GTI Project Number: 40453-01

ANALYSIS OF ELEVEN LIQUID SAMPLES AND ONE SOIL SAMPLE FROM THE ASHLAND LAKEFRONT PROPERTY SITE (VARIOUS LOCATIONS), ASHLAND, WISCONSIN

FOURTH ADDENDUM TO THE REPORT: COMPARATIVE ANALYSIS OF NAPL RESIDUES FROM THE NSP ASHLAND FORMER MGP SITE AND THE ASHLAND LAKEFRONT PROPERTY (KREHER PARK)

Prepared by

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For

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January, 2002

EXECUTIVE SUMMARY

The Gas Technology Institute (GTI) has conducted laboratory analysis of eleven liquid samples and one soil sample retrieved from various locations at the Ashland Lakefront Property Site in Ashland, Wisconsin. Samples were collected and described according to information obtained by URS Corporation. The samples described in this report were retrieved in three separate sampling events: July 24 and 25, 2001, September 12 and 13, 2001 and September 19 and 20, 2001. During the July sampling event, five liquid samples were retrieved ("Seep Trench West", MW-7, TW-9, "Upgradient Riser" and "Clay Pipe"); during the earlier September event, four liquid samples were retrieved (TW-13, MW-15, "West Trench Riser" and "Upgradient Riser") and during the later September sampling event, two liquid samples and one soil sample were retrieved ("Clay Tile #1A", "Clay Tile #1B" and "Clay Tile #2). Samples were tested using GC/FID protocols described in the report, *Comparative Analysis Of NAPL Residues From The NSP Ashland Former MGP Site And The Ashland Lakefront Property (Kreher Park)* ("NAPL Report", March, 2000) and GC/MS/SIM. This document serves as the Fourth Addendum to the NAPL Report. An initial Addendum Report, *Comparative Analysis Of Sediment Samples From The Chequamegon Bay Near The Kreher Park Shoreline, Ashland, Wisconsin*, was prepared in May, 2000. A second Addendum report, *Comparative Analysis Of Two Samples From Kreher Park, Ashland, Wisconsin*, was prepared in April, 2001. A third Addendum Report, *Comparative Analysis Of Ten Sediment Samples From Chequamegon Bay, Ashland, Wisconsin* was prepared in May, 2001.

The GC/FID fingerprints of the whole, aliphatic and aromatic portions of all samples tested exhibited characteristics of pyrogenic (substances originating from petroleum created under low temperature conditions, such as fuels, lubricants and derivatives) and petrogenic substances (organics originating from oxygen-depleted high temperature process, such as incomplete combustion, pyrolysis, cracking or destructive distillation) with pyrogenic portions predominating. Both tar and middle weight petroleum distillates are present in all samples, but the ratios of these components vary. Comparing chromatograms of these samples to each other, it is concluded that the samples bear some similarities and some differences to each other. Samples MW-7 and MW-15 are different, both in tar fingerprint and in proportions of aliphatic and aromatic components, as stated in prior reports. Based upon specific compound ratios, however, all tar samples tested appear to be of MGP origin.

From the July 24th and 25th sampling event, the five liquid (water) samples tested exhibited a wide range in percent aromatic component. The sample "Upgradient Riser" consisted of 58.4% aromatic, while MW-7 consisted of 109% aromatic. This percentage in MW-7 is apparently higher than the original sample analysis (NAPL Report) probably due to the low amount of hydrocarbon in this water sample. Thus, the percentage of aromatic and aliphatic hydrocarbon for this sample may not be representative. The Source and Weathering Ratios of the tar samples in this set vary, with none matching. The aliphatic component of this sample set also ranges between 12.4% in "Seep Trench West" and 25.3% in MW-7. The aliphatic portion of MW-7 is consistent with the earlier testing (NAPL Report: 28% aliphatic content). The aliphatic

component in these samples ranges from highly weathered (MW-7) to only mildly weathered (TW-9 and "Upgradient Riser").

From the September 12th and 13th, 2001 sampling event, the four liquid (TW-13 and MW-15: DNAPL; "West Trench Riser" and "Upgradient Riser": water) samples tested exhibited a more consistent range in aromatic and aliphatic components, with the exception of the "Upgradient Riser". Most of the samples in this set consisted of approximately 83% aromatic component; "Upgradient Riser" consisted of 74.1% aromatic. The sample from MW-15 was found to consist of 84.1% aromatic component, consistent with earlier testing of this material (NAPL Report: 84% aromatic content). The Source and Weathering Ratios of this set also vary, although some consistencies may be noted. Most different are samples MW-15 and "Upgradient Riser". This is also evident in the chromatograms for each of these sample fractions. The aliphatic component in these samples is nearly consistent: from 13.1-19.4%. The aliphatic component of MW-15 is also consistent with the earlier analysis (NAPL Report). All samples in this set appear to be moderately weathered.

From the September 19th and 20th, 2001 sampling event, the two liquid ("Clay Tile #1A and Clay Tile #2) and the one soil ("Clay Tile #1B") samples tested were highly similar, with an average of approximately 73% aromatic component and 15% aliphatic component. The Source and Weathering Ratios for these samples are highly similar. The samples appear to be moderately weathered.

Comparison of all samples to the samples MW-7 and MW-15 is difficult and inconclusive. While the chromatograms of many of the tested samples appear to be highly similar to the MW-15 NAPL sample, the Source and Weathering Ratios are not. Similarly, the chromatograms of some of the samples may be more similar to MW-7, without parallels in the Source and Weathering Ratio data. As well, percents of aliphatic and aromatic components are varied. However, MW-7 contains the highest percentage of aliphatic component and MW-15, the least.

INTRODUCTION

Northern States Power Company (NSP) has contracted the Gas Technology Institute (GTI) to determine whether samples retrieved from various locations at the Ashland Lakefront Property, Ashland, Wisconsin are chemically similar or dissimilar to NAPL resides found in wells located at the NSP former MGP site (MW-15) and in an area of reported former wood treatment operations in Kreher Park (MW-7). The samples detailed in this report were retrieved in three separate sampling events: July 24 and 25, September 12 and 13, and September 19 and 20, 2001. The results of this combined analysis of samples serve as an Addendum to the report, *Comparative Analysis of NAPL Residues From The NSP Ashland Former MGP Site And The Ashland Lakefront Property (Kreher Park)* ("NAPL Report", March, 2000).

GTI and its subcontractor (META Environmental, Inc.) have completed forensic analysis of twelve samples, consisting of DNAPL samples, water samples and a soil sample. Analyses of these samples have included identification and/or quantification of: 1) monocyclic aromatic hydrocarbons (MAHs), 2) polycyclic aromatic hydrocarbons (PAHs), and, 3) aliphatic hydrocarbons and polar hydrocarbons. Analyses and hydrocarbon fingerprinting were performed using gas chromatography with flame ionization detection (GC/FID) and GC/MS/SIM (EPA 8260/8270 mod.). The GC/FID analyses are described in the NAPL Report. The purpose of these tests was to determine chemical similarity or dissimilarity between all samples tested here, and between these samples and previously described NAPL samples from wells MW-15 and MW-7 (NAPL Report.) Results of all sample analyses are included in this Addendum Report, with expanded analytical data detailed in Appendices A, B and C of this Addendum Report.

SITE BACKGROUND

Complete site background can be found in the original NAPL Report, March, 2000.

METHODS

Sample collection was performed by URS; a map of the sampling locations can be found in Figure 1. According to URS, three sampling events occurred: on July 24 and 25, on September 13 and 14, and on September 19 and 20, 2001.

Samples "Seep Trench West", MW-7, TW-9 "Upgradient Riser" and "Clay Pipe" were collected on July 24 and 25, 2001. All were water samples. Samples TW-13, MW-15, "West Trench Riser" and "Upgradient Riser" were collected on September 12 and 13, 2001. The samples TW-13 and MW-15 were non-aqueous phase liquids (NAPL) samples; "West Trench Riser" and "Upgradient Riser" were water samples. Samples "Clay Tile #1A", "Clay Tile #1B" and "Clay Tile #2" were collected on September 19 and 20, 2001. The sample "Clay Tile #1A" and "Clay Tile #2" were water samples; sample "Clay Tile #1B" was a soil sample.

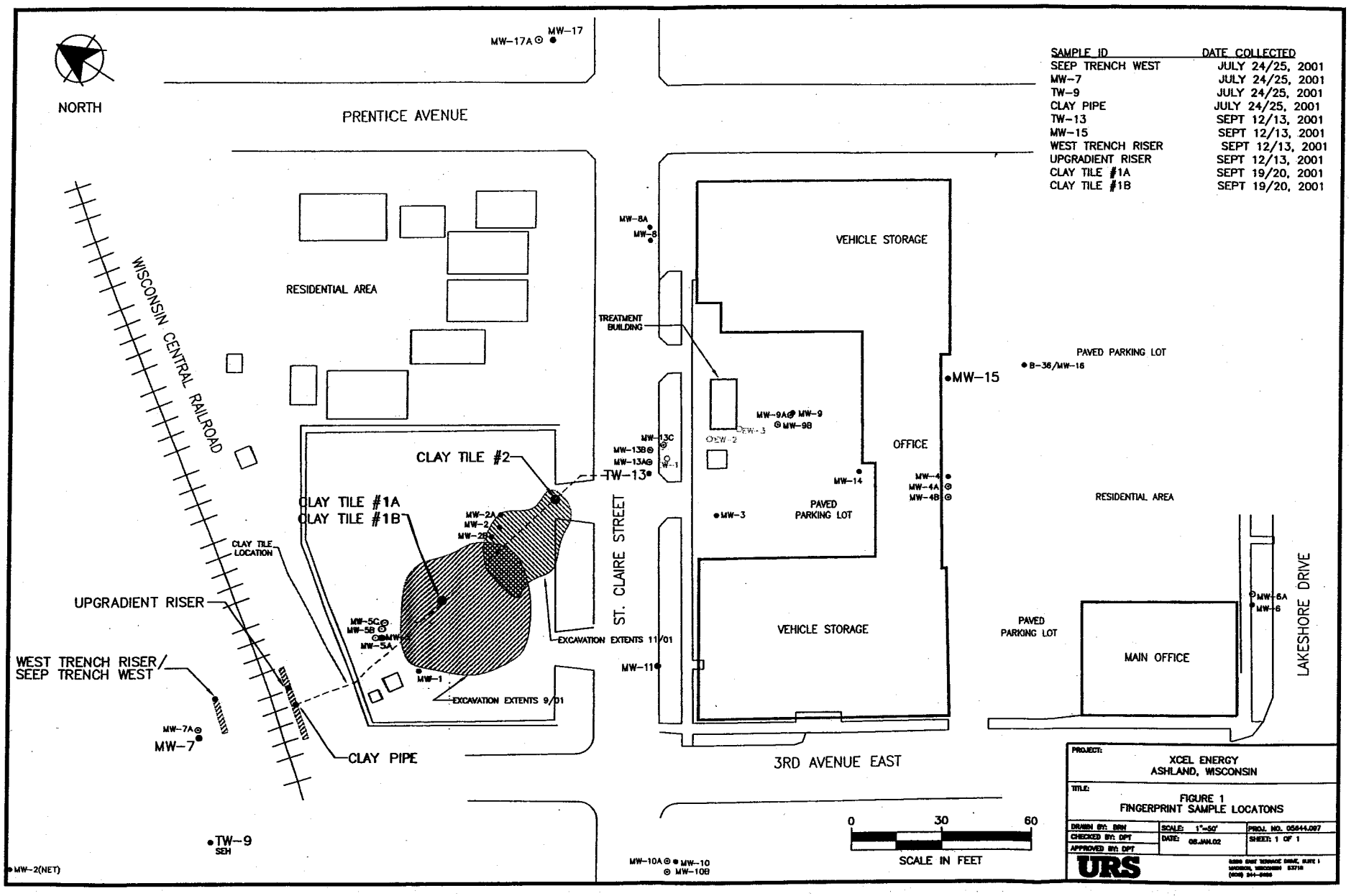
The aqueous samples were prepared for analysis by liquid:liquid extraction (EPA 3511 Draft) using dichloromethane (DCM) (EPA 3510 mod.) The NAPL samples were prepared by waste dilution (EPA 3580) to a 5 mg/ml concentration in DCM. The soil sample was prepared by solvent extraction using DCM (Draft EPA Method 3570 mod.) The extracts were then dried with sodium sulfate and concentrated to known final volumes. A portion of each extract was spiked with internal standard and analyzed by gas chromatography with flame ionization detection (GC/FID) (EPA 8100 mod.) and GC/MS/SIM (EPA 8260/8270 mod.).

An additional portion of each extract was silica gel fractionated (simulated distillation) into aliphatic, aromatic, and polar fractions (EPA 3630 mod.). Each fraction was analyzed by GC/FID (EPA 8100 mod.)

A chromatographic fingerprint was obtained from each sample using GC/FID, identifying and/or quantifying each of the compound classes: 1) monocyclic hydrocarbons (MAHs), 2) polycyclic aromatic hydrocarbons (PAHs), and, 3) aliphatic hydrocarbons and polar hydrocarbons.

Source and Weathering Ratios were obtained by comparing the concentrations of a particular organic species against another selected organic species. The compounds selected for this comparison are considered highly recalcitrant and persistent in the environment under a variety of site conditions. These ratios of certain PAHs and alkylated PAHs can be used as indicators of the source of the material. The Source and Weathering ratios therefore removes specific compound concentration from the analysis and focuses on the patterns of the compound ratios. This is important because it eliminates effects often associated with batch to batch variability and weathering of the material. Additionally, the specific ratios selected have been reported in literature or identified as consistent indicators of the type of production process used in generation of the waste.

The results of the analyses are included in this Addendum report, with expanded analytical data detailed in Appendices A, B and C of this Addendum report.



SAMPLE ID	DATE COLLECTED
SEEP TRENCH WEST	JULY 24/25, 2001
MW-7	JULY 24/25, 2001
TW-9	JULY 24/25, 2001
CLAY PIPE	JULY 24/25, 2001
TW-13	SEPT 12/13, 2001
MW-15	SEPT 12/13, 2001
WEST TRENCH RISER	SEPT 12/13, 2001
UPGRADIENT RISER	SEPT 12/13, 2001
CLAY TILE #1A	SEPT 19/20, 2001
CLAY TILE #1B	SEPT 19/20, 2001

PROJECT: XCEL ENERGY
ASHLAND, WISCONSIN

TITLE: FIGURE 1
FINGERPRINT SAMPLE LOCATONS

DRAWN BY: BRN
CHECKED BY: DPT
APPROVED BY: DPT
SCALE: 1"=50'
DATE: 08.JAN.02
PROJ. NO. 05644.097
SHEET: 1 OF 1

URS

FILE: S:\CADDFILES\NSP\GTL_SAMPLE_LOCATIONS

RESULTS

July 24 and 25, 2001 Sampling Event:

The GC/FID fingerprint data from this sampling event, including the liquid (water) samples "Seep Trench West", MW-7, TW-9 "Upgradient Riser" and "Clay Pipe", shows that there was variability in the aromatic (tar) components and in the Source and Weathering Ratios. Particular observations drawn from the results are as follows:

- The five liquid (water) samples tested exhibited a wide range in percent aromatic component. The sample "Upgradient Riser" consisted of 58.4% aromatic, while MW-7 consisted of 109% aromatic. This percentage in MW-7 is apparently higher than the original sample analysis (NAPL Report) probably due to the low amount of hydrocarbon in the water sample. For example, the total area of aliphatic fraction recovered by pentane extraction on a silica gel was only 1.5 times the baseline area (see *Discussion of Results*, below). Similarly, the total area of the aromatic fraction recovered by methylene chloride extraction was only 2.6 times the baseline. Bias introduced from the subtraction of baseline areas and standard areas from the total area are highest at these low levels. Thus, the percentages of aromatic and aliphatic fractions for this sample, MW-7, may not be representative.

- The aliphatic component of this sample set ranges between 12.4% in "Seep Trench West" and 25.3% in MW-7. The aliphatic portion of MW-7 is consistent with the earlier testing (NAPL Report: 28% aliphatic content).

- The Source and Weathering Ratios of the tar samples in this set vary, with none matching. All appear to be in the range indicating an MGP-type tar.

- The aliphatic component in these samples ranges from highly weathered (MW-7) to only mildly weathered (TW-9 and "Upgradient Riser").

- The GC/FID fingerprints of the whole extracts of the samples "Seep Trench West", TW-9, "Upgradient Riser" and "Clay Pipe" are similar (not identical), exhibiting a tar-like pattern. The tar fingerprints of samples "Upgradient Riser" and "Clay Pipe" are most similar in this set. The GC/FID fingerprint of the whole extract of the sample MW-7 is somewhat different than the other samples in this set.

Specific laboratory results of this sampling event are detailed in Appendix A of this report.

September 12th and 13th, 2001 Sampling Event:

The GC/FID fingerprint data from this sampling event, including the two liquid (NAPL) samples TW-13 and MW-15 and the two liquid (water) samples "West Trench Riser" and

"Upgradient Riser" exhibited a more consistent range in aromatic and aliphatic component percentages, with the exception of the "Upgradient Riser" sample. Variability exists in the Source and Weathering Ratios. Particular observations drawn from the results are as follows:

- The four liquid samples tested exhibited a more consistent range in aromatic and aliphatic components, with the exception of the "Upgradient Riser". Most of the samples in this set consisted of approximately 83% aromatic component; "Upgradient Riser" consisted of 74.1% aromatic. The sample from MW-15 was found to consist of 84.1% aromatic component. This is consistent with test results detailed in the NAPL Report, which indicated that material from this well consisted of 84% aromatic component.

- The aliphatic component in these samples is nearly consistent: from 13.1-19.4%. The aliphatic component of MW-15 (13.1%) is consistent with the earlier analysis (NAPL Report: 9.8% aliphatic content).

- The Source and Weathering Ratios of this set also vary, although some consistency may be noted. Most different are samples MW-15 and "Upgradient Riser". All ratios are consistent with MGP-type tar.

- The GC/FID fingerprints for the whole extracts of the samples TW-13 and MW-15 are similar, exhibiting tar-like patterns. The GC/FID fingerprints for the whole extracts of samples "West Trench Riser" and "Upgradient Riser" are similar, also exhibiting tar-like patterns. Sample "West Trench Riser" and the previously tested "Seep Trench West" are very similar. This is consistent with sampling locations. However, the aromatic and aliphatic fingerprints of "Upgradient Riser" from the July 24/25 sampling is different from this "Upgradient Riser" sample. The aromatic fraction of "West Trench Riser" and "Upgradient Riser" are different from the aromatic fractions seen in samples TW-13 and MW-15.

- All samples in this set appear to be moderately weathered.

Specific laboratory results of this sampling event are detailed in Appendix B of this report.

September 19th and 20th, 2001 sampling event:

The GC/FID fingerprint data from this sampling event, including the two liquid (water) samples, "Clay Tile #1A" and "Clay Tile #2", and the one soil sample, "Clay Tile #1B", were highly similar in percentage of aromatic and aliphatic components. There is little variability in the Source and Weathering Ratios. Particular observations drawn from the results are as follows:

- The samples tested in this set were highly similar in GC/FID fingerprinting patterns, exhibiting tar-like patterns.

- The percentages of aromatic and aliphatic components within this sample set are highly consistent, with approximately 73% aromatic component and 15% aliphatic component.
- The Source and Weathering Ratios for these samples are highly similar.
- The samples appear to be moderately weathered.

Specific laboratory results of this sampling event are detailed in Appendix C of this report.

DISCUSSION OF RESULTS

A summary of testing results from all sampling events is indicated the following:

1) The fingerprints of the aromatic components (tar) from all samples tested during the three sampling events range from highly similar to each other and to different from each other. The tar fingerprints from samples MW-15 and MW-7 are most dissimilar, with the samples "Clay Tile #1A", "Clay Tile #1B" and "Clay Tile #2" being most similar. All fingerprints are consistent with MGP-type tar.

2) The quantity (percentage) of aromatic compounds in the samples vary between 109% (MW-7) to 58.4% ("Upgradient Riser", July sampling). Nearly all environmental measurements have an inherent variability of 10% or more. Further, the aromatic recovery of 109% in sample MW-7, as well as the total recovery (aromatic and aliphatic fractions) of 134% in this sample, is likely due to the relatively low amount of organic material in the sample. The calculations are based on the total chromatographic area (the area under the chromatogram) corrected for the baseline rise and QC compounds (surrogates and internal standards). The area under the chromatogram is obtained by integration using a level line drawn from just after the solvent peak (the wide peak at the beginning of the chromatogram) to the time point where the normal alkane hexatriacontane (C36) eluted in the standard. The baseline rise correction area is obtained using a solvent blank integrated by the same method. This correction is necessary to account for changes in the baseline (the instrument signal when no peaks are eluting) as the run progresses and the temperature increases. For sample MW-7, the total area of the aliphatic fraction was only 1.5 times the area under the baseline rise and the total area of the aromatic fraction was only 2.6 times the baseline rise. After all corrections, the areas used to calculate the aromatic and aliphatic fractions are 54% and 21%, respectively, of the original areas. This can be contrasted with sample TW-9 which had corrected areas of 93% and 98% of the originals, respectively. Subtracting such a large portion of any measurement significantly reduces the precision of that measurement. A reasonably analogy would be weighing something relatively light by stepping on a bathroom scale while holding the object and then subtracting your body weight.

3) The most variability exists in sample set collected during the July 24th and 25th (MW-7: 109% to "Upgradient Riser": 58.4%). Samples collected during the September 19th and 20th event were most similar, at approximately 73% aromatic component. All samples collected during the September 12th and 13th sampling event were also very similar in aromatic (approximately 83%), with the exception of sample "Upgradient Riser" (74.1% aromatic). Samples "Seep Trench West" (81.7% aromatic) and "West Trench Riser" (82.9%) are nearly consistent in percentages of this fraction. The two "Upgradient Riser" samples from the different sampling events are less similar: July sampling: 58.4% aromatic; September sampling: 74.1% aromatic content.

4) The quantity (percentage) of aliphatic compounds in all samples vary less than the aromatic fractions, but fluctuations can be seen. Sample MW-15 consists of only 13.1% aliphatic component, while sample MW-7 consists of 25.3% aliphatic component. Sample TW-9 also

consists of a higher percentage of aliphatic content (21.1%). Samples "Seep Trench West" and "West Trench Riser" are similar in content of aliphatic fraction (12.4% and 13.8%, respectively). This is consistent with sample locations. Samples of "Upgradient Riser" from the two sampling events were nearly consistent (17.6% and 19.4% aliphatic fraction). Analysis of the aliphatic component associated with samples MW-15 and MW-7 are consistent with the original testing of these NAPL materials (NAPL Report– MW-15: 9.8% aliphatic and MW-7: 28%).

5) The aliphatic component in all samples tested ranges from severely weathered (MW-7) to mildly weathered.

6) The Source and Weathering Ratios for all samples varies from highly similar to dissimilar within specific ratios. It is apparent that although the chemical fingerprint of the specific sample is similar to another in the composite set, the Source and Weathering Ratios may be different for the same sample comparison.

CONCLUSIONS

The GC/FID fingerprints of the whole, aliphatic and aromatic portions of all samples tested exhibited characteristics of pyrogenic (substances originating from petroleum created under low temperature conditions, such as fuels, lubricants and derivatives) and petrogenic substances (organics originating from oxygen-depleted high temperature process, such as incomplete combustion, pyrolysis, cracking or destructive distillation), with pyrogenic portions predominating. Both tar and middle weight petroleum distillate are present in all samples, but ratios of these components vary considerably. Comparing chromatograms of these samples to each other, it is concluded that the samples bear some similarities and some differences to each other. Samples MW-7 and MW-15 are different, both in tar fingerprint and in proportions of aliphatic and aromatic components, as stated in prior reports. Based upon specific compound ratios, however, all tar samples tested appear to be of MGP origin.

Comparison of all samples tested to the samples MW-7 and MW-15 is difficult and inconclusive. While the chromatograms of some of the tested samples may appear to be highly similar to the MW-15 NAPL, the Source and Weathering Ratios are not. Similarly, the chromatograms of some of the samples may be more similar to MW-7, without parallels in the Source and Weathering Ratio data. As well, percents of aliphatic and aromatic components are varied. However, MW-7 contains the highest percentage of aliphatic component and MW-15, the least.

Some of this variability may be due to the sample matrix tested. While most of the samples retrieved for tested were "liquid", most were water samples. Testing of DNAPL material within a water matrix can present some difficulty, as aromatic organics possess a higher range of solubility in the water as compared to aliphatic compounds of similar molecular weight, while others may be removed by "sinking". This is also true of contaminants adhered to a soil matrix (one sample in this set). Consequently, the final chromatogram picture of a water sample may resemble, but not match, the original DNAPL contaminant material. Only two of the samples were "source material" or DNAPL. In these samples, the chemical fingerprint should most resemble the original contaminant material, without "matrix effects". This can be seen for sample MW-15, where the fingerprints as well as fractionation data is highly consistent with previous reporting (NAPL Report). The other NAPL sample is TW-13, not tested as part of the earlier work.

Variability in water samples (and to a lesser degree, DNAPL material) may also be due to the degree of weathering to which the sample was subjected over time. While this fulfills some explanation of sample dissimilarities, it does not completely explain the differences in the test results.

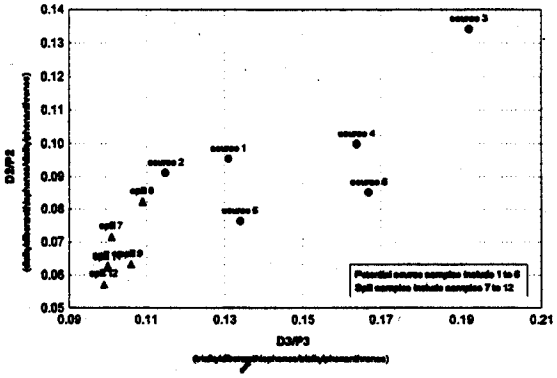
Based on the results of analyses performed on the samples collected as part of the three sampling events described here and in comparison with reference standards, GTI concludes that the tar component in the samples are of MGP origin, with wide ranging characteristics.

Environmental Forensic Report

Five Liquid Samples

SDG: IG010727

Figure 1. Double Ratio Plot



Report To:

Gas Technology Institute
1700 S. Mt. Prospect Road
Des Plaines, IL 60018

Report By:

META Environmental, Inc.
49 Clarendon Street
Watertown, MA 02472

September 20, 2001

Identifying and allocating sources of pollutants in complex environments.

META Environmental, Inc.
ENGINEERING & CHEMISTRY

APPENDIX A

Final Laboratory Report

META Environmental, Inc.
49 Clarendon Street
Watertown, MA 02472

Phone: 617-923-4662
Fax: 617-923-4610
e-Mail: metaenv@aol.com

Certification

This certifies that this package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed herein. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Director and Quality Assurance Officer, as verified by the following signatures.

David R. Craig — Date: 9/20/01
Laboratory Director, META Environmental, Inc.

David M. Mauro — Date: 9/20/01
Quality Assurance Officer, META Environmental, Inc.

Sample Delivery Group Narrative

Project: Ashland MGP Site Forensic Analyses

Client: Gas Technology Institute
1700 S. Mt. Prospect Road
Des Plains, IL 60018

Report Contact: Dr. Diane Saber

Date of Receipt: 7/27/01

Sample Summary:

The samples received for this project are summarized in the attached sample login forms.

META Project Number: I05001-60

Chain of Custody

Samples were received in good condition. The internal temperatures of the shipment containers were as follows:

Samples received 7/27/2001 -1.2°C

Internal chain of custody procedures were followed after sample receipt. Samples were stored in a locked refrigerator. A sample custody logbook contains the record of sample removal from the secure sample storage area to the sample preparation laboratory. The custody record for the sample extracts is present on the sample extraction logbook page.

The disposal of samples and extracts will be authorized 1 month after the release of this data report. Sample disposal will be documented.

Methods

The aqueous samples were prepared by liquid:liquid extraction using dichloromethane (DCM) (EPA 3511 Mod.). The extracts were spiked with internal standard and analyzed by GC/FID (EPA 8100 mod.) and GC/MS/SIM (EPA 8260/8270 mod.).

Subsequently, a portion of each extract was fractionated into aliphatic, aromatic, and polar fractions using silica gel column chromatography (EPA 3630 mod.). Each fraction was analyzed by GC/FID (EPA 8100 mod.).

Results

Sample results were presented in summary forms (CLP Form 1 equivalent) which follow this narrative.

Quality Control

Analyte Flags

The detection limits were determined as the sample equivalent of the lowest linear initial calibration standard. Analytes measured between 50% and 100% of the lowest standard were reported as "estimated" and flagged with the letter "J." No value was reported above the calibration range. Undetected analytes were flagged with the letter, "U." Analytes marked with a "B" were detected in the associated blank and should be reviewed for a possible positive bias. No deviations were thought significant enough to compromise the integrity of the reported values.

Holding Times

All samples were extracted within holding times. All samples and extracts were stored at 4°C ± 2°C prior to extraction and analysis. All extracts were analyzed within 40 days of sample preparation.

Surrogate Spikes

Extraction surrogates were added to each sample prior to extraction. Fractionation surrogates were added to all extracts prior to fractionation. Recoveries for all surrogates are reported with the sample results. All surrogate recoveries in the unfractionated extracts were within QC limits with the exception of fluorobenzene in sample "Upgradient Riser". This low recovery may be indicative of volatile loss, but does not effect the interpretation of the results.

Blanks
No target analytes were present above the detection limit in the blank

Internal Standards
Internal standards were recovered within acceptable QC limits (50%-200%) relative to the continuing calibration standards.

Interpretation

The GC/FID fingerprints of the whole, aliphatic, and aromatic portions of the five samples were very similar. All the samples exhibited characteristics of pyrogenic and petrogenic substances, with the pyrogenic portion predominant. The substantial amounts of parent PAHs (e.g., naphthalene, phenanthrene, pyrene) indicated the presence of tar. However, the unresolved complex mixture (UCM or "hump") centered around about 17 minutes and the numerous small peaks from about 10 minutes to about 25 minutes indicated the presence of a middle distillate of petroleum.

The aliphatic fractions of all the samples showed a middle distillate of petroleum. The low abundance of normal alkanes relative to the isoprenoid hydrocarbons, pristane and phytane, indicated moderate weathering.

Table 1 presents the total hydrocarbon concentrations of the whole, aliphatic, and aromatic portions of each sample.

Finally, relatively low amounts of some compounds were detected in the polar fractions of each sample. However, most of material in the polar fractions was aromatic compounds that were not fully recovered in the aromatic fraction.

Table 1
Aliphatic and Aromatic Hydrocarbons in NAPL Samples

Sample	TEH (mg/L)	Aliphatic (mg/L)	Aromatic (mg/L)	% Aliphatic	% Aromatic
Seep trench west	7,860	975	6420	12.4	81.7
MW-7	19.3	4.89	21.1	25.3	109
TW-9	1,050	222	763	21.1	72.7
Upgradient Riser	1,190	209	695	17.6	58.4
Clay Pipe	162	29.3	118	18.1	72.9

TEH – total extractable hydrocarbons

References

1 "Chemical Source Attribution at Former MGP Sites," EPRI Report 1000728, December 2000.

Table 1
Source and Weathering Ratios

Sample	Fl/Py	D/F	C17/Pris	C18/Phy	Pris/Phy	C3D/C3PA	C2D/C2PA	N/P
Seep trench west	0.72	0.21	1.03	0.92	1.11	0.86	0.38	0.89
MW-7	0.69	0.26	0.08	0.07	0.99	1.08	0.46	0.84
TW-9	0.66	0.04	0.09	0.10	1.14	0.87	0.23	2.00
Upgradient Riser	0.68	0.16	0.70	0.58	1.06	0.96	0.35	1.64
Clay pipe	0.76	0.22	0.49	0.40	0.96	0.85	0.36	1.43

Ratios:

Fl/Py	fluoranthene/pyrene
D/F	dibenzofuran/fluorene
C17/Pris	septadecane/pristane
C18/Phy	octadecane/phytane
Pris/Phy	pristane/phytane
C3D/C3PA	trialkyldibenzothiophenes/trialkylphenanthrenes/anthracenes
C2D/C2PA	dialkyldibenzothiophenes/dialkylphenanthrenes/anthracenes
N/P	Naphthalene/Phenanthrene

Appendix A

Chains of Custody

META ENVIRONMENTAL SAMPLE RECEIPT

Lab ID	Field ID	Matrix	Analysis	Date Sampled	Date Received	Client/ Project	Container/ Storage
IG010727-02a,b	Seep trench west	Water	2005/4007	07/24/01	07/27/01	I05001-60	2oz. Jar
IG010727-03a,b	MW-7	Water	2005/4007	07/24/01	07/27/01	I05001-60	2oz. Jar
IG010727-04a,b	TW-9	Water	2005/4007	07/24/01	07/27/01	I05001-60	2oz. Jar
IG010727-05a,b	Upgradient Riser	Water	2005/4007	07/24/01	07/27/01	I05001-60	2oz. Jar
IG010727-06a,b	Clay pipe	Water	2005/4007	07/25/01	07/27/01	I05001-60	2oz. Jar

Dwory 7/27/01

Job No. 05644-098

CHAIN OF CUSTODY RECORD

GENERATOR INFORMATION

Facility NSP - Ashland Lakefront Site IGU0727-01

Address 301 Lakeshore Dr.

Ashland, WI 54806

Telephone ( )

SAMPLE INFORMATION

No.	~~DEPTH~~ ID #	TYPE	DATE	TIME
1 -02	seep trench west	oil tar water	7/24/01	14
2 -03	MW-7			14
3 -04	TW-9			14 30
4 -05	upgradient riser			14 4
5 -06	clay pipe		7/25/01	15 45

COLLECTOR INFORMATION

Collected by Derek Zoellner / URS Corp.

Address 5250 E. Terrace Dr. Ste I

Madison, WI 53718

Telephone (608) 244-5656

Suspected Waste Constituents Analyze for Modified 8100 Fingerprint Analysis. Send results to Dave Trainor at URS Corp at above address.

Field Conditions/Remarks

SAMPLE ALLOCATION

Name

Address

Telephone ( )

_____ sample received intact

_____ sample received damaged or missing (describe on back)

(Signature) (Date)

CHAIN OF POSSESSION

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
1. [signature]	7/26/01	0830	[signature]	7/27/01	4:30pm
2.					Temp: - -1
3.					
4.					

Distribution

White-w/shipment-for consignee files

Blue-w/shipment-forward to Dames & Moore

Attn: Dave Mauro

Pink-with report

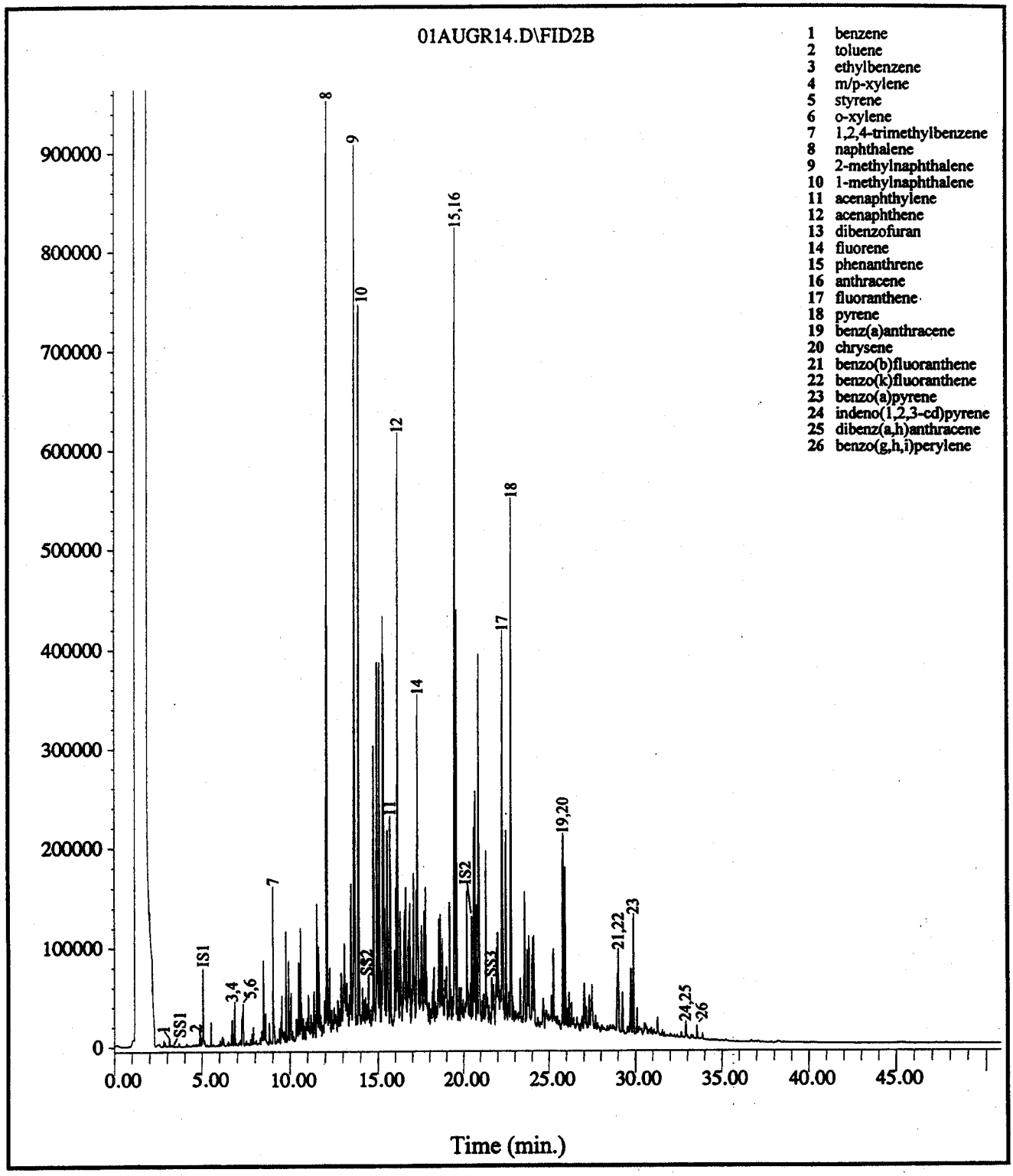
Goldenrod-Dames & Moore - Job File

Dames & Moore

Appendix B

GC/FID Fingerprints

GC/FID Fingerprint

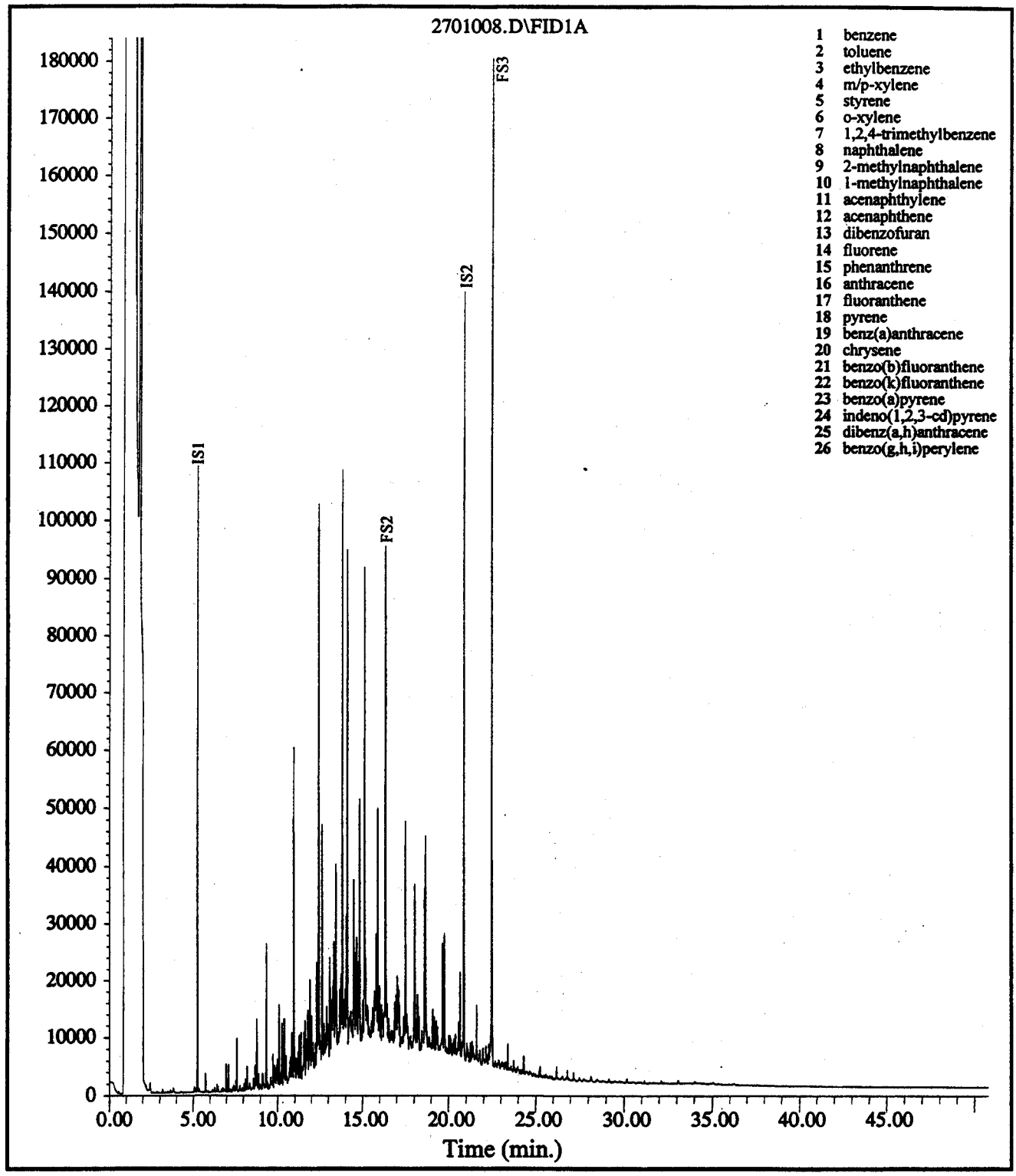


IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane

Field ID:	**Seep trench west**
Laboratory ID:	IG010727-02
Method:	MET4007D

META

GC/FID Fingerprint



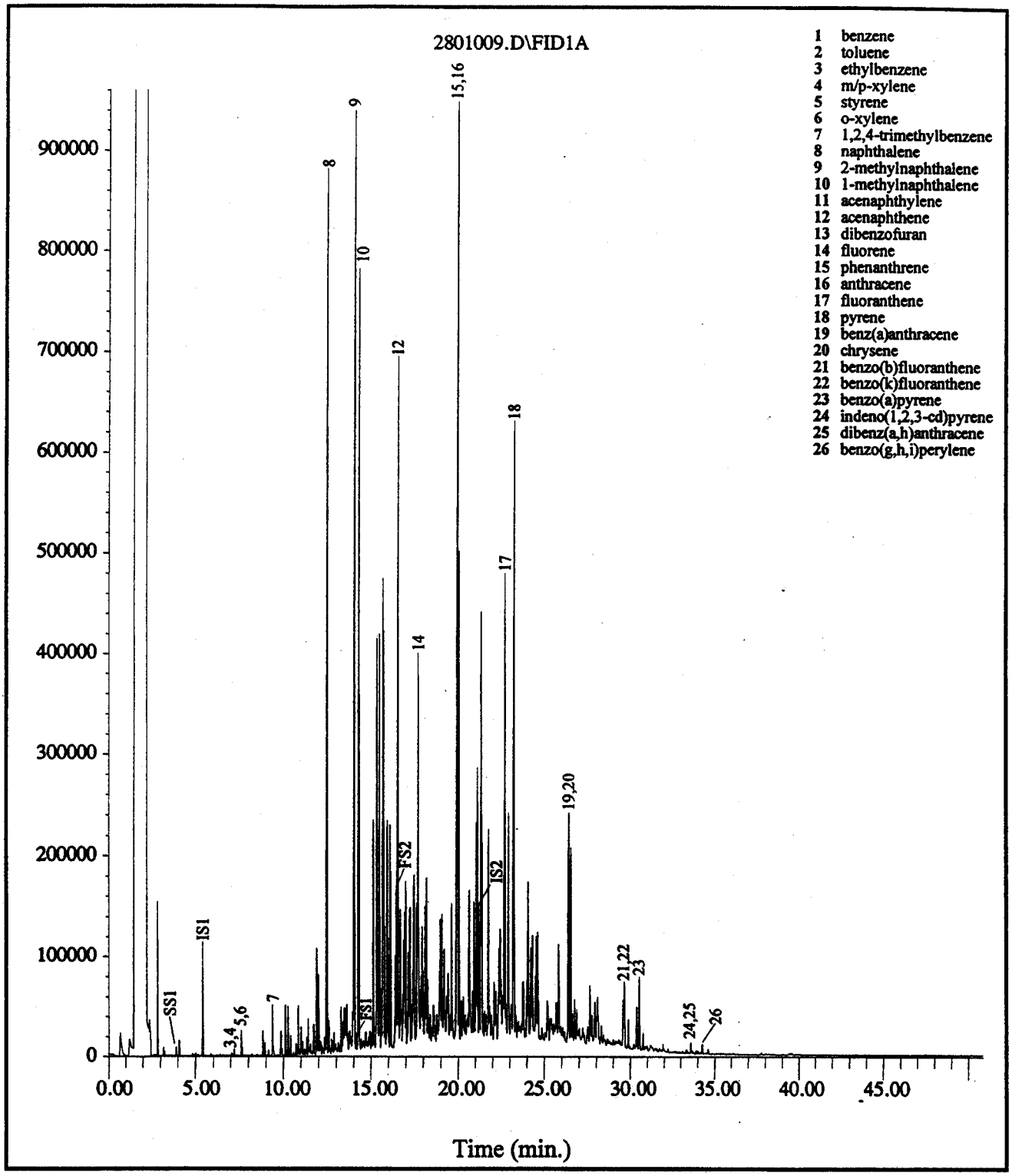
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	**Seep Trench West**
Laboratory ID:	IG010727-02PF
Method:	MET4007

IG010727.ppt

META

GC/FID Fingerprint



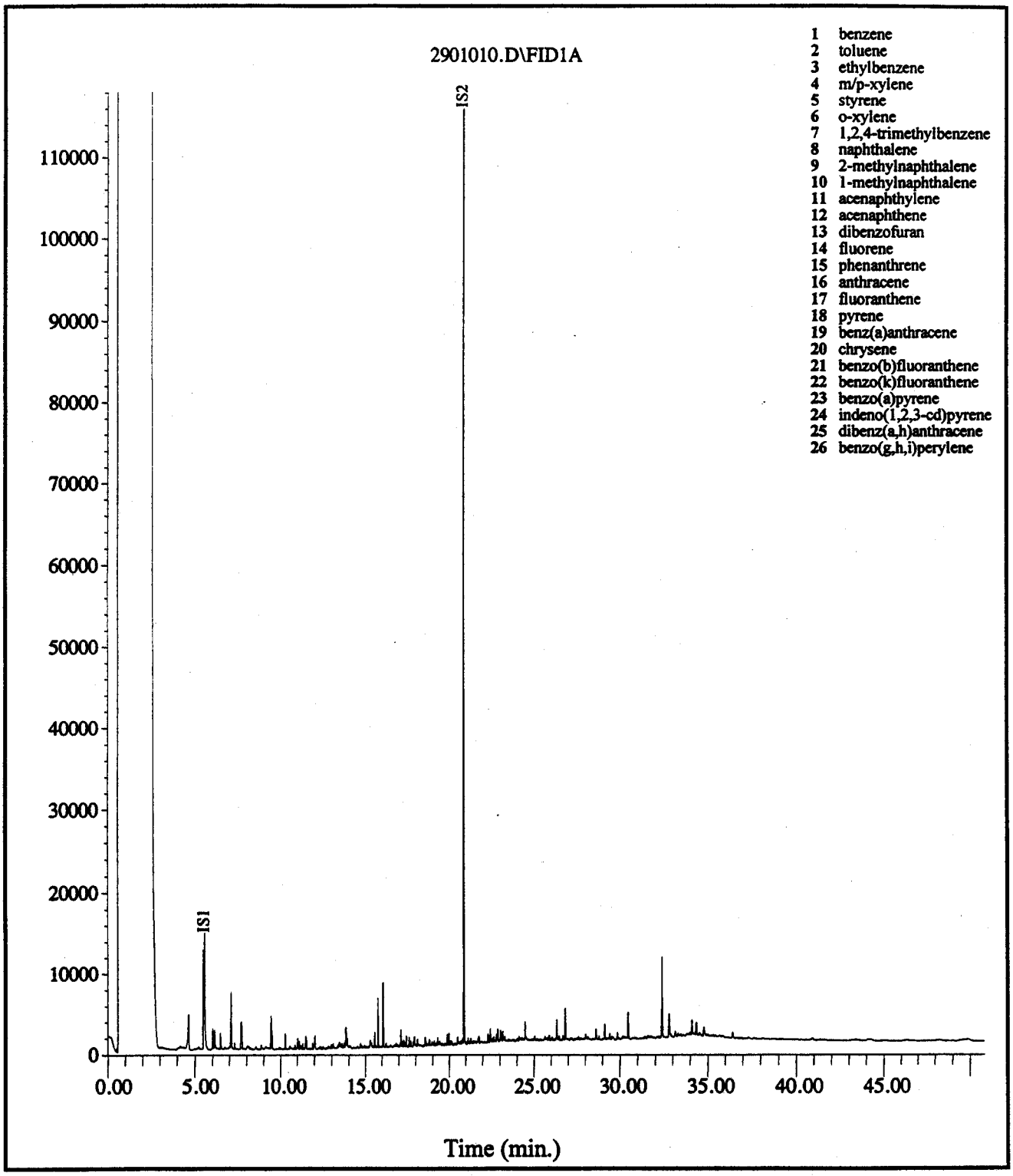
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	**Seep Trench West**
Laboratory ID:	IG010727-02DF
Method:	MET4007

IG010727.ppt

META

GC/FID Fingerprint



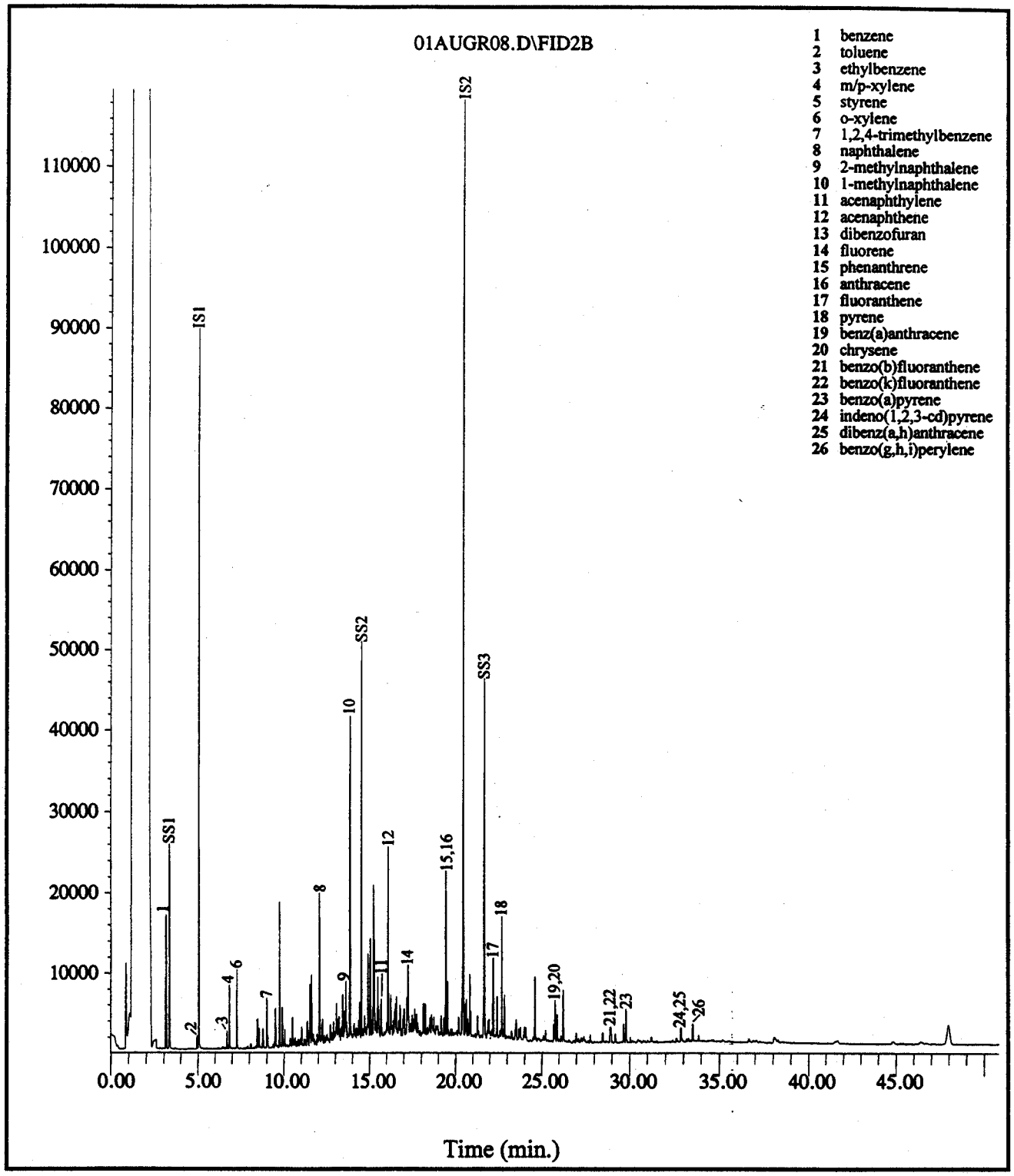
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	**Seep Trench West**
Laboratory ID:	IG010727-02MF
Method:	MET4007

IG010727.ppt

META

GC/FID Fingerprint



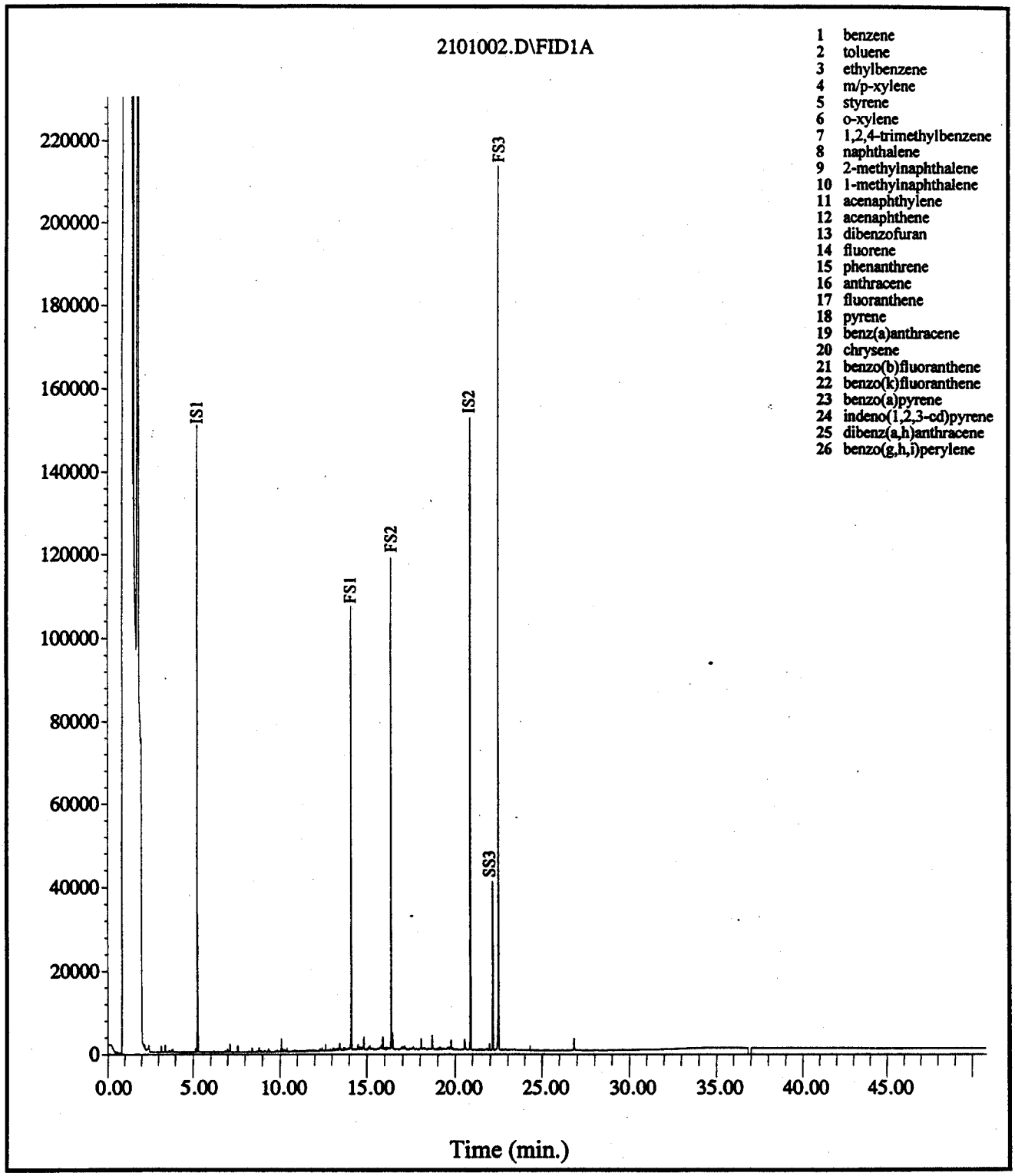
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane

Field ID:	MW-7
Laboratory ID:	IG010727-03
Method:	MET4007D

ig0727.ppt

META

GC/FID Fingerprint



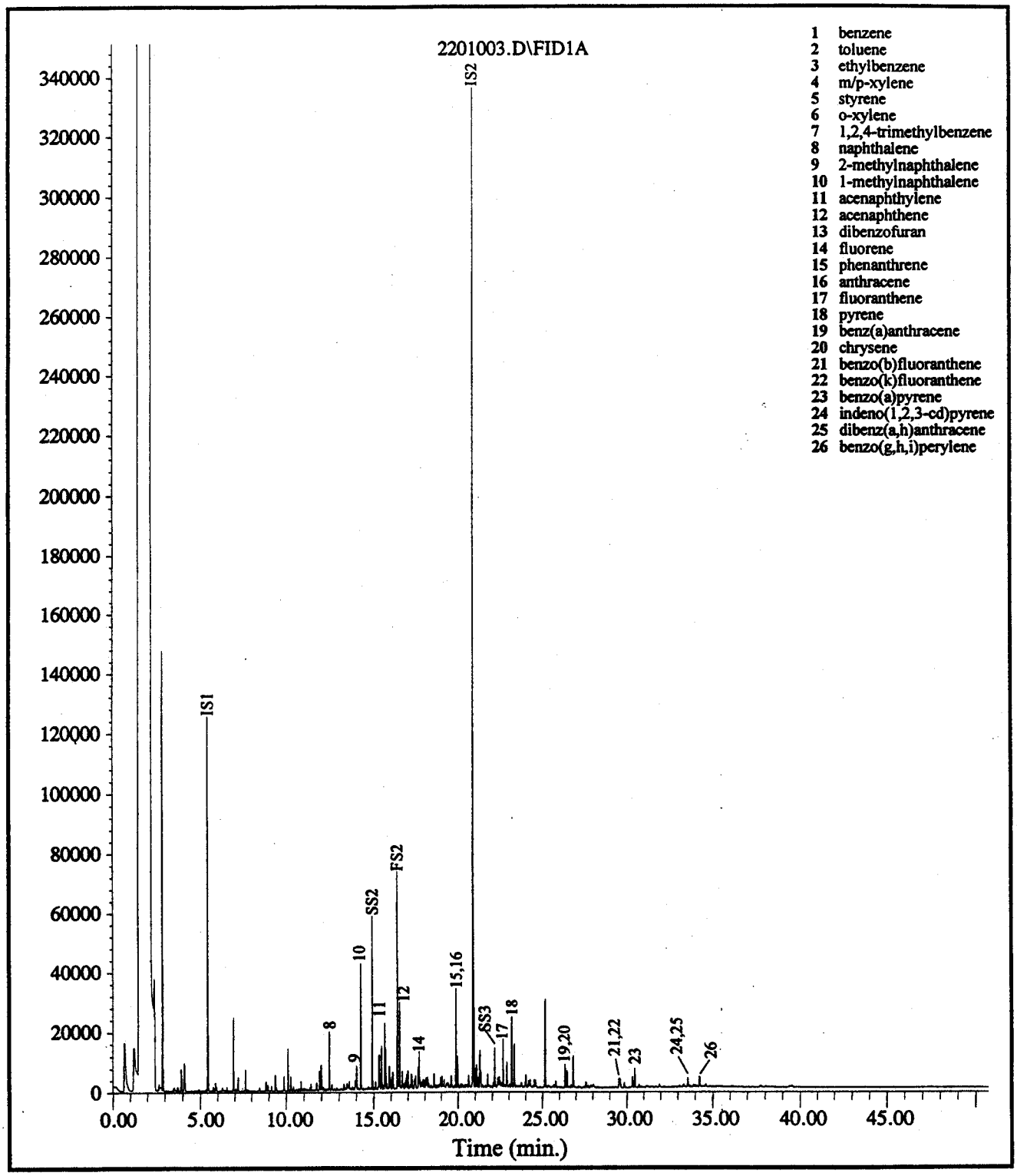
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	MW-7
Laboratory ID:	IG010727-03PF
Method:	MET4007

IG010727.ppt

META

GC/FID Fingerprint



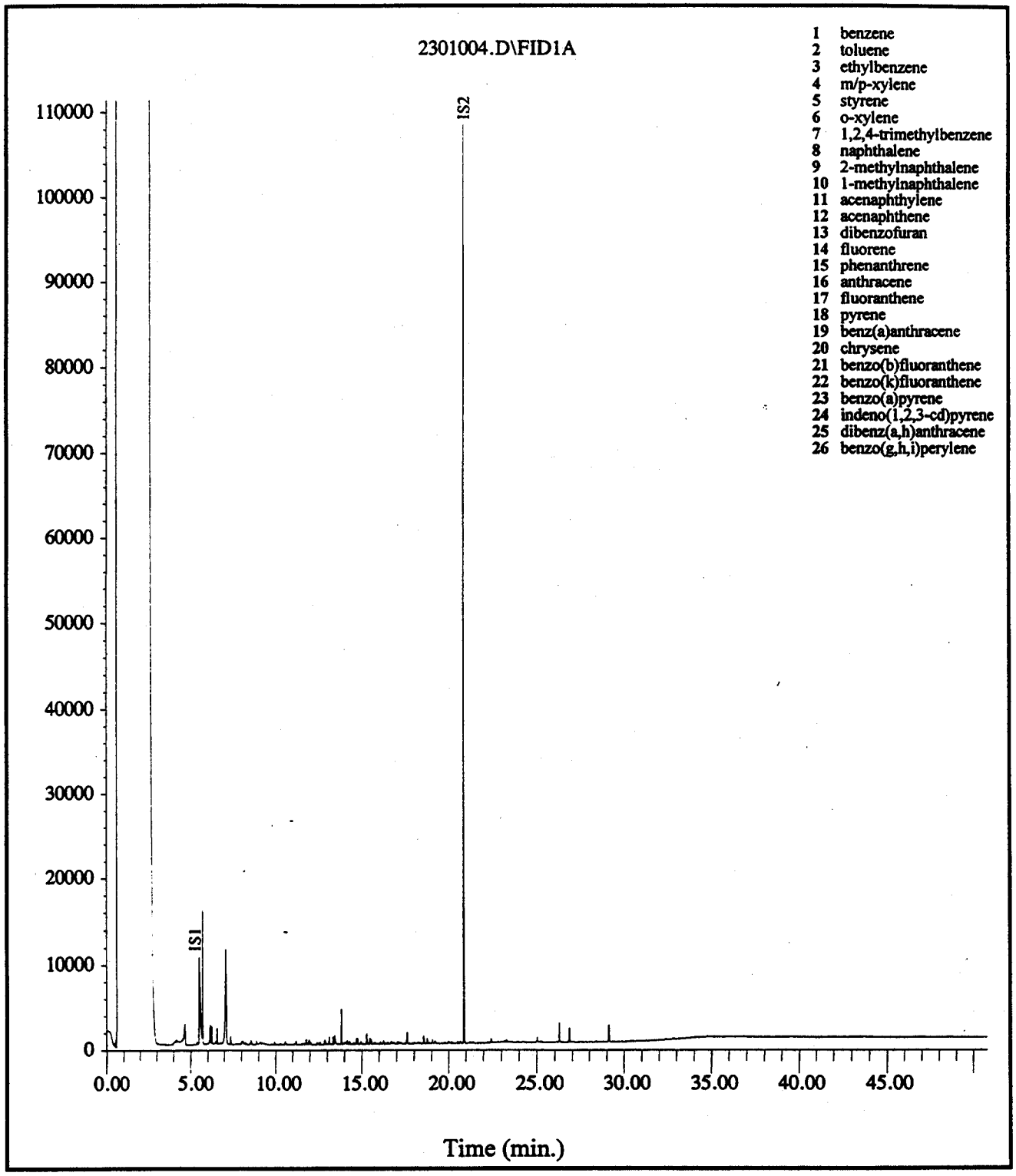
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	MW-7
Laboratory ID:	IG010727-03DF
Method:	MET4007

IG010727.ppt

META

GC/FID Fingerprint



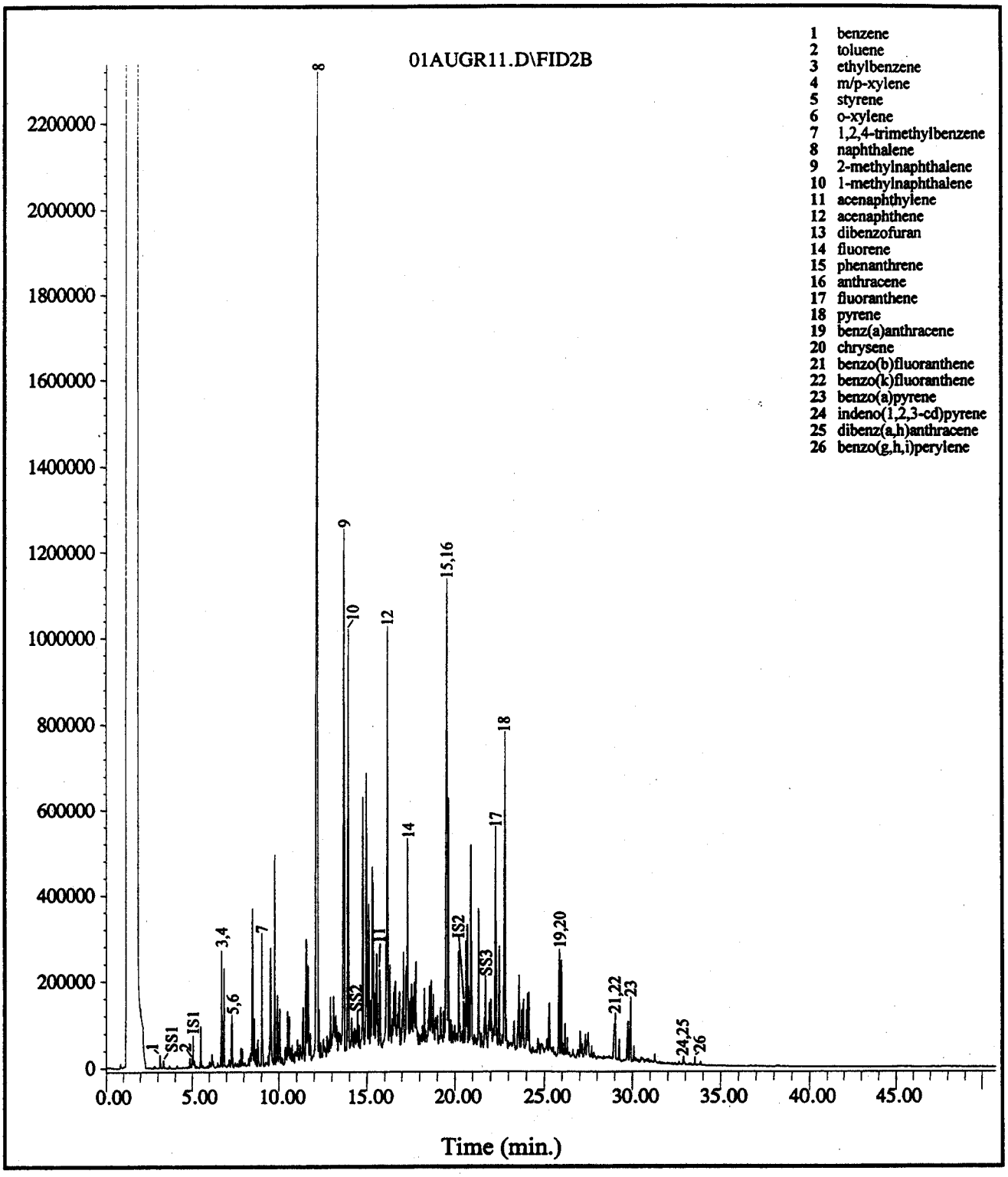
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	MW-7
Laboratory ID:	IG010727-03MF
Method:	MET4007

IG010727.ppt

META

GC/FID Fingerprint



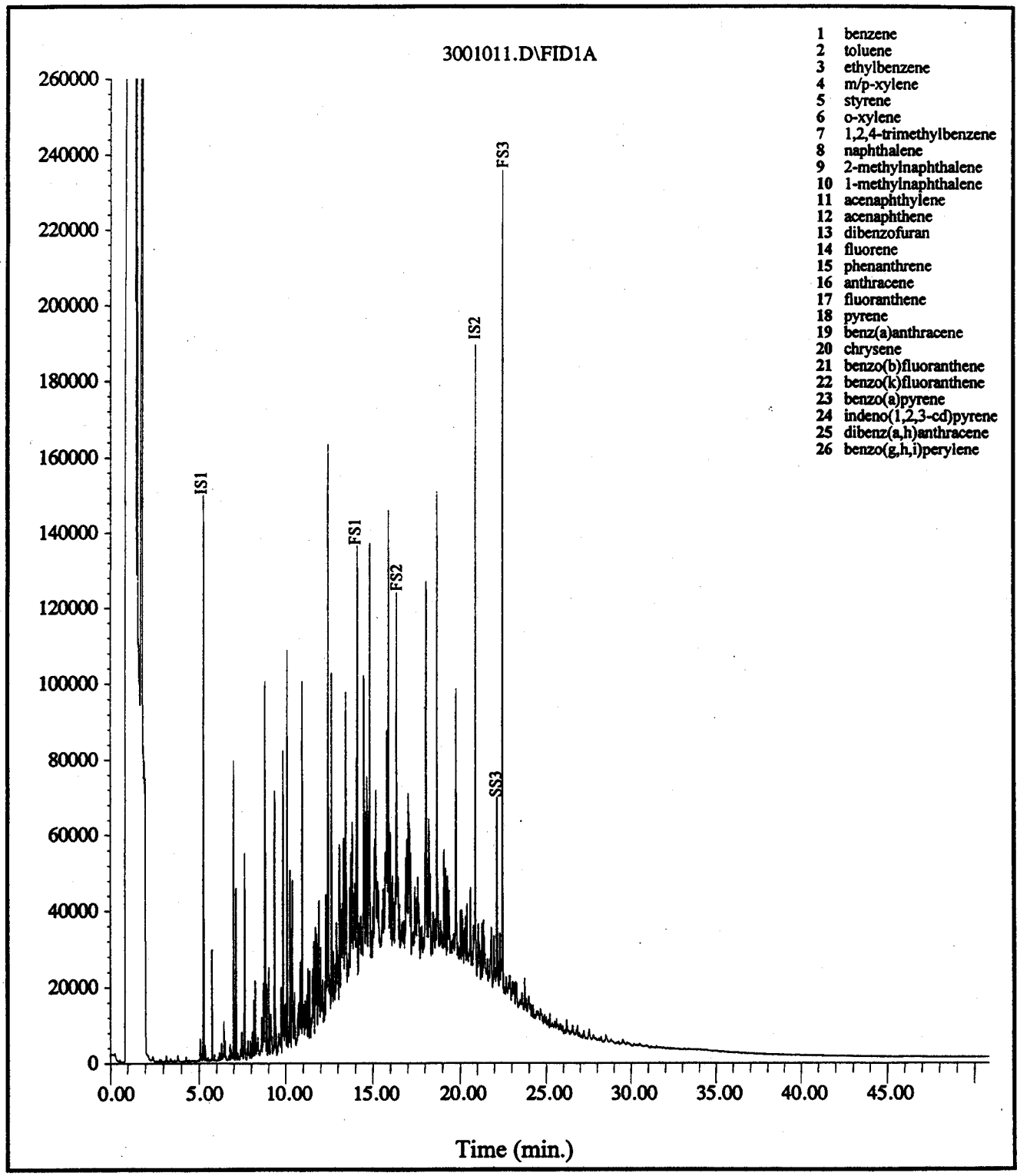
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane

Field ID:	**TW-9**
Laboratory ID:	IG010727-04
Method:	MET4007D

ig0727.ppt

META

GC/FID Fingerprint



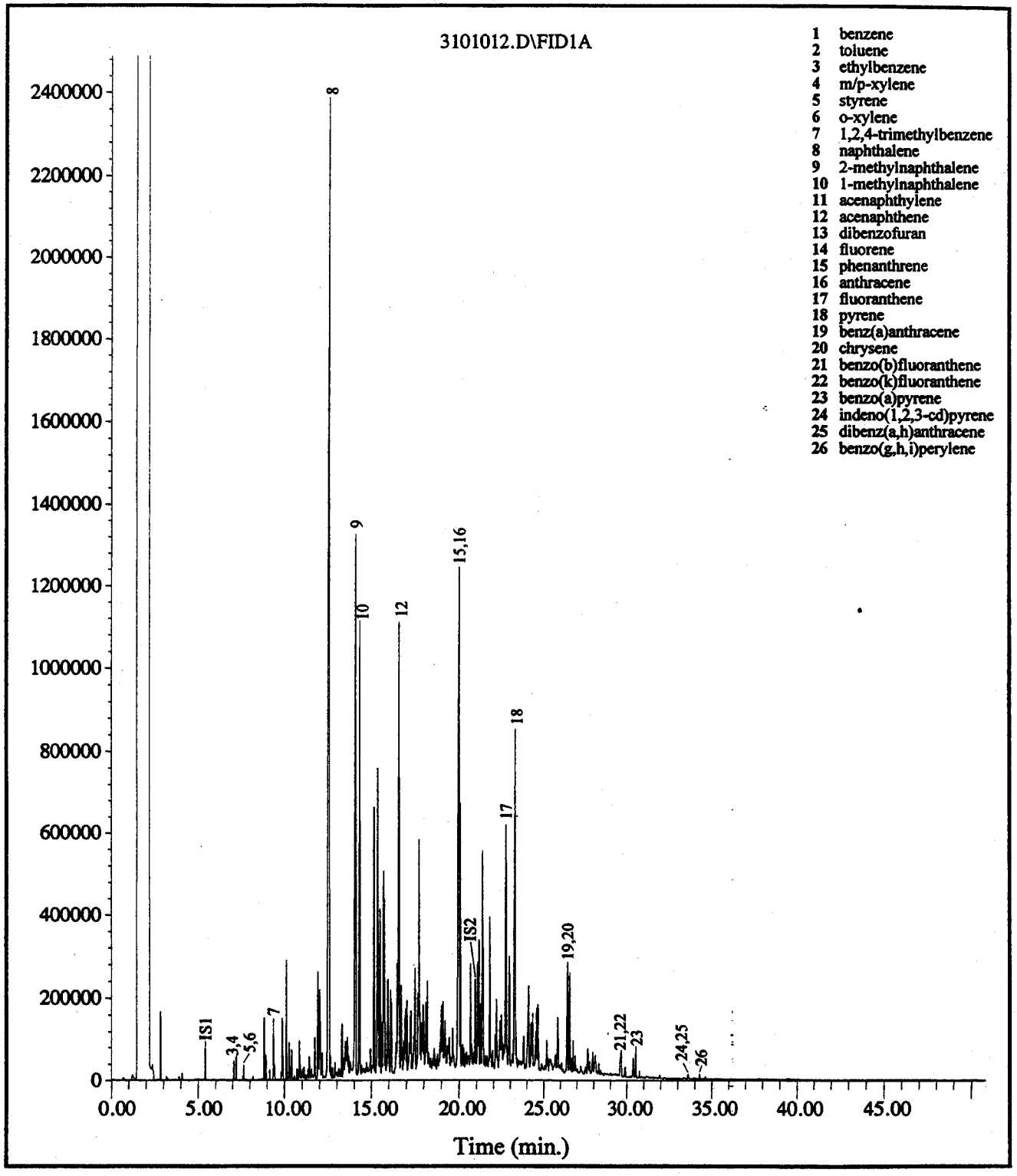
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	TW-9
Laboratory ID:	IG010727-04PF
Method:	MET4007

IG010727.ppt

META

GC/FID Fingerprint



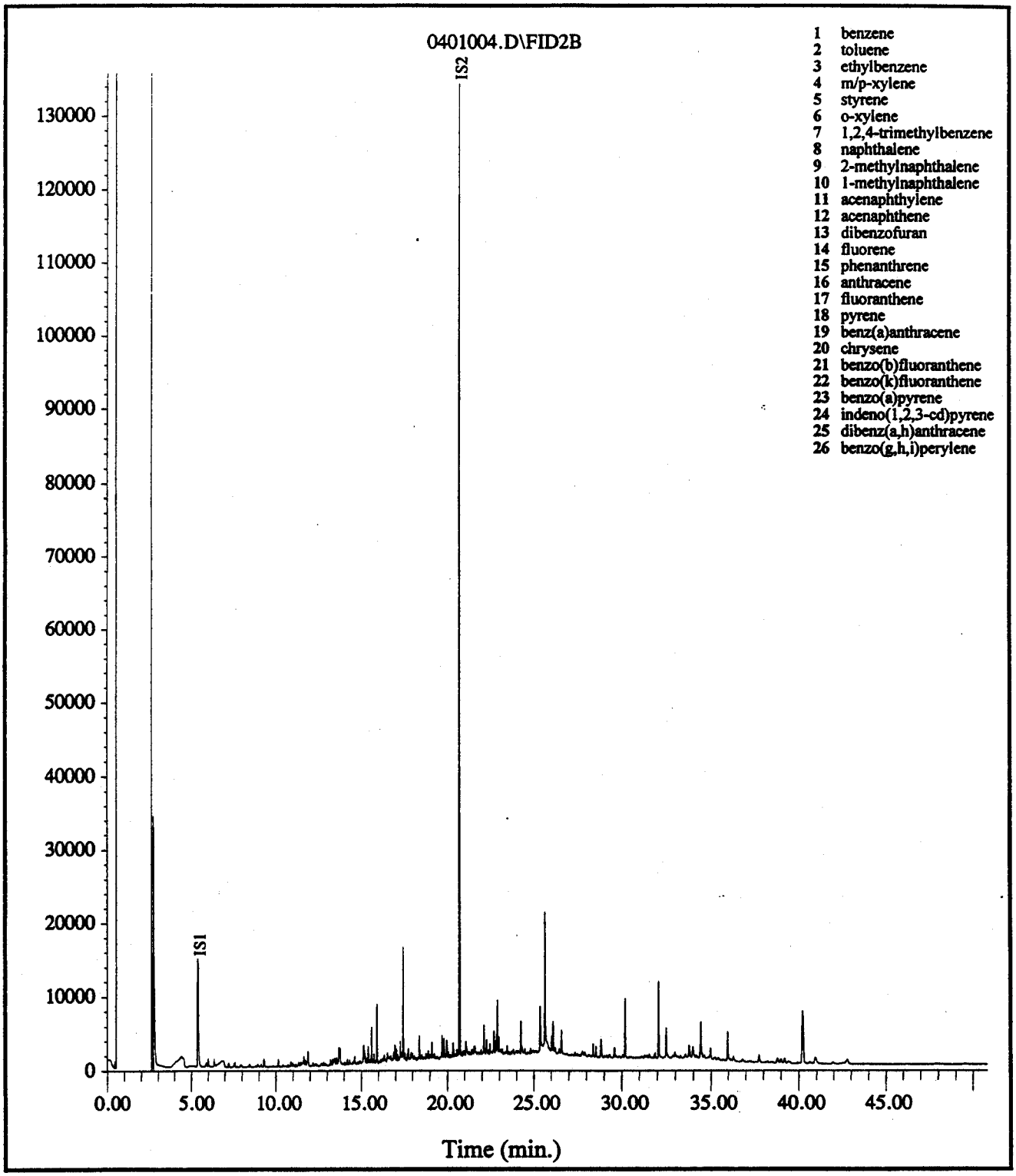
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	**TW-9**
Laboratory ID:	IG010727-04DF
Method:	MET4007

IG010727.ppt

META

GC/FID Fingerprint

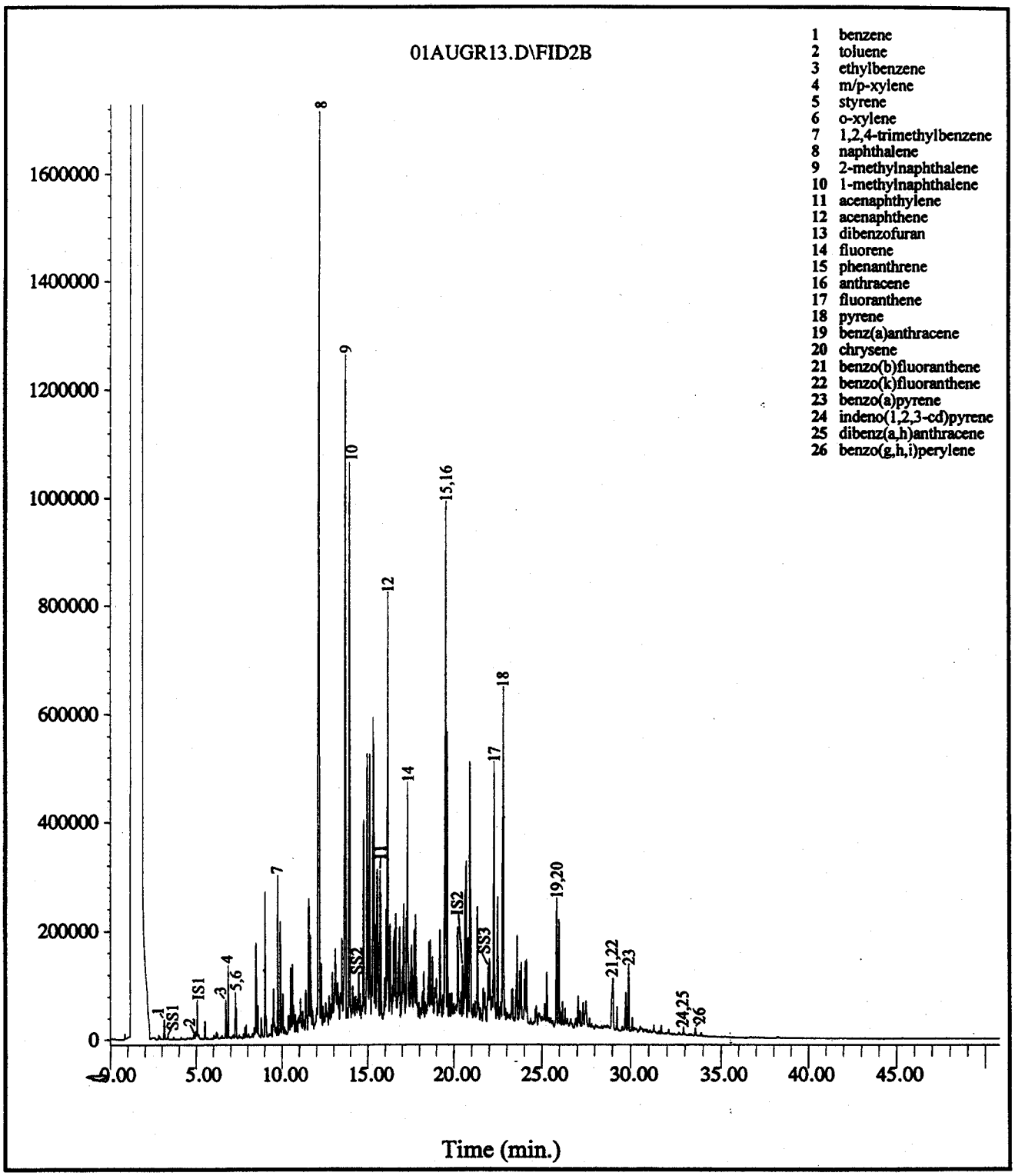


IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	TW-9
Laboratory ID:	IG010727-04MF
Method:	MET4007

META

GC/FID Fingerprint

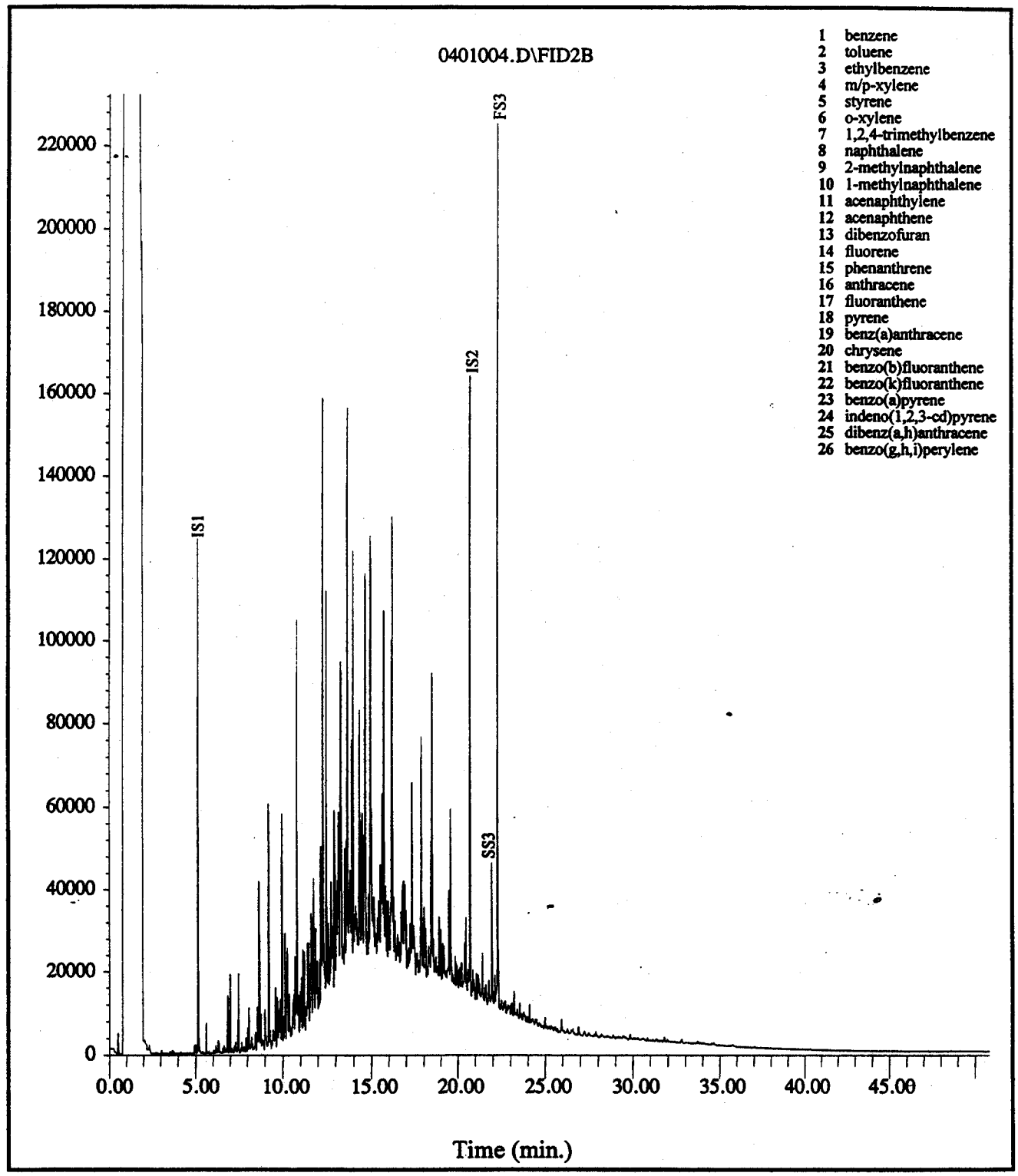


IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane

Field ID:	**Upgradient Riser**
Laboratory ID:	IG010727-05
Method:	MET4007D

META

GC/FID Fingerprint



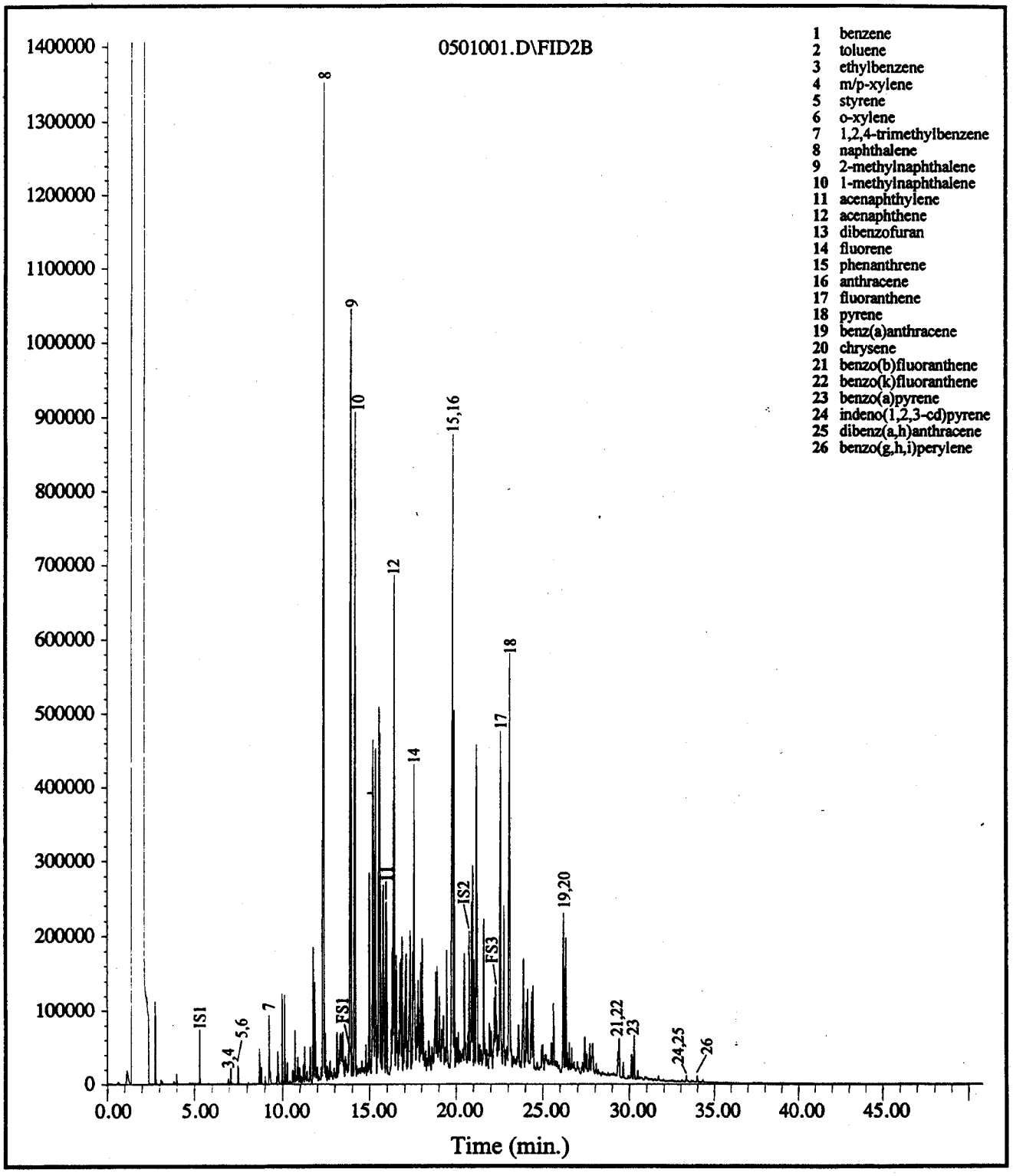
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	**Upgradient Riser**
Laboratory ID:	IG010727-05PF
Method:	MET4007

IG010727.ppt

META

GC/FID Fingerprint

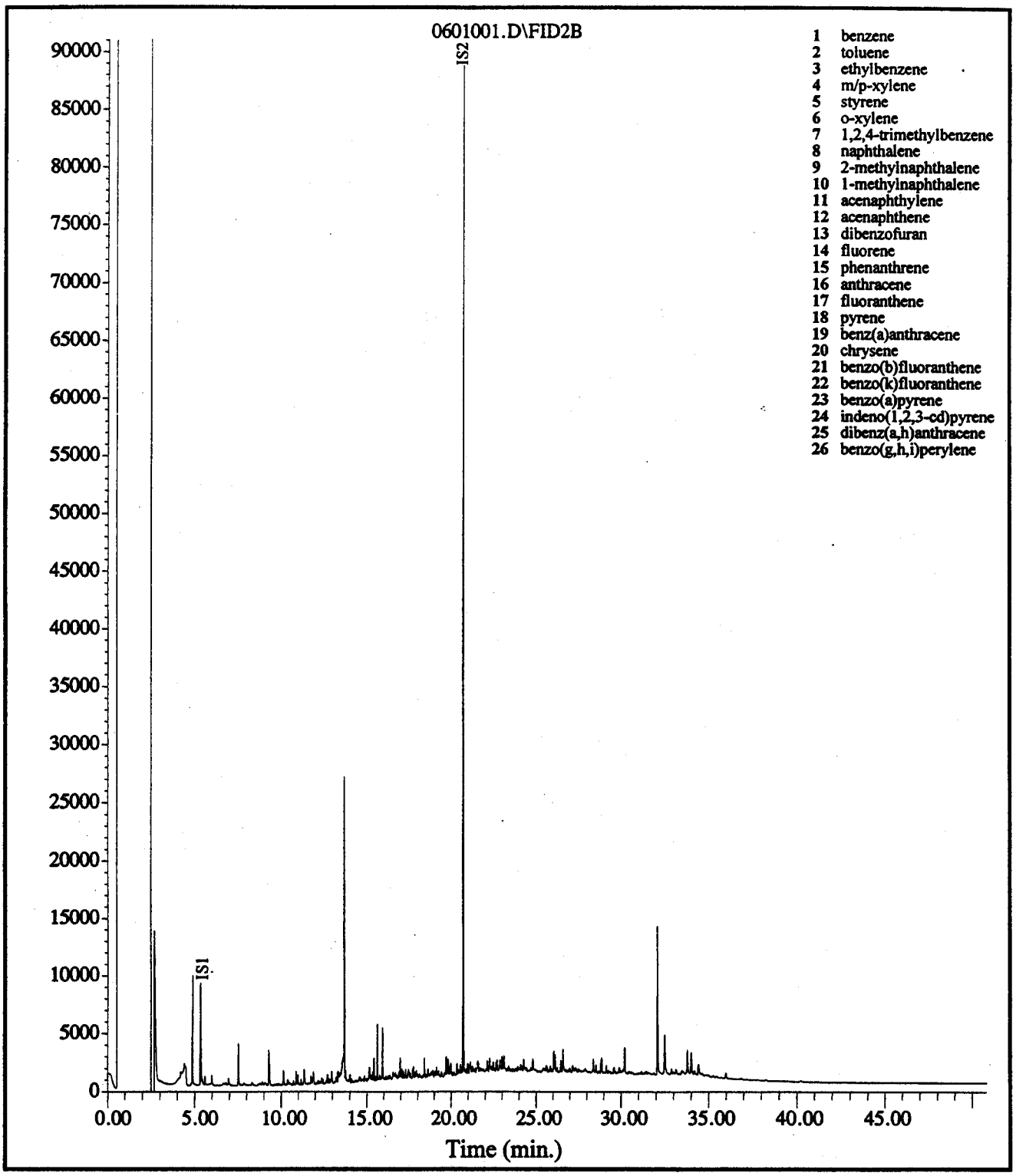


IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	**Upgradient Riser**
Laboratory ID:	IG010727-05DF
Method:	MET4007

META

GC/FID Fingerprint



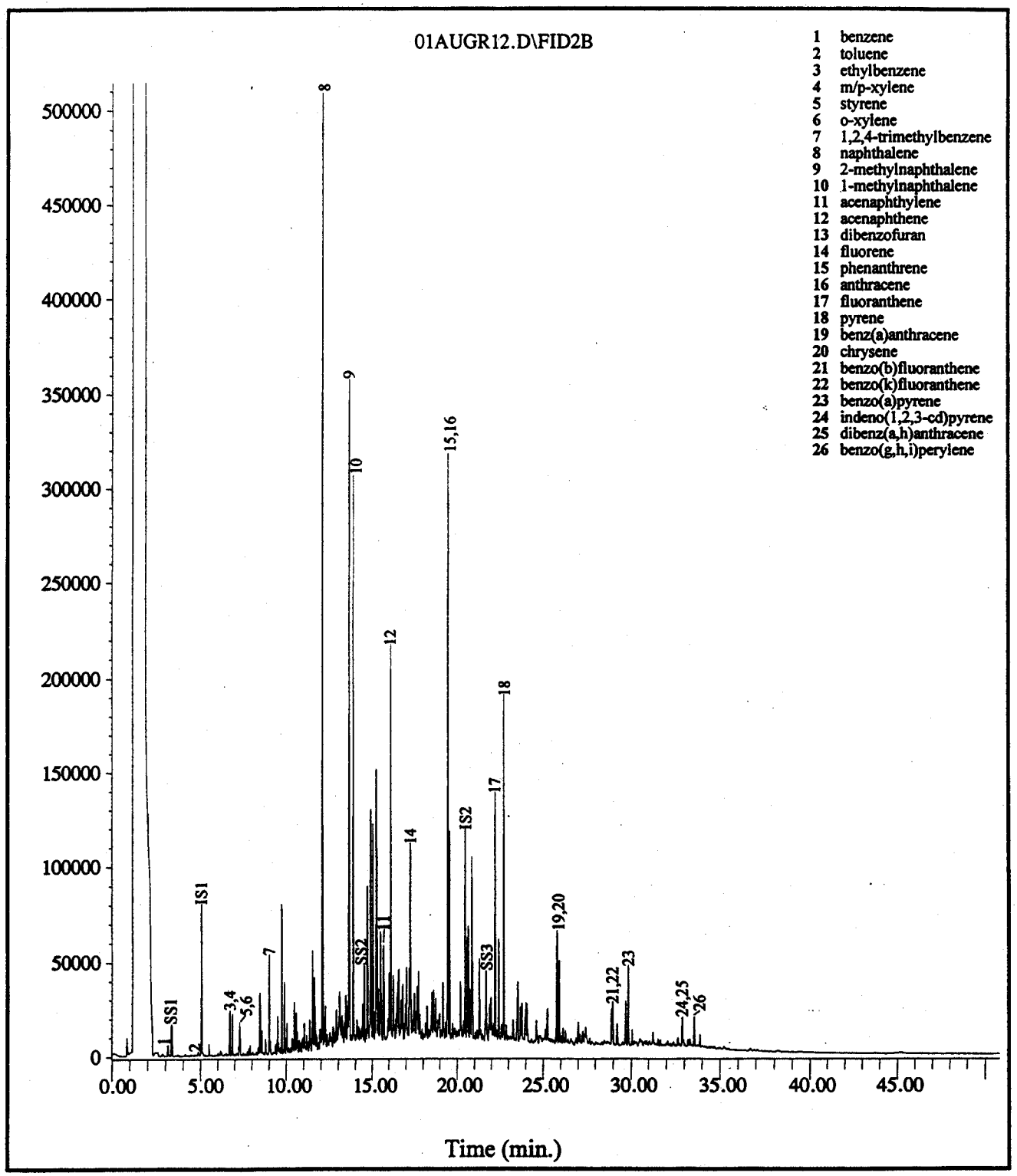
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	**Upgradient Riser**
Laboratory ID:	IG010727-05MF
Method:	MET4007

IG010727.ppt

META

GC/FID Fingerprint

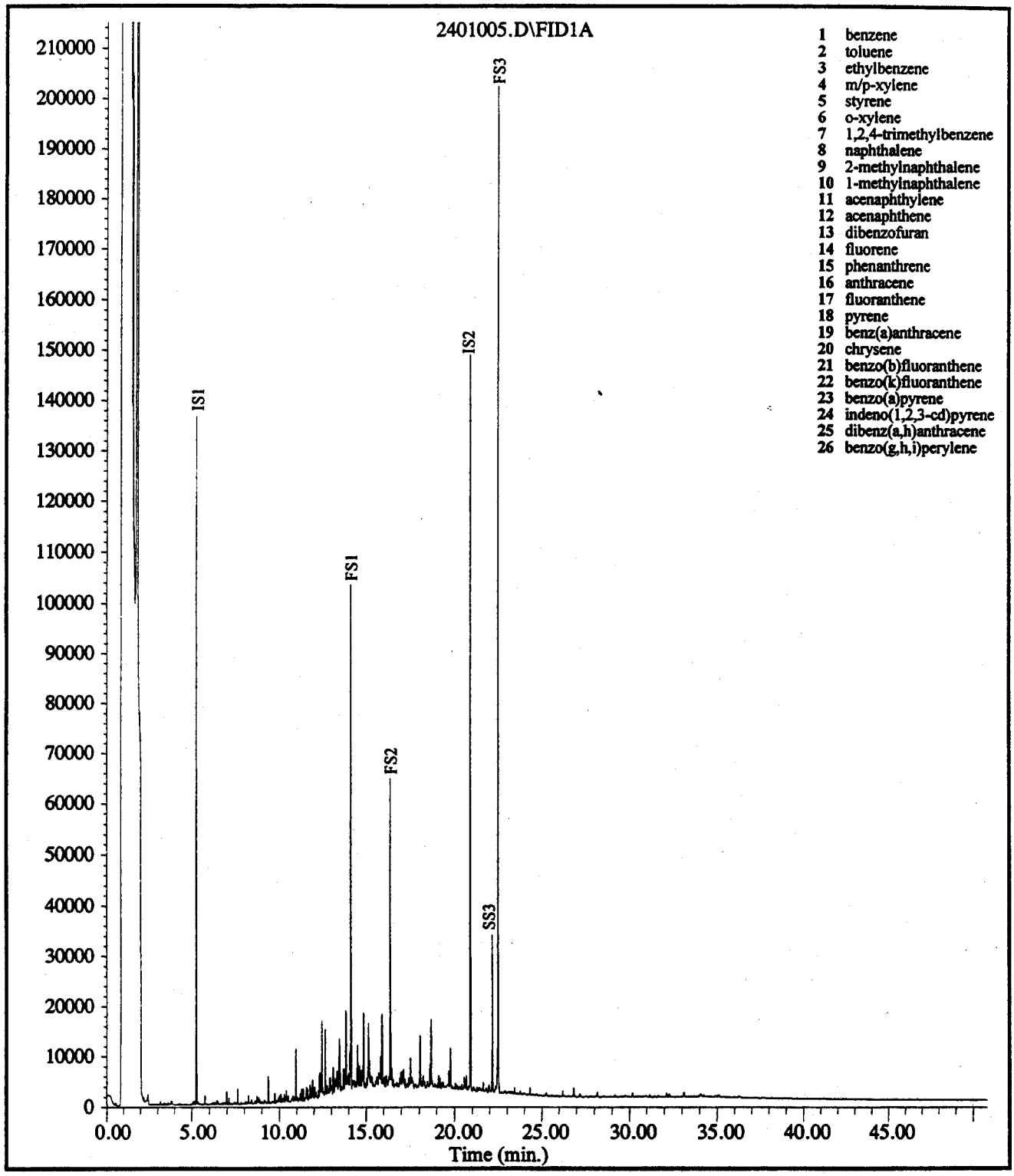


IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane

Field ID:	**Clay Pipe**
Laboratory ID:	IG010727-06
Method:	MET4007D

META

GC/FID Fingerprint



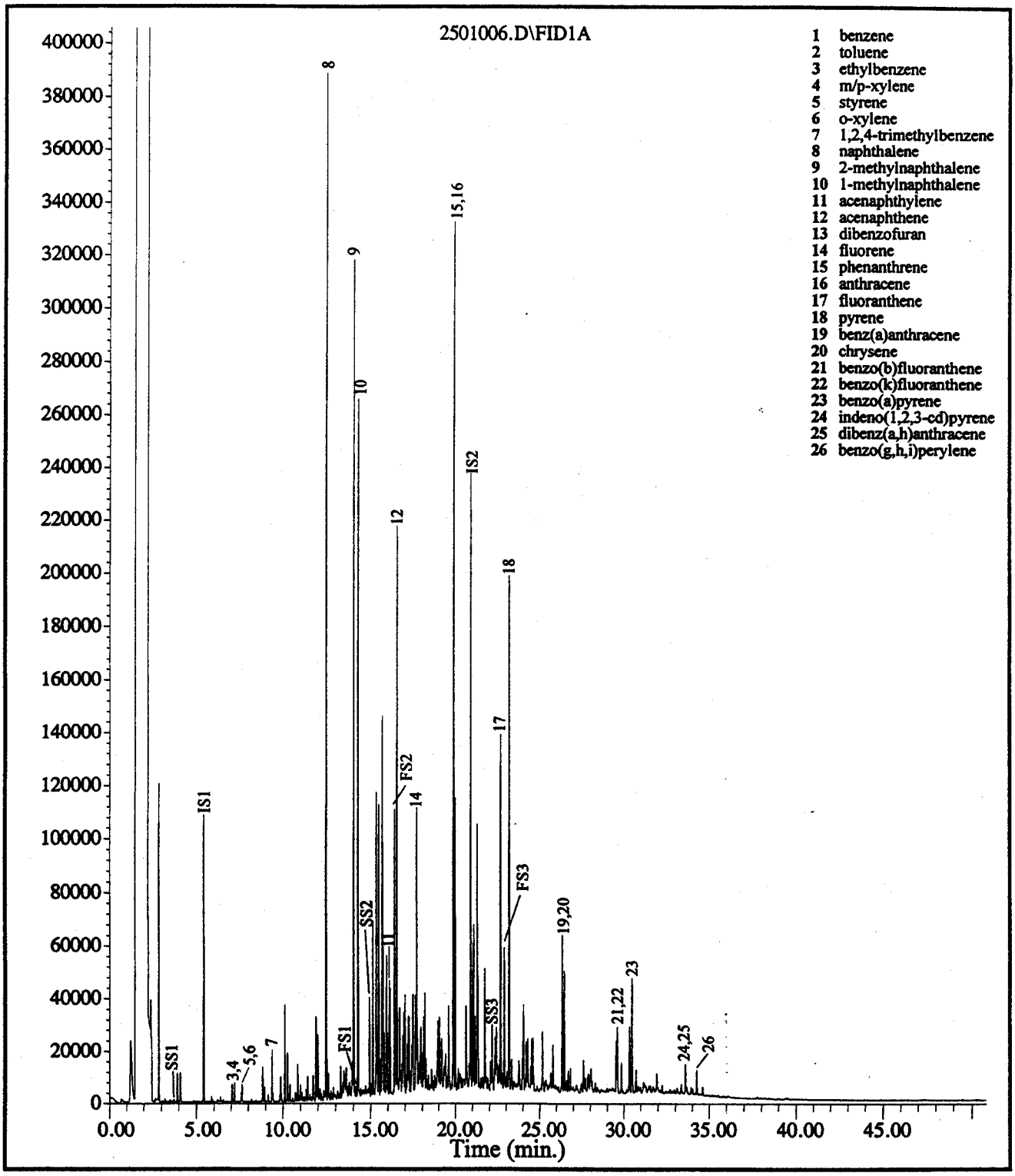
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	**Clay Pipe**
Laboratory ID:	IG010727-06PF
Method:	MET4007

