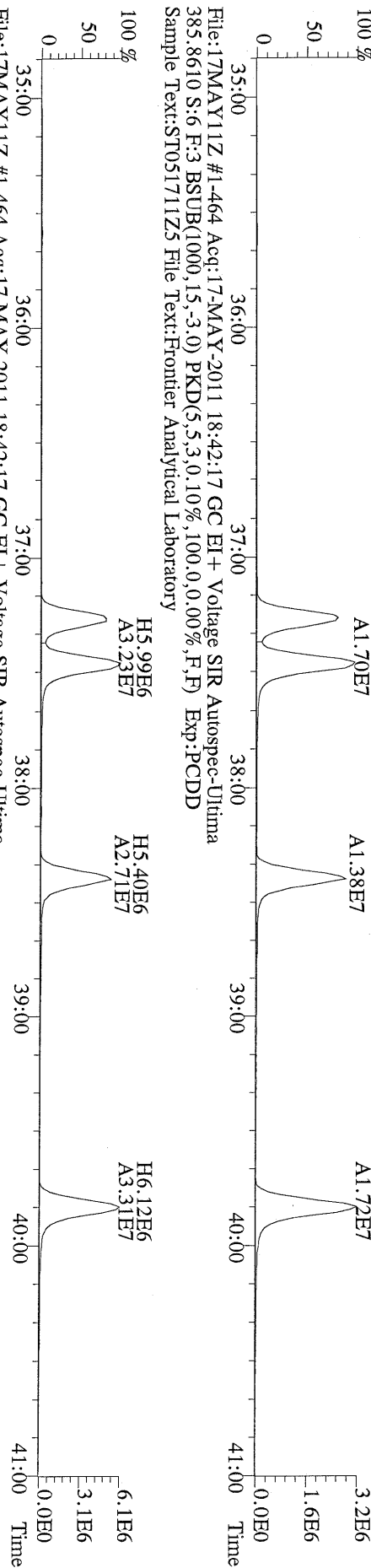
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 409.7974 S:6 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:PCDD
 Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory
 100 %



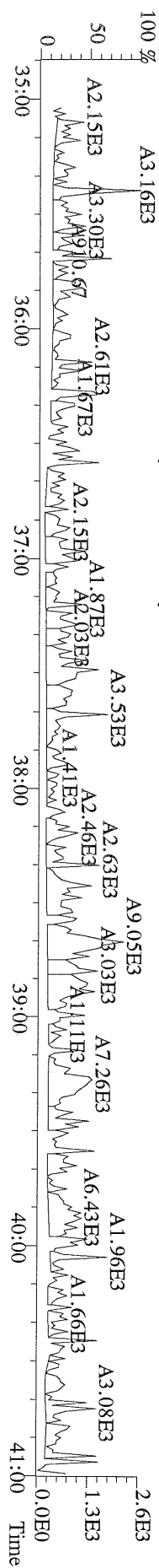
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373.8207 S:6 F:3 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory



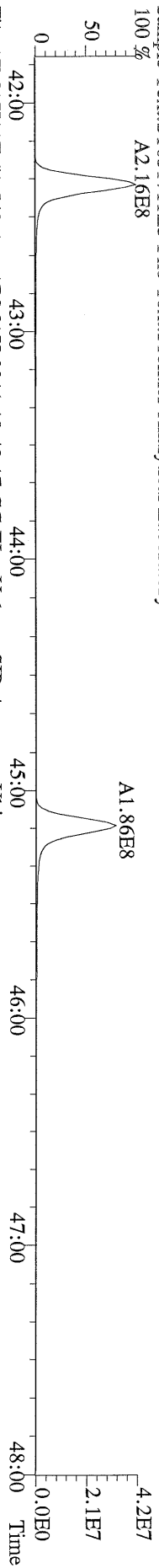
File:17MAY11Z #1-464 Acq:17-MAY-2011 18:42:17 GC EI+ Voltage SIR Autospec-Ultima
383.8639 S:6 F:3 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory



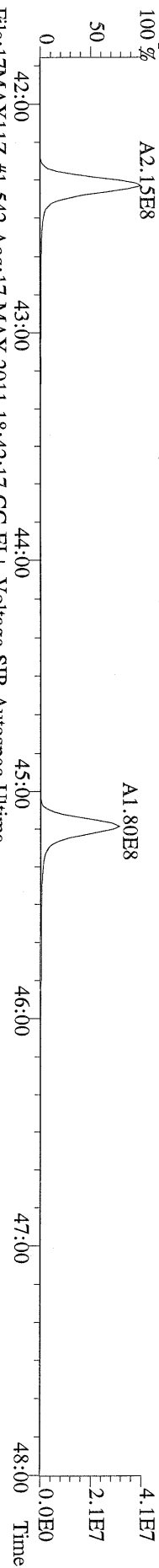
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445.7555 S:6 F:3 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory



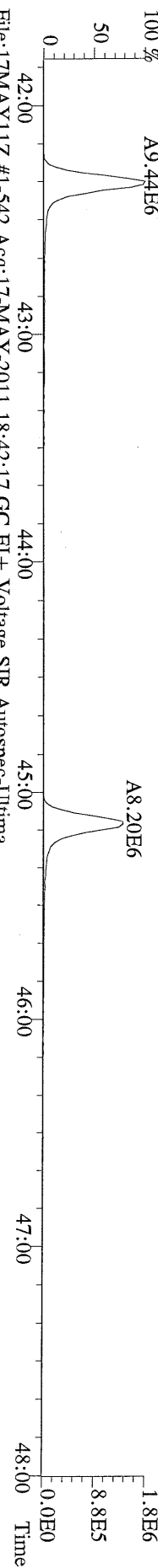
File:17MAY11Z #1-542 Acq:17-MAY-2011 18:42:17 GC EI+ Voltage SIR Autospec-Utima
407.7818 S:6 F:4 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory



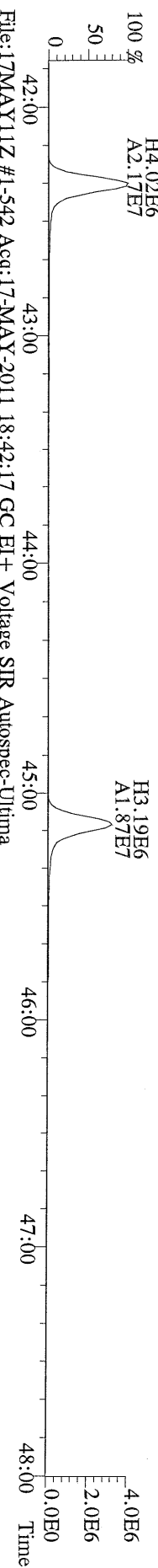
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409.7788 S:6 F:4 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory



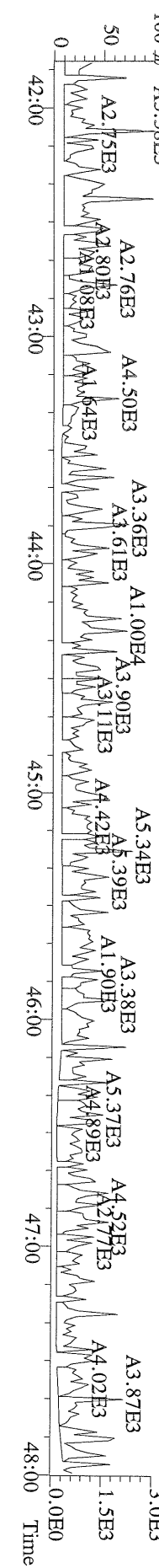
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417.8253 S:6 F:4 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory



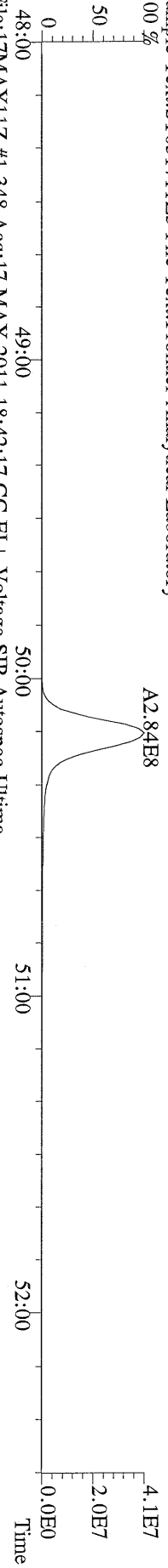
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419.8220 S:6 F:4 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory



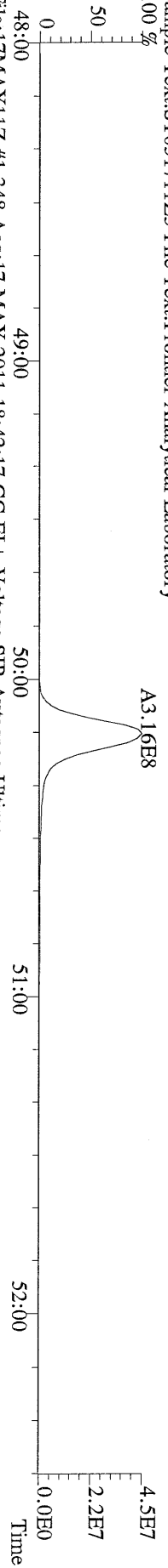
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479.7165 S:6 F:4 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory



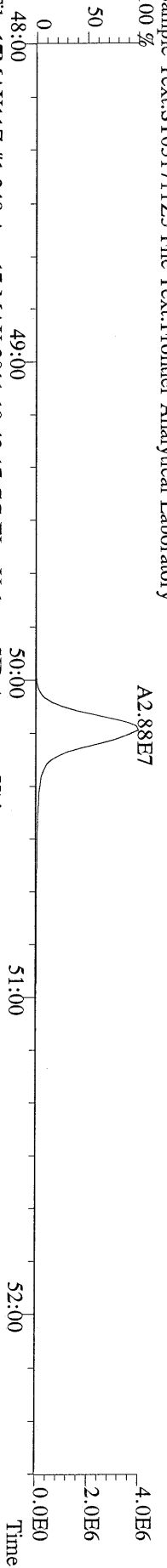
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441.7428 S:6 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory
100 %



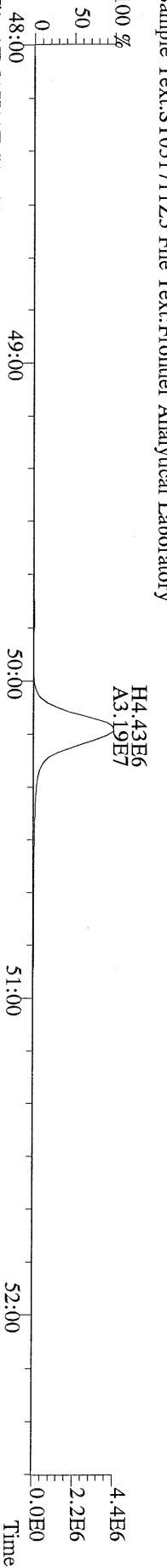
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443.7398 S:6 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory
100 %



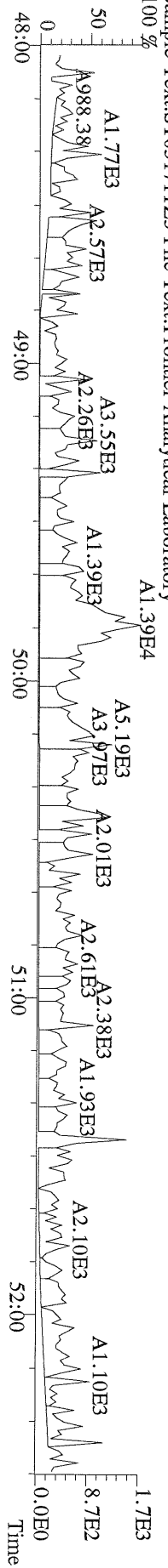
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453.7831 S:6 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory
100 %

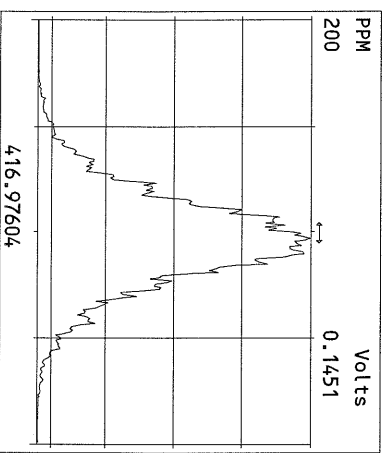
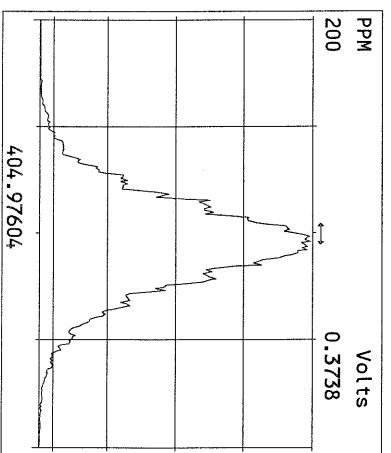
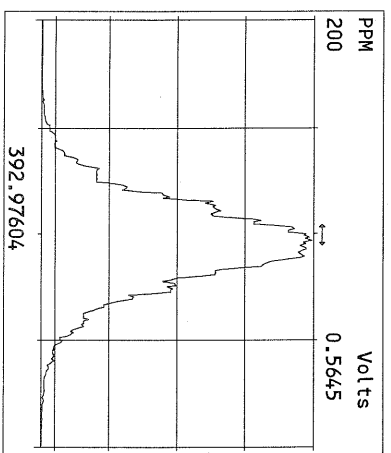
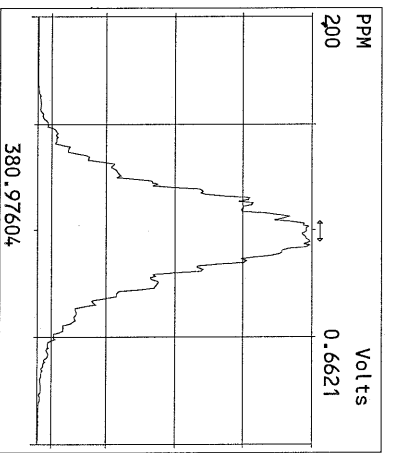
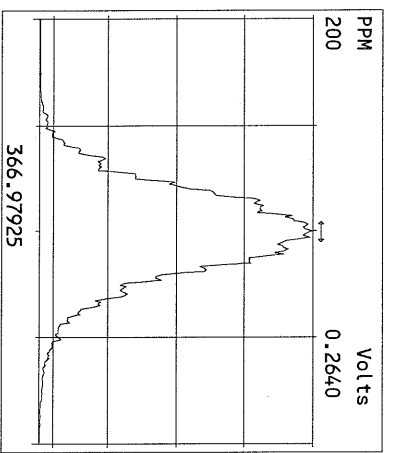
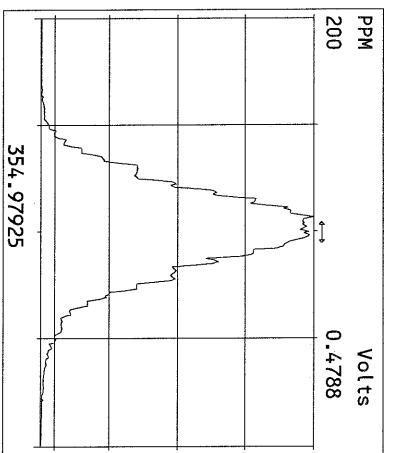
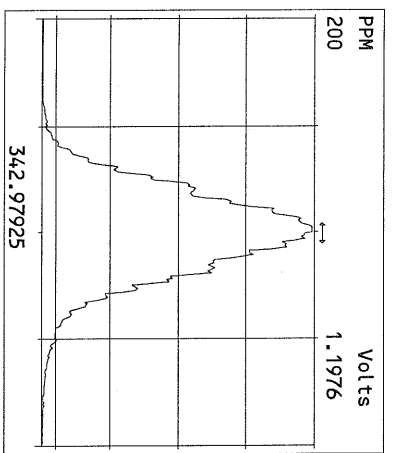
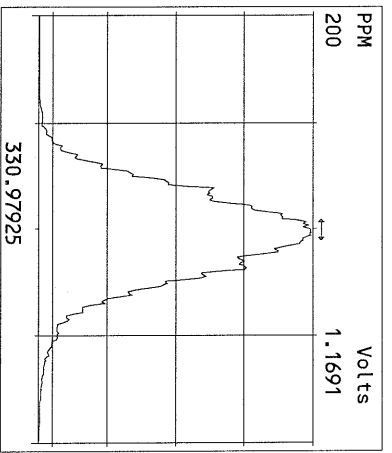
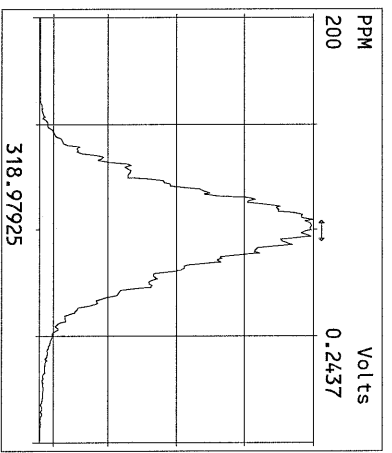
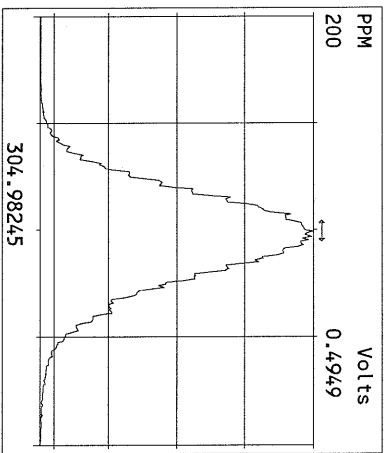
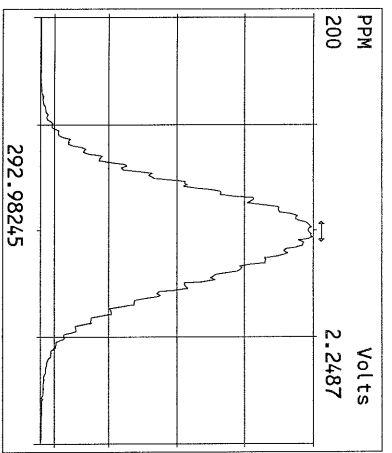


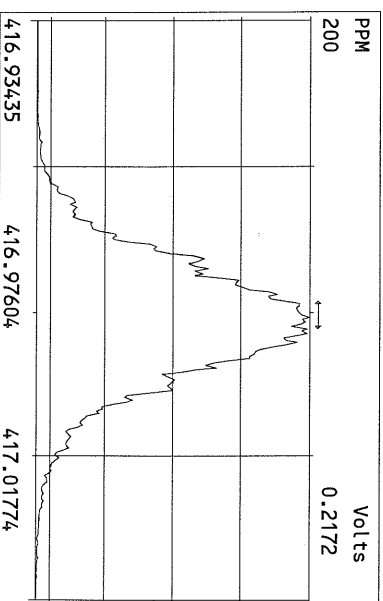
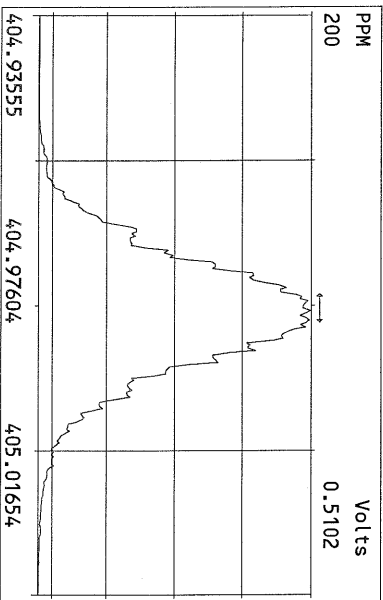
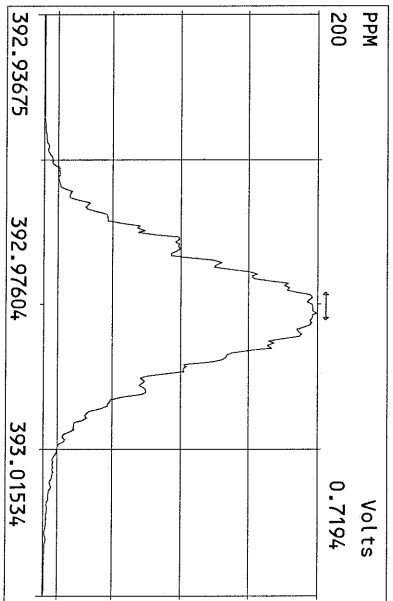
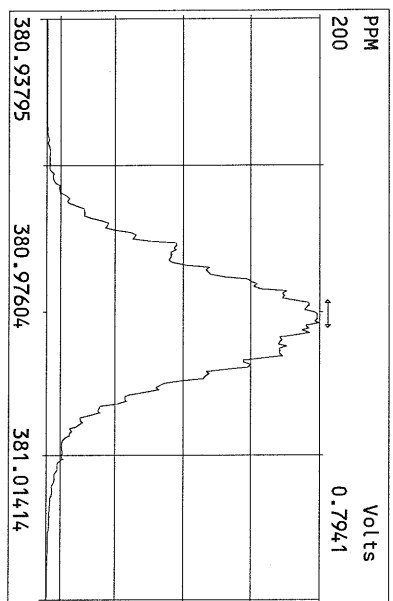
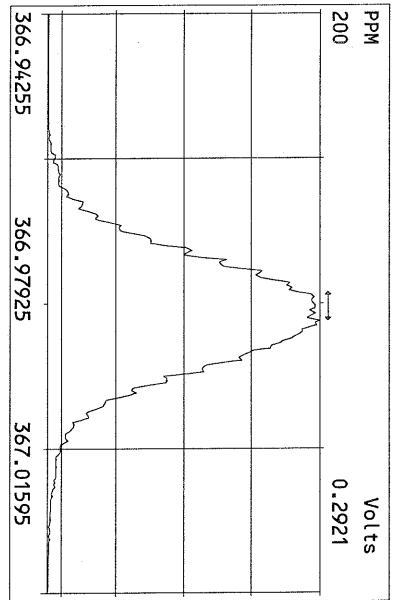
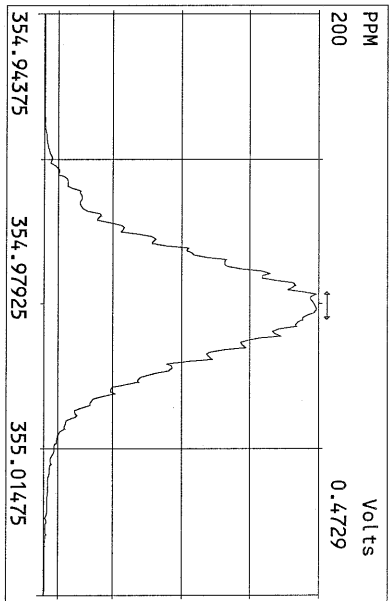
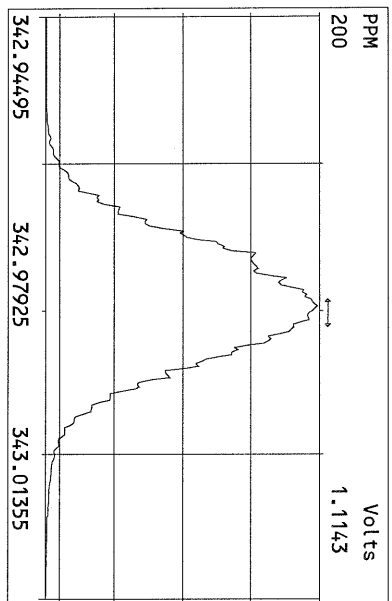
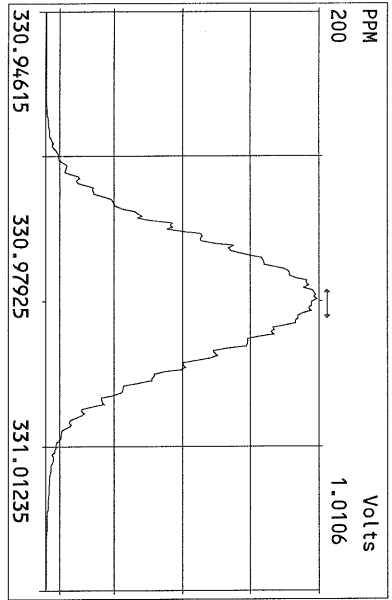
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455.7801 S:6 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory

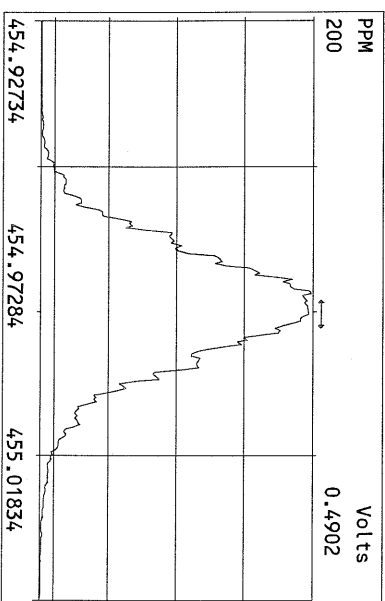
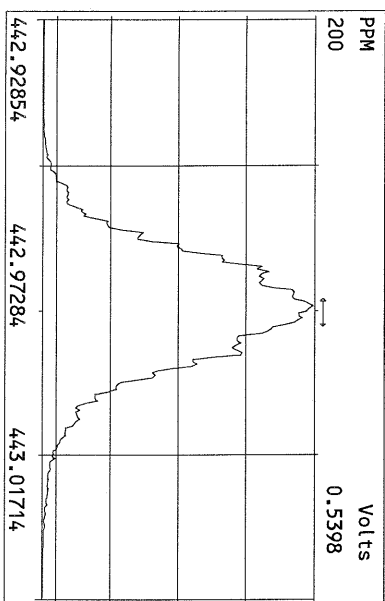
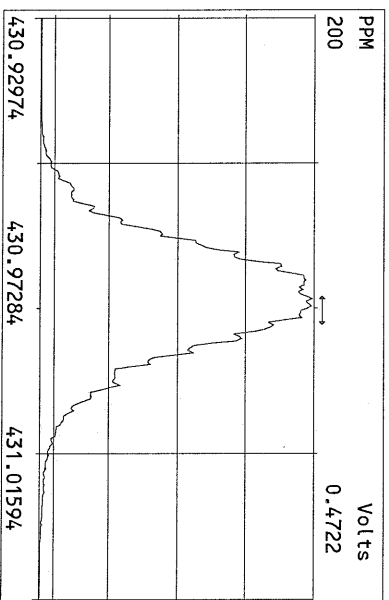
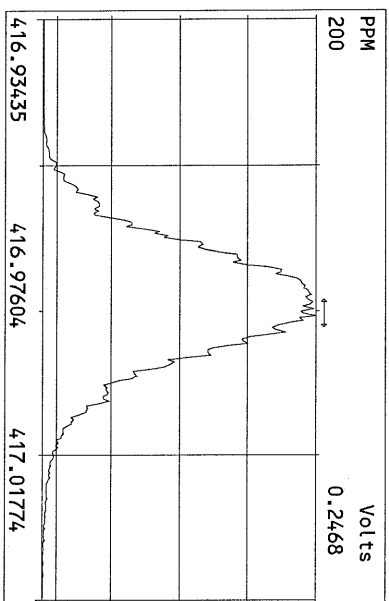
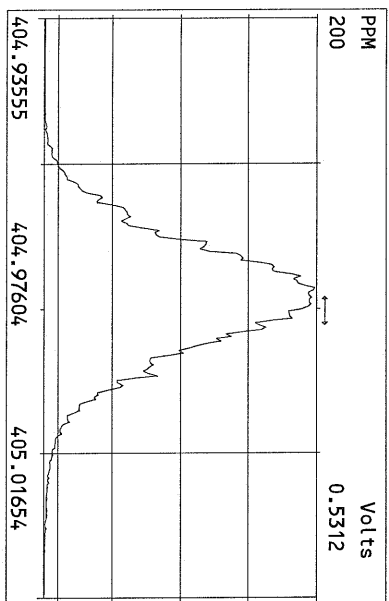
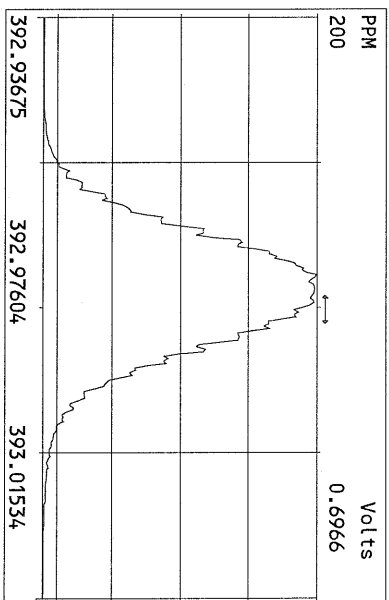
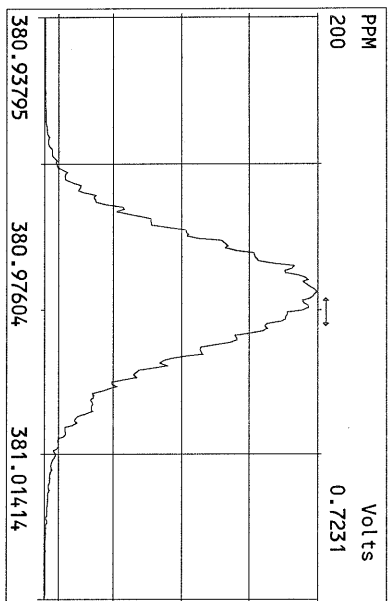
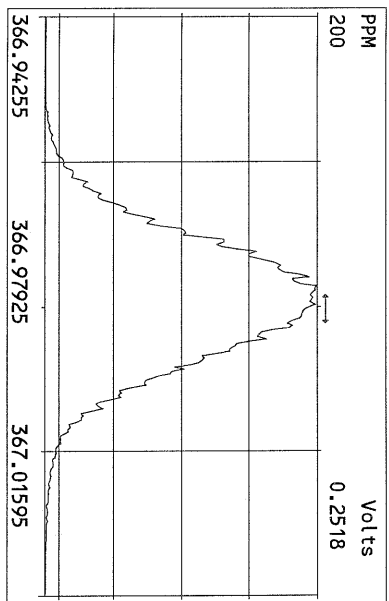


