

Frontier Analytical Laboratory

Data Filename: 18FEB11B

Analyte: TCDFAL1-2-18-11

Cal: TCDFAL1-2-18-11

Name	RRF	S. D.	%RSD	S1 RRF#1	S2 RRF#2	S3 RRF#3	S4 RRF#4	S5 RRF#5
2,3,7,8-TCDF	1.16	0.0391	3.38 %	1.13	1.22	1.12	1.17	1.14
13C-2,3,7,8-TCDF	1.05	0.0980	9.31 %	0.97	1.00	0.98	1.12	1.19
13C-1,2,3,4-TCDF	-	-	- %	-	-	-	-	-

Analyst: 

Date: 2/18/11

Run #1 Filename 18FEB11B
Client ID: ST021811B3

S: 1

Acquired: 18-FEB-11 13:45:12 Cal: TCDFFAL1-2-18-11

Analyte: TCDF

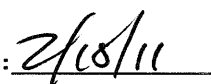
FAL ID: 1613 CS3 100511J

	Typ	Name	Amount	Resp	RA	RT	RF	RRF
1	Unk	2,3,7,8-TCDF	10.00	2.06e+07	0.79 y	19:23	-	1.13 y
2	IS	13C-2,3,7,8-TCDF	100.00	1.82e+08	0.81 y	19:23	-	0.970 y
3	RS	13C-1,2,3,4-TCDF	100.00	1.87e+08	0.80 y	16:48	1.87e+06	- n

Analyst: _____



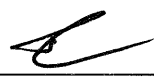
Date: _____



Run #2 Filename 18FEB11B
Client ID: ST021811B1

S: 2 Acquired: 18-FEB-11 14:20:15 Cal: TCDFFAL1-2-18-11
Analyte: TCDF FAL ID: 1613 CS1 100511H

	Typ	Name	Amount	Resp	RA	RT	RF	RRF
1	Unk	2,3,7,8-TCDF	0.50	1.07e+06	0.72 y	19:22	-	1.22 y
2	IS	13C-2,3,7,8-TCDF	100.00	1.76e+08	0.81 y	19:21	-	0.998 y
3	RS	13C-1,2,3,4-TCDF	100.00	1.76e+08	0.79 y	16:46	1.76e+06	- n


Analyst: 

Date: 2/18/11

Run #3 Filename 18FEB11B
Client ID: ST021811B2

S: 3 Acquired: 18-FEB-11 14:55:19 Cal: TCDFFAL1-2-18-11
Analyte: TCDF FAL ID: 1613 CS2 100511I

	Typ	Name	Amount	Resp	RA	RT	RF	RRF	
1	Unk	2,3,7,8-TCDF	2.00	4.55e+06	0.79 y	19:22	-	1.12	y
2	IS	13C-2,3,7,8-TCDF	100.00	2.02e+08	0.81 y	19:21	-	0.983	y
3	RS	13C-1,2,3,4-TCDF	100.00	2.06e+08	0.80 y	16:47	2.06e+06	-	n

Analyst:  Date: 2/18/11

Run #4 Filename 18FEB11B
Client ID: ST021811B4

S: 4 Acquired: 18-FEB-11 15:30:23 Cal: TCDFFAL1-2-18-11
Analyte: TCDF FAL ID: 1613 CS4 100511K

	Typ	Name	Amount	Resp	RA	RT	RF	RRF
1	Unk	2,3,7,8-TCDF	40.00	9.40e+07	0.79 y	19:22	-	1.17 y
2	IS	13C-2,3,7,8-TCDF	100.00	2.00e+08	0.81 y	19:20	-	1.12 y
3	RS	13C-1,2,3,4-TCDF	100.00	1.78e+08	0.80 y	16:47	1.78e+06	- n

Analyst: 

Date: 2/18/11

Run #5 Filename 18FEB11B
Client ID: ST021811B5

S: 5 Acquired: 18-FEB-11 16:05:28 Cal: TCDFFAL1-2-18-11
Analyte: TCDFFAL1-2-18-11 FAL ID: 1613 CS5 100511L

	Typ	Name	Amount	Resp	RA	RT	RF	RRF
1	Unk	2,3,7,8-TCDF	200.00	3.70e+08	0.79 y	19:22	-	1.14 y
2	IS	13C-2,3,7,8-TCDF	100.00	1.63e+08	0.81 y	19:21	-	1.19 y
3	RS	13C-1,2,3,4-TCDF	100.00	1.37e+08	0.80 y	16:46	1.37e+06	- n

Analyst: 

Date: 2/18/11

TCDF INITIAL CALIBRATION RELATIVE RESPONSES

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.:

Initial Calibration Date: 2/18/11

Instrument ID: FAL1 GC Column ID: DB225

CS1 Data Filename: 18FEB11B S1 CS4 Data Filename: 18FEB11B S4

CS2 Data Filename: 18FEB11B S2 CS5 Data Filename: 18FEB11B S5

CS3 Data Filename: 18FEB11B S3

	RELATIVE RESPONSE (RR)					MEAN	Cv
	CS1	CS2	CS3	CS4	CS5	RR	(%RSD)
NATIVE ANALYTES							
2,3,7,8-TCDF	1.13	1.22	1.12	1.17	1.14	1.16	3.38
13C-2,3,7,8-TCDF	0.97	1.00	0.98	1.12	1.19	1.05	9.31

Analyst: 

Date: 2/18/11

FORM 4A
TCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.:

Initial Calibration Date: 2/18/11

Instrument ID: FAL1 GC Column ID: DB225

VER Data Filename: 18FEB11B Sam:1 Analysis Date: 18-FEB-11 Time: 13:45:12


	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
NATIVE ANALYTES						
2,3,7,8-TCDF	M/M+2	0.79	0.65-0.89	y	9.78	8.40 - 12.0
LABELED COMPOUNDS						
13C-2,3,7,8-TCDF	M/M+2	0.81	0.65-0.89	y	92.2	71.0 - 140

- (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 6A, Method 1613

Analyst: Date: 2/18/11

FAL ID: ST021811B3 Filename: 18FEB11B Sam:1 Acquired: 18-FEB-11 13:45:12 ICal: TCDFFAL1-2-18-11
Client ID: 1613 CS3 100511J ConCal: NA EndCal: NA
Results: GC Column: DB225 Amount: 1.000

Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise	DL	#Hom	Rec
2,3,7,8-TCDF	2.06e+07	0.79 y	19:23	1.16	9.78		2.50	-	-	1	
13C-2,3,7,8-TCDF	1.82e+08	0.81 y	19:23	1.05	92.2						92.2
13C-1,2,3,4-TCDF	1.87e+08	0.80 y	16:48	-	106						

Analyst: 

Date: 2/18/11

Frontier Analytical Laboratory - Acquisition Log

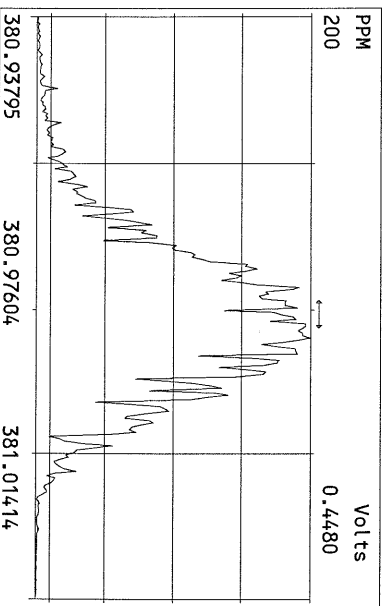
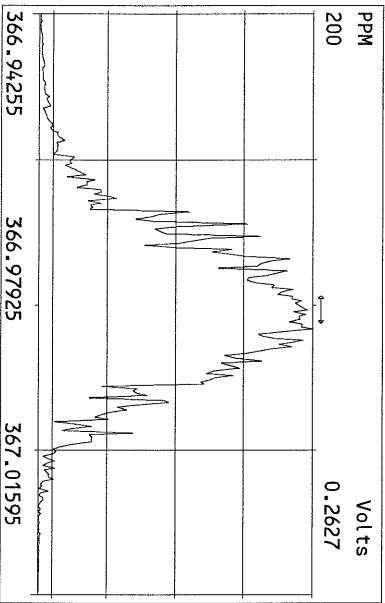
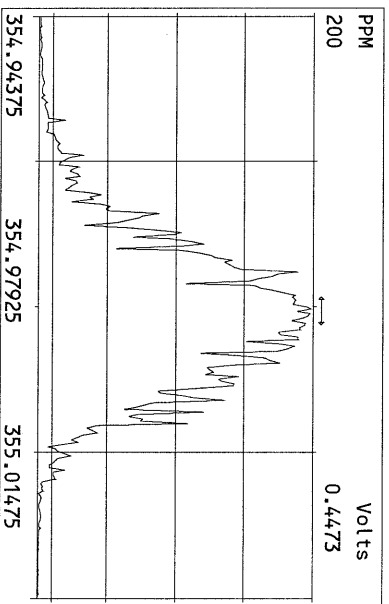
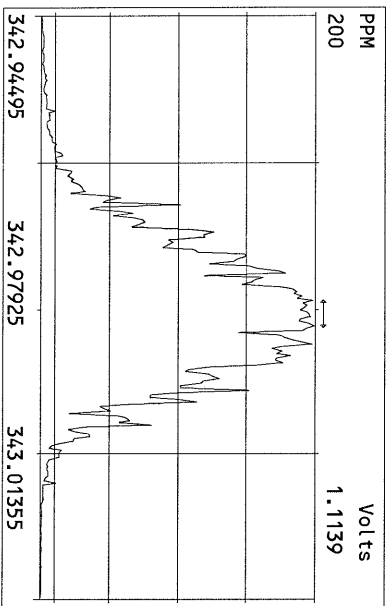
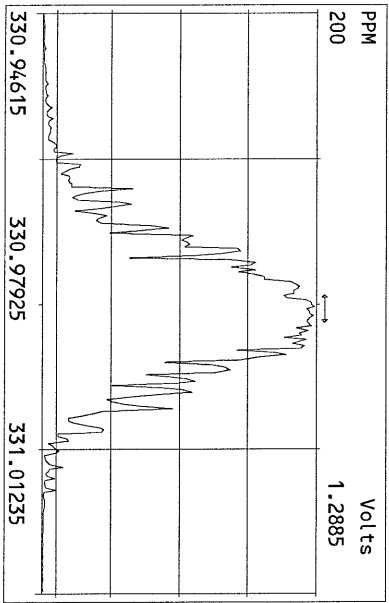
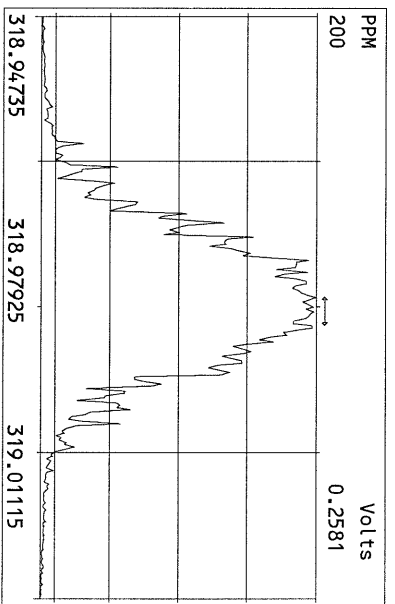
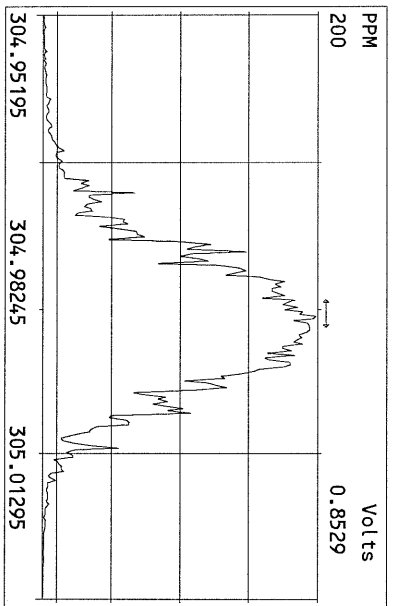
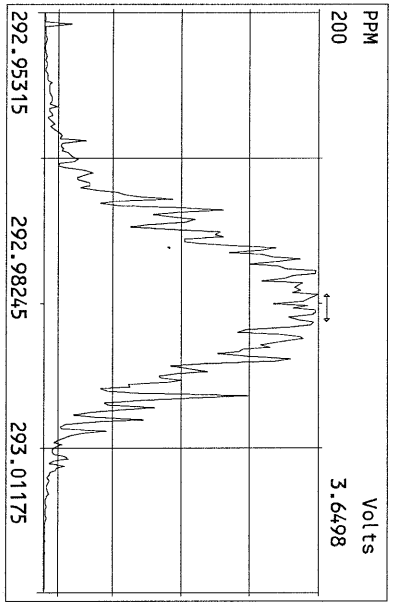
Run Name:18FEB11B Instrument: FAL1 GC: DB225 Experiment:TCDF

Data File S	FAL ID	Client ID	Acquired	ConCal	EndCal	Analyst
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18FEB11B 2	ST021811B1	1613 CS1 100511H	18-FEB-11 14:20:15	NA	NA	TC
18FEB11B 3	ST021811B2	1613 CS2 100511I	18-FEB-11 14:55:19	NA	NA	TC
18FEB11B 4	ST021811B4	1613 CS4 100511K	18-FEB-11 15:30:23	NA	NA	TC
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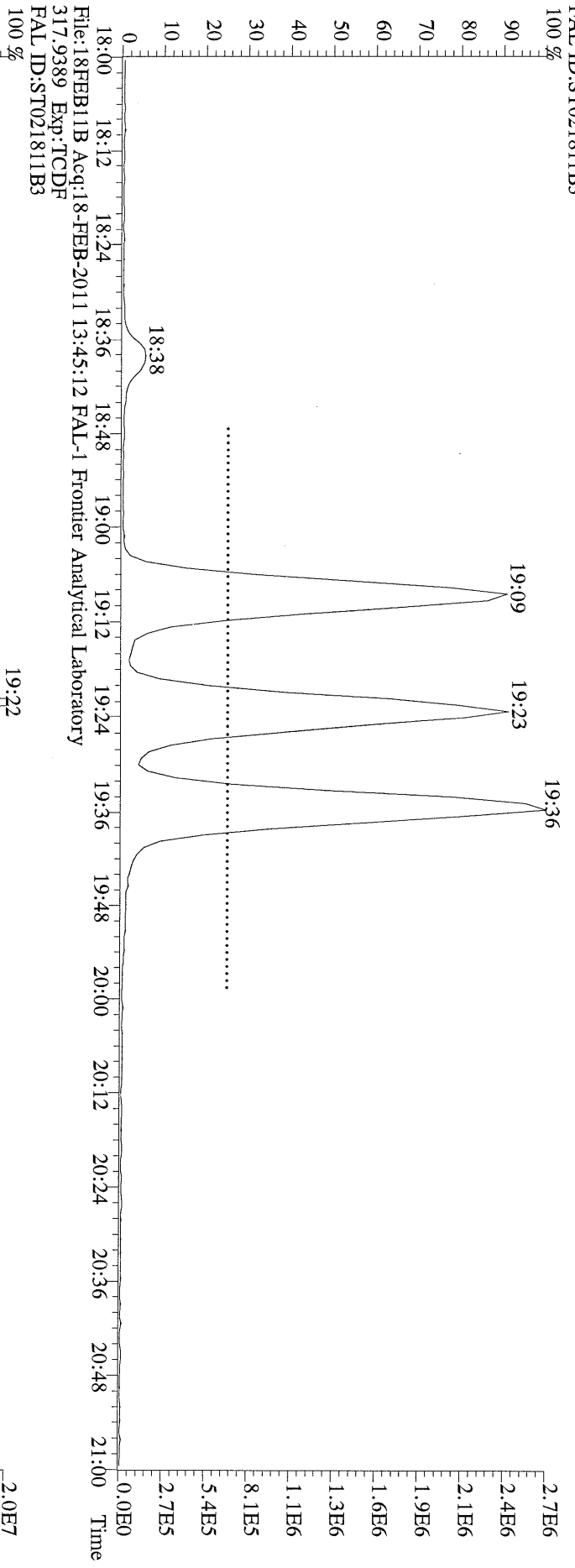
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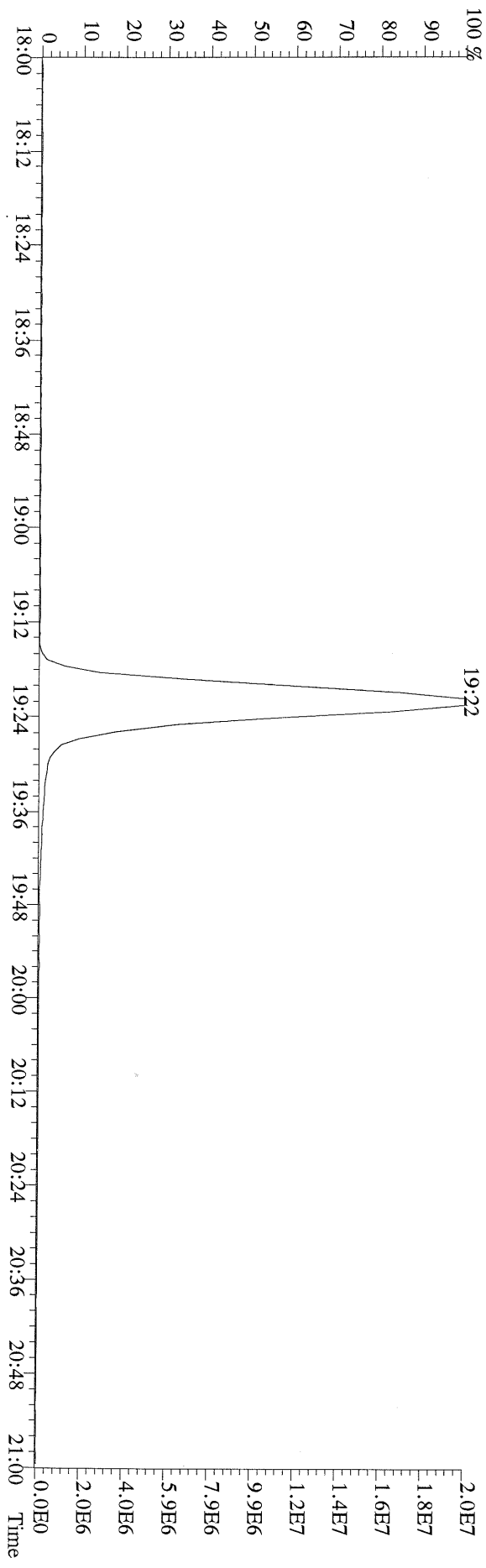
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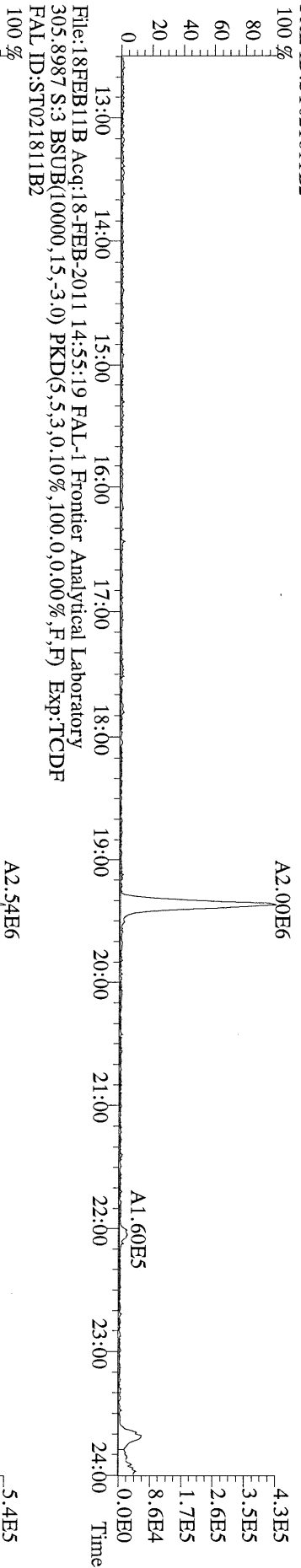
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305.8987 Exp:TCDF
FAL ID:ST021811B3



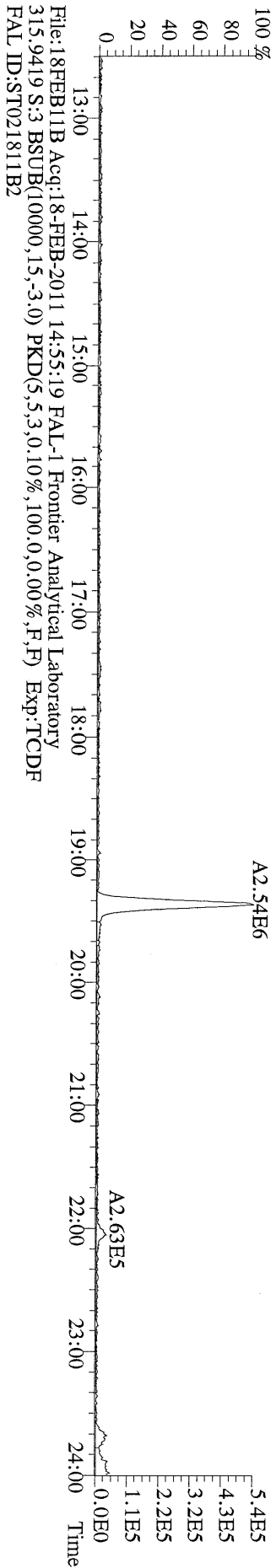
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317.9389 Exp:TCDF
FAL ID:ST021811B3



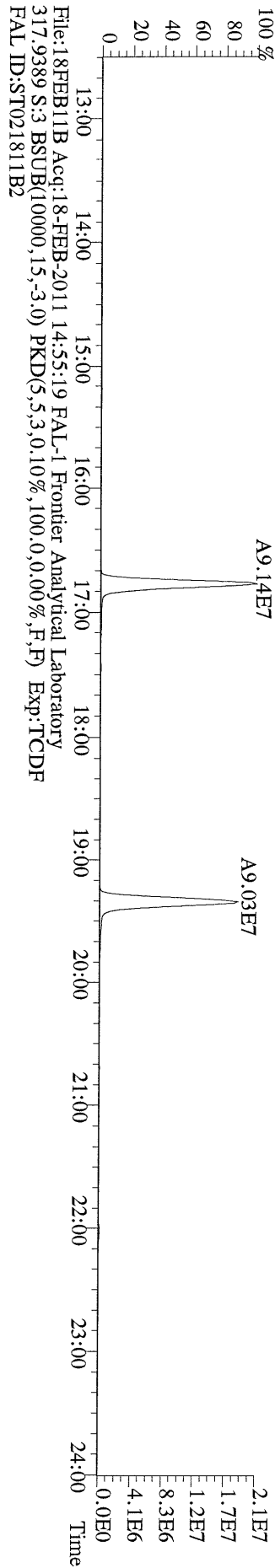
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FAL ID:ST021811B2



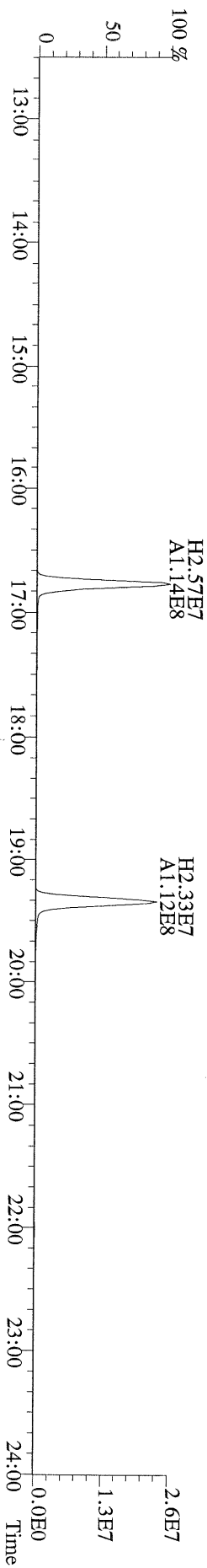
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305.8987 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:TCDF
FAL ID:ST021811B2



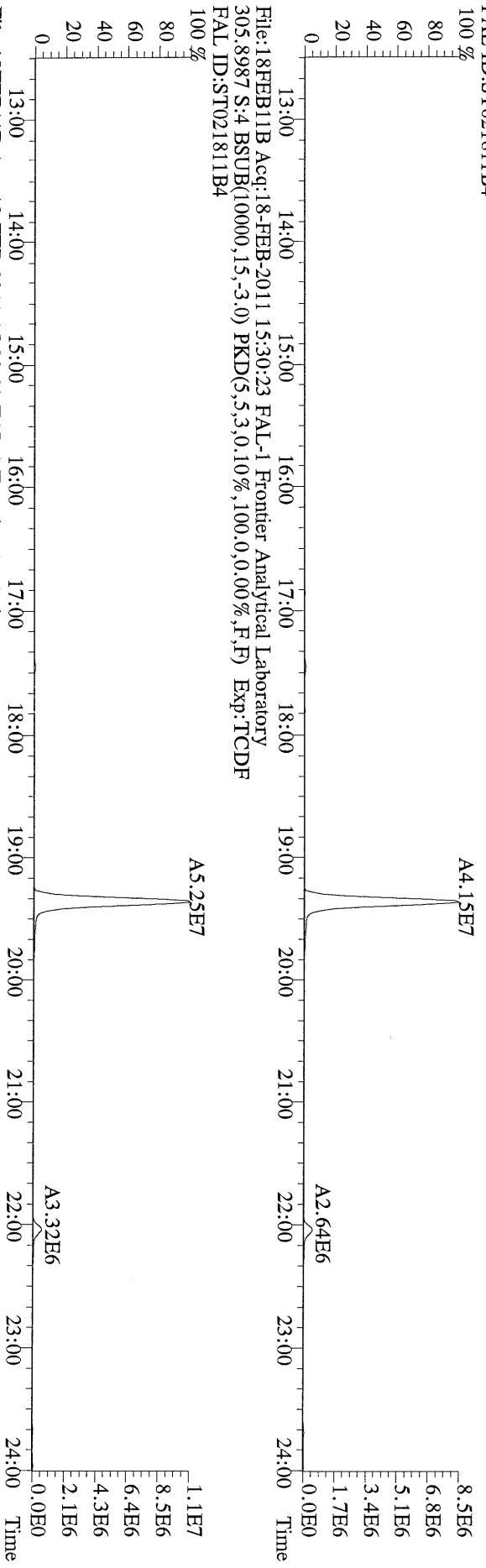
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315.9419 S:3 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:TCDF
FAL ID:ST021811B2



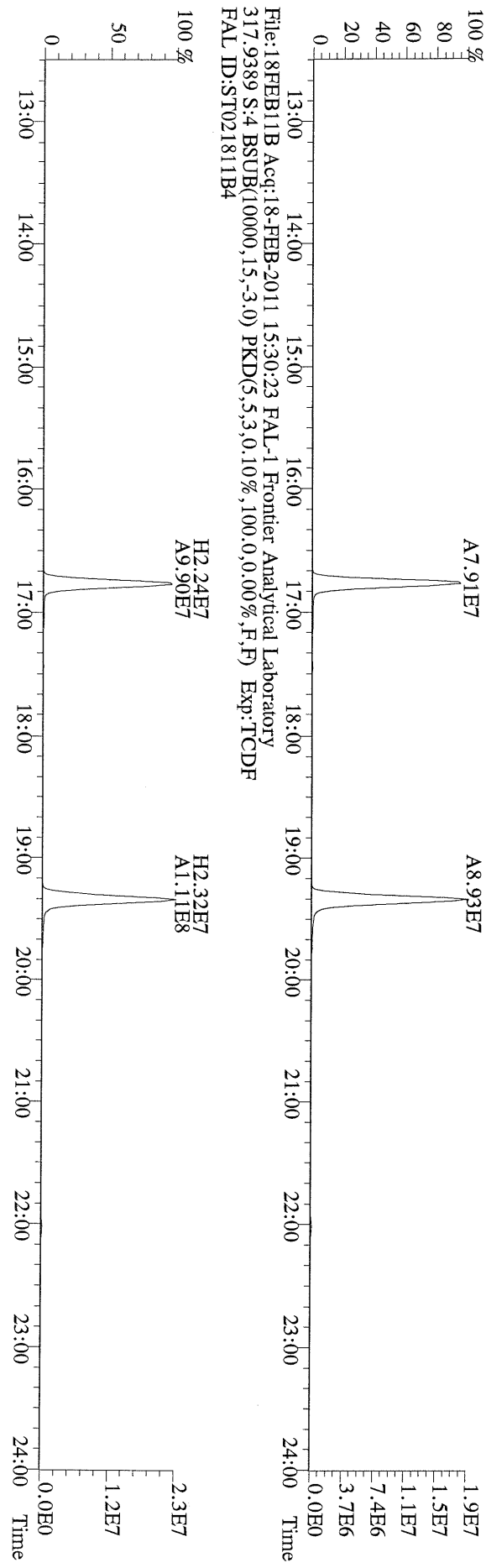
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FAL ID:ST021811B2



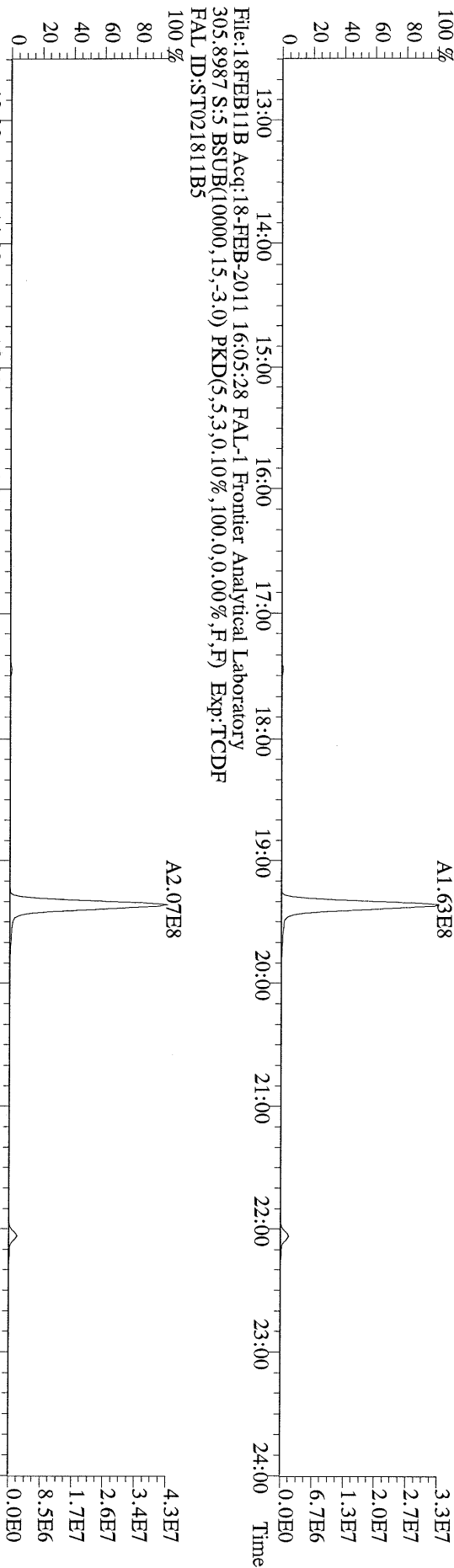
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FAL ID:ST021811B4



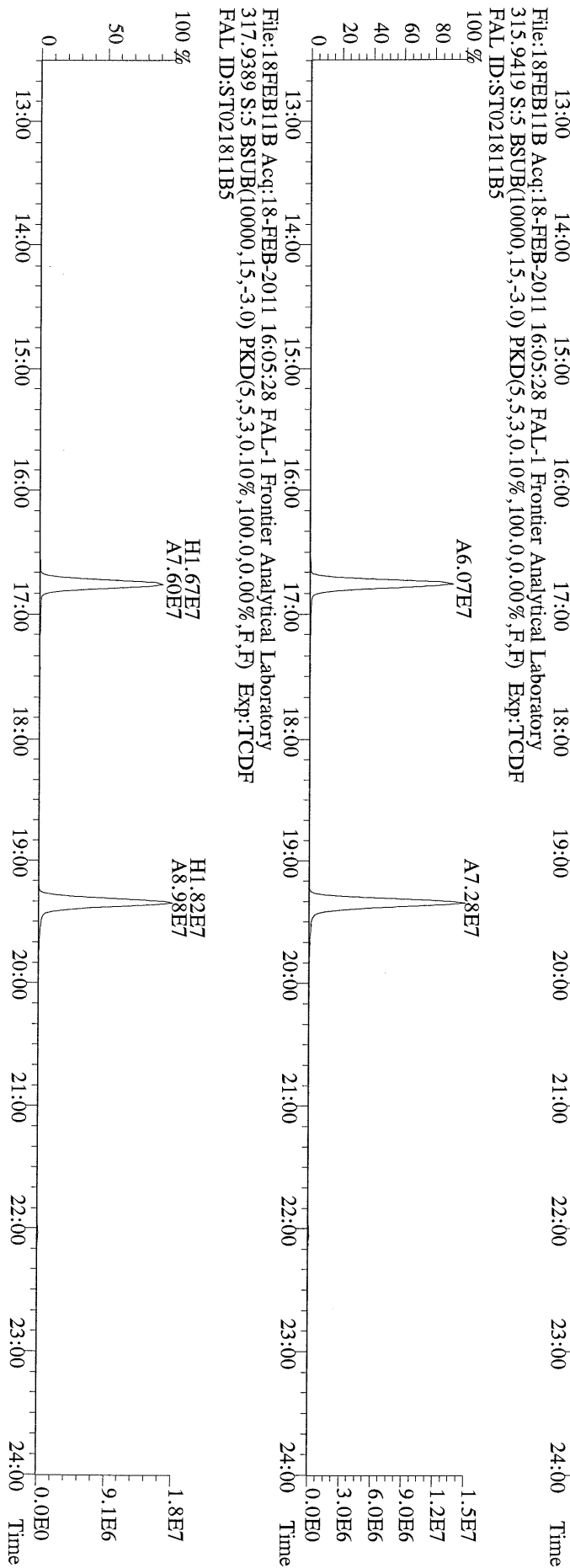
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FAL ID:ST021811B4

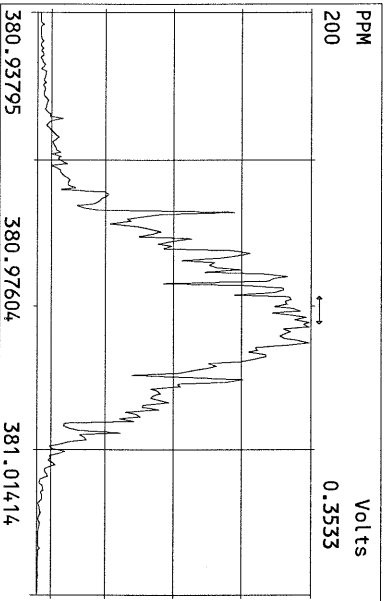
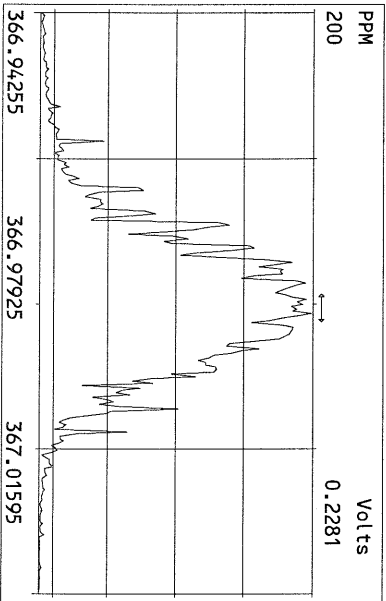
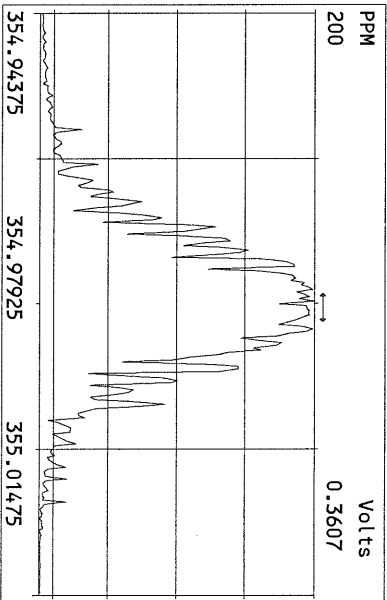
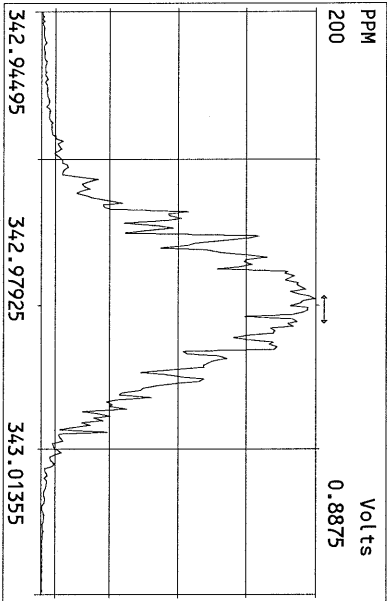
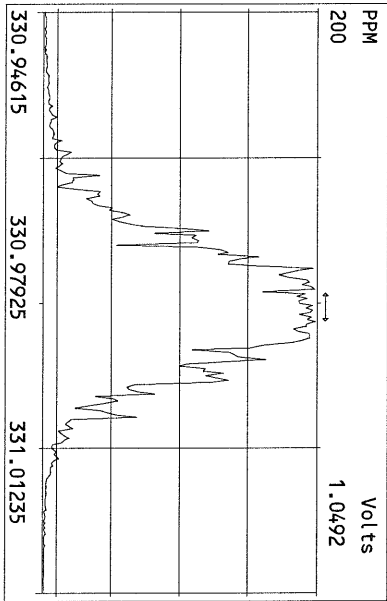
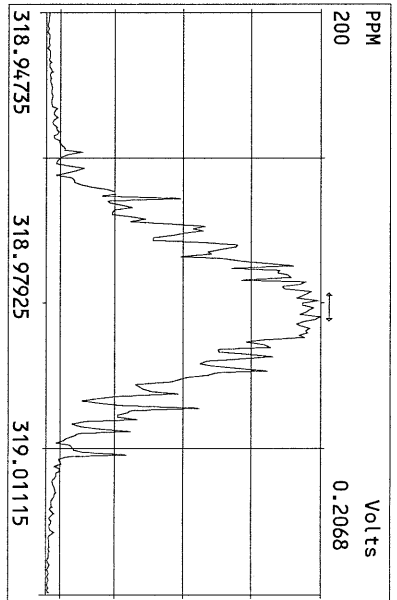
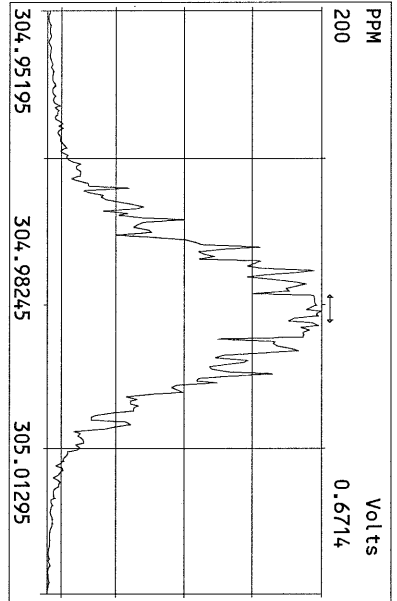
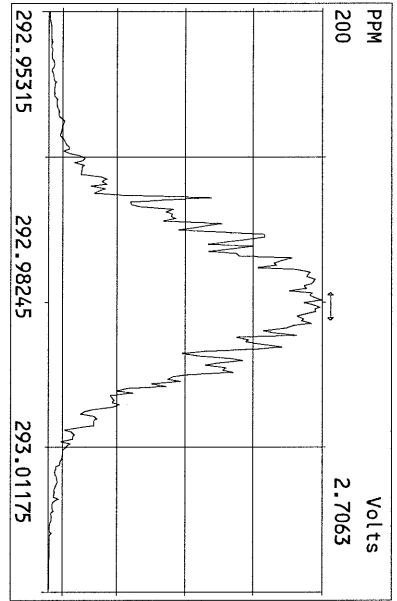


File:18FEB11B Acq:18-FEB-2011 16:05:28 FAL-1 Frontier Analytical Laboratory
303.9016 S:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0,00%,F,F) Exp:TCDF
FAL ID:ST021811B5



File:18FEB11B Acq:18-FEB-2011 16:05:28 FAL-1 Frontier Analytical Laboratory
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FAL ID:ST021811B5





USEPA - ITD

FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.:

Initial Calibration Date: 3/7/11

Instrument ID: FAL3

GC Column ID: DB5

VER Data Filename: 10MAY11M Sam:1

Analysis Date: 10-MAY-11 10:19:37

NATIVE ANALYTES	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
2,3,7,8-TCDD	M/M+2	0.75	0.65-0.89	y	10.5	7.80 - 12.9 ✓
1,2,3,7,8-PeCDD	M+2/M+4	1.57	1.32-1.78	y	51.3	39.0 - 65.0 ✓
1,2,3,4,7,8-HxCDD	M+2/M+4	1.31	1.05-1.43	y	47.8	39.0 - 64.0 ✓
1,2,3,6,7,8-HxCDD	M+2/M+4	1.30	1.05-1.43	y	50.3	39.0 - 64.0 ✓
1,2,3,7,8,9-HxCDD	M+2/M+4	1.29	1.05-1.43	y	50.6	41.0 - 61.0 ✓
1,2,3,4,6,7,8-HpCDD	M+2/M+4	0.92	0.88-1.20	y	50.8	43.0 - 58.0 ✓
OCDD	M+2/M+4	0.94	0.76-1.02	y	100	79.0 - 126 ✓
2,3,7,8-TCDF	M/M+2	0.67	0.65-0.89	y	11.3	8.40 - 12.0 ✓
1,2,3,7,8-PeCDF	M+2/M+4	1.52	1.32-1.78	y	51.0	41.0 - 60.0 ✓
2,3,4,7,8-PeCDF	M+2/M+4	1.52	1.32-1.78	y	50.1	41.0 - 60.0 ✓
1,2,3,4,7,8-HxCDF	M+2/M+4	1.21	1.05-1.43	y	46.9	45.0 - 56.0 ✓
1,2,3,6,7,8-HxCDF	M+2/M+4	1.22	1.05-1.43	y	48.1	44.0 - 57.0 ✓
2,3,4,6,7,8-HxCDF	M+2/M+4	1.21	1.05-1.43	y	46.1	44.0 - 57.0 ✓
1,2,3,7,8,9-HxCDF	M+2/M+4	1.21	1.05-1.43	y	47.2	45.0 - 56.0 ✓
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.04	0.88-1.20	y	47.0	45.0 - 55.0 ✓
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.05	0.88-1.20	y	48.0	43.0 - 58.0 ✓
OCDF	M+2/M+4	0.92	0.76-1.02	y	95.3	63.0 - 159 ✓

(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.

Analyst: Date: 5/11/11

USEPA - ITD

FORM 4B
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Initial Calibration Date: 3/7/11

Instrument ID: FAL3

GC Column ID: DB5

VER Data Filename: 10MAY11M Sam:1

Analysis Date: 10-MAY-11 10:19:37

LABELED 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	93.7	82.0 - 121 ✓
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.76	1.32-1.78	y	90.7	62.0 - 160 ✓
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.25	1.05-1.43	y	97.3	85.0 - 117 ✓
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.24	1.05-1.43	y	103	85.0 - 118 ✓
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.05	0.88-1.20	y	115	72.0 - 138 ✓
13C-OCDD	M+2/M+4	0.96	0.76-1.02	y	200	96.0 - 415 ✓
13C-2,3,7,8-TCDF	M/M+2	0.87	0.65-0.89	y	95.6	71.0 - 140 ✓
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.67	1.32-1.78	y	102	76.0 - 130 ✓
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.70	1.32-1.78	y	100	77.0 - 130 ✓
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.48	0.43-0.59	y	107	76.0 - 131 ✓
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.50	0.43-0.59	y	109	70.0 - 143 ✓
13C-2,3,4,6,7,8-HxCDF	M/M+2	0.49	0.43-0.59	y	107	73.0 - 137 ✓
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.49	0.43-0.59	y	98.7	74.0 - 135 ✓
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.45	0.37-0.51	y	114	78.0 - 129 ✓
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.45	0.37-0.51	y	114	77.0 - 129 ✓
13C-OCDF	M+2/M+4	0.96	0.76-1.02	y	190	96.0 - 415 ✓
CLEANUP STANDARD (4)						
37Cl-2,3,7,8-TCDD					8.93	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: 5/11/11

PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Init. Cal. Date: 3/7/11

Instrument ID: FAL3

GC Column ID: DB5


Analysis Date: 10-MAY-11 10:19:37

CS3 or VER Data Filename: 10MAY11M

Sam:1

NATIVE ANALYTES	RETENTION TIME		RRT	RRT	QC LIMITS (1)
	REFERENCE				
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		1.023		0.989-1.052 ✓
13C-2,3,7,8-TCDD			1.022		0.976-1.043 ✓
13C-2,3,7,8-TCDF			0.993		0.923-1.103 ✓
13C-1,2,3,7,8-PeCDD			1.241		1.000-1.567 ✓
13C-1,2,3,7,8-PeCDF			1.176		0.923-1.203 ✓
13C-2,3,4,7,8-PeCDF			1.226		0.923-1.303 ✓

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

Analyst: Date: 

PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Init. Cal. Date: 3/7/11

Instrument ID: FAL3

GC Column ID: DB5


Analysis Date: 10-MAY-11 10:19:37 CS3 or VER Data Filename: 10MAY11M 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	1.001	0.999-1.001 ✓
1,2,3,6,7,8-HxCDD	13C-1,2,3,6,7,8-HxCDD	1.000	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	1.001	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	1.000	0.999-1.001 ✓
1,2,3,4,7,8,9-HpCDF	13C-1,2,3,4,7,8,9-HpCDF	1.001	0.999-1.001 ✓
OCDD	13C-OCDD	1.000	0.999-1.001 ✓
OCDF	13C-OCDF	1.001	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		0.948	0.944-0.970 ✓
13C-1,2,3,6,7,8-HxCDF		0.953	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		1.128	1.086-1.130 ✓
13C-1,2,3,4,6,7,8-HpCDF		1.079	1.043-1.085 ✓
13C-1,2,3,4,7,8,9-HpCDF		1.151	1.057-1.154 ✓
13C-OCDD		1.270	1.032-1.311 ✓
13C-OCDF		1.279	1.000-1.311 ✓

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

Analyst: Date: 

Name	Resp	RA	RT	RRF	Conc	Qual	Fac Noise-1	Noise-2	DL	DL	
2,3,7,8-TCDD	4.53e+06	0.75 y	27:14	1.13	10.5		2.50	-	-	*	
1,2,3,7,8-PeCDD	1.88e+07	1.57 y	33:05	1.02	51.3		2.50	-	-	*	
1,2,3,4,7,8-HxCDD	1.98e+07	1.31 y	38:28	1.45	47.8		2.50	-	-	*	
1,2,3,6,7,8-HxCDD	1.73e+07	1.30 y	38:37	1.45	50.3		2.50	-	-	*	
1,2,3,7,8,9-HxCDD	1.95e+07	1.29 y	39:05	1.47	50.6		2.50	-	-	*	
1,2,3,4,6,7,8-HpCDD	1.55e+07	0.92 y	44:04	1.30	50.8		2.50	-	-	*	
OCDD	2.17e+07	0.94 y	49:37	1.45	100		2.50	-	-	*	
2,3,7,8-TCDF	8.06e+06	0.67 y	26:29	1.15	11.3		2.50	-	-	*	
1,2,3,7,8-PeCDF	2.52e+07	1.52 y	31:20	0.89	51.0		2.50	-	-	*	
2,3,4,7,8-PeCDF	2.39e+07	1.52 y	32:39	0.89	50.1		2.50	-	-	*	
1,2,3,4,7,8-HxCDF	2.30e+07	1.21 y	37:04	1.01	46.9		2.50	-	-	*	
1,2,3,6,7,8-HxCDF	2.66e+07	1.22 y	37:16	0.89	48.1		2.50	-	-	*	
2,3,4,6,7,8-HxCDF	2.31e+07	1.21 y	38:13	1.02	46.1		2.50	-	-	*	
1,2,3,7,8,9-HxCDF	2.52e+07	1.21 y	39:39	1.10	47.2		2.50	-	-	*	
1,2,3,4,6,7,8-HpCDF	1.93e+07	1.04 y	42:10	1.48	47.0		2.50	-	-	*	
1,2,3,4,7,8,9-HpCDF	1.48e+07	1.05 y	44:59	1.43	48.0		2.50	-	-	*	
OCDF	2.20e+07	0.92 y	49:59	0.84	95.3		2.50	-	-	*	
										Rec	
13C-2,3,7,8-TCDD	3.79e+07	0.78 y	27:13	1.03	93.7					93.7	
13C-1,2,3,7,8-PeCDD	3.61e+07	1.76 y	33:03	1.01	90.7					90.7	
13C-1,2,3,4,7,8-HxCDD	2.86e+07	1.25 y	38:27	1.19	97.3					97.3	
13C-1,2,3,6,7,8-HxCDD	2.37e+07	1.24 y	38:37	0.94	103					103	
13C-1,2,3,4,6,7,8-HpCDD	2.35e+07	1.05 y	44:04	0.83	115					115	
13C-OCDD	3.00e+07	0.96 y	49:36	0.61	200					99.9	
13C-2,3,7,8-TCDF	6.21e+07	0.87 y	26:27	0.98	95.6					95.6	
13C-1,2,3,7,8-PeCDF	5.59e+07	1.67 y	31:19	0.83	102					102	
13C-2,3,4,7,8-PeCDF	5.35e+07	1.70 y	32:38	0.80	100					100	
13C-1,2,3,4,7,8-HxCDF	4.86e+07	0.48 y	37:03	1.84	107					107	
13C-1,2,3,6,7,8-HxCDF	6.20e+07	0.50 y	37:15	2.29	109					109	
13C-2,3,4,6,7,8-HxCDF	4.93e+07	0.49 y	38:11	1.86	107					107	
13C-1,2,3,7,8,9-HxCDF	4.83e+07	0.49 y	39:37	1.98	98.7					98.7	
13C-1,2,3,4,6,7,8-HpCDF	2.77e+07	0.45 y	42:09	0.99	114					114	
13C-1,2,3,4,7,8,9-HpCDF	2.16e+07	0.45 y	44:58	0.77	114					114	
13C-OCDF	5.47e+07	0.96 y	49:58	1.17	190					94.9	
37Cl-2,3,7,8-TCDD	2.56e+06		27:14	0.73	8.93					89.3	
13C-1,2,3,4-TCDD	3.93e+07	0.79 y	26:38	-	104						
13C-1,2,3,4-TCDF	6.63e+07	0.88 y	25:22	-	92.1						
13C-1,2,3,7,8,9-HxCDD	2.47e+07	1.24 y	39:04	-	99.6						
Total Tetra-Dioxins	2.37e+07		24:14	1.13	55.1		2.50	-	-	*	21
Total Penta-Dioxins	4.17e+07		30:06	1.02	114		2.50	-	-	*	10
Total Hexa-Dioxins	6.50e+07		36:00	1.46	170		2.50	-	-	*	17
Total Hepta-Dioxins	3.29e+07		42:42	1.30	108		2.50	-	-	*	13
Total Tetra-Furans	3.75e+07		22:52	1.15	52.7		2.50	-	-	*	19
1st Fn. Tot Penta-Furans	2.95e+07		28:15	0.89	60.8		2.50	-	-	*	PeCDF 1
Total Penta-Furans	7.25e+07		30:01	0.89	149		2.50	-	-	*	210 14
Total Hexa-Furans	1.14e+08		35:06	1.00	219		2.50	-	-	*	11
Total Hepta-Furans	3.47e+07		42:10	1.46	96.6		2.50	-	-	*	15

Analyst: 

Date: 5/11/11

Frontier Analytical Laboratory - Acquisition Log

Run Name:10MAY11M

Instrument: FAL3

GC: DB5

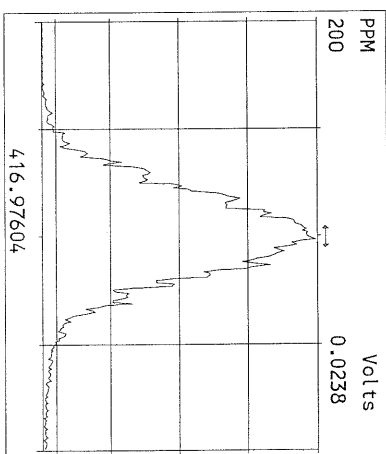
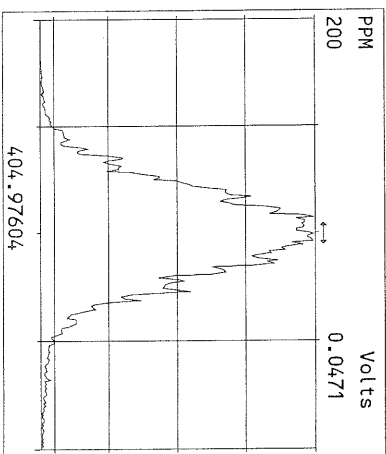
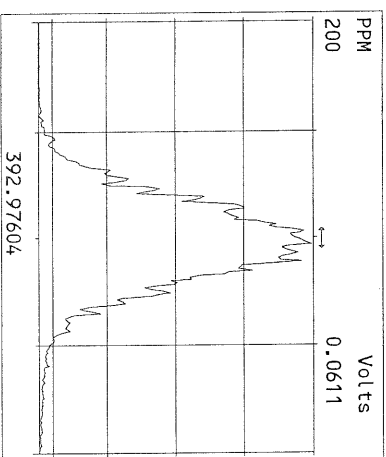
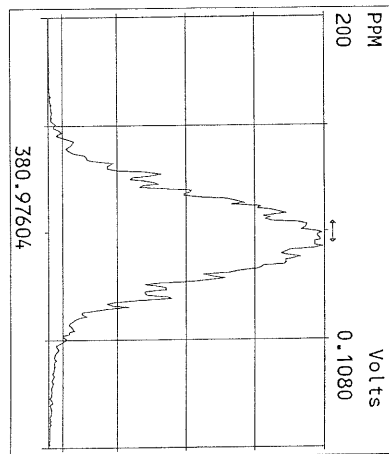
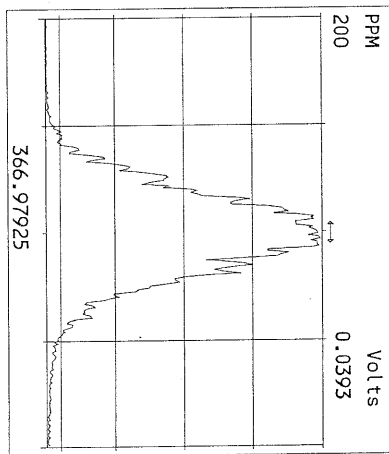
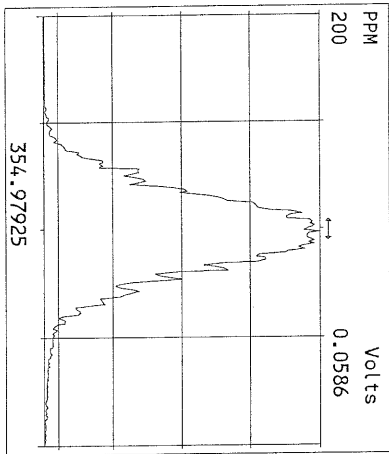
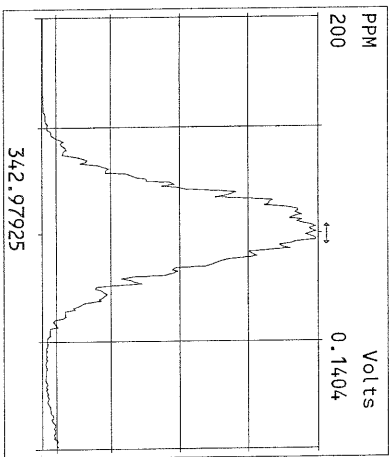
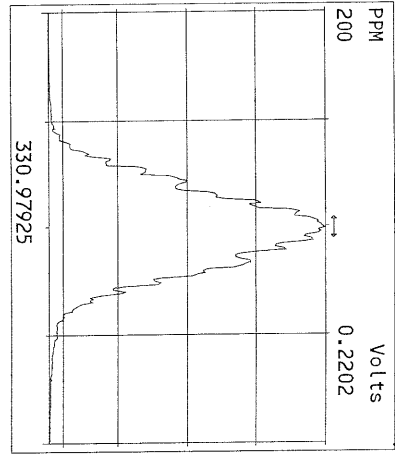
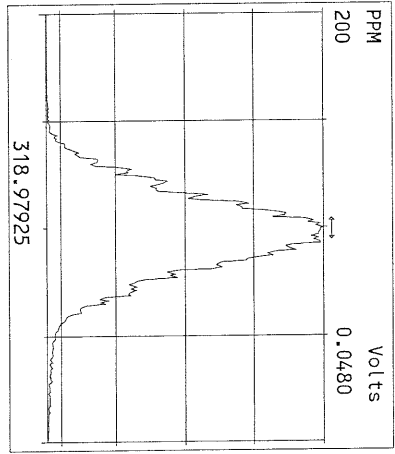
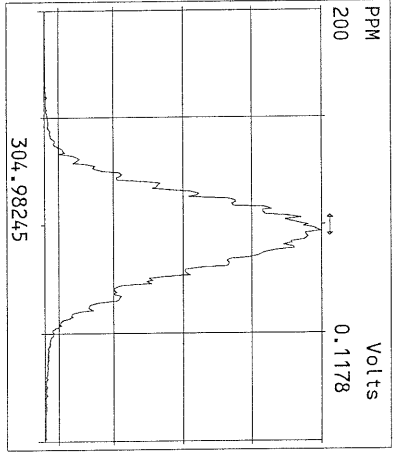
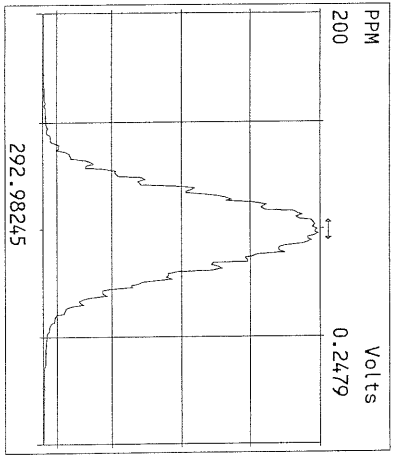
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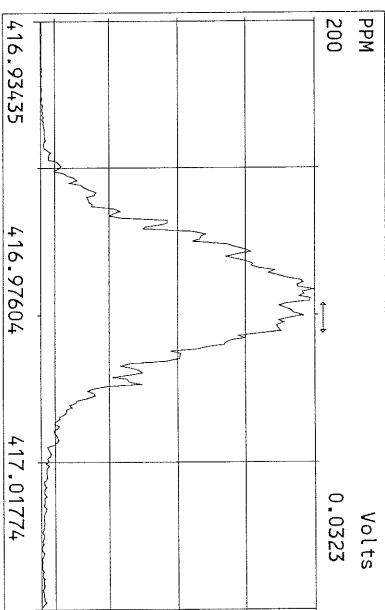
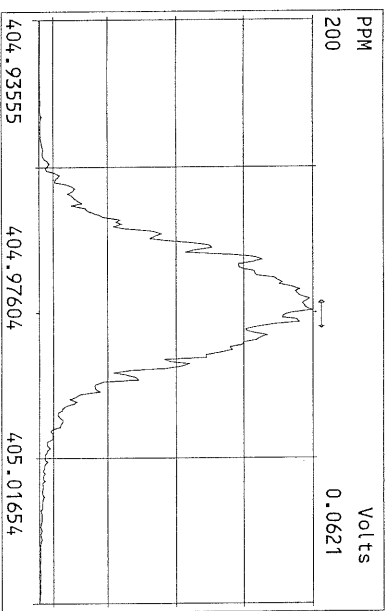
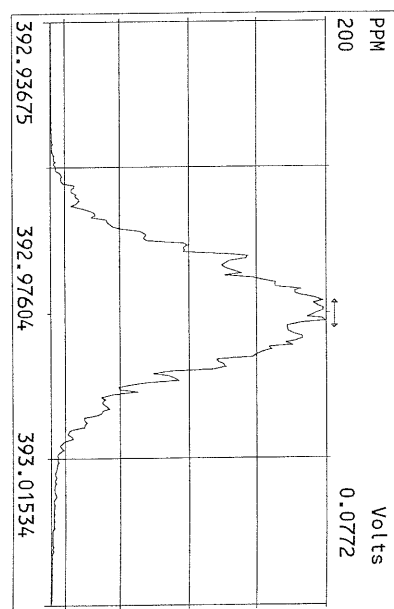
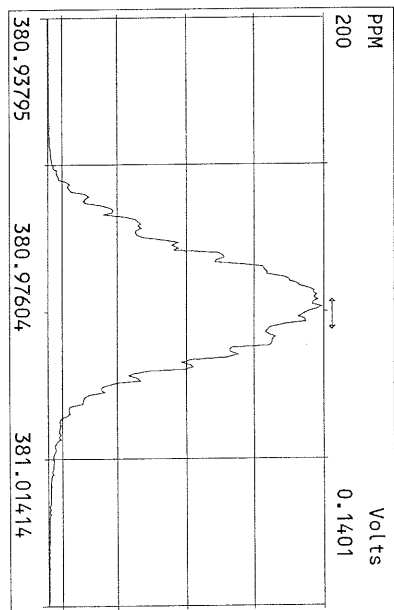
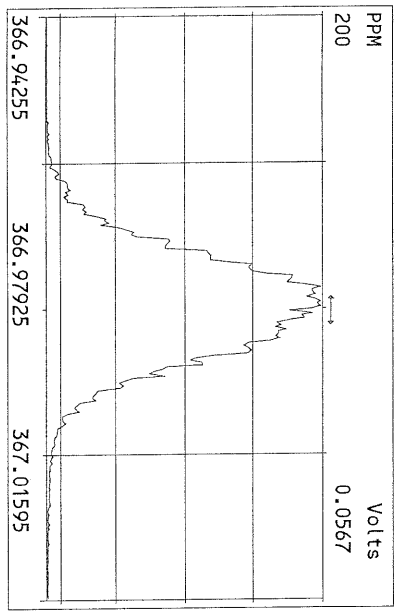
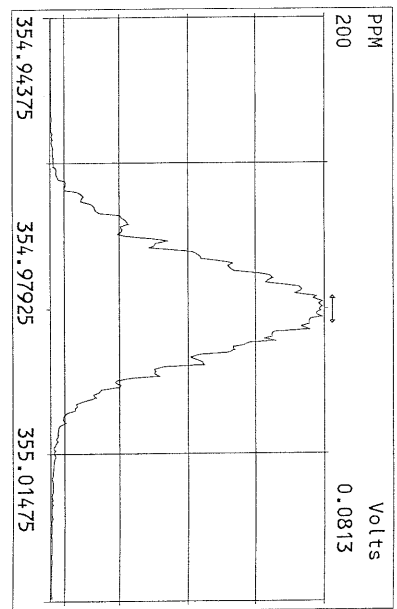
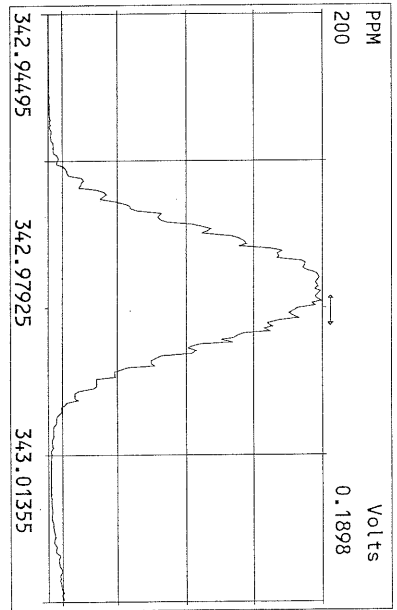
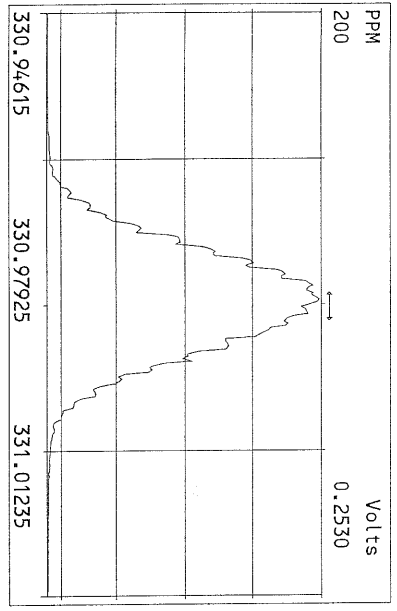
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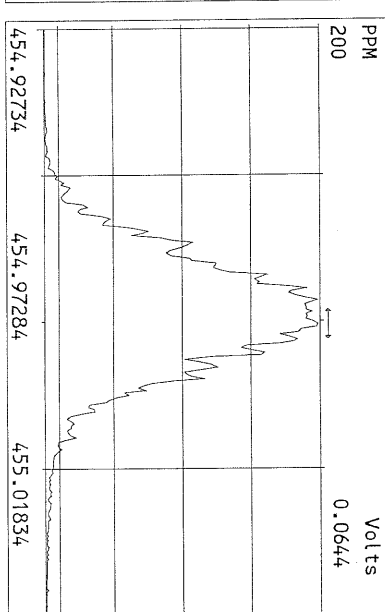
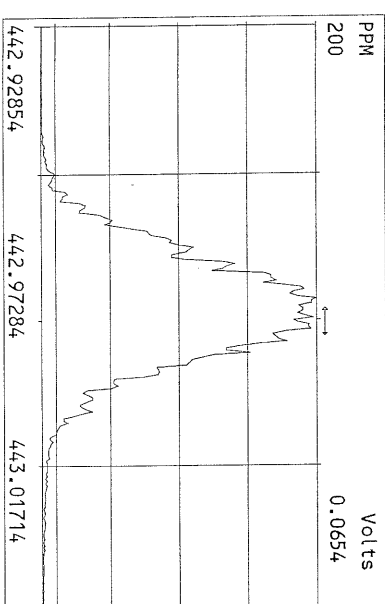
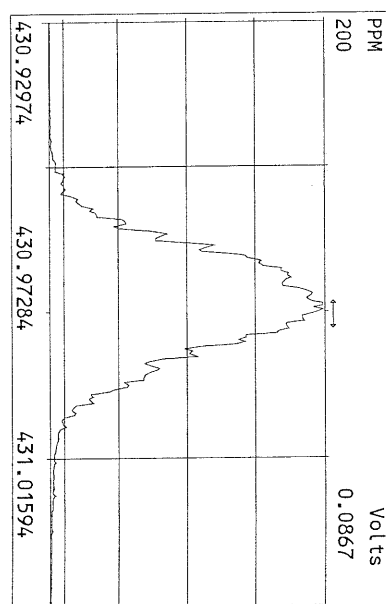
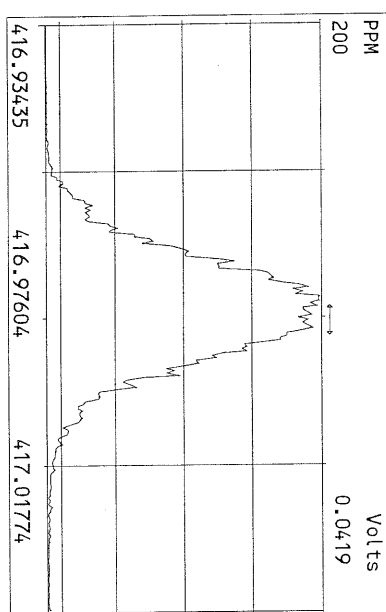
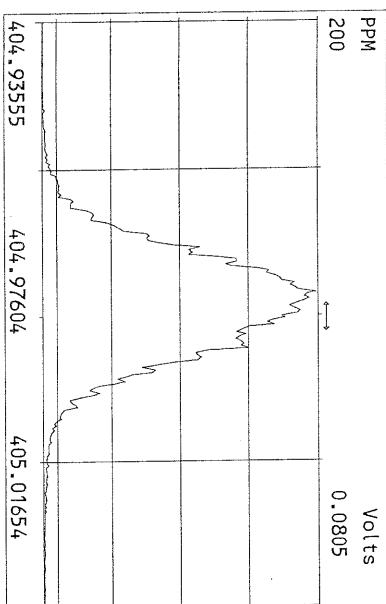
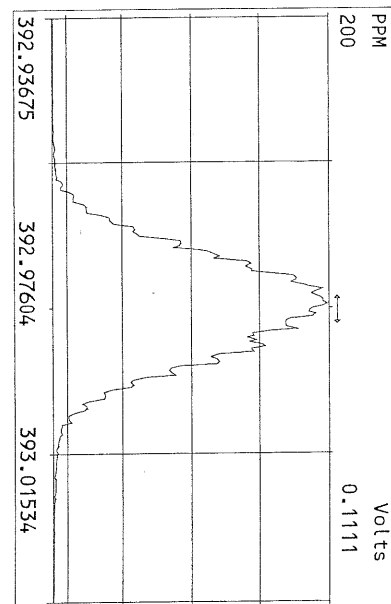
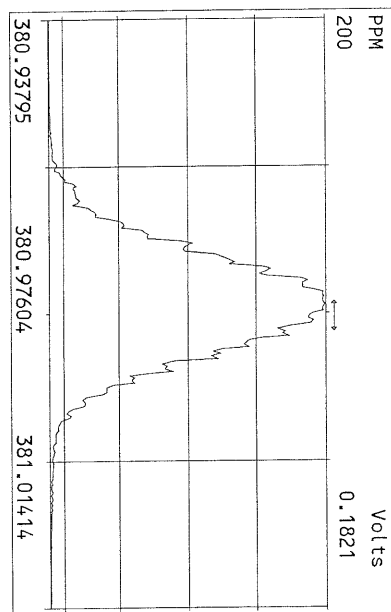
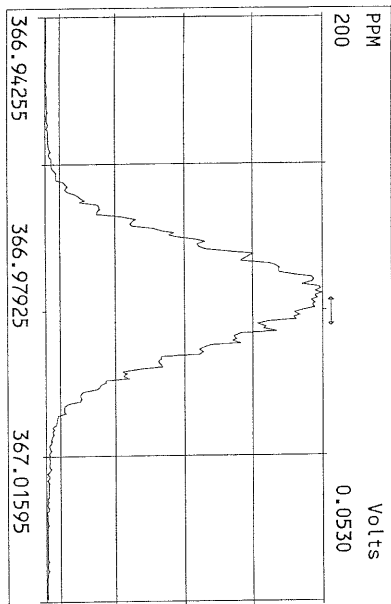
5/11/11

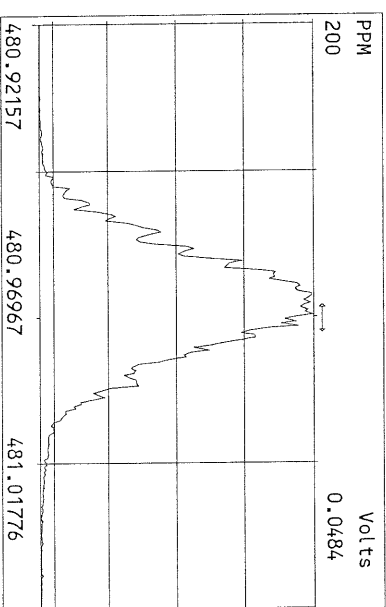
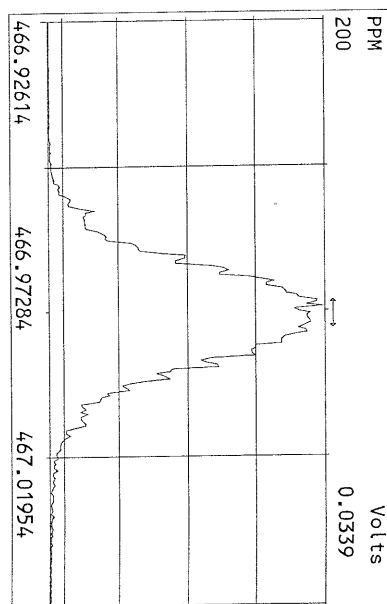
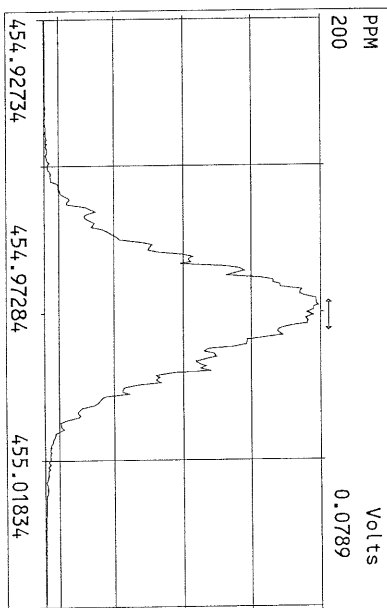
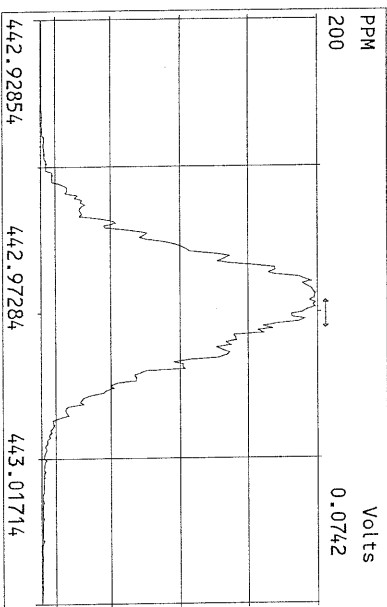
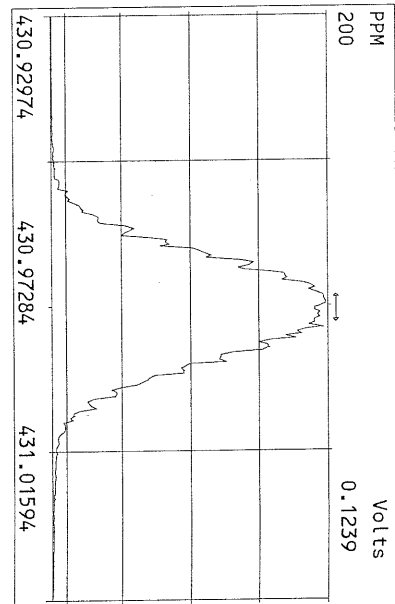
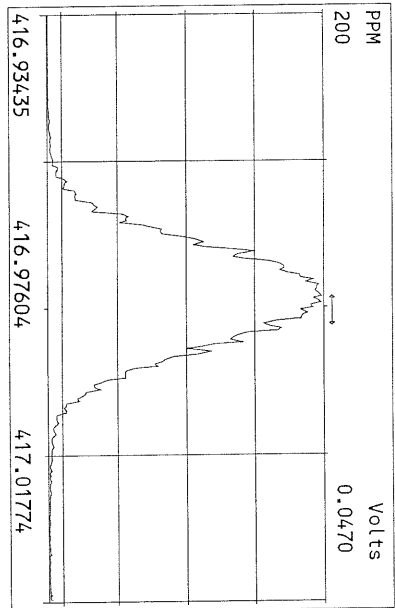
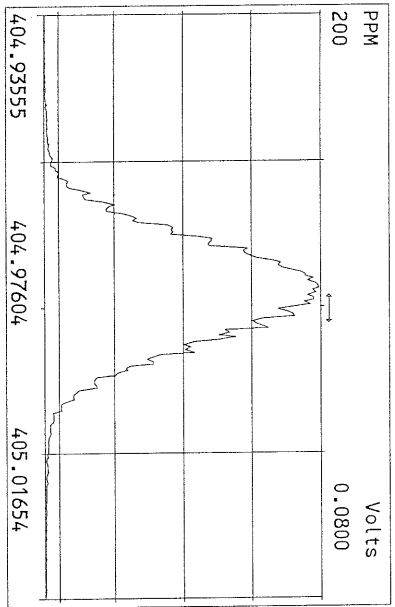
Data Backed Up: _____

