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Prepared for

STATOIL

CORRELATION STUDY INVOLVING DST FLUIDS AND HYDROCARBON SHOWS FROM THE MIDDLE - LOWER JURASSIC SANDS IN THE STATOIL 6506 12-3 WELL HALTENBANKEN OFFSHORE NORWAY

GEOCHEM

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Petroleum Geochemistry Division

CORRELATION STUDY INVOLVING DST FLUIDS AND HYDROCARBON SHOWS FROM THE MIDDLE - LOWER JURASSIC SANDS IN THE STATOIL 6506/12-3 WELL, HALTENBANKEN, OFFSHORE NORWAY.

SUMMARY

A suite of twenty core samples between 3837 metres and 4264 metres and six tested fluids from the 3162-4241 metre interval have been evaluated.

Shows of a mature light-medium gravity crude oil in the sands vary in strength in a cyclic manner within the analysed interval; suggesting that "gravity" separation within multiple reservoir units is occurring. Water washing resulting in deterioration of oil quality, but not biodegradation, is suspected in the leannest intervals.

Apart from traces of suspected drilling introduced hydrocarbons from the cores the extracted hydrocarbons closely correlate with the tested fluids. The oils have a common source.

M.J. Sauer

GEOCHEM LABORATORIES LIMITED

INTRODUCTION

This report presents a correlation study involving extracted hydrocarbons from the Lower-Middle Jurassic sands at 3837-4264± metres and six crude oils from 3162-4241 metres.

The study was designed to investigate relationships between the shows and the tested crudes and to postulate the source of the oils.

This project was authorised by T. Meyer, Statoil, Stavanger.

A. ANALYTICAL

A total of twenty (20) core fragments from the 3837-4264 metre interval plus six crude oils (DST-6 3162-3173 metres, DST-5 3822-3836 metres, DST-4 3880-3890 metres, DST-3 3960-3980 metres, DST-2 4165-4170 metres and DST-1 4222-4241 metres) were received and assigned the Geochem job number 1111.

The samples were analysed in accordance with contract T-6192 No. 11 (telexes 14/6/85 and 25/6/85). A total of six API gravity determinations, six whole oil chromatograms, twenty C_{15+} extractions with chromatography, six separation and chromatography of 210°C + fractions, twenty six C_{15+} saturates analyses, six C_{15+} branched cyclics analyses, twenty one 8 ion mass fragmentograms, twenty six C_{15+} aromatics analyses and sixty nine carbon isotopes analyses were performed in this study.

The data are listed in tables 1 to 11 and presented graphically in figures 1 to 12.

A brief description of the analysed methods is enclosed in the back of this report.

B. GENERAL INFORMATION

Ten (10) copies of this report have been forwarded to T. Meyer, Statoil, Stavanger. A copy of the data has been retained by Geochem for future consultation with authorised Statoil personnel.

The results of this study are proprietary to Statoil.

RESULTS AND DISCUSSION

Hydrocarbon shows in the Lower-Middle Jurassic sands of the Tomma, Leka and Aldra formations have been evaluated, correlated to each other and to the six drill stem test fluids from this interval.

SHOW EVALUATION

The analysed sandstones are from three cored intervals (3837.18-3912.20 metres, 3949.00-4009.07 metres and 4146.50-4624.05 metres). It should be noted that, apart from silty shales in the cores at 4232± metres and 4264± metres, the beds of siltstone, shale and minor coal? (at 3940-3980± metres) also present within this gross interval are not represented. C_{15+} hydrocarbons extracted from the samples range widely in abundance from 31 ppm up to 2857 ppm, and constitute 44.0-88.8% of the total soluble extract. More significantly, the distribution of these hydrocarbons varies in a cyclic manner; in that the maxima at 3898± metres, 3994± metres, 4202± metres and 4249± metres are each followed by a trend in decreasing hydrocarbon abundance. The C_1-C_4 and C_5-C_7 hydrocarbons follow a similar pattern - distorted by indigenous hydrocarbons and by losses due to suspected water washing. The abundance of C_{15+} hydrocarbons within each individual reservoir unit increases with increasing depth. This effect may be due to "gravity" separation of the reservoired hydrocarbons, gas-condensate and associated crude oil, resulting in a preponderance of the heavier hydrocarbons at the base of each reservoir unit.

Paraffin naphthene fraction chromatograms of the hydrocarbons extracted from the sands, with two possible exceptions, possess an underlying similarity, suggesting that a single family of mature light-medium gravity crude oils is involved. Differences in the chromatographic traces are believed to be due to alteration of the oils in the reservoir. These effects are generally limited to an enhancement of the heavier less water soluble hydrocarbons in the leannest samples at 3912-3950± metres, 4009± metres and at 4219± metres. The marked baseline hump ast 3950± metres may be due to biodegradation but it is suspected that the reservoir temperature would preclude this process - traces of contamination are suspected. At 4232± metres and at 4264± metres but not at 4249± metres the paraffin-naphthene traces have minimal pristane and phytane peaks and a greater proportion of waxy paraffins - suggesting hydrocarbons from a source containing significant amounts of landplant debris.

When the paraffin-naphthene fraction chromatograms are compared to those of the tested fluids the similarity between them is apparent. A more pronounced baseline hump in the sandstone extracts suggests that traces of contamination from the mud system are also present.

Chromatograms of the corresponding C_{15+} aromatic hydrocarbons, although they possess an underlying similarity - suggesting a single source - differ markedly in the proportion of the methyl and dimethyl - naphthalenes. This difference is primarily associated with the leaner samples at 3912-3949± metres, 4009± metres and at 4219± metres and, again, water washing is believed to be responsible for the loss of the lighter components. The near consistency of the methyl phenanthrene index suggests minimal variation in inferred source maturity of the oils within the reservoir. If chromatograms of the C_{15+} aromatic hydrocarbons from the crude oils are compared with those extracted from the sands the preponderance of lighter components in the former is obvious. The relative proportions of the heavier hydrocarbons are the same, however, suggesting that the same oil is present throughout the analysed interval. Front end bias in the oil derived aromatics is believed to reflect the composition of the produced oil as opposed to the total hydrocarbons in the reservoir sands (wherein a heavy residue will always remain).

More detailed correlations are based upon mass fragmentograms of the triterpanes and steranes, plus those of the phenanthrenes and dibenzothiophenes, isolated from the C_{15+} fractions. Poor signal to noise ratios of several of these traces are the results of very low biomarker abundances in the soluble extracts. The extreme sparcity of these hydrocarbons precluded analyses by GC-MS at 3912± metres, 3949.8 metres, 4009 metres, 4146.5 metres and at 4219 metres. Mass fragmentograms of the triterpanes (at m/z 191 and 177) and of the steranes (at m/z 217, 218 and 259), with two exceptions, exhibit a minimal variation and confirm that a single family of crude oils is involved. Possible exceptions are the saturated hydrocarbons extracted from the sands at 4232± metres and 4264± metres (but not those at 4249± metres) where a prepondance of C_{29} steranes indicates a greater proportion of land plant organic matter in the inferred source. It is doubtful if this is a real effect since the phenanthrenes (at m/z 178-220) and dibenzothiophenes (at m/z 184-212) closely resemble those of the other extracts and also the equivalent crude oil fractions. The anomalous saturated hydrocarbon data at 4232± metres and 4264± metres however, cannot be attributed to contamination since the intervening core sample has a 'normal' saturates fingerprint.

Apart from the two exceptions referred to above the relative abundances of C_{27} as opposed to C_{28} and C_{29} steranes indicate that the source rocks for the migrated crude oil contain a high proportion of marine organic matter, where available, the ratios of selected steranes and triterpanes show that the oils are derived from a mature, but not highly mature, source. Excluding results from two of the leanest samples, the carbon isotope ratios of the total soluble extracts range narrowly between $-28.2^{o}/oo$ and $-29.5^{o}/oo$, the C_{15+} saturates between $-29.0^{o}/oo$ and $-30.16^{o}/oo$ and the C_{15+} aromatics between $-26.8^{o}/oo$ and $-28/58^{o}/oo$. The corresponding results for the six oil samples are -29.0 to $-29.3^{o}/oo$, $-29.1^{o}/oo$ to $-29.4^{o}/oo$ and -27.0 to $-28.3^{o}/oo$ respectively. These results suggest that a single family of crude oils is involved and although the deeper samples tend to be isotopically heavier, the variation in delta values is not considered to be significant; and certainly insufficient to justify subdivision of the crudes into separate families.

Summarising:

- the abundance of C_{15+} hydrocarbons varies in a cyclic manner within the 3837-4264± metre interval.

- suspected water washing at the concentration minima has resulted in a deterioration in oil quality and in loss of the lighter polyaromatic hydrocarbons.

- mild biodegradation of the crude may have occurred but is unlikely at the reservoir depth.

- an upward diminution in C_{15+} hydrocarbon abundance within each reservoir unit is believed to be due to "gravity" separation of the gas-condensate and associated crude oil.

- the oils belong to a single family of light-medium gravity crudes and are derived from a mature, but not highly mature, source.

CONCLUSIONS

Shows of light-medium gravity crude oil in the Tomma - Aldra sands at 3837-4264 metres in the 6506/12-3 well have been characterised and correlated with six DST fluids from the 3162-4241 metre interval.

The oils, light-medium gravity crudes, are associated with strong shows of wet gas - condensate in this interval. C_{15+} hydrocarbon abundances diminish from maxima at 3897± metres, 3994± metres, 4202± metres and at 4249± metres; suggesting that "gravity" separation within each reservoir unit is occurring. The leannest intervals are, however, associated with a deterioration in oil quality and a loss of the lighter poly-aromatic species; suggesting that water washing is occurring.

Alteration of the oils in the reservoir is minimal (with the exceptions refered to above) and detailed analyses of the C_{15+} hydrocarbons indicate that they belong to a single family of crudes, derived from a mature but not highly mature source.