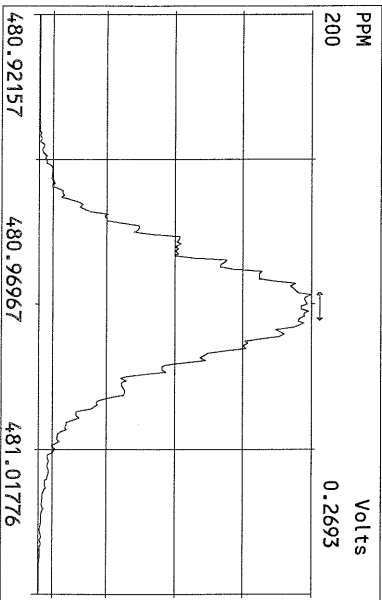
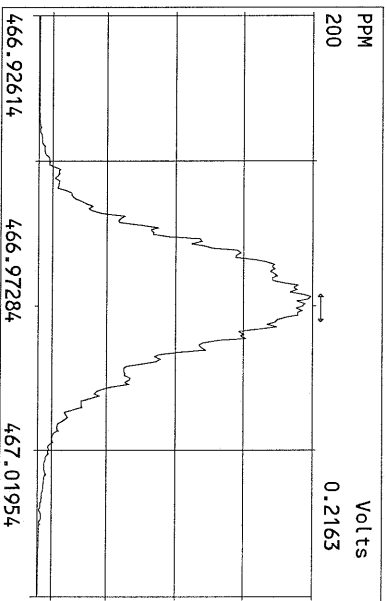
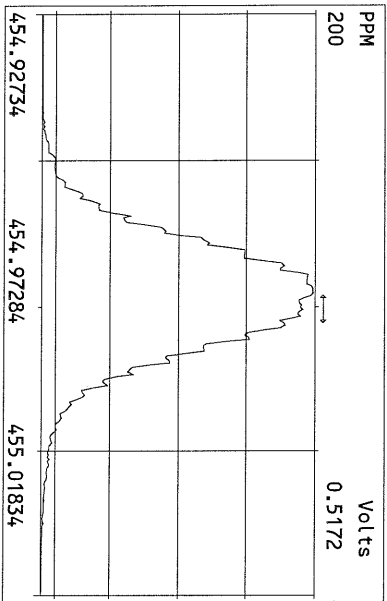
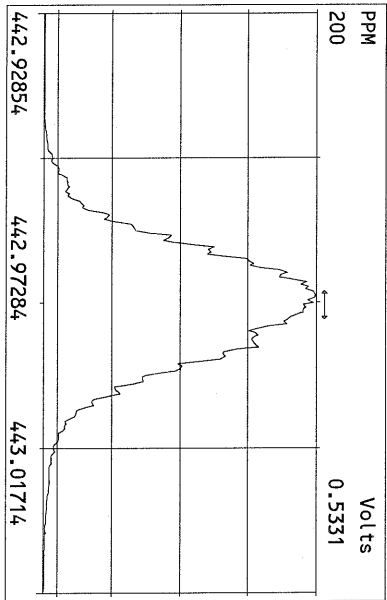
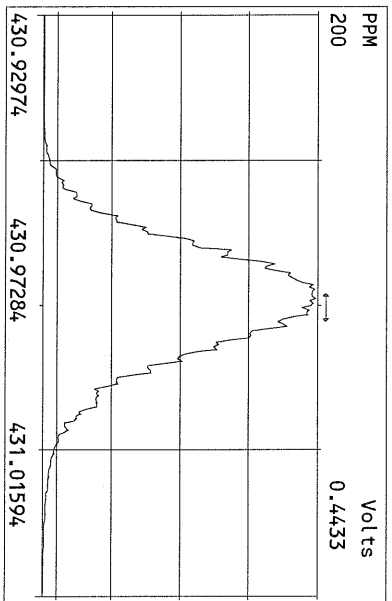
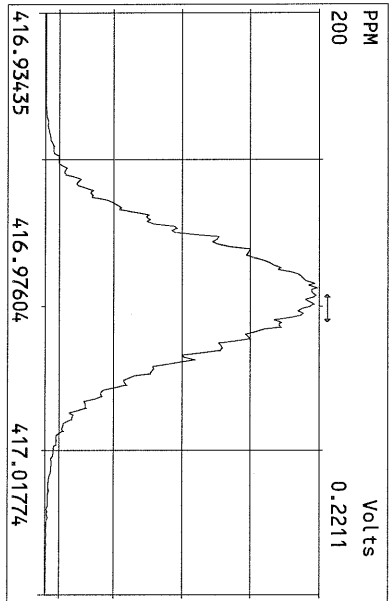
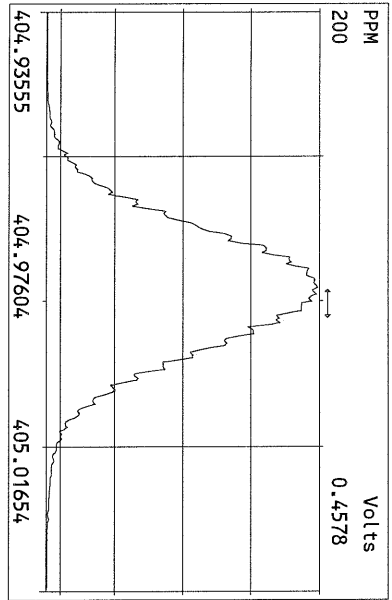
File:17MAY11Z #1-348 Acq:17-MAY-2011 18:42:17 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:6 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051711Z5 File Text:Frontier Analytical Laboratory
100 %

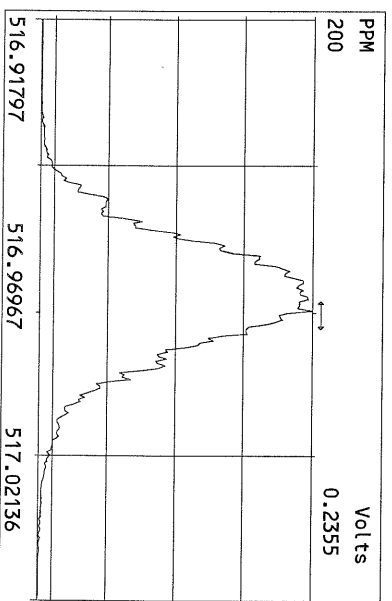
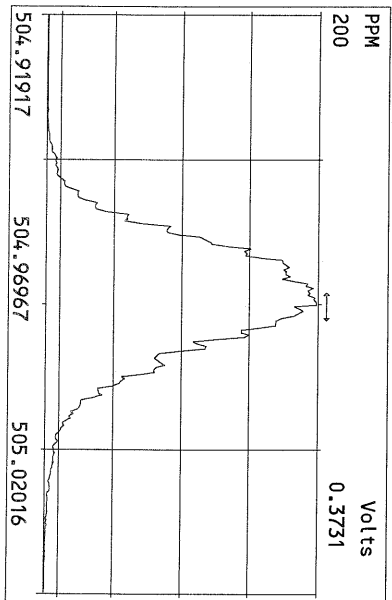
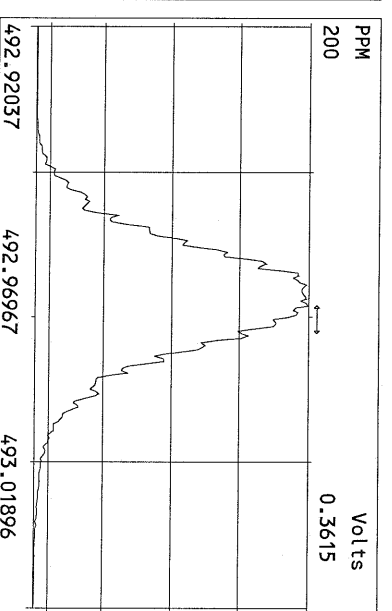
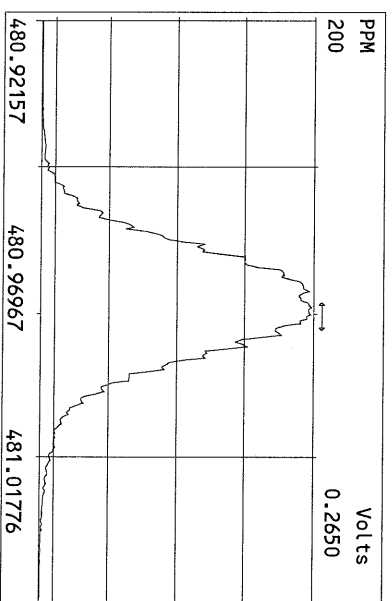
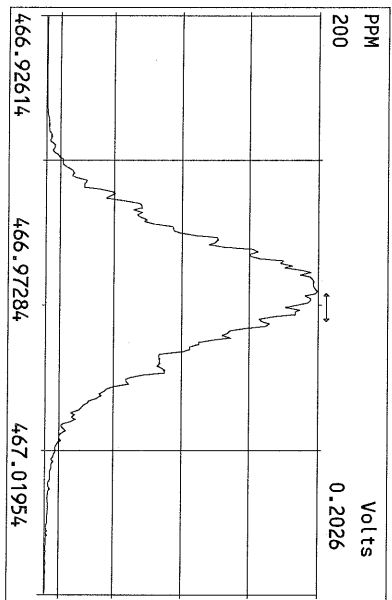
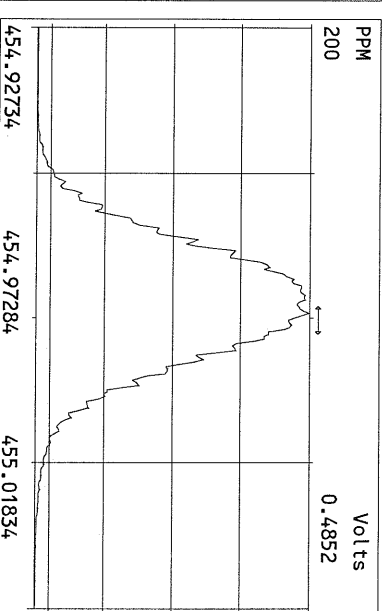
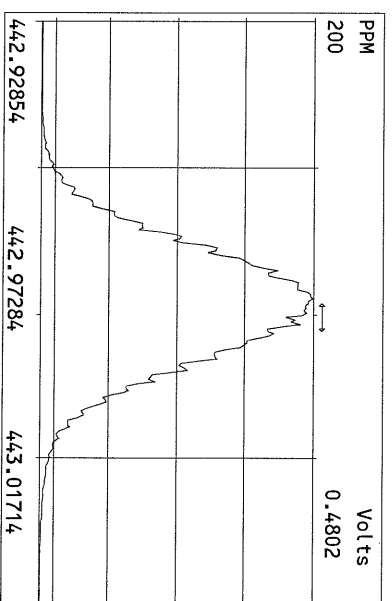
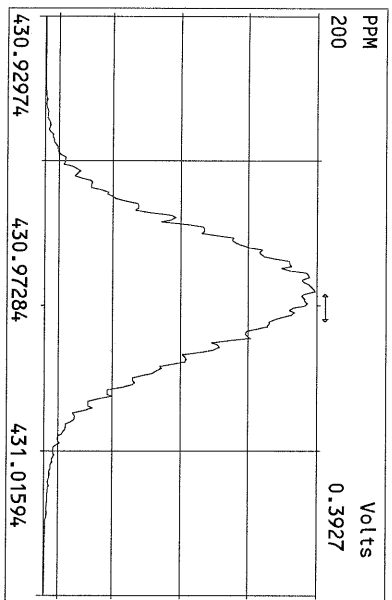












USEPA - ITD

FORM 4B
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Initial Calibration Date: 5/17/11

Instrument ID: FAL4

GC Column ID: DB5

VER Data Filename: 18MAY11Z Sam:1

Analysis Date: 18-MAY-11 12:16:46

LABELLED COMPOUNDS	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
13C-2,3,7,8-TCDD	M/M+2	0.79	0.65-0.89	y	100	82.0 - 121
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.61	1.32-1.78	y	89.1	62.0 - 160
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.29	1.05-1.43	y	102	85.0 - 117
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.26	1.05-1.43	y	105	85.0 - 118
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.09	0.88-1.20	y	99.1	72.0 - 138
13C-OCDD	M+2/M+4	0.91	0.76-1.02	y	204	96.0 - 415
13C-2,3,7,8-TCDF	M/M+2	0.79	0.65-0.89	y	102	71.0 - 140
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.59	1.32-1.78	y	91.0	76.0 - 130
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.59	1.32-1.78	y	90.6	77.0 - 130
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.52	0.43-0.59	y	109	76.0 - 131
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.54	0.43-0.59	y	112	70.0 - 143
13C-2,3,4,6,7,8-HxCDF	M/M+2	0.53	0.43-0.59	y	109	73.0 - 137
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.54	0.43-0.59	y	107	74.0 - 135
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.44	0.37-0.51	y	114	78.0 - 129
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.43	0.37-0.51	y	109	77.0 - 129
13C-OCDF	M+2/M+4	0.91	0.76-1.02	y	203	96.0 - 415
CLEANUP STANDARD (4)						
37Cl-2,3,7,8-TCDD					9.57	7.80 - 12.8

(1) See Table 8, Method 1613, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 9, Method 1613.

(3) Contract-required concentration range as specified in Table 6, Method 1613.

(4) No ion abundance ratio; report concentration found.

Analyst: _____

Date: _____

USEPA - ITD

FORM 6A

PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Init. Cal. Date: 5/17/11

Instrument ID: FAL4

GC Column ID: DB5

Analysis Date: 18-MAY-11 12:16:46

CS3 or VER Data Filename: 18MAY11Z

Sam:1

NATIVE ANALYTES	RETENTION TIME REFERENCE	RRT	RRT QC LIMITS (1)
2,3,7,8-TCDD	13C-2,3,7,8-TCDD	1.001	0.999-1.002
2,3,7,8-TCDF	13C-2,3,7,8-TCDF	1.001	0.999-1.003
1,2,3,7,8-PeCDD	13C-1,2,3,7,8-PeCDD	1.001	0.999-1.002
1,2,3,7,8-PeCDF	13C-1,2,3,7,8-PeCDF	1.001	0.999-1.002
2,3,4,7,8-PeCDF	13C-2,3,4,7,8-PeCDF	1.001	0.999-1.002
LABELED COMPOUNDS			
37Cl-2,3,7,8-TCDD	13C-1,2,3,4-TCDD	1.022	0.989-1.052
13C-2,3,7,8-TCDD		1.021	0.976-1.043
13C-2,3,7,8-TCDF		0.993	0.923-1.103
13C-1,2,3,7,8-PeCDD		1.240	1.000-1.567
13C-1,2,3,7,8-PeCDF		1.175	0.923-1.203
13C-2,3,4,7,8-PeCDF		1.224	0.923-1.303

(1) Contract-required limits for Relative Retention Times (RRT) as specified
in Table 2, Method 1613.

Analyst: Date: 5/18/11

USEPA - ITD

FORM 6B

PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Init. Cal. Date: 5/17/11

Instrument ID: FAL4

GC Column ID: DB5

Analysis Date: 18-MAY-11 12:16:46

CS3 or VER Data Filename: 18MAY11Z

Sam:1

NATIVE ANALYTES	RETENTION TIME		RRT	RRT
	REFERENCE			QC LIMITS (1)
1,2,3,4,7,8-HxCDD	13C-1,2,3,4,7,8-HxCDD		1.000	0.999-1.001
1,2,3,6,7,8-HxCDD	13C-1,2,3,6,7,8-HxCDD		1.001	0.998-1.004
1,2,3,7,8,9-HxCDD	13C-1,2,3,6,7,8-HxCDD		1.012	1.000-1.019
1,2,3,4,7,8-HxCDF	13C-1,2,3,4,7,8-HxCDF		1.000	0.999-1.001
1,2,3,6,7,8-HxCDF	13C-1,2,3,6,7,8-HxCDF		1.000	0.997-1.005
2,3,4,6,7,8-HxCDF	13C-2,3,4,6,7,8-HxCDF		1.001	0.999-1.001
1,2,3,7,8,9-HxCDF	13C-1,2,3,7,8,9-HxCDF		1.001	0.999-1.001
1,2,3,4,6,7,8-HpCDD	13C-1,2,3,4,6,7,8-HpCDD		1.000	0.999-1.001
1,2,3,4,6,7,8-HpCDF	13C-1,2,3,4,6,7,8-HpCDF		1.001	0.999-1.001
1,2,3,4,7,8,9-HpCDF	13C-1,2,3,4,7,8,9-HpCDF		1.000	0.999-1.001
OCDD	13C-OCDD		1.001	0.999-1.001
OCDF	13C-OCDF		1.000	0.999-1.001
LABELED COMPOUNDS				
13C-1,2,3,4,7,8-HxCDD	13C-1,2,3,7,8,9-HxCDD		0.985	0.977-1.000
13C-1,2,3,6,7,8-HxCDD			0.988	0.981-1.003
13C-1,2,3,4,7,8-HxCDF			0.949	0.944-0.970
13C-1,2,3,6,7,8-HxCDF			0.954	0.949-0.975
13C-2,3,4,6,7,8-HxCDF			0.978	0.959-1.021
13C-1,2,3,7,8,9-HxCDF			1.014	0.977-1.047
13C-1,2,3,4,6,7,8-HpCDD			1.127	1.086-1.130
13C-1,2,3,4,6,7,8-HpCDF			1.078	1.043-1.085
13C-1,2,3,4,7,8,9-HpCDF			1.150	1.057-1.154
13C-OCDD			1.267	1.032-1.311
13C-OCDF			1.277	1.000-1.311

(1) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1613.

Analyst: 8Date: 5/18/11

WHO 1998 Tox: 128 WHO 2005 Tox: 116
 Conc Qual Fac Noise-1 Noise-2 DL

Name	Resp	RA	RT	RRF	Conc	Qual	Fac Noise-1	Noise-2	DL	#Hom
2,3,7,8-TCDD	2.45e+06	0.78 y	27:24	1.15	10.2		2.50	-	*	
1,2,3,7,8-PeCDD	7.74e+06	1.57 y	33:16	1.02	50.6		2.50	-	*	
1,2,3,4,7,8-HxCDD	6.95e+06	1.24 y	38:36	1.09	49.4		2.50	-	*	
1,2,3,6,7,8-HxCDD	7.02e+06	1.24 y	38:46	1.08	52.0		2.50	-	*	
1,2,3,7,8,9-HxCDD	7.59e+06	1.25 y	39:13	1.12	53.4		2.50	-	*	
1,2,3,4,6,7,8-HpCDD	5.05e+06	1.02 y	44:11	1.03	53.5		2.50	-	*	
OCDD	7.74e+06	0.88 y	49:42	1.21	101		2.50	-	*	
2,3,7,8-TCDF	3.27e+06	0.78 y	26:38	1.09	9.79		2.50	-	*	
1,2,3,7,8-PeCDF	1.10e+07	1.56 y	31:32	0.96	52.6		2.50	-	*	
2,3,4,7,8-PeCDF	1.04e+07	1.57 y	32:51	0.96	51.5		2.50	-	*	
1,2,3,4,7,8-HxCDF	8.43e+06	1.26 y	37:14	1.18	50.1		2.50	-	*	
1,2,3,6,7,8-HxCDF	1.04e+07	1.21 y	37:25	1.03	51.8		2.50	-	*	
2,3,4,6,7,8-HxCDF	9.36e+06	1.22 y	38:22	1.17	51.4		2.50	-	*	
1,2,3,7,8,9-HxCDF	1.12e+07	1.23 y	39:47	1.27	51.4		2.50	-	*	
1,2,3,4,6,7,8-HpCDF	8.09e+06	1.03 y	42:18	1.36	51.2		2.50	-	*	
1,2,3,4,7,8,9-HpCDF	6.31e+06	1.02 y	45:05	1.35	50.2		2.50	-	*	
OCDF	9.94e+06	0.91 y	50:05	0.97	106		2.50	-	*	
13C-2,3,7,8-TCDD	2.10e+07	0.79 y	27:23	0.99	100					Rec 100
13C-1,2,3,7,8-PeCDD	1.50e+07	1.61 y	33:14	0.79	89.1					89.1
13C-1,2,3,4,7,8-HxCDD	1.30e+07	1.29 y	38:36	1.03	102					102
13C-1,2,3,6,7,8-HxCDD	1.25e+07	1.26 y	38:45	0.96	105					105
13C-1,2,3,4,6,7,8,9-HpCDD	9.15e+06	1.09 y	44:10	0.75	99.1					99.1
13C-OCDD	1.27e+07	0.91 y	49:41	0.50	204					102
13C-2,3,7,8-TCDF	3.08e+07	0.79 y	26:37	0.98	102					102
13C-1,2,3,7,8-PeCDF	2.18e+07	1.59 y	31:31	0.78	91.0					91.0
13C-2,3,4,7,8-PeCDF	2.11e+07	1.59 y	32:50	0.75	90.6					90.6
13C-1,2,3,4,7,8-HxCDF	1.42e+07	0.52 y	37:13	1.05	109					109
13C-1,2,3,6,7,8-HxCDF	1.94e+07	0.54 y	37:24	1.40	112					112
13C-2,3,4,6,7,8-HxCDF	1.56e+07	0.53 y	38:20	1.16	109					109
13C-1,2,3,7,8,9-HxCDF	1.72e+07	0.54 y	39:46	1.30	107					107
13C-1,2,3,4,6,7,8-HpCDF	1.16e+07	0.44 y	42:16	0.83	114					114
13C-1,2,3,4,7,8,9-HpCDF	9.33e+06	0.43 y	45:05	0.69	109					109
13C-OCDF	1.93e+07	0.91 y	50:04	0.77	203					101
37Cl-2,3,7,8-TCDD	1.44e+06		27:24	0.71	9.57					95.7
13C-1,2,3,4-TCDD	2.12e+07	0.81 y	26:49	-	39.7					
13C-1,2,3,4-TCDF	3.09e+07	0.79 y	25:31	-	41.3					
13C-1,2,3,7,8,9-HxCDD	1.24e+07	1.27 y	39:12	-	32.0					
Total Tetra-Dioxins	1.31e+07		22:52	1.15	54.6		2.50	-	*	26
Total Penta-Dioxins	1.70e+07		30:18	1.02	111		2.50	-	*	18
Total Hexa-Dioxins	2.47e+07		35:47	1.10	177		2.50	-	*	27
Total Hepta-Dioxins	1.14e+07		41:13	1.03	120		2.50	-	*	42
Total Tetra-Furans	1.49e+07		22:59	1.09	44.5		2.50	-	*	21
1st Fn. Tot Penta-Furans	1.57e+07		28:27	0.96	76.0		2.50	-	*	PeCDF 1
Total Penta-Furans	3.19e+07		30:07	0.96	154		2.50	-	*	230 19
Total Hexa-Furans	4.60e+07		35:17	1.16	239		2.50	-	*	22
Total Hepta-Furans	1.49e+07		42:18	1.36	105		2.50	-	*	31

Analyst: J

Date: 5/18/11

Frontier Analytical Laboratory - Acquisition Log

Run Name:18MAY11Z

Instrument: FAL4

GC: DB5

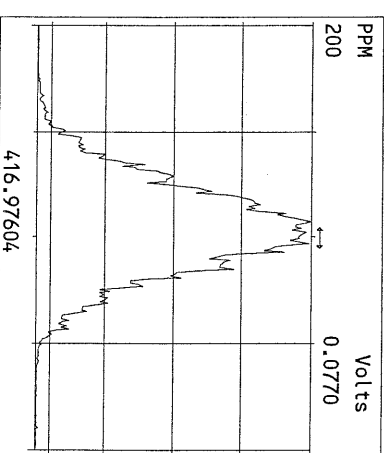
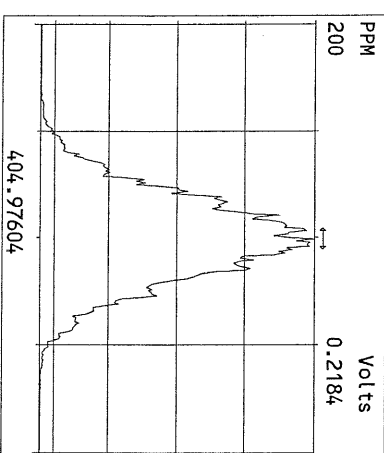
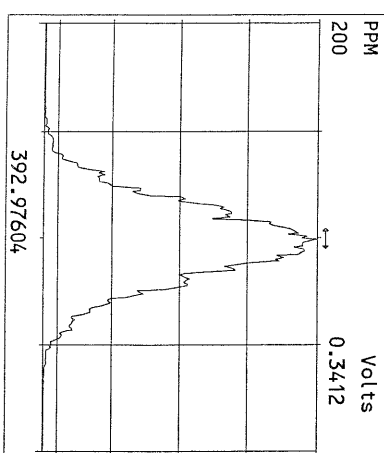
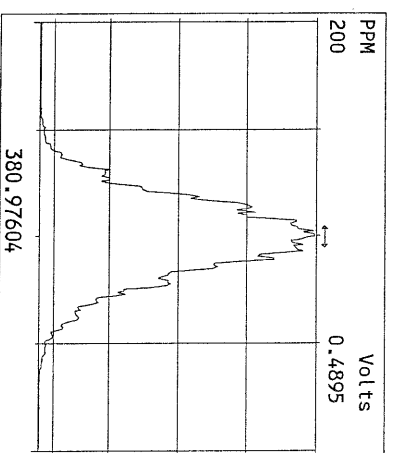
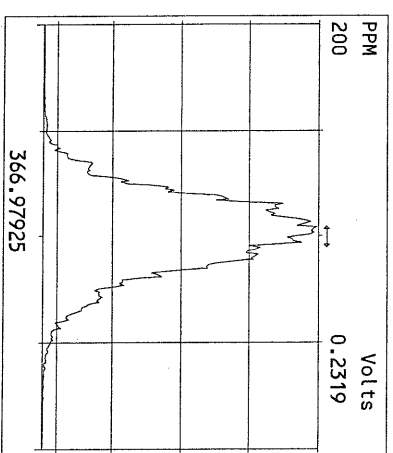
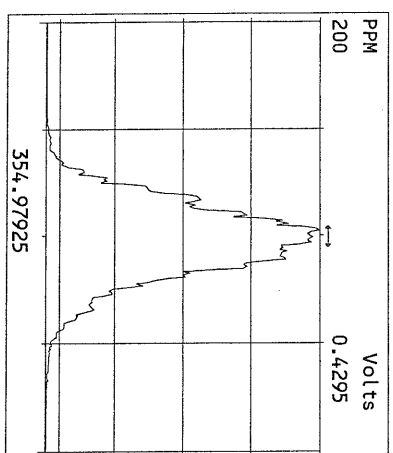
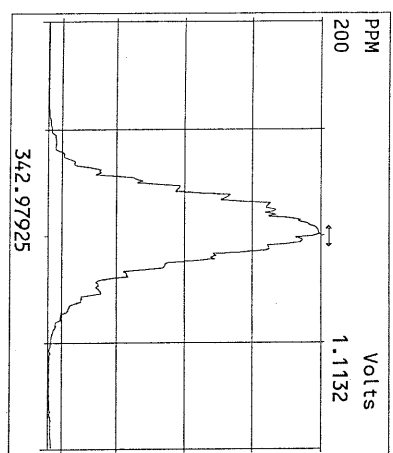
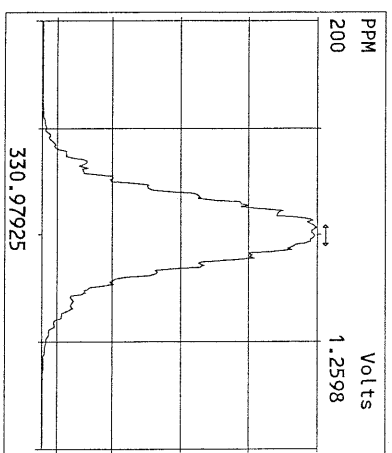
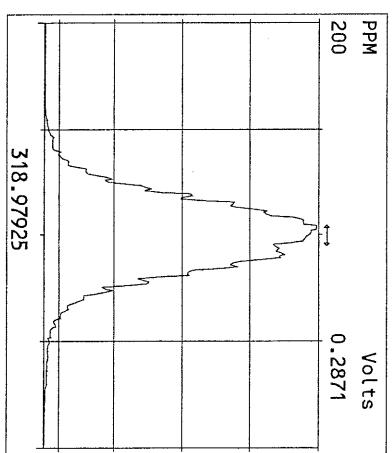
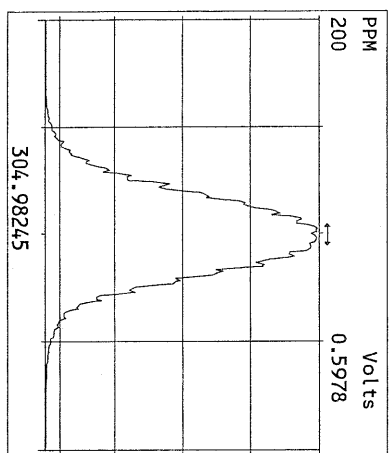
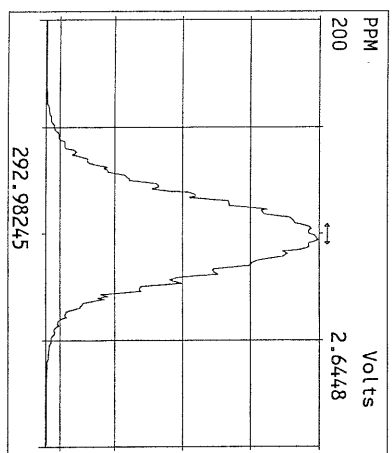
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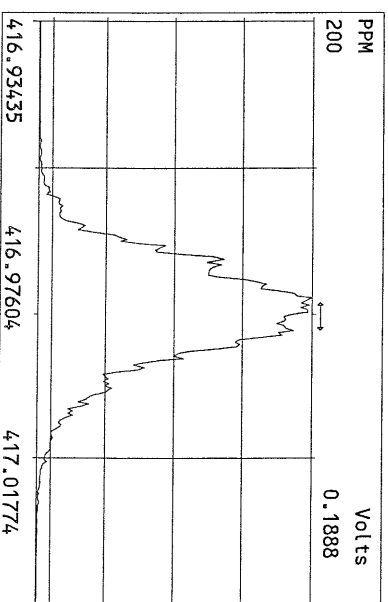
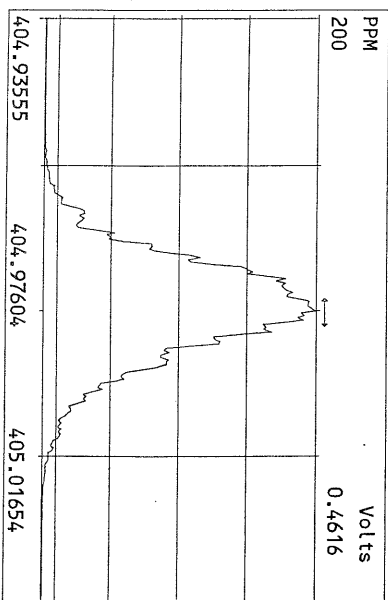
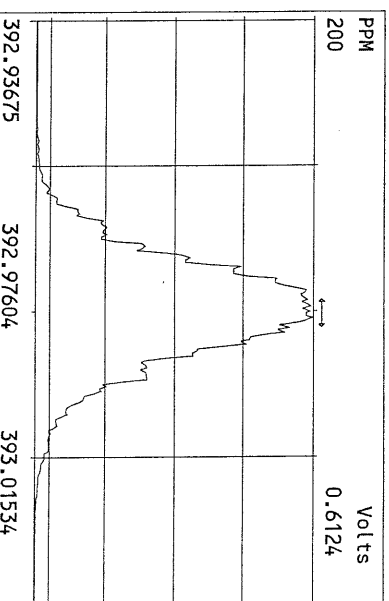
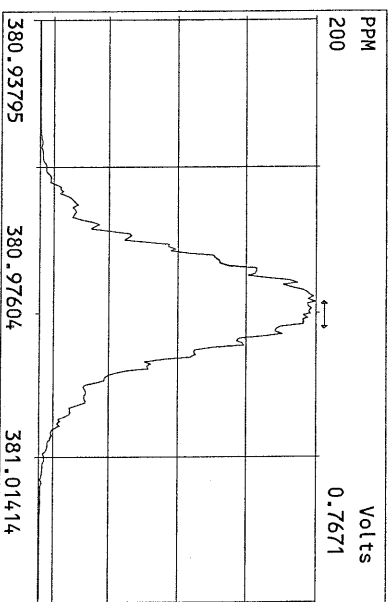
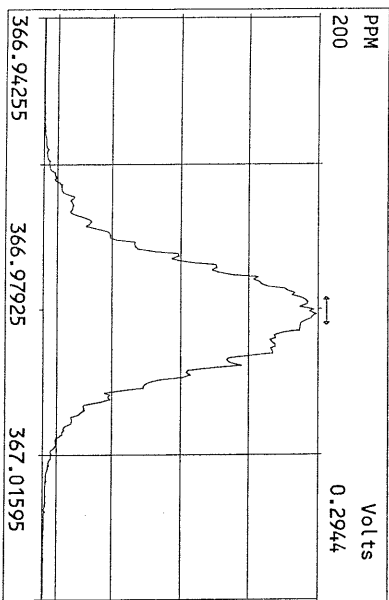
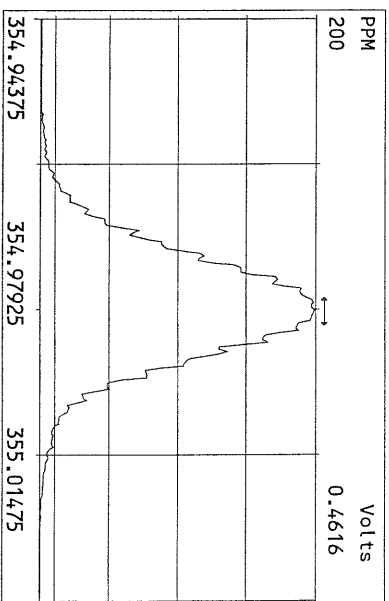
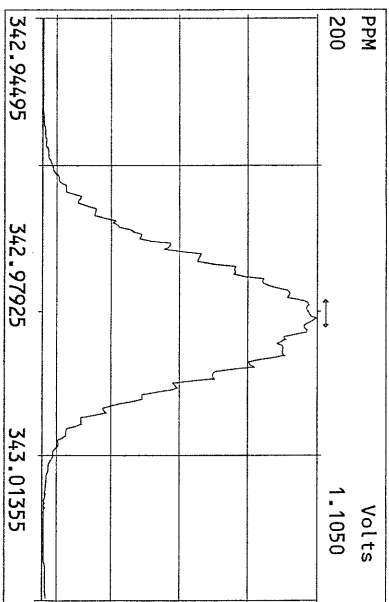
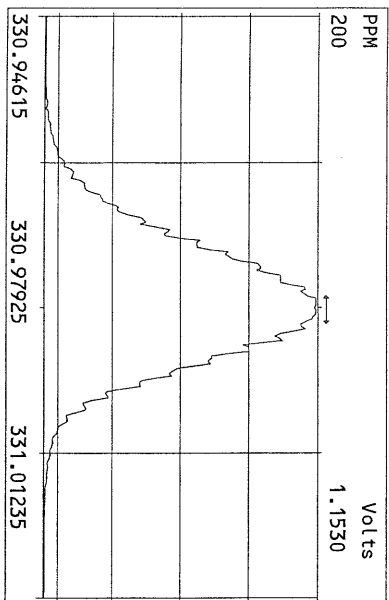
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18MAY11Z	14	SB051811Z2	Solvent Blank	19-MAY-11 00:08:56	ST051811Z1	ST051811Z2	BS
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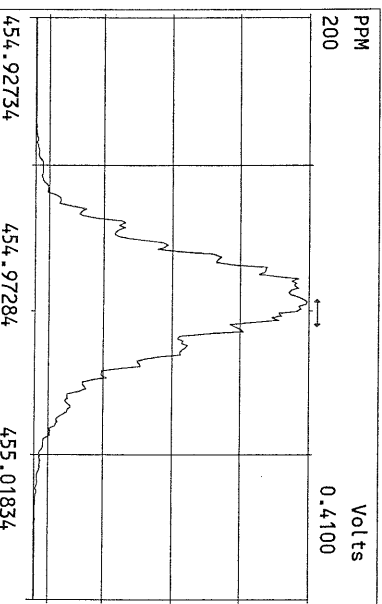
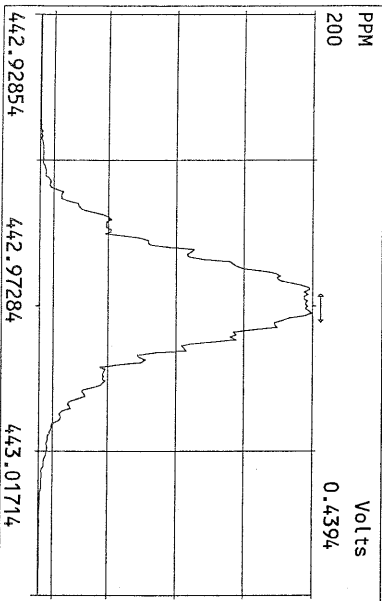
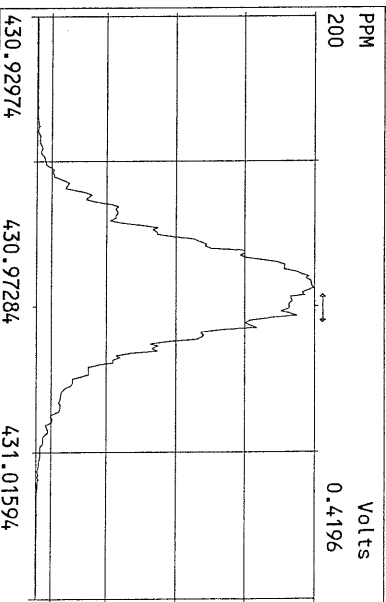
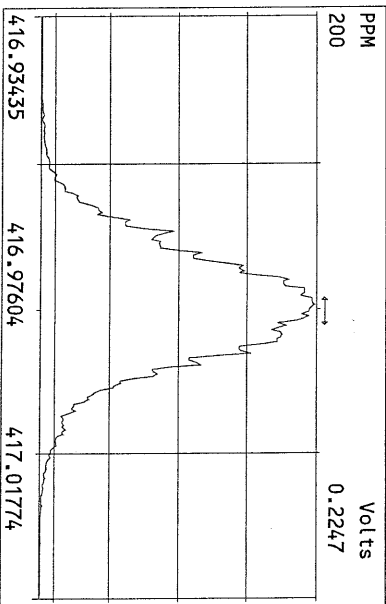
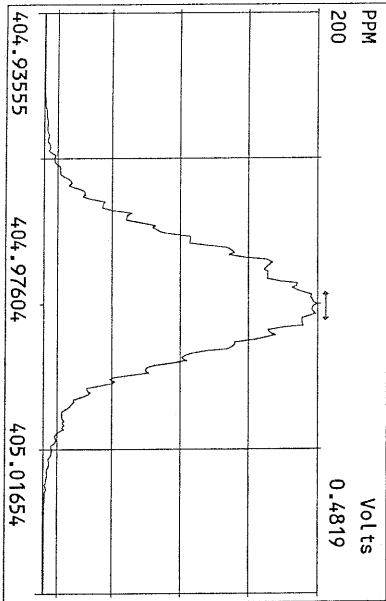
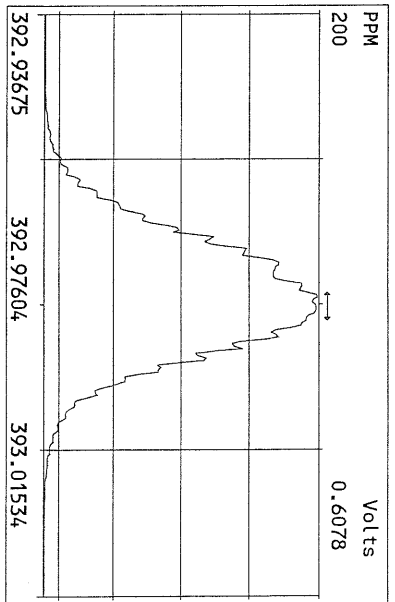
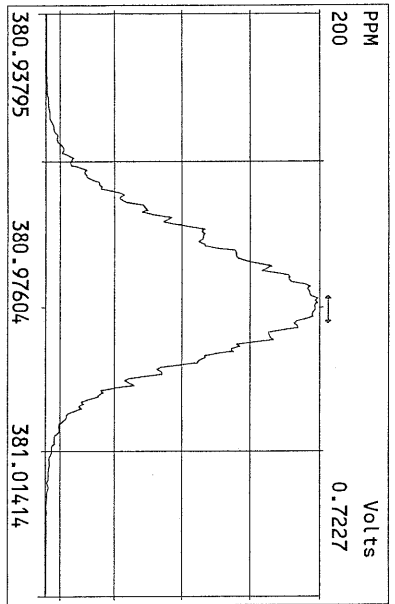
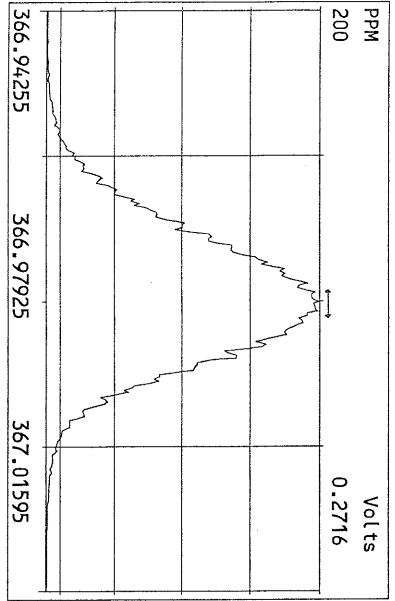
6/5/11