IG010727.ppt

META

GC/FID Fingerprint



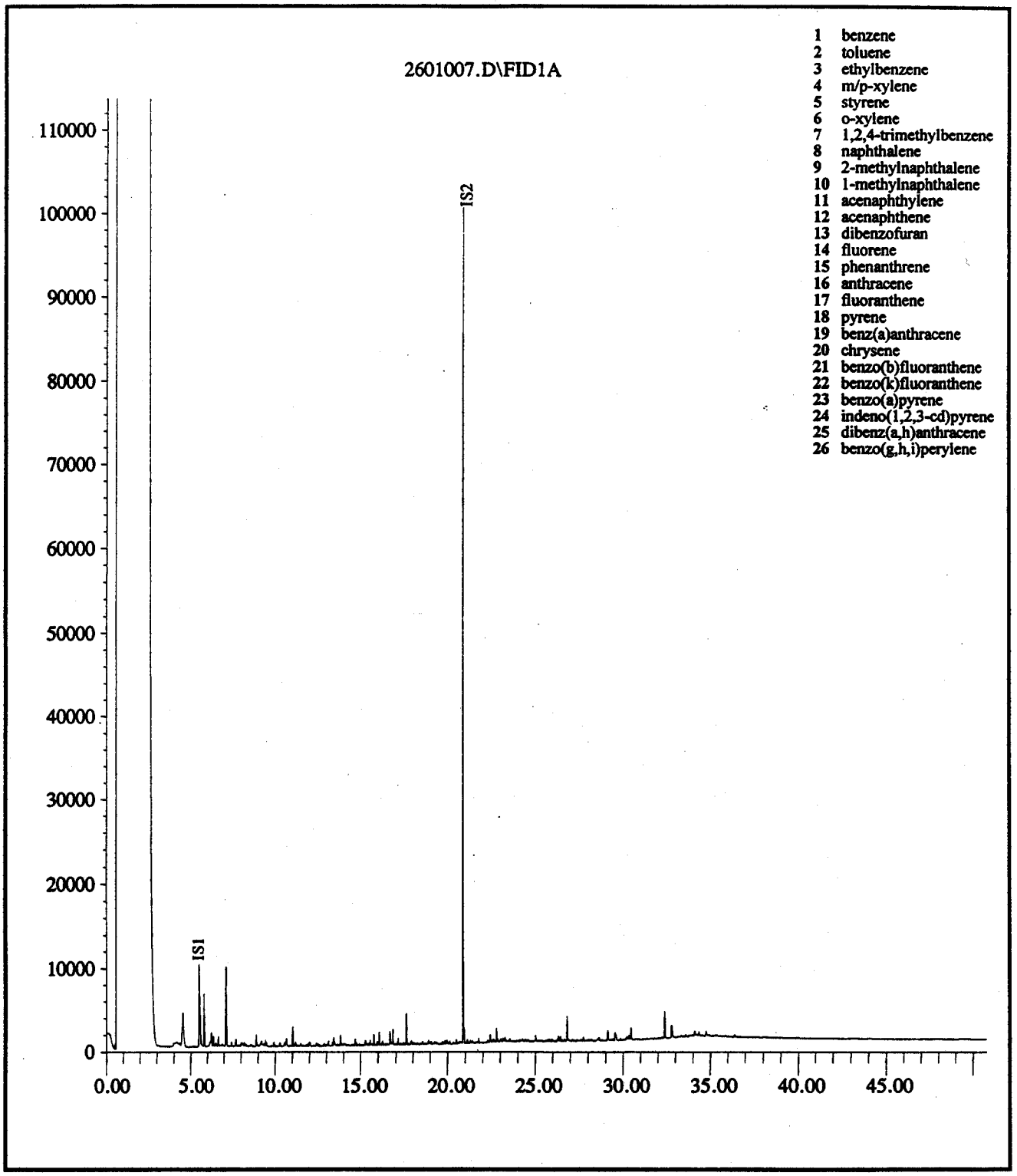
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	**Clay Pipe**
Laboratory ID:	IG010727-06DF
Method:	MET4007

IG010727.ppt

META

GC/FID Fingerprint



IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-Dibromotoluene
FS2 - 2-Bromonaphthalene
FS3 - 1-Chlorooctadecane

Field ID:	**Clay Pipe**
Laboratory ID:	IG010727-06MF
Method:	MET4007

META

Appendix C

Chemical Concentrations

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3511 Mod.	
Field ID:	**Seep trench west**	Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	Water	
		Preservation:	None	
Lab ID:	IG010727-02	Decanted:	No	
File ID:	13AUG10.D			
		Sample Size:	63.213	g
Date Sampled:	7/24/2001	%Solid:	100%	
Date Received:	7/27/2001	Extract Volume:	25	mL
Date Prepared:	7/31/2001	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	8/13/2001	Injection Volume:	0.001	mL
Instrument:	GC-2/MS			
Operator:	kty	Batch QC:	IG010731-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene	2,850		39.5	19.8	
Toluene	1,720		39.5	19.8	
Ethylbenzene	6,060		39.5	19.8	
m/p-Xylenes	11,700		39.5	19.8	
Styrene	9,660		39.5	19.8	
o-Xylene	7,360		39.5	19.8	
1,2,4-Trimethylbenzene	20,300		39.5	19.8	
Naphthalene	176,000	D	39.5	19.8	
2-Methylnaphthalene	204,000	D	39.5	19.8	
1-Methylnaphthalene	139,000	D	39.5	19.8	
Acenaphthylene	31,400		39.5	19.8	
Acenaphthene	109,000	D	39.5	19.8	
Dibenzofuran	12,500		39.5	19.8	
Fluorene	59,100	D	39.5	19.8	
Phenanthrene	198,000	D	39.5	19.8	
Anthracene	73,100	D	39.5	19.8	
Fluoranthene	98,100	D	39.5	19.8	
Pyrene	137,000	D	39.5	19.8	
Benz[a]anthracene	51,000	D	39.5	19.8	
Chrysene	35,200		39.5	19.8	
Benzo[b]fluoranthene	15,200		39.5	19.8	
Benzo[k]fluoranthene	16,300		39.5	19.8	
Benzo[a]pyrene	29,600		39.5	19.8	
Indeno[1,2,3-cd]pyrene	15,500		39.5	19.8	
Dibenz[a,h]anthracene	3,630		39.5	19.8	
Benzo[g,h,i]perylene	15,400		39.5	19.8	
ALKYLATED PAHs:					
C0-Benzene	2,850		39.5	19.8	
C1-Benzene	1,860		39.5	19.8	
C2-Benzene	28,200		39.5	19.8	
C3-Benzene	64,000	D	39.5	19.8	
C4-Benzene	89,700	D	39.5	19.8	
C5-Benzene	22,300		39.5	19.8	
C0-Naphthalene	176,000	D	39.5	19.8	
C1-Naphthalene	209,000	D	39.5	19.8	
C2-Naphthalene	177,000	D	39.5	19.8	
C3-Naphthalene	59,100	D	39.5	19.8	
C4-Naphthalene	13,400		39.5	19.8	
C0-Fluorene	59,100	D	39.5	19.8	
C1-Fluorene	69,900	D	39.5	19.8	
C2-Fluorene	25,800		39.5	19.8	
C3-Fluorene	4,900		39.5	19.8	
C0-Phenanthrene/Anthracene	269,000	D	39.5	19.8	
C1-Phenanthrene/Anthracene	124,000	D	39.5	19.8	
C2-Phenanthrene/Anthracene	37,900		39.5	19.8	
C3-Phenanthrene/Anthracene	7,670		39.5	19.8	
C4-Phenanthrene/Anthracene	1,430		39.5	19.8	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3511 Mod.	
Field ID:	**Seep trench west**	Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	Water	
		Preservation:	None	
Lab ID:	IG010727-02	Decanted:	No	
File ID:	13AUG10.D			
		Sample Size:	63.213	g
Date Sampled:	7/24/2001	%Solid:	100%	
Date Received:	7/27/2001	Extract Volume:	25	mL
Date Prepared:	7/31/2001	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	8/13/2001	Injection Volume:	0.001	mL
Instrument:	GC-2/MS			
Operator:	kty	Batch QC:	IG010731-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
C0-Dibenzothiophene	15,500		39.5	19.8	
C1-Dibenzothiophene	20,700		39.5	19.8	
C2-Dibenzothiophene	14,500		39.5	19.8	
C3-Dibenzothiophene	6,570		39.5	19.8	
C0-Fluoranthene/Pyrene	283,000	D	39.5	19.8	
C1-Fluoranthene/Pyrene	109,000	D	39.5	19.8	
C2-Fluoranthene/Pyrene	23,400		39.5	19.8	
C3-Fluoranthene/Pyrene	4,050		39.5	19.8	
C0-Benz(a)anthracene/Chrysene	104,000	D	39.5	19.8	
C1-Benz(a)anthracene/Chrysene	17,900		39.5	19.8	
C2-Benz(a)anthracene/Chrysene	6,020		39.5	19.8	
C3-Benz(a)anthracene/Chrysene	1,380		39.5	19.8	
C4-Benz(a)anthracene/Chrysene	330		39.5	19.8	

Surrogates	%R	Min	Max
Fluorobenzene	83%	50%	150%
2-Fluorobiphenyl	92%	50%	120%
5a-Androstane	62%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **MW-7**

Client:	GTI	Preparation Method:	EPA 3511 Mod.	
Project:	Ashland	Cleanup Method(s):		
Lab ID:	IG010727-03	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
File ID:	13AUG05.D	Matrix:	Water	
		Preservation:	None	
		Decanted:	No	
		Sample Size:	62.717	g
Date Sampled:	7/24/2001	%Solid:	100%	
Date Received:	7/27/2001	Extract Volume:	2	mL
Date Prepared:	7/31/2001	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	8/13/2001	Injection Volume:	0.001	mL
Instrument:	GC-2/MS			
Operator:	kty	Batch QC:	IG010731-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene	343		3.19	1.59	
Toluene	22.1		3.19	1.59	
Ethylbenzene	27.4		3.19	1.59	
m/p-Xylenes	124		3.19	1.59	
Styrene	3.30		3.19	1.59	
o-Xylene	158		3.19	1.59	
1,2,4-Trimethylbenzene	91.6		3.19	1.59	
Naphthalene	261		3.19	1.59	
2-Methylnaphthalene	96.9		3.19	1.59	
1-Methylnaphthalene	507		3.19	1.59	
Acenaphthylene	50.0		3.19	1.59	
Acenaphthene	321		3.19	1.59	
Dibenzofuran	30.1		3.19	1.59	
Fluorene	118		3.19	1.59	
Phenanthrene	312		3.19	1.59	
Anthracene	133		3.19	1.59	
Fluoranthene	159		3.19	1.59	
Pyrene	229		3.19	1.59	
Benz[a]anthracene	74.0		3.19	1.59	
Chrysene	77.6		3.19	1.59	
Benzo[b]fluoranthene	33.6		3.19	1.59	
Benzo[k]fluoranthene	41.2		3.19	1.59	
Benzo[a]pyrene	71.3		3.19	1.59	
Indeno[1,2,3-cd]pyrene	37.0		3.19	1.59	
Dibenz[a,h]anthracene	6.18		3.19	1.59	
Benzo[g,h,i]perylene	41.5		3.19	1.59	
ALKYLATED PAHs:					
C0-Benzene	343		3.19	1.59	
C1-Benzene	23.9		3.19	1.59	
C2-Benzene	355		3.19	1.59	
C3-Benzene	448		3.19	1.59	
C4-Benzene	502		3.19	1.59	
C5-Benzene	121		3.19	1.59	
C0-Naphthalene	261		3.19	1.59	
C1-Naphthalene	405		3.19	1.59	
C2-Naphthalene	505		3.19	1.59	
C3-Naphthalene	118		3.19	1.59	
C4-Naphthalene	63.1		3.19	1.59	
C0-Fluorene	118		3.19	1.59	
C1-Fluorene	154		3.19	1.59	
C2-Fluorene	65.6		3.19	1.59	
C3-Fluorene	21.6		3.19	1.59	
C0-Phenanthrene/Anthracene	476		3.19	1.59	
C1-Phenanthrene/Anthracene	233		3.19	1.59	
C2-Phenanthrene/Anthracene	91.8		3.19	1.59	
C3-Phenanthrene/Anthracene	23.0		3.19	1.59	
C4-Phenanthrene/Anthracene	7.65		3.19	1.59	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **MW-7**

Client:	GTI	Preparation Method:	EPA 3511 Mod.	
Project:	Ashland	Cleanup Method(s):		
Lab ID:	IG010727-03	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
File ID:	13AUG05.D	Matrix:	Water	
		Preservation:	None	
		Decanted:	No	
		Sample Size:	62.717	g
Date Sampled:	7/24/2001	%Solid:	100%	
Date Received:	7/27/2001	Extract Volume:	2	mL
Date Prepared:	7/31/2001	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	8/13/2001	Injection Volume:	0.001	mL
Instrument:	GC-2/MS			
Operator:	kty	Batch QC:	IG010731-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
C0-Dibenzothiophene	32.2		3.19	1.59	
C1-Dibenzothiophene	51.0		3.19	1.59	
C2-Dibenzothiophene	42.5		3.19	1.59	
C3-Dibenzothiophene	24.8		3.19	1.59	
C0-Fluoranthene/Pyrene	502		3.19	1.59	
C1-Fluoranthene/Pyrene	185		3.19	1.59	
C2-Fluoranthene/Pyrene	56.6		3.19	1.59	
C3-Fluoranthene/Pyrene	21.1		3.19	1.59	
C0-Benz(a)anthracene/Chrysene	155		3.19	1.59	
C1-Benz(a)anthracene/Chrysene	44.2		3.19	1.59	
C2-Benz(a)anthracene/Chrysene	19.6		3.19	1.59	
C3-Benz(a)anthracene/Chrysene	10.4		3.19	1.59	
C4-Benz(a)anthracene/Chrysene		U	3.19	1.59	

Surrogates	%R	Min	Max
Fluorobenzene	76%	50%	150%
2-Fluorobiphenyl	81%	50%	120%
5a-Androstane	71%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **TW-9**

Client:	GTI	Preparation Method:	EPA3511 Mod.
Project:	Ashland	Cleanup Method(s):	
Lab ID:	IG010727-04	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
File ID:	14AUG07.D	Matrix:	Water
		Preservation:	None
		Decanted:	No
Date Sampled:	7/24/2001	Sample Size:	70.652 g
Date Received:	7/27/2001	%Solid:	100%
Date Prepared:	7/31/2001	Extract Volume:	2 mL
Date Cleanup:		Prep DF:	1
Date Analyzed:	14 Aug 20101 5:27 pm	Analysis DF:	1
Instrument:	GC-2/MS	Injection Volume:	0.001 mL
Operator:	kty	Batch QC:	IG010731-AB

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene	598		2.83	1.42	
Toluene	215		2.83	1.42	
Ethylbenzene	3,590	D	2.83	1.42	
m/p-Xylenes	3,470	D	2.83	1.42	
Styrene	364		2.83	1.42	
o-Xylene	1,350		2.83	1.42	
1,2,4-Trimethylbenzene	3,340	D	2.83	1.42	
Naphthalene	71,300	D	2.83	1.42	
2-Methylnaphthalene	32,600	D	2.83	1.42	
1-Methylnaphthalene	22,100	D	2.83	1.42	
Acenaphthylene	1,640		2.83	1.42	
Acenaphthene	24,200	D	2.83	1.42	
Dibenzofuran	334		2.83	1.42	
Fluorene	8,710	D	2.83	1.42	
Phenanthrene	35,700	D	2.83	1.42	
Anthracene	10,400	D	2.83	1.42	
Fluoranthene	13,300	D	2.83	1.42	
Pyrene	20,200	D	2.83	1.42	
Benz[a]anthracene	5,250	D	2.83	1.42	
Chrysene	6,000	D	2.83	1.42	
Benzo[b]fluoranthene	1,780		2.83	1.42	
Benzo[k]fluoranthene	1,510		2.83	1.42	
Benzo[a]pyrene	5,730	D	2.83	1.42	
Indeno[1,2,3-cd]pyrene	1,630		2.83	1.42	
Dibenz[a,h]anthracene	448		2.83	1.42	
Benzo[g,h,i]perylene	1,780		2.83	1.42	
ALKYLATED PAHs:					
C0-Benzene	598		2.83	1.42	
C1-Benzene	233		2.83	1.42	
C2-Benzene	9,910	D	2.83	1.42	
C3-Benzene	19,300	D	2.83	1.42	
C4-Benzene	22,300	D	2.83	1.42	
C5-Benzene	1,830		2.83	1.42	
C0-Naphthalene	71,300	D	2.83	1.42	
C1-Naphthalene	32,000	D	2.83	1.42	
C2-Naphthalene	18,400	D	2.83	1.42	
C3-Naphthalene	8,710	D	2.83	1.42	
C4-Naphthalene	1,150		2.83	1.42	
C0-Fluorene	8,710	D	2.83	1.42	
C1-Fluorene	8,950	D	2.83	1.42	
C2-Fluorene	2,010		2.83	1.42	
C3-Fluorene	785		2.83	1.42	
C0-Phenanthrene/Anthracene	46,000	D	2.83	1.42	
C1-Phenanthrene/Anthracene	15,600	D	2.83	1.42	
C2-Phenanthrene/Anthracene	4,470	D	2.83	1.42	
C3-Phenanthrene/Anthracene	802		2.83	1.42	
C4-Phenanthrene/Anthracene	182		2.83	1.42	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **TW-9**

Client:	GTI	Preparation Method:	EPA3511 Mod.
Project:	Ashland	Cleanup Method(s):	
Lab ID:	IG010727-04	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
File ID:	14AUG07.D	Matrix:	Water
		Preservation:	None
		Decanted:	No
		Sample Size:	70.652 g
Date Sampled:	7/24/2001	%Solid:	100%
Date Received:	7/27/2001	Extract Volume:	2 mL
Date Prepared:	7/31/2001	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	14 Aug 20101 5:27 pm	Injection Volume:	0.001 mL
Instrument:	GC-2/MS		
Operator:	kty	Batch QC:	IG010731-AB

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
C0-Dibenzothiophene	711		2.83	1.42	
C1-Dibenzothiophene	1,120		2.83	1.42	
C2-Dibenzothiophene	1,030		2.83	1.42	
C3-Dibenzothiophene	698		2.83	1.42	
C0-Fluoranthene/Pyrene	39,600	D	2.83	1.42	
C1-Fluoranthene/Pyrene	12,100	D	2.83	1.42	
C2-Fluoranthene/Pyrene	2,440		2.83	1.42	
C3-Fluoranthene/Pyrene	517		2.83	1.42	
C0-Benz(a)anthracene/Chrysene	11,600	D	2.83	1.42	
C1-Benz(a)anthracene/Chrysene	1,790		2.83	1.42	
C2-Benz(a)anthracene/Chrysene	543		2.83	1.42	
C3-Benz(a)anthracene/Chrysene	144		2.83	1.42	
C4-Benz(a)anthracene/Chrysene	27.2		2.83	1.42	

Surrogates	%R	Min	Max
Fluorobenzene	70%	50%	150%
2-Fluorobiphenyl	64%	50%	120%
5a-Androstane	55%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **Upgradient Riser**

		Preparation Method:	EPA 3511 Mod.	
		Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	Water	
		Preservation:	None	
Lab ID:	IG010727-05	Decanted:	No	
File ID:	14AUG06.D			
		Sample Size:	55.408	g
Date Sampled:	7/24/2001	%Solid:	100%	
Date Received:	7/27/2001	Extract Volume:	2	mL
Date Prepared:	7/31/2001	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	8/14/2001	Injection Volume:	0.001	mL
Instrument:	GC-2/MS			
Operator:	kty	Batch QC:	IG010731-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene	1,020		3.61	1.80	
Toluene	461		3.61	1.80	
Ethylbenzene	1,360		3.61	1.80	
m/p-Xylenes	2,540		3.61	1.80	
Styrene	1,280		3.61	1.80	
o-Xylene	1,510		3.61	1.80	
1,2,4-Trimethylbenzene	3,390		3.61	1.80	
Naphthalene	61,900	D	3.61	1.80	
2-Methylnaphthalene	40,600	D	3.61	1.80	
1-Methylnaphthalene	27,400	D	3.61	1.80	
Acenaphthylene	3,380		3.61	1.80	
Acenaphthene	19,800	D	3.61	1.80	
Dibenzofuran	1,350		3.61	1.80	
Fluorene	8,680	D	3.61	1.80	
Phenanthrene	37,800	D	3.61	1.80	
Anthracene	13,000	D	3.61	1.80	
Fluoranthene	15,500	D	3.61	1.80	
Pyrene	22,700	D	3.61	1.80	
Benz[a]anthracene	6,600	D	3.61	1.80	
Chrysene	6,800	D	3.61	1.80	
Benzo[b]fluoranthene	2,120		3.61	1.80	
Benzo[k]fluoranthene	2,220		3.61	1.80	
Benzo[a]pyrene	5,720	D	3.61	1.80	
Indeno[1,2,3-cd]pyrene	2,210		3.61	1.80	
Dibenz[a,h]anthracene	587		3.61	1.80	
Benzo[g,h,i]perylene	2,280		3.61	1.80	
ALKYLATED PAHs:					
C0-Benzene	1,020		3.61	1.80	
C1-Benzene	499		3.61	1.80	
C2-Benzene	6,700	D	3.61	1.80	
C3-Benzene	16,800	D	3.61	1.80	
C4-Benzene	18,800	D	3.61	1.80	
C5-Benzene	2,900		3.61	1.80	
C0-Naphthalene	61,900	D	3.61	1.80	
C1-Naphthalene	42,900	D	3.61	1.80	
C2-Naphthalene	27,800	D	3.61	1.80	
C3-Naphthalene	8,680	D	3.61	1.80	
C4-Naphthalene	1,470		3.61	1.80	
C0-Fluorene	8,680	D	3.61	1.80	
C1-Fluorene	11,000	D	3.61	1.80	
C2-Fluorene	2,170		3.61	1.80	
C3-Fluorene	614		3.61	1.80	
C0-Phenanthrene/Anthracene	49,100	D	3.61	1.80	
C1-Phenanthrene/Anthracene	19,200	D	3.61	1.80	
C2-Phenanthrene/Anthracene	5,240	D	3.61	1.80	
C3-Phenanthrene/Anthracene	978		3.61	1.80	
C4-Phenanthrene/Anthracene	214		3.61	1.80	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3511 Mod.	
Field ID:	**Upgradient Riser**	Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	Water	
		Preservation:	None	
Lab ID:	IG010727-05	Decanted:	No	
File ID:	14AUG06.D			
		Sample Size:	55.408	g
Date Sampled:	7/24/2001	%Solid:	100%	
Date Received:	7/27/2001	Extract Volume:	2	mL
Date Prepared:	7/31/2001	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	8/14/2001	Injection Volume:	0.001	mL
Instrument:	GC-2/MS			
Operator:	kty	Batch QC:	IG010731-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
C0-Dibenzothiophene	1,840		3.61	1.80	
C1-Dibenzothiophene	2,410		3.61	1.80	
C2-Dibenzothiophene	1,840		3.61	1.80	
C3-Dibenzothiophene	935		3.61	1.80	
C0-Fluoranthene/Pyrene	45,100	D	3.61	1.80	
C1-Fluoranthene/Pyrene	14,800	D	3.61	1.80	
C2-Fluoranthene/Pyrene	3,260		3.61	1.80	
C3-Fluoranthene/Pyrene	905		3.61	1.80	
C0-Benz(a)anthracene/Chrysene	12,900	D	3.61	1.80	
C1-Benz(a)anthracene/Chrysene	2,640		3.61	1.80	
C2-Benz(a)anthracene/Chrysene	891		3.61	1.80	
C3-Benz(a)anthracene/Chrysene	201		3.61	1.80	
C4-Benz(a)anthracene/Chrysene	42.8		3.61	1.80	

Surrogates	%R	Min	Max
Fluorobenzene	36%	50%	150%
2-Fluorobiphenyl	55%	50%	120%
5a-Androstane	45%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **Clay pipe**

Client:	GTI	Preparation Method:	EPA 3511 Mod.	
Project:	Ashland	Cleanup Method(s):		
		Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
		Matrix:	Water	
		Preservation:	None	
Lab ID:	IG010727-06	Decanted:	No	
File ID:	13AUG08.D			
		Sample Size:	66.83	g
Date Sampled:	7/25/2001	%Solid:	100%	
Date Received:	7/27/2001	Extract Volume:	2	mL
Date Prepared:	7/31/2001	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	8/13/2001	Injection Volume:	0.001	mL
Instrument:	GC-2/MS			
Operator:	kty	Batch QC:	IG010731-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene	122		2.99	1.50	
Toluene	18.1		2.99	1.50	
Ethylbenzene	324		2.99	1.50	
m/p-Xylenes	326		2.99	1.50	
Styrene	94.4		2.99	1.50	
o-Xylene	242		2.99	1.50	
1,2,4-Trimethylbenzene	538		2.99	1.50	
Naphthalene	7,220	D	2.99	1.50	
2-Methylnaphthalene	5,660	D	2.99	1.50	
1-Methylnaphthalene	4,240	D	2.99	1.50	
Acenaphthylene	538		2.99	1.50	
Acenaphthene	2,190		2.99	1.50	
Dibenzofuran	253		2.99	1.50	
Fluorene	1,130		2.99	1.50	
Phenanthrene	5,050	D	2.99	1.50	
Anthracene	1,320		2.99	1.50	
Fluoranthene	1,650		2.99	1.50	
Pyrene	2,180		2.99	1.50	
Benz[a]anthracene	739		2.99	1.50	
Chrysene	688		2.99	1.50	
Benzo[b]fluoranthene	261		2.99	1.50	
Benzo[k]fluoranthene	284		2.99	1.50	
Benzo[a]pyrene	538		2.99	1.50	
Indeno[1,2,3-cd]pyrene	238		2.99	1.50	
Dibenz[a,h]anthracene	45.8		2.99	1.50	
Benzo[g,h,i]perylene	224		2.99	1.50	
ALKYLATED PAHs:					
C0-Benzene	122		2.99	1.50	
C1-Benzene	19.6		2.99	1.50	
C2-Benzene	1,040		2.99	1.50	
C3-Benzene	2,150		2.99	1.50	
C4-Benzene	2,690		2.99	1.50	
C5-Benzene	502		2.99	1.50	
C0-Naphthalene	7,220	D	2.99	1.50	
C1-Naphthalene	5,910	D	2.99	1.50	
C2-Naphthalene	4,150	D	2.99	1.50	
C3-Naphthalene	1,130		2.99	1.50	
C4-Naphthalene	286		2.99	1.50	
C0-Fluorene	1,130		2.99	1.50	
C1-Fluorene	1,360		2.99	1.50	
C2-Fluorene	414		2.99	1.50	
C3-Fluorene	95.3		2.99	1.50	
C0-Phenanthrene/Anthracene	6,770	D	2.99	1.50	
C1-Phenanthrene/Anthracene	2,160		2.99	1.50	
C2-Phenanthrene/Anthracene	730		2.99	1.50	
C3-Phenanthrene/Anthracene	149		2.99	1.50	
C4-Phenanthrene/Anthracene	33.7		2.99	1.50	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **Clay pipe**

Client:	GTI
Project:	Ashland
Lab ID:	IG010727-06
File ID:	13AUG08.D
Date Sampled:	7/25/2001
Date Received:	7/27/2001
Date Prepared:	7/31/2001
Date Cleanup:	
Date Analyzed:	8/13/2001
Instrument:	GC-2/MS
Operator:	kty

Preparation Method:	EPA 3511 Mod.	
Cleanup Method(s):		
Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Matrix:	Water	
Preservation:	None	
Decanted:	No	
Sample Size:	66.83	g
%Solid:	100%	
Extract Volume:	2	mL
Prep DF:	1	
Analysis DF:	1	
Injection Volume:	0.001	mL
Batch QC:	IG010731-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
C0-Dibenzothiophene	357		2.99	1.50	
C1-Dibenzothiophene	401		2.99	1.50	
C2-Dibenzothiophene	260		2.99	1.50	
C3-Dibenzothiophene	126		2.99	1.50	
C0-Fluoranthene/Pyrene	6,070	D	2.99	1.50	
C1-Fluoranthene/Pyrene	1,610		2.99	1.50	
C2-Fluoranthene/Pyrene	418		2.99	1.50	
C3-Fluoranthene/Pyrene	88.2		2.99	1.50	
C0-Benz(a)anthracene/Chrysene	1,400		2.99	1.50	
C1-Benz(a)anthracene/Chrysene	332		2.99	1.50	
C2-Benz(a)anthracene/Chrysene	107		2.99	1.50	
C3-Benz(a)anthracene/Chrysene	21.7		2.99	1.50	
C4-Benz(a)anthracene/Chrysene	7.20		2.99	1.50	

Surrogates	%R	Min	Max
Fluorobenzene	57%	50%	150%
2-Fluorobiphenyl	63%	50%	120%
5a-Androstane	56%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **Aqueous Blank**

Client:	GTI	Preparation Method:	EPA 3511 Mod.	
Project:	Ashland	Cleanup Method(s):		
		Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
		Matrix:	Water	
		Preservation:	None	
Lab ID:	IG010731-AB	Decanted:	No	
File ID:	13AUG03.D			
		Sample Size:	60	g
Date Sampled:		%Solid:	100%	
Date Received:		Extract Volume:	2	mL
Date Prepared:	7/31/2001	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	8/13/2001	Injection Volume:	0.001	mL
Instrument:	GC-2/MS			
Operator:	kty	Batch QC:	IG010731-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene		U	3.33	1.67	
Toluene		U	3.33	1.67	
Ethylbenzene		U	3.33	1.67	
m/p-Xylenes		U	3.33	1.67	
Styrene		U	3.33	1.67	
o-Xylene		U	3.33	1.67	
1,2,4-Trimethylbenzene		U	3.33	1.67	
Naphthalene		U	3.33	1.67	
2-Methylnaphthalene		U	3.33	1.67	
1-Methylnaphthalene		U	3.33	1.67	
Acenaphthylene		U	3.33	1.67	
Acenaphthene		U	3.33	1.67	
Dibenzofuran		U	3.33	1.67	
Fluorene		U	3.33	1.67	
Phenanthrene		U	3.33	1.67	
Anthracene		U	3.33	1.67	
Fluoranthene		U	3.33	1.67	
Pyrene		U	3.33	1.67	
Benz[a]anthracene		U	3.33	1.67	
Chrysene		U	3.33	1.67	
Benzo[b]fluoranthene		U	3.33	1.67	
Benzo[k]fluoranthene		U	3.33	1.67	
Benzo[a]pyrene		U	3.33	1.67	
Indeno[1,2,3-cd]pyrene		U	3.33	1.67	
Dibenz[a,h]anthracene		U	3.33	1.67	
Benzo[g,h,i]perylene		U	3.33	1.67	
ALKYLATED PAHs:					
C0-Benzene		U	3.33	1.67	
C1-Benzene		U	3.33	1.67	
C2-Benzene		U	3.33	1.67	
C3-Benzene		U	3.33	1.67	
C4-Benzene		U	3.33	1.67	
C5-Benzene		U	3.33	1.67	
C0-Naphthalene		U	3.33	1.67	
C1-Naphthalene		U	3.33	1.67	
C2-Naphthalene		U	3.33	1.67	
C3-Naphthalene		U	3.33	1.67	
C4-Naphthalene		U	3.33	1.67	
C0-Fluorene		U	3.33	1.67	
C1-Fluorene		U	3.33	1.67	
C2-Fluorene		U	3.33	1.67	
C3-Fluorene		U	3.33	1.67	
C0-Phenanthrene/Anthracene		U	3.33	1.67	
C1-Phenanthrene/Anthracene		U	3.33	1.67	
C2-Phenanthrene/Anthracene		U	3.33	1.67	
C3-Phenanthrene/Anthracene		U	3.33	1.67	
C4-Phenanthrene/Anthracene		U	3.33	1.67	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3511 Mod.
Field ID:	**Aqueous Blank**	Cleanup Method(s):	
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
Project:	Ashland	Matrix:	Water
		Preservation:	None
Lab ID:	IG010731-AB	Decanted:	No
File ID:	13AUG03.D		
		Sample Size:	60 g
Date Sampled:		%Solid:	100%
Date Received:		Extract Volume:	2 mL
Date Prepared:	7/31/2001	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	8/13/2001	Injection Volume:	0.001 mL
Instrument:	GC-2/MS		
Operator:	kty	Batch QC:	IG010731-AB

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
C0-Dibenzothiophene		U	3.33	1.67	
C1-Dibenzothiophene		U	3.33	1.67	
C2-Dibenzothiophene		U	3.33	1.67	
C3-Dibenzothiophene		U	3.33	1.67	
C0-Fluoranthene/Pyrene		U	3.33	1.67	
C1-Fluoranthene/Pyrene		U	3.33	1.67	
C2-Fluoranthene/Pyrene		U	3.33	1.67	
C3-Fluoranthene/Pyrene		U	3.33	1.67	
C0-Benz(a)anthracene/Chrysene		U	3.33	1.67	
C1-Benz(a)anthracene/Chrysene		U	3.33	1.67	
C2-Benz(a)anthracene/Chrysene		U	3.33	1.67	
C3-Benz(a)anthracene/Chrysene		U	3.33	1.67	
C4-Benz(a)anthracene/Chrysene		U	3.33	1.67	

Surrogates	%R	Min	Max
Fluorobenzene	67%	50%	150%
2-Fluorobiphenyl	72%	50%	120%
5a-Androstane	67%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **Blank Spike**

Client:	GTI	Preparation Method:	EPA 3511 Mod.
Project:	Ashland	Cleanup Method(s):	
		Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
		Matrix:	Water
		Preservation:	None
Lab ID:	IG010731-ABS	Decanted:	No
File ID:	13AUG04.D		
		Sample Size:	60 g
Date Sampled:		%Solid:	100%
Date Received:		Extract Volume:	2 mL
Date Prepared:	7/31/2001	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	8/13/2001	Injection Volume:	0.001 mL
Instrument:	GC-2/MS		
Operator:	kty	Batch QC:	IG010731-AB

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene	0.43		3.33	1.67	51.6%
Toluene	0.45		3.33	1.67	54.0%
Ethylbenzene	0.48		3.33	1.67	57.6%
m/p-Xylenes	0.49		3.33	1.67	58.8%
Styrene	0.49		3.33	1.67	58.8%
o-Xylene	0.44		3.33	1.67	52.8%
1,2,4-Trimethylbenzene	0.47		3.33	1.67	56.4%
Naphthalene	0.51		3.33	1.67	61.2%
2-Methylnaphthalene	0.56		3.33	1.67	67.2%
1-Methylnaphthalene	0.52		3.33	1.67	62.4%
Acenaphthylene	0.52		3.33	1.67	62.4%
Acenaphthene	0.52		3.33	1.67	62.4%
Dibenzofuran	0.53		3.33	1.67	63.6%
Fluorene	0.53		3.33	1.67	63.6%
Phenanthrene	0.54		3.33	1.67	64.8%
Anthracene	0.55		3.33	1.67	66.0%
Fluoranthene	0.56		3.33	1.67	67.2%
Pyrene	0.54		3.33	1.67	64.8%
Benz[a]anthracene	0.56		3.33	1.67	67.2%
Chrysene	0.52		3.33	1.67	62.4%
Benzo[b]fluoranthene	0.46		3.33	1.67	55.2%
Benzo[k]fluoranthene	0.44		3.33	1.67	52.8%
Benzo[a]pyrene	0.47		3.33	1.67	56.4%
Indeno[1,2,3-cd]pyrene	0.50		3.33	1.67	60.0%
Dibenz[a,h]anthracene	0.43		3.33	1.67	51.6%
Benzo[g,h,i]perylene	0.47		3.33	1.67	56.4%

Surrogates	%R	Min	Max
Fluorobenzene	49%	50%	150%
2-Fluorobiphenyl	60%	50%	120%
5a-Androstane	62%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Ananlytical Results for Total Petroleum Hydrocarbons

META Environmental, Inc.

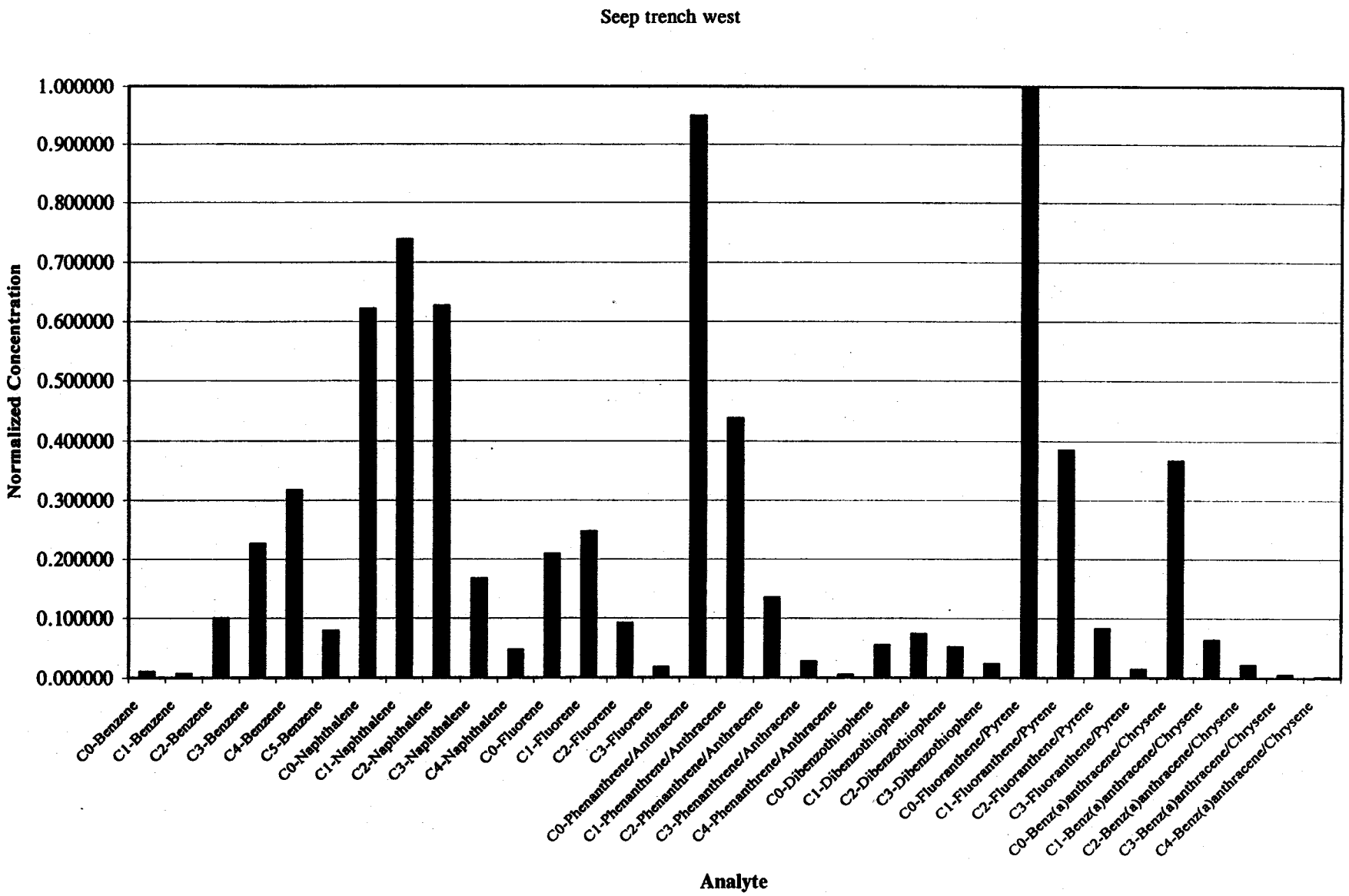
Client:	GTI	Instrument:	GC3-Front
Project:	Ashland	Analysis Date:	9/12/01
Calibration Material:	Alkane	Alkane Range:	C6-C40

Sample Data		Sample Size	Final Volume	Percent	Dilution	SS1 %Rec	SS2 %Rec	SS3 %Rec	FS1 %Rec	FS2 %Rec	FS3 %Rec			
Field ID	Lab ID	(mL or g)	(mL)	Solid	Factor	(FB)	(2FBP)	(5AA)	2,5_DBT	2-BN	1-CO	TPH	Units	Comments
Fractionation Blank	IG010813-FBPF	60.000	0.5	100%	1	NA	NA	NA	94%	41%	112%	0.04	mg/L	
	IG010813-FBDF					NA	NA	NA	8%	65%	8%	1.36	mg/L	
	IG010813-FBMF					NA	NA	NA	0%	0%	0%	0.30	mg/L	
Aqueouds Blank	IG010731-AB	60.000	2.0	100%	1	68%	68%	74%	NA	NA	NA	-0.76	mg/L	
	IG010731-ABPF					0%	0%	40%	93%	71%	102%	0.46	mg/L	
	IG010731-ABDF					5%	69%	8%	3%	26%	3%	5.15	mg/L	
	IG010731-ABMF					0%	0%	0%	0%	0%	0%	1.40	mg/L	
Seep trench west	IG010727-02	63.213	25.0	100%	1	64% I	I		NA	NA	NA	8,750	mg/L	
	IG010727-02PF					0%	35%	48%	71%	63%	72%	975	mg/L	
	IG010727-02DF					10% I	I		13%	51%	22%	6420	mg/L	
	IG010727-02MF					0%	6%	2%	0%	0%	1%	142	mg/L	
MW-7	IG010727-03	62.717	2.0	100%	1	76%	83%	86%	NA	NA	NA	21.5	mg/L	
	IG010727-03PF					0%	0%	55%	86%	61%	95%	4.89	mg/L	
	IG010727-03DF					4%	72%	7%	1%	37%	1%	21.1	mg/L	
	IG010727-03MF					0%	0%	0%	0%	0%	0%	1.29	mg/L	
TW-9	IG010727-04	70.652	2.0	100%	1	68%	129%	261%	NA	NA	NA	1,140	mg/L	
	IG010727-04PF					0%	10%	59%	96%	50%	90%	222	mg/L	
	IG010727-04DF					2%	98%	96% I		56%	46%	730	mg/L	
	IG010727-04MF					0%	1%	1%	0%	0%	0%	14.0	mg/L	
Upgradient Riser	IG010727-05	55.408	2.0	100%	1	36%	111%	42%	NA	NA	NA	1,310	mg/L	
	IG010727-05PF					1%	6%	42%	89%	53%	88%	209	mg/L	
	IG010727-05DF					1%	66%	4%	22%	40%	59%	695	mg/L	
	IG010727-05MF					0%	0%	0%	0%	0%	0%	8.17	mg/L	
Clay pipe	IG010727-06	66.830	2.0	100%	1	65%	82%	57%	NA	NA	NA	209	mg/L	
	IG010727-06PF					0%	1%	42%	80%	34%	87%	29.3	mg/L	
	IG010727-06DF					2%	48%	10%	4%	60%	4%	118	mg/L	
	IG010727-06MF					0%	0%	0%	0%	0%	0%	5.29	mg/L	

META

Appendix D

Extended PAH Profiles – Bar Graphs


Seep trench west
Normalized Concentration
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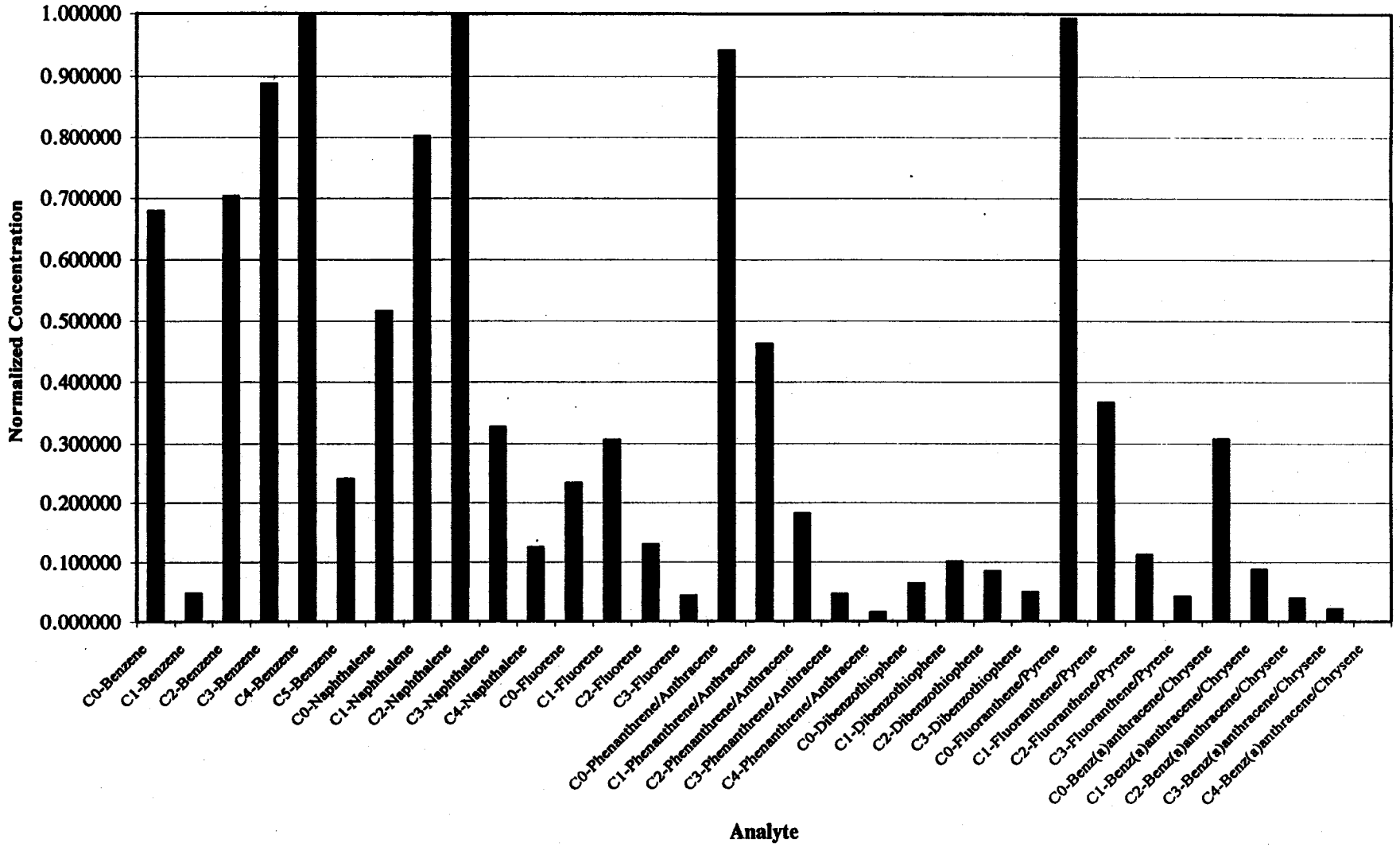
0.900000
0.800000
0.700000
0.600000
0.500000
0.400000
0.300000
0.200000
0.100000
0.000000
C0-Benzene
C1-Benzene
C2-Benzene
C3-Benzene
C4-Benzene
C5-Benzene
C0-Naphthalene
C1-Naphthalene
C2-Naphthalene
C3-Naphthalene
C4-Naphthalene
C0-Fluorene
C1-Fluorene
C2-Fluorene
C3-Fluorene
C0-Phenanthrene/Anthracene
C1-Phenanthrene/Anthracene
C2-Phenanthrene/Anthracene
C3-Phenanthrene/Anthracene
C4-Phenanthrene/Anthracene
C0-Dibenzothiophene
C1-Dibenzothiophene
C2-Dibenzothiophene
C3-Dibenzothiophene
C0-Fluoranthene/Pyrene
C1-Fluoranthene/Pyrene
C2-Fluoranthene/Pyrene
C3-Fluoranthene/Pyrene
C0-Benz(a)anthracene/Chrysene
C1-Benz(a)anthracene/Chrysene
C2-Benz(a)anthracene/Chrysene
C3-Benz(a)anthracene/Chrysene
C4-Benz(a)anthracene/Chrysene
Analyte

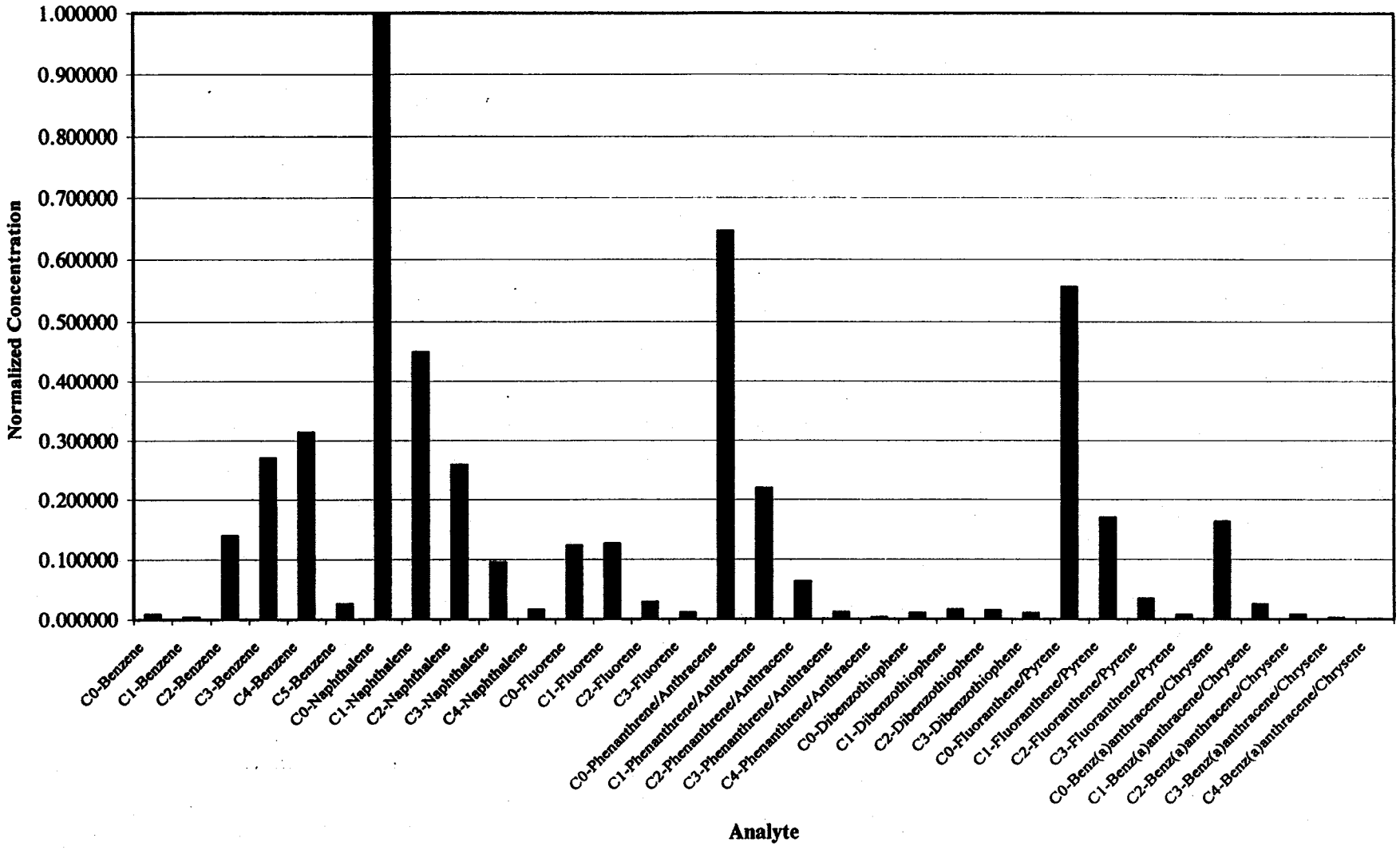
META

MW-7

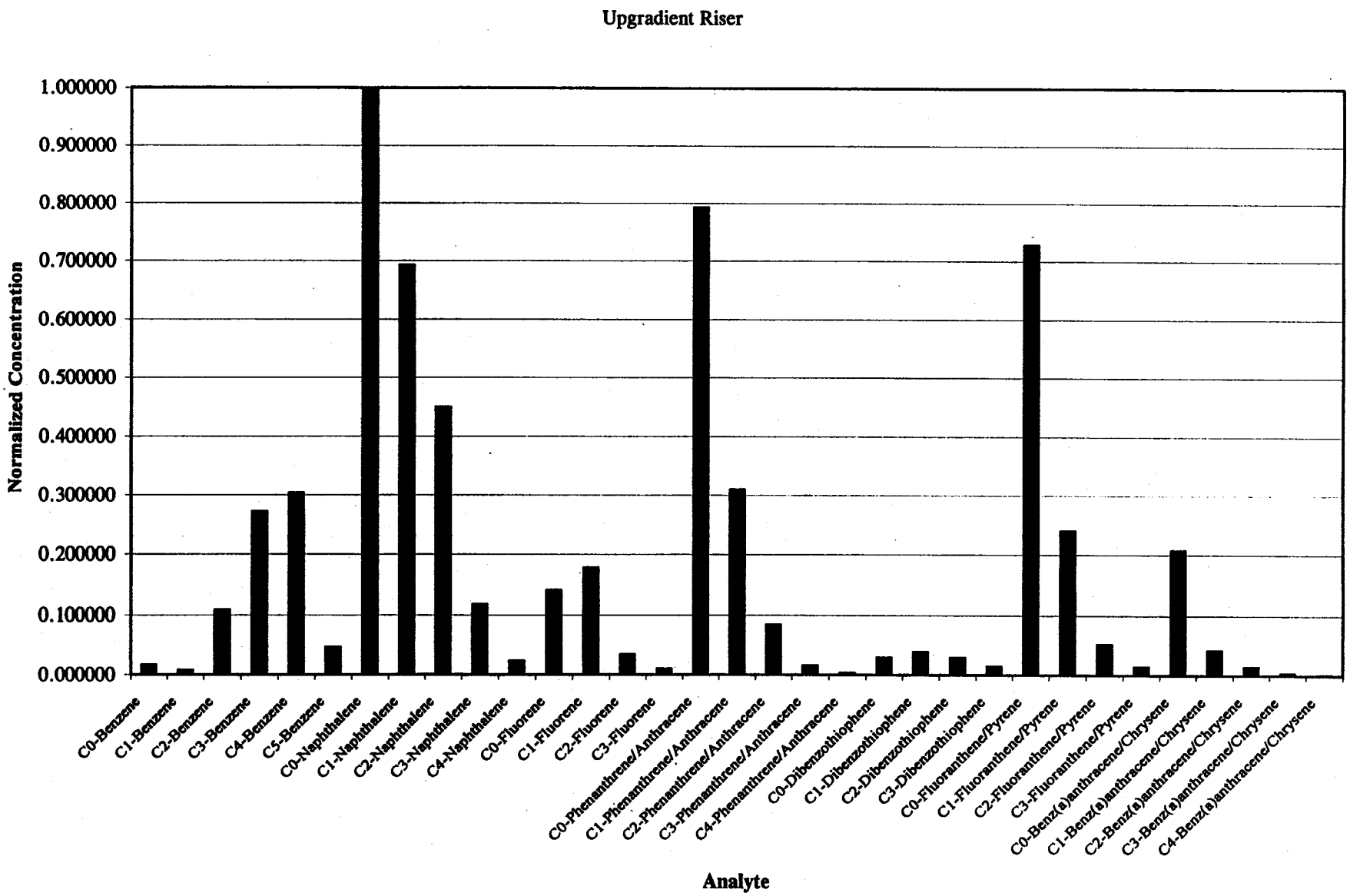

1.000000
0.900000
0.800000
0.700000
0.600000
0.500000
0.400000
0.300000
0.200000
0.100000
0.000000
Normalized Concentration
C0-Benzene
C1-Benzene
C2-Benzene
C3-Benzene
C4-Benzene
C5-Benzene
C0-Naphthalene
C1-Naphthalene
C2-Naphthalene
C3-Naphthalene
C4-Naphthalene
C0-Fluorene
C1-Fluorene
C2-Fluorene
C3-Fluorene
C0-Phenanthrene/Anthracene
C1-Phenanthrene/Anthracene
C2-Phenanthrene/Anthracene
C3-Phenanthrene/Anthracene
C4-Phenanthrene/Anthracene
C0-Dibenzothiophene
C1-Dibenzothiophene
C2-Dibenzothiophene
C3-Dibenzothiophene
C0-Fluoranthene/Pyrene
C1-Fluoranthene/Pyrene
C2-Fluoranthene/Pyrene
C3-Fluoranthene/Pyrene
C0-Benz(a)anthracene/Chrysene
C1-Benz(a)anthracene/Chrysene
C2-Benz(a)anthracene/Chrysene
C3-Benz(a)anthracene/Chrysene
C4-Benz(a)anthracene/Chrysene
Analyte

META

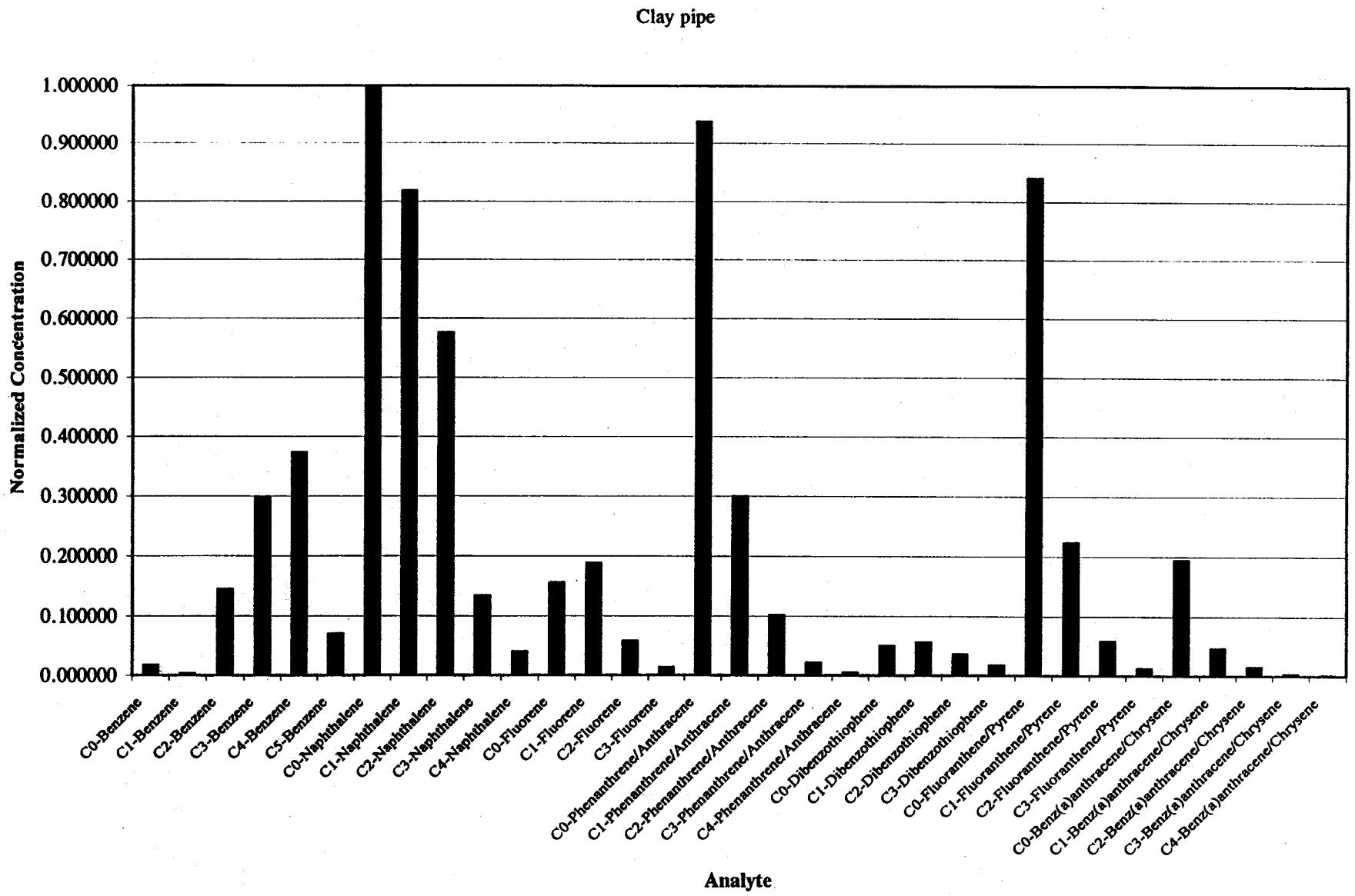
TW-9


Normalized Concentration
1.000000
0.900000
0.800000
0.700000
0.600000
0.500000
0.400000
0.300000
0.200000
0.100000
0.000000
C0-Benzene
C1-Benzene
C2-Benzene
C3-Benzene
C4-Benzene
C5-Benzene
C0-Naphthalene
C1-Naphthalene
C2-Naphthalene
C3-Naphthalene
C4-Naphthalene
C0-Fluorene
C1-Fluorene
C2-Fluorene
C3-Fluorene
C0-Phenanthrene/Anthracene
C1-Phenanthrene/Anthracene
C2-Phenanthrene/Anthracene
C3-Phenanthrene/Anthracene
C4-Phenanthrene/Anthracene
C0-Dibenzothiophene
C1-Dibenzothiophene
C2-Dibenzothiophene
C3-Dibenzothiophene
C0-Fluoranthene/Pyrene
C1-Fluoranthene/Pyrene
C2-Fluoranthene/Pyrene
C3-Fluoranthene/Pyrene
C0-Benz(a)anthracene/Chrysene
C1-Benz(a)anthracene/Chrysene
C2-Benz(a)anthracene/Chrysene
C3-Benz(a)anthracene/Chrysene
C4-Benz(a)anthracene/Chrysene
Analyte

META


Upgradient Riser
Normalized Concentration
1.000000
0.900000
0.800000
0.700000
0.600000
0.500000
0.400000
0.300000
0.200000
0.100000
0.000000
C0-Benzene
C1-Benzene
C2-Benzene
C3-Benzene
C4-Benzene
C5-Benzene
C0-Naphthalene
C1-Naphthalene
C2-Naphthalene
C3-Naphthalene
C4-Naphthalene
C0-Fluorene
C1-Fluorene
C2-Fluorene
C3-Fluorene
C0-Phenanthrene/Anthracene
C1-Phenanthrene/Anthracene
C2-Phenanthrene/Anthracene
C3-Phenanthrene/Anthracene
C4-Phenanthrene/Anthracene
C0-Dibenzothiophene
C1-Dibenzothiophene
C2-Dibenzothiophene
C3-Dibenzothiophene
C0-Fluoranthene/Pyrene
C1-Fluoranthene/Pyrene
C2-Fluoranthene/Pyrene
C3-Fluoranthene/Pyrene
C0-Benz(a)anthracene/Chrysene
C1-Benz(a)anthracene/Chrysene
C2-Benz(a)anthracene/Chrysene
C3-Benz(a)anthracene/Chrysene
C4-Benz(a)anthracene/Chrysene
Analyte

META


Clay pipe
Normalized Concentration
1.000000
0.900000
0.800000
0.700000
0.600000
0.500000
0.400000
0.300000
0.200000
0.100000
0.000000
C0-Benzene
C1-Benzene
C2-Benzene
C3-Benzene
C4-Benzene
C5-Benzene
C0-Naphthalene
C1-Naphthalene
C2-Naphthalene
C3-Naphthalene
C4-Naphthalene
C0-Fluorene
C1-Fluorene
C2-Fluorene
C3-Fluorene
C0-Phenanthrene/Anthracene
C1-Phenanthrene/Anthracene
C2-Phenanthrene/Anthracene
C3-Phenanthrene/Anthracene
C4-Phenanthrene/Anthracene
C0-Dibenzothiophene
C1-Dibenzothiophene
C2-Dibenzothiophene
C3-Dibenzothiophene
C0-Fluoranthene/Pyrene
C1-Fluoranthene/Pyrene
C2-Fluoranthene/Pyrene
C3-Fluoranthene/Pyrene
C0-Benz(a)anthracene/Chrysene
C1-Benz(a)anthracene/Chrysene
C2-Benz(a)anthracene/Chrysene
C3-Benz(a)anthracene/Chrysene
C4-Benz(a)anthracene/Chrysene
Analyte

META

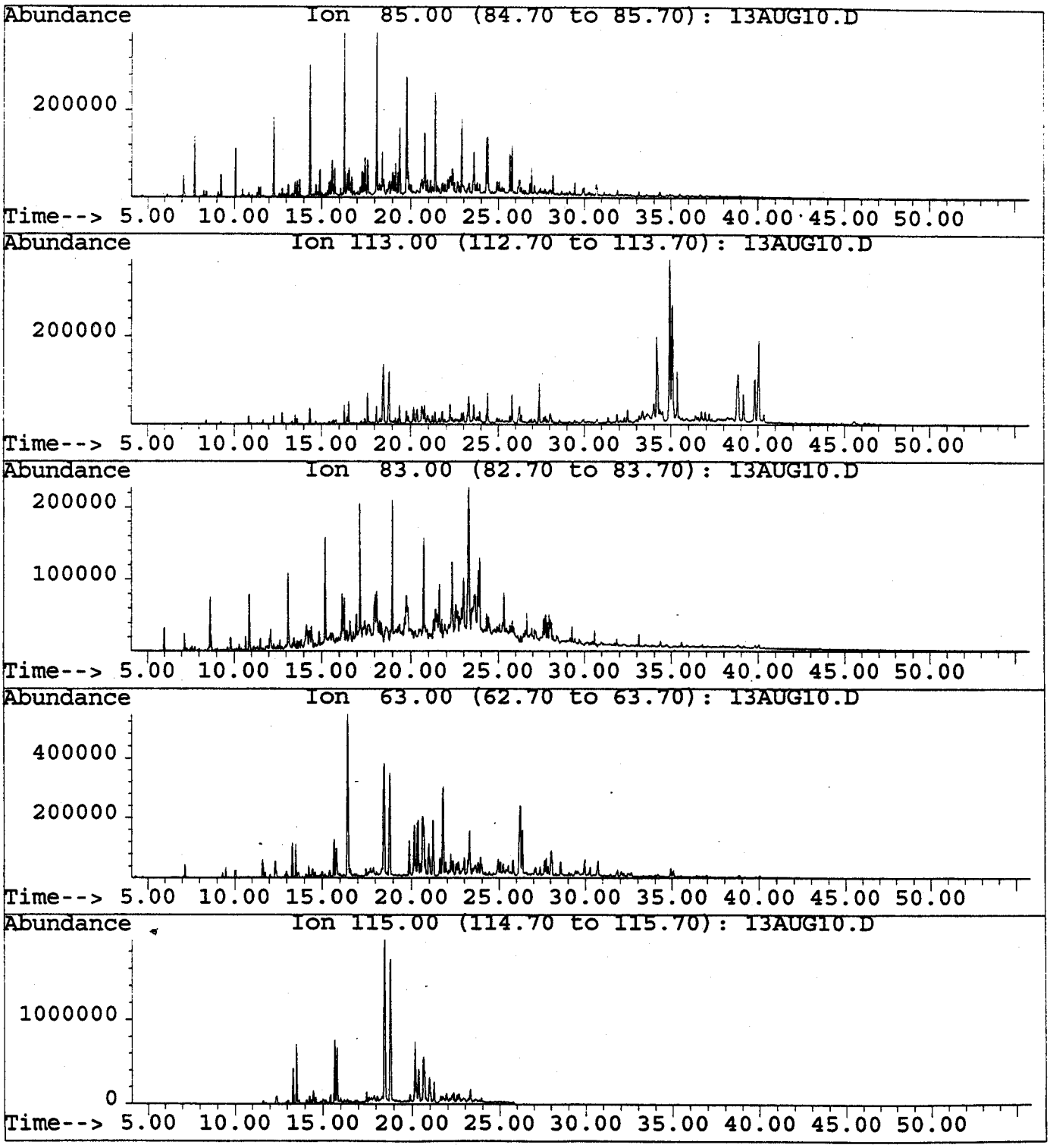
Appendix E

Extracted Ion Current Profiles (EICs)

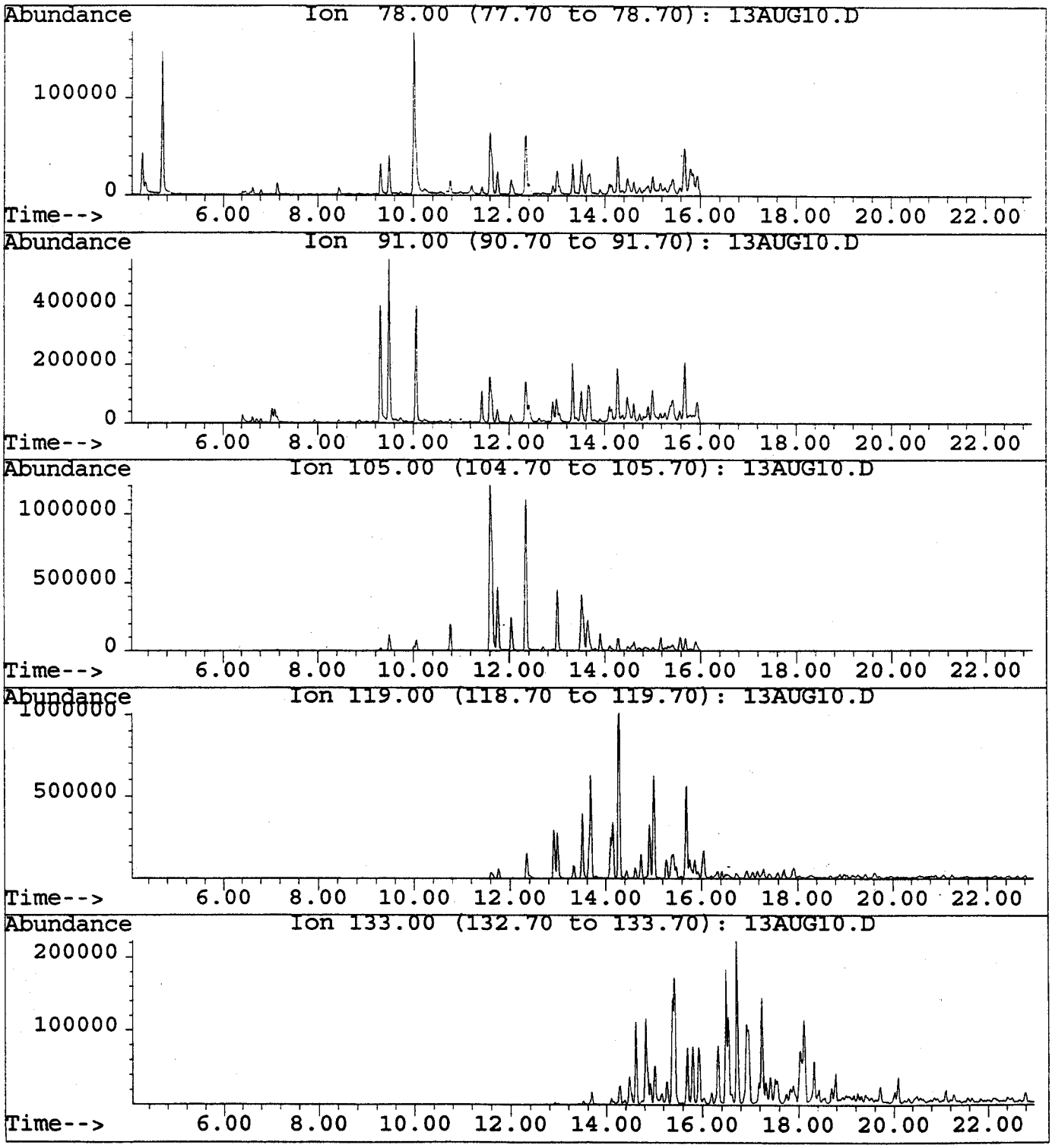
Primary Ions for Target Compounds and Compound Groups

Target Compound or Group	Abbreviation	Ion
Alkylated cyclohexanes		83
Normal alkanes, pristane, phytane		85
Isoprenoid hydrocarbons, pristane, phytane		113
Olefins		115
Hopanes		191
Steranes		217
Benzene	B	78
Monoalkylbenzenes	C1B	91
Dialkylbenzenes	C2B	91
Trialkylbenzenes	C3B	105
Tetraalkylbenzenes	C4B	119
Pentaalkylbenzenes	C5B	133
Naphthalene	N	128
Monoalkylnaphthalenes	C1N	142
Dialkylnaphthalenes	C2N	156
Trialkylnaphthalenes	C3N	170
Tetraalkylnaphthalenes	C4N	184
Fluorene	F	166
Monoalkylfluorenes	C1F	180
Dialkylfluorenes	C2F	194
Trialkylfluorenes	C3F	208
Phenanthrene, anthracene	PA	178
Monoalkylphenanthrenes and anthracenes	C1PA	192
Dialkylphenanthrenes and anthracenes	C2PA	206
Trialkylphenanthrenes and anthracenes	C3PA	220
Tetraalkylphenanthrenes and anthracenes	C4PA	234
Dibenzothiophene	D	184
Monoalkyldibenzothiophenes	C1D	198
Dialkyldibenzothiophenes	C2D	212
Trialkyldibenzothiophenes	C3D	226
Fluoranthene, pyrene	FP	202
Monoalkylfluoranthenes and pyrenes	C1FP	216
Dialkylfluoranthenes and pyrenes	C2FP	230
Trialkyfluoranthenes and pyrenes	C3FP	244
Benz(a)anthracene, chrysene	BC	228
Monoalkylbenz(a)anthracenes and chrysenes	C1BC	242
Dialkylbenz(a)anthracenes and chrysenes	C2BC	256
Trialkylbenz(a)anthracenes and chrysenes	C3BC	270
Tetraalkylbenz(a)anthrancenes and chrysenes	C4BC	284

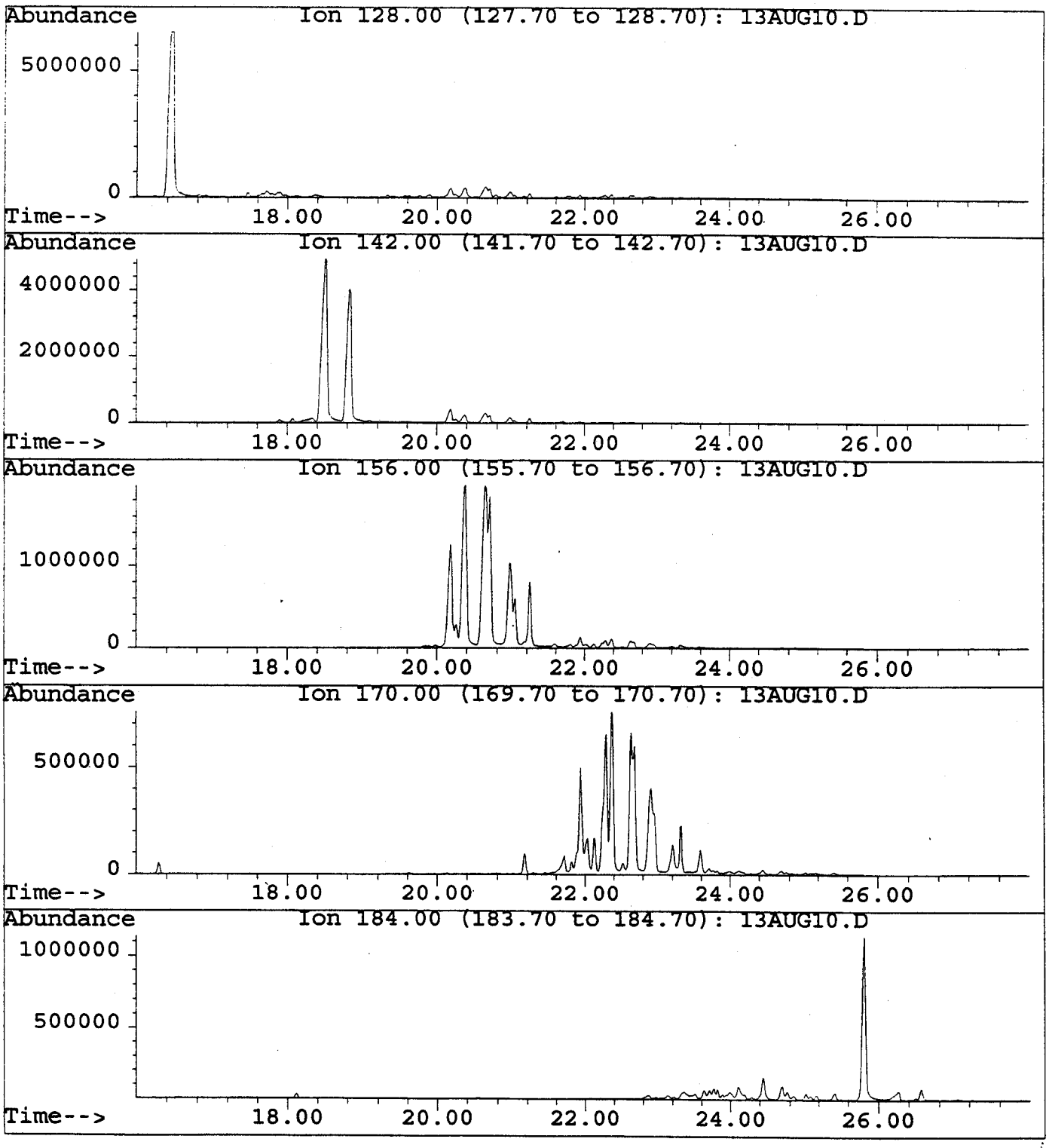
File : C:\HPCHEM\2\DATA\010813\13AUG10.D
Operator : kty
Acquired : 13 Aug 101 9:13 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-02 Seep trench west
Misc Info :
Vial Number: 10



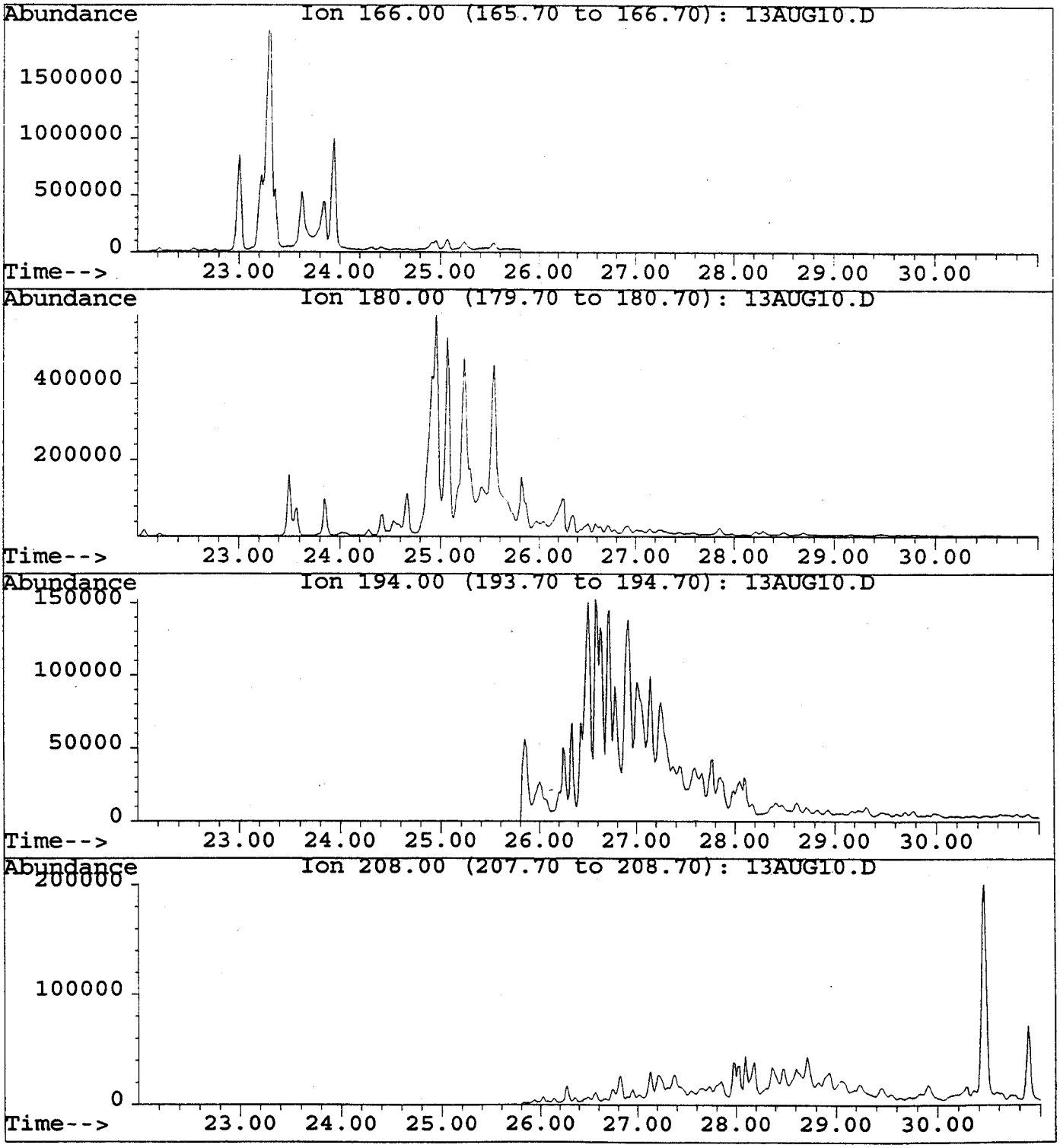
File : C:\HPCHEM\2\DATA\010813\13AUG10.D
Operator : kty
Acquired : 13 Aug 101 9:13 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-02 Seep trench west
Misc Info :
Vial Number: 10



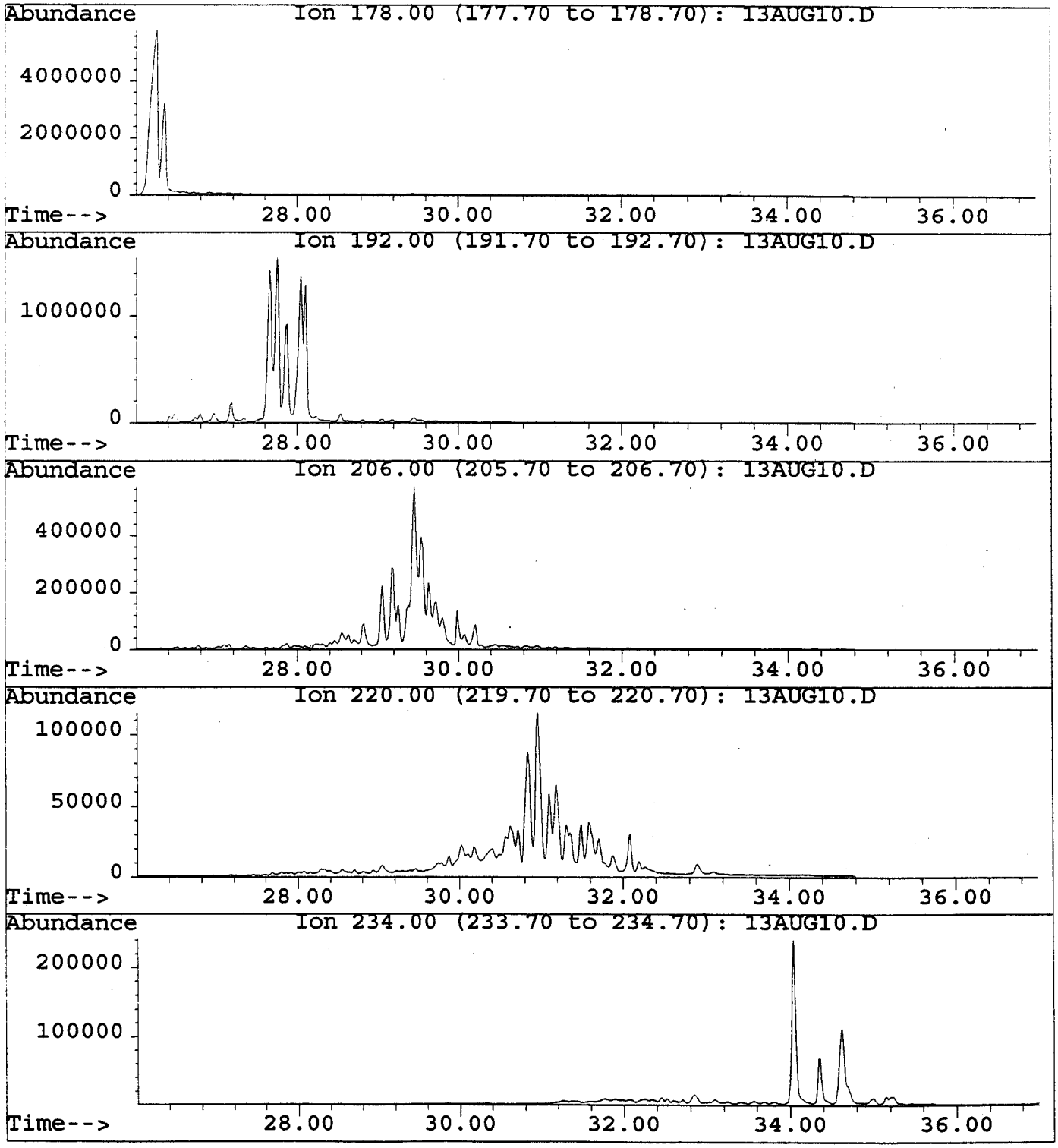
File : C:\HPCHEM\2\DATA\010813\13AUG10.D
Operator : kty
Acquired : 13 Aug 101 9:13 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-02 Seep trench west
Misc Info :
Vial Number: 10



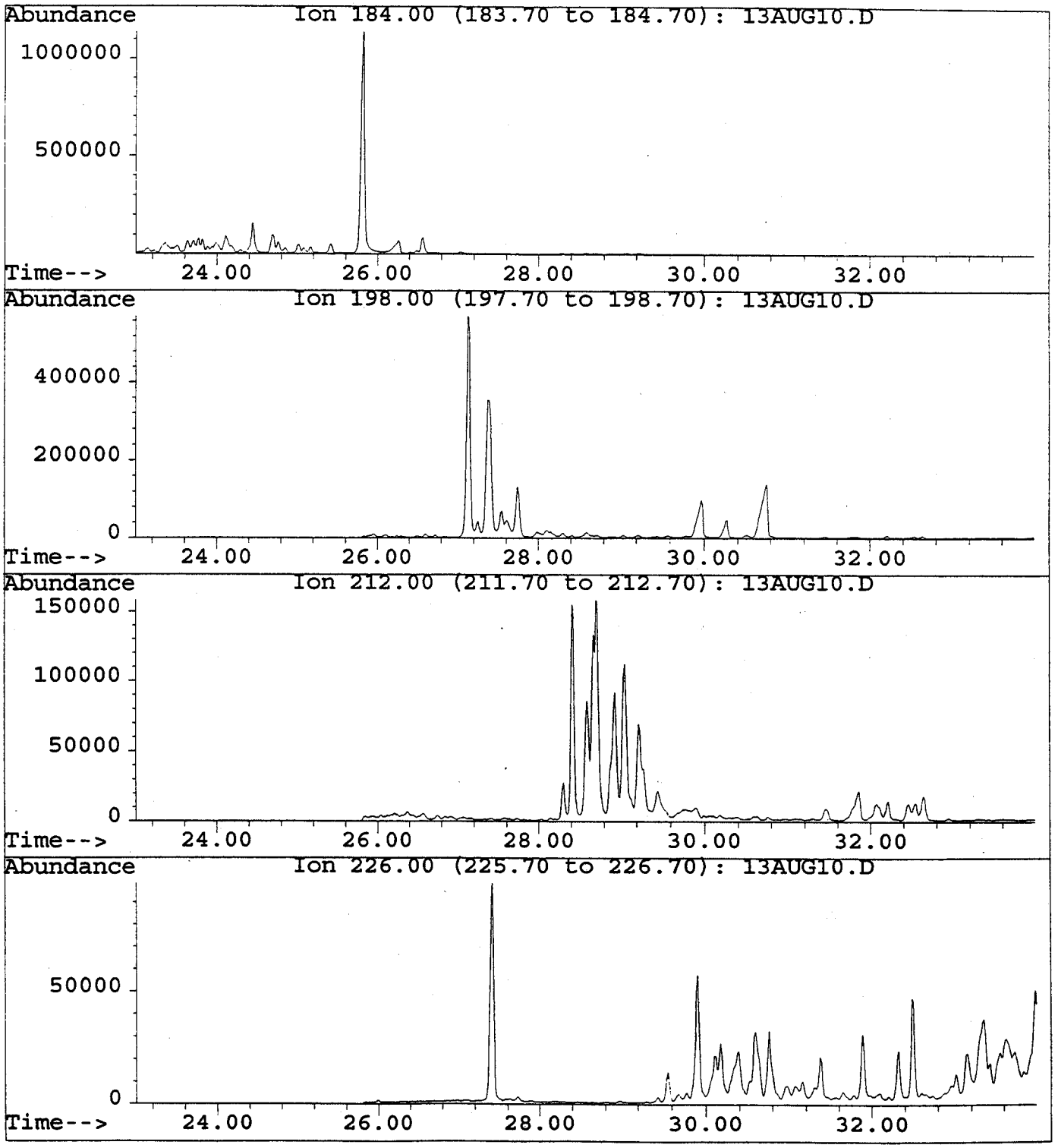
File : C:\HPCHEM\2\DATA\010813\13AUG10.D
Operator : kty
Acquired : 13 Aug 101 9:13 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-02 Seep trench west
Misc Info :
Vial Number: 10



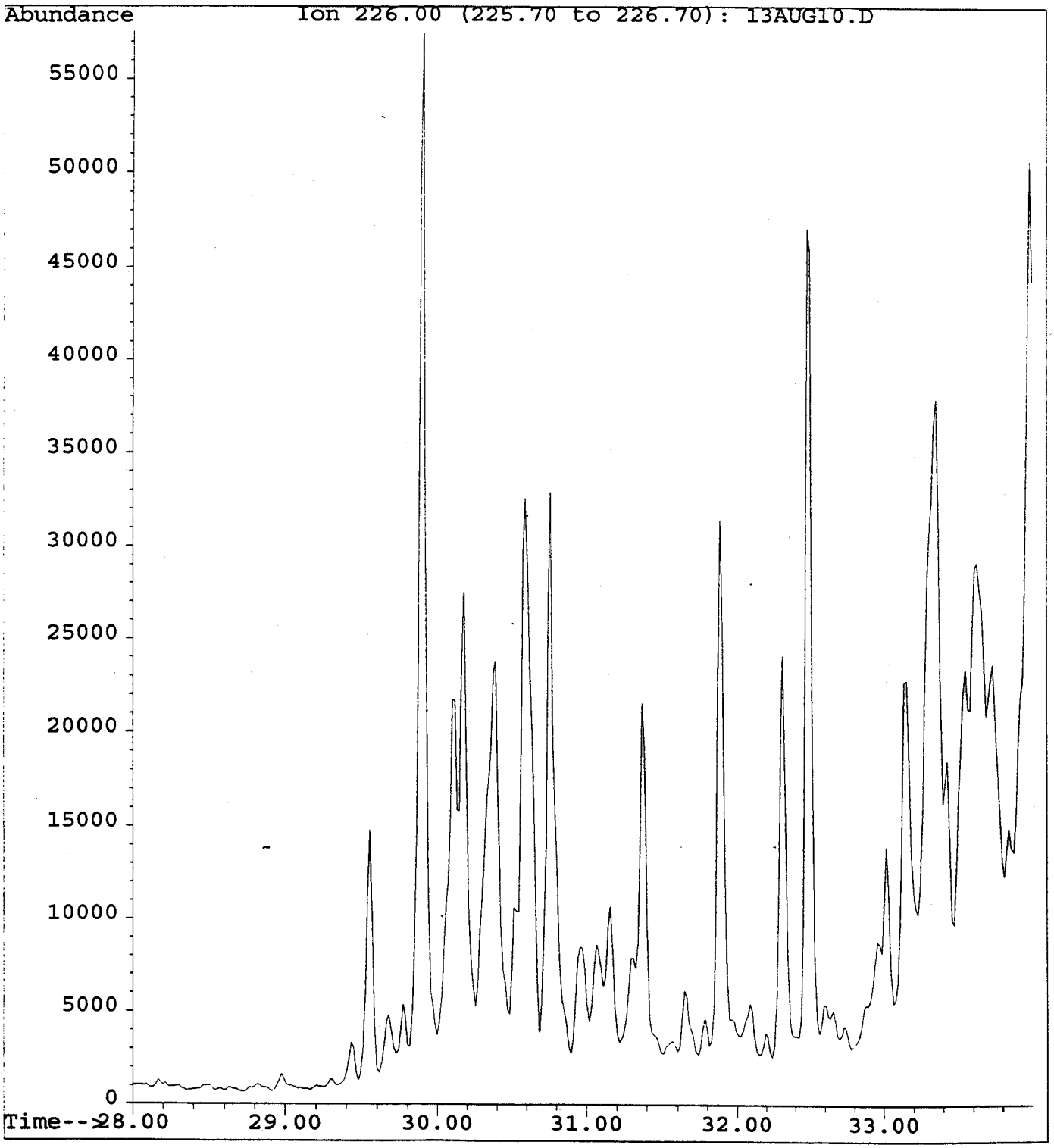
File : C:\HPCHEM\2\DATA\010813\13AUG10.D
Operator : kty
Acquired : 13 Aug 101 9:13 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-02 Seep trench west
Misc Info :
Vial Number: 10



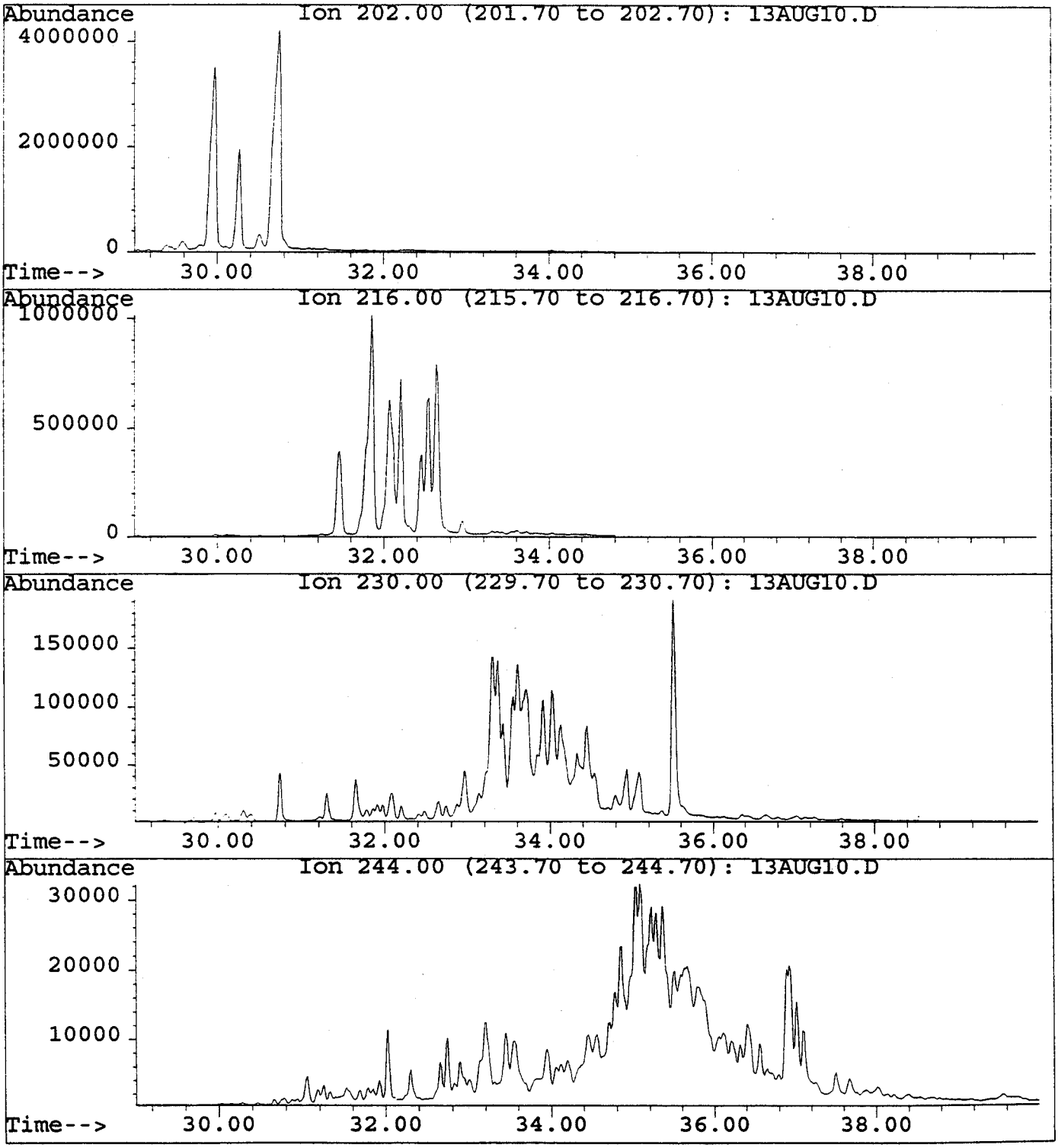
File : C:\HPCHEM\2\DATA\010813\13AUG10.D
Operator : kty
Acquired : 13 Aug 101 9:13 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-02 Seep trench west
Misc Info :
Vial Number: 10



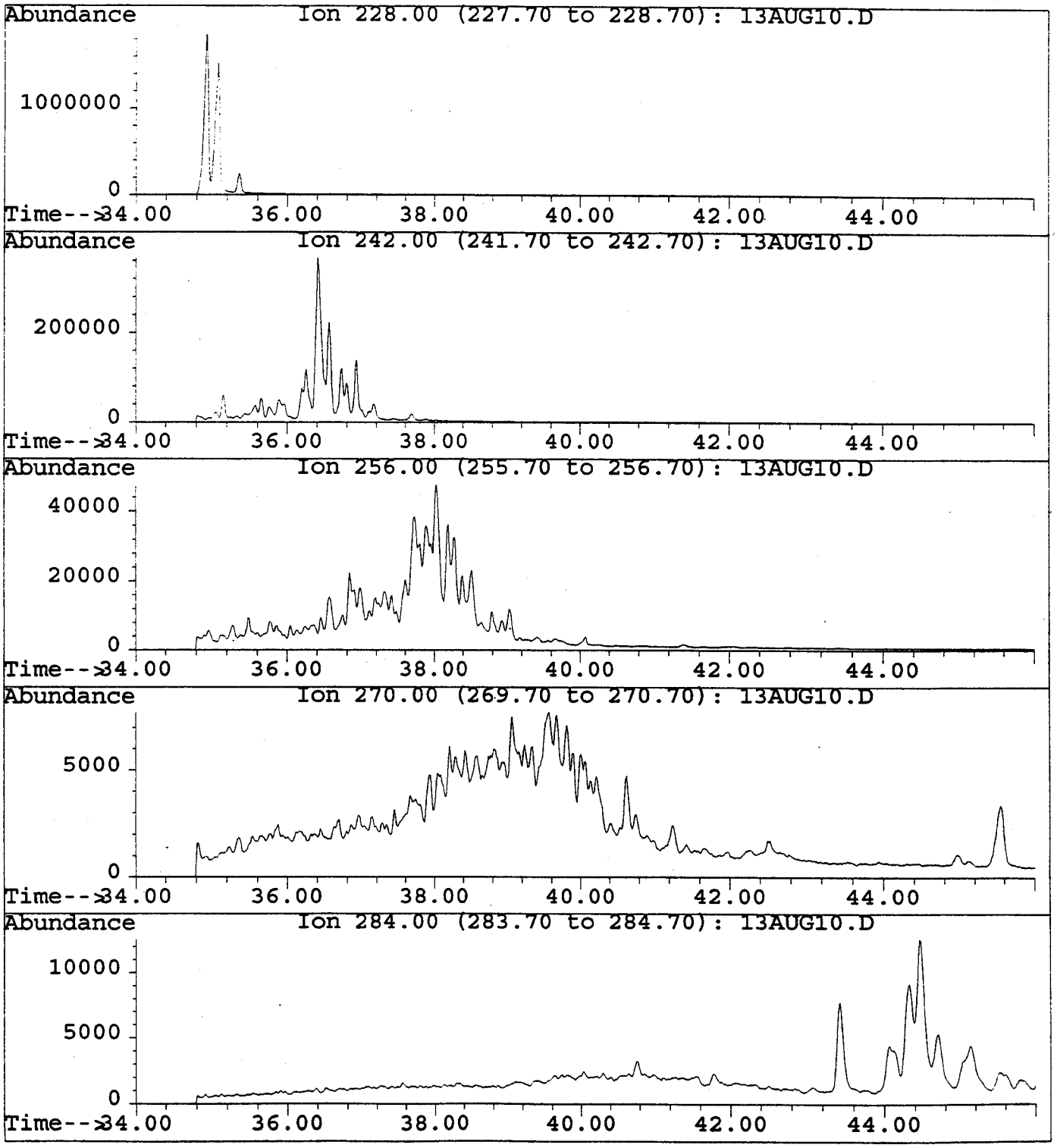
File : C:\HPCHEM\2\DATA\010813\13AUG10.D
Operator : kty
Acquired : 13 Aug 101 9:13 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-02 Seep trench west
Misc Info :
Vial Number: 10



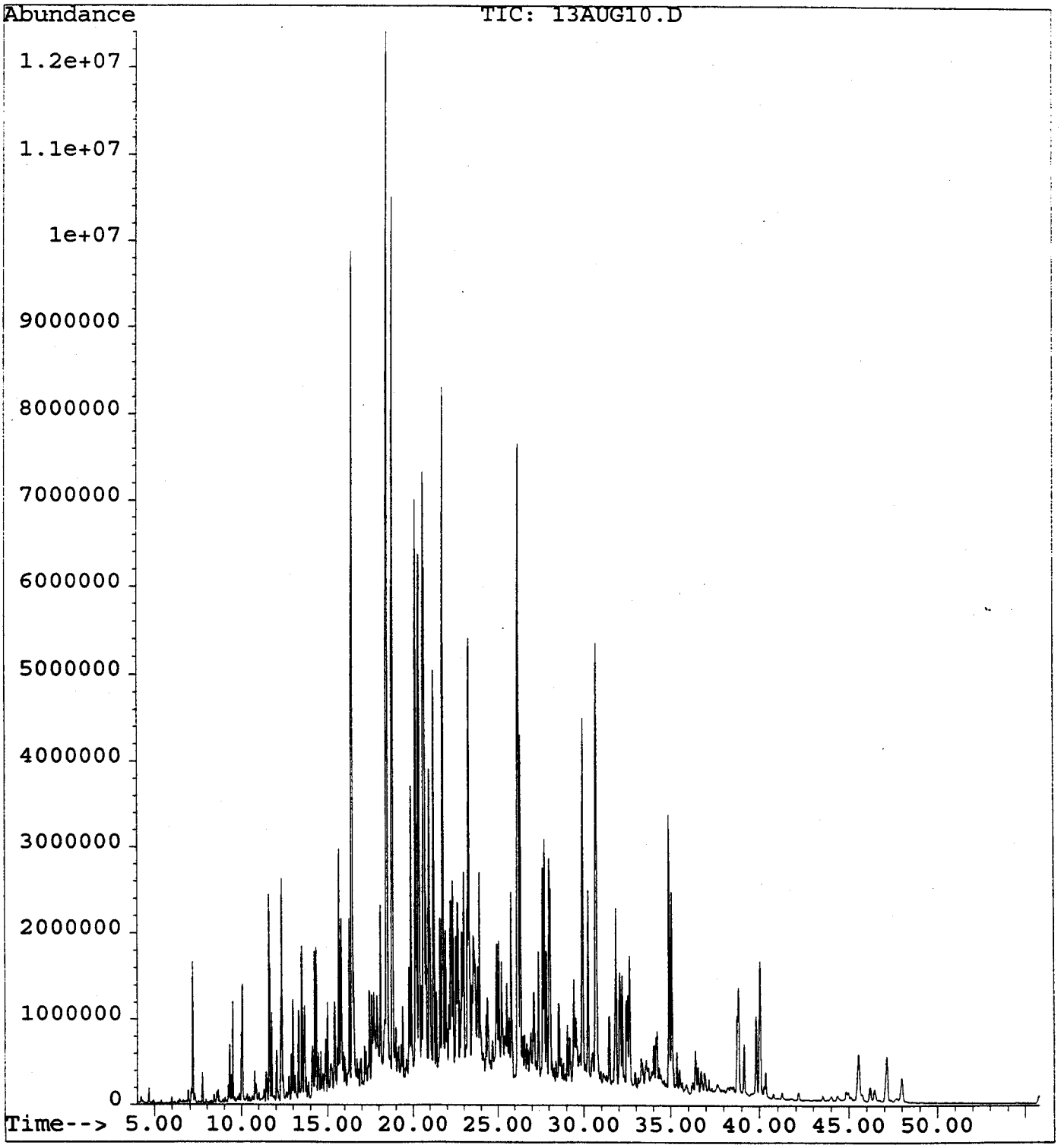
File : C:\HPCHEM\2\DATA\010813\13AUG10.D
Operator : kty
Acquired : 13 Aug 101 9:13 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-02 Seep trench west
Misc Info :
Vial Number: 10



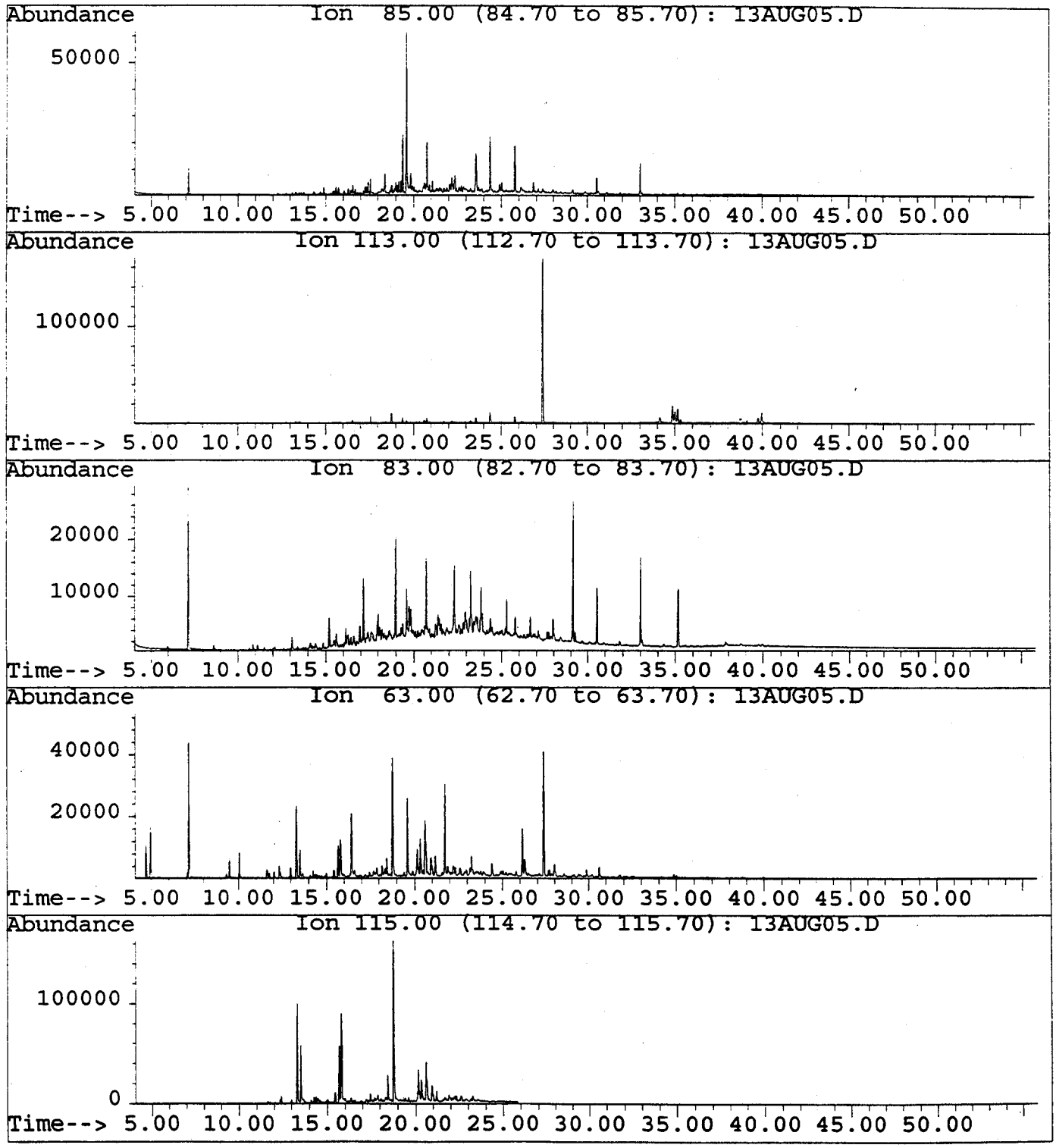
File : C:\HPCHEM\2\DATA\010813\13AUG10.D
Operator : kty
Acquired : 13 Aug 101 9:13 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-02 Seep trench west
Misc Info :
Vial Number: 10



