

OLJEDIREKTORATET

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Prepared for

SAGA PETROLEUM a.s

TAMPEN AREA STUDY,
DATA REPORT 2

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SAGA PETROLEUM a.s

TAMPEN AREA STUDY,
DATA REPORT 2

VOLUME 2

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33/9-12

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OLJEDIREKTORATET

TABLE K1
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

JOB 4133				
GEOCHEM SAMPLE NUMBER	DEPTH/ IDENTITY	GROSS LITHOLOGIC DESCRIPTION	G S A COLOUR CODE	TOTAL ORGANIC CARBON (Wt. %)

WELL: 33/9-12

4133-001	2467.9m	A100% SANDSTONE - coarse grained, poorly sorted,, blocky, firm, sl micaceous, yellow F, no C, dark yellowish brown.	10YR4/2	
4133-002	2482.5m	A100% SANDSTONE - med grained, blocky, mod soft, sl micaceous, yellow F, slow blooming milky cut, dark yellowish brown.	10YR4/2	

TABLE K2
CONCENTRATION (PPM) OF EXTRACTED C₁₅₊ MATERIAL IN ROCK

JOB 4133	LITHO	DEPTH/ IDENTITY	TOTAL EXTRACT	HYDROCARBONS			NON HYDROCARBONS			
GEOCHEM SAMPLE NUMBER				Saturates	Aromatics	TOTAL	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's	TOTAL

WELL: 33/9-12

4133-001	2467.9m	6292	4855	575	5430	364	485	13	863
4133-002	2482.5m	16664	13271	2001	15273	259	1116	17	1392

TABLE K3
COMPOSITION (NORMALISED %) OF C₁₅₊ MATERIAL

JOB 4133	LITHO	DEPTH/ IDENTITY	HYDROCARBONS		NON HYDROCARBONS		
GEOCHEM SAMPLE NUMBER			Saturates	Aromatics	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's

WELL: 33/9-12

4133-001	2467.9m	77.16	9.13	5.78	7.72	0.21
4133-002	2482.5m	79.64	12.01	1.55	6.69	0.10

TABLE K4
SIGNIFICANT C₁₅₊ RATIOS

JOB 4133	LITHO	DEPTH/ IDENTITY	TOC (%)	mg/g TOC						HYDROCARBONS % TOTAL EXTRACT	SATURATES % AROMATICS
GEOCHEM SAMPLE NUMBER				TOTAL EXTRACT	SATURATES	AROMATICS	TOTAL HYDROCARBONS	ELUTED NSO'S	ASPHALTENES		

WELL: 33/9-12

4133-001	2467.9m	0.16	3932.68	3034.32	359.17	3393.49	303.43	227.35	86.29	8.45
4133-002	2482.5m	0.34	4901.24	3903.38	588.57	4491.95	328.10	76.17	91.65	6.63

TABLE K5
C₁₅₊ CHROMATOGRAPHY WEIGHTS (gms)

JOB 4133	L									
GEOCHEM SAMPLE NUMBER	I T H O	DEPTH/ IDENTITY	ROCK EXTRACTED	TOTAL EXTRACT	PRECIPTD. ASPHALTENES	NC5	SATURATES	AROMATICS	ELUTED NSO's	NON-ELUTED NSO's

WELL: 33/9-12

4133-001A	2467.9m	14.1300	0.08891	0.00514	0.08377	0.06860	0.00812	0.00686	0.00019
4133-002A	2482.5m	17.5700	0.29279	0.00455	0.28824	0.23318	0.03516	0.01960	0.00030

TABLE K6
COMPOSITION (NORMALISED %) OF C₁₅₊ SATURATE (PARAFFIN - NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	001	002
DEPTH	2467.9m	2482.5m
SAMPLE TYPE		
nC15	5.24	9.63
nC16	6.83	9.34
nC17	6.69	8.55
nC18	7.24	8.63
nC19	7.69	8.72
nC20	8.25	8.48
nC21	7.90	7.40
nC22	7.67	6.70
nC23	7.01	5.99
nC24	6.97	5.70
nC25	6.19	4.75
nC26	5.41	4.34
nC27	4.23	3.44
nC28	3.47	2.62
nC29	3.16	2.09
nC30	2.07	1.31
nC31	1.54	0.89
nC32	0.88	0.50
nC33	0.69	0.40
nC34	0.52	0.32
nC35	0.35	0.20
Paraffin	16.03	15.53
Isoprenoid	2.61	2.66
Naphthene	81.36	81.81
CPI 1 Index	0.99	0.99
CPI 2 Index	1.06	1.04
CPI 3 Index	0.95	0.99
Prist/Phytane	1.36	1.25
Prist/nC17	0.86	0.80
Phytane/nC18	0.58	0.63

Job Number : 4133

$$C.P.I. 1 = \frac{1}{2} \left[\frac{C_{21} + C_{23} + C_{25} + C_{27}}{C_{20} + C_{22} + C_{24} + C_{26}} + \frac{C_{21} + C_{23} + C_{25} + C_{27}}{C_{22} + C_{24} + C_{26} + C_{28}} \right]$$

$$C.P.I. 2 = \frac{1}{2} \left[\frac{C_{25} + C_{27} + C_{29} + C_{31}}{C_{24} + C_{26} + C_{28} + C_{30}} + \frac{C_{25} + C_{27} + C_{29} + C_{31}}{C_{26} + C_{28} + C_{30} + C_{32}} \right]$$

$$C.P.I. 3 = \frac{2 \times (C_{27})}{C_{26} + C_{28}}$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE K7
METHYLPHENANTHRENE INDICES (MPI)

JOB 4133			MPI 1		Rcalc		MPI 2	
GEOCHEM SAMPLE NUMBER	DEPTH/ IDENTITY	SAMPLE TYPE	AREA	HEIGHT	AREA	HEIGHT	AREA	HEIGHT

WELL: 33/9-12

4133-001	2467.9m		0.57	0.64			0.60	0.62
4133-002	2482.5m		0.66	0.69			0.70	0.68

$$\text{MPI 1} = \frac{1.5(2\text{-MP} + 3\text{-MP})}{\text{P} + 1\text{-MP} + 9\text{-MP}} \quad \text{MPI 2} = \frac{3(2\text{-MP})}{\text{P} + 1\text{-MP} + 9\text{-MP}}$$

$$\text{Rcalc} = \begin{cases} 0.60(\text{MPI 1}) + 0.40 & (\text{if } \text{Ro} < 1.35\%) \\ -0.60(\text{MPI 1}) + 2.30 & (\text{if } \text{Ro} > 1.35\%) \end{cases}$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE K8

AROMATIC HYDROCARBONS RATIOS (MSD, PEAK AREA DATA)

SAMPLE NUMBER	DEPTH (m)	2MP/ 1MP	RATIO 1	RATIO 2	RATIO 3
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WELL: 33/9-12

4133-001A	2467.9	0.61	0.20	0.53	0.11
4133-002A	2482.5	0.81	0.23	0.56	0.11

$$\text{RATIO 1} = \frac{A(231)}{A(231) + G(231)}$$

$$\text{RATIO 2} = \frac{E(253)}{E(253) + G(253)}$$

$$\text{RATIO 3} = \frac{A(253)}{B(231) + E(253)}$$

TABLE K9
CARBON ISOTOPE COMPOSITIONS (‰,PDB)

JOB 4133								
GEOCHEM SAMPLE NUMBER	DEPTH/ IDENTITY	TOTAL EXTRACT WHOLE OIL	SATURATES	AROMATICS	NSO	ASPHALTENES	KEROGEN	PYROLYSATE (S2)

WELL: 33/9-12

4133-001	2467.9m	-29.71	-29.89	-29.35	-29.99	-29.62		
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TABLE K10
BIOMARKER MOLECULAR RATIOS

WELL: 33/9-12

		Steranes (m/z 217)			Steranes (m/z 218)		
SAMPLE NUMBER	DEPTH (m)	<u>A</u>	<u>Q</u>	<u>(R+S)</u>	NORMALISED COMPOSITION:		
		(A+J)	(Q+T)	(Q+R+S+T)	B	D	F
4133-001A	2467.9	0.54	0.58	0.46	30%	28%	42%
4133-002A	2482.5	0.58	0.51	0.50	28%	24%	48%

TABLE K11
BIOMARKER MOLECULAR RATIOS

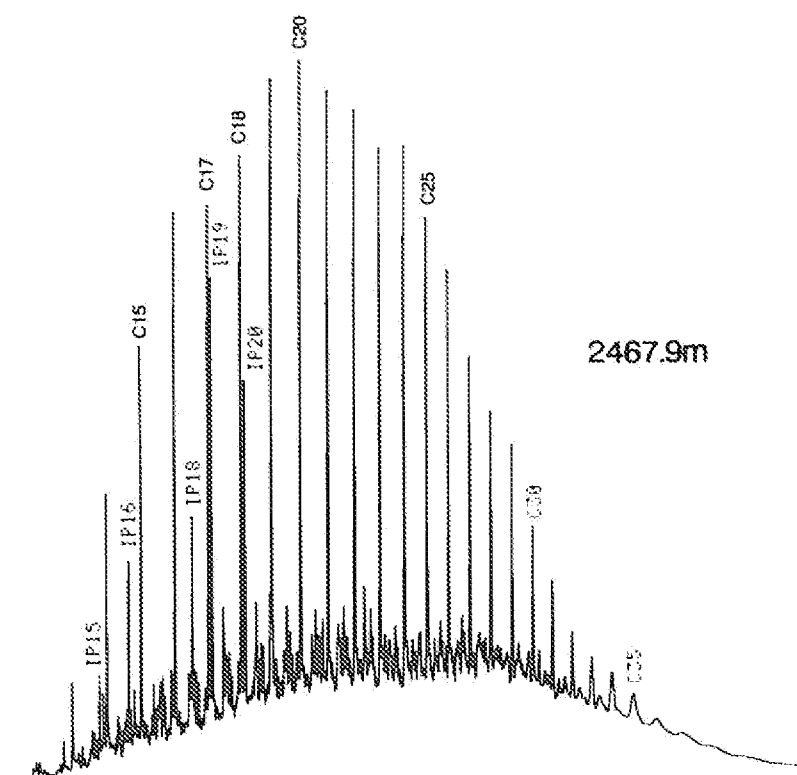
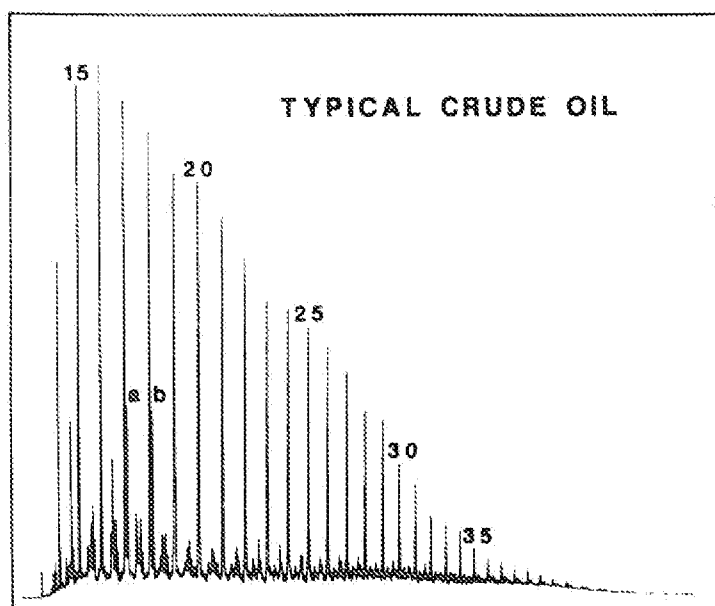
WELL 33/9-12

Terpanes (m/z 191)

SAMPLE NUMBER	DEPTH (m)	A/B	Z/E	Z/C	<u>Z</u> (Z+E)	<u>C</u> (C+E)	%22S for J	<u>E</u> (E+F)	<u>X</u> (X+D)	Q/E
4133-001A	2467.9	2.06	0.26	0.62	0.20	0.29	57%	0.93	0.51	0.05
4133-002A	2482.5	1.22	0.37	0.55	0.27	0.40	51%	0.89	0.58	0.08

FIGURE K.1.1 C₁₅+ SATURATES CHROMATOGRAMS

WELL 33/9-12

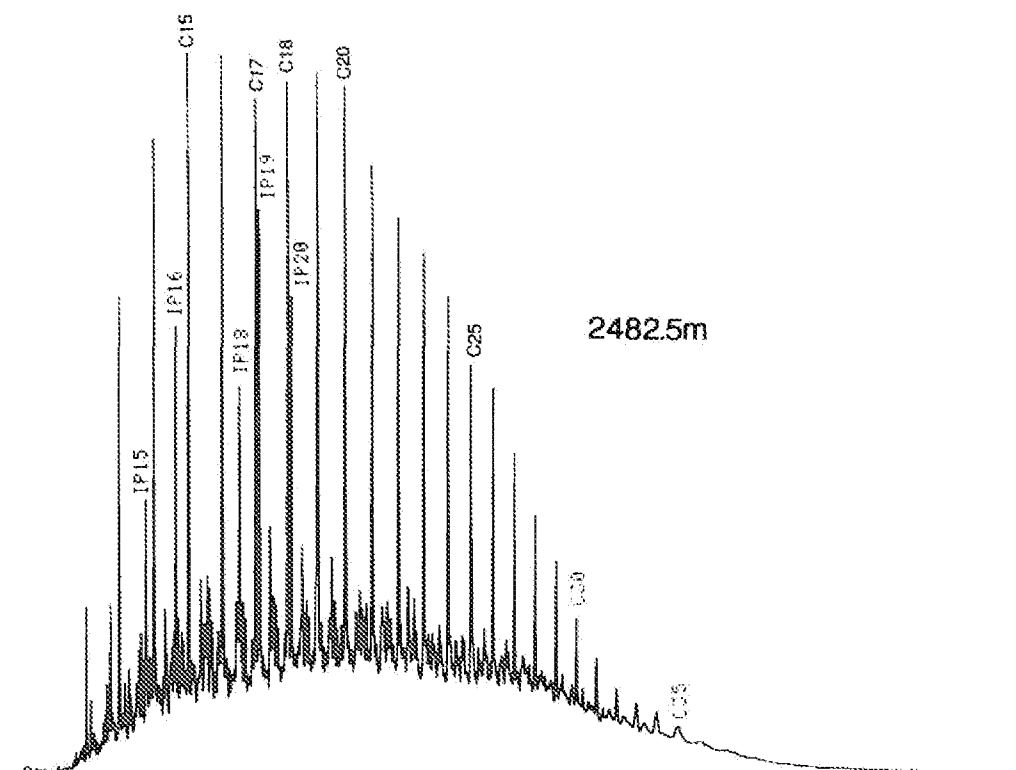


a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20-nC₂₀)

FIGURE K12 **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 33/9-12



a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE K2.1

C₁₅+ AROMATIC CHROMATOGRAMS

WELL 33/9-12

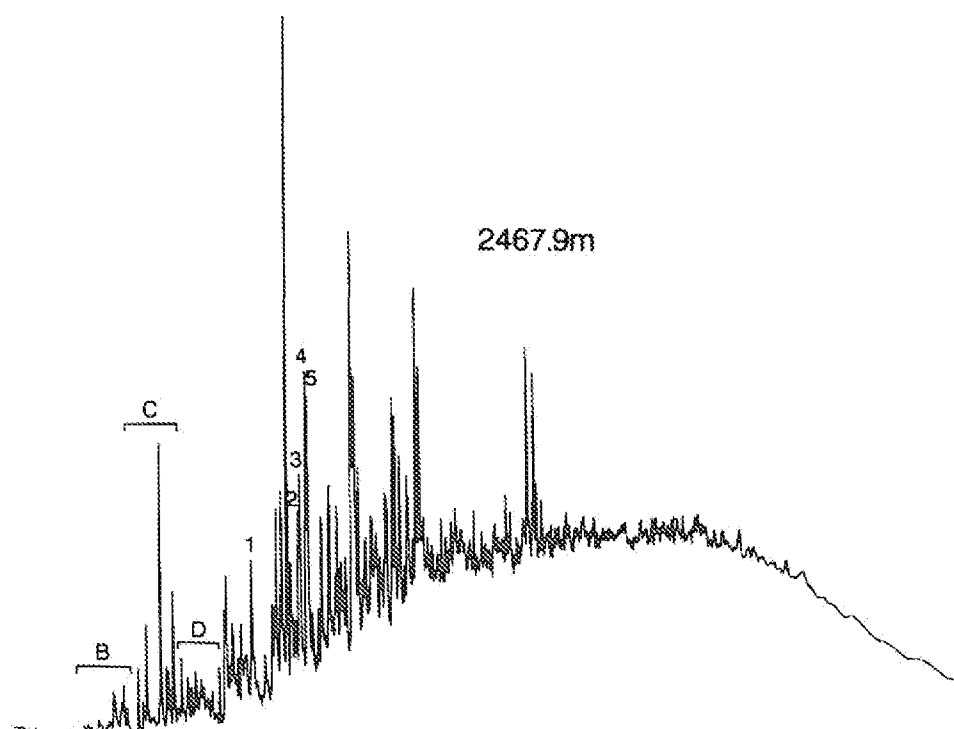
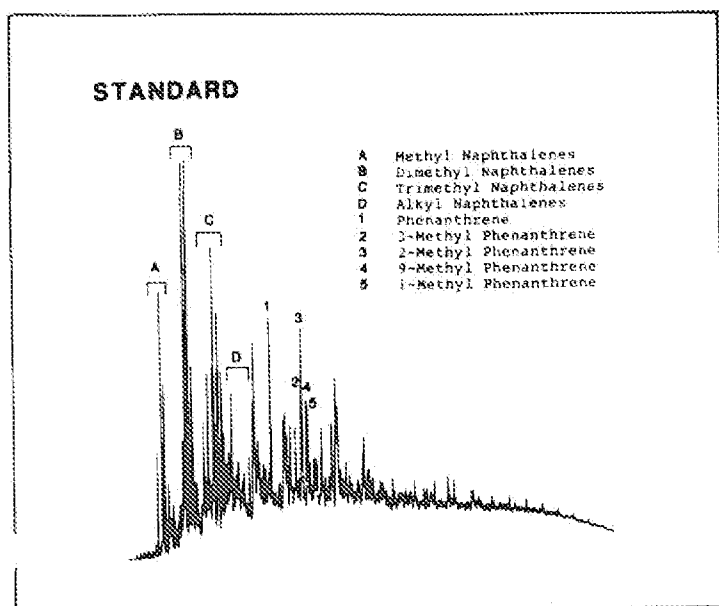
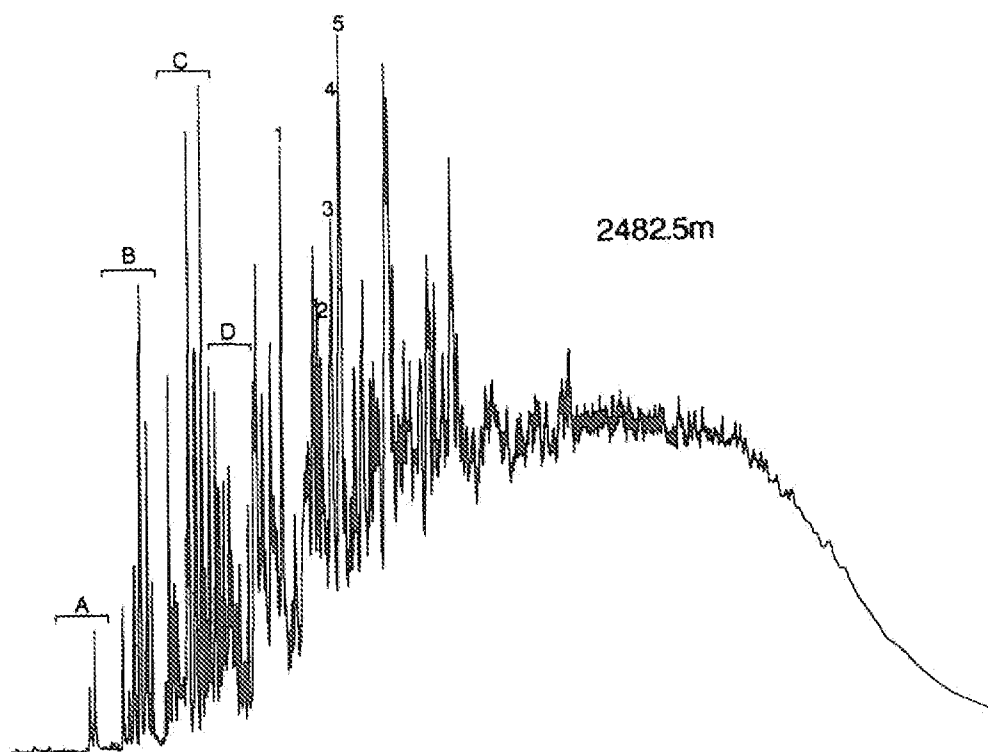
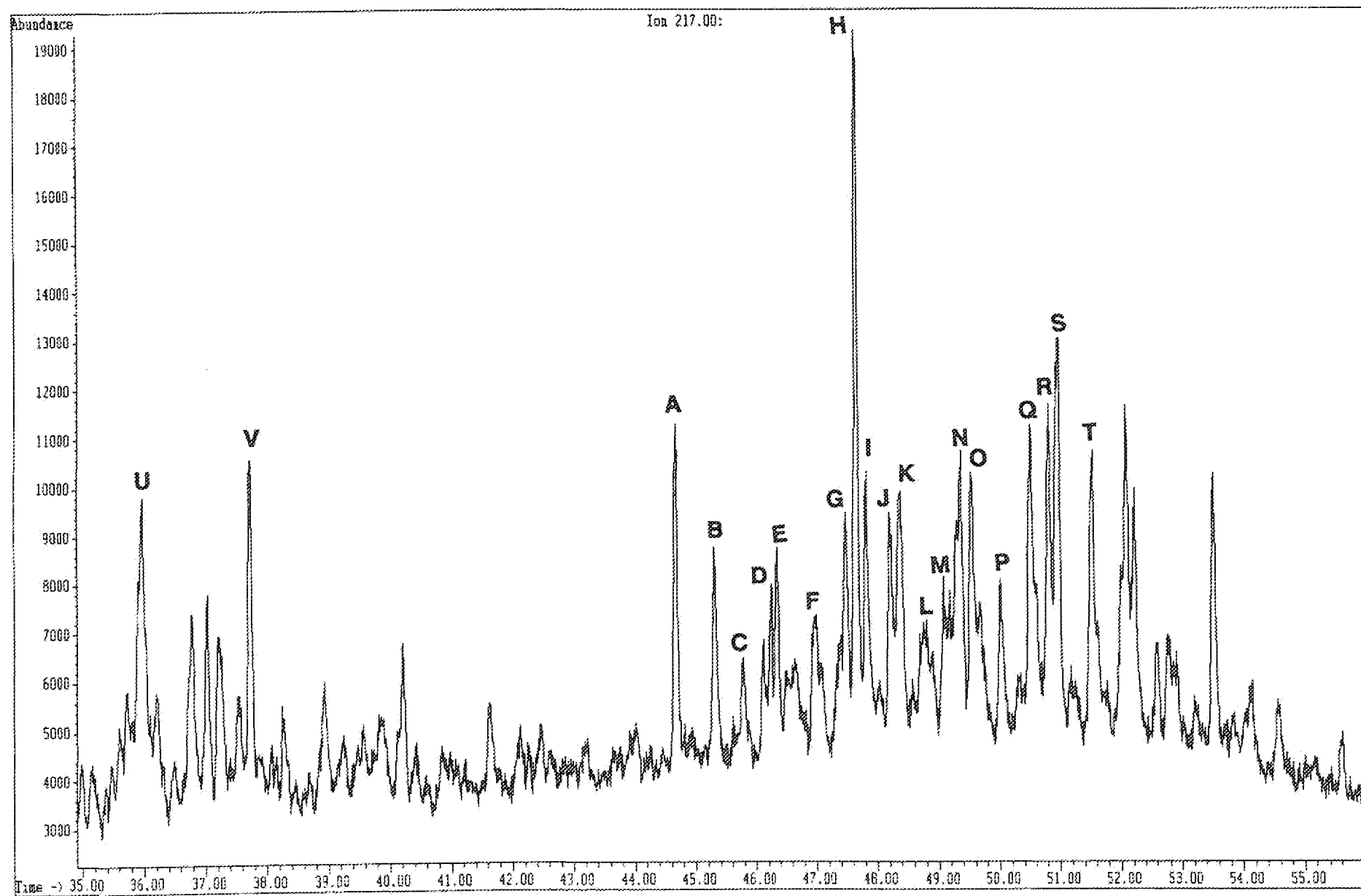


FIGURE K22 **C₁₅+ AROMATIC CHROMATOGRAMS**

WELL 33/9-12

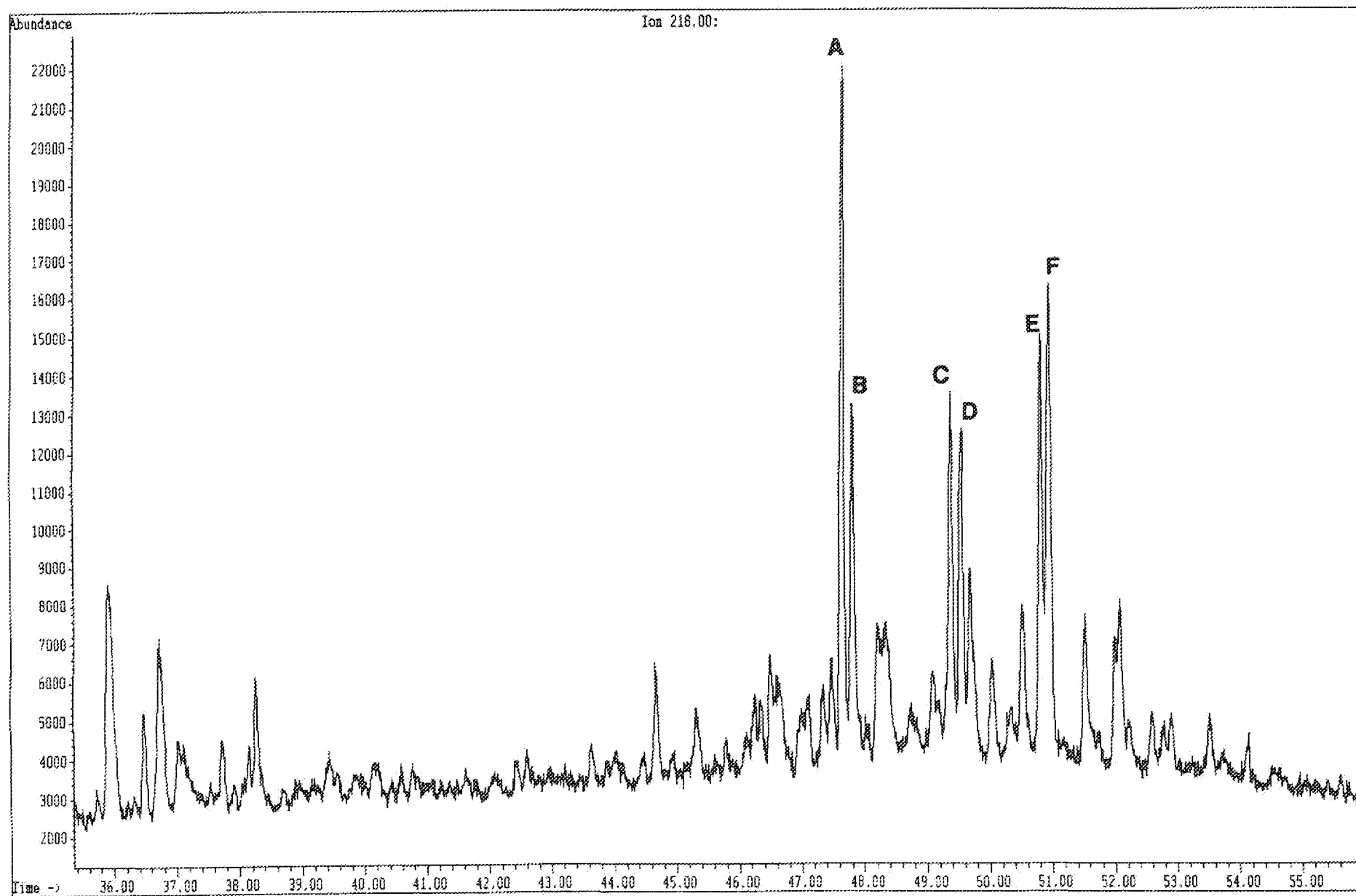


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Misc Info: WELL 33/9-12 2467.9M
Bottle Number: 29



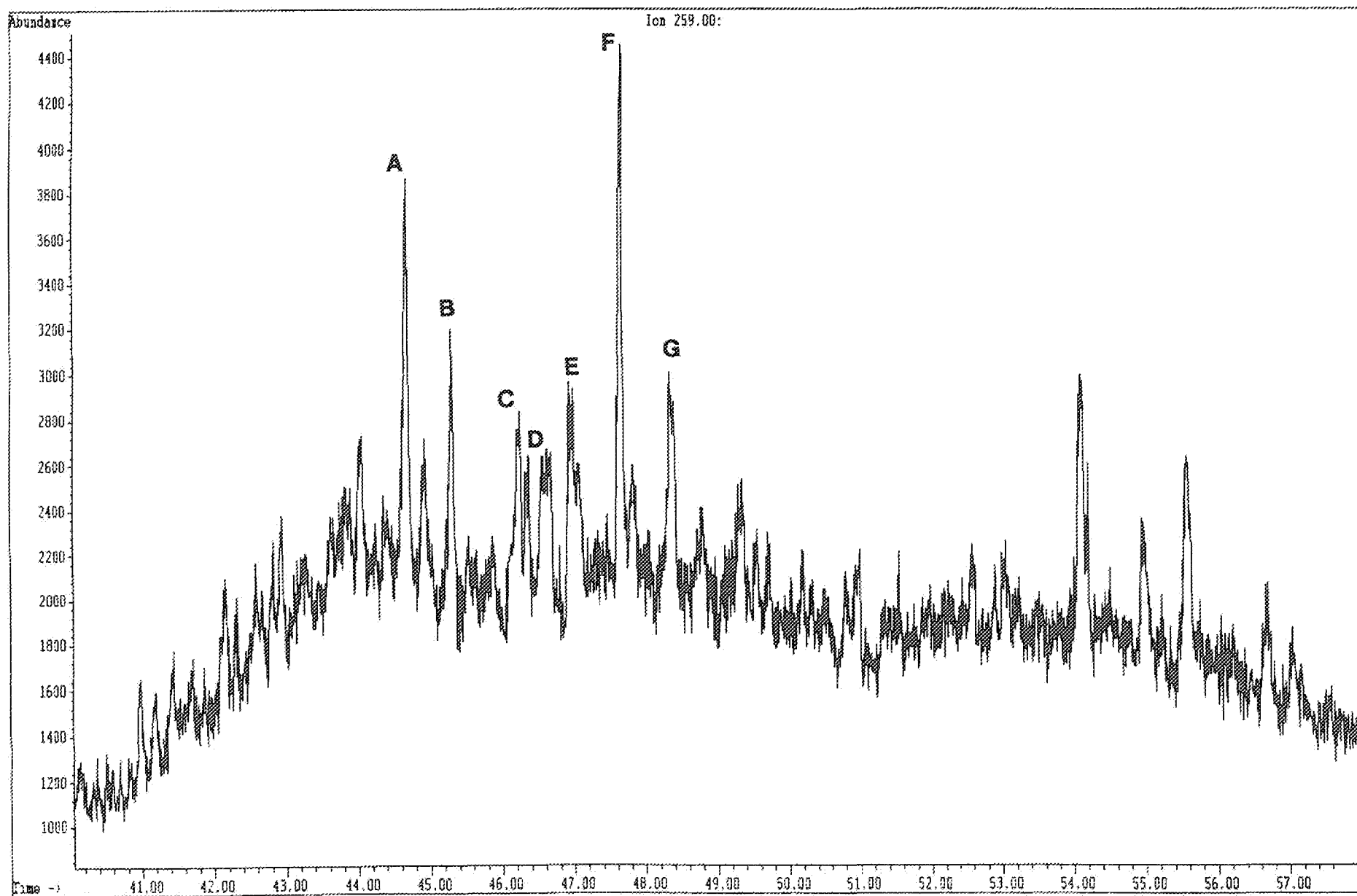
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Bottle Number: 29

K3.1b



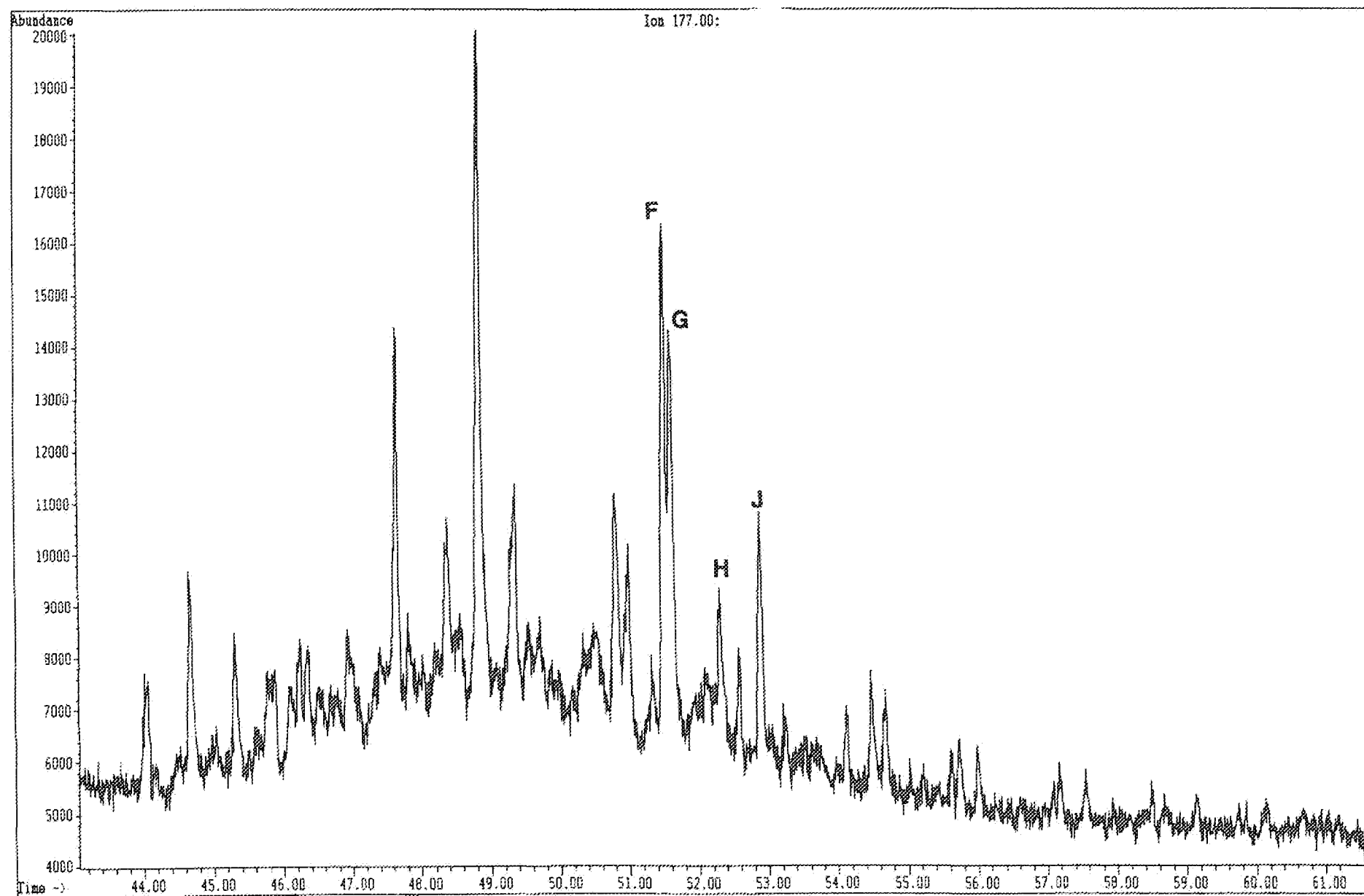
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Bottle Number: 29

K3.1c



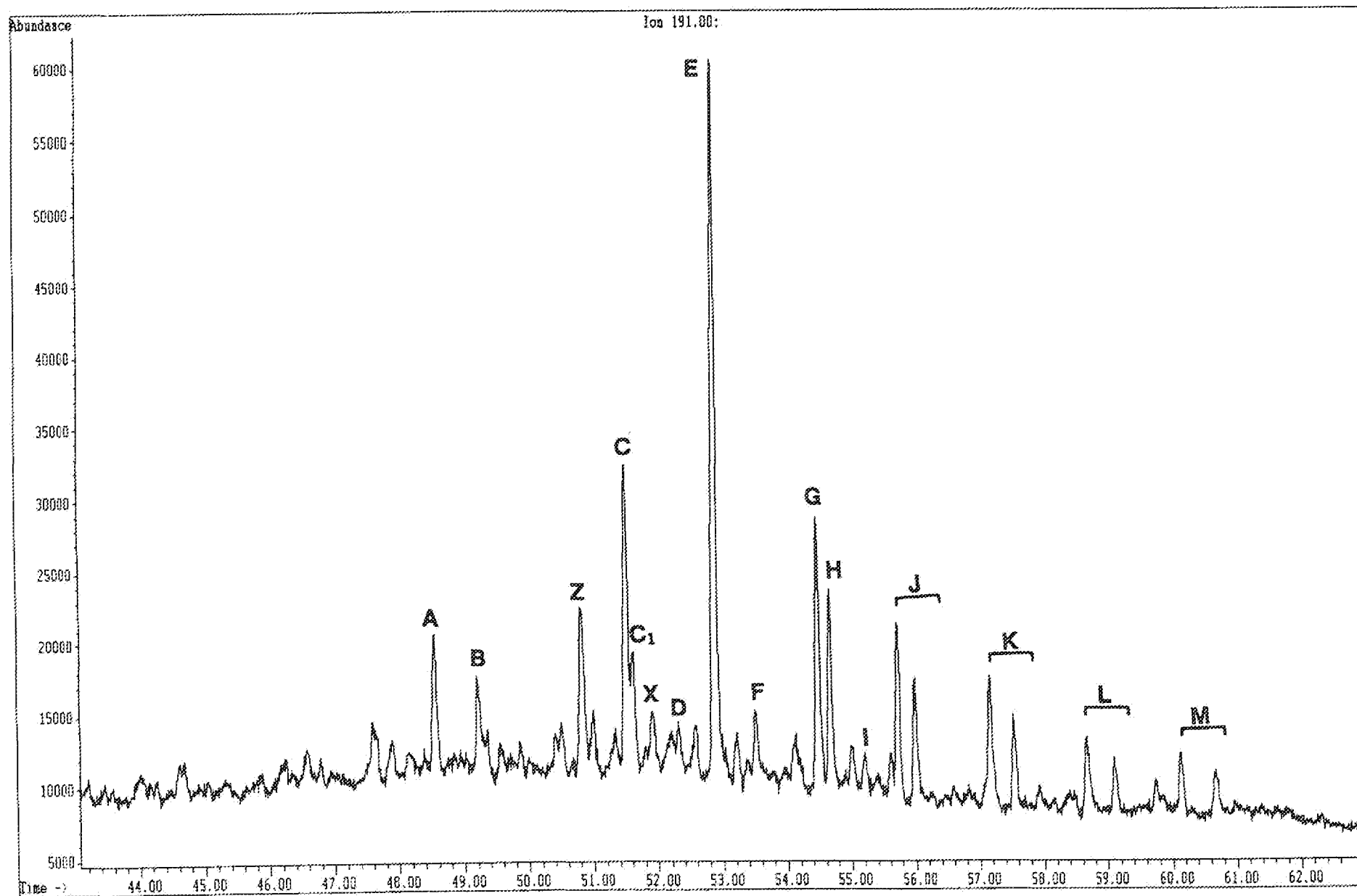
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Bottle Number: 29

K3.1d



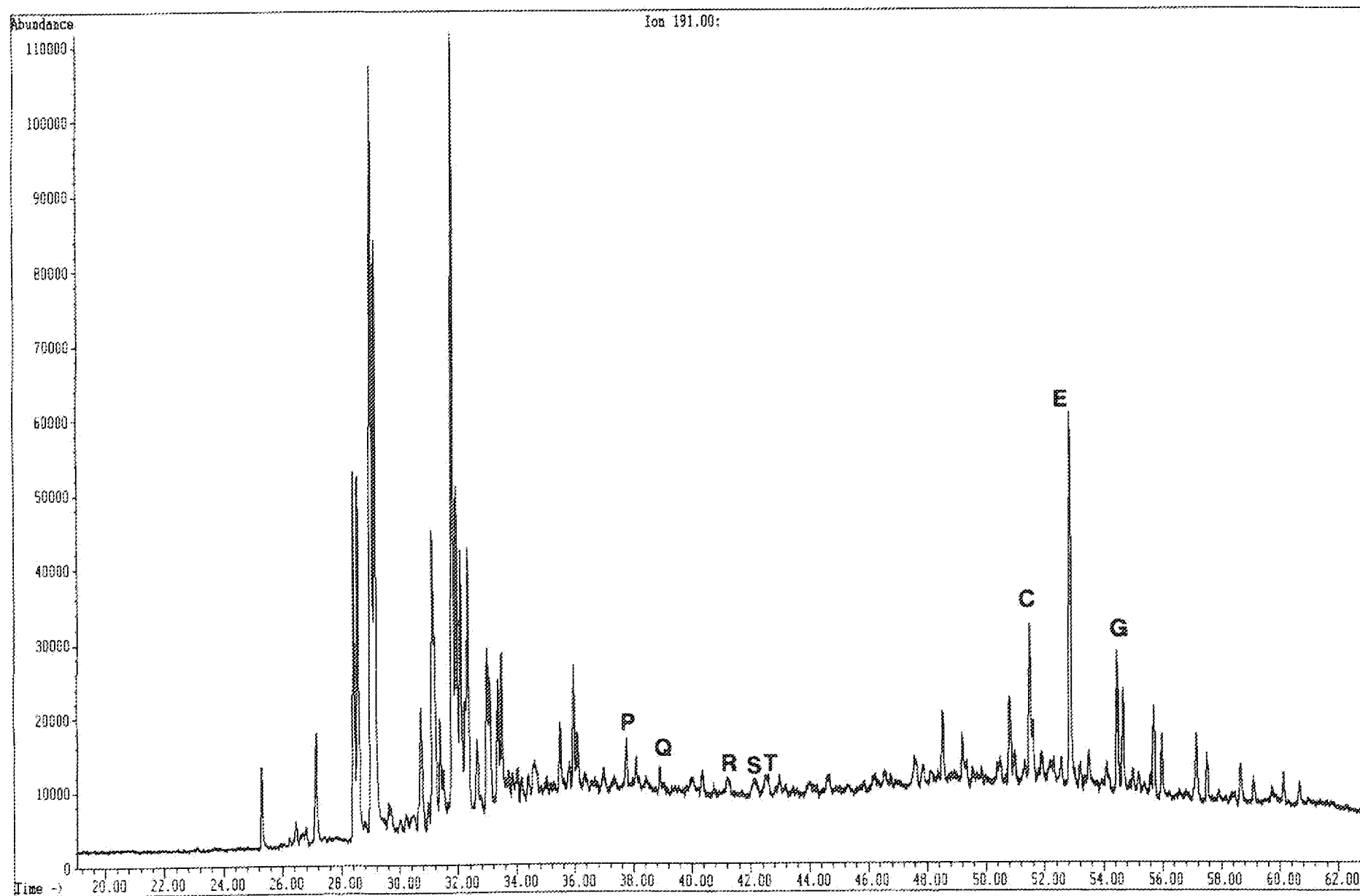
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K3.1e



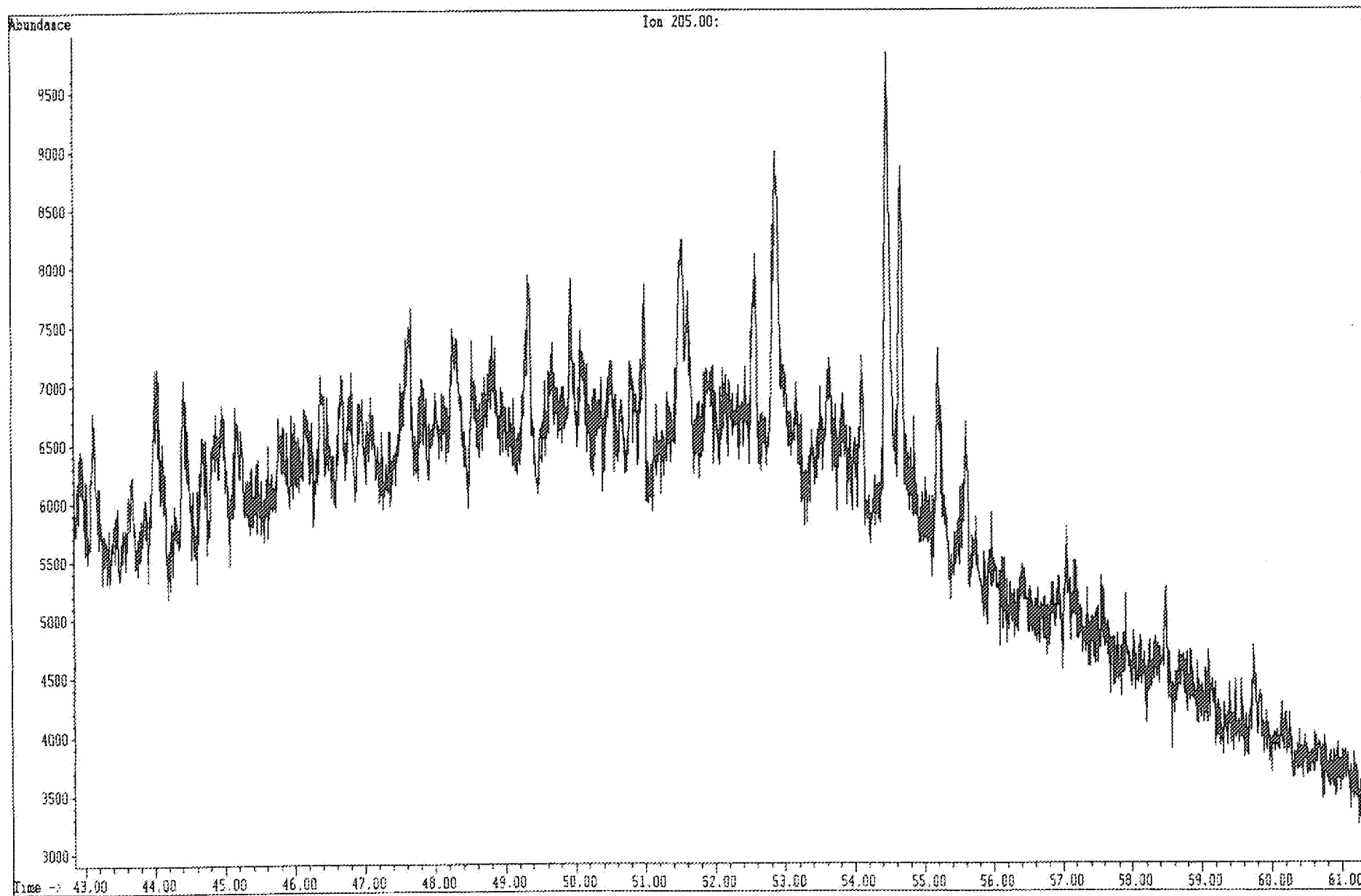
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K3.1f



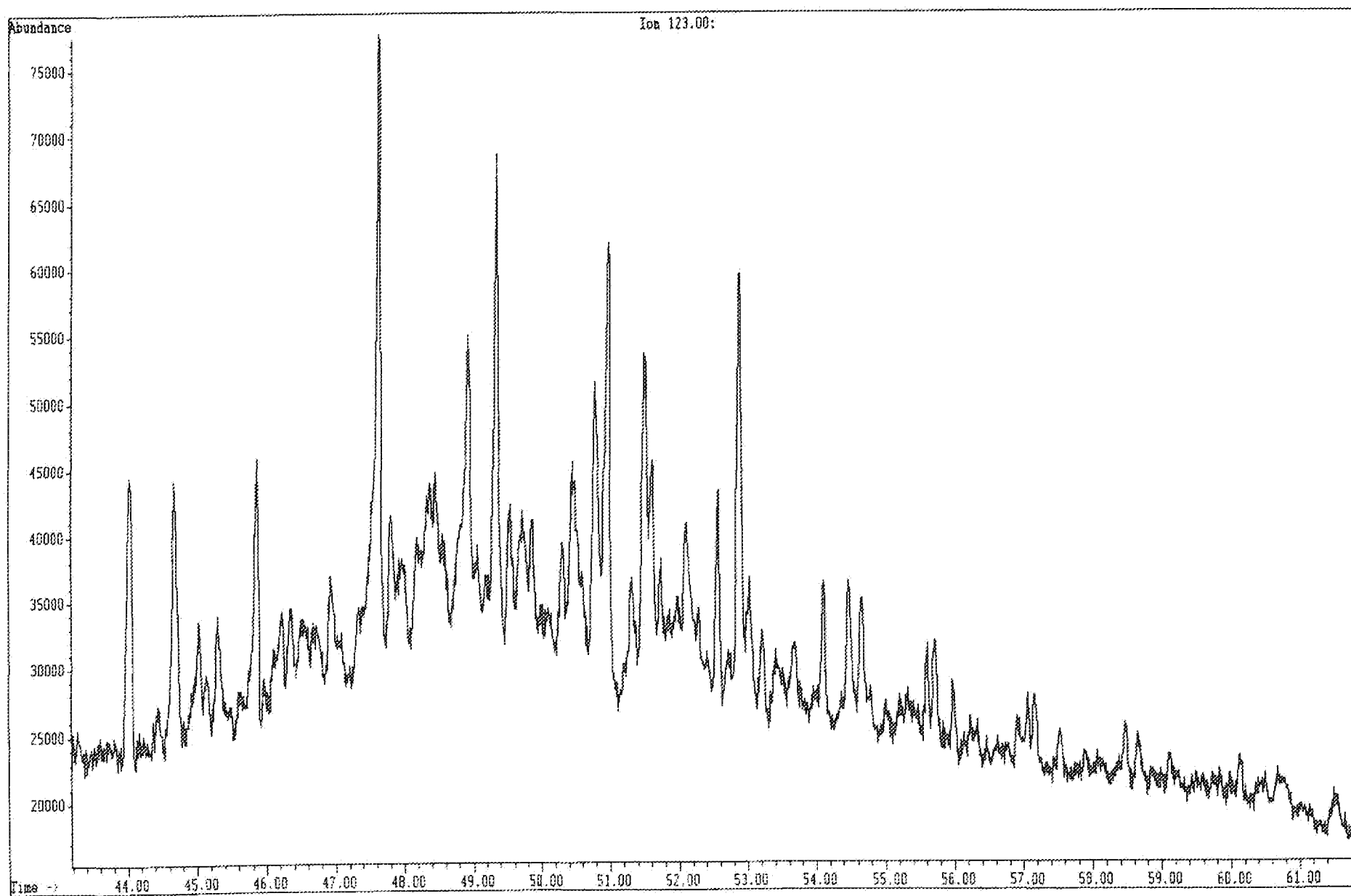
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K3.1g



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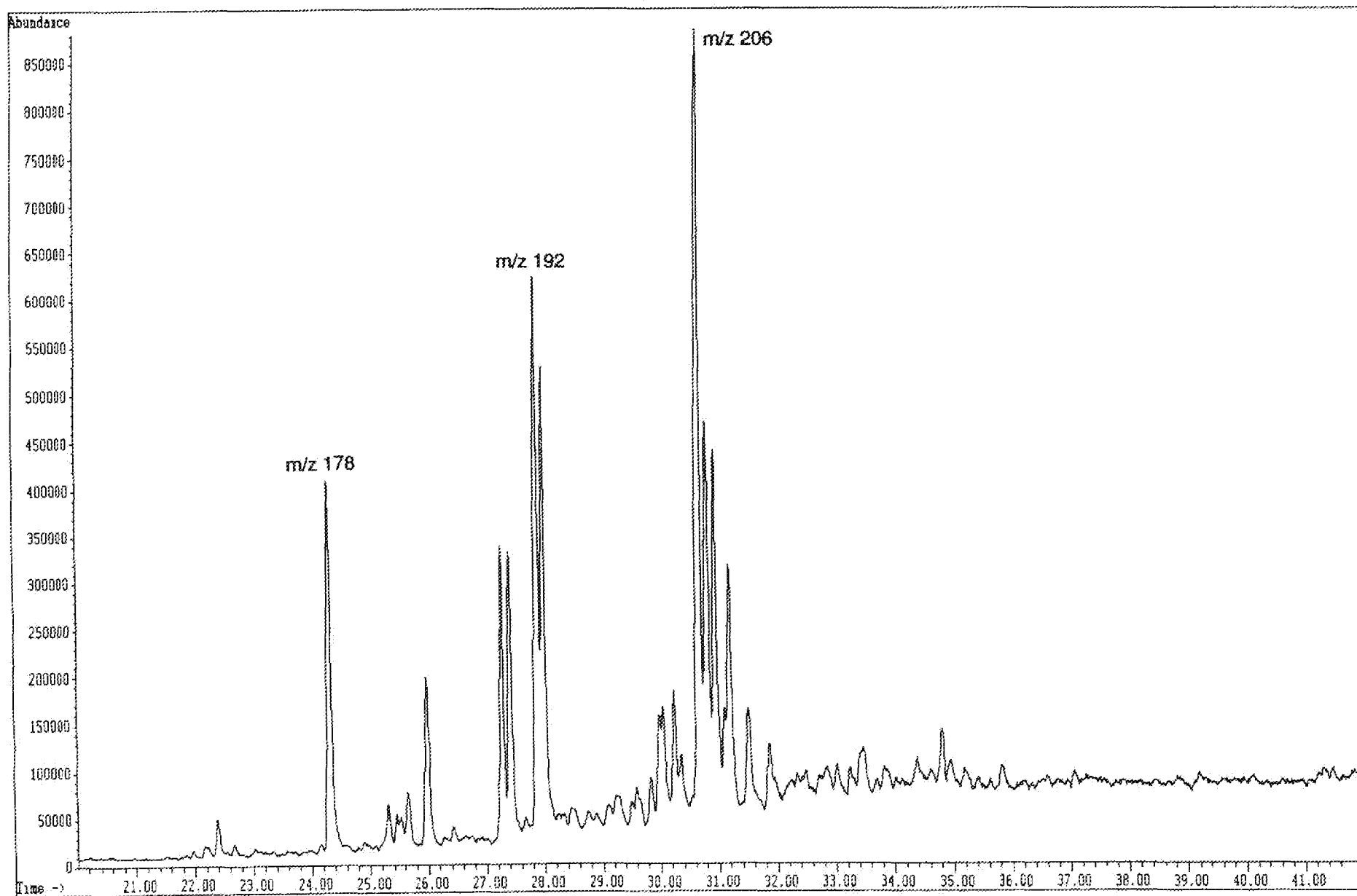
K3.1h



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Bottle Number: 96

K3.11

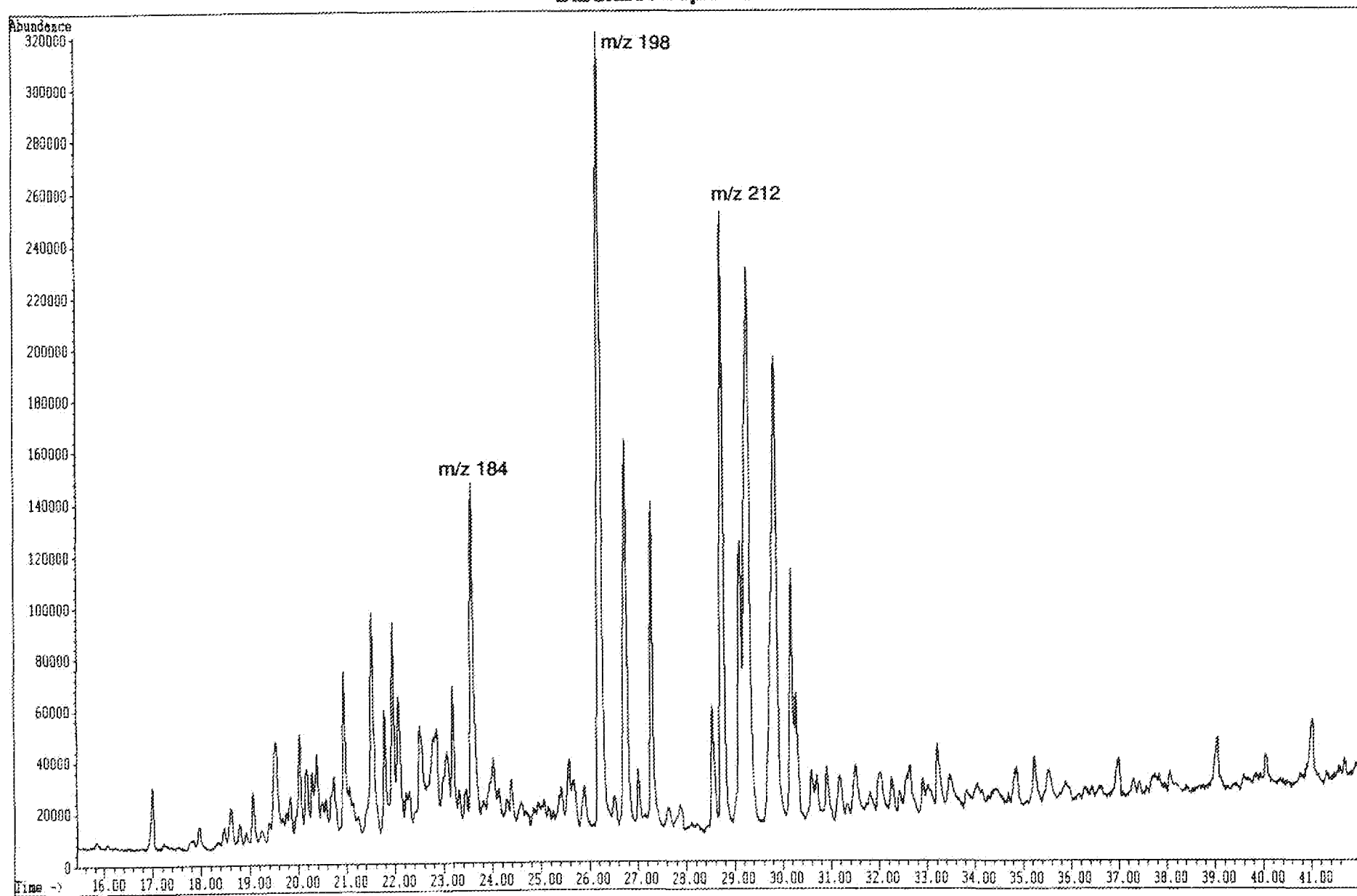
Phenanthrenes



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Bottle Number: 96

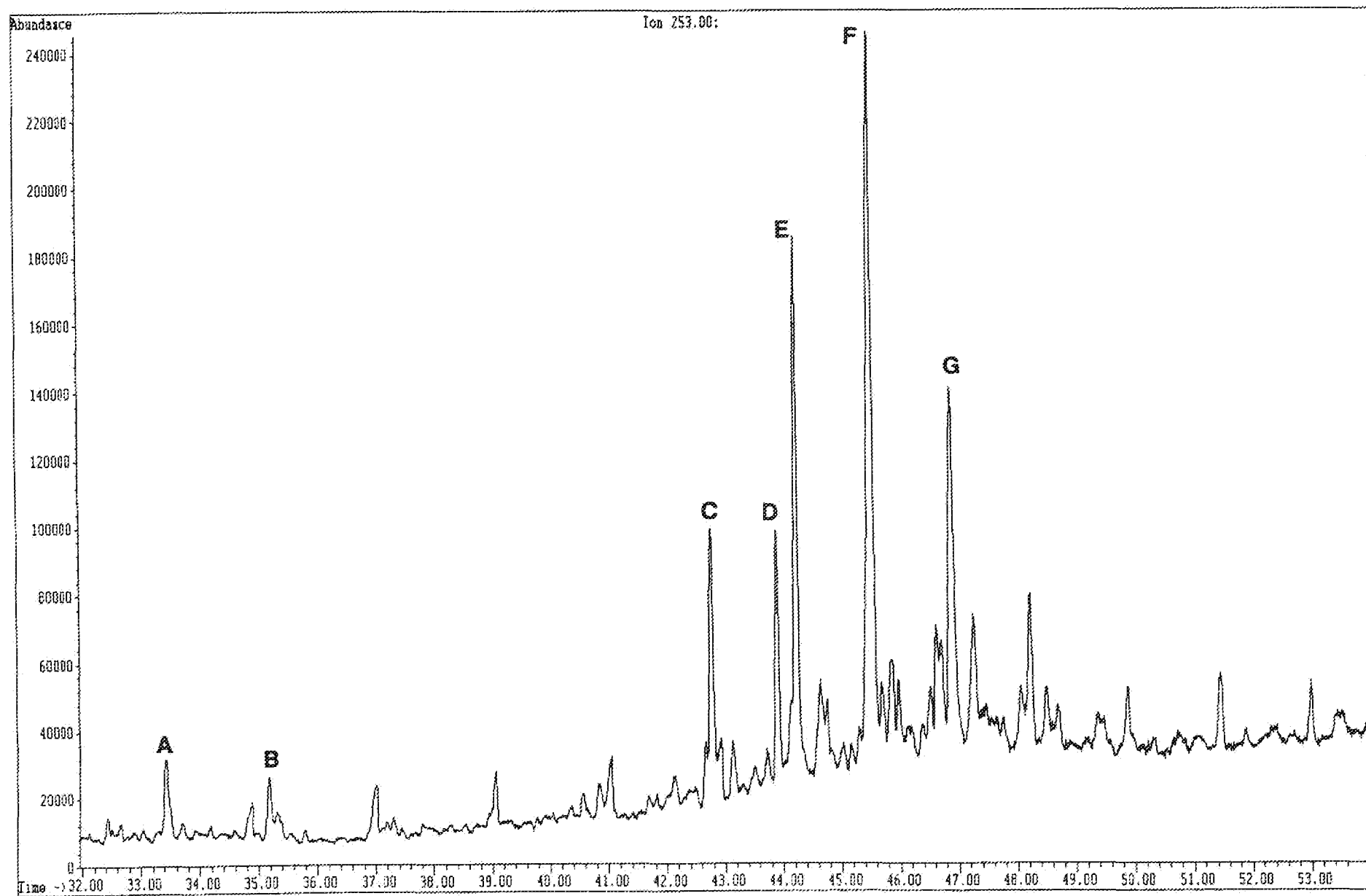
K3.1j

Dibenzothiophenes

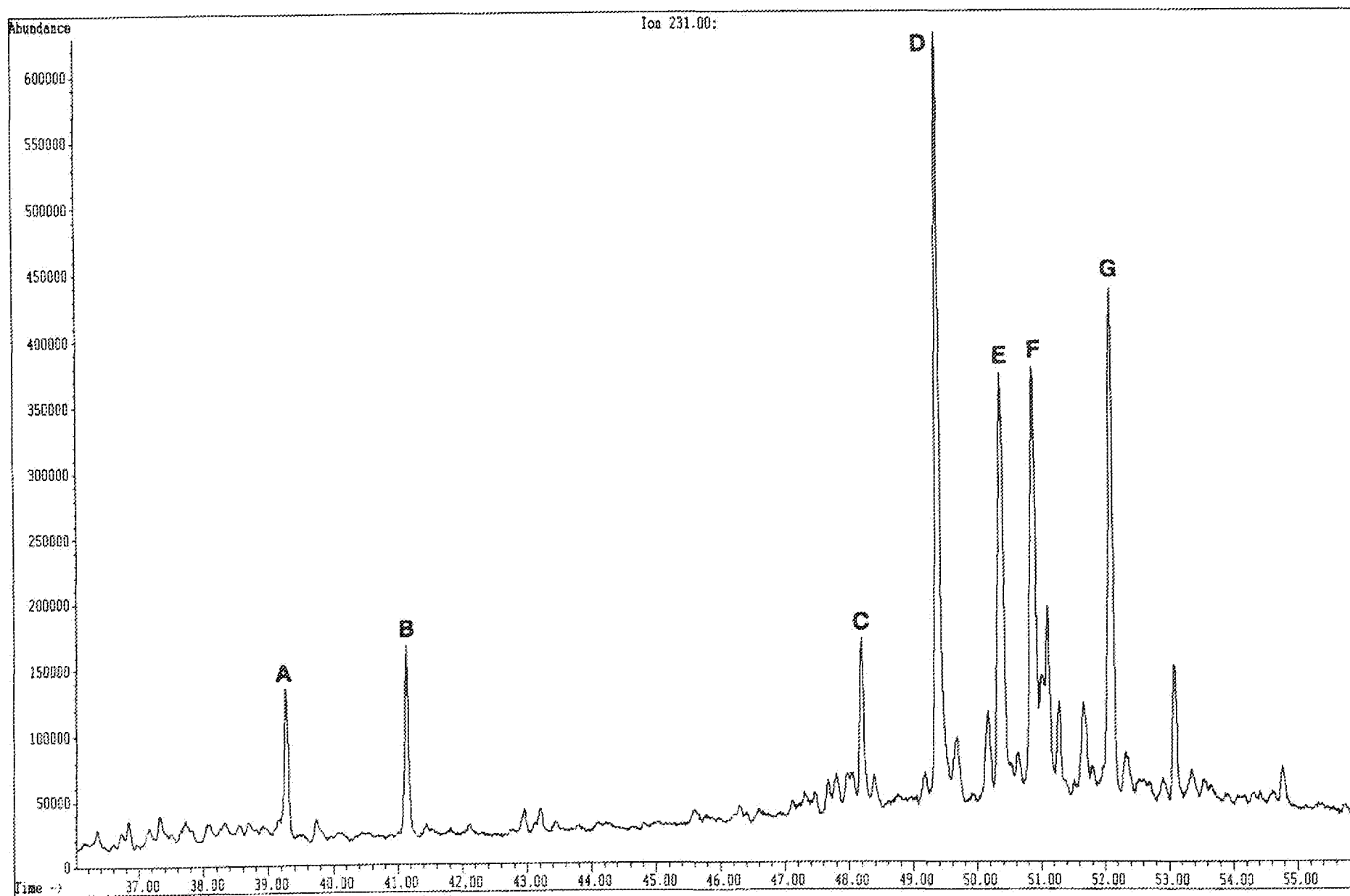


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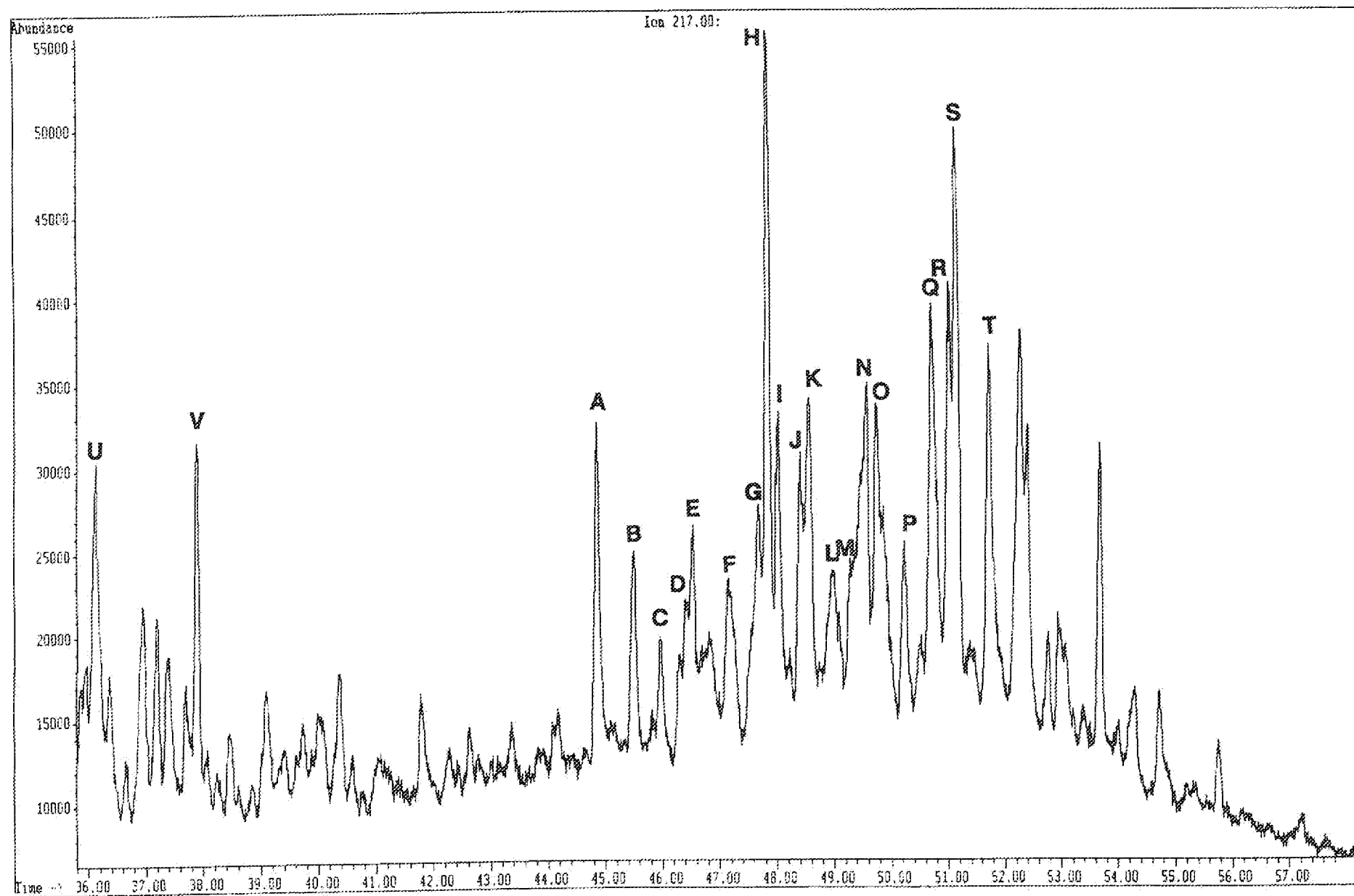
K3.1k



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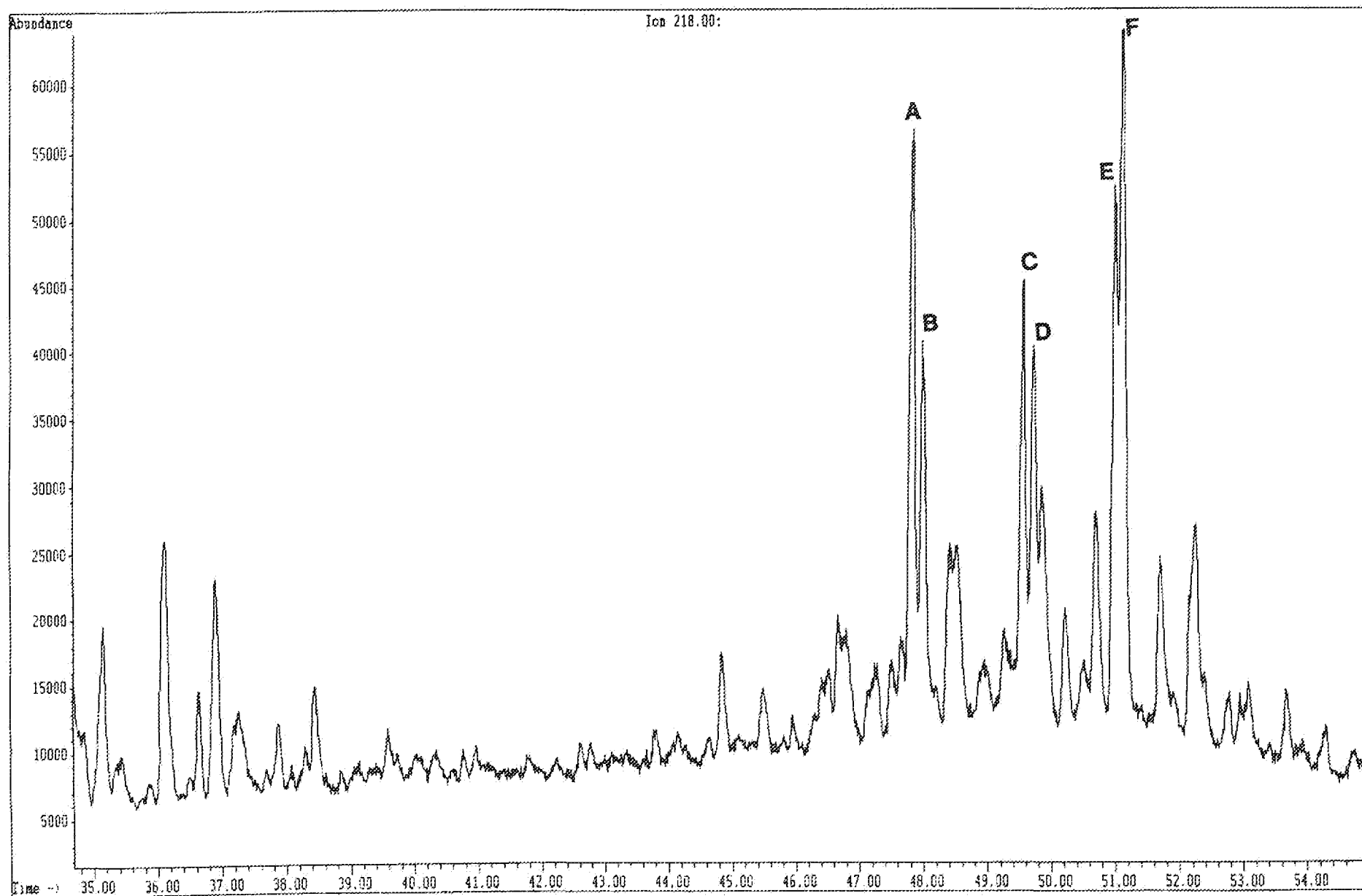


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Bottle Number: 30

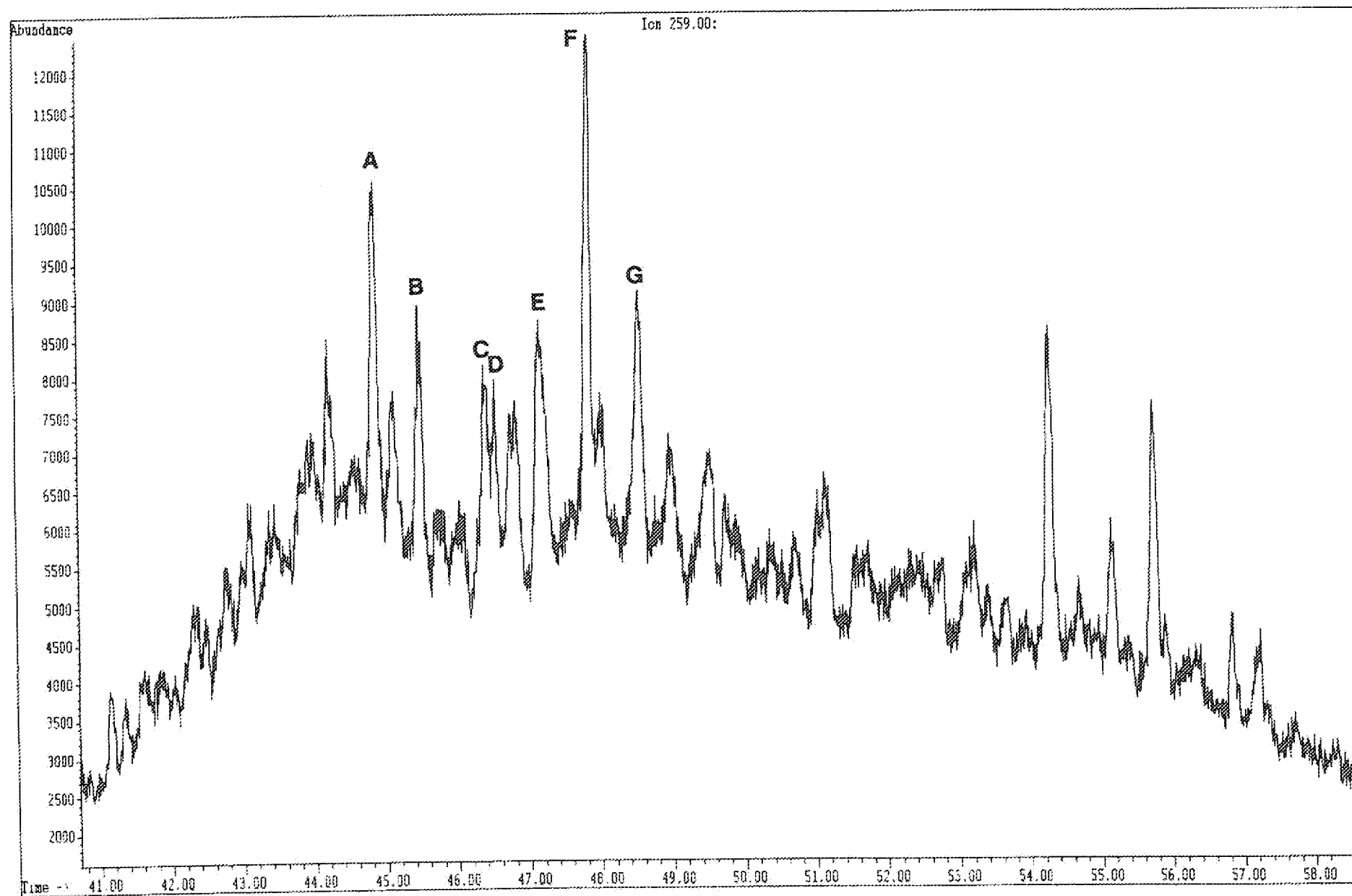


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Bottle Number: 30

K3.2b

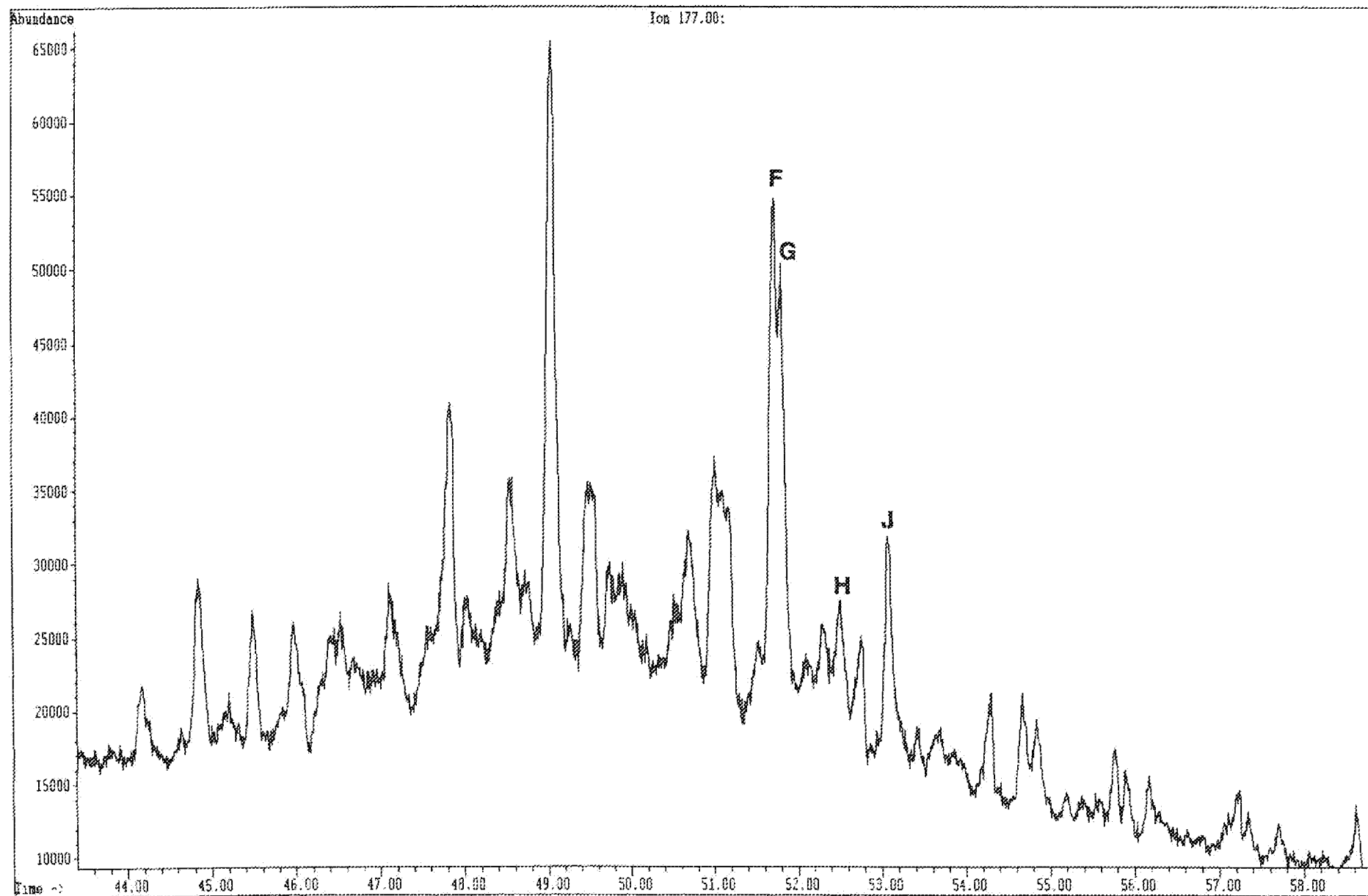


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Bottle Number: 30



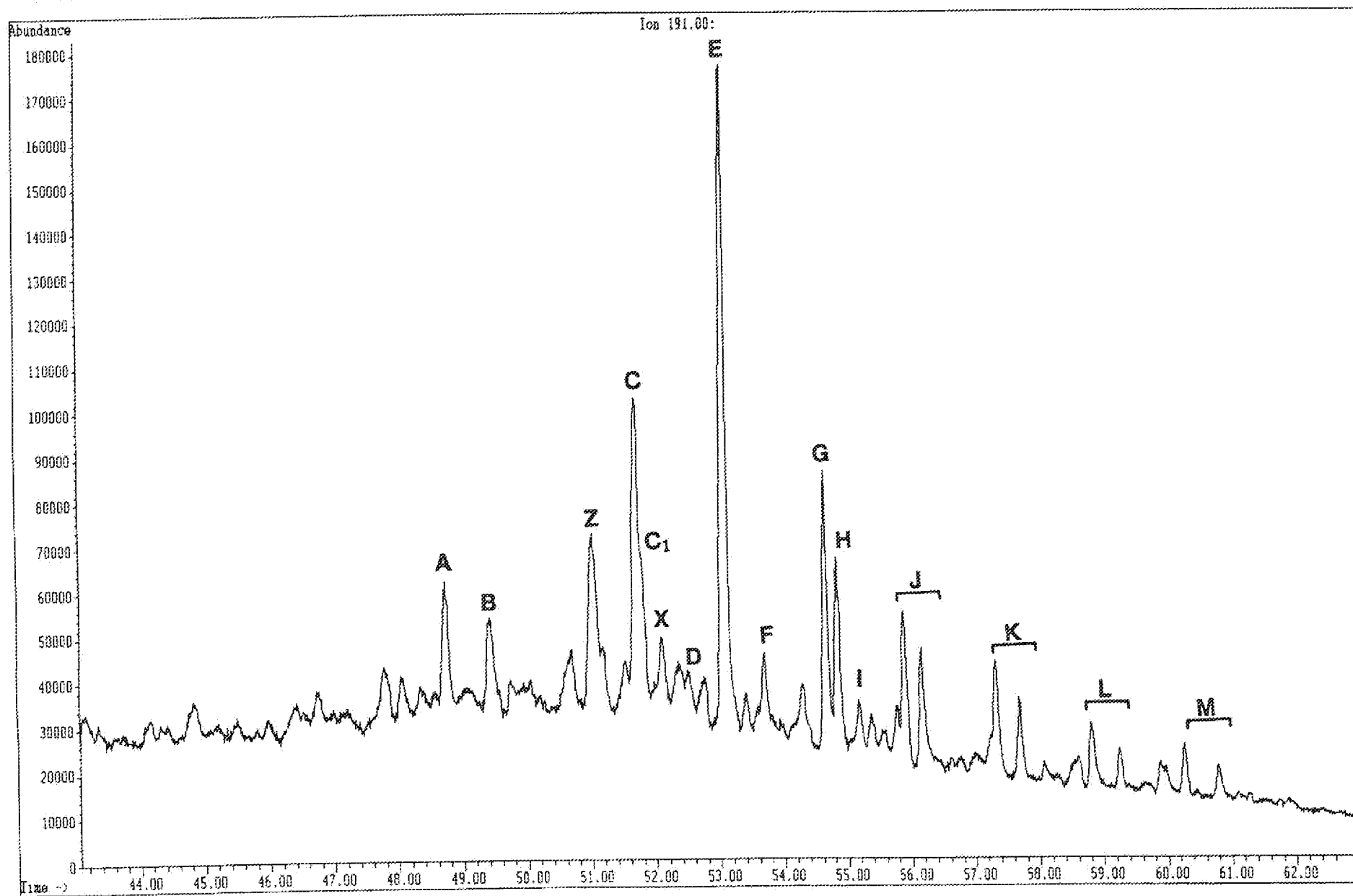
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K3.2d

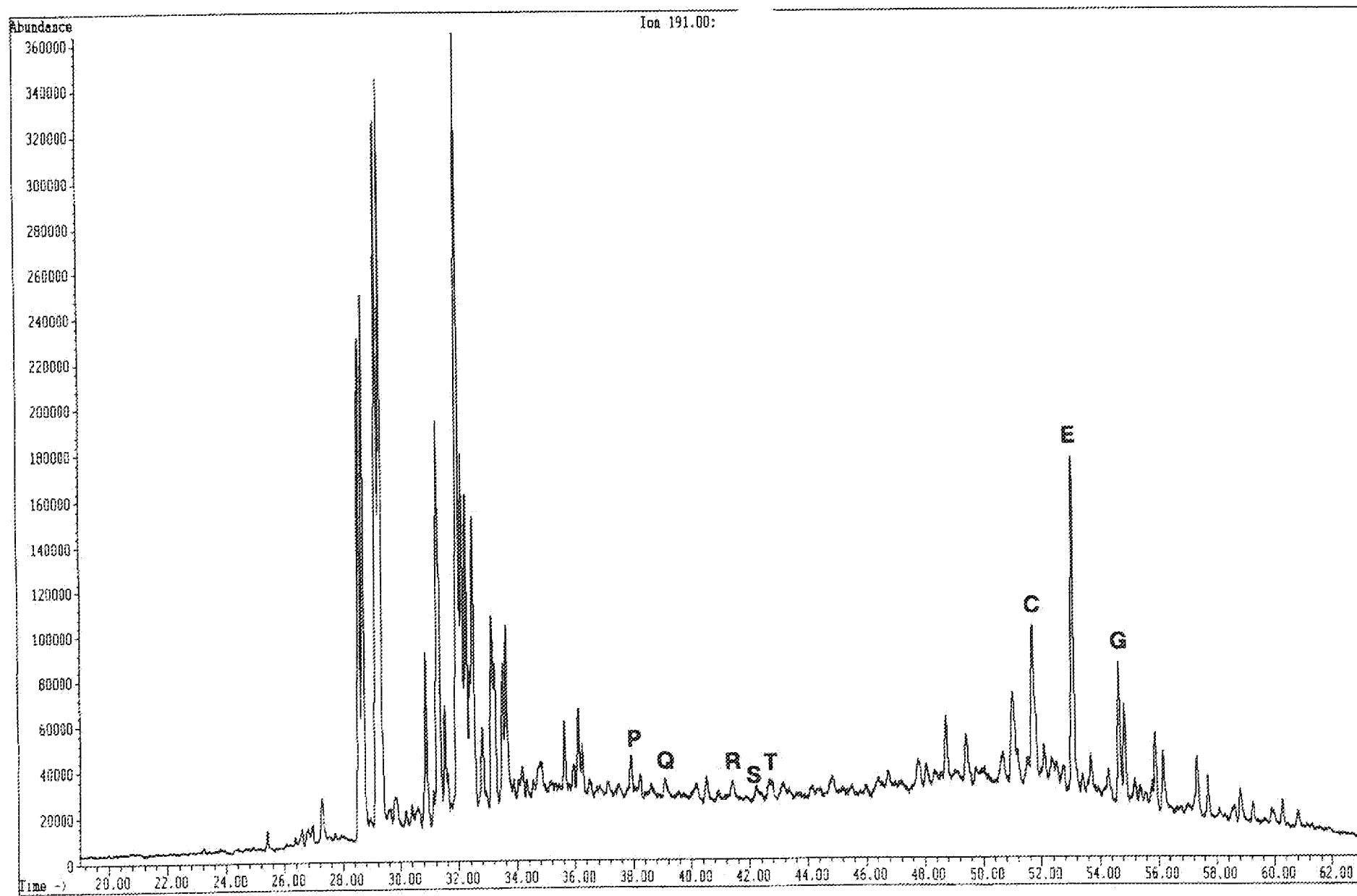


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Bottle Number: 39

K3.2e

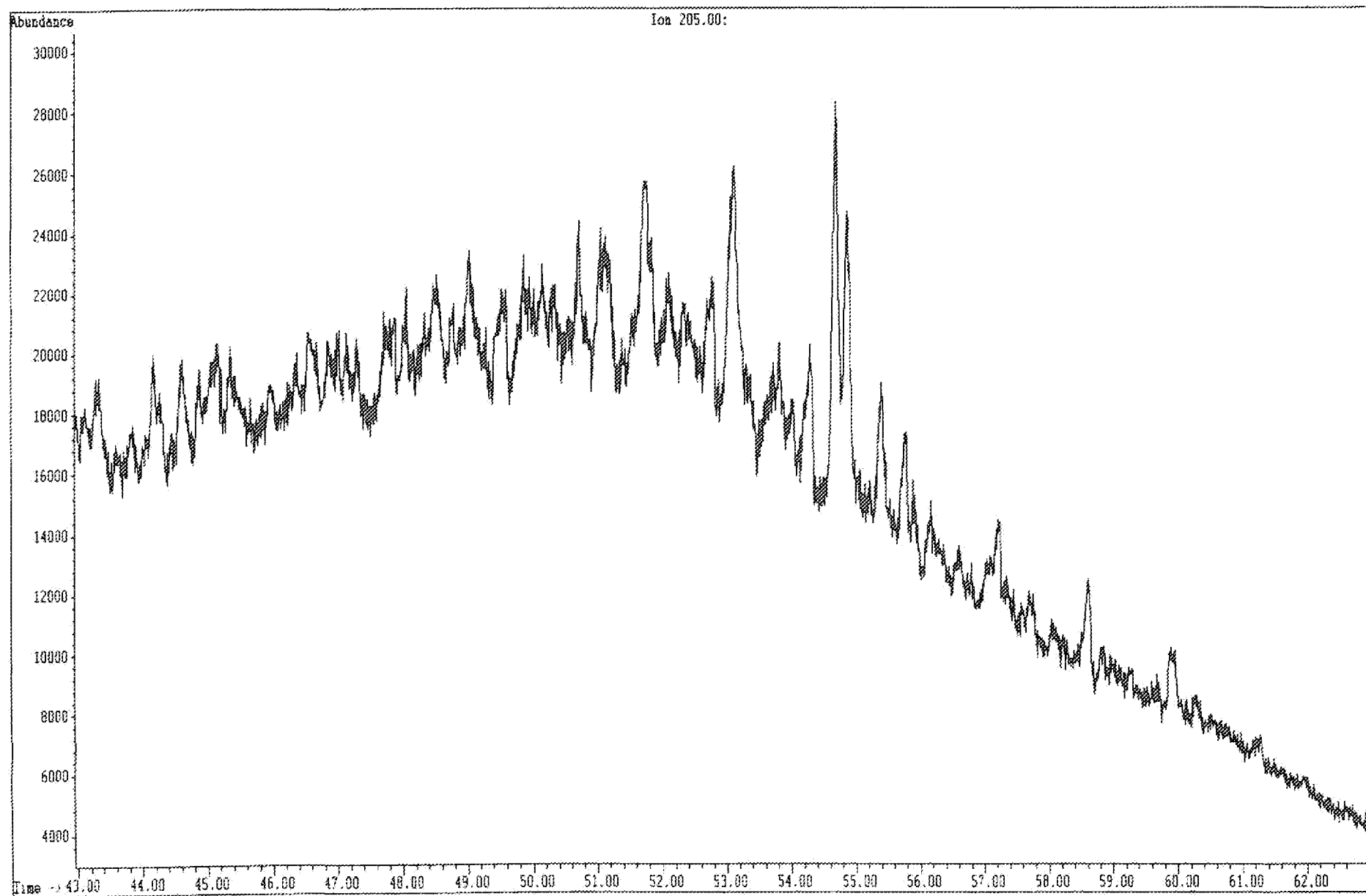


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Bottle Number: 30



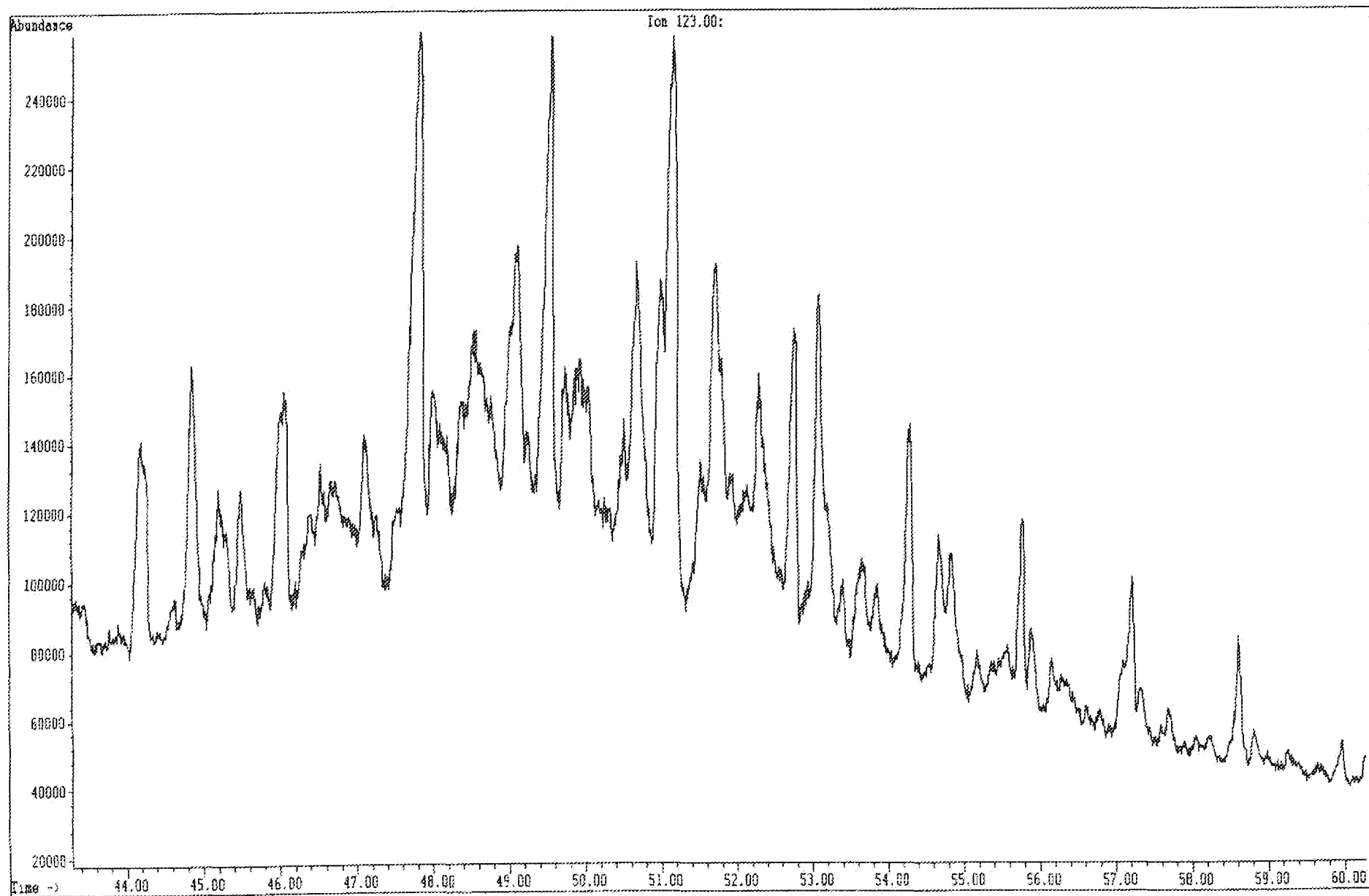
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Bottle Number: 30

K3.2g



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Bottle Number: 30

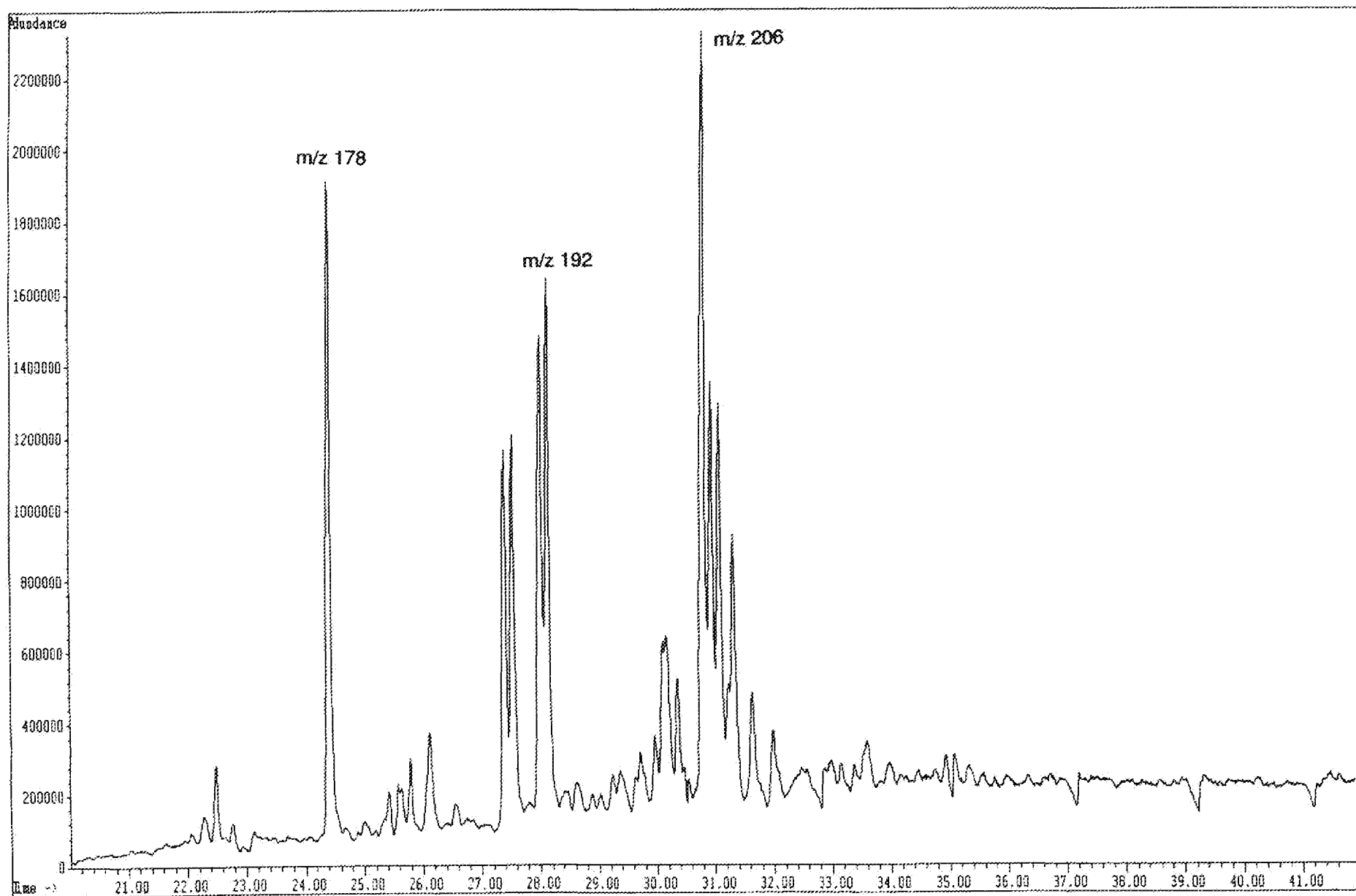
K3.2h



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Bottle Number: 97

K3.2i

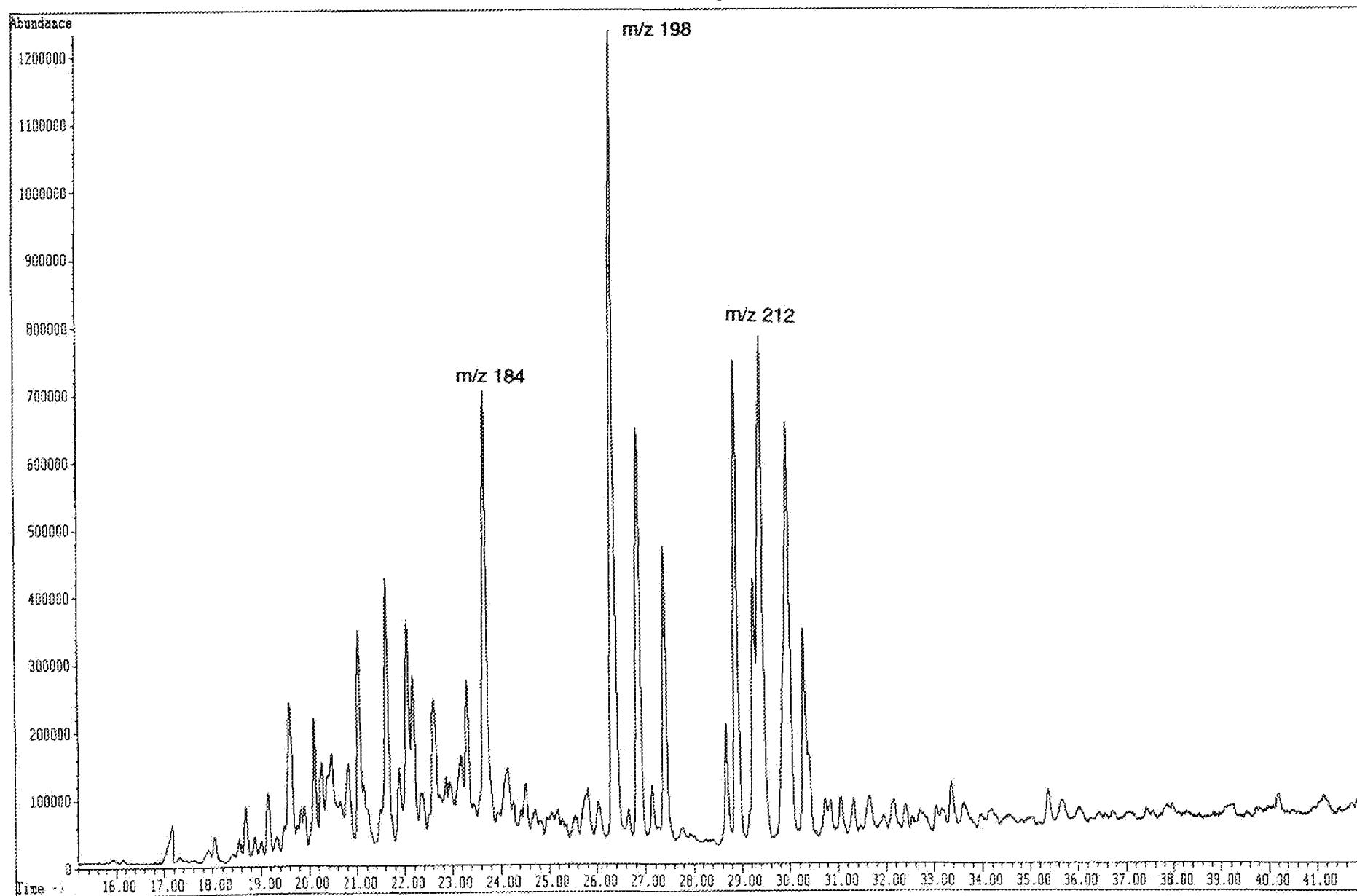
Phenanthrenes



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Bottle Number: 97

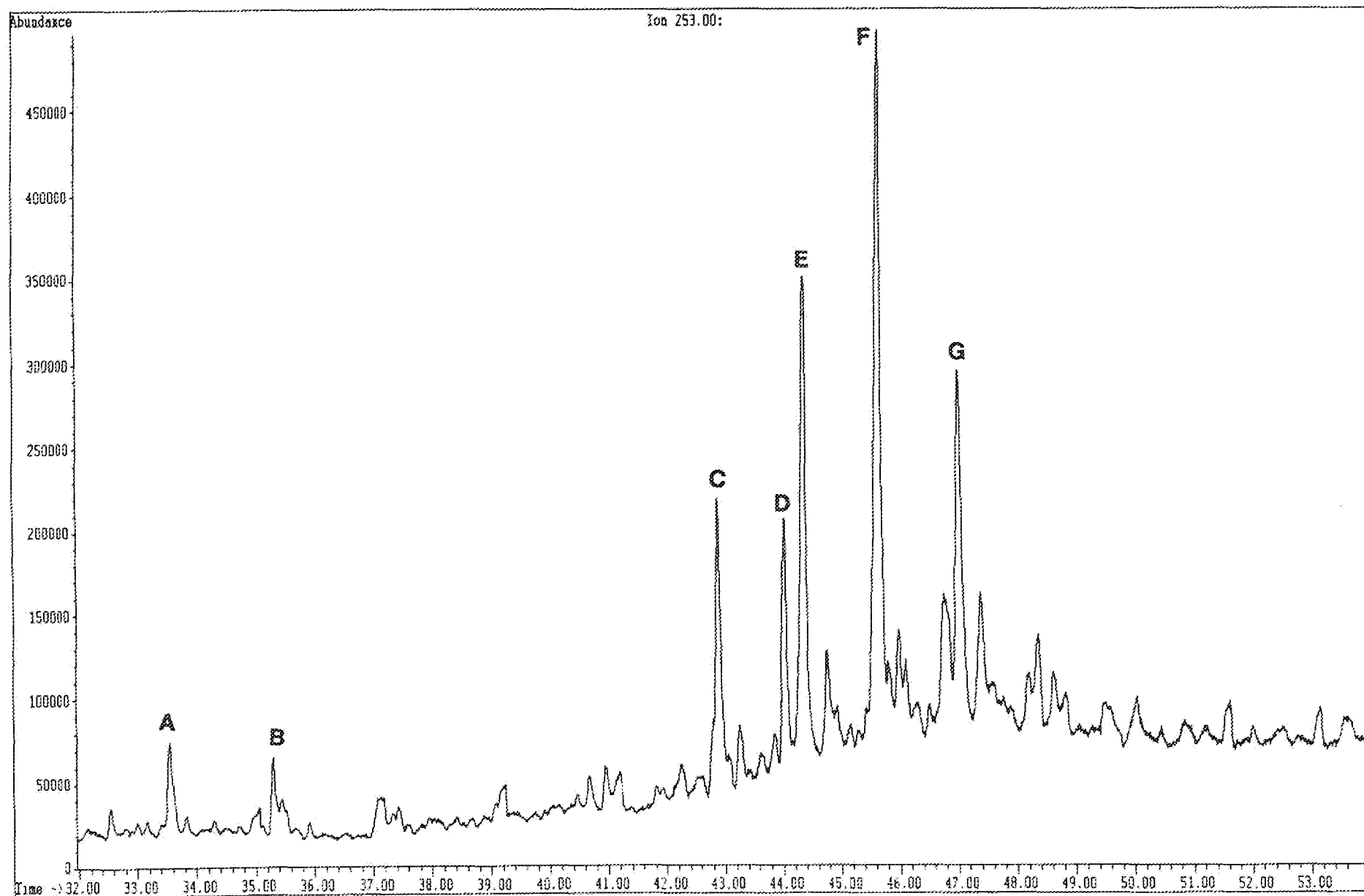
K3.2j

Dibenzothiophenes



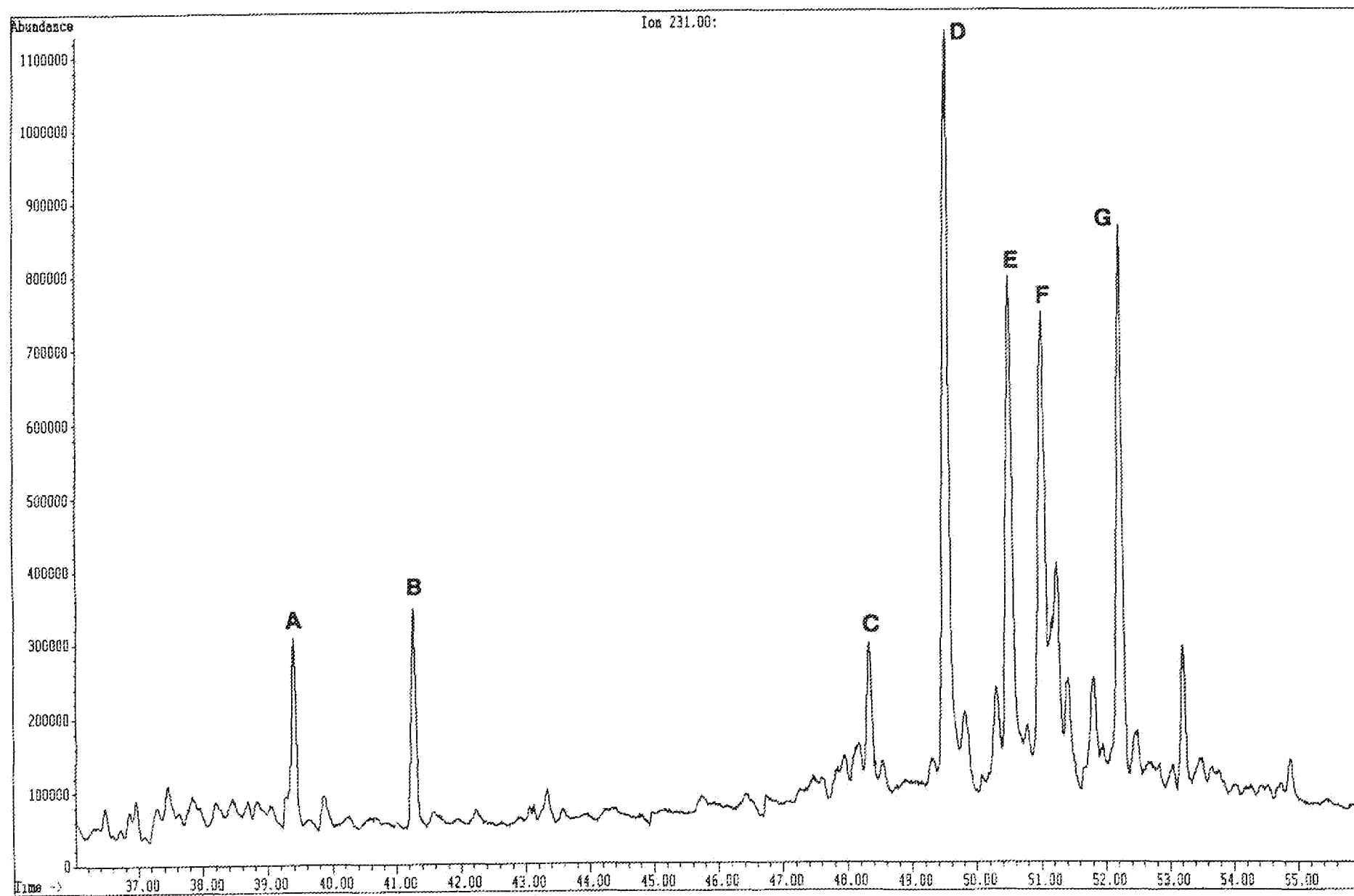
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Misc Info: WELL 33/9-12 2402.5M
Bottle Number: 97

K3.2k



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Sample Name: 4133-002
Misc Info: WELL 33/9-12 2402.5M
Bottle Number: 97

K3.21



33/9-10

TABLE L1
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

JOB 4134				
GEOCHEM SAMPLE NUMBER	DEPTH/ IDENTITY	GROSS LITHOLOGIC DESCRIPTION	G S A COLOUR CODE	TOTAL ORGANIC CARBON (Wt. %)

WELL: 33/9-10

4134-001	3370.4m	A100% SANDSTONE - med grained, blocky, hard, no F, no C, very pale orange.	10YR8/2	
4134-002	3373.6m	A100% SANDSTONE - med grained, blocky, v hard, sl micaceous, dark grey banding, current bedding, no F no C, pale yellowish brown.	10YR6/2	

Abbreviations = arenaceous, argillaceous, calcareous, Cut, dolomite, Fluorescence, foraminifera
fossiliferous, Lost Circulation Material, moderately, occasionally, slightly, very