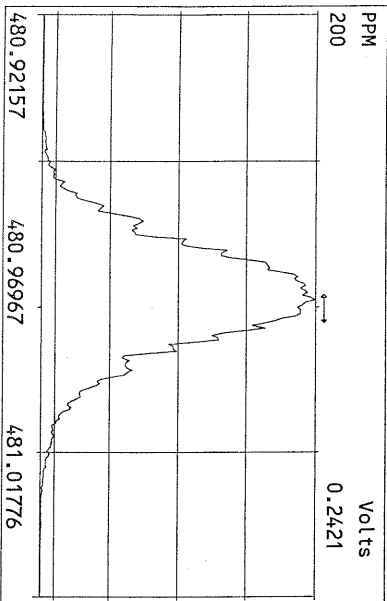
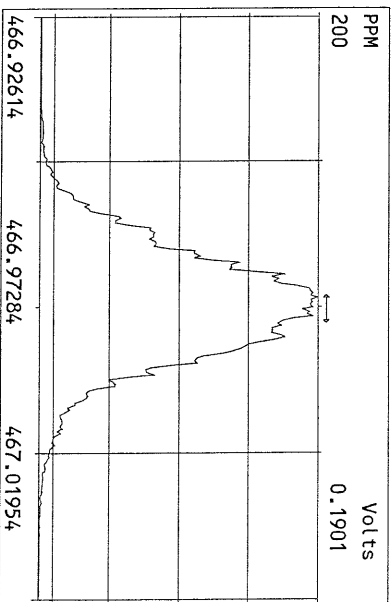
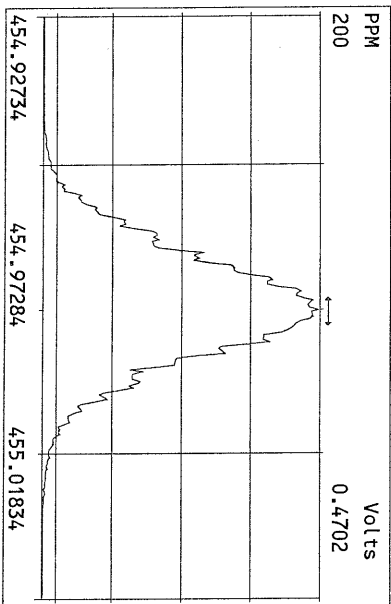
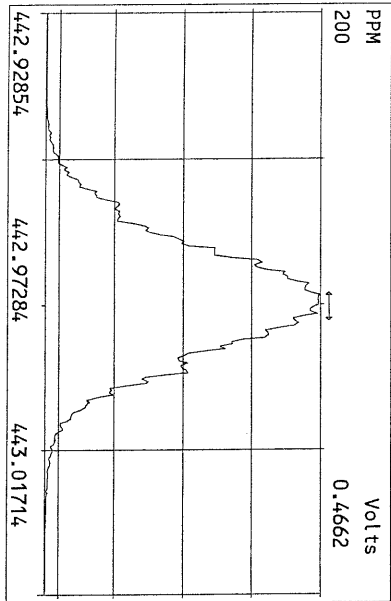
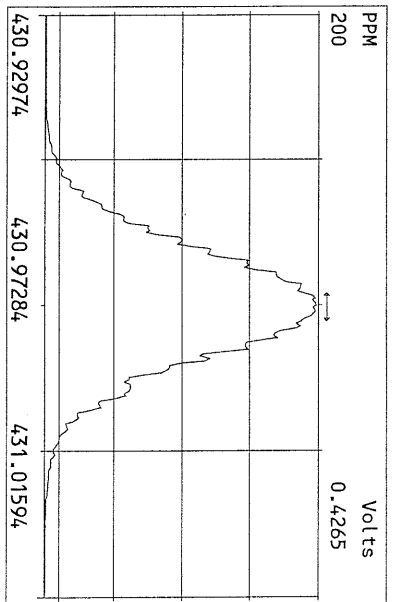
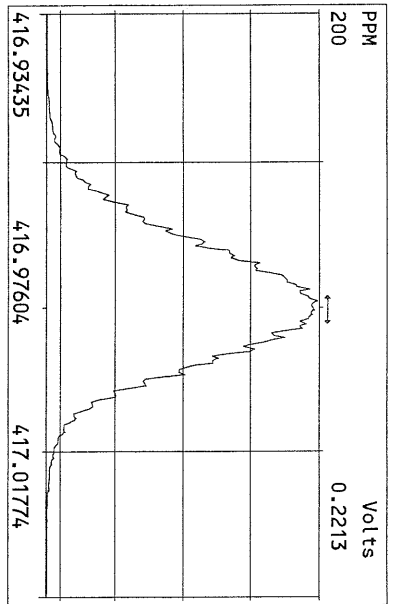
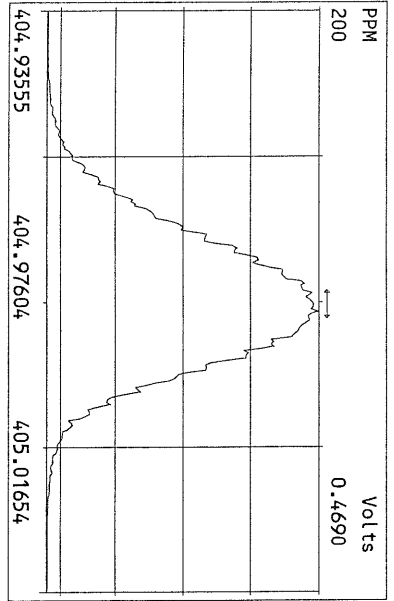
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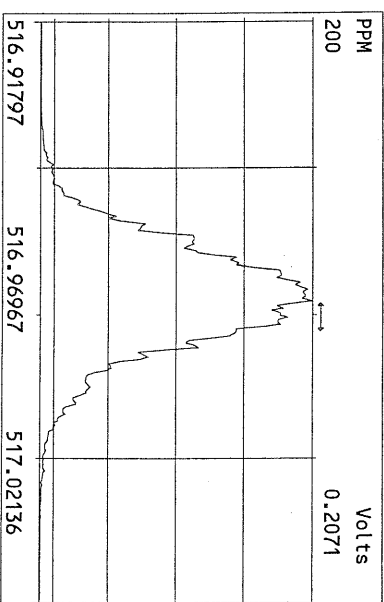
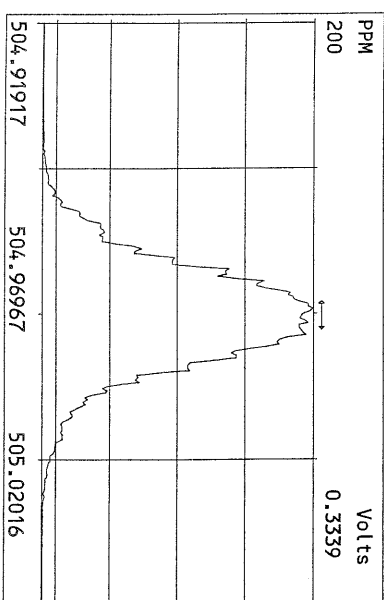
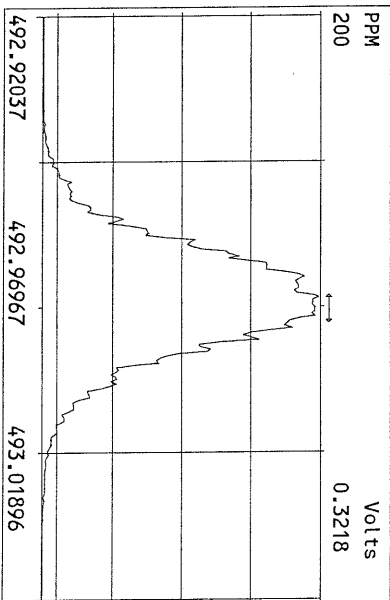
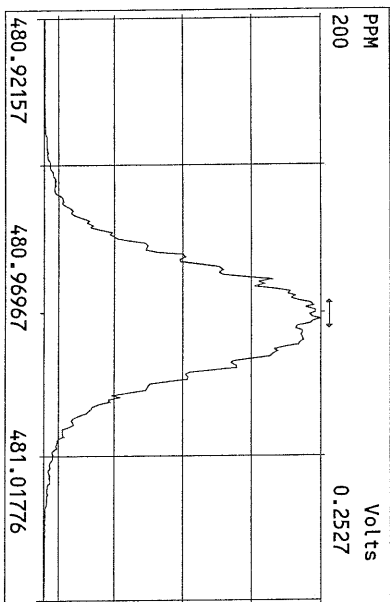
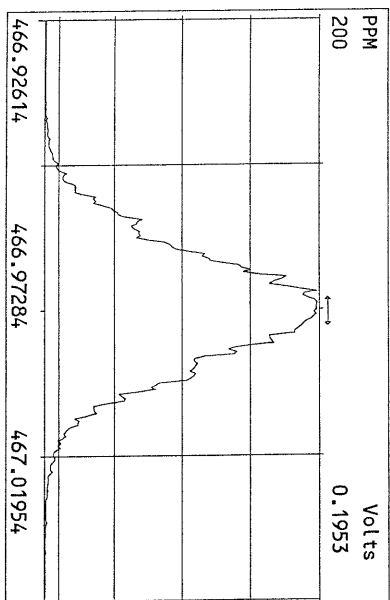
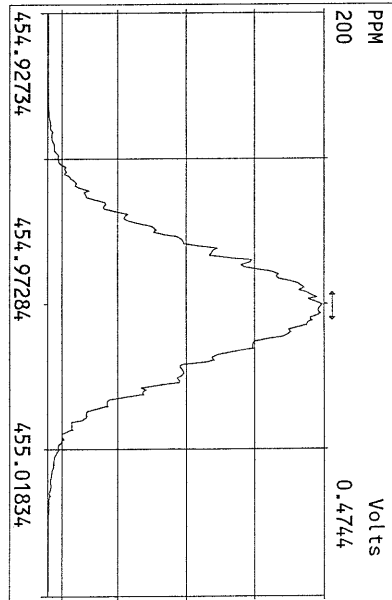
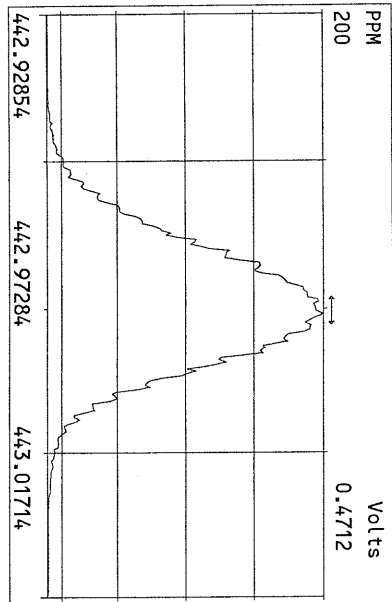
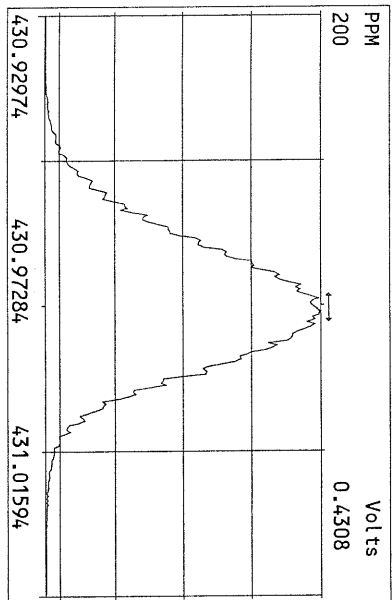
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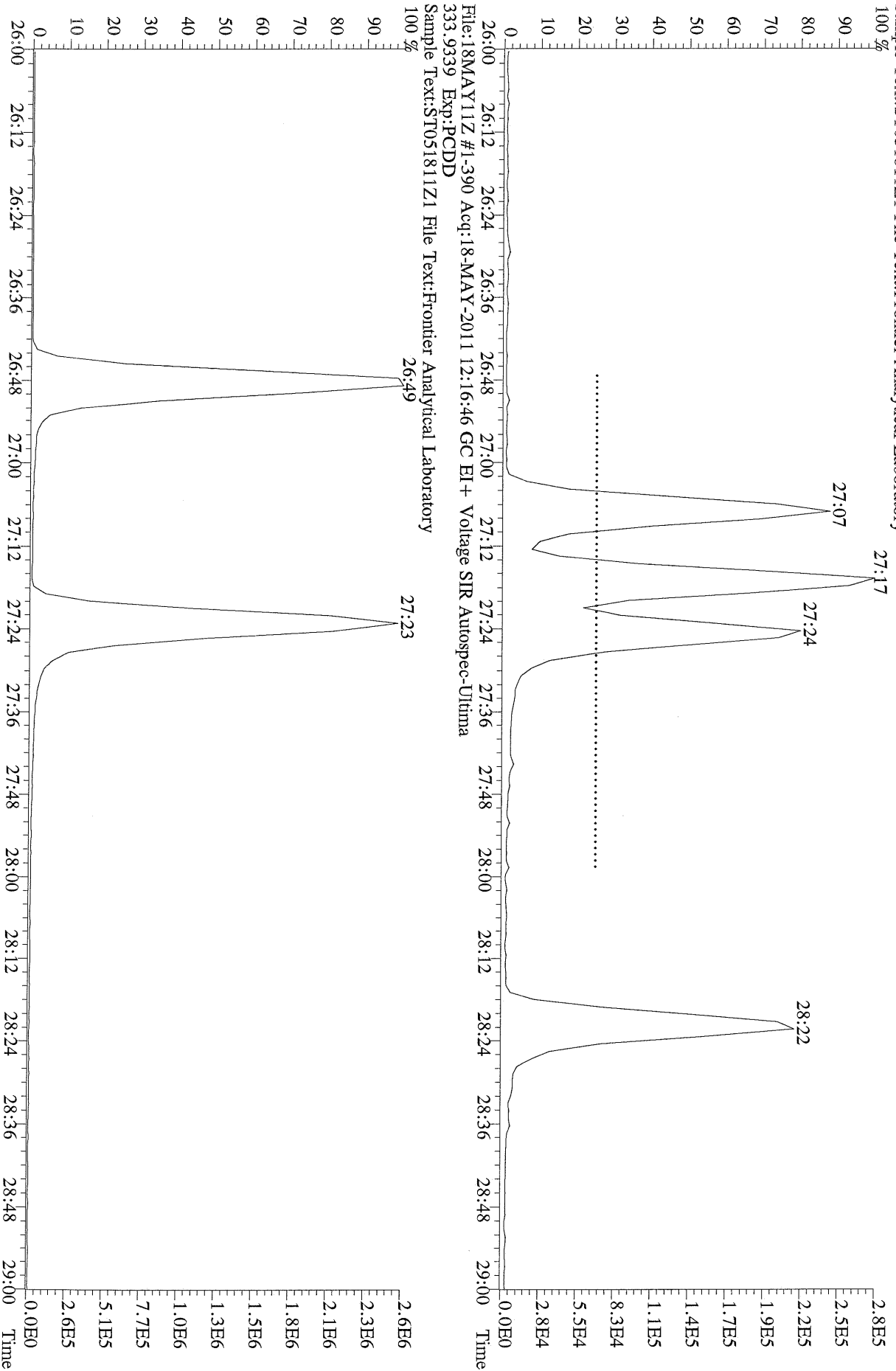




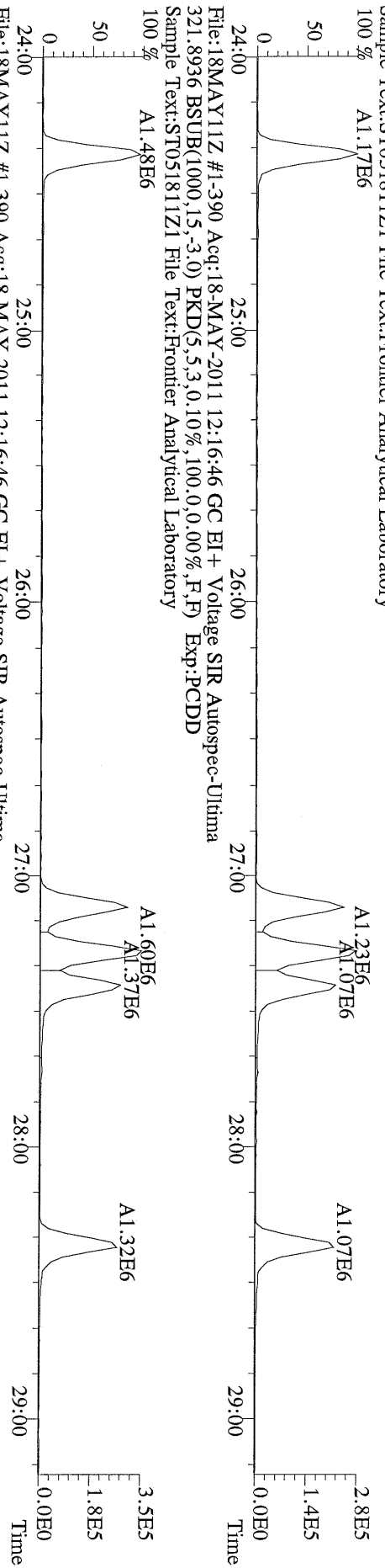




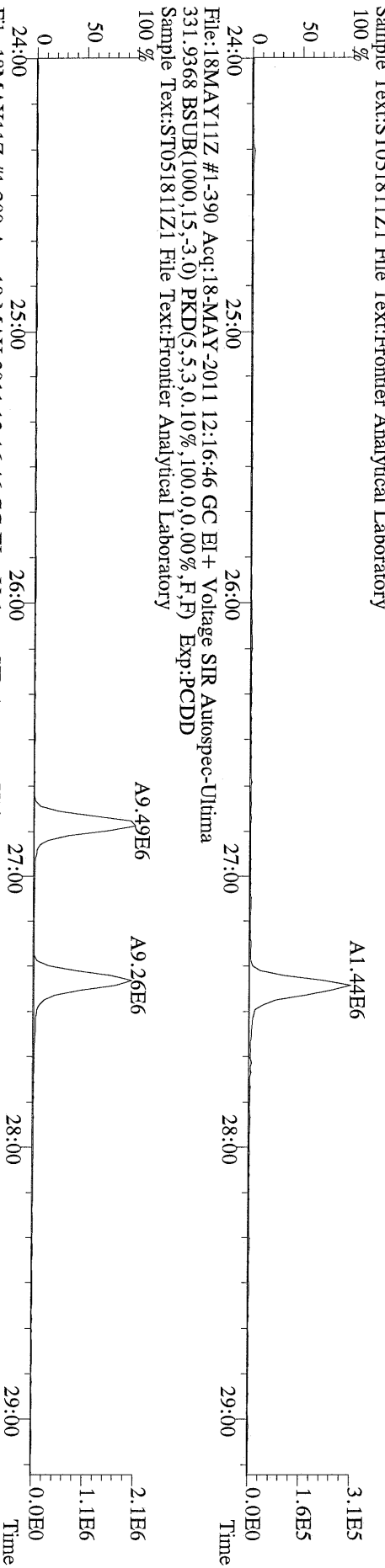
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319.8965 Exp: PCDD
Sample Text: ST051811Z1 File Text: Frontier Analytical Laboratory
100 %



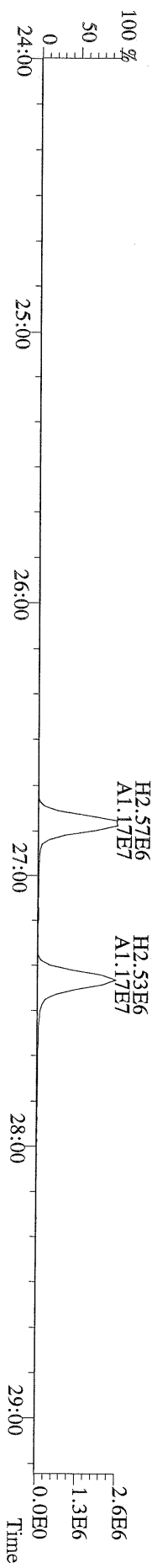
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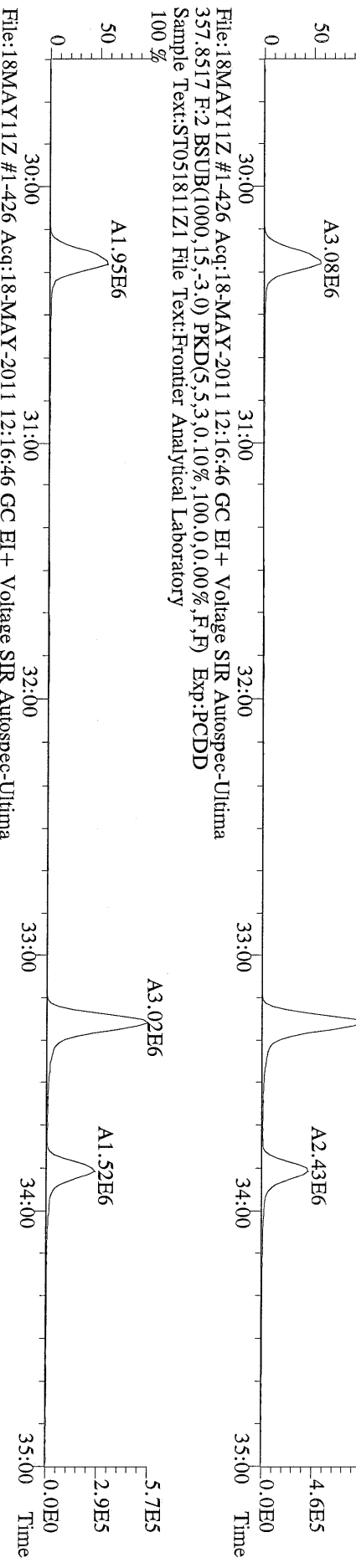
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327.8847 BSUB(1000,15,-3.0) PKD(5,5.3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory