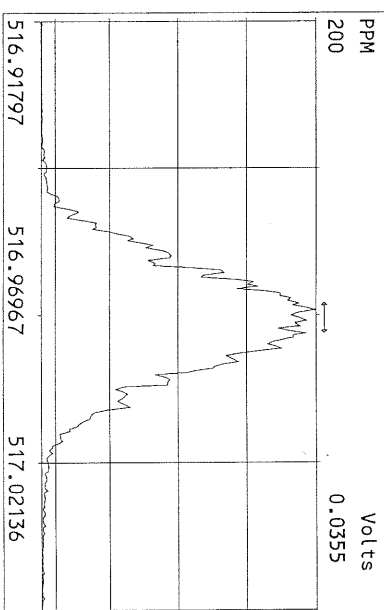
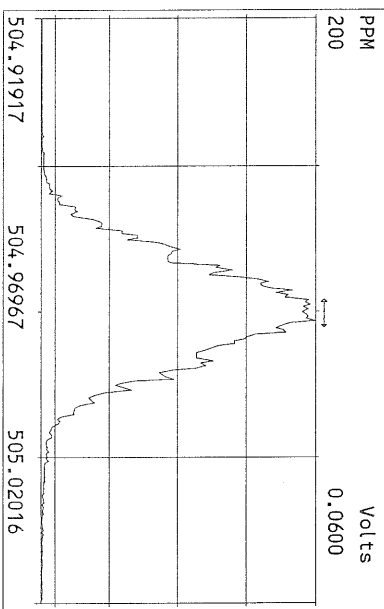
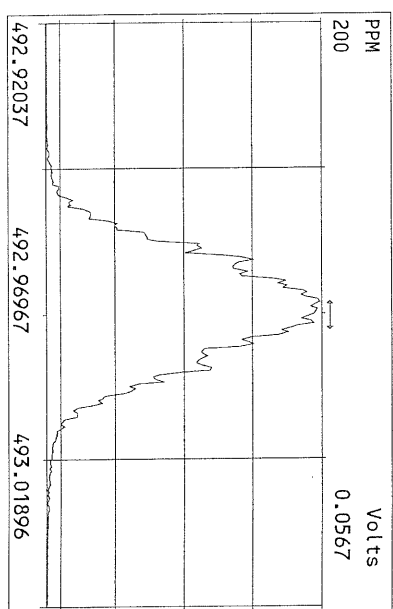
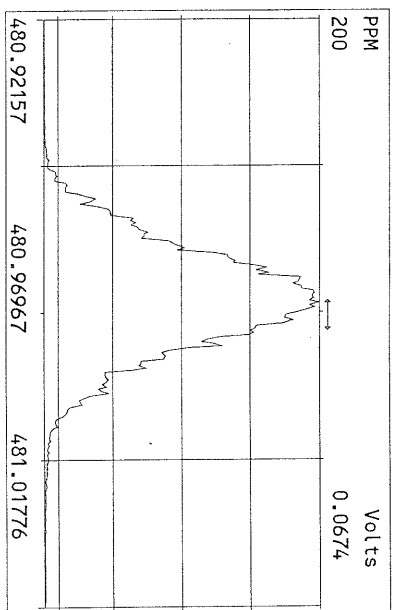
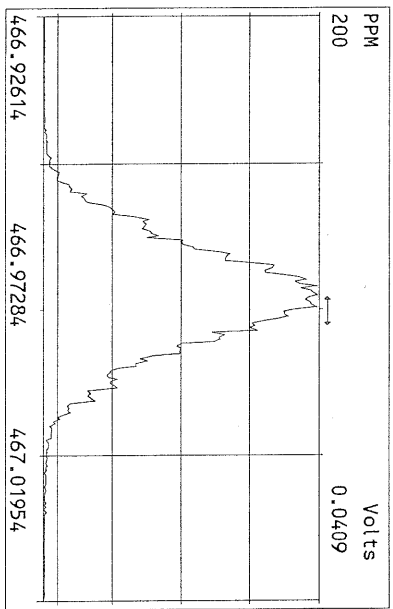
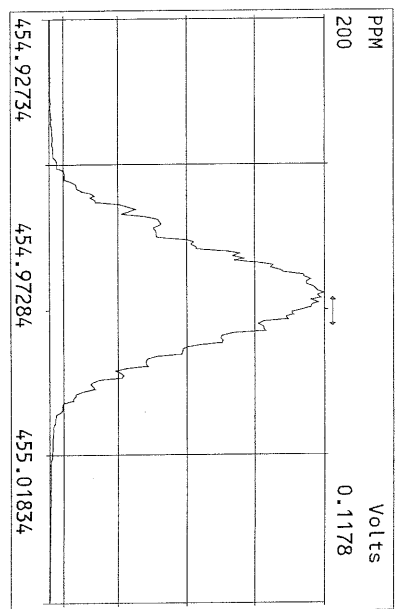
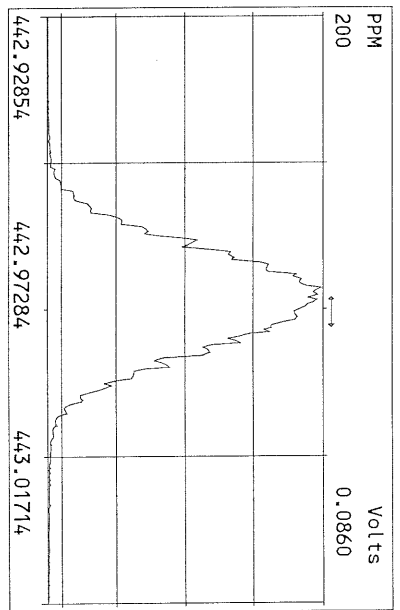
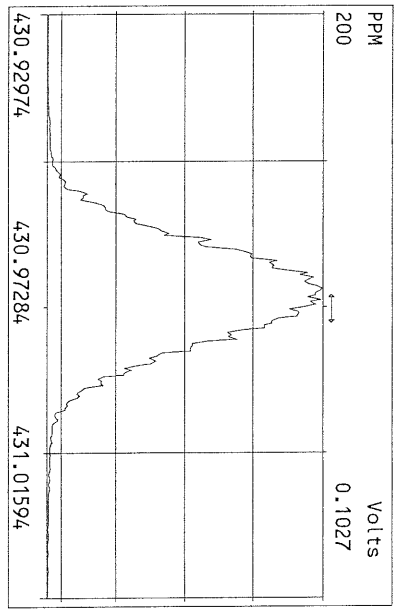
Date: _____



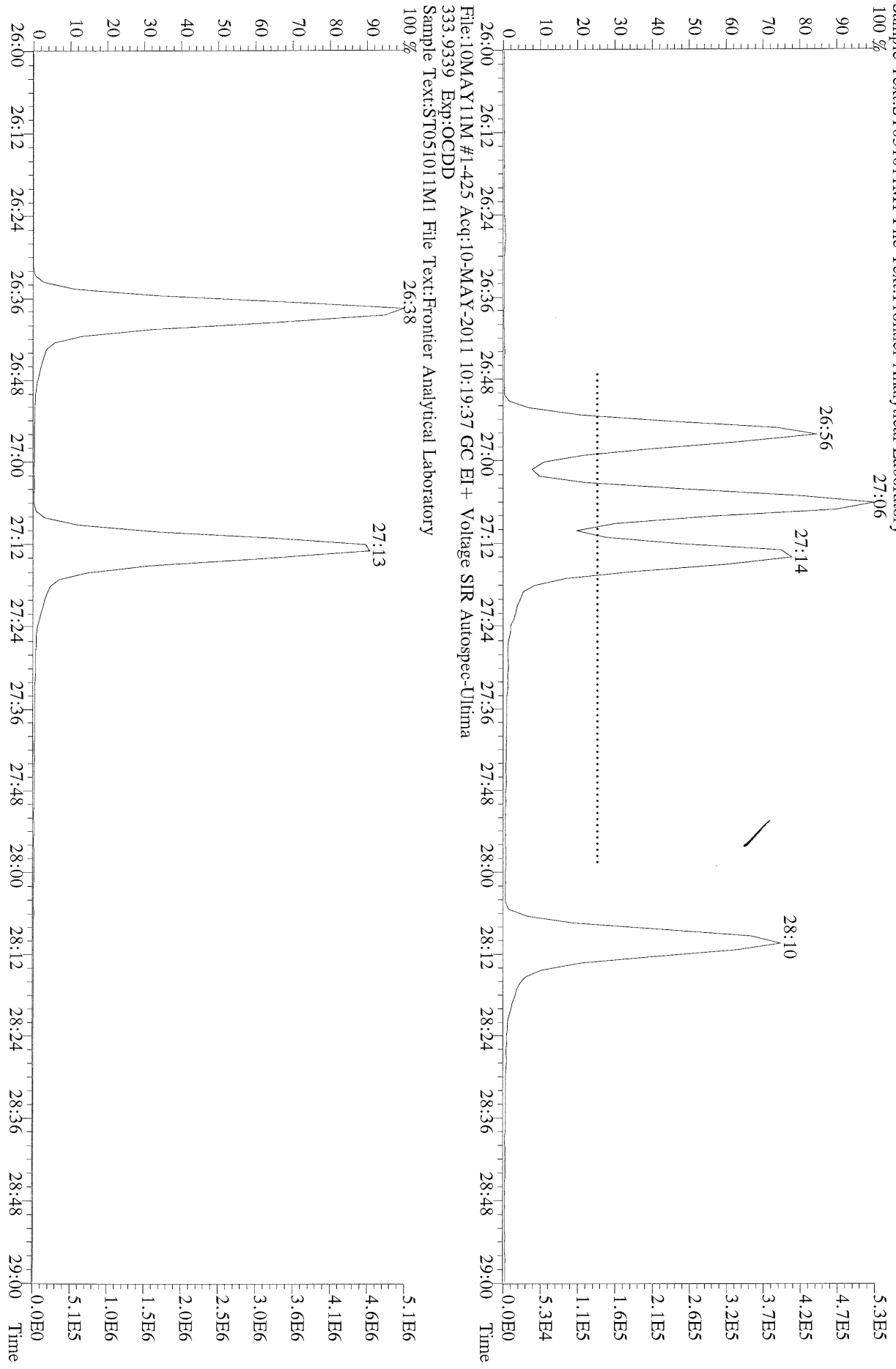






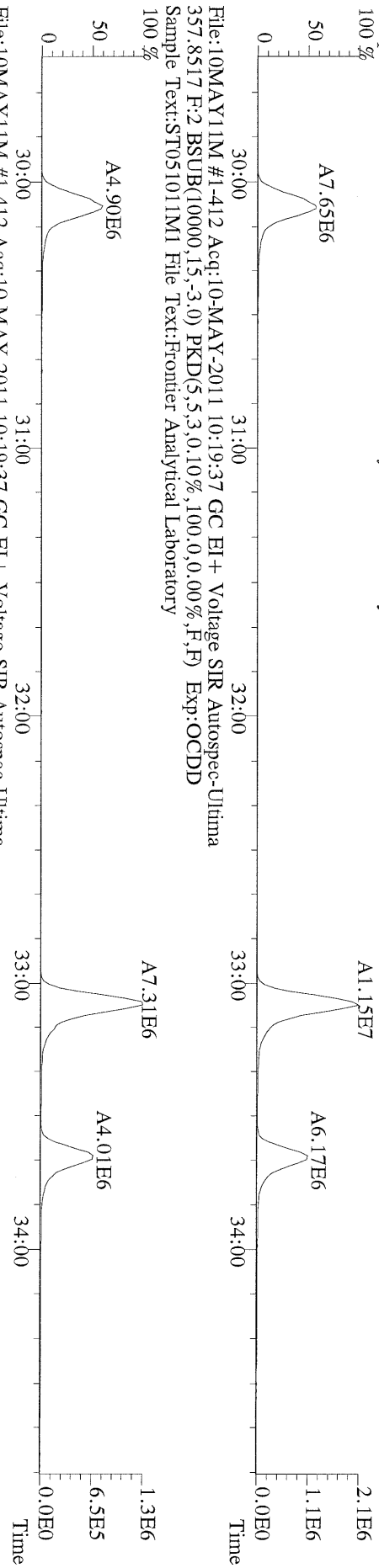


File:10MAY11M #1-425 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
319.8965 Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory
100%

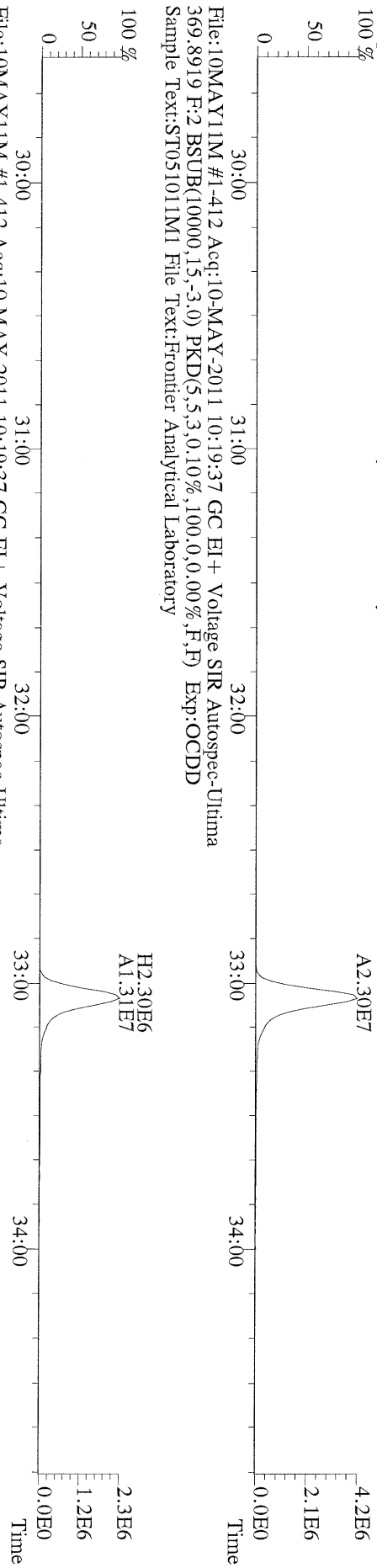


File:10MAY11M #1-425 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
333.9339 Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory

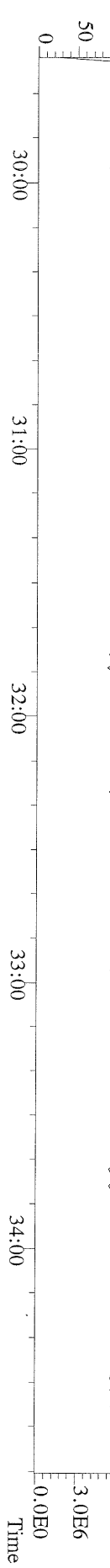
File:10MAY11M #1-412 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
 355.8546 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory
 100 %



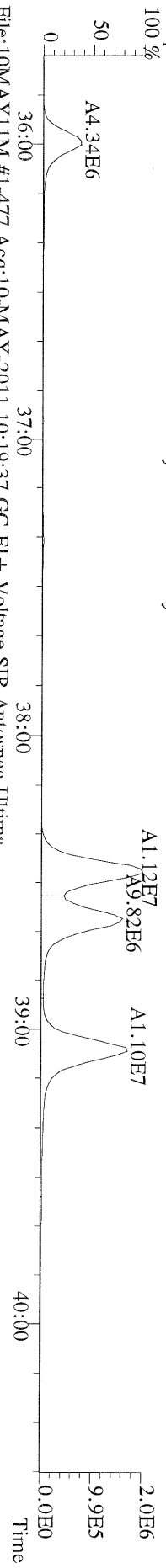
File:10MAY11M #1-412 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
 367.8949 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory
 100 %



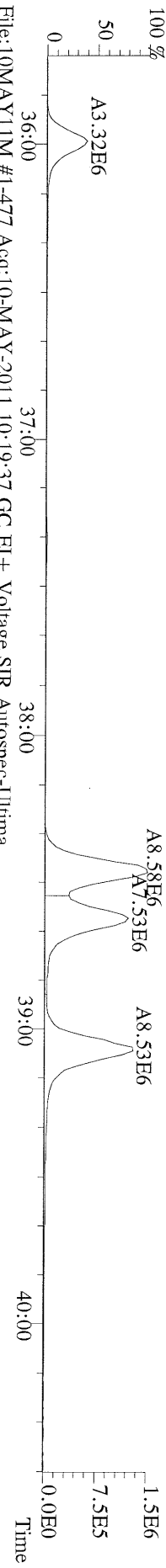
File:10MAY11M #1-412 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
 369.8919 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory
 100 %



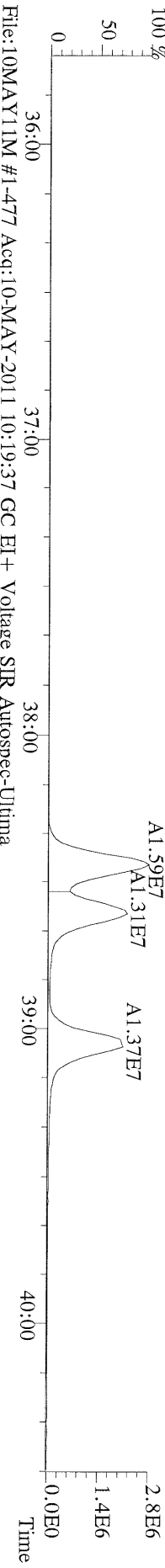
File:10MAY11M #1-477 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Utima
 389.8156 F:3 BSUB(10000,15,-3.0) PKD(5,5,3.0,10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



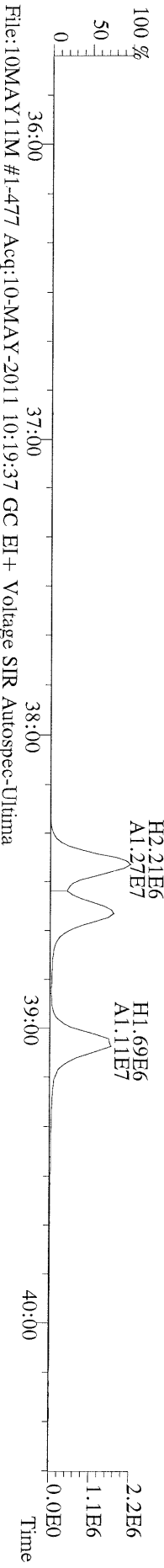
File:10MAY11M #1-477 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Utima
 391.8127 F:3 BSUB(10000,15,-3.0) PKD(5,5,3.0,10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



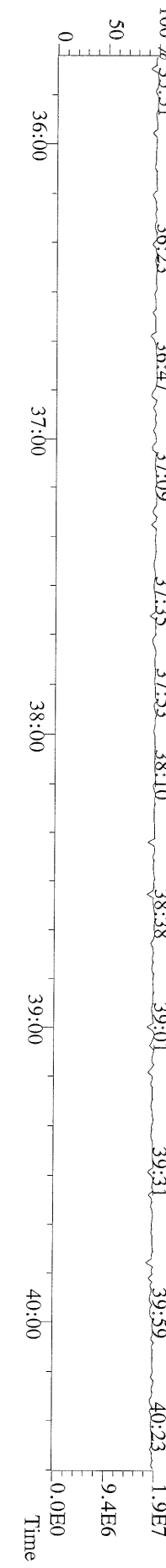
File:10MAY11M #1-477 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Utima
 401.8559 F:3 BSUB(10000,15,-3.0) PKD(5,5,3.0,10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



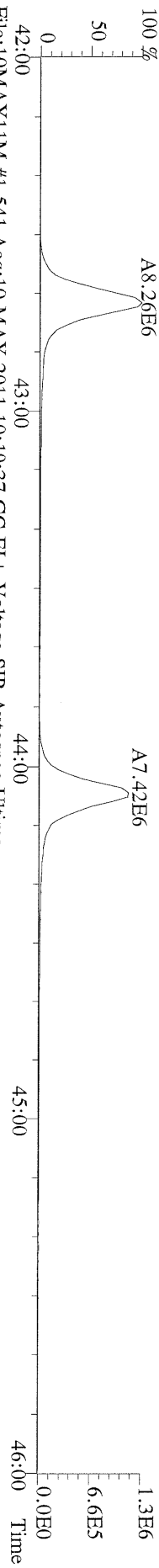
File:10MAY11M #1-477 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Utima
 403.8530 F:3 BSUB(10000,15,-3.0) PKD(5,5,3.0,10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



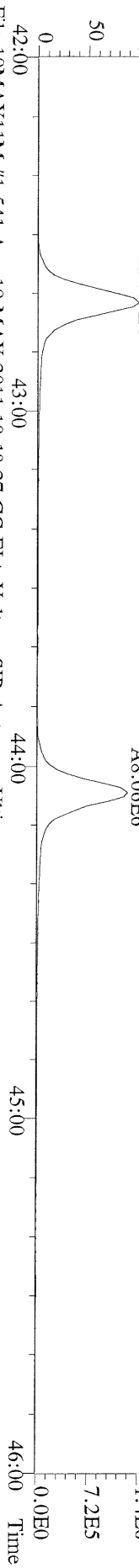
File:10MAY11M #1-477 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Utima
 380.9760 F:3 Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



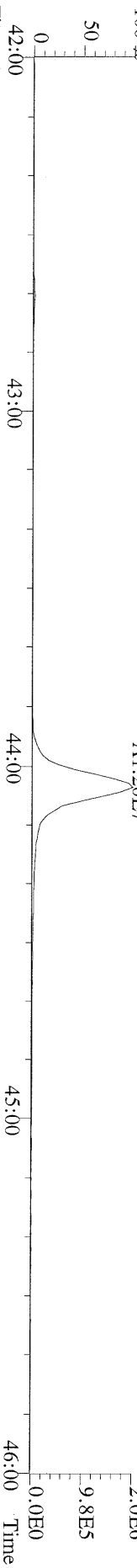
File:10MAY11M #1-541 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
423.7767 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



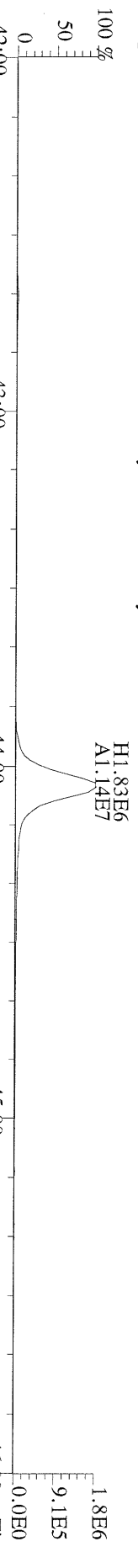
File:10MAY11M #1-541 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
425.7737 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



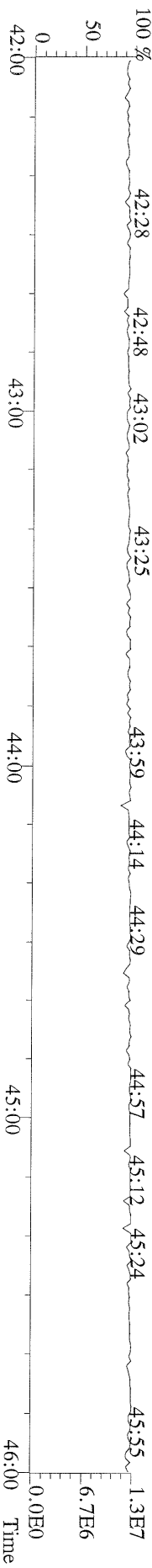
File:10MAY11M #1-541 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
435.8169 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



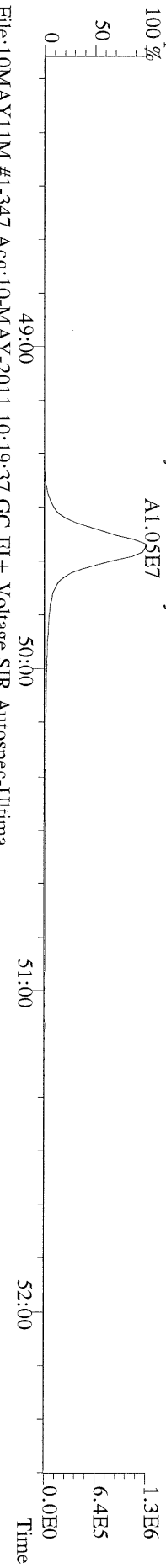
File:10MAY11M #1-541 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
437.8140 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



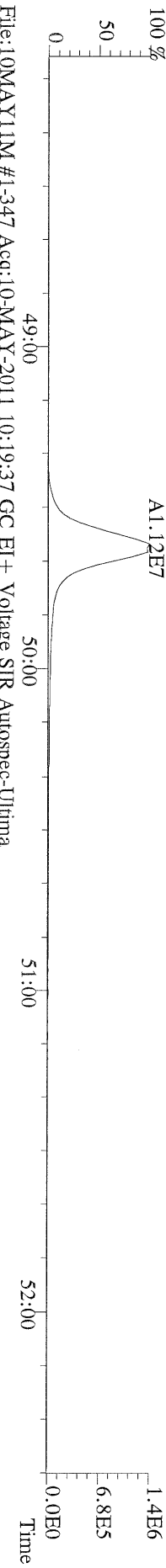
File:10MAY11M #1-541 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
430.9728 F:4 Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



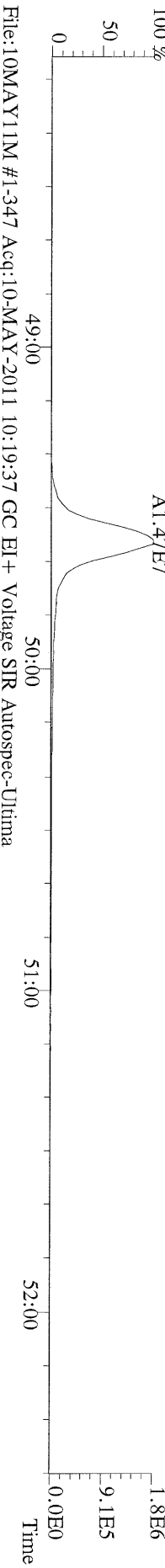
File:10MAY11M #1-347 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Utima
457.7377 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



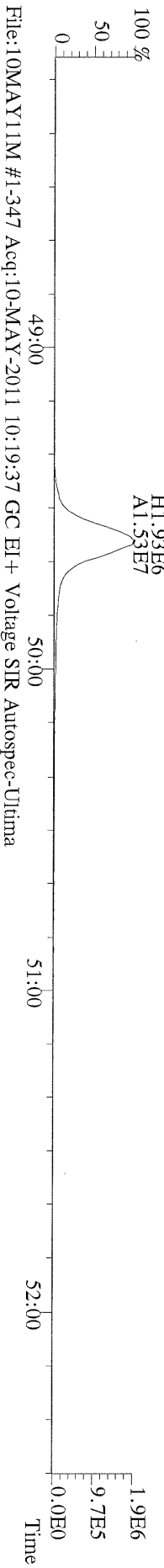
File:10MAY11M #1-347 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Utima
459.7348 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



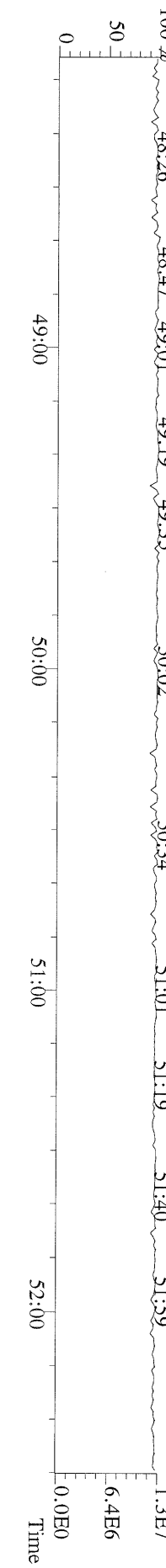
File:10MAY11M #1-347 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Utima
469.7780 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



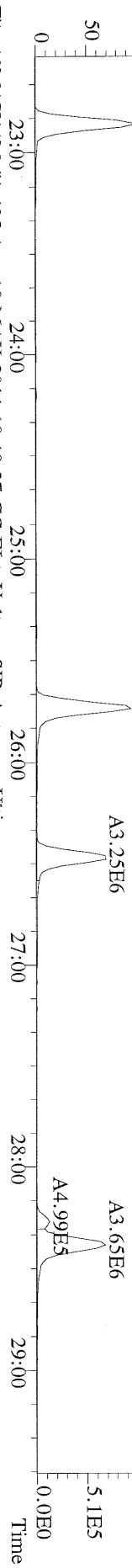
File:10MAY11M #1-347 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Utima
471.7750 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



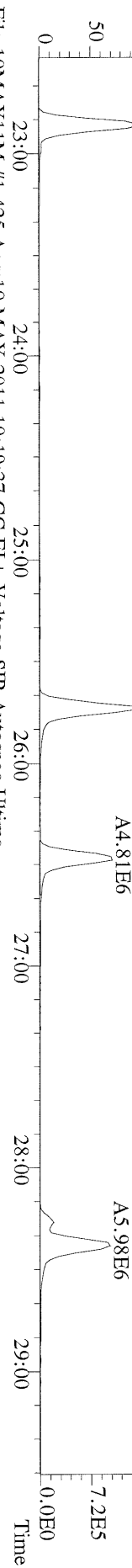
File:10MAY11M #1-347 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Utima
454.9728 F:5 Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



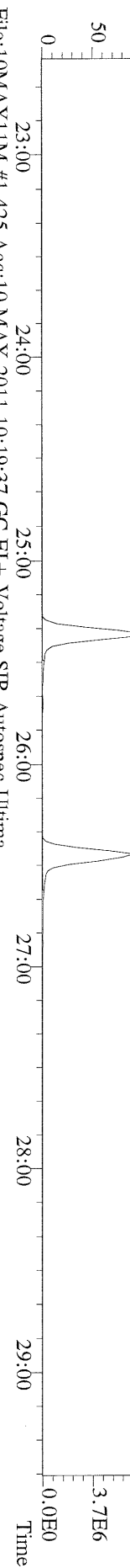
File:10MAY11M #1-425 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
 303.9016 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0,0%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



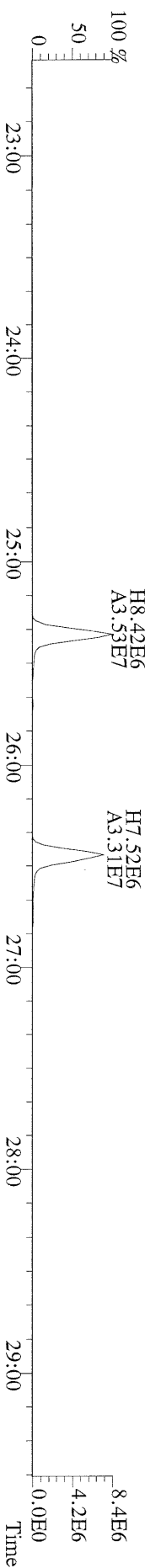
File:10MAY11M #1-425 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
 305.8987 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0,0%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



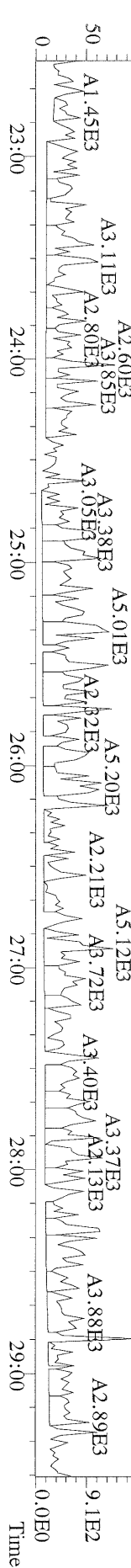
File:10MAY11M #1-425 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
 315.9419 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0,0%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



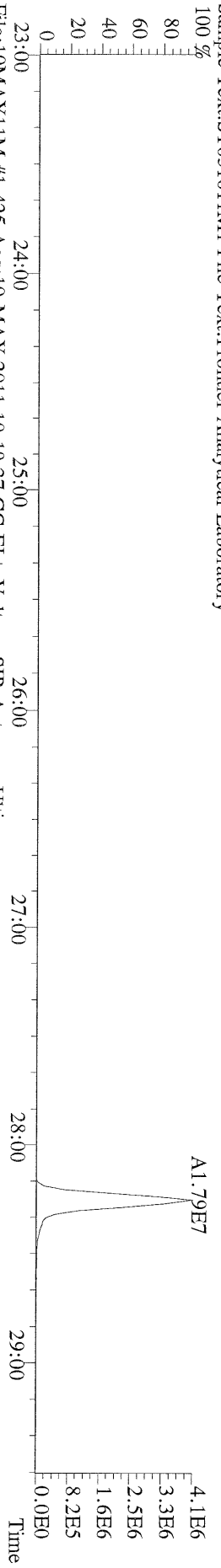
File:10MAY11M #1-425 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
 317.9389 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0,0%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



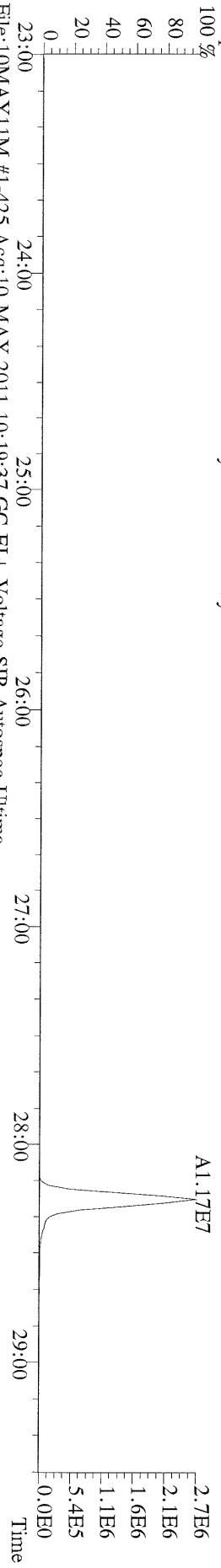
File:10MAY11M #1-425 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
 375.8364 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0,0%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



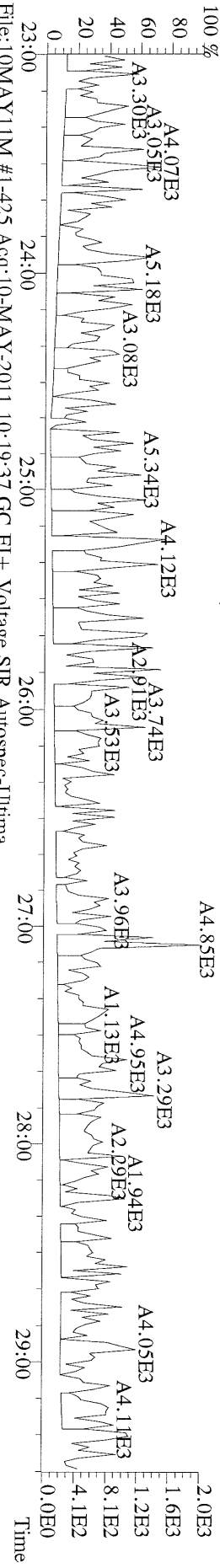
File:10MAY11M #1-425 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
 339.8597 BSUB(10000,15,-3.0) PKD(5,5.3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



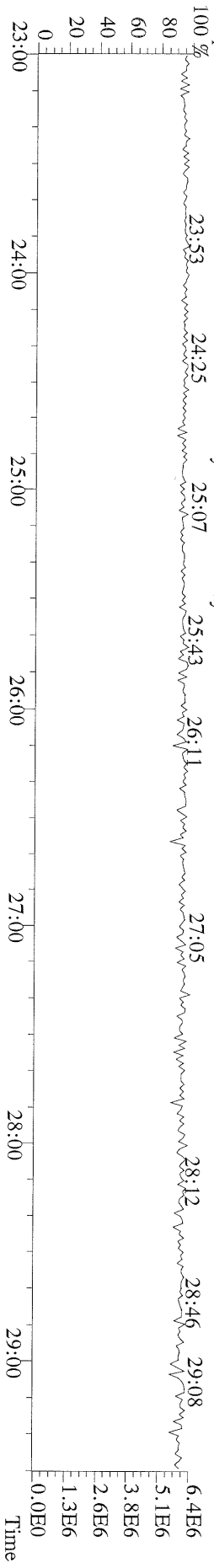
File:10MAY11M #1-425 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
 341.8568 BSUB(10000,15,-3.0) PKD(5,5.3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



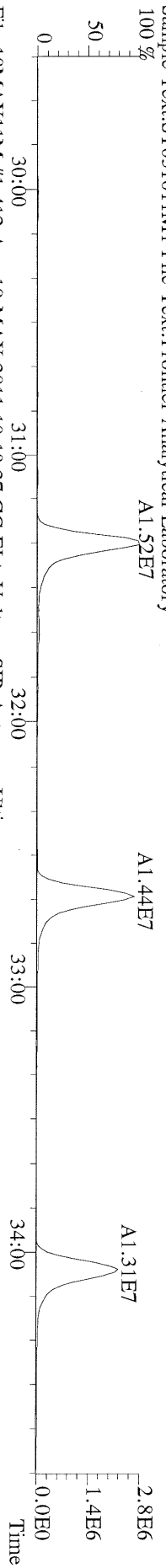
File:10MAY11M #1-425 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
 409.7974 BSUB(10000,15,-3.0) PKD(5,5.3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



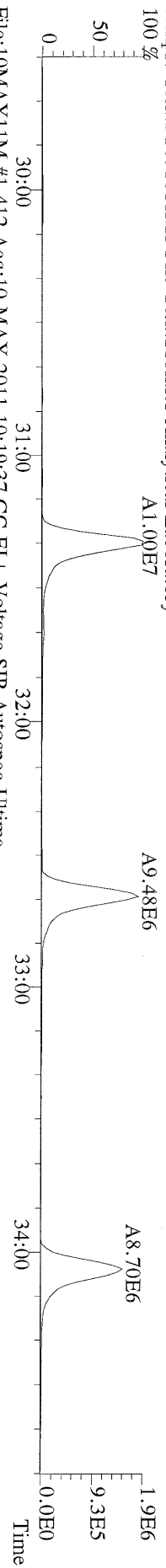
File:10MAY11M #1-425 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
 316.9824 Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



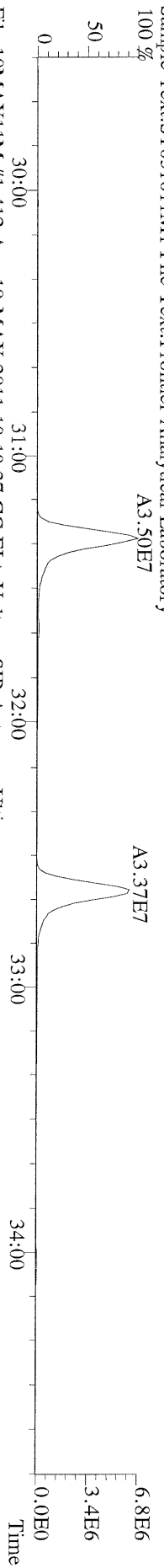
File:10MAY11M #1-412 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
 339.8597 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



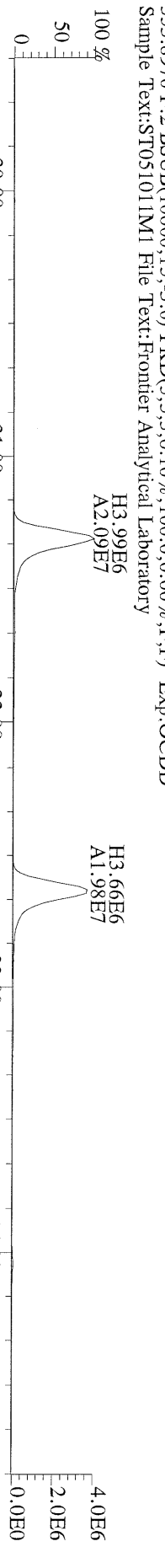
File:10MAY11M #1-412 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
 341.8568 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



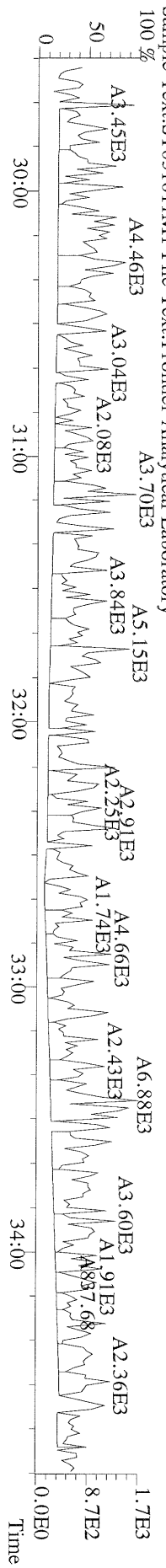
File:10MAY11M #1-412 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
 351.9000 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



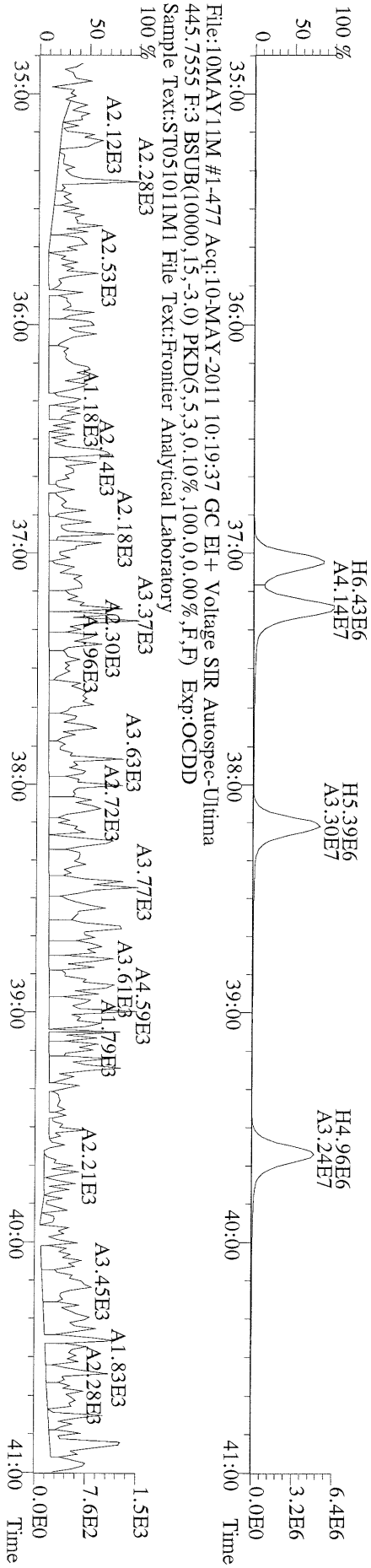
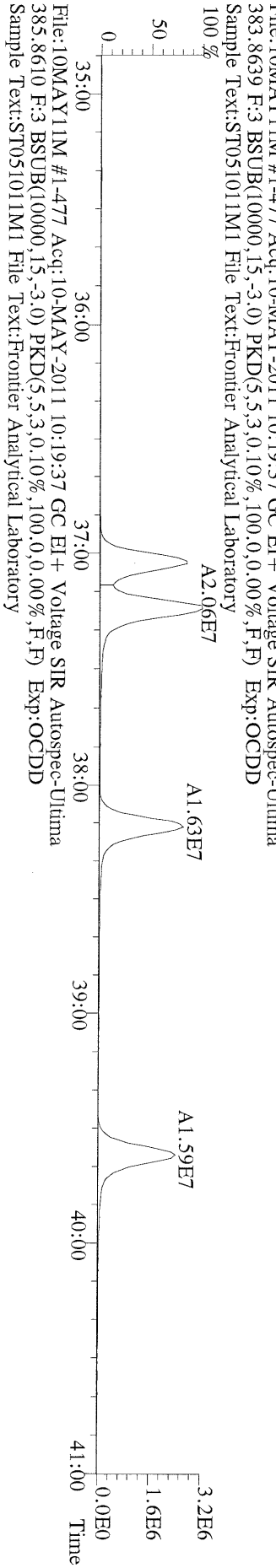
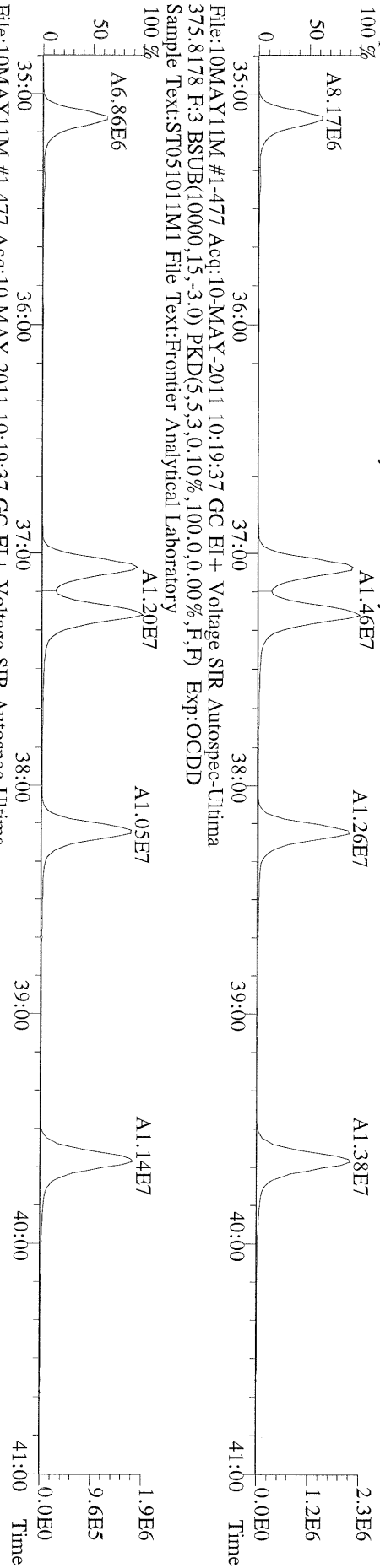
File:10MAY11M #1-412 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
 353.8970 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



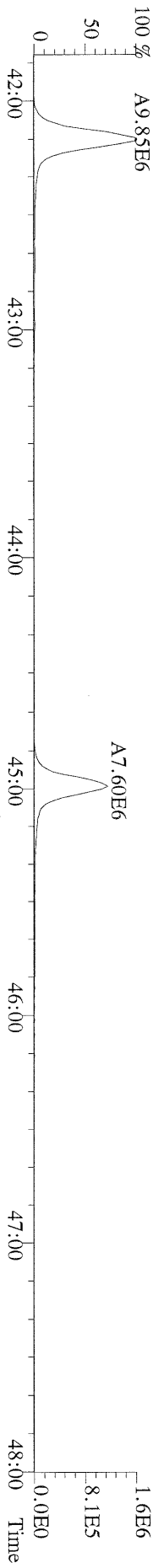
File:10MAY11M #1-412 Acq:10-MAY-2011 10:19:37 GC EI + Voltage SIR Autospec-Ultima
 409.7974 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



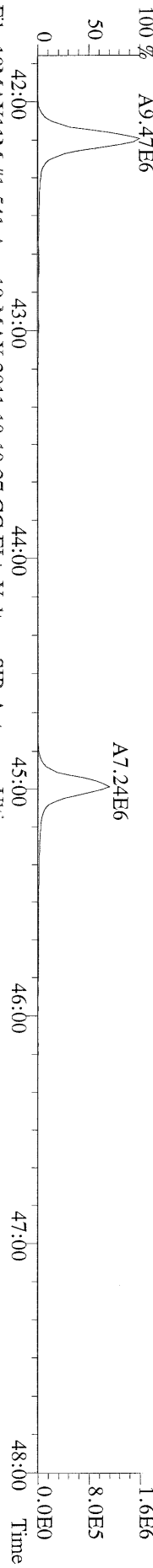
File:10MAY11M #1-477 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
373.8207 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



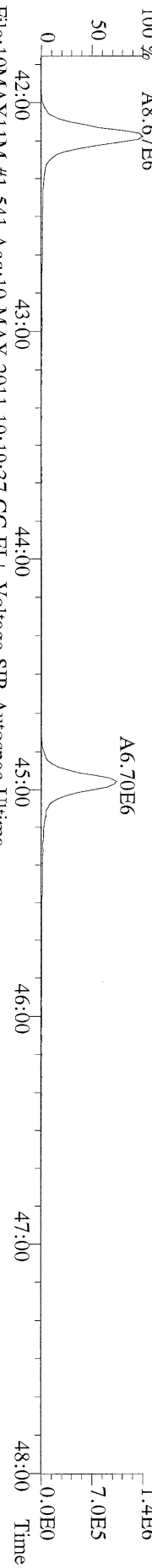
File:10MAY11M #1-541 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Ultima
407.7818 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



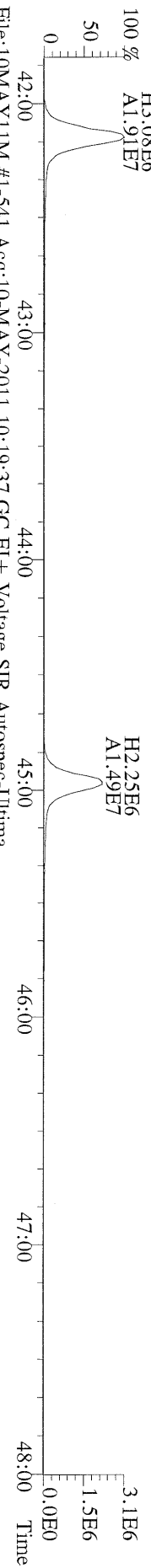
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409.7788 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



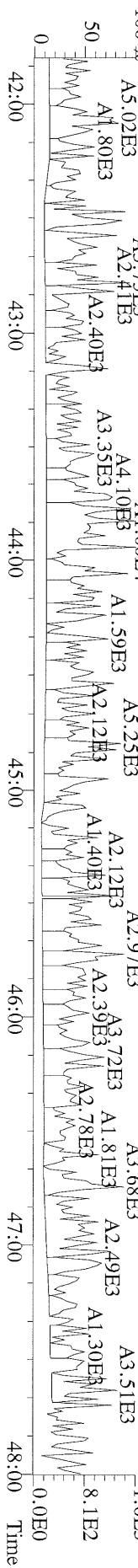
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417.8253 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



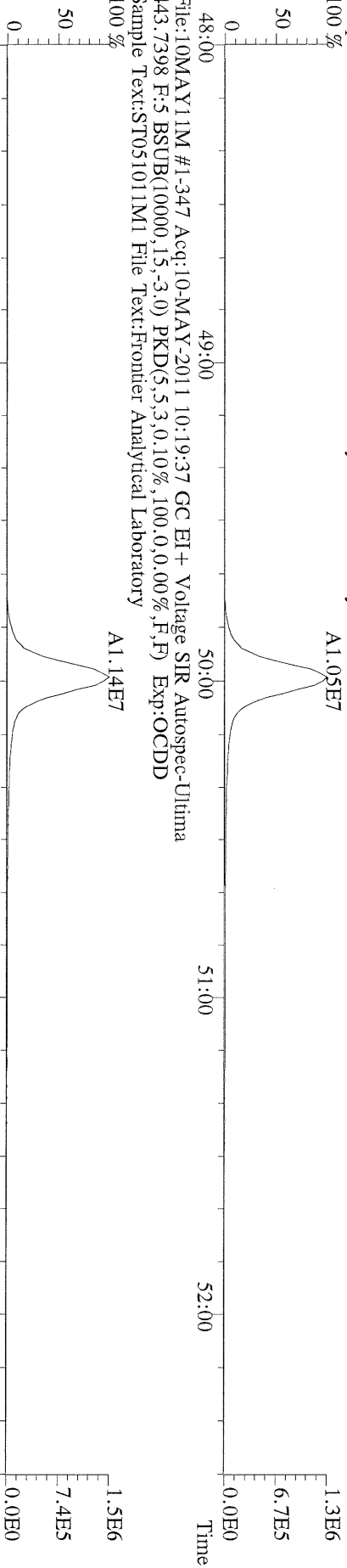
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Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



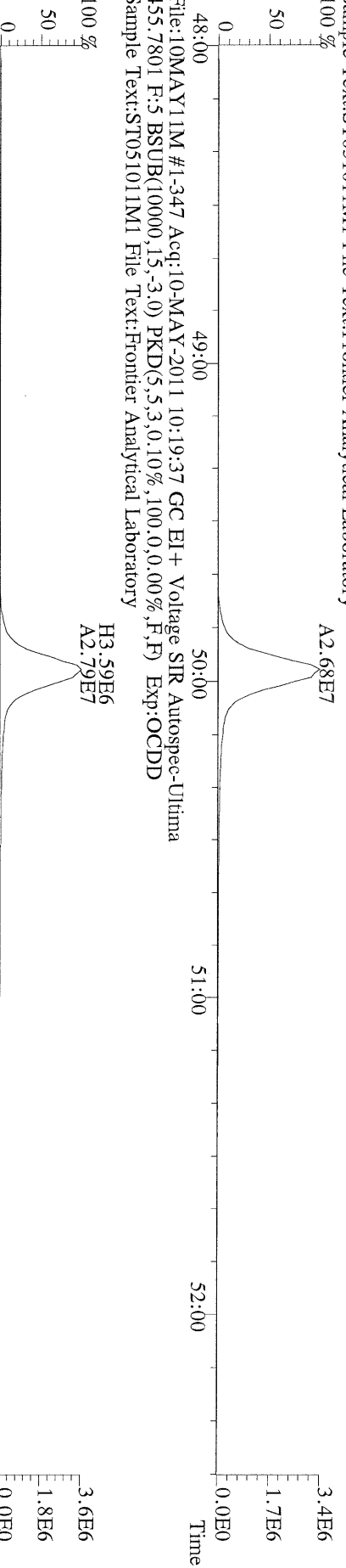
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479.7165 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory



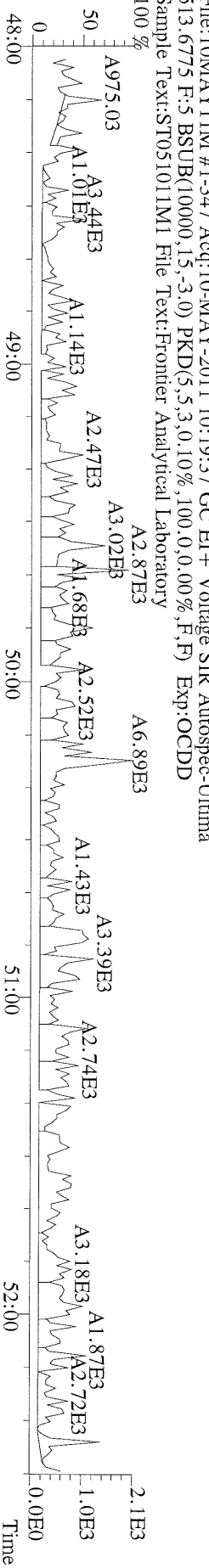
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441.7428 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0,0%) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory
100 %

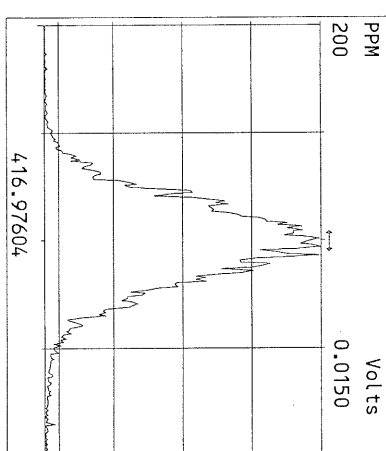
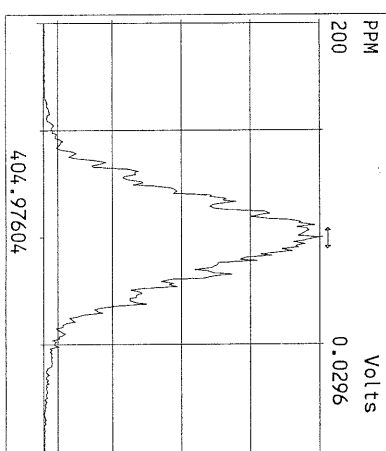
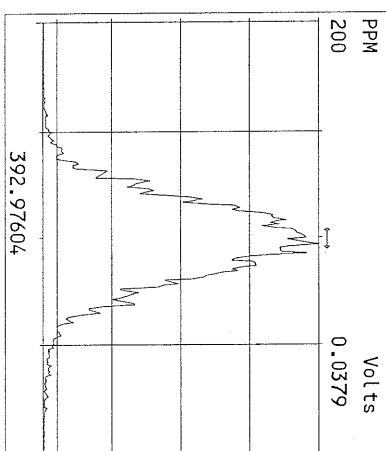
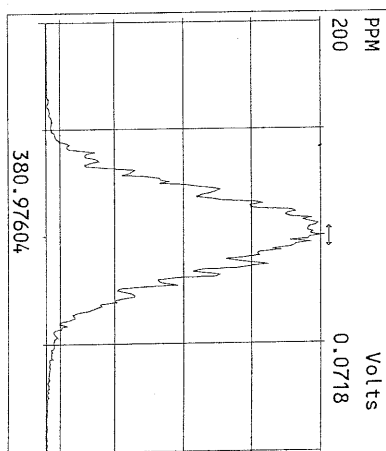
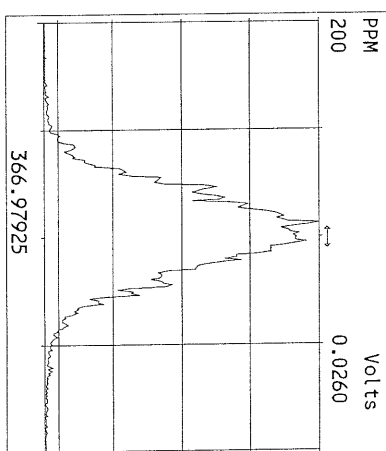
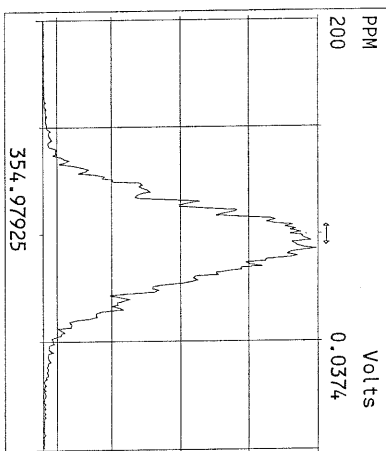
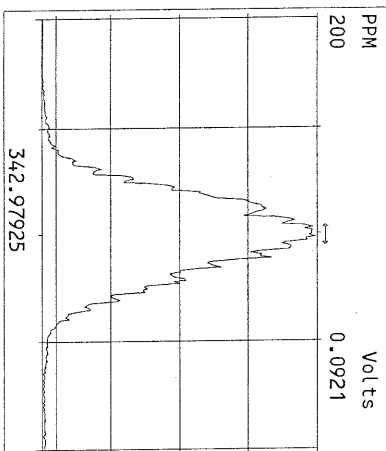
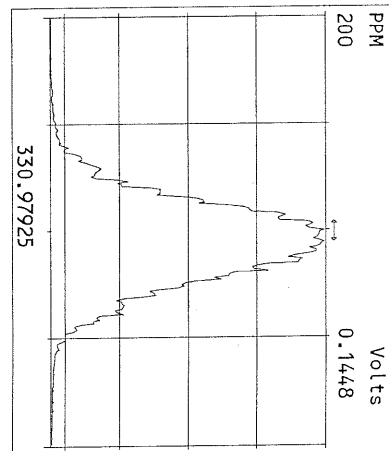
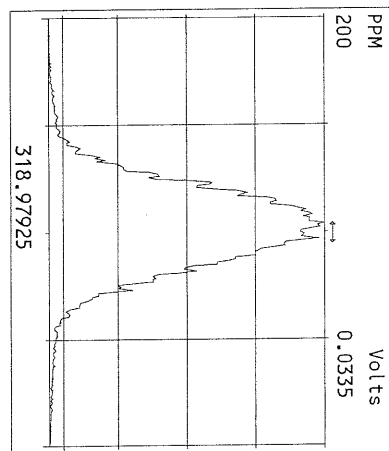
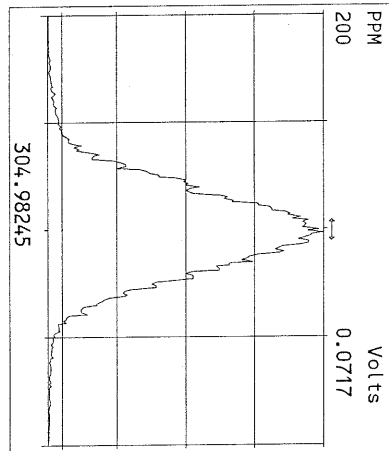
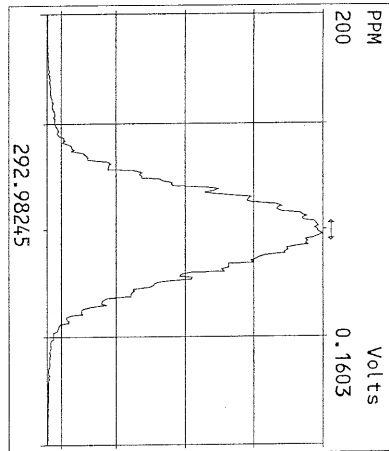


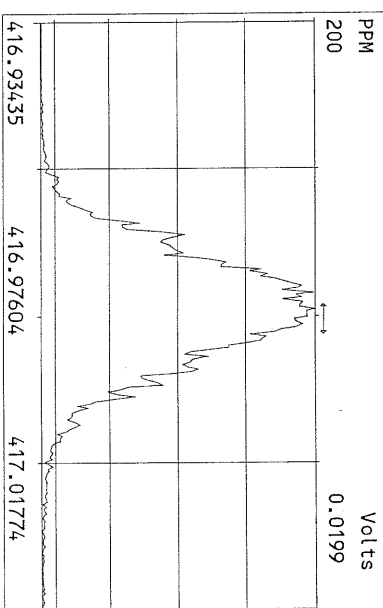
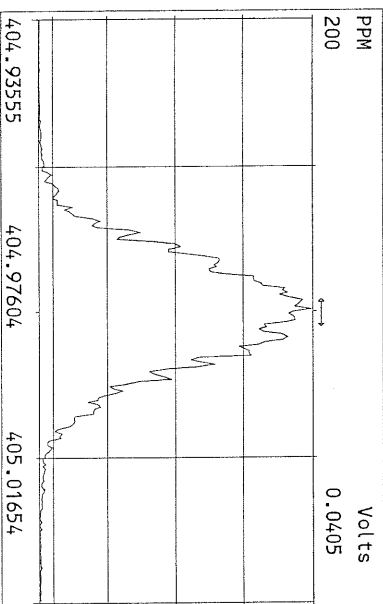
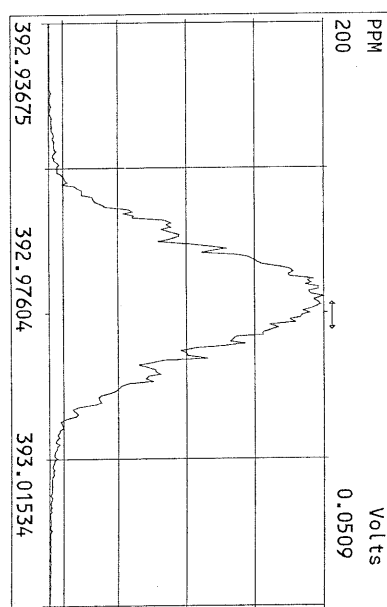
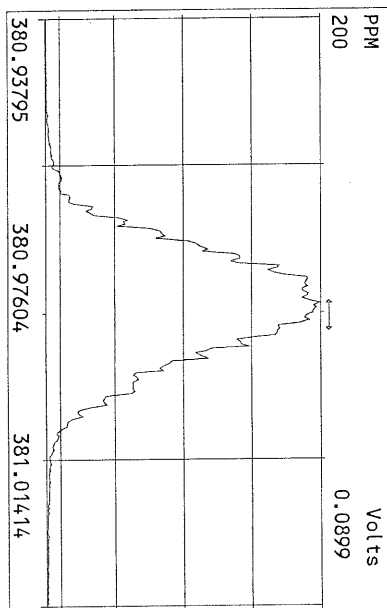
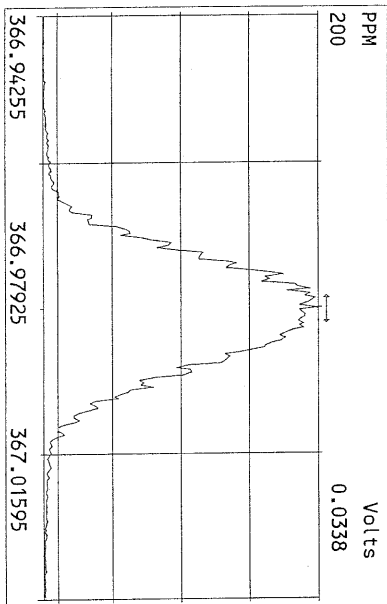
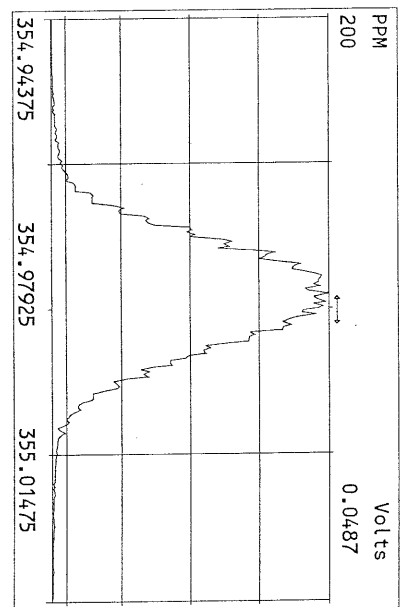
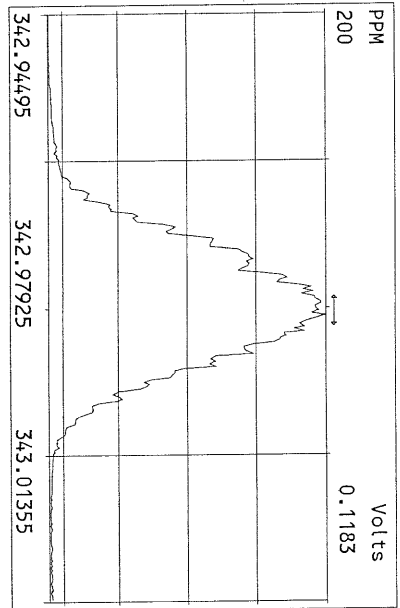
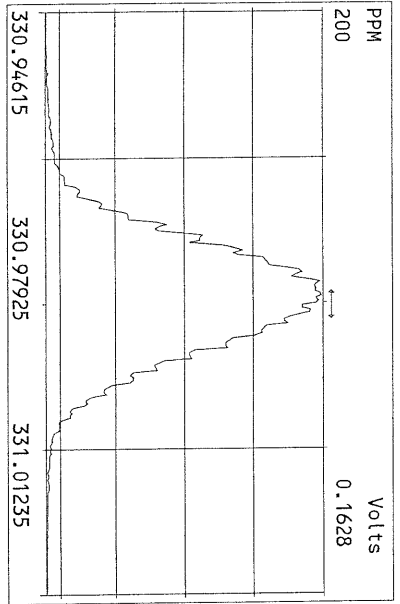
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453.7831 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0,0%) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory
100 %

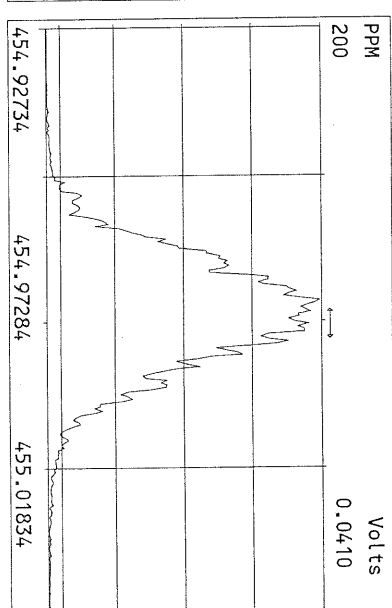
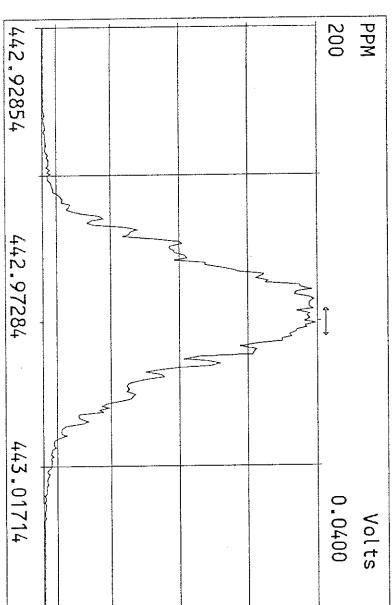
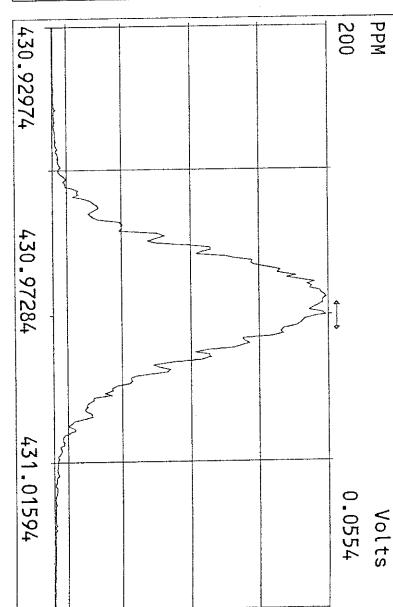
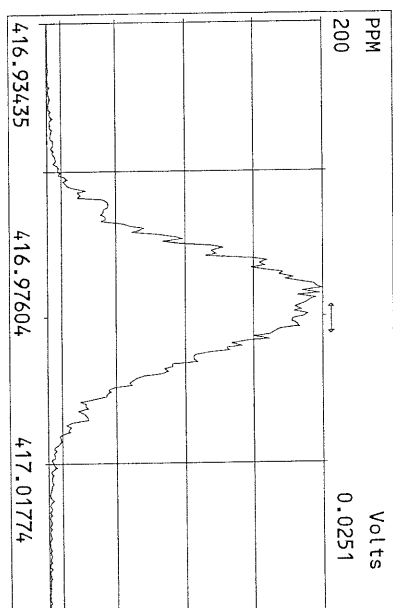
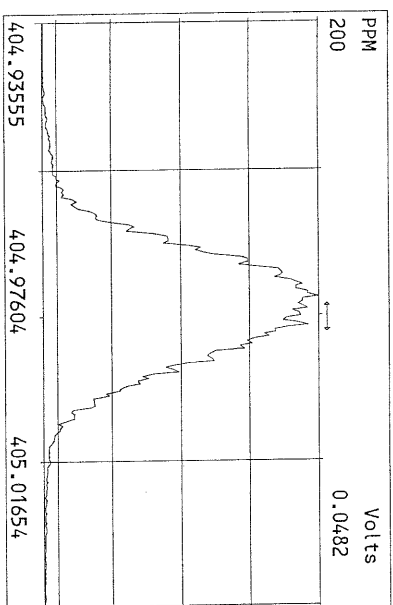
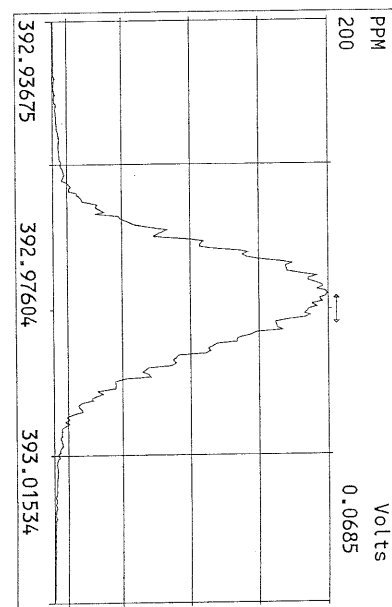
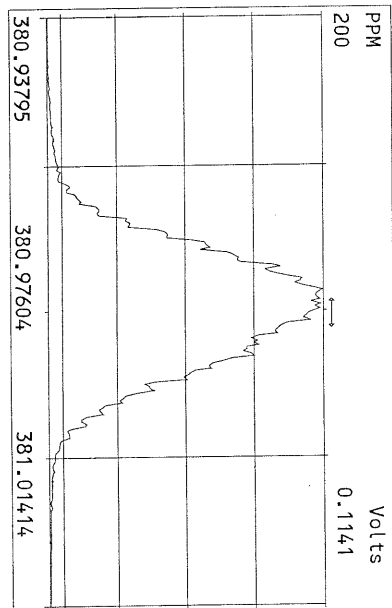
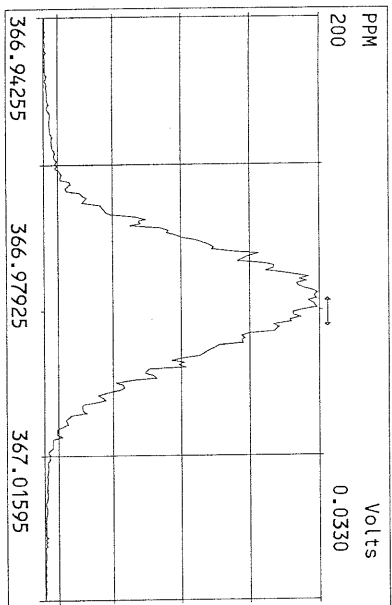