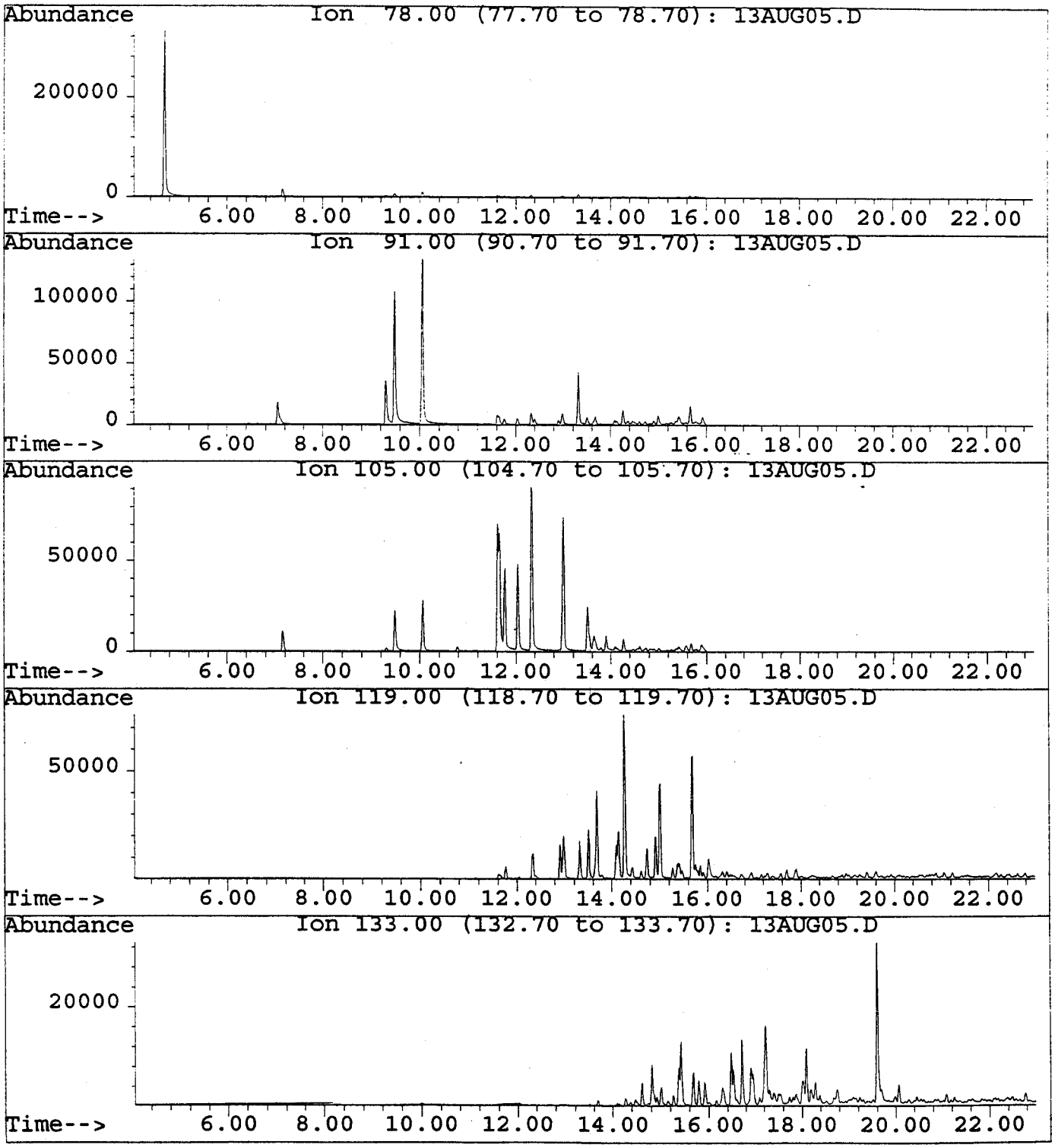
File : C:\HPCHEM\2\DATA\010813\13AUG10.D
Operator : kty
Acquired : 13 Aug 101 9:13 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-02 Seep trench west
Misc Info :
Vial Number: 10



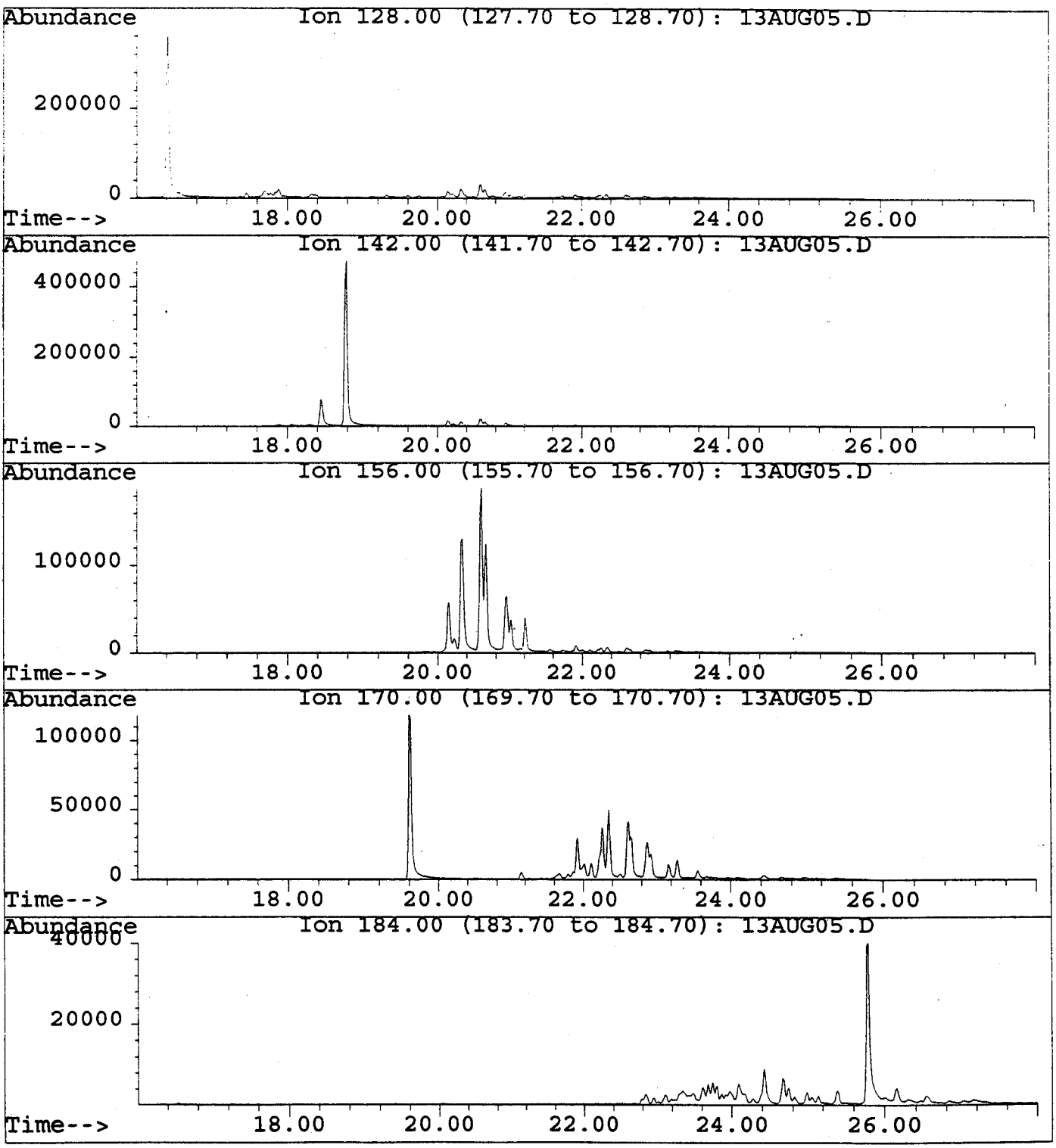
File : C:\HPCHEM\2\DATA\010813\13AUG05.D
Operator : kty
Acquired : 13 Aug 101 2:38 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-03 MW-7
Misc Info :
Vial Number: 5



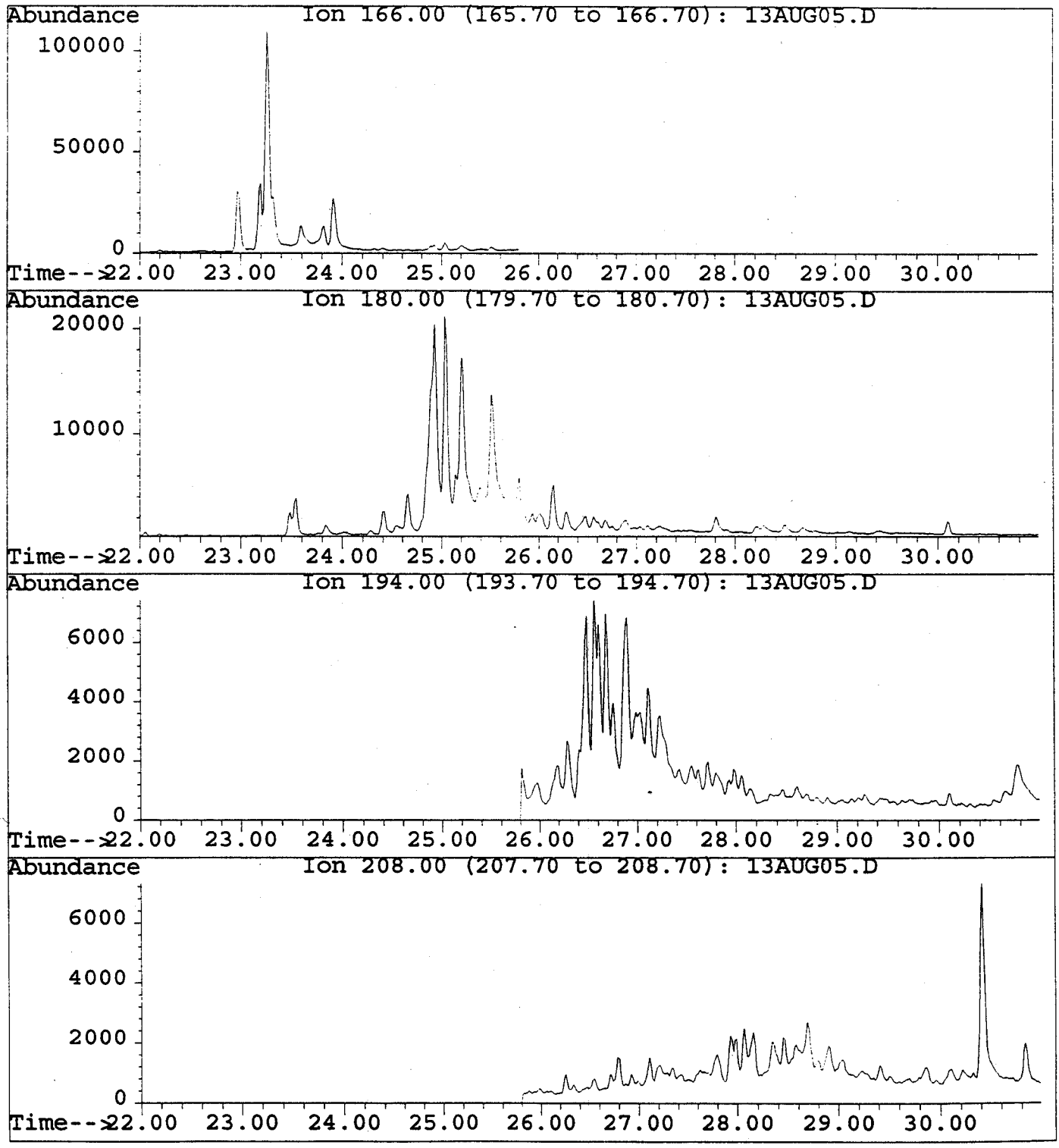
File : C:\HPCHEM\2\DATA\010813\13AUG05.D
Operator : kty
Acquired : 13 Aug 101 2:38 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-03 MW-7
Misc Info :
Vial Number: 5



File : C:\HPCHEM\2\DATA\010813\13AUG05.D
Operator : kty
Acquired : 13 Aug 101 2:38 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-03 MW-7
Misc Info :
Vial Number: 5



File : C:\HPCHEM\2\DATA\010813\13AUG05.D
Operator : kty
Acquired : 13 Aug 101 2:38 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-03 MW-7
Misc Info :
Vial Number: 5



File : C:\HPCHEM\2\DATA\010813\13AUG05.D
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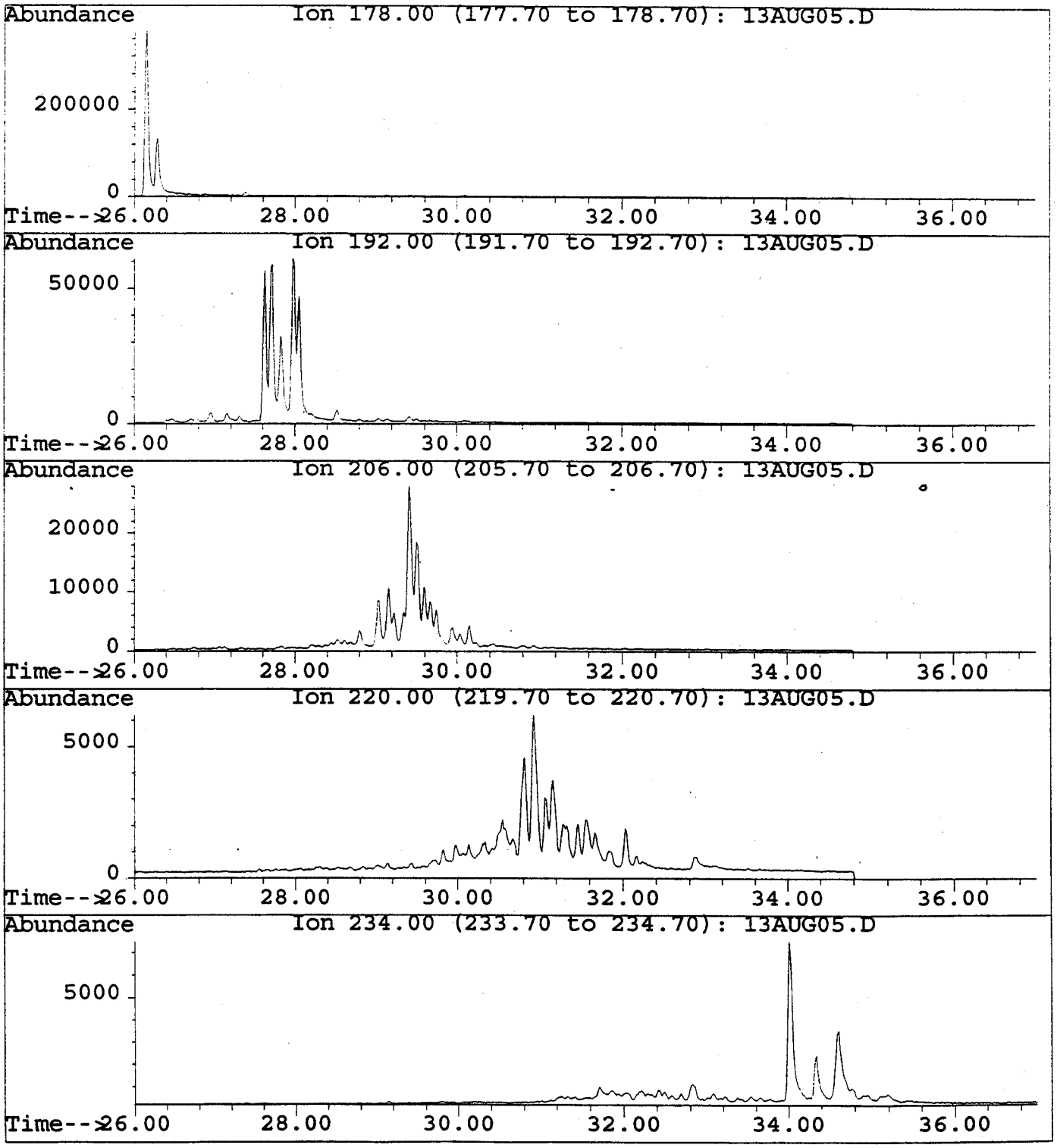
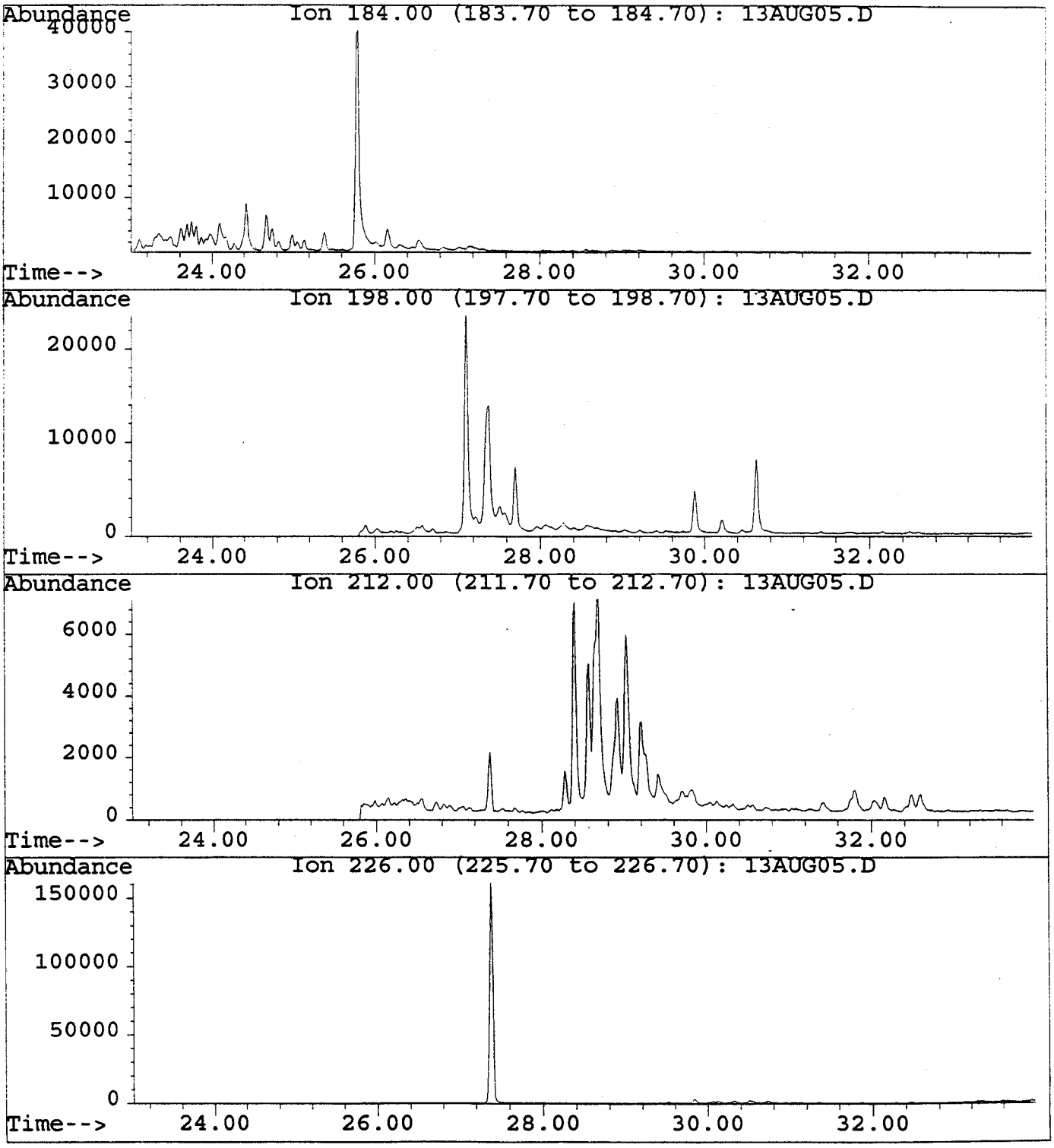
Instrument : GC-2/MS
Sample Name: IG010727-03 MW-7
Misc Info :
Vial Number: 5



File : C:\HPCHEM\2\DATA\010813\13AUG05.D
Operator : kty
Acquired : 13 Aug 101 2:38 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-03 MW-7
Misc Info :
Vial Number: 5



File : C:\HPCHEM\2\DATA\010813\13AUG05.D
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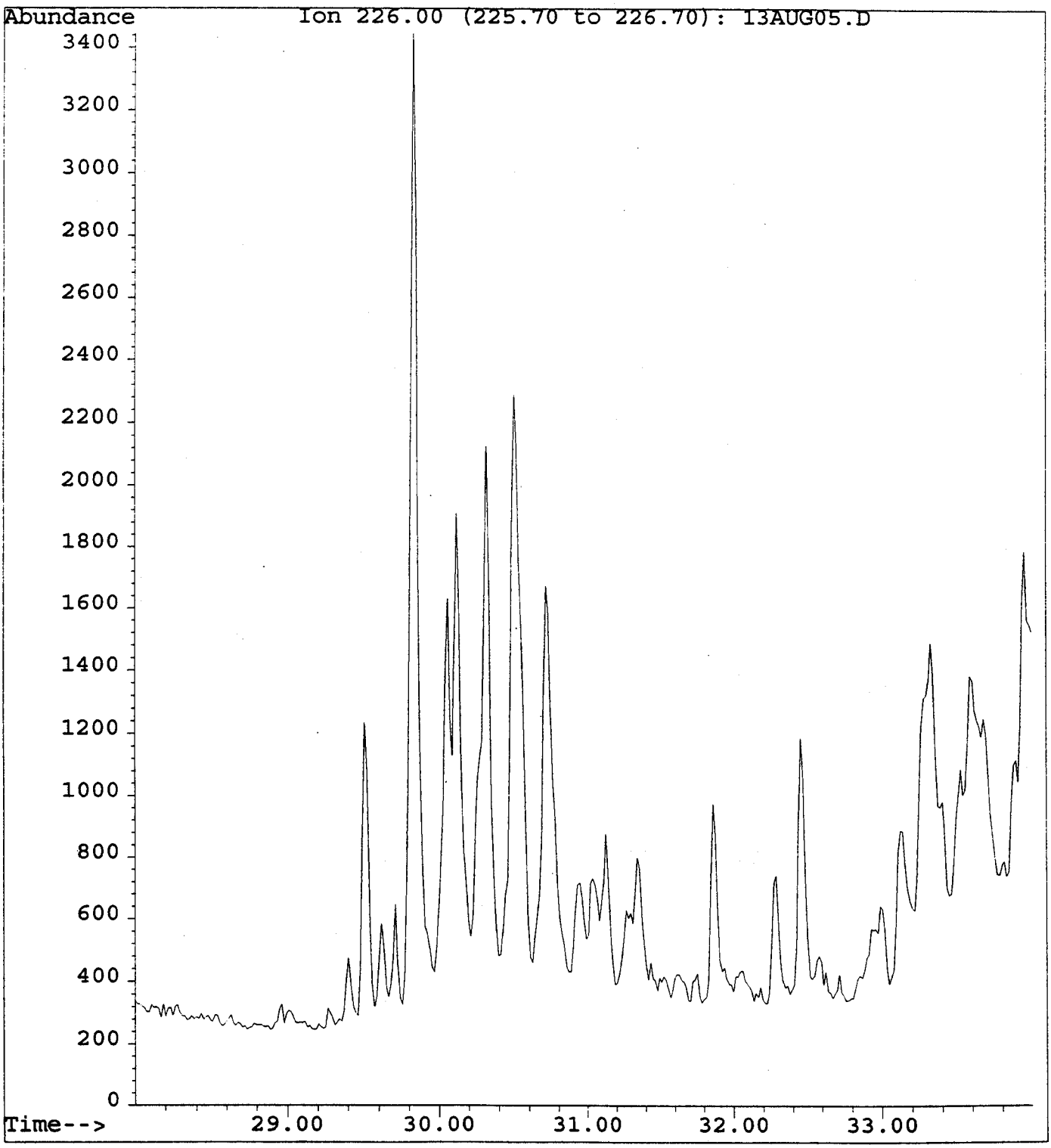
Instrument : GC-2/MS
Sample Name: IG010727-03 MW-7
Misc Info :
Vial Number: 5



File : C:\HPCHEM\2\DATA\010813\13AUG05.D
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Instrument : GC-2/MS
Sample Name: IG010727-03 MW-7
Misc Info :
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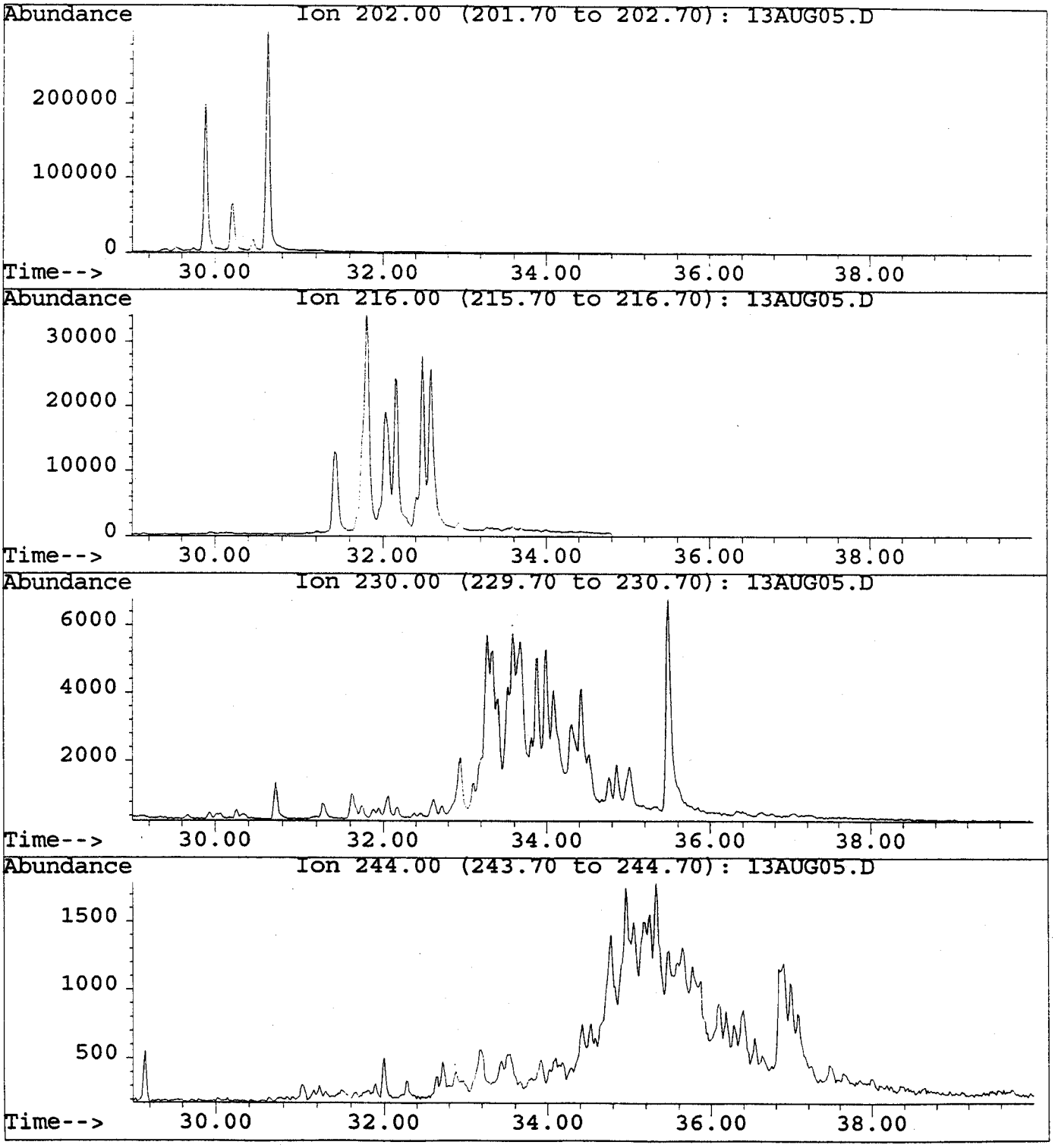
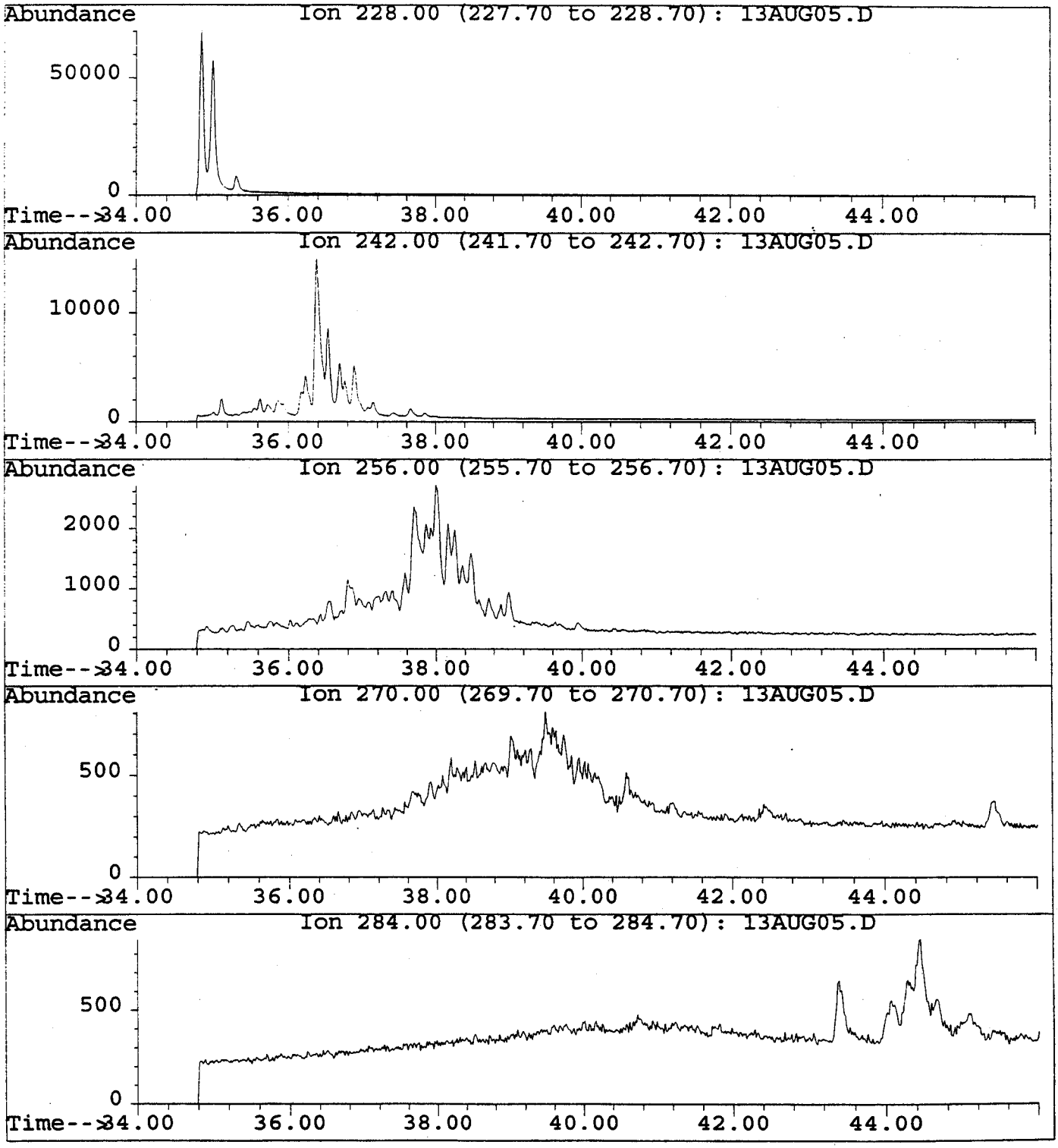
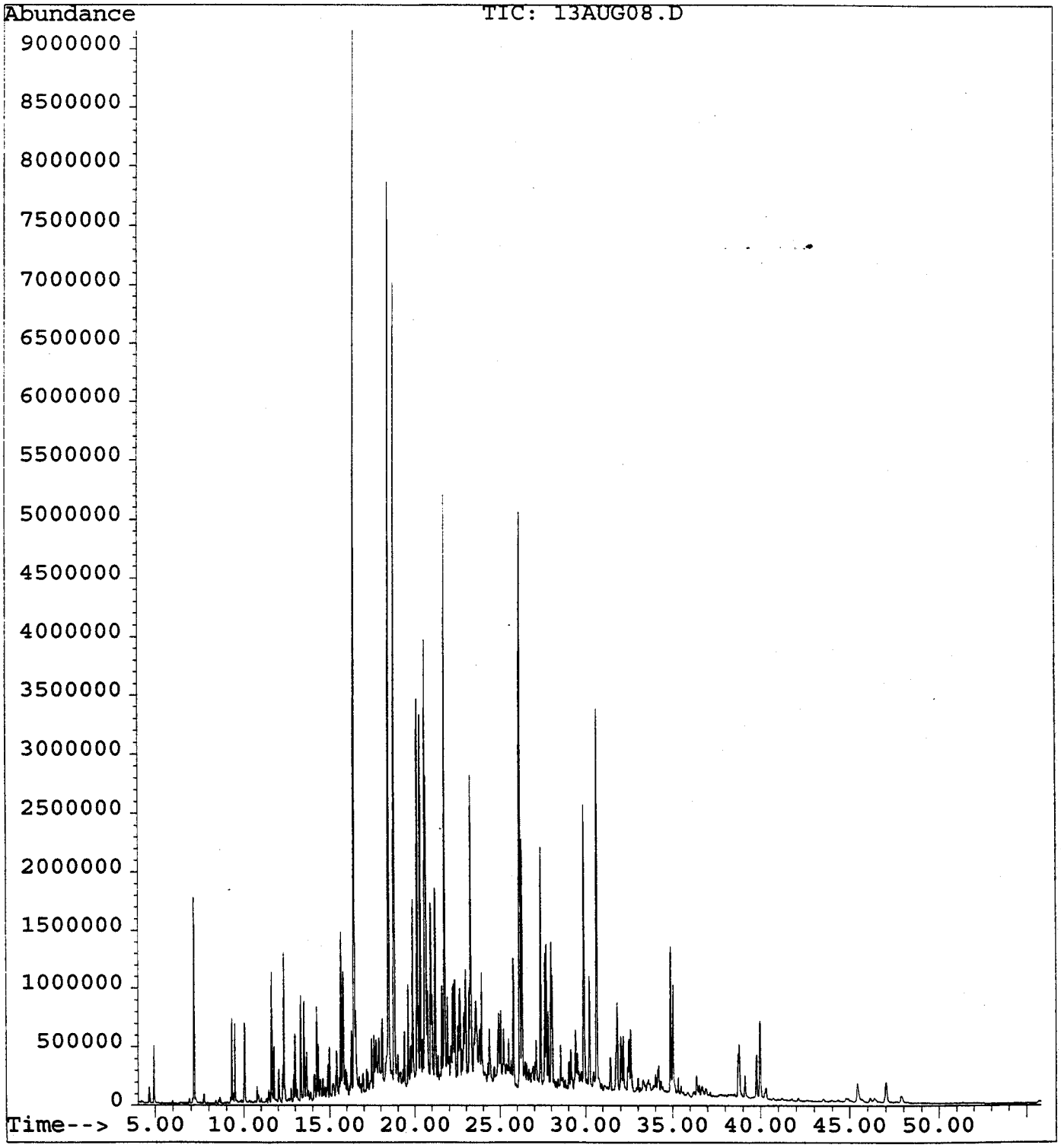


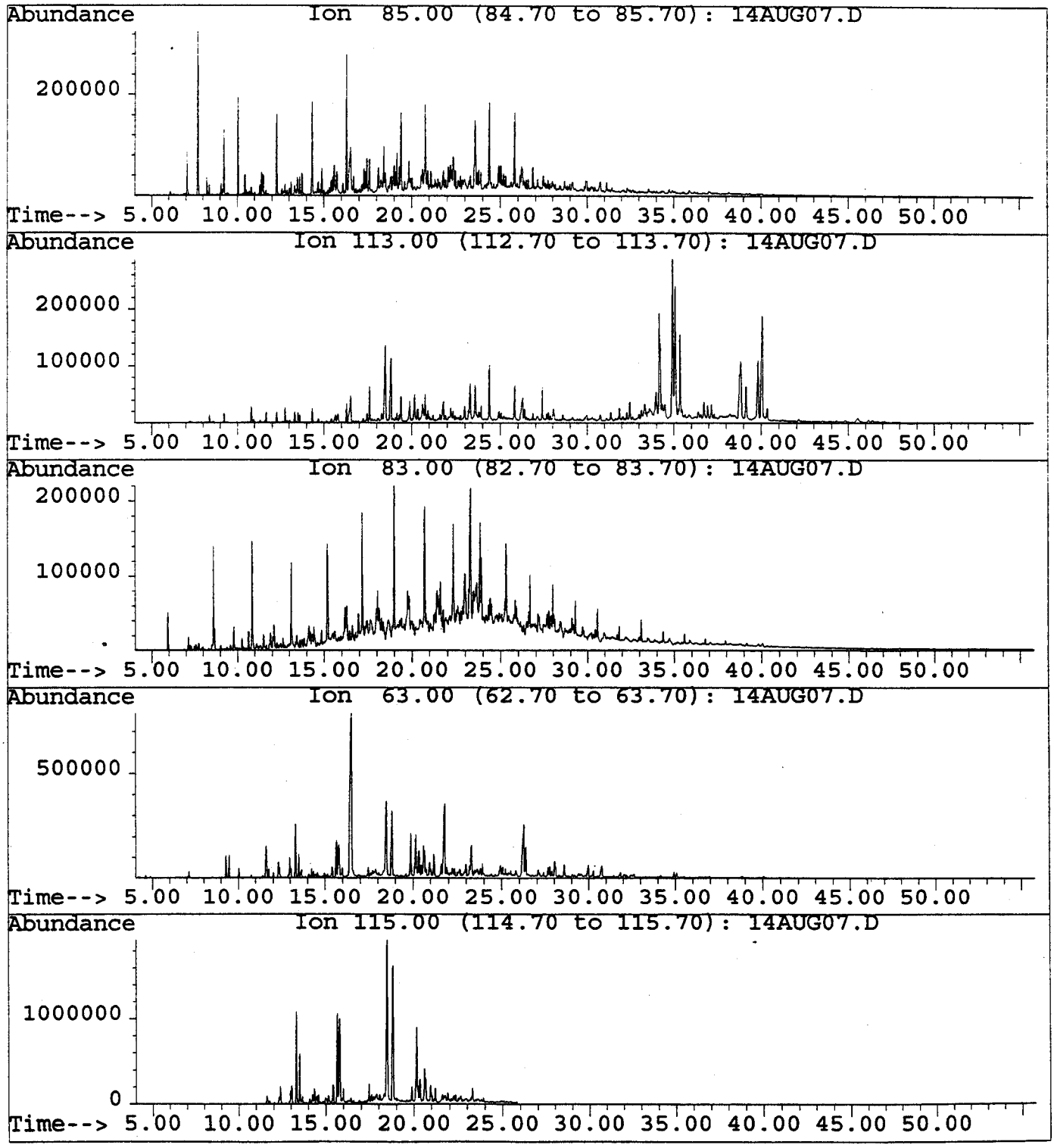
File : C:\HPCHEM\2\DATA\010813\13AUG05.D
Operator : kty
Acquired : 13 Aug 101 2:38 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-03 MW-7
Misc Info :
Vial Number: 5



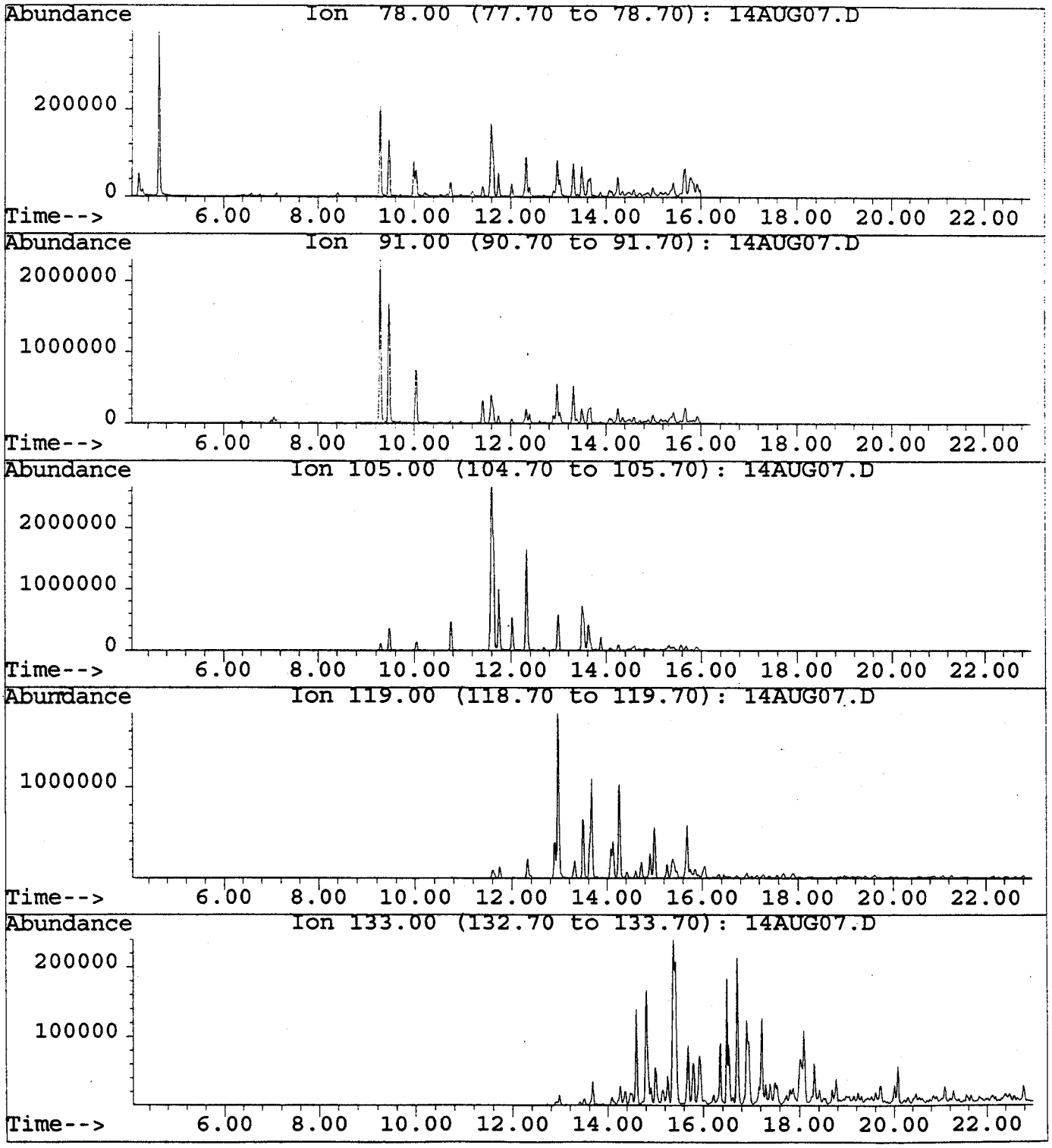
File : C:\HPCHEM\2\DATA\010813\13AUG08.D
Operator : kty
Acquired : 13 Aug 101 6:35 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-06 Clay pipe
Misc Info :
Vial Number: 8



File : C:\HPCHEM\2\DATA\010814\14AUG07.D
Operator : kty
Acquired : 14 Aug 101 5:27 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-04 TW-9
Misc Info :
Vial Number: 7



File : C:\HPCHEM\2\DATA\010814\14AUG07.D
Operator : kty
Acquired : 14 Aug 101 5:27 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-04 TW-9
Misc Info :
Vial Number: 7



File : C:\HPCHEM\2\DATA\010814\14AUG07.D
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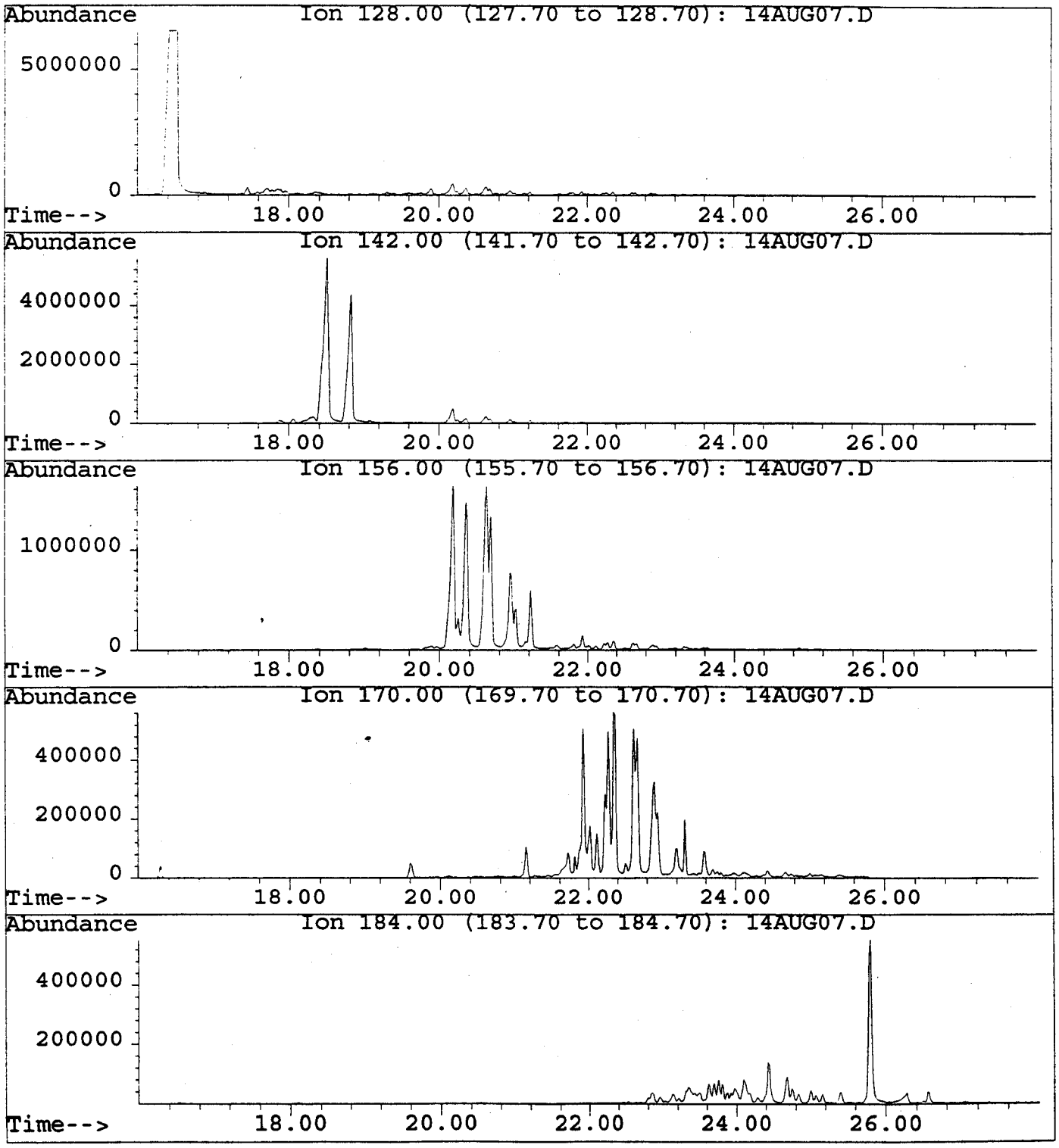
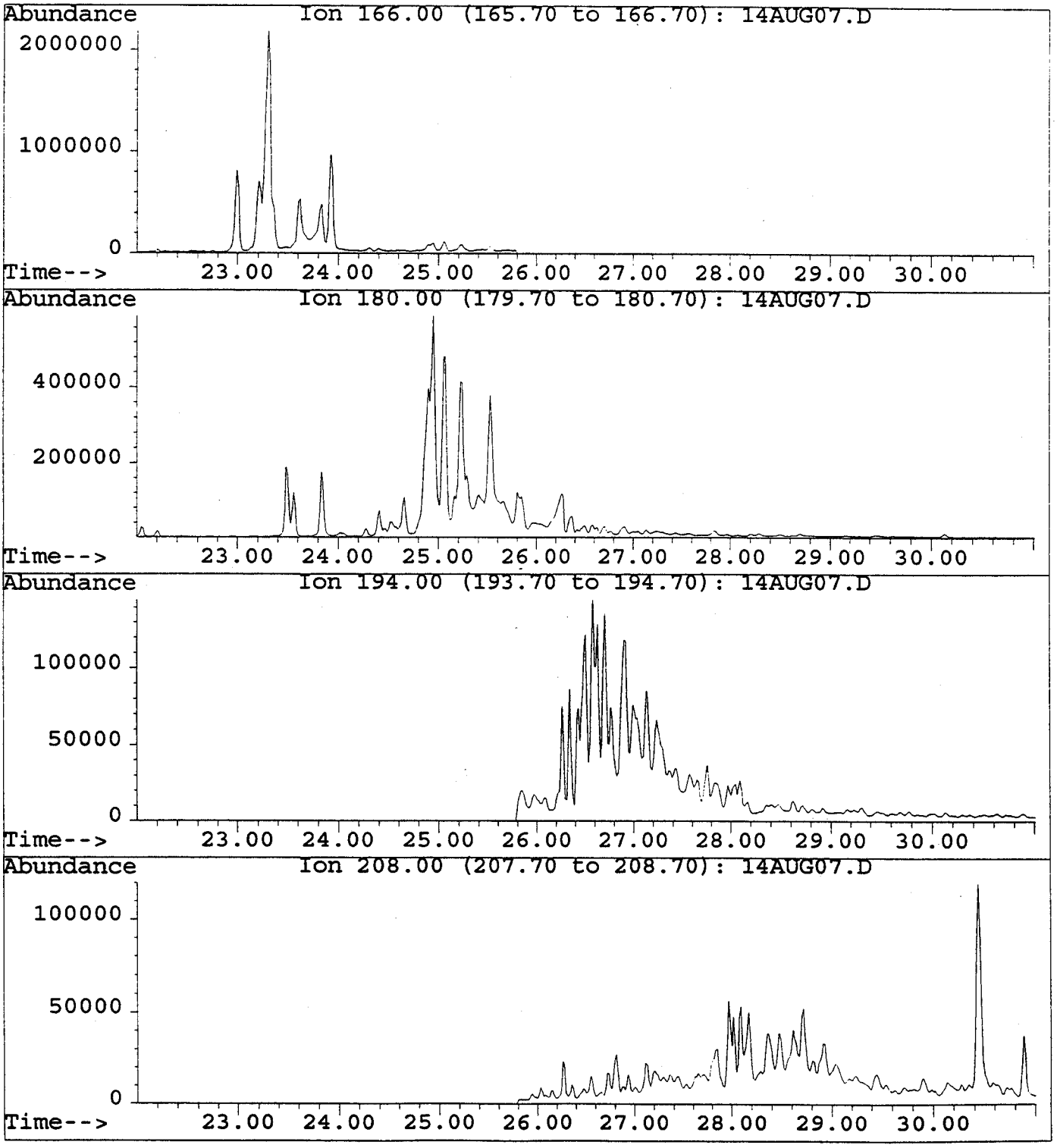
Acquired : 14 Aug 101 5:27 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-04 TW-9
Misc Info :
Vial Number: 7



File : C:\HPCHEM\2\DATA\010814\14AUG07.D
Operator : kty
Acquired : 14 Aug 101 5:27 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-04 TW-9
Misc Info :
Vial Number: 7



File : C:\HPCHEM\2\DATA\010814\14AUG07.D
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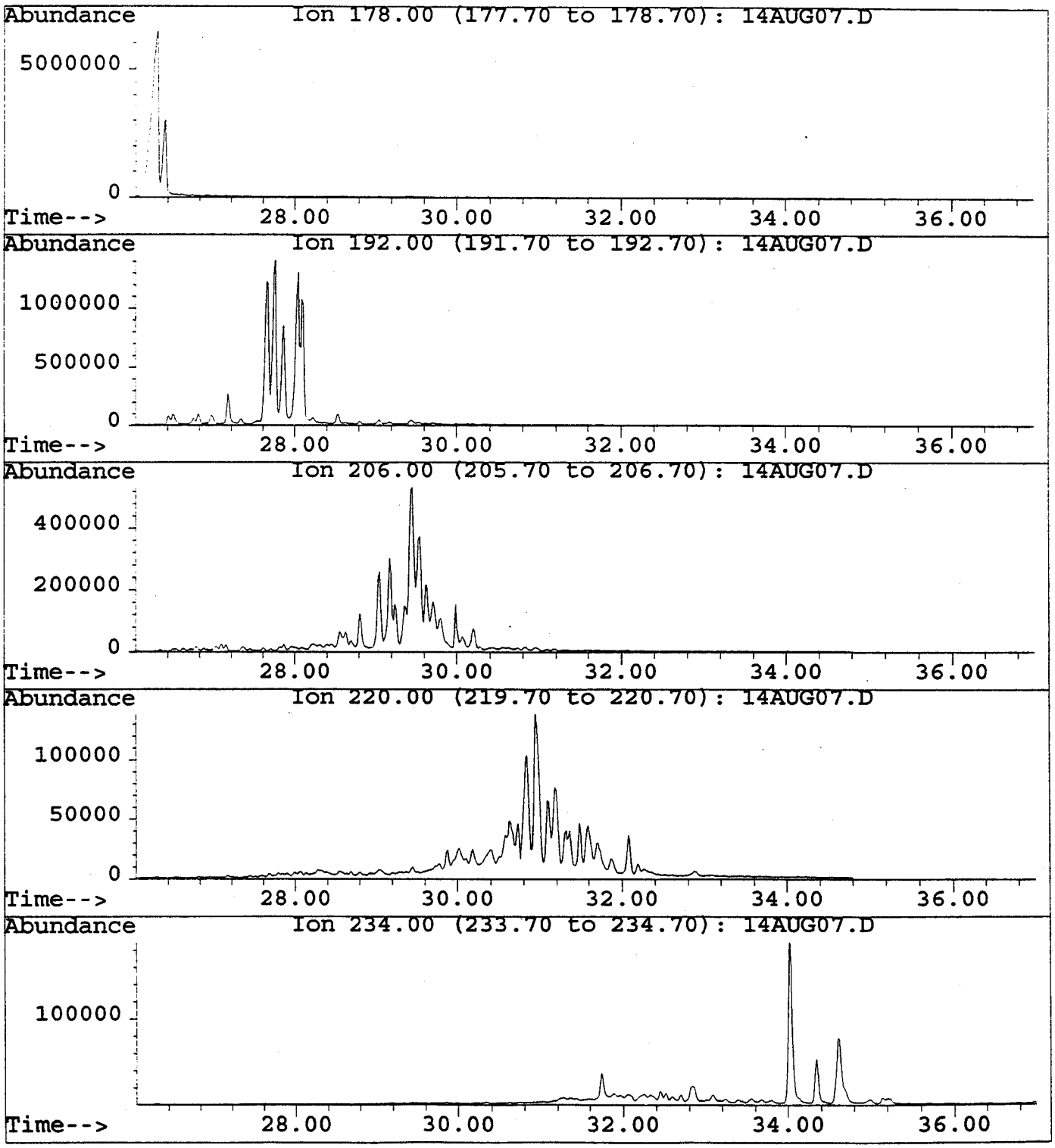
Acquired : 14 Aug 101 5:27 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-04 TW-9
Misc Info :
Vial Number: 7



File : C:\HPCHEM\2\DATA\010814\14AUG07.D
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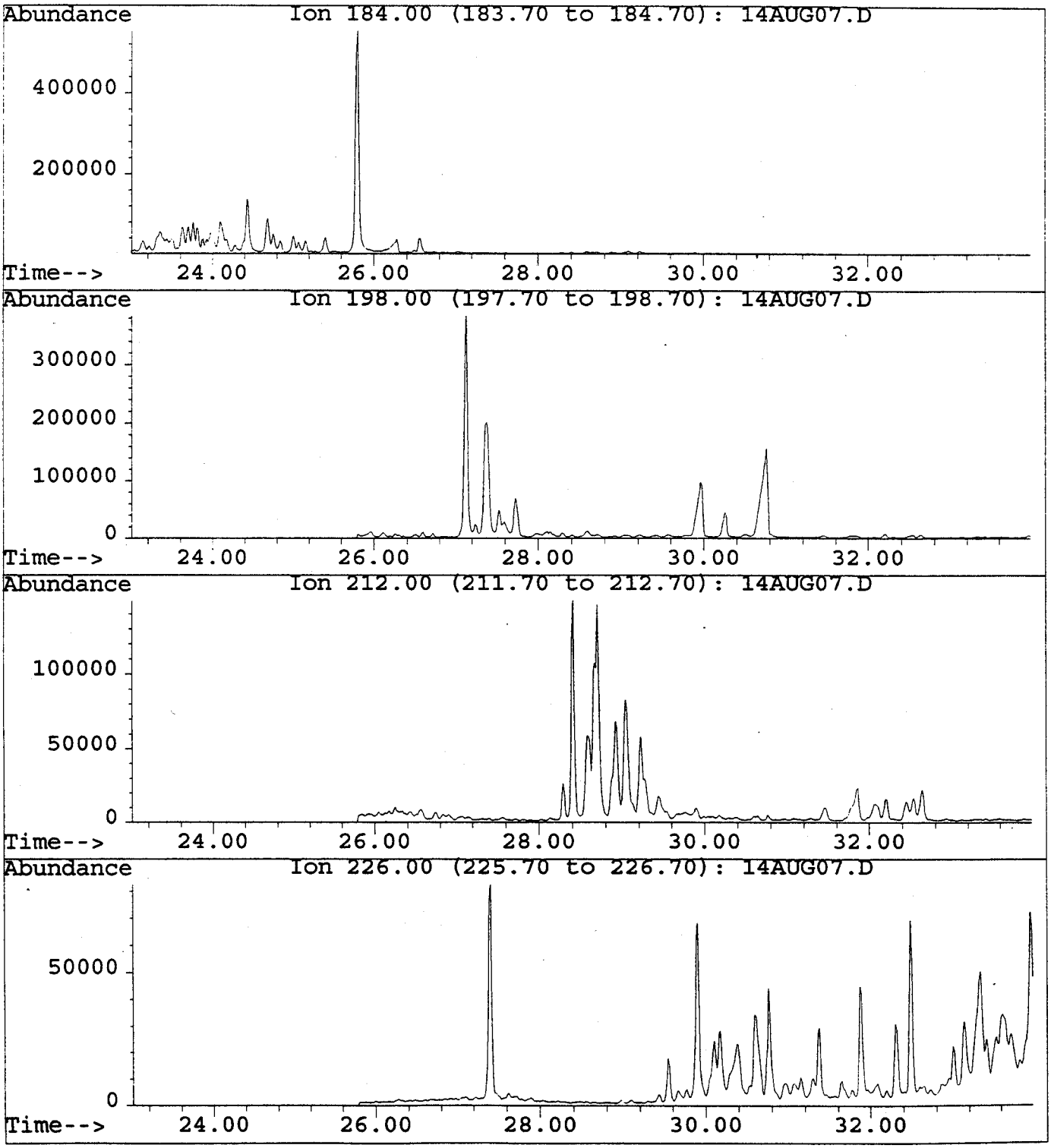
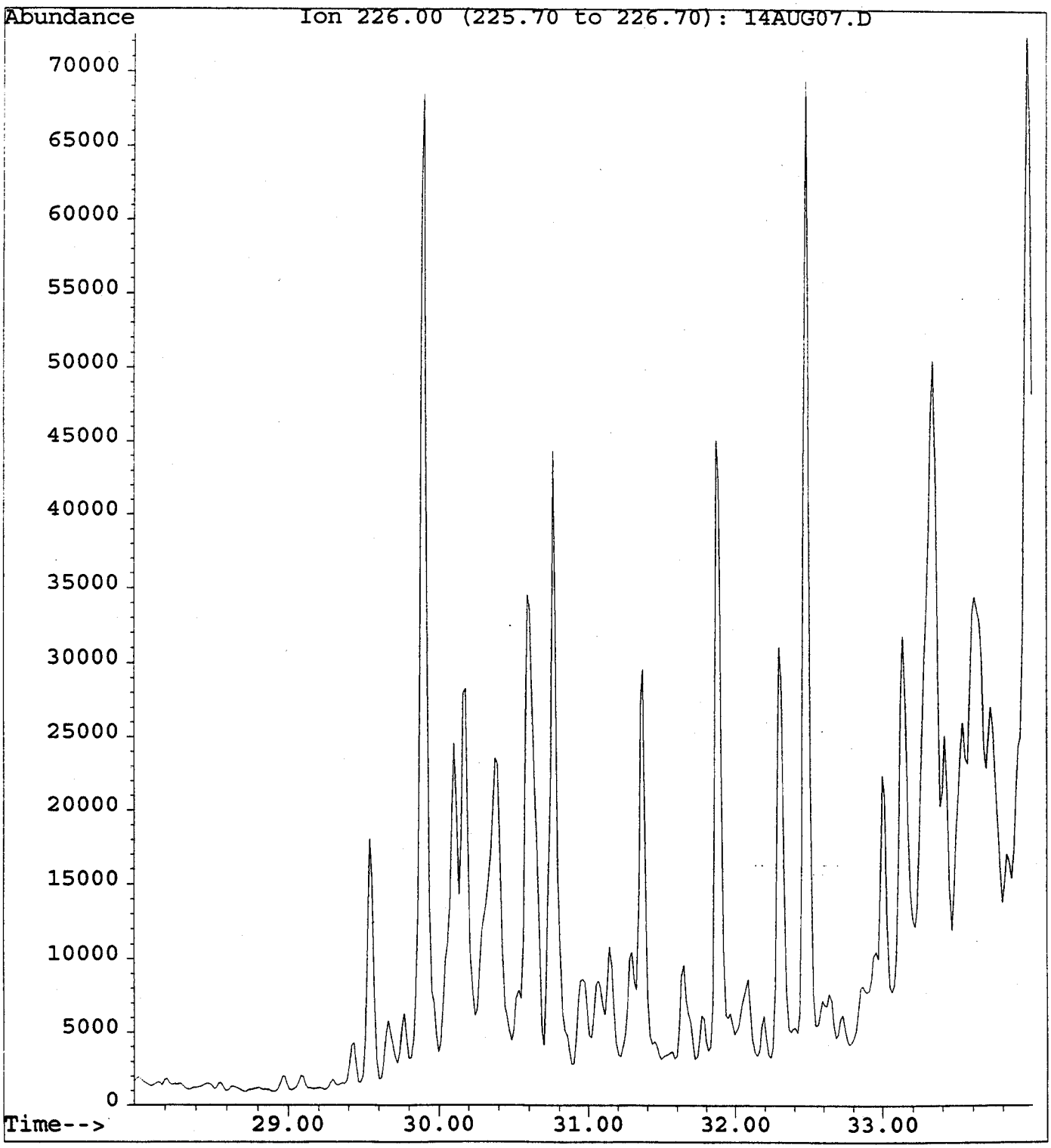
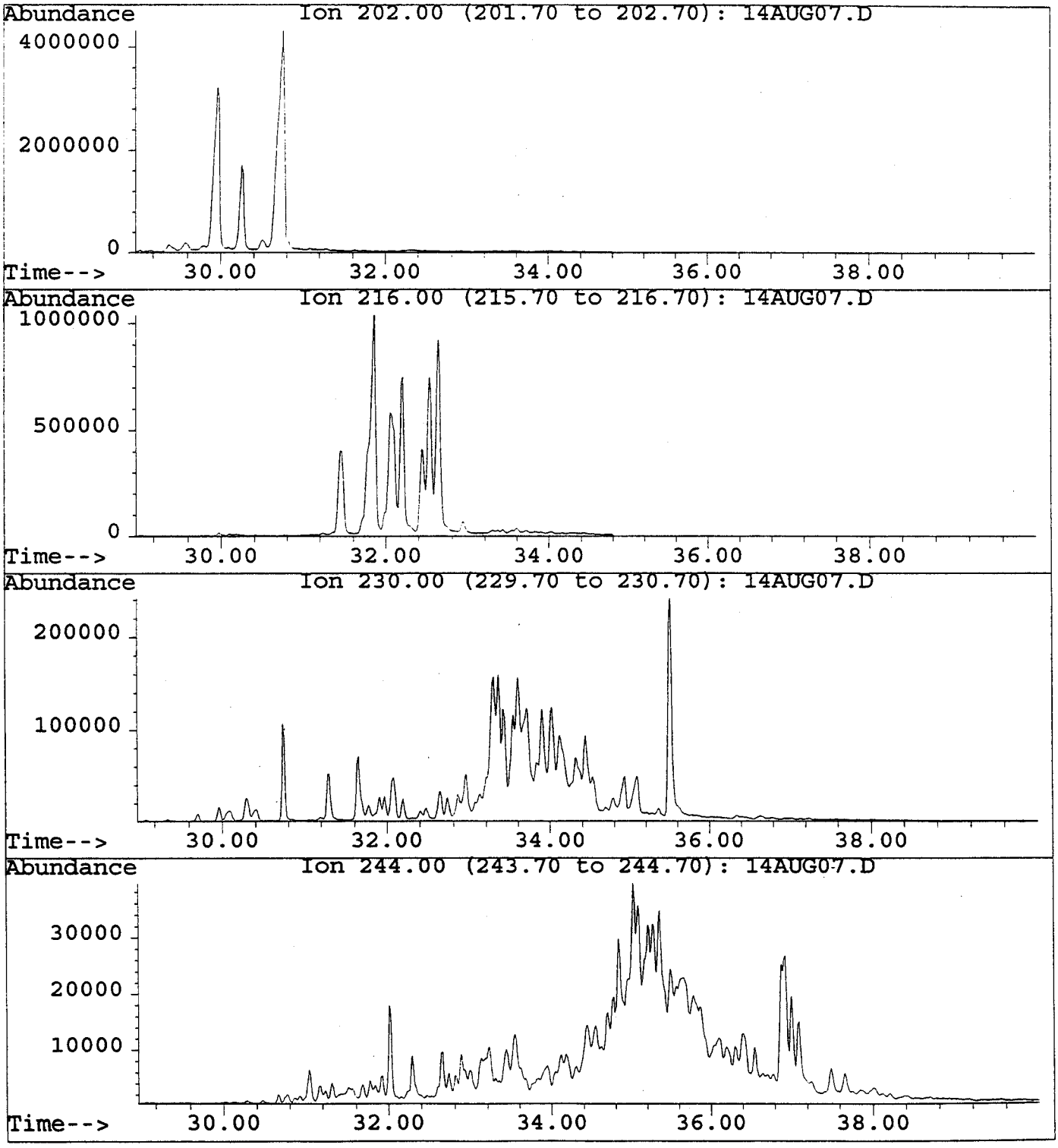
Acquired : 14 Aug 101 5:27 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-04 TW-9
Misc Info :
Vial Number: 7



File : C:\HPCHEM\2\DATA\010814\14AUG07.D
Operator : kty
Acquired : 14 Aug 101 5:27 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-04 TW-9
Misc Info :
Vial Number: 7



File : C:\HPCHEM\2\DATA\010814\14AUG07.D
Operator : kty
Acquired : 14 Aug 101 5:27 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-04 TW-9
Misc Info :
Vial Number: 7



File : C:\HPCHEM\2\DATA\010814\14AUG07.D
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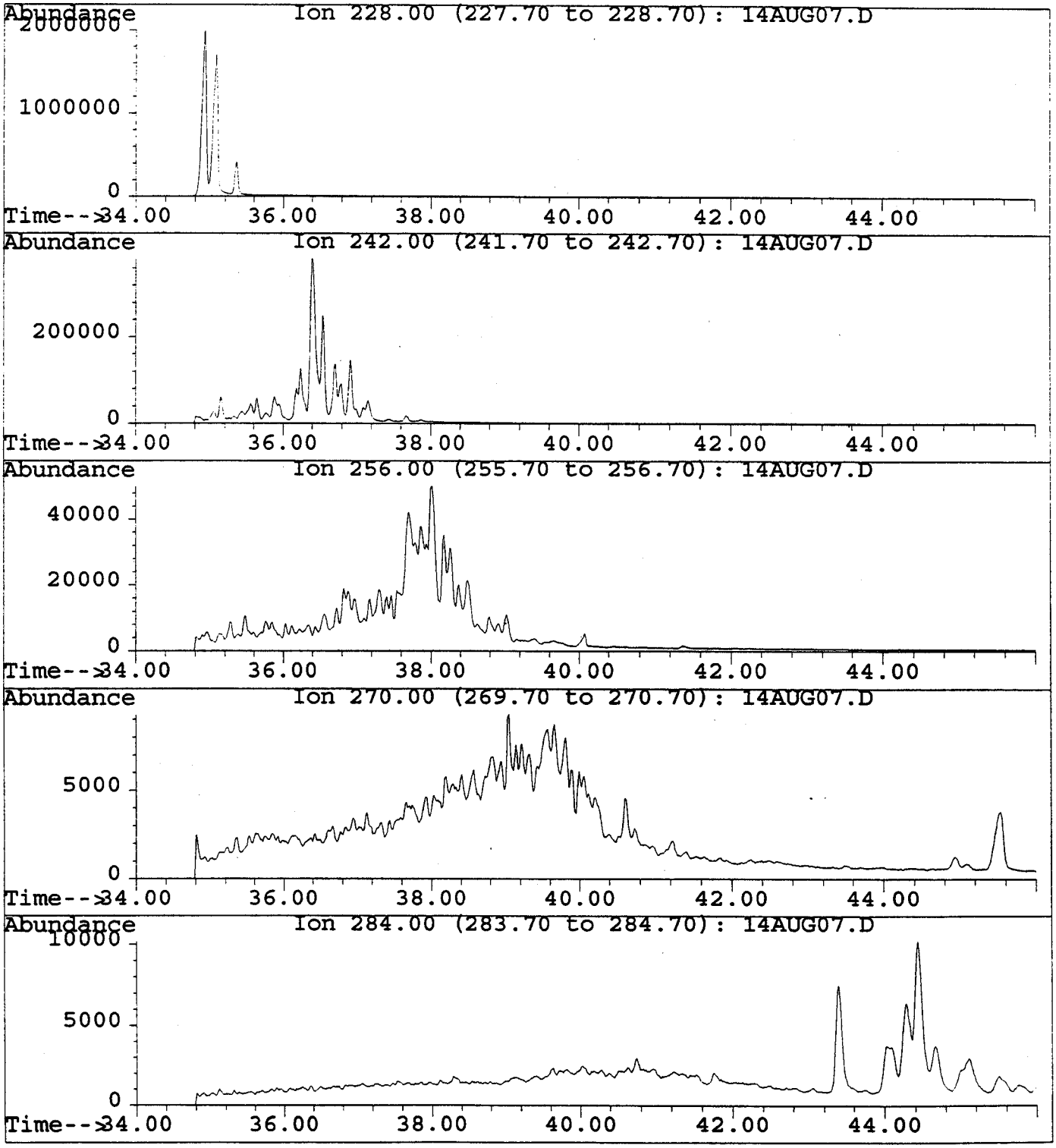
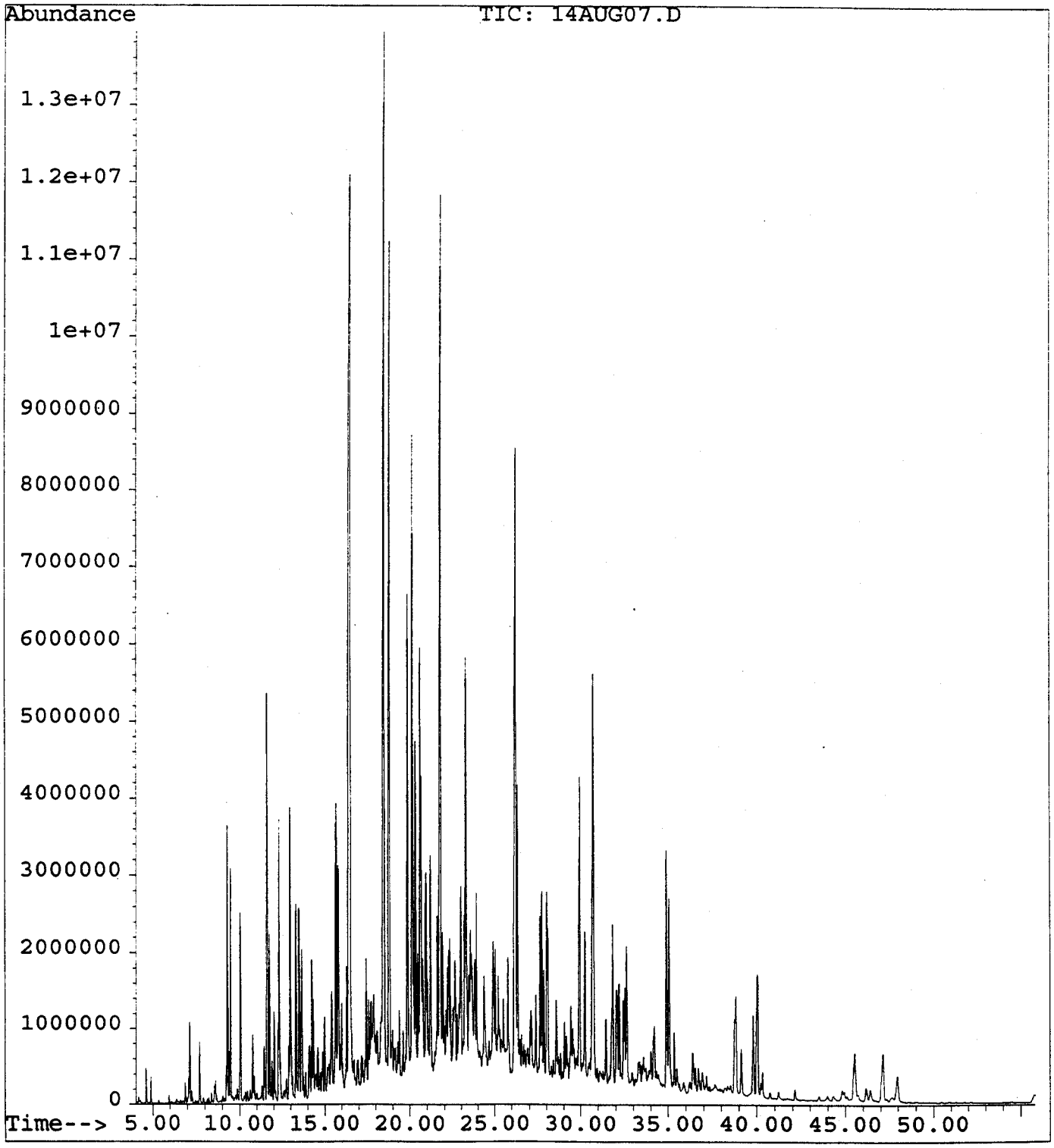
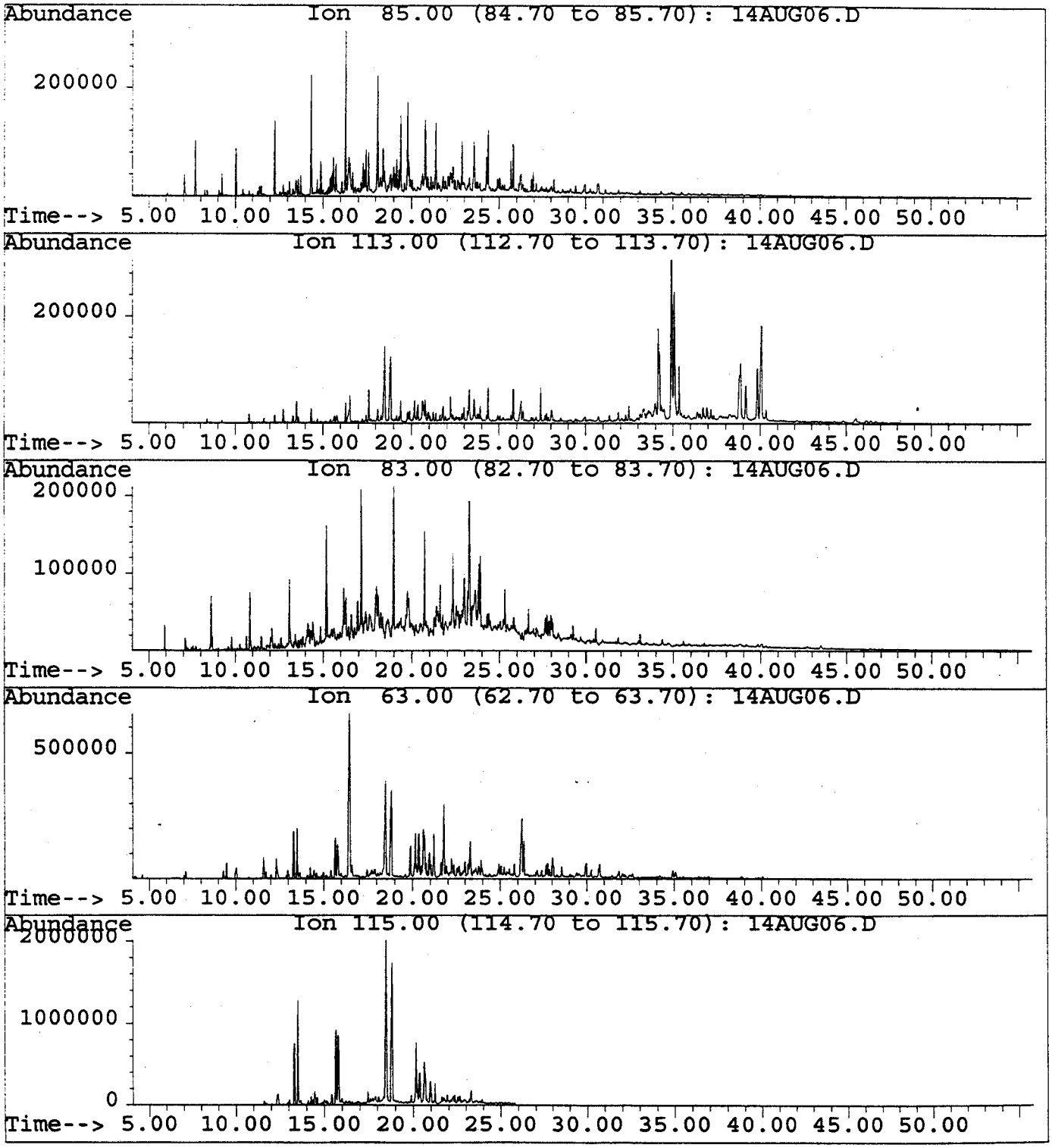
Instrument : GC-2/MS
Sample Name: IG010727-04 TW-9
Misc Info :
Vial Number: 7



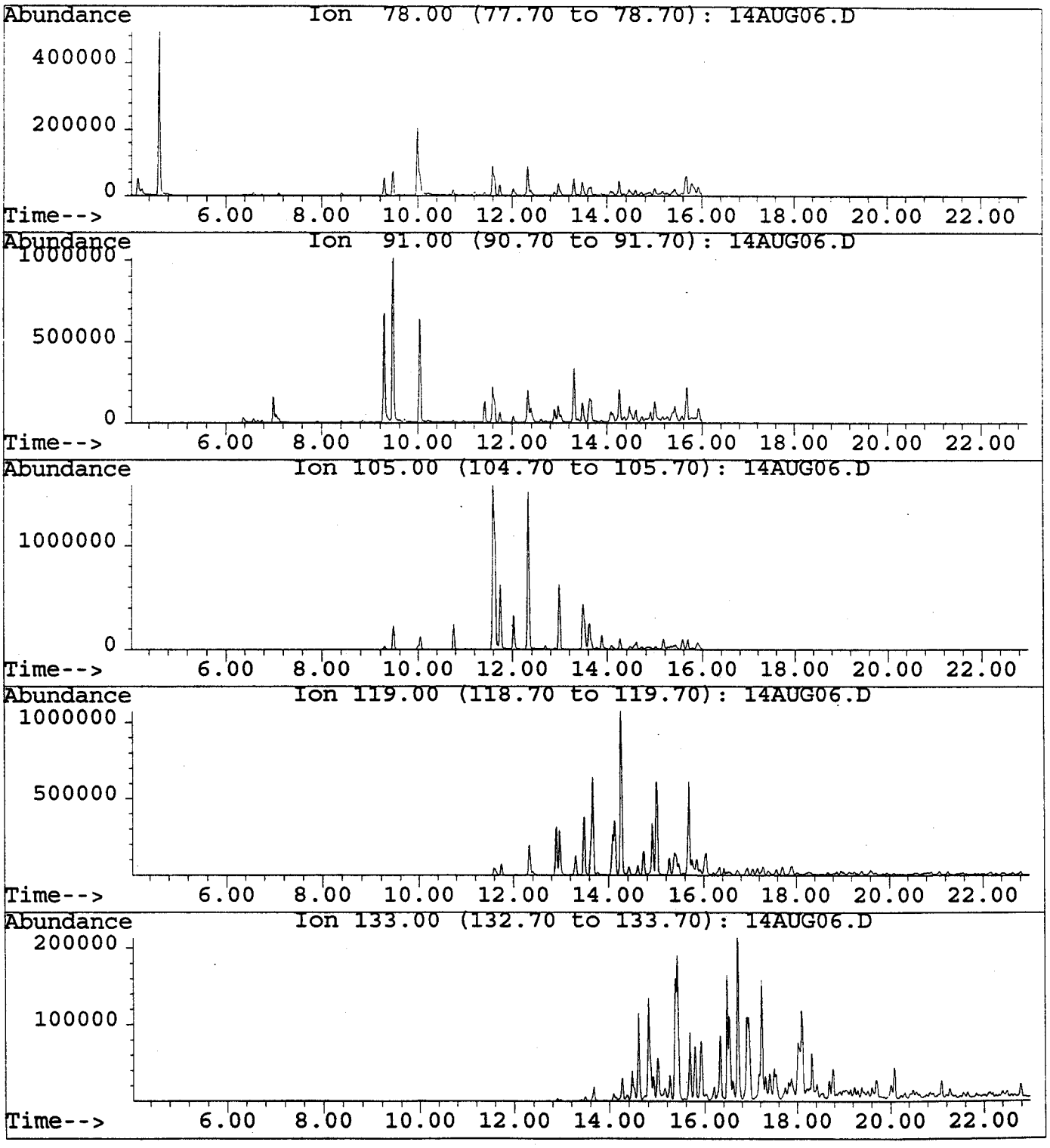
File : C:\HPCHEM\2\DATA\010814\14AUG07.D
Operator : kty
Acquired : 14 Aug 101 5:27 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-04 TW-9
Misc Info :
Vial Number: 7



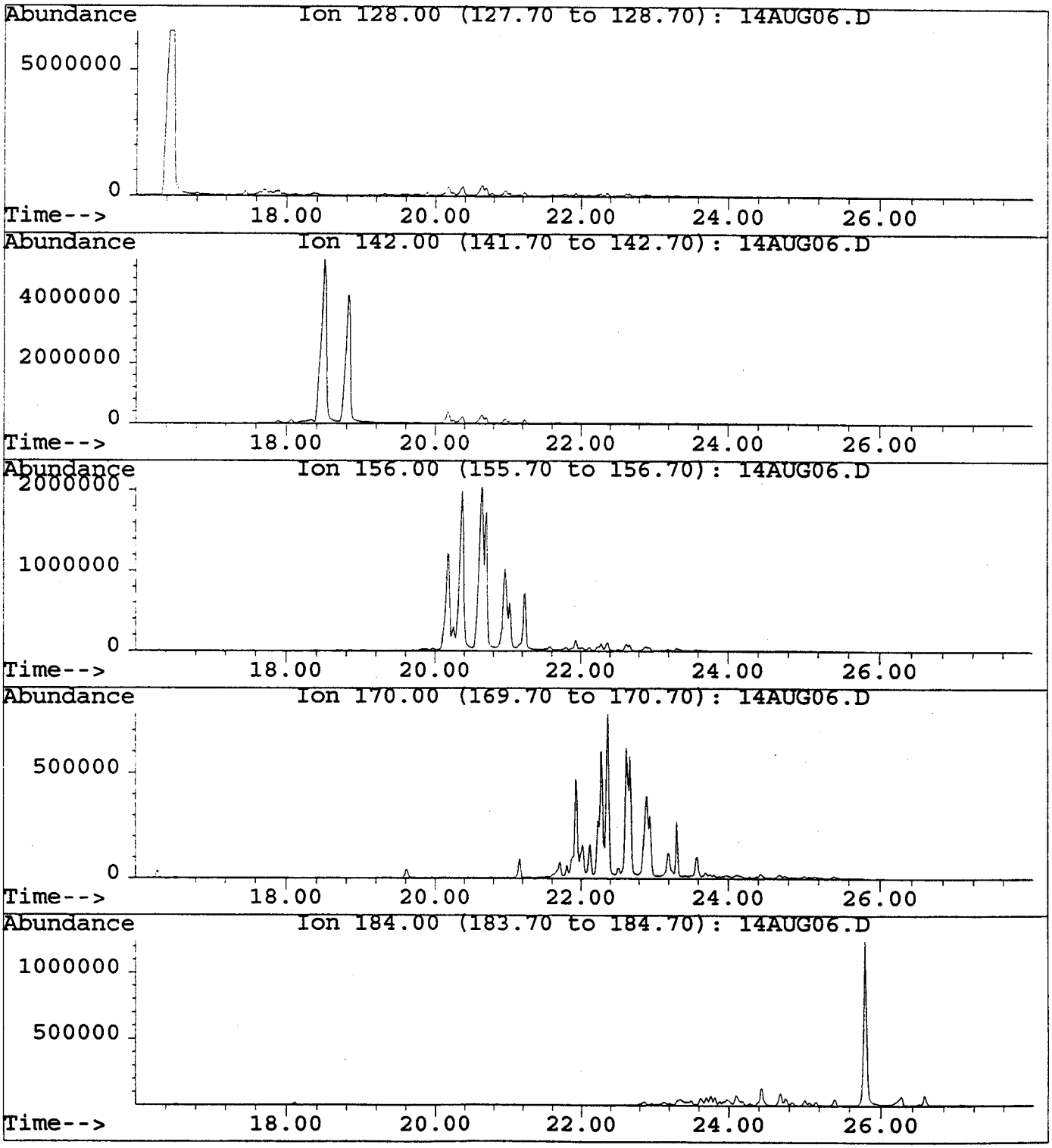
File : C:\HPCHEM\2\DATA\010814\14AUG06.D
Operator : kty
Acquired : 14 Aug 101 4:07 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-05 Upgradient Riser
Misc Info :
Vial Number: 6



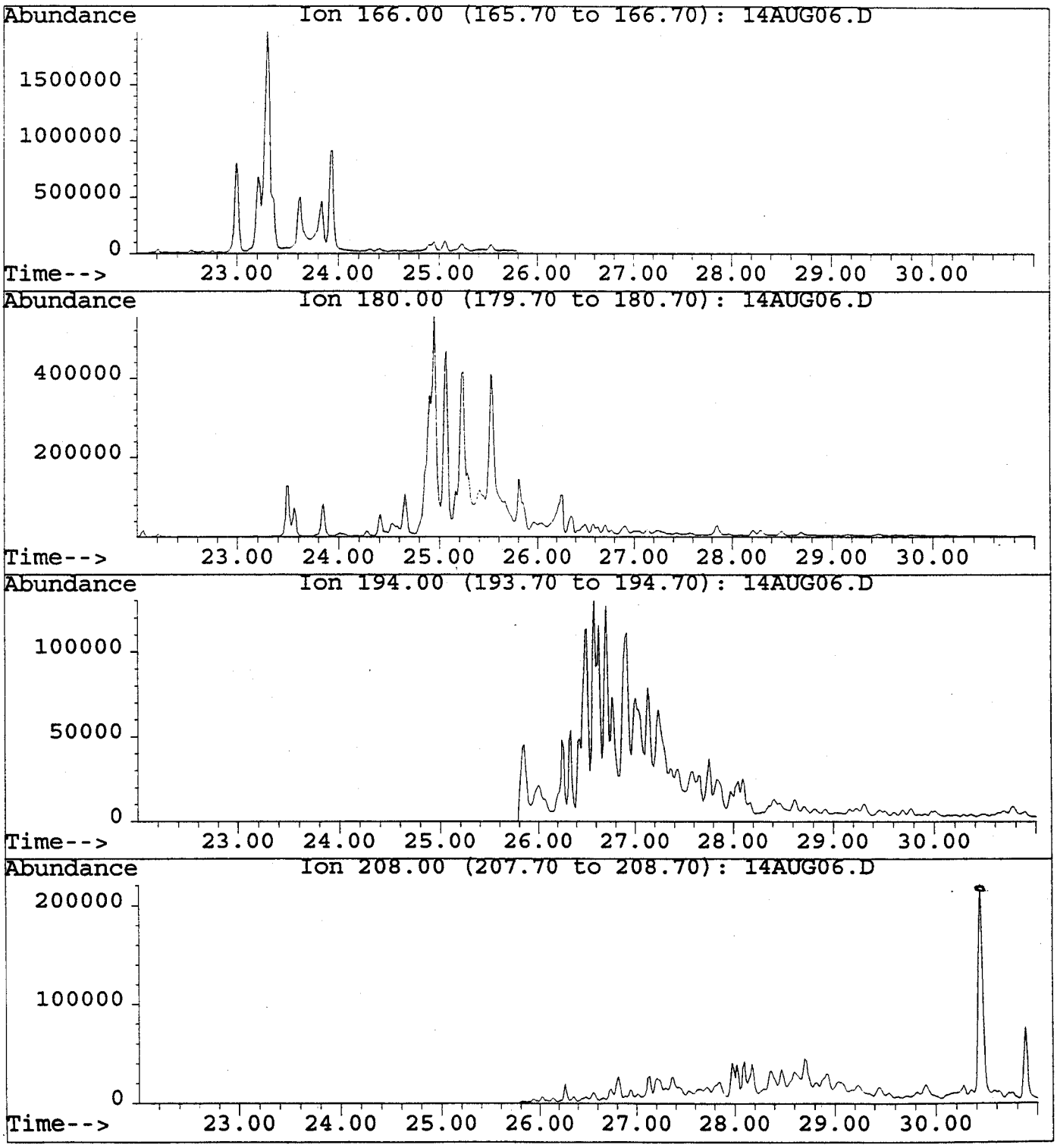
File : C:\HPCHEM\2\DATA\010814\14AUG06.D
Operator : kty
Acquired : 14 Aug 101 4:07 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-05 Upgradient Riser
Misc Info :
Vial Number: 6



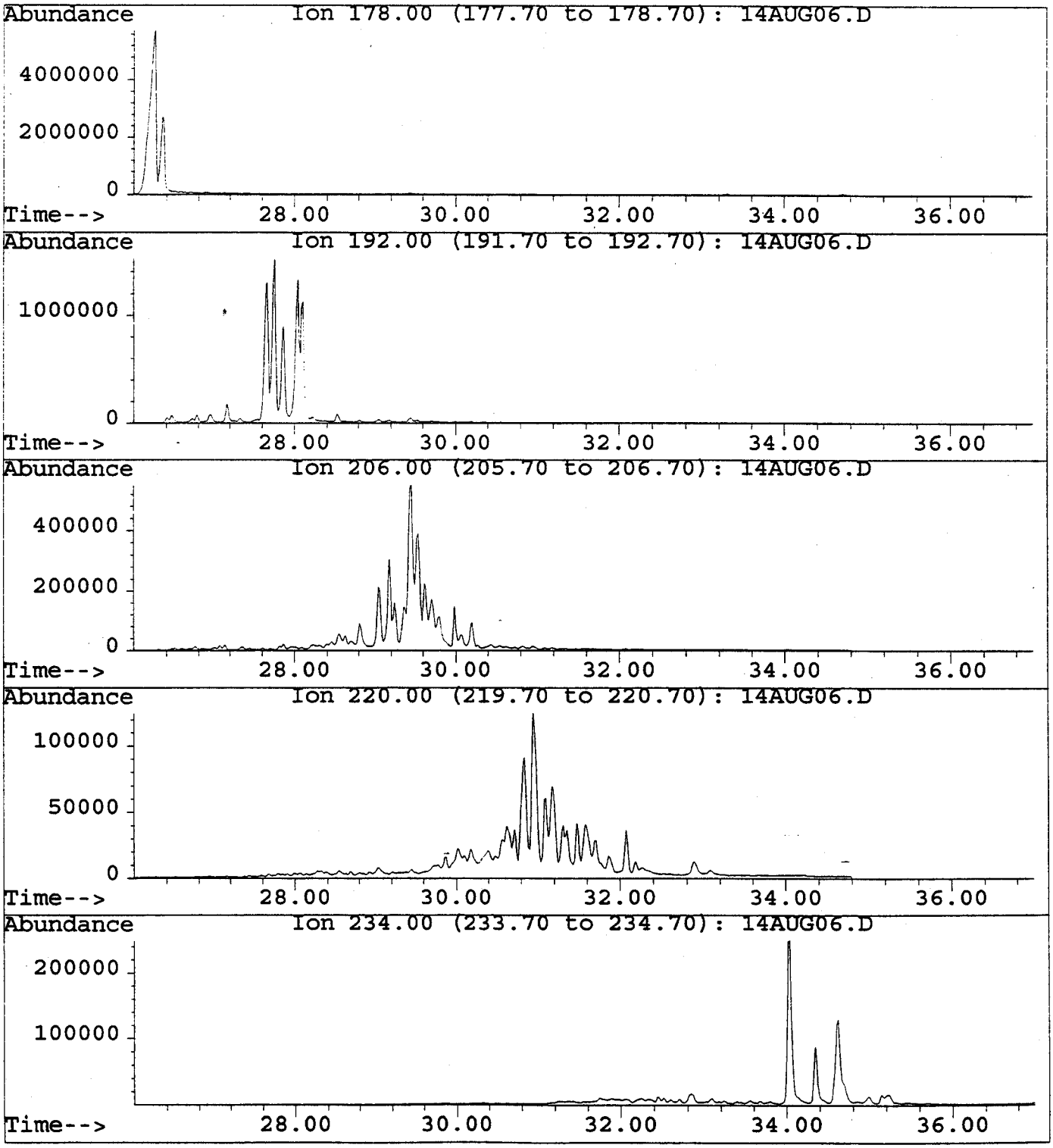
File : C:\HPCHEM\2\DATA\010814\14AUG06.D
Operator : kty
Acquired : 14 Aug 101 4:07 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-05 Upgradient Riser
Misc Info :
Vial Number: 6



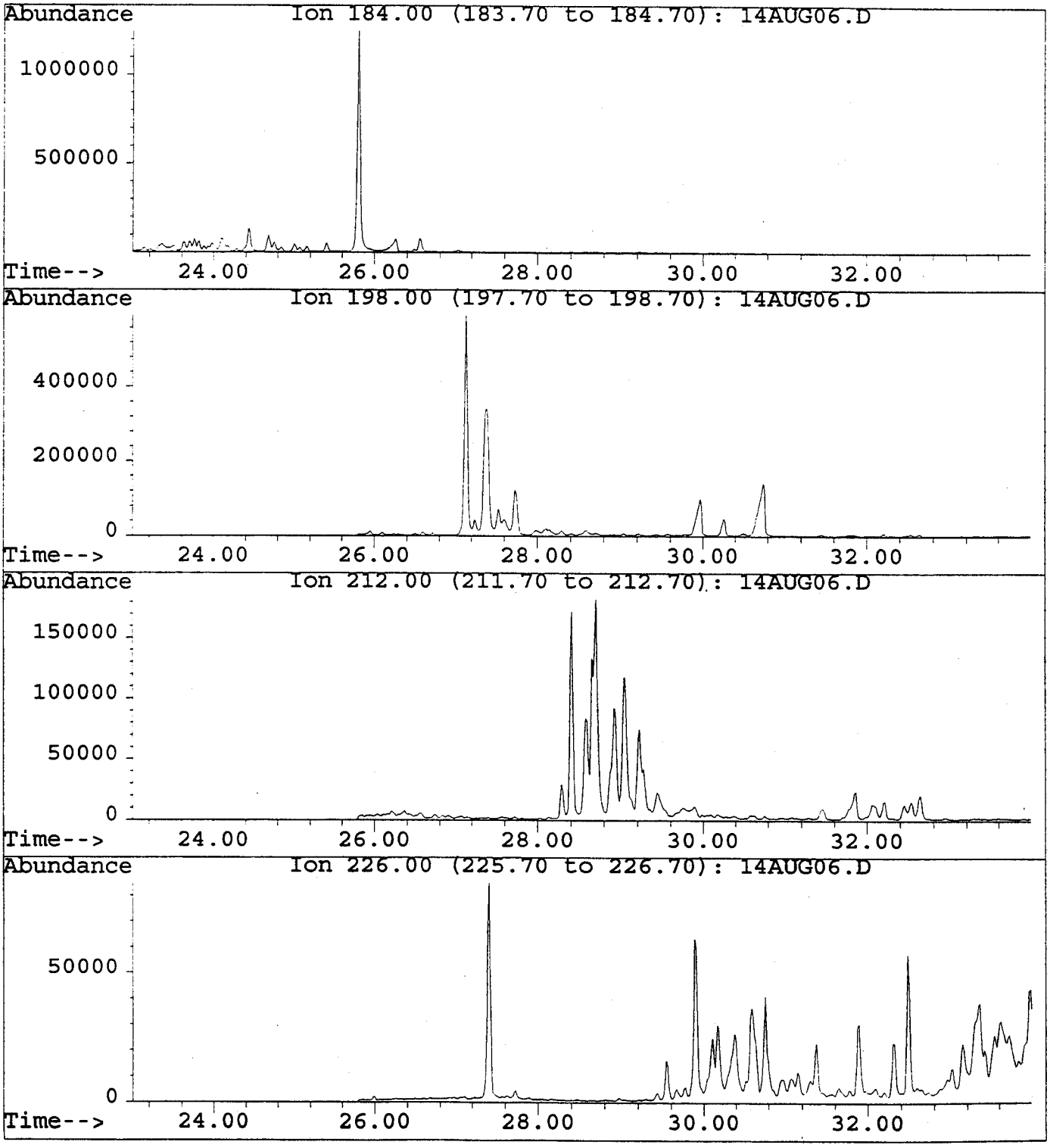
File : C:\HPCHEM\2\DATA\010814\14AUG06.D
Operator : kty
Acquired : 14 Aug 101 4:07 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-05 Upgradient Riser
Misc Info :
Vial Number: 6



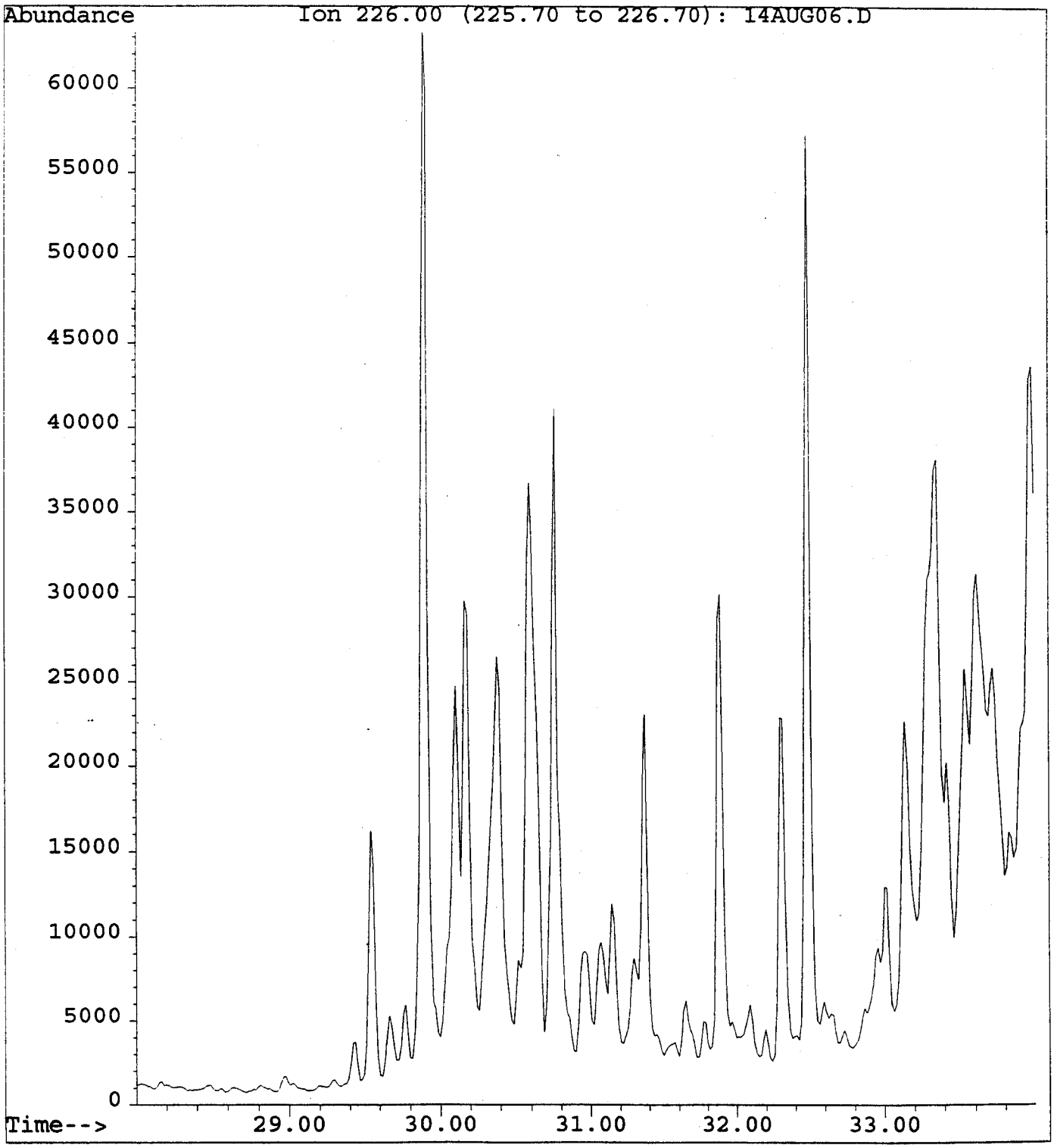
File : C:\HPCHEM\2\DATA\010814\14AUG06.D
Operator : kty
Acquired : 14 Aug 101 4:07 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-05 Upgradient Riser
Misc Info :
Vial Number: 6



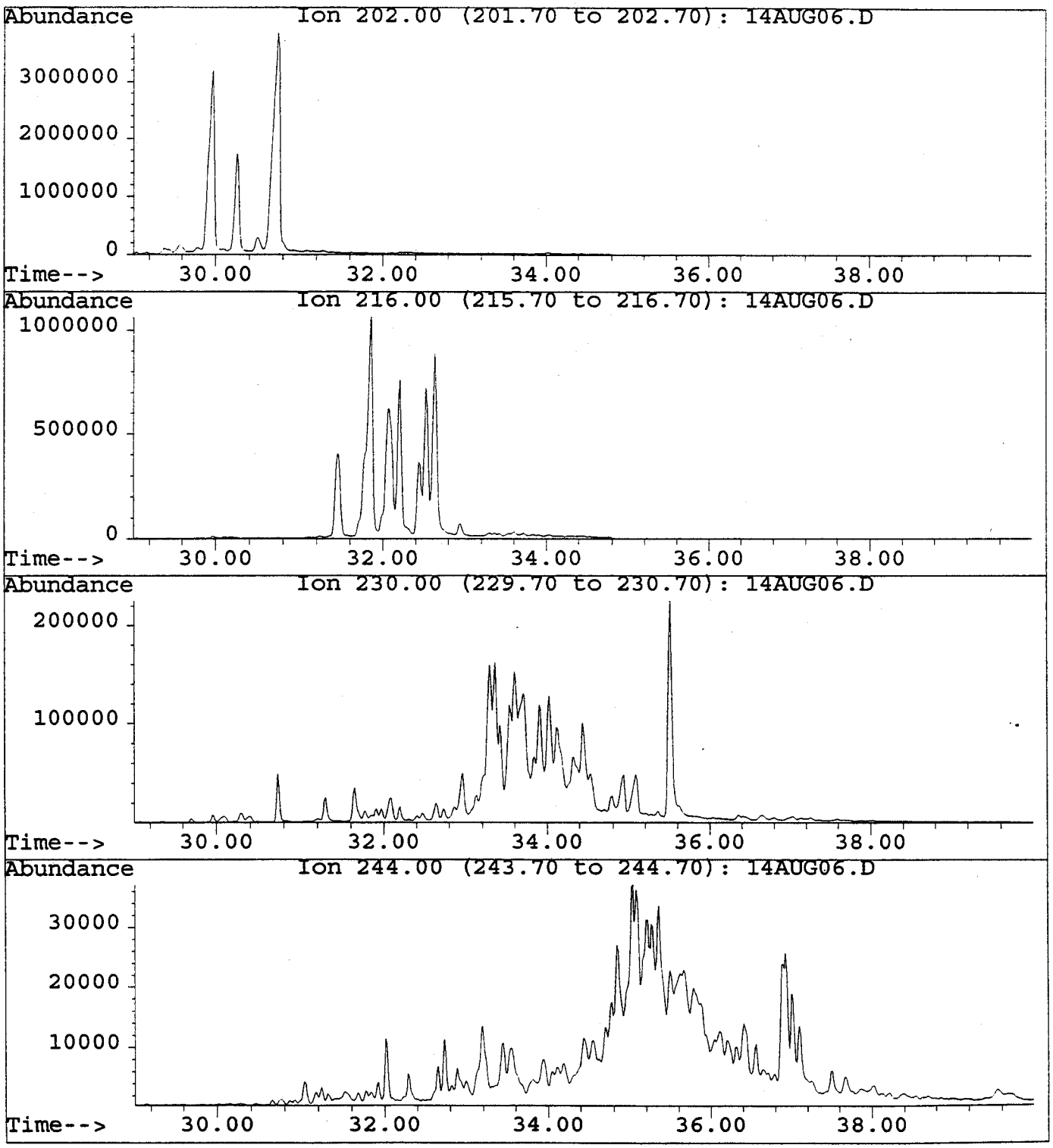
File : C:\HPCHEM\2\DATA\010814\14AUG06.D
Operator : kty
Acquired : 14 Aug 101 4:07 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-05 Upgradient Riser
Misc Info :
Vial Number: 6



File : C:\HPCHEM\2\DATA\010814\14AUG06.D
Operator : kty
Acquired : 14 Aug 101 4:07 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-05 Upgradient Riser
Misc Info :
Vial Number: 6



File : C:\HPCHEM\2\DATA\010814\14AUG06.D
Operator : kty
Acquired : 14 Aug 101 4:07 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-05 Upgradient Riser
Misc Info :
Vial Number: 6



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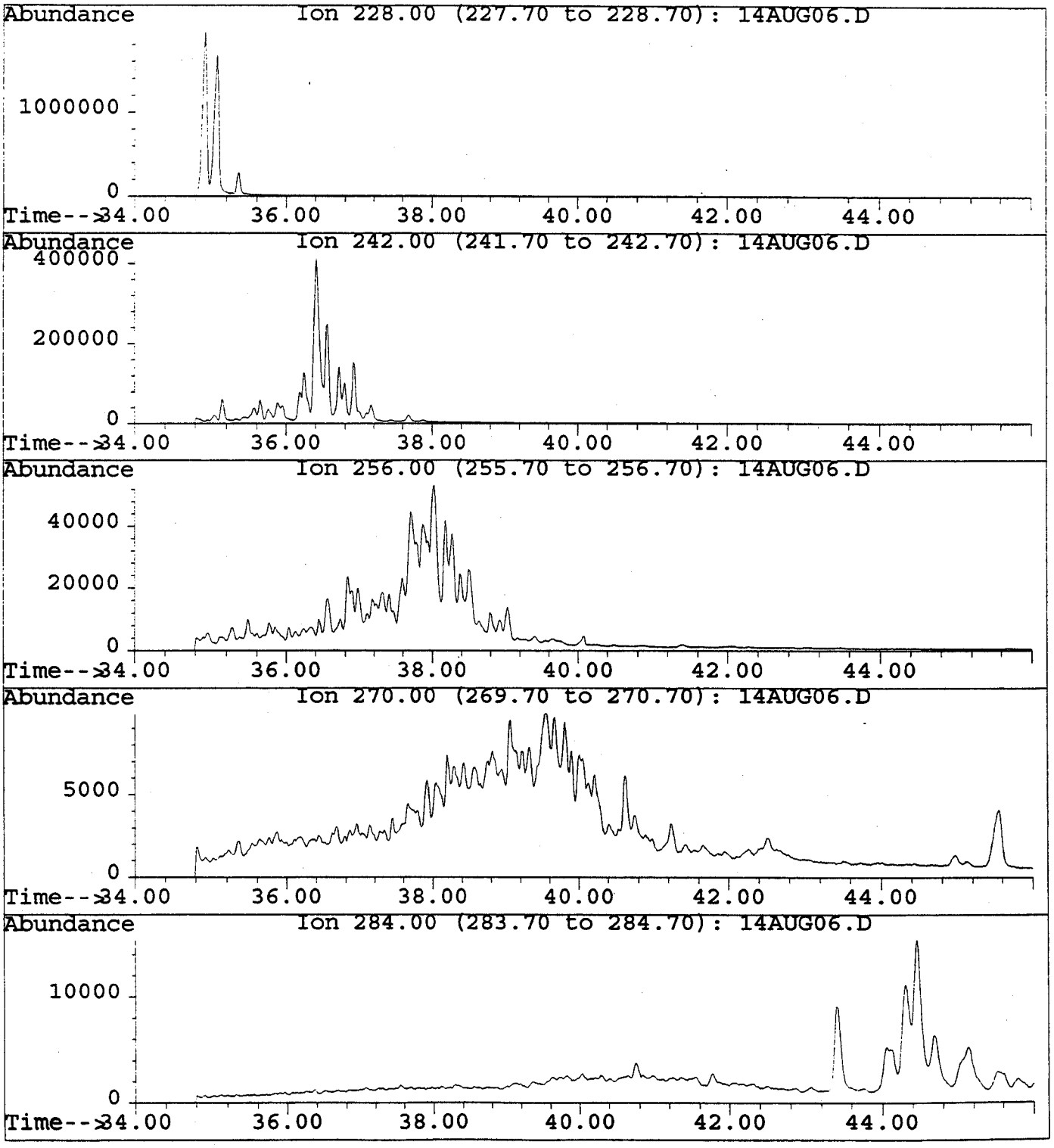
Operator : kty
Acquired : 14 Aug 101 4:07 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-05 Upgradient Riser
Misc Info :
Vial Number: 6



