



11/27/12

## Technical Report for

**XTO Energy**

**PCU 296-5A**

**1210-04**

**Accutest Job Number: D41014**

**Sampling Date: 11/14/12**

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**Total number of pages in report: 149**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
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Laboratory Director

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Certifications: CO, ID, NE, NM, ND (R-027) (PW), UT (NELAP CO00049), TX (T104704511-12-1)

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Test results relate only to samples analyzed.

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Sample Summary

XTO Energy

Job No: D41014

PCU 296-5A  
Project No: 1210-04

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
D41014-1	11/14/12	13:45 DS	11/16/12	SO	Soil	CUT 2 SUBLINER (COMP)
D41014-1A	11/14/12	13:45 DS	11/16/12	SO	Soil	CUT 2 SUBLINER (COMP)

Soil samples reported on a dry weight basis unless otherwise indicated on result page.



## CASE NARRATIVE / CONFORMANCE SUMMARY

**Client:** XTO Energy

**Job No** D41014

**Site:** PCU 296-5A

**Report Date** 11/27/2012 2:15:27 PM

On 11/16/2012, 1 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at Accutest Mountain States (AMS) at a temperature of 2.7 °C. The samples were intact and properly preserved, unless noted below. An AMS Job Number of D41014 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** SO

**Batch ID:** V5V1506

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D41036-1MS, D41036-1MSD were used as the QC samples indicated.

### Extractables by GCMS By Method SW846 8270C BY SIM

**Matrix** SO

**Batch ID:** OP6988

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- Sample(s) D41014-1MS, D41014-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

### Volatiles by GC By Method SW846 8015B

**Matrix** SO

**Batch ID:** GGB1010

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D41015-1MS, D41015-1MSD were used as the QC samples indicated.

### Extractables by GC By Method SW846-8015B

**Matrix** SO

**Batch ID:** OP6979

- All samples were extracted within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D41044-9MS, D41044-9MSD were used as the QC samples indicated.

## Metals By Method SW846 6010C

**Matrix** AQ

**Batch ID:** MP8915

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D41042-1AMS, D41042-1AMSD, D41042-1ASDL were used as the QC samples for the metals analysis.
- The serial dilution RPD(s) for Magnesium, Sodium are outside control limits for sample MP8915-SD1. Probable cause due to sample homogeneity.
- MP8915-SD1 for Magnesium: Serial dilution indicates possible matrix interference.
- MP8915-SD1 for Sodium: Serial dilution indicates possible matrix interference.

**Matrix** SO

**Batch ID:** MP8913

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D41013-1MS, D41013-1MSD, D41013-1SDL were used as the QC samples for the metals analysis.
- The matrix spike (MS) recovery(s) of Nickel, Silver are outside control limits. Spike recovery indicates possible matrix interference.
- The matrix spike duplicate (MSD) recovery(s) of Chromium, Nickel, Silver are outside control limits. Probable cause due to matrix interference.
- The matrix spike (MS) recovery(s) of Barium are outside control limits. Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.
- The serial dilution RPD(s) for Selenium, Silver, Barium, Chromium, Nickel, Zinc are outside control limits for sample MP8913-SD1. Percent difference acceptable due to low initial sample concentration (< 50 times IDL).
- MP8913-SD1 for Nickel: Serial dilution indicates possible matrix interference.
- MP8913-SD1 for Chromium: Serial dilution indicates possible matrix interference.
- MP8913-SD1 for Barium: Serial dilution indicates possible matrix interference.
- MP8913-SD1 for Zinc: Serial dilution indicates possible matrix interference.

## Metals By Method SW846 6020A

**Matrix** SO

**Batch ID:** MP8914

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D41013-1MS, D41013-1MSD, D41013-1SDL were used as the QC samples for the metals analysis.

## Metals By Method SW846 7471B

**Matrix** SO

**Batch ID:** MP8936

- All samples were digested within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40988-1MS, D40988-1MSD were used as the QC samples for the metals analysis.

## Wet Chemistry By Method ASTM D1498-76M

**Matrix** SO

**Batch ID:** GN17722

- Sample(s) D41014-1DUP were used as the QC samples for the Redox Potential Vs H2 analysis.

### Wet Chemistry By Method SM19 2540B M

<b>Matrix</b> SO	<b>Batch ID:</b> GN17724
------------------	--------------------------

- The data for SM19 2540B M meets quality control requirements.

### Wet Chemistry By Method SW846 3060/7196A M

<b>Matrix</b> SO	<b>Batch ID:</b> R15202
------------------	-------------------------

- The data for SW846 3060/7196A M meets quality control requirements.
- D41014-1 for Chromium, Trivalent: Calculated as: (Chromium) - (Chromium, Hexavalent)

### Wet Chemistry By Method SW846 3060A/7196A

<b>Matrix</b> SO	<b>Batch ID:</b> GP8709
------------------	-------------------------

- All samples were prepared within the recommended method holding time.
- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) D40985-1DUP, D40985-1MS, D40985-1MSD were used as the QC samples for the Chromium, Hexavalent analysis.

### Wet Chemistry By Method SW846 9045D

<b>Matrix</b> SO	<b>Batch ID:</b> GN17719
------------------	--------------------------

- The following samples were run outside of holding time for method SW846 9045D: D41014-1

### Wet Chemistry By Method USDA HANDBOOK 60

<b>Matrix</b> SO	<b>Batch ID:</b> MP8915
------------------	-------------------------

- D41014-1A for Sodium Adsorption Ratio: Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

AMS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting AMS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

AMS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by AMS indicated via signature on the report cover.

## Summary of Hits

Page 1 of 1

**Job Number:** D41014  
**Account:** XTO Energy  
**Project:** PCU 296-5A  
**Collected:** 11/14/12



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
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### D41014-1 CUT 2 SUBLINER (COMP)

Benzene	0.0444 J	0.065	0.032	mg/kg	SW846 8260B
Toluene	0.158	0.13	0.065	mg/kg	SW846 8260B
Ethylbenzene	0.0330 J	0.13	0.025	mg/kg	SW846 8260B
Xylene (total)	0.161 J	0.26	0.13	mg/kg	SW846 8260B
Naphthalene	0.0348	0.013	0.012	mg/kg	SW846 8270C BY SIM
TPH-DRO (C10-C28)	24.7	15	10	mg/kg	SW846-8015B
Arsenic	13.0	0.11		mg/kg	SW846 6020A
Barium	1710	1.1		mg/kg	SW846 6010C
Chromium	65.4	1.1		mg/kg	SW846 6010C
Copper	8.1	1.1		mg/kg	SW846 6010C
Lead	9.1	5.7		mg/kg	SW846 6010C
Nickel	20.5	3.4		mg/kg	SW846 6010C
Zinc	38.2	3.4		mg/kg	SW846 6010C
Specific Conductivity	353	1.0		umhos/cm	SM2510B-1997 MOD
Chromium, Trivalent <sup>a</sup>	65.4	2.1		mg/kg	SW846 3060/7196A M
Redox Potential Vs H2	94.2			mv	ASTM D1498-76M
pH	9.90			su	SW846 9045D

### D41014-1A CUT 2 SUBLINER (COMP)

Calcium	14.0	2.0		mg/l	SW846 6010C
Magnesium	4.53	1.0		mg/l	SW846 6010C
Sodium	61.8	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio <sup>b</sup>	3.67			ratio	USDA HANDBOOK 60

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

(b) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]



Sample Results

Report of Analysis

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## Report of Analysis

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<b>Client Sample ID:</b>	CUT 2 SUBLINER (COMP)	<b>Date Sampled:</b>	11/14/12
<b>Lab Sample ID:</b>	D41014-1	<b>Date Received:</b>	11/16/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	86.4
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	PCU 296-5A		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V24680.D	1	11/19/12	BD	n/a	n/a	V5V1506
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.07 g	5.0 ml	100 ul
Run #2			

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	0.0444	0.065	0.032	mg/kg	J
108-88-3	Toluene	0.158	0.13	0.065	mg/kg	
100-41-4	Ethylbenzene	0.0330	0.13	0.025	mg/kg	J
1330-20-7	Xylene (total)	0.161	0.26	0.13	mg/kg	J

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
2037-26-5	Toluene-D8	101%		64-130%
460-00-4	4-Bromofluorobenzene	100%		62-131%
17060-07-0	1,2-Dichloroethane-D4	96%		70-130%

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

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## Report of Analysis

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<b>Client Sample ID:</b>	CUT 2 SUBLINER (COMP)	<b>Date Sampled:</b>	11/14/12
<b>Lab Sample ID:</b>	D41014-1	<b>Date Received:</b>	11/16/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	86.4
<b>Method:</b>	SW846 8270C BY SIM SW846 3546		
<b>Project:</b>	PCU 296-5A		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3G12231.D	1	11/26/12	SM	11/20/12	OP6988	E3G577
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	1.0 ml
Run #2		

## COGCC Table 910-1 PAH List

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	0.0096	0.0050	mg/kg	
120-12-7	Anthracene	ND	0.0096	0.0050	mg/kg	
56-55-3	Benzo(a)anthracene	ND	0.0096	0.0050	mg/kg	
205-99-2	Benzo(b)fluoranthene	ND	0.0096	0.0050	mg/kg	
207-08-9	Benzo(k)fluoranthene	ND	0.0096	0.0050	mg/kg	
50-32-8	Benzo(a)pyrene	ND	0.0096	0.0050	mg/kg	
218-01-9	Chrysene	ND	0.0096	0.0050	mg/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	0.0096	0.0050	mg/kg	
206-44-0	Fluoranthene	ND	0.0096	0.0050	mg/kg	
86-73-7	Fluorene	ND	0.0096	0.0050	mg/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	0.0096	0.0050	mg/kg	
91-20-3	Naphthalene	0.0348	0.013	0.012	mg/kg	
129-00-0	Pyrene	ND	0.0096	0.0050	mg/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
4165-60-0	Nitrobenzene-d5	80%		10-159%
321-60-8	2-Fluorobiphenyl	85%		19-131%
1718-51-0	Terphenyl-d14	85%		18-150%

ND = Not detected MDL - Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

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N = Indicates presumptive evidence of a compound

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## Report of Analysis

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<b>Client Sample ID:</b>	CUT 2 SUBLINER (COMP)		
<b>Lab Sample ID:</b>	D41014-1	<b>Date Sampled:</b>	11/14/12
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b>	11/16/12
<b>Method:</b>	SW846 8015B	<b>Percent Solids:</b>	86.4
<b>Project:</b>	PCU 296-5A		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GB18507.D	1	11/16/12	SK	n/a	n/a	GGB1010
Run #2							

	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.1 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	13	6.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	92%		60-140%		

ND = Not detected      MDL - Method Detection Limit  
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J = Indicates an estimated value  
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 N = Indicates presumptive evidence of a compound

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## Report of Analysis

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<b>Client Sample ID:</b>	CUT 2 SUBLINER (COMP)	
<b>Lab Sample ID:</b>	D41014-1	<b>Date Sampled:</b> 11/14/12
<b>Matrix:</b>	SO - Soil	<b>Date Received:</b> 11/16/12
<b>Method:</b>	SW846-8015B SW846 3546	<b>Percent Solids:</b> 86.4
<b>Project:</b>	PCU 296-5A	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FD19691.D	1	11/19/12	AV	11/19/12	OP6979	GFD990
Run #2							

	Initial Weight	Final Volume
Run #1	30.0 g	2.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	24.7	15	10	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	79%		35-130%		

ND = Not detected      MDL - Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	CUT 2 SUBLINER (COMP)	<b>Date Sampled:</b>	11/14/12
<b>Lab Sample ID:</b>	D41014-1	<b>Date Received:</b>	11/16/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	86.4
<b>Project:</b>	PCU 296-5A		

## Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Arsenic	13.0	0.11	mg/kg	5	11/19/12	11/26/12 JB	SW846 6020A <sup>2</sup>	SW846 3050B <sup>5</sup>
Barium	1710	1.1	mg/kg	1	11/19/12	11/19/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Cadmium	< 1.1	1.1	mg/kg	1	11/19/12	11/19/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Chromium	65.4	1.1	mg/kg	1	11/19/12	11/19/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Copper	8.1	1.1	mg/kg	1	11/19/12	11/19/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Lead	9.1	5.7	mg/kg	1	11/19/12	11/20/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Mercury	< 0.090	0.090	mg/kg	1	11/27/12	11/27/12 JM	SW846 7471B <sup>3</sup>	SW846 7471B <sup>6</sup>
Nickel	20.5	3.4	mg/kg	1	11/19/12	11/19/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Selenium	< 5.7	5.7	mg/kg	1	11/19/12	11/19/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Silver	< 3.4	3.4	mg/kg	1	11/19/12	11/19/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>
Zinc	38.2	3.4	mg/kg	1	11/19/12	11/19/12 JM	SW846 6010C <sup>1</sup>	SW846 3050B <sup>4</sup>

(1) Instrument QC Batch: MA3012

(2) Instrument QC Batch: MA3019

(3) Instrument QC Batch: MA3023

(4) Prep QC Batch: MP8913

(5) Prep QC Batch: MP8914

(6) Prep QC Batch: MP8936

RL = Reporting Limit

## Report of Analysis

<b>Client Sample ID:</b>	CUT 2 SUBLINER (COMP)	<b>Date Sampled:</b>	11/14/12
<b>Lab Sample ID:</b>	D41014-1	<b>Date Received:</b>	11/16/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	86.4
<b>Project:</b>	PCU 296-5A		

## General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
<b>prep: DEPT.OF AG, BOOK N9</b>							
Specific Conductivity	353	1.0	umhos/cm	1	11/19/12	JD	SM2510B-1997 MOD
Chromium, Hexavalent	< 1.0	1.0	mg/kg	1	11/19/12	KB	SW846 3060A/7196A
Chromium, Trivalent <sup>a</sup>	65.4	2.1	mg/kg	1	11/19/12 17:50	JM	SW846 3060/7196A M
Redox Potential Vs H2	94.2		mv	1	11/16/12	CT	ASTM D1498-76M
Solids, Percent	86.4		%	1	11/19/12	SWT	SM19 2540B M
pH	9.90		su	1	11/16/12 15:45	JD	SW846 9045D

(a) Calculated as: (Chromium) - (Chromium, Hexavalent)

RL = Reporting Limit

Report of Analysis

<b>Client Sample ID:</b>	CUT 2 SUBLINER (COMP)	<b>Date Sampled:</b>	11/14/12
<b>Lab Sample ID:</b>	D41014-1A	<b>Date Received:</b>	11/16/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	86.4
<b>Project:</b>	PCU 296-5A		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	14.0	2.0	mg/l	1	11/19/12	11/19/12 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Magnesium	4.53	1.0	mg/l	1	11/19/12	11/19/12 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Sodium	61.8	2.0	mg/l	1	11/19/12	11/19/12 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>

(1) Instrument QC Batch: MA3012  
(2) Prep QC Batch: MP8915

RL = Reporting Limit



Report of Analysis

<b>Client Sample ID:</b>	CUT 2 SUBLINER (COMP)	<b>Date Sampled:</b>	11/14/12
<b>Lab Sample ID:</b>	D41014-1A	<b>Date Received:</b>	11/16/12
<b>Matrix:</b>	SO - Soil	<b>Percent Solids:</b>	86.4
<b>Project:</b>	PCU 296-5A		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	3.67		ratio	1	11/19/12 15:32	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody



## Accutest Laboratories Sample Receipt Summary

**Accutest Job Number:** D41014

**Client:** KRW CONSULTING

**Immediate Client Services Action Required:** No

**Date / Time Received:** 11/16/2012 1:00:00 PM

**No. Coolers:** 1

**Client Service Action Required at Login:** No

**Project:** XTO PCU 296-5A

**Airbill #'s:** HDCO

<b>Cooler Security</b>	<b>Y</b>	<b>or</b>	<b>N</b>		<b>Y</b>	<b>or</b>	<b>N</b>
1. Custody Seals Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<b>Cooler Temperature</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Cooler temp verification:			Infrared gun
3. Cooler media:			Ice (bag)

<b>Quality Control Preservation</b>	<b>Y</b>	<b>or</b>	<b>N</b>	<b>N/A</b>
1. Trip Blank present / cooler:	<input type="checkbox"/>		<input type="checkbox"/>	
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. VOCs headspace free:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>Sample Integrity - Documentation</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>

<b>Sample Integrity - Condition</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:			Intact

<b>Sample Integrity - Instructions</b>	<b>Y</b>	<b>or</b>	<b>N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
3. Sufficient volume rec'd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments

 Accutest Laboratories  
 V:(303) 425-6021

 4036 Youngfield Street  
 F: (303) 425-6854

 Wheat Ridge, CO  
 www.accutest.com

## GC/MS Volatiles

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

**Method Blank Summary**

Page 1 of 1

**Job Number:** D41014  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1506-MB	5V24673.D	1	11/19/12	BD	n/a	n/a	V5V1506

**The QC reported here applies to the following samples:****Method:** SW846 8260B

D41014-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	50	25	ug/kg	
100-41-4	Ethylbenzene	ND	100	19	ug/kg	
108-88-3	Toluene	ND	100	50	ug/kg	
1330-20-7	Xylene (total)	ND	200	100	ug/kg	

CAS No.	Surrogate Recoveries	Limits
2037-26-5	Toluene-D8	101% 64-130%
460-00-4	4-Bromofluorobenzene	93% 62-131%
17060-07-0	1,2-Dichloroethane-D4	95% 70-130%

## Blank Spike Summary

Page 1 of 1

**Job Number:** D41014  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V1506-BS	5V24674.D	1	11/19/12	BD	n/a	n/a	V5V1506

The QC reported here applies to the following samples:

Method: SW846 8260B

D41014-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	54.0	108	70-130
100-41-4	Ethylbenzene	50	54.2	108	70-130
108-88-3	Toluene	50	53.2	106	70-130
1330-20-7	Xylene (total)	150	168	112	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
2037-26-5	Toluene-D8	100%	64-130%
460-00-4	4-Bromofluorobenzene	98%	62-131%
17060-07-0	1,2-Dichloroethane-D4	96%	70-130%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D41014  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D41036-1MS	5V24676.D	1	11/19/12	BD	n/a	n/a	V5V1506
D41036-1MSD	5V24677.D	1	11/19/12	BD	n/a	n/a	V5V1506
D41036-1	5V24675.D	1	11/19/12	BD	n/a	n/a	V5V1506

The QC reported here applies to the following samples:

Method: SW846 8260B

D41014-1

CAS No.	Compound	D41036-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	702		5720	6570	103	6760	106	3	64-139/30
100-41-4	Ethylbenzene	2750		5720	8410	99	8720	104	4	68-136/30
108-88-3	Toluene	2340		5720	7850	96	7970	98	2	60-130/30
1330-20-7	Xylene (total)	21000		17200	35900	87	37500	96	4	58-142/30

CAS No.	Surrogate Recoveries	MS	MSD	D41036-1	Limits
2037-26-5	Toluene-D8	99%	98%	100%	64-130%
460-00-4	4-Bromofluorobenzene	105%	108%	103%	62-131%
17060-07-0	1,2-Dichloroethane-D4	97%	98%	95%	70-130%

\* = Outside of Control Limits.



GC/MS Volatiles

Raw Data

7

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5111912.S\  
 Data File : 5V24680.D  
 Acq On : 19 Nov 2012 4:33 pm  
 Operator : BRETD  
 Sample : D41014-1  
 Misc : MS4990,V5V1506,5.068,,100,5,1  
 ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 08:58:55 2012  
 Quant Method : C:\msdchem\1\METHODS\V5AP1497TVH1497.M  
 Quant Title : 8260  
 QLast Update : Wed Nov 14 09:54:38 2012  
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
2) Pentafluorobenzene	11.624	168	442147	50.00	ug/l	0.00
35) 1,4-Difluorobenzene	12.423	114	536703	50.00	ug/l	0.00
53) Chlorobenzene-d5	15.072	117	501261	50.00	ug/l	0.00
74) 1,4-Dichlorobenzene-d4	17.036	152	375149	50.00	ug/l	0.00

## System Monitoring Compounds

33) 1,2-Dichloroethane-d4	12.024	102	36310	48.25	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	96.50%
61) Toluene-d8	13.816	98	597215	50.29	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	100.58%
69) 4-Bromofluorobenzene	16.020	95	255528	49.93	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	99.86%

## Target Compounds

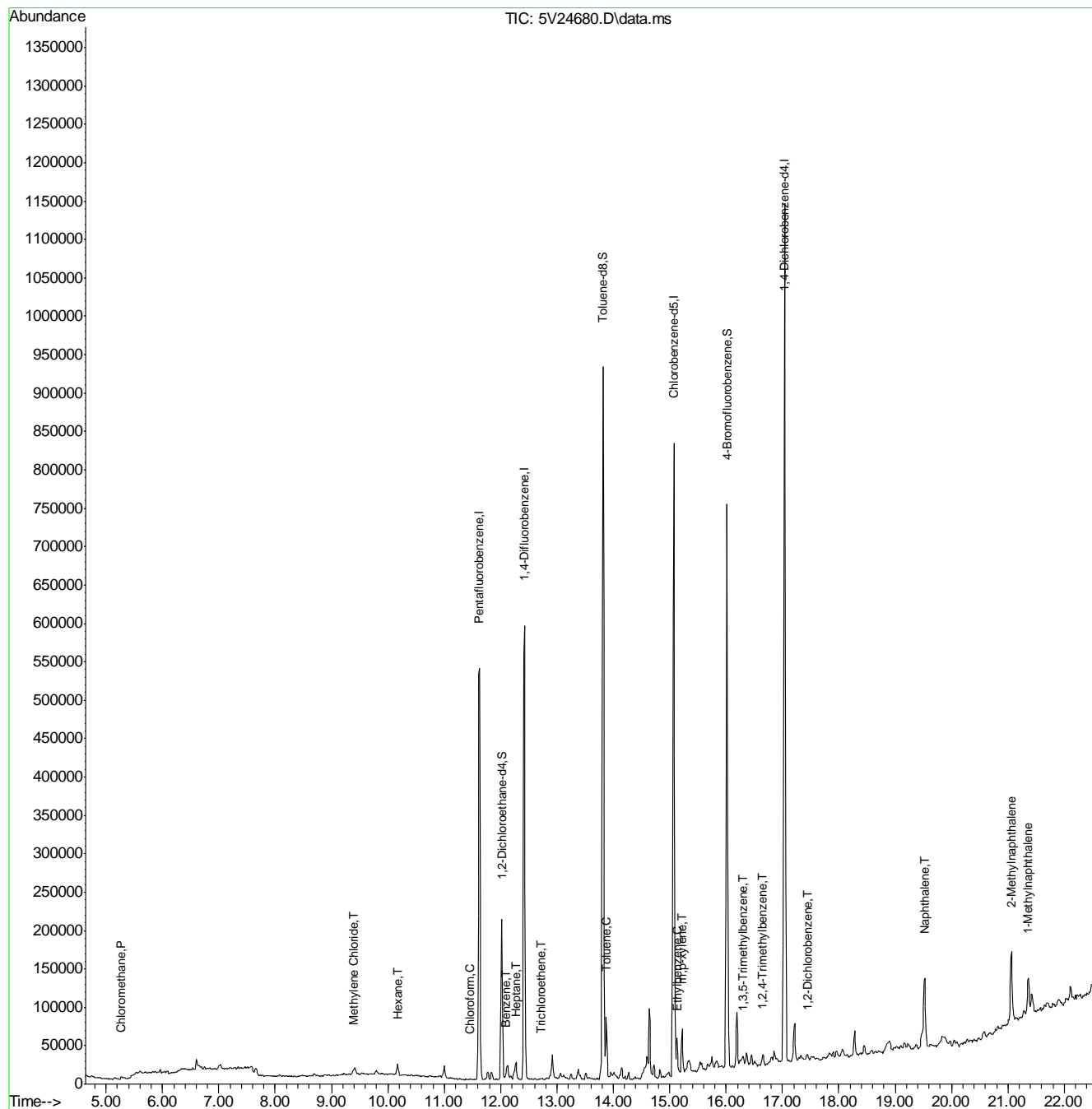
						Qvalue
4) Chloromethane	5.265	50	1771	0.36	ug/l	100
17) Methylene Chloride	9.387	84	2041	0.51	ug/l #	80
29) Chloroform	11.453	83	384	0.06	ug/l	75
41) Hexane	10.174	57	6721	1.38	ug/l	100
43) Heptane	12.275	43	9325	1.67	ug/l	92
48) Trichloroethene	12.709	95	427	0.11	ug/l #	86
50) Benzene	12.092	78	9734	0.68	ug/l	100
62) Toluene	13.873	92	22472	2.43	ug/l	98
66) Ethylbenzene	15.141	91	8987	0.51	ug/l	91
72) m,p-xylene	15.221	106	17579	2.48	ug/l	96
80) 1,3,5-Trimethylbenzene	16.305	105	4098m	0.24	ug/l	
82) 1,2,4-Trimethylbenzene	16.648	105	7525	0.42	ug/l	90
87) 1,2-Dichlorobenzene	17.447	146	462	0.04	ug/l #	78
91) Naphthalene	19.525	128	115642	6.22	ug/l	100
94) 2-Methylnaphthalene	21.066	142	67966	10.95	ug/l	97
95) 1-Methylnaphthalene	21.363	142	37759	4.85	ug/l	95

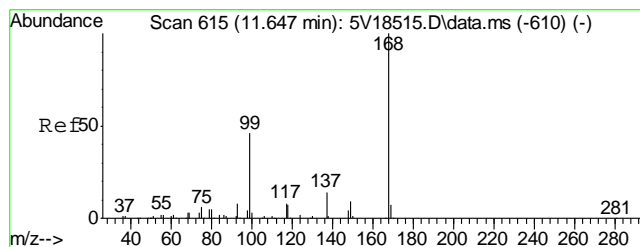
(#) = qualifier out of range (m) = manual integration (+) = signals summed

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5111912.S\  
Data File : 5V24680.D  
Acq On : 19 Nov 2012 4:33 pm  
Operator : BRETD  
Sample : D41014-1  
Misc : MS4990,V5V1506,5.068,,100,5,1  
ALS Vial : 12 Sample Multiplier: 1

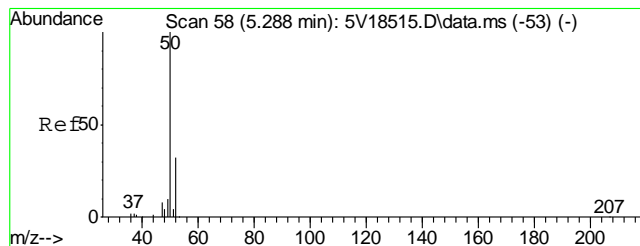
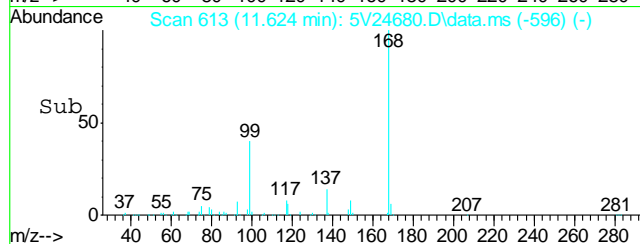
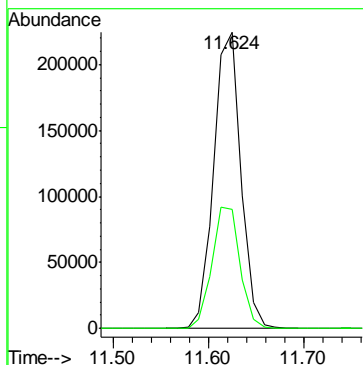
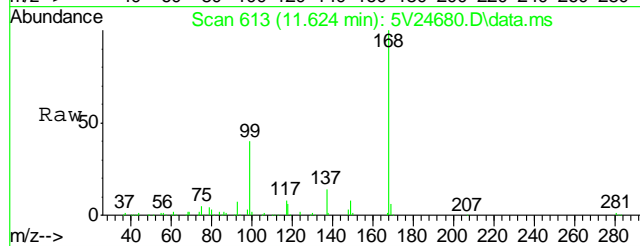
Quant Time: Nov 20 08:58:55 2012  
Quant Method : C:\msdchem\1\METHODS\V5AP1497TVH1497.M  
Quant Title : 8260  
QLast Update : Wed Nov 14 09:54:38 2012  
Response via : Initial Calibration





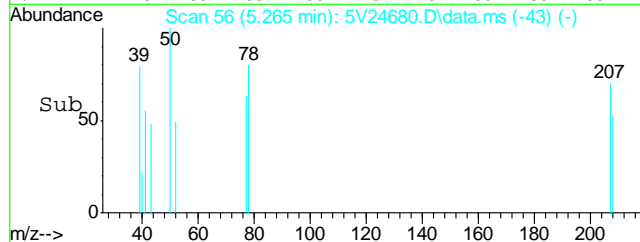
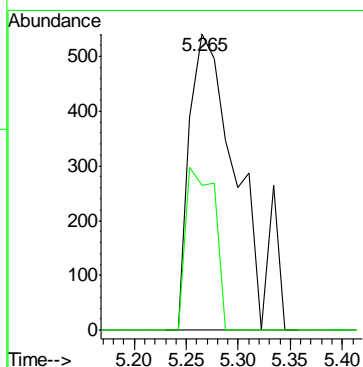
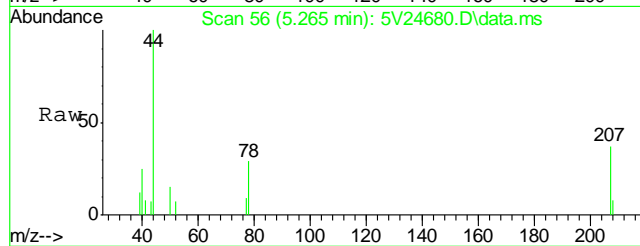
#2  
Pentafluorobenzene  
Concen: 50.00 ug/l  
RT: 11.624 min Scan# 613  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

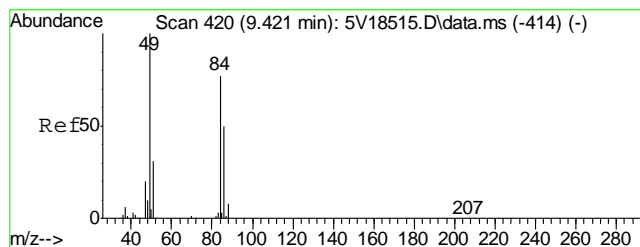
Tgt Ion	Ratio	Lower	Upper
168	100		
99	42.3	37.4	56.2



#4  
Chloromethane  
Concen: 0.36 ug/l  
RT: 5.265 min Scan# 56  
Delta R.T. 0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

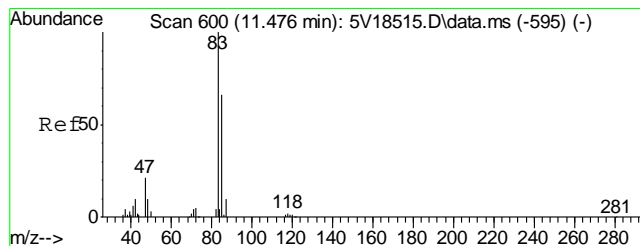
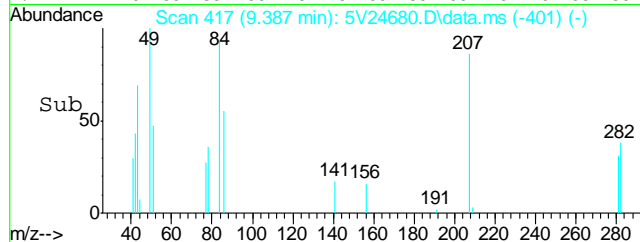
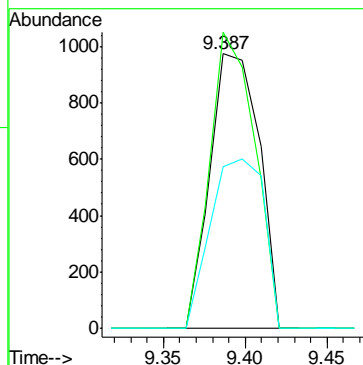
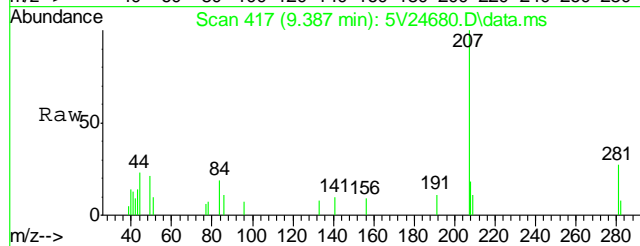
Tgt Ion	Ratio	Lower	Upper
50	100		
52	32.1	12.1	52.1





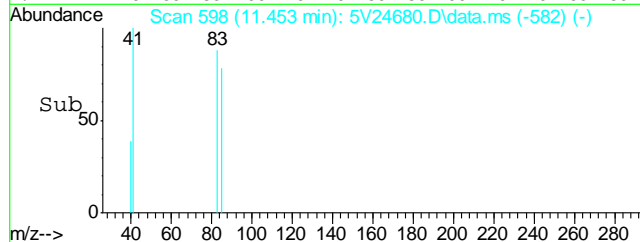
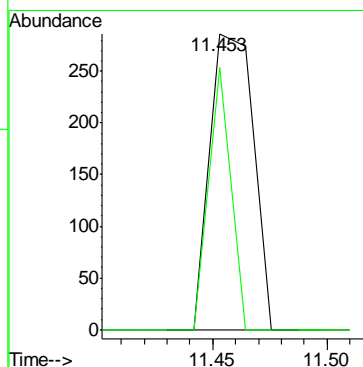
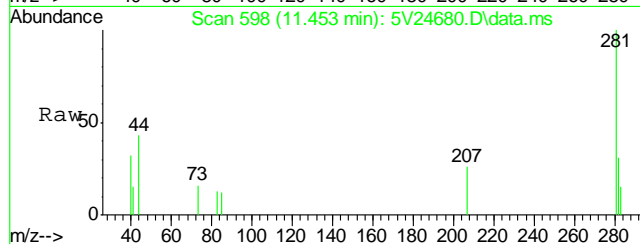
#17  
Methylene Chloride  
Concen: 0.51 ug/l  
RT: 9.387 min Scan# 417  
Delta R.T. -0.012 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

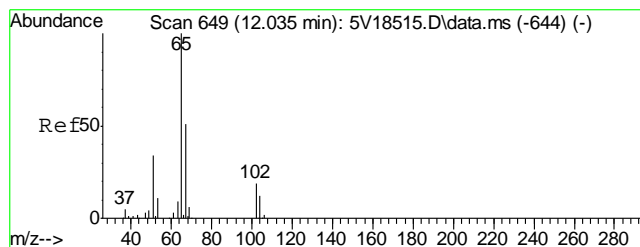
Tgt Ion:	84	Resp:	2041
Ion Ratio	Lower	Upper	
84	100		
49	98.6	110.4	150.4#
86	67.2	44.0	84.0



#29  
Chloroform  
Concen: 0.06 ug/l  
RT: 11.453 min Scan# 598  
Delta R.T. -0.012 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

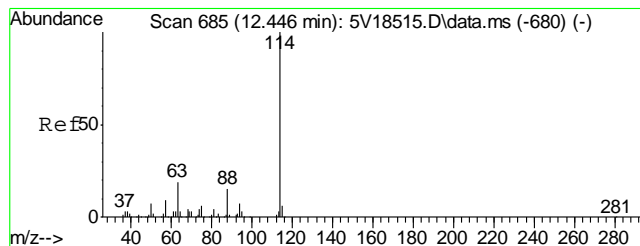
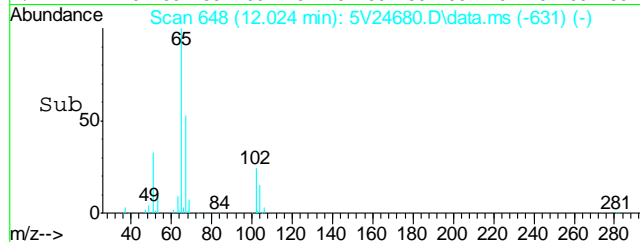
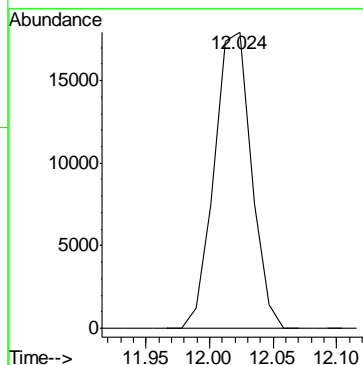
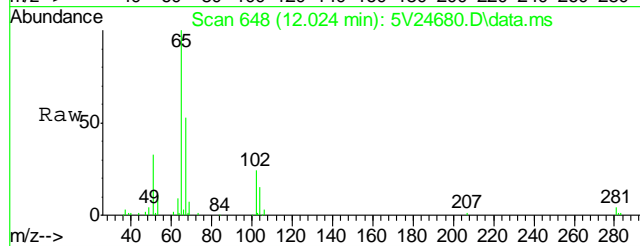
Tgt Ion:	83	Resp:	384
Ion Ratio	Lower	Upper	
83	100		
85	45.3	44.9	84.9





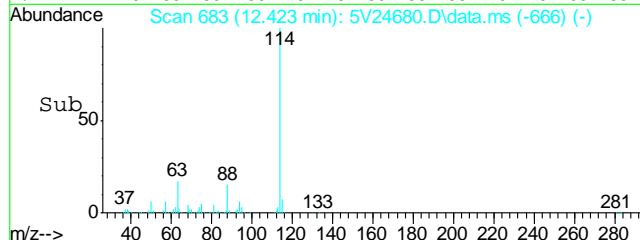
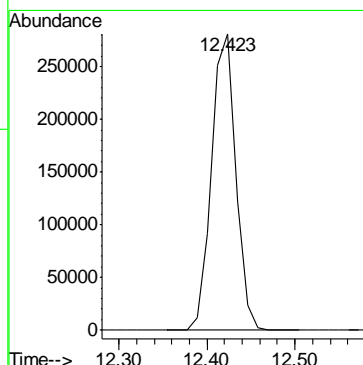
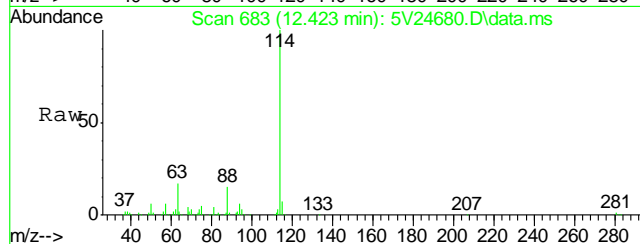
#33  
1,2-Dichloroethane-d4  
Concen: 48.25 ug/l  
RT: 12.024 min Scan# 648  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

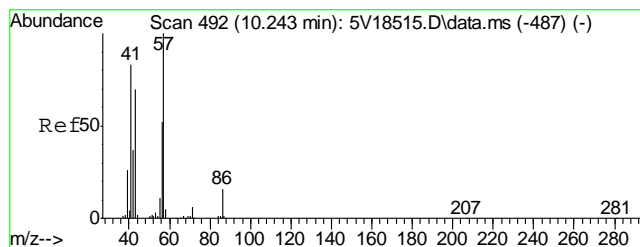
Tgt Ion:102 Resp: 36310



#35  
1,4-Difluorobenzene  
Concen: 50.00 ug/l  
RT: 12.423 min Scan# 683  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

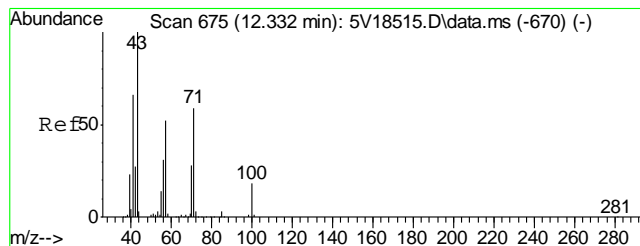
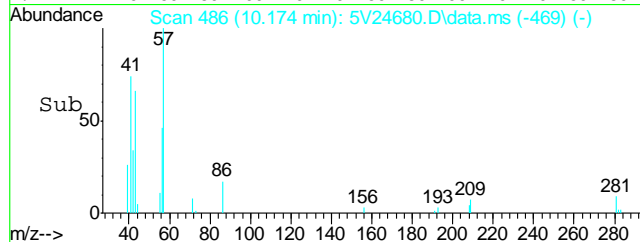
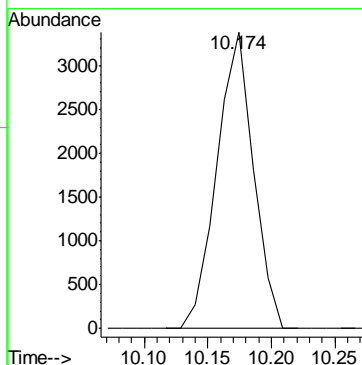
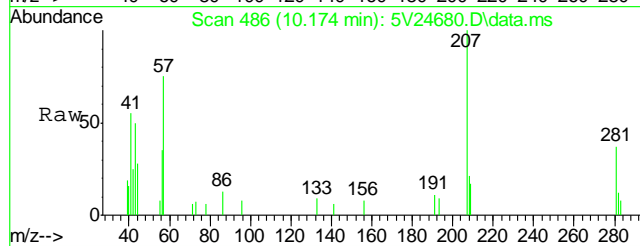
Tgt Ion:114 Resp: 536703





#41  
Hexane  
Concen: 1.38 ug/l  
RT: 10.174 min Scan# 486  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