TABLE L2
CONCENTRATION (PPM) OF EXTRACTED C₁₅₊ MATERIAL IN ROCK

JOB 4134 GEOCHEM SAMPLE NUMBER	L I T H O	DEPTH/ IDENTITY	TOTAL EXTRACT	HYDROCARBONS			NON HYDROCARBONS			
				Saturates	Aromatics	TOTAL	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's	TOTAL

WELL: 33/9-10

4134-001	3370.4m	256	148	13	161	44	49	2	94
4134-002	3373.6m	409	236	24	260	91	57	1	149

TABLE L3
COMPOSITION (NORMALISED %) OF C₁₅₊ MATERIAL

JOB 4134	L I T H O	DEPTH/ IDENTITY	HYDROCARBONS		NON HYDROCARBONS		
GEOCHEM SAMPLE NUMBER			Saturates	Aromatics	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's

WELL: 33/9-10

4134-001	3370.4m	57.96	5.10	17.20	19.11	0.64
4134-002	3373.6m	57.68	5.87	22.16	14.02	0.27

TABLE L4
SIGNIFICANT C₁₅₊ RATIOS

JOB 4134 GEOCHEM SAMPLE NUMBER	LITHOLOGY	DEPTH/ IDENTITY	TOC (%)	mg/g TOC						HYDROCARBONS % TOTAL EXTRACT	SATURATES AROMATICS
				TOTAL EXTRACT	SATURATES	AROMATICS	TOTAL HYDROCARBONS	ELUTED NSO's	ASPHALTENES		

WELL: 33/9-10

4134-001	3370.4m	0.19	134.51	77.96	6.85	84.82	25.70	23.13	63.06	11.38
4134-002	3373.6m	0.38	107.71	62.12	6.33	68.45	15.10	23.87	63.55	9.82

TABLE L5
C₁₅₊ CHROMATOGRAPHY WEIGHTS (grms)

JOB 4134	L									
GEOCHEM SAMPLE NUMBER	I T H O	DEPTH/ IDENTITY	ROCK EXTRACTED	TOTAL EXTRACT	PRECIPTD. ASPHALTENES	NC5	SATURATES	AROMATICS	ELUTED NSO's	NON-ELUTED NSO's

WELL: 33/9-10

4134-001A	3370.4m	18.4300	0.00470	0.00081	0.00390	0.00273	0.00024	0.00090	0.00003
4134-002A	3373.6m	18.3000	0.00749	0.00166	0.00583	0.00432	0.00044	0.00105	0.00002

TABLE L6
COMPOSITION (NORMALISED %) OF C₁₅+ SATURATE (PARAFFIN - NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	001	002
DEPTH	3370.4m	3373.6m
SAMPLE TYPE		
nC15	9.57	9.29
nC16	8.79	10.43
nC17	7.06	8.92
nC18	6.73	6.81
nC19	5.70	6.06
nC20	7.74	6.39
nC21	8.04	7.27
nC22	7.82	7.16
nC23	7.15	6.95
nC24	6.39	6.00
nC25	5.69	5.40
nC26	4.88	4.63
nC27	4.21	3.97
nC28	3.37	3.44
nC29	2.52	2.78
nC30	1.76	1.78
nC31	1.12	1.17
nC32	0.59	0.64
nC33	0.39	0.43
nC34	0.28	0.29
nC35	0.18	0.20
Paraffin	19.73	24.51
Isoprenoid	2.69	3.78
Naphthene	77.58	71.71
CPI 1 Index	1.03	1.04
CPI 2 Index	1.05	1.06
CPI 3 Index	1.02	0.98
Prist/Phytane	1.43	1.71
Prist/nC17	0.79	0.56
Phytane/nC18	0.58	0.43

Job Number : 4134

$$C.P.I. 1 = \frac{1}{2} \left[\frac{C_{21} + C_{23} + C_{25} + C_{27}}{C_{20} + C_{22} + C_{24} + C_{26}} + \frac{C_{21} + C_{23} + C_{25} + C_{27}}{C_{22} + C_{24} + C_{26} + C_{28}} \right]$$

$$C.P.I. 2 = \frac{1}{2} \left[\frac{C_{25} + C_{27} + C_{29} + C_{31}}{C_{24} + C_{26} + C_{28} + C_{30}} + \frac{C_{25} + C_{27} + C_{29} + C_{31}}{C_{26} + C_{28} + C_{30} + C_{32}} \right]$$

$$C.P.I. 3 = \frac{2 \times (C_{27})}{C_{26} + C_{28}}$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE L7
METHYLPHENANTHRENE INDICES (MPI)

JOB 4134	DEPTH/ IDENTITY	SAMPLE TYPE	MPI 1		Rcalc		MPI 2	
GEOCHEM SAMPLE NUMBER			AREA	HEIGHT	AREA	HEIGHT	AREA	HEIGHT

WELL: 33/9-10

4134-001	3370.4m		0.41	0.50			0.46	0.51
4134-002	3373.6m		0.53	0.55			0.61	0.57

$$\text{MPI 1} = \frac{1.5(2\text{-MP} + 3\text{-MP})}{\text{P} + 1\text{-MP} + 9\text{-MP}} \quad \text{MPI 2} = \frac{3(2\text{-MP})}{\text{P} + 1\text{-MP} + 9\text{-MP}}$$

$$\text{Rcalc} = \begin{cases} 0.60(\text{MPI 1}) + 0.40 & \text{if } \text{Ro} < 1.35\% \\ -0.60(\text{MPI 1}) + 2.30 & \text{if } \text{Ro} > 1.35\% \end{cases}$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE L8

AROMATIC HYDROCARBONS RATIOS (MSD, PEAK AREA DATA)

SAMPLE NUMBER	DEPTH (m)	2MP/ 1MP	RATIO 1	RATIO 2	RATIO 3
------------------	--------------	-------------	---------	---------	---------

WELL: 33/9-10

4134-001A	3370.4	0.60	0.23	0.47	0.18
4134-002A	3373.6	0.72	0.25	0.50	0.10

RATIO 1 = $A(231)/A(231) + G(231)$ RATIO 2 = $E(253)/E(253) + G(253)$ RATIO 3 = $A(253)/B(231) + E(253)$

TABLE L9
CARBON ISOTOPE COMPOSITIONS (‰,PDB)

JOB 4134								
GEOCHEM SAMPLE NUMBER	DEPTH/ IDENTITY	TOTAL EXTRACT WHOLE OIL	SATURATES	AROMATICS	NSO	ASPHALTENES	KEROGEN	PYROLYSATE (S2)

WELL: 33/9-10

4134-001	3370.4m	-29.37	-29.49	-28.75	-29.76	-29.48		
4134-002	3373.6m	-29.94	-30.52	-30.10	-30.30	-29.89		

TABLE L11
BIOMARKER MOLECULAR RATIOS

WELL 33/9-10

Terpanes (m/z 191)

SAMPLE NUMBER	DEPTH (m)	A/B	Z/E	Z/C	<u>Z</u> (Z+E)	<u>C</u> (C+E)	%22S for J	<u>E</u> (E+F)	<u>X</u> (X+D)	Q/E
4134-001A	3370.4	2.78	-	-	-	0.40	-	-	-	-
4134-002A	3373.6	3.11	0.26	0.44	0.21	0.37	44%	0.83	0.45	-

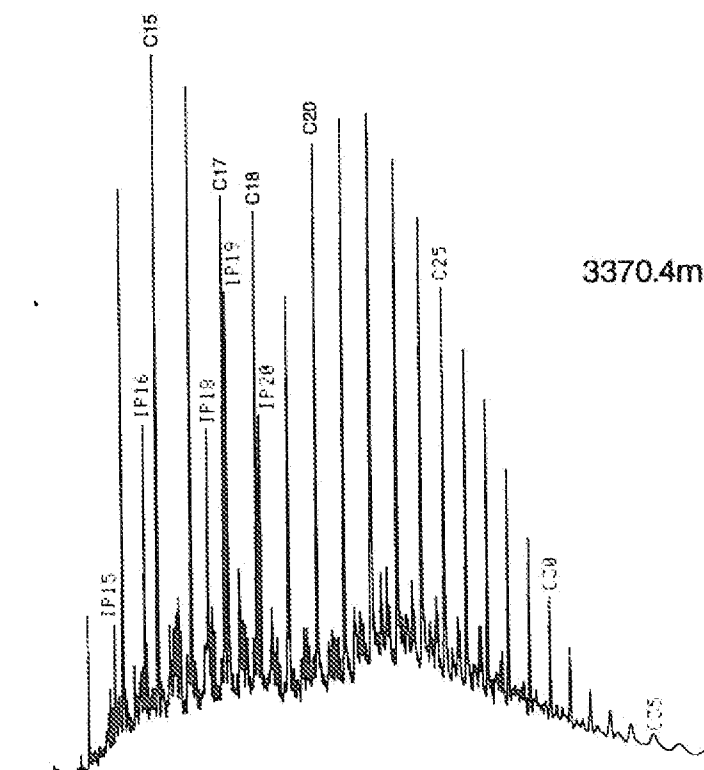
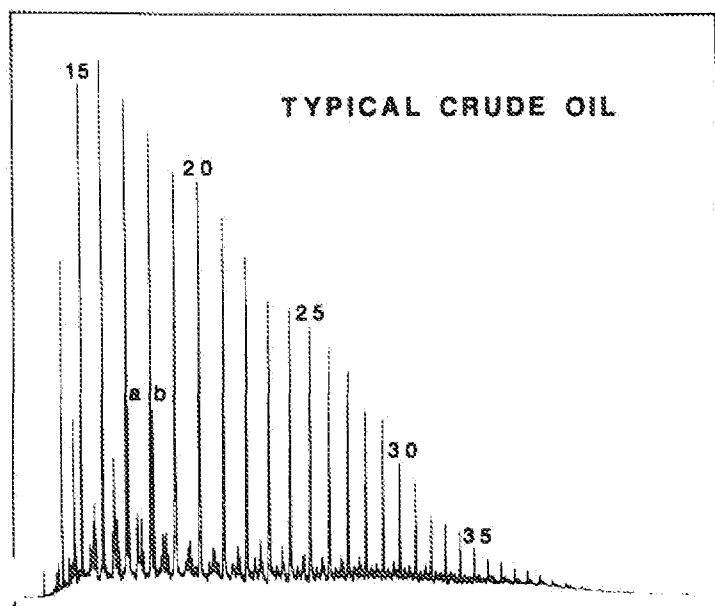
TABLE L10
BIOMARKER MOLECULAR RATIOS

WELL: 33/9-10

		Steranes (m/z 217)			Steranes (m/z 218)		
SAMPLE NUMBER	DEPTH (m)	<u>A</u>	<u>Q</u>	<u>(R+S)</u>	NORMALISED COMPOSITION:		
		(A+J)	(Q+T)	(Q+R+S+T)	B	D	F
4134-001A	3370.4	-	-	-	17%	25%	58%
4134-002A	3373.6	0.60	0.50	0.53	32%	30%	38%

FIGURE L1.1 C₁₅+ SATURATES CHROMATOGRAMS

WELL 33/9-10

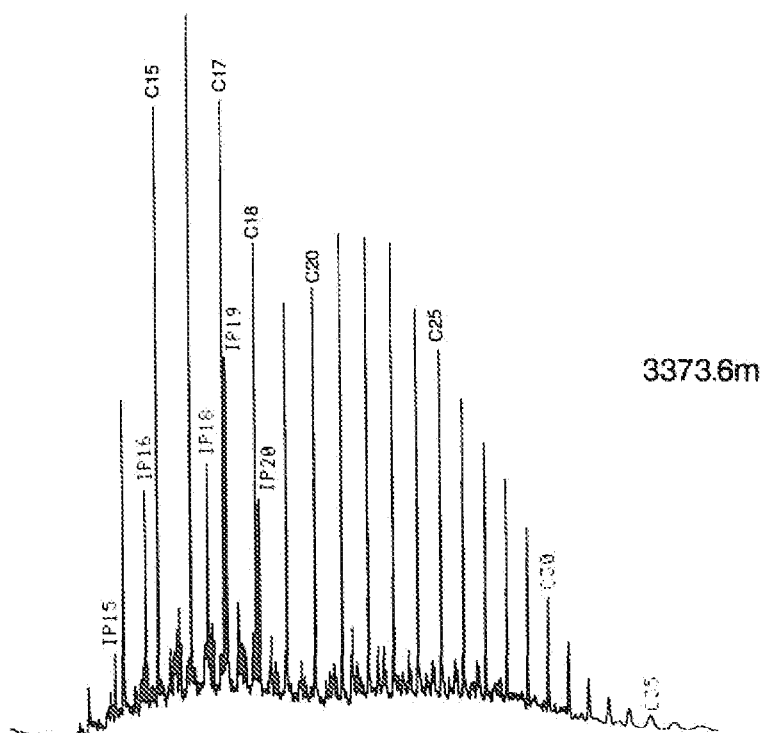


a = PRISTANE
b = PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20-nC₂₀)

FIGURE L12 C₁₅+ SATURATES CHROMATOGRAMS

WELL 33/9-10



a = PRISTANE
b = PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE L2.1

C₁₅+ AROMATIC CHROMATOGRAMS

WELL 33/9-10

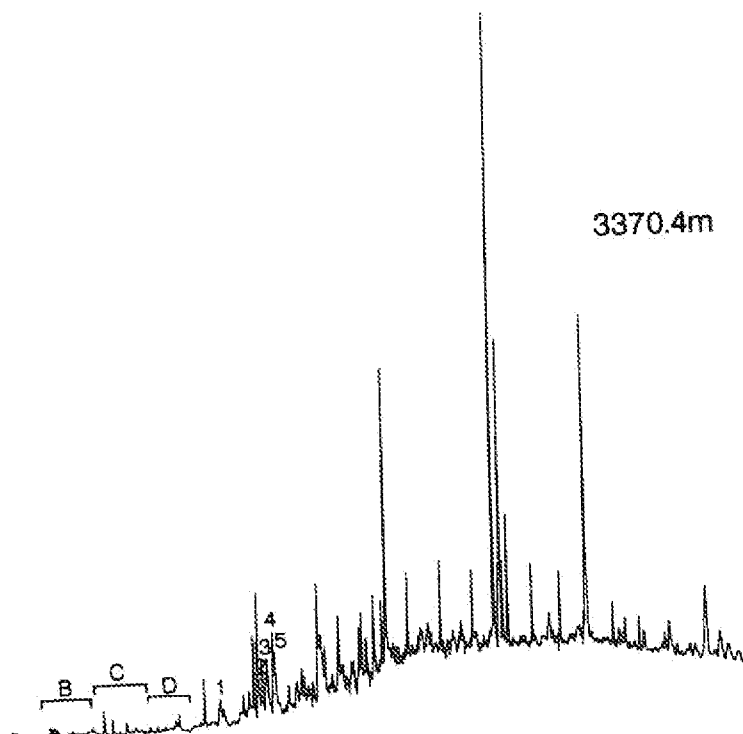
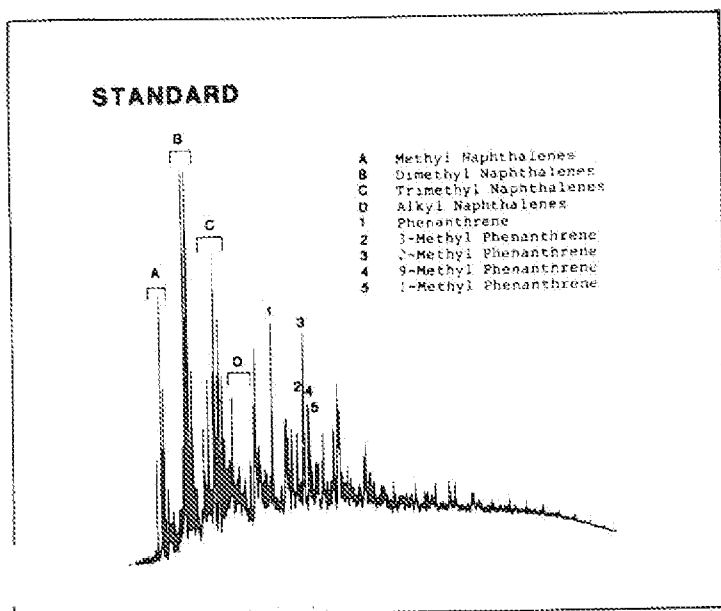
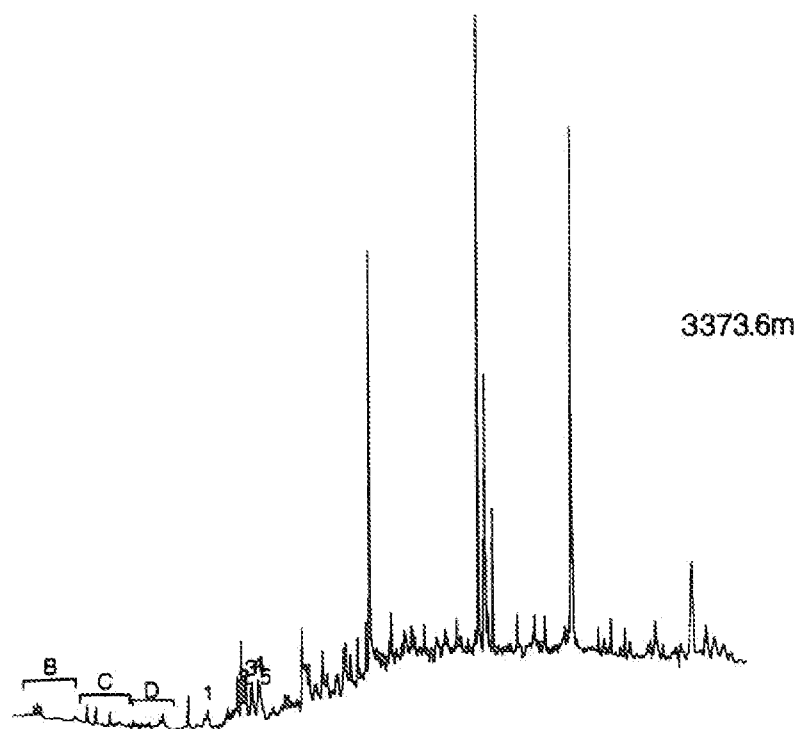


FIGURE L22

C₁₅+ AROMATIC CHROMATOGRAMS

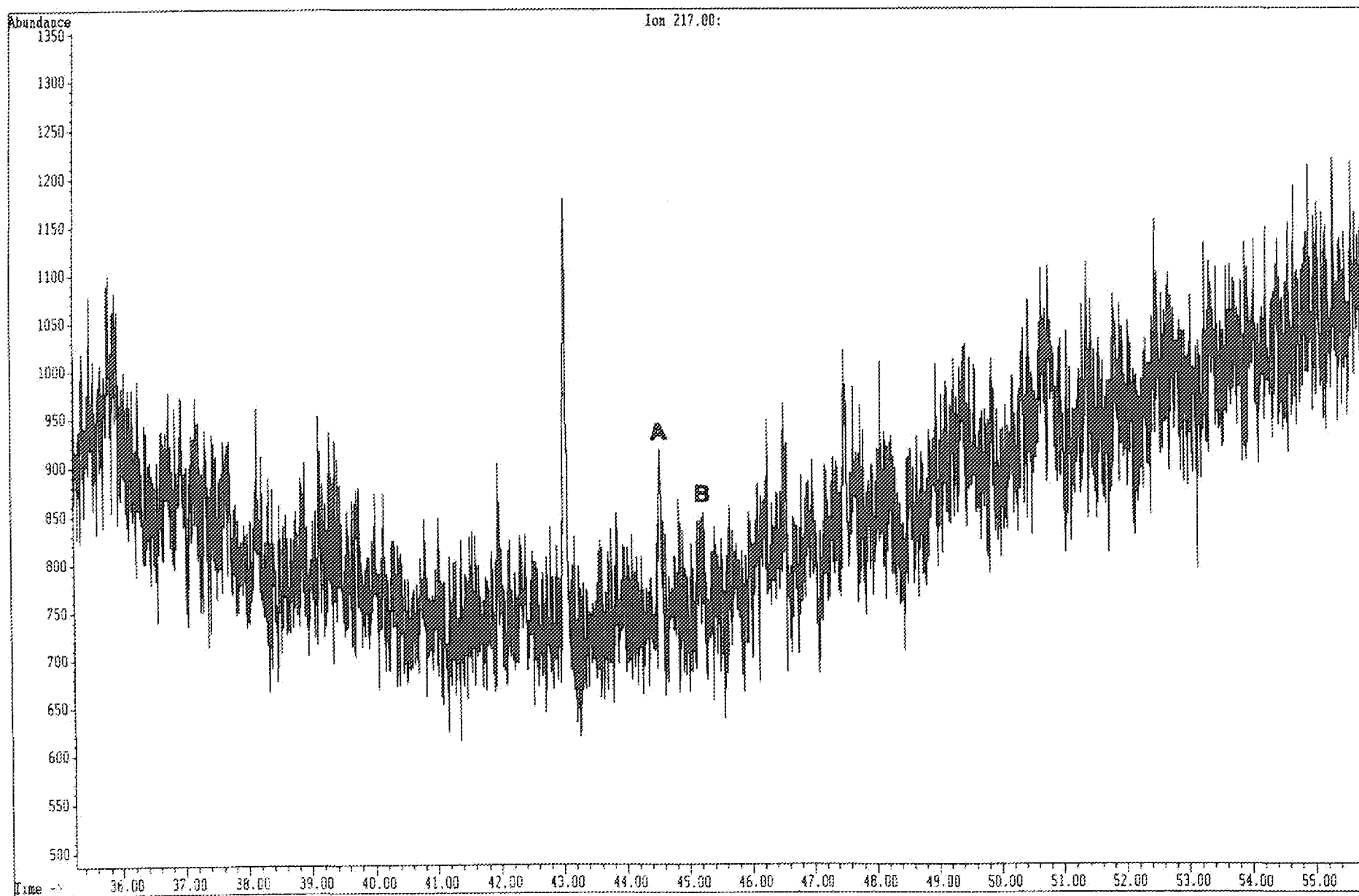
WELL 33/9-10



PEAK IDENTIFICATION ON FIRST SHEET

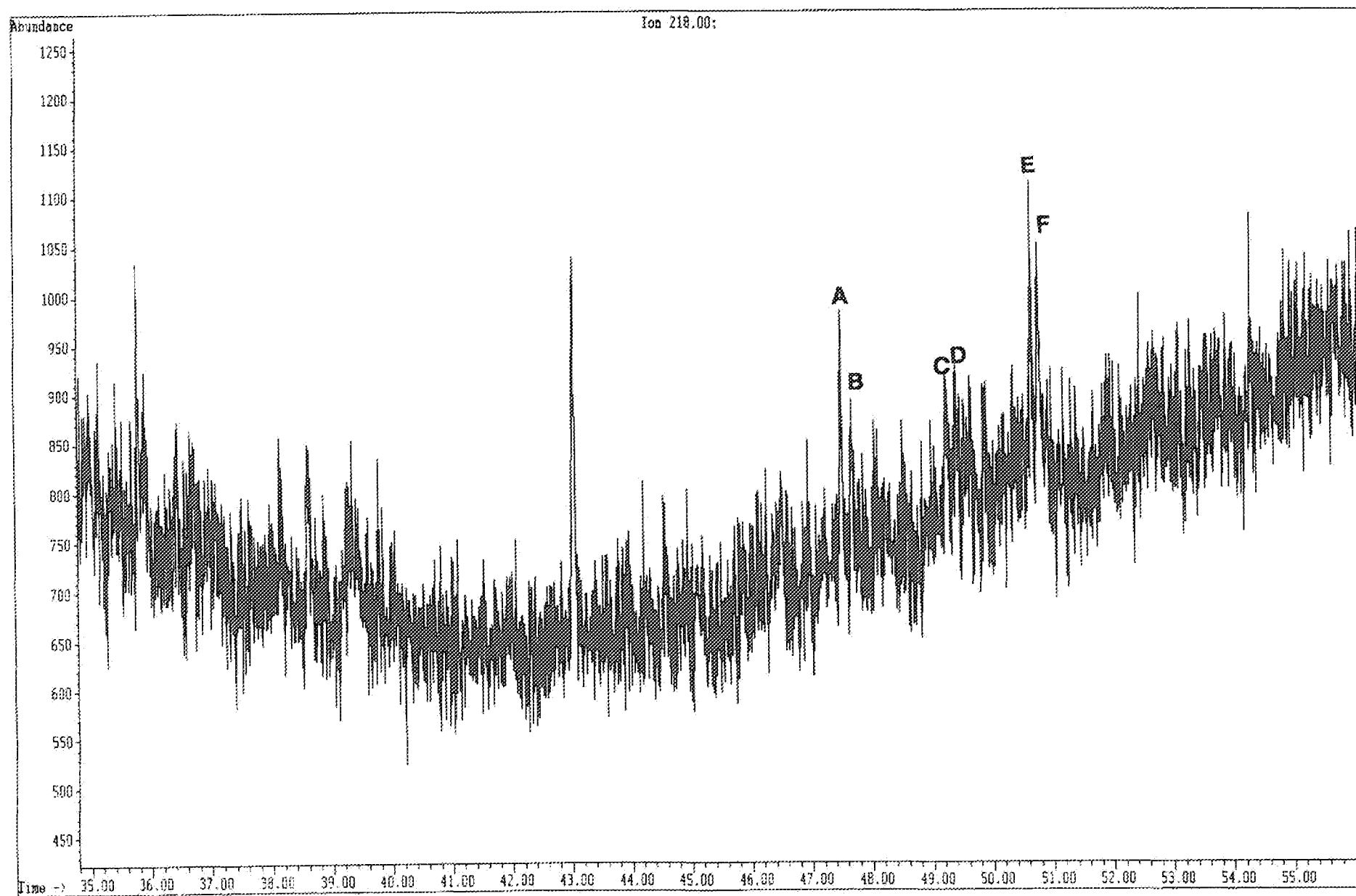
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Sample Name: 4134-001
Misc Info: WELL 33/9-10 3370.4M
Bottle Number: 31

L3.1a



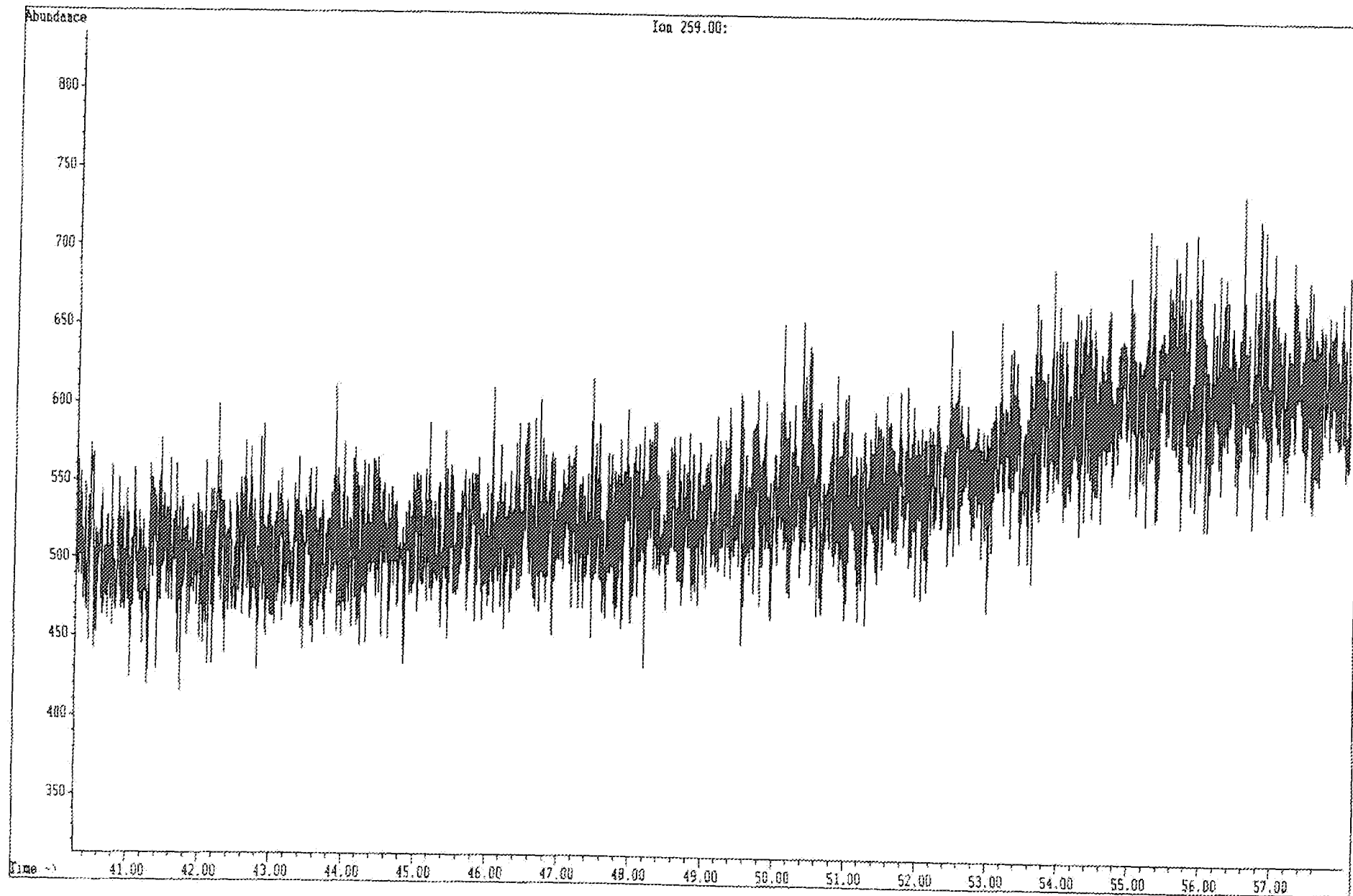
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Bottle Number: 31

L3.1b



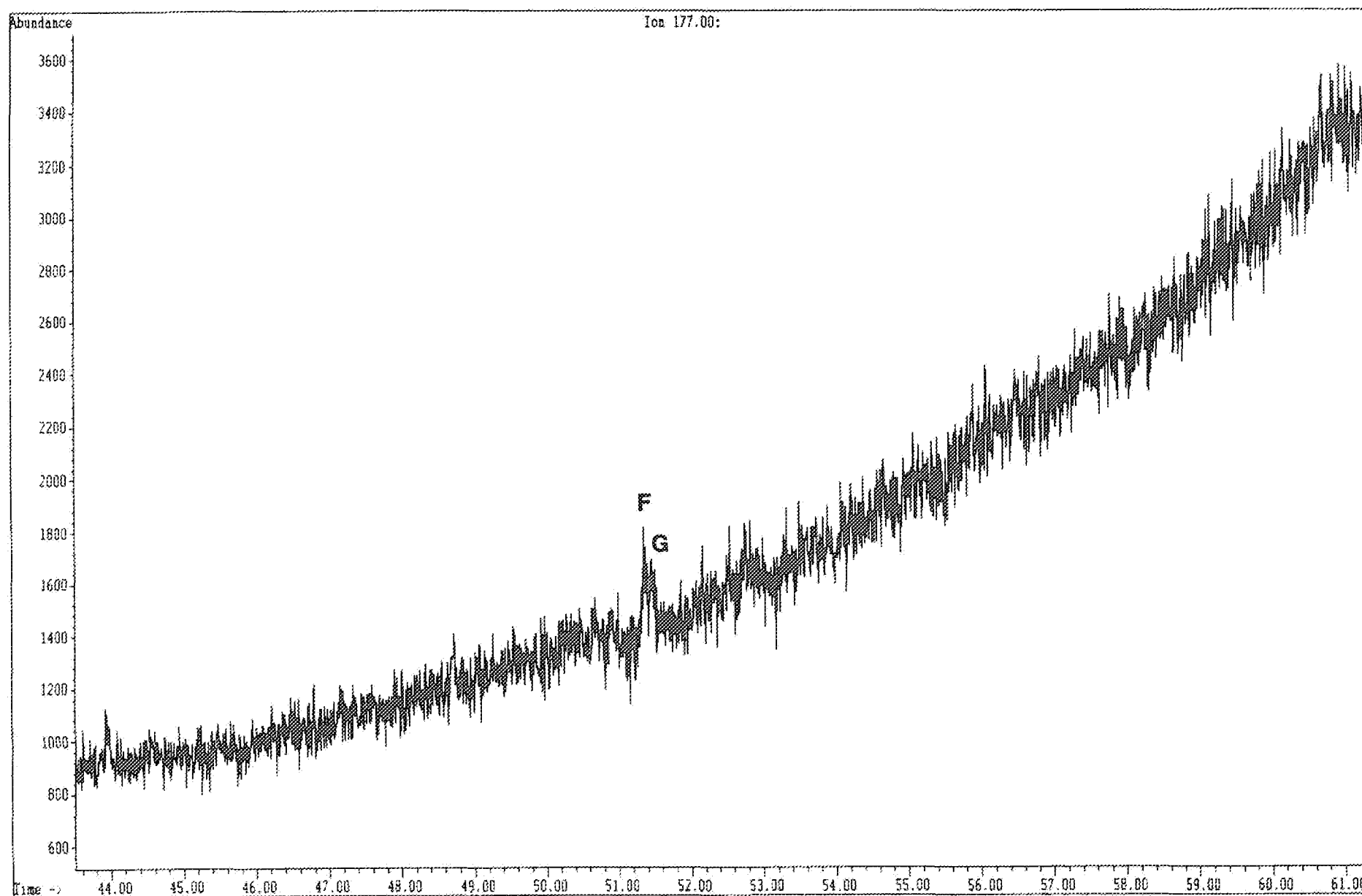
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Bottle Number: 31

L3.1c



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Operator:
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Method File Name: B10M.M
Sample Name: 4134-001
Misc Info: WELL 33/9-10 3370.4M
Bottle Number: 31

L3.1d



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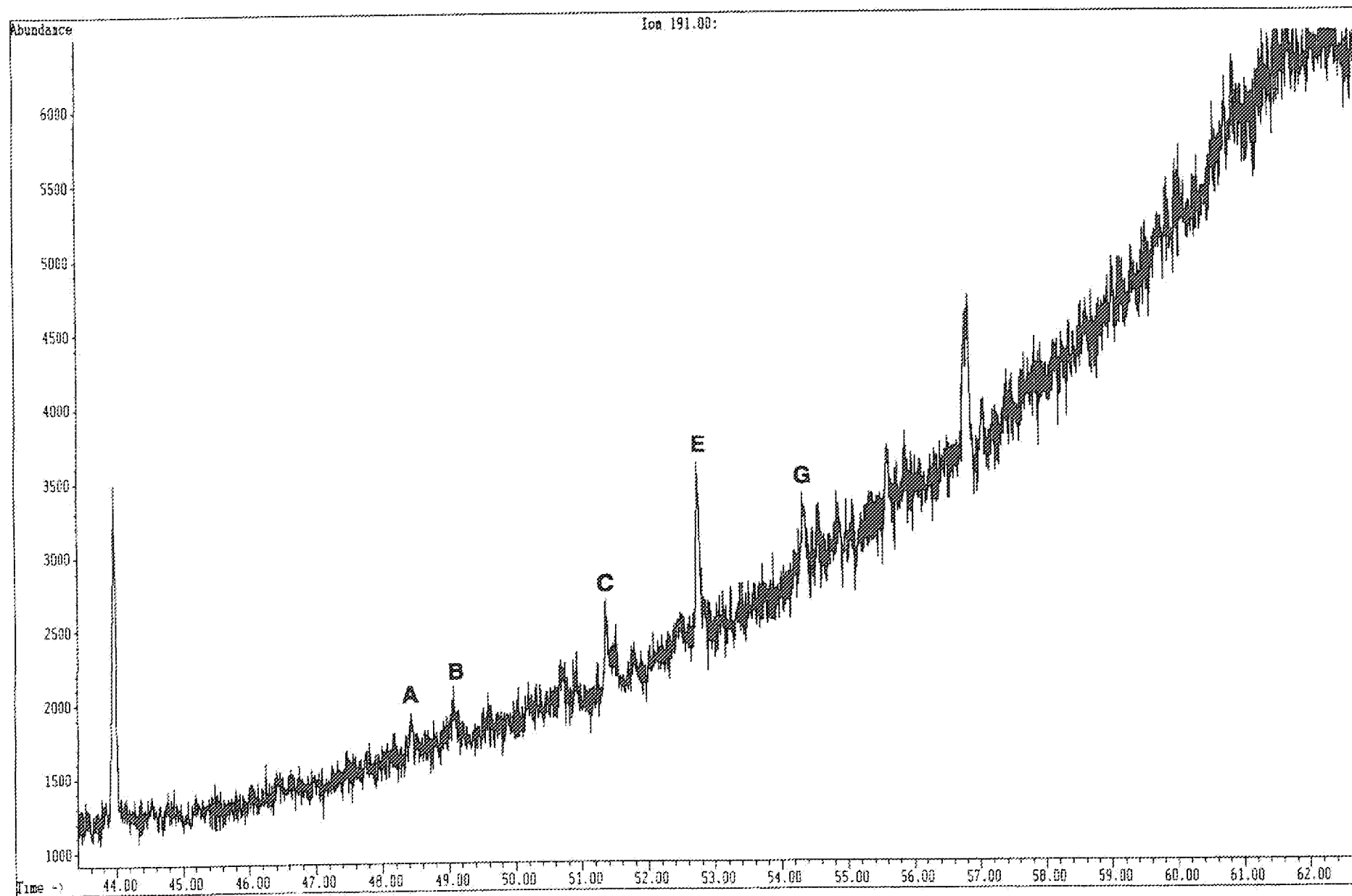
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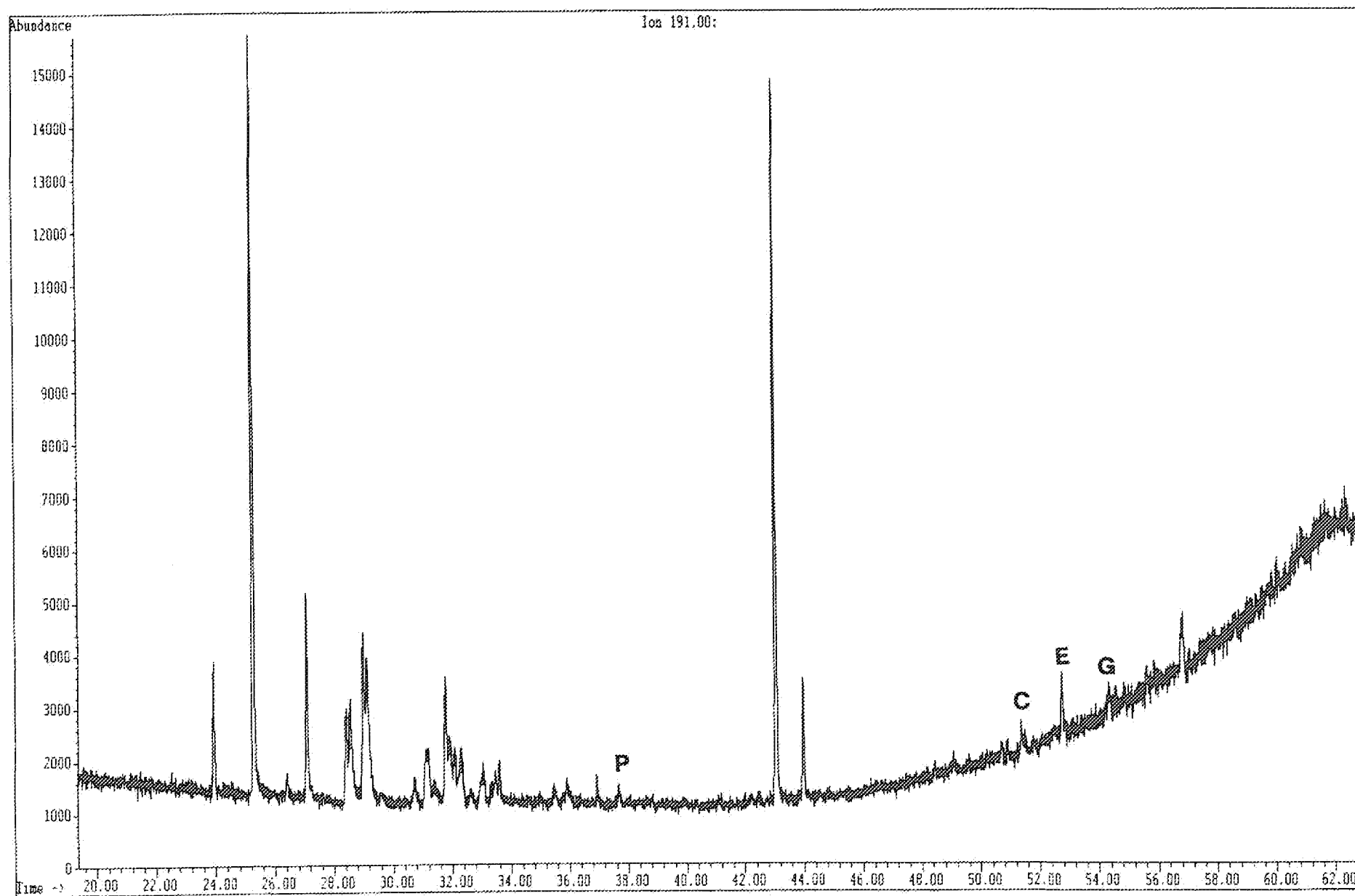
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Bottle Number: 31



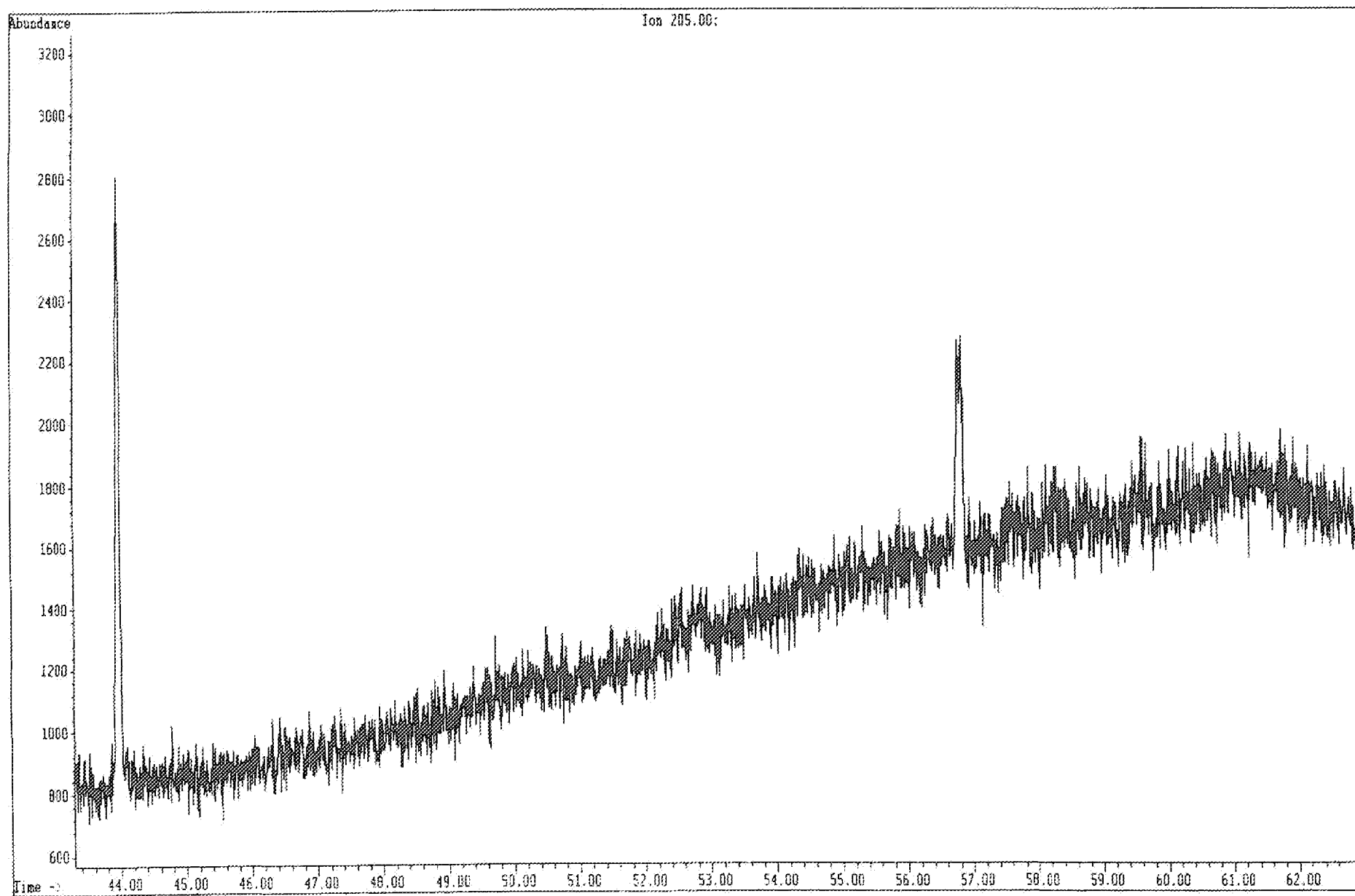
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Bottle Number: 31

L3.1f



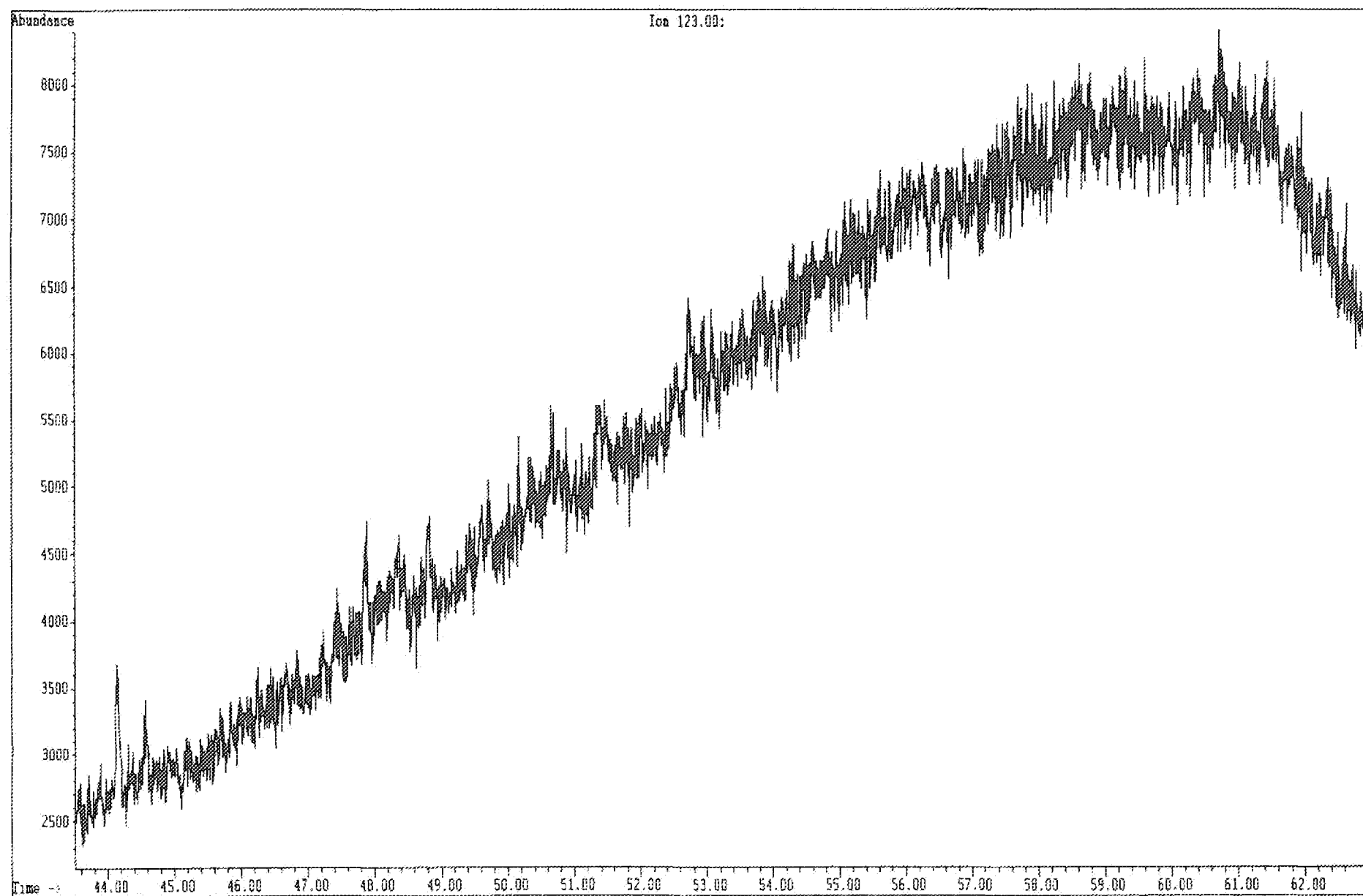
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Bottle Number: 31

L3.1g



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Bottle Number: 31

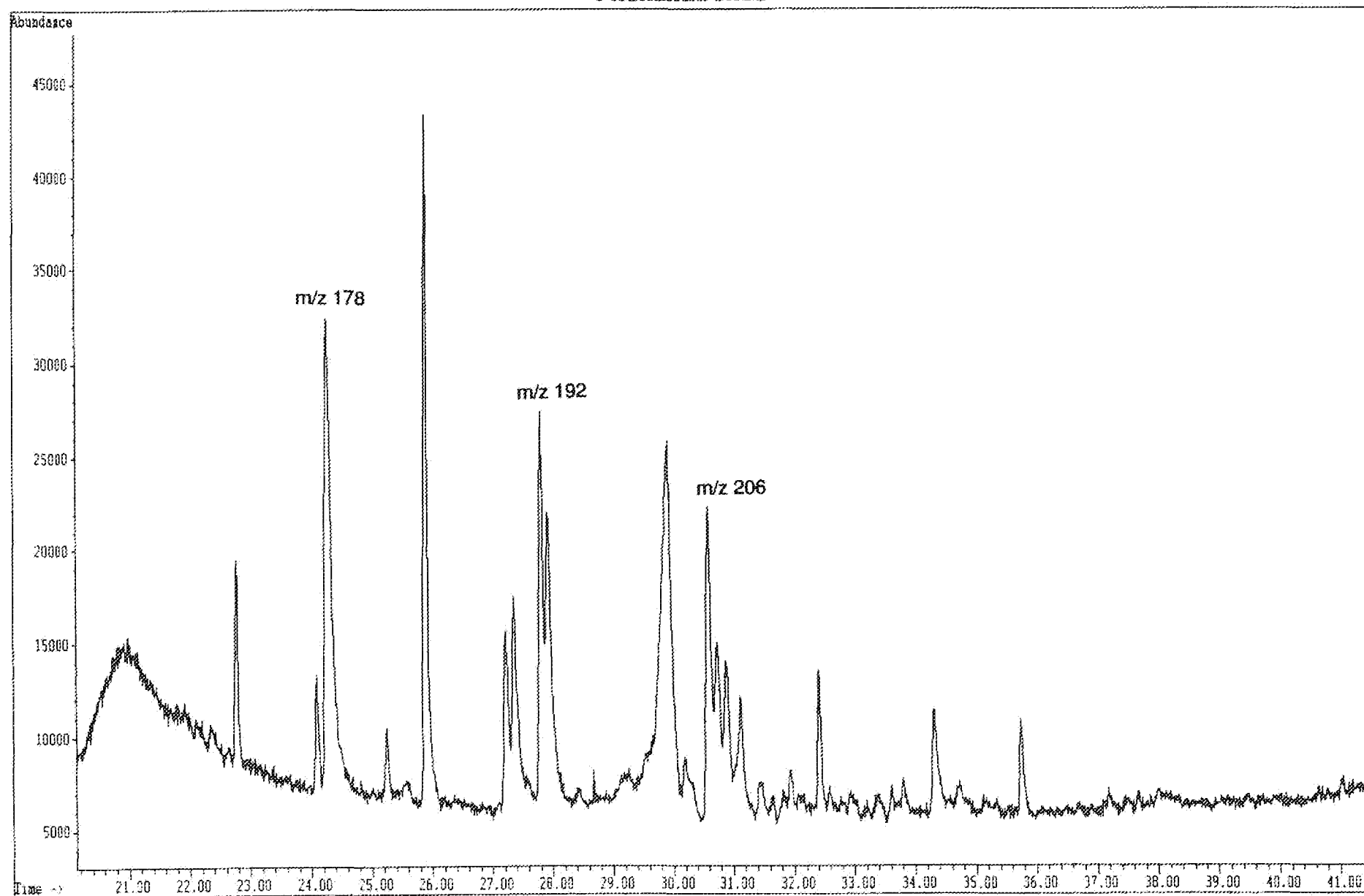
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Method File Name: BIOMY.M
Sample Name: 4134-001
Misc Info: WELL 33/9-10 3370.4M
Bottle Number: 98

L3.11

Phenanthrenes



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L3.1j

Operator:

Date Acquired: 11 Dec 90 11:55 pm

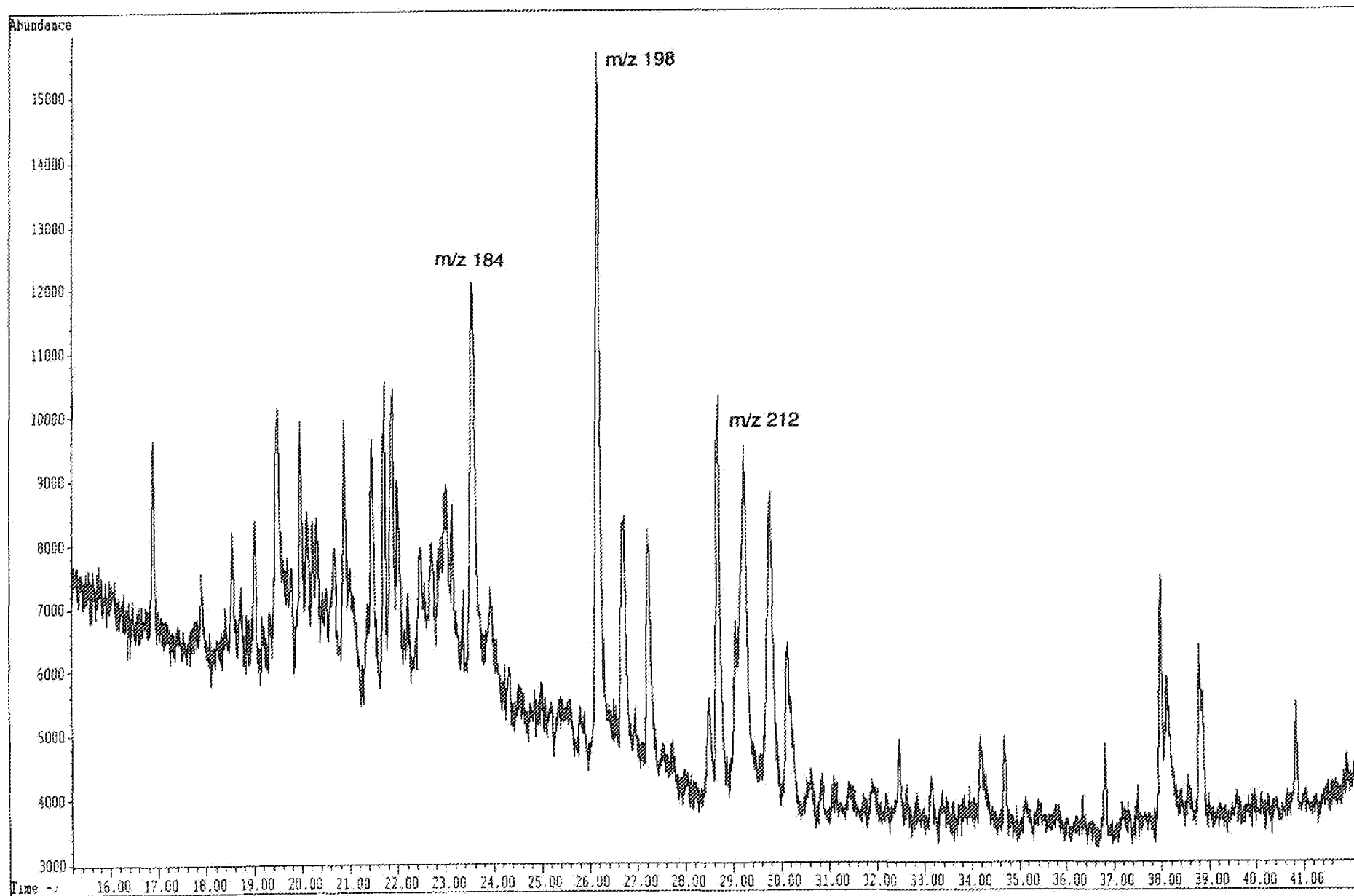
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Sample Name: 4134-001

Misc Info: WELL 33/9-10 3370.4M

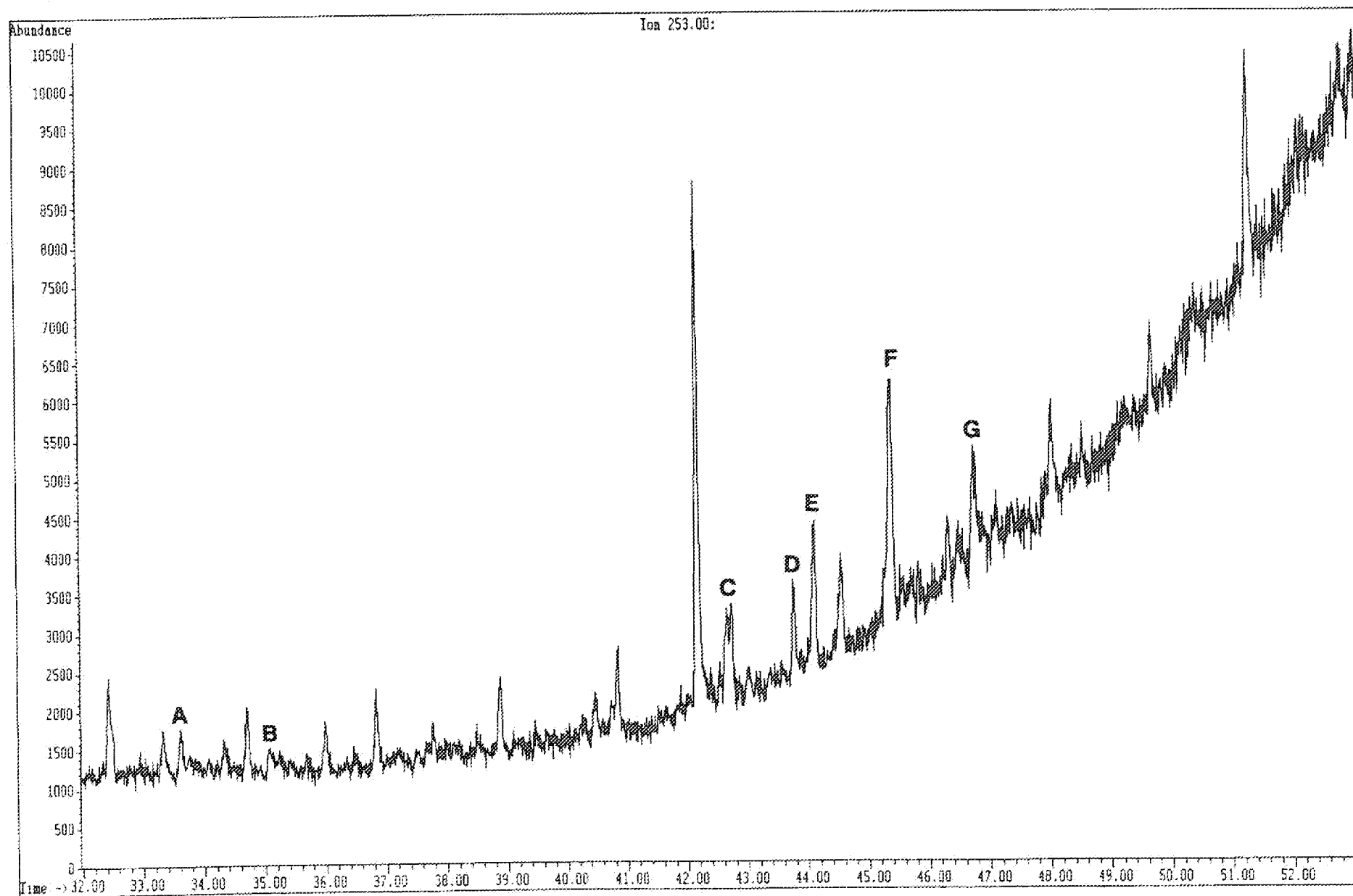
Bottle Number: 98

Dibenzothiophenes



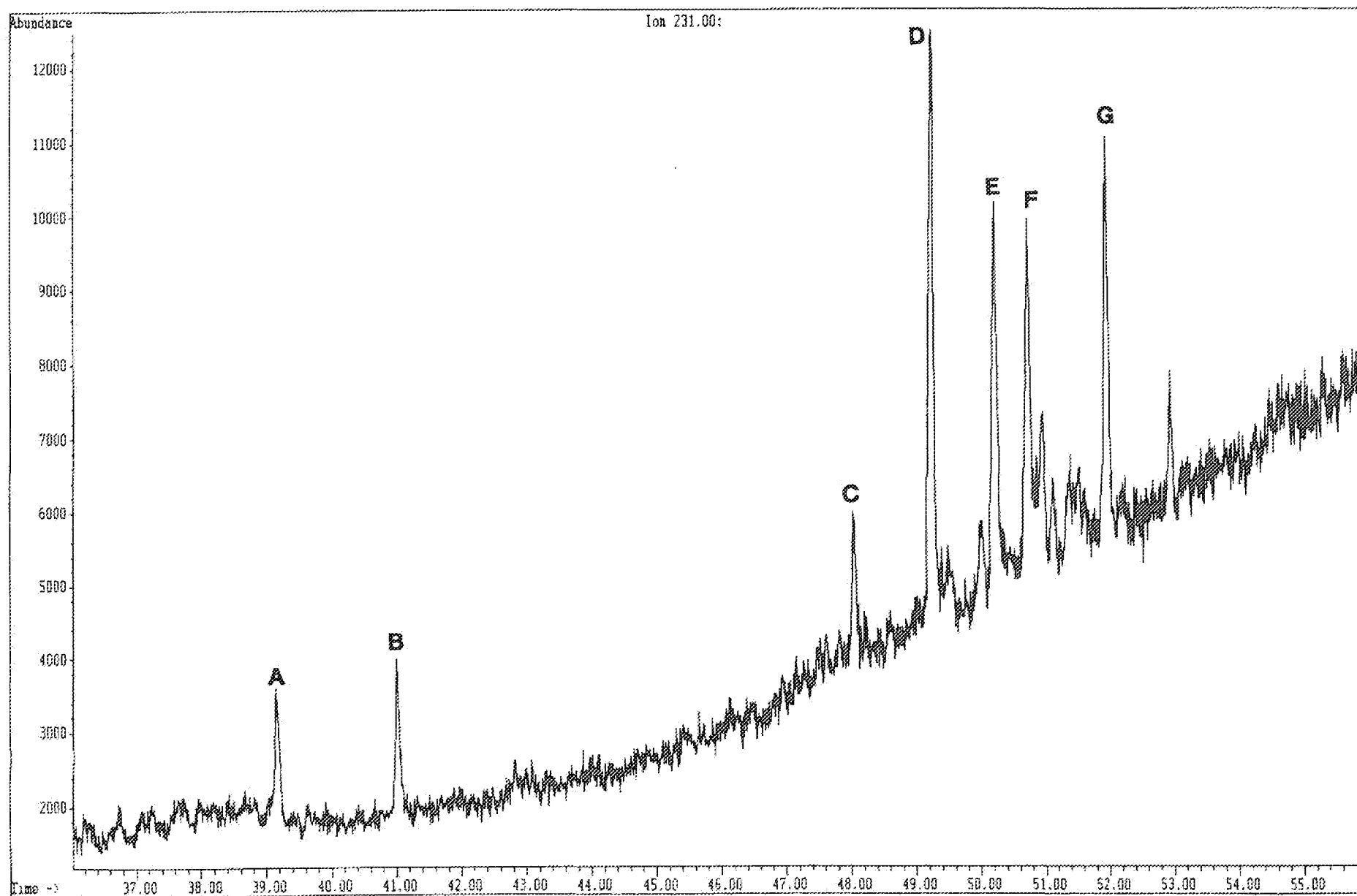
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Misc Info: WELL 33/9-10 3370.4M
Bottle Number: 98

L3.1k



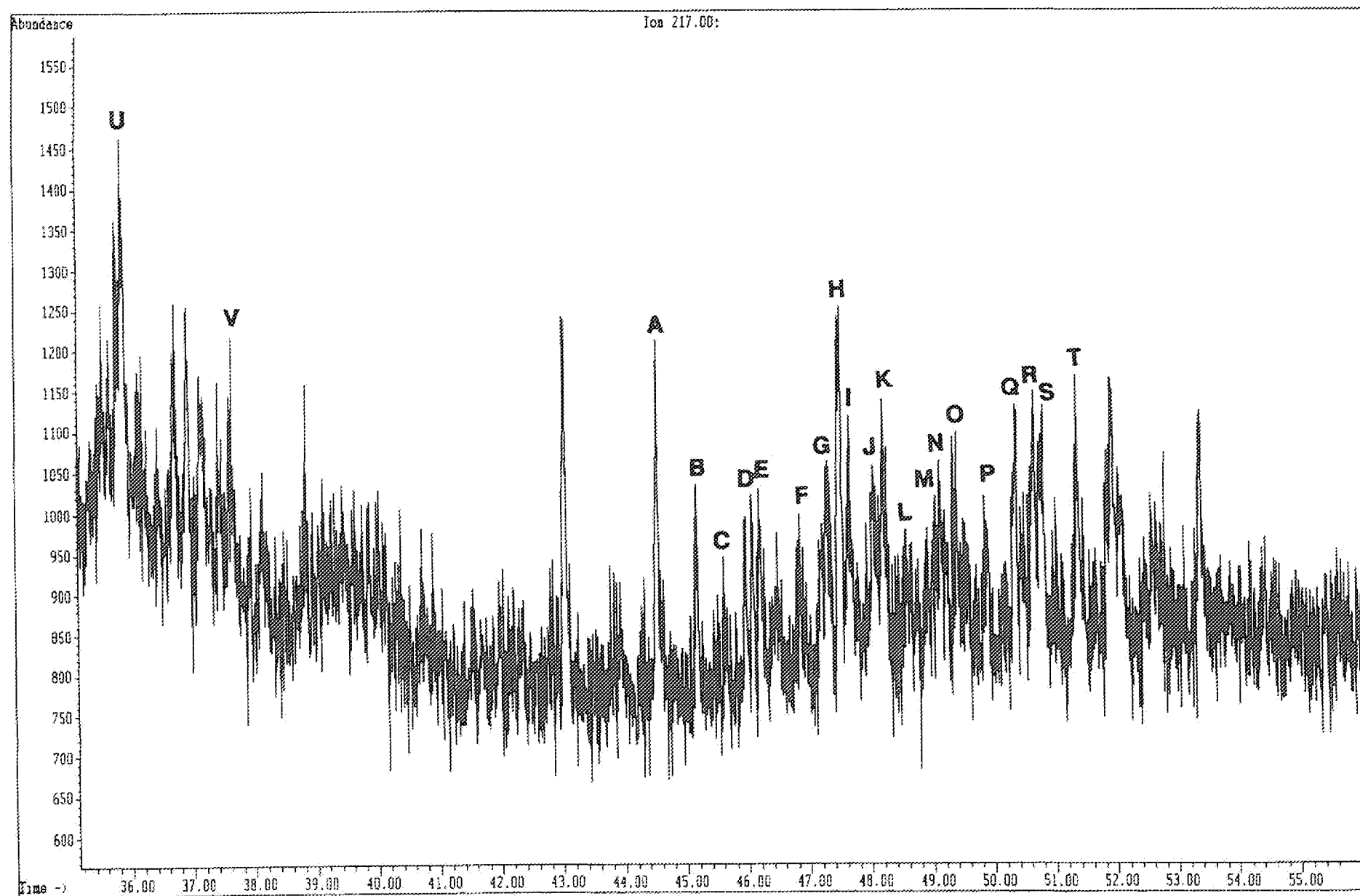
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Sample Name: 4134-001
Misc Info: WELL 33/9-10 3370.4M
Bottle Number: 98

L3.11



File: C:\CHEMPC\DATA\3201011.D
Operator:
Date Acquired: 14 Dec 90 11:34 pm
Method File Name: BIOM.M
Sample Name: 4134-002
Misc Info: WELL 33/9-10 3373.6M
Bottle Number: 32

L3.2a



File: C:\CHEMPC\DATA\3201011.D

L3.2b

Operator:

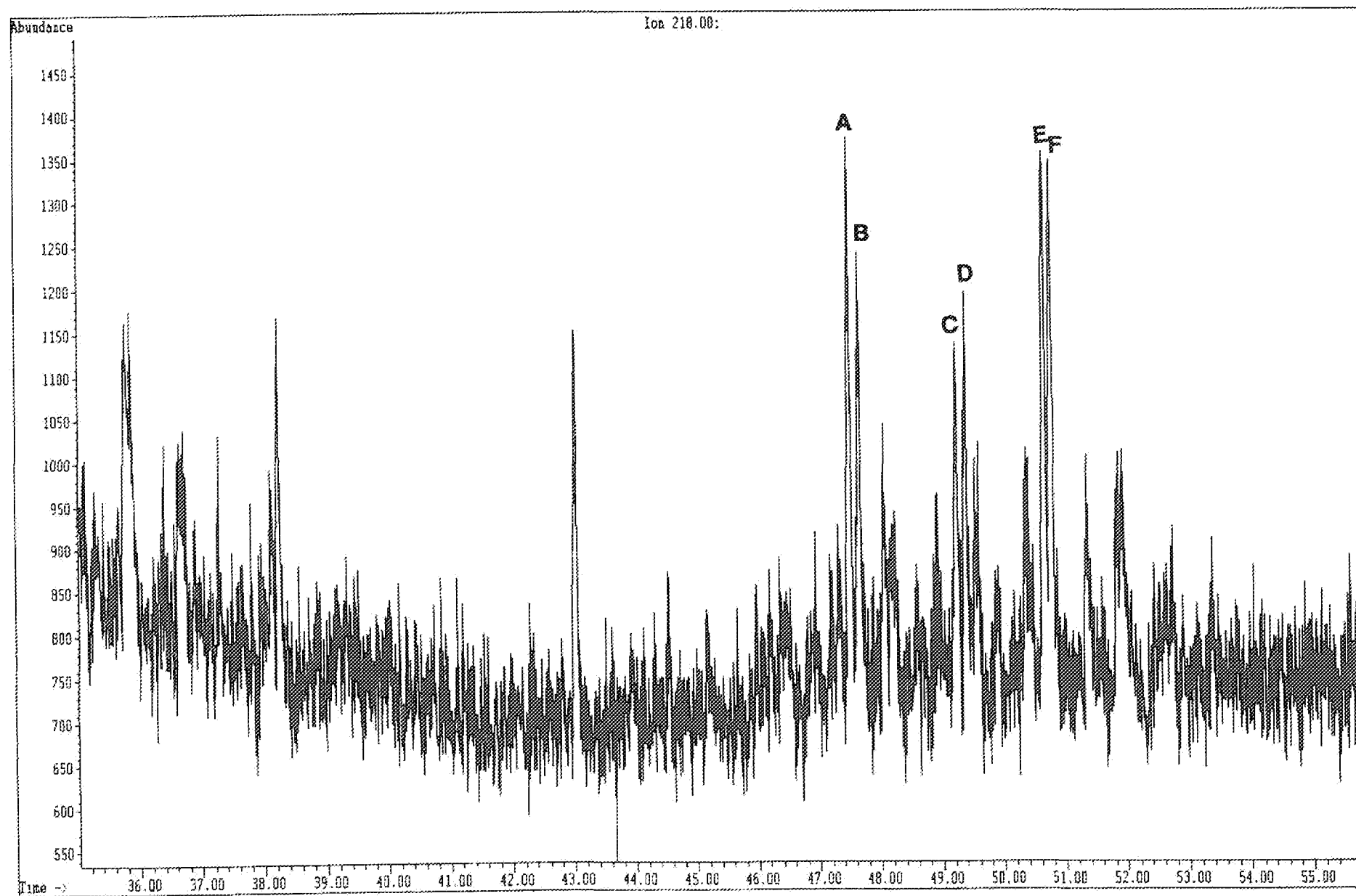
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Method File Name: BIOM.M

Sample Name: 4134-002

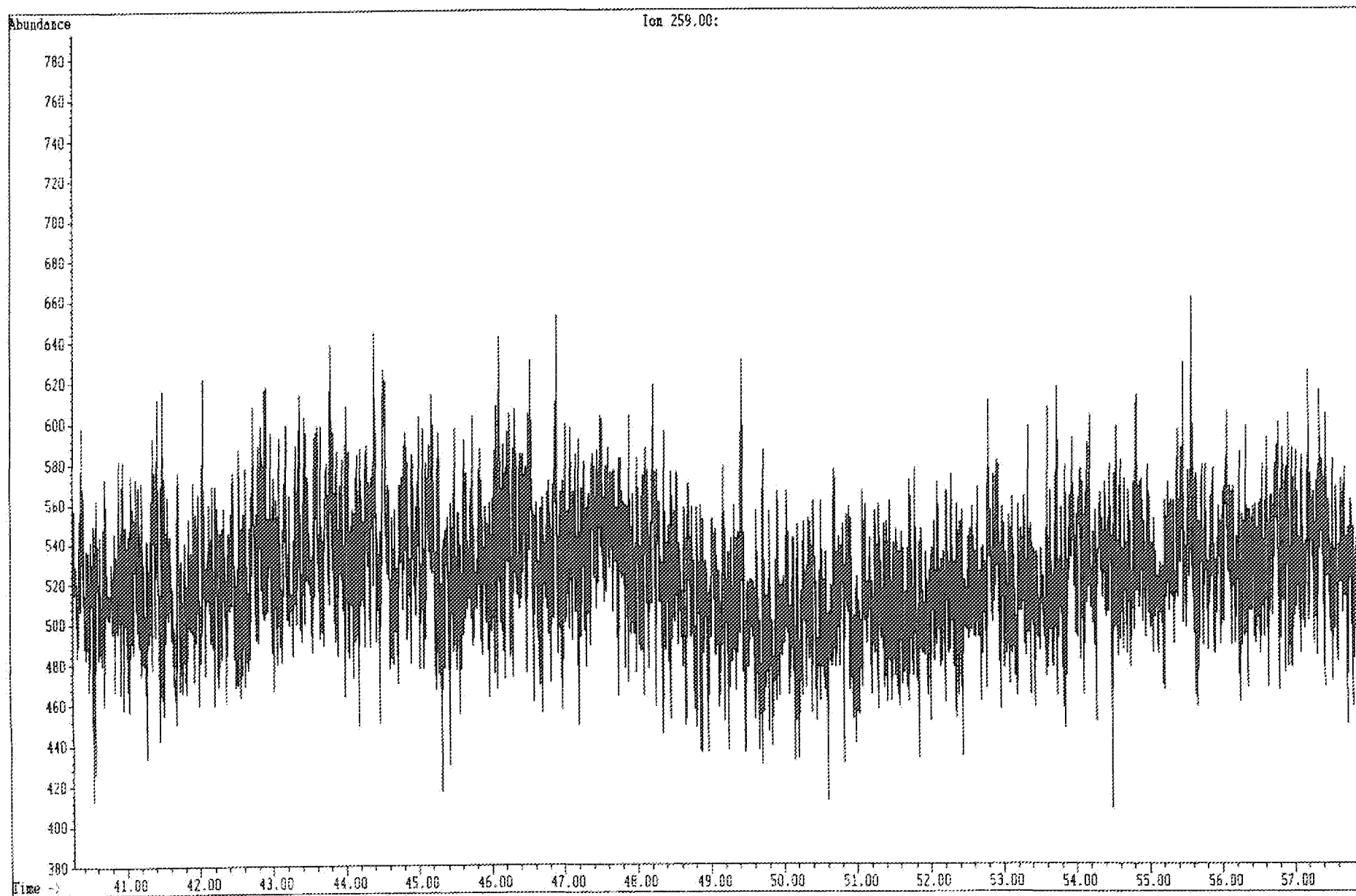
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Bottle Number: 32

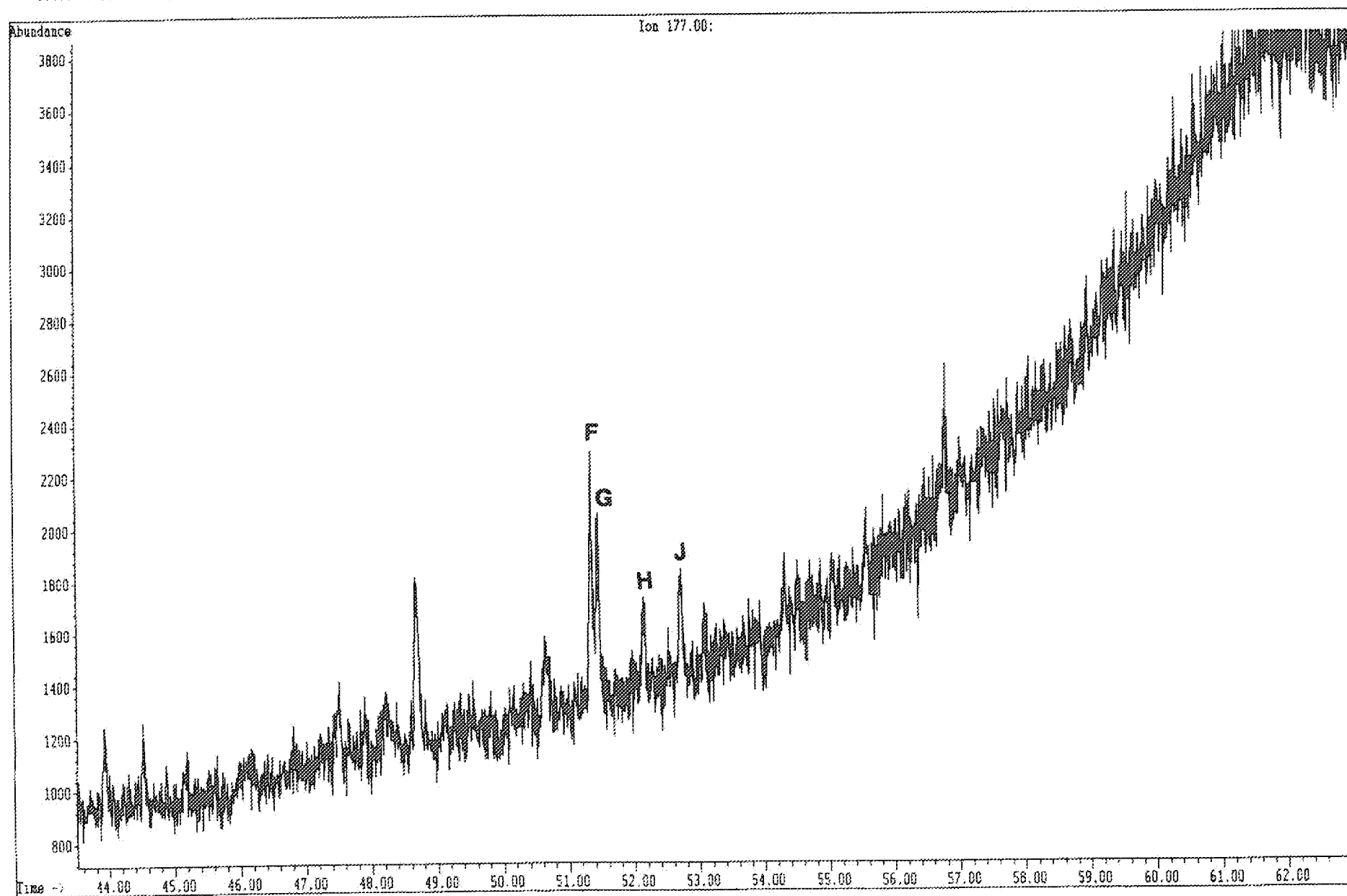


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Bottle Number: 32

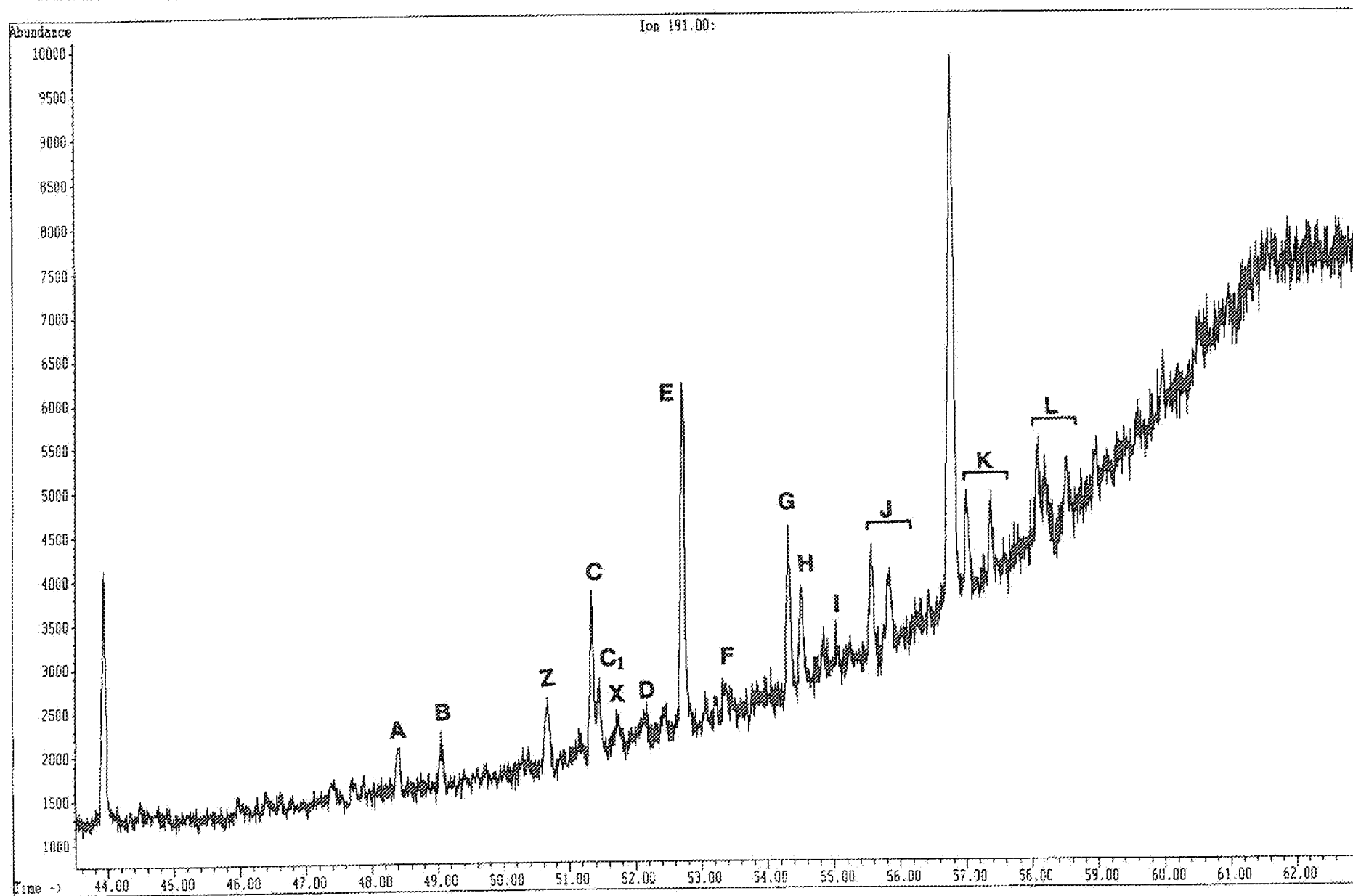
L3.2c



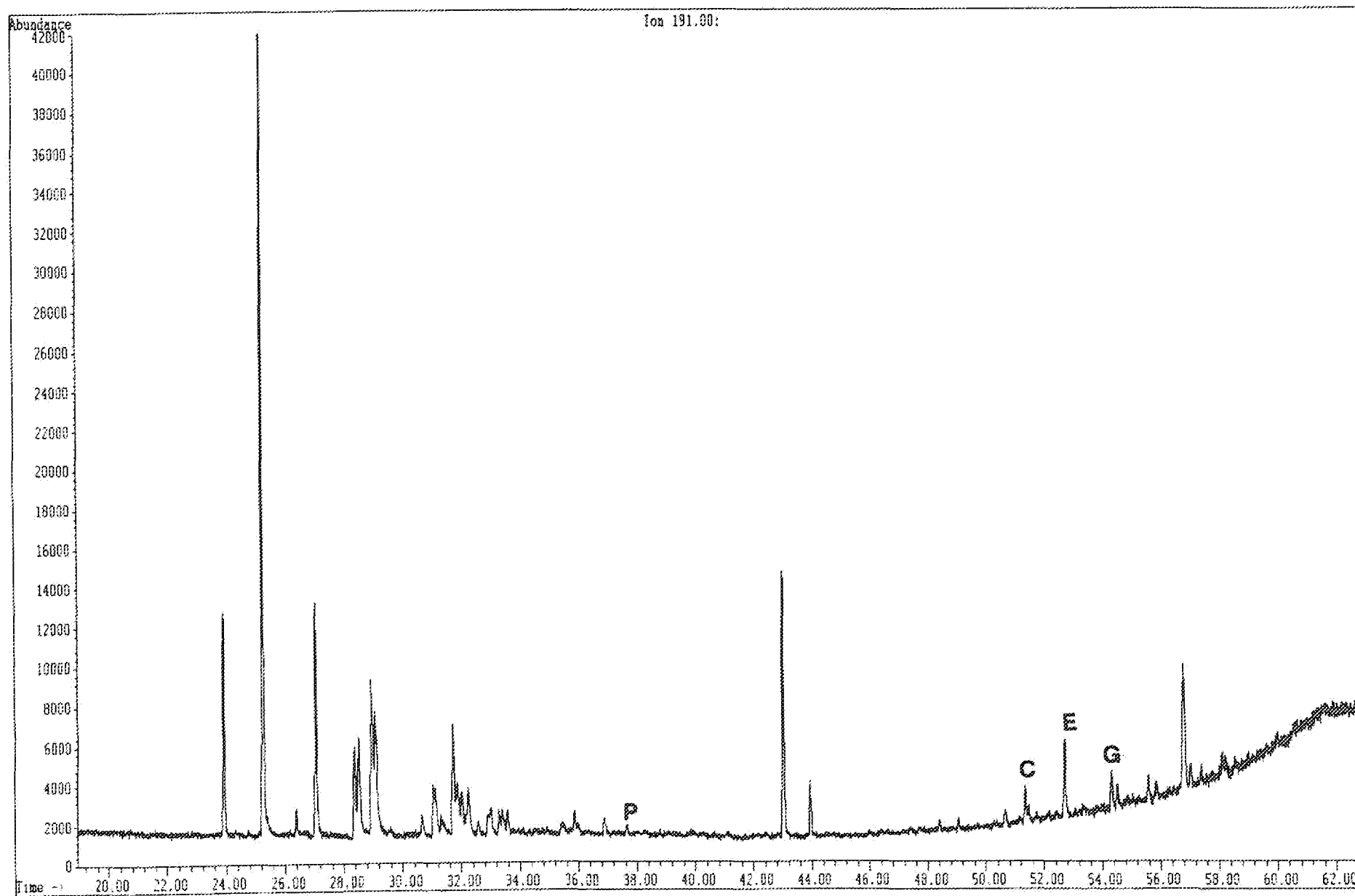
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Misc Info: WELL 33/9-10 3373.6M
Bottle Number: 32



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Misc Info: WELL 33/9-10 3373.6M
Bottle Number: 32

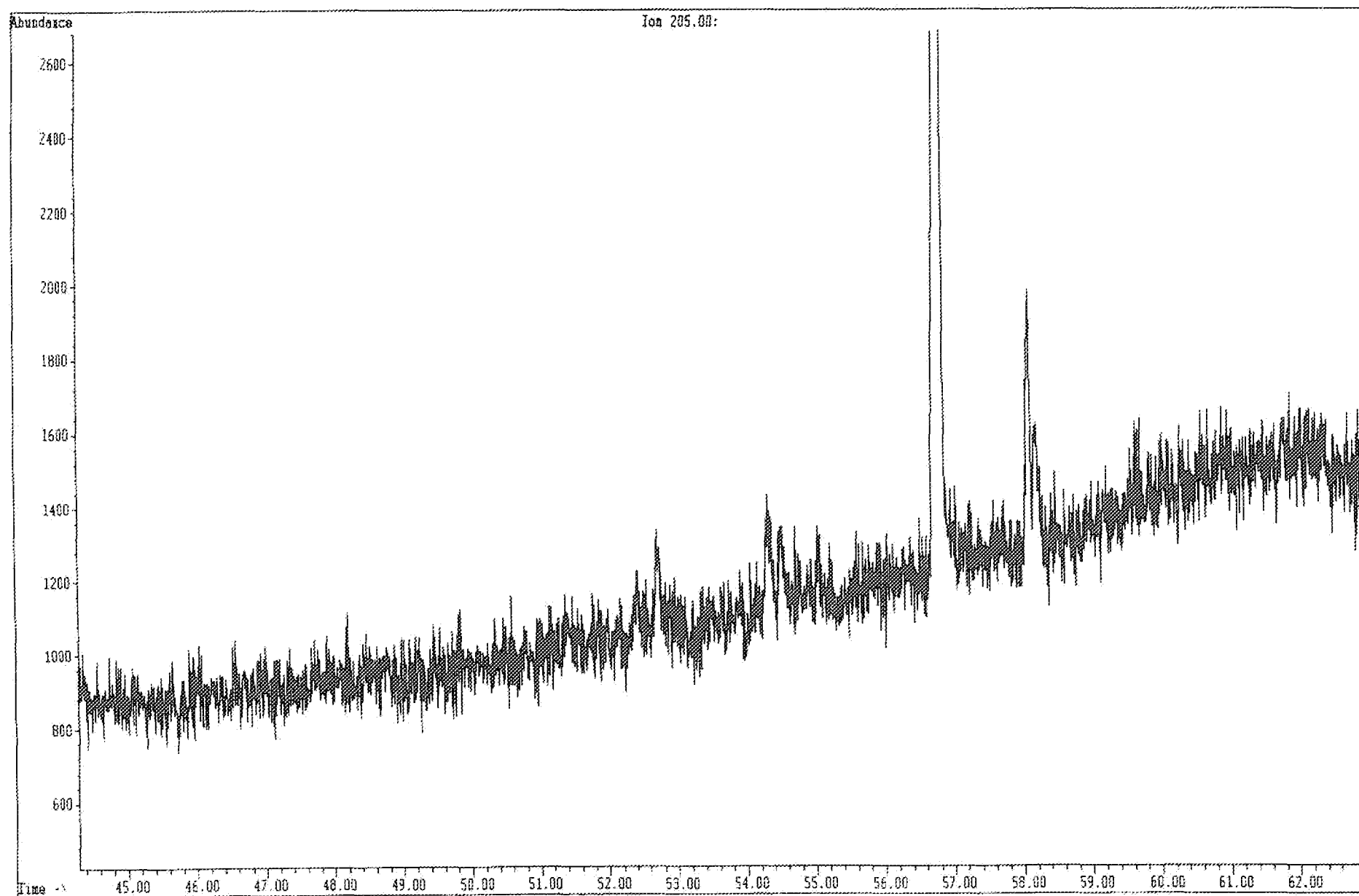


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Bottle Number: 32

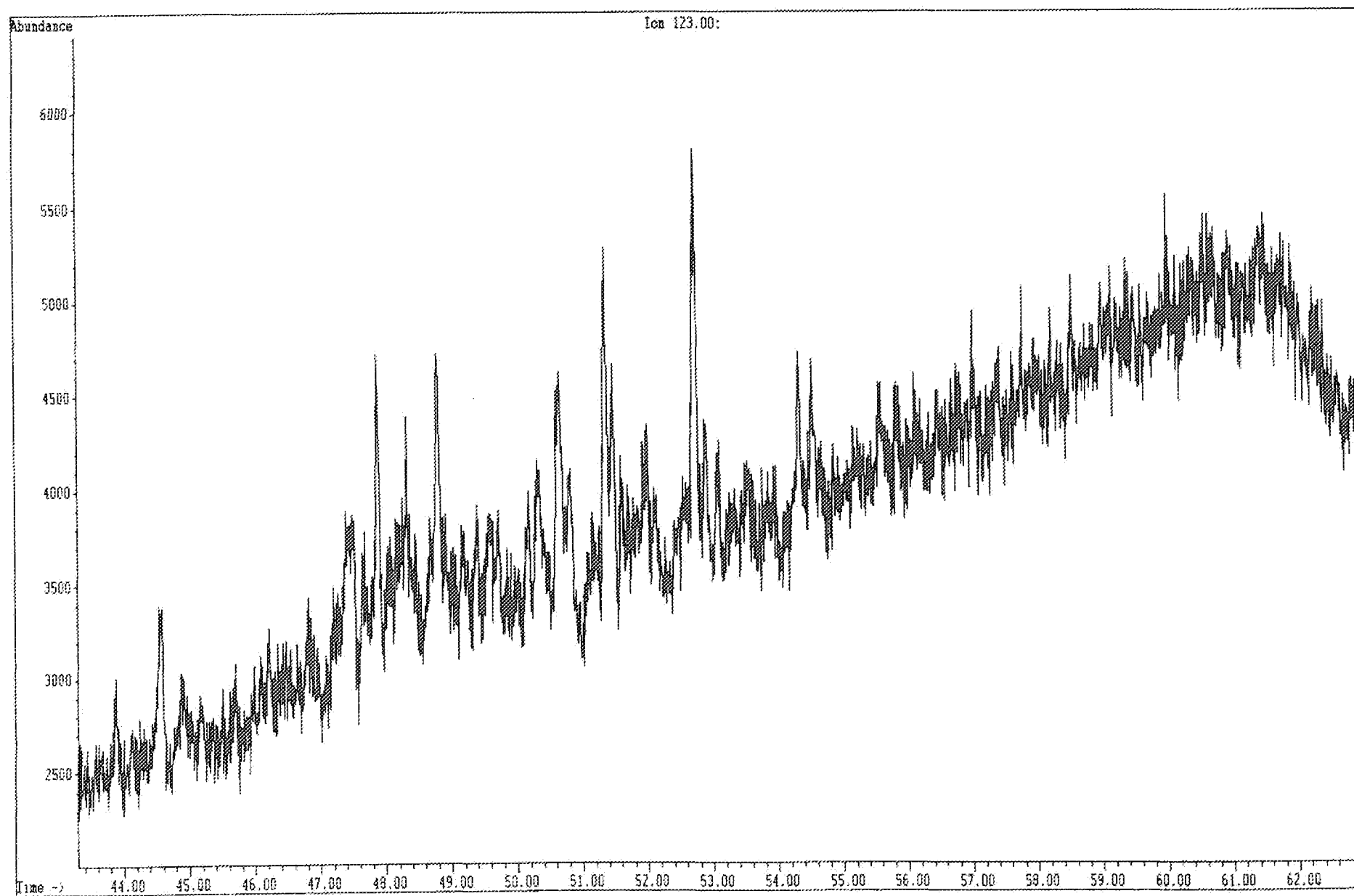


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Sample Name: 4134-002
Misc Info: WELL 33/9-10 3373.6M
Bottle Number: 32

L3.2g



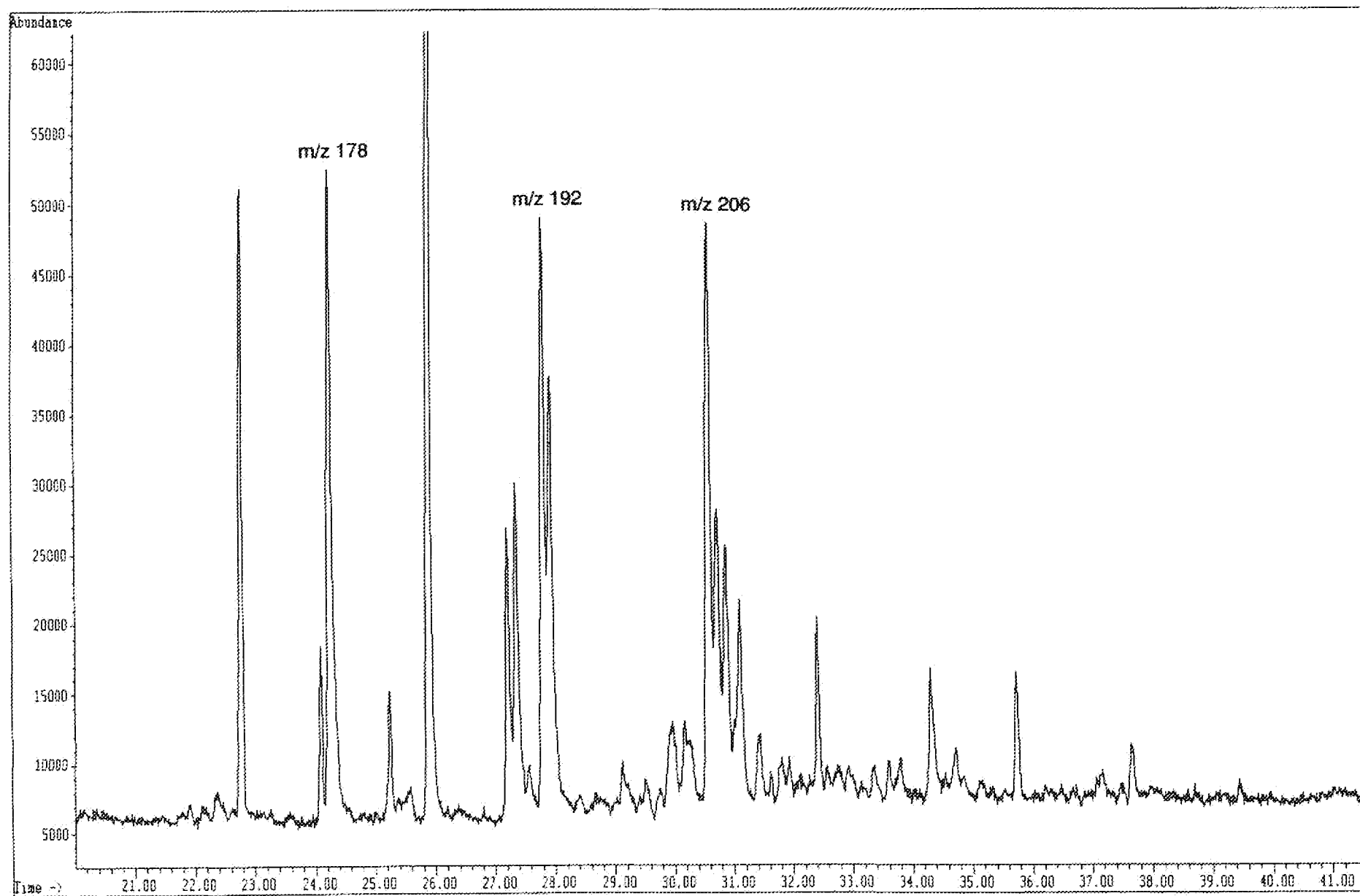
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Sample Name: 4134-002
Misc Info: WELL 33/9-10 3373.6M
Bottle Number: 32



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Operator:
Date Acquired: 12 Dec 90 1:04 am
Method File Name: BIOMY.M
Sample Name: 4134-002
Misc Info: WELL 33/9-10 3373.6M
Bottle Number: 99

L3.21

Phenanthrenes



File: C:\CHEMPC\DATA\9901021.D

L3.2j

Operator:

Date Acquired: 12 Dec 90 1:04 am

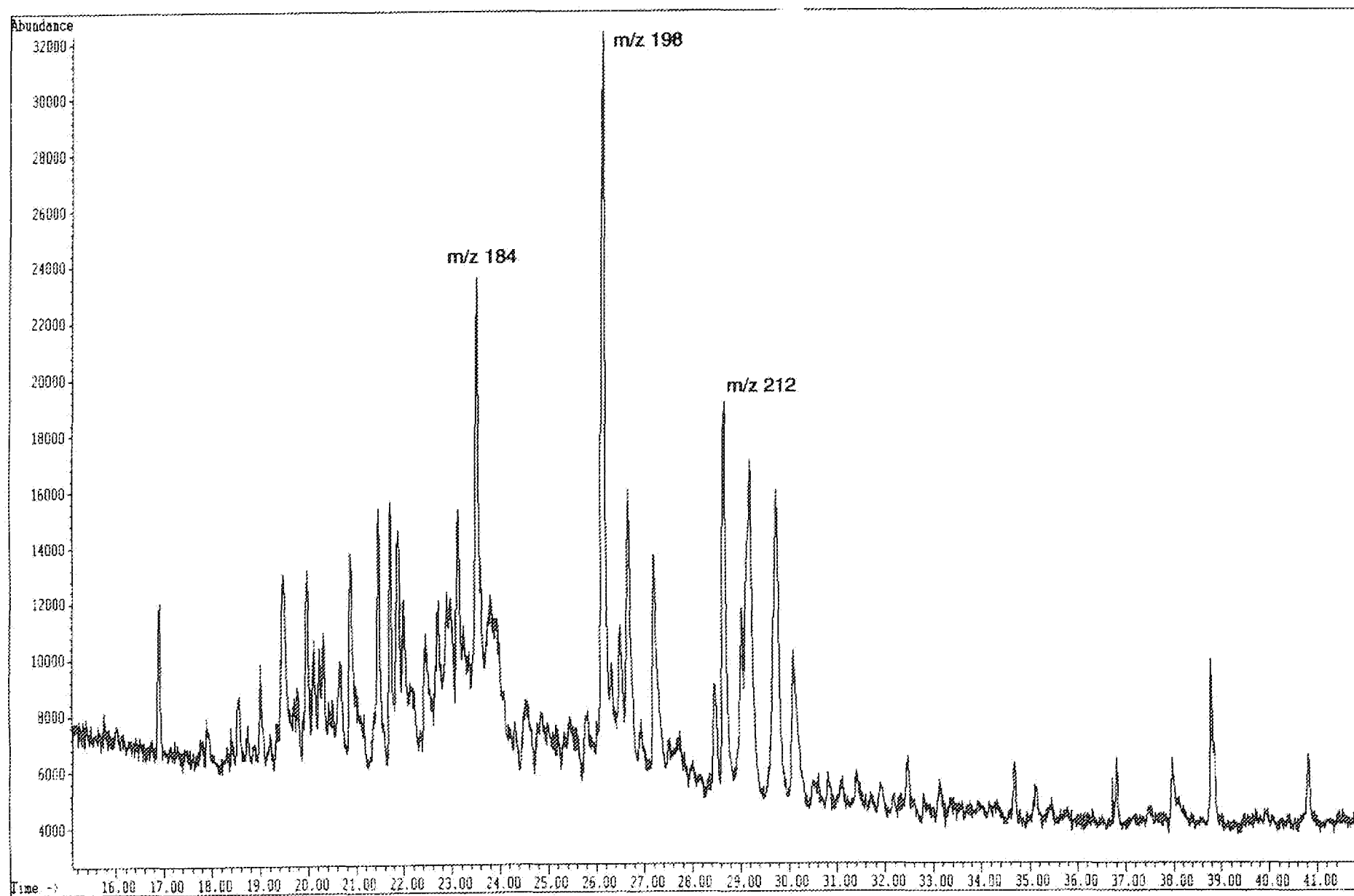
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Sample Name: 4134-002

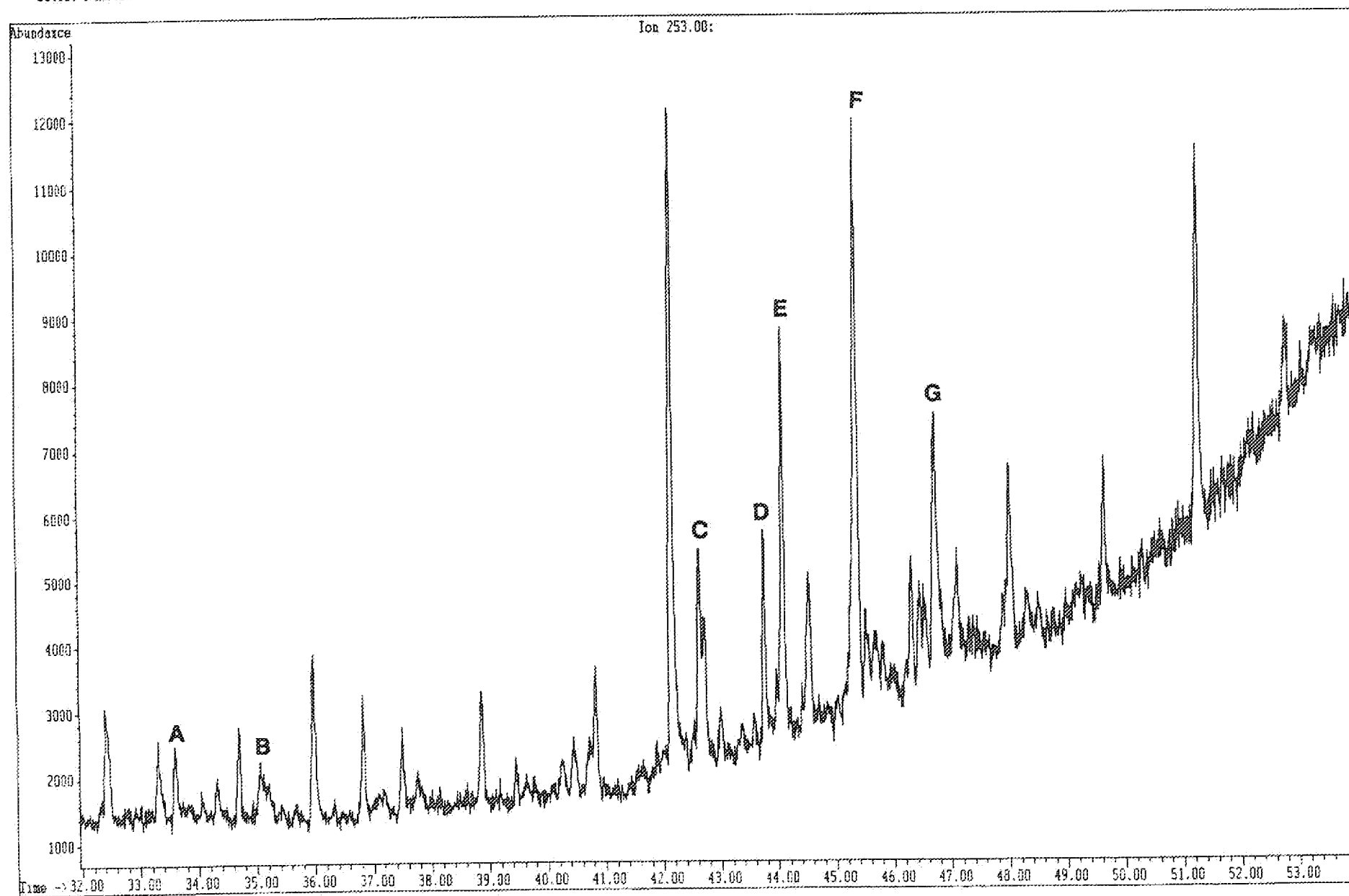
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Bottle Number: 99

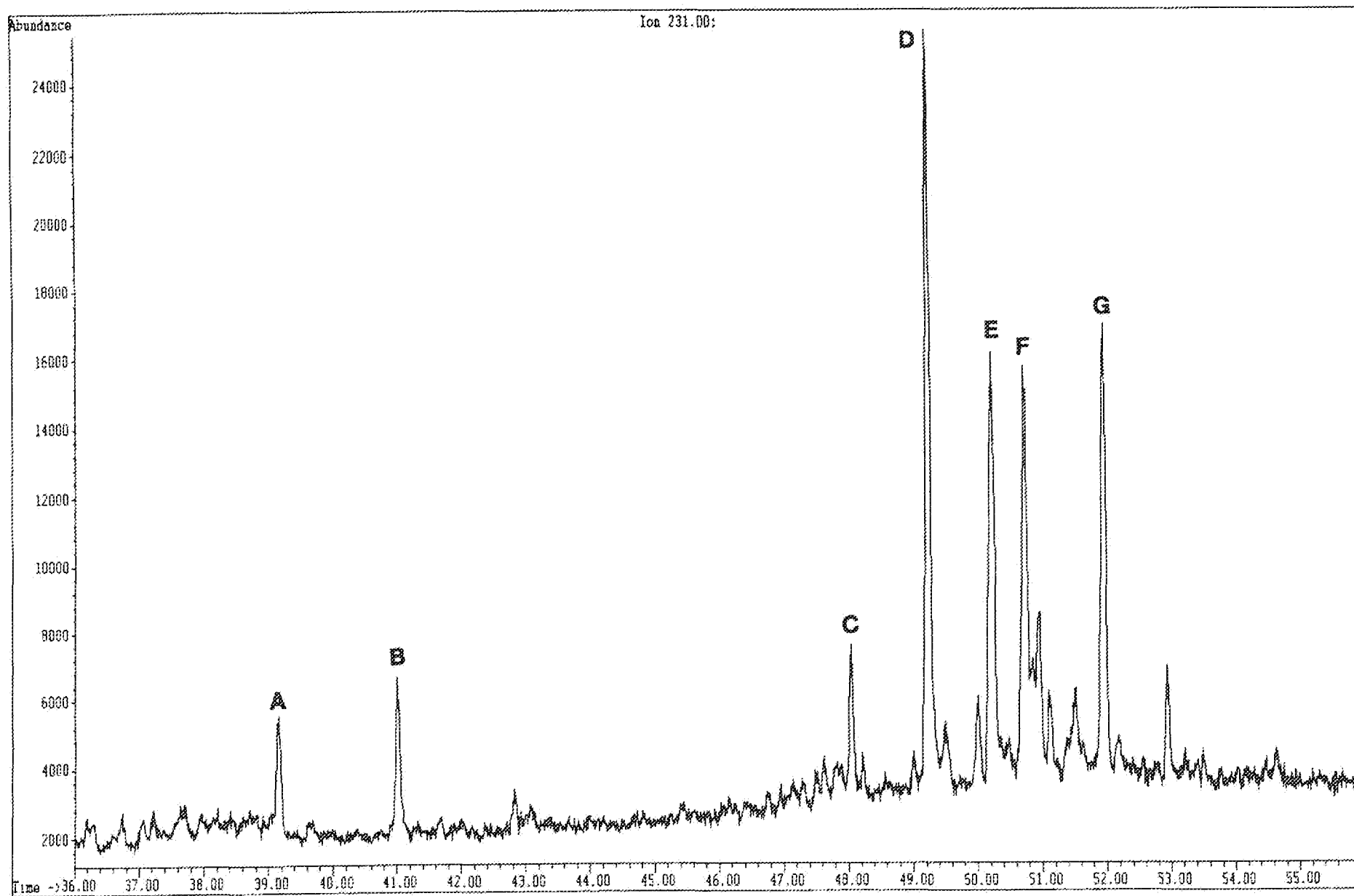
Dibenzothiophenes



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Operator:
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Method File Name: B10MY.M
Sample Name: 4134-002
Misc Info: WELL 33/9-10 3373.6M
Bottle Number: 99



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Operator:
Date Acquired: 12 Dec 90 1:04 am
Method File Name: BIOMY.M
Sample Name: 4134-002
Misc Info: WELL 33/9-10 3373.6M
Bottle Number: 99



33/9-6

TABLE M1
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

JOB 4135				
GEOCHEM SAMPLE NUMBER	DEPTH/ IDENTITY	GROSS LITHOLOGIC DESCRIPTION	G S A COLOUR CODE	TOTAL ORGANIC CARBON (Wt. %)

WELL: 33/9-6

4135-001	2997.9m	A100% SANDSTONE - fine to med grained, blocky, mod hard, sl micaceous, yellow F, v slow blooming milky cut, pale yellowish brown.	10YR6/2	
4135-002	2999.5m	A100% SANDSTONE - as 4135-001A, pale yellowish brown.	10YR6/2	

Abbreviations = arenaceous, argillaceous, calcareous, Cut, dolomite, Fluorescence, foraminifera fossiliferous, Lost Circulation Material, moderately, occasionally, slightly, very

TABLE M2
CONCENTRATION (PPM) OF EXTRACTED C₁₅₊ MATERIAL IN ROCK

JOB 4135	L I T H O	DEPTH/ IDENTITY	TOTAL EXTRACT	HYDROCARBONS			NON HYDROCARBONS			
GEOCHEM SAMPLE NUMBER				Saturates	Aromatics	TOTAL	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's	TOTAL

WELL: 33/9-6

4135-001	2997.9m	6911	4947	608	5555	641	708	7	1357
4135-002	2999.5m	8835	6412	930	7343	453	1014	26	1493

TABLE M3
COMPOSITION (NORMALISED %) OF C₁₅₊ MATERIAL

JOB 4135	L I T H O	DEPTH/ IDENTITY	HYDROCARBONS		NON HYDROCARBONS		
GEOCHEM SAMPLE NUMBER			Saturates	Aromatics	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's

