Columbia Analytical Services inc.

A FULL SERVICE ENVIRONMENTAL LABORATORY

August 31, 2007

Mr. Jon Nickerson
Ecology and Environment
368 Pleasantview Drive
Lancaster, NY 14086

PROJECT:OLD TROY MUNICIPAL INCINERATOR SITE 002699.ID09.03
Submission #:R2738992

Dear Mr. Nickerson

Enclosed are the analytical results of the analyses requested. All data has been reviewed prior to report submission. Should you have any questions please contact me at (585) 288-5380.

Thank you for letting us provide this service.

Sincerely,

COLUMBIA ANALYTICAL SERVICES

Carlton Beechler
Project Chemist

Enc.

Columbia Analytical Services, inc.

1 Mustard ST.
Suite 250
Rochester, NY 14609
(585) 288-5380

THIS IS AN ANALYTICAL TEST REPORT FOR:

Client : Ecology and Environment
Project Reference: OLD TROY MUNICIPAL INCINERATOR SITE 002699.ID09.03
Lab Submission # : R2738992
Project Manager : Carlton Beechler
Reported : 08/31/07

Samples Subcontracted to:

Columbia Analytical Services
10655 Richmond Ave.
Suite 150
Houston, TX 77042
Lab ID:
Phone #: (713) 266-1599
Fax #: (713) 266-0130
Contact:

Report Contains a total of _____ pages

This package has been reviewed by Columbia Analytical Services' QA Department/Laboratory Director to comply with NELAC standards prior to report submittal. _____

10655 Richmond Avenue Suite 130 A Houston, TX 77042 (713) 266-1599 (713) 266-0130 fax

Columbia Analytical Services, INC.
An Employee - Owned Company

August 29, 2007 Service Request No: E0700759

Carlton Beechler
Columbia Analytical Services, Inc.
1 Mustard Street
Rochester, NY 14609

RE: Ecology & Environment/R2738992

Dear Carlton:

Enclosed are the results of the sample(s) submitted to our laboratory on August 7, 2007. For your reference, these analyses have been assigned our service request number **E0700759**.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and Columbia Analytical Services, Inc. (CAS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. In accordance to the NELAC 2003 Standard, a statement on the estimated uncertainty of measurement of any quantitative analysis will be supplied upon request.

Please call if you have any questions. My extension is 23. You may also contact me via email at JFreemyer@houston.caslab.com.

Respectfully submitted,

Columbia Analytical Services, Inc.

Jane Freemyer

Jane Freemyer
Project Chemist

Page 1 of _____

Columbia Analytical Services INC.

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Certificate of Analysis

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COLUMBIA ANALYTICAL SERVICES, INC

Client:	Columbia Analytical Services	**Service Request No.:**	E0700759
Project:	Ecology & Environment/R2738992	**Date Received:**	08/07/07
Sample Matrix:	Solid		

CASE NARRATIVE

All analyses were performed in adherence to the quality assurance program of Columbia Analytical Services, Inc. (CAS). This report contains analytical results for samples designated for Tier IV. When appropriate to the method, method blank results have been reported with each analytical test.

Sample Receipt

Two solid samples were received for analysis at Columbia Analytical Services on 08/07/07.

The following discrepancies were noted upon initial sample inspection: no custody seals on cooler(s). The exceptions are also noted on the cooler receipt and preservation form included in this data package.

The samples were received at 4°C in good condition and are consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4°C upon receipt at the laboratory.

Data Validation Notes and Discussion

MS/MSD

EQ700252: Laboratory Control Spike/Laboratory Control Spike Duplicate (LCS/LCSD) samples were analyzed and reported in lieu of an MS/MSD for this extraction batch.

Detection Limits

Detection limits are calculated for each congener in each sample by measuring the height of the noise level for each quantitation ion for the associated labeled standard. The concentration equivalent to 2.5 times the height of the noise is then calculated using the appropriate response factor and the weight of the sample. The calculated concentration equals the detection limit.

Approved by Xiangqiu Liang Date 8/30/07

Xiangqiu Liang, Laboratory Director

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
E0700759-001	OTMi-SB02	08/01/07	14:15
E0700759-002	OTMi-SB201	08/01/07	14:20

Data Qualifier Flags

- B — Used when an associated analyte is found in the method blank, as well as in the sample
- C — Confirmation of the TCDF compound: When 2378-TCDF is detected on the DB-5 column, confirmation analyses are performed on a second column (DB-225.) The results from both the DB-5 column and the DB-225 column are included in this data package. The results from the DB-225 analyses should be used to evaluate the 2378-TCDF in the samples. The confirmed result should be used in determining the TEQ value for TCDF. The samples requiring confirmation are indicated in the table above.
- E — Indicates an estimated value – used when the analyte concentration exceeds the upper end of the linear calibration range
- J — Indicates an estimated value – used when the analyte concentration is below the method reporting limit (MRL) and above the detection limit (DL)
- K — EMPC - When the ion abundance ratios associated with a particular compound are outside the QC limits, samples are flagged with a 'K' flag. A 'K' flag indicates an estimated maximum possible concentration for the associated compound.
- U — Indicates the compound was analyzed and not detected.
- X — User defined; see case narrative for detailed explanation
- Y — Samples that had recoveries of labeled standards outside the acceptance limits are flagged with 'Y' flags on the Form 2s. In all cases, the signal-to-noise ratios are greater than 10:1, making these data acceptable.
- * — Indicates concentration is reported as 'Not Detected'
- S — Peak is saturated; data not reportable
- Q — Lock-mass interference by ether compounds

CAS/HOU - Form Production, Peer Review & Project Review Signatures

SR# Unique ID: EU200754

First Level - Data Processing - to be filled by person generating the forms

Date	08/27/07	Person 1	
Date		Person 2	

Second Level - Data Review – to be filled by person doing peer review

Date	8/29/07	Primary Data Reviewer	
Date		Secondary Data Reviewer	

Project Level - Review – to be filled by person doing project compliance review

Date	8/30/7	Reviewer	

Analytical Results

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COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report
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Client:	Columbia Analytical Services, Inc.	**Service Request:**	E0700759
Project:	Ecology & Environment/R2738992	**Date Collected:**	
Sample Matrix:	Soil	**Date Received:**	
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ0700252-01	**Basis:**	Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method:	8290	**Date Analyzed:**	8/20/07 2001
Prep Method:	Method	**Date Extracted:**	8/14/07
Sample Amount:	10.0g	**Instrument Name:**	E-HRMS-01
Percent Solids:		**GC Column:**	DB-5
Data File Name:	U122454	**Blank File Name:**	U122454
ICAL Name:	U704028290I	**Cal Ver. File Name:**	U122452

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.0423	1.00			1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
C13-2,3,7,8-TCDD	1000	740.910	74		40-135	0.79	1.007
CL37-2,3,7,8-TCDD	800	659.059	82		40-135	NA	1.007

Comments: 8/30/07 qc

Client:	Columbia Analytical Services, Inc.	**Service Request:**	E0700759
Project:	Ecology & Environment/R2738992	**Date Collected:**	
Sample Matrix:	Soil	**Date Received:**	
Sample Name:	Method Blank	**Units:**	ng/Kg
Lab Code:	EQ0700252-01.R01	**Basis:**	Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method:	8290	**Date Analyzed:**	8/21/07 0839
Prep Method:	Method	**Date Extracted:**	8/14/07
Sample Amount:	10.0g	**Instrument Name:**	E-HRMS-01
Percent Solids:		**GC Column:**	db5
Data File Name:	U122468	**Blank File Name:**	U122468
ICAL Name:	U7040282901	**Cal Ver. File Name:**	U122466

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.0199	1.00			1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
C13-2,3,7,8-TCDD	1000	680.491	68		40-135	0.78	1.007
CL37-2,3,7,8-TCDD	800	575.820	72		40-135	NA	1.008

Comments: 8/30/07 QC

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report
10

Client:	Columbia Analytical Services,Inc.	**Service Request:**	E0700759
Project:	Ecology & Environment/R2738992	**Date Collected:**	08/01/2007
Sample Matrix:	Soil	**Date Received:**	08/07/2007
Sample Name:	OTMi-SB02	**Units:**	ng/Kg
Lab Code:	E0700759-001	**Basis:**	Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method:	8290	**Date Analyzed:**	8/20/07 2136
Prep Method:	Method	**Date Extracted:**	8/14/07
Sample Amount:	9.947g	**Instrument Name:**	E-HRMS-01
Percent Solids:	61.6	**GC Column:**	DB-5
Data File Name:	U122456	**Blank File Name:**	U122454
ICAL Name:	U704028290I	**Cal Ver. File Name:**	U122452

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	ND	U	0.0380	1.63			1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
C13-2,3,7,8-TCDD	1000	804.590	80		40-135	0.78	1.007
CL37-2,3,7,8-TCDD	800	783.390	98		40-135	NA	1.008

Comments: 8/30/07 gc

Client:	Columbia Analytical Services,Inc.	**Service Request:**	E0700759
Project:	Ecology & Environment/R2738992	**Date Collected:**	08/01/2007
Sample Matrix:	Soil	**Date Received:**	08/07/2007
Sample Name:	OTMi-SB201	**Units:**	ng/Kg
Lab Code:	E0700759-002	**Basis:**	Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method:	8290	**Date Analyzed:**	8/20/07 2224
Prep Method:	Method	**Date Extracted:**	8/14/07
Sample Amount:	10.115g	**Instrument Name:**	E-HRMS-01
Percent Solids:	74.9	**GC Column:**	DB-5
Data File Name:	U122457	**Blank File Name:**	U122454
ICAL Name:	U704028290I	**Cal Ver. File Name:**	U122452

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	**0.303**	JK	0.0359	1.32	0.60	1.001	1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
C13-2,3,7,8-TCDD	1000	897.837	90		40-135	0.79	1.007
CL37-2,3,7,8-TCDD	800	791.361	99		40-135	NA	1.007

Comments: 8/30/07 GC

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Accuracy & Precision Data

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COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Columbia Analytical Services, Inc.
Project: Ecology & Environment/R2738992
Sample Matrix: Soil

Service Request: E0700759

Sample Name: Lab Control Sample
Lab Code: EQ0700252-02

Units: ng/Kg
Basis: Dry

Analytical Method: 8290
Prep Method: Method

Analyte Name	Lab Control Sample Result	Expected	% Rec	Duplicate Lab Control Sample Result	Expected	% Rec	% Rec Limits	RPD	RPD Limit
2,3,7,8-TCDD	20.5	20.0	103	20.7	20.0	104	70 - 130	1	50

Comments: 8/30/07 GC

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report
14

Client:	Columbia Analytical Services, Inc.	**Service Request:**	E0700759
Project:	Ecology & Environment/R2738992	**Date Collected:**	
Sample Matrix:	Soil	**Date Received:**	
Sample Name:	Lab Control Sample	**Units:**	ng/Kg
Lab Code:	EQ0700252-02	**Basis:**	Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method:	8290	**Date Analyzed:**	8/21/07 1539
Prep Method:	Method	**Date Extracted:**	8/14/07
Sample Amount:	10.0g	**Instrument Name:**	E-HRMS-01
Percent Solids:		**GC Column:**	db5
Data File Name:	U122476	**Blank File Name:**	U122468
ICAL Name:	U704028290I	**Cal Ver. File Name:**	U122466

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	**20.5**		0.0426	1.00	0.76	1.001	1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
C13-2,3,7,8-TCDD	1000	627.202	63		40-135	0.77	1.007
CL37-2,3,7,8-TCDD	800	527.627	66		40-135	NA	1.007

Comments: 8/30/07 GC

Client:	Columbia Analytical Services, Inc.	**Service Request:**	E0700759
Project:	Ecology & Environment/R2738992	**Date Collected:**	
Sample Matrix:	Soil	**Date Received:**	
Sample Name:	Lab Control Sample Dup	**Units:**	ng/Kg
Lab Code:	EQ0700252-03	**Basis:**	Dry

Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans by HRGC/HRMS

Analytical Method:	8290	**Date Analyzed:**	8/21/07 1443
Prep Method:	Method	**Date Extracted:**	8/14/07
Sample Amount:	10.0g	**Instrument Name:**	E-HRMS-01
Percent Solids:		**GC Column:**	db5
Data File Name:	U122475	**Blank File Name:**	U122468
ICAL Name:	U704028290I	**Cal Ver. File Name:**	U122466

Analyte Name	Result	Q	EDL	MRL	Ion Ratio	RRT	Dilution Factor
2,3,7,8-TCDD	**20.7**		0.0342	1.00	0.76	1.001	1

Labeled Compounds	Spike Conc.(pg)	Conc. Found (pg)	%Rec	Q	Control Limits	Ion Ratio	RRT
C13-2,3,7,8-TCDD	1000	734.957	73		40-135	0.78	1.007
CL37-2,3,7,8-TCDD	800	609.241	76		40-135	NA	1.007

Comments: 8/30/07 GC

Columbia Analytical Services INC.

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Chain-of-custody

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CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

One Mustard St., Suite 250 • Rochester, NY 14609-0859 • (585) 288-5380 • 800-695-7222 x11 • FAX (585) 288-8475 PAGE 1 OF 1

SR #

CAS Contact

Project Name: Ecology & Env.	Project Number: R2738992
Project Manager: Carlton Beechler	Report CC:
Company Address: CAS 1 Mustard St. Suite 250 Rochester, NY 14609	
Phone #: (585) 288-5390	FAX #: (585) 288-8475
Sampler's Signature:	Sampler's Printed Name:

ANALYSIS REQUESTED *(Include Method Number and Container Preservative)*

PRESERVATIVE

NUMBER OF CONTAINERS

GC/MS VOA's ☐ 8260 ☐ 624 ☐ CLP
GC/MS SVOA's ☐ 8270 ☐ 625 ☐ CLP
GC VOA's ☐ 8021
PESTICIDES ☐ 8081 ☐ 608 ☐ CLP
PCB's ☐ 8082 ☐ 608 ☐ CLP
METALS, TOTAL (List in comments below)
METALS, DISSOLVED (List in comments below)
Dioxins by Method 8290

Preservative Key
0. NONE
1. HCL
2. HNO_3
3. H_2SO_4
4. NaOH
5. Zn. Acetate
6. MeOH
7. $NaHSO_4$
8. Other _____

CLIENT SAMPLE ID	FOR OFFICE USE ONLY LAB ID	SAMPLING DATE	SAMPLING TIME	MATRIX	Dioxins by Method 8290	REMARKS/ ALTERNATE DESCRIPTION
OTMi-SB02	1025097	08/06/07	1415	S	X	
OTMi-SB201	1025098	↓	1420	↓	X	

17 of 196

AW 08/06/07

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SPECIAL INSTRUCTIONS/COMMENTS
Metals

See QAPP ☐

TURNAROUND REQUIREMENTS
____ RUSH (SURCHARGES APPLY)
____ 24 hr ____ 48 hr ____ 5 day
____ STANDARD
REQUESTED FAX DATE
REQUESTED REPORT DATE

REPORT REQUIREMENTS
____ I. Results Only
____ II. Results + QC Summaries (LCS, DUP, MS/MSD as required)
____ III. Results + QC and Calibration Summaries
____ IV. Data Validation Report with Raw Data
X V. Specialized Forms / Custom Report
Edata ____ Yes ____ No

INVOICE INFORMATION
R2738992
PO#
BILL TO:
SUBMISSION #:

SAMPLE RECEIPT: CONDITION/COOLER TEMP: _____ CUSTODY SEALS: Y N

RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY	RELINQUISHED BY	RECEIVED BY
Signature: A Kerlin	Signature: Claire Fremyer	Signature:	Signature:	Signature:	Signature:
Printed Name:	Printed Name:	Printed Name:	Printed Name:	Printed Name:	Printed Name:
Firm: CAS	Firm: CAS	Firm:	Firm:	Firm:	Firm:
Date/Time: 08/06/07 1700	Date/Time: 8/7/07 1100 4°C	Date/Time:	Date/Time:	Date/Time:	Date/Time:

Distribution: White - Return to Originator; Yellow - Lab Copy; Pink - Retained by Client

SCOC-1102-08

Service Request Summary

Folder #: **E0700759**
Client Name: Columbia Analytical Services,Inc.
Project Name: Ecology & Environment
Project Number: R2738992

Report To: Carlton Beechler
Columbia Analytical Services, Inc.
1 Mustard Street
Rochester, NY 14609
Phone Number: (716) 288-5380
Cell Number:
Fax Number:
E-mail: cbeechler@rochester.caslab.com

Project Chemist: Jane Freemyer
Originating Lab: HOUSTON
Logged By: SMALHOTRA
Date Received: 08/07/2007
Internal Due Date: 08/21/2007
QAPP: LAB QAP
Qualifier Set: CAS Standard
Formset: CAS Standard
Merged?: N
Report to MDL?: Y
P.O. Number: R2738992
EDD: E & E - Roch

4 - 4 oz-Glass Jar WM CLEAR Teflon Liner Unpreserved

Location: SMO

					SVM	
CAS Samp No.	**Client Samp No.**	**Matrix**	**Collected**		PCDD PCDF/ 8290	Total Solids/ 8290
E0700759-001	OTMi-SB02	Soil	8/1/07	1415	IV	IV
E0700759-002	OTMi-SB201	Soil	8/1/07	1420	IV	IV

Columbia Analytical Services Inc.
Cooler Receipt And Preservation Form

Project/Client: Ecology & Environment/Columbia Analytical Services,Inc. Work Order: E0700759

Cooler received on 08/07/2007 and opened on 8/07/07 1100 by

1.	Were custody seals on outside of cooler?		Y	(N)	9.	Did all bottle labels and tags agree with custody papers?	NA (Y) N
2.	Were seals intact and signature & date correct?	(NA)	Y	N	10.	Were the correct types of bottles used for the tests indicated?	NA (Y) N
3.	Is the shipper's airbill available and filed?		(Y)	N	11.	Were all of the preserved bottles received at the lab with the appropriate pH?	(NA) Y N
4.	COC #				12.	Were VOA vials checked for absence of air bubbles, and if present, noted below?	(NA) Y N
5.	Were custody papers properly filled out (ink, signed, etc.)?	NA	(Y)	N	13.	Did the bottles originate from CAS/E or a branch laboratory?	Y N
6.	Type of packing material present				14.	Are CWA Microbiology samples received with >½ the 24 hr. hold time remaining from collection?	(NA) Y N
7.	Did all bottles arrive in good condition (unbroken)?	NA	(Y)	N	15.	Was Cl2/Res negative?	(NA) Y N
8.	Were all bottle labels complete (*i.e.* analysis, preservation, etc.)?	NA	(Y)	N			

Lab Code **Sample Name**
E0700759-001 OTMi-SB02

4oz-Glass Jar WM CLEAR Teflon Liner(Unpreserved)

Bottle ID	Barcode	Expected Conditions HS	pH	Temp	Cooler #	Received Conditions Temp deg C	pH Check	Rec HS	Seal Intact?	Corrective Action
E0700759-001.01		NA		-		4.0		NA		
Test List: 8290	8290									
E0700759-001.02		NA		-		4.0		NA		
Test List: 8290	8290									

E0700759-002 OTMi-SB201

4oz-Glass Jar WM CLEAR Teflon Liner(Unpreserved)

Bottle ID	Barcode	Expected Conditions HS	pH	Temp	Cooler #	Received Conditions Temp deg C	pH Check	Rec HS	Seal Intact?	Corrective Action
E0700759-002.01		NA		-		4.0		NA		
Test List: 8290	8290									
E0700759-002.02		NA		-		4.0		NA		
Test List: 8290	8290									

Cooler Receipt Comments: UPS Tracking 1Z17W4381347639160

All tests have one or more assigned bottles

Preparation Information Benchsheet

Prep Run#: 53101
Team: Semivoa GCMS

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 08/14/2007 03:00 PM

#	Lab Code	Client ID	B#	Method /Test	pH	Matrix	Amt. Ext.	Sample Description
1	EQ0700252-01	MB		8290/PCDD PCDF		Soil	10.0g	
2	EQ0700252-02	LCS		8290/PCDD PCDF		Soil	10.0g	
3	EQ0700252-03	DLCS		8290/PCDD PCDF		Soil	10.0g	
4	E0700756-001	Pile #12	.01	8290/PCDD PCDF		Sludge, Solid	9.735g	Black compost
5	E0700759-001	OTMi-SB02	.01	8290/PCDD PCDF		Soil	9.947g	Dark brown mud
6	E0700759-002	OTMi-SB201	.01	8290/PCDD PCDF		Soil	10.115g	Dark brown wet sand
7	E0700765-001	LPTP07-S3	.01	8290/PCDD PCDF		Soil	7.620g	Gray dust
8	E0700766-001	1	.01	8290/PCDD PCDF		Soil	2.380g	White paper
9	E0700766-002	2	.01	8290/PCDD PCDF		Soil	2.309g	White paper
10	E0700766-003	3	.01	8290/PCDD PCDF		Soil	2.322g	White paper
11	E0700766-004	1A	.01	8290/PCDD PCDF		Soil	0.307g	Ash
12	E0700766-005	2A	.01	8290/PCDD PCDF		Soil	0.358g	Ash
13	E0700766-006	3A	.01	8290/PCDD PCDF		Soil	0.337g	Ash
14	E0700767-001	10-1213-SW-010	.01	8290/PCDD PCDF		Soil	10.769g	Brown soil
15	E0700767-002	10-1213-EF-018	.01	8290/PCDD PCDF		Soil	11.375g	Brown rocky mud
16	E0700767-003	10-1213-SW-019	.01	8290/PCDD PCDF		Soil	11.513g	Brown sand
17	E0700767-004	10-1213-SW-024	.01	8290/PCDD PCDF		Soil	10.368g	Dark brown sand
18	E0700781-001	G9-B-3-D	.01	8290/PCDD PCDF		Soil	9.756g	Brown soil
19	E0700781-002	G15-D-1-D	.01	8290/PCDD PCDF		Soil	9.146g	Brown soil
20	E0700781-003	G4-A-3	.01	8290/PCDD PCDF		Soil	9.215g	Brown soil
21	E0700781-004	G4-B-3	.01	8290/PCDD PCDF		Soil	9.603g	Brown soil
22	E0700781-005	G4-D-3	.01	8290/PCDD PCDF		Soil	9.428g	Brown soil

Reviewed By: _____ Date: 8/30/07

Chain of Custody

Relinquished By: _____ Date: _____

Received By: _____ Date: _____

Extracts Examined
Yes No

Preparation Information Benchsheet

Prep Run#: 53101
Team: Semivoa GCMS

Prep WorkFlow: OrgExtDioxS(30)
Prep Method: Method

Status: Prepped
Prep Date/Time: 08/14/2007 03:00 PM

Spiking Solutions

Name:	8290 Matrix Working Standard	Inventory ID	2946	Logbook Ref:	D8-91-3A	Expires On:	07/10/2017

EQ0700252-02	100.00uL	EQ0700252-03	100.00uL				

Name:	8290 Internal Working Standard	Inventory ID	2964	Logbook Ref:	D8-95-5A	Expires On:	08/03/2017

E0700756-001	100.00uL	E0700759-001	100.00uL	E0700759-002	100.00uL	E0700765-001	100.00uL	E0700766-001	100.00uL	E0700766-002	100.00uL
E0700766-003	100.00uL	E0700766-004	100.00uL	E0700766-005	100.00uL	E0700766-006	100.00uL	E0700767-001	100.00uL	E0700767-002	100.00uL
E0700767-003	100.00uL	E0700767-004	100.00uL	E0700781-001	100.00uL	E0700781-002	100.00uL	E0700781-003	100.00uL	E0700781-004	100.00uL
E0700781-005	100.00uL	EQ0700252-01	100.00uL	EQ0700252-02	100.00uL	EQ0700252-03	100.00uL				

Name:	8290/1613B Cleanup Working Standard	Inventory ID	2971	Logbook Ref:	D8-96-2A/B	Expires On:	08/05/2017

E0700756-001	100.00uL	E0700759-001	100.00uL	E0700759-002	100.00uL	E0700765-001	100.00uL	E0700766-001	100.00uL	E0700766-002	100.00uL
E0700766-003	100.00uL	E0700766-004	100.00uL	E0700766-005	100.00uL	E0700766-006	100.00uL	E0700767-001	100.00uL	E0700767-002	100.00uL
E0700767-003	100.00uL	E0700767-004	100.00uL	E0700781-001	100.00uL	E0700781-002	100.00uL	E0700781-003	100.00uL	E0700781-004	100.00uL
E0700781-005	100.00uL	EQ0700252-01	100.00uL	EQ0700252-02	100.00uL	EQ0700252-03	100.00uL				

Preparation Materials

Silica Gel Reagent Grade	C1-109-1 (346)	Carbon, High Purity	C1-120-005 (2763)	Glass Wool	C1-110-2 (352)
Acetone 99.5% Minimum	C1-87-2 (402)	Nonane (n-Nonane) 99%	C1-108-2 (403)	Dichloromethane (Methylene Chl	C1-108-4 (319)
Toluene 99.9% Minimum	C1-109-4 (349)	Hexane (n-Hexane) 98.5% Minim	C1-110-1 (320)	Tridecane (n-Tridecane)	C1-106-4 (351)
Sulfuric Acid Reagent Grade	C1-109-3 (348)	Extraction Thimbles 43 x123 mm	(1577)	Sand Reagent Grade	C1-99-1 (345)

Preparation Steps

Step:	Extraction	Step:	Acid Clean	Step:	Silica Gel Clean	Step:	Final Volume
Started:	8/14/07 15:00	Started:	8/16/07 10:00	Started:	8/16/07 13:00	Started:	8/17/07 06:00
Finished:	8/14/07 16:00	Finished:	8/16/07 11:00	Finished:	8/16/07 15:00	Finished:	8/17/07 10:00
By:	ABIDDLE	By:	ABIDDLE	By:	ABIDDLE	By:	ABIDDLE

Comments: _____

_____

Reviewed By: _____ Date: _____

Chain of Custody

Relinquished By: _____ Date: _____ Extracts Examined

Received By: _____ Date: _____ Yes No

Columbia Analytical Services INC.

An Employee - Owned Company

Chromatograms & Selected Ion Monitoring

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Sample Response Summary

EPA SAMPLE NO.
METHOD BLANK

Run #7 Filename U122454#1 Samp: 1 Inj: 1 Acquired: 20-AUG-07 20:01:46
Processed: 27-AUG-07 10:38:40 Sample ID: EQ0700252-01

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRF
11	Unk	2,3,7,8-TCDD	NotFnd	*	*	*	no	no	0.96
22	IS	13C-2,3,7,8-TCDD	28:07	3.429e+04	4.362e+04	0.79	yes	no	
27	RS/RT	13C-1,2,3,4-TCDD	27:55	5.095e+04	6.592e+04	0.77	yes	no	
29	C/Up	37Cl-2,3,7,8-TCDD	28:07	6.616e+04					

Signal/Noise Height Ratio Summary

	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
11	2,3,7,8-TCDD	*	1.53e+03	*	*	6.12e+02	*
22	13C-2,3,7,8-TCDD	5.77e+06	3.99e+03	1.4e+03	7.35e+06	1.31e+03	5.6e+03
27	13C-1,2,3,4-TCDD	8.47e+06	3.99e+03	2.1e+03	1.12e+07	1.31e+03	8.5e+03
29	37Cl-2,3,7,8-TCDD	1.13e+07	6.80e+02	1.7e+04			

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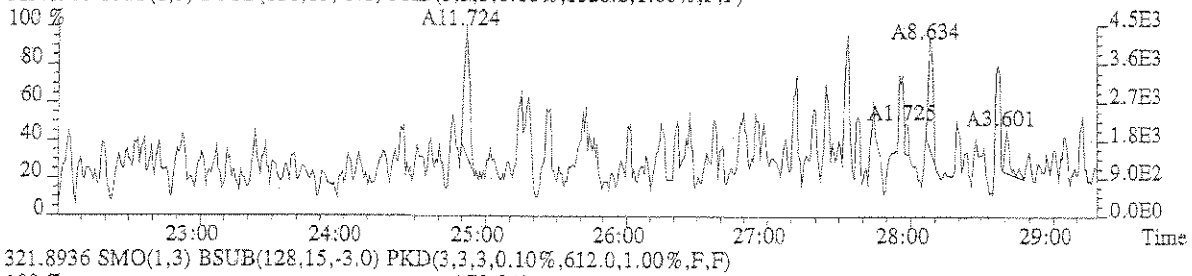
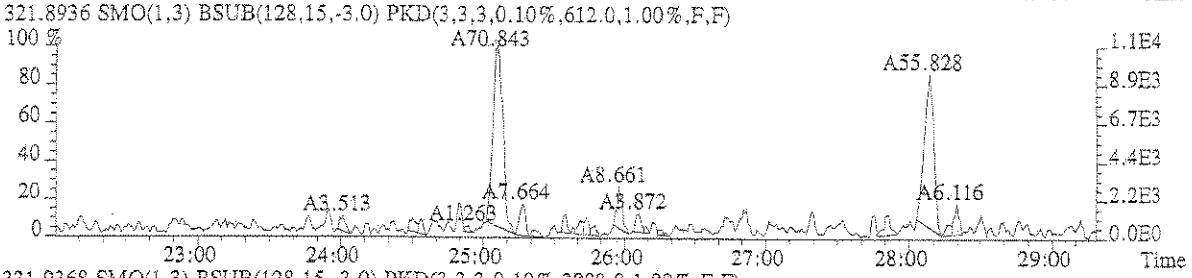
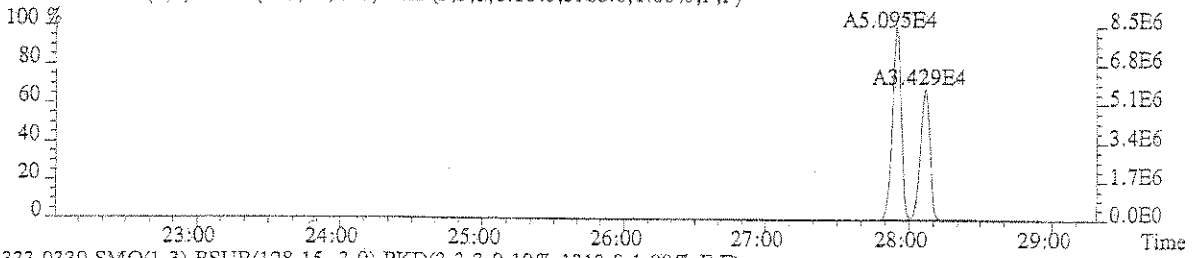
File:U122454 #1-610 Acq:20-AUG-2007 20:01:46 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 File Text:METHOD BLANK Exp:EQ0700252-01MB
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1528.0,1.00%,F,F)



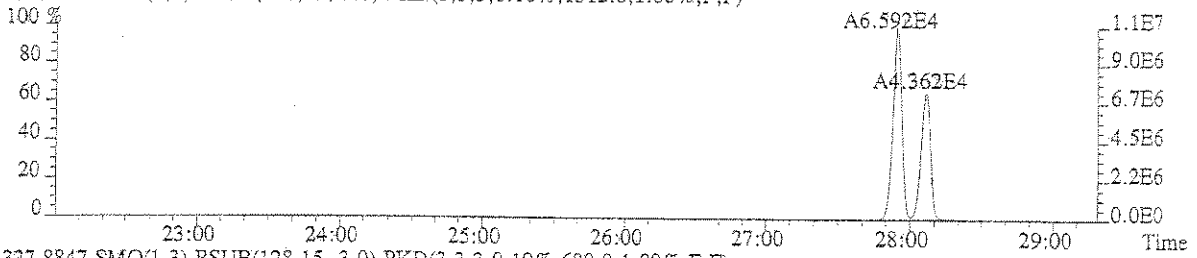
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,612.0,1.00%,F,F)



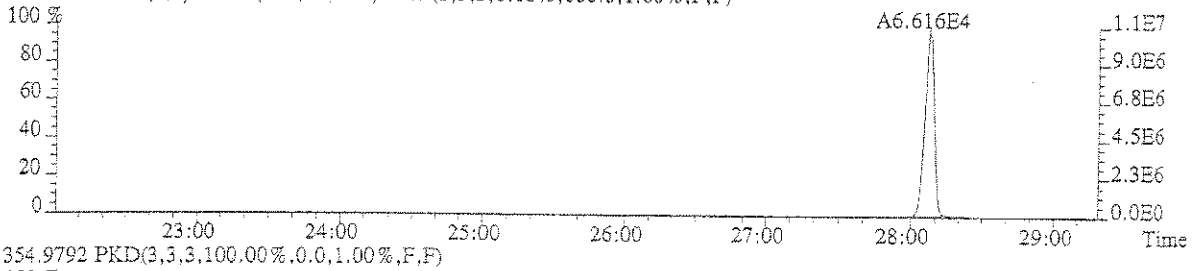
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3988.0,1.00%,F,F)



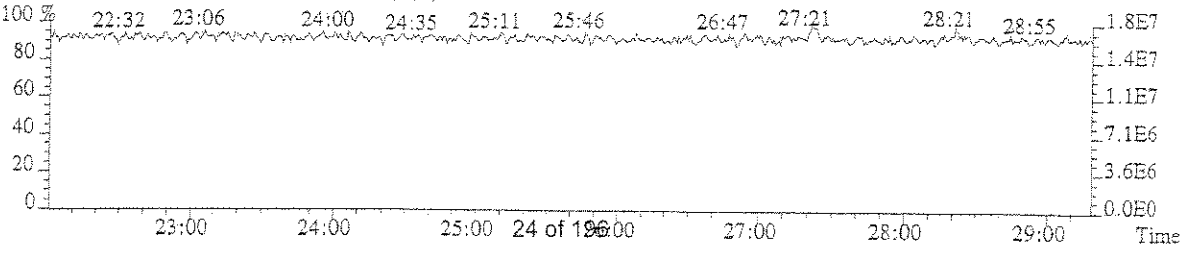
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1312.0,1.00%,F,F)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,680.0,1.00%,F,F)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



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Sample Response Summary

EPA SAMPLE NO.
METHOD BLANK

Run #3 Filename U122468#1 Samp: 1 Inj: 1 Acquired: 21-AUG-07 08:39:40
Processed: 22-AUG-07 09:01:16 Sample ID: EQ0700252-01

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
11	Unk	2,3,7,8-TCDD	NotFnd	*	*	*	no	no
22	IS	13C-2,3,7,8-TCDD	28:07	2.934e+04	3.744e+04	0.78	yes	no
27	RS/RT	13C-1,2,3,4-TCDD	27:55	4.583e+04	5.948e+04	0.77	yes	no
29	C/Up	37Cl-2,3,7,8-TCDD	28:08	5.661e+04				

Signal/Noise Height Ratio Summary

	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
11	2,3,7,8-TCDD	*	5.24e+02	*	*	3.88e+02	*
22	13C-2,3,7,8-TCDD	5.21e+06	2.81e+03	1.9e+03	6.60e+06	7.16e+02	9.2e+03
27	13C-1,2,3,4-TCDD	8.18e+06	2.81e+03	2.9e+03	1.07e+07	7.16e+02	1.5e+04
29	37Cl-2,3,7,8-TCDD	9.95e+06	2.00e+02	5.0e+04			

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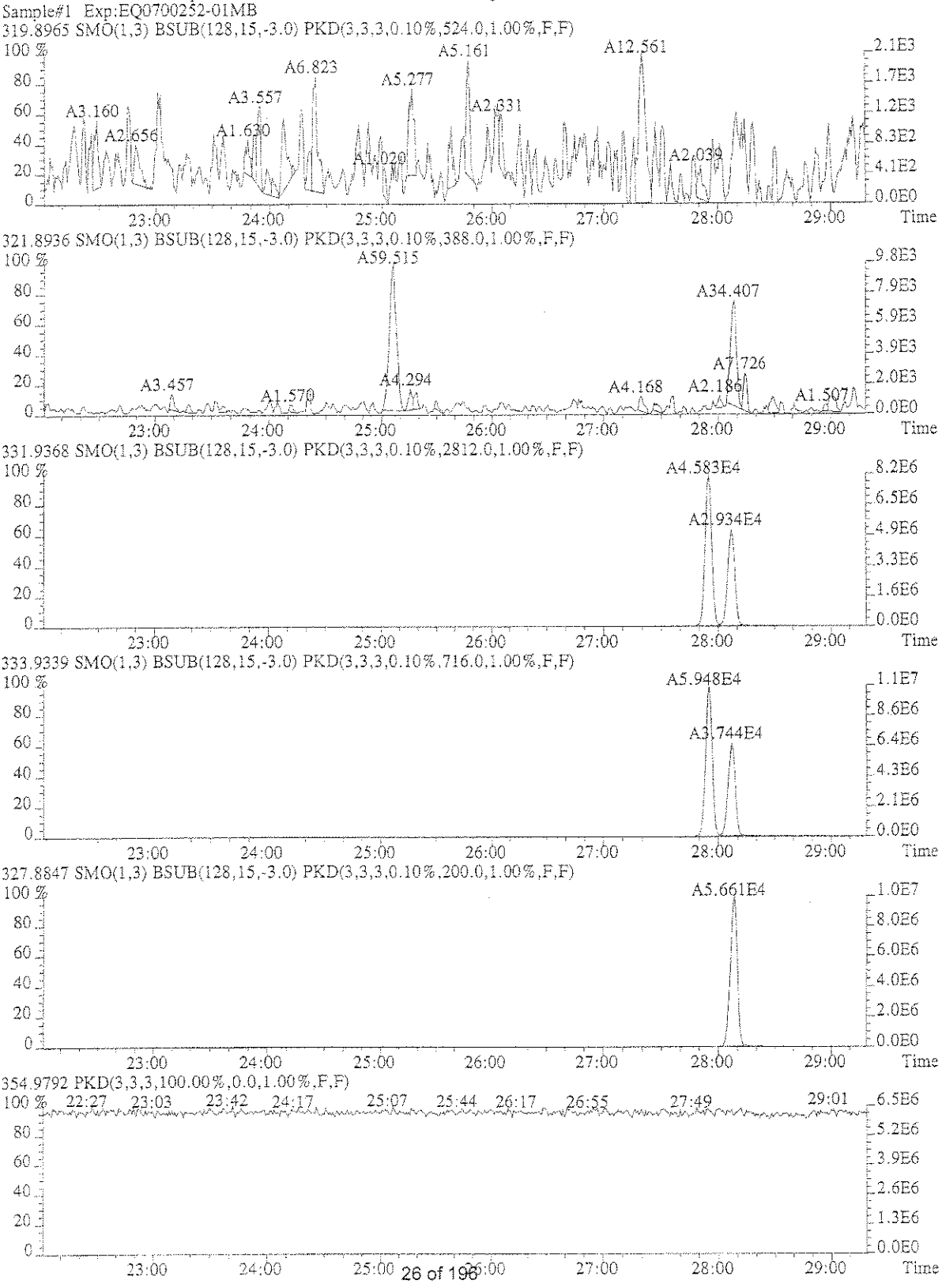
File:U122468 #1-610 Acq:21-AUG-2007 08:39:40 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:EQ0700252-01MB



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Sample Response Summary

EPA SAMPLE NO.
OTMi-SB02

Run #9 Filename U122456#1 Samp: 1 Inj: 1 Acquired: 20-AUG-07 21:36:56
Processed: 27-AUG-07 10:41:17 Sample ID: E0700759-001