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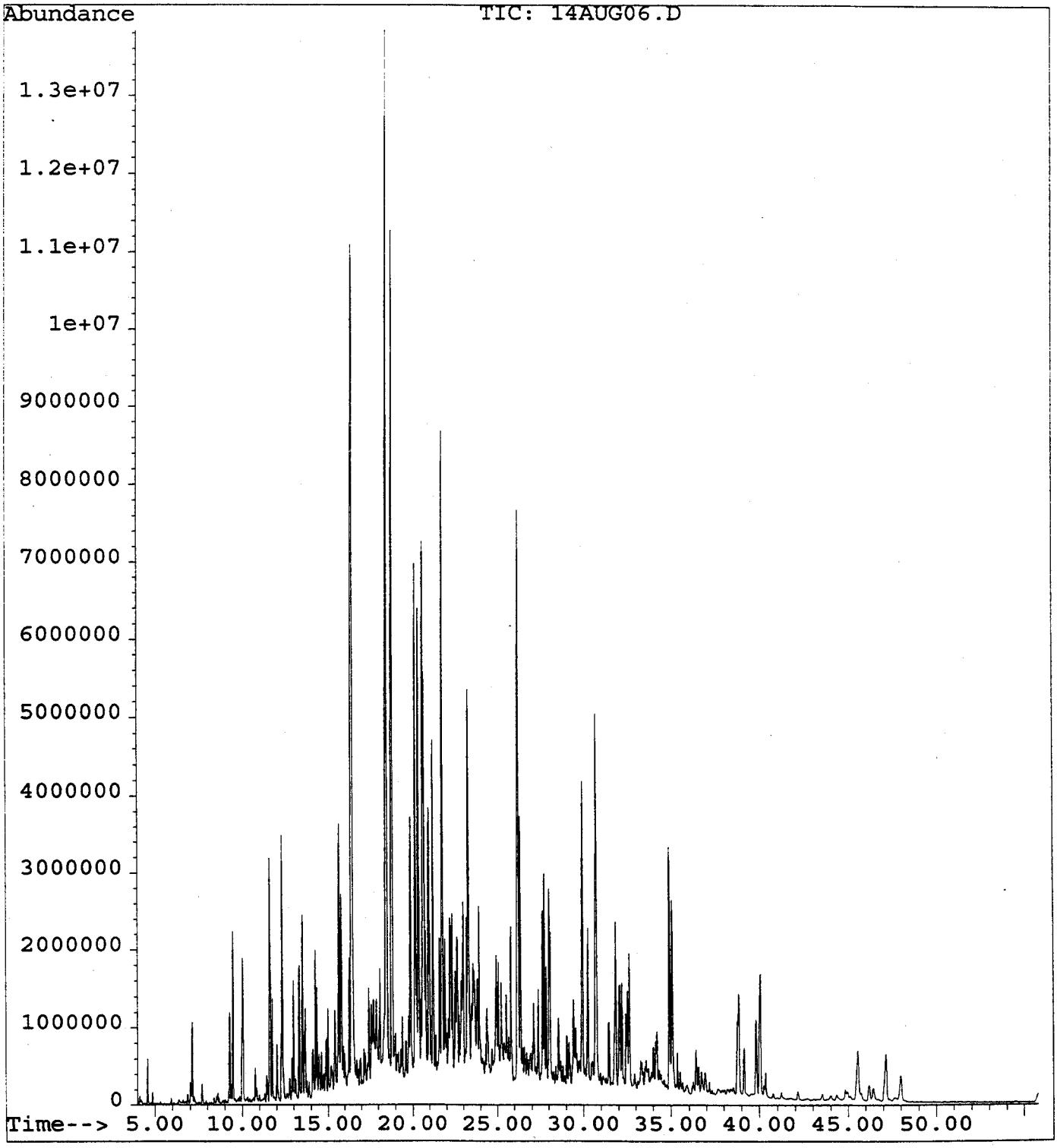
Operator : kty
Acquired : 14 Aug 101 4:07 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-05 Upgradient Riser
Misc Info :
Vial Number: 6



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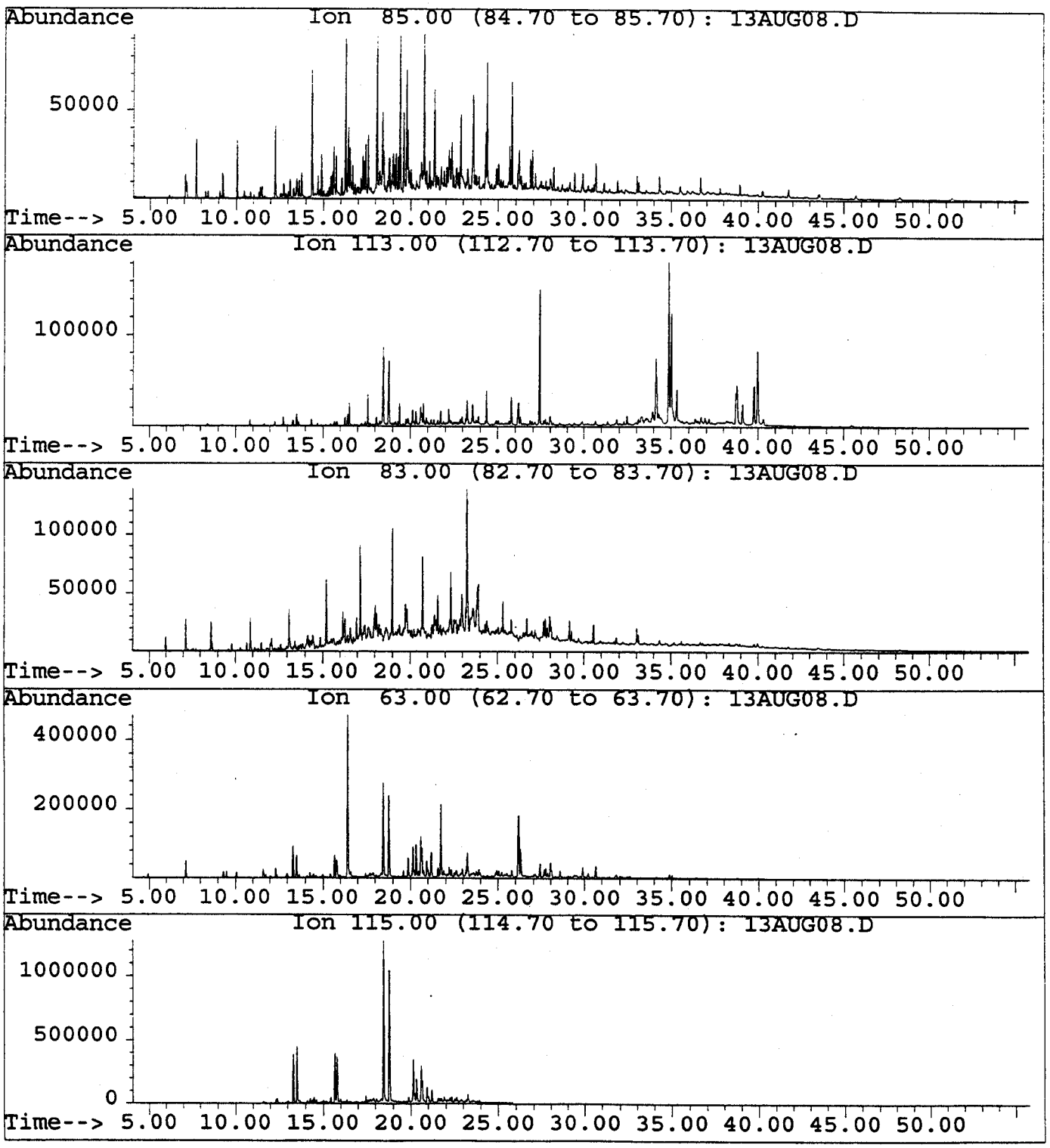
Instrument : GC-2/MS
Sample Name: IG010727-06 Clay pipe
Misc Info :
Vial Number: 8



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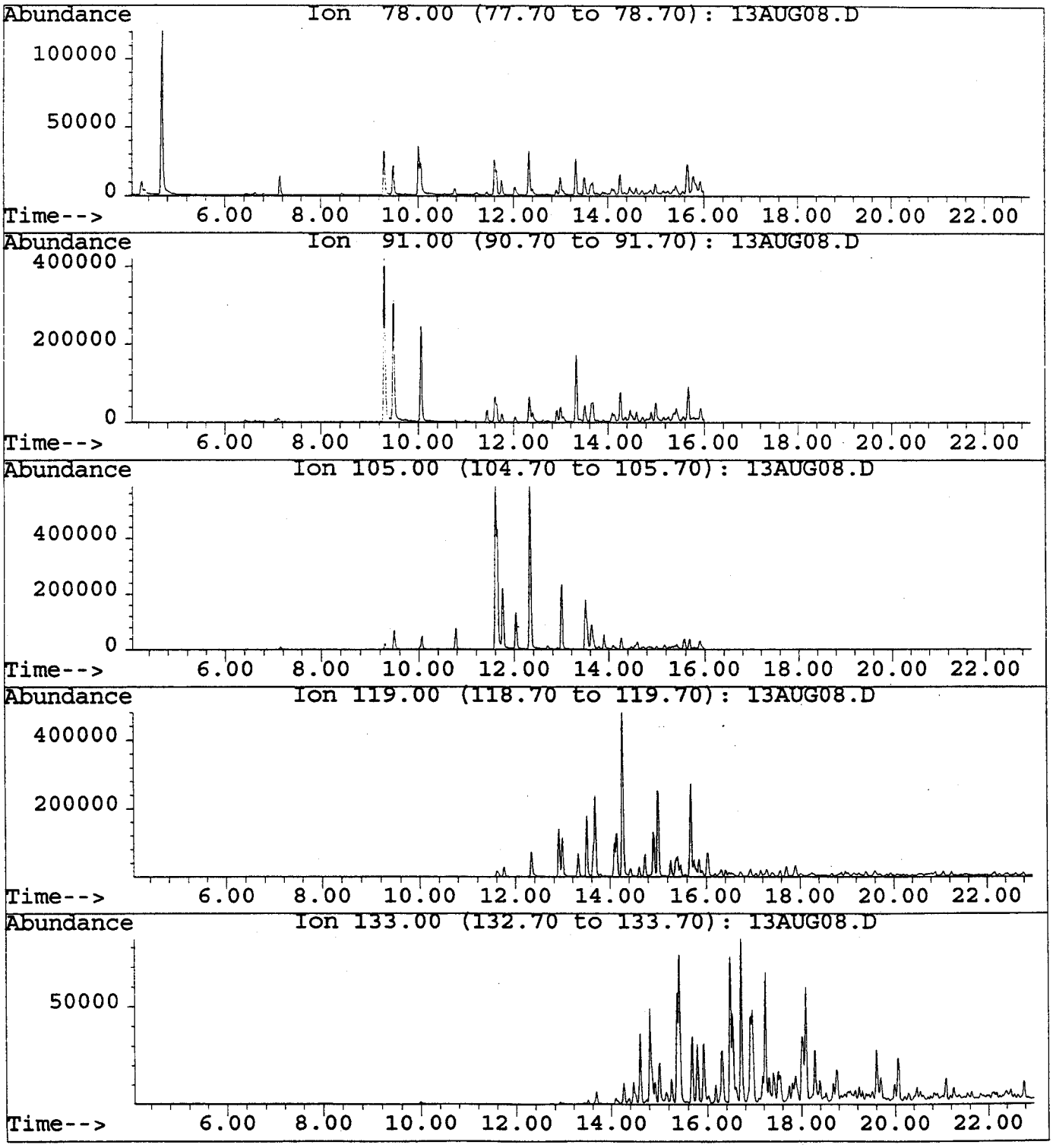
Acquired : 13 Aug 101 6:35 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-06 Clay pipe
Misc Info :
Vial Number: 8



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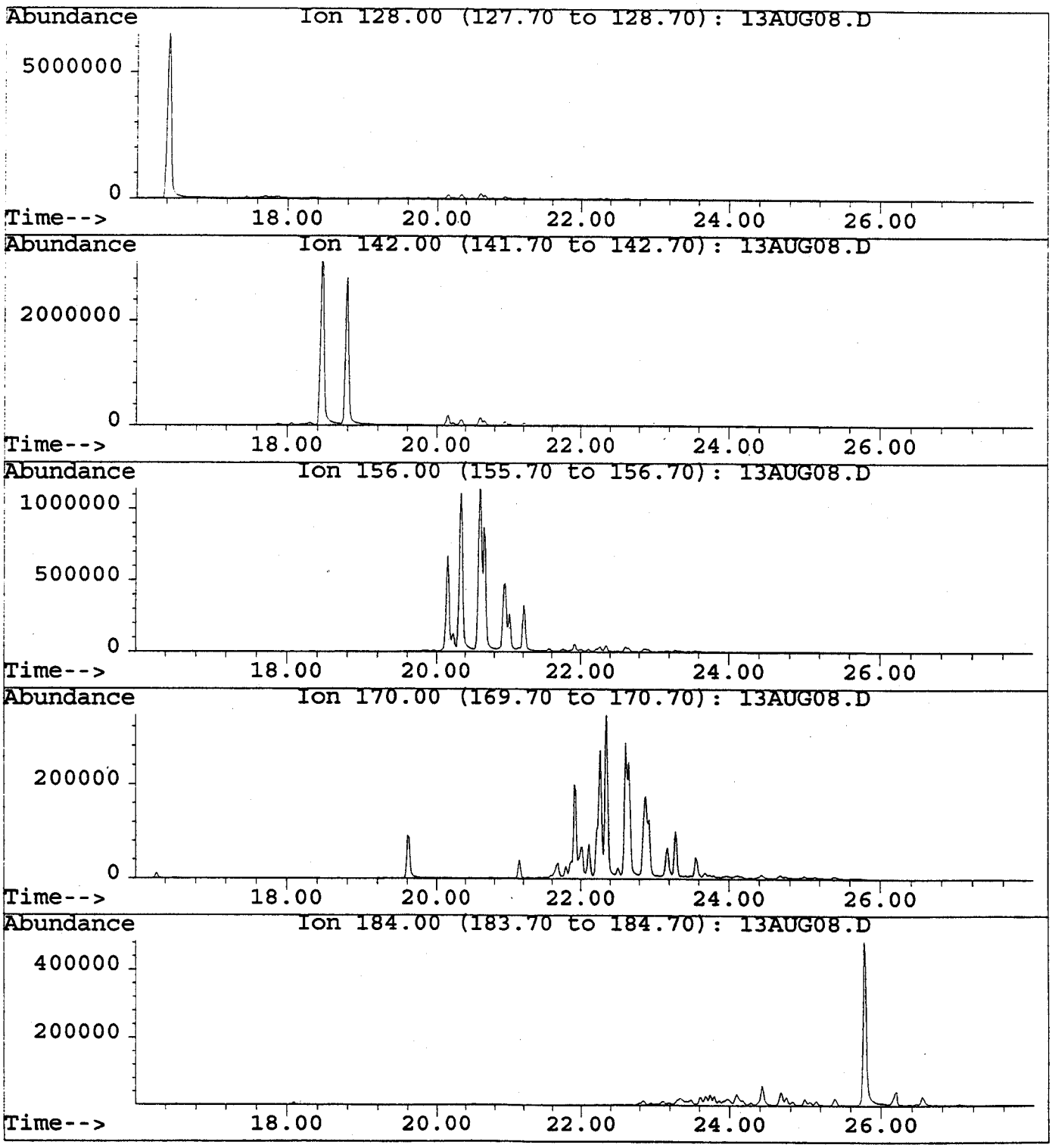
Operator : kty
Acquired : 13 Aug 101 6:35 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-06 Clay pipe
Misc Info :
Vial Number: 8



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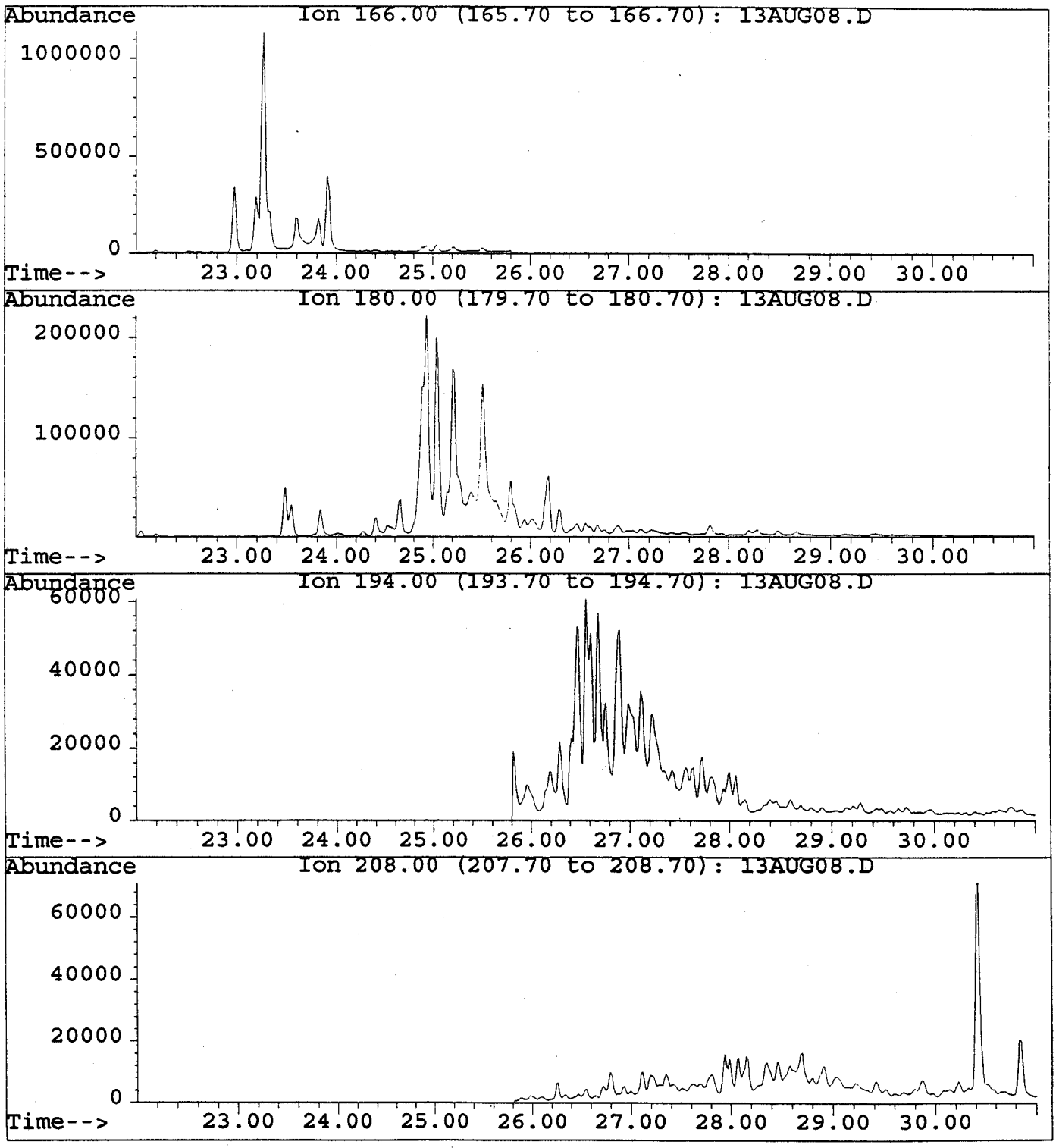
Operator : kty
Acquired : 13 Aug 101 6:35 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-06 Clay pipe
Misc Info :
Vial Number: 8



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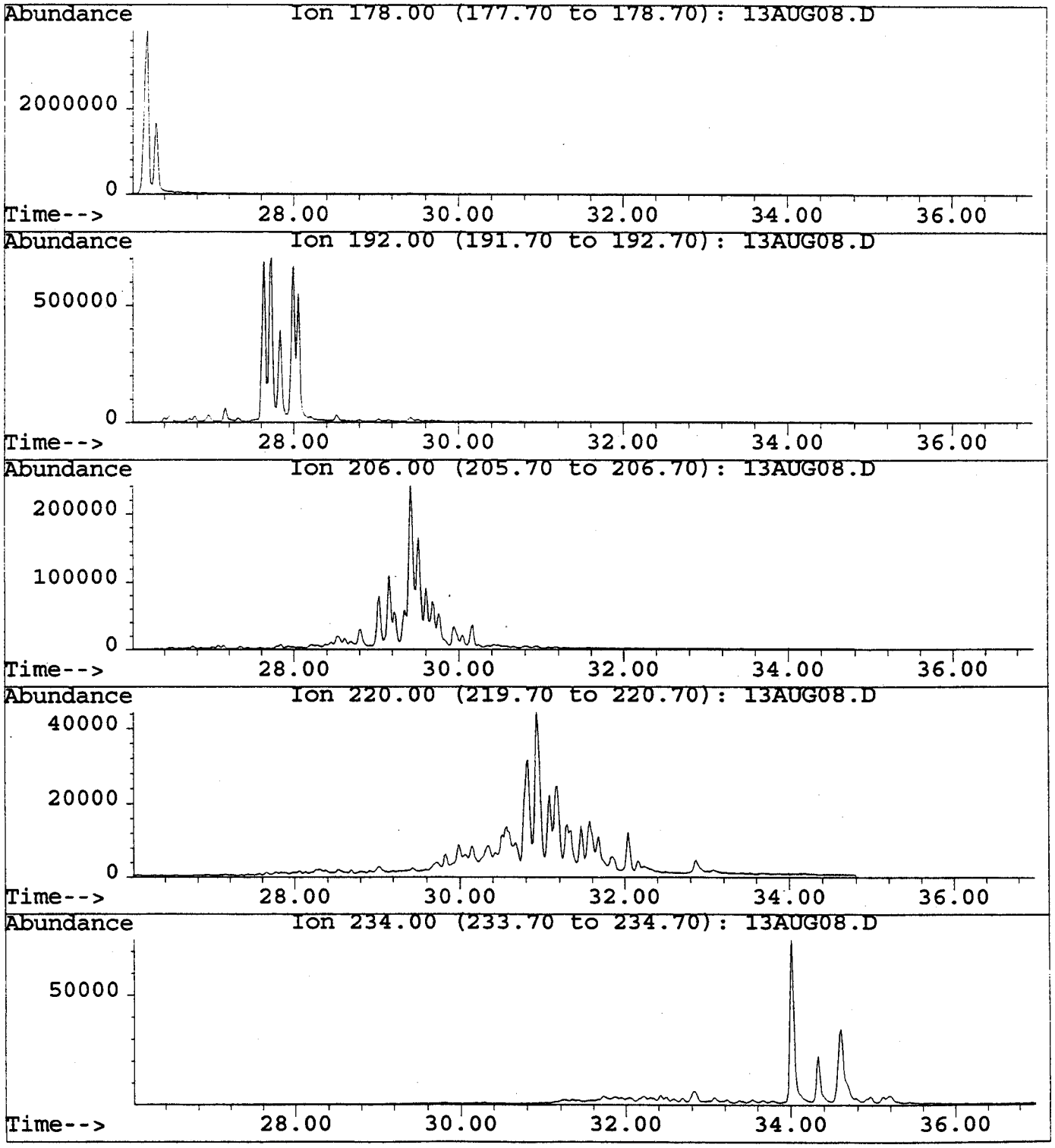
Operator : kty
Acquired : 13 Aug 101 6:35 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-06 Clay pipe
Misc Info :
Vial Number: 8



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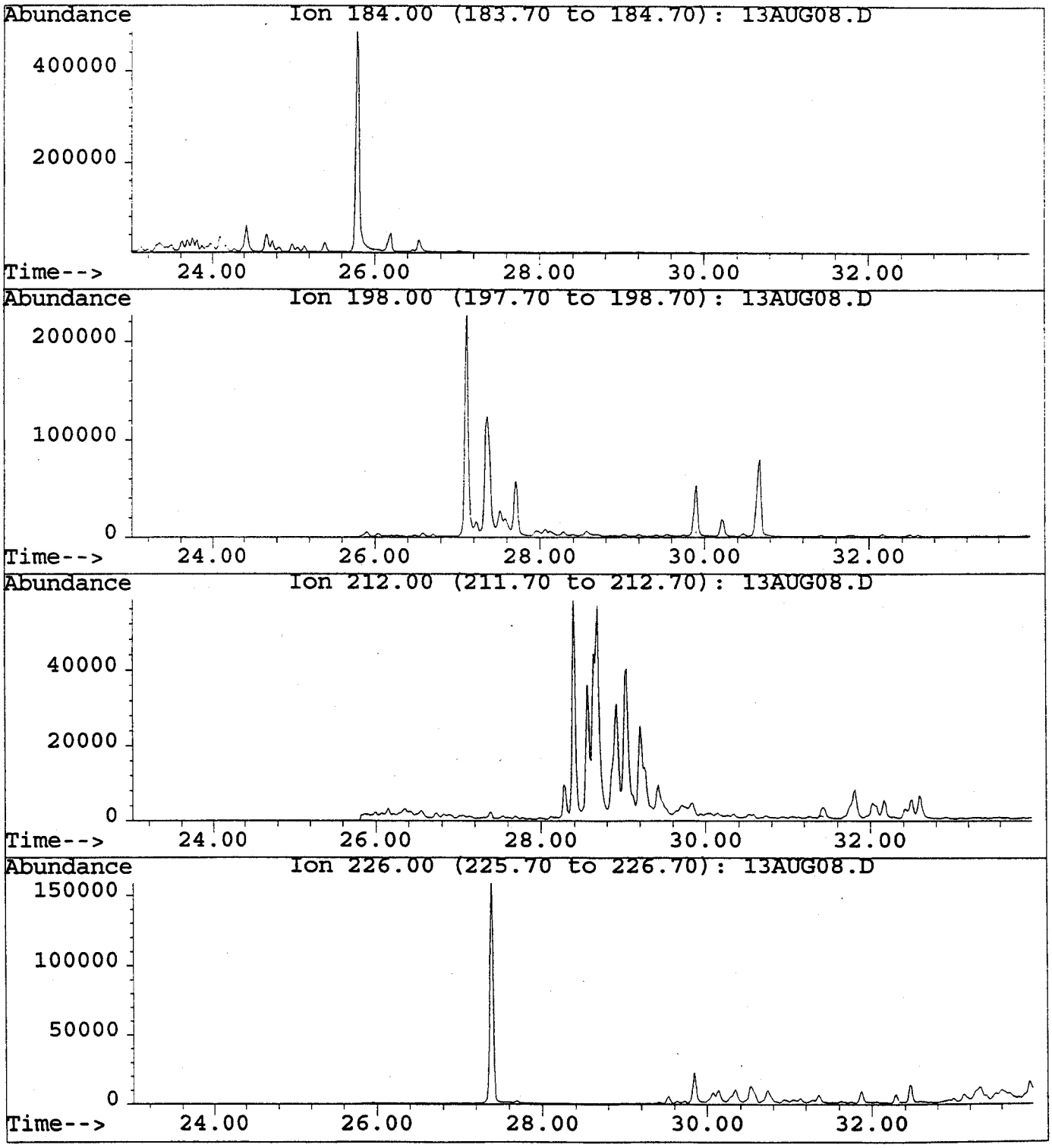
Operator : kty
Acquired : 13 Aug 101 6:35 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-06 Clay pipe
Misc Info :
Vial Number: 8



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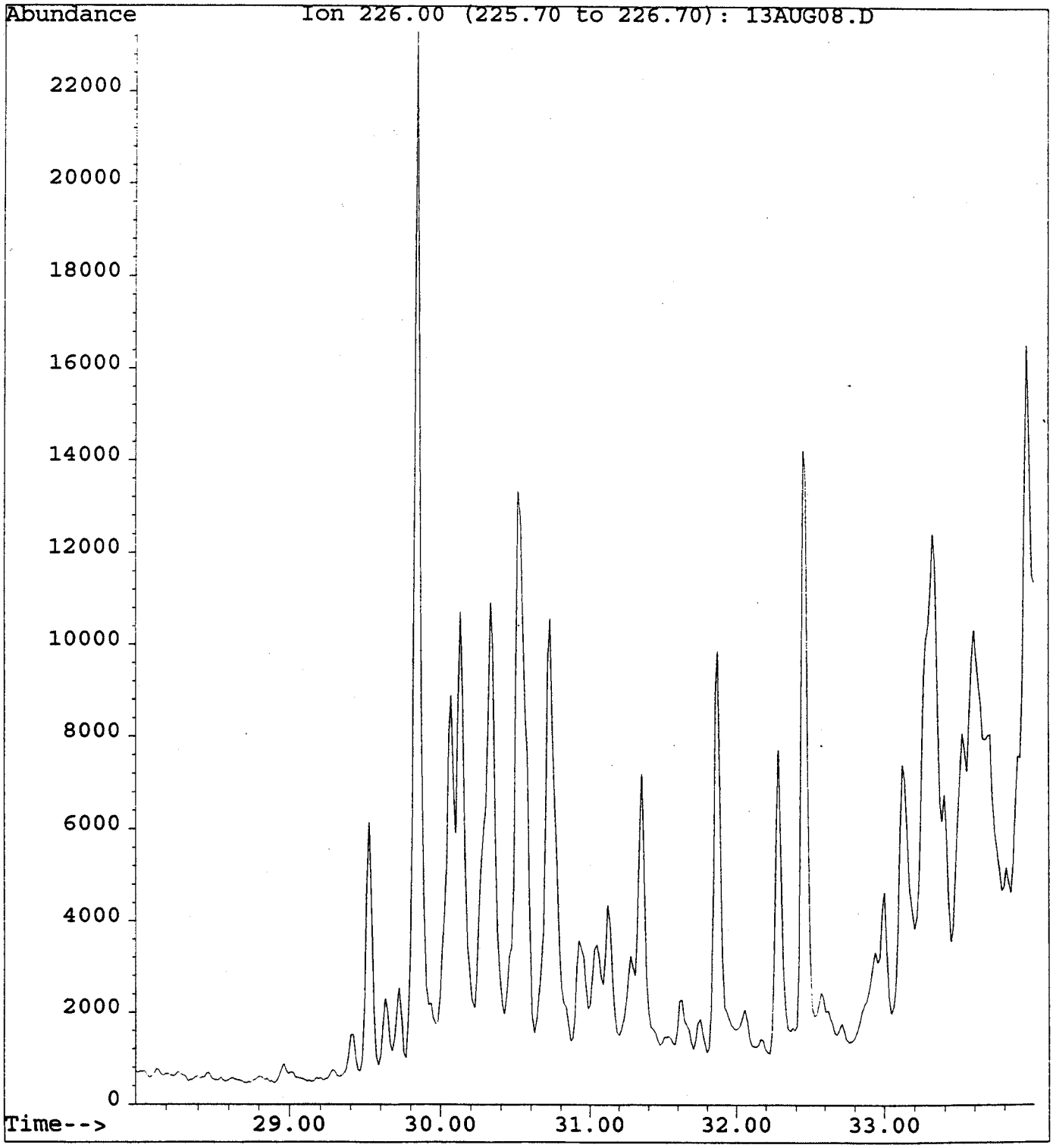
Instrument : GC-2/MS
Sample Name: IG010727-06 Clay pipe
Misc Info :
Vial Number: 8



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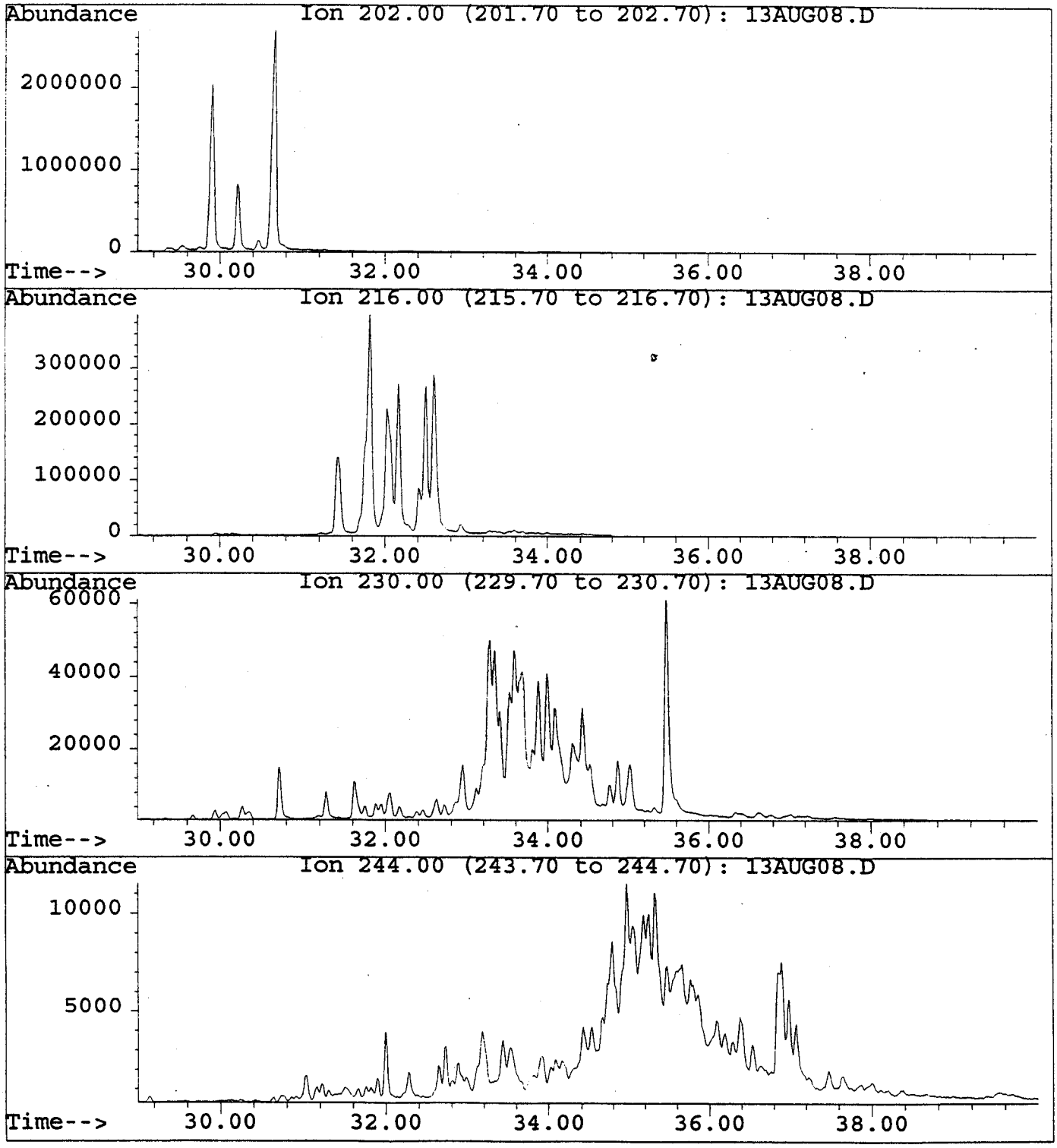
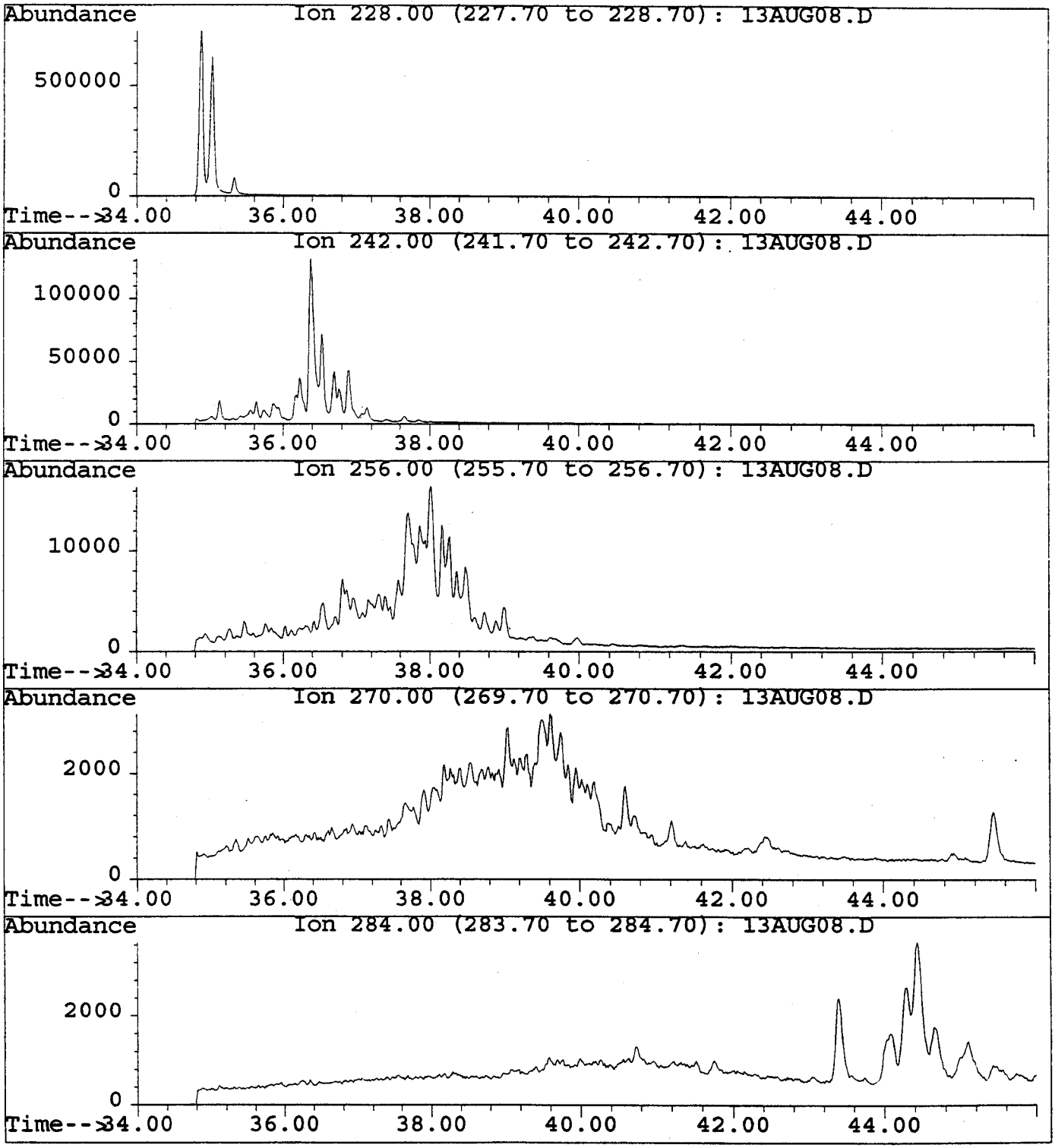
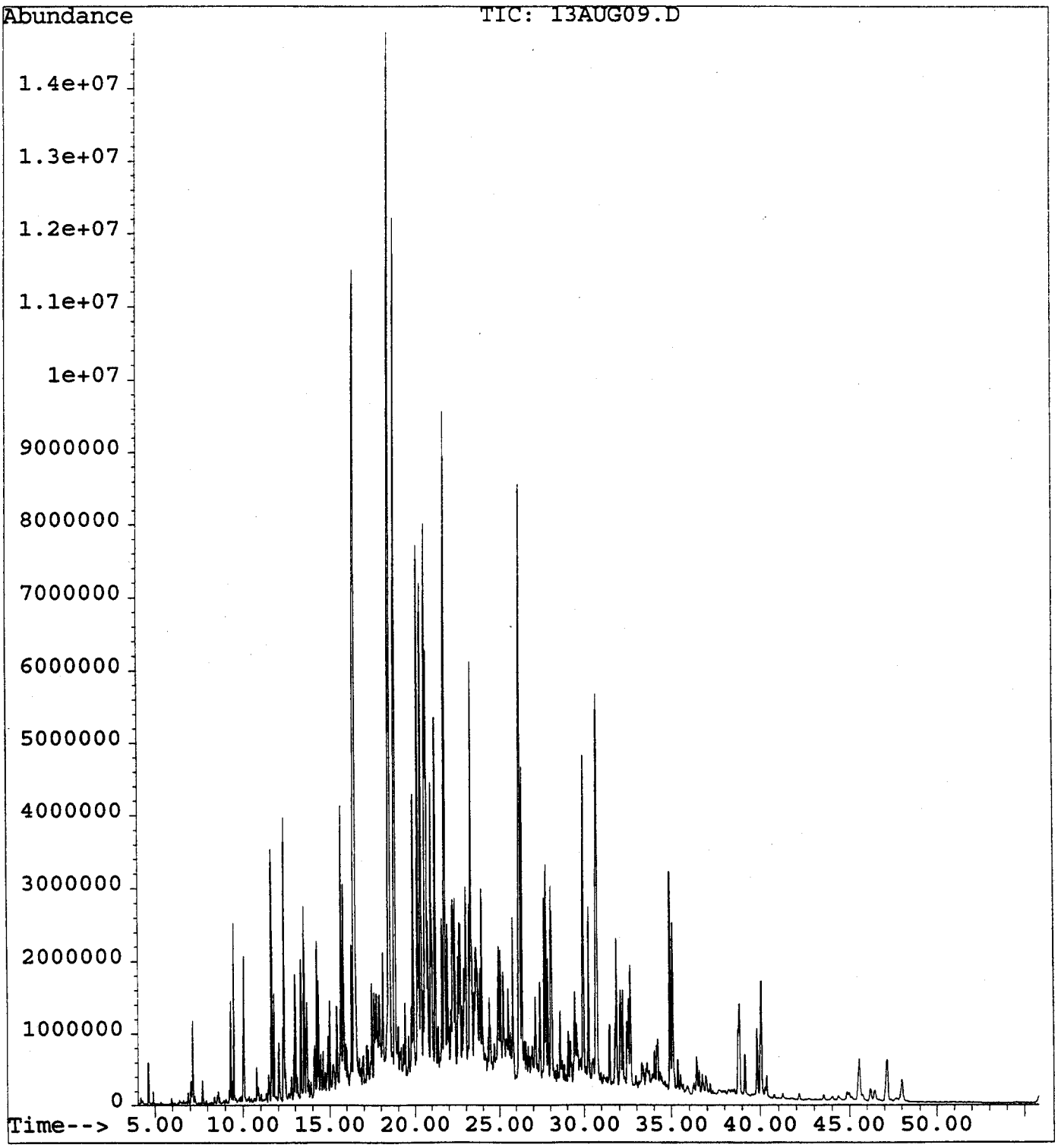
Operator : kty
Acquired : 13 Aug 101 6:35 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-06 Clay pipe
Misc Info :
Vial Number: 8



File : C:\HPCHEM\2\DATA\010813\13AUG08.D
Operator : kty
Acquired : 13 Aug 101 6:35 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-06 Clay pipe
Misc Info :
Vial Number: 8



File : C:\HPCHEM\2\DATA\010813\13AUG09.D
Operator : kty
Acquired : 13 Aug 101 7:54 pm using AcqMethod SIM4008M
Instrument : GC-2/MS
Sample Name: IG010727-05 Upgradient Riser
Misc Info :
Vial Number: 9



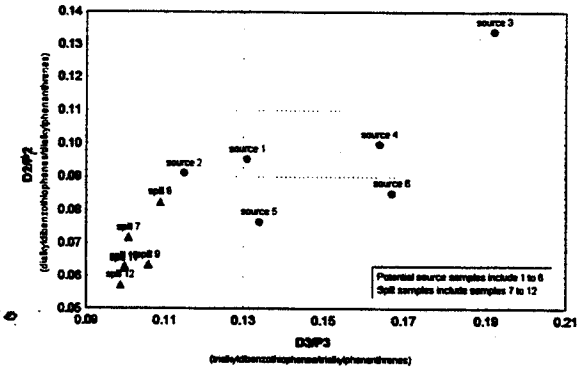
APPENDIX B

Environmental Forensic Report

Four Liquid Samples

SDG: IG010918

Figure 1. Double Ratio Plot



Report To:

Gas Technology Institute
1700 S. Mt. Prospect Road
Des Plaines, IL 60018

Report By:

META Environmental, Inc.
49 Clarendon Street
Watertown, MA 02472

October 5, 2001

Identifying and allocating sources of pollutants in complex environments.

META Environmental, Inc.
ENGINEERING & CHEMISTRY

Final Laboratory Report

META Environmental, Inc.
49 Clarendon Street
Watertown, MA 02472

Phone: 617-923-4662
Fax: 617-923-4610
e-Mail: metaenv@aol.com

Certification

This certifies that this package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed herein. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Director and Quality Assurance Officer, as verified by the following signatures.

David R. Craig — Date: 10/5/01
Laboratory Director, META Environmental, Inc.

David M. Mauro — Date: 10/5/01
Quality Assurance Officer, META Environmental, Inc.

Sample Delivery Group Narrative

Project: Ashland MGP Site Forensic Analyses

Client: Gas Technology Institute
1700 S. Mt. Prospect Road
Des Plains, IL 60018

Report Contact: Dr. Diane Saber

Date of Receipt: 9/18/01

Sample Summary:

The samples received for this project are summarized in the attached sample login forms.

META Project Number: I05001-60

Chain of Custody

Samples were received in good condition. The internal temperatures of the shipment containers were as follows:

Samples received 9/18/2001 8.3°C

Internal chain of custody procedures were followed after sample receipt. Samples were stored in a locked refrigerator. A sample custody logbook contains the record of sample removal from the secure sample storage area to the sample preparation laboratory. The custody record for the sample extracts is present on the sample extraction logbook page.

The disposal of samples and extracts will be authorized 1 month after the release of this data report. Sample disposal will be documented.

Methods

The aqueous samples were prepared by liquid:liquid extraction (EPA 3511 Draft) using dichloromethane (DCM). The non-aqueous phase liquid (NAPL) samples were prepared by waste dilution (EPA 3580) to a 5mg/ml concentration in DCM. The extracts were spiked with internal standard and analyzed by GC/FID (EPA 8100 mod.) and GC/MS/SIM (EPA 8260/8270 mod.).

Subsequently, a portion of each extract was fractionated into aliphatic, aromatic, and polar fractions using silica gel column chromatography (EPA 3630 mod.). Each fraction was analyzed by GC/FID (EPA 8100 mod.).

Results

Sample results were presented in summary forms (CLP Form 1 equivalent) which follow this narrative.

Quality Control

Analyte Flags

The detection limits were determined as the sample equivalent of the lowest linear initial calibration standard. Analytes measured between 50% and 100% of the lowest standard were reported as "estimated" and flagged with the letter "J." No value was reported above the calibration range. Undetected analytes were flagged with the letter, "U." Analytes marked with a "B" were detected in the associated blank and should be reviewed for a possible positive bias. No deviations were thought significant enough to compromise the integrity of the reported values.

Holding Times

All samples were extracted within holding times. All samples and extracts were stored at 4°C ± 2°C prior to extraction and analysis. All extracts were analyzed within 40 days of sample preparation.

Surrogate Spikes

Extraction surrogates were added to each aqueous sample prior to extraction. Fractionation surrogates were added to all extracts prior to fractionation. Recoveries for all surrogates are reported with the sample results. All surrogate recoveries in the unfractionated extracts were

within QC limits.

Blanks
No target analytes were present above the detection limit in the blanks. The fractionated blanks contained peaks associated with the silica gel. The presence of these peaks does not effect the data interpretation

Internal Standards
Internal standards were recovered within acceptable QC limits (50%-200%) relative to the continuing calibration standards.

Interpretation

The GC/FID fingerprints of the whole, aliphatic, and aromatic portions of the five samples were very similar. All the samples exhibited characteristics of pyrogenic and petrogenic substances, with the pyrogenic portion predominant. The substantial amounts of parent PAHs (e.g., naphthalene, phenanthrene, pyrene) indicated the presence of tar. However, the unresolved complex mixture (UCM or "hump") centered around about 17 minutes and the numerous small peaks from about 10 minutes to about 25 minutes indicated the presence of a middle distillate of petroleum.

The aliphatic fractions of all the samples showed a middle distillate of petroleum. The low abundance of normal alkanes relative to the isoprenoid hydrocarbons, pristane and phytane, indicated moderate weathering.

Table 1 presents the total hydrocarbon concentrations of the whole, aliphatic, and aromatic portions of each sample.

Finally, relatively low amounts of some compounds were detected in the polar fractions of each sample. However, most of material in the polar fractions was aromatic compounds that were not fully recovered in the aromatic fraction.

Table 1
Aliphatic and Aromatic Hydrocarbons in NAPL Samples

Sample	TEH (mg/kg)	Aliphatic (mg/kg)	Aromatic (mg/kg)	% Aliphatic	% Aromatic
TW-13	599,000	111,000	495,000	18.5	82.6
TW-13 dup	610,000	86,200	506,000	14.1	83.0
MW-15	302,000	39,500	254,000	13.1	84.1
West Trench Riser	416,000	57,500	345,000	13.8	82.9
Sample	**TEH (mg/L)**	**Aliphatic (mg/L)**	**Aromatic (mg/L)**	**% Aliphatic**	**% Aromatic**
Upgradient Riser	143	27.7	106	19.4	74.1

TEH – total extractable hydrocarbons

References

1 "Chemical Source Attribution at Former MGP Sites," EPRI Report 1000728, December 2000.

Table 1
Source and Weathering Ratios

Sample	Fl/Py	D/F	C17/Pris	C18/Phy	Pris/Phy	C3D/C3PA	C2D/C2PA	N/P
TW-13	0.69	0.21	2.27	0.88	0.99	1.00	0.36	2.37
MW-15	0.67	0.15	2.57	1.71	1.33	1.02	0.32	4.65
West Trench Riser	0.69	0.18	1.00	0.51	0.98	1.27	0.37	0.81
Upgradient Riser	0.66	0.17	0.46	0.35	1.03	1.01	0.35	0.64

Ratios:

Fl/Py	fluoranthene/pyrene
D/F	dibenzofuran/fluorene
C17/Pris	septadecane/pristane
C18/Phy	octadecane/phytane
Pris/Phy	pristane/phytane
C3D/C3PA	trialkyldibenzothiophenes/trialkylphenanthrenes/anthracenes
C2D/C2PA	dialkyldibenzothiophenes/dialkylphenanthrenes/anthracenes
N/P	Naphthalene/Phenanthrene

Appendix A

Chains of Custody

META ENVIRONMENTAL SAMPLE RECEIPT

Lab ID	Field ID	Matrix	Analysis	Date Sampled	Date Received	Client/ Project	Container/ Storage
IG010918-01	TW-13	NAPL	2512/4007/4008	09/12/01	09/18/01	I05001-60	40mL VOA vial
IG010918-02	MW-15	NAPL	2512/4007/4008	09/12/01	09/18/01	I05001-60	40mL VOA vial
IG010918-03	West Trench Riser	Water	2005/4007/4008	09/13/01	09/18/01	I05001-60	40mL VOA vial
IG010918-04	Upgradient Riser	Water	2005/4007/4008	09/13/01	09/18/01	I05001-60	40mL VOA vial

Dunsing 9/18/01

PROGRESSIVE PRINTING SERVICES (714) 393-4724

Job No. 05644-097

CHAIN OF CUSTODY RECORD

GENERATOR INFORMATION

Facility NSP - Ashland Lakefront

Address 301 Lakeshore Dr.

Ashland WI 54806

Telephone ( )

SAMPLE INFORMATION

	No.	DEPTH	TYPE	DATE	TIME
(NAPL)	TW-13	NA	coal tar	9/12	1410
↓	MW-15	↓	↓	9/12	1630
H_2O	west trench riser			9/13	0940
↓	upgradient riser			9/13	0950

COLLECTOR INFORMATION

Collected by Derek Zoellner / URS Corp.

Address 5250 E. Terrace Dr. Ste I

Madison WI 53718

Telephone (608) 244-5656

~~Suspected Waste Constituents~~ Analyze for 8100 Fingerprint Analysis. Send results to Dave Trainor @ URS Corp address

Field Conditions/Remarks Call Dave Trainor @ above number with questions.

SAMPLE ALLOCATION

Name _____

Address _____

Telephone ( )

_____ sample received intact

_____ sample received damaged or missing (describe on back)

(Signature) (Date)

CHAIN OF POSSESSION

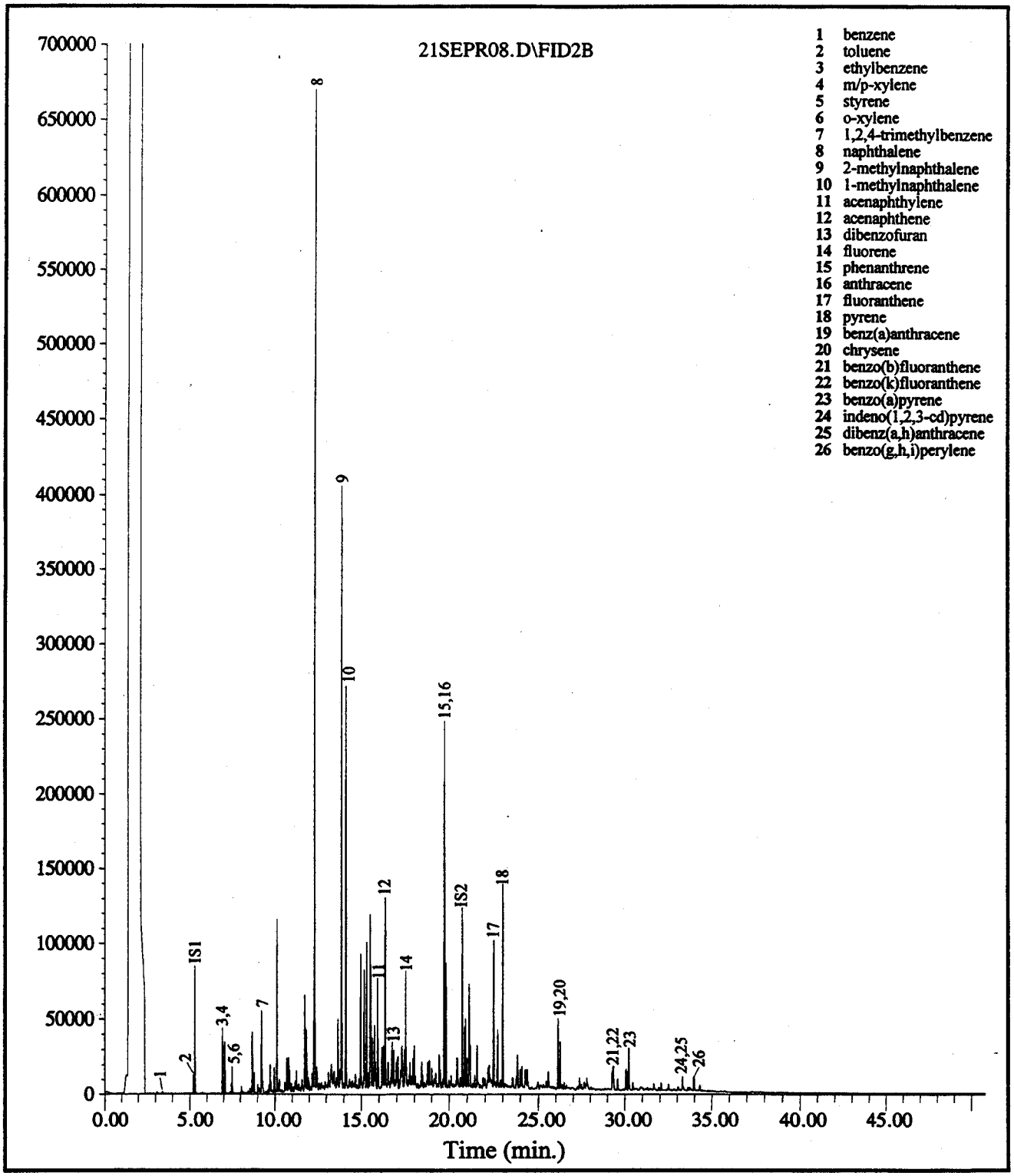
	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
1.	[signature]	9/17/01	0730	K. Peterson	8.3°C	9/19/01 9:55am
2.						
3.						
4.						

Distribution

Appendix B

GC/FID Fingerprints

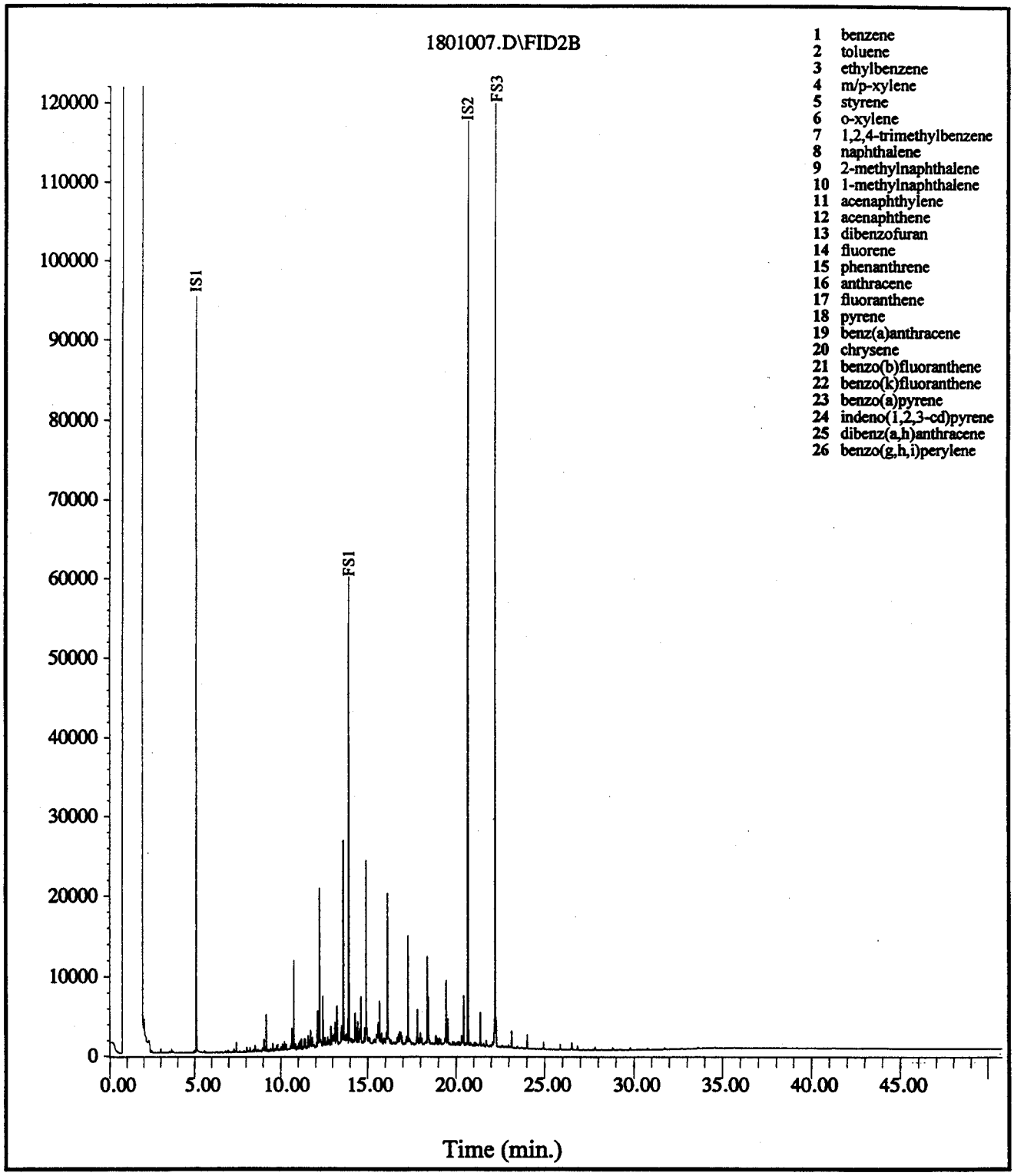
GC/FID Fingerprint



IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane

Field ID:	**TW-13**
Laboratory ID:	IG010918-01
Method:	MET4007D

GC/FID Fingerprint



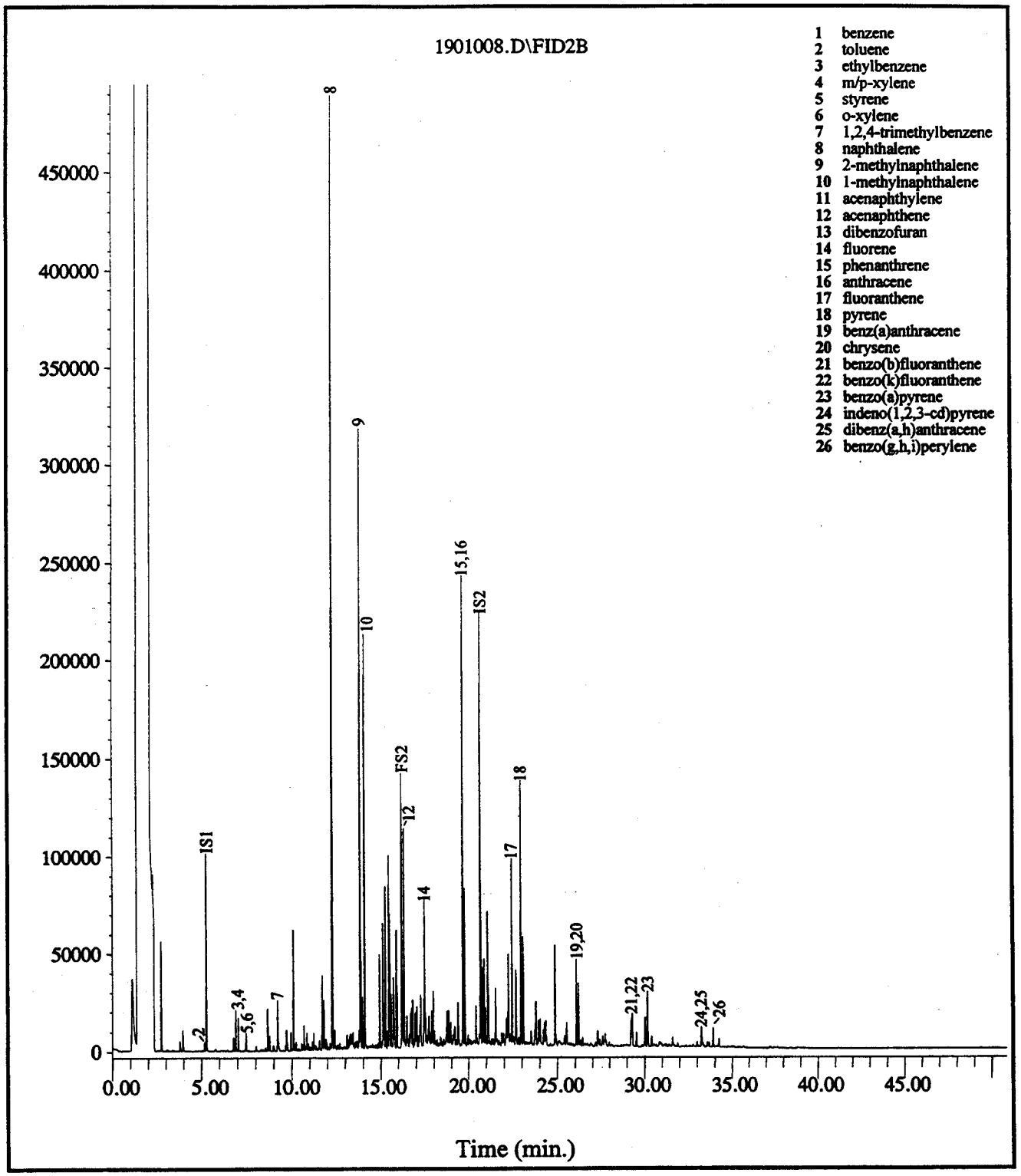
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**TW-13**
Laboratory ID:	IG010918-01PF
Method:	MET4007D

IG918frac.ppt

META

GC/FID Fingerprint



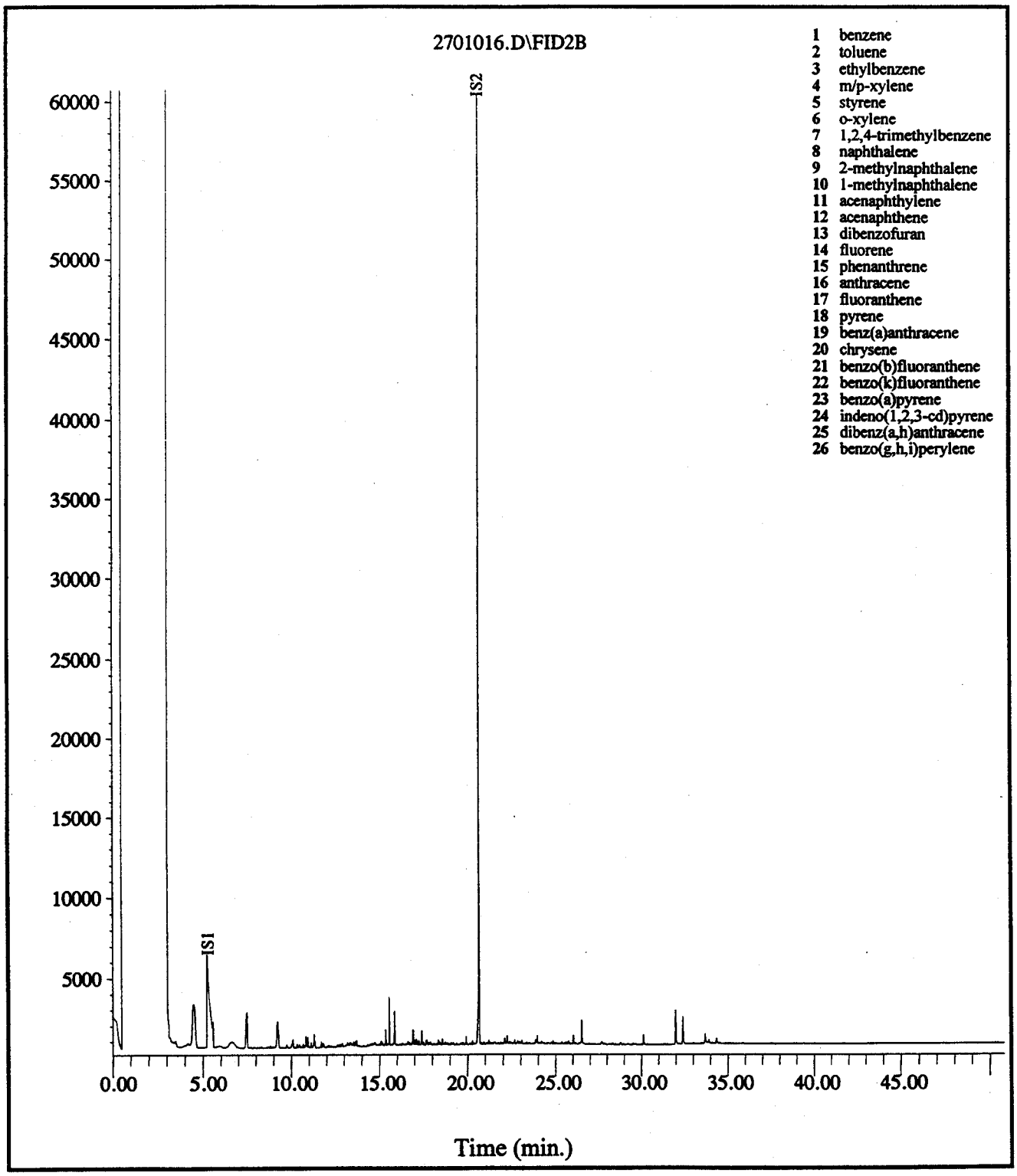
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**TW-13**
Laboratory ID:	IG010918-01DF
Method:	MET4007D

IG918frac.ppt

META

GC/FID Fingerprint



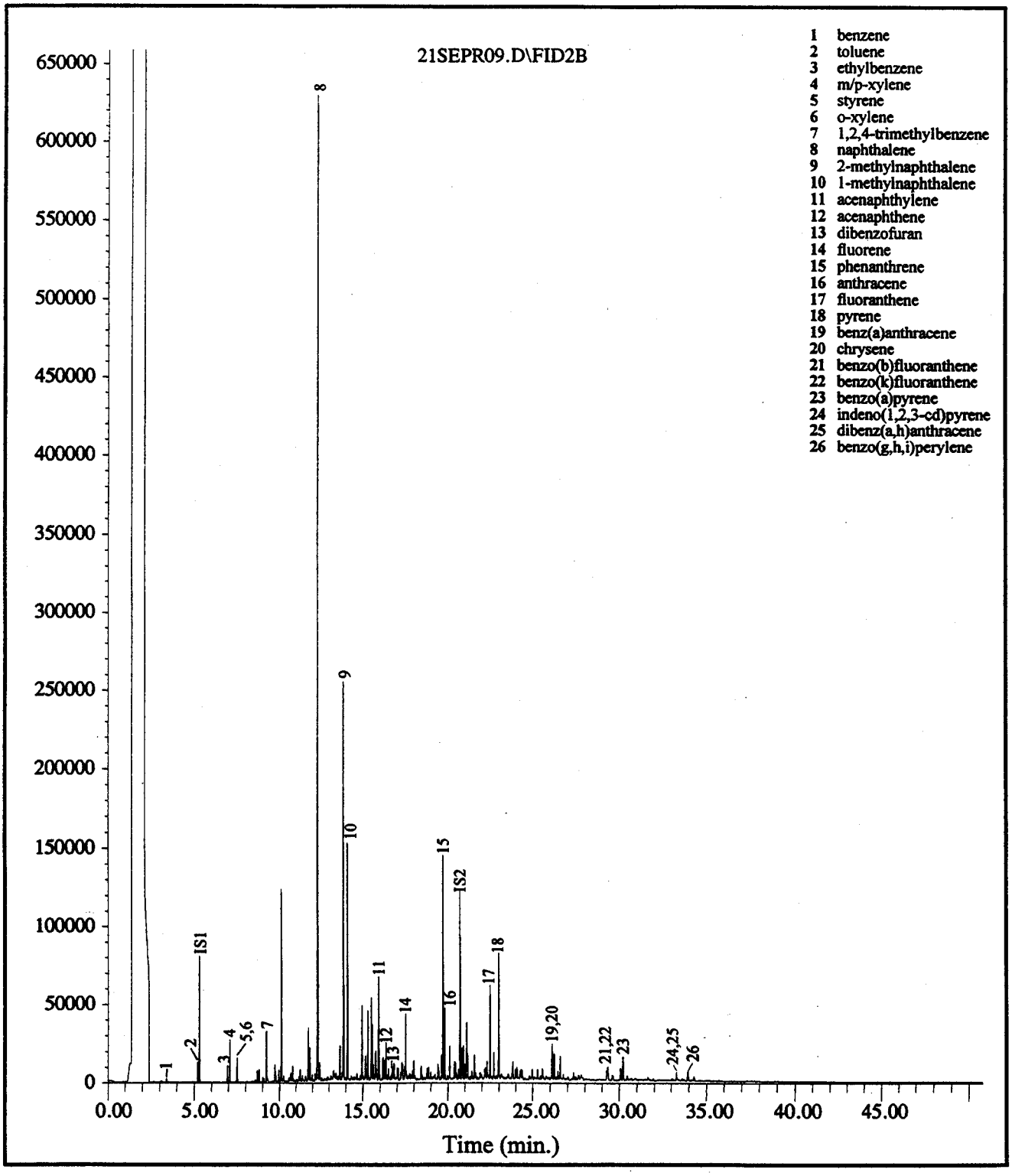
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**TW-13**
Laboratory ID:	IG010918-01MF
Method:	MET4007D

IG918fmc.ppt

META

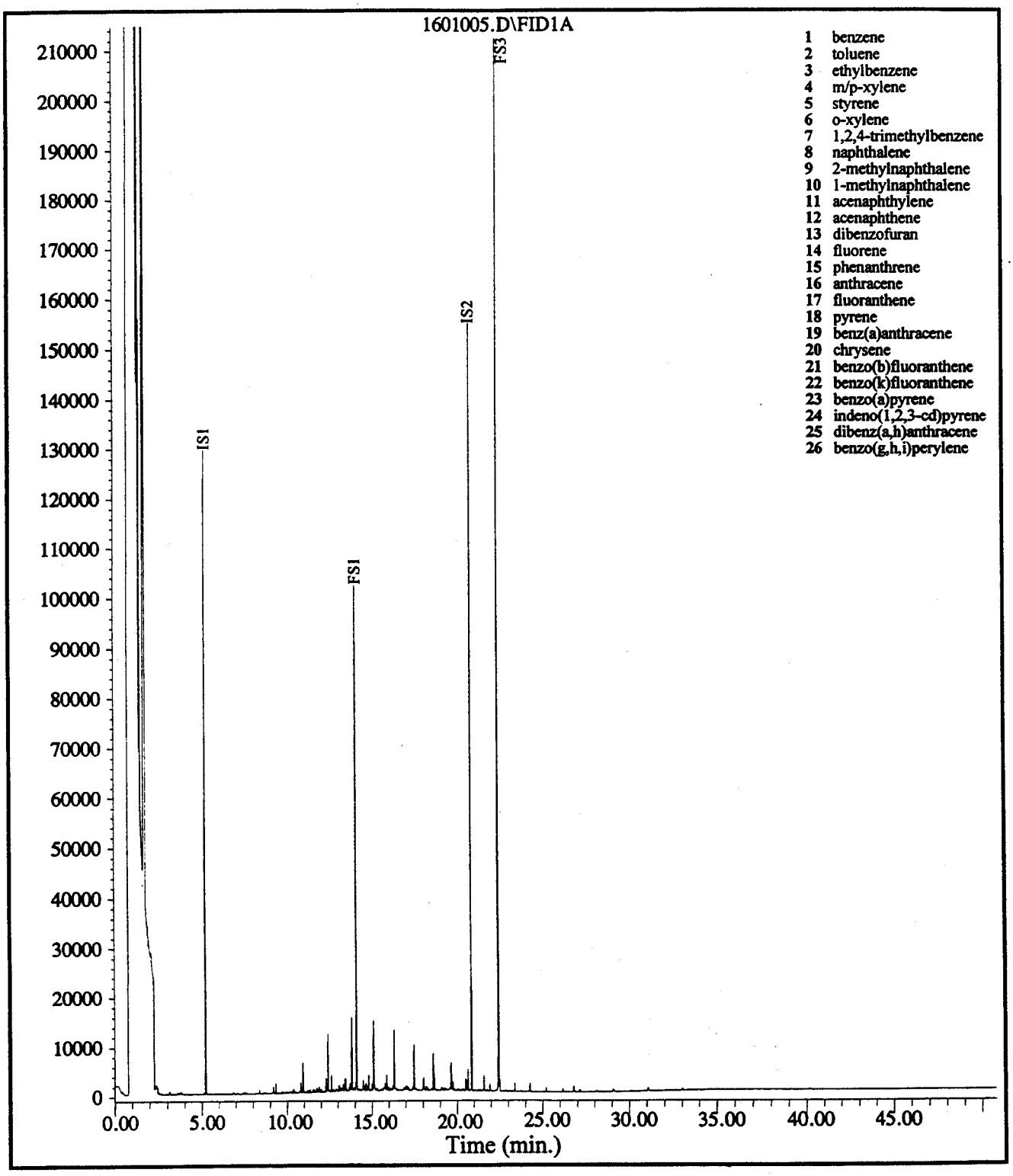
GC/FID Fingerprint



IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane

Field ID:	**MW-15**
Laboratory ID:	IG010918-02
Method:	MET4007D

GC/FID Fingerprint



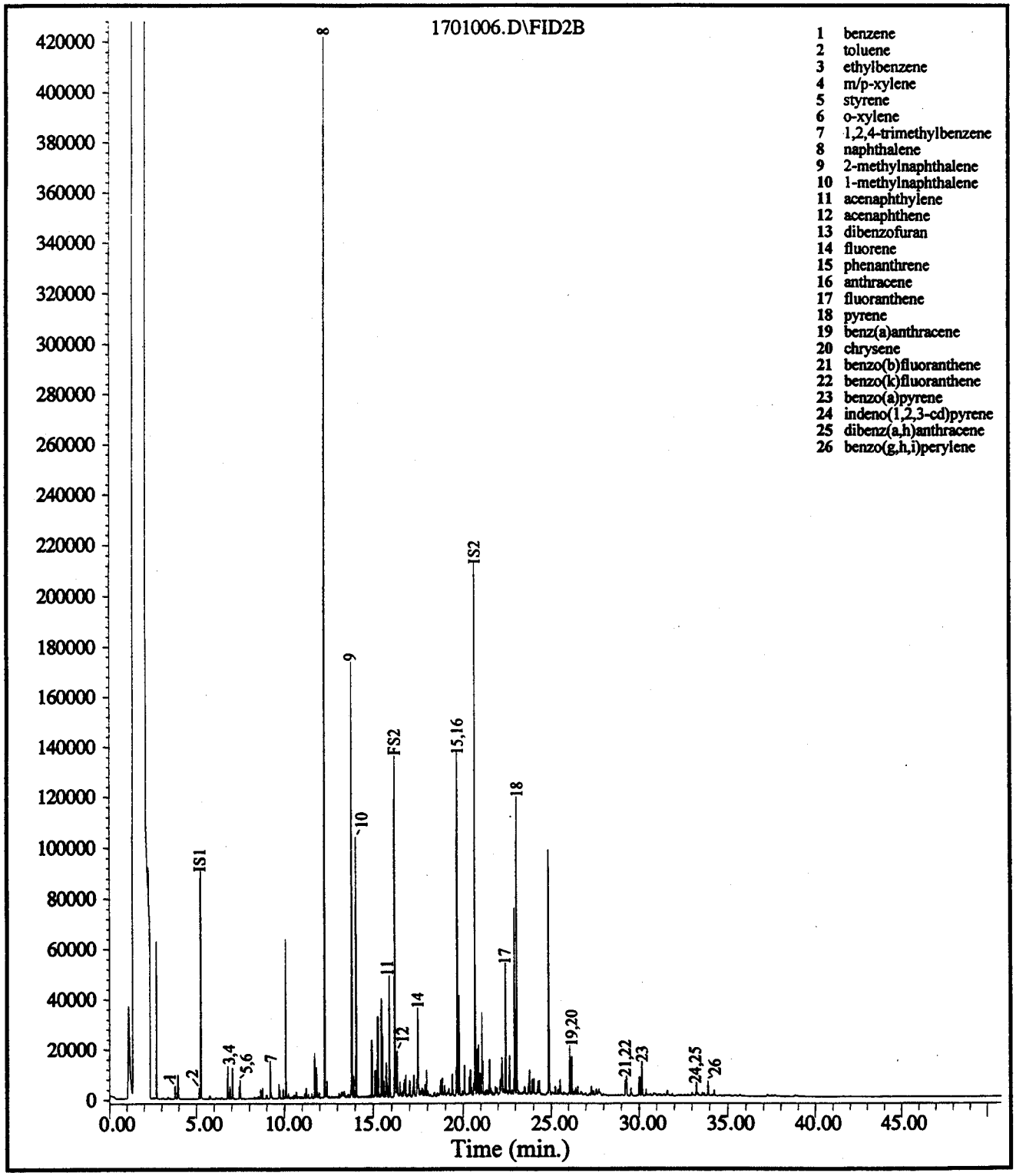
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**MW-15**
Laboratory ID:	IG010918-02PF
Method:	MET4007D

IG918frac.ppt

META

GC/FID Fingerprint



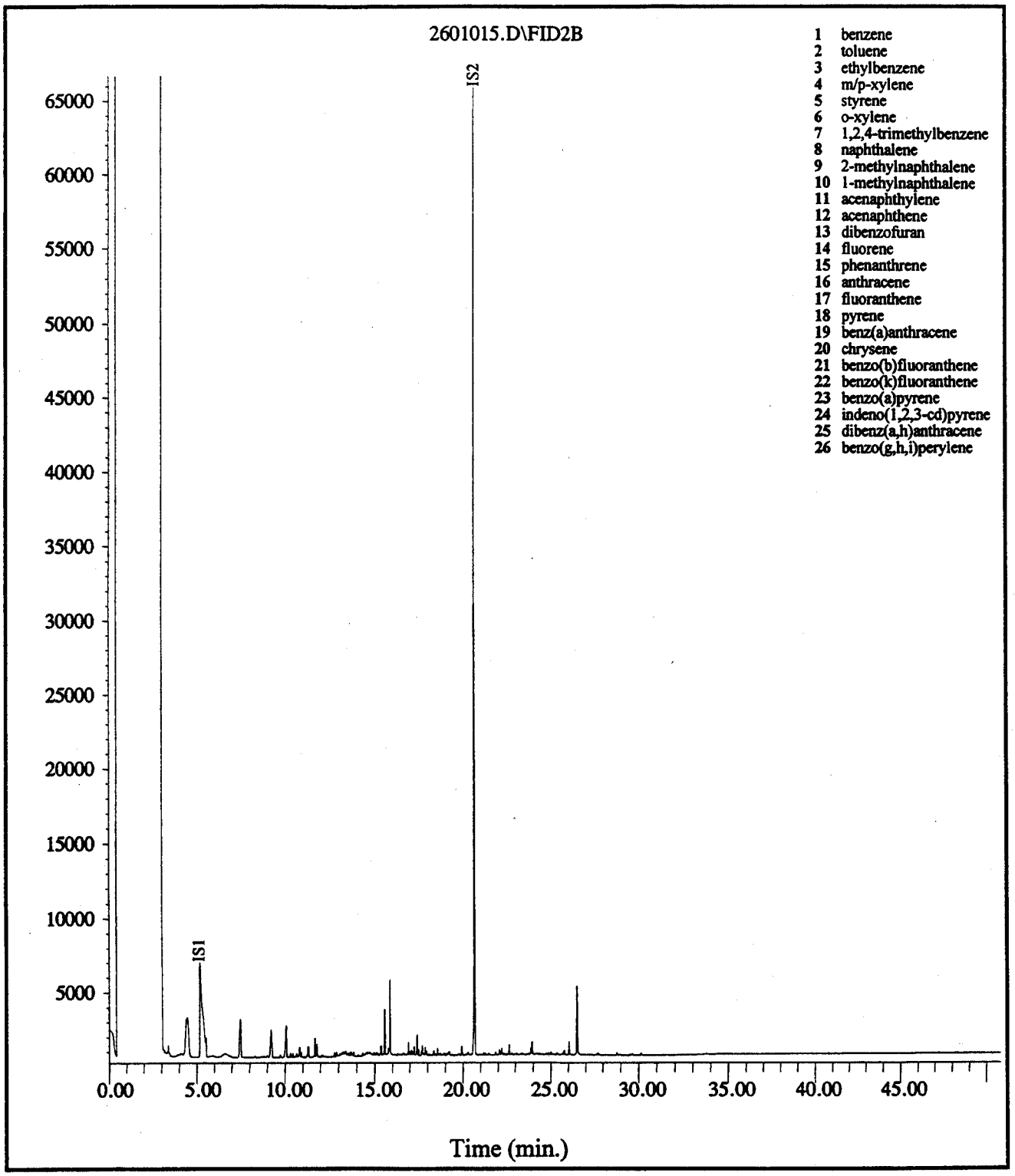
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**MW-15**
Laboratory ID:	IG010918-02DF
Method:	MET4007D

IG918frac.ppt

META

GC/FID Fingerprint



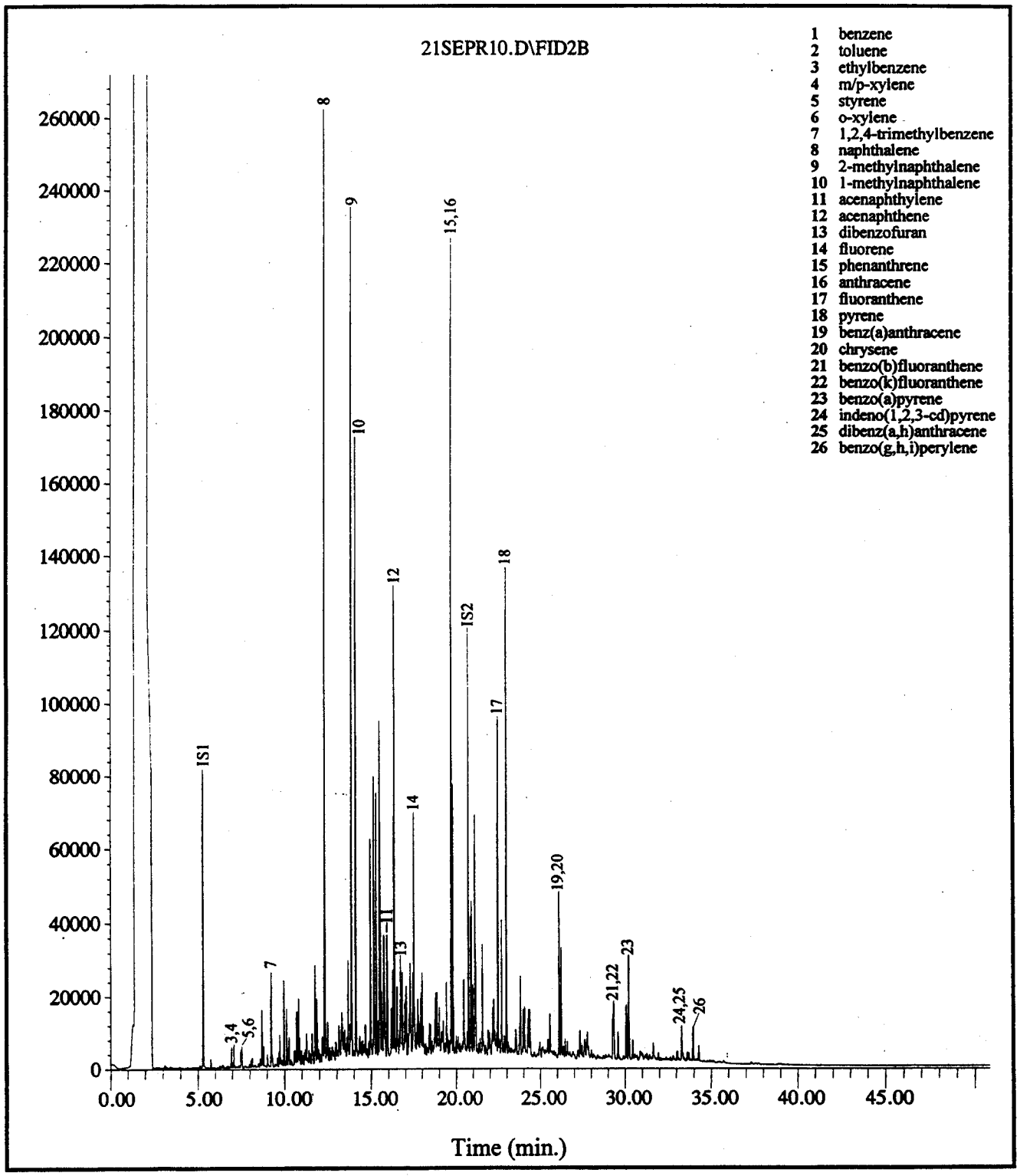
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

IG918fmc.ppt

Field ID:	**MW-15**
Laboratory ID:	IG010918-02MF
Method:	MET4007D

META

GC/FID Fingerprint

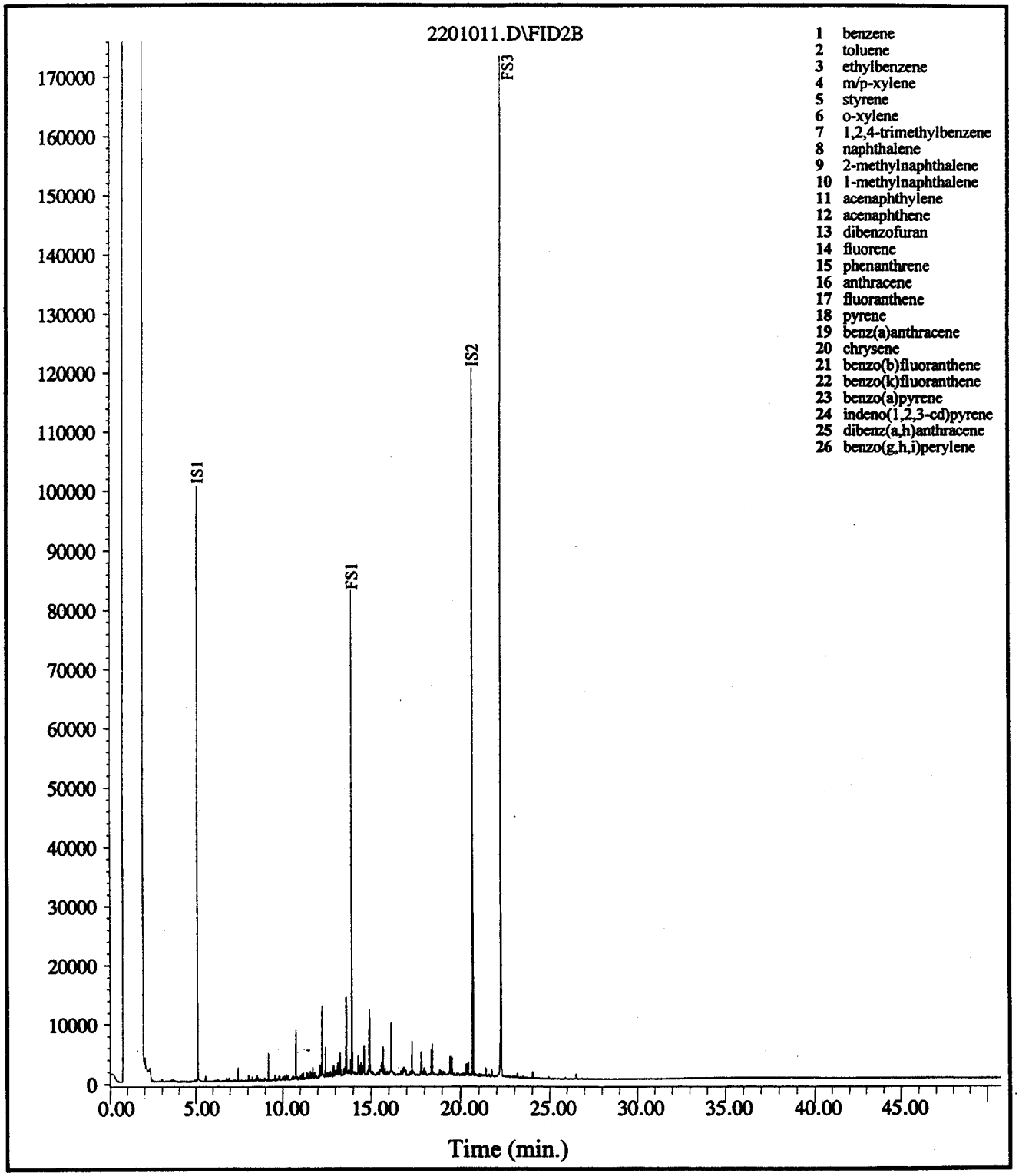


IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane

Field ID:	**West Trench Riser**
Laboratory ID:	IG010918-03
Method:	MET4007D

META

GC/FID Fingerprint



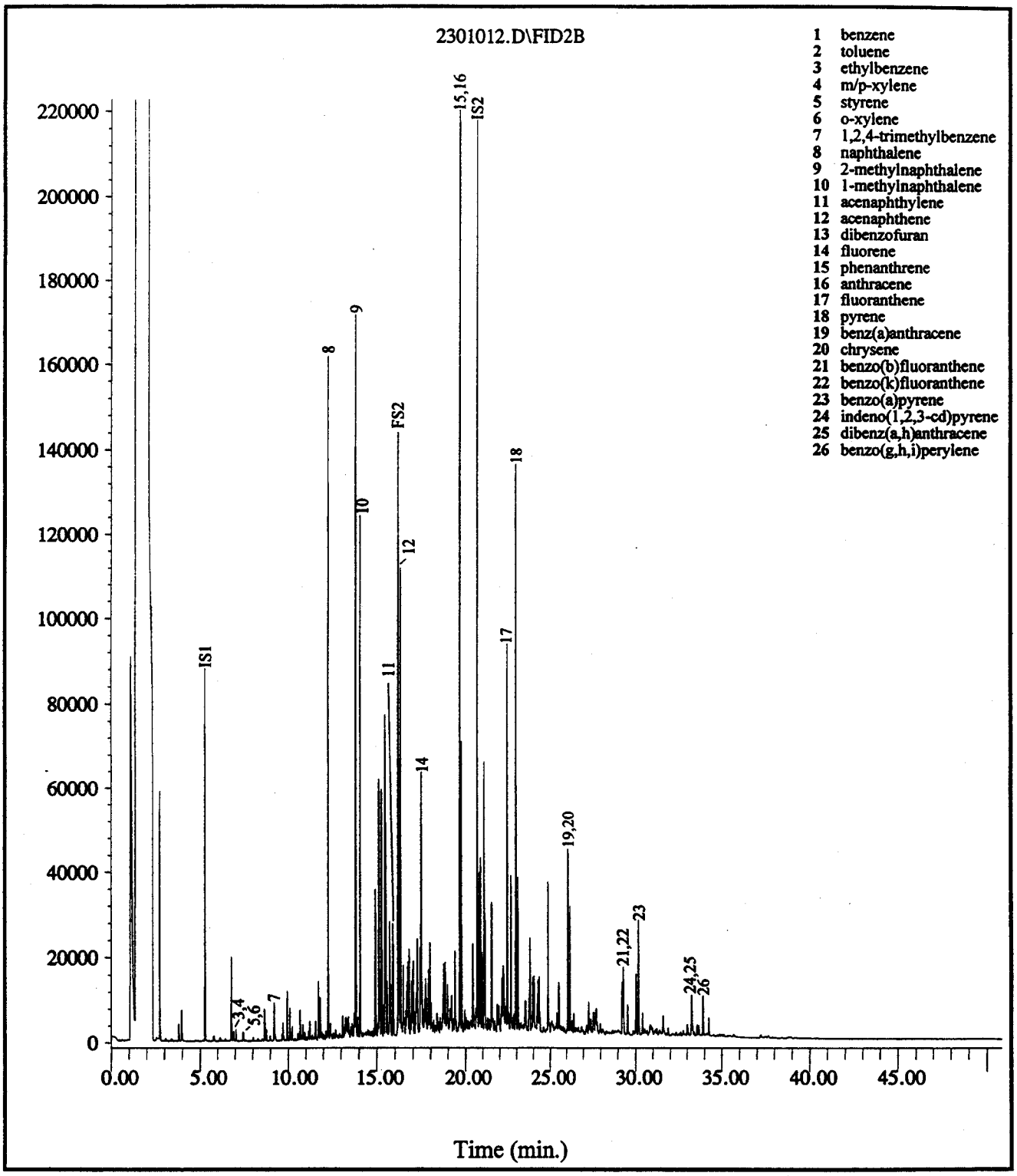
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**West Trench Riser**
Laboratory ID:	IG010918-03PF
Method:	MET4007D

IG918frac.ppt

META

GC/FID Fingerprint



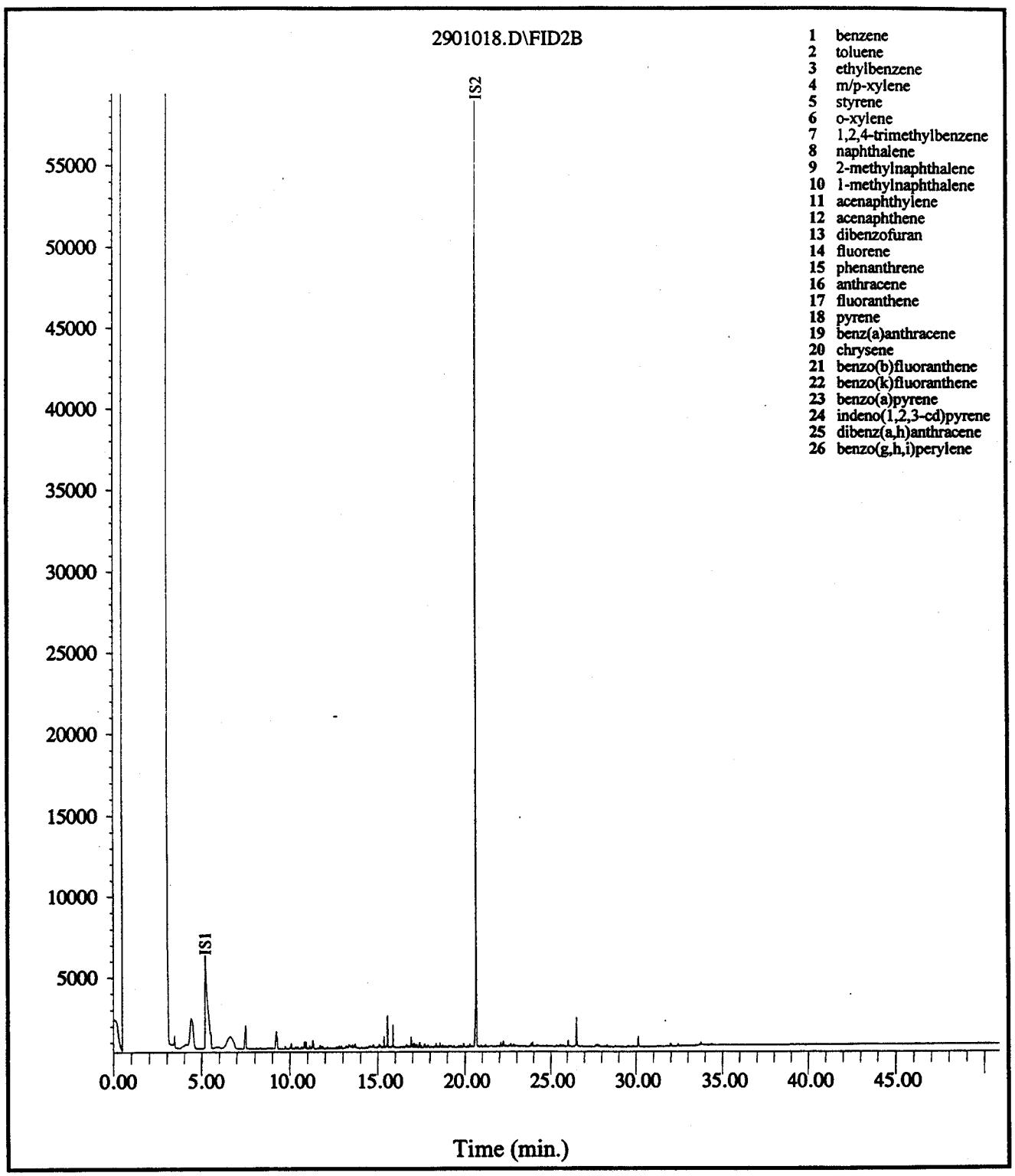
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

IG918frac.ppt

Field ID:	**West trench riser**
Laboratory ID:	IG010918-03DF
Method:	MET4007D

META

GC/FID Fingerprint



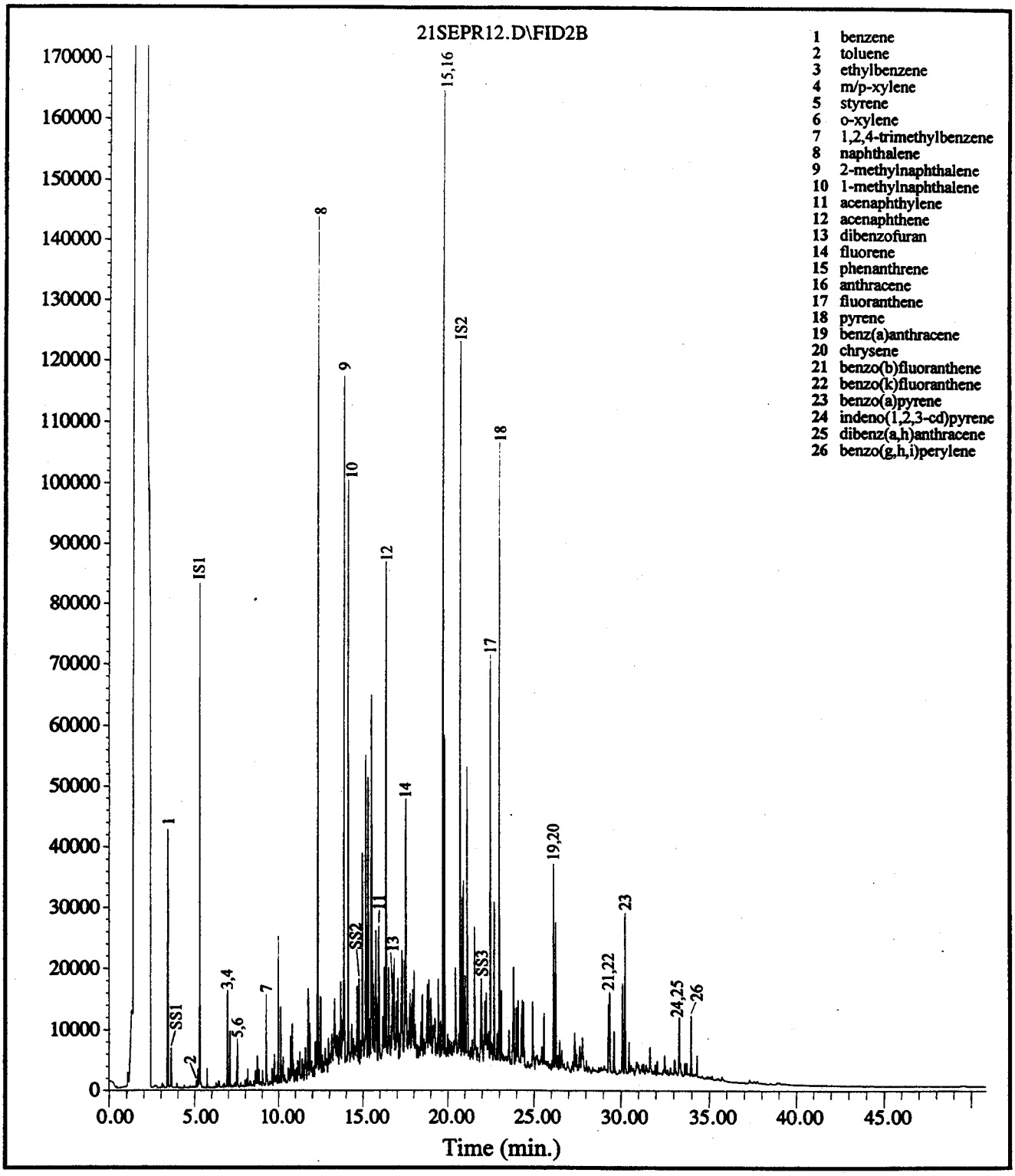
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**West trench riser**
Laboratory ID:	IG010918-03MF
Method:	MET4007D

IG918frac.ppt

META

GC/FID Fingerprint

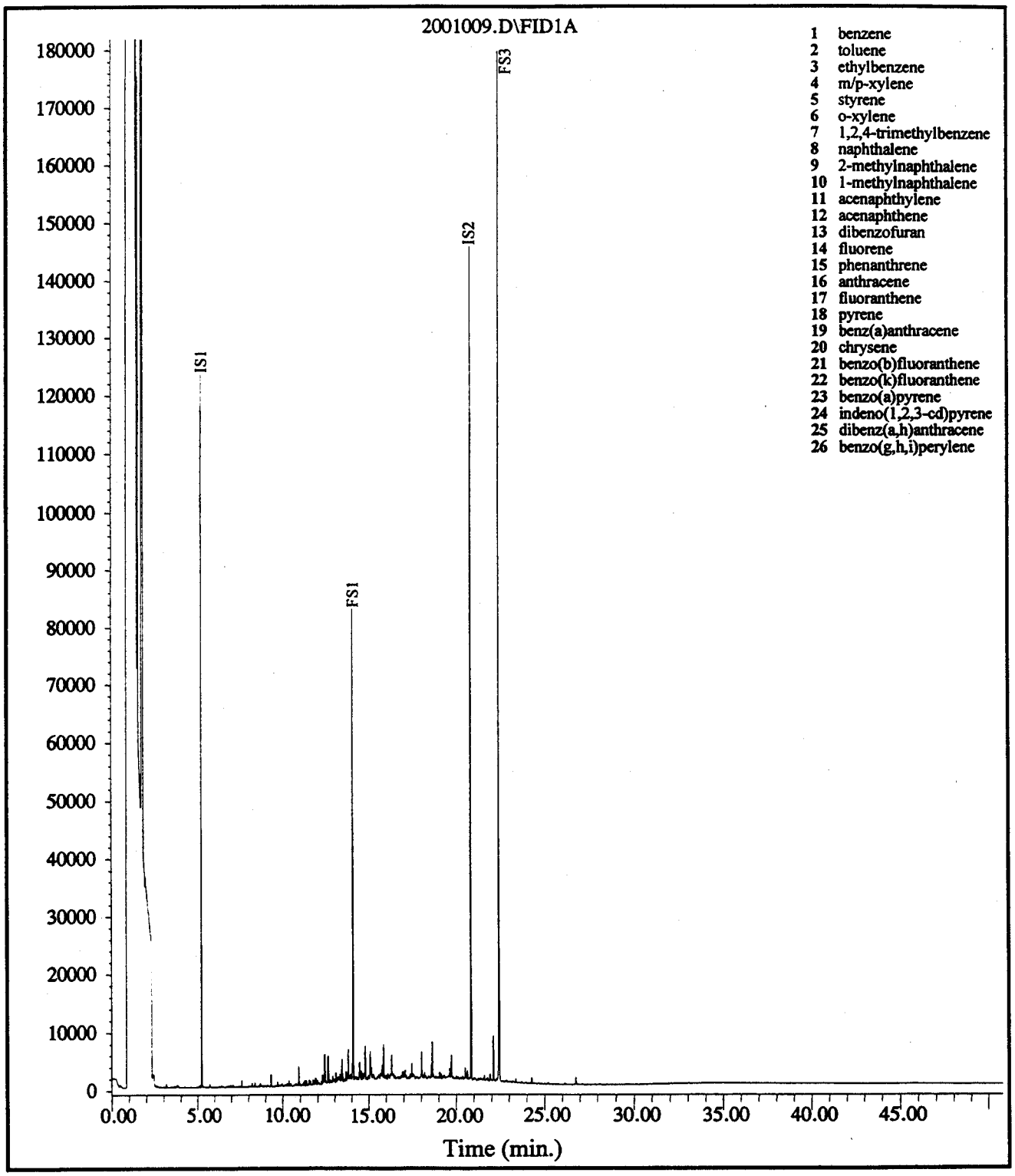


IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane

Field ID:	**Upgradient Riser**
Laboratory ID:	IG010918-04
Method:	MET4007D

META

GC/FID Fingerprint



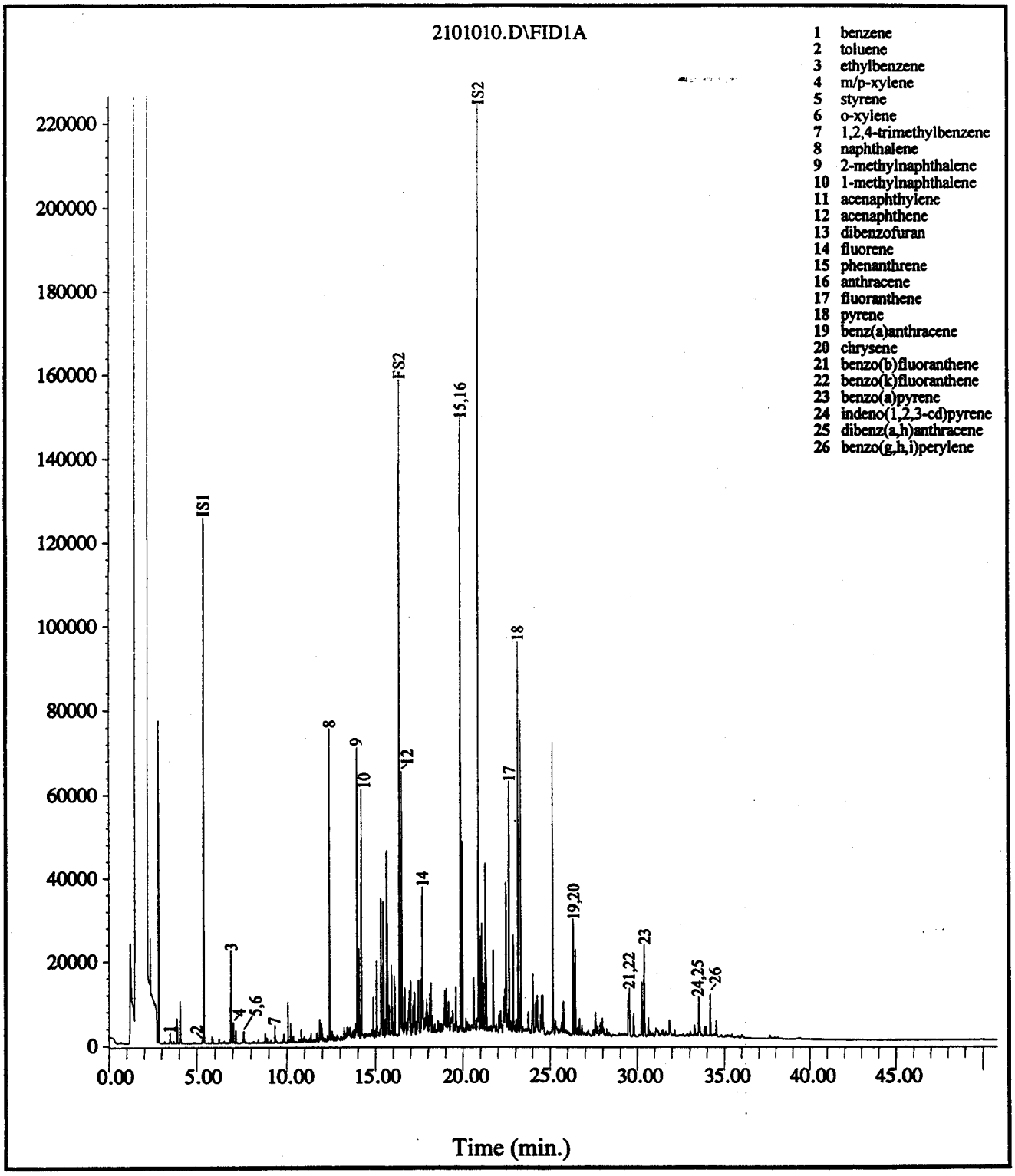
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**Upgradient riser**
Laboratory ID:	IG010918-04PF
Method:	MET4007D