TABLE 1
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH	GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (Wt. % of Rock)
1111-004 CORE	3837.18-3837.30m	A 98% Sandstone, medium grained, sub-angular, well sorted, micaceous, non-calc. matrix, pale yellow F., milky cut, pinkish grey	5YR8/1	
1111-005 CORE	3852.00-3852.10m	A 98% Sandstone, as 1111-004A	5YR8/1	
1111-006 CORE	3867.10-3867.20m	A 98% Sandstone, blocky, medium to coarse grained, sub-angular, well sorted, non-calc., milky cut, pinkish grey to v. light brownish grey	5YR8/1-5YR7/1	
1111-007 CORE	3881.41-3881.51m	A 98% Sandstone, as 1111-006A, milky cut	5YR8/1-	
1111-008 CORE	3897.60-3897.70m	A 98% Sandstone, blocky, medium grained, sub-angular, well sorted, non-calc. matrix, pale yellow F., milky cut, pinkish grey	5YR8/1	
1111-009 CORE	3912.10-3912.20	A 98% Sandstone, blocky, fine to medium grained, sub-angular, well sorted, minor silty/arg. laminations, non-calc. matrix, sl. micaceous, v. light grey	N8	
1111-010 CORE	3949.00-3949.05m	A 98% Sandstone, subfissile, medium to fine grained, well sorted, micaceous, sl. arg., non-calc. matrix, v. light grey to light grey	N8-7	
1111-011 CORE	3964.00-3964.05m	A 98% Sandstone, blocky, medium grained, fairly well sorted, non-calc. matrix, minor carb./arg. inclusions, v. light grey to pinkish grey	N8-5YR8/1	
1111-012 CORE	3979.00-3979.05m	A 98% Sandstone, blocky, medium to fine grained, sub-angular, well sorted, micaceous/carb. inclusions, non-calc. matrix, pinkish grey	5YR8/1	
1111-013 CORE	3994.00-3994.07m	A 98% Sandstone, blocky, medium grained, sub-angular, fairly well sorted, non-calc. matrix, v. pale yellowish brown	10YR7/2	
1111-014 CORE	4009.00-4009.07m	A 98% Sandstone, blocky, medium to fine grained, sub-angular, well sorted, arg./micaceous laminations, non-calc. matrix, v. light grey to light grey	N8-7	
1111-015 CORE	4146.50-4146.54m	A 98% Sandstone, blocky, fine grained, sub-angular, fairly well sorted, non-calc. matrix, minor arg. laminations, light grey	N7	

Abbreviations = **arena**ceous, **argill**aceous, **calc**areous, Cut, **dolo**mitic, Fluorescence, **foram**inifera, **foss**iliferous
Lost Circulation Material, **mod**erately, **occ**asionally, **sl**ightly, very

TABLE 1
ORGANIC CARBON RESULTS AND GROSS LITHOLOGIC DESCRIPTIONS

GEOCHEM SAMPLE NUMBER	DEPTH		GROSS LITHOLOGIC DESCRIPTION	G S A Colour Code	TOTAL ORGANIC CARBON (Wt. % of Rock)
1111-016 CORE	4161.00-4161.06m	A 98%	Sandstone, blocky, fine to medium grained, sub-angular, well sorted, non-calc. matrix, minor darker lamillae, milky cut, pinkish grey	5YR8/1	
1111-017 CORE	4176.00-4176.05m	A 98%	Sandstone, as 1111-016A, milky cut	5YR8/1	
1111-018 CORE	4187.00-4187.05m	A 98%	Sandstone, blocky, medium grained, sub-angular, well sorted, non-calc. matrix, milky cut, white to v. light grey	N9-5YR8/1	
1111-019 CORE	4202.00-4202.06m	A 98%	Sandstone, blocky, medium to coarse grained, sub-angular, fairly well sorted, non-calc. matrix, micaceous lamillae, v. light grey to white	N8-9	
1111-020 CORE	4219.00-4219.05m	A 98%	Sandstone, blocky, fine to medium grained, sub-angular, non-calc. matrix, v. light grey Minor arg. lenses	N8	
1111-021 CORE	4232.00-4232.05m	A 80%	Sandstone, blocky, medium grained, sub-angular, fairly well sorted, non-calc. matrix, sl. micaceous, light grey to v. light grey, interbedded with	N7-8	
		B 20%	Silty shale, subfissile, mod. hard, non-calc., micaceous, medium dark grey	N4	1.67
1111-022 CORE	4249.00-4249.05m	A 98%	Sandstone, blocky, medium to coarse grained, sub-angular, well sorted, non-calc. matrix, sl. milky cut, pinkish grey	5RY8/1	
1111-023 CORE	4264.00-4624.05m	A 60%	Sandstone, blocky, medium grained, sub-angular, well sorted, micaceous, non-calc. matrix, v. light grey to pinkish grey, interbedded with	N8-5YR8/1	
		B 40%	Silty shale, platy to subfissile, mod. hard, non-calc., sl. micaceous, medium dark grey	N4	1.33

Abbreviations = **arena**ceous, **argil**laceous, **calc**areous, Cut, **dolo**mitic, Fluorescence, **foram**inifera, **fossil**iferous
Lost Circulation Material, **mode**rately, **occ**asionally, **sl**ightly, very

TABLE 2

DETAILED GASOLINE (C_{4-7}) ANALYSIS

GEOCHEM SAMPLE NUMBER	-025	-026	-024	-001	-002	-003
DEPTH	3162-3173m	3822-3836m	3880-3890m	3960-3980m	4165-4170m	4222-4241m
isobutane	0.37	0.54	0.17	0.15	0.00	0.09
n-butane	1.48	4.51	1.90	0.65	0.00	0.48
isopentane	3.19	4.77	2.47	2.76	0.03	1.32
n-pentane	6.74	7.97	6.40	5.20	0.12	2.97
2,2-dimethyl B	0.26	0.18	0.25	0.31	0.01	0.09
cyclopentane (CP)	1.19	1.69	1.54	1.82	0.12	1.28
2,3 dimethyl B	0.04	0.05	0.15	0.08	0.01	0.18
2-methyl P	5.33	5.03	4.63	4.66	0.43	3.26
3-methyl P	3.45	3.13	2.97	2.40	0.32	2.29
n-hexane	10.05	9.43	9.32	9.67	1.99	8.12
methyl CP(MCP)	5.65	5.45	6.21	8.48	2.34	5.87
2,2-dimethyl P	0.70	0.40	0.81	0.29	0.04	0.41
2,4-dimethyl P	0.03	0.03	0.07	0.04	0.00	0.05
2,2,3-trimethyl B	0.00	0.01	0.03	0.00	0.00	0.02
benzene	0.88	2.67	3.21	2.84	0.72	2.24
cyclohexane (CH)	7.91	9.00	9.02	8.35	7.19	11.42
3,3-dimethyl P	0.00	0.00	0.00	0.00	0.00	0.00
1,1-dimethyl CP	0.00	0.00	0.00	0.00	0.00	0.00
2-methyl H	6.68	4.66	5.05	4.62	4.26	5.23
2,3-dimethyl P	0.00	0.01	0.00	0.00	0.00	0.02
3-methyl H	4.91	3.46	3.81	3.20	3.27	3.80
1,c,3-dimethyl CP	1.25	0.86	0.84	1.11	1.11	0.96
1,t,3-dimethyl CP	1.57	1.18	1.01	1.04	1.35	0.95
1,t,2-dimethyl CP	3.16	2.27	2.59	2.49	2.93	2.28
3-ethyl P	0.03	0.03	0.00	0.02	0.04	0.01
n-heptane	13.47	9.78	10.87	11.05	14.78	11.92
methyl CH(MCH)	18.34	13.94	15.54	17.02	36.90	22.05
1,c,2-dimethyl CP	0.01	0.02	0.00	0.04	0.10	0.03
toluene	3.31	8.91	11.13	11.72	21.95	12.68
ABUNDANCE						
nC7/C7 nap x 100	55.34	53.48	54.38	50.91	34.86	45.40
MCP/Bz	6.45	2.04	1.93	2.99	3.27	2.62
MH/DMCP	1.93	1.87	1.99	1.67	1.37	2.14
nC6/MCP	1.78	1.73	1.50	1.14	0.85	1.38
%n-PARAFFINS	31.73	31.68	28.50	26.57	16.88	23.50
%iso-PARAFFINS	24.98	22.31	20.40	18.53	8.42	16.76
%NAPHTHENES	39.10	34.42	36.76	40.35	52.03	44.83
% AROMATICS	4.19	11.59	14.34	14.56	22.67	14.92

TABLE 3a

CONCENTRATION (PPM) OF EXTRACTED C_{15+} MATERIAL IN ROCK

GEOCHEM SAMPLE NUMBER	DEPTH	TOTAL EXTRACT	HYDROCARBONS			NON HYDROCARBONS			
			Paraffin - Naphthenes	Aromatics	TOTAL	Precipitd. Asphaltenes	Eluted NSO's	Non-eluted NSO's	Sulphur
1111-004	3837.18	4839	3166	861	4027	80	535	187	10
1111-005A	3852.00	910	601	125	727	73	78	32	0
1111-006A	3867.1	970	553	143	696	107	104	37	26
1111-007A	3881.41	3374	2326	531	2857	143	285	88	0
1111-008A	3897.6	2725	1829	536	2365	76	213	68	4
1111-009A	3912.1	184	61	41	102	23	46	12	0
1111-010A	3949.8	215	68	42	109	28	51	19	7
1111-011A	3964.0	907	621	116	737	66	71	26	7
1111-012A	3979.00	909	635	98	733	90	59	23	3
1111-013A	3994.0	926	680	118	798	54	55	19	0
1111-014A	4009.0	196	17	81	98	40	40	15	3
1111-015A	4146.5	492	283	93	376	69	31	13	3
1111-016A	4161.0	931	573	172	745	73	62	37	14
1111-017A	4176.0	769	520	132	651	45	53	19	1
1111-018A	4187.0	732	466	142	608	33	63	21	7
1111-019A	4202.0	2051	1477	345	1822	59	111	53	6
1111-020A	4219.0	71	22	10	31	14	18	8	0
1111-021A	4232.0	526	209	88	297	120	72	34	4
1111-022A	4249.0	1845	1180	297	1477	214	111	45	0
1111-023A	4264.0	665	261	137	398	136	100	28	4