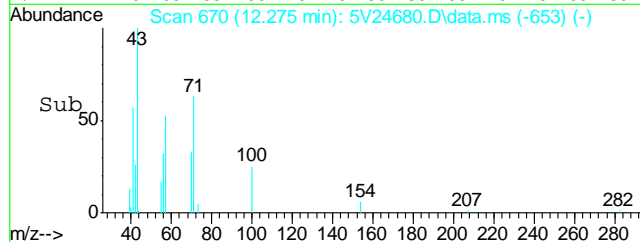
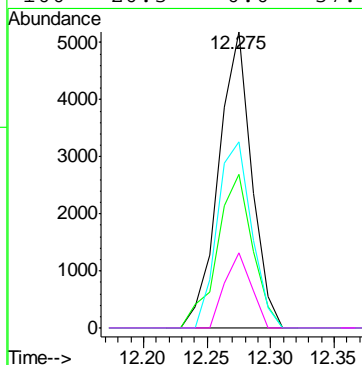
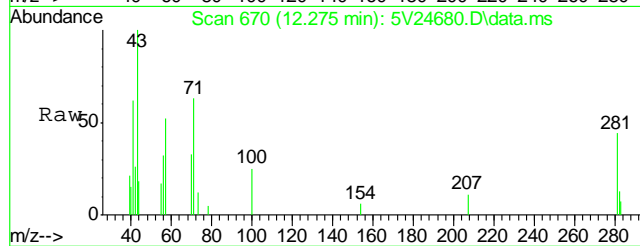
Tgt Ion: 57 Resp: 6721

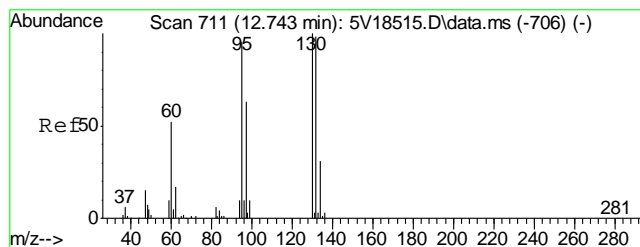


#43  
Heptane  
Concen: 1.67 ug/l  
RT: 12.275 min Scan# 670  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

Tgt Ion: 43 Resp: 9325

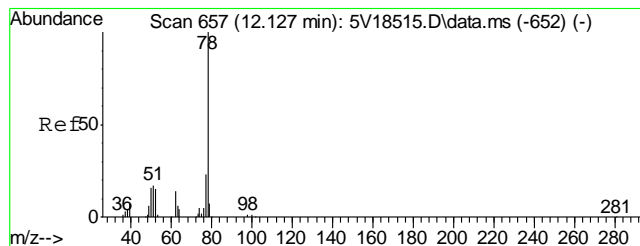
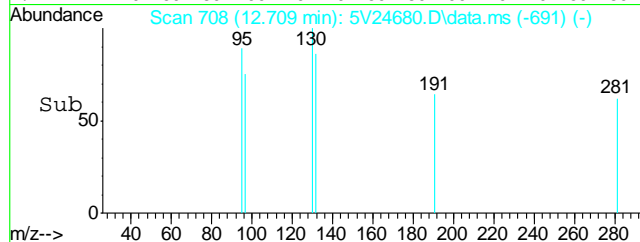
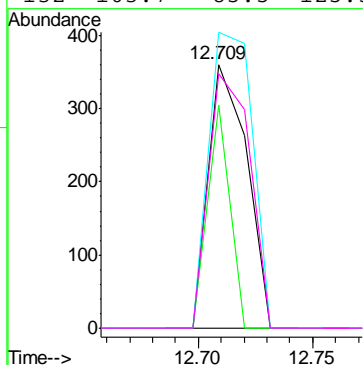
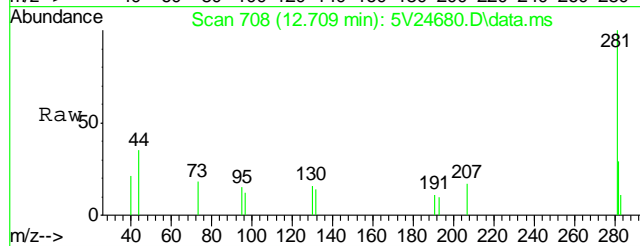
Ion	Ratio	Lower	Upper
43	100		
57	55.8	30.6	70.6
71	65.2	38.9	78.9
100	20.3	0.0	37.4





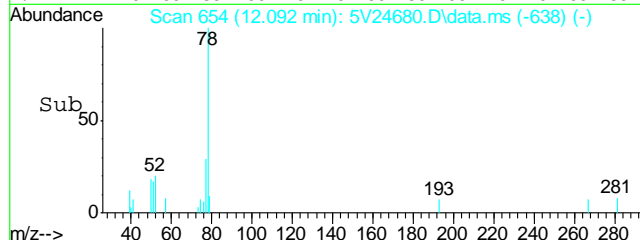
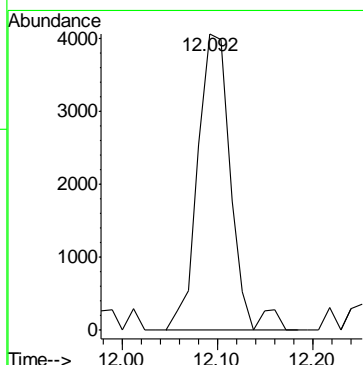
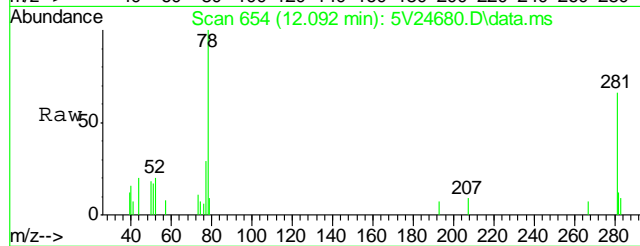
#48  
Trichloroethene  
Concen: 0.11 ug/l  
RT: 12.709 min Scan# 708  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

Tgt Ion:	95	Resp:	427
Ion Ratio	Lower	Upper	
95	100		
97	48.7	47.1	87.1
130	127.2	85.2	125.2#
132	103.7	85.5	125.5

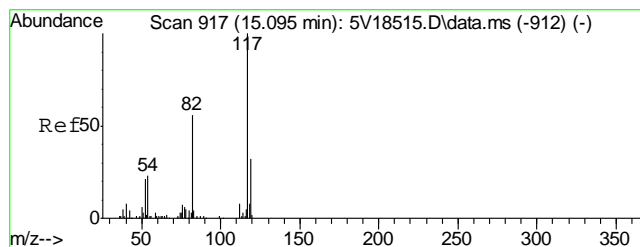


#50  
Benzene  
Concen: 0.68 ug/l  
RT: 12.092 min Scan# 654  
Delta R.T. -0.012 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

Tgt Ion: 78 Resp: 9734

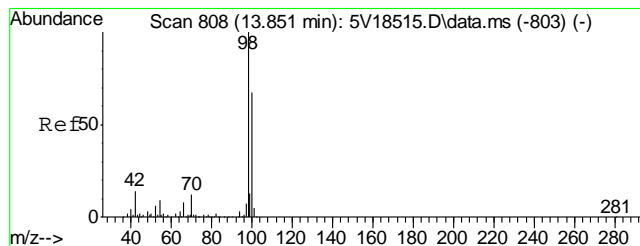
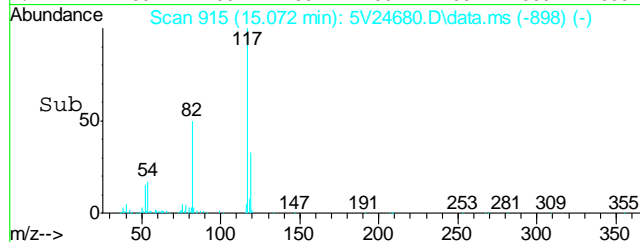
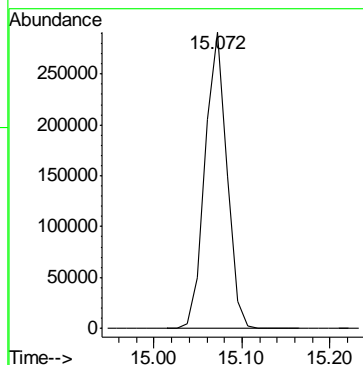
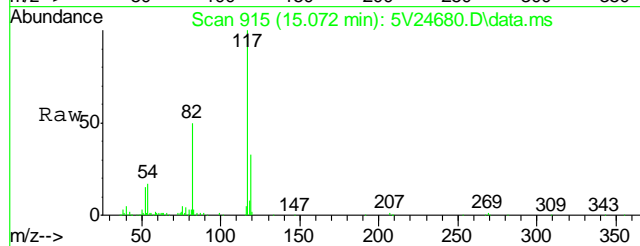






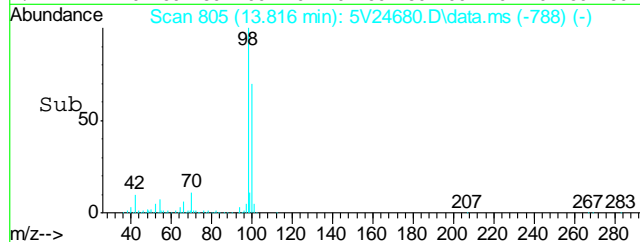
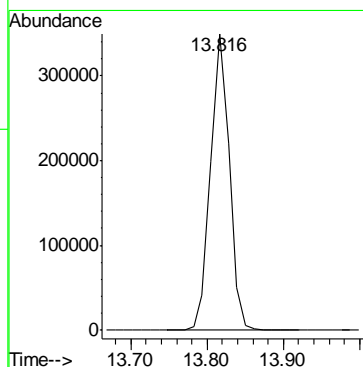
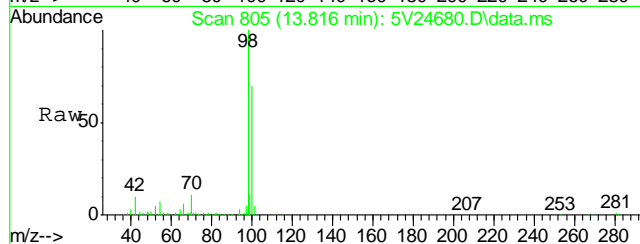
#53  
Chlorobenzene-d5  
Concen: 50.00 ug/l  
RT: 15.072 min Scan# 915  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

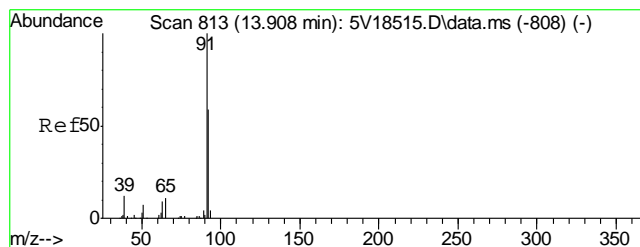
Tgt Ion:117 Resp: 501261



#61  
Toluene-d8  
Concen: 50.29 ug/l  
RT: 13.816 min Scan# 805  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

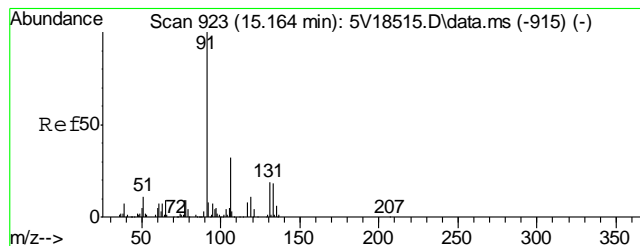
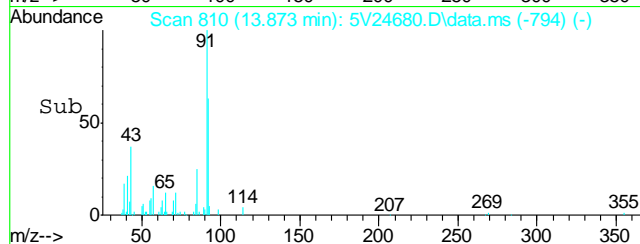
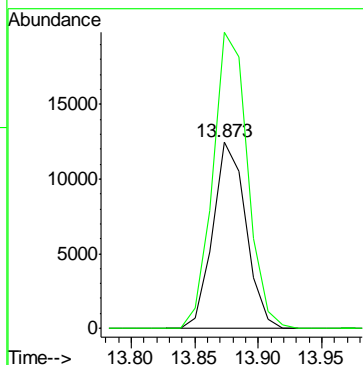
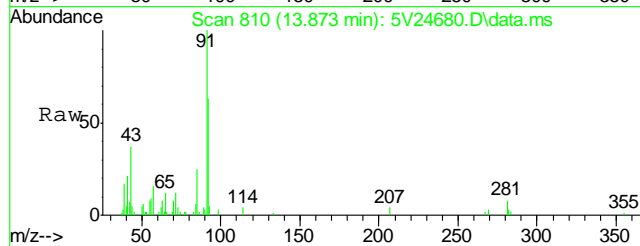
Tgt Ion: 98 Resp: 597215





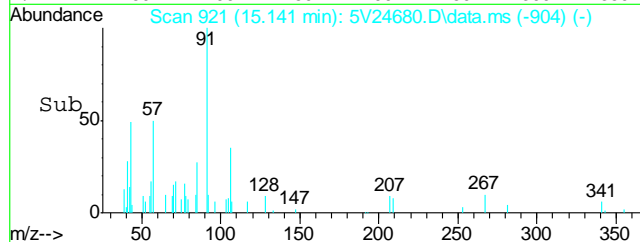
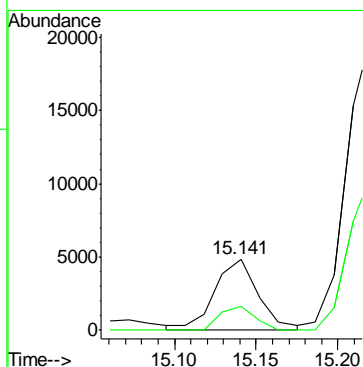
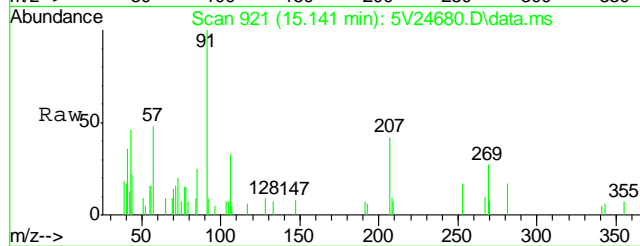
#62  
Toluene  
Concen: 2.43 ug/l  
RT: 13.873 min Scan# 810  
Delta R.T. -0.012 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

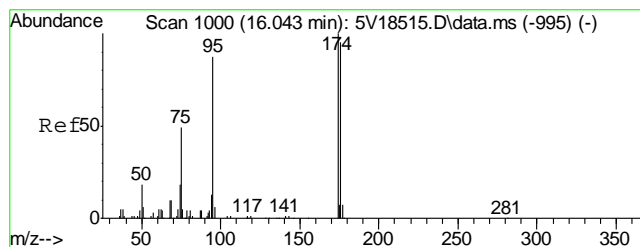
Tgt Ion: 92 Resp: 22472  
Ion Ratio Lower Upper  
92 100  
91 166.8 149.8 189.8



#66  
Ethylbenzene  
Concen: 0.51 ug/l  
RT: 15.141 min Scan# 921  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

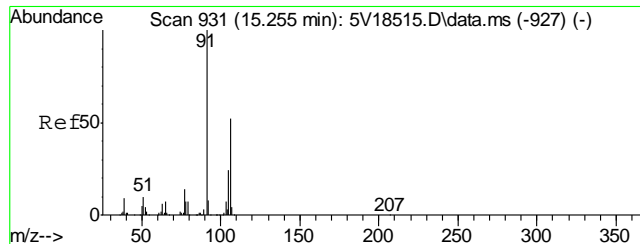
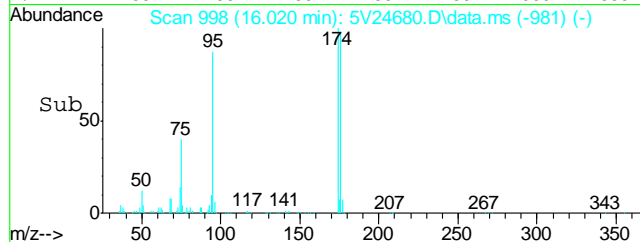
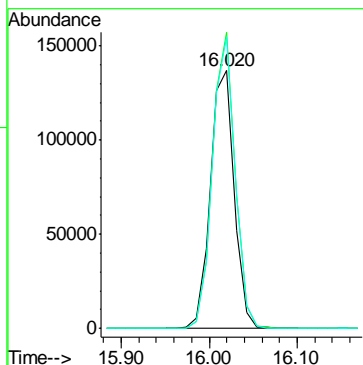
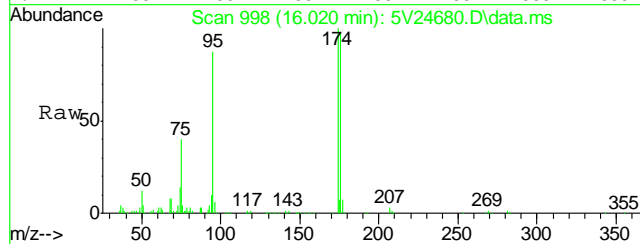
Tgt Ion: 91 Resp: 8987  
Ion Ratio Lower Upper  
91 100  
106 26.5 11.7 51.7





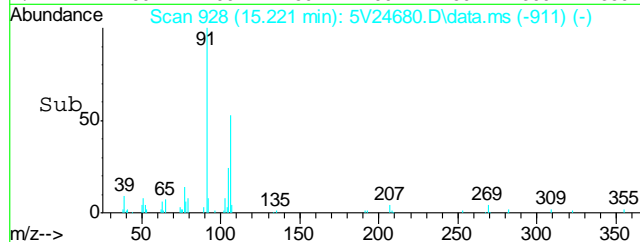
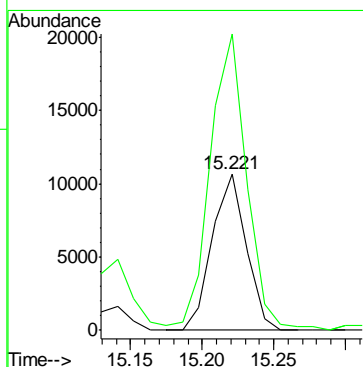
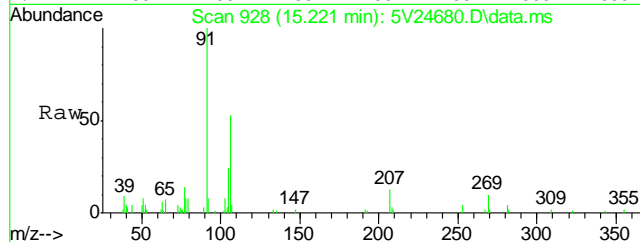
#69  
4-Bromofluorobenzene  
Concen: 49.93 ug/l  
RT: 16.020 min Scan# 998  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

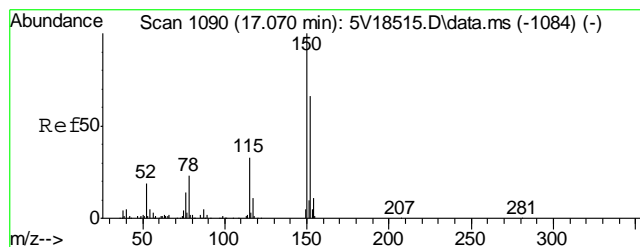
Tgt Ion	Ratio	Lower	Upper
95	100		
174	109.0	77.1	117.1
176	108.0	73.4	113.4



#72  
m,p-xylene  
Concen: 2.48 ug/l  
RT: 15.221 min Scan# 928  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

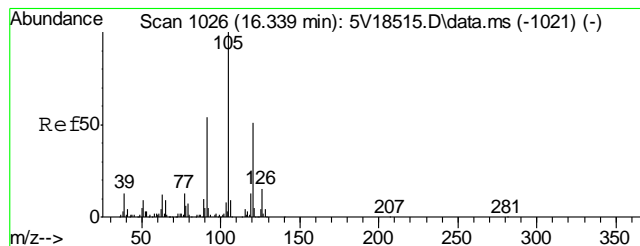
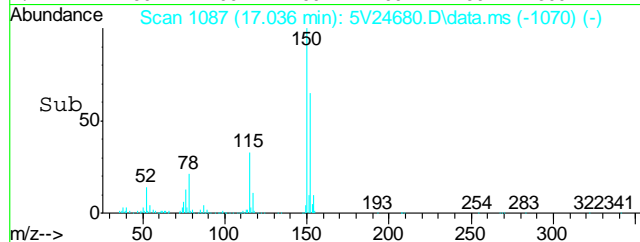
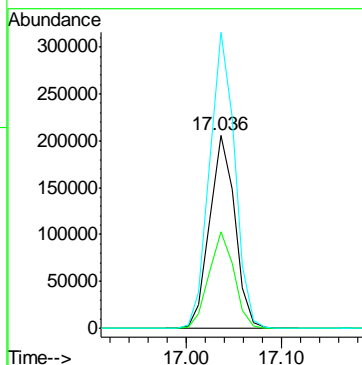
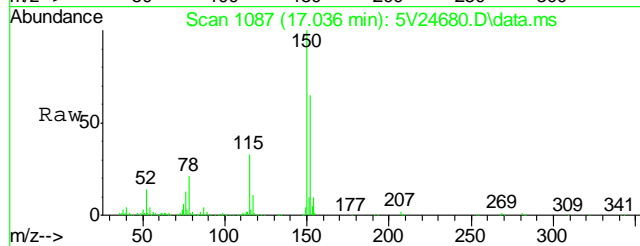
Tgt Ion	Ratio	Lower	Upper
106	100		
91	203.3	177.1	217.1





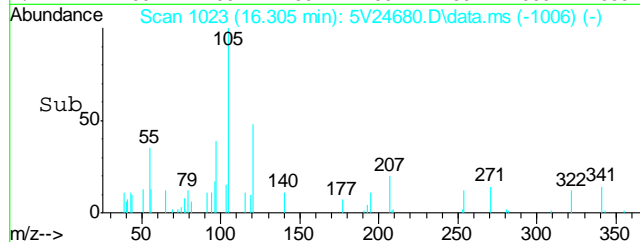
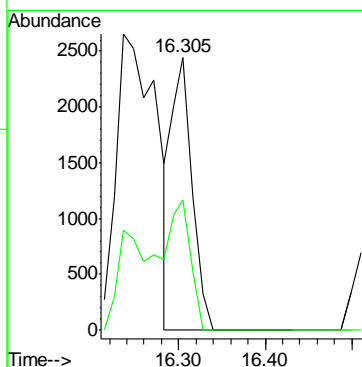
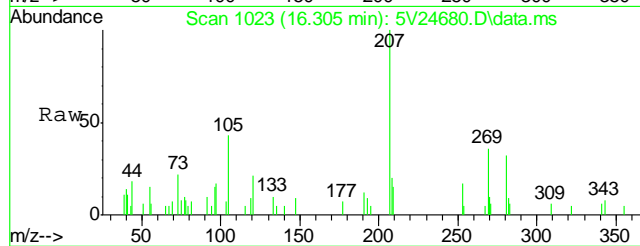
#74  
1,4-Dichlorobenzene-d4  
Concen: 50.00 ug/l  
RT: 17.036 min Scan# 1087  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

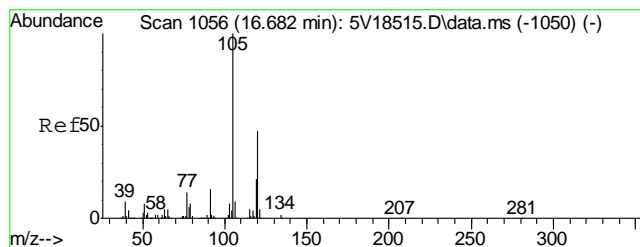
Tgt Ion	Ratio	Lower	Upper
152	100		
115	50.3	41.4	62.0
150	153.1	153.9	230.9#



#80  
1,3,5-Trimethylbenzene  
Concen: 0.24 ug/l m  
RT: 16.305 min Scan# 1023  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

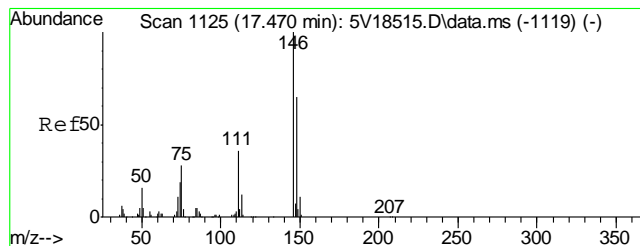
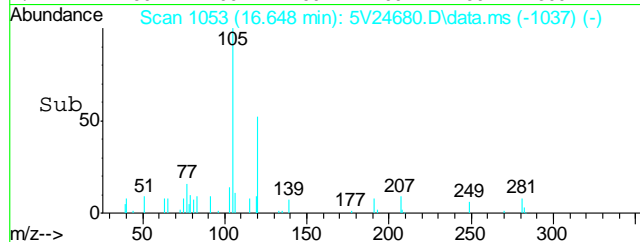
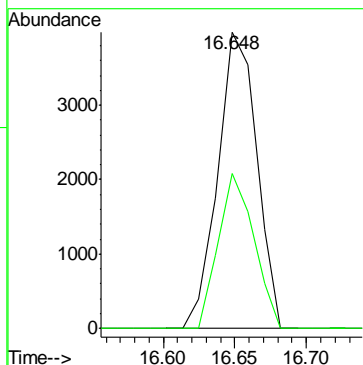
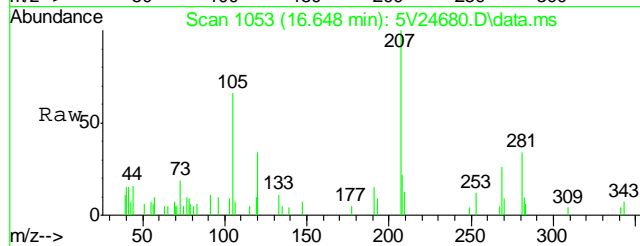
Tgt Ion	Ratio	Lower	Upper
105	100		
120	65.8	40.1	60.1#





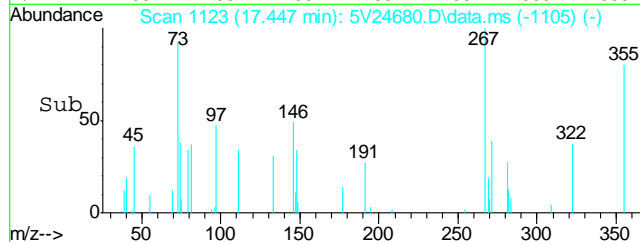
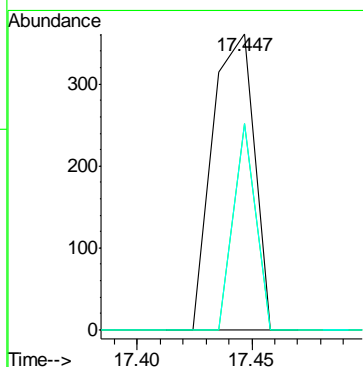
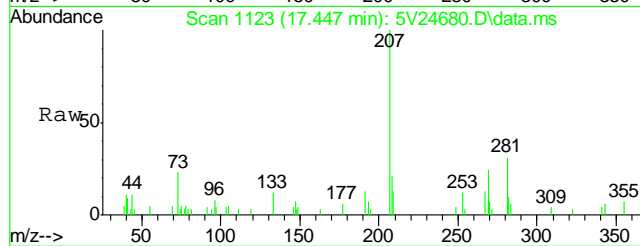
#82  
1,2,4-Trimethylbenzene  
Concen: 0.42 ug/l  
RT: 16.648 min Scan# 1053  
Delta R.T. -0.012 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

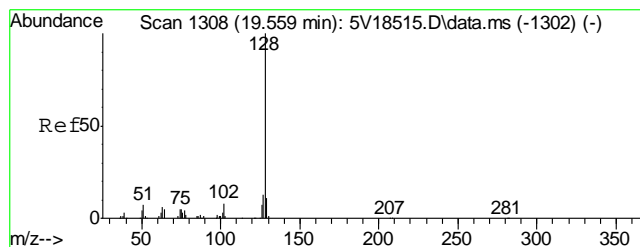
Tgt Ion:105 Resp: 7525  
Ion Ratio Lower Upper  
105 100  
120 47.6 43.8 65.8



#87  
1,2-Dichlorobenzene  
Concen: 0.04 ug/l  
RT: 17.447 min Scan# 1123  
Delta R.T. 0.011 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

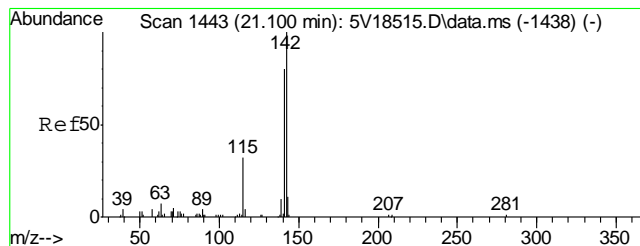
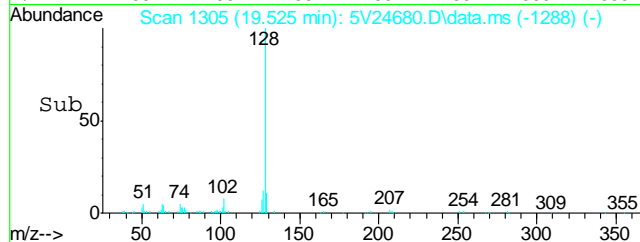
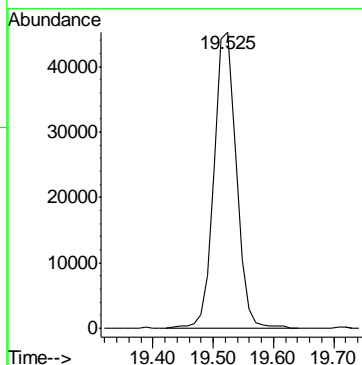
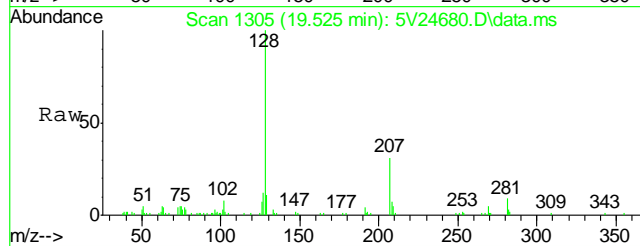
Tgt Ion:146 Resp: 462  
Ion Ratio Lower Upper  
146 100  
111 37.4 29.9 44.9  
148 37.2 51.9 77.9#





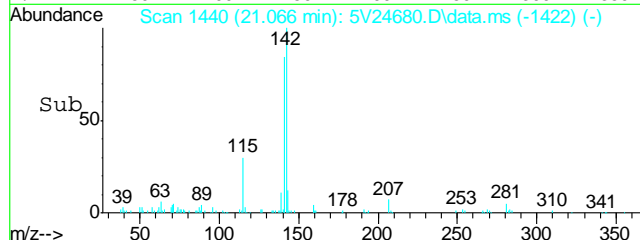
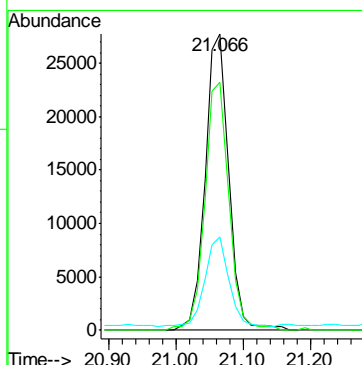
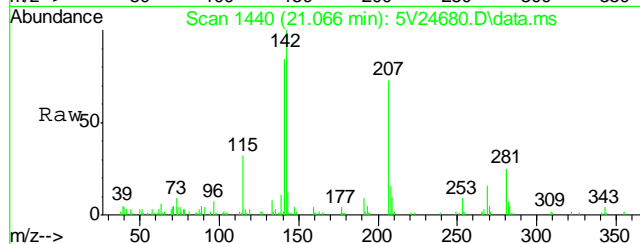
#91  
Naphthalene  
Concen: 6.22 ug/l  
RT: 19.525 min Scan# 1305  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

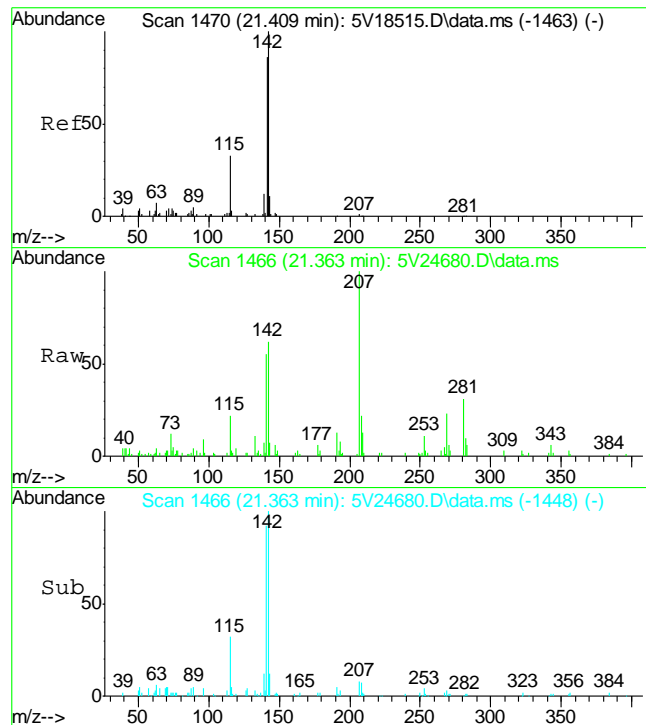
Tgt Ion:128 Resp: 115642



#94  
2-Methylnaphthalene  
Concen: 10.95 ug/l  
RT: 21.066 min Scan# 1440  
Delta R.T. 0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

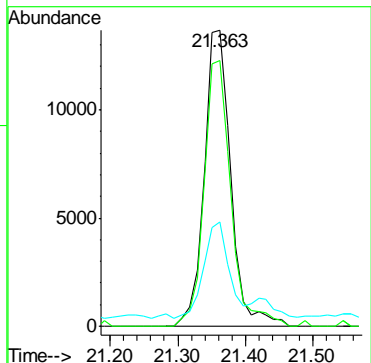
Tgt Ion:142 Resp: 67966  
Ion Ratio Lower Upper  
142 100  
141 85.4 66.2 99.4  
115 30.9 25.9 38.9





#95  
1-Methylnaphthalene  
Concen: 4.85 ug/l  
RT: 21.363 min Scan# 1466  
Delta R.T. -0.000 min  
Lab File: 5V24680.D  
Acq: 19 Nov 2012 4:33 pm

Tgt Ion:	142	Resp:	37759
Ion Ratio	Lower	Upper	
142	100		
141	91.2	68.9	103.3
115	31.8	27.3	40.9



7.1.1  
7

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5111912.S\  
 Data File : 5V24673.D  
 Acq On : 19 Nov 2012 12:44 pm  
 Operator : BRETD  
 Sample : MB  
 Misc : MS4990,V5V1506,5.00,,100,5,1  
 ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 20 08:43:29 2012  
 Quant Method : C:\msdchem\1\METHODS\V5AP1497TVH1497.M  
 Quant Title : 8260  
 QLast Update : Wed Nov 14 09:54:38 2012  
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
2) Pentafluorobenzene	11.624	168	473270	50.00	ug/l	0.00
35) 1,4-Difluorobenzene	12.423	114	576356	50.00	ug/l	0.00
53) Chlorobenzene-d5	15.072	117	535944	50.00	ug/l	0.00
74) 1,4-Dichlorobenzene-d4	17.036	152	360659	50.00	ug/l	0.00

System Monitoring Compounds						
33) 1,2-Dichloroethane-d4	12.024	102	38220	47.45	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	94.90%
61) Toluene-d8	13.816	98	640357	50.44	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	100.88%
69) 4-Bromofluorobenzene	16.020	95	254413	46.49	ug/l	0.00
Spiked Amount	50.000	Range	70 - 130	Recovery	=	92.98%

Target Compounds	R.T.	QIon	Response	Conc	Units	Qvalue
48) Trichloroethene	12.709	95	778	0.19	ug/l	93
50) Benzene	12.104	78	1232	0.08	ug/l	100
80) 1,3,5-Trimethylbenzene	16.305	105	800	0.05	ug/l #	66
82) 1,2,4-Trimethylbenzene	16.648	105	1132	0.07	ug/l #	83
87) 1,2-Dichlorobenzene	17.436	146	1204	0.11	ug/l #	82
88) n-Butylbenzene	17.287	91	2178	0.12	ug/l #	71
90) 1,2,4-Trichlorobenzene	19.159	180	2308	0.23	ug/l #	72
91) Naphthalene	19.525	128	6488	0.36	ug/l	100
93) 1,2,3-Trichlorobenzene	19.833	180	2556	0.27	ug/l	94

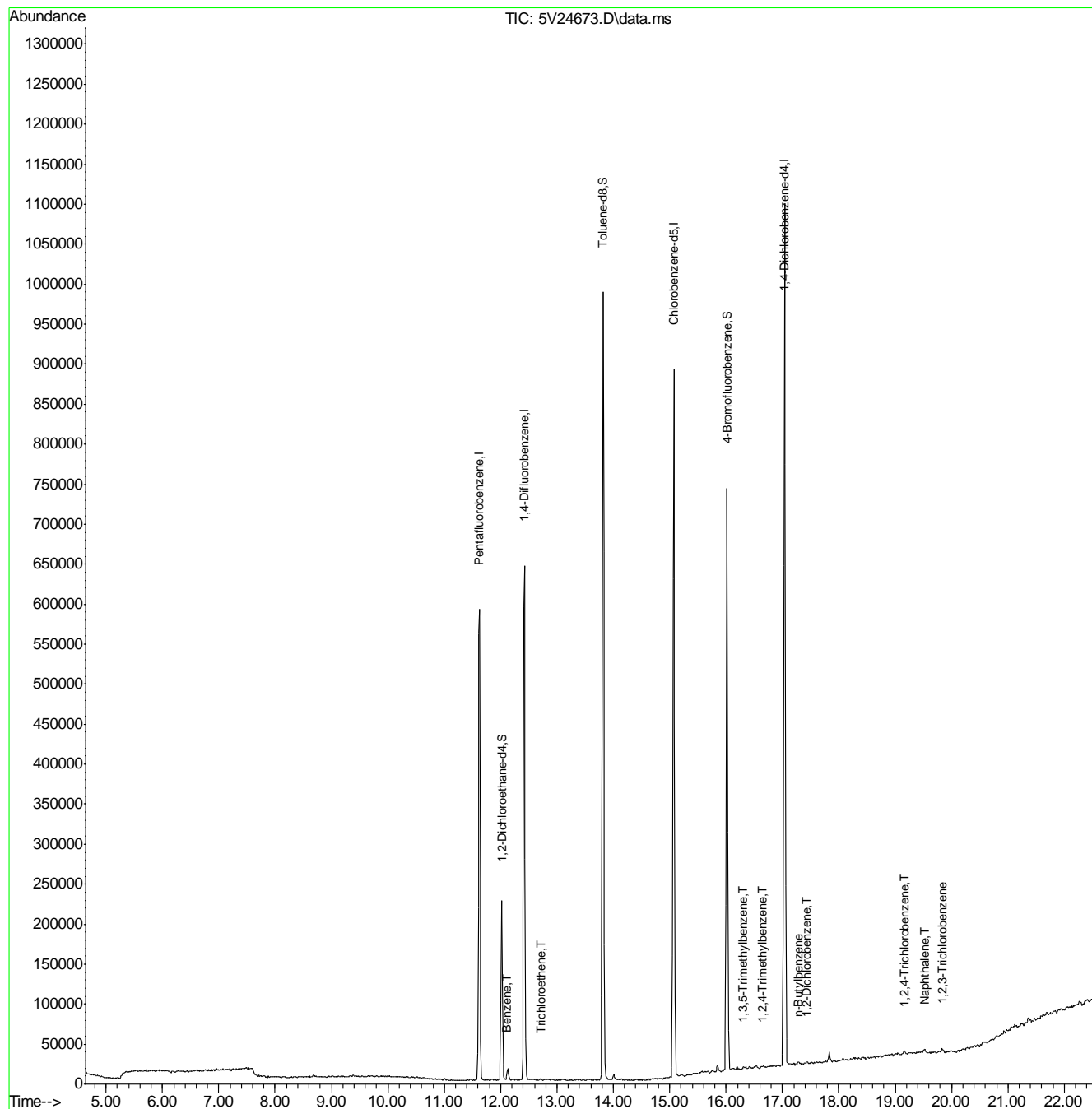
(#) = qualifier out of range (m) = manual integration (+) = signals summed

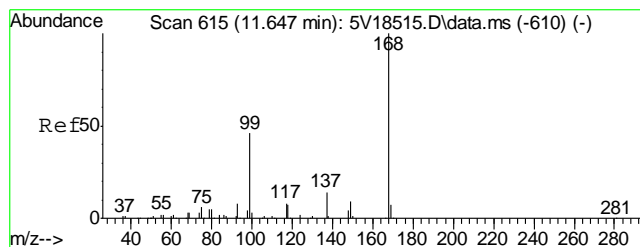


## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\V5111912.S\  
Data File : 5V24673.D  
Acq On : 19 Nov 2012 12:44 pm  
Operator : BRETD  
Sample : MB  
Misc : MS4990,V5V1506,5.00,,100,5,1  
ALS Vial : 5 Sample Multiplier: 1