WELL: 33/9-6

4135-001	2997.9m	71.57	8.80	9.28	10.25	0.10
4135-002	2999.5m	72.58	10.53	5.13	11.48	0.29

TABLE M4
SIGNIFICANT C₁₅₊ RATIOS

JOB 4135	L I T H O	DEPTH/ IDENTITY	TOC (%)	mg/g TOC						HYDROCARBONS % TOTAL EXTRACT	SATURATES AROMATICS
GEOCHEM SAMPLE NUMBER				TOTAL EXTRACT	SATURATES	AROMATICS	TOTAL HYDROCARBONS	ELUTED NSO's	ASPHALTENES		

WELL: 33/9--6

4135-001	2997.9m	0.28	2468.32	1766.67	217.18	1983.85	253.00	228.99	80.37	8.13
4135-002	2999.5m	0.39	2265.48	1644.19	238.54	1882.72	259.98	116.18	83.10	6.89

TABLE M5
C₁₅+ CHROMATOGRAPHY WEIGHTS (grams)

JOB 4135	L I T H O	DEPTH/ IDENTITY	ROCK EXTRACTED	TOTAL EXTRACT	PRECIPITD. ASPHALTENES	NC5	SATURATES	AROMATICS	ELUTED NSO's	NON-ELUTED NSO's
GEOCHEM SAMPLE NUMBER										

WELL: 33/9-6

4135-001A	2997.9m	17.2500	0.11922	0.01106	0.10816	0.08533	0.01049	0.01222	0.00012
4135-002A	2999.5m	18.6500	0.16478	0.00845	0.15633	0.11959	0.01735	0.01891	0.00048

TABLE M6
COMPOSITION (NORMALISED %) OF C₁₅+ SATURATE (PARAFFIN - NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	001	002
DEPTH	2997.9m	2999.5m
SAMPLE TYPE		
nC15	1.56	1.82
nC16	3.01	3.66
nC17	4.84	5.72
nC18	7.47	7.18
nC19	8.64	8.77
nC20	8.79	9.08
nC21	8.01	8.35
nC22	8.04	8.20
nC23	7.51	7.24
nC24	7.36	7.09
nC25	7.29	6.48
nC26	6.24	5.86
nC27	5.34	5.11
nC28	4.48	4.13
nC29	3.74	3.57
nC30	2.70	2.69
nC31	1.94	1.97
nC32	1.15	1.22
nC33	0.87	0.85
nC34	0.62	0.63
nC35	0.40	0.39
Paraffin	17.54	17.57
Isoprenoid	1.66	1.98
Naphthene	80.80	80.45
CPI 1 Index	1.00	0.99
CPI 2 Index	1.07	1.05
CPI 3 Index	1.00	1.02
Prist/Phytane	0.94	0.95
Prist/nC17	0.88	0.90
Phytane/nC18	0.61	0.75

Job Number : 4135

$$C.P.I. 1 = \frac{1}{2} \left[\frac{C_{21} + C_{23} + C_{25} + C_{27}}{C_{20} + C_{22} + C_{24} + C_{26}} + \frac{C_{21} + C_{23} + C_{25} + C_{27}}{C_{22} + C_{24} + C_{26} + C_{28}} \right]$$

$$C.P.I. 2 = \frac{1}{2} \left[\frac{C_{25} + C_{27} + C_{29} + C_{31}}{C_{24} + C_{26} + C_{28} + C_{30}} + \frac{C_{25} + C_{27} + C_{29} + C_{31}}{C_{26} + C_{28} + C_{30} + C_{32}} \right]$$

$$C.P.I. 3 = \frac{2 \times (C_{27})}{C_{26} + C_{28}}$$

CT ~ ditch cuttings CO ~ core SWC ~ sidewall core

TABLE M7
METHYLPHENANTHRENE INDICES (MPI)

JOB 4135	DEPTH/ IDENTITY	SAMPLE TYPE	MPI 1		Rcalc		MPI 2	
GEOCHEM SAMPLE NUMBER			AREA	HEIGHT	AREA	HEIGHT	AREA	HEIGHT

WELL: 33/9-6

4135-001	2997.9m		0.57	0.63			0.61	0.63
4135-002	2999.5m		0.60	0.64			0.64	0.66

$$\text{MPI 1} = \frac{1.5(2\text{-MP} + 3\text{-MP})}{\text{P} + 1\text{-MP} + 9\text{-MP}} \quad \text{MPI 2} = \frac{3(2\text{-MP})}{\text{P} + 1\text{-MP} + 9\text{-MP}}$$

$$\text{Rcalc} = 0.60(\text{MPI 1}) + 0.40 \quad (\text{if Ro} < 1.35\%) \\ = -0.60(\text{MPI 1}) + 2.30 \quad (\text{if Ro} > 1.35\%)$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE M8

AROMATIC HYDROCARBONS RATIOS (MSD, PEAK AREA DATA)

SAMPLE NUMBER	DEPTH (m)	2MP/ 1MP	RATIO 1	RATIO 2	RATIO 3
------------------	--------------	-------------	---------	---------	---------

WELL: 33/9-6

4135-001A	2997.9	0.55	0.32	0.52	0.17
4135-002A	2999.5	0.62	0.30	0.54	0.17

RATIO 1 = $A(231)/A(231) + G(231)$ RATIO 2 = $E(253)/E(253) + G(253)$ RATIO 3 = $A(253)/B(231) + E(253)$

TABLE M9
CARBON ISOTOPE COMPOSITIONS (‰,PDB)

JOB 4135								
GEOCHEM SAMPLE NUMBER	DEPTH/ IDENTITY	TOTAL EXTRACT WHOLE OIL	SATURATES	AROMATICS	NSO	ASPHALTENES	KEROGEN	PYROLYSATE (S2)

WELL: 33/9-6

4135-001	2997.9m	-28.96	-29.32	-28.55	-29.04	-28.66		
4135-002	2999.5m	-28.81	-29.41	-29.28	-29.92	-29.54		

TABLE M10
BIOMARKER MOLECULAR RATIOS

WELL: 33/9-6

SAMPLE NUMBER	DEPTH (m)	Steranes (m/z 217)			Steranes (m/z 218)		
		<u>A</u> (A+J)	<u>Q</u> (Q+T)	<u>(R+S)</u> (Q+R+S+T)	NORMALISED COMPOSITION:		
					B	D	F
4135-001A	2997.9	0.62	0.54	0.51	27%	30%	43%
4135-002A	2999.5	0.65	0.60	0.53	29%	25%	46%

TABLE M11
BIOMARKER MOLECULAR RATIOS

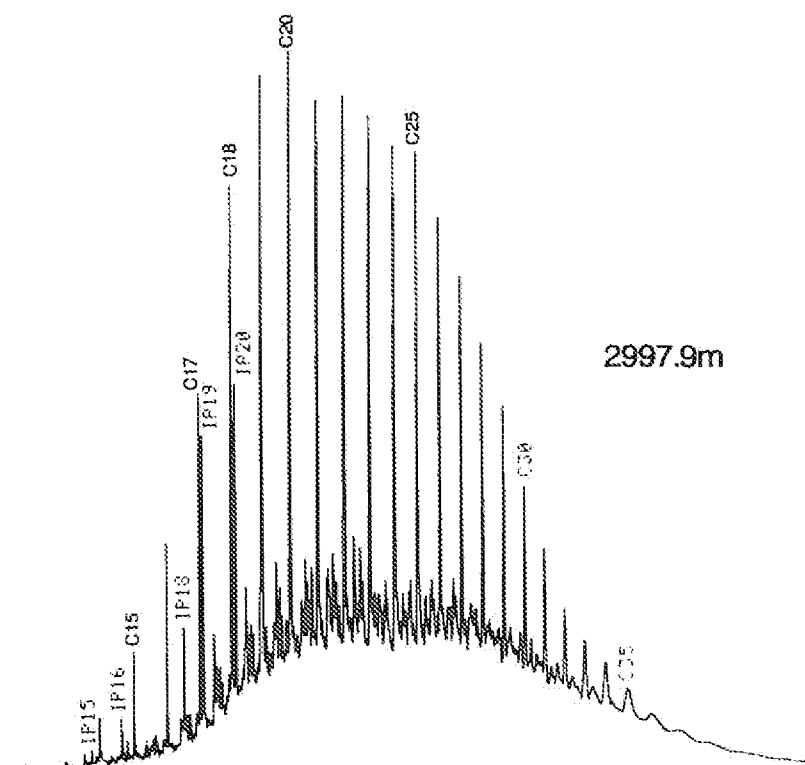
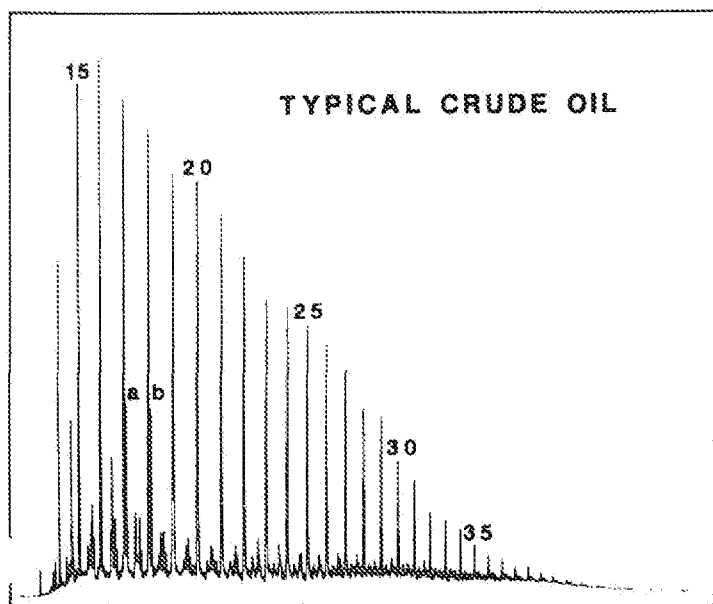
WELL 33/9-6

Terpanes (m/z 191)

SAMPLE NUMBER	DEPTH (m)	A/B	Z/E	Z/C	<u>Z</u> (Z+E)	<u>C</u> (C+E)	%22S for J	<u>E</u> (E+F)	<u>X</u> (X+D)	Q/E
4135-001A	2997.9	1.86	0.25	0.65	0.20	0.28	56%	0.85	0.72	0.09
4135-002A	2999.5	1.17	0.26	0.43	0.21	0.38	56%	0.82	0.63	0.08

FIGURE M1.1 C₁₅+ SATURATES CHROMATOGRAMS

WELL 33/9-6



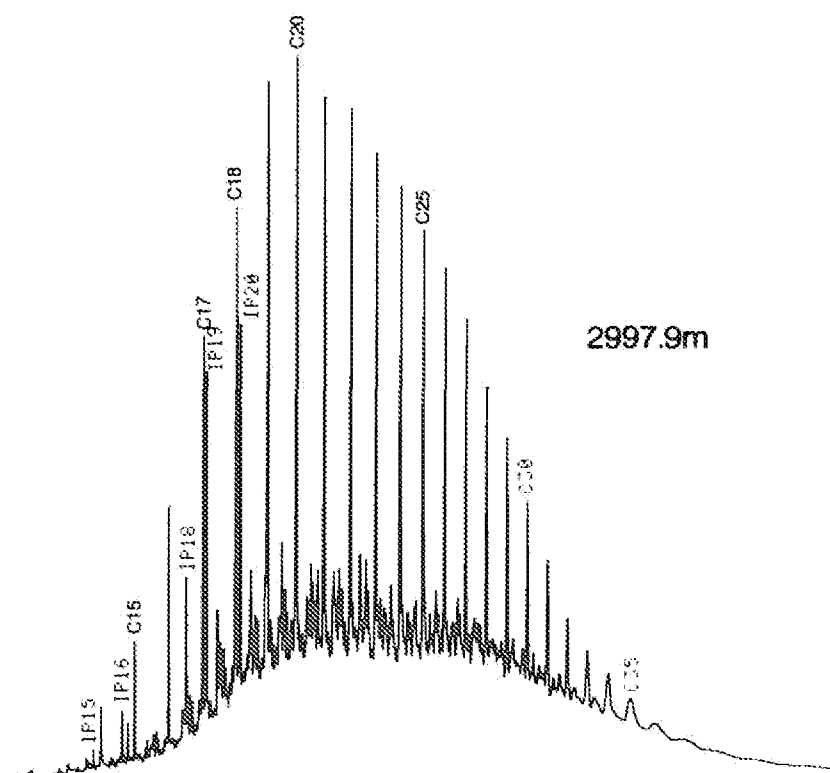
a = PRISTANE

b = PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20-nC₂₀)

FIGURE M1.2 **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 33/9-6



a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE M2.1

C₁₅+ AROMATIC CHROMATOGRAMS

WELL 33/9-6

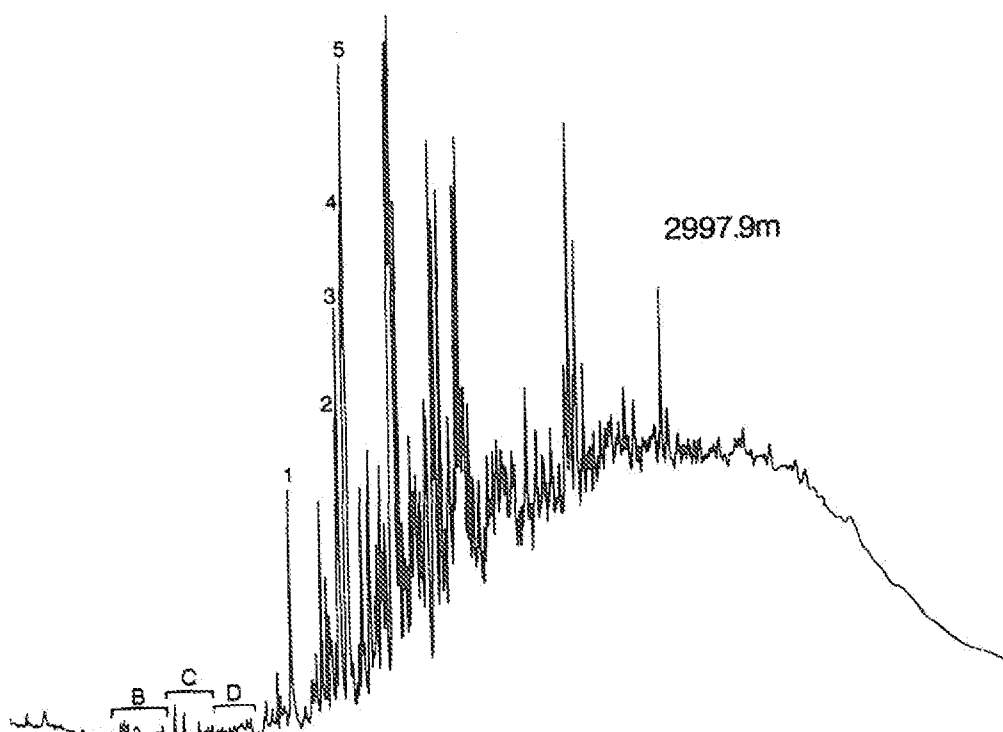
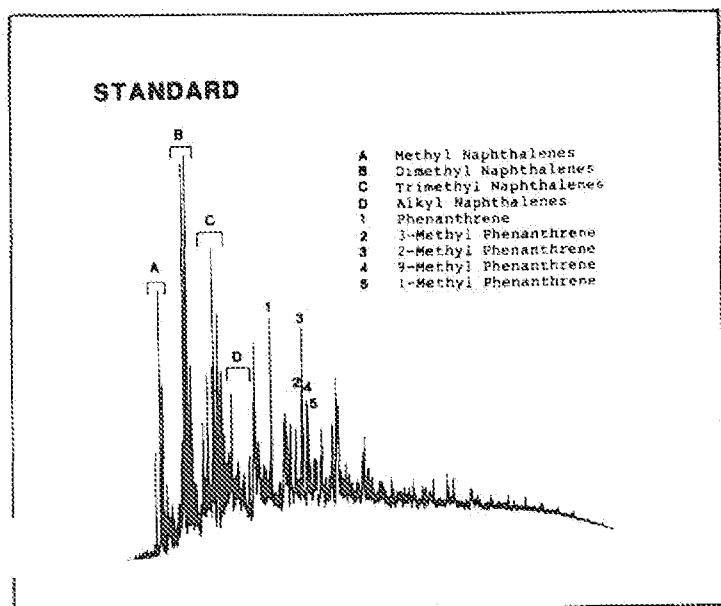
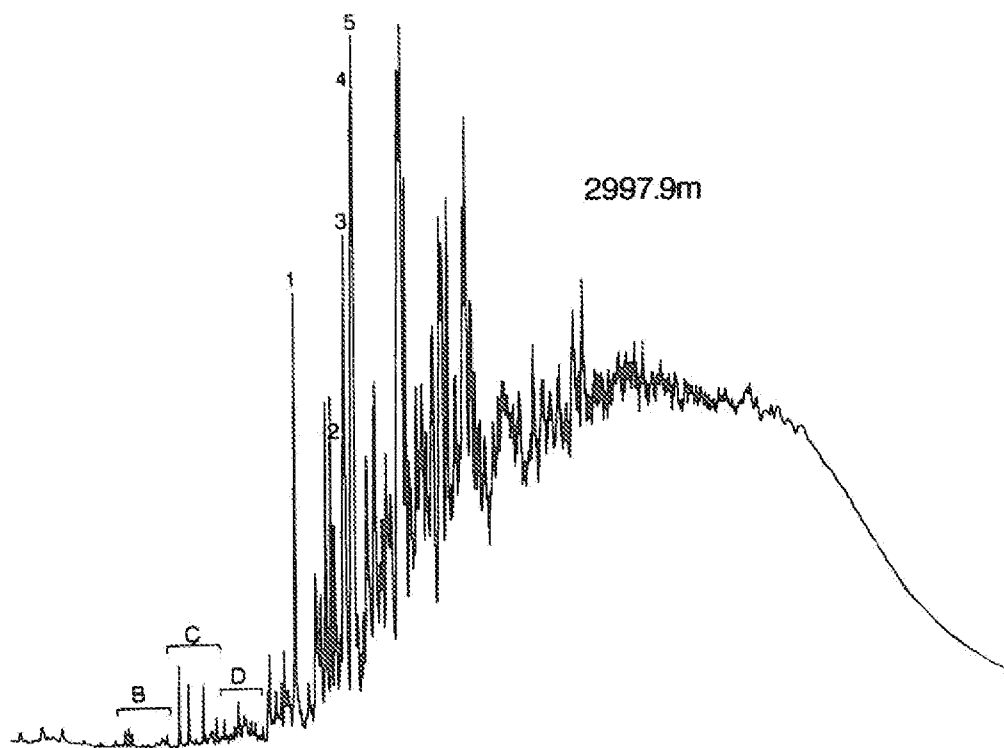


FIGURE M2.2 **C₁₅+ AROMATIC CHROMATOGRAMS**

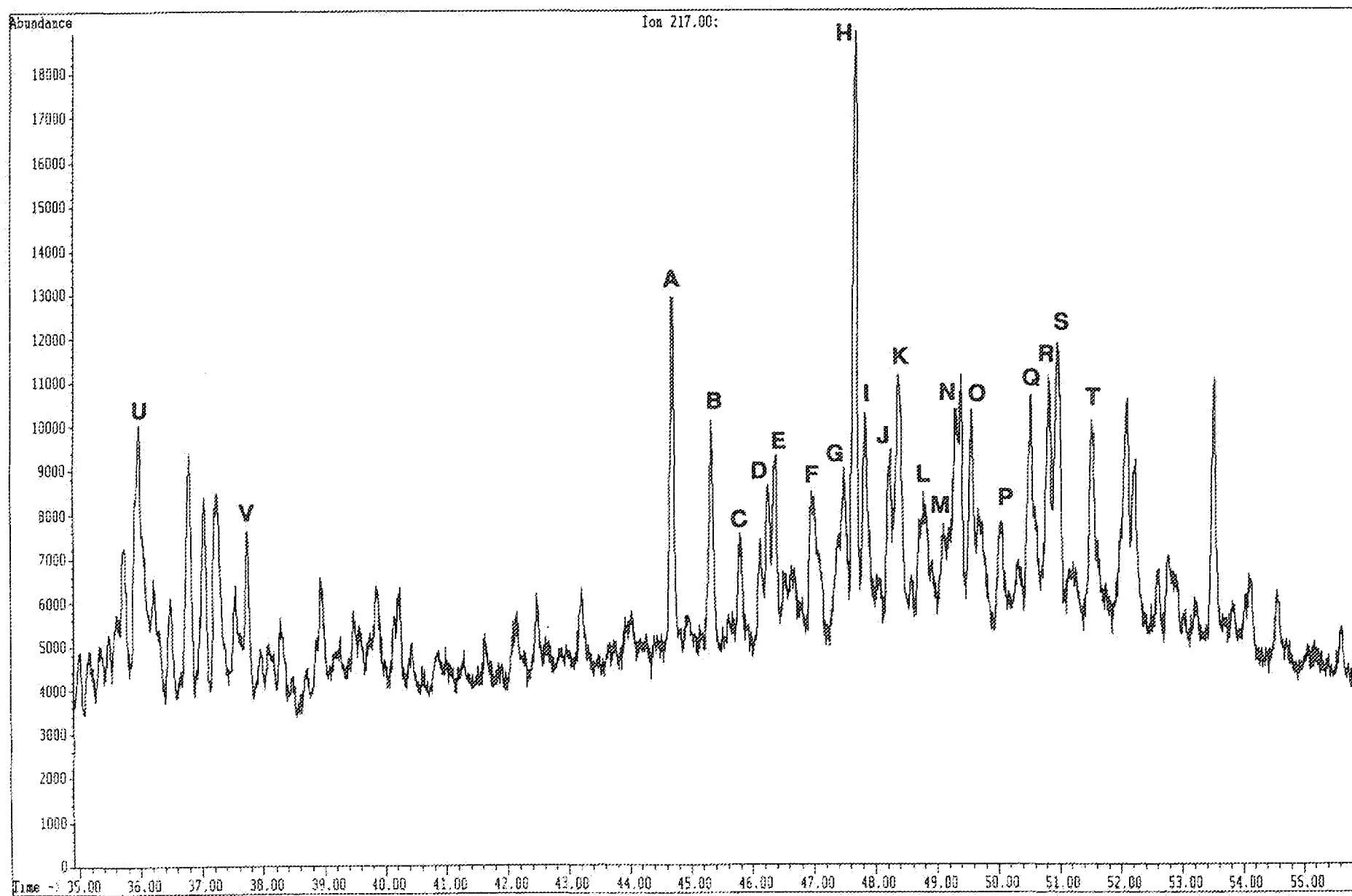
WELL 33/9-6



PEAK IDENTIFICATION ON FIRST SHEET

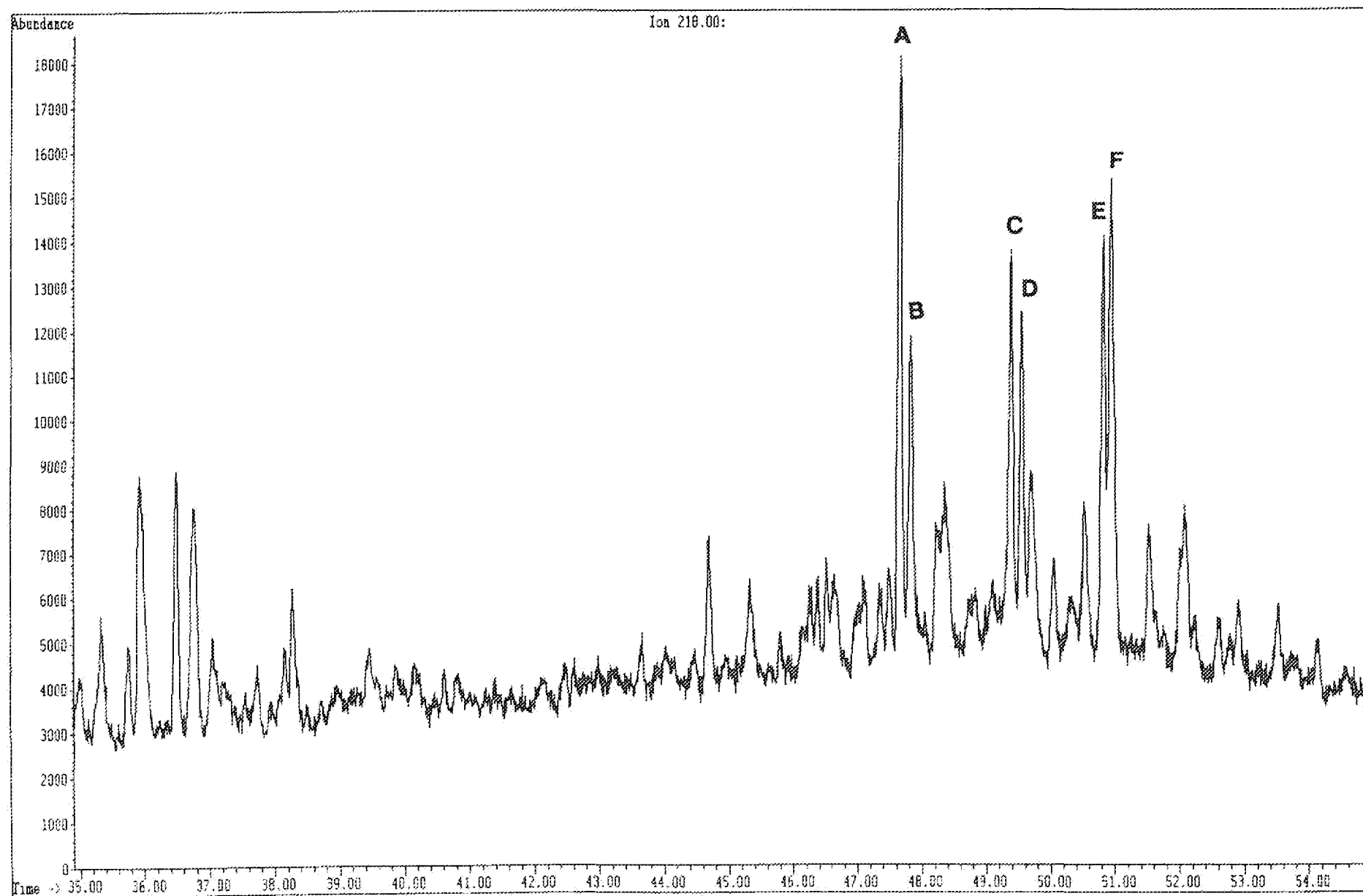
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Operator:
Date Acquired: 15 Dec 90 0:44 am
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Sample Name: 4135-001
Misc Info: WELL 33/9-6 2997.9M
Bottle Number: 33

M3.1a

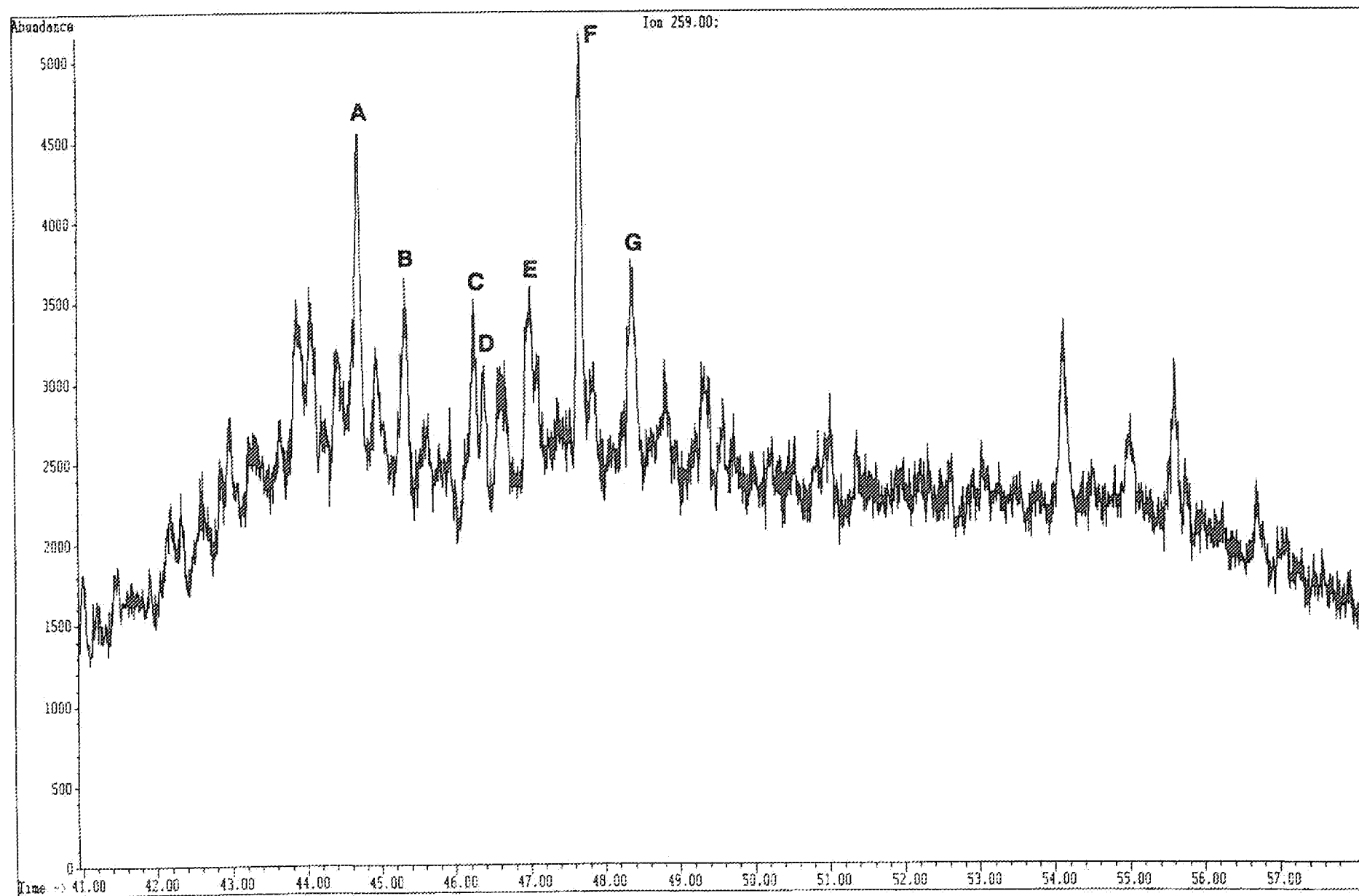


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Method File Name: BIOM.M
Sample Name: 4135-031
Misc Info: WELL 33/9-6 2997.9M
Bottle Number: 33

M3.1b



File: C:\CHEMP\DATA\3301012.D
Operator:
Date Acquired: 15 Dec 98 0:44 am
Method File Name: B10M.M
Sample Name: 4135-001
Misc Info: WELL 33/9-6 2997.9M
Bottle Number: 33



File: C:\CHEMPC\DATA\3301012.D

M3.1d

Operator:

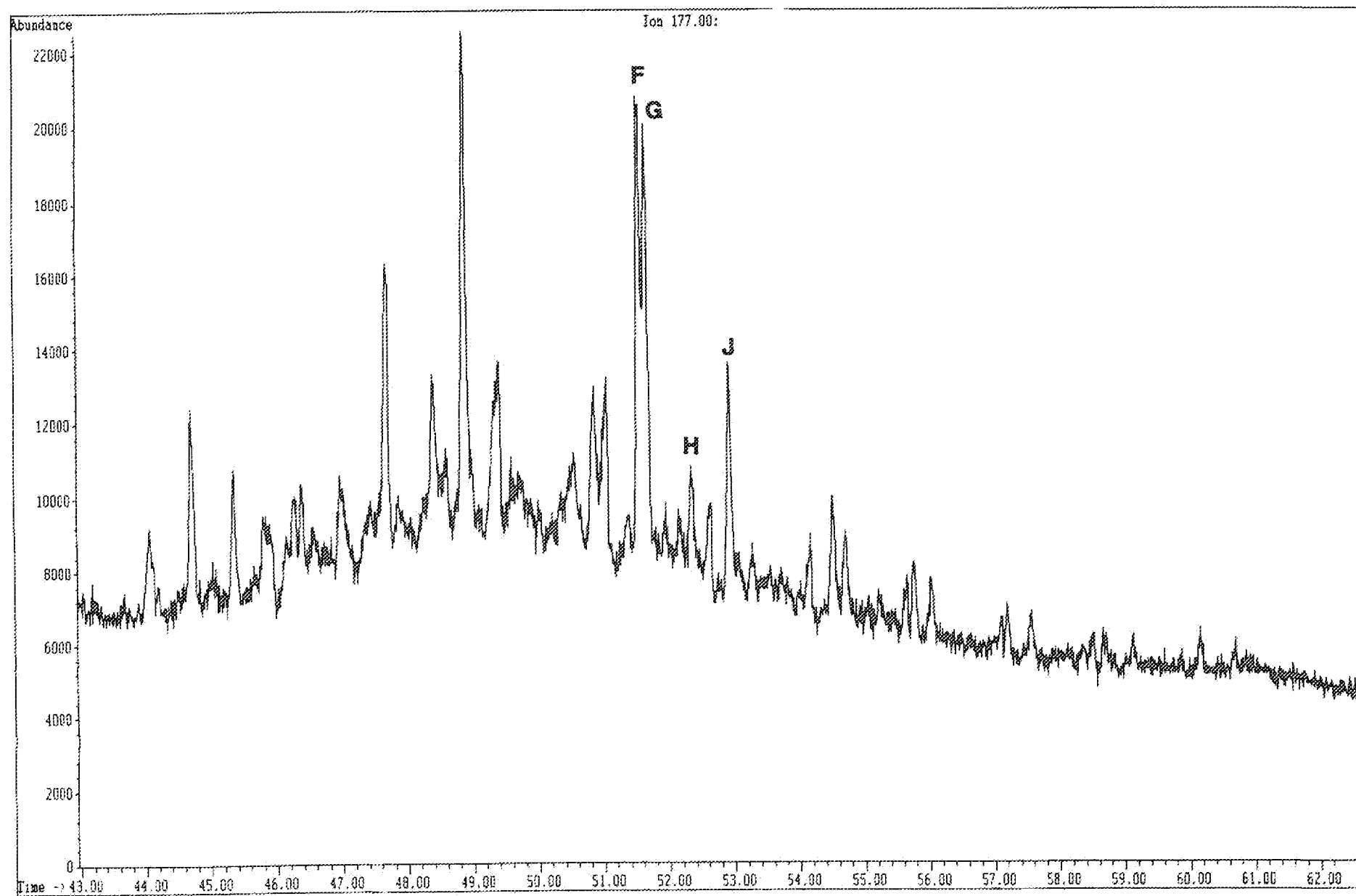
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Method File Name: E10M.M

Sample Name: 4135-001

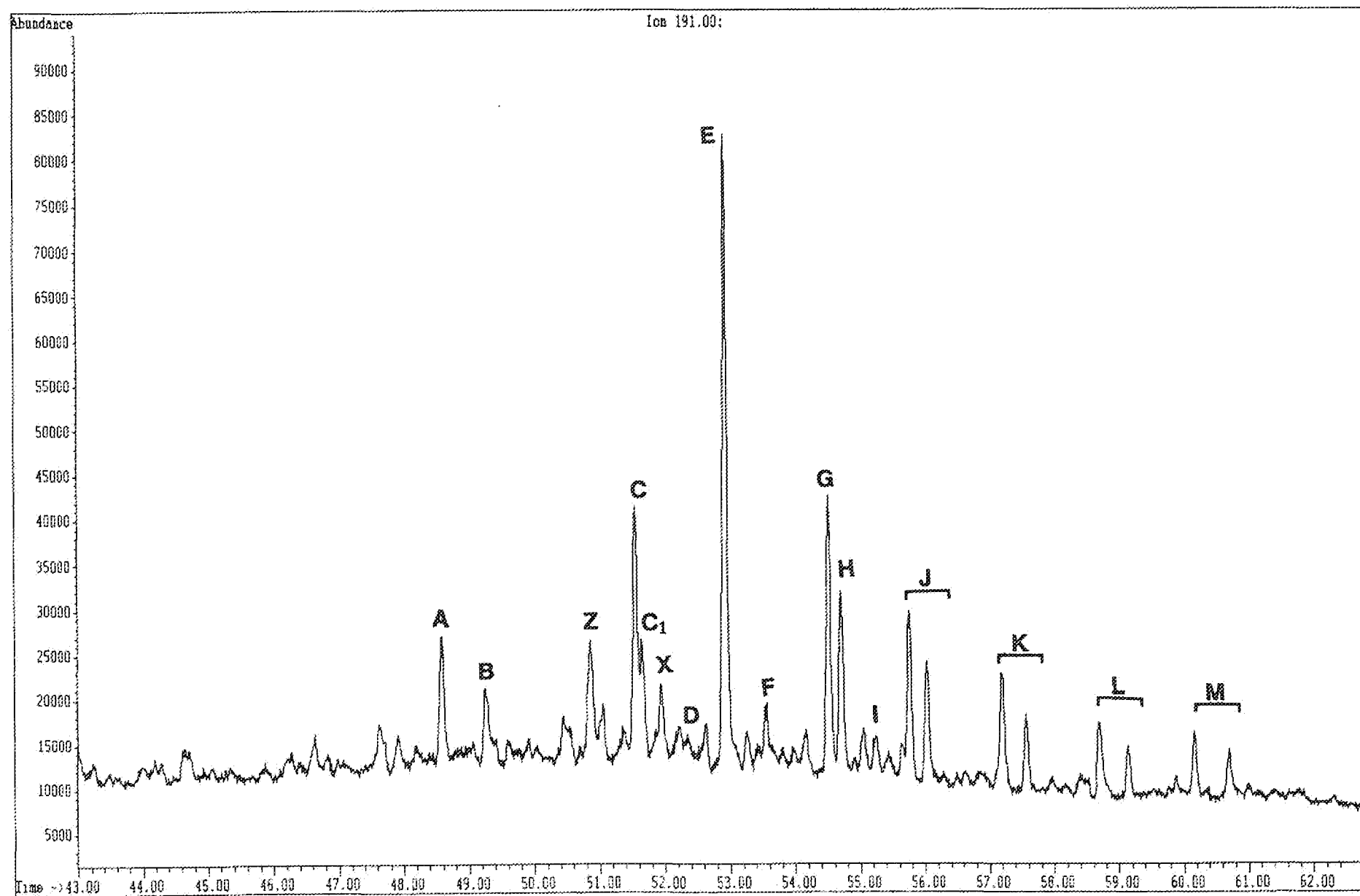
Misc Info: WELL 33/9-6 2997.9M

Bottle Number: 33

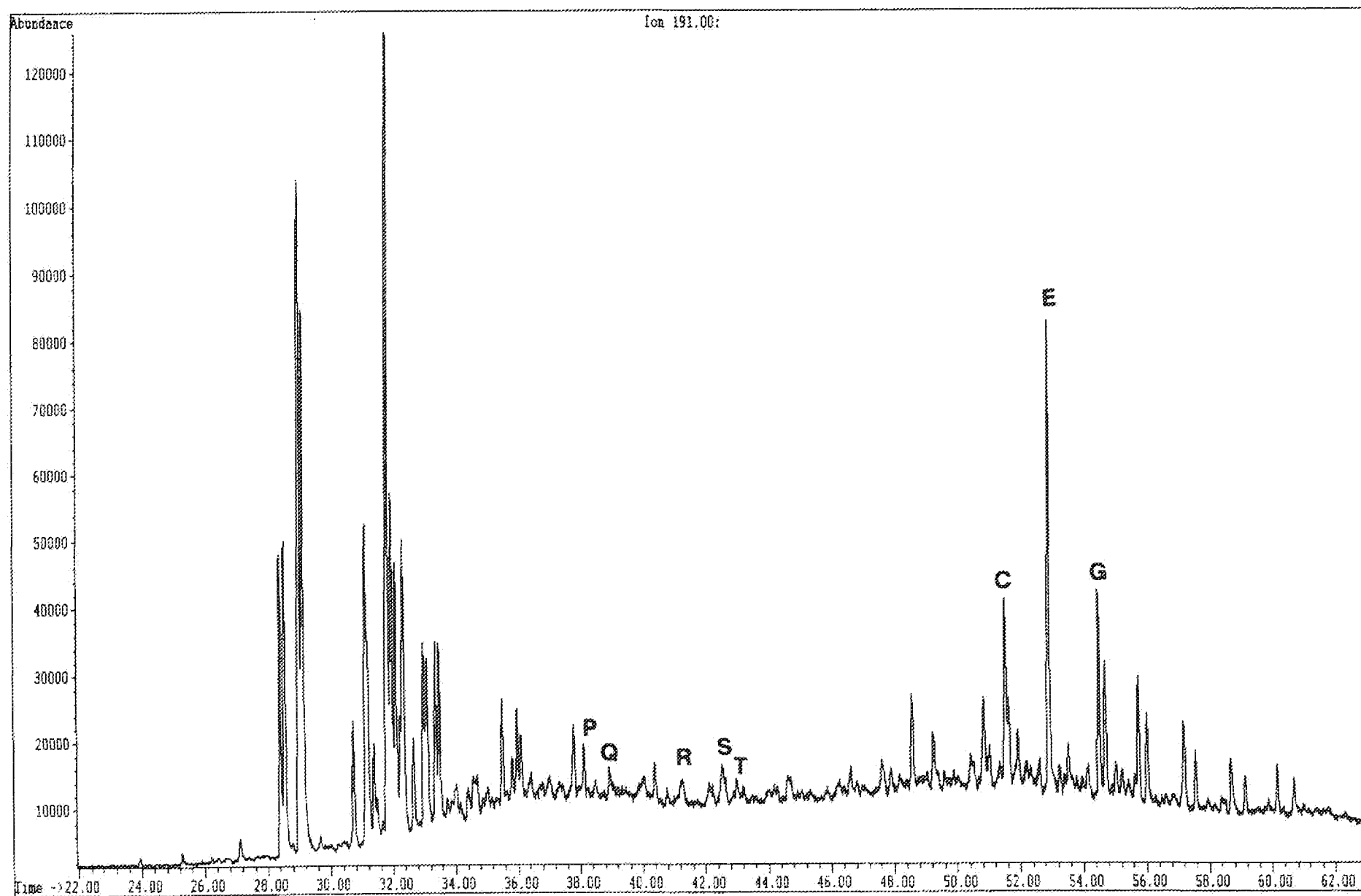


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Misc Info: WELL 33/9-6 2997.9M
Bottle Number: 33

M3.1e

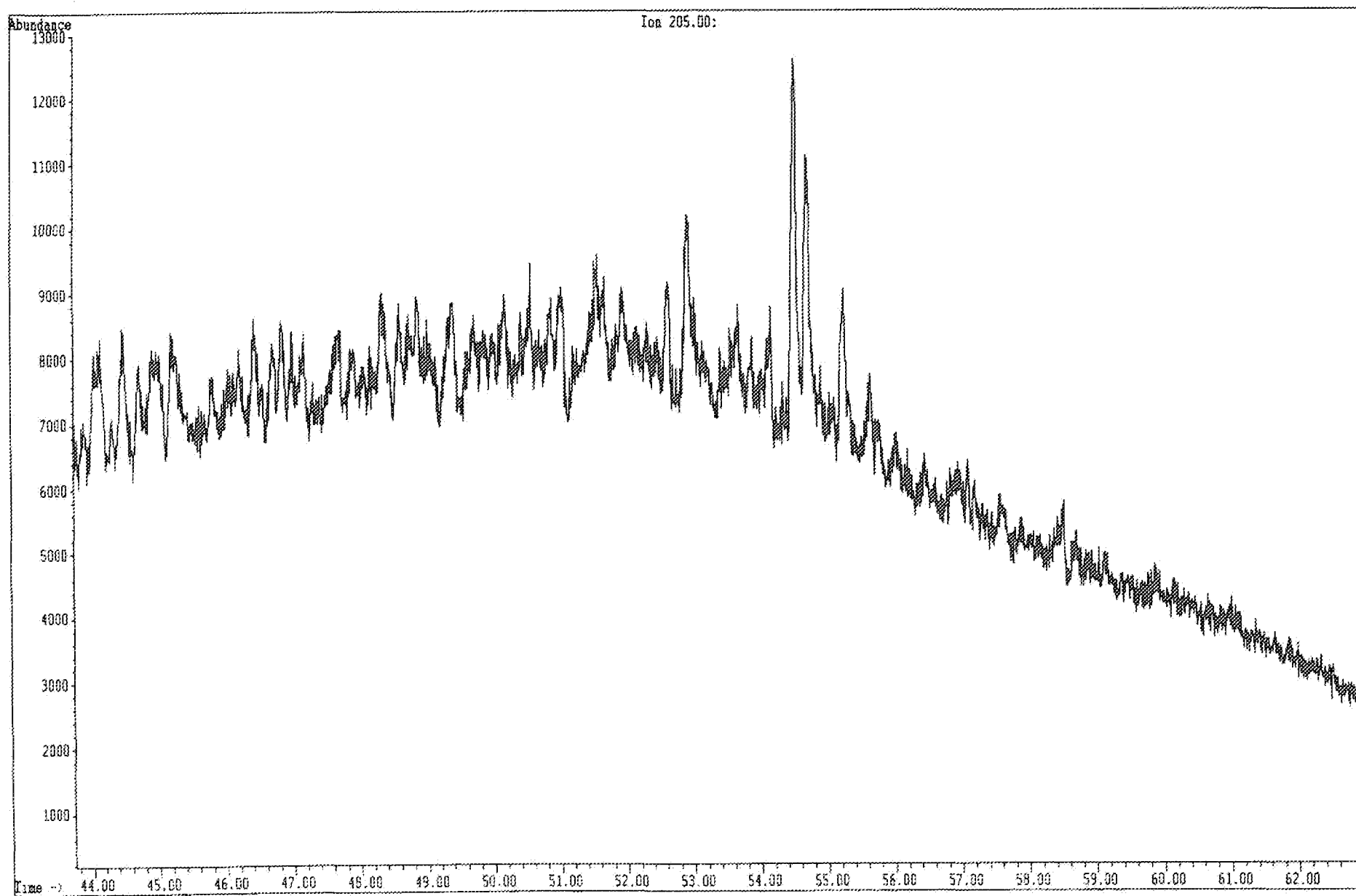


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Operator:
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Method File Name: BICH.M
Sample Name: 4135-001
Misc Info: WELL 33/3-6 2997.9M
Bottle Number: 33



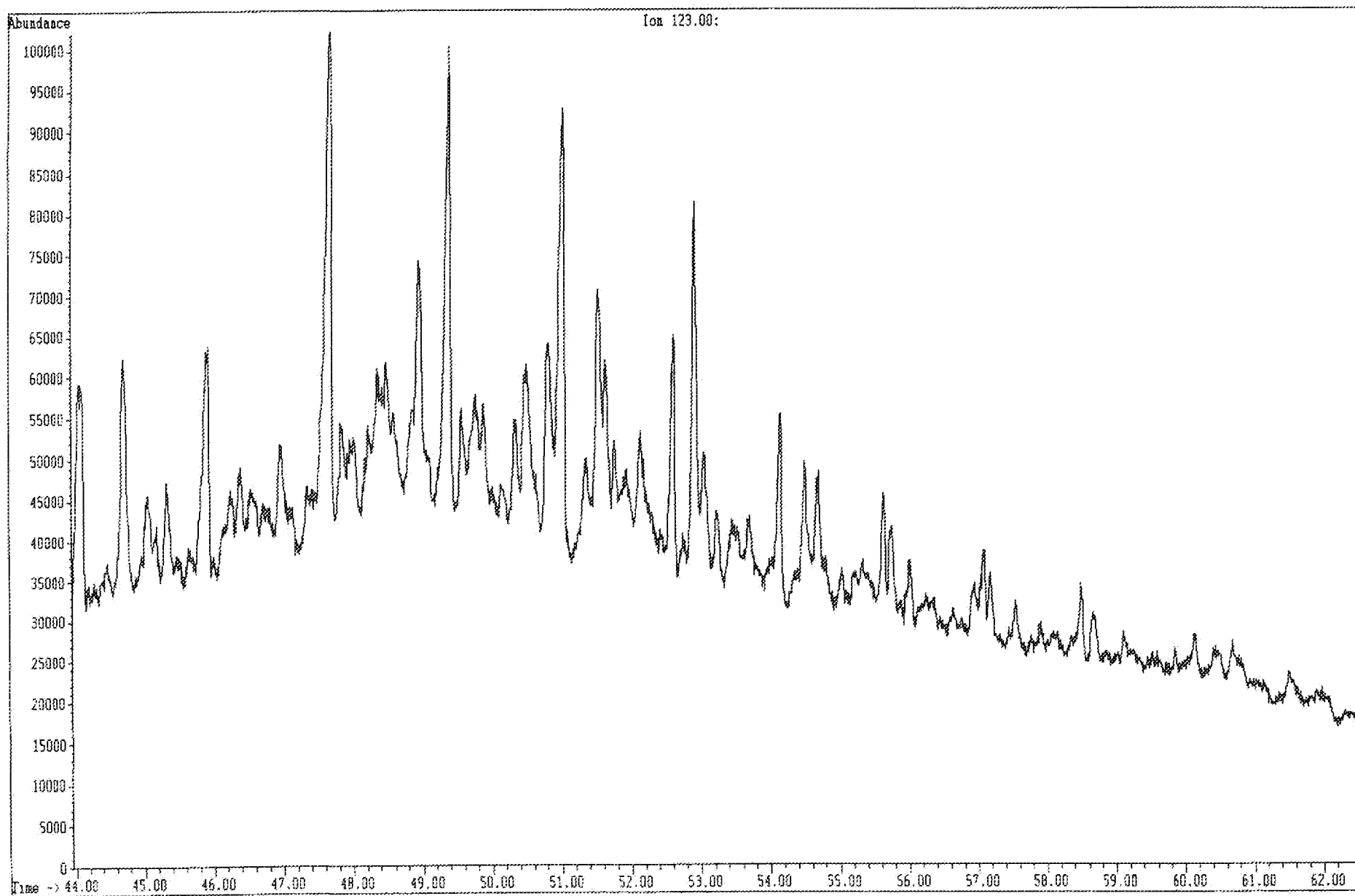
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Operator:
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Method File Name: BIOM.M
Sample Name: 4135-001
Misc Info: WELL 33/9-6 2997.9M
Bottle Number: 33

M3.1g



File: C:\CHEMPC\DATA\3301012.D
Operator:
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Method File Name: BIOM.M
Sample Name: 4135-001
Misc Info: WELL 33/9-6 2997.9M
Bottle Number: 33

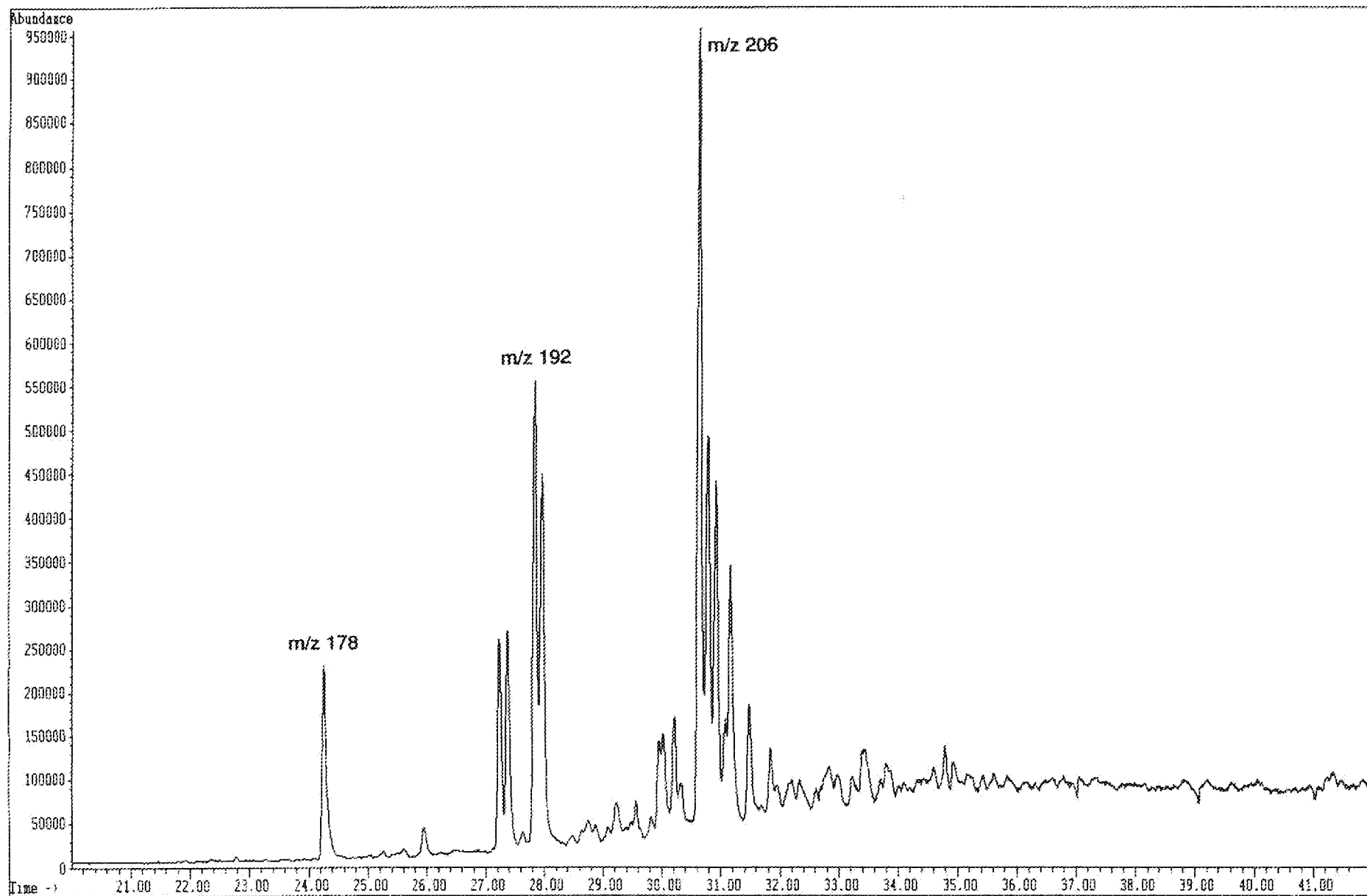
M3.1h



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Operator:
Date Acquired: 12 Dec 90 2:12 am
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Sample Name: 4135-001
Misc Info: WELL 33/9-6 2997.9M
Bottle Number: 100

M3.1i

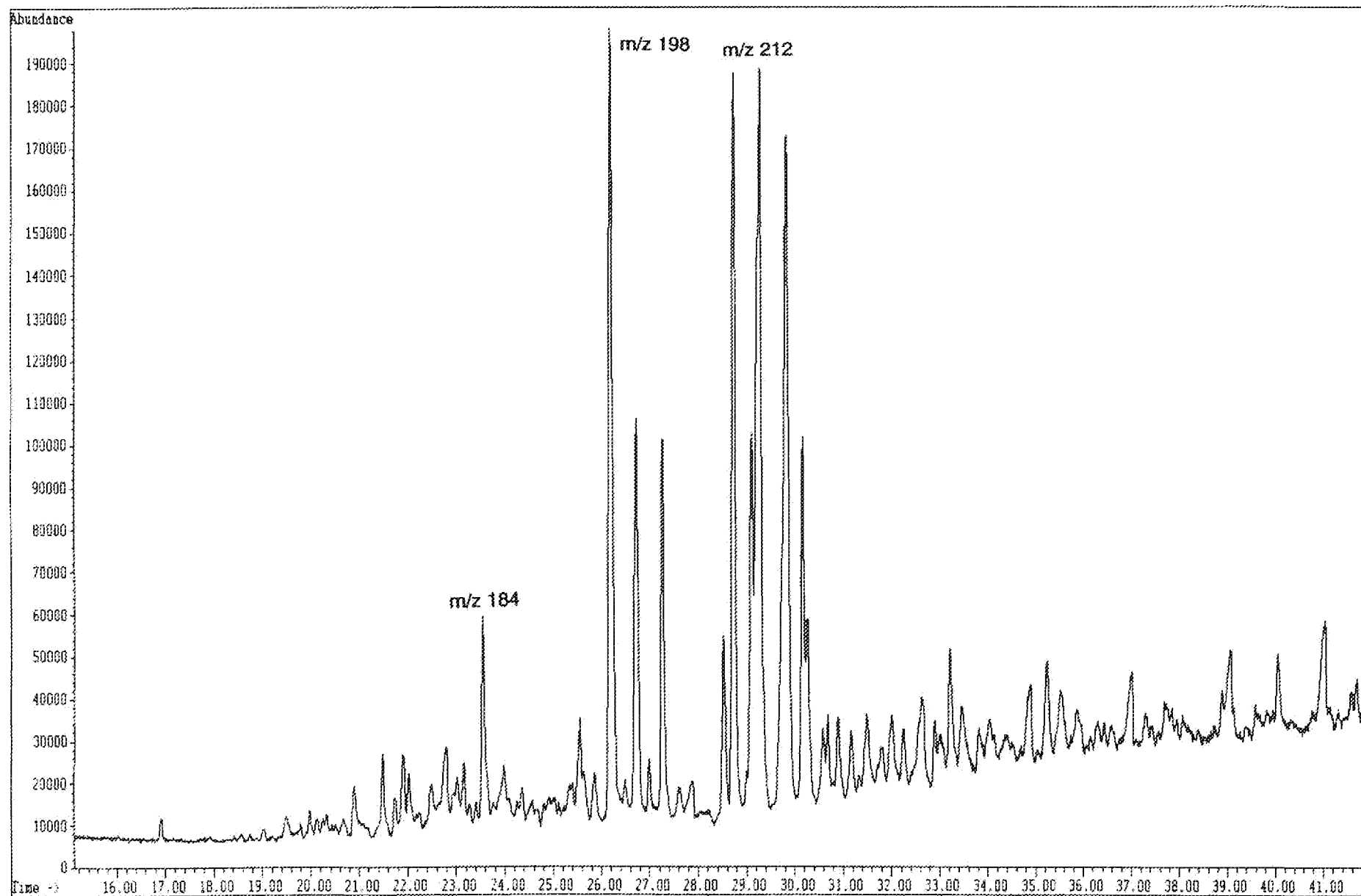
Phenanthrenes



File: C:\CHEMPC\DATA\A001022.D
Operator:
Date Acquired: 12 Dec 90 2:12 am
Method File Name: BIOMY.M
Sample Name: 4135-001
Misc Info: WELL 33/9-6 2997.9M
Bottle Number: 100

M3.1j

Dibenzothiophenes



File: C:\CHEMPC\DATA\A001022.D

M3.1k

Operator:

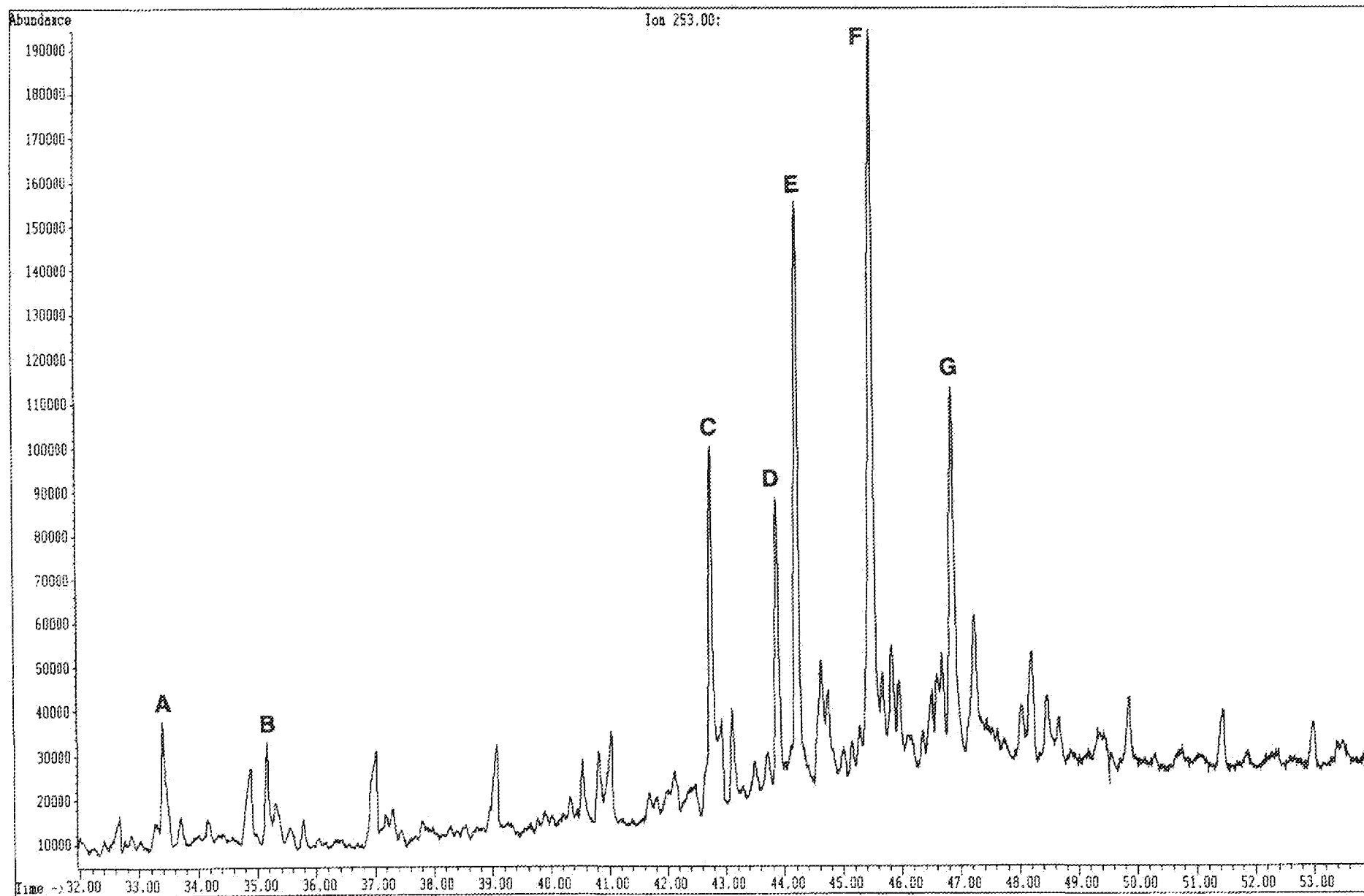
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Method File Name: B10MY.M

Sample Name: 4135-001

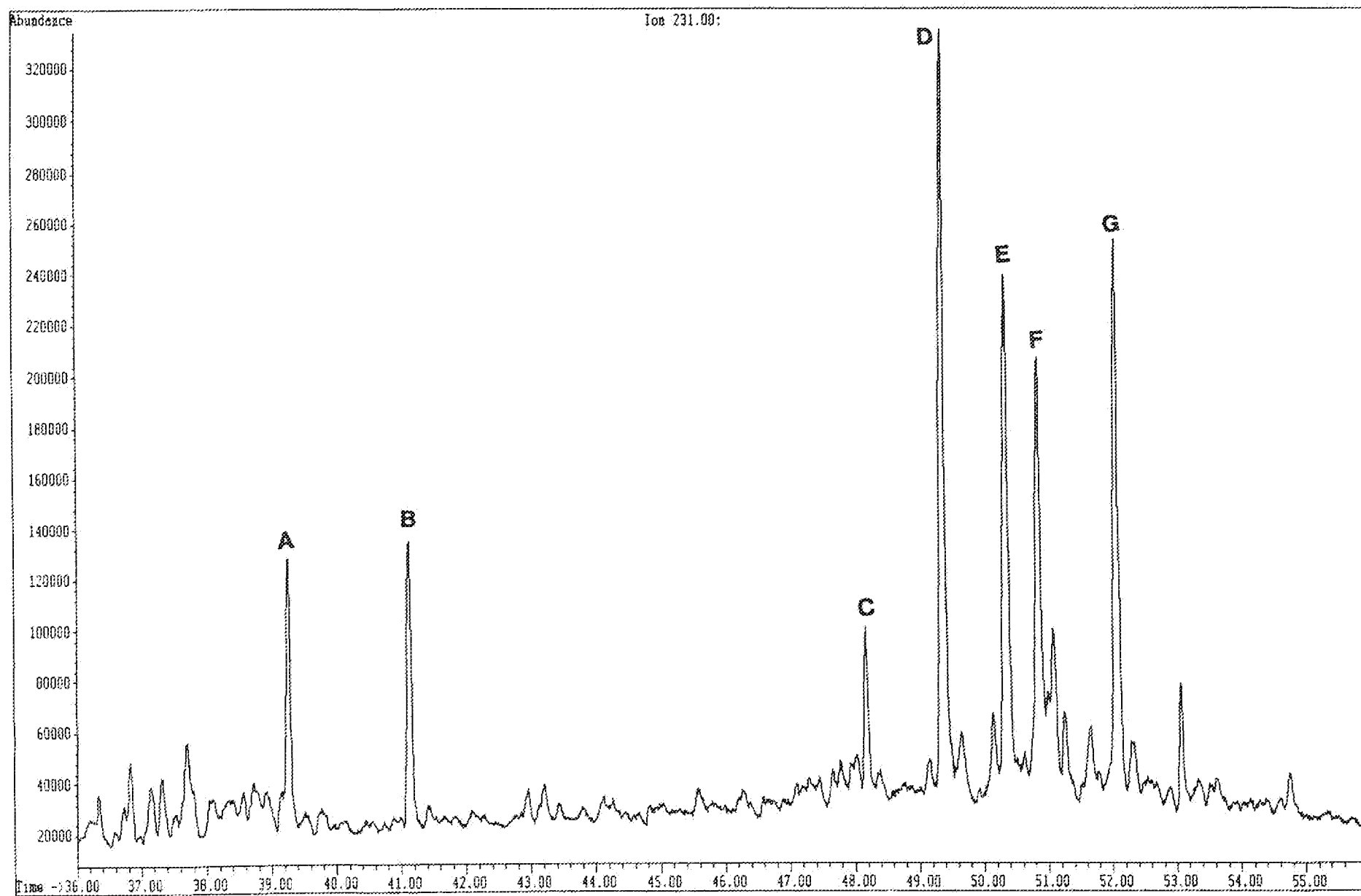
Misc Info: WELL 33/3-6 2997.9M

Bottle Number: 100



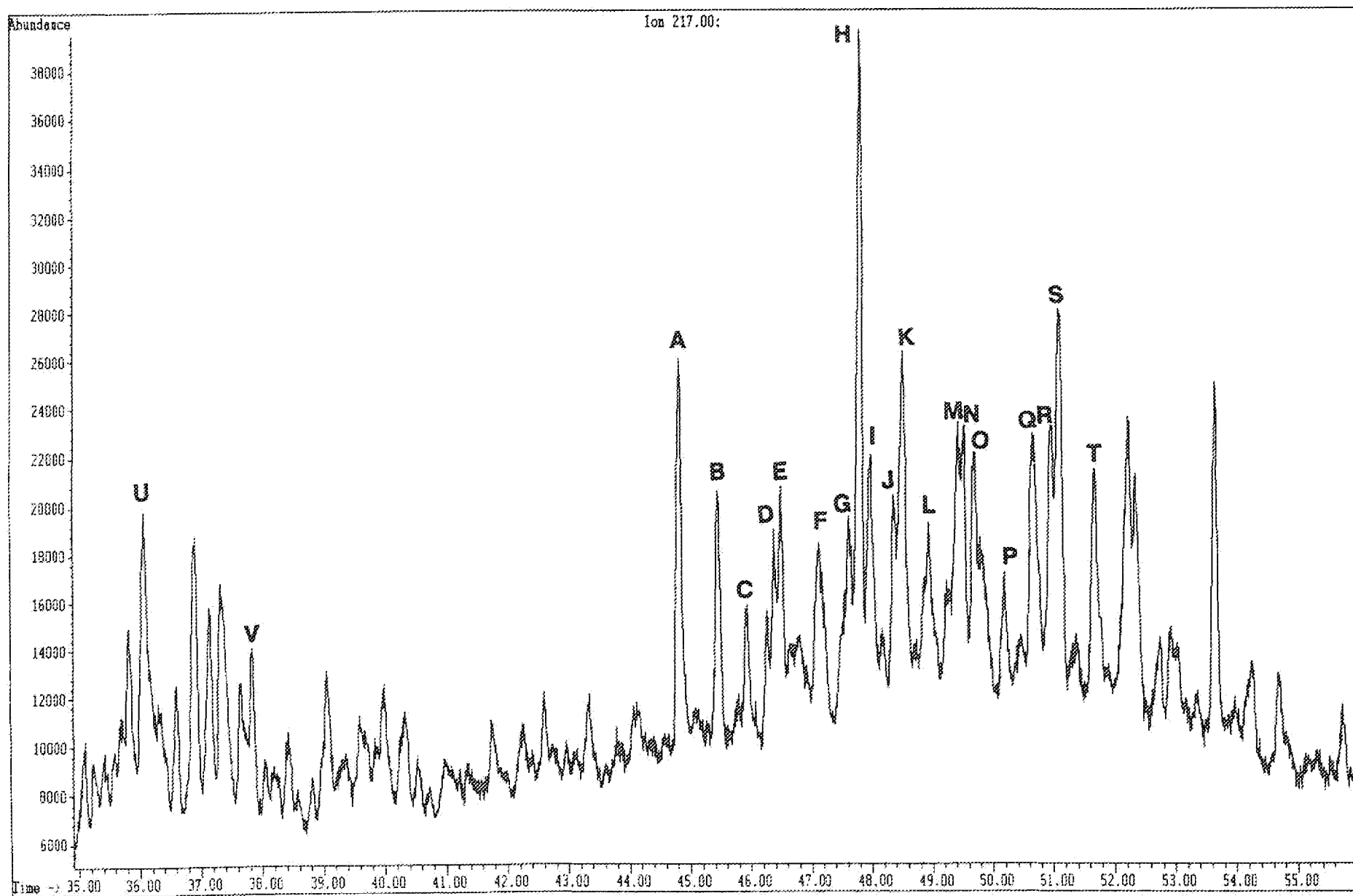
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Method File Name: BIOMY.M
Sample Name: 4135-001
Misc Info: WELL 33/9-6 2997.9M
Bottle Number: 100

M3.11



File: C:\CHEMPC\DATA\9401013.D
Operator:
Date Acquired: 15 Dec 90 1:54 am
Method File Name: BIOW.M
Sample Name: 4135-892
Misc Info: WELL 33/9-6 2999.SM
Bottle Number: 34

M3.2a



File: C:\CHEMPC\DATA\3401013.D

M3.2b

Operator:

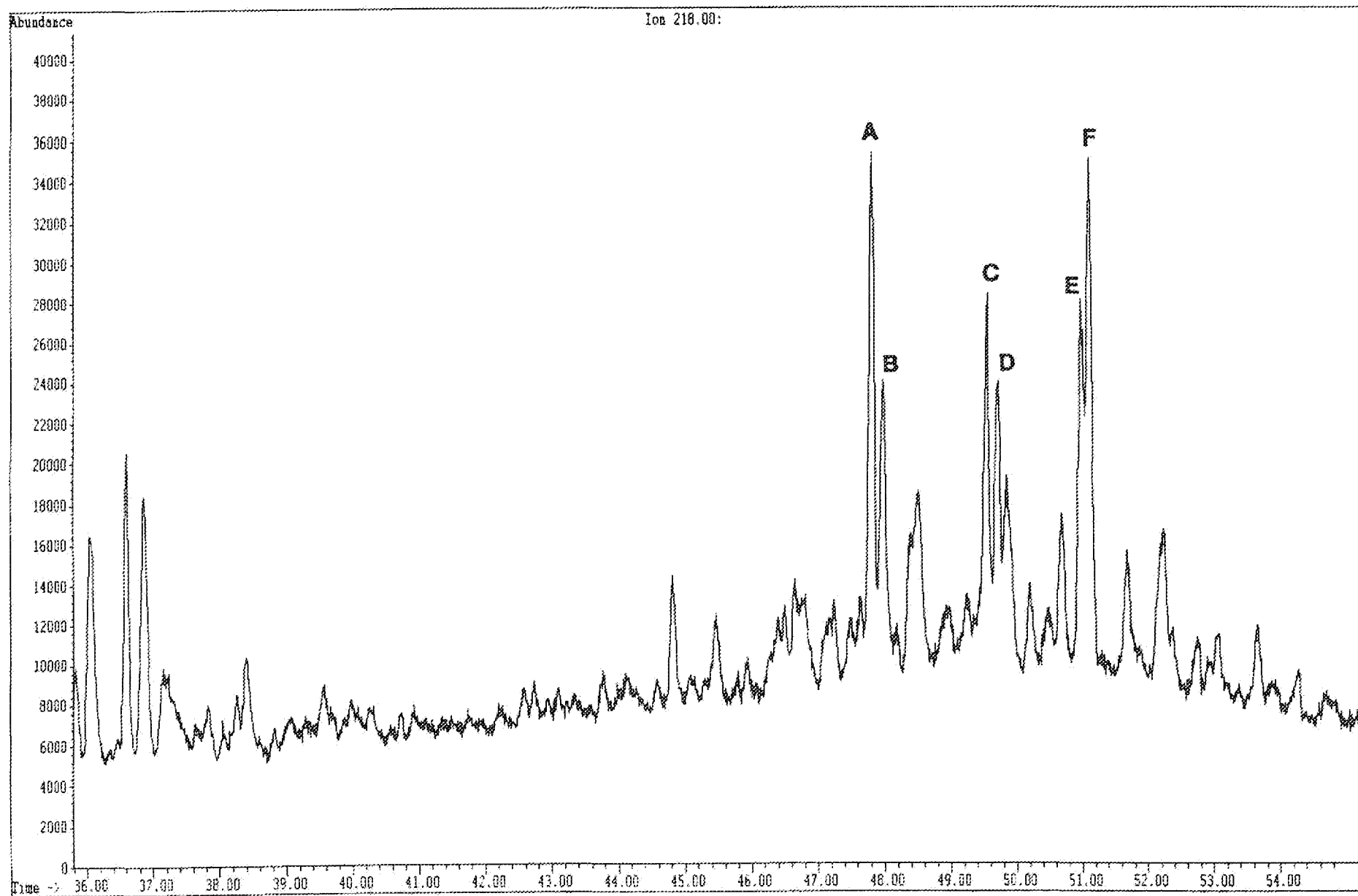
Date Acquired: 15 Dec 90 1:54 am

Method File Name: B10M.M

Sample Name: 4135-002

Misc Info: WELL 33/9-6 2999.5M

Bottle Number: 34



File: C:\CHEMPC\DATA\3401013.D

M3.2c

Operator:

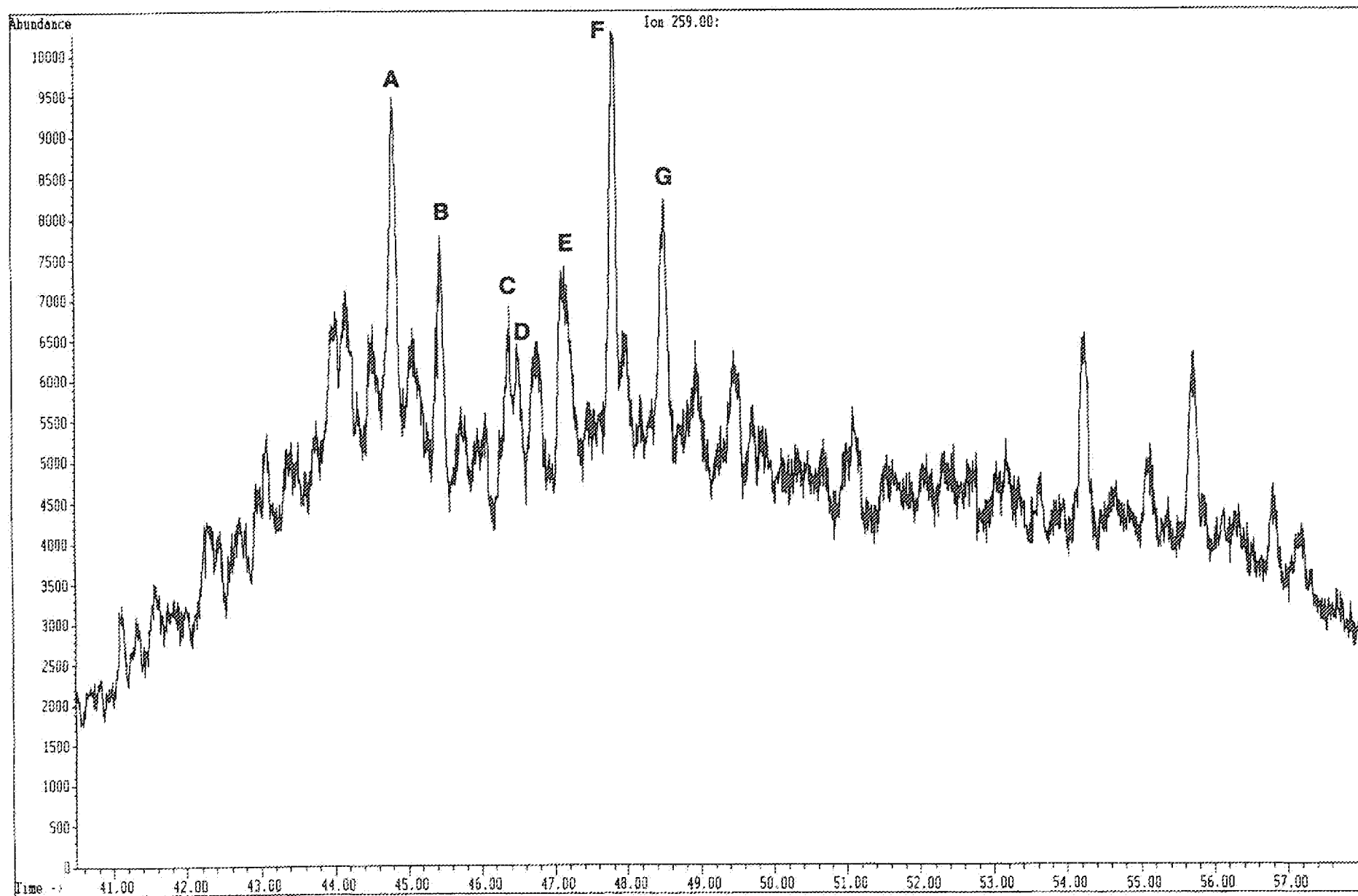
Date Acquired: 15 Dec 90 1:54 am

Method File Name: B10M.M

Sample Name: 4135-002

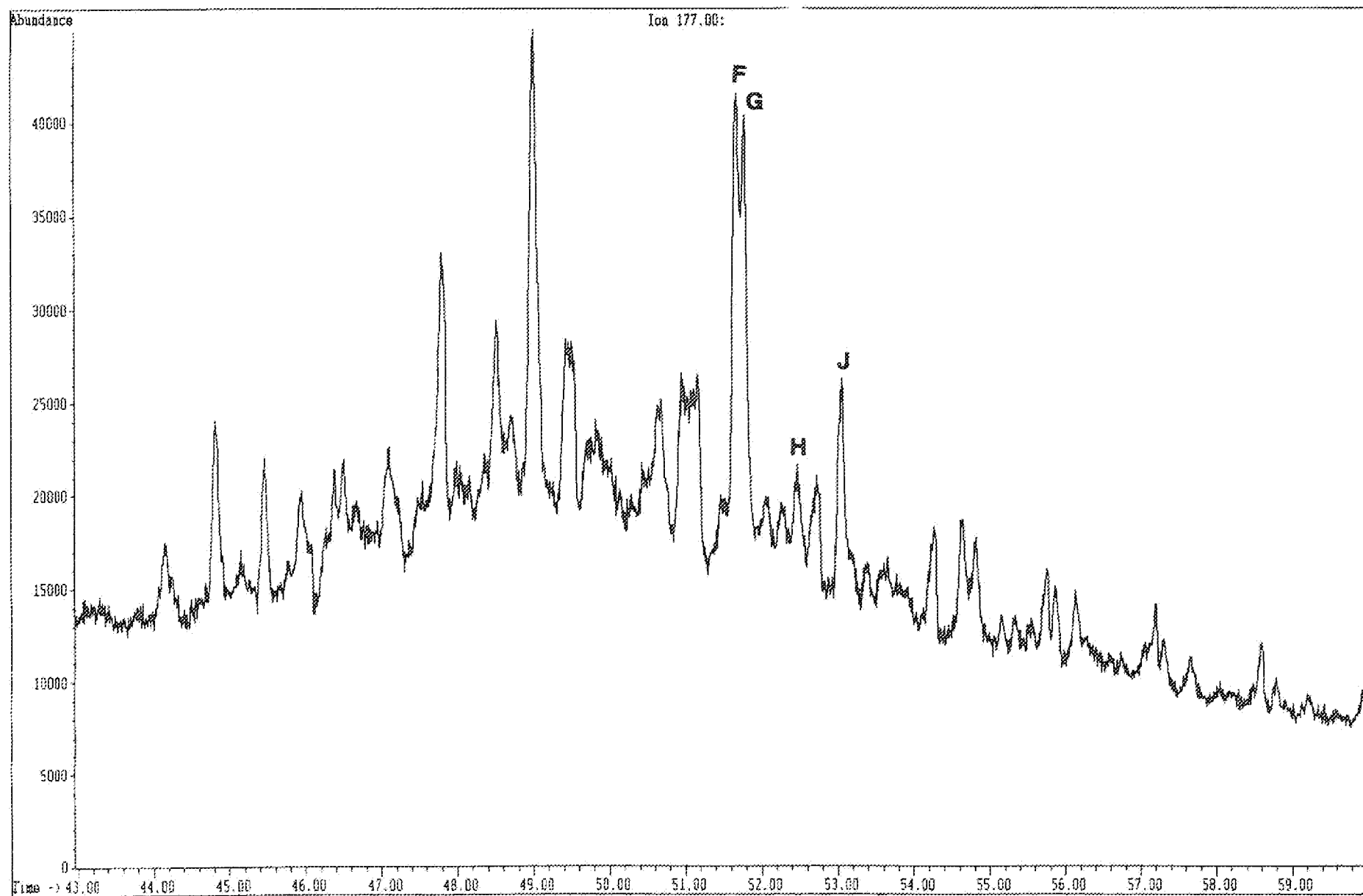
Misc Info: WELL 33/9-6 2999.5M

Bottle Number: 34



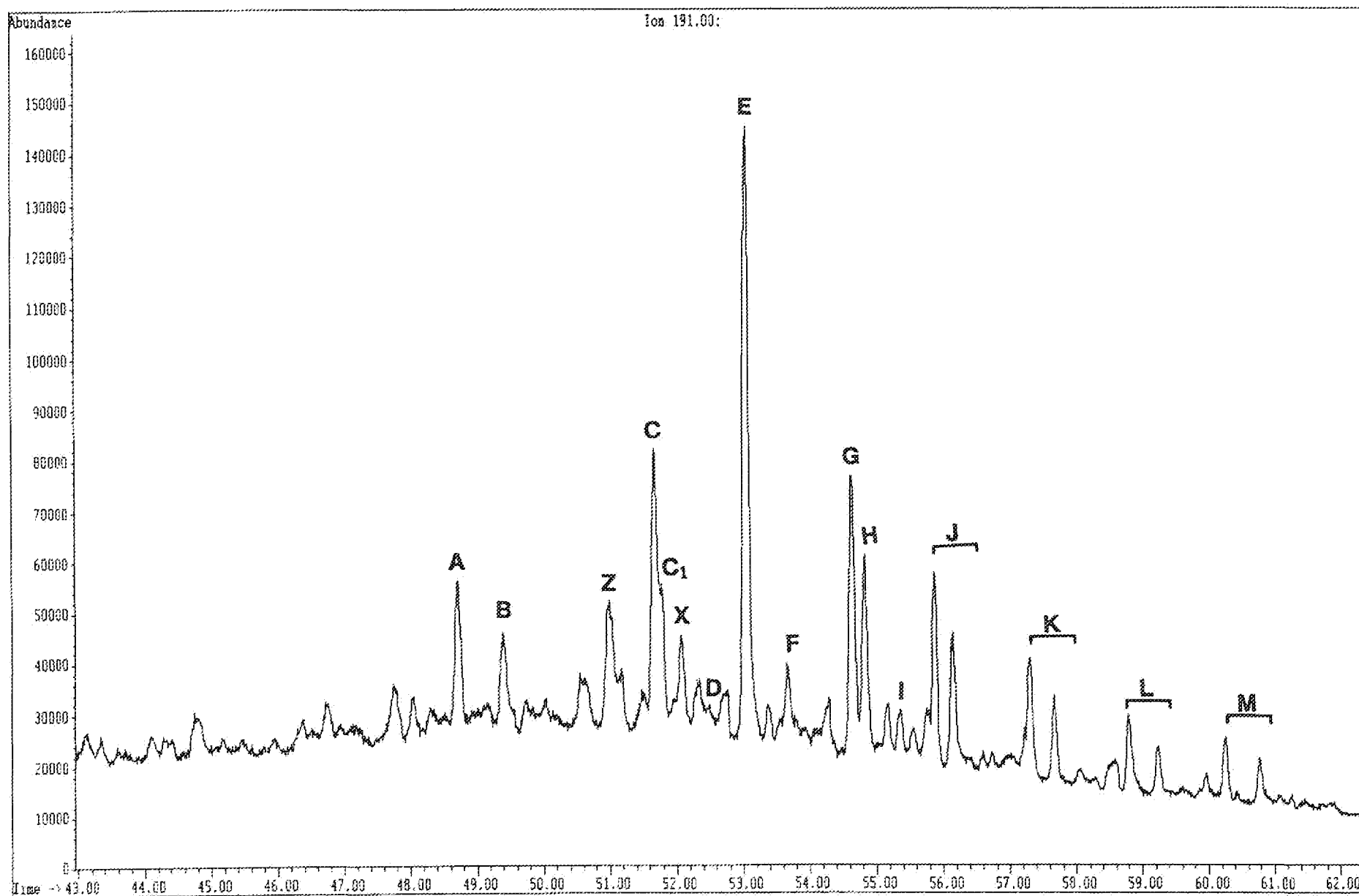
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Operator:
Date Acquired: 15 Dec 90 1:54 am
Method File Name: BIOM.M
Sample Name: 4135-002
Misc Info: WELL 33/9-6 2999.5M
Bottle Number: 34

M3.2d



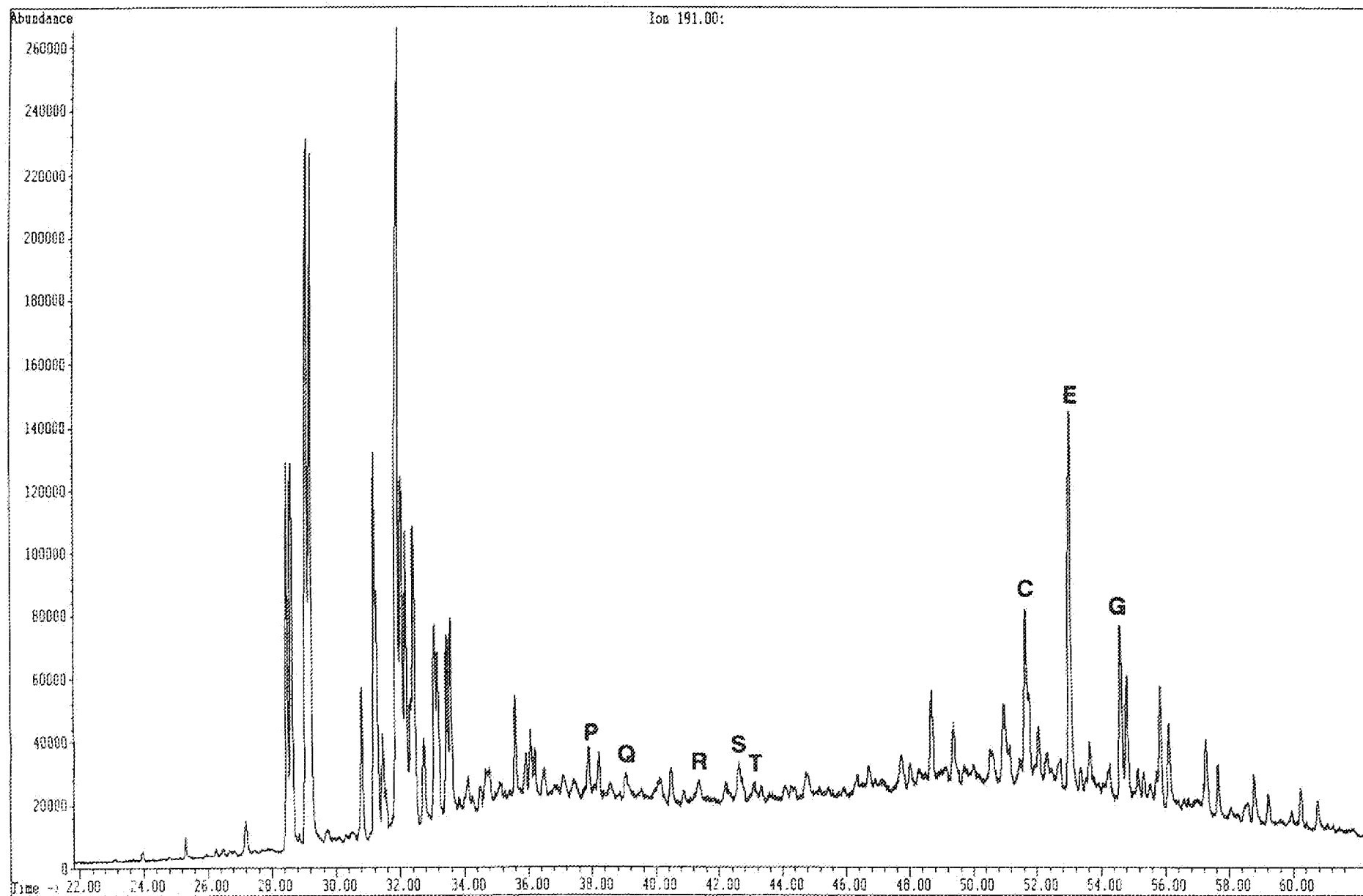
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Operator:
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Sample Name: 4135-002
Misc Info: WELL 33/9-6 2999.SM
Bottle Number: 34

M3.2e



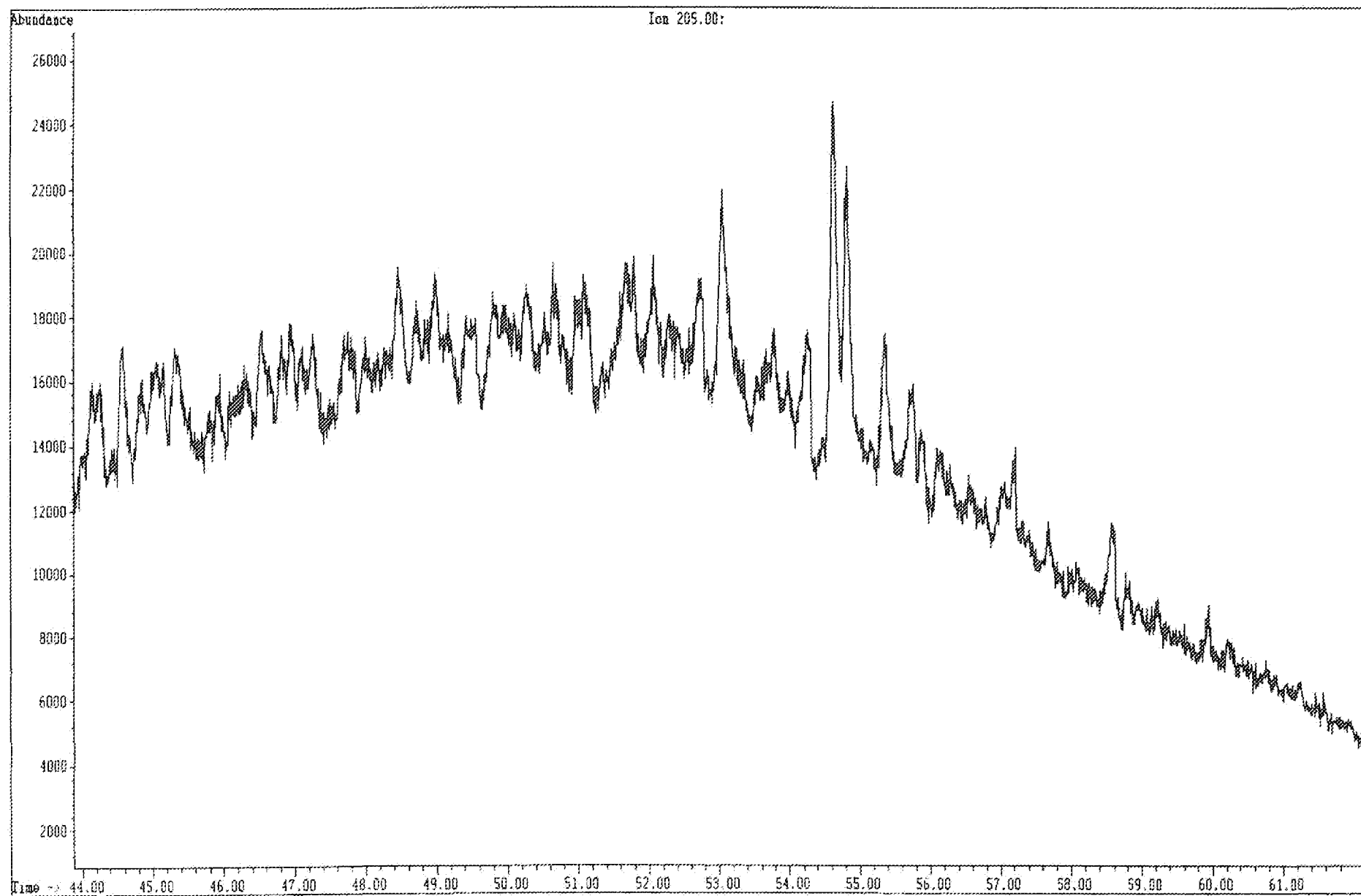
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Sample Name: 4135-002
Misc Info: WELL 33/9-6 2999.5M
Bottle Number: 34

M3.21



File: C:\CHEMPC\DATA\3401B13.D
Operator:
Date Acquired: 15 Dec 90 1:54 am
Method File Name: BIOM.M
Sample Name: 4135-002
Misc Info: WELL 33/9-6 2999.5M
Bottle Number: 34

M3.2g



File: C:\CHEMPC\DATA\3401013.D

M3.2h

Operator:

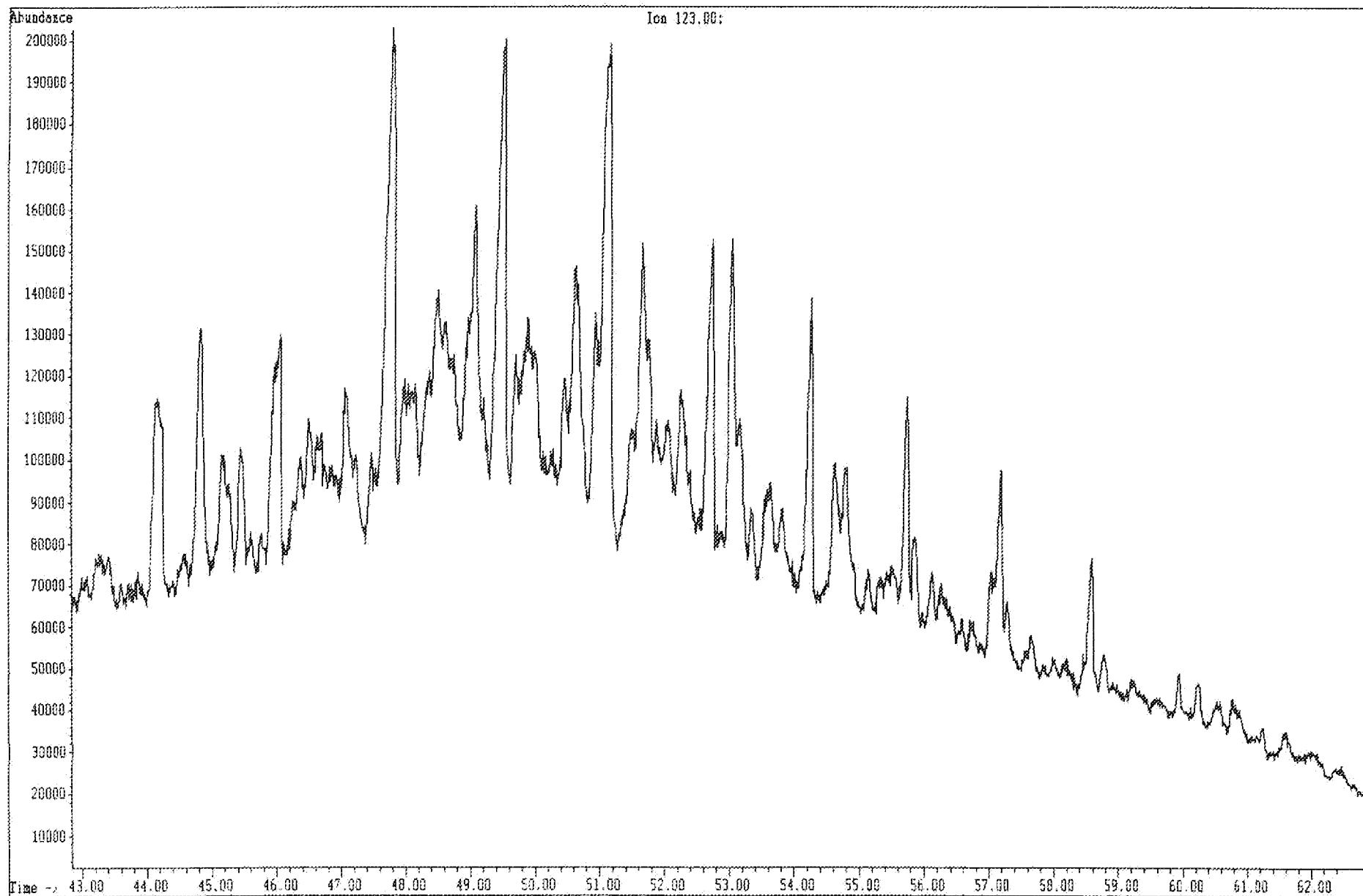
Date Acquired: 15 Dec 90 1:54 am

Method File Name: BIOM.M

Sample Name: 4135-002

Misc Info: WELL 33/9-6 2999.5M

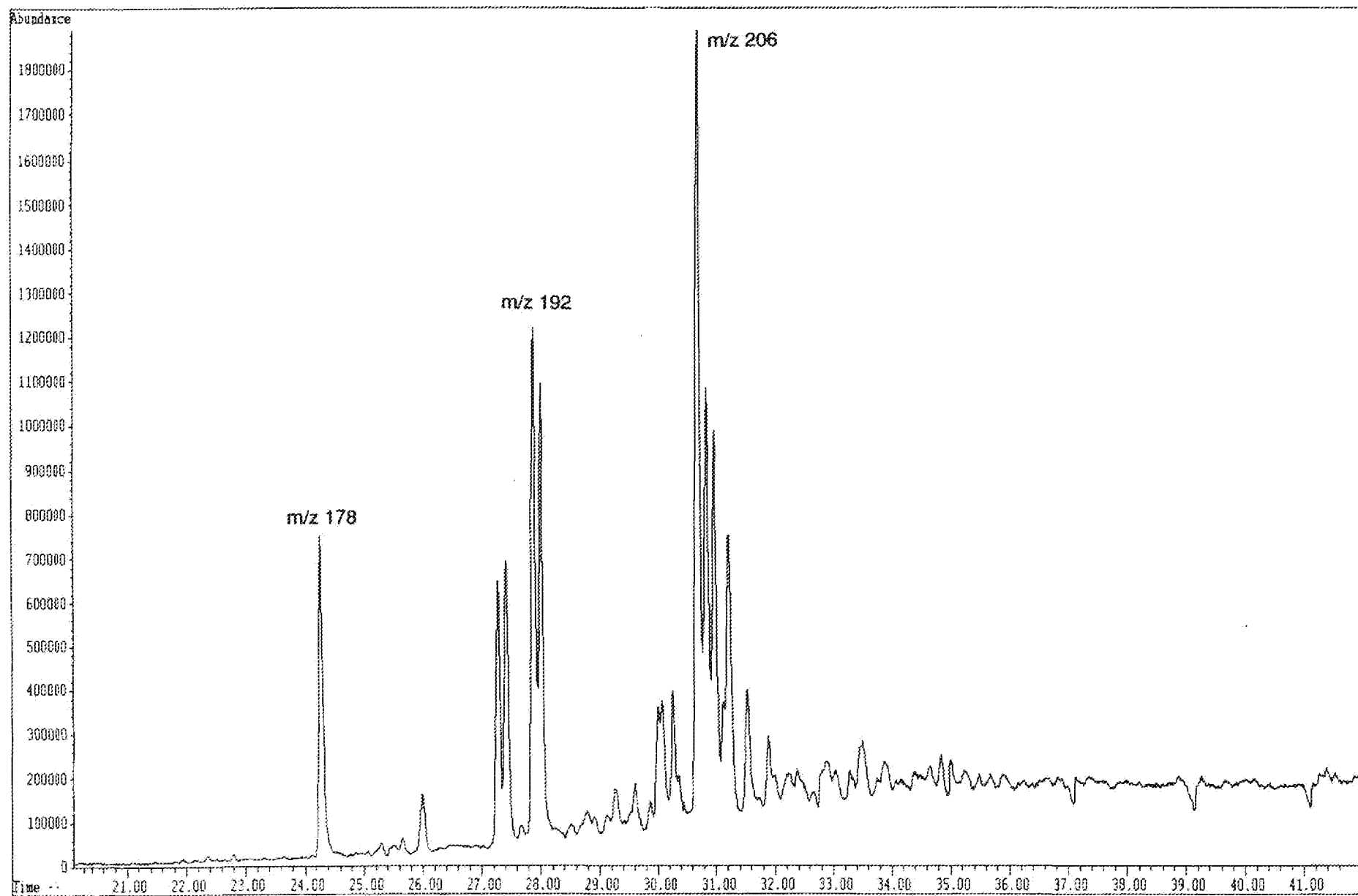
Bottle Number: 34



File: C:\CHEMPC\DATA\0101001.D
Operator:
Date Acquired: 12 Dec 90 4:24 pm
Method File Name: BIOMY.M
Sample Name: 4135-002 WCS
Misc Info:
Bottle Number: 1

M3.2i

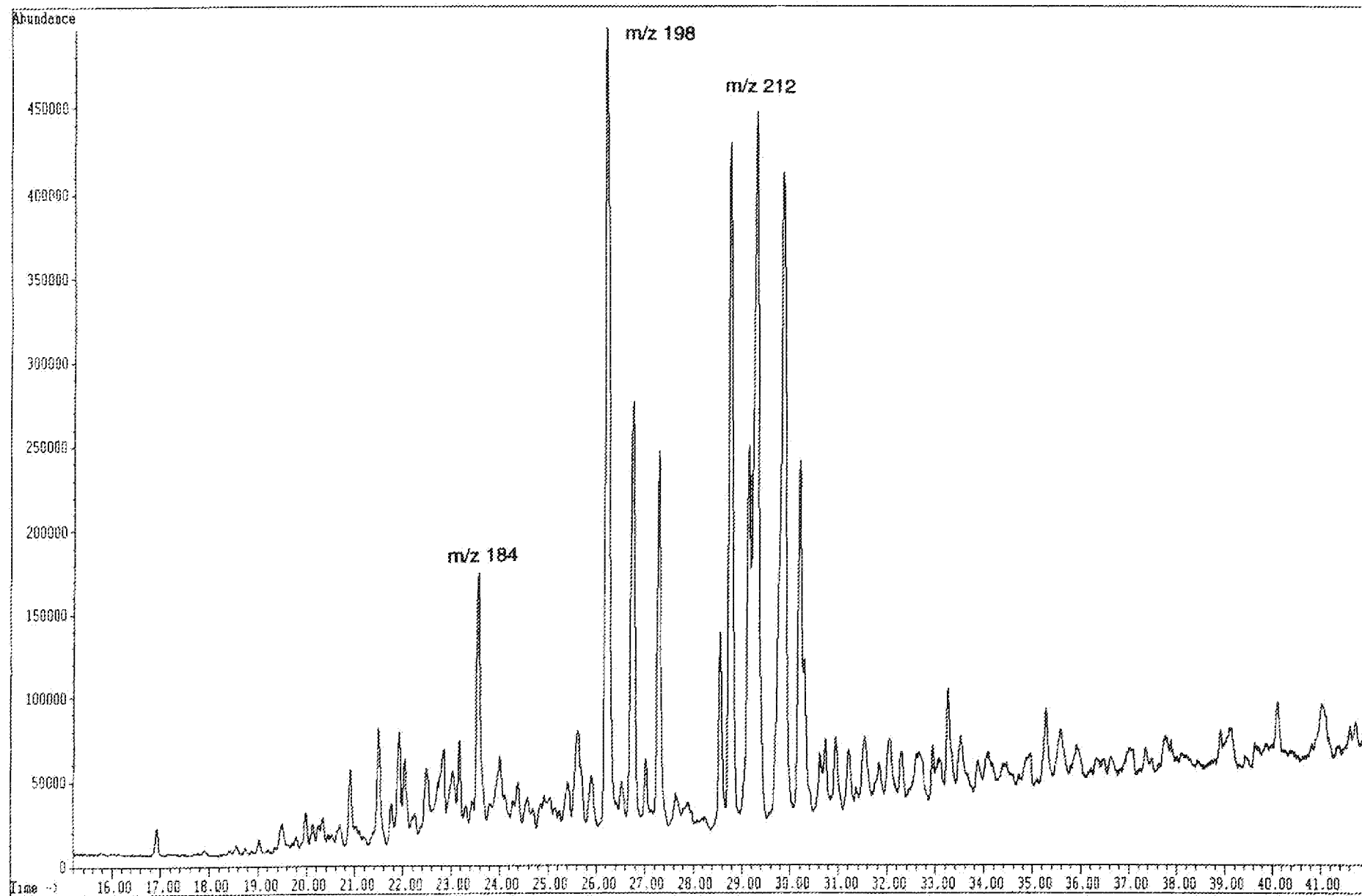
Phenanthrenes



File: C:\CHEMPC\DATA\0101001.D
Operator:
Date Acquired: 12 Dec 90 4:24 pm
Method File Name: BIOMY.M
Sample Name: 4135-002 NC5
Misc Info:
Bottle Number: 1

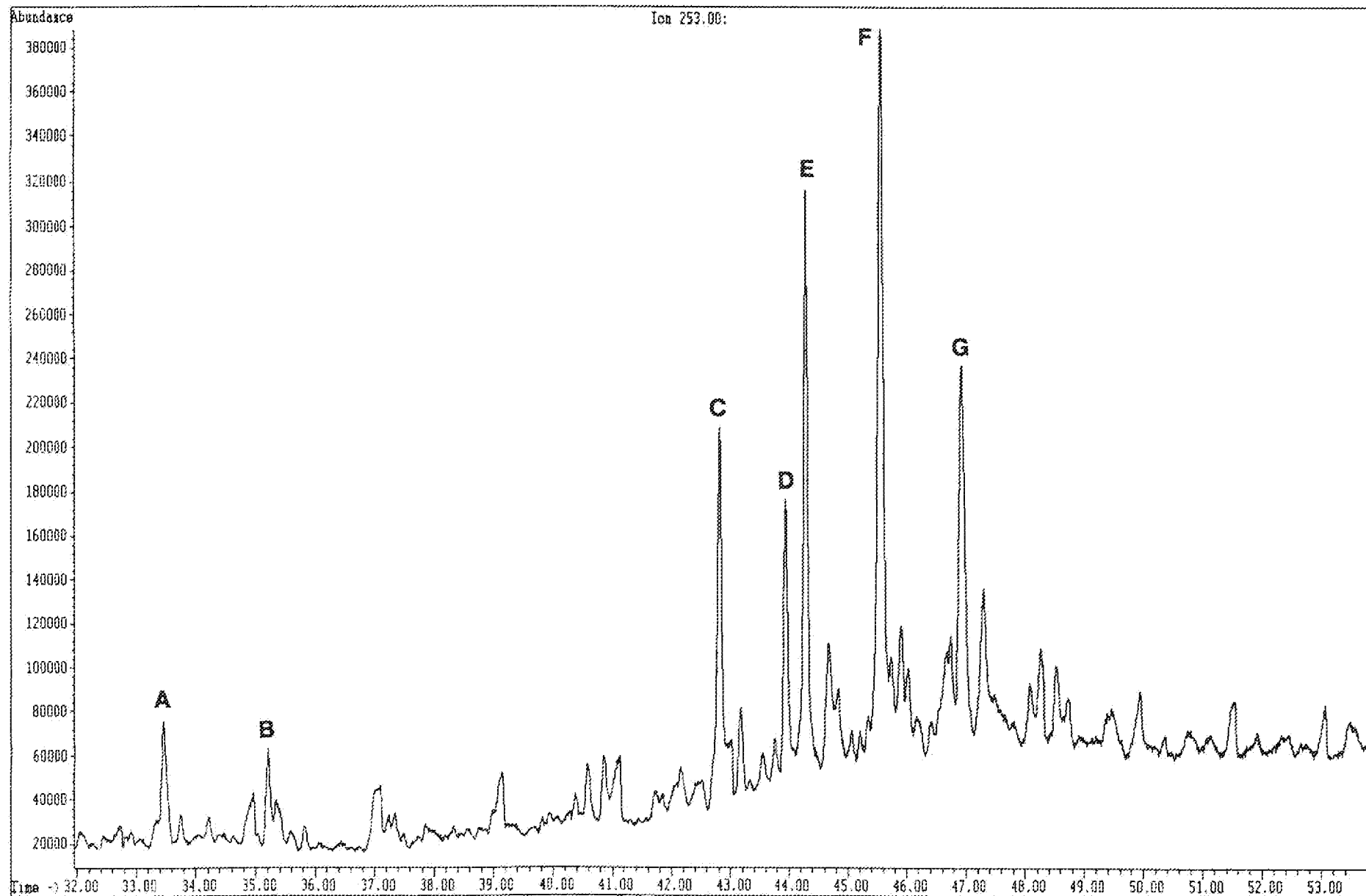
M3.2j

Dibenzothiophenes



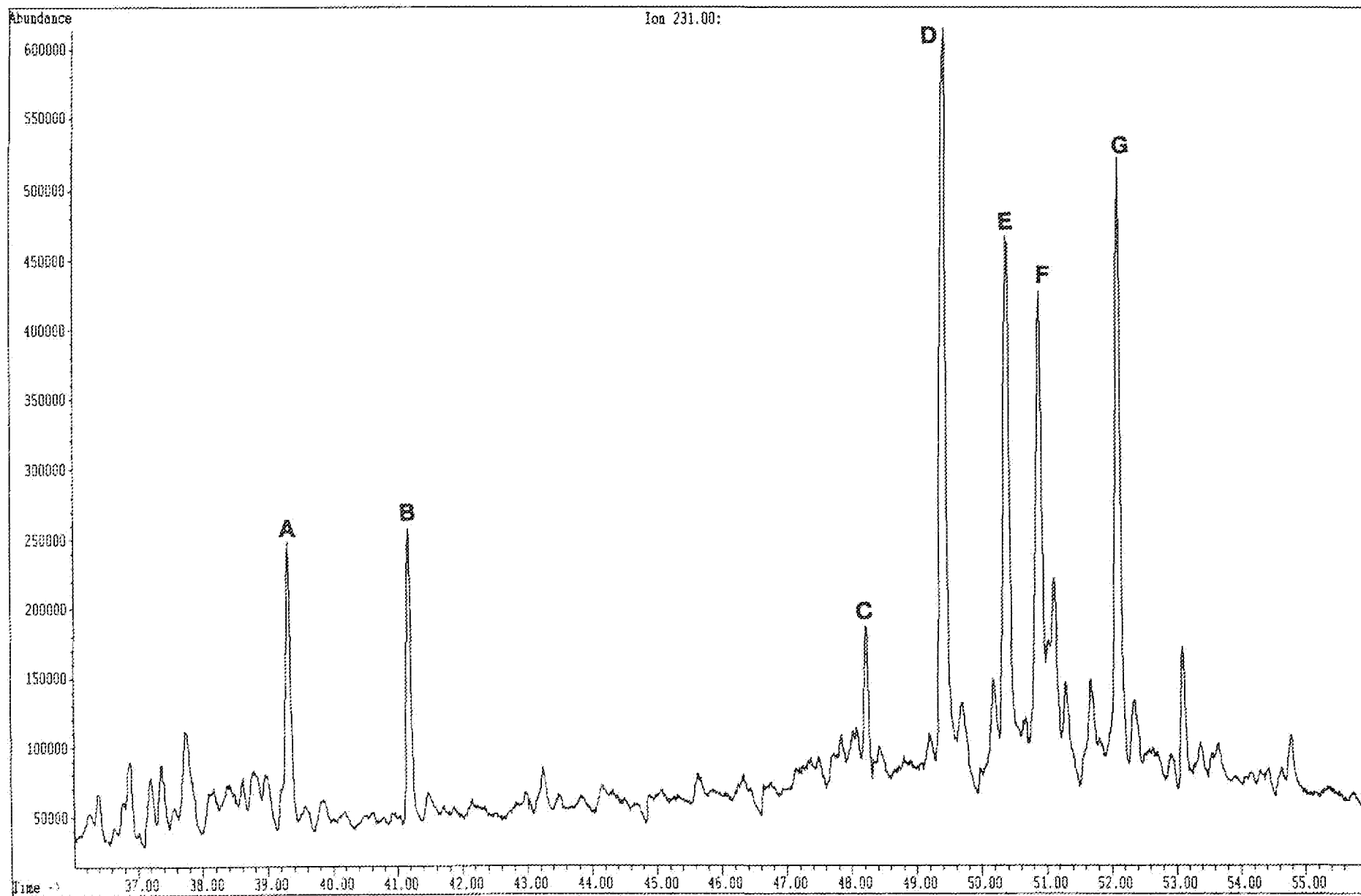
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Operator:
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Method File Name: BICMY.M
Sample Name: 4135-002 NCS
Misc Info:
Bottle Number: 1