TABLE 3b

COMPOSITION (NORMALISED %) OF C_{15+} MATERIAL EXTRACTED FROM ROCK

GEOCHEM SAMPLE NUMBER	DEPTH	HYDROCARBONS		NON HYDROCARBONS			
		Paraffin – Naphthenes	Aromatics	Precipitd. Asphaltenes	Eluted NSO's	Non eluted NSO's	Sulphur
1111-004	3837.18	65.43	17.79	1.65	11.05	3.87	0.21
1111-005A	3852.00	66.09	13.78	8.03	8.63	3.47	0.00
1111-006A	3867.1	56.97	14.77	11.08	10.74	3.81	2.63
1111-007A	3881.41	68.94	15.73	4.24	8.46	2.62	0.00
1111-008A	3897.6	67.11	19.65	2.78	7.81	2.49	0.16
1111-009A	3912.1	33.23	22.58	12.26	25.16	6.77	0.00
1111-010A	3949.8	31.57	19.35	13.13	23.73	8.99	3.23
1111-011A	3964.0	68.45	12.76	7.33	7.85	2.85	0.77
1111-012A	3979.00	69.84	10.82	9.93	6.53	2.55	0.32
1111-013A	3994.0	73.49	12.70	5.81	5.90	2.10	0.00
1111-014A	4009.0	8.68	41.48	20.26	20.58	7.72	1.29
1111-015A	4146.5	57.66	18.91	14.02	6.27	2.58	0.55
1111-016A	4161.0	61.55	18.51	7.84	6.61	3.97	1.52
1111-017A	4176.0	67.53	17.12	5.84	6.92	2.46	0.13
1111-018A	4187.0	63.69	19.38	4.49	8.61	2.87	0.96
1111-019A	4202.0	72.01	16.82	2.89	5.41	2.57	0.31
1111-020A	4219.0	30.50	13.50	19.50	25.00	11.50	0.00
1111-021A	4232.0	39.73	16.68	22.80	13.59	6.38	0.83
1111-022A	4249.0	63.95	16.07	11.57	6.00	2.41	0.00
1111-023A	4264.0	39.22	20.56	20.38	15.05	4.24	0.55

TABLE 3c

COMPOSITION (NORMALISED %) OF C_{15+} MATERIAL EXTRACTED FROM ROCK

GEOCHEM SAMPLE NUMBER	DEPTH	HYDROCARBONS		NON HYDROCARBONS			
		Paraffin – Naphthenes	Aromatics	Preciptd. Asphaltenes	Eluted NSO's	Non eluted NSO's	Sulphur
1111-025	3162-3173	87.86	6.99	0.77	2.61	1.70	0.07
1111-026	3822-3836	79.16	13.77	2.03	3.19	1.73	0.11
1111-024	3880-3890	73.49	17.49	2.32	4.59	1.81	0.30
1111-001	3960-3980	81.67	10.26	1.47	4.66	1.47	0.47
1111-002	4165-4170	77.91	16.81	1.47	2.46	1.03	0.31
1111-003	4222-4241	79.89	14.89	1.17	2.95	0.77	0.33

TABLE 4

SIGNIFICANT RATIOS (%) OF C_{15+} FRACTIONS AND ORGANIC CARBON

GEOCHEM SAMPLE NUMBER	DEPTH	ORGANIC CARBON (wt. %)	HYDROCARBONS / TOTAL EXTRACT	HYDROCARBONS / ORG. CARBON	TOTAL EXTRACT / ORG. CARBON	P-NAPHTHENES / AROMATICS
1111-004	3837.18	0.10	83.22	402.70	483.89	3.68
1111-005A	3852.00	0.09	79.87	80.75	101.10	4.80
1111-006A	3867.1	0.16	71.74	42.19	58.81	3.86
1111-007A	3881.41	0.11	84.68	259.72	306.72	4.38
1111-008A	3897.6	0.07	86.76	337.81	389.34	3.41
1111-009A	3912.1	0.12	55.81	8.54	15.30	1.47
1111-010A	3949.8	0.36	50.92	3.04	5.97	1.63
1111-011A	3964.0	0.09	81.21	81.87	100.81	5.36
1111-012A	3979.00	0.08	80.67	86.23	106.90	6.45
1111-013A	3994.0	0.16	86.19	49.88	57.87	5.79
1111-014A	4009.0	0.35	50.16	2.81	5.60	0.21
1111-015A	4146.5	0.15	76.57	25.09	32.77	3.05
1111-016A	4161.0	0.17	80.06	43.83	54.74	3.32
1111-017A	4176.0	0.10	84.65	62.03	73.27	3.95
1111-018A	4187.0	0.19	83.07	32.01	38.54	3.29
1111-019A	4202.0	0.16	88.83	113.86	128.18	4.28
1111-020A	4219.0	0.08	44.00	3.91	8.89	2.26
1111-021A	4232.0	1.03	56.41	2.88	5.11	2.38
1111-022A	4249.0	0.10	80.02	147.68	184.55	3.98
1111-023A	4264.0	0.43	59.78	9.14	15.29	1.91

TABLE 5

METHYL PHENANTHRENE INDEX

GEOCHEM SAMPLE NUMBER	DEPTH	% AREA	% HEIGHT
1111-004 CORE	3837.18-.30m	0.67	0.73
1111-005 CORE	3852.00-.10m	0.71	0.77
1111-006 CORE	3867.10-.20m	0.79	0.72
1111-007 CORE	3881.41-.51m	0.74	0.78
1111-008 CORE	3897.60-.70m	0.68	0.72
1111-009 CORE	3912.10-.20m	0.75	0.74
1111-010 CORE	3949.00-.05m	0.62	0.74
1111-011 CORE	3964.00-.05m	0.83	0.86
1111-012 CORE	3979.00-.05m	0.96	0.95
1111-013 CORE	3994.00-.07m	0.91	0.88
1111-014 CORE	4009.00-.07m	0.68	0.76
1111-015 CORE	4146.50-.54m	0.64	0.70
1111-016 CORE	4161.00-.06m	0.64	0.69
1111-017 CORE	4176.00-.05m	0.66	0.70
1111-018 CORE	4187.00-.05m	0.70	0.68
1111-019 CORE	4202.00-.06m	0.61	0.67
1111-020 CORE	4219.00-.05m	0.64	0.70
1111-021 CORE	4232.00-.05m	1.03	1.14
1111-022 CORE	4249.00-.05m	0.69	0.74

TABLE 5

METHYL PHENANTHRENE INDEX

GEOCHEM SAMPLE NUMBER	DEPTH	% AREA	% HEIGHT
1111-023 CORE	4264.00-.05m	0.64	0.66
OILS			
1111-025 DST 6	3162-3173m	0.77	0.85
1111-026 DST 5	3822-3836m	0.63	0.74
1111-024 DST 4	3880-3890m	0.74	0.73
1111-001 DST 3	3960-3980m	0.80	0.83
1111-002 DST 2	4165-4170m	0.63	0.71
1111-003 DST 1	4222-4241m	0.63	0.73

TABLE 6

CARBON ISOTOPE RESULTS

°/oo PDB

GEOCHEM SAMPLE NUMBER	DEPTH	PARAFFIN-NAPHTHENE	AROMATICS	TOTAL EXTRACT	WHOLE OIL
1111-004	3837.18-.30m CORE	-29.78	-28.58	-29.37	-
1111-005	3852.00-.10m CORE	-29.77	-28.33	-29.49	-
1111-006	3867.10-.20m CORE	-29.90	-28.06	-29.34	-
1111-007	3881.41-.51m CORE	-29.49	-28.05	-29.34	-
1111-008	3897.60-.70m CORE	-29.55	-28.15	-29.07	-
1111-009	3912.10-.20m CORE	-	-	-27.72	-
1111-010	3949.00-.05m CORE	-	-	-26.92	-
1111-011	3964.00-.05m CORE	-29.40	-27.69	-29.05	-
1111-012	3979.00-.05m CORE	-29.61	-27.78	-28.85	-
1111-013	3994.00-.07m CORE	-29.46	-27.62	-29.03	-
1111-014	4009.00-.07m CORE	-	-	-28.23	-
1111-015	4146.50-.54m CORE	-	-	-28.67	-
1111-016	4161.00-.06m CORE	-29.27	-26.82	-29.80	-
1111-017	4176.00-.05m CORE	-29.14	-27.23	-28.60	-
1111-018	4187.00-.05m CORE	-29.10	-28.18	-28.95	-
1111-019	4202.00-.06m CORE	-29.30	-27.54	-28.79	-

TABLE 6

CARBON ISOTOPE RESULTS

°/oo PDB

GEOCHEM SAMPLE NUMBER	DEPTH	PARAFFIN-NAPHTHENE	AROMATICS	TOTAL EXTRACT	WHOLE OIL
1111-020	4219.00-.05m CORE	-	-	-29.03	-
1111-021	4232.00-.05m CORE	-30.16	-27.27	-28.54	-
1111-022	4249.00-.05m CORE	-29.34	-27.26	-28.30	-
1111-023	4264.00-.05m CORE	-29.56	-27.19	-28.42	
OILS					
1111-025	3162-3173m DST 6	-29.12	-27.85	-	-29.16
1111-026	3822-3826m DST 5	-29.39	-28.01	-	-29.34
1111-024	3880-3890m DST 4	-29.47	-28.32	-28.42	-29.34
1111-001	3960-3980m DST 3	-29.39	-27.51	-	-29.05
1111-002	4165-4170m DST 2	-29.08	-26.95	-	-29.00
1111-003	4222-4241m DST 1	-29.36	-27.37	-	-28.99

TABLE 7

COMPOSITION (NORMALISED %) OF C_{15+} AROMATIC HYDROCARBONS

- PHENANTHRENE SERIES

GEOCHEM SAMPLE NUMBER	DEPTH	PHENANTHRENE (M/Z 178)	METHYL PHENANTHRENE (M/Z 192)	DIMETHYL PHENANTHRENE (M/Z 206)	TRIMETHYL PHENANTHRENE (M/Z 220)
1111-004	3837.18-.30m CORE	9.5	38.0	36.4	16.1
1111-005	3852.00-.10m CORE	9.6	37.7	37.7	15.0
1111-006	3867.10-.20m CORE	8.1	39.2	37.1	15.6
1111-007	3881.41-.51m CORE	9.9	37.2	37.1	15.8
1111-008	3897.60-.70m CORE	9.1	36.9	38.4	15.6
1111-011	3964.00-.05m CORE	10.3	37.8	38.1	13.8
1111-012	3979.00-.05m CORE	8.9	37.8	38.8	14.5
1111-013	3994.00-.07m CORE	10.2	38.4	37.8	13.6
1111-016	4161.00-.06m CORE	10.1	37.3	37.7	14.9
1111-017	4176.00-.05m CORE	9.7	36.4	38.3	15.6
1111-018	4187.00-.05m CORE	11.0	38.1	36.5	14.4
1111-019	4202.00-.06m CORE	12.0	37.8	35.7	14.5
1111-021	4232.00-.05m CORE	12.8	41.5	33.6	12.1
1111-022	4249.00-.05m CORE	11.6	39.5	35.4	13.7
1111-023	4264.00-.05m CORE	15.7	42.7	31.0	10.6