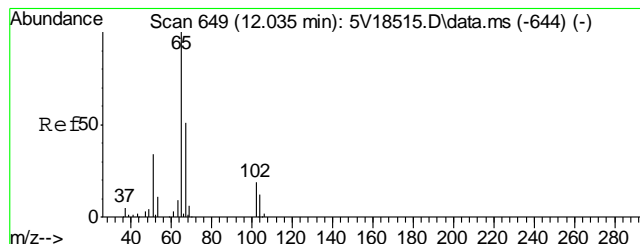
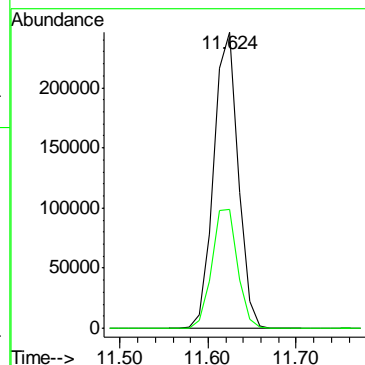
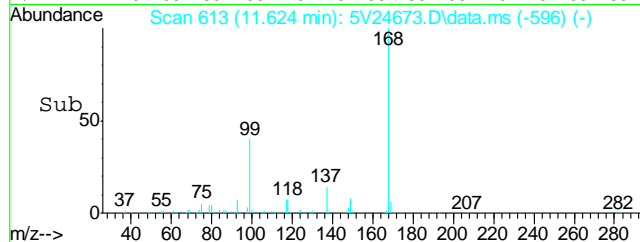
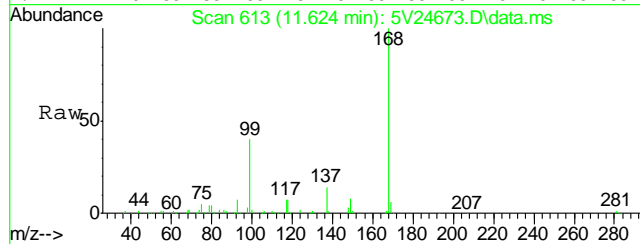
Quant Time: Nov 20 08:43:29 2012  
Quant Method : C:\msdchem\1\METHODS\V5AP1497TVH1497.M  
Quant Title : 8260  
QLast Update : Wed Nov 14 09:54:38 2012  
Response via : Initial Calibration





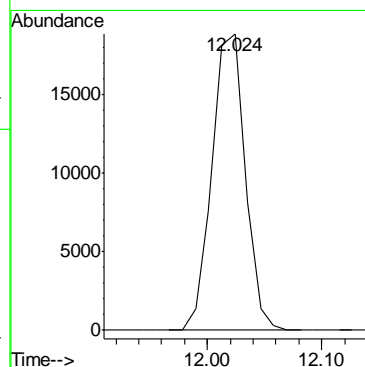
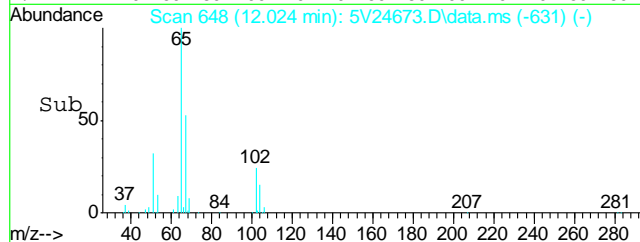
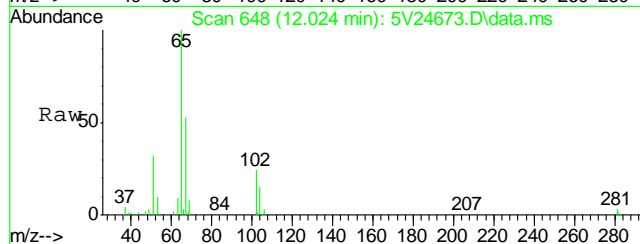
#2  
Pentafluorobenzene  
Concen: 50.00 ug/l  
RT: 11.624 min Scan# 613  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

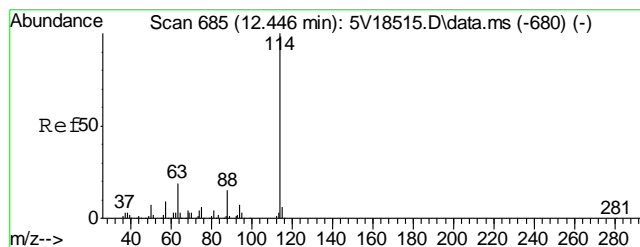
Tgt Ion:168 Resp: 473270  
Ion Ratio Lower Upper  
168 100  
99 42.3 37.4 56.2



#33  
1,2-Dichloroethane-d4  
Concen: 47.45 ug/l  
RT: 12.024 min Scan# 648  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

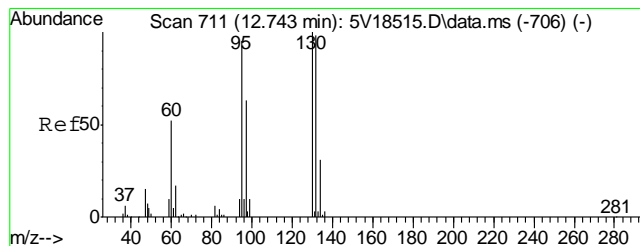
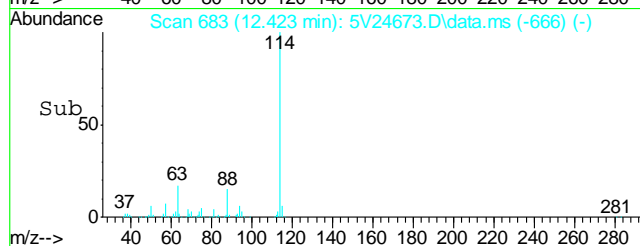
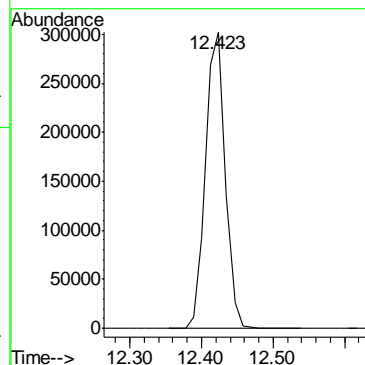
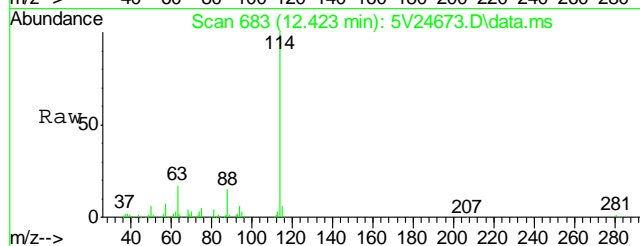
Tgt Ion:102 Resp: 38220





#35  
1,4-Difluorobenzene  
Concen: 50.00 ug/l  
RT: 12.423 min Scan# 683  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

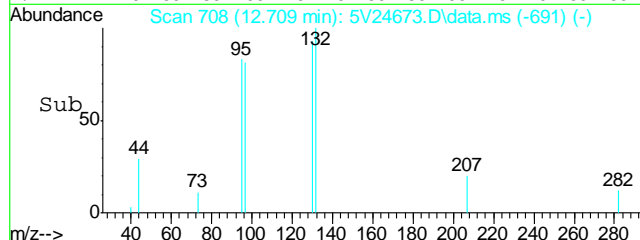
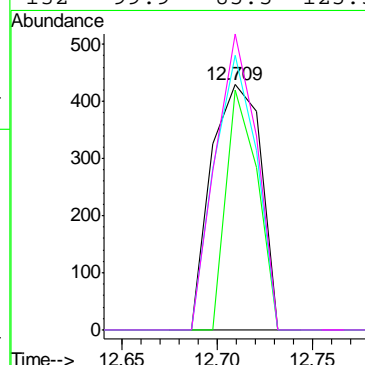
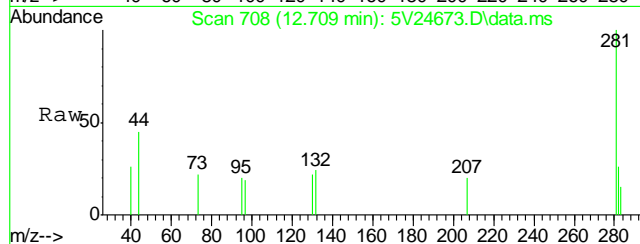
Tgt Ion: 114 Resp: 576356

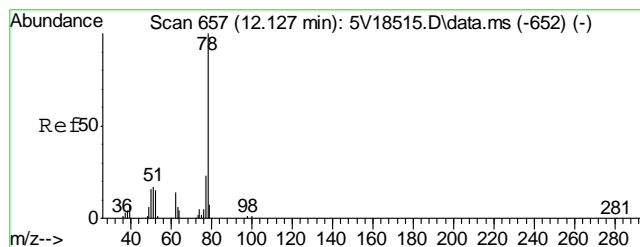


#48  
Trichloroethene  
Concen: 0.19 ug/l  
RT: 12.709 min Scan# 708  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

Tgt Ion: 95 Resp: 778

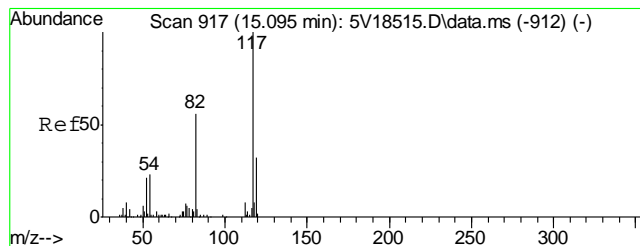
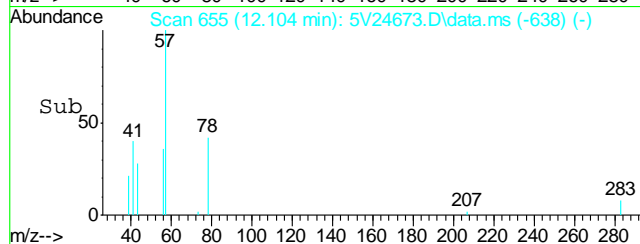
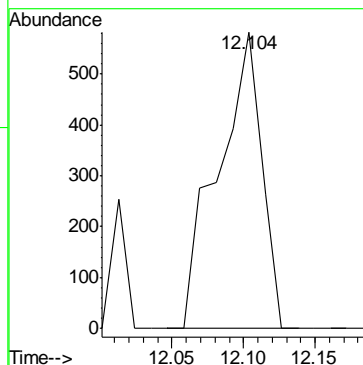
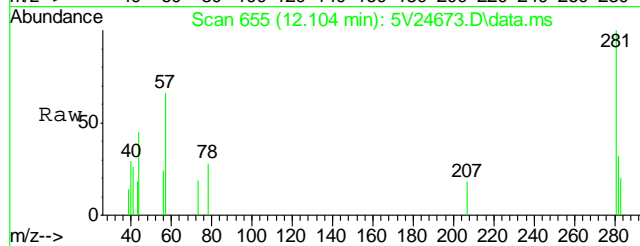
Ion	Ratio	Lower	Upper
95	100		
97	62.0	47.1	87.1
130	94.7	85.2	125.2
132	99.9	85.5	125.5





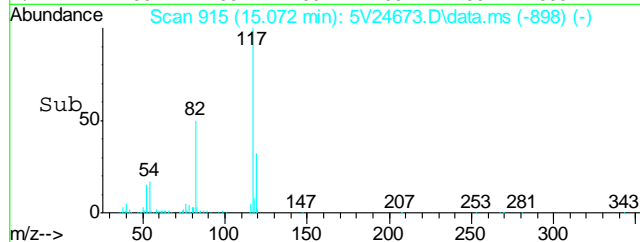
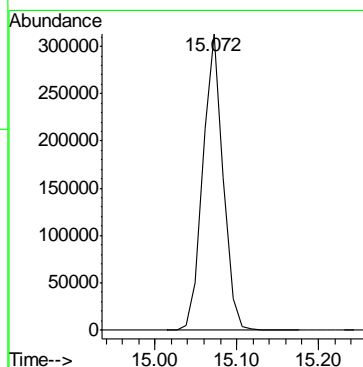
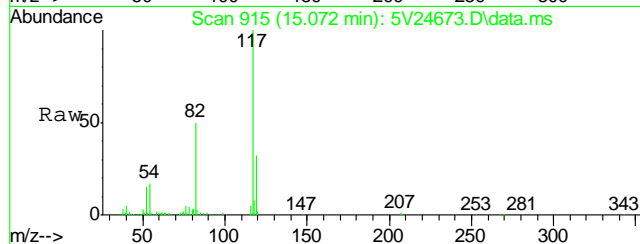
#50  
Benzene  
Concen: 0.08 ug/l  
RT: 12.104 min Scan# 655  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

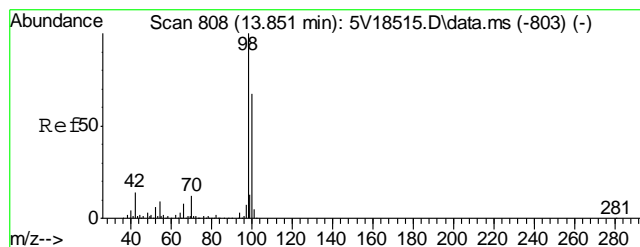
Tgt Ion: 78 Resp: 1232



#53  
Chlorobenzene-d5  
Concen: 50.00 ug/l  
RT: 15.072 min Scan# 915  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

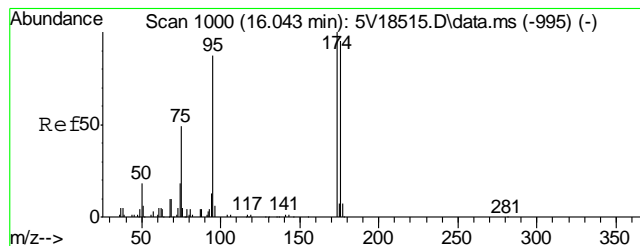
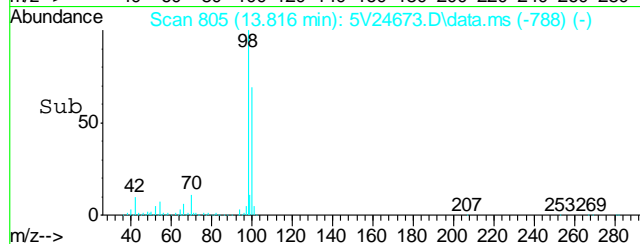
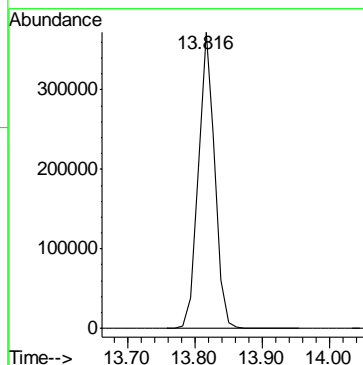
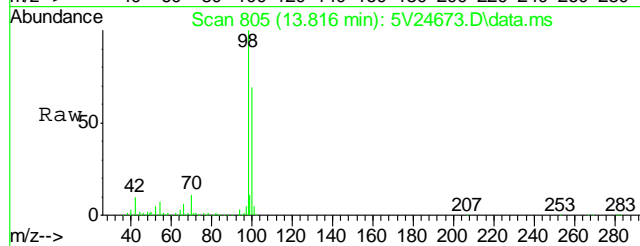
Tgt Ion: 117 Resp: 535944





#61  
Toluene-d8  
Concen: 50.44 ug/l  
RT: 13.816 min Scan# 805  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

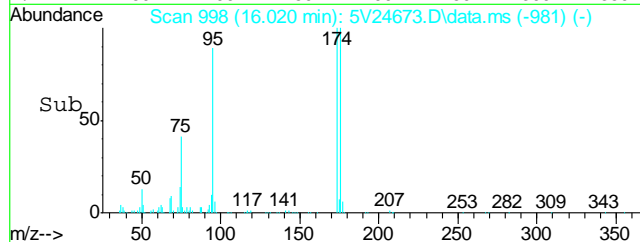
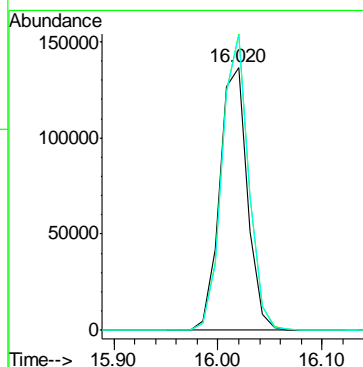
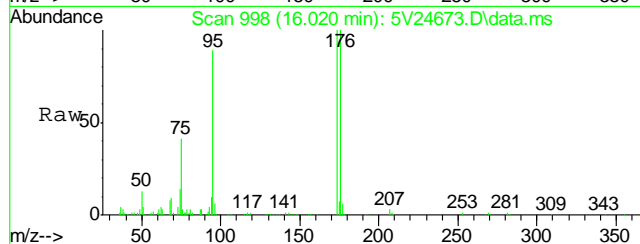
Tgt Ion: 98 Resp: 640357

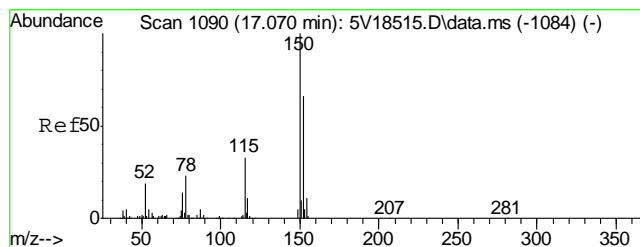


#69  
4-Bromofluorobenzene  
Concen: 46.49 ug/l  
RT: 16.020 min Scan# 998  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

Tgt Ion: 95 Resp: 254413

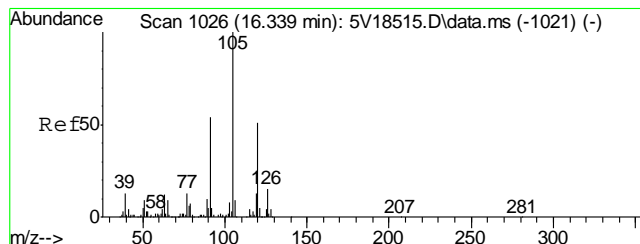
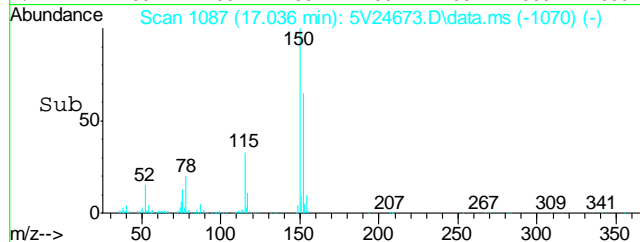
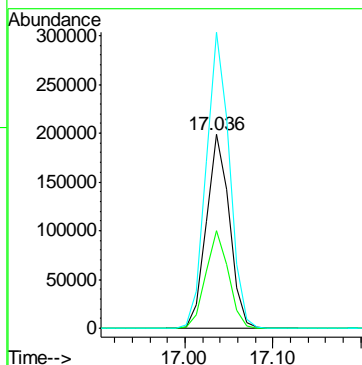
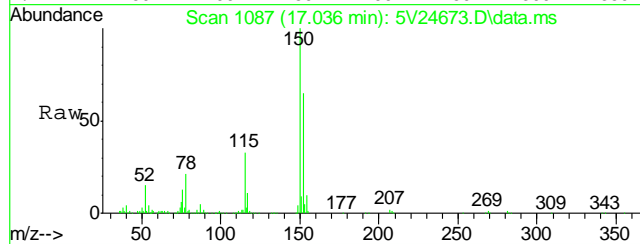
Ion	Ratio	Lower	Upper
95	100		
174	107.9	77.1	117.1
176	107.3	73.4	113.4





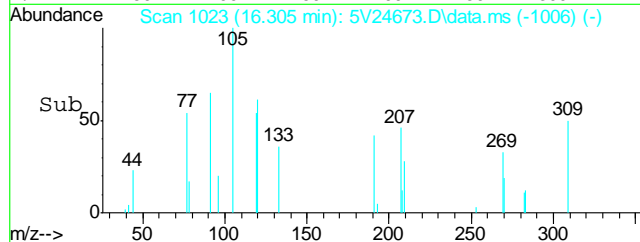
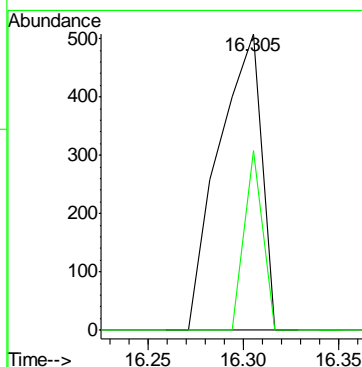
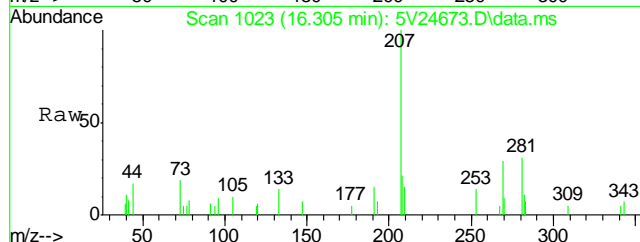
#74  
1,4-Dichlorobenzene-d4  
Concen: 50.00 ug/l  
RT: 17.036 min Scan# 1087  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

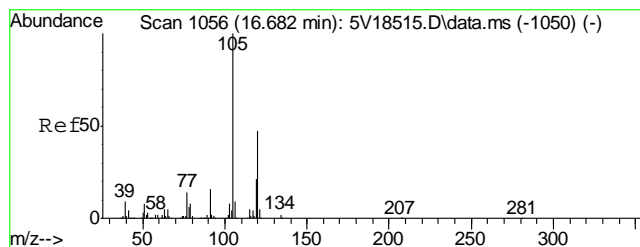
Tgt Ion:	152	Resp:	360659
Ion Ratio	Lower	Upper	
152	100		
115	49.8	41.4	62.0
150	153.6	153.9	230.9#



#80  
1,3,5-Trimethylbenzene  
Concen: 0.05 ug/l  
RT: 16.305 min Scan# 1023  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

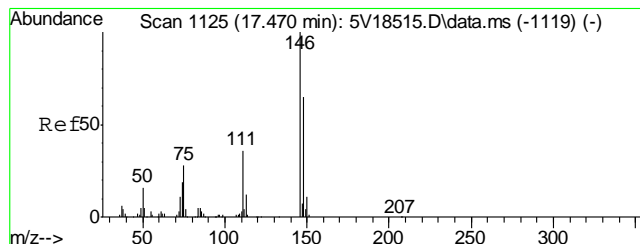
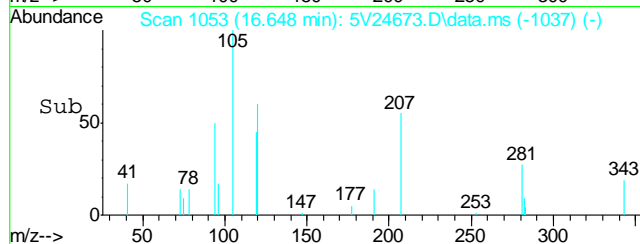
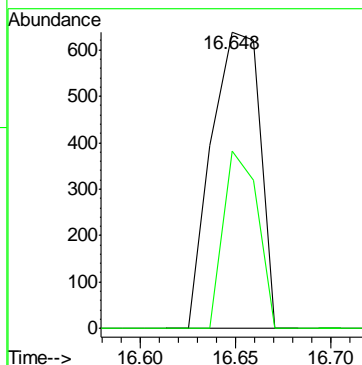
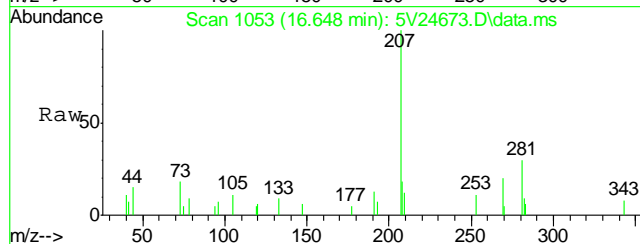
Tgt Ion:	105	Resp:	800
Ion Ratio	Lower	Upper	
105	100		
120	26.5	40.1	60.1#





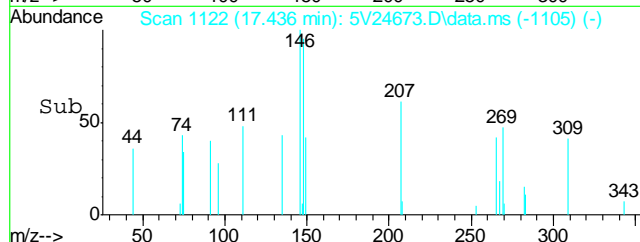
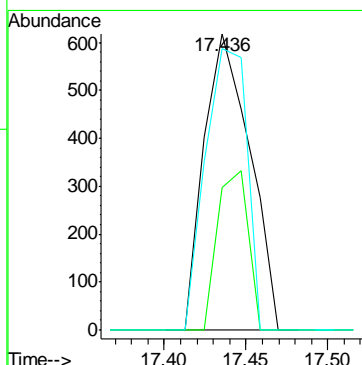
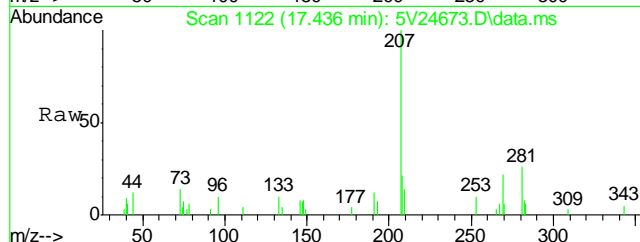
#82  
1,2,4-Trimethylbenzene  
Concen: 0.07 ug/l  
RT: 16.648 min Scan# 1053  
Delta R.T. -0.012 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

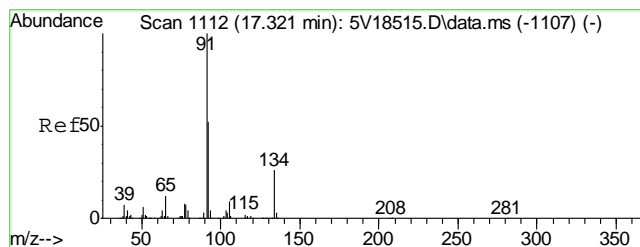
Tgt Ion:105 Resp: 1132  
Ion Ratio Lower Upper  
105 100  
120 42.3 43.8 65.8#



#87  
1,2-Dichlorobenzene  
Concen: 0.11 ug/l  
RT: 17.436 min Scan# 1122  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

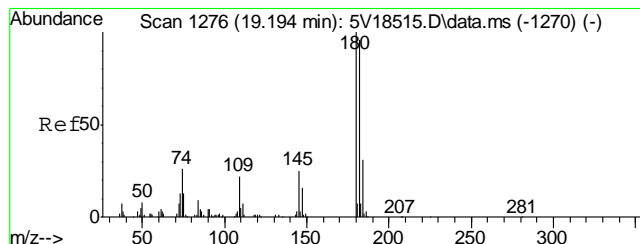
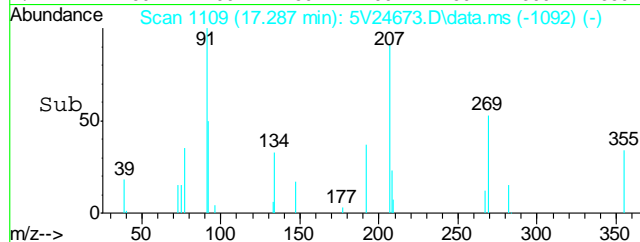
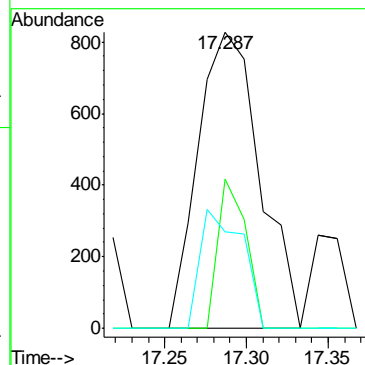
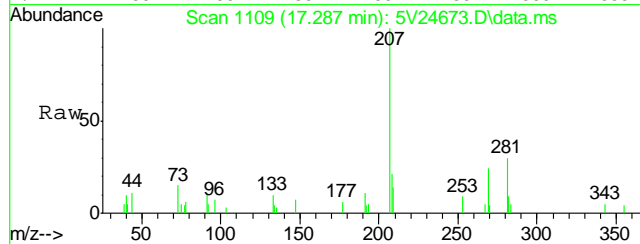
Tgt Ion:146 Resp: 1204  
Ion Ratio Lower Upper  
146 100  
111 35.9 29.9 44.9  
148 85.8 51.9 77.9#





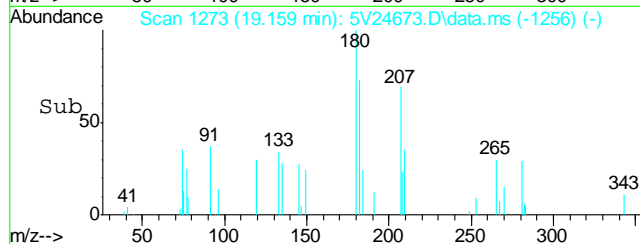
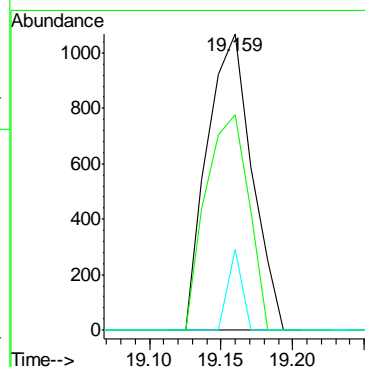
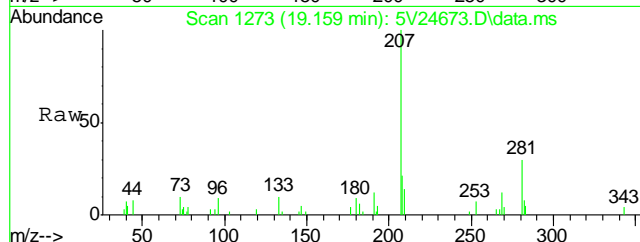
#88  
n-Butylbenzene  
Concen: 0.12 ug/l  
RT: 17.287 min Scan# 1109  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

Tgt Ion	Ratio	Lower	Upper
91	100		
92	22.6	42.2	63.4#
134	27.3	21.4	32.2

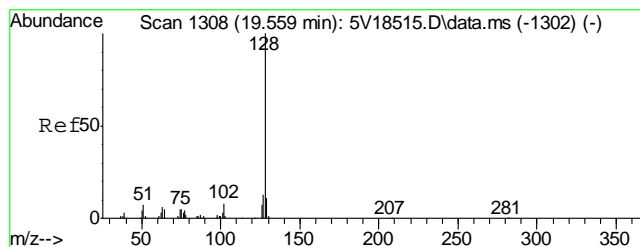


#90  
1,2,4-Trichlorobenzene  
Concen: 0.23 ug/l  
RT: 19.159 min Scan# 1273  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

Tgt Ion	Ratio	Lower	Upper
180	100		
182	69.7	76.2	114.4#
145	8.7	20.1	30.1#

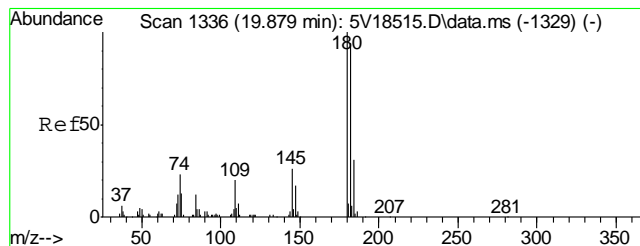
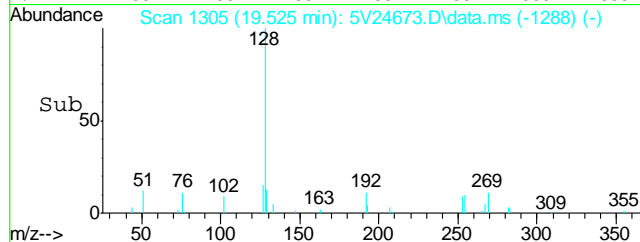
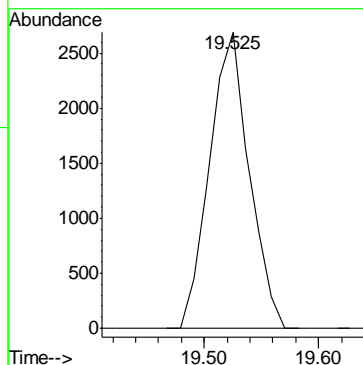
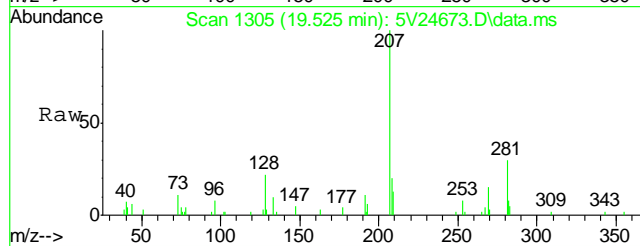






#91  
Naphthalene  
Concen: 0.36 ug/l  
RT: 19.525 min Scan# 1305  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

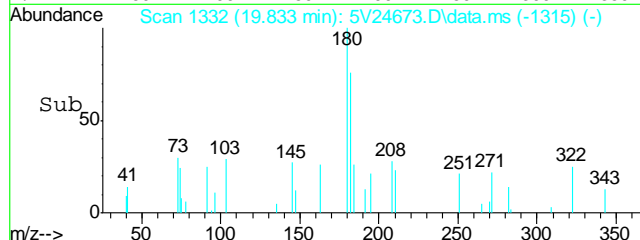
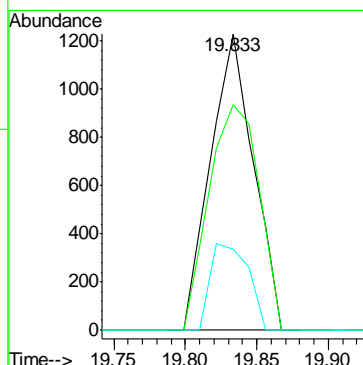
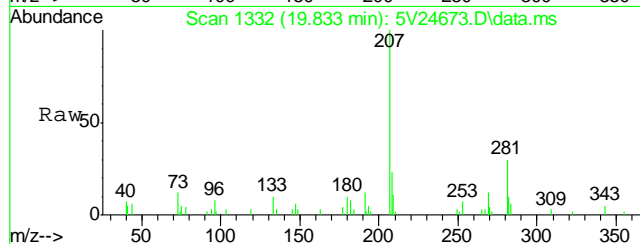
Tgt Ion:128 Resp: 6488



#93  
1,2,3-Trichlorobenzene  
Concen: 0.27 ug/l  
RT: 19.833 min Scan# 1332  
Delta R.T. -0.000 min  
Lab File: 5V24673.D  
Acq: 19 Nov 2012 12:44 pm

Tgt Ion:180 Resp: 2556

Ion	Ratio	Lower	Upper
180	100		
182	88.7	76.0	114.0
145	25.5	21.4	32.0



## GC/MS Semi-volatiles

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

**Method Blank Summary**

Page 1 of 1

**Job Number:** D41014  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6988-MB	3G12229.D	1	11/26/12	SM	11/20/12	OP6988	E3G577

**The QC reported here applies to the following samples:****Method:** SW846 8270C BY SIM

D41014-1

CAS No.	Compound	Result	RL	MDL	Units	Q
83-32-9	Acenaphthene	ND	8.3	4.3	ug/kg	
120-12-7	Anthracene	ND	8.3	4.3	ug/kg	
56-55-3	Benzo(a)anthracene	ND	8.3	4.3	ug/kg	
205-99-2	Benzo(b)fluoranthene	ND	8.3	4.3	ug/kg	
207-08-9	Benzo(k)fluoranthene	ND	8.3	4.3	ug/kg	
50-32-8	Benzo(a)pyrene	ND	8.3	4.3	ug/kg	
218-01-9	Chrysene	ND	8.3	4.3	ug/kg	
53-70-3	Dibenzo(a,h)anthracene	ND	8.3	4.3	ug/kg	
206-44-0	Fluoranthene	ND	8.3	4.3	ug/kg	
86-73-7	Fluorene	ND	8.3	4.3	ug/kg	
193-39-5	Indeno(1,2,3-cd)pyrene	ND	8.3	4.3	ug/kg	
91-20-3	Naphthalene	ND	12	10	ug/kg	
129-00-0	Pyrene	ND	8.3	4.3	ug/kg	

CAS No.	Surrogate Recoveries	Limits
4165-60-0	Nitrobenzene-d5	97% 10-159%
321-60-8	2-Fluorobiphenyl	99% 19-131%
1718-51-0	Terphenyl-d14	91% 18-150%

8.1.1

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## Blank Spike Summary

Page 1 of 1

**Job Number:** D41014  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6988-BS	3G12230.D	1	11/26/12	SM	11/20/12	OP6988	E3G577

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D41014-1

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
83-32-9	Acenaphthene	83.3	93.9	113	68-130
120-12-7	Anthracene	83.3	80.2	96	67-130
56-55-3	Benzo(a)anthracene	83.3	82.1	99	65-130
205-99-2	Benzo(b)fluoranthene	83.3	71.9	86	44-130
207-08-9	Benzo(k)fluoranthene	83.3	74.2	89	56-131
50-32-8	Benzo(a)pyrene	83.3	77.6	93	62-130
218-01-9	Chrysene	83.3	73.8	89	70-130
53-70-3	Dibenzo(a,h)anthracene	83.3	75.6	91	55-130
206-44-0	Fluoranthene	83.3	78.6	94	70-130
86-73-7	Fluorene	83.3	79.4	95	70-130
193-39-5	Indeno(1,2,3-cd)pyrene	83.3	75.5	91	56-130
91-20-3	Naphthalene	83.3	102	122	70-130
129-00-0	Pyrene	83.3	75.6	91	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
4165-60-0	Nitrobenzene-d5	90%	10-159%
321-60-8	2-Fluorobiphenyl	93%	19-131%
1718-51-0	Terphenyl-d14	86%	18-150%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D41014  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6988-MS	3G12232.D	1	11/26/12	SM	11/20/12	OP6988	E3G577
OP6988-MSD	3G12233.D	1	11/26/12	SM	11/20/12	OP6988	E3G577
D41014-1	3G12231.D	1	11/26/12	SM	11/20/12	OP6988	E3G577

The QC reported here applies to the following samples:

Method: SW846 8270C BY SIM

D41014-1

CAS No.	Compound	D41014-1 ug/kg	Q	Spike ug/kg	MS ug/kg	MS %	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
83-32-9	Acenaphthene	ND		96.2	110	114	103	107	7	25-151/30
120-12-7	Anthracene	ND		96.2	96.8	101	93.9	98	3	39-159/30
56-55-3	Benzo(a)anthracene	ND		96.2	98.2	102	95.3	99	3	39-168/30
205-99-2	Benzo(b)fluoranthene	ND		96.2	83.8	87	83.2	86	1	24-163/30
207-08-9	Benzo(k)fluoranthene	ND		96.2	88.6	92	85.5	89	4	10-188/30
50-32-8	Benzo(a)pyrene	ND		96.2	92.1	96	88.2	92	4	32-144/30
218-01-9	Chrysene	ND		96.2	88.5	92	84.3	88	5	43-150/30
53-70-3	Dibenzo(a,h)anthracene	ND		96.2	84.5	88	85.3	89	1	21-152/30
206-44-0	Fluoranthene	ND		96.2	99.2	103	95.6	99	4	36-157/30
86-73-7	Fluorene	ND		96.2	98.0	102	94.0	98	4	10-182/30
193-39-5	Indeno(1,2,3-cd)pyrene	ND		96.2	87.0	90	84.6	88	3	20-154/30
91-20-3	Naphthalene	34.8		96.2	134	103	111	79	19	10-163/30
129-00-0	Pyrene	ND		96.2	95.0	99	91.8	95	3	25-180/30

CAS No.	Surrogate Recoveries	MS	MSD	D41014-1	Limits
4165-60-0	Nitrobenzene-d5	86%	74%	80%	10-159%
321-60-8	2-Fluorobiphenyl	84%	80%	85%	19-131%
1718-51-0	Terphenyl-d14	80%	78%	85%	18-150%

\* = Outside of Control Limits.