M3.2k



File: C:\CHEMPC\DATA\0101001.D
Operator:
Date Acquired: 12 Dec 90 4:24 pm
Method File Name: BIOMY.M
Sample Name: 4135-002 NCS
Misc Info:
Bottle Number: 1

M3.21



34/2-3

TABLE N1
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

JOB 4136	DEPTH/ IDENTITY	GROSS LITHOLOGIC DESCRIPTION	G S A COLOUR CODE	TOTAL ORGANIC CARBON (wt. %)
GEOCHEM SAMPLE NUMBER				

WELL: 34/2-3

4136-001	3361.0m	A100% SANDSTONE - med to coarse grained, blocky, firm, dull gold F, v slow blooming milky cut, dark yellowish brown.	10YR4/2	
4136-002	3372.4m	A100% SANDSTONE - med grained, blocky, firm, sl micaceous, dull gold F, v slow weak blooming milky cut, pale yellowish brown.	10YR6/2	

Abbreviations = arenaceous, argillaceous, calcareous, Cut, dolomite, Fluorescence, foraminifera, fossiliferous, Lost Circulation Material, moderately, occasionally, slightly, very

TABLE N2
CONCENTRATION (PPM) OF EXTRACTED C₁₅₊ MATERIAL IN ROCK

JOB 4136	LITHO	DEPTH/ IDENTITY	TOTAL EXTRACT	HYDROCARBONS			NON HYDROCARBONS			
GEOCHEM SAMPLE NUMBER				Saturates	Aromatics	TOTAL	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's	TOTAL

WELL: 34/2-3

4136-001	3361.0m	3212	2245	341	2587	366	247	12	625
4136-002	3372.4m	5085	3784	452	4236	419	415	15	849

TABLE N3
COMPOSITION (NORMALISED %) OF C₁₅₊ MATERIAL

JOB 4136	L I T H O	DEPTH/ IDENTITY	HYDROCARBONS		NON HYDROCARBONS		
GEOCHEM SAMPLE NUMBER			Saturates	Aromatics	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's

WELL: 34/2-3

4136-001	3361.0m	69.90	10.63	11.40	7.69	0.38
4136-002	3372.4m	74.41	8.90	8.24	8.16	0.29

TABLE N4
SIGNIFICANT C₁₅₊ RATIOS

JOB 4136	L I T H O	DEPTH/ IDENTITY	TOC (%)	mg/g TOC						HYDROCARBONS % TOTAL EXTRACT	SATURATES AROMATICS
GEOCHEM SAMPLE NUMBER				TOTAL EXTRACT	SATURATES	AROMATICS	TOTAL HYDROCARBONS	ELUTED NSO's	ASPHALTENES		

WELL: 34/2-3

4136-001	3361.0m	0.41	783.50	547.67	83.27	630.94	60.27	89.33	80.53	6.58
4136-002	3372.4m	0.21	2421.35	1801.73	215.39	2017.12	197.70	199.61	83.31	8.37

TABLE N5
C₁₅+ CHROMATOGRAPHY WEIGHTS (gms)

JOB 4136	L I T H O	DEPTH/ IDENTITY	ROCK EXTRACTED	TOTAL EXTRACT	PRECIPTD. ASPHALTENES	NC5	SATURATES	AROMATICS	ELUTED NSO's	NON-ELUTED NSO's
GEOCHEM SAMPLE NUMBER										

WELL: 34/2-3

4136-001A	3361.0m	18.1300	0.05824	0.00664	0.05160	0.04071	0.00619	0.00448	0.00022
4136-002A	3372.4m	19.9200	0.10129	0.00835	0.09294	0.07537	0.00901	0.00827	0.00029

TABLE N6
COMPOSITION (NORMALISED %) OF C₁₅+ SATURATE (PARAFFIN - NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	001	002
DEPTH	3361m	3372.4m
SAMPLE TYPE		
nC15	0.58	1.70
nC16	1.29	3.90
nC17	1.61	4.91
nC18	2.61	5.66
nC19	3.96	7.27
nC20	5.44	7.92
nC21	5.88	8.14
nC22	7.76	7.42
nC23	7.97	7.75
nC24	8.46	7.87
nC25	9.12	7.35
nC26	9.36	6.82
nC27	8.66	5.69
nC28	7.40	4.80
nC29	6.47	4.18
nC30	4.67	3.01
nC31	3.46	2.24
nC32	2.03	1.34
nC33	1.61	1.01
nC34	1.00	0.69
nC35	0.67	0.33
Paraffin	10.13	16.83
Isoprenoid	0.27	0.92
Napthene	89.61	82.25
CPI 1 Index	0.99	1.02
CPI 2 Index	1.05	1.04
CPI 3 Index	1.03	0.98
Prist/Phytane	0.88	1.22
Prist/nC17	0.50	0.51
Phytane/nC18	0.35	0.36

Job Number : 4136

$$C.P.I. 1 = \frac{1}{2} \left[\frac{C_{21} + C_{23} + C_{25} + C_{27} + C_{29} + C_{31} + C_{33} + C_{35}}{C_{20} + C_{22} + C_{24} + C_{26} + C_{28} + C_{30} + C_{32} + C_{34}} + \frac{C_{21} + C_{23} + C_{25} + C_{27}}{C_{22} + C_{24} + C_{26} + C_{28}} \right]$$

$$C.P.I. 2 = \frac{1}{2} \left[\frac{C_{25} + C_{27} + C_{29} + C_{31} + C_{33} + C_{35}}{C_{24} + C_{26} + C_{28} + C_{30} + C_{32} + C_{34}} + \frac{C_{25} + C_{27} + C_{29} + C_{31}}{C_{26} + C_{28} + C_{30} + C_{32}} \right]$$

$$C.P.I. 3 = \frac{2 \times (C_{27})}{C_{26} + C_{28}}$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE N7
METHYLPHENANTHRENE INDICES (MPI)

JOB 4136	DEPTH/ IDENTITY	SAMPLE TYPE	MPI 1		Rcalc		MPI 2	
GEOCHEM SAMPLE NUMBER			AREA	HEIGHT	AREA	HEIGHT	AREA	HEIGHT

WELL: 34/2-3

4136-001	3361.0m		0.28	0.31			0.34	0.36
4136-002	3372.4m		0.34	0.38			0.41	0.43

$$\text{MPI 1} = \frac{1.5(2\text{-MP} + 3\text{-MP})}{9 + 1\text{-MP} + 9\text{-MP}} \quad \text{MPI 2} = \frac{3(2\text{-MP})}{9 + 1\text{-MP} + 9\text{-MP}} \quad \text{Rcalc} = \begin{cases} 0.60(\text{MPI 1}) + 0.40 & (\text{if Ro} < 1.35\%) \\ -0.60(\text{MPI 1}) + 2.30 & (\text{if Ro} > 1.35\%) \end{cases}$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE N8

AROMATIC HYDROCARBONS RATIOS (MSD, PEAK AREA DATA)

SAMPLE NUMBER	DEPTH (m)	2MP/ 1MP	RATIO 1	RATIO 2	RATIO 3
------------------	--------------	-------------	---------	---------	---------

WELL: 34/2-3

4136-001A	3361.0	0.37	0.42	0.61	0.16
4136-002A	3372.4	0.49	0.36	0.59	0.15

RATIO 1 = $A(231)/A(231) + G(231)$ RATIO 2 = $E(253)/E(253) + G(253)$ RATIO 3 = $A(253)/B(231) + E(253)$

TABLE N9
CARBON ISOTOPE COMPOSITIONS (‰,PDB)

JOB 4136								
GEOCHEM SAMPLE NUMBER	DEPTH/ IDENTITY	TOTAL EXTRACT WHOLE OIL	SATURATES	AROMATICS	NSO	ASPHALTENES	KEROGEN	PYROLYSATE (S2)

WELL: 34/2-3

4136-001	3361.0m	-28.06	-28.25	-28.37	-29.34	-29.34		
4136-002	3372.4m	-28.36	-28.70	-28.42	-29.60	-30.81		

TABLE N10
BIOMARKER MOLECULAR RATIOS

WELL: 34/2-3

		Steranes (m/z 217)			Steranes (m/z 218)		
SAMPLE NUMBER	DEPTH (m)	<u>A</u>	<u>Q</u>	<u>(R+S)</u>	NORMALISED COMPOSITION:		
		(A+J)	(Q+T)	(Q+R+S+T)	B	D	F
4136-001A	3361.0	0.67	0.65	0.56	27%	28%	45%
4136-002A	3372.4	0.83	0.59	0.58	26%	27%	47%

TABLE N11
BIOMARKER MOLECULAR RATIOS

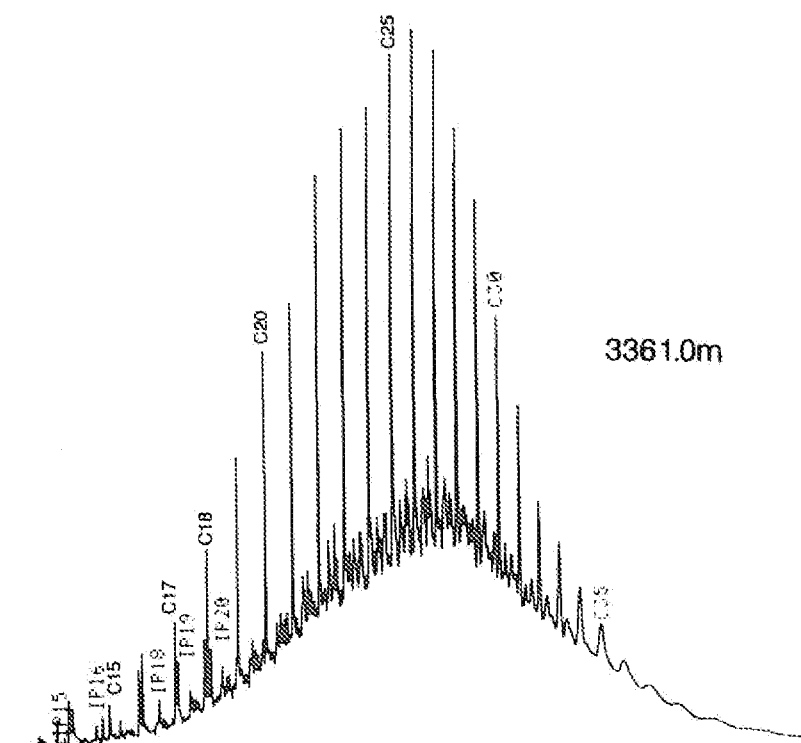
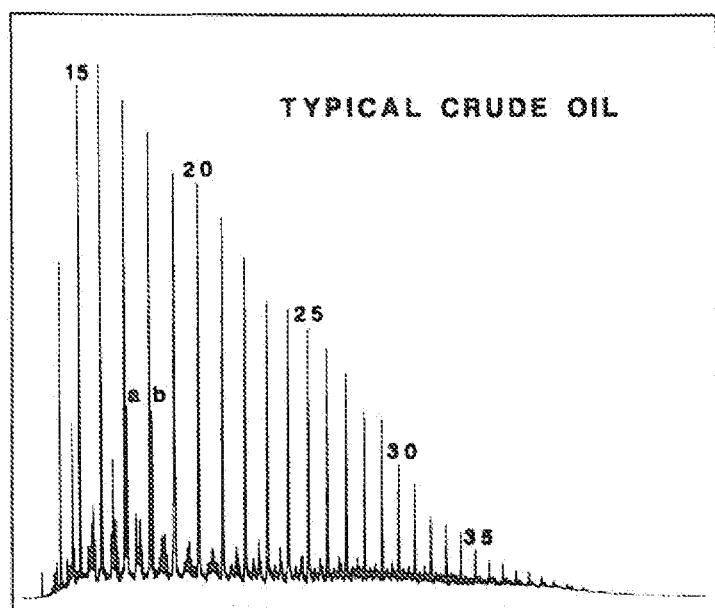
WELL 34/2-3

Terpanes (m/z 191)

SAMPLE NUMBER	DEPTH (m)	A/B	Z/E	Z/C	<u>Z</u> (Z+E)	<u>C</u> (C+E)	%22S for J	<u>E</u> (E+F)	<u>X</u> (X+D)	Q/E
4136-001A	3361.0	4.54	0.52	1.14	0.34	0.31	63%	0.90	0.62	0.10
4136-002A	3372.4	2.56	0.66	1.32	0.40	0.33	57%	0.88	0.65	0.15

FIGURE N1.1 C₁₅+ SATURATES CHROMATOGRAMS

WELL 34/2-3



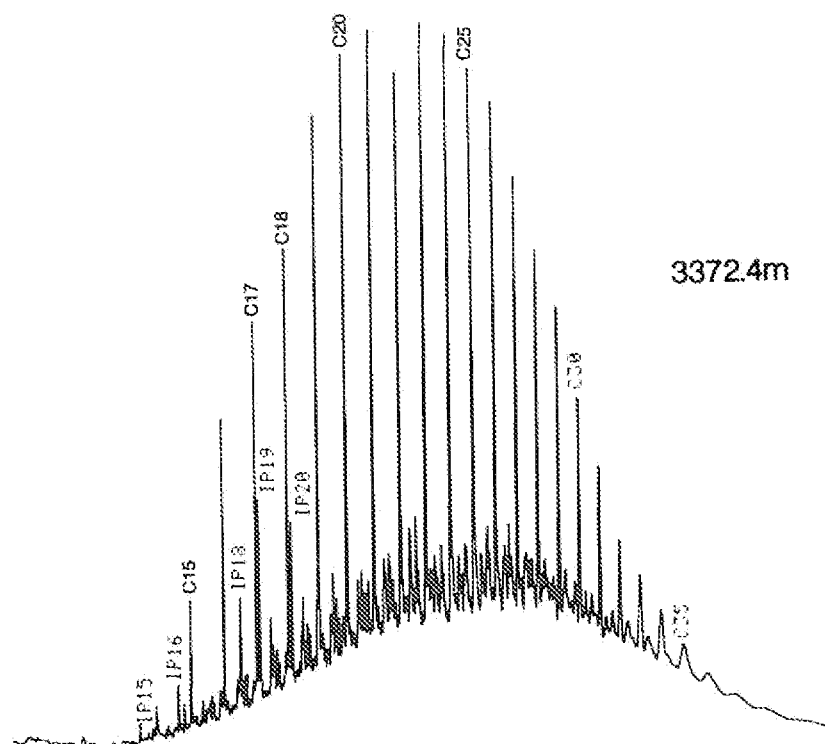
a ~ PRISTANE
b ~ PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20-nC₂₀)

FIGURE N1.2

C₁₅+ SATURATES CHROMATOGRAMS

WELL 34/2-3



a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 ~ nC₂₀)

FIGURE N2.1

C₁₅+ AROMATIC CHROMATOGRAMS

WELL 34/2-3

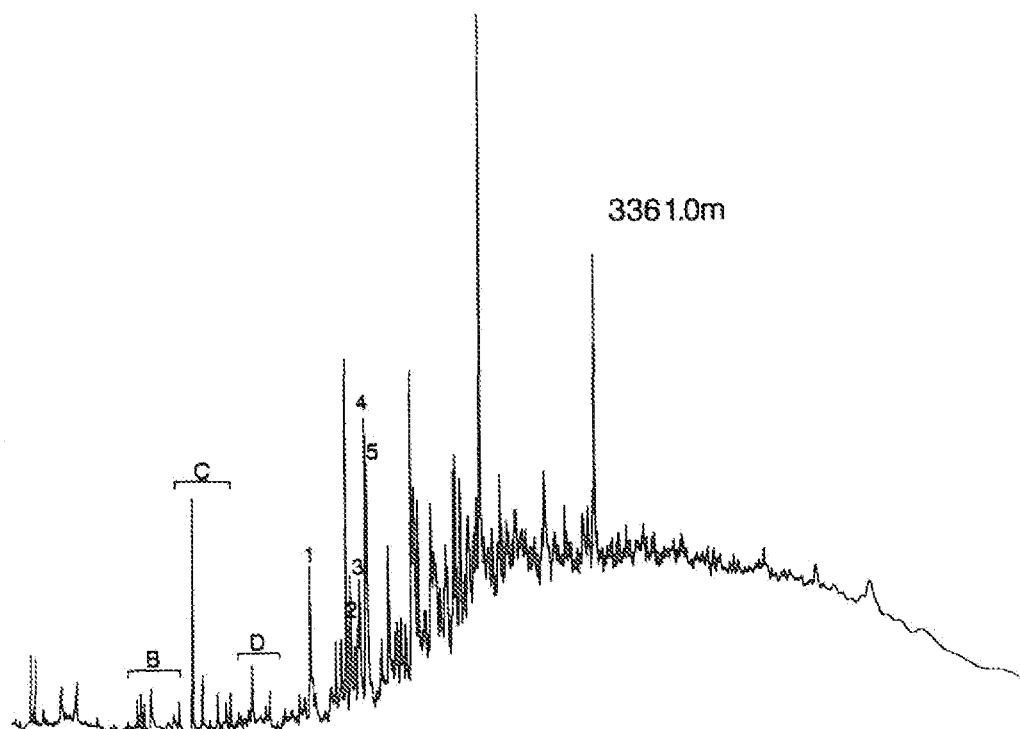
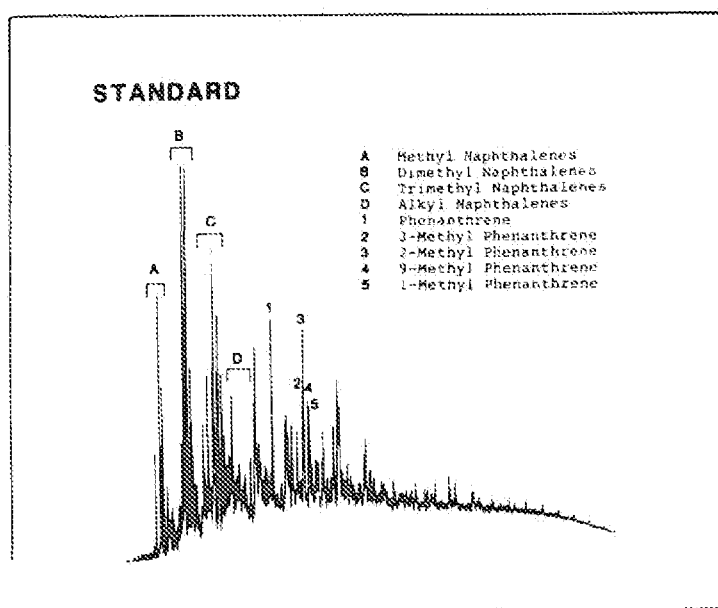
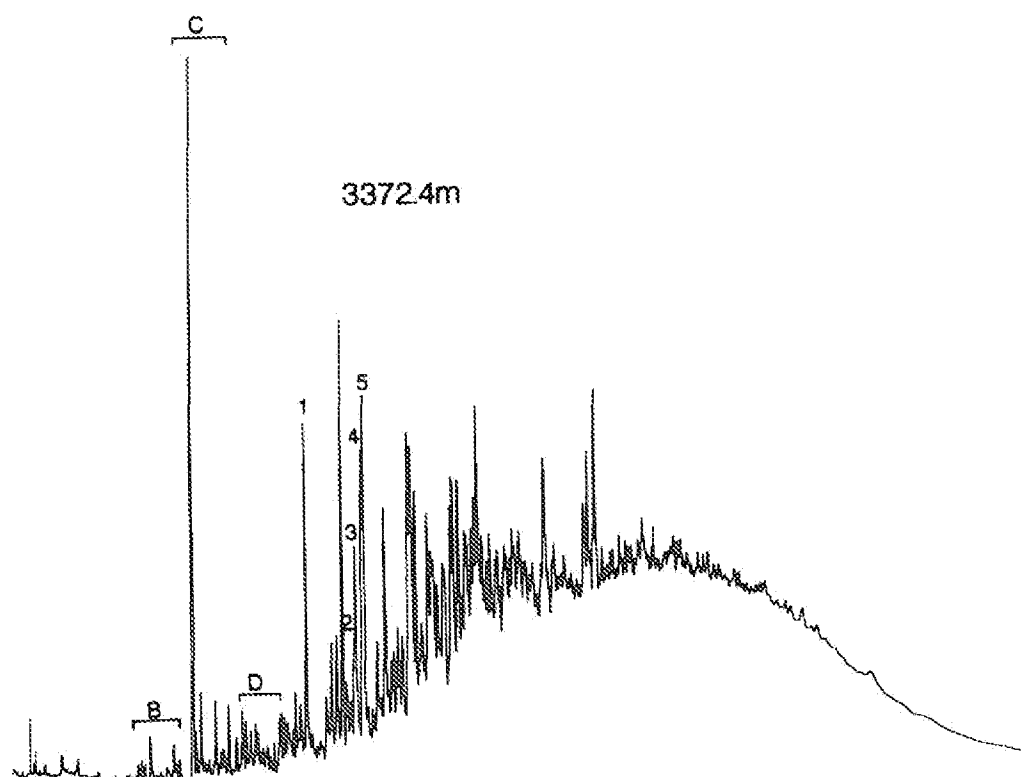


FIGURE N22 **C₁₅+ AROMATIC CHROMATOGRAMS**

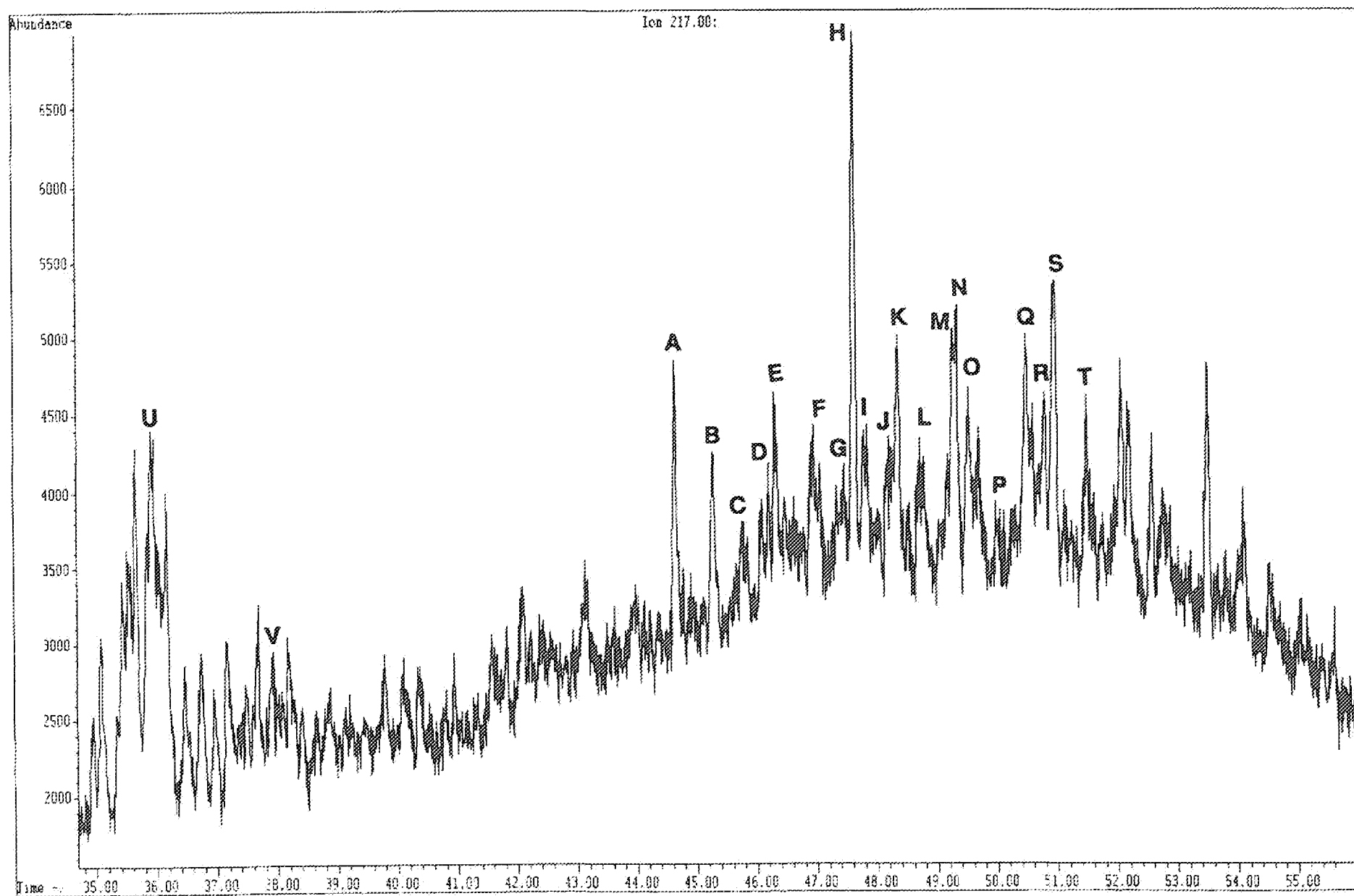
WELL 34/2-3



PEAK IDENTIFICATION ON FIRST SHEET

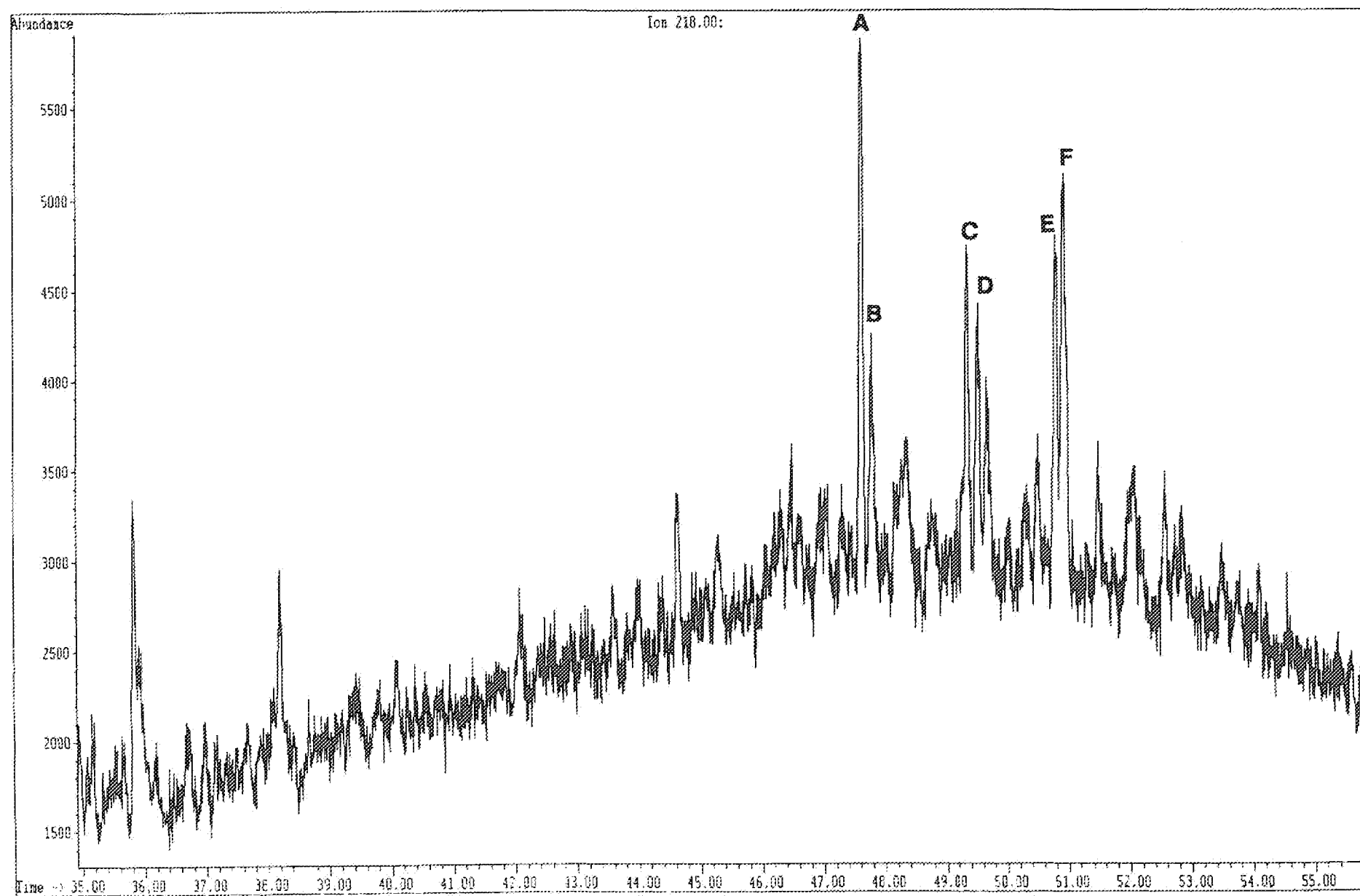
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Operator:
Date Acquired: 15 Dec 90 3:04 am
Method File Name: BIOM.M
Sample Name: 4136-001
Misc Info: WELL 34/2-3 3361.0M
Bottle Number: 35

N3.1a



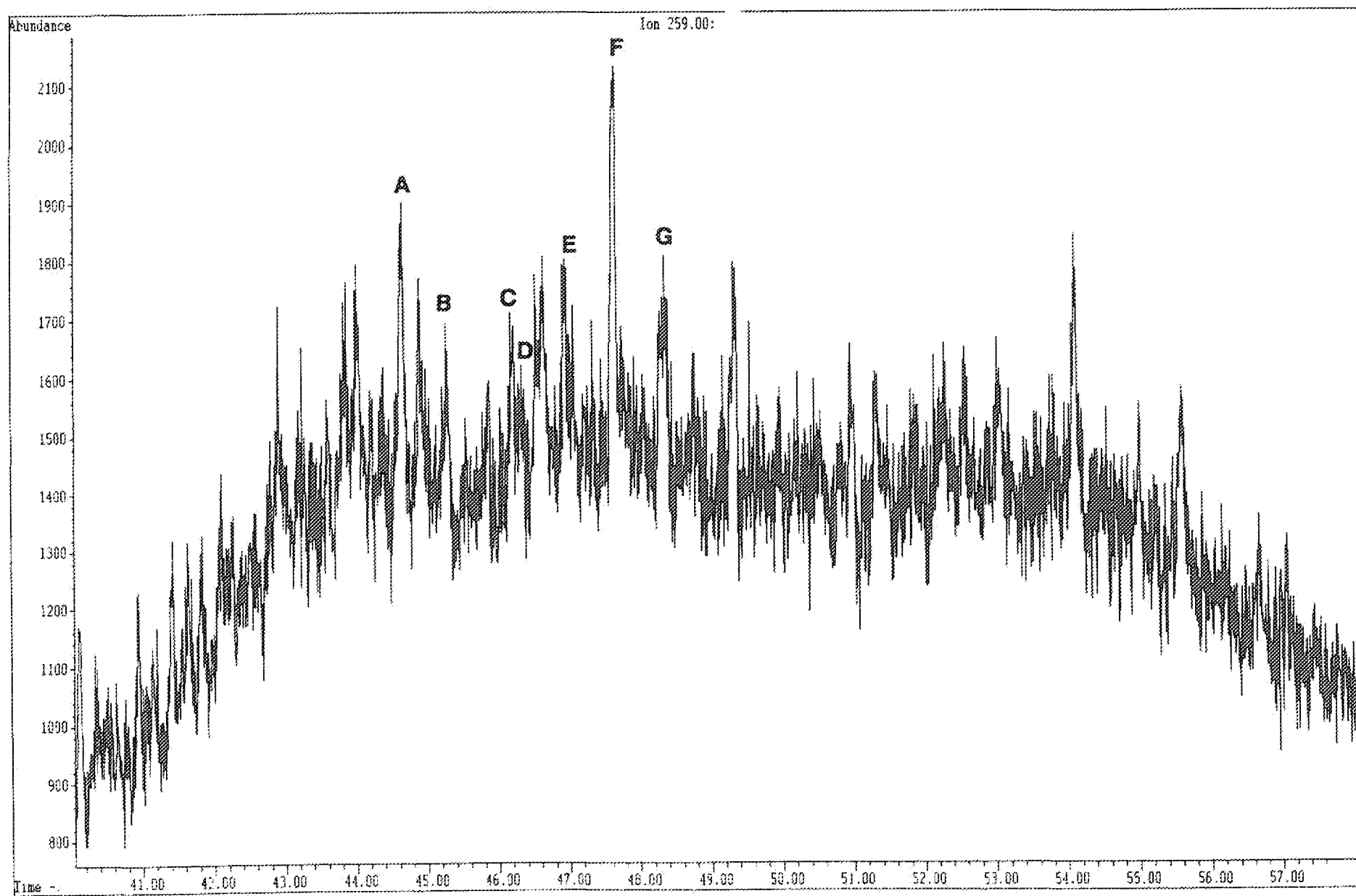
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Method File Name: BIOM.M
Sample Name: 4136-001
Misc Info: WELL 34/2-3 3361.0M
Bottle Number: 35

N3.1b

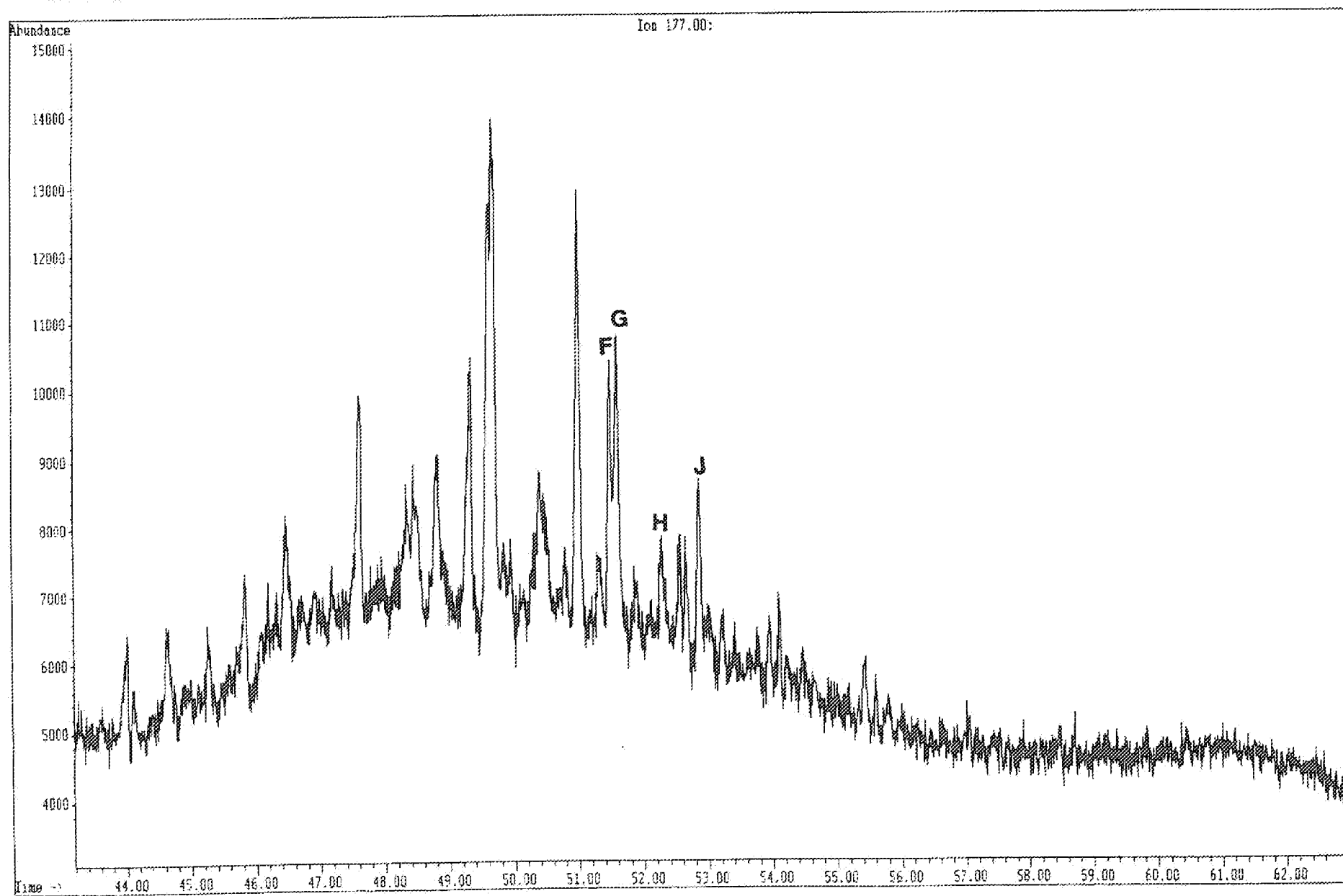


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Method File Name: BIOM.M
Sample Name: 4136-001
Misc Info: WELL 34/2-3 3361.OM
Bottle Number: 35

N3.1c

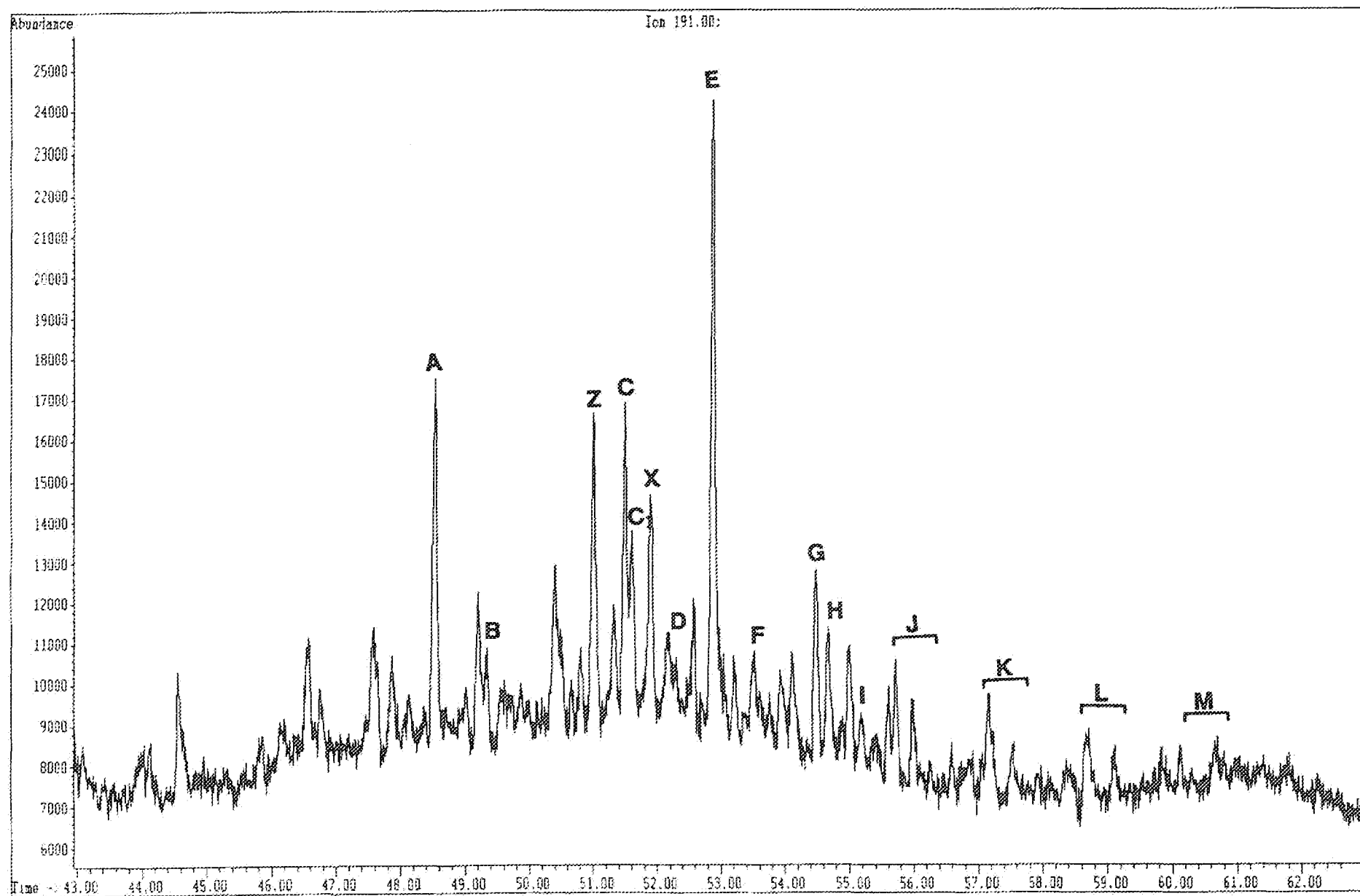


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Method File Name: B10M.M
Sample Name: 4136-001
Misc Info: WELL 34/2-3 3361.0M
Bottle Number: 35



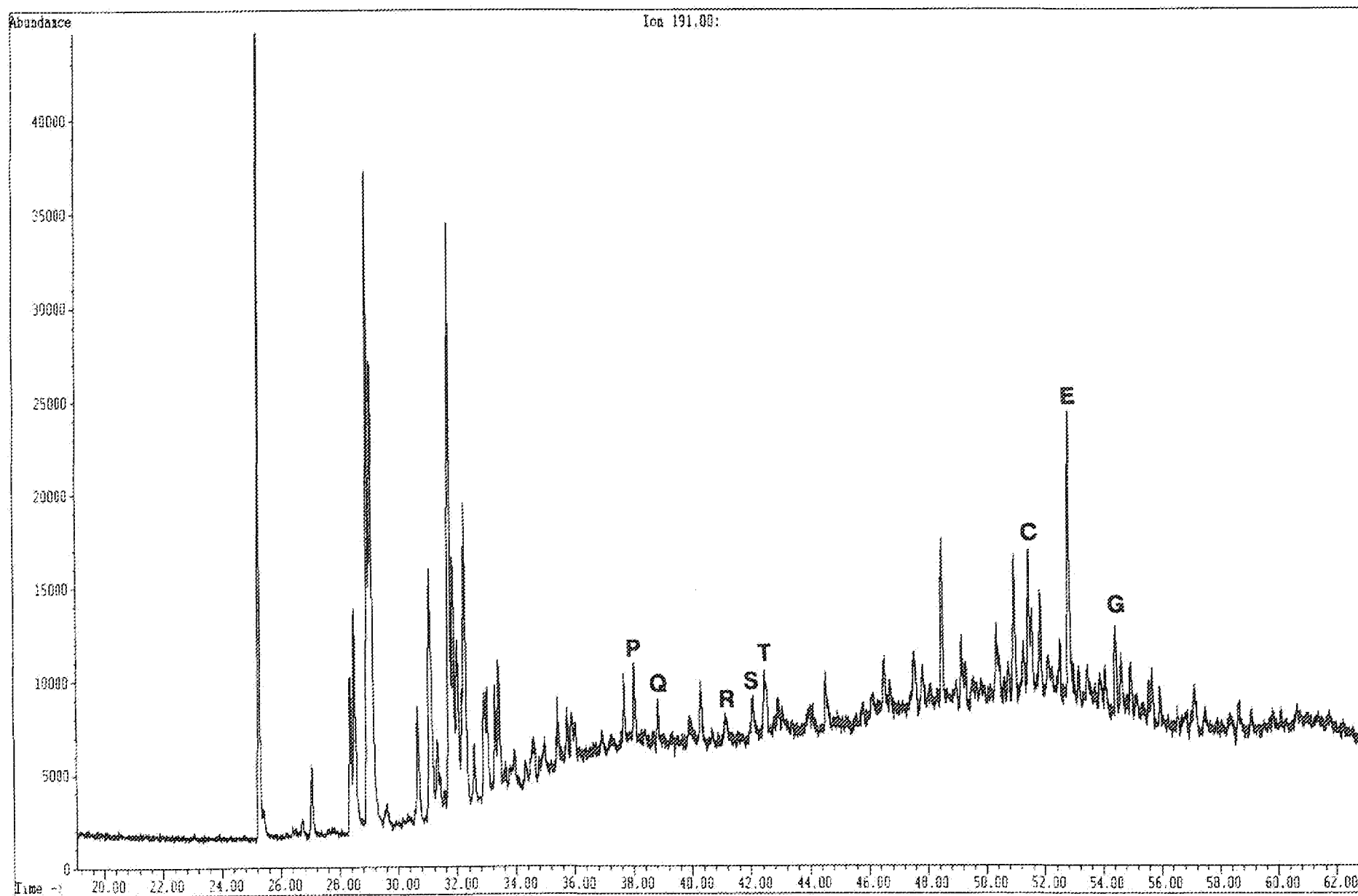
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Method File Name: BIOM.M
Sample Name: 4136-001
Misc Info: WELL 34/2-3 3361.0M
Bottle Number: 35

N3.1e



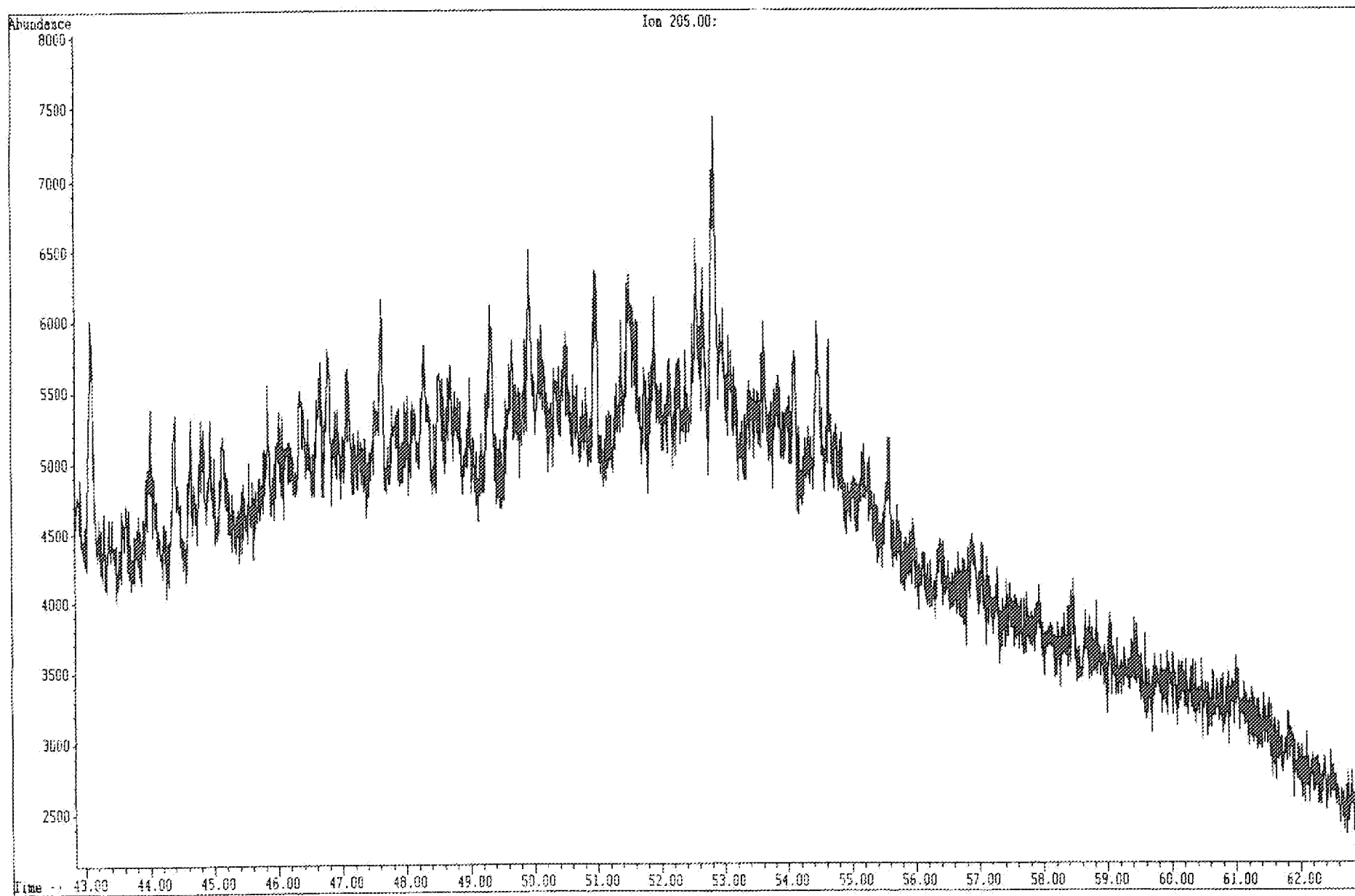
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Sample Name: 4136-001
Misc Info: WELL 34/2-3 3361.0M
Bottle Number: 35

N3.1f



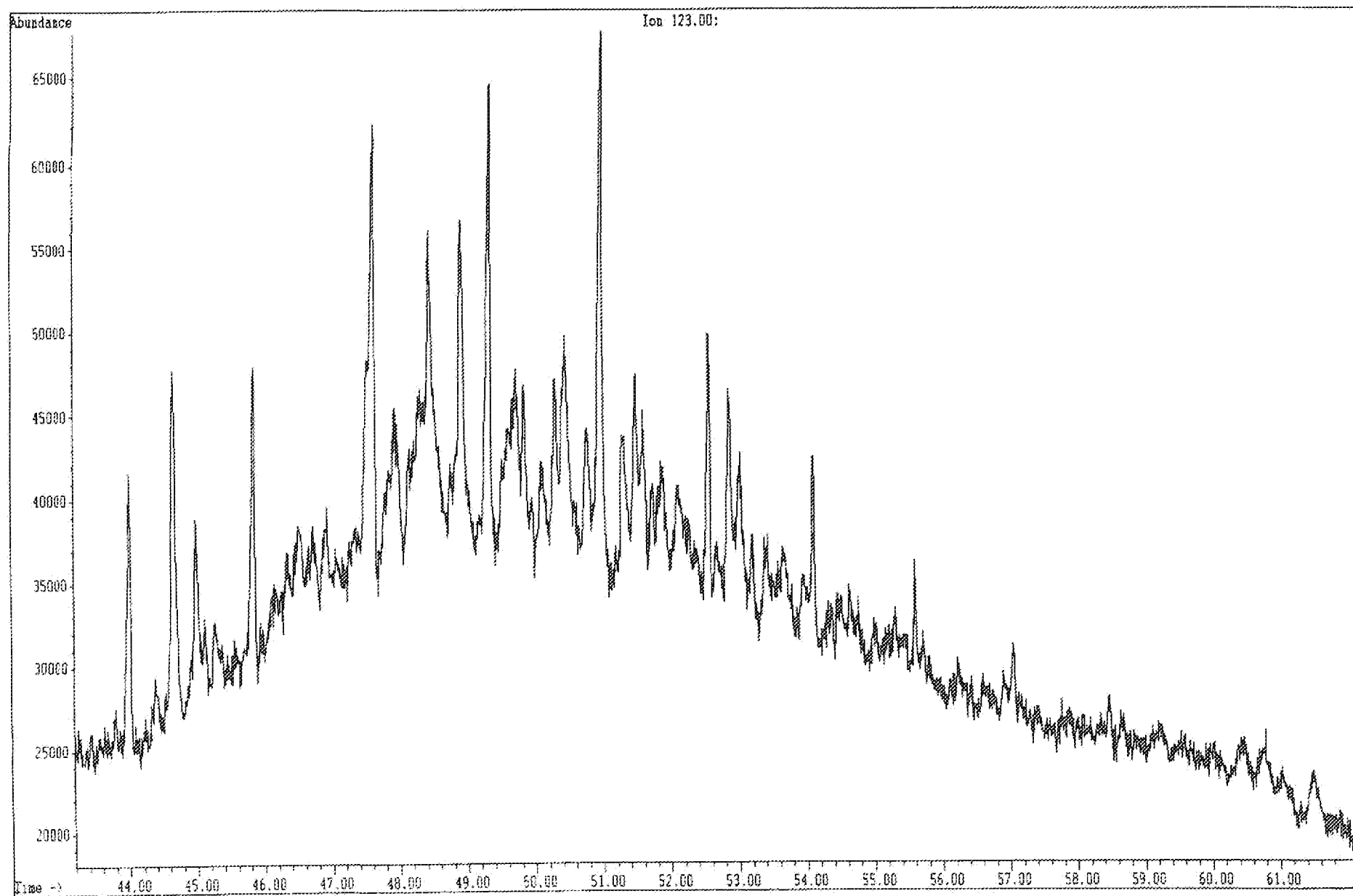
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Operator:
Date Acquired: 15 Dec 90 3:04 am
Method File Name: BIOM.M
Sample Name: 4136-001
Misc Info: WELL 34/2-3 3361.0M
Bottle Number: 35

N3.1g



File: C:\CHEMPC\DATA\3501014.D
Operator:
Date Acquired: 15 Dec 90 3:04 am
Method File Name: B10M.M
Sample Name: 4136-001
Misc Info: WELL 34/2-3 3361.0M
Bottle Number: 35

N3.1h



File: D:\CHEMPC\DATA\0201001.D

Operator:

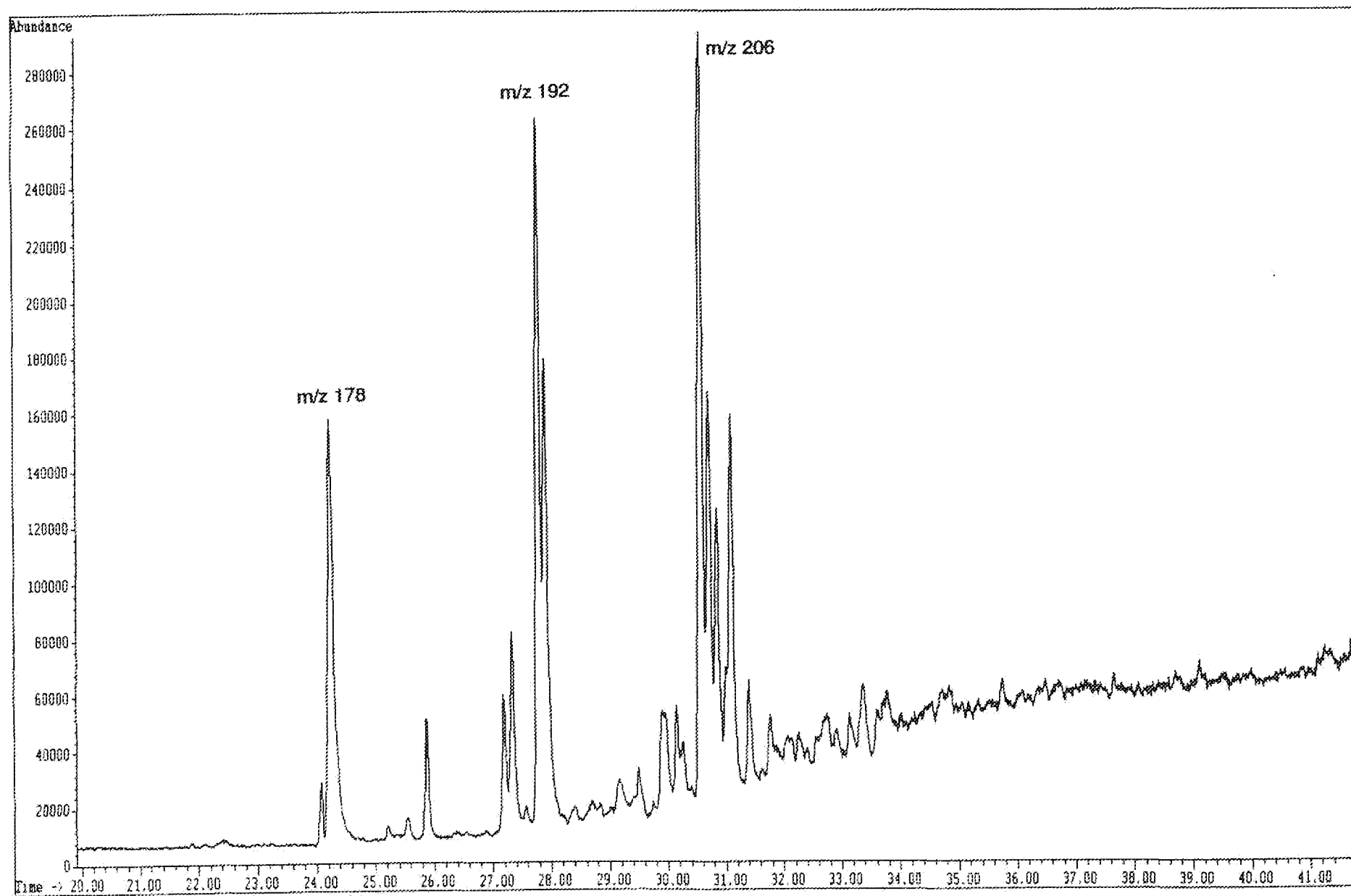
Date Acquired: 12 Dec 90 6:32 pm

Method File Name: B10MY.M

Sample Name: 4136-001

Misc Info: WELL 34/2-3 3361.0M

Bottle Number: 2

Phenanthrenes

File: D:\CHEMPC\DATA\0201001.D

Operator:

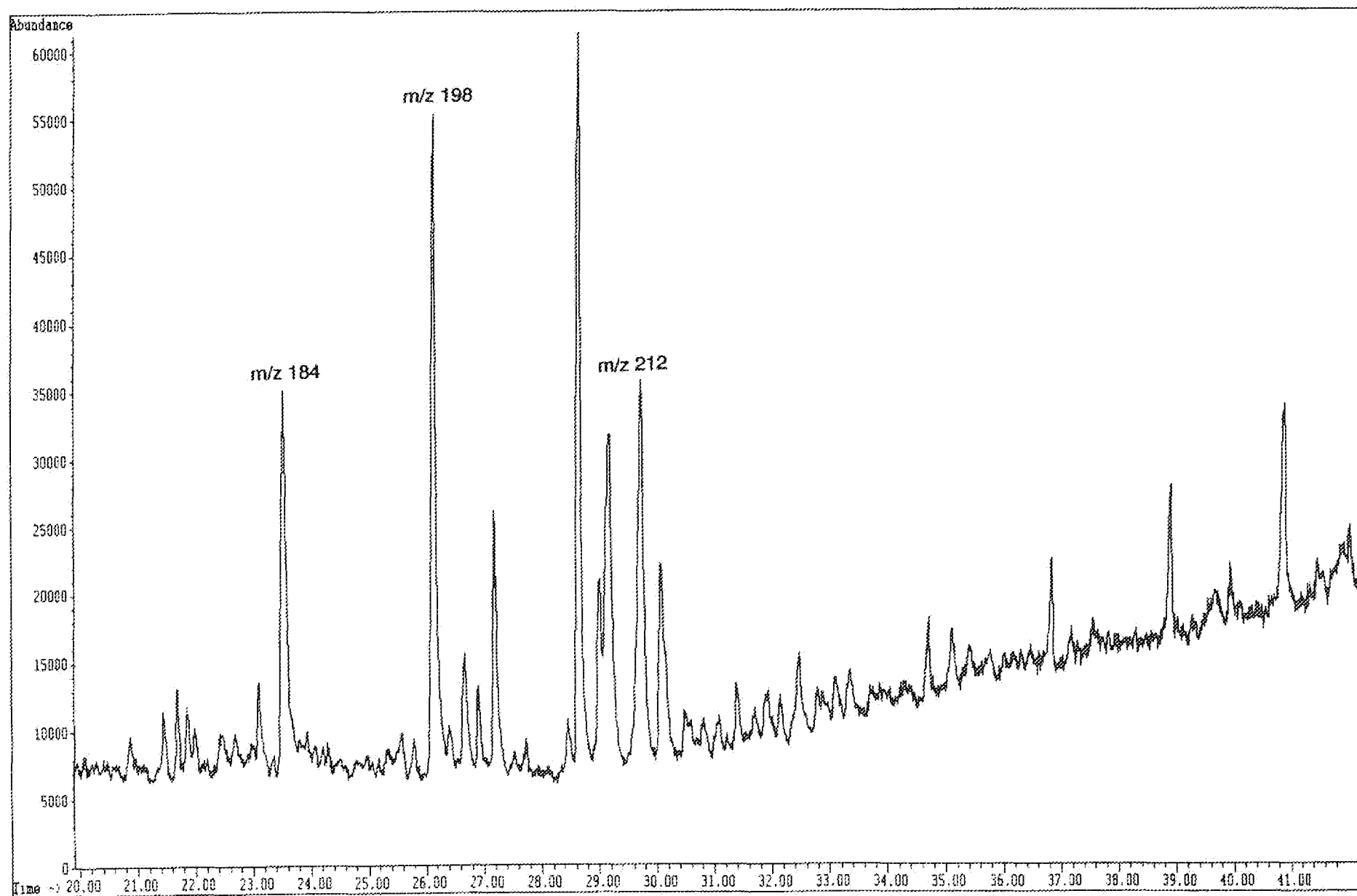
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Method File Name: B10MY.M

Sample Name: 4136-001

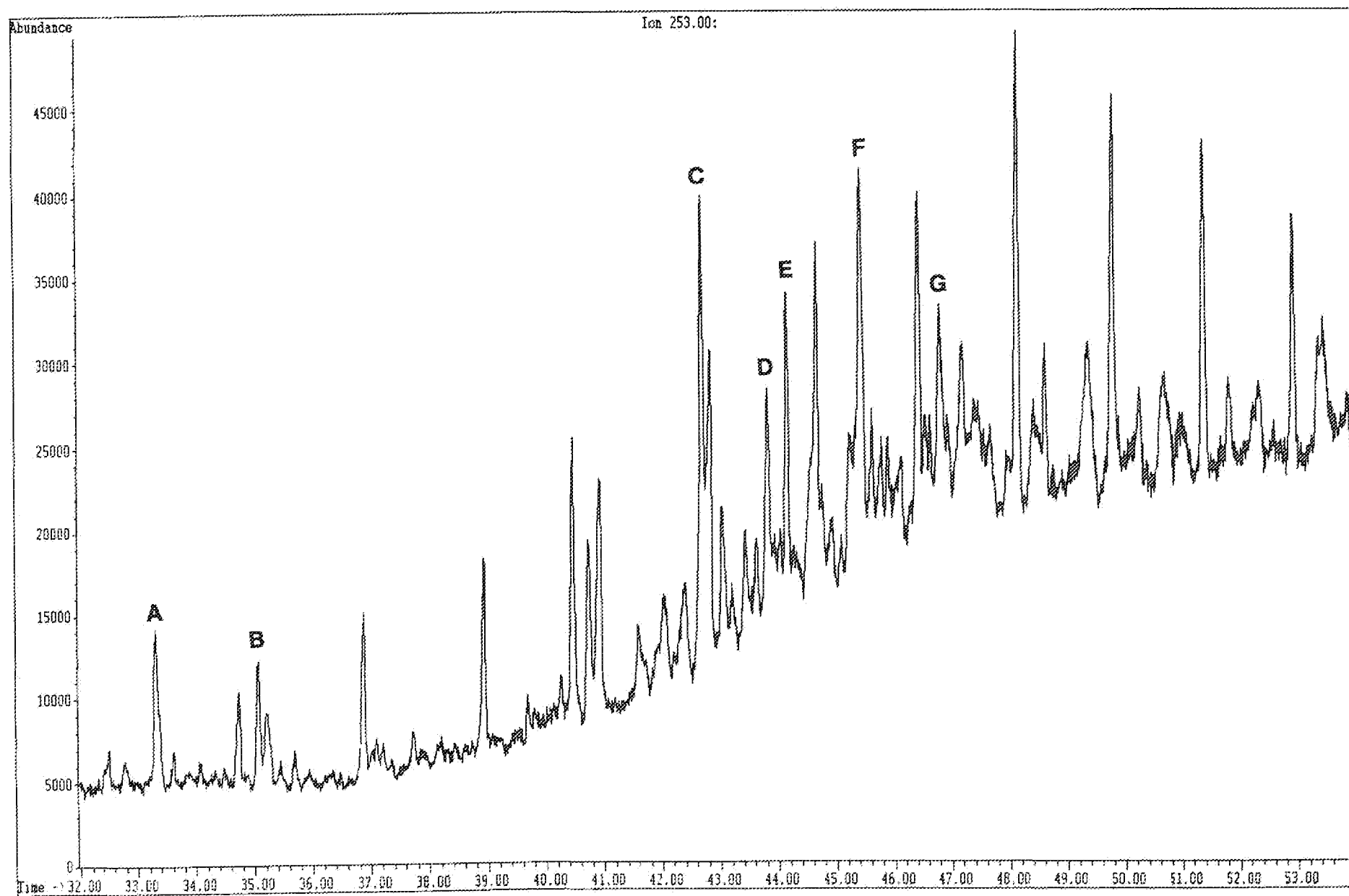
Misc Info: WELL 34/2-3 3361.0M

Bottle Number: 2

Dibenzothiophenes

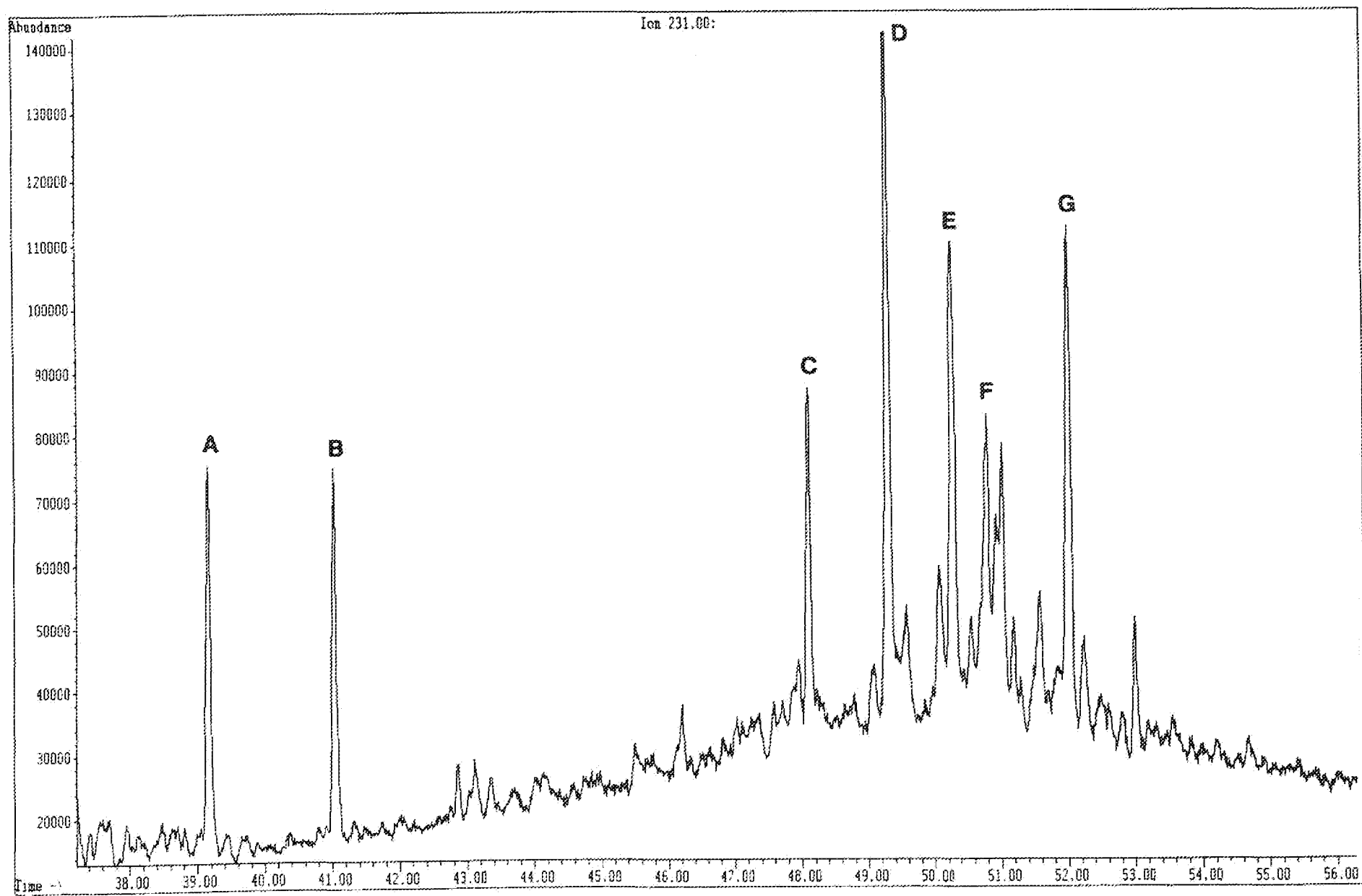
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Sample Name: 4136-001
Misc Info: WELL 34/2-3 3361.0M
Bottle Number: 2

N3.1k



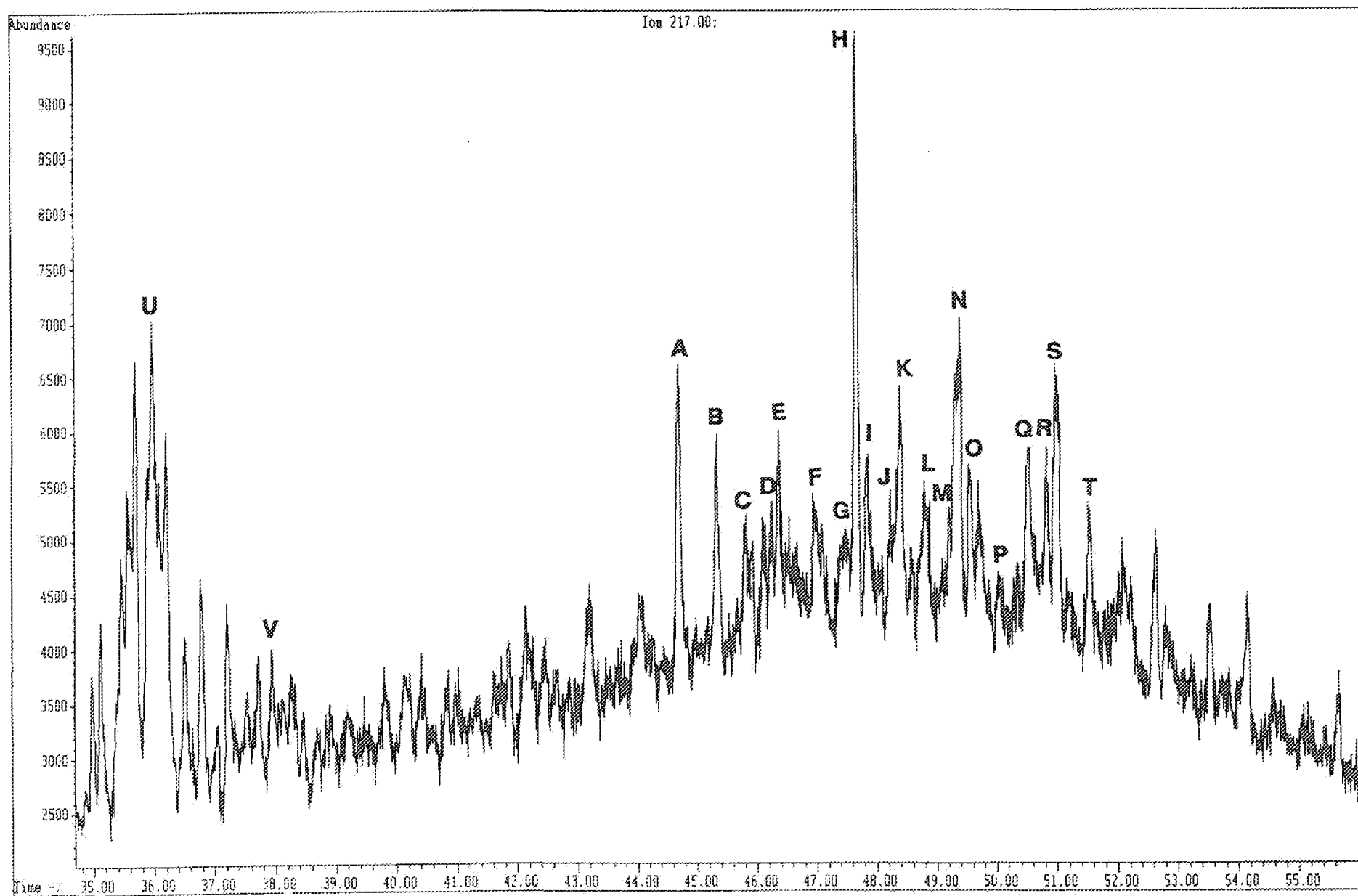
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Method File Name: BIOMY.M
Sample Name: 4136-001
Misc Info: WELL 34/2-3 3361.0M
Bottle Number: 2

N3.11

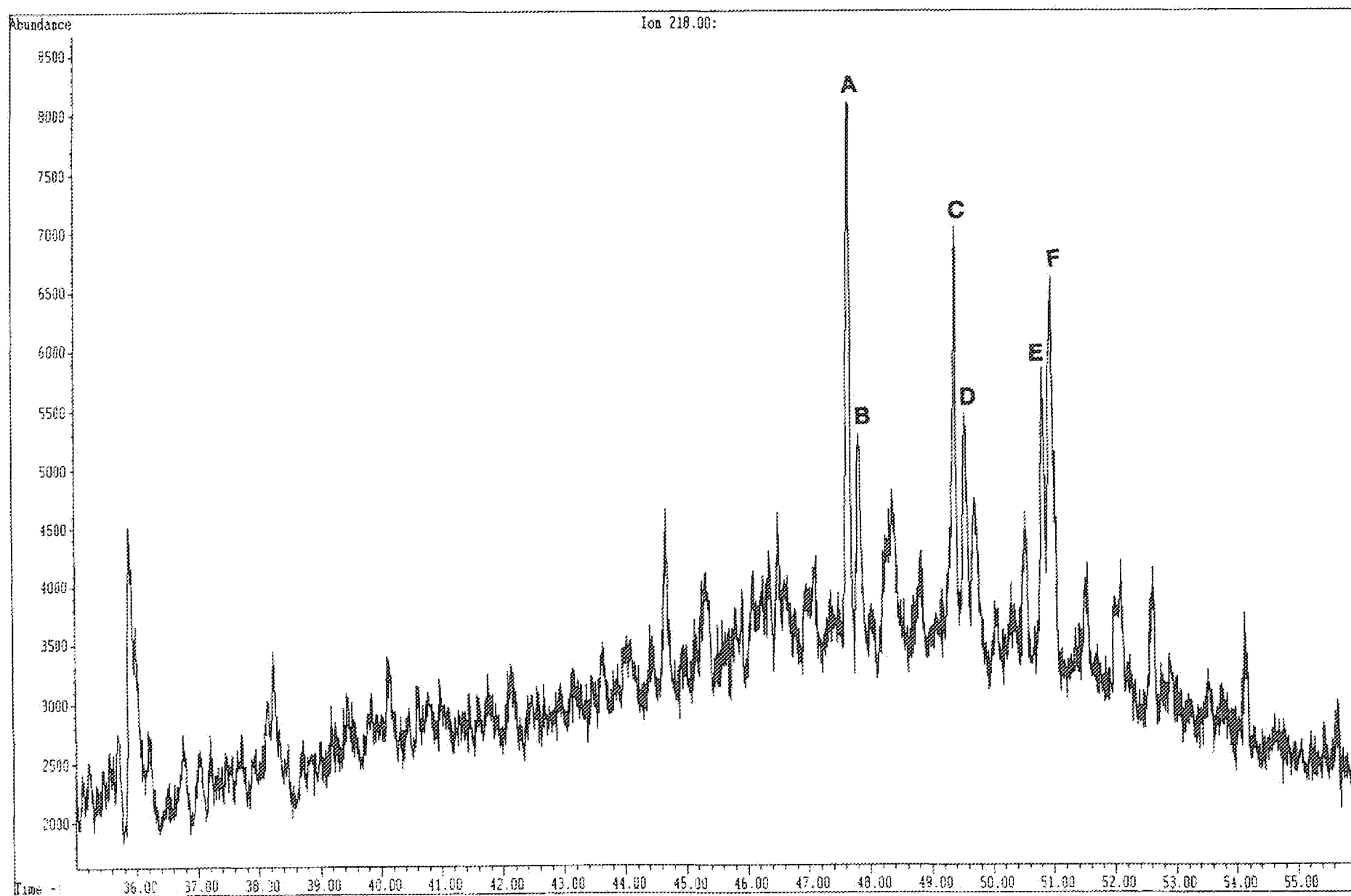


File: C:\CHEMPC\DATA\3601015.D
Operator:
Date Acquired: 15 Dec 90 4:14 am
Method File Name: BIOM.M
Sample Name: 4136-002
Misc Info: WELL 34/2-3 3372.4M
Bottle Number: 36

N3.2a



File: C:\CHEMPC\DATA\3601015.D
Operator:
Date Acquired: 15 Dec 90 4:14 am
Method File Name: BIOM.M
Sample Name: 4136-002
Misc Info: WELL 34/2-3 3372.4M
Bottle Number: 36



File: C:\CHEMP\DATA\3601815.D

N3.2c

Operator:

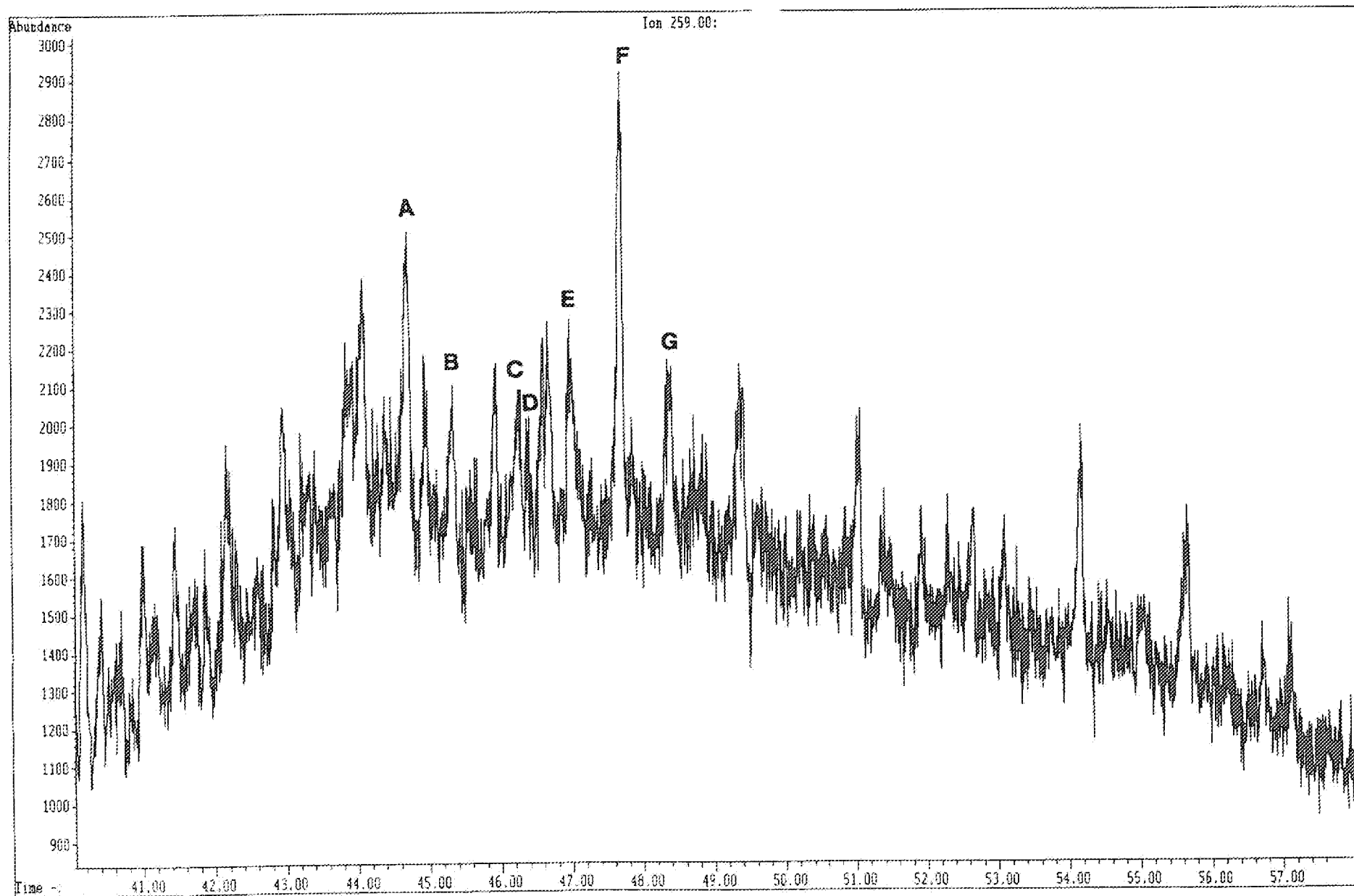
Date Acquired: 15 Dec 90 4:14 am

Method File Name: BIOM.M

Sample Name: 4136-002

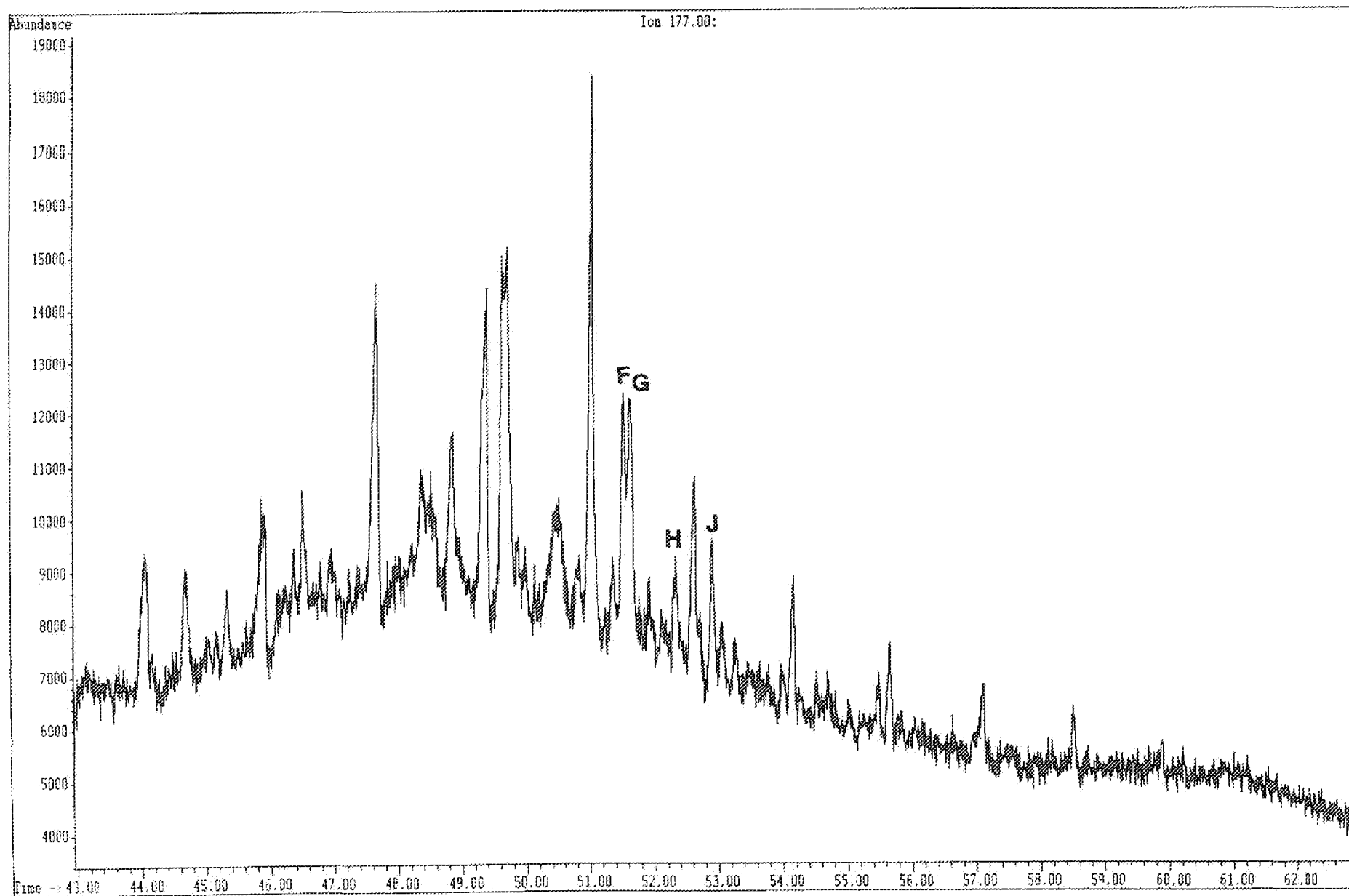
Misc Info: WELL 34/2-3 3372.4M

Bottle Number: 36



File: C:\CHEMPC\DATA\3601015.D
Operator:
Date Acquired: 15 Dec 90 4:14 am
Method File Name: B10M.M
Sample Name: 4136-002
Misc Info: WELL 34/2-3 3372.4M
Bottle Number: 36

N3.2d



File: C:\CHEMPC\DATA\3601015.D

N3.2e

Operator:

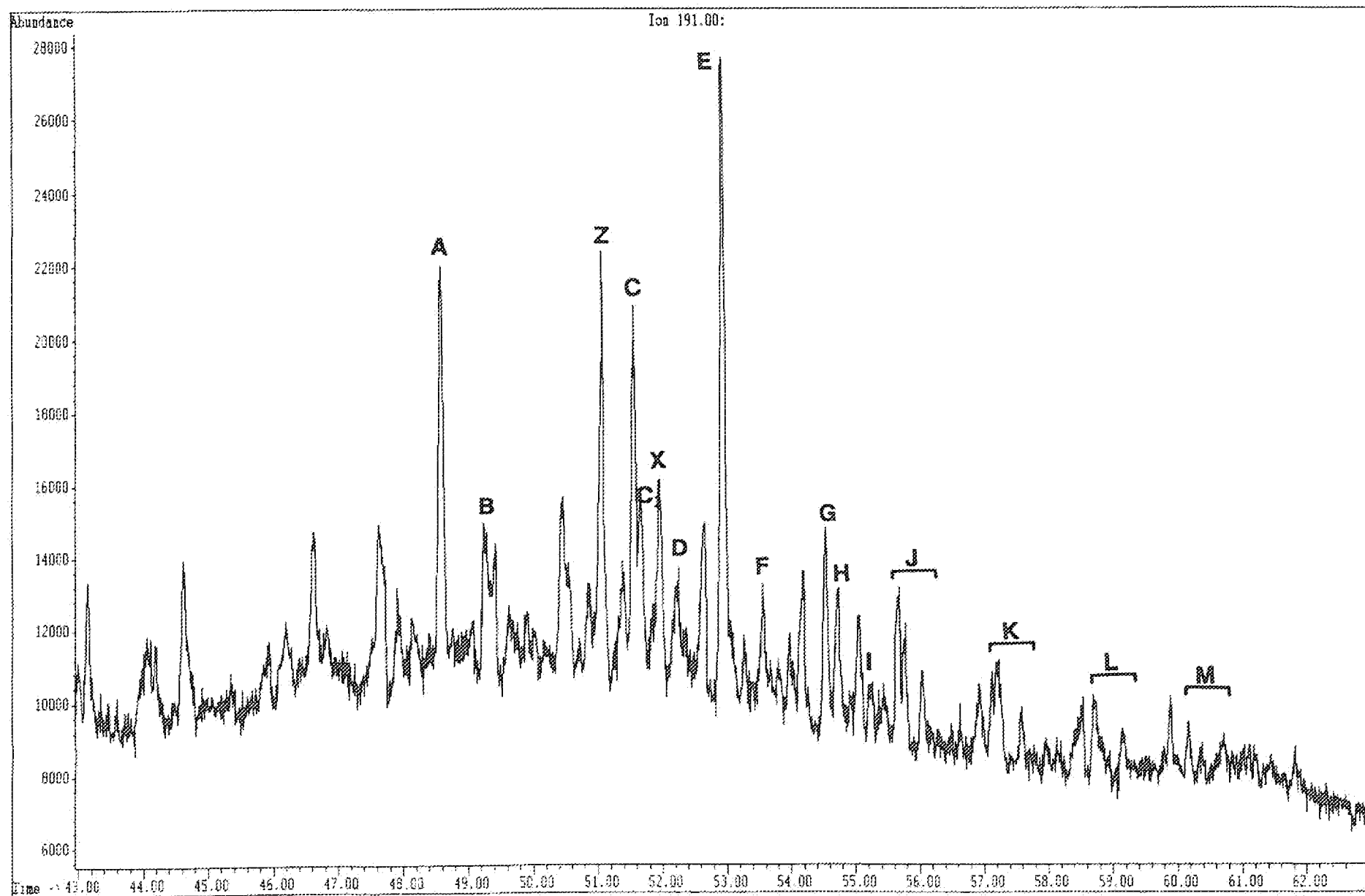
Date Acquired: 15 Dec 90 4:14 am

Method File Name: BIOM.M

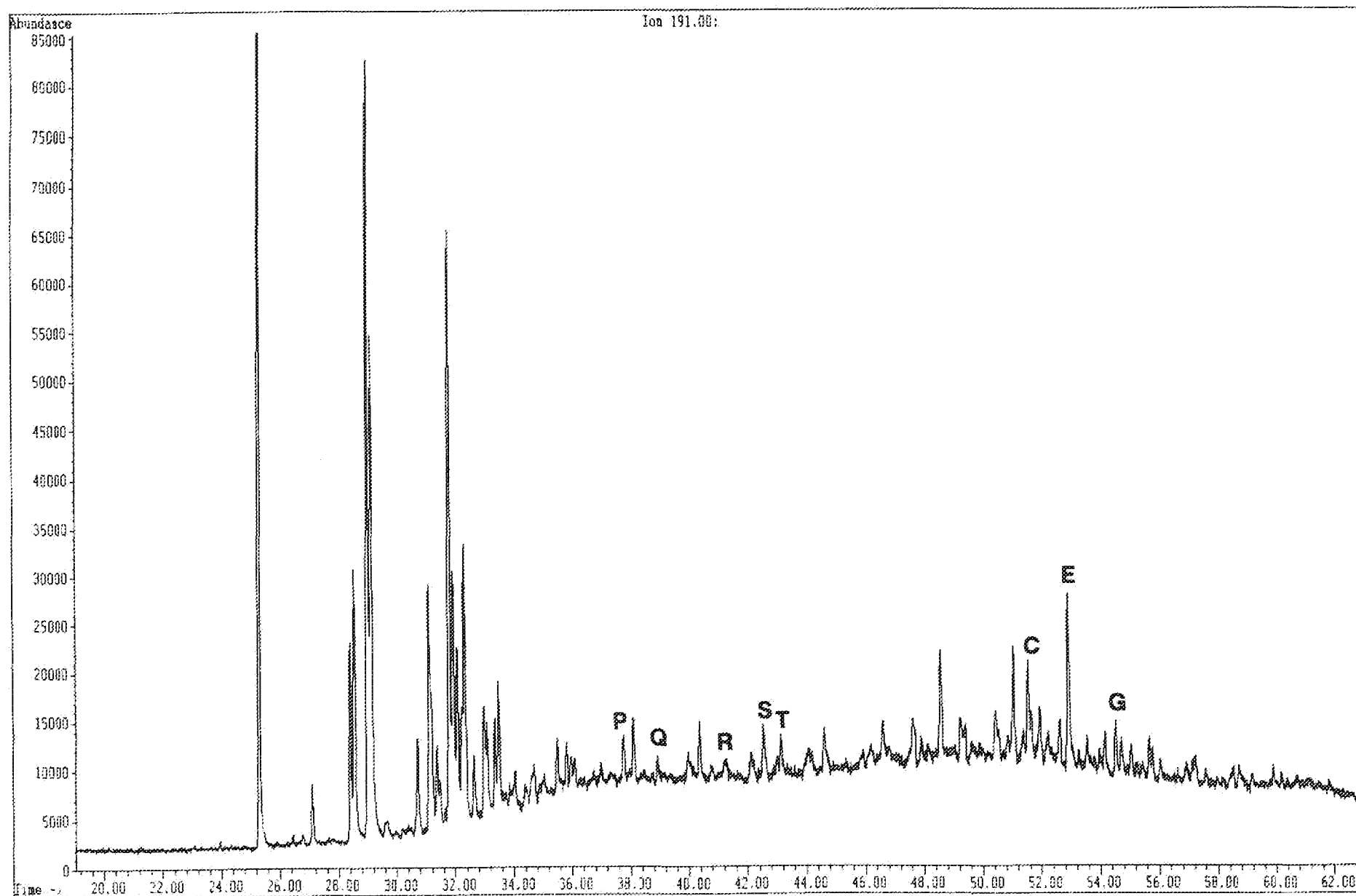
Sample Name: 4136-002

Misc Info: WELL 34/2-3 3372.4M

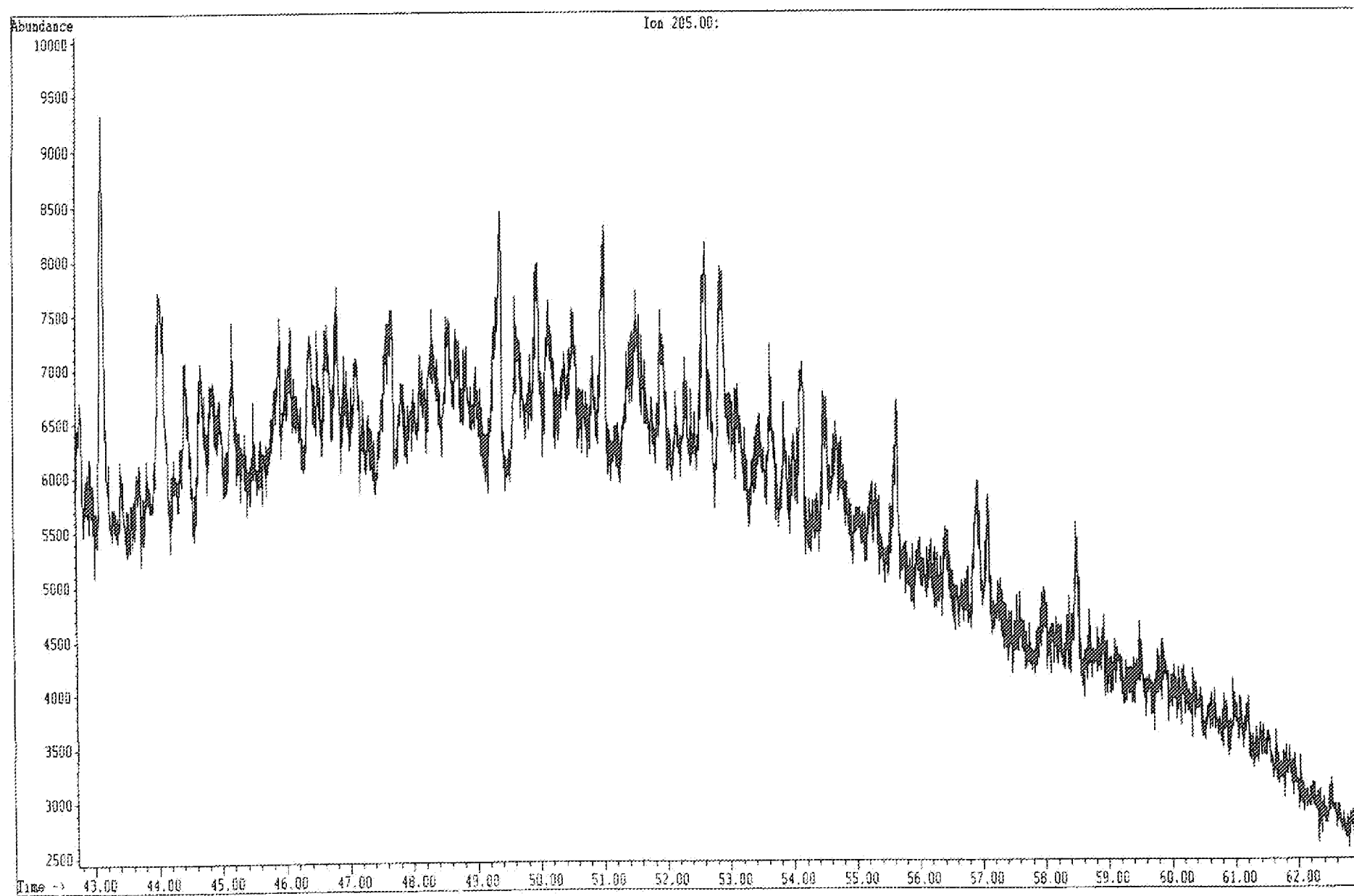
Bottle Number: 35



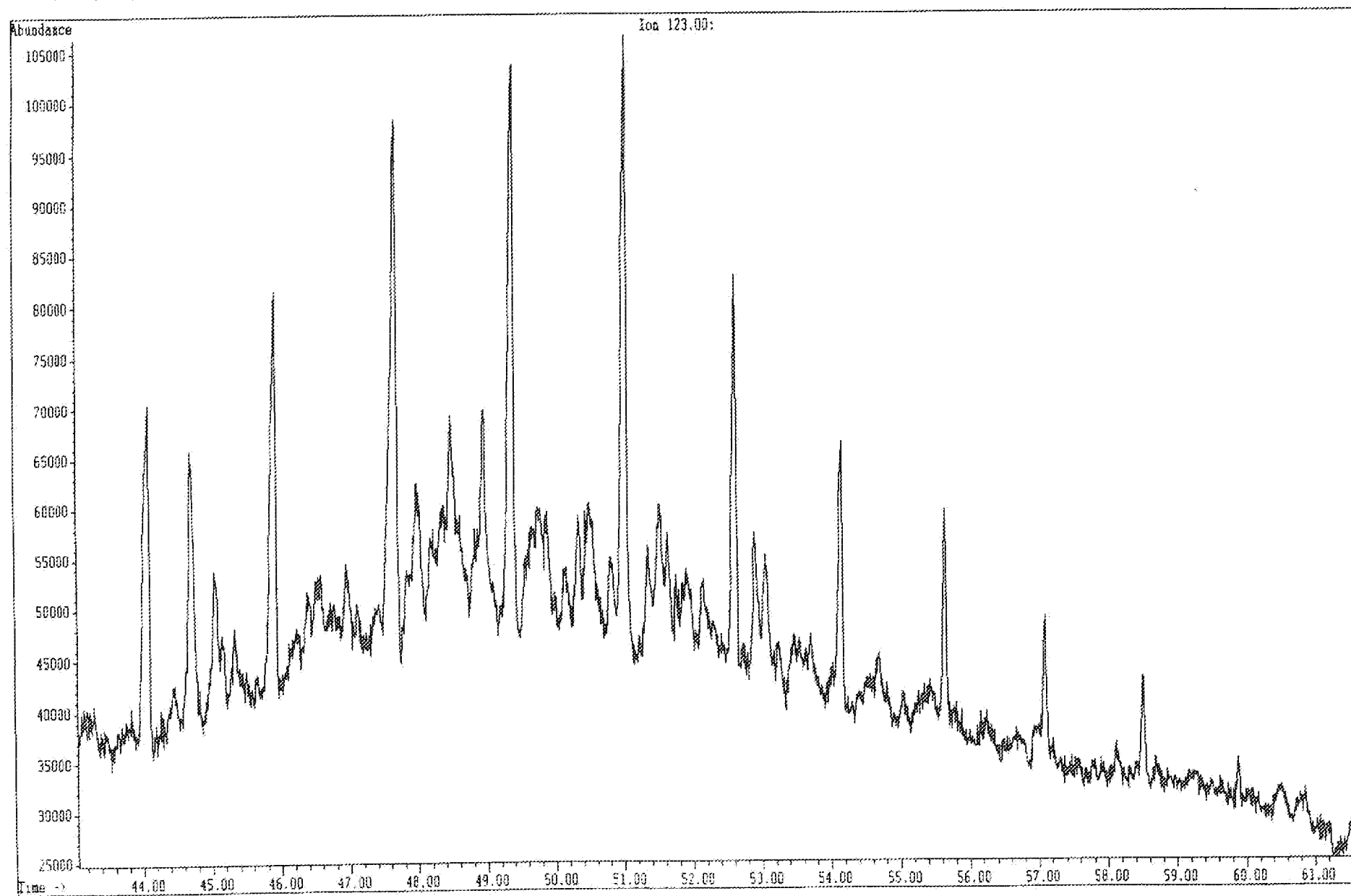
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Operator:
Date Acquired: 15 Dec 90 4:14 am
Method File Name: E10M.M
Sample Name: 4136-002
Misc Info: WELL 34/2-3 3372.4M
Bottle Number: 36



File: C:\CHEMPC\DATA\3601015.D
Operator:
Date Acquired: 15 Dec 90 4:14 am
Method File Name: B10M.M
Sample Name: 4136-002
Misc Info: WELL 34/2-3 3372.4M
Bottle Number: 36



File: E:\CHEMP\DATA\3601015.D
Operator:
Date Acquired: 15 Dec 90 4:14 am
Method File Name: BIOM.M
Sample Name: 4136-082
Misc Info: WELL 34/2-3 3372.4M
Bottle Number: 36



File: D:\CHEMPC\DATA\0301002.D

N3.2i

Operator:

Date Acquired: 12 Dec 90 7:40 pm

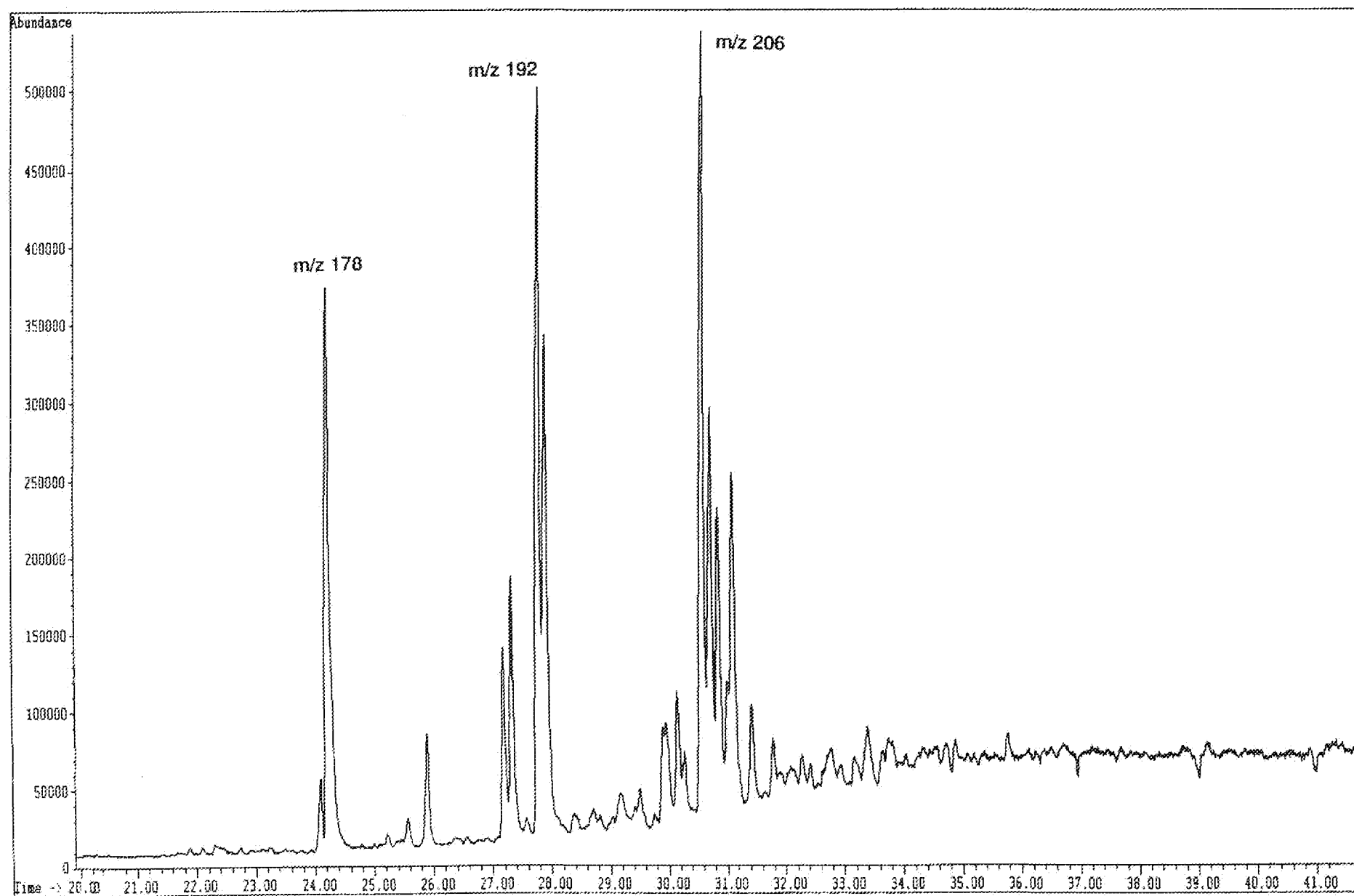
Method File Name: BIOMY.M

Sample Name: 4136-002

Misc info: WELL 34/2-3 3372.4M

Bottle Number: 3

Phenanthrenes



File: C:\CHEMPC\DATA\0301002.D

N3.2j

Operator:

Date Acquired: 12 Dec 90 7:40 pm

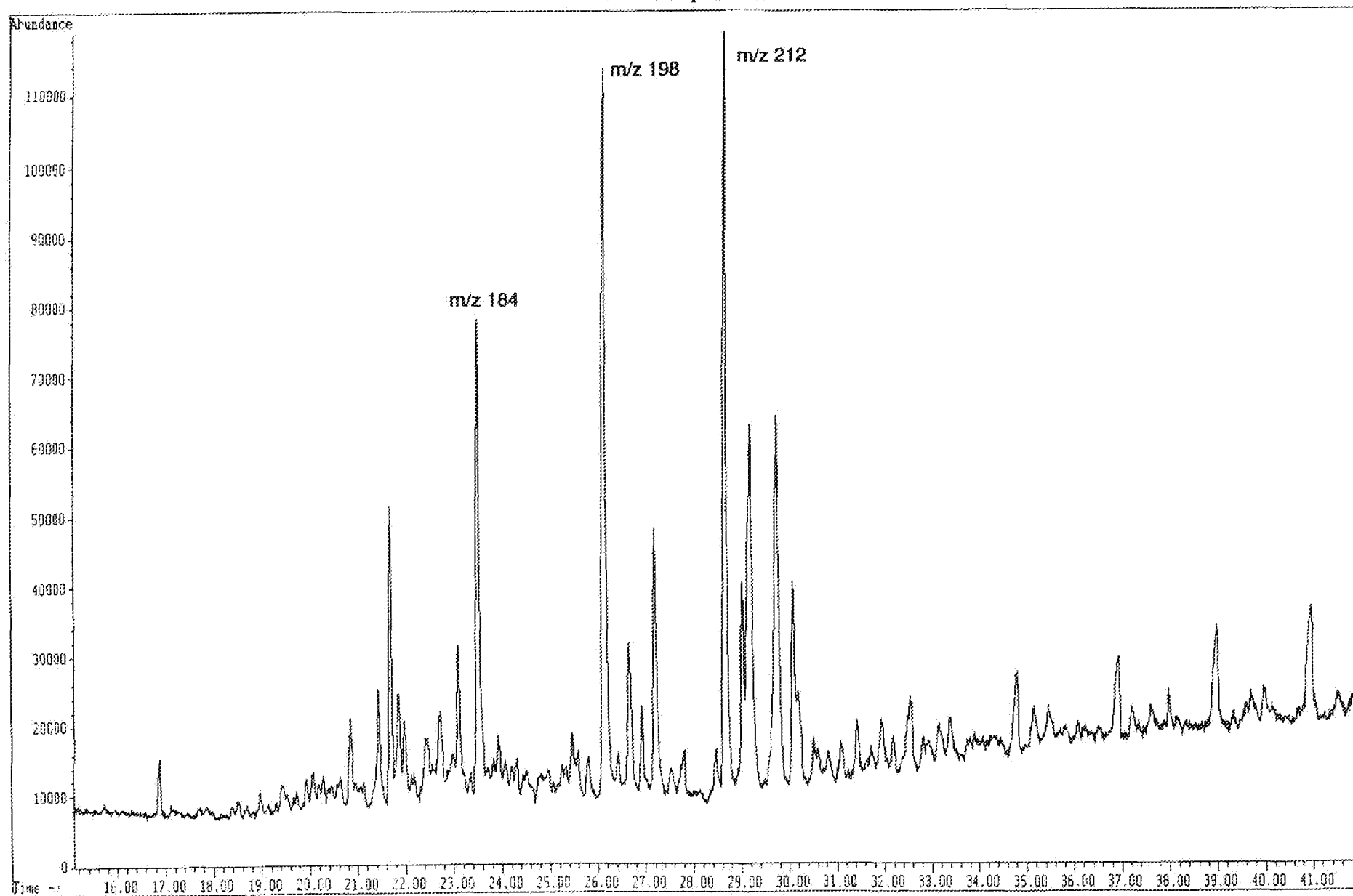
Method File Name: BIOMY.M

Sample Name: 4136-002

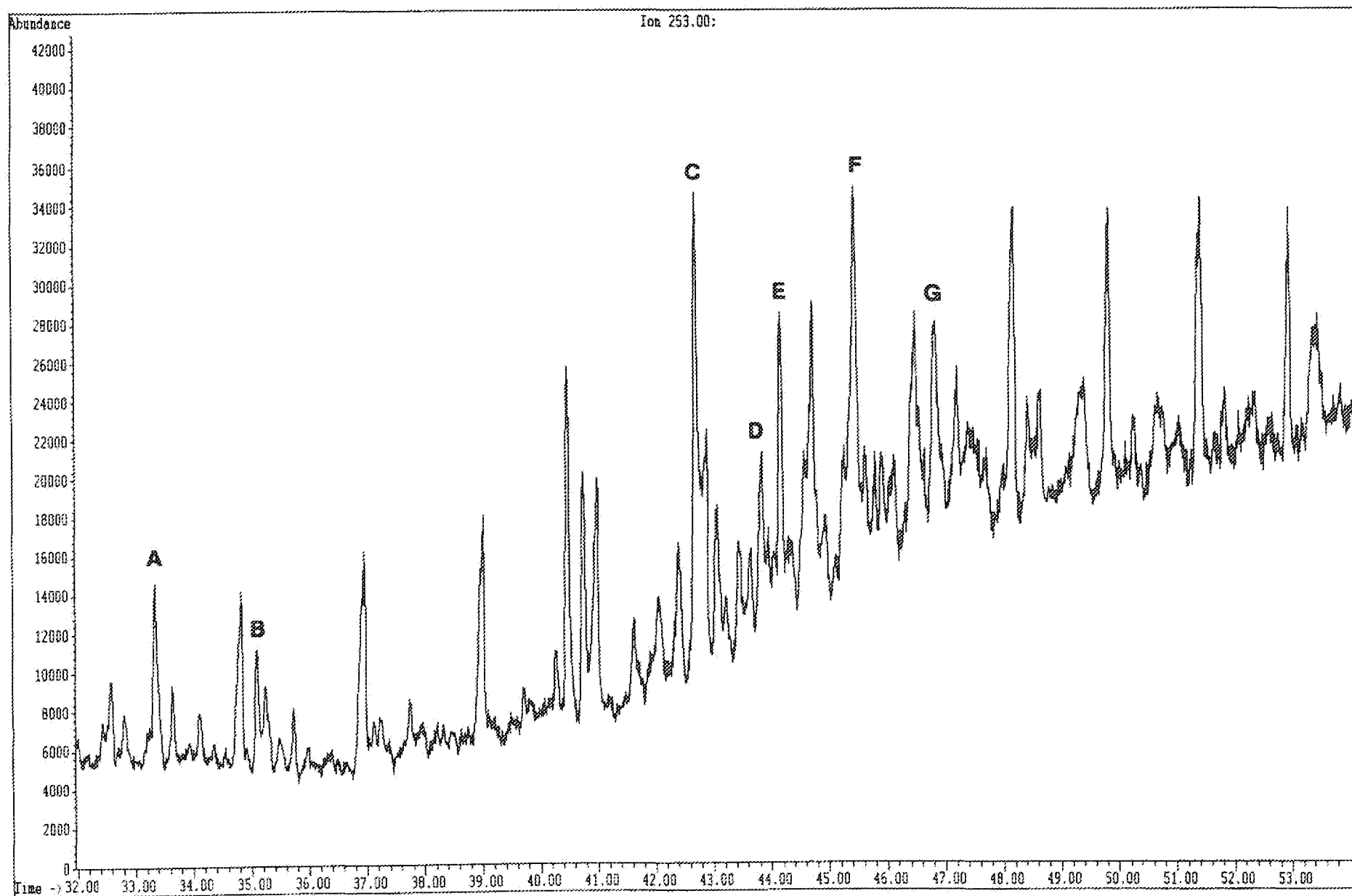
Misc Info: WELL 34/2-3 3372.4M

Bottle Number: 3

Dibenzothiophenes

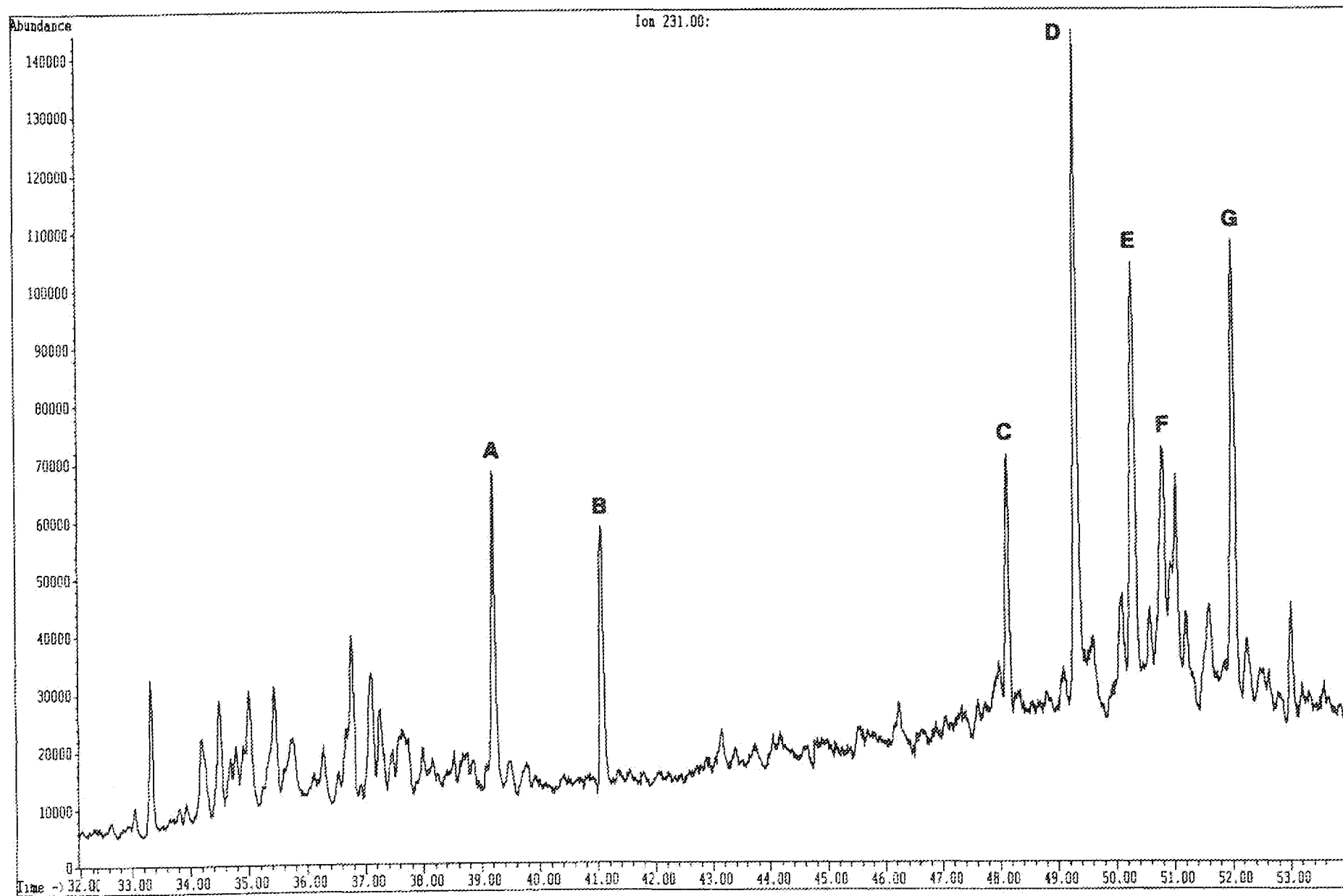


File: D:\CHEMPC\DATA\0301002.D
Operator:
Date Acquired: 12 Dec 90 7:40 pm
Method File Name: B10MY.M
Sample Name: 4136-002
Misc Info: WELL 34/2-3 3372.4M
Bottle Number: 3