TABLE 7

COMPOSITION (NORMALISED %) OF C_{15+} AROMATIC HYDROCARBONS

- PHENANTHRENE SERIES

GEOCHEM SAMPLE NUMBER	DEPTH	PHENANTHRENE (M/Z 178)	METHYL PHENANTHRENE (M/Z 192)	DIMETHYL PHENANTHRENE (M/Z 206)	TRIMETHYL PHENANTHRENE (M/Z 220)
OILS					
1111-025	3162-3173m DST 6	14.7	33.8	35.6	15.9
1111-026	3822-3826m DST 5	17.2	36.8	32.9	13.1
1111-024	3880-3890m DST 4	15.5	40.3	32.2	12.0
1111-001	3960-3980m DST 3	19.6	39.6	31.0	9.8
1111-002	4165-4170m DST 2	22.1	38.6	29.4	9.9
1111-003	4222-4241m DST 1	20.9	39.2	29.4	10.5

TABLE 8

COMPOSITION (NORMALISED %) OF C_{15+} AROMATIC HYDROCARBONS

- DIBENZOTHIOPHENE SERIES

GEOCHEM SAMPLE NUMBER	DEPTH	DIBENZOTHIOPHENE (M/Z 184)	METHYL DIBENZOTHIOPHENE (M/Z 198)	DIMETHYL DIBENZOTHIOPHENE (M/Z 212)
1111-004	3837.18-.30m CORE	10.8	41.6	47.6
1111-005	3852.00-.10m CORE	9.2	41.0	49.8
1111-006	3867.10-.20m CORE	8.4	40.8	50.8
1111-007	3881.41-.51m CORE	10.7	41.2	48.1
1111-008	3897.60-.70m CORE	10.1	41.1	48.8
1111-011	3964.00-.05m CORE	8.6	40.5	50.9
1111-012	3979.00-.05m CORE	6.9	38.5	54.6
1111-013	3994.00-.07m CORE	6.8	40.2	53.0
1111-016	4161.00-.06m CORE	10.8	41.7	47.5
1111-017	4176.00-.05m CORE	9.2	40.0	50.8
1111-018	4187.00-.05m CORE	9.2	41.6	49.2
1111-019	4202.00-.06m CORE	8.8	40.0	51.2
1111-021	4232.00-.05m CORE	10.8	42.9	46.3
1111-022	4249.00-.05m CORE	7.9	39.1	53.0
1111-023	4264.00-.05m CORE	18.2	46.0	35.8

TABLE 8

COMPOSITION (NORMALISED %) OF C_{15+} AROMATIC HYDROCARBONS

- DIBENZOTHIOPHENE SERIES

GEOCHEM SAMPLE NUMBER	DEPTH	DIBENZOTHIOPHENE (M/Z 184)	METHYL DIBENZOTHIOPHENE (M/Z 198)	DIMETHYL DIBENZOTHIOPHENE (M/Z 212)
OILS				
1111-025	3162-3173m DST 6	11.8	38.0	50.2
1111-026	3822-3826m DST 5	1.4	50.6	48.0
1111-024	3880-3890m DST 4	12.0	42.8	45.2
1111-001	3960-3980m DST 3	11.2	43.0	45.8
1111-002	4165-4170m DST 2	16.0	42.8	41.2
1111-003	4222-4241m DST 3	13.8	42.4	43.8

TABLE 9

MOLECULAR MATURATION PARAMETERS

GEOCHEM SAMPLE NO.	DEPTH	STERANES M/Z 217 (259) $\frac{C_{29}\ 20S\ (\alpha\alpha)}{C_{29}\ 20R\ (\alpha\alpha)}$	STERANES M/Z 217 (259) $\frac{C_{29}\ 20R\ (\beta\beta)}{C_{29}\ 20R\ (\alpha\alpha)}$	STERANES M/Z 217 (259) $\frac{C_{27}\ (20S)\ Diasteranes}{C_{27}\ (20R)\ Diasteranes}$	TERPANES M/Z 191 $\frac{Tm}{Ts}$	TERPANES M/Z 191 $\frac{C_{30}\ Moretane}{C_{30}\ Hopane}$	TERPANES M/Z 191 $\frac{C_{29}\ normoretane}{C_{29}\ norhopane + C_{29}\ normoretane}$	TERPANES M/Z 191 $\frac{Bisnorhopane\ (C_{28})}{Tm + Bisnorhopane + C_{29}\ norhopane}$	TERPANES M/Z 191 $\frac{C_{31}\ (20S)}{C_{31}\ (20S) + C_{31}\ (20R)} \times 100$
1111-004	3837.18-.30m CORE	1.63	2.01	1.51	0.92	0.11	0.08	0.17	58%
1111-005	3852.00-.10m CORE	1.42	2.00	1.63	0.84	0.11	0.08	0.18	61.5%
1111-006	3867.10-.20m CORE	1.59	1.98	1.44	0.81	0.11	0.08	0.21	61.5%
1111-007	3881.41-.51m CORE	1.55	1.90	1.49	0.76	0.11	0.08	0.18	61%
1111-008	3897.60-.70m CORE	1.44	1.90	1.45	0.81	0.11	0.09	0.18	60.5%
1111-009	3912.10-.20m CORE	-	-	-	-	-	-	-	-
1111-010	3949.00-.05m CORE	-	-	-	-	-	-	-	-
1111-011	3964.00-.05m CORE	1.75	2.22	1.59	0.64	0.10	0.08	0.30	61.5%
1111-012	3979.00-.05m CORE	1.61	1.89	1.45	0.73	0.11	0.07	0.20	60%
1111-013	3994.00-.07m CORE	1.84	2.31	1.62	0.61	0.14	0.07	0.22	58%
1111-014	4009.00-.07m CORE	-	-	-	-	-	-	-	-

TABLE 9

MOLECULAR MATURATION PARAMETERS

GEOCHEM SAMPLE NO.	DEPTH	STERANES M/Z 217 (259)			TERPANES M/Z 191				
		$\frac{C_{29}\ 20S\ (\alpha\alpha)}{C_{29}\ 20R\ (\alpha\alpha)}$	$\frac{C_{29}\ 20R\ (\beta\beta)}{C_{29}\ 20R\ (\alpha\alpha)}$	$\frac{C_{27}\ (20S)\ \text{Diasteranes}}{C_{27}\ (20R)\ \text{Diasteranes}}$	$\frac{Tm}{Ts}$	$\frac{C_{30}\ \text{Moretane}}{C_{30}\ \text{Hopane}}$	$\frac{C_{29}\ \text{normoretane}}{C_{29}\ \text{norhopane} + C_{29}\ \text{normoretane}}$	$\frac{\text{Bisnorhopane } (C_{28})}{Tm + \text{Bisnorhopane} + C_{29}\ \text{norhopane}}$	$\frac{C_{31}\ (20S)}{C_{31}\ (20S) + C_{31}\ (20R)} \times 100$
1111-015	4146.50-.54m CORE	-	-	-	-	-	-	-	-
1111-016	4161.00-.06m CORE	1.60	1.80	1.46	0.61	0.11	0.07	0.21	58%
1111-017	4176.00-.05m CORE	1.78	2.11	1.55	0.60	0.11	0.09	0.21	59%
1111-018	4187.00-.05m CORE	2.05	2.44	1.45	0.56	0.11	0.06	0.20	61.5%
1111-019	4202.00-.06m CORE	1.77	2.02	1.52	0.56	0.11	0.07	0.20	62%
1111-020	4219.00-.05m CORE	-	-	-	-	-	-	-	-
1111-021	4232.00-.05m CORE	1.00	3.20	1.55	1.87	0.10	0.14	0.20	60%
1111-022	4249.00-.05m CORE	1.50	1.82	1.40	0.68	0.14	0.10	0.23	59.5%
1111-023	4264.00-.05m CORE	1.66	3.46	-	1.39	0.10	0.13	0.21	59%

TABLE 9

MOLECULAR MATURATION PARAMETERS

GEOCHEM SAMPLE NO.	DEPTH	STERANES M/Z 217 (259)			TERPANES M/Z 191				
		$\frac{C_{29}\ 20S\ (\alpha\alpha)}{C_{29}\ 20R\ (\alpha\alpha)}$	$\frac{C_{29}\ 20R\ (\beta\beta)}{C_{29}\ 20R\ (\alpha\alpha)}$	$\frac{C_{27}\ (20S)\ \text{Diasteranes}}{C_{27}\ (20R)\ \text{Diasteranes}}$	$\frac{Tm}{Ts}$	$\frac{C_{30}\ \text{Moretane}}{C_{30}\ \text{Hopane}}$	$\frac{C_{29}\ \text{normoretane}}{C_{29}\ \text{norhopane} + C_{29}\ \text{normoretane}}$	$\frac{\text{Bisnorhopane } (C_{28})}{Tm + \text{Bisnorhopane} + C_{29}\ \text{norhopane}}$	$\frac{C_{31}\ (20S)}{C_{31}\ (20S) + C_{31}\ (20R)} \times 100$
OILS									
1111-025	3162-3173m DST 6	1.28	1.56	1.47	1.20	0.11	0.08	0.11	60%
1111-026	3822-3836m DST 5	1.15	1.52	1.51	1.34	0.10	0.07	0.09	59%
1111-024	3880-3890m DST 4	1.64	2.08	1.46	0.81	0.10	0.08	0.18	61.5%
1111-001	3960-3980m DST 3	1.24	1.65	1.44	1.28	0.09	0.06	0.10	59.5%
1111-002	4165-4170m DST 2	1.33	1.73	1.42	1.06	0.09	0.07	0.10	59%
1111-003	4222-4241m DST 1	1.24	1.56	1.40	1.40	0.09	0.08	0.08	58%