GC/MS Semi-volatiles

Raw Data

6

## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\112612\  
 Data File : 3g12231.D  
 Acq On : 26 Nov 2012 6:54 pm  
 Operator : SARAHM1  
 Sample : D41014-1  
 Misc : OP6988,E3G577,30.04,,,1,1  
 ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 27 09:24:41 2012  
 Quant Method : C:\msdchem\1\METHODS\SIMPE3G574.M  
 Quant Title : PAHSIM BASE  
 QLast Update : Mon Nov 26 15:39:31 2012  
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Naphthalene-d8	5.707	136	137587	4.0000	ug/mL	0.00
6) Acenaphthene-d10	7.412	164	88246	4.0000	ug/mL	0.00
15) Phenanthrene-d10	8.894	188	156268	4.0000	ug/mL	-0.06
19) Chrysene-d12	11.535	240	124910	4.0000	ug/mL	0.00
24) Perylene-d12	12.913	264	73114	4.0000	ug/mL	0.00

## System Monitoring Compounds

2) Nitrobenzene-d5	5.021	82	531547	40.1835	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	80.36%		
7) 2-Fluorobiphenyl	6.751	172	1363494	42.3736	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	84.74%		
21) Terphenyl-d14	10.493	244	689124	42.3295	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	84.66%		

## Target Compounds

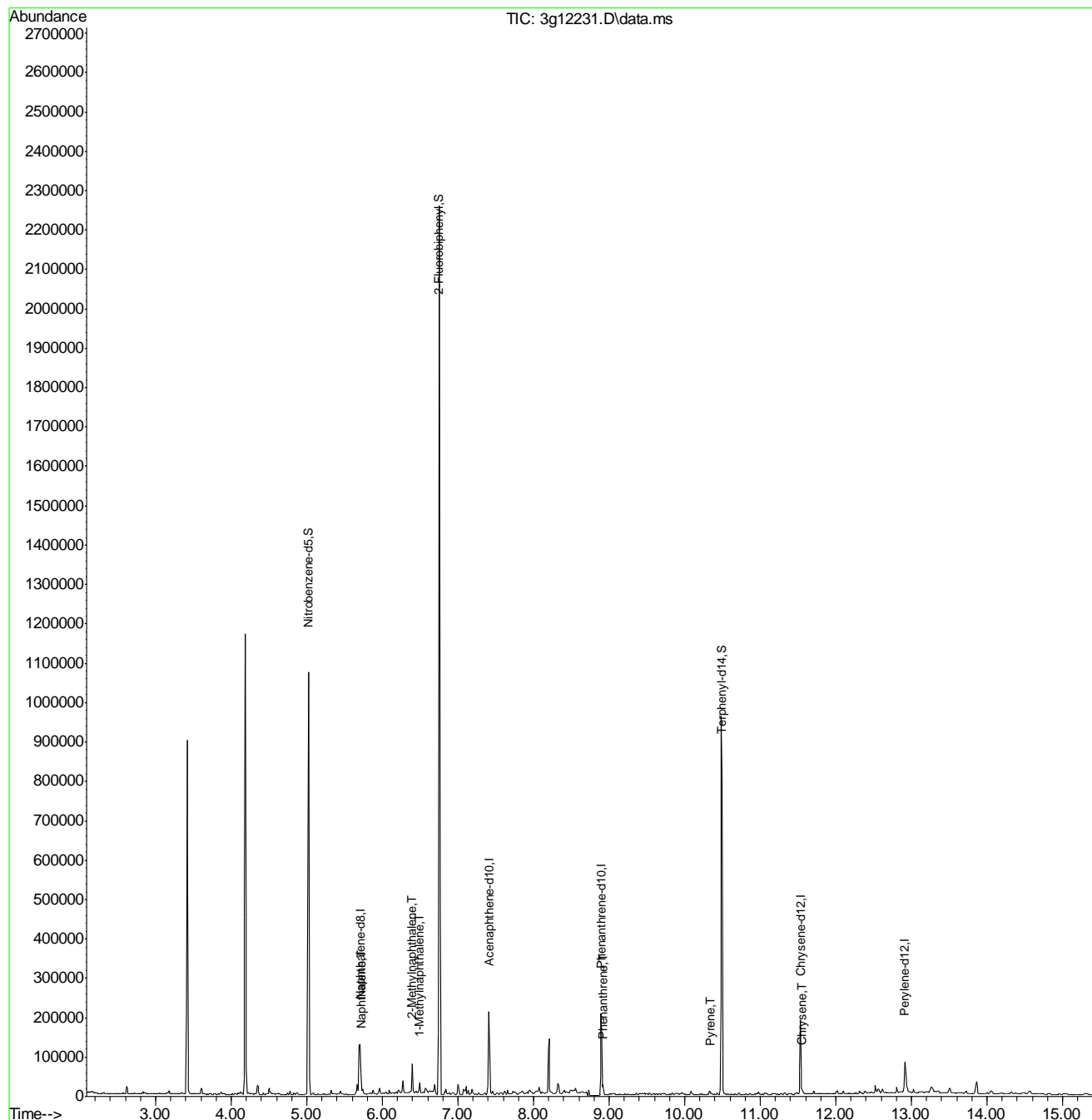
					Qvalue
3) N-Nitrosodimethylamine	2.443	74	129	N.D.	
4) N-Nitrosodi-propylamine	0.000	70	0	N.D. d	
5) Naphthalene	5.719	128	32496	0.9030 ug/mL	95
8) 2-Methylnaphthalene	6.392	142	29666	1.0768 ug/mL	97
9) 1-Methylnaphthalene	6.492	142	10901	0.4244 ug/mL	90
10) Acenaphthylene	7.271	152	489	N.D.	
11) Acenaphthene	7.448	154	415	Below Cal #	1
12) Dibenzofuran	7.625	168	1779	N.D.	
13) Fluorene	0.000	166	0	N.D. d	
14) Diphenylamine	0.000	169	0	N.D. d	
16) Phenanthrene	8.918	178	16041	0.2573 ug/mL	80
17) Anthracene	0.000	178	0	N.D. d	
18) Fluoranthene	10.105	202	2970	N.D.	
20) Pyrene	10.335	202	4918	0.0717 ug/mL#	66
22) Benzo(a)anthracene	0.000	228	0	N.D. d	
23) Chrysene	11.555	228	4302	0.0708 ug/mL	92
25) Benzo(b)fluoranthene	0.000	252	0	N.D. d	
26) Benzo(k)fluoranthene	0.000	252	0	N.D. d	
27) Benzo(a)pyrene	12.860	252	1575	N.D.	
28) Indeno(1,2,3-cd)pyrene	14.143	276	823	N.D.	
29) Dibenz(a,h)anthracene	14.164	278	803	N.D.	
30) Benzo(g,h,i)perylene	14.880	276	181	N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

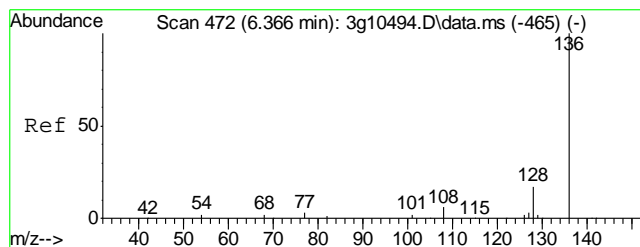
Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\112612\  
 Data File : 3g12231.D  
 Acq On : 26 Nov 2012 6:54 pm  
 Operator : SARAHM1  
 Sample : D41014-1  
 Misc : OP6988,E3G577,30.04,,,1,1  
 ALS Vial : 9 Sample Multiplier: 1

Quant Time: Nov 27 09:24:41 2012  
 Quant Method : C:\msdchem\1\METHODS\SIMPE3G574.M  
 Quant Title : PAHSIM BASE  
 QLast Update : Mon Nov 26 15:39:31 2012  
 Response via : Initial Calibration

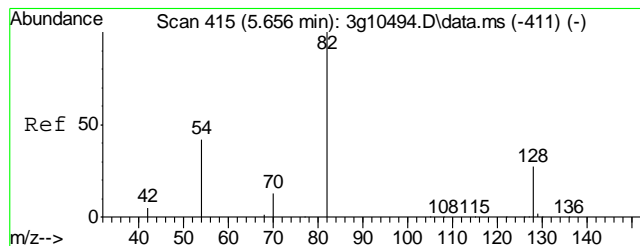
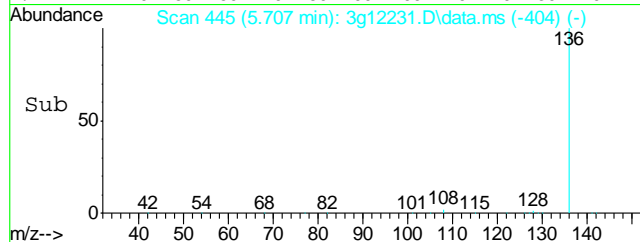
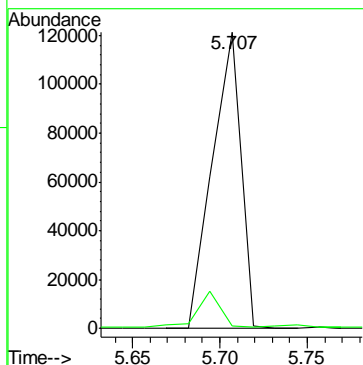
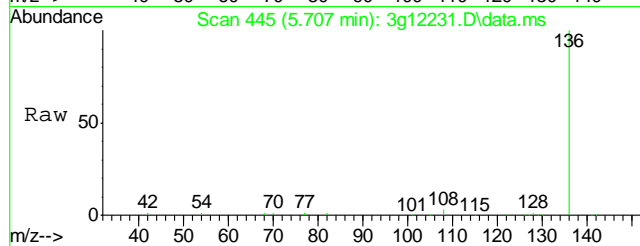






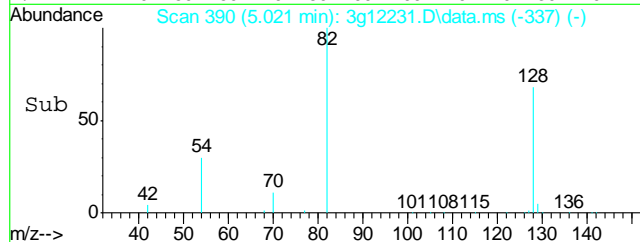
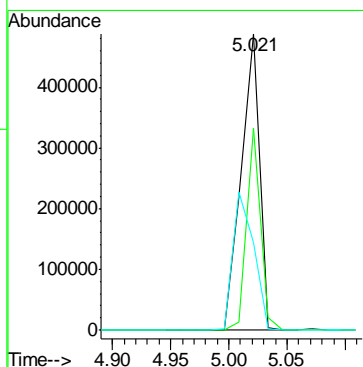
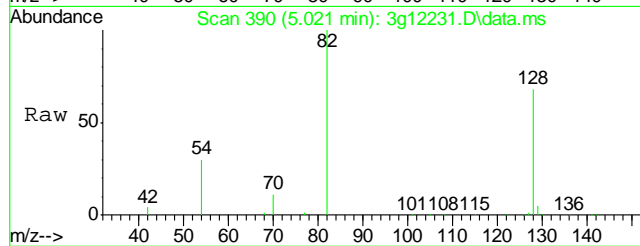
#1  
Naphthalene-d8  
Concen: 4.0000 ug/mL  
RT: 5.707 min Scan# 445  
Delta R.T. 0.005 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

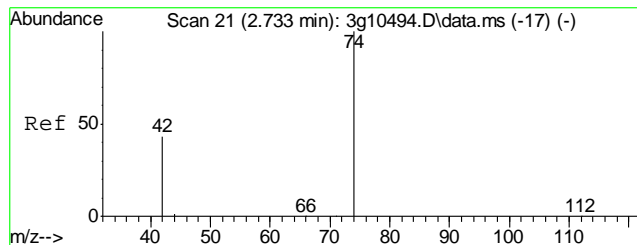
Tgt Ion: 136 Resp: 137587  
Ion Ratio Lower Upper  
136 100  
68 10.0 0.0 21.7



#2  
Nitrobenzene-d5  
Concen: 40.1835 ug/mL  
RT: 5.021 min Scan# 390  
Delta R.T. -0.005 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

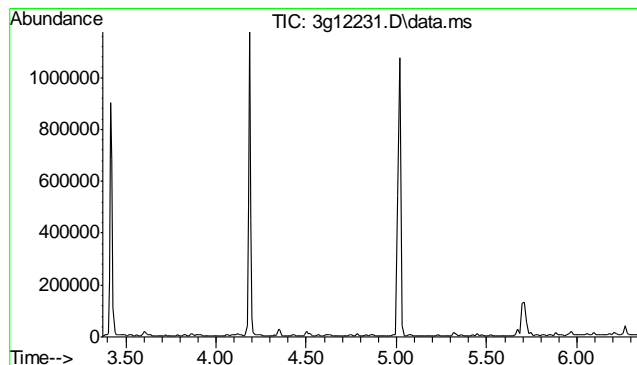
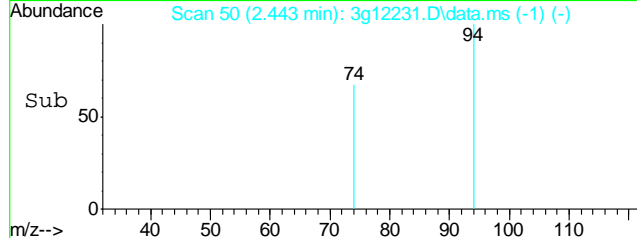
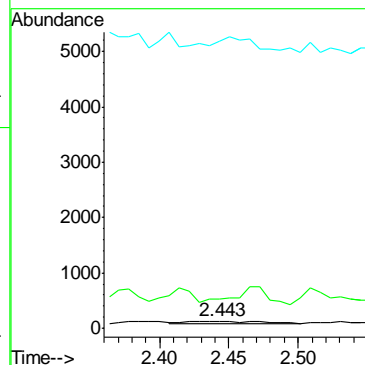
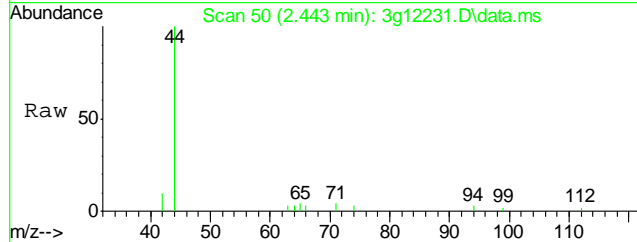
Tgt Ion: 82 Resp: 531547  
Ion Ratio Lower Upper  
82 100  
128 51.6 30.7 70.7  
54 52.7 36.8 76.8





#3  
N-Nitrosodimethylamine  
Concen: Below ug/mL  
RT: 2.443 min Scan# 50  
Delta R.T. -0.006 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

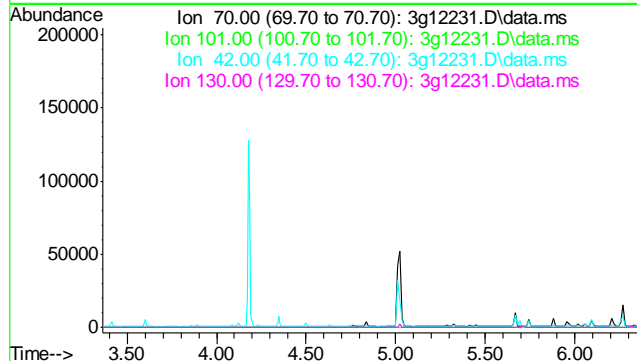
Tgt Ion	Ratio	Lower	Upper
74	100		
42	379.8	53.9	93.9#
44	0.0	0.0	24.2

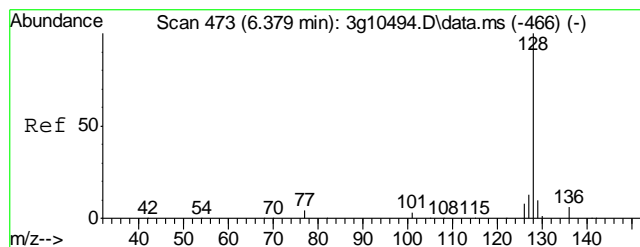


#4  
N-Nitrosodi-propylamine  
Concen: N.D. ug/mL  
Expected RT: 4.87 min

Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

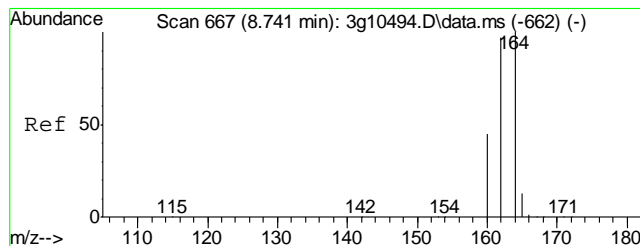
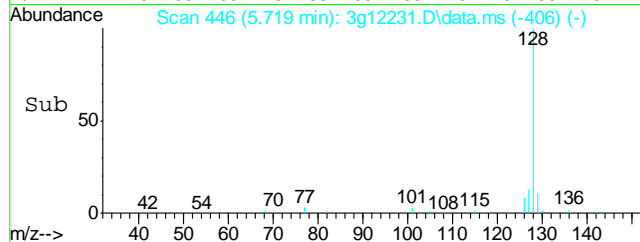
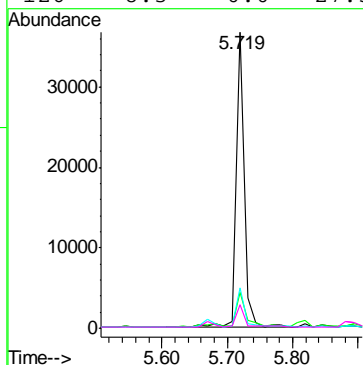
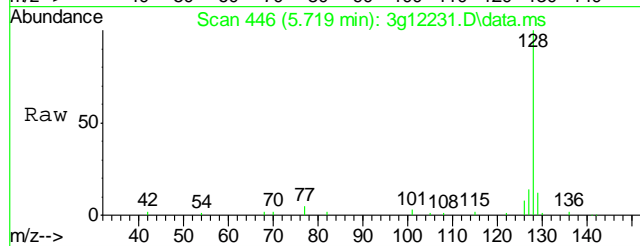
Tgt Ion	Sig	Exp Ratio
70	100	
101	13.9	
42	52.4	
130	27.1	





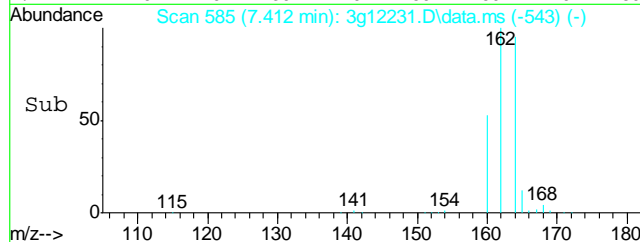
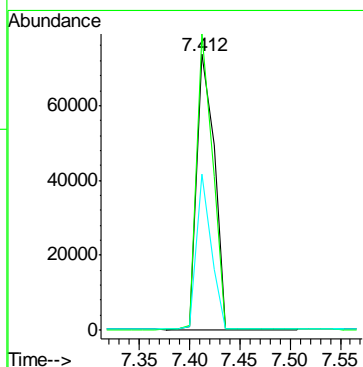
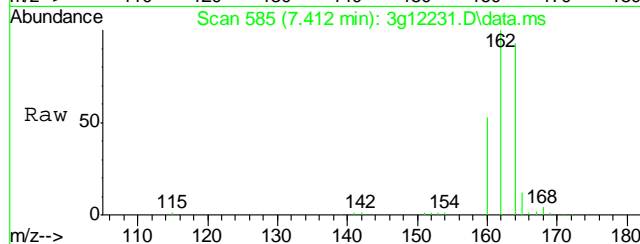
#5  
Naphthalene  
Concen: 0.9030 ug/mL  
RT: 5.719 min Scan# 446  
Delta R.T. -0.007 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

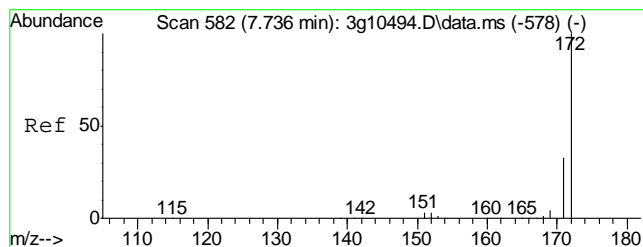
Tgt Ion:128	Resp:	32496
Ion Ratio	Lower	Upper
128	100	
129	14.2	0.0 31.0
127	14.3	0.0 32.8
126	8.3	0.0 27.5



#6  
Acenaphthene-d10  
Concen: 4.0000 ug/mL  
RT: 7.412 min Scan# 585  
Delta R.T. -0.001 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

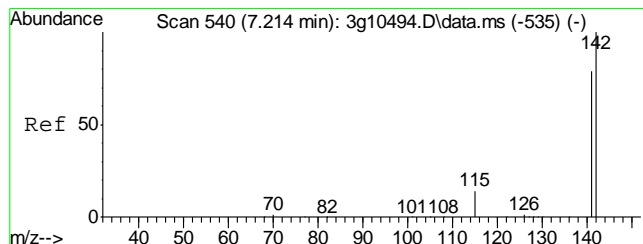
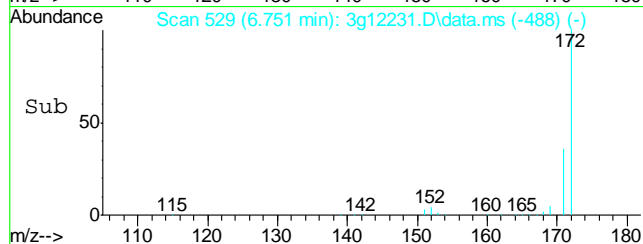
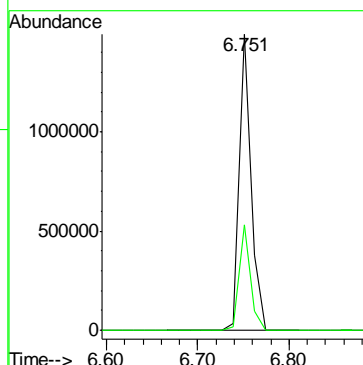
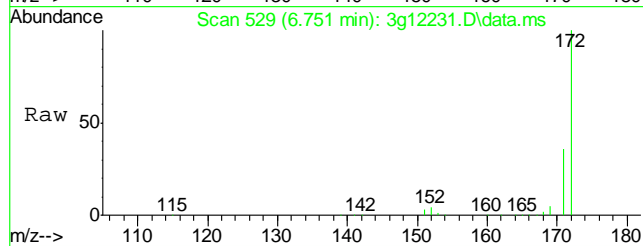
Tgt Ion:164	Resp:	88246
Ion Ratio	Lower	Upper
164	100	
162	97.3	84.8 124.8
160	46.9	33.9 73.9





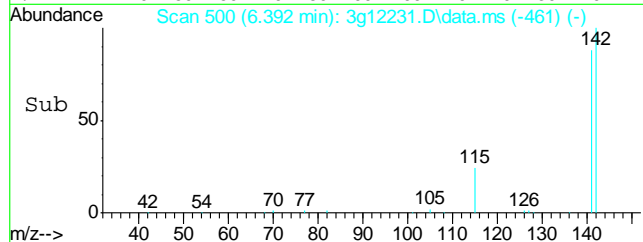
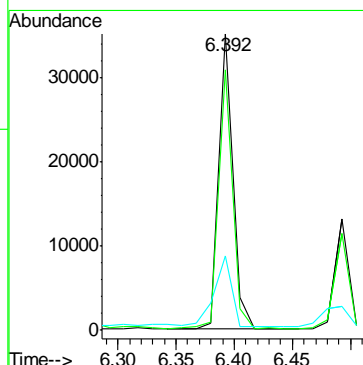
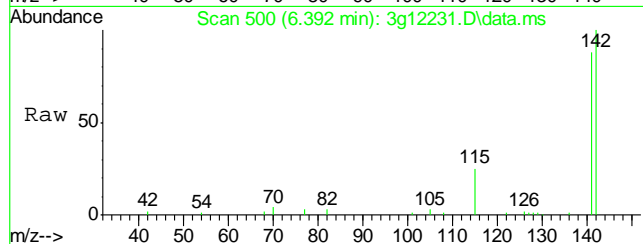
#7  
2-Fluorobiphenyl  
Concen: 42.3736 ug/mL  
RT: 6.751 min Scan# 529  
Delta R.T. 0.004 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

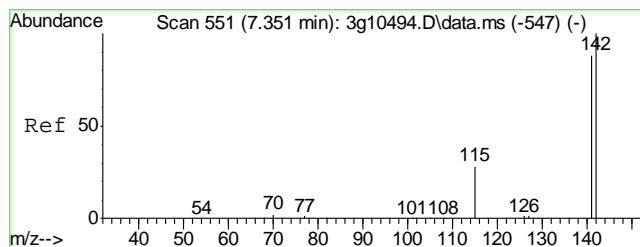
Tgt Ion	Ratio	Lower	Upper
172	100		
171	33.7	12.6	52.6



#8  
2-Methylnaphthalene  
Concen: 1.0768 ug/mL  
RT: 6.392 min Scan# 500  
Delta R.T. -0.013 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

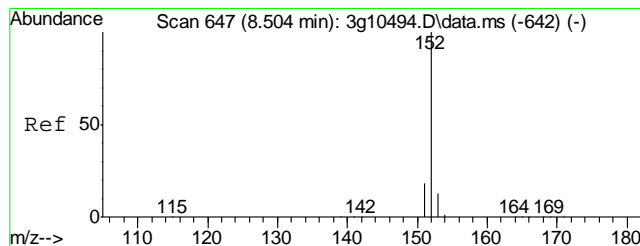
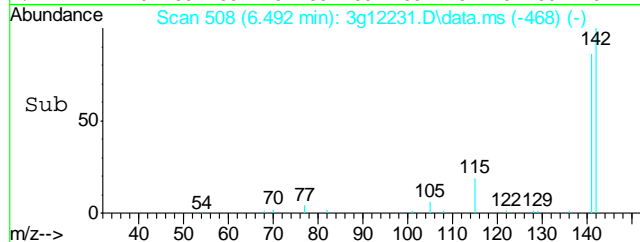
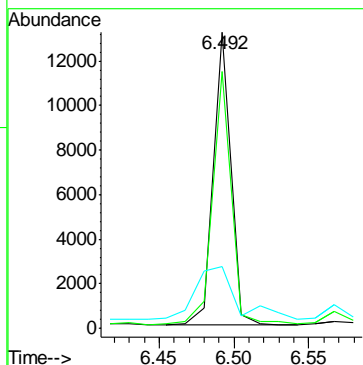
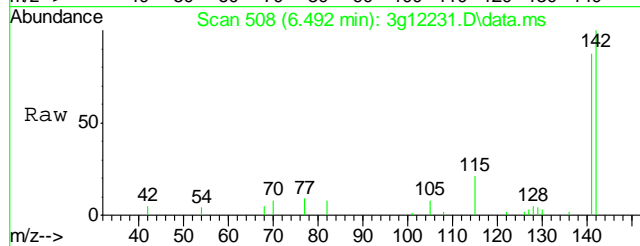
Tgt Ion	Ratio	Lower	Upper
142	100		
141	86.6	64.0	104.0
115	29.2	7.1	47.1





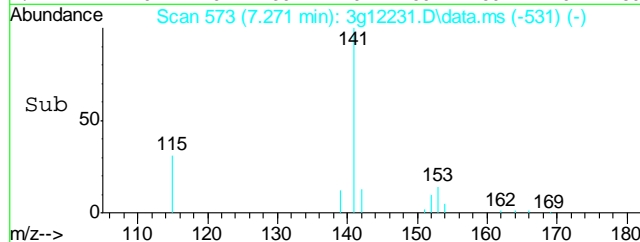
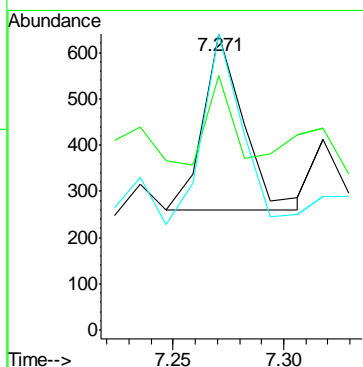
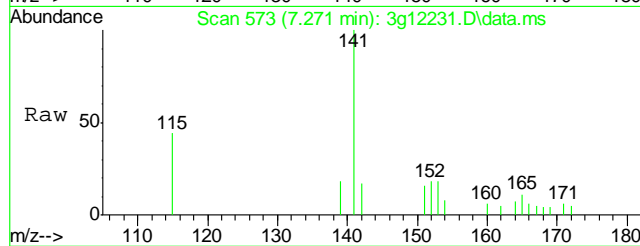
#9  
1-Methylnaphthalene  
Concen: 0.4244 ug/mL  
RT: 6.492 min Scan# 508  
Delta R.T. 0.001 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

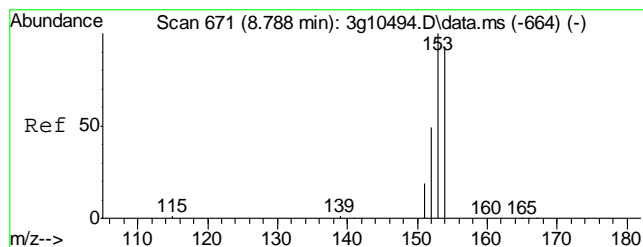
Tgt Ion:	142	Resp:	10901
Ion Ratio	Lower	Upper	
142	100		
141	90.3	65.4	105.4
115	41.8	9.7	49.7



#10  
Acenaphthylene  
Concen: Below ug/mL  
RT: 7.271 min Scan# 573  
Delta R.T. -0.002 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

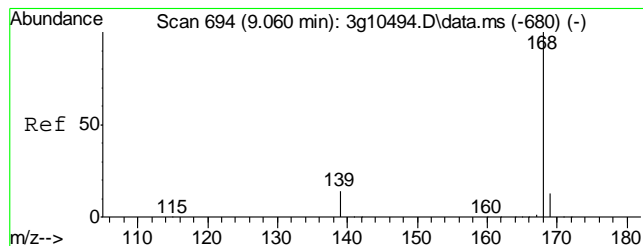
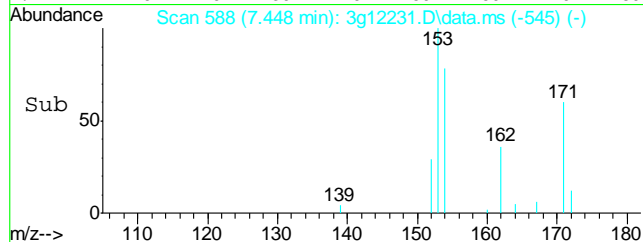
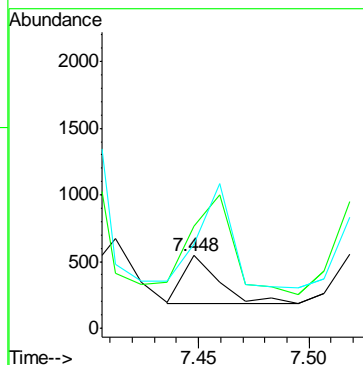
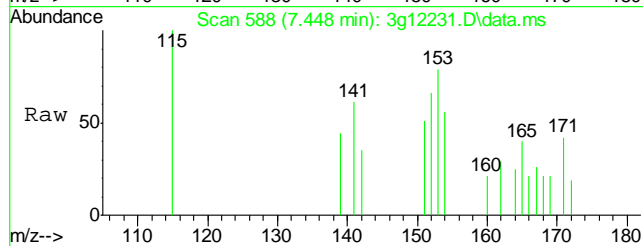
Tgt Ion:	152	Resp:	489
Ion Ratio	Lower	Upper	
152	100		
151	33.3	0.0	39.3
153	106.5	0.0	32.8#





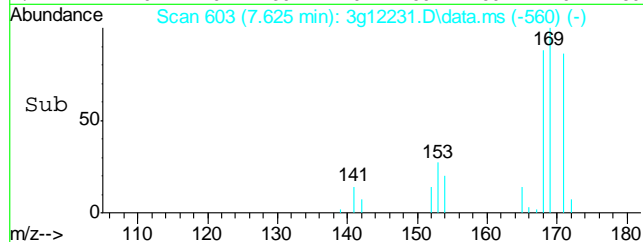
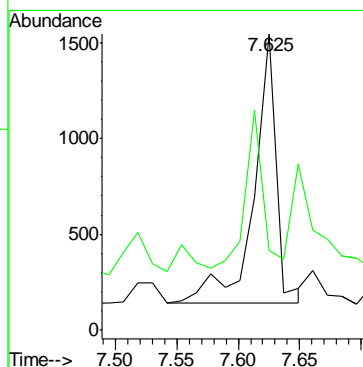
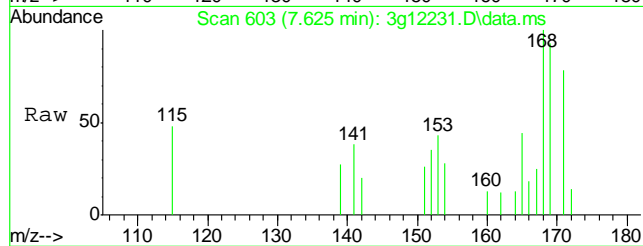
#11  
Acenaphthene  
Concen: Below ug/mL  
RT: 7.448 min Scan# 588  
Delta R.T. 0.011 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

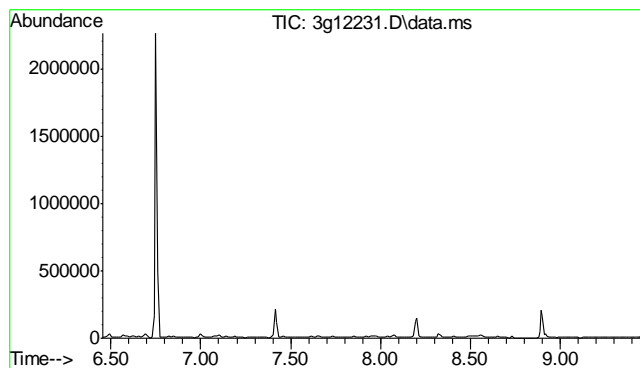
Tgt Ion:154 Resp: 415  
Ion Ratio Lower Upper  
154 100  
153 252.0 84.1 124.1#  
152 227.2 30.2 70.2#



#12  
Dibenzofuran  
Concen: Below ug/mL  
RT: 7.625 min Scan# 603  
Delta R.T. 0.014 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

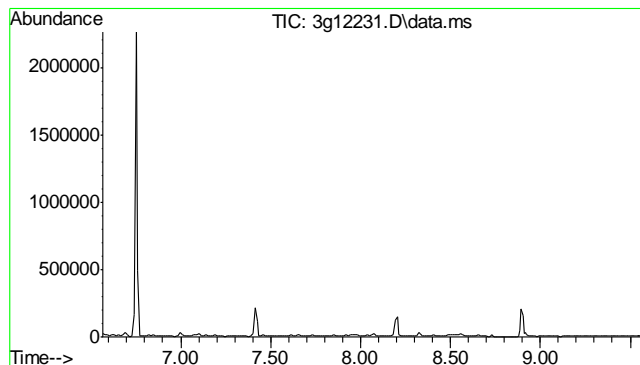
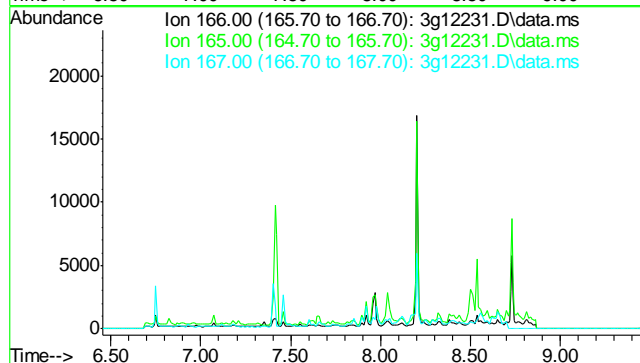
Tgt Ion:168 Resp: 1779  
Ion Ratio Lower Upper  
168 100  
139 47.1 10.9 50.9





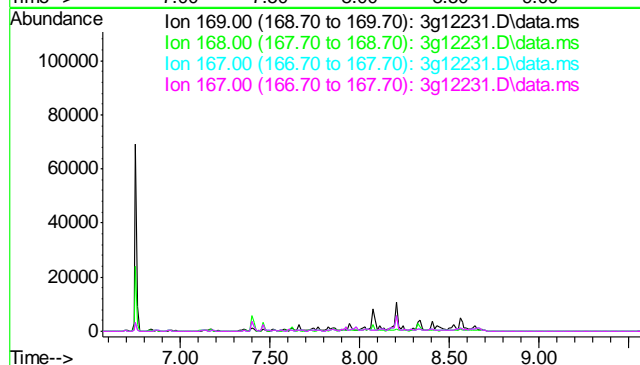
#13  
 Fluorene  
 Concen: N.D. ug/mL  
 Expected RT: 7.95 min  
  
 Lab File: 3g12231.D  
 Acq: 26 Nov 12 6:54 pm

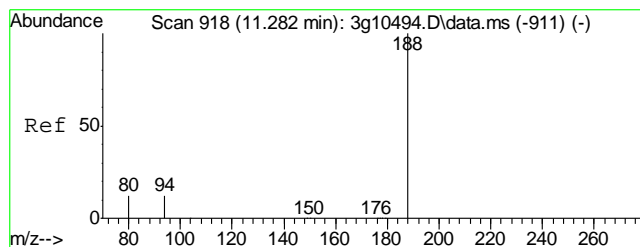
Tgt Ion	Exp Ratio
166	100
165	89.6
167	13.5



#14  
 Diphenylamine  
 Concen: N.D. ug/mL  
 Expected RT: 8.07 min  
  
 Lab File: 3g12231.D  
 Acq: 26 Nov 12 6:54 pm

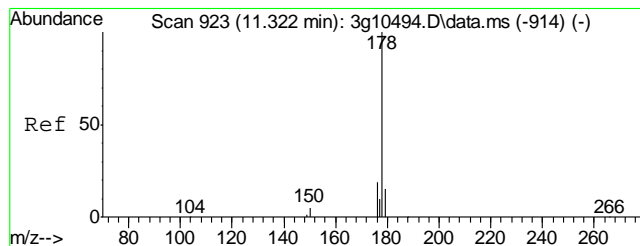
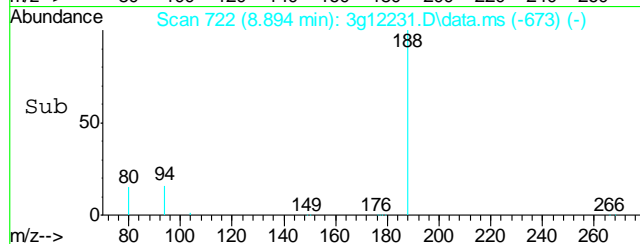
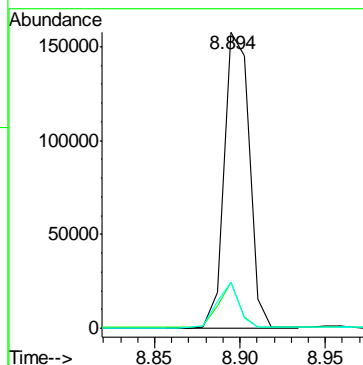
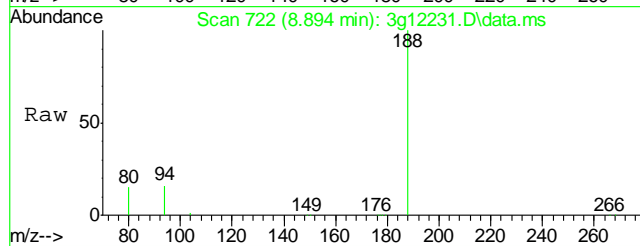
Tgt Ion	Exp Ratio
169	100
168	60.9
167	33.6
167	33.6





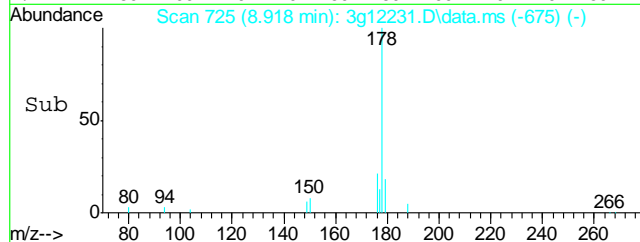
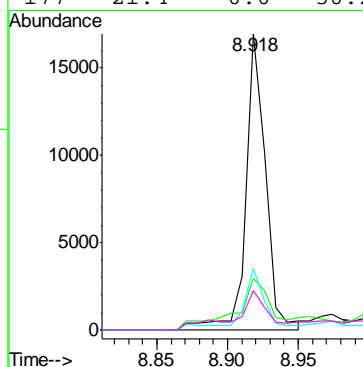
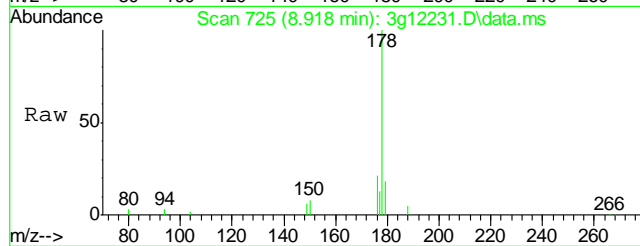
#15  
Phenanthrene-d10  
Concen: 4.0000 ug/mL  
RT: 8.894 min Scan# 722  
Delta R.T. -0.062 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

Tgt Ion:188	Resp:	156268
Ion Ratio	Lower	Upper
188 100		
94 12.4	0.0	32.1
80 14.2	0.0	32.0

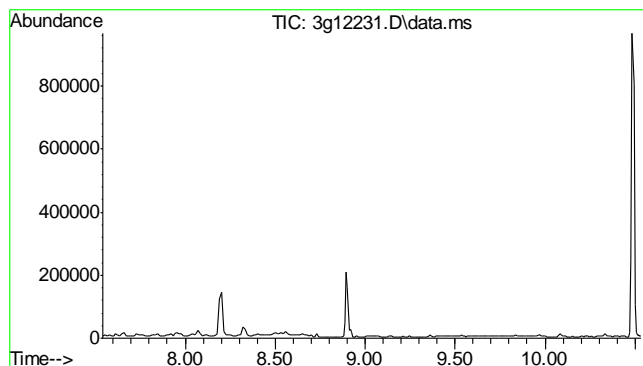


#16  
Phenanthrene  
Concen: 0.2573 ug/mL  
RT: 8.918 min Scan# 725  
Delta R.T. -0.061 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

Tgt Ion:178	Resp:	16041
Ion Ratio	Lower	Upper
178 100		
179 30.7	0.0	35.2
176 19.4	0.0	38.7
177 21.4	0.0	30.2

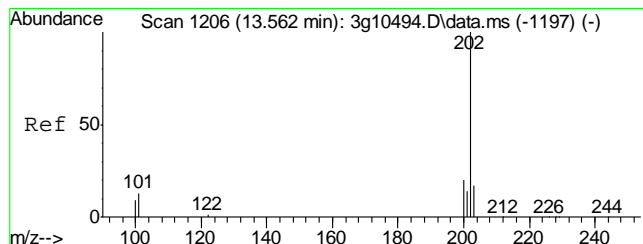
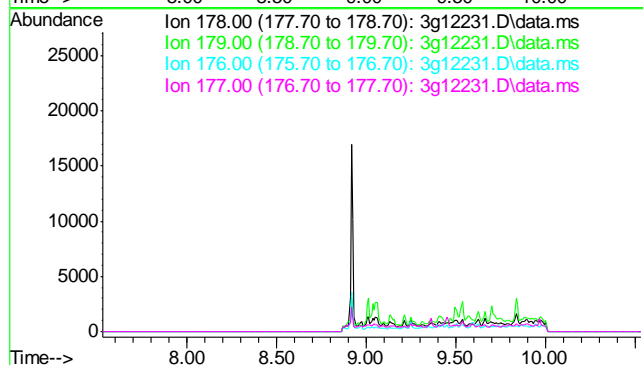