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRF
11	Unk	2,3,7,8-TCDD	NotFnd	*	*	*	no	no	0.96
22	IS	13C-2,3,7,8-TCDD	28:07	4.002e+04	5.118e+04	0.78	yes	no	
27	RS/RT	13C-1,2,3,4-TCDD	27:56	5.567e+04	7.031e+04	0.79	yes	no	
29	C/Up	37Cl-2,3,7,8-TCDD	28:09	8.477e+04					

Signal/Noise Height Ratio Summary

	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
11	2,3,7,8-TCDD	*	9.88e+02	*	*	4.44e+02	*
22	13C-2,3,7,8-TCDD	7.02e+06	4.18e+03	1.7e+03	8.93e+06	1.44e+03	6.2e+03
27	13C-1,2,3,4-TCDD	9.78e+06	4.18e+03	2.3e+03	1.25e+07	1.44e+03	8.7e+03
29	37Cl-2,3,7,8-TCDD	1.47e+07	6.52e+02	2.3e+04			

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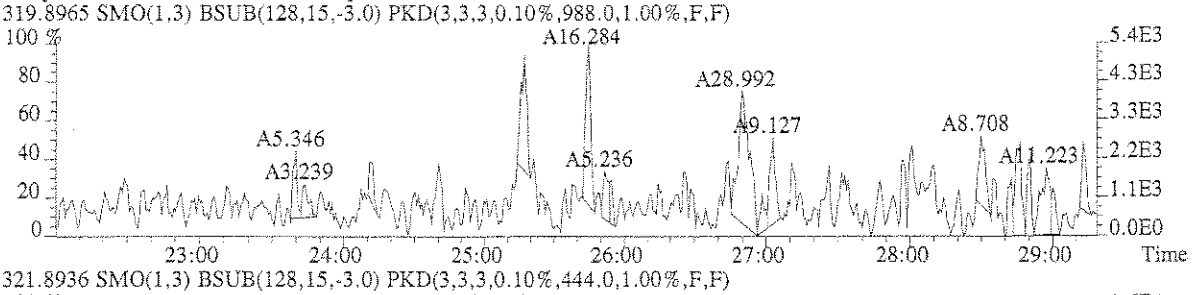
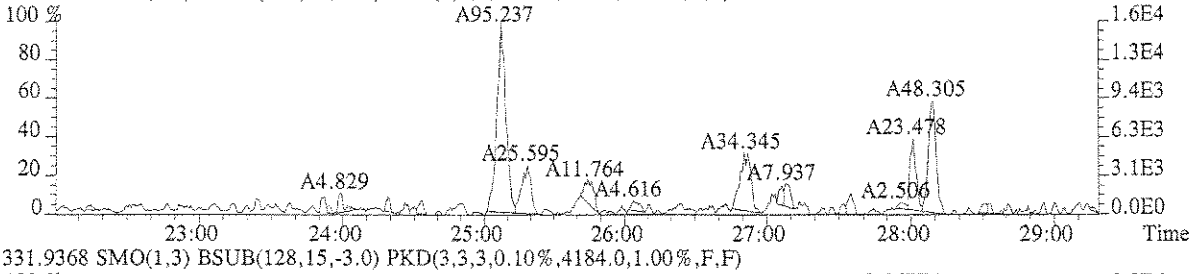
File:U122456 #1-610 Acq:20-AUG-2007 21:36:56 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 File Text:OTM1-SB02 Exp:E0700759-001

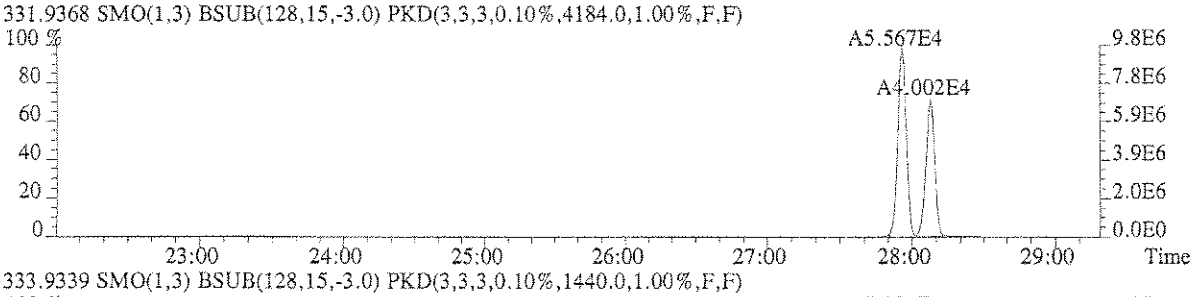
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,988.0,1.00%,F,F)



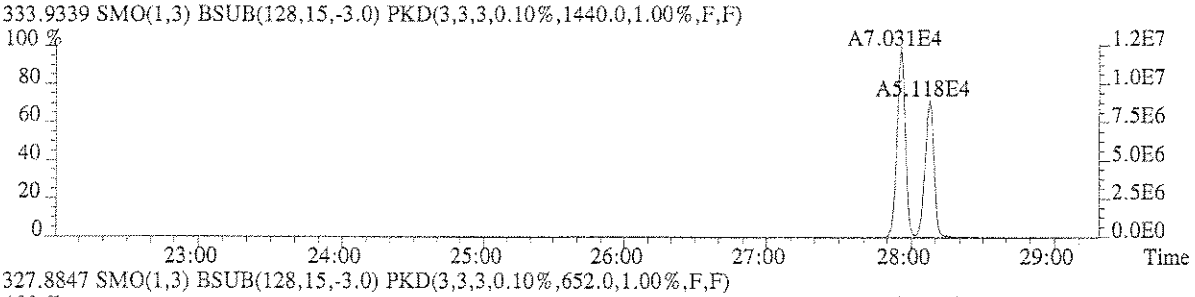
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,444.0,1.00%,F,F)



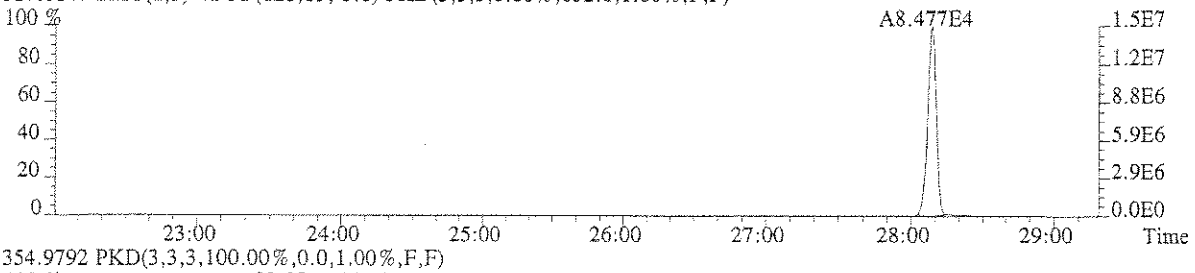
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,4184.0,1.00%,F,F)



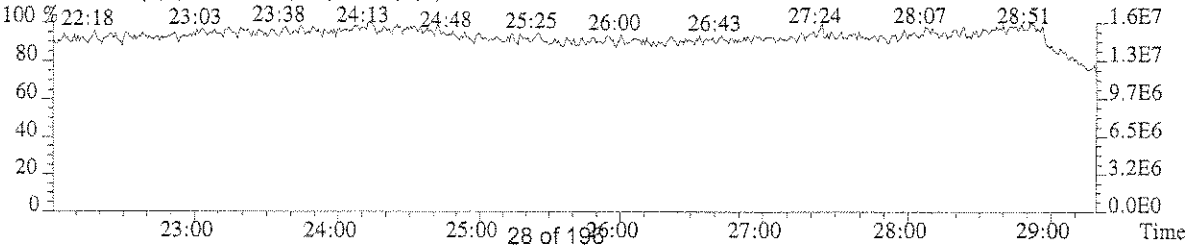
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1440.0,1.00%,F,F)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,652.0,1.00%,F,F)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



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Sample Response Summary

EPA SAMPLE NO.
OTMi-SB201

Run #10 Filename U122457#1 Samp: 1 Inj: 1 Acquired: 20-AUG-07 22:24:31
Processed: 27-AUG-07 10:41:18 Sample ID: E0700759-002

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?	RRF
11	Unk	2,3,7,8-TCDD	28:09	9.981e+01	1.653e+02	0.60	no	yes	0.96
22	IS	13C-2,3,7,8-TCDD	28:07	4.576e+04	5.828e+04	0.79	yes	no	
27	RS/RT	13C-1,2,3,4-TCDD	27:56	5.684e+04	7.196e+04	0.79	yes	no	
29	C/Up	37Cl-2,3,7,8-TCDD	28:08	8.755e+04					

Signal/Noise Height Ratio Summary

	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
11	2,3,7,8-TCDD	1.81e+04	1.16e+03	1.6e+01	2.72e+04	7.80e+02	3.5e+01
22	13C-2,3,7,8-TCDD	8.16e+06	3.63e+03	2.2e+03	1.03e+07	1.35e+03	7.6e+03
27	13C-1,2,3,4-TCDD	9.85e+06	3.63e+03	2.7e+03	1.25e+07	1.35e+03	9.2e+03
29	37Cl-2,3,7,8-TCDD	1.52e+07	8.44e+02	1.8e+04			

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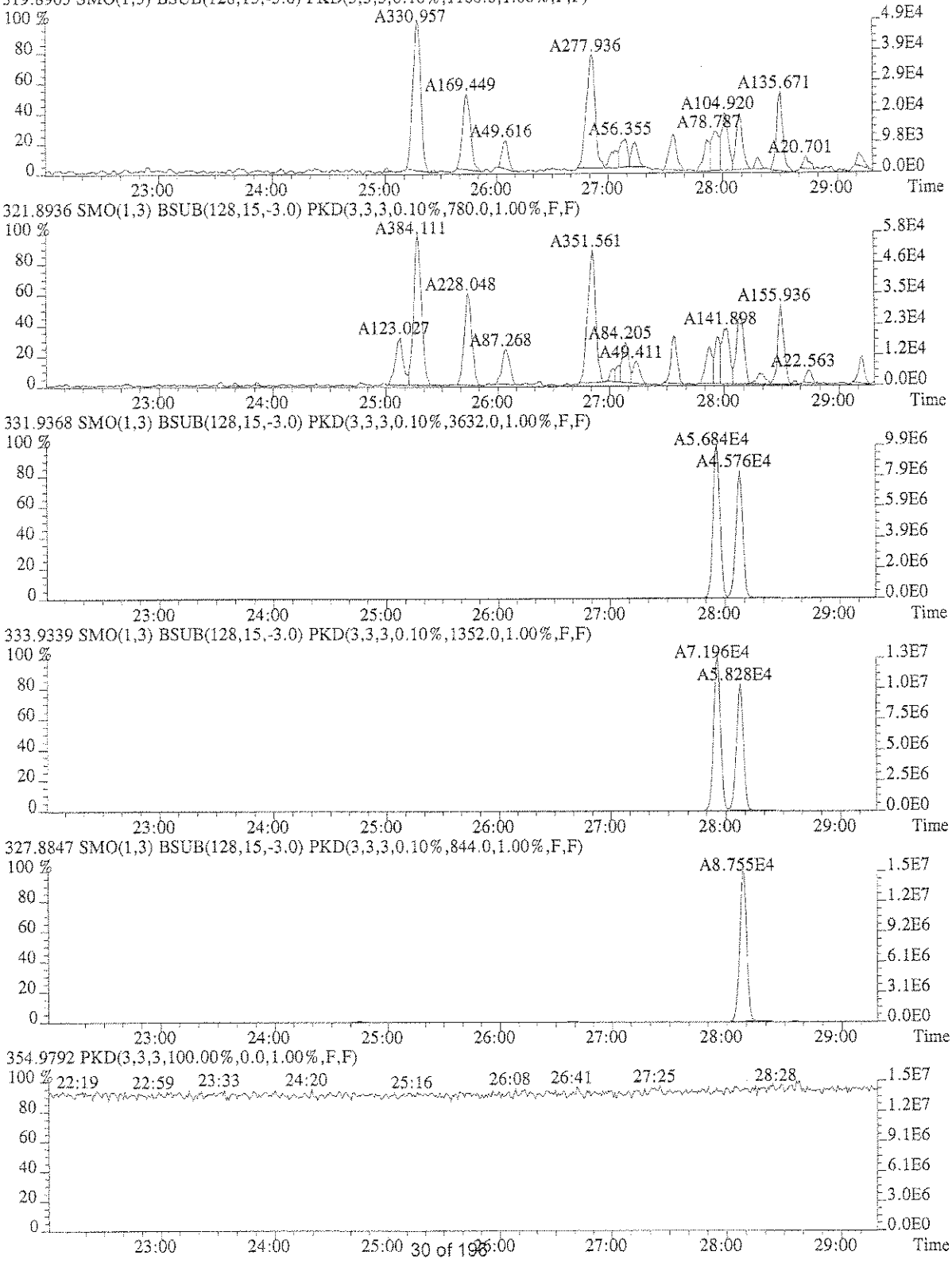
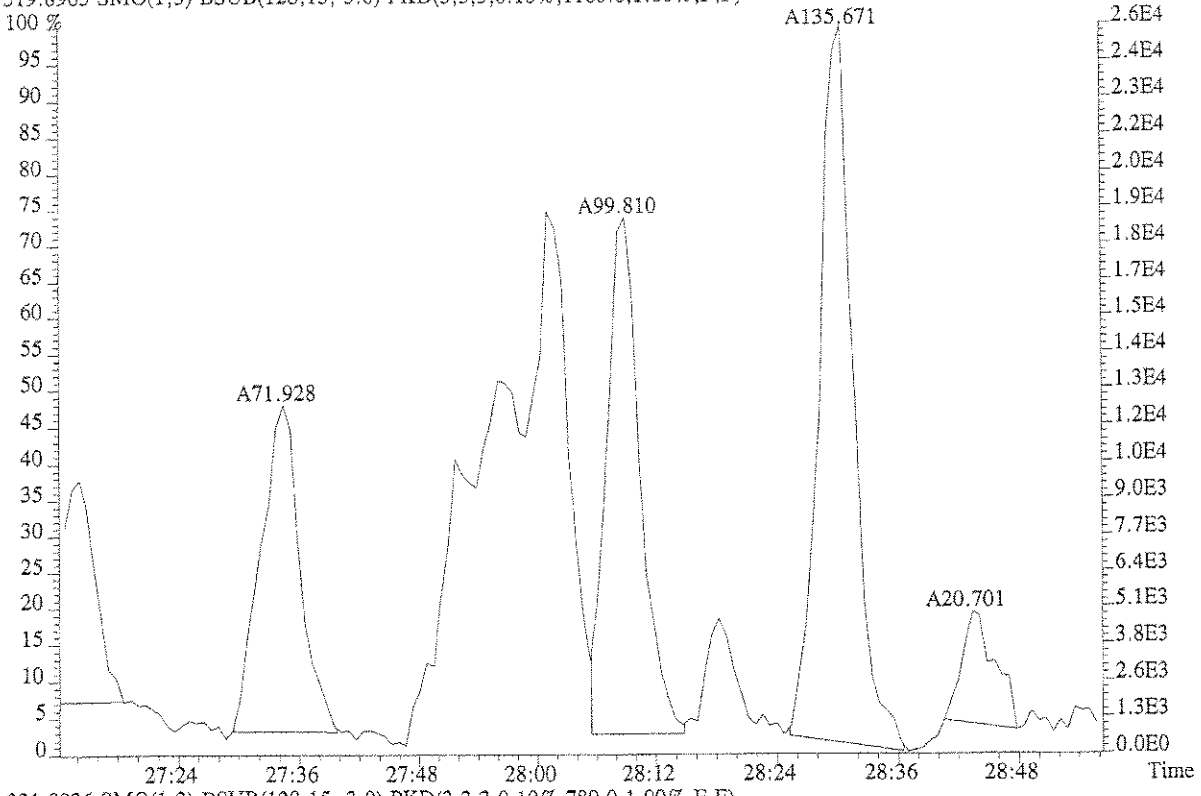
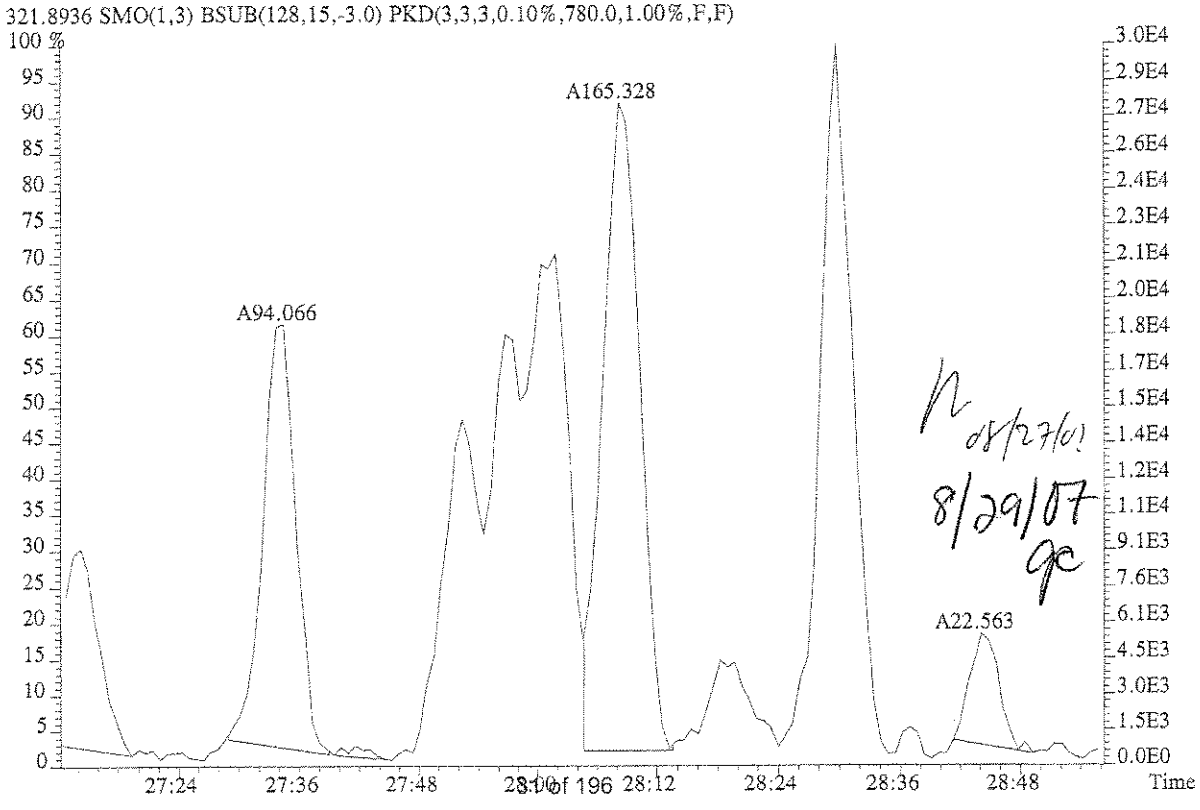
File:U122457 #1-610 Acq:20-AUG-2007 22:24:31 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 File Text:OTMi-SB201 Exp:E0700759-002



File:U122457 #1-610 Acq:20-AUG-2007 22:24:31 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 File Text:OTMi-SB201 Exp:E0700759-002
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1160.0,1.00%,F,F)



321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,780.0,1.00%,F,F)



08/27/07
8/29/07
gc

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Sample Response Summary

EPA SAMPLE NO.
LCS

Run #10 Filename U122476#1 Samp: 1 Inj: 1 Acquired: 21-AUG-07 15:39:11
Processed: 22-AUG-07 09:01:44 Sample ID: EQ0700252-02

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
11	Unk	2,3,7,8-TCDD	28:07	3.813e+03	4.996e+03	0.76	yes	no
22	IS	13C-2,3,7,8-TCDD	28:06	1.932e+04	2.505e+04	0.77	yes	no
27	RS/RT	13C-1,2,3,4-TCDD	27:55	3.344e+04	4.246e+04	0.79	yes	no
29	C/Up	37Cl-2,3,7,8-TCDD	28:07	3.739e+04				

Signal/Noise Height Ratio Summary

	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
11	2,3,7,8-TCDD	7.12e+05	4.60e+02	1.5e+03	9.42e+05	9.36e+02	1.0e+03
22	13C-2,3,7,8-TCDD	3.67e+06	2.33e+03	1.6e+03	4.77e+06	6.40e+02	7.5e+03
27	13C-1,2,3,4-TCDD	6.22e+06	2.33e+03	2.7e+03	7.90e+06	6.40e+02	1.2e+04
29	37Cl-2,3,7,8-TCDD	7.06e+06	4.56e+02	1.5e+04			

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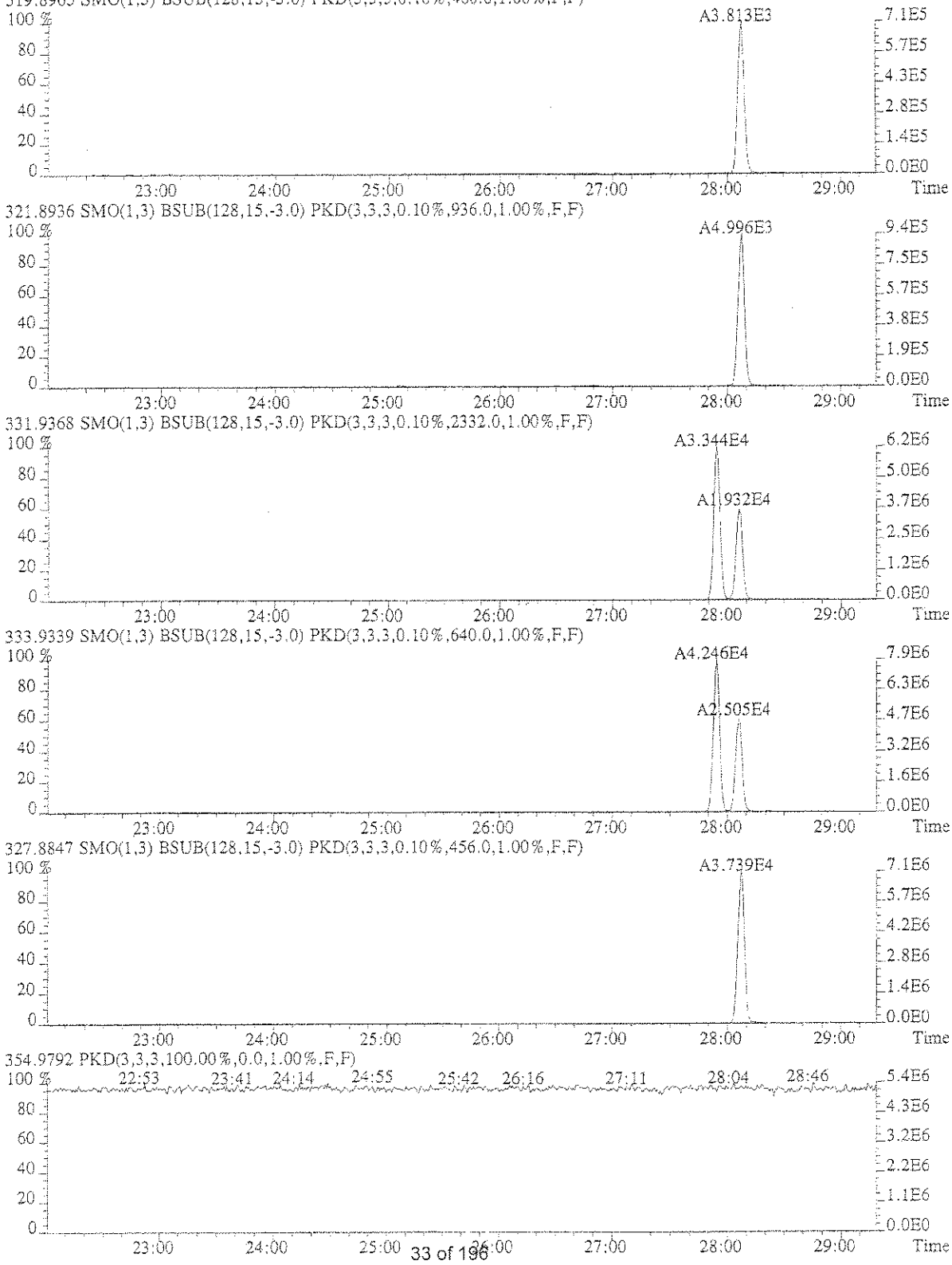
File:U122476 #1-610 Acq:21-AUG-2007 15:39:11 Probe EI+ Magnet SIR VG BioTech Mass spectr
Sample#1 File Text:LCS Exp:EQ0700252-02LCS



Columbia Analytical Services, Inc.
Sample Response Summary

EPA SAMPLE NO.
DLCS

Run #9 Filename U122475#1 Samp: 1 Inj: 1 Acquired: 21-AUG-07 14:43:08
Processed: 22-AUG-07 09:01:40 Sample ID: EQ0700252-03

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
11	Unk	2,3,7,8-TCDD	28:07	5.510e+03	7.275e+03	0.76	yes	no
22	IS	13C-2,3,7,8-TCDD	28:06	2.794e+04	3.591e+04	0.78	yes	no
27	RS/RT	13C-1,2,3,4-TCDD	27:55	4.115e+04	5.208e+04	0.79	yes	no
29	C/Up	37Cl-2,3,7,8-TCDD	28:07	5.303e+04				

Signal/Noise Height Ratio Summary

	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
11	2,3,7,8-TCDD	1.04e+06	9.24e+02	1.1e+03	1.42e+06	6.48e+02	2.2e+03
22	13C-2,3,7,8-TCDD	5.16e+06	1.69e+03	3.1e+03	6.67e+06	7.04e+02	9.5e+03
27	13C-1,2,3,4-TCDD	7.71e+06	1.69e+03	4.6e+03	9.86e+06	7.04e+02	1.4e+04
29	37Cl-2,3,7,8-TCDD	1.02e+07	5.92e+02	1.7e+04			

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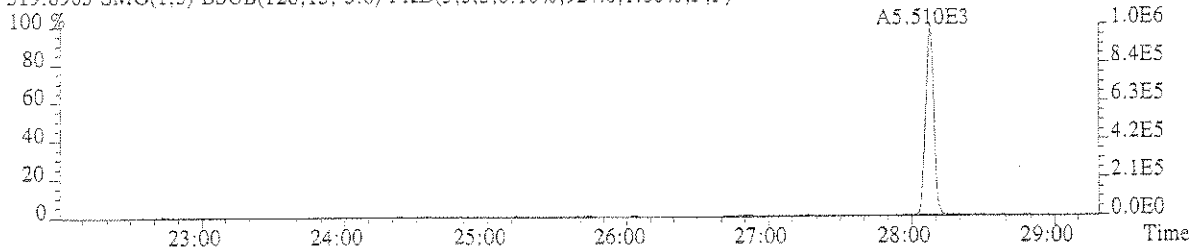
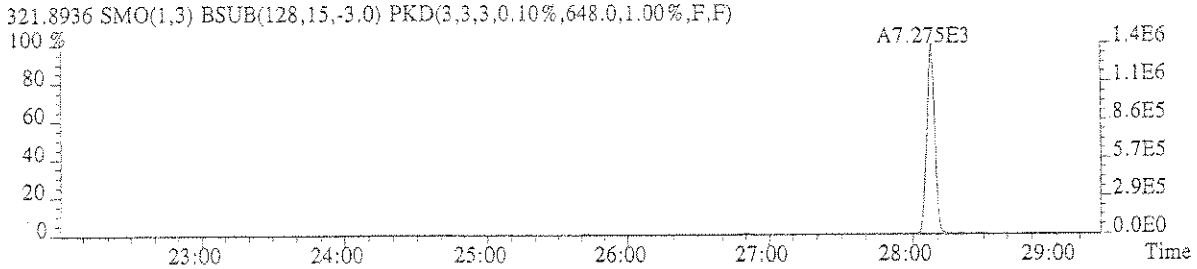
File:U122475 #1-610 Acq:21-AUG-2007 14:43:08 Probe EI+ Magnet SIR VG BioTech Mass spectr
Sample#1 File Text:DLCS Exp:EQ0700252-03DLCS

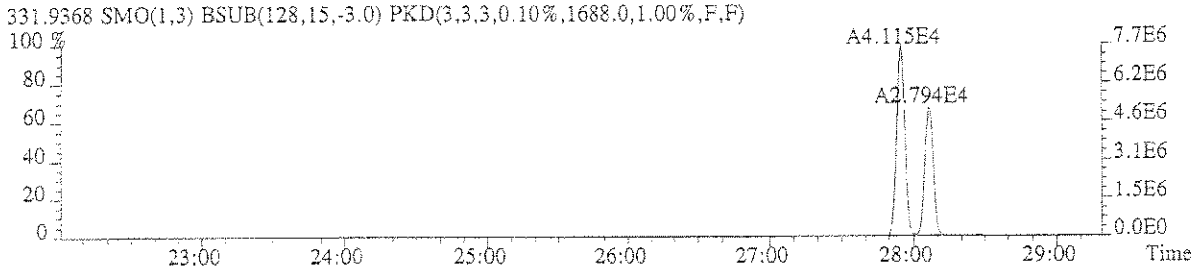
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,924.0,1.00%,F,F)



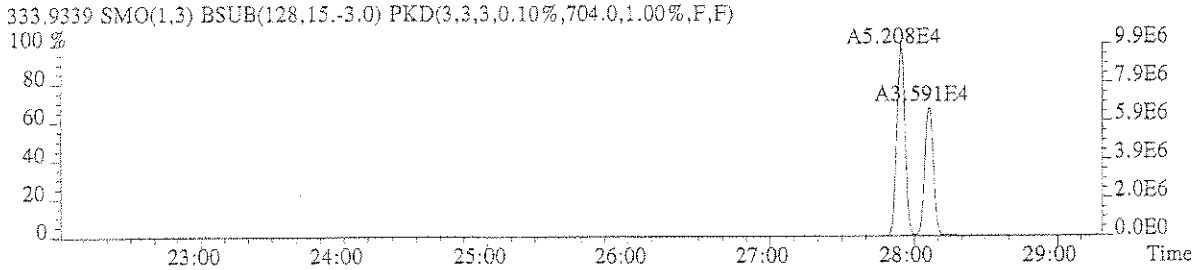
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,648.0,1.00%,F,F)



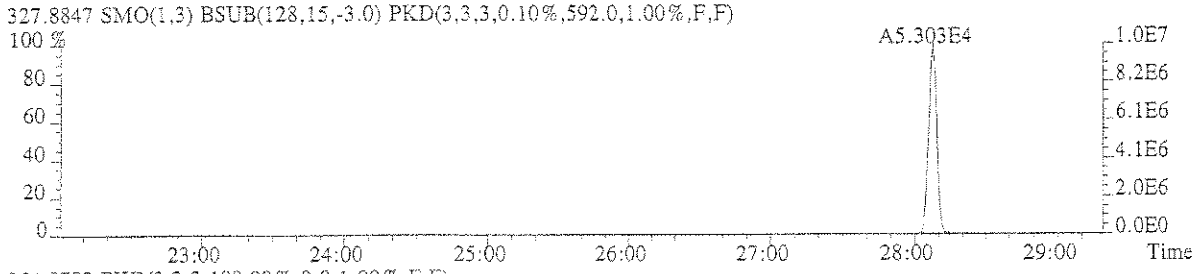
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1688.0,1.00%,F,F)



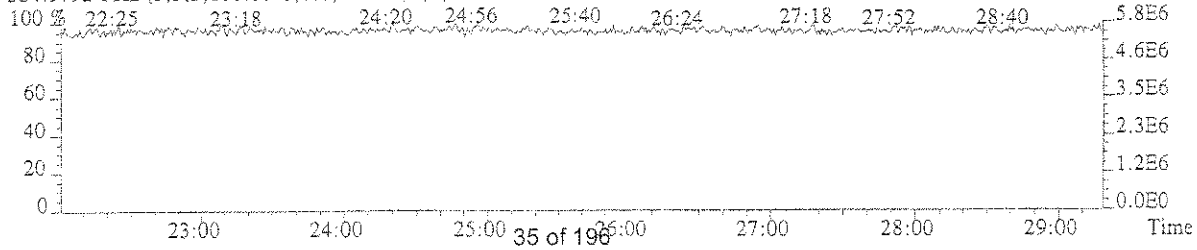
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,704.0,1.00%,F,F)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,592.0,1.00%,F,F)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



Columbia Analytical Services INC.

An Employee - Owned Company

Continuing Calibration

10655 Richmond Avenue, Suite 130-A, Houston, TX 77042
Phone(713)266-1599 Fax (713)266-0130
www.caslab.com

RW/ HRCC3 Daily Calibration QC Checklist

Calibration File Name: U122452/U122466

Date: 8/20/02

Circle one: Beginning / Ending

Method: 8290 / Tetra / TCDD Only / TCDF Conf

Retention Window/Column Performance Check:	Analyst	Second Check
Windows labeled for first and last eluting compounds	✓	✓
Column performance shows less than or equal to 25% valley between column specific 2378 isomer and the closest eluters	✓	✓
No QC ion deflections affect column specific 2378 isomer or the closest eluters	✓	✓

HRCC3 Continuing Calibration	Analyst	Second Check
Percent RSD within method criteria	✓	✓
All relative abundance ratios meet method criteria	✓	✓
No QC ion deflections greater than 20%	✓	✓
Mass spectrometer resolution greater than or equal to 10,000 and documented	✓	✓
Signal-to-noise of all target analytes and associated labeled standards at least 2.5:1	✓	✓
Ending Calibration injected prior to end of 12 hour clock	✓	✓

Analyst: ✓

Second QC: QC

5DFC
PCDD/PCDF ANALYTICAL SEQUENCE SUMMARY

Lab Name: Columbia Analytical Services Contract:

Lab Code: TX01411 Case No.: Client No.: SDG No.:

GC Column: DB-5 ID: 0.25 (mm) Instrument ID: AutoSpec-Ultima

Init. Calib. Date: 04/02/07

Init. Calib.Times: 11:25

THE ANALYTICAL SEQUENCE OF STANDARDS, SAMPLES, BLANKS, AND LABORATORY CONTROL SAMPLES (LCSs) IS AS FOLLOWS:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
WINDOW DEFINE		U122451	20-AUG-07	17:40:41
CCAL HRCC3		U122452	20-AUG-07	18:26:34
METHOD BLANK	EQ0700252-01	U122454	20-AUG-07	20:01:46
PILE #12	E0700756-001	U122455	20-AUG-07	20:49:21
OTMi-SB02	E0700759-001	U122456	20-AUG-07	21:36:56
OTMi-SB201	E0700759-002	U122457	20-AUG-07	22:24:31
1	E0700766-001	U122458	20-AUG-07	23:12:06
2	E0700766-002	U122459	20-AUG-07	23:59:39
3	E0700766-003	U122460	21-AUG-07	00:47:14
1A	E0700766-004	U122461	21-AUG-07	01:34:48
2A	E0700766-005	U122462	21-AUG-07	02:22:22
3A	E0700766-006	U122463	21-AUG-07	03:09:56
LCS	EQ0700258-02	U122464	21-AUG-07	03:57:30
DLCS	EQ0700258-03	U122465	21-AUG-07	04:45:05
CCAL HRCC3	CCAL HRCC3	U122466	21-AUG-07	05:45:09

HRGC/HRMS RUN LOG

CAS HOUSTON 10655 Richmond Avenue, Suite 130-A Houston, TX 77042

Columbia Analytical Services inc. An Employee Owned Company

Acq Method: 8290CAS/1613 Result File: F U122452RFS Archive Tape: ______

GC Method: 8290CAS/1613 EDD File: ______ Instrument ID: AutoSpec 1

Date	Time	File	CAS ID	Client ID	Batch #	Analyst	Comments	RE
8/20/07	14:53	U122448	E0706810-020	GW-0214	EQ258	[illegible]		
↓	15:41	U122449	E 6810-021	GW-0290	↓	↓		
	16:40	U122450	Cal HRCC3	D8-2-2A			Use average RF	
	17:46	U122451	Window Define	D4-90-2				
	18:26	U122452	CCAL HRCC3	D8-2-2A				
	19:16	U122453	Test					
	20:01	U122454	EQ0700258MB	Method Blank				
	20:49	U122455 55	E0700756-001	Pile #12				
	21:36	U122456 56	E0700759-001	OTMi-SB02			Tcon	
	22:24	U122457 57	E0700759-002	OTMi-SB201			↓	
	23:12	U122458 58	E0700766-001	1			Full	
↓	23:59	U122460 59	-002	2				
08/21/07	00:47	U122461	-003	3				
	01:34	U122462 61	-004	1A				
	02:22	U122463 62	-005	2A				
↓	03:09	U122464 63	E0700766-006	3A		↓	↓	

Reviewed by: JB

080

HRGC/HRMS RUN LOG

CAS HOUSTON 10655 Richmond Avenue, Suite 130-A Houston, TX 77042

Columbia Analytical Services inc. An Employee Owned Company

Acq Method: 8290CAS/I6I3 Result File: D: U122466CAL/RES Archive Tape: ________

GC Method: 8290CAS/I6I3 EDD File: D: U122479CAL/RES Instrument ID: AutoSpec 1

Date	Time	File	CAS ID	Client ID	Batch #	Analyst	Comments	RE
8/21/07	03:57	U122464	~~EQ0607~~ EQ0700258-02LCS	LCS		KC		
↓	04:43	U122465	EQ0700258-03DLCS	DLCS		│		
08/21/07	05:45	U122466	CCAL HRCC3	D8-2-2A		│		
│	07:21	U122467	Window Defore	D4-90-2		│		
│	08:39	U122468	EQ0700252-01MB	METHOD BLANK	EQ252	│		
│	09:25	U122469	EQ0700781-001	GA-B-3-D		│		
│	10:12	U122470	│ 781-002	G15-D-1-D		│		
│	11:00	U122471	│ 781-003	G4-A-3		│		
│	11:41	U122472	│ 781-004	G4-B-3		│		
│	12:35	U122473	EQ0700781-005	G4-D-3		│		
│	13:57	U122474	EQ0700252-02LCS			│	needs reinjection	
│	14:43	U122475	│ 252-03DLCS	DUP LAB SPIKE		│		
│	15:39	U122476	EQ0700252-02LCS	LAB SPIKE		│		
│	16:38	U122477	CCAL HRCC3	D8-2-2A		│	Use average RF	
│	17:37	U122478	Window Defore	D4-90-2		│		
↓	18:22	U122479	CCAL HRCC3	D8-2-2A		↓		

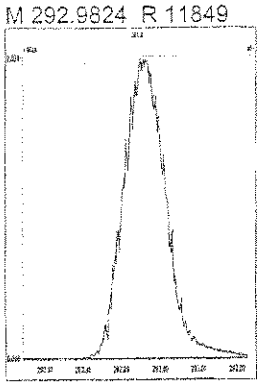
Reviewed by: [signature]

031

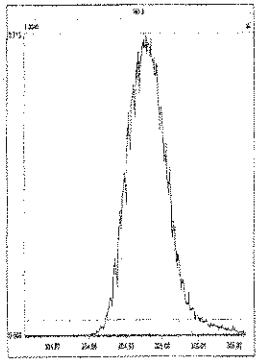
File: Experiment: 8290CAS.exp Reference: pfk.ref Function: 1 @ 200 (ppm)