IG918frac.ppt

META

GC/FID Fingerprint



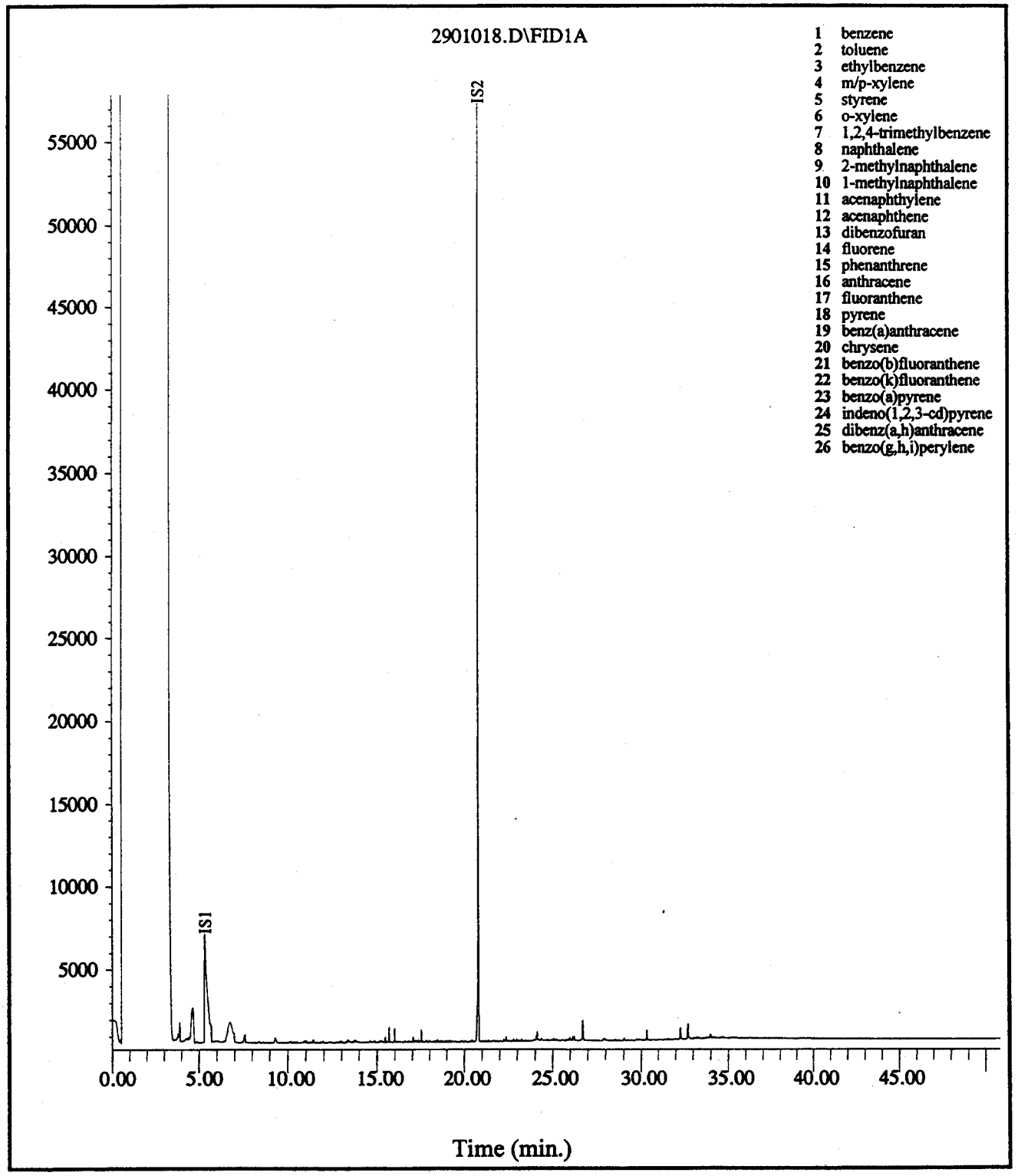
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

IG918frac.ppt

Field ID:	**Upgradient riser**
Laboratory ID:	IG010918-04DF
Method:	MET4007D

META

GC/FID Fingerprint



IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**Upgradient riser**
Laboratory ID:	IG010918-04MF
Method:	MET4007D

IG918frac.ppt

META

Appendix C

Chemical Concentrations

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **TW-13**

Client:	GTI	Preparation Method:	EPA 3580
Project:	Ashland	Cleanup Method(s):	
Lab ID:	IG010918-01	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
File ID:	21SEP06.D	Matrix:	NAPL
		Preservation:	None
		Decanted:	No
Date Sampled:	9/12/01	Sample Size:	0.0119 g
Date Received:	9/18/01	%Solid:	100%
Date Prepared:	9/20/01	Extract Volume:	2 mL
Date Cleanup:		Prep DF:	1
Date Analyzed:	21 Sep 2001 1:22 pm	Analysis DF:	1
Instrument:	HP_5972	Injection Volume:	0.001 mL
Operator:	kty	Batch QC:	IG010920-MB

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
PAH COMPOUNDS:					
Benzene	103		16.8	8.40	
Toluene	674		16.8	8.40	
Ethylbenzene	2,210		16.8	8.40	
m/p-Xylenes	1,970		16.8	8.40	
Styrene	507		16.8	8.40	
o-Xylene	930		16.8	8.40	
1,2,4-Trimethylbenzene	2,360		16.8	8.40	
Naphthalene	46,500	D	16.8	8.40	
2-Methylnaphthalene	26,700	D	16.8	8.40	
1-Methylnaphthalene	15,700		16.8	8.40	
Acenaphthylene	4,560		16.8	8.40	
Acenaphthene	7,430		16.8	8.40	
Dibenzofuran	995		16.8	8.40	
Fluorene	4,830		16.8	8.40	
Phenanthrene	19,900	D	16.8	8.40	
Anthracene	5,340		16.8	8.40	
Fluoranthene	6,330		16.8	8.40	
Pyrene	9,160		16.8	8.40	
Benz[a]anthracene	3,150		16.8	8.40	
Chrysene	2,830		16.8	8.40	
Benzo[b]fluoranthene	1,190		16.8	8.40	
Benzo[k]fluoranthene	1,720		16.8	8.40	
Benzo[a]pyrene	2,870		16.8	8.40	
Indeno[1,2,3-cd]pyrene	1,110		16.8	8.40	
Dibenz[a,h]anthracene	249		16.8	8.40	
Benzo[g,h,i]perylene	1,190		16.8	8.40	
ALKYLATED PAHs:					
C0-Benzene	103		16.8	8.40	
C1-Benzene	774		16.8	8.40	
C2-Benzene	6,450		16.8	8.40	
C3-Benzene	8,760		16.8	8.40	
C4-Benzene	5,740		16.8	8.40	
C5-Benzene	1,310		16.8	8.40	
C0-Naphthalene	46,500	D	16.8	8.40	
C1-Naphthalene	27,000	D	16.8	8.40	
C2-Naphthalene	14,200		16.8	8.40	
C3-Naphthalene	4,830		16.8	8.40	
C4-Naphthalene	797		16.8	8.40	
C0-Fluorene	4,830		16.8	8.40	
C1-Fluorene	4,170		16.8	8.40	
C2-Fluorene	1,070		16.8	8.40	
C3-Fluorene	508		16.8	8.40	
C0-Phenanthrene/Anthracene	25,600	D	16.8	8.40	
C1-Phenanthrene/Anthracene	8,440		16.8	8.40	
C2-Phenanthrene/Anthracene	2,250		16.8	8.40	
C3-Phenanthrene/Anthracene	407		16.8	8.40	
C4-Phenanthrene/Anthracene	97.5		16.8	8.40	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3580
Field ID:	**MW-15**	Cleanup Method(s):	
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
Project:	Ashland	Matrix:	NAPL
		Preservation:	None
Lab ID:	IG010918-02	Decanted:	No
File ID:	21SEP07.D		
		Sample Size:	0.0131 g
Date Sampled:	9/12/01	%Solid:	100%
Date Received:	9/18/01	Extract Volume:	2 mL
Date Prepared:	9/20/01	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	21 Sep 2001 2:31 pm	Injection Volume:	0.001 mL
Instrument:	HP_5972		
Operator:	kty	Batch QC:	IG010920-MB

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
C0-Dibenzothiophene	654		15.3	7.63	
C1-Dibenzothiophene	505		15.3	7.63	
C2-Dibenzothiophene	310		15.3	7.63	
C3-Dibenzothiophene	173		15.3	7.63	
C0-Fluoranthene/Pyrene	9,320		15.3	7.63	
C1-Fluoranthene/Pyrene	2,310		15.3	7.63	
C2-Fluoranthene/Pyrene	447		15.3	7.63	
C3-Fluoranthene/Pyrene	96.7		15.3	7.63	
C0-Benz(a)anthracene/Chrysene	2,690		15.3	7.63	
C1-Benz(a)anthracene/Chrysene	569		15.3	7.63	
C2-Benz(a)anthracene/Chrysene	151		15.3	7.63	
C3-Benz(a)anthracene/Chrysene	34.5		15.3	7.63	
C4-Benz(a)anthracene/Chrysene	9.22	J	15.3	7.63	

Surrogates	%R	Min	Max
Fluorobenzene	Not Spiked	50%	150%
2-Fluorobiphenyl	Not Spiked	50%	120%
5a-Androstane	Not Spiked	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **TW-13**

Client:	GTI	Preparation Method:	EPA 3580
Project:	Ashland	Cleanup Method(s):	
		Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
		Matrix:	NAPL
		Preservation:	None
Lab ID:	IG010918-01Dup	Decanted:	No
File ID:	21SEP09.D		
		Sample Size:	0.0113 g
Date Sampled:	9/12/01	%Solid:	100%
Date Received:	9/18/01	Extract Volume:	2 mL
Date Prepared:	9/20/01	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	21 Sep 2001 4:50 pm	Injection Volume:	0.001 mL
Instrument:	HP_5972		
Operator:	kty	Batch QC:	IG010920-MB

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
PAH COMPOUNDS:					
Benzene	44.0		17.7	8.85	80.3%
Toluene	323		17.7	8.85	70.4%
Ethylbenzene	1,490		17.7	8.85	38.9%
m/p-Xylenes	1,330		17.7	8.85	38.8%
Styrene	562		17.7	8.85	10.3%
o-Xylene	685		17.7	8.85	30.3%
1,2,4-Trimethylbenzene	2,200		17.7	8.85	7.0%
Naphthalene	52,100	D	17.7	8.85	11.4%
2-Methylnaphthalene	29,400	D	17.7	8.85	9.6%
1-Methylnaphthalene	17,400		17.7	8.85	10.3%
Acenaphthylene	4,960		17.7	8.85	8.4%
Acenaphthene	8,190		17.7	8.85	9.7%
Dibenzofuran	1,150		17.7	8.85	14.5%
Fluorene	5,290		17.7	8.85	9.1%
Phenanthrene	21,000	D	17.7	8.85	5.4%
Anthracene	5,730		17.7	8.85	7.0%
Fluoranthene	6,710		17.7	8.85	5.8%
Pyrene	9,620		17.7	8.85	4.9%
Benz[a]anthracene	3,250		17.7	8.85	3.1%
Chrysene	2,900		17.7	8.85	2.4%
Benzo[b]fluoranthene	1,260		17.7	8.85	5.7%
Benzo[k]fluoranthene	1,560		17.7	8.85	9.8%
Benzo[a]pyrene	2,780		17.7	8.85	3.2%
Indeno[1,2,3-cd]pyrene	1,080		17.7	8.85	2.7%
Dibenz[a,h]anthracene	246		17.7	8.85	1.2%
Benzo[g,h,i]perylene	1,090		17.7	8.85	8.8%
ALKYLATED PAHs:					
C0-Benzene	44.0		17.7	8.85	80.3%
C1-Benzene	371		17.7	8.85	70.4%
C2-Benzene	4,450		17.7	8.85	36.7%
C3-Benzene	7,940		17.7	8.85	9.8%
C4-Benzene	5,990		17.7	8.85	4.3%
C5-Benzene	1,470		17.7	8.85	11.5%
C0-Naphthalene	52,100	D	17.7	8.85	11.4%
C1-Naphthalene	30,000	D	17.7	8.85	10.5%
C2-Naphthalene	15,800		17.7	8.85	10.7%
C3-Naphthalene	5,290		17.7	8.85	9.1%
C4-Naphthalene	869		17.7	8.85	8.6%
C0-Fluorene	5,290		17.7	8.85	9.1%
C1-Fluorene	4,520		17.7	8.85	8.1%
C2-Fluorene	1,540		17.7	8.85	36.0%
C3-Fluorene	320		17.7	8.85	45.4%
C0-Phenanthrene/Anthracene	27,100	D	17.7	8.85	5.7%
C1-Phenanthrene/Anthracene	9,040		17.7	8.85	6.9%
C2-Phenanthrene/Anthracene	2,430		17.7	8.85	7.7%
C3-Phenanthrene/Anthracene	455		17.7	8.85	11.1%
C4-Phananthrene/Anthracene	92.8		17.7	8.85	4.9%

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **TW-13**

Client:	GTI	Preparation Method:	EPA 3580
Project:	Ashland	Cleanup Method(s):	
Lab ID:	IG010918-01	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
File ID:	21SEP06.D	Matrix:	NAPL
		Preservation:	None
Date Sampled:	9/12/01	Decanted:	No
Date Received:	9/18/01	Sample Size:	0.0119 g
Date Prepared:	9/20/01	%Solid:	100%
Date Cleanup:		Extract Volume:	2 mL
Date Analyzed:	21 Sep 2001 1:22 pm	Prep DF:	1
Instrument:	HP_5972	Analysis DF:	1
Operator:	kty	Injection Volume:	0.001 mL
		Batch QC:	IG010920-MB

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
C0-Dibenzothiophene	1,520		16.8	8.40	
C1-Dibenzothiophene	1,310		16.8	8.40	
C2-Dibenzothiophene	799		16.8	8.40	
C3-Dibenzothiophene	409		16.8	8.40	
C0-Fluoranthene/Pyrene	18,800		16.8	8.40	
C1-Fluoranthene/Pyrene	5,510		16.8	8.40	
C2-Fluoranthene/Pyrene	1,270		16.8	8.40	
C3-Fluoranthene/Pyrene	290		16.8	8.40	
C0-Benz(a)anthracene/Chrysene	5,880		16.8	8.40	
C1-Benz(a)anthracene/Chrysene	1,400		16.8	8.40	
C2-Benz(a)anthracene/Chrysene	380		16.8	8.40	
C3-Benz(a)anthracene/Chrysene	104		16.8	8.40	
C4-Benz(a)anthracene/Chrysene	23.7		16.8	8.40	

Surrogates	%R	Min	Max
Fluorobenzene	Not Spiked	50%	150%
2-Fluorobiphenyl	Not Spiked	50%	120%
5a-Androstane	Not Spiked	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **MW-15**

Client:	GTI	Preparation Method:	EPA 3580
Project:	Ashland	Cleanup Method(s):	
		Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
		Matrix:	NAPL
		Preservation:	None
Lab ID:	IG010918-02	Decanted:	No
File ID:	21SEP07.D		
		Sample Size:	0.0131 g
Date Sampled:	9/12/01	%Solid:	100%
Date Received:	9/18/01	Extract Volume:	2 mL
Date Prepared:	9/20/01	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	21 Sep 2001 2:31 pm	Injection Volume:	0.001 mL
Instrument:	HP_5972		
Operator:	kty	Batch QC:	IG010920-MB

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
PAH COMPOUNDS:					
Benzene	172		15.3	7.63	
Toluene	744		15.3	7.63	
Ethylbenzene	606		15.3	7.63	
m/p-Xylenes	1,580		15.3	7.63	
Styrene	608		15.3	7.63	
o-Xylene	826		15.3	7.63	
1,2,4-Trimethylbenzene	1,600		15.3	7.63	
Naphthalene	43,100	D	15.3	7.63	
2-Methylnaphthalene	14,500		15.3	7.63	
1-Methylnaphthalene	8,150		15.3	7.63	
Acenaphthylene	4,000		15.3	7.63	
Acenaphthene	1,290		15.3	7.63	
Dibenzofuran	371		15.3	7.63	
Fluorene	2,400		15.3	7.63	
Phenanthrene	9,260		15.3	7.63	
Anthracene	2,730		15.3	7.63	
Fluoranthene	3,200		15.3	7.63	
Pyrene	4,760		15.3	7.63	
Benz[a]anthracene	1,430		15.3	7.63	
Chrysene	1,300		15.3	7.63	
Benzo[b]fluoranthene	595		15.3	7.63	
Benzo[k]fluoranthene	690		15.3	7.63	
Benzo[a]pyrene	1,310		15.3	7.63	
Indeno[1,2,3-cd]pyrene	510		15.3	7.63	
Dibenz[a,h]anthracene	110		15.3	7.63	
Benzo[g,h,i]perylene	559		15.3	7.63	
ALKYLATED PAHs:					
C0-Benzene	172		15.3	7.63	
C1-Benzene	854		15.3	7.63	
C2-Benzene	3,630		15.3	7.63	
C3-Benzene	3,970		15.3	7.63	
C4-Benzene	2,260		15.3	7.63	
C5-Benzene	570		15.3	7.63	
C0-Naphthalene	43,100	D	15.3	7.63	
C1-Naphthalene	14,400		15.3	7.63	
C2-Naphthalene	5,570		15.3	7.63	
C3-Naphthalene	2,400		15.3	7.63	
C4-Naphthalene	310		15.3	7.63	
C0-Fluorene	2,400		15.3	7.63	
C1-Fluorene	1,520		15.3	7.63	
C2-Fluorene	534		15.3	7.63	
C3-Fluorene	143		15.3	7.63	
C0-Phenanthrene/Anthracene	12,100		15.3	7.63	
C1-Phenanthrene/Anthracene	3,820		15.3	7.63	
C2-Phenanthrene/Anthracene	970		15.3	7.63	
C3-Phenanthrene/Anthracene	170		15.3	7.63	
C4-Phenanthrene/Anthracene	36.7		15.3	7.63	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **TW-13**

Client:	GTI	Preparation Method:	EPA 3580	
Project:	Ashland	Cleanup Method(s):		
		Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
		Matrix:	NAPL	
		Preservation:	None	
Lab ID:	IG010918-01Dup	Decanted:	No	
File ID:	21SEP09.D			
		Sample Size:	0.0113	g
Date Sampled:	9/12/01	%Solid:	100%	
Date Received:	9/18/01	Extract Volume:	2	mL
Date Prepared:	9/20/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	21 Sep 2001 4:50 pm	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010920-MB	

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
C0-Dibenzothiophene	2,280		17.7	8.85	40.0%
C1-Dibenzothiophene	1,400		17.7	8.85	6.6%
C2-Dibenzothiophene	851		17.7	8.85	6.3%
C3-Dibenzothiophene	434		17.7	8.85	5.9%
C0-Fluoranthene/Pyrene	19,700		17.7	8.85	4.7%
C1-Fluoranthene/Pyrene	5,830		17.7	8.85	5.6%
C2-Fluoranthene/Pyrene	1,340		17.7	8.85	5.4%
C3-Fluoranthene/Pyrene	308		17.7	8.85	6.0%
C0-Benz(a)anthracene/Chrysene	6,050		17.7	8.85	2.8%
C1-Benz(a)anthracene/Chrysene	1,430		17.7	8.85	2.1%
C2-Benz(a)anthracene/Chrysene	376		17.7	8.85	1.1%
C3-Benz(a)anthracene/Chrysene	78.4		17.7	8.85	28.1%
C4-Benz(a)anthracene/Chrysene	15.6	J	17.7	8.85	41.2%

Surrogates	%R	Min	Max
Fluorobenzene	Not Spiked	50%	150%
2-Fluorobiphenyl	Not Spiked	50%	120%
5a-Androstane	Not Spiked	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3580	
Field ID:	**West Trench Riser**	Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	NAPL	
		Preservation:	None	
Lab ID:	IG010918-03	Decanted:	No	
File ID:	21SEP08.D			
		Sample Size:	0.0132	g
Date Sampled:	9/13/01	%Solid:	100%	
Date Received:	9/18/01	Extract Volume:	2	mL
Date Prepared:	9/20/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	21 Sep 2001 3:40 pm	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010920-MB	

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
PAH COMPOUNDS:					
Benzene	28.2		15.2	7.58	
Toluene	18.4		15.2	7.58	
Ethylbenzene	293		15.2	7.58	
m/p-Xylenes	357		15.2	7.58	
Styrene	379		15.2	7.58	
o-Xylene	221		15.2	7.58	
1,2,4-Trimethylbenzene	880		15.2	7.58	
Naphthalene	12,000		15.2	7.58	
2-Methylnaphthalene	12,500		15.2	7.58	
1-Methylnaphthalene	8,670		15.2	7.58	
Acenaphthylene	2,000		15.2	7.58	
Acenaphthene	7,060		15.2	7.58	
Dibenzofuran	700		15.2	7.58	
Fluorene	3,830		15.2	7.58	
Phenanthrene	14,900		15.2	7.58	
Anthracene	4,340		15.2	7.58	
Fluoranthene	5,690		15.2	7.58	
Pyrene	8,270		15.2	7.58	
Benz[a]anthracene	2,820		15.2	7.58	
Chrysene	2,450		15.2	7.58	
Benzo[b]fluoranthene	1,180		15.2	7.58	
Benzo[k]fluoranthene	1,340		15.2	7.58	
Benzo[a]pyrene	2,500		15.2	7.58	
Indeno[1,2,3-cd]pyrene	960		15.2	7.58	
Dibenz[a,h]anthracene	234		15.2	7.58	
Benzo[g,h,i]perylene	1,030		15.2	7.58	
ALKYLATED PAHs:					
C0-Benzene	28.2		15.2	7.58	
C1-Benzene	21.1		15.2	7.58	
C2-Benzene	1,110		15.2	7.58	
C3-Benzene	3,480		15.2	7.58	
C4-Benzene	3,950		15.2	7.58	
C5-Benzene	891		15.2	7.58	
C0-Naphthalene	12,000		15.2	7.58	
C1-Naphthalene	13,500		15.2	7.58	
C2-Naphthalene	10,500		15.2	7.58	
C3-Naphthalene	3,830		15.2	7.58	
C4-Naphthalene	696		15.2	7.58	
C0-Fluorene	3,830		15.2	7.58	
C1-Fluorene	3,720		15.2	7.58	
C2-Fluorene	954		15.2	7.58	
C3-Fluorene	270		15.2	7.58	
C0-Phenanthrene/Anthracene	19,400		15.2	7.58	
C1-Phenanthrene/Anthracene	7,430		15.2	7.58	
C2-Phenanthrene/Anthracene	2,020		15.2	7.58	
C3-Phenanthrene/Anthracene	358		15.2	7.58	
C4-Phananthrene/Anthracene	84.0		15.2	7.58	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3580	
Field ID:	**West Trench Riser**	Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	NAPL	
		Preservation:	None	
Lab ID:	IG010918-03	Decanted:	No	
File ID:	21SEP08.D			
		Sample Size:	0.0132	g
Date Sampled:	9/13/01	%Solid:	100%	
Date Received:	9/18/01	Extract Volume:	2	mL
Date Prepared:	9/20/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	21 Sep 2001 3:40 pm	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010920-MB	

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
C0-Dibenzothiophene	1,250		15.2	7.58	
C1-Dibenzothiophene	1,190		15.2	7.58	
C2-Dibenzothiophene	757		15.2	7.58	
C3-Dibenzothiophene	404		15.2	7.58	
C0-Fluoranthene/Pyrene	16,800		15.2	7.58	
C1-Fluoranthene/Pyrene	5,020		15.2	7.58	
C2-Fluoranthene/Pyrene	1,170		15.2	7.58	
C3-Fluoranthene/Pyrene	239		15.2	7.58	
C0-Benz(a)anthracene/Chrysene	5,210		15.2	7.58	
C1-Benz(a)anthracene/Chrysene	1,260		15.2	7.58	
C2-Benz(a)anthracene/Chrysene	322		15.2	7.58	
C3-Benz(a)anthracene/Chrysene	97.9		15.2	7.58	
C4-Benz(a)anthracene/Chrysene	37.8		15.2	7.58	

Surrogates	%R	Min	Max
Fluorobenzene	Not Spiked	50%	150%
2-Fluorobiphenyl	Not Spiked	50%	120%
5a-Androstane	Not Spiked	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3580	
Field ID:	**Method Blank**	Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	NAPL	
		Preservation:	None	
Lab ID:	IG010920-MB	Decanted:	No	
File ID:	21SEP03.D			
		Sample Size:	0.01	g
Date Sampled:		%Solid:	100%	
Date Received:		Extract Volume:	2	mL
Date Prepared:	9/20/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	21 Sep 2001 10:14 am	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010920-MB	

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
PAH COMPOUNDS:					
Benzene		U	20.0	10.0	
Toluene		U	20.0	10.0	
Ethylbenzene		U	20.0	10.0	
m/p-Xylenes		U	20.0	10.0	
Styrene		U	20.0	10.0	
o-Xylene		U	20.0	10.0	
1,2,4-Trimethylbenzene		U	20.0	10.0	
Naphthalene		U	20.0	10.0	
2-Methylnaphthalene		U	20.0	10.0	
1-Methylnaphthalene		U	20.0	10.0	
Acenaphthylene		U	20.0	10.0	
Acenaphthene		U	20.0	10.0	
Dibenzofuran		U	20.0	10.0	
Fluorene		U	20.0	10.0	
Phenanthrene		U	20.0	10.0	
Anthracene		U	20.0	10.0	
Fluoranthene		U	20.0	10.0	
Pyrene		U	20.0	10.0	
Benz[a]anthracene		U	20.0	10.0	
Chrysene		U	20.0	10.0	
Benzo[b]fluoranthene		U	20.0	10.0	
Benzo[k]fluoranthene		U	20.0	10.0	
Benzo[a]pyrene		U	20.0	10.0	
Indeno[1,2,3-cd]pyrene		U	20.0	10.0	
Dibenz[a,h]anthracene		U	20.0	10.0	
Benzo[g,h,i]perylene		U	20.0	10.0	
ALKYLATED PAHs:					
C0-Benzene		U	20.0	10.0	
C1-Benzene		U	20.0	10.0	
C2-Benzene		U	20.0	10.0	
C3-Benzene		U	20.0	10.0	
C4-Benzene		U	20.0	10.0	
C5-Benzene		U	20.0	10.0	
C0-Naphthalene		U	20.0	10.0	
C1-Naphthalene		U	20.0	10.0	
C2-Naphthalene		U	20.0	10.0	
C3-Naphthalene		U	20.0	10.0	
C4-Naphthalene		U	20.0	10.0	
C0-Fluorene		U	20.0	10.0	
C1-Fluorene		U	20.0	10.0	
C2-Fluorene		U	20.0	10.0	
C3-Fluorene		U	20.0	10.0	
C0-Phenanthrene/Anthracene		U	20.0	10.0	
C1-Phenanthrene/Anthracene		U	20.0	10.0	
C2-Phenanthrene/Anthracene		U	20.0	10.0	
C3-Phenanthrene/Anthracene		U	20.0	10.0	
C4-Phananthrene/Anthracene		U	20.0	10.0	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3580	
Field ID:	**Method Blank**	Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	NAPL	
		Preservation:	None	
Lab ID:	IG010920-MB	Decanted:	No	
File ID:	21SEP03.D			
		Sample Size:	0.01	g
Date Sampled:		%Solid:	100%	
Date Received:		Extract Volume:	2	mL
Date Prepared:	9/20/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	21 Sep 2001 10:14 am	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010920-MB	

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
C0-Dibenzothiophene		U	20.0	10.0	
C1-Dibenzothiophene		U	20.0	10.0	
C2-Dibenzothiophene		U	20.0	10.0	
C3-Dibenzothiophene		U	20.0	10.0	
C0-Fluoranthene/Pyrene		U	20.0	10.0	
C1-Fluoranthene/Pyrene		U	20.0	10.0	
C2-Fluoranthene/Pyrene		U	20.0	10.0	
C3-Fluoranthene/Pyrene		U	20.0	10.0	
C0-Benz(a)anthracene/Chrysene		U	20.0	10.0	
C1-Benz(a)anthracene/Chrysene		U	20.0	10.0	
C2-Benz(a)anthracene/Chrysene		U	20.0	10.0	
C3-Benz(a)anthracene/Chrysene		U	20.0	10.0	
C4-Benz(a)anthracene/Chrysene		U	20.0	10.0	

Surrogates	%R	Min	Max
Fluorobenzene	Not Spiked	50%	150%
2-Fluorobiphenyl	Not Spiked	50%	120%
5a-Androstane	Not Spiked	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3511 Draft
Field ID:	**Upgradient Riser**	Cleanup Method(s):	
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
Project:	Ashland	Matrix:	Water
		Preservation:	None
Lab ID:	IG010918-04	Decanted:	No
File ID:	21SEP10.D		
		Sample Size:	35.501 g
Date Sampled:	9/13/01	%Solid:	100%
Date Received:	9/18/01	Extract Volume:	2 mL
Date Prepared:	9/20/01	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	21 Sep 2001 5:56 pm	Injection Volume:	0.001 mL
Instrument:	HP_5972		
Operator:	kty	Batch QC:	IG010920-AB

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene	1,060		5.63	2.82	
Toluene	61.9		5.63	2.82	
Ethylbenzene	297		5.63	2.82	
m/p-Xylenes	190		5.63	2.82	
Styrene	77.5		5.63	2.82	
o-Xylene	150		5.63	2.82	
1,2,4-Trimethylbenzene	184		5.63	2.82	
Naphthalene	2,440		5.63	2.82	
2-Methylnaphthalene	2,150		5.63	2.82	
1-Methylnaphthalene	1,760		5.63	2.82	
Acenaphthylene	468		5.63	2.82	
Acenaphthene	1,650		5.63	2.82	
Dibenzofuran	149		5.63	2.82	
Fluorene	877		5.63	2.82	
Phenanthrene	3,800		5.63	2.82	
Anthracene	1,170		5.63	2.82	
Fluoranthene	1,480		5.63	2.82	
Pyrene	2,260		5.63	2.82	
Benz[a]anthracene	744		5.63	2.82	
Chrysene	706		5.63	2.82	
Benzo[b]fluoranthene	333		5.63	2.82	
Benzo[k]fluoranthene	415		5.63	2.82	
Benzo[a]pyrene	790		5.63	2.82	
Indeno[1,2,3-cd]pyrene	349		5.63	2.82	
Dibenz[a,h]anthracene	78.6		5.63	2.82	
Benzo[g,h,i]perylene	399		5.63	2.82	
ALKYLATED PAHs:					
C0-Benzene	1,060		5.63	2.82	
C1-Benzene	71.0		5.63	2.82	
C2-Benzene	822		5.63	2.82	
C3-Benzene	647		5.63	2.82	
C4-Benzene	845		5.63	2.82	
C5-Benzene	307		5.63	2.82	
C0-Naphthalene	2,440		5.63	2.82	
C1-Naphthalene	2,490		5.63	2.82	
C2-Naphthalene	2,420		5.63	2.82	
C3-Naphthalene	877		5.63	2.82	
C4-Naphthalene	222		5.63	2.82	
C0-Fluorene	877		5.63	2.82	
C1-Fluorene	978		5.63	2.82	
C2-Fluorene	277		5.63	2.82	
C3-Fluorene	141		5.63	2.82	
C0-Phenanthrene/Anthracene	5,020		5.63	2.82	
C1-Phenanthrene/Anthracene	1,930		5.63	2.82	
C2-Phenanthrene/Anthracene	566		5.63	2.82	
C3-Phenanthrene/Anthracene	116		5.63	2.82	
C4-Phananthrene/Anthracene	32.1		5.63	2.82	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **Upgradient Riser**

Client:	GTI	Preparation Method:	EPA 3511 Draft
Project:	Ashland	Cleanup Method(s):	
Lab ID:	IG010918-04	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
File ID:	21SEP10.D	Matrix:	Water
		Preservation:	None
		Decanted:	No
Date Sampled:	9/13/01	Sample Size:	35.501 g
Date Received:	9/18/01	%Solid:	100%
Date Prepared:	9/20/01	Extract Volume:	2 mL
Date Cleanup:		Prep DF:	1
Date Analyzed:	21 Sep 2001 5:56 pm	Analysis DF:	1
Instrument:	HP_5972	Injection Volume:	0.001 mL
Operator:	kty	Batch QC:	IG010920-AB

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
C0-Dibenzothiophene	290		5.63	2.82	
C1-Dibenzothiophene	297		5.63	2.82	
C2-Dibenzothiophene	200		5.63	2.82	
C3-Dibenzothiophene	117		5.63	2.82	
C0-Fluoranthene/Pyrene	4,500		5.63	2.82	
C1-Fluoranthene/Pyrene	1,410		5.63	2.82	
C2-Fluoranthene/Pyrene	375		5.63	2.82	
C3-Fluoranthene/Pyrene	104		5.63	2.82	
C0-Benz(a)anthracene/Chrysene	1,440		5.63	2.82	
C1-Benz(a)anthracene/Chrysene	406		5.63	2.82	
C2-Benz(a)anthracene/Chrysene	113		5.63	2.82	
C3-Benz(a)anthracene/Chrysene	29.5		5.63	2.82	
C4-Benz(a)anthracene/Chrysene	8.37		5.63	2.82	

Surrogates	%R	Min	Max
Fluorobenzene	78%	50%	150%
2-Fluorobiphenyl	94%	50%	120%
5a-Androstane	114%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **Aqueous Blank**

Client:	GTI	Preparation Method:	EPA 3511 Draft	
Project:	Ashland	Cleanup Method(s):		
		Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
		Matrix:	Water	
		Preservation:	None	
Lab ID:	IG010920-AB	Decanted:	No	
File ID:	21SEP04.D			
		Sample Size:	35	g
Date Sampled:		%Solid:	100%	
Date Received:		Extract Volume:	2	mL
Date Prepared:	9/20/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	21 Sep 2001 11:18 am	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010920-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene		U	5.71	2.86	
Toluene		U	5.71	2.86	
Ethylbenzene		U	5.71	2.86	
m/p-Xylenes		U	5.71	2.86	
Styrene		U	5.71	2.86	
o-Xylene		U	5.71	2.86	
1,2,4-Trimethylbenzene		U	5.71	2.86	
Naphthalene		U	5.71	2.86	
2-Methylnaphthalene		U	5.71	2.86	
1-Methylnaphthalene		U	5.71	2.86	
Acenaphthylene		U	5.71	2.86	
Acenaphthene		U	5.71	2.86	
Dibenzofuran		U	5.71	2.86	
Fluorene		U	5.71	2.86	
Phenanthrene		U	5.71	2.86	
Anthracene		U	5.71	2.86	
Fluoranthene		U	5.71	2.86	
Pyrene		U	5.71	2.86	
Benz[a]anthracene		U	5.71	2.86	
Chrysene		U	5.71	2.86	
Benzo[b]fluoranthene		U	5.71	2.86	
Benzo[k]fluoranthene		U	5.71	2.86	
Benzo[a]pyrene		U	5.71	2.86	
Indeno[1,2,3-cd]pyrene		U	5.71	2.86	
Dibenz[a,h]anthracene		U	5.71	2.86	
Benzo[g,h,i]perylene		U	5.71	2.86	
ALKYLATED PAHs:					
C0-Benzene		U	5.71	2.86	
C1-Benzene		U	5.71	2.86	
C2-Benzene		U	5.71	2.86	
C3-Benzene		U	5.71	2.86	
C4-Benzene		U	5.71	2.86	
C5-Benzene		U	5.71	2.86	
C0-Naphthalene		U	5.71	2.86	
C1-Naphthalene		U	5.71	2.86	
C2-Naphthalene		U	5.71	2.86	
C3-Naphthalene		U	5.71	2.86	
C4-Naphthalene		U	5.71	2.86	
C0-Fluorene		U	5.71	2.86	
C1-Fluorene		U	5.71	2.86	
C2-Fluorene		U	5.71	2.86	
C3-Fluorene		U	5.71	2.86	
C0-Phenanthrene/Anthracene		U	5.71	2.86	
C1-Phenanthrene/Anthracene		U	5.71	2.86	
C2-Phenanthrene/Anthracene		U	5.71	2.86	
C3-Phenanthrene/Anthracene		U	5.71	2.86	
C4-Phananthrene/Anthracene		U	5.71	2.86	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **Aqueous Blank**

Client:	GTI	Preparation Method:	EPA 3511 Draft	
Project:	Ashland	Cleanup Method(s):		
		Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
		Matrix:	Water	
		Preservation:	None	
Lab ID:	IG010920-AB	Decanted:	No	
File ID:	21SEP04.D			
		Sample Size:	35	g
Date Sampled:		%Solid:	100%	
Date Received:		Extract Volume:	2	mL
Date Prepared:	9/20/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	21 Sep 2001 11:18 am	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010920-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
C0-Dibenzothiophene		U	5.71	2.86	
C1-Dibenzothiophene		U	5.71	2.86	
C2-Dibenzothiophene		U	5.71	2.86	
C3-Dibenzothiophene		U	5.71	2.86	
C0-Fluoranthene/Pyrene		U	5.71	2.86	
C1-Fluoranthene/Pyrene		U	5.71	2.86	
C2-Fluoranthene/Pyrene		U	5.71	2.86	
C3-Fluoranthene/Pyrene		U	5.71	2.86	
C0-Benz(a)anthracene/Chrysene		U	5.71	2.86	
C1-Benz(a)anthracene/Chrysene		U	5.71	2.86	
C2-Benz(a)anthracene/Chrysene		U	5.71	2.86	
C3-Benz(a)anthracene/Chrysene		U	5.71	2.86	
C4-Benz(a)anthracene/Chrysene		U	5.71	2.86	

Surrogates	%R	Min	Max
Fluorobenzene	92%	50%	150%
2-Fluorobiphenyl	91%	50%	120%
5a-Androstane	109%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3511 Draft	
Field ID:	**Blank Spike**	Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	Water	
		Preservation:	None	
Lab ID:	IG010920-ABS	Decanted:	No	
File ID:	21SEP05.D			
		Sample Size:	35	g
Date Sampled:		%Solid:	100%	
Date Received:		Extract Volume:	2	mL
Date Prepared:	9/20/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	21 Sep 2001 12:20 pm	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010920-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene	540		5.71	2.86	77.1%
Toluene	591		5.71	2.86	84.4%
Ethylbenzene	666		5.71	2.86	95.1%
m/p-Xylenes	693		5.71	2.86	99.0%
Styrene	632		5.71	2.86	90.3%
o-Xylene	687		5.71	2.86	98.1%
1,2,4-Trimethylbenzene	727		5.71	2.86	103.9%
Naphthalene	672		5.71	2.86	96.0%
2-Methylnaphthalene	683		5.71	2.86	97.6%
1-Methylnaphthalene	677		5.71	2.86	96.7%
Acenaphthylene	712		5.71	2.86	101.7%
Acenaphthene	707		5.71	2.86	101.0%
Dibenzofuran	715		5.71	2.86	102.1%
Fluorene	714		5.71	2.86	102.0%
Phenanthrene	740		5.71	2.86	105.7%
Anthracene	765		5.71	2.86	109.3%
Fluoranthene	791		5.71	2.86	113.0%
Pyrene	780		5.71	2.86	111.4%
Benz[a]anthracene	849		5.71	2.86	121.3%
Chrysene	862		5.71	2.86	123.1%
Benzo[b]fluoranthene	866		5.71	2.86	123.7%
Benzo[k]fluoranthene	920		5.71	2.86	131.4%
Benzo[a]pyrene	900		5.71	2.86	128.6%
Indeno[1,2,3-cd]pyrene	935		5.71	2.86	133.6%
Dibenz[a,h]anthracene	898		5.71	2.86	128.3%
Benzo[g,h,i]perylene	923		5.71	2.86	131.9%

Surrogates	%R	Min	Max
Fluorobenzene	81%	50%	150%
2-Fluorobiphenyl	85%	50%	120%
5a-Androstane	106%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Ananlytical Results for Total Petroleum Hydrocarbons
META Environmental, Inc.

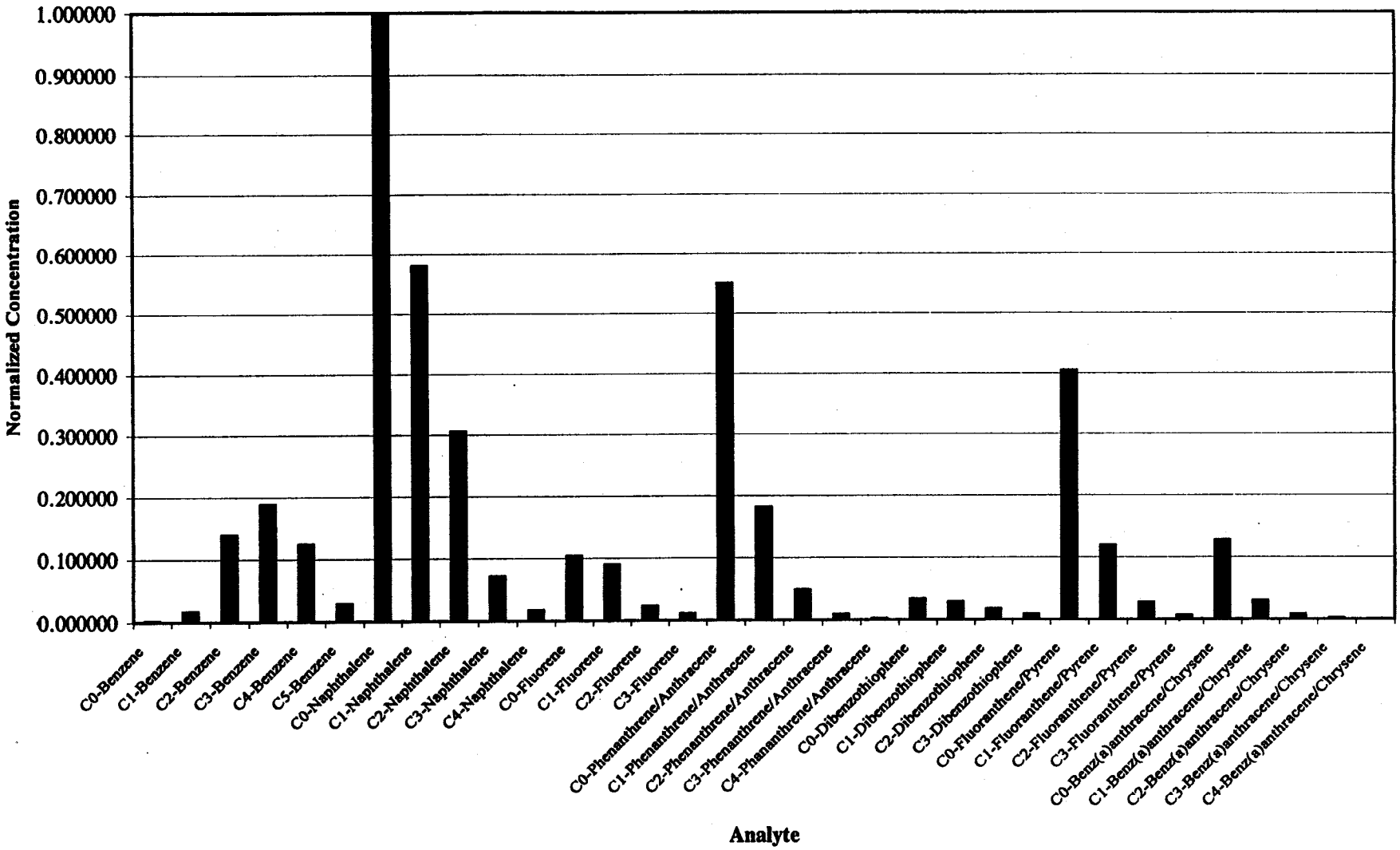
Client:	GTI	Instrument:	GC3-Front
Project:	Ashland	Analysis Date:	9/12/01
Calibration Material:	Alkane	Alkane Range:	C6-C40

Sample Data		Sample Size	Final Volume	Percent	Dilution	SS1 %Rec	SS2 %Rec	SS3 %Rec	FS1 %Rec	FS2 %Rec	FS3 %Rec			
Field ID	Lab ID	(mL or g)	(mL)	Solid	Factor	(FB)	(2FBP)	(5AA)	2,5_DBT	2-BN	1-CO	TPH	Units	Comments
Fractionation Blank	IG010926-FBPF	60.000	0.5	100%	1	NA	NA	NA	81%	0%	90%	24.7	mg/L	
	IG010926-FBDF					NA	NA	NA	8%	88%	7%	124.00	mg/L	
Aqueous Blank	IG010920-AB	35.000	2.0	100%	1	117%	104%	108%	NA	NA	NA	ND	mg/L	
	IG010920-ABPF					0%	0%	13%	88%	0%	100%	3.22	mg/L	
	IG010920-ABDF					13%	87%	21%	2%	102%	1%	21.0	mg/L	
Method Blank	IG010920-MB	0.0100	2.0	100%	1	NA	NA	NA	NA	NA	NA	ND	mg/kg	
	IG010920-MBPF					NA	NA	NA	82%	0%	89%	7,150	mg/kg	
	IG010920-MBDF					NA	NA	NA	1%	89%	1%	50,600	mg/kg	
TW-13	IG010918-01	0.0119	2.0	100%	1	NA	NA	NA	NA	NA	NA	722,000	mg/kg	
	IG010918-01PF					NA	NA	NA	59%	0%	64%	70,900	mg/kg	
	IG010918-01DF					NA	NA	NA	28%	96%	23%	475,000	mg/kg	
TW-13	IG010918-01Dup	0.0113	2.0	100%	1	NA	NA	NA	NA	NA	NA	780,000	mg/kg	
	IG010918-01DupPF					NA	NA	NA	82%	0%	88%	75,900	mg/kg	
	IG010918-01DupDF					NA	NA	NA	13%	94%	11%	476,000	mg/kg	
MW-15	IG010918-02	0.0131	2.0	100%	1	NA	NA	NA	NA	NA	NA	369,000	mg/kg	
	IG010918-02PF					NA	NA	NA	81%	0%	86%	34,000	mg/kg	
	IG010918-02DF					NA	NA	NA	10%	93%	9%	236,000	mg/kg	
West Trench Riser	IG010918-03	0.0132	2.0	100%	1	NA	NA	NA	NA	NA	NA	519,000	mg/kg	
	IG010918-03PF					NA	NA	NA	85%	0%	93%	53,500	mg/kg	
	IG010918-03DF					NA	NA	NA	6%	98%	9%	338,000	mg/kg	
Upgradient Riser	IG010918-04	35.501	2.0	100%	1	113%	140%	129%	NA	NA	NA	177	mg/L	
	IG010918-04PF					0%	0%	54%	65%	0%	74%	20.5	mg/L	
	IG010918-04DF					6%	65%	0%	16%	81%	0%	85.5	mg/L	

Appendix D

Extended PAH Profiles – Bar Graphs

TW-13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0.700000
0.600000
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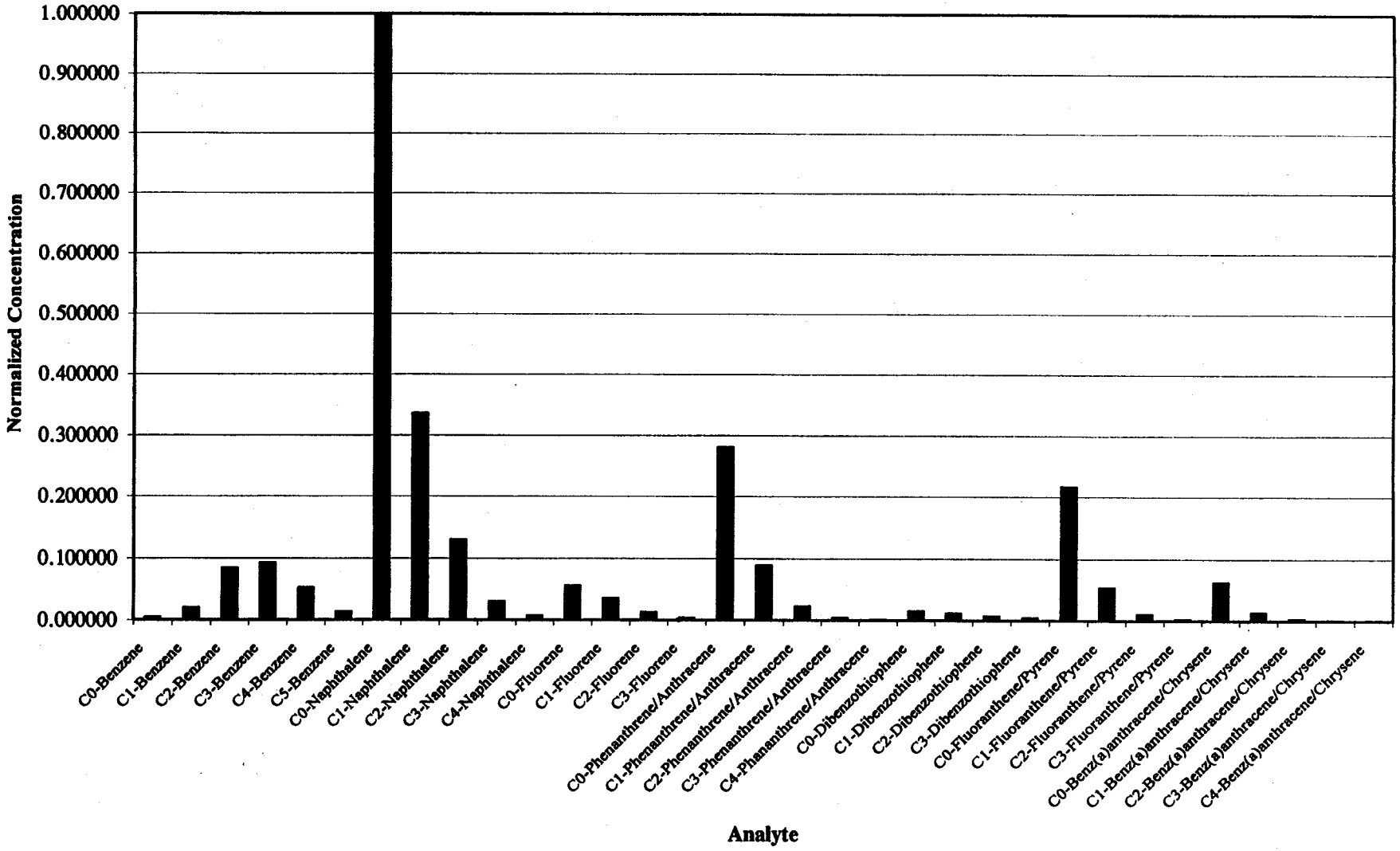
0.400000
0.300000
0.200000
0.100000
0.000000
C0-Benzene
C1-Benzene
C2-Benzene
C3-Benzene
C4-Benzene
C5-Benzene
C0-Naphthalene
C1-Naphthalene
C2-Naphthalene
C3-Naphthalene
C4-Naphthalene
C0-Fluorene
C1-Fluorene
C2-Fluorene
C3-Fluorene
C0-Phenanthrene/Anthracene
C1-Phenanthrene/Anthracene
C2-Phenanthrene/Anthracene
C3-Phenanthrene/Anthracene
C4-Phenanthrene/Anthracene
C0-Dibenzothiophene
C1-Dibenzothiophene
C2-Dibenzothiophene
C3-Dibenzothiophene
C0-Fluoranthene/Pyrene
C1-Fluoranthene/Pyrene
C2-Fluoranthene/Pyrene
C3-Fluoranthene/Pyrene
C0-Benz(a)anthracene/Chrysene
C1-Benz(a)anthracene/Chrysene
C2-Benz(a)anthracene/Chrysene
C3-Benz(a)anthracene/Chrysene
C4-Benz(a)anthracene/Chrysene
Analyte

META

MW-15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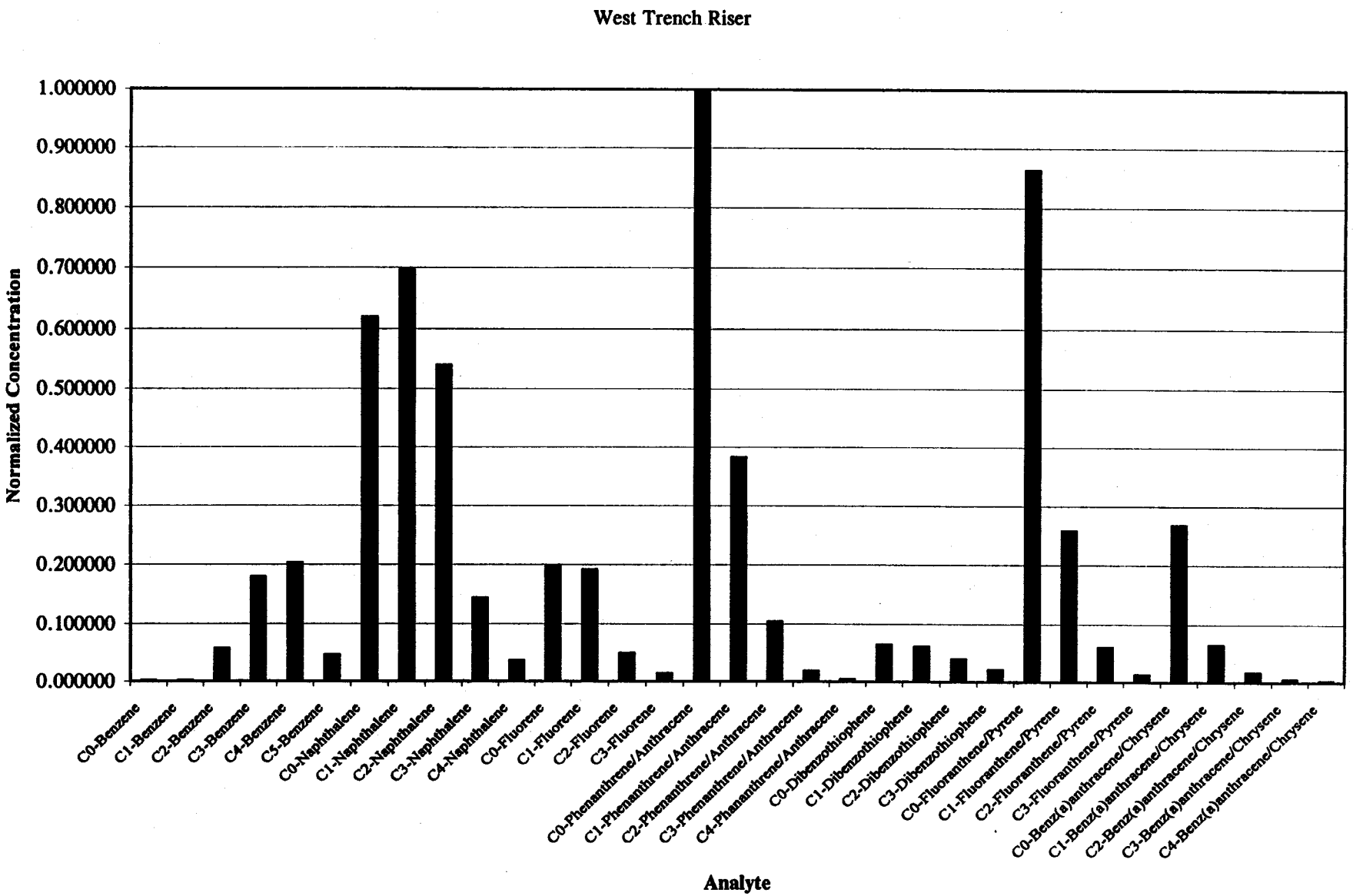
0.900000
0.800000
0.700000
0.600000
0.500000
0.400000
0.300000
0.200000
0.100000
0.000000
C0-Benzene
C1-Benzene
C2-Benzene
C3-Benzene
C4-Benzene
C5-Benzene
C0-Naphthalene
C1-Naphthalene
C2-Naphthalene
C3-Naphthalene
C4-Naphthalene
C0-Fluorene
C1-Fluorene
C2-Fluorene
C3-Fluorene
C0-Phenanthrene/Anthracene
C1-Phenanthrene/Anthracene
C2-Phenanthrene/Anthracene
C3-Phenanthrene/Anthracene
C4-Phananthrene/Anthracene
C0-Dibenzothiophene
C1-Dibenzothiophene
C2-Dibenzothiophene
C3-Dibenzothiophene
C0-Fluoranthene/Pyrene
C1-Fluoranthene/Pyrene
C2-Fluoranthene/Pyrene
C3-Fluoranthene/Pyrene
C0-Benz(a)anthracene/Chrysene
C1-Benz(a)anthracene/Chrysene
C2-Benz(a)anthracene/Chrysene
C3-Benz(a)anthracene/Chrysene
C4-Benz(a)anthracene/Chrysene
Analyte

META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0.700000
0.600000
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0.400000
0.300000
0.200000
0.100000
0.000000
C0-Benzene
C1-Benzene
C2-Benzene
C3-Benzene
C4-Benzene
C5-Benzene
C0-Naphthalene
C1-Naphthalene
C2-Naphthalene
C3-Naphthalene
C4-Naphthalene
C0-Fluorene
C1-Fluorene
C2-Fluorene
C3-Fluorene
C0-Phenanthrene/Anthracene
C1-Phenanthrene/Anthracene
C2-Phenanthrene/Anthracene
C3-Phenanthrene/Anthracene
C4-Phananthrene/Anthracene
C0-Dibenzothiophene
C1-Dibenzothiophene
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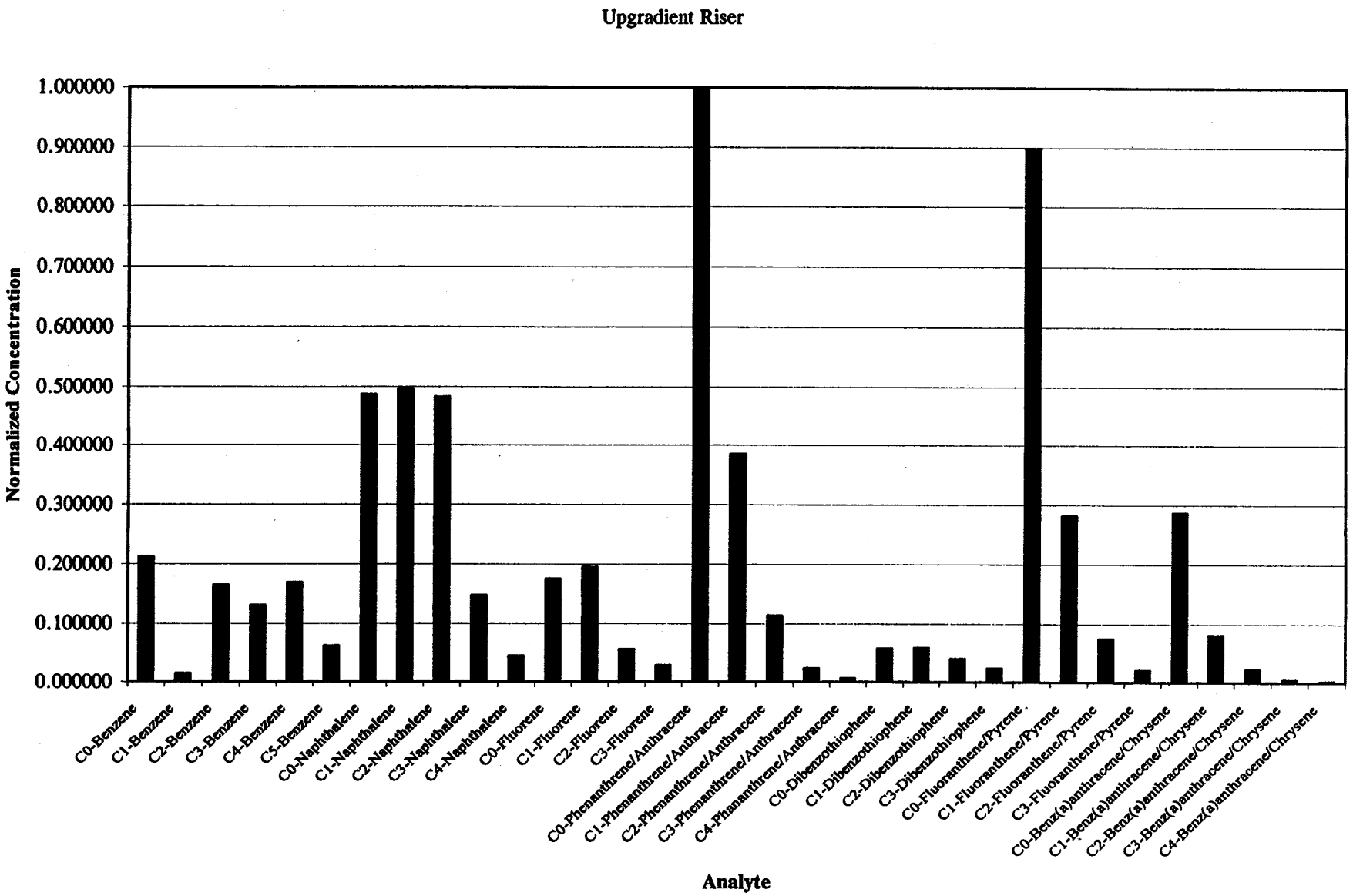
C3-Dibenzothiophene
C0-Fluoranthene/Pyrene
C1-Fluoranthene/Pyrene
C2-Fluoranthene/Pyrene
C3-Fluoranthene/Pyrene
C0-Benz(a)anthracene/Chrysene
C1-Benz(a)anthracene/Chrysene
C2-Benz(a)anthracene/Chrysene
C3-Benz(a)anthracene/Chrysene
C4-Benz(a)anthracene/Chrysene
Analyte

META


Upgradient Riser
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0.600000
0.500000
0.400000
0.300000
0.200000
0.100000
0.000000
C0-Benzene
C1-Benzene
C2-Benzene
C3-Benzene
C4-Benzene
C5-Benzene
C0-Naphthalene
C1-Naphthalene
C2-Naphthalene
C3-Naphthalene
C4-Naphthalene
C0-Fluorene
C1-Fluorene
C2-Fluorene
C3-Fluorene
C0-Phenanthrene/Anthracene
C1-Phenanthrene/Anthracene
C2-Phenanthrene/Anthracene
C3-Phenanthrene/Anthracene
C4-Phanamthrene/Anthracene
C0-Dibenzothiophene
C1-Dibenzothiophene
C2-Dibenzothiophene
C3-Dibenzothiophene
C0-Fluoranthene/Pyrene
C1-Fluoranthene/Pyrene
C2-Fluoranthene/Pyrene
C3-Fluoranthene/Pyrene
C0-Benz(a)anthracene/Chrysene
C1-Benz(a)anthracene/Chrysene
C2-Benz(a)anthracene/Chrysene
C3-Benz(a)anthracene/Chrysene
C4-Benz(a)anthracene/Chrysene
Analyte

META

Appendix E

Extracted Ion Current Profiles (EICs)

Primary Ions for Target Compounds and Compound Groups

Target Compound or Group	Abbreviation	Ion
Alkylated cyclohexanes		83
Normal alkanes, pristane, phytane		85
Isoprenoid hydrocarbons, pristane, phytane		113
Olefins		115
Hopanes		191
Steranes		217
Benzene	B	78
Monoalkylbenzenes	C1B	91
Dialkylbenzenes	C2B	91
Trialkylbenzenes	C3B	105
Tetraalkylbenzenes	C4B	119
Pentaalkylbenzenes	C5B	133
Naphthalene	N	128
Monoalkylnaphthalenes	C1N	142
Dialkylnaphthalenes	C2N	156
Trialkylnaphthalenes	C3N	170
Tetraalkylnaphthalenes	C4N	184
Fluorene	F	166
Monoalkylfluorenes	C1F	180
Dialkylfluorenes	C2F	194
Trialkylfluorenes	C3F	208
Phenanthrene, anthracene	PA	178
Monoalkylphenanthrenes and anthracenes	C1PA	192
Dialkylphenanthrenes and anthracenes	C2PA	206
Trialkylphenanthrenes and anthracenes	C3PA	220
Tetraalkylphenanthrenes and anthracenes	C4PA	234
Dibenzothiophene	D	184
Monoalkyldibenzothiophenes	C1D	198
Dialkyldibenzothiophenes	C2D	212
Trialkyldibenzothiophenes	C3D	226
Fluoranthene, pyrene	FP	202
Monoalkylfluoranthenes and pyrenes	C1FP	216
Dialkylfluoranthenes and pyrenes	C2FP	230
Trialkyfluoranthenes and pyrenes	C3FP	244
Benz(a)anthracene, chrysene	BC	228
Monoalkylbenz(a)anthracenes and chrysenes	C1BC	242
Dialkylbenz(a)anthracenes and chrysenes	C2BC	256
Trialkylbenz(a)anthracenes and chrysenes	C3BC	270
Tetraalkylbenz(a)anthrancenes and chrysenes	C4BC	284

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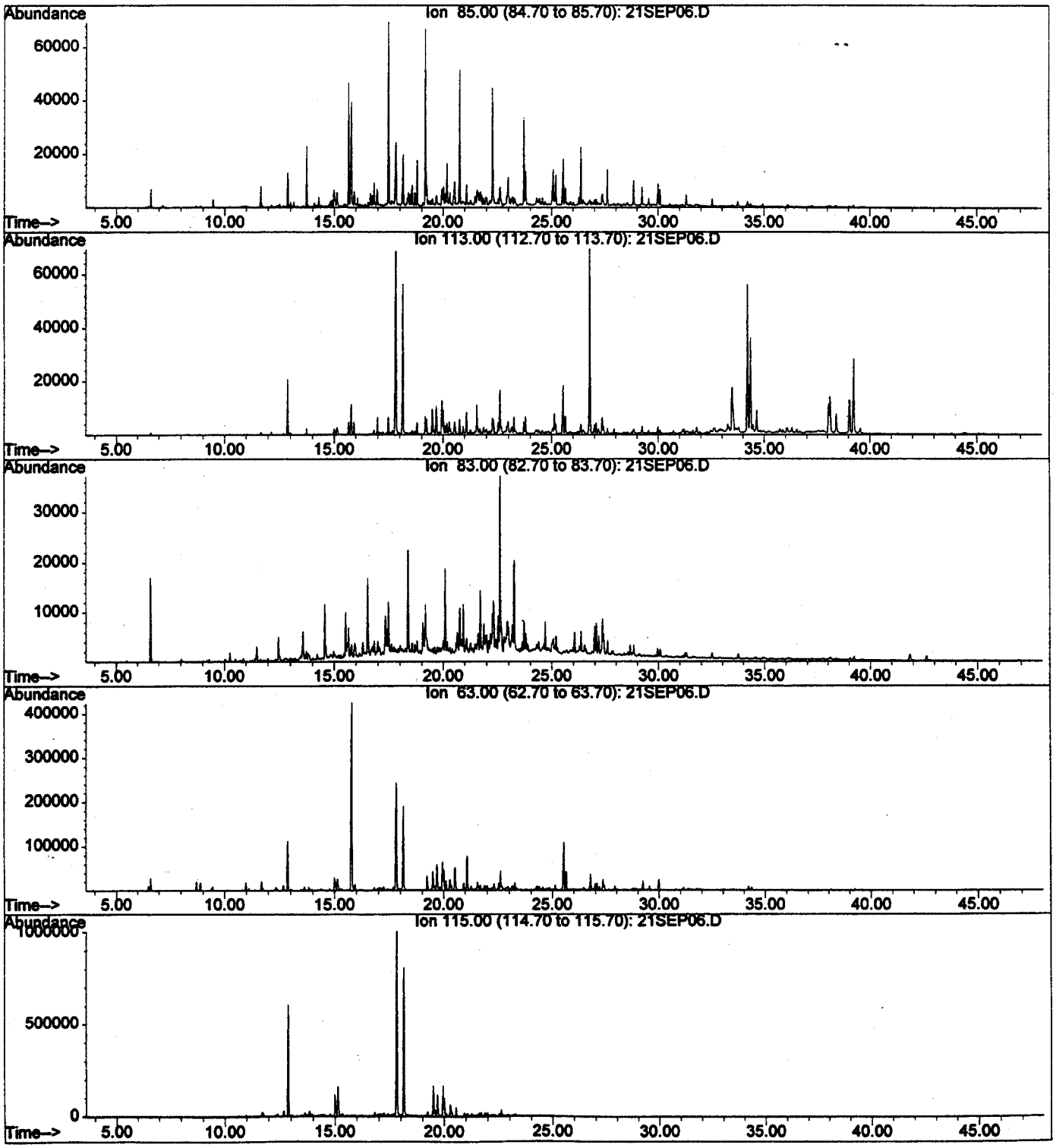
Instrument : HP_5972
Sample Name: IG010918-01
Misc Info : TW-13
Vial Number: 6



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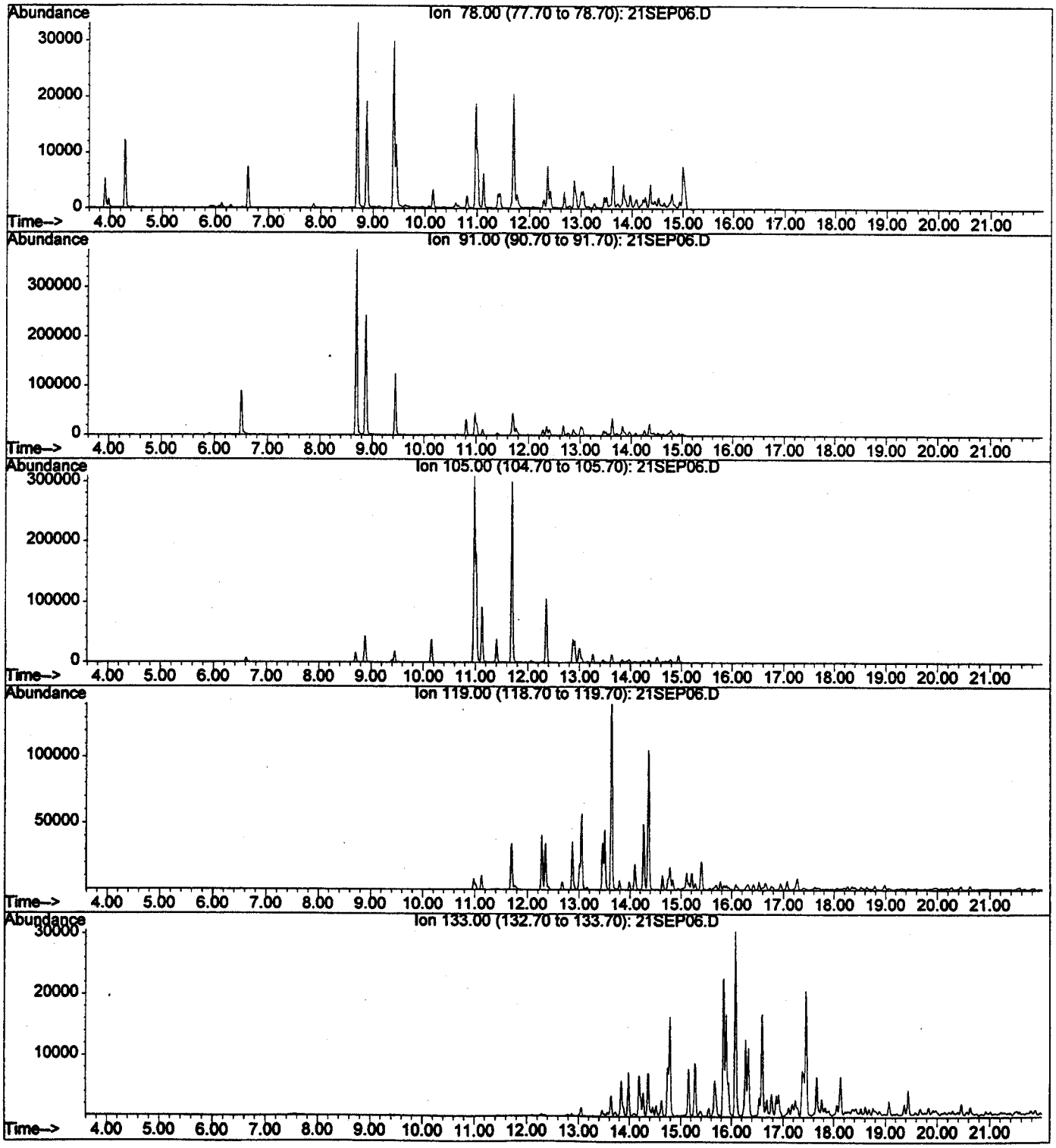
Instrument : HP_5972
Sample Name: IG010918-01
Misc Info : TW-13
Vial Number: 6



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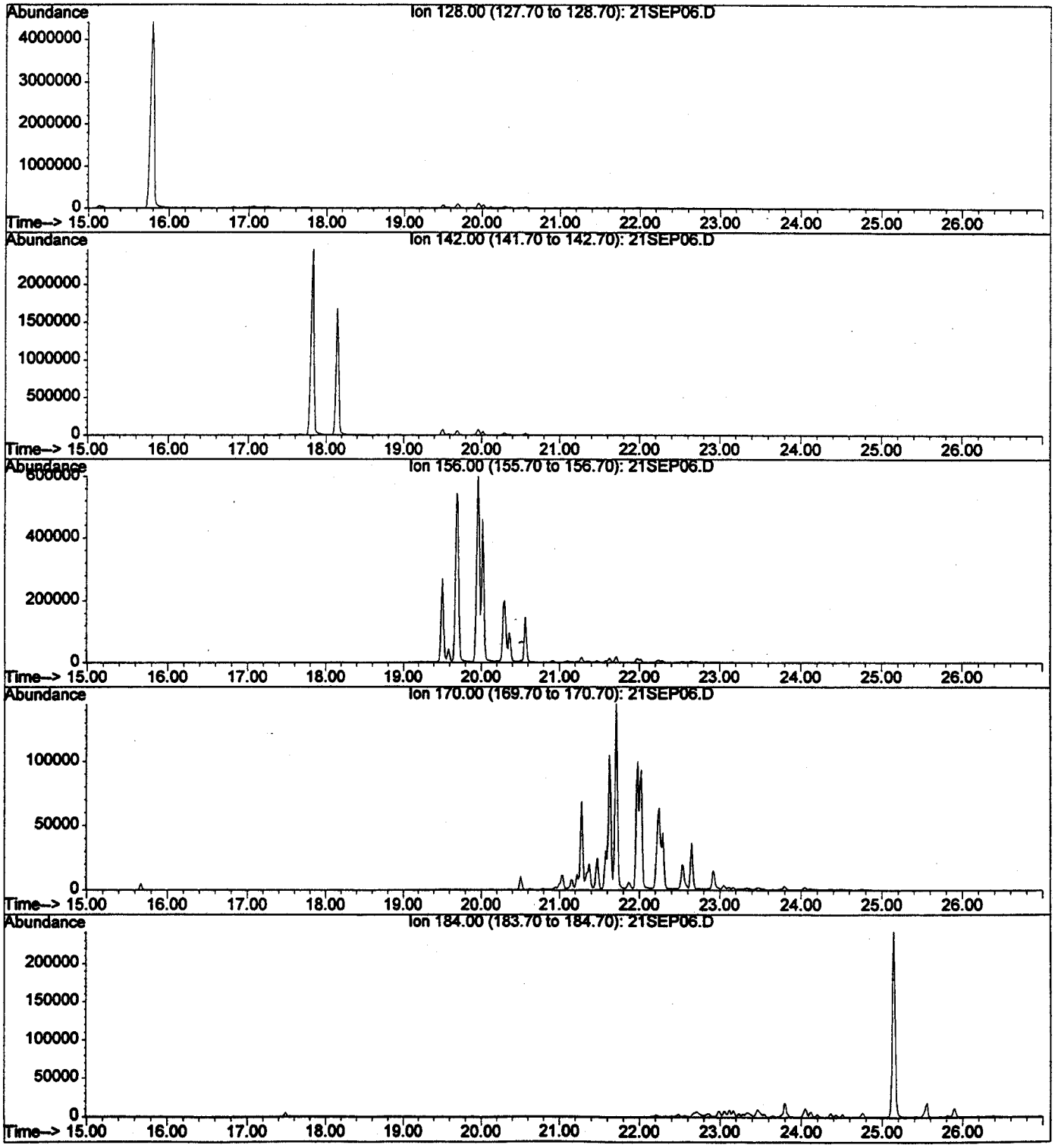
Instrument : HP_5972
Sample Name: IG010918-01
Misc Info : TW-13
Vial Number: 6



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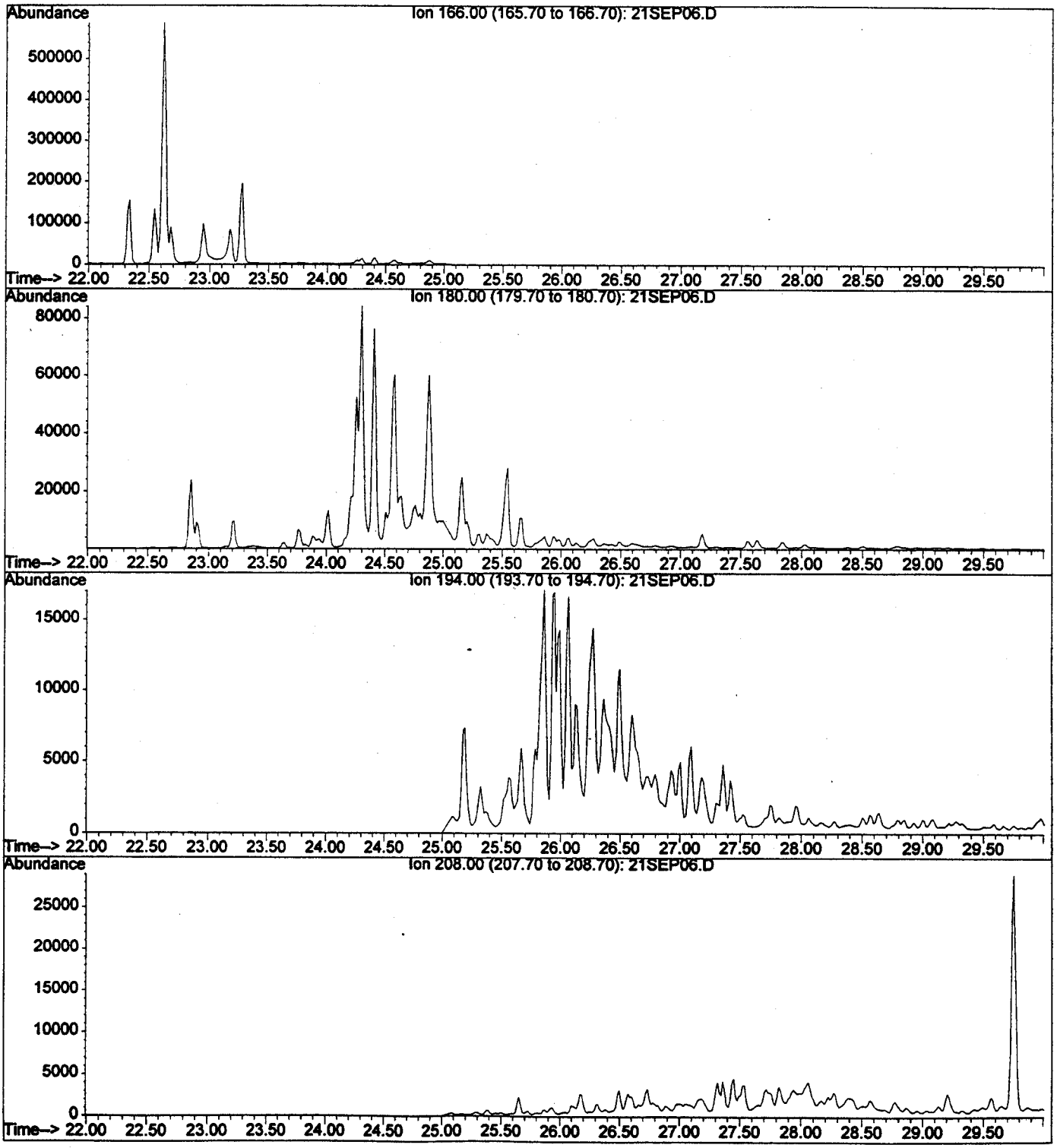
Vial Number: 6



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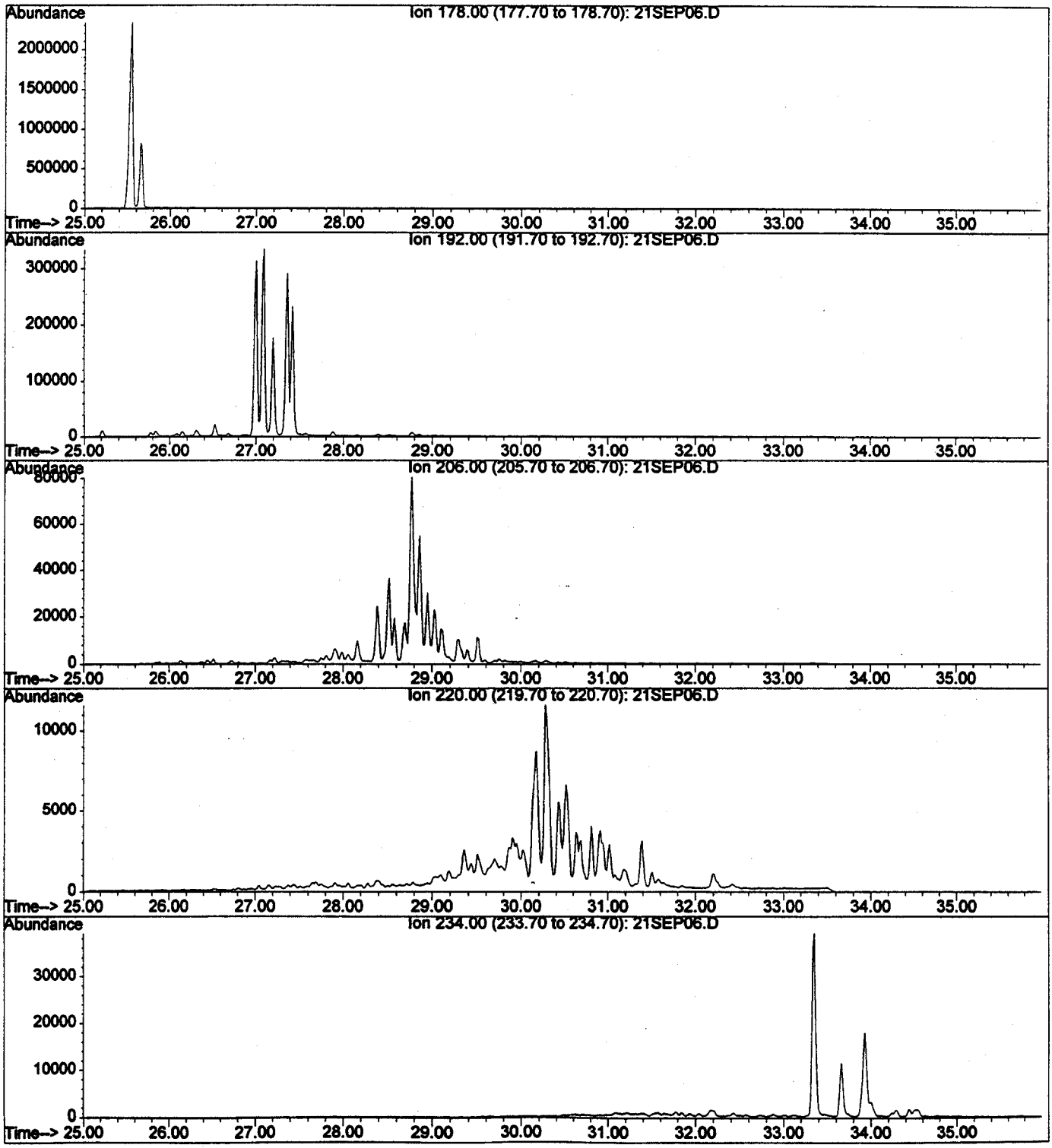
Instrument : HP_5972
Sample Name: IG010918-01
Misc Info : TW-13
Vial Number: 6



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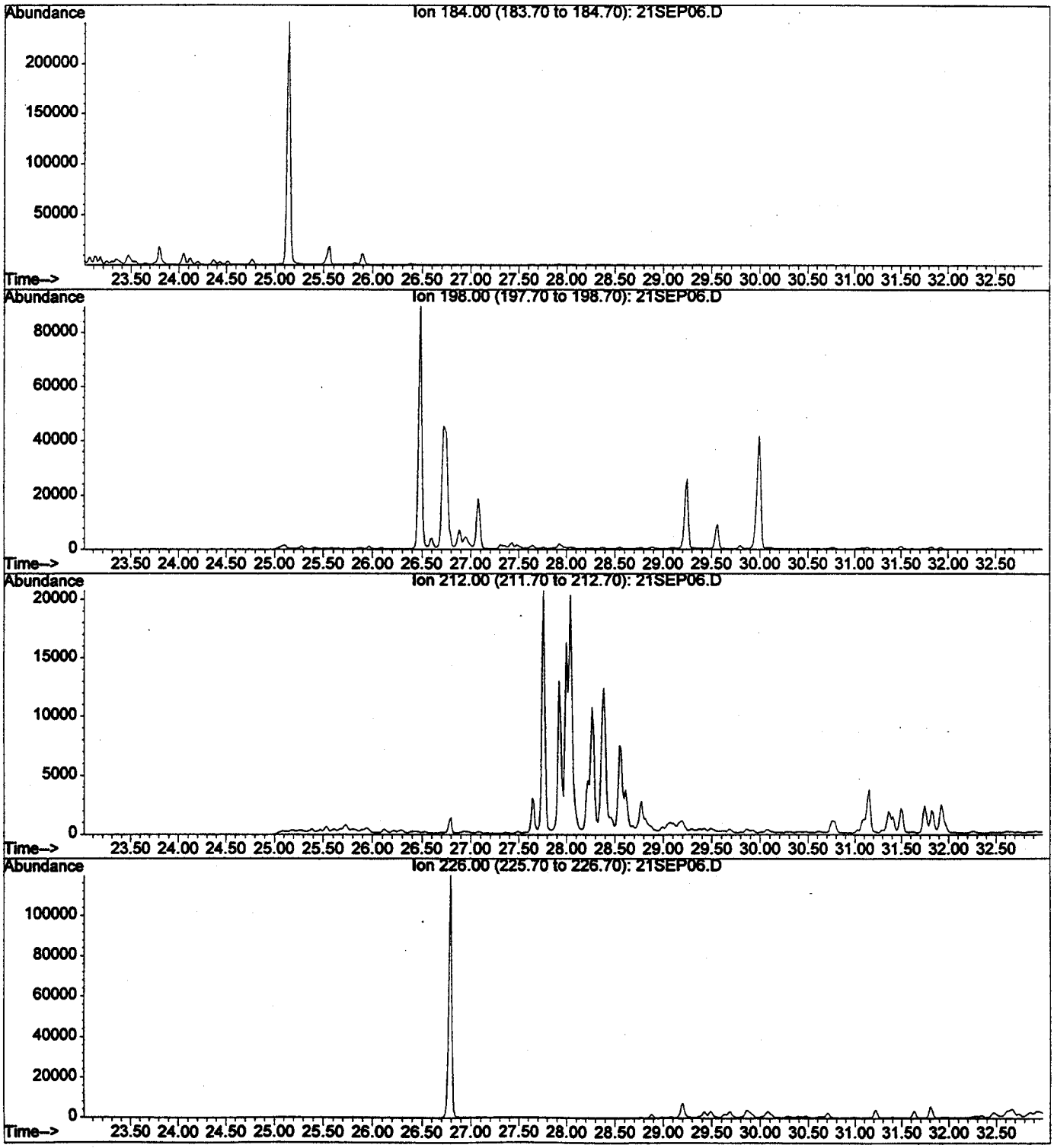

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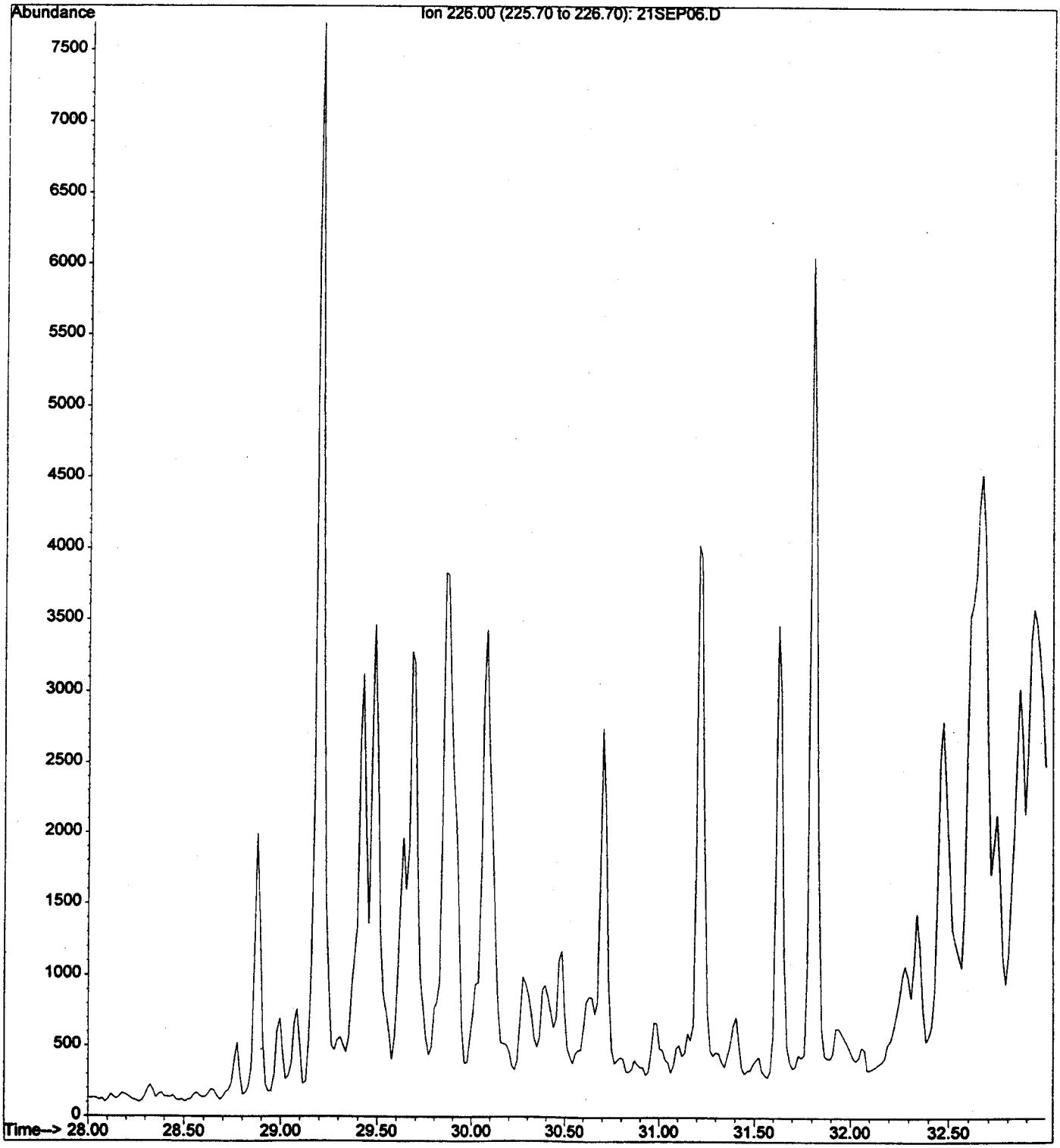
Vial Number: 6



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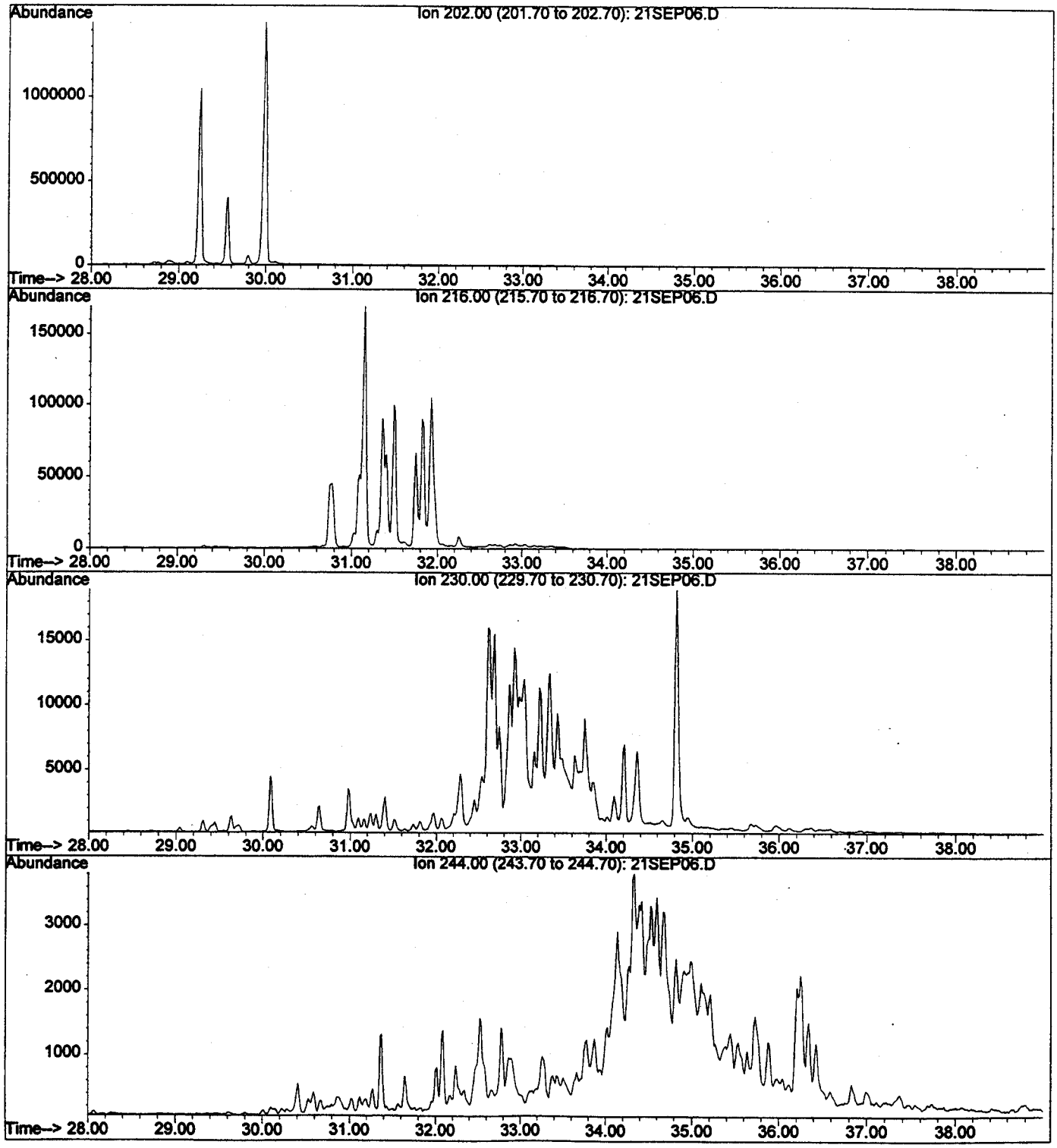
Sample Name: IG010918-01
Misc Info : TW-13
Vial Number: 6



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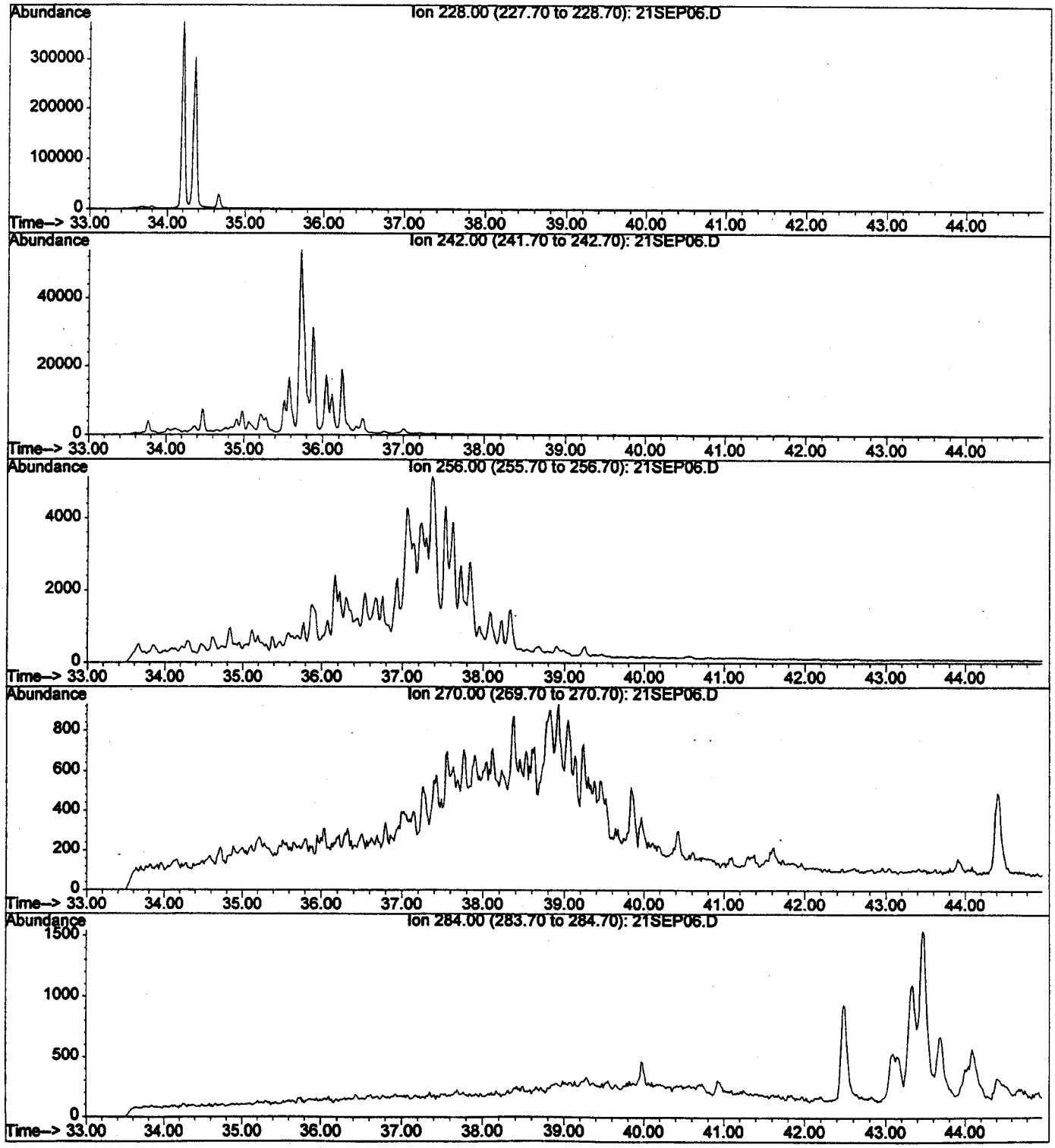
Instrument : HP_5972
Sample Name: IG010918-01
Misc Info : TW-13
Vial Number: 6



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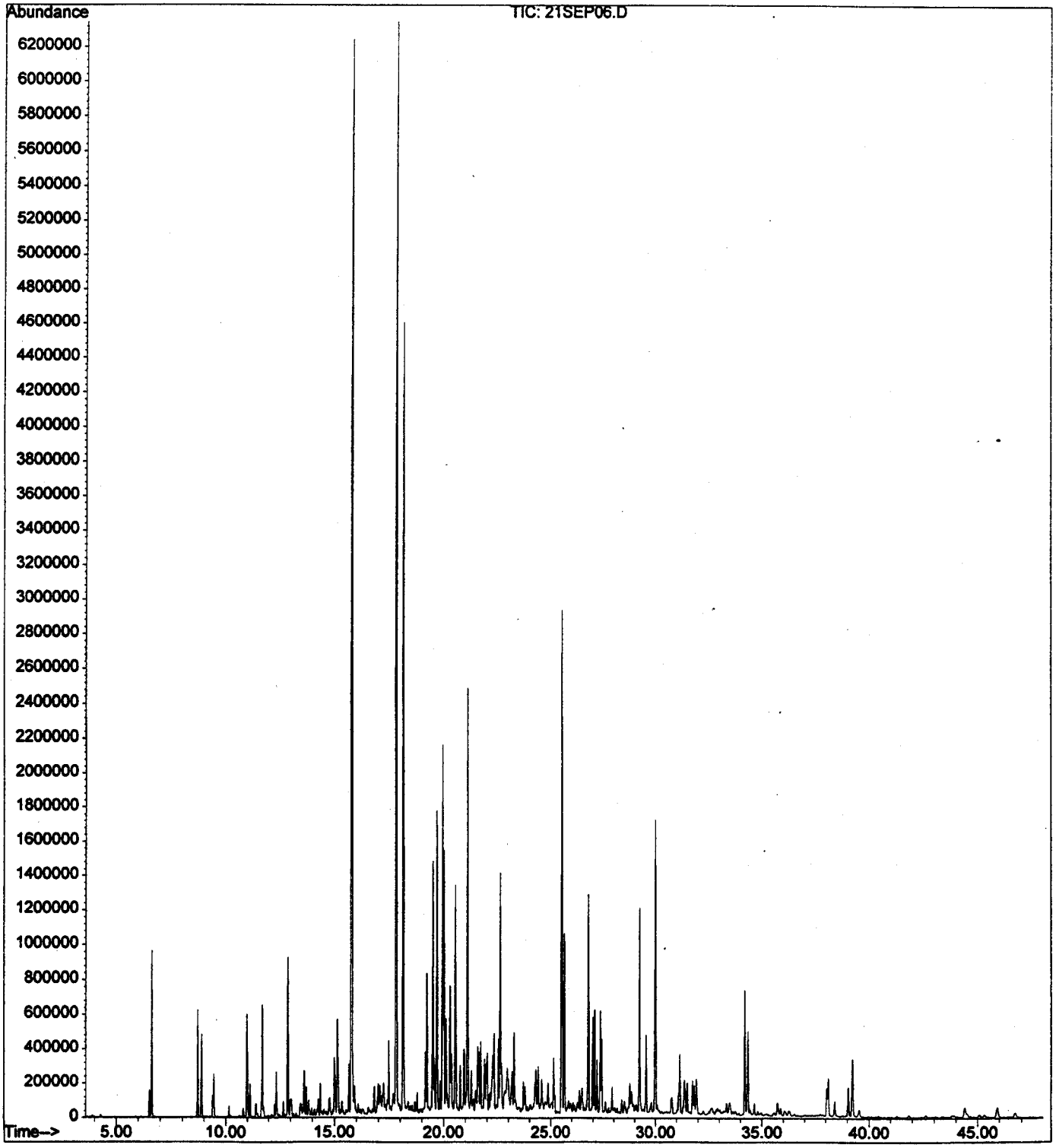
Instrument : HP_5972
Sample Name: IG010918-01
Misc Info : TW-13
Vial Number: 6



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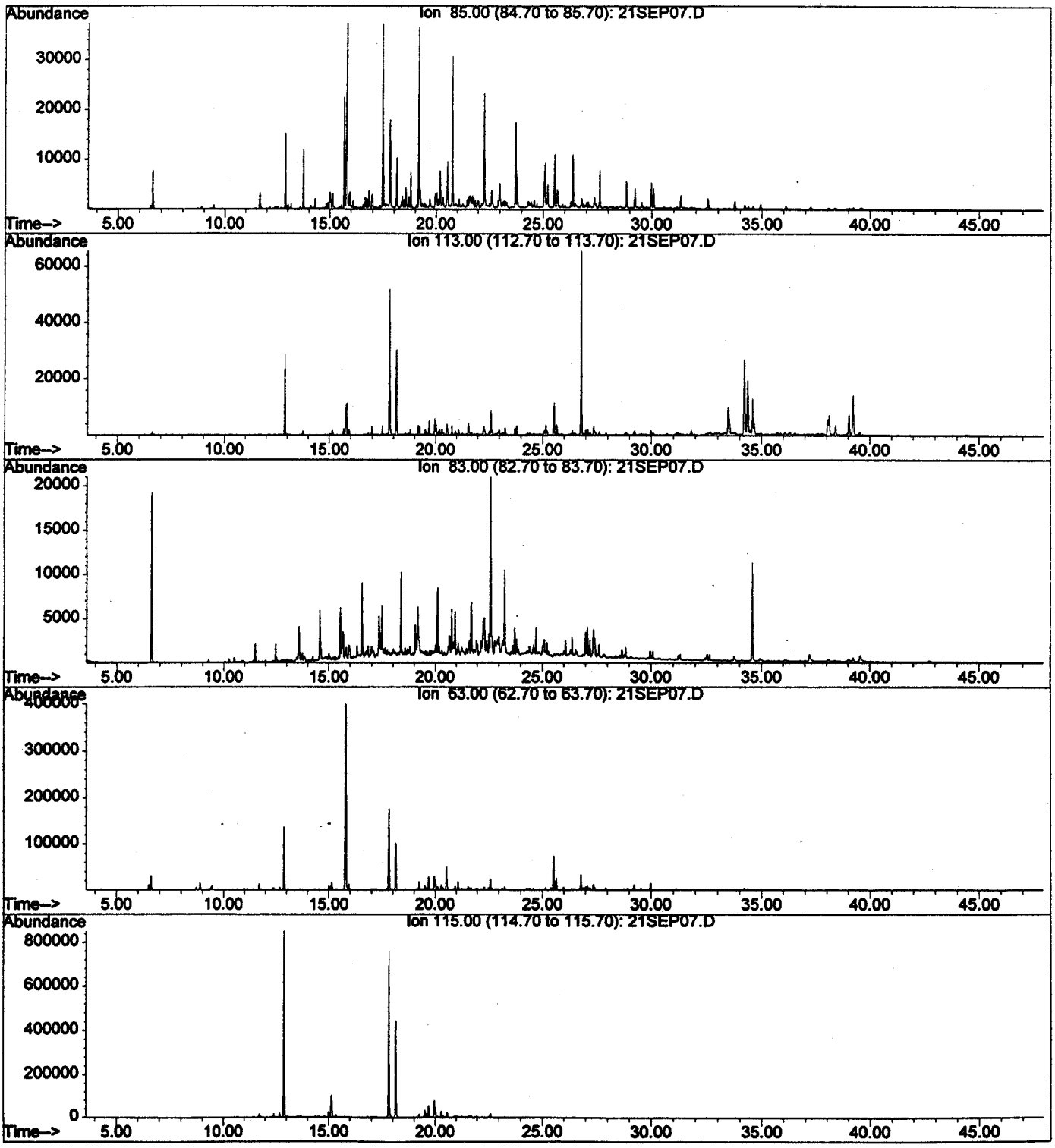
Instrument : HP_5972
Sample Name: IG010918-02
Misc Info : MW-15
Vial Number: 7



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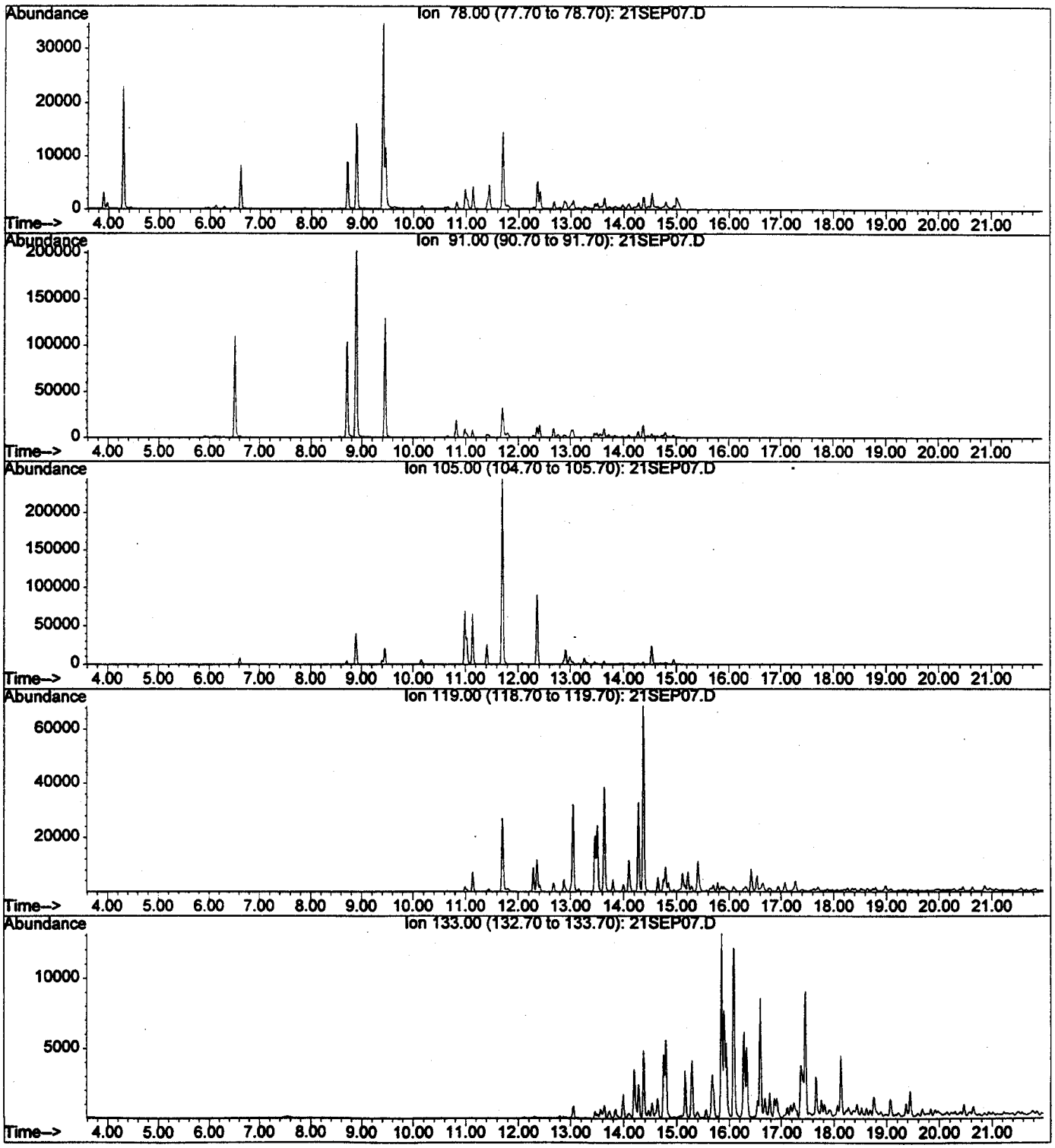
Instrument : HP_5972
Sample Name: IG010918-02
Misc Info : MW-15
Vial Number: 7