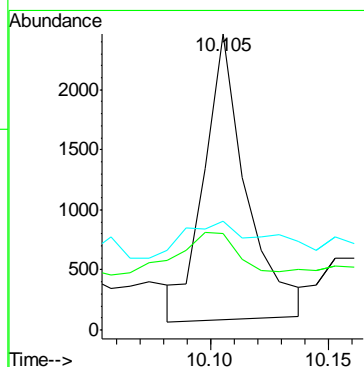
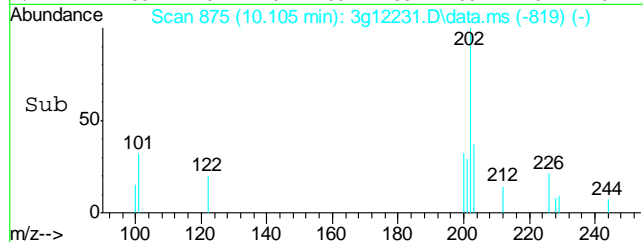
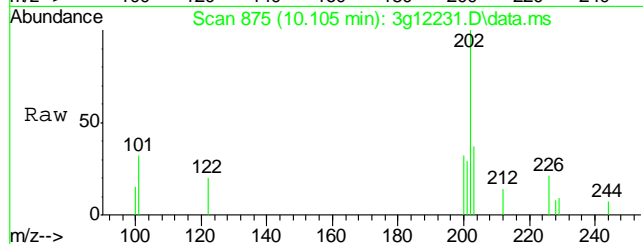
#17  
 Anthracene  
 Concen: N.D. ug/mL  
 Expected RT: 9.03 min  
 Lab File: 3g12231.D  
 Acq: 26 Nov 12 6:54 pm

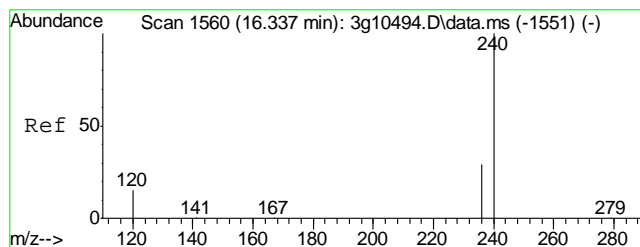
Tgt Ion: 178  
 Sig Exp Ratio  
 178 100  
 179 15.3  
 176 18.0  
 177 8.7



#18  
 Fluoranthene  
 Concen: Below ug/mL  
 RT: 10.105 min Scan# 875  
 Delta R.T. -0.057 min  
 Lab File: 3g12231.D  
 Acq: 26 Nov 12 6:54 pm

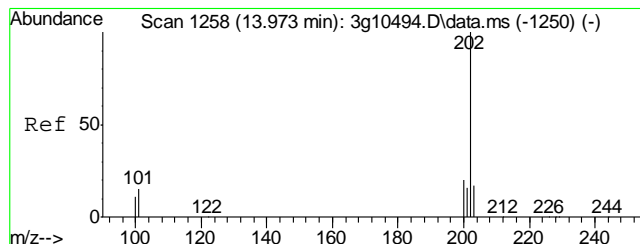
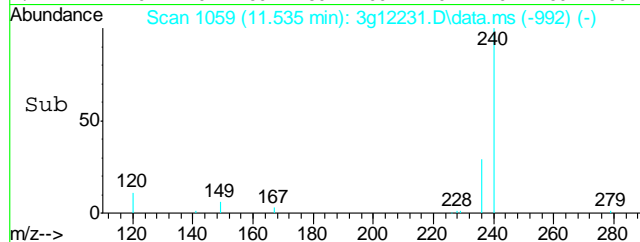
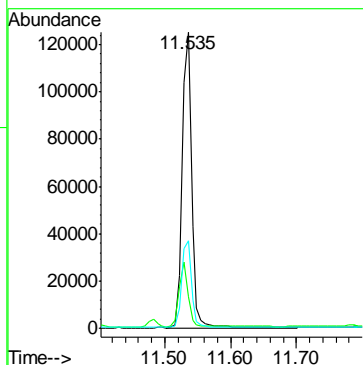
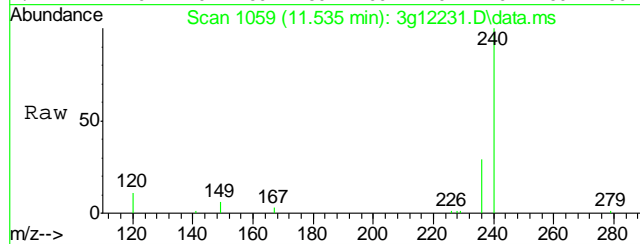
Tgt Ion: 202 Resp: 2970  
 Ion Ratio Lower Upper  
 202 100  
 101 41.7 0.0 31.8#  
 203 43.8 0.0 37.3#





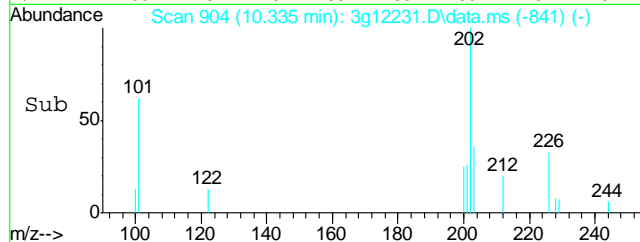
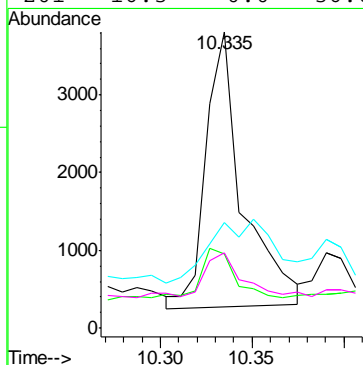
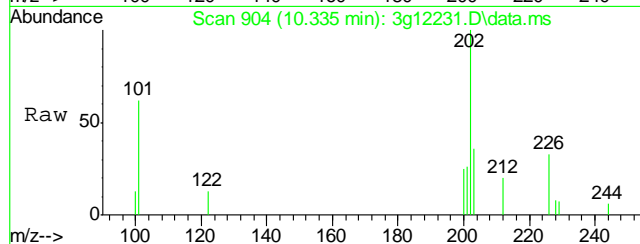
#19  
Chrysene-d12  
Concen: 4.0000 ug/mL  
RT: 11.535 min Scan# 1059  
Delta R.T. 0.005 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

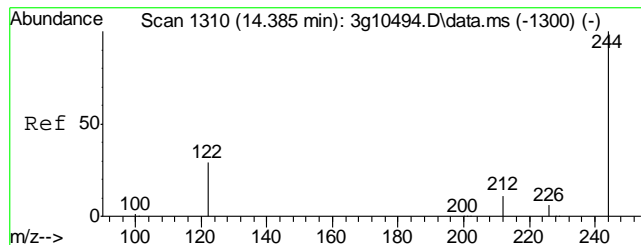
Tgt Ion:	240	Resp:	124910
Ion Ratio	Lower	Upper	
240	100		
120	21.4	0.0	35.5
236	30.3	8.6	48.6



#20  
Pyrene  
Concen: 0.0717 ug/mL  
RT: 10.335 min Scan# 904  
Delta R.T. -0.004 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

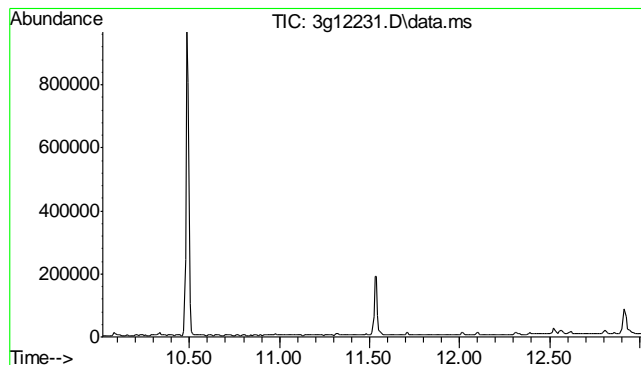
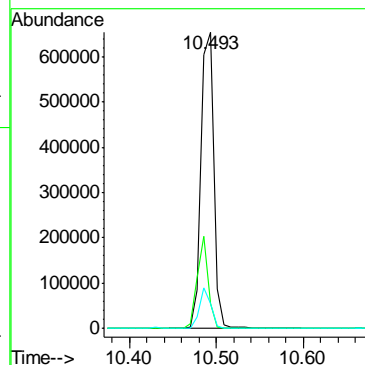
Tgt Ion:	202	Resp:	4918
Ion Ratio	Lower	Upper	
202	100		
200	15.1	0.3	40.3
203	58.0	0.0	37.8#
201	16.3	0.0	36.6





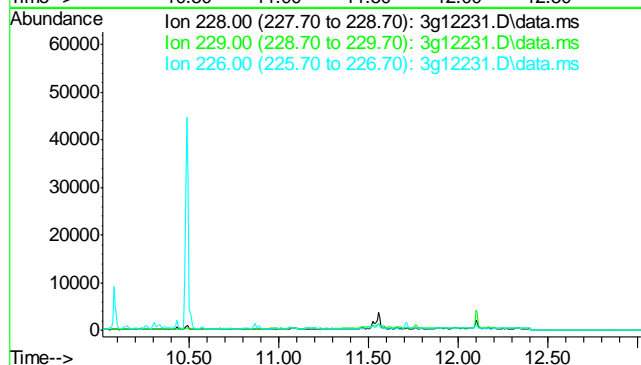
#21  
Terphenyl-d14  
Concen: 42.3295 ug/mL  
RT: 10.493 min Scan# 924  
Delta R.T. 0.005 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

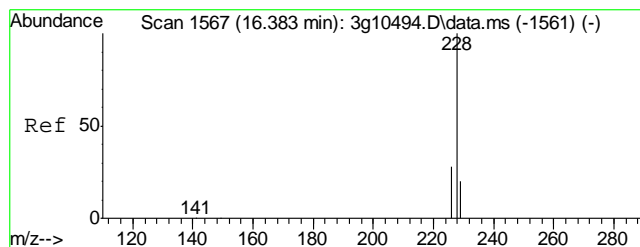
Tgt Ion	Ratio	Lower	Upper
244	100		
122	26.5	4.9	44.9
212	12.2	0.0	32.5



#22  
Benzo(a)anthracene  
Concen: N.D. ug/mL  
Expected RT: 11.52 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

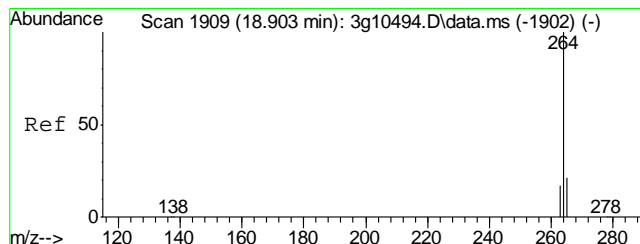
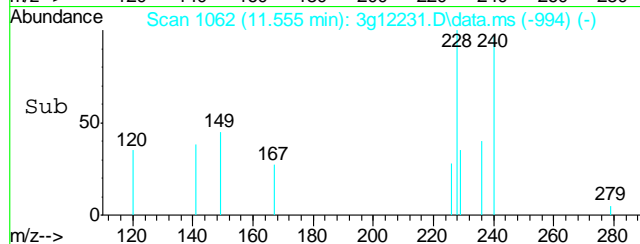
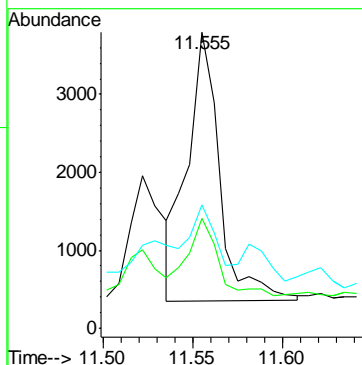
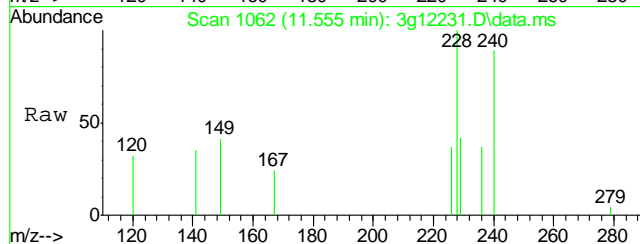
Tgt Ion	Sig	Exp Ratio
228	100	
229	19.5	
226	26.8	





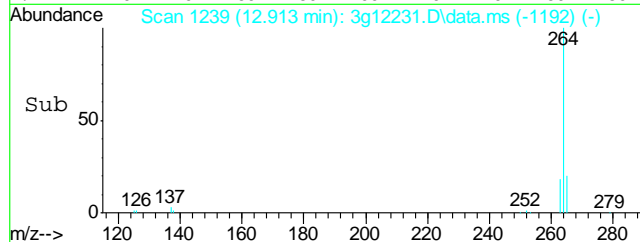
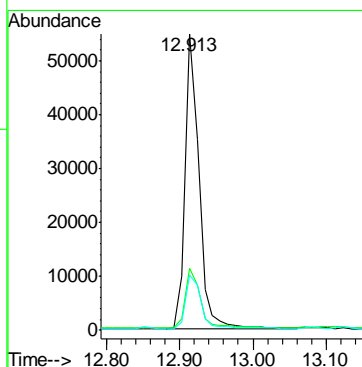
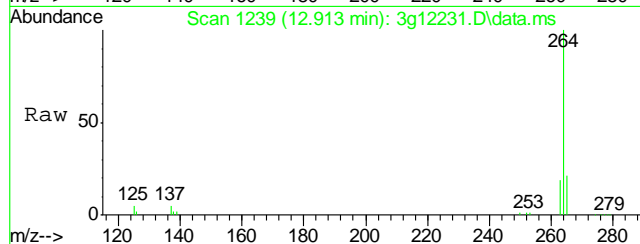
#23  
Chrysene  
Concen: 0.0708 ug/mL  
RT: 11.555 min Scan# 1062  
Delta R.T. 0.005 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

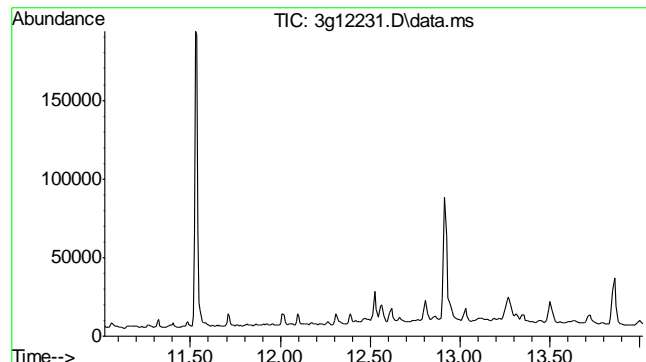
Tgt Ion	Ratio	Lower	Upper
228	100		
226	30.5	8.9	48.9
229	26.8	0.0	39.4



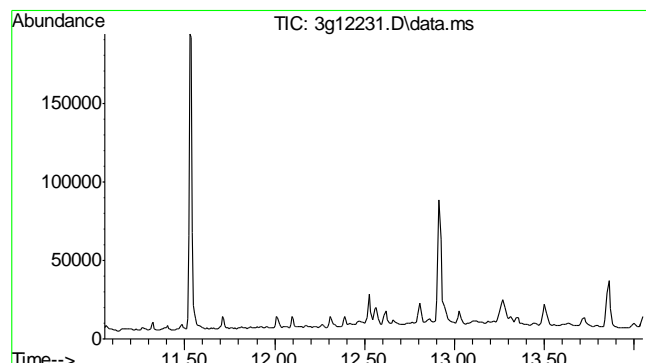
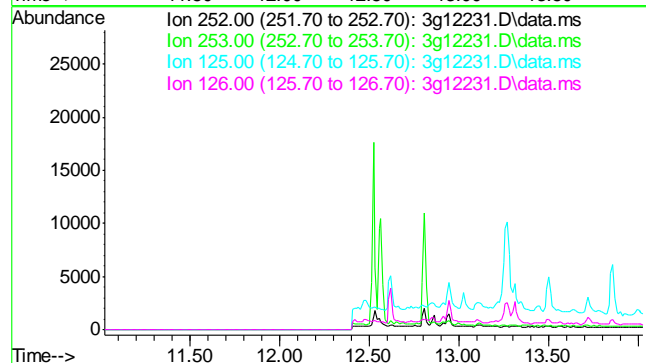
#24  
Perylene-d12  
Concen: 4.0000 ug/mL  
RT: 12.913 min Scan# 1239  
Delta R.T. -0.006 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

Tgt Ion	Ratio	Lower	Upper
264	100		
265	22.0	0.9	40.9
263	20.2	0.0	36.8

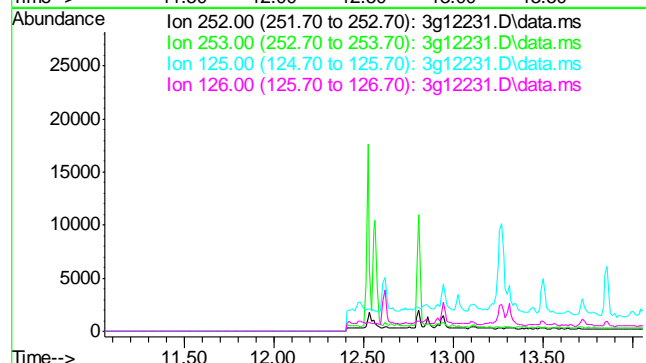


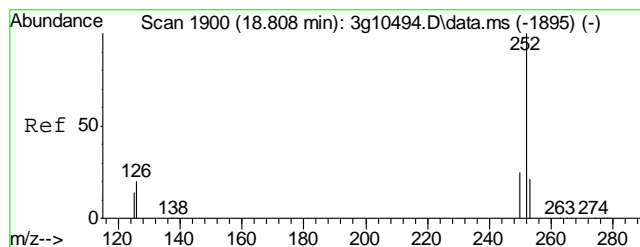


#25  
Benzo(b)fluoranthene  
Concen: N.D. ug/mL  
Expected RT: 12.52 min  
  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm  
  
Tgt Ion: 252  
Sig Exp Ratio  
252 100  
253 46.7  
125 13.5  
126 18.7



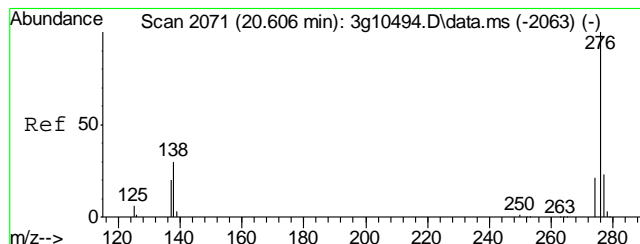
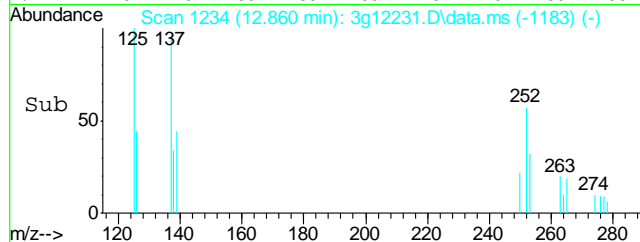
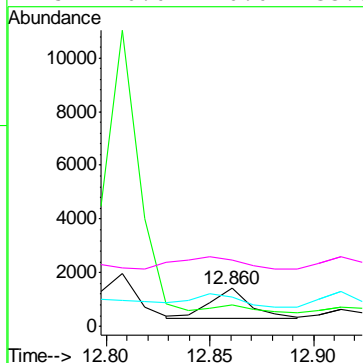
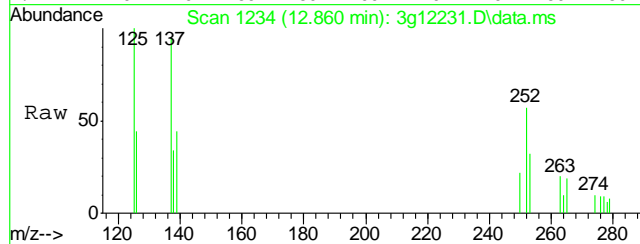
#26  
Benzo(k)fluoranthene  
Concen: N.D. ug/mL  
Expected RT: 12.55 min  
  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm  
  
Tgt Ion: 252  
Sig Exp Ratio  
252 100  
253 40.8  
125 11.8  
126 16.4





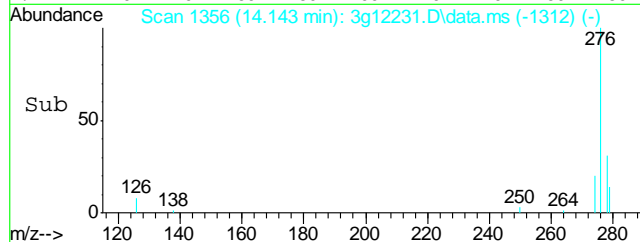
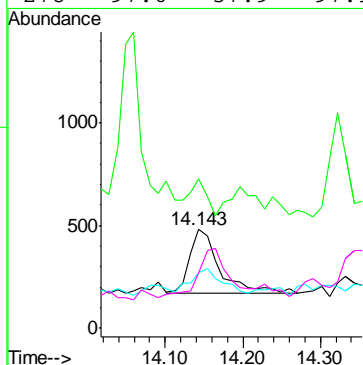
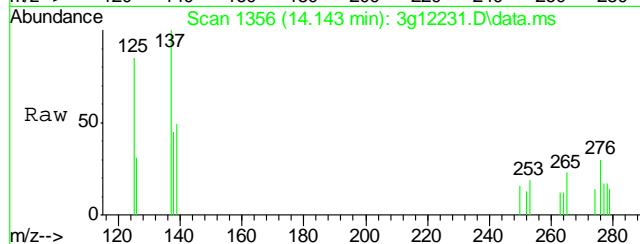
#27  
Benzo(a)pyrene  
Concen: Below ug/mL  
RT: 12.860 min Scan# 1234  
Delta R.T. 0.004 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

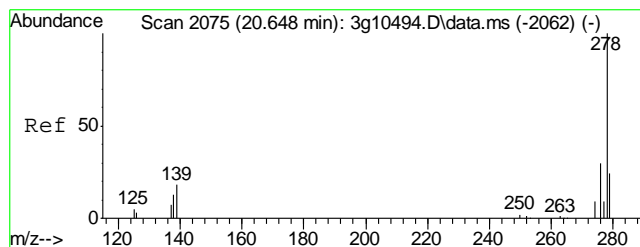
Tgt Ion	Ratio	Lower	Upper
252	100		
253	0.0	1.8	41.8#
126	48.7	0.0	38.6#
125	0.0	0.0	33.5



#28  
Indeno(1,2,3-cd)pyrene  
Concen: Below ug/mL  
RT: 14.143 min Scan# 1356  
Delta R.T. -0.037 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

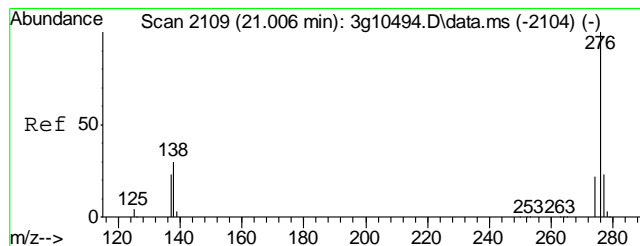
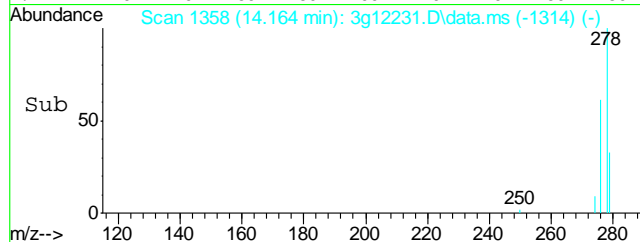
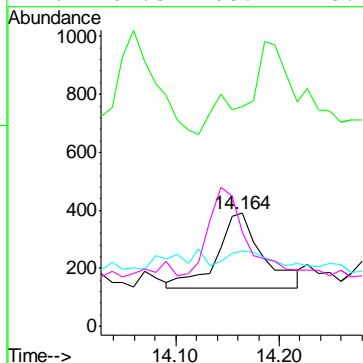
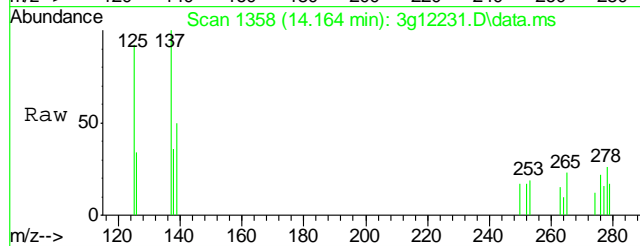
Tgt Ion	Ratio	Lower	Upper
276	100		
138	29.4	16.6	56.6
277	38.2	4.7	44.7
278	97.6	57.9	97.9





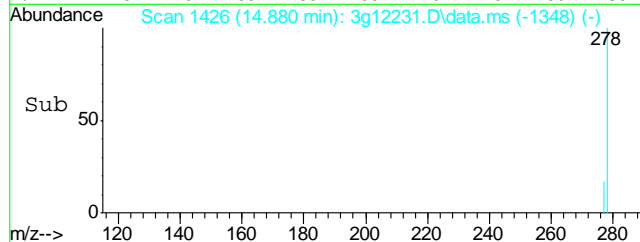
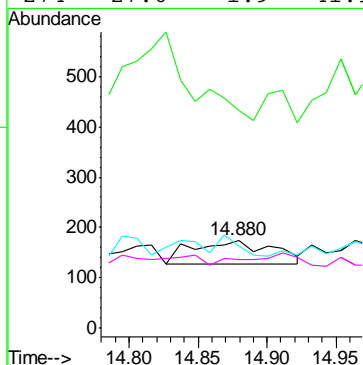
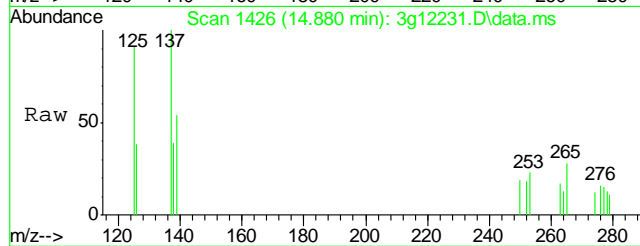
#29  
Dibenz(a,h)anthracene  
Concen: Below ug/mL  
RT: 14.164 min Scan# 1358  
Delta R.T. -0.037 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

Tgt Ion: 278 Resp: 803  
Ion Ratio Lower Upper  
278 100  
139 23.3 7.8 47.8  
279 48.3 2.3 42.3#  
276 102.5 108.4 148.4#



#30  
Benzo(g,h,i)perylene  
Concen: Below ug/mL  
RT: 14.880 min Scan# 1426  
Delta R.T. 0.324 min  
Lab File: 3g12231.D  
Acq: 26 Nov 12 6:54 pm

Tgt Ion: 276 Resp: 181  
Ion Ratio Lower Upper  
276 100  
138 42.0 11.5 51.5  
277 23.2 2.9 42.9  
274 27.6 1.9 41.9



## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\112612\  
 Data File : 3g12229.D  
 Acq On : 26 Nov 2012 6:07 pm  
 Operator : SARAHM1  
 Sample : OP6988-MB  
 Misc : OP6988,E3G577,30.00,,,1,1  
 ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 27 09:22:34 2012  
 Quant Method : C:\msdchem\1\METHODS\SIMPE3G574.M  
 Quant Title : PAHSIM BASE  
 QLast Update : Mon Nov 26 15:39:31 2012  
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Naphthalene-d8	5.707	136	129576	4.0000	ug/mL	0.00
6) Acenaphthene-d10	7.412	164	82091	4.0000	ug/mL	0.00
15) Phenanthrene-d10	8.894	188	139846	4.0000	ug/mL	-0.06
19) Chrysene-d12	11.535	240	111025	4.0000	ug/mL	0.00
24) Perylene-d12	12.913	264	69568	4.0000	ug/mL	0.00

## System Monitoring Compounds

2) Nitrobenzene-d5	5.021	82	606301	48.6684	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	97.34%		
7) 2-Fluorobiphenyl	6.751	172	1487976	49.7336	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	99.46%		
21) Terphenyl-d14	10.493	244	659134	45.5508	ug/mL	0.00
Spiked Amount 50.000	Range 25 - 135		Recovery =	91.10%		

## Target Compounds

					Qvalue
3) N-Nitrosodimethylamine	2.458	74	56	N.D.	
4) N-Nitrosodi-propylamine	0.000	70	0	N.D.	d
5) Naphthalene	5.719	128	385	N.D.	
8) 2-Methylnaphthalene	6.392	142	217	N.D.	
9) 1-Methylnaphthalene	6.492	142	148	N.D.	
10) Acenaphthylene	7.270	152	73	N.D.	
11) Acenaphthene	7.412	154	462	Below Cal	# 70
12) Dibenzofuran	7.790	168	83	N.D.	
13) Fluorene	0.000	166	0	N.D.	d
14) Diphenylamine	0.000	169	0	N.D.	d
16) Phenanthrene	8.918	178	1004	Below Cal	# 1
17) Anthracene	8.973	178	261	N.D.	
18) Fluoranthene	10.105	202	559	N.D.	
20) Pyrene	10.335	202	450	N.D.	
22) Benzo(a)anthracene	11.522	228	857	N.D.	
23) Chrysene	11.555	228	464	N.D.	
25) Benzo(b)fluoranthene	0.000	252	0	N.D.	d
26) Benzo(k)fluoranthene	12.534	252	410	N.D.	
27) Benzo(a)pyrene	12.860	252	352	N.D.	
28) Indeno(1,2,3-cd)pyrene	14.133	276	302	N.D.	
29) Dibenz(a,h)anthracene	14.154	278	241	N.D.	
30) Benzo(g,h,i)perylene	14.490	276	348	N.D.	

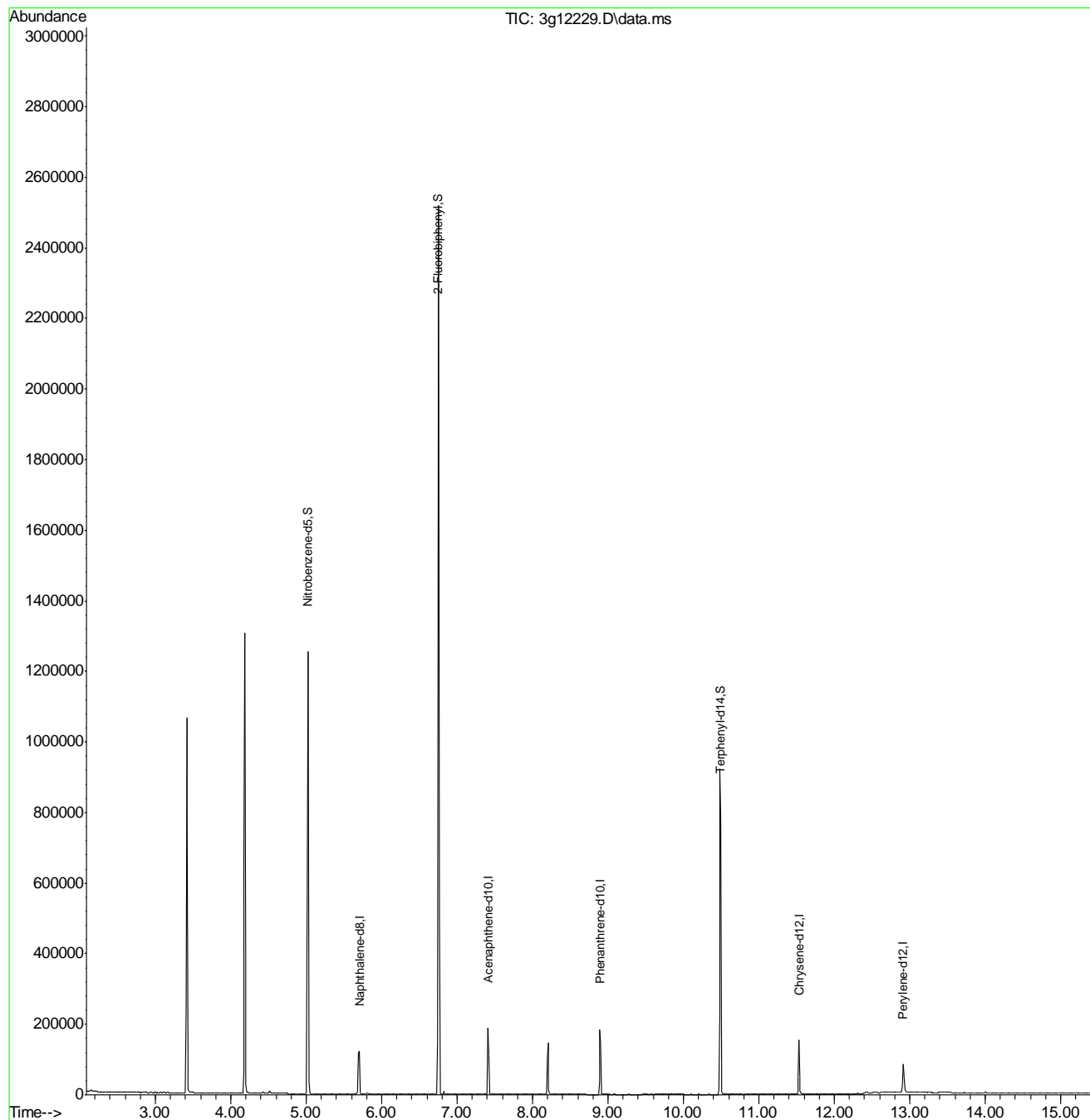
(#) = qualifier out of range (m) = manual integration (+) = signals summed

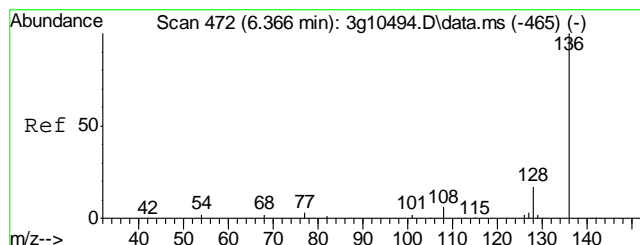


## Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\DATA\112612\  
Data File : 3g12229.D  
Acq On : 26 Nov 2012 6:07 pm  
Operator : SARAHM1  
Sample : OP6988-MB  
Misc : OP6988,E3G577,30.00,,,1,1  
ALS Vial : 7 Sample Multiplier: 1

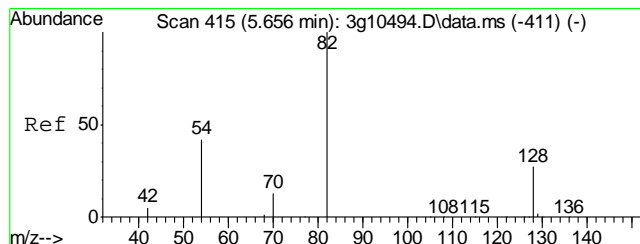
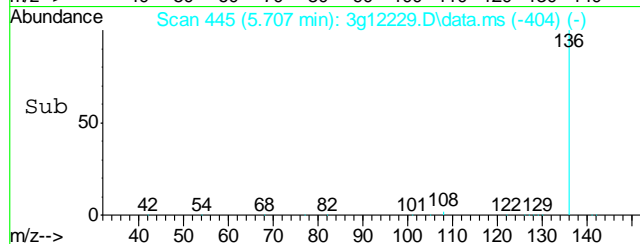
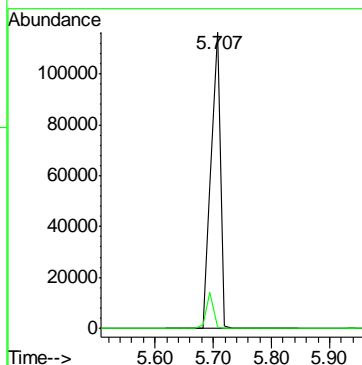
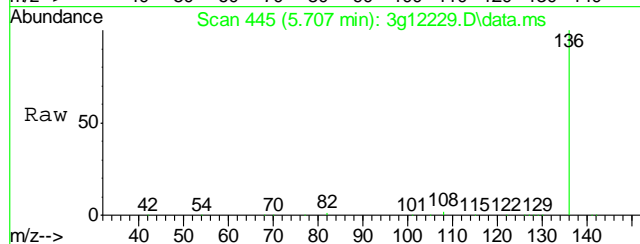
Quant Time: Nov 27 09:22:34 2012  
Quant Method : C:\msdchem\1\METHODS\SIMPE3G574.M  
Quant Title : PAHSIM BASE  
QLast Update : Mon Nov 26 15:39:31 2012  
Response via : Initial Calibration





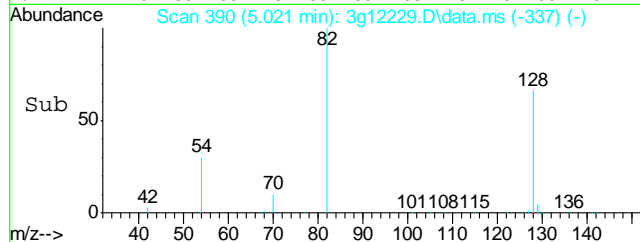
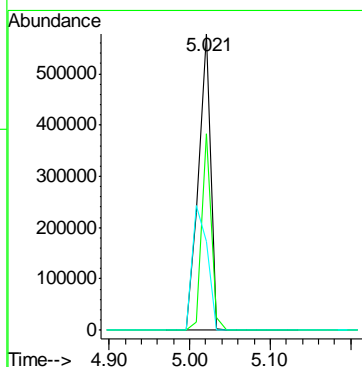
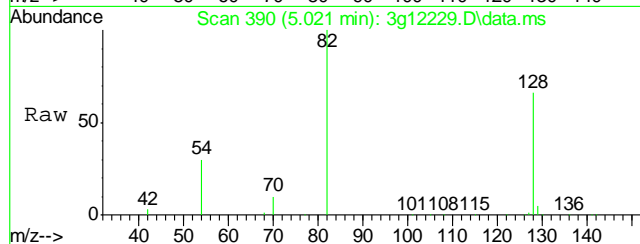
#1  
Naphthalene-d8  
Concen: 4.0000 ug/mL  
RT: 5.707 min Scan# 445  
Delta R.T. 0.005 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

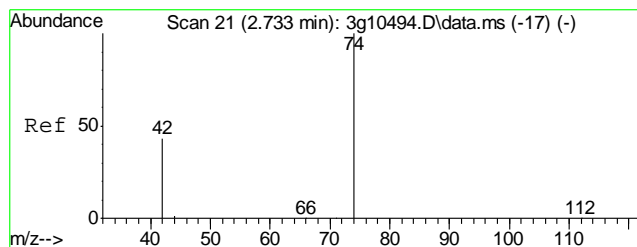
Tgt Ion:	136	Resp:	129576
Ion Ratio	Lower	Upper	
136	100		
68	9.2	0.0	21.7



#2  
Nitrobenzene-d5  
Concen: 48.6684 ug/mL  
RT: 5.021 min Scan# 390  
Delta R.T. -0.005 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

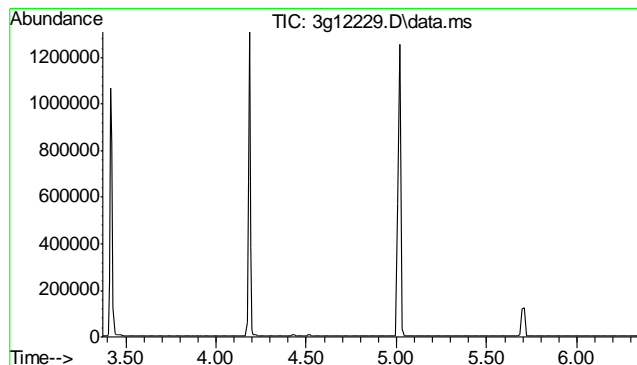
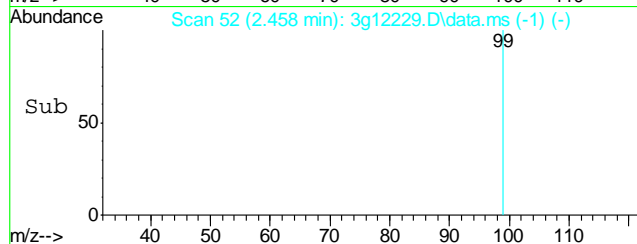
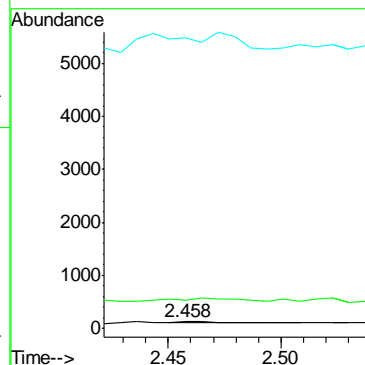
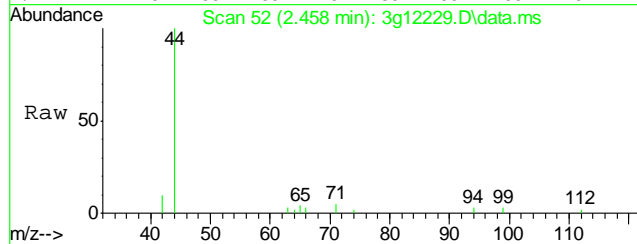
Tgt Ion:	82	Resp:	606301
Ion Ratio	Lower	Upper	
82	100		
128	52.1	30.7	70.7
54	51.6	36.8	76.8





#3  
N-Nitrosodimethylamine  
Concen: Below ug/mL  
RT: 2.458 min Scan# 52  
Delta R.T. 0.008 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

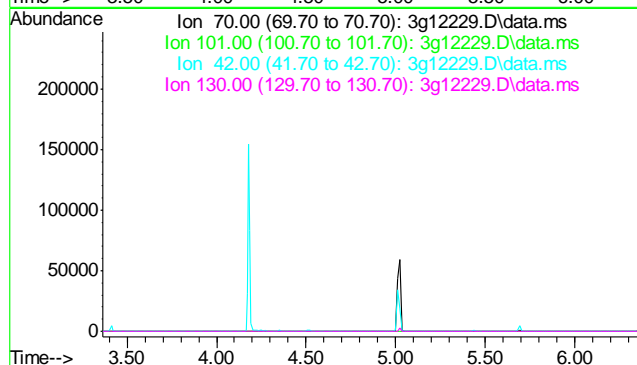
Tgt Ion: 74 Resp: 56  
Ion Ratio Lower Upper  
74 100  
42 291.1 53.9 93.9#  
44 0.0 0.0 24.2