Printed: Monday, August 20, 2007 17:39:17 Central Standard Time

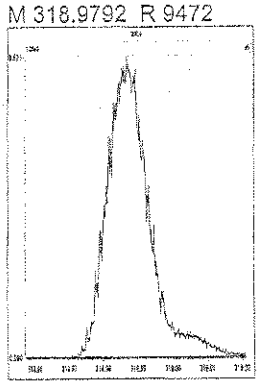
M 292.9824 R 11849



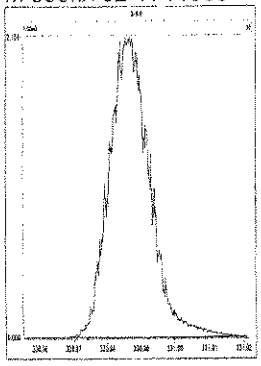
M 304.9824 R 11681



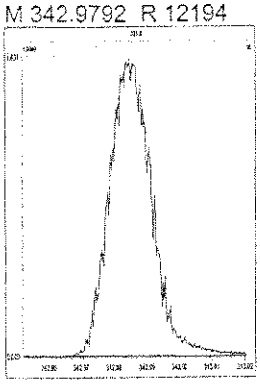
M 318.9792 R 9472



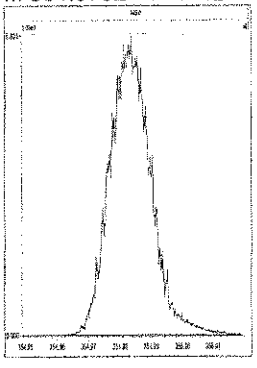
M 330.9792 R 11905



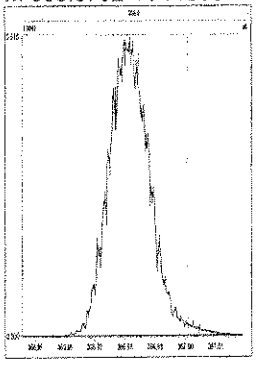
M 342.9792 R 12194



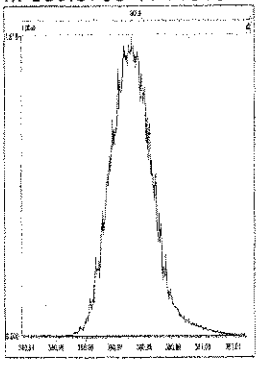
M 354.9792 R 11412



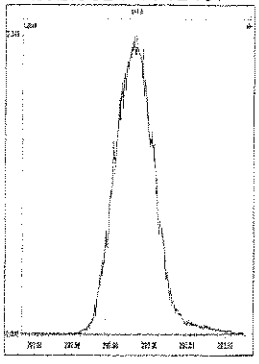
M 366.9792 R 11905



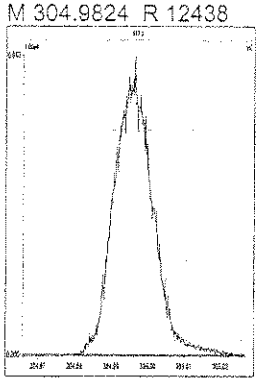
M 380.9760 R 11519



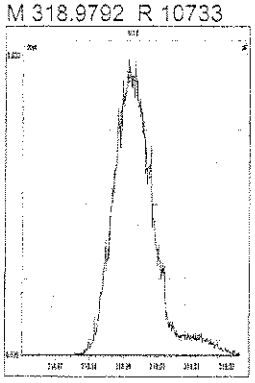
M 292.9824 R 12437



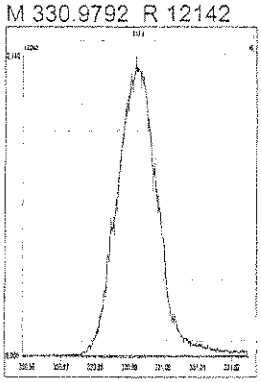
M 304.9824 R 12438



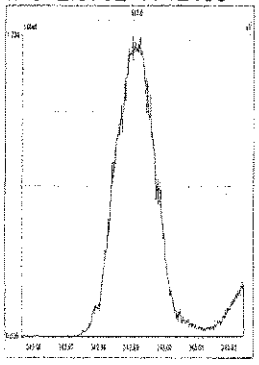
M 318.9792 R 10733



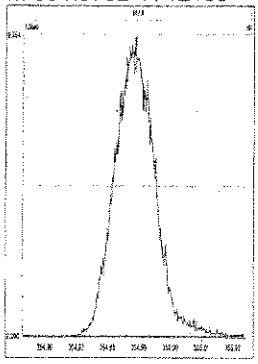
M 330.9792 R 12142



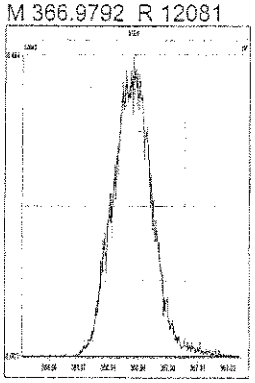
M 342.9792 R 12438



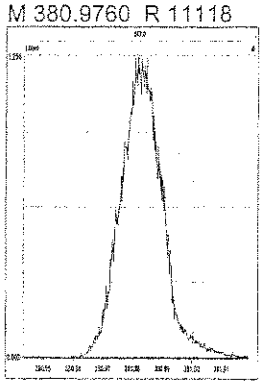
M 354.9792 R 12195



M 366.9792 R 12081



M 380.9760 R 11118



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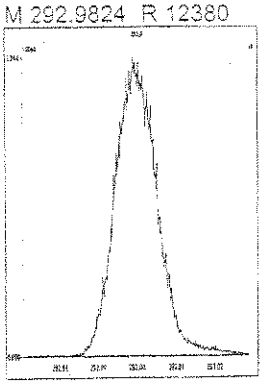

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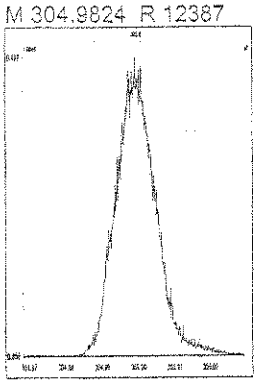
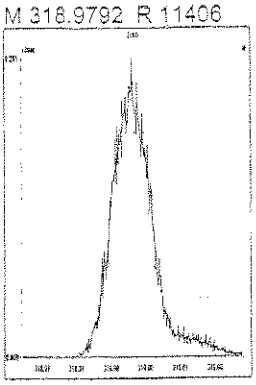
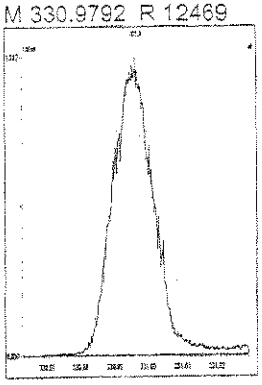


M 318.9792 R 11406



M 330.9792 R 12469



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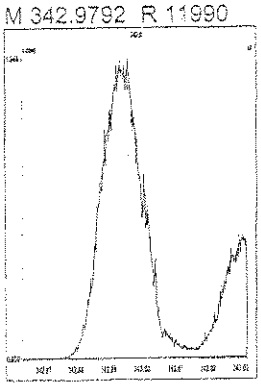

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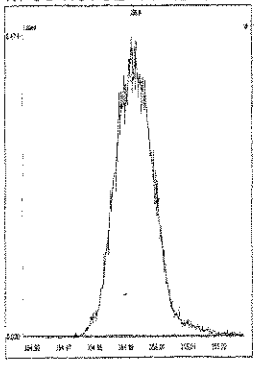

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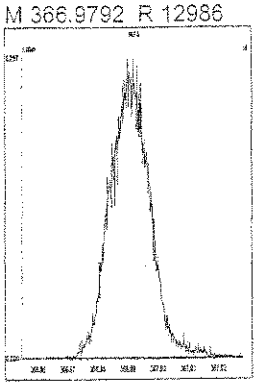
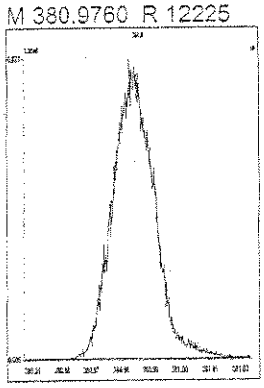


M 380.9760 R 12225



5DFA

WINDOW DEFINING MIX SUMMARY

CLIENT ID

WDM

Lab Name: COLUMBIA ANALYTICAL SERVICES

Lab Code: CAS Case No.: _____ SDG No.: _____

GC Column: DB-5 ID: 0.25 (mm) Lab File ID: U122451

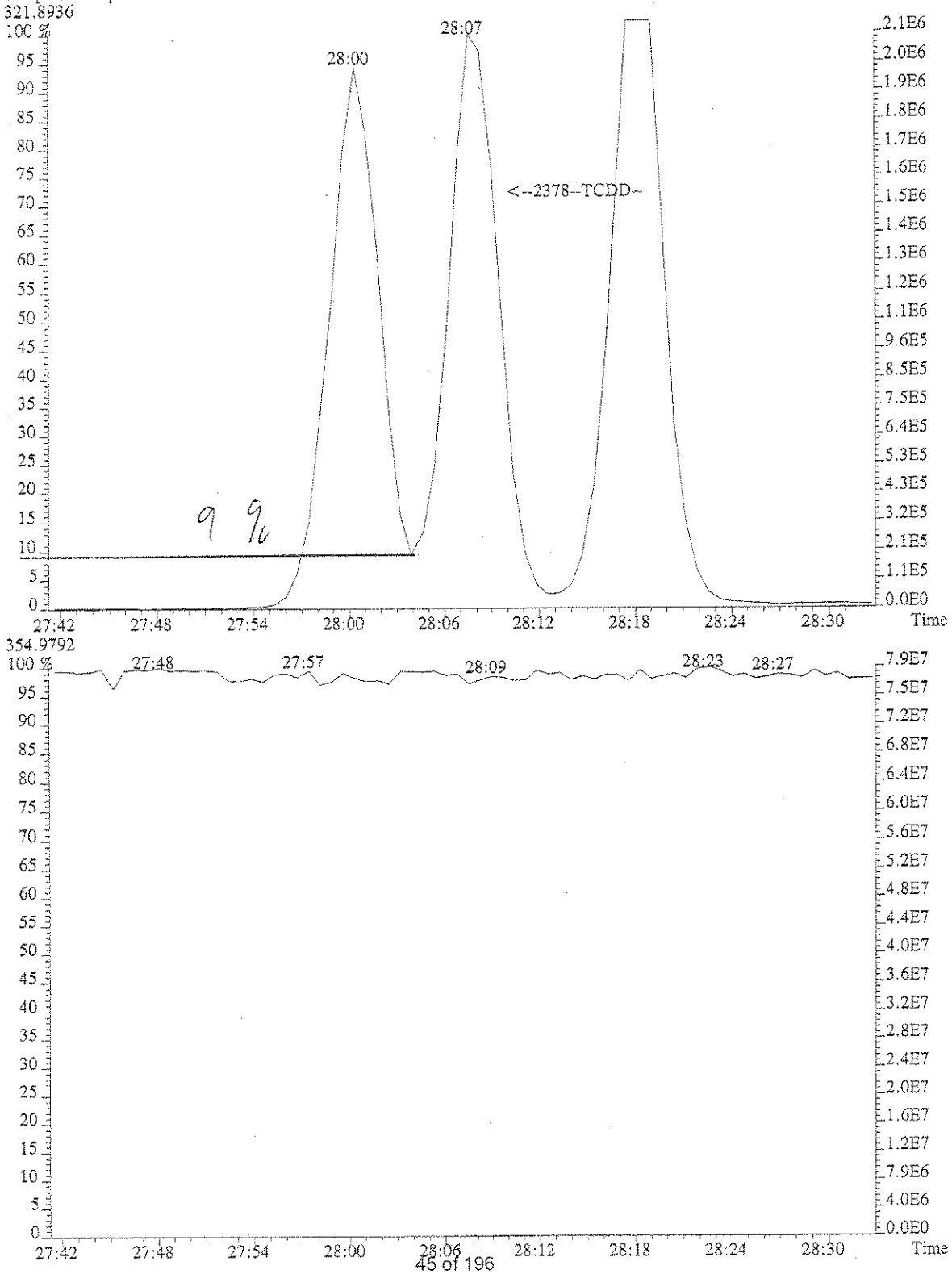
Date Analyzed: 08/20/07

Time Analyzed: 17:40:41

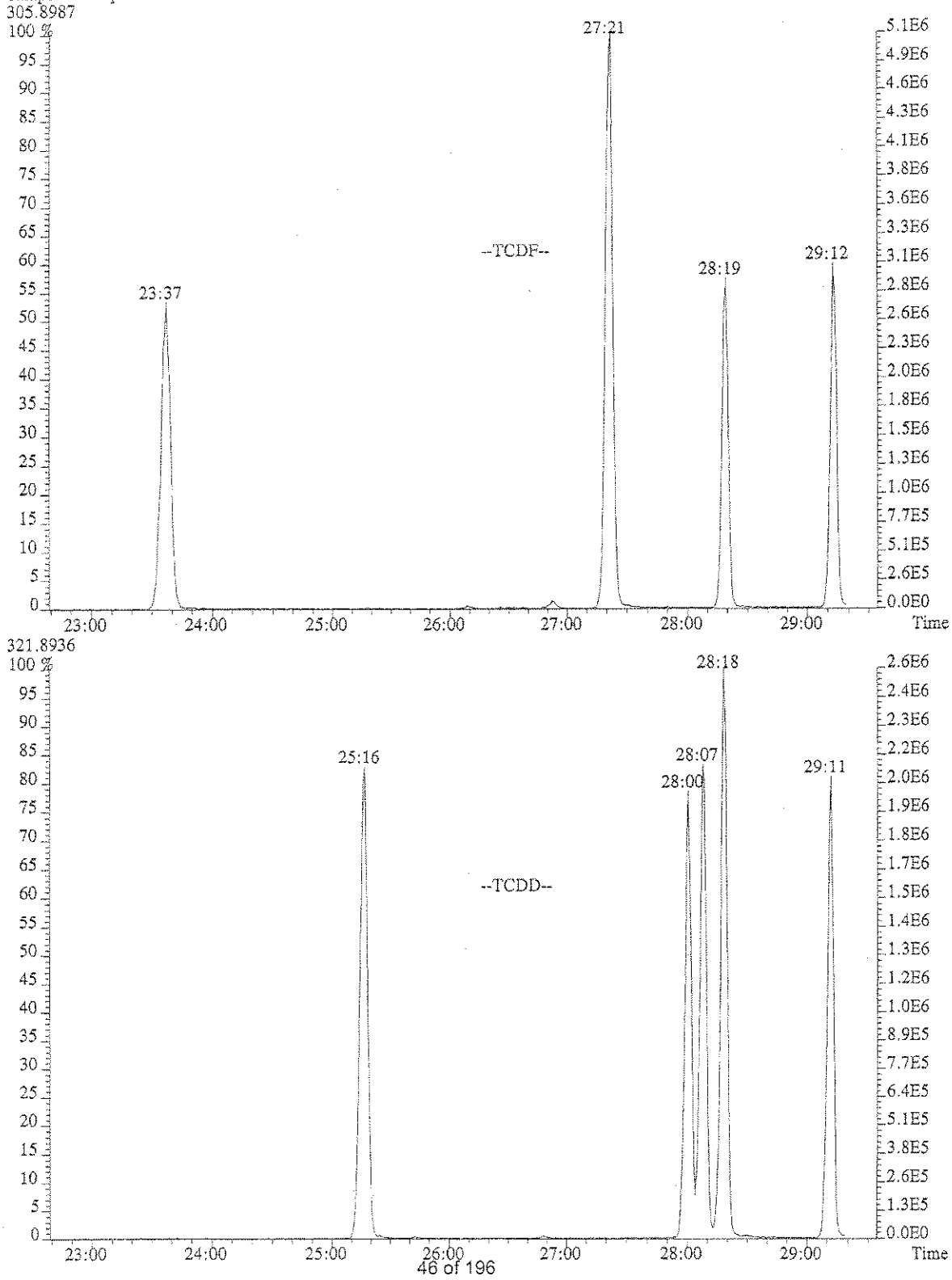
CONGENER	RT FIRST ELUTING	RT LAST ELUTING
TCDF	23:37	29:12
TCDD	25:16	29:11
PeCDF	29:27	33:11
PeCDD	30:45	32:03
HxCDF	34:02	36:19
HxCDD	34:31	35:59
HpCDF	37:41	39:02
HpCDD	37:57	38:36

% Valley 2378-TCDD 9%

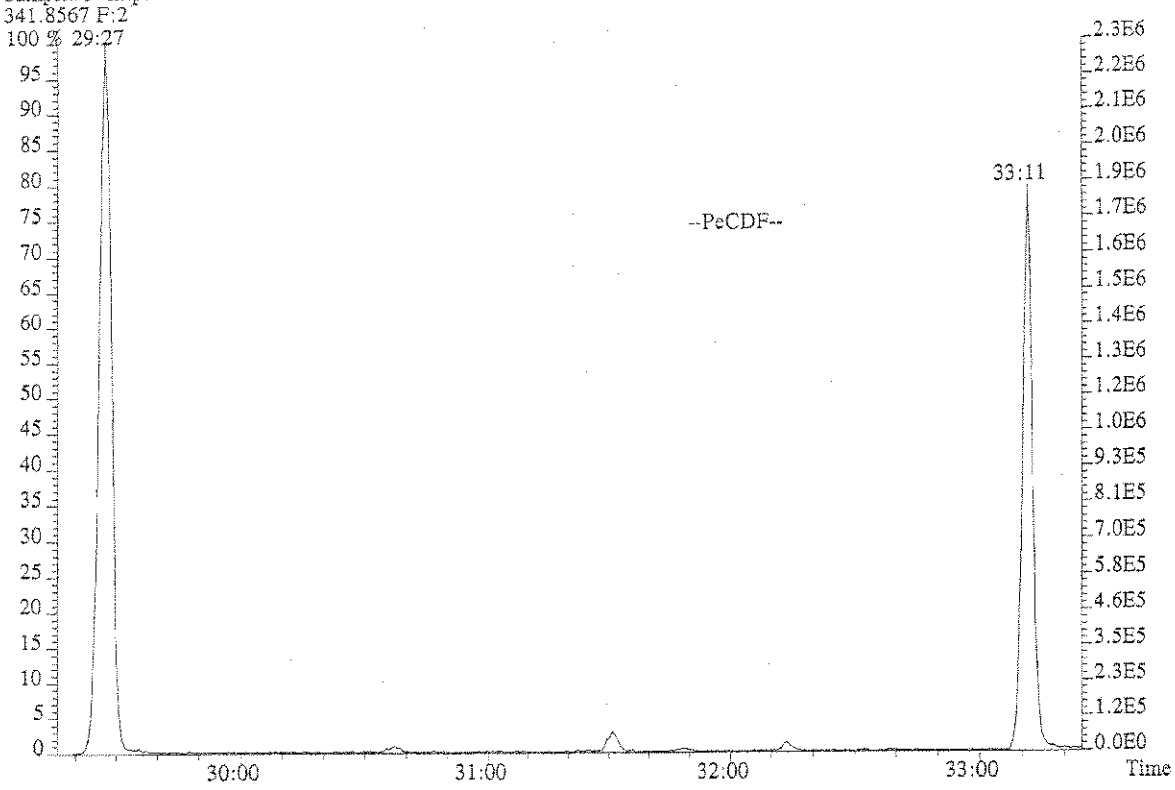
File:U122451 #1-610 Acq:20-AUG-2007 17:40:41 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 Exp:WIDOW DEFINE

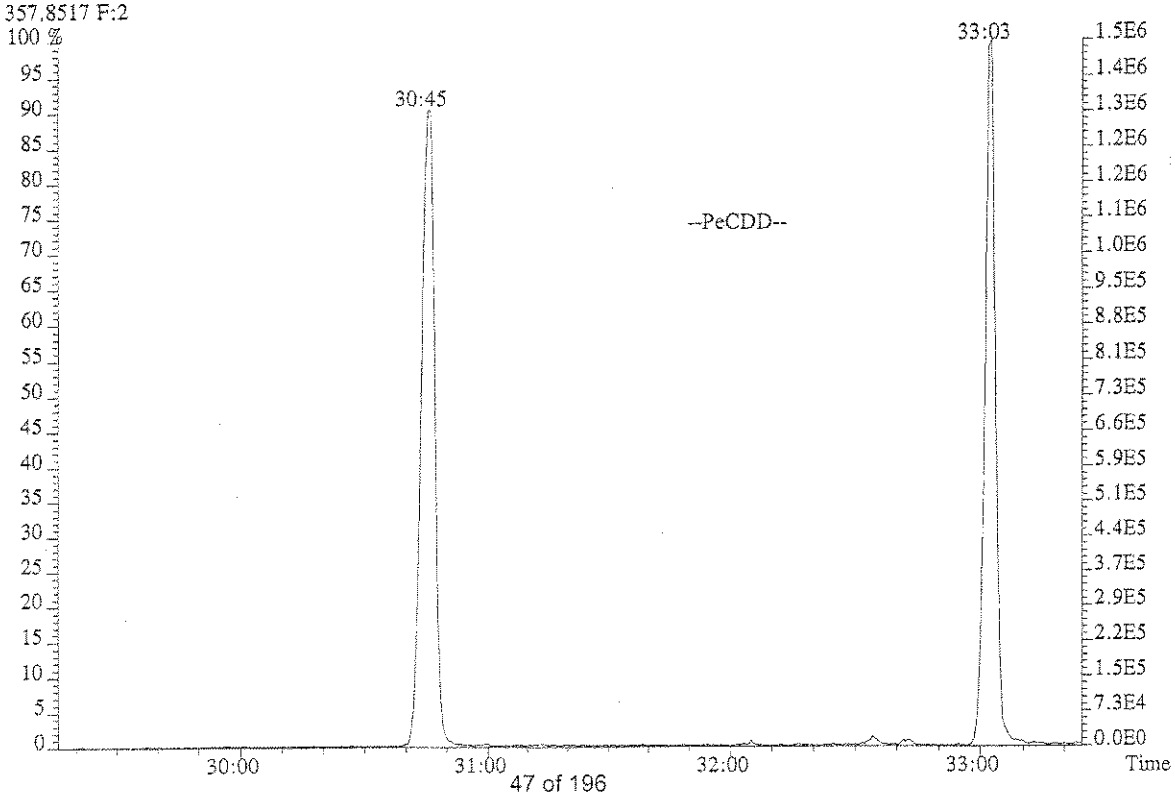


File:U122451 #1-610 Acq:20-AUG-2007 17:40:41 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 Exp:WIDOW DEFINE

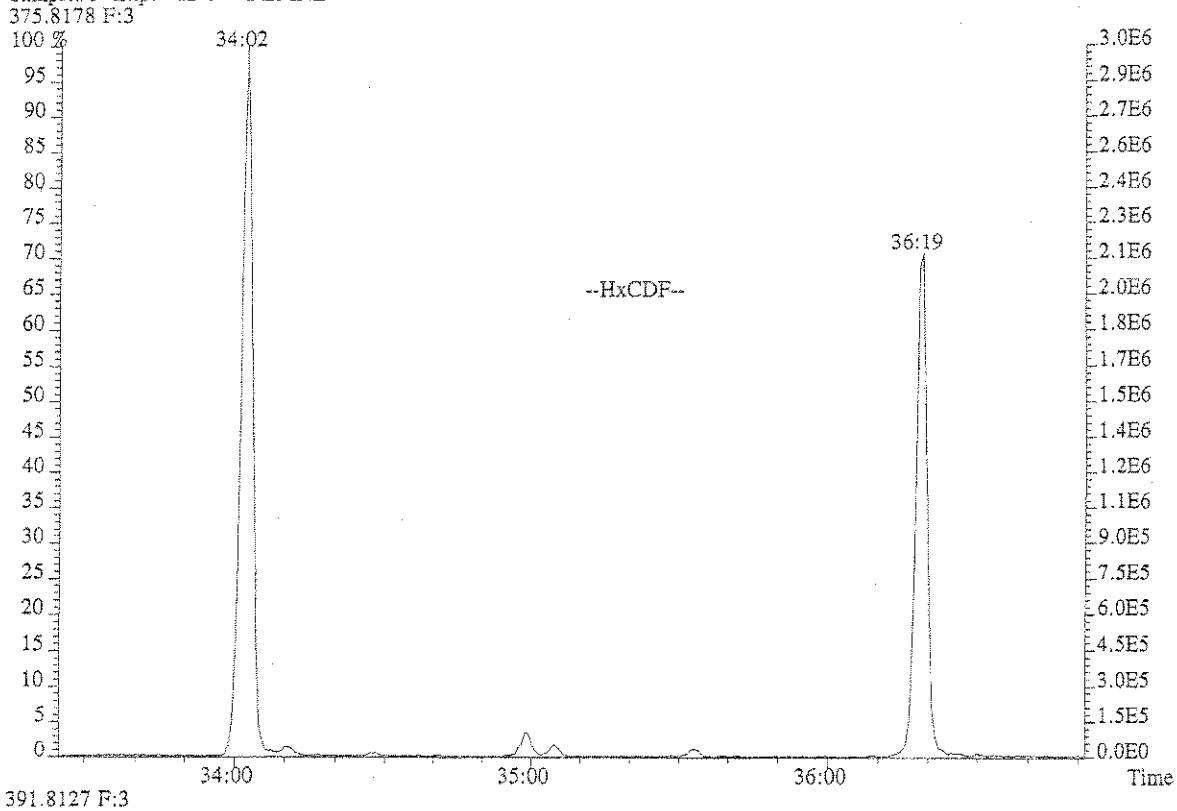


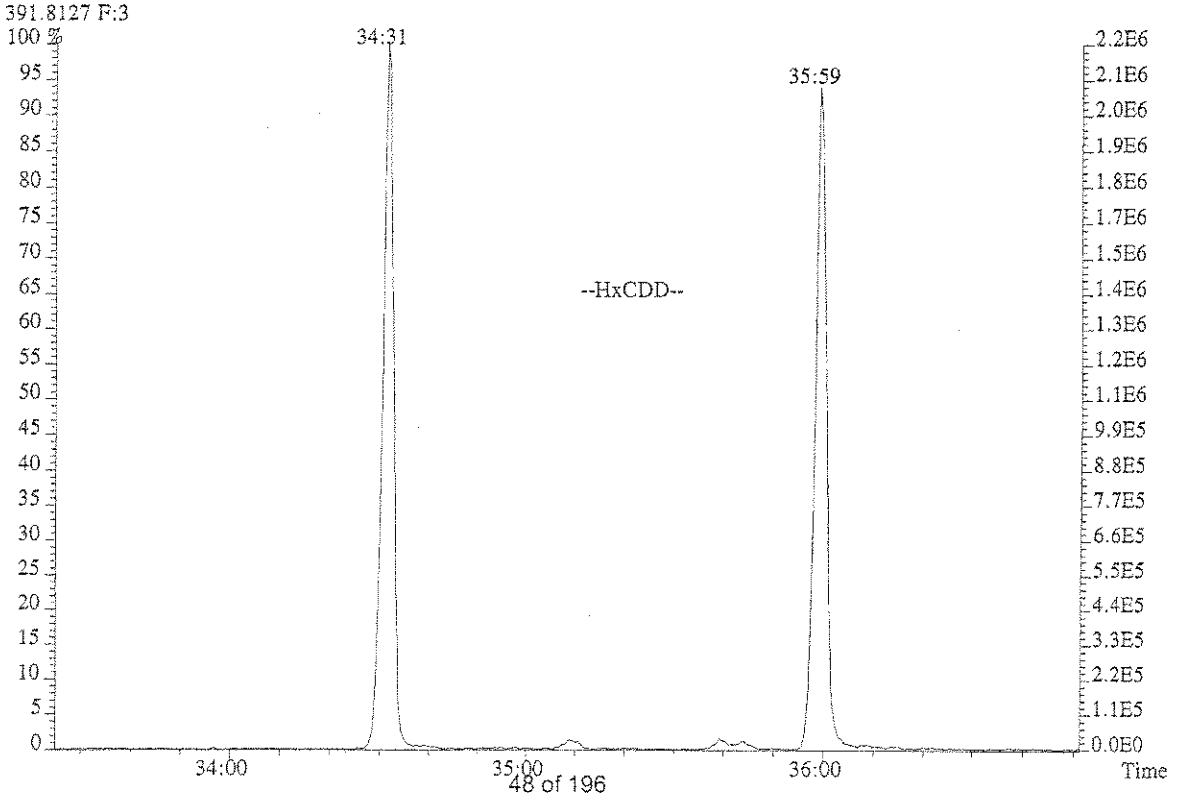
File:U122451 #1-372 Acq:20-AUG-2007 17:40:41 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 Exp:WIDOW DEFINE



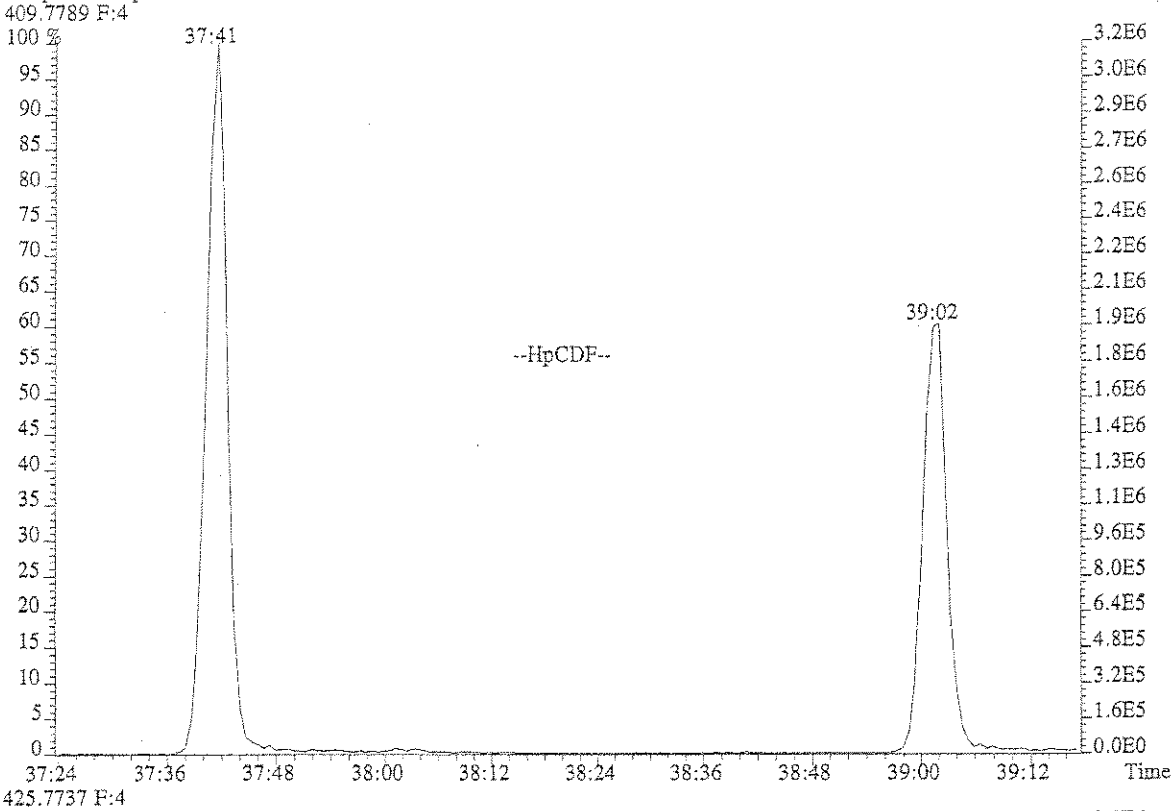


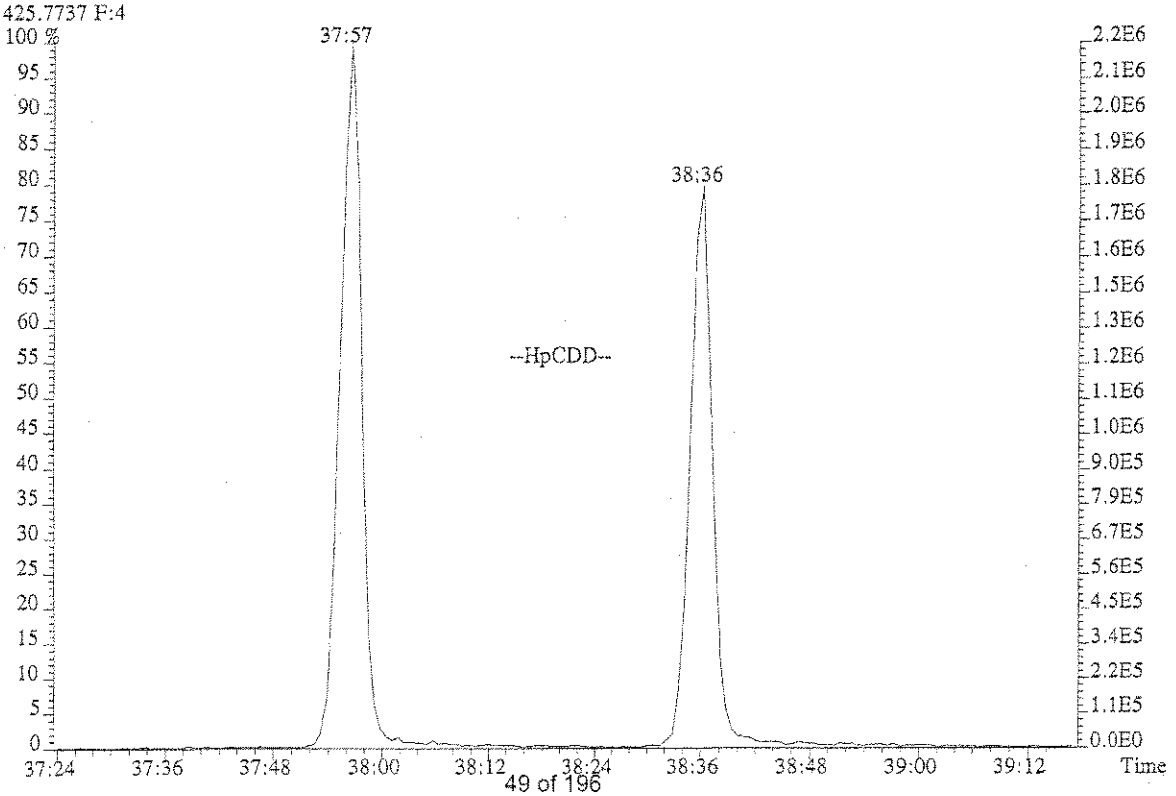
File:U122451 #1-313 Acq:20-AUG-2007 17:40:41 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 Exp:WIDOW DEFINE





File:U122451 #1-314 Acq:20-AUG-2007 17:40:41 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:WIDOW DEFINE





FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 04/02/07

Instrument ID: AutoSpec-Ultima GC Column ID: DB-5

VER Data Filename: U122452 Analysis Date: 20-AUG-07 Time: 18:26:34

	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	CCAL. RRF	MEAN RRF	%D (3)
NATIVE ANALYTES						
2,3,7,8-TCDD	M/M+2	0.74	0.65-0.89	0.98	0.96	1.85
1,2,3,7,8-PeCDD	M+2/M+4	1.56	1.32-1.78	0.92	0.91	0.45
1,2,3,4,7,8-HxCDD	M+2/M+4	1.22	1.05-1.43	1.05	1.03	1.02
1,2,3,6,7,8-HxCDD	M+2/M+4	1.24	1.05-1.43	1.00	1.07	-6.35
1,2,3,7,8,9-HxCDD	M+2/M+4	1.23	1.05-1.43	0.98	0.99	-0.47
1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.07	0.88-1.20	0.94	0.93	1.08
OCDD	M+2/M+4	0.89	0.76-1.02	1.05	1.02	3.06
2,3,7,8-TCDF	M/M+2	0.76	0.65-0.89	0.94	0.96	-1.88
1,2,3,7,8-PeCDF	M+2/M+4	1.45	1.32-1.78	0.93	0.91	2.29
2,3,4,7,8-PeCDF	M+2/M+4	1.61	1.32-1.78	0.97	0.95	2.65
1,2,3,4,7,8-HxCDF	M+2/M+4	1.24	1.05-1.43	1.16	1.17	-0.36
1,2,3,6,7,8-HxCDF	M+2/M+4	1.27	1.05-1.43	1.23	1.14	7.36
1,2,3,7,8,9-HxCDF	M+2/M+4	1.25	1.05-1.43	0.99	0.86	14.42
2,3,4,6,7,8-HxCDF	M+2/M+4	1.23	1.05-1.43	1.16	1.03	12.41
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.01	0.88-1.20	1.43	1.36	5.34
1,2,3,4,7,8,9-HpCDF	M+2/M+4	0.99	0.88-1.20	1.06	1.02	4.28
OCDF	M+2/M+4	0.89	0.76-1.02	1.16	1.09	6.03

(1) See Table 6, Method 8290, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 8, Method 8290.

(3) The beginning CCAL %RSD for the 17 unlabeled standard must not exceed +/- 20%, Section 7.7.4.1. The ending CCAL must not exceed +/-25%. Section 8.3.2.4.

8290F4A

FORM 4B
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 04/02/07

Instrument ID: AutoSpec-Ultima GC Column ID: DB-5

VER Data Filename: U122452 Analysis Date: 20-AUG-07 Time: 18:26:34

	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	CCAL. RRF	MEAN RRF	%D (3)
LABELED COMPOUNDS						
13C-2,3,7,8-TCDD	M/M+2	0.79	0.65-0.89	0.93	0.90	3.53
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.56	1.32-1.78	0.88	1.06	-16.48
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.25	1.05-1.43	0.99	1.01	-1.94
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.05	0.88-1.20	1.01	1.09	-7.32
13C-OCDD	M+2/M+4	0.92	0.76-1.02	0.97	1.17	-17.51
13C-2,3,7,8-TCDF	M/M+2	0.77	0.65-0.89	1.23	1.20	2.94
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.57	1.32-1.78	1.17	1.52	-22.61
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.56	0.43-0.59	1.13	1.28	-11.66
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.46	0.37-0.51	1.05	1.11	-5.43
CLEANUP STANDARD						
37Cl-2,3,7,8-TCDD				0.95	0.86	11.13

(1) See Table 6, Method 8290, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 8, Method 8290.

(3) The beginning CCAL %RSD for the labeled standard must not exceed +/- 30%, Section 7.7.4.2. The ending CCAL must not exceed +/- 35%, Section 8.3.2.4.