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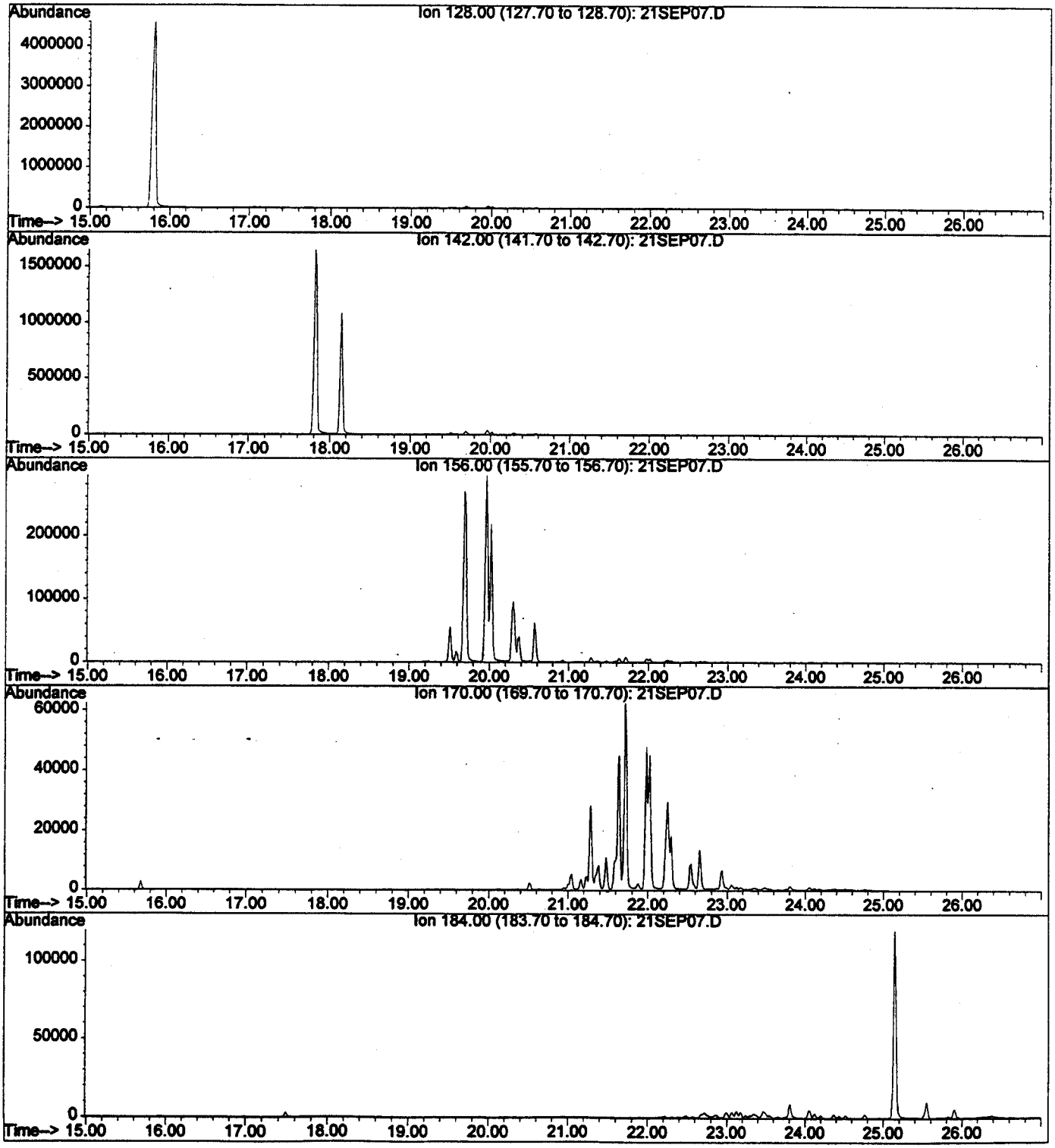

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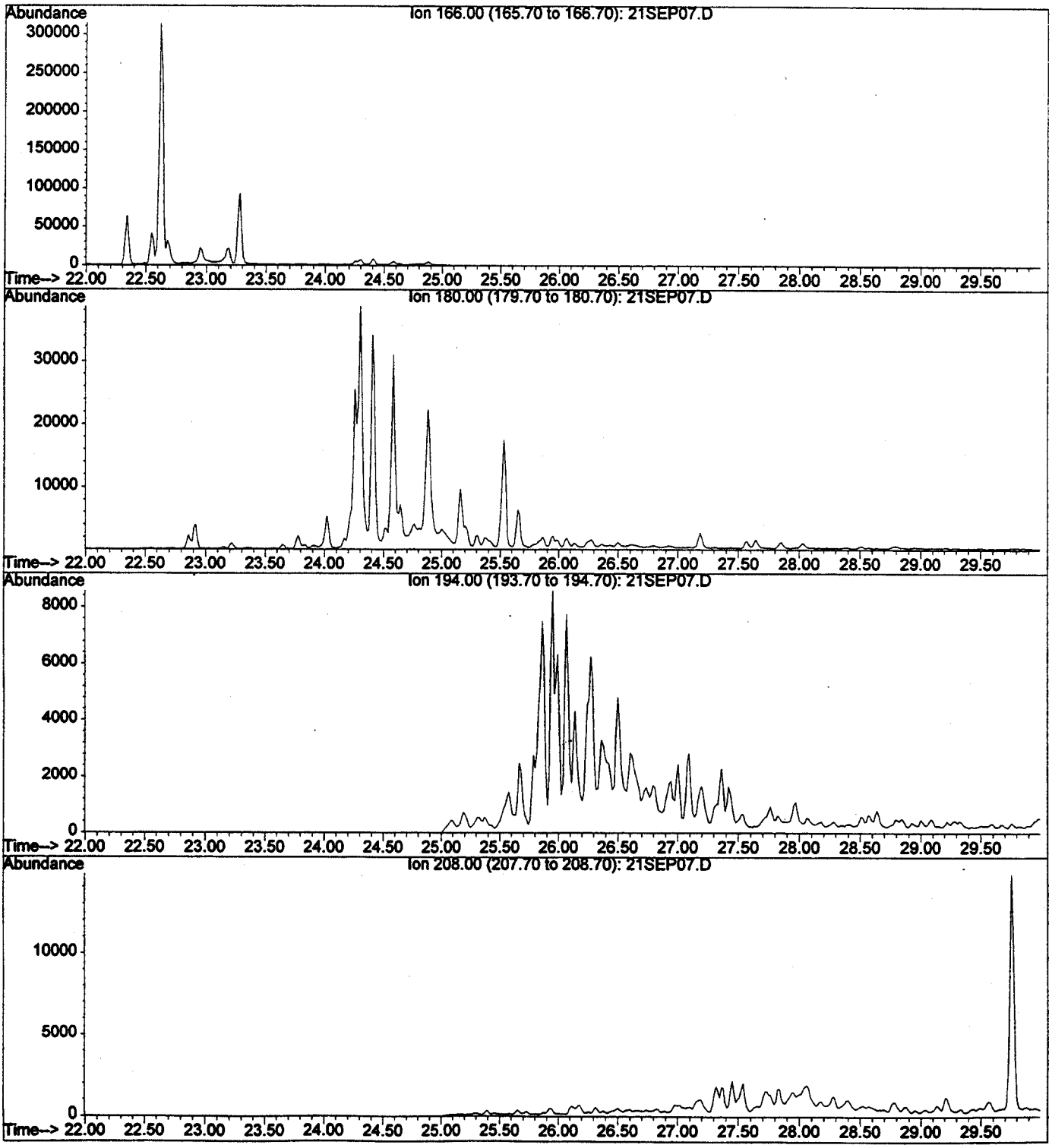

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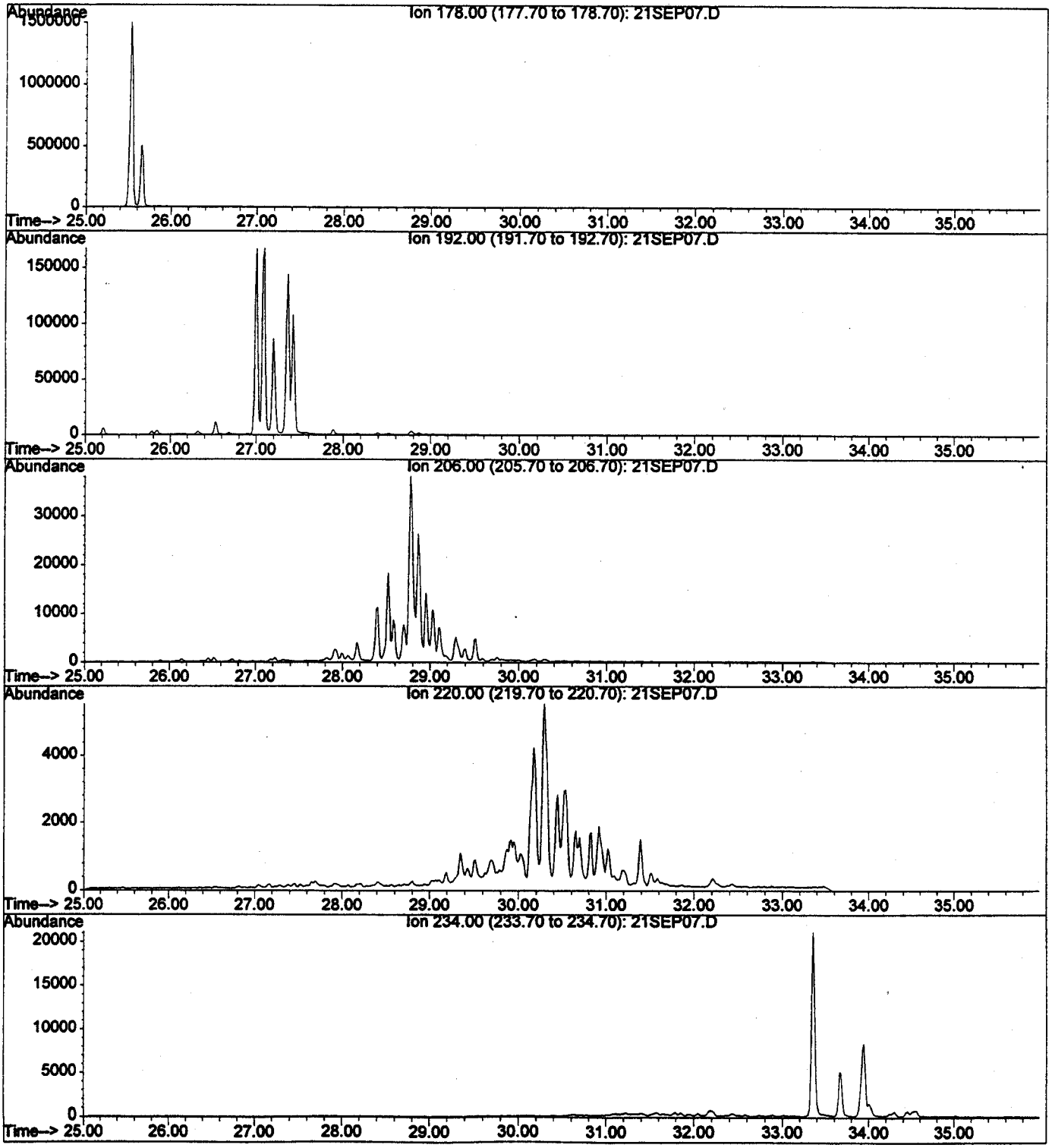

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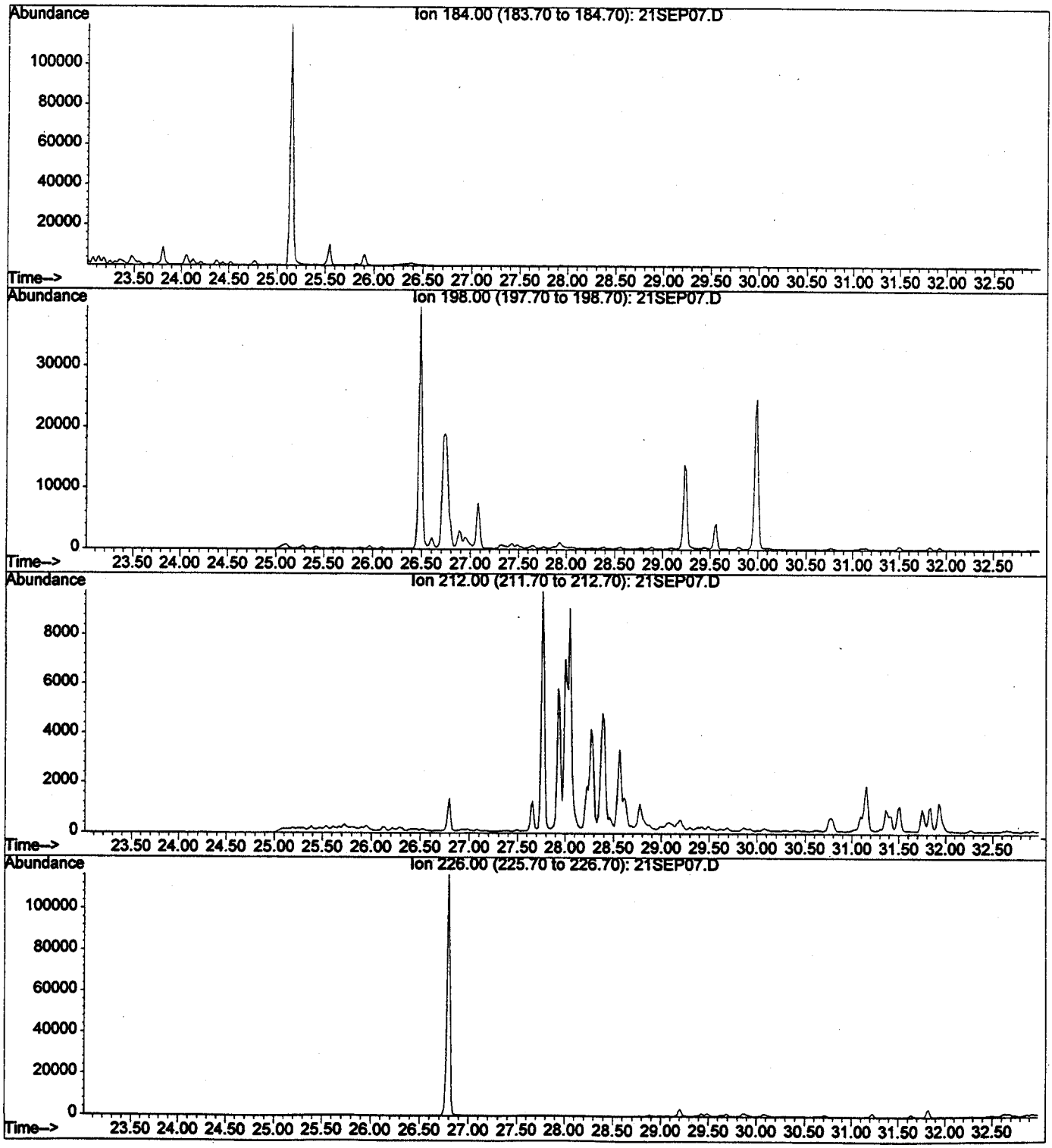

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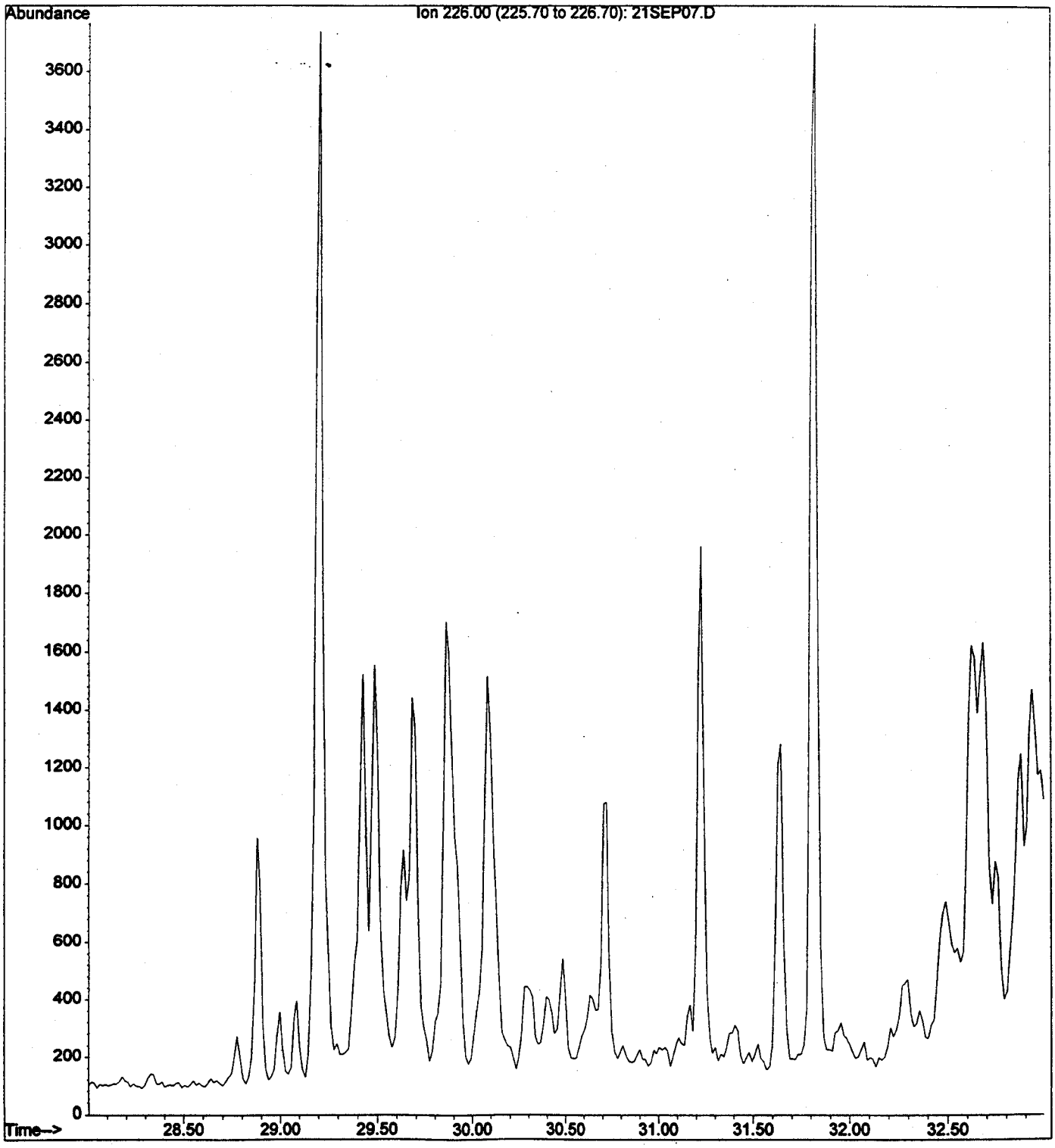

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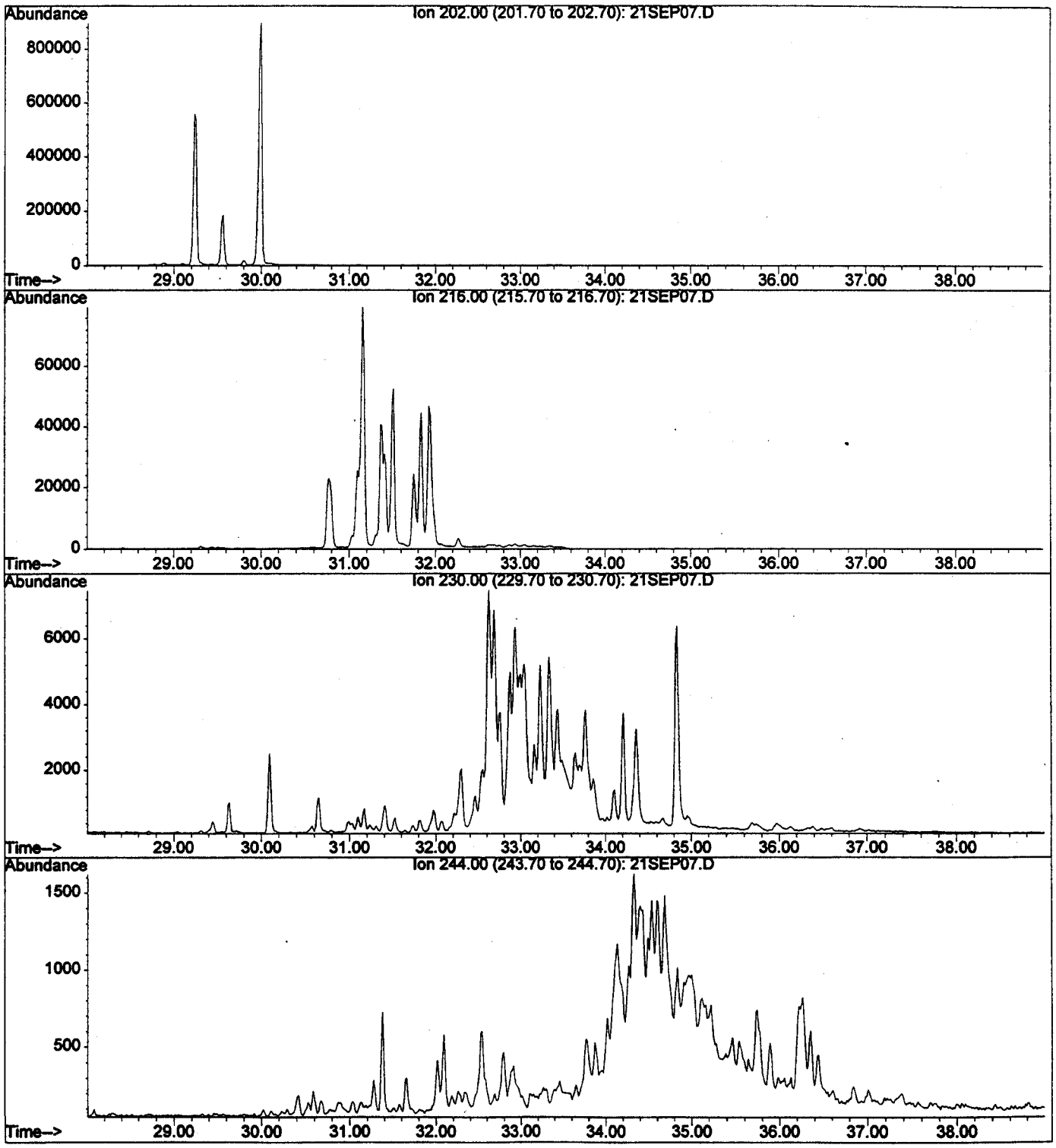

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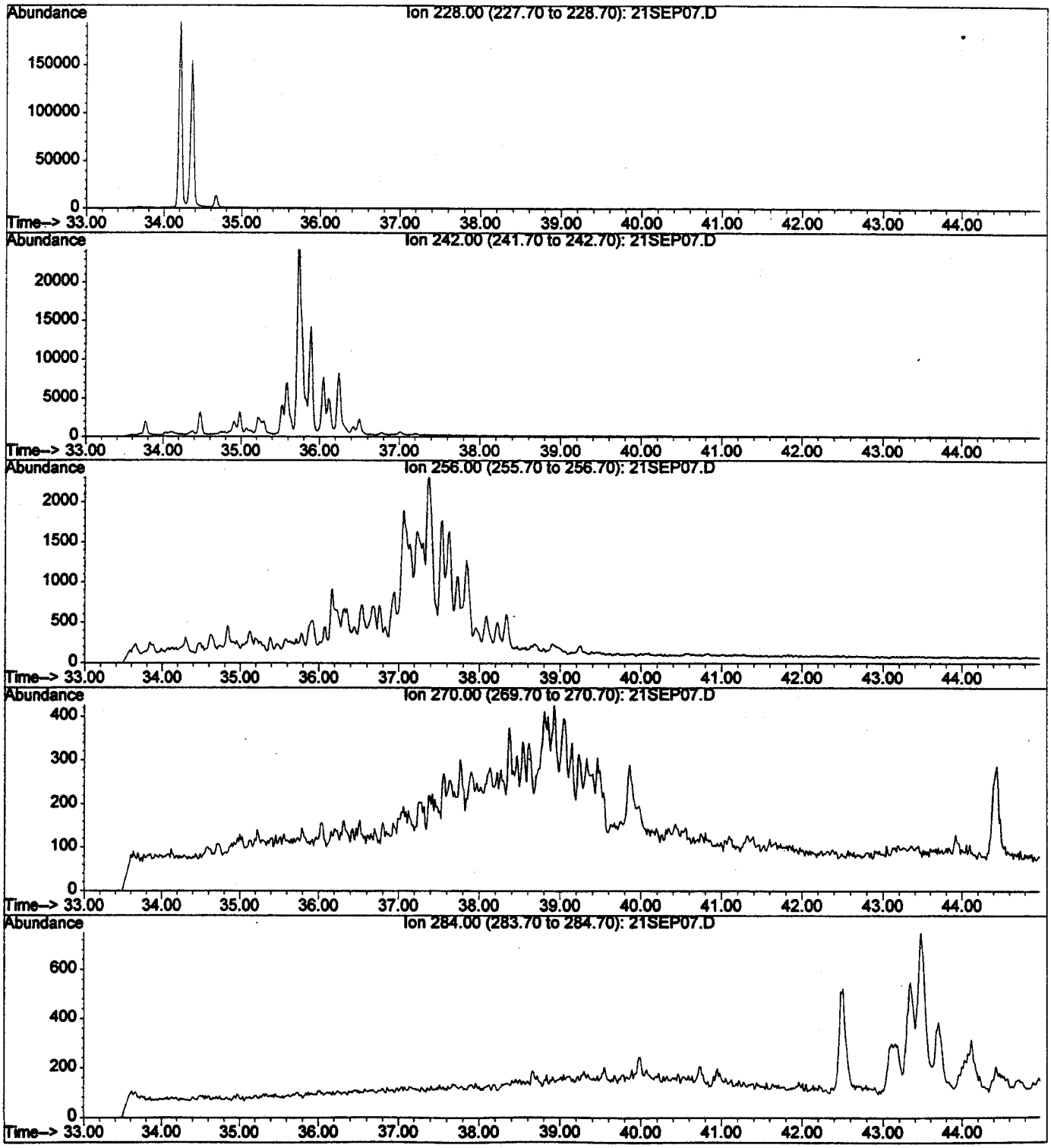

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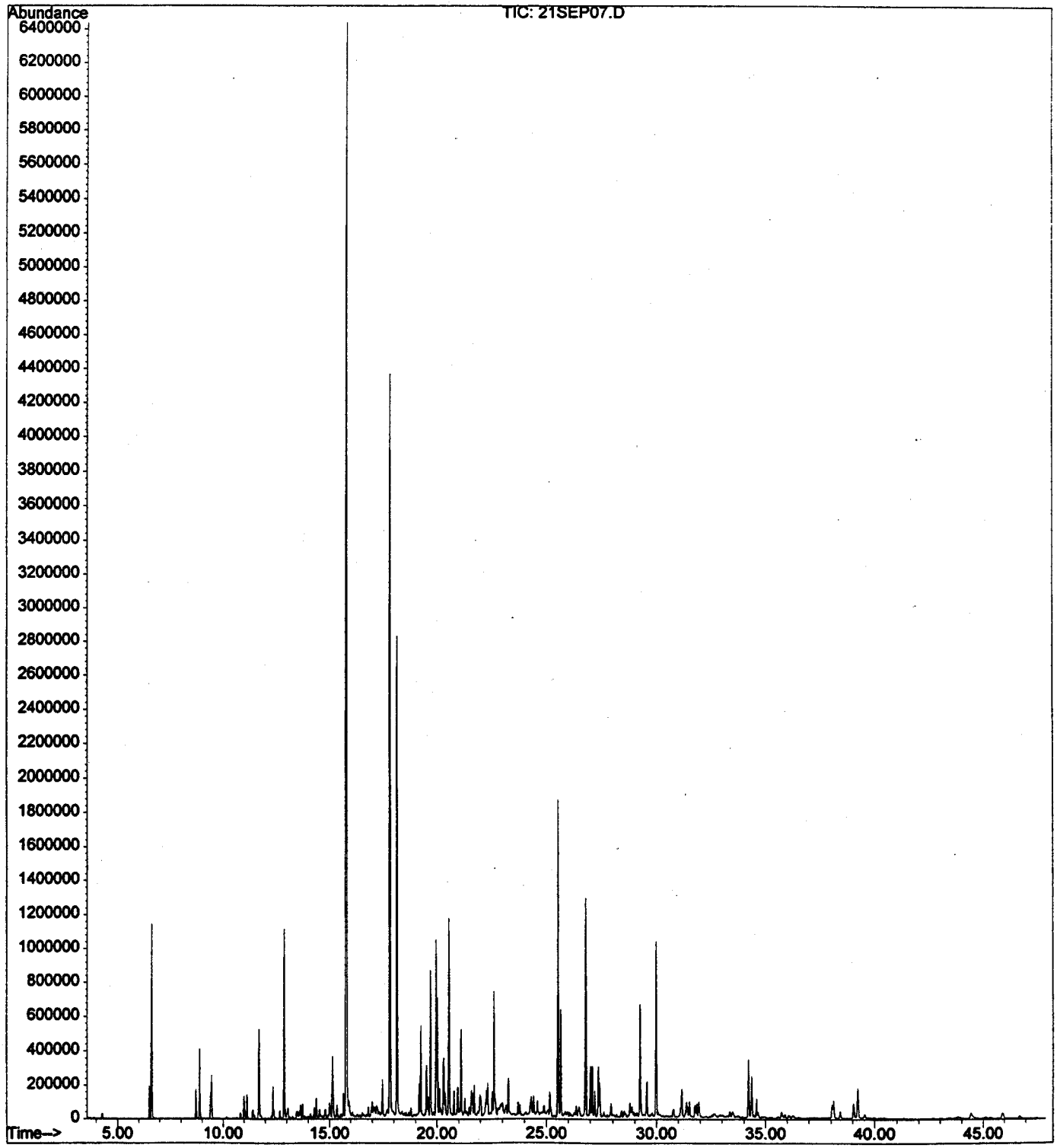
Vial Number: 7



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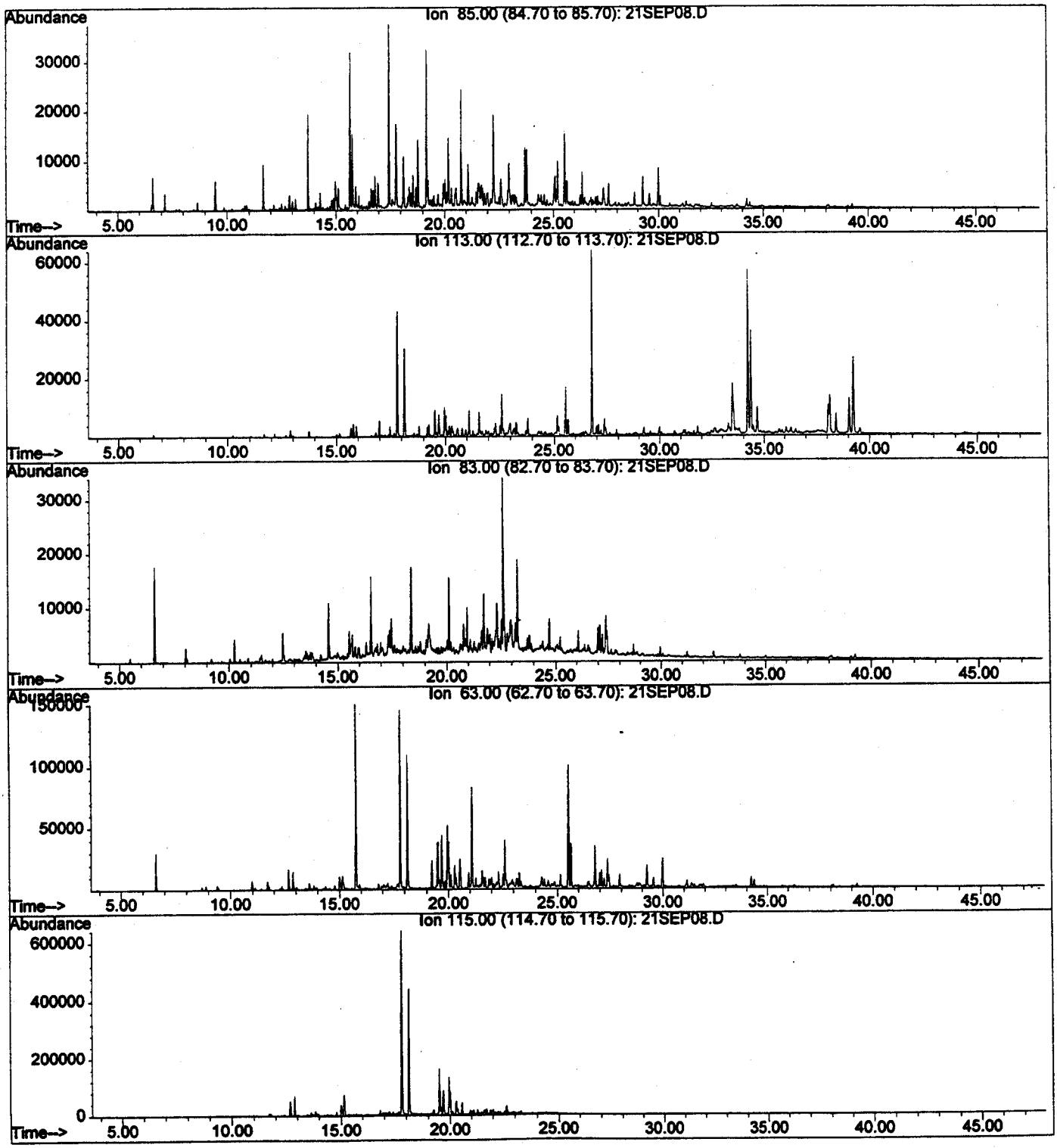
Sample Name: IG010918-03
Misc Info : West Trench Riser
Vial Number: 8



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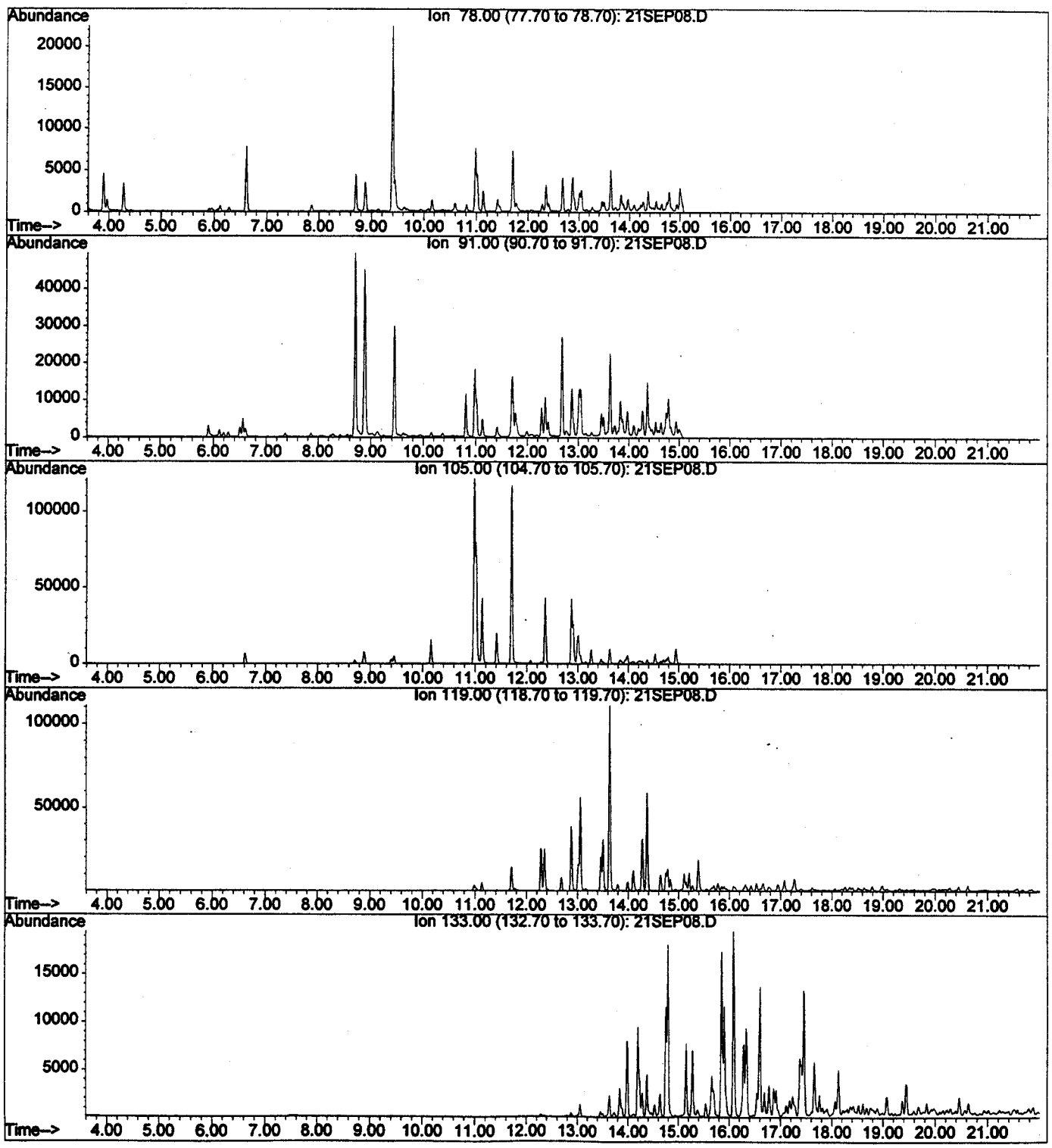
Misc Info : West Trench Riser
Vial Number: 8



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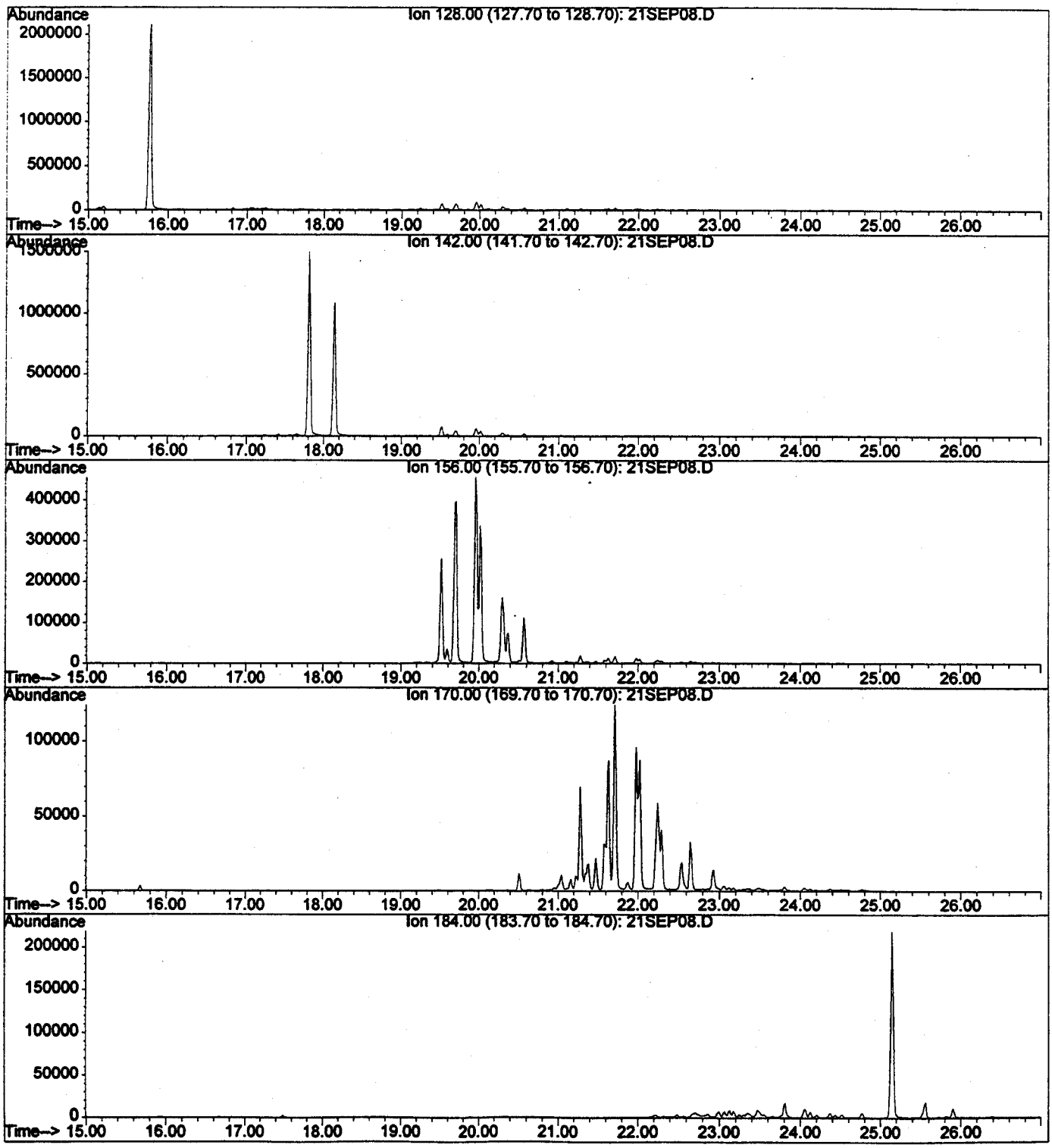
Vial Number: 8



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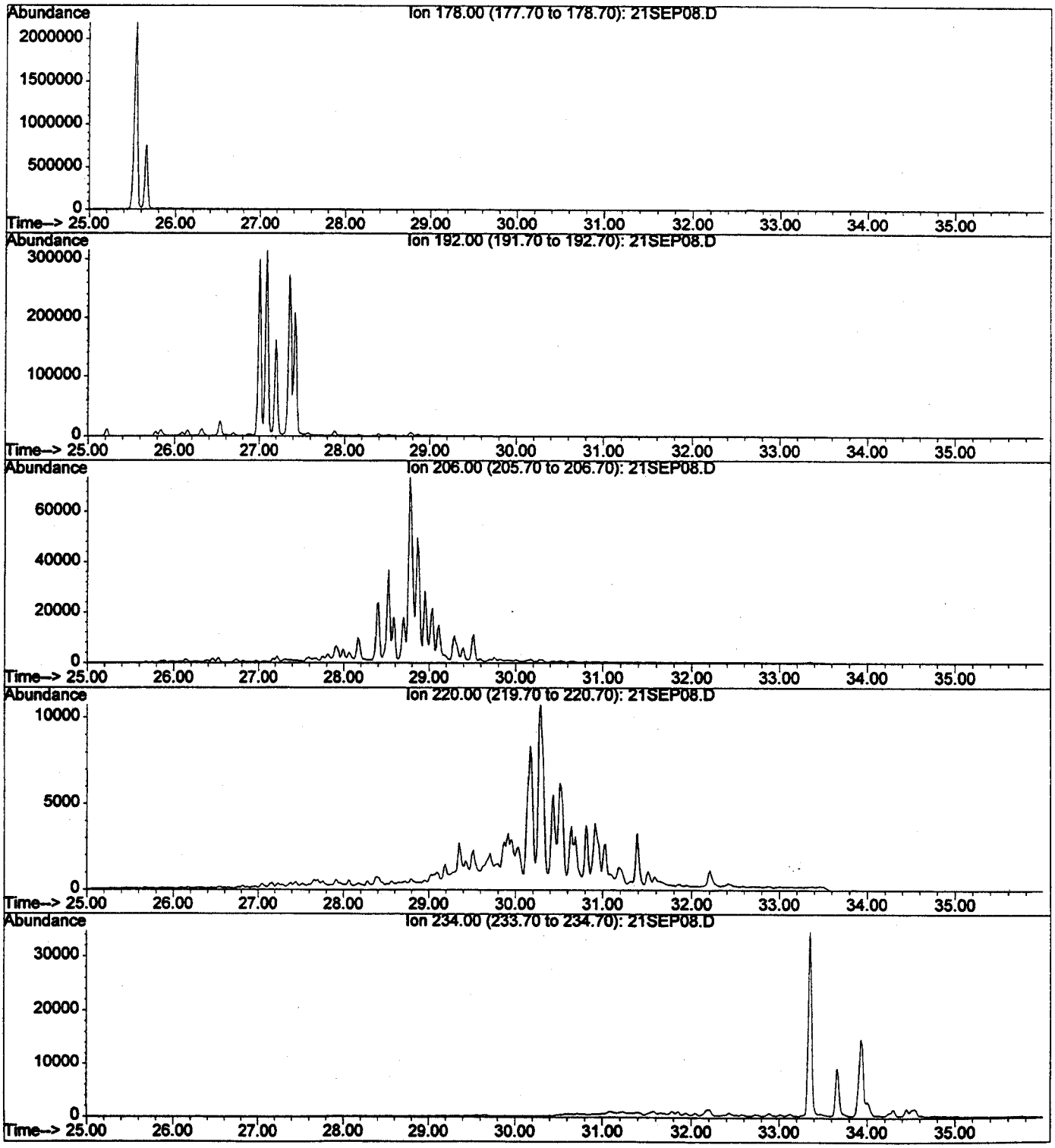

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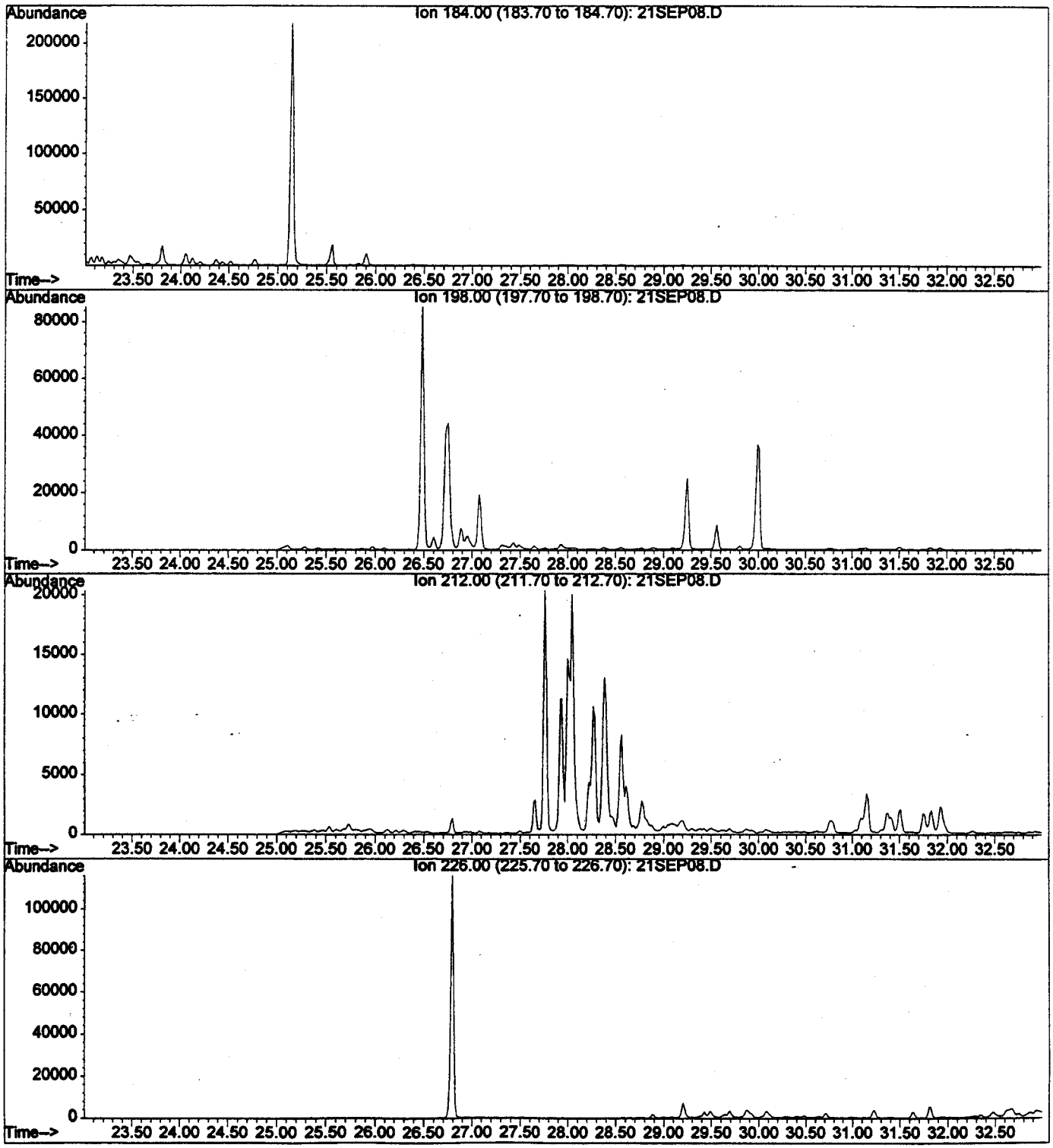

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Misc Info : West Trench Riser
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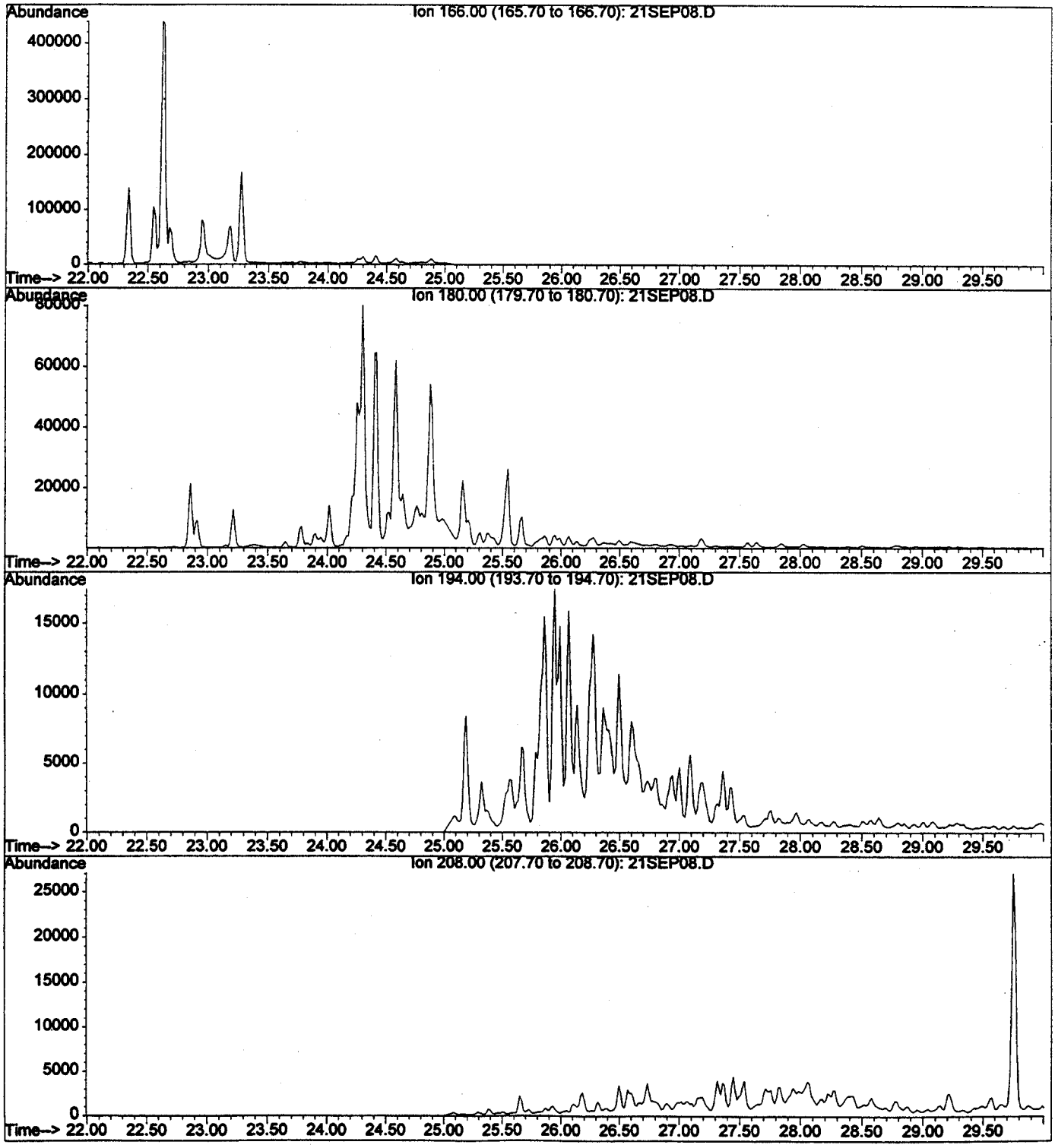

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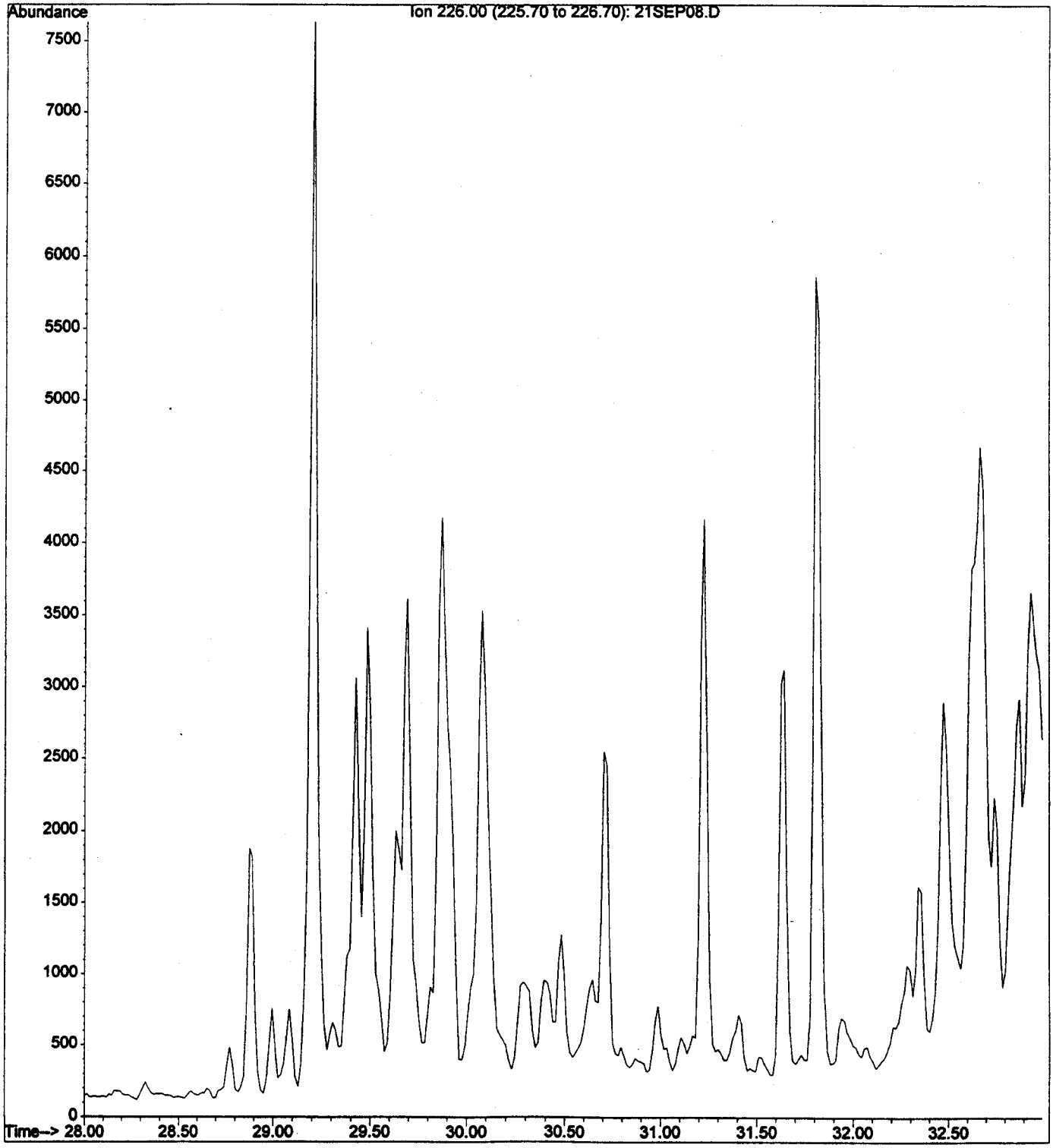
Vial Number: 8



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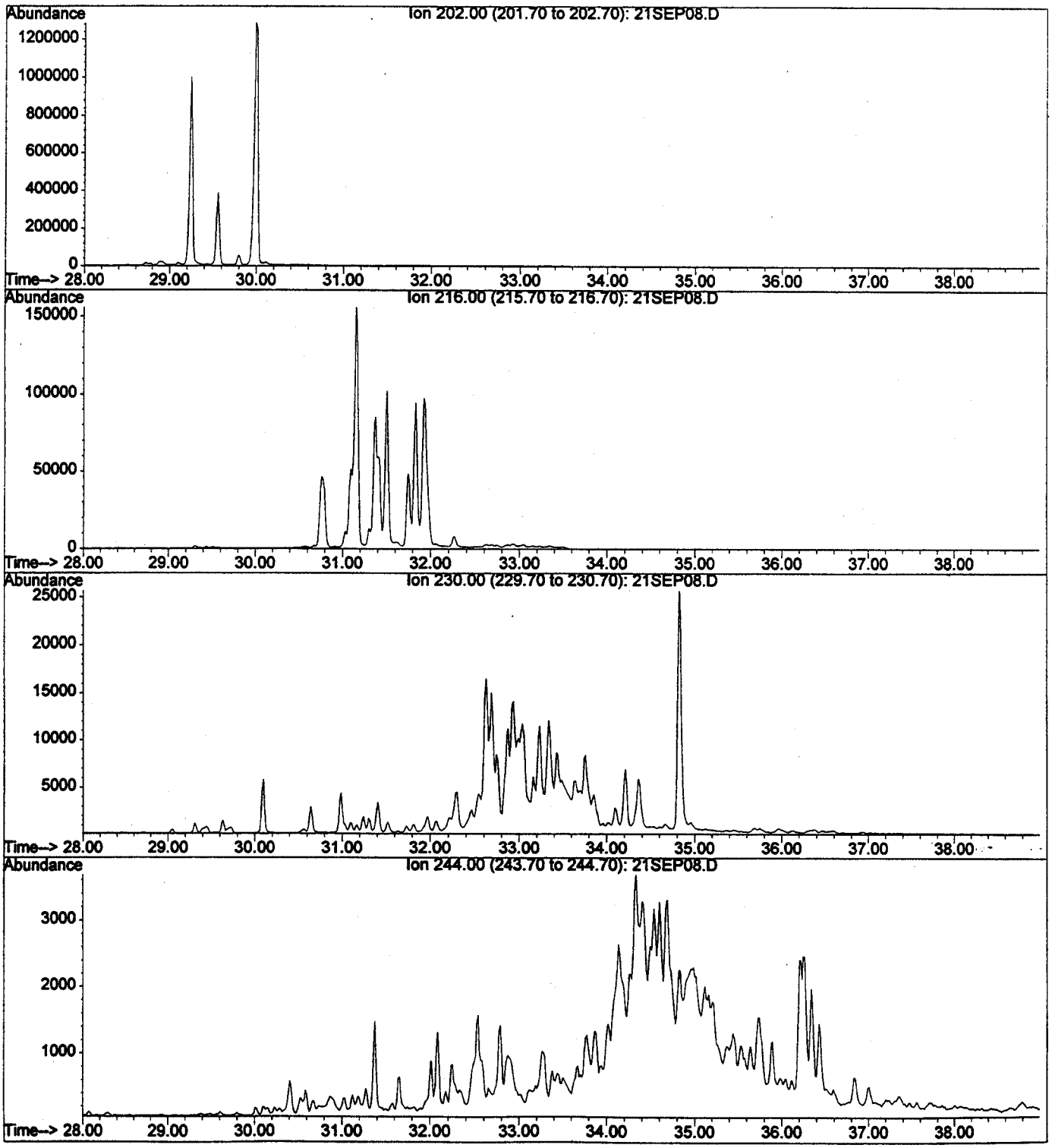
Vial Number: 8



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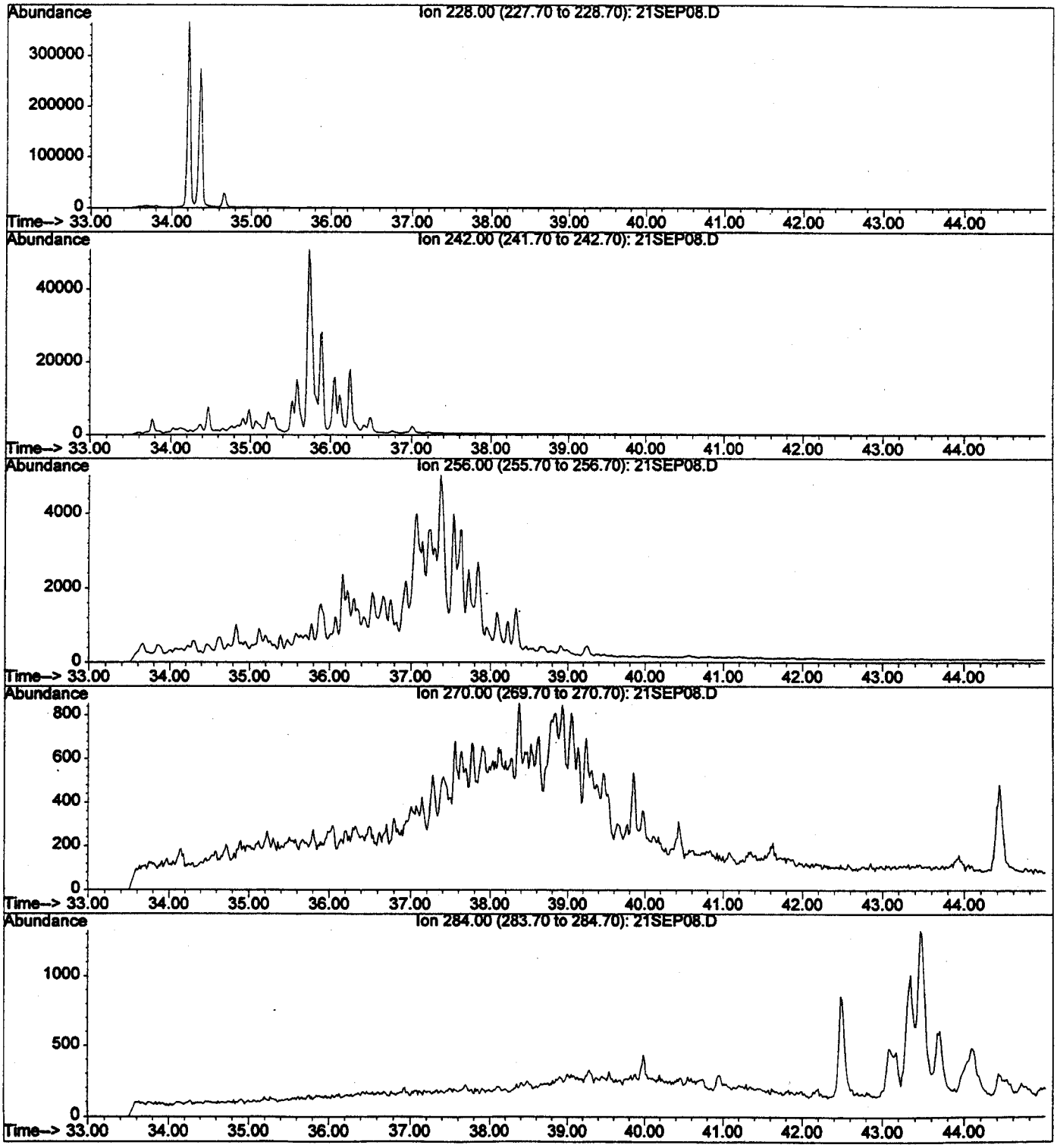
Vial Number: 8



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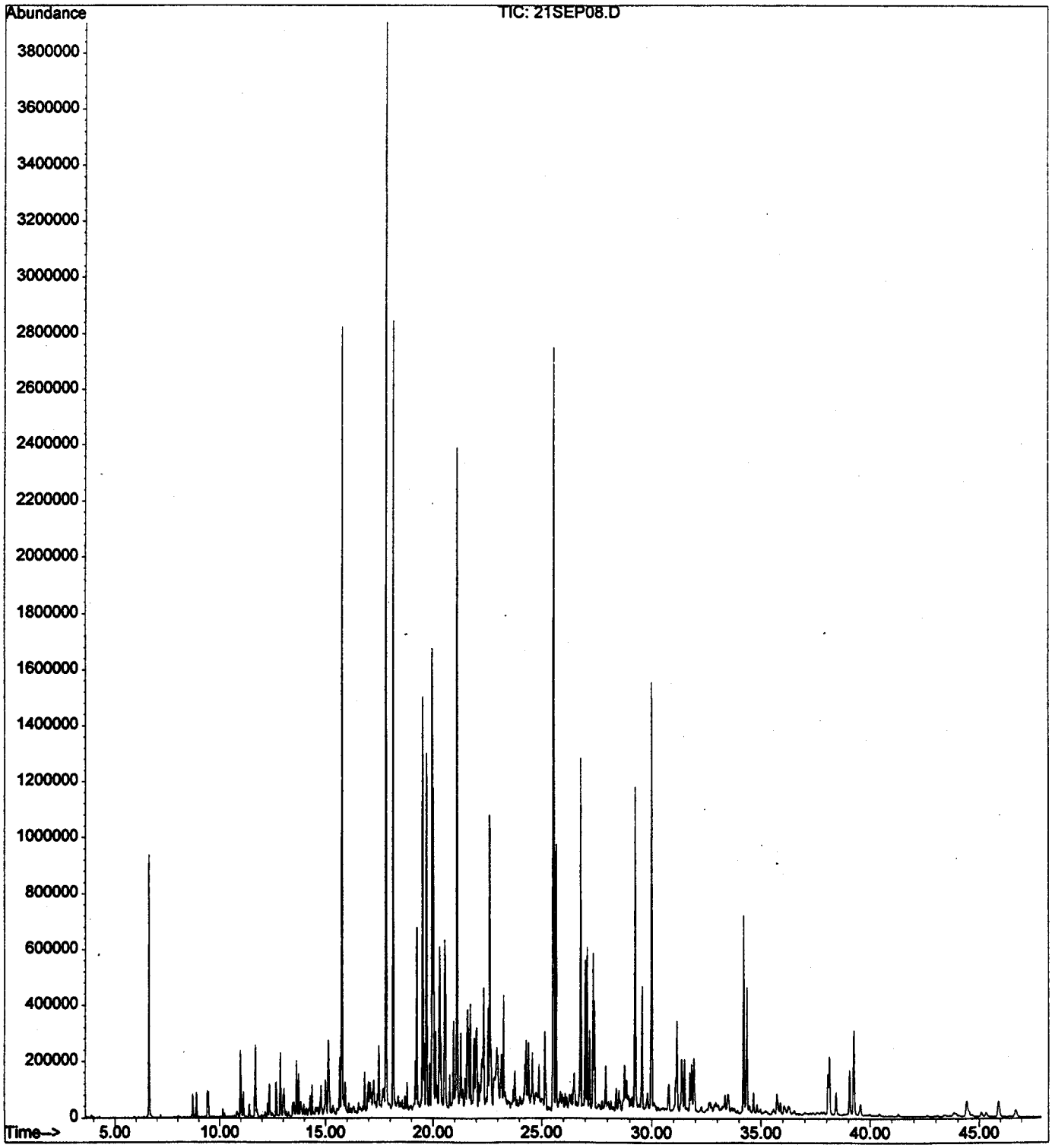

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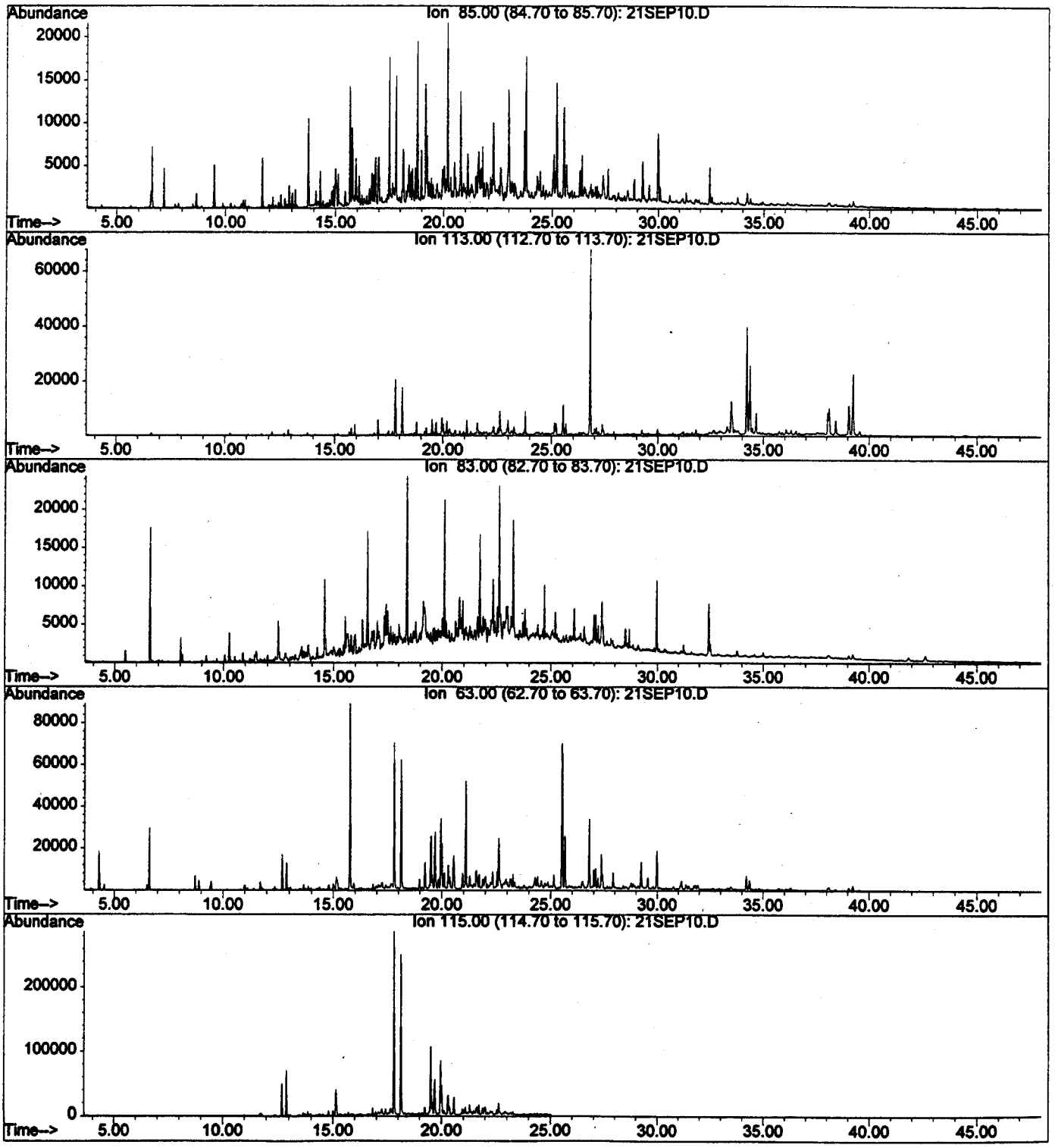
Vial Number: 10



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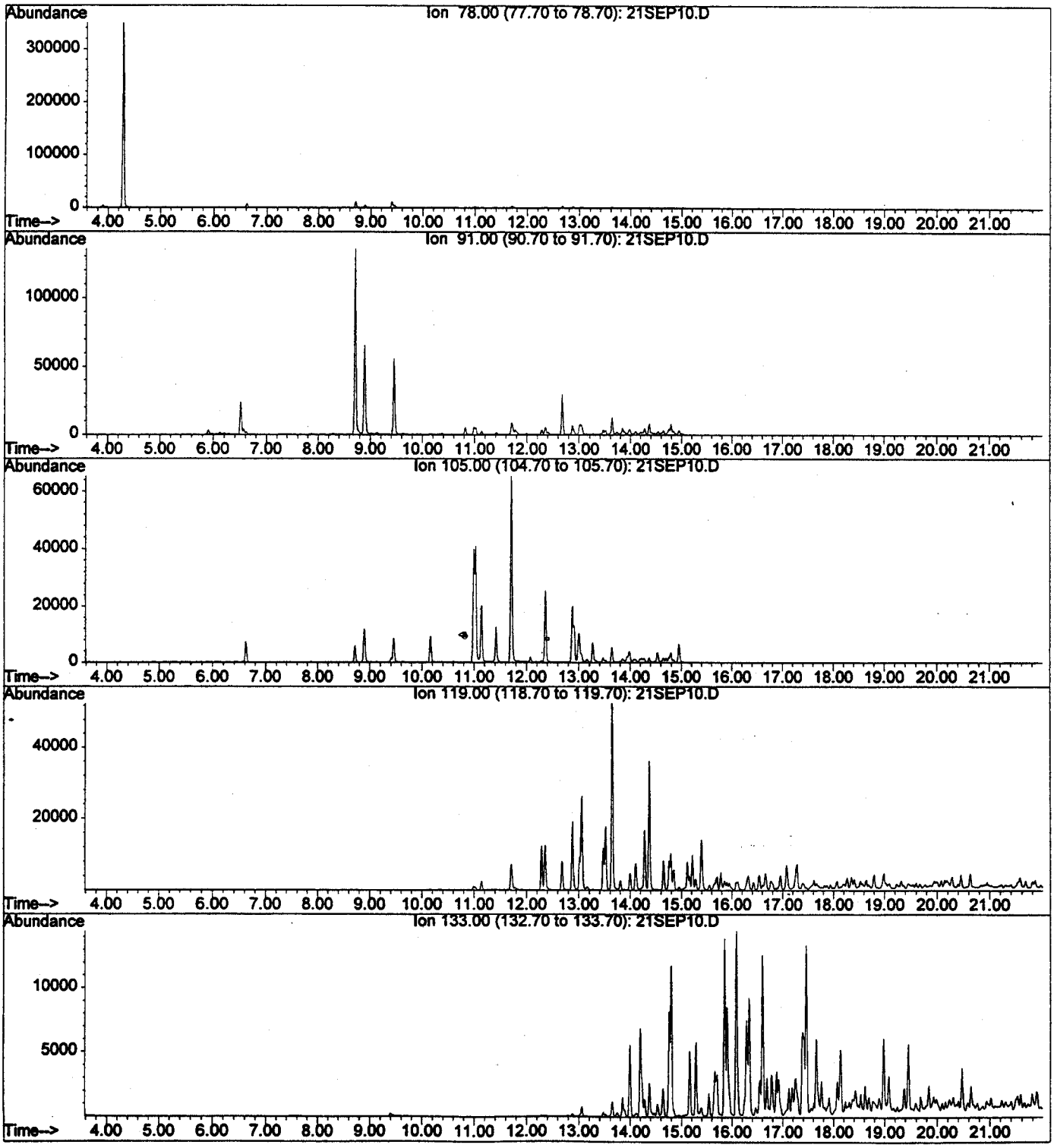

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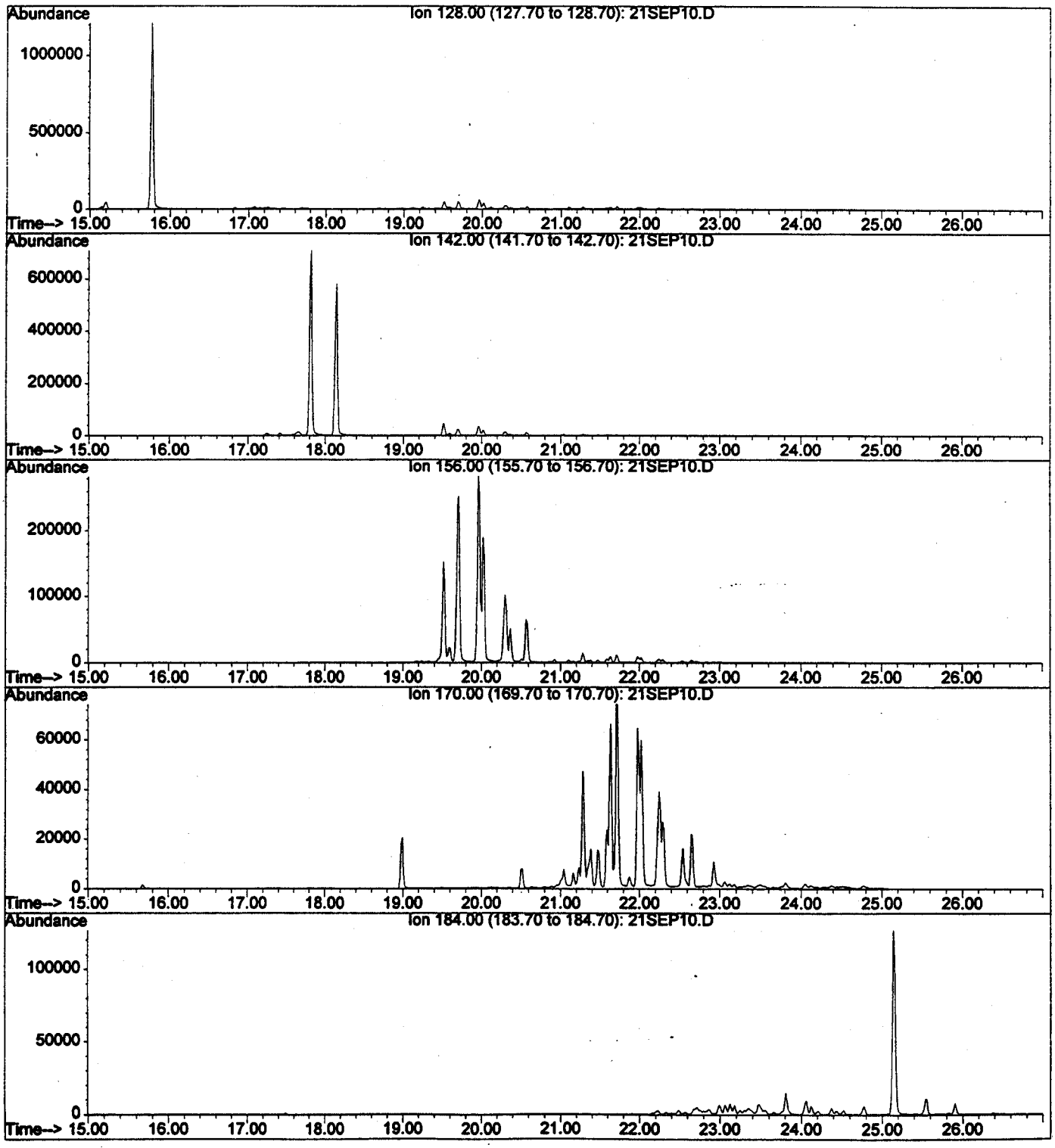
Vial Number: 10



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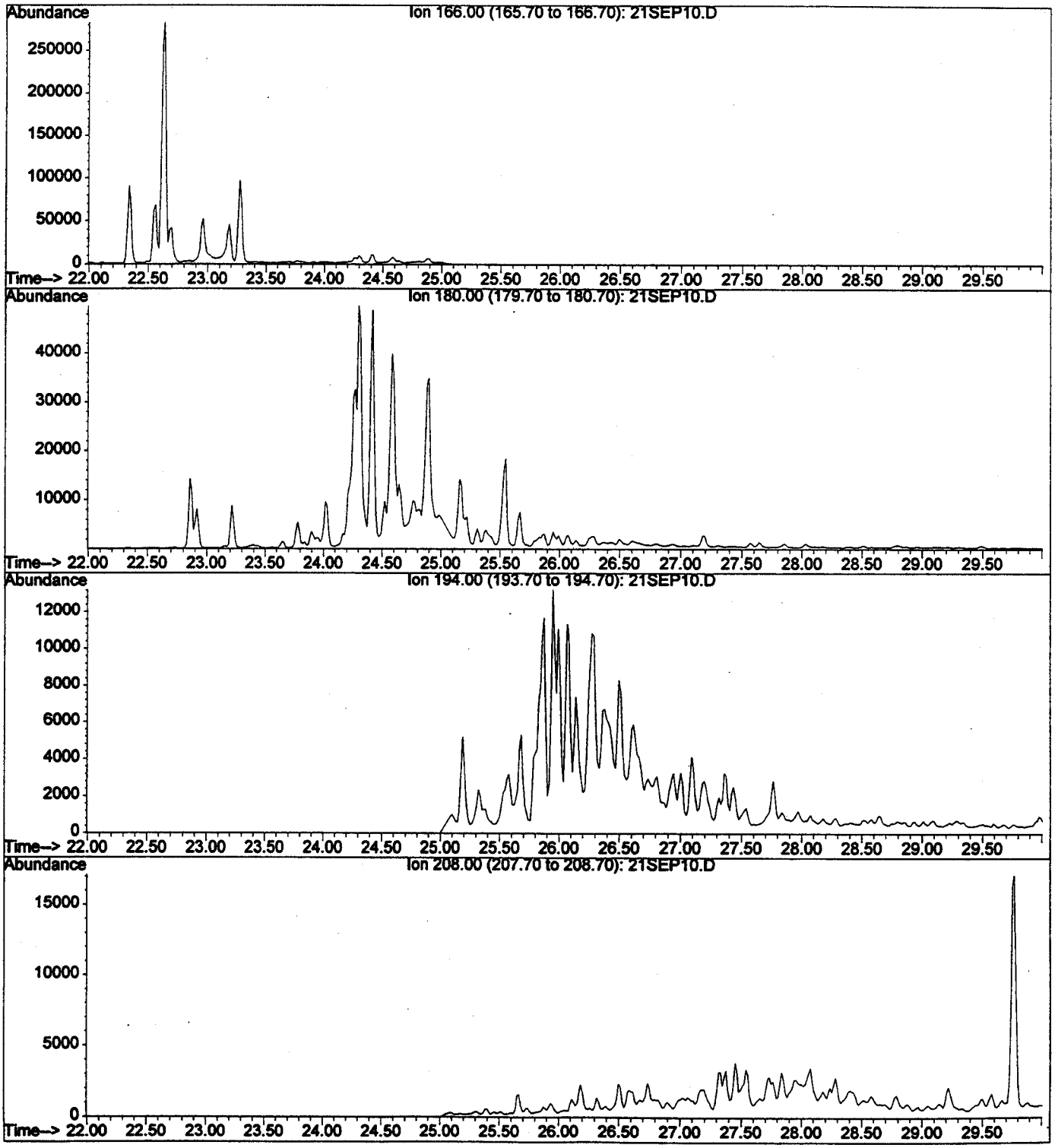

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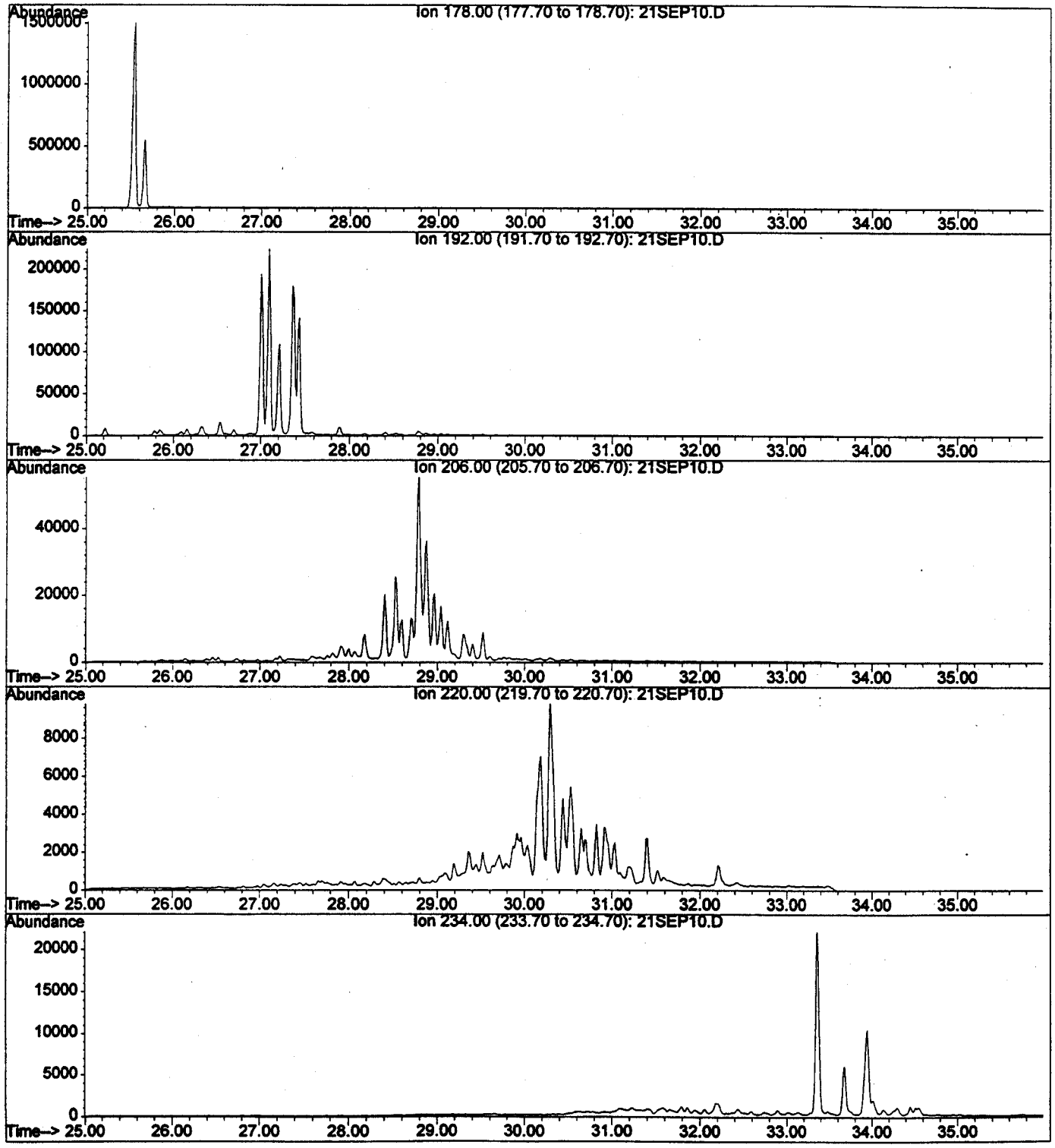

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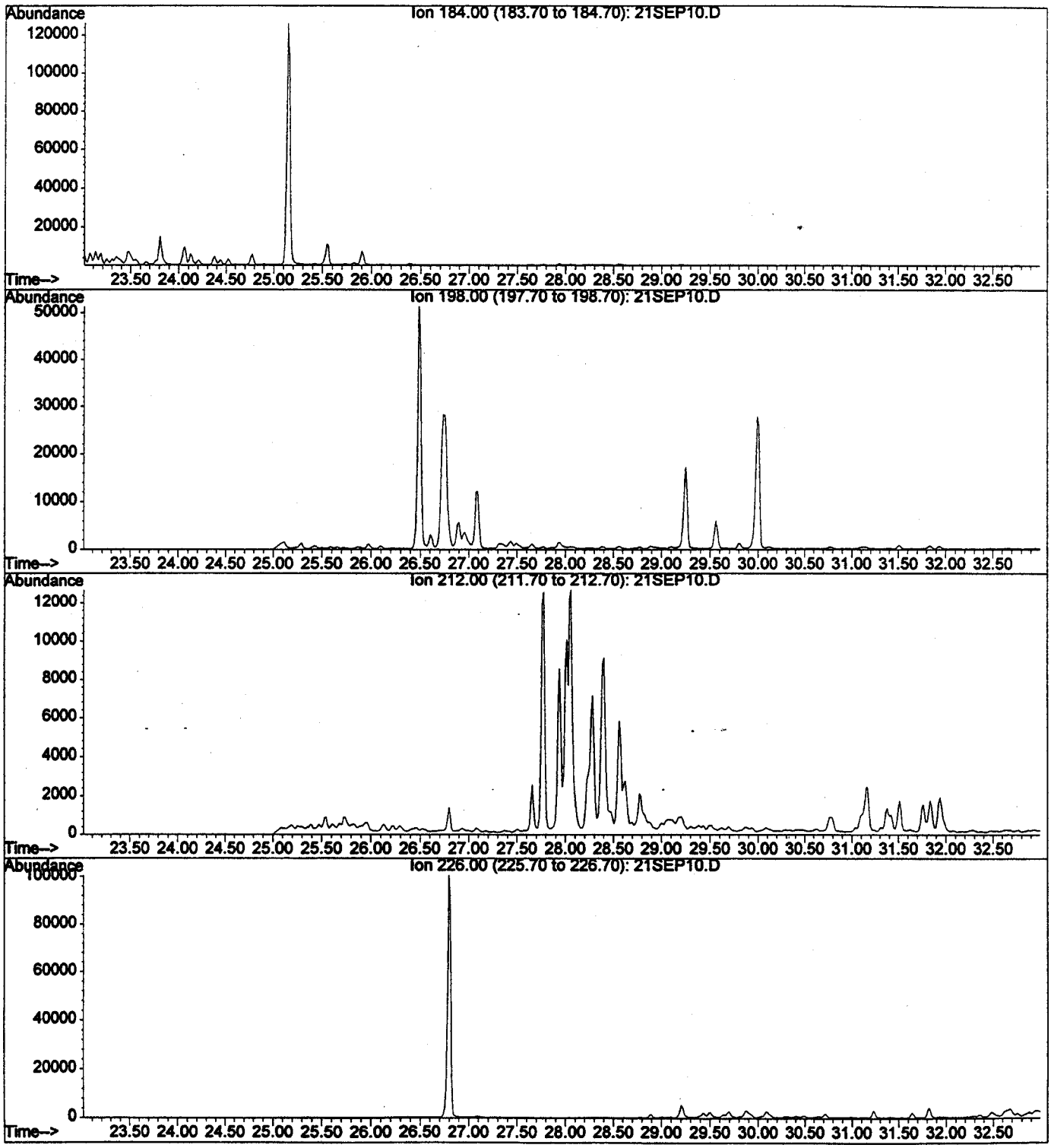

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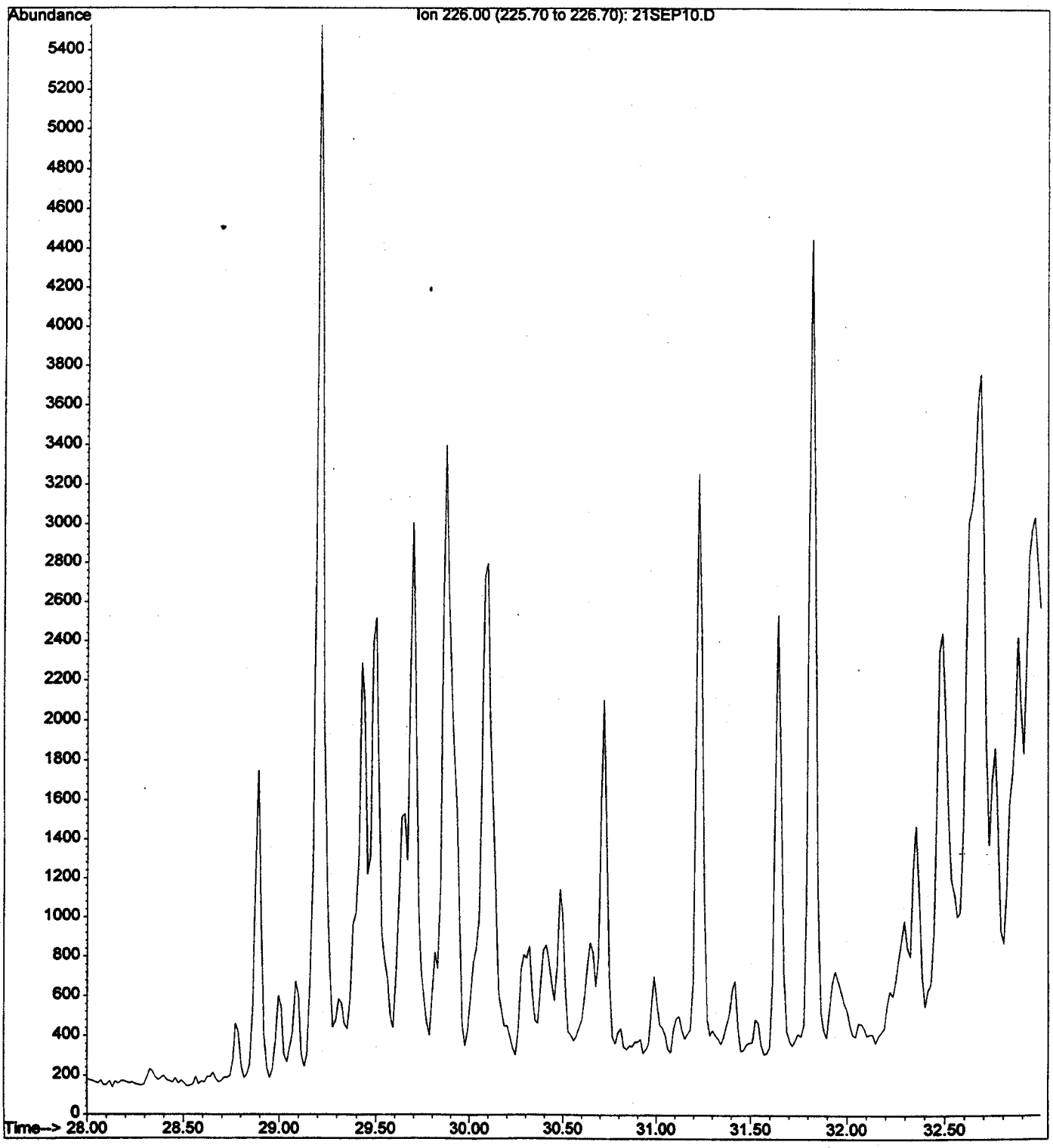

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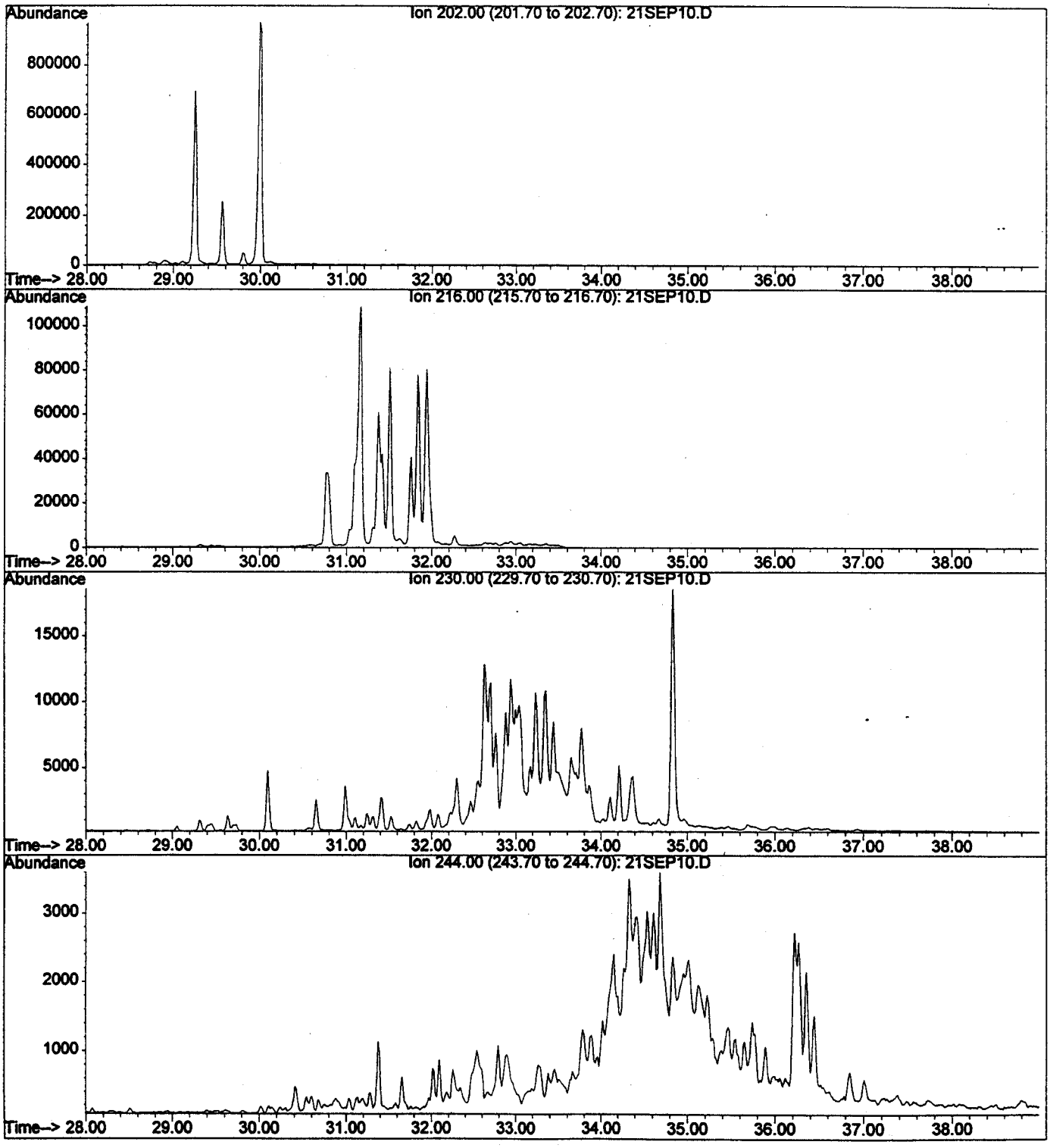

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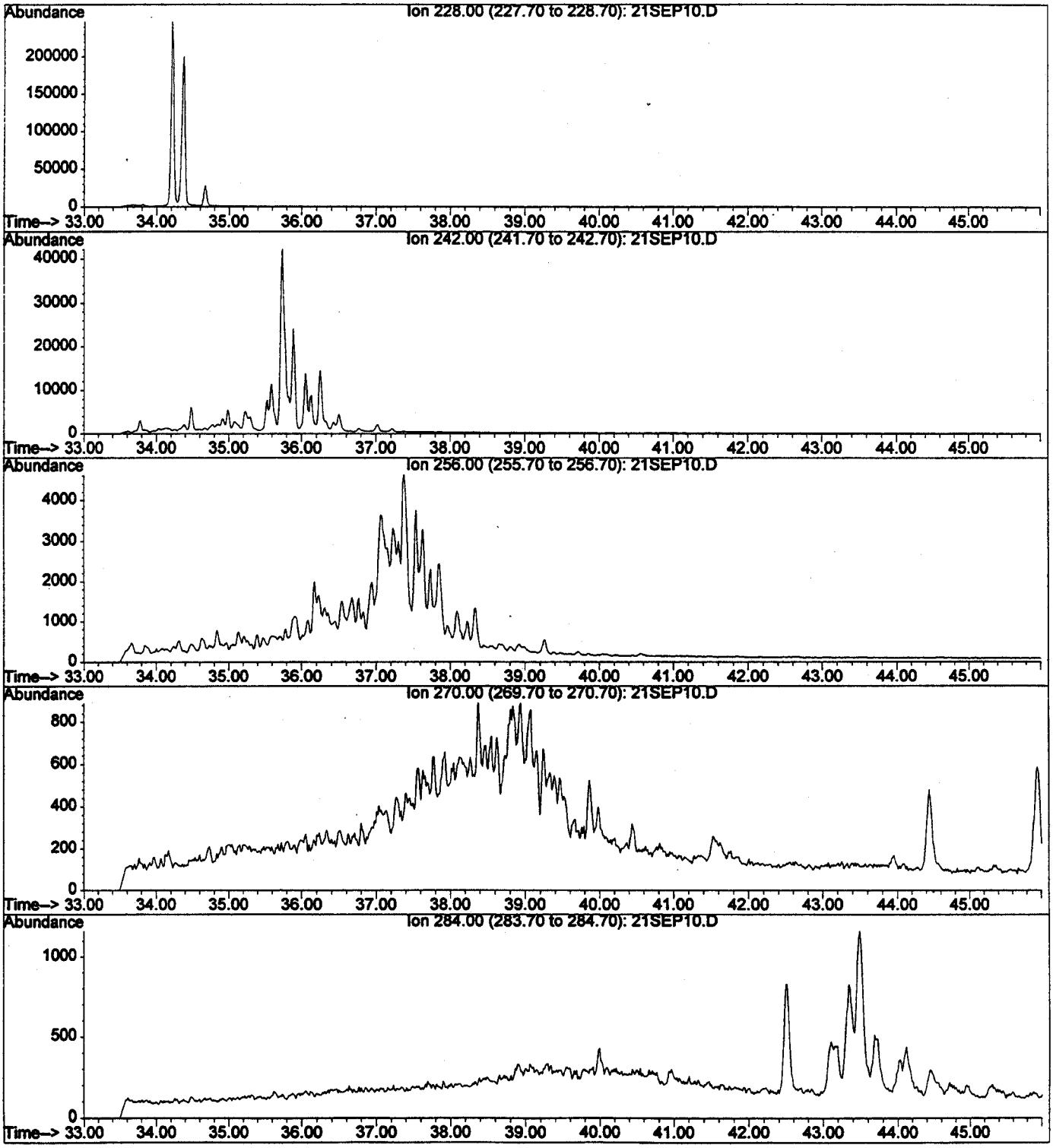

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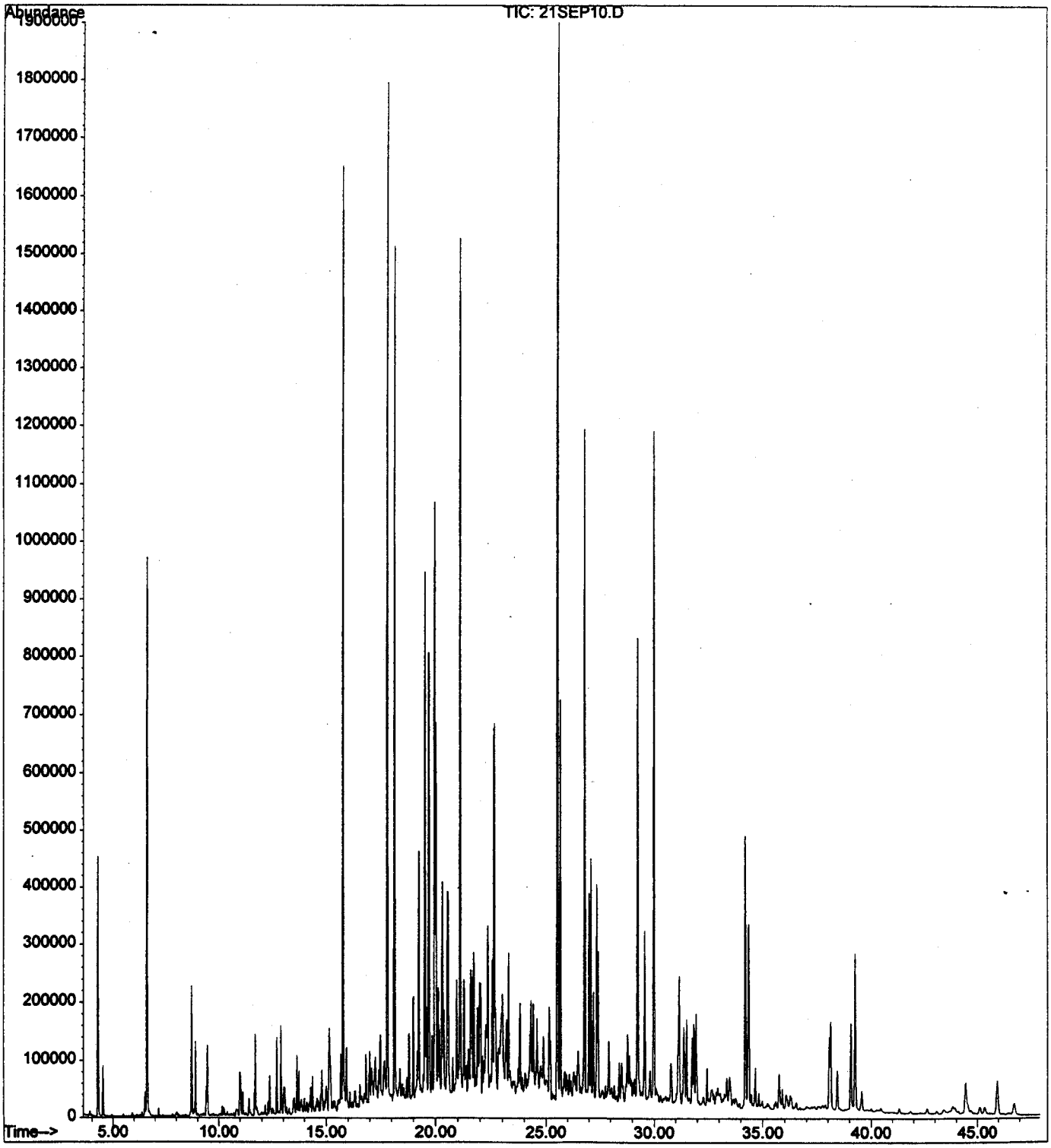
Vial Number: 10



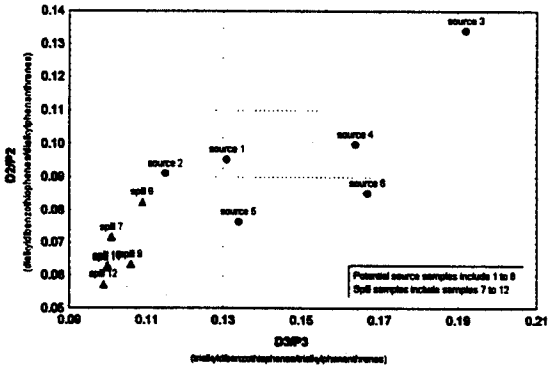
APPENDIX C

Environmental Forensic Report

Two Liquid Samples, One Soil Sample

SDG: IG010925

Figure 1. Double Ratio Plot



Report To:

Gas Technology Institute
1700 S. Mt. Prospect Road
Des Plaines, IL 60018

Report By:

META Environmental, Inc.
49 Clarendon Street
Watertown, MA 02472

October 17, 2001

Identifying and allocating sources of pollutants in complex environments.

META Environmental, Inc.
ENGINEERING & CHEMISTRY

Final Laboratory Report

META Environmental, Inc.
49 Clarendon Street
Watertown, MA 02472

Phone: 617-923-4662
Fax: 617-923-4610
e-Mail: metaenv@aol.com

Certification

This certifies that this package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed herein. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Director and Quality Assurance Officer, as verified by the following signatures.

David R. Craig — Date: 10/17/01
Laboratory Director, META Environmental, Inc.

David M. Mauro — Date: 10/17/01
Quality Assurance Officer, META Environmental, Inc.

Sample Delivery Group Narrative

Project: Ashland MGP Site Forensic Analyses

Client: Gas Technology Institute
1700 S. Mt. Prospect Road
Des Plains, IL 60018

Report Contact: Dr. Diane Saber

Date of Receipt: 9/25/01

Sample Summary:

The samples received for this project are summarized in the attached sample login forms.