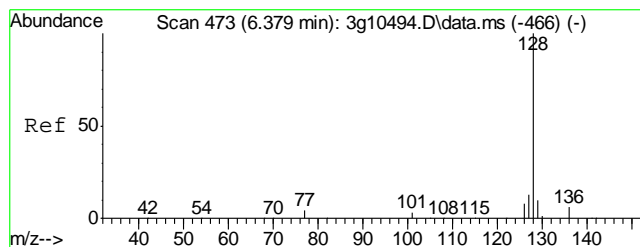


#4  
N-Nitrosodi-propylamine  
Concen: N.D. ug/mL  
Expected RT: 4.87 min

Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

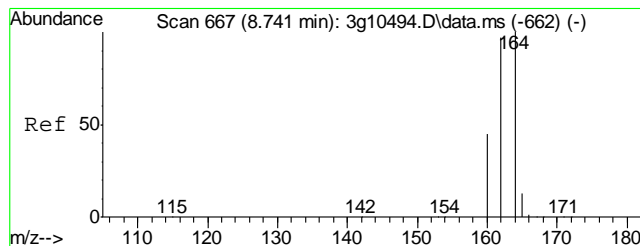
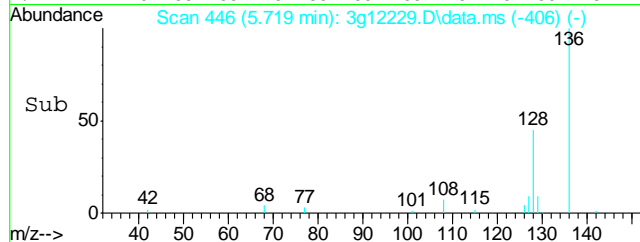
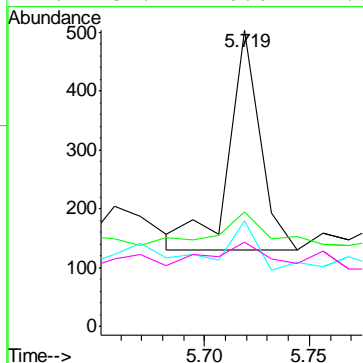
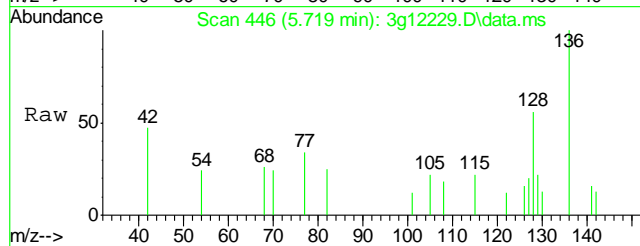
Tgt Ion: 70  
Sig Exp Ratio  
70 100  
101 13.9  
42 52.4  
130 27.1





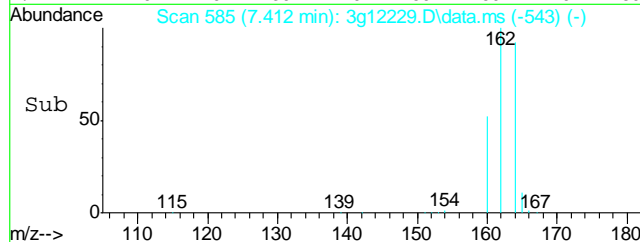
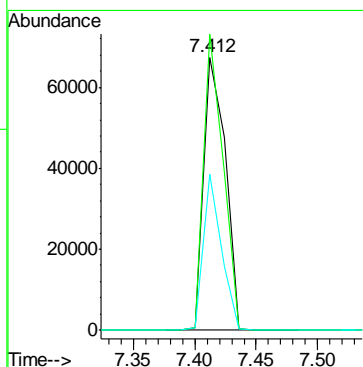
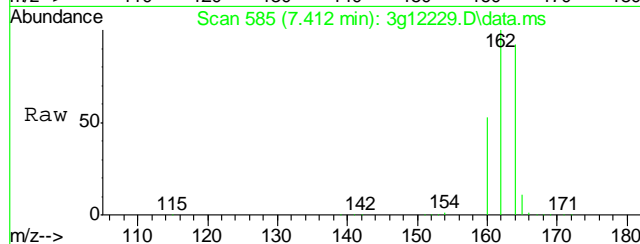
#5  
Naphthalene  
Concen: Below ug/mL  
RT: 5.719 min Scan# 446  
Delta R.T. -0.007 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

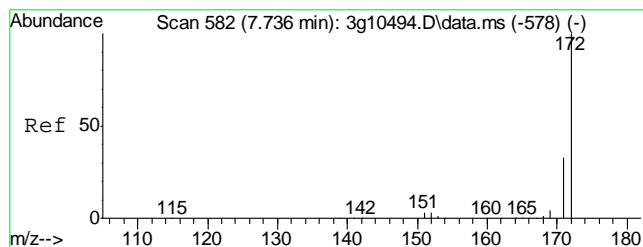
Tgt Ion	128	Resp	385
Ion Ratio	100		
Lower	0.0		
Upper	31.0		
129	24.9		
127	15.1		
126	31.2		



#6  
Acenaphthene-d10  
Concen: 4.0000 ug/mL  
RT: 7.412 min Scan# 585  
Delta R.T. -0.001 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

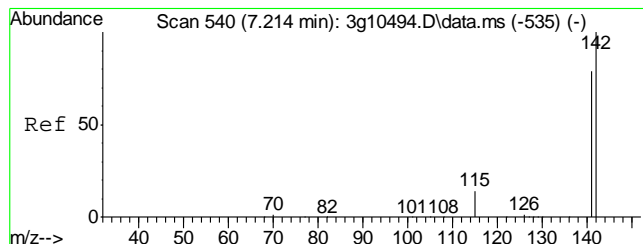
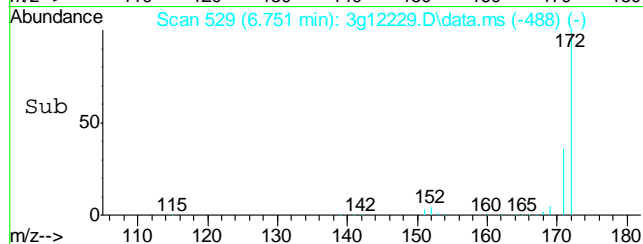
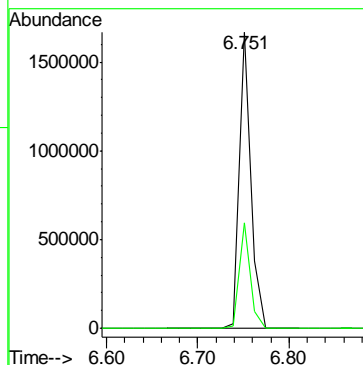
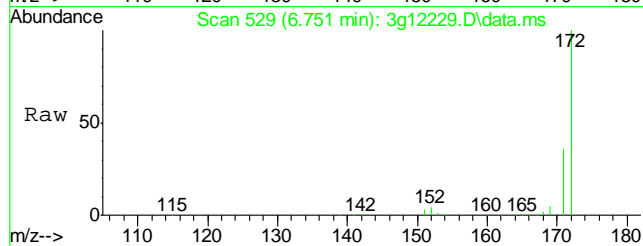
Tgt Ion	164	Resp	82091
Ion Ratio <td>100</td> <td></td> <td></td>	100		
Lower <td>84.8</td> <td></td> <td></td>	84.8		
Upper <td>124.8</td> <td></td> <td></td>	124.8		
162	97.7		
160	47.3		





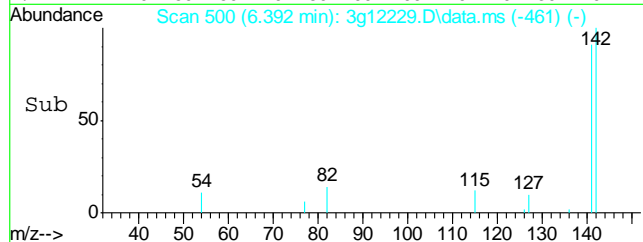
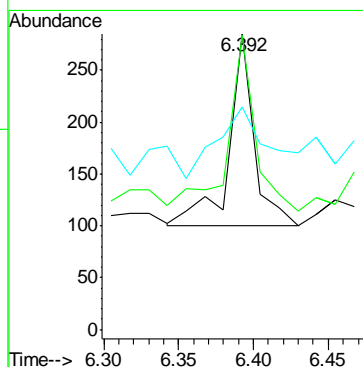
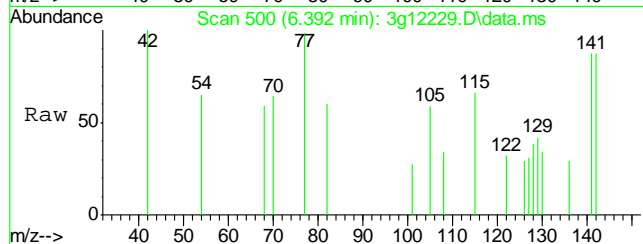
#7  
2-Fluorobiphenyl  
Concen: 49.7336 ug/mL  
RT: 6.751 min Scan# 529  
Delta R.T. 0.004 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

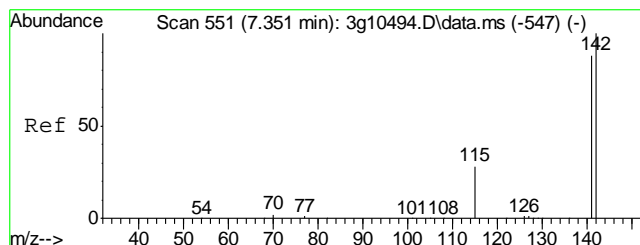
Tgt Ion:172 Resp: 1487976  
Ion Ratio Lower Upper  
172 100  
171 34.1 12.6 52.6



#8  
2-Methylnaphthalene  
Concen: Below ug/mL  
RT: 6.392 min Scan# 500  
Delta R.T. -0.013 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

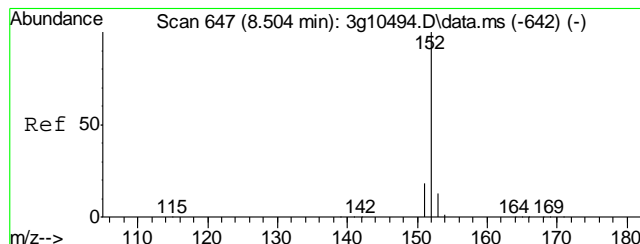
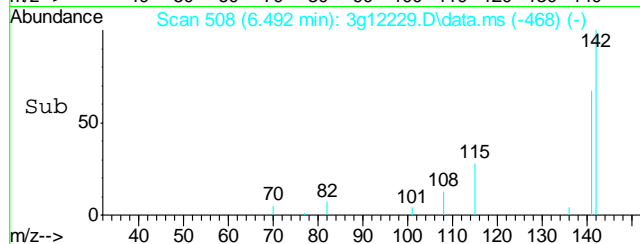
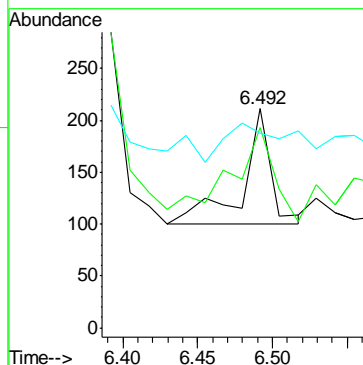
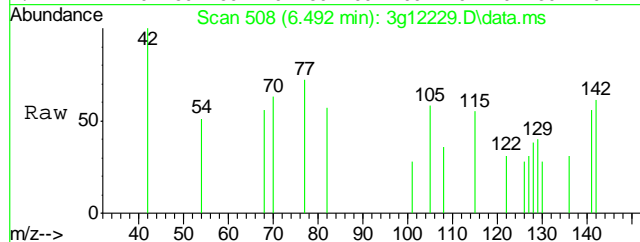
Tgt Ion:142 Resp: 217  
Ion Ratio Lower Upper  
142 100  
141 100.5 64.0 104.0  
115 0.0 7.1 47.1#





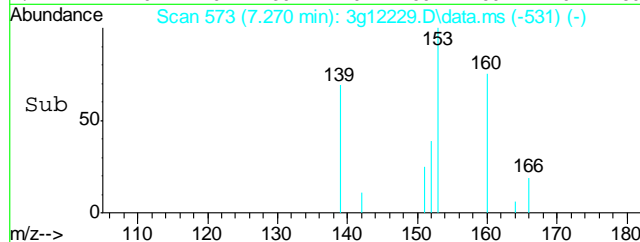
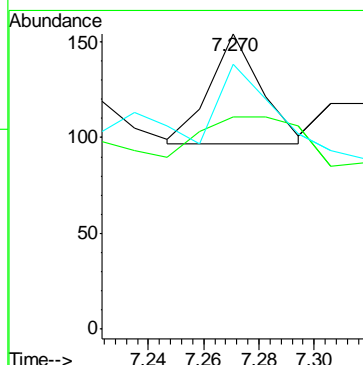
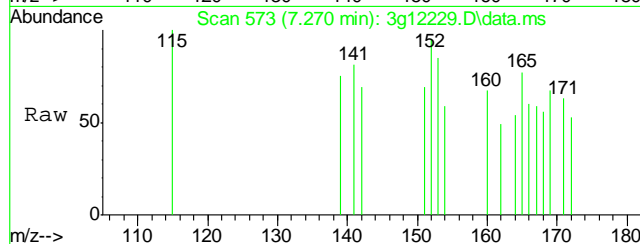
#9  
1-Methylnaphthalene  
Concen: Below ug/mL  
RT: 6.492 min Scan# 508  
Delta R.T. 0.001 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

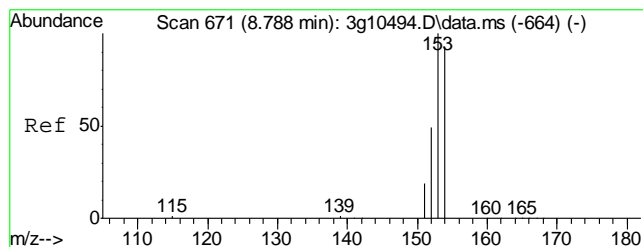
Tgt Ion: 142 Resp: 148  
Ion Ratio Lower Upper  
142 100  
141 130.4 65.4 105.4#  
115 0.0 9.7 49.7#



#10  
Acenaphthylene  
Concen: Below ug/mL  
RT: 7.270 min Scan# 573  
Delta R.T. -0.003 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

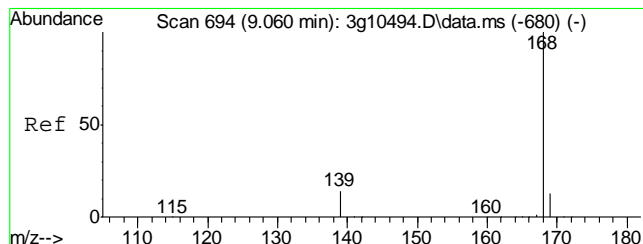
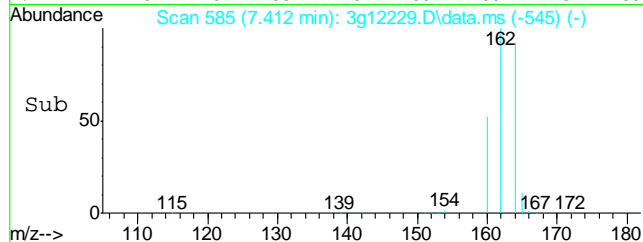
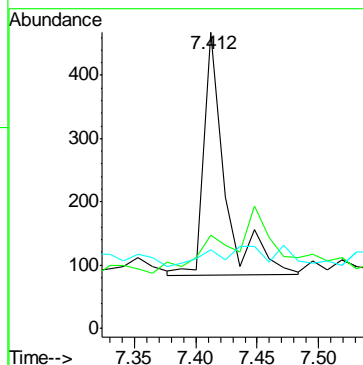
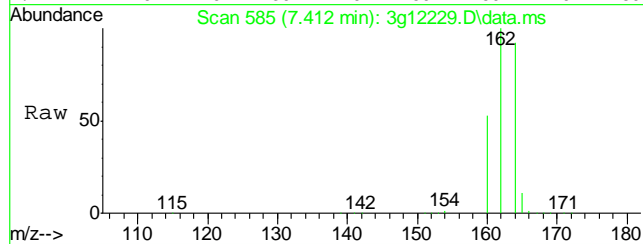
Tgt Ion: 152 Resp: 73  
Ion Ratio Lower Upper  
152 100  
151 89.0 0.0 39.3#  
153 94.5 0.0 32.8#





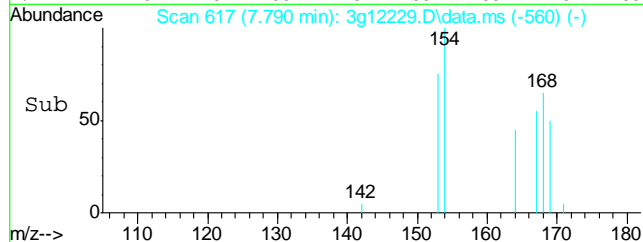
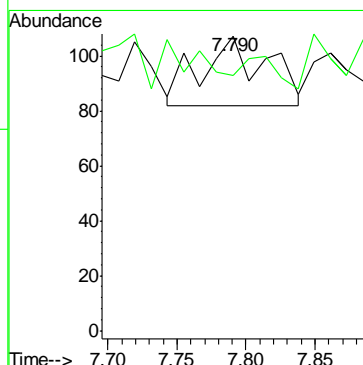
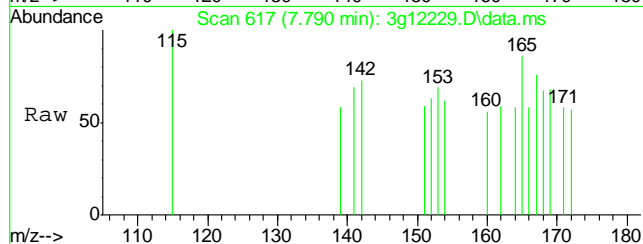
#11  
Acenaphthene  
Concen: Below ug/mL  
RT: 7.412 min Scan# 585  
Delta R.T. -0.024 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

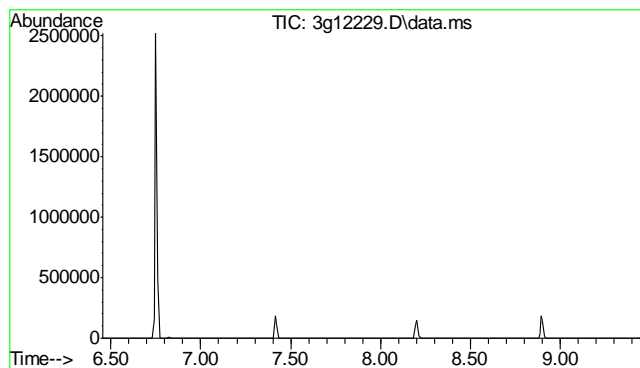
Tgt Ion:	154	Resp:	462
Ion Ratio	Lower	Upper	
154	100		
153	75.1	84.1	124.1#
152	27.3	30.2	70.2#



#12  
Dibenzofuran  
Concen: Below ug/mL  
RT: 7.790 min Scan# 617  
Delta R.T. 0.179 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

Tgt Ion:	168	Resp:	83
Ion Ratio	Lower	Upper	
168	100		
139	22.9	10.9	50.9

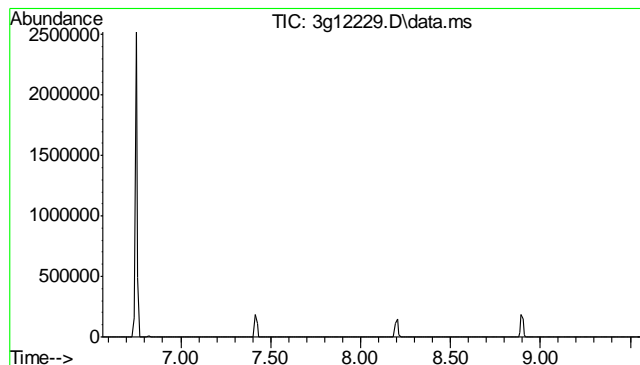
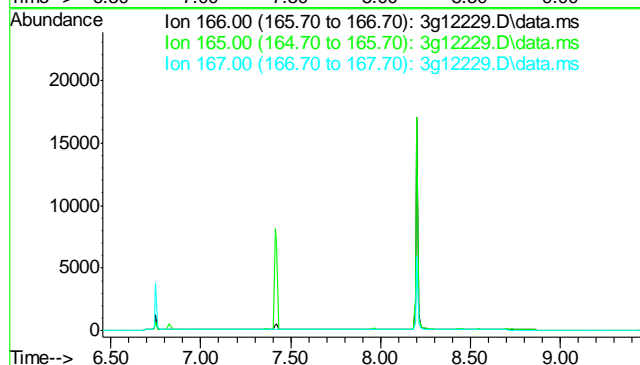




#13  
Fluorene  
Concen: N.D. ug/mL  
Expected RT: 7.95 min

Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

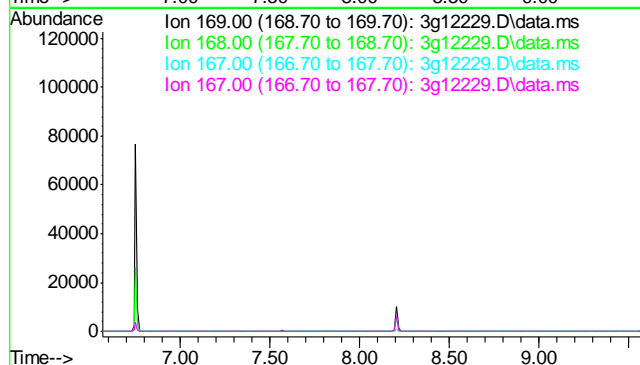
Tgt Ion:	166
Sig	Exp Ratio
166	100
165	89.6
167	13.5



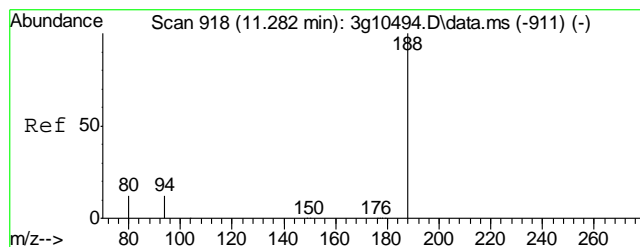
#14  
Diphenylamine  
Concen: N.D. ug/mL  
Expected RT: 8.07 min

Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

Tgt Ion:	169
Sig	Exp Ratio
169	100
168	60.9
167	33.6
167	33.6

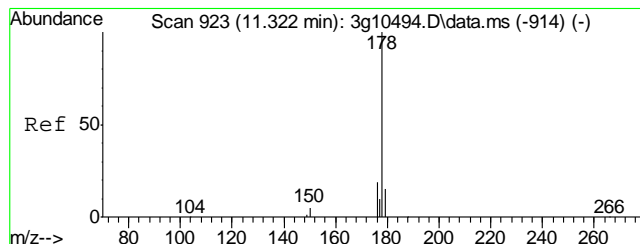
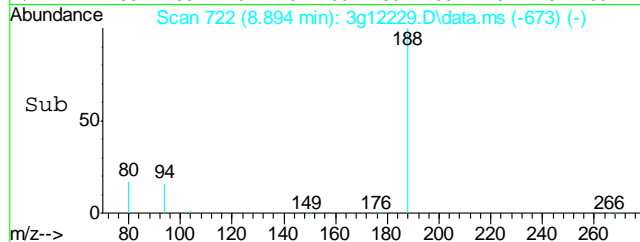
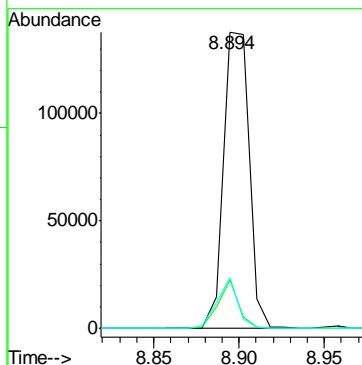
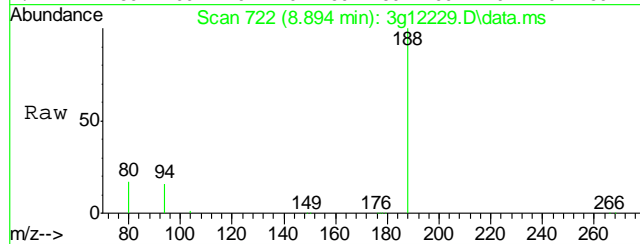






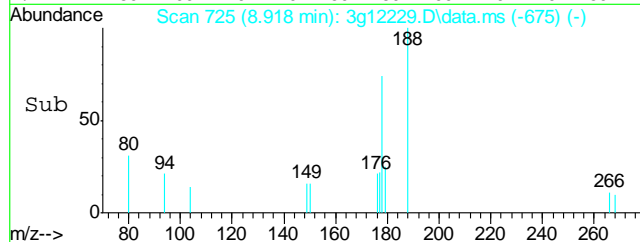
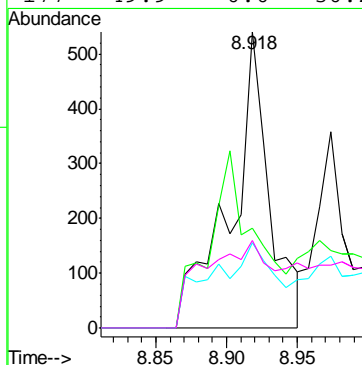
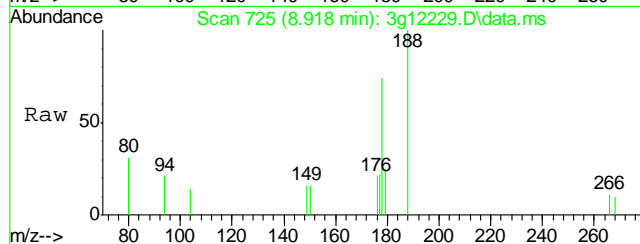
#15  
Phenanthrene-d10  
Concen: 4.0000 ug/mL  
RT: 8.894 min Scan# 722  
Delta R.T. -0.062 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

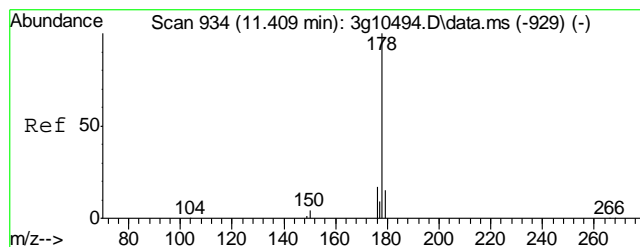
Tgt Ion:188	Resp: 139846
Ion Ratio	Lower Upper
188 100	
94 12.7	0.0 32.1
80 13.9	0.0 32.0



#16  
Phenanthrene  
Concen: Below ug/mL  
RT: 8.918 min Scan# 725  
Delta R.T. -0.061 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

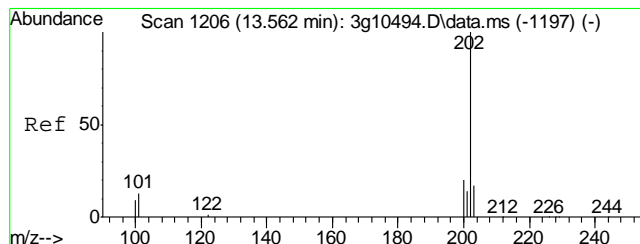
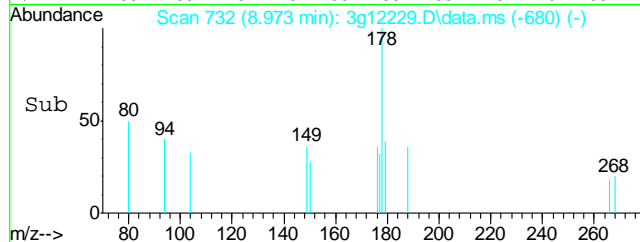
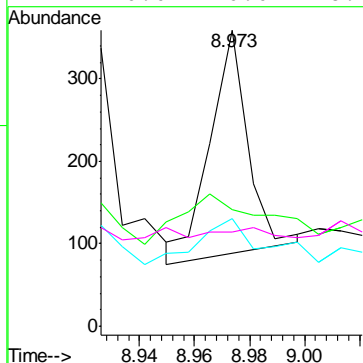
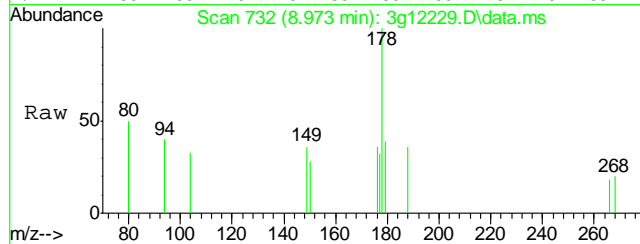
Tgt Ion:178	Resp: 1004
Ion Ratio	Lower Upper
178 100	
179 73.7	0.0 35.2#
176 47.6	0.0 38.7#
177 49.9	0.0 30.2#





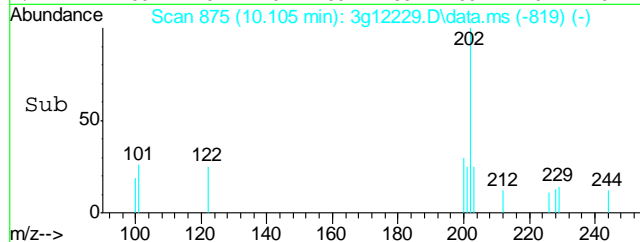
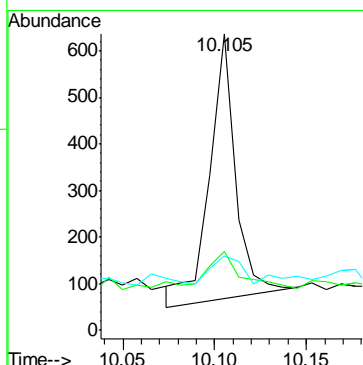
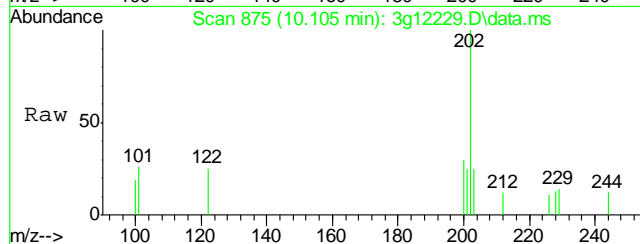
#17  
Anthracene  
Concen: Below ug/mL  
RT: 8.973 min Scan# 732  
Delta R.T. -0.061 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

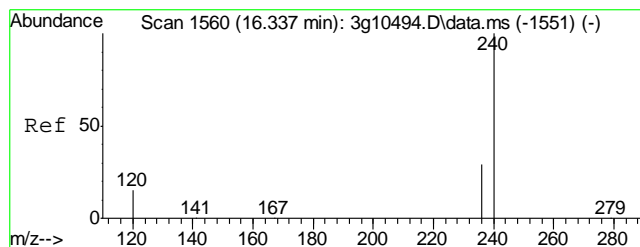
Tgt Ion	Ratio	Lower	Upper
178	100		
179	77.0	0.0	35.3#
176	47.9	0.0	38.0#
177	0.0	0.0	28.7



#18  
Fluoranthene  
Concen: Below ug/mL  
RT: 10.105 min Scan# 875  
Delta R.T. -0.057 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

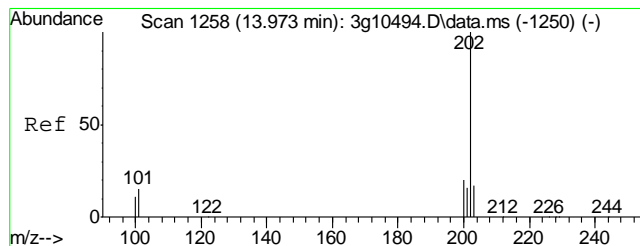
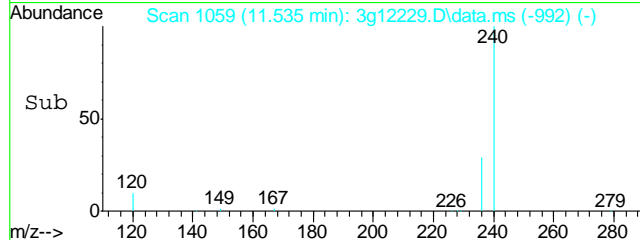
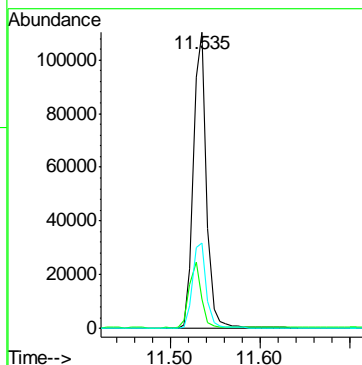
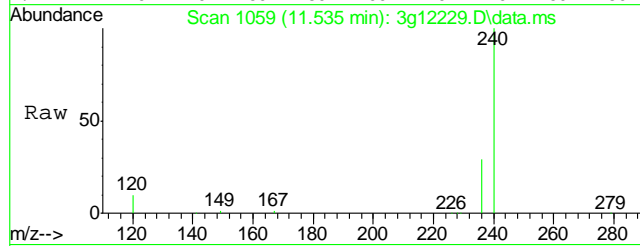
Tgt Ion	Ratio	Lower	Upper
202	100		
101	16.8	0.0	31.8
203	21.5	0.0	37.3





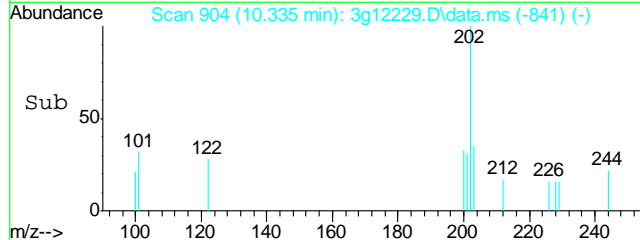
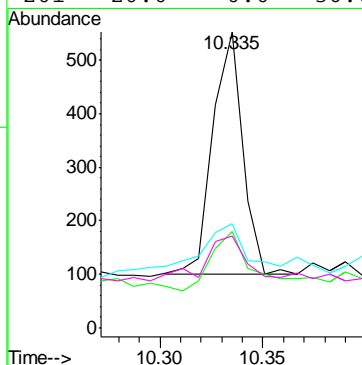
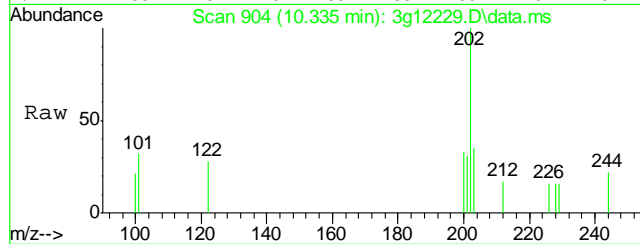
#19  
Chrysene-d12  
Concen: 4.0000 ug/mL  
RT: 11.535 min Scan# 1059  
Delta R.T. 0.005 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

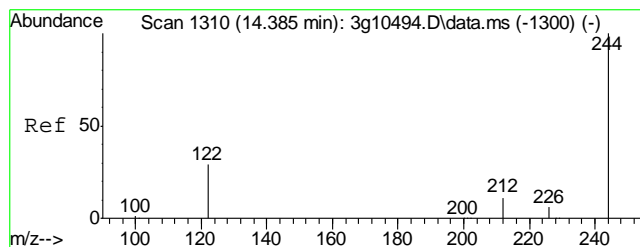
Tgt Ion:	240	Resp:	111025
Ion Ratio	Lower	Upper	
240	100		
120	20.7	0.0	35.5
236	30.5	8.6	48.6



#20  
Pyrene  
Concen: Below ug/mL  
RT: 10.335 min Scan# 904  
Delta R.T. -0.004 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

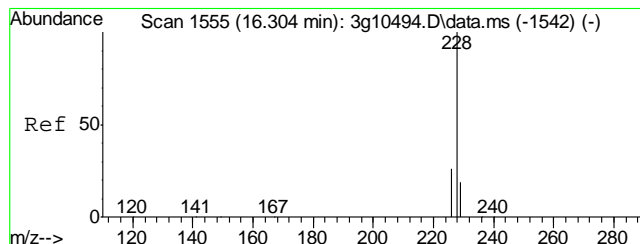
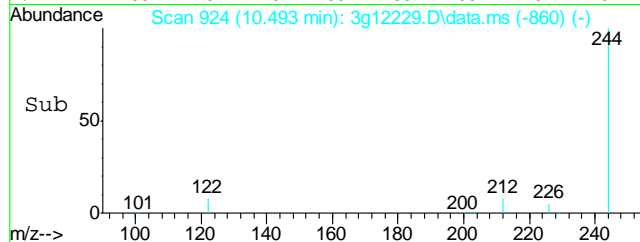
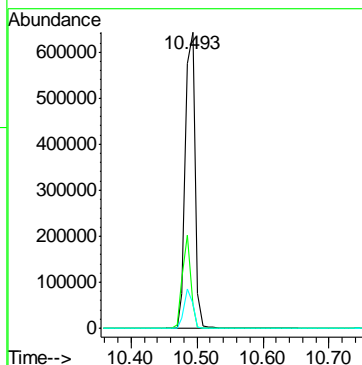
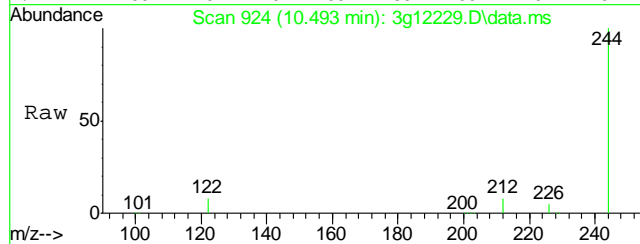
Tgt Ion:	202	Resp:	450
Ion Ratio	Lower	Upper	
202	100		
200	35.3	0.3	40.3
203	19.3	0.0	37.8
201	20.0	0.0	36.6





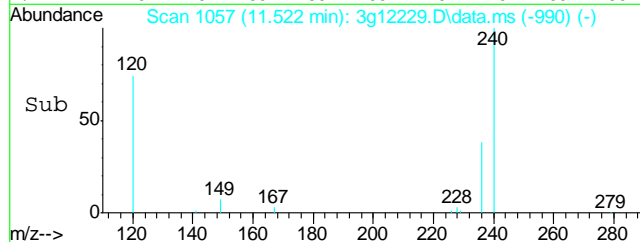
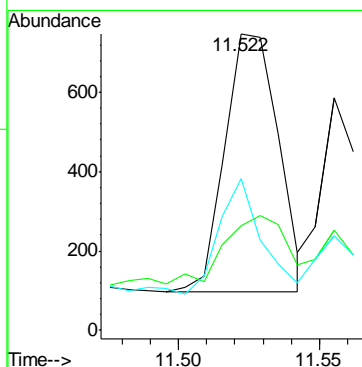
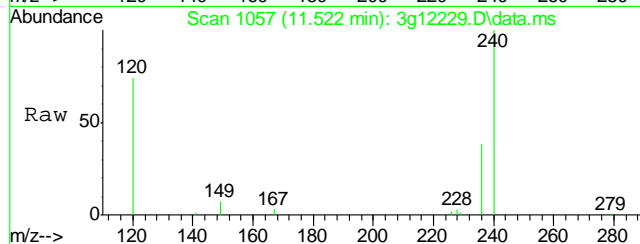
#21  
Terphenyl-d14  
Concen: 45.5508 ug/mL  
RT: 10.493 min Scan# 924  
Delta R.T. 0.005 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

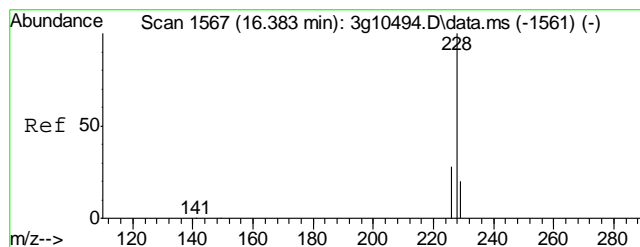
Tgt Ion:	244	Resp:	659134
Ion Ratio	Lower	Upper	
244	100		
122	26.9	4.9	44.9
212	12.0	0.0	32.5



#22  
Benzo(a)anthracene  
Concen: Below ug/mL  
RT: 11.522 min Scan# 1057  
Delta R.T. 0.005 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

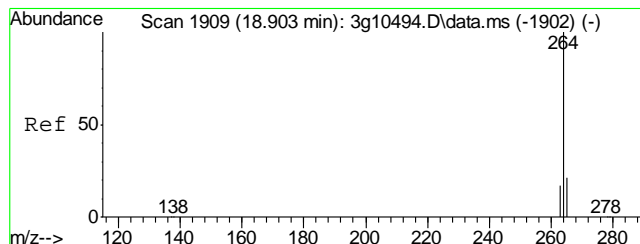
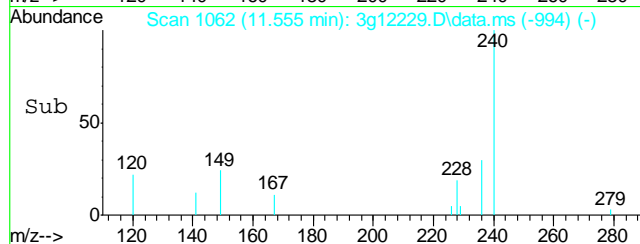
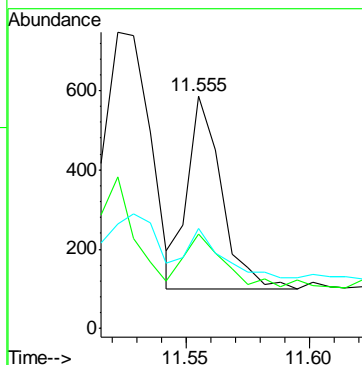
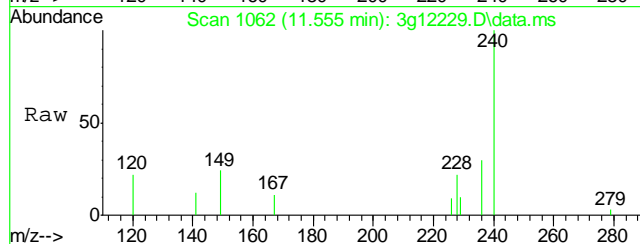
Tgt Ion:	228	Resp:	857
Ion Ratio	Lower	Upper	
228	100		
229	30.0	0.0	39.5
226	35.5	6.8	46.8