8290F4B

Columbia Analytical Services, Inc.
Sample Response Summary
CLIENT ID.
CCAL HRCC3

Run #6 Filename U122452 Samp: 1 Inj: 1 Acquired: 20-AUG-07 18:26:34
Processed: 27-AUG-07 10:26:16 LAB. ID: CCAL HRCC3

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
1	Unk	2,3,7,8-TCDF	27:20	8.782e+03	1.155e+04	0.76	yes	no
2	Unk	1,2,3,7,8-PeCDF	31:31	2.854e+04	1.972e+04	1.45	yes	no
3	Unk	2,3,4,7,8-PeCDF	32:14	3.100e+04	1.922e+04	1.61	yes	no
4	Unk	1,2,3,4,7,8-HxCDF	34:59	2.690e+04	2.170e+04	1.24	yes	no
5	Unk	1,2,3,6,7,8-HxCDF	35:05	2.864e+04	2.263e+04	1.27	yes	no
6	Unk	2,3,4,6,7,8-HxCDF	35:33	2.672e+04	2.175e+04	1.23	yes	no
7	Unk	1,2,3,7,8,9-HxCDF	36:14	2.294e+04	1.829e+04	1.25	yes	no
8	Unk	1,2,3,4,6,7,8-HpCDF	37:41	2.787e+04	2.757e+04	1.01	yes	no
9	Unk	1,2,3,4,7,8,9-HpCDF	39:01	2.050e+04	2.071e+04	0.99	yes	no
10	Unk	OCDF	41:52	3.878e+04	4.374e+04	0.89	yes	no
11	Unk	2,3,7,8-TCDD	28:07	6.830e+03	9.230e+03	0.74	yes	no
12	Unk	1,2,3,7,8-PeCDD	32:34	2.169e+04	1.395e+04	1.56	yes	no
13	Unk	1,2,3,4,7,8-HxCDD	35:39	2.088e+04	1.718e+04	1.22	yes	no
14	Unk	1,2,3,6,7,8-HxCDD	35:44	2.018e+04	1.624e+04	1.24	yes	no
15	Unk	1,2,3,7,8,9-HxCDD	36:01	1.975e+04	1.606e+04	1.23	yes	no
16	Unk	1,2,3,4,6,7,8-HpCDD	38:36	1.811e+04	1.685e+04	1.07	yes	no
17	Unk	OCDD	41:42	3.531e+04	3.958e+04	0.89	yes	no
18	IS	13C-2,3,7,8-TCDF	27:19	4.717e+04	6.132e+04	0.77	yes	no
19	IS	13C-1,2,3,7,8-PeCDF	31:30	6.331e+04	4.021e+04	1.57	yes	no
20	IS	13C-1,2,3,4,7,8-HxCDF	34:58	7.474e+04	1.344e+05	0.56	yes	no
21	IS	13C-1,2,3,4,6,7,8-HpCDF	37:41	6.094e+04	1.327e+05	0.46	yes	no
22	IS	13C-2,3,7,8-TCDD	28:07	3.615e+04	4.595e+04	0.79	yes	no
23	IS	13C-1,2,3,7,8-PeCDD	32:34	4.743e+04	3.038e+04	1.56	yes	no
24	IS	13C-1,2,3,6,7,8-HxCDD	35:43	1.013e+05	8.074e+04	1.25	yes	no
25	IS	13C-1,2,3,4,6,7,8-HpCDD	38:35	9.579e+04	9.115e+04	1.05	yes	no
26	IS	13C-OCDD	41:41	1.708e+05	1.863e+05	0.92	yes	no
27	RS/RT	13C-1,2,3,4-TCDD	27:55	3.876e+04	4.939e+04	0.78	yes	no
28	RS/RT	13C-1,2,3,7,8,9-HxCDD	36:00	1.030e+05	8.134e+04	1.27	yes	no
29	C/Up	37Cl-2,3,7,8-TCDD	28:07	1.683e+04				
					SUM AREA			
30	Tot	Total Tetra-Furans	27:20		2.033e+04	0.76	yes	
31	Tot	Total Tetra-Dioxins	28:07		1.609e+04	0.74	yes	
32	Tot	Total Penta-Furans	31:31		9.874e+04	1.45	yes	
33	Tot	Total Penta-Dioxins	32:34		3.564e+04	1.56	yes	
34	Tot	Total Hexa-Furans	34:59		1.896e+05	1.24	yes	
35	Tot	Total Hexa-Dioxins	35:39		1.103e+05	1.22	yes	
36	Tot	Total Hepta-Furans	37:41		9.688e+04	1.01	yes	
37	Tot	Total Hepta-Dioxins	37:57		3.529e+04	1.04	yes	

Columbia Analytical Services, Inc.
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Columbia Analytical Services,Inc. CLIENT ID.
Signal/Noise Height Ratio Summary CCAL HRCC3

Run #6 Filename U122452 Samp: 1 Inj: 1 Acquired: 20-AUG-07 18:26:34

Processed: 27-AUG-07 10:26:16 LAB. ID: CCAL HRCC3

	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	1.41e+06	3.56e+02	4.0e+03	1.92e+06	1.23e+03	1.6e+03
2	1,2,3,7,8-PeCDF	5.37e+06	7.28e+02	7.4e+03	3.71e+06	1.59e+03	2.3e+03
3	2,3,4,7,8-PeCDF	6.02e+06	7.28e+02	8.3e+03	3.73e+06	1.59e+03	2.3e+03
4	1,2,3,4,7,8-HxCDF	5.92e+06	1.47e+03	4.0e+03	4.75e+06	1.55e+03	3.1e+03
5	1,2,3,6,7,8-HxCDF	6.03e+06	1.47e+03	4.1e+03	4.70e+06	1.55e+03	3.0e+03
6	2,3,4,6,7,8-HxCDF	5.69e+06	1.47e+03	3.9e+03	4.68e+06	1.55e+03	3.0e+03
7	1,2,3,7,8,9-HxCDF	4.77e+06	1.47e+03	3.2e+03	3.87e+06	1.55e+03	2.5e+03
8	1,2,3,4,6,7,8-HpCDF	5.97e+06	3.21e+03	1.9e+03	5.87e+06	2.56e+03	2.3e+03
9	1,2,3,4,7,8,9-HpCDF	4.01e+06	3.21e+03	1.2e+03	4.05e+06	2.56e+03	1.6e+03
10	OCDF	5.77e+06	8.24e+02	7.0e+03	6.59e+06	1.92e+03	3.4e+03
11	2,3,7,8-TCDD	1.16e+06	1.16e+03	1.0e+03	1.54e+06	5.52e+02	2.8e+03
12	1,2,3,7,8-PeCDD	4.28e+06	1.94e+03	2.2e+03	2.81e+06	4.68e+02	6.0e+03
13	1,2,3,4,7,8-HxCDD	4.52e+06	1.31e+03	3.4e+03	3.71e+06	1.57e+03	2.4e+03
14	1,2,3,6,7,8-HxCDD	4.48e+06	1.31e+03	3.4e+03	3.64e+06	1.57e+03	2.3e+03
15	1,2,3,7,8,9-HxCDD	4.34e+06	1.31e+03	3.3e+03	3.54e+06	1.57e+03	2.2e+03
16	1,2,3,4,6,7,8-HpCDD	3.66e+06	1.78e+03	2.1e+03	3.43e+06	1.95e+03	1.8e+03
17	OCDD	5.12e+06	9.52e+02	5.4e+03	5.74e+06	8.36e+02	6.9e+03
18	13C-2,3,7,8-TCDF	7.57e+06	3.08e+03	2.5e+03	9.87e+06	2.39e+03	4.1e+03
19	13C-1,2,3,7,8-PeCDF	1.19e+07	3.60e+02	3.3e+04	7.66e+06	6.28e+02	1.2e+04
20	13C-1,2,3,4,7,8-HxCDF	1.62e+07	4.92e+02	3.3e+04	2.91e+07	1.44e+03	2.0e+04
21	13C-1,2,3,4,6,7,8-HpCDF	1.32e+07	5.42e+03	2.4e+03	2.83e+07	6.53e+03	4.3e+03
22	13C-2,3,7,8-TCDD	6.10e+06	2.99e+03	2.0e+03	7.68e+06	1.07e+03	7.2e+03
23	13C-1,2,3,7,8-PeCDD	9.15e+06	1.16e+03	7.9e+03	5.86e+06	6.32e+02	9.3e+03
24	13C-1,2,3,6,7,8-HxCDD	2.19e+07	1.31e+03	1.7e+04	1.77e+07	1.20e+03	1.5e+04
25	13C-1,2,3,4,6,7,8-HpCDD	1.94e+07	1.01e+03	1.9e+04	1.86e+07	1.26e+03	1.5e+04
26	13C-OCDD	2.47e+07	1.03e+03	2.4e+04	2.71e+07	8.88e+02	3.1e+04
27	13C-1,2,3,4-TCDD	6.62e+06	2.99e+03	2.2e+03	8.39e+06	1.07e+03	7.9e+03
28	13C-1,2,3,7,8,9-HxCDD	2.25e+07	1.31e+03	1.7e+04	1.78e+07	1.20e+03	1.5e+04
29	37Cl-2,3,7,8-TCDD	2.84e+06	6.76e+02	4.2e+03			

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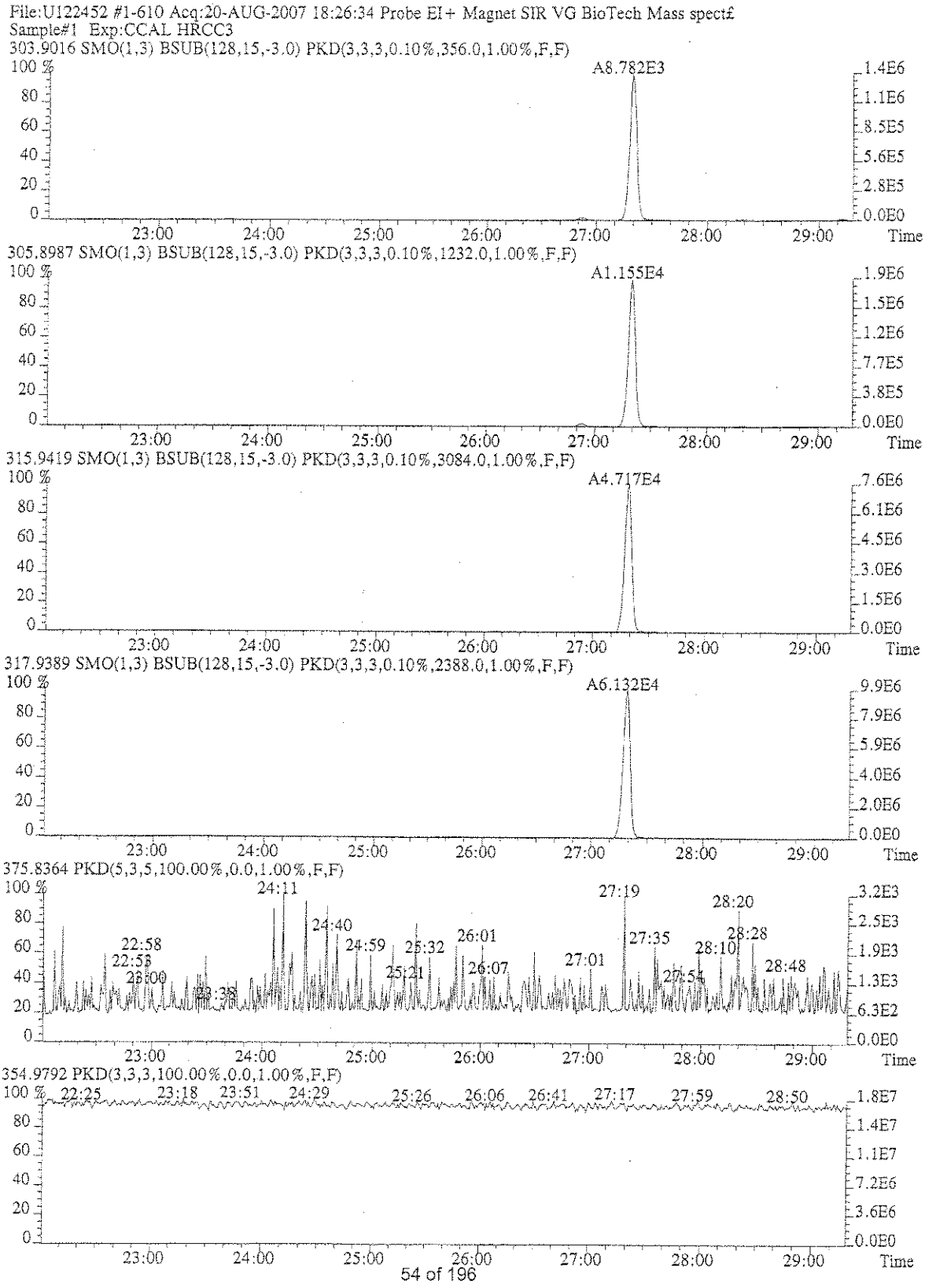
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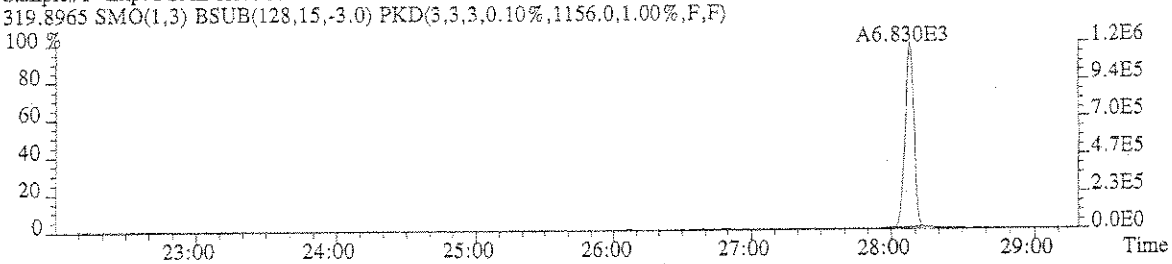
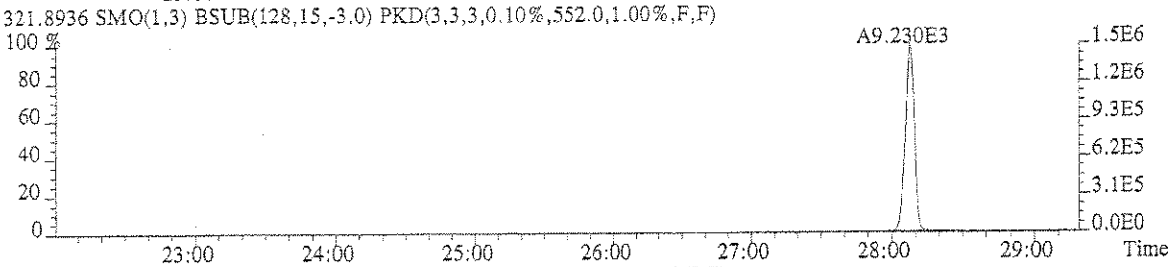
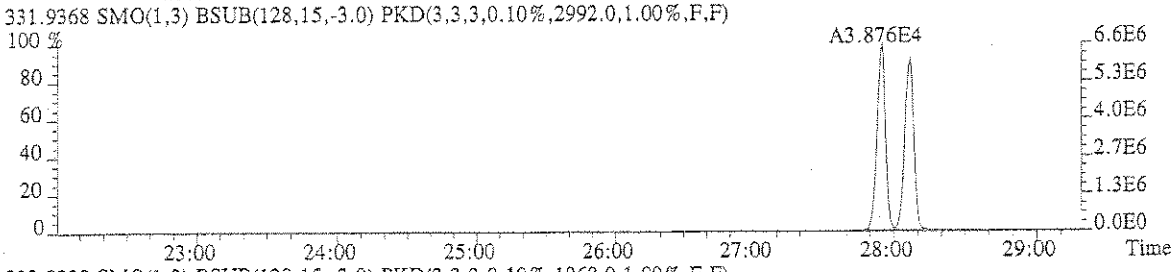
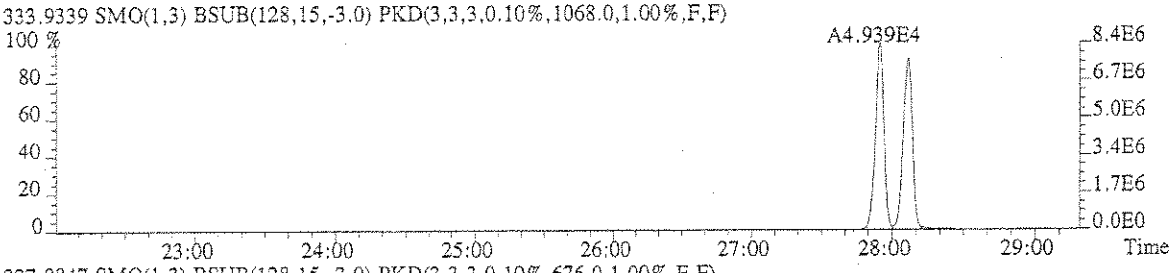
Sample#1 Exp:CCAL HRCC3
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,356.0,1.00%,F,F)
A8.782E3
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1232.0,1.00%,F,F)
A1.155E4
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,3084.0,1.00%,F,F)
A4.717E4
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2388.0,1.00%,F,F)
A6.132E4
375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)
Time

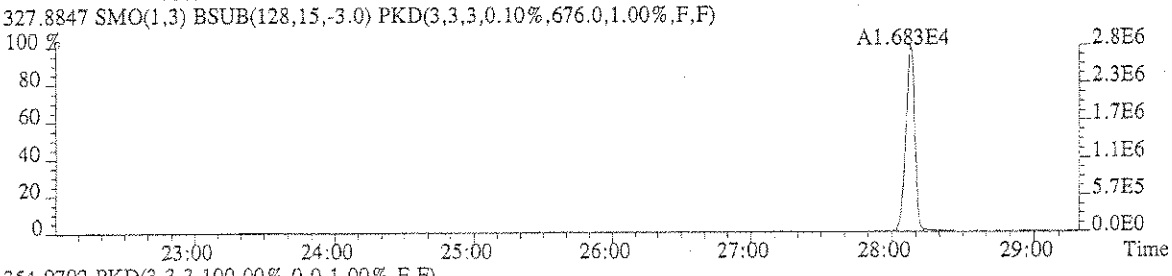
File:U122452 #1-610 Acq:20-AUG-2007 18:26:34 Probe EI+ Magnet SIR VG BioTech Mass spectr
Sample#1 Exp:CCAL HRCC3

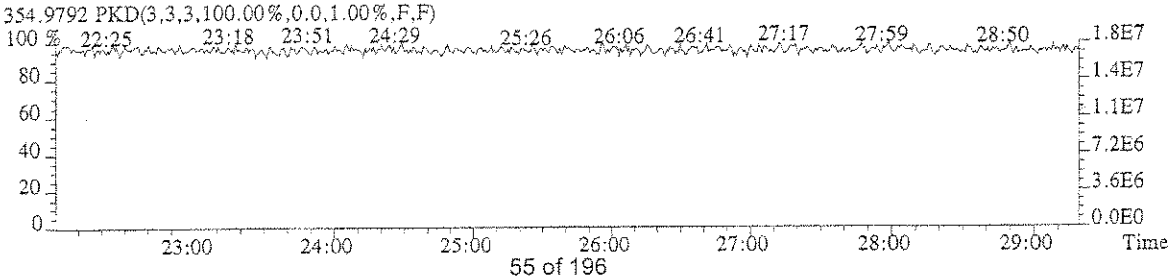






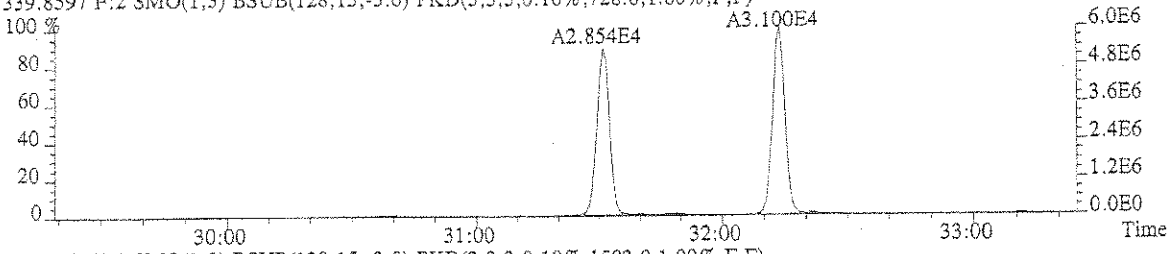






File:U122452 #1-372 Acq:20-AUG-2007 18:26:34 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 Exp:CCAL HRCC3

339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,728.0,1.00%,F,F)



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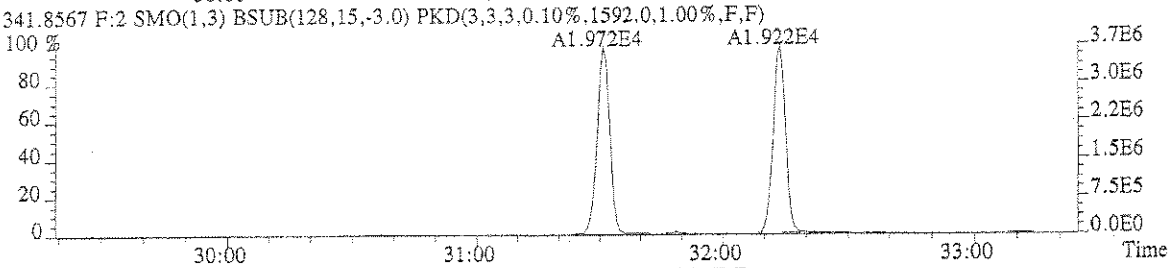
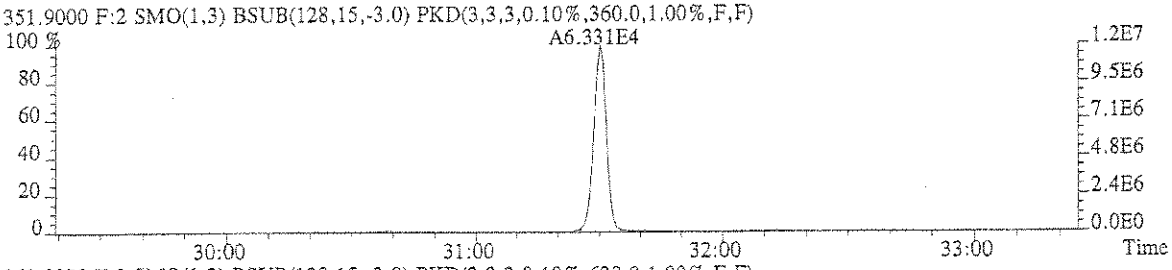
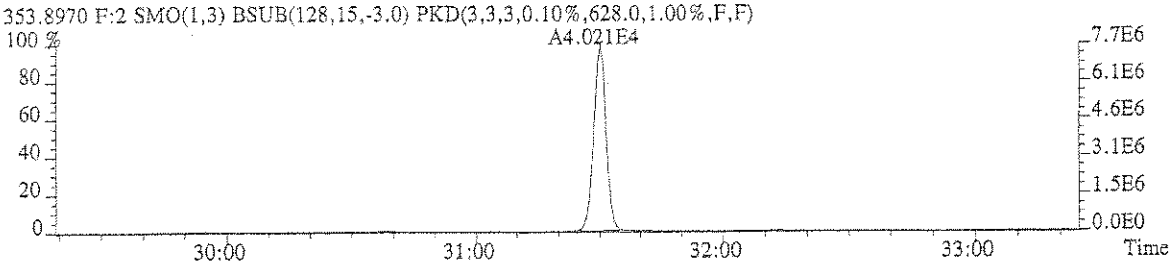


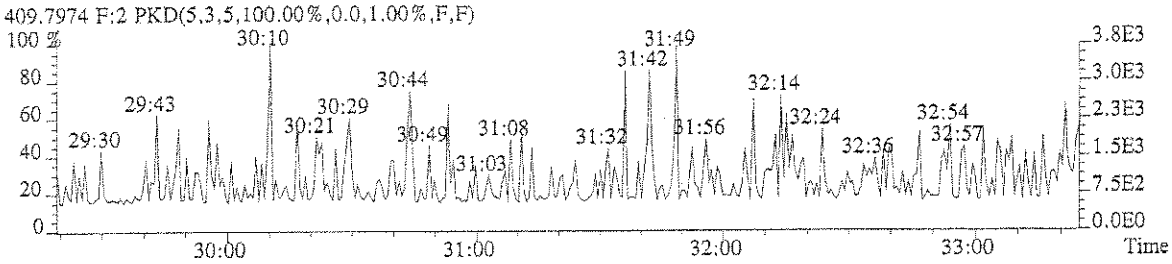
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,360.0,1.00%,F,F)



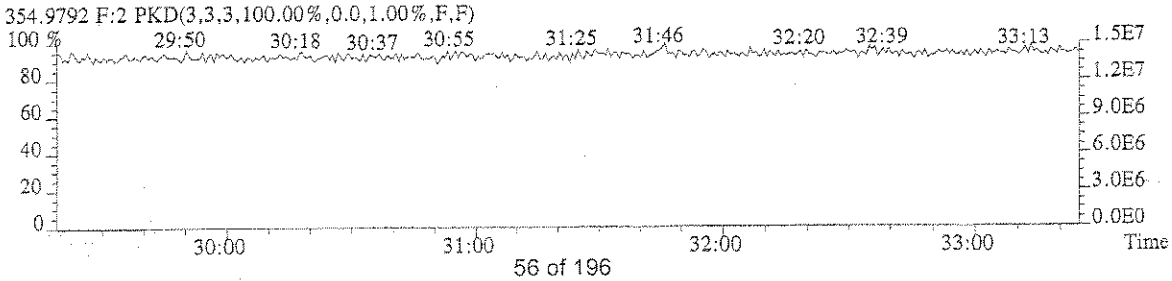
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,628.0,1.00%,F,F)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



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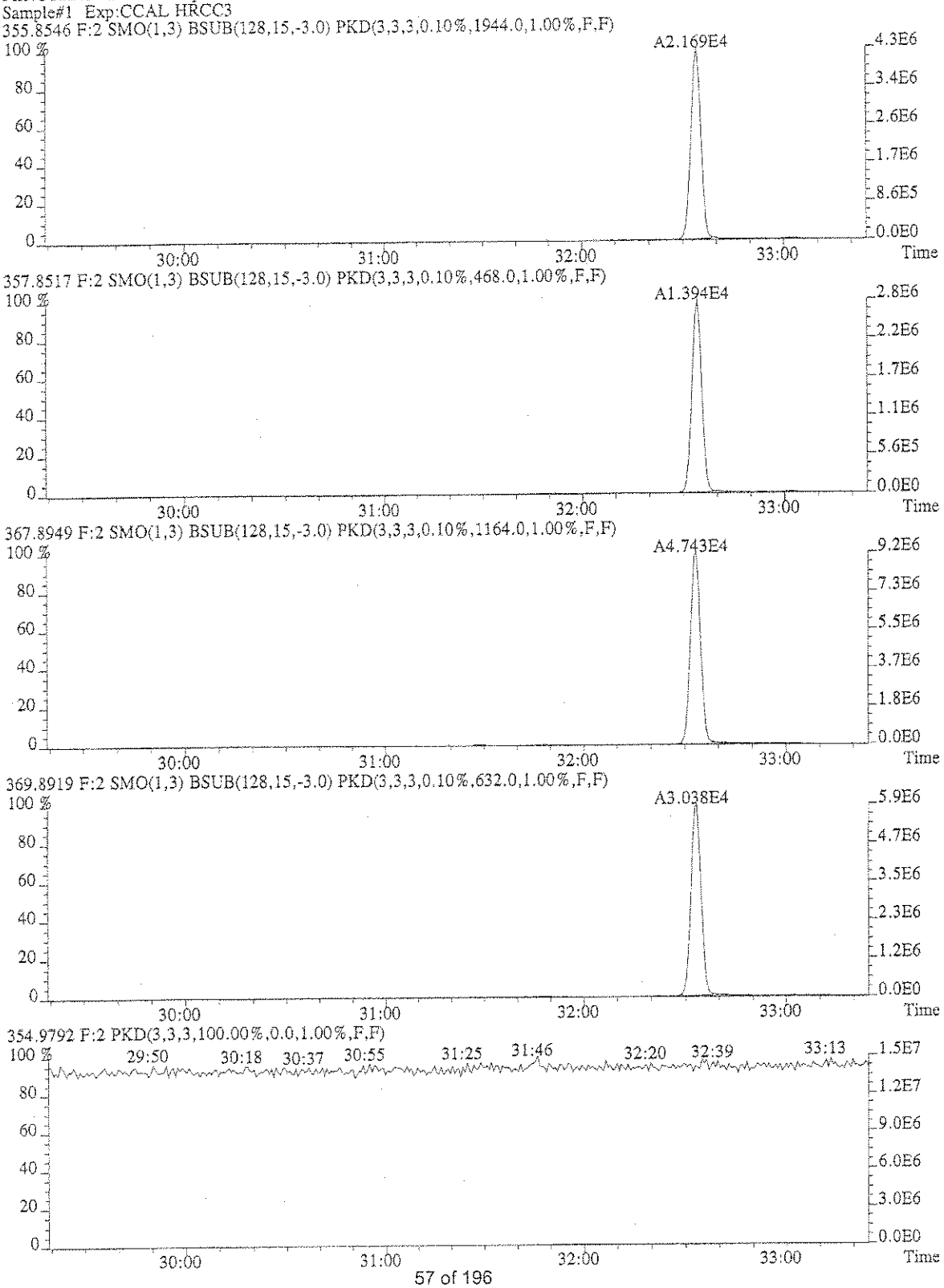
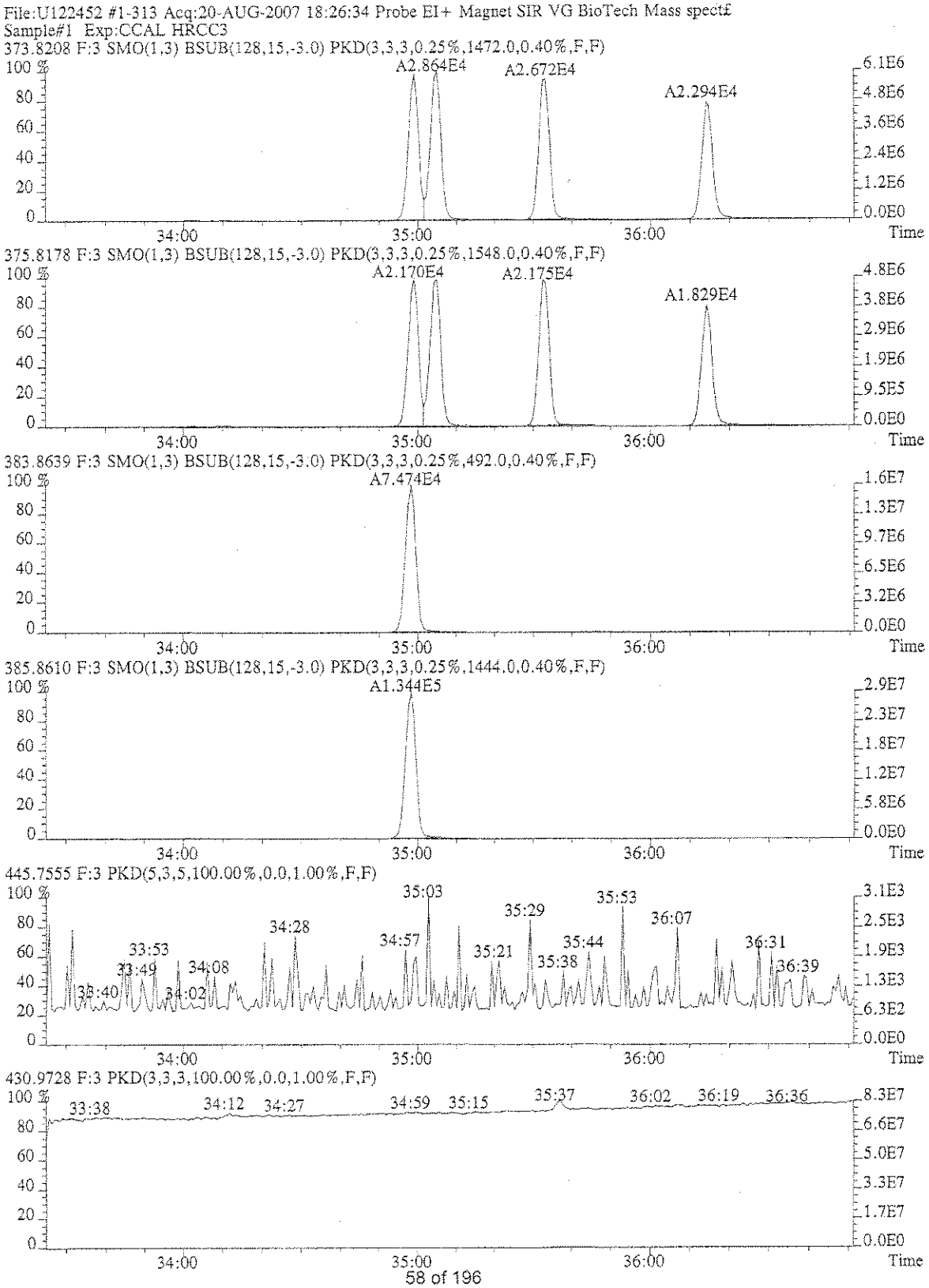
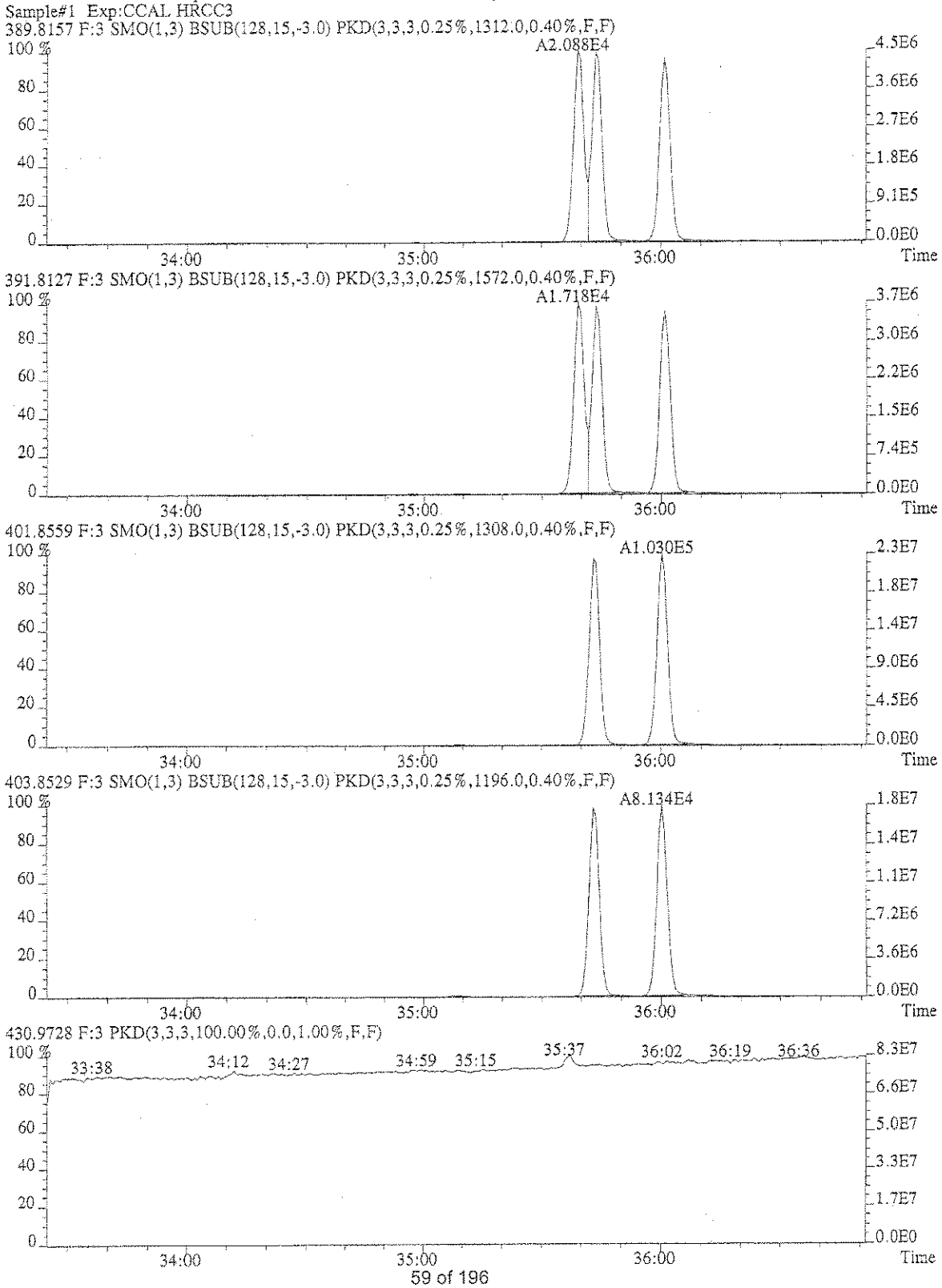
Sample#1 Exp:CCAL HRCC3



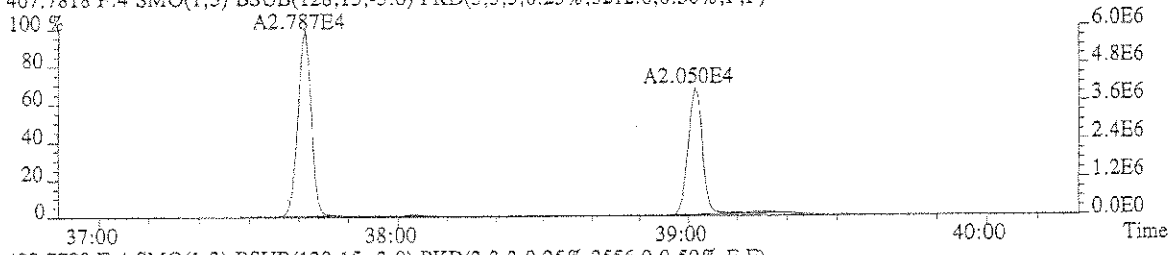

File:U122452 #1-313 Acq:20-AUG-2007 18:26:34 Probe EI+ Magnet SIR VG BioTech Mass spectr
Sample#1 Exp:CCAL HRCC3
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1472.0,0.40%,F,F)
A2.864E4
A2.672E4
A2.294E4
375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1548.0,0.40%,F,F)
A2.170E4
A2.175E4
A1.829E4
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,492.0,0.40%,F,F)
A7.474E4
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1444.0,0.40%,F,F)
A1.344E5
445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)
33:53
33:49
34:08
34:28
34:57
35:03
35:21
35:29
35:38
35:44
35:53
36:07
36:31
36:39
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)
33:38
34:12
34:27
34:59
35:15
35:37
36:02
36:19
36:36
Time

File:U122452 #1-313 Acq:20-AUG-2007 18:26:34 Probe EI+ Magnet SIR VG BioTech Mass spectr
Sample#1 Exp:CCAL HRCC3

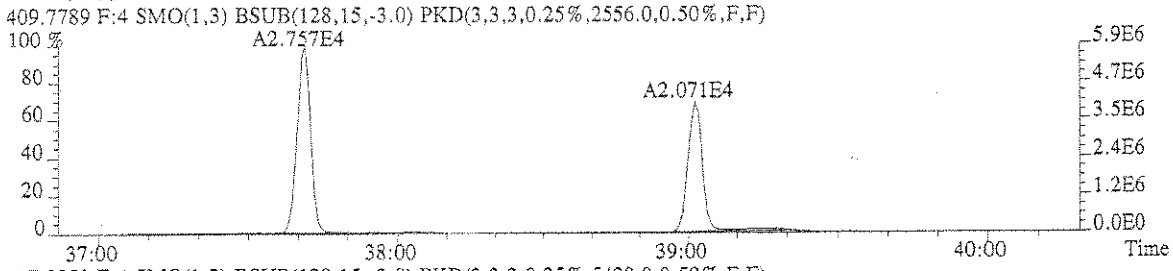


File:U122452 #1-314 Acq:20-AUG-2007 18:26:34 Probe EI+ Magnet SIR VG BioTech Mass spectr
Sample#1 Exp:CCAL HRCC3