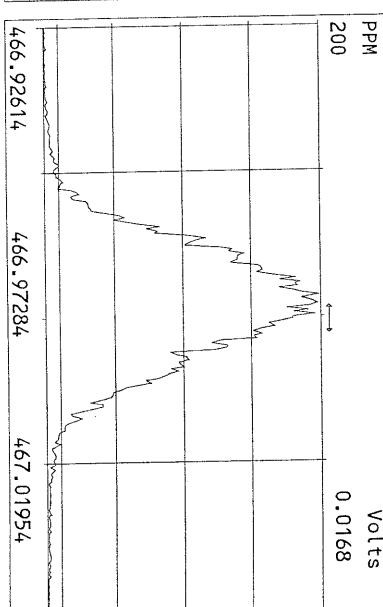
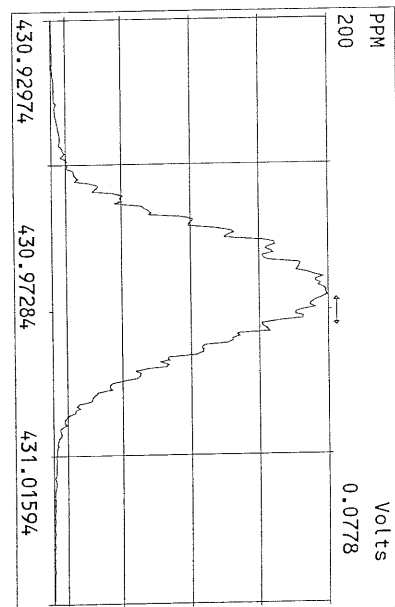
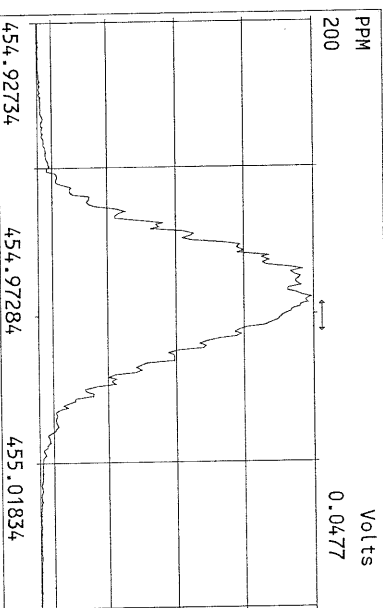
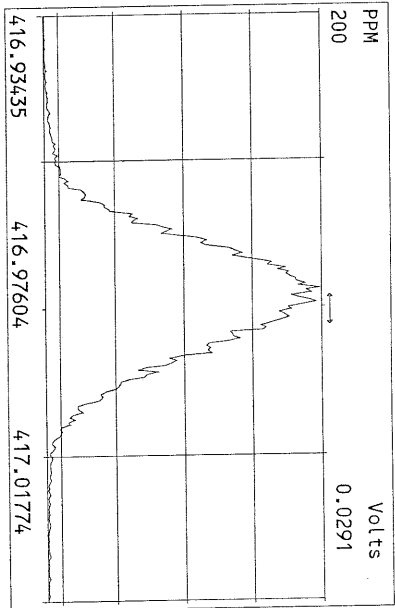
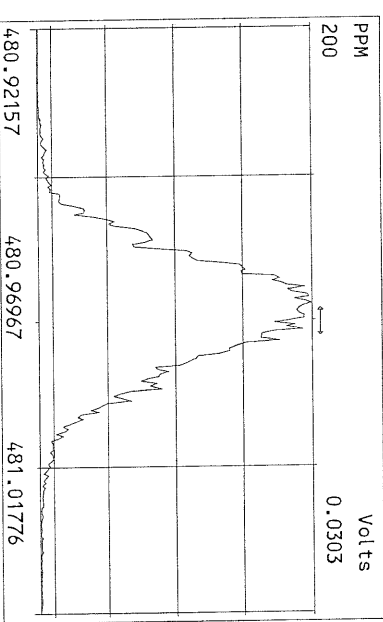
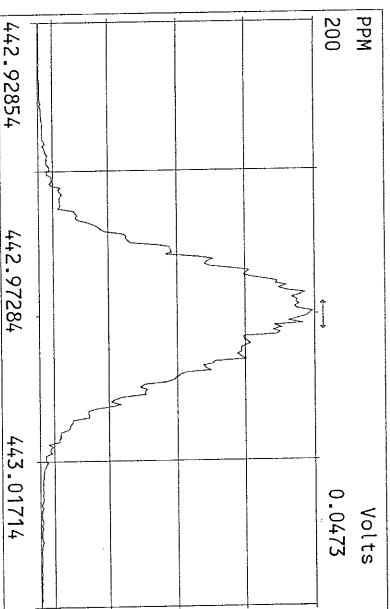
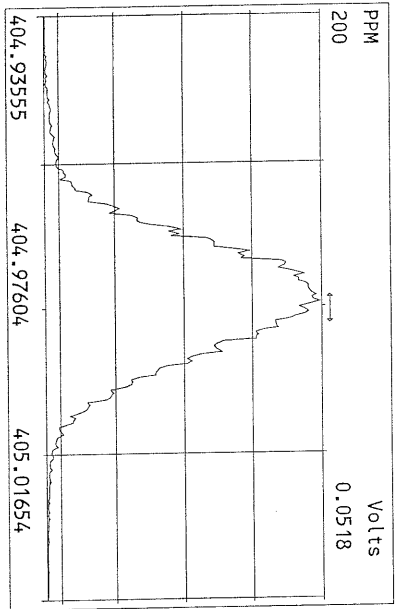
File:10MAY11M #1-347 Acq:10-MAY-2011 10:19:37 GC EI+ Voltage SIR Autospec-Utima
513.6775 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0,0%) Exp:OCDD
Sample Text:ST051011M1 File Text:Frontier Analytical Laboratory
100 %

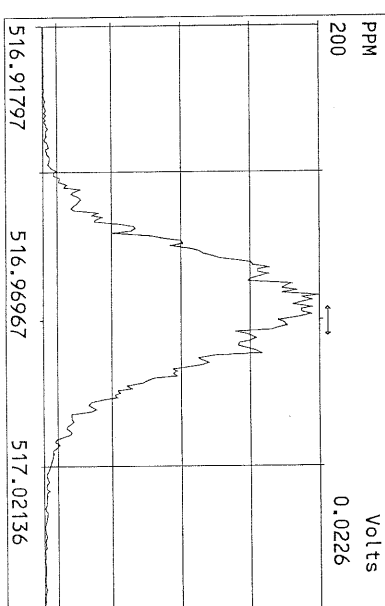
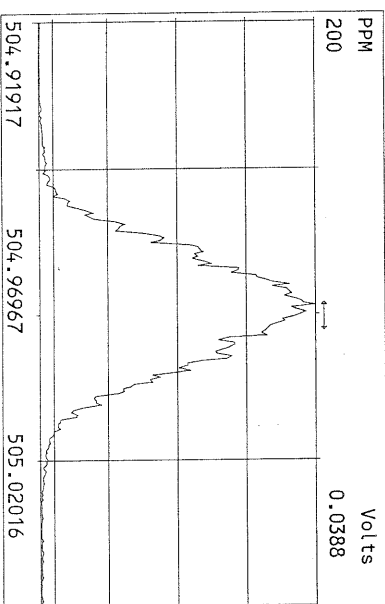
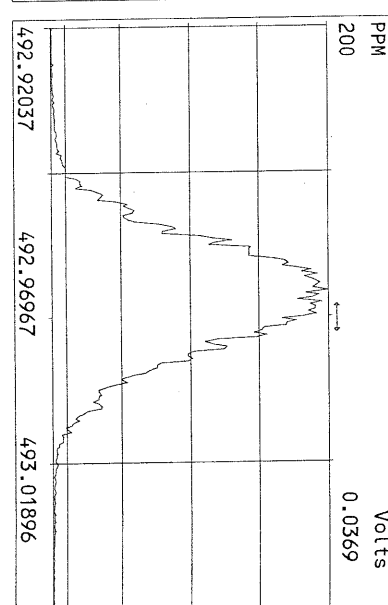
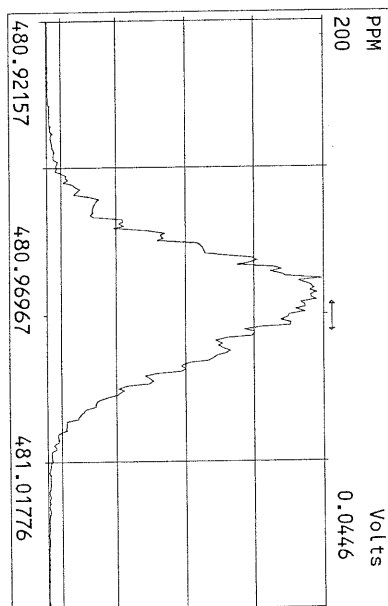
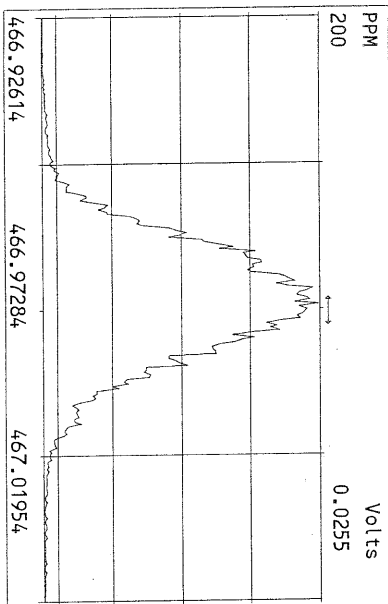
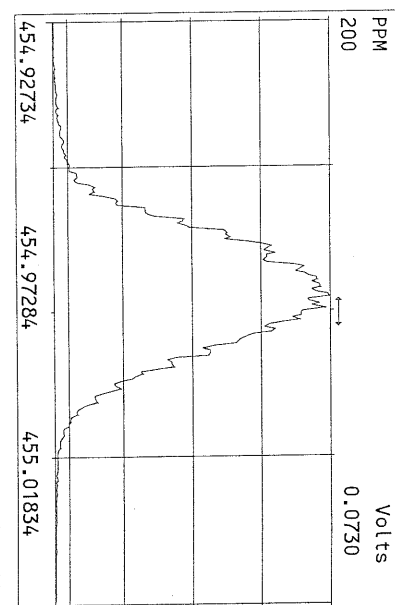
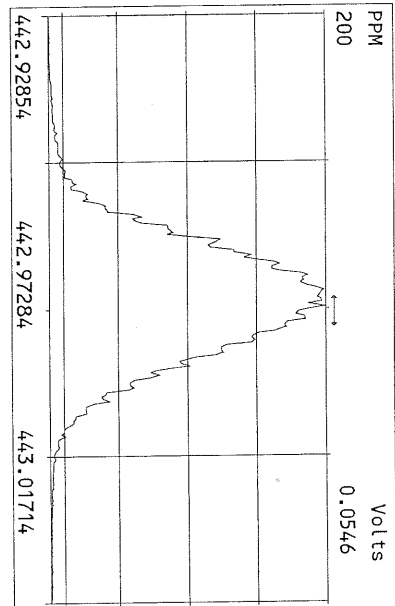
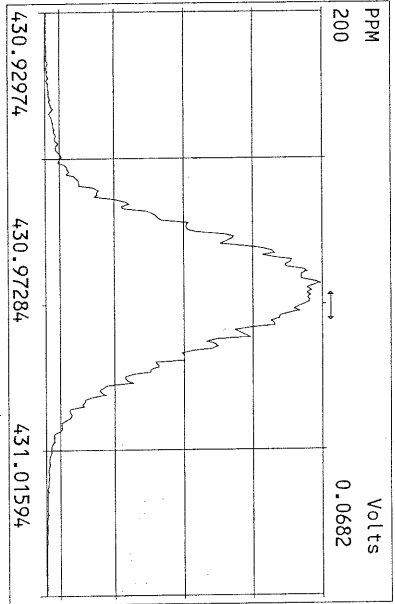












USEPA - ITD

FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.:

Initial Calibration Date: 3/7/11

Instrument ID: FAL3

GC Column ID: DB5

VER Data Filename: 10MAY11M Sam:14

Analysis Date: 10-MAY-11 22:19:14

NATIVE ANALYTES	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
2,3,7,8-TCDD	M/M+2	0.78	0.65-0.89	y	10.1	7.80 - 12.9 ✓
1,2,3,7,8-PeCDD	M+2/M+4	1.56	1.32-1.78	y	51.9	39.0 - 65.0 ✓
1,2,3,4,7,8-HxCDD	M+2/M+4	1.31	1.05-1.43	y	48.6	39.0 - 64.0 ✓
1,2,3,6,7,8-HxCDD	M+2/M+4	1.31	1.05-1.43	y	49.9	39.0 - 64.0 ✓
1,2,3,7,8,9-HxCDD	M+2/M+4	1.29	1.05-1.43	y	52.2	41.0 - 61.0 ✓
1,2,3,4,6,7,8-HpCDD	M+2/M+4	0.92	0.88-1.20	y	49.3	43.0 - 58.0 ✓
OCDD	M+2/M+4	0.94	0.76-1.02	y	99.9	79.0 - 126 ✓
2,3,7,8-TCDF	M/M+2	0.69	0.65-0.89	y	11.2	8.40 - 12.0 ✓
1,2,3,7,8-PeCDF	M+2/M+4	1.53	1.32-1.78	y	51.1	41.0 - 60.0 ✓
2,3,4,7,8-PeCDF	M+2/M+4	1.51	1.32-1.78	y	49.3	41.0 - 60.0 ✓
1,2,3,4,7,8-HxCDF	M+2/M+4	1.24	1.05-1.43	y	47.9	45.0 - 56.0 ✓
1,2,3,6,7,8-HxCDF	M+2/M+4	1.25	1.05-1.43	y	48.3	44.0 - 57.0 ✓
2,3,4,6,7,8-HxCDF	M+2/M+4	1.22	1.05-1.43	y	48.3	44.0 - 57.0 ✓
1,2,3,7,8,9-HxCDF	M+2/M+4	1.25	1.05-1.43	y	48.2	45.0 - 56.0 ✓
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.07	0.88-1.20	y	48.2	45.0 - 55.0 ✓
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.06	0.88-1.20	y	48.8	43.0 - 58.0 ✓
OCDF	M+2/M+4	0.93	0.76-1.02	y	95.9	63.0 - 159 ✓

(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.

Analyst: Date: 5/11/11

USEPA - ITD

FORM 6A

PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Init. Cal. Date: 3/7/11

Instrument ID: FAL3

GC Column ID: DB5


Analysis Date: 10-MAY-11 22:19:14

CS3 or VER Data Filename: 10MAY11M

Sam:14

NATIVE ANALYTES	RETENTION TIME	RRT	RRT
	REFERENCE		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		1.022	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: 5/11/11

USEPA - ITD

FORM 6B

PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Init. Cal. Date: 3/7/11

Instrument ID: FAL3

GC Column ID: DB5

Analysis Date: 10-MAY-11 22:19:14 CS3 or VER Data Filename: 10MAY11M Sam:14

NATIVE ANALYTES	RETENTION TIME		RRT	QC LIMITS (1)
	REFERENCE	RRT		
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	1.000	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	1.001	0.999-1.001 ✓	
1,2,3,4,6,7,8-HpCDF	13C-1,2,3,4,6,7,8-HpCDF	1.000	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	1.001	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		0.989	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		1.015	0.977-1.047 ✓	
13C-1,2,3,4,6,7,8-HpCDD		1.128	1.086-1.130 ✓	
13C-1,2,3,4,6,7,8-HpCDF		1.079	1.043-1.085 ✓	
13C-1,2,3,4,7,8,9-HpCDF		1.152	1.057-1.154 ✓	
13C-OCDD		1.270	1.032-1.311 ✓	
13C-OCDF		1.280	1.000-1.311 ✓	

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

Analyst: 

Date: 5/11/11

Frontier Analytical Laboratory - Acquisition Log

Run Name:10MAY11M

Instrument: FAL3

GC: DB5

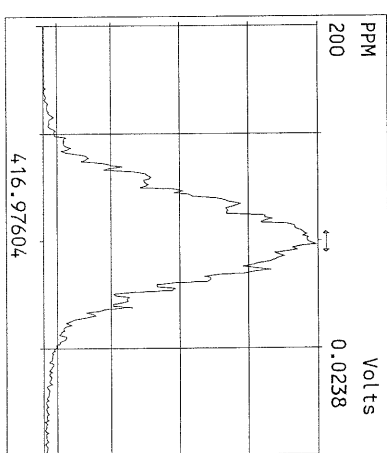
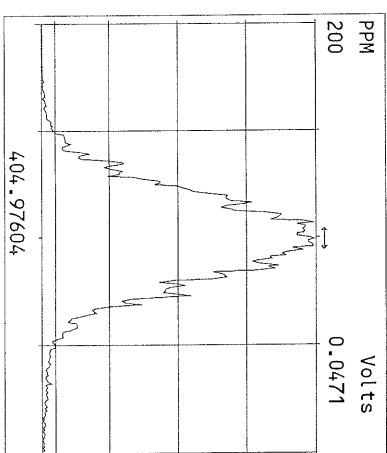
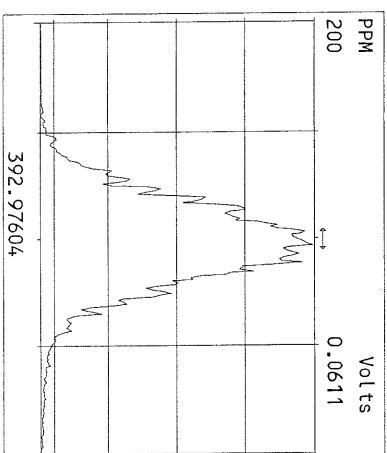
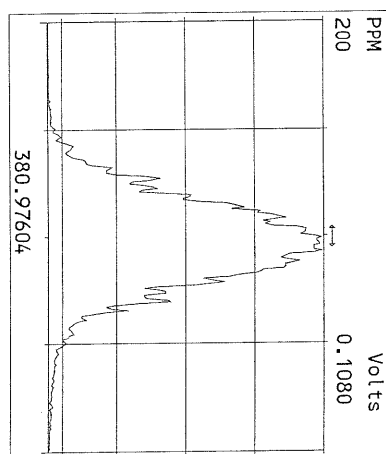
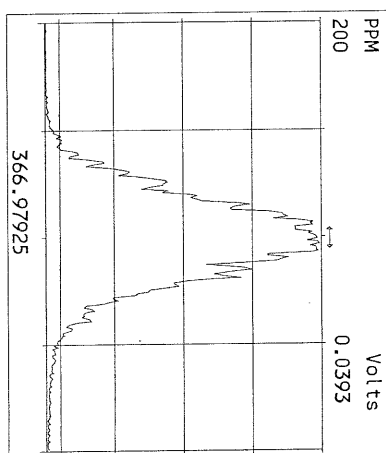
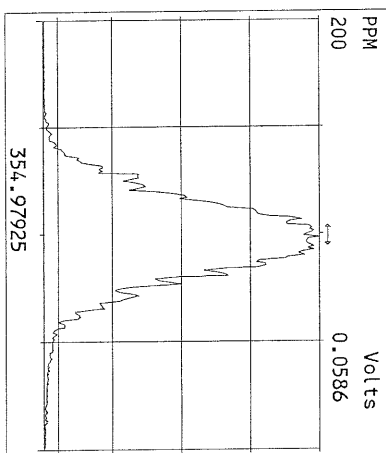
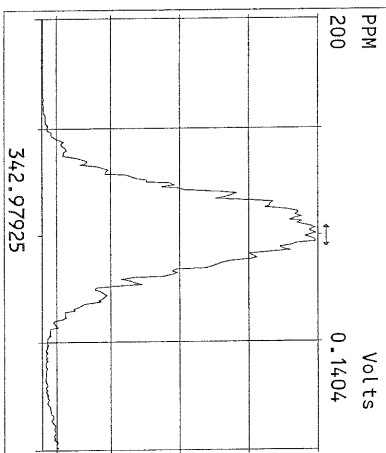
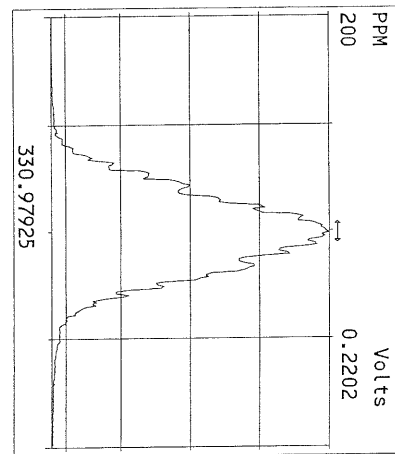
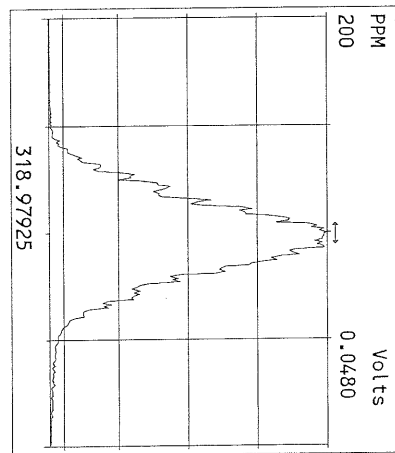
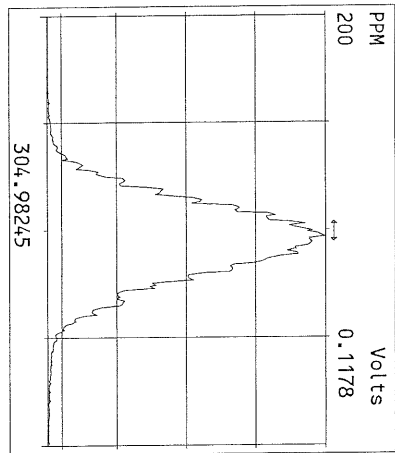
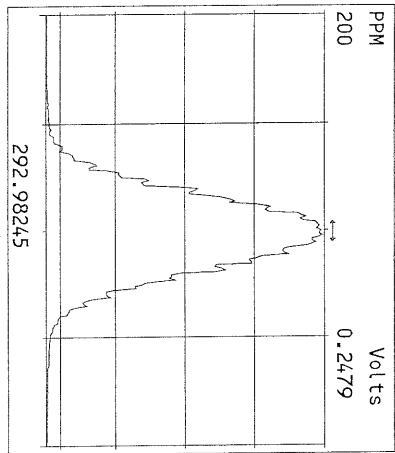
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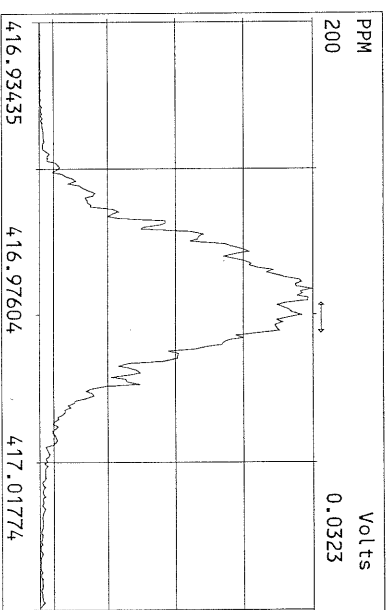
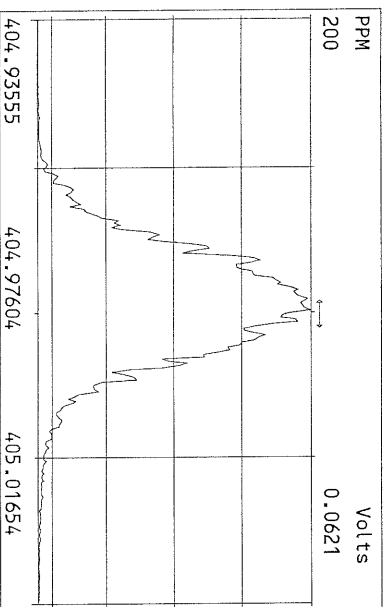
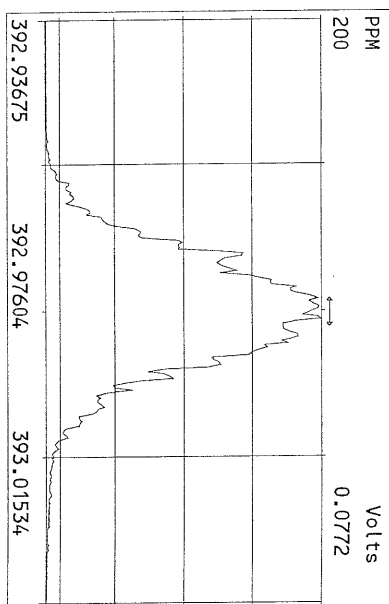
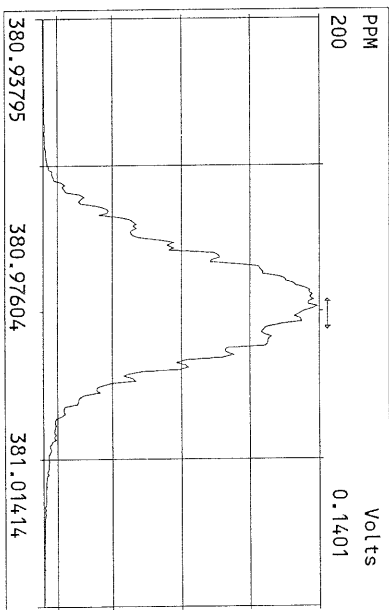
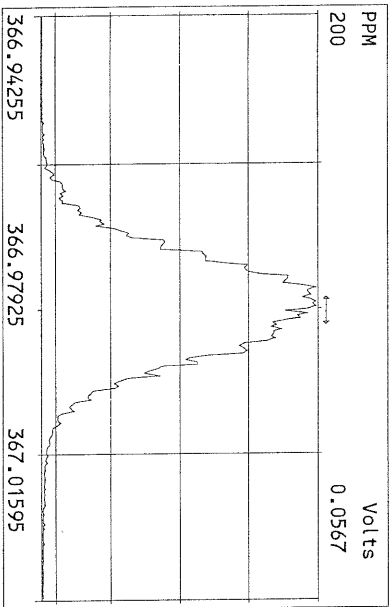
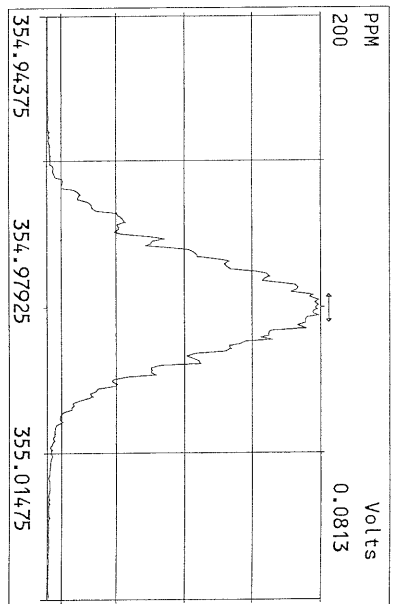
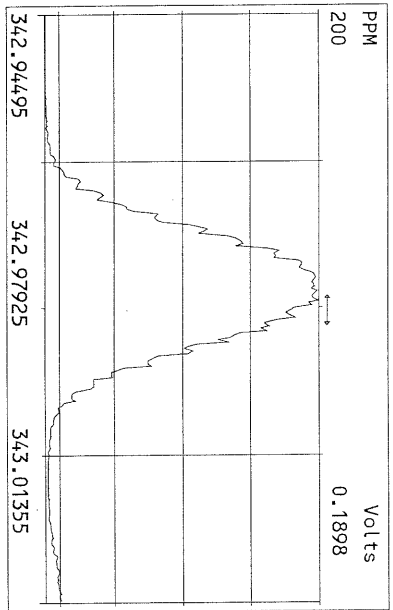
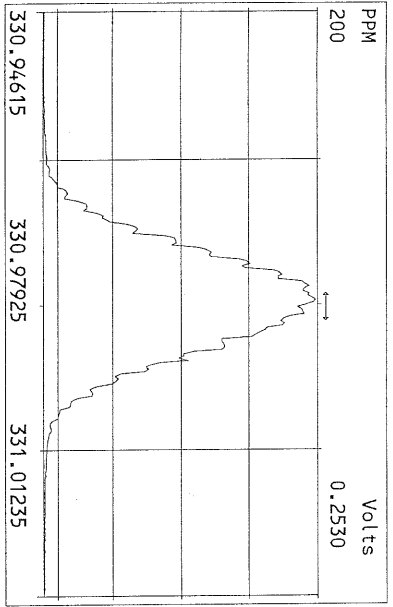
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10MAY11M 4	6735-003-0001-SA	DMA-TP1-4.5-5.5-041911	10-MAY-11 13:05:46	ST051011M1	ST051011M2	TC
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10MAY11M 15	2288-001-0001-OPR	OPR	10-MAY-11 23:14:33	ST051011M2	ST051011M3	TC
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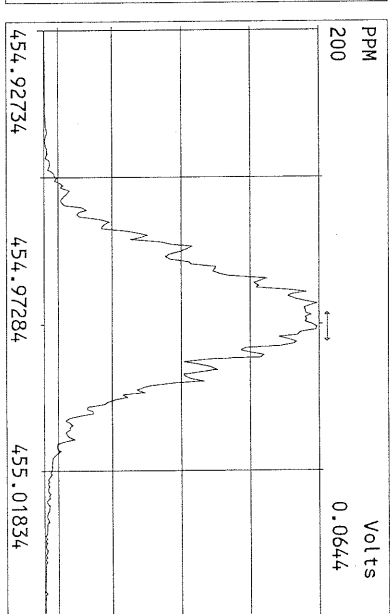
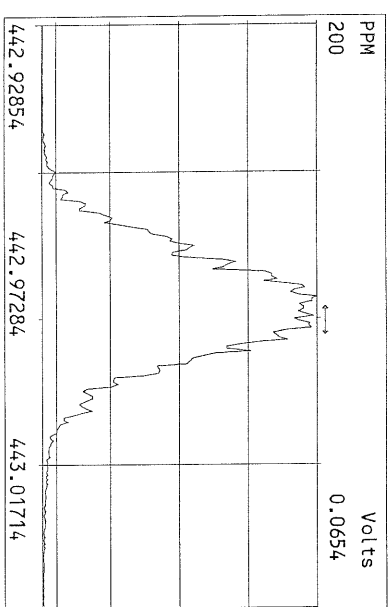
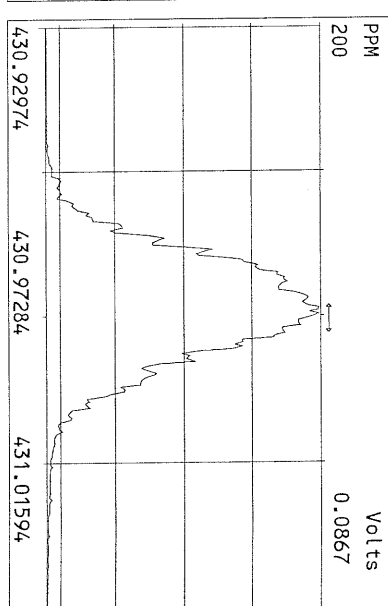
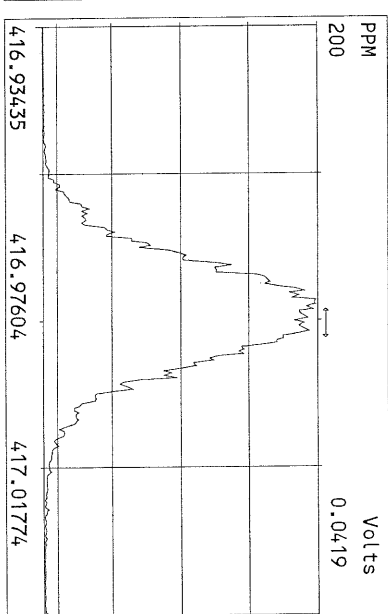
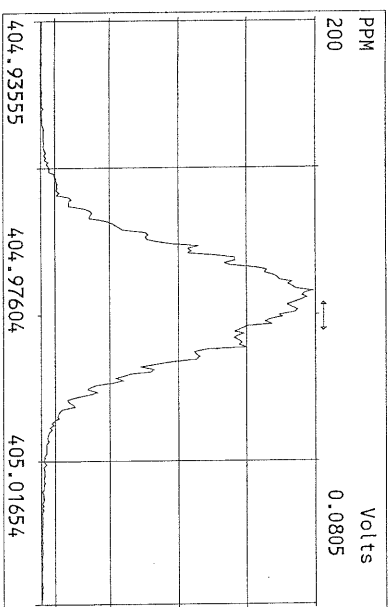
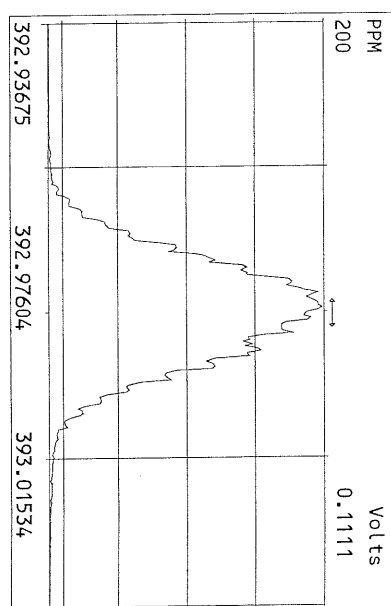
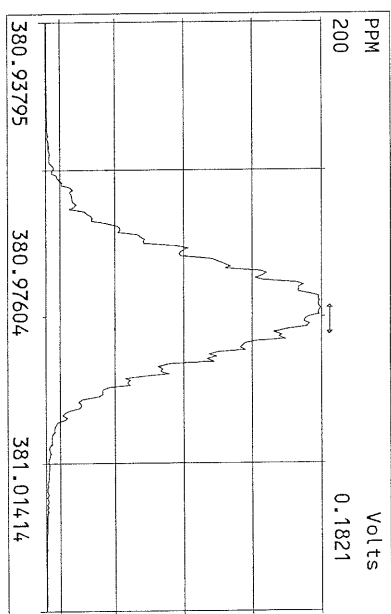
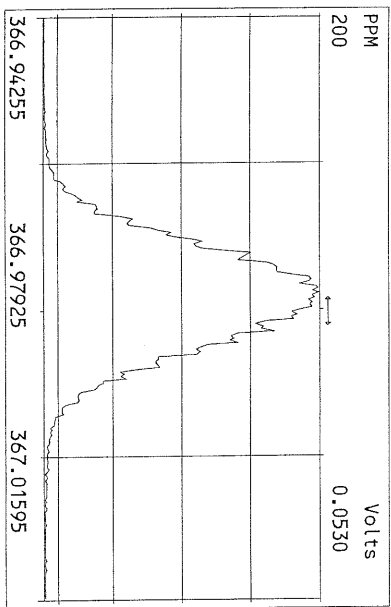
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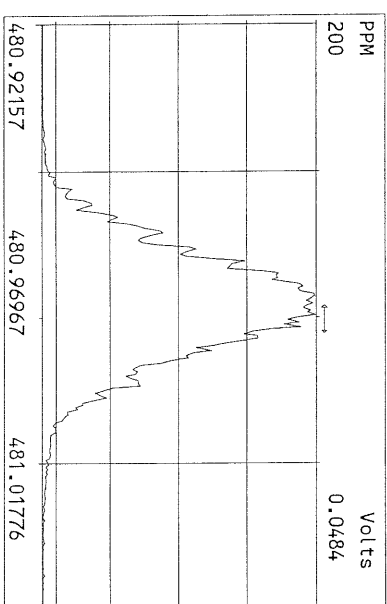
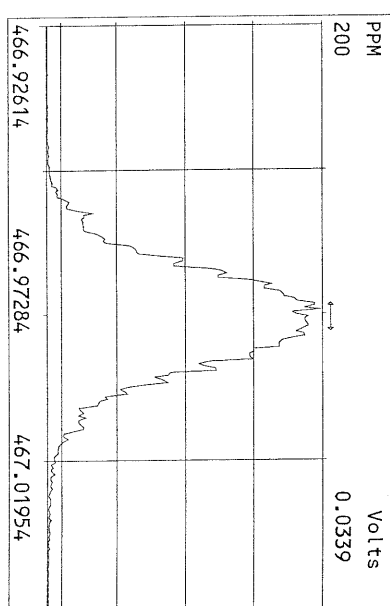
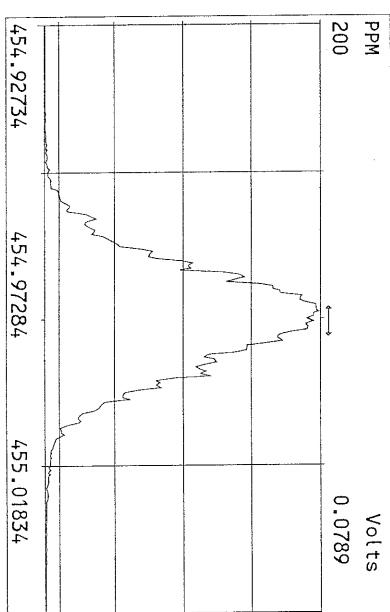
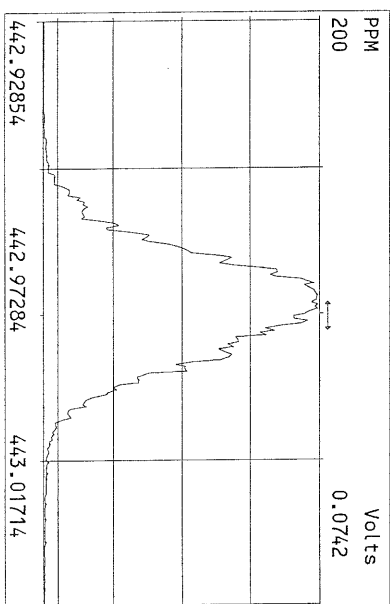
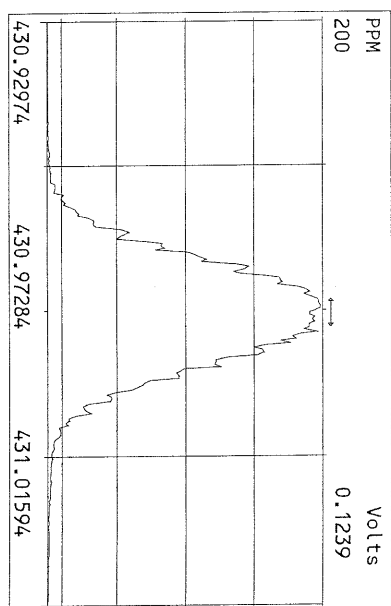
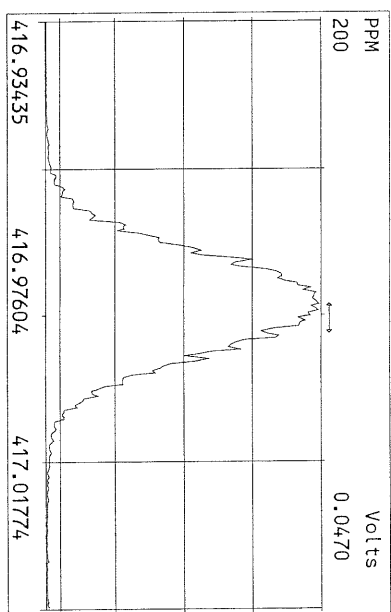
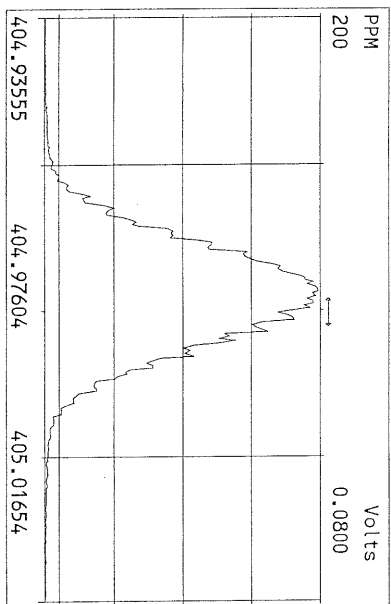
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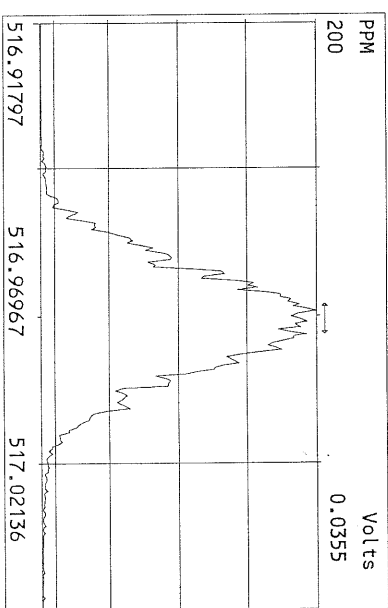
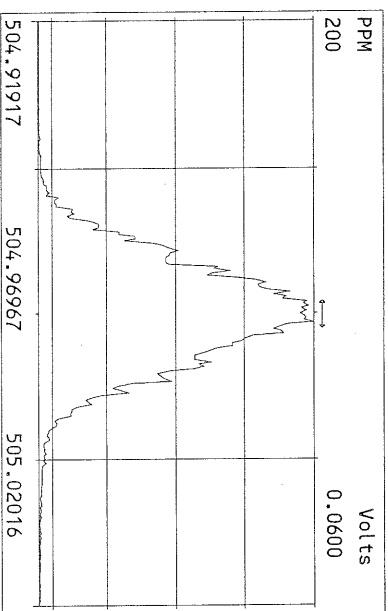
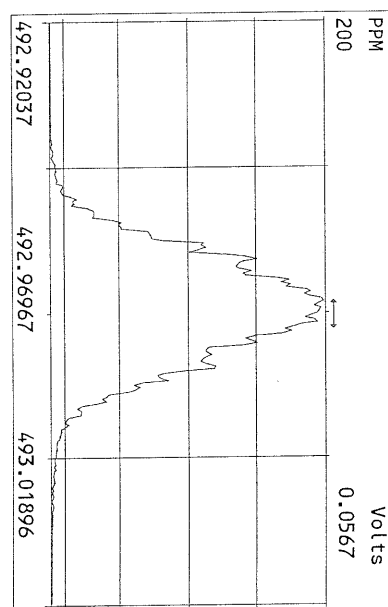
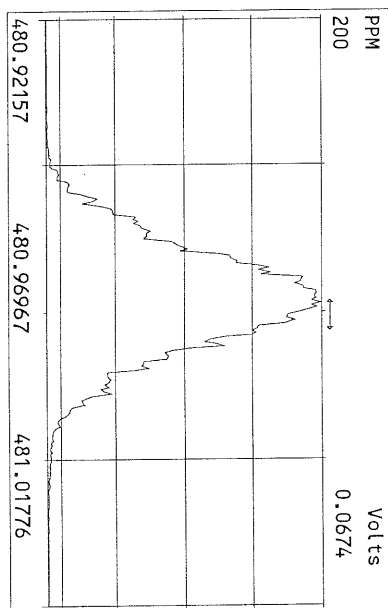
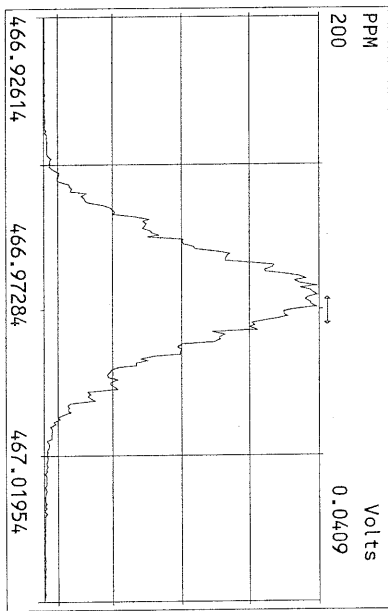
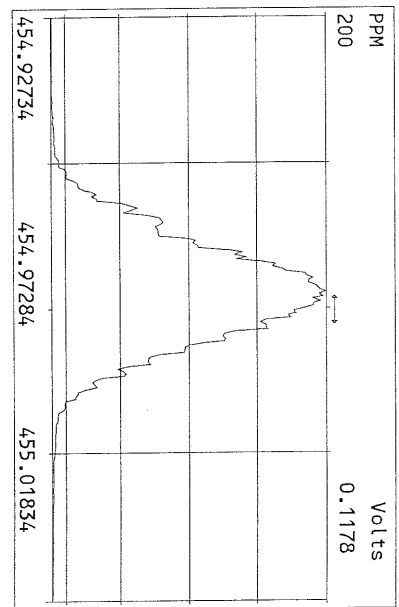
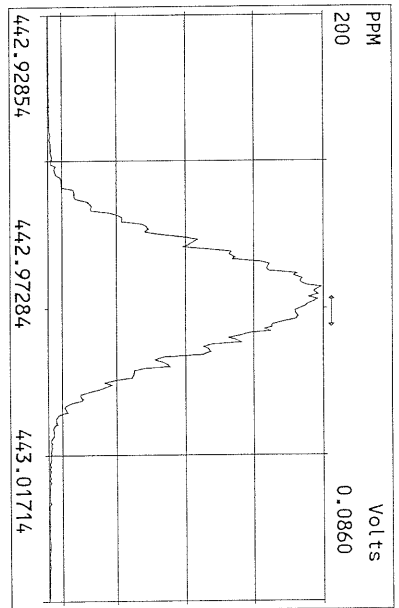
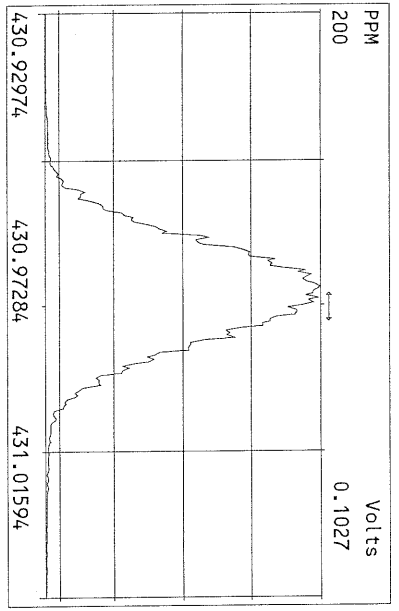
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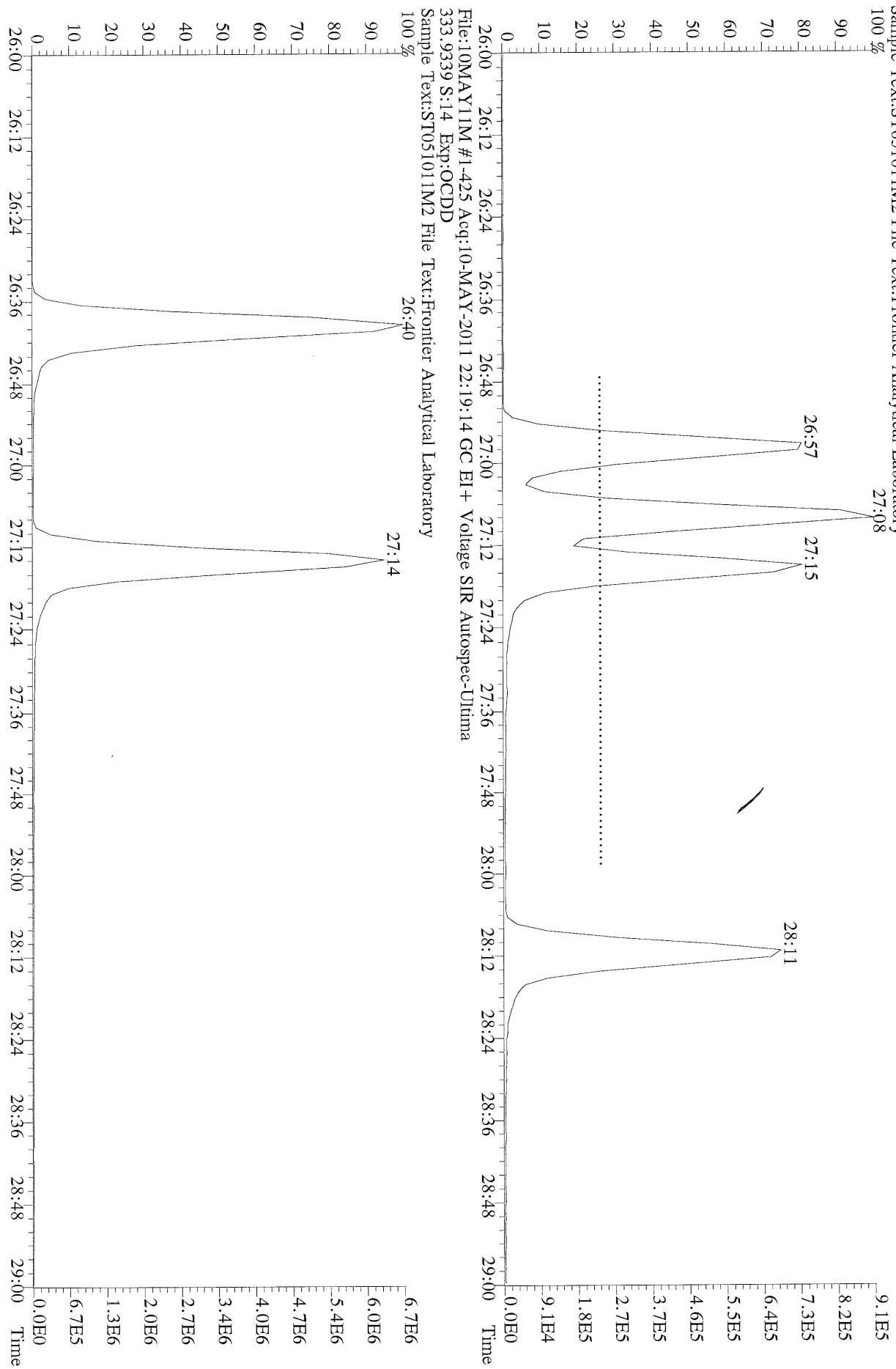






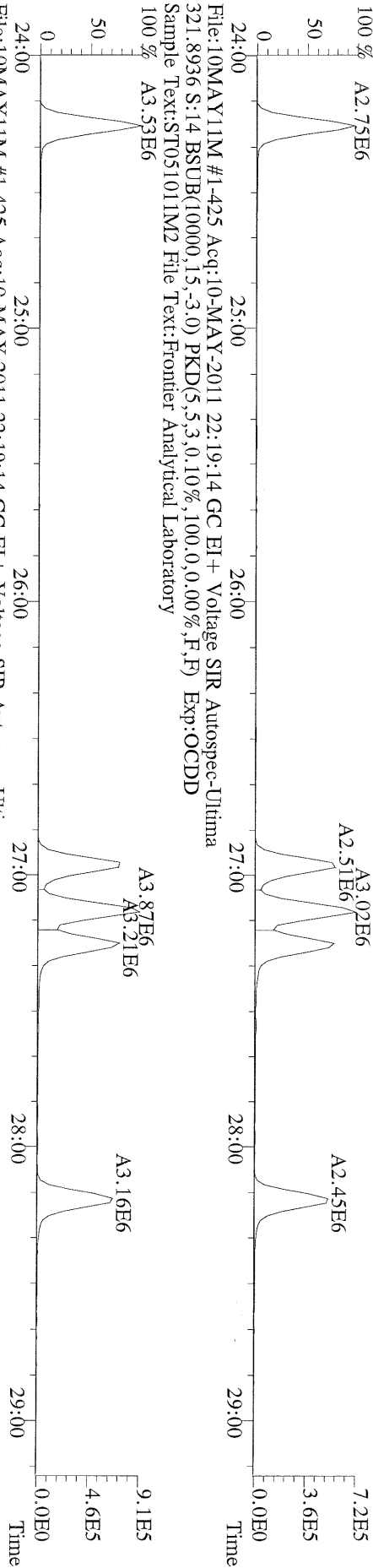


File:10MAY11M #1-425 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
321.8936 S:14 Exp:OCDD
Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory
100 %

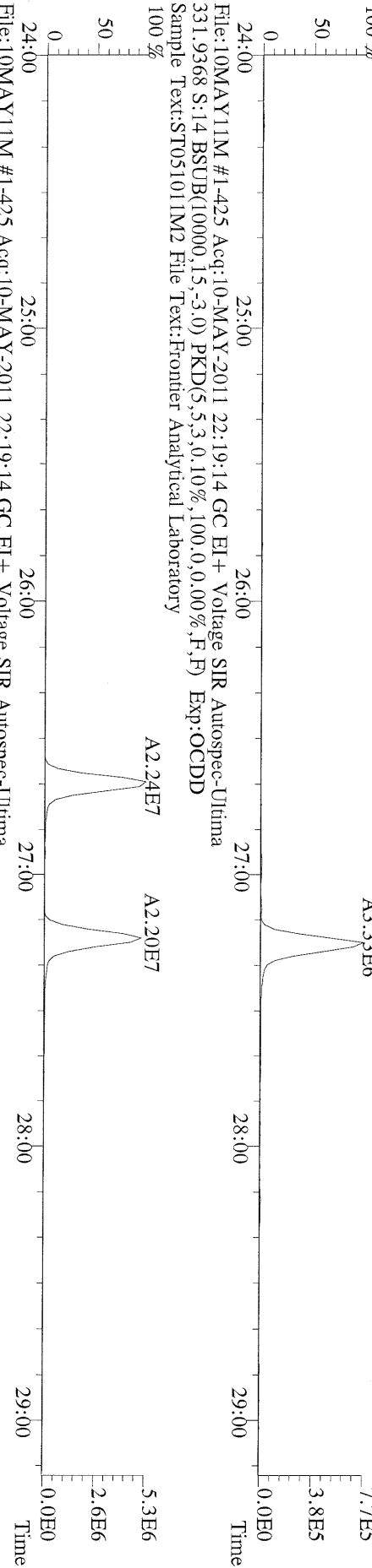


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333.9339 S:14 Exp:OCDD
Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory

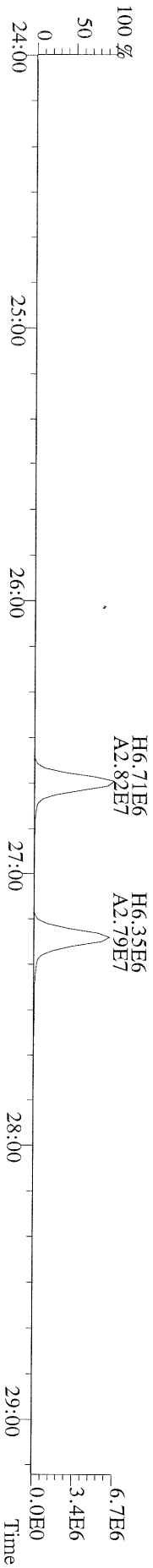
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319.8965 S:14 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



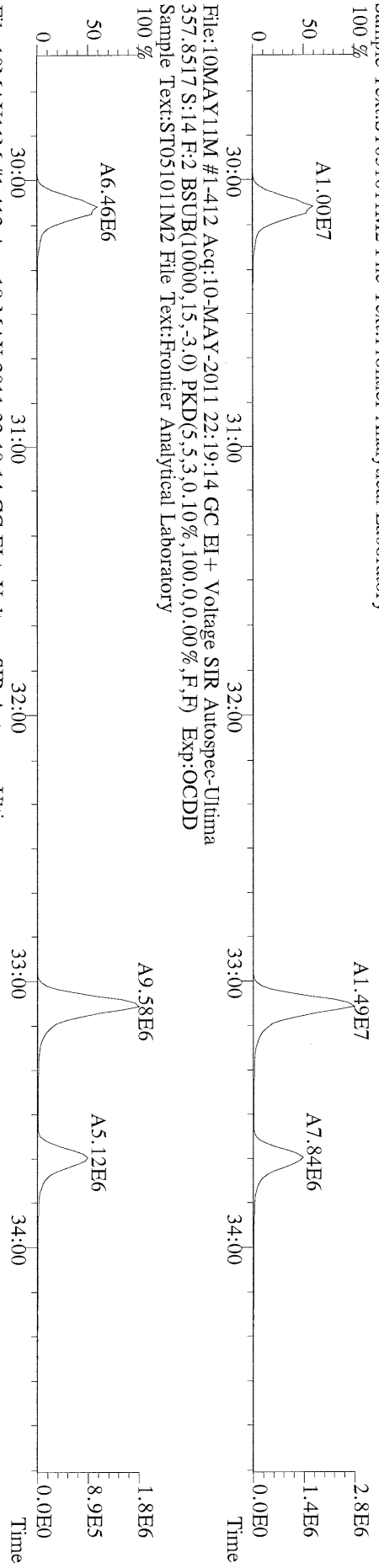
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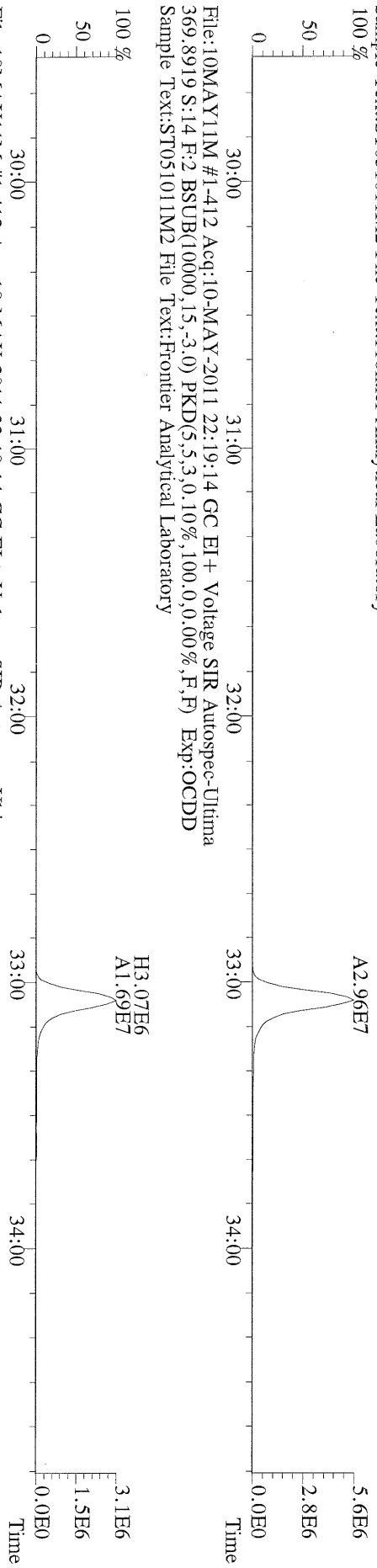
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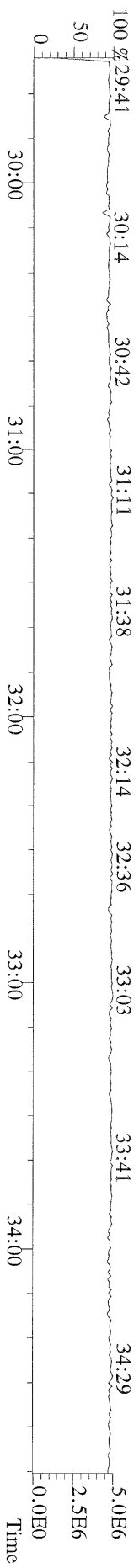
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355.8546 S:14 F:2 BSUB(10000,15,-3.0) PKD(5.5,3.0,100.0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M2 File Text:Fronter Analytical Laboratory



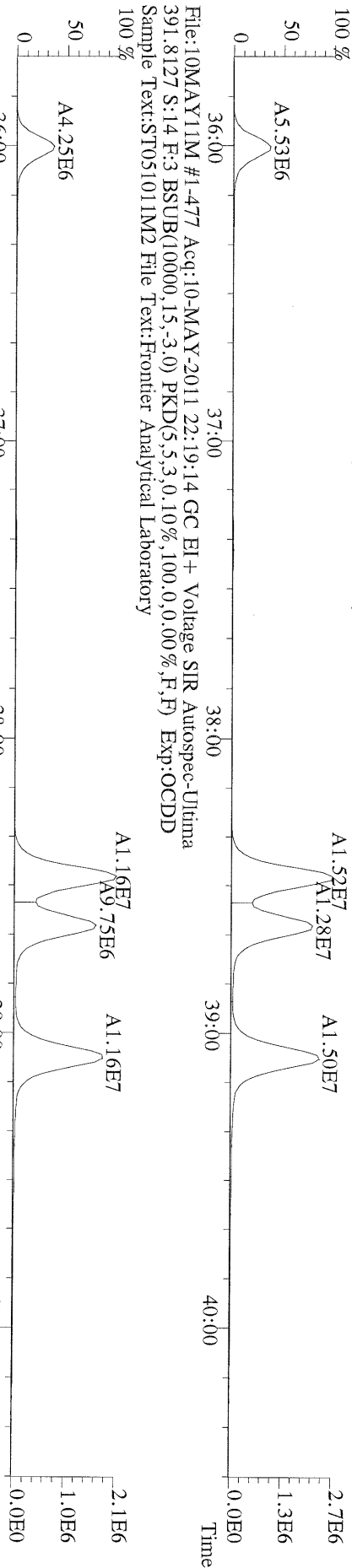
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367.8949 S:14 F:2 BSUB(10000,15,-3.0) PKD(5.5,3.0,100.0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M2 File Text:Fronter Analytical Laboratory



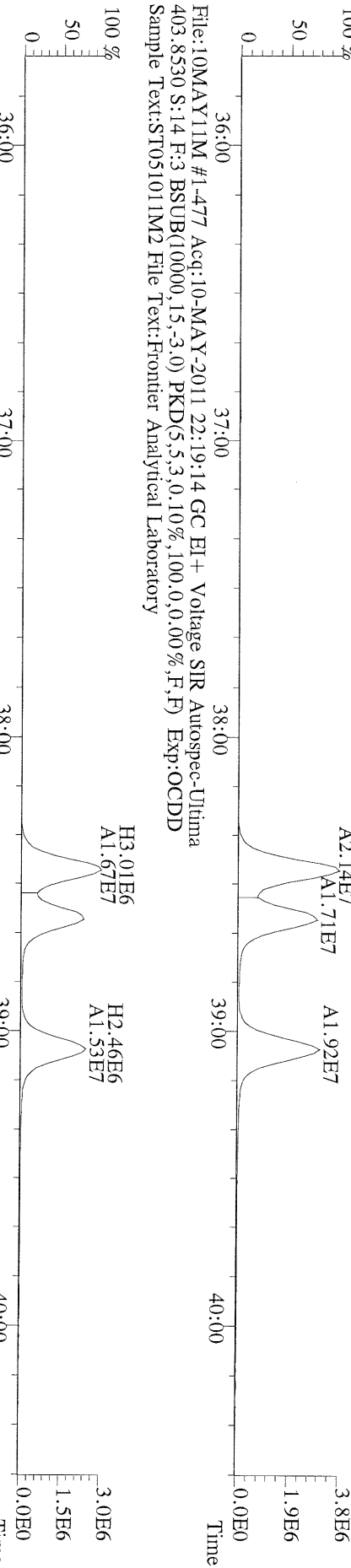
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366.9792 S:14 F:2 Exp:OCDD
Sample Text:ST051011M2 File Text:Fronter Analytical Laboratory



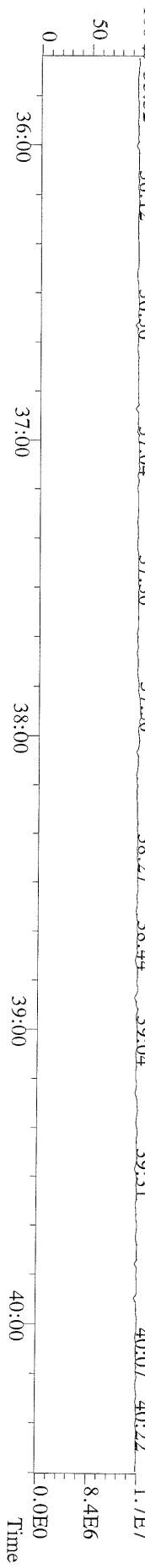
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389.8156 S:14 F:3 BSUB(10000,15,-3.0) PKD(5.5,3,0,10%,100.0,0.00%,F,F) Exp:OCDD
Sample Text:ST05101IM2 File Text:Frontier Analytical Laboratory



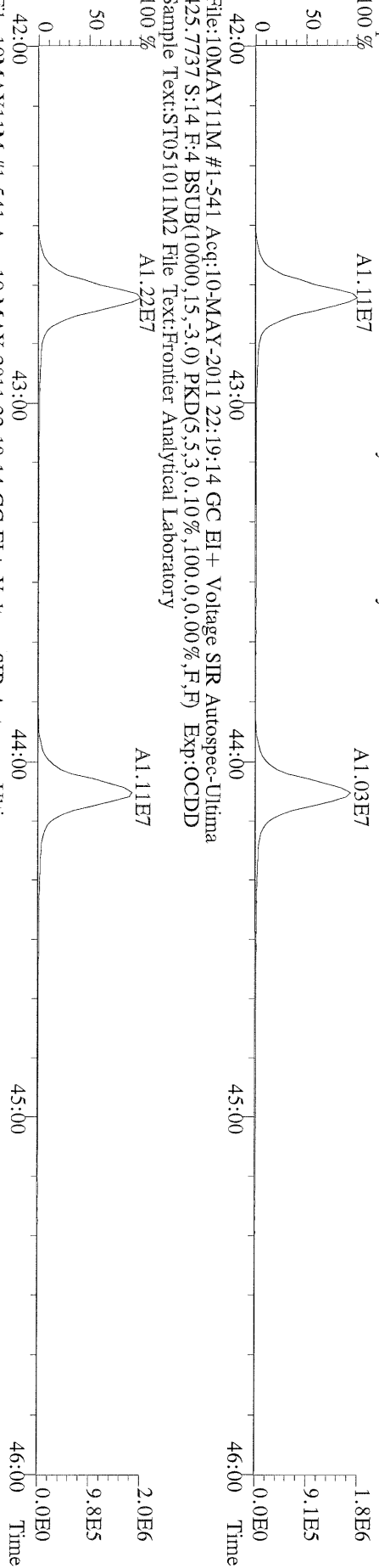
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Sample Text:ST05101IM2 File Text:Frontier Analytical Laboratory



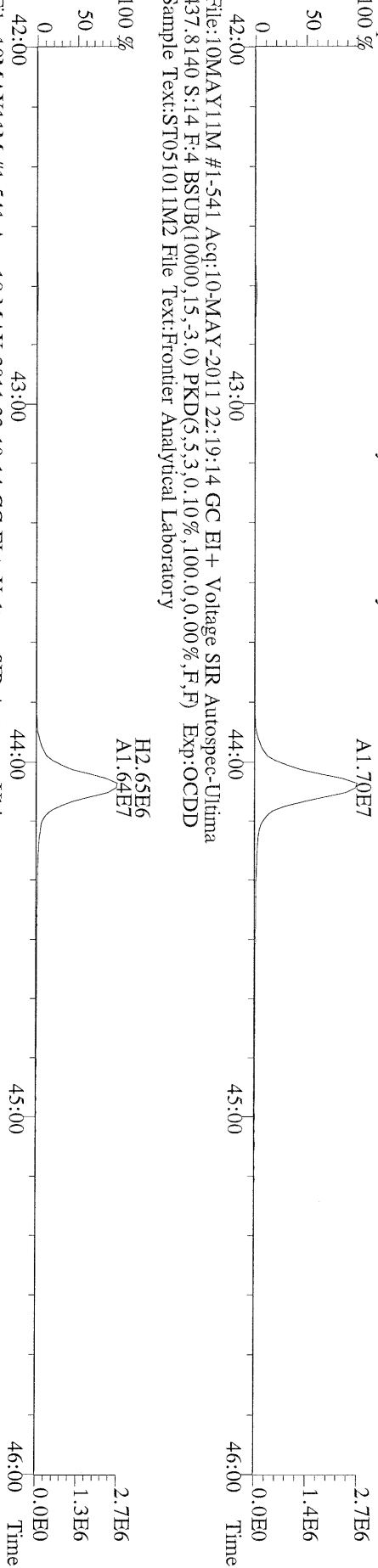
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380.9760 S:14 F:3 Exp:OCDD
Sample Text:ST05101IM2 File Text:Frontier Analytical Laboratory



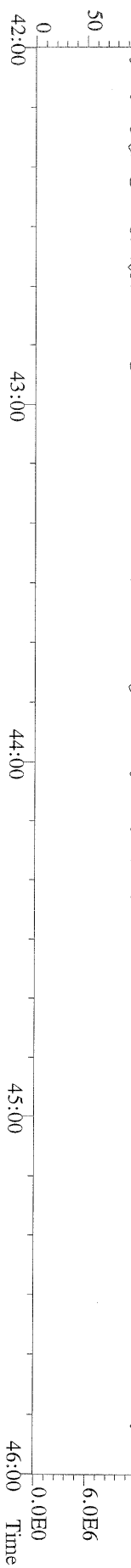
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423.7767 S:14 F:4 BSUB(10000,15,-3.0) PKD(5.5,3,0,10%,100.0,0.00%,F,F) Exp:OCDD
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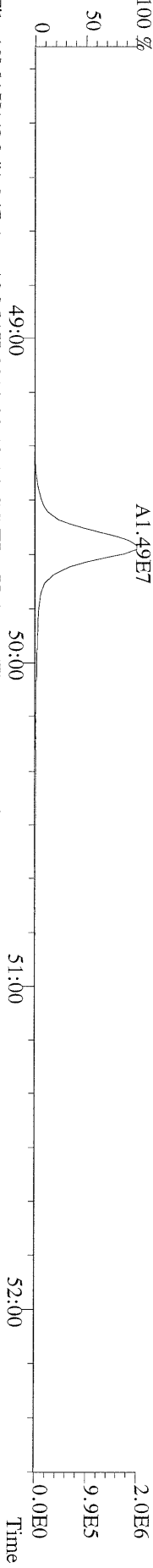
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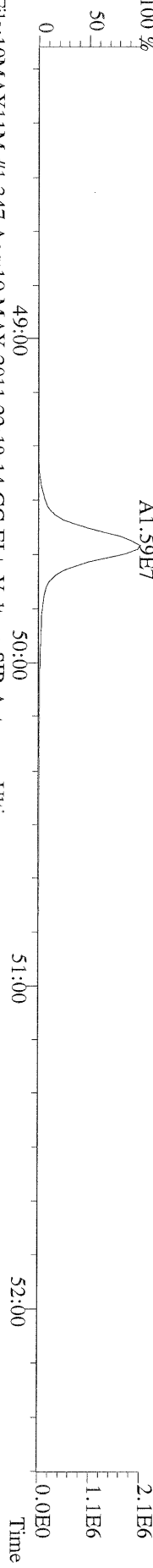
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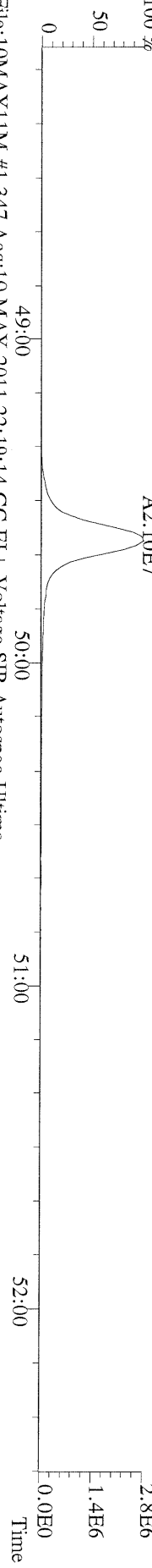
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Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



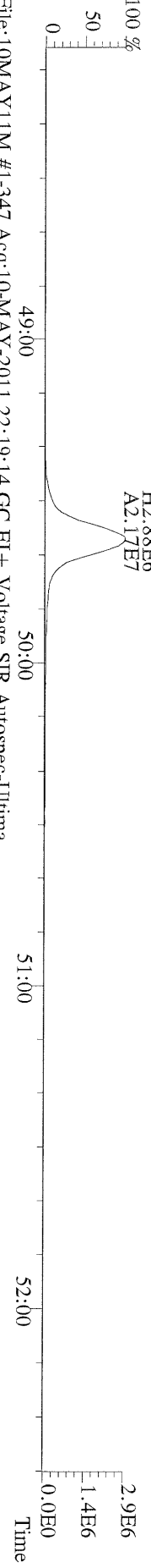
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Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



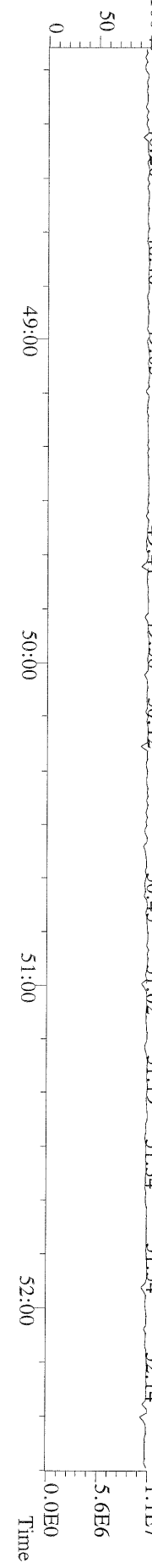
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469.7780 S:14 F:5 BSUB(10000,15,-3.0) PKD(5.5,3,0,100,0.0,00%,F,F) Exp:OCDD
Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



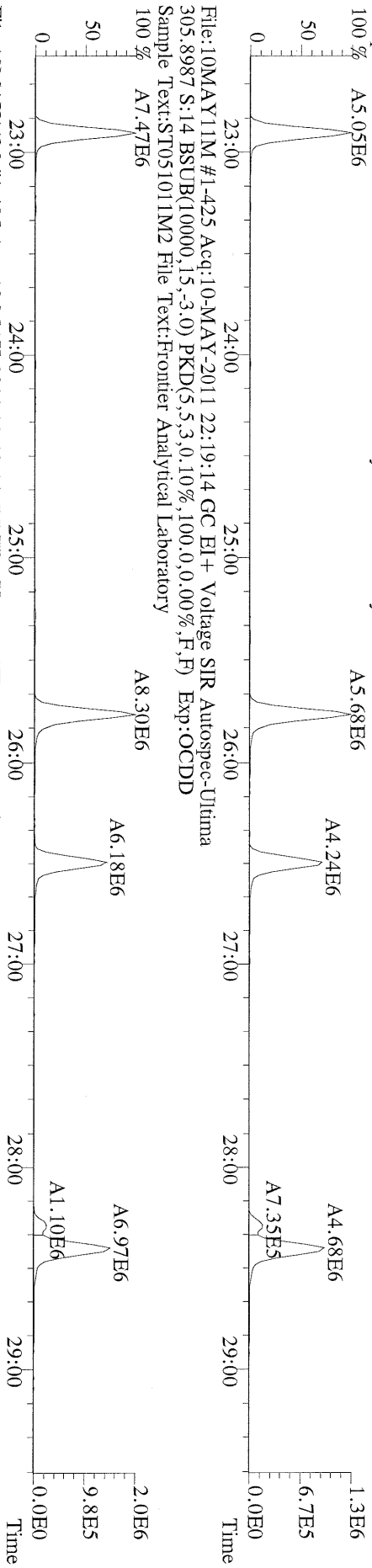
File:10MAY11M #1-347 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
471.7750 S:14 F:5 BSUB(10000,15,-3.0) PKD(5.5,3,0,100,0.0,00%,F,F) Exp:OCDD
Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