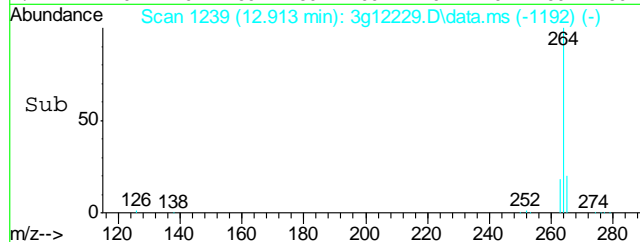
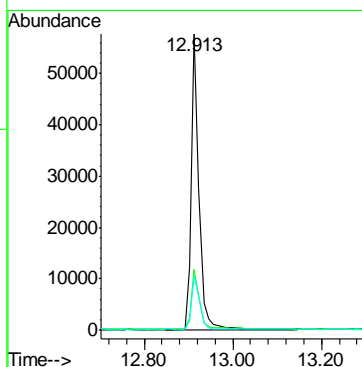
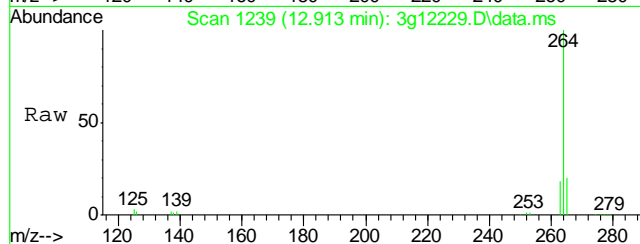
#23  
Chrysene  
Concen: Below ug/mL  
RT: 11.555 min Scan# 1062  
Delta R.T. 0.005 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

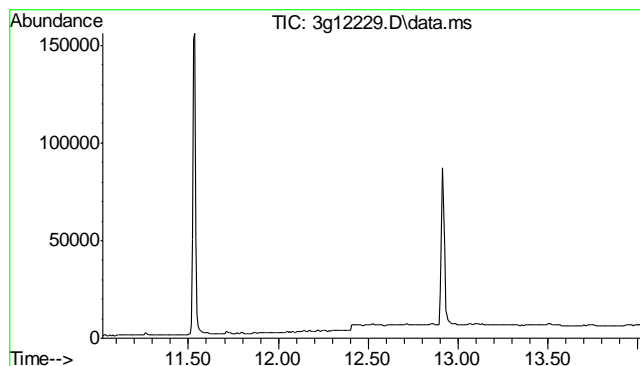
Tgt Ion:	228	Resp:	464
Ion Ratio	Lower	Upper	
228	100		
226	40.3	8.9	48.9
229	24.1	0.0	39.4



#24  
Perylene-d12  
Concen: 4.0000 ug/mL  
RT: 12.913 min Scan# 1239  
Delta R.T. -0.006 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

Tgt Ion:	264	Resp:	69568
Ion Ratio	Lower	Upper	
264	100		
265	20.3	0.9	40.9
263	19.6	0.0	36.8

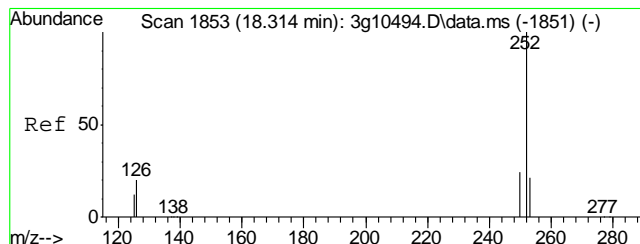
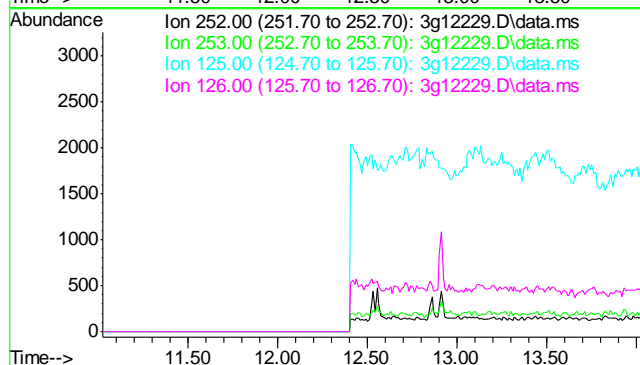




#25  
Benzo(b)fluoranthene  
Concen: N.D. ug/mL  
Expected RT: 12.52 min

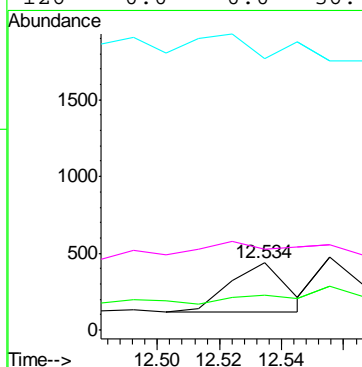
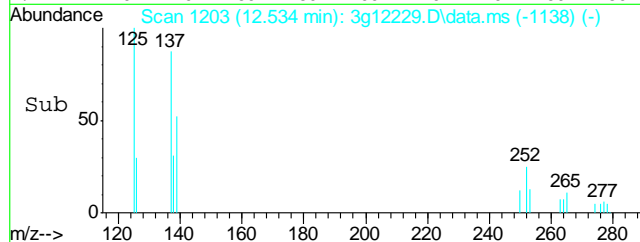
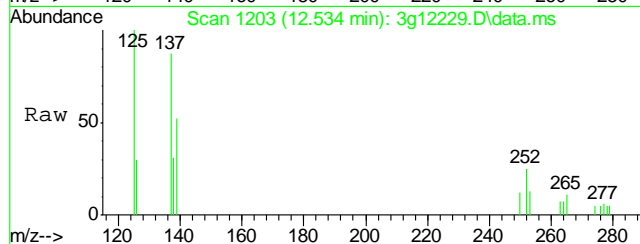
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

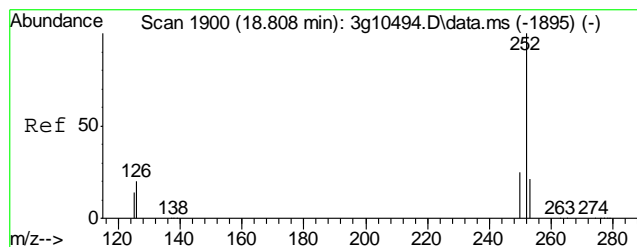
Tgt Ion	Exp Ratio
252	100
253	46.7
125	13.5
126	18.7



#26  
Benzo(k)fluoranthene  
Concen: Below ug/mL  
RT: 12.534 min Scan# 1203  
Delta R.T. -0.020 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

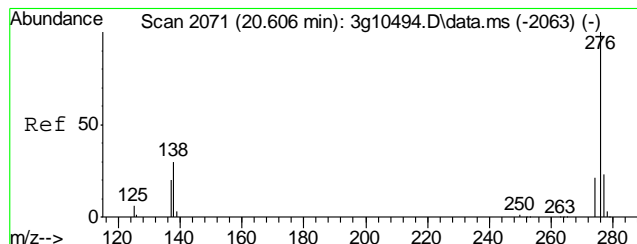
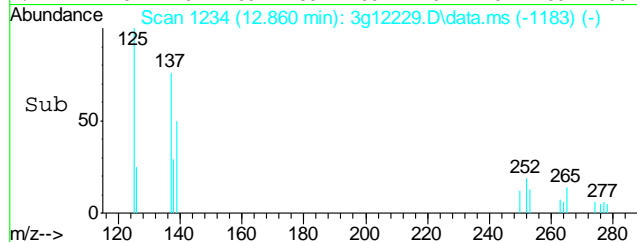
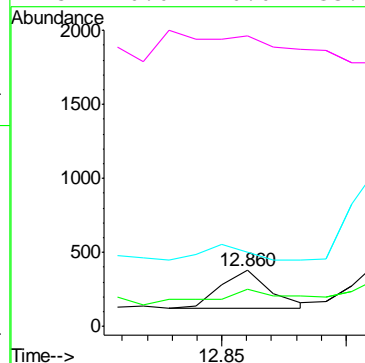
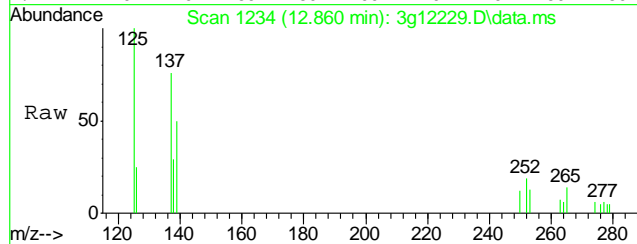
Tgt Ion	Ratio	Lower	Upper
252	100		
253	55.6	20.8	60.8
125	0.0	0.0	31.8
126	0.0	0.0	36.4





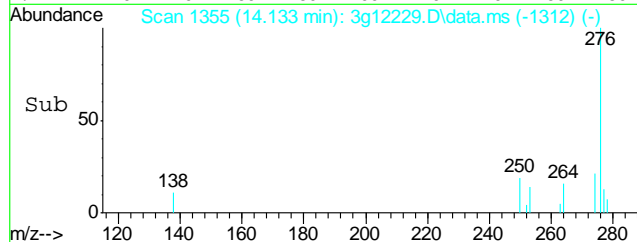
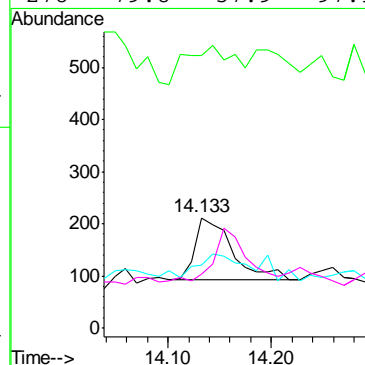
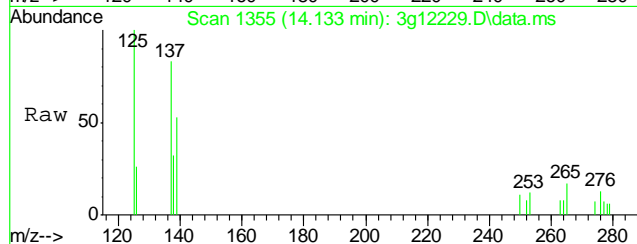
#27  
Benzo(a)pyrene  
Concen: Below ug/mL  
RT: 12.860 min Scan# 1234  
Delta R.T. 0.003 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

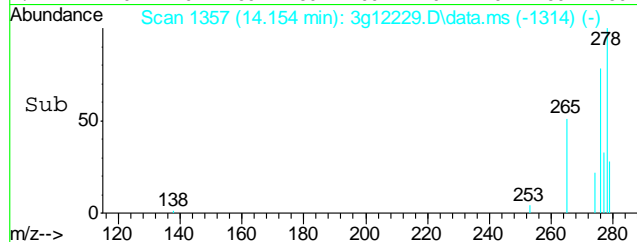
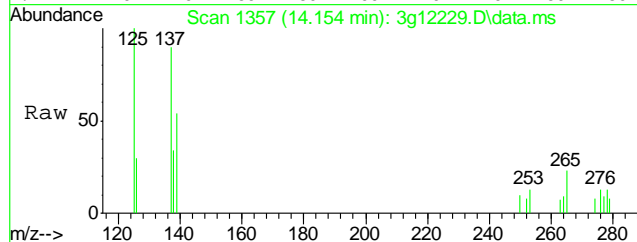
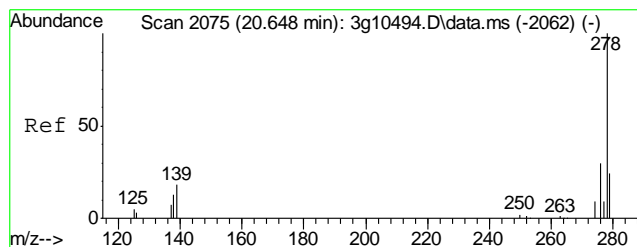
Tgt Ion	Ratio	Lower	Upper
252	100		
253	24.4	1.8	41.8
126	0.0	0.0	38.6
125	0.0	0.0	33.5



#28  
Indeno(1,2,3-cd)pyrene  
Concen: Below ug/mL  
RT: 14.133 min Scan# 1355  
Delta R.T. -0.048 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

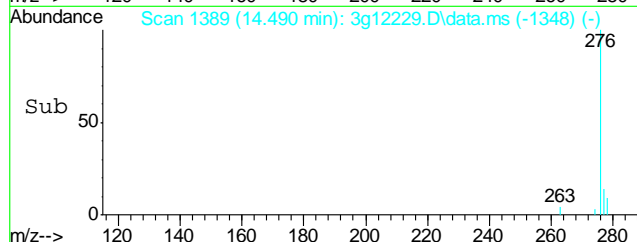
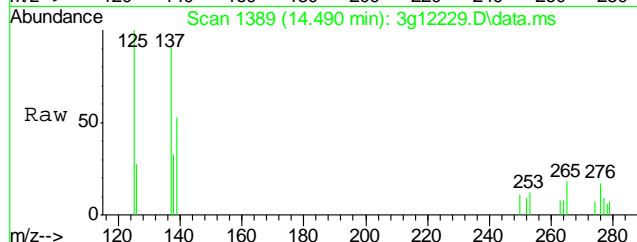
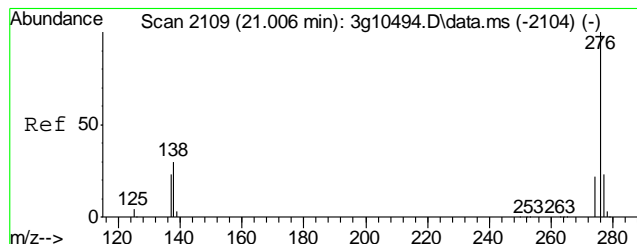
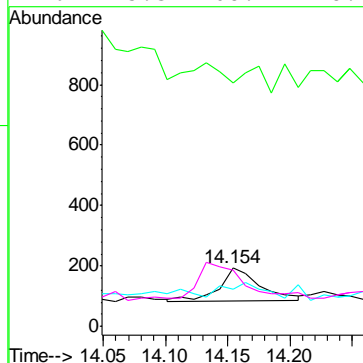
Tgt Ion	Ratio	Lower	Upper
276	100		
138	80.1	16.6	56.6#
277	55.6	4.7	44.7#
278	79.8	57.9	97.9





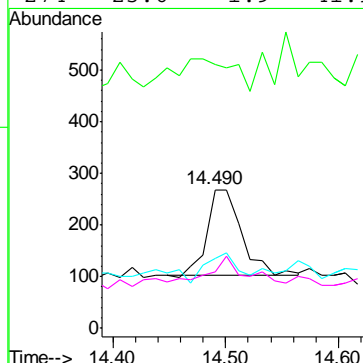
#29  
Dibenz(a,h)anthracene  
Concen: Below ug/mL  
RT: 14.154 min Scan# 1357  
Delta R.T. -0.048 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

Tgt Ion	Ratio	Lower	Upper
278	100		
139	41.1	7.8	47.8
279	43.2	2.3	42.3#
276	125.3	108.4	148.4



#30  
Benzo(g,h,i)perylene  
Concen: Below ug/mL  
RT: 14.490 min Scan# 1389  
Delta R.T. -0.065 min  
Lab File: 3g12229.D  
Acq: 26 Nov 12 6:07 pm

Tgt Ion	Ratio	Lower	Upper
276	100		
138	72.1	11.5	51.5#
277	32.2	2.9	42.9
274	25.6	1.9	41.9





## GC Volatiles

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

**Method Blank Summary**

Page 1 of 1

**Job Number:** D41014  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB1010-MB	GB18499.D	1	11/16/12	SK	n/a	n/a	GGB1010

The QC reported here applies to the following samples:

Method: SW846 8015B

D41014-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	10	5.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	92% 60-140%

10.1.1  
10

Blank Spike Summary

Job Number: D41014  
Account: XTOKRWR XTO Energy  
Project: PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGB1010-BS	GB18500.D	1	11/16/12	SK	n/a	n/a	GGB1010

The QC reported here applies to the following samples: Method: SW846 8015B

D41014-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	110	124	113	70-130

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	105%	60-140%

\* = Outside of Control Limits.

## Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D41014  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
D41015-1MS	GB18502.D	1	11/16/12	SK	n/a	n/a	GGB1010
D41015-1MSD	GB18503.D	1	11/16/12	SK	n/a	n/a	GGB1010
D41015-1	GB18501.D	1	11/16/12	SK	n/a	n/a	GGB1010

The QC reported here applies to the following samples:

Method: SW846 8015B

D41014-1

CAS No.	Compound	D41015-1 mg/kg	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	ND	128	146	114	146	114	0	70-130/30

CAS No.	Surrogate Recoveries	MS	MSD	D41015-1	Limits
120-82-1	1,2,4-Trichlorobenzene	109%	111%	93%	60-140%

\* = Outside of Control Limits.

GC Volatiles

Raw Data



Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\111612\GB18507.D\FID1A.CH Vial: 11  
 Signal #2 : Y:\1\DATA\111612\GB18507.D\FID2B.CH  
 Acq On : 16 Nov 2012 10:34 pm Operator: StephK  
 Sample : D41014-1, 50X Inst : GC/MS Ins  
 Misc : GC3242,GGB1010,5.068,,100,5,1 Multiplr: 1.00  
 IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
 Quant Time: Nov 17 09:39:26 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)  
 Title : 8015B/8021B TVH/BTEX  
 Last Update : Fri Nov 16 18:14:55 2012  
 Response via : Initial Calibration  
 DataAcq Meth : TVB4.M

Volume Inj. :  
 Signal #1 Phase : DB-624 Signal #2 Phase: DB-624  
 Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm

	Compound	R.T.	Response	Conc	Units
-----					
System Monitoring Compounds					
2) S	1,2,4-Trichlorobenzene	14.38	2867749	91.522	%
10) S	1,2,4-Trichlorobenzene (P)	14.38	15266238	93.930	%
Target Compounds					
1) H	TVH-Gasoline	7.23	4368751	<MDL	mg/L
4) T	Methyl-t-butyl-ether	0.00	0	N.D.	ug/L d
5) T	Benzene	0.00	0	N.D.	ug/L d
6) T	Toluene	7.67	177320	0.447	ug/L
7) T	Ethylbenzene	0.00	0	N.D.	ug/L d
8) T	m,p-Xylene	10.48	174040	0.103	ug/L
9) T	o-Xylene	0.00	0	N.D.	ug/L d
11) T	Naphthalene	14.56	233105	1.181	ug/L

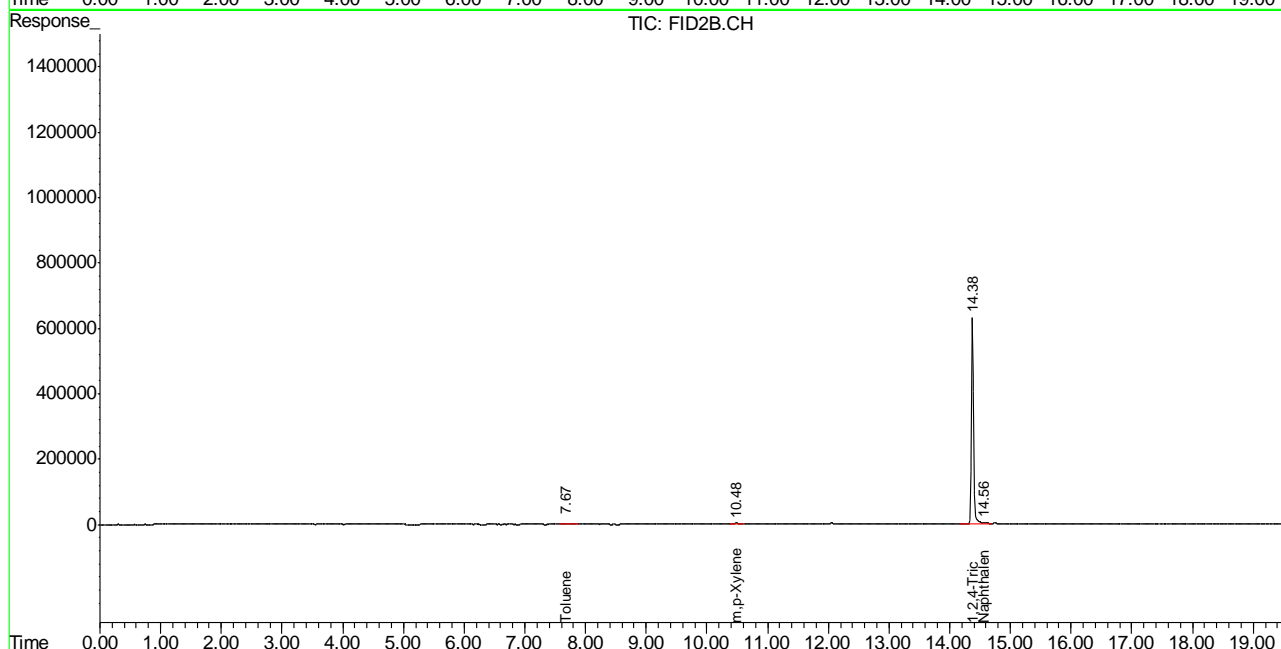
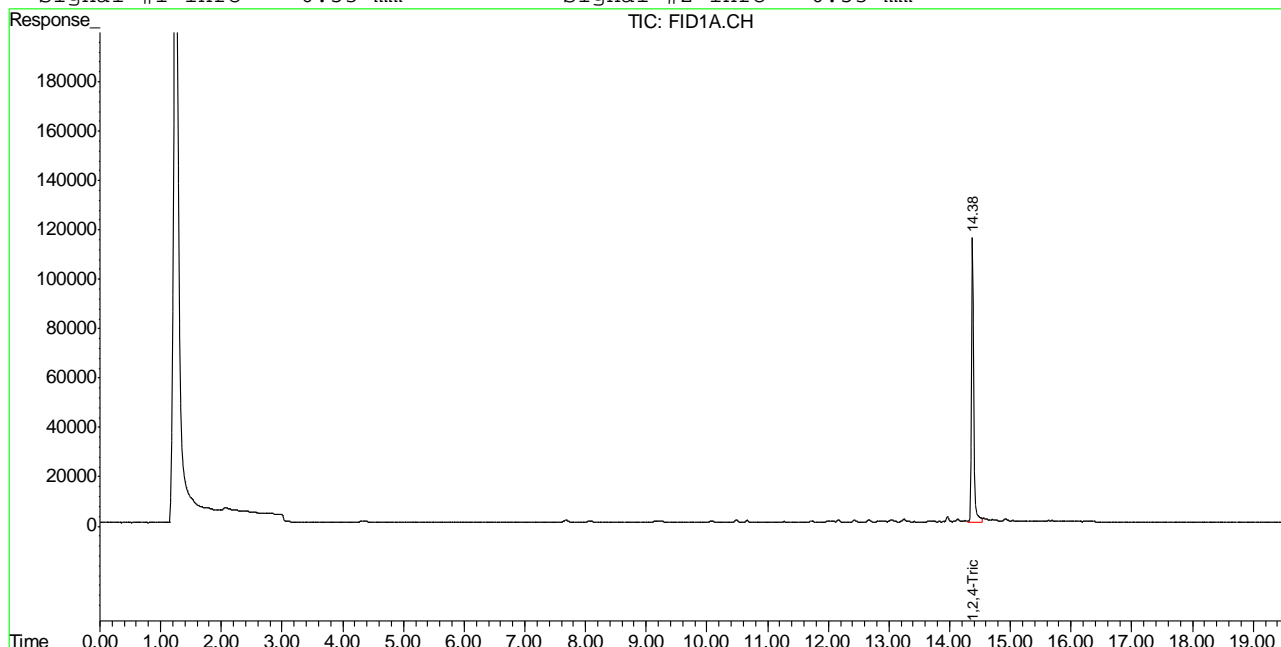
(f)=RT Delta > 1/2 Window (m)=manual int.  
 GB18507.D TB868GB868SOIL.M Sat Nov 17 09:49:17 2012 GC

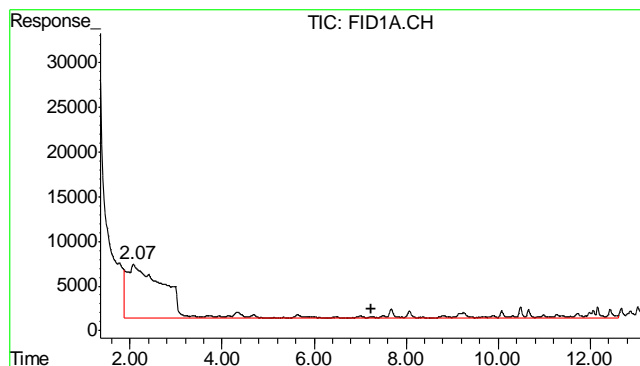
Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\111612\GB18507.D\FID1A.CH Vial: 11  
 Signal #2 : Y:\1\DATA\111612\GB18507.D\FID2B.CH  
 Acq On : 16 Nov 2012 10:34 pm Operator: StephK  
 Sample : D41014-1, 50X Inst : GC/MS Ins  
 Misc : GC3242,GGB1010,5.068,,100,5,1 Multiplr: 1.00  
 IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
 Quant Time: Nov 17 9:43 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)  
 Title : 8015B/8021B TVH/BTEX  
 Last Update : Fri Nov 16 18:14:55 2012  
 Response via : Multiple Level Calibration  
 DataAcq Meth : TVB4.M

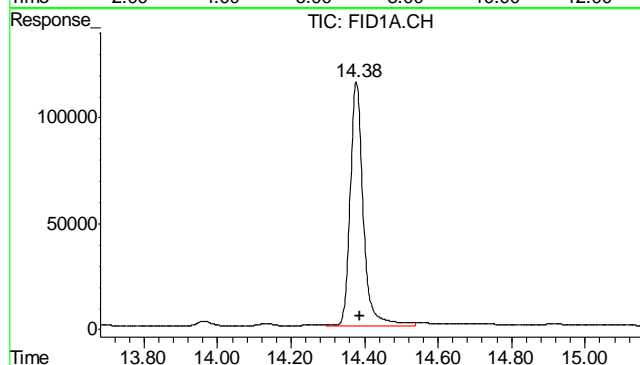
Volume Inj. :  
 Signal #1 Phase : DB-624 Signal #2 Phase: DB-624  
 Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm





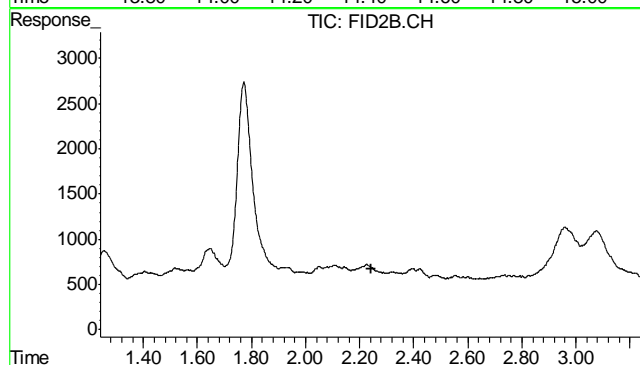
#1 TVH-Gasoline

R.T.: 7.230 min  
Delta R.T.: 0.000 min  
Response: 4368751  
Conc: N.D.



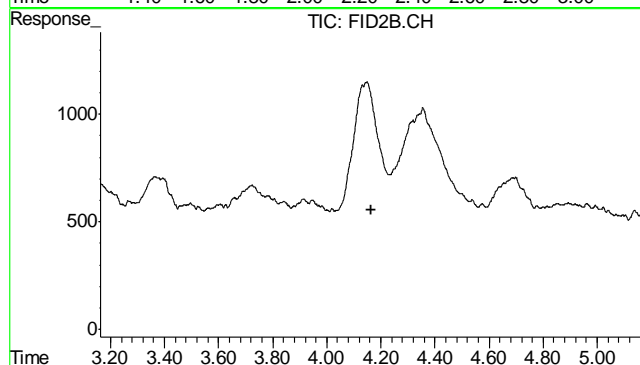
#2 1,2,4-Trichlorobenzene

R.T.: 14.378 min  
Delta R.T.: -0.010 min  
Response: 2867749  
Conc: 91.52 %



#4 Methyl-t-butyl-ether

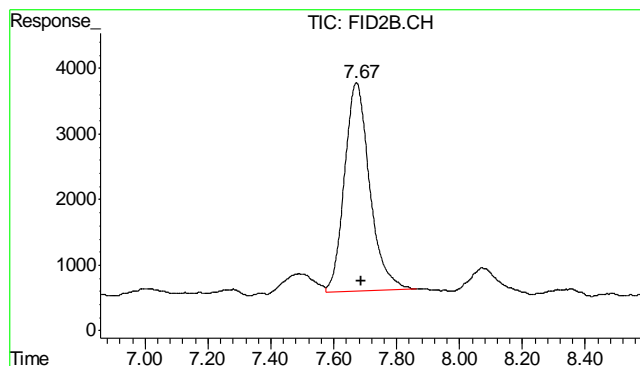
R.T.: 0.000 min  
Exp R.T.: 2.242 min  
Response: 0  
Conc: N.D.



#5 Benzene

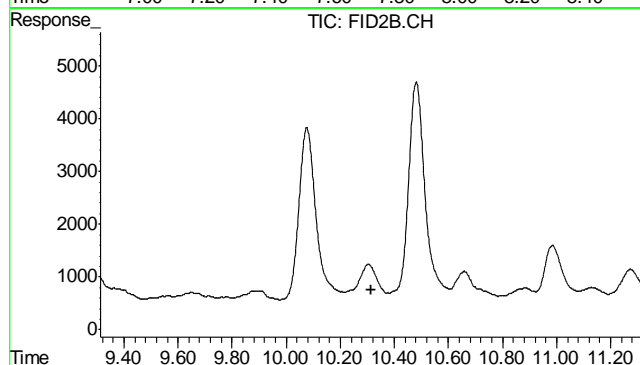
R.T.: 0.000 min  
Exp R.T.: 4.163 min  
Response: 0  
Conc: N.D.





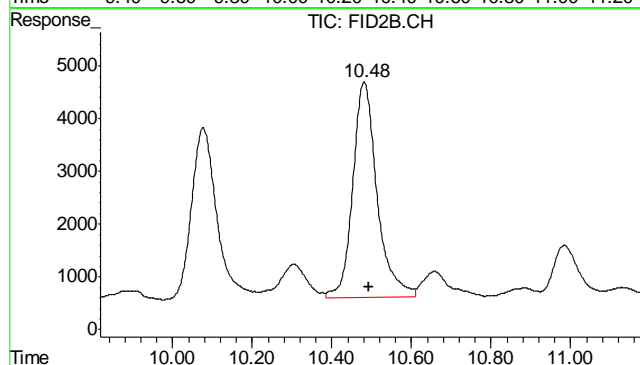
#6 Toluene

R.T.: 7.672 min  
Delta R.T.: -0.016 min  
Response: 177320  
Conc: 0.45 ug/L



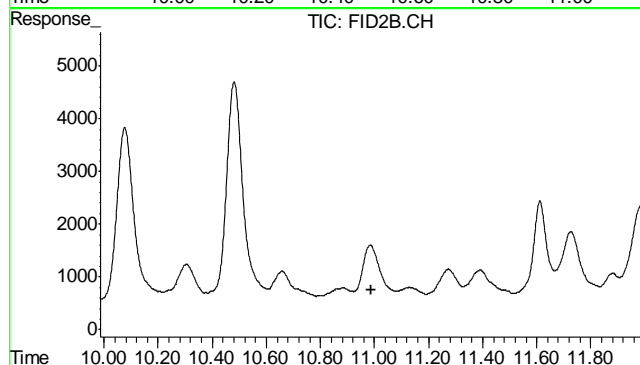
#7 Ethylbenzene

R.T.: 0.000 min  
Exp R.T.: 10.313 min  
Response: 0  
Conc: N.D.



#8 m,p-Xylene

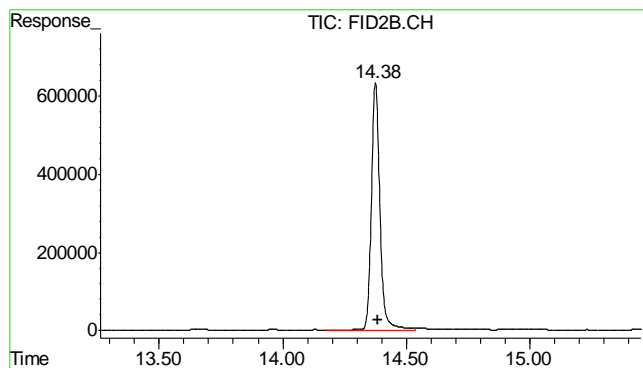
R.T.: 10.481 min  
Delta R.T.: -0.011 min  
Response: 174040  
Conc: 0.10 ug/L



#9 o-Xylene

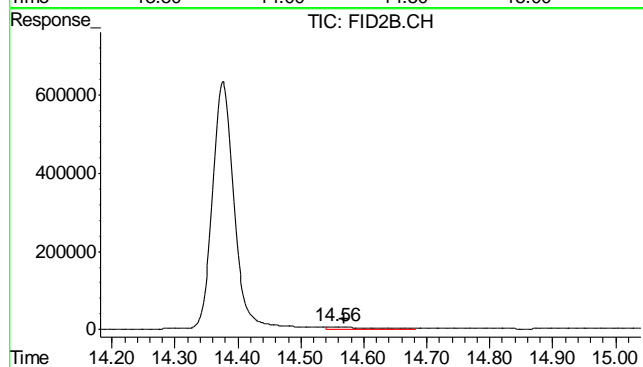
R.T.: 0.000 min  
Exp R.T.: 10.986 min  
Response: 0  
Conc: N.D.

11.11



#10 1,2,4-Trichlorobenzene (P)

R.T.: 14.376 min  
 Delta R.T.: -0.010 min  
 Response: 15266238  
 Conc: 93.93 %



#11 Naphthalene

R.T.: 14.555 min  
 Delta R.T.: -0.013 min  
 Response: 233105  
 Conc: 1.18 ug/L

11.1.1

## Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\111612\GB18499.D\FID1A.CH Vial: 3  
 Signal #2 : Y:\1\DATA\111612\GB18499.D\FID2B.CH  
 Acq On : 16 Nov 2012 5:51 pm Operator: StephK  
 Sample : MB Inst : GC/MS Ins  
 Misc : GC3242,GGB1010,5.000,,100,5,1 Multiplr: 1.00  
 IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
 Quant Time: Nov 16 18:15:12 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)  
 Title : 8015B/8021B TVH/BTEX  
 Last Update : Fri Nov 16 18:14:55 2012  
 Response via : Initial Calibration  
 DataAcq Meth : TVB4.M

Volume Inj. :  
 Signal #1 Phase : DB-624 Signal #2 Phase: DB-624  
 Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm

	Compound	R.T.	Response	Conc	Units
-----					
System Monitoring Compounds					
2) S	1,2,4-Trichlorobenzene	14.38	2895056	92.393	%
10) S	1,2,4-Trichlorobenzene (P)	14.38	15453853	95.085	%
Target Compounds					
1) H	TVH-Gasoline	7.23	4428413	<MDL	mg/L
4) T	Methyl-t-butyl-ether	0.00	0	N.D.	ug/L d
5) T	Benzene	0.00	0	N.D.	ug/L d
6) T	Toluene	7.68	166985	0.421	ug/L
7) T	Ethylbenzene	0.00	0	N.D.	ug/L d
8) T	m,p-Xylene	0.00	0	N.D.	ug/L d
9) T	o-Xylene	0.00	0	N.D.	ug/L d
11) T	Naphthalene	14.56	187354	0.950	ug/L

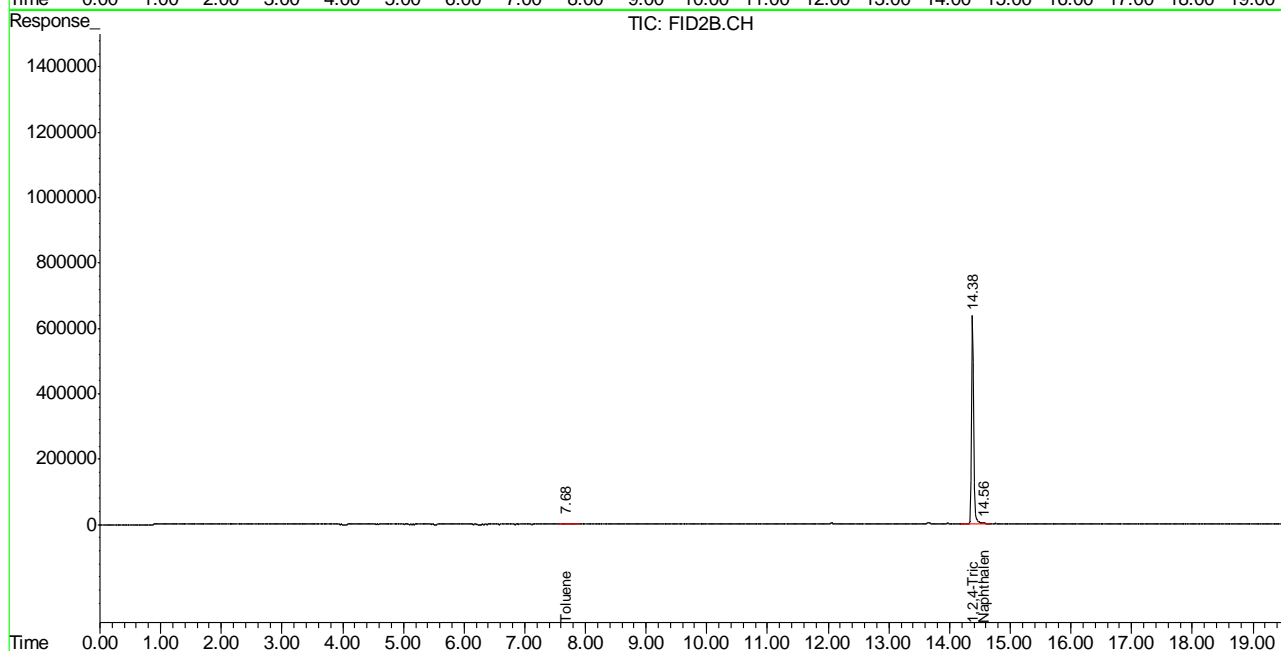
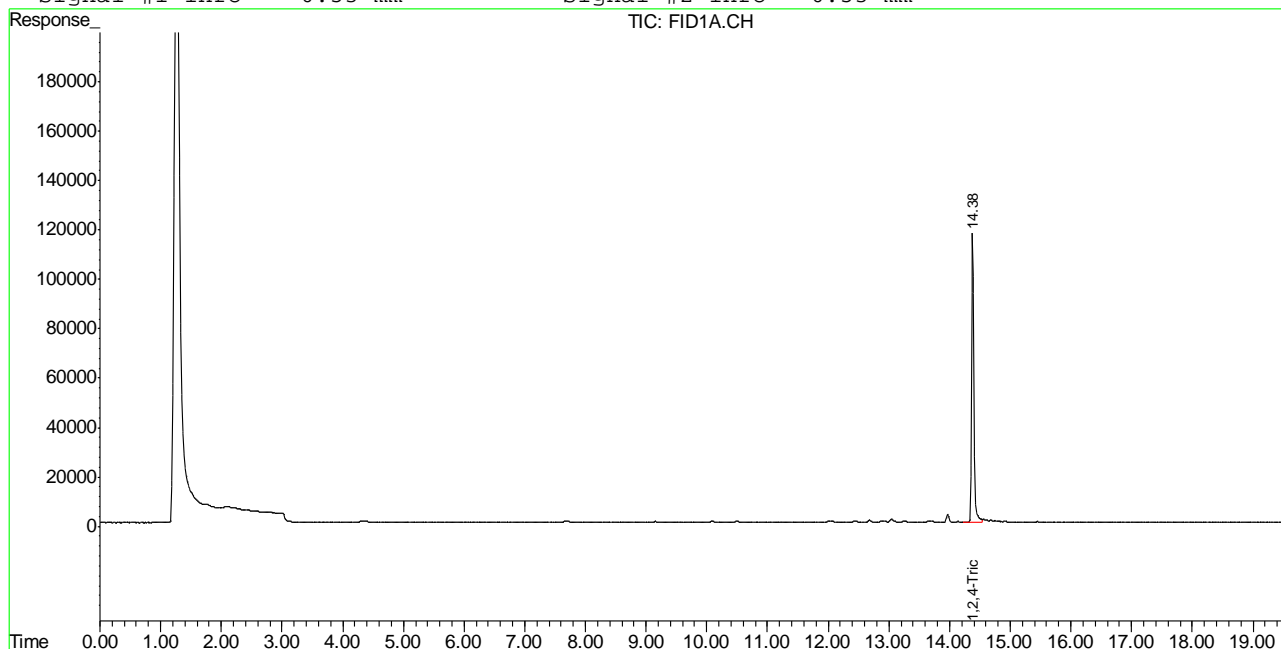
(f)=RT Delta > 1/2 Window (m)=manual int.  
 GB18499.D TB868GB868SOIL.M Sat Nov 17 09:48:53 2012 GC

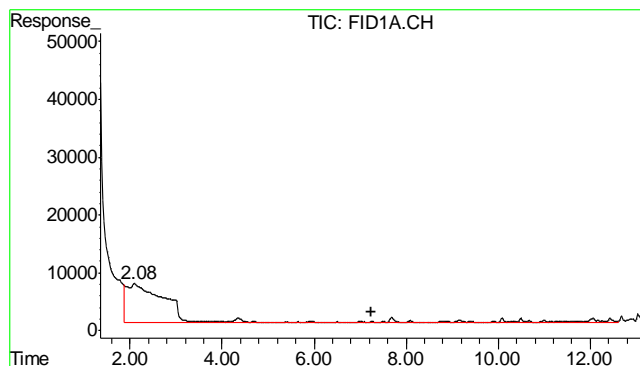
## Quantitation Report (QT Reviewed)

Signal #1 : Y:\1\DATA\111612\GB18499.D\FID1A.CH Vial: 3  
Signal #2 : Y:\1\DATA\111612\GB18499.D\FID2B.CH  
Acq On : 16 Nov 2012 5:51 pm Operator: StephK  
Sample : MB Inst : GC/MS Ins  
Misc : GC3242,GGB1010,5.000,,100,5,1 Multiplr: 1.00  
IntFile Signal #1: TVH1.E IntFile Signal #2: FB2.E  
Quant Time: Nov 16 18:14 2012 Quant Results File: TB868GB868SOIL.RES

Quant Method : C:\MSDCHEM\1...\TB868GB868SOIL.M (Chemstation Integrator)  
Title : 8015B/8021B TVH/BTEX  
Last Update : Fri Nov 16 18:14:55 2012  
Response via : Multiple Level Calibration  
DataAcq Meth : TVB4.M

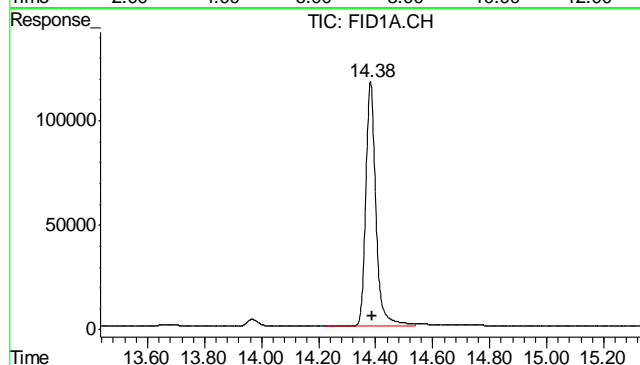
Volume Inj. :  
Signal #1 Phase : DB-624 Signal #2 Phase: DB-624  
Signal #1 Info : 0.53 mm Signal #2 Info : 0.53 mm





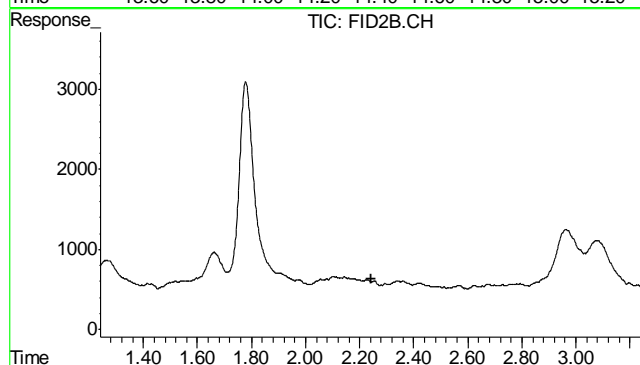
#1 TVH-Gasoline

R.T.: 7.230 min  
Delta R.T.: 0.000 min  
Response: 4428413  
Conc: N.D.