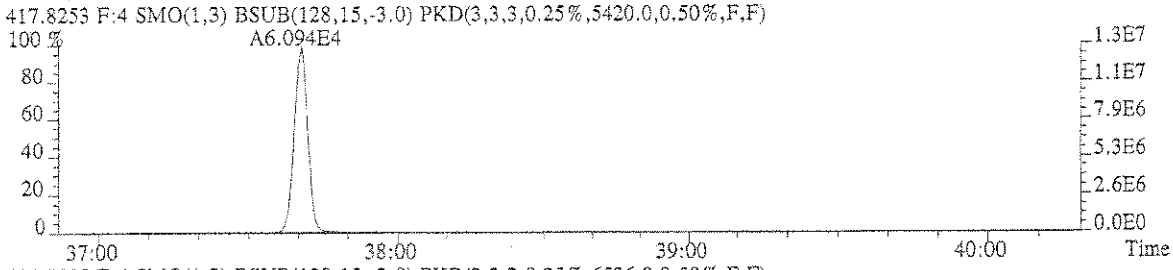
407.7818 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,3212.0,0.50%,F,F)



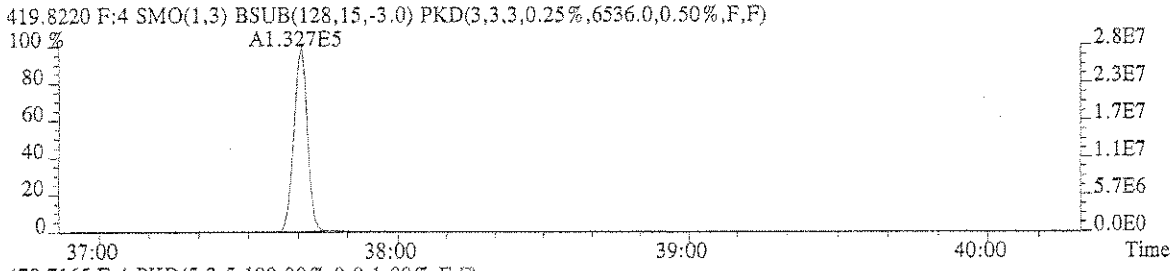
409.7789 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,2556.0,0.50%,F,F)



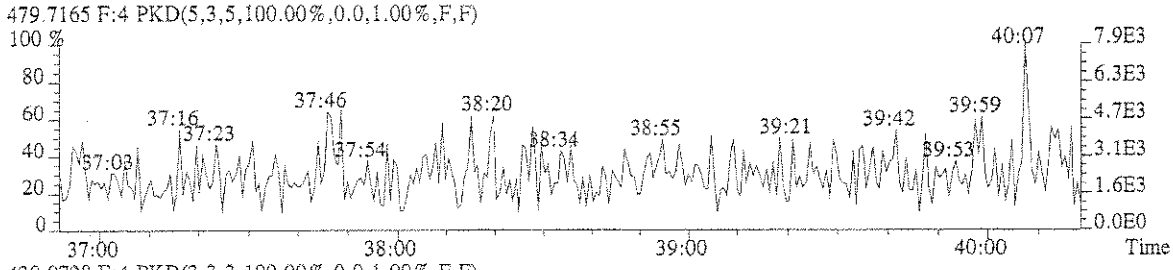
417.8253 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,5420.0,0.50%,F,F)



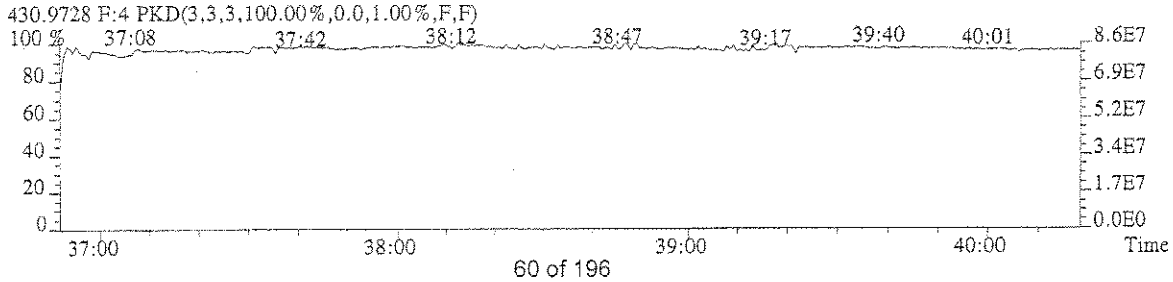
419.8220 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,6536.0,0.50%,F,F)



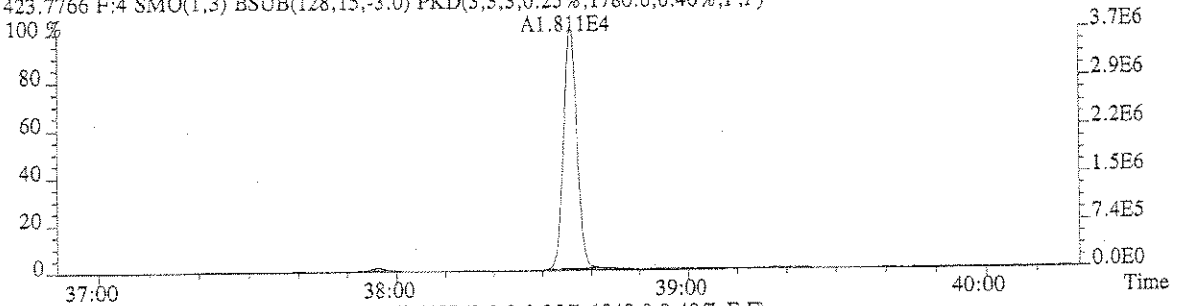
479.7165 F:4 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



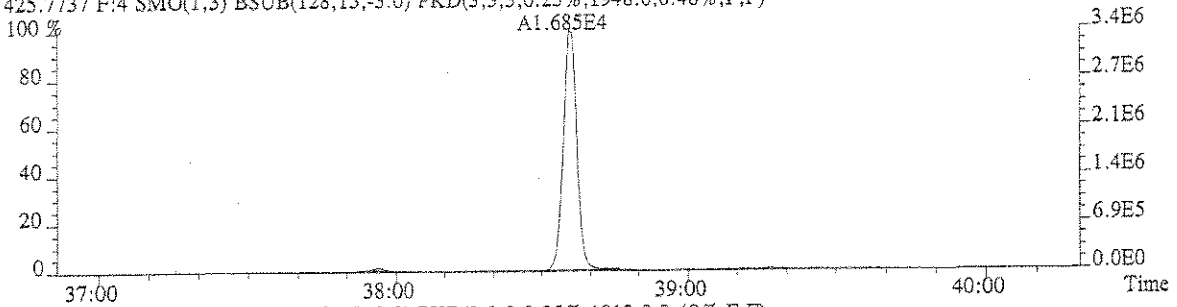
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



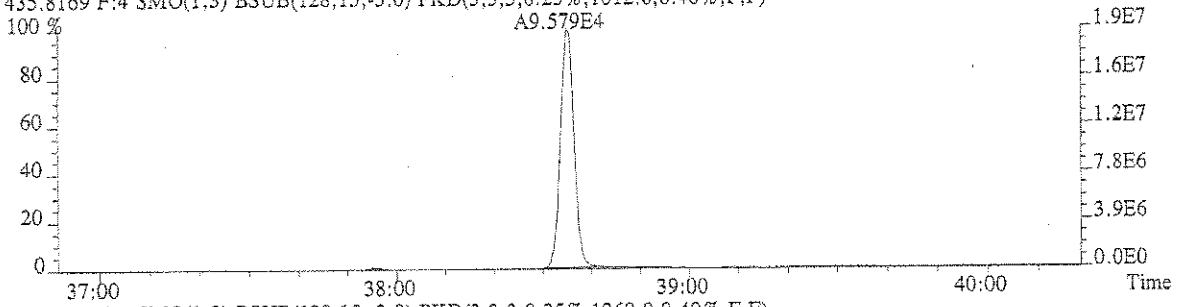
File:U122452 #1-314 Acq:20-AUG-2007 18:26:34 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:CCAL HRCC3
423.7766 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1780.0,0.40%,F,F)



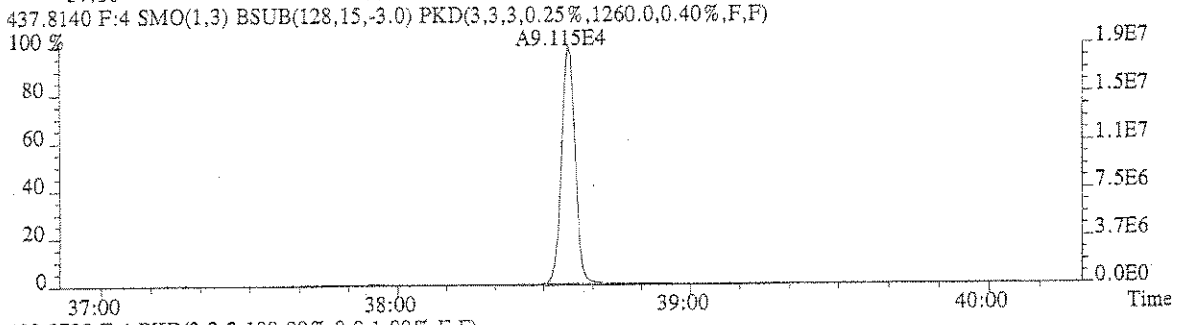
425.7737 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1948.0,0.40%,F,F)



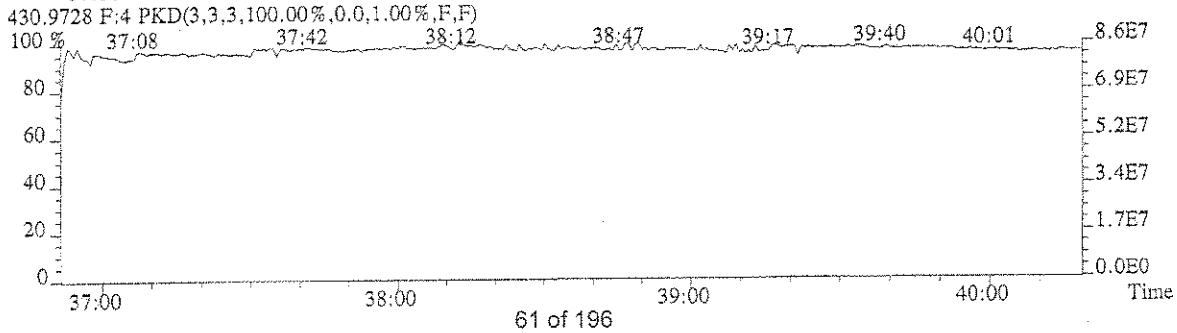
435.8169 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1012.0,0.40%,F,F)

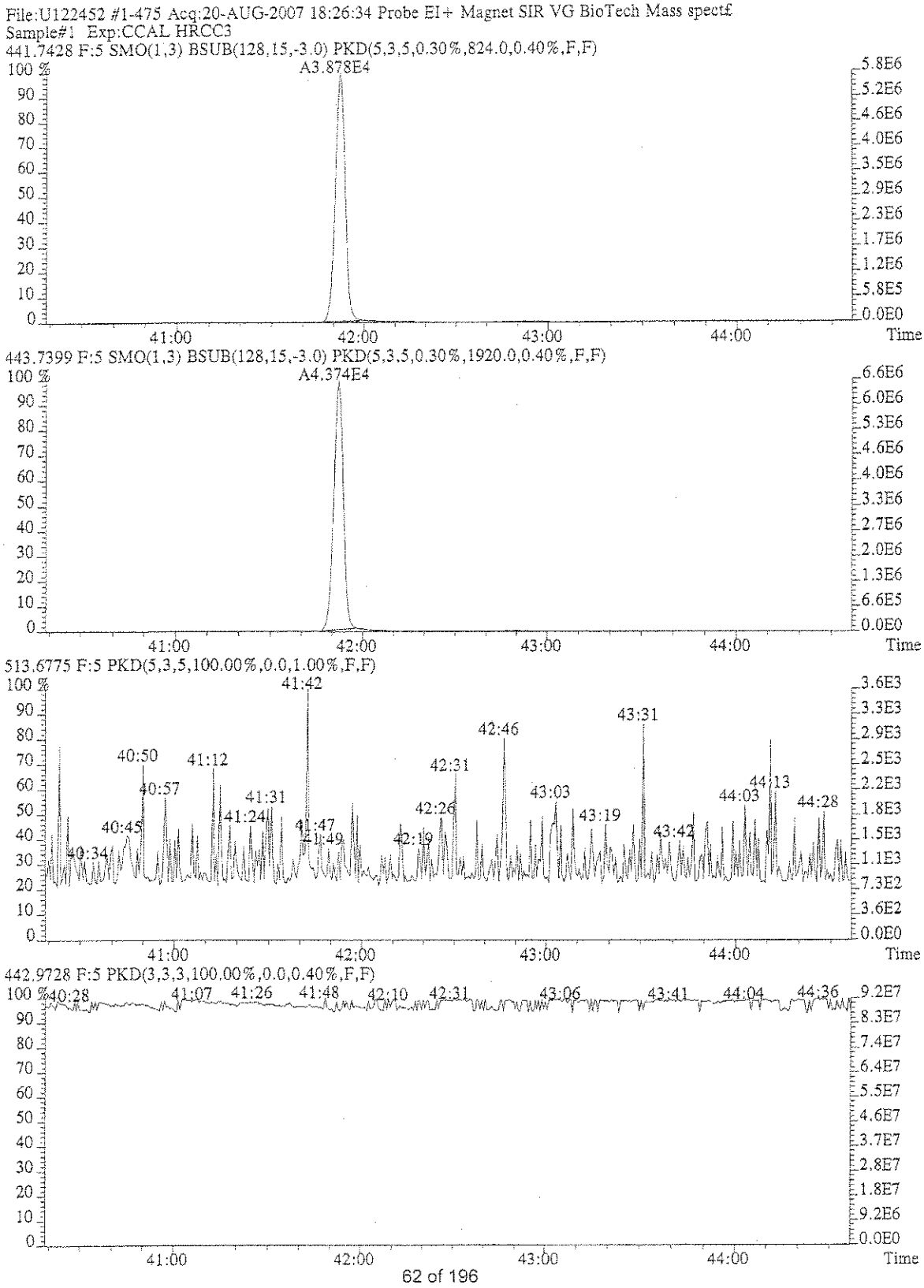


437.8140 F:4 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,1260.0,0.40%,F,F)



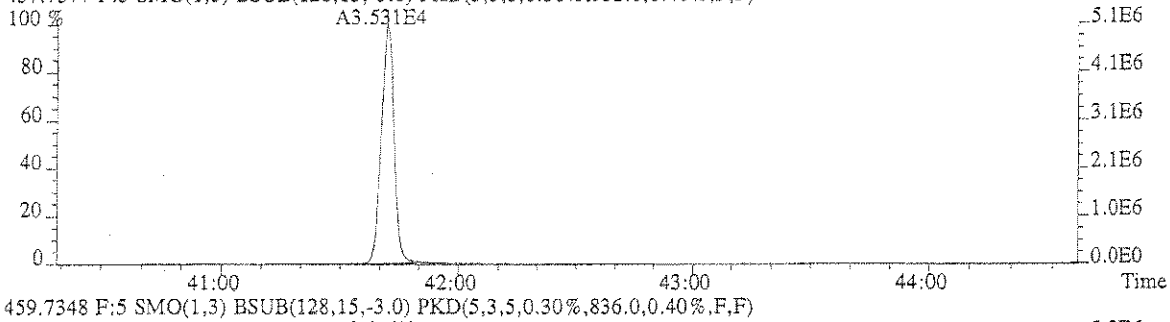
430.9728 F:4 PKD(3,3,3,100.00%,0.0,1.00%,F,F)



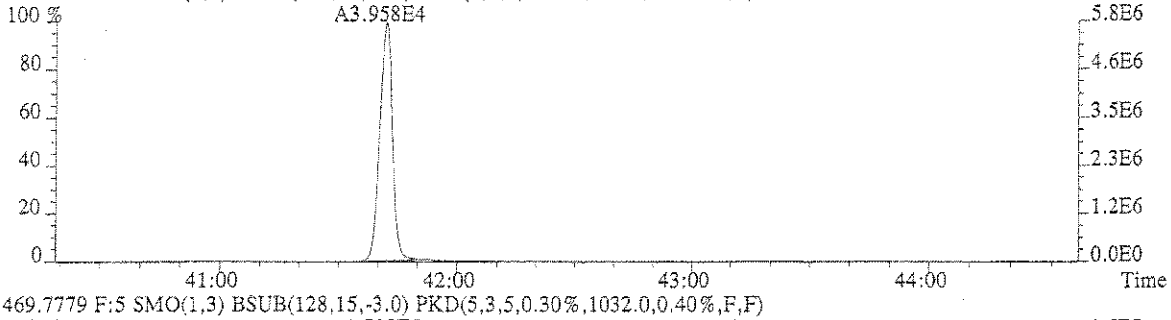

File:U122452 #1-475 Acq:20-AUG-2007 18:26:34 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:CCAL HRCC3
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,824.0,0.40%,F,F)
A3.878E4
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1920.0,0.40%,F,F)
A4.374E4
513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)
40:34
40:45
40:50
40:57
41:12
41:24
41:31
41:42
41:47
41:49
42:19
42:26
42:31
42:46
43:03
43:19
43:31
43:42
44:03
44:13
44:28
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)
40:28
41:07
41:26
41:48
42:10
42:31
43:06
43:41
44:04
44:36
Time

File:U122452 #1-475 Acq:20-AUG-2007 18:26:34 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 Exp:CCAL HRCC3

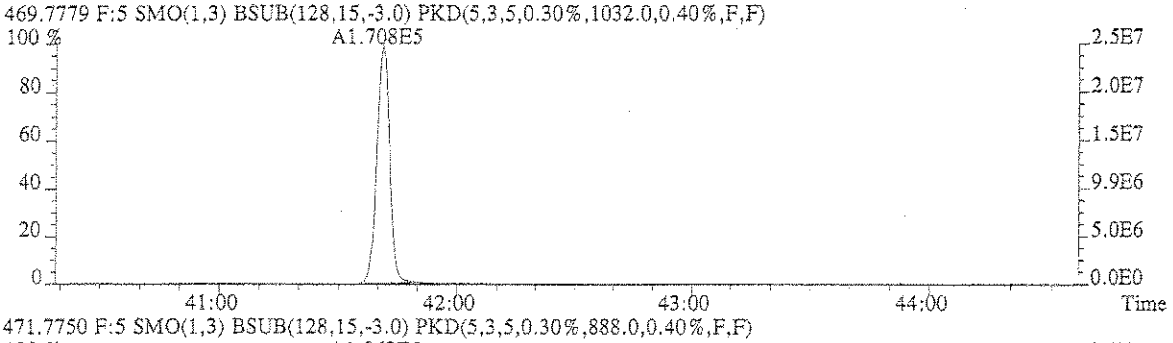
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,952.0,0.40%,F,F)



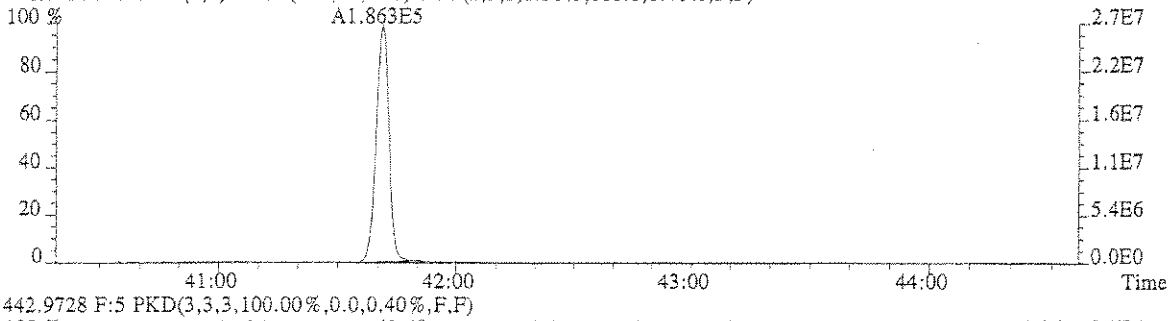
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,836.0,0.40%,F,F)



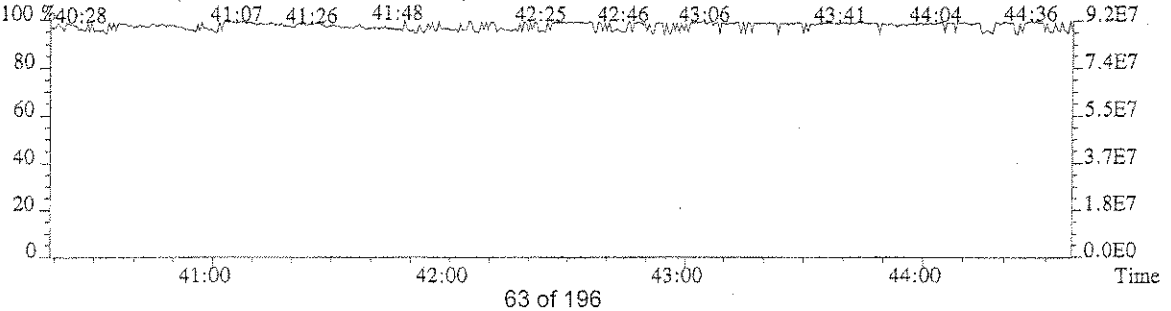
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1032.0,0.40%,F,F)



471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,888.0,0.40%,F,F)



442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)



FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 04/02/07

Instrument ID: AutoSpec-Ultima GC Column ID: DB-5

VER Data Filename: U122466 Analysis Date: 21-AUG-07 Time: 05:45:09

	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	CCAL. RRF	MEAN RRF	%D (3)
NATIVE ANALYTES						
2,3,7,8-TCDD	M/M+2	0.78	0.65-0.89	0.99	0.96	2.92
1,2,3,7,8-PeCDD	M+2/M+4	1.57	1.32-1.78	0.92	0.91	1.40
1,2,3,4,7,8-HxCDD	M+2/M+4	1.23	1.05-1.43	0.95	1.03	-7.88
1,2,3,6,7,8-HxCDD	M+2/M+4	1.26	1.05-1.43	0.99	1.07	-7.74
1,2,3,7,8,9-HxCDD	M+2/M+4	1.27	1.05-1.43	0.98	0.99	-0.56
1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.07	0.88-1.20	0.95	0.93	2.31
OCDD	M+2/M+4	0.89	0.76-1.02	1.03	1.02	0.97
2,3,7,8-TCDF	M/M+2	0.79	0.65-0.89	0.96	0.96	0.04
1,2,3,7,8-PeCDF	M+2/M+4	1.58	1.32-1.78	0.93	0.91	2.42
2,3,4,7,8-PeCDF	M+2/M+4	1.55	1.32-1.78	0.97	0.95	2.75
1,2,3,4,7,8-HxCDF	M+2/M+4	1.23	1.05-1.43	1.23	1.17	5.59
1,2,3,6,7,8-HxCDF	M+2/M+4	1.25	1.05-1.43	1.18	1.14	3.26
1,2,3,7,8,9-HxCDF	M+2/M+4	1.25	1.05-1.43	1.03	0.86	19.12
2,3,4,6,7,8-HxCDF	M+2/M+4	1.24	1.05-1.43	1.13	1.03	9.77
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.01	0.88-1.20	1.47	1.36	8.00
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.04	0.88-1.20	1.02	1.02	-0.36
OCDF	M+2/M+4	0.88	0.76-1.02	1.10	1.09	0.65

(1) See Table 6, Method 8290, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 8, Method 8290.

(3) The beginning CCAL %RSD for the 17 unlabeled standard must not exceed +/- 20%, Section 7.7.4.1. The ending CCAL must not exceed +/-25%. Section 8.3.2.4.

8290F4A

FORM 4B
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 04/02/07

Instrument ID: AutoSpec-Ultima GC Column ID: DB-5

VER Data Filename: U122466 Analysis Date: 21-AUG-07 Time: 05:45:09

	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	CCAL. RRF	MEAN RRF	%D (3)
LABELED COMPOUNDS						
13C-2,3,7,8-TCDD	M/M+2	0.79	0.65-0.89	0.90	0.90	0.37
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.55	1.32-1.78	0.86	1.06	-19.09
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.26	1.05-1.43	0.97	1.01	-3.49
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.05	0.88-1.20	0.99	1.09	-9.72
13C-OCDD	M+2/M+4	0.91	0.76-1.02	0.99	1.17	-15.49
13C-2,3,7,8-TCDF	M/M+2	0.76	0.65-0.89	1.20	1.20	0.10
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.56	1.32-1.78	1.16	1.52	-23.39
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.56	0.43-0.59	1.04	1.28	-19.06
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.44	0.37-0.51	1.04	1.11	-6.10
CLEANUP STANDARD						
37Cl-2,3,7,8-TCDD				0.92	0.86	7.67

(1) See Table 6, Method 8290, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 8, Method 8290.

(3) The beginning CCAL %RSD for the labeled standard must not exceed +/- 30%, Section 7.7.4.2. The ending CCAL must not exceed +/- 35%, Section 8.3.2.4.

8290F4B

Columbia Analytical Services, Inc.
Sample Response Summary

CLIENT ID.
CCAL HRCC3

Run #19 Filename U122466 Samp: 1 Inj: 1 Acquired: 21-AUG-07 05:45:09
Processed: 27-AUG-07 10:41:36 Sample ID: CCAL HRCC3

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
1	Unk	2,3,7,8-TCDF	27:20	8.463e+03	1.075e+04	0.79	yes	no
2	Unk	1,2,3,7,8-PeCDF	31:31	2.790e+04	1.770e+04	1.58	yes	no
3	Unk	2,3,4,7,8-PeCDF	32:13	2.886e+04	1.859e+04	1.55	yes	no
4	Unk	1,2,3,4,7,8-HxCDF	34:58	2.853e+04	2.314e+04	1.23	yes	no
5	Unk	1,2,3,6,7,8-HxCDF	35:04	2.746e+04	2.202e+04	1.25	yes	no
6	Unk	2,3,4,6,7,8-HxCDF	35:33	2.627e+04	2.122e+04	1.24	yes	no
7	Unk	1,2,3,7,8,9-HxCDF	36:14	2.397e+04	1.910e+04	1.25	yes	no
8	Unk	1,2,3,4,6,7,8-HpCDF	37:41	3.100e+04	3.081e+04	1.01	yes	no
9	Unk	1,2,3,4,7,8,9-HpCDF	39:01	2.178e+04	2.104e+04	1.04	yes	no
10	Unk	OCDF	41:51	4.111e+04	4.678e+04	0.88	yes	no
11	Unk	2,3,7,8-TCDD	28:07	6.557e+03	8.441e+03	0.78	yes	no
12	Unk	1,2,3,7,8-PeCDD	32:34	2.032e+04	1.290e+04	1.57	yes	no
13	Unk	1,2,3,4,7,8-HxCDD	35:39	2.060e+04	1.681e+04	1.23	yes	no
14	Unk	1,2,3,6,7,8-HxCDD	35:44	2.153e+04	1.714e+04	1.26	yes	no
15	Unk	1,2,3,7,8,9-HxCDD	36:00	2.159e+04	1.698e+04	1.27	yes	no
16	Unk	1,2,3,4,6,7,8-HpCDD	38:35	1.949e+04	1.826e+04	1.07	yes	no
17	Unk	OCDD	41:42	3.874e+04	4.358e+04	0.89	yes	no
18	IS	13C-2,3,7,8-TCDF	27:19	4.350e+04	5.706e+04	0.76	yes	no
19	IS	13C-1,2,3,7,8-PeCDF	31:29	5.955e+04	3.815e+04	1.56	yes	no
20	IS	13C-1,2,3,4,7,8-HxCDF	34:58	7.550e+04	1.343e+05	0.56	yes	no
21	IS	13C-1,2,3,4,6,7,8-HpCDF	37:40	6.483e+04	1.457e+05	0.44	yes	no
22	IS	13C-2,3,7,8-TCDD	28:07	3.352e+04	4.236e+04	0.79	yes	no
23	IS	13C-1,2,3,7,8-PeCDD	32:33	4.373e+04	2.812e+04	1.55	yes	no
24	IS	13C-1,2,3,6,7,8-HxCDD	35:43	1.092e+05	8.700e+04	1.26	yes	no
25	IS	13C-1,2,3,4,6,7,8-HpCDD	38:35	1.021e+05	9.731e+04	1.05	yes	no
26	IS	13C-OCDD	41:41	1.906e+05	2.101e+05	0.91	yes	no
27	RS/RT	13C-1,2,3,4-TCDD	27:55	3.710e+04	4.692e+04	0.79	yes	no
28	RS/RT	13C-1,2,3,7,8,9-HxCDD	36:00	1.125e+05	8.938e+04	1.26	yes	no
29	C/Up	37Cl-2,3,7,8-TCDD	28:07	1.554e+04				

Columbia Analytical Services, Inc.
10655 Richmond Ave., Suite 130A
Houston, TX 77042
Office(713)266-1599. Fax(713)266-0130

Columbia Analytical Services,Inc. CLIENT ID.
Signal/Noise Height Ratio Summary CCAL HRCC3

Run #19 Filename U122466 Samp: 1 Inj: 1 Acquired: 21-AUG-07 05:45:09

Processed: 27-AUG-07 10:41:36 LAB. ID: CCAL HRCC3

	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	1.51e+06	2.20e+02	6.9e+03	1.94e+06	6.76e+02	2.9e+03
2	1,2,3,7,8-PeCDF	5.61e+06	4.68e+02	1.2e+04	3.60e+06	1.15e+03	3.1e+03
3	2,3,4,7,8-PeCDF	6.16e+06	4.68e+02	1.3e+04	4.02e+06	1.15e+03	3.5e+03
4	1,2,3,4,7,8-HxCDF	6.48e+06	9.64e+02	6.7e+03	5.28e+06	7.16e+02	7.4e+03
5	1,2,3,6,7,8-HxCDF	6.29e+06	9.64e+02	6.5e+03	5.00e+06	7.16e+02	7.0e+03
6	2,3,4,6,7,8-HxCDF	6.10e+06	9.64e+02	6.3e+03	4.90e+06	7.16e+02	6.8e+03
7	1,2,3,7,8,9-HxCDF	5.41e+06	9.64e+02	5.6e+03	4.24e+06	7.16e+02	5.9e+03
8	1,2,3,4,6,7,8-HpCDF	6.88e+06	4.51e+03	1.5e+03	6.83e+06	3.40e+02	2.0e+04
9	1,2,3,4,7,8,9-HpCDF	4.41e+06	4.51e+03	9.8e+02	4.25e+06	3.40e+02	1.2e+04
10	OCDF	6.07e+06	7.56e+02	8.0e+03	6.99e+06	1.05e+03	6.7e+03
11	2,3,7,8-TCDD	1.24e+06	5.16e+02	2.4e+03	1.64e+06	4.08e+02	4.0e+03
12	1,2,3,7,8-PeCDD	4.34e+06	1.12e+03	3.9e+03	2.82e+06	2.96e+02	9.5e+03
13	1,2,3,4,7,8-HxCDD	4.91e+06	4.12e+02	1.2e+04	3.87e+06	6.12e+02	6.3e+03
14	1,2,3,6,7,8-HxCDD	4.93e+06	4.12e+02	1.2e+04	3.88e+06	6.12e+02	6.3e+03
15	1,2,3,7,8,9-HxCDD	4.99e+06	4.12e+02	1.2e+04	3.93e+06	6.12e+02	6.4e+03
16	1,2,3,4,6,7,8-HpCDD	4.09e+06	9.84e+02	4.2e+03	3.86e+06	9.56e+02	4.0e+03
17	OCDD	5.91e+06	8.88e+02	6.7e+03	6.66e+06	1.10e+03	6.1e+03
18	13C-2,3,7,8-TCDF	7.55e+06	2.30e+03	3.3e+03	9.93e+06	8.28e+02	1.2e+04
19	13C-1,2,3,7,8-PeCDF	1.17e+07	1.72e+02	6.8e+04	7.58e+06	4.48e+02	1.7e+04
20	13C-1,2,3,4,7,8-HxCDF	1.68e+07	7.64e+02	2.2e+04	3.00e+07	8.56e+02	3.5e+04
21	13C-1,2,3,4,6,7,8-HpCDF	1.43e+07	4.26e+03	3.4e+03	3.25e+07	1.09e+04	3.0e+03
22	13C-2,3,7,8-TCDD	6.12e+06	2.10e+03	2.9e+03	7.65e+06	9.72e+02	7.9e+03
23	13C-1,2,3,7,8-PeCDD	9.48e+06	8.12e+02	1.2e+04	6.10e+06	4.28e+02	1.4e+04
24	13C-1,2,3,6,7,8-HxCDD	2.56e+07	2.28e+03	1.1e+04	2.01e+07	1.14e+03	1.8e+04
25	13C-1,2,3,4,6,7,8-HpCDD	2.13e+07	1.72e+03	1.2e+04	2.02e+07	8.60e+02	2.4e+04
26	13C-OCDD	2.85e+07	1.01e+03	2.8e+04	3.15e+07	1.11e+03	2.8e+04
27	13C-1,2,3,4-TCDD	6.85e+06	2.10e+03	3.3e+03	8.73e+06	9.72e+02	9.0e+03
28	13C-1,2,3,7,8,9-HxCDD	2.58e+07	2.28e+03	1.1e+04	2.07e+07	1.14e+03	1.8e+04
29	37Cl-2,3,7,8-TCDD	2.93e+06	5.52e+02	5.3e+03			

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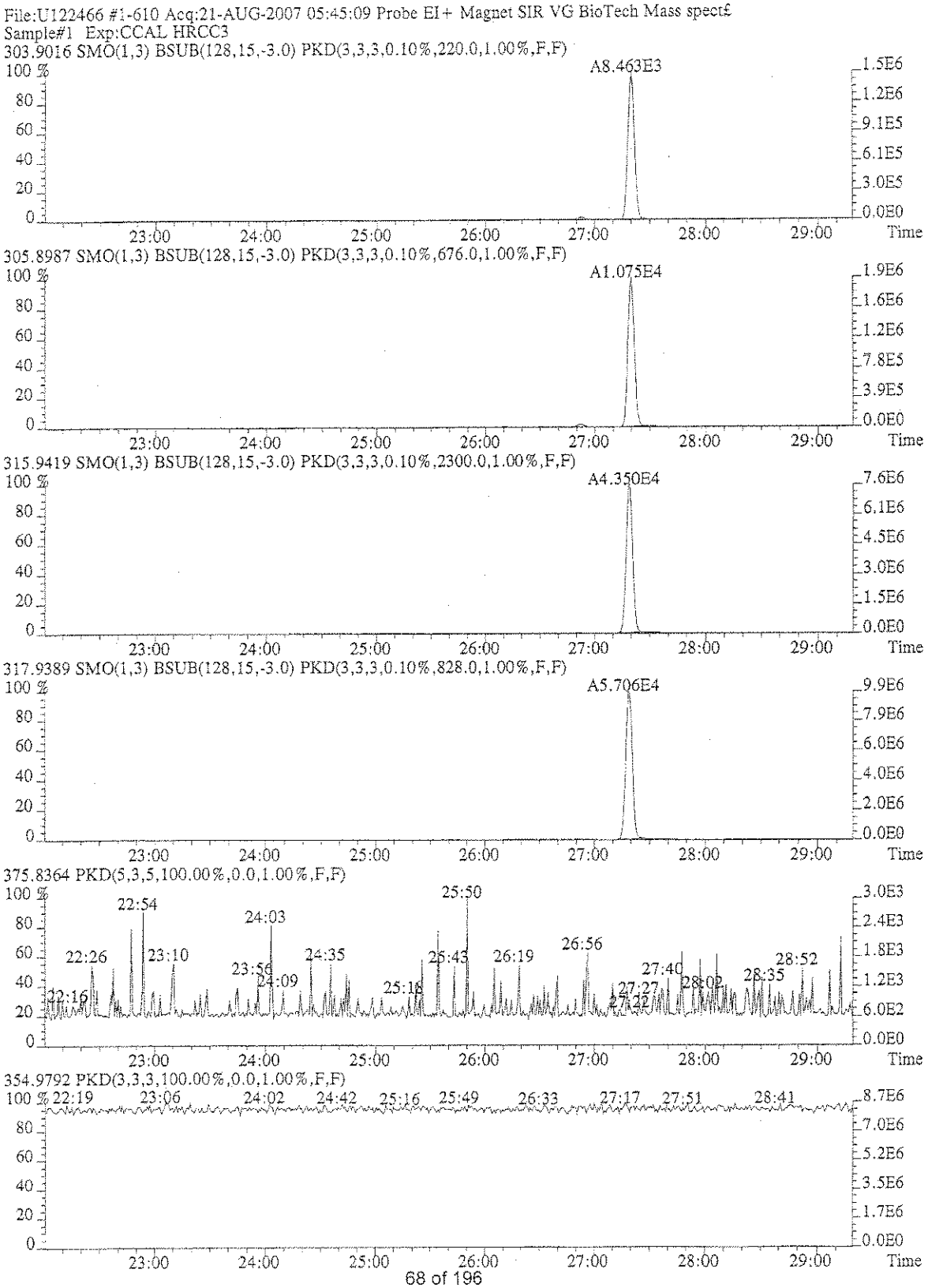
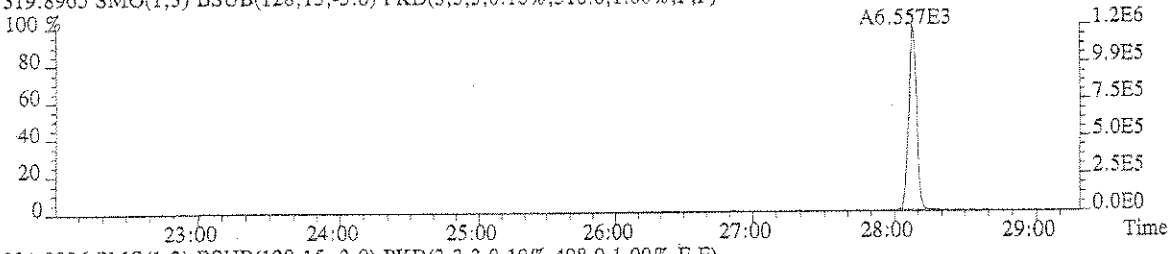
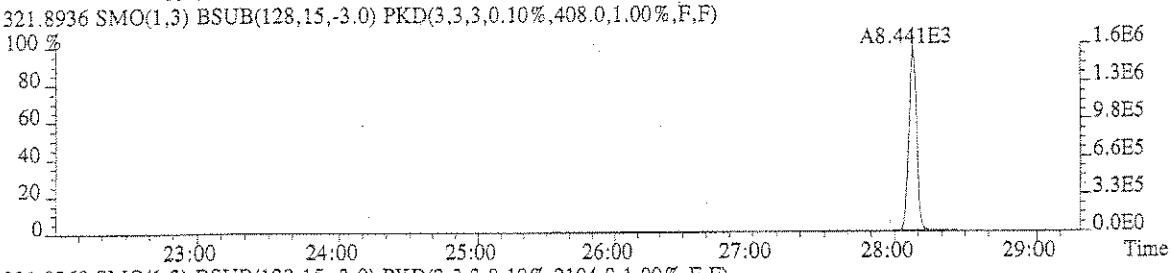