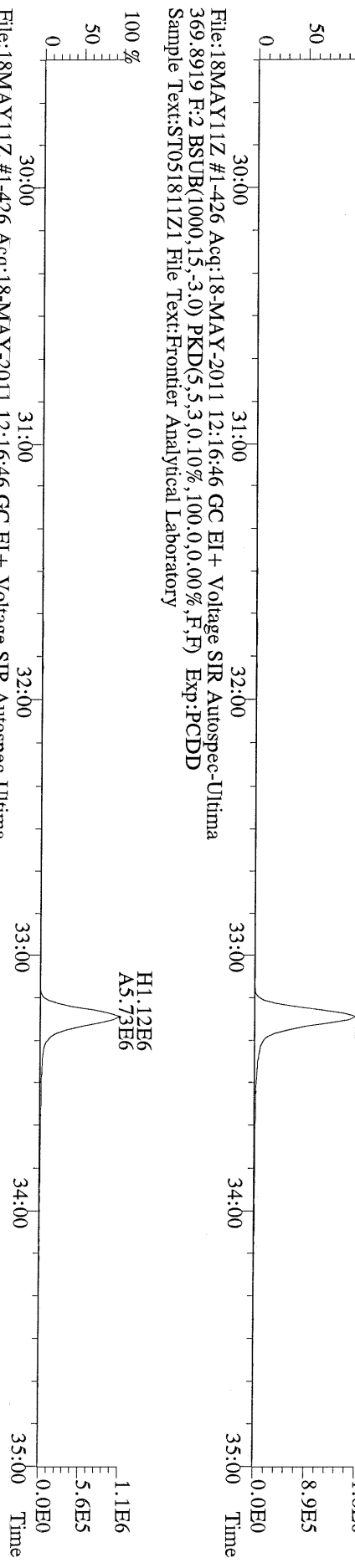
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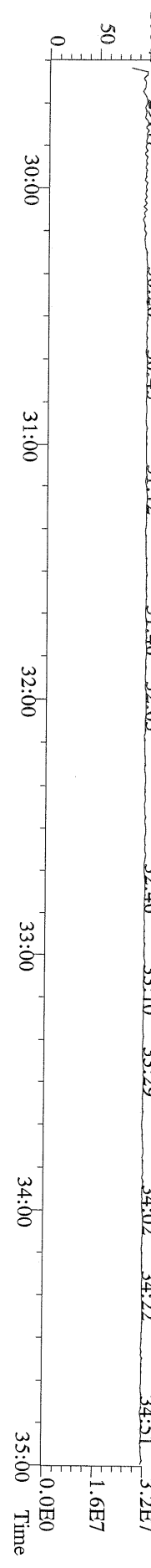
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 355.8546 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
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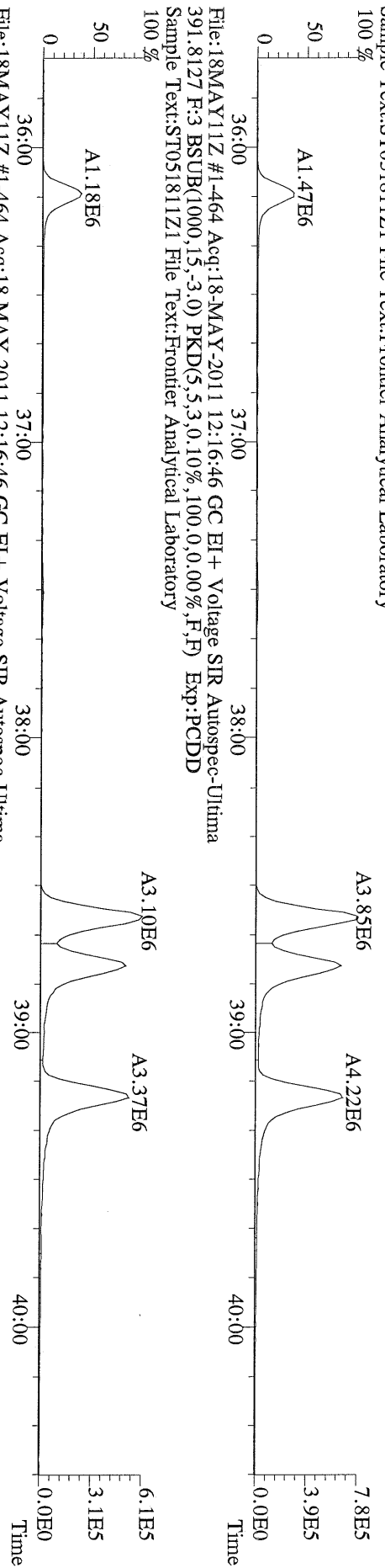
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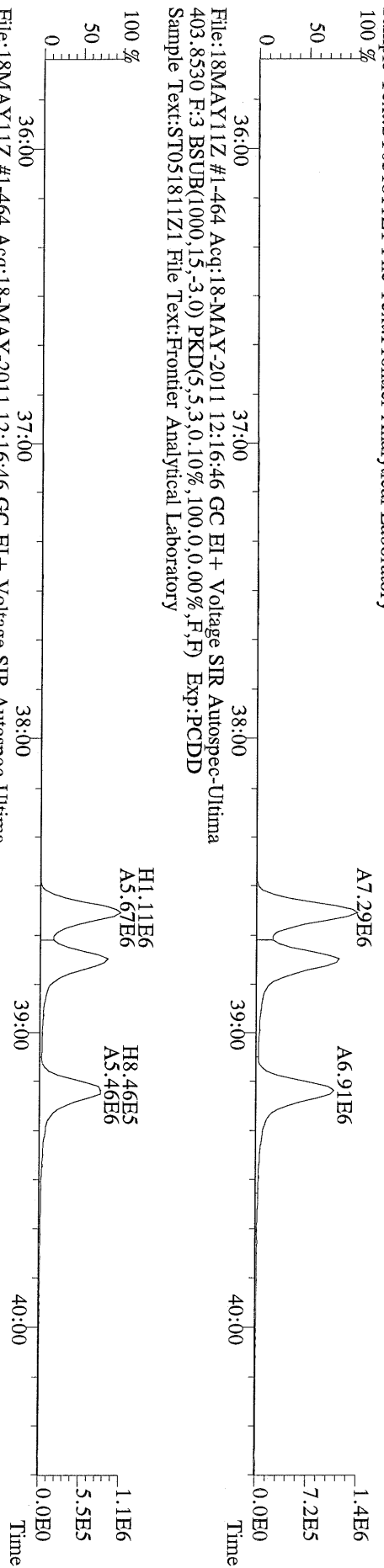
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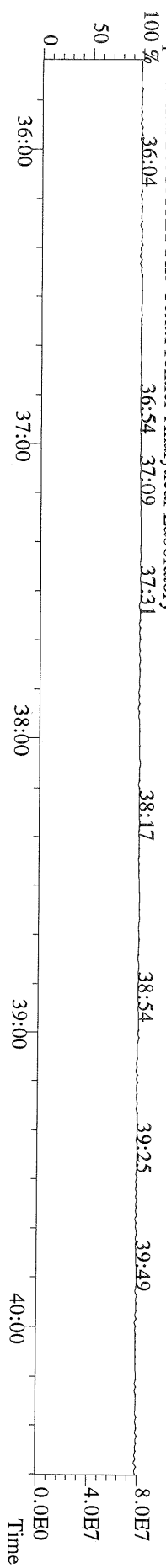
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Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory



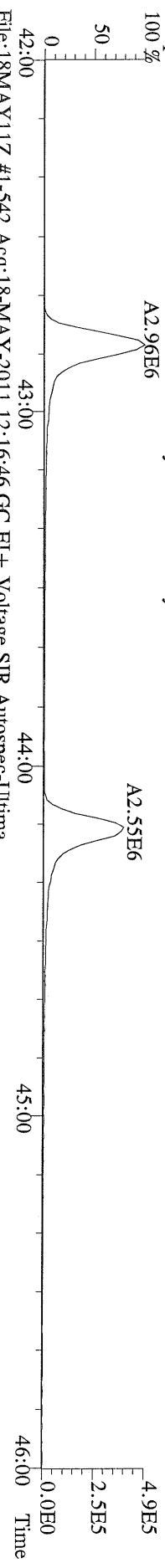
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401.8559 F:3 BSUB(1000,15,-3.0) PKD(5,5,3.0,10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory



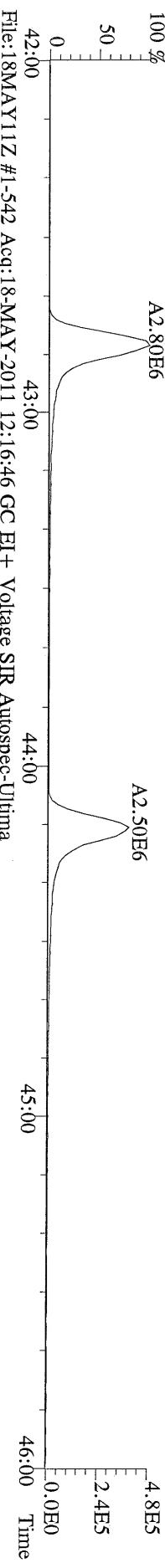
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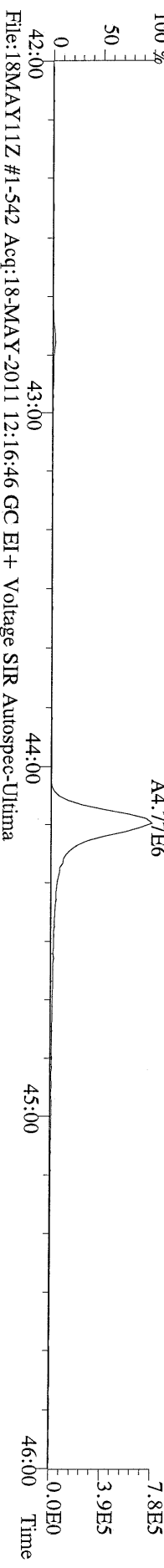
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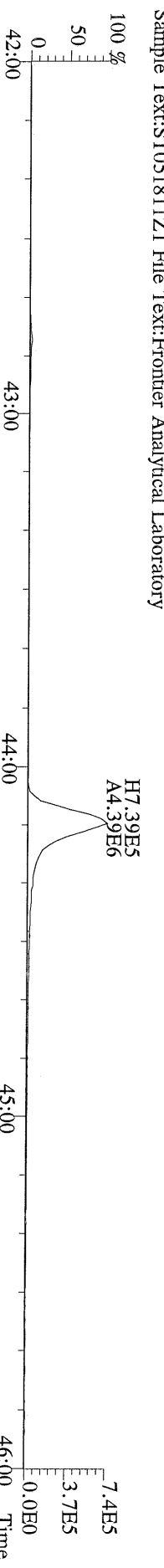
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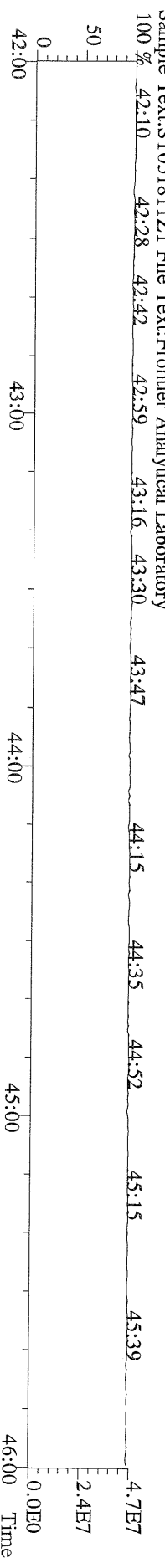
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Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory



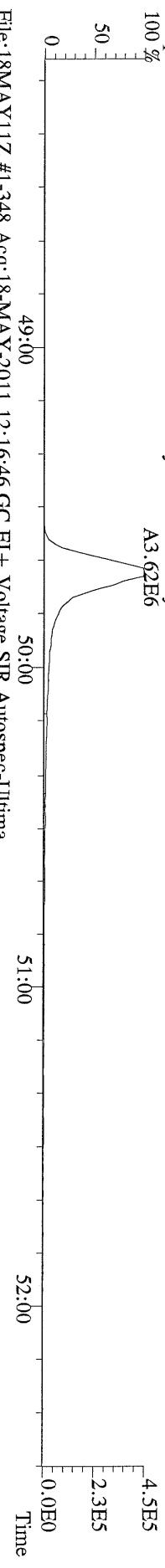
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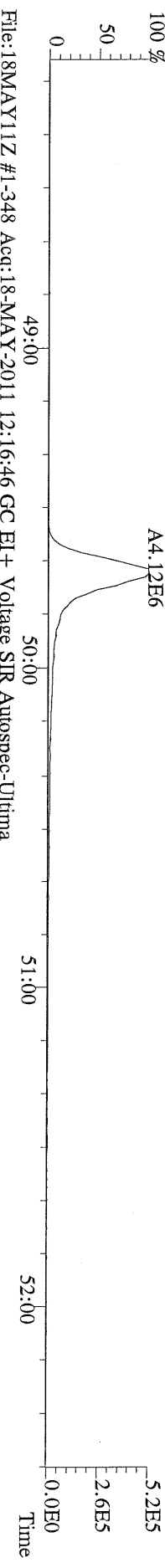
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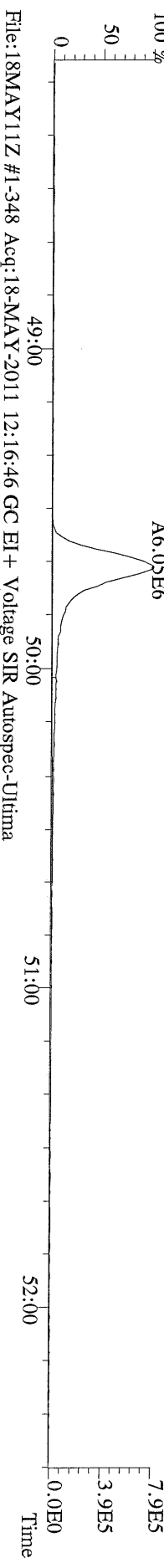
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457.7377 F:5 BSUB(1000,15,-3.0) PKD(5,5,3.0,10%,100.0,0.00%,F,F) Exp:PCDD
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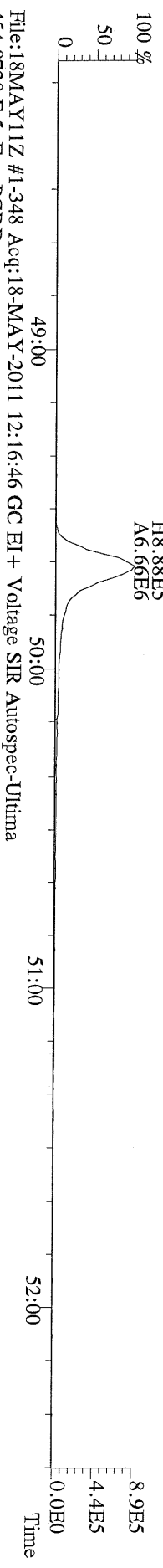
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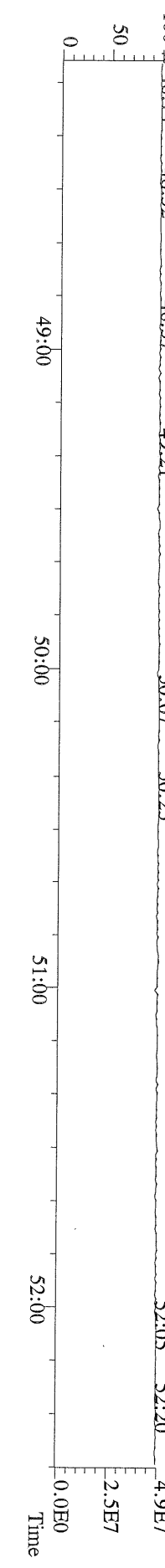
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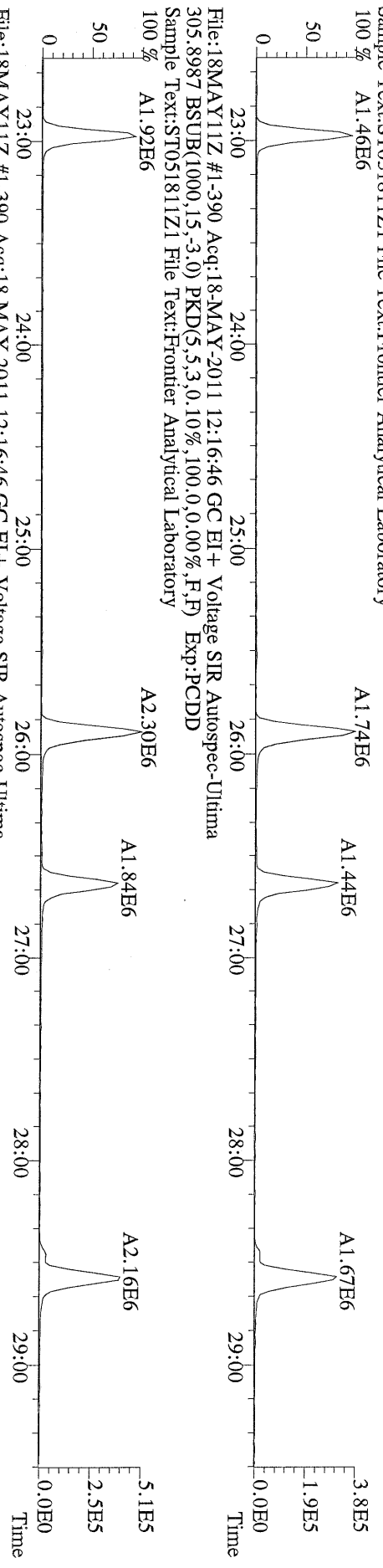
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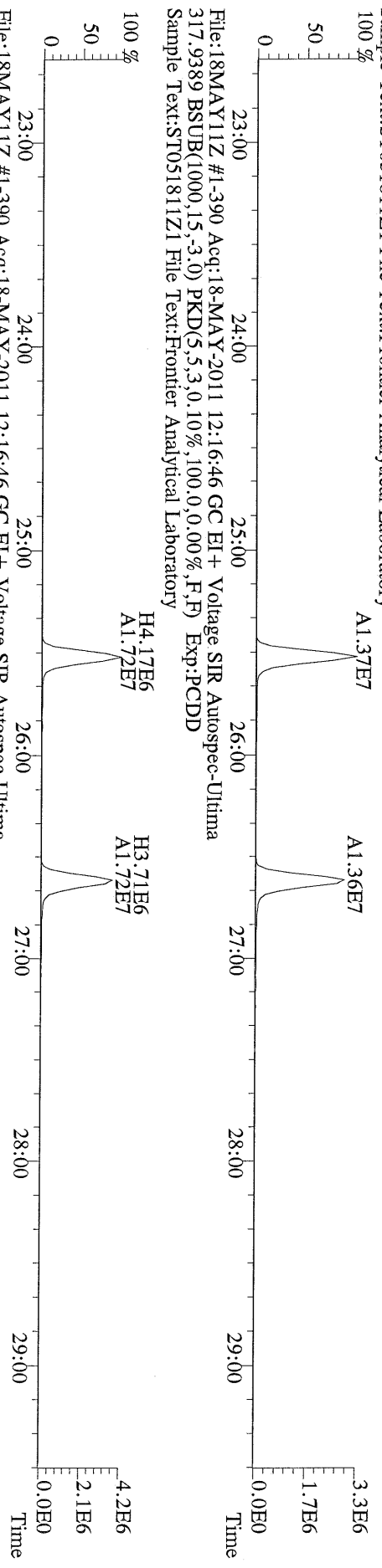
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Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory



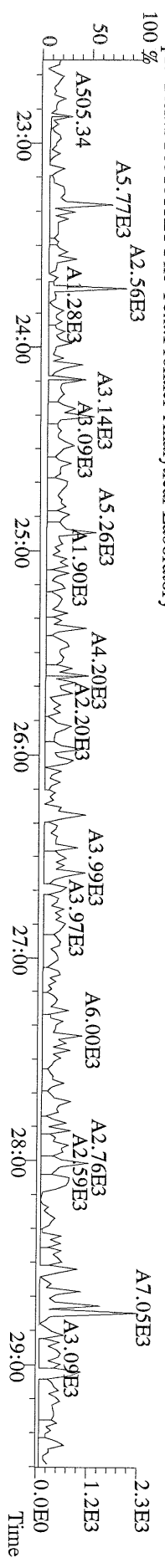
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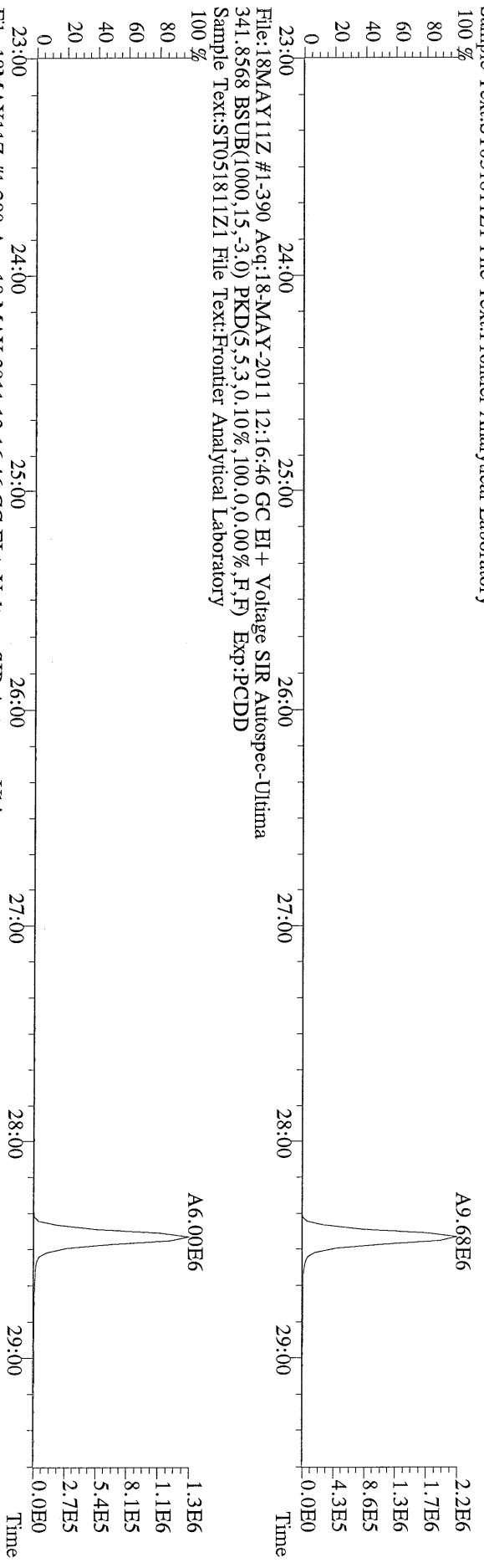
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Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory



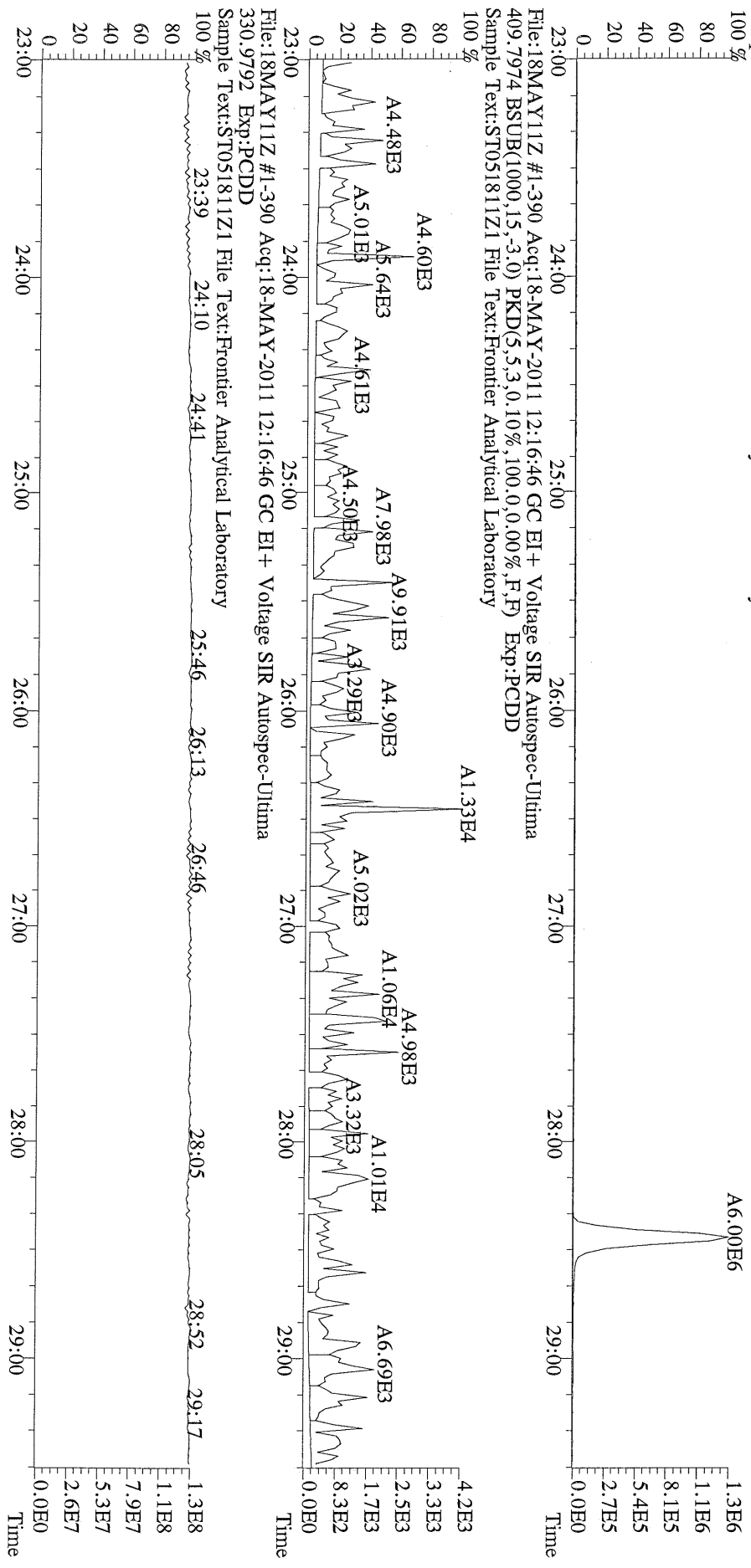
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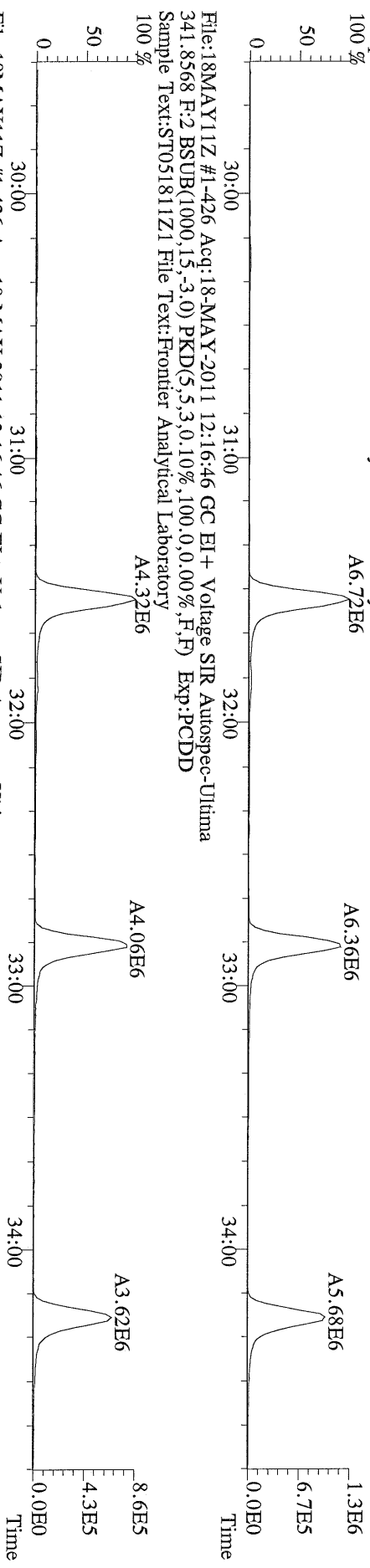
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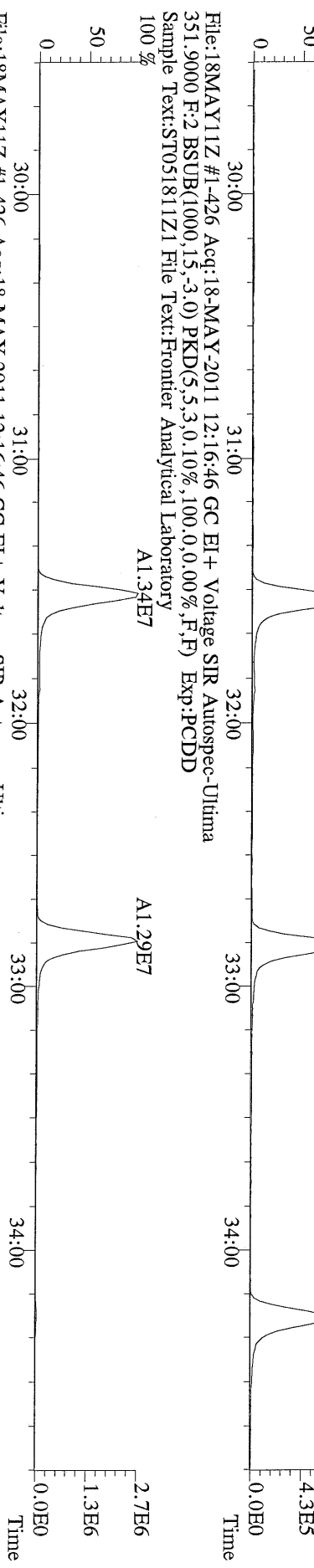
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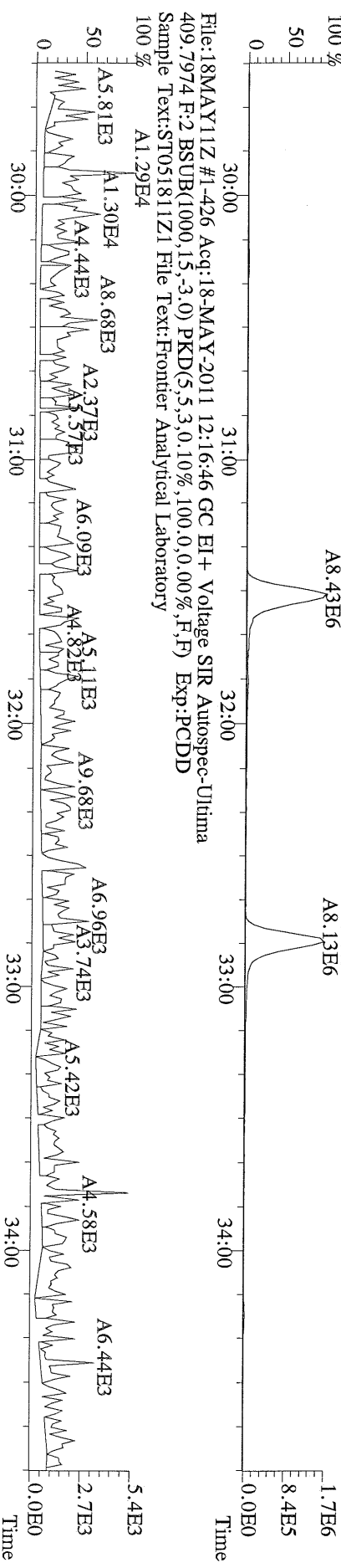
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339.8597 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory



File:18MAY11Z #1-426 Acq:18-MAY-2011 12:16:46 GC EI+ Voltage SIR Autospec-Ultima
341.8568 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory



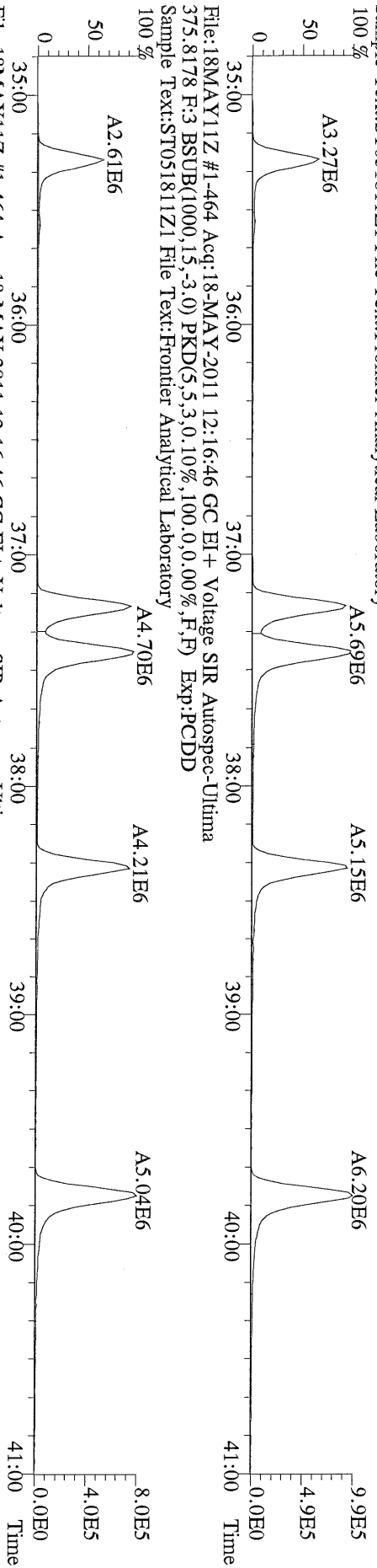
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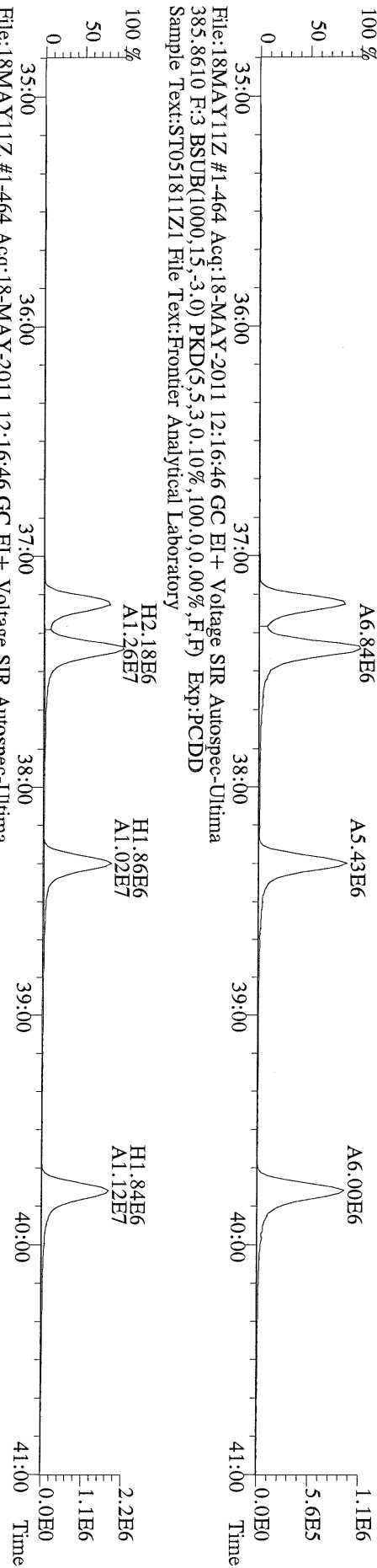
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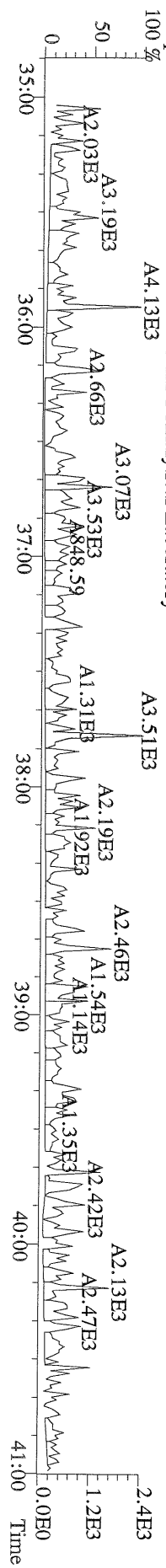
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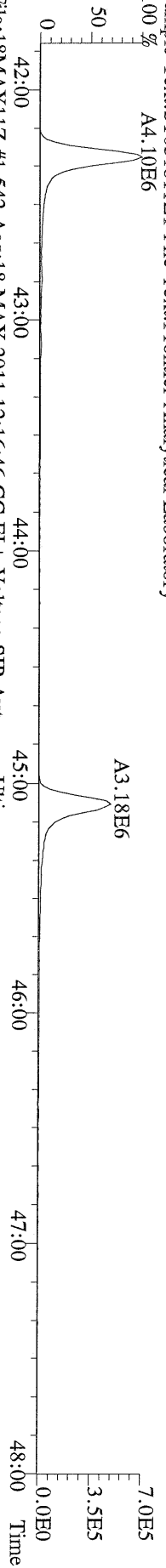
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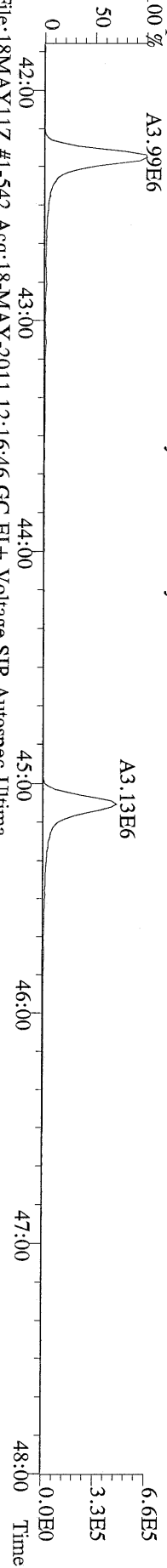
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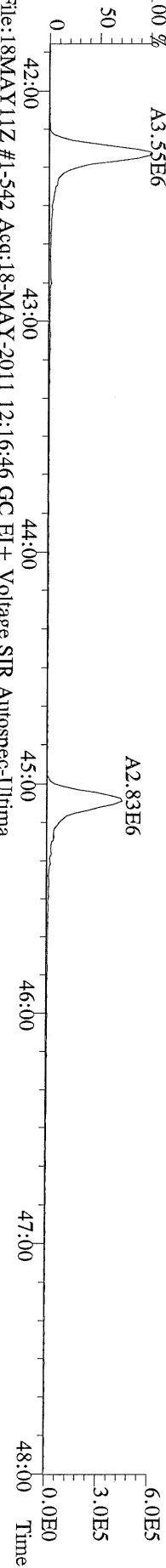
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407.7818 F:4 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100.0,0.00%,F,F) Exp:PCDD
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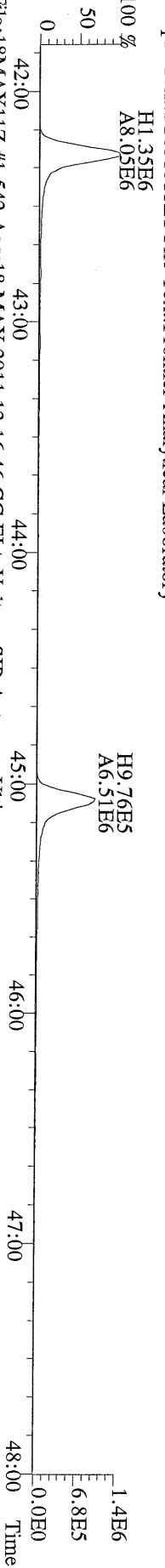
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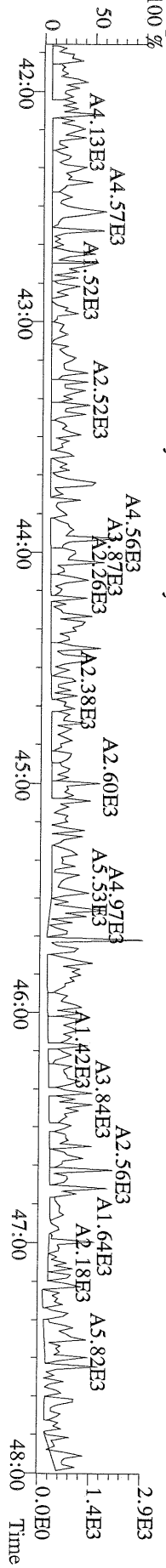
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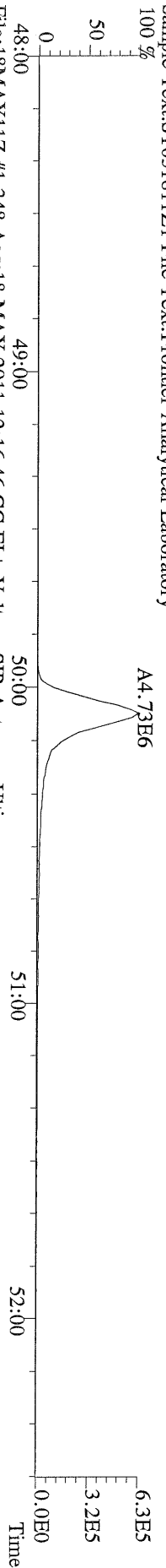
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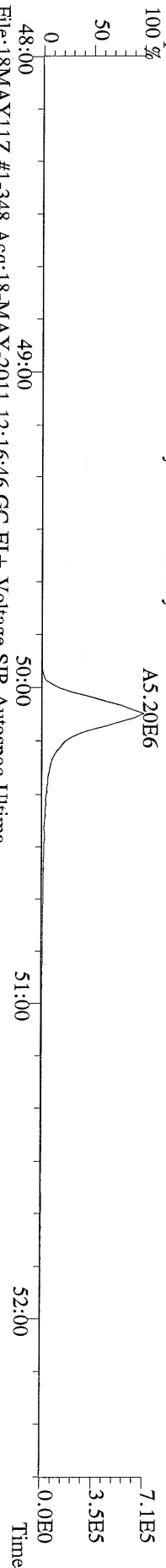
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Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory



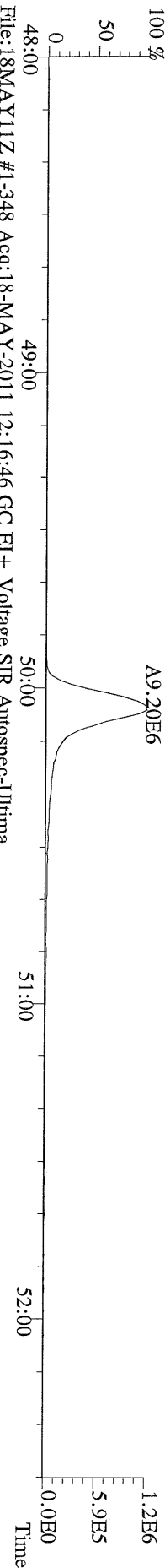
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441.7428 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100.0,0.00%,F,F) Exp:PCDD
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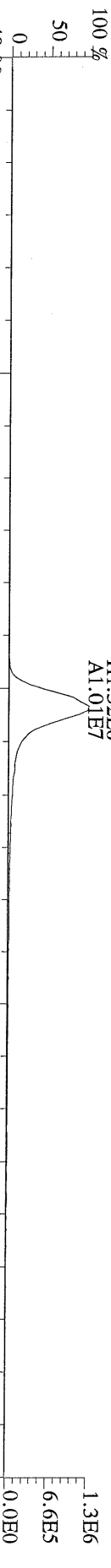
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443.7398 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory



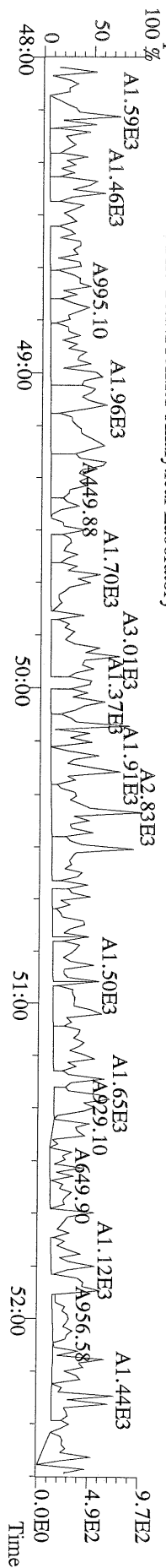
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Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory

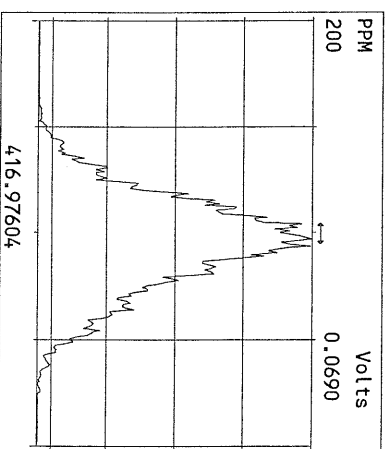
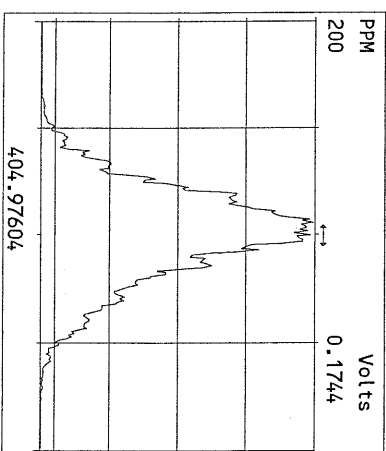
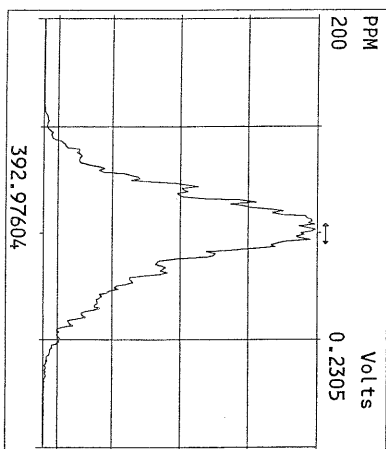
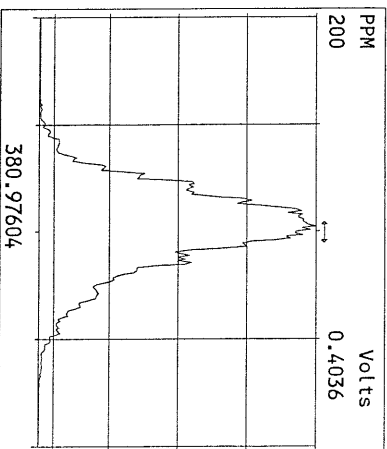
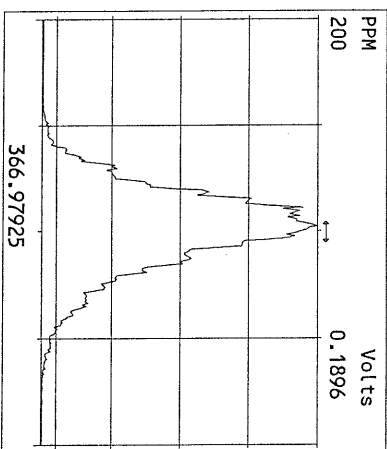
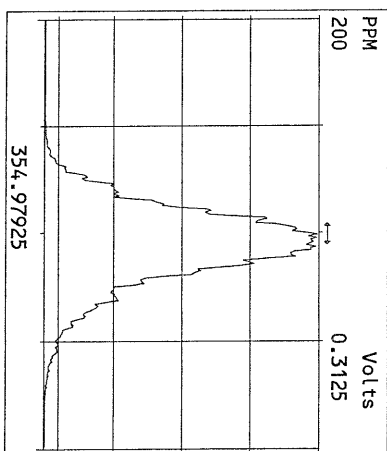
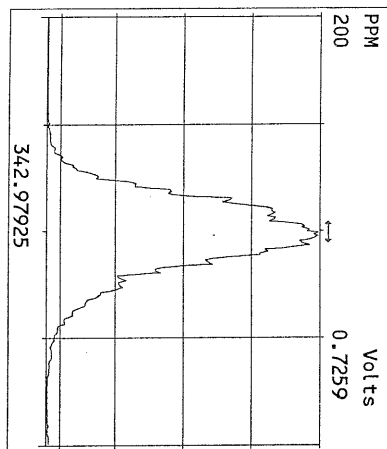
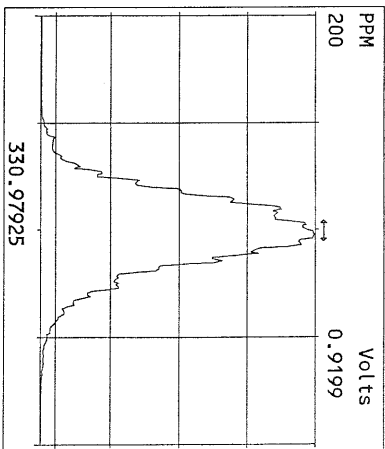
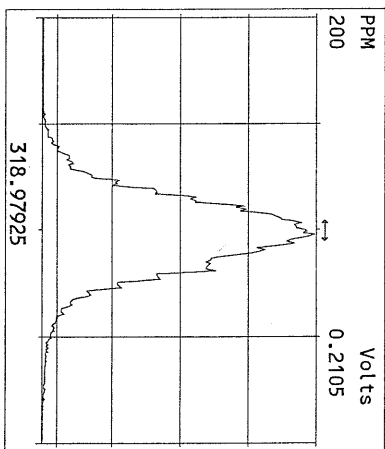
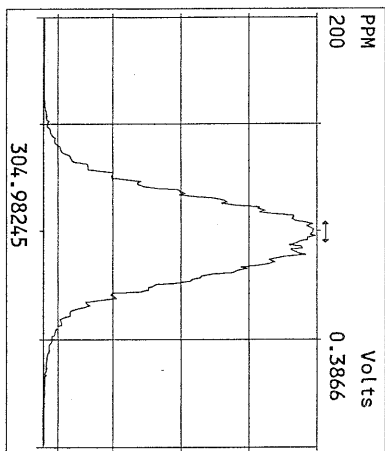
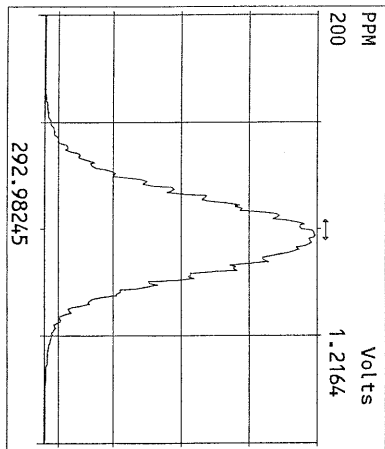


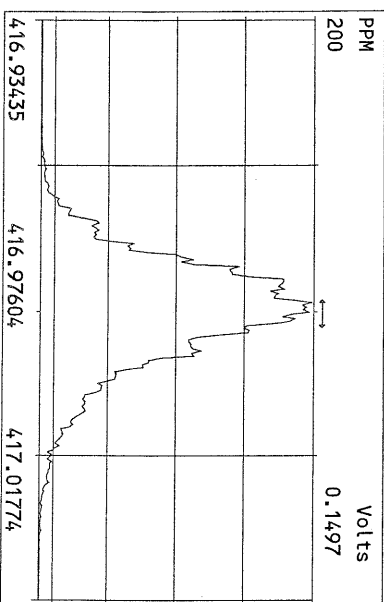
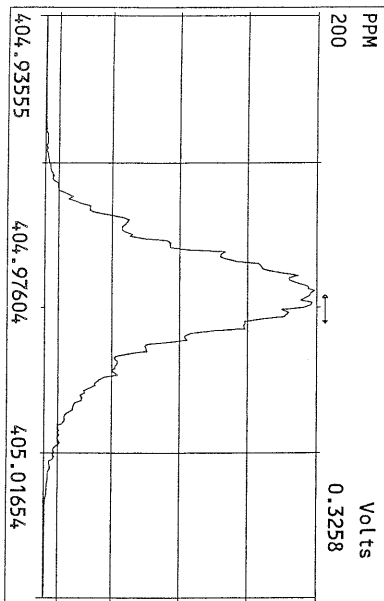
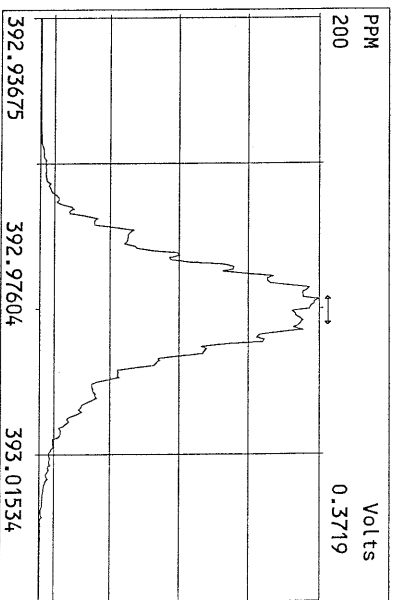
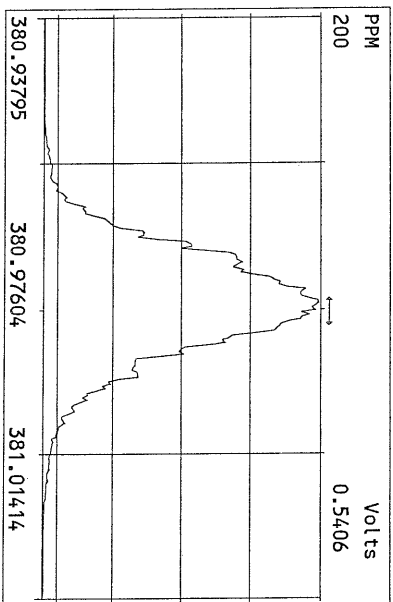
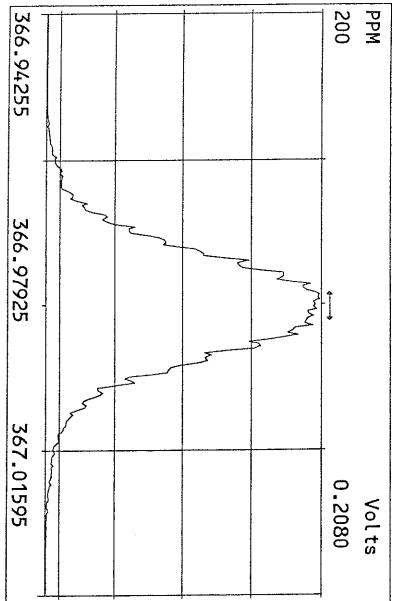
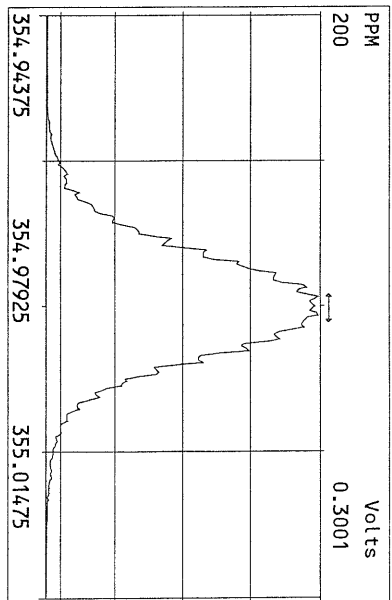
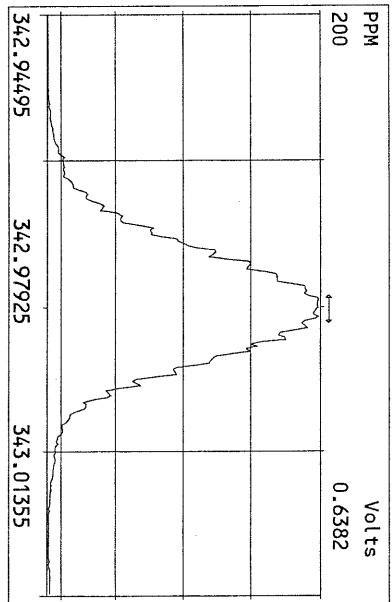
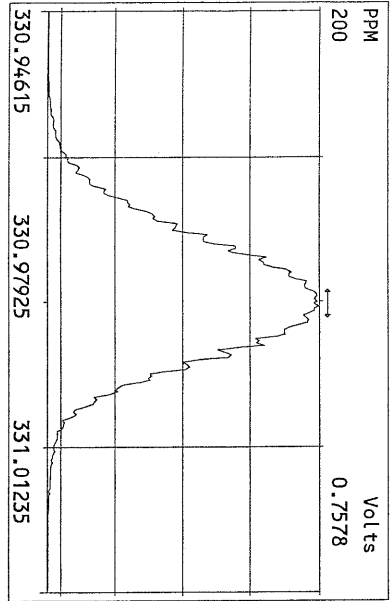
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Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory

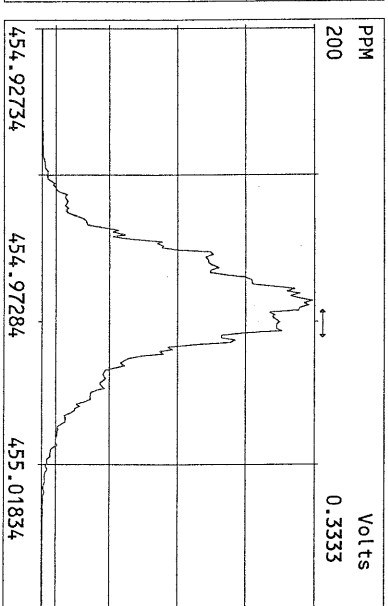
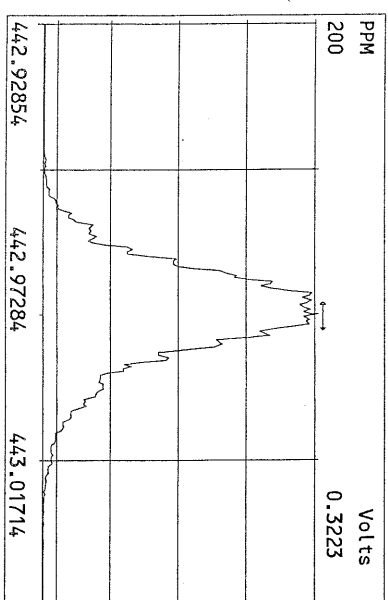
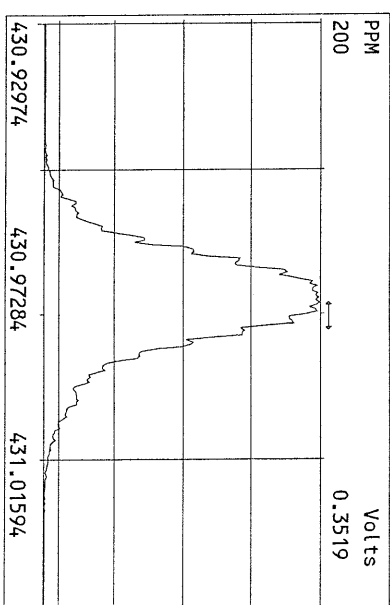
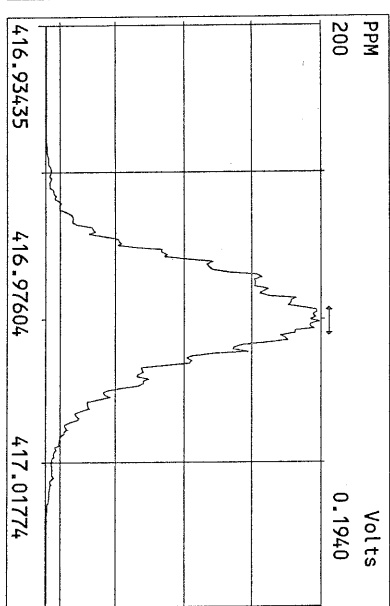
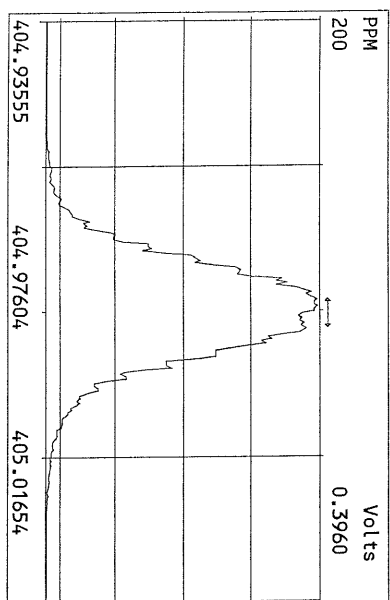
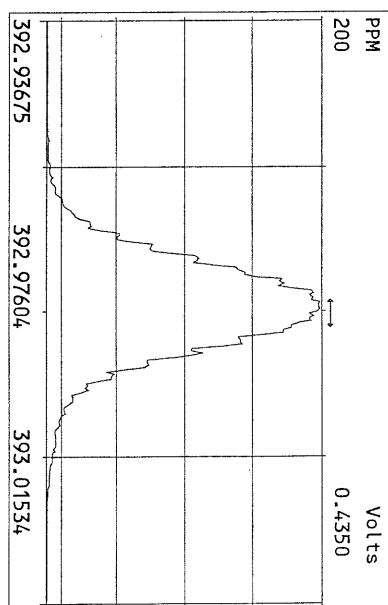
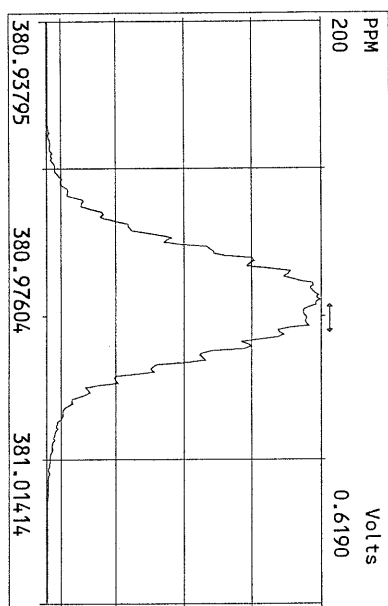
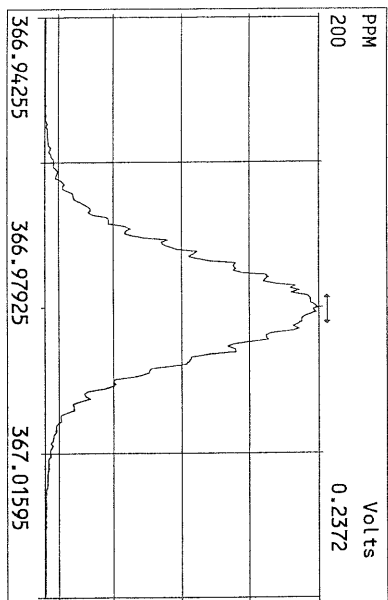


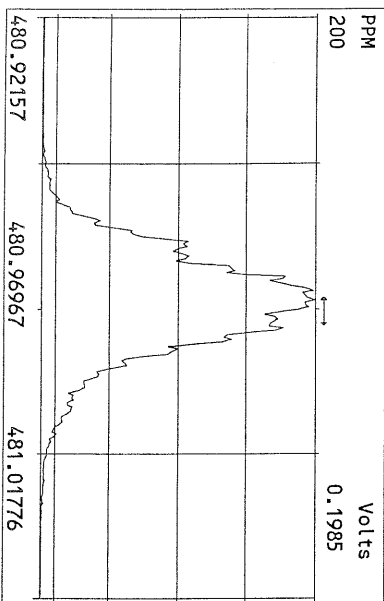
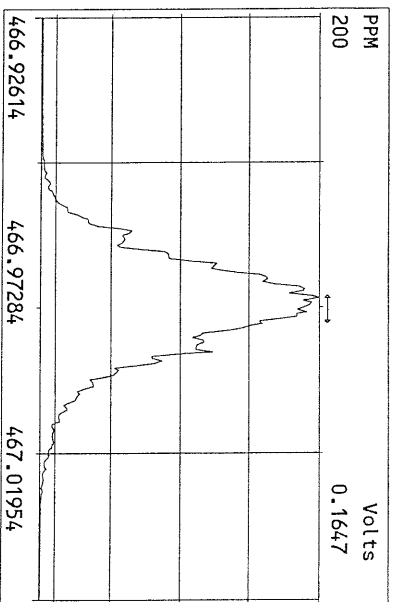
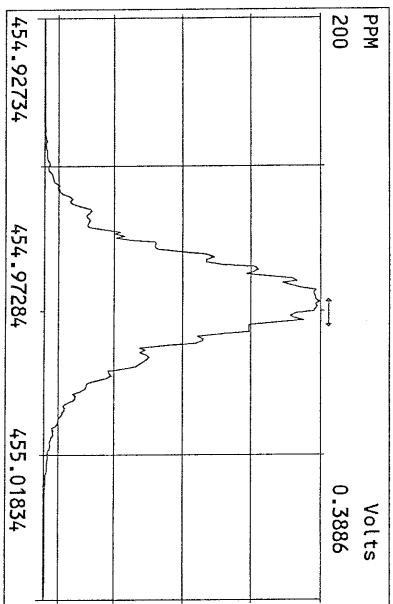
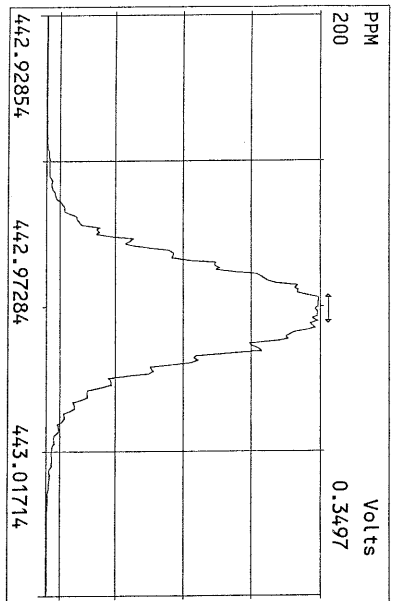
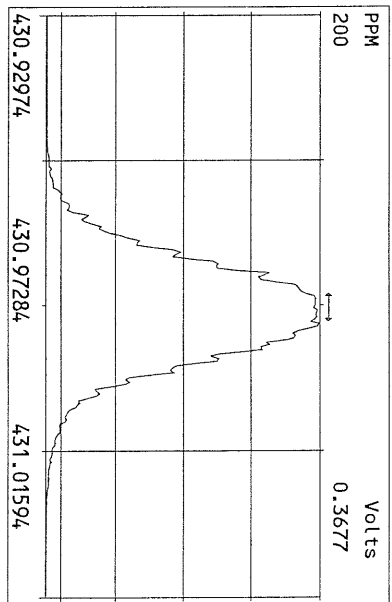
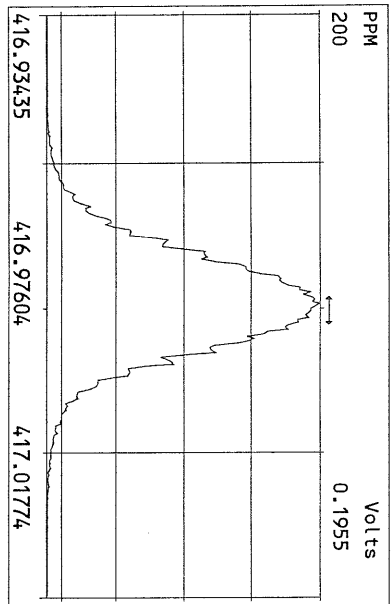
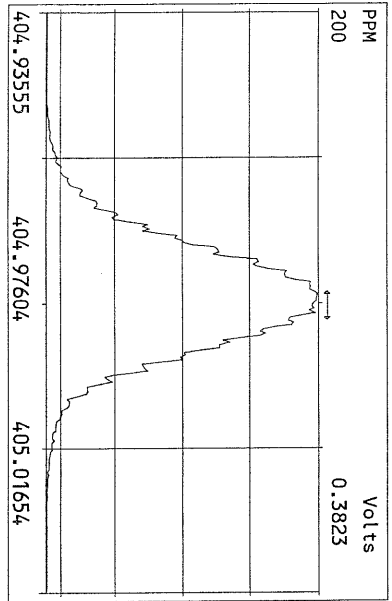
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Sample Text:ST051811Z1 File Text:Frontier Analytical Laboratory