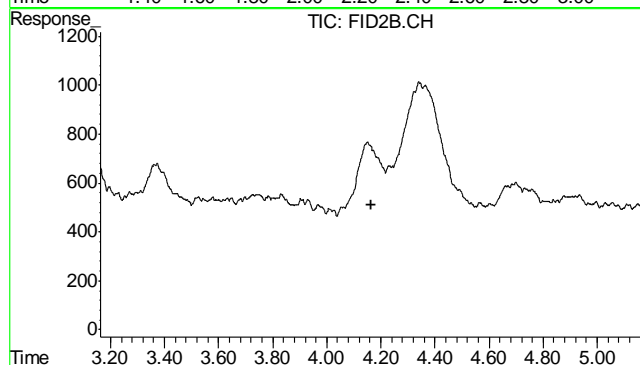
#2 1,2,4-Trichlorobenzene

R.T.: 14.382 min  
Delta R.T.: -0.006 min  
Response: 2895056  
Conc: 92.39 %



#4 Methyl-t-butyl-ether

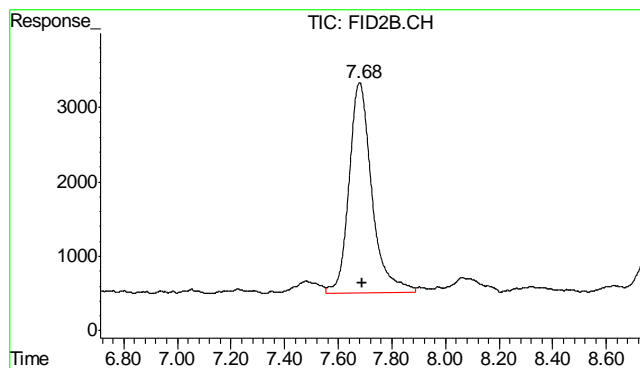
R.T.: 0.000 min  
Exp R.T.: 2.242 min  
Response: 0  
Conc: N.D.



#5 Benzene

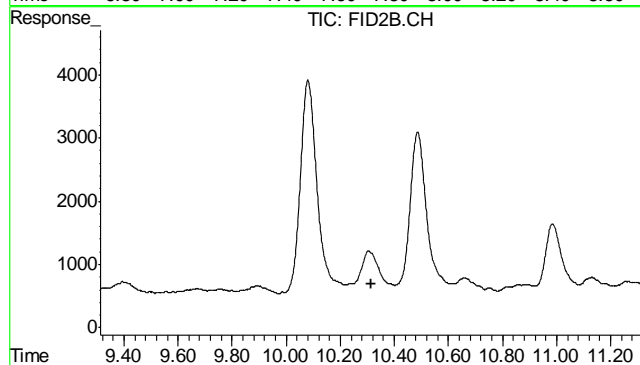
R.T.: 0.000 min  
Exp R.T.: 4.163 min  
Response: 0  
Conc: N.D.

11.21  
11



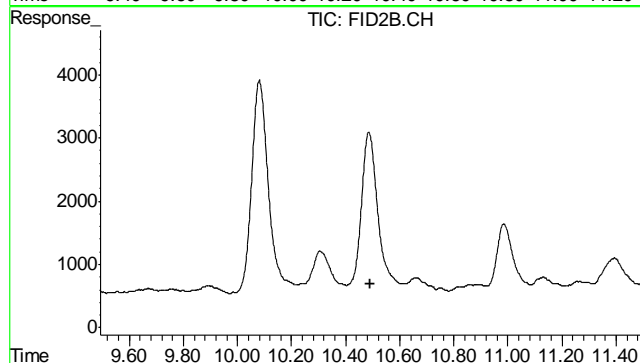
#6 Toluene

R.T.: 7.680 min  
Delta R.T.: -0.009 min  
Response: 166985  
Conc: 0.42 ug/L



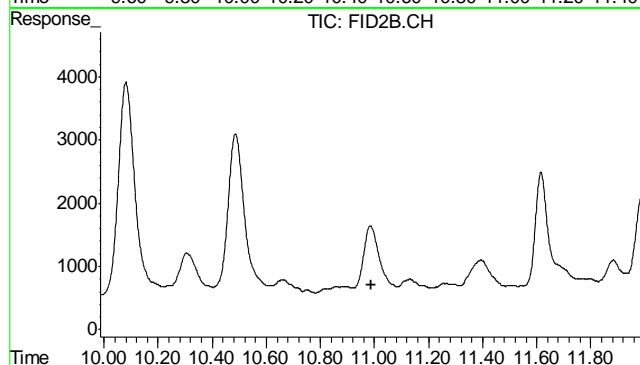
#7 Ethylbenzene

R.T.: 0.000 min  
Exp R.T.: 10.313 min  
Response: 0  
Conc: N.D.



#8 m,p-Xylene

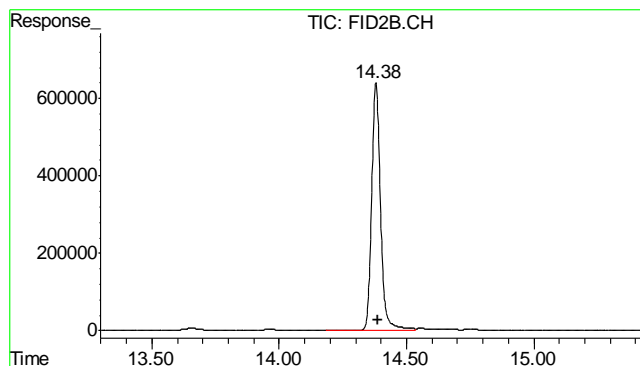
R.T.: 0.000 min  
Exp R.T.: 10.492 min  
Response: 0  
Conc: N.D.



#9 o-Xylene

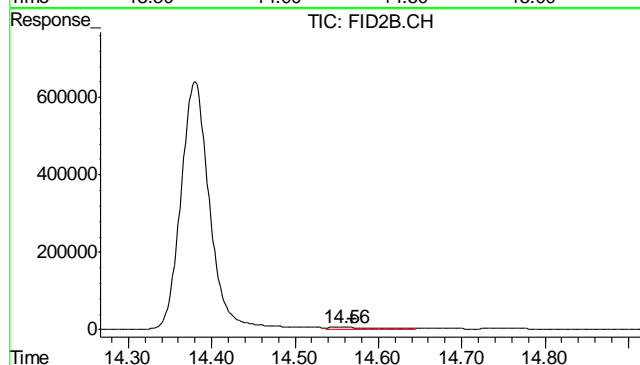
R.T.: 0.000 min  
Exp R.T.: 10.986 min  
Response: 0  
Conc: N.D.

11.21  
11



#10 1,2,4-Trichlorobenzene (P)

R.T.: 14.380 min  
Delta R.T.: -0.006 min  
Response: 15453853  
Conc: 95.08 %



#11 Naphthalene

R.T.: 14.558 min  
Delta R.T.: -0.010 min  
Response: 187354  
Conc: 0.95 ug/L

11.2.1  
11

## GC Semi-volatiles

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



**Method Blank Summary**

Page 1 of 1

**Job Number:** D41014  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6979-MB	FD19679.D	1	11/19/12	AV	11/19/12	OP6979	GFD990

The QC reported here applies to the following samples:

Method: SW846-8015B

D41014-1

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	13	8.7	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	88% 35-130%

12.1.1  
12

## Blank Spike Summary

Page 1 of 1

**Job Number:** D41014  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6979-BS	FD19681.D	1	11/19/12	AV	11/19/12	OP6979	GFD990

The QC reported here applies to the following samples:

Method: SW846-8015B

D41014-1

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	667	689	103	48-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	95%	35-130%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** D41014  
**Account:** XTOKRWR XTO Energy  
**Project:** PCU 296-5A

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP6979-MS	FD19683.D	1	11/19/12	AV	11/19/12	OP6979	GFD990
OP6979-MSD	FD19685.D	1	11/19/12	AV	11/19/12	OP6979	GFD990
D41044-9	FD19687.D	1	11/19/12	AV	11/19/12	OP6979	GFD990

The QC reported here applies to the following samples:

Method: SW846-8015B

D41014-1

CAS No.	Compound	D41044-9 mg/kg	Q	Spike mg/kg	MS mg/kg	MS %	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	80.3		738	764	93	734	89	4	20-168/30

CAS No.	Surrogate Recoveries	MS	MSD	D41044-9	Limits
84-15-1	o-Terphenyl	80%	80%	65%	35-130%

\* = Outside of Control Limits.

GC Semi-volatiles

Raw Data

Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\NOV\FD111912\FD19691.D Vial: 9  
Acq On : 11-19-2012 05:37:12 PM Operator: ashleyv  
Sample : D41014-1 Inst : FID5  
Misc : OP6979,GFD990,30.01,,,2,1 Multiplr: 1.00  
IntFile : autoint1.e  
Quant Time: Nov 20 15:06:13 2012 Quant Results File: DRO-GFD982F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD982F.M (Chemstation Integrator)  
Title : 8015B TEH  
Last Update : Fri Nov 16 10:24:56 2012  
Response via : Initial Calibration  
DataAcq Meth : DRODUAL.M

Volume Inj. : 1ul  
Signal Phase : RTX-5  
Signal Info : 530um

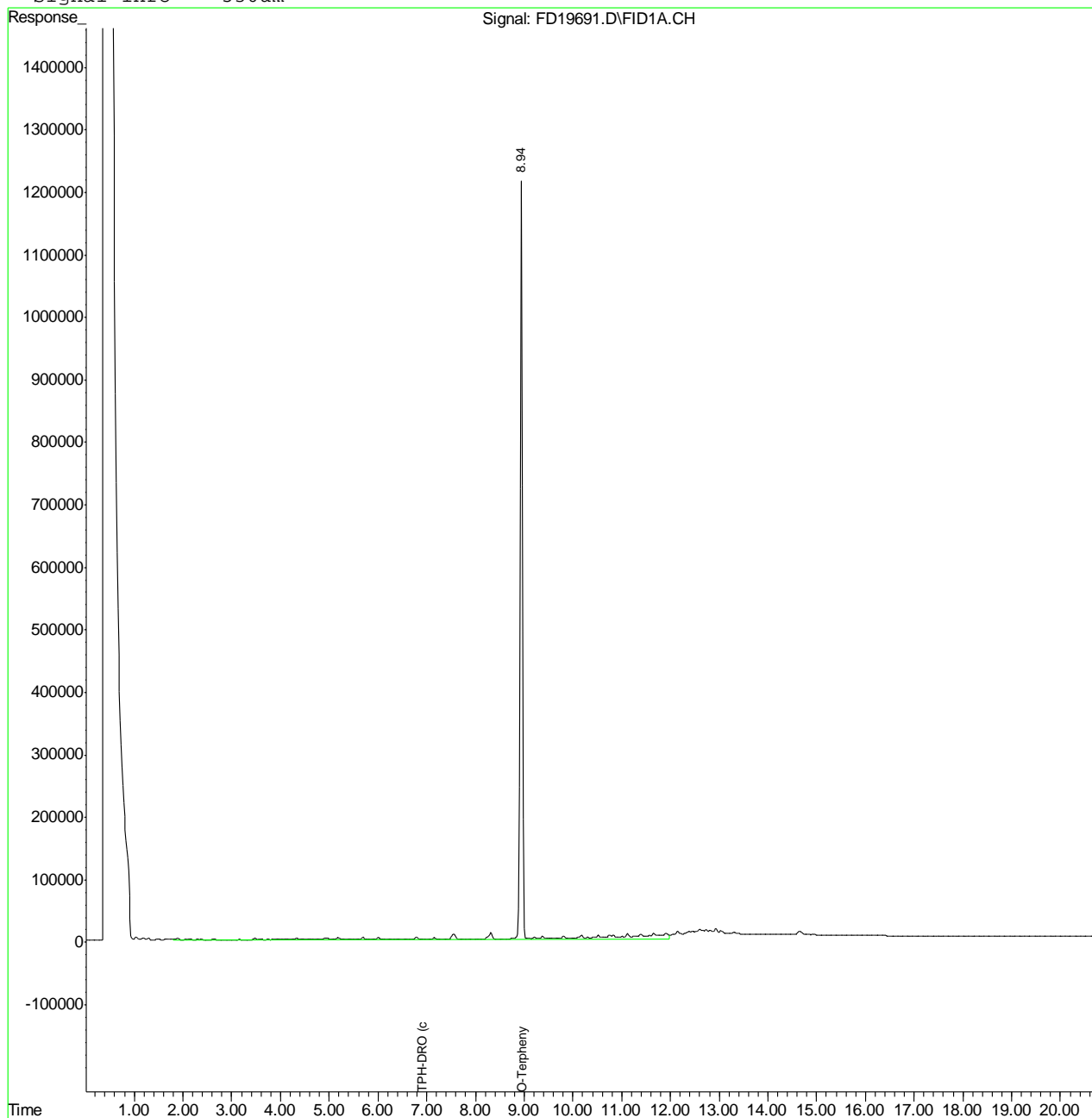
Compound	R.T.	Response	Conc Units
-----			
System Monitoring Compounds			
1) S O-Terphenyl	8.95	43488217	785.974 mg/L
Target Compounds			
2) H TPH-DRO (c10-c28)	6.89	12147235	319.869 mg/L

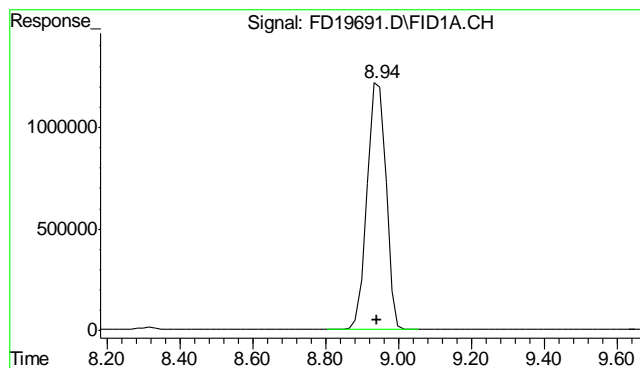
Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\NOV\FD111912\FD19691.D Vial: 9  
 Acq On : 11-19-2012 05:37:12 PM Operator: ashleyv  
 Sample : D41014-1 Inst : FID5  
 Misc : OP6979,GFD990,30.01,,,2,1 Multiplr: 1.00  
 IntFile : autoint1.e  
 Quant Time: Nov 20 15:06 2012 Quant Results File: DRO-GFD982F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD982F.M (Chemstation Integrator)  
 Title : 8015B TEH  
 Last Update : Fri Nov 16 10:24:56 2012  
 Response via : Multiple Level Calibration  
 DataAcq Meth : DRODUAL.M

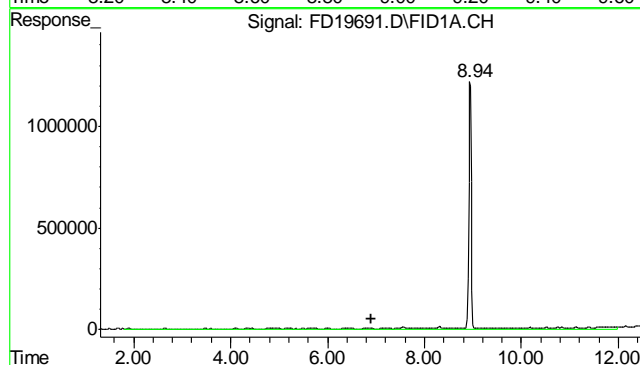
Volume Inj. : 1ul  
 Signal Phase : RTX-5  
 Signal Info : 530um





#1 O-Terphenyl

R.T.: 8.947 min  
 Delta R.T.: 0.007 min  
 Response: 43488217  
 Conc: 785.97 mg/L



#2 TPH-DRO (c10-c28)

R.T.: 6.895 min  
 Delta R.T.: 0.000 min  
 Response: 12147235  
 Conc: 319.87 mg/L m

## Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\NOV\FD111912\FD19679.D Vial: 3  
Acq On : 11-19-2012 02:55:37 PM Operator: ashleyv  
Sample : OP6979-MB Inst : FID5  
Misc : OP6979,GFD990,30.00,,,2,1 Multiplr: 1.00  
IntFile : autoint1.e  
Quant Time: Nov 20 15:02:12 2012 Quant Results File: DRO-GFD982F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD982F.M (Chemstation Integrator)  
Title : 8015B TEH  
Last Update : Fri Nov 16 10:24:56 2012  
Response via : Initial Calibration  
DataAcq Meth : DRODUAL.M

Volume Inj. : 1ul  
Signal Phase : RTX-5  
Signal Info : 530um

Compound	R.T.	Response	Conc Units
-----			
System Monitoring Compounds			
1) S O-Terphenyl	8.97	48861805	883.092 mg/L
Target Compounds			
2) H TPH-DRO (c10-c28)	6.89	2183565	57.499 mg/L

-----  
(f)=RT Delta > 1/2 Window (m)=manual int.  
FD19679.D DRO-GFD982F.M Wed Nov 21 09:05:39 2012 GC

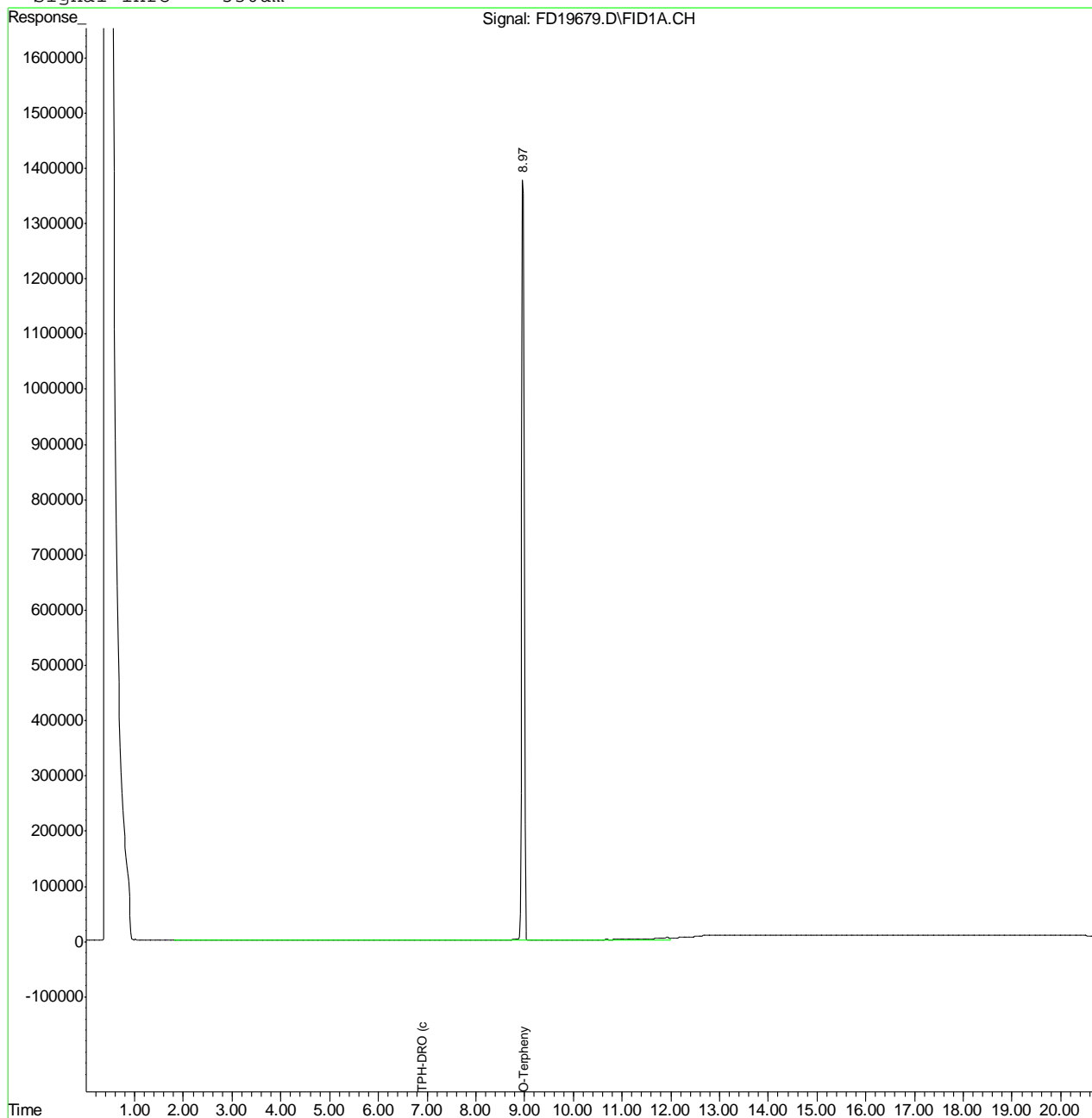


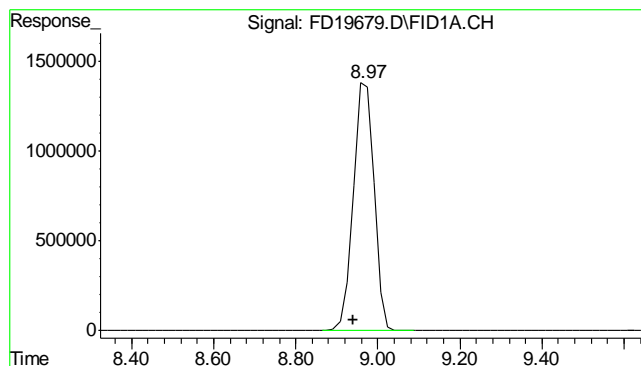
## Quantitation Report (QT Reviewed)

Data File : C:\MSDCHEM\2\DATA\2012\NOV\FD111912\FD19679.D Vial: 3  
Acq On : 11-19-2012 02:55:37 PM Operator: ashleyv  
Sample : OP6979-MB Inst : FID5  
Misc : OP6979,GFD990,30.00,,,2,1 Multiplr: 1.00  
IntFile : autoint1.e  
Quant Time: Nov 20 15:02 2012 Quant Results File: DRO-GFD982F.RES

Quant Method : C:\MSDCHEM\2...\DRO-GFD982F.M (Chemstation Integrator)  
Title : 8015B TEH  
Last Update : Fri Nov 16 10:24:56 2012  
Response via : Multiple Level Calibration  
DataAcq Meth : DRODUAL.M

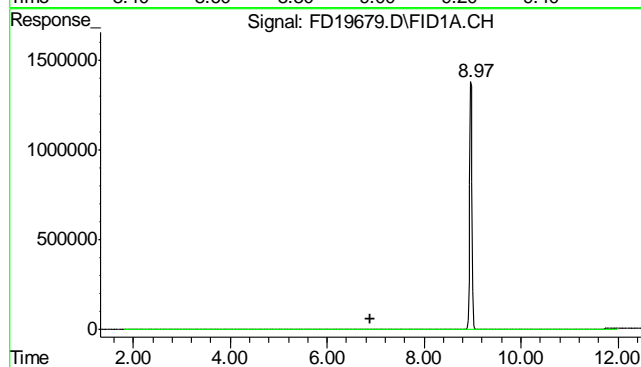
Volume Inj. : 1ul  
Signal Phase : RTX-5  
Signal Info : 530um





#1 O-Terphenyl

R.T.: 8.972 min  
Delta R.T.: 0.032 min  
Response: 48861805  
Conc: 883.09 mg/L



#2 TPH-DRO (c10-c28)

R.T.: 6.895 min  
Delta R.T.: 0.000 min  
Response: 2183565  
Conc: 57.50 mg/L m

## Metals Analysis

### QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8913  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 11/19/12

Metal	RL	IDL	MDL	MB raw	final
Aluminum	10	.96	.57		
Antimony	3.0	.17	.12		
Arsenic	2.5	.44	.56		
Barium	1.0	.01	.11	0.020	<1.0
Beryllium	1.0	.13	.15		
Boron	5.0	.1	.06		
Cadmium	1.0	.06	.036	-0.020	<1.0
Calcium	40	.54	9		
Chromium	1.0	.03	.03	0.010	<1.0
Cobalt	0.50	.04	.07		
Copper	1.0	.12	.15	-0.070	<1.0
Iron	7.0	.12	.87		
Lead	5.0	.19	.24	-0.33	<5.0
Lithium	0.20	.05	.054		
Magnesium	20	.65	.98		
Manganese	0.50	.12	.022		
Molybdenum	1.0	.21	.08		
Nickel	3.0	.05	.026	0.0	<3.0
Phosphorus	10	1.4	1.9		
Potassium	200	6.1	7		
Selenium	5.0	.48	.36	-0.21	<5.0
Silicon	5.0	.29	.37		
Silver	3.0	.04	.06	-0.040	<3.0
Sodium	40	.59	1.9		
Strontium	5.0	.004	.017		
Thallium	1.0	.29	.53		
Tin	5.0	1.2	2		
Titanium	1.0	.01	.038		
Uranium	5.0	.22	.26		
Vanadium	1.0	.02	.036		
Zinc	3.0	.05	.37	-0.18	<3.0

Associated samples MP8913: D41014-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8913  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8913  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 11/19/12

Metal	D41013-1 Original MS	Spikelot ICPAL2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	1000	1310	244	127.2(a) 75-125
Beryllium	anr			
Boron				
Cadmium	0.0	49.1	60.9	80.6 75-125
Calcium				
Chromium	34.1	80.8	60.9	76.7 75-125
Cobalt	anr			
Copper	12.6	63.5	60.9	83.5 75-125
Iron	anr			
Lead	11.5	112	122	82.5 75-125
Lithium				
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	17.5	61.9	60.9	72.9N(b) 75-125
Phosphorus	anr			
Potassium				
Selenium	0.77	99.9	122	81.4 75-125
Silicon				
Silver	0.18	18.1	24.4	73.5N(b) 75-125
Sodium				
Strontium				
Thallium	anr			
Tin				
Titanium				
Uranium				
Vanadium	anr			
Zinc	46.7	96.6	60.9	81.9 75-125

Associated samples MP8913: D41014-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8913  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested  
(a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.  
(b) Spike recovery indicates possible matrix interference.

## MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D41014  
 Account: XTOKRWR - XTO Energy  
 Project: PCU 296-5A

QC Batch ID: MP8913  
 Matrix Type: SOLID

Methods: SW846 6010C  
 Units: mg/kg

Prep Date: 11/19/12

Metal	D41013-1 Original MSD		Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum	anr					
Antimony	anr					
Arsenic	anr					
Barium	1000	1220	251	87.5	7.1	20
Beryllium	anr					
Boron						
Cadmium	0.0	50.0	62.8	79.6	1.8	20
Calcium						
Chromium	34.1	77.5	62.8	69.1N(a)	4.2	20
Cobalt	anr					
Copper	12.6	64.7	62.8	82.9	1.9	20
Iron	anr					
Lead	11.5	113	126	80.8	0.9	20
Lithium						
Magnesium						
Manganese	anr					
Molybdenum						
Nickel	17.5	62.3	62.8	71.3N(a)	0.6	20
Phosphorus	anr					
Potassium						
Selenium	0.77	101	126	79.8	1.1	20
Silicon						
Silver	0.18	18.5	25.1	72.9N(a)	2.2	20
Sodium						
Strontium						
Thallium	anr					
Tin						
Titanium						
Uranium						
Vanadium	anr					
Zinc	46.7	96.1	62.8	78.6	0.5	20

Associated samples MP8913: D41014-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8913  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested  
(a) Spike recovery indicates possible matrix interference.

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8913  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date: 11/19/12

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	190	200	95.0	80-120
Beryllium	anr			
Boron				
Cadmium	45.1	50	90.2	80-120
Calcium				
Chromium	47.7	50	95.4	80-120
Cobalt	anr			
Copper	43.0	50	86.0	80-120
Iron	anr			
Lead	96.2	100	96.2	80-120
Lithium				
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	45.7	50	91.4	80-120
Phosphorus	anr			
Potassium				
Selenium	91.1	100	91.1	80-120
Silicon				
Silver	16.8	20	84.0	80-120
Sodium				
Strontium				
Thallium	anr			
Tin				
Titanium				
Uranium				
Vanadium	anr			
Zinc	48.3	50	96.6	80-120

Associated samples MP8913: D41014-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

14.1.3  
14

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8913  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: mg/kg

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8913  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date: 11/19/12

Metal	D41013-1 Original	SDL 1:5	%DIF	QC Limits
Aluminum	anr			
Antimony	anr			
Arsenic	anr			
Barium	8220	9560	16.3*(a)	0-10
Beryllium	anr			
Boron				
Cadmium	0.00	0.00	NC	0-10
Calcium				
Chromium	280	326	16.4*(a)	0-10
Cobalt	anr			
Copper	103	106	2.3	0-10
Iron	anr			
Lead	94.0	92.0	2.1	0-10
Lithium				
Magnesium				
Manganese	anr			
Molybdenum				
Nickel	144	173	19.8*(a)	0-10
Phosphorus	anr			
Potassium				
Selenium	6.30	0.00	100.0(b)	0-10
Silicon				
Silver	1.50	0.00	100.0(b)	0-10
Sodium				
Strontium				
Thallium	anr			
Tin				
Titanium				
Uranium				
Vanadium	anr			
Zinc	383	458	19.5*(a)	0-10

Associated samples MP8913: D41014-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

SERIAL DILUTION RESULTS SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8913  
Matrix Type: SOLID

Methods: SW846 6010C  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

(a) Serial dilution indicates possible matrix interference.

(b) Percent difference acceptable due to low initial sample concentration (< 50 times IDL).

14.1.4  
14

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8914  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 11/19/12

Metal	RL	IDL	MDL	MB raw	final
Aluminum	25	.22	.31		
Antimony	0.20	.0018	.0075		
Arsenic	0.10	.006	.06	0.0076	<0.10
Barium	1.0	.0065	.037		
Beryllium	0.10	.016	.09		
Boron	20	1.2	1.2		
Calcium	200	7.9	8		
Chromium	1.0	.033	.19		
Cobalt	0.10	.0012	.015		
Copper	1.0	.017	.065		
Iron	20	.8	5		
Lead	0.25	.0011	.024		
Magnesium	50	.44	.85		
Manganese	0.50	.0043	.02		
Molybdenum	0.50	.018	.018		
Nickel	1.0	.0049	.011		
Potassium	100	9.8	10		
Selenium	0.20	.029	.14		
Silver	0.050	.0009	.0065		
Sodium	250	1.5	2.3		
Strontium	10	.036	.036		
Thallium	0.10	.00095	.0095		
Tin	5.0	.023	.34		
Titanium	1.0	.044	.1		
Uranium	0.25	.00085	.001		
Vanadium	2.0	.12	.21		
Zinc	5.0	.033	.35		

Associated samples MP8914: D41014-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

14.2.1  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8914  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 11/19/12

Metal	D41013-1 Original MS	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	8.1	128	122	98.4
Barium				75-125
Beryllium				
Boron				
Calcium				
Cobalt				
Iron				
Lead	anr			
Magnesium				
Manganese				
Molybdenum	anr			
Potassium	anr			
Selenium	anr			
Silver				
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				

Associated samples MP8914: D41014-1

Results < IDL are shown as zero for calculation purposes  
(\* ) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

14.2.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8914  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 11/19/12

Metal	D41013-1 Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic	8.1	130	126	97.0	1.6	20
Barium						
Beryllium						
Boron						
Calcium						
Cobalt						
Iron						
Lead	anr					
Magnesium						
Manganese						
Molybdenum	anr					
Potassium	anr					
Selenium	anr					
Silver						
Sodium	anr					
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						

Associated samples MP8914: D41014-1

Results < IDL are shown as zero for calculation purposes  
(\* ) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

14.2.2  
14



## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8914  
Matrix Type: SOLID

Methods: SW846 6020A  
Units: mg/kg

Prep Date: 11/19/12

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic	100	100	100.0	80-120
Barium				
Beryllium				
Boron				
Calcium				
Chromium	anr			
Cobalt				
Copper	anr			
Iron				
Lead	anr			
Magnesium				
Manganese				
Molybdenum	anr			
Nickel	anr			
Potassium	anr			
Selenium	anr			
Silver				
Sodium	anr			
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc	anr			

Associated samples MP8914: D41014-1

Results < IDL are shown as zero for calculation purposes

(\*) Outside of QC limits

(anr) Analyte not requested

14.2.3  
14

SERIAL DILUTION RESULTS SUMMARY

Login Number: D41014  
 Account: XTOKRWR - XTO Energy  
 Project: PCU 296-5A

QC Batch ID: MP8914  
 Matrix Type: SOLID

Methods: SW846 6020A  
 Units: ug/l

Prep Date: 11/19/12

Metal	D41013-1			QC	
	Original	SDL 5:25	%DIF	Limits	
Aluminum					
Antimony					
Arsenic	66.8	73.5	9.9	0-10	
Barium					
Beryllium					
Boron					
Calcium					
Cobalt					
Iron					
Lead	anr				
Magnesium					
Manganese					
Molybdenum	anr				
Potassium	anr				
Selenium	anr				
Silver					
Sodium	anr				
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					

Associated samples MP8914: D41014-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested

14.2.4  
 14

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8915  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date: 11/19/12

Metal	RL	IDL	MDL	MB raw	final
Aluminum	500	48	130		
Antimony	150	8.5	18		
Arsenic	130	22	42		
Barium	50	.5	9		
Beryllium	50	6.5	16		
Boron	250	5	22		
Cadmium	50	3	3		
Calcium	2000	27	80	22.5	<2000
Chromium	50	1.5	2.8		
Cobalt	25	2	2.1		
Copper	50	6	15		
Iron	350	6	100		
Lead	250	9.5	15		
Lithium	10	2.5			
Magnesium	1000	33	110	38.0	<1000
Manganese	25	6	6		
Molybdenum	50	11	11		
Nickel	150	2.5	2.9		
Phosphorus	500	70	300		
Potassium	5000	310	750		
Selenium	250	24	55		
Silicon	250	15			
Silver	150	2	4.9		
Sodium	2000	30	490	-290	<2000
Strontium	25	.2	7.5		
Thallium	50	15	43		
Tin	250	60			
Titanium	50	.5			
Uranium	250	11	23		
Vanadium	50	1	2.4		
Zinc	150	2.5	12		

Associated samples MP8915: D41014-1A

Results < IDL are shown as zero for calculation purposes  
(\* ) Outside of QC limits

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8915  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8915  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date: 11/19/12

Metal	D41042-1A Original MS		Spikelot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	194000	332000	125000	110.4	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	99900	226000	125000	100.9	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	660000	765000	125000	84.0	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP8915: D41014-1A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

14.3.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8915  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date:

Metal

(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8915  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date: 11/19/12

Metal	D41042-1A Original	MSD	Spikelot ICPALL2	% Rec	MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	194000	337000	125000	114.4	1.5	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	99900	221000	125000	96.9	2.2	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	660000	746000	125000	68.8 (a)	2.5	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP8915: D41014-1A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

14.3.2  
14

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8915  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date:

Metal

- (N) Matrix Spike Rec. outside of QC limits
- (anr) Analyte not requested
- (a) Spike amount low relative to the sample amount. Refer to lab control or spike blank for recovery information.



## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8915  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date: 11/19/12

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	141000	125000	112.8	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	126000	125000	100.8	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	122000	125000	97.6	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP8915: D41014-1A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8915  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: D41014  
 Account: XTOKRWR - XTO Energy  
 Project: PCU 296-5A

QC Batch ID: MP8915  
 Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
 Units: ug/l

Prep Date: 11/19/12

Metal	D41042-1A Original SDL 1:5		%DIF	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	38800	40600	4.9	0-10
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	20000	22200	11.3*(a)	0-10
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	132000	147000	11.4*(a)	0-10
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP8915: D41014-1A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits

14.3.4  
14

SERIAL DILUTION RESULTS SUMMARY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8915  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date:

Metal

(anr) Analyte not requested  
(a) Serial dilution indicates possible matrix interference.

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

QC Batch ID: MP8936  
Matrix Type: SOLID

Methods: SW846 7471B  
Units: mg/kg

Prep Date: 11/27/12

Metal	RL	IDL	MDL	MB	
				raw	final
Mercury	0.083	.00088	.00075	0.0013	<0.083

Associated samples MP8936: D41014-1

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits  
(anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D41014  
 Account: XTOKRWR - XTO Energy  
 Project: PCU 296-5A

QC Batch ID: MP8936  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/27/12

Metal	D40988-1 Original MS	Spikelot HGWSR1	% Rec	QC Limits
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Mercury	0.029	0.39	0.369	97.8	75-125
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Associated samples MP8936: D41014-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: D41014  
 Account: XTOKRWR - XTO Energy  
 Project: PCU 296-5A

QC Batch ID: MP8936  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/27/12

Metal	D40988-1 Original	MSD	Spikelot HGWSR1	% Rec	MSD RPD	QC Limit
Mercury	0.029	0.39	0.382	94.6	0.0	20

Associated samples MP8936: D41014-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (N) Matrix Spike Rec. outside of QC limits  
 (anr) Analyte not requested

SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: D41014  
 Account: XTOKRWR - XTO Energy  
 Project: PCU 296-5A

QC Batch ID: MP8936  
 Matrix Type: SOLID

Methods: SW846 7471B  
 Units: mg/kg

Prep Date: 11/27/12

Metal	BSP Result	Spikelot HGWSR1	% Rec	QC Limits
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Mercury	0.33	0.333	99.0	80-120
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Associated samples MP8936: D41014-1

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits  
 (anr) Analyte not requested



## General Chemistry

### QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Chromium, Hexavalent	GP8709/GN17735	1.0	0.0	mg/kg	176.0	166	94.0	80-120%
Specific Conductivity	GP8712/GN17742			umhos/cm	9991	9990	100.0	90-110%
pH	GN17719			su	8.00	8.00	100.0	99.3-100.7%

Associated Samples:  
Batch GP8709: D41014-1  
Batch GP8712: D41014-1  
Batch GN17719: D41014-1  
(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Chromium, Hexavalent	GP8709/GN17735	D40985-1	mg/kg	0.0	0.0	0.0	0-20%
Redox Potential Vs H2	GN17722	D41014-1	mv	94.2	93.7	0.5	0-20%

Associated Samples:  
Batch GP8709: D41014-1  
Batch GN17722: D41014-1  
(\*) Outside of QC limits

MATRIX SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MS Result	%Rec	QC Limits
Chromium, Hexavalent	GP8709/GN17735	D40985-1	mg/kg	0.0	40.0	39.8	99.5	75-125%

Associated Samples:

Batch GP8709: D41014-1

(\*) Outside of QC limits

(N) Matrix Spike Rec. outside of QC limits

MATRIX SPIKE DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: D41014  
Account: XTOKRWR - XTO Energy  
Project: PCU 296-5A

Analyte	Batch ID	QC Sample	Units	Original Result	Spike Amount	MSD Result	RPD	QC Limit
Chromium, Hexavalent	GP8709/GN17735	D40985-1	mg/kg	0.0	40.0	40.9	2.7	20%

Associated Samples:  
Batch GP8709: D41014-1  
(\*) Outside of QC limits  
(N) Matrix Spike Rec. outside of QC limits