TABLE 10

COMPOSITION (NORMALISED %) OF C_{15+} PARAFFIN – NAPHTHENE HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-004	-005	-006	-007	-008	-009	-010
DEPTH	3837.18-3837.30m	3852.00-3852.10m	3876.10-3867.20m	3881.41-3881.51m	3897.60-3897.70m	3912.10-3912.20m	3949.00-3949.05m
SAMPLE TYPE							
nC_{15}	5.20	5.54	5.39	6.61	5.59	1.54	6.94
nC_{16}	9.18	7.18	8.44	7.77	6.69	4.02	9.12
nC_{17}	7.58	9.16	9.16	8.37	7.42	9.56	9.31
nC_{18}	7.81	9.04	9.77	8.08	7.01	7.98	9.62
nC_{19}	8.38	10.10	11.28	9.07	7.69	5.36	10.18
nC_{20}	7.02	9.24	8.60	7.99	7.01	9.49	7.21
nC_{21}	5.74	7.58	7.37	6.72	6.74	7.51	5.99
nC_{22}	6.33	6.90	7.66	5.92	6.22	6.56	6.02
nC_{23}	5.32	5.42	6.24	5.81	5.23	6.82	3.78
nC_{24}	5.69	5.44	6.55	5.23	6.01	5.78	4.59
nC_{25}	5.16	5.24	5.54	5.60	5.55	5.87	4.24
nC_{26}	4.32	3.89	4.33	4.06	4.21	4.18	3.65
nC_{27}	3.51	2.53	2.07	3.28	3.74	4.10	2.86
nC_{28}	3.47	2.67	1.37	3.32	3.62	3.68	3.06
nC_{29}	2.96	2.01	1.49	2.56	3.16	3.69	2.55
nC_{30}	2.62	1.62	1.79	2.04	2.68	3.35	2.13
nC_{31}	2.76	1.44	1.33	1.73	2.56	2.60	2.16
nC_{32}	1.59	1.19	0.51	1.34	2.11	2.28	1.60
nC_{33}	1.91	1.28	0.51	1.57	2.23	1.79	1.69
nC_{34}	1.99	1.43	0.39	1.60	2.54	1.82	1.93
nC_{35}	1.44	1.09	0.21	1.33	1.98	2.01	1.36
PARAFFIN	22.42	25.34	23.77	22.28	24.43	27.30	15.23
ISOPRENOID	2.54	3.95	3.55	3.02	2.61	3.76	2.29
NAPHTHENE	75.04	70.70	72.68	74.70	72.96	68.95	82.47
CPI INDEX A	0.92	0.96	0.92	1.04	0.98	1.07	0.88
CPI INDEX B	1.05	1.01	1.02	1.06	1.05	1.08	1.01
PRISTANE/PHYTANE	1.22	1.42	1.30	1.34	1.38	0.72	1.28
PRISTANE/nC_{17}	0.82	1.00	0.92	0.93	0.84	0.60	0.91

TABLE 10

COMPOSITION (NORMALISED %) OF C_{15+} PARAFFIN – NAPHTHENE HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-011	-012	-013	-014	-015	-016	-017
DEPTH	3964.00-3964.05m	3979.00-3979.05m	3994.00-3994.07m	4009.00-4009.07m	4146.50-4146.54m	4161.00-4161.06m	4176.00-4176.05m
SAMPLE TYPE							
nC_{15}	5.35	4.64	6.22	0.52	3.65	4.72	2.99
nC_{16}	7.62	6.42	8.39	1.12	5.43	6.19	4.96
nC_{17}	7.80	7.67	8.50	3.41	6.51	7.07	6.33
nC_{18}	9.15	8.28	8.54	6.05	7.43	7.80	7.16
nC_{19}	9.49	9.42	9.08	8.25	8.47	8.73	9.17
nC_{20}	7.48	8.34	7.51	8.01	7.36	8.07	8.35
nC_{21}	6.31	7.33	6.16	6.35	7.37	6.82	7.18
nC_{22}	6.56	6.65	6.45	6.70	7.29	6.94	7.75
nC_{23}	5.89	5.72	5.87	5.45	6.65	6.37	7.09
nC_{24}	5.25	6.48	5.64	6.33	6.48	6.51	6.70
nC_{25}	5.12	5.73	4.80	6.36	5.82	5.70	6.11
nC_{26}	4.41	4.18	3.35	6.41	5.07	4.80	4.79
nC_{27}	3.75	3.29	2.96	5.51	4.03	4.16	3.89
nC_{28}	3.32	3.19	3.08	5.77	3.67	3.45	3.74
nC_{29}	2.67	2.66	2.71	5.99	3.16	2.98	3.11
nC_{30}	2.06	2.12	2.19	5.08	2.47	2.25	2.49
nC_{31}	1.74	1.80	2.42	4.40	2.23	1.91	1.88
nC_{32}	1.53	1.37	1.72	2.90	1.58	1.40	1.58
nC_{33}	1.64	1.62	1.64	2.40	1.89	1.34	1.53
nC_{34}	1.72	1.79	1.63	1.91	1.97	1.56	1.72
nC_{35}	1.17	1.32	1.14	1.09	1.45	1.24	1.48
PARAFFIN	22.45	26.08	26.31	25.94	27.70	27.28	35.29
ISOPRENOID	2.63	2.91	2.83	1.16	2.46	2.96	3.59
NAPHTHENE	74.91	71.01	70.86	72.90	69.84	69.75	61.12
CPI INDEX A	0.98	0.97	0.96	0.90	0.99	0.97	0.97
CPI INDEX B	1.03	1.04	1.07	1.02	1.03	1.05	1.02
PRISTANE/PHYTANE	1.27	1.24	1.40	0.73	1.22	1.21	1.05
PRISTANE/nC_{17}	0.84	0.80	0.74	0.55	0.75	0.84	0.82

Phyt / 18 0.41 0.60

TABLE 10

COMPOSITION (NORMALISED %) OF C_{15+} PARAFFIN – NAPHTHENE HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-018	-019	-020	-021	-022	-023
DEPTH	4187.00-4187.05m	4202.00-4202.06m	4219.00-4219.05m	4232.00-4232.05m	4249.00-4249.05m	4264.00-4264.05m
SAMPLE TYPE						
nC_{15}	5.18	6.37	2.58	4.37	3.41	5.61
nC_{16}	6.52	7.62	5.59	5.92	5.32	6.90
nC_{17}	15.33	8.19	8.50	7.11	6.38	8.64
nC_{18}	7.85	8.14	7.10	7.95	7.08	8.96
nC_{19}	8.32	9.74	8.67	8.79	7.53	9.71
nC_{20}	7.91	8.20	7.16	8.50	7.58	8.80
nC_{21}	6.45	6.87	5.91	8.59	6.86	8.68
nC_{22}	6.25	6.66	6.20	7.93	6.66	7.24
nC_{23}	5.46	5.62	5.55	7.05	6.67	6.67
nC_{24}	5.10	5.99	5.43	5.97	5.39	5.72
nC_{25}	4.50	4.80	5.19	5.71	5.12	5.20
nC_{26}	4.25	4.16	5.32	4.17	5.60	3.64
nC_{27}	3.02	3.10	4.11	3.94	4.76	3.23
nC_{28}	2.66	3.31	5.03	2.89	3.88	2.44
nC_{29}	2.39	2.62	4.21	2.53	4.84	2.13
nC_{30}	1.89	2.01	3.27	1.92	2.89	1.66
nC_{31}	1.96	1.44	2.76	1.81	2.13	1.42
nC_{32}	1.35	1.38	1.99	1.57	1.56	1.19
nC_{33}	1.19	1.01	2.01	1.51	2.02	1.05
nC_{34}	1.41	1.57	1.91	0.93	2.42	0.70
nC_{35}	1.01	1.20	1.51	0.83	1.89	0.58
PARAFFIN	28.08	30.65	45.43	38.99	25.80	34.70
ISOPRENOID	2.99	3.69	4.52	0.76	2.75	1.47
NAPHTHENE	68.93	65.65	50.05	60.25	71.45	63.83
CPI INDEX A	0.95	0.91	0.90	1.08	1.01	1.09
CPI INDEX B	1.01	0.94	0.95	1.13	1.08	1.12
PRISTANE/PHYTANE	1.18	1.09	1.31	1.71	1.29	1.81
PRISTANE/nC_{17}	0.38	0.77	0.66	0.17	0.94	0.32

Q2/18 0,62 0,54

TABLE 10

COMPOSITION (NORMALISED %) OF C_{15+} PARAFFIN – NAPHTHENE HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-025	-026	-024	-001	-002	-003
DEPTH	3162-3173m	3822-3836m	3880-3890m	3960-3980m	4165-4170m	4222-4241m
SAMPLE TYPE	DST 6	DST 5	DST 4	DST 3	DST 2	DST 1
nC_{15}	11.34	9.92	8.79	13.76	10.79	11.70
nC_{16}	11.07	9.74	9.81	13.11	10.10	9.88
nC_{17}	10.15	8.58	9.43	11.51	9.38	9.52
nC_{18}	8.91	8.42	8.60	9.36	7.99	7.93
nC_{19}	8.99	8.56	9.07	9.19	8.63	6.44
nC_{20}	7.55	6.69	8.14	7.24	7.86	5.17
nC_{21}	6.13	5.98	5.76	5.93	6.07	5.51
nC_{22}	5.89	5.72	5.64	5.52	6.23	5.10
nC_{23}	5.01	4.59	4.76	4.30	5.32	4.30
nC_{24}	4.78	4.53	5.15	3.66	4.98	3.70
nC_{25}	4.56	4.21	4.21	2.83	4.38	4.39
nC_{26}	3.41	3.10	3.58	2.56	4.09	3.59
nC_{27}	2.47	2.64	2.76	2.26	3.01	3.86
nC_{28}	2.15	2.76	2.56	2.80	3.07	3.42
nC_{29}	1.72	2.77	2.19	1.48	2.14	2.71
nC_{30}	1.37	2.46	1.91	1.03	1.40	2.11
nC_{31}	0.96	2.06	2.08	0.69	1.04	2.18
nC_{32}	0.86	1.58	1.25	0.58	0.86	2.11
nC_{33}	0.92	2.00	1.47	0.77	0.85	2.07
nC_{34}	1.06	2.09	1.54	0.76	0.98	2.21
nC_{35}	0.73	1.59	1.28	0.68	0.83	2.11
PARAFFIN	25.17	24.95	23.66	27.62	31.54	28.33
ISOPRENOID	2.99	3.27	3.14	3.81	3.76	4.13
NAPHTHENE	71.83	71.78	73.20	68.56	64.70	67.54
CPI INDEX A	0.98	0.98	0.91	0.93	0.92	1.09
CPI INDEX B	1.04	1.04	1.03	0.88	0.95	1.10
PRISTANE/PHYTANE	1.54	1.29	1.29	1.87	1.54	0.70
PRISTANE/nC_{17}	0.71	0.86	0.79	0.78	0.77	0.63
Ph/18	0,49	0,71	0,58	0,40	0,54	0,47