File: D:\CHEMPC\DATA\0301002.D
Operator
Date Acquired: 12 Dec 90 7:40 pm
Method File Name: BICMY.M
Sample No: 4136-002
Misc In6: WELL 34/2-3 3372.4M
Bottle Number: 3

N3.21



33/12-7

TABLE 01
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

JOB 4137	DEPTH/ IDENTITY	GROSS LITHOLOGIC DESCRIPTION	G S A COLOUR CODE	TOTAL ORGANIC CARBON (Wt. %)
GEOCHEM SAMPLE NUMBER				

WELL: 33/12-7

4137-001	3035.1m	A100% SANDSTONE - coarse grained, blocky, 10YR6/2 mod hard, no F, no C, pale yellowish brown.		
4137-002	3037.9m	A100% SANDSTONE - med grained, blocky, mod hard, sl micaceous, no F, no C, very light grey.	N8	
4137-003	3041.7m	A100% SANDSTONE - med grained, blocky, mod hard, sl micaceous, dull gold F, no C, very light grey.	N8	

TABLE O2
CONCENTRATION (PPM) OF EXTRACTED C₁₅₊ MATERIAL IN ROCK

JOB 4137	LITHO	DEPTH/ IDENTITY	TOTAL EXTRACT	HYDROCARBONS			NON HYDROCARBONS			
GEOCHEM SAMPLE NUMBER				Saturates	Aromatics	TOTAL	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's	TOTAL

WELL: 33/12-7

4137-001	3035.1m	245	89	14	103	98	42	1	141
4137-002	3037.9m	382	138	33	171	143	66	1	211
4137-003	3041.7m	205	65	7	72	79	54	1	133

TABLE O3
COMPOSITION (NORMALISED %) OF C₁₅₊ MATERIAL

JOB 4137	L I T H O	DEPTH/ IDENTITY	HYDROCARBONS		NON HYDROCARBONS		
GEOCHEM SAMPLE NUMBER			Saturates	Aromatics	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's

WELL: 33/12-7

4137-001	3035.1m	36.56	5.67	40.22	17.18	0.37
4137-002	3037.9m	36.13	8.63	37.48	17.39	0.37
4137-003	3041.7m	31.53	3.60	38.29	26.13	0.45

TABLE O4
SIGNIFICANT C₁₅₊ RATIOS

JOB 4137	LITHO	DEPTH/ IDENTITY	TOC (%)	mg/g TOC						HYDROCARBONS % TOTAL EXTRACT	SATURATES /AROMATICS
GEOCHEM SAMPLE NUMBER				TOTAL EXTRACT	SATURATES	AROMATICS	TOTAL HYDROCARBONS	ELUTED NSO's	ASPHALTENES		

WELL: 33/12-7

4137-001	3035.1m	0.15	163.09	59.63	9.24	68.87	28.03	65.59	42.23	6.45
4137-002	3037.9m	0.15	254.79	92.05	21.99	114.04	44.30	95.51	44.76	4.19
4137-003	3041.7m	0.11	186.70	58.87	6.73	65.60	48.78	71.48	35.14	8.75

TABLE O5
C₁₅₊ CHROMATOGRAPHY WEIGHTS (gms)

JOB 4137	L									
GEOCHEM SAMPLE NUMBER	I T H O	DEPTH/ IDENTITY	ROCK EXTRACTED	TOTAL EXTRACT	PRECIPTD. ASPHALTENES	NC5	SATURATES	AROMATICS	ELUTED NSO's	NON-ELUTED NSO's

WELL: 33/12-7

4137-001A	3035.1m	22.3600	0.00547	0.00220	0.00327	0.00200	0.00031	0.00094	0.00002
4137-002A	3037.9m	21.2200	0.00811	0.00304	0.00507	0.00293	0.00070	0.00141	0.00003
4137-003A	3041.7m	21.6200	0.00444	0.00170	0.00274	0.00140	0.00016	0.00116	0.00002

TABLE 06
COMPOSITION (NORMALISED %) OF C₁₅+ SATURATE (PARAFFIN - NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	001	002	003
DEPTH	3035.1m	3037.9m	3041.7m
SAMPLE TYPE			
nC15	11.88	11.70	5.67
nC16	11.17	9.97	9.24
nC17	7.16	7.21	8.65
nC18	8.12	7.53	9.38
nC19	6.35	6.26	7.05
nC20	7.34	6.89	7.54
nC21	5.52	7.23	7.14
nC22	5.48	6.49	7.08
nC23	4.39	5.62	5.16
nC24	4.57	5.22	5.22
nC25	4.52	5.37	5.61
nC26	4.14	4.61	5.22
nC27	3.78	3.58	4.19
nC28	3.53	3.03	3.42
nC29	3.48	2.85	3.13
nC30	2.82	2.18	2.24
nC31	2.27	1.68	1.68
nC32	1.43	0.96	0.94
nC33	0.98	0.69	0.65
nC34	0.65	0.53	0.47
nC35	0.42	0.42	0.31
Paraffin	12.63	12.34	11.66
Isoprenoid	2.81	2.15	2.02
Naphthene	84.56	85.51	86.32
CPI 1 Index	0.94	1.03	0.97
CPI 2 Index	1.06	1.07	1.07
CPI 3 Index	0.99	0.94	0.97
Prist/Phytane	1.32	1.63	1.40
Prist/nC17	1.10	1.01	0.73
Phytane/nC18	0.73	0.59	0.49

Job Number : 4137

$$C.P.I. 1 = \frac{1}{2} \left[\frac{C_{21} + C_{23} + C_{25} + C_{27}}{C_{20} + C_{22} + C_{24} + C_{26}} + \frac{C_{21} + C_{23} + C_{25} + C_{27}}{C_{22} + C_{24} + C_{26} + C_{28}} \right]$$

$$C.P.I. 2 = \frac{1}{2} \left[\frac{C_{25} + C_{27} + C_{29} + C_{31}}{C_{24} + C_{26} + C_{28} + C_{30}} + \frac{C_{25} + C_{27} + C_{29} + C_{31}}{C_{26} + C_{28} + C_{30} + C_{32}} \right]$$

$$C.P.I. 3 = \frac{2 \times (C_{27})}{C_{26} + C_{28}}$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE 07
METHYLPHENANTHRENE INDICES (MPI)

JOB 4137	DEPTH/ IDENTITY	SAMPLE TYPE	MPI 1		Rcalc		MPI 2	
GEOCHEM SAMPLE NUMBER			AREA	HEIGHT	AREA	HEIGHT	AREA	HEIGHT

WELL: 33/12-7

4137-001	3035.1m		0.19	0.22			0.22	0.23
4137-002	3037.9m		0.15	0.17			0.17	0.18
4137-003	3041.7m		0.15	0.16			0.17	0.17

$$\text{MPI 1} = \frac{1.5(2\text{-MP} + 3\text{-MP})}{\text{P} + 1\text{-MP} + 9\text{-MP}} \quad \text{MPI 2} = \frac{3(2\text{-MP})}{\text{P} + 1\text{-MP} + 9\text{-MP}}$$

$$\text{Rcalc} = \begin{cases} 0.60(\text{MPI 1}) + 0.40 & (\text{if } R_o < 1.35\%) \\ -0.60(\text{MPI 1}) + 2.30 & (\text{if } R_o > 1.35\%) \end{cases}$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE O8

AROMATIC HYDROCARBONS RATIOS (MSD, PEAK AREA DATA)

SAMPLE NUMBER	DEPTH (m)	2MP/ 1MP	RATIO 1	RATIO 2	RATIO 3
------------------	--------------	-------------	---------	---------	---------

WELL: 33/12-7

4137-001A	3035.1	0.56	0.43	0.21	1.44
4137-002A	3037.9	0.66	0.46	0.21	1.25
4137-003A	3041.7	0.87	0.60	0.23	2.15

RATIO 1 = $A(231)/A(231) + G(231)$

RATIO 2 = $E(253)/E(253) + G(253)$

RATIO 3 = $A(253)/B(231) + E(253)$

TABLE 09
CARBON ISOTOPE COMPOSITIONS (‰,PDB)

JOB 4137								
GEOCHEM SAMPLE NUMBER	DEPTH/ IDENTITY	TOTAL EXTRACT WHOLE OIL	SATURATES	AROMATICS	NSO	ASPHALTENES	KEROGEN	PYROLYSATE (S2)

WELL: 33/12-7

4137-001	3035.1m	-29.57	-31.13	-28.15	-28.42	-28.49		
4137-002	3037.9m	-29.74	-30.82	-28.32	-28.95	-28.46		
4137-003	3041.7m	-29.82	-30.24	-29.77	-28.17	-28.72		

TABLE O10
BIOMARKER MOLECULAR RATIOS

WELL: 33/12-7

		Steranes (m/z 217)			Steranes (m/z 218)		
SAMPLE NUMBER	DEPTH (m)	<u>A</u>	<u>Q</u>	<u>(R+S)</u>	NORMALISED COMPOSITION:		
		(A+J)	(Q+T)	(Q+R+S+T)	B	D	F
4137-001A	3035.1	-	-	-	-	-	-
4137-002A	3037.9	-	-	-	-	-	-
4137-003A	3041.7	-	-	-	22%	33%	45%

TABLE O11
BIOMARKER MOLECULAR RATIOS

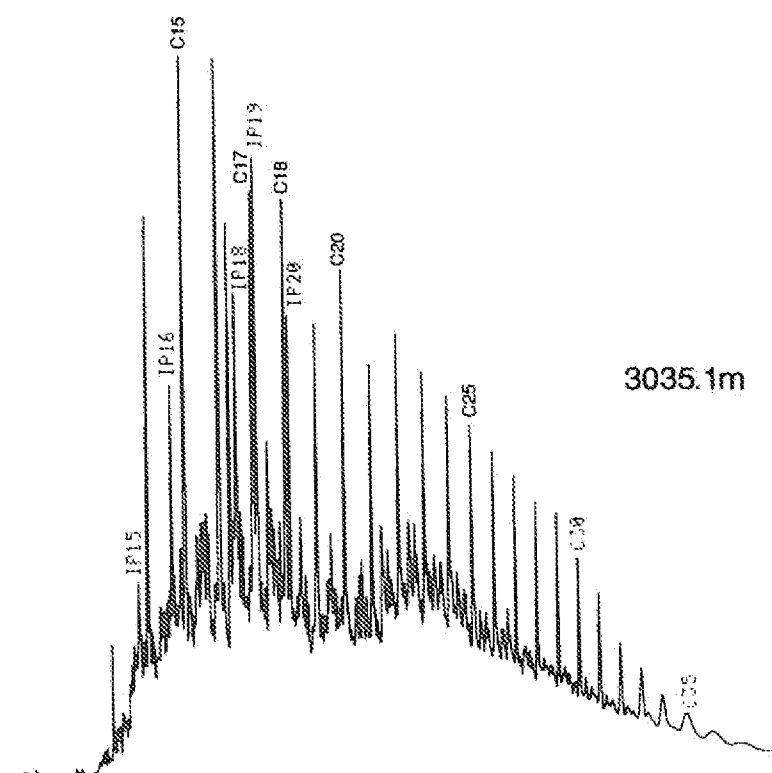
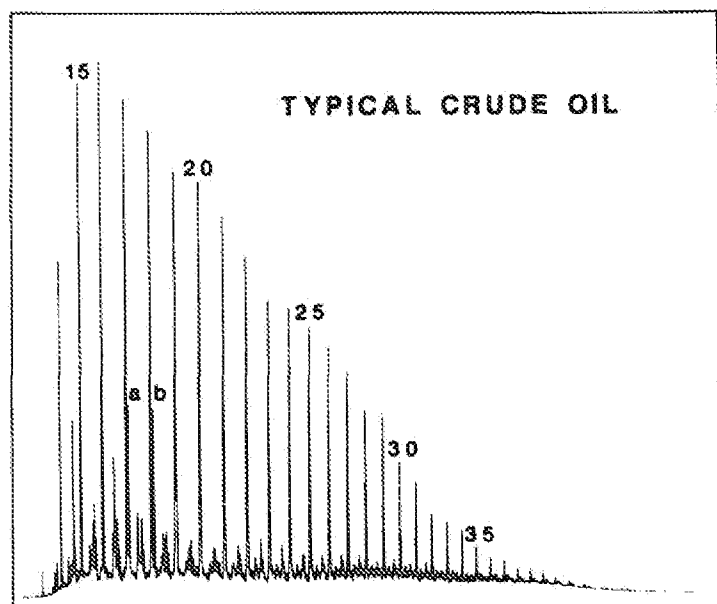
WELL 33/12-7

Terpanes (m/z 191)

SAMPLE NUMBER	DEPTH (m)	A/B	Z/E	Z/C	<u>Z</u> (Z+E)	<u>C</u> (C+E)	%22S for J	<u>E</u> (E+F)	<u>X</u> (X+D)	Q/E
4137-001A	3035.1	0.45	-	-	-	0.25	58%	0.96	-	-
4137-002A	3037.9	0.64	-	-	-	0.24	68%	0.90	-	-
4137-003A	3041.7	0.38	-	-	-	0.42	75%	-	-	-

FIGURE O1.1 C₁₅+ SATURATES CHROMATOGRAMS

WELL 33/12-7



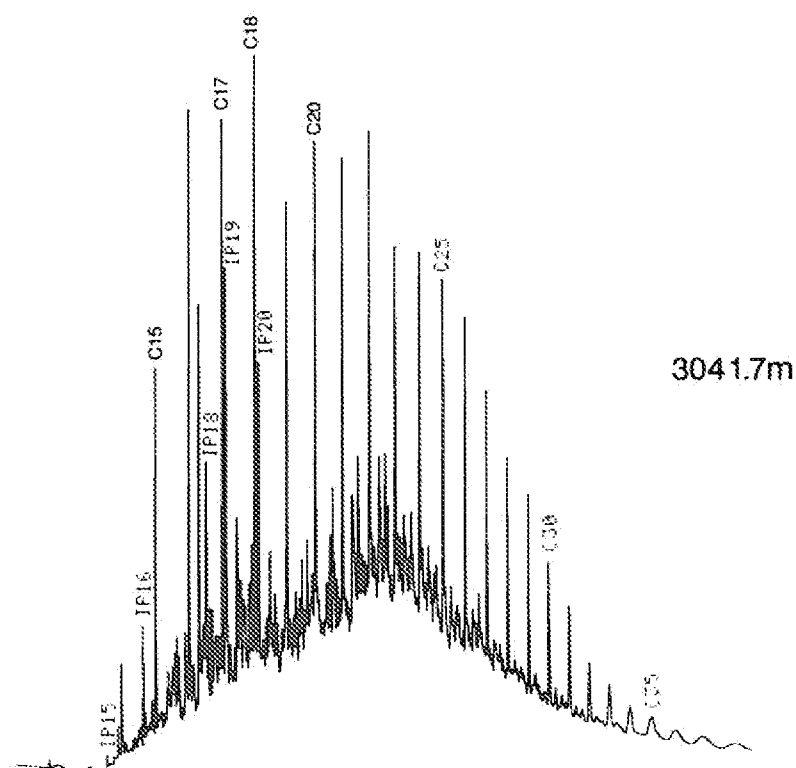
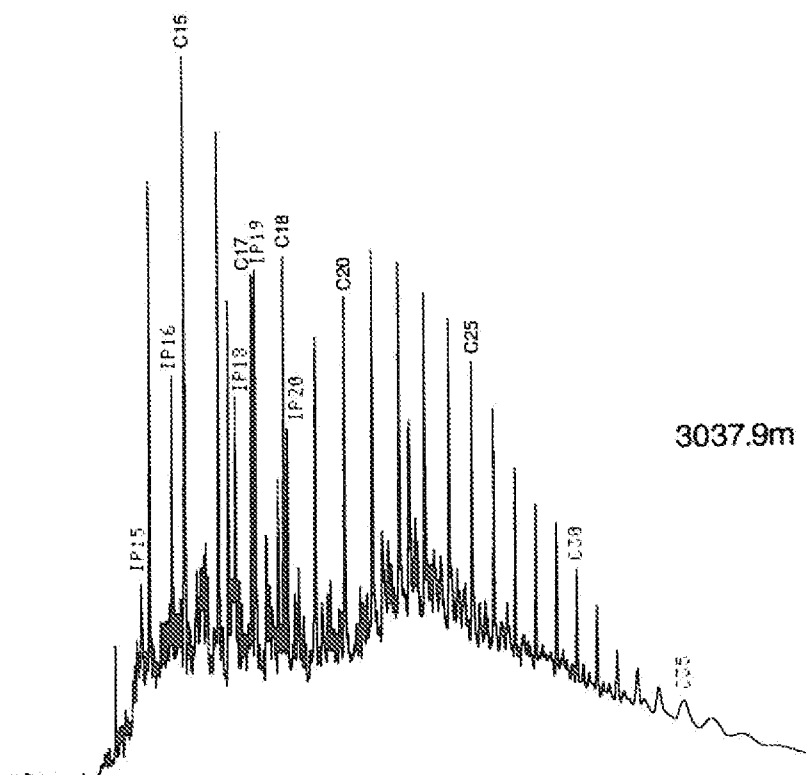
a = PRISTANE

b = PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20~nC₂₀)

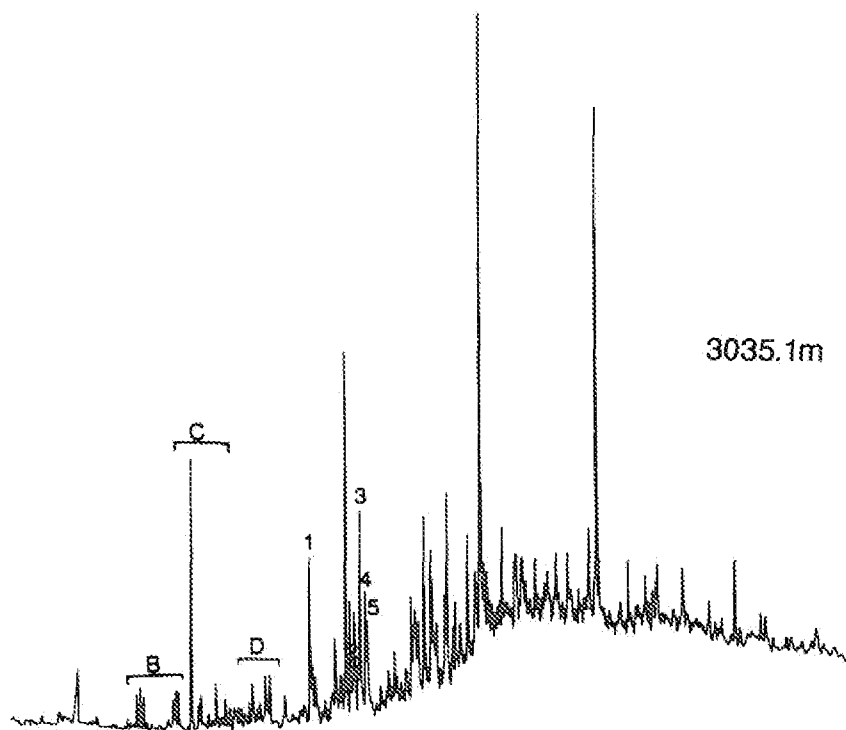
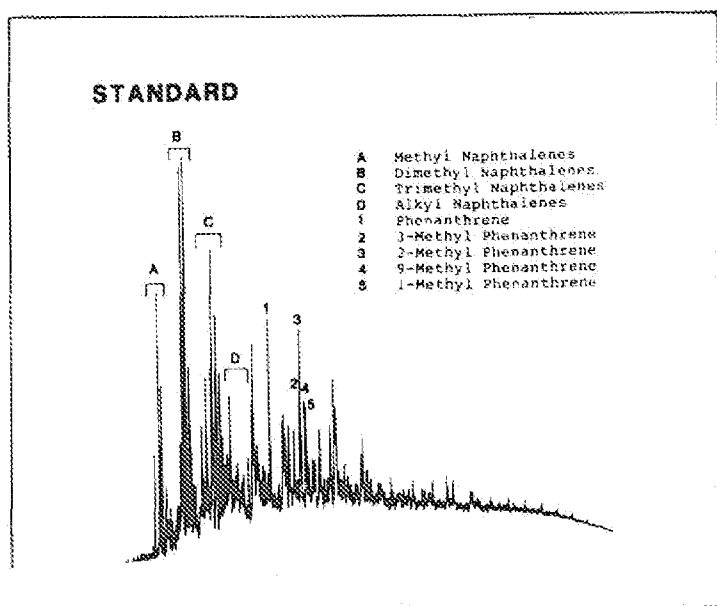
FIGURE O1.2 C₁₅+ SATURATES CHROMATOGRAMS

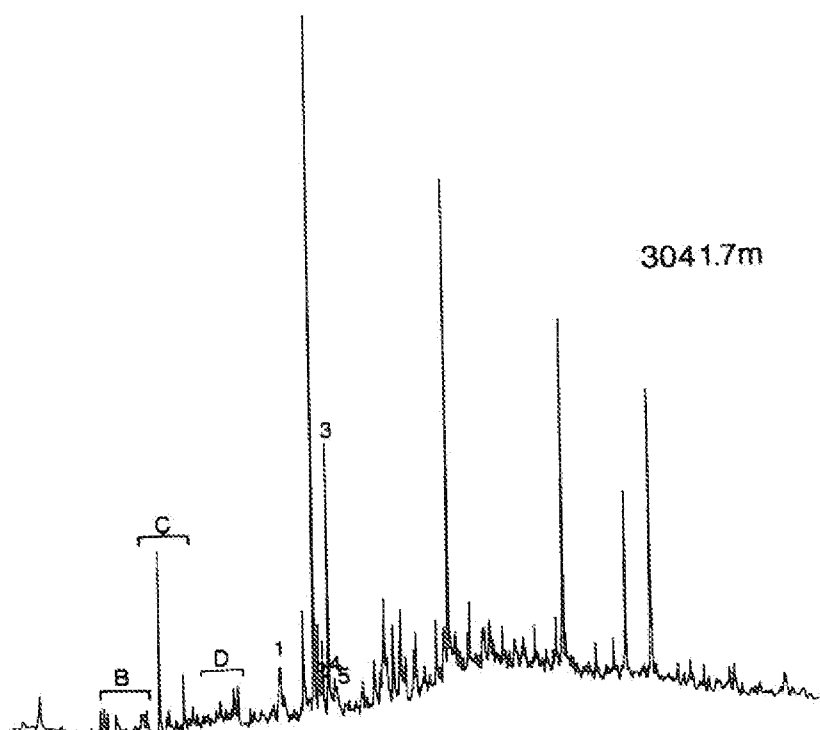
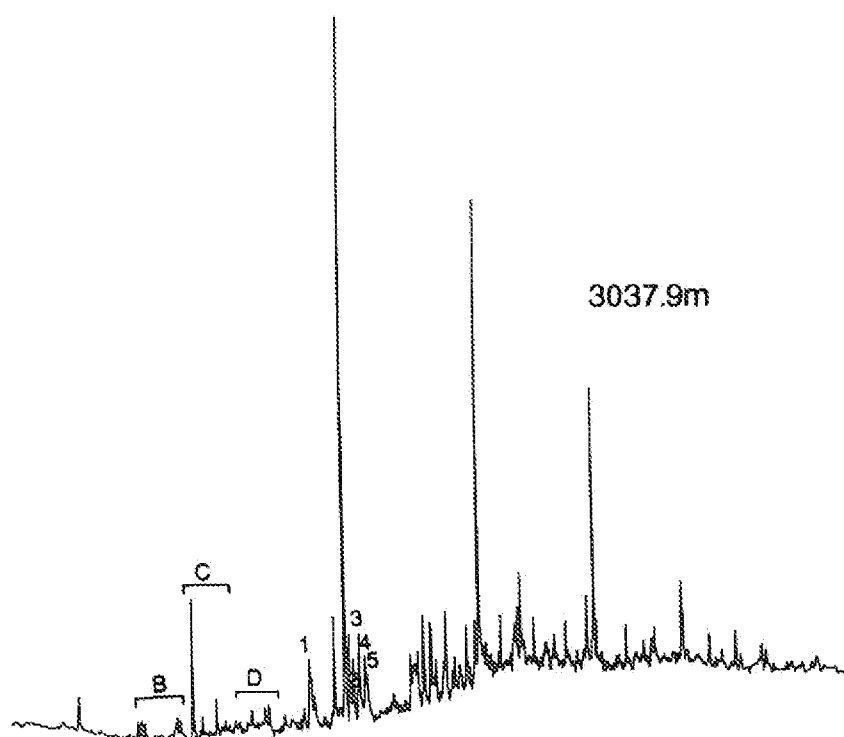
WELL 33/12-7



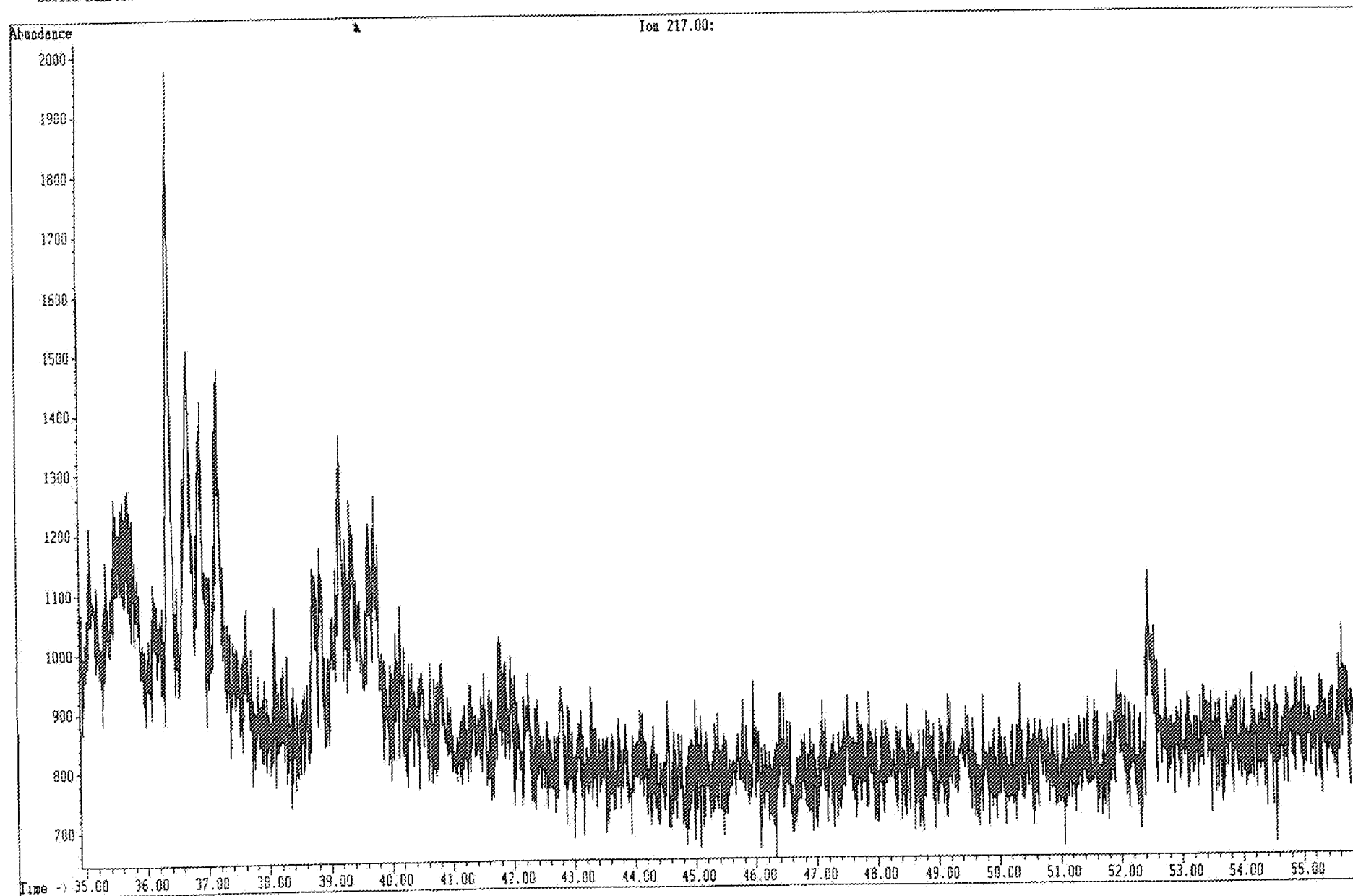
a = PRISTANE
b = PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)



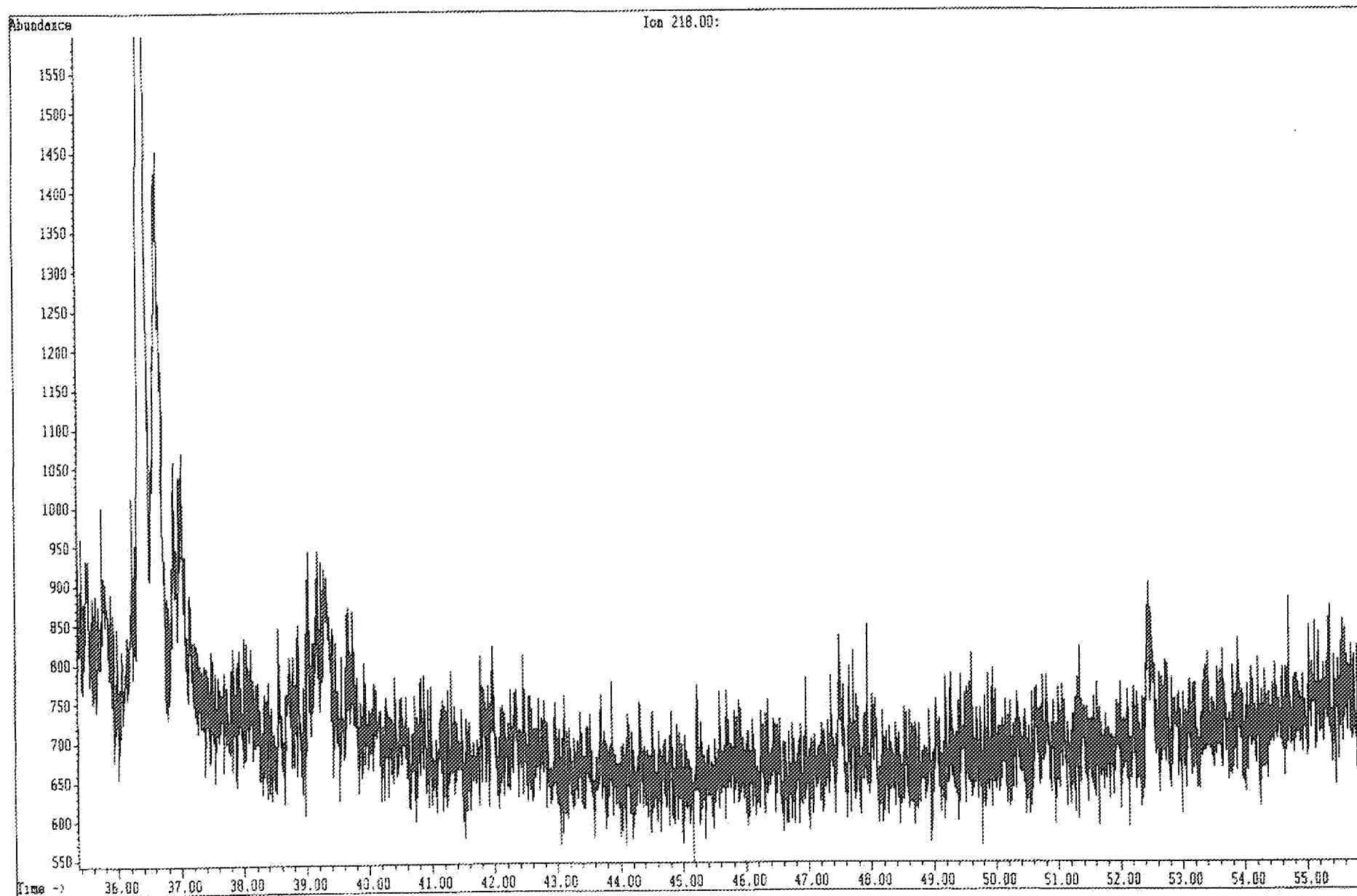


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Operator:
Date Acquired: 15 Dec 90 5:24 am
Method File Name: BIOM.M
Sample Name: 4137-001
Misc Info: WELL 33/12-7 3035.1M
Bottle Number: 37



File: C:\CHEMPC\DATA\3701016.D
Operator:
Date Acquired: 15 Dec 90 5:24 am
Method File Name: BIOM.M
Sample Name: 4137-001
Misc Info: WELL 33/12-7 3035.1M
Bottle Number: 37

O3.1b



File: C:\CHEMP\DATA\3701016.D

O3.1c

Operator:

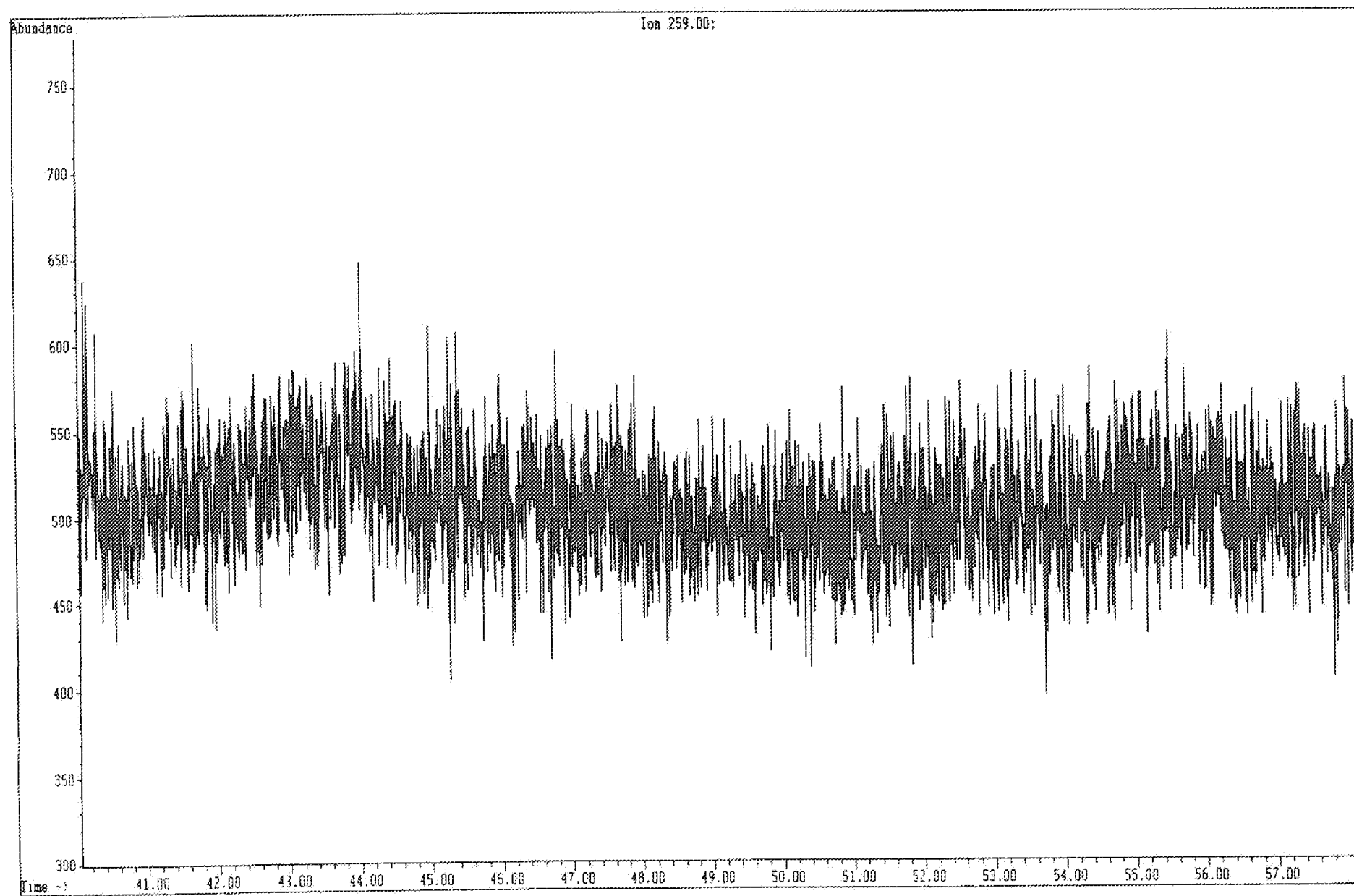
Date Acquired: 15 Dec 90 5:24 am

Method File Name: BIOM.M

Sample Name: 4137-081

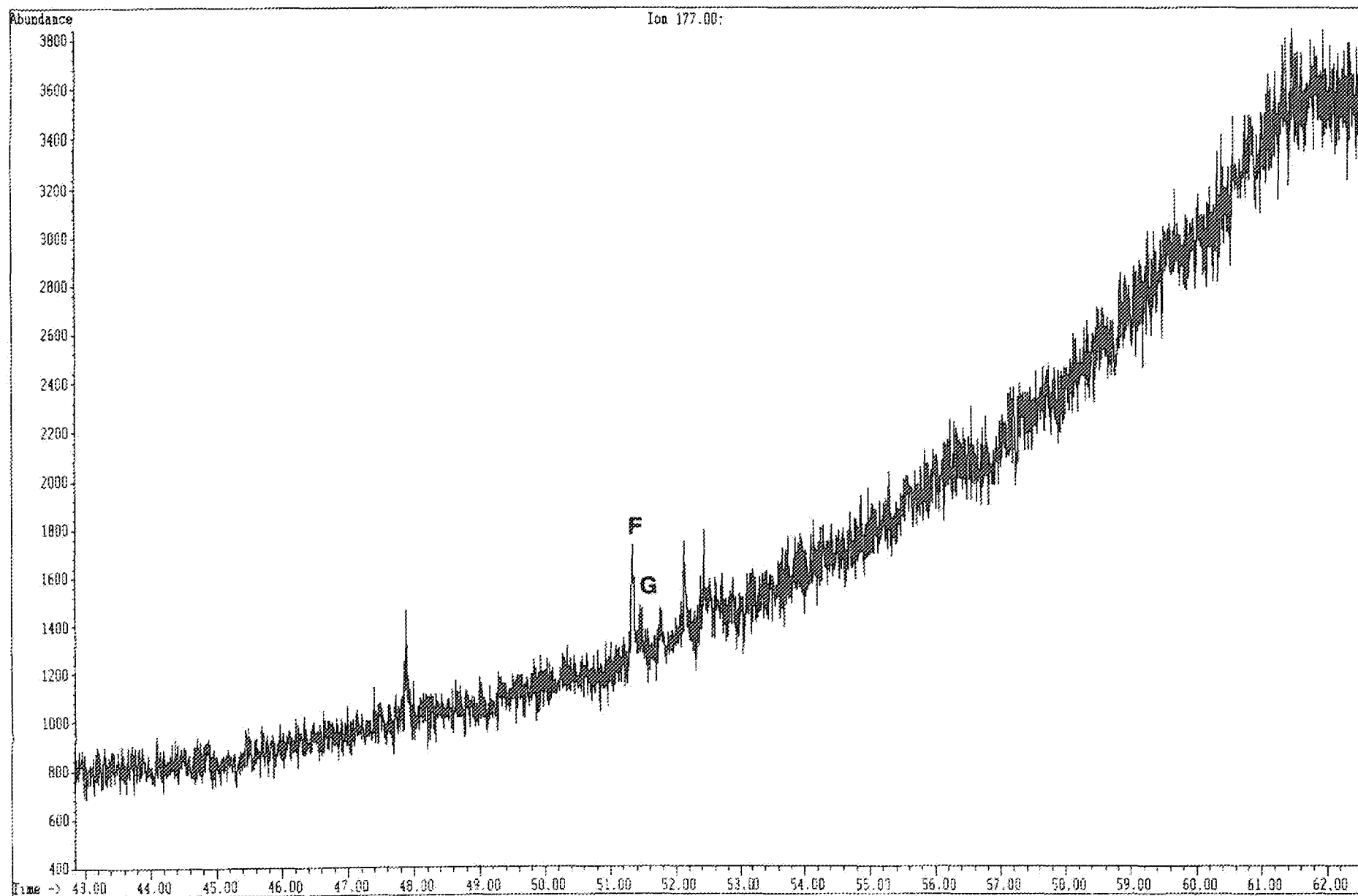
Misc Info: WELL 33/12-7 3035.1M

Bottle Number: 37



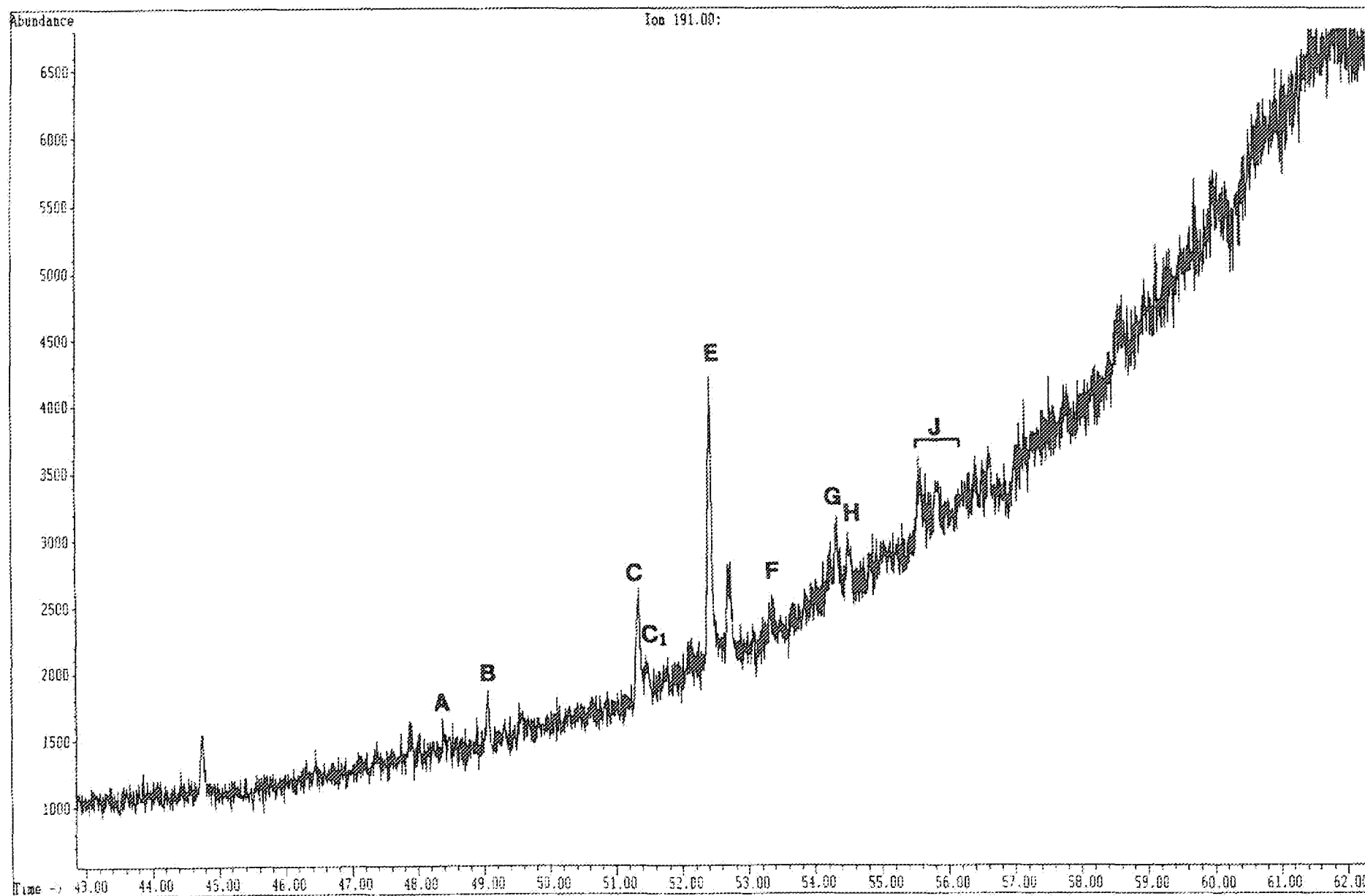
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Operator:
Date Acquired: 15 Dec 90 5:24 am
Method File Name: BIOM.M
Sample Name: 4137-001
Misc Info: WELL 33/12-7 3035.1M
Bottle Number: 37

03.1d



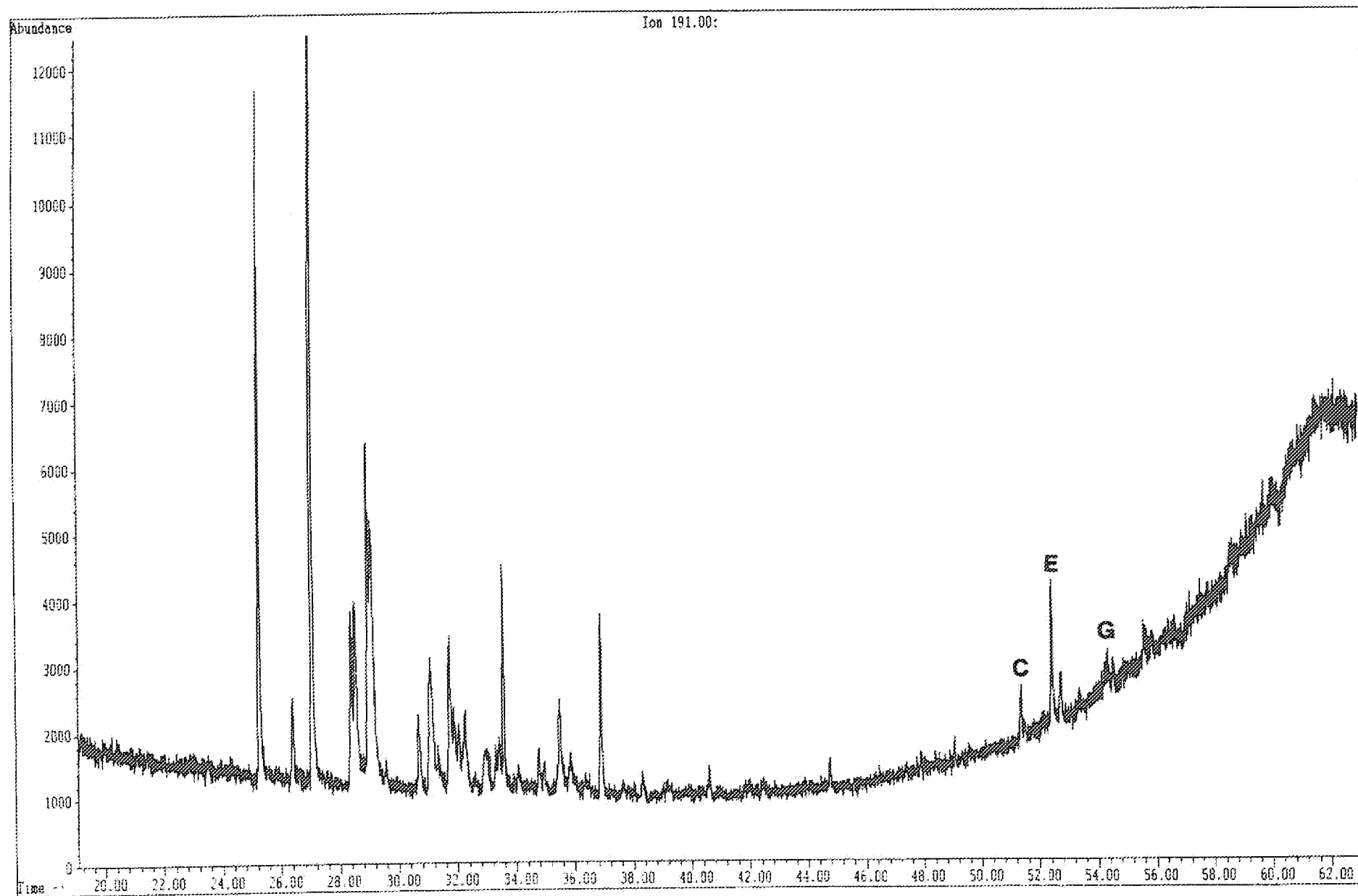
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Operator:
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Method File Name: BIOM.M
Sample Name: 4137-001
Misc Info: WELL 33/12-7 3035.1M
Bottle Number: 37

O3.1e



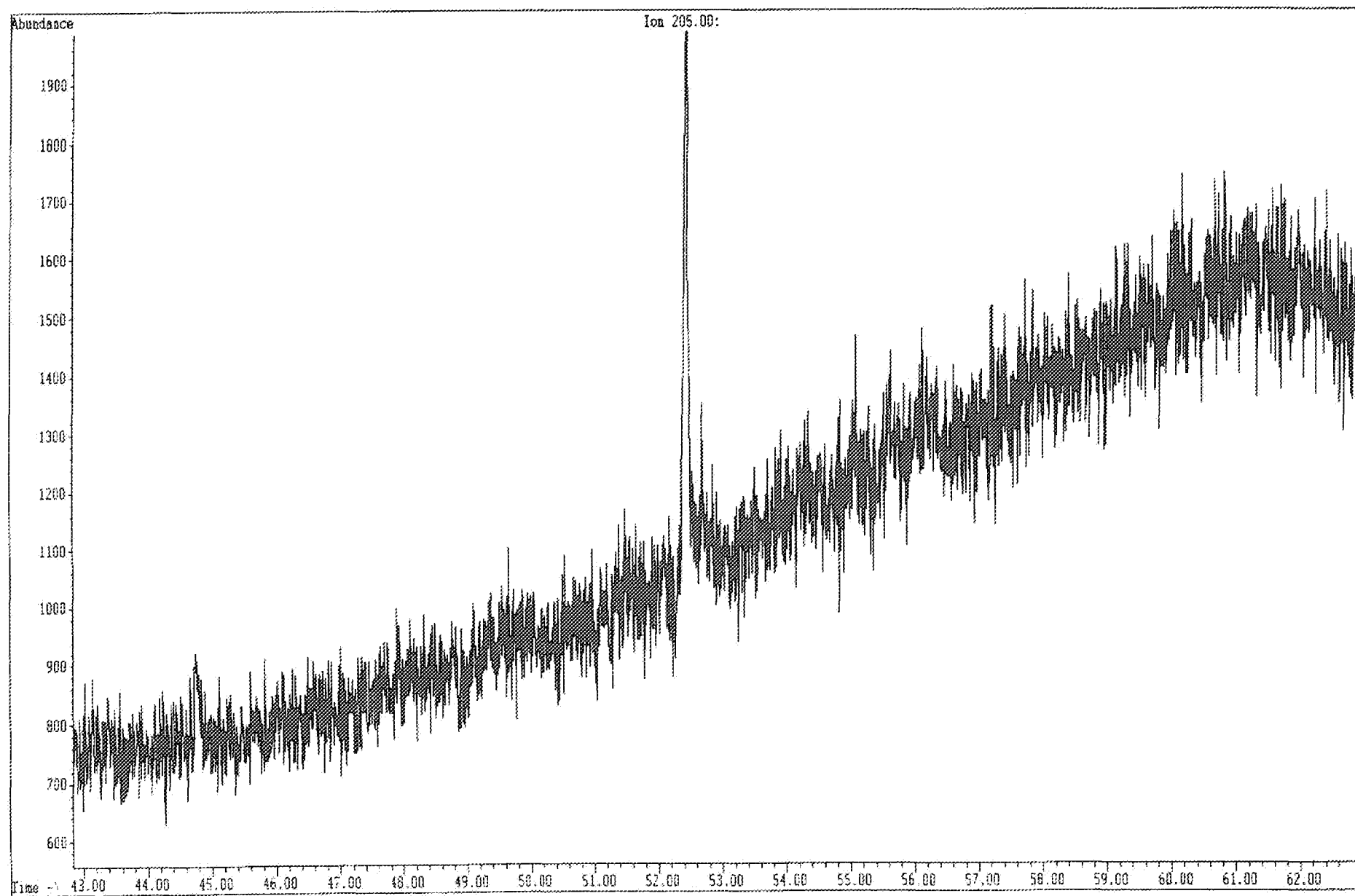
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Operator:
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Sample Name: 4137-001
Misc Info: WELL 33/12-7 3035.1M
Bottle Number: 37

O3.1f



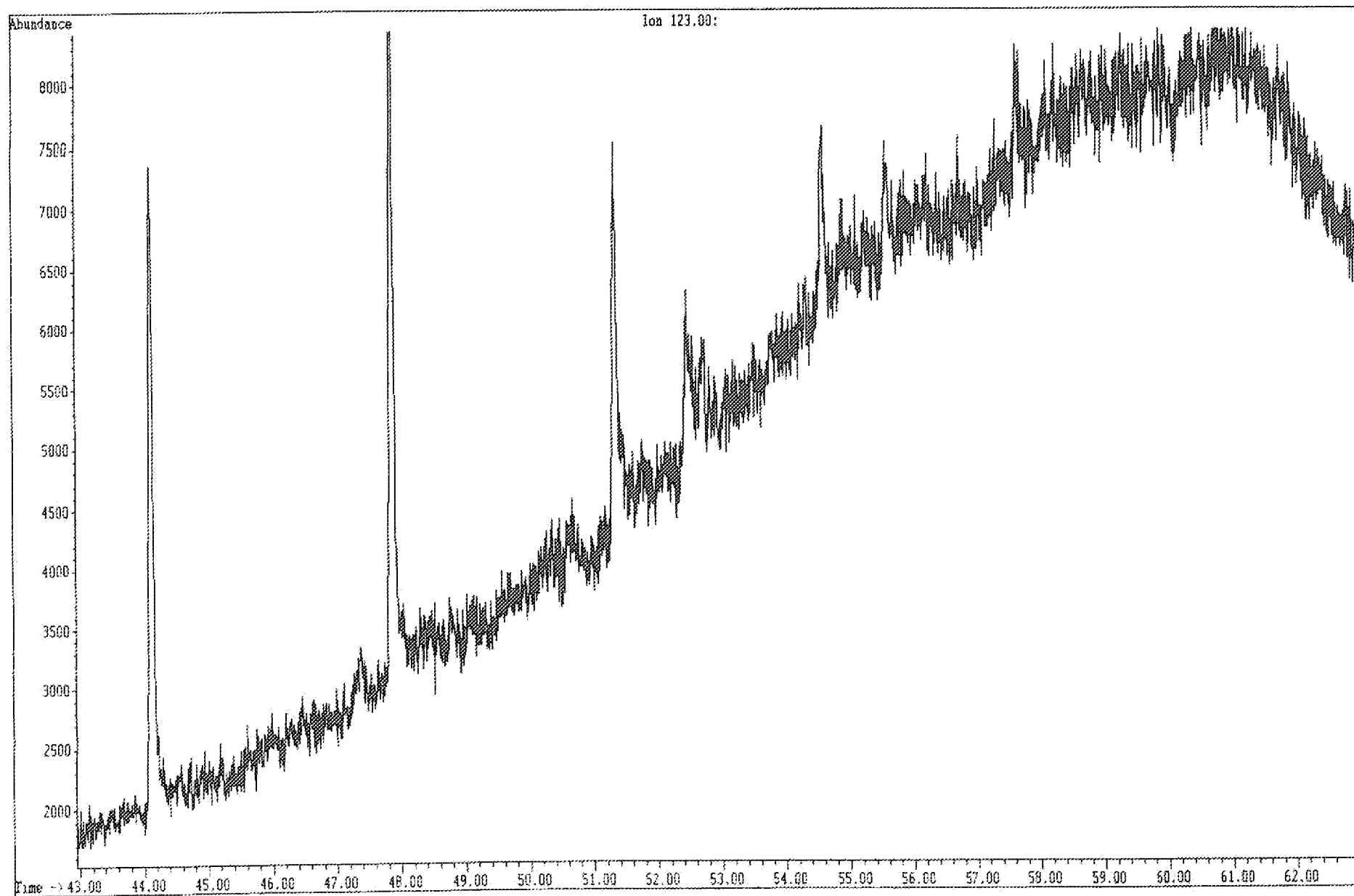
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Operator:
Date Acquired: 15 Dec 90 5:24 am
Method File Name: BIOM.M
Sample Name: 4137-001
Misc Info: WELL 33/12-7 3035.1M
Bottle Number: 37

O3.1g



File: C:\CHEMP\DATA\3701016.D
Operator:
Date Acquired: 15 Dec 90 5:24 am
Method File Name: B10M.M
Sample Name: 4137-001
Misc Info: WELL 33/12-7 3035.1M
Bottle Number: 37

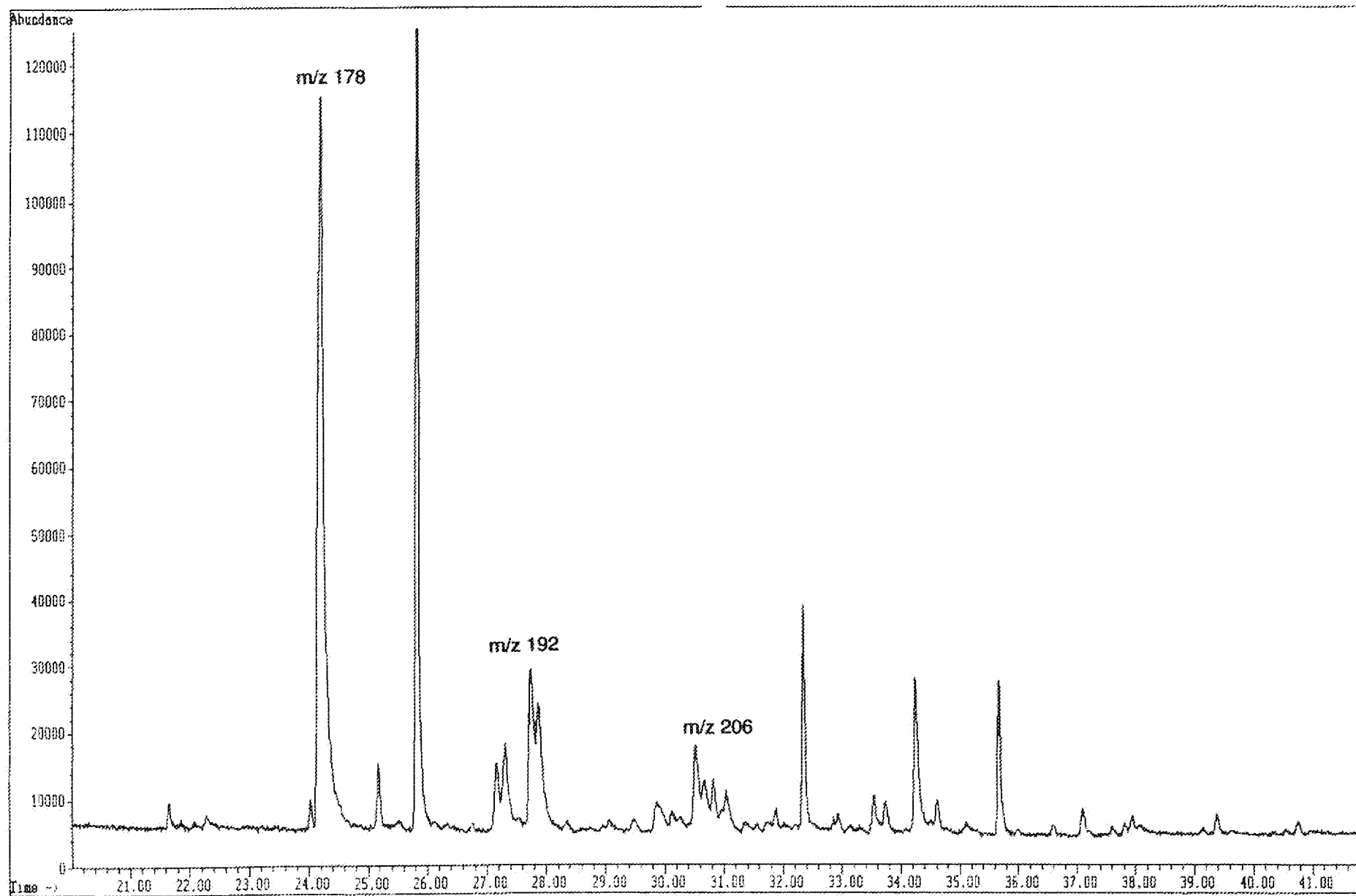
03.1h



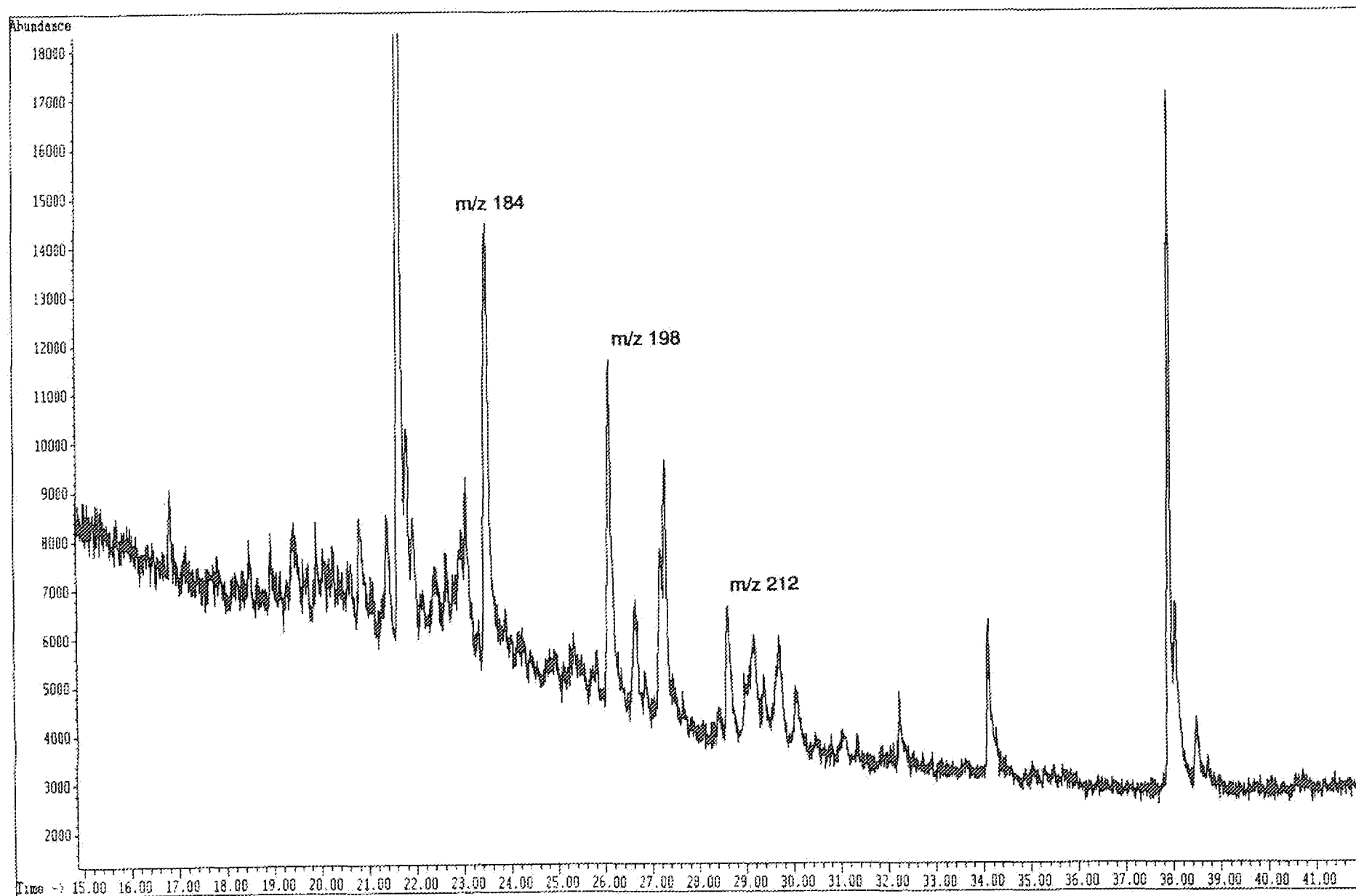
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Operator:
Date Acquired: 12 Dec 90 8:49 pm
Method File Name: BICMY.M
Sample Name: 4137-001
Misc Info: WELL 33/12-7 3035.1M
Bottle Number: 4

O3.1i

Phenanthrenes



File: C:\CHEMPC\DATA\0401003.D
Operator:
Date Acquired: 12 Dec 90 8:49 pm
Method File Name: B10MY.M
Sample Name: 4137-001
Misc Info: WELL 33/12-7 3035.1M
Bottle Number: 4

Dibenzothiophenes

File: C:\CHEMPC\DATA\0401003.D

O3.1k

Operator:

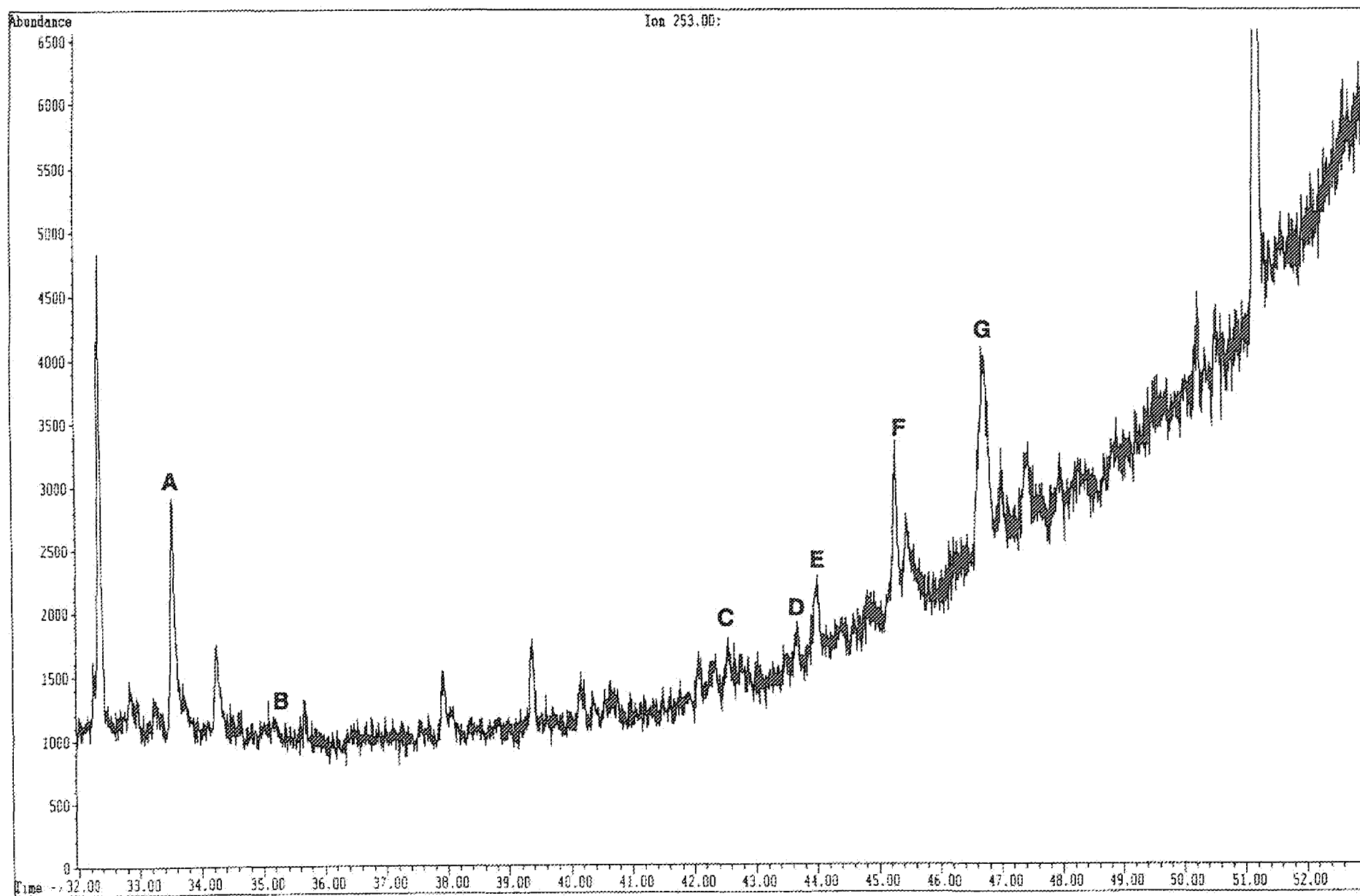
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Method File Name: BIONY.M

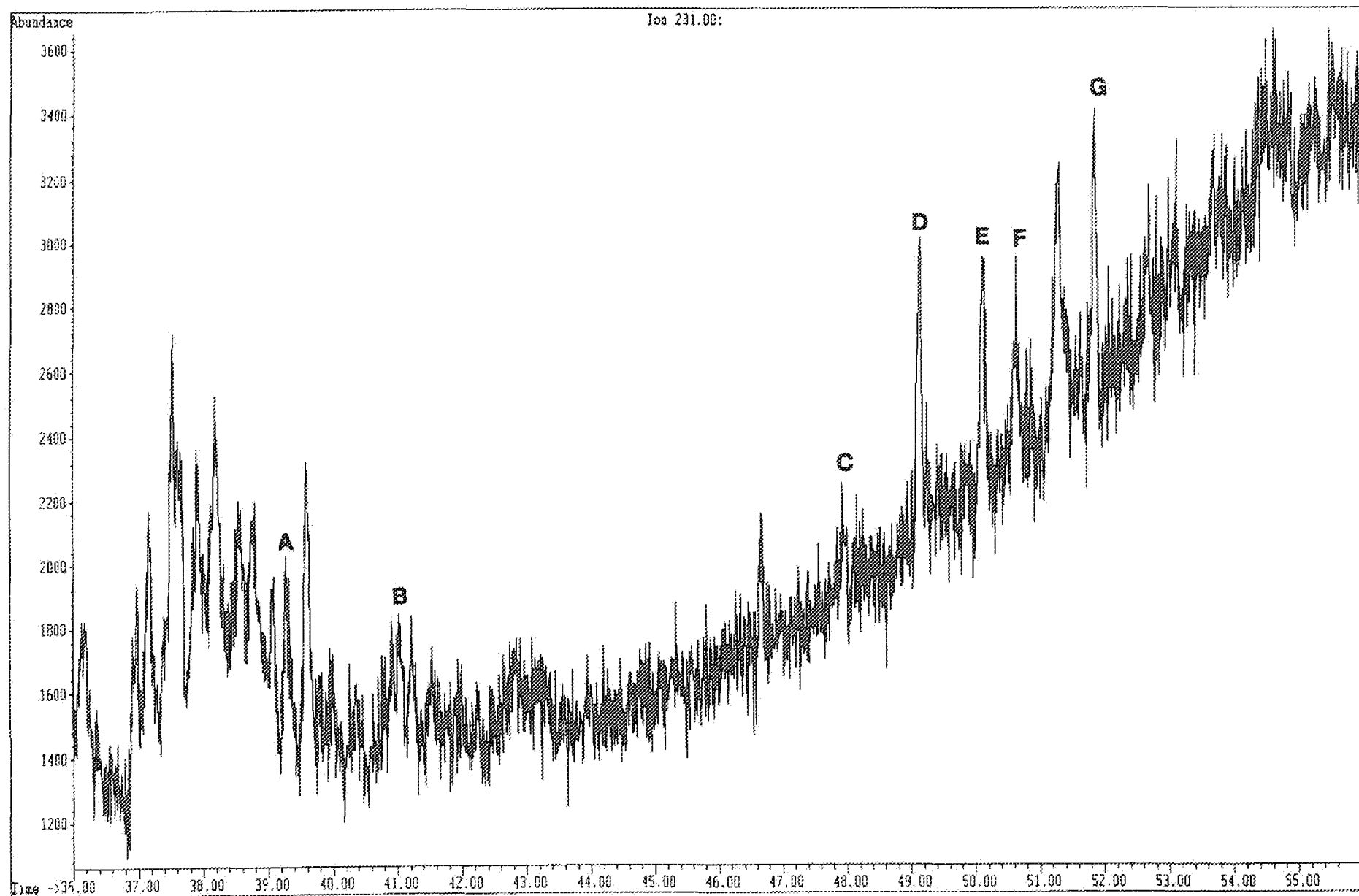
Sample Name: 4137-001

Misc Info: WELL 33/12-7 3035.1M

Bottle Number: 4

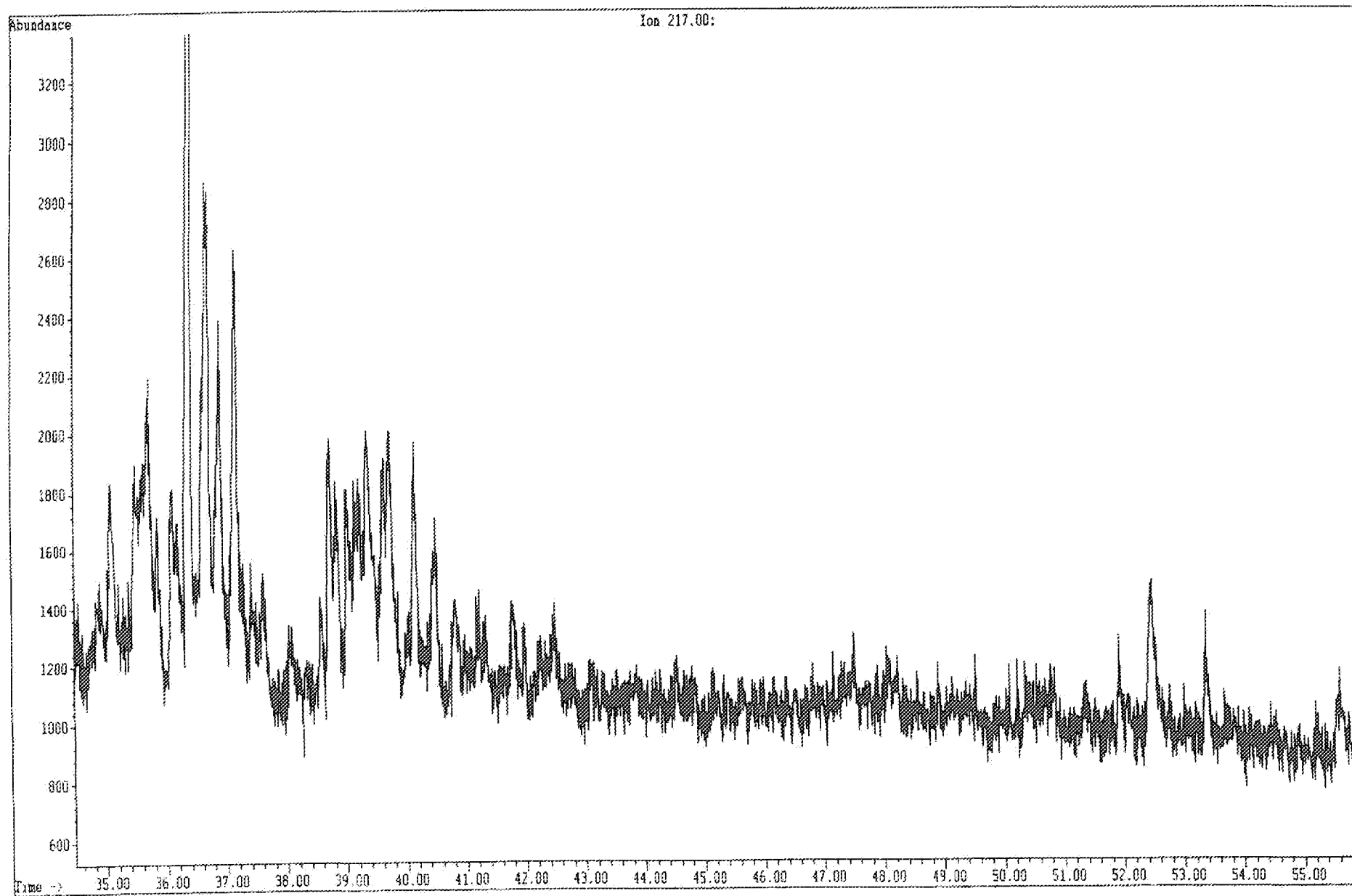


File: C:\CHEMPC\DATA\0401003.D
Operator:
Date Acquired: 12 Dec 90 8:49 pm
Method File Name: BIOMY.M
Sample Name: 4137-001
Misc Info: WELL 31/12-7 3035.1M
Bottle Number: 4



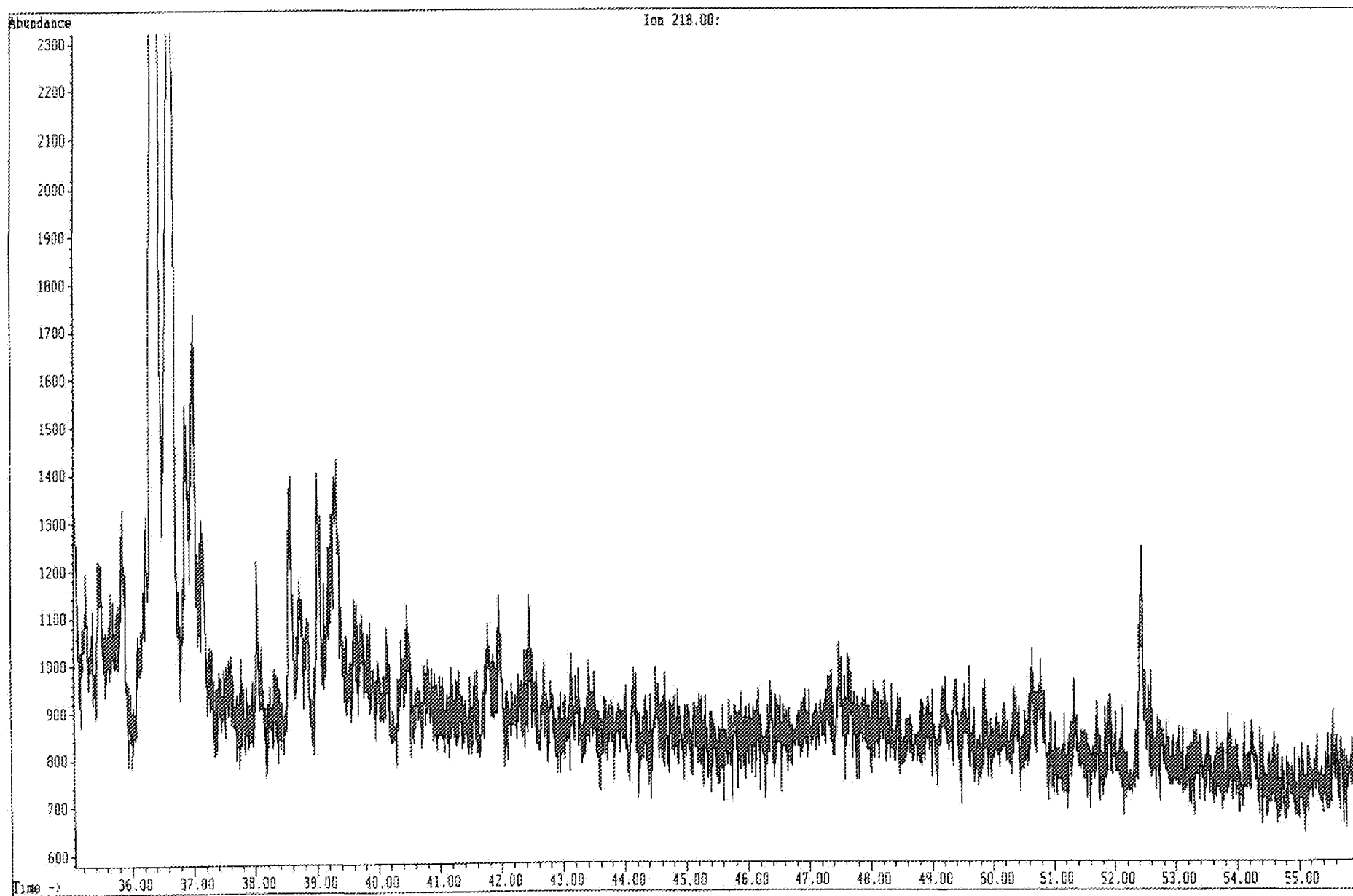
File: C:\CHEMPC\DATA\3801017.D
Operator:
Date Acquired: 15 Dec 90 6:34 am
Method File Name: BIOM.M
Sample Name: 4137-002
Misc Info: WELL 33/12-7 3037.9M
Bottle Number: 38

O3.2a



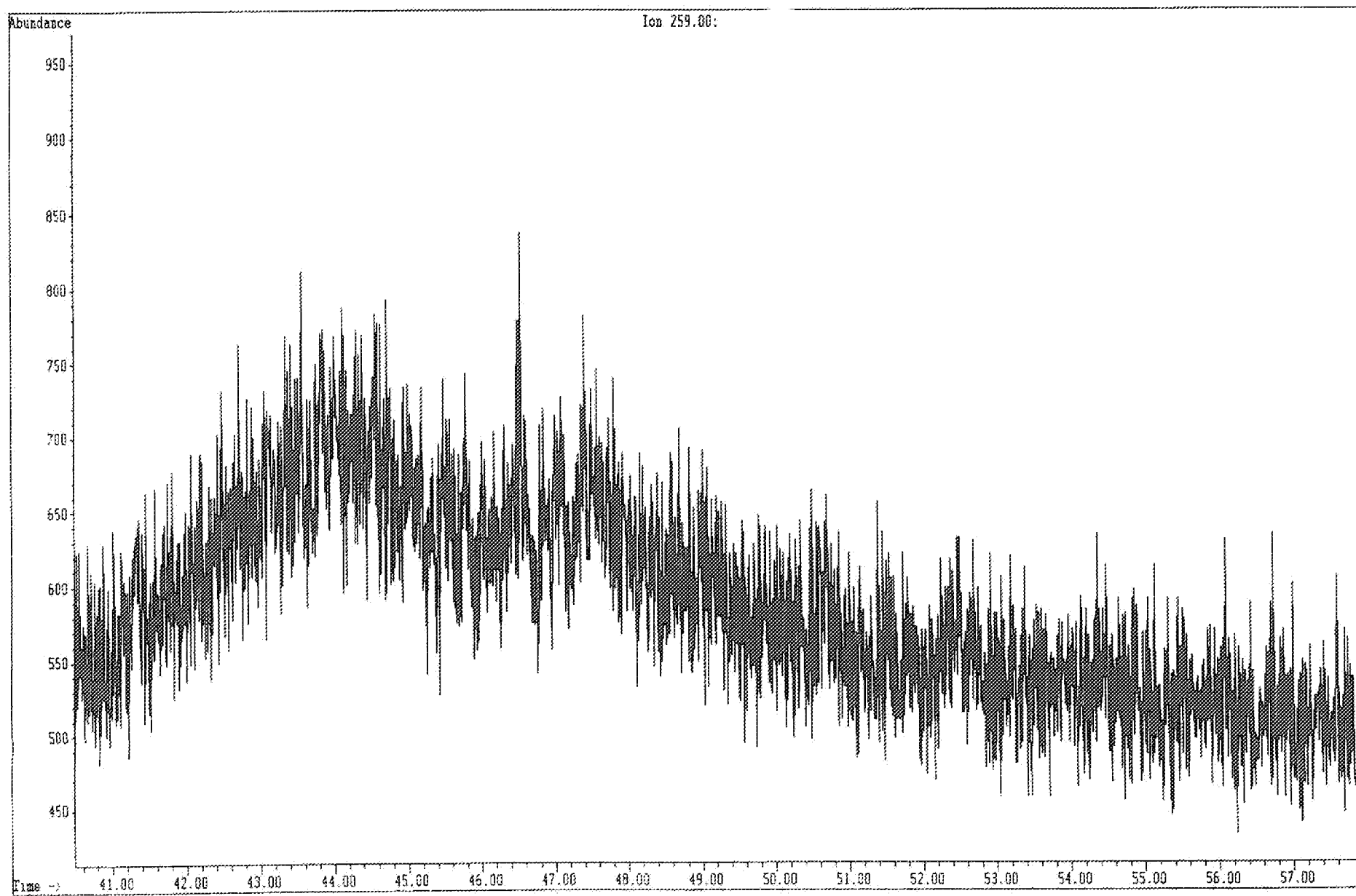
File: C:\CHEMPC\DATA\3801017.D
Operator:
Date Acquired: 15 Dec 90 6:34 am
Method File Name: BIOW.M
Sample Name: 4137-002
Misc Info: WELL 33/12-7 3037,9M
Bottle Number: 38

O3.2b



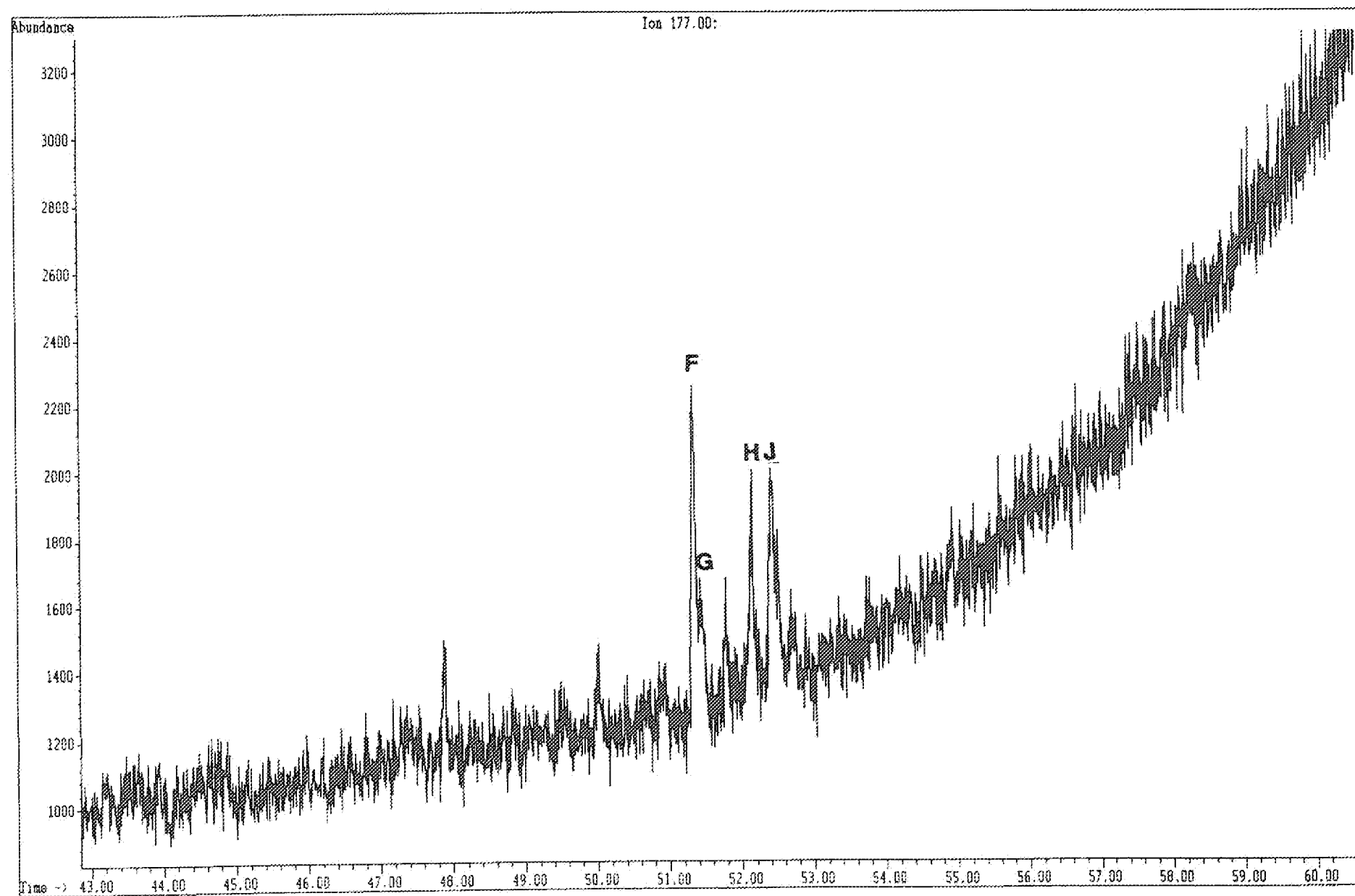
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Operator:
Date Acquired: 15 Dec 90 6:34 am
Method File Name: BIOM.M
Sample Name: 4137-002
Misc Info: WELL 33/12-7 3837.9M
Bottle Number: 38

03.2c



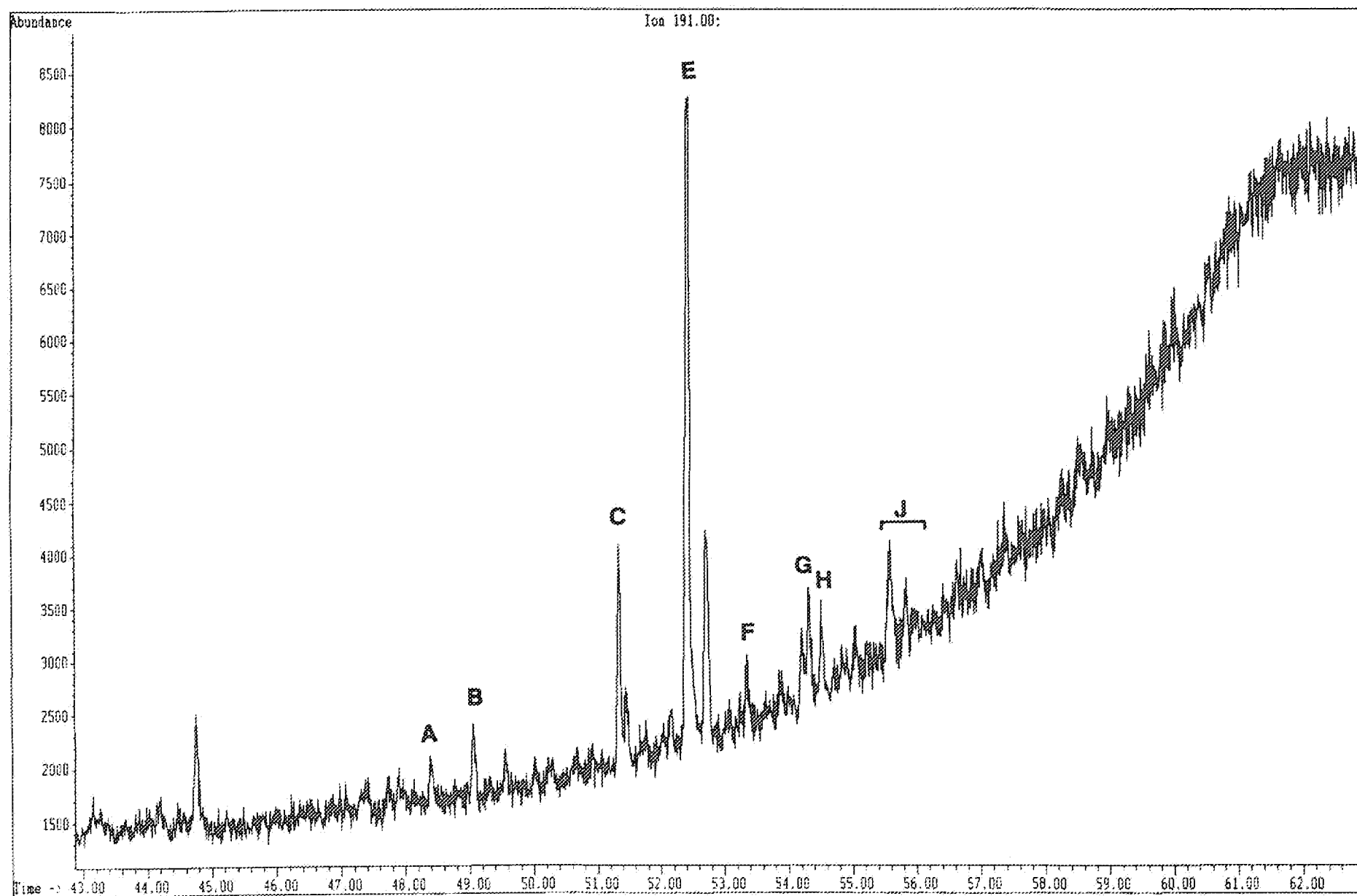
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Operator:
Date Acquired: 15 Dec 90 6:34 am
Method File Name: BIOM.M
Sample Name: 4137-002
Misc Info: WELL 93/12-7 3037.9M
Bottle Number: 38

O3.2d



File: C:\CHEMPC\DATA\3801017.D
Operator:
Date Acquired: 15 Dec 90 6:34 am
Method File Name: BIOM.M
Sample Name: 4137-002
Misc Info: WELL 33/12-7 3037.9M
Bottle Number: 38

O3.2e



File: C:\CHEMPC\DATA\3801017.D

Operator:

Date Acquired: 15 Dec 90 6:34 am

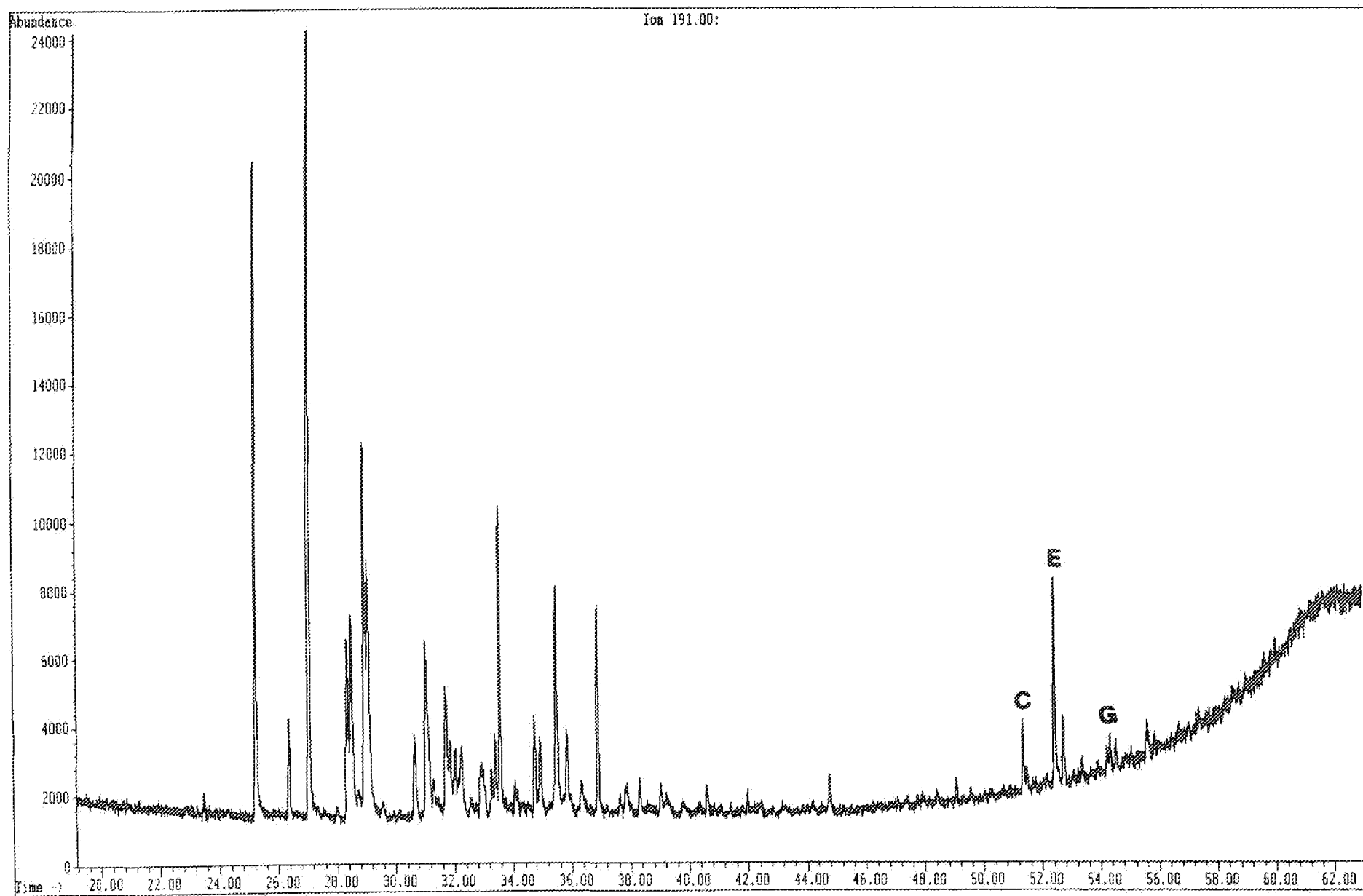
Method File Name: B10M.M

Sample Name: 4137-002

Misc Info: WELL 33/12-7 3037.9M

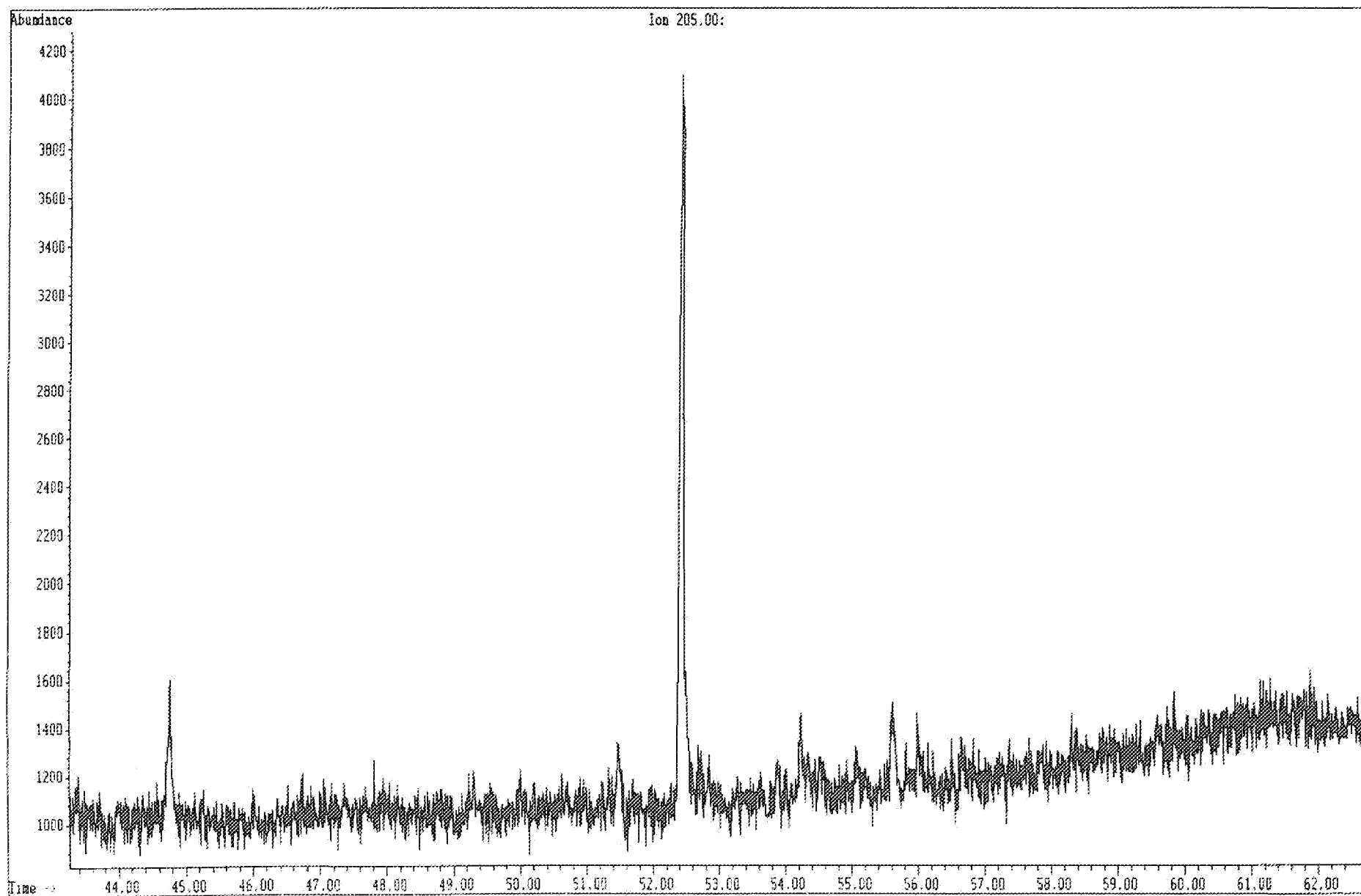
Bottle Number: 38

03.2f



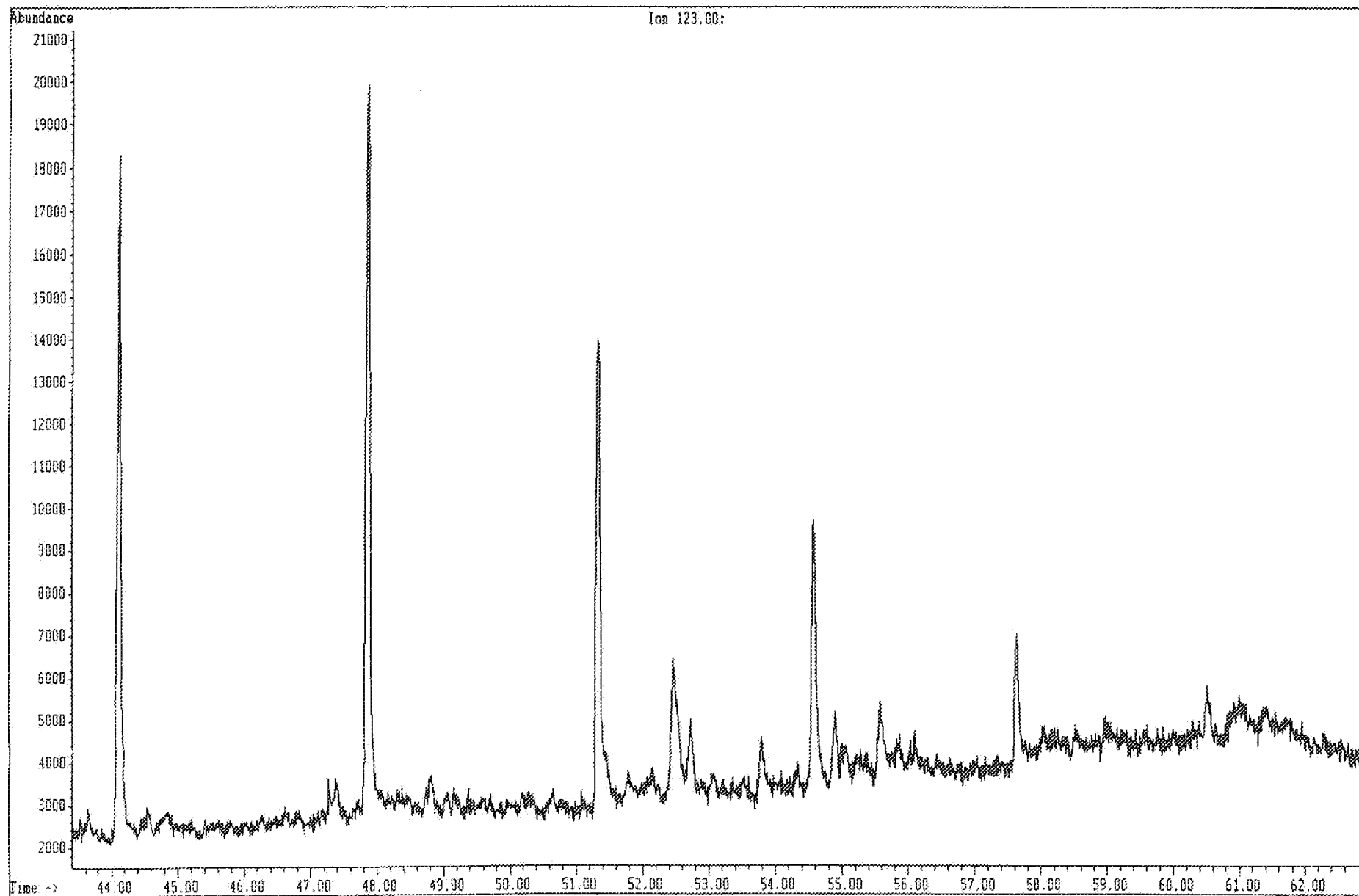
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Operator:
Date Acquired: 15 Dec 90 6:34 am
Method File Name: B10M.M
Sample Name: 4137-002
Misc Info: WELL 33/12-7 3037.9M
Bottle Number: 38

03.2g



File: C:\CHEMPC\DATA\3901017.D
Operator:
Date Acquired: 15 Dec 90 6:34 am
Method File Name: BIOM.M
Sample Name: 4137-002
Misc Info: WELL 33/12-7 3037.9M
Bottle Number: 38

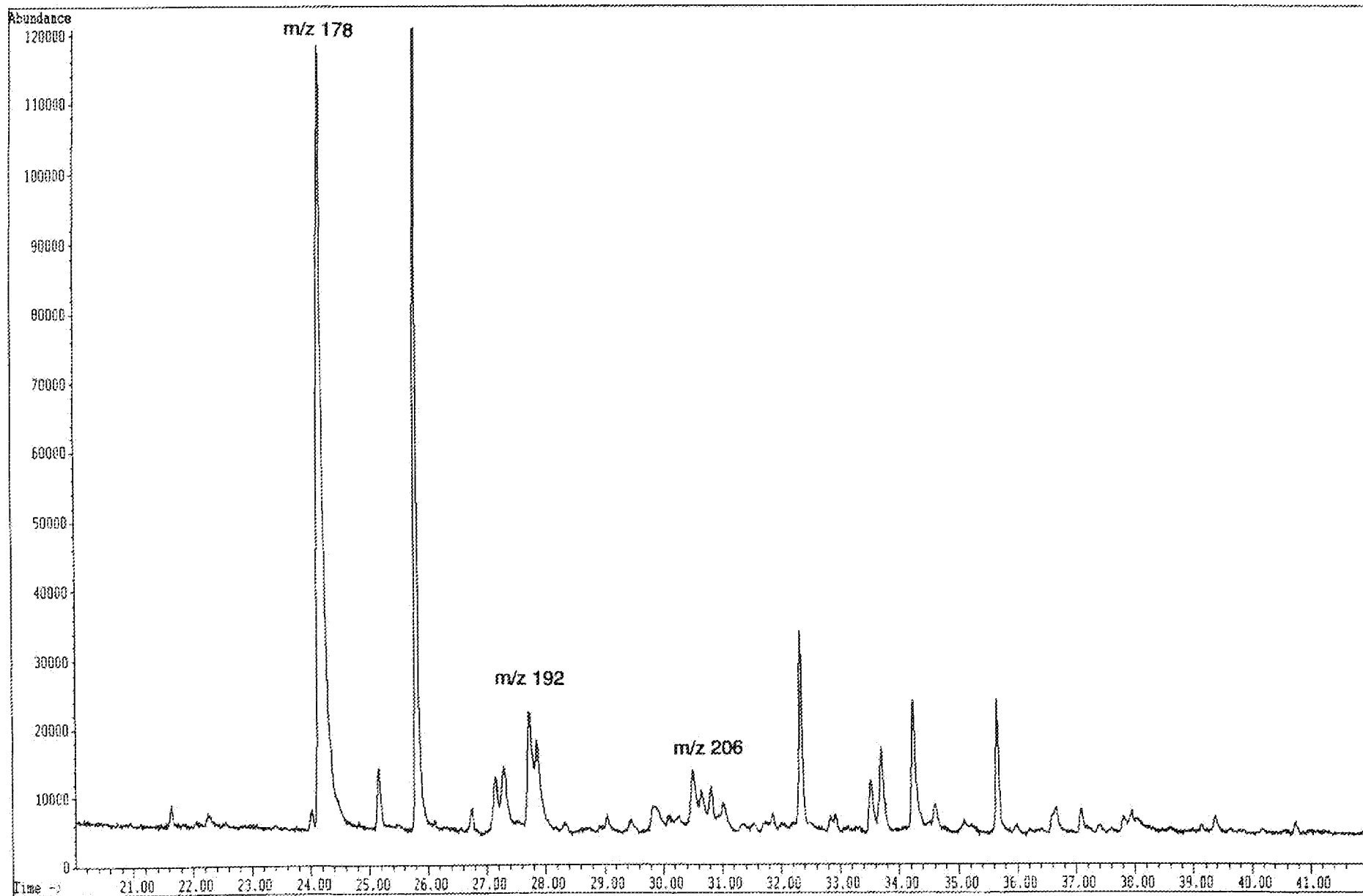
03.2h



File: C:\CHEMPC\DATA\0501004.D
Operator:
Data Acquired: 12 Dec 90 9:57 pm
Method File Name: BIOMY.M
Sample Name: 4137-002
Misc Info: WELL 33/12-7 3037.9M
Bottle Number: 5