File:U122466 #1-610 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 Exp:CCAL HRCC3
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,220.0,1.00%,F,F)
A8.463E3
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,676.0,1.00%,F,F)
A1.075E4
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2300.0,1.00%,F,F)
A4.350E4
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,828.0,1.00%,F,F)
A5.706E4
375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)
354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)
Time

File:U122466 #1-610 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spectr
Sample#1 Exp:CCAL HRCC3

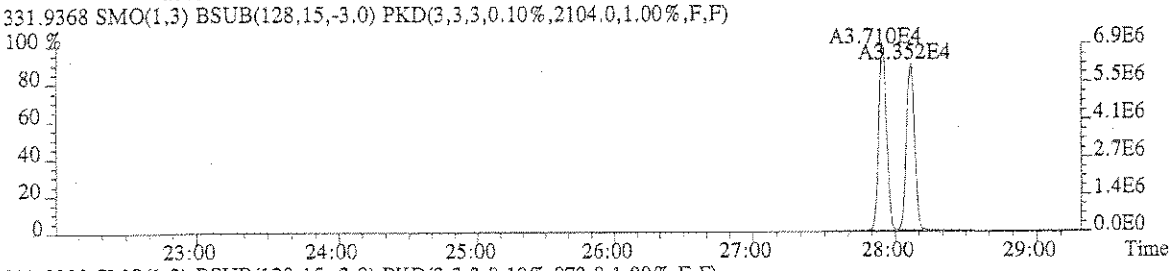
319.8965 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,516.0,1.00%,F,F)



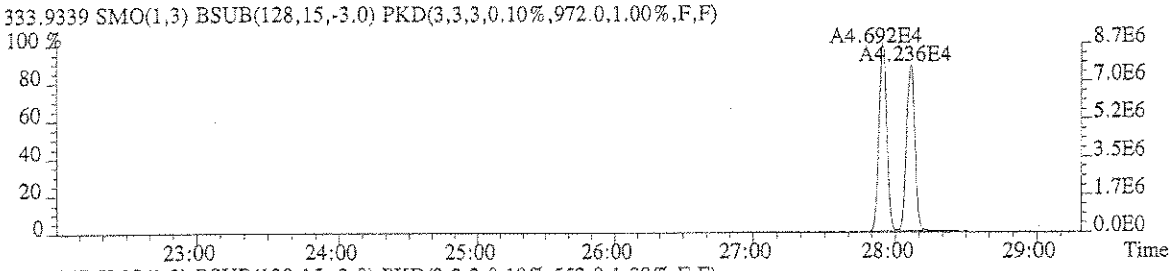
321.8936 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,408.0,1.00%,F,F)



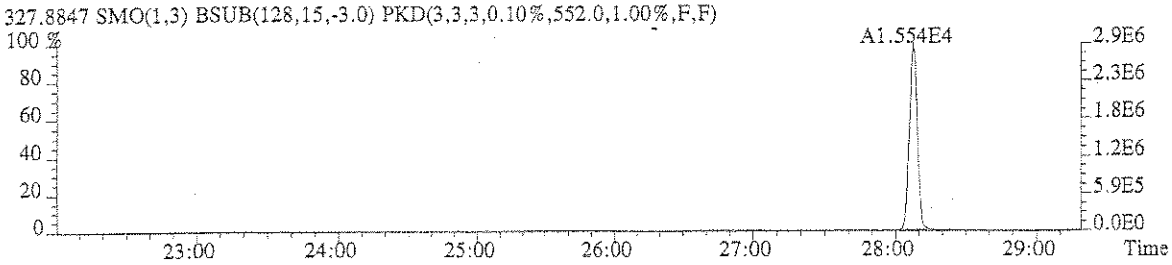
331.9368 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2104.0,1.00%,F,F)



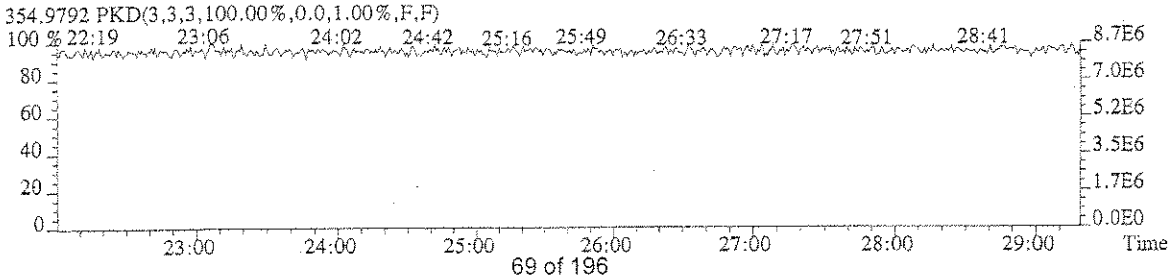
333.9339 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,972.0,1.00%,F,F)



327.8847 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,552.0,1.00%,F,F)

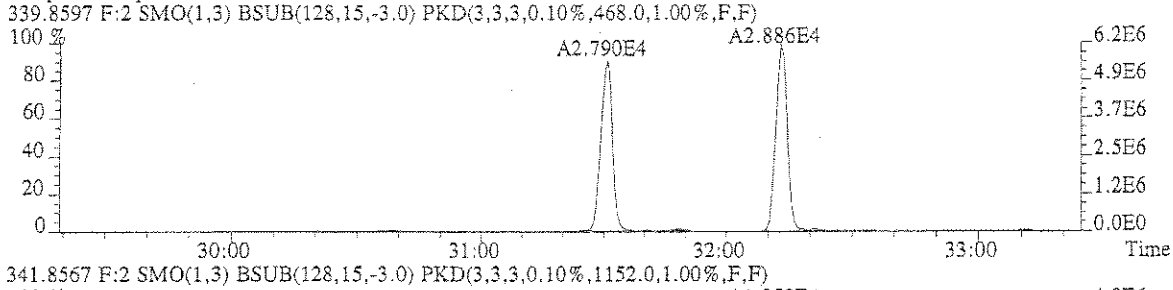


354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)

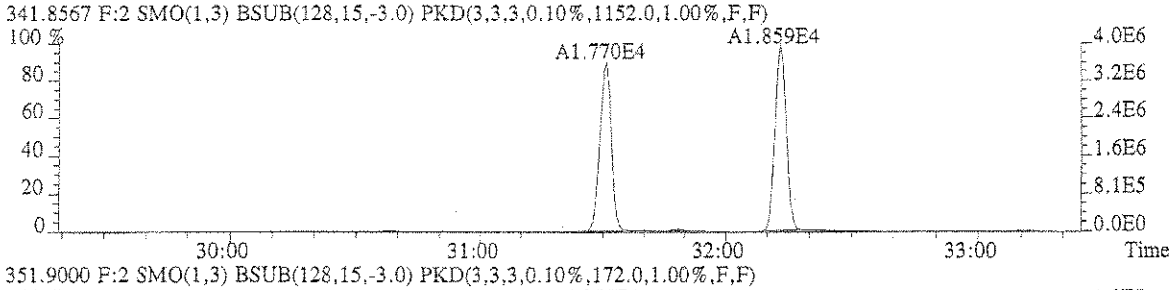


File:U122466 #1-372 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:CCAL HRCC3

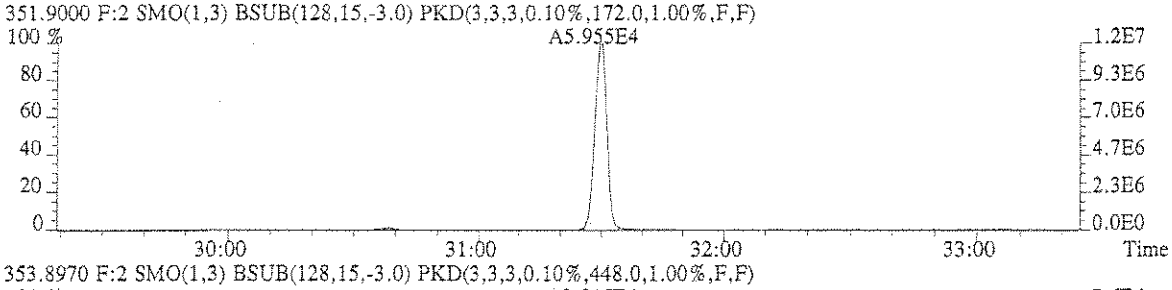
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,468.0,1.00%,F,F)



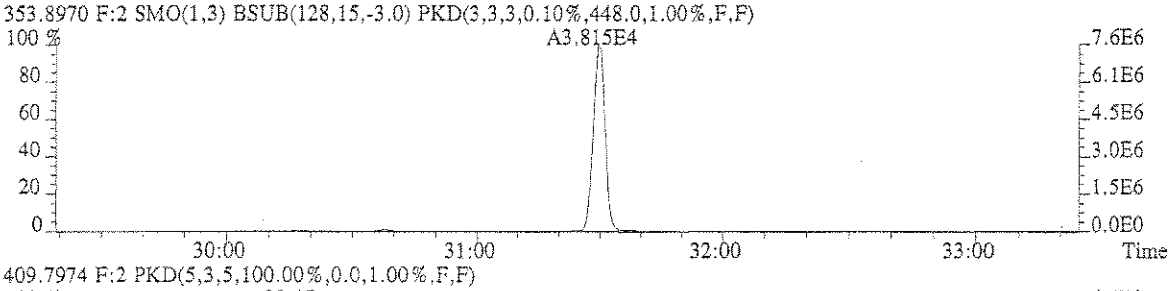
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1152.0,1.00%,F,F)



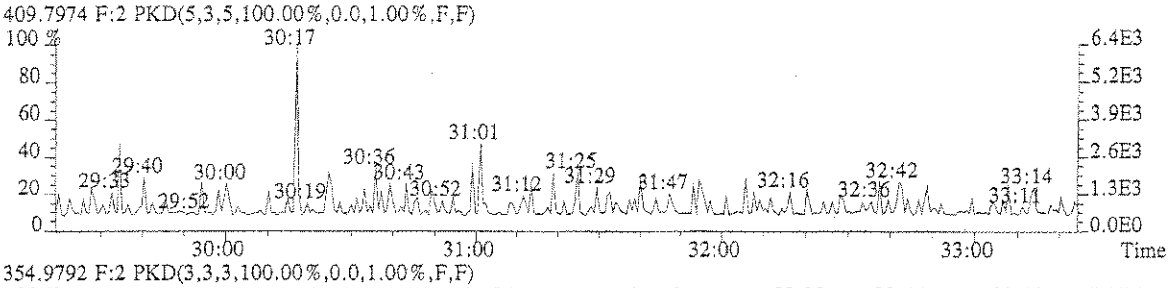
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,172.0,1.00%,F,F)



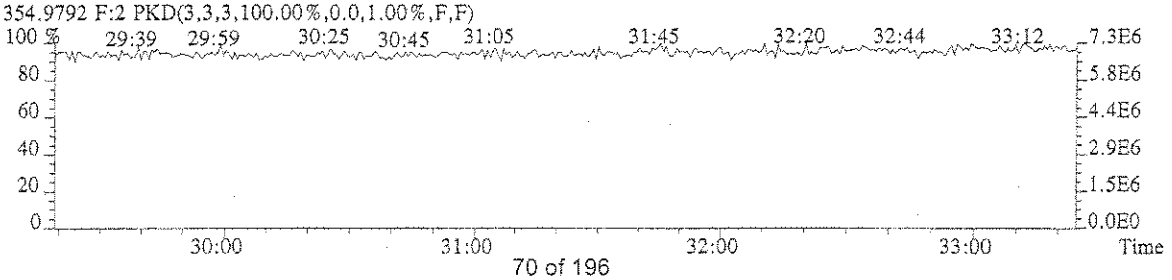
353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,448.0,1.00%,F,F)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)

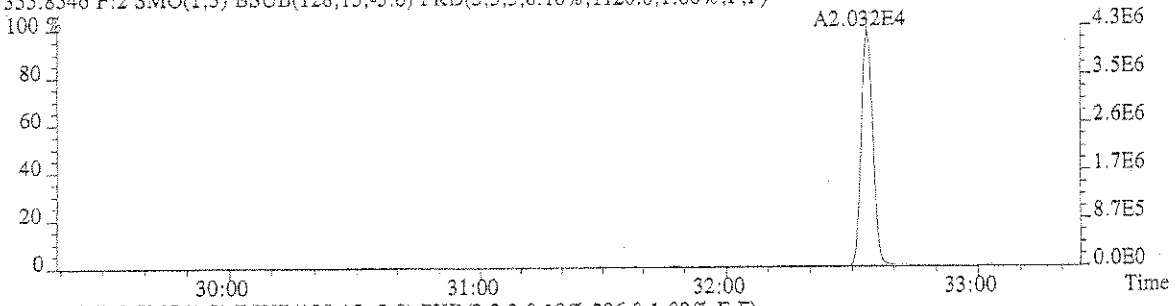


354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)

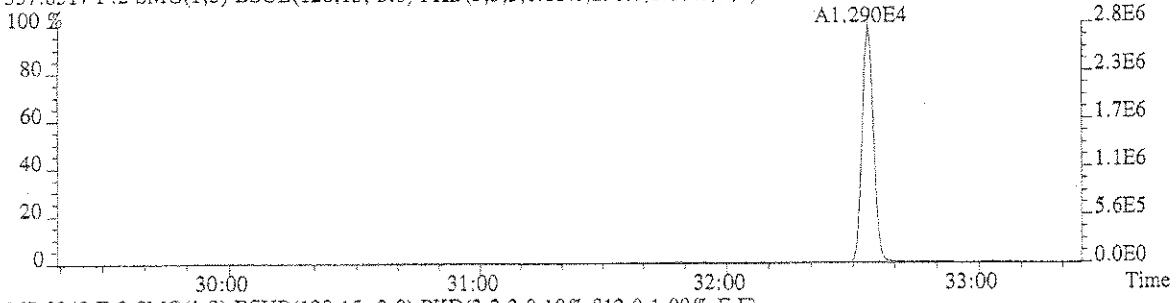


File:U122466 #1-372 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 Exp:CCAL HRCC3

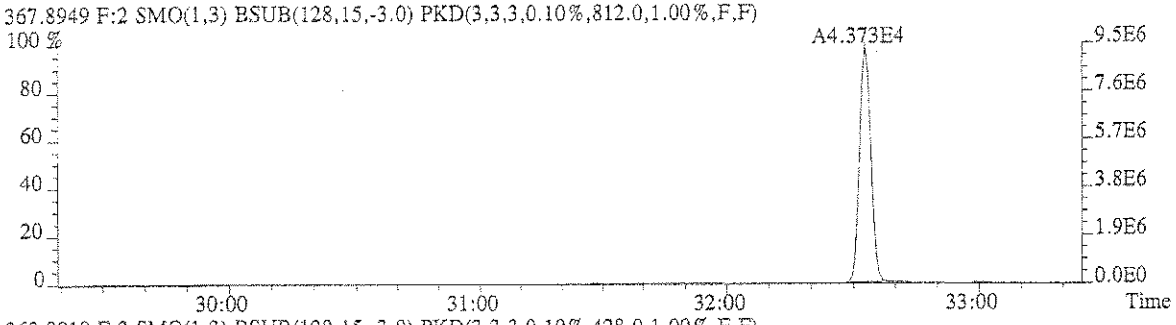
355.8546 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1120.0,1.00%,F,F)



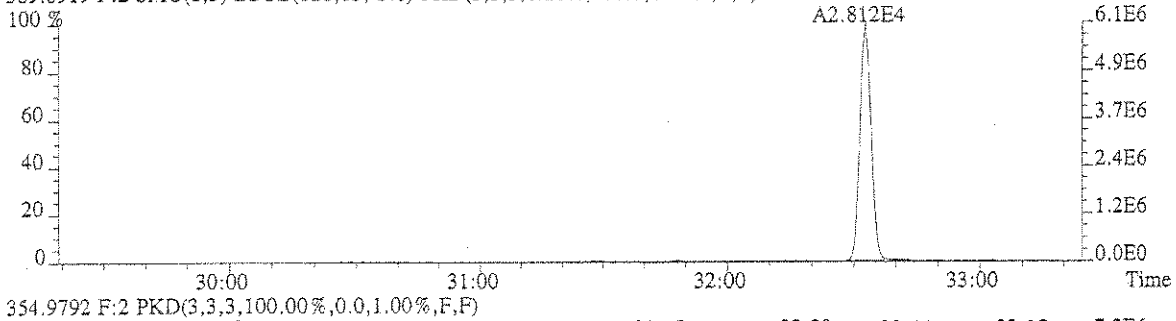
357.8517 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,296.0,1.00%,F,F)



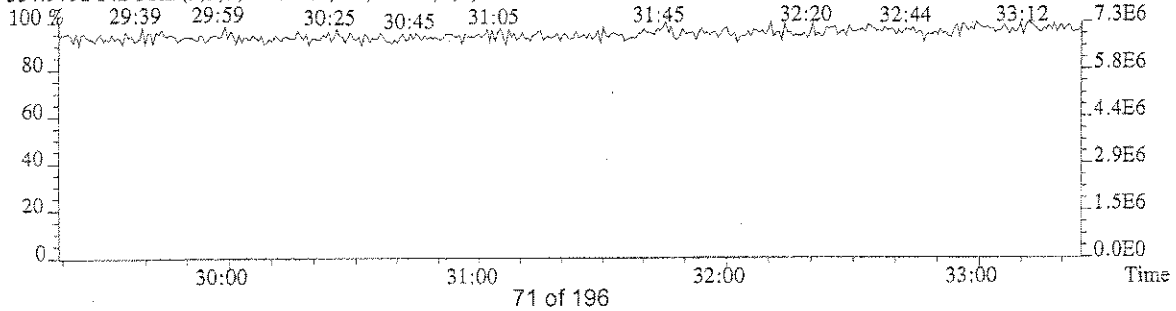
367.8949 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,812.0,1.00%,F,F)

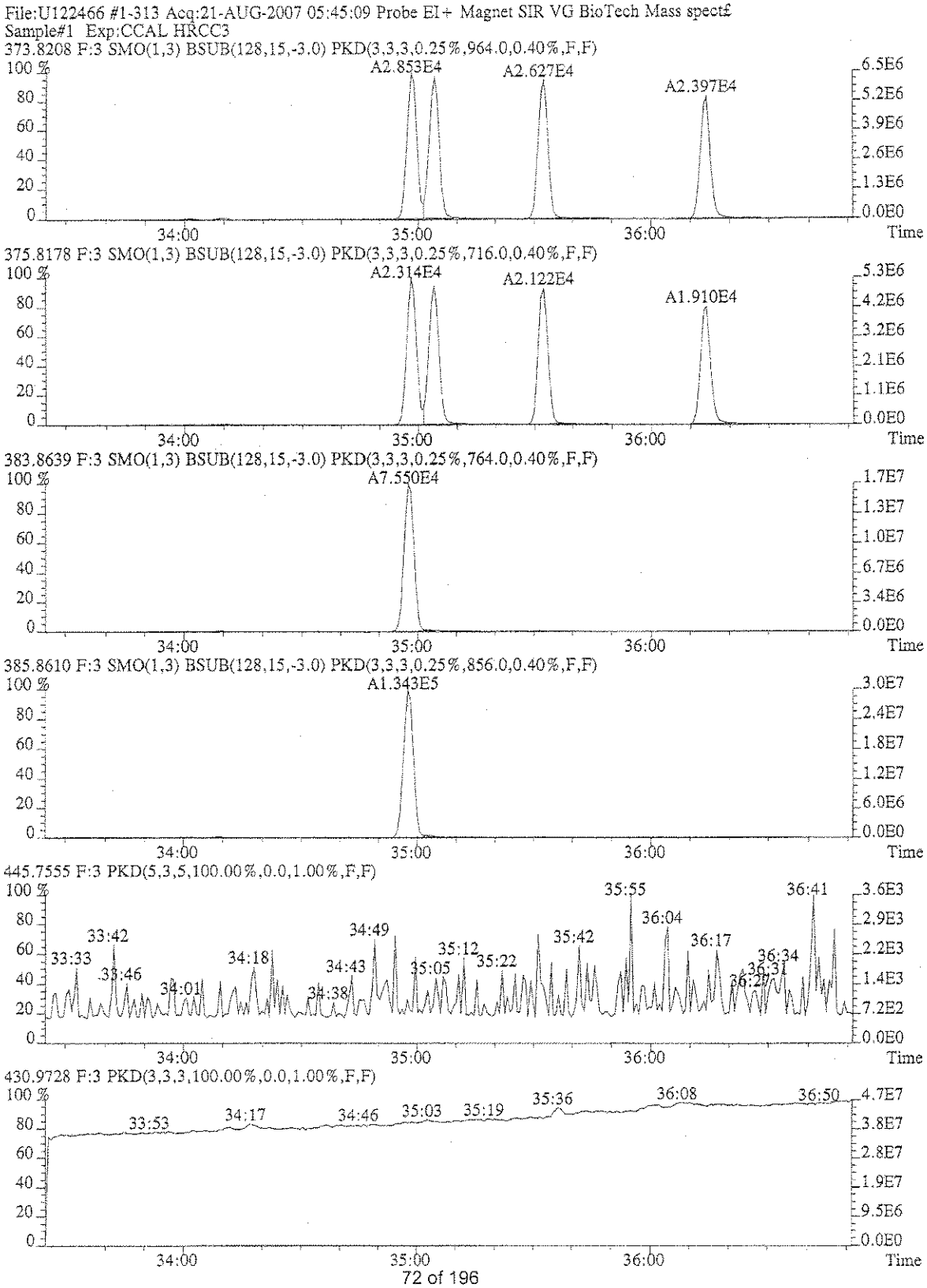


369.8919 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,428.0,1.00%,F,F)

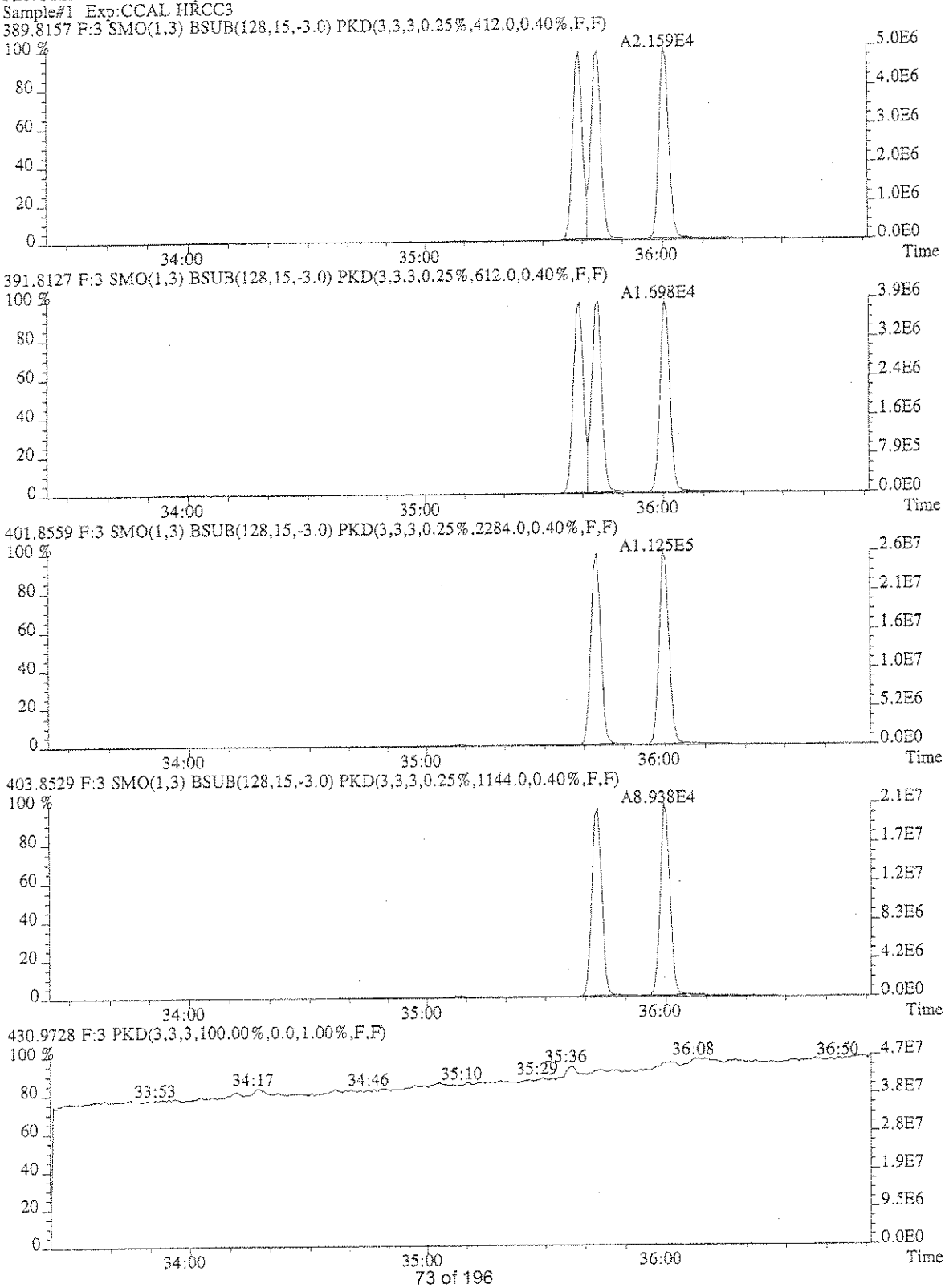


354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)

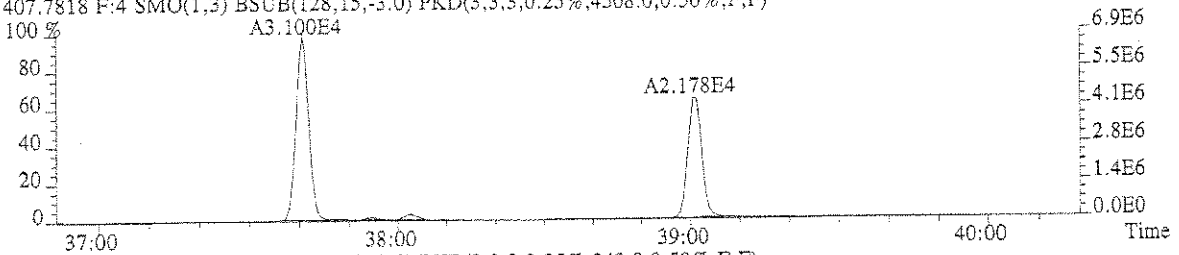


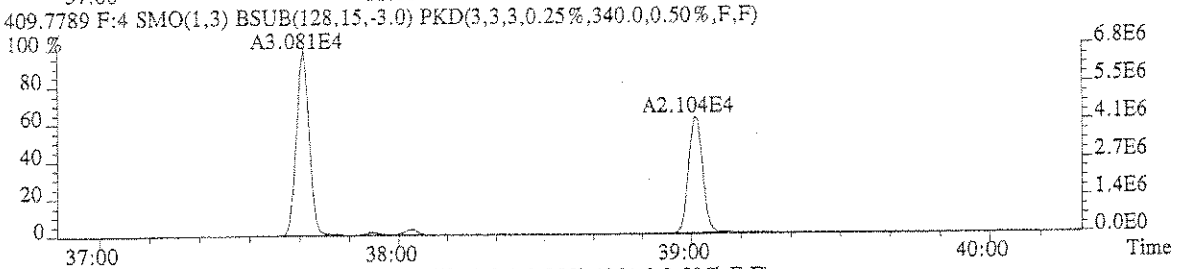

File:U122466 #1-313 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spectr
Sample#1 Exp:CCAL HRCC3
373.8208 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,964.0,0.40%,F,F)
A2.853E4
A2.627E4
A2.397E4
375.8178 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,716.0,0.40%,F,F)
A2.314E4
A2.122E4
A1.910E4
383.8639 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,764.0,0.40%,F,F)
A7.550E4
385.8610 F:3 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.25%,856.0,0.40%,F,F)
A1.343E5
445.7555 F:3 PKD(5,3,5,100.00%,0.0,1.00%,F,F)
430.9728 F:3 PKD(3,3,3,100.00%,0.0,1.00%,F,F)
Time

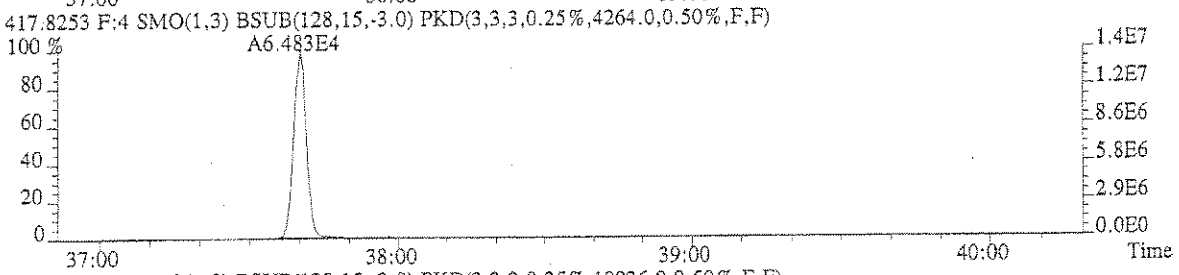
File:U122466 #1-313 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 Exp:CCAL HRCC3

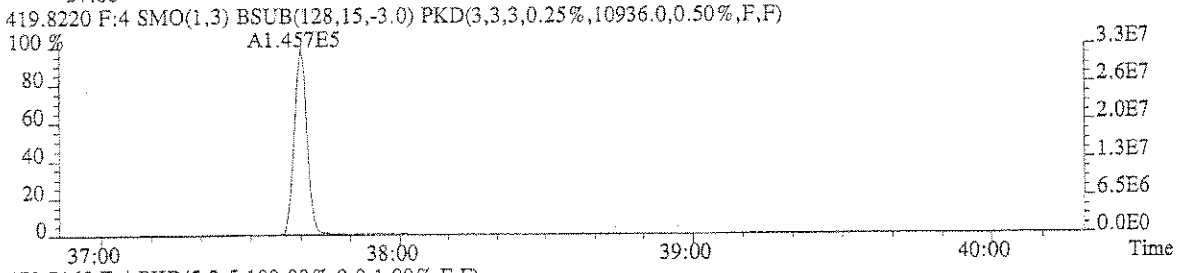


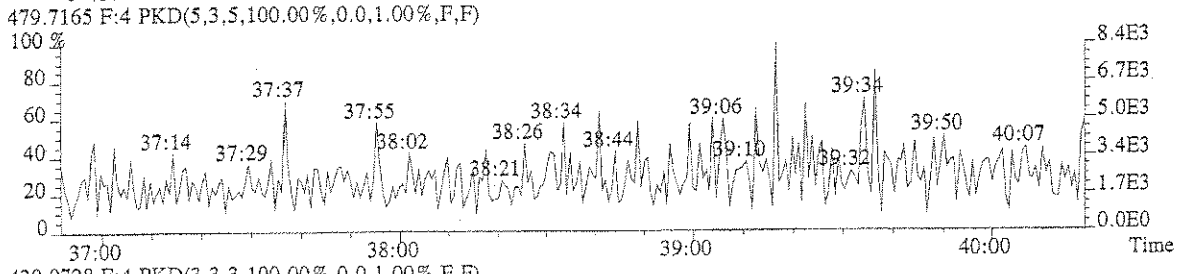
File:U122466 #1-314 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 Exp:CCAL HRCC3

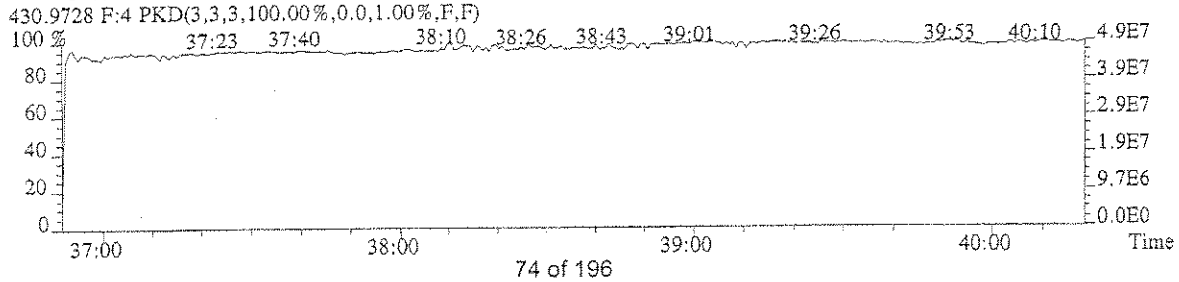




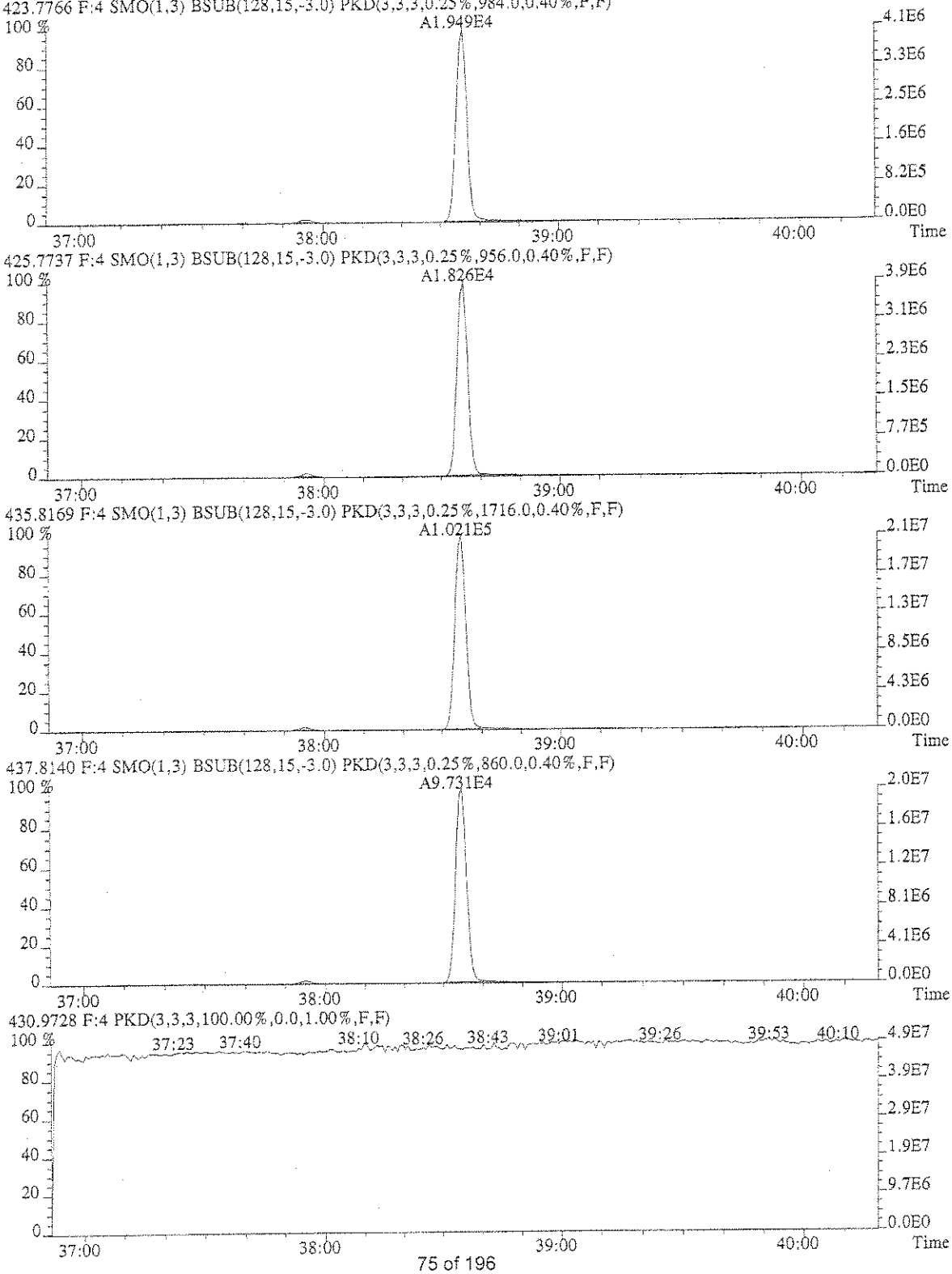


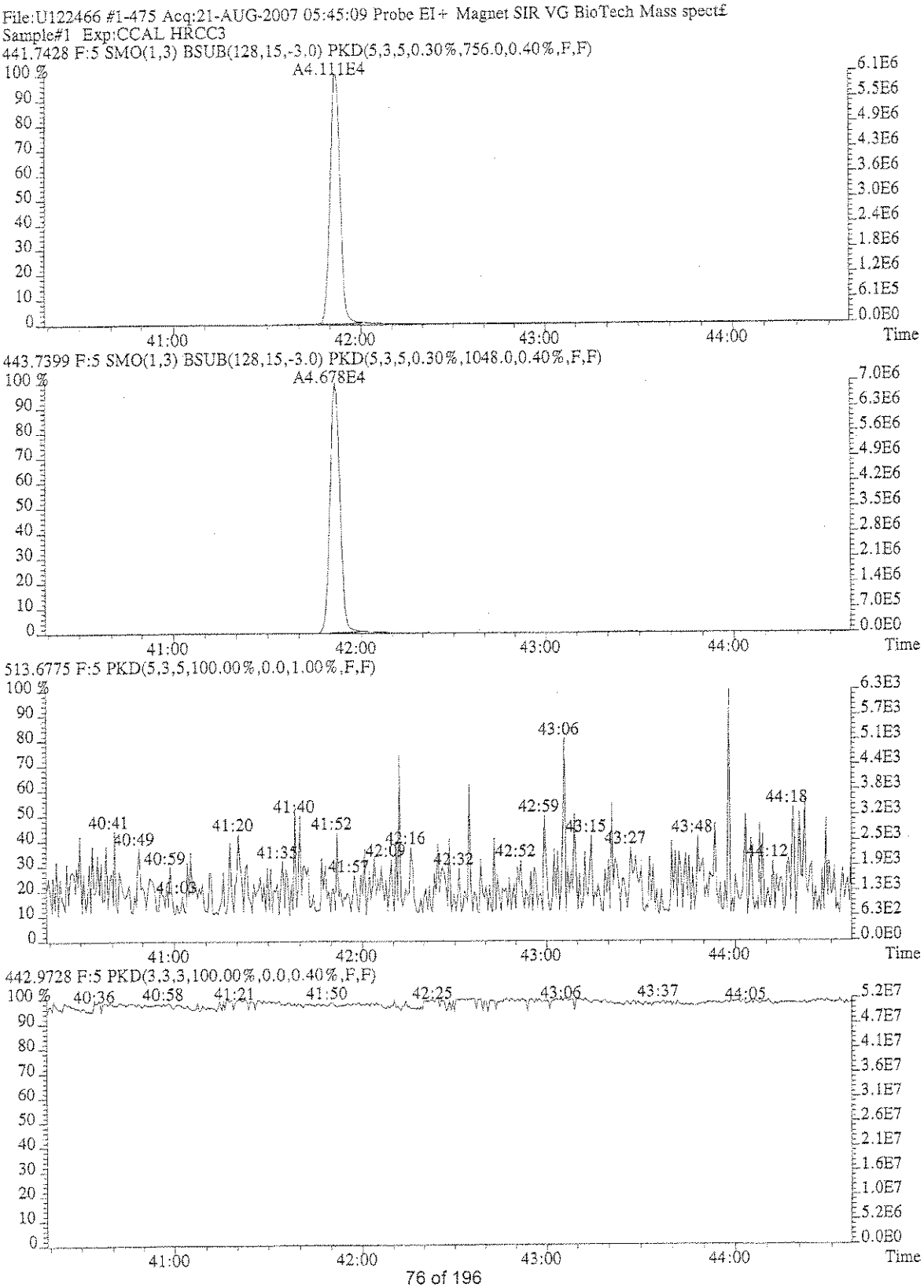


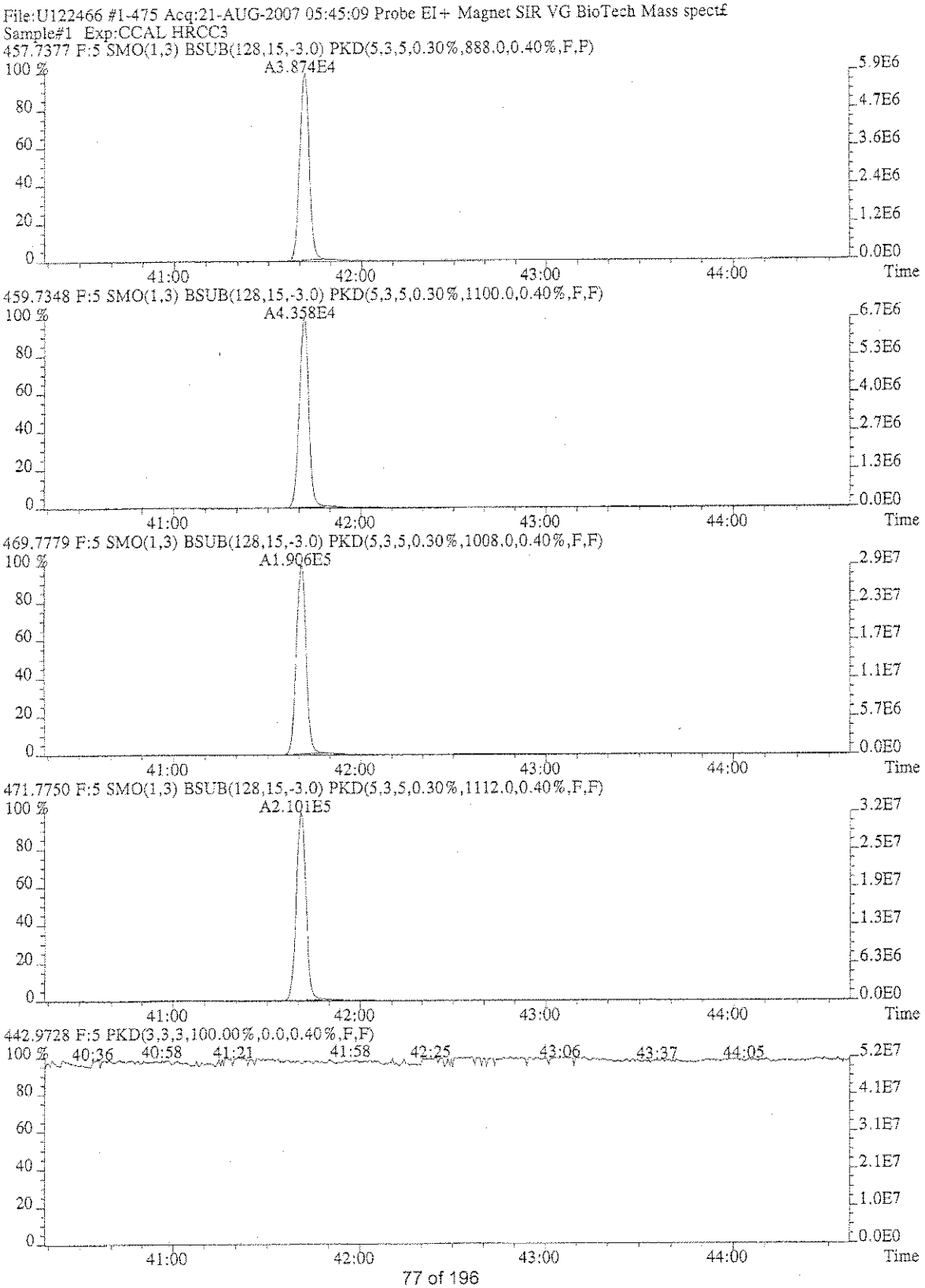




File:U122466 #1-314 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spectr
Sample#1 Exp:CCAL HRCC3