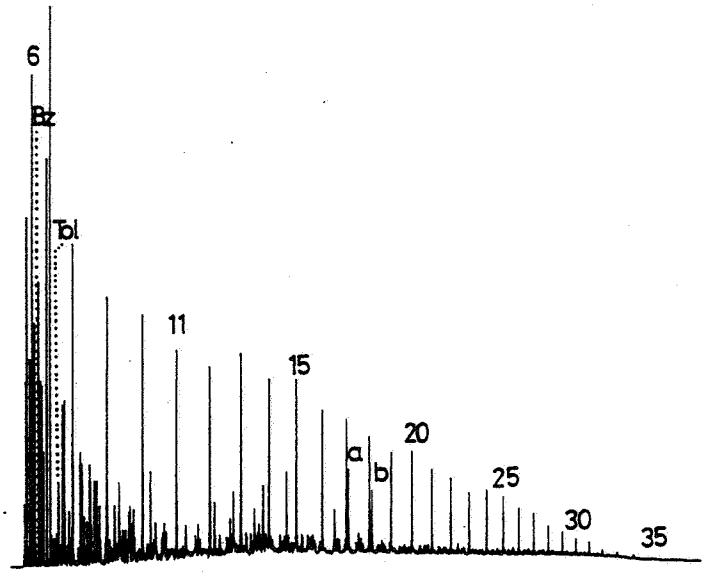
TABLE 11

API GRAVITIES*

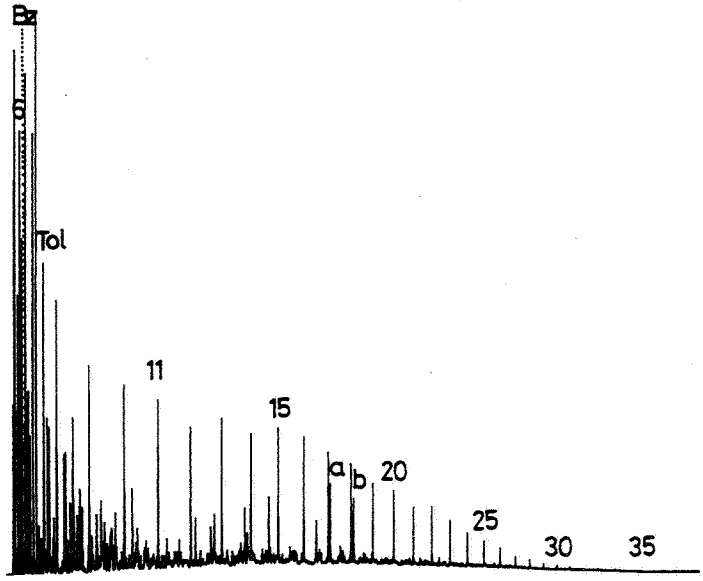
GEOCHEM SAMPLE NUMBER	DST	DEPTH (METRES)	API GRAVITY (°API)
1111-025	6	3162-3173	42
1111-026	5	3822-3836	40
1111-024	4	3880-3890	42
1111-001	3	3960-3980	44
1111-002	2	4165-4170	39.5
1111-003	1	4222-4241	42