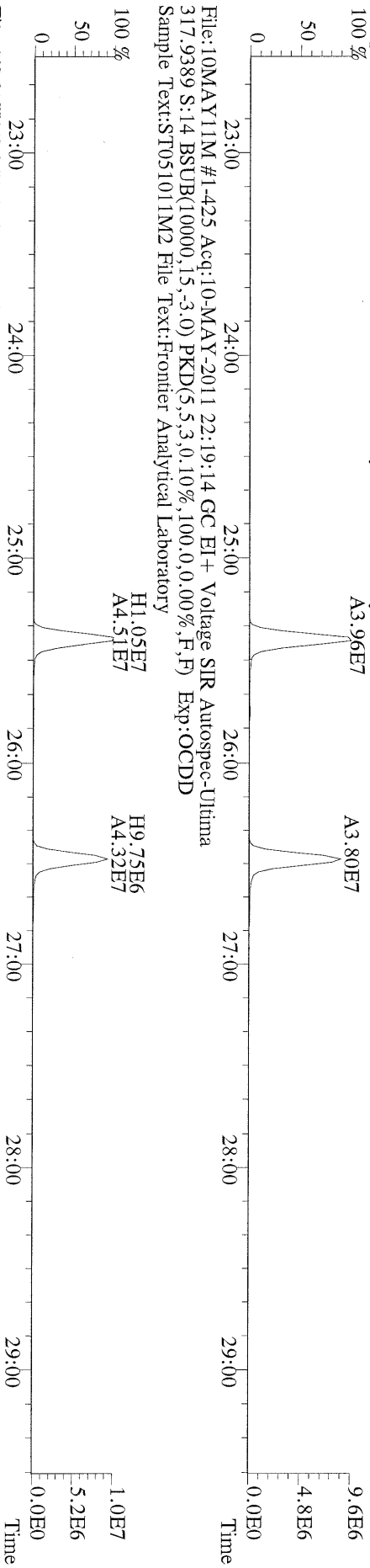
File:10MAY11M #1-347 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:14 F:5 Exp:OCDD
Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



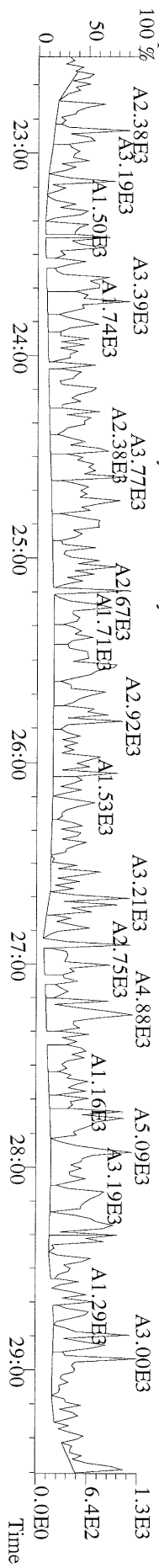
File:10MAY11M #1-425 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
 303.9016 S:14 BSUB(10000,15,-3.0) PKD(5,5,3,0,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory
 100 % A5.05E6



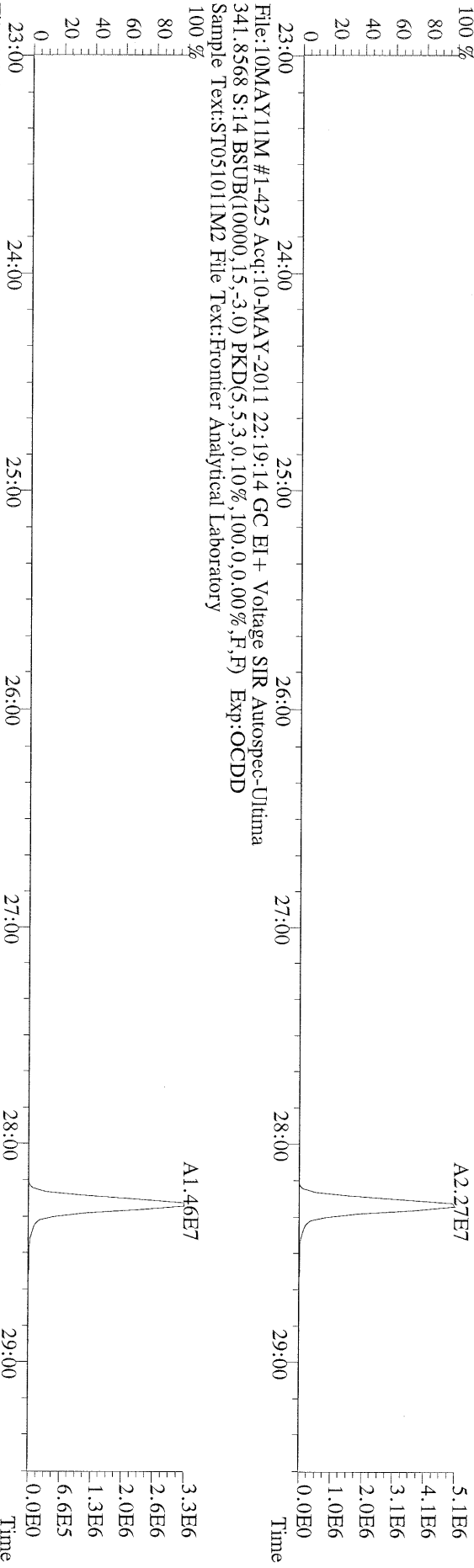
File:10MAY11M #1-425 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
 315.9419 S:14 BSUB(10000,15,-3.0) PKD(5,5,3,0,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory
 100 % A3.96E7



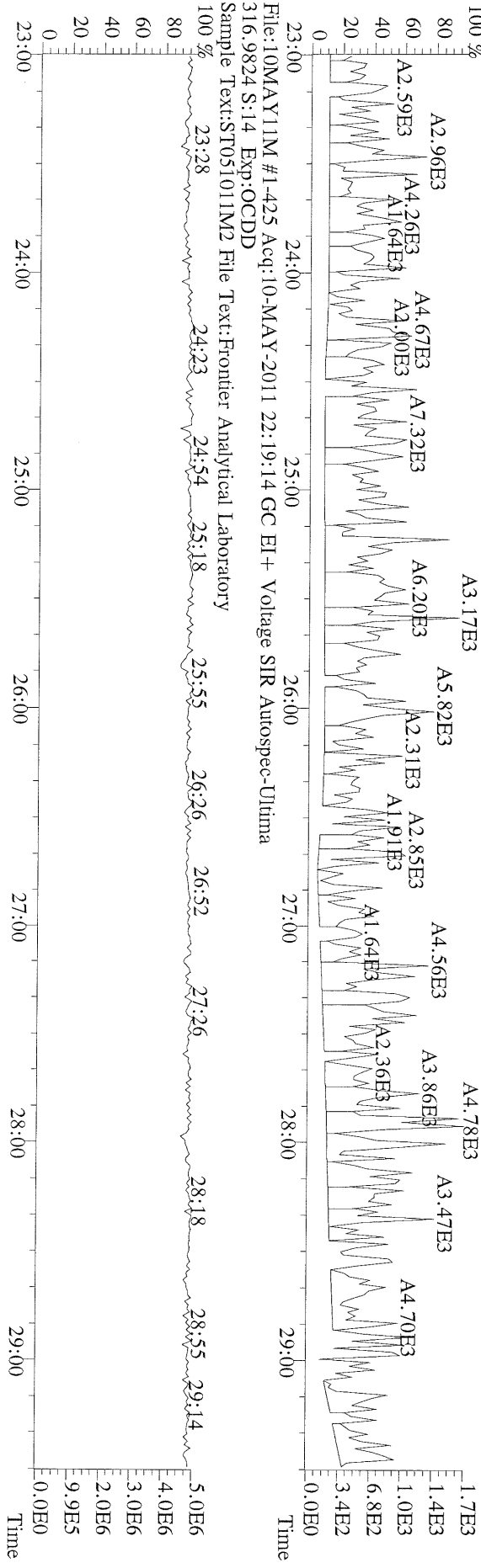
File:10MAY11M #1-425 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
 375.8364 S:14 BSUB(10000,15,-3.0) PKD(5,5,3,0,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory
 100 % A2.38E3



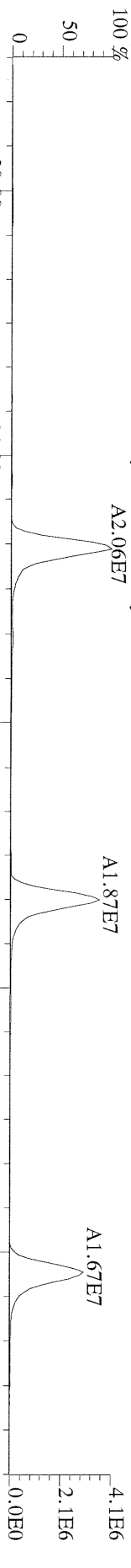
File:10MAY11M #1-425 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
 339.8597 S:14 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



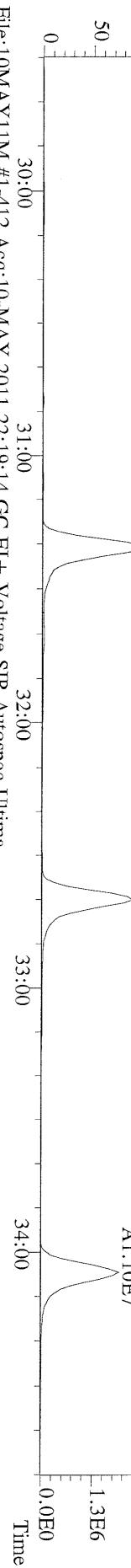
File:10MAY11M #1-425 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
 409.7974 S:14 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



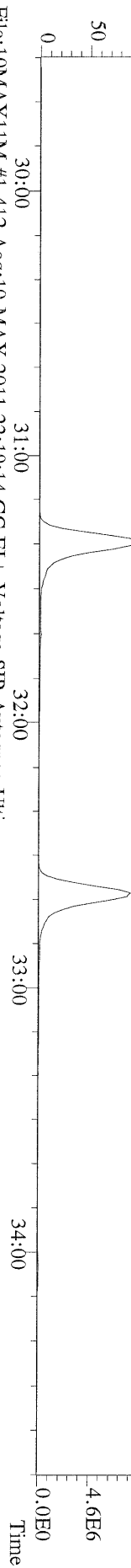
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 339.8597 S:14 F:2 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



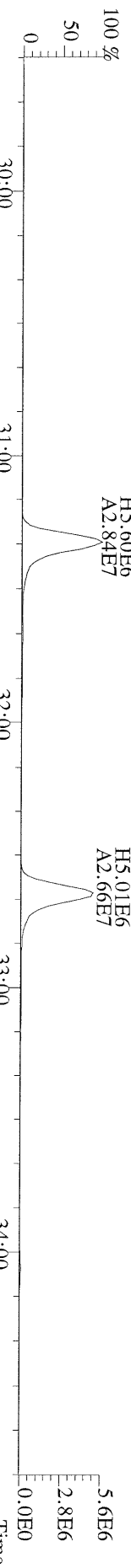
File:10MAY11M #1-412 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
 341.8568 S:14 F:2 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



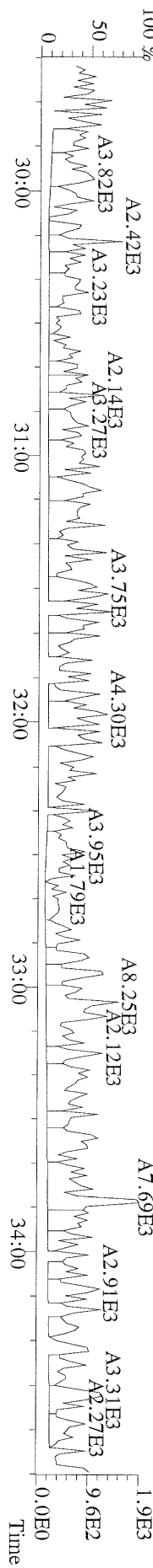
File:10MAY11M #1-412 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
 351.9000 S:14 F:2 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



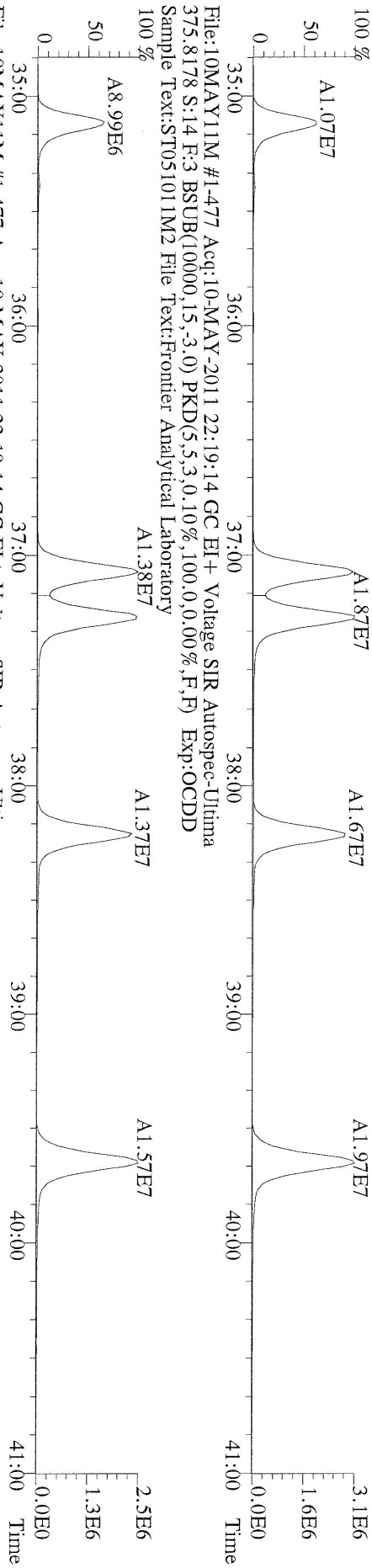
File:10MAY11M #1-412 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
 353.8970 S:14 F:2 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



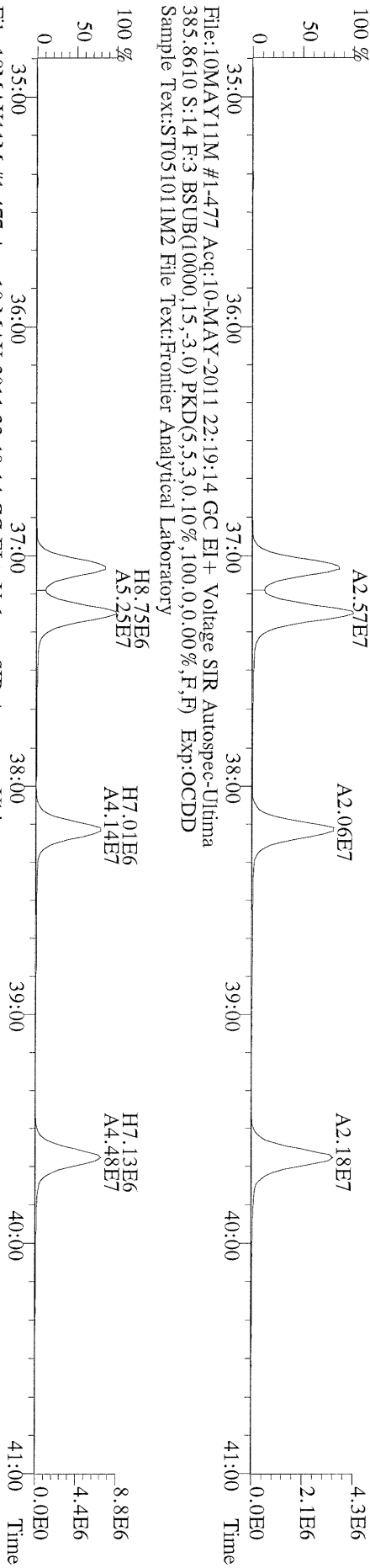
File:10MAY11M #1-412 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
 409.7974 S:14 F:2 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory



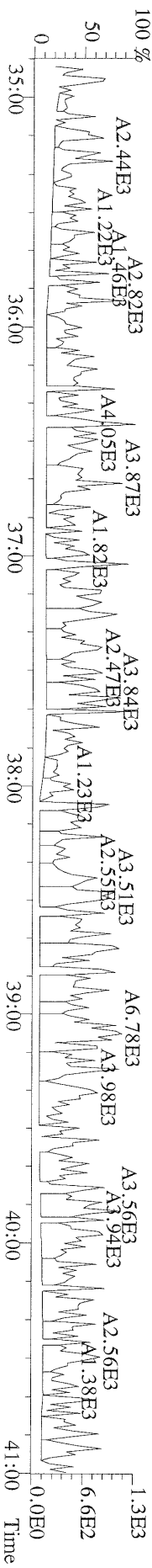
File:10MAY11M #1-477 Acq:10-MAY-2011 22:19:14 GC EI + Voltage SIR Autospec-Ultima
 373.8207 S:14 F:3 BSUB(10000,15,-3.0) PKD(5.5,3.0,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST05101IM2 File Text:Frontier Analytical Laboratory



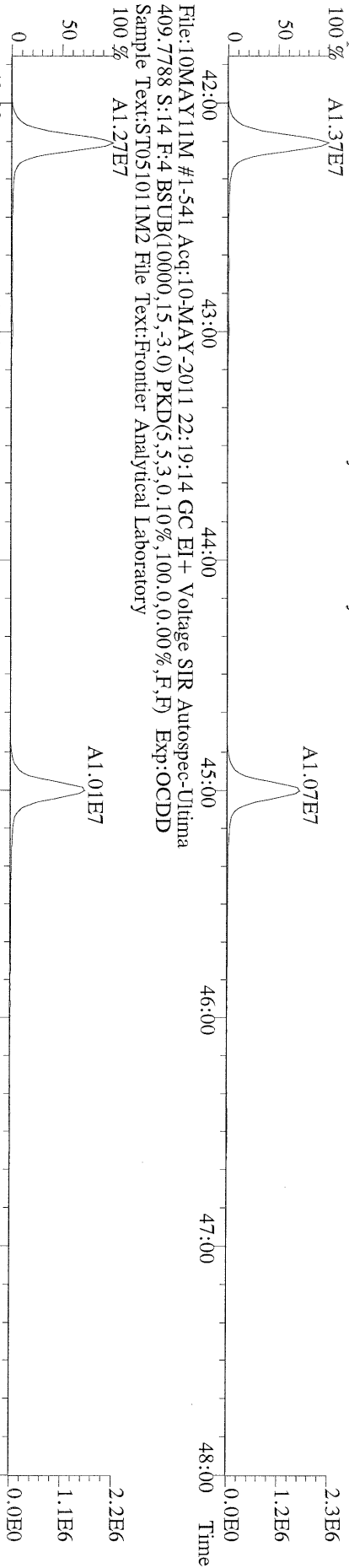
File:10MAY11M #1-477 Acq:10-MAY-2011 22:19:14 GC EI + Voltage SIR Autospec-Ultima
 383.8639 S:14 F:3 BSUB(10000,15,-3.0) PKD(5.5,3.0,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST05101IM2 File Text:Frontier Analytical Laboratory



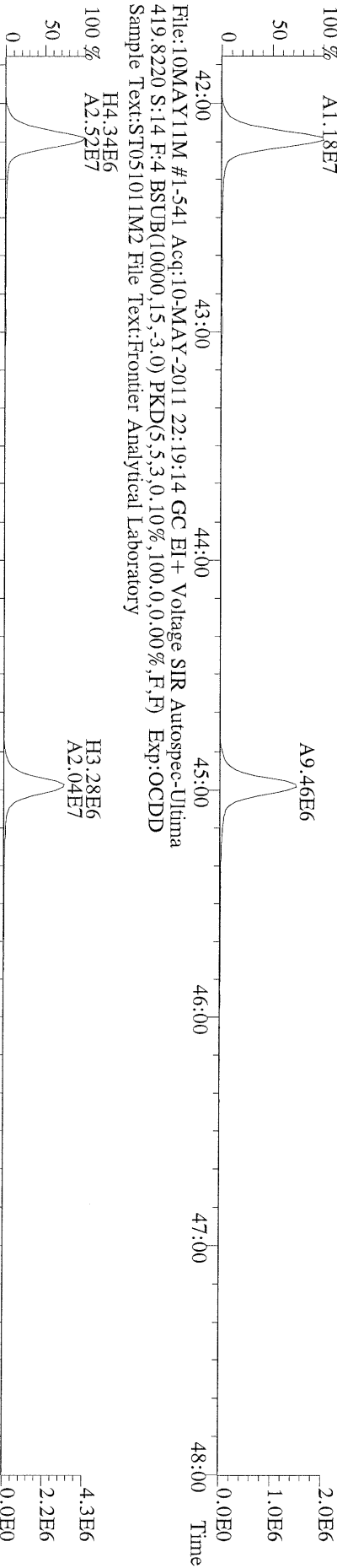
File:10MAY11M #1-477 Acq:10-MAY-2011 22:19:14 GC EI + Voltage SIR Autospec-Ultima
 445.7555 S:14 F:3 BSUB(10000,15,-3.0) PKD(5.5,3.0,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST05101IM2 File Text:Frontier Analytical Laboratory



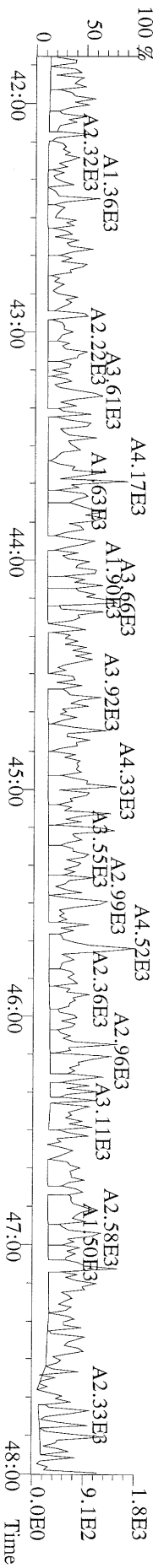
File:10MAY11M #1-541 Acq:10-MAY-2011 22:19:14 GC EI + Voltage SIR Autospec-Ultima
 407.7818 S:14 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST05101IM2 File Text:Frontier Analytical Laboratory
 100 % A1.37E7



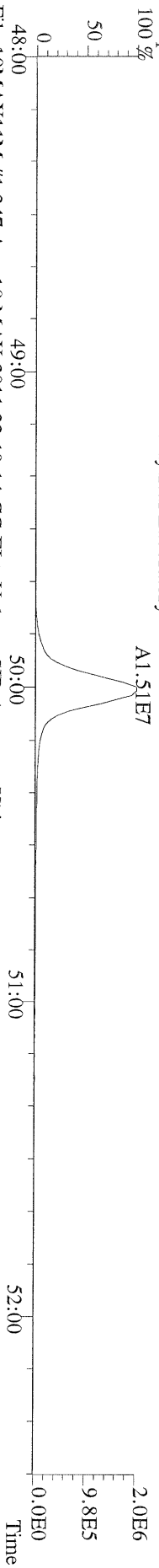
File:10MAY11M #1-541 Acq:10-MAY-2011 22:19:14 GC EI + Voltage SIR Autospec-Ultima
 417.8253 S:14 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST05101IM2 File Text:Frontier Analytical Laboratory
 100 % A1.18E7



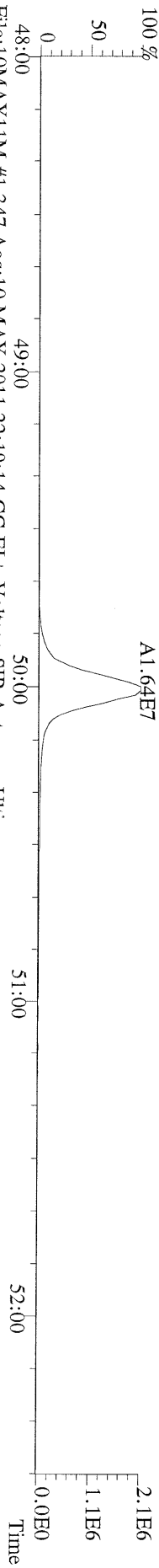
File:10MAY11M #1-541 Acq:10-MAY-2011 22:19:14 GC EI + Voltage SIR Autospec-Ultima
 419.8220 S:14 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST05101IM2 File Text:Frontier Analytical Laboratory
 100 % H4.34E6
 A2.52E7



File:10MAY11M #1-347 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
 441.7428 S:14 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory
 100 %



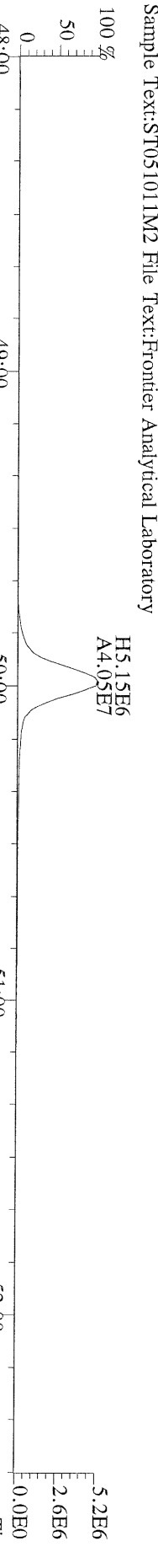
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 443.7398 S:14 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory
 100 %



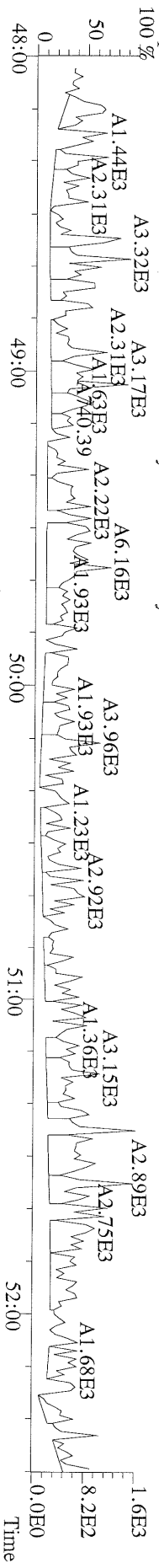
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 453.7831 S:14 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory
 100 %

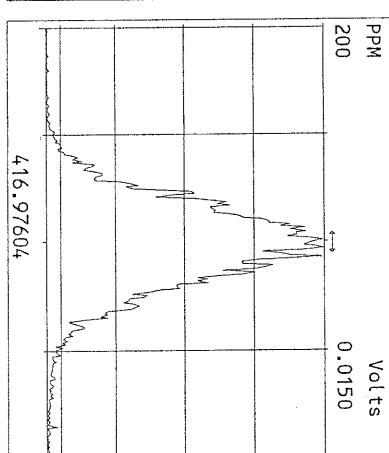
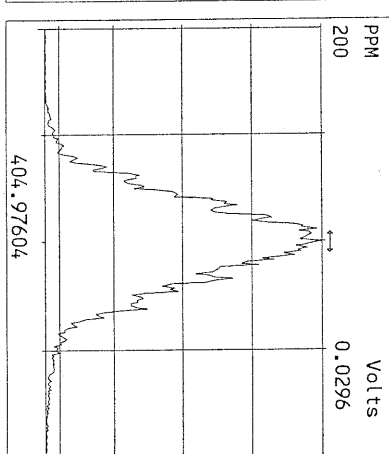
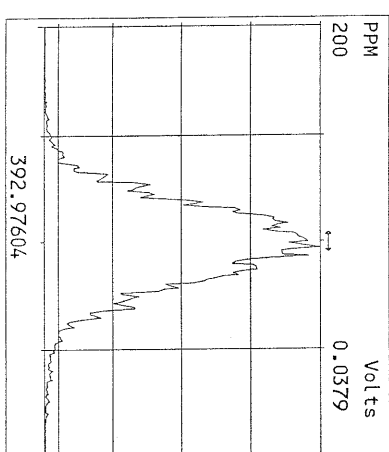
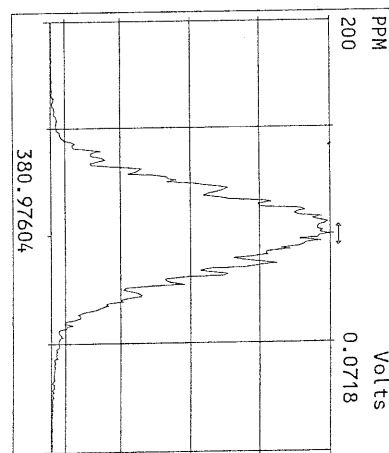
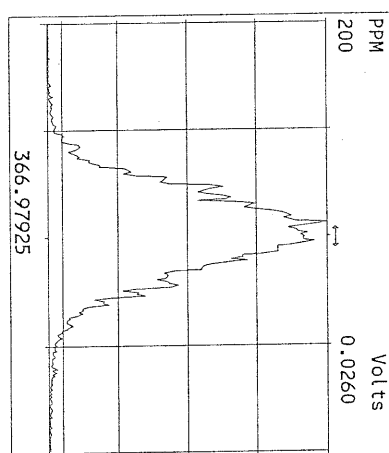
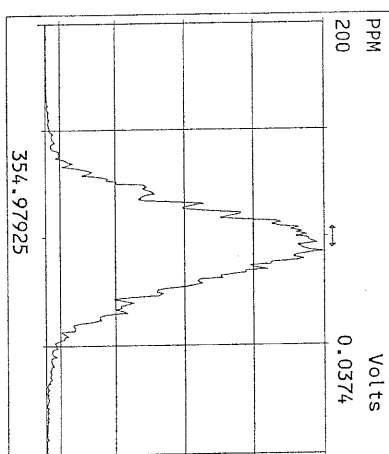
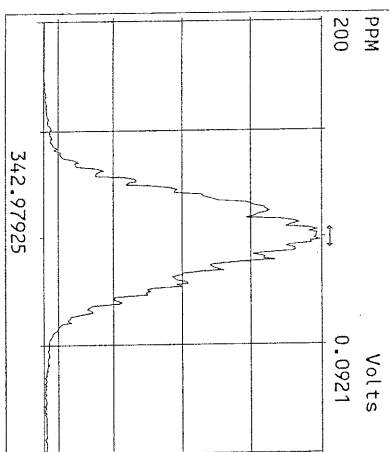
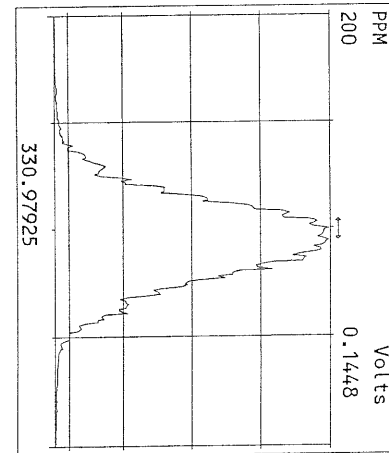
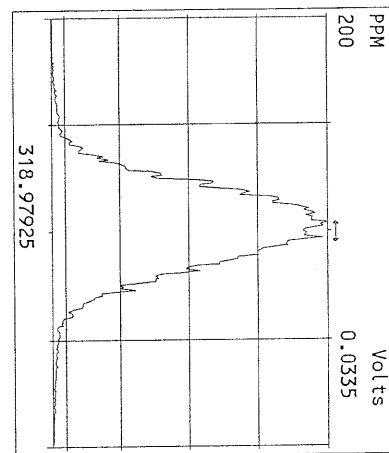
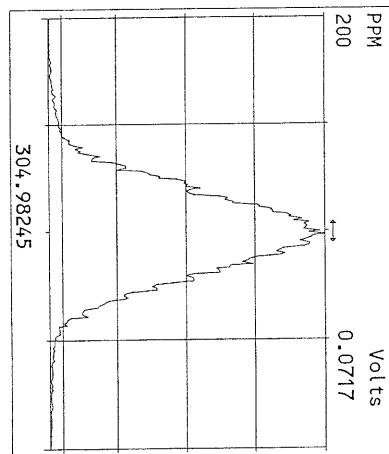
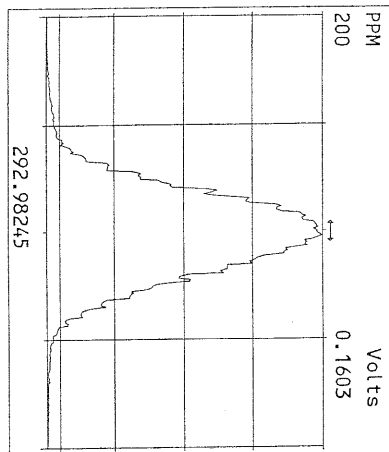


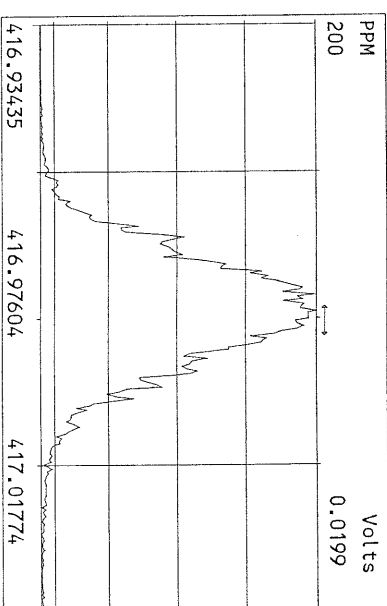
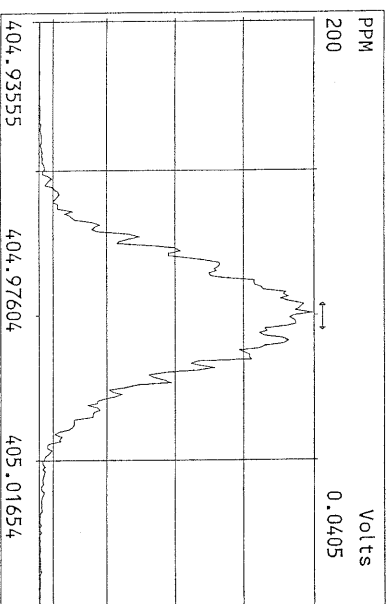
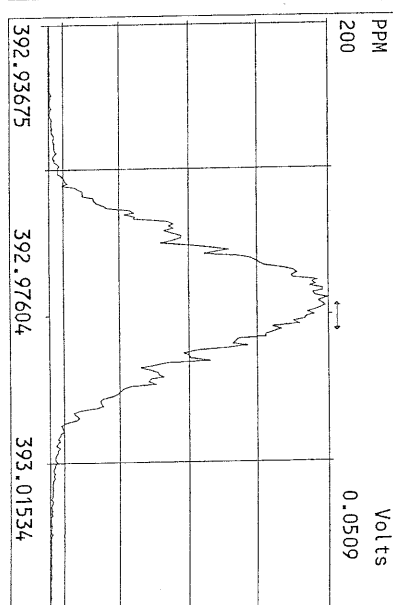
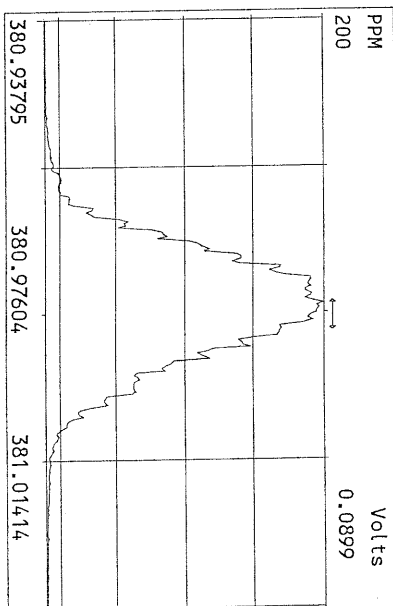
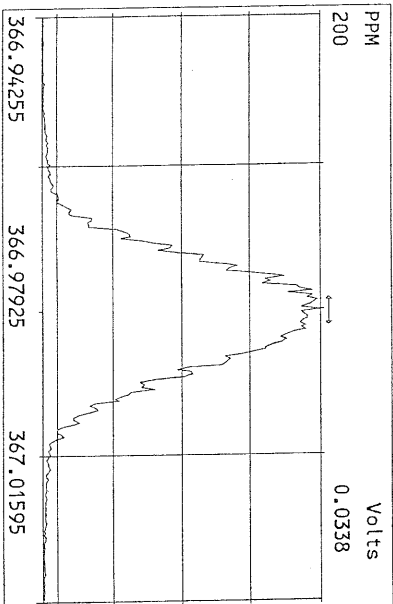
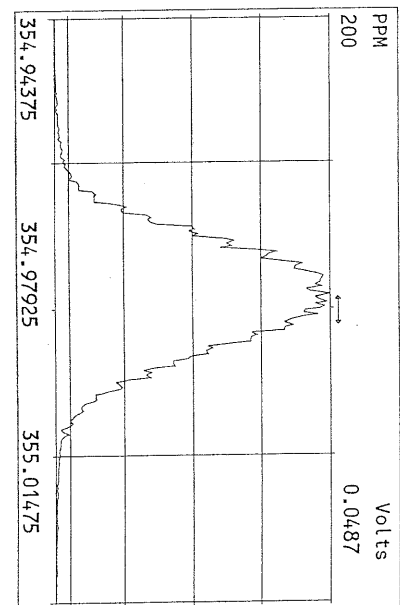
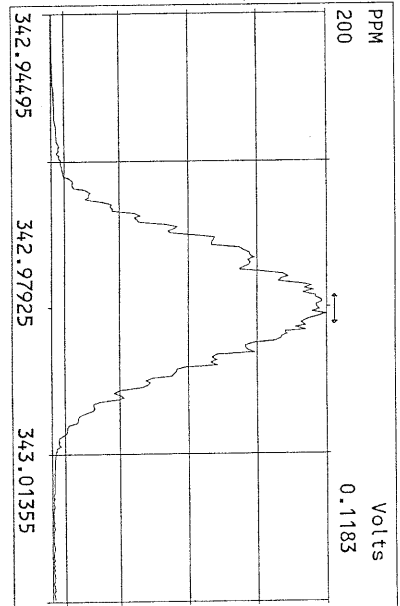
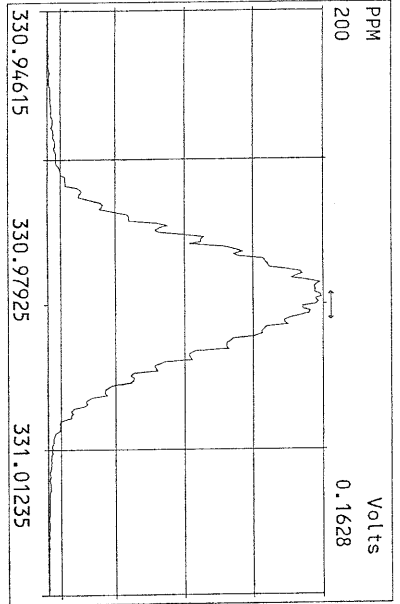
File:10MAY11M #1-347 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
 455.7801 S:14 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory

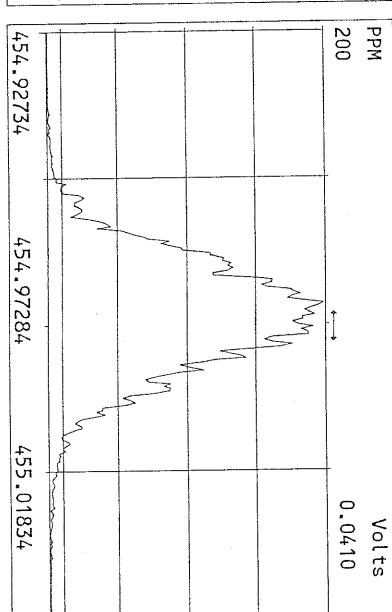
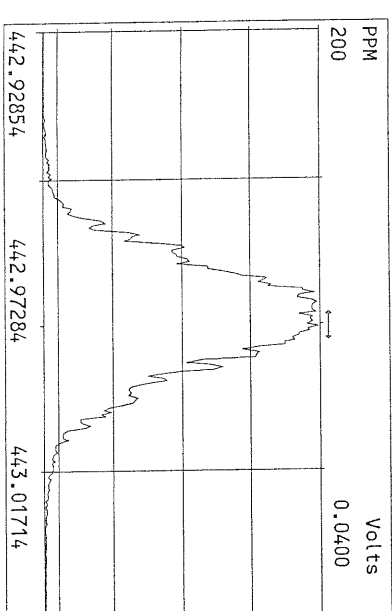
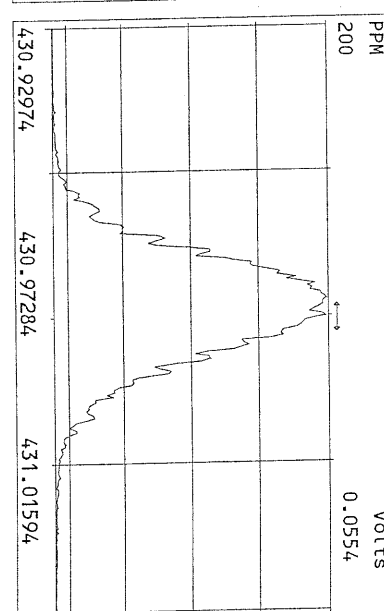
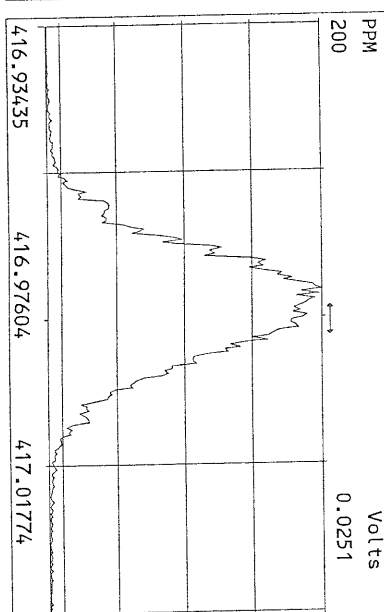
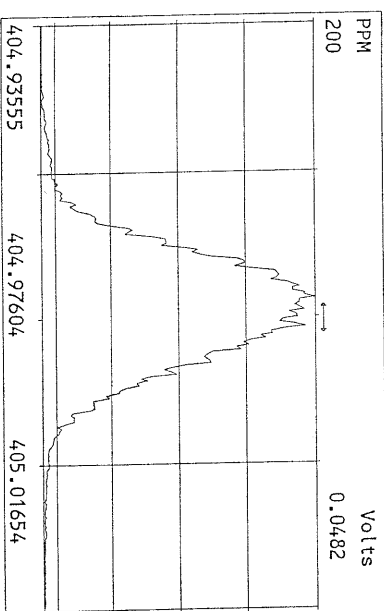
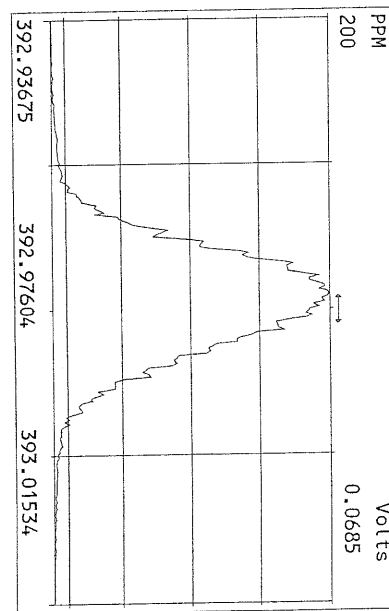
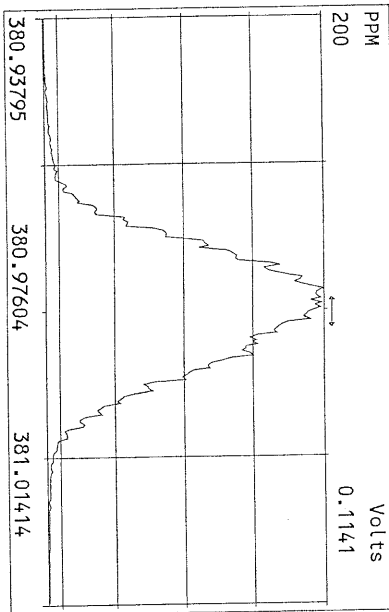
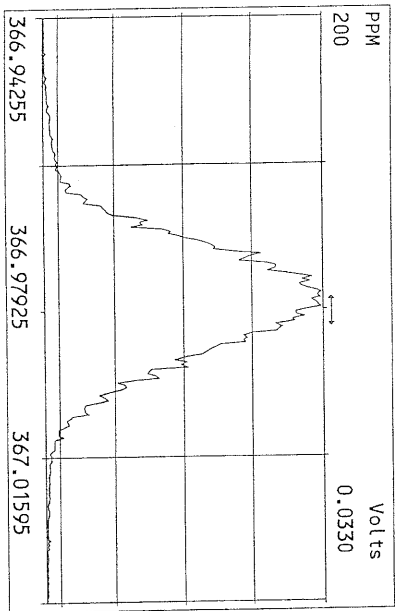


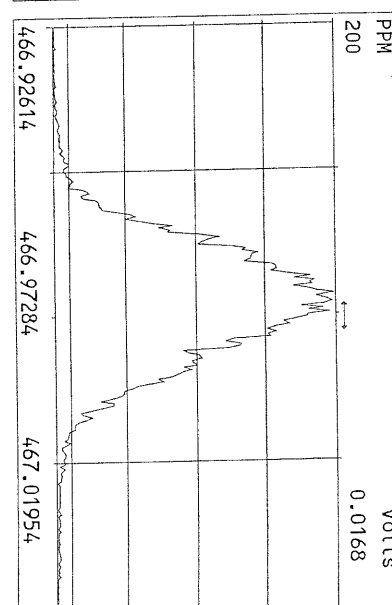
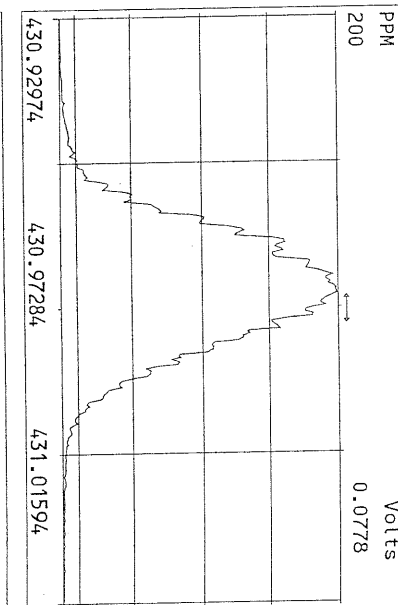
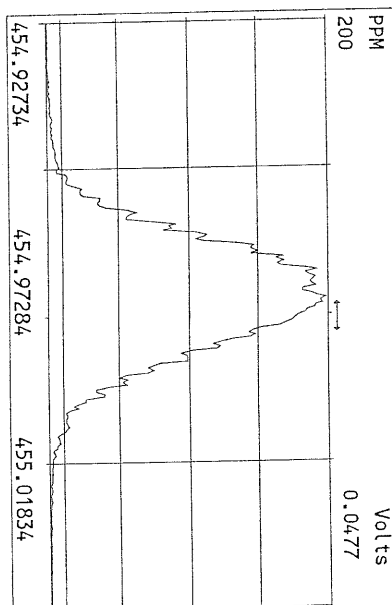
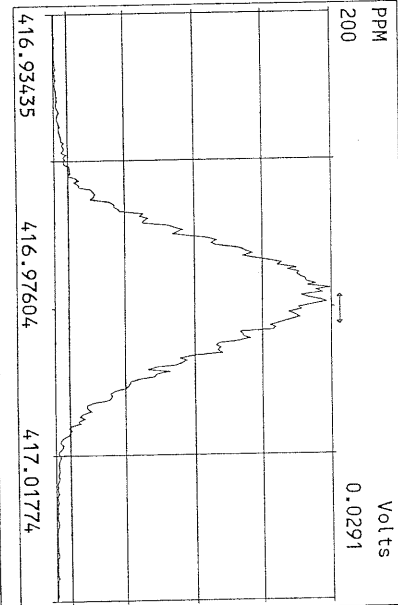
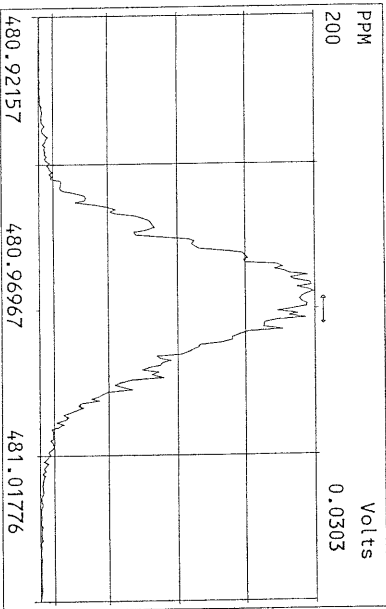
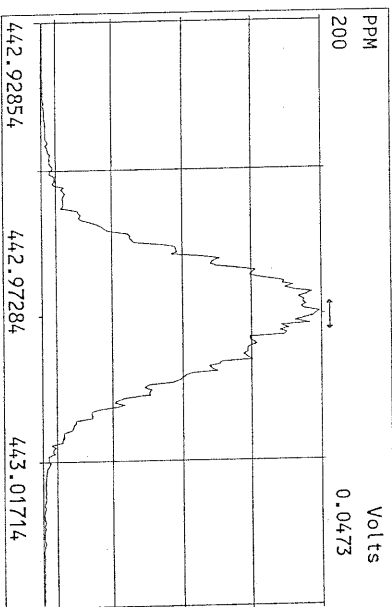
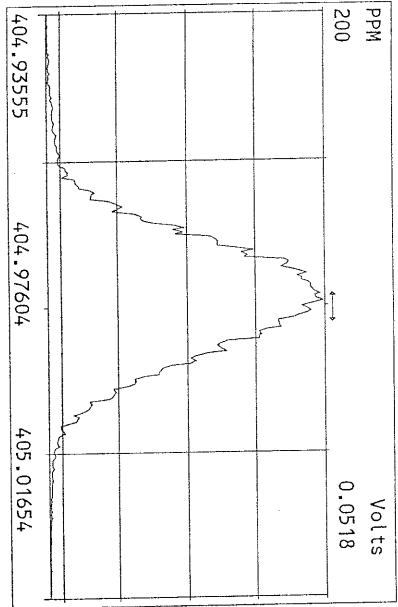
File:10MAY11M #1-347 Acq:10-MAY-2011 22:19:14 GC EI+ Voltage SIR Autospec-Ultima
 513.6775 S:14 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M2 File Text:Frontier Analytical Laboratory
 100 %



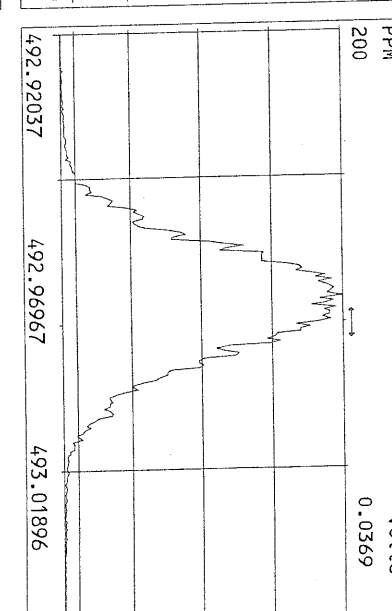
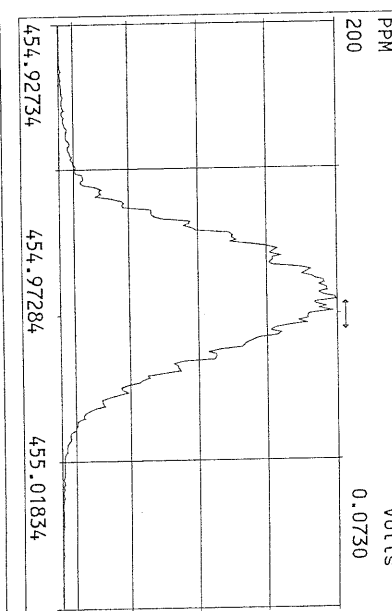
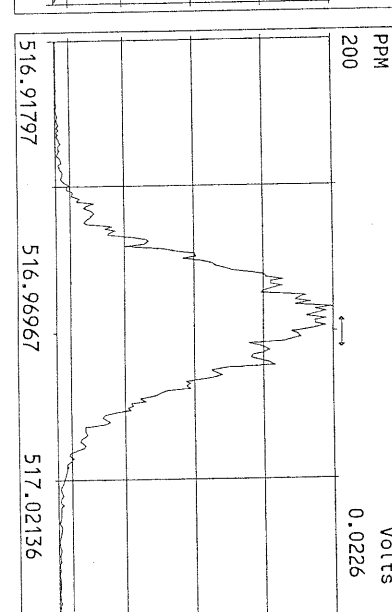
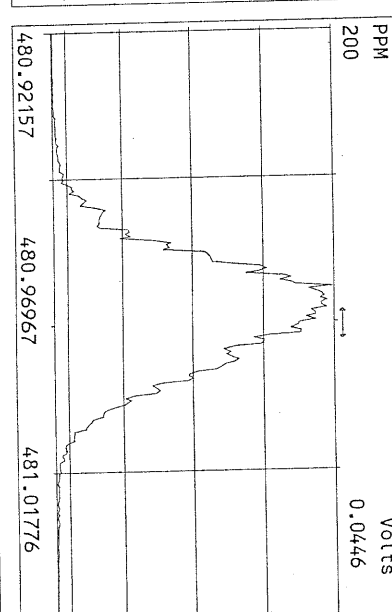
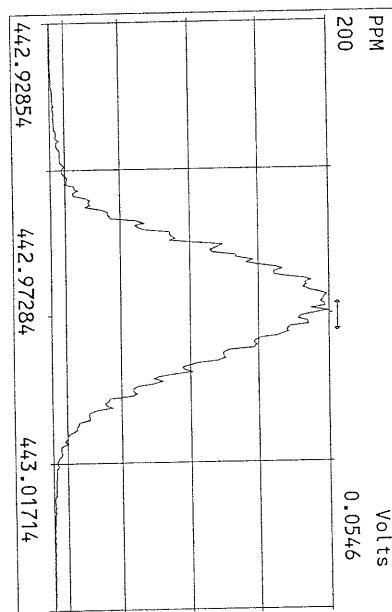
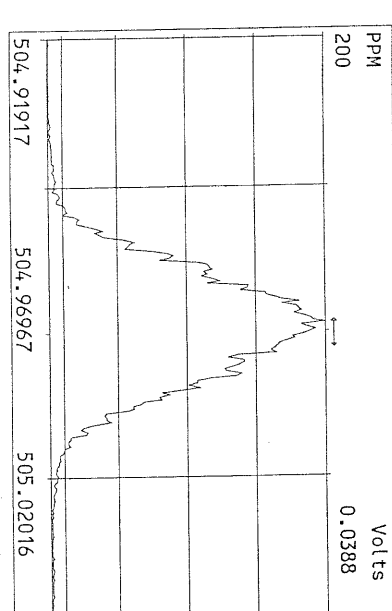
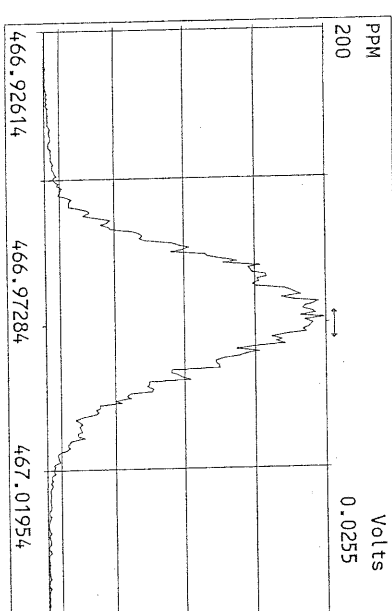
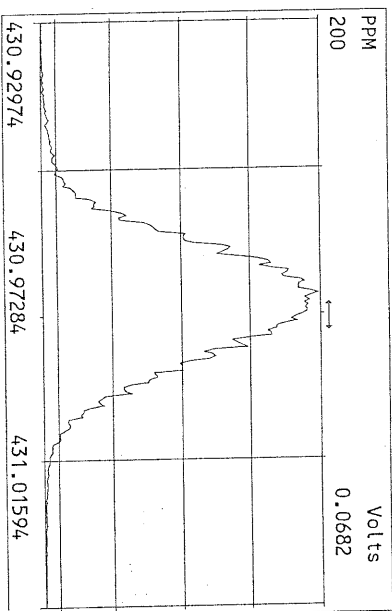








Peak Locate Examination: 11-MAY-2011:13:11 File:10MAY11M_RES_CHECK
 Experiment:OCDD Function:5 Reference:PFK



FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.:

Initial Calibration Date: 3/7/11

Instrument ID: FAL3

GC Column ID: DB5

VER Data Filename: 10MAY11M Sam:29


Analysis Date: 11-MAY-11 12:09:32

NATIVE ANALYTES	M/Z'S	ION	QC	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
	FORMING RATIO (1)	ABUND. RATIO	LIMITS (2)			
2,3,7,8-TCDD	M/M+2	0.79	0.65-0.89	y	10.1	7.80 - 12.9 ✓
1,2,3,7,8-PeCDD	M+2/M+4	1.53	1.32-1.78	y	52.5	39.0 - 65.0 ✓
1,2,3,4,7,8-HxCDD	M+2/M+4	1.31	1.05-1.43	y	48.4	39.0 - 64.0 ✓
1,2,3,6,7,8-HxCDD	M+2/M+4	1.31	1.05-1.43	y	50.6	39.0 - 64.0 ✓
1,2,3,7,8,9-HxCDD	M+2/M+4	1.28	1.05-1.43	y	51.0	41.0 - 61.0 ✓
1,2,3,4,6,7,8-HpCDD	M+2/M+4	0.92	0.88-1.20	y	49.8	43.0 - 58.0 ✓
OCDD	M+2/M+4	0.95	0.76-1.02	y	99.0	79.0 - 126 ✓
2,3,7,8-TCDF	M/M+2	0.66	0.65-0.89	y	11.5	8.40 - 12.0 ✓
1,2,3,7,8-PeCDF	M+2/M+4	1.55	1.32-1.78	y	51.4	41.0 - 60.0 ✓
2,3,4,7,8-PeCDF	M+2/M+4	1.54	1.32-1.78	y	50.3	41.0 - 60.0 ✓
1,2,3,4,7,8-HxCDF	M+2/M+4	1.24	1.05-1.43	y	48.5	45.0 - 56.0 ✓
1,2,3,6,7,8-HxCDF	M+2/M+4	1.23	1.05-1.43	y	49.1	44.0 - 57.0 ✓
2,3,4,6,7,8-HxCDF	M+2/M+4	1.22	1.05-1.43	y	48.7	44.0 - 57.0 ✓
1,2,3,7,8,9-HxCDF	M+2/M+4	1.23	1.05-1.43	y	49.3	45.0 - 56.0 ✓
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.05	0.88-1.20	y	47.5	45.0 - 55.0 ✓
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.07	0.88-1.20	y	48.3	43.0 - 58.0 ✓
OCDF	M+2/M+4	0.91	0.76-1.02	y	96.3	63.0 - 159 ✓

(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.

Analyst: Date: 5/11/11

Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL	#Hom
2,3,7,8-TCDD	5.68e+06	0.79 y	27:14	1.13	10.1		2.50	-	-	*	
1,2,3,7,8-PeCDD	2.73e+07	1.53 y	33:04	1.02	52.5		2.50	-	-	*	
1,2,3,4,7,8-HxCDD	3.04e+07	1.31 y	38:26	1.45	48.4		2.50	-	-	*	
1,2,3,6,7,8-HxCDD	2.50e+07	1.31 y	38:37	1.45	50.6		2.50	-	-	*	
1,2,3,7,8,9-HxCDD	2.90e+07	1.28 y	39:04	1.47	51.0		2.50	-	-	*	
1,2,3,4,6,7,8-HpCDD	2.32e+07	0.92 y	44:04	1.30	49.8		2.50	-	-	*	
OCDD	3.24e+07	0.95 y	49:37	1.45	99.0		2.50	-	-	*	
2,3,7,8-TCDF	1.10e+07	0.66 y	26:29	1.15	11.5		2.50	-	-	*	
1,2,3,7,8-PeCDF	3.63e+07	1.55 y	31:20	0.89	51.4		2.50	-	-	*	
2,3,4,7,8-PeCDF	3.47e+07	1.54 y	32:39	0.89	50.3		2.50	-	-	*	
1,2,3,4,7,8-HxCDF	3.51e+07	1.24 y	37:03	1.01	48.5		2.50	-	-	*	
1,2,3,6,7,8-HxCDF	3.85e+07	1.23 y	37:14	0.89	49.1		2.50	-	-	*	
2,3,4,6,7,8-HxCDF	3.51e+07	1.22 y	38:11	1.02	48.7		2.50	-	-	*	
1,2,3,7,8,9-HxCDF	3.99e+07	1.23 y	39:38	1.10	49.3		2.50	-	-	*	
1,2,3,4,6,7,8-HpCDF	2.98e+07	1.05 y	42:10	1.48	47.5		2.50	-	-	*	
1,2,3,4,7,8,9-HpCDF	2.27e+07	1.07 y	44:59	1.43	48.3		2.50	-	-	*	
OCDF	3.35e+07	0.91 y	49:58	0.84	96.3		2.50	-	-	*	
										Rec	
13C-2,3,7,8-TCDD	4.98e+07	0.79 y	27:13	1.03	94.1					94.1	
13C-1,2,3,7,8-PeCDD	5.11e+07	1.76 y	33:03	1.01	98.3					98.3	
13C-1,2,3,4,7,8-HxCDD	4.34e+07	1.24 y	38:26	1.19	96.4					96.4	
13C-1,2,3,6,7,8-HxCDD	3.40e+07	1.24 y	38:36	0.94	96.1					96.1	
13C-1,2,3,4,6,7,8-HpCDD	3.59e+07	1.05 y	44:03	0.83	115					115	
13C-OCDD	4.52e+07	0.96 y	49:35	0.61	197					98.4	
13C-2,3,7,8-TCDF	8.39e+07	0.87 y	26:28	0.98	97.5					97.5	
13C-1,2,3,7,8-PeCDF	7.96e+07	1.66 y	31:18	0.83	109					109	
13C-2,3,4,7,8-PeCDF	7.73e+07	1.67 y	32:38	0.80	110					110	
13C-1,2,3,4,7,8-HxCDF	7.17e+07	0.48 y	37:01	1.84	103					103	
13C-1,2,3,6,7,8-HxCDF	8.80e+07	0.48 y	37:14	2.29	102					102	
13C-2,3,4,6,7,8-HxCDF	7.09e+07	0.48 y	38:10	1.86	101					101	
13C-1,2,3,7,8,9-HxCDF	7.33e+07	0.49 y	39:36	1.98	97.9					97.9	
13C-1,2,3,4,6,7,8-HpCDF	4.24e+07	0.46 y	42:08	0.99	114					114	
13C-1,2,3,4,7,8,9-HpCDF	3.30e+07	0.45 y	44:58	0.77	114					114	
13C-OCDF	8.27e+07	0.95 y	49:57	1.17	188					93.8	
37Cl-2,3,7,8-TCDD	3.35e+06		27:14	0.73	8.92					89.2	
13C-1,2,3,4-TCDD	5.15e+07	0.80 y	26:39	-	135						
13C-1,2,3,4-TCDF	8.78e+07	0.88 y	25:23	-	122						
13C-1,2,3,7,8,9-HxCDD	3.78e+07	1.24 y	39:02	-	152						
Total Tetra-Dioxins	3.12e+07		24:14	1.13	55.3		2.50	-	-	*	17
Total Penta-Dioxins	5.98e+07		30:05	1.02	115		2.50	-	-	*	15
Total Hexa-Dioxins	9.57e+07		35:59	1.46	170		2.50	-	-	*	5
Total Hepta-Dioxins	4.96e+07		42:41	1.30	106		2.50	-	-	*	10
Total Tetra-Furans	5.26e+07		22:54	1.15	54.7		2.50	-	-	*	17
1st Fn. Tot Penta-Furans	3.73e+07		28:15	0.89	53.4		2.50	-	-	*	PeCDF 1
Total Penta-Furans	1.04e+08		30:01	0.89	150		2.50	-	-	*	203 9
Total Hexa-Furans	1.73e+08		35:06	1.00	227		2.50	-	-	*	18
Total Hepta-Furans	5.28e+07		42:10	1.46	96.3		2.50	-	-	*	4