META Project Number: I05001-60

Chain of Custody

Samples were received in good condition. The internal temperatures of the shipment containers were as follows:

Samples received 9/25/2001 3.8°C

Internal chain of custody procedures were followed after sample receipt. Samples were stored in a locked refrigerator. A sample custody logbook contains the record of sample removal from the secure sample storage area to the sample preparation laboratory. The custody record for the sample extracts is present on the sample extraction logbook page.

The disposal of samples and extracts will be authorized 1 month after the release of this data report. Sample disposal will be documented.

Methods

The aqueous samples were prepared by liquid:liquid extraction (EPA 3511 Draft) using dichloromethane (DCM). The non-aqueous phase liquid (NAPL) samples were prepared by waste dilution (EPA 3580) to a 5mg/ml concentration in DCM. The extracts were spiked with internal standard and analyzed by GC/FID (EPA 8100 mod.) and GC/MS/SIM (EPA 8260/8270 mod.).

Subsequently, a portion of each extract was fractionated into aliphatic, aromatic, and polar fractions using silica gel column chromatography (EPA 3630 mod.). Each fraction was analyzed by GC/FID (EPA 8100 mod.).

Results

Sample results were presented in summary forms (CLP Form 1 equivalent) which follow this narrative.

Quality Control

Analyte Flags

The detection limits were determined as the sample equivalent of the lowest linear initial calibration standard. Analytes measured between 50% and 100% of the lowest standard were reported as "estimated" and flagged with the letter "J." No value was reported above the calibration range. Undetected analytes were flagged with the letter, "U." Analytes marked with a "B" were detected in the associated blank and should be reviewed for a possible positive bias. No deviations were thought significant enough to compromise the integrity of the reported values.

Holding Times

All samples were extracted within holding times. All samples and extracts were stored at 4°C ± 2°C prior to extraction and analysis. All extracts were analyzed within 40 days of sample preparation.

Surrogate Spikes

Extraction surrogates were added to each aqueous sample prior to extraction. Fractionation surrogates were added to all extracts prior to fractionation. Recoveries for all surrogates are reported with the sample results. All surrogate recoveries in the unfractionated extracts were

within QC limits.

Blanks
No target analytes were present above the detection limit in the blanks. The fractionated blanks contained peaks associated with the silica gel. The presence of these peaks does not effect the data interpretation

Internal Standards
Internal standards were recovered within acceptable QC limits (50%-200%) relative to the continuing calibration standards.

Interpretation

The GC/FID fingerprints of the whole, aliphatic, and aromatic portions of the five samples were very similar. All the samples exhibited characteristics of pyrogenic and petrogenic substances, with the pyrogenic portion predominant. The substantial amounts of parent PAHs (e.g., naphthalene, phenanthrene, pyrene) indicated the presence of tar. However, the unresolved complex mixture (UCM or "hump") centered around about 17 minutes and the numerous small peaks from about 10 minutes to about 25 minutes indicated the presence of a middle distillate of petroleum.

The aliphatic fractions of all the samples showed a middle distillate of petroleum. The low abundance of normal alkanes relative to the isoprenoid hydrocarbons, pristane and phytane, indicated moderate weathering.

Table 1 presents the total hydrocarbon concentrations of the whole, aliphatic, and aromatic portions of each sample.

Finally, relatively low amounts of some compounds were detected in the polar fractions of each sample. However, most of material in the polar fractions was aromatic compounds that were not fully recovered in the aromatic fraction.

Table 1 Aliphatic and Aromatic Hydrocarbons in NAPL Samples					
Sample	**TEH (mg/L)**	**Aliphatic (mg/L)**	**Aromatic (mg/L)**	**% Aliphatic**	**% Aromatic**
Clay Tile #1A	1,580	251	1,080	15.9	68.4
Sample	**TEH (mg/kg)**	**Aliphatic (mg/kg)**	**Aromatic (mg/kg)**	**% Aliphatic**	**% Aromatic**
Clay Tile #1B	13,400	2,080	10,100	15.5	75.4
Clay Tile #2	486,000	69,200	371,000	14.2	76.3
TEH – total extractable hydrocarbons					

References

1 "Chemical Source Attribution at Former MGP Sites," EPRI Report 1000728, December 2000.

Table 1
Source and Weathering Ratios

Sample	Fl/Py	D/F	C17/Pris	C18/Phy	Pris/Phy	C3D/C3PA	C2D/C2PA	N/P
Clay Tile #1A	0.67	0.14	0.88	0.72	1.18	1.02	0.37	1.41
Clay Tile #1B	0.75	0.19	0.55	0.42	1.16	0.95	0.36	1.76
Clay Tile #2	0.69	0.23	0.76	0.52	1.18	1.09	0.37	1.72

Ratios:

Fl/Py	fluoranthene/pyrene
D/F	dibenzofuran/fluorene
C17/Pris	septadecane/pristane
C18/Phy	octadecane/phytane
Pris/Phy	pristane/phytane
C3D/C3PA	trialkyldibenzothiophenes/trialkylphenanthrenes/anthracenes
C2D/C2PA	dialkyldibenzothiophenes/dialkylphenanthrenes/anthracenes
N/P	Naphthalene/Phenanthrene

Appendix A

Chains of Custody

META ENVIRONMENTAL SAMPLE RECEIPT

Lab ID	Field ID	Matrix	Analysis	Date Sampled	Date Received	Client/ Project	Container/ Storage
IG010925-01a,b	Clay Tile #1A	Water	2005/4007/4008	09/19/01	09/25/01	I05001-60	2x 40mL VOA Vial
IG010925-02a	Clay Tile#1B	Soil	2508/4007/4008	09/19/01	09/25/01	I05001-60	2x 40mL VOA Vial
IG010925-03a,b	Clay Tile#2	Water	2005/4007/4008	09/20/01	09/25/01	I05001-60	2x 40mL VOA Vial

9/25/01

PROGRESSIVE PRINTING SERVICES (714) 393-4724

Job No. 05644-098

CHAIN OF CUSTODY RECORD

GENERATOR INFORMATION

Facility NSP - Ashland Lakefront

Address 301 Lake Shore Drive East
Ashland, WI 54806

Telephone (715) 682-6936

SAMPLE INFORMATION

No.	DEPTH	TYPE	DATE	TIME
Clay Tile #1A	—	water	9/19	1200
Clay Tile #1B	—	soil	9/19	1230
Clay Tile #2	—	water	9/20	1030

COLLECTOR INFORMATION

Collected by Mark McCulloch

Address 5250 E. Terrace Dr. Suit I
Madison, WI 53718

Telephone (608) 244-5656

Suspected Waste Constituents Analyze for 8100 Fingerprint Analysis (2 VOA vials per sample, Call Dave Trainer - URS w/ questions

Field Conditions/Remarks Sample 1A consists of oily water, sample 1B is oily soil/sludge (both) from clay tile. Sample 2 is oily water from clay tile.

SAMPLE ALLOCATION

Name

Address

Telephone ( )

___ sample received intact

✓ sample received damaged or missing (describe on back)

1 broken Vial (40mL) - Clay Tile #1

(Signature) (Date)

CHAIN OF POSSESSION

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
1. Mark S McCulloch	9/24	400PM	Fed Ex	9/24	400PM
2. Rec'd - Diana Burham	9/25/01	9:15 am	3.8°C		
3.					
4.					

Distribution

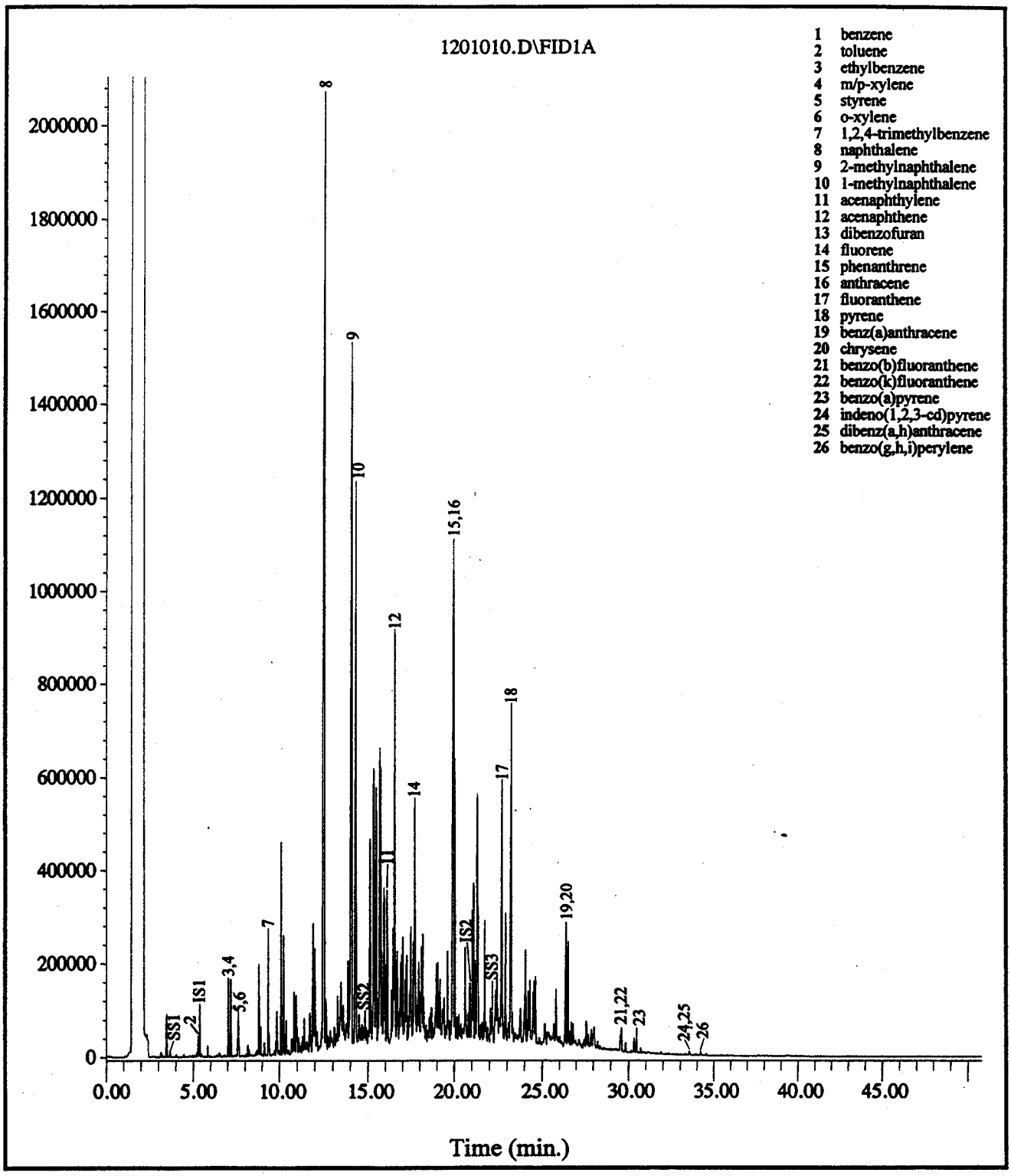
White-w/shipment-for consignee files

Pink-with report

Appendix B

GC/FID Fingerprints

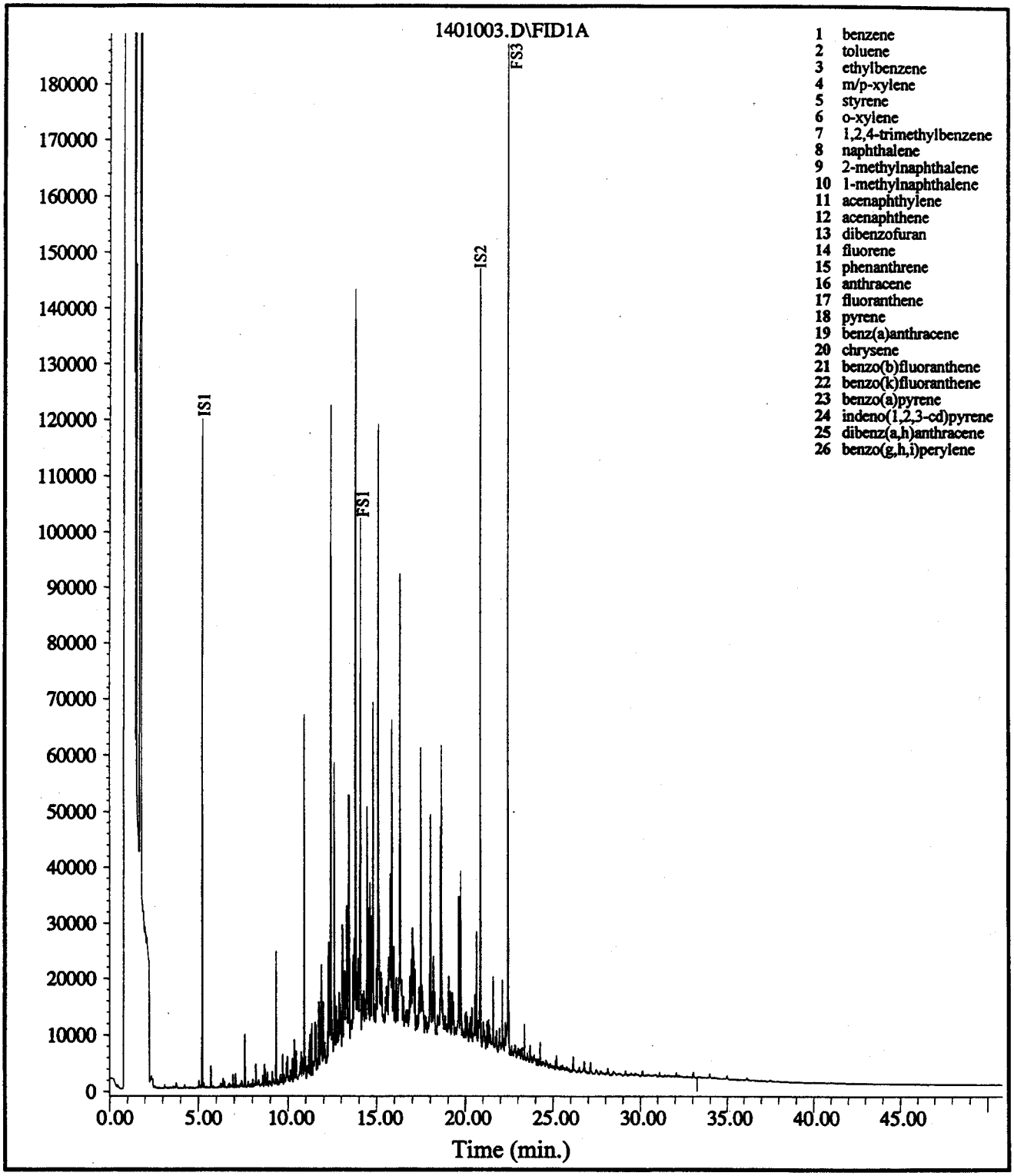
GC/FID Fingerprint



IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane

Field ID:	**Clay Tile #1A**
Laboratory ID:	IG010925-01
Method:	MET4007D

GC/FID Fingerprint



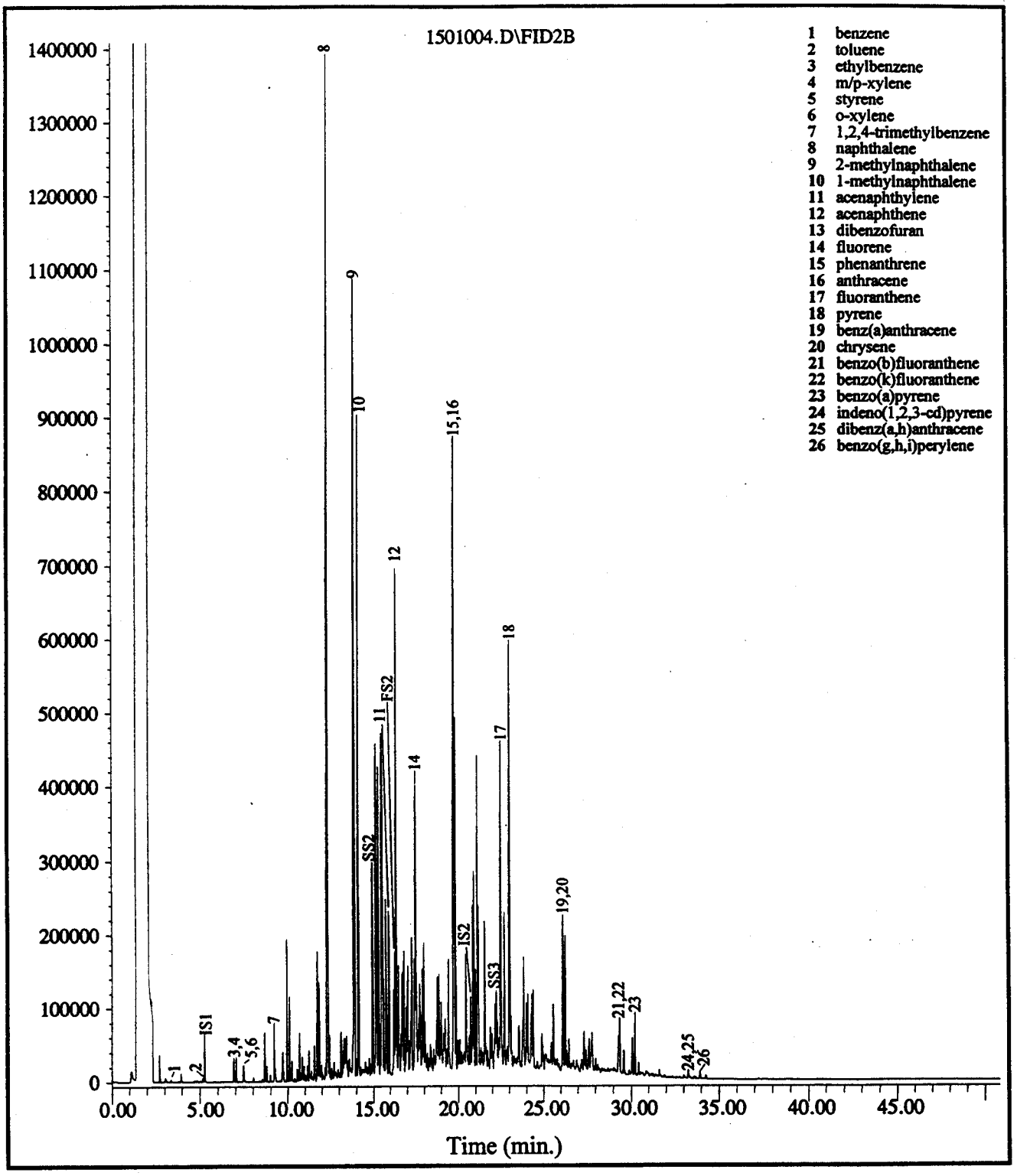
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**Clay Tile #1A**
Laboratory ID:	IG010925-01PF
Method:	MET4007D

IG925frac.ppt

META

GC/FID Fingerprint



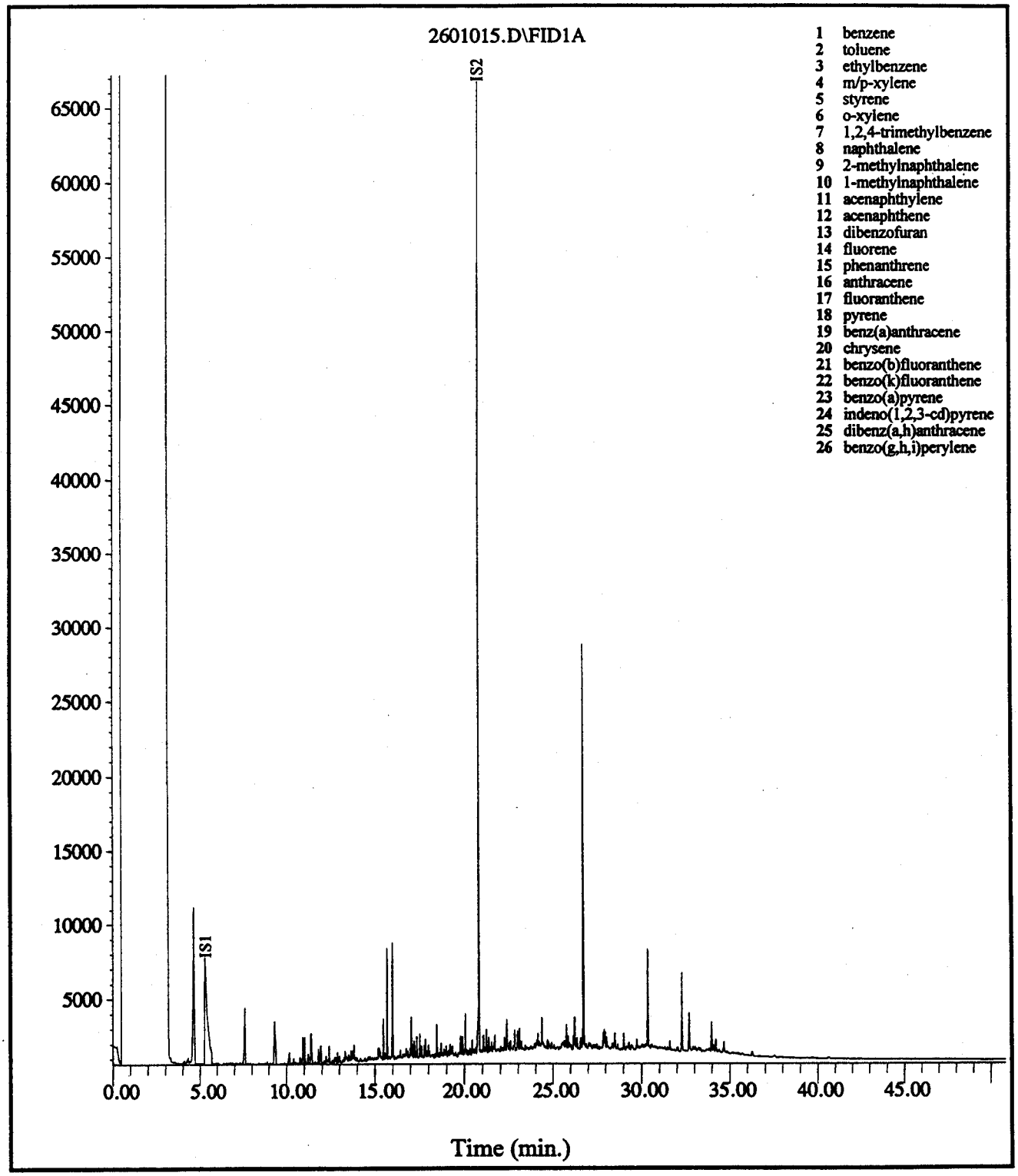
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

IG925fmc.ppt

Field ID:	**Clay Tile #1A**
Laboratory ID:	IG010925-01DF
Method:	MET4007D

META

GC/FID Fingerprint



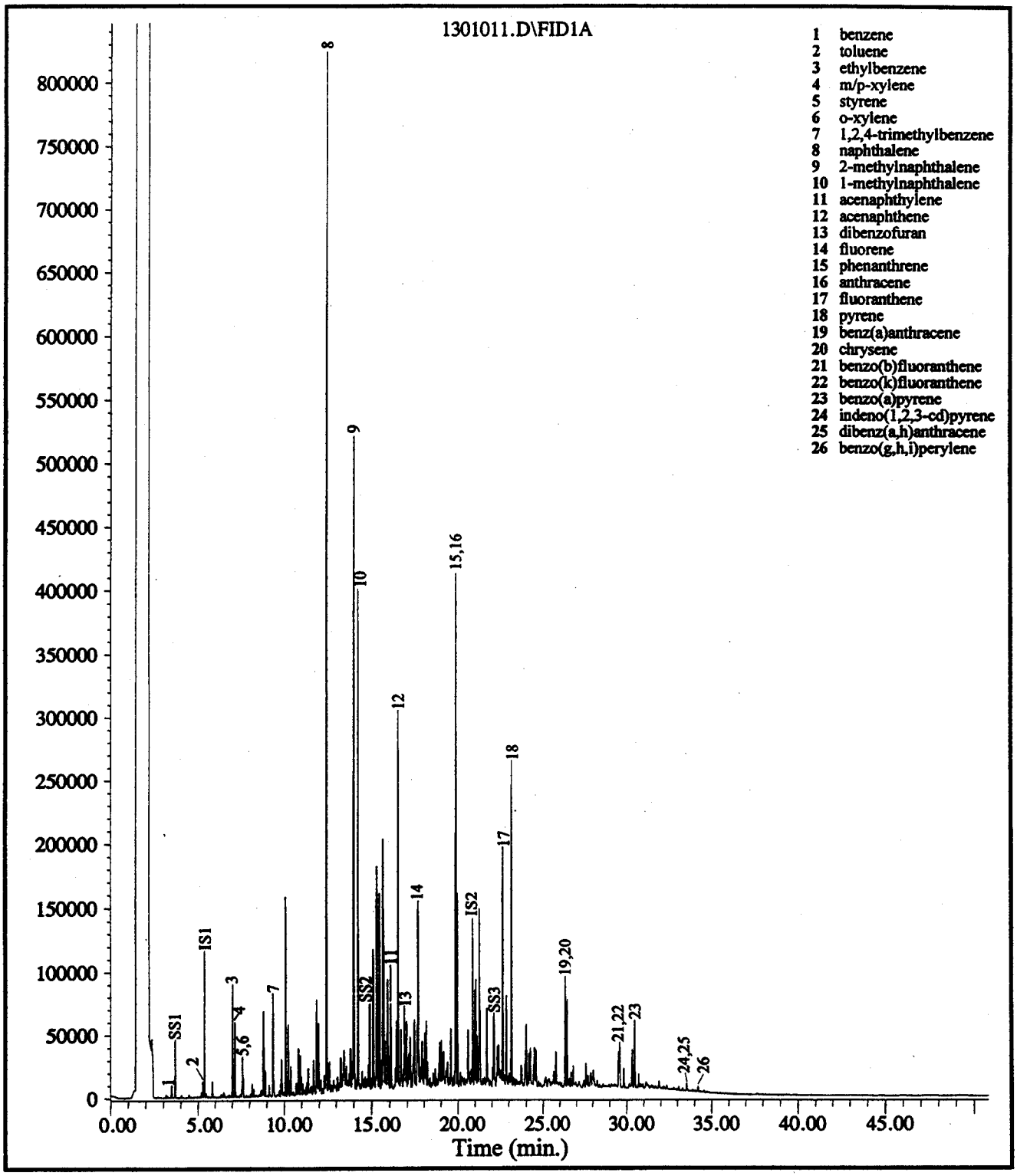
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**Clay Tile #1A**
Laboratory ID:	IG010925-01MF
Method:	MET4007D

IG925frac.ppt

META

GC/FID Fingerprint

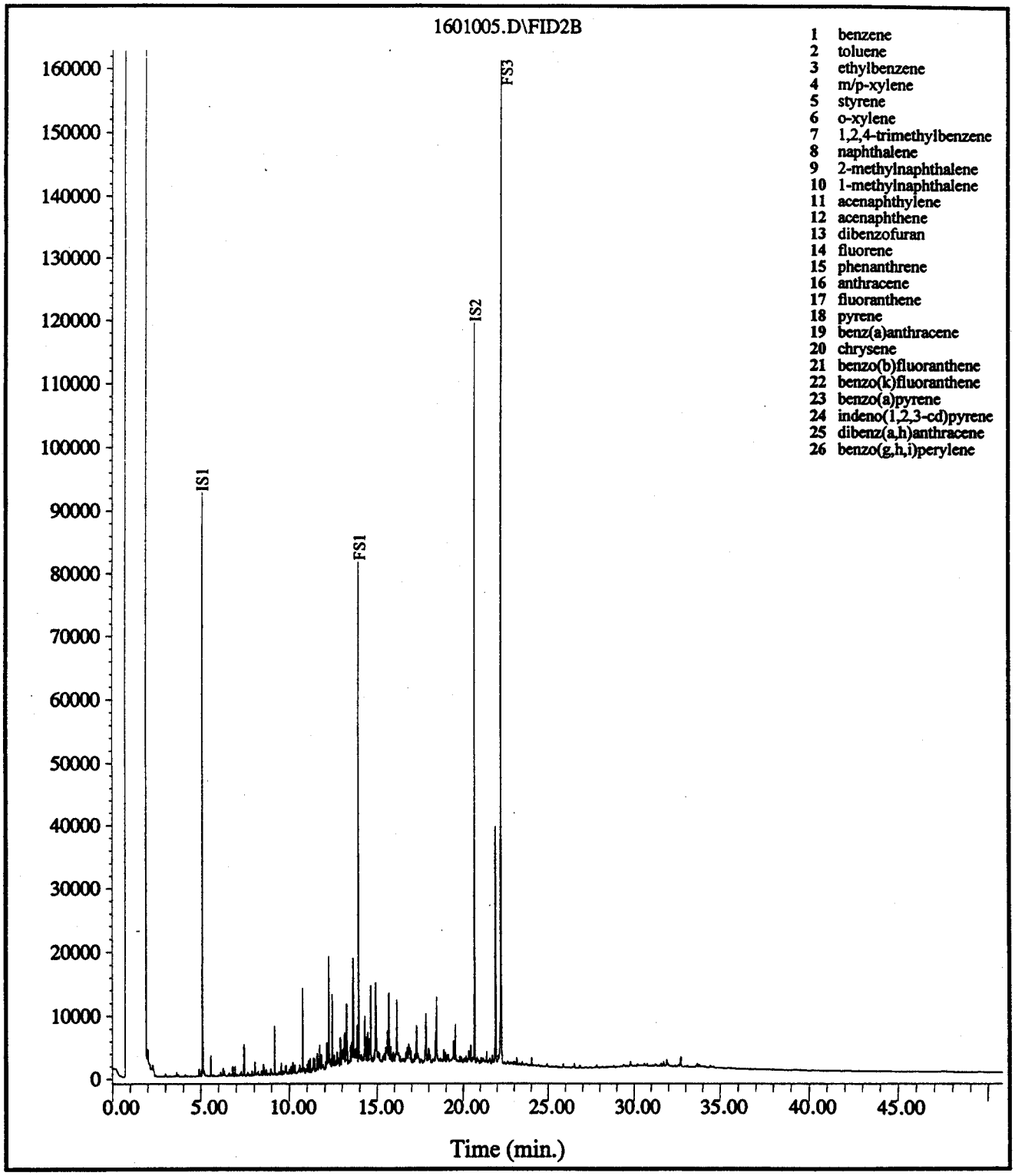


IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane

Field ID:	**Clay Tile #1B**
Laboratory ID:	IG010925-02
Method:	MET4007D

META

GC/FID Fingerprint



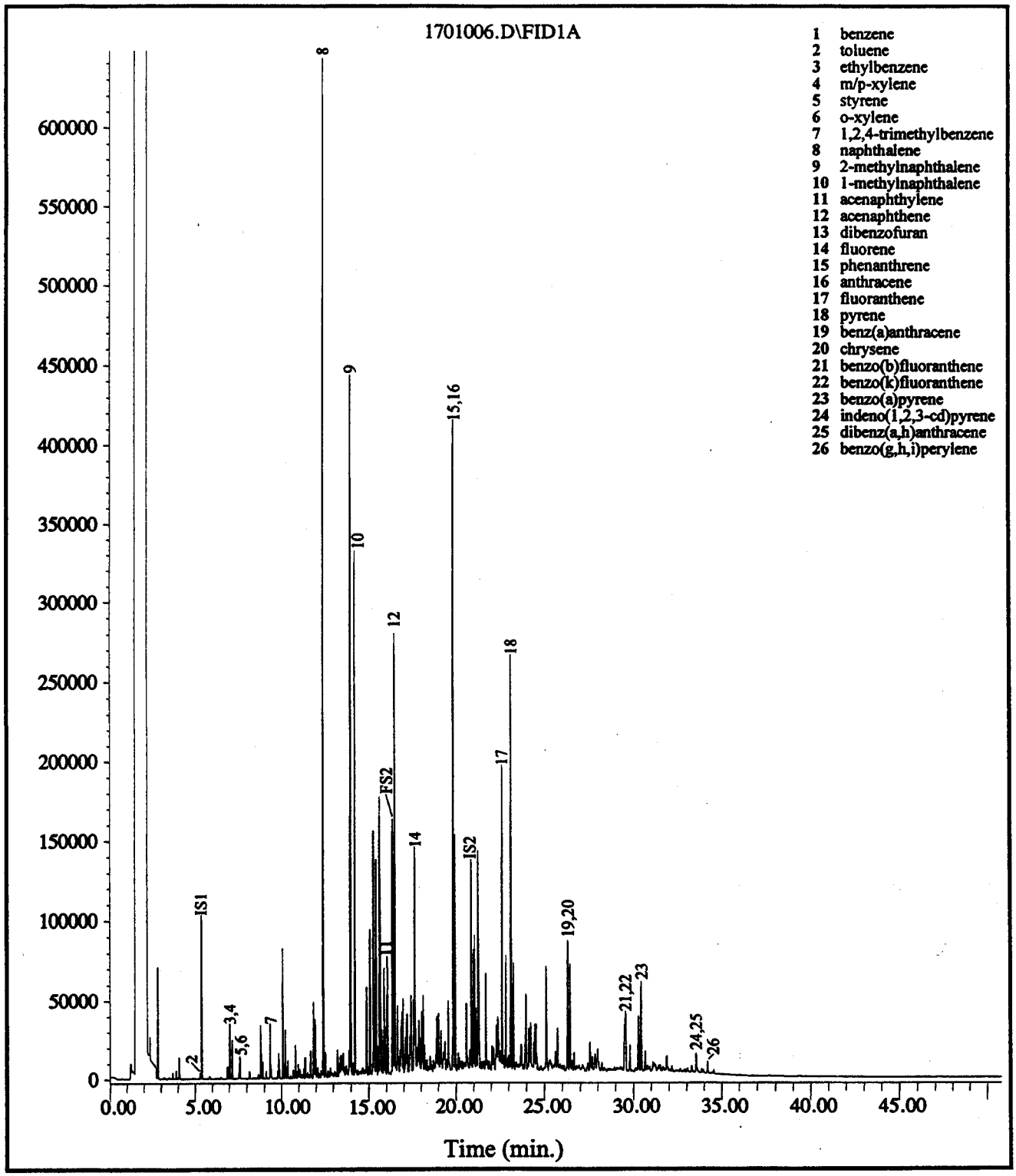
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**Clay Tile #1B**
Laboratory ID:	IG010925-02PF
Method:	MET4007D

1G925frac.ppt

META

GC/FID Fingerprint



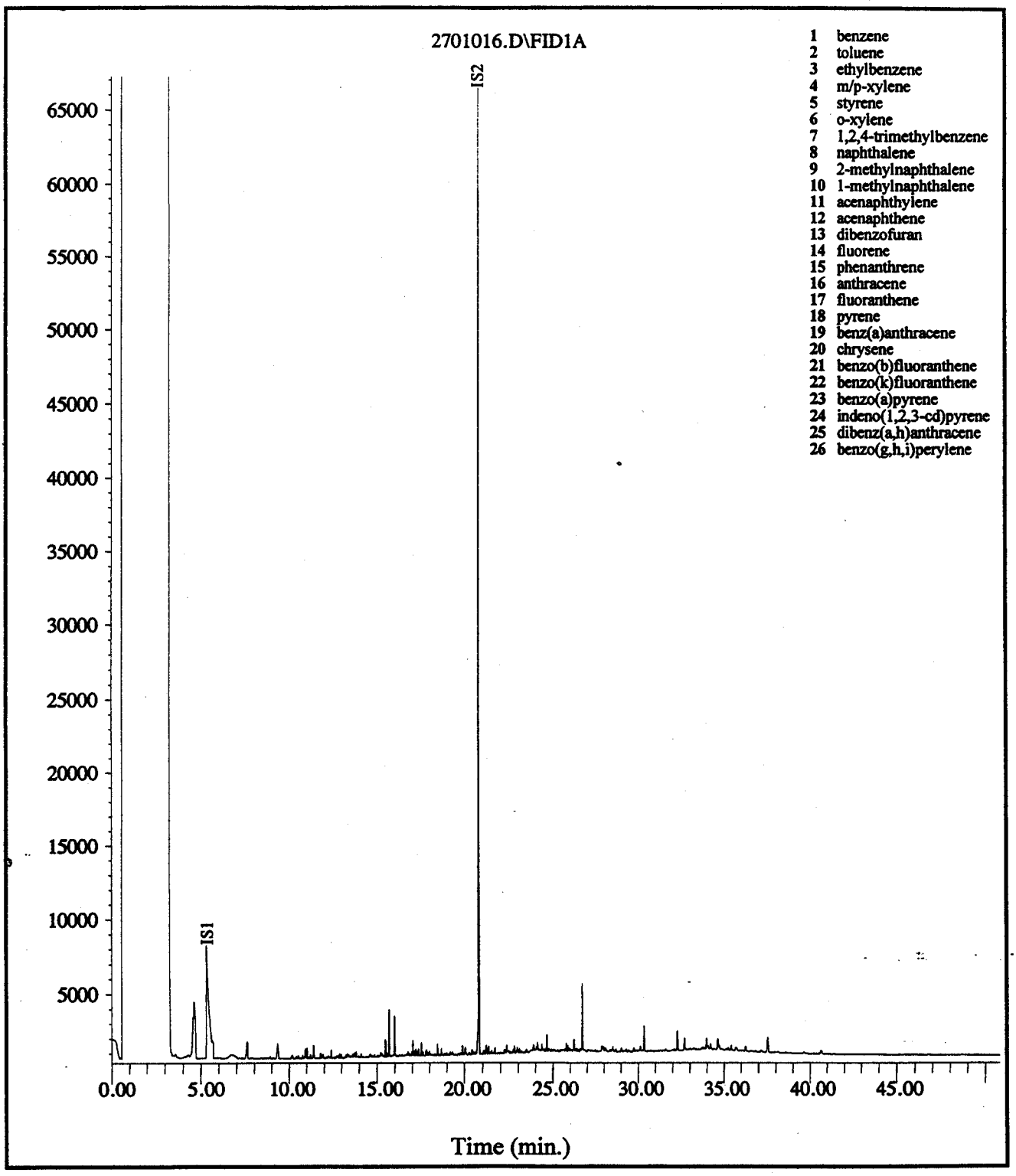
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

IG925ftrac.ppt

Field ID:	**Clay Tile #1B**
Laboratory ID:	IG010925-02DF
Method:	MET4007D

META

GC/FID Fingerprint



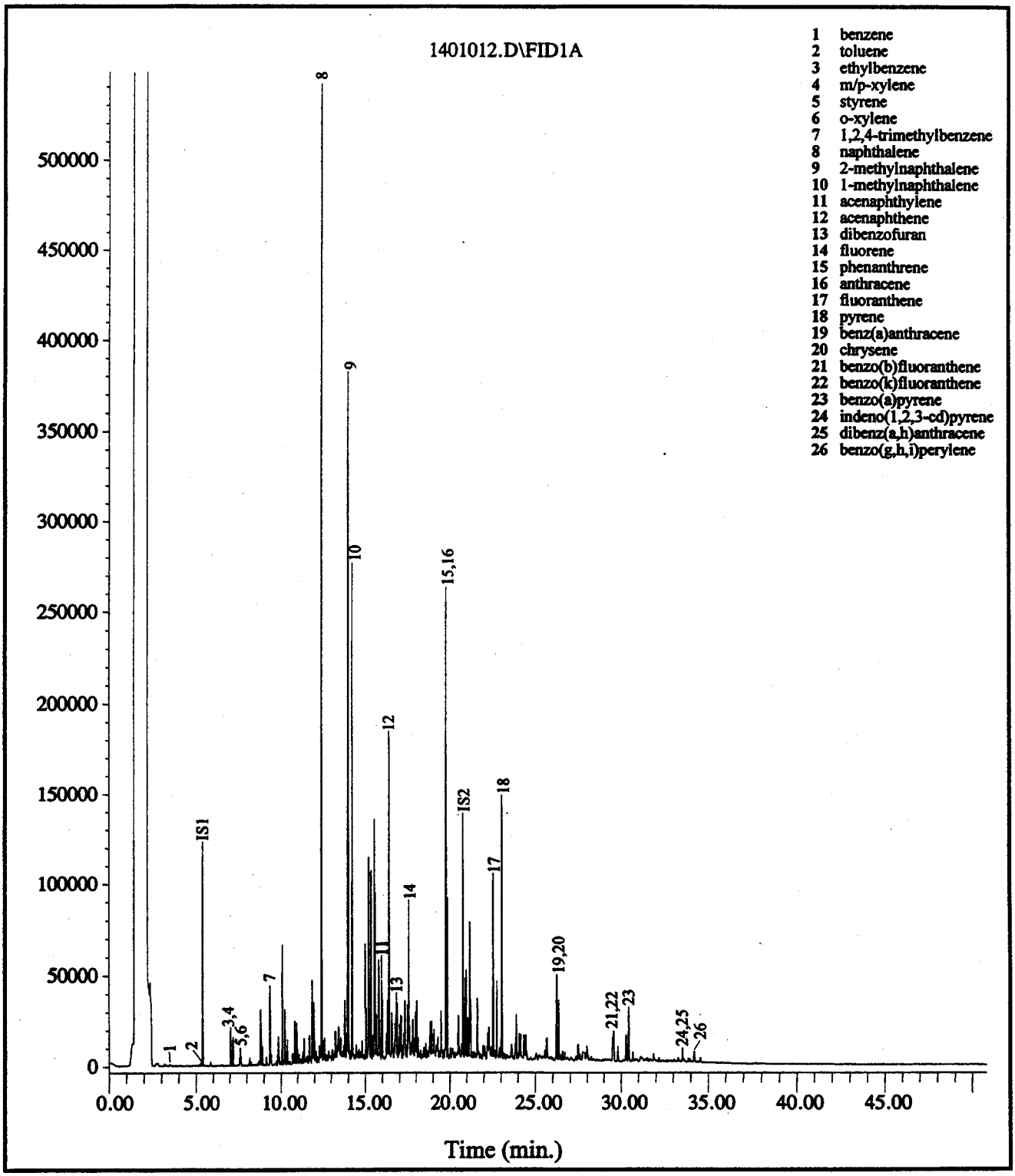
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**Clay Tile #1B**
Laboratory ID:	IG010925-02MF
Method:	MET4007D

IG925frac.ppt

META

GC/FID Fingerprint

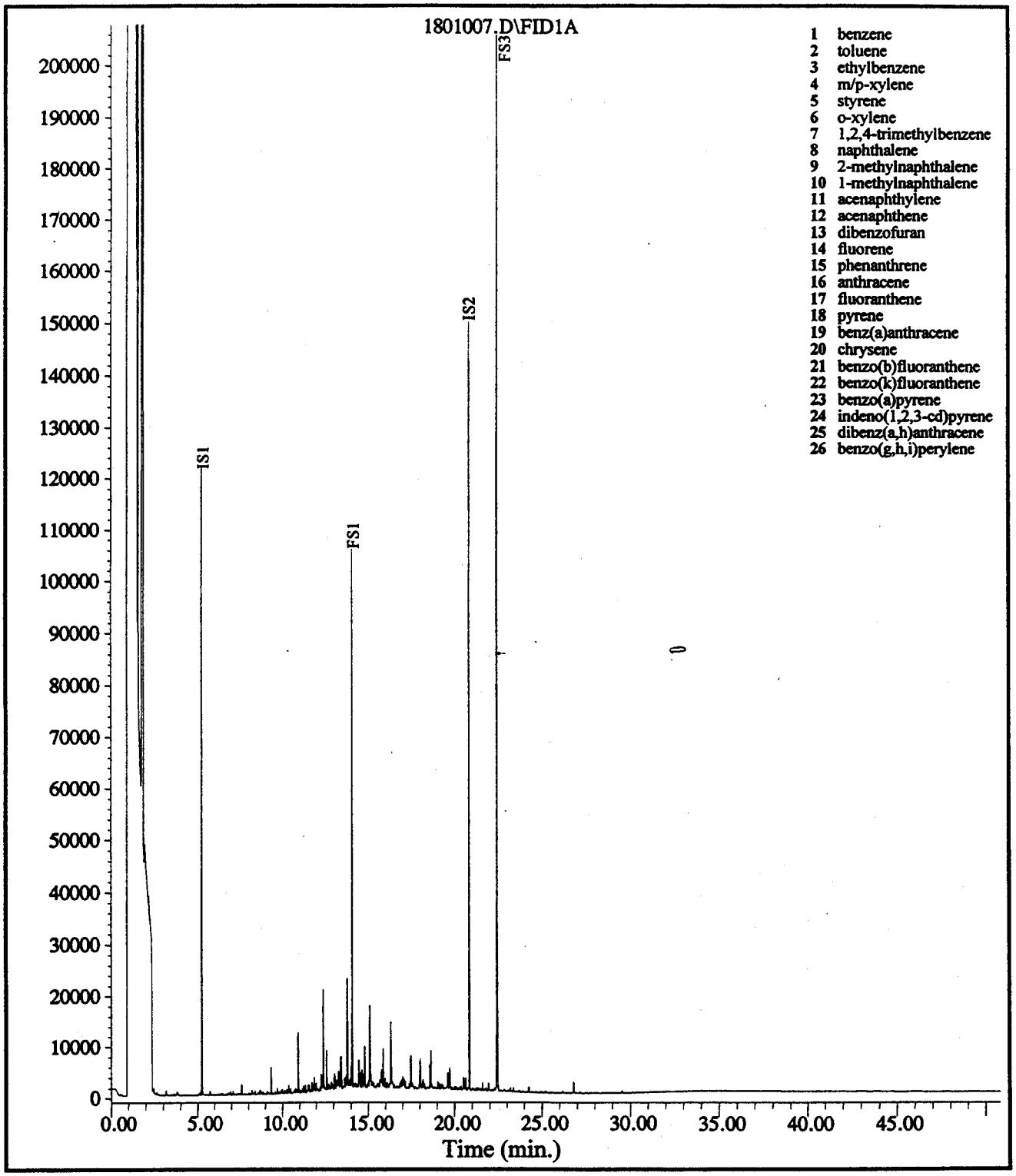


IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane

Field ID:	**Clay Tile #2**
Laboratory ID:	IG010925-03
Method:	MET4007D

META

GC/FID Fingerprint



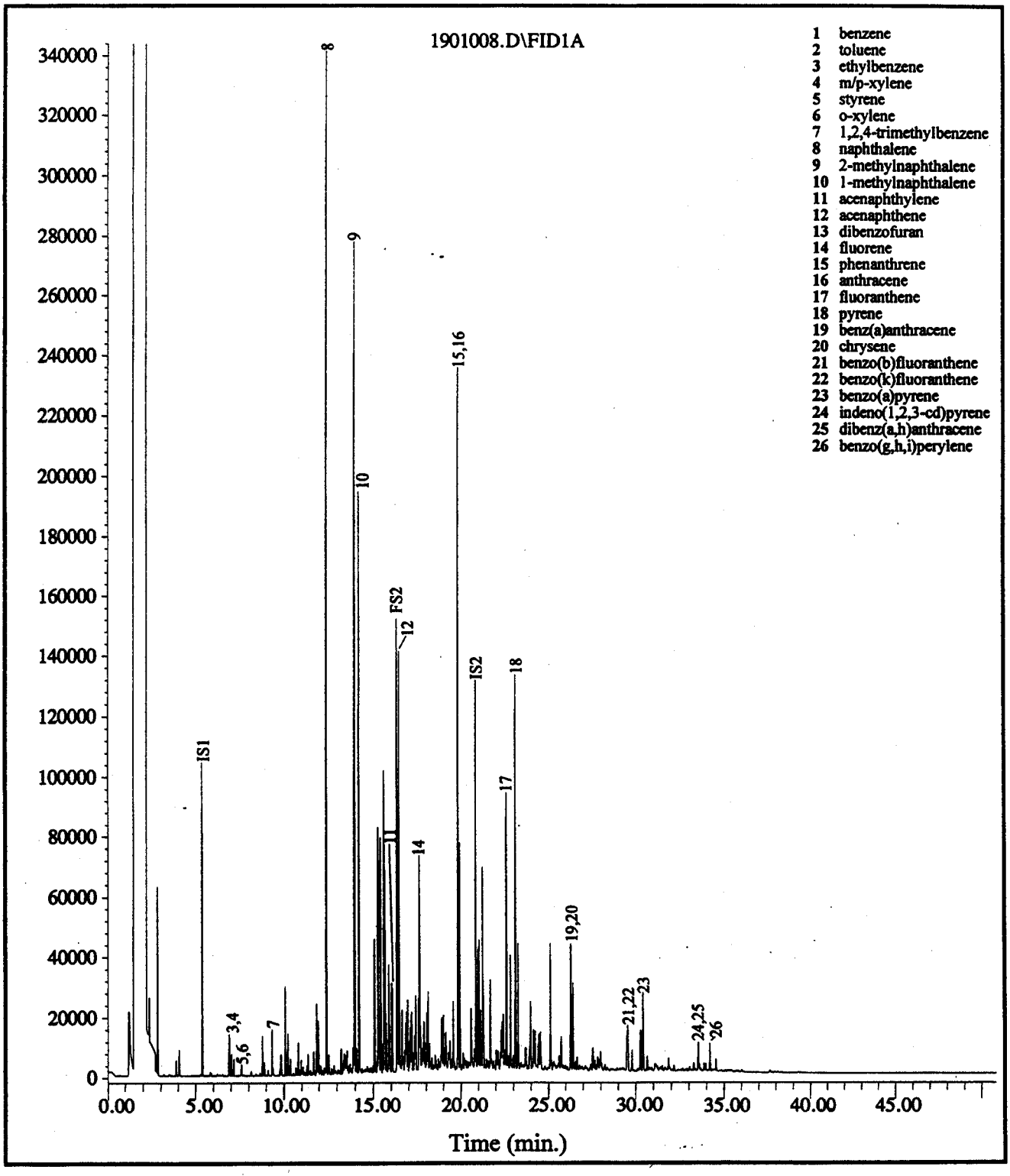
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**Clay Tile #2**
Laboratory ID:	IG010925-03PF
Method:	MET4007D

IG925frac.ppt

META

GC/FID Fingerprint



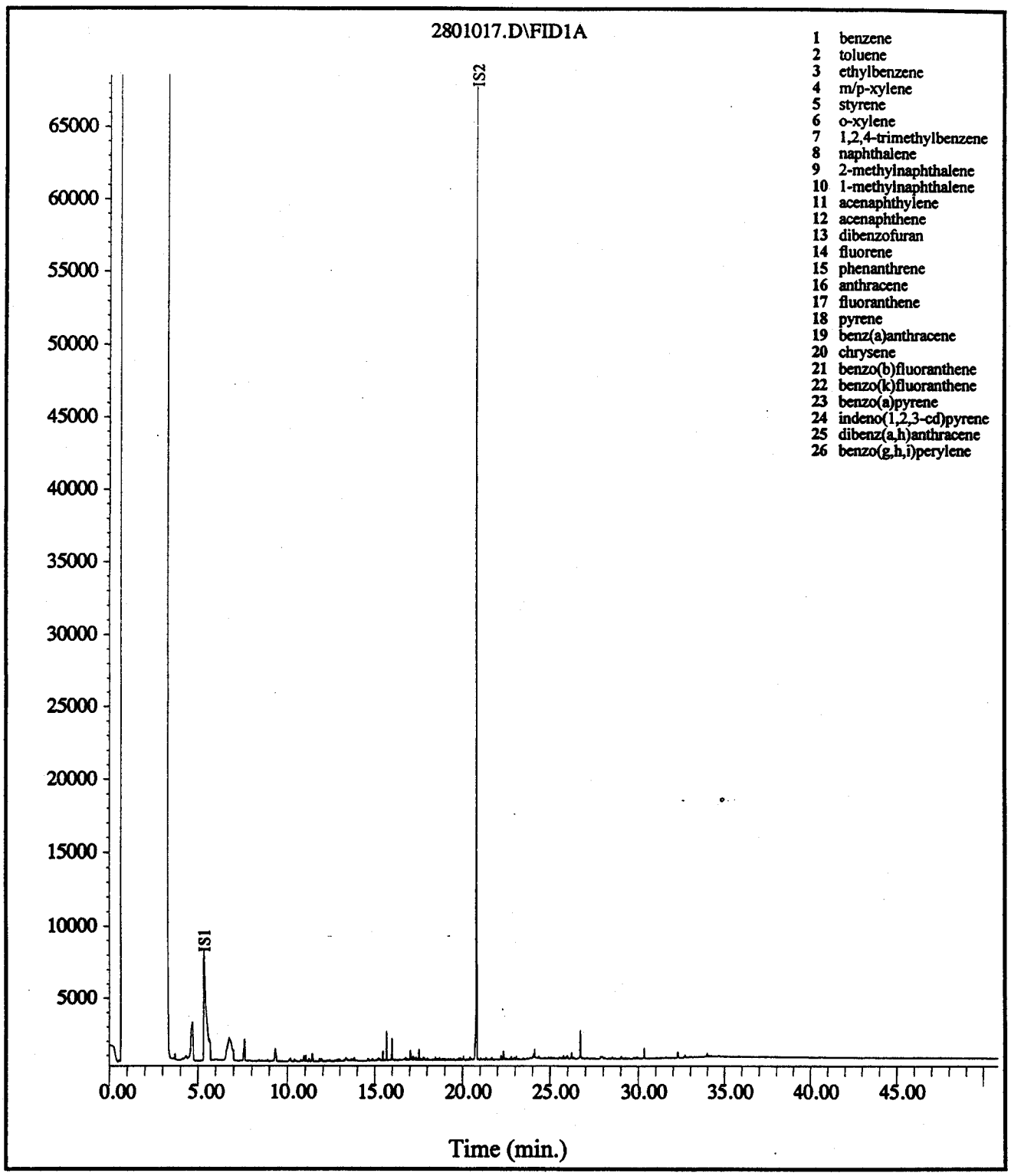
IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

IG925fmc.ppt

Field ID:	**Clay Tile #2**
Laboratory ID:	IG010925-03DF
Method:	MET4007D

META

GC/FID Fingerprint



IS1 - 2,4-difluorotoluene
IS2 - o-terphenyl
SS1 - fluorobenzene
SS2 - 2-fluorobiphenyl
SS3 - 5α-androstane
FS1 - 2,5-dibromotoluene
FS2 - 2-bromonaphthalene
FS3 - 1-chloroocatane

Field ID:	**Clay Tile #2**
Laboratory ID:	IG010925-03MF
Method:	MET4007D

IG925frac.ppt

META

Appendix C

Chemical Concentrations

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID:	**Clay Tile#1A**	Preparation Method:	EPA 3511 Draft
		Cleanup Method(s):	
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
Project:	Ashland	Matrix:	Water
		Preservation:	None
Lab ID:	IG010925-01b	Decanted:	No
File ID:	04OCT04.D		
		Sample Size:	35.818 g
Date Sampled:	9/19/01	%Solid:	100%
Date Received:	9/25/01	Extract Volume:	2 mL
Date Prepared:	9/25/01	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	4 Oct 2001 10:39 am	Injection Volume:	0.001 mL
Instrument:	HP_5972		
Operator:	kty	Batch QC:	IG010925-AB

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene	1,460		5.58	2.79	
Toluene	840		5.58	2.79	
Ethylbenzene	2,980		5.58	2.79	
m/p-Xylenes	3,250		5.58	2.79	
Styrene	1,070		5.58	2.79	
o-Xylene	1,720		5.58	2.79	
1,2,4-Trimethylbenzene	4,290		5.58	2.79	
Naphthalene	83,200	D	5.58	2.79	
2-Methylnaphthalene	56,600	D	5.58	2.79	
1-Methylnaphthalene	37,500	D	5.58	2.79	
Acenaphthylene	5,510		5.58	2.79	
Acenaphthene	28,300	D	5.58	2.79	
Dibenzofuran	2,280		5.58	2.79	
Fluorene	16,200	D	5.58	2.79	
Phenanthrene	59,100	D	5.58	2.79	
Anthracene	17,100	D	5.58	2.79	
Fluoranthene	22,000	D	5.58	2.79	
Pyrene	32,800	D	5.58	2.79	
Benz[a]anthracene	11,100	D	5.58	2.79	
Chrysene	5,060		5.58	2.79	
Benzo[b]fluoranthene	2,540		5.58	2.79	
Benzo[k]fluoranthene	2,440		5.58	2.79	
Benzo[a]pyrene	4,800		5.58	2.79	
Indeno[1,2,3-cd]pyrene	2,640		5.58	2.79	
Dibenz[a,h]anthracene	694		5.58	2.79	
Benzo[g,h,i]perylene	2,730		5.58	2.79	
ALKYLATED PAHs:					
C0-Benzene	1,460		5.58	2.79	
C1-Benzene	964		5.58	2.79	
C2-Benzene	8,890	D	5.58	2.79	
C3-Benzene	14,500	D	5.58	2.79	
C4-Benzene	19,500	D	5.58	2.79	
C5-Benzene	3,030		5.58	2.79	
C0-Naphthalene	83,200	D	5.58	2.79	
C1-Naphthalene	59,500	D	5.58	2.79	
C2-Naphthalene	40,000	D	5.58	2.79	
C3-Naphthalene	16,200	D	5.58	2.79	
C4-Naphthalene	2,340		5.58	2.79	
C0-Fluorene	16,200	D	5.58	2.79	
C1-Fluorene	12,700	D	5.58	2.79	
C2-Fluorene	2,790		5.58	2.79	
C3-Fluorene	744		5.58	2.79	
C0-Phenanthrene/Anthracene	76,900	D	5.58	2.79	
C1-Phenanthrene/Anthracene	27,300	D	5.58	2.79	
C2-Phenanthrene/Anthracene	5,540		5.58	2.79	
C3-Phenanthrene/Anthracene	980		5.58	2.79	
C4-Phenanthrene/Anthracene	224		5.58	2.79	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3511 Draft	
Field ID:	**Clay Tile#1A**	Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	Water	
		Preservation:	None	
Lab ID:	IG010925-01b	Decanted:	No	
File ID:	04OCT04.D			
		Sample Size:	35.818	g
Date Sampled:	9/19/01	%Solid:	100%	
Date Received:	9/25/01	Extract Volume:	2	mL
Date Prepared:	9/25/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	4 Oct 2001 10:39 am	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010925-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
C0-Dibenzothiophene	3,690		5.58	2.79	
C1-Dibenzothiophene	3,340		5.58	2.79	
C2-Dibenzothiophene	2,050		5.58	2.79	
C3-Dibenzothiophene	996		5.58	2.79	
C0-Fluoranthene/Pyrene	66,700	D	5.58	2.79	
C1-Fluoranthene/Pyrene	18,900	D	5.58	2.79	
C2-Fluoranthene/Pyrene	2,770		5.58	2.79	
C3-Fluoranthene/Pyrene	559		5.58	2.79	
C0-Benz(a)anthracene/Chrysene	20,700	D	5.58	2.79	
C1-Benz(a)anthracene/Chrysene	2,710		5.58	2.79	
C2-Benz(a)anthracene/Chrysene	710		5.58	2.79	
C3-Benz(a)anthracene/Chrysene	145		5.58	2.79	
C4-Benz(a)anthracene/Chrysene	64.7		5.58	2.79	

Surrogates	%R	Min	Max
Fluorobenzene	89%	50%	150%
2-Fluorobiphenyl	114%	50%	120%
5a-Androstane	127%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID:	**Clay Tile#1B**	Preparation Method:	EPA 3570 Draft	
		Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	Soil	
		Preservation:	None	
Lab ID:	IG010925-02a	Decanted:	No	
File ID:	04OCT03.D			
		Sample Size:	1.953	g
Date Sampled:	9/19/01	%Solid:	54%	
Date Received:	9/25/01	Extract Volume:	2	mL
Date Prepared:	9/25/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	4 Oct 2001 9:36 am	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010925-SB	

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
PAH COMPOUNDS:					
Benzene	5.22		0.19	0.10	
Toluene	7.16		0.19	0.10	
Ethylbenzene	48.1		0.19	0.10	
m/p-Xylenes	36.7		0.19	0.10	
Styrene	6.06		0.19	0.10	
o-Xylene	17.8		0.19	0.10	
1,2,4-Trimethylbenzene	40.1		0.19	0.10	
Naphthalene	679	D	0.19	0.10	
2-Methylnaphthalene	404	D	0.19	0.10	
1-Methylnaphthalene	264	D	0.19	0.10	
Acenaphthylene	39.4		0.19	0.10	
Acenaphthene	208	D	0.19	0.10	
Dibenzofuran	19.7		0.19	0.10	
Fluorene	102		0.19	0.10	
Phenanthrene	386	D	0.19	0.10	
Anthracene	103		0.19	0.10	
Fluoranthene	124		0.19	0.10	
Pyrene	165		0.19	0.10	
Benz[a]anthracene	54.4		0.19	0.10	
Chrysene	49.3		0.19	0.10	
Benzo[b]fluoranthene	21.2		0.19	0.10	
Benzo[k]fluoranthene	29.4		0.19	0.10	
Benzo[a]pyrene	44.1		0.19	0.10	
Indeno[1,2,3-cd]pyrene	19.8		0.19	0.10	
Dibenz[a,h]anthracene	5.02		0.19	0.10	
Benzo[g,h,i]perylene	20.0		0.19	0.10	
ALKYLATED PAHs:					
C0-Benzene	5.22		0.19	0.10	
C1-Benzene	8.21		0.19	0.10	
C2-Benzene	130		0.19	0.10	
C3-Benzene	162		0.19	0.10	
C4-Benzene	131		0.19	0.10	
C5-Benzene	25.6		0.19	0.10	
C0-Naphthalene	679	D	0.19	0.10	
C1-Naphthalene	422	D	0.19	0.10	
C2-Naphthalene	266	D	0.19	0.10	
C3-Naphthalene	102		0.19	0.10	
C4-Naphthalene	18.8		0.19	0.10	
C0-Fluorene	102		0.19	0.10	
C1-Fluorene	85.6		0.19	0.10	
C2-Fluorene	21.8		0.19	0.10	
C3-Fluorene	6.61		0.19	0.10	
C0-Phenanthrene/Anthracene	498	D	0.19	0.10	
C1-Phenanthrene/Anthracene	168		0.19	0.10	
C2-Phenanthrene/Anthracene	46.8		0.19	0.10	
C3-Phenanthrene/Anthracene	8.77		0.19	0.10	
C4-Phenanthrene/Anthracene	9.99		0.19	0.10	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3570 Draft
Field ID:	**Clay Tile#1B**	Cleanup Method(s):	
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
Project:	Ashland	Matrix:	Soil
		Preservation:	None
Lab ID:	IG010925-02a	Decanted:	No
File ID:	04OCT03.D		
		Sample Size:	1.953 g
Date Sampled:	9/19/01	%Solid:	54%
Date Received:	9/25/01	Extract Volume:	2 mL
Date Prepared:	9/25/01	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	4 Oct 2001 9:36 am	Injection Volume:	0.001 mL
Instrument:	HP_5972		
Operator:	kty	Batch QC:	IG010925-SB

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
C0-Dibenzothiophene	31.3		0.19	0.10	
C1-Dibenzothiophene	27.8		0.19	0.10	
C2-Dibenzothiophene	16.8		0.19	0.10	
C3-Dibenzothiophene	8.29		0.19	0.10	
C0-Fluoranthene/Pyrene	348		0.19	0.10	
C1-Fluoranthene/Pyrene	98.7		0.19	0.10	
C2-Fluoranthene/Pyrene	22.1		0.19	0.10	
C3-Fluoranthene/Pyrene	5.61		0.19	0.10	
C0-Benz(a)anthracene/Chrysene	103		0.19	0.10	
C1-Benz(a)anthracene/Chrysene	25.2		0.19	0.10	
C2-Benz(a)anthracene/Chrysene	7.34		0.19	0.10	
C3-Benz(a)anthracene/Chrysene	2.33		0.19	0.10	
C4-Benz(a)anthracene/Chrysene	0.75		0.19	0.10	

Surrogates	%R	Min	Max
Fluorobenzene	65%	50%	150%
2-Fluorobiphenyl	91%	50%	120%
5a-Androstane	95%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **Clay Tile#2**

		Preparation Method:	EPA 3580	
		Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	NAPL	
		Preservation:	None	
Lab ID:	IG010920-03	Decanted:	No	
File ID:	26SEP24.D			
		Sample Size:	0.0145	g
Date Sampled:	9/20/01	%Solid:	100%	
Date Received:	9/25/01	Extract Volume:	2	mL
Date Prepared:	9/25/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	27 Sep 2001 11:01 am	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010925-MB	

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
PAH COMPOUNDS:					
Benzene	36.7		13.8	6.90	
Toluene	79.3		13.8	6.90	
Ethylbenzene	743		13.8	6.90	
m/p-Xylenes	580		13.8	6.90	
Styrene	392		13.8	6.90	
o-Xylene	336		13.8	6.90	
1,2,4-Trimethylbenzene	1,270		13.8	6.90	
Naphthalene	28,700	D	13.8	6.90	
2-Methylnaphthalene	20,900	D	13.8	6.90	
1-Methylnaphthalene	13,300		13.8	6.90	
Acenaphthylene	2,110		13.8	6.90	
Acenaphthene	7,260		13.8	6.90	
Dibenzofuran	842		13.8	6.90	
Fluorene	3,590		13.8	6.90	
Phenanthrene	16,700	D	13.8	6.90	
Anthracene	4,150		13.8	6.90	
Fluoranthene	5,100		13.8	6.90	
Pyrene	7,340		13.8	6.90	
Benz[a]anthracene	2,340		13.8	6.90	
Chrysene	2,150		13.8	6.90	
Benzo[b]fluoranthene	918		13.8	6.90	
Benzo[k]fluoranthene	1,100		13.8	6.90	
Benzo[a]pyrene	1,930		13.8	6.90	
Indeno[1,2,3-cd]pyrene	907		13.8	6.90	
Dibenz[a,h]anthracene	196		13.8	6.90	
Benzo[g,h,i]perylene	904		13.8	6.90	
ALKYLATED PAHs:					
C0-Benzene	36.7		13.8	6.90	
C1-Benzene	91.0		13.8	6.90	
C2-Benzene	2,150		13.8	6.90	
C3-Benzene	4,330		13.8	6.90	
C4-Benzene	4,730		13.8	6.90	
C5-Benzene	1,470		13.8	6.90	
C0-Naphthalene	28,700	D	13.8	6.90	
C1-Naphthalene	21,600	D	13.8	6.90	
C2-Naphthalene	11,200		13.8	6.90	
C3-Naphthalene	3,590		13.8	6.90	
C4-Naphthalene	646		13.8	6.90	
C0-Fluorene	3,590		13.8	6.90	
C1-Fluorene	3,440		13.8	6.90	
C2-Fluorene	859		13.8	6.90	
C3-Fluorene	203		13.8	6.90	
C0-Phenanthrene/Anthracene	21,700	D	13.8	6.90	
C1-Phenanthrene/Anthracene	6,830		13.8	6.90	
C2-Phenanthrene/Anthracene	1,880		13.8	6.90	
C3-Phenanthrene/Anthracene	331		13.8	6.90	
C4-Phananthrene/Anthracene	80.1		13.8	6.90	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3580	
Field ID:	**Clay Tile#2**	Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	NAPL	
		Preservation:	None	
Lab ID:	IG010920-03	Decanted:	No	
File ID:	26SEP24.D			
		Sample Size:	0.0145	g
Date Sampled:	9/20/01	%Solid:	100%	
Date Received:	9/25/01	Extract Volume:	2	mL
Date Prepared:	9/25/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	27 Sep 2001 11:01 am	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010925-MB	

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
C0-Dibenzothiophene	1,270		13.8	6.90	
C1-Dibenzothiophene	1,150		13.8	6.90	
C2-Dibenzothiophene	704		13.8	6.90	
C3-Dibenzothiophene	361		13.8	6.90	
C0-Fluoranthene/Pyrene	17,000	D	13.8	6.90	
C1-Fluoranthene/Pyrene	4,620		13.8	6.90	
C2-Fluoranthene/Pyrene	775		13.8	6.90	
C3-Fluoranthene/Pyrene	132		13.8	6.90	
C0-Benz(a)anthracene/Chrysene	4,420		13.8	6.90	
C1-Benz(a)anthracene/Chrysene	1,080		13.8	6.90	
C2-Benz(a)anthracene/Chrysene	297		13.8	6.90	
C3-Benz(a)anthracene/Chrysene	121		13.8	6.90	
C4-Benz(a)anthracene/Chrysene	35.8		13.8	6.90	

Surrogates	%R	Min	Max
Fluorobenzene	0%	50%	150%
2-Fluorobiphenyl	0%	50%	120%
5a-Androstane	0%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3580	
Field ID:	**Method Blank**	Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	NAPL	
		Preservation:	None	
Lab ID:	IG010925-MB	Decanted:	No	
File ID:	27SEP03.D			
		Sample Size:	0.01	g
Date Sampled:		%Solid:	100%	
Date Received:		Extract Volume:	2	mL
Date Prepared:	9/25/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	27 Sep 2001 5:05 pm	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010925-MB	

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
PAH COMPOUNDS:					
Benzene		U	20.0	10.0	
Toluene		U	20.0	10.0	
Ethylbenzene		U	20.0	10.0	
m/p-Xylenes		U	20.0	10.0	
Styrene		U	20.0	10.0	
o-Xylene		U	20.0	10.0	
1,2,4-Trimethylbenzene		U	20.0	10.0	
Naphthalene		U	20.0	10.0	
2-Methylnaphthalene		U	20.0	10.0	
1-Methylnaphthalene		U	20.0	10.0	
Acenaphthylene		U	20.0	10.0	
Acenaphthene		U	20.0	10.0	
Dibenzofuran		U	20.0	10.0	
Fluorene		U	20.0	10.0	
Phenanthrene		U	20.0	10.0	
Anthracene		U	20.0	10.0	
Fluoranthene		U	20.0	10.0	
Pyrene		U	20.0	10.0	
Benz[a]anthracene		U	20.0	10.0	
Chrysene		U	20.0	10.0	
Benzo[b]fluoranthene		U	20.0	10.0	
Benzo[k]fluoranthene		U	20.0	10.0	
Benzo[a]pyrene		U	20.0	10.0	
Indeno[1,2,3-cd]pyrene		U	20.0	10.0	
Dibenz[a,h]anthracene		U	20.0	10.0	
Benzo[g,h,i]perylene		U	20.0	10.0	
ALKYLATED PAHs:					
C0-Benzene		U	20.0	10.0	
C1-Benzene		U	20.0	10.0	
C2-Benzene		U	20.0	10.0	
C3-Benzene		U	20.0	10.0	
C4-Benzene		U	20.0	10.0	
C5-Benzene		U	20.0	10.0	
C0-Naphthalene		U	20.0	10.0	
C1-Naphthalene		U	20.0	10.0	
C2-Naphthalene		U	20.0	10.0	
C3-Naphthalene		U	20.0	10.0	
C4-Naphthalene		U	20.0	10.0	
C0-Fluorene		U	20.0	10.0	
C1-Fluorene		U	20.0	10.0	
C2-Fluorene		U	20.0	10.0	
C3-Fluorene		U	20.0	10.0	
C0-Phenanthrene/Anthracene		U	20.0	10.0	
C1-Phenanthrene/Anthracene		U	20.0	10.0	
C2-Phenanthrene/Anthracene		U	20.0	10.0	
C3-Phenanthrene/Anthracene		U	20.0	10.0	
C4-Phananthrene/Anthracene		U	20.0	10.0	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3580
Field ID:	**Method Blank**	Cleanup Method(s):	
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
Project:	Ashland	Matrix:	NAPL
		Preservation:	None
Lab ID:	IG010925-MB	Decanted:	No
File ID:	27SEP03.D		
		Sample Size:	0.01 g
Date Sampled:		%Solid:	100%
Date Received:		Extract Volume:	2 mL
Date Prepared:	9/25/01	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	27 Sep 2001 5:05 pm	Injection Volume:	0.001 mL
Instrument:	HP_5972		
Operator:	kty	Batch QC:	IG010925-MB

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
C0-Dibenzothiophene		U	20.0	10.0	
C1-Dibenzothiophene		U	20.0	10.0	
C2-Dibenzothiophene		U	20.0	10.0	
C3-Dibenzothiophene		U	20.0	10.0	
C0-Fluoranthene/Pyrene		U	20.0	10.0	
C1-Fluoranthene/Pyrene		U	20.0	10.0	
C2-Fluoranthene/Pyrene		U	20.0	10.0	
C3-Fluoranthene/Pyrene		U	20.0	10.0	
C0-Benz(a)anthracene/Chrysene		U	20.0	10.0	
C1-Benz(a)anthracene/Chrysene		U	20.0	10.0	
C2-Benz(a)anthracene/Chrysene		U	20.0	10.0	
C3-Benz(a)anthracene/Chrysene		U	20.0	10.0	
C4-Benz(a)anthracene/Chrysene		U	20.0	10.0	

Surrogates	%R	Min	Max
Fluorobenzene	Not Spiked	50%	150%
2-Fluorobiphenyl	Not Spiked	50%	120%
5a-Androstane	Not Spiked	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **Aqueous Blank**

Client:	GTI	Preparation Method:	EPA 3511 Draft	
Project:	Ashland	Cleanup Method(s):		
Lab ID:	IG010925-AB	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
File ID:	27SEP04.D	Matrix:	Water	
		Preservation:	None	
		Decanted:	No	
Date Sampled:		Sample Size:	35	g
Date Received:		%Solid:	100%	
Date Prepared:	9/25/01	Extract Volume:	2	mL
Date Cleanup:		Prep DF:	1	
Date Analyzed:	27 Sep 2001 6:14 pm	Analysis DF:	1	
Instrument:	HP_5972	Injection Volume:	0.001	mL
Operator:	kty	Batch QC:	IG010925-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene		U	5.71	2.86	
Toluene		U	5.71	2.86	
Ethylbenzene		U	5.71	2.86	
m/p-Xylenes		U	5.71	2.86	
Styrene		U	5.71	2.86	
o-Xylene		U	5.71	2.86	
1,2,4-Trimethylbenzene		U	5.71	2.86	
Naphthalene		U	5.71	2.86	
2-Methylnaphthalene		U	5.71	2.86	
1-Methylnaphthalene		U	5.71	2.86	
Acenaphthylene		U	5.71	2.86	
Acenaphthene		U	5.71	2.86	
Dibenzofuran		U	5.71	2.86	
Fluorene		U	5.71	2.86	
Phenanthrene		U	5.71	2.86	
Anthracene		U	5.71	2.86	
Fluoranthene		U	5.71	2.86	
Pyrene		U	5.71	2.86	
Benz[a]anthracene		U	5.71	2.86	
Chrysene		U	5.71	2.86	
Benzo[b]fluoranthene		U	5.71	2.86	
Benzo[k]fluoranthene		U	5.71	2.86	
Benzo[a]pyrene		U	5.71	2.86	
Indeno[1,2,3-cd]pyrene		U	5.71	2.86	
Dibenz[a,h]anthracene		U	5.71	2.86	
Benzo[g,h,i]perylene		U	5.71	2.86	
ALKYLATED PAHs:					
C0-Benzene		U	5.71	2.86	
C1-Benzene		U	5.71	2.86	
C2-Benzene		U	5.71	2.86	
C3-Benzene		U	5.71	2.86	
C4-Benzene		U	5.71	2.86	
C5-Benzene		U	5.71	2.86	
C0-Naphthalene		U	5.71	2.86	
C1-Naphthalene		U	5.71	2.86	
C2-Naphthalene		U	5.71	2.86	
C3-Naphthalene		U	5.71	2.86	
C4-Naphthalene		U	5.71	2.86	
C0-Fluorene		U	5.71	2.86	
C1-Fluorene		U	5.71	2.86	
C2-Fluorene		U	5.71	2.86	
C3-Fluorene		U	5.71	2.86	
C0-Phenanthrene/Anthracene		U	5.71	2.86	
C1-Phenanthrene/Anthracene		U	5.71	2.86	
C2-Phenanthrene/Anthracene		U	5.71	2.86	
C3-Phenanthrene/Anthracene		U	5.71	2.86	
C4-Phananthrene/Anthracene		U	5.71	2.86	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3511 Draft
Field ID:	**Aqueous Blank**	Cleanup Method(s):	
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
Project:	Ashland	Matrix:	Water
		Preservation:	None
Lab ID:	IG010925-AB	Decanted:	No
File ID:	27SEP04.D		
		Sample Size:	35 g
Date Sampled:		%Solid:	100%
Date Received:		Extract Volume:	2 mL
Date Prepared:	9/25/01	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	27 Sep 2001 6:14 pm	Injection Volume:	0.001 mL
Instrument:	HP_5972		
Operator:	kty	Batch QC:	IG010925-AB

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
C0-Dibenzothiophene		U	5.71	2.86	
C1-Dibenzothiophene		U	5.71	2.86	
C2-Dibenzothiophene		U	5.71	2.86	
C3-Dibenzothiophene		U	5.71	2.86	
C0-Fluoranthene/Pyrene		U	5.71	2.86	
C1-Fluoranthene/Pyrene		U	5.71	2.86	
C2-Fluoranthene/Pyrene		U	5.71	2.86	
C3-Fluoranthene/Pyrene		U	5.71	2.86	
C0-Benz(a)anthracene/Chrysene		U	5.71	2.86	
C1-Benz(a)anthracene/Chrysene		U	5.71	2.86	
C2-Benz(a)anthracene/Chrysene		U	5.71	2.86	
C3-Benz(a)anthracene/Chrysene		U	5.71	2.86	
C4-Benz(a)anthracene/Chrysene		U	5.71	2.86	

Surrogates	%R	Min	Max
Fluorobenzene	81%	50%	150%
2-Fluorobiphenyl	88%	50%	120%
5a-Androstane	94%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3511 Draft	
Field ID:	**Blank Spike**	Cleanup Method(s):		
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)	
Project:	Ashland	Matrix:	Water	
		Preservation:	None	
Lab ID:	IG010925-ABS	Decanted:	No	
File ID:	27SEP05.D			
		Sample Size:	35	g
Date Sampled:		%Solid:	100%	
Date Received:		Extract Volume:	2	mL
Date Prepared:	9/25/01	Prep DF:	1	
Date Cleanup:		Analysis DF:	1	
Date Analyzed:	27 Sep 2001 7:23 pm	Injection Volume:	0.001	mL
Instrument:	HP_5972			
Operator:	kty	Batch QC:	IG010925-AB	

Analyte:	Concentration µg/L	Q	RL µg/L	DL µg/L	Comments
PAH COMPOUNDS:					
Benzene	438		5.71	2.86	76.7%
Toluene	464		5.71	2.86	81.2%
Ethylbenzene	484		5.71	2.86	84.7%
m/p-Xylenes	484		5.71	2.86	84.7%
Styrene	455		5.71	2.86	79.6%
o-Xylene	491		5.71	2.86	85.9%
1,2,4-Trimethylbenzene	525		5.71	2.86	91.9%
Naphthalene	525		5.71	2.86	91.9%
2-Methylnaphthalene	533		5.71	2.86	93.3%
1-Methylnaphthalene	537		5.71	2.86	94.0%
Acenaphthylene	561		5.71	2.86	98.2%
Acenaphthene	544		5.71	2.86	95.2%
Dibenzofuran	562		5.71	2.86	98.4%
Fluorene	557		5.71	2.86	97.5%
Phenanthrene	579		5.71	2.86	101.3%
Anthracene	598		5.71	2.86	104.7%
Fluoranthene	582		5.71	2.86	101.9%
Pyrene	571		5.71	2.86	99.9%
Benz[a]anthracene	592		5.71	2.86	103.6%
Chrysene	581		5.71	2.86	101.7%
Benzo[b]fluoranthene	527		5.71	2.86	92.2%
Benzo[k]fluoranthene	561		5.71	2.86	98.2%
Benzo[a]pyrene	528		5.71	2.86	92.4%
Indeno[1,2,3-cd]pyrene	480		5.71	2.86	84.0%
Dibenz[a,h]anthracene	511		5.71	2.86	89.4%
Benzo[g,h,i]perylene	460		5.71	2.86	80.5%

Surrogates	%R	Min	Max
Fluorobenzene	82%	50%	150%
2-Fluorobiphenyl	95%	50%	120%
5a-Androstane	102%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

Field ID: **Soil Blank**

Client:	GTI	Preparation Method:	EPA 3570 Draft
Project:	Ashland	Cleanup Method(s):	
		Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
		Matrix:	Soil
		Preservation:	None
Lab ID:	IG010925-SB	Decanted:	No
File ID:	27SEP06.D		
		Sample Size:	2 g
Date Sampled:		%Solid:	100%
Date Received:		Extract Volume:	2 mL
Date Prepared:	9/25/01	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	27 Sep 2001 8:31 pm	Injection Volume:	0.001 mL
Instrument:	HP_5972		
Operator:	kty	Batch QC:	IG010925-SB

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
PAH COMPOUNDS:					
Benzene		U	0.10	0.05	
Toluene		U	0.10	0.05	
Ethylbenzene		U	0.10	0.05	
m/p-Xylenes		U	0.10	0.05	
Styrene		U	0.10	0.05	
o-Xylene		U	0.10	0.05	
1,2,4-Trimethylbenzene		U	0.10	0.05	
Naphthalene		U	0.10	0.05	
2-Methylnaphthalene		U	0.10	0.05	
1-Methylnaphthalene		U	0.10	0.05	
Acenaphthylene		U	0.10	0.05	
Acenaphthene		U	0.10	0.05	
Dibenzofuran		U	0.10	0.05	
Fluorene		U	0.10	0.05	
Phenanthrene		U	0.10	0.05	
Anthracene		U	0.10	0.05	
Fluoranthene		U	0.10	0.05	
Pyrene		U	0.10	0.05	
Benz[a]anthracene		U	0.10	0.05	
Chrysene		U	0.10	0.05	
Benzo[b]fluoranthene		U	0.10	0.05	
Benzo[k]fluoranthene		U	0.10	0.05	
Benzo[a]pyrene		U	0.10	0.05	
Indeno[1,2,3-cd]pyrene		U	0.10	0.05	
Dibenz[a,h]anthracene		U	0.10	0.05	
Benzo[g,h,i]perylene		U	0.10	0.05	
ALKYLATED PAHs:					
C0-Benzene		U	0.10	0.05	
C1-Benzene		U	0.10	0.05	
C2-Benzene		U	0.10	0.05	
C3-Benzene		U	0.10	0.05	
C4-Benzene		U	0.10	0.05	
C5-Benzene		U	0.10	0.05	
C0-Naphthalene		U	0.10	0.05	
C1-Naphthalene		U	0.10	0.05	
C2-Naphthalene		U	0.10	0.05	
C3-Naphthalene		U	0.10	0.05	
C4-Naphthalene		U	0.10	0.05	
C0-Fluorene		U	0.10	0.05	
C1-Fluorene		U	0.10	0.05	
C2-Fluorene		U	0.10	0.05	
C3-Fluorene		U	0.10	0.05	
C0-Phenanthrene/Anthracene		U	0.10	0.05	
C1-Phenanthrene/Anthracene		U	0.10	0.05	
C2-Phenanthrene/Anthracene		U	0.10	0.05	
C3-Phenanthrene/Anthracene		U	0.10	0.05	
C4-Phananthrene/Anthracene		U	0.10	0.05	

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3570 Draft
Field ID:	**Soil Blank**	Cleanup Method(s):	
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
Project:	Ashland	Matrix:	Soil
		Preservation:	None
Lab ID:	IG010925-SB	Decanted:	No
File ID:	27SEP06.D		
		Sample Size:	2 g
Date Sampled:		%Solid:	100%
Date Received:		Extract Volume:	2 mL
Date Prepared:	9/25/01	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	27 Sep 2001 8:31 pm	Injection Volume:	0.001 mL
Instrument:	HP_5972		
Operator:	kty	Batch QC:	IG010925-SB

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
C0-Dibenzothiophene		U	0.10	0.05	
C1-Dibenzothiophene		U	0.10	0.05	
C2-Dibenzothiophene		U	0.10	0.05	
C3-Dibenzothiophene		U	0.10	0.05	
C0-Fluoranthene/Pyrene		U	0.10	0.05	
C1-Fluoranthene/Pyrene		U	0.10	0.05	
C2-Fluoranthene/Pyrene		U	0.10	0.05	
C3-Fluoranthene/Pyrene		U	0.10	0.05	
C0-Benz(a)anthracene/Chrysene		U	0.10	0.05	
C1-Benz(a)anthracene/Chrysene		U	0.10	0.05	
C2-Benz(a)anthracene/Chrysene		U	0.10	0.05	
C3-Benz(a)anthracene/Chrysene		U	0.10	0.05	
C4-Benz(a)anthracene/Chrysene		U	0.10	0.05	

Surrogates	%R	Min	Max
Fluorobenzene	66%	50%	150%
2-Fluorobiphenyl	89%	50%	120%
5a-Androstane	92%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Analytical Results for Volatile and Semivolatile Organics
META Environmental, Inc.

		Preparation Method:	EPA 3570 Draft
Field ID:	**Blank Spike**	Cleanup Method(s):	
Client:	GTI	Analysis Method:	GC/MS (EPA 8260/8270 Mod.)
Project:	Ashland	Matrix:	Soil
		Preservation:	None
Lab ID:	IG010925-SBS	Decanted:	No
File ID:	27SEP07.D		
		Sample Size:	2 g
Date Sampled:		%Solid:	100%
Date Received:		Extract Volume:	2 mL
Date Prepared:	9/25/01	Prep DF:	1
Date Cleanup:		Analysis DF:	1
Date Analyzed:	27 Sep 2001 9:38 pm	Injection Volume:	0.001 mL
Instrument:	HP_5972		
Operator:	kty	Batch QC:	IG010925-SB

Analyte:	Concentration mg/kg	Q	RL mg/kg	DL mg/kg	Comments
PAH COMPOUNDS:					
Benzene	14.3		0.10	0.05	57.2%
Toluene	16.2		0.10	0.05	64.8%
Ethylbenzene	16.9		0.10	0.05	67.6%
m/p-Xylenes	17.3		0.10	0.05	69.2%
Styrene	16.7		0.10	0.05	66.8%
o-Xylene	17.2		0.10	0.05	68.8%
1,2,4-Trimethylbenzene	18.4		0.10	0.05	73.6%
Naphthalene	17.8		0.10	0.05	71.2%
2-Methylnaphthalene	17.8		0.10	0.05	71.2%
1-Methylnaphthalene	17.8		0.10	0.05	71.2%
Acenaphthylene	18.5		0.10	0.05	74.0%
Acenaphthene	18.4		0.10	0.05	73.6%
Dibenzofuran	18.9		0.10	0.05	75.6%
Fluorene	18.9		0.10	0.05	75.6%
Phenanthrene	19.9		0.10	0.05	79.6%
Anthracene	20.7		0.10	0.05	82.8%
Fluoranthene	20.6		0.10	0.05	82.4%
Pyrene	20.6		0.10	0.05	82.4%
Benz[a]anthracene	21.8		0.10	0.05	87.2%
Chrysene	21.4		0.10	0.05	85.6%
Benzo[b]fluoranthene	20.9		0.10	0.05	83.6%
Benzo[k]fluoranthene	20.0		0.10	0.05	80.0%
Benzo[a]pyrene	20.1		0.10	0.05	80.4%
Indeno[1,2,3-cd]pyrene	17.2		0.10	0.05	68.8%
Dibenz[a,h]anthracene	18.9		0.10	0.05	75.6%
Benzo[g,h,i]perylene	16.3		0.10	0.05	65.2%

Surrogates	%R	Min	Max
Fluorobenzene	66%	50%	150%
2-Fluorobiphenyl	77%	50%	120%
5a-Androstane	84%	50%	120%

Qualifiers:

B	Analyte detected in the blank
D	Analyte reported from a diluted extract
U	Undetected above the detection limit
J	Estimated value detected between the reporting and detection limits
E	Estimated value detected above calibration range
RL	Reporting limit is the sample equivalent of the lowest linear calibration concentration
EDL	Estimated detection limit is 50% of the RL

Ananlytical Results for Total Petroleum Hydrocarbons

META Environmental, Inc.

Client:	GTI	Instrument:	GC3-Front
Project:	Ashland	Analysis Date:	9/26/01
Calibration Material:	Alkane	Alkane Range:	C6-C40

Sample Data		Sample Size	Final Volume	Percent	Dilution	SS1 %Rec	SS2 %Rec	SS3 %Rec	FS1 %Rec	FS2 %Rec	FS3 %Rec			
Field ID	Lab ID	(mL or g)	(mL)	Solid	Factor	(FB)	(2FBP)	(5AA)	2,5_DBT	2-BN	1-CO	TPH	Units	Comments
Fractionation Blank	IG010926-FBPF	0.500	0.5	100%	1	NA	NA	NA	81%	0%	90%	24.7	mg/L	
	IG010926-FBDF					NA	NA	NA	8%	88%	7%	124.00	mg/L	
Aqueous Blank	IG010925-AB	35.000	2.0	100%	1	81%	88%	94%	NA	NA	NA	0.51	mg/L	
	IG010925-ABPF					0%	0%	77%	80%	0%	87%	3.58	mg/L	
	IG010925-ABDF					16%	79%	18%	12%	92%	8%	10.8	mg/L	
Method Blank	IG010925-MB	0.0100	2.0	100%	1	NA	NA	NA	NA	NA	NA	908	mg/kg	
	IG010925-MBPF					NA	NA	NA	66%	0%	7%	22,000	mg/kg	
	IG010925-MBDF					NA	NA	NA	8%	78%	7%	43,200	mg/kg	
Soil Blank	IG010925-SB	2.0000	2.0	100%	1	66%	89%	92%	NA	NA	NA	4.12	mg/kg	
	IG010925-SBPF					0%	0%	74%	85%	0%	93%	54.4	mg/kg	
	IG010925-SBDF					10%	70%	12%	10%	88%	7%	272	mg/kg	
Clay Tile #1A	IG010925-01	35.818	2.0	100%	1	89%	114%	127%	NA	NA	NA	1,670	mg/L	
	IG010925-01PF					3%	21%	82%	75%	36%	73%	183	mg/L	
	IG010925-01DF					2%	43%	4%	32%	96%	42%	1,040	mg/L	
Clay Tile #1B	IG010918-02	1.953	2.0	54%	1	65%	91%	95%	NA	NA	NA	14,700	mg/kg	
	IG010918-02PF					0%	0%	70%	81%	5%	89%	1,850	mg/kg	
	IG010918-02DF					7%	76%	19%	8%	92%	6%	9,320	mg/kg	
Clay Tile #2	IG010918-03	0.0145	2.0	100%	1	NA	NA	NA	NA	NA	NA	515,000	mg/kg	
	IG010918-03PF					NA	NA	NA	85%	7%	85%	58,800	mg/kg	
	IG010918-03DF					NA	NA	NA	8%	83%	7%	308,000	mg/kg	

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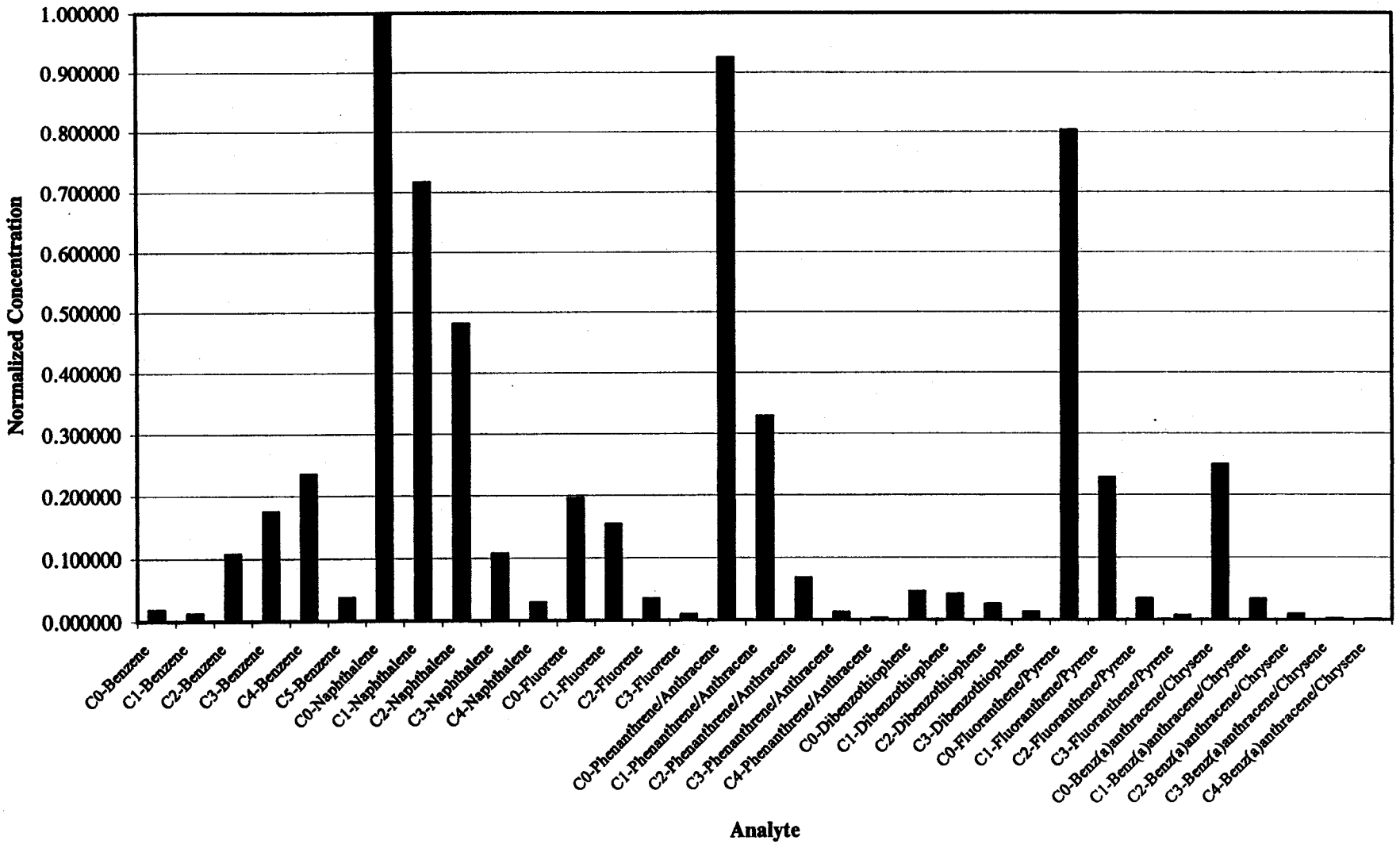
Appendix D

Extended PAH Profiles – Bar Graphs

Clay Tile #1A



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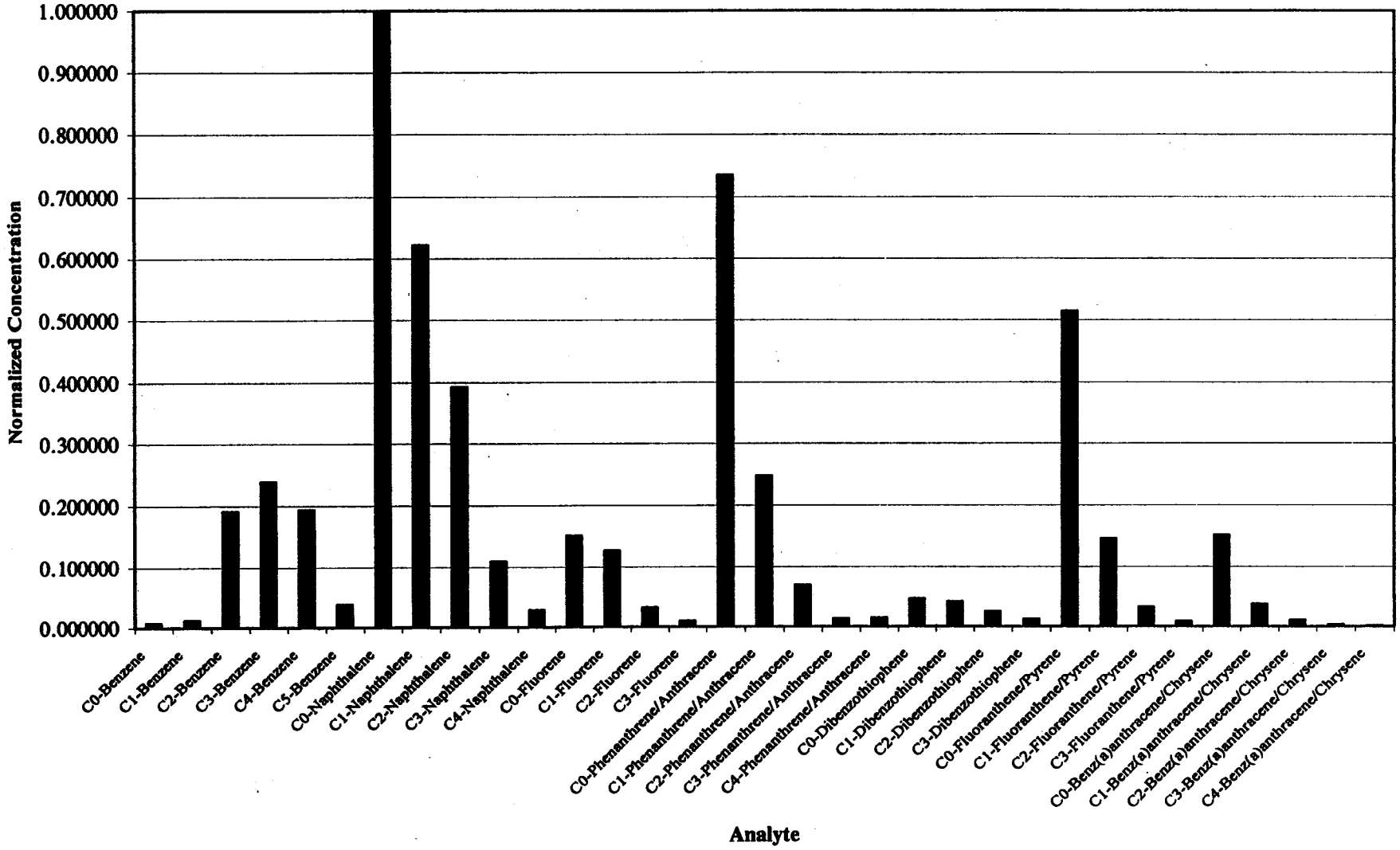
Clay Tile #1B



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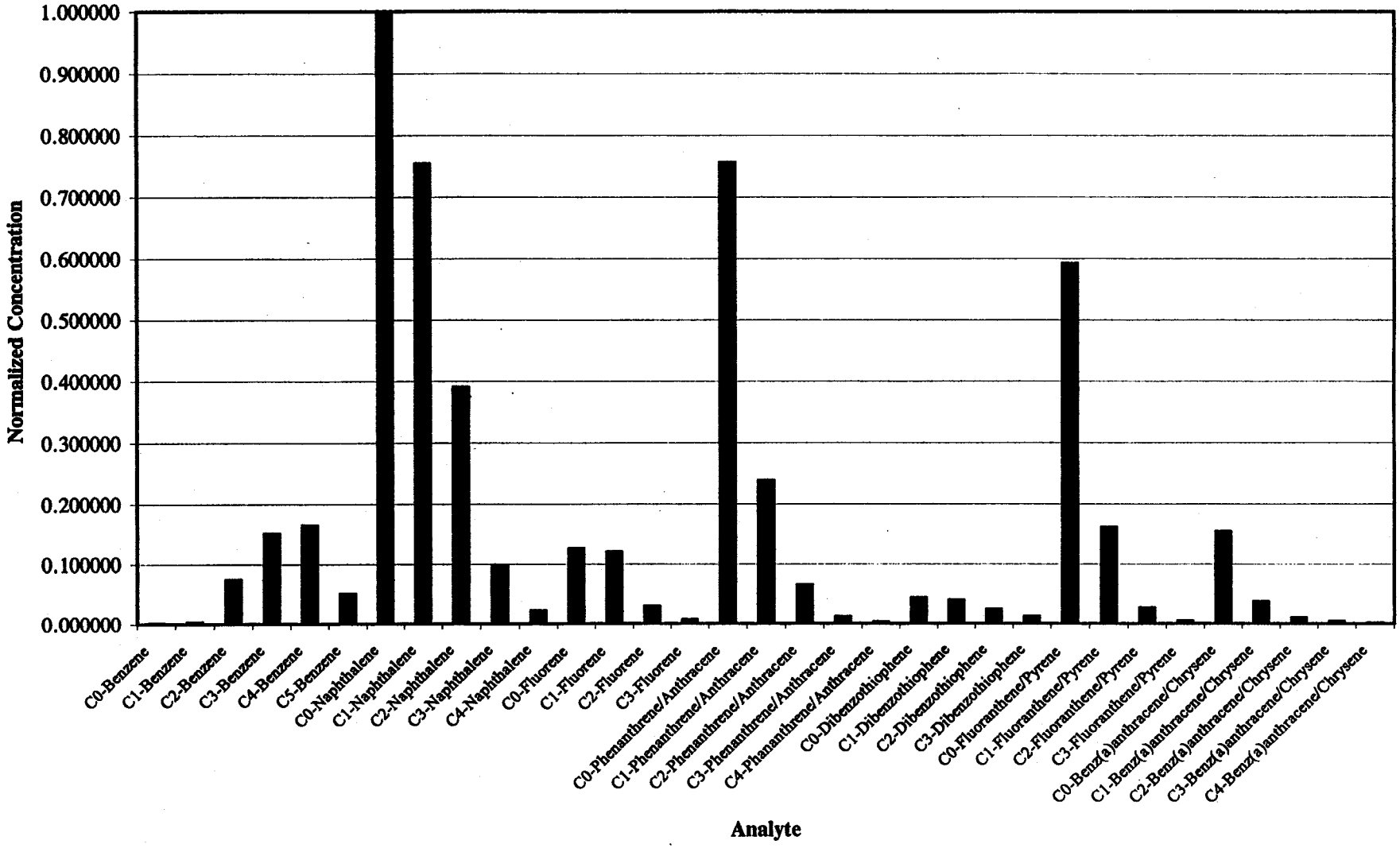
Clay Tile #2

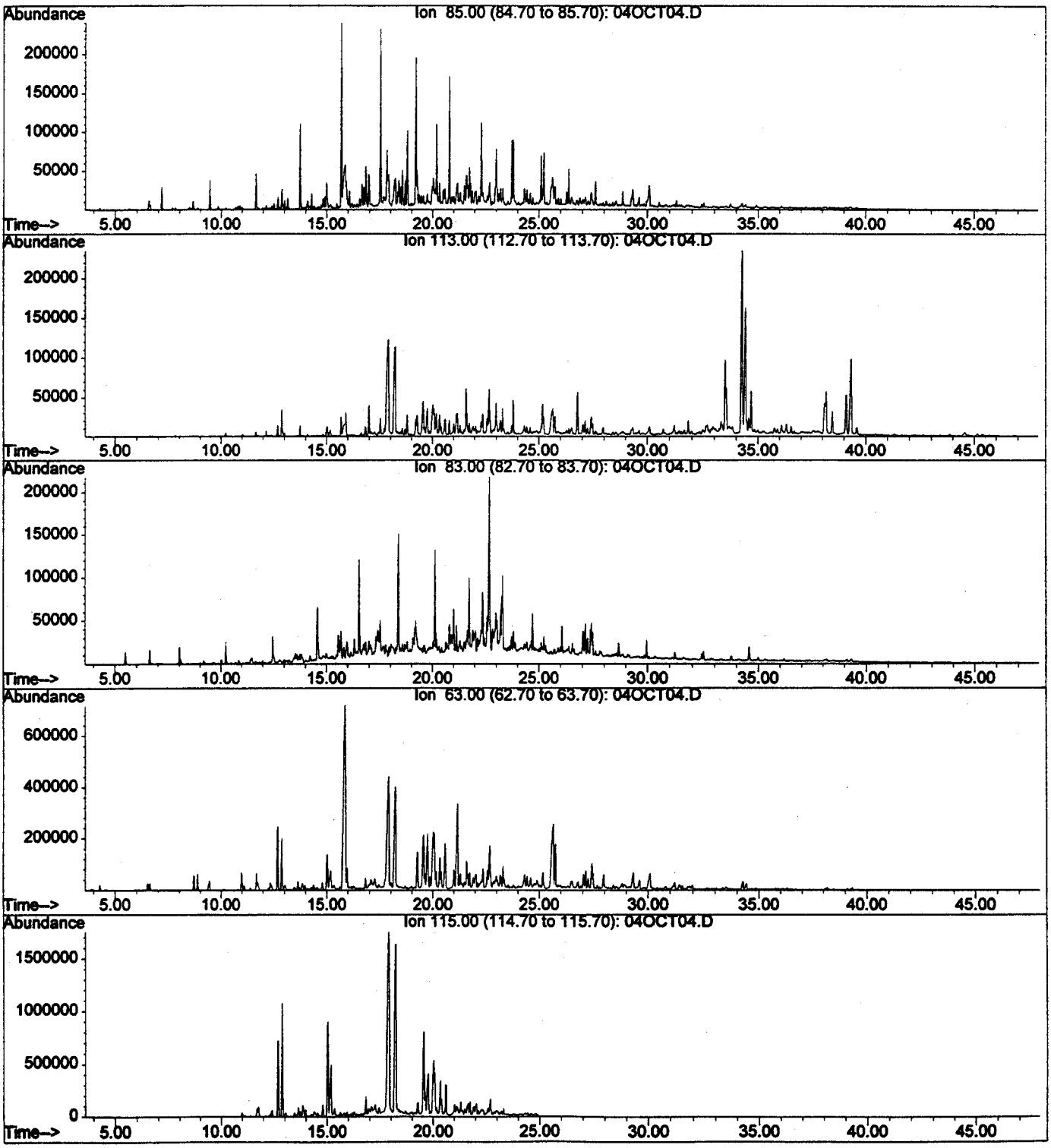


META

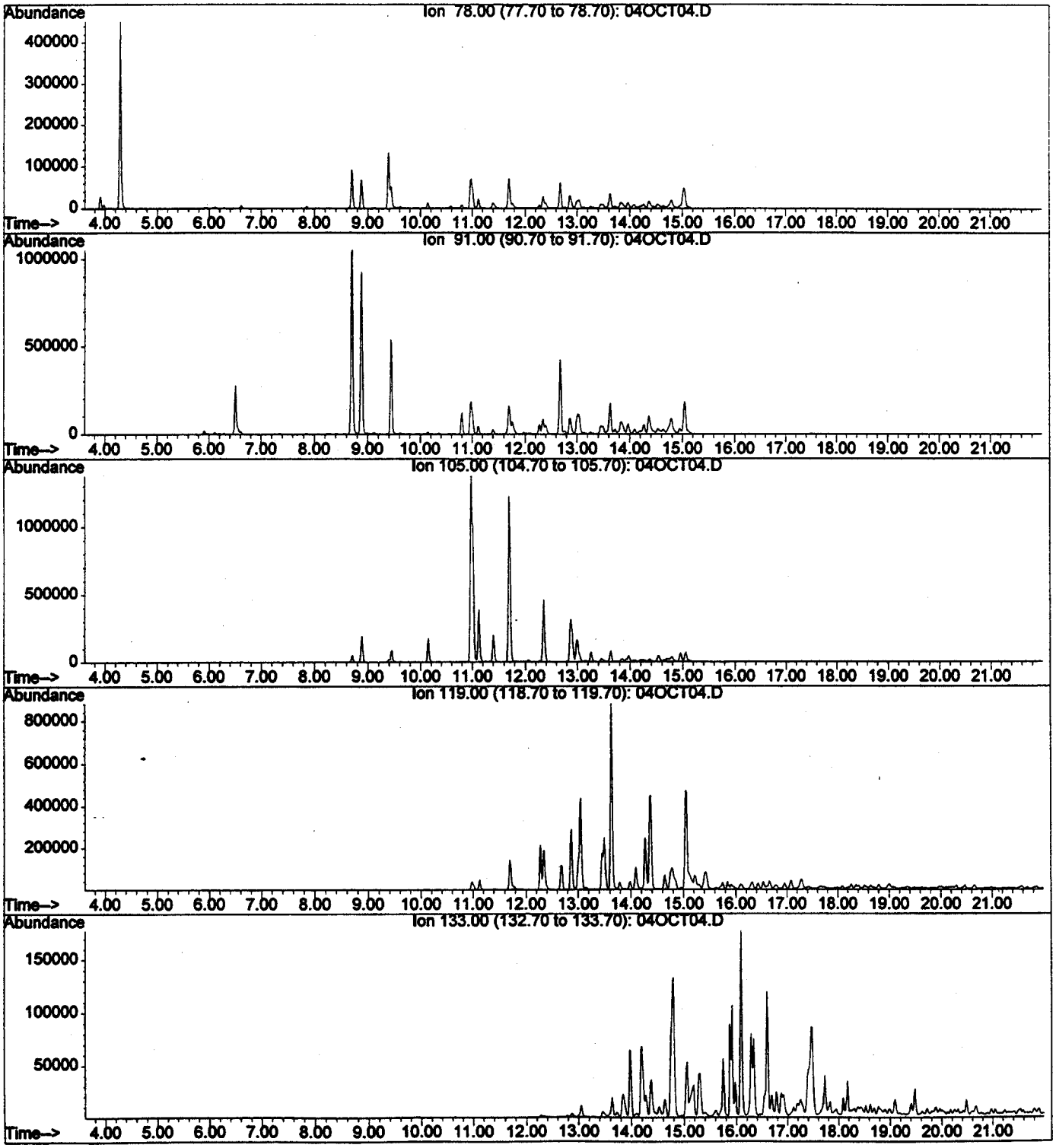
Appendix E

Extracted Ion Current Profiles (EICs)