File:U122466 #1-475 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spectr
Sample#1 Exp:CCAL HRCC3
441.7428 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,756.0,0.40%,F,F)
A4.111E4
443.7399 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1048.0,0.40%,F,F)
A4.678E4
513.6775 F:5 PKD(5,3,5,100.00%,0.0,1.00%,F,F)
40:41
40:49
40:59
41:03
41:20
41:35
41:40
41:52
41:57
42:09
42:16
42:32
42:52
42:59
43:06
43:15
43:27
43:48
44:12
44:18
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)
40:36
40:58
41:21
41:50
42:25
43:06
43:37
44:05
Time


File:U122466 #1-475 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spectr
Sample#1 Exp:CCAL HRCC3
457.7377 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,888.0,0.40%,F,F)
A3.874E4
459.7348 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1100.0,0.40%,F,F)
A4.358E4
469.7779 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1008.0,0.40%,F,F)
A1.906E5
471.7750 F:5 SMO(1,3) BSUB(128,15,-3.0) PKD(5,3,5,0.30%,1112.0,0.40%,F,F)
A2.101E5
442.9728 F:5 PKD(3,3,3,100.00%,0.0,0.40%,F,F)
40:36 40:58 41:21 41:58 42:25 43:06 43:37 44:05
100 %
80
60
40
20
0
41:00
42:00
43:00
44:00
Time
5.9E6
4.7E6
3.6E6
2.4E6
1.2E6
0.0E0
6.7E6
5.3E6
4.0E6
2.7E6
1.3E6
2.9E7
2.3E7
1.7E7
1.1E7
5.7E6
3.2E7
2.5E7
1.9E7
1.3E7
6.3E6
5.2E7
4.1E7
3.1E7
2.1E7
1.0E7

RW/ HRCC3 Daily Calibration QC Checklist

Calibration File Name: U122466~U122477

Date: 21 AUG. '07

Circle one: Beginning / Ending

Method: 8290 / Tetra / TCDD Only / TCDF Conf

Retention Window/Column Performance Check:	Analyst	Second Check
Windows labeled for first and last eluting compounds	✓	✓
Column performance shows less than or equal to 25% valley between column specific 2378 isomer and the closest eluters	✓	✓
No QC ion deflections affect column specific 2378 isomer or the closest eluters	✓	✓

HRCC3 Continuing Calibration	Analyst	Second Check
Percent RSD within method criteria	✓	✓ Avg.
All relative abundance ratios meet method criteria	✓	✓
No QC ion deflections greater than 20%	✓	✓
Mass spectrometer resolution greater than or equal to 10,000 and documented	✓	✓
Signal-to-noise of all target analytes and associated labeled standards at least 2.5:1	✓	✓
Ending Calibration injected prior to end of 12 hour clock	✓	✓

Analyst: [signature]

Second QC: MC

CAS HOUSTON INC.

5DFC
PCDD/PCDF ANALYTICAL SEQUENCE SUMMARY

Lab Name: Columbia Analytical Services, Houston Contract:

Lab Code: CAS Episode No.: SDG No.:

GC Column: db5 ID: 0.25 (mm) Instrument ID: AutoSpec-Ultima

Init. Calib. Date: 04/02/07

Init. Calib.Times: 11:25

THE ANALYTICAL SEQUENCE OF STANDARDS, SAMPLES, BLANKS, SPIKES AND DUPLICATES IS AS FOLLOWS:

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
WINDOW DEFINE		U122467	21-AUG-07	07:21:09
CCAL HRCC3		U122466	21-AUG-07	05:45:09
METHOD BLANK	EQ0700252-01	U122468	21-AUG-07	08:39:40
G9-B-3-D	E0700781-001	U122469	21-AUG-07	09:25:07
G15-D-1-D	E0700781-002	U122470	21-AUG-07	10:12:42
G4-A-3	E0700781-003	U122471	21-AUG-07	11:00:16
G4-B-3	E0700781-004	U122472	21-AUG-07	11:47:50
G4-D-3	E0700781-005	U122473	21-AUG-07	12:35:25
DLCS	EQ0700252-03	U122475	21-AUG-07	14:43:08
LCS	EQ0700252-02	U122476	21-AUG-07	15:39:11

HRGC/HRMS RUN LOG

CAS HOUSTON 10655 Richmond Avenue, Suite 130-A Houston, TX 77042

Columbia Analytical Services inc. An Employee Owned Company

Acq Method: 8290CAL/613 Result File: D:U122466CAL/RES Archive Tape: ______

GC Method: 8290CAL/613 EDD File: ______ Instrument ID: AutoSpec 1

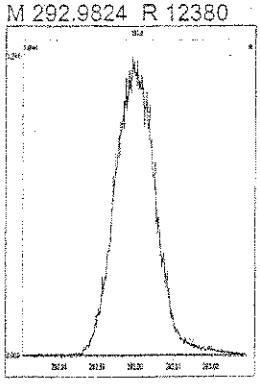
Date	Time	File	CAS ID	Client ID	Batch #	Analyst	Comments	RE
8/21/07		U122464	~~EQ0702~~ EQ0700258-02LCS			JK		
		U122465	EQ0700258-03DLCS					
08/21/07	05:45	U122466	CCAL HRCC3	D8-2-2A				
	07:21	U122467	Window Defense	D4-90-2				
	08:39	U122468	EQ0700252-01MB	METHOD BLANK	EQ252			
	09:25	U122469	EQ0700781-001	G9-B-3-D				
	10:12	U122470	781-002	G15-D-1-D				
	11:00	U122471	781-003	G4-A-3				
	11:47	U122472	781-004	G4-B-3				
	12:35	U122473	EQ0700781-005	G4-D-3				
	13:57	U122474	EQ0700252-02LCS				Needs reinjection	
	14:43	U122475	252-03DLCS	DUP LAB SPIKE				
	15:39	U122476	EQ0700252-02LCS	LAB SPIKE				
	16:38	U122477	CCAL HRCC3	D8-2-2A			Use average RF	
		U122478	Window Defense	D4-90-2				
		U122479	CCAL HRCC3	D8-2-2A				

Reviewed by: [signature]

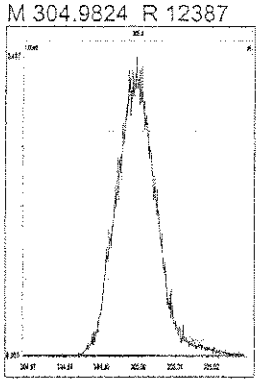
081

Printed: Tuesday, August 21, 2007 06:32:18 Central Standard Time

M 292.9824 R 12380



M 304.9824 R 12387



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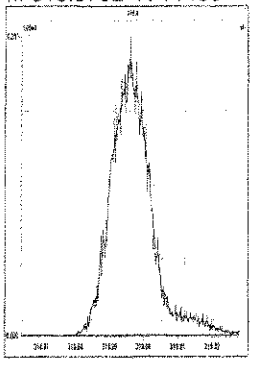

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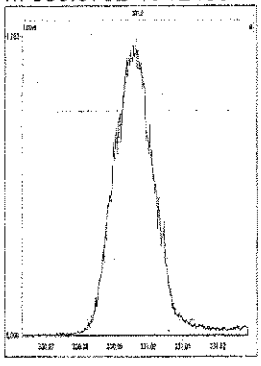

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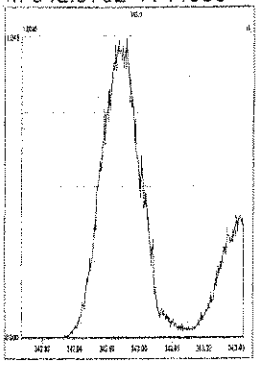

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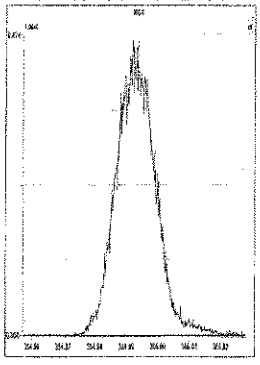

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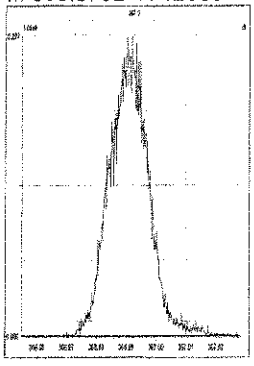
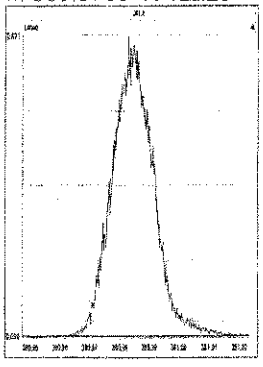


M 380.9760 R 12225



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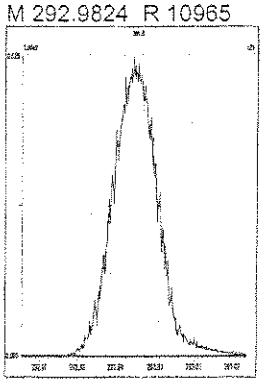
Printed: Tuesday, August 21, 2007 17:36:03 Central Standard Time

M 292.9824 R 10965



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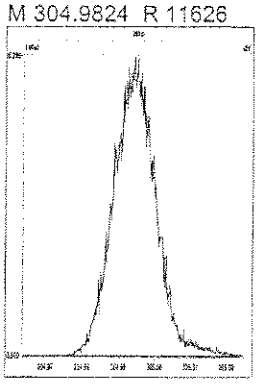

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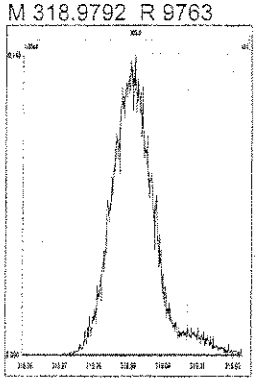

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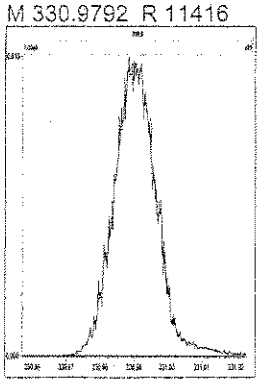

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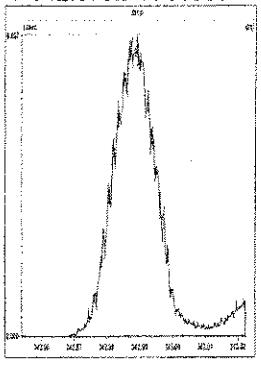

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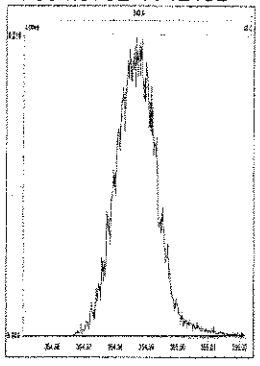

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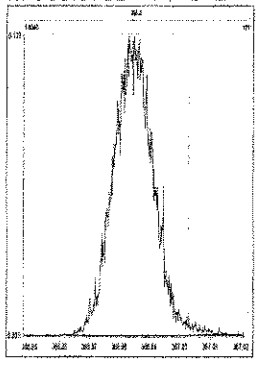

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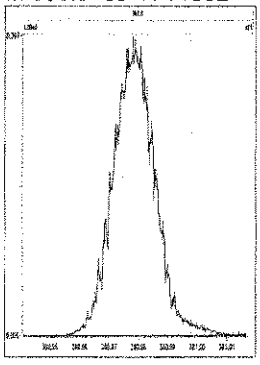

5DFA

WINDOW DEFINING MIX SUMMARY

CLIENT ID

WDM

Lab Name: COLUMBIA ANALYTICAL SERVICES

Lab Code: CAS Case No.: _____ SDG No.: _____

GC Column: DB-5 ID: 0.25 (mm) Lab File ID: U122467

Date Analyzed: 08/21/07

Time Analyzed: 07:21:09

CONGENER	RT FIRST ELUTING	RT LAST ELUTING
TCDF	23:37	29:13
TCDD	25:17	29:11
PeCDF	29:27	33:11
PeCDD	30:45	33:02
HxCDF	34:02	36:18
HxCDD	34:31	35:59
HpCDF	37:41	39:01
HpCDD	37:57	38:35

% Valley 2378-TCDD 7%

File:U122467 #1-610 Acq:21-AUG-2007 07:21:09 Probe EI+ Magnet SIR VG BioTech Mass spectr
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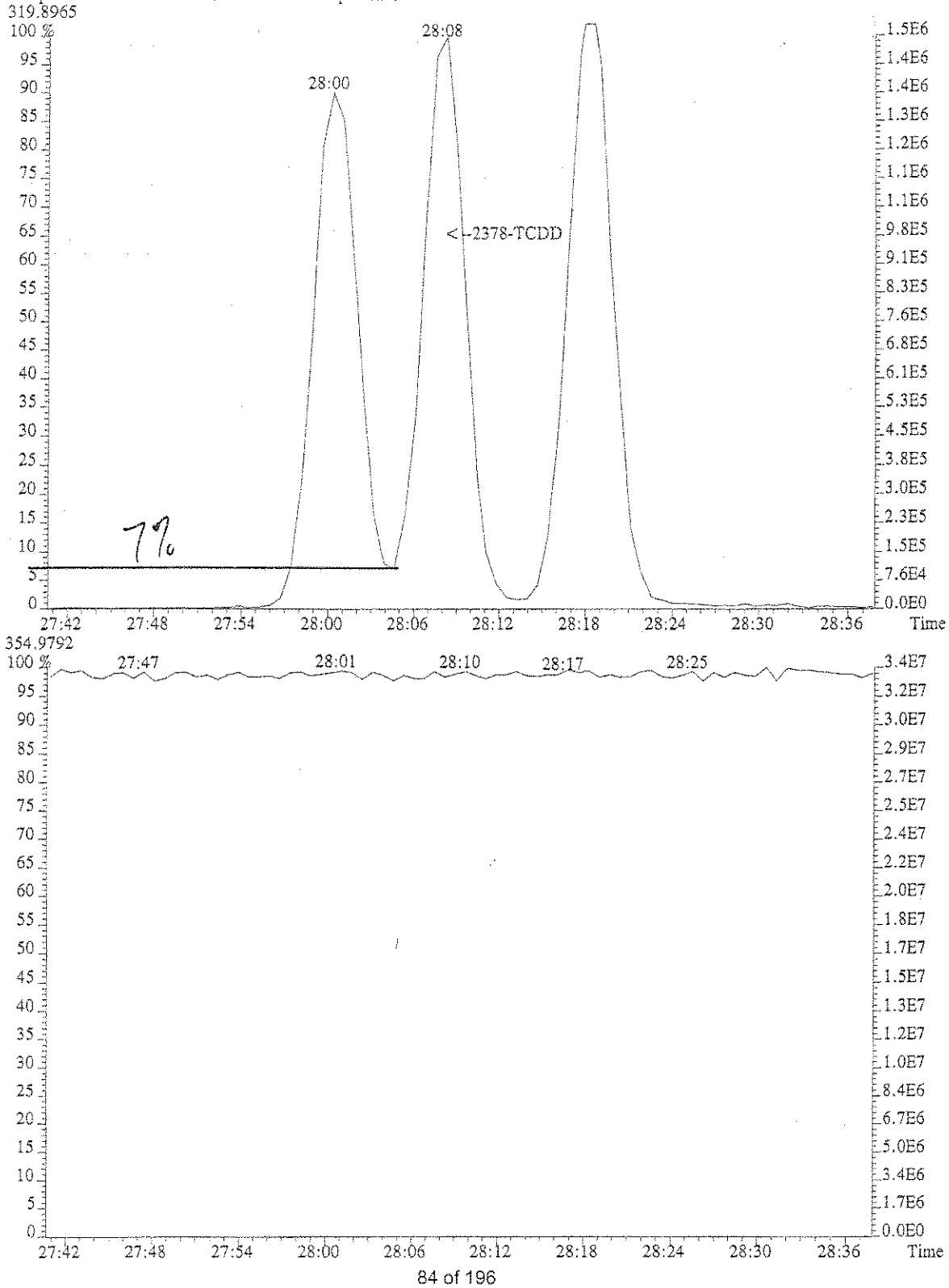

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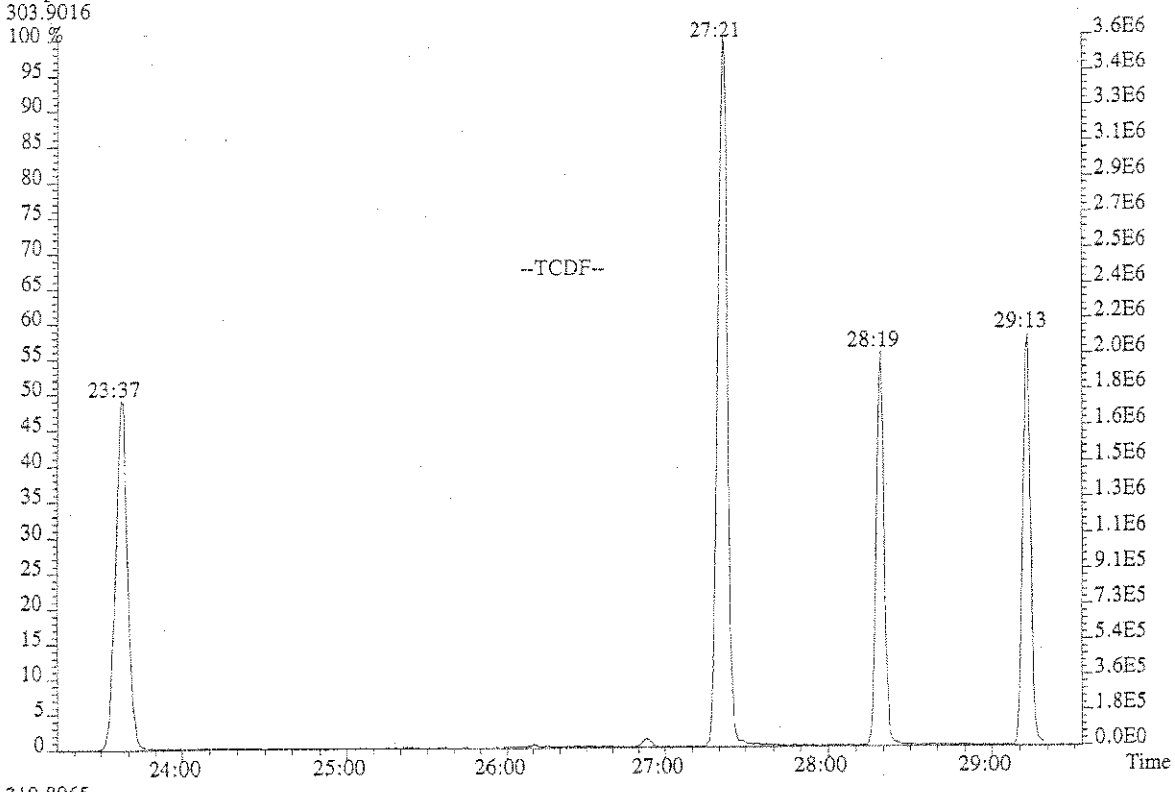

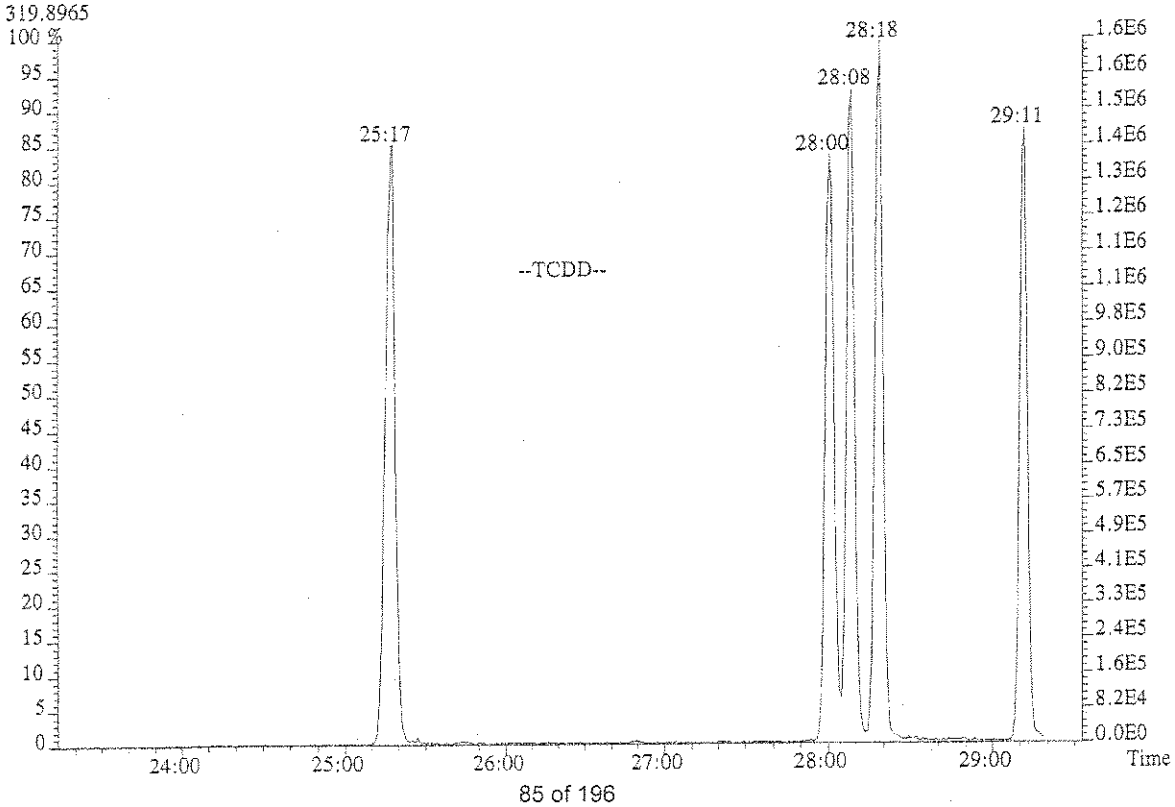

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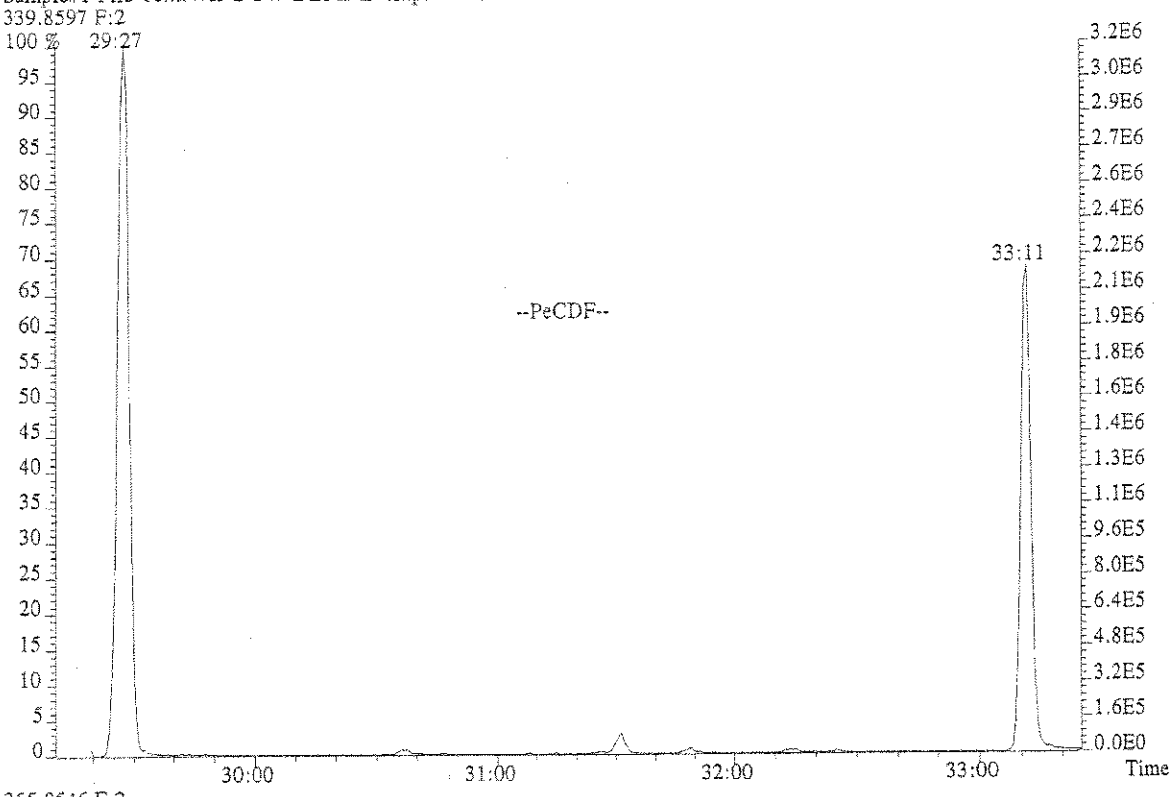

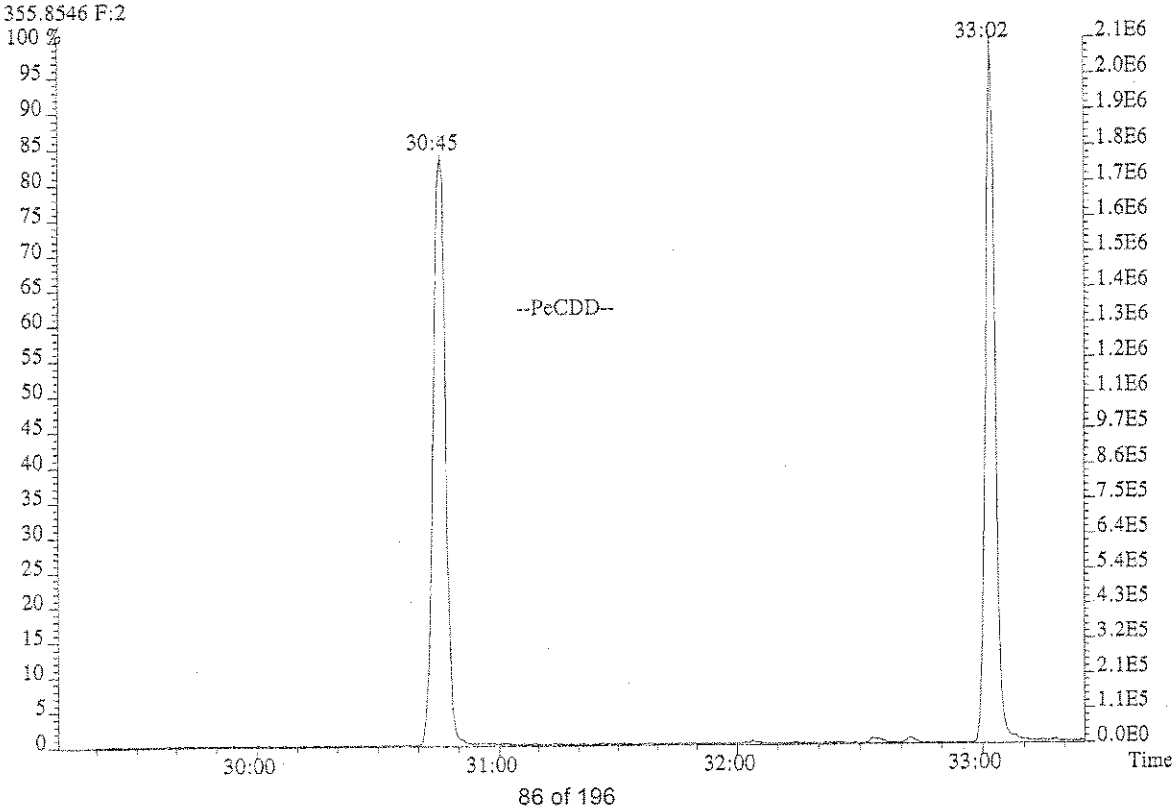

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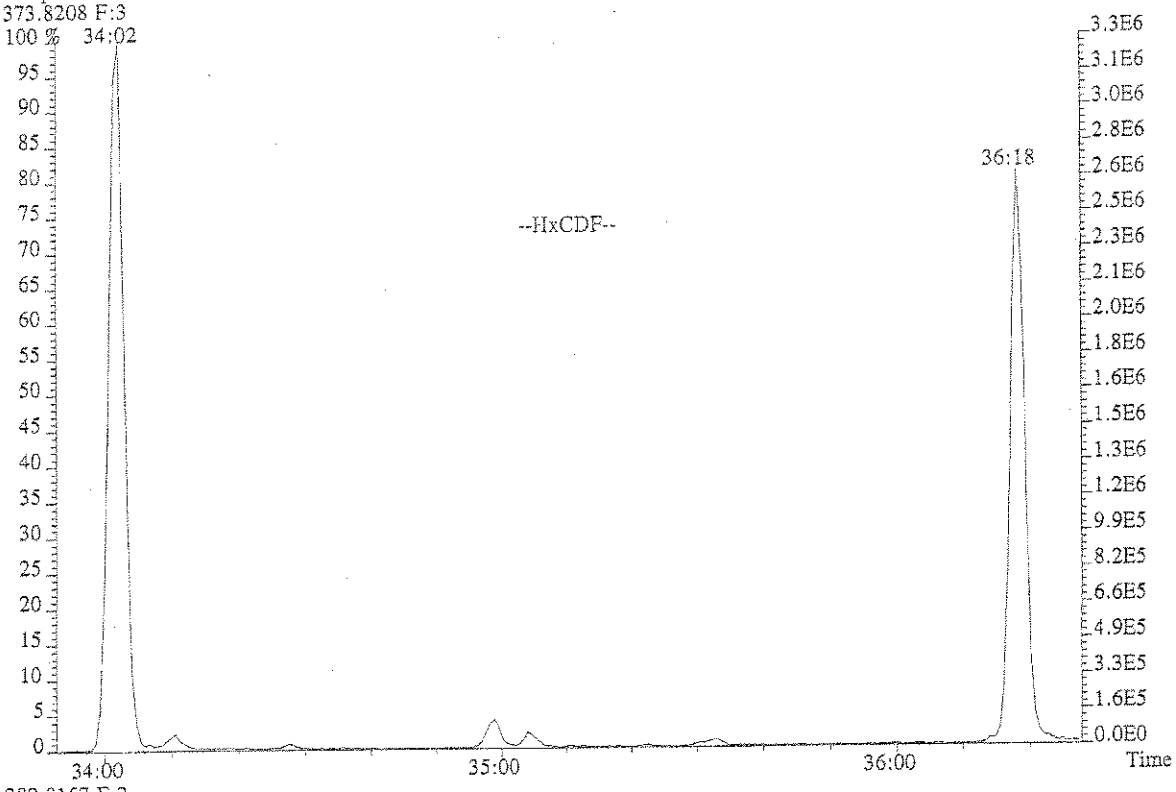

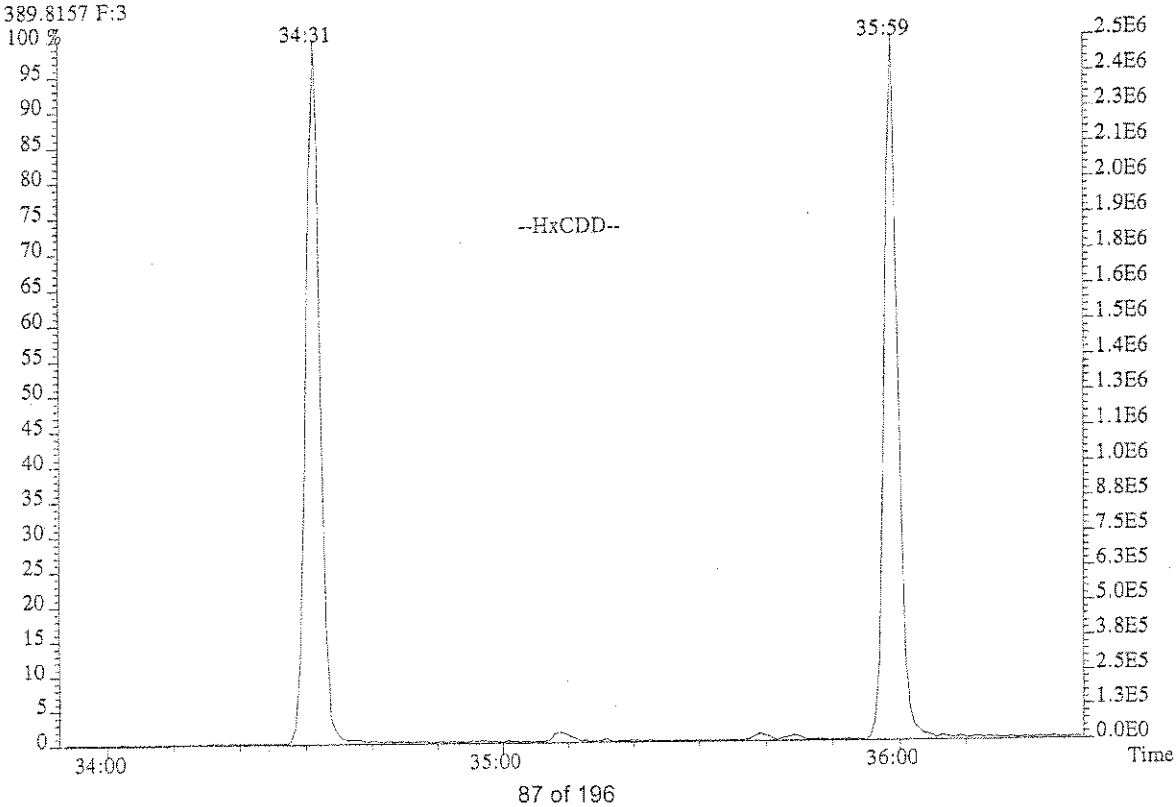

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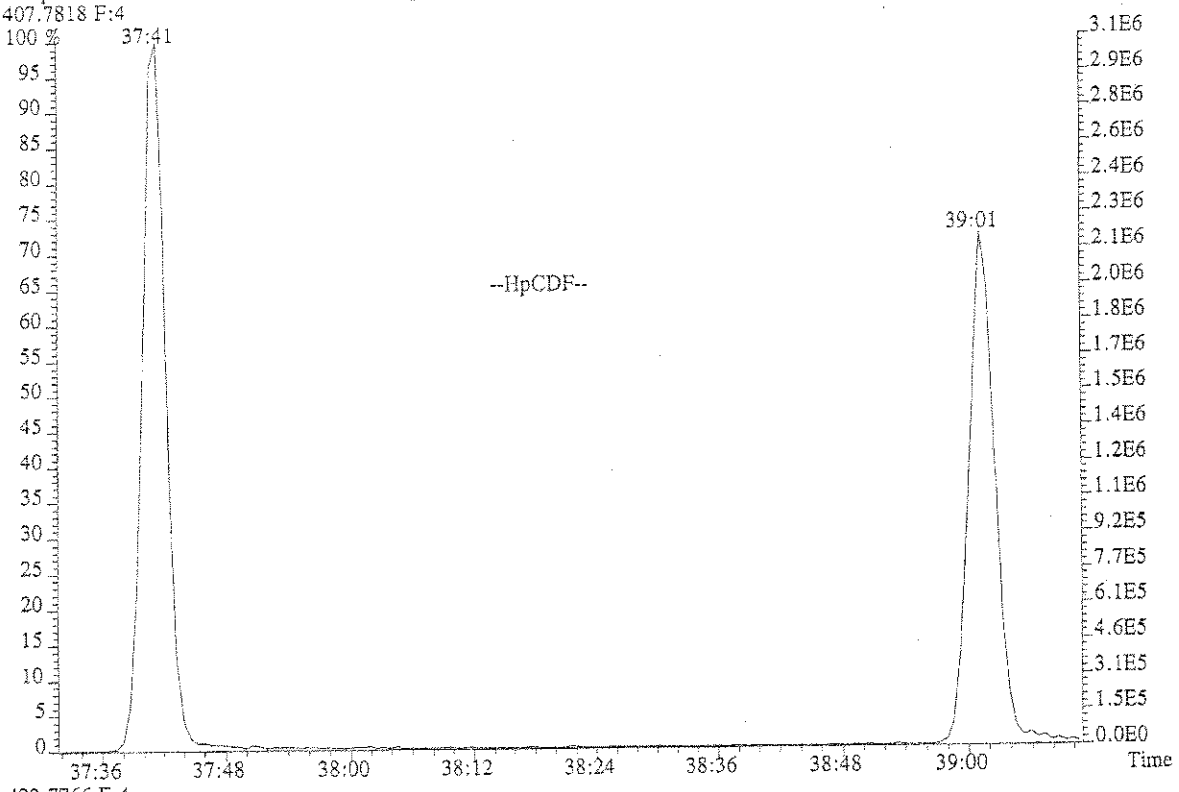