Analyst:  Date: 5/11/11

Frontier Analytical Laboratory - Acquisition Log

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Instrument: FAL3

GC: DB5

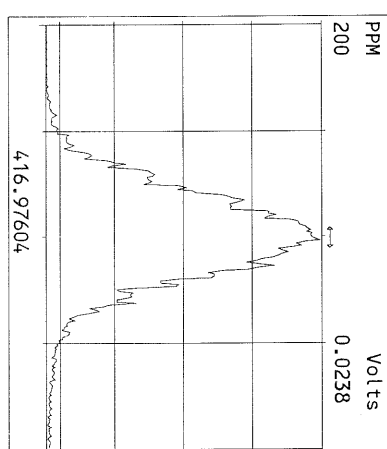
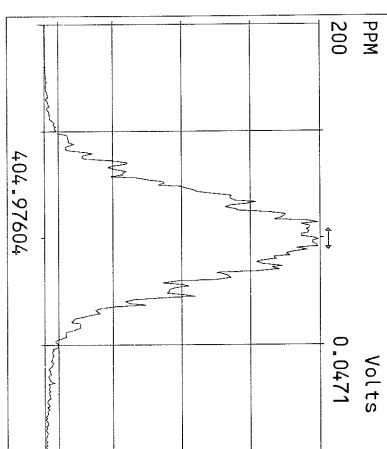
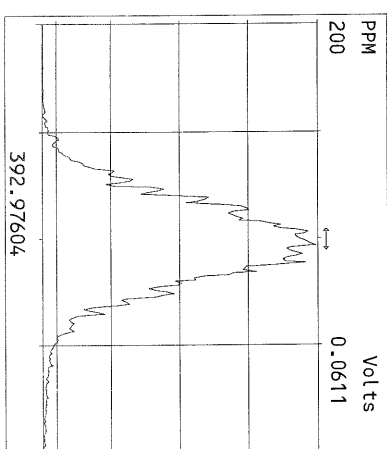
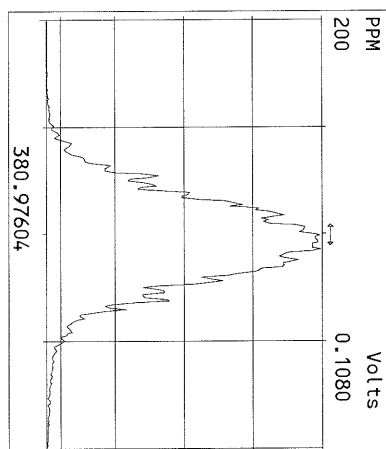
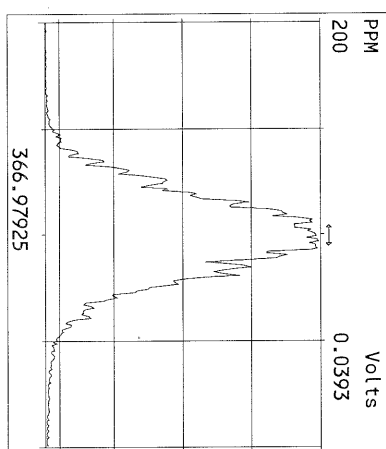
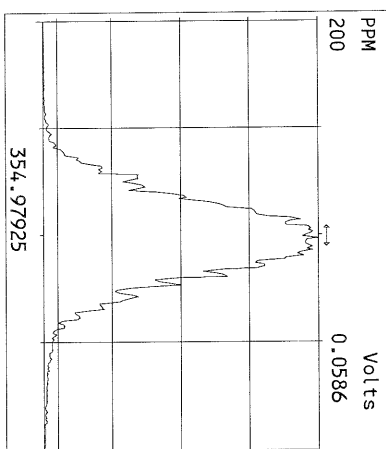
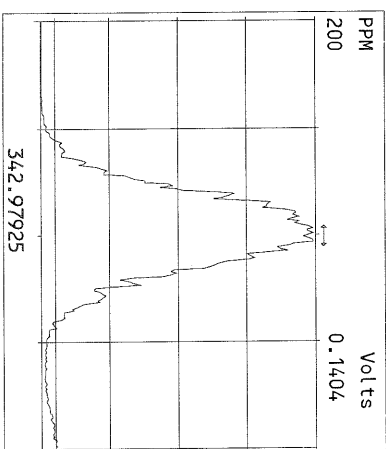
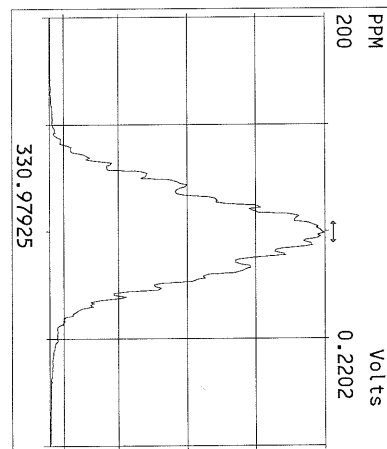
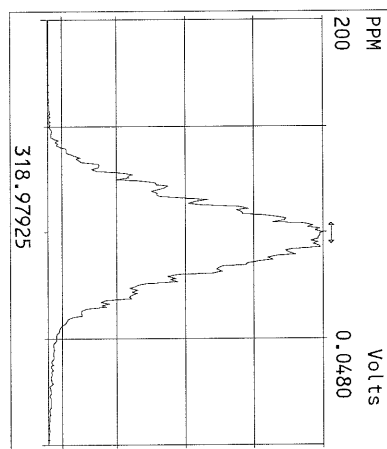
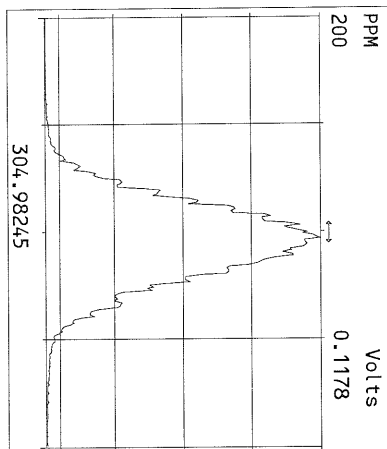
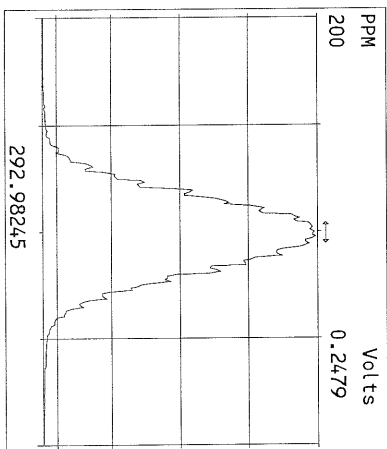
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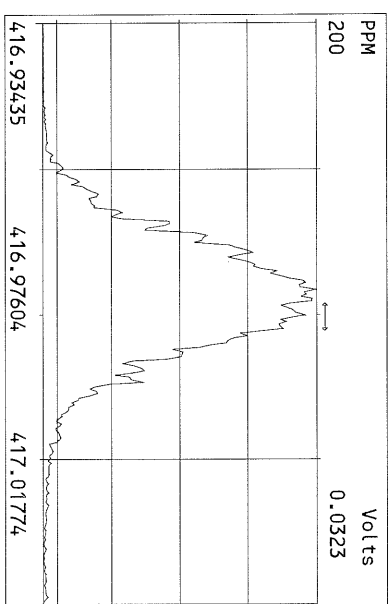
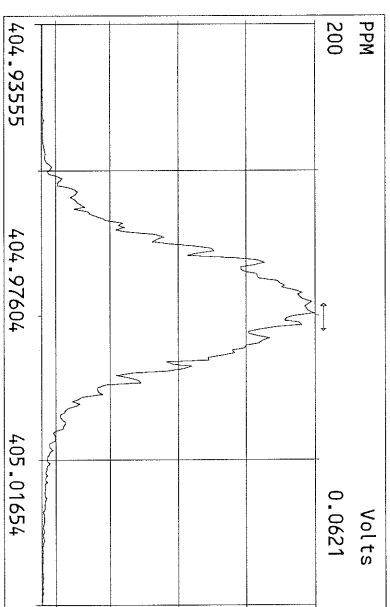
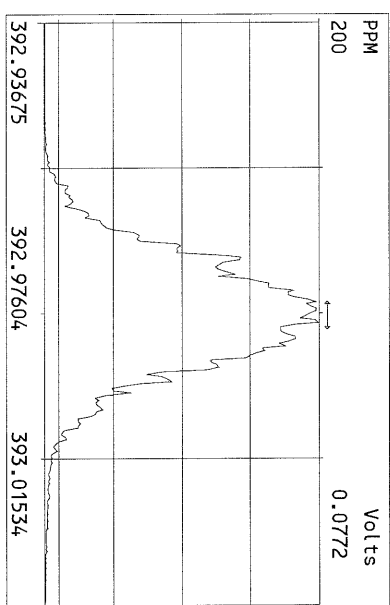
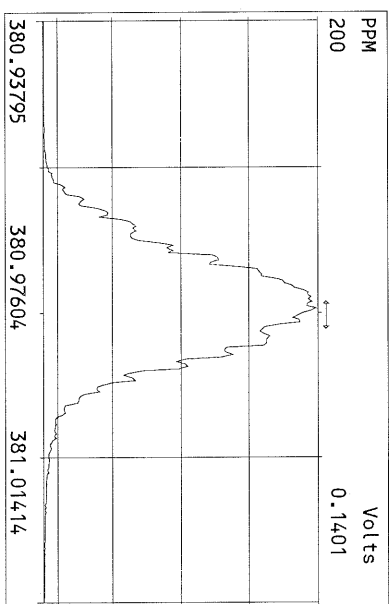
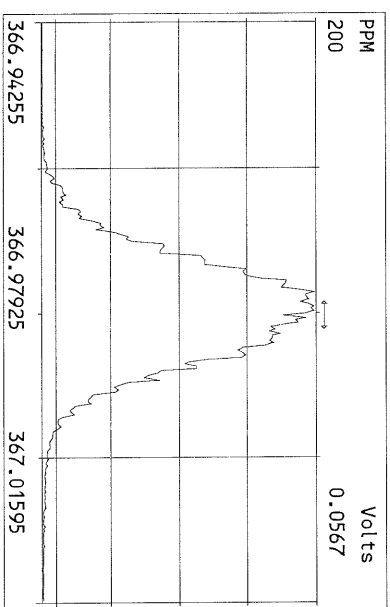
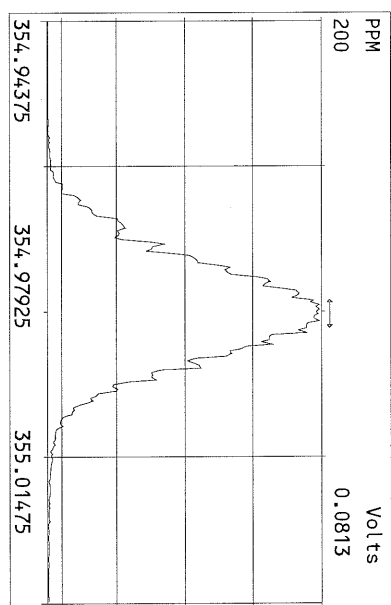
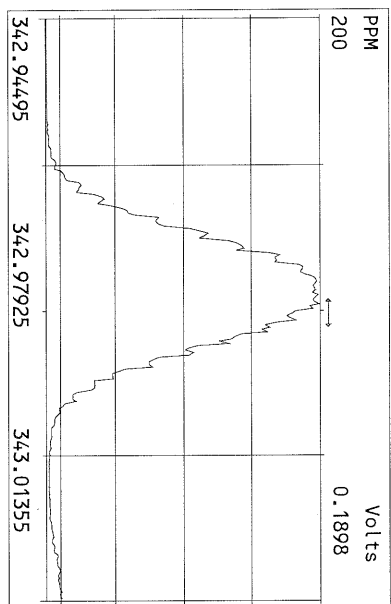
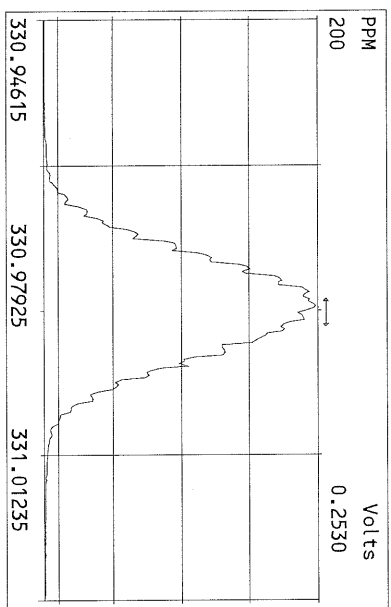
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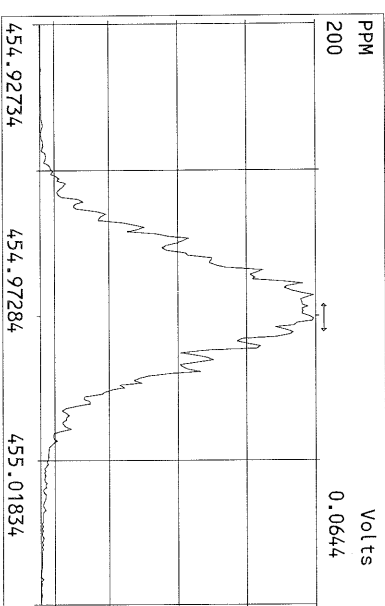
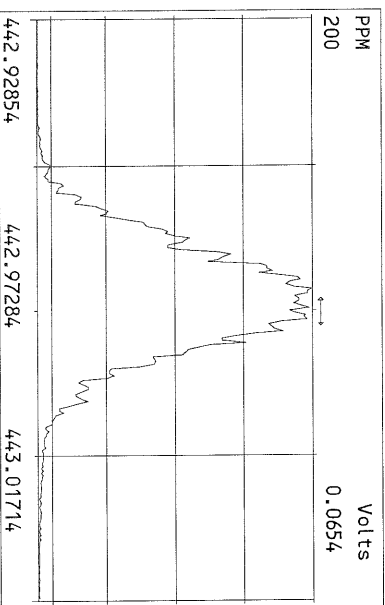
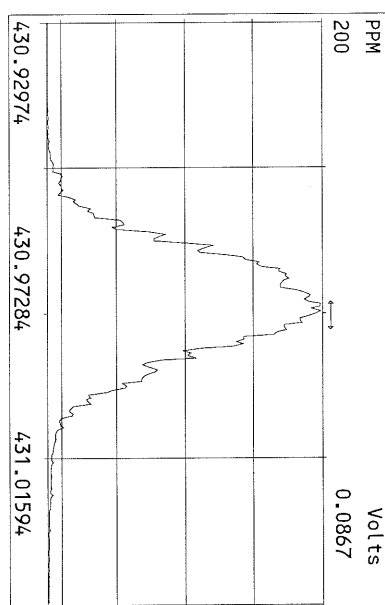
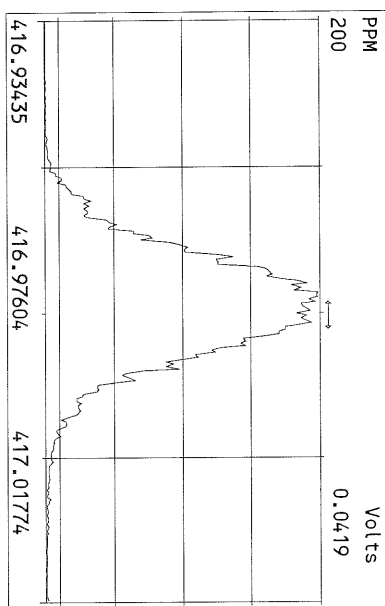
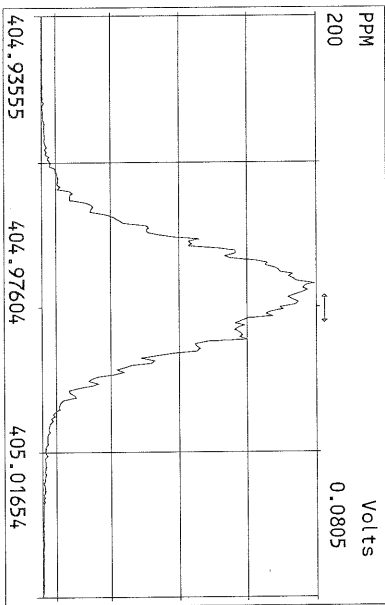
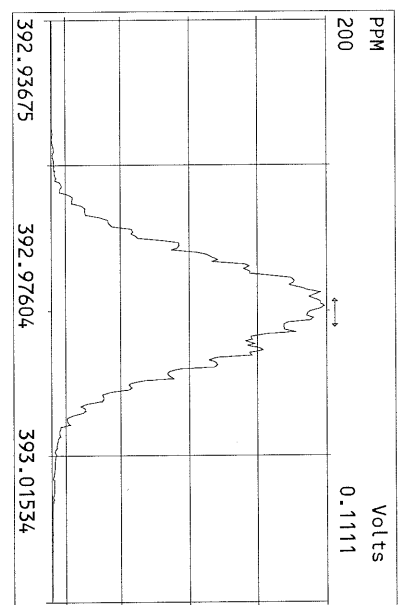
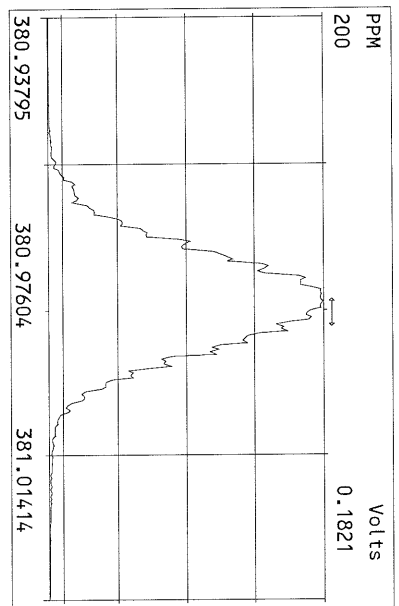
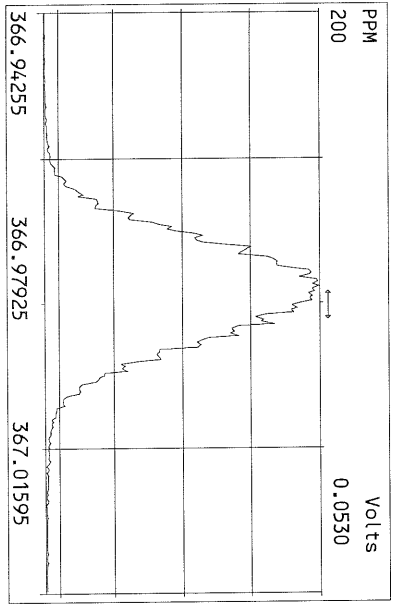
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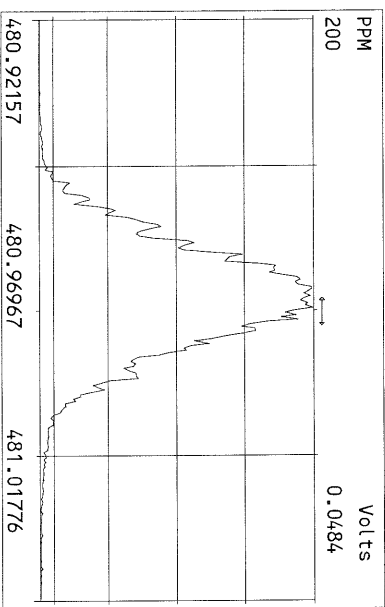
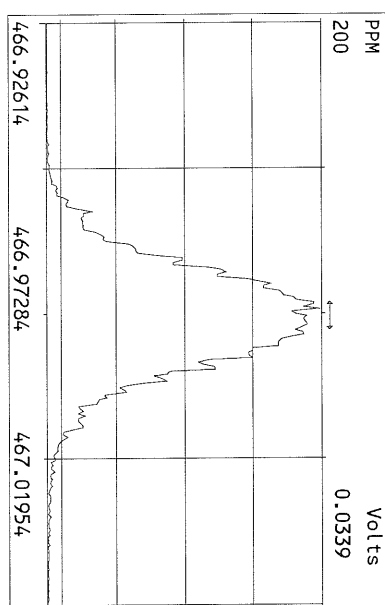
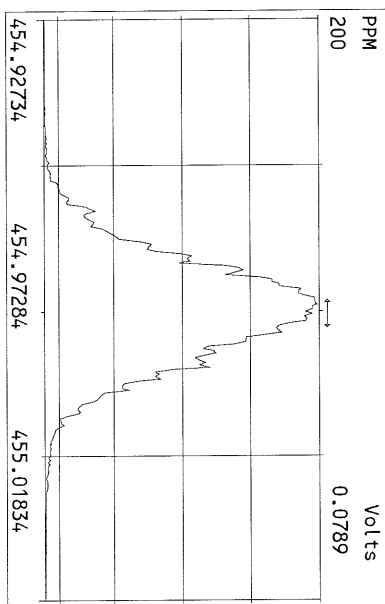
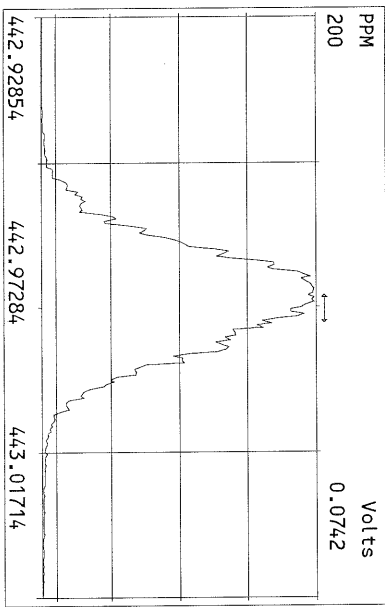
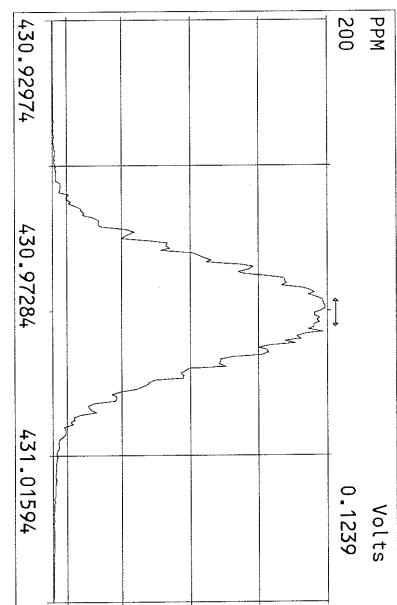
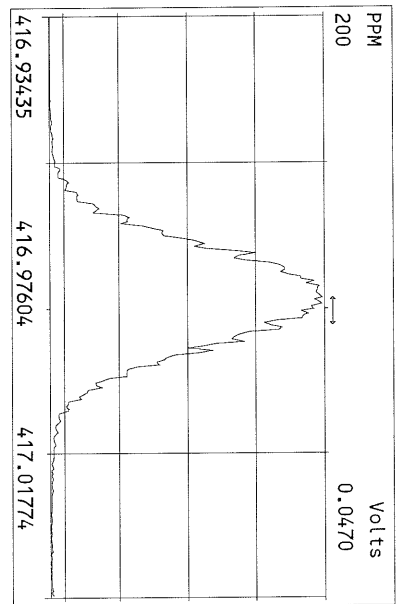
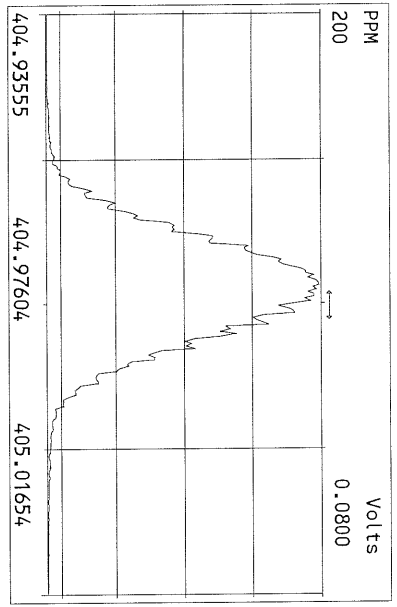
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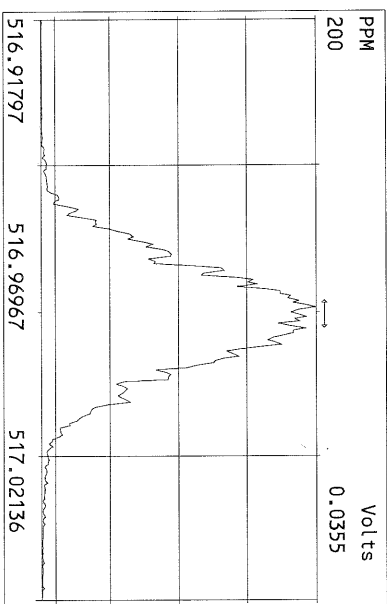
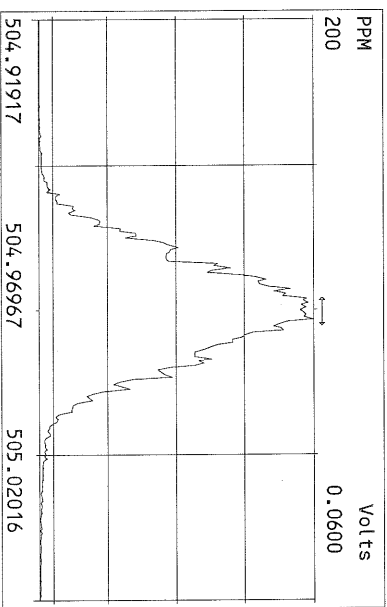
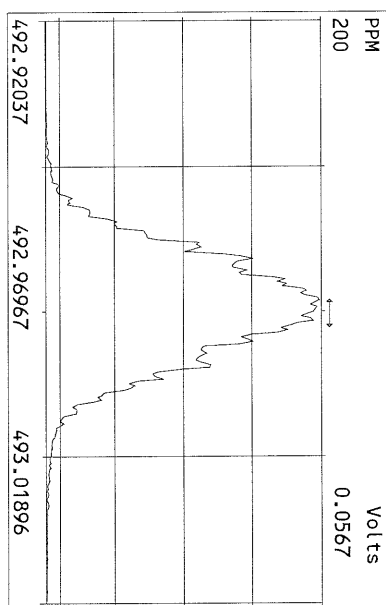
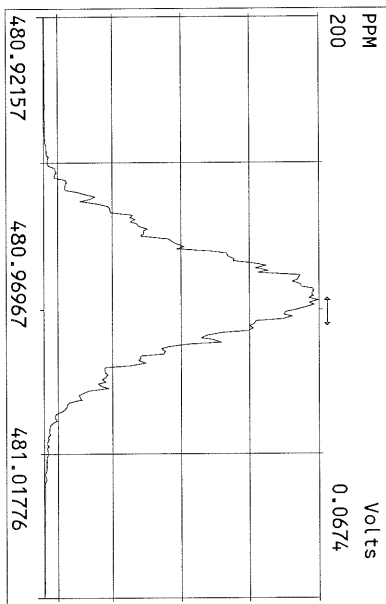
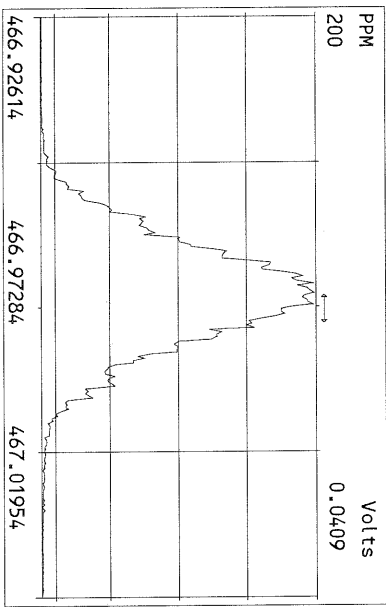
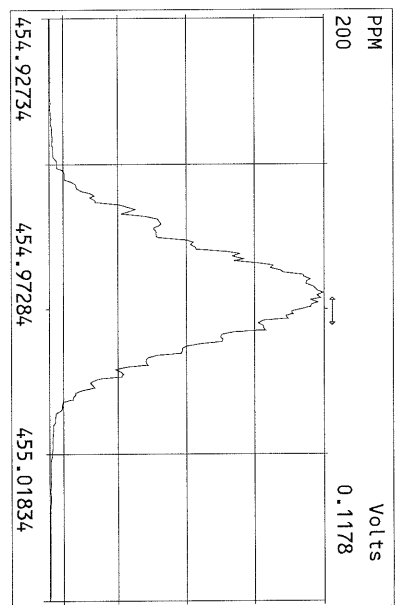
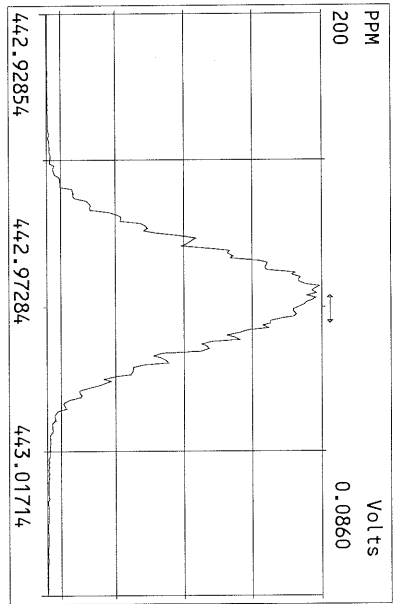
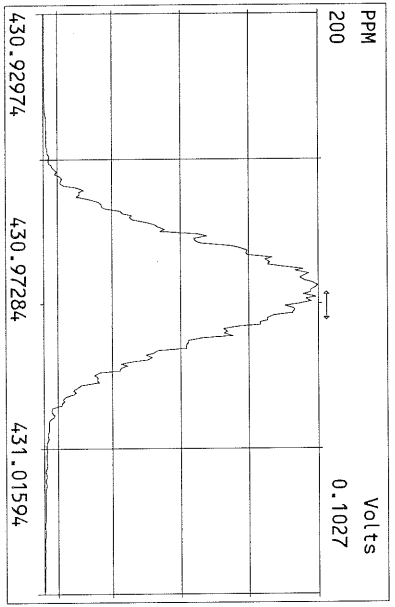
Date: _____



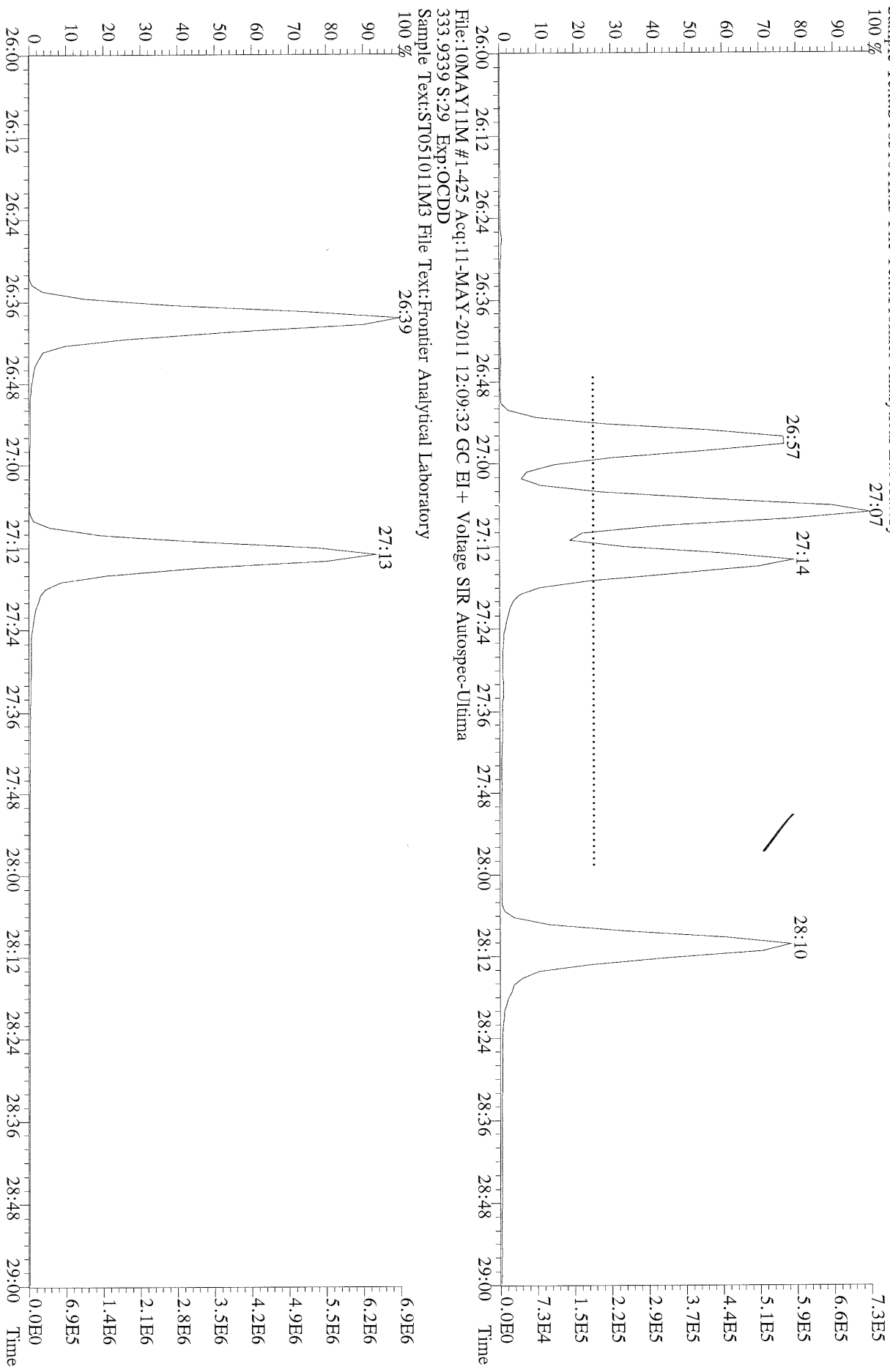




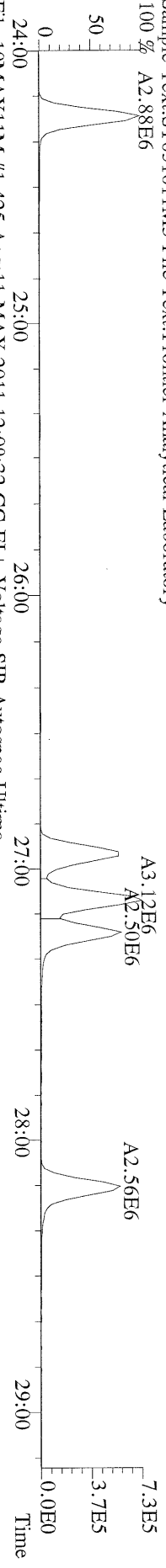




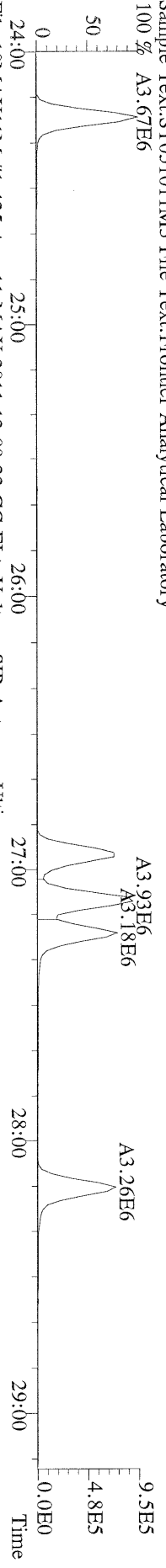
File:10MAY11M #1-425 Acq:11-MAY-2011 12:09:32 GC EI+ Voltage SIR Autospec-Utima
319.8965 S:29 Exp:OCDD
Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory
100 %



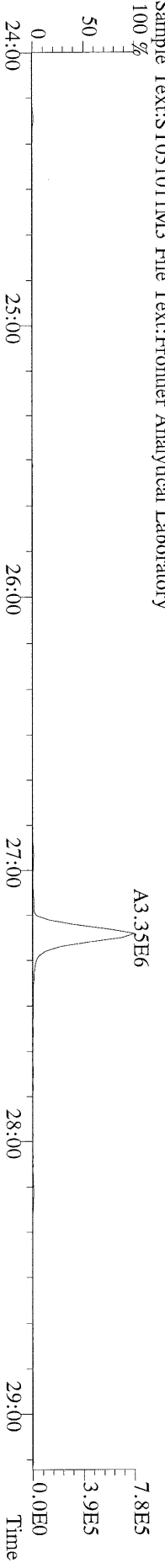
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 319.8965 S:29 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory
 100% A2.88E6



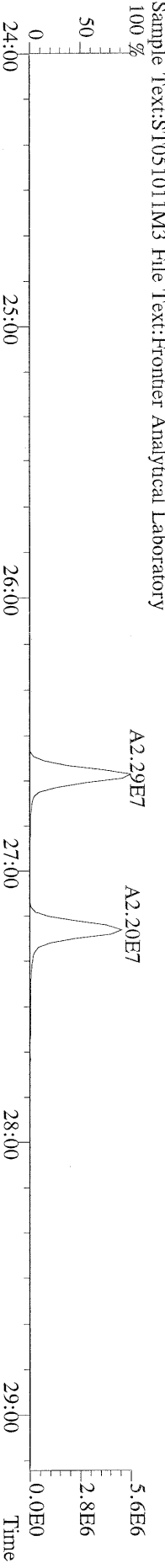
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 321.8936 S:29 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory
 100% A3.67E6



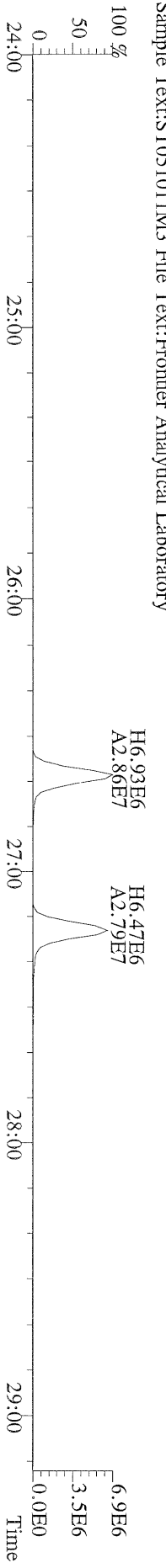
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 327.8847 S:29 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory
 100% A3.35E6



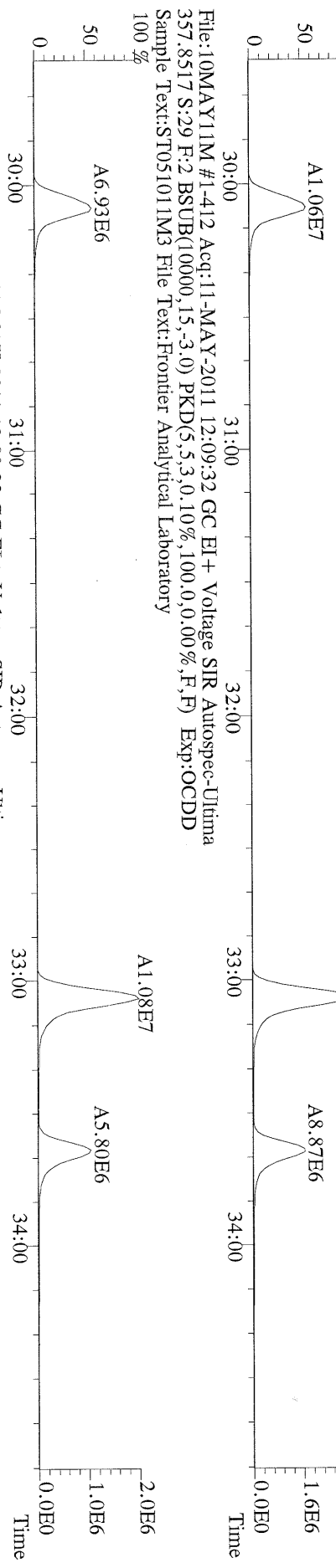
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 331.9368 S:29 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory
 100% A2.29E7



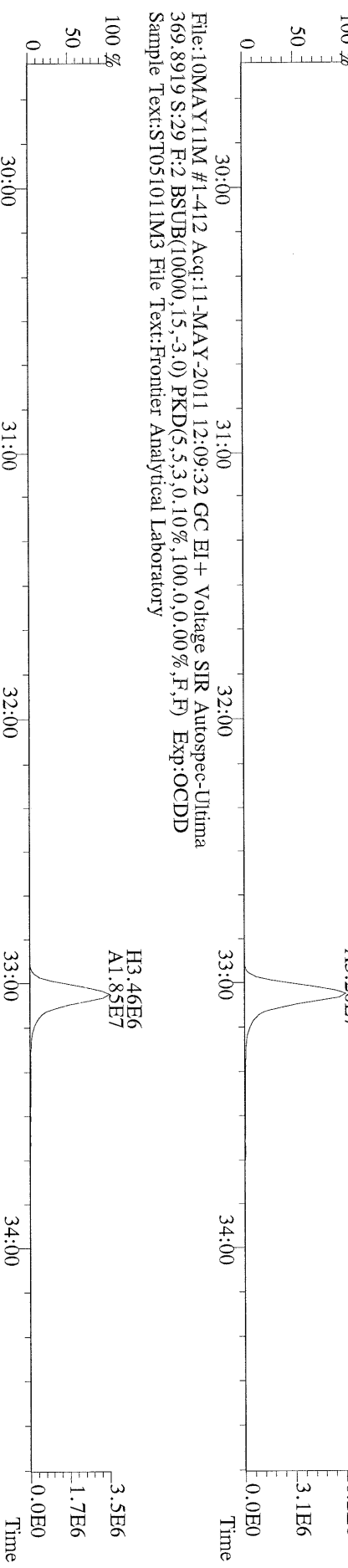
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 333.9339 S:29 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory
 100% H6.93E6
 A2.86E7



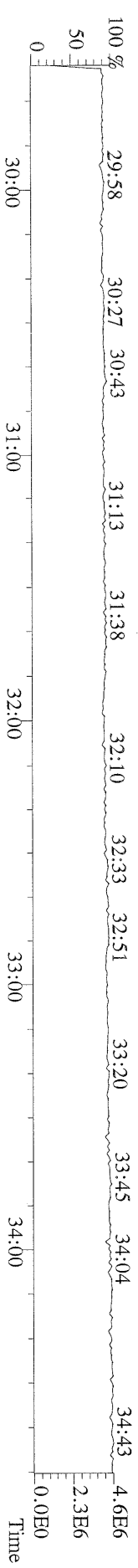
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 355.8546 S:29 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



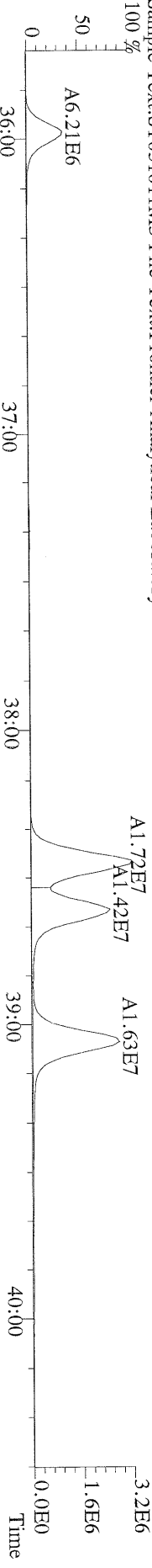
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 367.8949 S:29 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



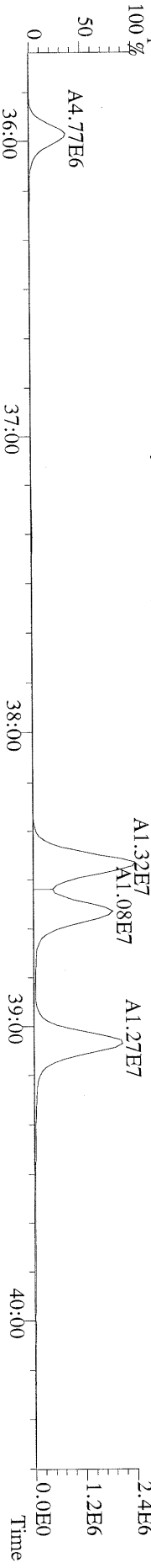
File:10MAY11M #1-412 Acq:11-MAY-2011 12:09:32 GC EI+ Voltage SIR Autospec-Ultima
 366.9792 S:29 F:2 Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



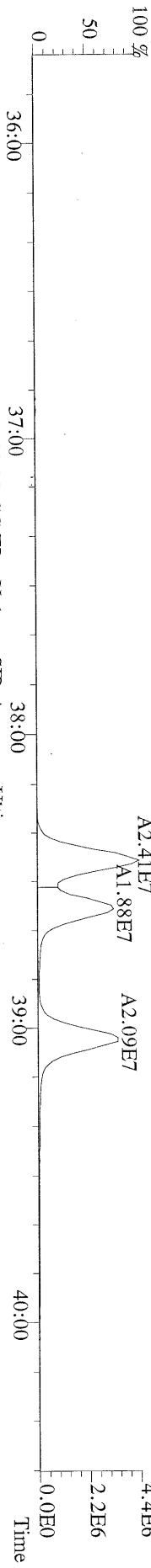
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 389.8156 S:29 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



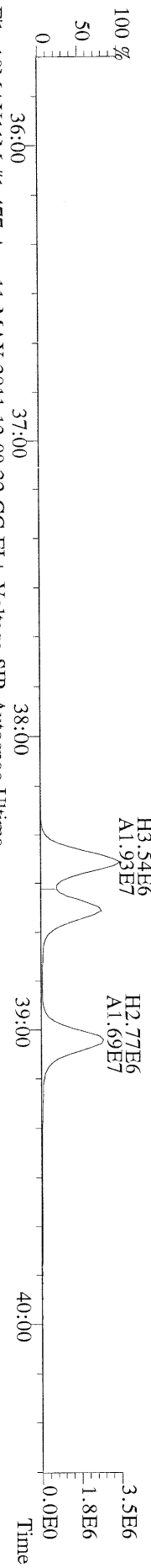
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 391.8127 S:29 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



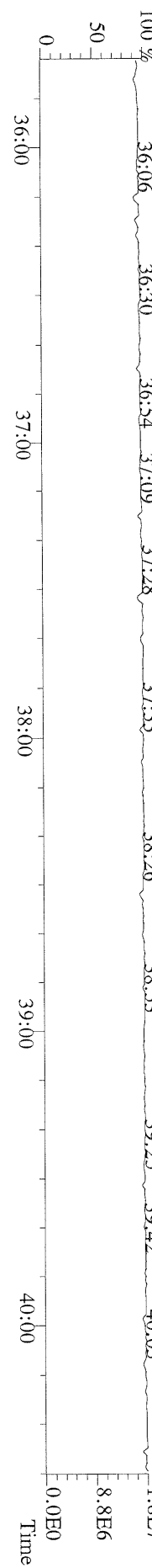
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 401.8559 S:29 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



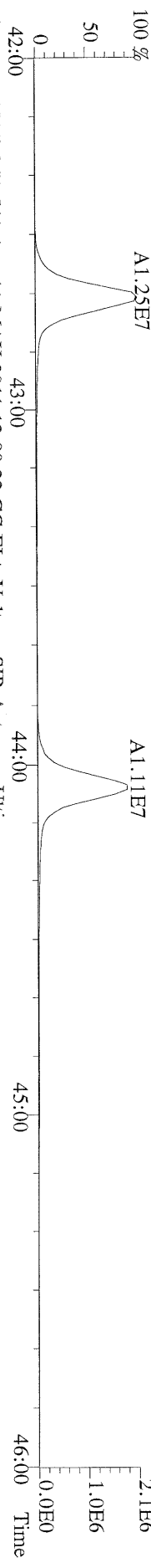
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 403.8530 S:29 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



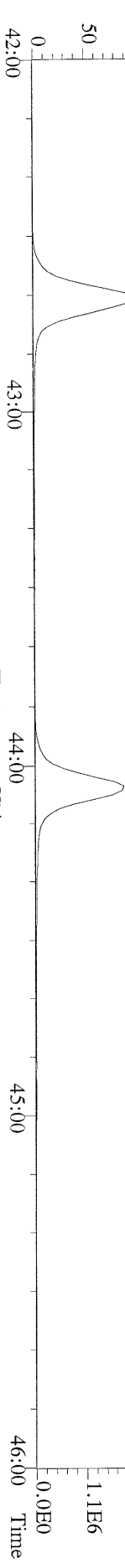
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 380.9760 S:29 F:3 Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



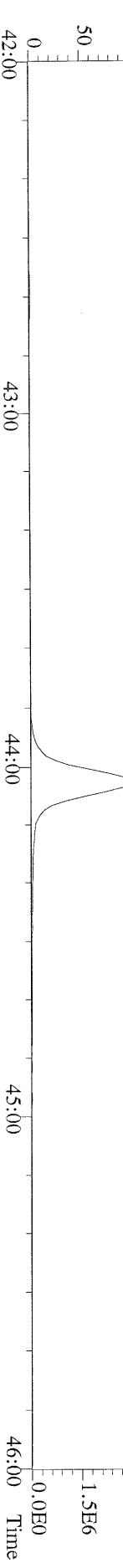
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423.7767 S:29 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



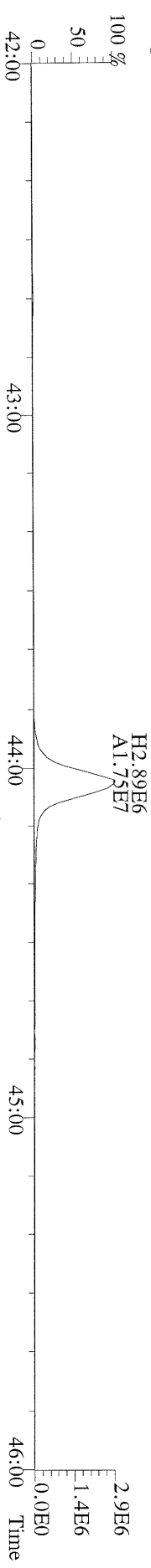
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425.7737 S:29 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



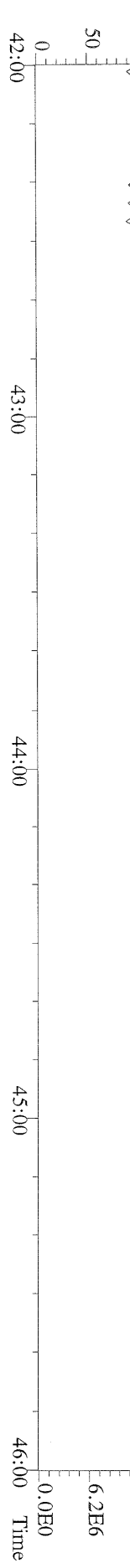
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435.8169 S:29 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



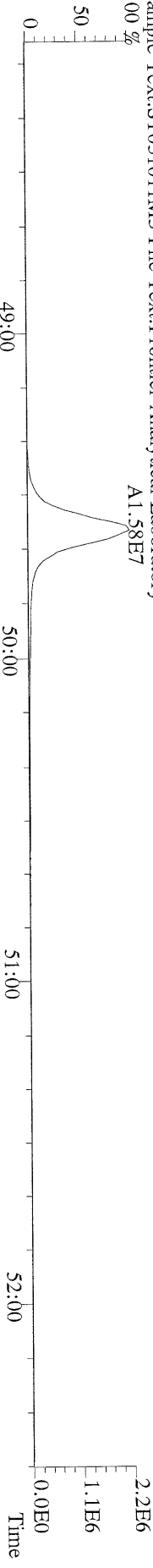
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437.8140 S:29 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



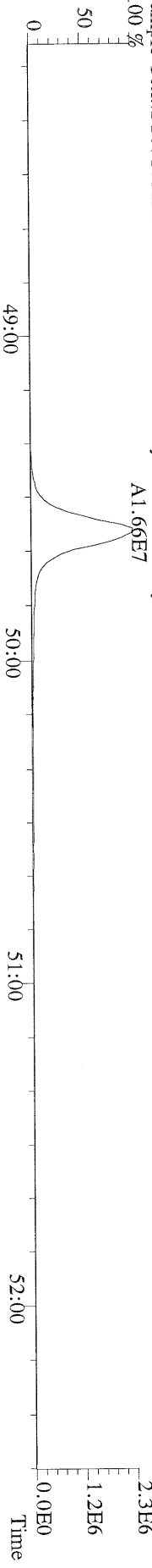
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430.9728 S:29 F:4 Exp:OCDD
Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



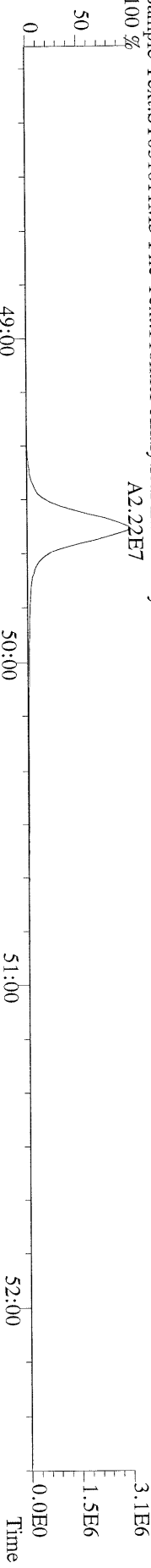
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457.7377 S:29 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST05101IM3 File Text:Frontier Analytical Laboratory
100 %



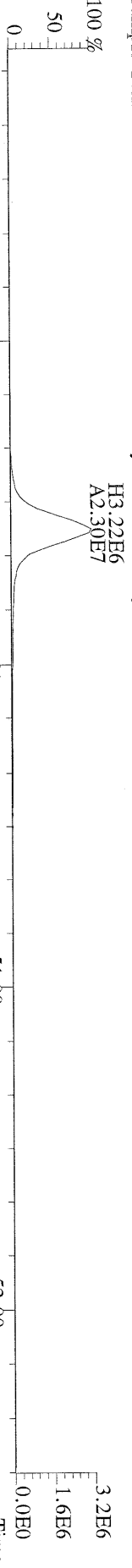
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459.7348 S:29 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST05101IM3 File Text:Frontier Analytical Laboratory
100 %



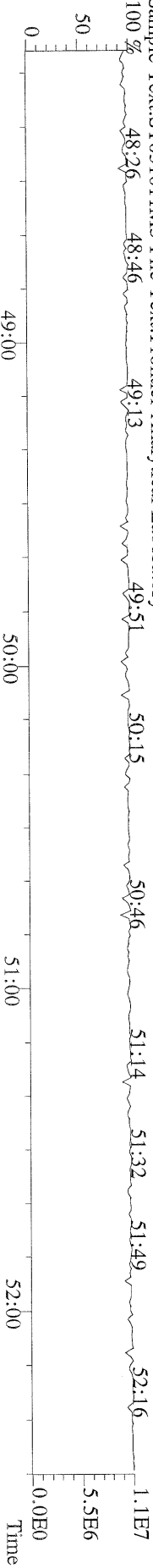
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469.7780 S:29 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST05101IM3 File Text:Frontier Analytical Laboratory
100 %



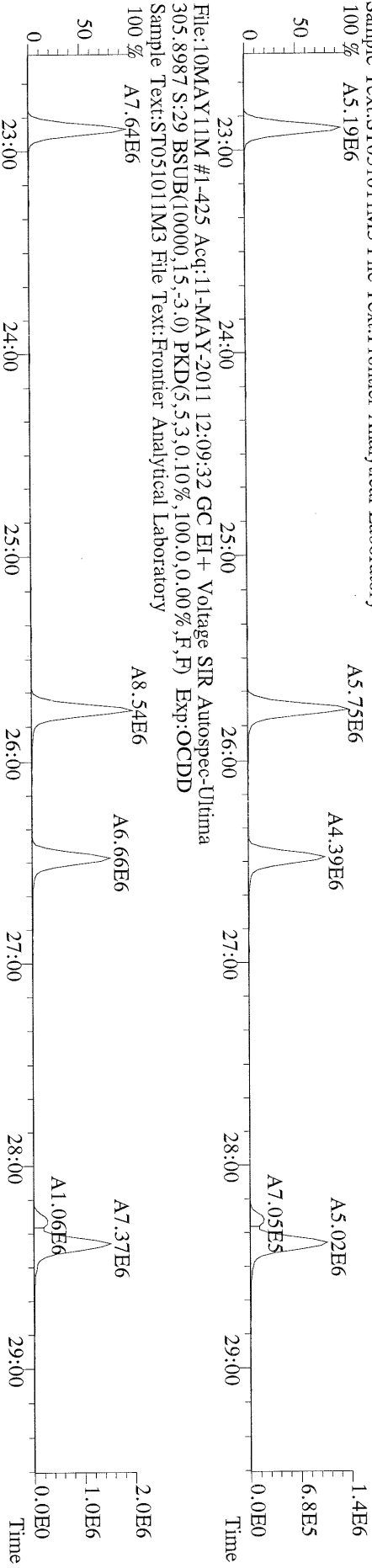
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471.7750 S:29 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST05101IM3 File Text:Frontier Analytical Laboratory



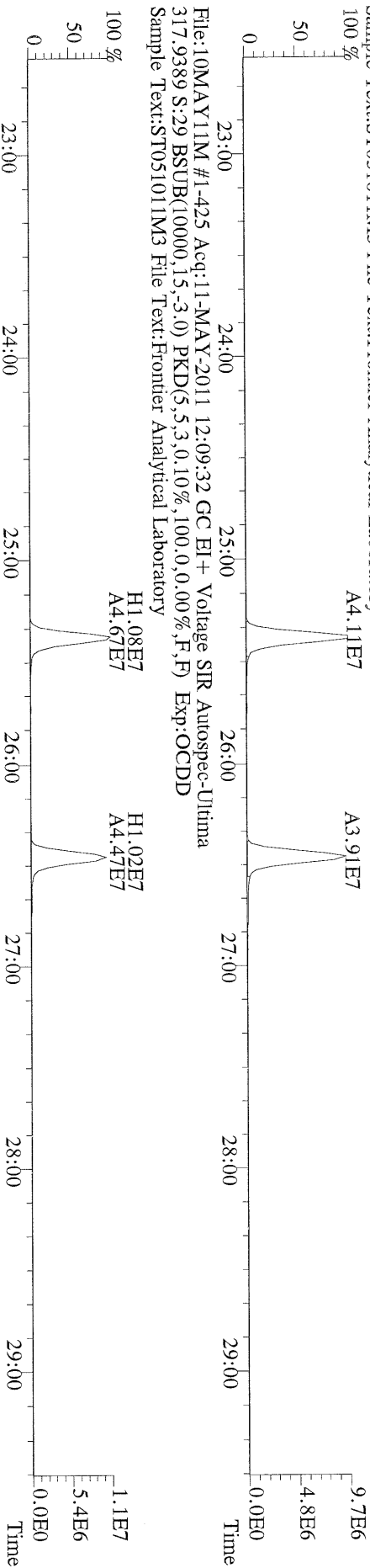
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454.9728 S:29 F:5 Exp:OCDD
Sample Text:ST05101IM3 File Text:Frontier Analytical Laboratory



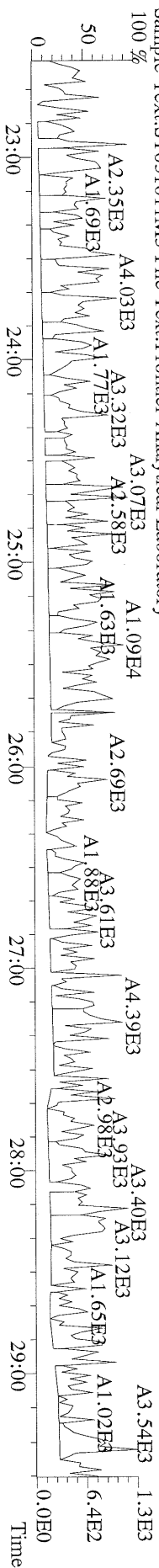
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 303.9016 S:29 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



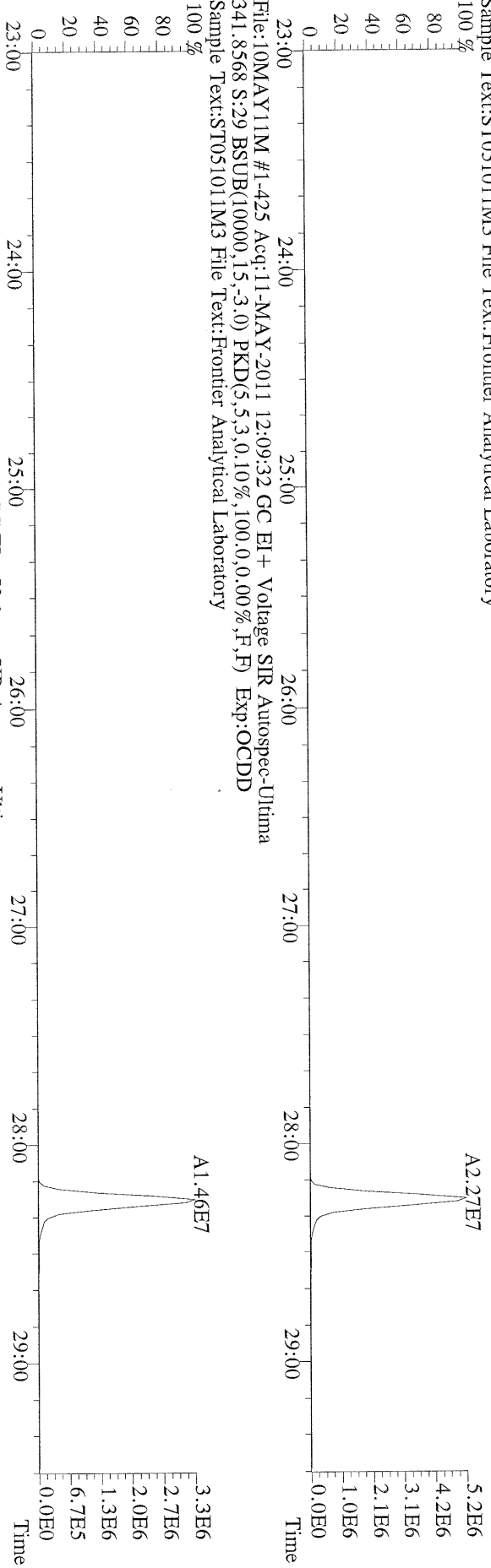
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 315.9419 S:29 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



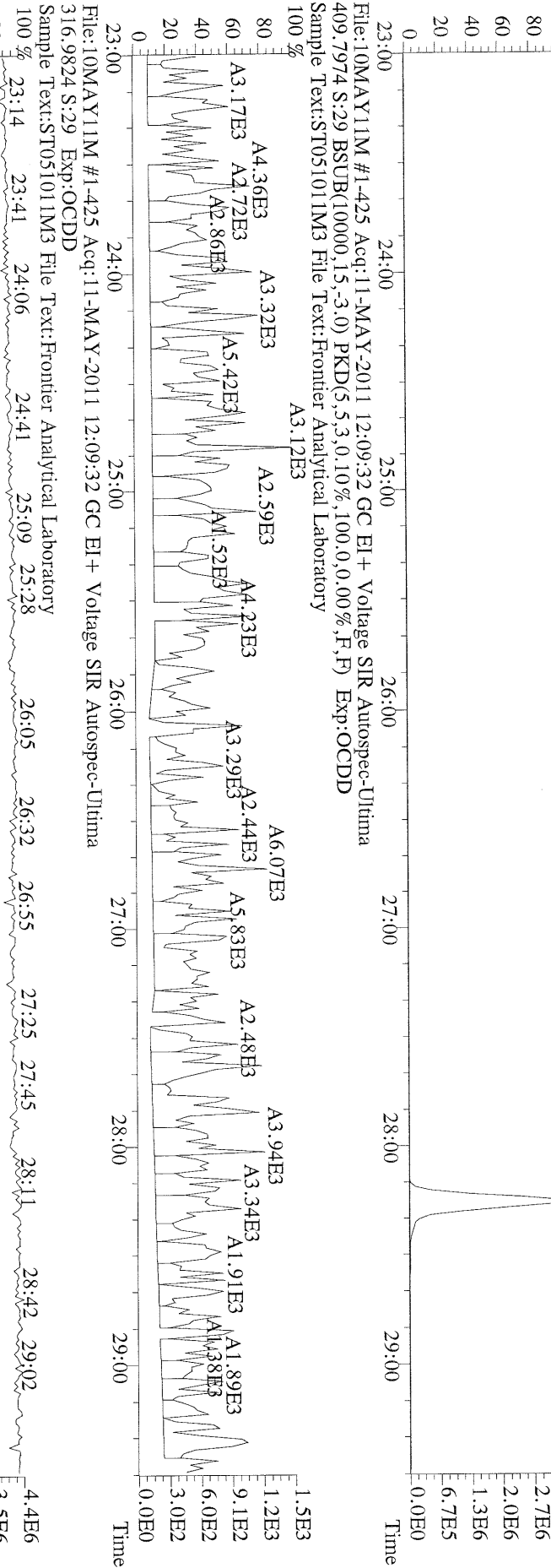
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 375.8364 S:29 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



File:10MAY11M #1-425 Acq:11-MAY-2011 12:09:32 GC EI+ Voltage SIR Autospec-Ultima
 339.8597 S:29 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
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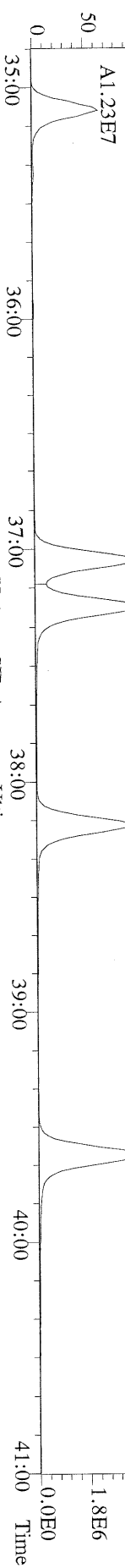
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 341.8568 S:29 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
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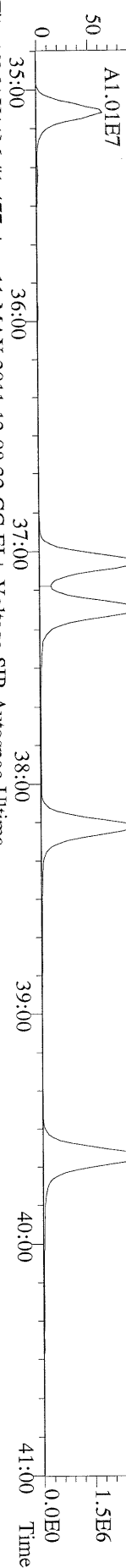
File:10MAY11M #1-425 Acq:11-MAY-2011 12:09:32 GC EI+ Voltage SIR Autospec-Ultima
 316.9824 S:29 Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



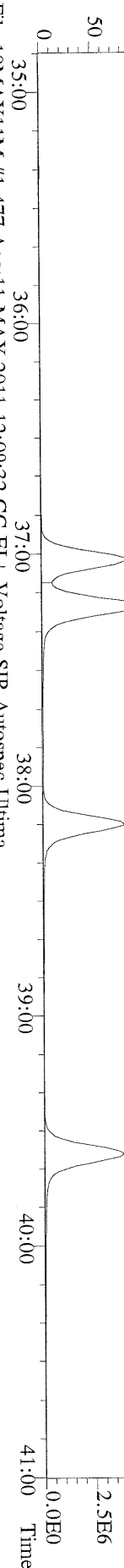
File:10MAY11M #1-477 Acq:11-MAY-2011 12:09:32 GC EI + Voltage SIR Autospec-Ultima
 373.8207 S:29 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



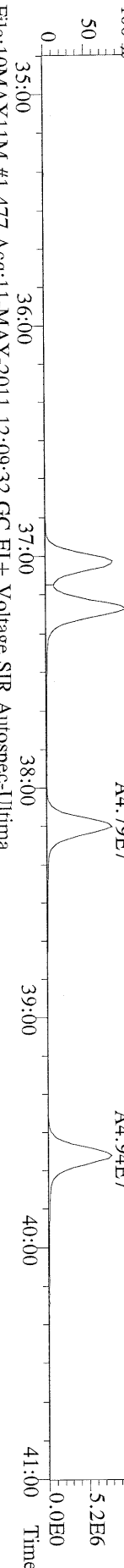
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 375.8178 S:29 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



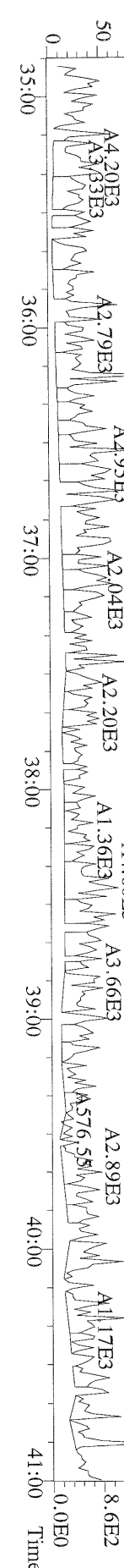
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 383.8639 S:29 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



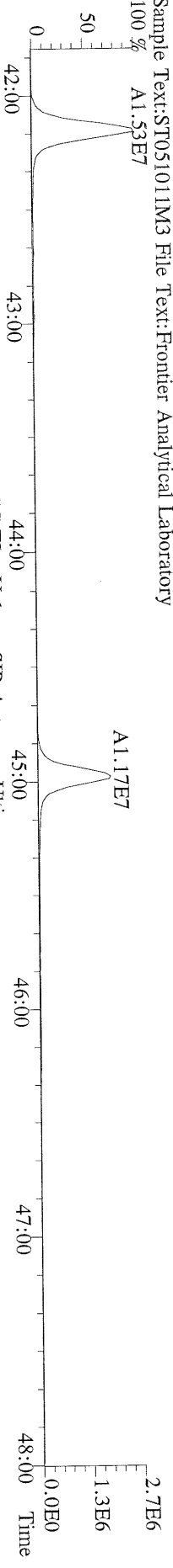
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 385.8610 S:29 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



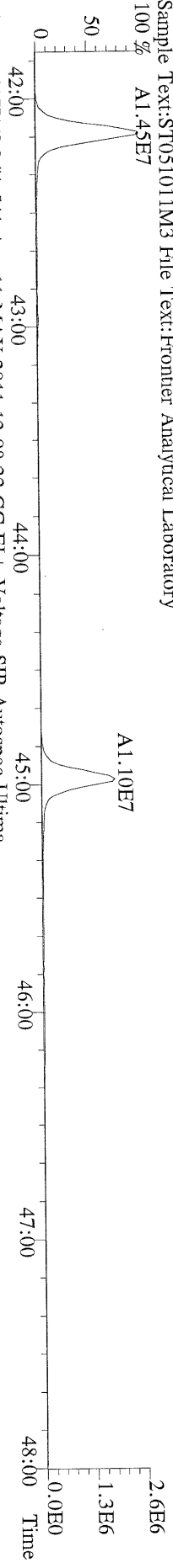
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 445.7555 S:29 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



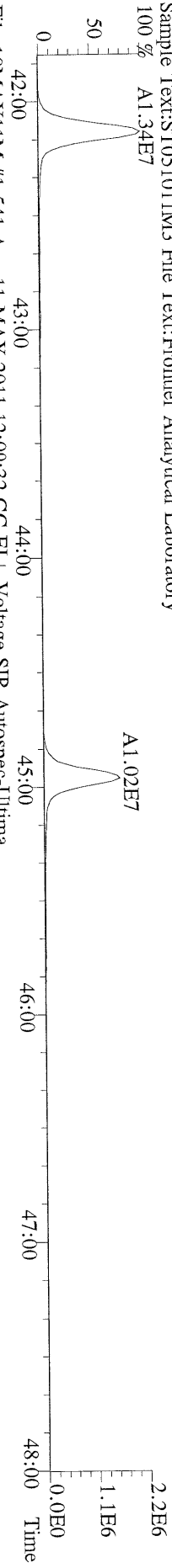
File:10MAY11M #1-541 Acq:11-MAY-2011 12:09:32 GC EI+ Voltage SIR Autospec-Ultima
 407.7818 S:29 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



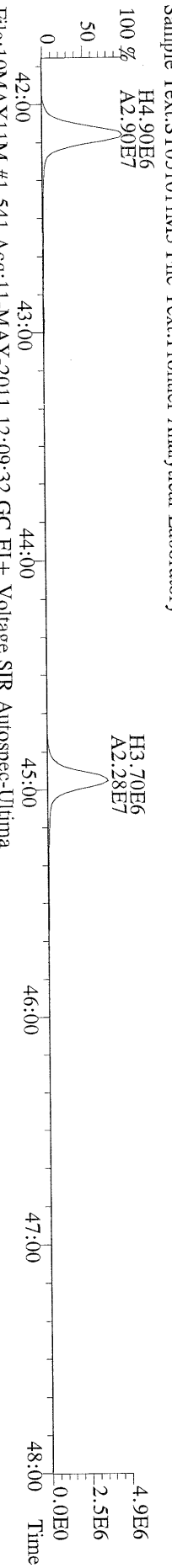
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 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



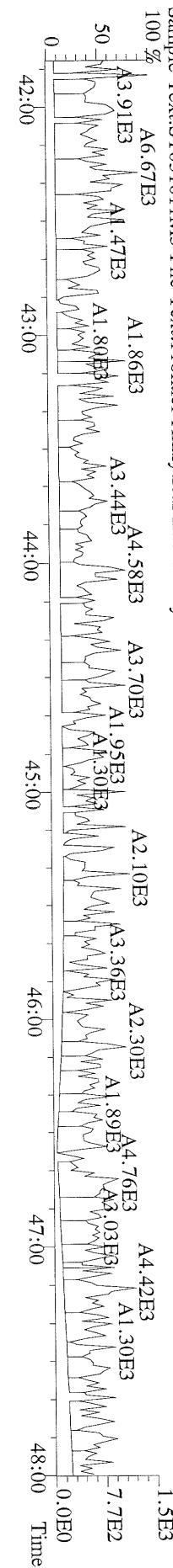
File:10MAY11M #1-541 Acq:11-MAY-2011 12:09:32 GC EI+ Voltage SIR Autospec-Ultima
 417.8253 S:29 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



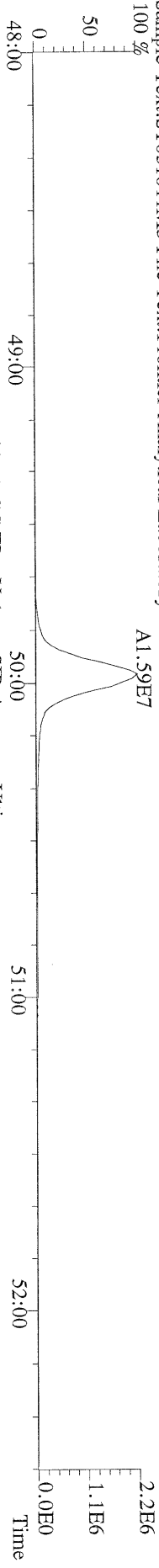
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 419.8220 S:29 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



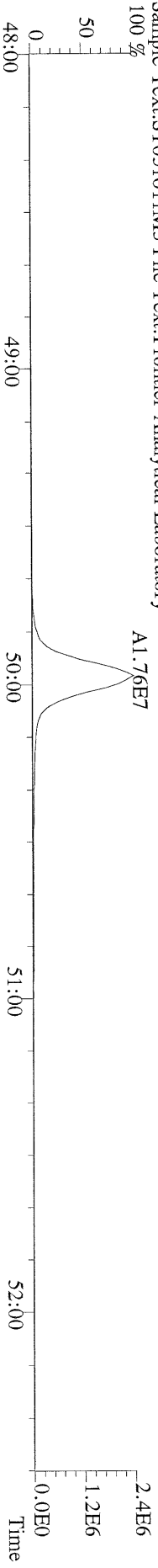
File:10MAY11M #1-541 Acq:11-MAY-2011 12:09:32 GC EI+ Voltage SIR Autospec-Ultima
 479.7165 S:29 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Frontier Analytical Laboratory



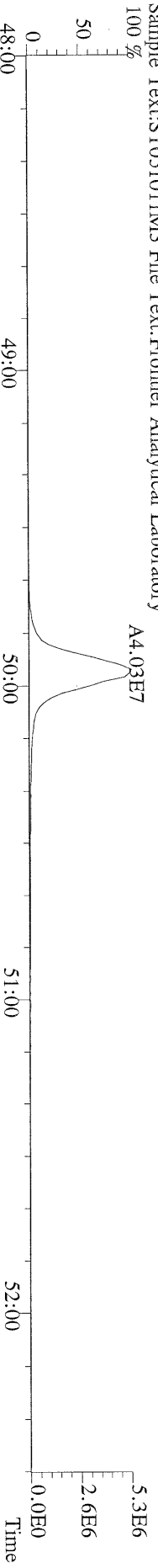
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 441.7428 S:29 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Fronter Analytical Laboratory



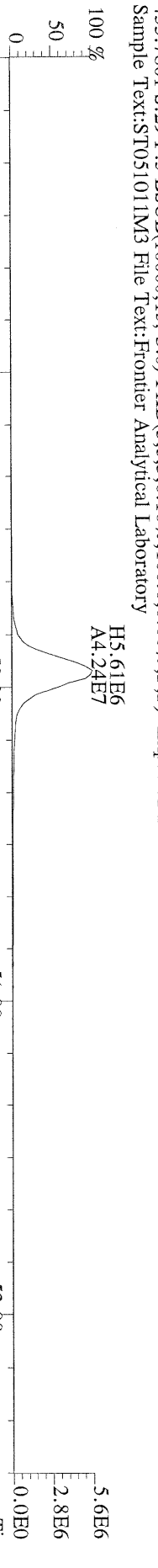
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 443.7398 S:29 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Fronter Analytical Laboratory



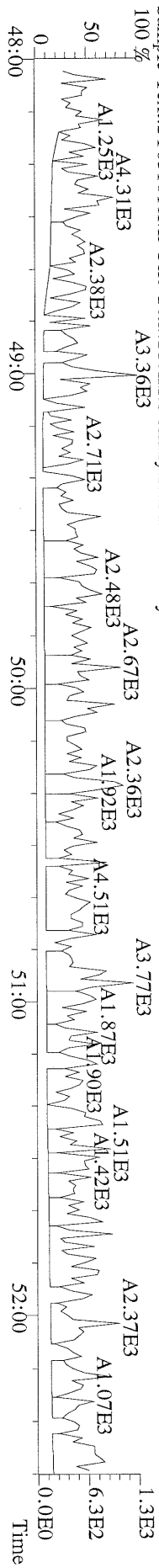
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 453.7831 S:29 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Fronter Analytical Laboratory

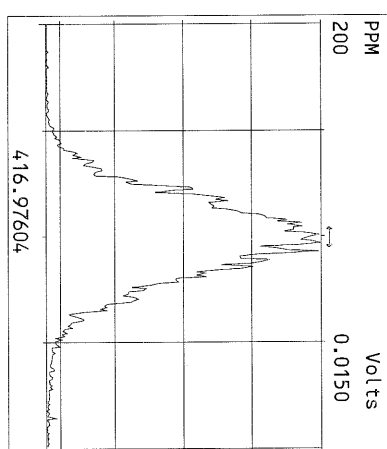
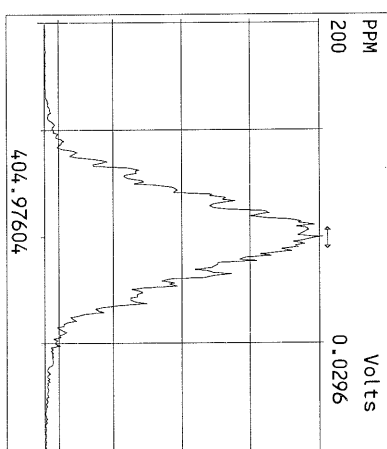
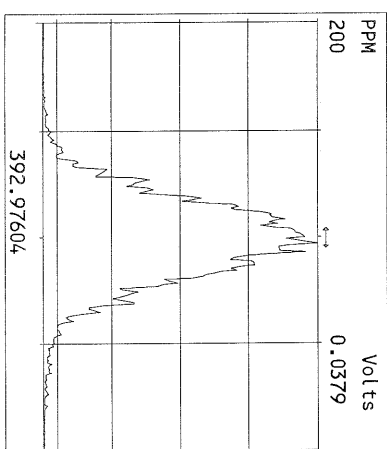
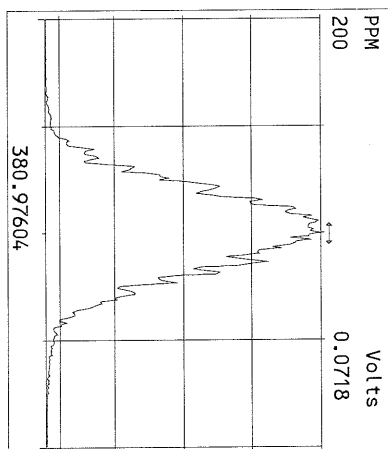
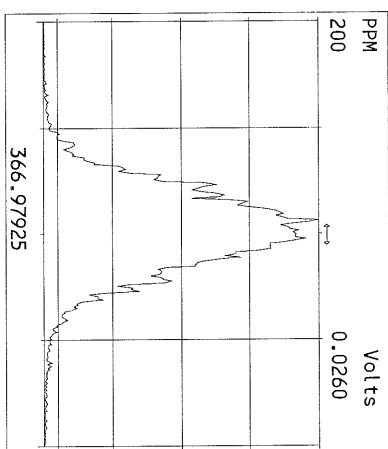
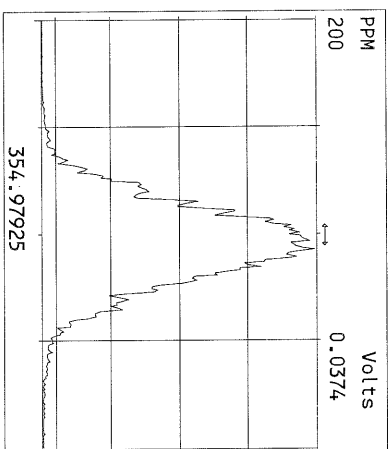
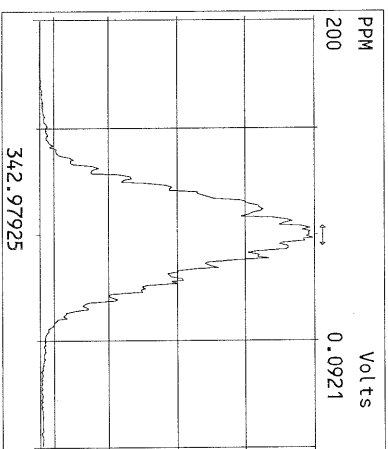
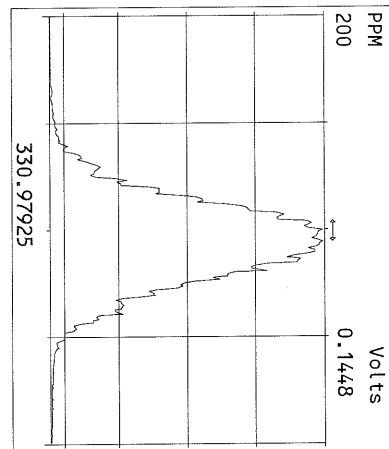
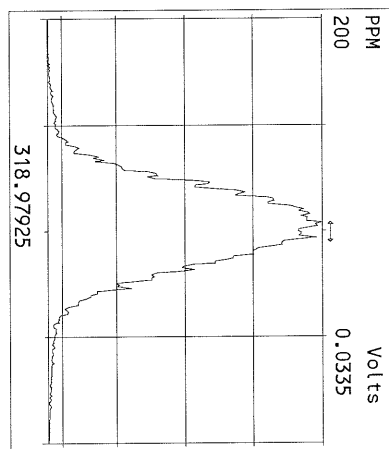
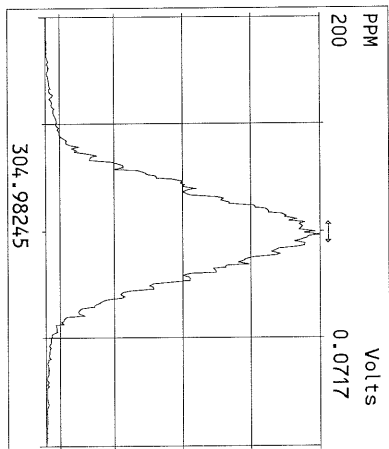
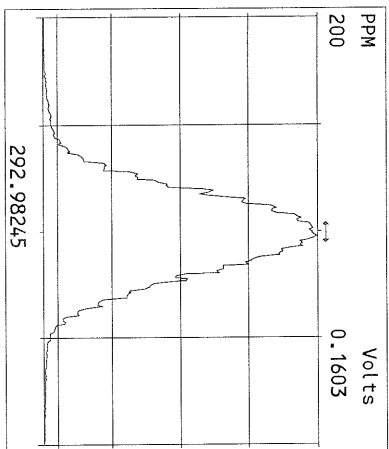