03.2i

Phenanthrenes



File: C:\CHEMPC\DATA\0501004.D

032j

Operator:

Date Acquired: 12 Dec 90 9:57 pm

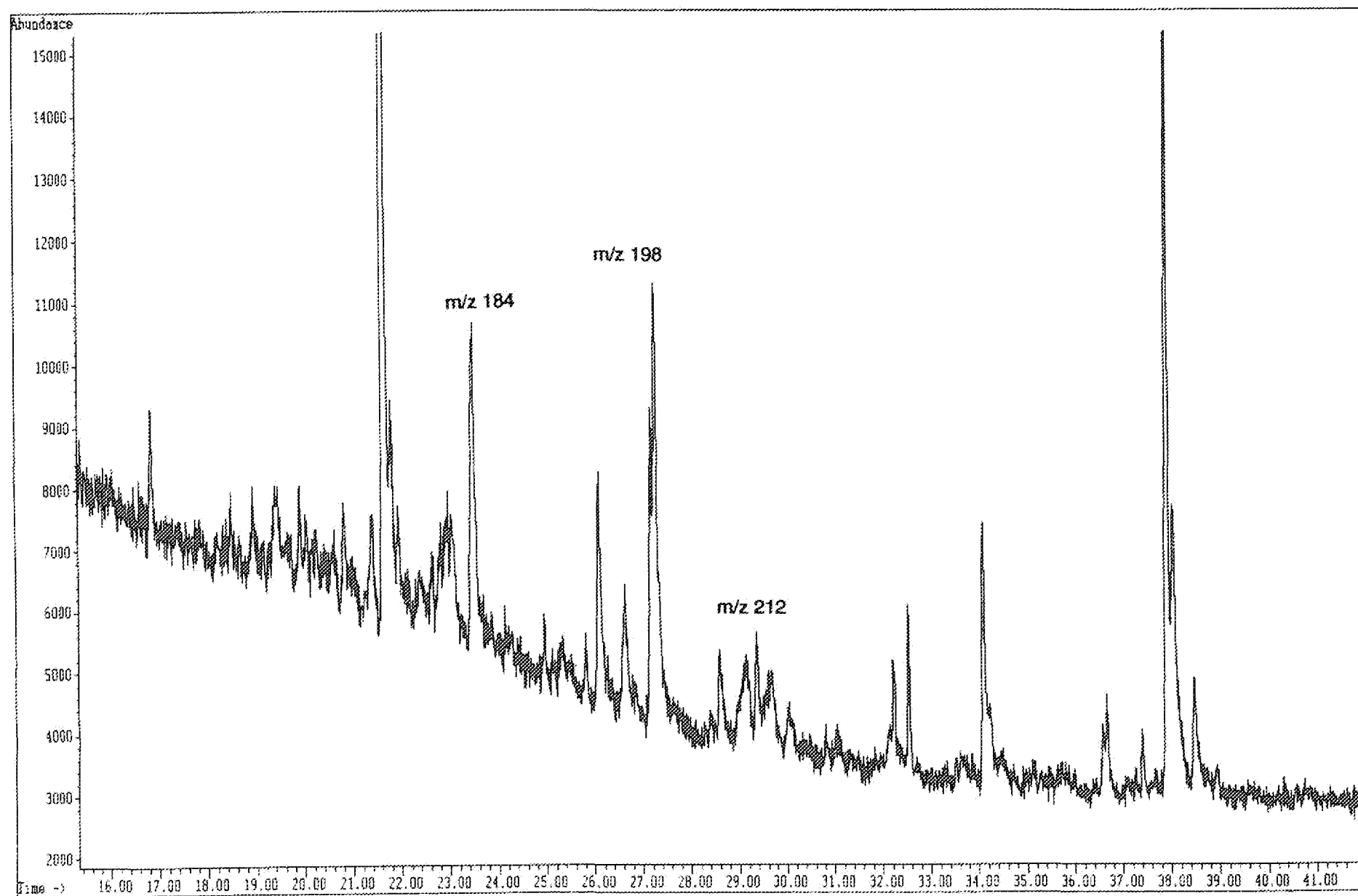
Method File Name: B10MY.M

Sample Name: 4137-002

Misc Info: WELL 33/12-7 3037.9M

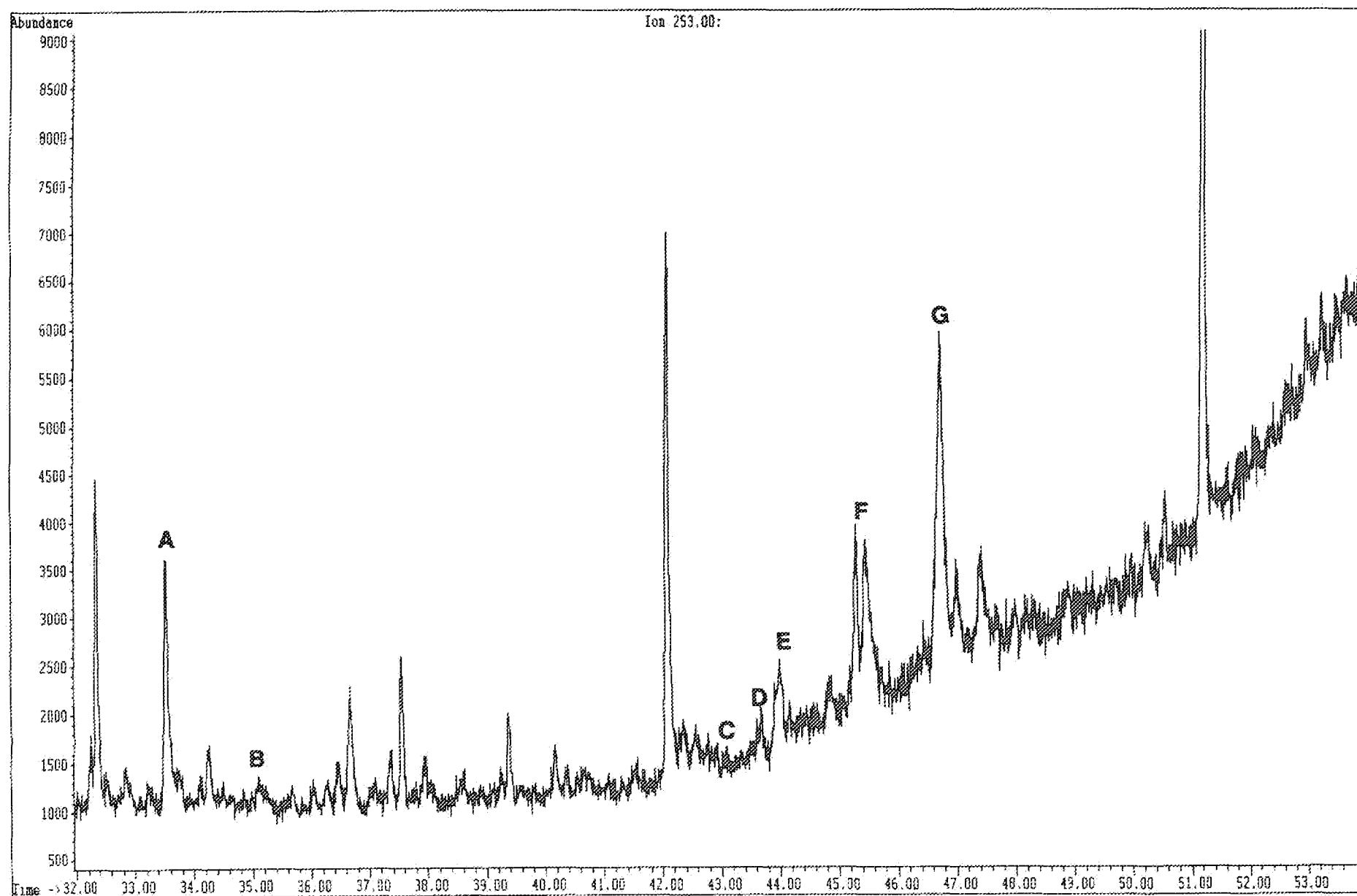
Bottle Number: 5

Dibenzothiophenes



File: C:\CHEMPC\DATA\0501004.D
Operator:
Date Acquired: 12 Dec 90 9:57 pm
Method File Name: BIOMY.M
Sample Name: 4137-002
Misc Info: WELL 33/12-7 3037.9M
Bottle Number: 5

03.2k



File: C:\CHEMPC\DATA\0501004.D

03.21

Operator:

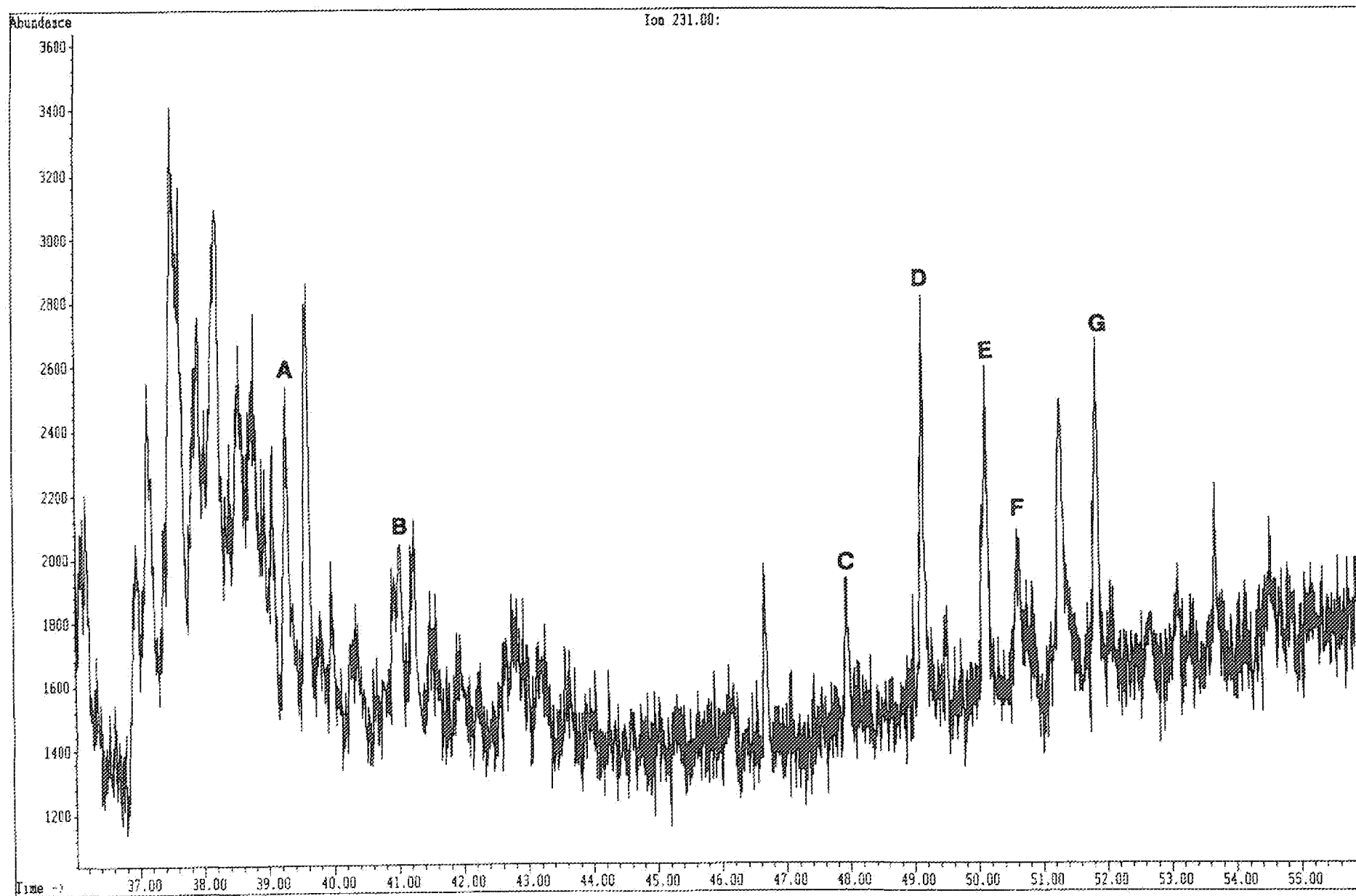
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Method File Name: B10MY.M

Sample Name: 4137-002

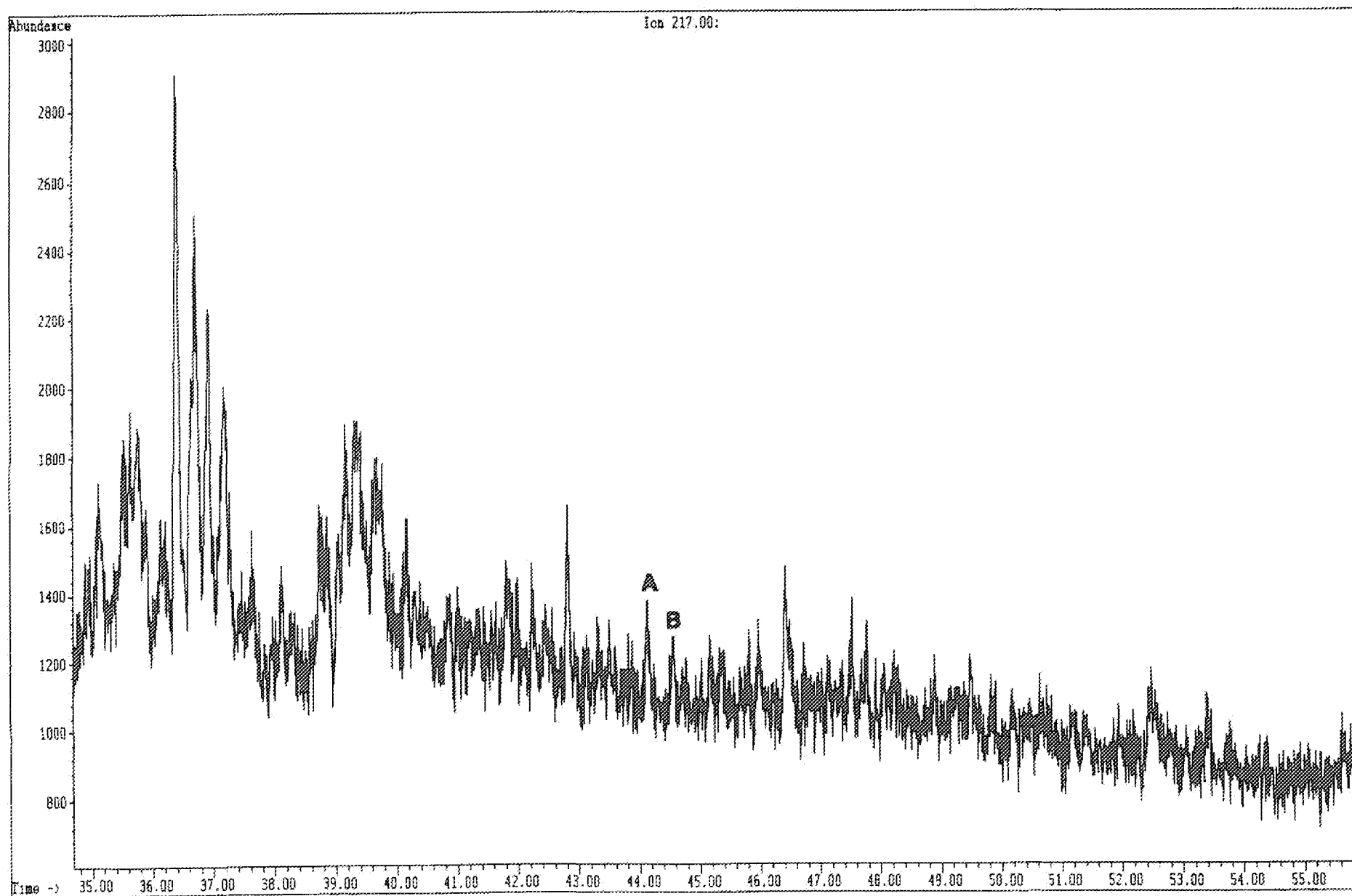
Misc Info: WELL 33/12-7 3037.9M

Bottle Number: 5



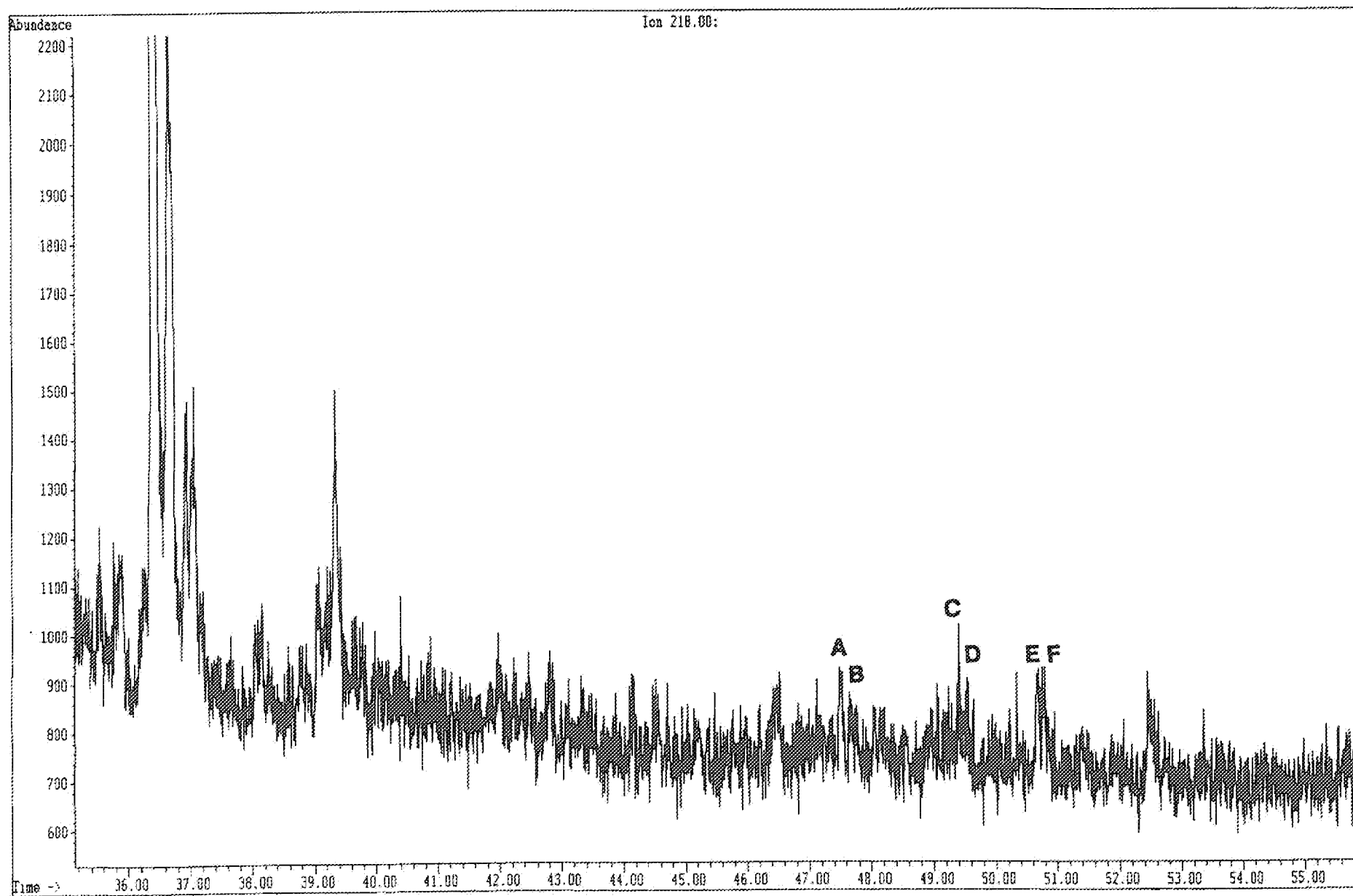
File: C:\CHEMPC\DATA\3901001.D
Operator:
Date Acquired: 15 Dec 90 1:39 pm
Method File Name: 810M.M
Sample Name: 4137-003
Misc Info: WELL 33/12-7 3041.7M
Bottle Number: 39

03.3a



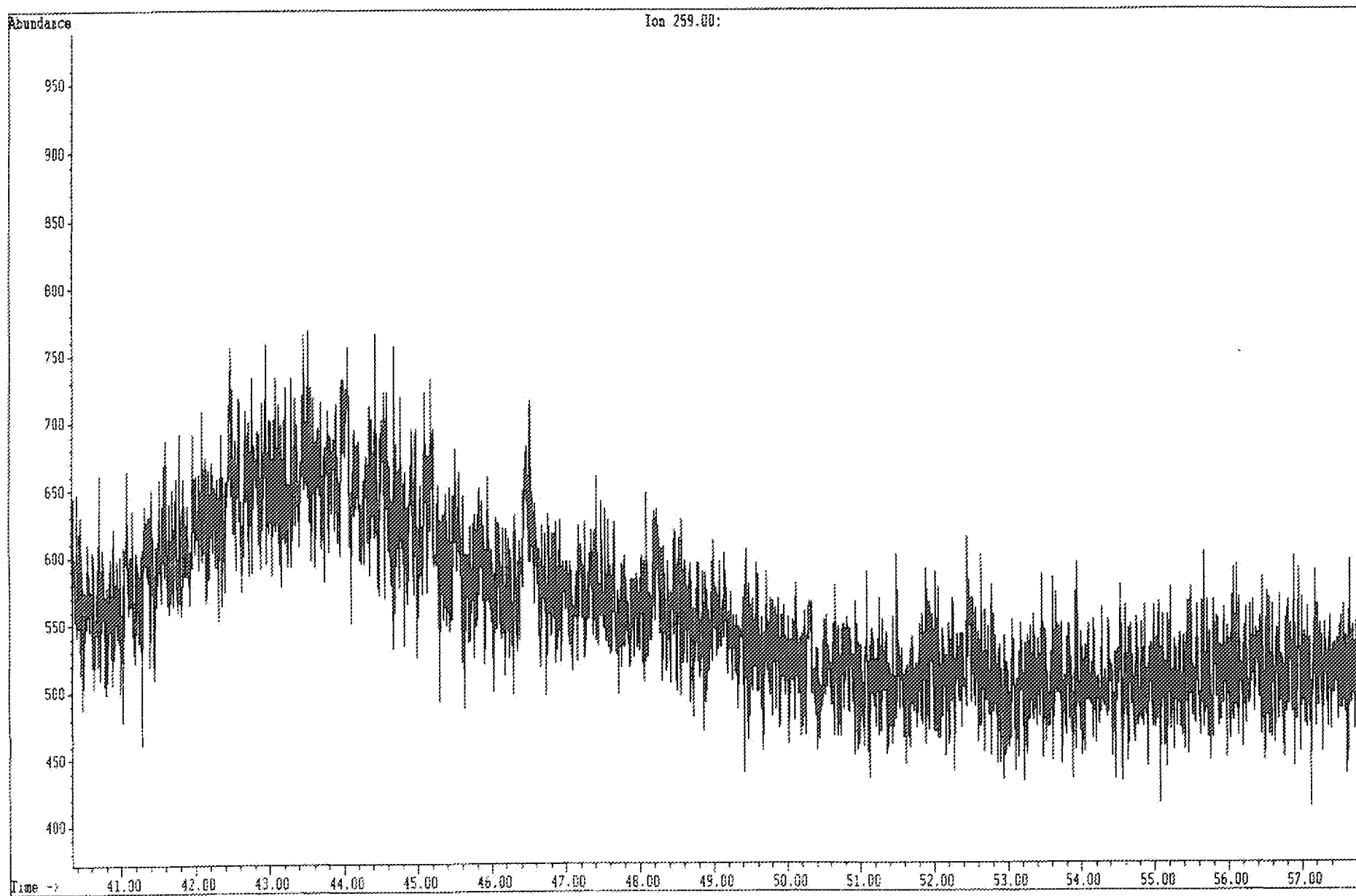
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Operator:
Date Acquired: 15 Dec 90 1:39 pm
Method File Name: BIOM.M
Sample Name: 4137-003
Misc Info: WELL 33/12-7 3041.7M
Bottle Number: 39

O3.3b



File: C:\CHEMPC\DATA\3901001.D
Operator:
Date Acquired: 15 Dec 90 1:39 pm
Method File Name: BICM.M
Sample Name: 4137-003
Misc Info: WELL 33/12-7 3041.7M
Bottle Number: 39

03.3c



File: C:\CHEMPC\DATA\3901001.D

03.3d

Operator:

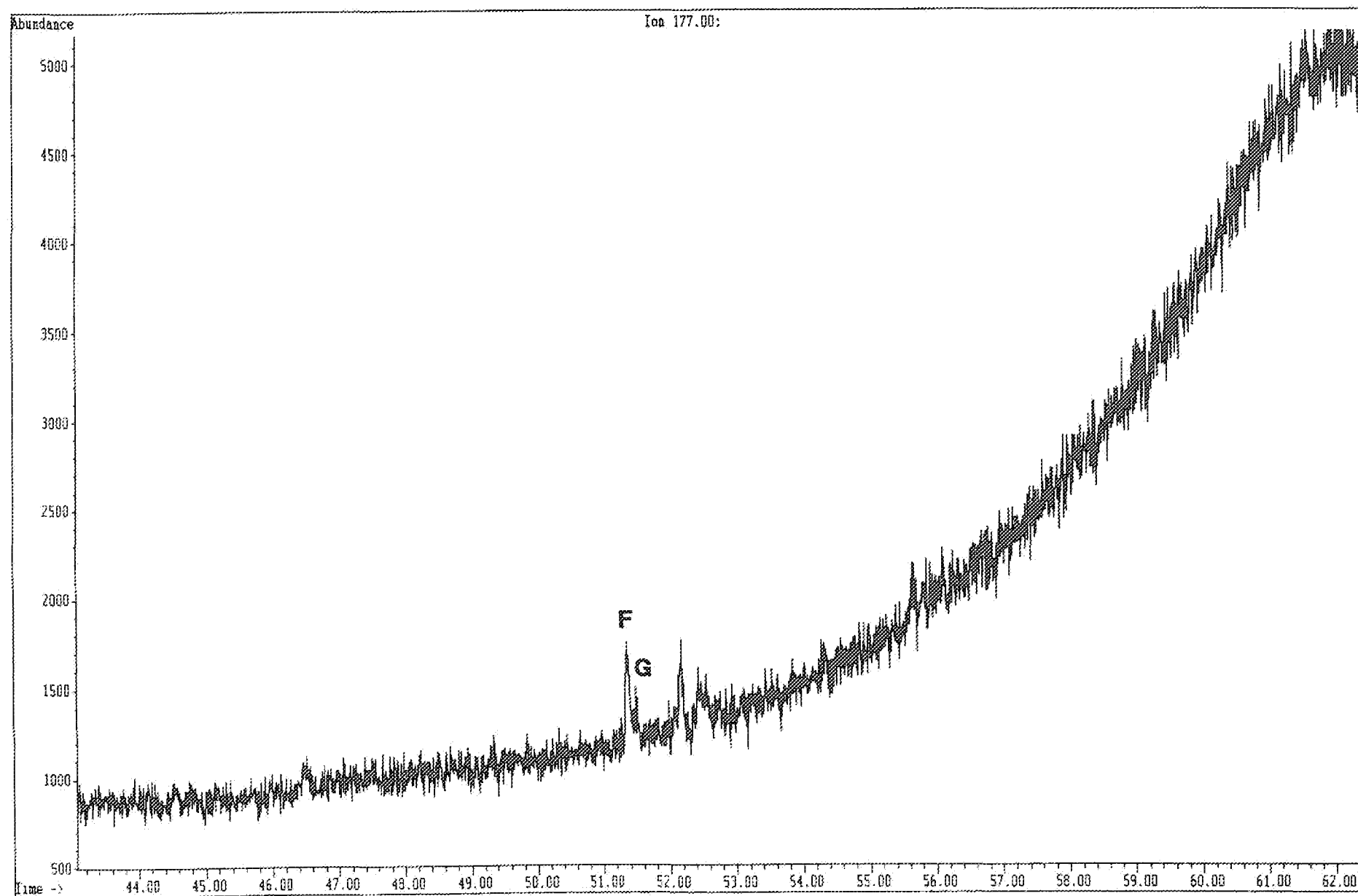
Date Acquired: 15 Dec 90 1:39 pm

Method File Name: BIOW.M

Sample Name: 4137-003

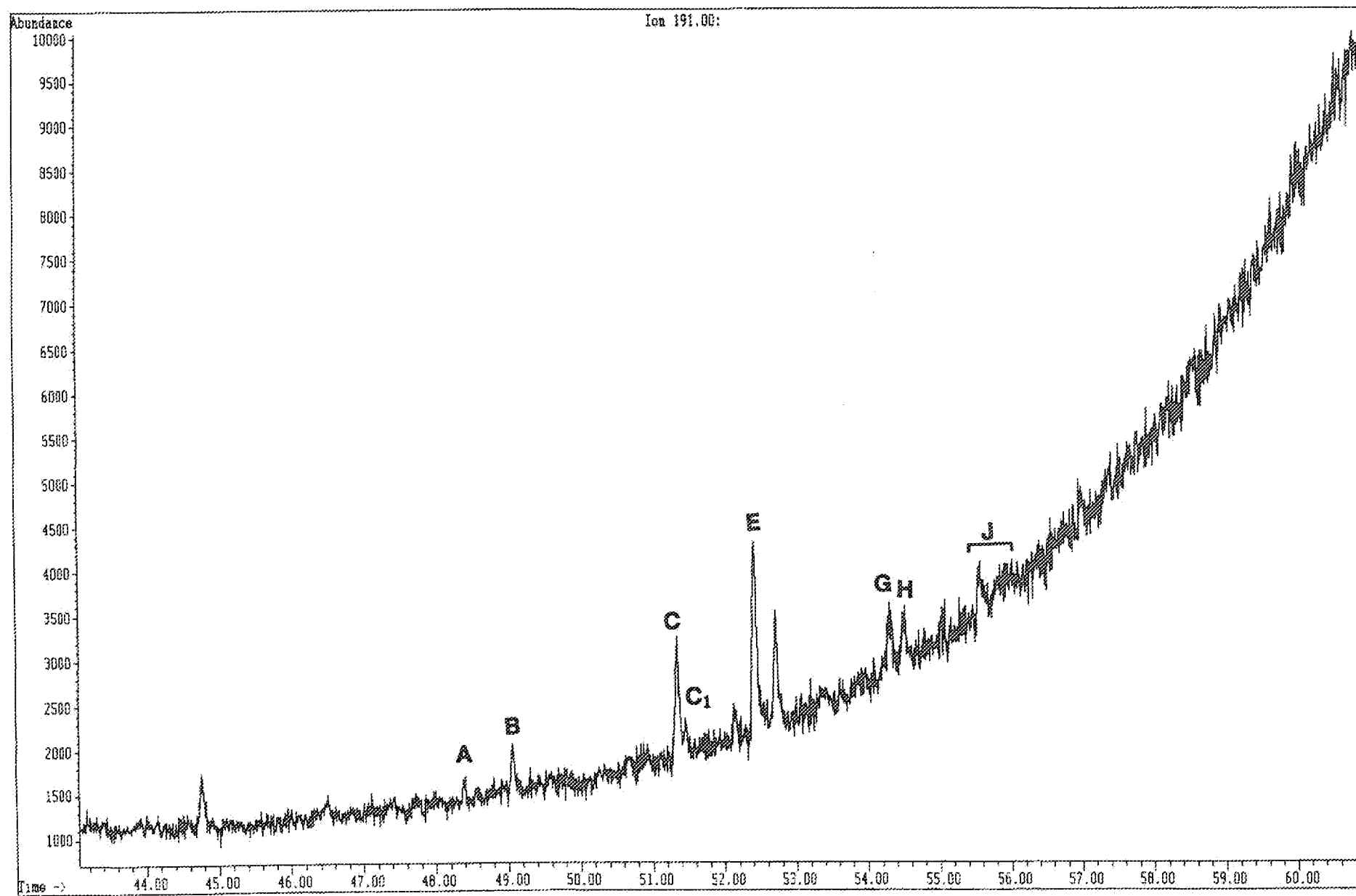
Misc Info: WELL 33/12-7 3041.7M

Bottle Number: 39



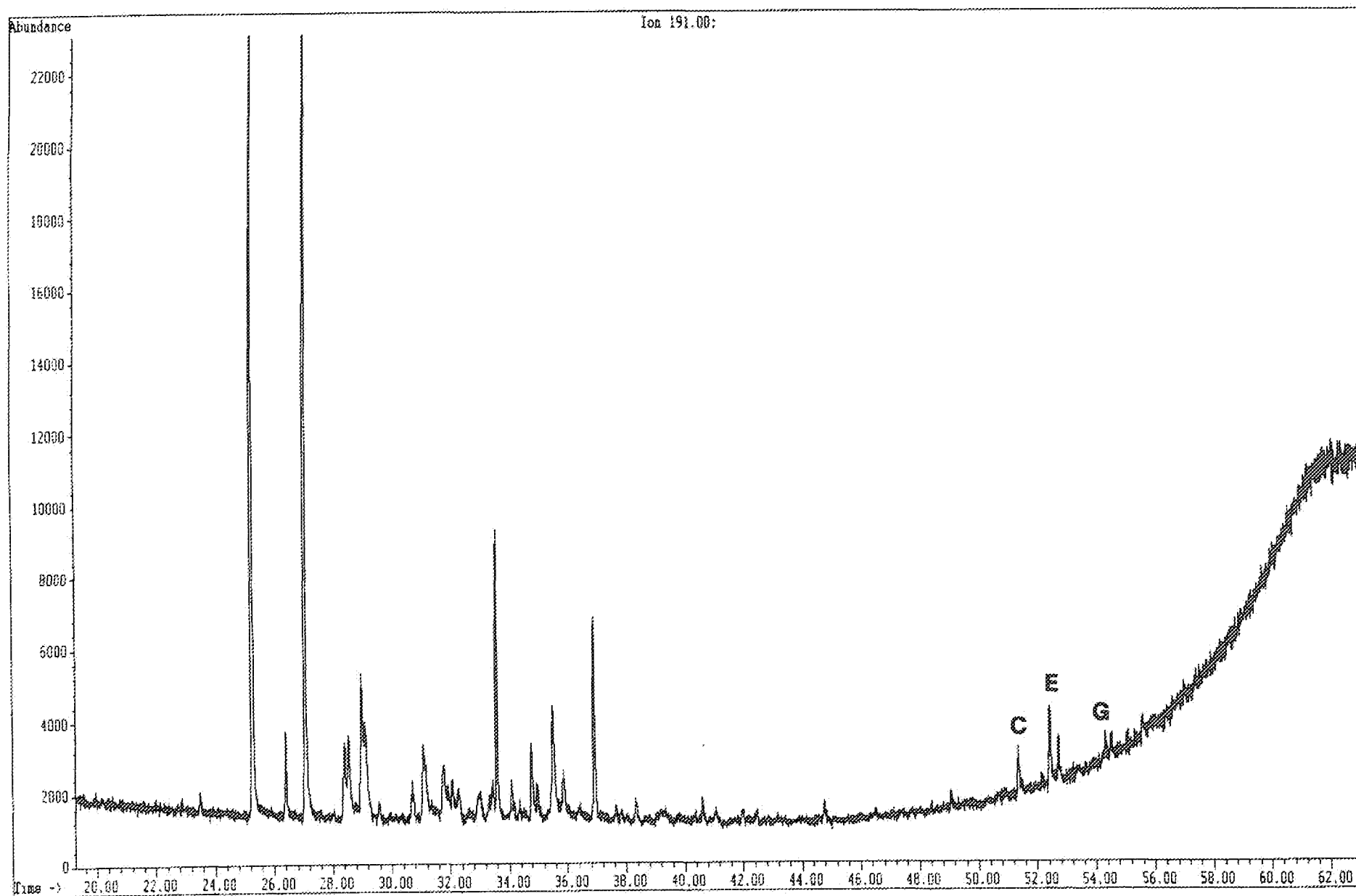
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Operator:
Date Acquired: 15 Dec 90 1:39 pm
Method File Name: BIOM.M
Sample Name: 4137-003
Misc Info: WELL 33/12-7 3041.7M
Bottle Number: 39

O3.3e



File: C:\CHEMPC\DATA\3901001.D
Operator:
Date Acquired: 15 Dec 90 1:39 pm
Method File Name: B10M.M
Sample Name: 4137-003
Misc Info: WELL 33/12-7 3041.7M
Bottle Number: 39

03.3f



File: C:\CHEMPC\DATA\3901001.D

O33g

Operator:

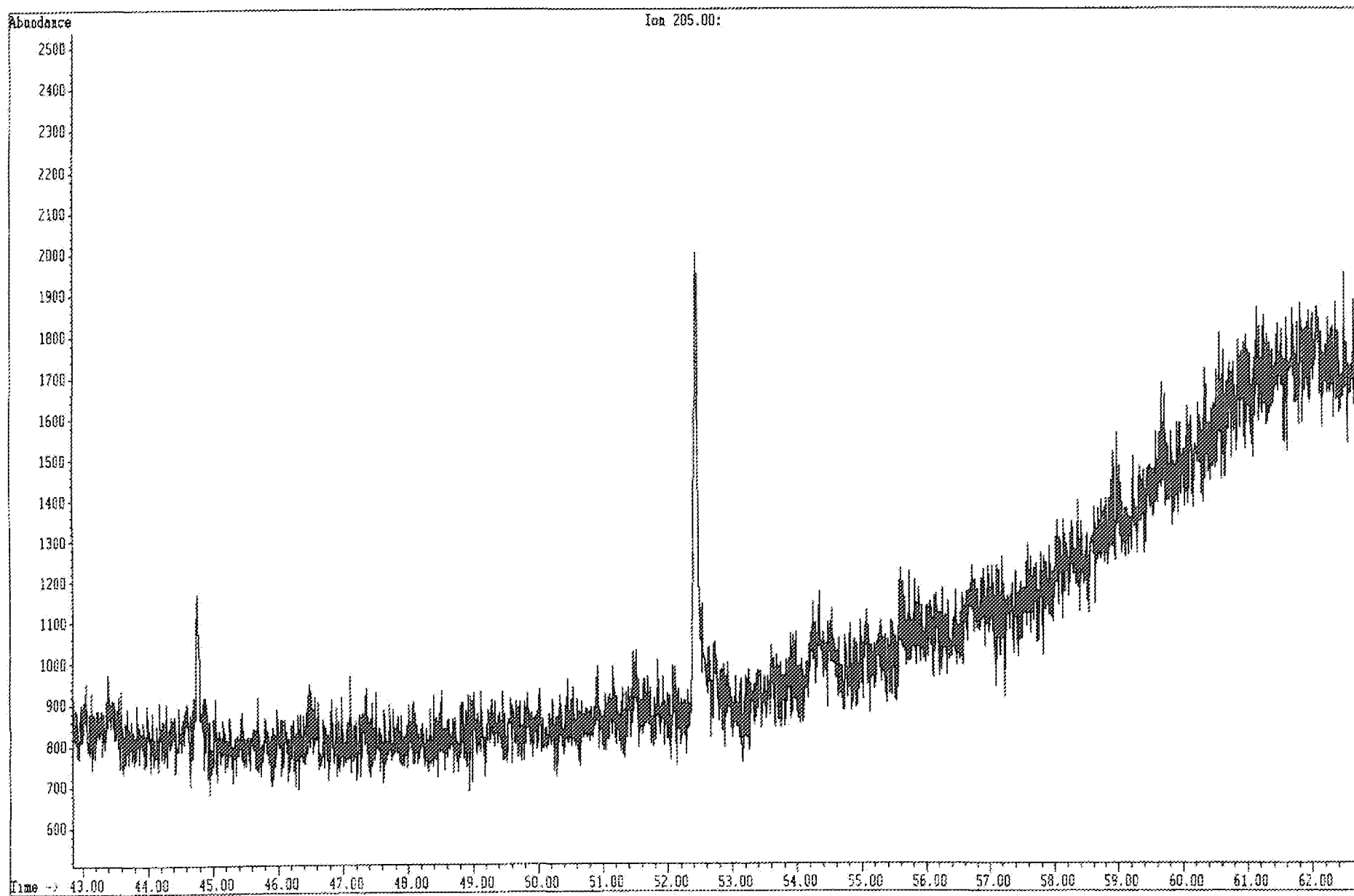
Date Acquired: 15 Dec 90 1:39 pm

Method File Name: BIOM.M

Sample Name: 4137-003

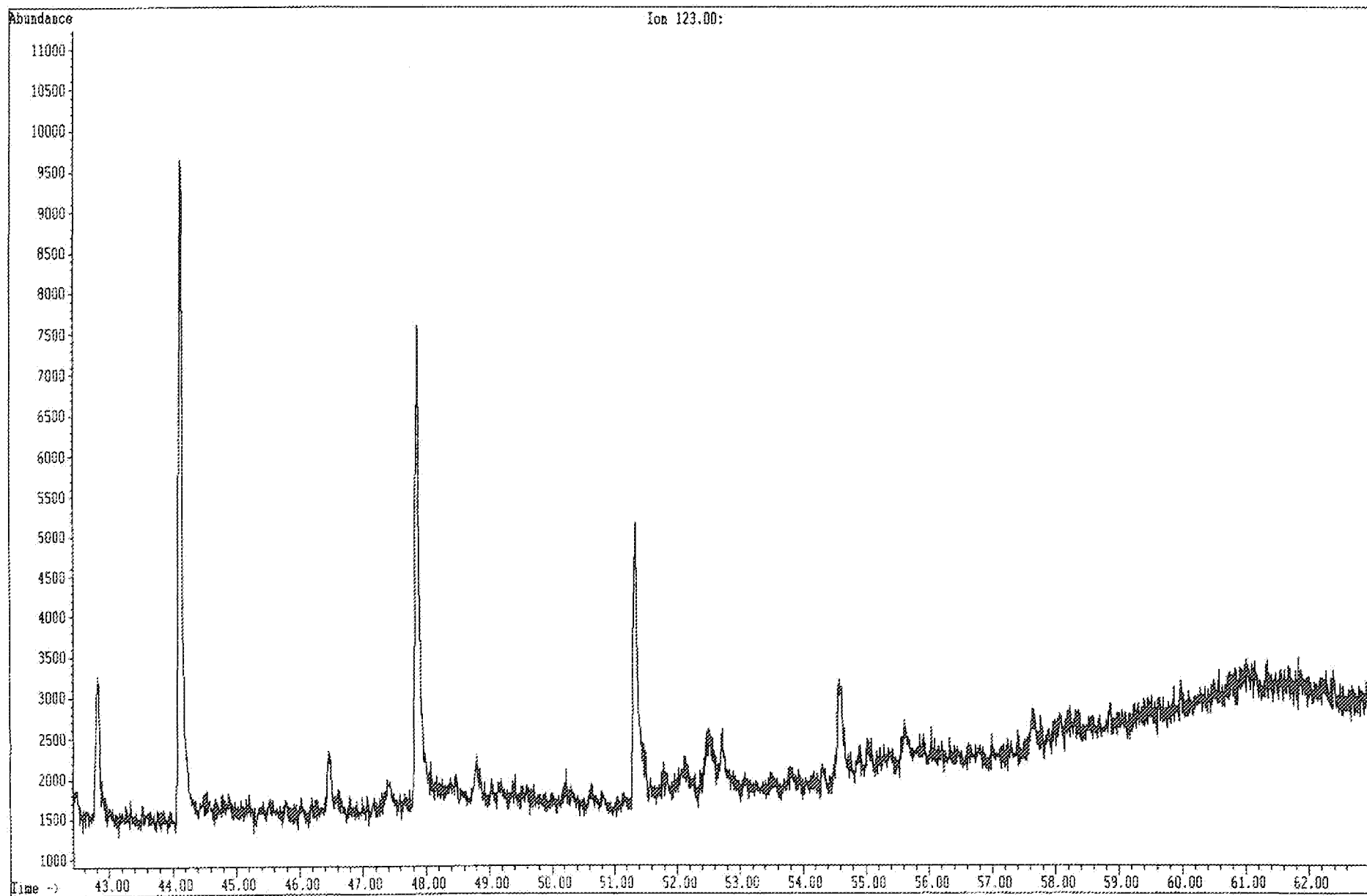
Misc Info: WELL 33/12-7 3041.7M

Bottle Number: 39



File: C:\CHEMPC\DATA\3901001.D
Operator:
Date Acquired: 15 Dec 90 1:39 pm
Method File Name: BIOD.M
Sample Name: 4137-003
Misc Info: WELL 33/12-7 3041.7M
Bottle Number: 39

03.3h



File: C:\CHEMPC\DATA\0601005.D

03.3i

Operator:

Date Acquired: 12 Dec 90 11:05 pm

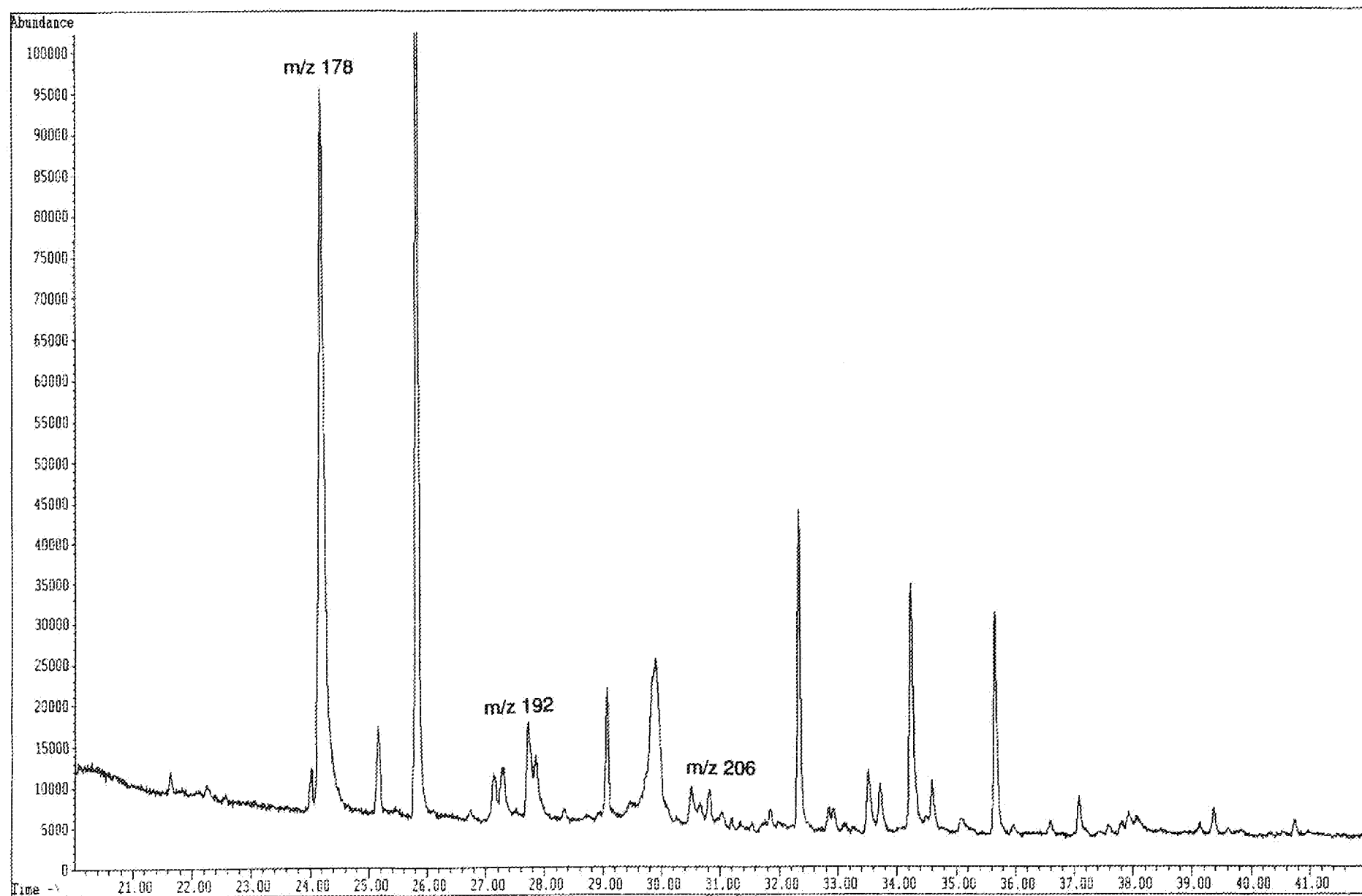
Method File Name: HYOMY.M

Sample Name: 4137-003

Misc Info: WELL 33/12-7 3041.7M

Bottle Number: 6

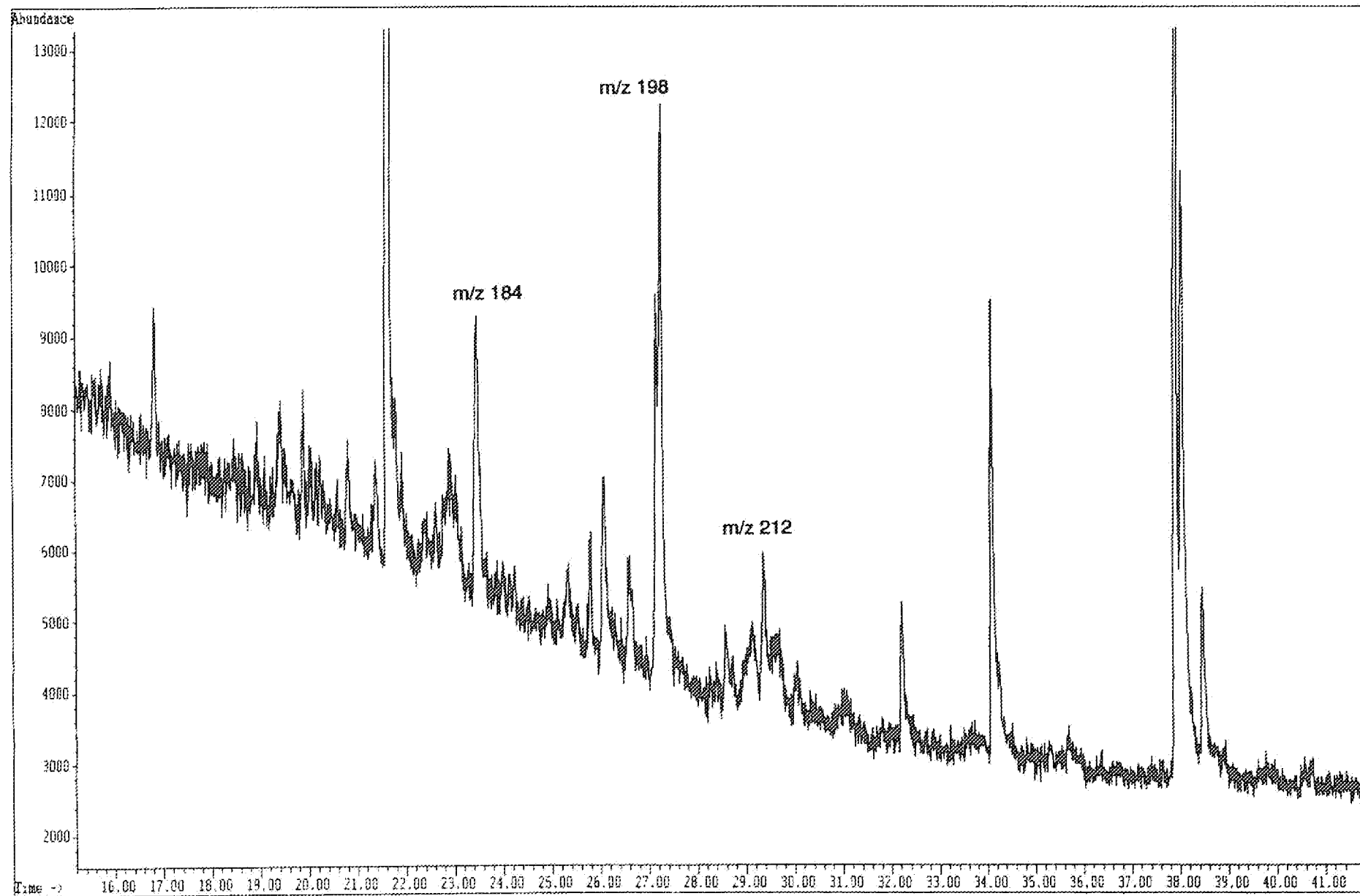
Phenanthrenes



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Operator:
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Sample Name: 4137-003
Misc Info: WELL 33/12-7 3041.7M
Bottle Number: 6

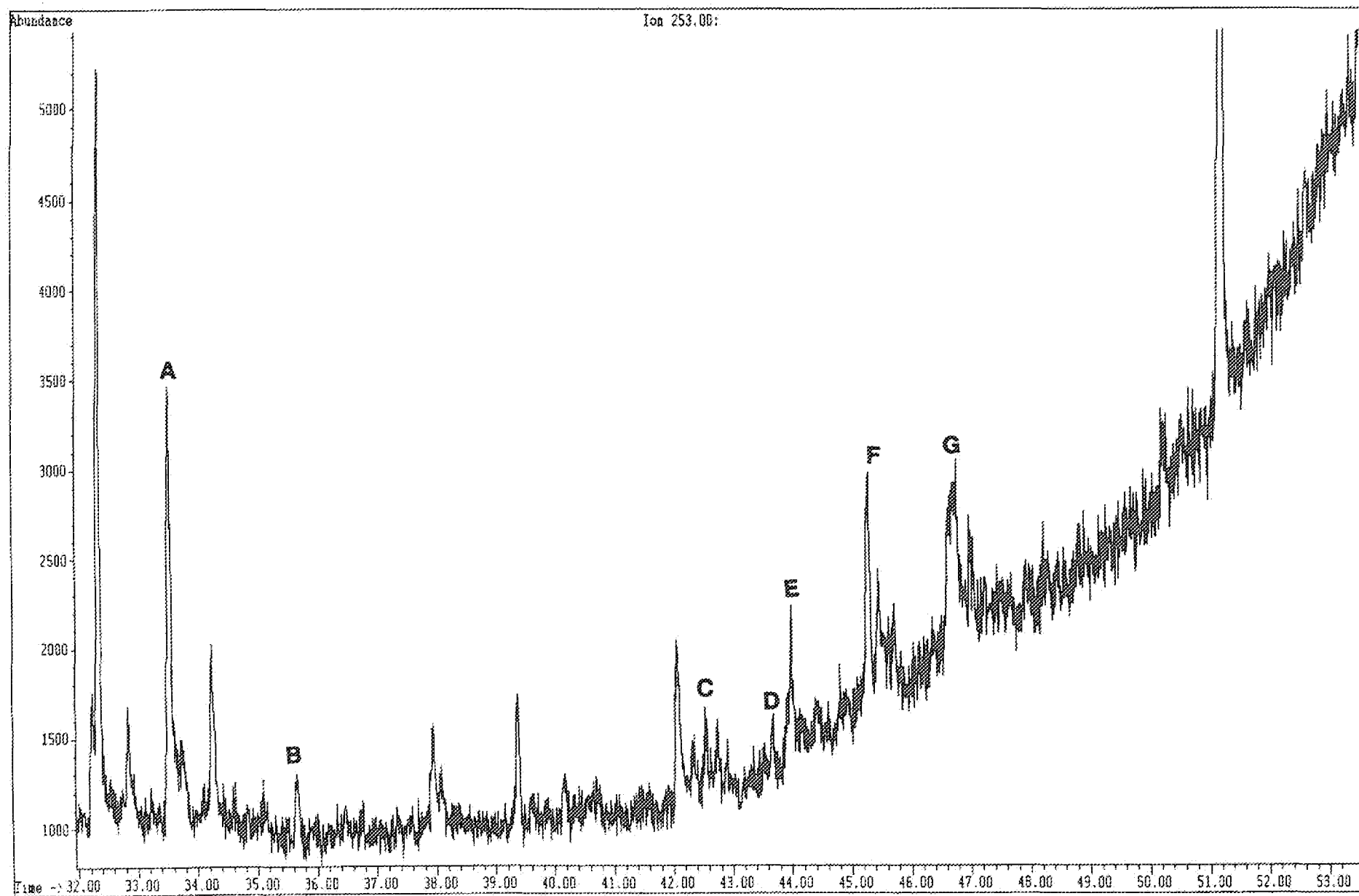
03.3j

Dibenzothiophenes



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Method File Name: B10MY.M
Sample Name: 4137-003
Misc Info: WELL 33/12-7 3041.7M
Bottle Number: 6

03.3k



File: C:\CHEMPC\DATA\0601005.D

0331

Operator:

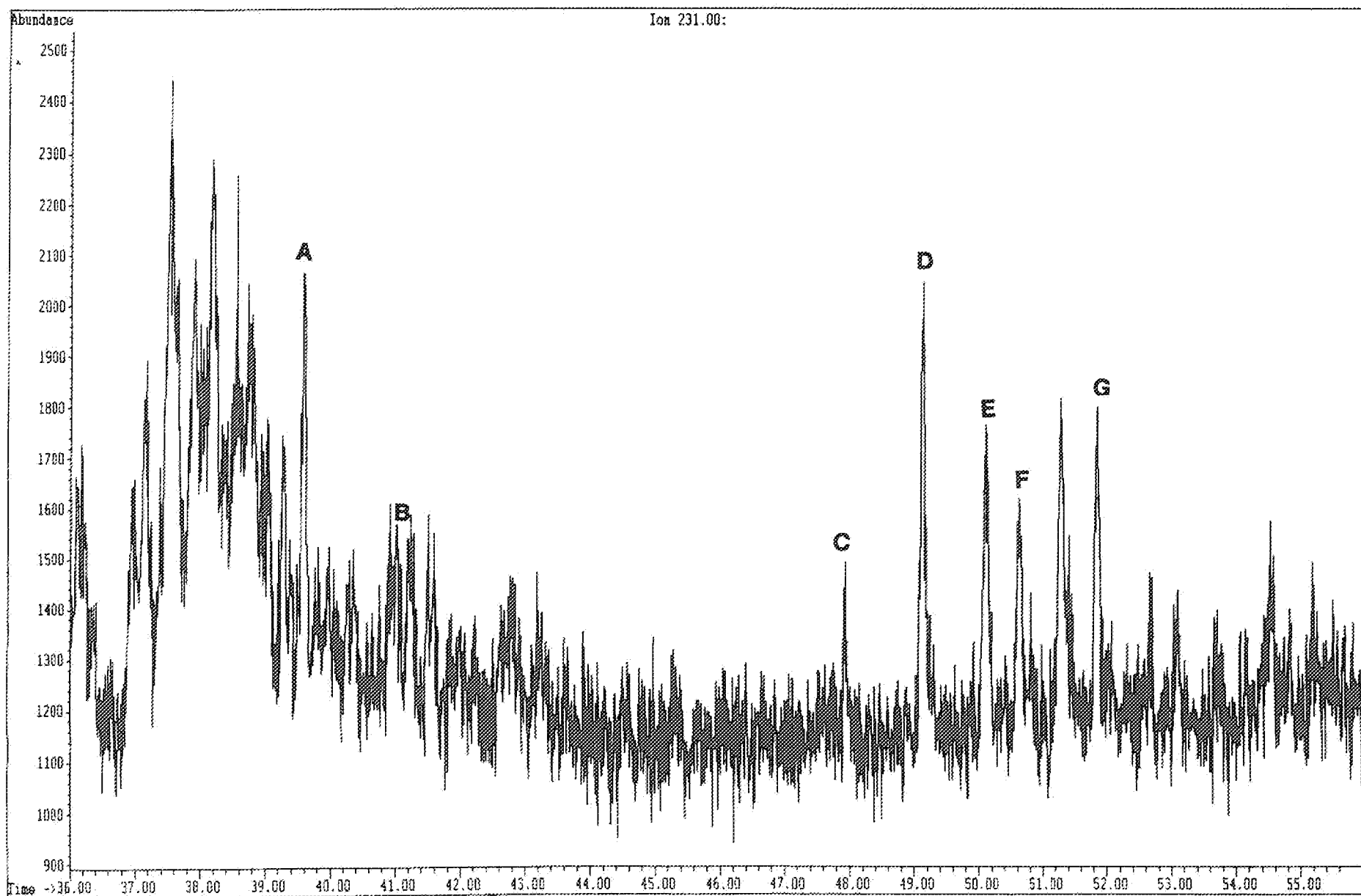
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Method File Name: BIONY.M

Sample Name: 4137-003

Misc Info: WELL 33/12-7 3041.7M

Bottle Number: 6



34/10-18

TABLE P1
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

JOB 4138				
GEOCHEM SAMPLE NUMBER	DEPTH/ IDENTITY	GROSS LITHOLOGIC DESCRIPTION	G S A COLOUR CODE	TOTAL ORGANIC CARBON (Wt. %)

WELL: 34/10-18

4138-001	2376.6m	A100% SANDSTONE - coarse grained, blocky, 10YR8/2 mod hard, no F, no C, very pale orange.		
4138-002	2389.5m	A100% SANDSTONE - coarse grained, blocky, 10YR8/2 mod hard, no F, no C, very pale orange.		
4138-003	2390.7m	A100% SANDSTONE - coarse grained, blocky, 10YR8/2 mod hard, no F, no C, very pale orange.		

Abbreviations = arenaceous, argillaceous, calcareous, Cut, dolomite, Fluorescence, foraminifera
fossiliferous, Lost Circulation Material, moderately, occasionally, slightly, very

TABLE P2
CONCENTRATION (PPM) OF EXTRACTED C₁₅₊ MATERIAL IN ROCK

JOB 4138	L I T H O	DEPTH/ IDENTITY	TOTAL EXTRACT	HYDROCARBONS			NON HYDROCARBONS			
GEOCHEM SAMPLE NUMBER				Saturates	Aromatics	TOTAL	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's	TOTAL

WELL: 34/10-18

4138-001	2376.6m	119	46	3	50	49	20	1	69
4138-002	2389.5m	264	52	4	56	152	54	1	207
4138-003	2390.7m	179	42	3	45	76	58	0	134

TABLE P3
COMPOSITION (NORMALISED %) OF C₁₅₊ MATERIAL

JOB 4138	L I T H O	DEPTH/ IDENTITY	HYDROCARBONS		NON HYDROCARBONS		
GEOCHEM SAMPLE NUMBER			Saturates	Aromatics	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's

WELL: 34/10-18

4138-001	2376.6m	39.00	2.70	40.93	16.60	0.77
4138-002	2389.5m	19.79	1.56	57.64	20.66	0.35
4138-003	2390.7m	23.30	1.83	42.41	32.20	0.26

TABLE P 4
SIGNIFICANT C₁₅₊ RATIOS

JOB 4138	L I T H O	DEPTH/ IDENTITY	TOC (%)	mg/g TOC						HYDROCARBONS % TOTAL EXTRACT	SATURATES AROMATICS
GEOCHEM SAMPLE NUMBER				TOTAL EXTRACT	SATURATES	AROMATICS	TOTAL HYDROCARBONS	ELUTED NSO's	ASPHALTENES		

WELL: 34/10-18

4138-001	2376.6m	0.07	169.65	66.16	4.59	70.74	28.17	69.43	41.70	14.43
4138-002	2389.5m	0.12	219.68	43.48	3.43	46.91	45.39	126.62	21.35	12.67
4138-003	2390.7m	0.12	149.38	34.80	2.74	37.54	48.10	63.35	25.13	12.71

TABLE P5
C₁₅₊ CHROMATOGRAPHY WEIGHTS (gms)

JOB 4138	L I T H O	DEPTH/ IDENTITY	ROCK EXTRACTED	TOTAL EXTRACT	PRECIPTD. ASPHALTENES	NC5	SATURATES	AROMATICS	ELUTED NSO's	NON-ELUTED NSO's
GEOCHEM SAMPLE NUMBER										

WELL: 34/10-18

4138-001A	2376.6m	21.8100	0.00259	0.00106	0.00153	0.00101	0.00007	0.00043	0.00002
4138-002A	2389.5m	21.8500	0.00576	0.00332	0.00244	0.00114	0.00009	0.00119	0.00002
4138-003A	2390.7m	21.3100	0.00382	0.00162	0.00220	0.00089	0.00007	0.00123	0.00001

TABLE P6
COMPOSITION (NORMALISED %) OF C₁₅+ SATURATE (PARAFFIN - NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	001	002	003
DEPTH	2376.6m	2389.5m	2390.7m
SAMPLE TYPE			
nC15	2.74	2.31	2.94
nC16	6.09	4.01	6.16
nC17	5.30	3.31	4.85
nC18	9.08	4.58	7.91
nC19	6.69	4.75	5.33
nC20	10.56	5.48	8.40
nC21	8.87	5.61	7.99
nC22	8.32	7.19	10.38
nC23	6.41	8.08	8.14
nC24	6.96	8.57	8.39
nC25	6.56	7.92	6.18
nC26	5.41	7.52	5.02
nC27	4.43	6.34	3.94
nC28	3.60	5.49	3.56
nC29	2.92	5.05	3.00
nC30	2.00	4.38	2.40
nC31	1.42	3.20	1.84
nC32	0.90	2.61	1.39
nC33	0.71	1.54	0.86
nC34	0.54	1.30	0.79
nC35	0.50	0.76	0.52
Paraffin	9.69	19.32	10.87
Isoprenoid	1.60	1.84	1.97
Naphthene	88.71	78.84	87.16
CPI 1 Index	0.96	0.97	0.89
CPI 2 Index	1.07	1.00	0.99
CPI 3 Index	0.98	0.97	0.92
Prist/Phytane	1.20	1.33	1.85
Prist/nC17	1.07	1.34	1.60
Phytane/nC18	0.52	0.73	0.53

Job Number : 4138

$$C.P.I. 1 = \frac{1}{2} \left[\frac{C_{21} + C_{23} + C_{25} + C_{27}}{C_{20} + C_{22} + C_{24} + C_{26}} + \frac{C_{21} + C_{23} + C_{25} + C_{27}}{C_{22} + C_{24} + C_{26} + C_{28}} \right]$$

$$C.P.I. 2 = \frac{1}{2} \left[\frac{C_{25} + C_{27} + C_{29} + C_{31}}{C_{24} + C_{26} + C_{28} + C_{30}} + \frac{C_{25} + C_{27} + C_{29} + C_{31}}{C_{26} + C_{28} + C_{30} + C_{32}} \right]$$

$$C.P.I. 3 = \frac{2 \times (C_{27})}{C_{26} + C_{28}}$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE P7
METHYLPHENANTHRENE INDICES (MPI)

TOB 4138	DEPTH/ IDENTITY	SAMPLE TYPE	MPI 1		Rcalc		MPI 2	
GEOCHEM SAMPLE NUMBER			AREA	HEIGHT	AREA	HEIGHT	AREA	HEIGHT

WELL: 34/10-18

4138-001	2376.6m		0.10	0.09			0.12	0.10
4138-002	2389.5m		0.28	0.33			0.32	0.35
4138-003	2390.7m		0.15	0.17			0.17	0.18

$$MPI\ 1 = \frac{1.5(2-MP + 3-MP)}{P + 1-MP + 9-MP} \quad MPI\ 2 = \frac{3(2-MP)}{P + 1-MP + 9-MP}$$

$$Rcalc = \begin{cases} 0.60(MPI\ 1) + 0.40 & \text{if } Ro < 1.35\% \\ -0.60(MPI\ 1) + 2.30 & \text{if } Ro > 1.35\% \end{cases}$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE P8

AROMATIC HYDROCARBONS RATIOS (MSD, PEAK AREA DATA)

SAMPLE NUMBER	DEPTH (m)	2MP/ 1MP	RATIO 1	RATIO 2	RATIO 3
------------------	--------------	-------------	---------	---------	---------

WELL: 34/10-18

4138-001A	2376.6	0.87	0.39	0.54	0.90
4138-002A	2389.5	0.73	0.44	0.38	0.42
4138-003A	2390.7	0.89	0.63	0.39	1.29

RATIO 1 = $A(231)/A(231) + G(231)$ RATIO 2 = $E(253)/E(253) + G(253)$ RATIO 3 = $A(253)/B(231) + E(253)$

TABLE P9
CARBON ISOTOPE COMPOSITIONS (‰,PDB)

JOB 4138								
GEOCHEM SAMPLE NUMBER	DEPTH/ IDENTITY	TOTAL EXTRACT WHOLE OIL	SATURATES	AROMATICS	NSO	ASPHALTENES	KEROGEN	PYROLYSATE (S2)

WELL: 34/10-18

4138-001	2376.6m	-29.33	-29.67			-28.75		
4138-002	2389.5m	-28.39	-29.42			-28.62		
4138-003	2390.7m	-28.68	-29.38					

TABLE P10
BIOMARKER MOLECULAR RATIOS

WELL: 34/10-18

		Steranes (m/z 217)			Steranes (m/z 218)		
SAMPLE NUMBER	DEPTH (m)	<u>A</u>	<u>Q</u>	<u>(R+S)</u>	NORMALISED COMPOSITION:		
		(A+J)	(Q+T)	(Q+R+S+T)	B	D	F
4138-001A	2376.6	-	0.34	0.45	26%	31%	43%
4138-002A	2389.5	-	-	-	31%	33%	36%
4138-003A	2390.7	-	-	-	16%	35%	49%

TABLE P11
BIOMARKER MOLECULAR RATIOS

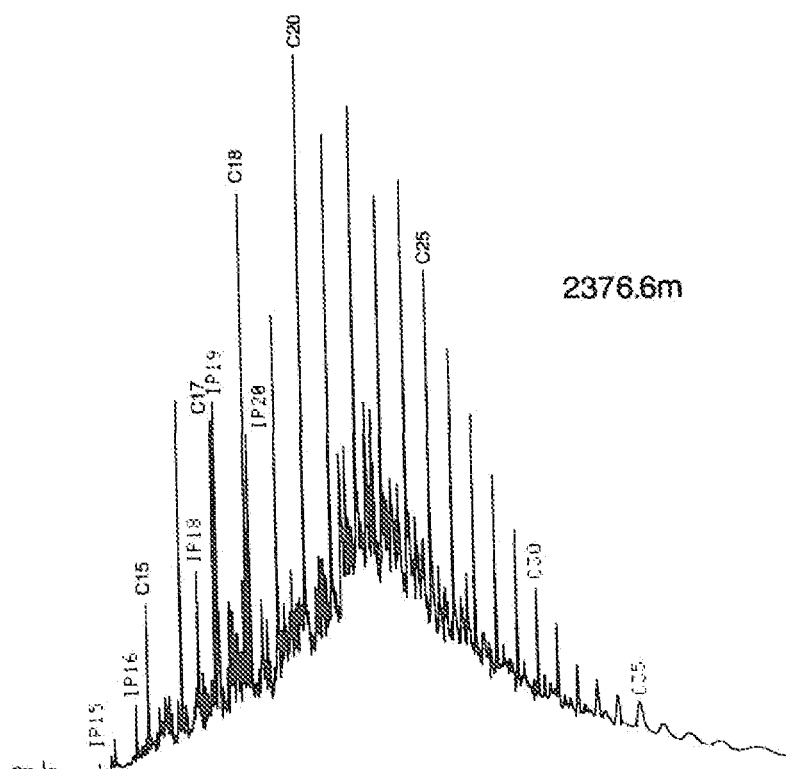
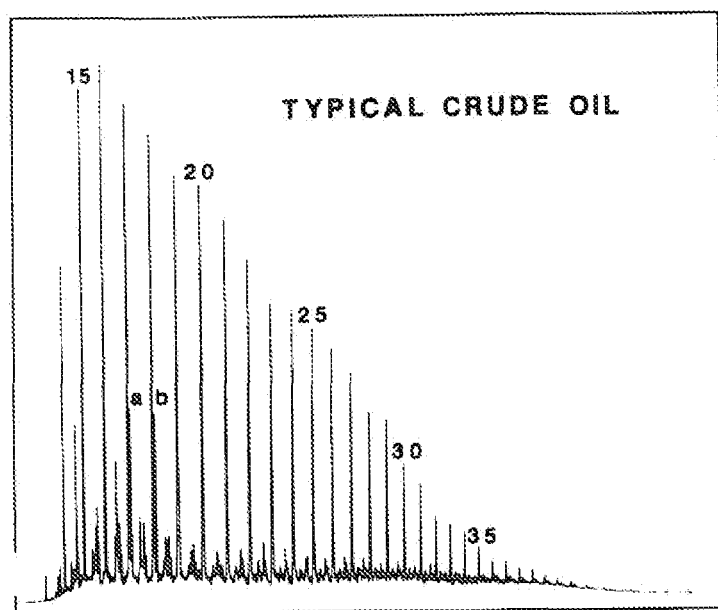
WELL 34/10-18

Terpanes (m/z 191)

SAMPLE NUMBER	DEPTH (m)	A/B	Z/E	Z/C	Z (Z+E)	C (C+E)	%22S for J	E (E+F)	X (X+D)	Q/E
4138-001A	2376.6	1.00	0.24	0.41	0.20	0.37	64%	-	0.61	-
4138-002A	2389.5	0.77	0.68	0.99	0.41	0.41	48%	0.79	0.29	-
4138-003A	2390.7	0.81	0.91	1.15	0.48	0.44	63%	0.74	0.20	-

FIGURE P1.1 C₁₅+ SATURATES CHROMATOGRAMS

WELL 834/10-18

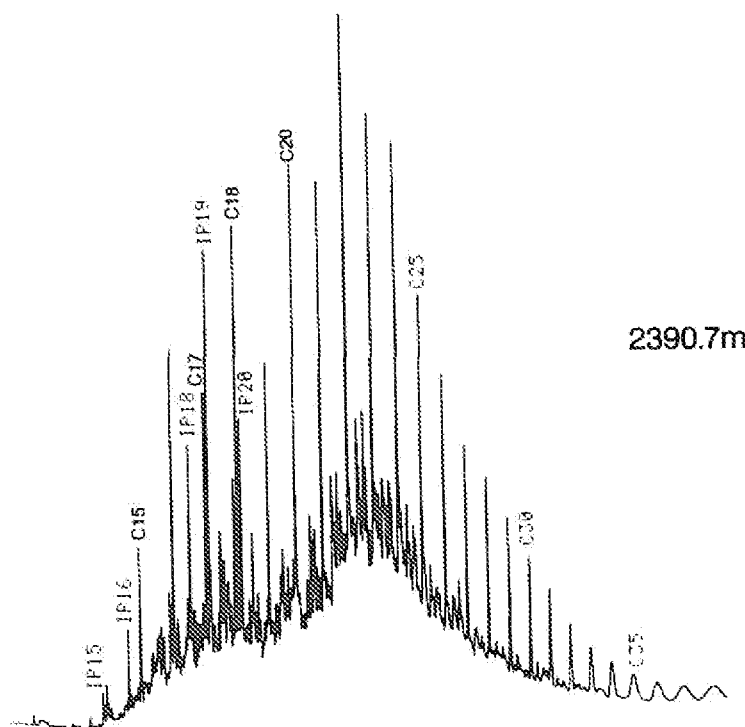
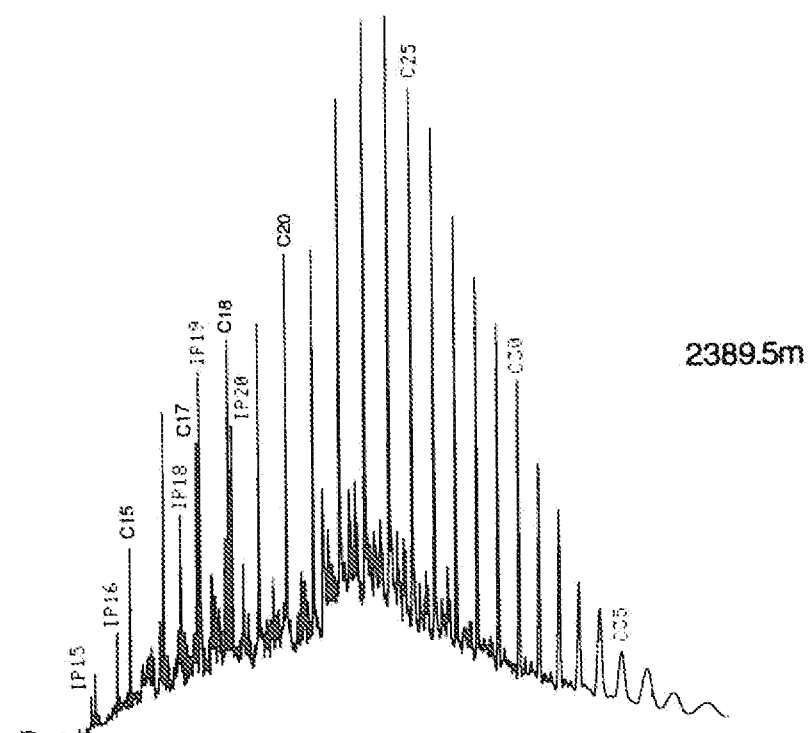


a ~ PRISTANE
b ~ PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20-nC₂₀)

FIGURE P1.2 C₁₅+ SATURATES CHROMATOGRAMS

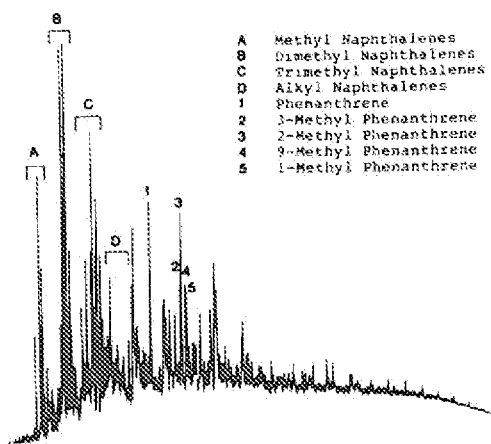
WELL 34/10-18



a = PRISTANE
b = PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

WELL 34/10-18

**STANDARD**

- A Methyl Naphthalenes
- B Dimethyl Naphthalenes
- C Trimethyl Naphthalenes
- D Alkyl Naphthalenes
- 1 Phenanthrene
- 2 3-Methyl Phenanthrene
- 3 2-Methyl Phenanthrene
- 4 9-Methyl Phenanthrene
- 5 1-Methyl Phenanthrene

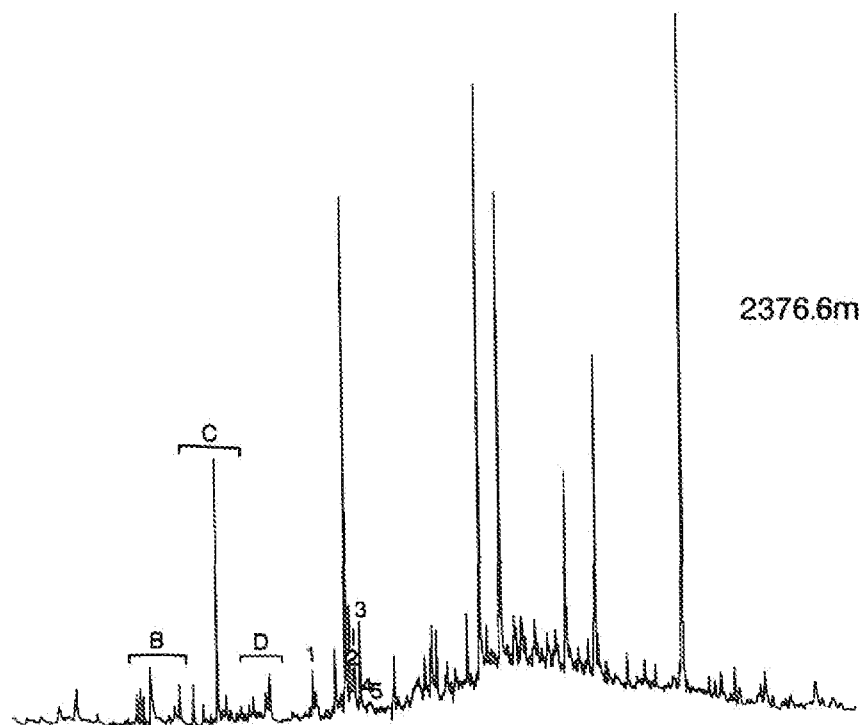
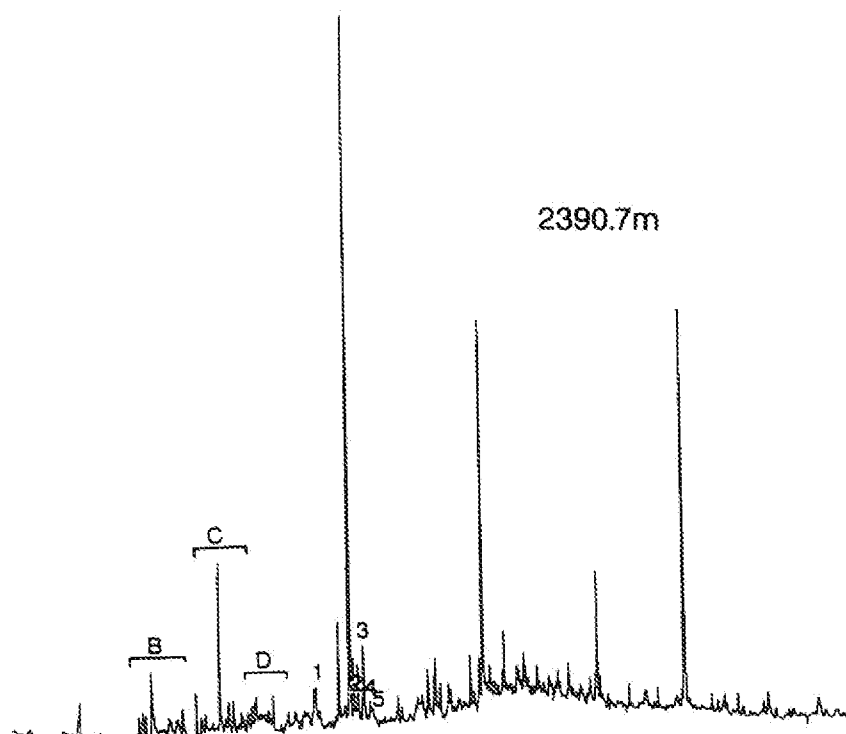
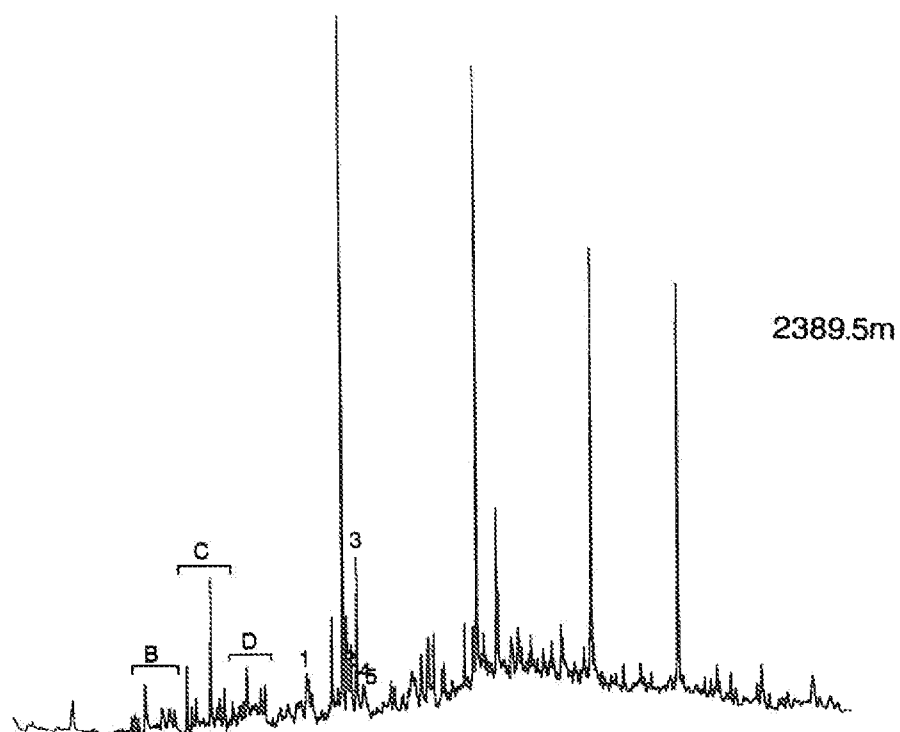


FIGURE P22

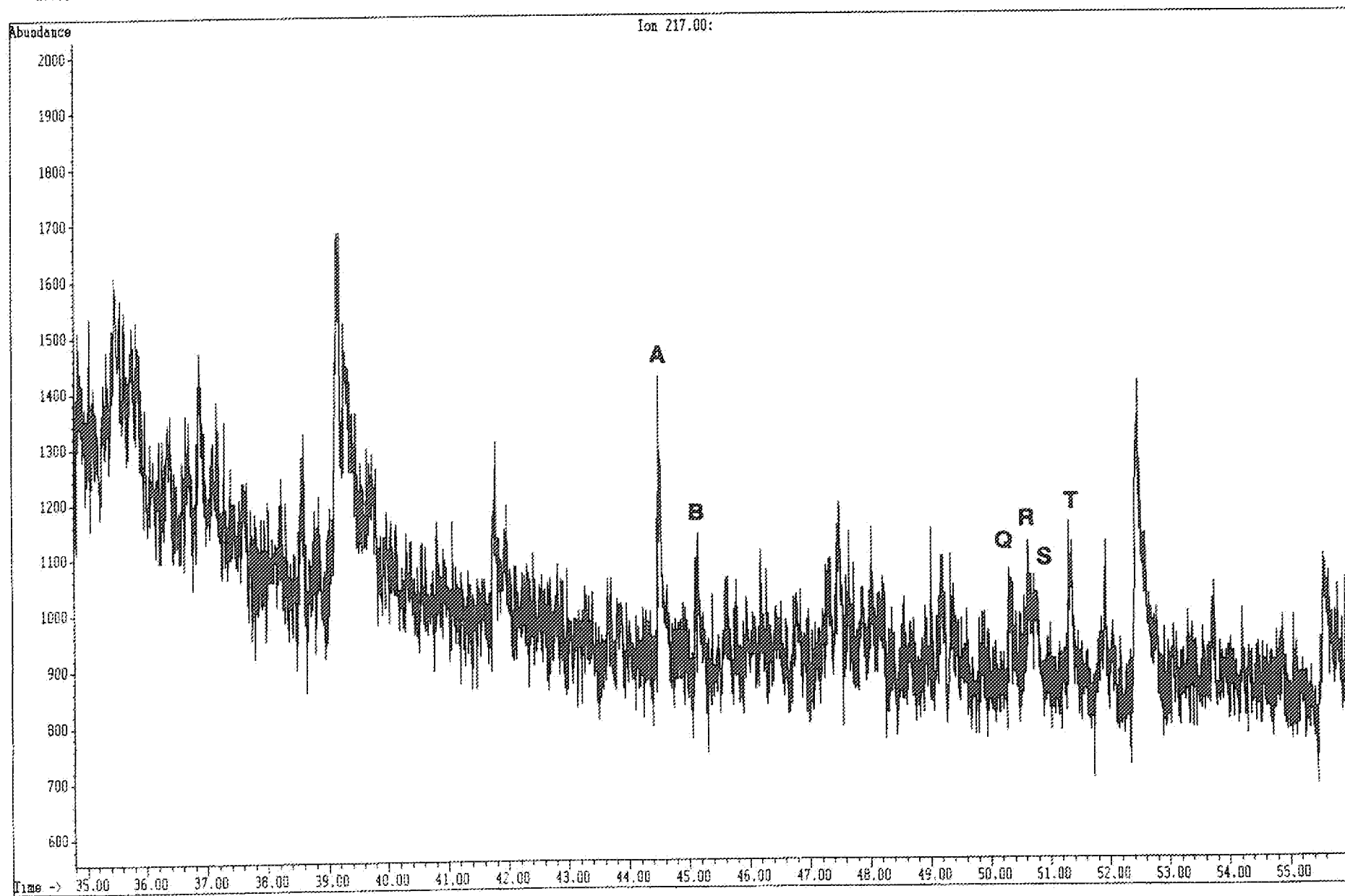
C₁₅+ AROMATIC CHROMATOGRAMS

WELL 34/10-18



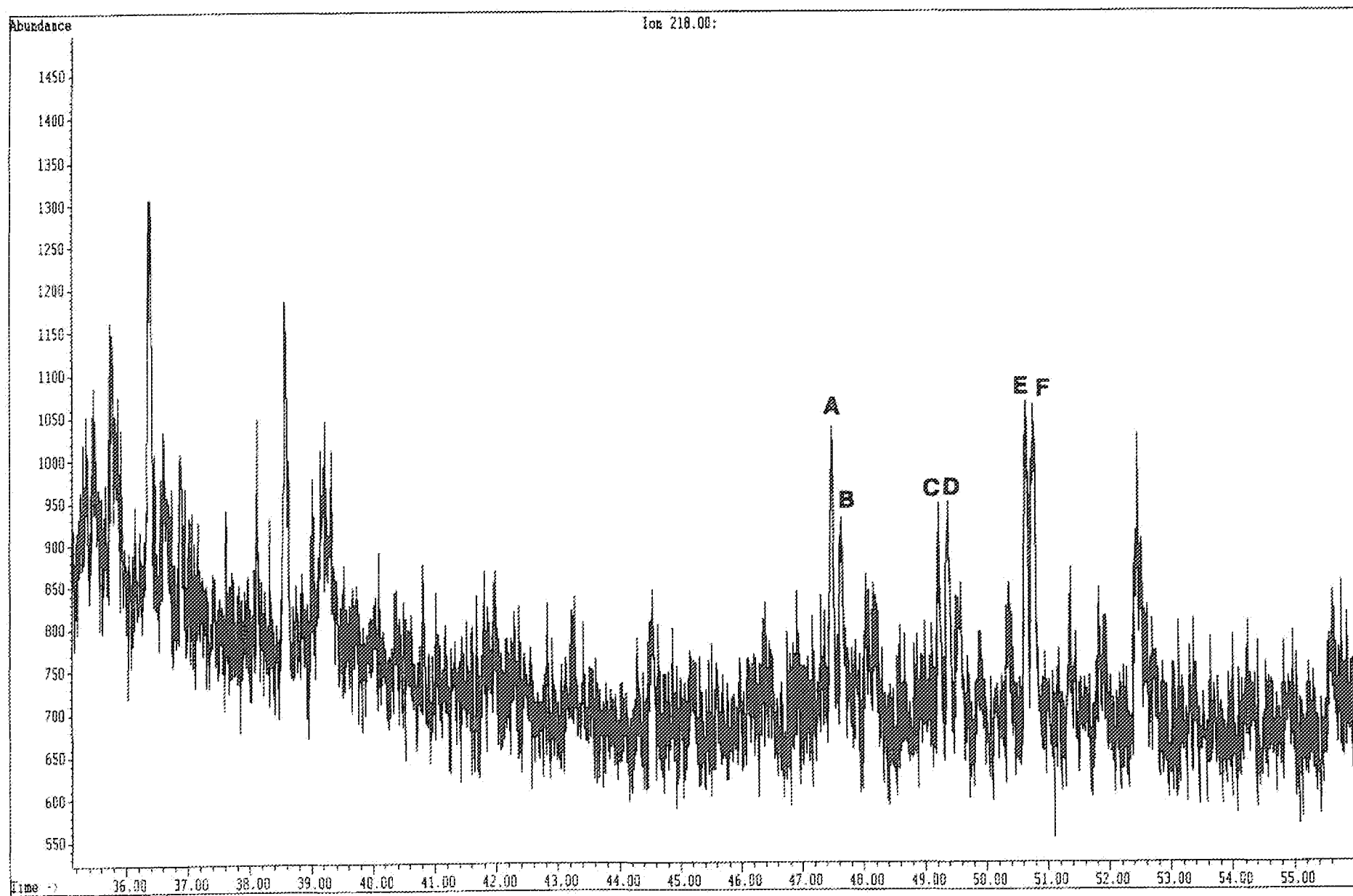
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Bottle Number: 40



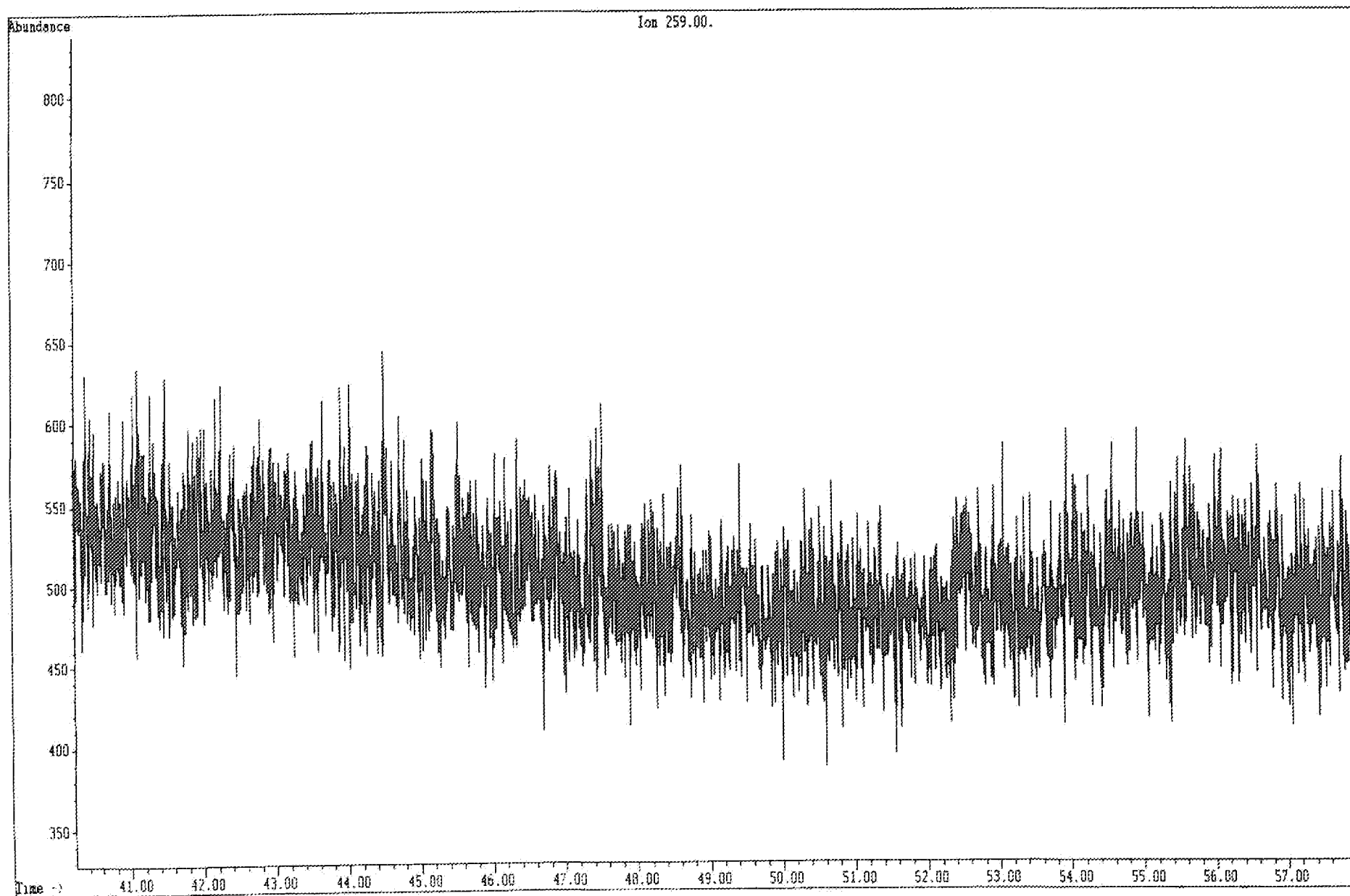
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P3.1b

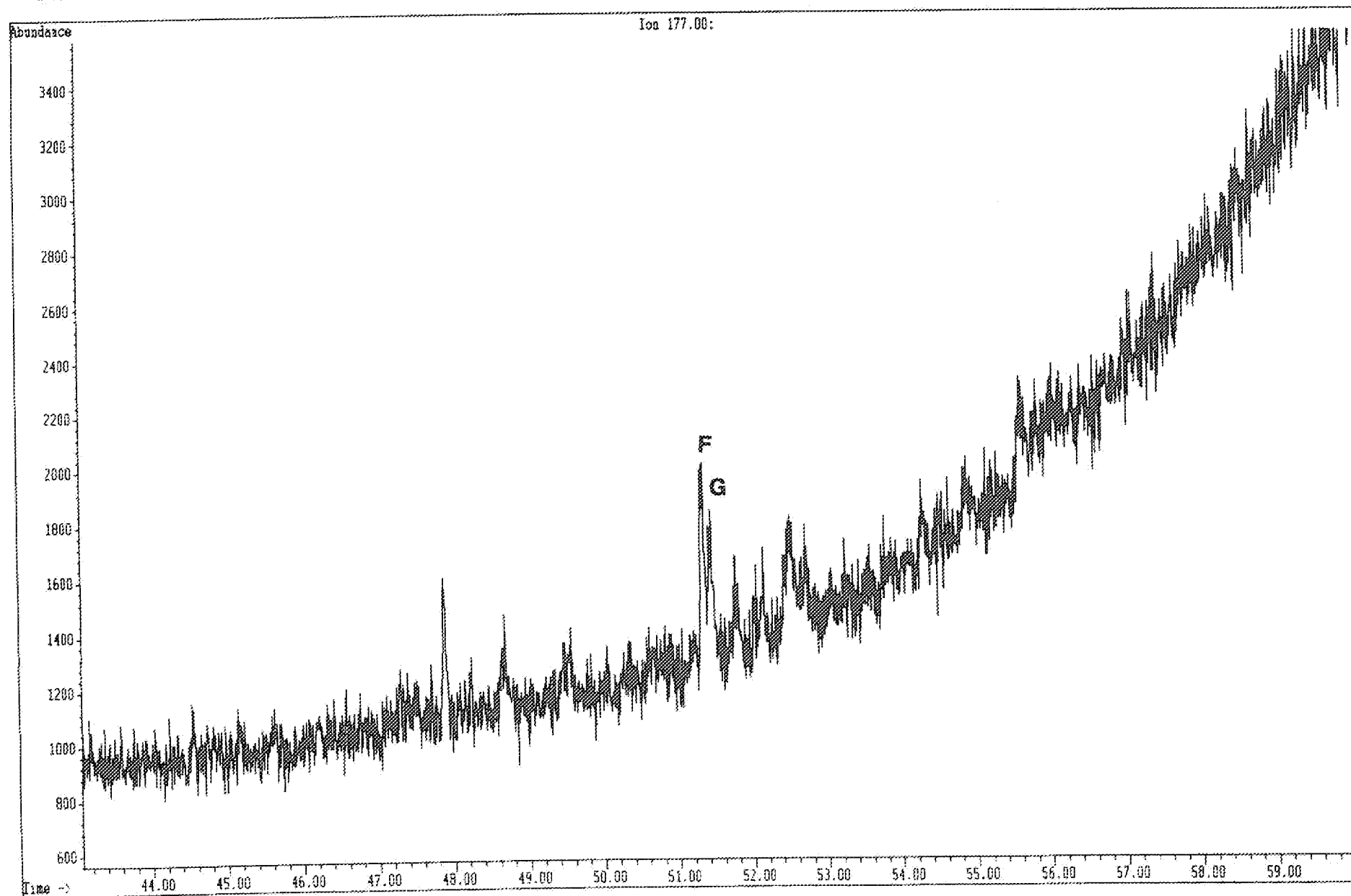


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Bottle Number: 40

P3.1c

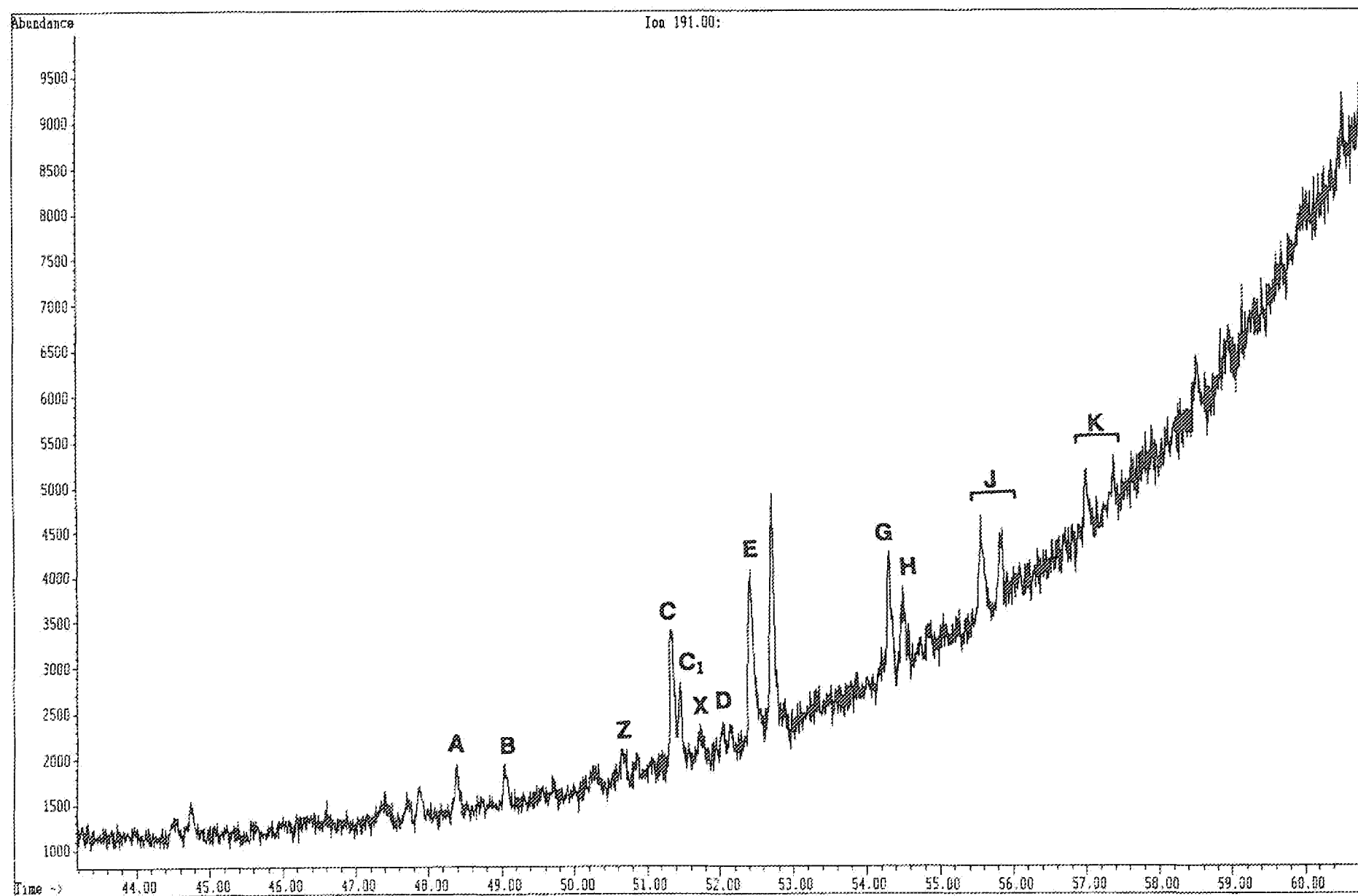


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Bottle Number: 40



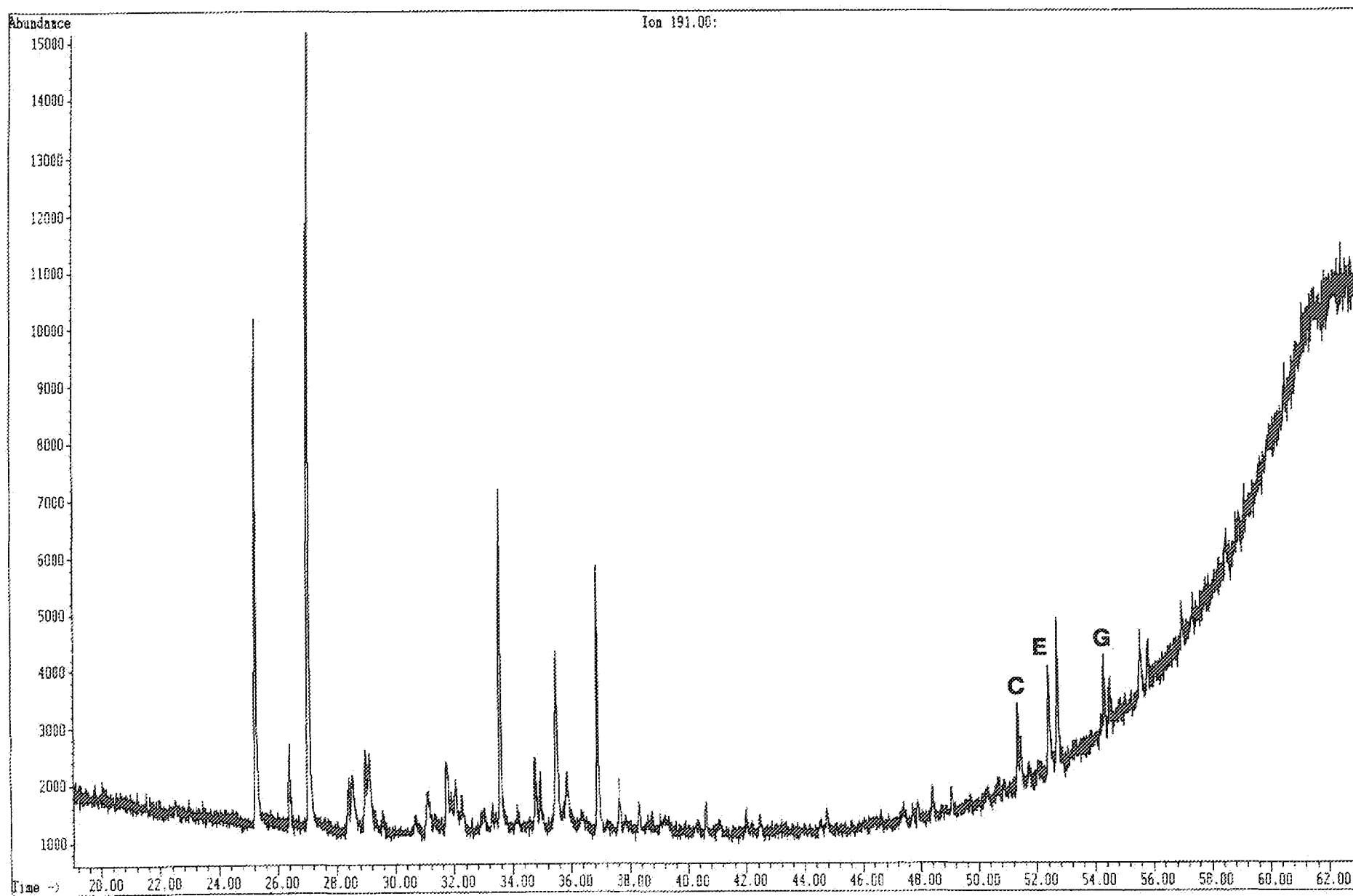
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Bottle Number: 40

P3.1e

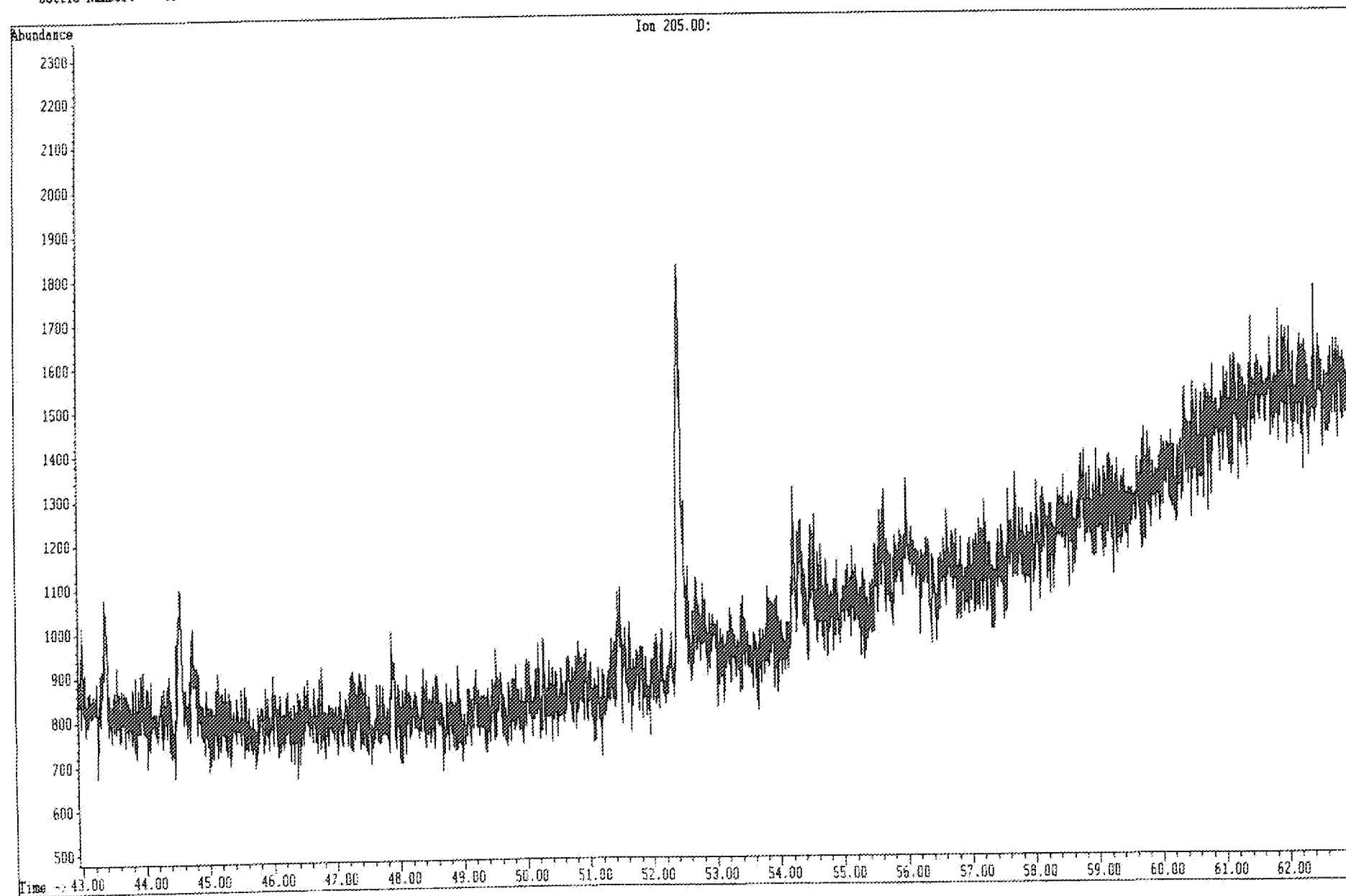


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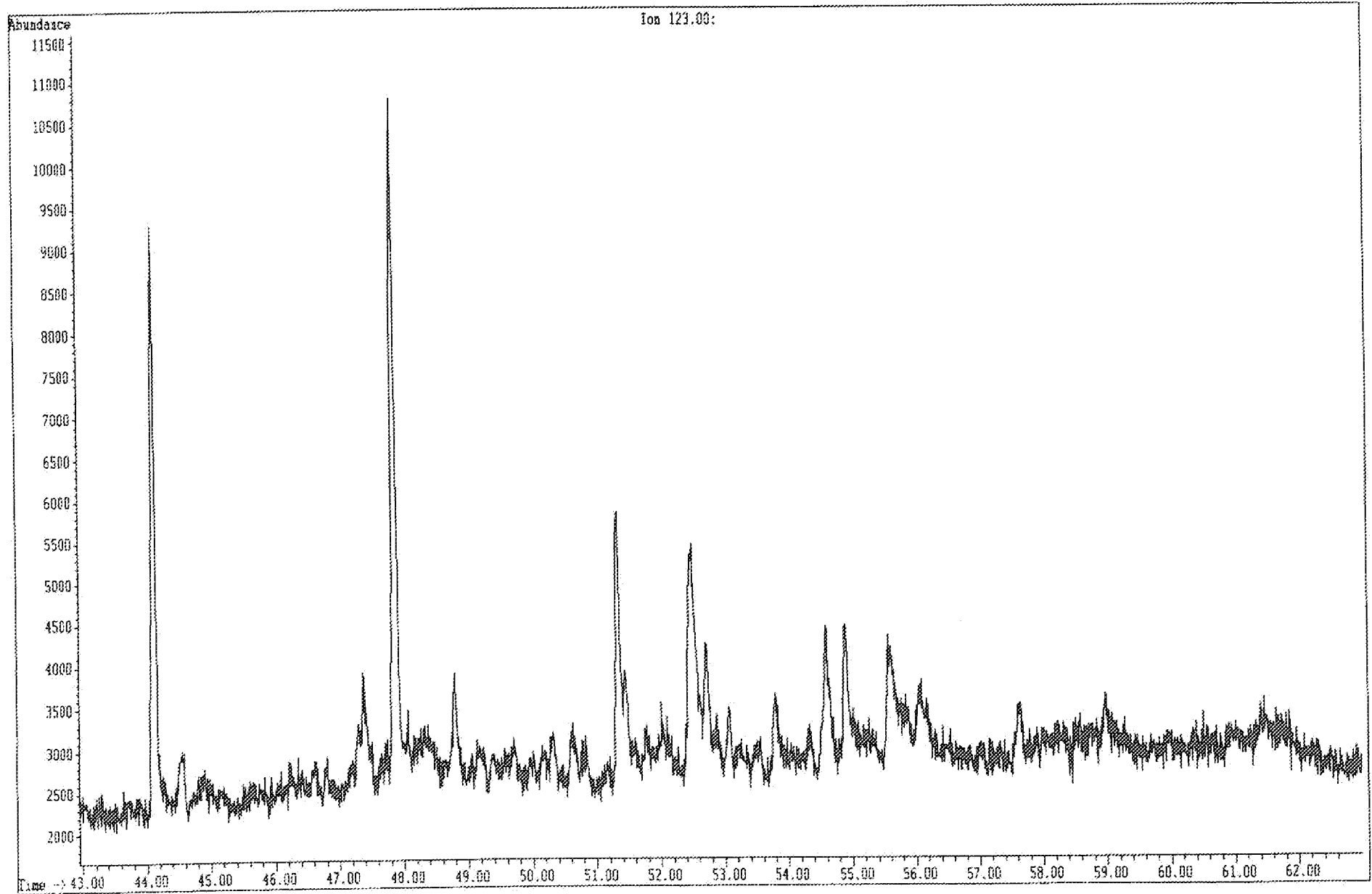
P3.1f