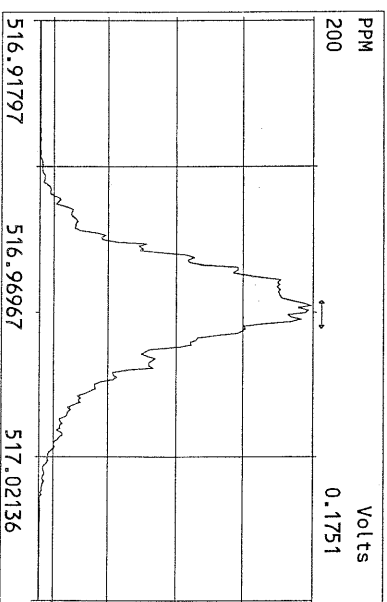
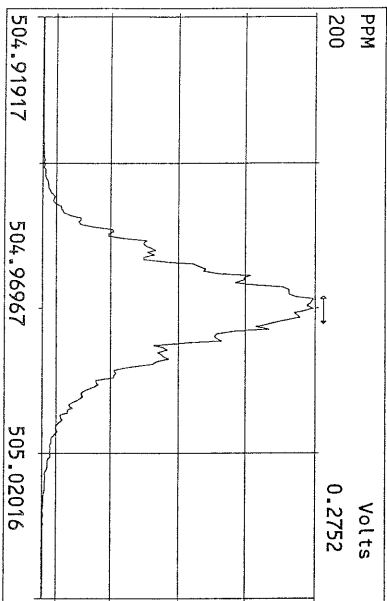
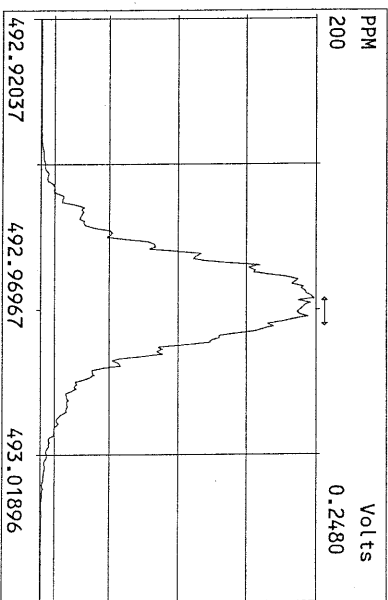
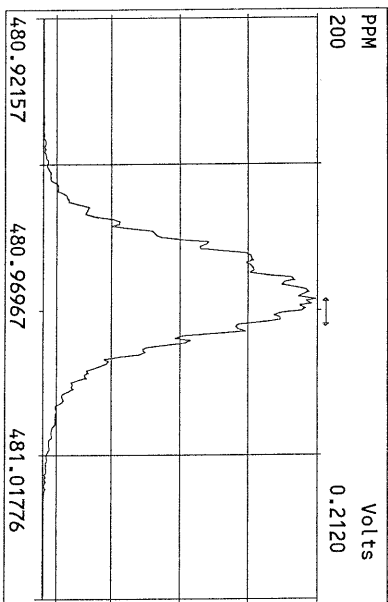
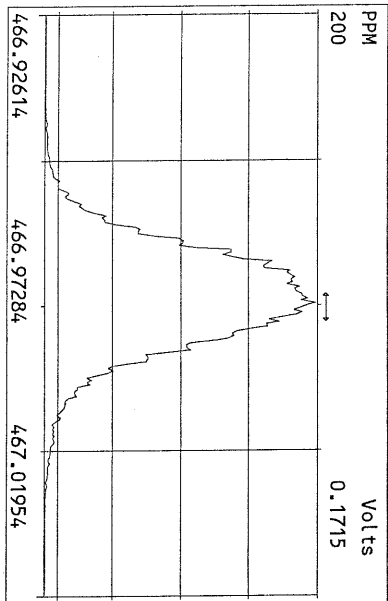
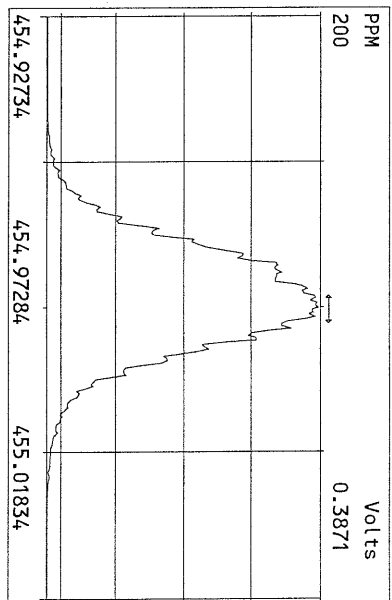
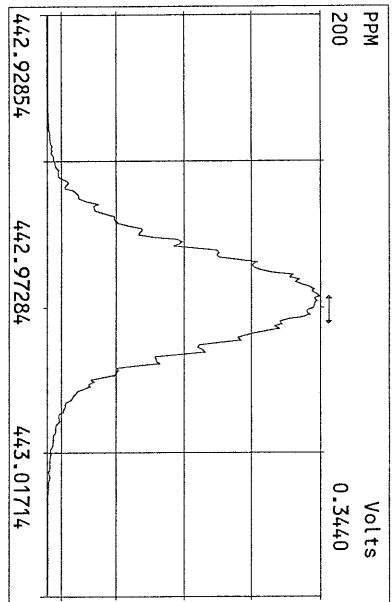
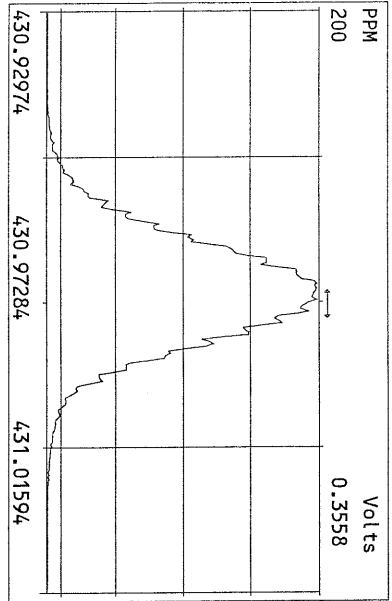












USEPA - ITD

FORM 4B
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Initial Calibration Date: 5/17/11

Instrument ID: FAL4

GC Column ID: DB5

VER Data Filename: 18MAY11Z Sam:15

Analysis Date: 19-MAY-11 01:03:43

LABELLED COMPOUNDS	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
13C-2,3,7,8-TCDD	M/M+2	0.78	0.65-0.89	y	104	82.0 - 121
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.58	1.32-1.78	y	94.2	62.0 - 160
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.27	1.05-1.43	y	109	85.0 - 117
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.23	1.05-1.43	y	97.4	85.0 - 118
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.07	0.88-1.20	y	113	72.0 - 138
13C-OCDD	M+2/M+4	0.88	0.76-1.02	y	256	96.0 - 415
13C-2,3,7,8-TCDF	M/M+2	0.80	0.65-0.89	y	105	71.0 - 140
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.56	1.32-1.78	y	95.9	76.0 - 130
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.58	1.32-1.78	y	95.8	77.0 - 130
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.52	0.43-0.59	y	112	76.0 - 131
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.51	0.43-0.59	y	105	70.0 - 143
13C-2,3,4,6,7,8-HxCDF	M/M+2	0.52	0.43-0.59	y	109	73.0 - 137
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.52	0.43-0.59	y	109	74.0 - 135
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.45	0.37-0.51	y	112	78.0 - 129
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.45	0.37-0.51	y	116	77.0 - 129
13C-OCDF	M+2/M+4	0.88	0.76-1.02	y	222	96.0 - 415
CLEANUP STANDARD (4)						
37Cl-2,3,7,8-TCDD					9.81	7.80 - 12.8

(1) See Table 8, Method 1613, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 9, Method 1613.

(3) Contract-required concentration range as specified in Table 6, Method 1613.

(4) No ion abundance ratio; report concentration found.

Analyst: Date: 5/19/11

FORM 5
 PCDD/PCDF RT WINDOW AND ISOMER SPECIFICITY STANDARDS

Lab Name: Frontier Analytical Laboratory Episode No.:
 Contract No.: SAS No.:
 Instrument ID: FAL4 Initial Calibration Date: 5/17/11
 RT Window Data Filename: 18MAY11Z Sam:15 Analysis Date: 19-MAY-11 Time: 01:03:43
 DB-5 IS Data Filename: 18MAY11Z Sam:15 Analysis Date: 19-MAY-11 Time: 01:03:43
 DB-225 IS Date Filename: Analysis Date: Time:

DB-5 RT WINDOW DEFINING STANDARDS RESULTS

ISOMERS	ABSOLUTE RT	ISOMERS	ABSOLUTE RT
1,3,6,8-TCDD (F)	24:21	1,3,6,8-TCDF (F)	22:58
1,2,8,9-TCDD (L)	28:22	1,2,8,9-TCDF (L)	28:35
1,2,4,7,9-PeCDD (F)	30:17	1,3,4,6,8-PeCDF (F)	28:26
1,2,3,8,9-PeCDD (L)	33:50	1,2,3,8,9-PeCDF (L)	34:15
1,2,4,6,7,9-HxCDD (F)	36:09	1,2,3,4,6,8-HxCDF (F)	35:17
1,2,3,7,8,9-HxCDD (L)	39:12	1,2,3,7,8,9-HxCDF (L)	39:47
1,2,3,4,6,7,9-HpCDD (F)	42:47	1,2,3,4,6,7,8-HpCDF (F)	42:17
1,2,3,4,6,7,8-HpCDD (L)	44:10	1,2,3,4,7,8,9-HpCDF (L)	45:05

(F) = First eluting iosmer (DB-5); (L) = Last eluting isomer (DB-5)

ISOMER SPECIFICITY (IS) TEST STANDARD RESULTS

% VALLEY HEIGHT
 BETWEEN
 COMPARED PEAKS (1)

<25%

(1) To meet contract requirement, %Valley Height Between Compared Peaks shall not exceed 25% (section 15.4.2.2, Method 1613).

Analyst: Date: 5/19/11

USEPA - ITD
FORM 6B
PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Init. Cal. Date: 5/17/11

Instrument ID: FAL4

GC Column ID: DB5

Analysis Date: 19-MAY-11 01:03:43

CS3 or VER Data Filename: 18MAY11Z

Sam:15

NATIVE ANALYTES	RETENTION TIME		RRT	RRT
	REFERENCE			QC LIMITS (1)
1,2,3,4,7,8-HxCDD	13C-1,2,3,4,7,8-HxCDD		1.001	0.999-1.001
1,2,3,6,7,8-HxCDD	13C-1,2,3,6,7,8-HxCDD		1.001	0.998-1.004
1,2,3,7,8,9-HxCDD	13C-1,2,3,6,7,8-HxCDD		1.012	1.000-1.019
1,2,3,4,7,8-HxCDF	13C-1,2,3,4,7,8-HxCDF		1.001	0.999-1.001
1,2,3,6,7,8-HxCDF	13C-1,2,3,6,7,8-HxCDF		1.000	0.997-1.005
2,3,4,6,7,8-HxCDF	13C-2,3,4,6,7,8-HxCDF		1.000	0.999-1.001
1,2,3,7,8,9-HxCDF	13C-1,2,3,7,8,9-HxCDF		1.001	0.999-1.001
1,2,3,4,6,7,8-HpCDD	13C-1,2,3,4,6,7,8-HpCDD		1.001	0.999-1.001
1,2,3,4,6,7,8-HpCDF	13C-1,2,3,4,6,7,8-HpCDF		1.001	0.999-1.001
1,2,3,4,7,8,9-HpCDF	13C-1,2,3,4,7,8,9-HpCDF		1.000	0.999-1.001
OCDD	13C-OCDD		1.001	0.999-1.001
OCDF	13C-OCDF		1.000	0.999-1.001
LABELED COMPOUNDS				
13C-1,2,3,4,7,8-HxCDD	13C-1,2,3,7,8,9-HxCDD		0.984	0.977-1.000
13C-1,2,3,6,7,8-HxCDD			0.988	0.981-1.003
13C-1,2,3,4,7,8-HxCDF			0.949	0.944-0.970
13C-1,2,3,6,7,8-HxCDF			0.954	0.949-0.975
13C-2,3,4,6,7,8-HxCDF			0.978	0.959-1.021
13C-1,2,3,7,8,9-HxCDF			1.014	0.977-1.047
13C-1,2,3,4,6,7,8-HpCDD			1.126	1.086-1.130
13C-1,2,3,4,6,7,8-HpCDF			1.078	1.043-1.085
13C-1,2,3,4,7,8,9-HpCDF			1.150	1.057-1.154
13C-OCDD			1.267	1.032-1.311
13C-OCDF			1.277	1.000-1.311

(1) Contract-required limits for Relative Retention Times (RRT) as specified in Table 2, Method 1613.

Analyst:

Date: 5/19/11

Frontier Analytical Laboratory - Acquisition Log

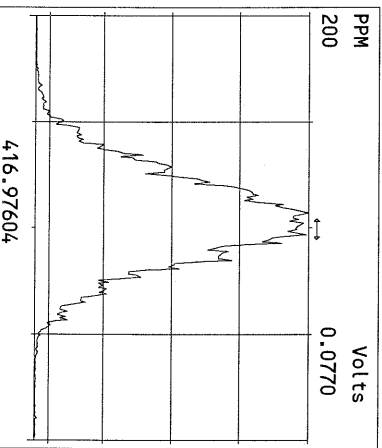
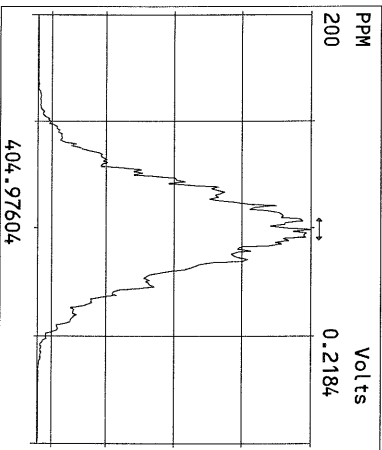
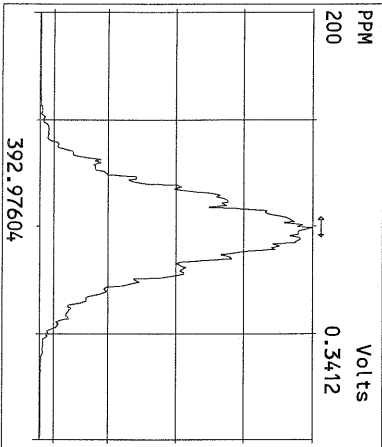
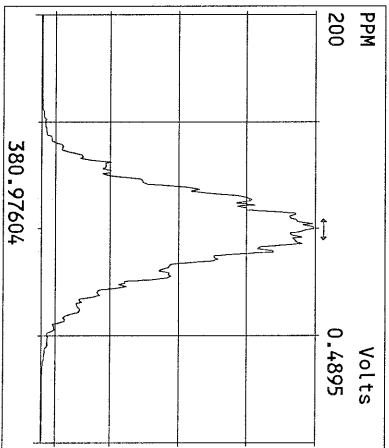
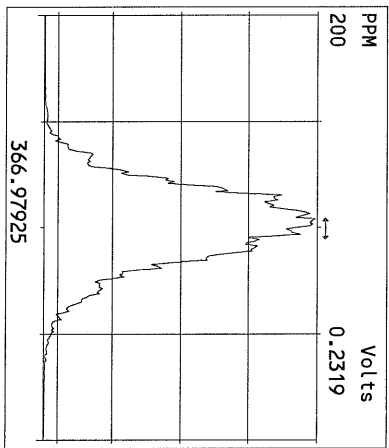
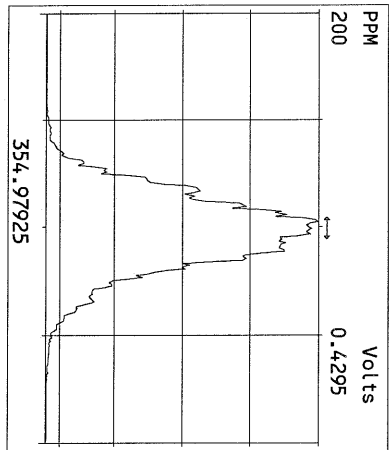
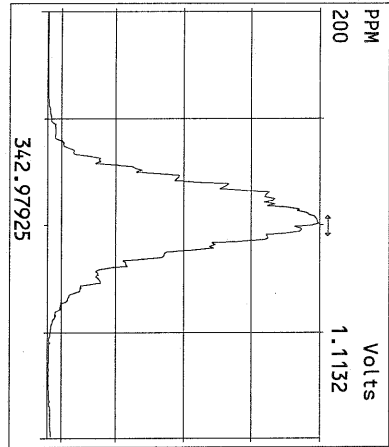
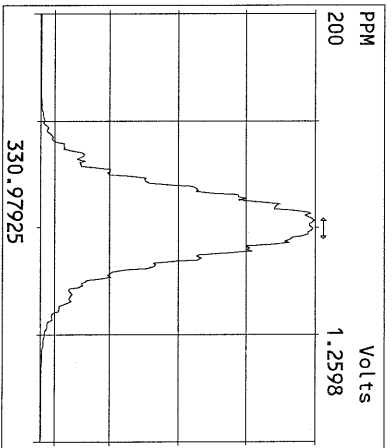
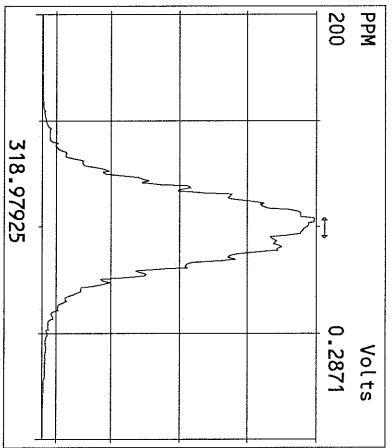
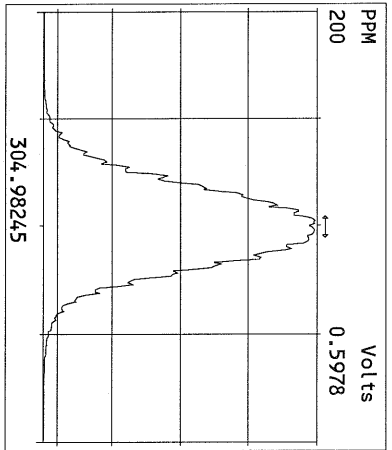
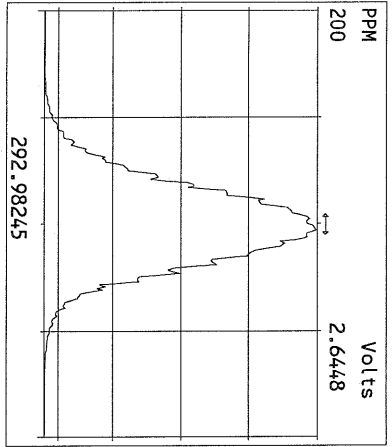
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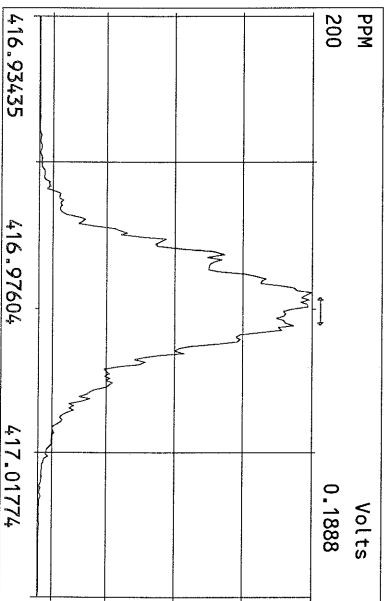
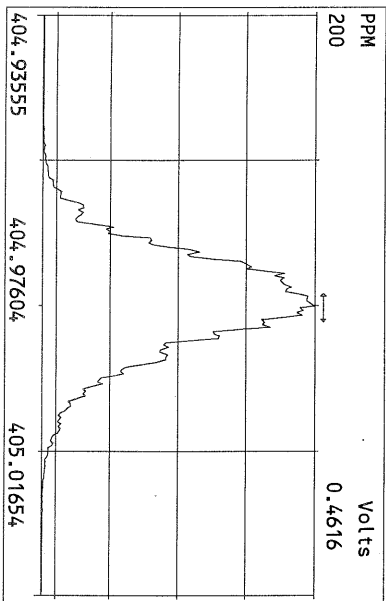
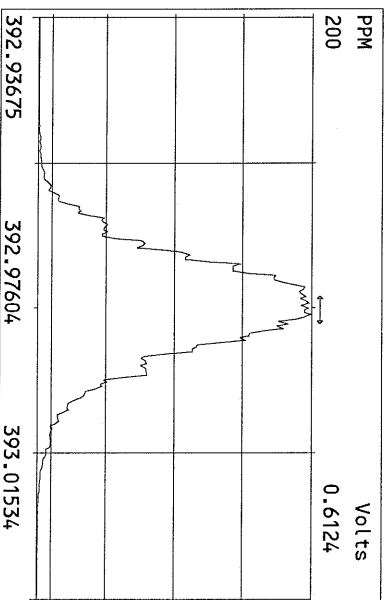
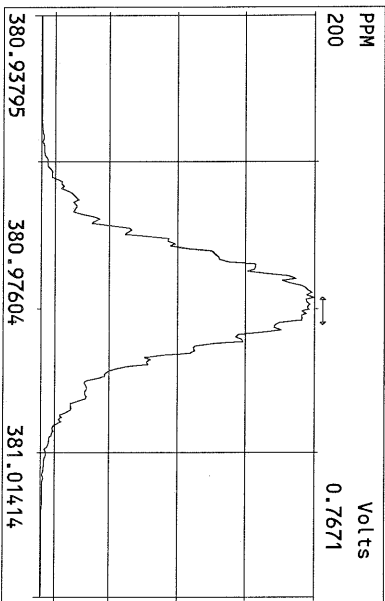
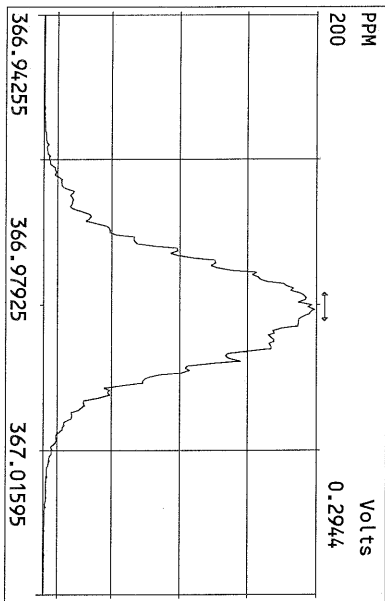
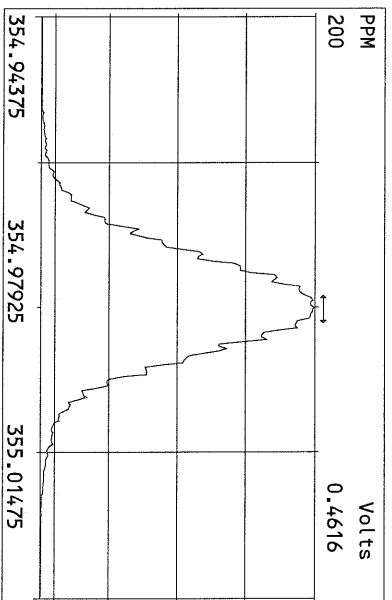
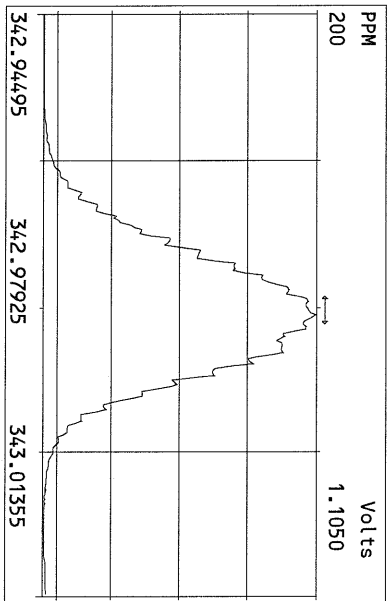
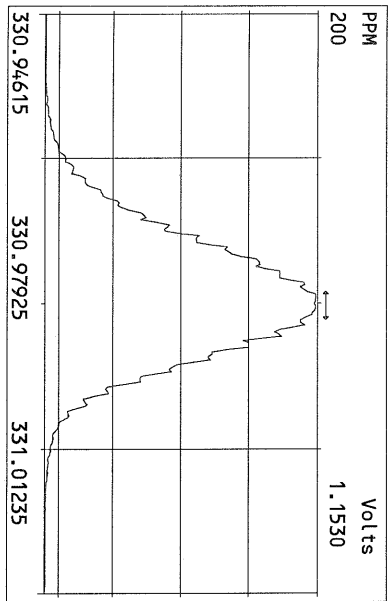
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18MAY11Z 3	2293-001-0001-OPR	OPR	18-MAY-11 14:06:21	ST051811Z1	ST051811Z2	BS
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18MAY11Z 8	6740-001-0001-SA	MW07-042711	18-MAY-11 18:40:18	ST051811Z1	ST051811Z2	BS
18MAY11Z 9	6740-002-0001-SA	MW11-042711	18-MAY-11 19:35:05	ST051811Z1	ST051811Z2	BS
18MAY11Z 10	6740-003-0001-SA	MW10-042711	18-MAY-11 20:29:51	ST051811Z1	ST051811Z2	BS
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18MAY11Z 13	6740-006-0001-SA	MW12-042711	18-MAY-11 23:14:09	ST051811Z1	ST051811Z2	BS
18MAY11Z 14	SB051811Z2	Solvent Blank	19-MAY-11 00:08:56	ST051811Z1	ST051811Z2	BS
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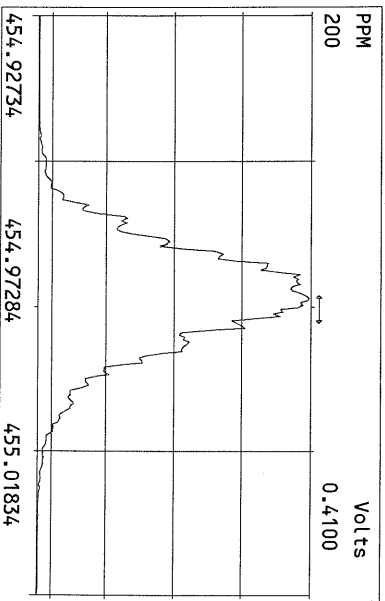
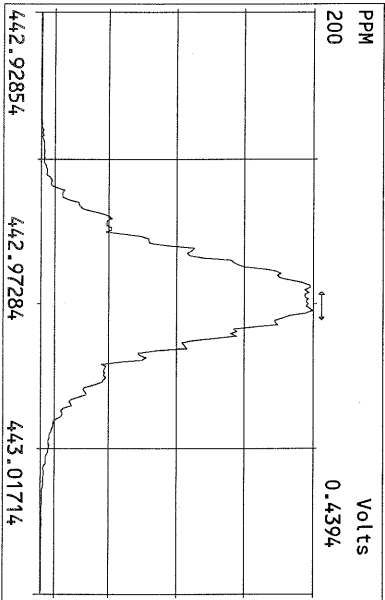
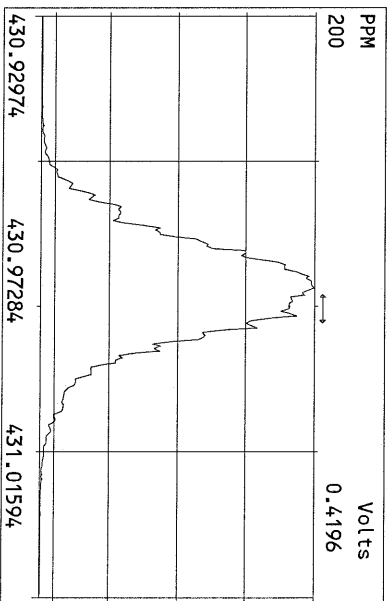
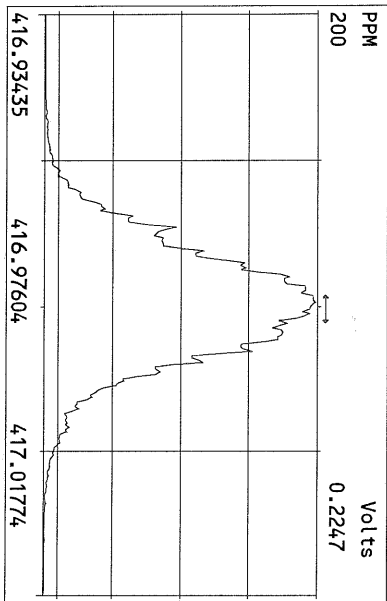
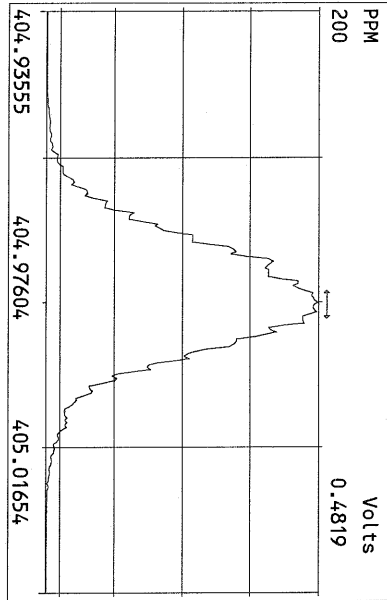
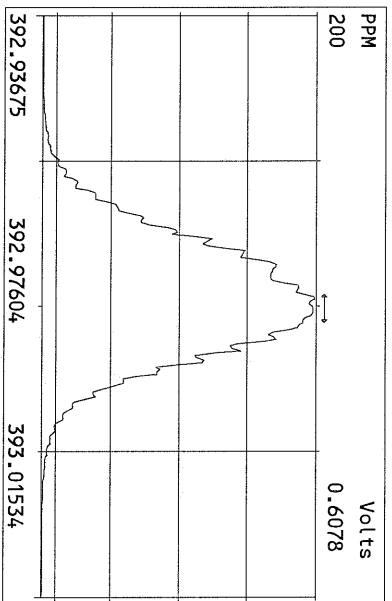
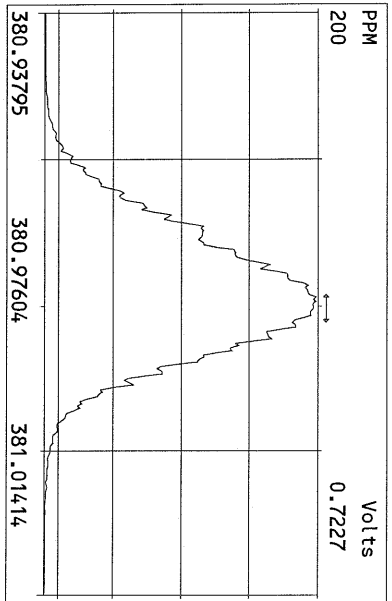
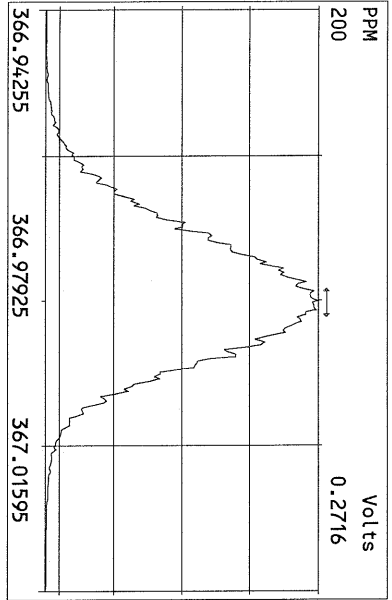
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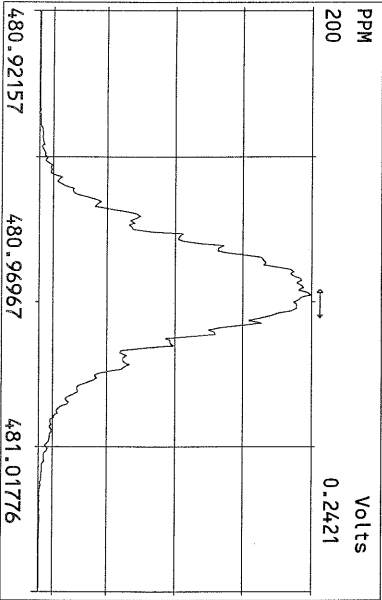
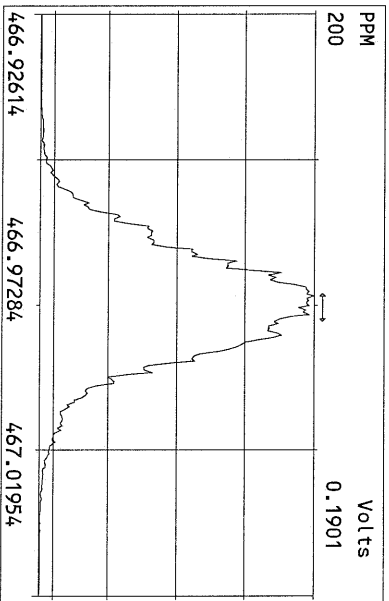
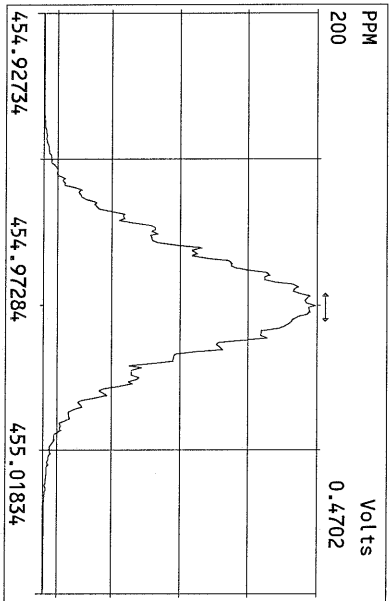
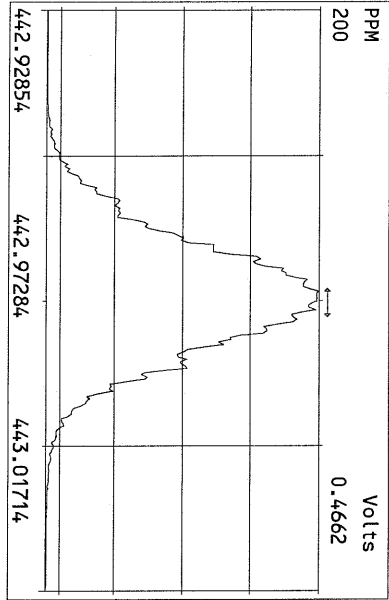
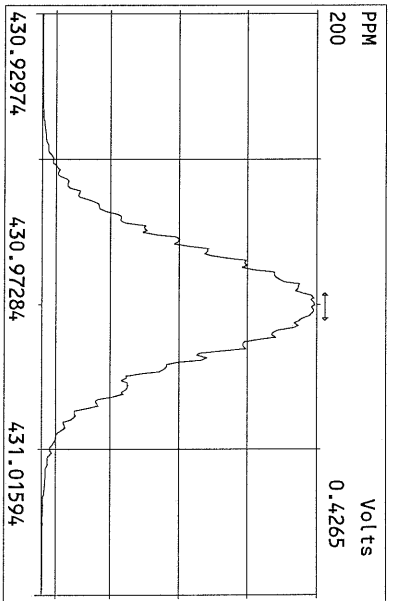
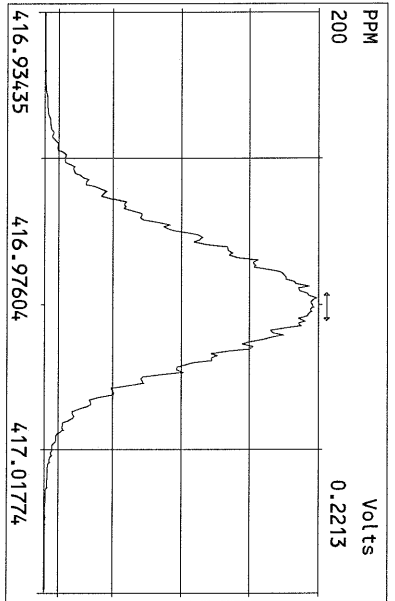
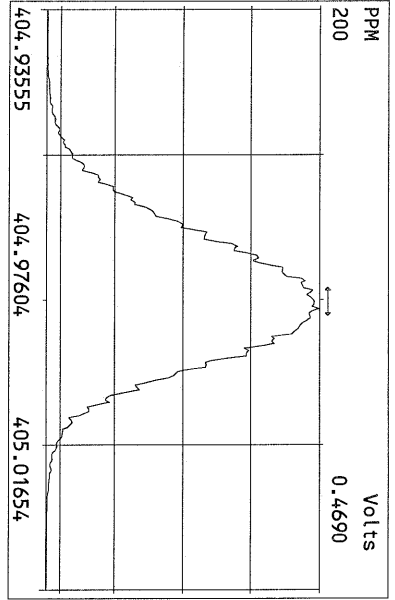
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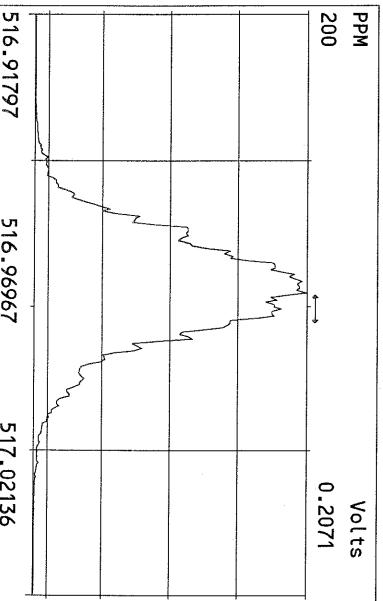
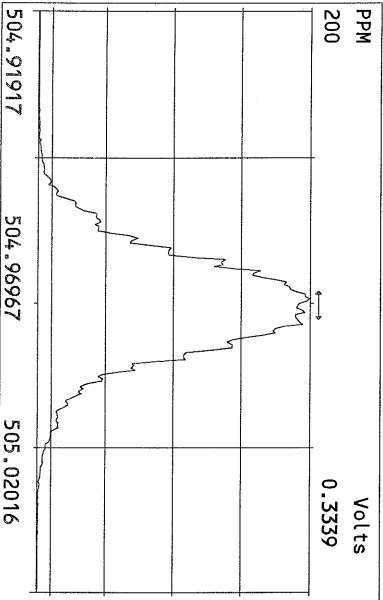
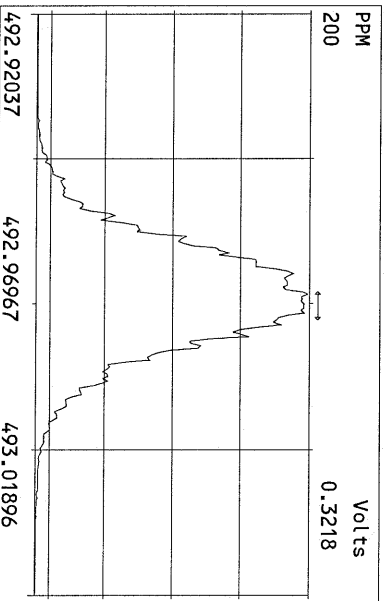
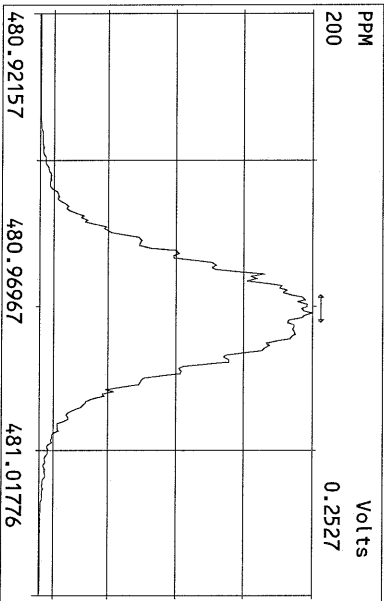
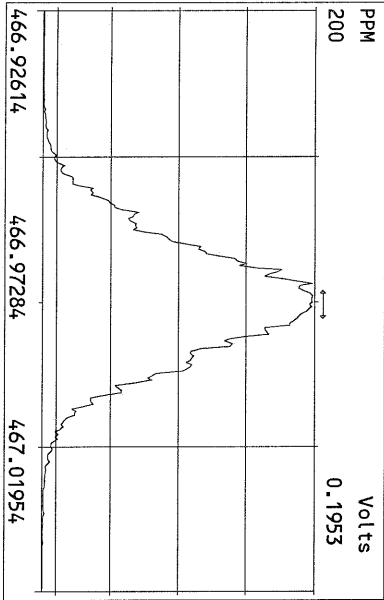
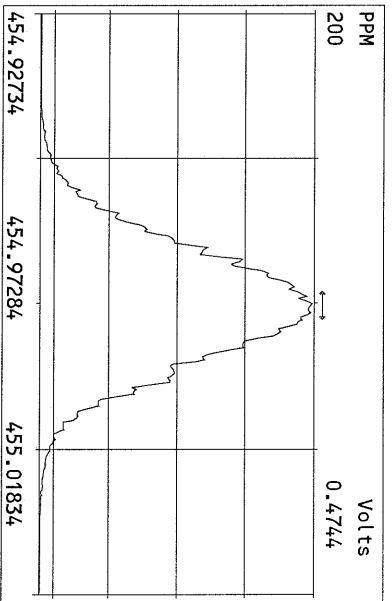
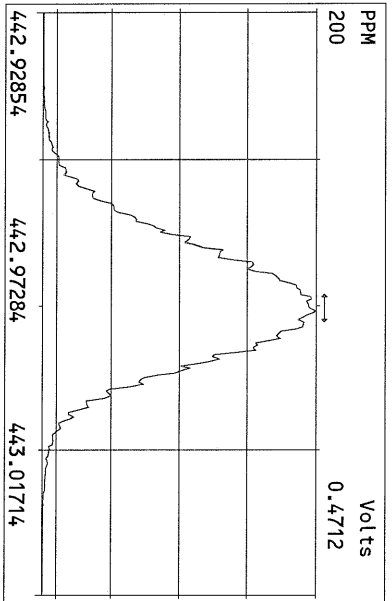
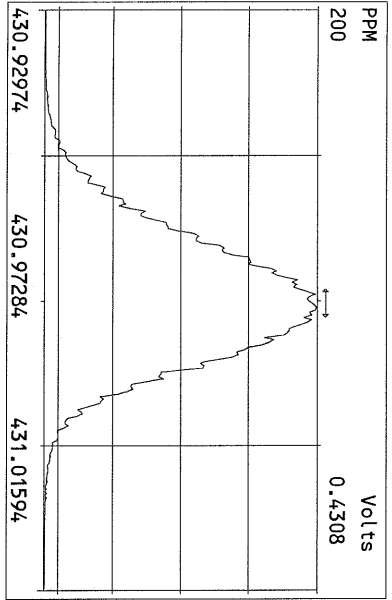
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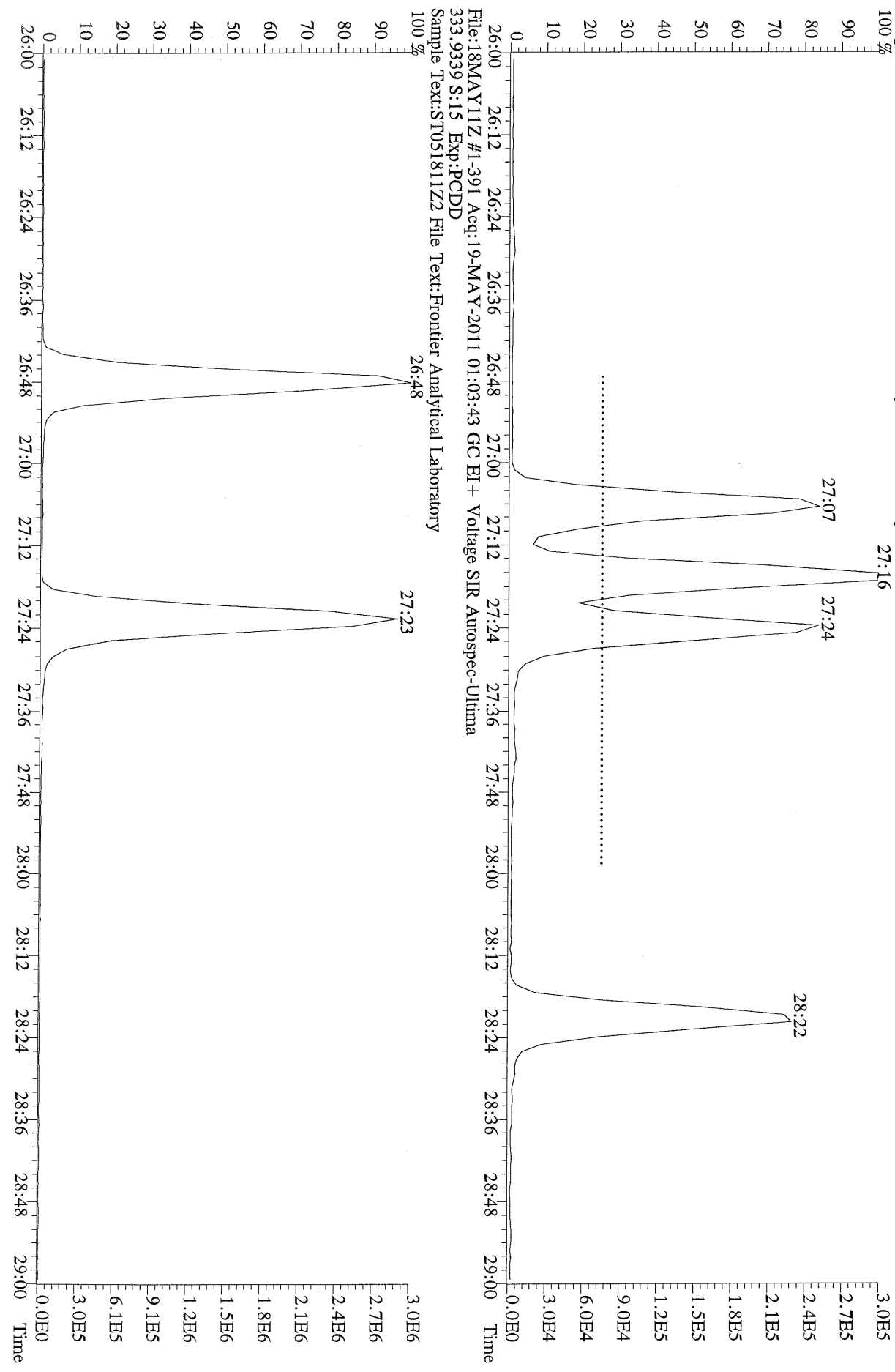