* Small samples - calculated from refractive indices 25°C

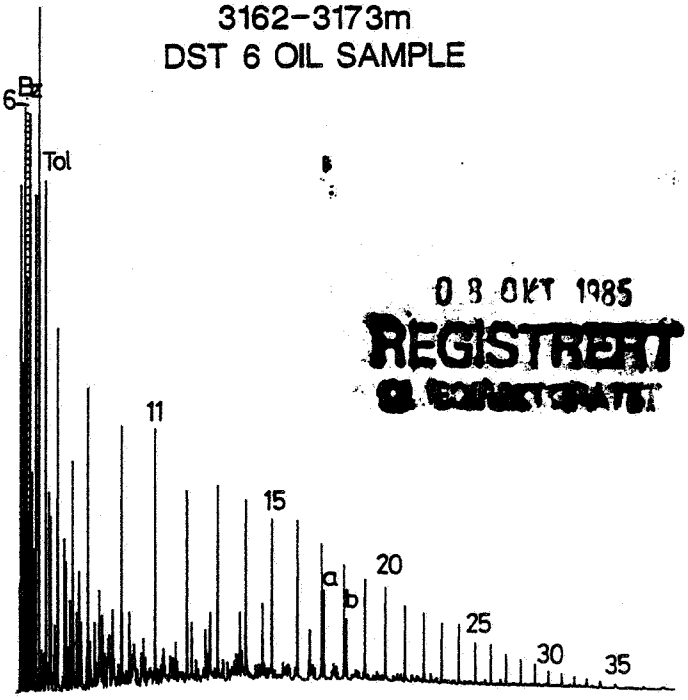
FIGURE 1 **WHOLE OILS** WELL 6506/12-3



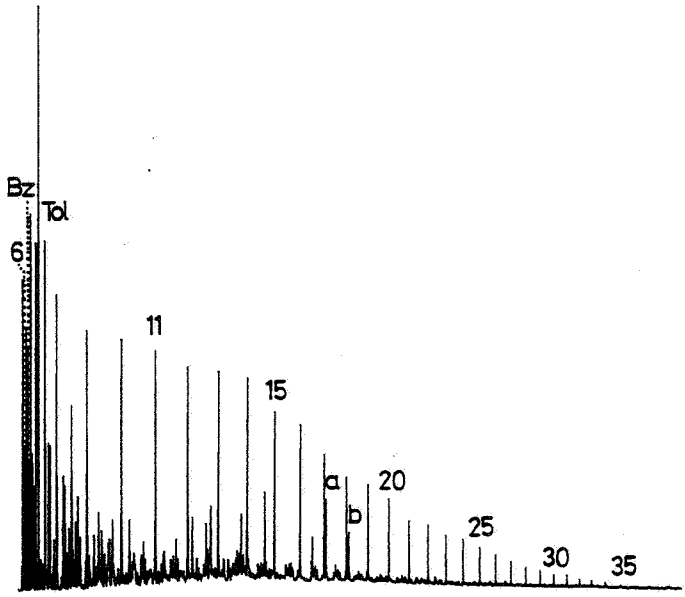
3162–3173m
DST 6 OIL SAMPLE



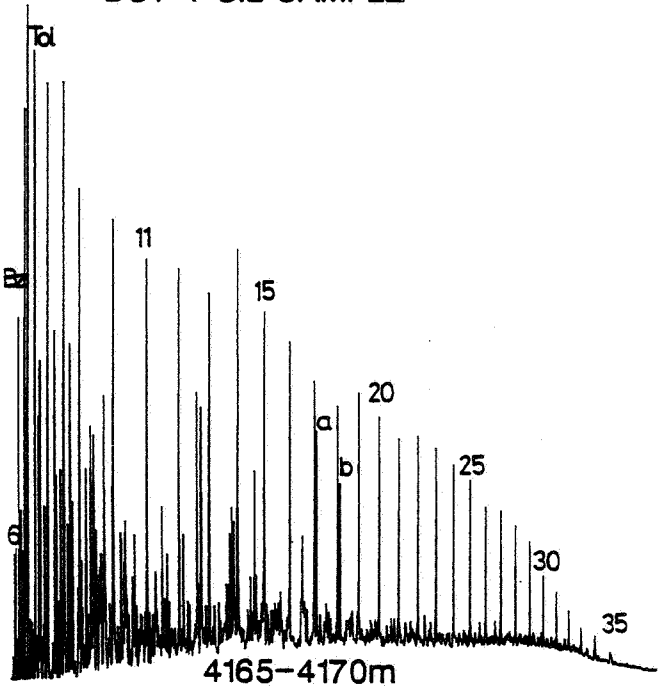
3822–3836m
DST 5 OIL SAMPLE



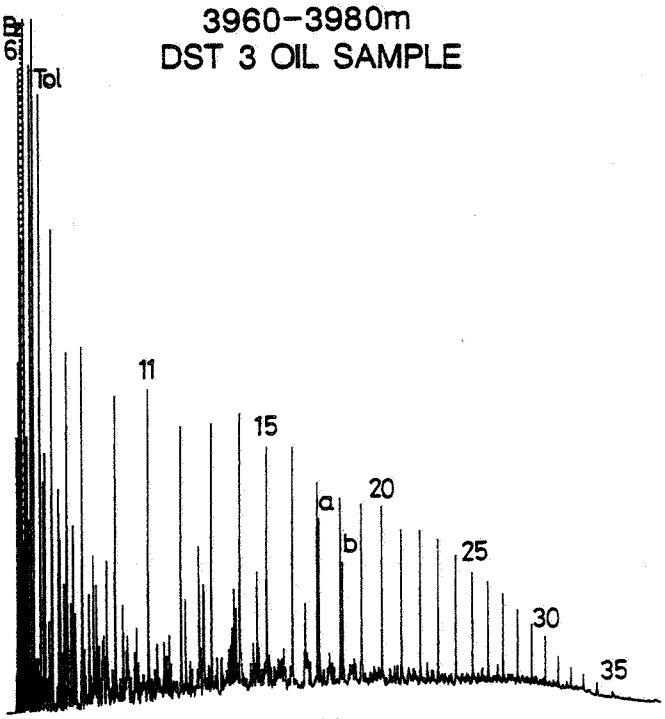
3880–3890m
DST 4 OIL SAMPLE



3960–3980m
DST 3 OIL SAMPLE

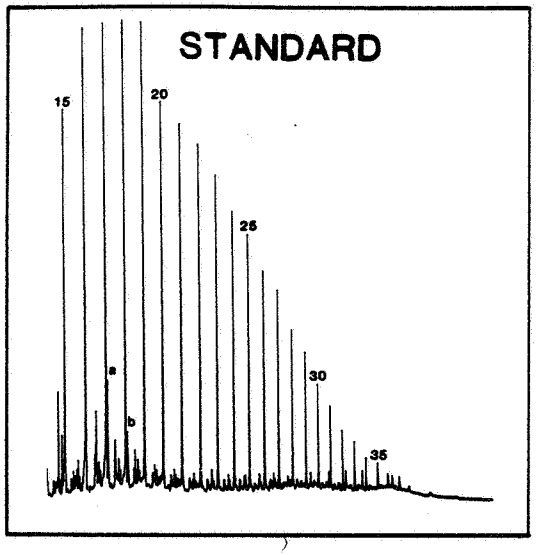


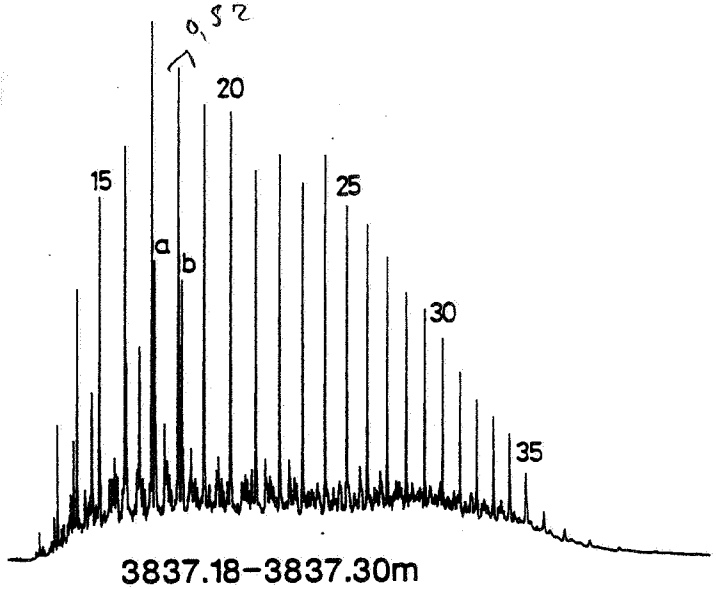
4165–4170m
DST 2 OIL SAMPLE



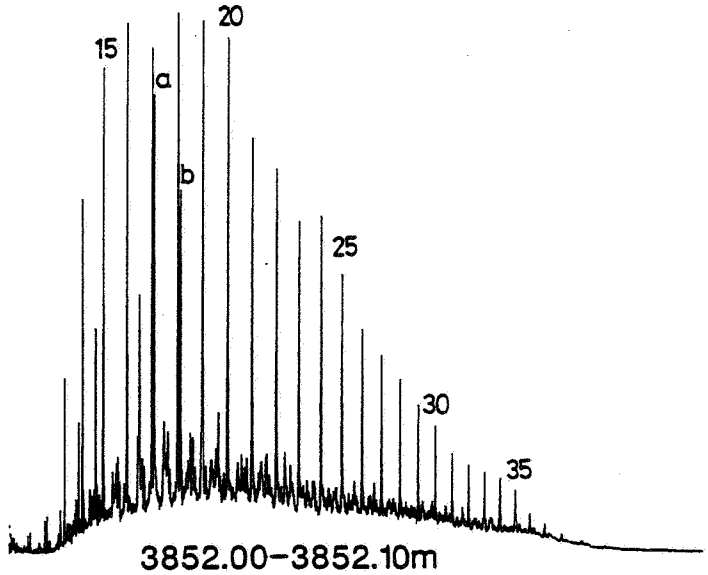
4222–4241m
DST 1 OIL SAMPLE

FIGURE 2a C_{15+} PARAFFIN - NAPHTHENES WELL 6506/12-3

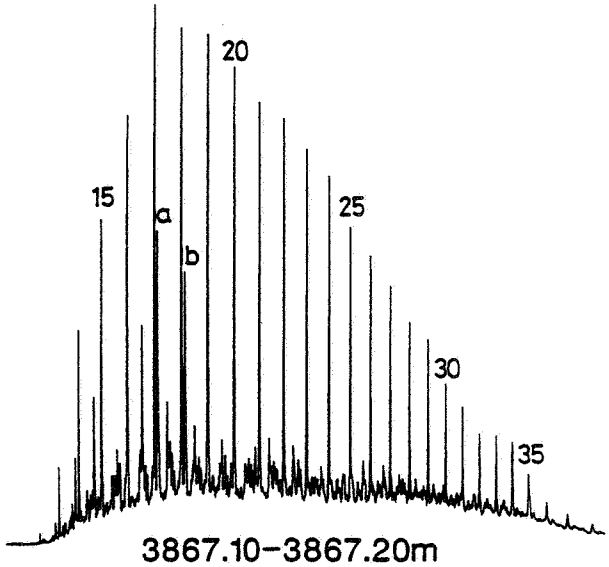




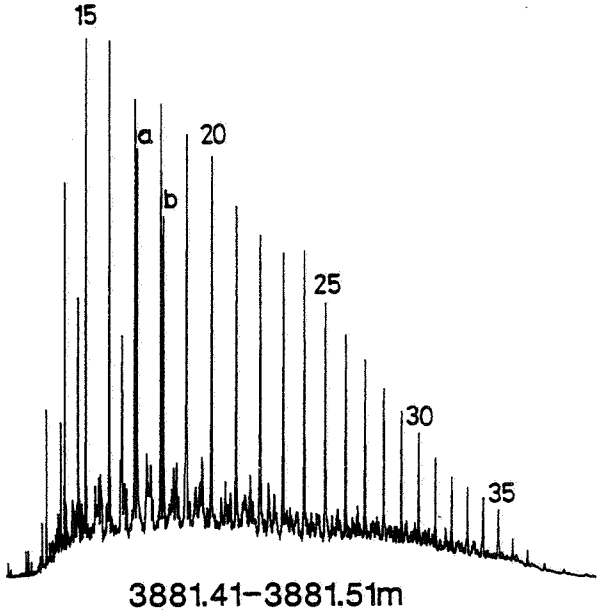
3837.18-3837.30m
CORE



3852.00-3852.10m
CORE



3867.10-3867.20m
CORE

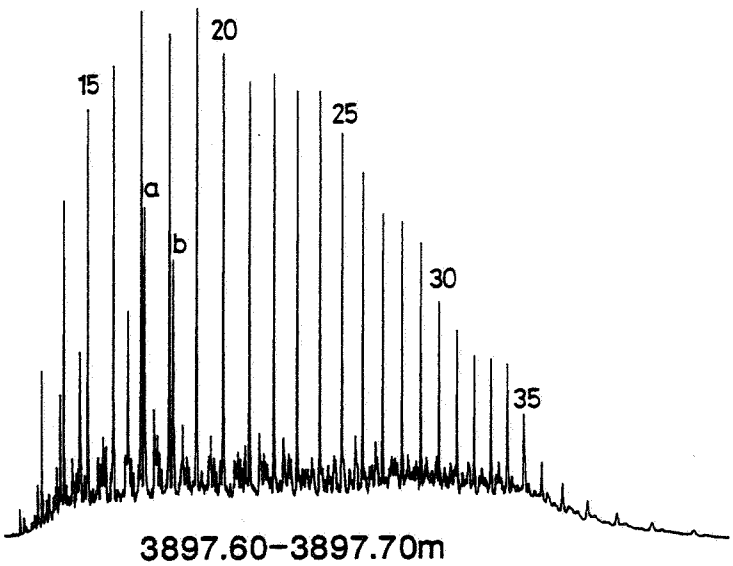


3881.41-3881.51m
CORE

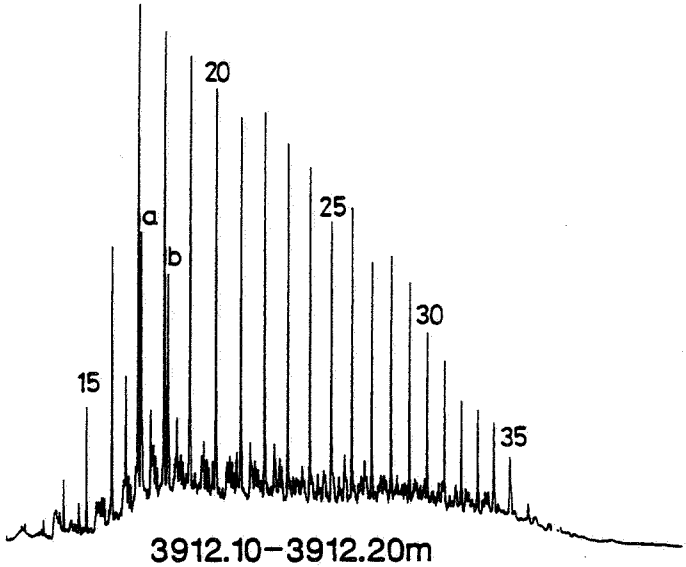
a - PRISTANE
b - PHYTANE

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

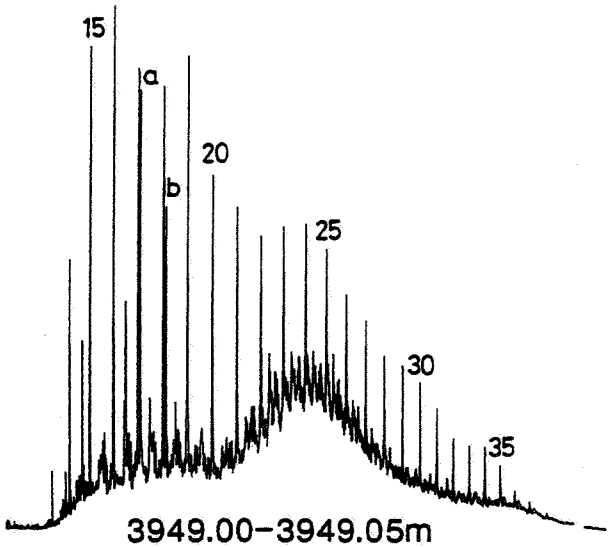
FIGURE 2b C_{15+} PARAFFIN-NAPHTHENES WELL 6506/12-3