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Bottle Number: 40



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 Method File Name: BIOM.M
 Sample Name: 4136-001
 Misc Info: WELL 34/10-18 2376.6M
 Bottle Number: 40



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P3.1i

Operator:

Date Acquired: 13 Dec 98 0:13 am

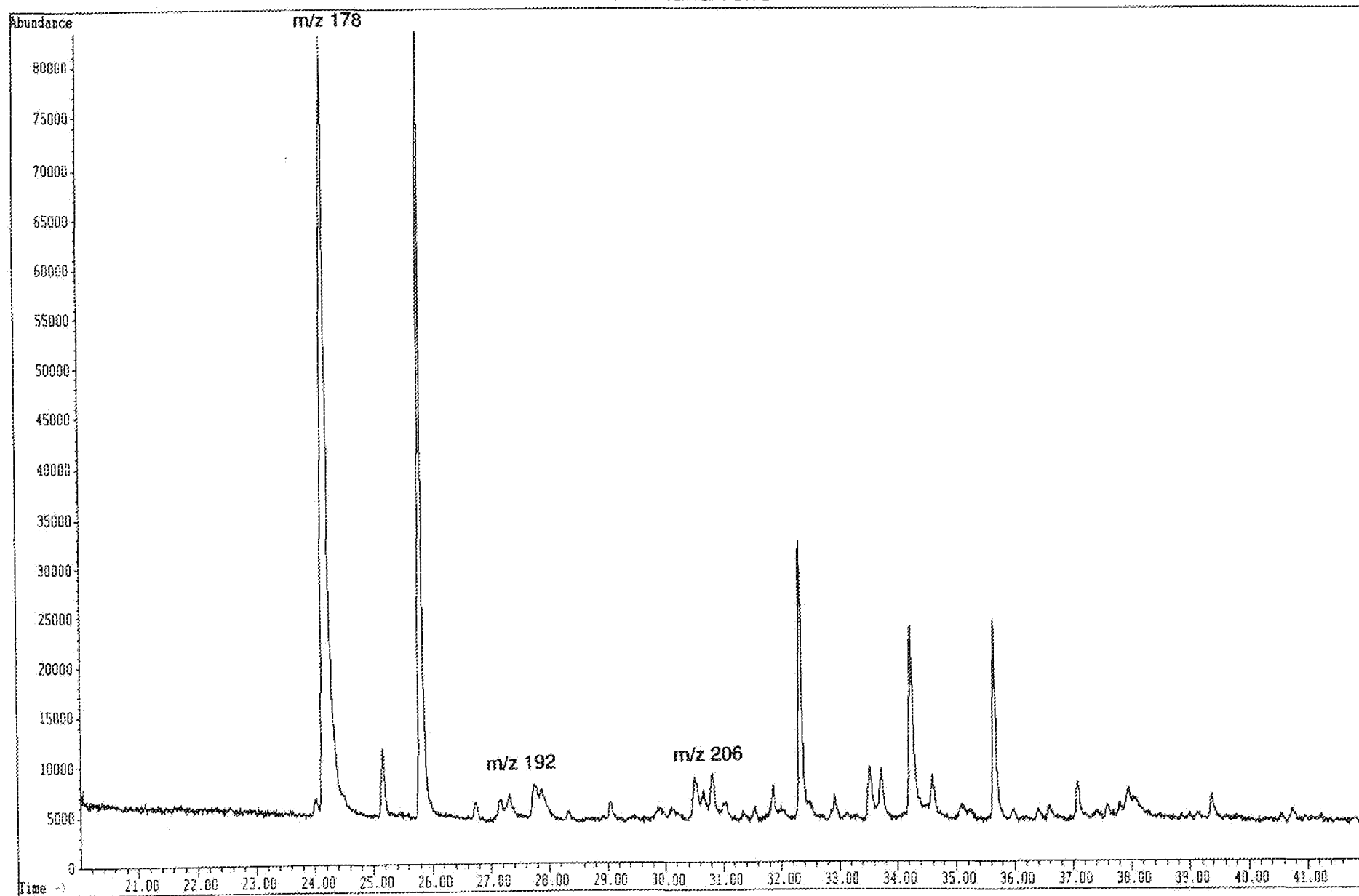
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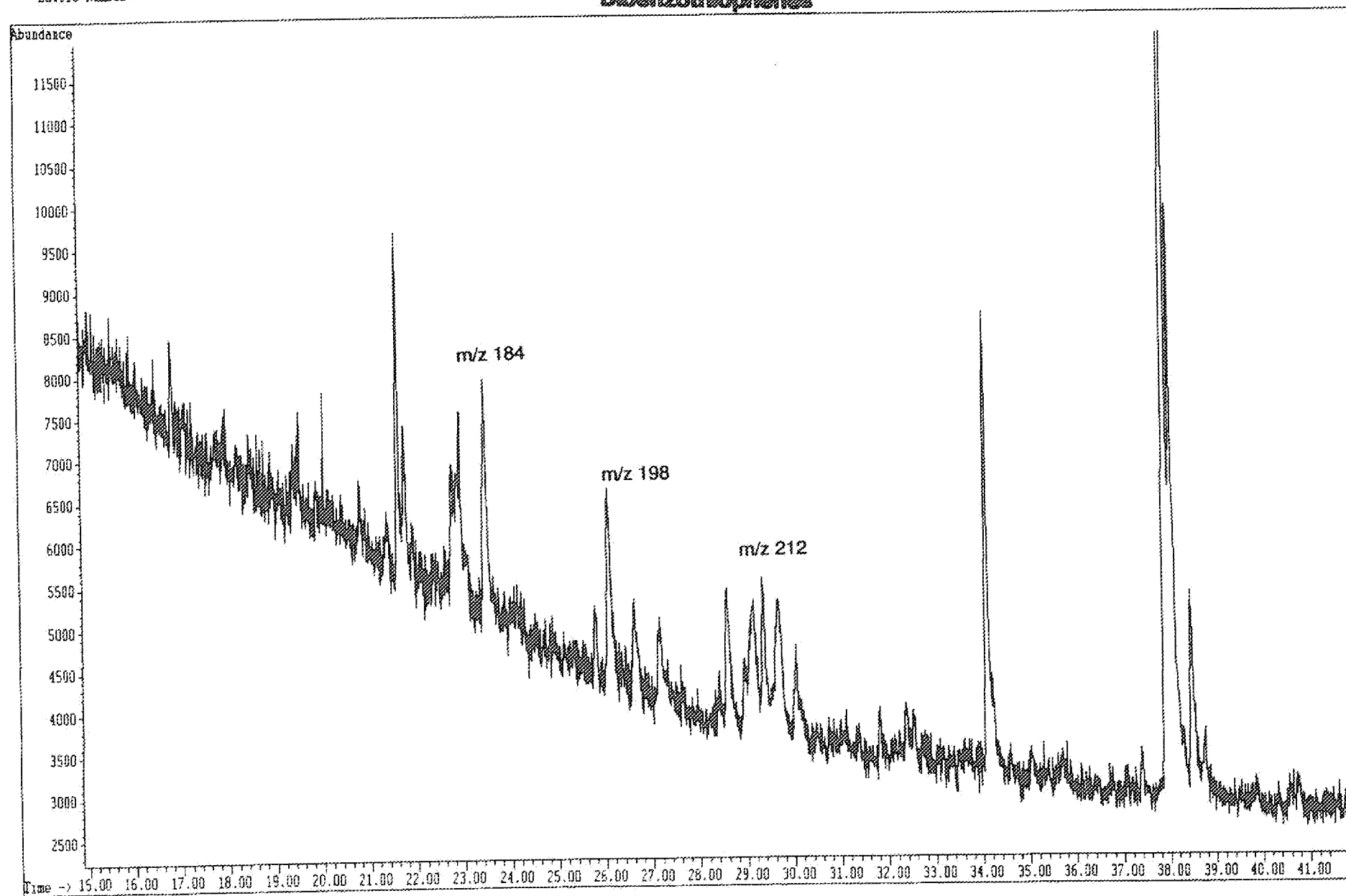
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Bottle Number: 7

Phenanthrene



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Sample Name: 4138-001
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Bottle Number: 7

Dibenzothiophenes

File: C:\CHEMPC\DATA\0701006.D

P3.1k

Operator:

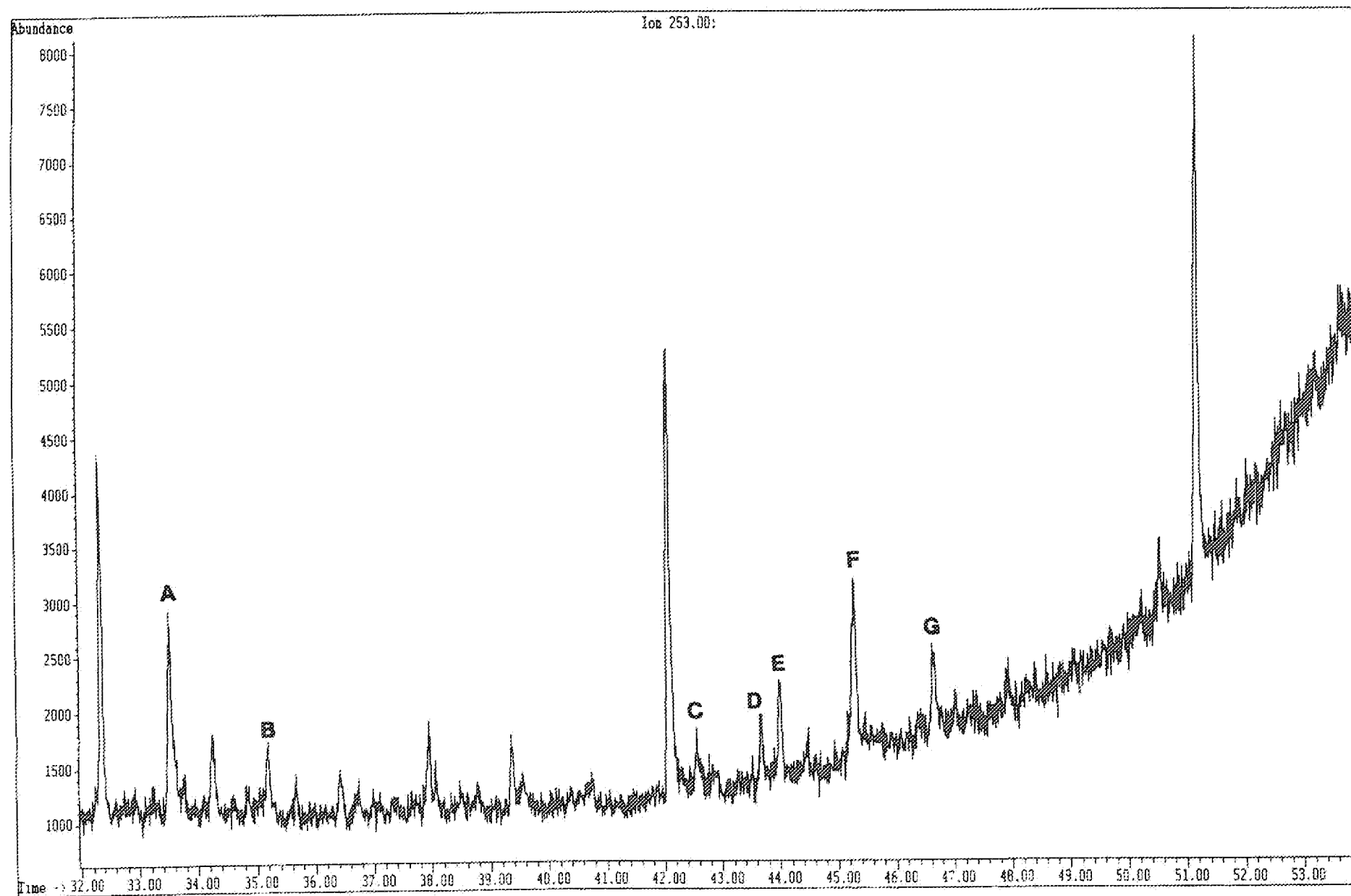
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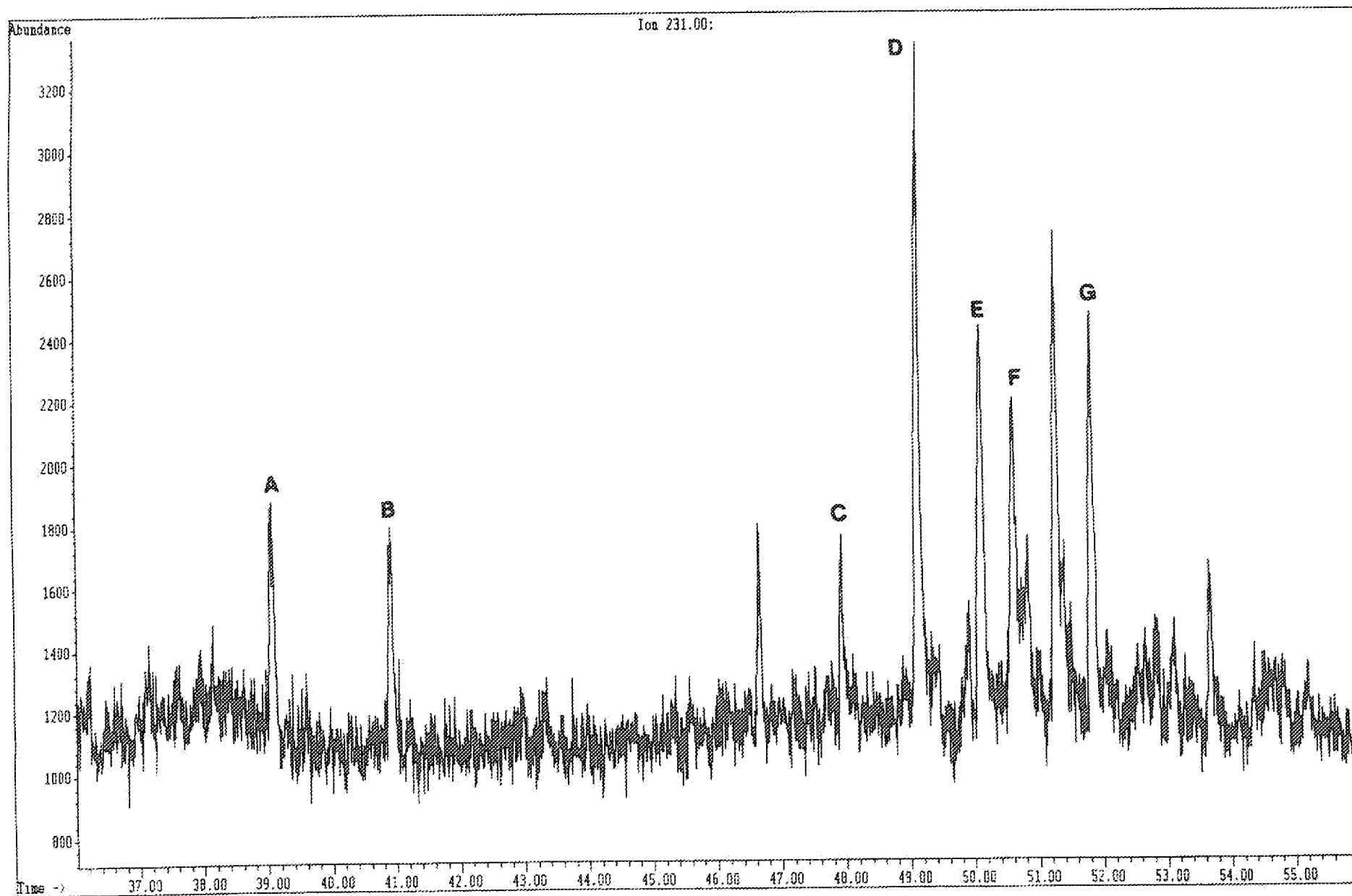
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Bottle Number: 7



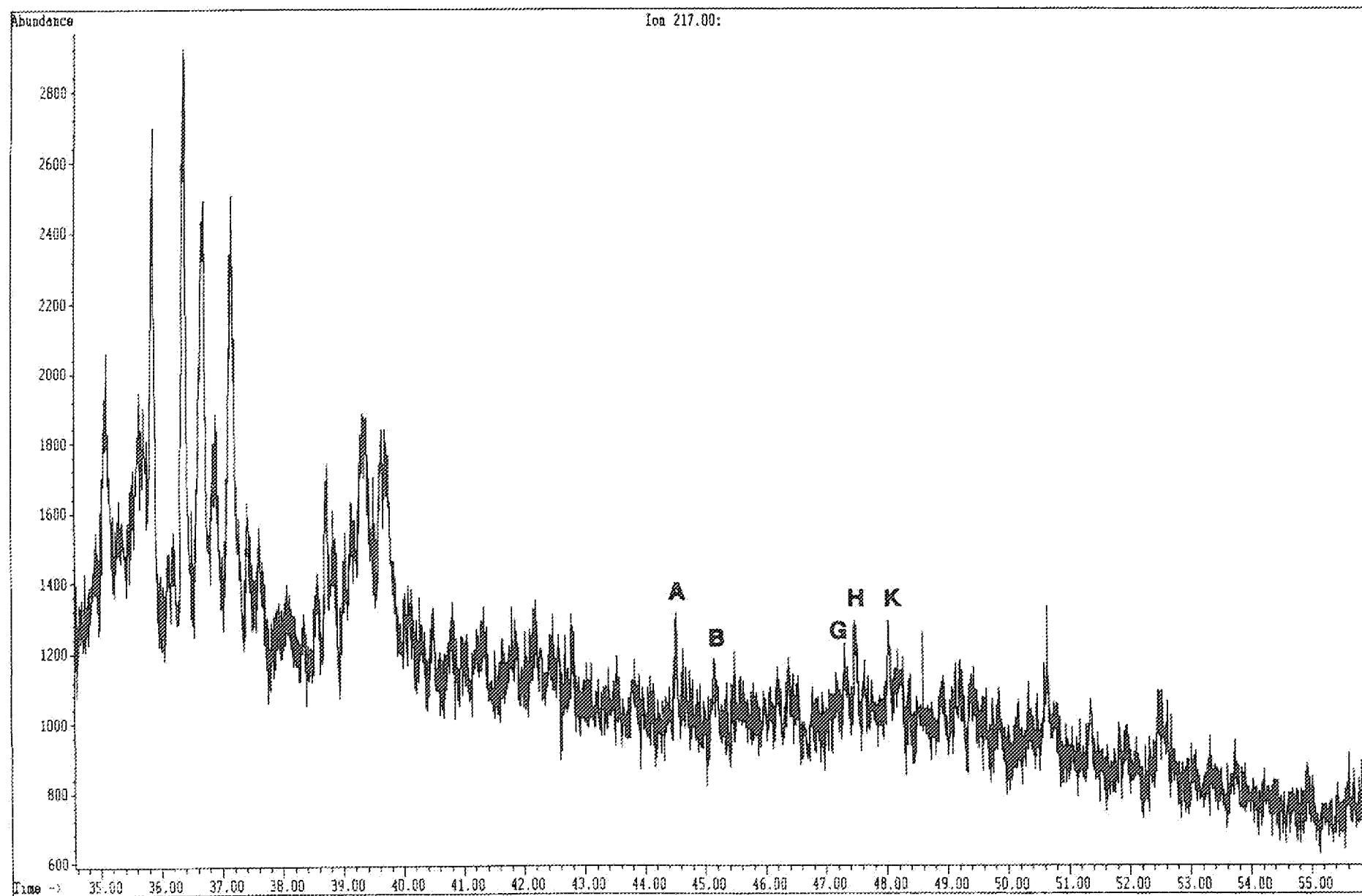
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Bottle Number: 7

P3.11

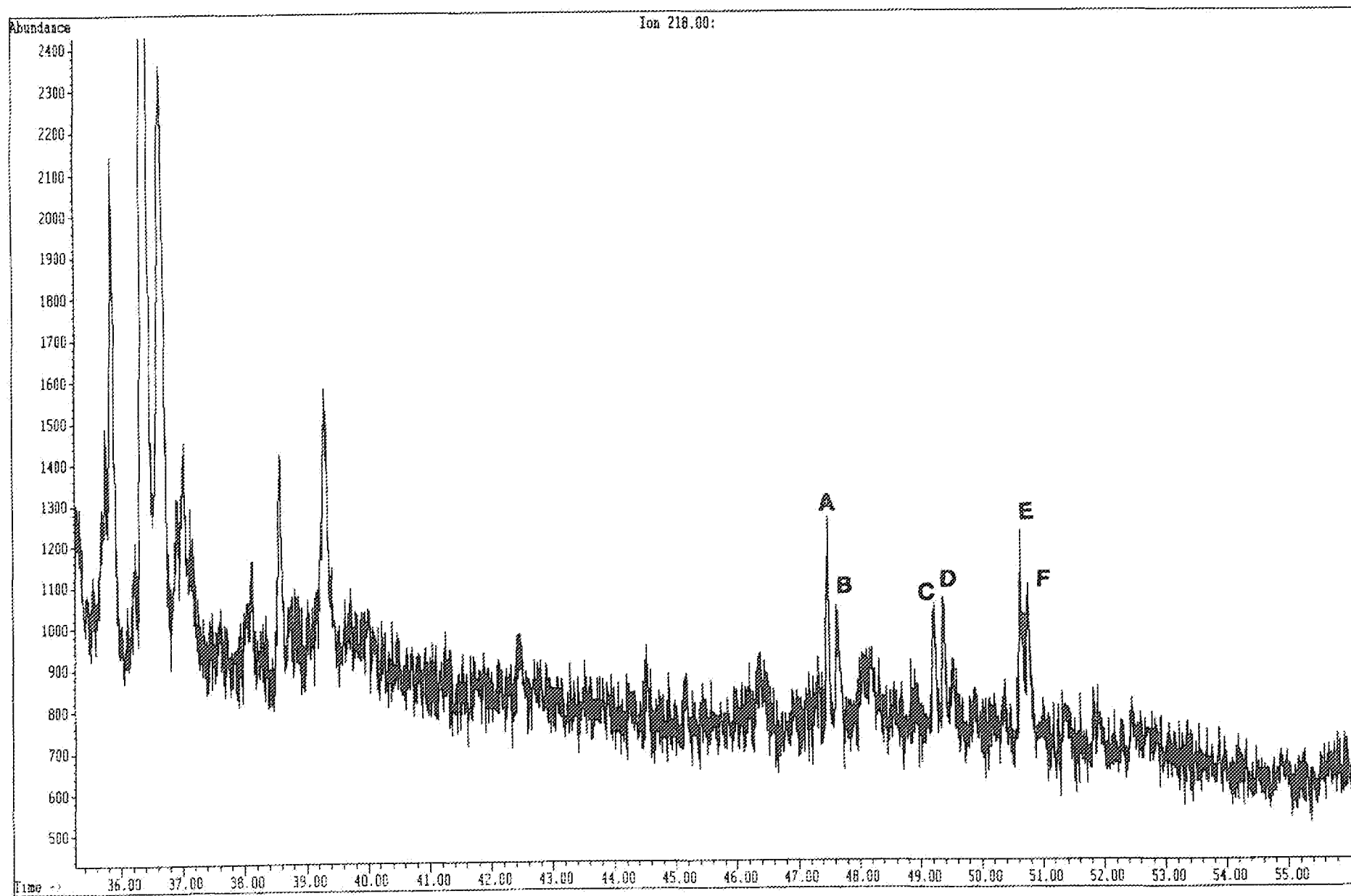


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Method File Name: BICM.M
Sample Name: 4138-002
Misc Info: WELL 34/10-18 2389.5M
Bottle Number: 41

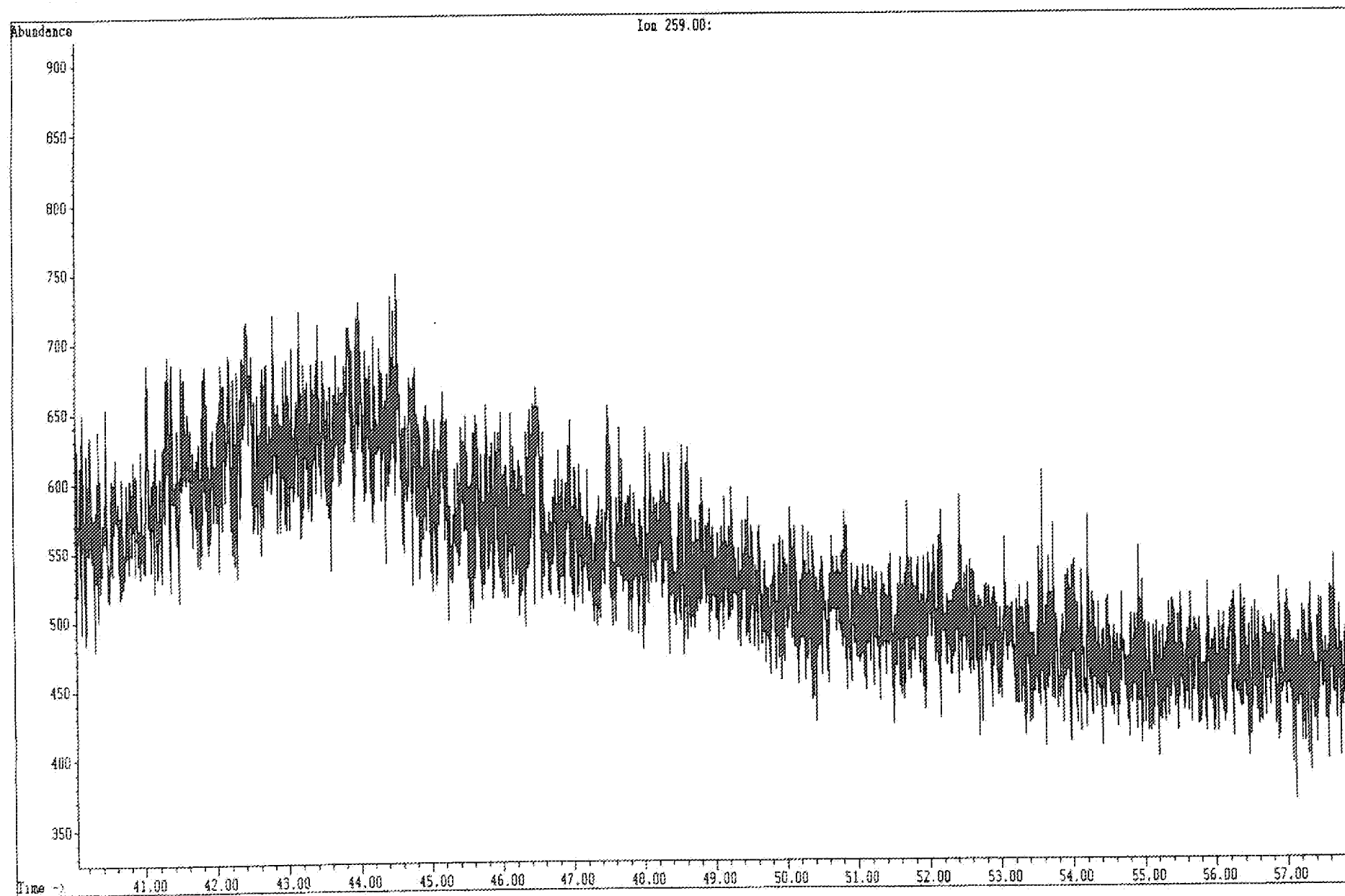
P3.2a



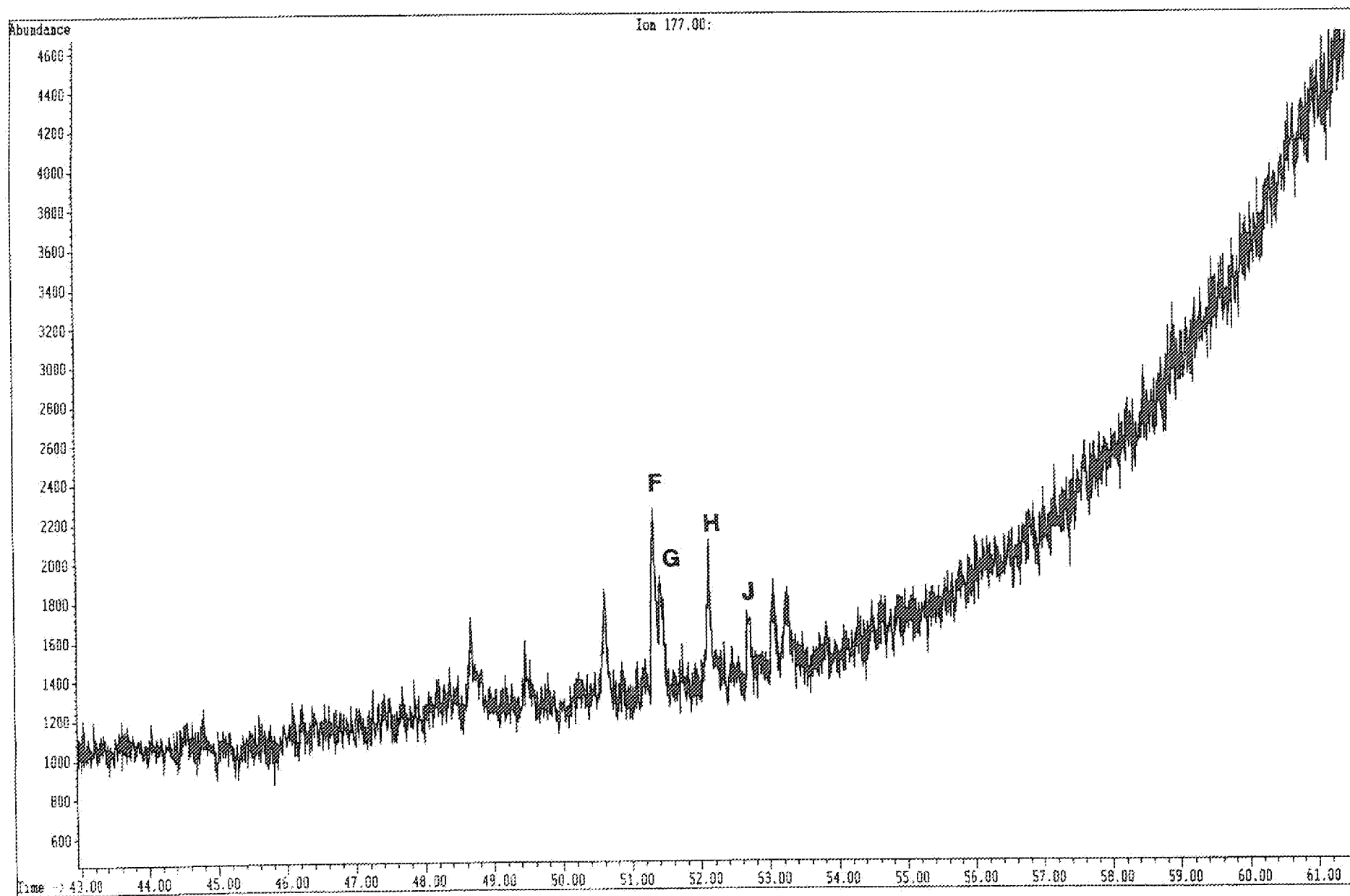
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Sample Name: 4138-002
Misc Info: WELL 34/10-18 2389.5M
Bottle Number: 41



File: C:\CHEMPC\DATA\4101003.D
Operator:
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Method File Name: BIOM.M
Sample Name: 4138-002
Misc Info: WELL 34/10-18 2389.5M
Bottle Number: 41



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Operator:
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Method File Name: B10M.M
Sample Name: 4138-802
Misc Info: WELL 34/10-18 2389.5M
Bottle Number: 41



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P3.2e

Operator

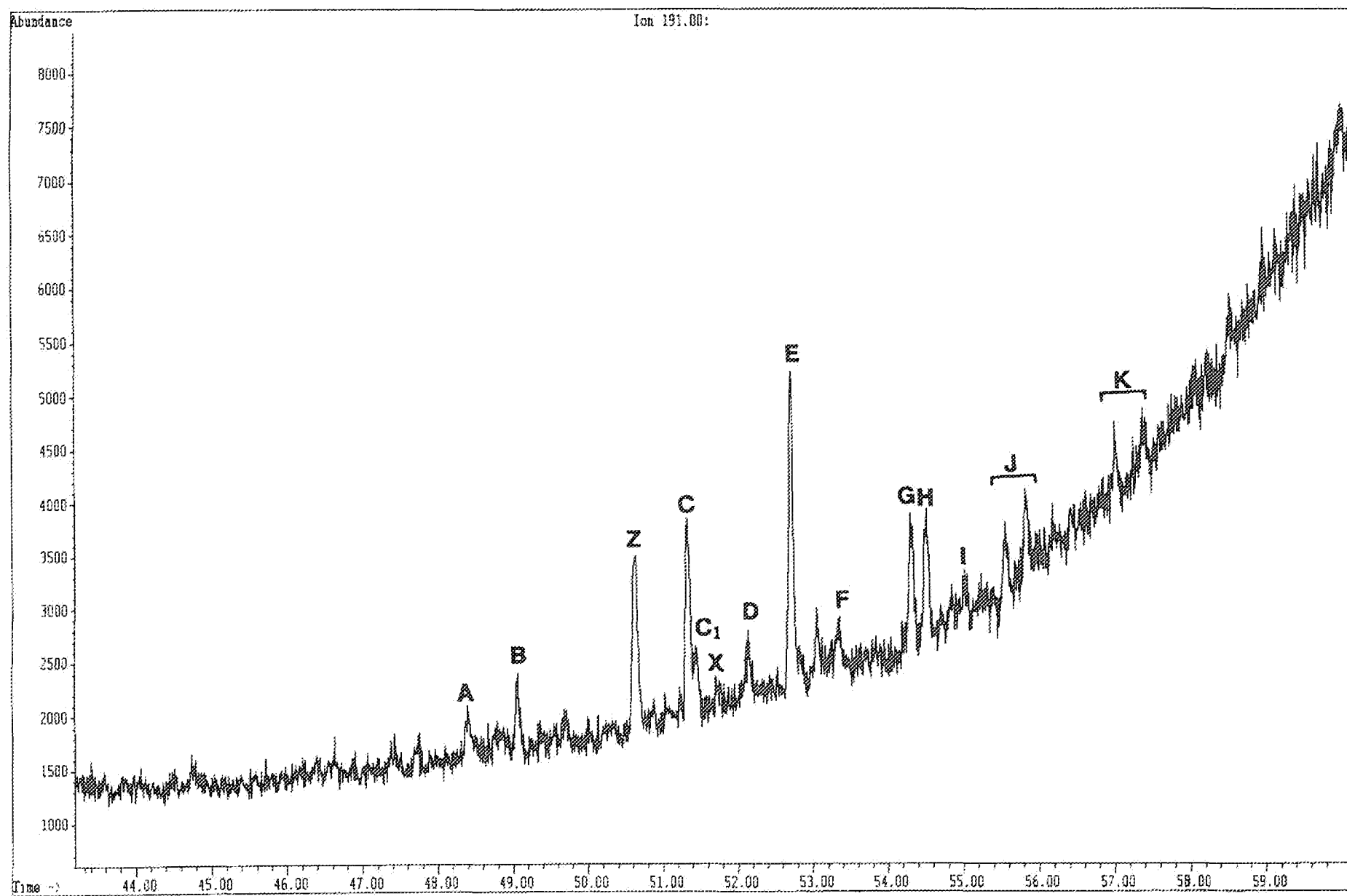
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Sample Name: 4139-092

Misc Info: WELL 34/10-18 2389.5M

Bottle Number: 41



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P32f

Operator:

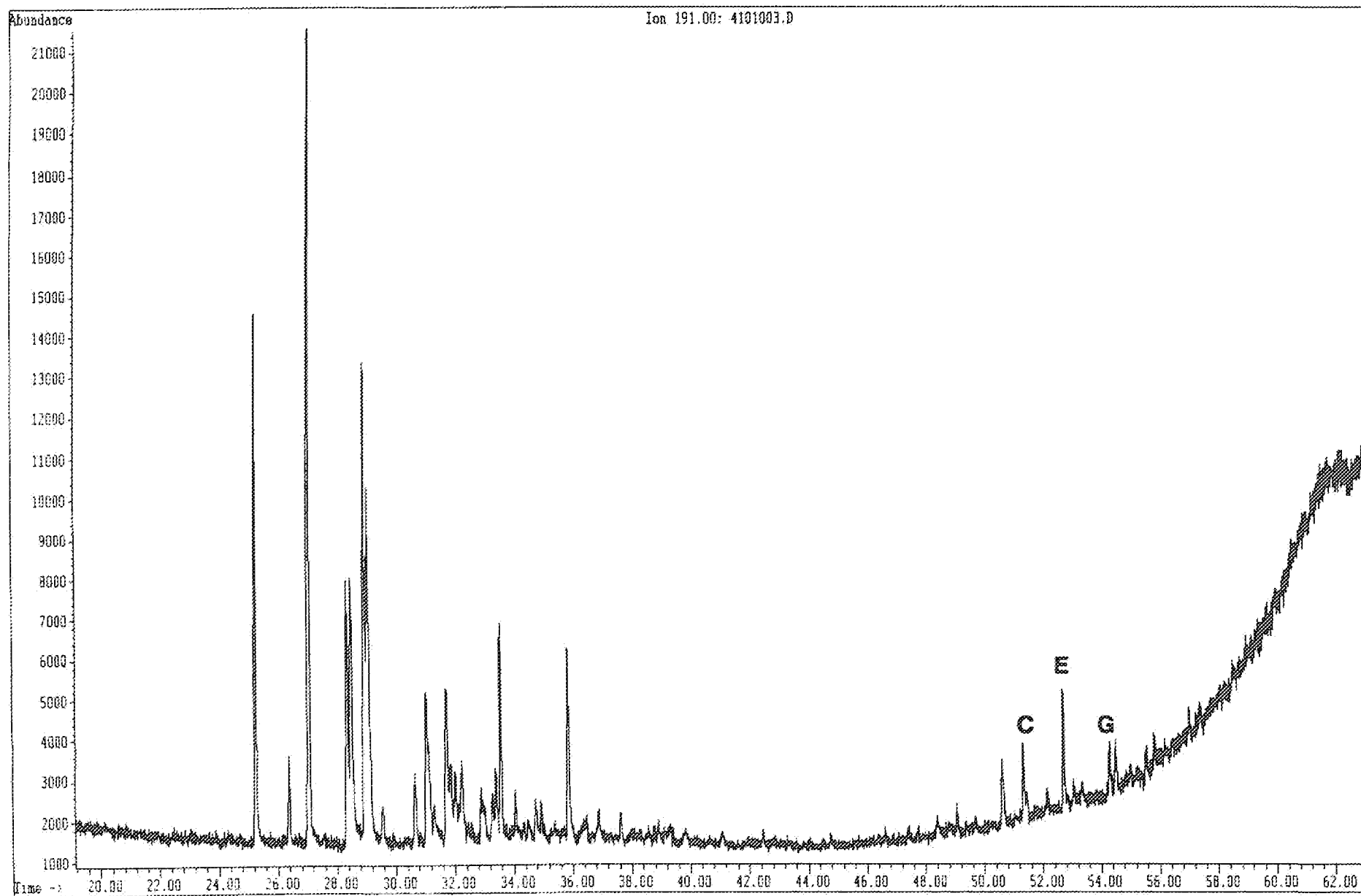
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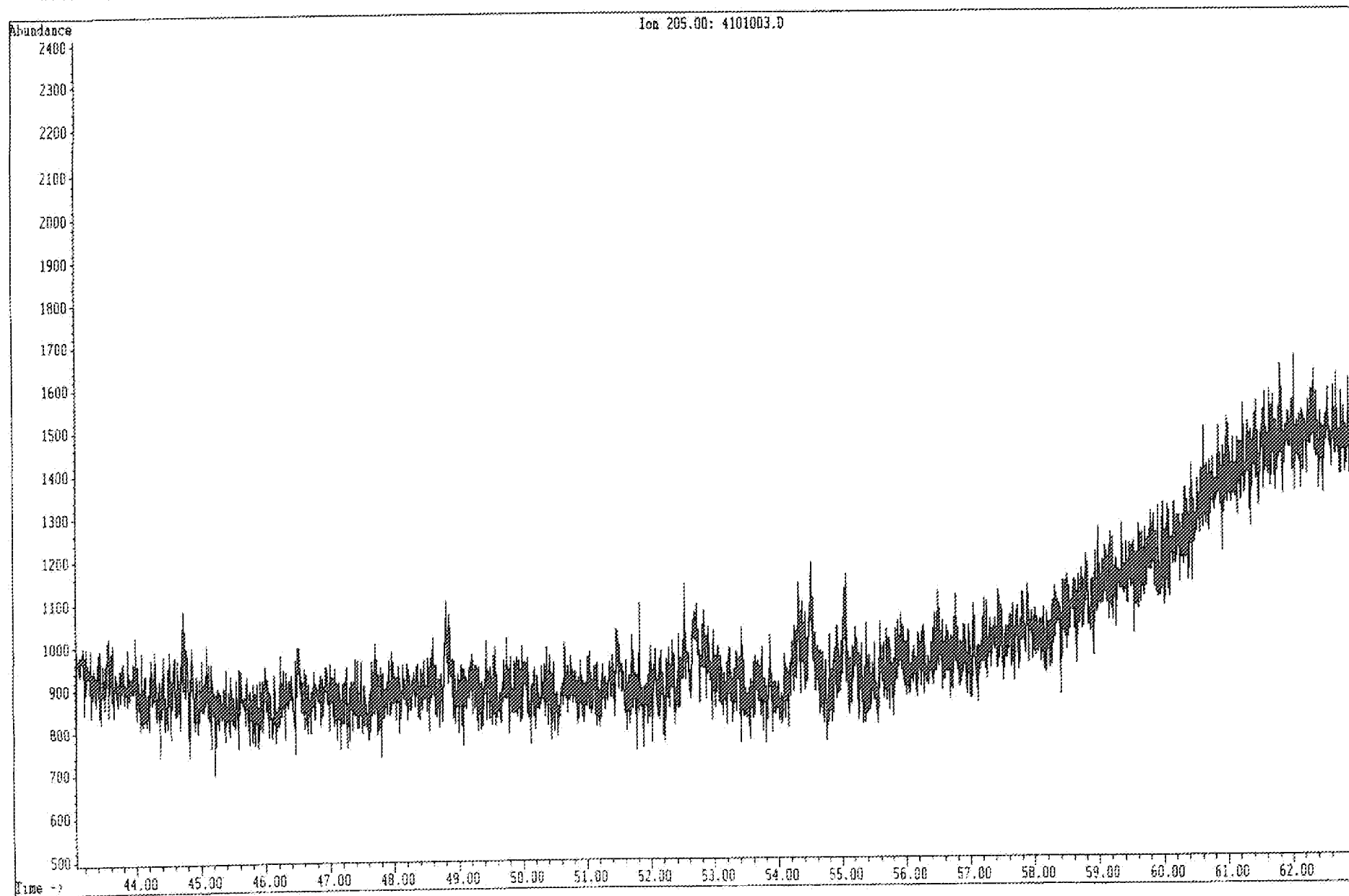
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Misc Info: WELL 34/10-18 2389.5M

Bottle Number: 41



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Operator:
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Method File Name: BIOM.M
Sample Name: 4138-002
Misc Info: WELL 34/10-10 2389.5M
Bottle Number: 41



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Operator:

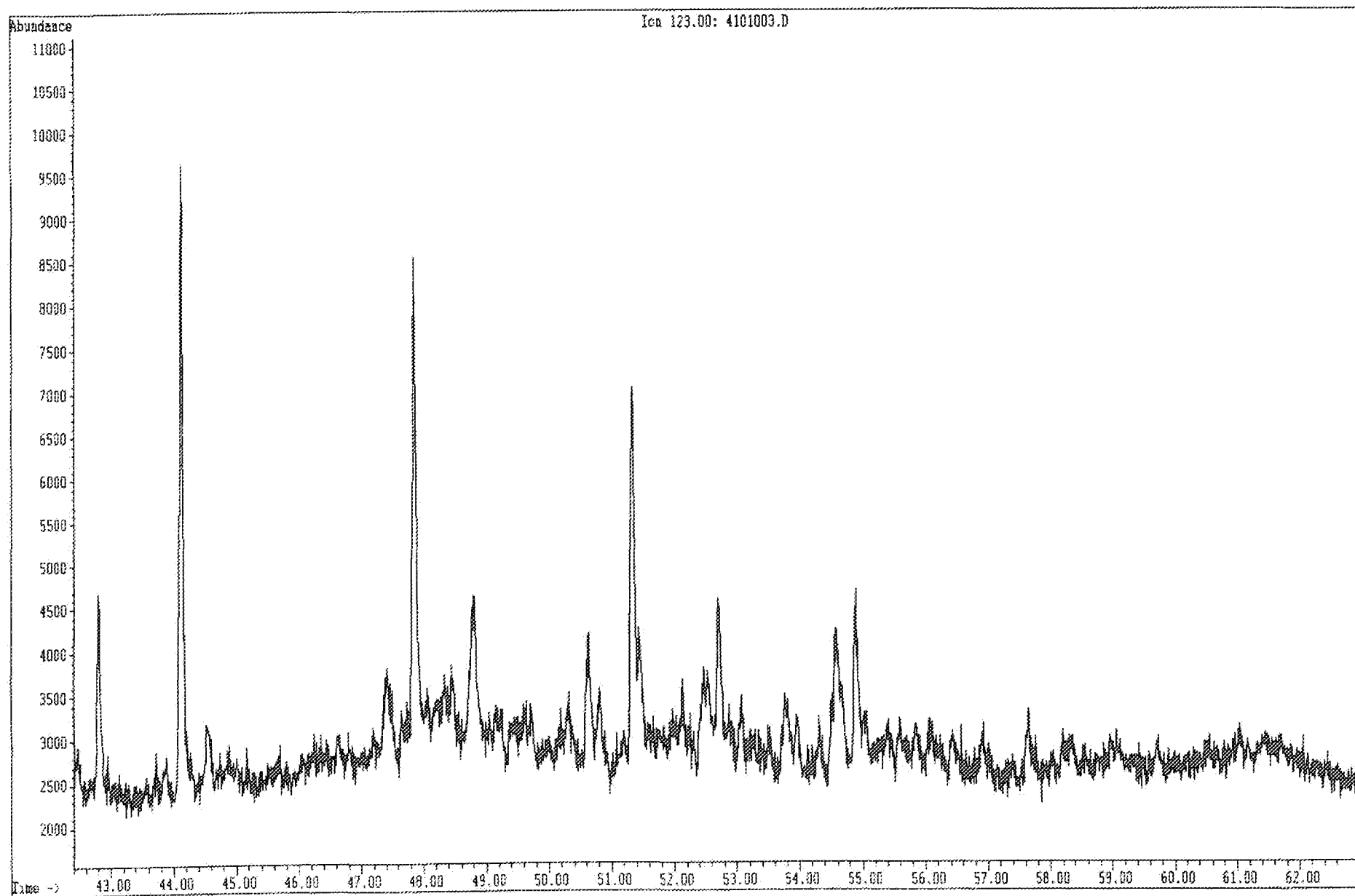
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Method File Name: B10M.M

Sample Name: 4138-002

Misc Info: WELL 34/10-18 2389.5M

Bottle Number: 41



File: C:\CHEMPC\DATA\0001007.D

P3.2i

Operator:

Date Acquired: 13 Dec 90 1:21 am

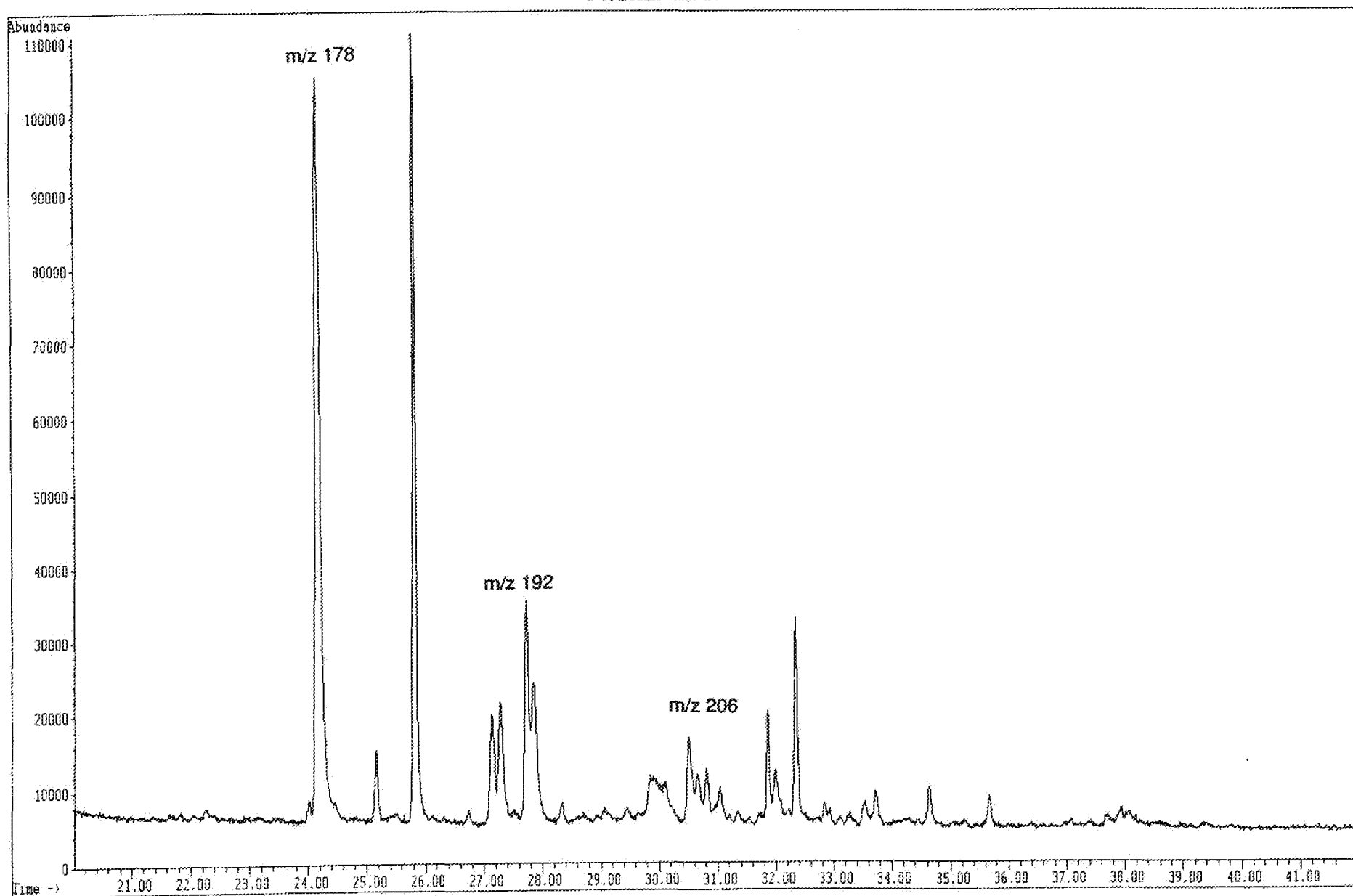
Method File Name: BICMY.M

Sample Name: 4138-002

Misc Info: WELL 34/10-18 2389.5M

Bottle Number: 8

Phenanthrene



File: C:\CHEMPC\DATA\0801007.D

P3.2j

Operator:

Date Acquired: 13 Dec 90 1:21 am

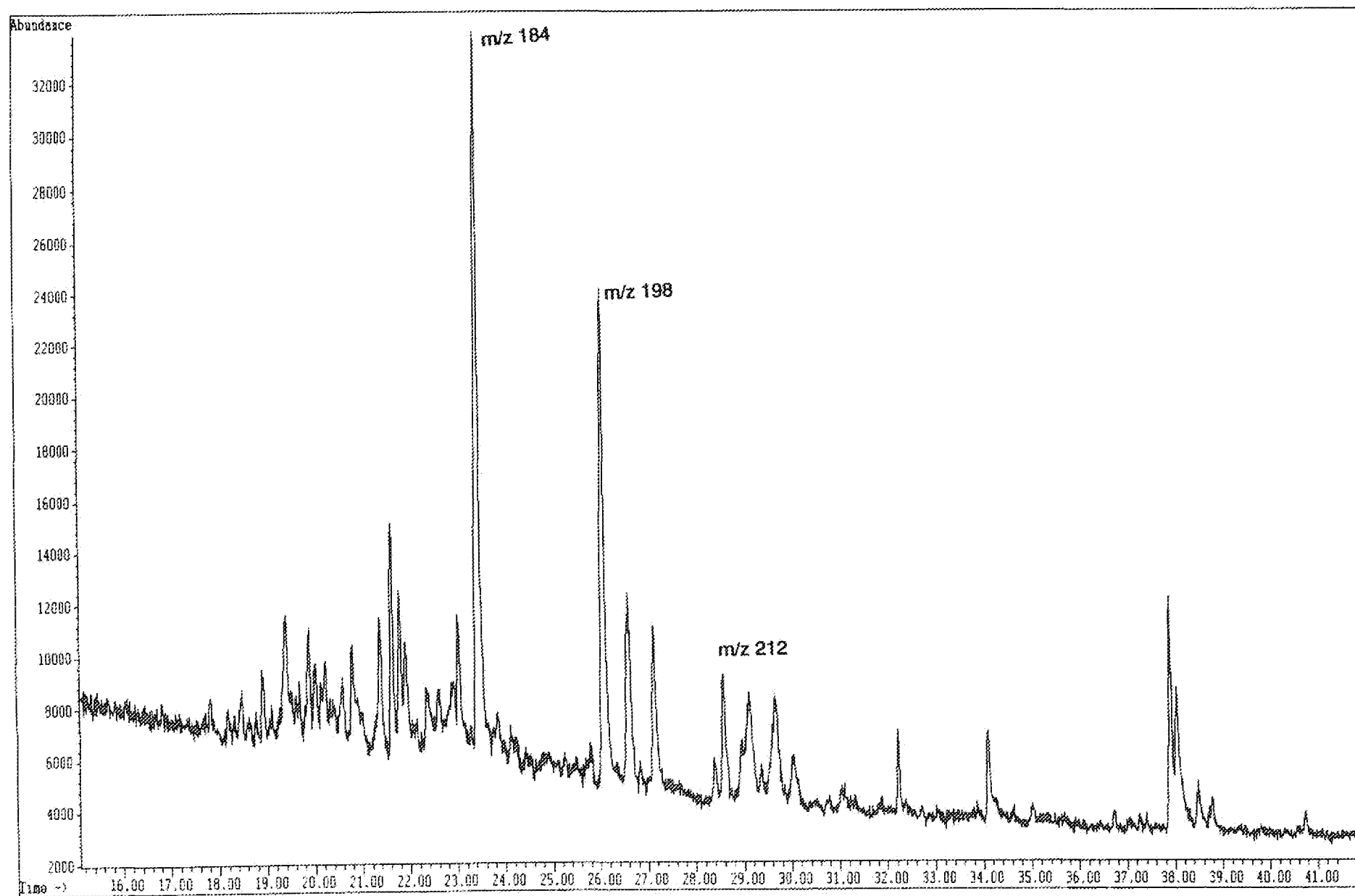
Method File Name: B10MY.M

Sample Name: 4138-002

Misc Info: WELL 34/10-18 2389.5M

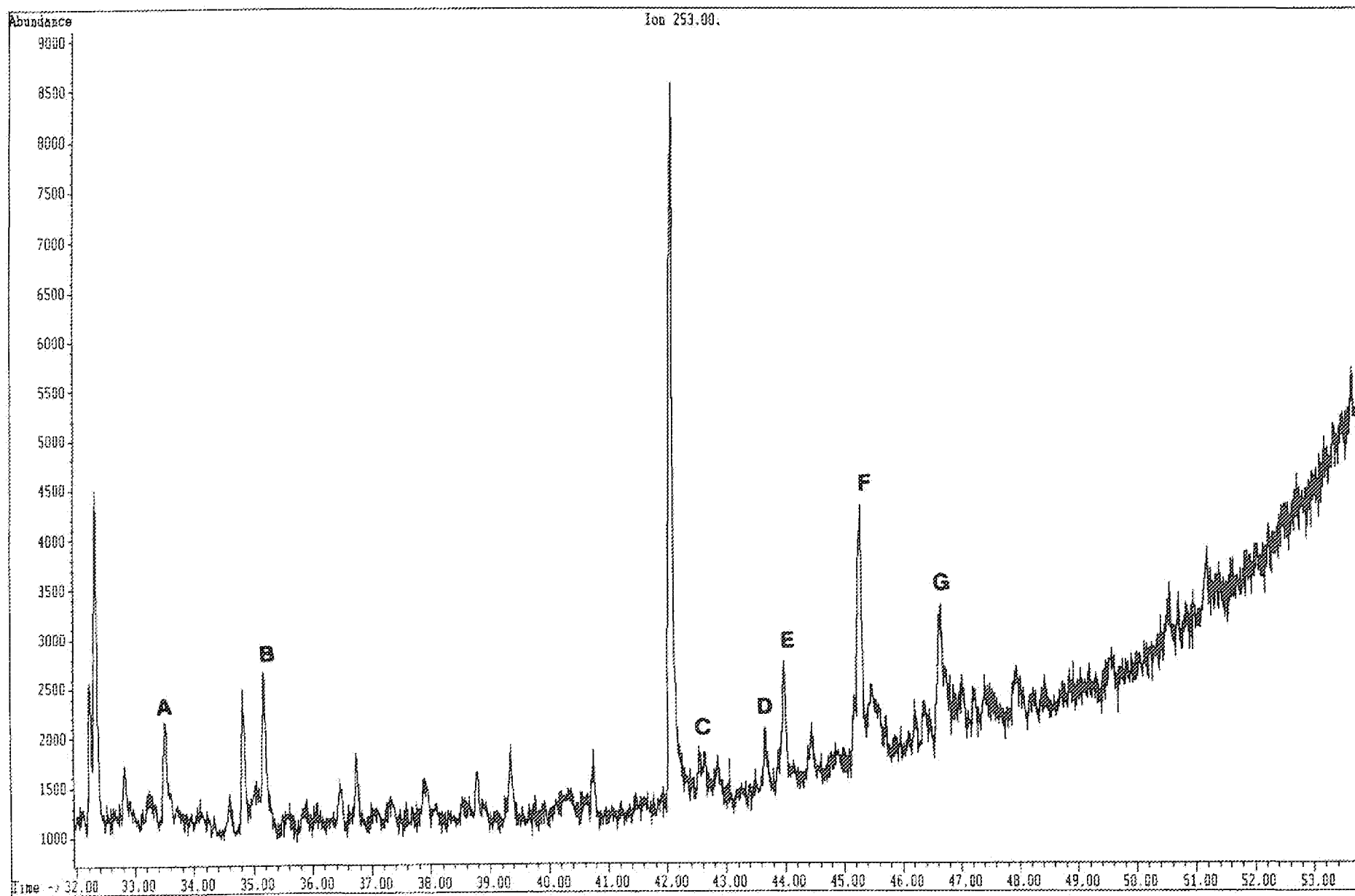
Bottle Number: 8

Dibenzothiophenes



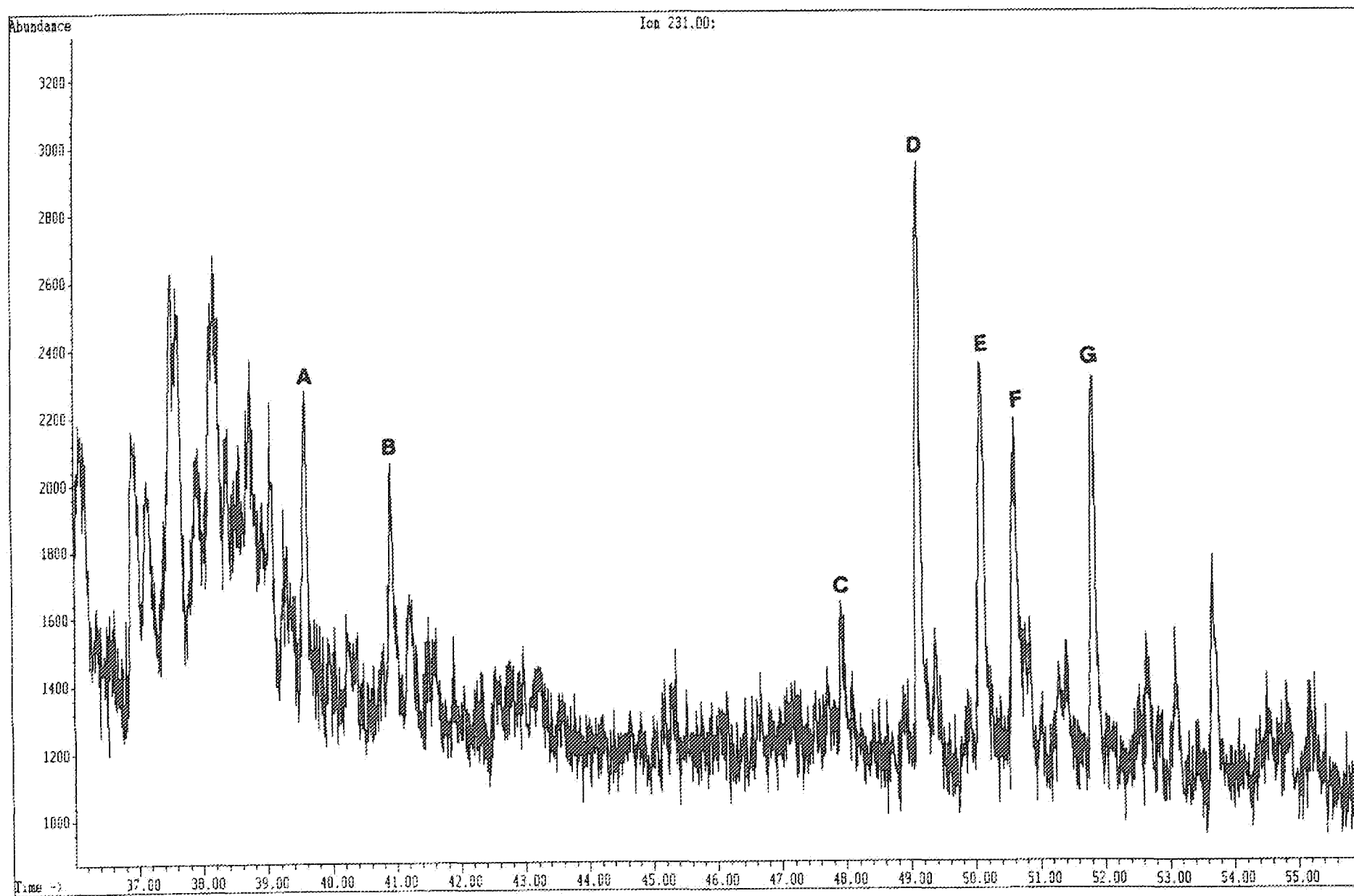
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Operator:
Date Acquired: 13 Dec 90 1:21 am
Method File Name: BIOMY.M
Sample Name: 4138-002
Misc info: WELL 34/10-18 2389.5M
Bottle Number: 8

P3.2k

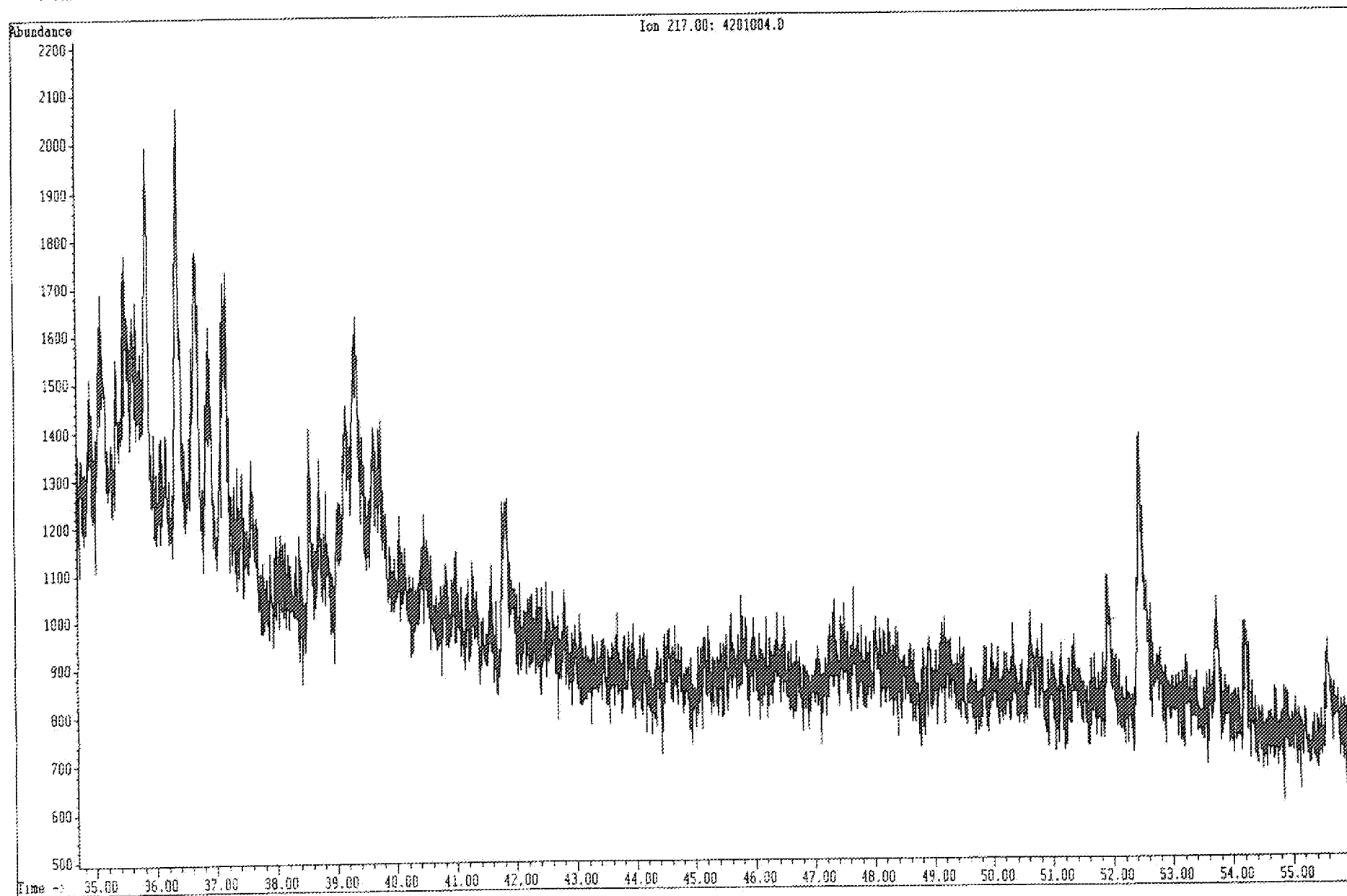


File: C:\CHEMPC\DATA\0801007.D
Operator:
Date Acquired: 19 Dec 90 1:21 am
Method File Name: BIOMY.M
Sample Name: 4138-002
Misc Info: WELL 34/10-18 2389.5M
Bottle Number: 8

P3.21

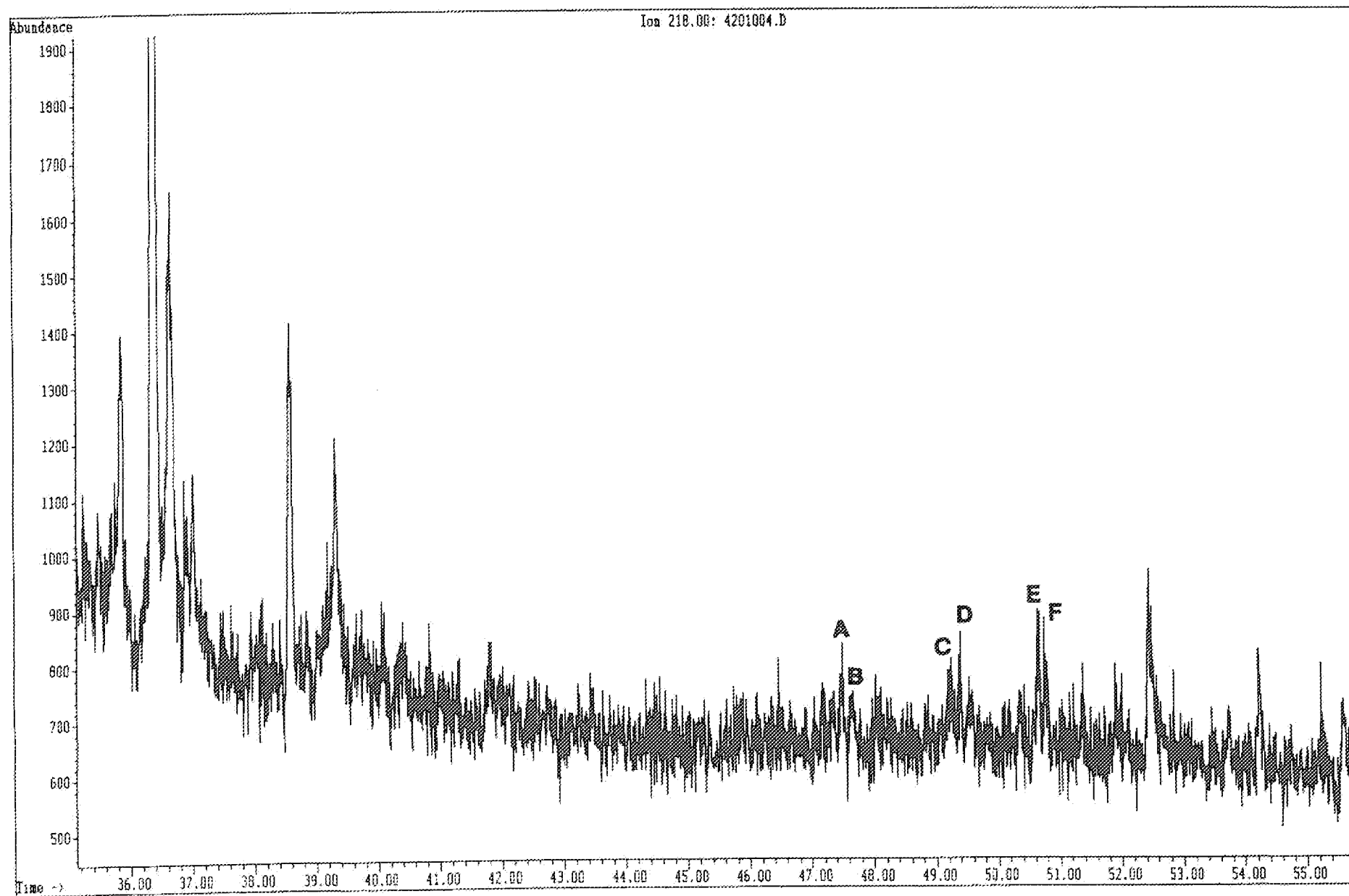


File: C:\CHEMPC\DATA\4201004.D
Operator:
Date Acquired: 15 Dec 90 5:09 pm
Method File Name: BIOM.M
Sample Name: 4136-083
Misc Info: WELL 34/10-18 2390.7M
Bottle Number: 42



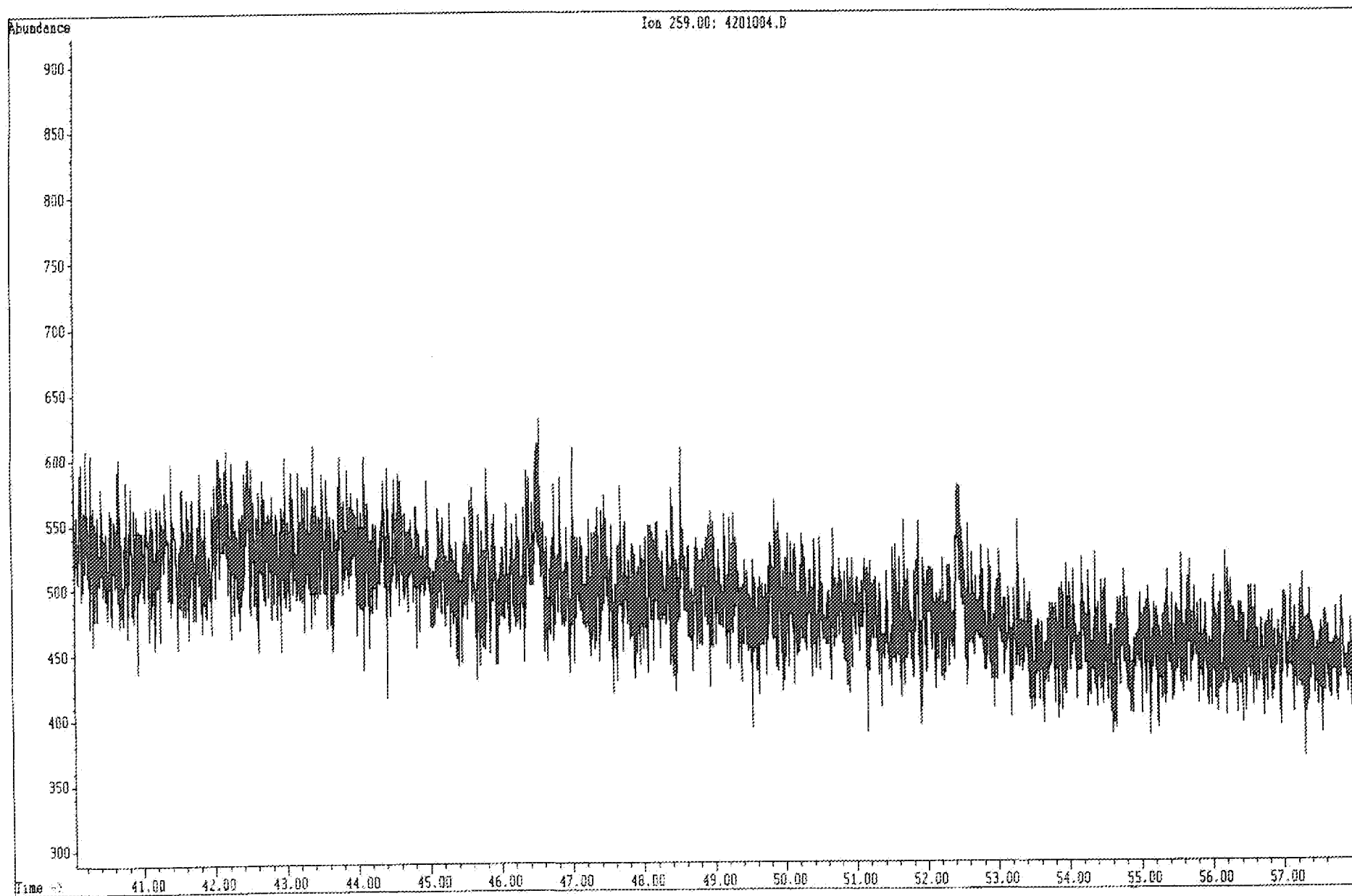
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Operator:
Date Acquired: 15 Dec 90 5:09 pm
Method File Name: B10M.M
Sample Name: 4138-003
Misc Info: WELL 34/10-18 2390.7M
Bottle Number: 42

P3.3b

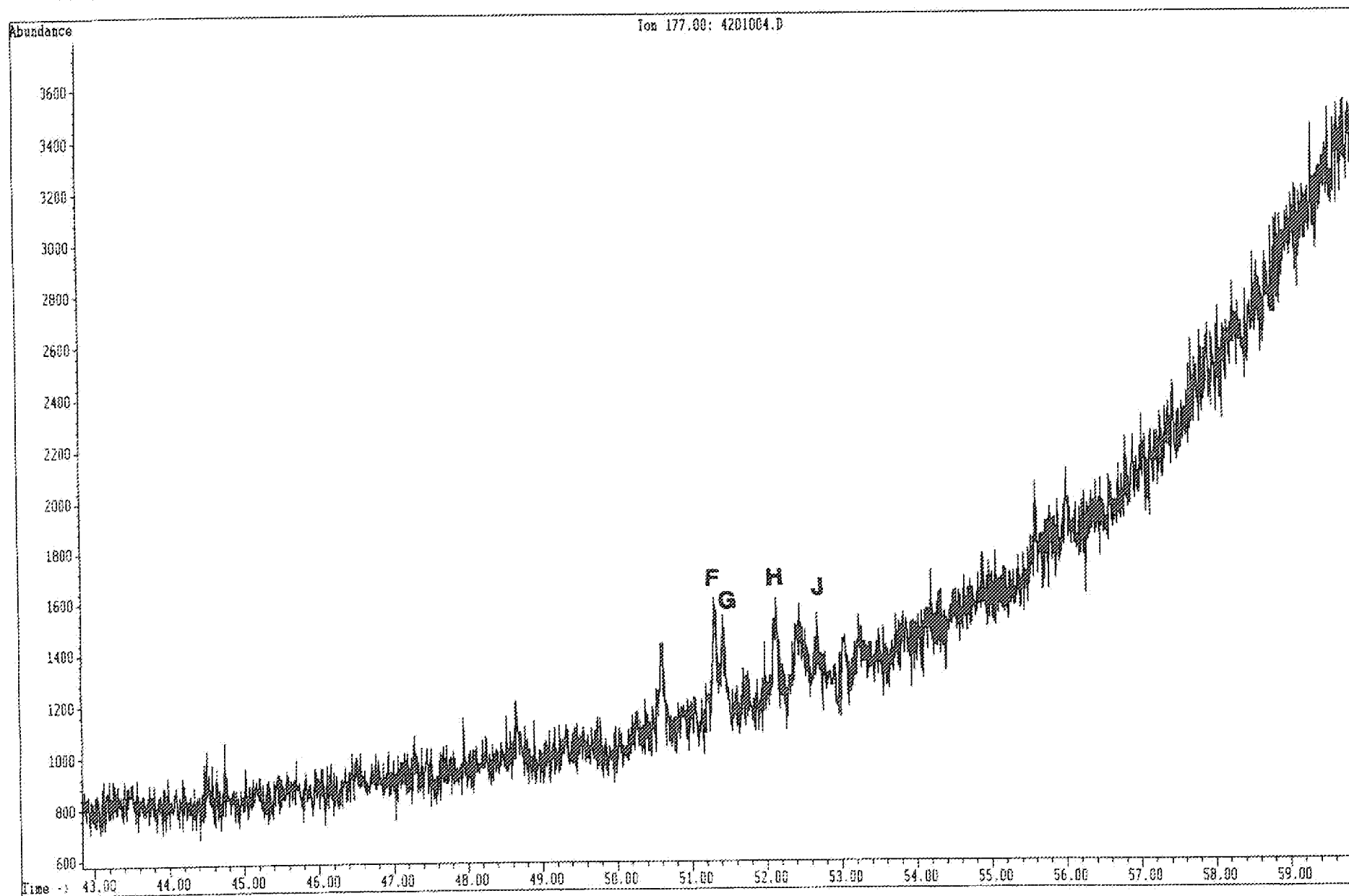


File: C:\CHEMPC\DATA\4201004.D
Operator:
Date Acquired: 15 Dec 90 5:09 pm
Method File Name: BIOM.M
Sample Name: 4138-003
Misc Info: WELL 34/10-18 2390.7M
Bottle Number: 42

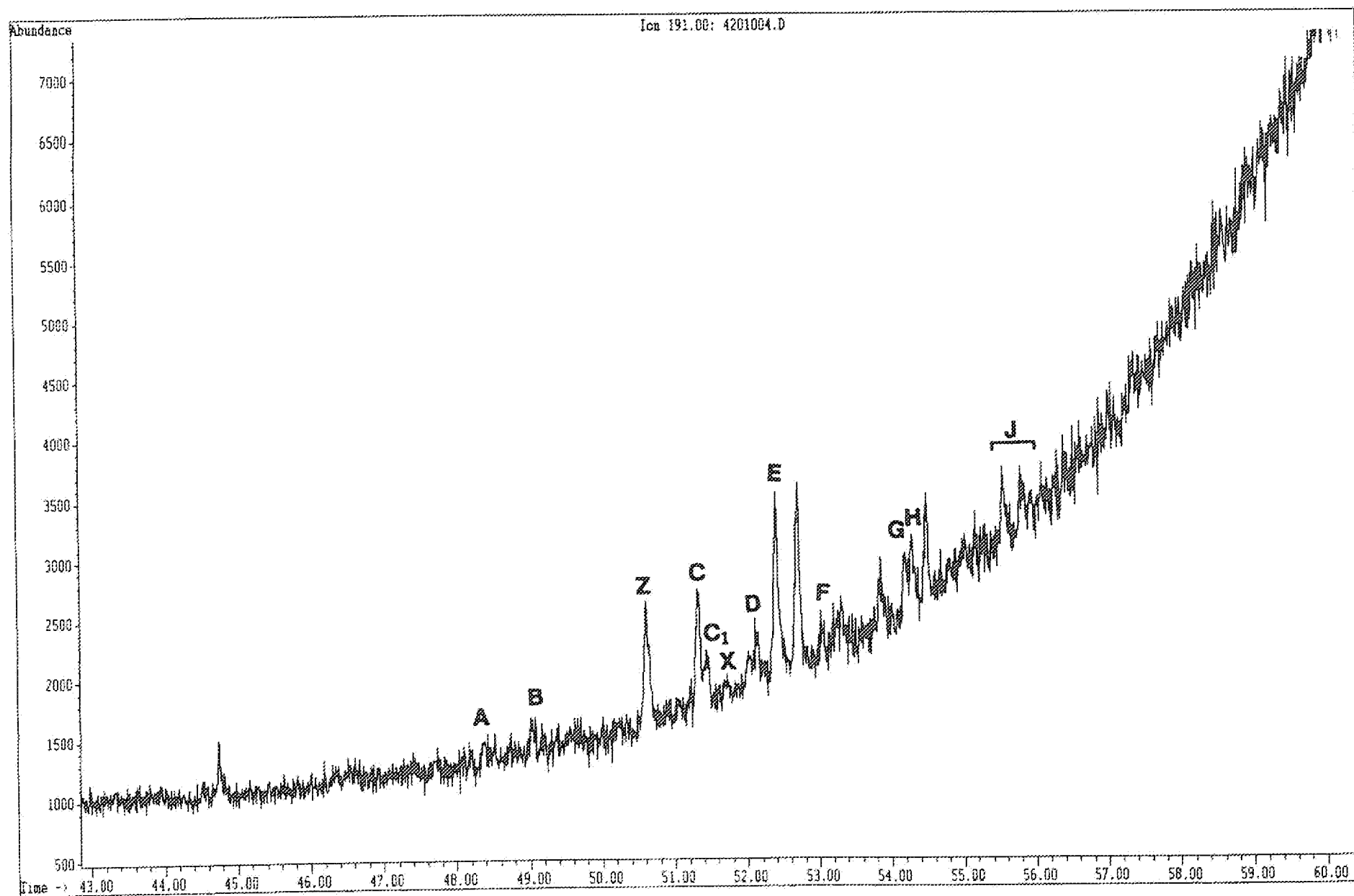
P3.3c



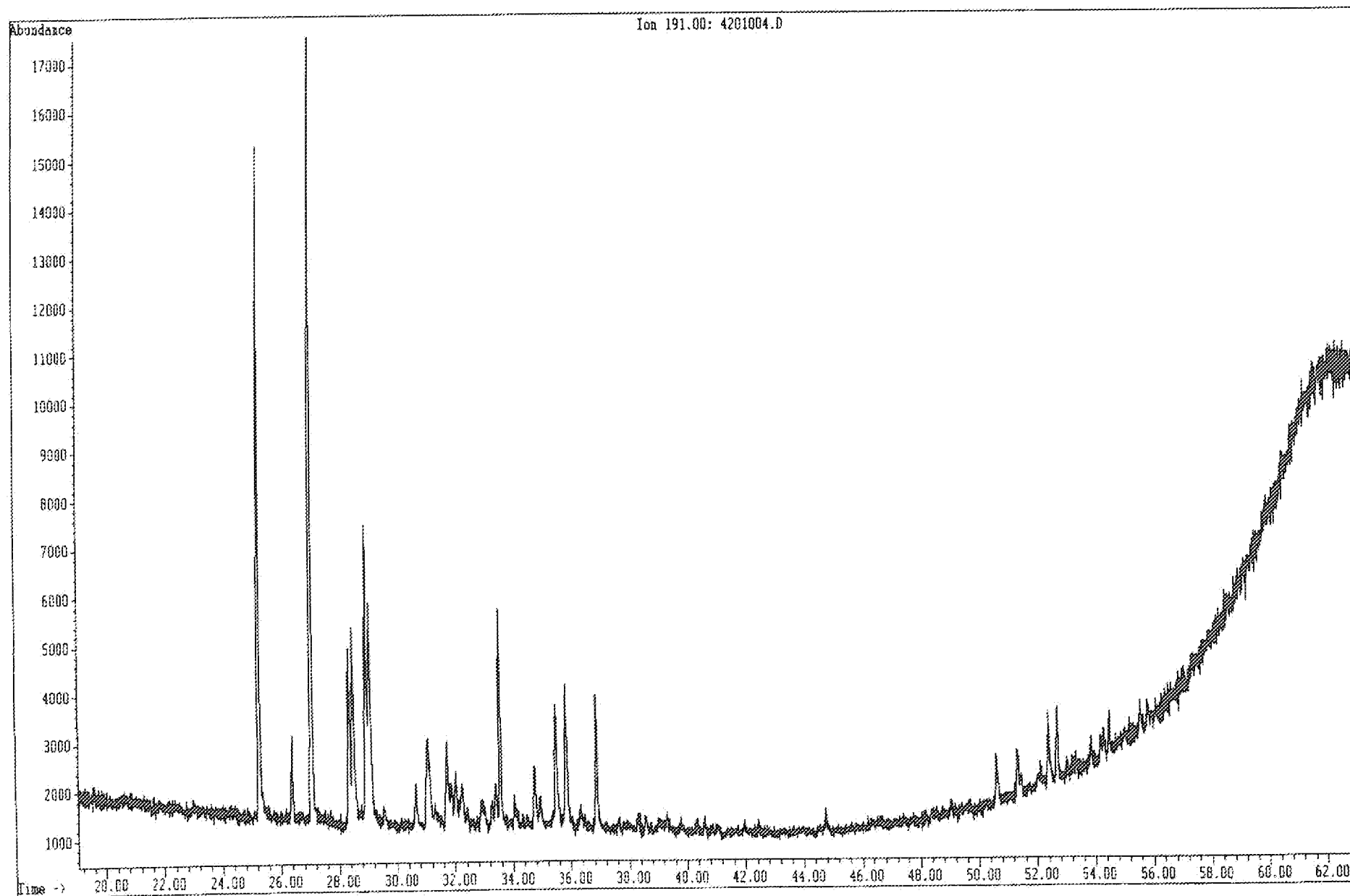
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Operator:
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Method File Name: B10M.M
Sample Name: 4138-003
Misc Info: WELL 34/10-18 2390.7M
Bottle Number: 42



File: C:\CHEMPC\DATA\4201004.D
Operator:
Date Acquired: 15 Dec 90 5:09 pm
Method File Name: BIOM.M
Sample Name: 4138-003
Misc Info: WELL 34/10-1B 2390.7M
Bottle Number: 42

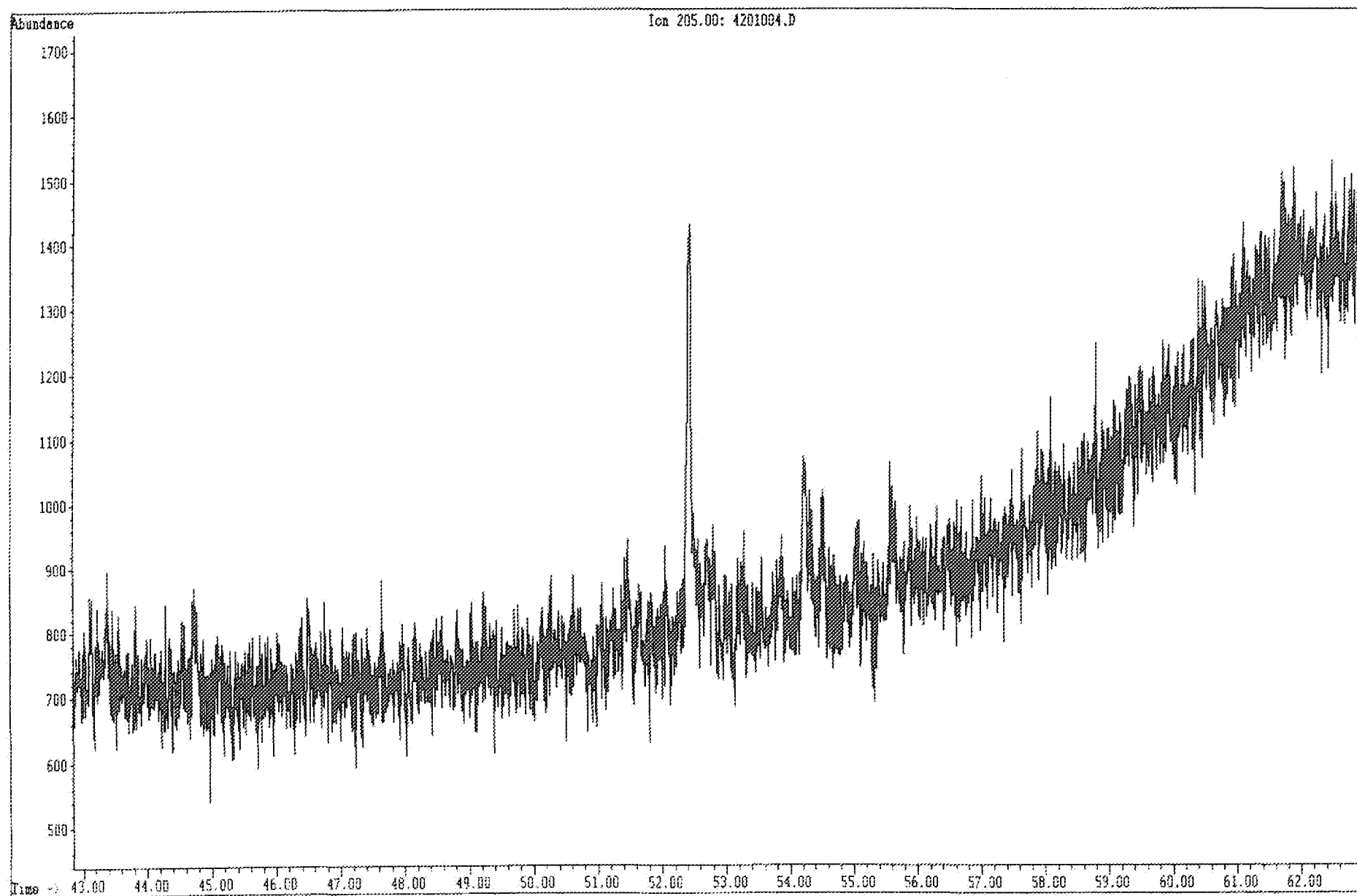


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Operator:
Date Acquired: 15 Dec 98 5:09 pm
Method File Name: BIOM.M
Sample Name: 4138-003
Misc Info: WELL 34/10-18 2390.7M
Bottle Number: 42



File: C:\CHEMPC\DATA\4201004.D
Operator:
Date Acquired: 15 Dec 90 5:09 pm
Method File Name: 810M.M
Sample Name: 4138-003
Misc Info: WELL 34/10-18 2390.7M
Bottle Number: 42

P3.3g



File: C:\CHEMPC\DATA\4201004.D

P3.3h

Operator:

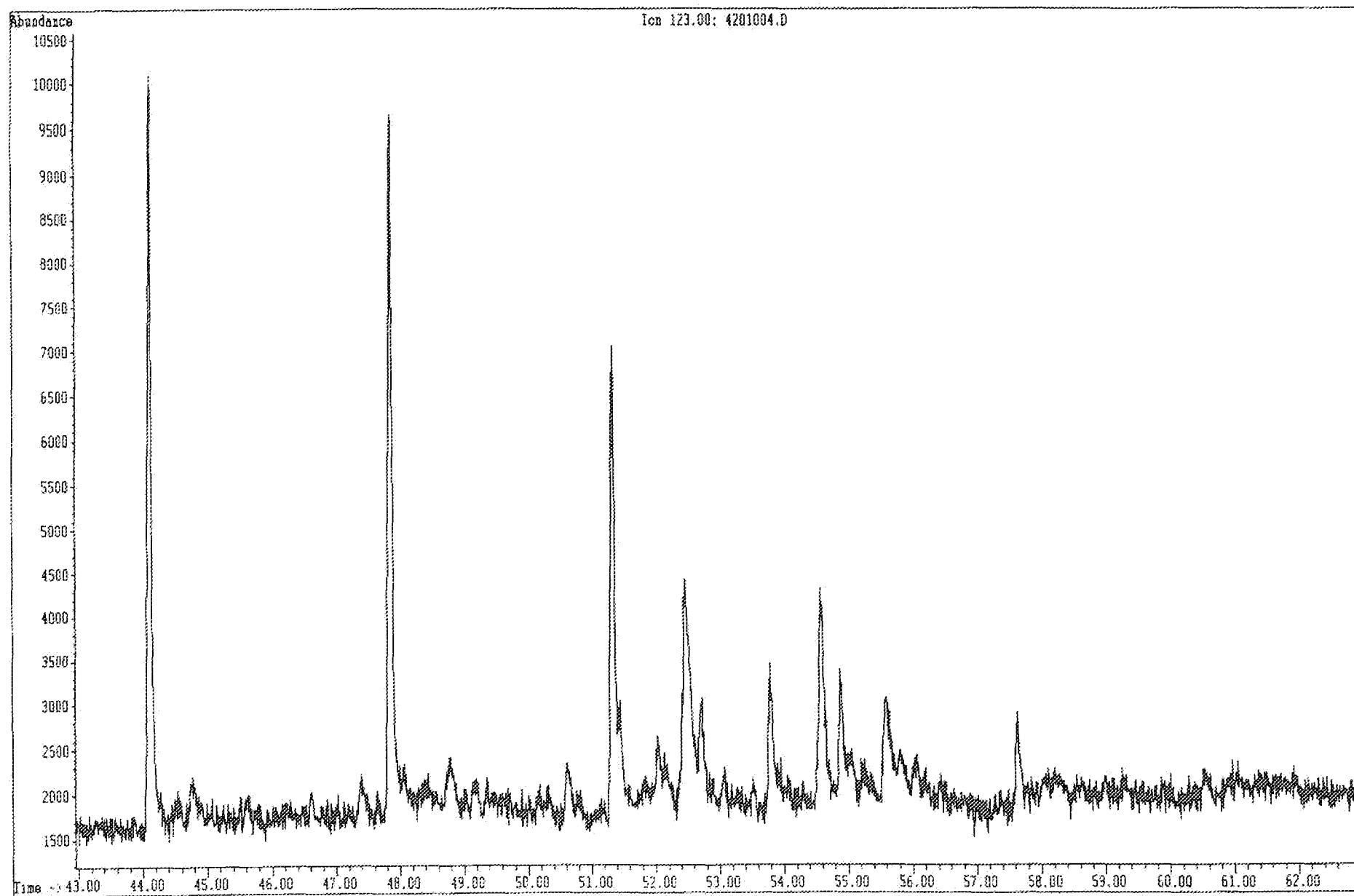
Date Acquired: 15 Dec 90 5:09 pm

Method File Name: BLOM.M

Sample Name: 4138-003

Misc Info: WELL 34/10-18 2390.7M

Bottle Number: 42



File: C:\CHEMPC\DATA\0901008.D

Operator:

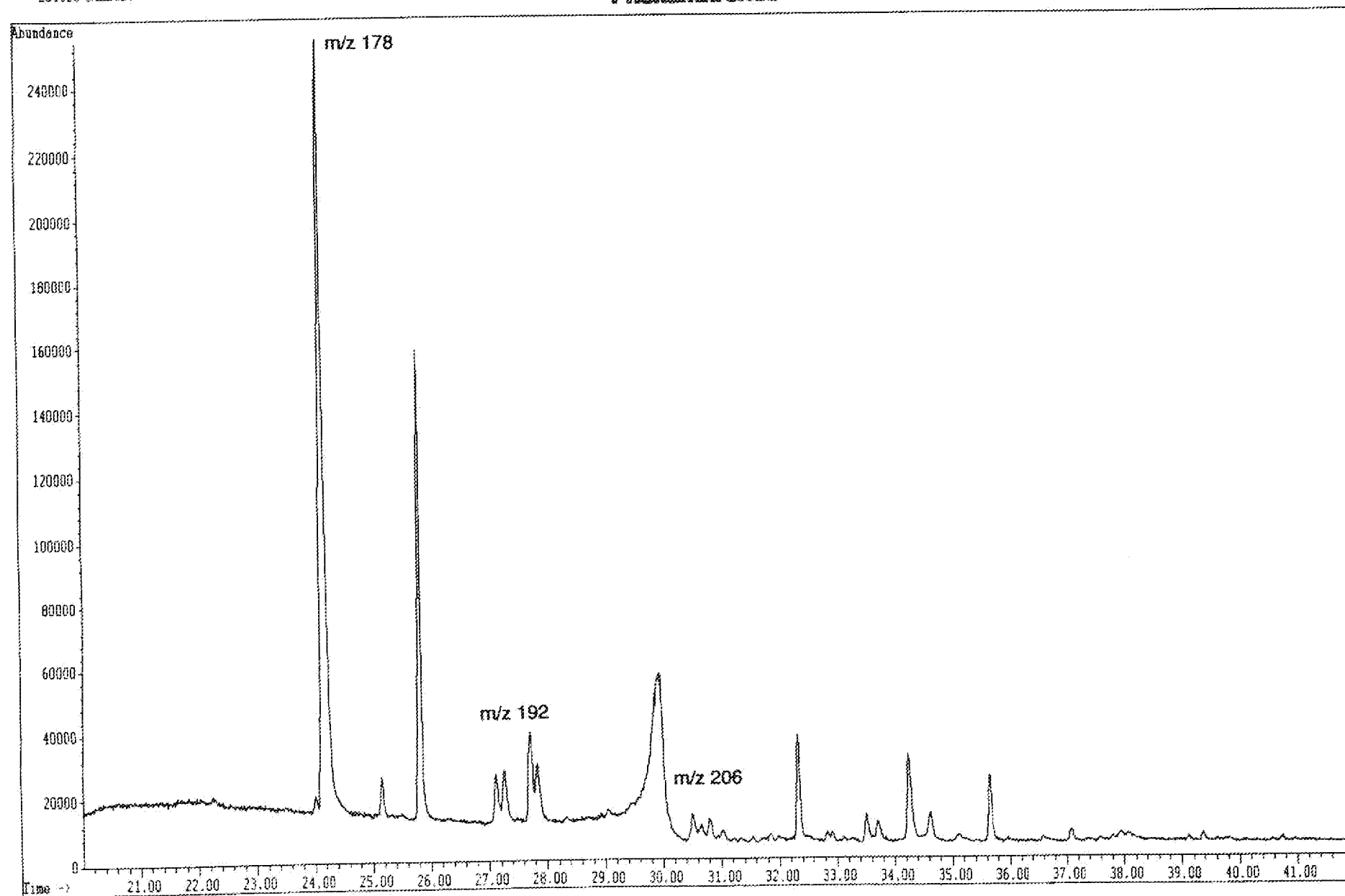
Date Acquired: 13 Dec 90 2:29 am

Method File Name: BIOMY.M

Sample Name: 4136-003

Misc Info: WELL 34/10-18 2390.7M

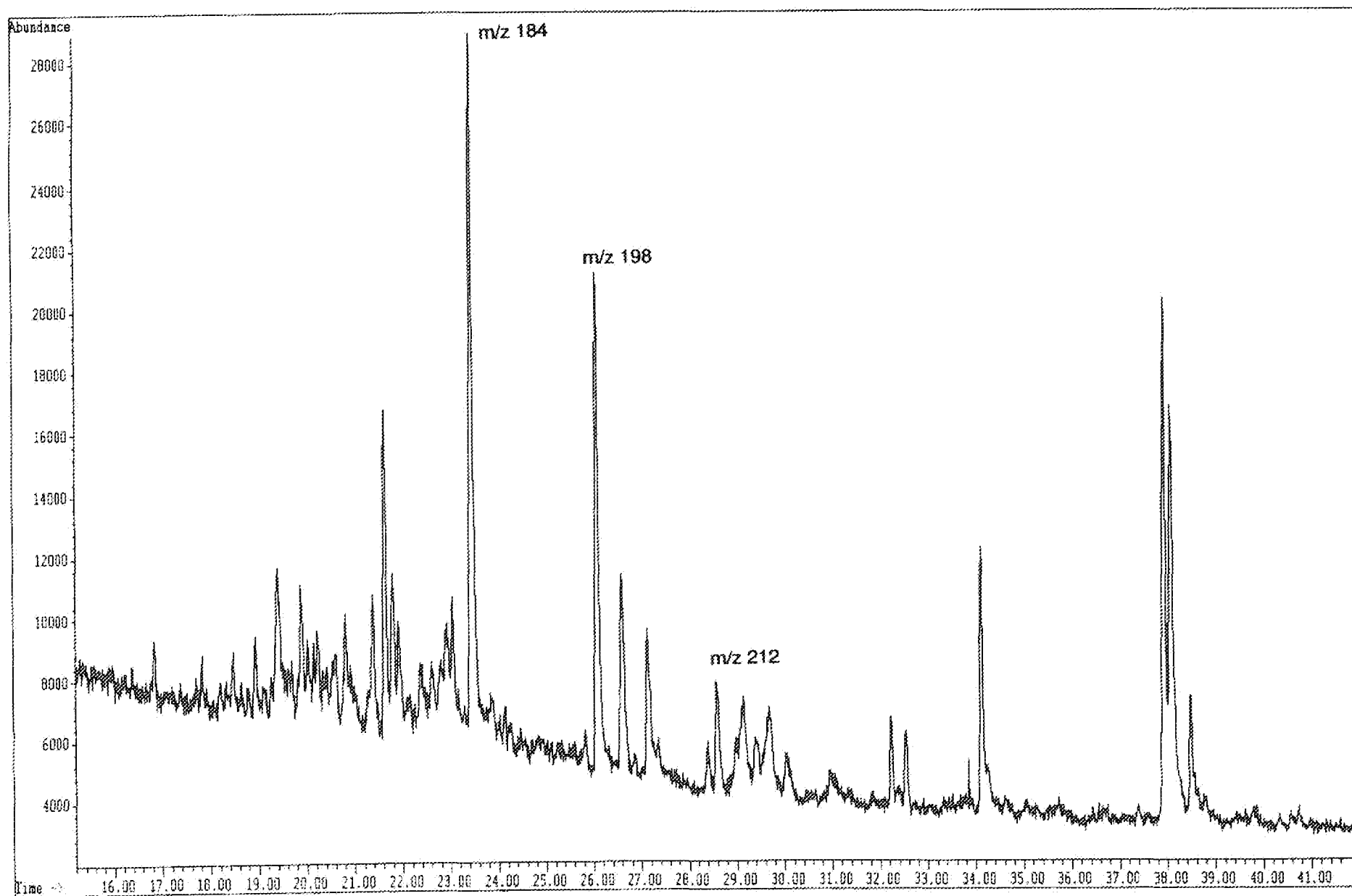
Bottle Number: 9

Phenanthrenes

File: C:\CHEMPC\DATA\0901008.D
Operator:
Date Acquired: 13 Dec 90 2:29 am
Method File Name: RIOMY.M
Sample Name: 4138-003
Misc Info: WELL 34/10-18 2390.7M
Bottle Number: 9

P3.3j

Dibenzothiophenes



File: C:\CHEMPC\DATA\0901008.D

P3.3k

Operator:

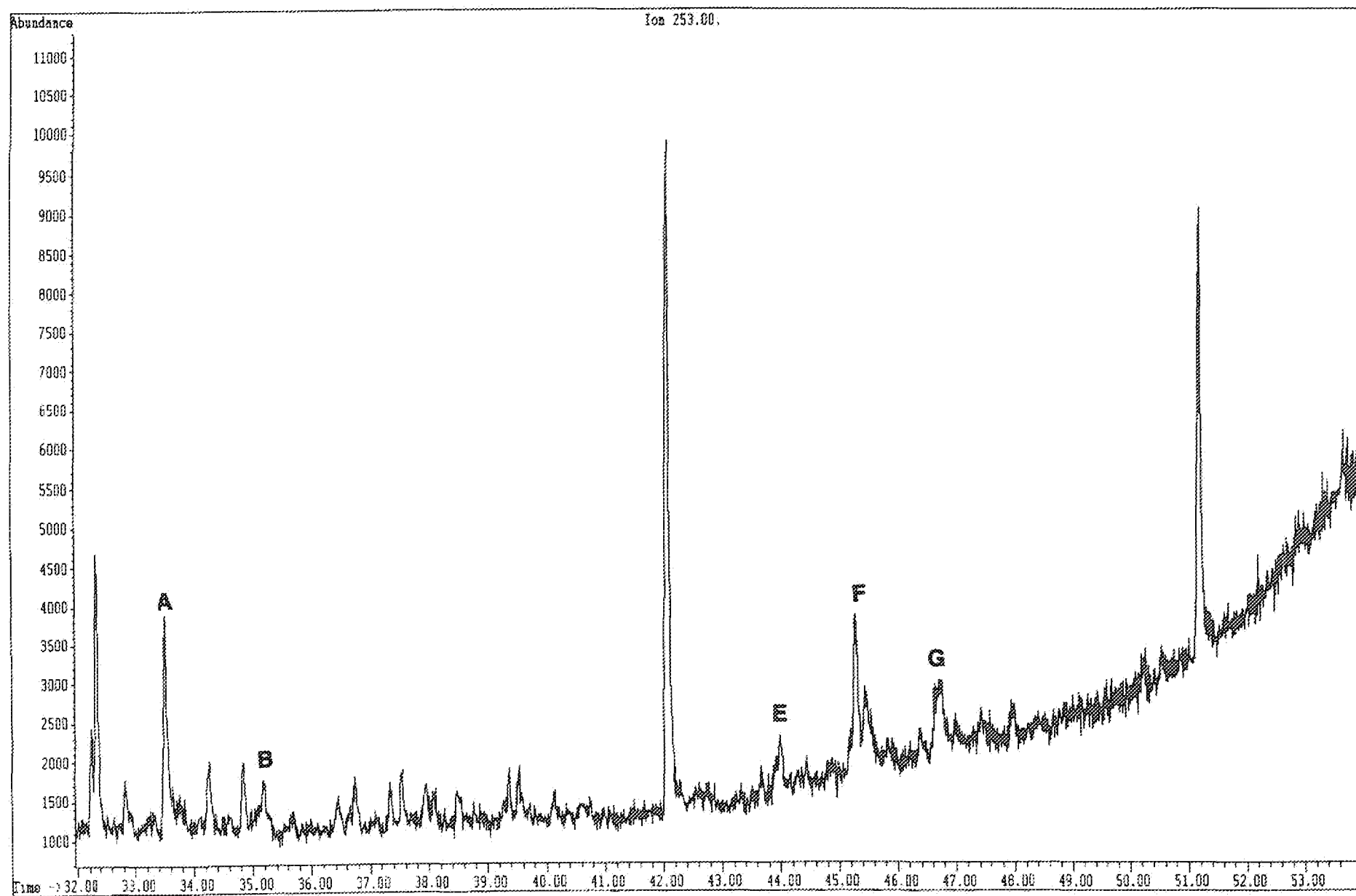
Date Acquired: 13 Dec 90 2:29 am

Method File Name: BIONY.M

Sample Name: 4138-003

Misc Info: WELL 34/10-18 2390.7M

Bottle Number: 9



File: C:\CHEMPC\DATA\0901008.D

P3.31

Operator:

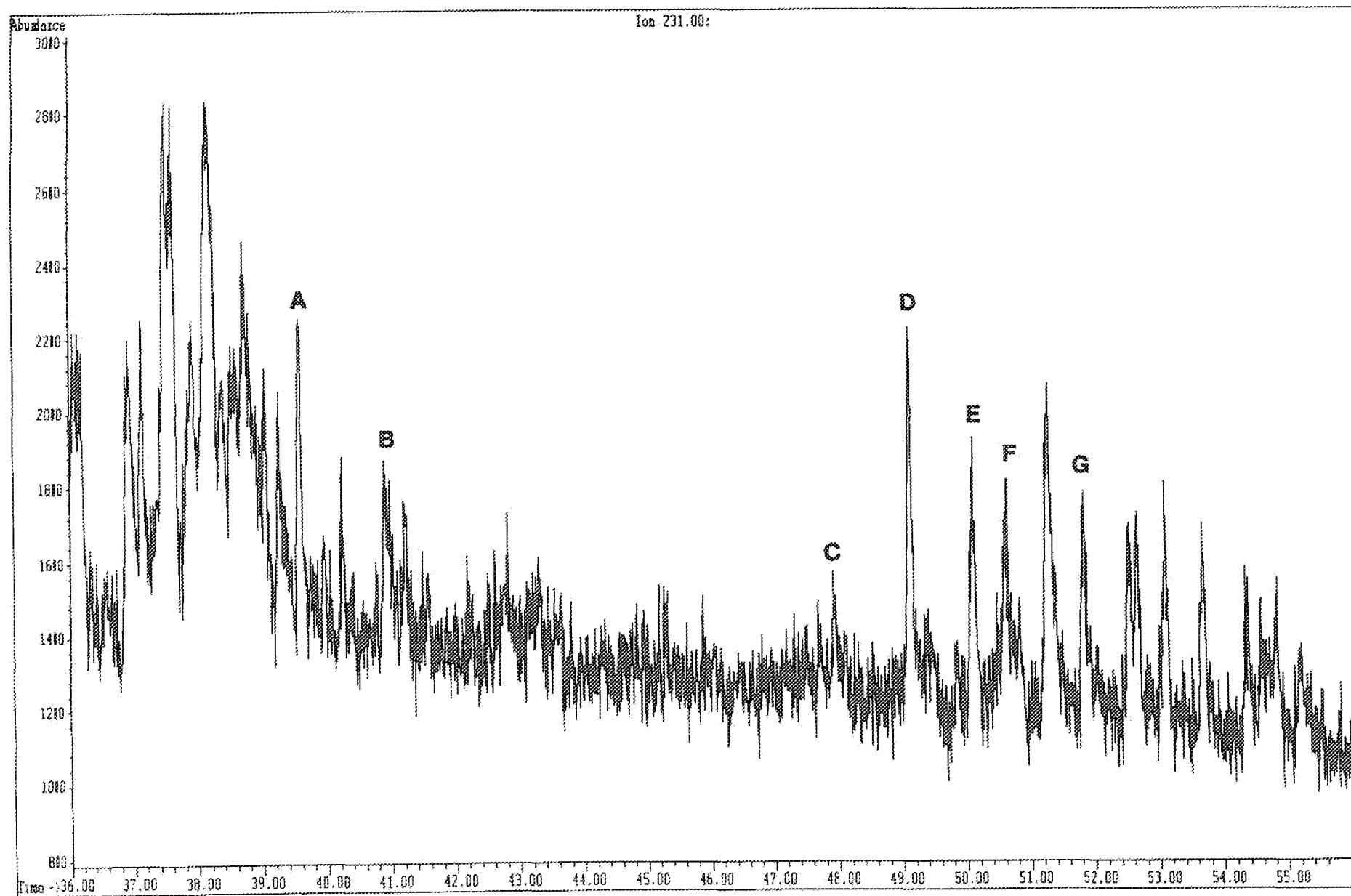
Date Acquired: 13 Dec 90 2:29 am

Method File Name: BIOMY.M

Sample Name: 4138-003

Misc Info: WELL 34/10-18 2390.7M

Bottle Number: 9



33/5-2

TABLE Q1
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

JOB 4139	DEPTH/ IDENTITY	GROSS LITHOLOGIC DESCRIPTION	G S A COLOUR CODE	TOTAL ORGANIC CARBON (Wt. %)
GEOCHEM SAMPLE NUMBER				