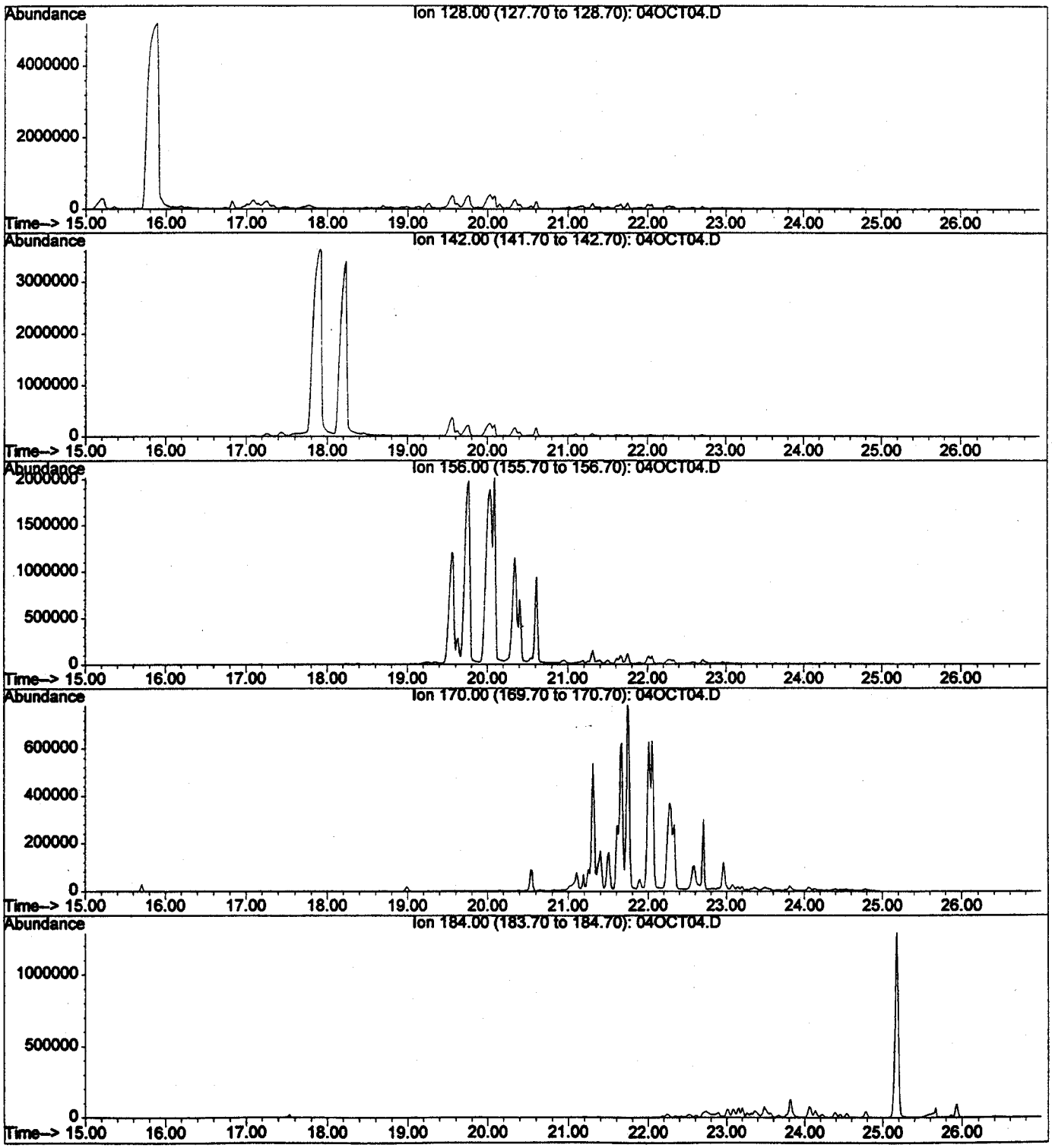
File : I:\1\DATA\011004\04OCT04.D
Operator : kty
Acquired : 4 Oct 2001 10:39 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-01b
Misc Info : Clay Tile#1A
Vial Number: 4



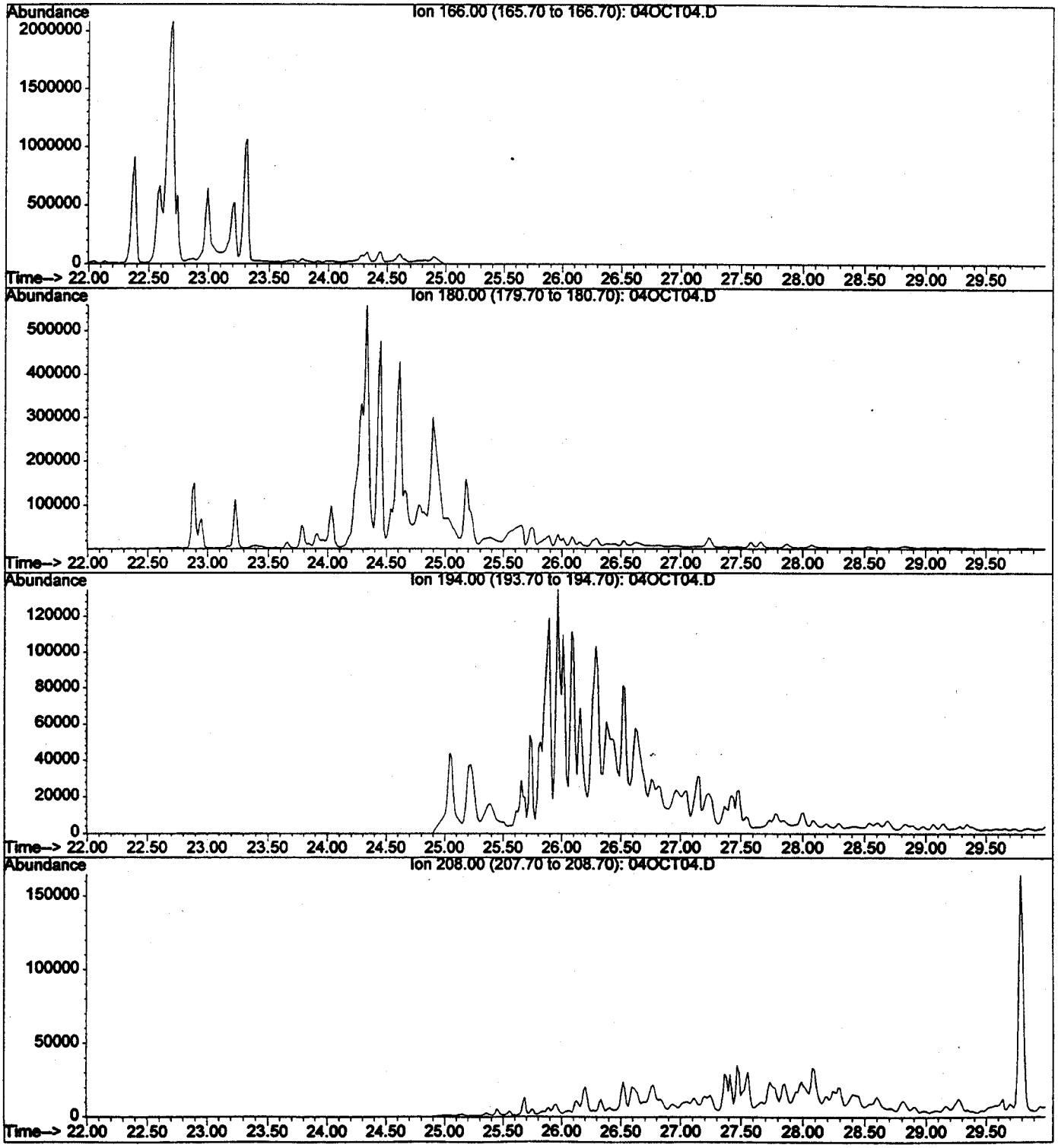
File : I:\1\DATA\011004\04OCT04.D
Operator : kty
Acquired : 4 Oct 2001 10:39 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-01b
Misc Info : Clay Tile#1A
Vial Number: 4



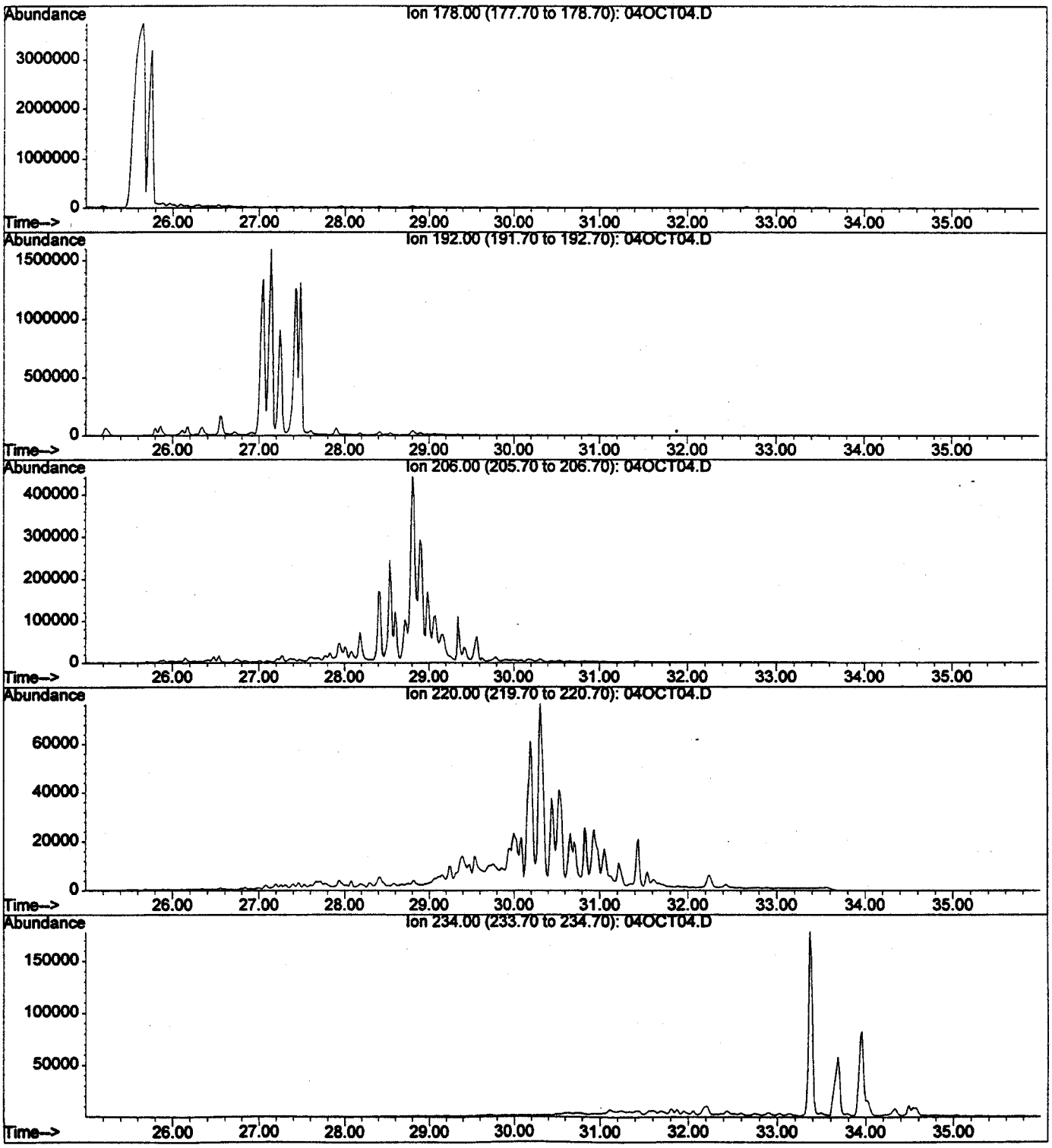
File : I:\1\DATA\011004\04OCT04.D
Operator : kty
Acquired : 4 Oct 2001 10:39 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-01b
Misc Info : Clay Tile#1A
Vial Number: 4



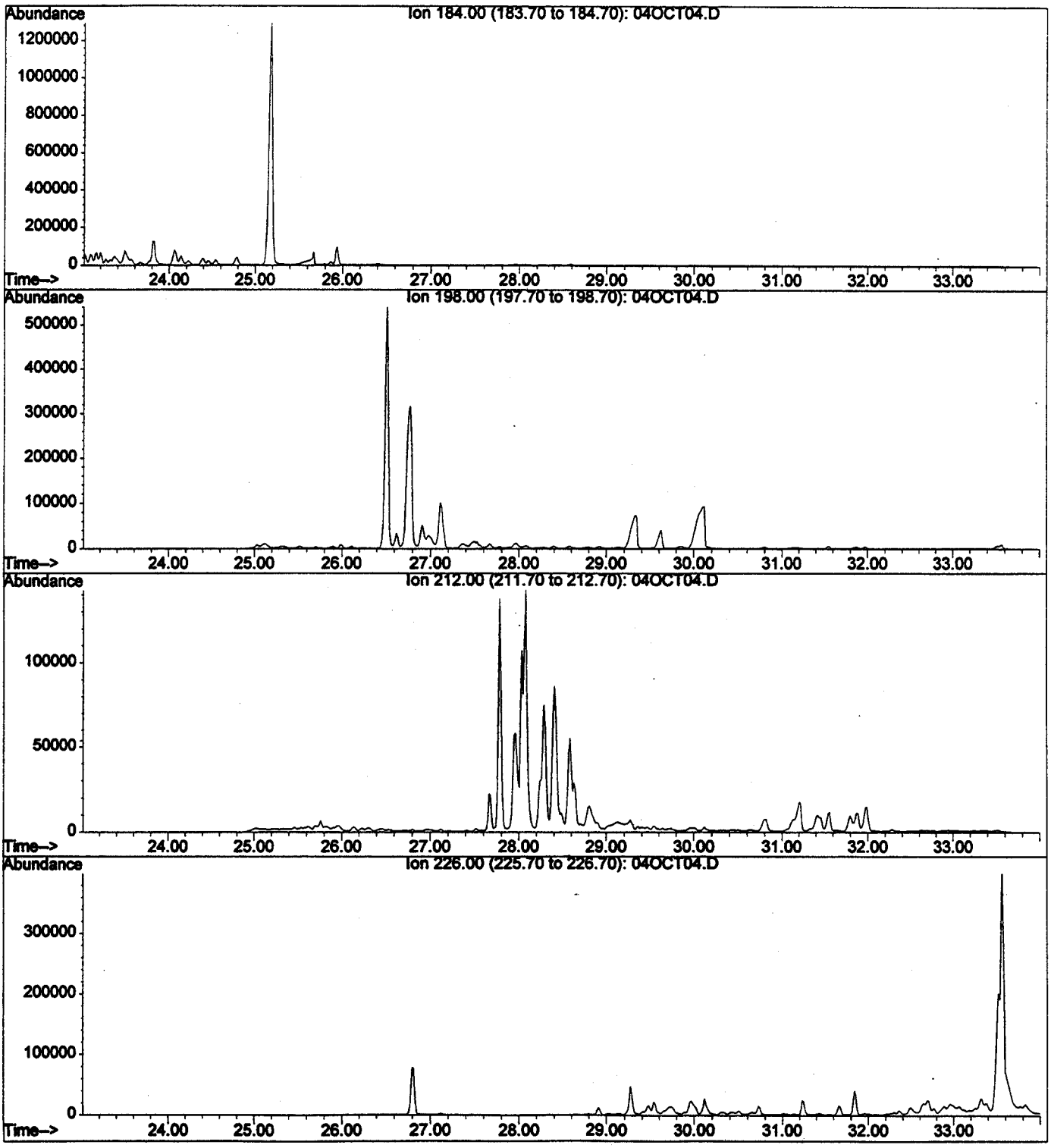
File : I:\1\DATA\011004\04OCT04.D
Operator : kty
Acquired : 4 Oct 2001 10:39 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-01b
Misc Info : Clay Tile#1A
Vial Number: 4



File : I:\1\DATA\011004\04OCT04.D
Operator : kty
Acquired : 4 Oct 2001 10:39 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-01b
Misc Info : Clay Tile#1A
Vial Number: 4



File : I:\1\DATA\011004\04OCT04.D
Operator : kty
Acquired : 4 Oct 2001 10:39 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-01b
Misc Info : Clay Tile#1A
Vial Number: 4



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Operator : kty
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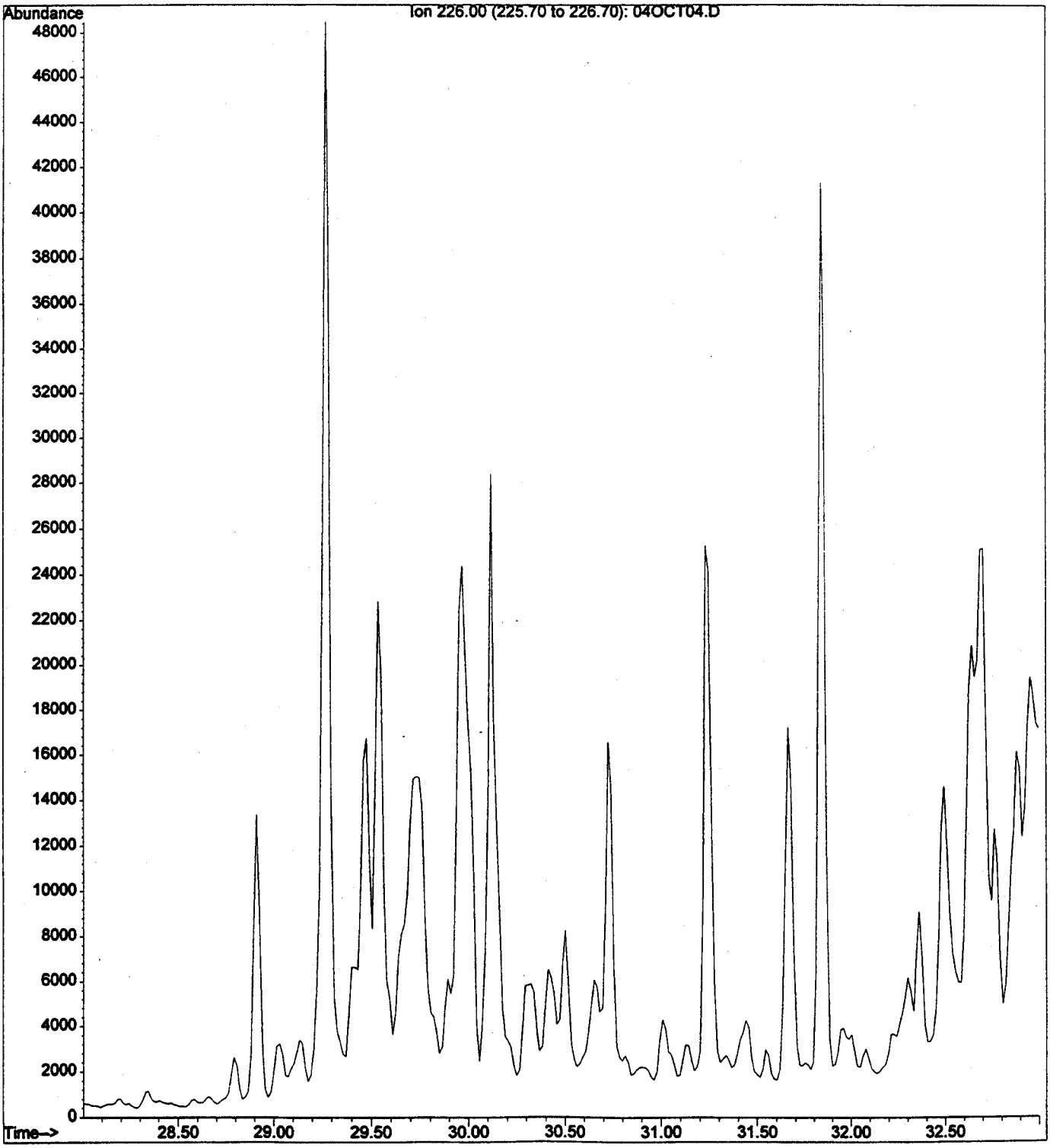
Instrument : HP_5972
Sample Name: IG010925-01b
Misc Info : Clay Tile#1A
Vial Number: 4



File : I:\1\DATA\011004\04OCT04.D
Operator : kty
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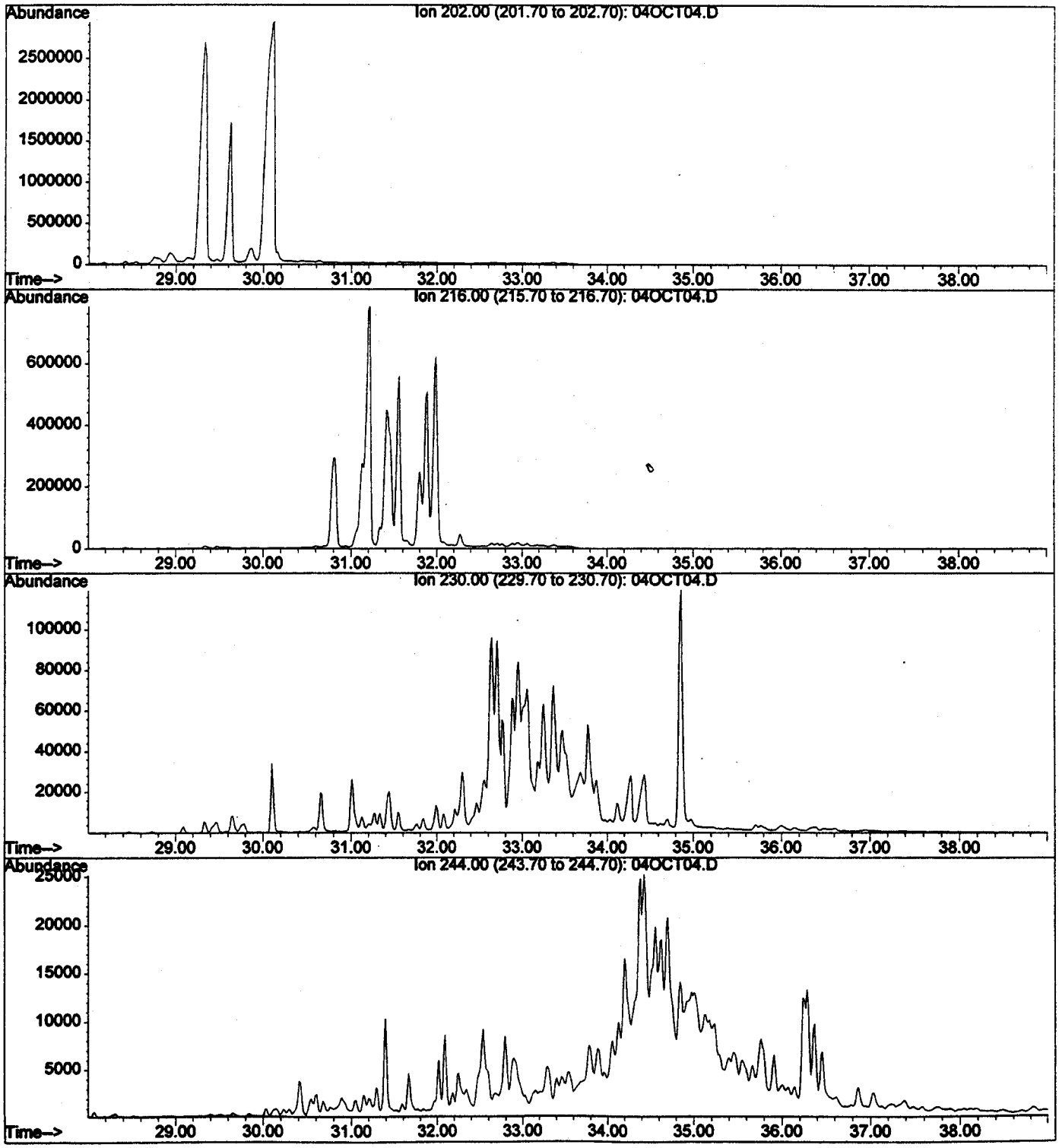
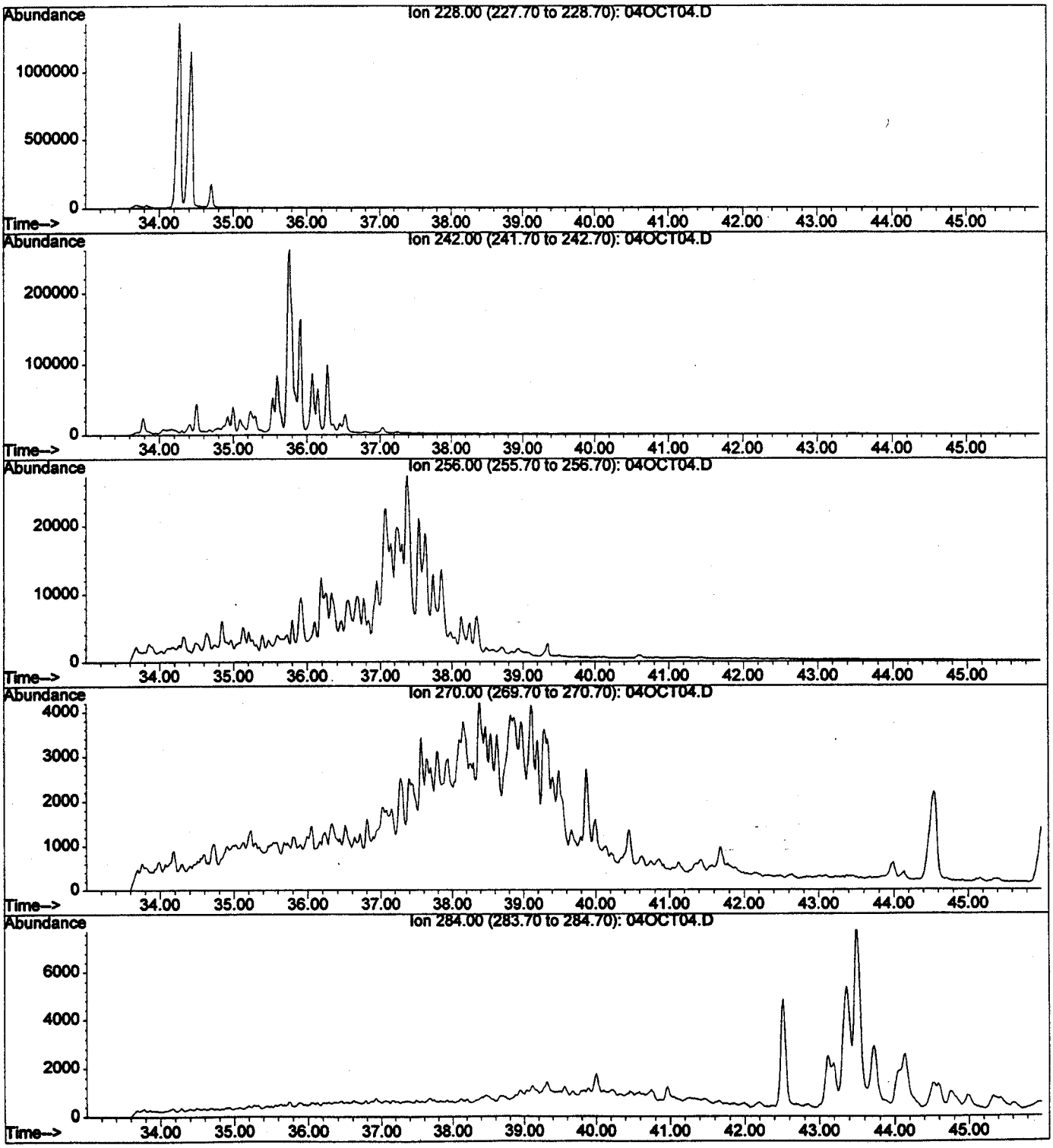
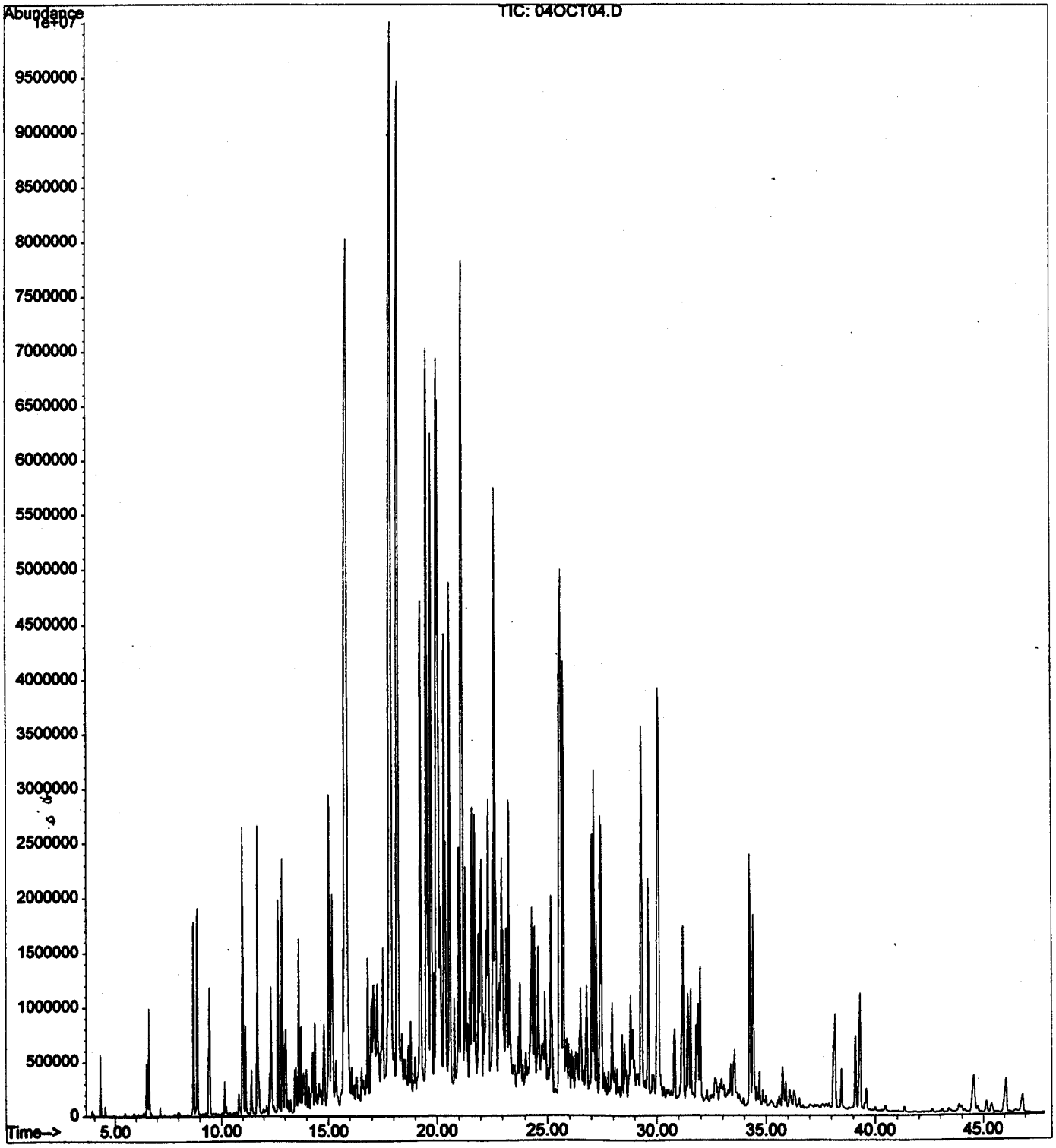
Instrument : HP_5972
Sample Name: IG010925-01b
Misc Info : Clay Tile#1A
Vial Number: 4



File : I:\1\DATA\011004\04OCT04.D
Operator : kty
Acquired : 4 Oct 2001 10:39 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-01b
Misc Info : Clay Tile#1A
Vial Number: 4



File : I:\1\DATA\011004\04OCT04.D
Operator : kty
Acquired : 4 Oct 2001 10:39 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-01b
Misc Info : Clay Tile#1A
Vial Number: 4



File : I:\1\DATA\011004\04OCT03.D
Operator : kty
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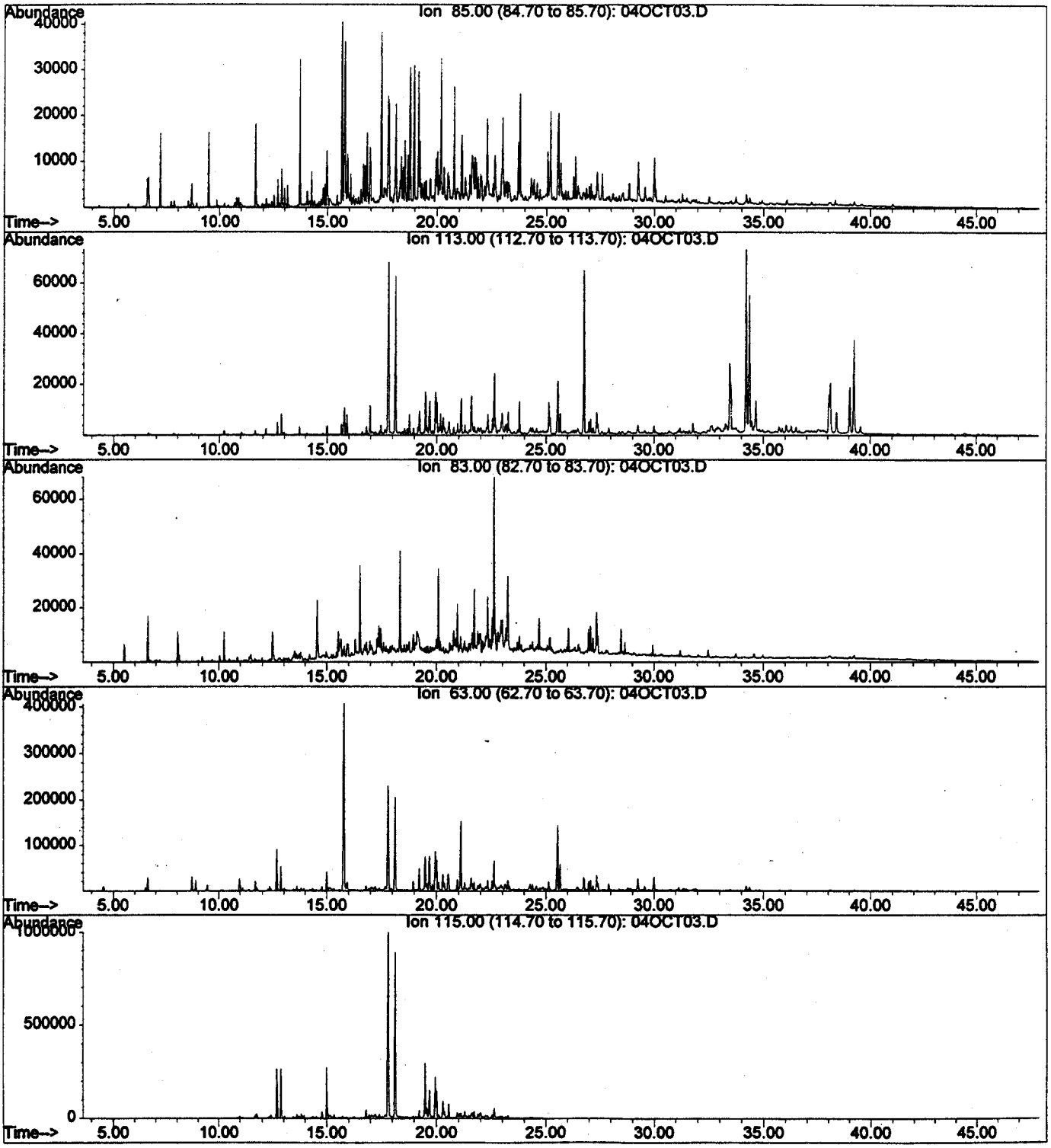
Instrument : HP_5972
Sample Name: IG010925-02a
Misc Info : Clay Tile#1B
Vial Number: 3



File : I:\1\DATA\011004\04OCT03.D
Operator : kty
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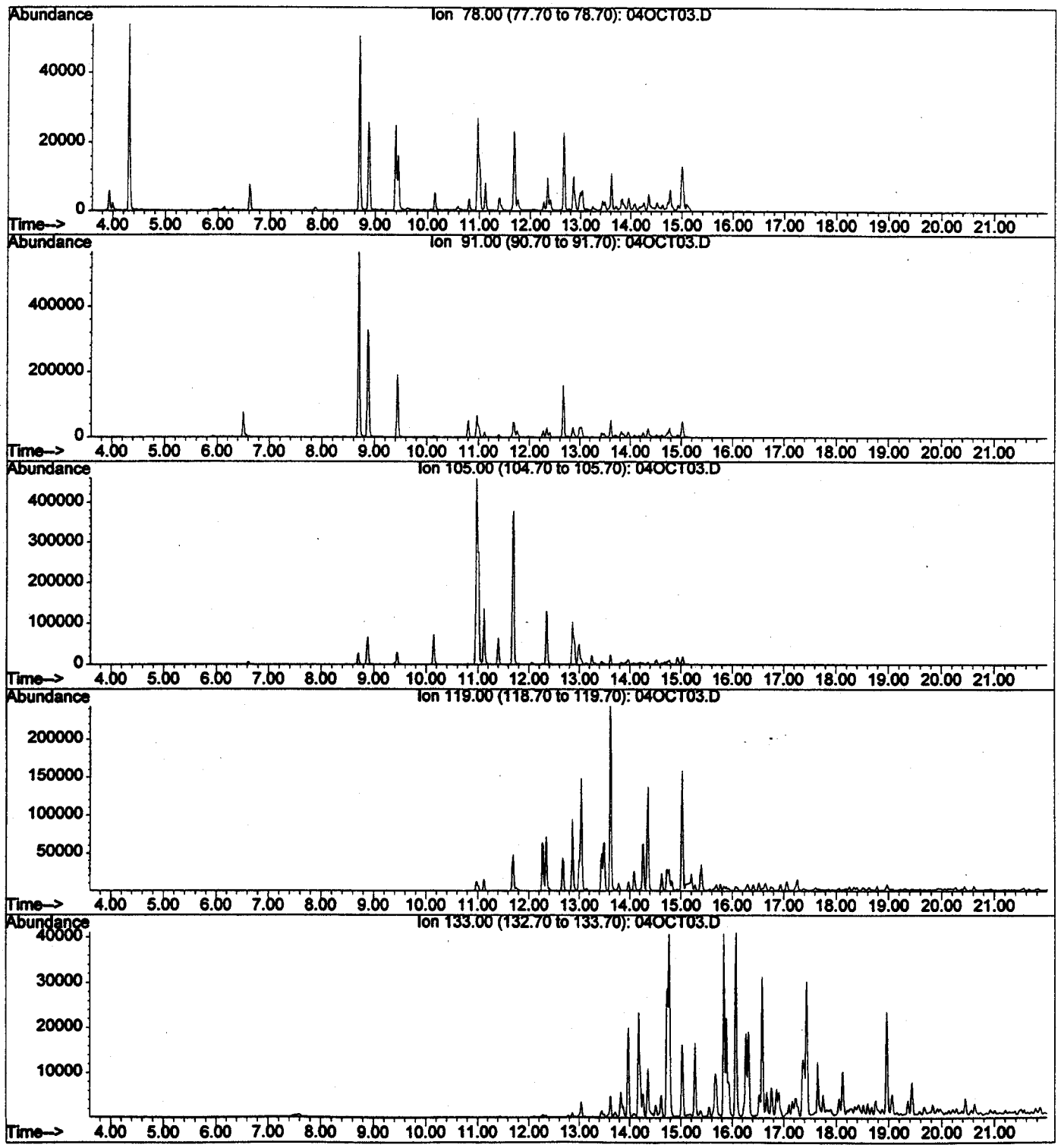
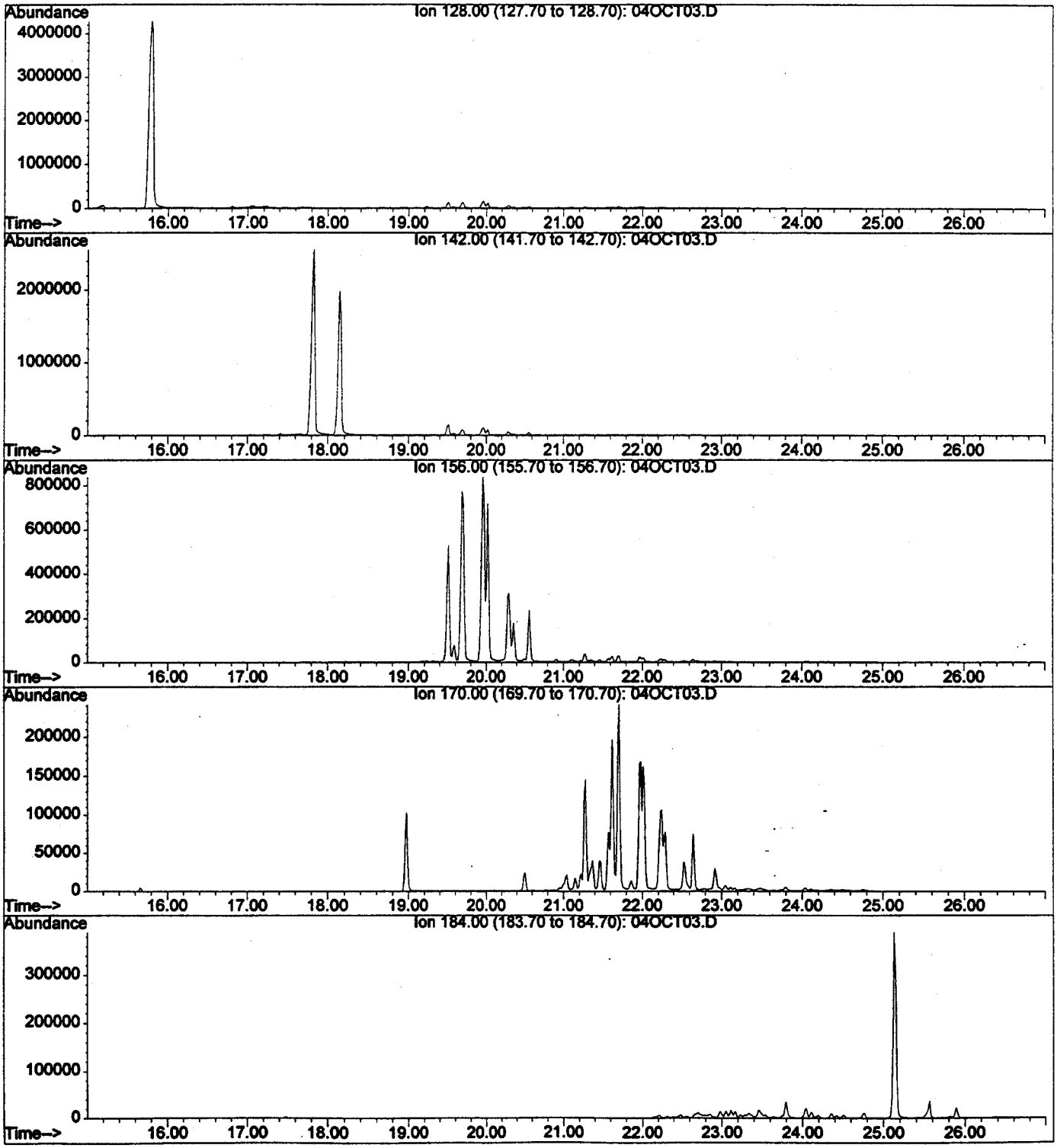
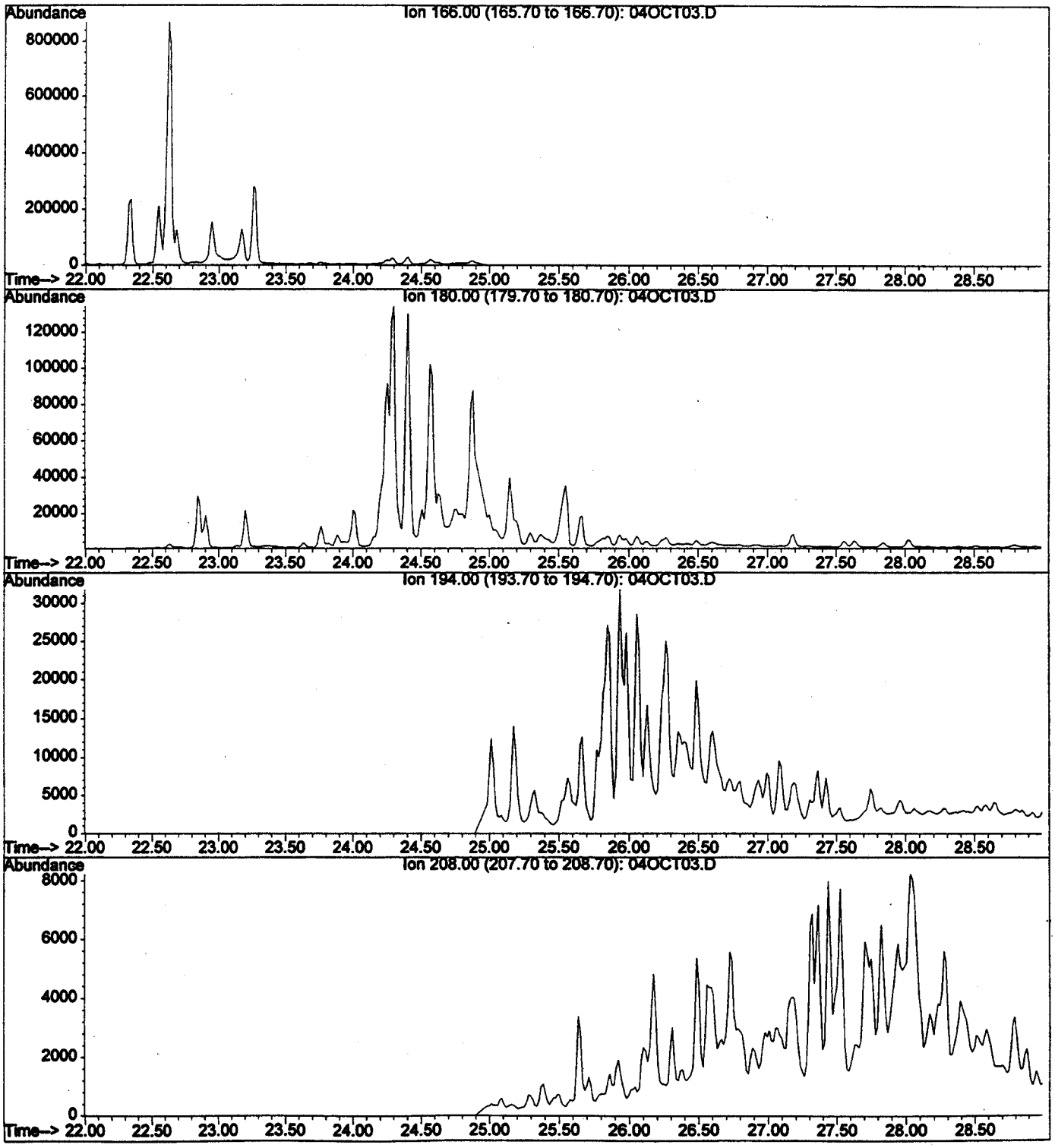
Instrument : HP_5972
Sample Name: IG010925-02a
Misc Info : Clay Tile#1B
Vial Number: 3



File : I:\1\DATA\011004\04OCT03.D
Operator : kty
Acquired : 4 Oct 2001 9:36 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-02a
Misc Info : Clay Tile#1B
Vial Number: 3



File : I:\1\DATA\011004\04OCT03.D
Operator : kty
Acquired : 4 Oct 2001 9:36 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-02a
Misc Info : Clay Tile#1B
Vial Number: 3



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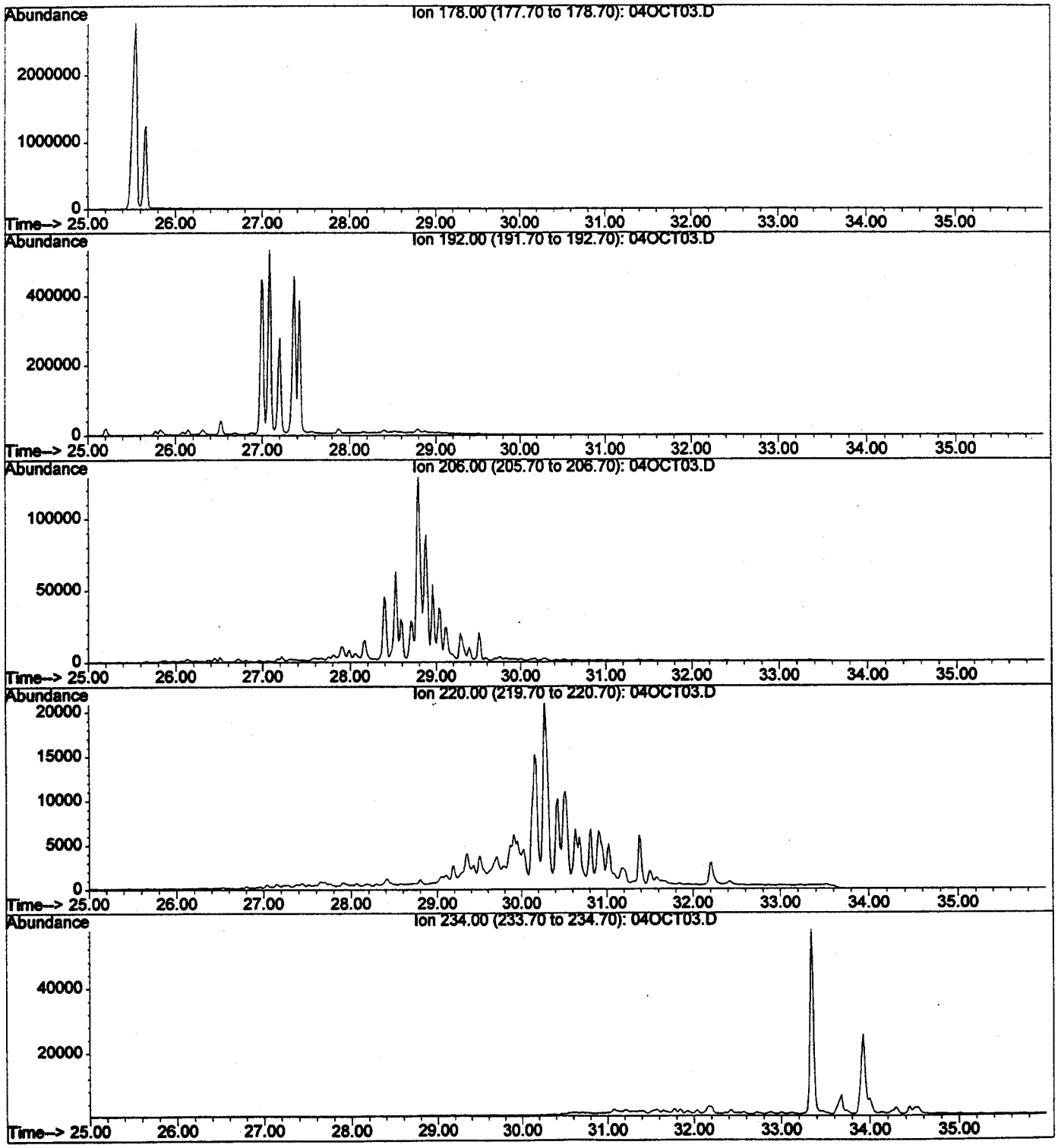
Operator : kty
Acquired : 4 Oct 2001 9:36 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-02a
Misc Info : Clay Tile#1B
Vial Number: 3



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Operator : kty
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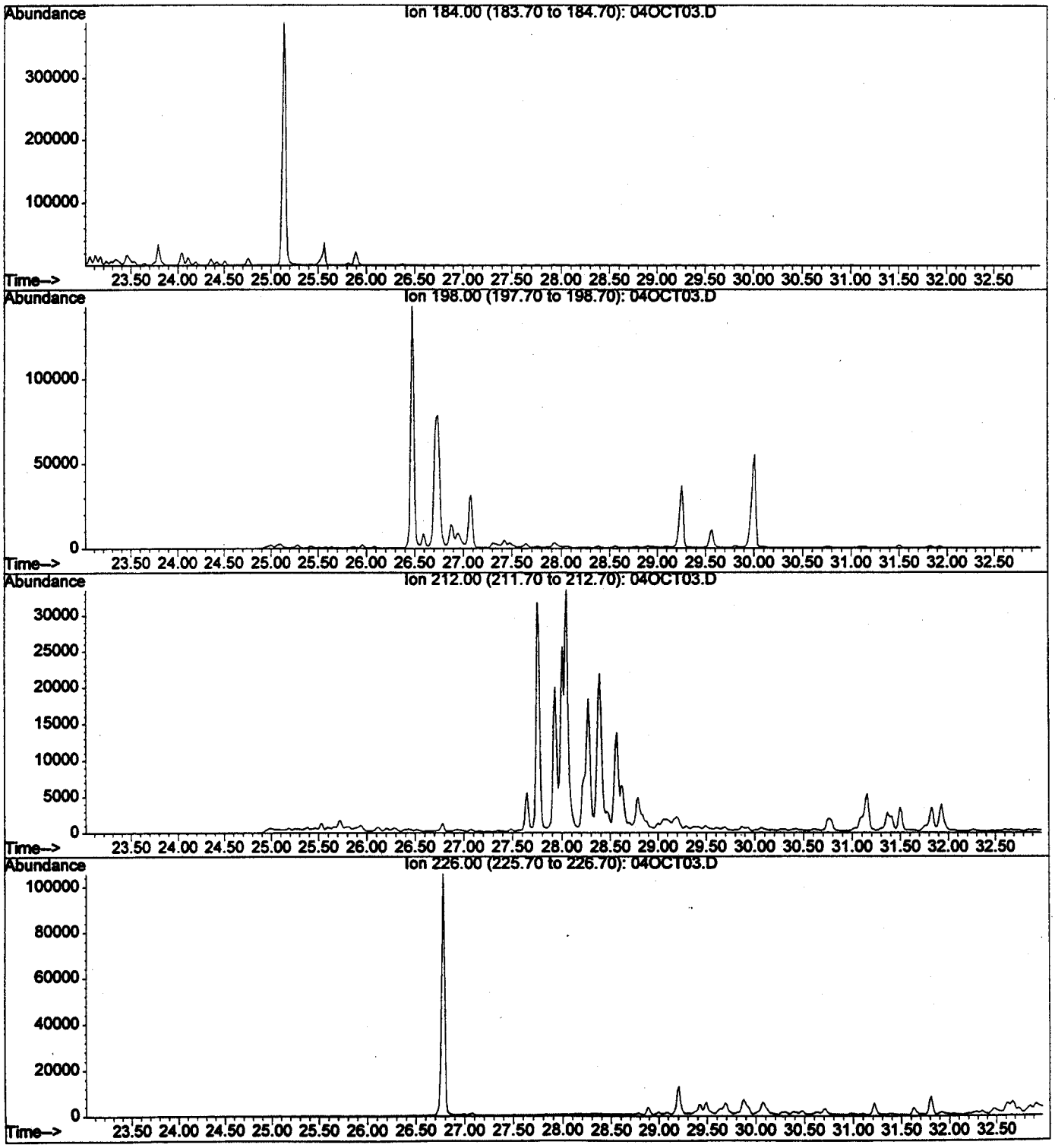
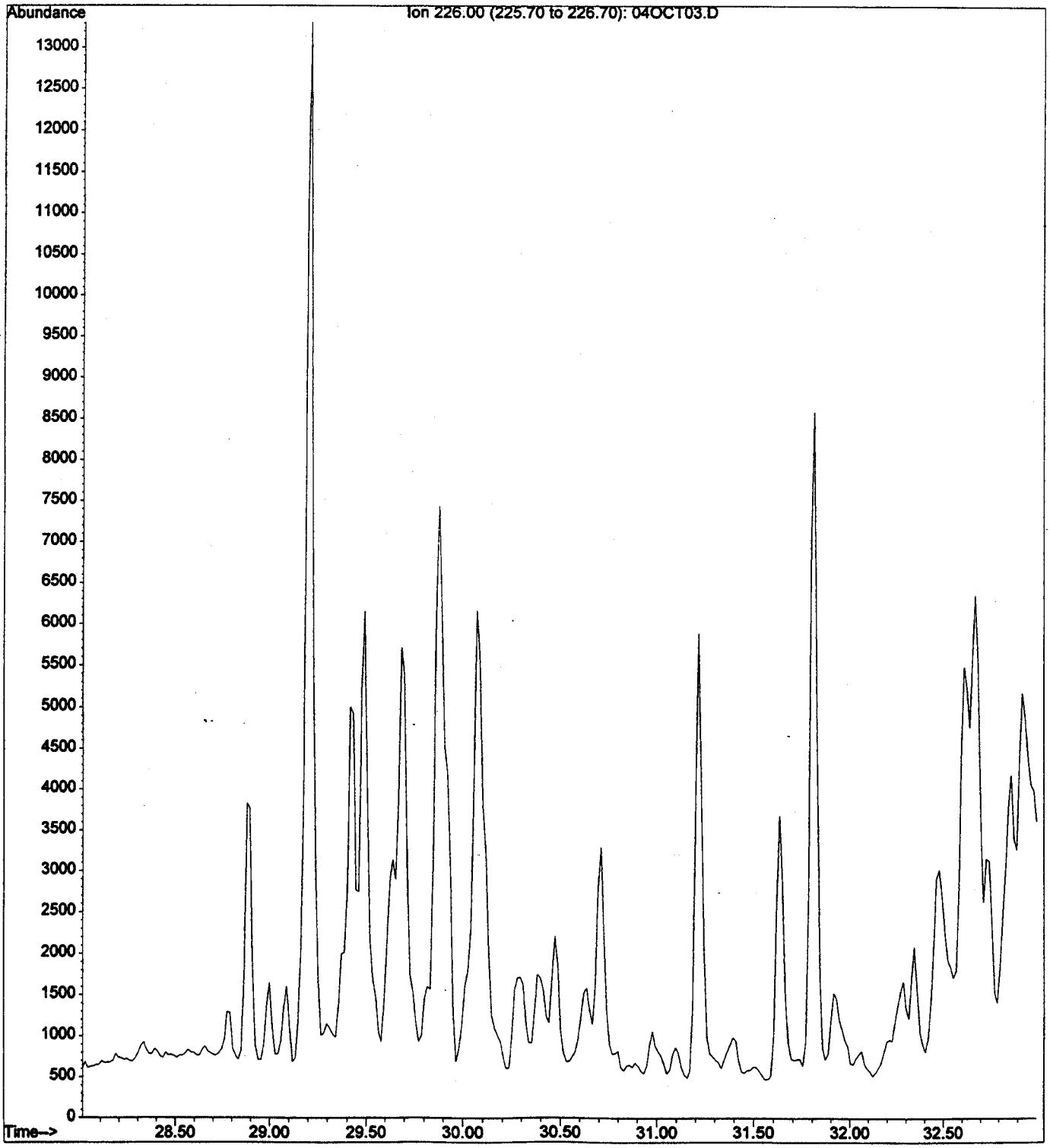
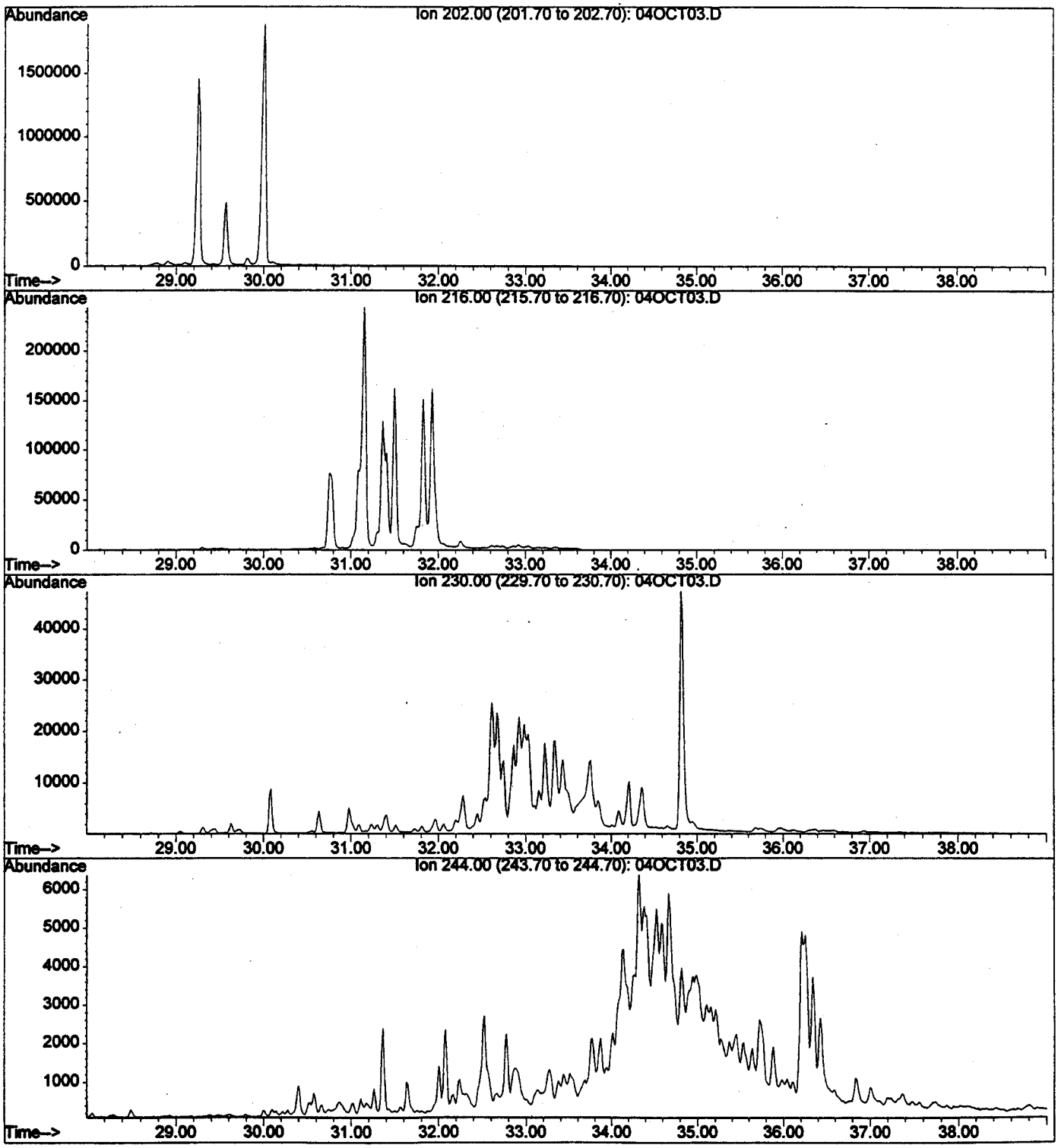
Instrument : HP_5972
Sample Name: IG010925-02a
Misc Info : Clay Tile#1B
Vial Number: 3



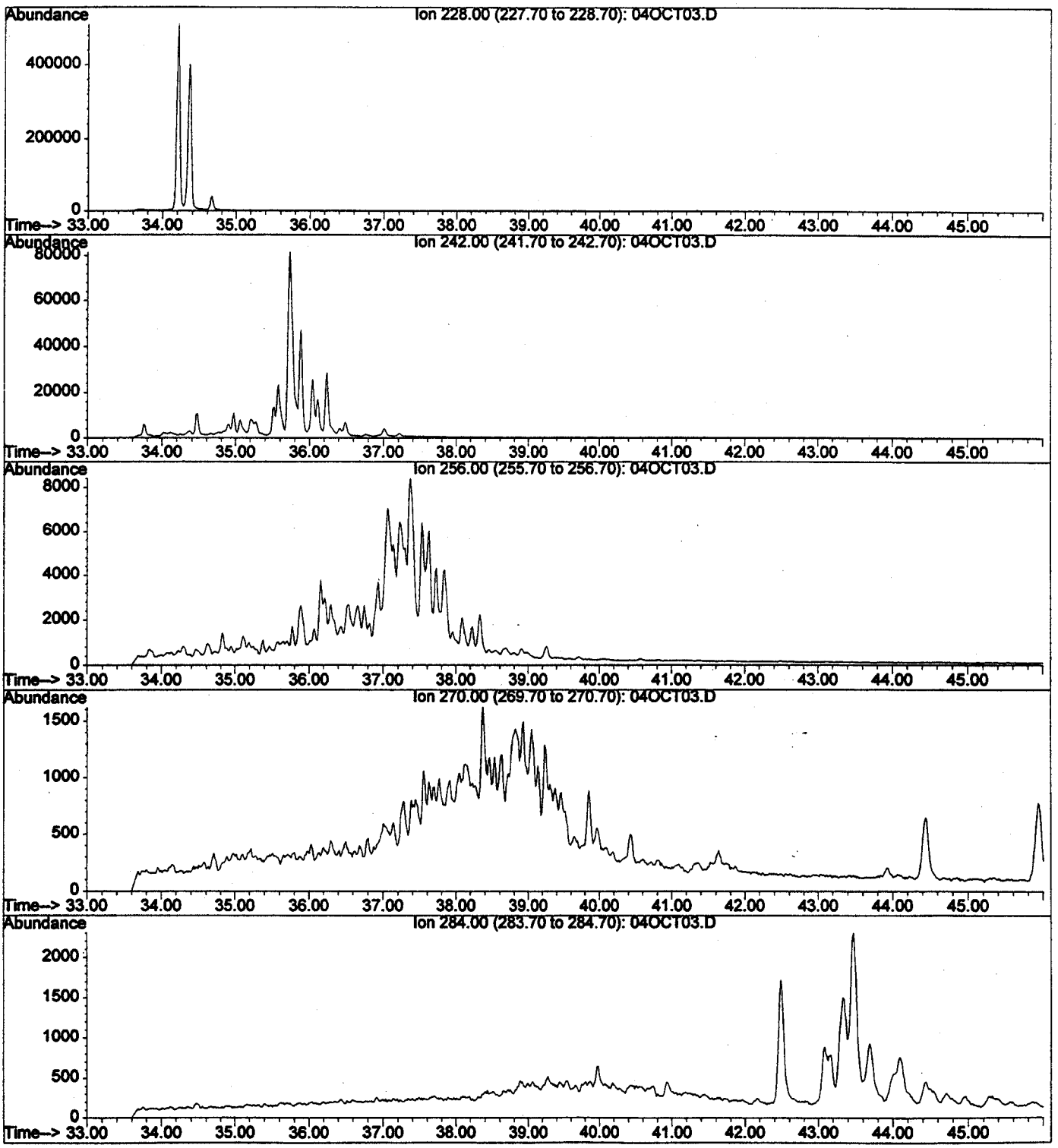
File : I:\1\DATA\011004\04OCT03.D
Operator : kty
Acquired : 4 Oct 2001 9:36 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-02a
Misc Info : Clay Tile#1B
Vial Number: 3



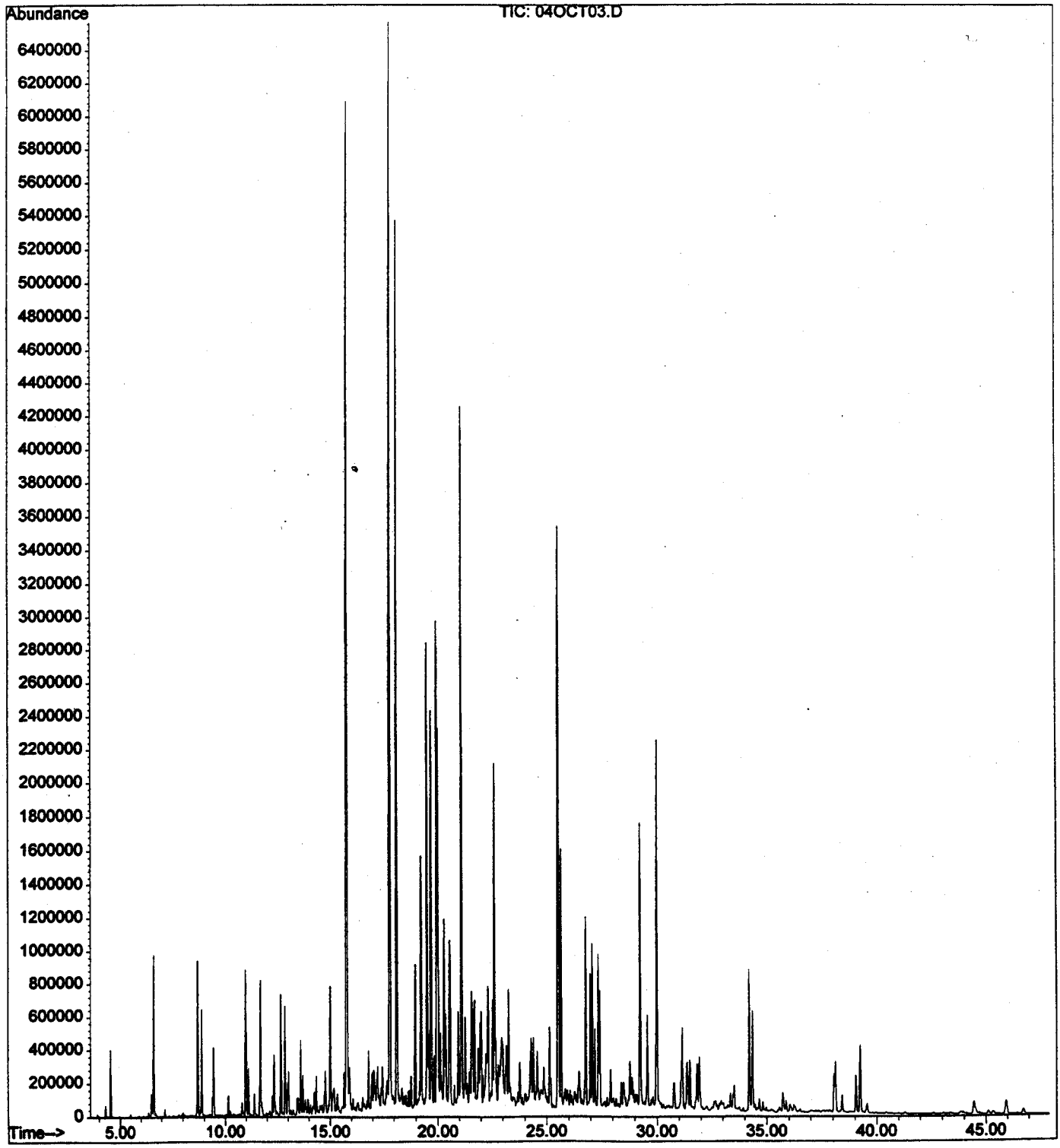
File : I:\1\DATA\011004\04OCT03.D
Operator : kty
Acquired : 4 Oct 2001 9:36 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-02a
Misc Info : Clay Tile#1B
Vial Number: 3



File : I:\1\DATA\011004\04OCT03.D
Operator : kty
Acquired : 4 Oct 2001 9:36 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-02a
Misc Info : Clay Tile#1B
Vial Number: 3



File : I:\1\DATA\011004\04OCT03.D
Operator : kty
Acquired : 4 Oct 2001 9:36 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-02a
Misc Info : Clay Tile#1B
Vial Number: 3



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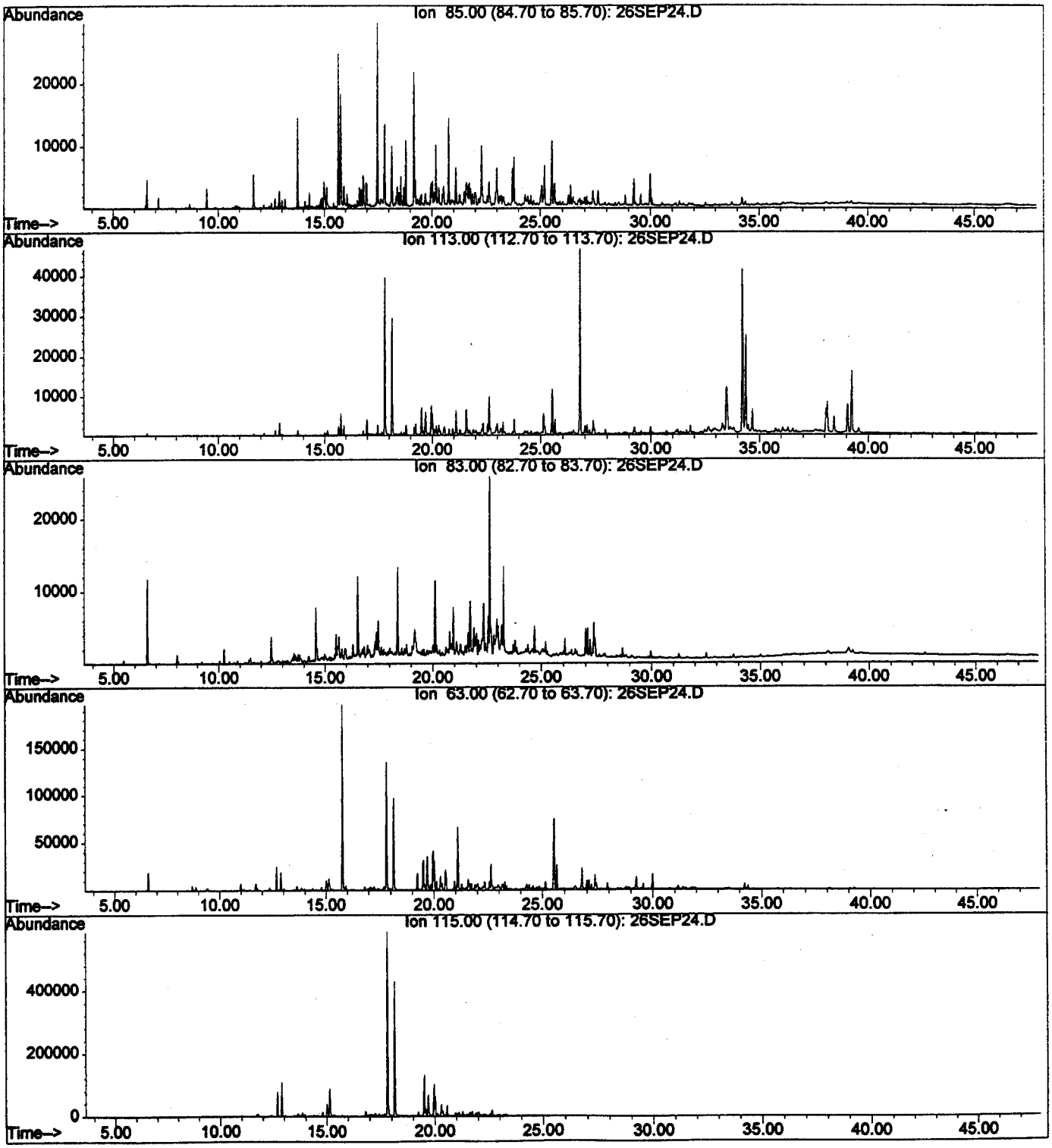
Operator : kty
Acquired : 27 Sep 2001 11:01 am using AcqMethod SIM4008M
Instrument : HP_5972
Sample Name: IG010925-03
Misc Info : Clay Tile#2
Vial Number: 24



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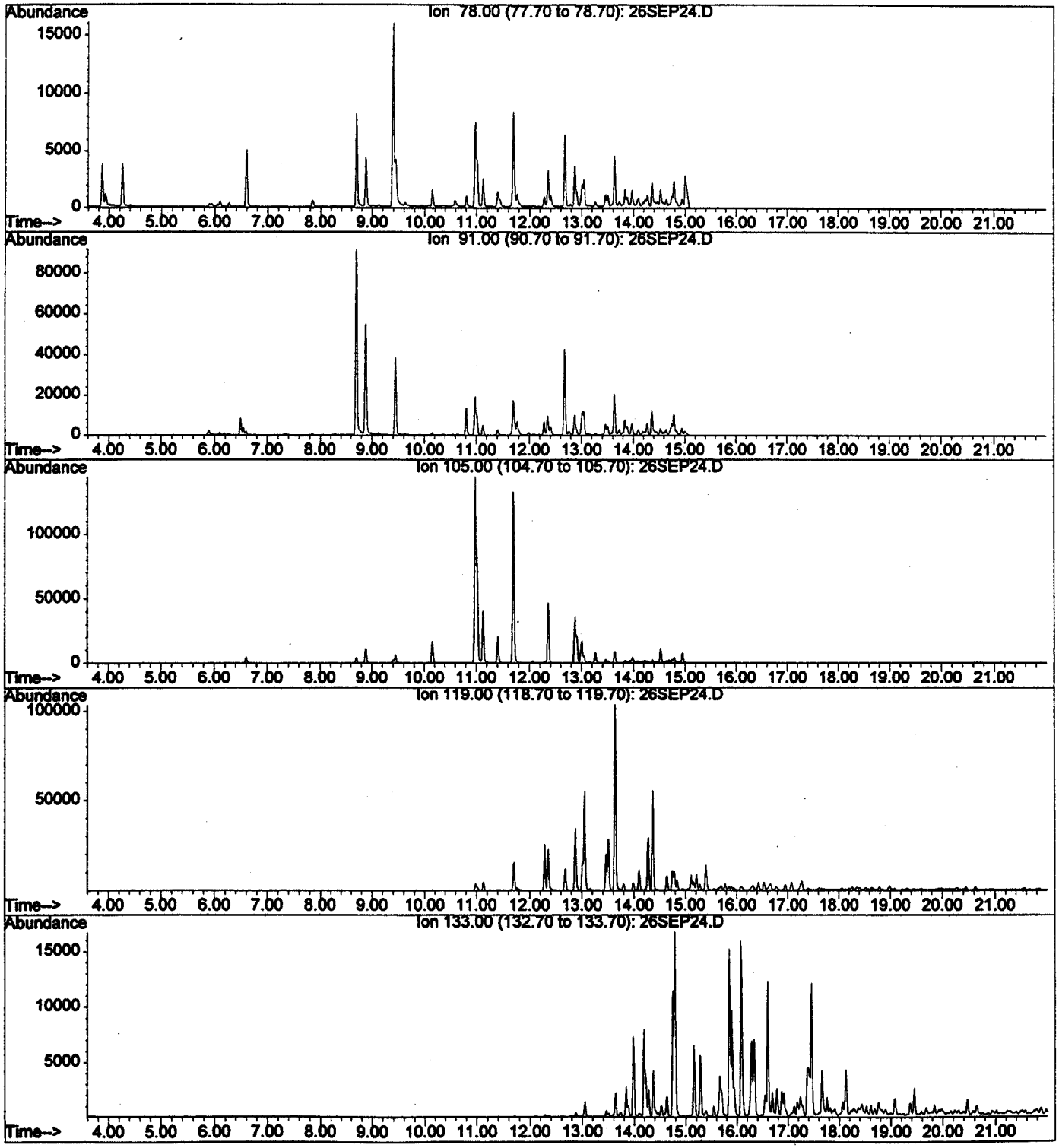
Instrument : HP_5972
Sample Name: IG010920-03
Misc Info : Clay Tile#2
Vial Number: 24



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Instrument : HP_5972
Sample Name: IG010920-03
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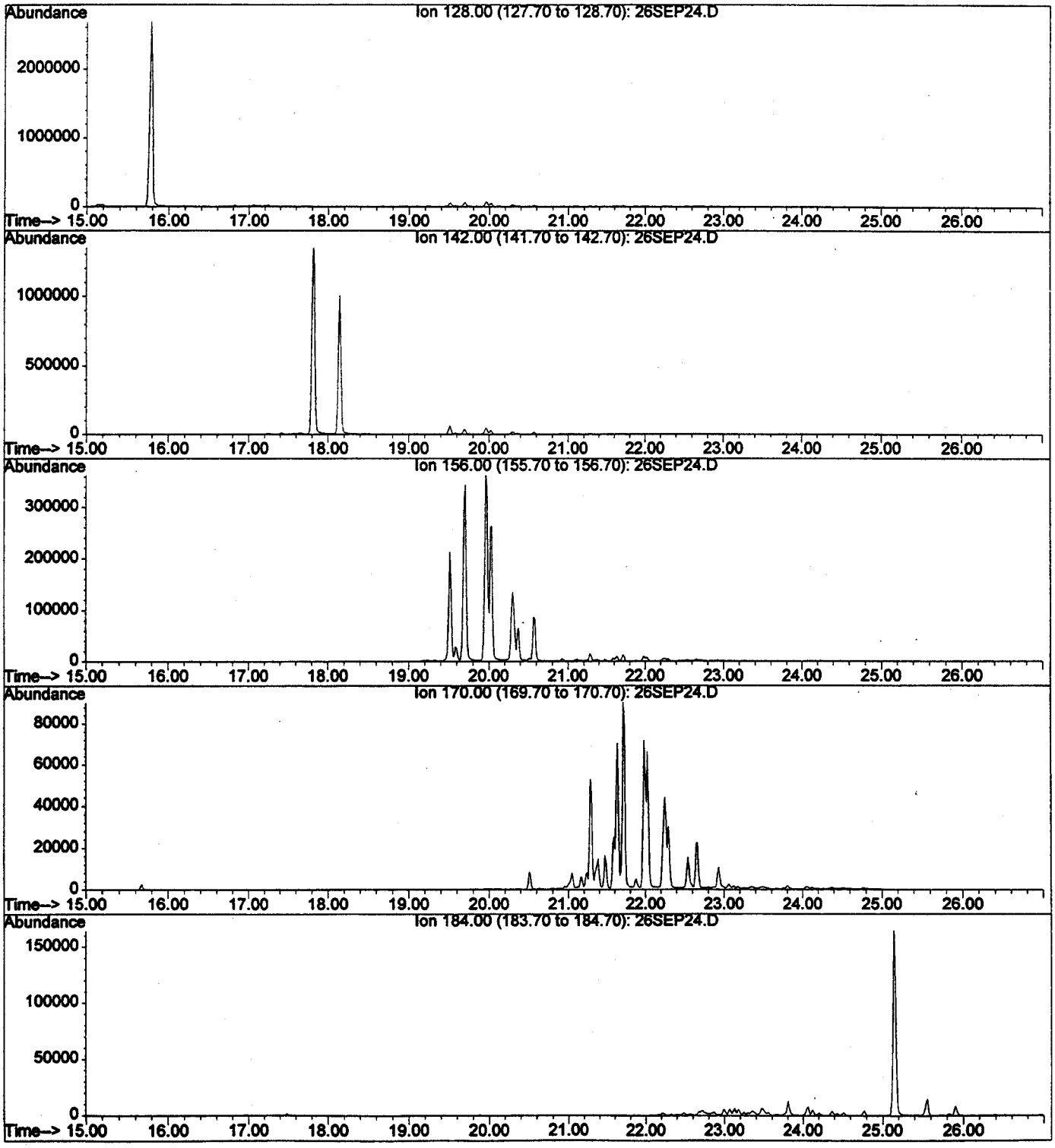
Vial Number: 24



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Sample Name: IG010920-03
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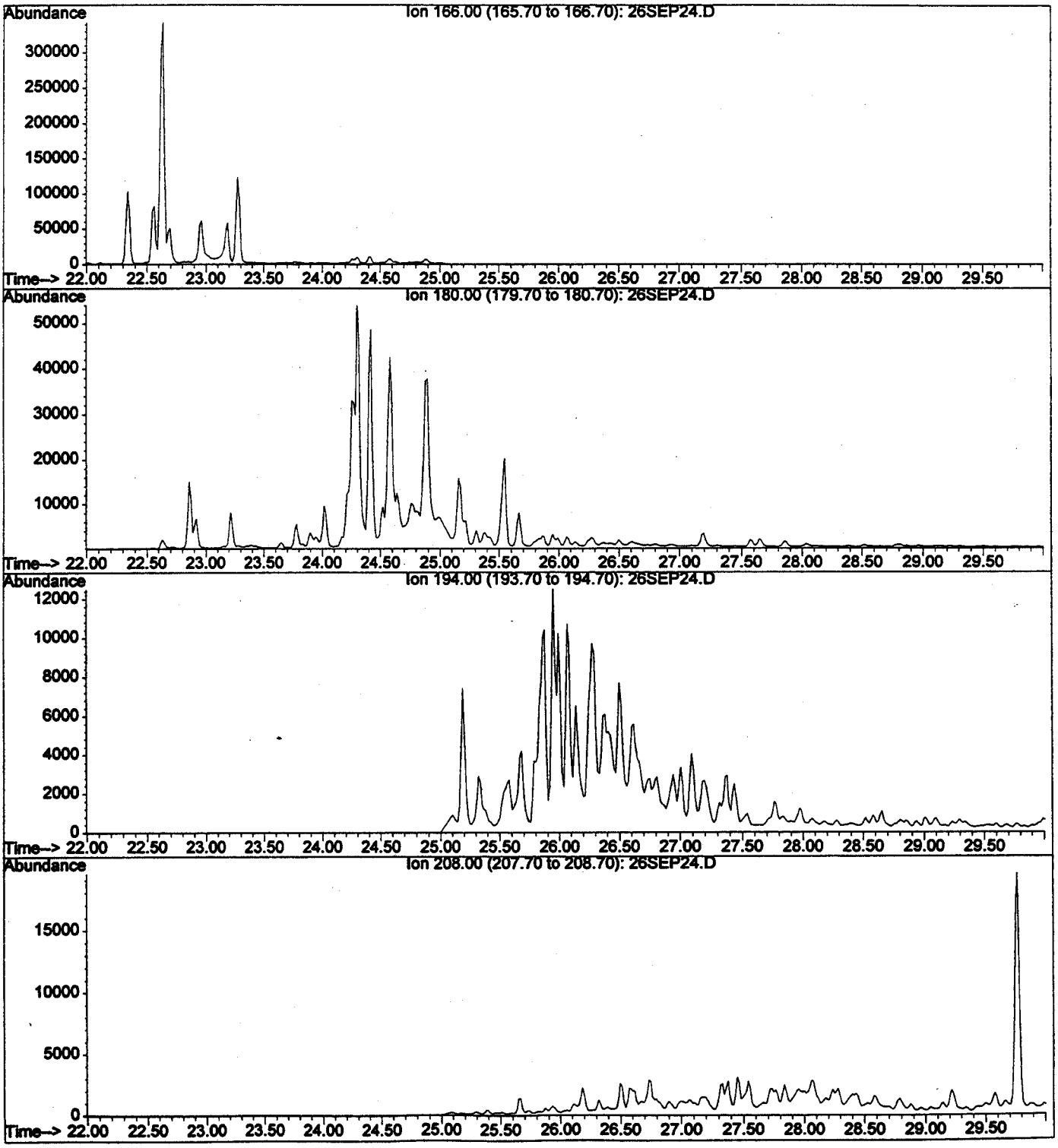
Vial Number: 24



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Instrument : HP_5972
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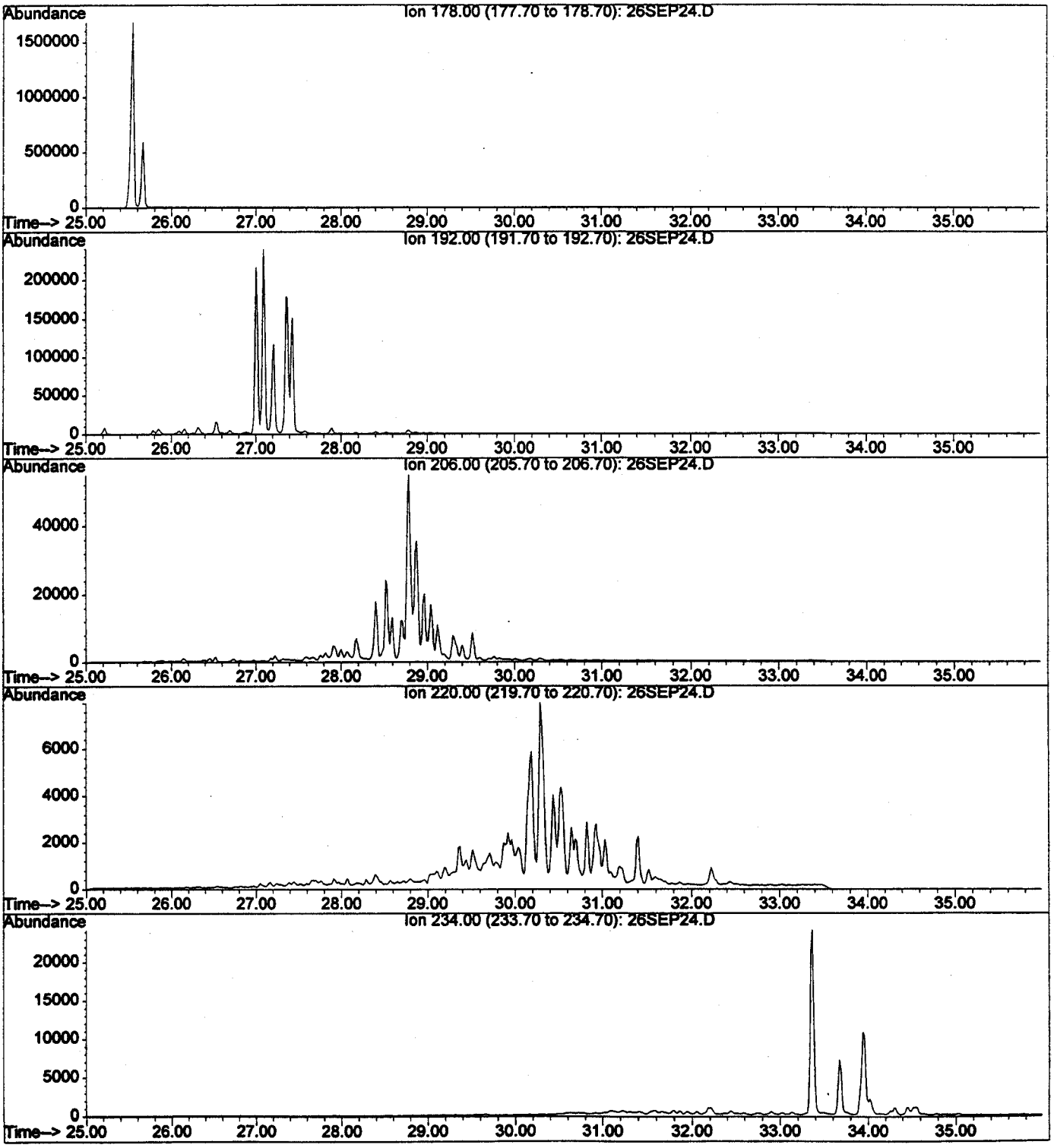
Vial Number: 24



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Instrument : HP_5972
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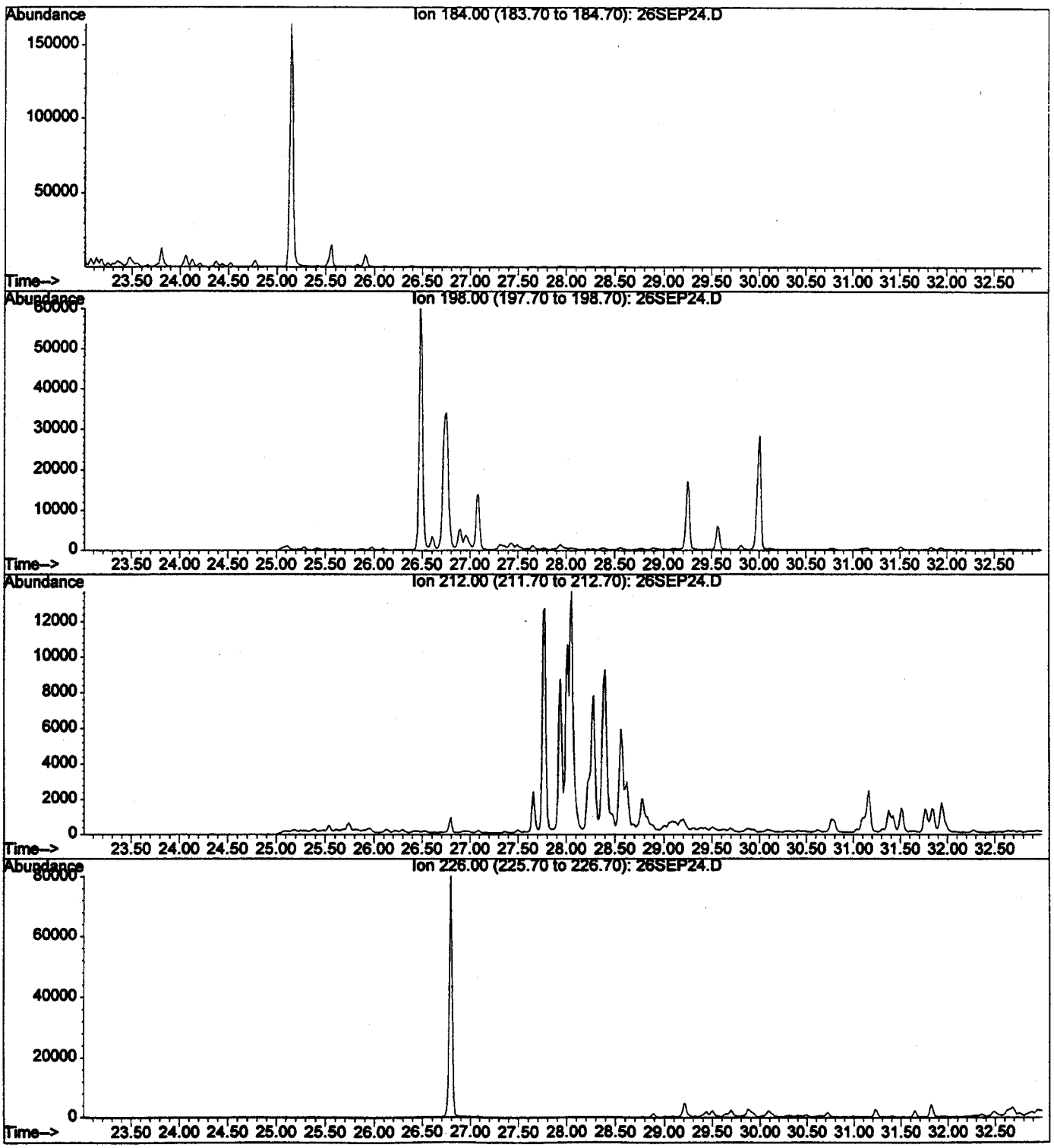
Vial Number: 24



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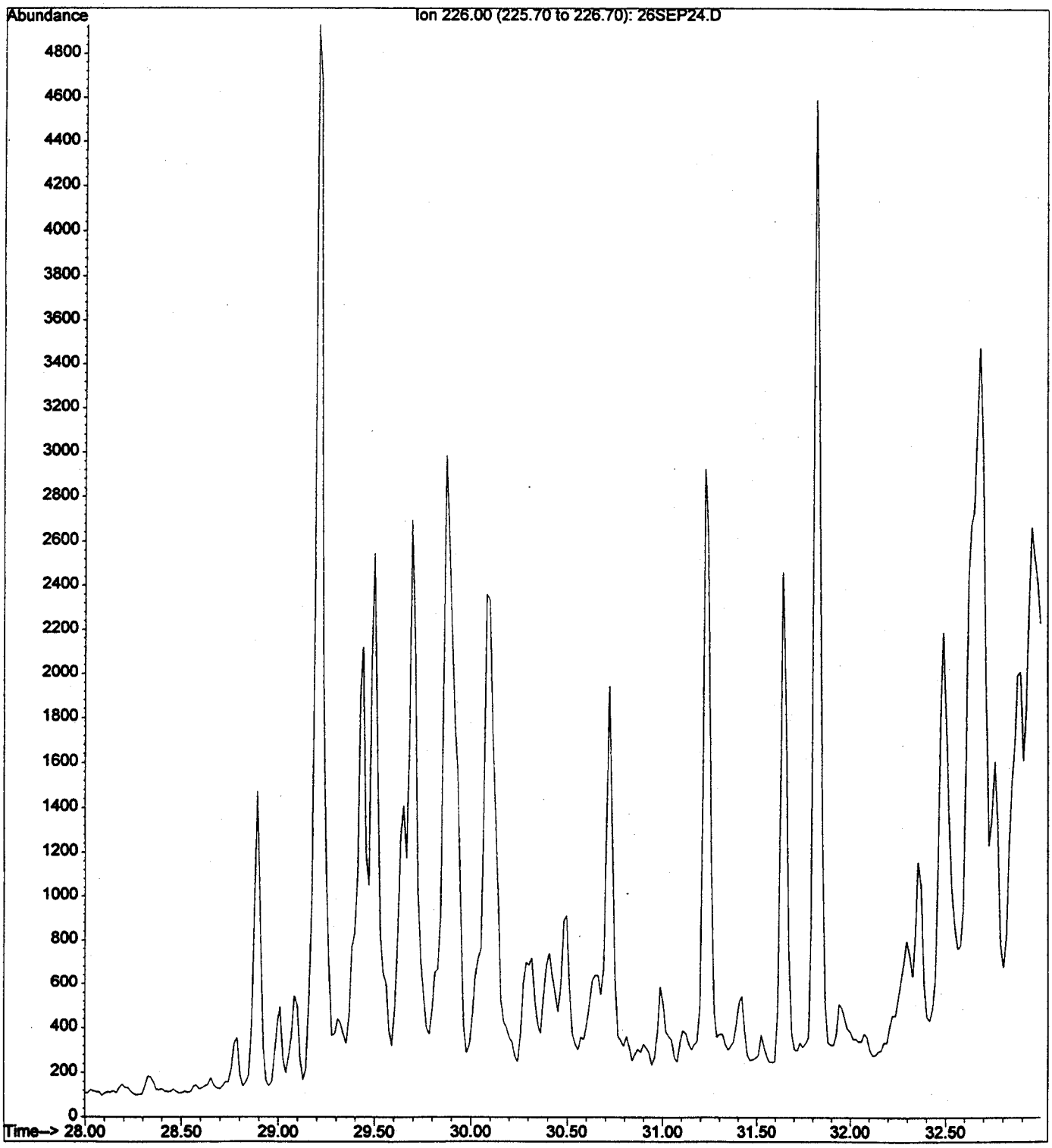
Vial Number: 24



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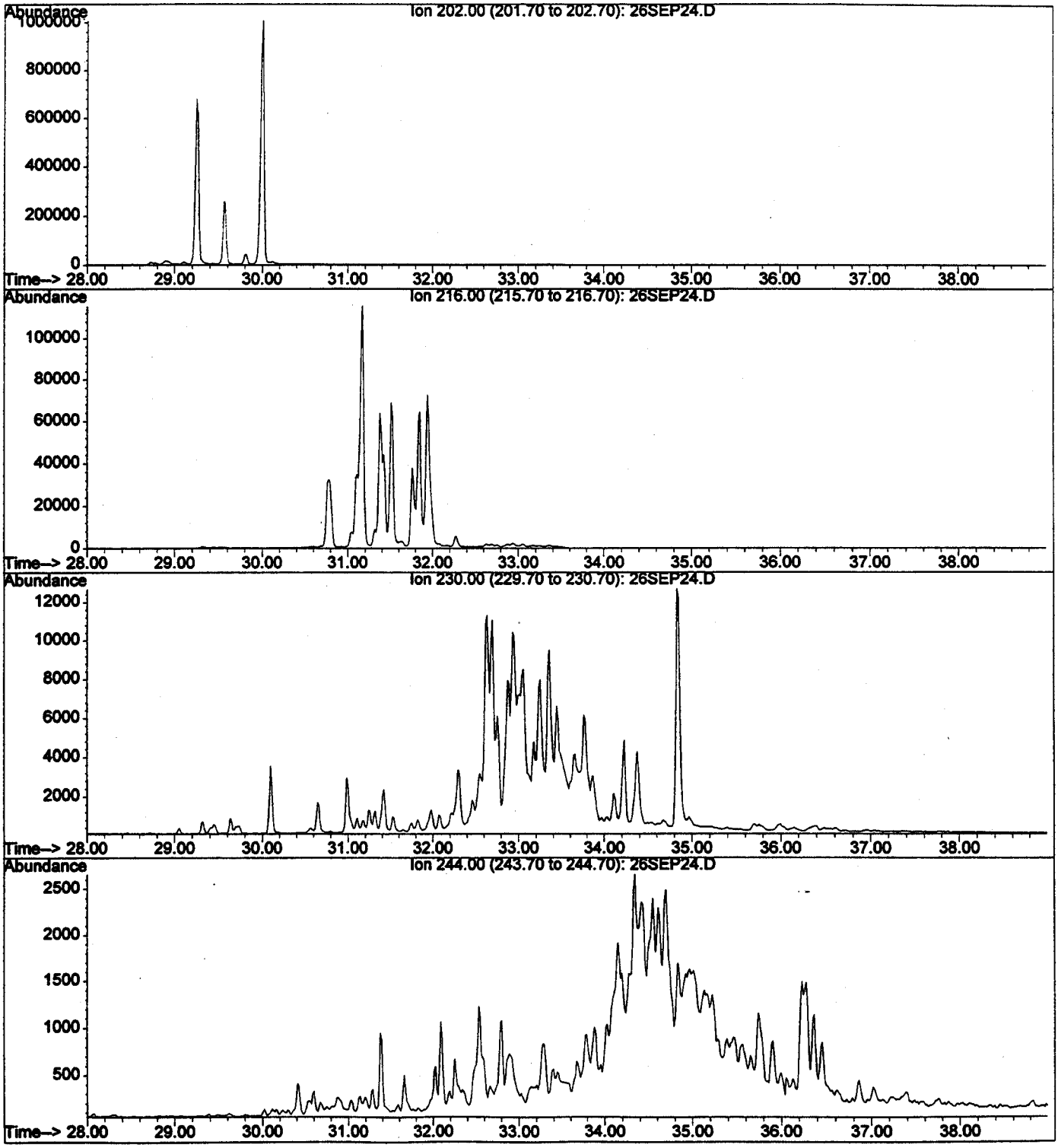
Vial Number: 24



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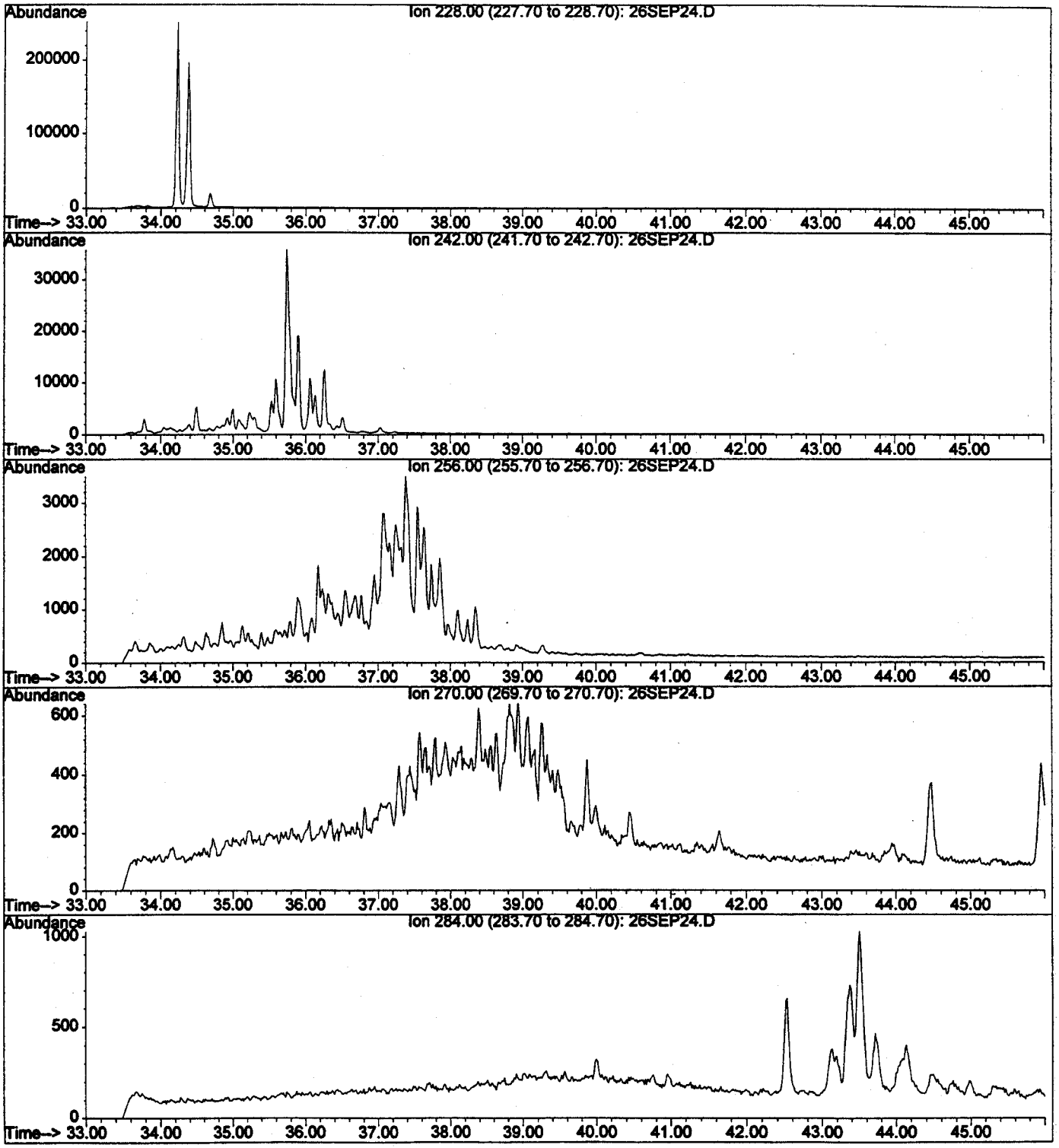
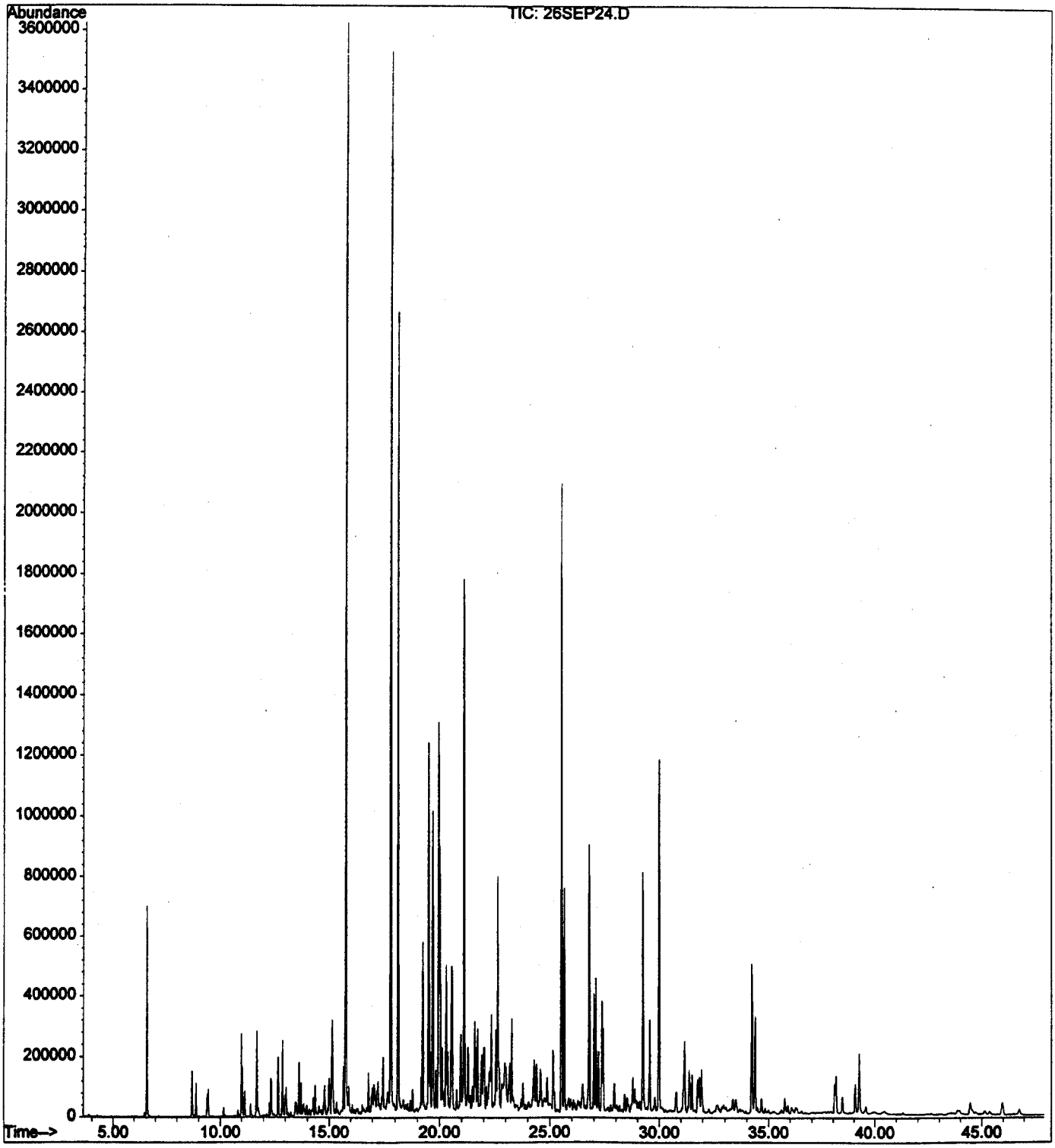
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Instrument : HP_5972
Sample Name: IG010926-03
Misc Info : Clay Tile#2
Vial Number: 24