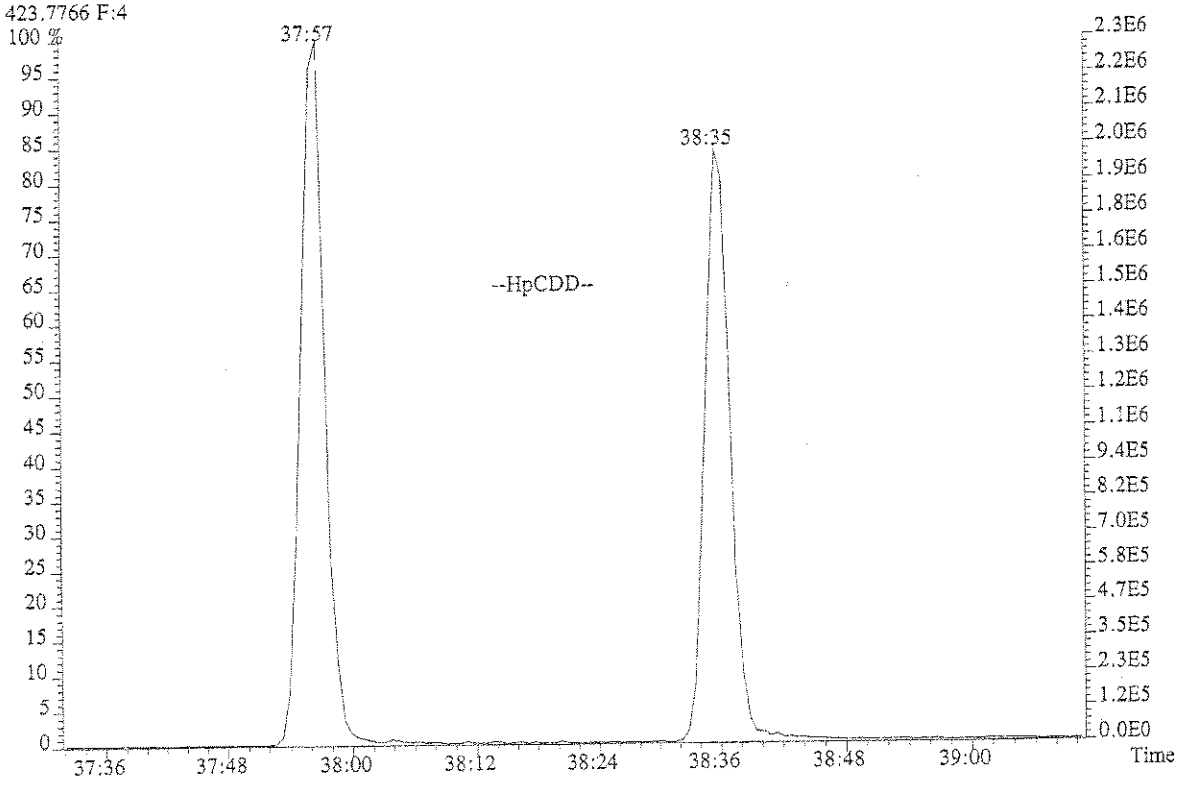

FORM 6A
PCDD/PCDF DAILY CALIBRATION RELATIVE RESPONSES

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 04/02/07

Instrument: AutoSpec-Ultima GC Column ID: DB-5

Begin CCAL Filename: U122466

End CCAL Filename: U122477

	RELATIVE RESPONSE (RR)		MEAN RR(1)	Cv (RSD)
	Begin CCAL	End CCAL		
NATIVE ANALYTES				
2,3,7,8-TCDD	0.99	0.95	0.97	2.98
1,2,3,7,8-PeCDD	0.92	0.90	0.91	2.00
1,2,3,4,7,8-HxCDD	0.95	0.97	0.96	1.29
1,2,3,6,7,8-HxCDD	0.99	0.96	0.97	1.83
1,2,3,7,8,9-HxCDD	0.98	0.90	0.94	6.14
1,2,3,4,6,7,8-HpCDD	0.95	1.07	1.01	8.74
OCDD	1.03	1.27	1.15	15.00
2,3,7,8-TCDF	0.96	0.90	0.93	4.51
1,2,3,7,8-PeCDF	0.93	0.92	0.93	0.92
2,3,4,7,8-PeCDF	0.97	0.95	0.96	1.57
1,2,3,4,7,8-HxCDF	1.23	1.16	1.20	4.11
1,2,3,6,7,8-HxCDF	1.18	1.11	1.14	4.32
1,2,3,7,8,9-HxCDF	1.03	0.91	0.97	8.65
2,3,4,6,7,8-HxCDF	1.13	1.08	1.11	3.22
1,2,3,4,6,7,8-HpCDF	1.47	1.50	1.48	1.34
1,2,3,4,7,8,9-HpCDF	1.02	1.00	1.01	1.25
OCDF	1.10	1.03	1.07	4.14

(1) Two daily mean RF values are used to compute the analyte and and labeled compouds, see Section 8.3.2.4, Method 8290.

8290F6A

FORM 6B
PCDD/PCDF DAILY CALIBRATION RELATIVE RESPONSES

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 04/02/07

Instrument: AutoSpec-Ultima GC Column ID: DB-5

Begin CCAL Filename: U122466

End CCAL Filename: U122477

	RELATIVE RESPONSE (RR)		MEAN RR(1)	Cv (RSD)
	Begin CCAL	End CCAL		
LABELED COMPOUNDS				
13C-2,3,7,8-TCDD	0.90	0.96	0.93	4.39
13C-1,2,3,7,8-PeCDD	0.86	0.90	0.88	3.34
13C-1,2,3,6,7,8-HxCDD	0.97	1.01	0.99	2.75
13C-1,2,3,4,6,7,8-HpCDD	0.99	0.95	0.97	2.83
13C-OCDD	0.99	1.00	1.00	0.82
13C-2,3,7,8-TCDF	1.20	1.18	1.19	1.12
13C-1,2,3,7,8-PeCDF	1.16	1.19	1.18	1.93
13C-1,2,3,4,7,8-HxCDF	1.04	1.09	1.07	3.60
13C-1,2,3,4,6,7,8-HpCDF	1.04	0.94	0.99	7.35
CLEANUP STANDARD				
37Cl-2,3,7,8-TCDD	0.92	0.94	0.93	1.34

(1) Two daily mean RF values are used to compute the analyte and labeled compounds, see Section 8.3.2.4, Method 8290.

8290F6B

FORM 4A
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 04/02/07

Instrument ID: AutoSpec-Ultima GC Column ID: DB-5

VER Data Filename: U122466 Analysis Date: 21-AUG-07 Time: 05:45:09

	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	CCAL. RRF	MEAN RRF	%D (3)
NATIVE ANALYTES						
2,3,7,8-TCDD	M/M+2	0.78	0.65-0.89	0.99	0.96	2.92
1,2,3,7,8-PeCDD	M+2/M+4	1.57	1.32-1.78	0.92	0.91	1.40
1,2,3,4,7,8-HxCDD	M+2/M+4	1.23	1.05-1.43	0.95	1.03	-7.88
1,2,3,6,7,8-HxCDD	M+2/M+4	1.26	1.05-1.43	0.99	1.07	-7.74
1,2,3,7,8,9-HxCDD	M+2/M+4	1.27	1.05-1.43	0.98	0.99	-0.56
1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.07	0.88-1.20	0.95	0.93	2.31
OCDD	M+2/M+4	0.89	0.76-1.02	1.03	1.02	0.97
2,3,7,8-TCDF	M/M+2	0.79	0.65-0.89	0.96	0.96	0.04
1,2,3,7,8-PeCDF	M+2/M+4	1.58	1.32-1.78	0.93	0.91	2.42
2,3,4,7,8-PeCDF	M+2/M+4	1.55	1.32-1.78	0.97	0.95	2.75
1,2,3,4,7,8-HxCDF	M+2/M+4	1.23	1.05-1.43	1.23	1.17	5.59
1,2,3,6,7,8-HxCDF	M+2/M+4	1.25	1.05-1.43	1.18	1.14	3.26
1,2,3,7,8,9-HxCDF	M+2/M+4	1.25	1.05-1.43	1.03	0.86	19.12
2,3,4,6,7,8-HxCDF	M+2/M+4	1.24	1.05-1.43	1.13	1.03	9.77
1,2,3,4,6,7,8-HpCDF	M+2/M+4	1.01	0.88-1.20	1.47	1.36	8.00
1,2,3,4,7,8,9-HpCDF	M+2/M+4	1.04	0.88-1.20	1.02	1.02	-0.36
OCDF	M+2/M+4	0.88	0.76-1.02	1.10	1.09	0.65

(1) See Table 6, Method 8290, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 8, Method 8290.

(3) The beginning CCAL %RSD for the 17 unlabeled standard must not exceed +/- 20%, Section 7.7.4.1. The ending CCAL must not exceed +/-25%. Section 8.3.2.4.

8290F4A

FORM 4B
PCDD/PCDF CALIBRATION VERIFICATION

Lab Name: Columbia Analytical Services Episode No.:

Contract No.: SDG No.:

Initial Calibration Date: 04/02/07

Instrument ID: AutoSpec-Ultima GC Column ID: DB-5

VER Data Filename: U122466 Analysis Date: 21-AUG-07 Time: 05:45:09

	M/Z'S FORMING RATIO (1)	ION ABUND. RATIO	QC LIMITS (2)	CCAL. RRF	MEAN RRF	%D (3)
LABELED COMPOUNDS						
13C-2,3,7,8-TCDD	M/M+2	0.79	0.65-0.89	0.90	0.90	0.37
13C-1,2,3,7,8-PeCDD	M+2/M+4	1.55	1.32-1.78	0.86	1.06	-19.09
13C-1,2,3,6,7,8-HxCDD	M+2/M+4	1.26	1.05-1.43	0.97	1.01	-3.49
13C-1,2,3,4,6,7,8-HpCDD	M+2/M+4	1.05	0.88-1.20	0.99	1.09	-9.72
13C-OCDD	M+2/M+4	0.91	0.76-1.02	0.99	1.17	-15.49
13C-2,3,7,8-TCDF	M/M+2	0.76	0.65-0.89	1.20	1.20	0.10
13C-1,2,3,7,8-PeCDF	M+2/M+4	1.56	1.32-1.78	1.16	1.52	-23.39
13C-1,2,3,4,7,8-HxCDF	M/M+2	0.56	0.43-0.59	1.04	1.28	-19.06
13C-1,2,3,4,6,7,8-HpCDF	M/M+2	0.44	0.37-0.51	1.04	1.11	-6.10
CLEANUP STANDARD						
37Cl-2,3,7,8-TCDD				0.92	0.86	7.67

(1) See Table 6, Method 8290, for m/z specifications.

(2) Ion Abundance Ratio Control Limits as specified in Table 8, Method 8290.

(3) The beginning CCAL %RSD for the labeled standard must not exceed +/- 30%, Section 7.7.4.2. The ending CCAL must not exceed +/- 35%, Section 8.3.2.4.

8290F4B

Columbia Analytical Services, Inc.
Sample Response Summary

CLIENT ID.
CCAL HRCC3

Run #6 Filename U122466 Samp: 1 Inj: 1 Acquired: 21-AUG-07 05:45:09
Processed: 22-AUG-07 08:52:52 LAB. ID: CCAL HRCC3

	Typ	Name	RT-1	Resp 1	Resp 2	Ratio	Meet	Mod?
1	Unk	2,3,7,8-TCDF	27:20	8.463e+03	1.075e+04	0.79	yes	no
2	Unk	1,2,3,7,8-PeCDF	31:31	2.790e+04	1.770e+04	1.58	yes	no
3	Unk	2,3,4,7,8-PeCDF	32:13	2.886e+04	1.859e+04	1.55	yes	no
4	Unk	1,2,3,4,7,8-HxCDF	34:58	2.853e+04	2.314e+04	1.23	yes	no
5	Unk	1,2,3,6,7,8-HxCDF	35:04	2.746e+04	2.202e+04	1.25	yes	no
6	Unk	2,3,4,6,7,8-HxCDF	35:33	2.627e+04	2.122e+04	1.24	yes	no
7	Unk	1,2,3,7,8,9-HxCDF	36:14	2.397e+04	1.910e+04	1.25	yes	no
8	Unk	1,2,3,4,6,7,8-HpCDF	37:41	3.100e+04	3.081e+04	1.01	yes	no
9	Unk	1,2,3,4,7,8,9-HpCDF	39:01	2.178e+04	2.104e+04	1.04	yes	no
10	Unk	OCDF	41:51	4.111e+04	4.678e+04	0.88	yes	no
11	Unk	2,3,7,8-TCDD	28:07	6.557e+03	8.441e+03	0.78	yes	no
12	Unk	1,2,3,7,8-PeCDD	32:34	2.032e+04	1.290e+04	1.57	yes	no
13	Unk	1,2,3,4,7,8-HxCDD	35:39	2.060e+04	1.681e+04	1.23	yes	no
14	Unk	1,2,3,6,7,8-HxCDD	35:44	2.153e+04	1.714e+04	1.26	yes	no
15	Unk	1,2,3,7,8,9-HxCDD	36:00	2.159e+04	1.698e+04	1.27	yes	no
16	Unk	1,2,3,4,6,7,8-HpCDD	38:35	1.949e+04	1.826e+04	1.07	yes	no
17	Unk	OCDD	41:42	3.874e+04	4.358e+04	0.89	yes	no
18	IS	13C-2,3,7,8-TCDF	27:19	4.350e+04	5.706e+04	0.76	yes	no
19	IS	13C-1,2,3,7,8-PeCDF	31:29	5.955e+04	3.815e+04	1.56	yes	no
20	IS	13C-1,2,3,4,7,8-HxCDF	34:58	7.550e+04	1.343e+05	0.56	yes	no
21	IS	13C-1,2,3,4,6,7,8-HpCDF	37:40	6.483e+04	1.457e+05	0.44	yes	no
22	IS	13C-2,3,7,8-TCDD	28:07	3.352e+04	4.236e+04	0.79	yes	no
23	IS	13C-1,2,3,7,8-PeCDD	32:33	4.373e+04	2.812e+04	1.55	yes	no
24	IS	13C-1,2,3,6,7,8-HxCDD	35:43	1.092e+05	8.700e+04	1.26	yes	no
25	IS	13C-1,2,3,4,6,7,8-HpCDD	38:35	1.021e+05	9.731e+04	1.05	yes	no
26	IS	13C-OCDD	41:41	1.906e+05	2.101e+05	0.91	yes	no
27	RS/RT	13C-1,2,3,4-TCDD	27:55	3.710e+04	4.692e+04	0.79	yes	no
28	RS/RT	13C-1,2,3,7,8,9-HxCDD	35:60	1.125e+05	8.938e+04	1.26	yes	no
29	C/Up	37Cl-2,3,7,8-TCDD	28:07	1.554e+04				
					SUM AREA			
30	Tot	Total Tetra-Furans	26:53		1.954e+04	0.72	yes	
31	Tot	Total Tetra-Dioxins	28:07		1.500e+04	0.78	yes	
32	Tot	Total Penta-Furans	30:39		9.383e+04	1.50	yes	
33	Tot	Total Penta-Dioxins	32:34		3.322e+04	1.57	yes	
34	Tot	Total Hexa-Furans	34:58		1.917e+05	1.23	yes	
35	Tot	Total Hexa-Dioxins	35:39		1.146e+05	1.23	yes	
36	Tot	Total Hepta-Furans	37:41		1.063e+05	1.01	yes	
37	Tot	Total Hepta-Dioxins	37:56		3.829e+04	1.05	yes	

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Columbia Analytical Services,Inc. CLIENT ID.
Signal/Noise Height Ratio Summary CCAL HRCC3

Run #6 Filename U122466 Samp: 1 Inj: 1 Acquired: 21-AUG-07 05:45:09

Processed: 22-AUG-07 08:52:52 LAB. ID: CCAL HRCC3

	Name	Signal 1	Noise 1	S/N Rat.1	Signal 2	Noise 2	S/N Rat.2
1	2,3,7,8-TCDF	1.51e+06	2.20e+02	6.9e+03	1.94e+06	6.76e+02	2.9e+03
2	1,2,3,7,8-PeCDF	5.61e+06	4.68e+02	1.2e+04	3.60e+06	1.15e+03	3.1e+03
3	2,3,4,7,8-PeCDF	6.16e+06	4.68e+02	1.3e+04	4.02e+06	1.15e+03	3.5e+03
4	1,2,3,4,7,8-HxCDF	6.48e+06	9.64e+02	6.7e+03	5.28e+06	7.16e+02	7.4e+03
5	1,2,3,6,7,8-HxCDF	6.29e+06	9.64e+02	6.5e+03	5.00e+06	7.16e+02	7.0e+03
6	2,3,4,6,7,8-HxCDF	6.10e+06	9.64e+02	6.3e+03	4.90e+06	7.16e+02	6.8e+03
7	1,2,3,7,8,9-HxCDF	5.41e+06	9.64e+02	5.6e+03	4.24e+06	7.16e+02	5.9e+03
8	1,2,3,4,6,7,8-HpCDF	6.88e+06	4.51e+03	1.5e+03	6.83e+06	3.40e+02	2.0e+04
9	1,2,3,4,7,8,9-HpCDF	4.41e+06	4.51e+03	9.8e+02	4.25e+06	3.40e+02	1.2e+04
10	OCDF	6.07e+06	7.56e+02	8.0e+03	6.99e+06	1.05e+03	6.7e+03
11	2,3,7,8-TCDD	1.24e+06	5.16e+02	2.4e+03	1.64e+06	4.08e+02	4.0e+03
12	1,2,3,7,8-PeCDD	4.34e+06	1.12e+03	3.9e+03	2.82e+06	2.96e+02	9.5e+03
13	1,2,3,4,7,8-HxCDD	4.91e+06	4.12e+02	1.2e+04	3.87e+06	6.12e+02	6.3e+03
14	1,2,3,6,7,8-HxCDD	4.93e+06	4.12e+02	1.2e+04	3.88e+06	6.12e+02	6.3e+03
15	1,2,3,7,8,9-HxCDD	4.99e+06	4.12e+02	1.2e+04	3.93e+06	6.12e+02	6.4e+03
16	1,2,3,4,6,7,8-HpCDD	4.09e+06	9.84e+02	4.2e+03	3.86e+06	9.56e+02	4.0e+03
17	OCDD	5.91e+06	8.88e+02	6.7e+03	6.66e+06	1.10e+03	6.1e+03
18	13C-2,3,7,8-TCDF	7.55e+06	2.30e+03	3.3e+03	9.93e+06	8.28e+02	1.2e+04
19	13C-1,2,3,7,8-PeCDF	1.17e+07	1.72e+02	6.8e+04	7.58e+06	4.48e+02	1.7e+04
20	13C-1,2,3,4,7,8-HxCDF	1.68e+07	7.64e+02	2.2e+04	3.00e+07	8.56e+02	3.5e+04
21	13C-1,2,3,4,6,7,8-HpCDF	1.43e+07	4.26e+03	3.4e+03	3.25e+07	1.09e+04	3.0e+03
22	13C-2,3,7,8-TCDD	6.12e+06	2.10e+03	2.9e+03	7.65e+06	9.72e+02	7.9e+03
23	13C-1,2,3,7,8-PeCDD	9.48e+06	8.12e+02	1.2e+04	6.10e+06	4.28e+02	1.4e+04
24	13C-1,2,3,6,7,8-HxCDD	2.56e+07	2.28e+03	1.1e+04	2.01e+07	1.14e+03	1.8e+04
25	13C-1,2,3,4,6,7,8-HpCDD	2.13e+07	1.72e+03	1.2e+04	2.02e+07	8.60e+02	2.4e+04
26	13C-OCDD	2.85e+07	1.01e+03	2.8e+04	3.15e+07	1.11e+03	2.8e+04
27	13C-1,2,3,4-TCDD	6.85e+06	2.10e+03	3.3e+03	8.73e+06	9.72e+02	9.0e+03
28	13C-1,2,3,7,8,9-HxCDD	2.58e+07	2.28e+03	1.1e+04	2.07e+07	1.14e+03	1.8e+04
29	37Cl-2,3,7,8-TCDD	2.93e+06	5.52e+02	5.3e+03			

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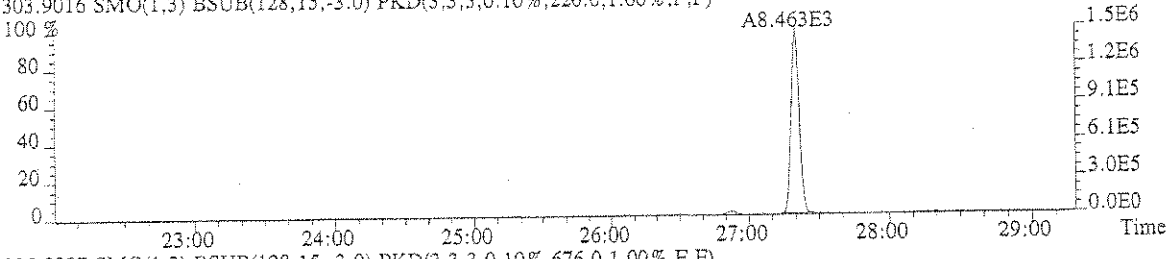
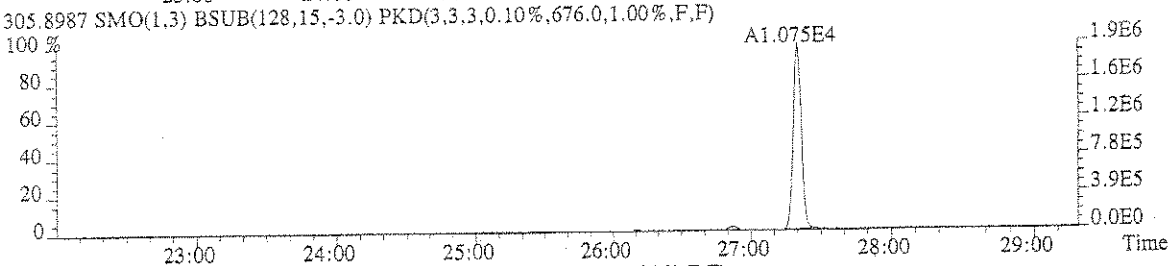
File:U122466 #1-610 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 File Text:CCAL HRCC3 Exp:CCAL HRCC3

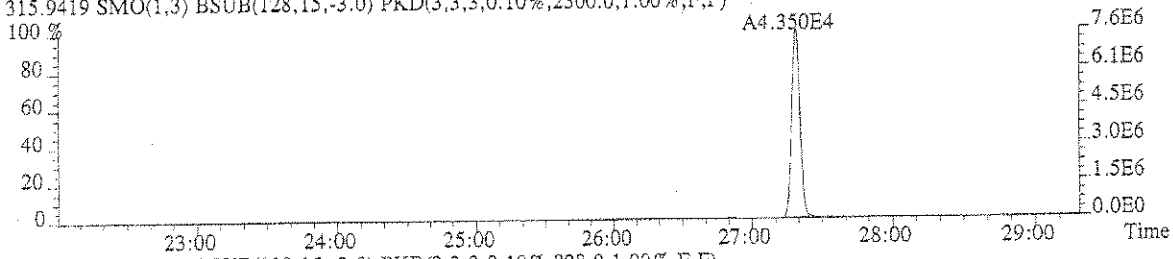
303.9016 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,220.0,1.00%,F,F)



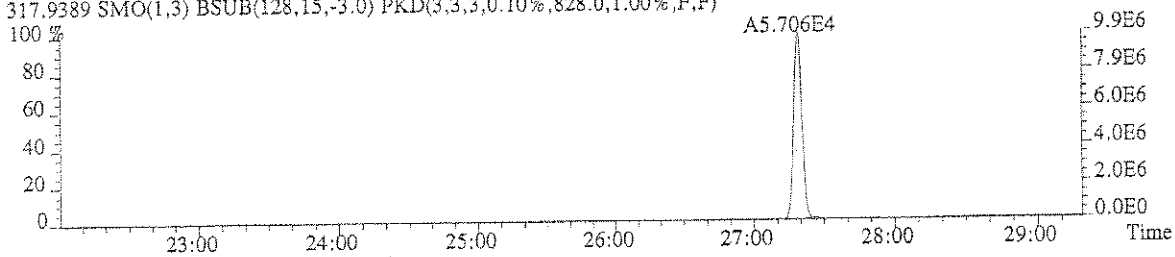
305.8987 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,676.0,1.00%,F,F)



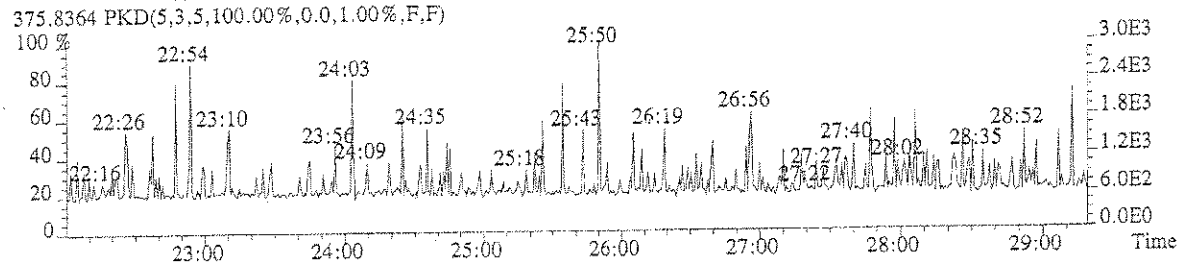
315.9419 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,2300.0,1.00%,F,F)



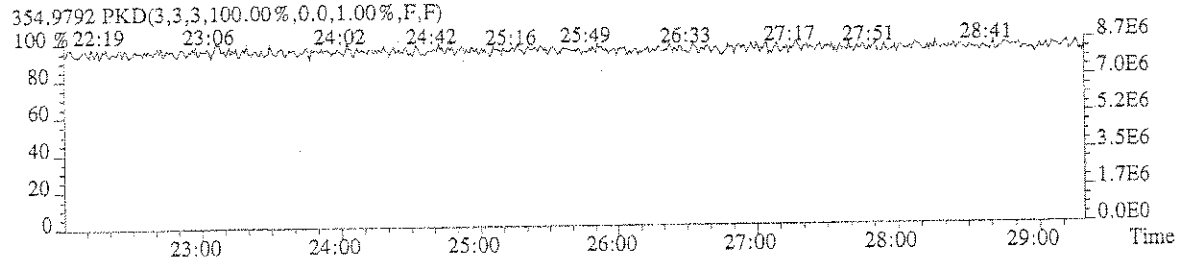
317.9389 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,828.0,1.00%,F,F)



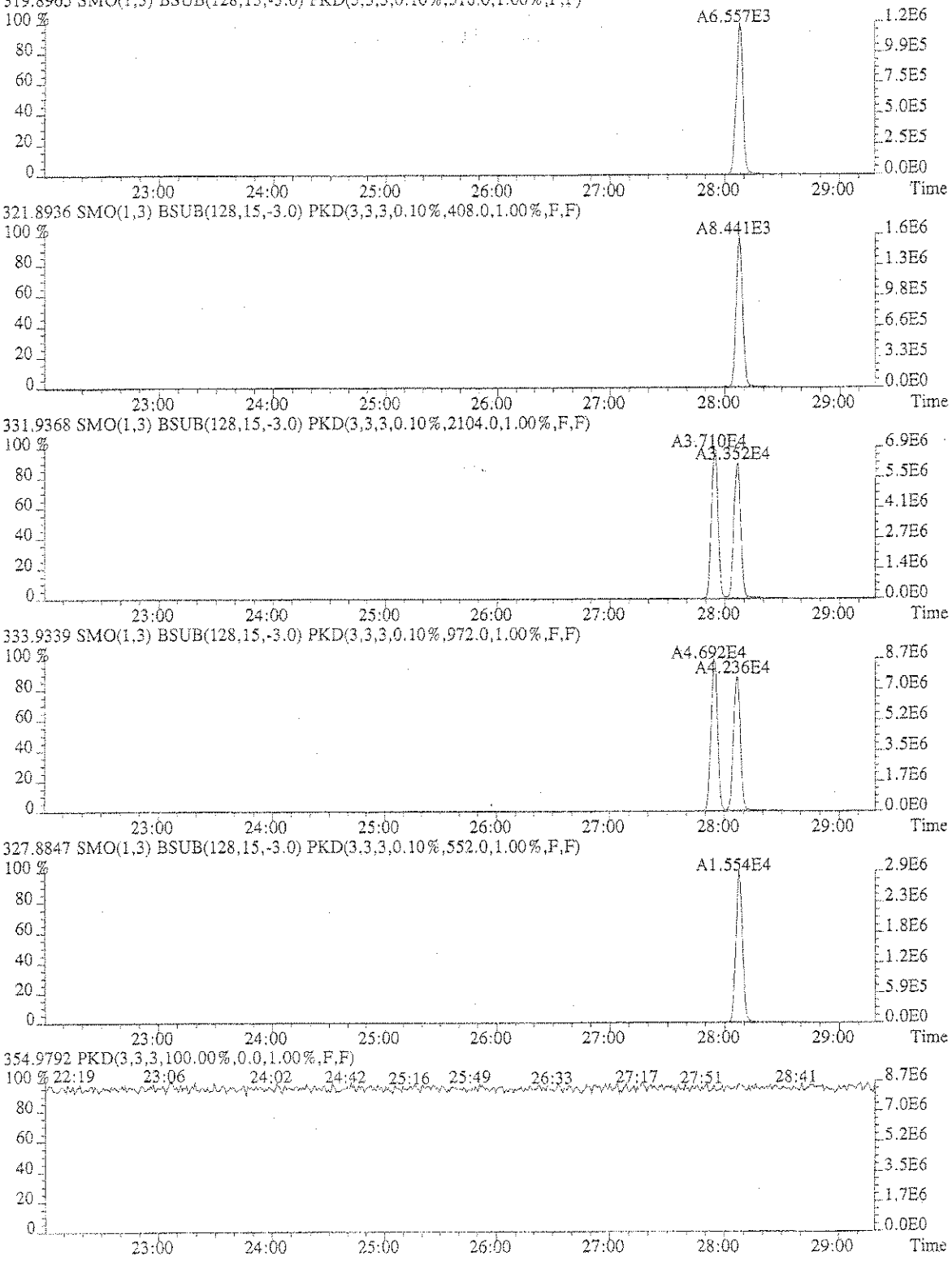
375.8364 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



354.9792 PKD(3,3,3,100.00%,0.0,1.00%,F,F)

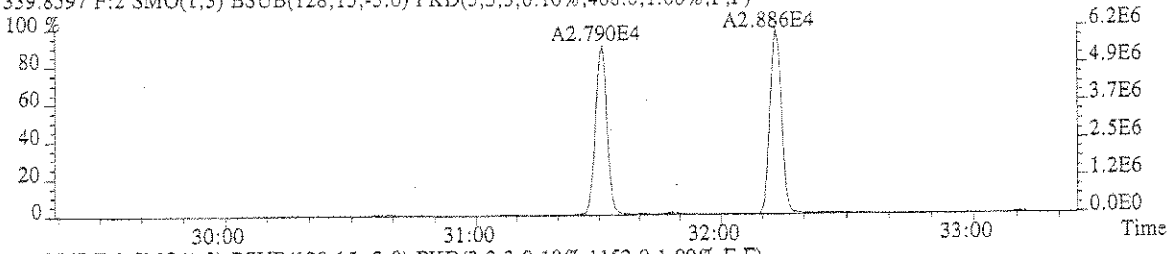


File:U122466 #1-610 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spect£
Sample#1 File Text:CCAL HRCC3 Exp:CCAL HRCC3

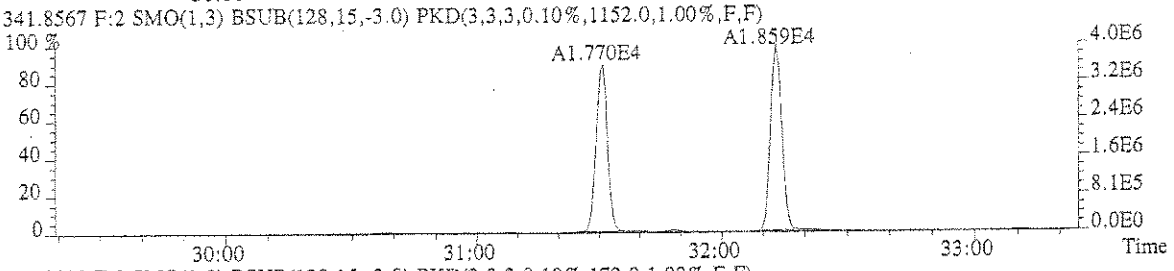


File:U122466 #1-372 Acq:21-AUG-2007 05:45:09 Probe EI+ Magnet SIR VG BioTech Mass spectf
Sample#1 File Text:CCAL HRCC3 Exp:CCAL HRCC3

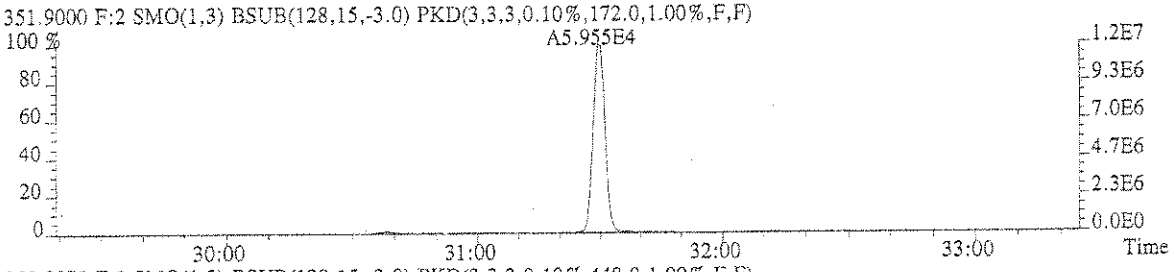
339.8597 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,468.0,1.00%,F,F)



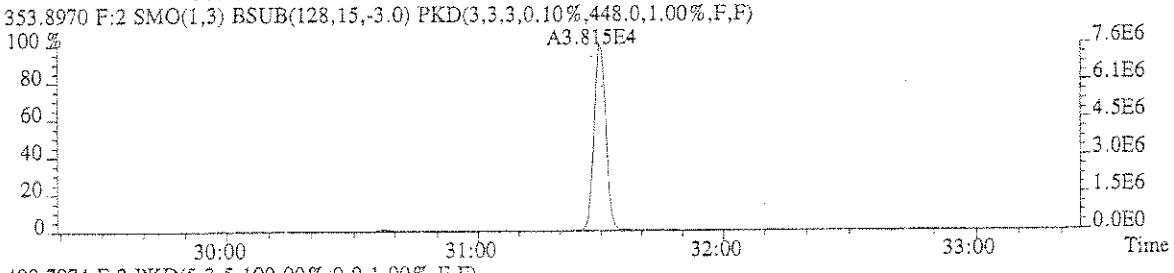
341.8567 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,1152.0,1.00%,F,F)



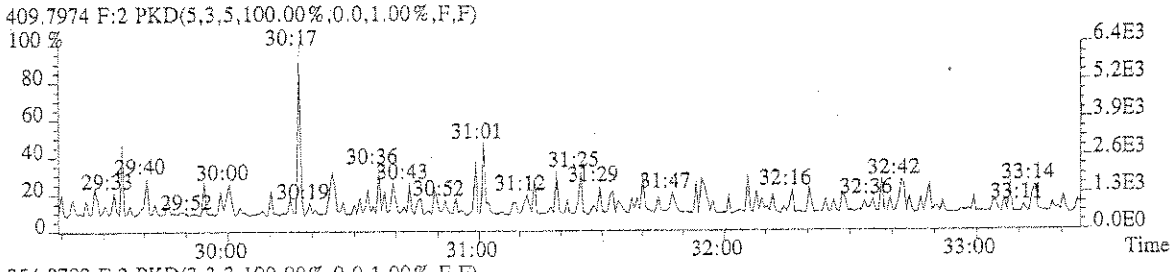
351.9000 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,172.0,1.00%,F,F)



353.8970 F:2 SMO(1,3) BSUB(128,15,-3.0) PKD(3,3,3,0.10%,448.0,1.00%,F,F)



409.7974 F:2 PKD(5,3,5,100.00%,0.0,1.00%,F,F)



354.9792 F:2 PKD(3,3,3,100.00%,0.0,1.00%,F,F)