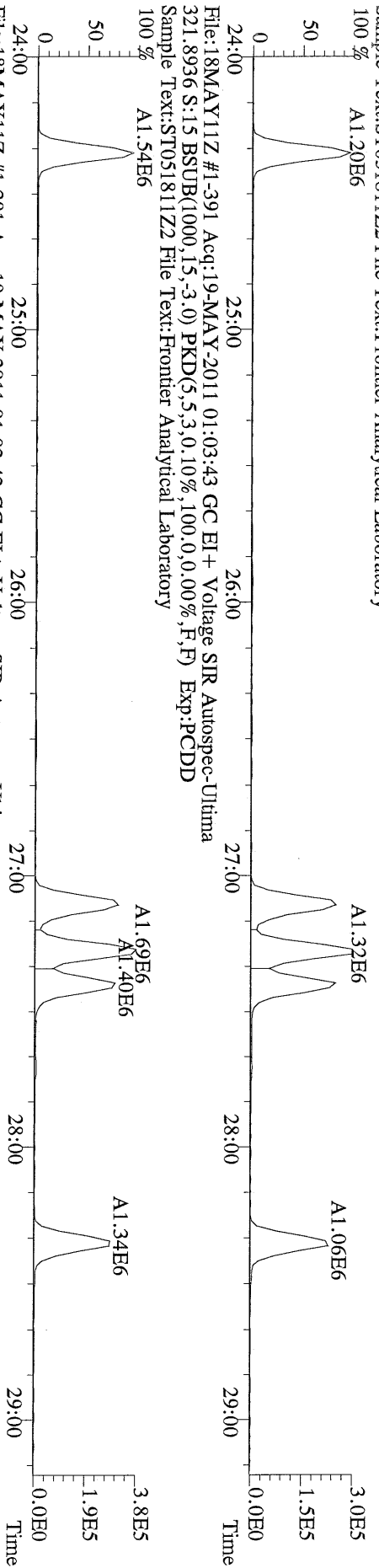




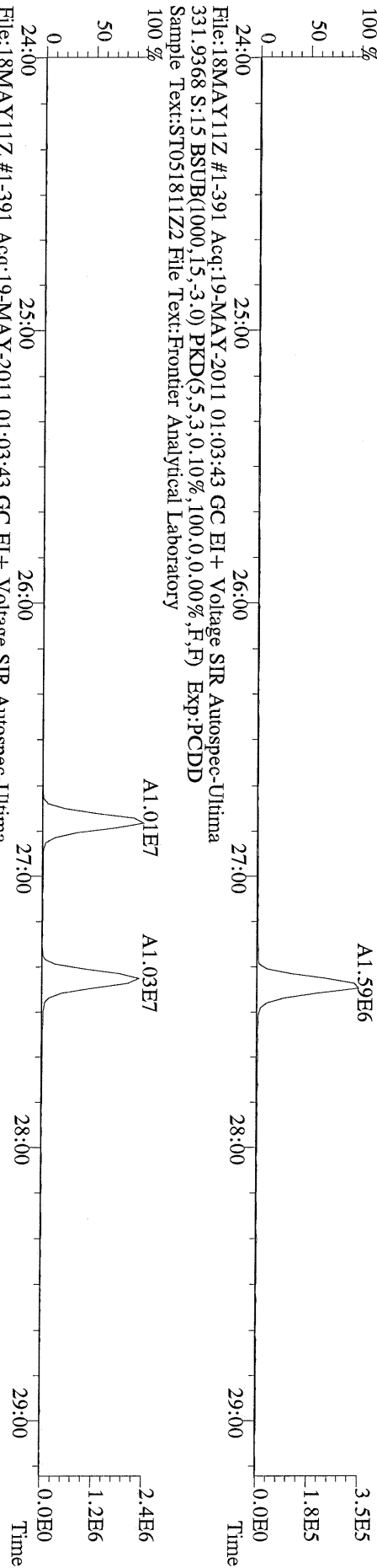
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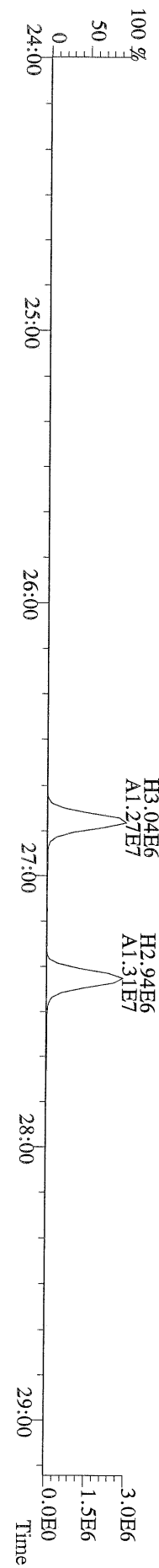
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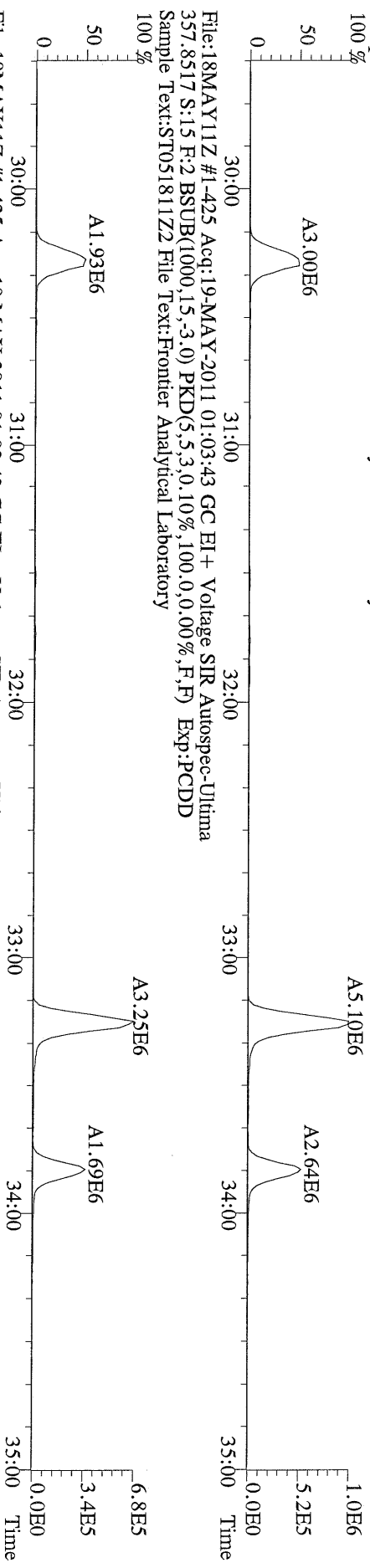
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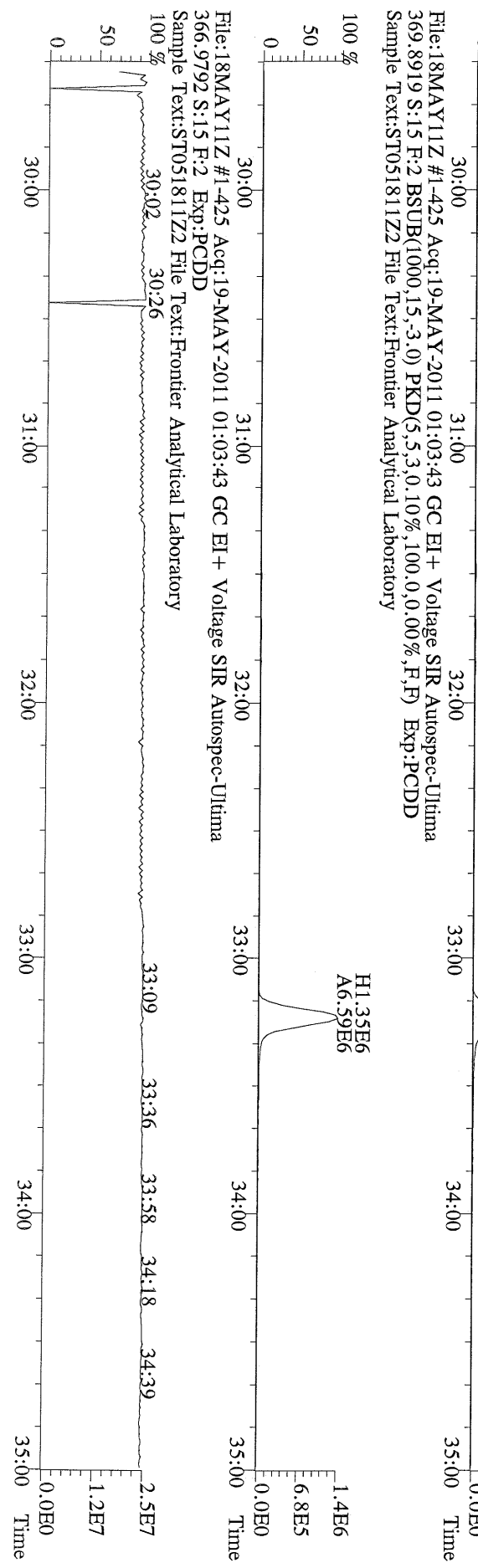
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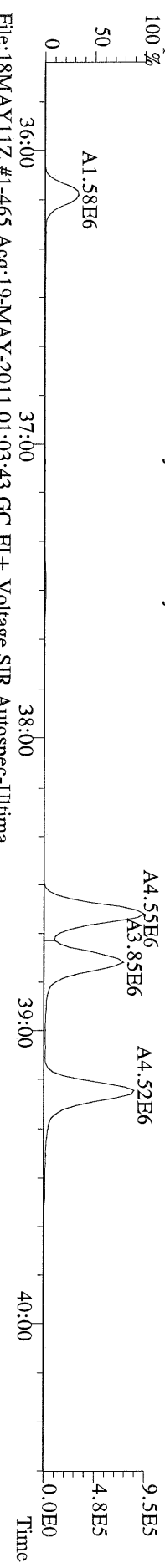
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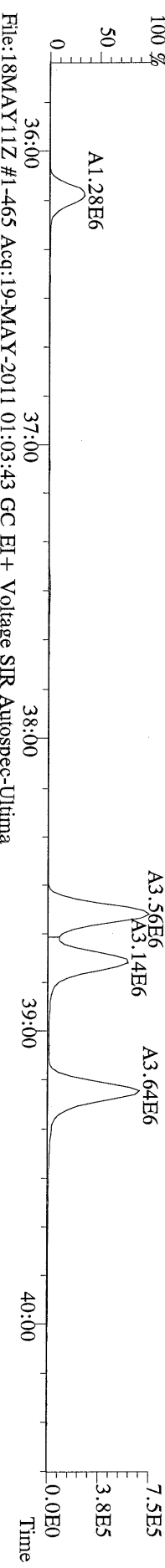
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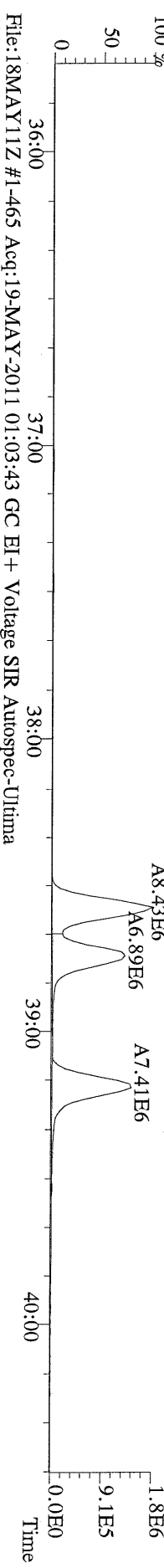
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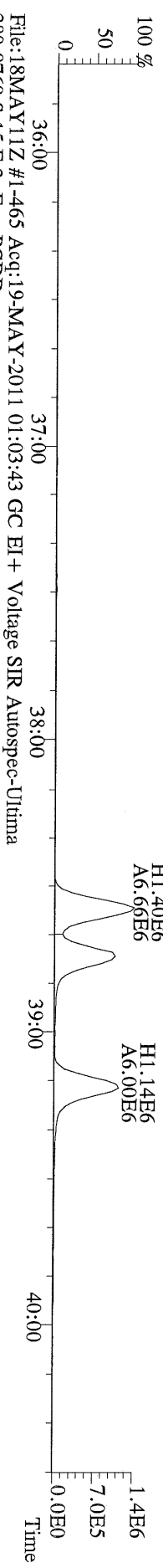
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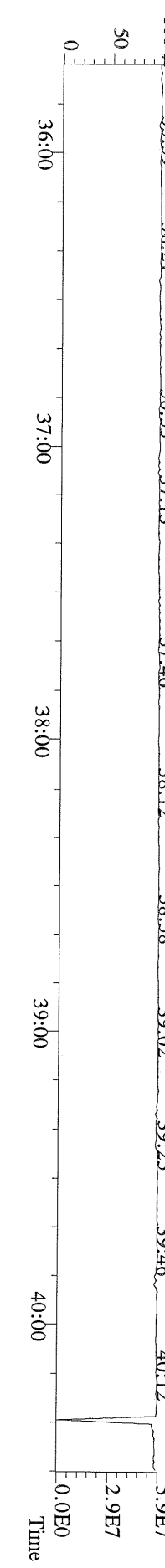
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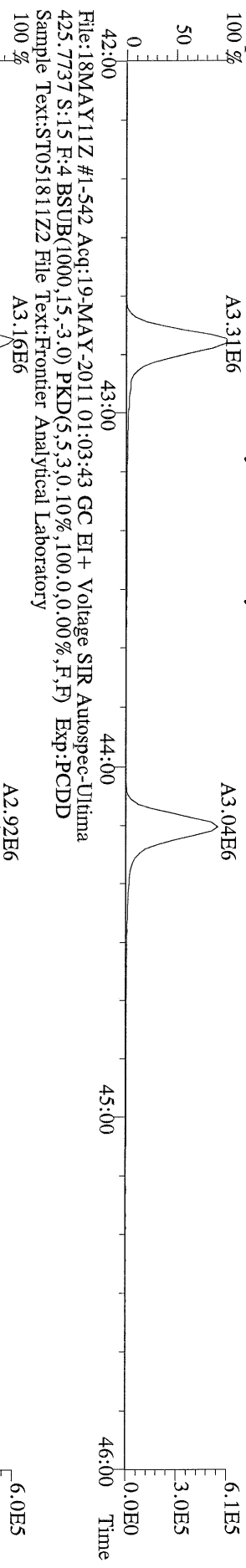
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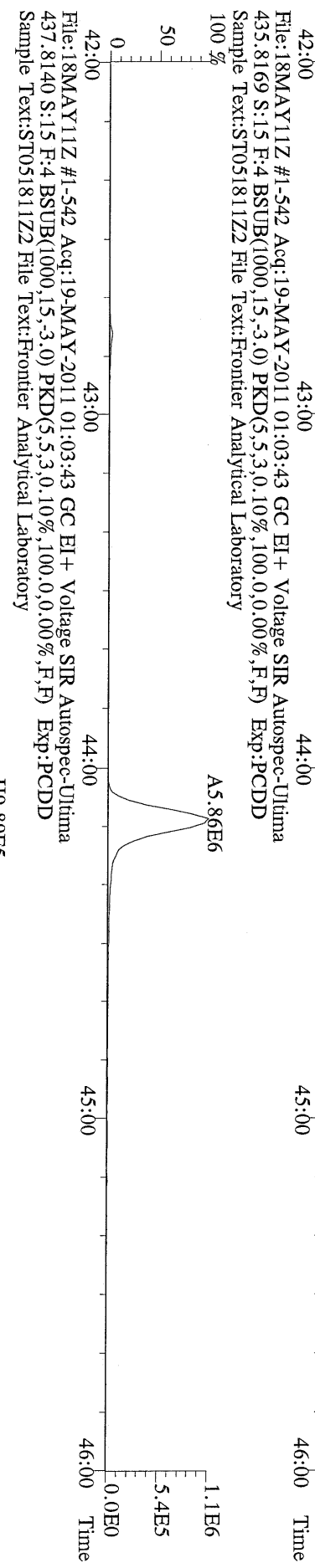
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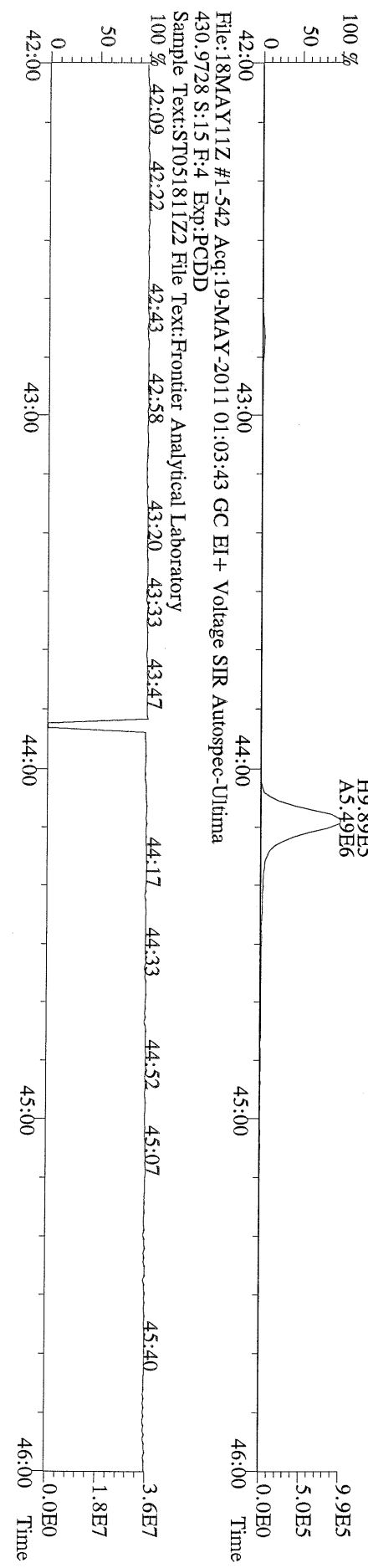
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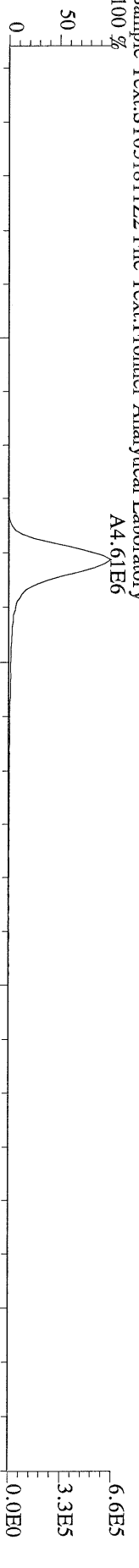
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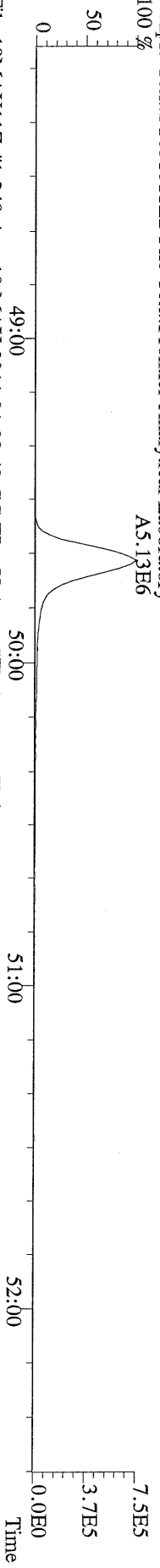
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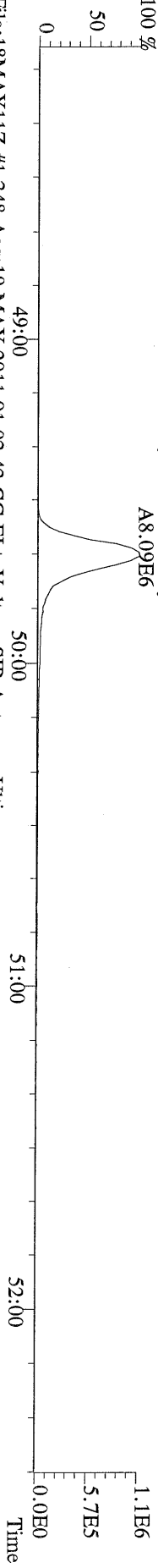
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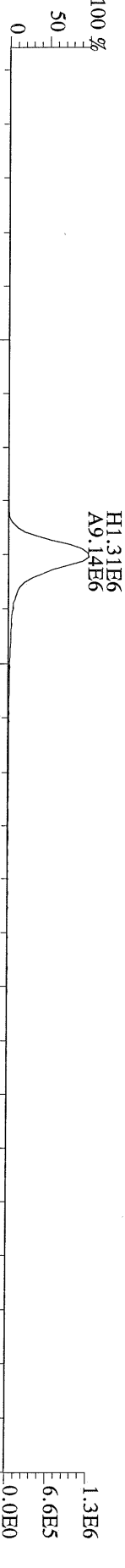
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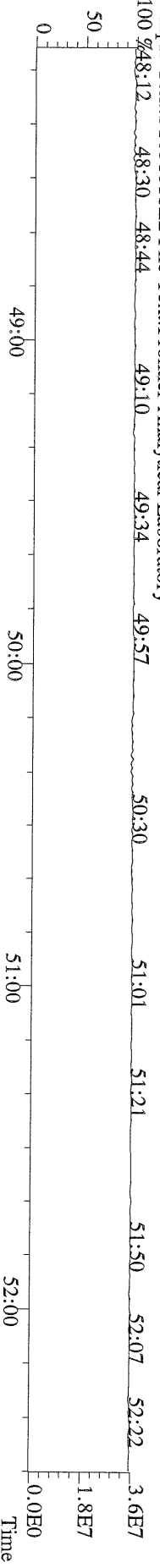
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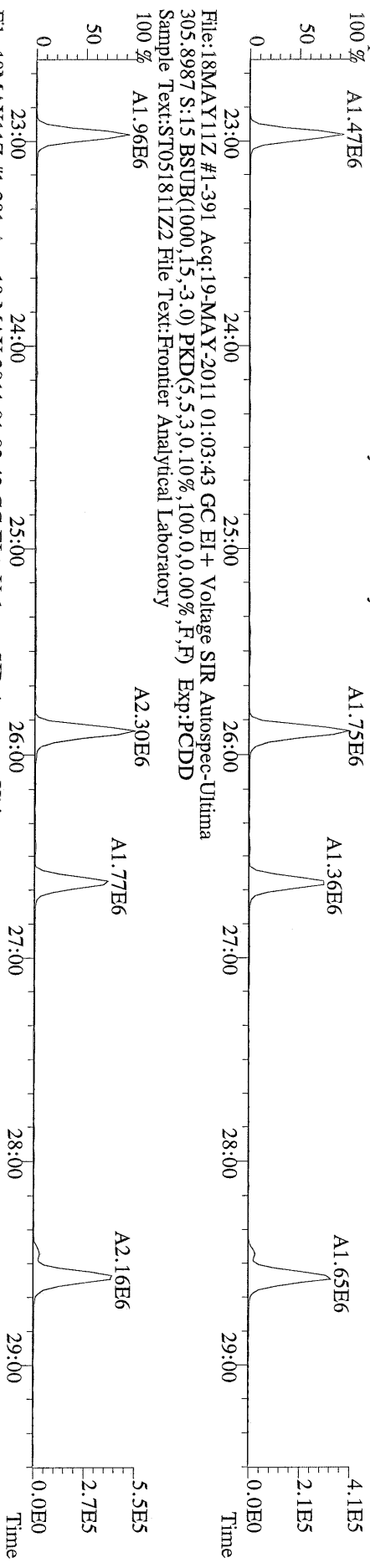
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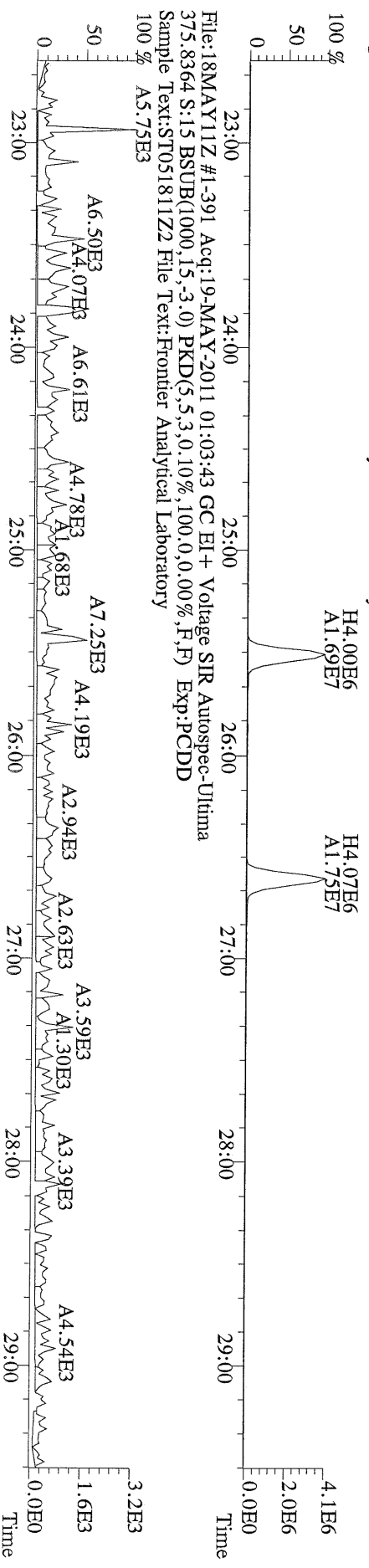
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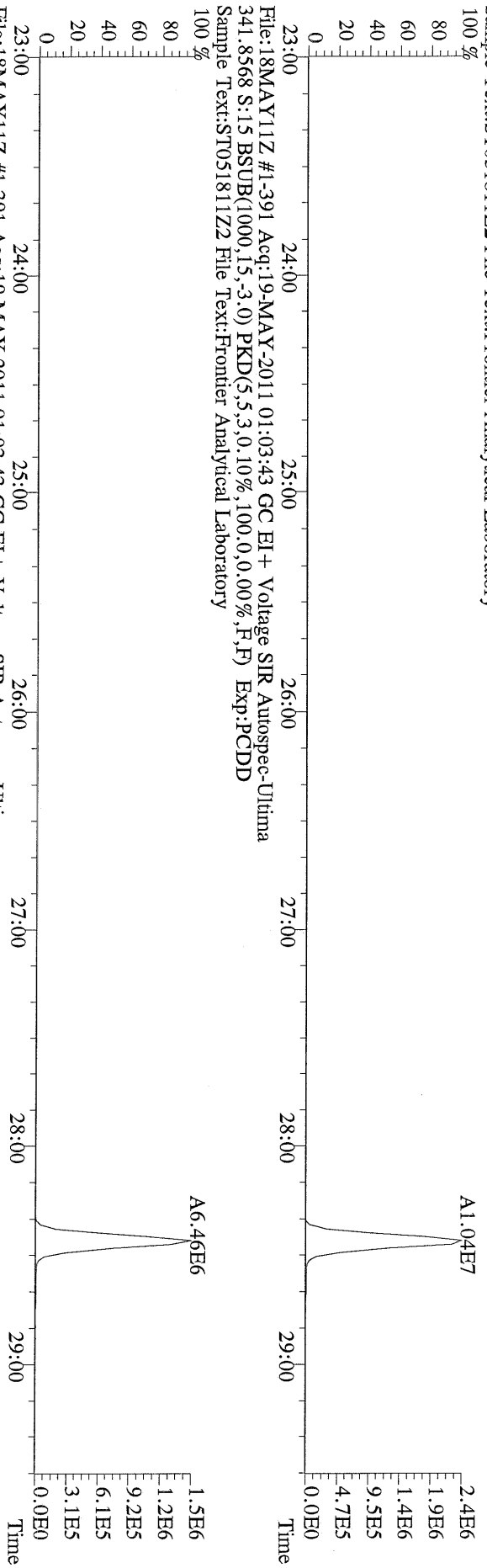
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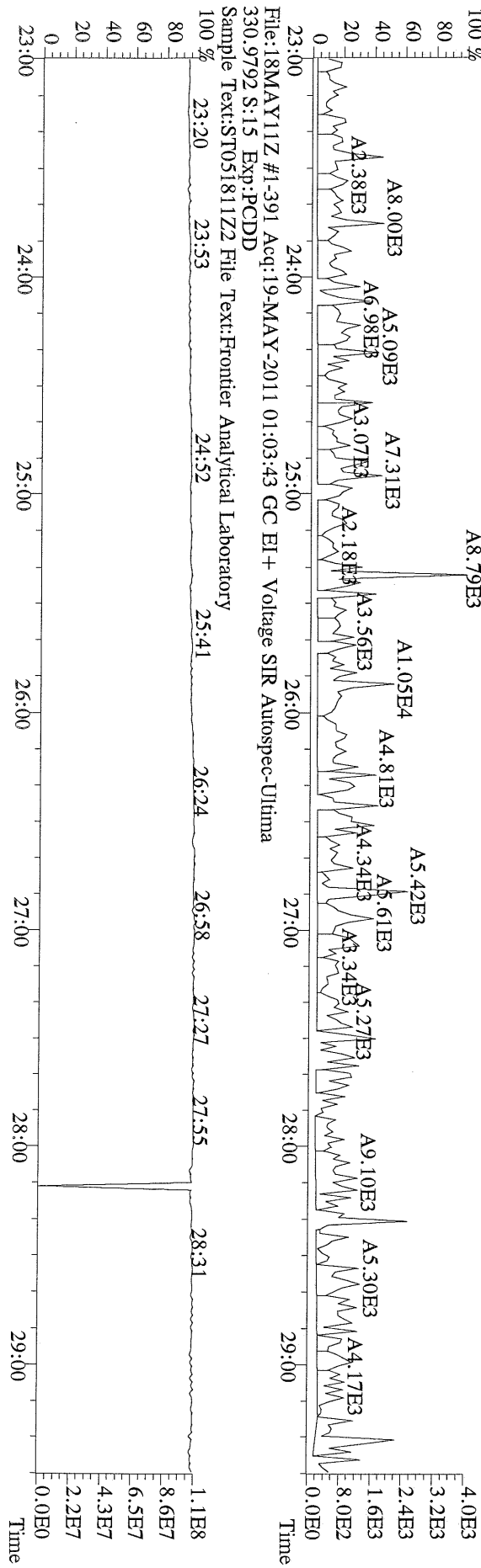
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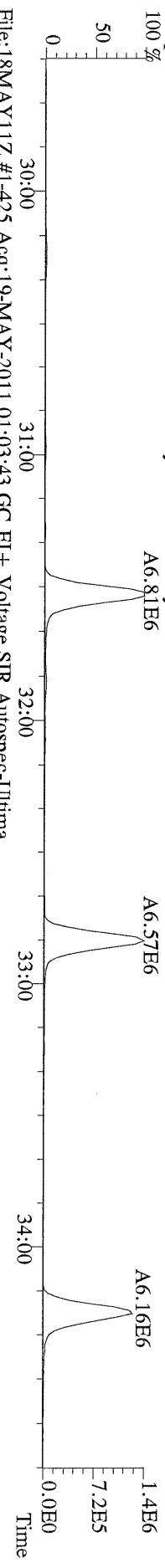
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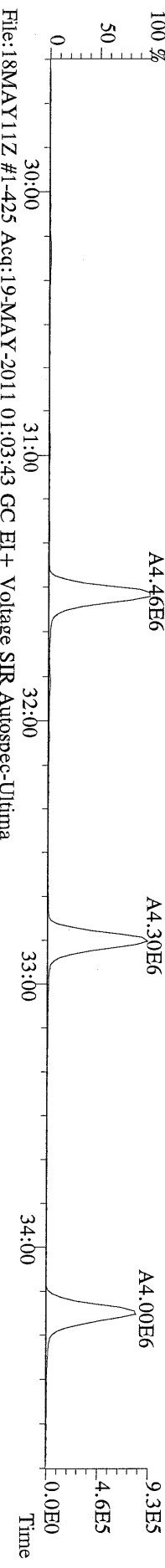
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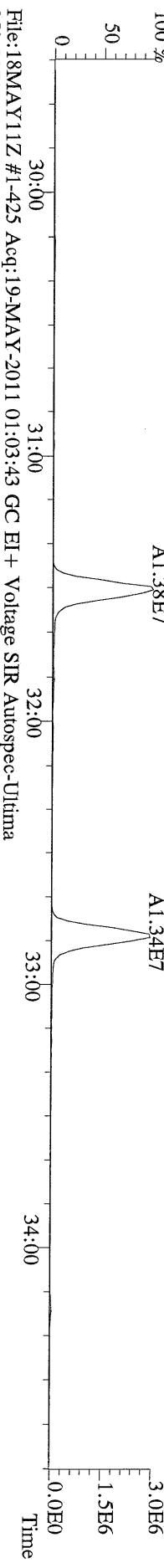
File: 18MAY11Z #1-425 Acq: 19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
 339.8597 S:15 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:PCDD
 Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



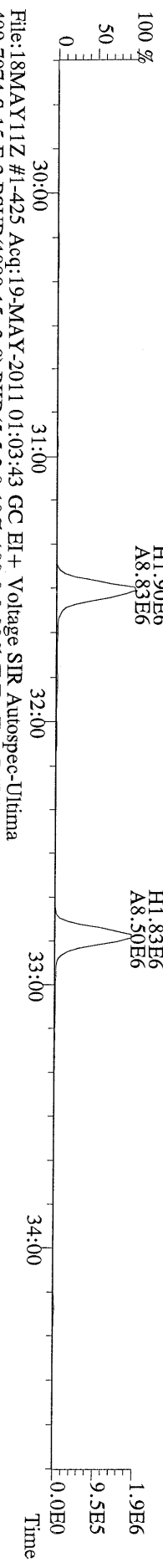
File: 18MAY11Z #1-425 Acq: 19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
 341.8568 S:15 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:PCDD
 Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



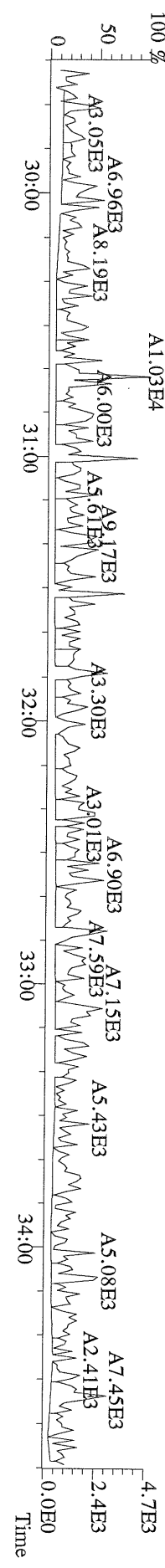