WELL: 33/5-2

4139-001	4063.0m	A100% SANDSTONE - fine grained, blocky, mod hard, mod micaceous, dark grey banding, no F, no C, light grey.	N7	
4139-002	4080.0m	A100% SANDSTONE - fine grained, blocky, hard, micaceous, no F, no C, pale yellowish brown.	10YR6/2	

Abbreviations = arenaceous, argillaceous, calcareous, Cut, dolomite, Fluorescence, foraminifera fossiliferous, Lost Circulation Material, moderately, occasionally, slightly, very

TABLE Q2
CONCENTRATION (PPM) OF EXTRACTED C₁₅₊ MATERIAL IN ROCK

JOB 4139	L I T H O	DEPTH/ IDENTITY	TOTAL EXTRACT	HYDROCARBONS			NON HYDROCARBONS			
GEOCHEM SAMPLE NUMBER				Saturates	Aromatics	TOTAL	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's	TOTAL

WELL: 33/5-2

4139-001	4063.Om	1478	497	43	539	791	146	2	939
4139-002	4080.Om	375	180	13	193	68	113	2	183

TABLE Q3
COMPOSITION (NORMALISED %) OF C₁₅₊ MATERIAL

JOB 4139	L I T H O	DEPTH/ IDENTITY	HYDROCARBONS		NON HYDROCARBONS		
GEOCHEM SAMPLE NUMBER			Saturates	Aromatics	Preciptd. Asphaltenes	Eluted NSO's	Non-Eluted NSO's

WELL: 33/5-2

4139-001	4063.0m	33.60	2.88	53.51	9.87	0.13
4139-002	4080.0m	47.94	3.42	18.14	30.04	0.47

TABLE Q4
SIGNIFICANT C₁₅₊ RATIOS

JOB 4139	LITHO	DEPTH/ IDENTITY	TOC (%)	mg/g TOC						HYDROCARBONS % TOTAL EXTRACT	SATURATES AROMATICS
GEOCHEM SAMPLE NUMBER				TOTAL EXTRACT	SATURATES	AROMATICS	TOTAL HYDROCARBONS	ELUTED NSO's	ASPHALTENES		

WELL: 33/5-2

4139-001	4063.0m	0.27	547.58	183.99	15.76	199.75	54.06	293.03	36.48	11.67
4139-002	4080.0m	0.52	72.18	34.60	2.47	37.07	21.68	13.09	51.35	14.03

TABLE Q5
C₁₅₊ CHROMATOGRAPHY WEIGHTS (gms)

JOB 4139	L									
GEOCHEM SAMPLE NUMBER	I T H O	DEPTH/ IDENTITY	ROCK EXTRACTED	TOTAL EXTRACT	PRECIPTD. ASPHALTENES	NC5	SATURATES	AROMATICS	ELUTED NSO's	NON-ELUTED NSO's

WELL: 33/5-2

4139-001A	4063.0m	20.2100	0.02988	0.01599	0.01389	0.01004	0.00086	0.00295	0.00004
4139-002A	4080.0m	22.6200	0.00849	0.00154	0.00695	0.00407	0.00029	0.00255	0.00004

TABLE Q6
COMPOSITION (NORMALISED %) OF C₁₅+ SATURATE (PARAFFIN - NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	001	002
DEPTH	4063m	4080m
SAMPLE TYPE		
nC15	0.04	2.35
nC16	1.37	3.77
nC17	4.43	3.05
nC18	7.66	4.26
nC19	8.66	4.19
nC20	9.84	5.07
nC21	8.62	5.68
nC22	8.16	7.35
nC23	7.30	7.91
nC24	7.81	8.98
nC25	6.59	8.09
nC26	6.17	7.34
nC27	5.13	6.42
nC28	4.59	6.03
nC29	4.25	5.18
nC30	3.25	4.53
nC31	2.36	3.32
nC32	1.45	2.75
nC33	1.00	1.63
nC34	0.80	1.38
nC35	0.52	0.72
Paraffin	19.59	16.43
Isoprenoid	2.01	1.50
Naphthene	78.40	82.07
CPI 1 Index	0.95	0.96
CPI 2 Index	1.01	0.99
CPI 3 Index	0.95	0.96
Prist/Phytane	0.69	1.45
Prist/nC17	0.99	1.37
Phytane/nC18	0.83	0.68

Job Number : 4139

$$C.P.I. 1 = \frac{1}{2} \left[\frac{C_{21} + C_{23} + C_{25} + C_{27} + C_{21} + C_{23} + C_{25} + C_{27}}{C_{20} + C_{22} + C_{24} + C_{26}} + \frac{C_{21} + C_{23} + C_{25} + C_{27}}{C_{22} + C_{24} + C_{26} + C_{28}} \right]$$

$$C.P.I. 2 = \frac{1}{2} \left[\frac{C_{25} + C_{27} + C_{29} + C_{31} + C_{25} + C_{27} + C_{29} + C_{31}}{C_{24} + C_{26} + C_{28} + C_{30}} + \frac{C_{25} + C_{27} + C_{29} + C_{31}}{C_{26} + C_{28} + C_{30} + C_{32}} \right]$$

$$C.P.I. 3 = \frac{2 \times (C_{27})}{C_{26} + C_{28}}$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE Q7
METHYLPHENANTHRENE INDICES (MPI)

JOB 4139	DEPTH/ IDENTITY	SAMPLE TYPE	MPI 1		Rcalc		MPI 2	
GEOCHEM SAMPLE NUMBER			AREA	HEIGHT	AREA	HEIGHT	AREA	HEIGHT

WELL: 33/5-2

4139-001	4063.0m		0.42	0.46			0.48	0.51
4139-002	4080.0m		0.22	0.24			0.27	0.27

$$\text{MPI 1} = \frac{1.5(2\text{-MP} + 3\text{-MP})}{\text{P} + 1\text{-MP} + 9\text{-MP}} \quad \text{MPI 2} = \frac{3(2\text{-MP})}{\text{P} + 1\text{-MP} + 9\text{-MP}}$$

$$\text{Rcalc} = \begin{cases} 0.60(\text{MPI 1}) + 0.40 & \text{if } \text{Rc} < 1.35\% \\ -0.60(\text{MPI 1}) + 2.30 & \text{if } \text{Rc} > 1.35\% \end{cases}$$

CT - ditch cuttings CO - core SWC - sidewall core

TABLE Q8

AROMATIC HYDROCARBONS RATIOS (MSD, PEAK AREA DATA)

SAMPLE NUMBER	DEPTH (m)	2MP/ 1MP	RATIO 1	RATIO 2	RATIO 3
------------------	--------------	-------------	---------	---------	---------

WELL: 33/5-2

4139-001A	4063.0	0.76	0.87	0.16	0.22
4139-002A	4080.0	0.86	0.52	0.16	1.15

RATIO 1 = $A(231)/A(231) + G(231)$ RATIO 2 = $E(253)/E(253) + G(253)$ RATIO 3 = $A(253)/B(231) + E(253)$

TABLE Q9
CARBON ISOTOPE COMPOSITIONS (‰,PDB)

JOB 4139	DEPTH/ IDENTITY	TOTAL EXTRACT WHOLE OIL	SATURATES	AROMATICS	NSO	ASPHALTENES	KEROGEN	PYROLYSATE (S2)
GEOCHEM SAMPLE NUMBER								

WELL: 33/5-2

4139-001	4063.0m	-28.41	-28.74	-28.42	-29.10	-28.76
----------	---------	--------	--------	--------	--------	--------

TABLE Q10
BIOMARKER MOLECULAR RATIOS

WELL: 33/5-2

		Steranes (m/z 217)			Steranes (m/z 218)		
SAMPLE NUMBER	DEPTH (m)	<u>A</u>	<u>Q</u>	<u>(R+S)</u>	NORMALISED COMPOSITION:		
		(A+J)	(Q+T)	(Q+R+S+T)	B	D	F
4139-001A	4063.0	0.73	0.54	0.54	30%	33%	37%
4139-002A	4080.0	-	-	-	29%	31%	40%

TABLE Q11
BIOMARKER MOLECULAR RATIOS

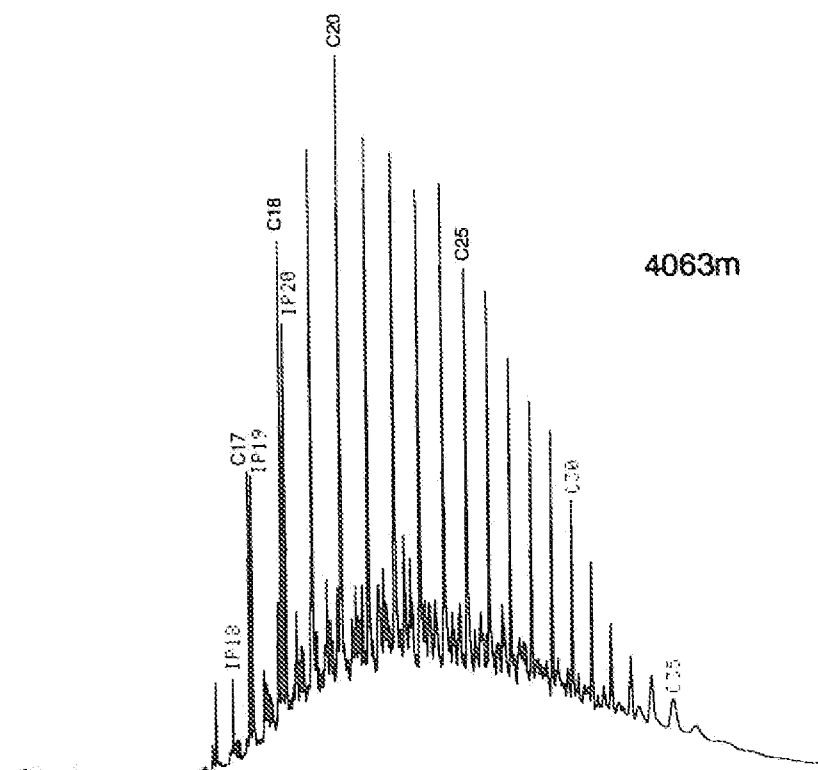
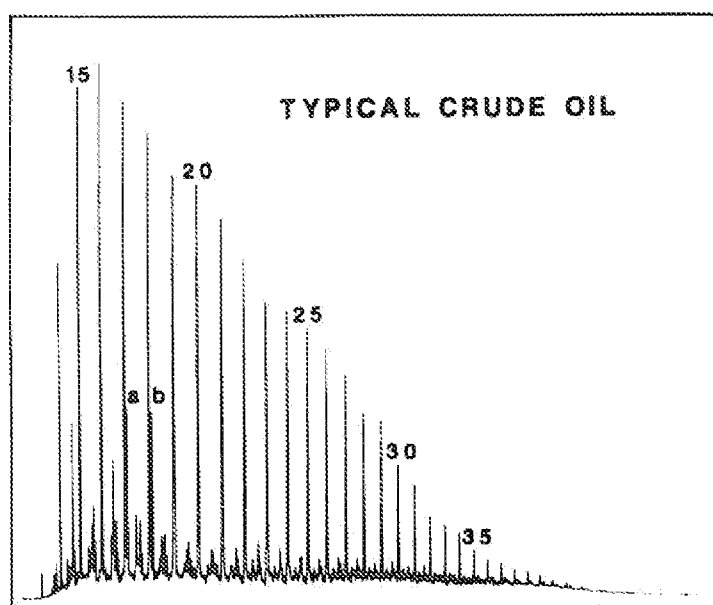
WELL 33/5-2

Terpanes (m/z 191)

SAMPLE NUMBER	DEPTH (m)	A/B	Z/E	Z/C	<u>Z</u> (Z+E)	<u>C</u> (C+E)	%22S for J	<u>E</u> (E+F)	<u>X</u> (X+D)	Q/E
4139-001A	4063.0	3.88	0.42	0.87	0.29	0.32	63%	0.93	0.81	0.08
4139-002A	4080.0	1.04	-	-	-	0.46	52%	-	0.72	-

FIGURE Q1.1 C₁₅+ SATURATES CHROMATOGRAMS

WELL 33/5-2

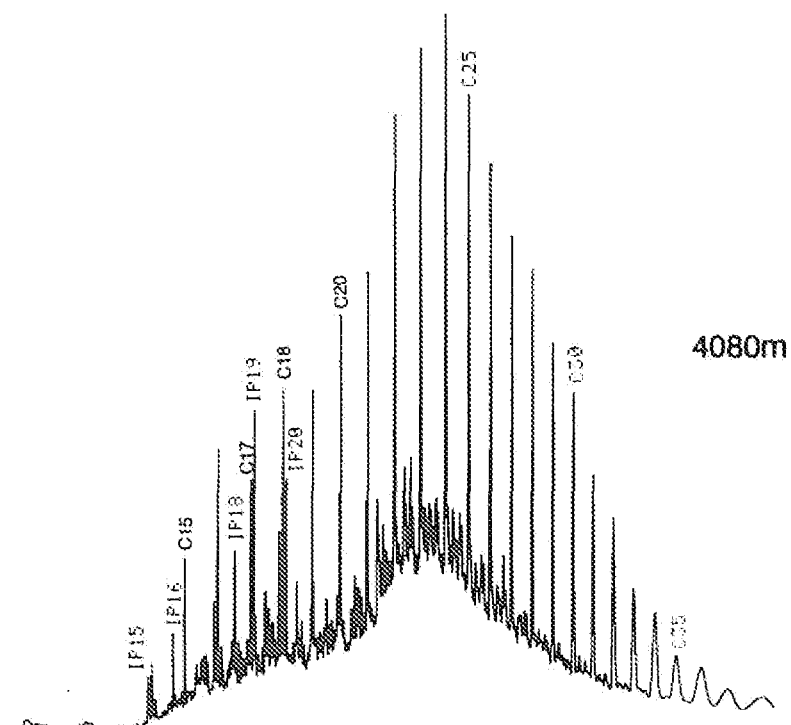


a = PRISTANE

b = PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20-nC₂₀)

WELL 33/5-2



2 - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC_{20})

FIGURE Q2.1

C₁₅+ AROMATIC CHROMATOGRAMS

WELL 33/5-2

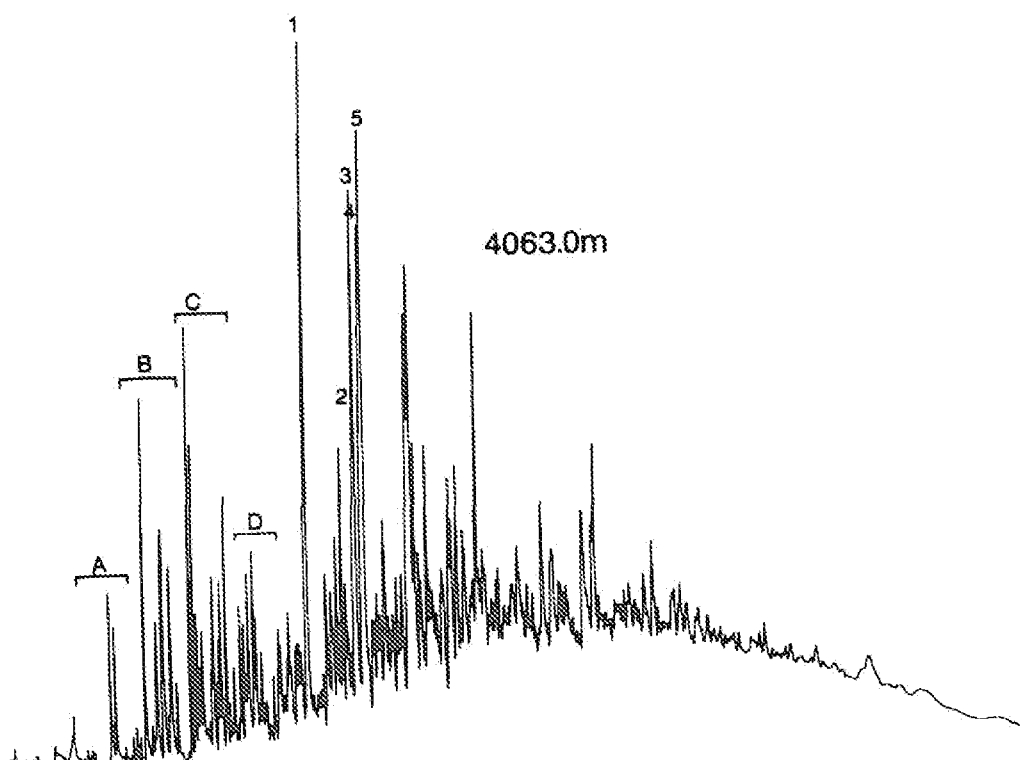
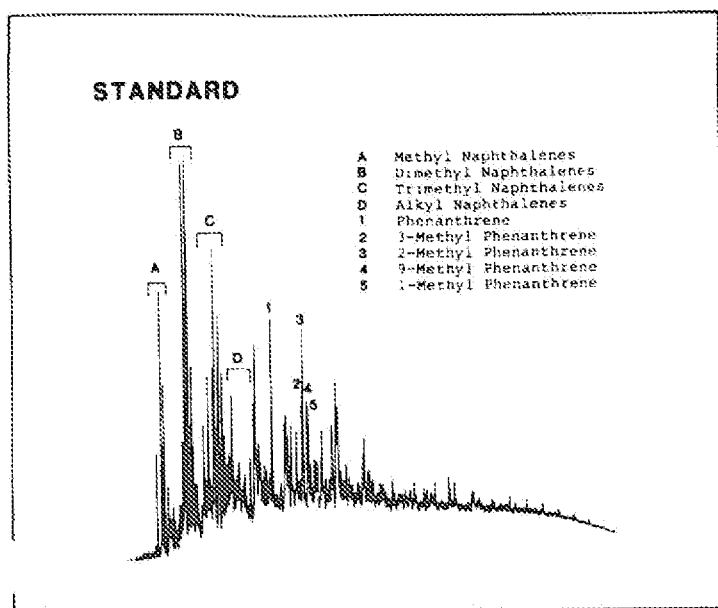
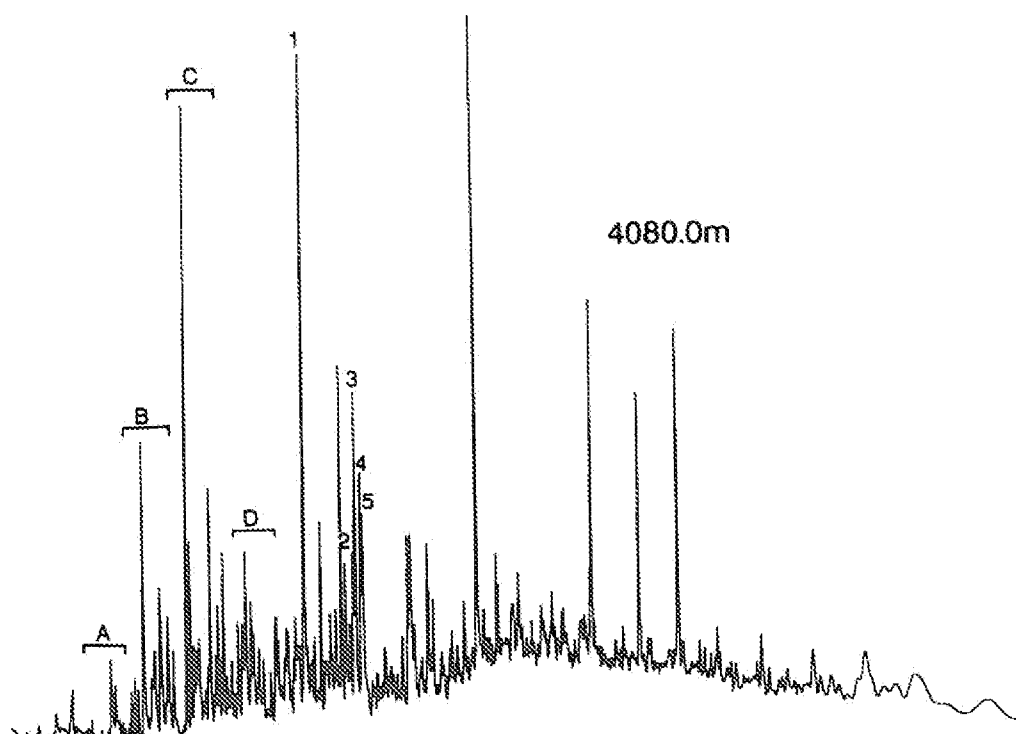


FIGURE Q2.2

C₁₅+ AROMATIC CHROMATOGRAMS

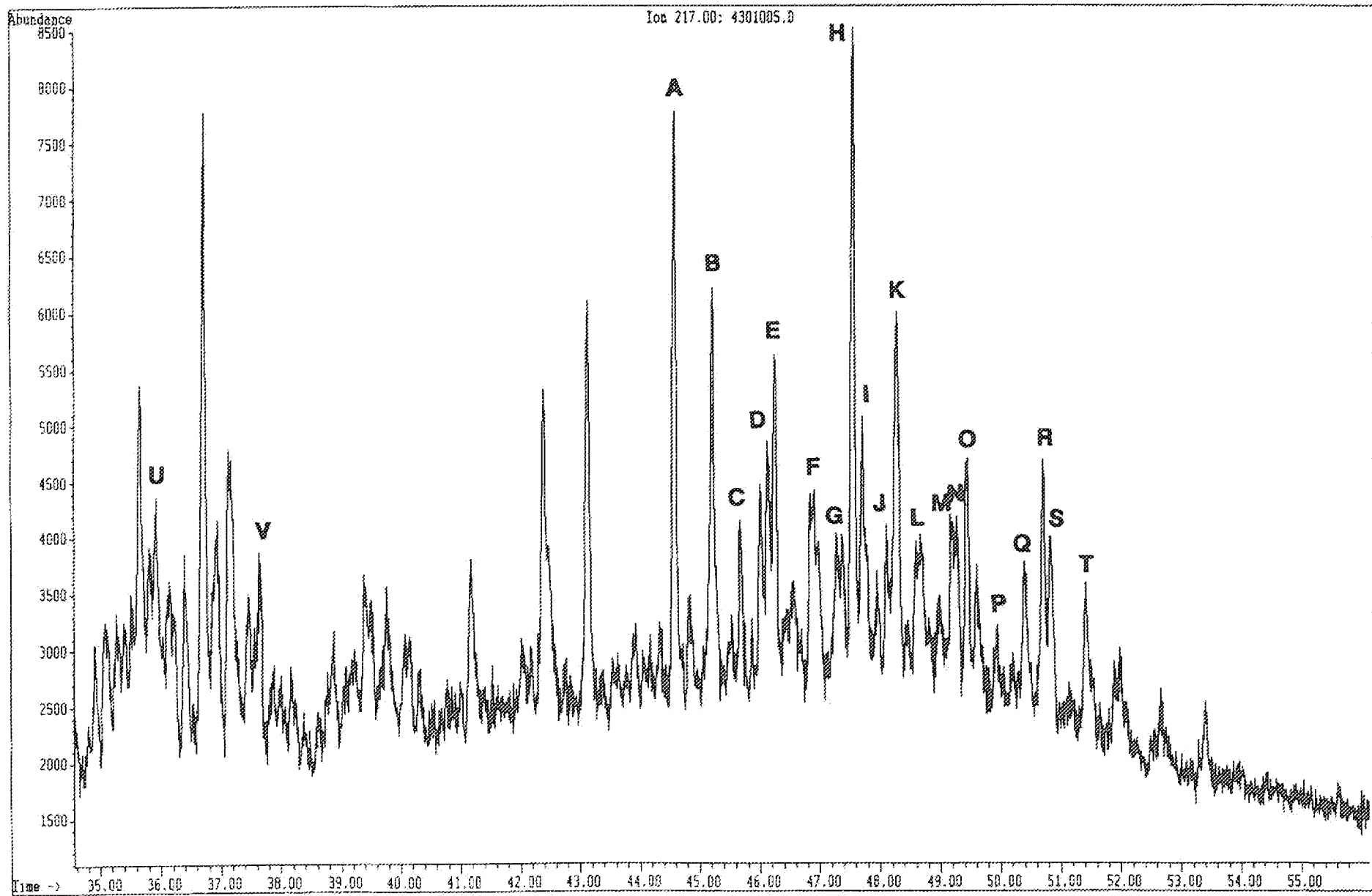
WELL 33/5-2



PEAK IDENTIFICATION ON FIRST SHEET

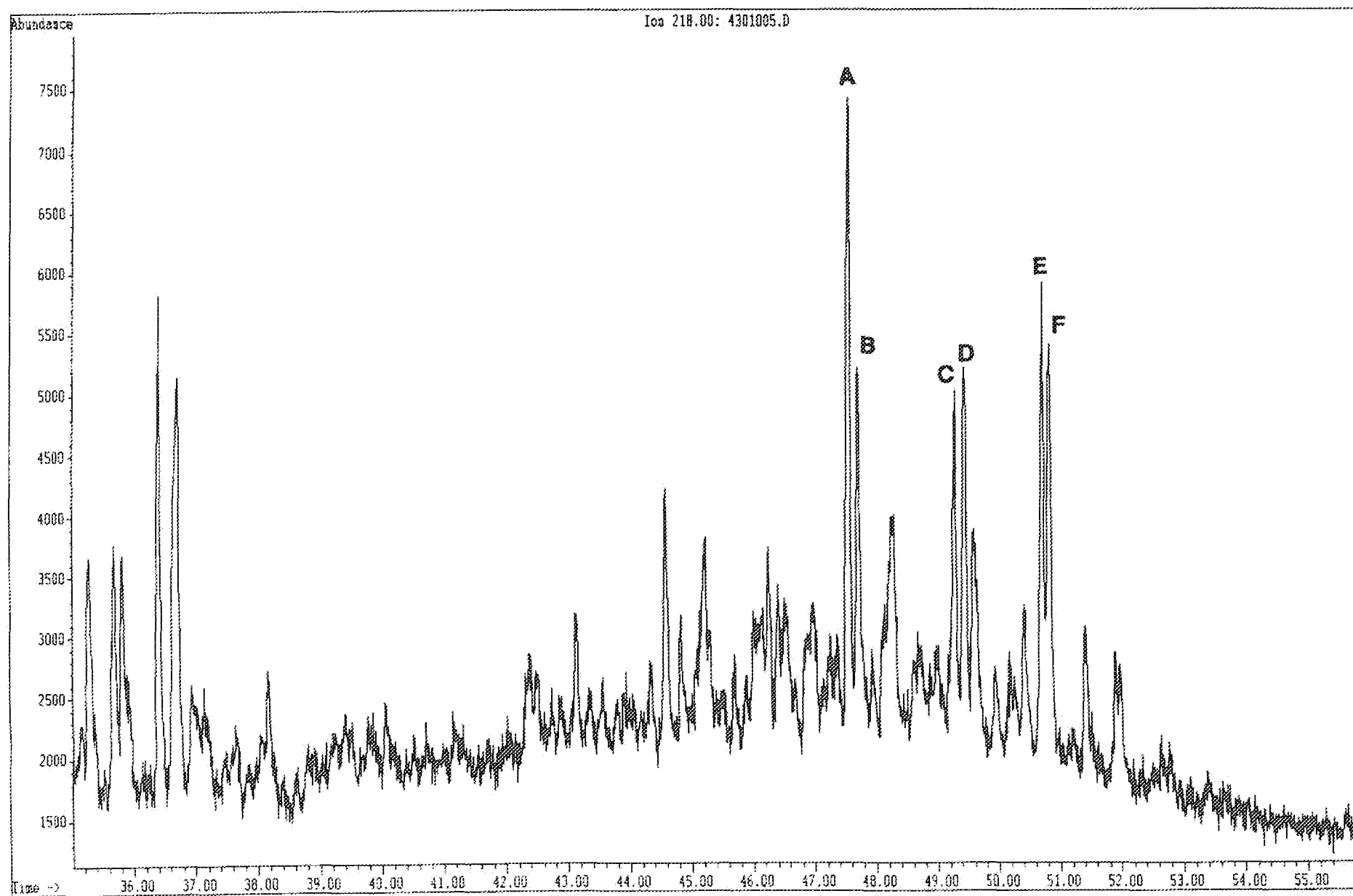
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Operator:
Date Acquired: 15 Dec 90 6:19 pm
Method File Name: BIOM.M
Sample Name: 4139-001
Misc Info: WELL 31/5-2 4063.OM
Bottle Number: 43

Q3.1a



File: C:\CHEMPC\DATA\4301005.D
Operator:
Date Acquired: 15 Dec 90 6:19 pm
Method File Name: BICM.M
Sample Name: 4139-001
Misc Info: WELL 33/5-2 4063.0M
Bottle Number: 43

Q3.1b



File: C:\CHEMPC\DATA\4301005.D

Q3.1c

Operator:

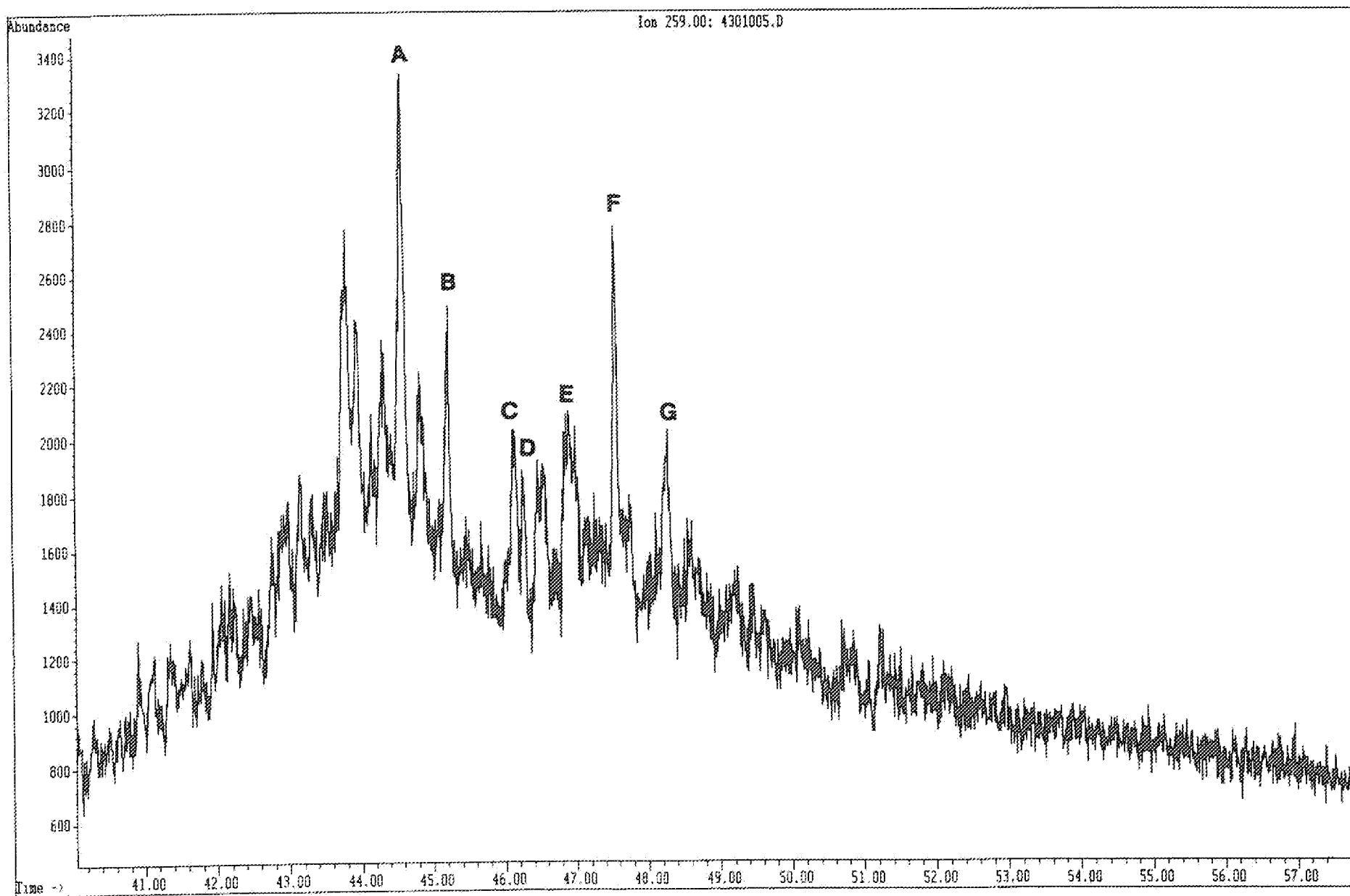
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Method File Name: BIOM.M

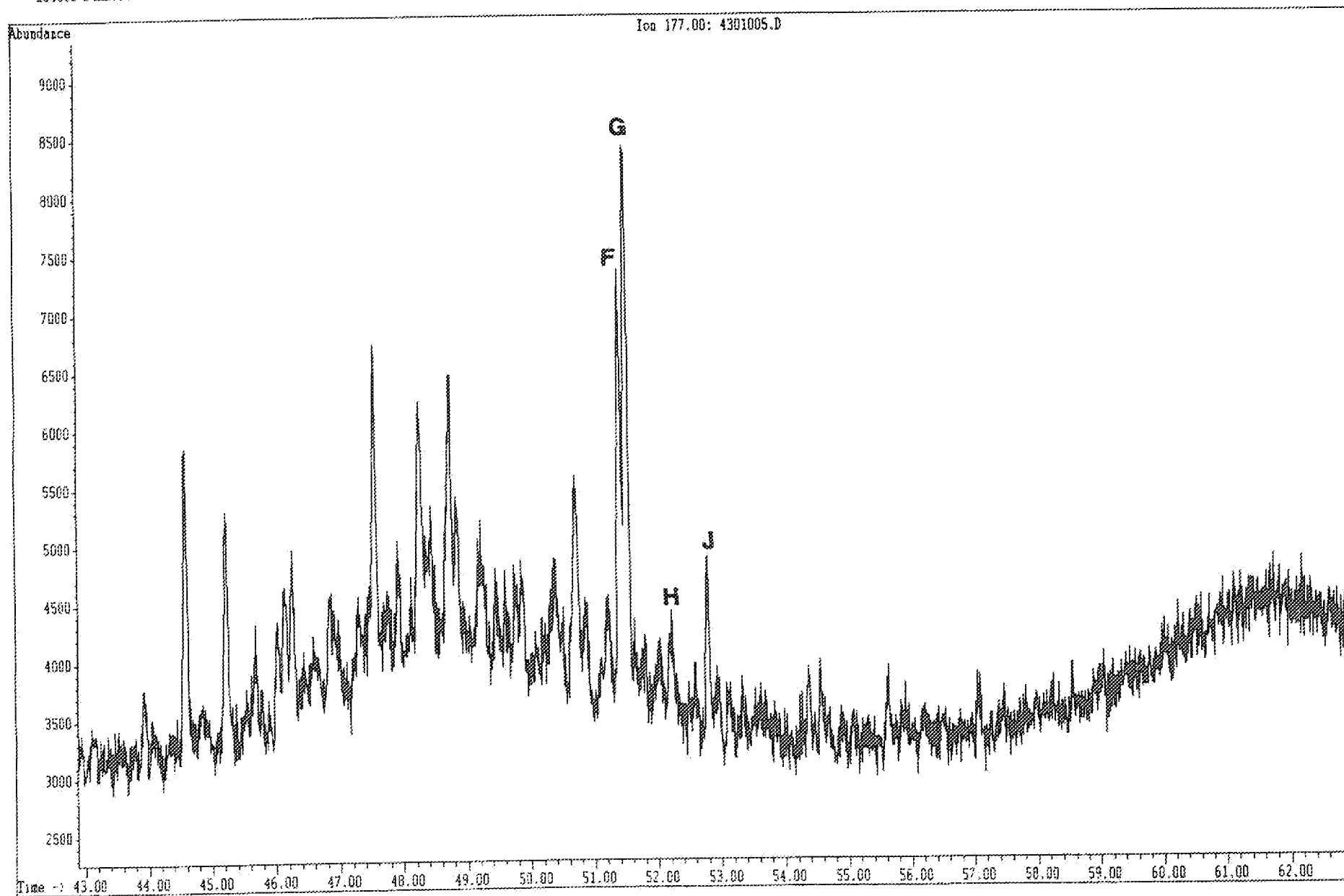
Sample Name: 4139-001

Misc Info: WELL 33/5-2 4063.0M

Bottle Number: 43

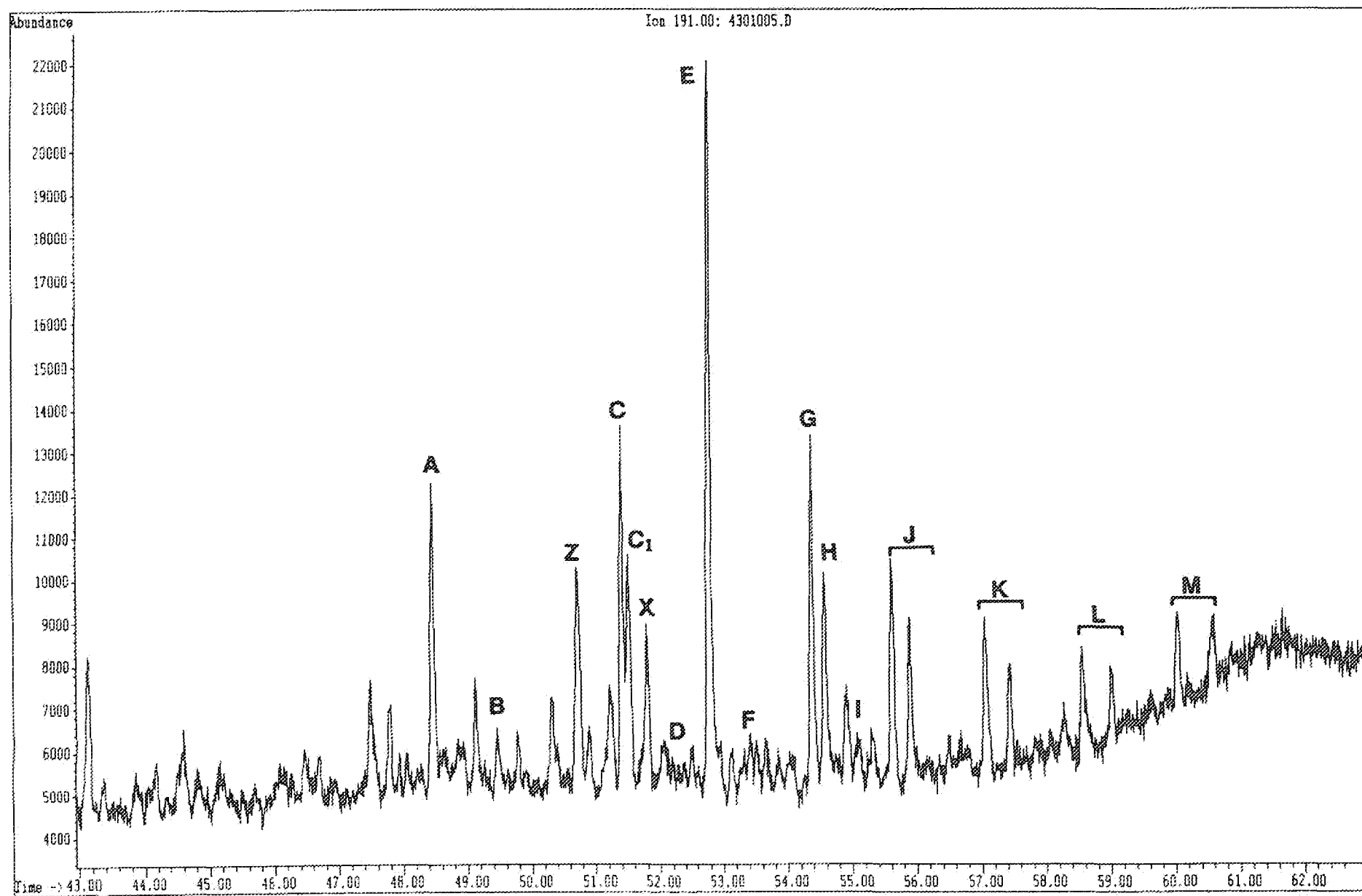


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Operator:
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Method File Name: BIOM.M
Sample Name: 4139-001
Misc Info: WELL 33/S-2 4063.0M
Bottle Number: 43

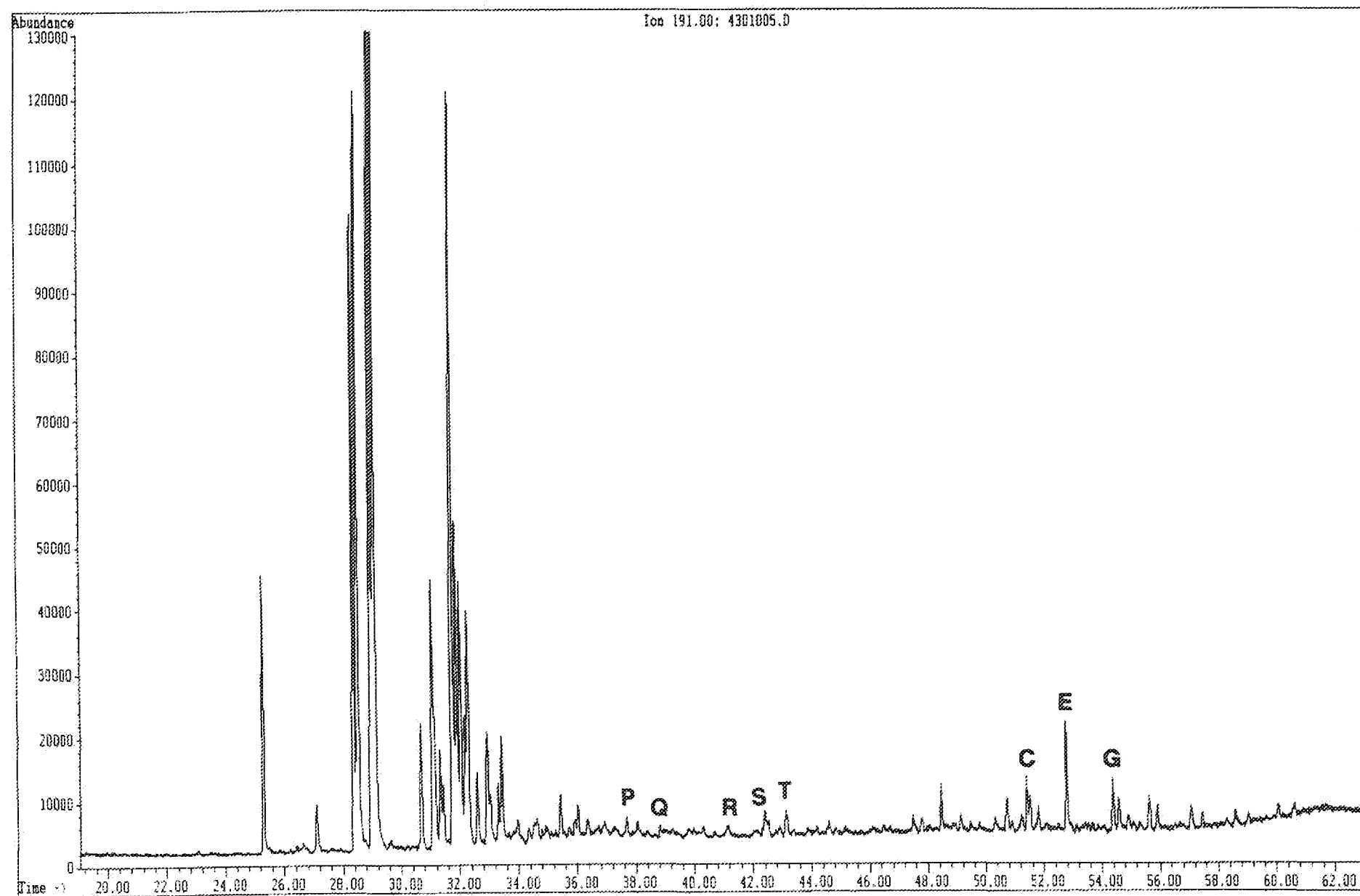


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Operator:
Date Acquired: 15 Dec 90 6:19 pm
Method File Name: BION.M
Sample Name: 4139-001
Misc Info: WELL 33/5-2 4063.QM
Bottle Number: 43

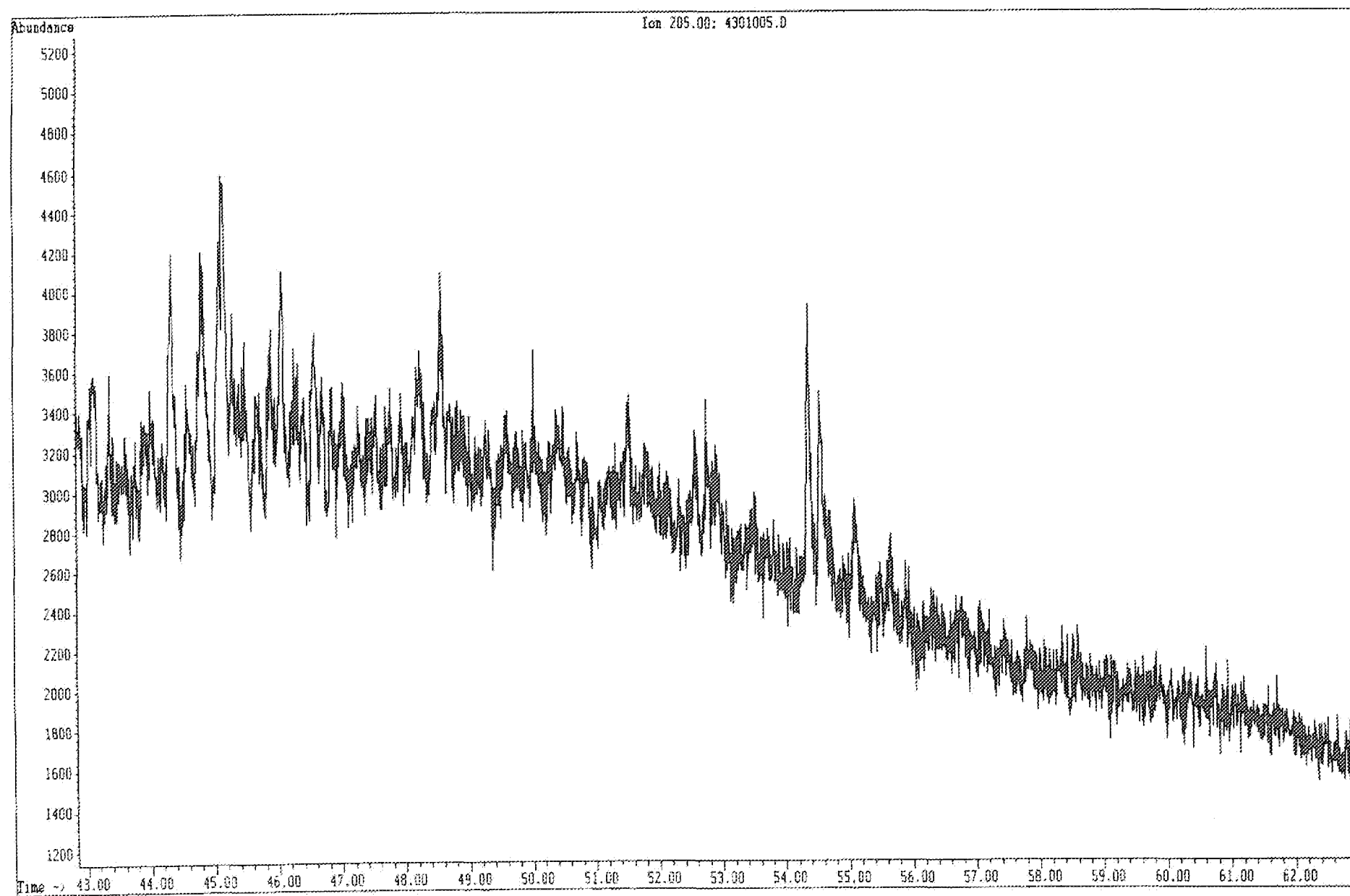
Q3.1e



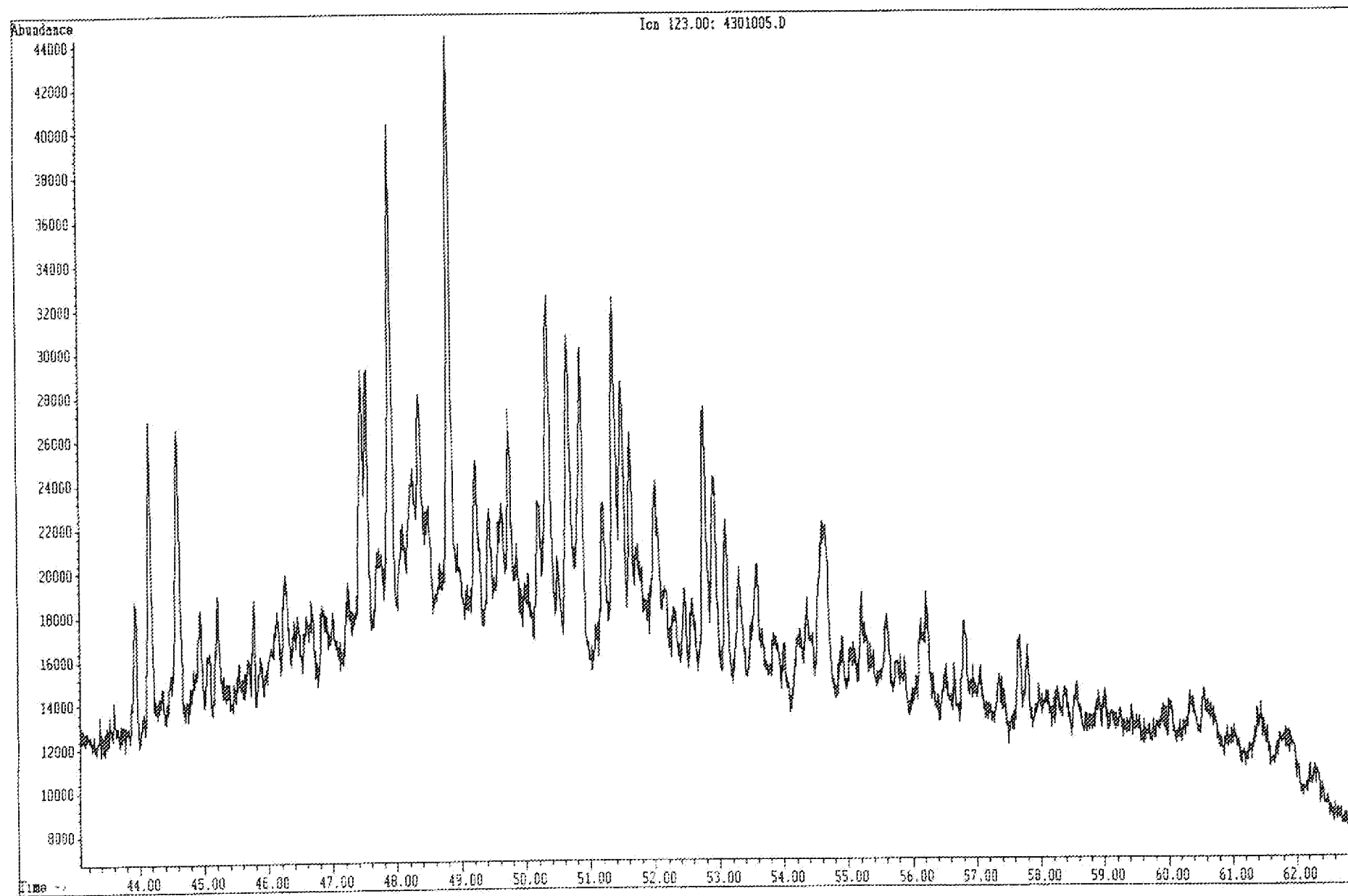
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Operator:
Date Acquired: 15 Dec 90 6:19 pm
Method File Name: B10M.M
Sample Name: 4139-001
Misc Info: WELL 33/5-2 4063.0M
Bottle Number: 43



File: C:\CHEMPC\DATA\4301005.D
Operator:
Date Acquired: 15 Dec 90 6:19 pm
Method File Name: 810M.M
Sample Name: 4139-001
Misc Info: WELL 33/5-2 4063.0M
Bottle Number: 43



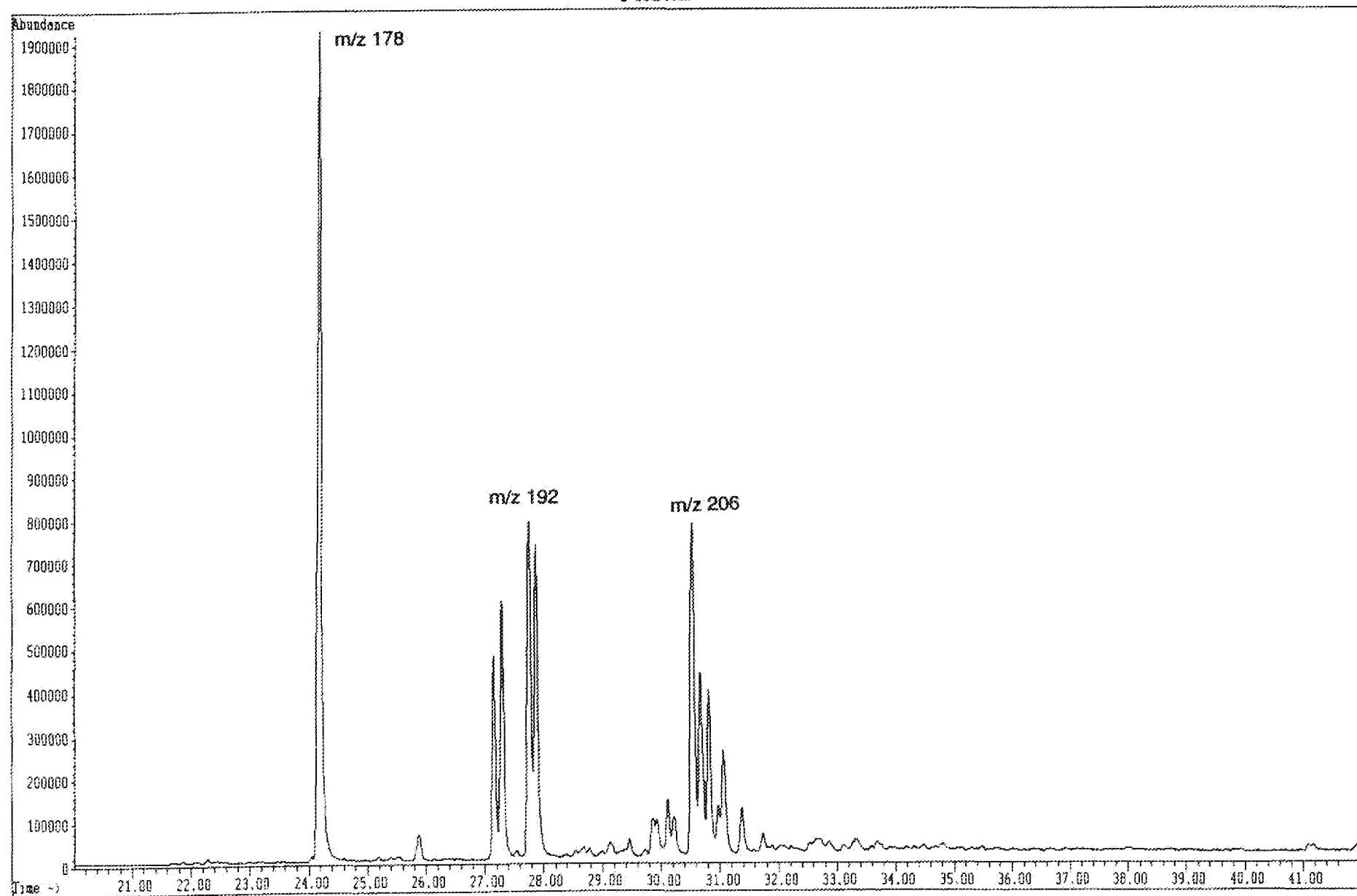
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Operator:
Date Acquired: 15 Dec 98 6:19 pm
Method File Name: BIOM.M
Sample Name: 4139-001
Misc Info: WELL 33/5-2 4063.0M
Bottle Number: 43



File: C:\CHEMPC\DATA\1001009.D
Operator:
Date Acquired: 13 Dec 90 3:38 am
Method File Name: B1QMY.M
Sample Name: 4139-001
Misc Info: WELL 33/5-2 4063.0M
Bottle Number: 10

Q3.11

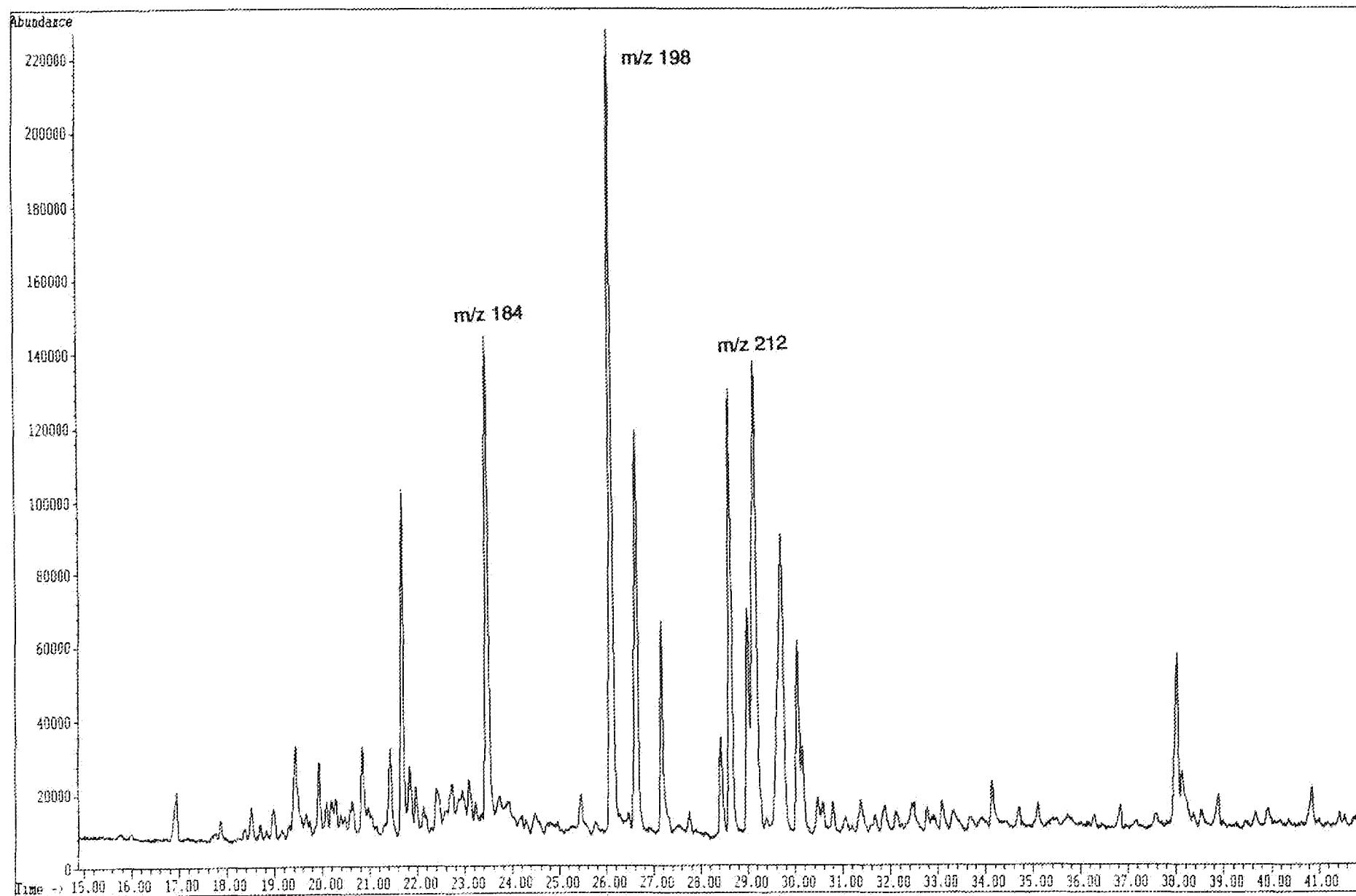
Phenanthrenes



File: C:\CHEMPC\DATA\1001009.D
Operator:
Date Acquired: 13 Dec 90 3:38 am
Method File Name: BTOMY.M
Sample Name: 4199-001
Misc Info: WELL 33/5-2 4063.0M
Bottle Number: 10

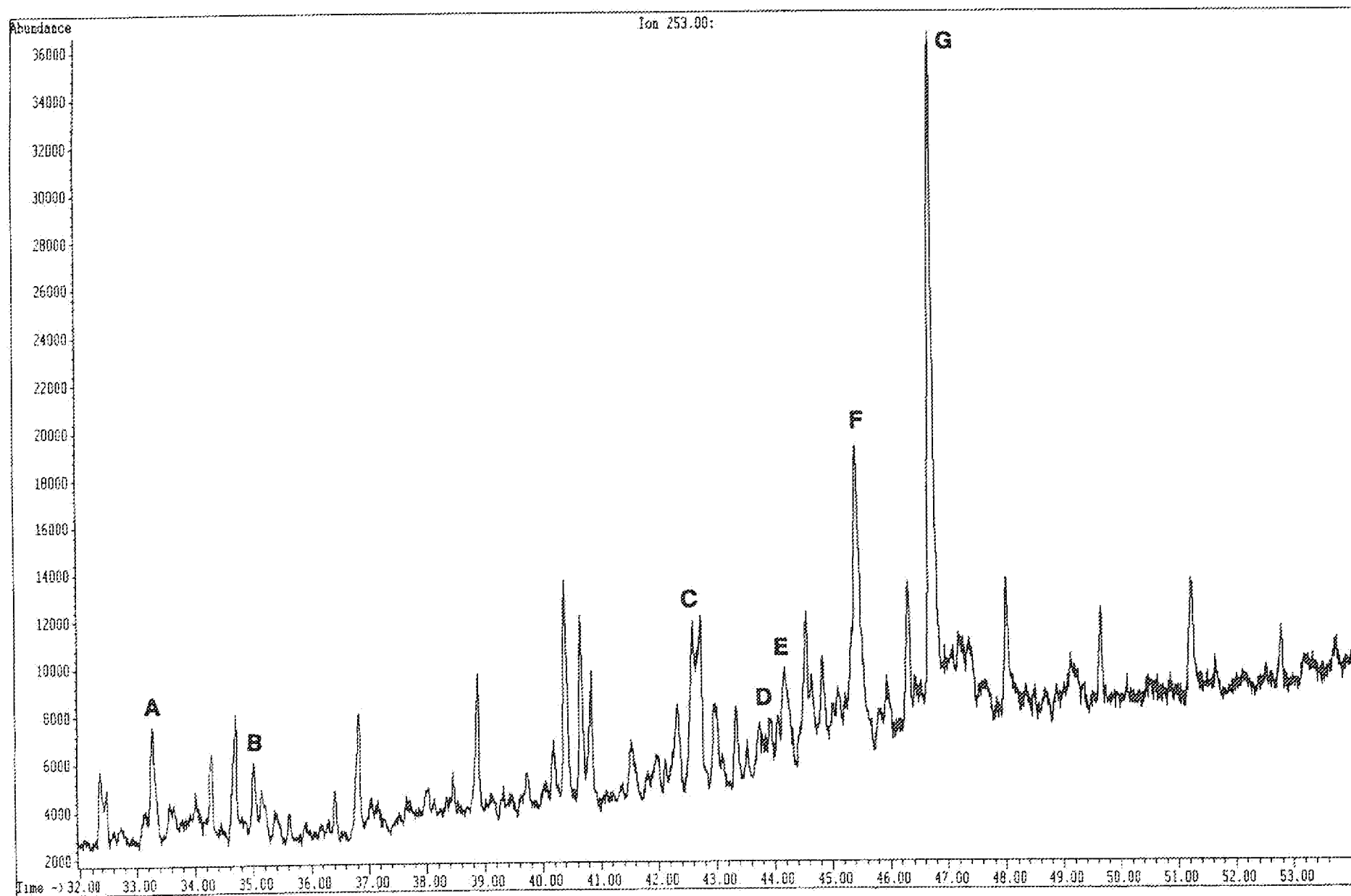
Q3.1j

Dibenzothiophenes

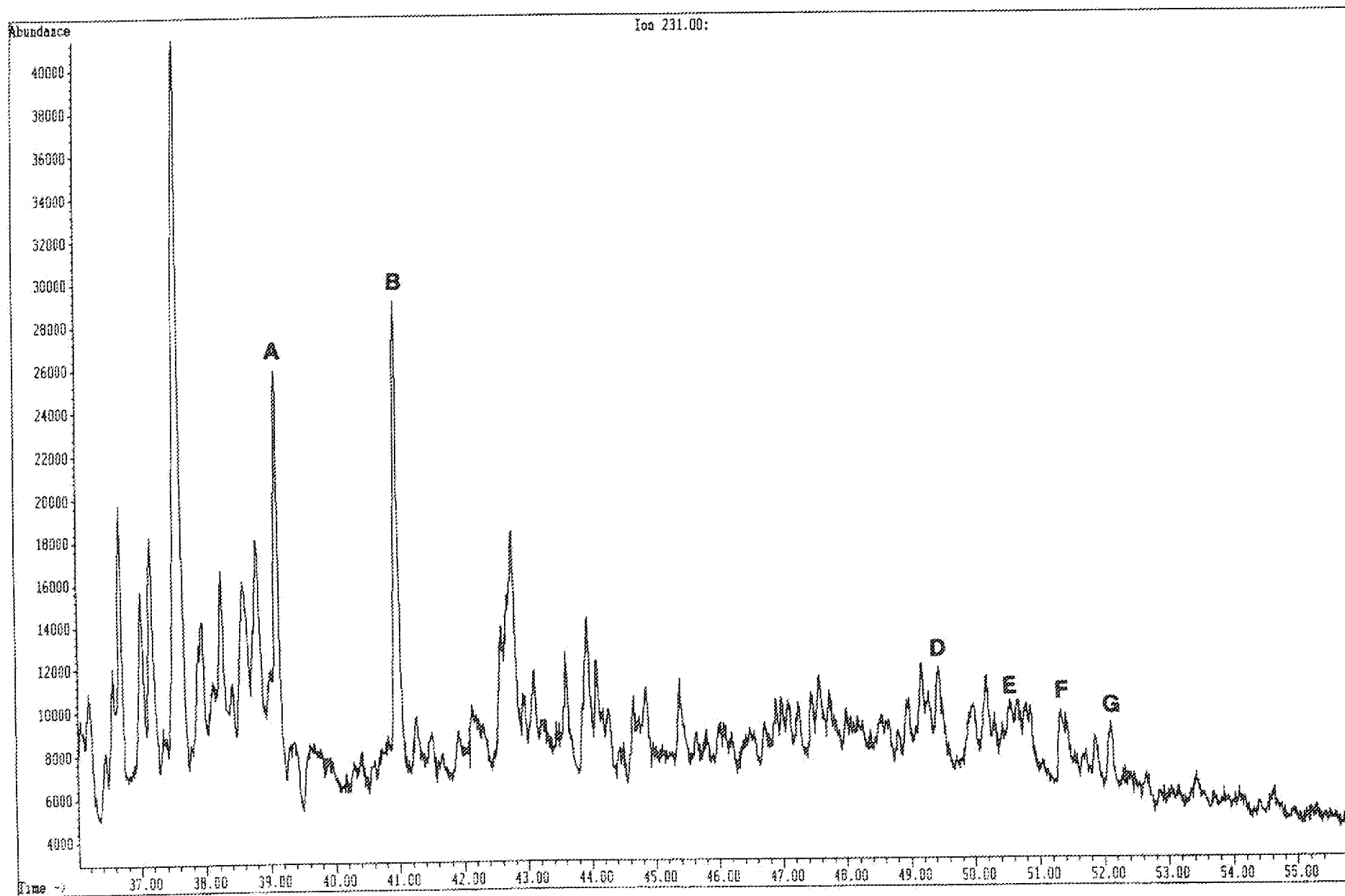


File: C:\CHEMPC\DATA\1001009.D
Operator:
Date Acquired: 13 Dec 90 3:38 am
Method File Name: BLOMY.M
Sample Name: 4139-001
Misc Info: WELL 33/5-2 4063.0M
Bottle Number: 10

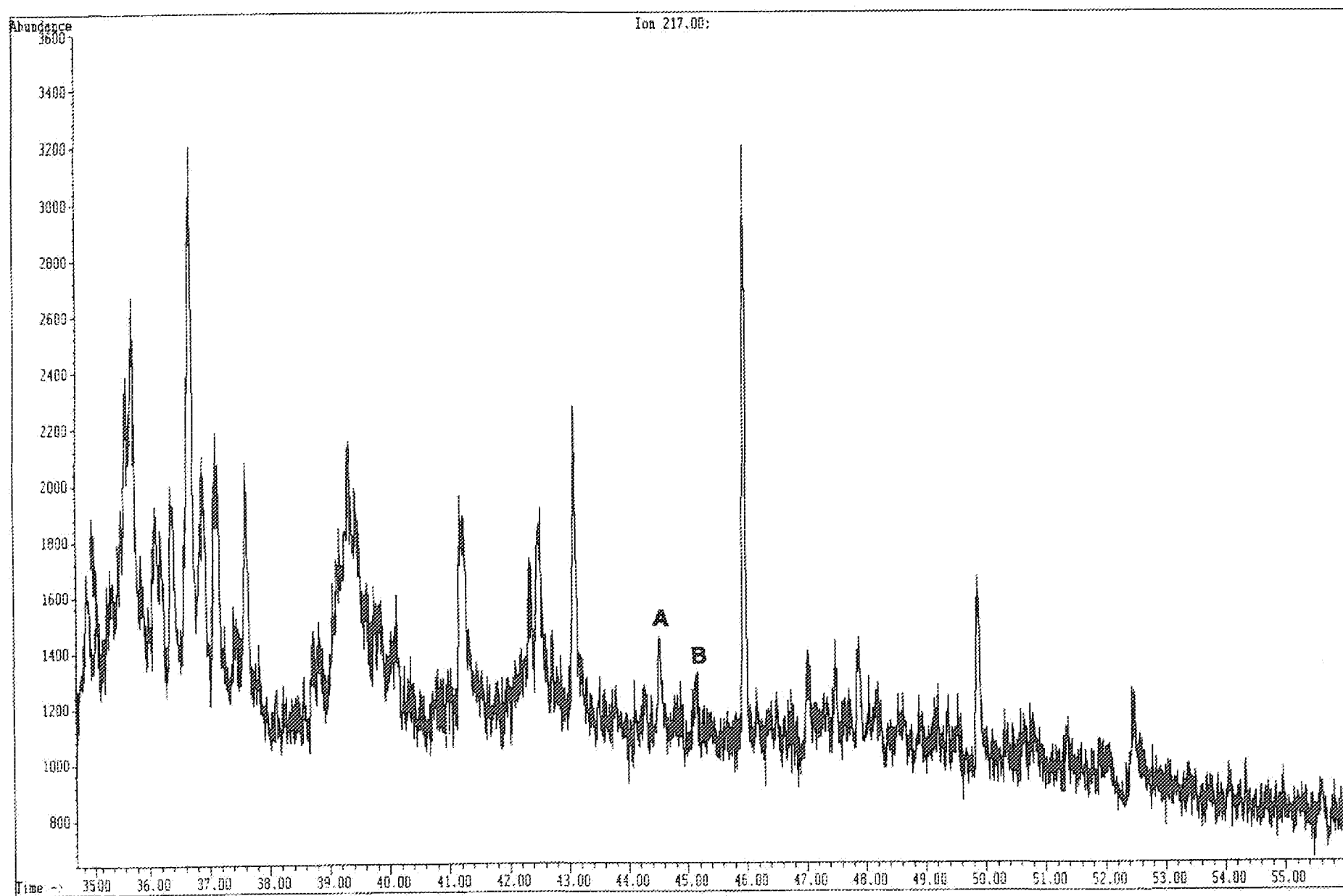
Q3.1k



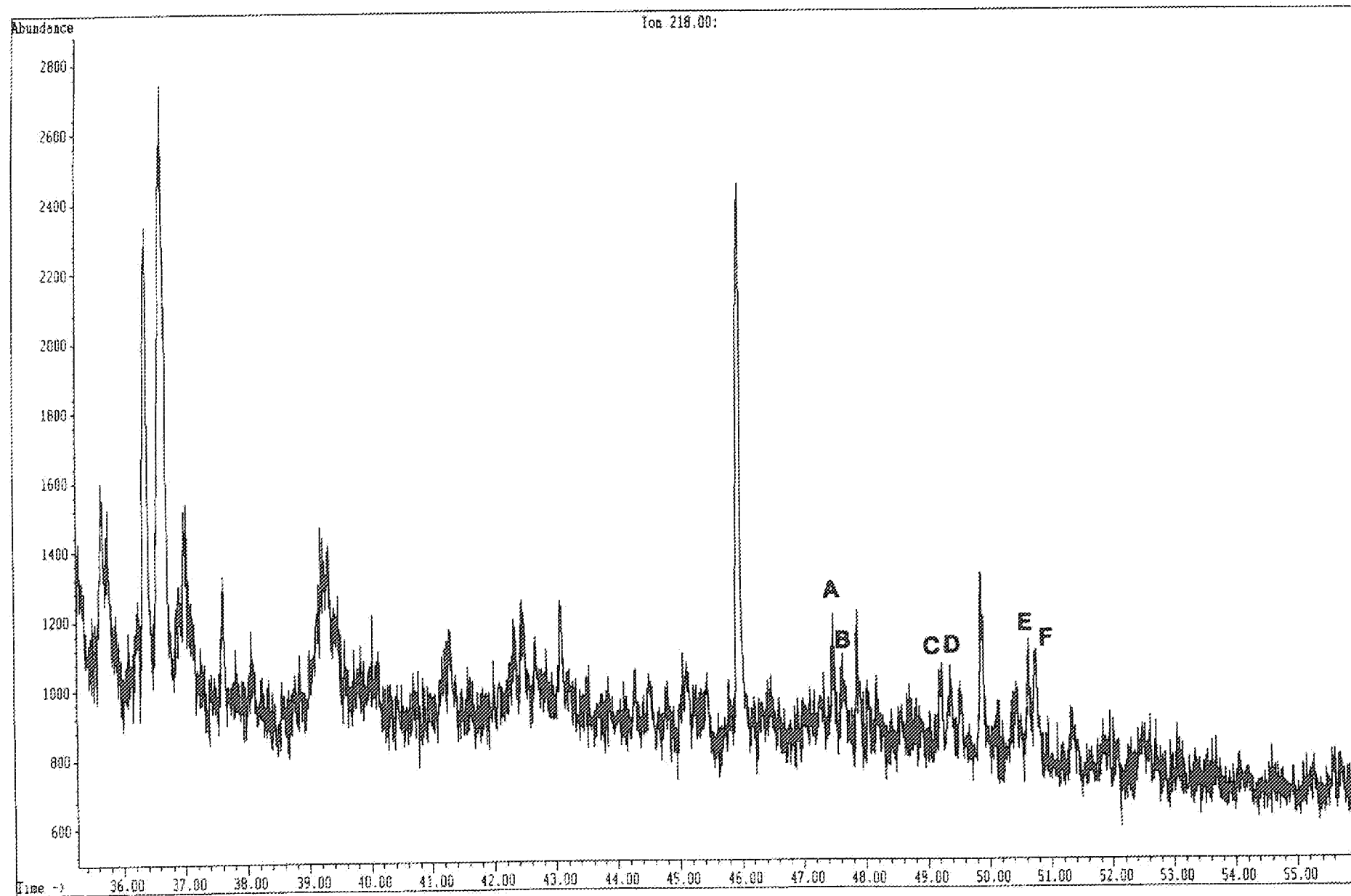
File: C:\CHEMPC\DATA\1001009.D
Operator:
Date Acquired: 13 Dec 90 3:38 am
Method File Name: BICMY.M
Sample Name: 4139-001
Misc Info: WELL 33/5-2 4063.0M
Bottle Number: 10



File: C:\CHEMPC\DATA\4401006.D
Operator
Date Acquired: 15 Dec 90 7:29 pm
Method File Name: H10M.M
Sample Name: 4139-002
Misc Info: WELL 33/5-2 4080.0M
Bottle Number: 44

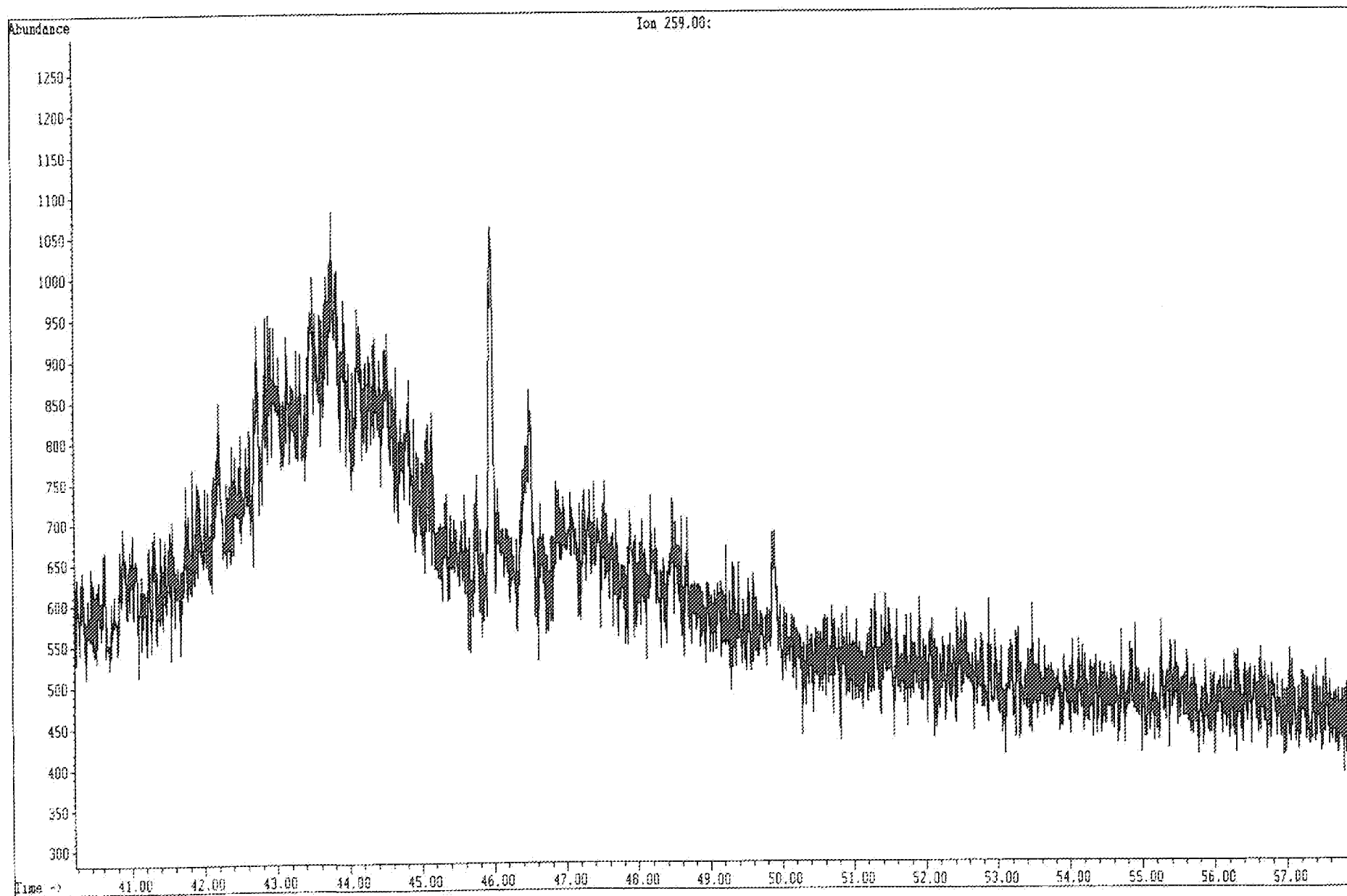


File: C:\CHEMPC\DATA\4401006.D
Operator:
Date Acquired: 15 Dec 90 7:29 pm
Method File Name: B10M.M
Sample Name: 4139-002
Misc Info: WELL 33/5-2 4080.0M
Bottle Number: 44

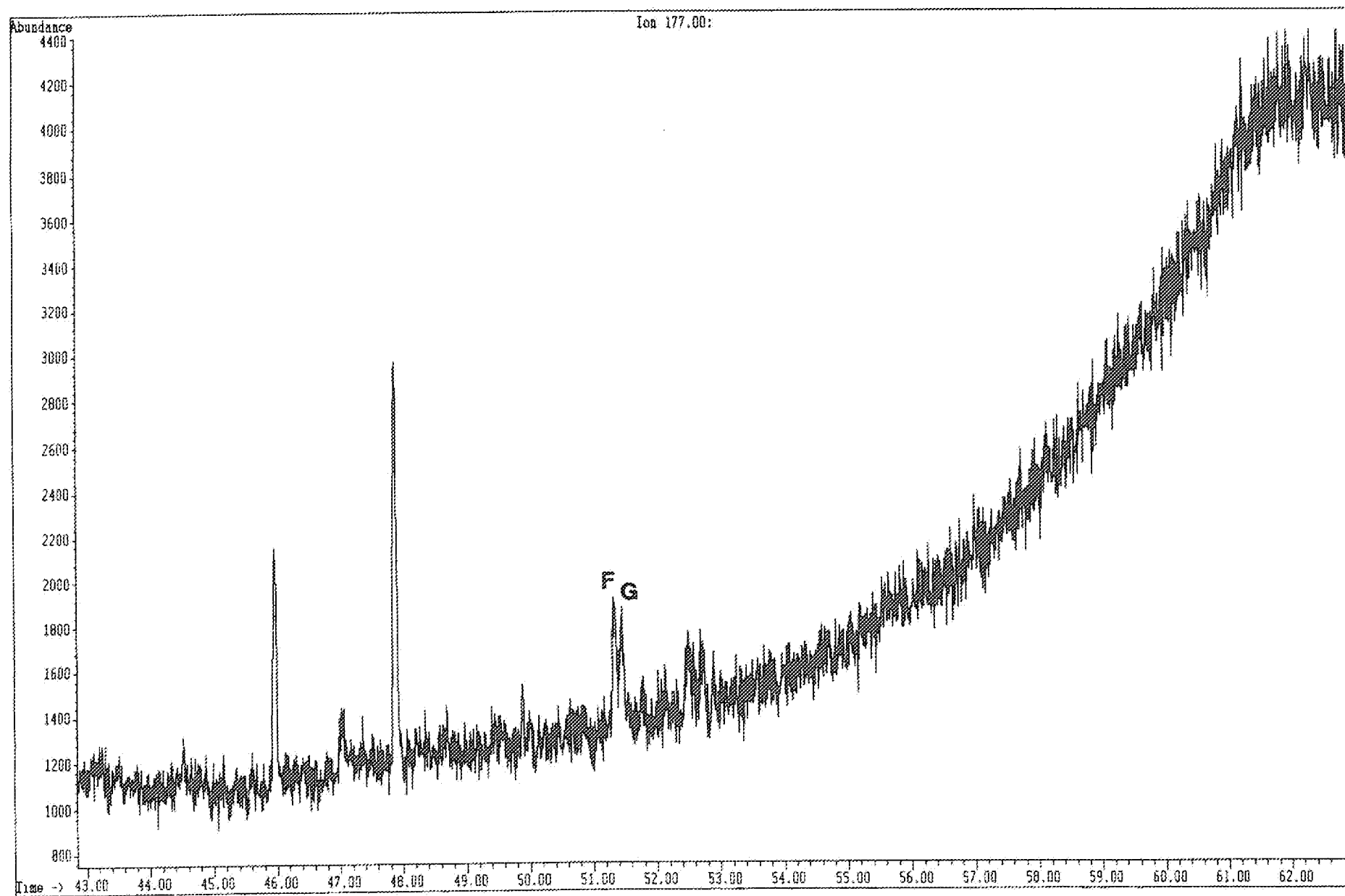


File: C:\CHEMPC\DATA\4401086.D
Operator:
Date Acquired: 15 Dec 90 7:29 pm
Method File Name: BIOM.M
Sample Name: 4139-802
Misc Info: WELL 33/5-2 4080.0M
Bottle Number: 44

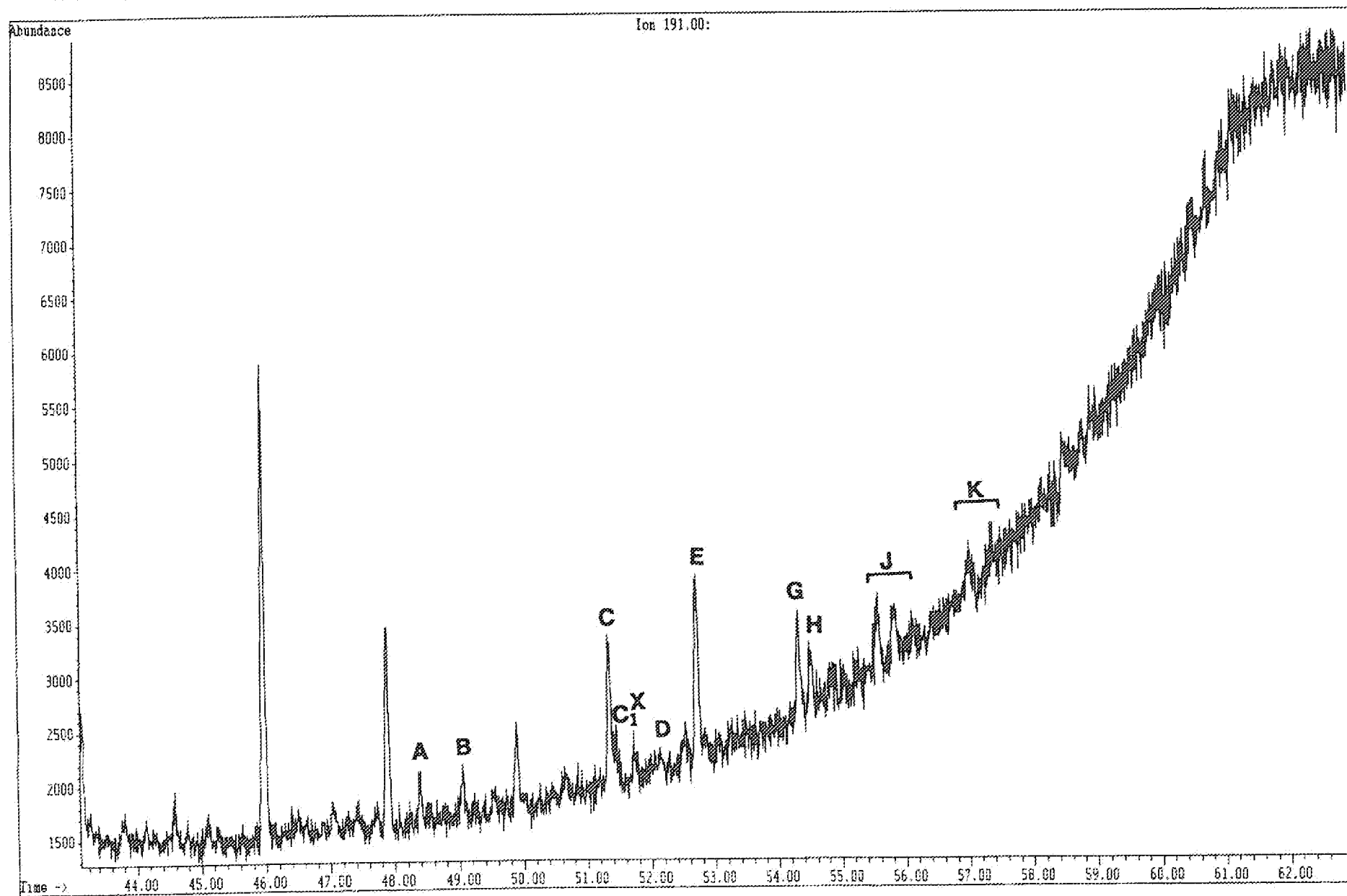
Q3.2c



File: C:\CHEMPC\DATA\4401006.D
Operator:
Date Acquired: 15 Dec 90 7:29 pm
Method File Name: BIOM.M
Sample Name: 4139-002
Misc Info: WELL 33/5-2 4080.0M
Bottle Number: 44

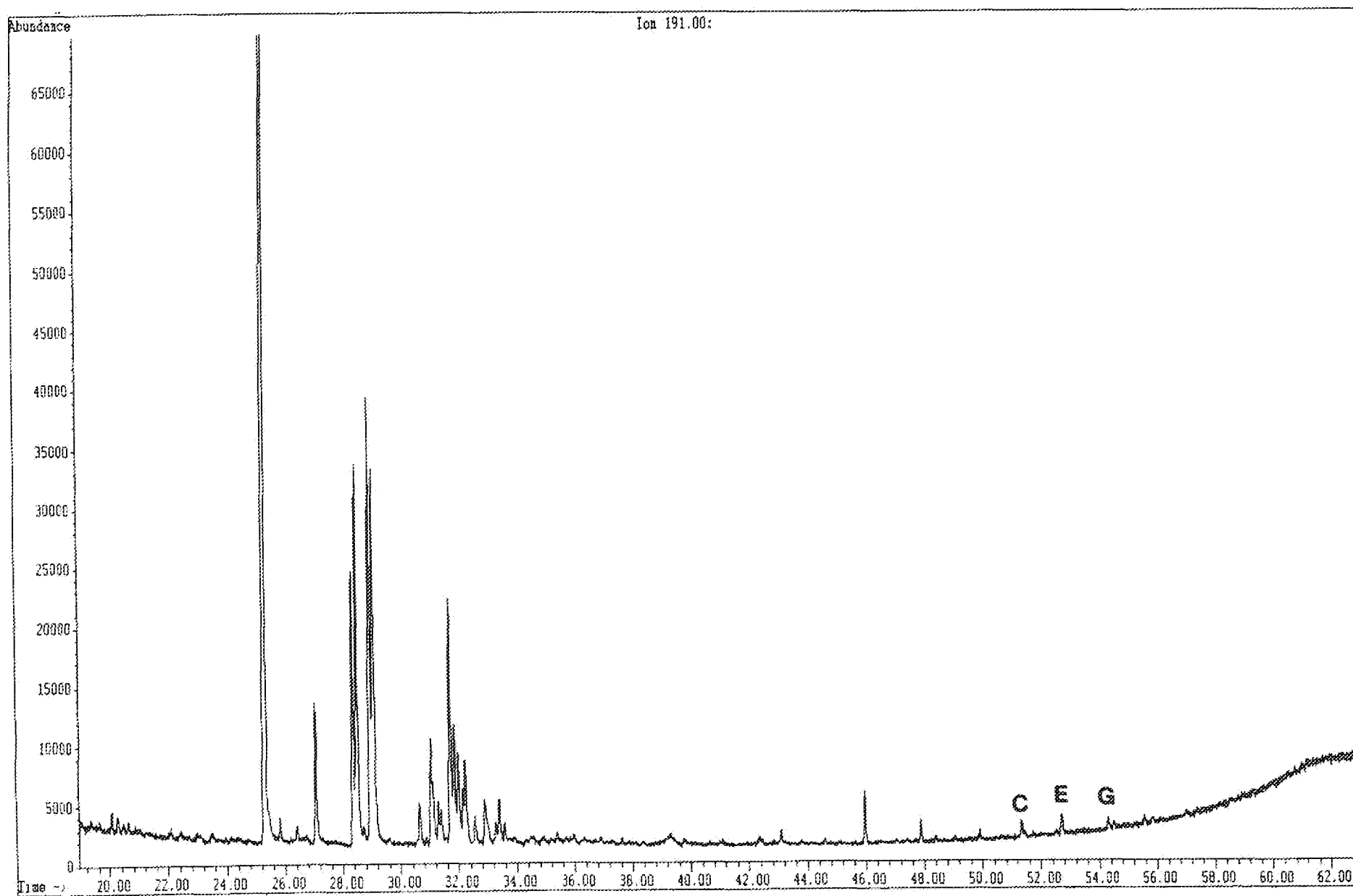


File: C:\CHEMPC\DATA\44B1006.D
Operator:
Date Acquired: 15 Dec 90 7:29 pm
Method File Name: BIOM.M
Sample Name: 4139-002
Misc Info: WELL 33/5-2 4080.0M
Bottle Number: 44



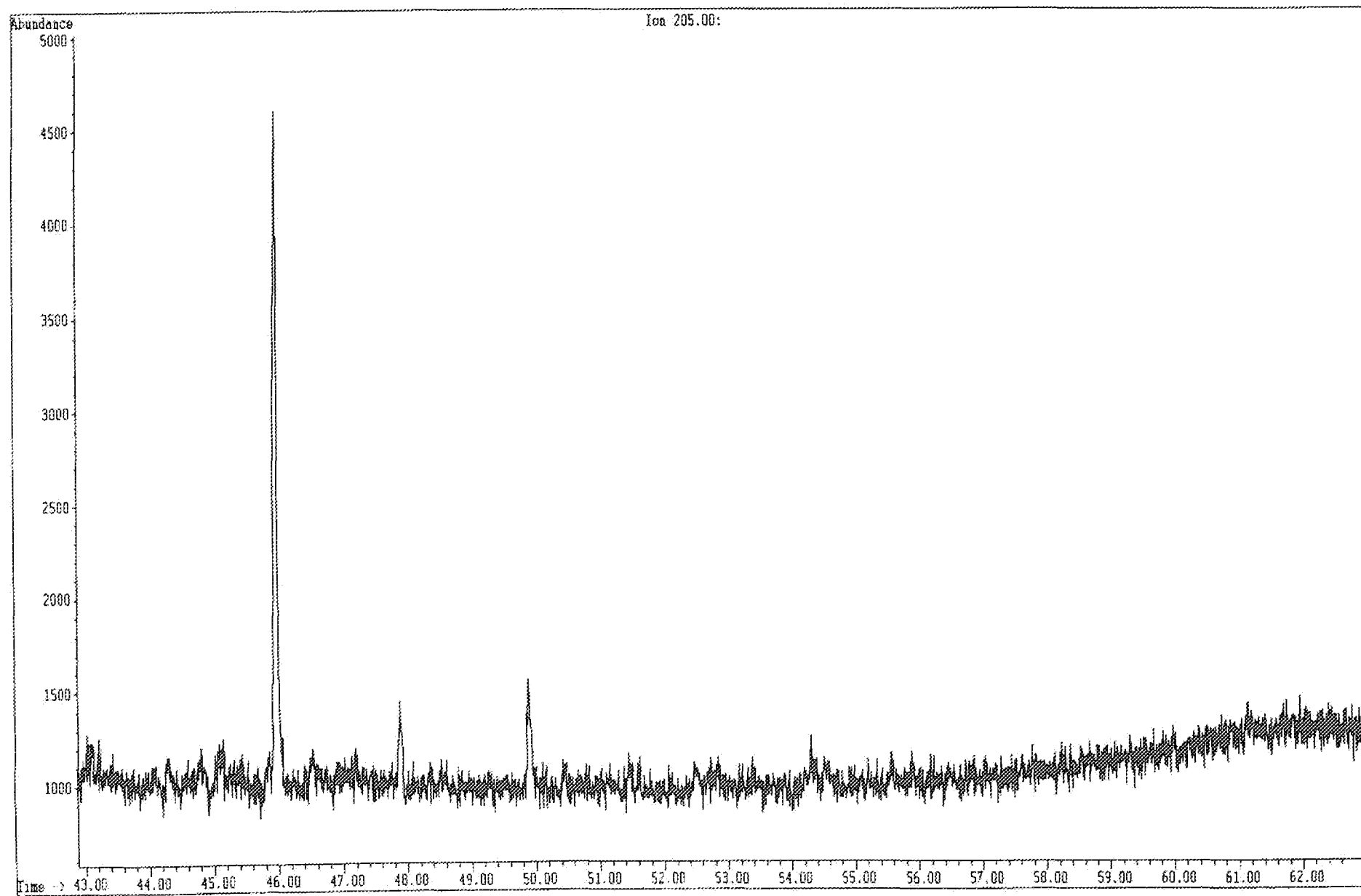
File: C:\CHEMPC\DATA\4401006.D
Operator:
Date Acquired: 15 Dec 90 7:29 pm
Method File Name: BIOM.M
Sample Name: 4139-002
Misc Info: WELL 33/5-2 4080.OM
Bottle Number: 44

Q3.21



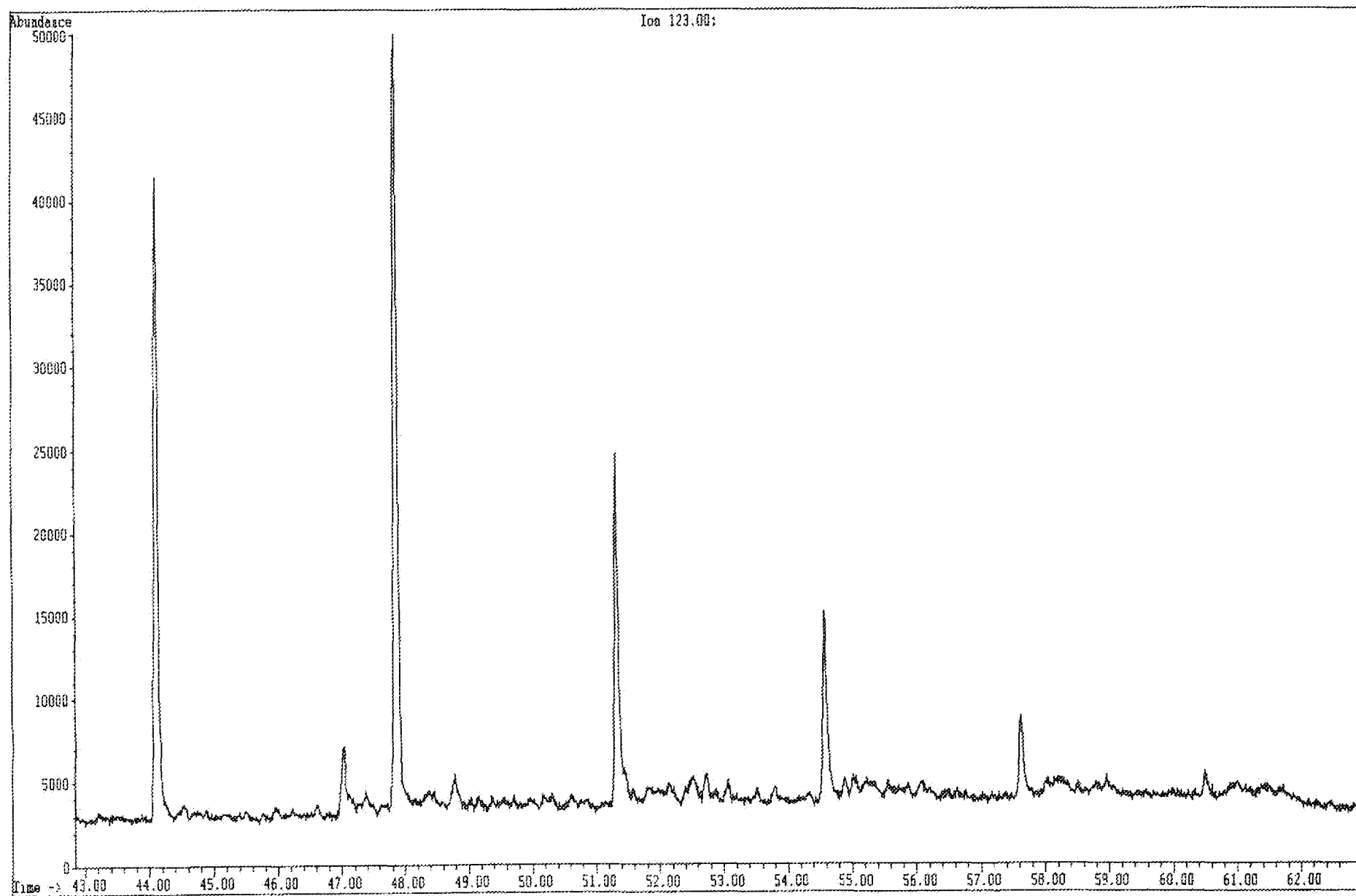
File: C:\CHEMPC\DATA\4401006.D
Operator:
Date Acquired: 15 Dec 98 7:29 pm
Method File Name: BIOM.M
Sample Name: 4139-002
Misc Info: WELL 33/5-2 4080.0M
Bottle Number: 44

Q3.2g

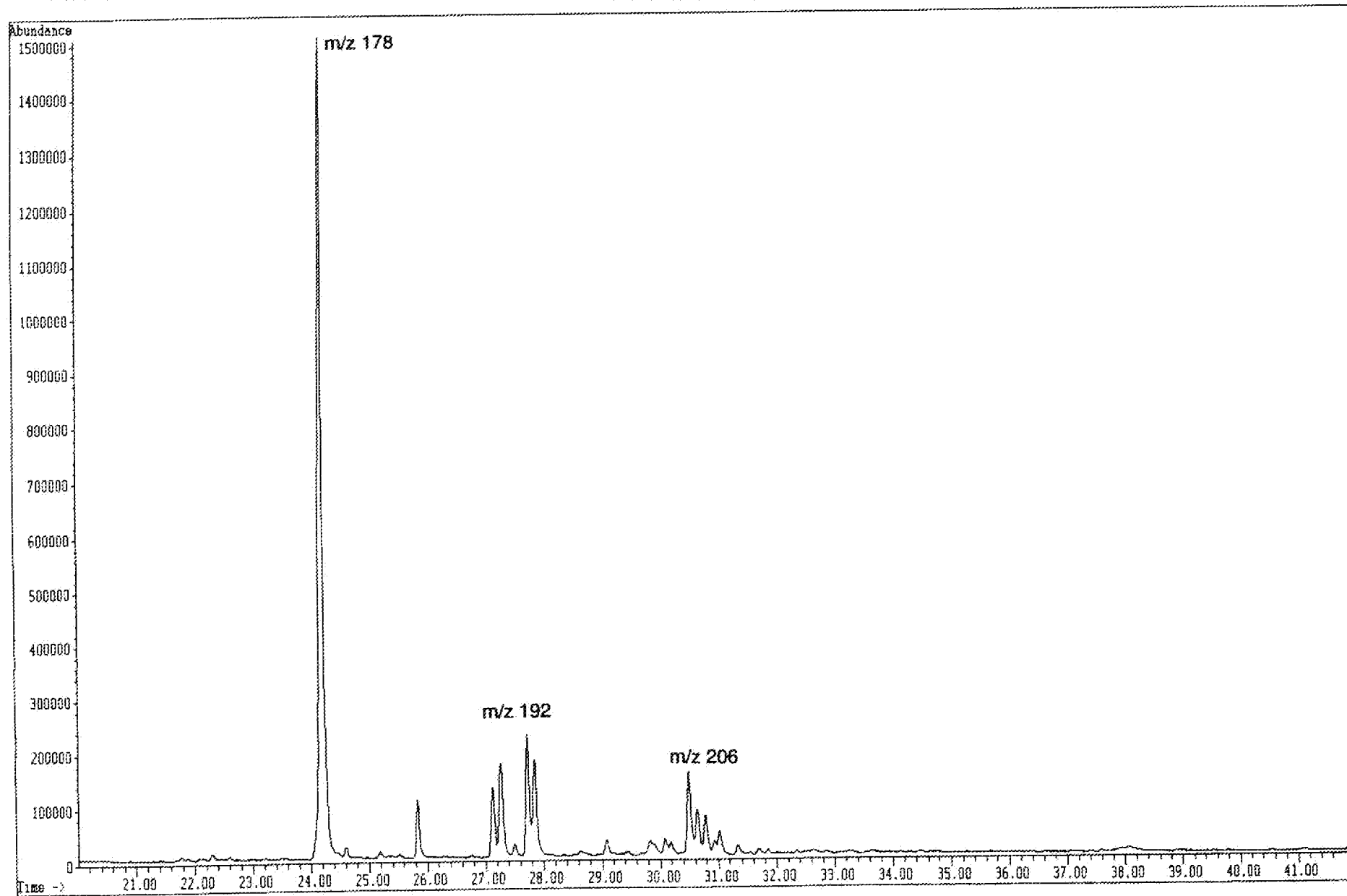


File: C:\CHEMPC\DATA\4401006.D
Operator:
Date Acquired: 15 Dec 90 7:29 pm
Method File Name: BIOM.M
Sample Name: 4139-002
Misc Info: WELL 33/5-2 4080.0M
Bottle Number: 44

Q3.2h



File: C:\CHEMPC\DATA\1101010.D
Operator:
Date Acquired: 13 Dec 90 4:46 am
Method File Name: BIOMY.M
Sample Name: 4139-002
Misc Info: WELL 33/5-2 4080.0M
Bottle Number: 11

Phenanthrenes

File: C:\CHEMPC\DATA\1101010.D

Q3.2j

Operator:

Date Acquired: 13 Dec 90 4:46 am

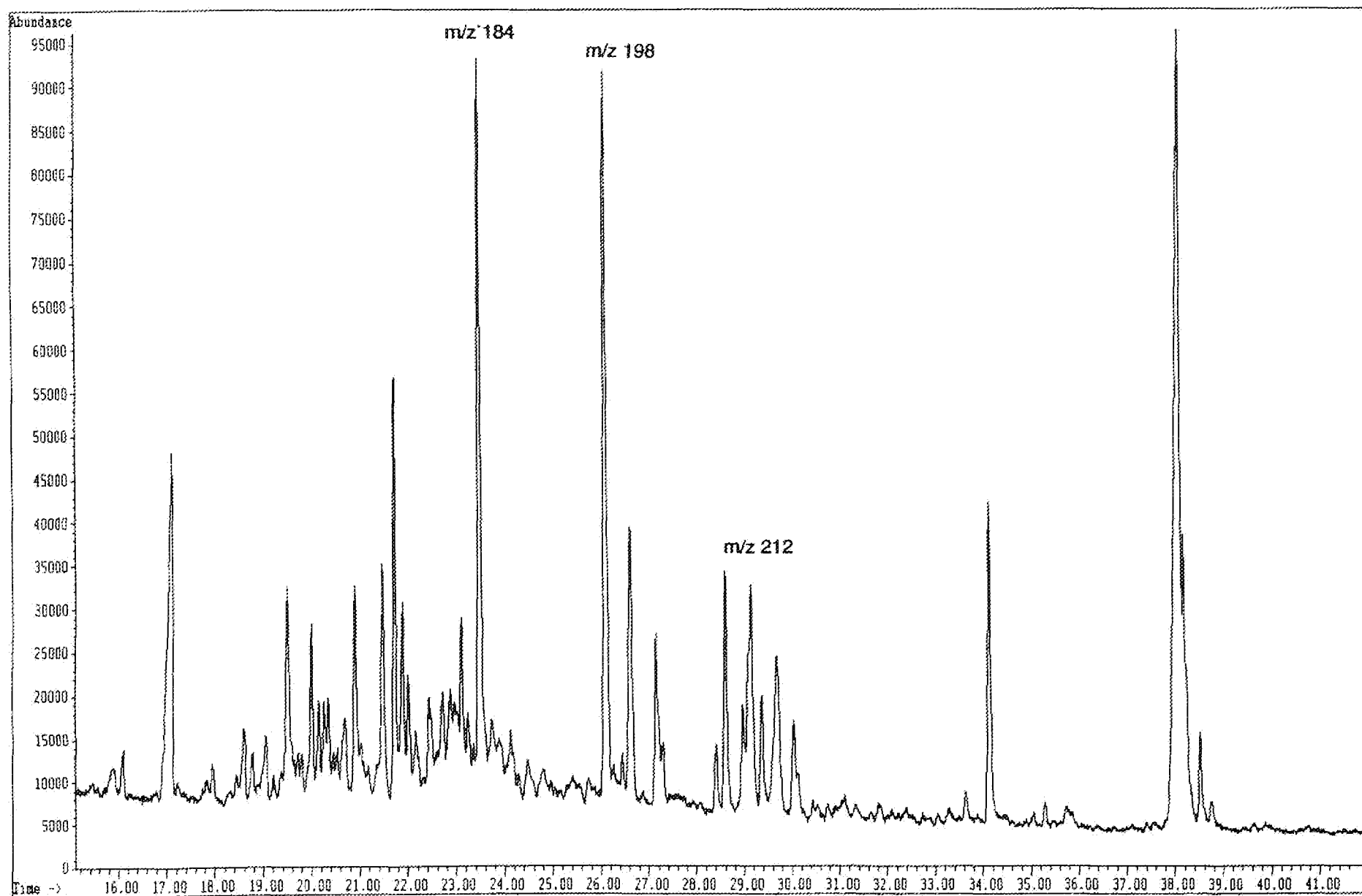
Method File Name: BICOMY.M

Sample Name: 4139-002

Misc Info: WELL 33/5-2 4080.0M

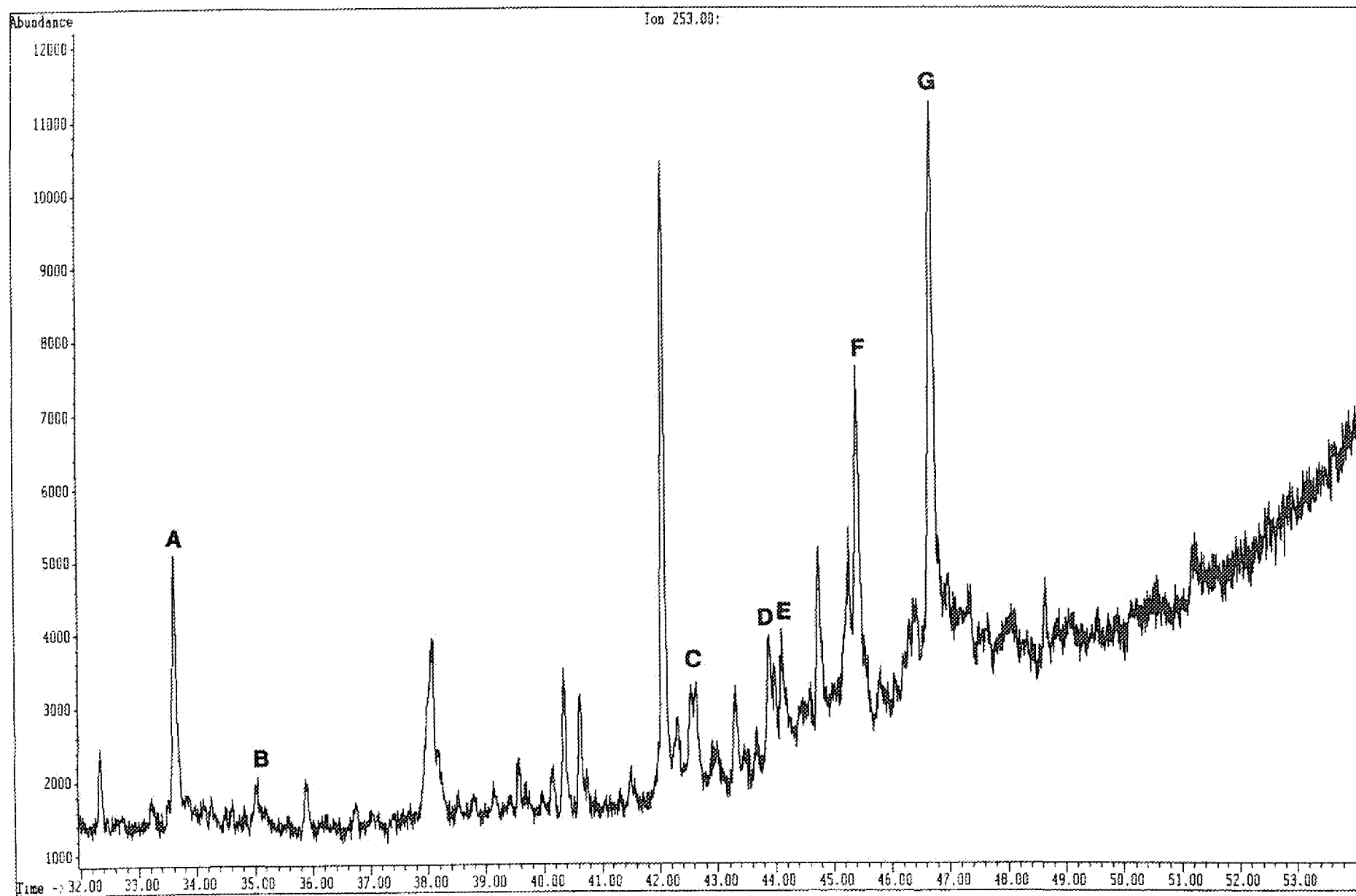
Bottle Number: 11

Dibenzothiophenes



File: C:\CHEMPC\DATA\1101010.D
Operator:
Date Acquired: 13 Dec 90 4:46 am
Method File Name: BIOMY.M
Sample Name: 4139-002
Misc Info: WELL 33/5-2 4080.0M
Bottle Number: 11

Q3.2k



File: C:\CHEMP\DATA\1101010.D
Operator:
Date Acquired: 13 Dec 98 4:46 am
Method File Name: BTOMY.M
Sample Name: 4139-082
Misc Info: WELL 33/5-2 4080.0M
Bottle Number: 11

Q3.21