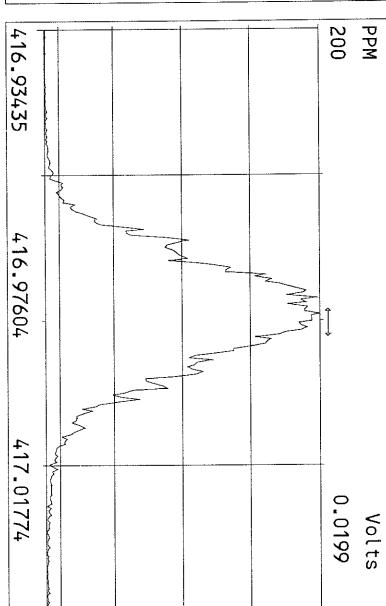
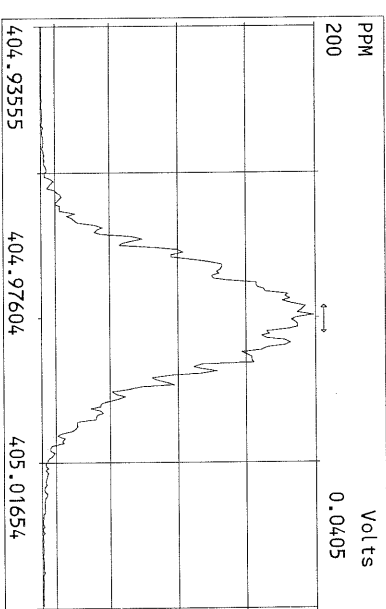
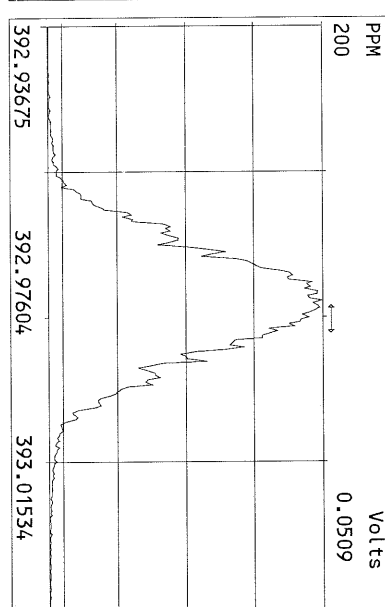
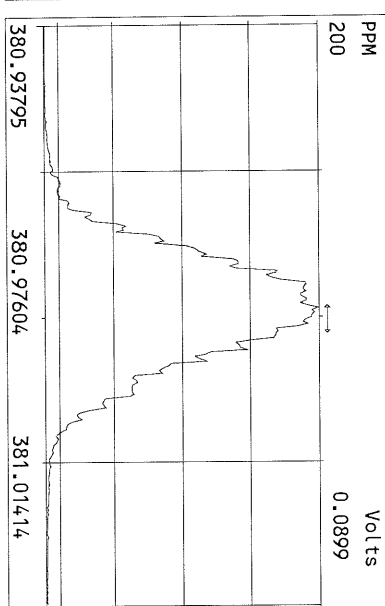
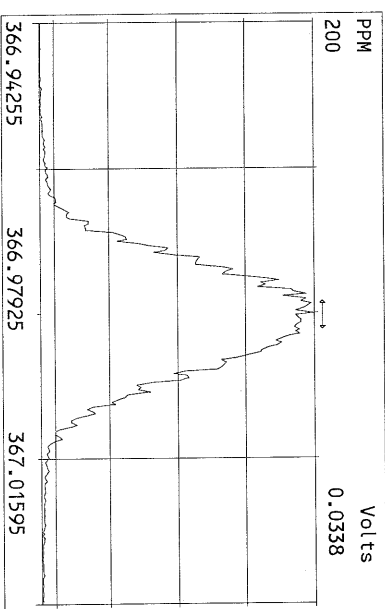
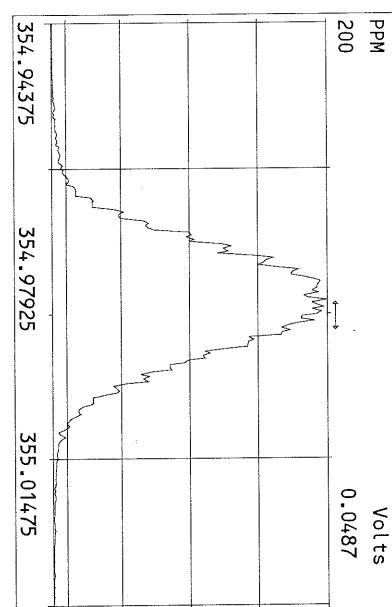
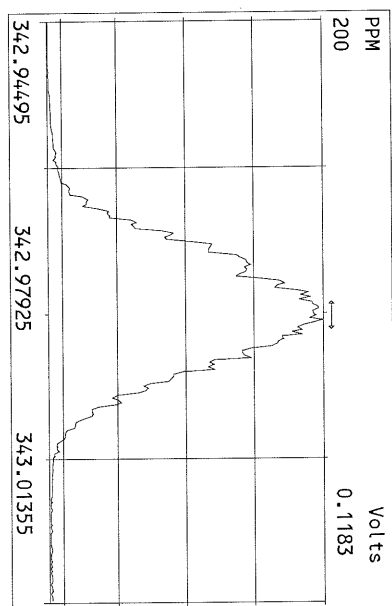
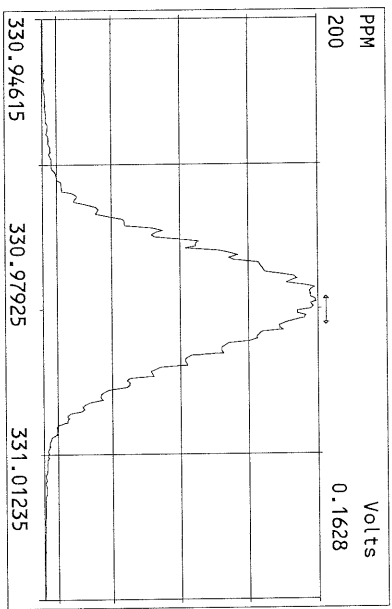
File:10MAY11M #1-347 Acq:11-MAY-2011 12:09:32 GC EI+ Voltage SIR Autospec-Ultima
 455.7801 S:29 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Fronter Analytical Laboratory

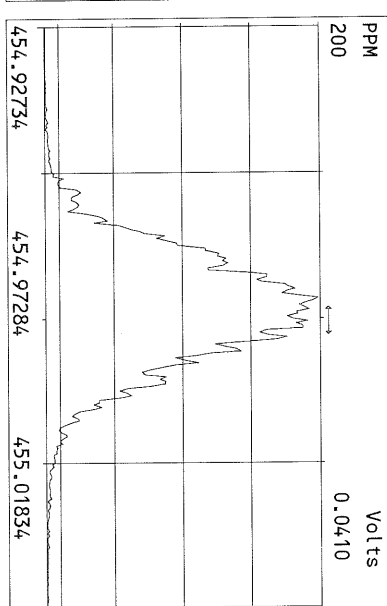
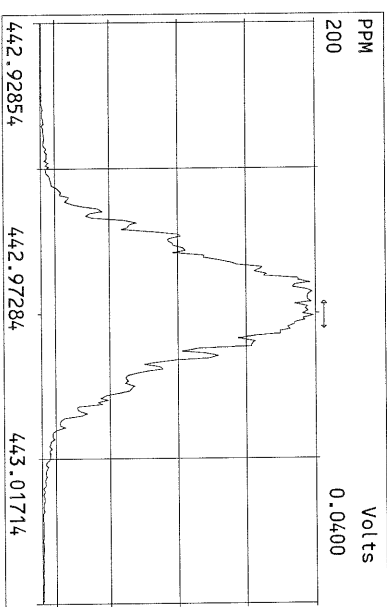
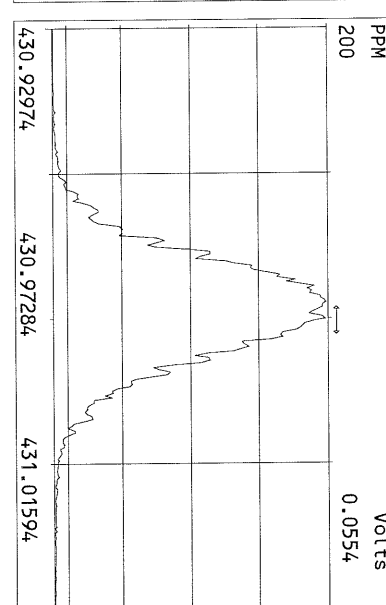
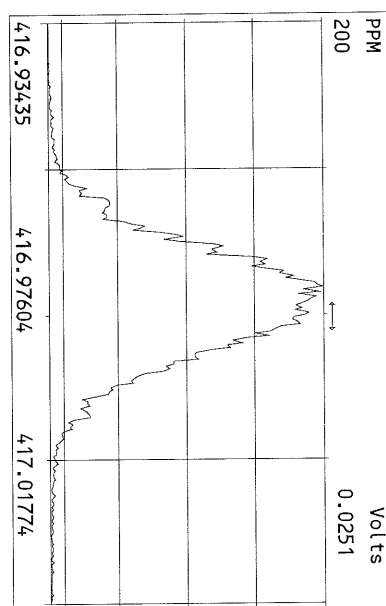
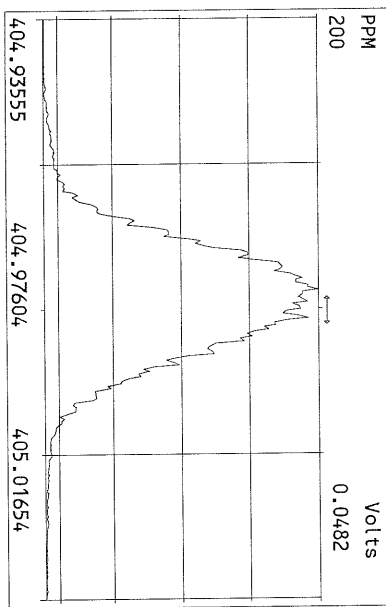
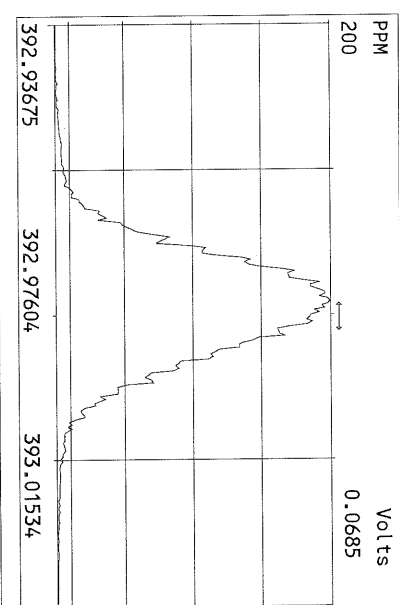
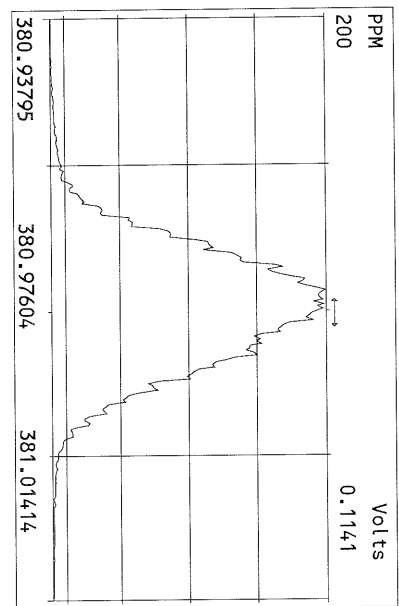
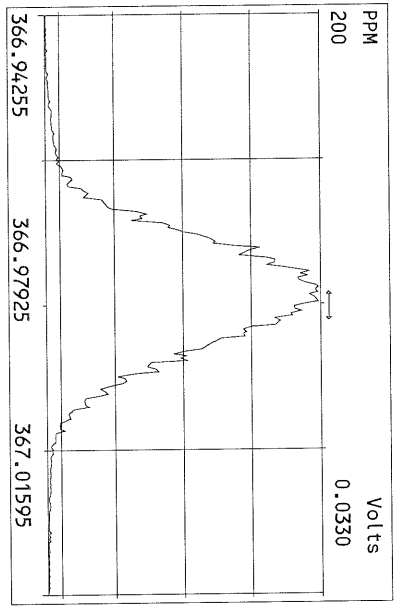


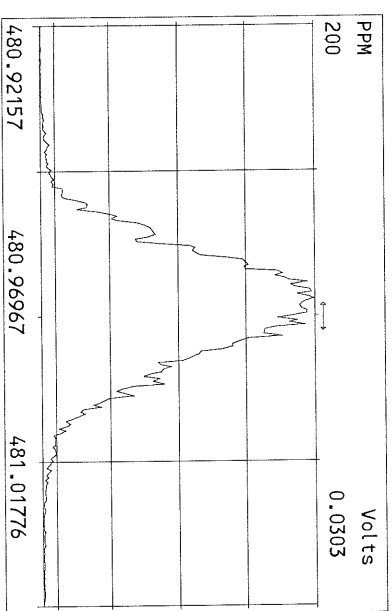
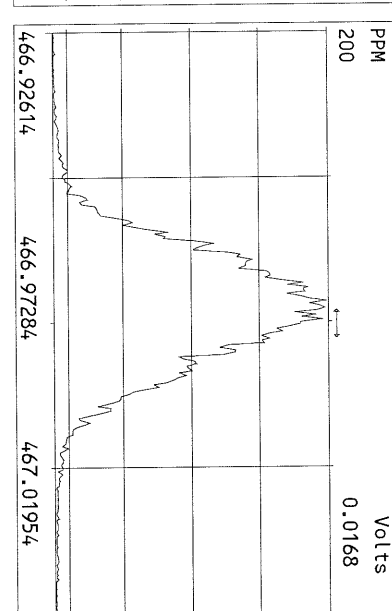
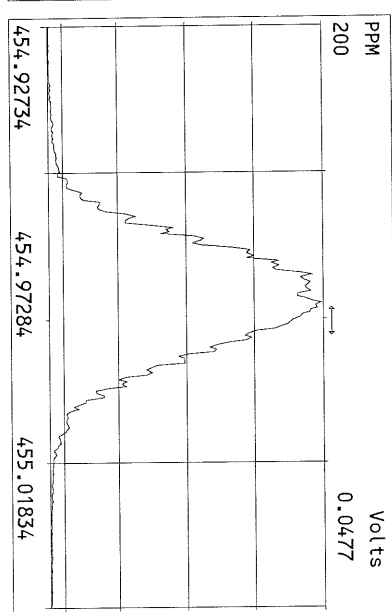
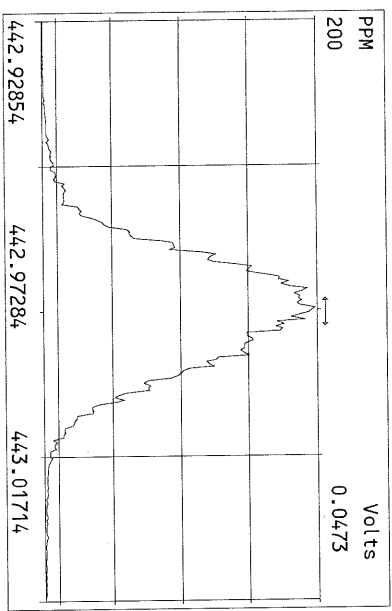
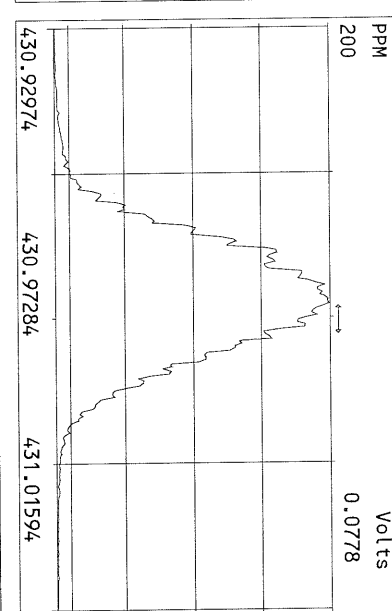
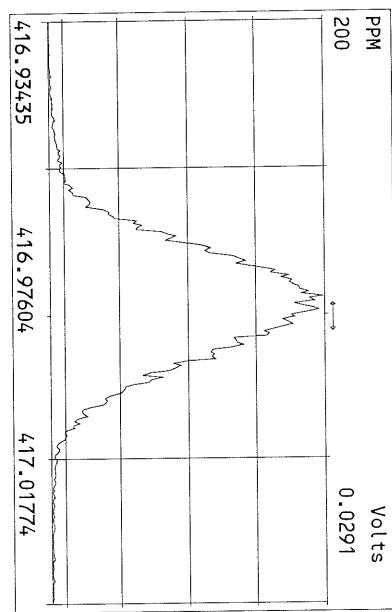
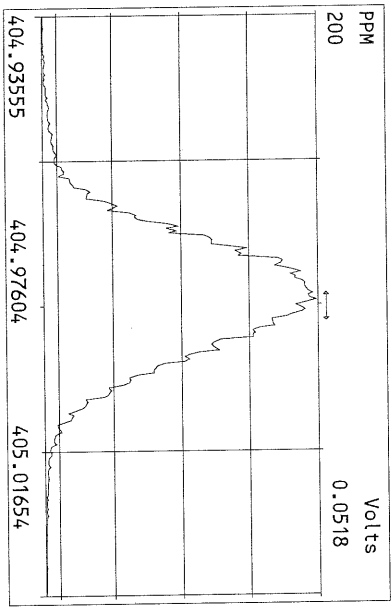
File:10MAY11M #1-347 Acq:11-MAY-2011 12:09:32 GC EI+ Voltage SIR Autospec-Ultima
 513.6775 S:29 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051011M3 File Text:Fronter Analytical Laboratory



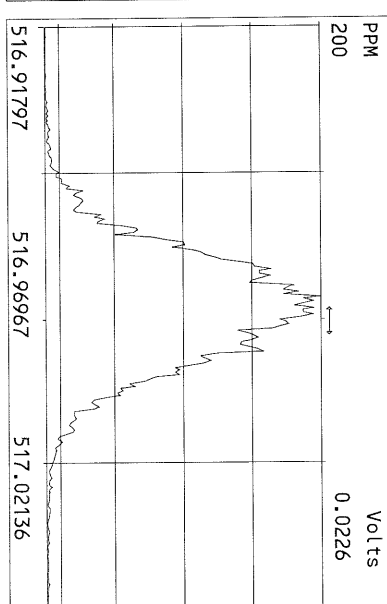
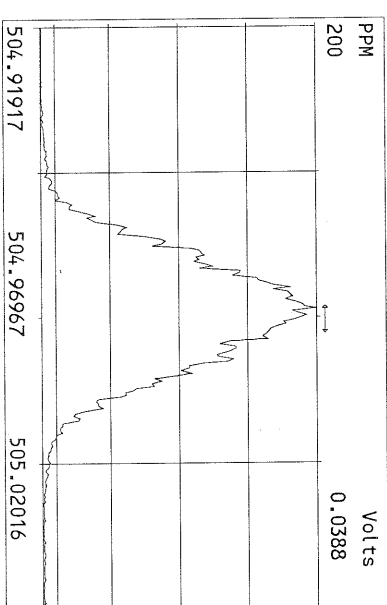
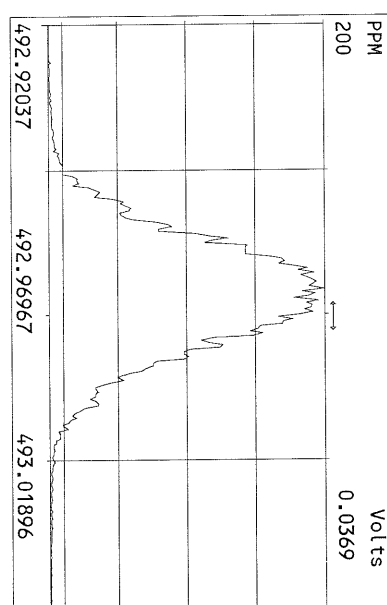
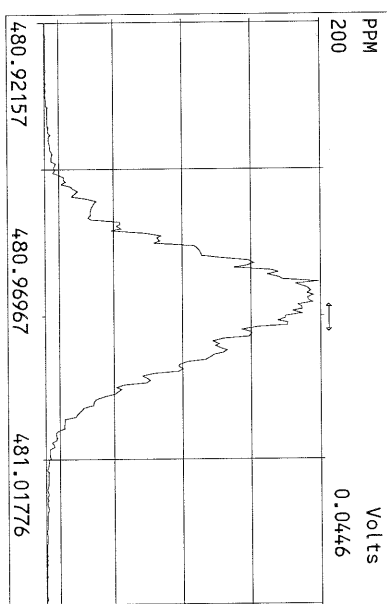
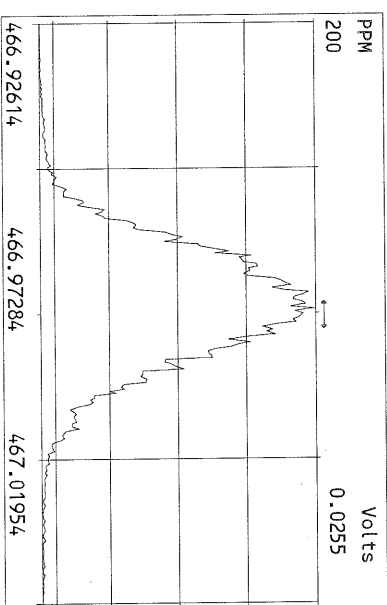
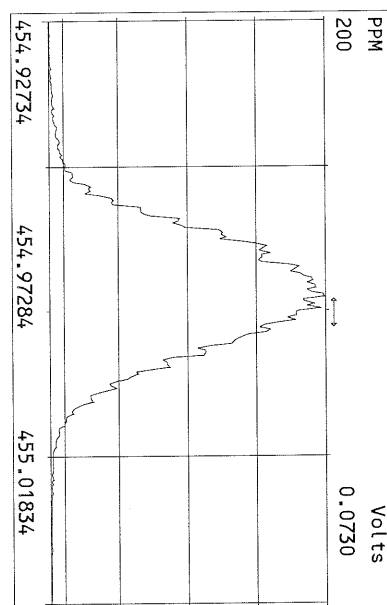
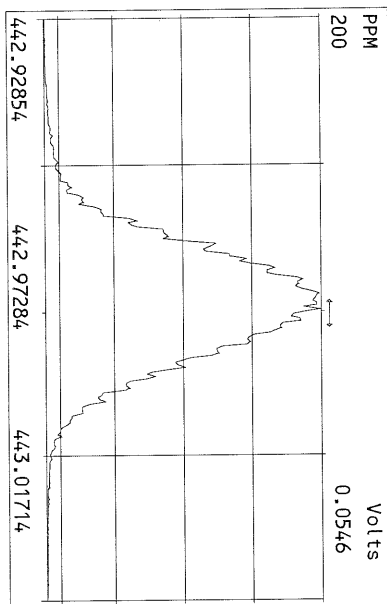
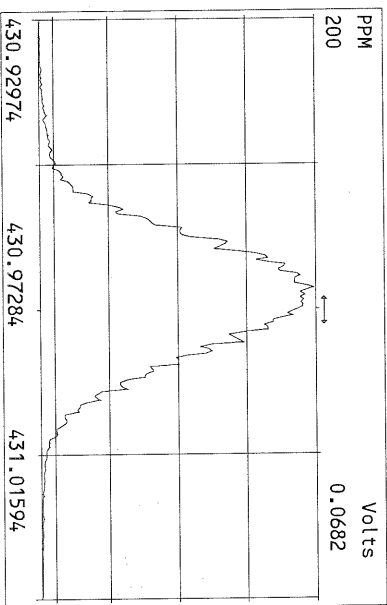








Peak Locate Examination: 11-MAY-2011:13:11 File:10MAY11M_RES_CHECK
 Experiment:OCDD Function:5 Reference:PFK



USEPA - ITD

FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory Episode No.:

Contract No.: SAS No.:

Initial Calibration Date: 3/7/11

Instrument ID: FAL3

GC Column ID: DB5

VER Data Filename: 11MAY11M Sam:1

Analysis Date: 11-MAY-11 13:29:01

NATIVE ANALYTES	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	ACCEPT	CONC. FOUND	CONC. RANGE (ng/mL) (3)
2,3,7,8-TCDD	M/M+2	0.79	0.65-0.89	y	10.3	7.80 - 12.9 ✓
1,2,3,7,8-PeCDD	M+2/M+4	1.58	1.32-1.78	y	51.9	39.0 - 65.0 ✓
1,2,3,4,7,8-HxCDD	M+2/M+4	1.30	1.05-1.43	y	48.8	39.0 - 64.0 ✓
1,2,3,6,7,8-HxCDD	M+2/M+4	1.28	1.05-1.43	y	47.0	39.0 - 64.0 ✓
1,2,3,7,8,9-HxCDD	M+2/M+4	1.28	1.05-1.43	y	51.3	41.0 - 61.0 ✓
1,2,3,4,6,7,8-HpCDD	M+2/M+4	0.92	0.88-1.20	y	47.9	43.0 - 58.0 ✓
OCDD	M+2/M+4	0.96	0.76-1.02	y	99.6	79.0 - 126 ✓
2,3,7,8-TCDF	M/M+2	0.68	0.65-0.89	y	10.7	8.40 - 12.0 ✓
1,2,3,7,8-PeCDF	M+2/M+4	1.60	1.32-1.78	y	51.1	41.0 - 60.0 ✓
2,3,4,7,8-PeCDF	M+2/M+4	1.59	1.32-1.78	y	49.1	41.0 - 60.0 ✓
1,2,3,4,7,8-HxCDF	M+2/M+4	1.23	1.05-1.43	y	48.4	45.0 - 56.0 ✓
1,2,3,6,7,8-HxCDF	M+2/M+4	1.22	1.05-1.43	y	48.3	44.0 - 57.0 ✓
2,3,4,6,7,8-HxCDF	M+2/M+4	1.19	1.05-1.43	y	48.0	44.0 - 57.0 ✓
1,2,3,7,8,9-HxCDF	M+2/M+4	1.25	1.05-1.43	y	48.8	45.0 - 56.0 ✓
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.07	0.88-1.20	y	47.6	45.0 - 55.0 ✓
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.05	0.88-1.20	y	48.4	43.0 - 58.0 ✓
OCDF	M+2/M+4	0.94	0.76-1.02	y	96.9	63.0 - 159 ✓

(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.

Analyst: Date: 5/10/11

USEPA - ITD

FORM 4B
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Initial Calibration Date: 3/7/11

Instrument ID: FAL3

GC Column ID: DB5

VER Data Filename: 11MAY11M Sam:1

Analysis Date: 11-MAY-11 13:29:01

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	0.76	0.65-0.89	y	95.5	82.0 - 121 ✓
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.75	1.32-1.78	y	101	62.0 - 160 ✓
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.28	1.05-1.43	y	92.9	85.0 - 117 ✓
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.26	1.05-1.43	y	100	85.0 - 118 ✓
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.06	0.88-1.20	y	118	72.0 - 138 ✓
13C-OCDD	M+2/M+4	1.00	0.76-1.02	y	187	96.0 - 415 ✓
13C-2,3,7,8-TCDF	M/M+2	0.88	0.65-0.89	y	98.0	71.0 - 140 ✓
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.69	1.32-1.78	y	112	76.0 - 130 ✓
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.71	1.32-1.78	y	111	77.0 - 130 ✓
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.48	0.43-0.59	y	99.4	76.0 - 131 ✓
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.48	0.43-0.59	y	97.3	70.0 - 143 ✓
13C-2,3,4,6,7,8-HxCDF	M/M+2	0.49	0.43-0.59	y	96.6	73.0 - 137 ✓
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.48	0.43-0.59	y	93.6	74.0 - 135 ✓
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.46	0.37-0.51	y	120	78.0 - 129 ✓
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.46	0.37-0.51	y	105	77.0 - 129 ✓
13C-OCDF	M+2/M+4	0.95	0.76-1.02	y	173	96.0 - 415 ✓
CLEANUP STANDARD (4)						
37Cl-2,3,7,8-TCDD					8.95	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: 5/12/11

FORM 5
PCDD/PCDF RT WINDOW AND ISOMER SPECIFICITY STANDARDS

Lab Name: Frontier Analytical Laboratory Episode No.:
Contract No.: SAS No.:
Instrument ID: FAL3 Initial Calibration Date: 3/7/11
RT Window Data Filename: 11MAY11M Sam:1 Analysis Date: 11-MAY-11 Time: 13:29:01
DB-5 IS Data Filename: 11MAY11M Sam:1 Analysis Date: 11-MAY-11 Time: 13:29:01
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)	24:14 ✓	1,3,6,8-TCDF (F)	22:53 ✓
1,2,8,9-TCDD (L)	28:10 ✓	1,2,8,9-TCDF (L)	28:22 ✓
1,2,4,7,9-PeCDD (F)	30:05 ✓	1,3,4,6,8-PeCDF (F)	28:15 ✓
1,2,3,8,9-PeCDD (L)	33:38 ✓	1,2,3,8,9-PeCDF (L)	34:03 ✓
1,2,4,6,7,9-HxCDD (F)	35:58 ✓	1,2,3,4,6,8-HxCDF (F)	35:05 ✓
1,2,3,7,8,9-HxCDD (L)	39:03 ✓	1,2,3,7,8,9-HxCDF (L)	39:37 ✓
1,2,3,4,6,7,9-HpCDD (F)	42:40 ✓	1,2,3,4,6,7,8-HpCDF (F)	42:08 ✓
1,2,3,4,6,7,8-HpCDD (L)	44:03 ✓	1,2,3,4,7,8,9-HpCDF (L)	44:57 ✓

(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: J

Date: 5/12/11

PCDD/PCDF RELATIVE RETENTION TIMES

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Init. Cal. Date: 3/7/11

Instrument ID: FAL3

GC Column ID: DB5

Analysis Date: 11-MAY-11 13:29:01

CS3 or VER Data Filename: 11MAY11M

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	1.000	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		1.022	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: 5/12/11

FAL ID: ST051111M1		Filename: 11MAY11M		Sam:1		Acquired: 11-MAY-11 13:29:01		ICal: PCDDFAL3-3-7-11			
Client ID: 1613 CS3 100511J						ConCal: ST051111M1		EndCal: ST051111M2			
Results:		GC Column: DB5		Amount: 1.000		NATO 1989 Tox: 100		WHO 1998 Tox: 126		WHO 2005 Tox: 115	
Name	Resp	RA	RT	RRF	Conc	Qual	Fac	Noise-1	Noise-2	DL	
2,3,7,8-TCDD	4.08e+06	0.79 y	27:13	1.13	10.3		2.50	-	-	*	
1,2,3,7,8-PeCDD	1.92e+07	1.58 y	33:04	1.02	51.9		2.50	-	-	*	
1,2,3,4,7,8-HxCDD	2.05e+07	1.30 y	38:26	1.45	48.8		2.50	-	-	*	
1,2,3,6,7,8-HxCDD	1.68e+07	1.28 y	38:36	1.45	47.0		2.50	-	-	*	
1,2,3,7,8,9-HxCDD	2.02e+07	1.28 y	39:03	1.47	51.3		2.50	-	-	*	
1,2,3,4,6,7,8-HpCDD	1.60e+07	0.92 y	44:03	1.30	47.9		2.50	-	-	*	
OCDD	2.15e+07	0.96 y	49:35	1.45	99.6		2.50	-	-	*	
2,3,7,8-TCDF	7.27e+06	0.68 y	26:28	1.15	10.7		2.50	-	-	*	
1,2,3,7,8-PeCDF	2.59e+07	1.60 y	31:18	0.89	51.1		2.50	-	-	*	
2,3,4,7,8-PeCDF	2.41e+07	1.59 y	32:38	0.89	49.1		2.50	-	-	*	
1,2,3,4,7,8-HxCDF	2.34e+07	1.23 y	37:02	1.01	48.4		2.50	-	-	*	
1,2,3,6,7,8-HxCDF	2.52e+07	1.22 y	37:15	0.89	48.3		2.50	-	-	*	
2,3,4,6,7,8-HxCDF	2.30e+07	1.19 y	38:11	1.02	48.0		2.50	-	-	*	
1,2,3,7,8,9-HxCDF	2.62e+07	1.25 y	39:37	1.10	48.8		2.50	-	-	*	
1,2,3,4,6,7,8-HpCDF	2.19e+07	1.07 y	42:08	1.48	47.6		2.50	-	-	*	
1,2,3,4,7,8,9-HpCDF	1.45e+07	1.05 y	44:57	1.43	48.4		2.50	-	-	*	
OCDF	2.17e+07	0.94 y	49:58	0.84	96.9		2.50	-	-	*	
Rec											
13C-2,3,7,8-TCDD	3.51e+07	0.76 y	27:12	1.03	95.5					95.5	
13C-1,2,3,7,8-PeCDD	3.63e+07	1.75 y	33:02	1.01	101					101	
13C-1,2,3,4,7,8-HxCDD	2.90e+07	1.28 y	38:25	1.19	92.9					92.9	
13C-1,2,3,6,7,8-HxCDD	2.46e+07	1.26 y	38:35	0.94	100					100	
13C-1,2,3,4,6,7,8-HpCDD	2.57e+07	1.06 y	44:02	0.83	118					118	
13C-OCDD	2.98e+07	1.00 y	49:34	0.61	187					93.6	
13C-2,3,7,8-TCDF	5.91e+07	0.88 y	26:27	0.98	98.0					98.0	
13C-1,2,3,7,8-PeCDF	5.72e+07	1.69 y	31:18	0.83	112					112	
13C-2,3,4,7,8-PeCDF	5.49e+07	1.71 y	32:37	0.80	111					111	
13C-1,2,3,4,7,8-HxCDF	4.80e+07	0.48 y	37:01	1.84	99.4					99.4	
13C-1,2,3,6,7,8-HxCDF	5.85e+07	0.48 y	37:13	2.29	97.3					97.3	
13C-2,3,4,6,7,8-HxCDF	4.72e+07	0.49 y	38:09	1.86	96.6					96.6	
13C-1,2,3,7,8,9-HxCDF	4.87e+07	0.48 y	39:36	1.98	93.6					93.6	
13C-1,2,3,4,6,7,8-HpCDF	3.11e+07	0.46 y	42:08	0.99	120					120	
13C-1,2,3,4,7,8,9-HpCDF	2.10e+07	0.46 y	44:57	0.77	105					105	
13C-OCDF	5.30e+07	0.95 y	49:56	1.17	173					86.7	
37Cl-2,3,7,8-TCDD	2.33e+06		27:13	0.73	8.95					89.5	
13C-1,2,3,4-TCDD	3.57e+07	0.77 y	26:38	-	93.9						
13C-1,2,3,4-TCDF	6.15e+07	0.88 y	25:22	-	85.5						
13C-1,2,3,7,8,9-HxCDD	2.62e+07	1.26 y	39:02	-	106						
Total Tetra-Dioxins	2.15e+07		24:14	1.13	54.0		2.50	-	-	* 15	
Total Penta-Dioxins	4.19e+07		30:05	1.02	113		2.50	-	-	* 9	
Total Hexa-Dioxins	6.53e+07		35:58	1.46	167		2.50	-	-	* 11	
Total Hepta-Dioxins	3.41e+07		42:40	1.30	102		2.50	-	-	* 4	
Total Tetra-Furans	3.49e+07		22:53	1.15	51.4		2.50	-	-	* 22	
1st Fn. Tot Penta-Furans	2.72e+07		28:15	0.89	54.6		2.50	-	-	* PeCDF 4	
Total Penta-Furans	7.30e+07		29:59	0.89	146		2.50	-	-	* 201 16	
Total Hexa-Furans	1.13e+08		35:05	1.00	224		2.50	-	-	* 14	
Total Hepta-Furans	3.67e+07		42:08	1.46	96.9		2.50	-	-	* 9	

Analyst: Date: 5/12/17

Frontier Analytical Laboratory - Acquisition Log

Run Name:11MAY11M

Instrument: FAL3

GC: DB5

Experiment:OCDD

Data File	S	FAL ID	Client ID	Acquired	ConCal	EndCal	Analyst
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11MAY11M	3	6735-015-0002-MSD	DMA-TP3-5-6-042011	11-MAY-11 15:19:42	ST051111M1	ST051111M2	TC
11MAY11M	4	SB051111M1	Solvent Blank	11-MAY-11 16:15:00	ST051111M1	ST051111M2	TC
11MAY11M	5	ST051111M2	1613 cs3 100511J	11-MAY-11 17:10:23	ST051111M2	ST051111M3	TC
11MAY11M	6	2289-001-0001-OPR	OPR	11-MAY-11 18:05:42	ST051111M2	ST051111M3	TC
11MAY11M	7	2289-001-0001-MB	Method Blank	11-MAY-11 19:01:01	ST051111M2	ST051111M3	TC
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11MAY11M	9	6647-004-0001-SA	B-121a20'	11-MAY-11 20:51:47	ST051111M2	ST051111M3	TC
11MAY11M	10	6645-006-0001-SA	B-110a3.75	11-MAY-11 21:47:07	ST051111M2	ST051111M3	TC
11MAY11M	11	6644-008-0001-SA	B-104a0.0	11-MAY-11 22:42:30	ST051111M2	ST051111M3	TC
11MAY11M	12	6644-010-0001-SA	B-105a0.0	11-MAY-11 23:37:53	ST051111M2	ST051111M3	TC
11MAY11M	13	6644-012-0001-SA	B-106a0.0	12-MAY-11 00:33:11	ST051111M2	ST051111M3	TC
11MAY11M	14	6645-001-0001-SA	B-108a0.0	12-MAY-11 01:28:30	ST051111M2	ST051111M3	TC
11MAY11M	15	6645-009-0001-SA	B-112a0.0	12-MAY-11 02:23:53	ST051111M2	ST051111M3	TC
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11MAY11M	18	SB051111M4	Solvent Blank	12-MAY-11 05:09:56	ST051111M2	ST051111M3	TC
11MAY11M	19	SB051111M5	Solvent Blank	12-MAY-11 06:05:19	ST051111M2	ST051111M3	TC
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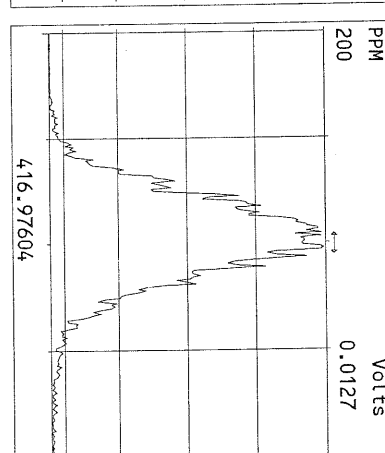
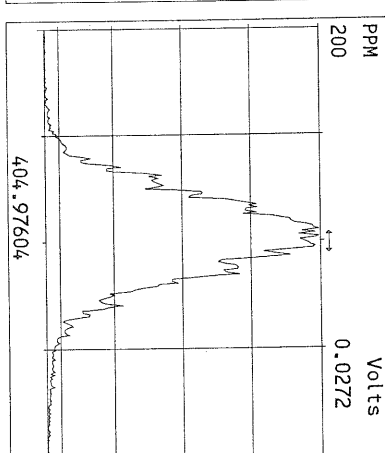
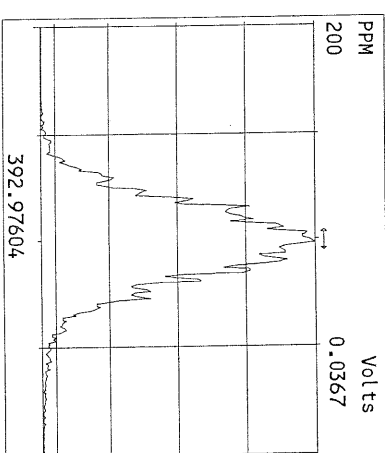
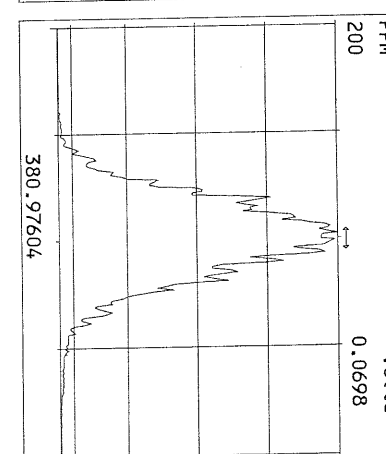
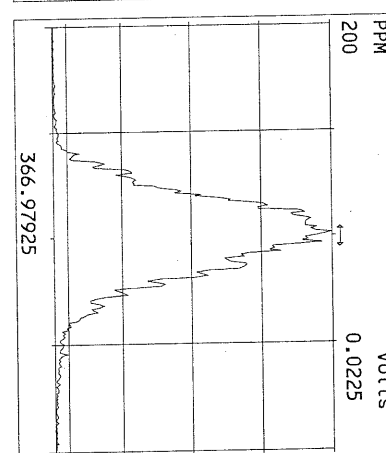
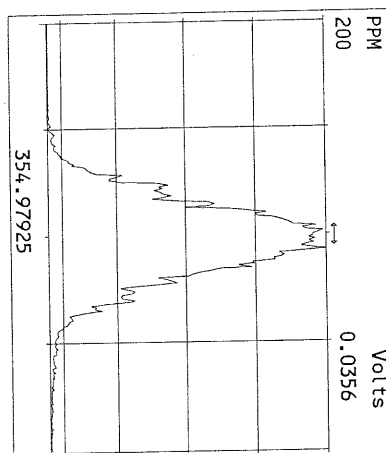
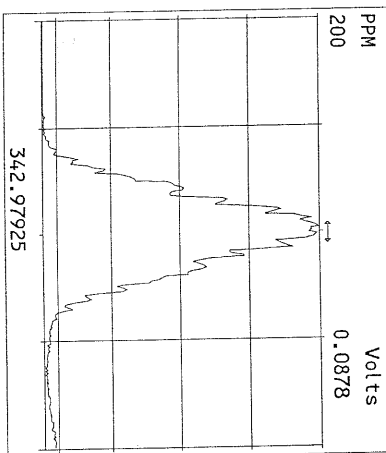
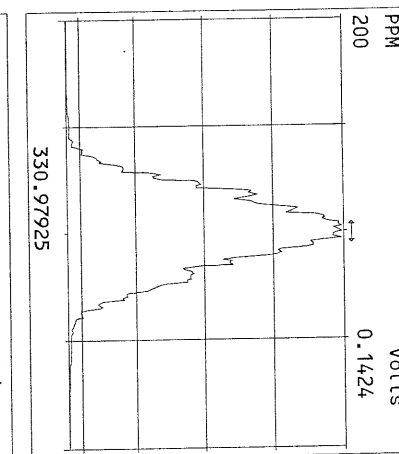
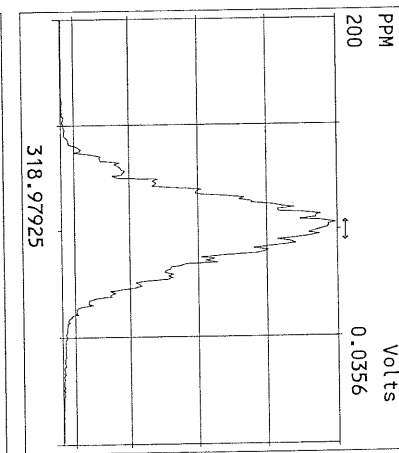
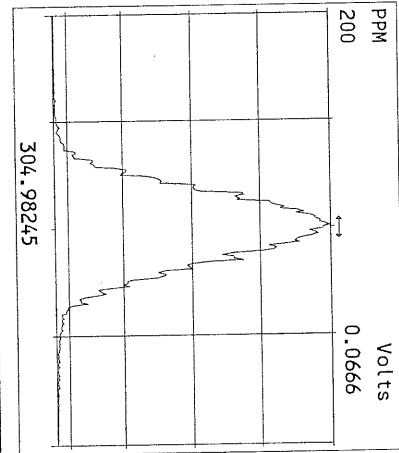
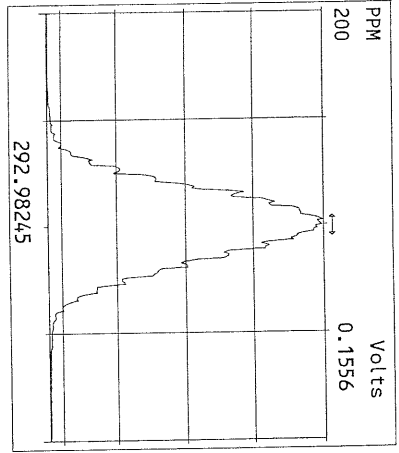
8 5/12/11

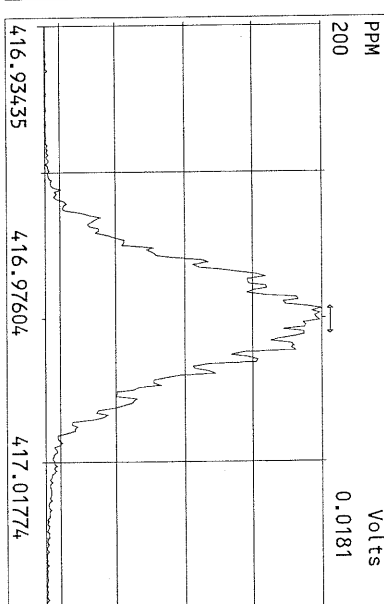
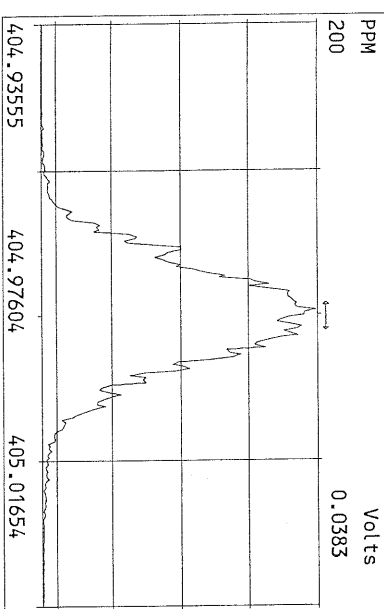
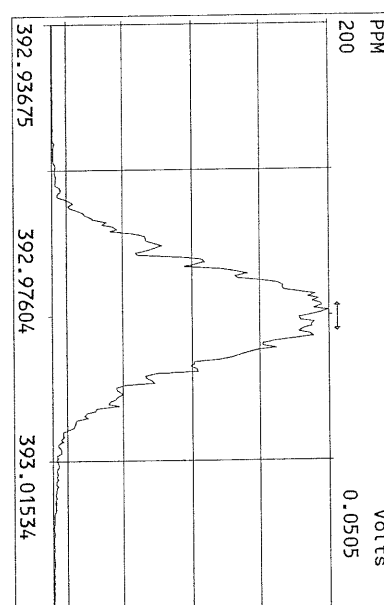
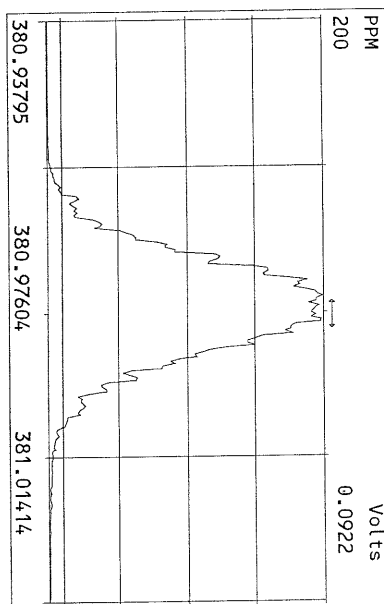
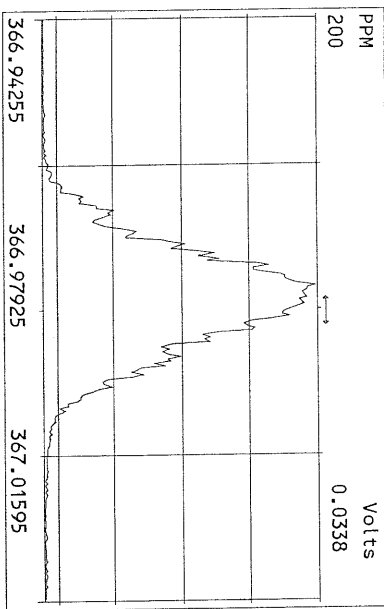
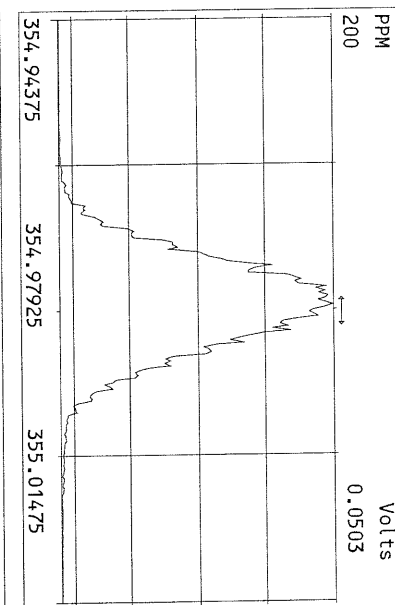
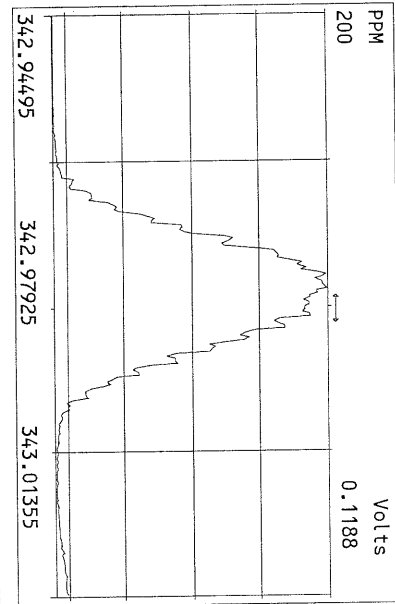
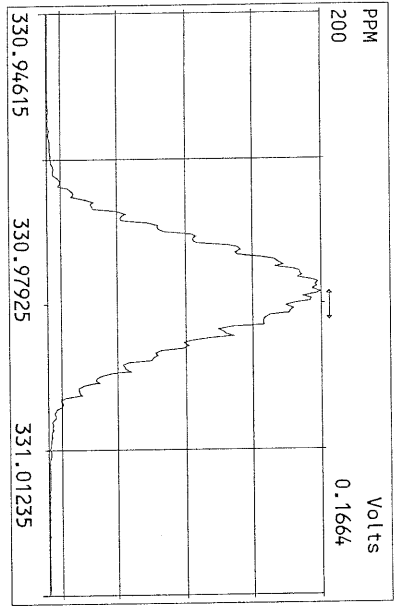
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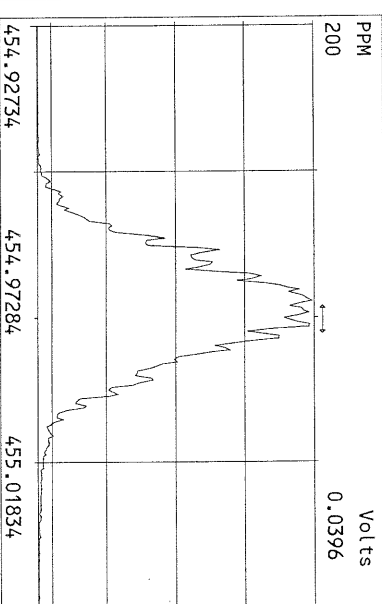
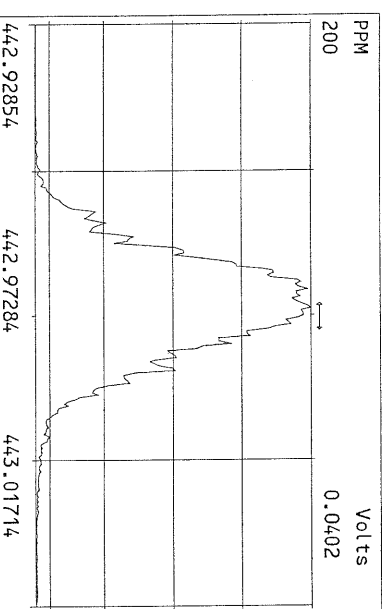
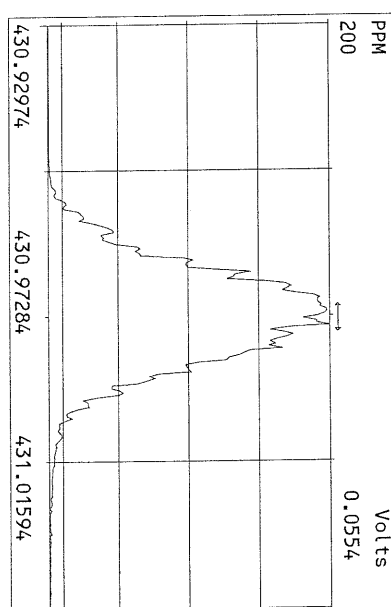
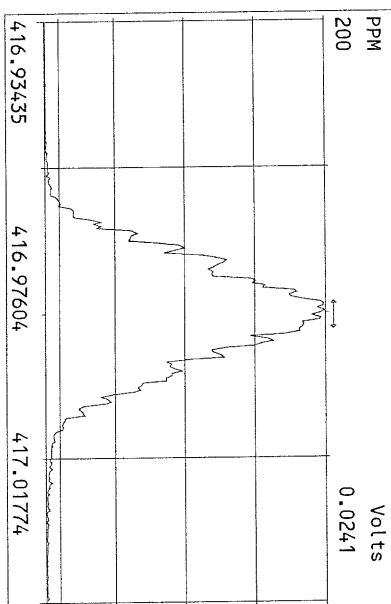
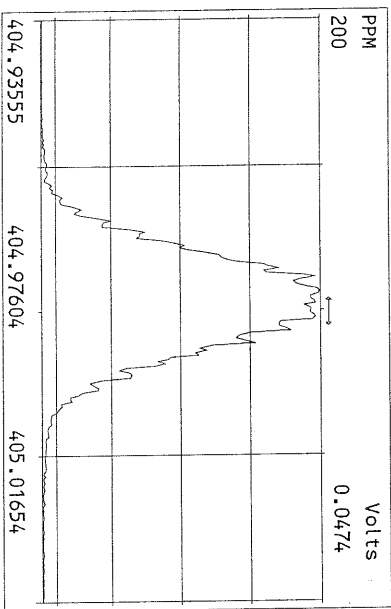
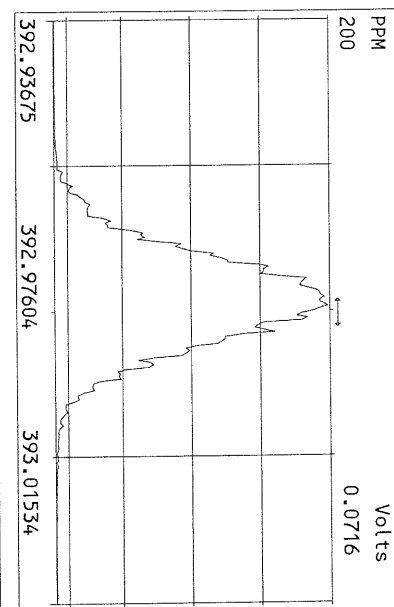
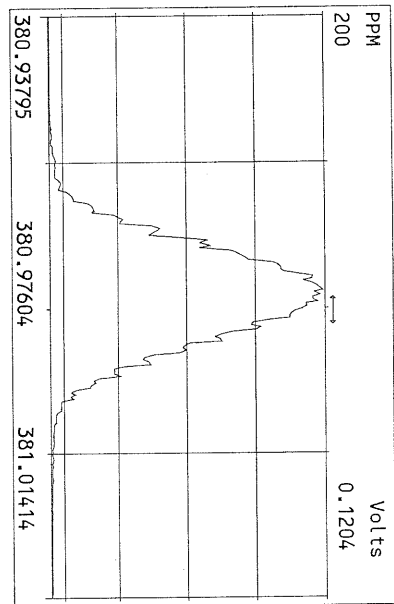
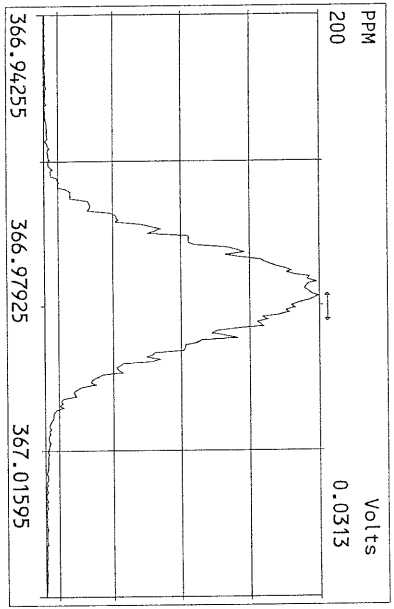
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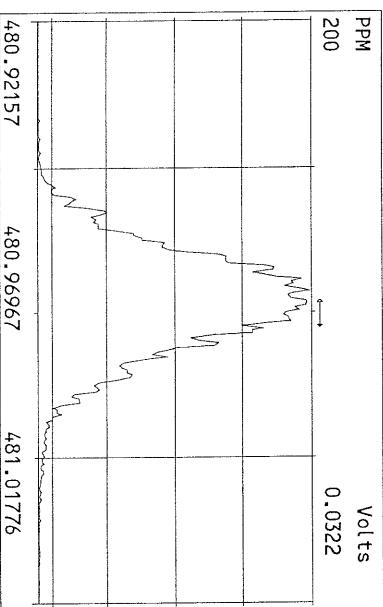
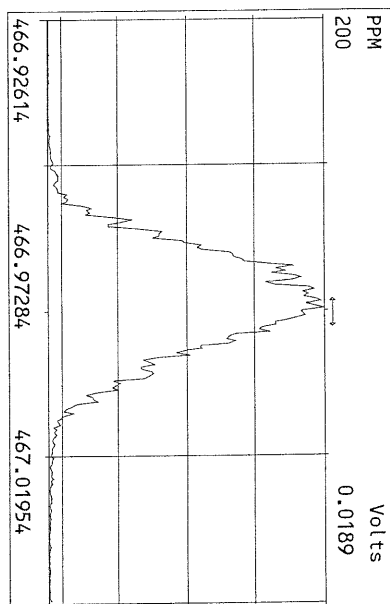
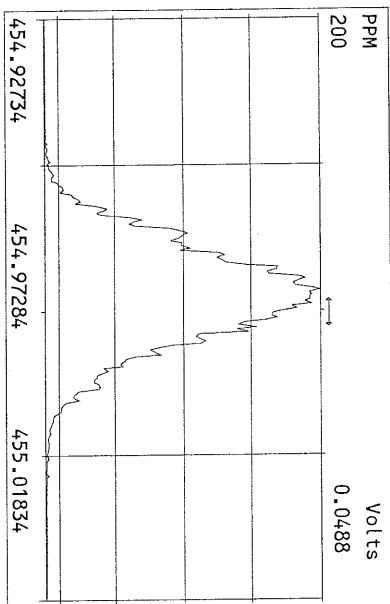
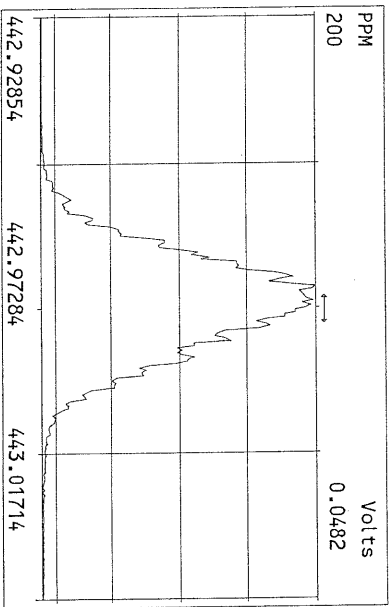
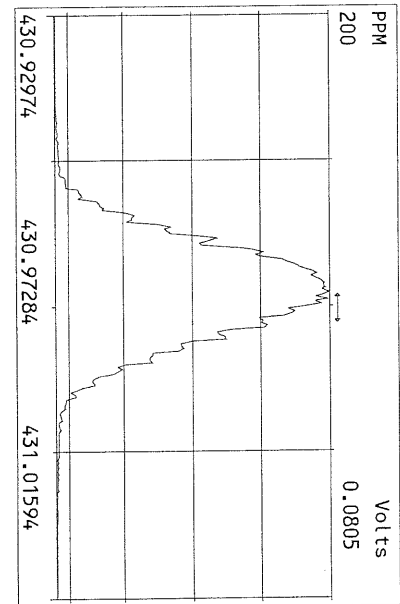
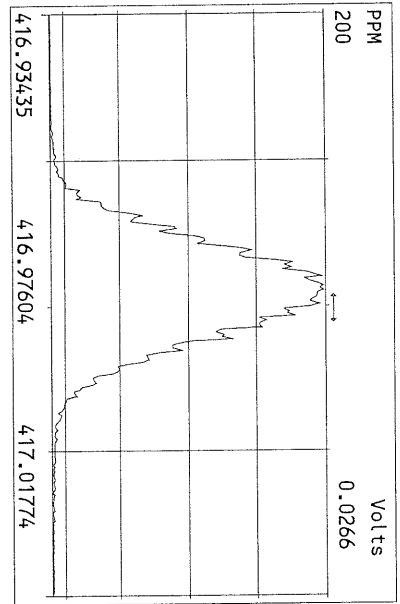
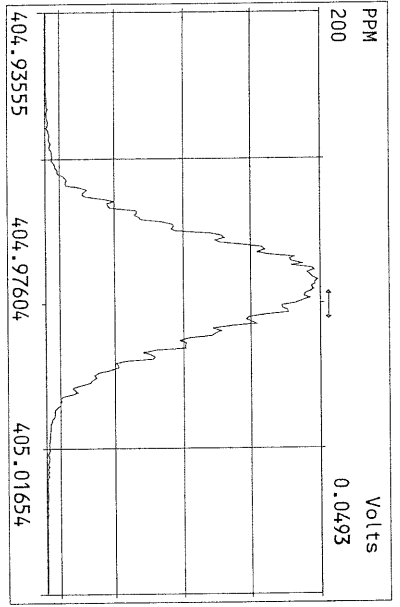
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Experiment:OCCD Function:1 Reference:PFK



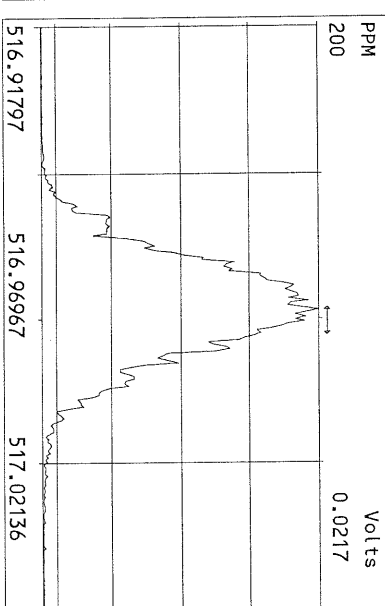
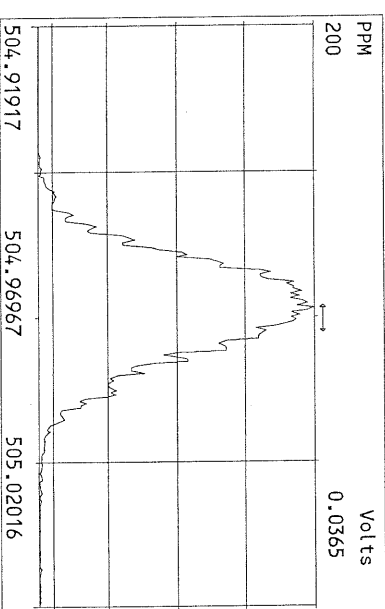
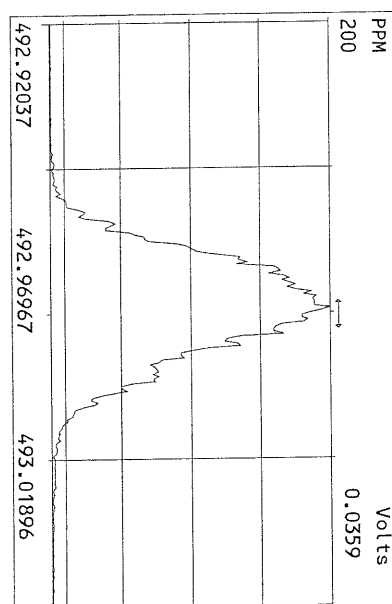
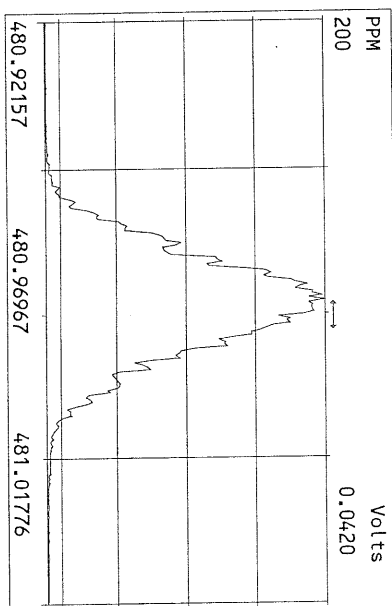
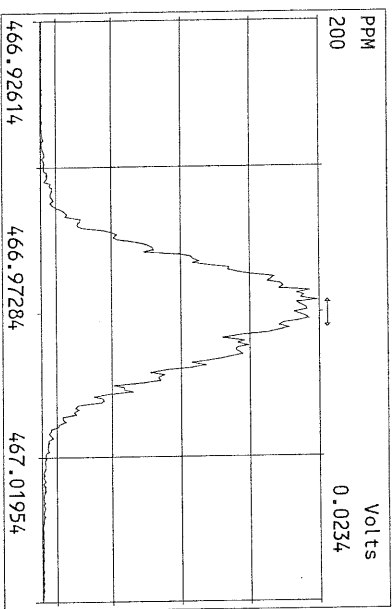
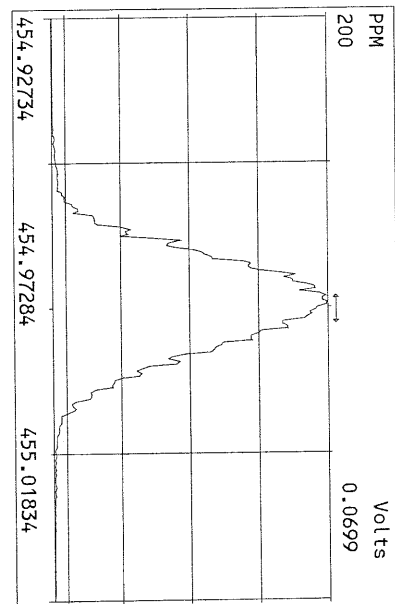
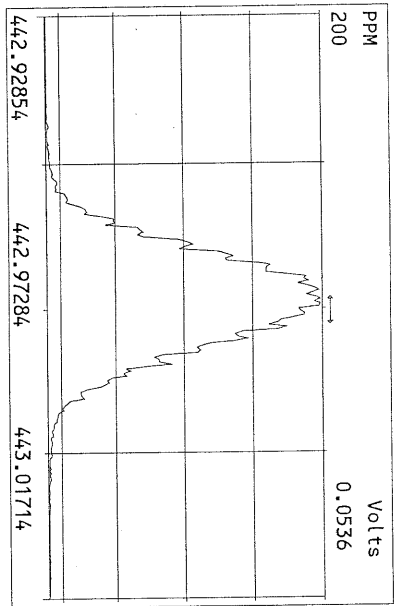
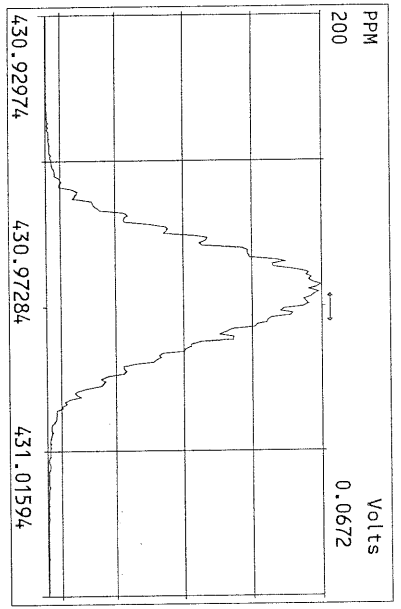




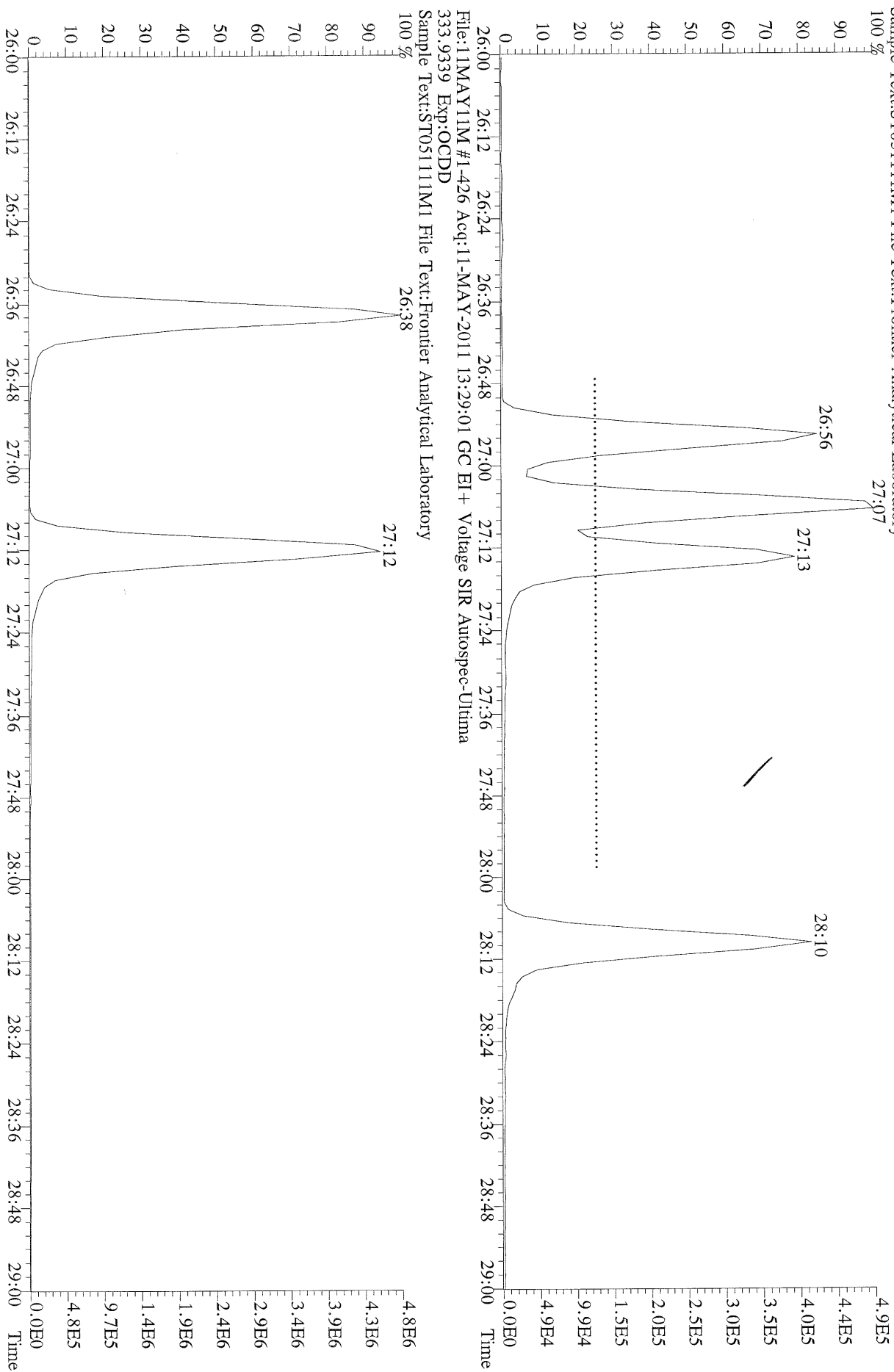
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Experiment: OCDD Function: 4 Reference: PFK



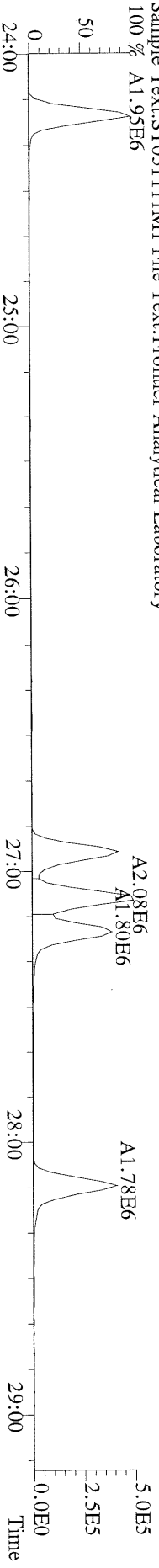
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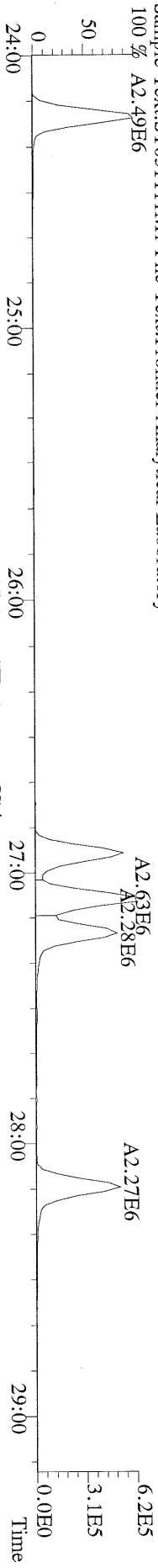
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319.8965 Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory
100%



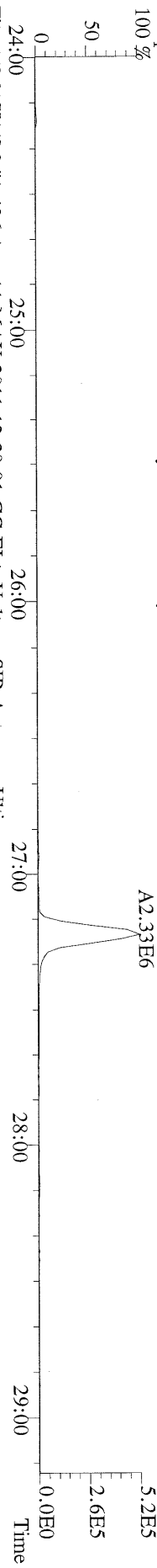
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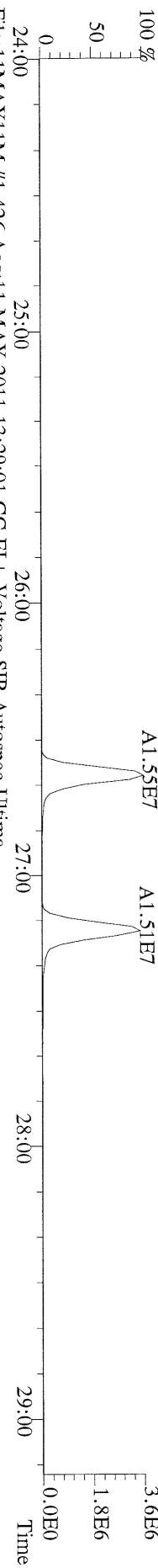
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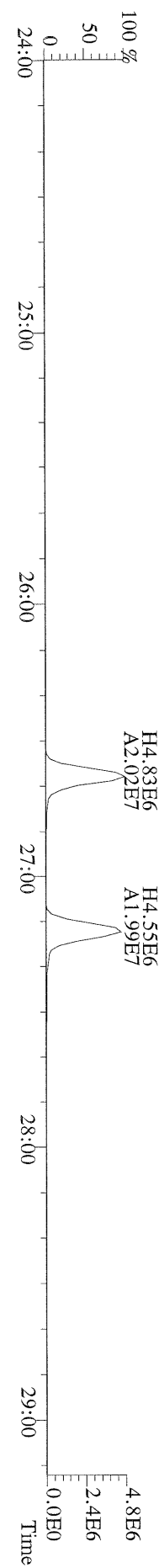
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100 %