File: 18MAY11Z #1-425 Acq: 19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
 351.9000 S:15 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:PCDD
 Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



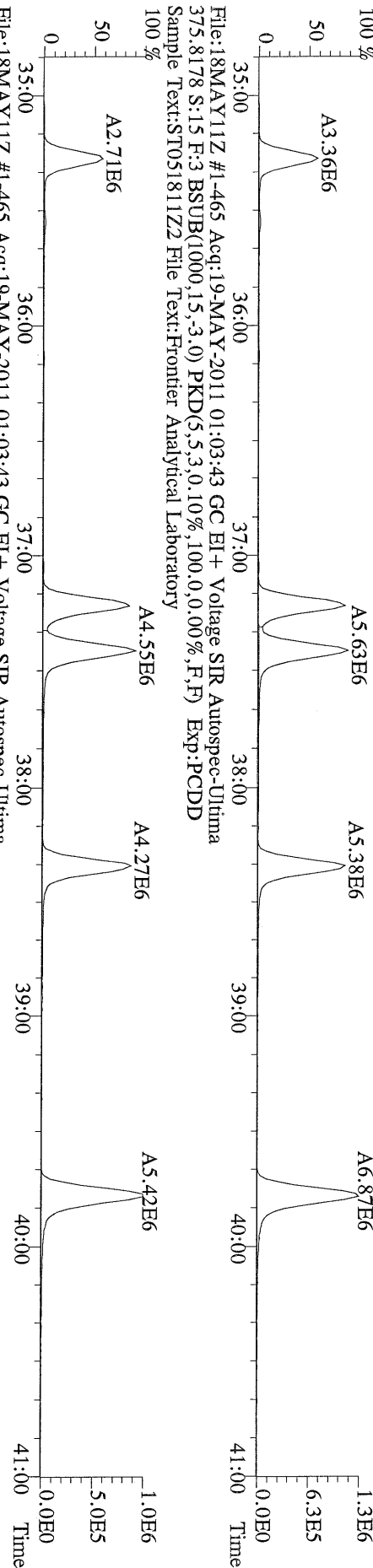
File: 18MAY11Z #1-425 Acq: 19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
 353.8970 S:15 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:PCDD
 Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



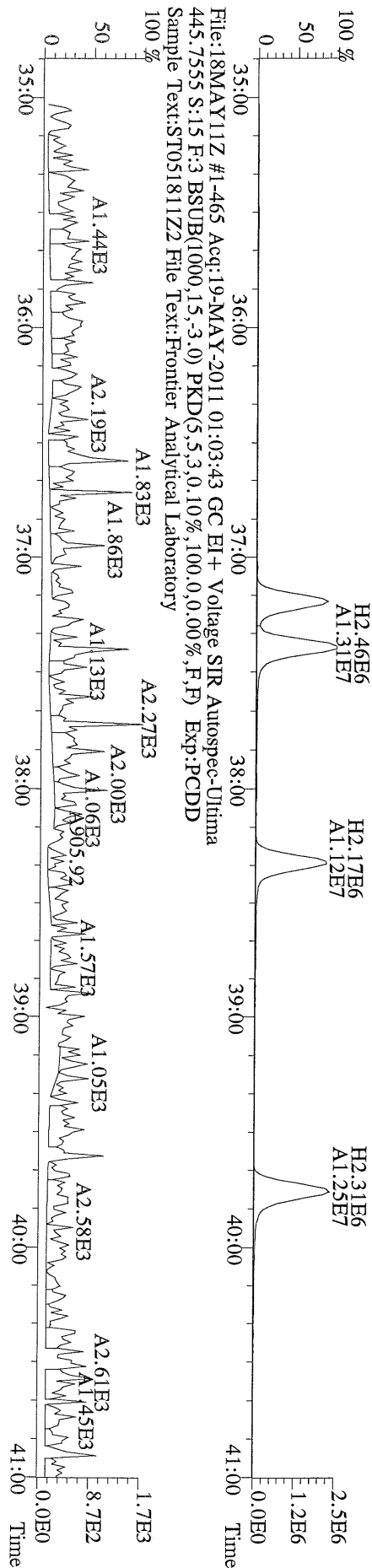
File: 18MAY11Z #1-425 Acq: 19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
 409.7974 S:15 F:2 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:PCDD
 Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



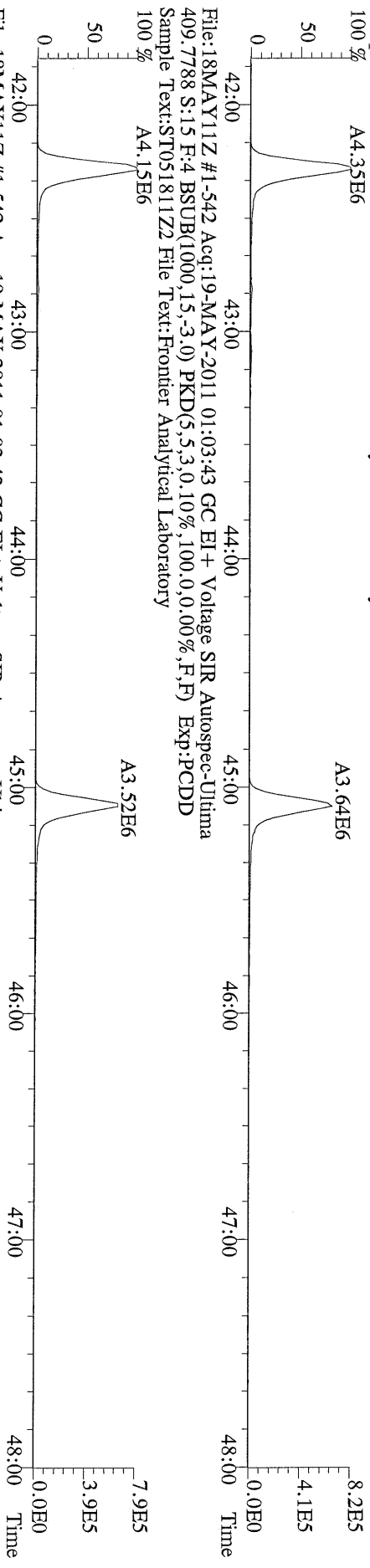
File:18MAY11Z #1-465 Acq:19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Utima
373.8207 S:15 F:3 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp.:PCDD
Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



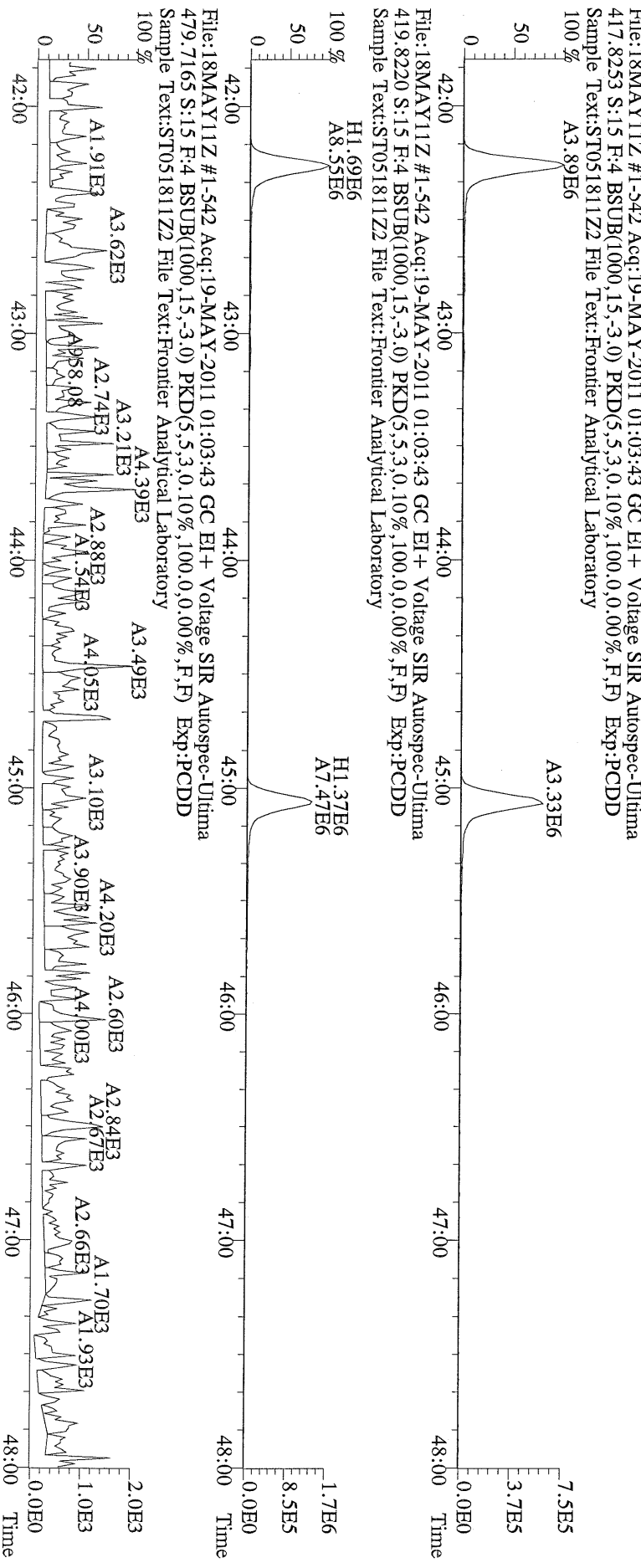
File:18MAY11Z #1-465 Acq:19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Utima
383.8639 S:15 F:3 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp.:PCDD
Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



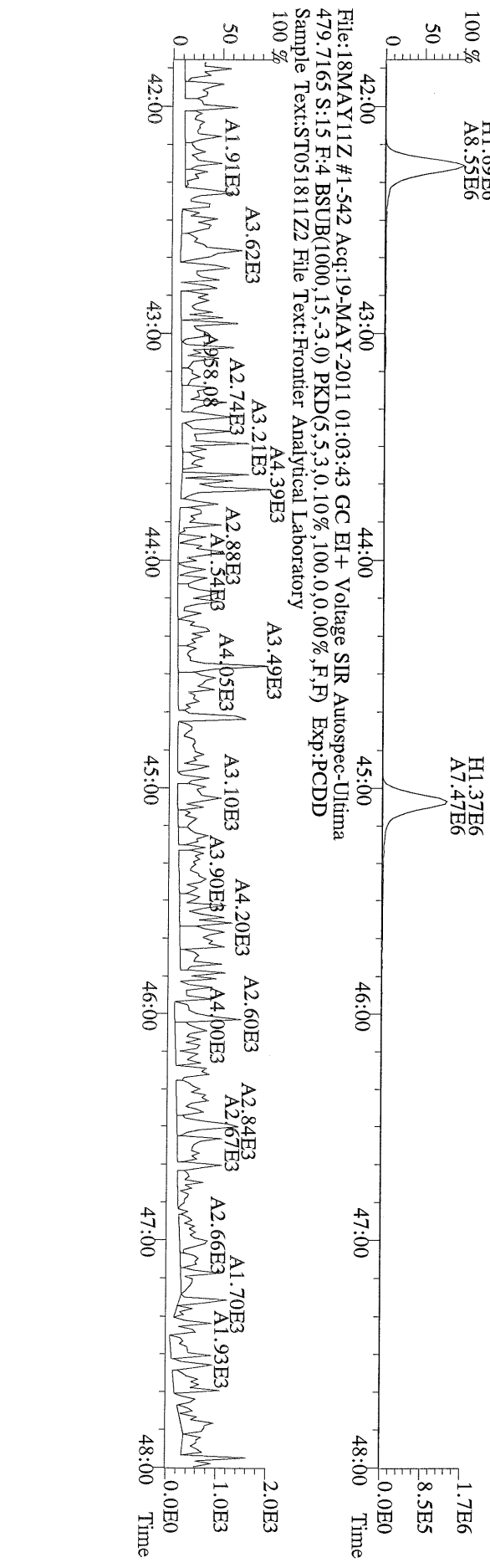
File: 18MAY11Z #1-542 Acq: 19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
407.7818 S:15 F:4 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



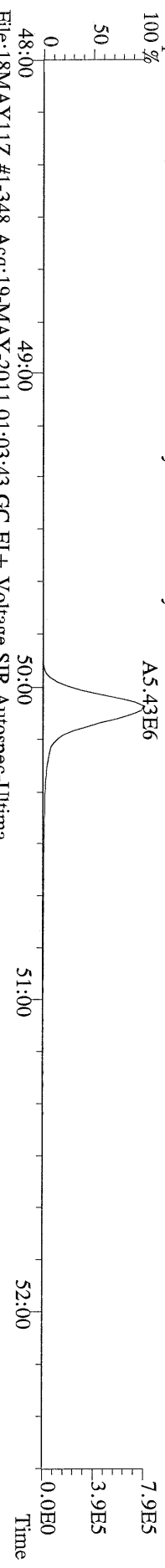
File: 18MAY11Z #1-542 Acq: 19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
417.8253 S:15 F:4 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



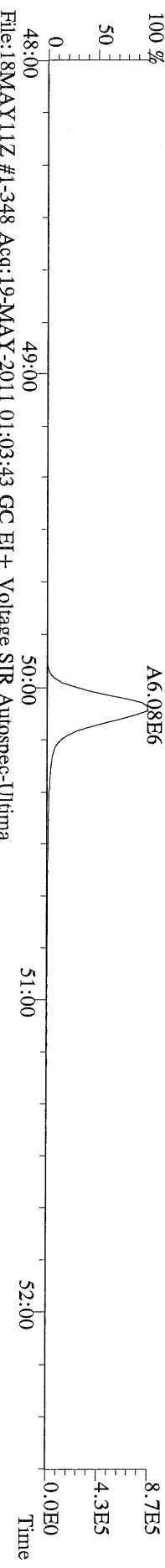
File: 18MAY11Z #1-542 Acq: 19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
479.7165 S:15 F:4 BSUB(1000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



File:18MAY11Z #1-348 Acq:19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
441.7428 S:15 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



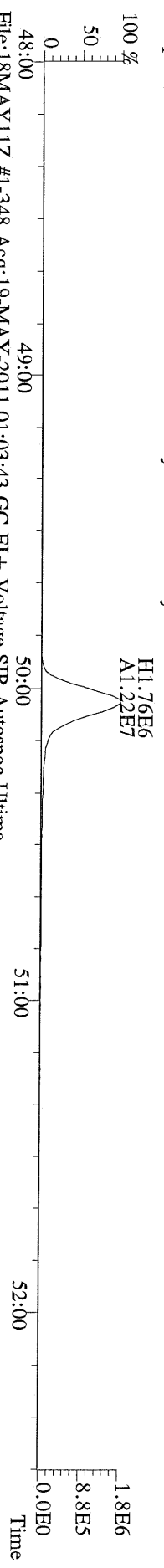
File:18MAY11Z #1-348 Acq:19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
443.7398 S:15 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



File:18MAY11Z #1-348 Acq:19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
453.7831 S:15 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



File:18MAY11Z #1-348 Acq:19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
455.7801 S:15 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory



File:18MAY11Z #1-348 Acq:19-MAY-2011 01:03:43 GC EI+ Voltage SIR Autospec-Ultima
513.6775 S:15 F:5 BSUB(1000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:PCDD
Sample Text:ST051811Z2 File Text:Frontier Analytical Laboratory