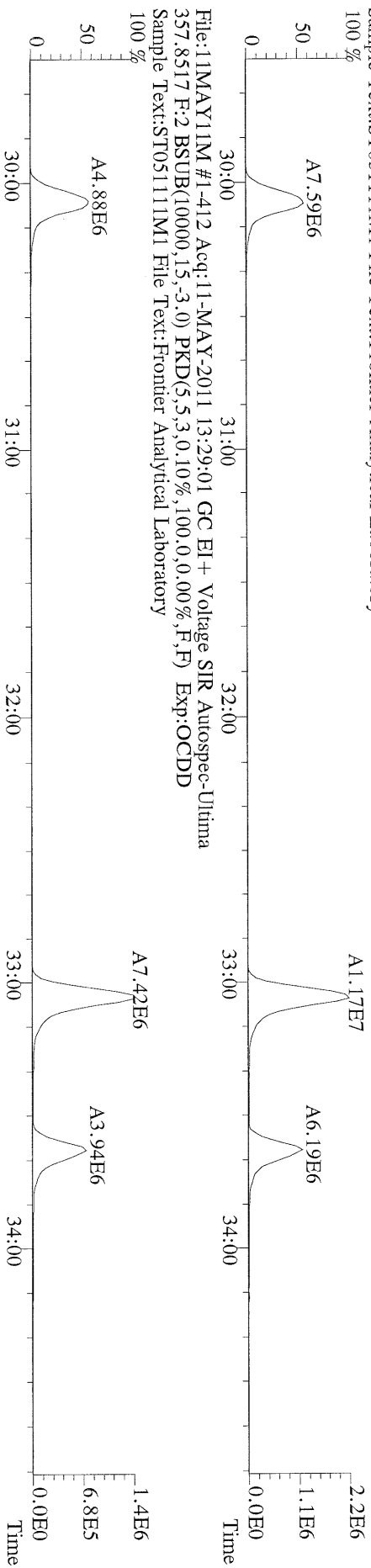
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331.9368 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory
100 %



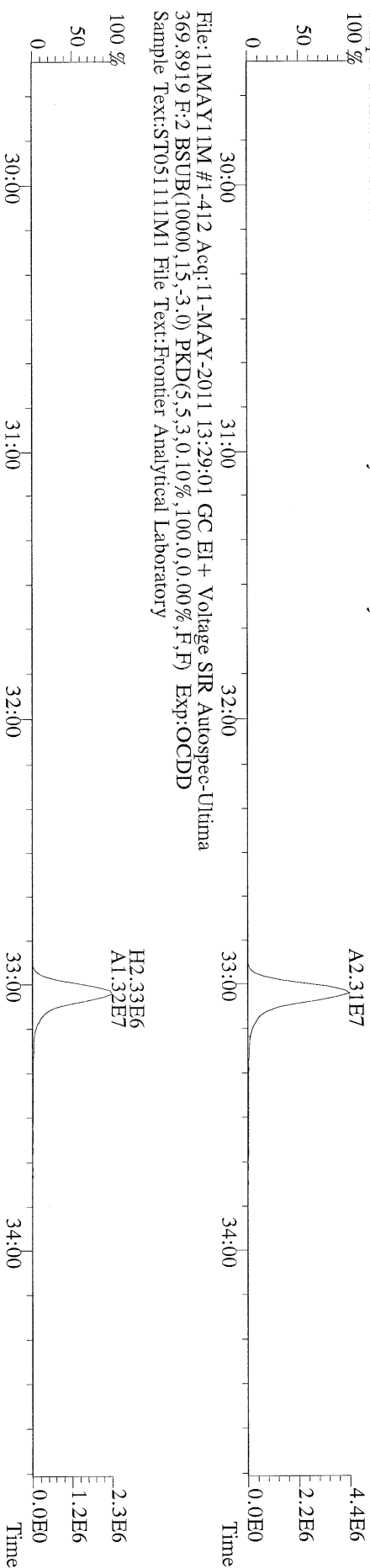
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333.9339 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



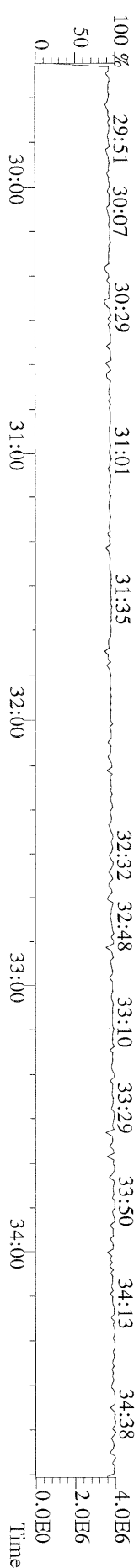
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 355.8546 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



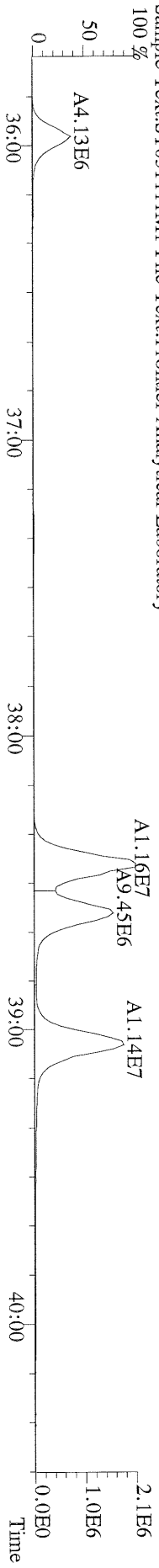
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 367.8949 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



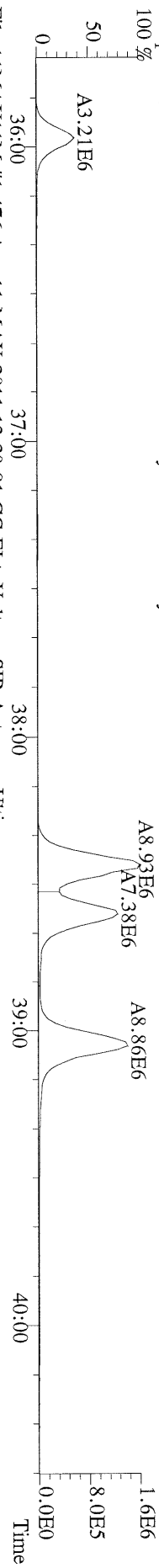
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 366.9792 F:2 Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



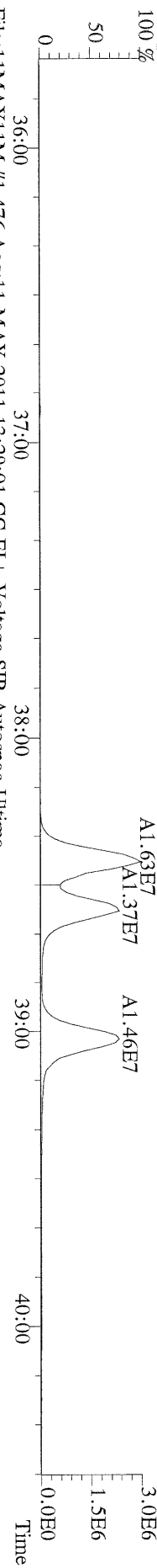
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 389.8156 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



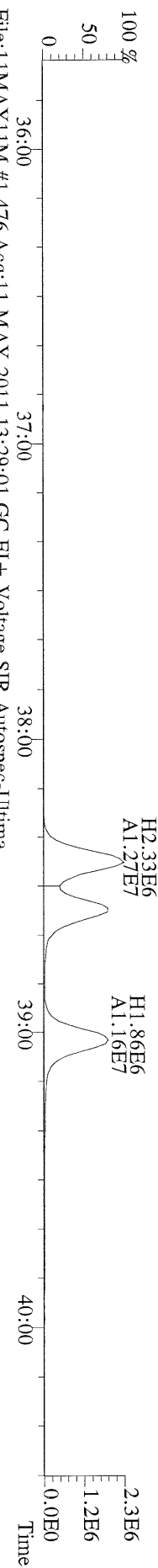
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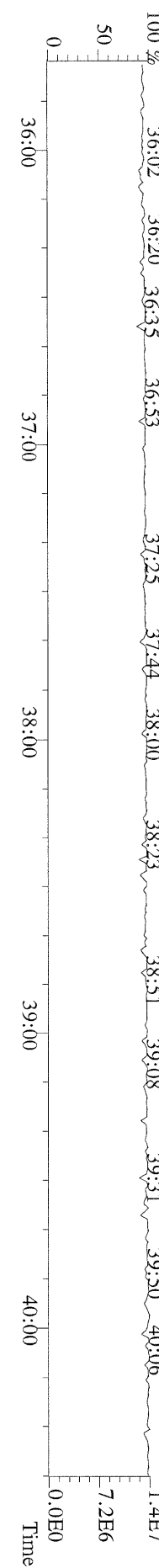
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 401.8559 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



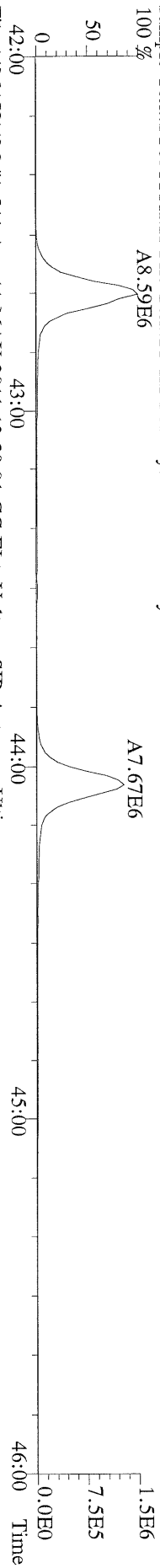
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 403.8530 F:3 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



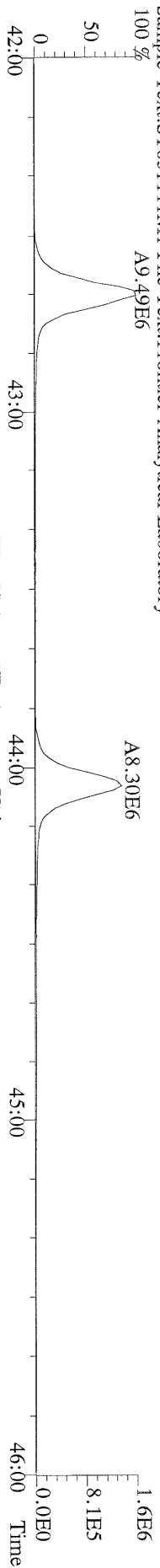
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 380.9760 F:3 Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



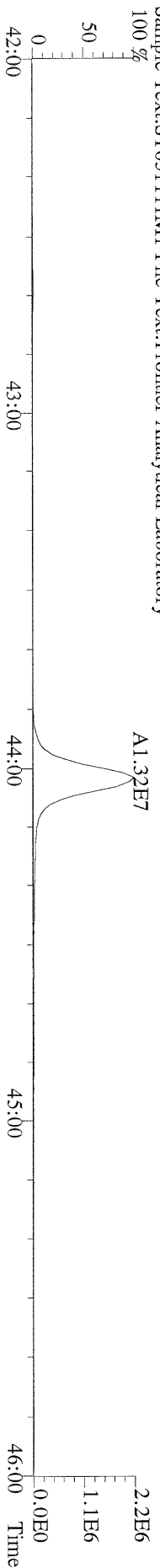
File:11MAY11M #1-541 Acq:11-MAY-2011 13:29:01 GC EI+ Voltage SIR Autospec-Ultima
423.7767 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



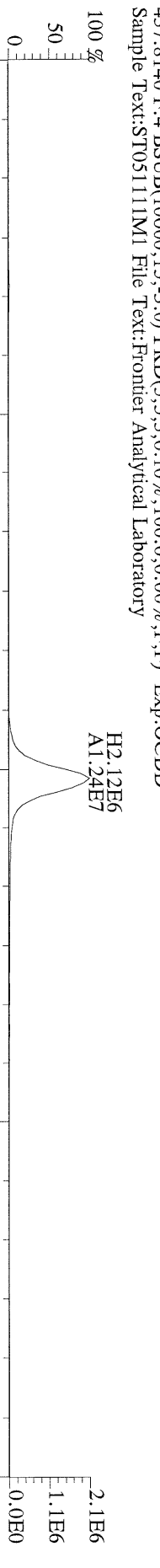
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425.7737 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



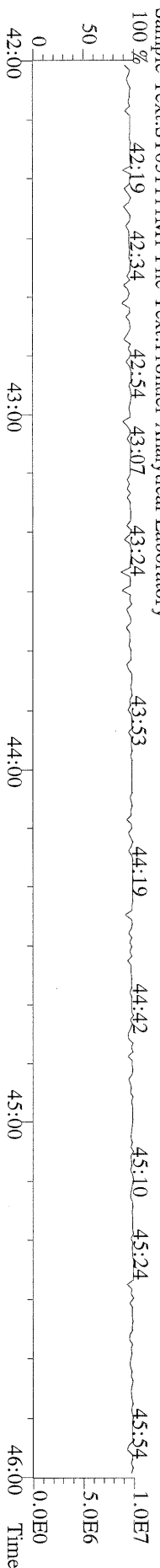
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435.8169 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



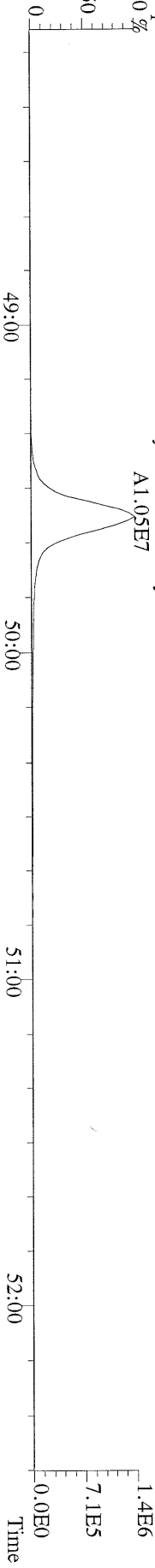
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437.8140 F:4 BSUB(10000,15,-3.0) PKD(5,5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



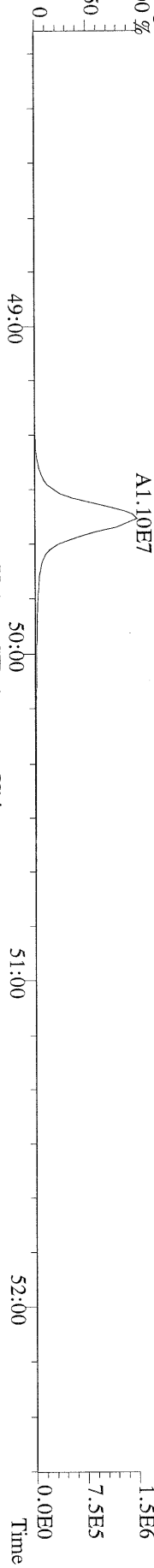
File:11MAY11M #1-541 Acq:11-MAY-2011 13:29:01 GC EI+ Voltage SIR Autospec-Ultima
430.9728 F:4 Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



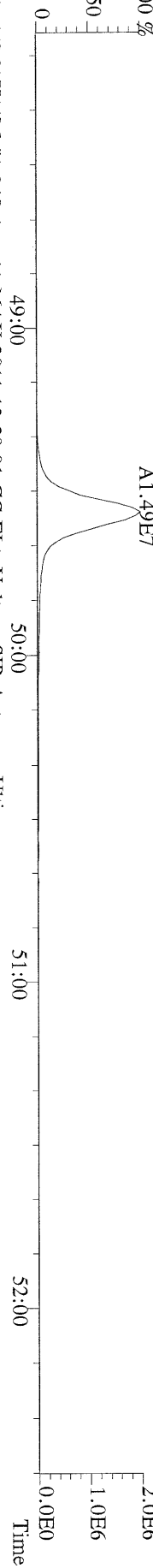
File:11MAY11M #1-348 Acq:11-MAY-2011 13:29:01 GC EI+ Voltage SIR Autospec-Ultima
457.7377 F:5 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



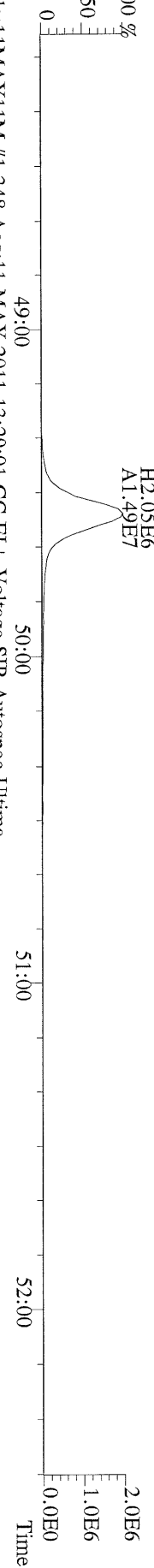
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459.7348 F:5 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



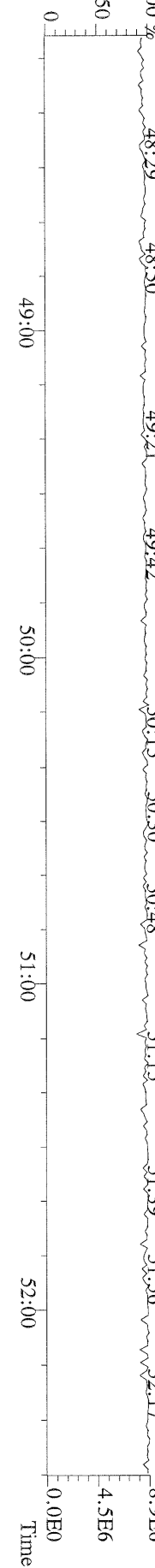
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469.7780 F:5 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



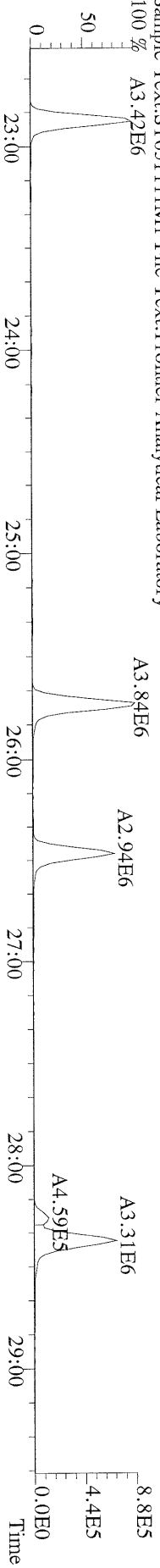
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471.7750 F:5 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



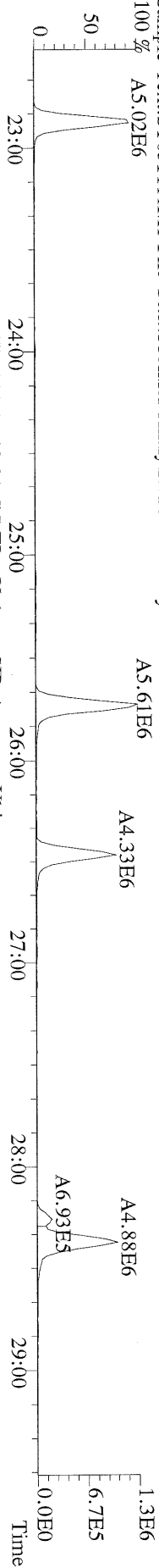
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454.9728 F:5 Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



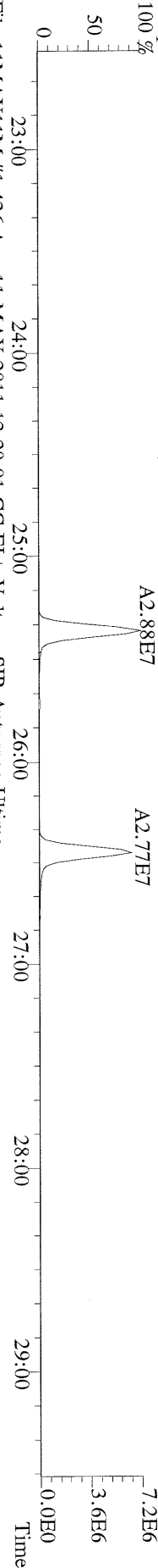
File:11MAY11M #1-426 Acq:11-MAY-2011 13:29:01 GC EI+ Voltage SIR Autospec-Ultima
303.9016 BSUB(10000,15,-3,0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Fronter Analytical Laboratory
100% A3.42E6



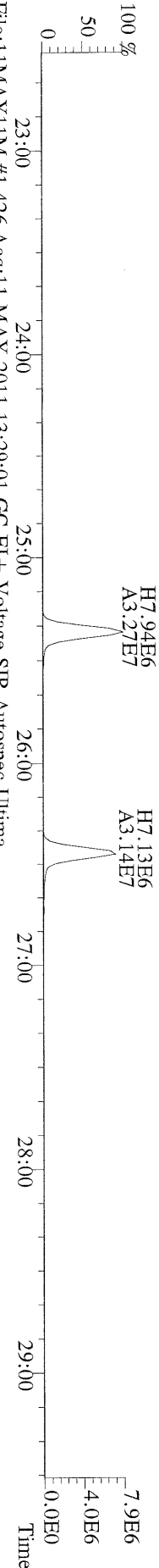
File:11MAY11M #1-426 Acq:11-MAY-2011 13:29:01 GC EI+ Voltage SIR Autospec-Ultima
305.8987 BSUB(10000,15,-3,0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Fronter Analytical Laboratory
100% A5.02E6



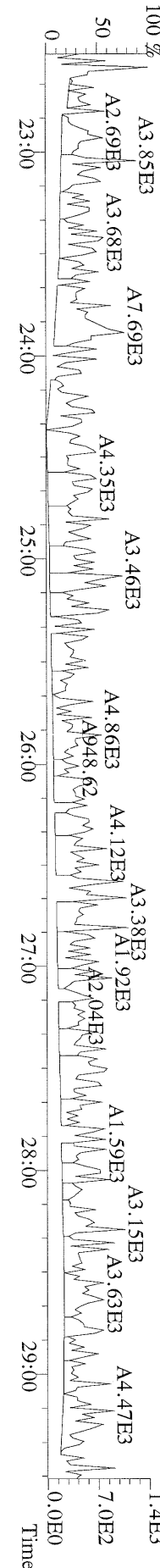
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315.9419 BSUB(10000,15,-3,0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Fronter Analytical Laboratory
100% A2.88E7



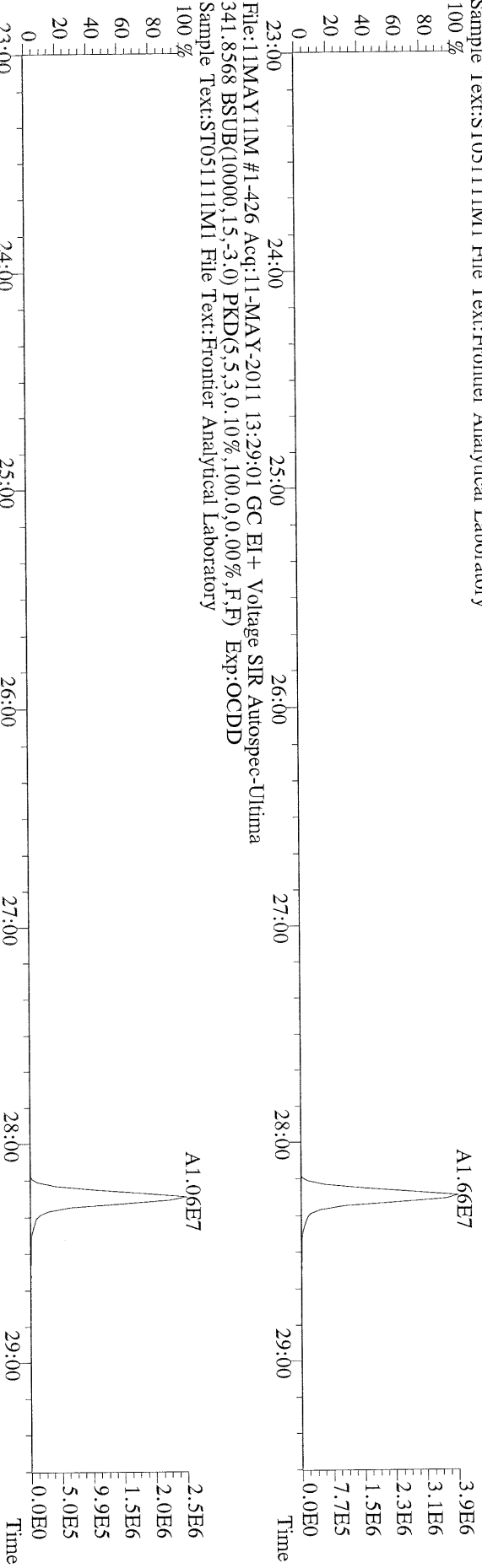
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317.9389 BSUB(10000,15,-3,0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Fronter Analytical Laboratory
100% H7.94E6
A3.27E7



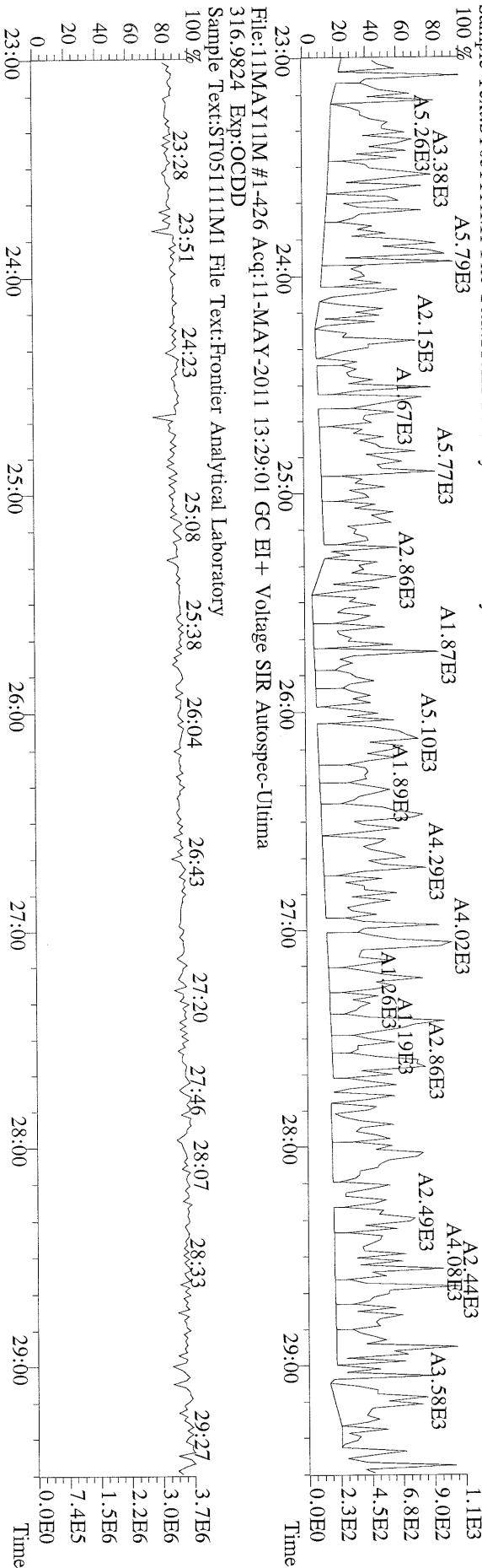
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375.8364 BSUB(10000,15,-3,0) PKD(5,5,3,0.10%,100,0,0.00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Fronter Analytical Laboratory
100% A2.69E3
A3.85E3
A3.68E3
A7.69E3
A4.35E3
A3.46E3
A4.86E3
A948.62
A4.12E3
A3.38E3
A1.92E3
A2.04E3
A1.59E3
A3.15E3
A3.63E3
A4.47E3



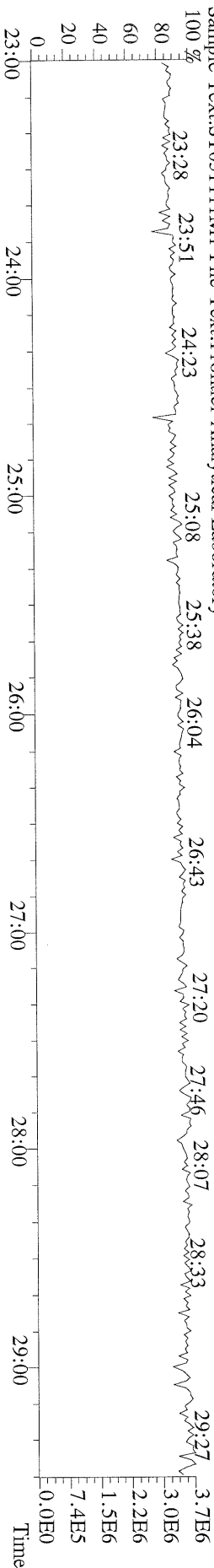
File:11MAY11M #1-426 Acq:11-MAY-2011 13:29:01 GC EI+ Voltage SIR Autospec-Ultima
 339.8597 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



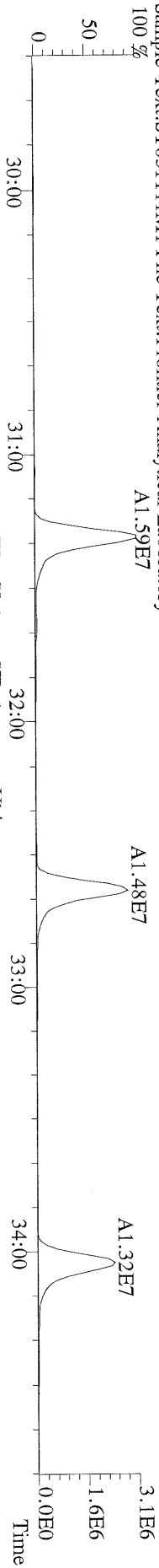
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 409.7974 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



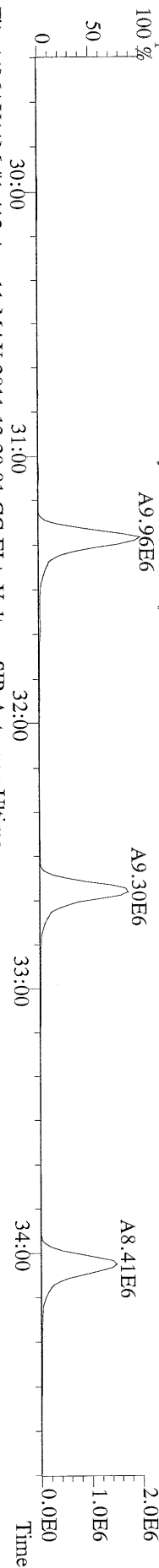
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 316.9824 Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



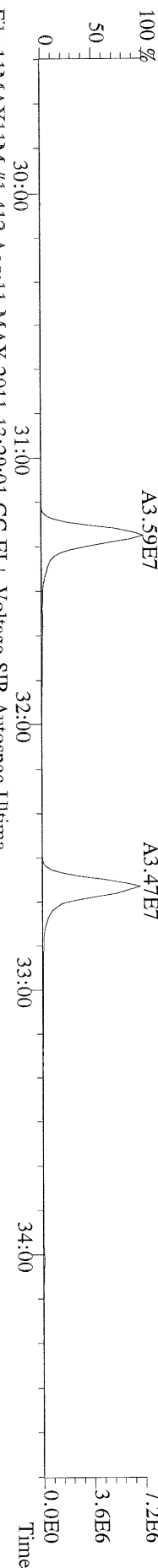
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 339.8597 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



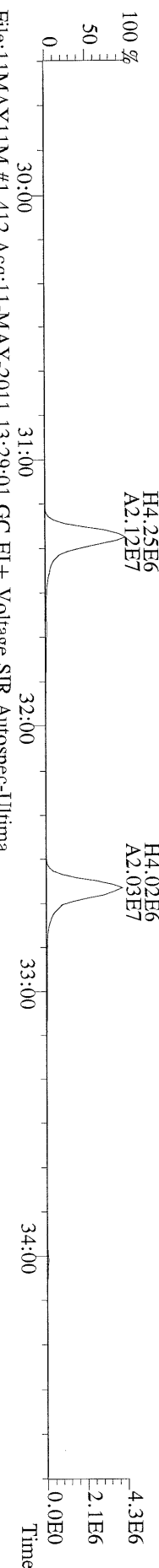
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 341.8568 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



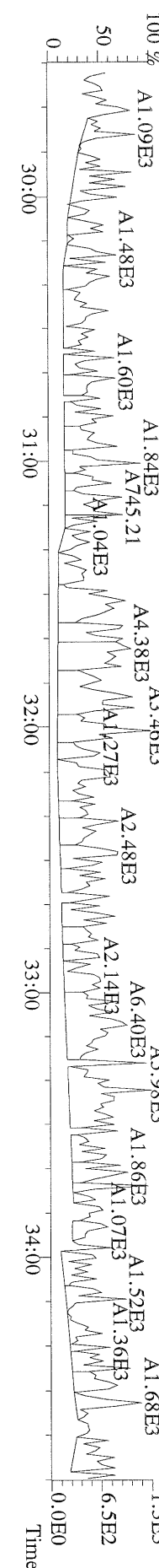
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 351.9000 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



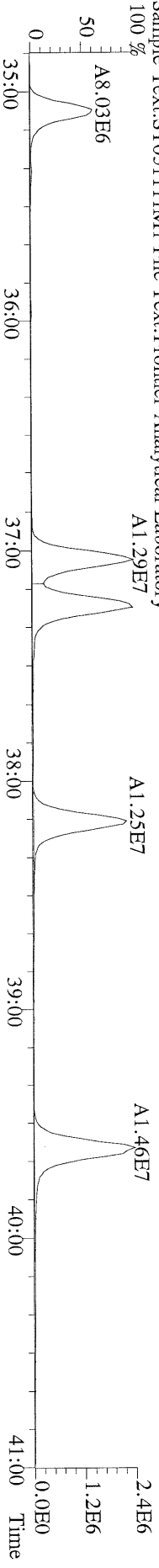
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 353.8970 F:2 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



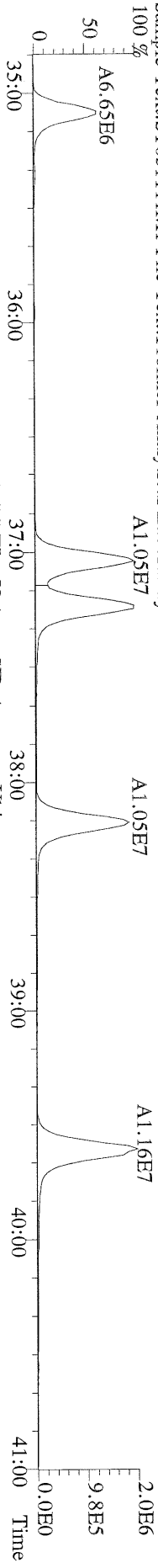
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 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



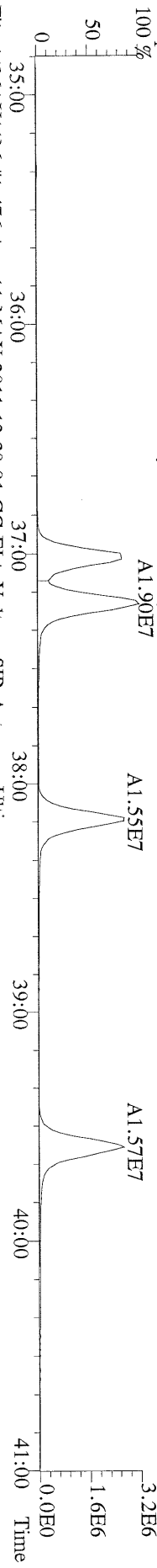
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373.8207 F:3 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



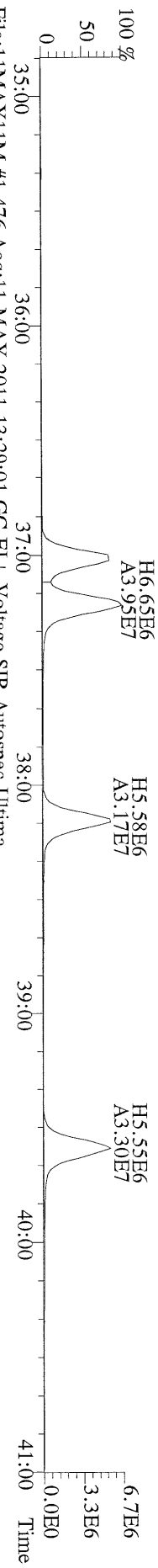
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375.8178 F:3 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



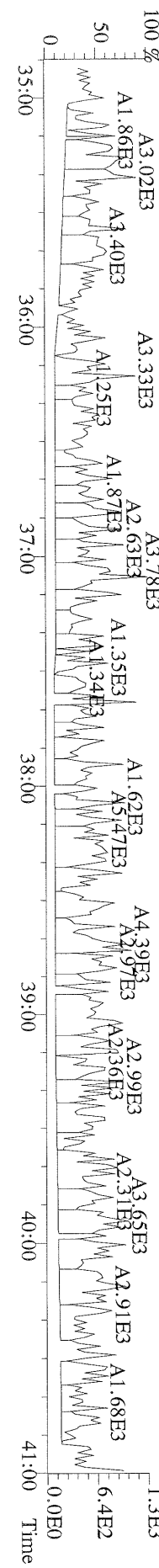
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383.8639 F:3 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



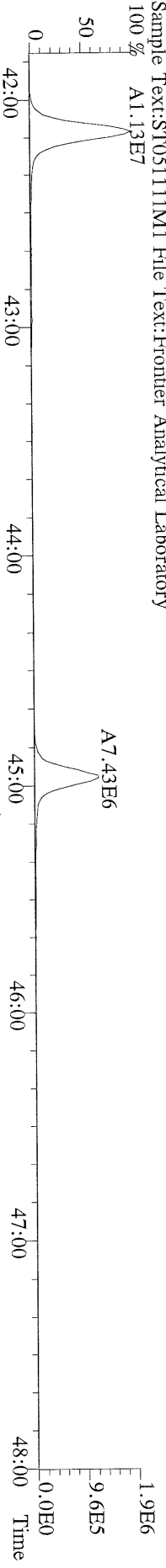
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385.8610 F:3 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



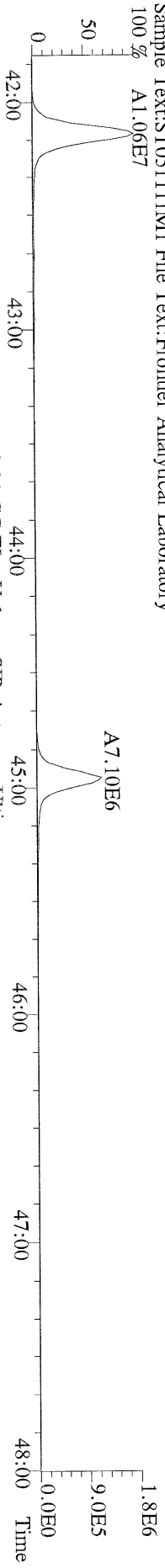
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445.7555 F:3 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



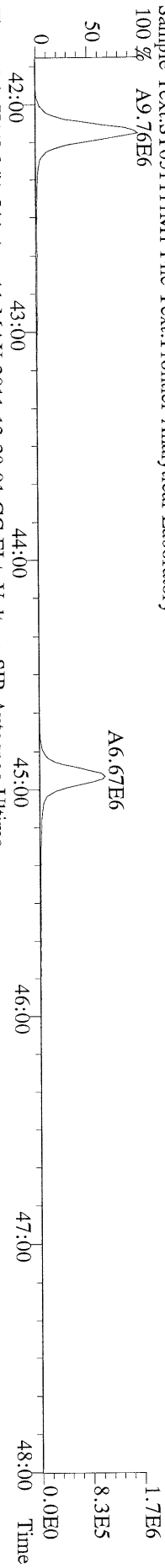
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407.7818 F:4 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory
100 % A1.13E7



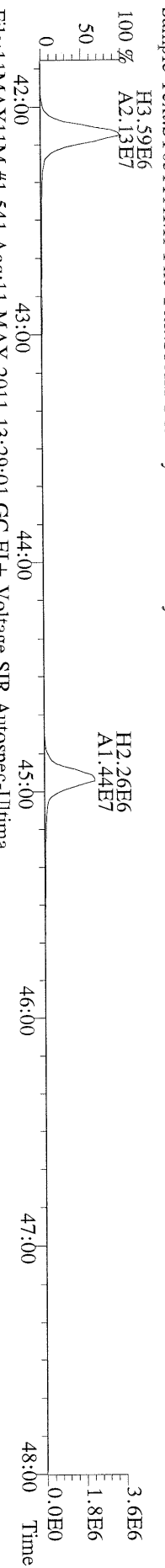
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409.7788 F:4 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory
100 % A1.06E7



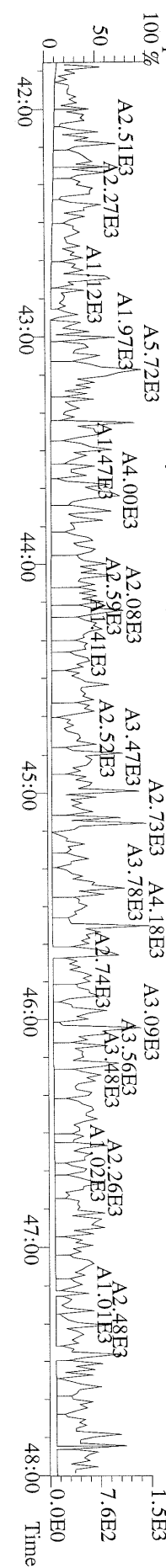
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417.8253 F:4 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
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100 % A9.76E6



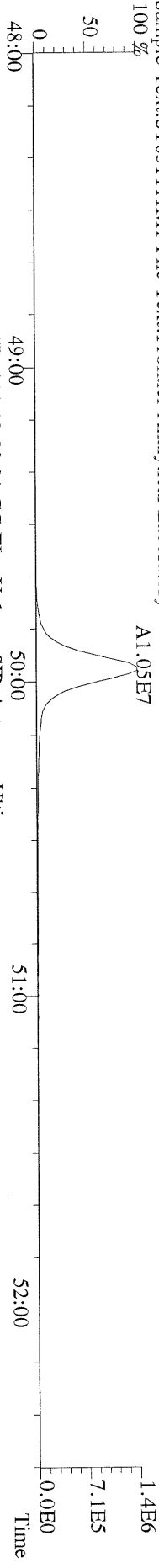
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419.8220 F:4 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory
H3.59E6
100 % A2.13E7



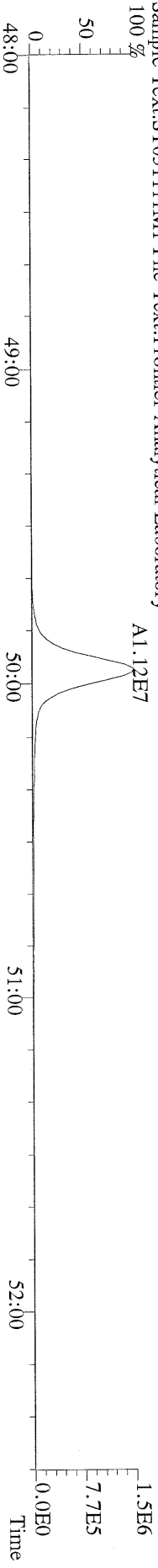
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479.7165 F:4 BSUB(10000,15,-3,0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory
100 %



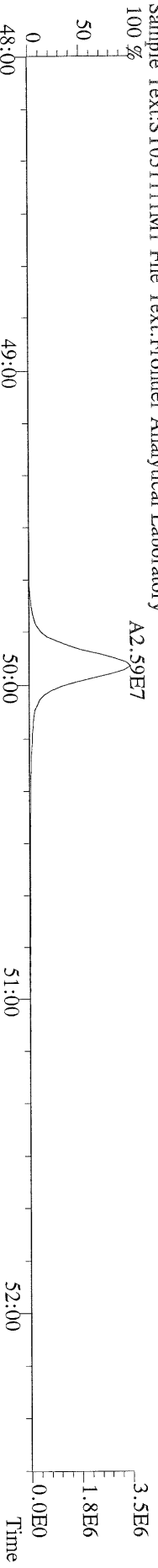
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 441.7428 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



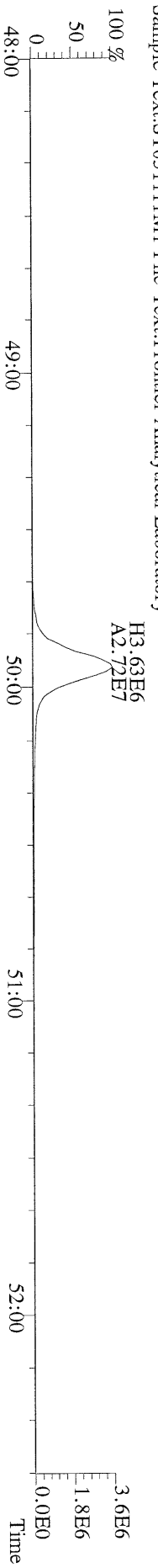
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 443.7398 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



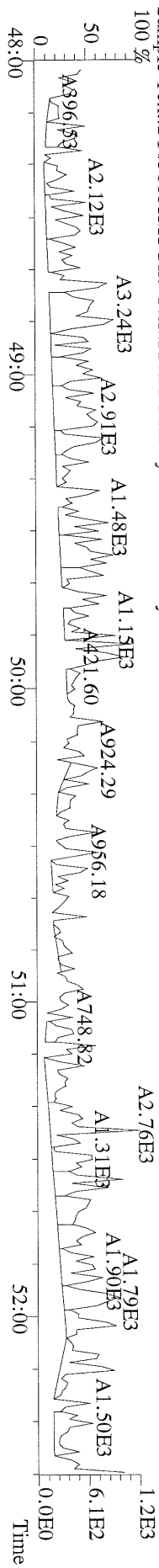
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 453.7831 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory



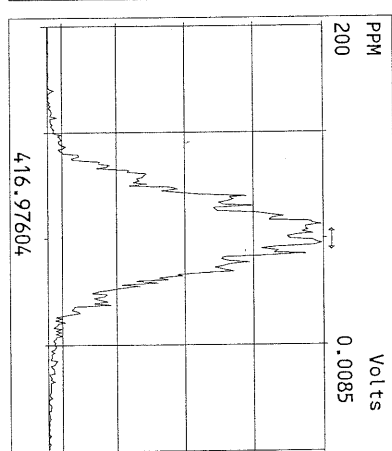
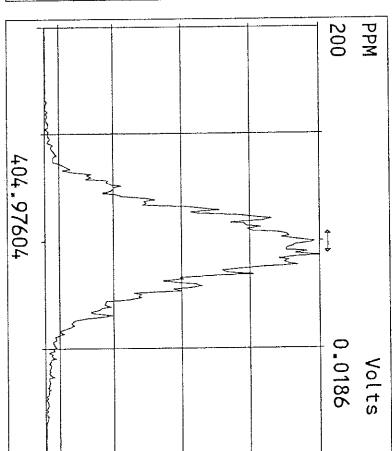
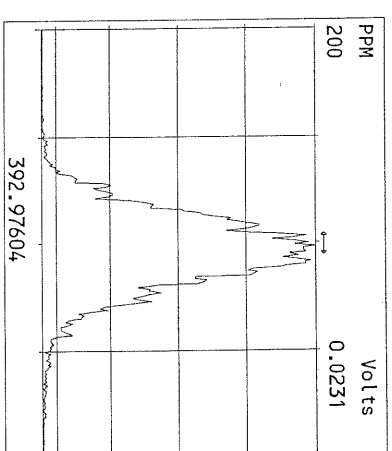
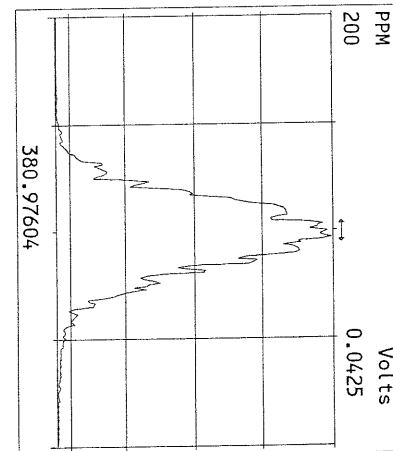
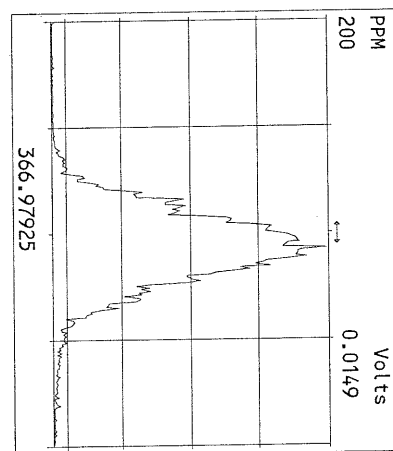
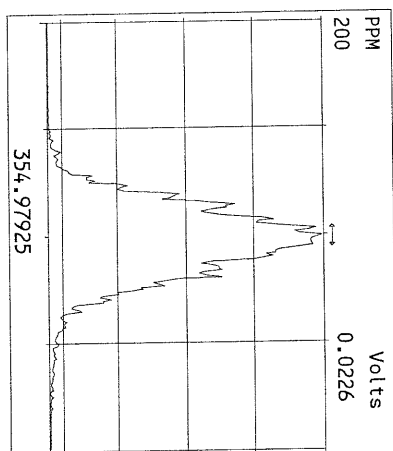
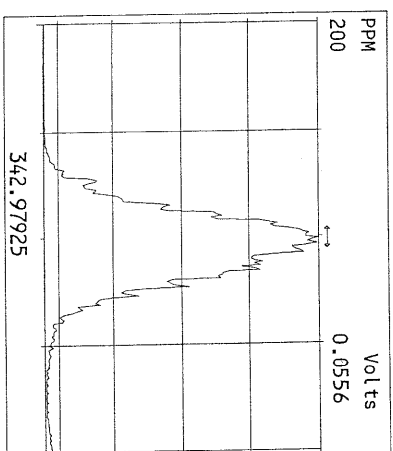
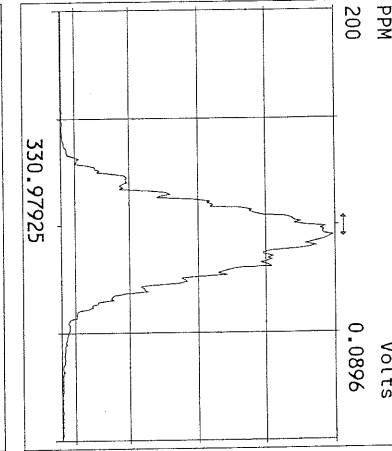
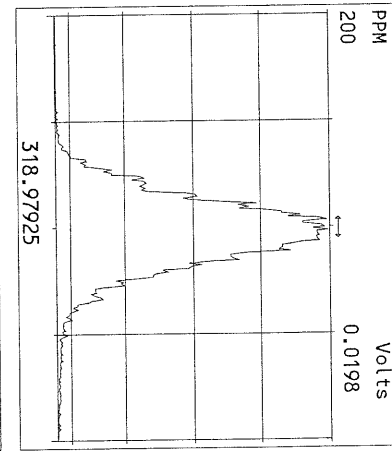
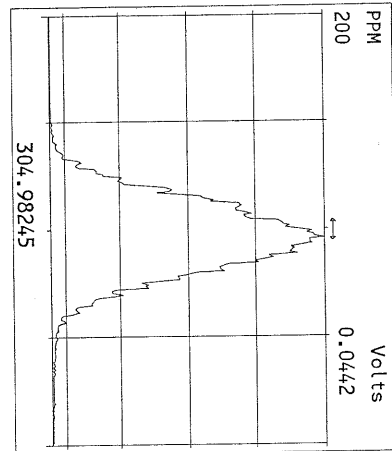
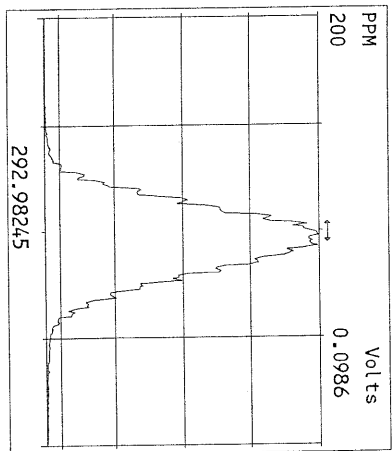
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 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory

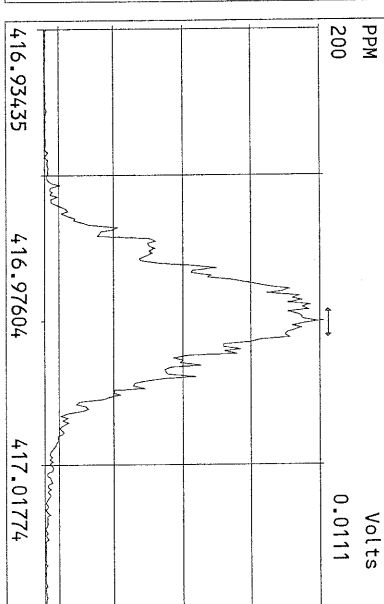
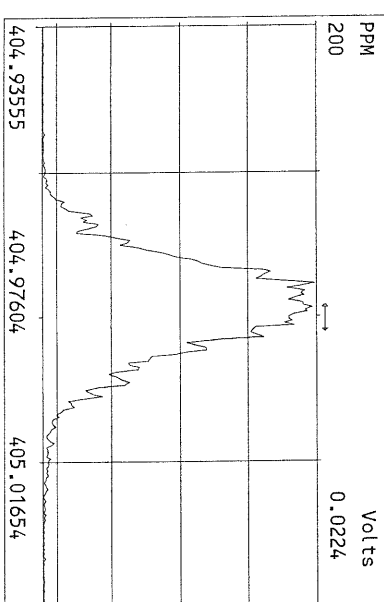
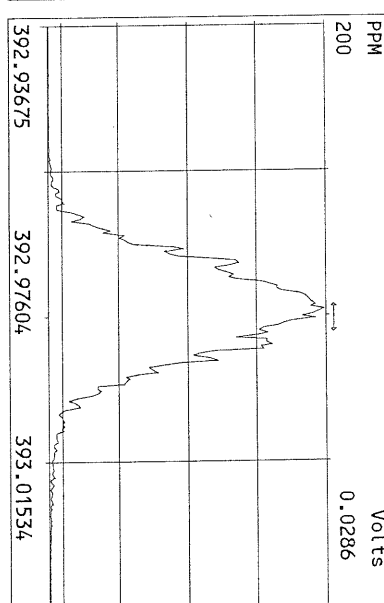
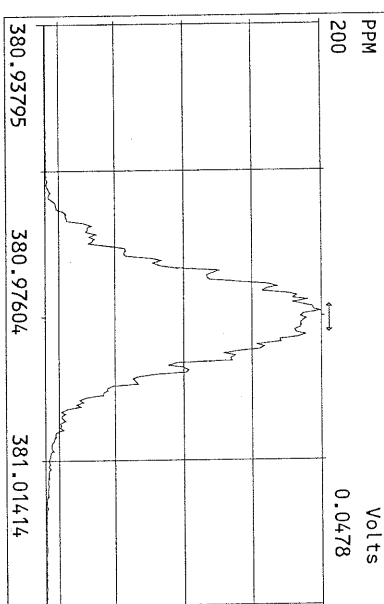
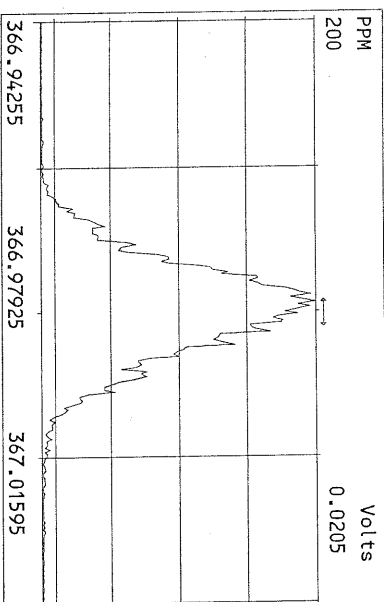
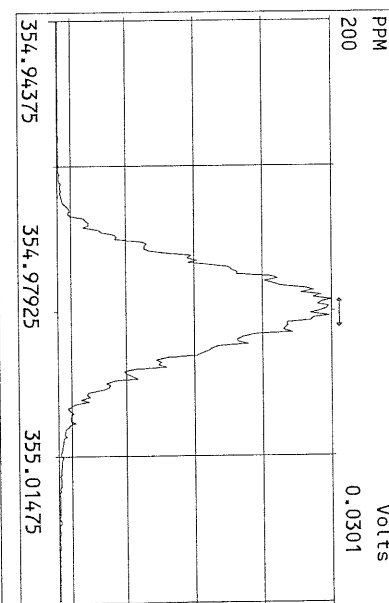
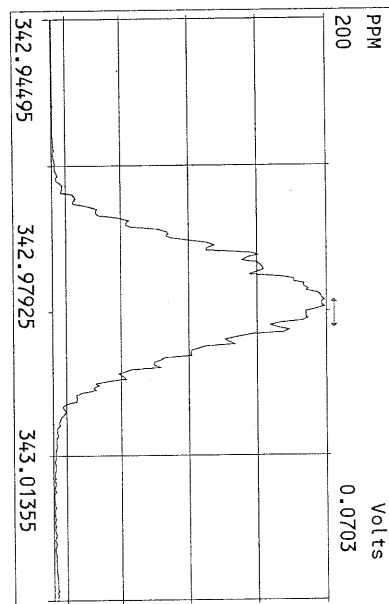
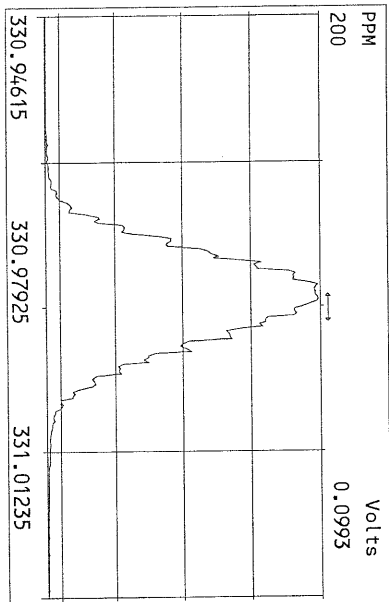


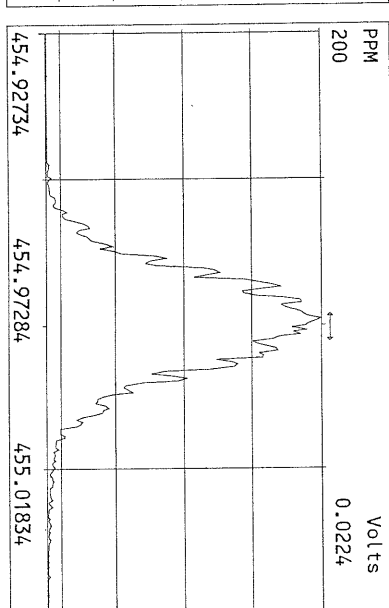
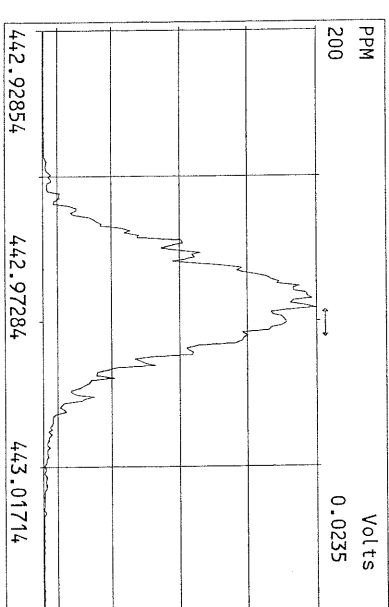
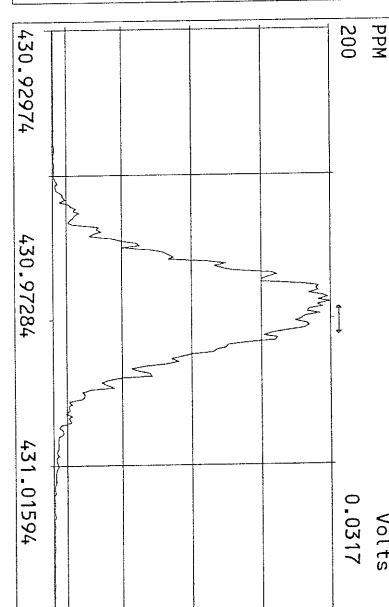
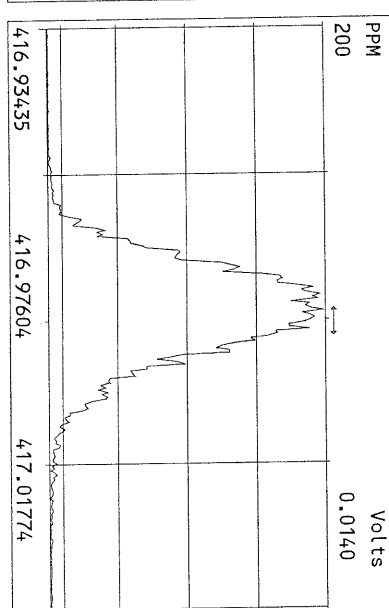
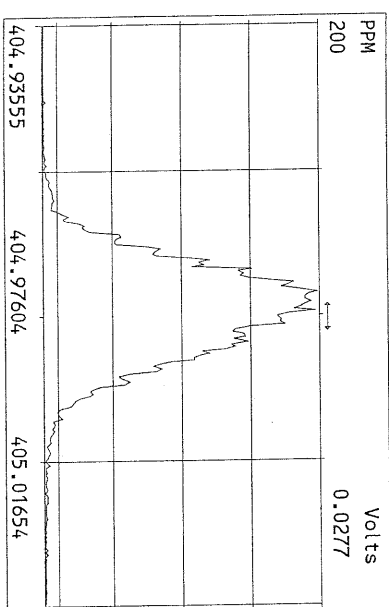
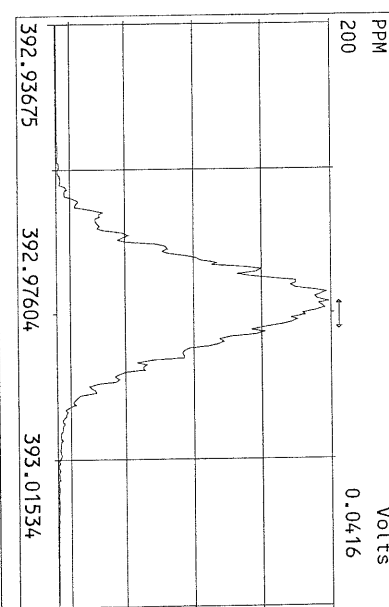
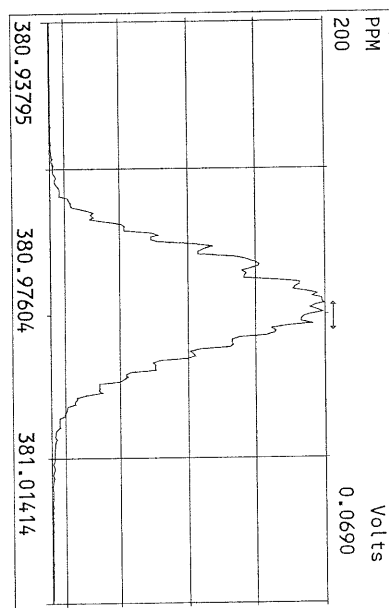
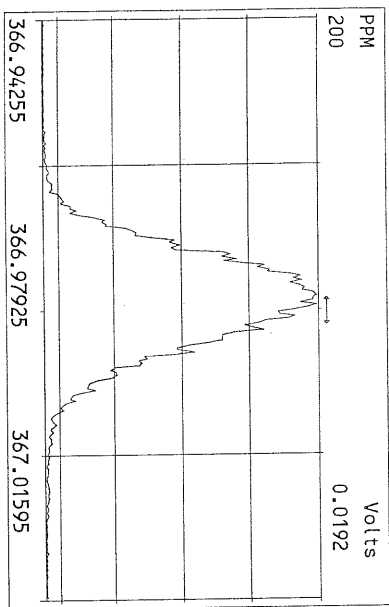
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 Sample Text:ST051111M1 File Text:Frontier Analytical Laboratory

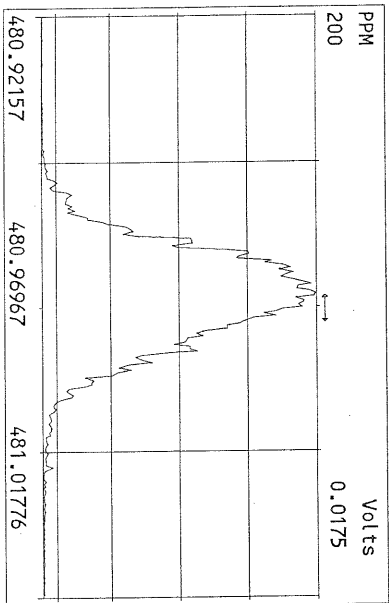
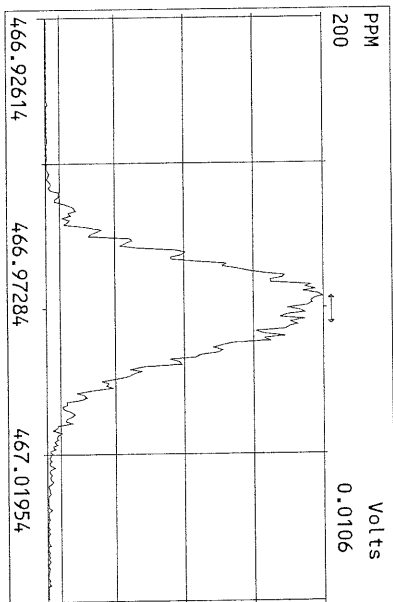
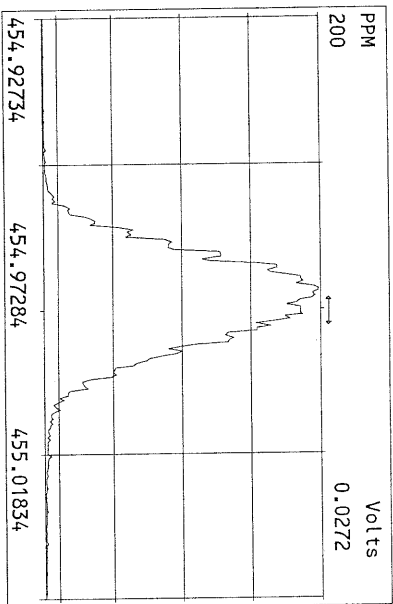
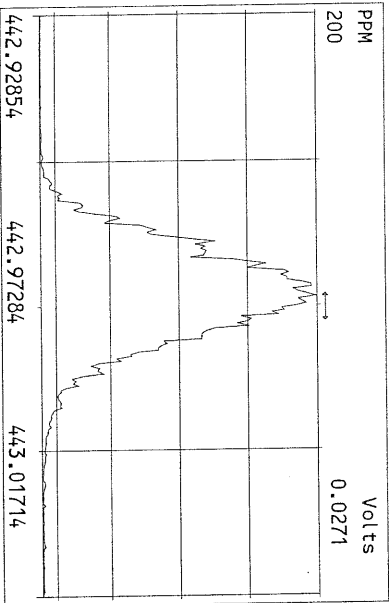
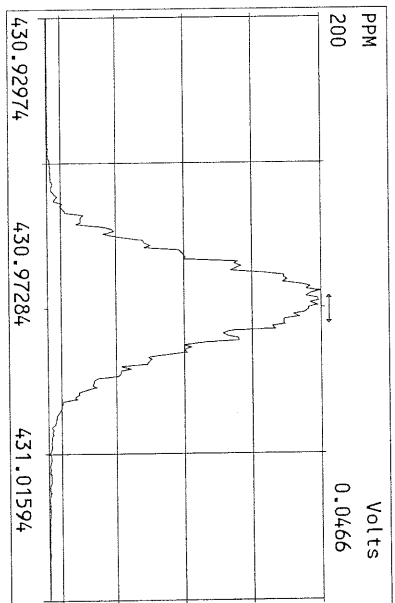
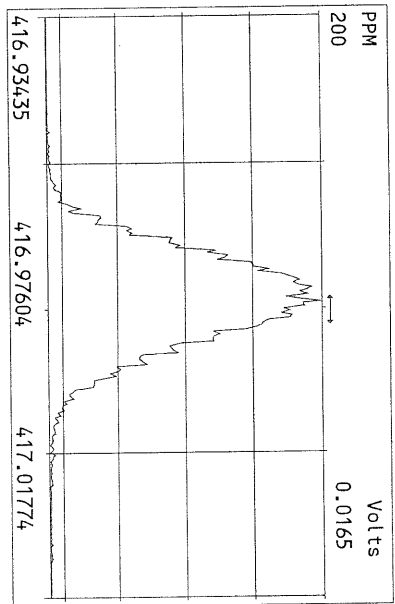
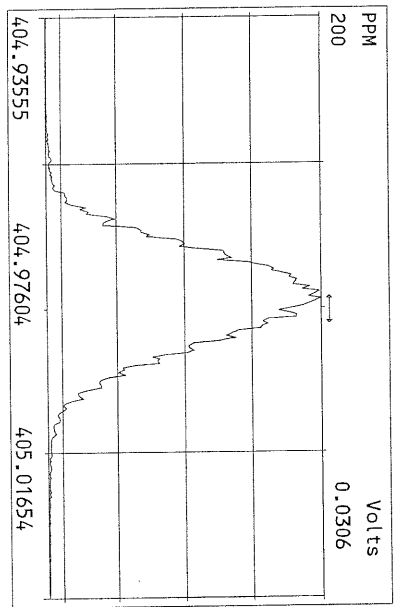


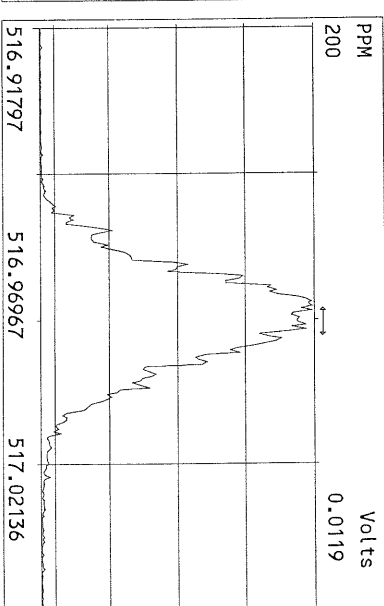
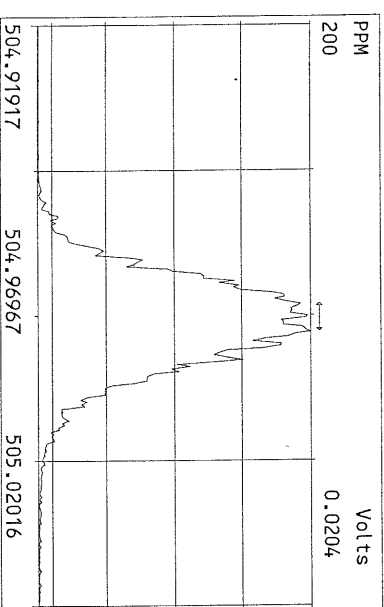
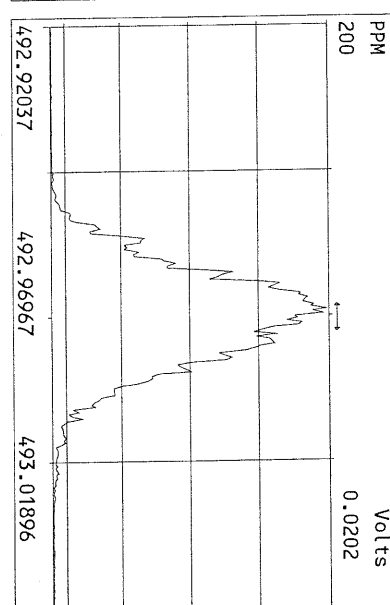
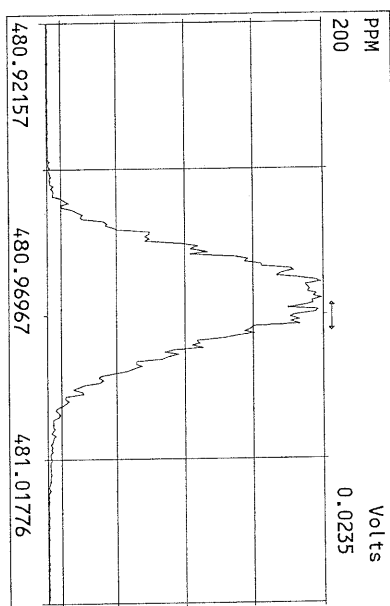
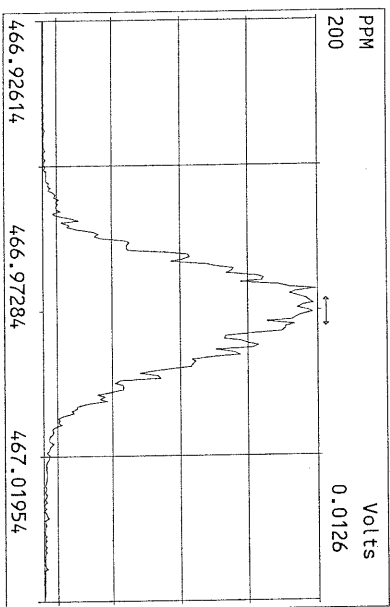
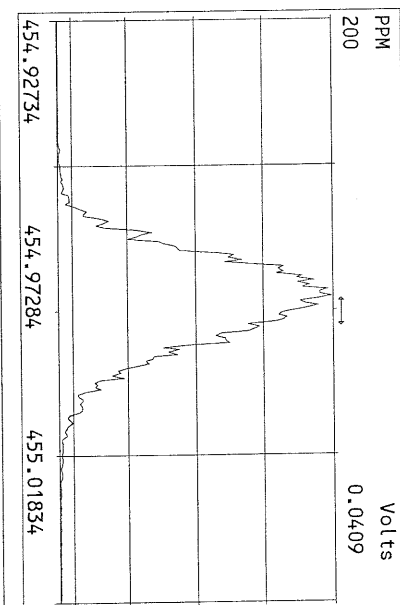
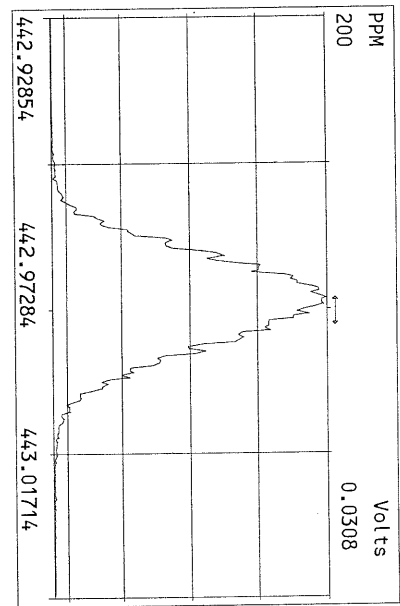
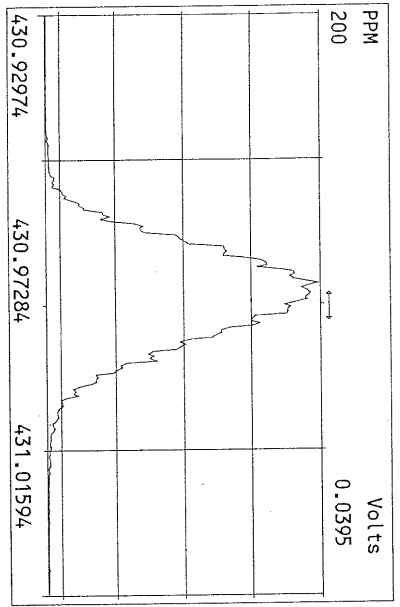
Peak Locate Examination:12-MAY-2011:07:58 File:11MAY11M_RES_CHECK
Experiment:OCD Function:1 Reference:PFK











USEPA - ITD

FORM 4B
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Frontier Analytical Laboratory

Episode No.:

Contract No.:

SAS No.:

Initial Calibration Date: 3/7/11

Instrument ID: FAL3

GC Column ID: DB5

VER Data Filename: 11MAY11M Sam:5

Analysis Date: 11-MAY-11 17:10:23

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	0.75	0.65-0.89	y	93.8	82.0 - 121 ✓
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.73	1.32-1.78	y	103	62.0 - 160 ✓
13C-1,2,3,4,7,8-HxCDD	M+2/M+4	1.27	1.05-1.43	y	94.9	85.0 - 117 ✓
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.27	1.05-1.43	y	100	85.0 - 118 ✓
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.04	0.88-1.20	y	106	72.0 - 138 ✓
13C-OCDD	M+2/M+4	0.99	0.76-1.02	y	178	96.0 - 415 ✓
13C-2,3,7,8-TCDF	M/M+2	0.88	0.65-0.89	y	98.6	71.0 - 140 ✓
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.69	1.32-1.78	y	111	76.0 - 130 ✓
13C-2,3,4,7,8-PeCDF	M+2/M+4	1.68	1.32-1.78	y	112	77.0 - 130 ✓
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.47	0.43-0.59	y	101	76.0 - 131 ✓
13C-1,2,3,6,7,8-HxCDF	M/M+2	0.47	0.43-0.59	y	97.7	70.0 - 143 ✓
13C-2,3,4,6,7,8-HxCDF	M/M+2	0.47	0.43-0.59	y	97.7	73.0 - 137 ✓
13C-1,2,3,7,8,9-HxCDF	M/M+2	0.48	0.43-0.59	y	95.4	74.0 - 135 ✓
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.46	0.37-0.51	y	105	78.0 - 129 ✓
13C-1,2,3,4,7,8,9-HpCDF	M/M+2	0.46	0.37-0.51	y	101	77.0 - 129 ✓
13C-OCDF	M+2/M+4	0.95	0.76-1.02	y	170	96.0 - 415 ✓
CLEANUP STANDARD (4)						
37Cl-2,3,7,8-TCDD					8.68	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: _____

5/12/11

Name	Resp	RA	RT	RRF	Conc	Qual	Fac Noise-1	Noise-2	DL	DL
2,3,7,8-TCDD	4.39e+06	0.78 y	27:13	1.13	10.1		2.50	-	-	*
1,2,3,7,8-PeCDD	2.12e+07	1.56 y	33:03	1.02	50.7		2.50	-	-	*
1,2,3,4,7,8-HxCDD	2.27e+07	1.29 y	38:27	1.45	48.8		2.50	-	-	*
1,2,3,6,7,8-HxCDD	1.80e+07	1.30 y	38:37	1.45	46.5		2.50	-	-	*
1,2,3,7,8,9-HxCDD	2.16e+07	1.31 y	39:03	1.47	49.9		2.50	-	-	*
1,2,3,4,6,7,8-HpCDD	1.57e+07	0.90 y	44:04	1.30	48.3		2.50	-	-	*
OCDD	2.23e+07	0.96 y	49:36	1.45	100		2.50	-	-	*
2,3,7,8-TCDF	7.86e+06	0.68 y	26:29	1.15	10.5		2.50	-	-	*
1,2,3,7,8-PeCDF	2.86e+07	1.59 y	31:19	0.89	52.2		2.50	-	-	*
2,3,4,7,8-PeCDF	2.72e+07	1.58 y	32:38	0.89	50.2		2.50	-	-	*
1,2,3,4,7,8-HxCDF	2.55e+07	1.22 y	37:03	1.01	48.0		2.50	-	-	*
1,2,3,6,7,8-HxCDF	2.73e+07	1.22 y	37:14	0.89	48.3		2.50	-	-	*
2,3,4,6,7,8-HxCDF	2.52e+07	1.21 y	38:11	1.02	48.0		2.50	-	-	*
1,2,3,7,8,9-HxCDF	2.87e+07	1.23 y	39:37	1.10	48.4		2.50	-	-	*
1,2,3,4,6,7,8-HpCDF	2.06e+07	1.05 y	42:09	1.48	47.4		2.50	-	-	*
1,2,3,4,7,8,9-HpCDF	1.50e+07	1.07 y	44:59	1.43	48.0		2.50	-	-	*
OCDF	2.31e+07	0.91 y	49:58	0.84	97.2		2.50	-	-	*
13C-2,3,7,8-TCDD	3.83e+07	0.75 y	27:13	1.03	93.8					Rec 93.8
13C-1,2,3,7,8-PeCDD	4.12e+07	1.73 y	33:02	1.01	103					103
13C-1,2,3,4,7,8-HxCDD	3.20e+07	1.27 y	38:26	1.19	94.9					94.9
13C-1,2,3,6,7,8-HxCDD	2.66e+07	1.27 y	38:35	0.94	100					100
13C-1,2,3,4,6,7,8-HpCDD	2.49e+07	1.04 y	44:03	0.83	106					106
13C-OCDD	3.07e+07	0.99 y	49:35	0.61	178					89.1
13C-2,3,7,8-TCDF	6.49e+07	0.88 y	26:28	0.98	98.6					98.6
13C-1,2,3,7,8-PeCDF	6.18e+07	1.69 y	31:18	0.83	111					111
13C-2,3,4,7,8-PeCDF	6.06e+07	1.68 y	32:37	0.80	112					112
13C-1,2,3,4,7,8-HxCDF	5.26e+07	0.47 y	37:01	1.84	101					101
13C-1,2,3,6,7,8-HxCDF	6.35e+07	0.47 y	37:13	2.29	97.7					97.7
13C-2,3,4,6,7,8-HxCDF	5.16e+07	0.47 y	38:09	1.86	97.7					97.7
13C-1,2,3,7,8,9-HxCDF	5.36e+07	0.48 y	39:36	1.98	95.4					95.4
13C-1,2,3,4,6,7,8-HpCDF	2.94e+07	0.46 y	42:07	0.99	105					105
13C-1,2,3,4,7,8,9-HpCDF	2.19e+07	0.46 y	44:57	0.77	101					101
13C-OCDF	5.63e+07	0.95 y	49:57	1.17	170					85.2
37Cl-2,3,7,8-TCDD	2.51e+06		27:14	0.73	8.68					86.8
13C-1,2,3,4-TCDD	3.97e+07	0.78 y	26:39	-	104					
13C-1,2,3,4-TCDF	6.73e+07	0.88 y	25:23	-	93.5					
13C-1,2,3,7,8,9-HxCDD	2.84e+07	1.26 y	39:02	-	114					
Total Tetra-Dioxins	2.36e+07		24:15	1.13	54.4		2.50	-	-	* 17
Total Penta-Dioxins	4.60e+07		30:05	1.02	110		2.50	-	-	* 3
Total Hexa-Dioxins	7.07e+07		35:58	1.46	165		2.50	-	-	* 8
Total Hepta-Dioxins	3.31e+07		42:41	1.30	102		2.50	-	-	* 10
Total Tetra-Furans	3.79e+07		22:54	1.15	50.9		2.50	-	-	* 13
1st Fn. Tot Penta-Furans	3.01e+07		28:15	0.89	55.3		2.50	-	-	* PeCDF 6
Total Penta-Furans	8.17e+07		29:60	0.89	150		2.50	-	-	* 205 16
Total Hexa-Furans	1.23e+08		35:05	1.00	223		2.50	-	-	* 12
Total Hepta-Furans	3.59e+07		42:09	1.46	96.1		2.50	-	-	* 6

Analyst: b

Date: 5/10/11

Frontier Analytical Laboratory - Acquisition Log

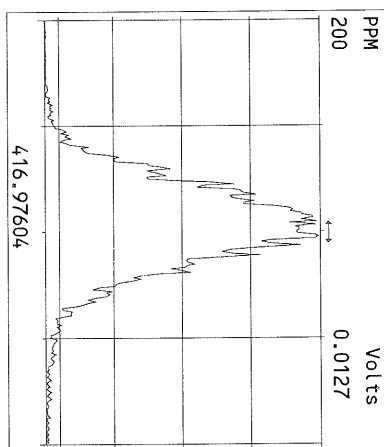
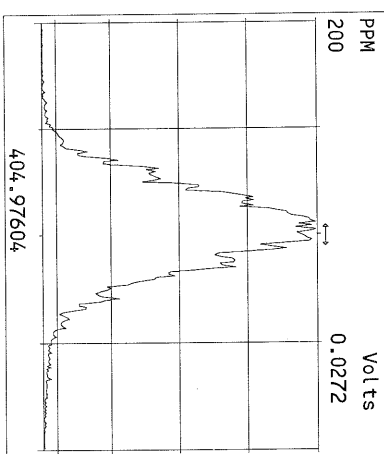
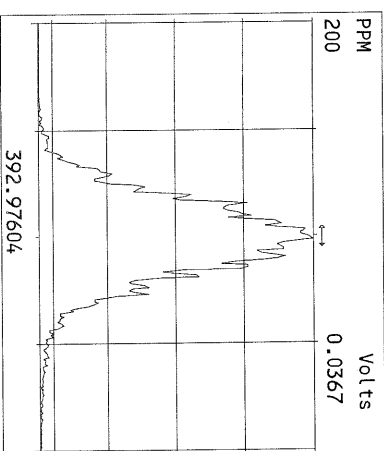
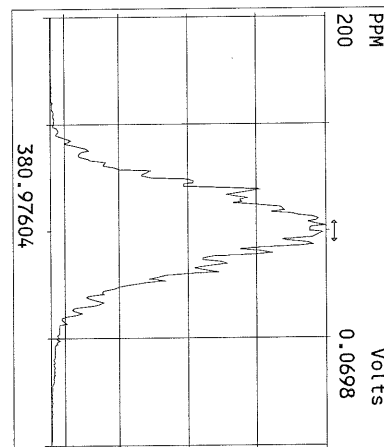
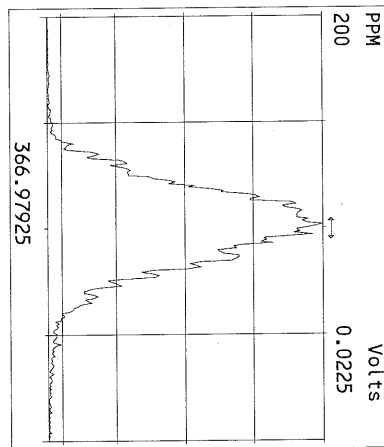
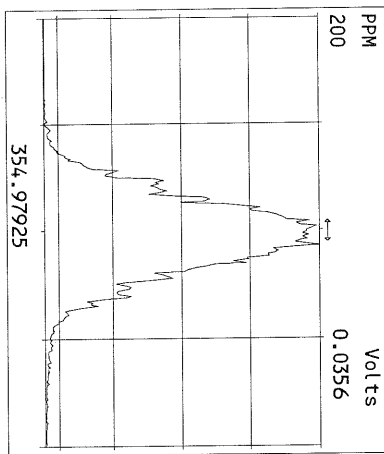
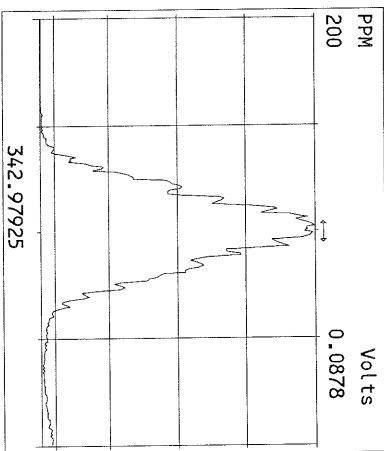
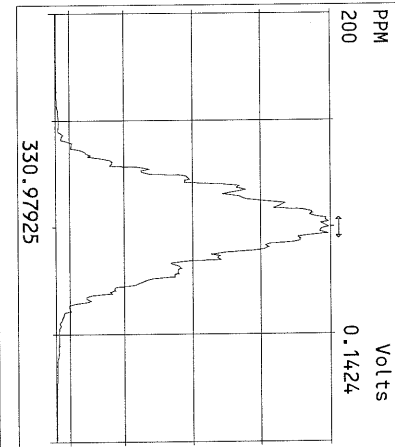
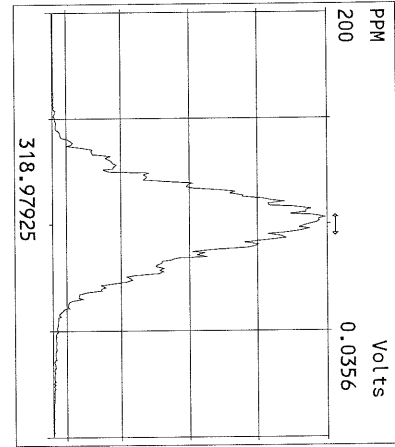
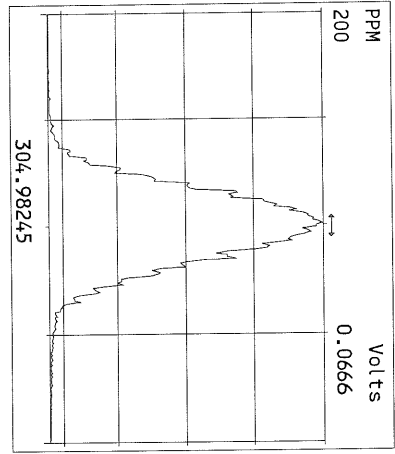
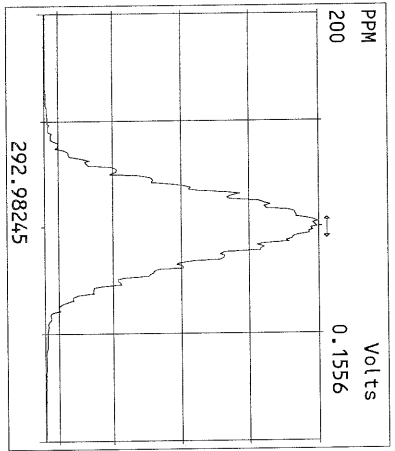
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Data File	S	FAL ID	Client ID	Acquired	ConCal	EndCal	Analyst
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11MAY11M	4	SB051111M1	Solvent Blank	11-MAY-11 16:15:00	ST051111M1	ST051111M2	TC
11MAY11M	5	ST051111M2	1613 CS3 100511J	11-MAY-11 17:10:23	ST051111M2	ST051111M3	TC
11MAY11M	6	2289-001-0001-OPR	OPR	11-MAY-11 18:05:42	ST051111M2	ST051111M3	TC
11MAY11M	7	2289-001-0001-MB	Method Blank	11-MAY-11 19:01:01	ST051111M2	ST051111M3	TC
11MAY11M	8	6647-005-0001-SA	B-121a30'	11-MAY-11 19:56:24	ST051111M2	ST051111M3	TC
11MAY11M	9	6647-004-0001-SA	B-121a20'	11-MAY-11 20:51:47	ST051111M2	ST051111M3	TC
11MAY11M	10	6645-006-0001-SA	B-110a3.75	11-MAY-11 21:47:07	ST051111M2	ST051111M3	TC
11MAY11M	11	6644-008-0001-SA	B-104a0.0	11-MAY-11 22:42:30	ST051111M2	ST051111M3	TC
11MAY11M	12	6644-010-0001-SA	B-105a0.0	11-MAY-11 23:37:53	ST051111M2	ST051111M3	TC
11MAY11M	13	6644-012-0001-SA	B-106a0.0	12-MAY-11 00:33:11	ST051111M2	ST051111M3	TC
11MAY11M	14	6645-001-0001-SA	B-108a0.0	12-MAY-11 01:28:30	ST051111M2	ST051111M3	TC
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11MAY11M	16	SB051111M2	Solvent Blank	12-MAY-11 03:19:18	ST051111M2	ST051111M3	TC
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11MAY11M	18	SB051111M4	Solvent Blank	12-MAY-11 05:09:56	ST051111M2	ST051111M3	TC
11MAY11M	19	SB051111M5	Solvent Blank	12-MAY-11 06:05:19	ST051111M2	ST051111M3	TC
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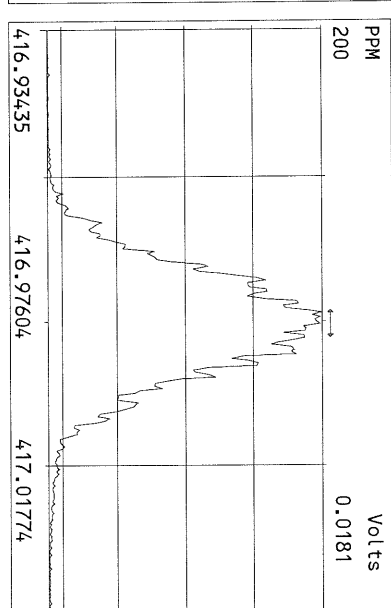
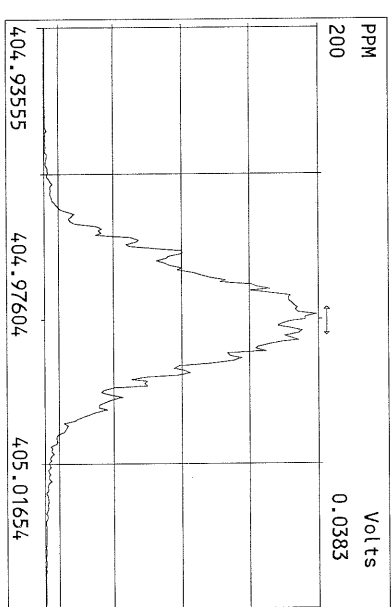
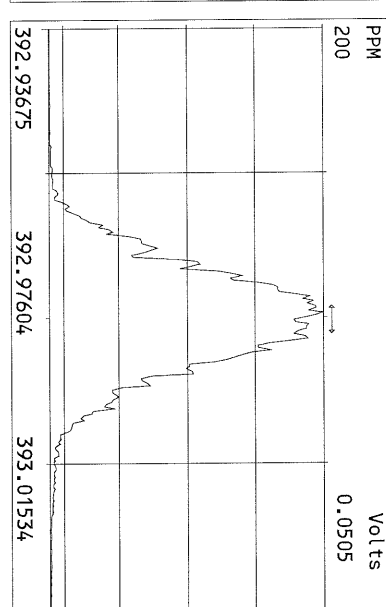
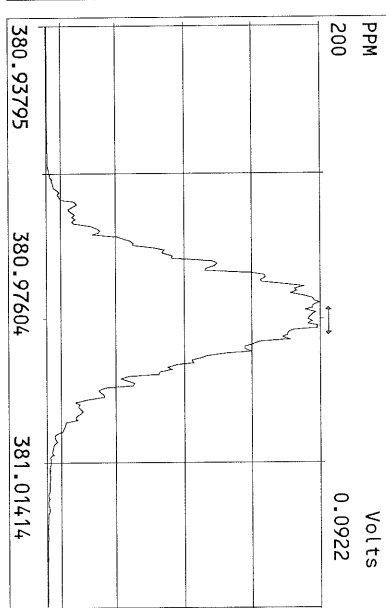
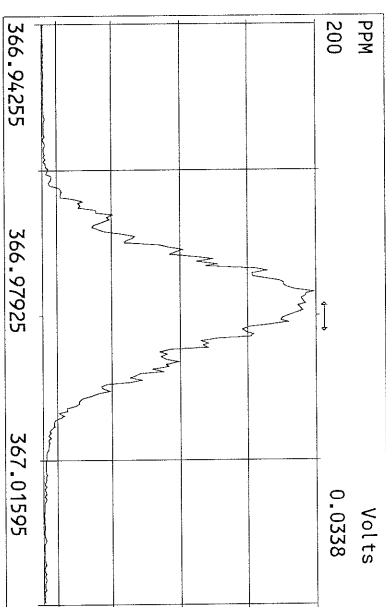
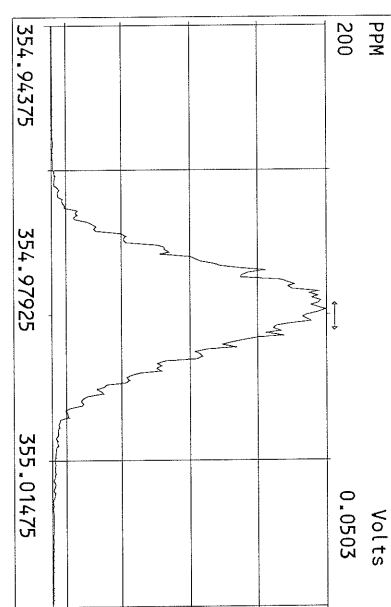
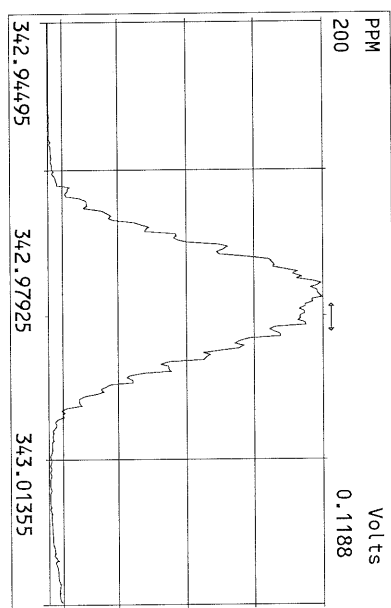
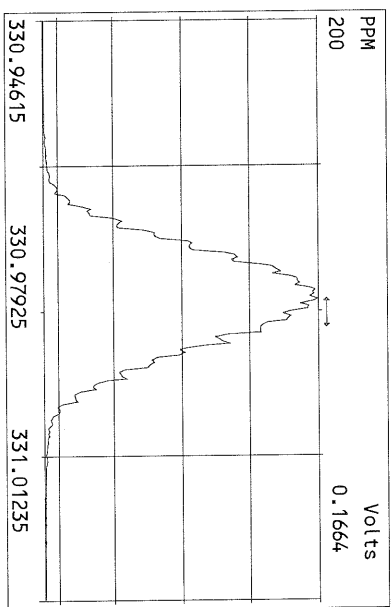
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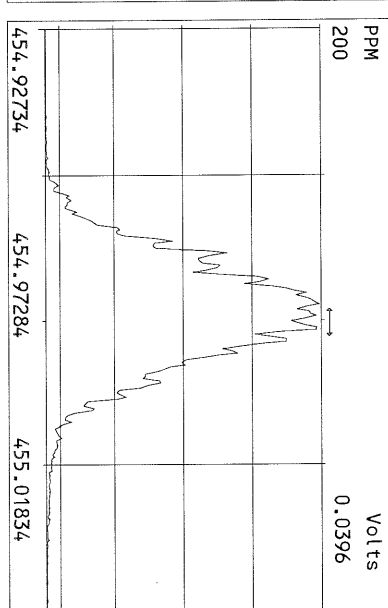
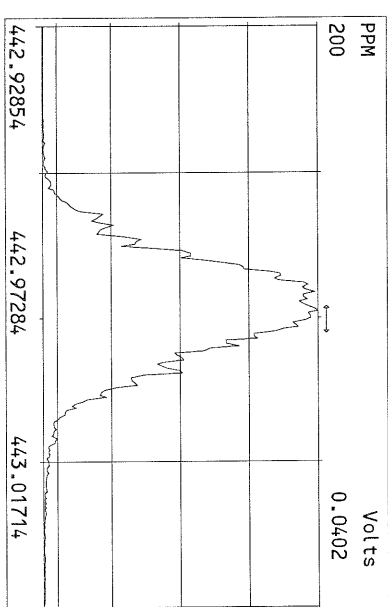
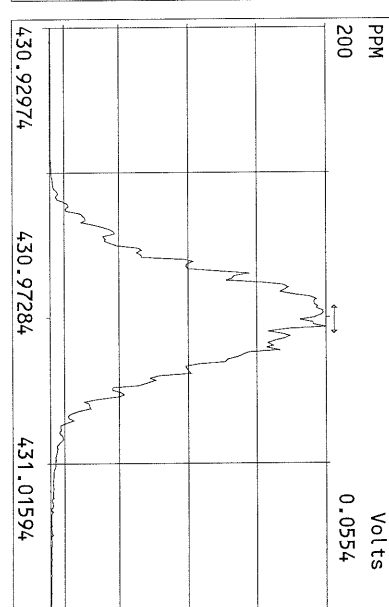
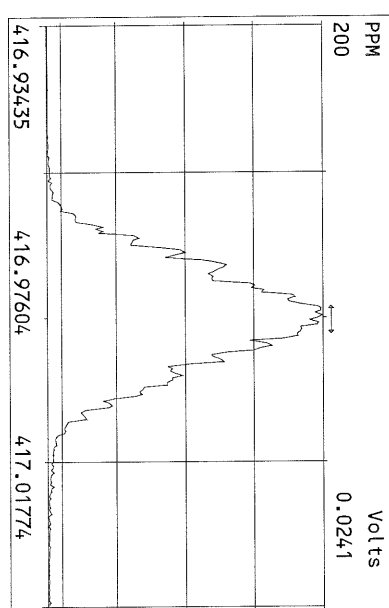
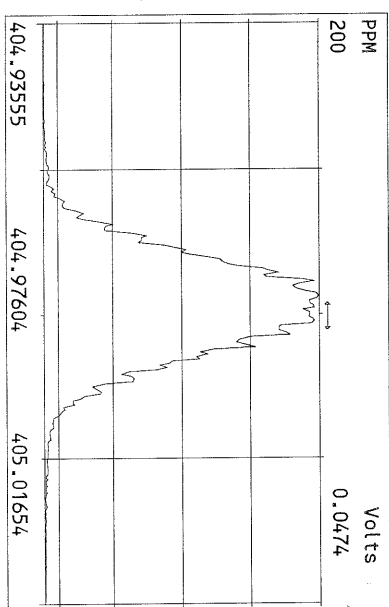
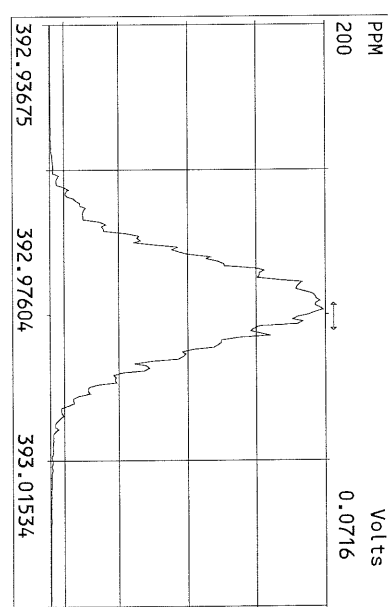
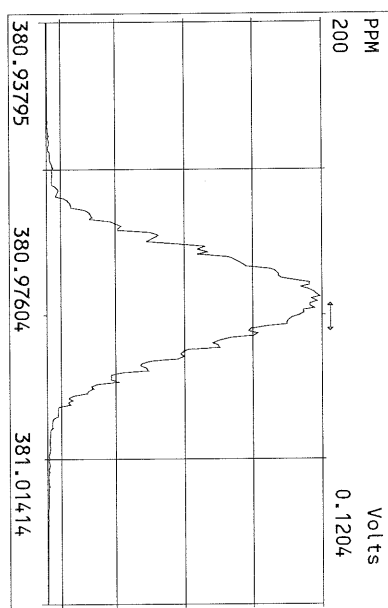
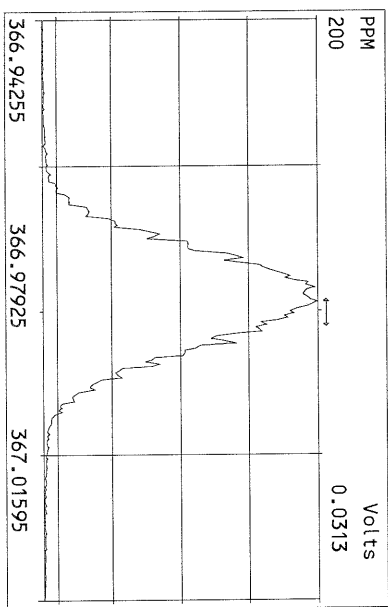
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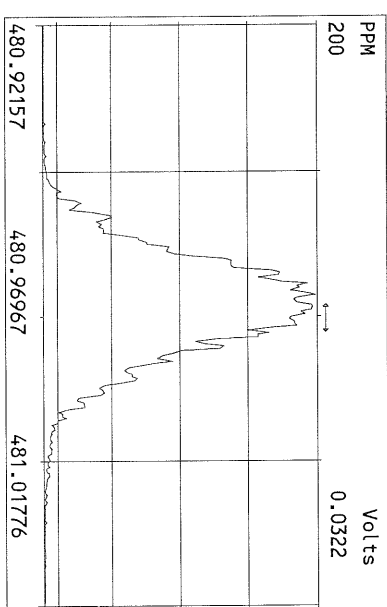
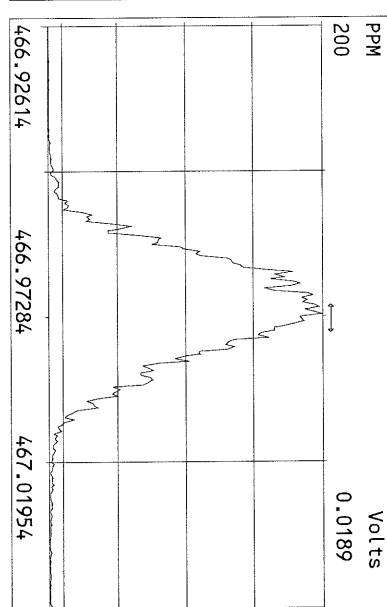
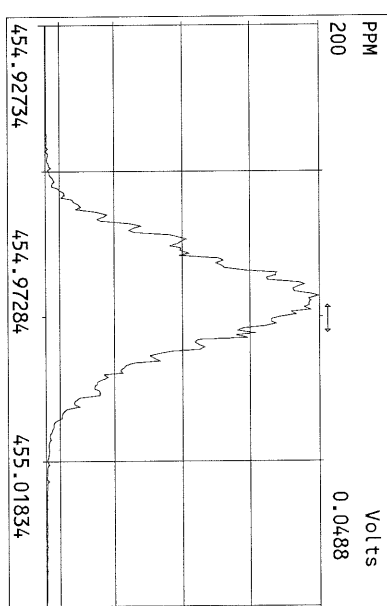
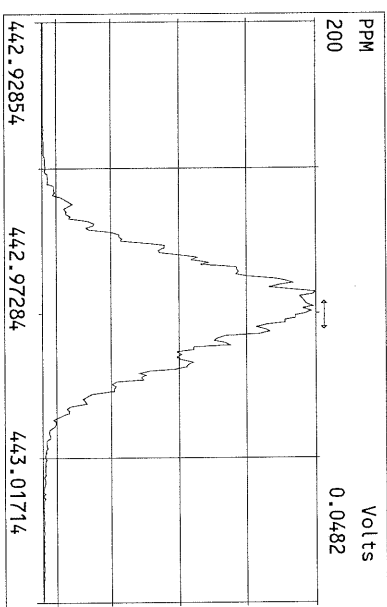
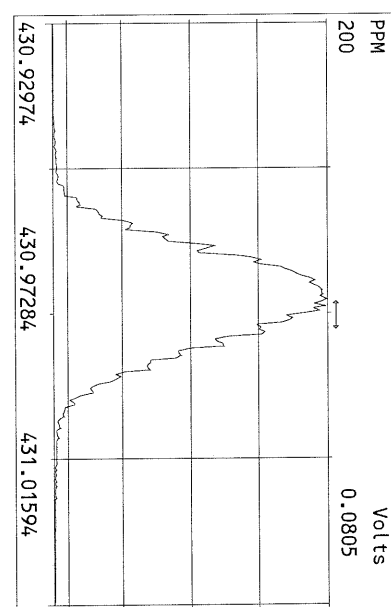
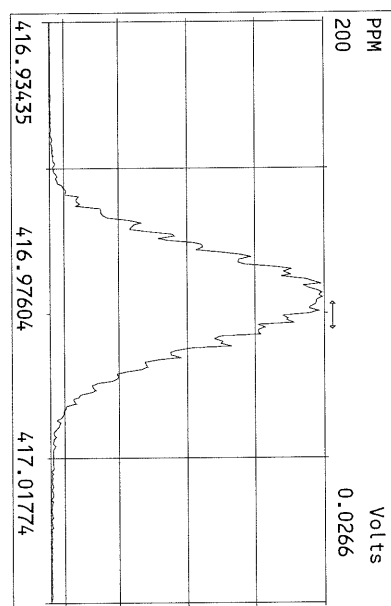
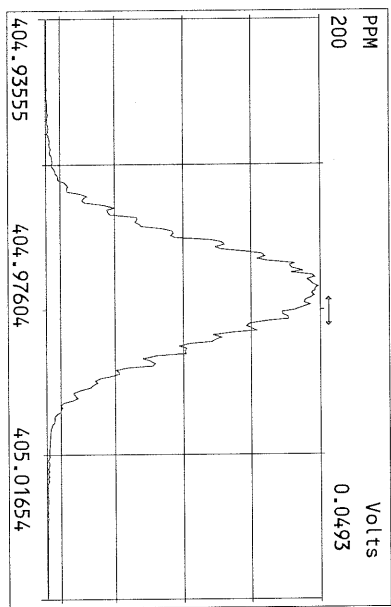
Peak Locate Examination:11-MAY-2011:13:27 File:11MAY11M
Experiment:OCDD Function:2 Reference:PKK

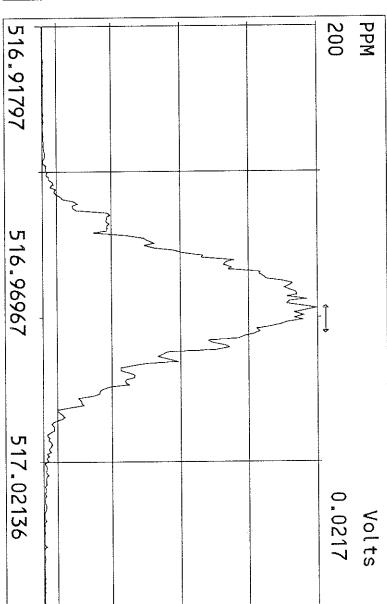
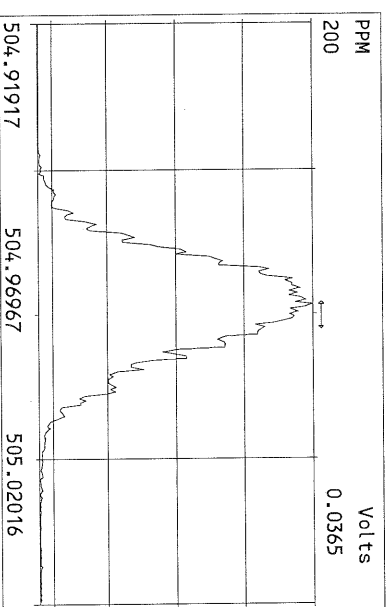
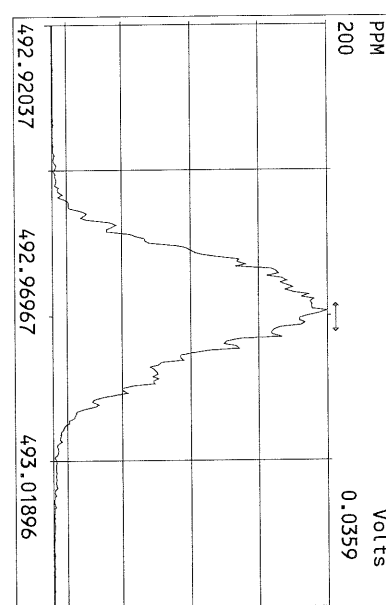
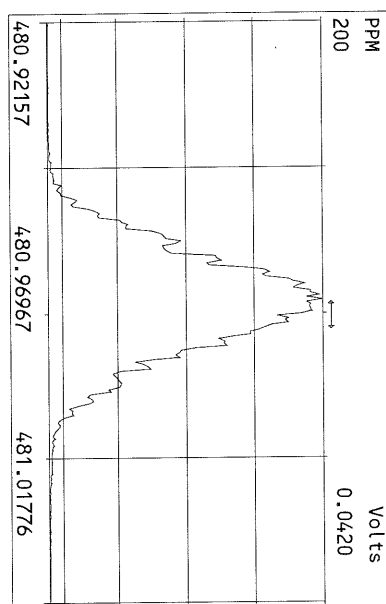
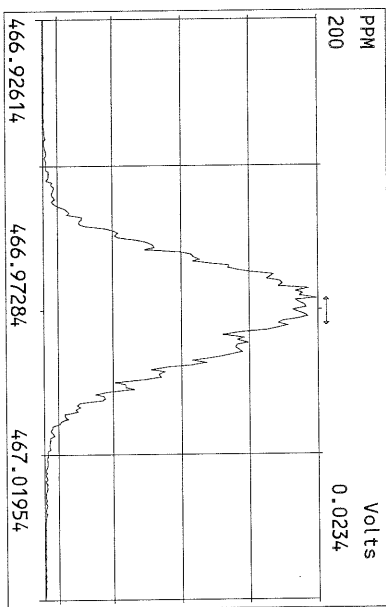
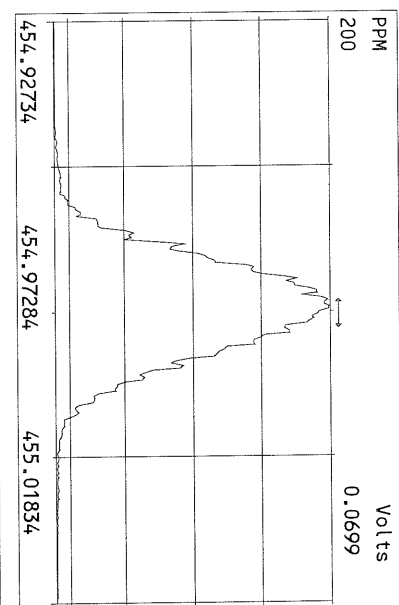
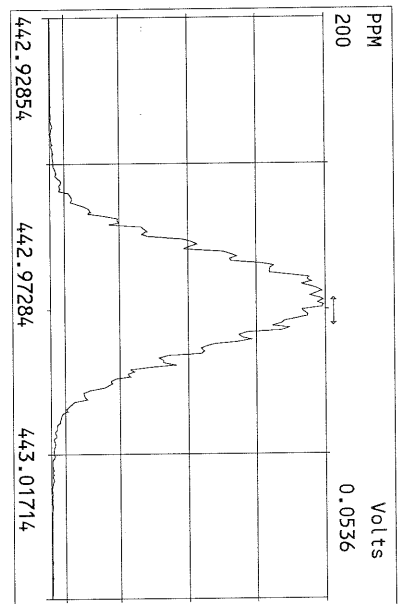
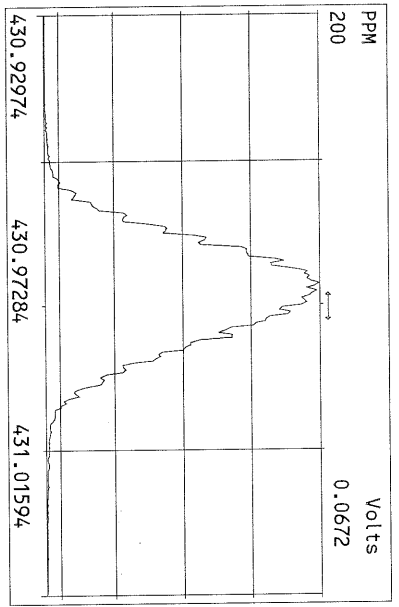


Peak Locate Examination:11-MAY-2011:13:27 File:11MAY11M
Experiment:OCDD Function:3 Reference:PKK

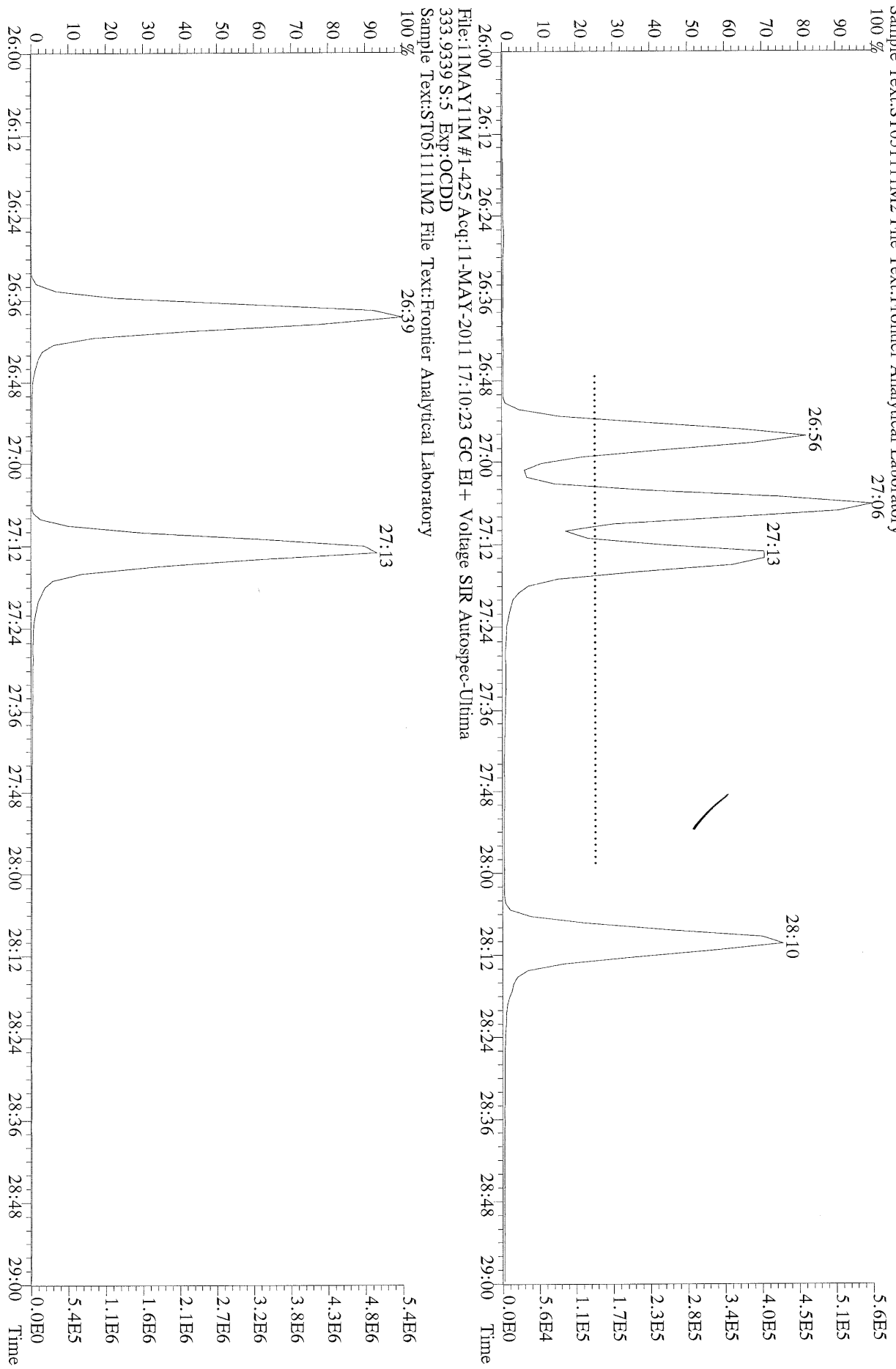


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Experiment:OCDD Function:4 Reference:PFK



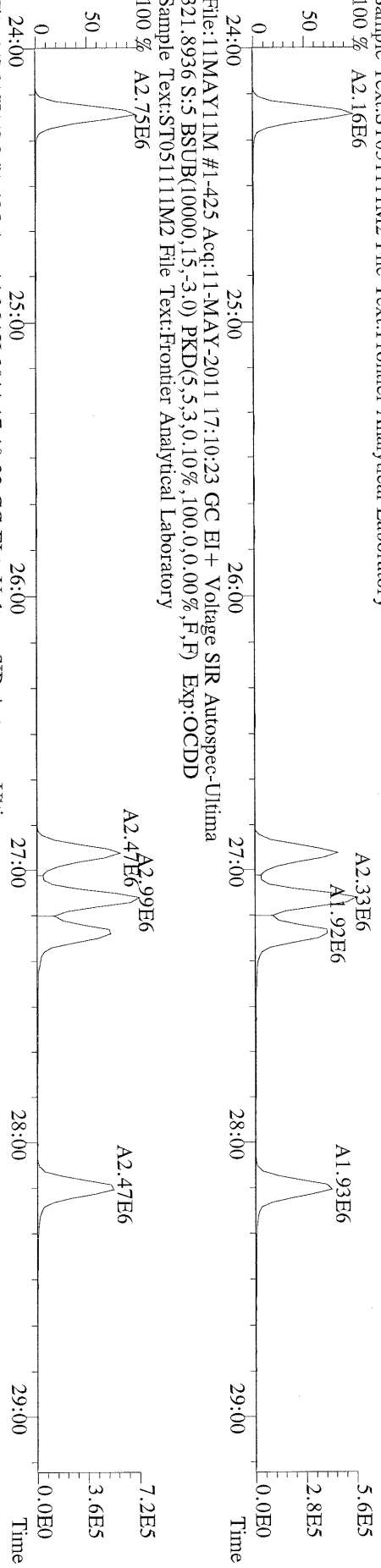


File:11MAYY11M #1-425 Acq:11-MAY-2011 17:10:23 GC EI+ Voltage SIR Autospec-Ultima
319.8965 S:5 Exp:OCDD
Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory

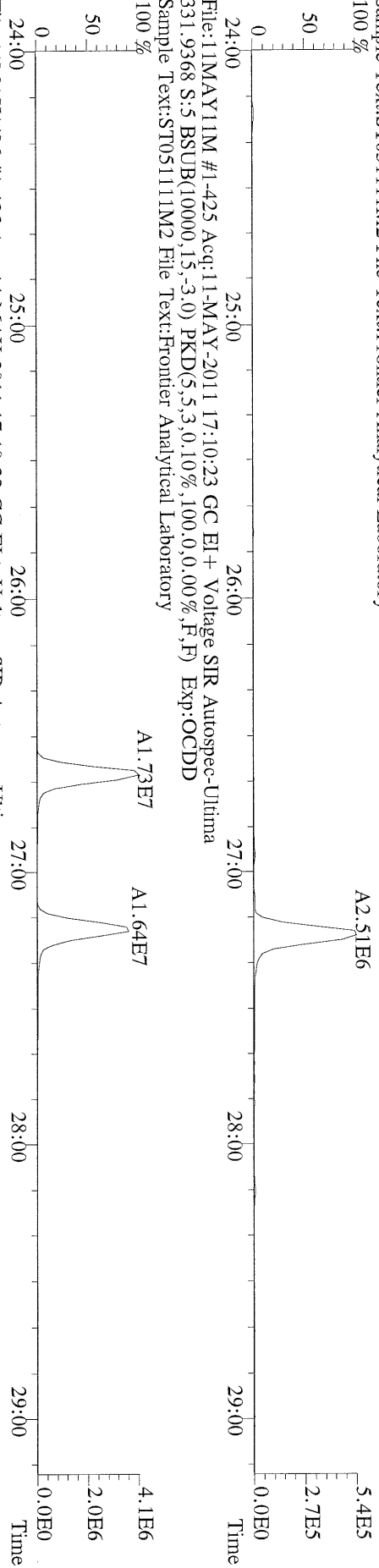


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333.9339 S:5 Exp:OCDD
Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory

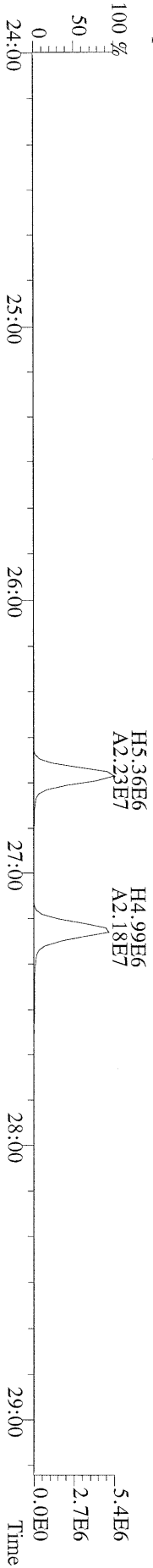
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319.8965 S:5 BSUB(10000,15,-3.0) PKD(5,5,3.0,10%,100.0,0.00%,F,F) Exp:OCDD
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100% A2.16E6



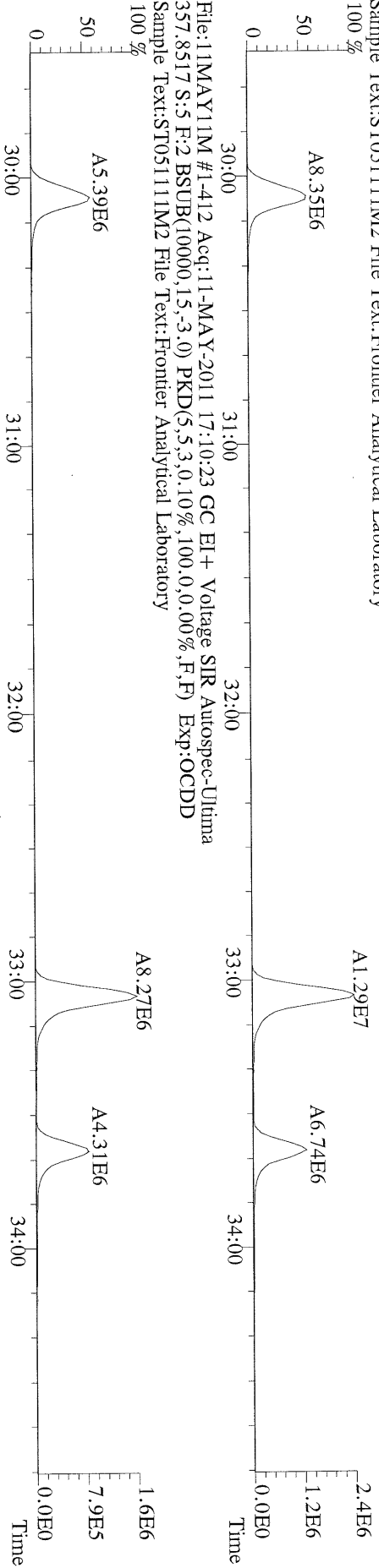
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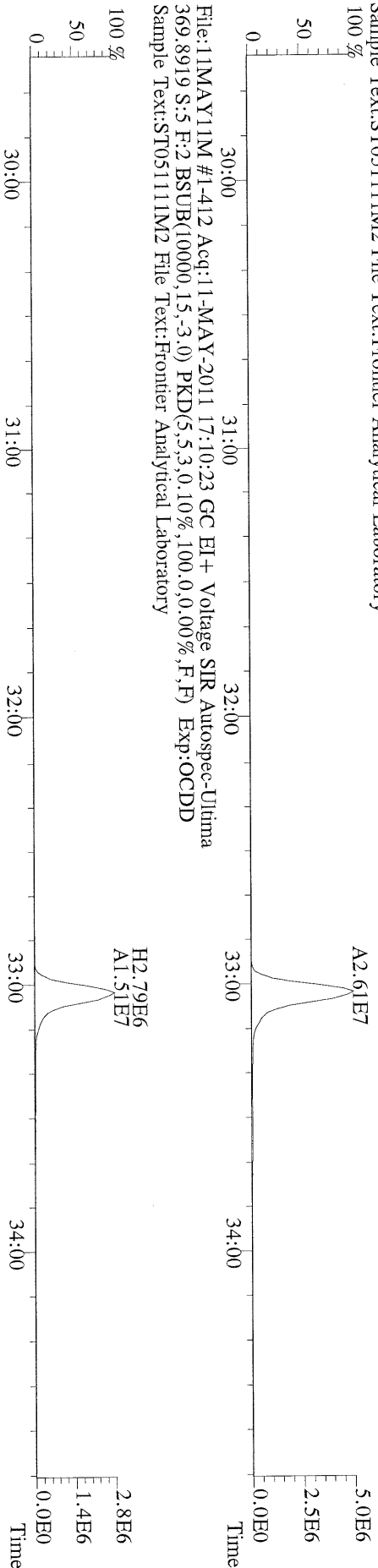
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Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory



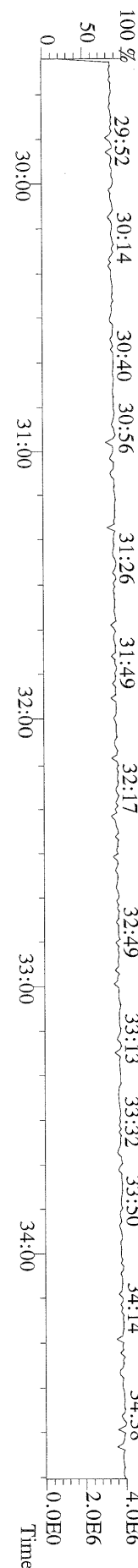
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100 %



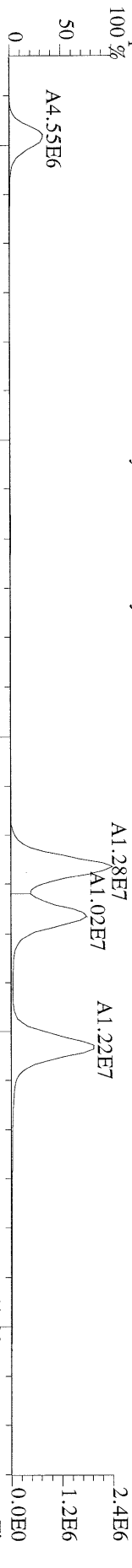
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Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory
100 %



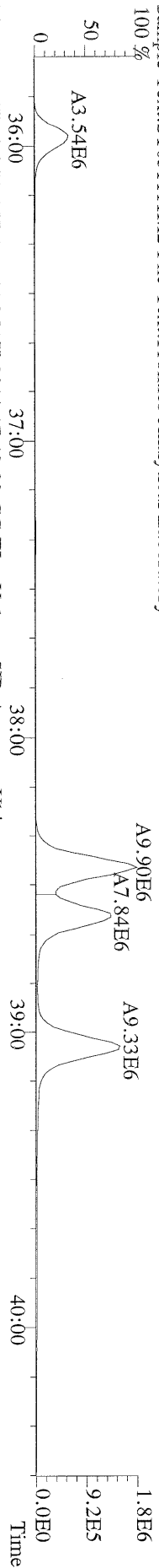
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366.9792 S:5 F:2 Exp:OCDD
Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory



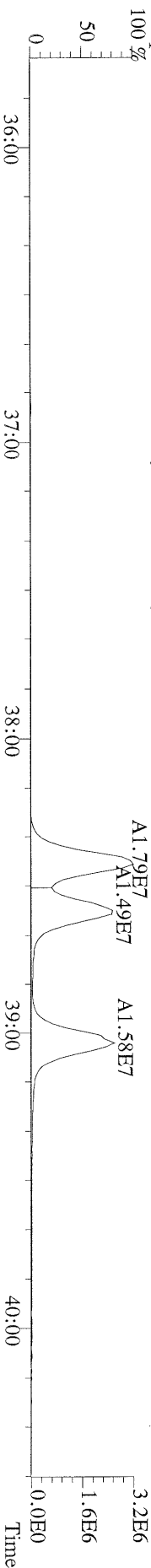
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 389.8156 S.5 F.3 BSUB(10000,15,-3.0) PKD(5.5,3,0.10%,100.0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory



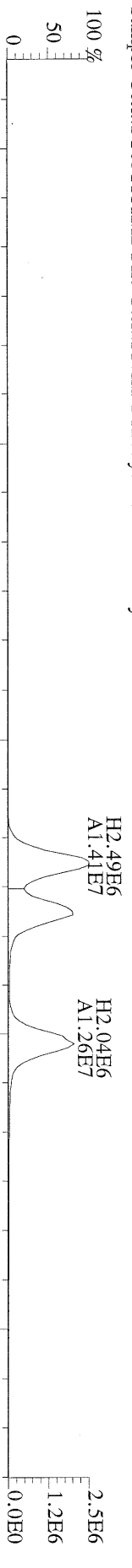
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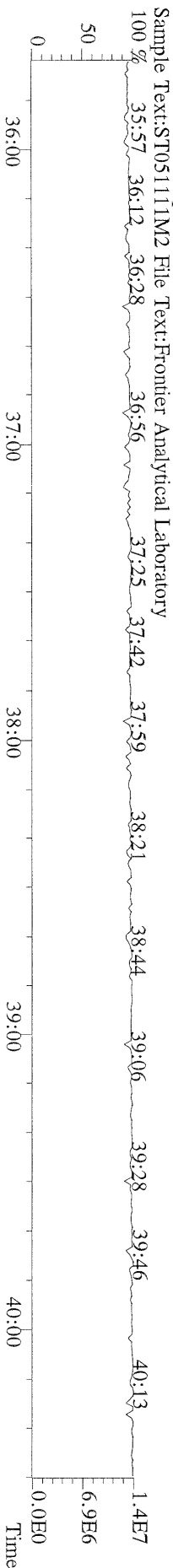
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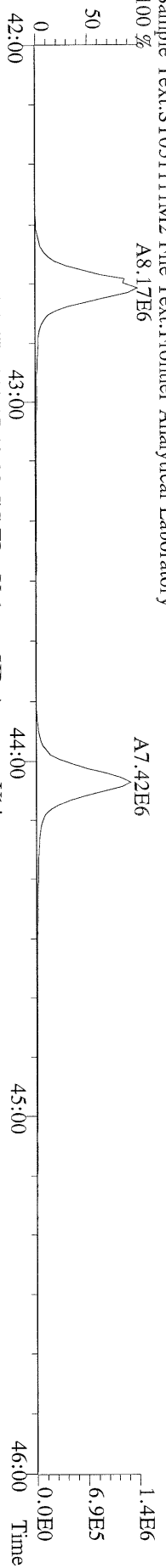
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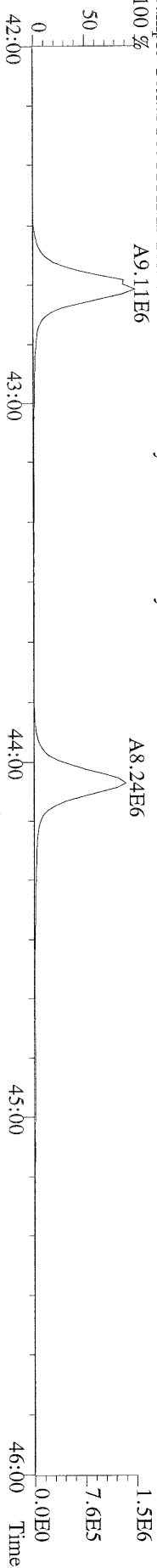
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 380.9760 S.5 F.3 Exp:OCDD
 Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory



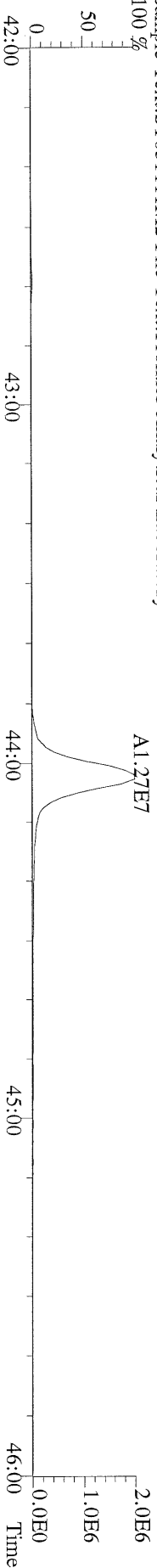
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423.7767 S:5 F:4 BSUB(10000,15,-3.0) PKD(5.5,3,0.10%,100,0.0,0.00%,F,F) Exp:OCDD
Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory
100 %
A8.17E6



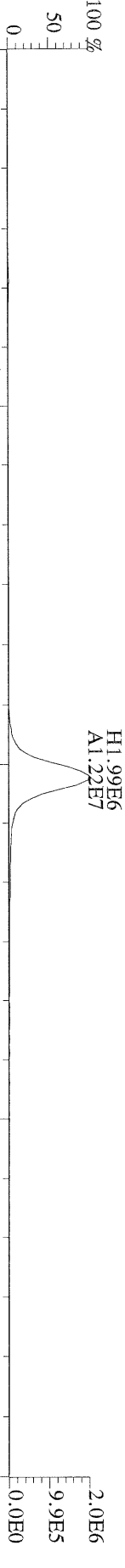
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425.7737 S:5 F:4 BSUB(10000,15,-3.0) PKD(5.5,3,0.10%,100,0.0,0.00%,F,F) Exp:OCDD
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100 %
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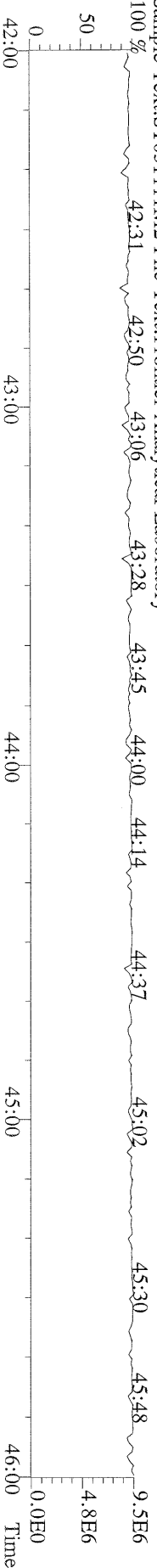
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100 %
A1.27E7



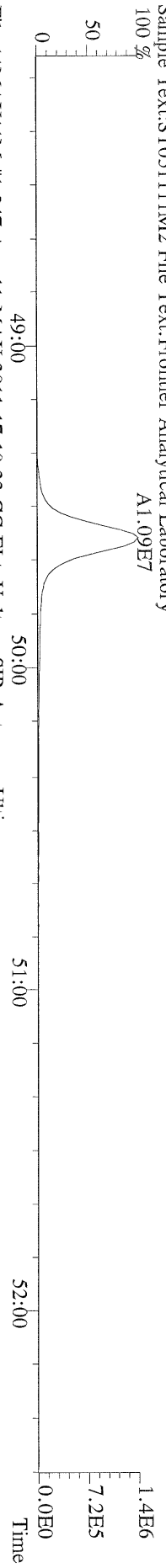
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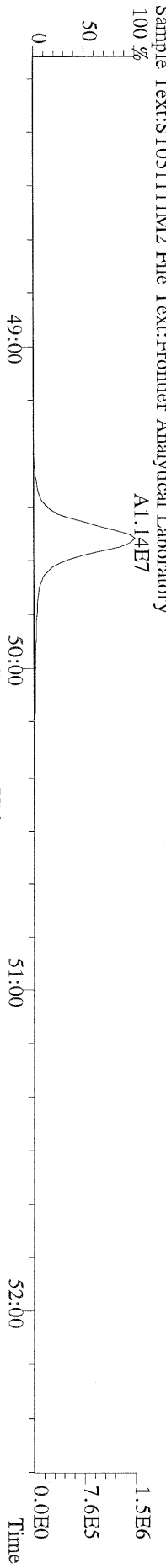
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430.9728 S:5 F:4 Exp:OCDD
Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory



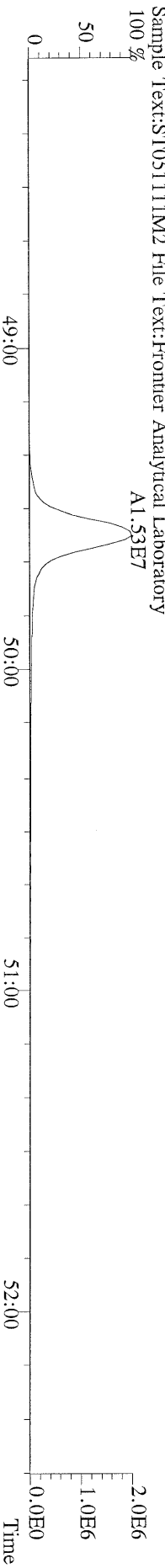
File:11MAY11M #1-347 Acq:11-MAY-2011 17:10:23 GC EI+ Voltage SIR Autospec-Ultima
457.7377 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory



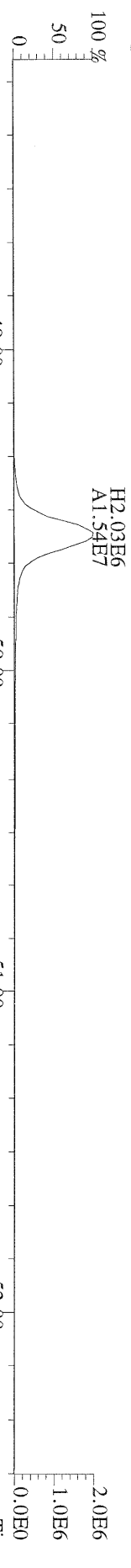
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459.7348 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory



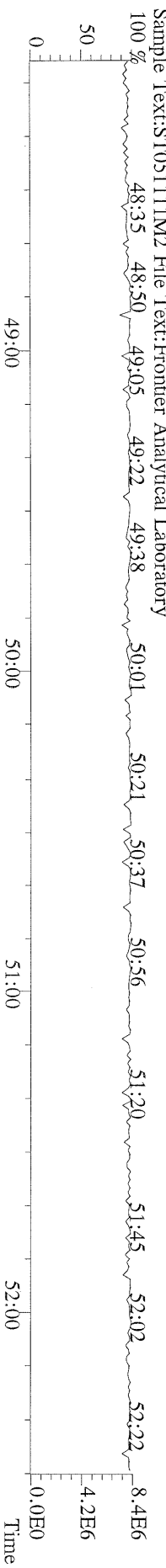
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469.7780 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
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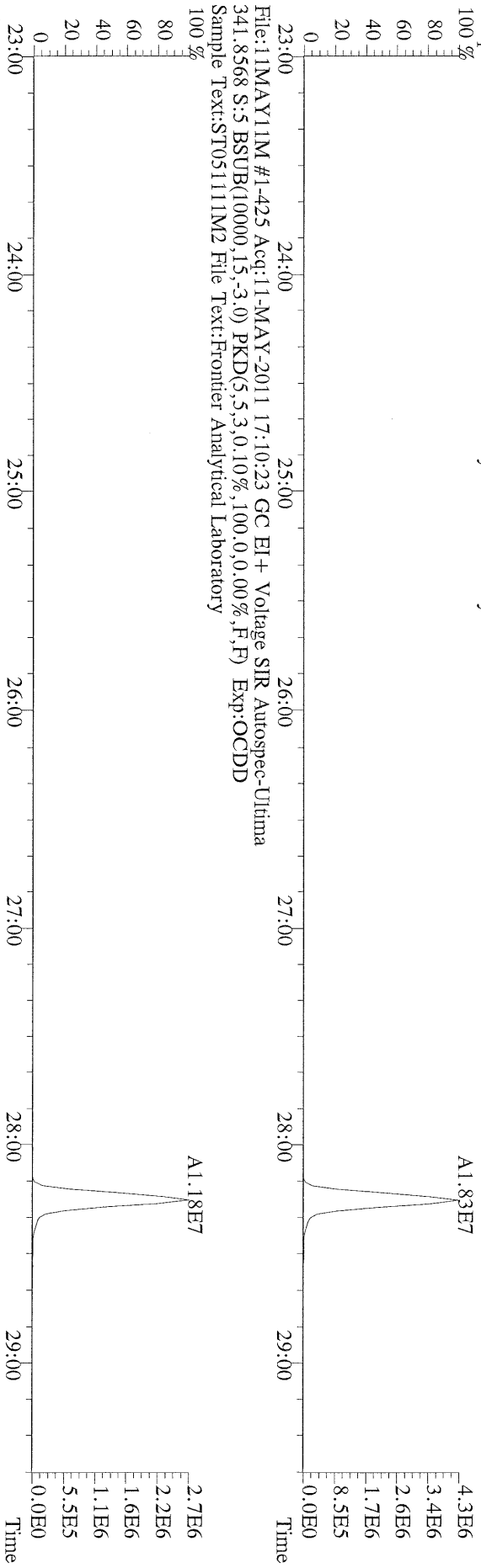
File:11MAY11M #1-347 Acq:11-MAY-2011 17:10:23 GC EI+ Voltage SIR Autospec-Ultima
471.7750 S:5 F:5 BSUB(10000,15,-3.0) PKD(5,5,3,0,10%,100,0,0,00%,F,F) Exp:OCDD
Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory



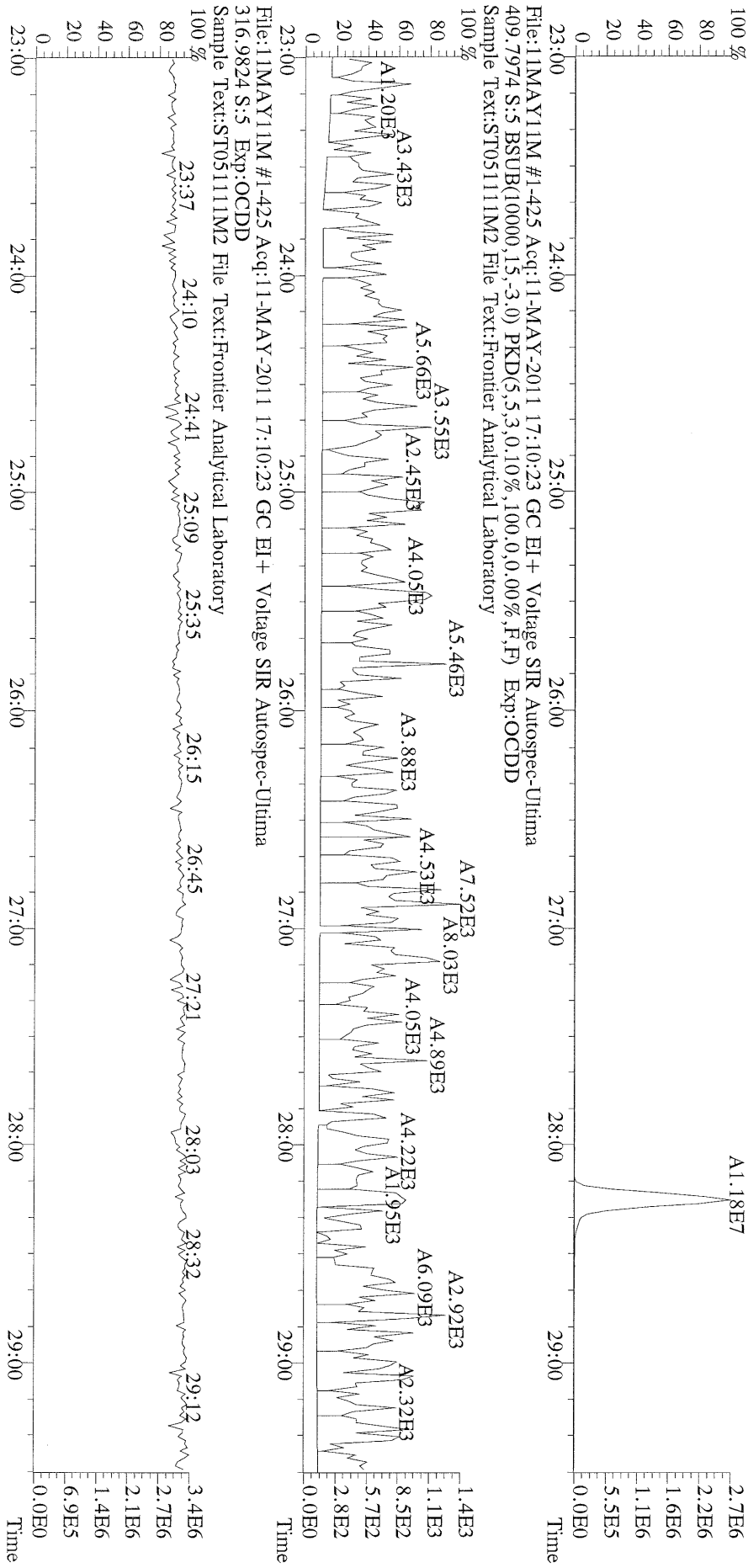
File:11MAY11M #1-347 Acq:11-MAY-2011 17:10:23 GC EI+ Voltage SIR Autospec-Ultima
454.9728 S:5 F:5 Exp:OCDD
Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory



File:11MAY11M2 #1-425 Acq:11-MAY-2011 17:10:23 GC EI+ Voltage SIR Autospec-Utima
 339.8597 S:5 BSUB(10000,15,-3.0) PKD(5,5,3.0,10%,100,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory



File:11MAY11M2 #1-425 Acq:11-MAY-2011 17:10:23 GC EI+ Voltage SIR Autospec-Utima
 341.8568 S:5 BSUB(10000,15,-3.0) PKD(5,5,3.0,10%,100,0,0.00%,F,F) Exp:OCDD
 Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory



File:11MAY11M2 #1-425 Acq:11-MAY-2011 17:10:23 GC EI+ Voltage SIR Autospec-Utima
 316.9824 S:5 Exp:OCDD
 Sample Text:ST051111M2 File Text:Frontier Analytical Laboratory