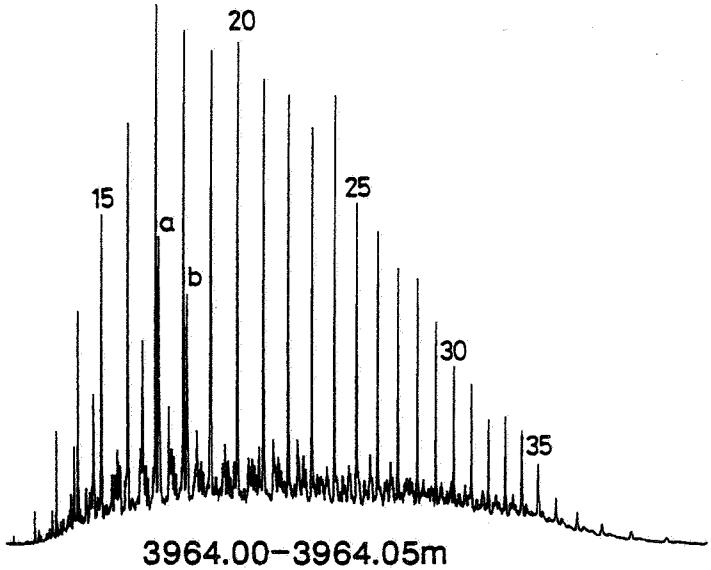
3897.60-3897.70m
CORE



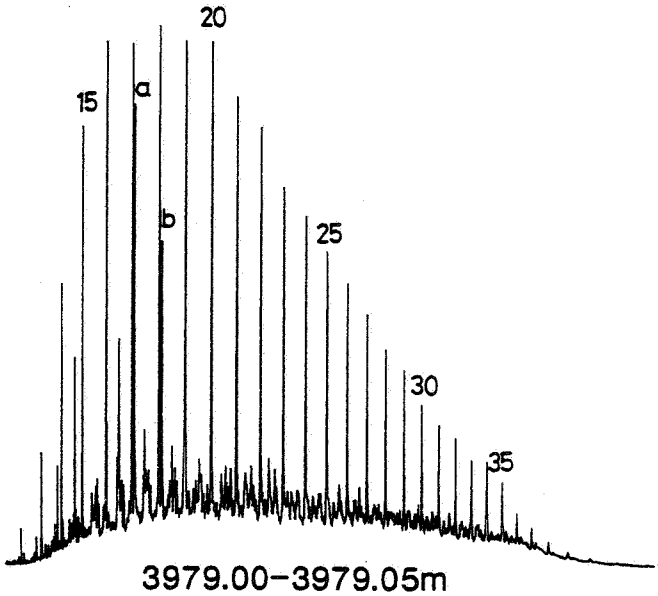
3912.10-3912.20m
CORE



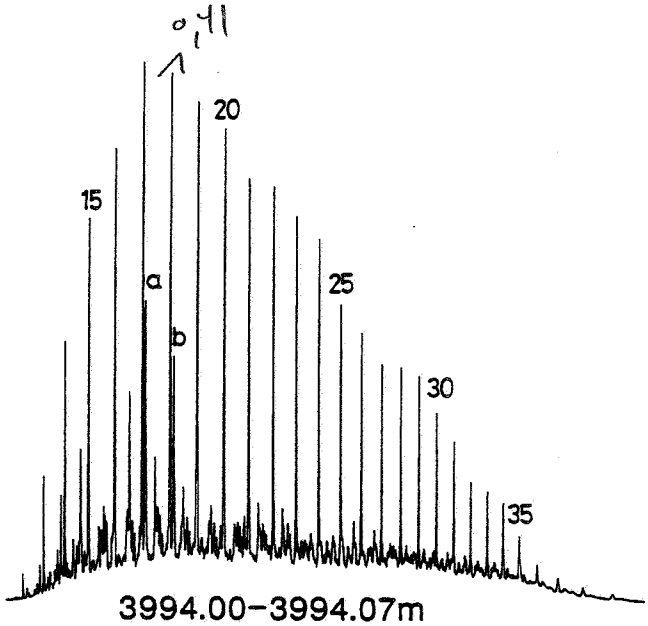
3949.00-3949.05m
CORE



3964.00-3964.05m
CORE



3979.00-3979.05m
CORE

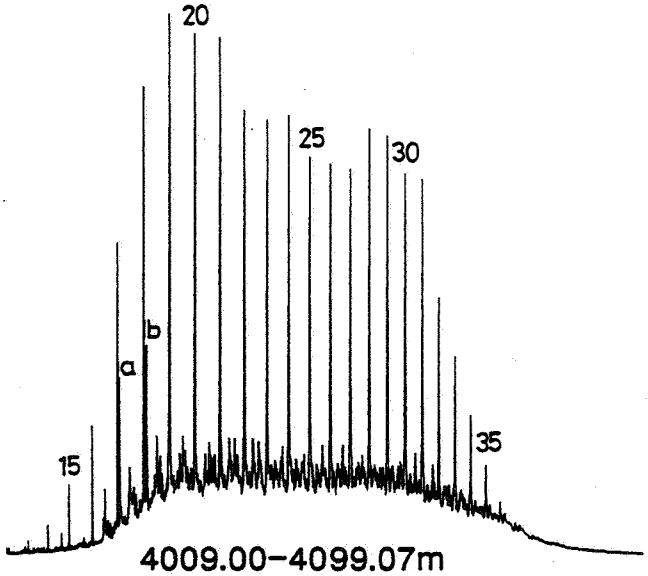


3994.00-3994.07m
CORE

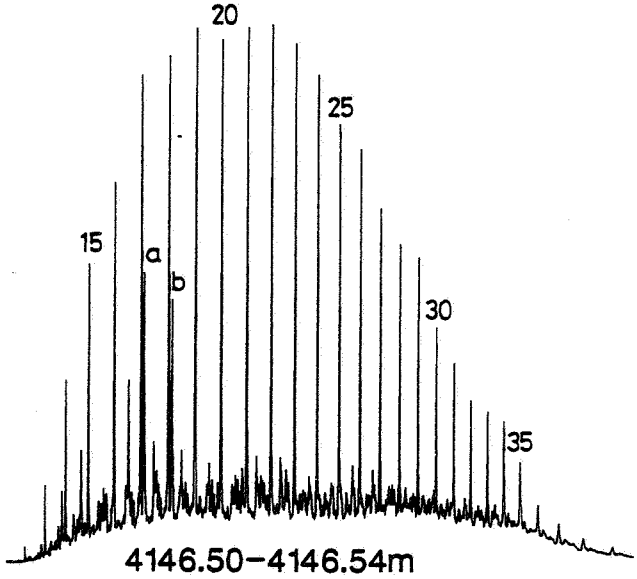
a - PRISTANE
b - PHYTANE

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

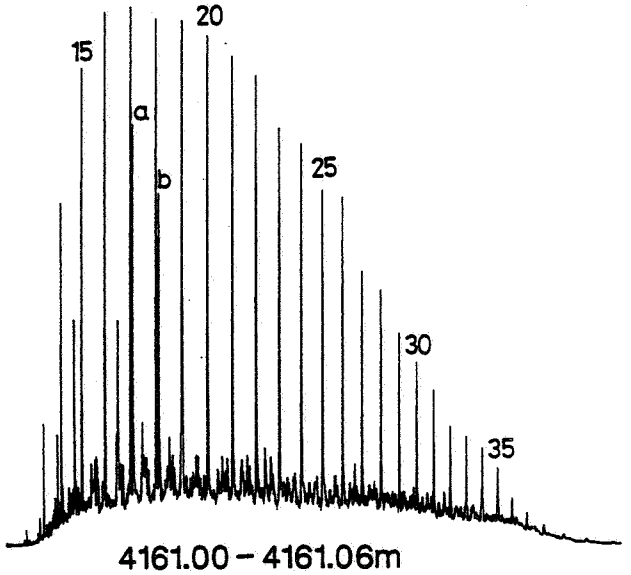
FIGURE 2c C_{15+} PARAFFIN - NAPHTHENES WELL 6506/12-3



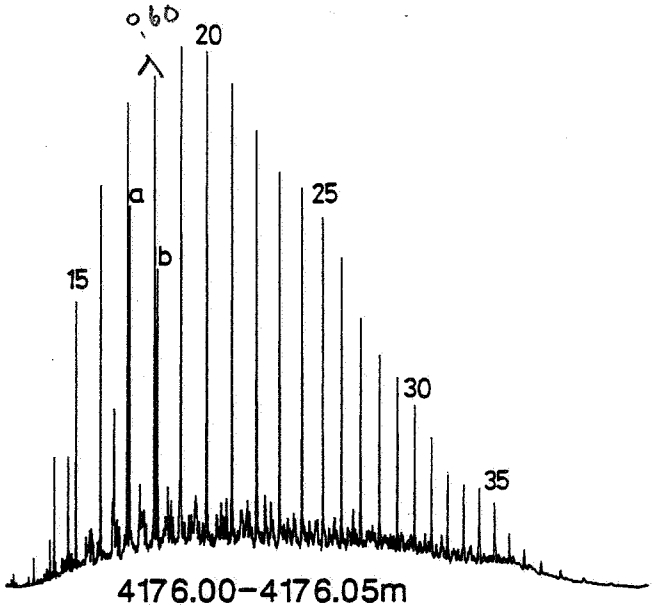
4009.00-4099.07m
CORE



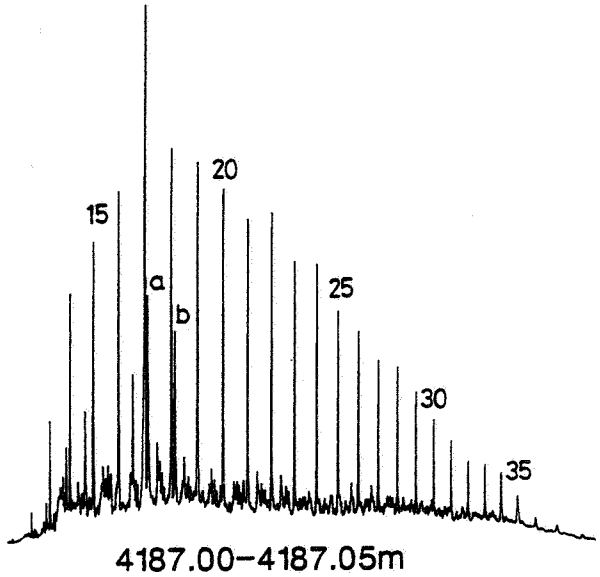
4146.50-4146.54m
CORE



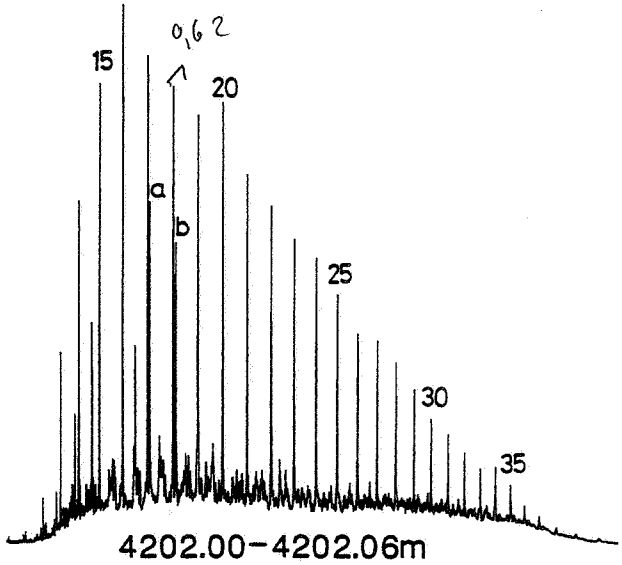
4161.00 - 4161.06m
CORE



4176.00-4176.05m
CORE



4187.00-4187.05m
CORE

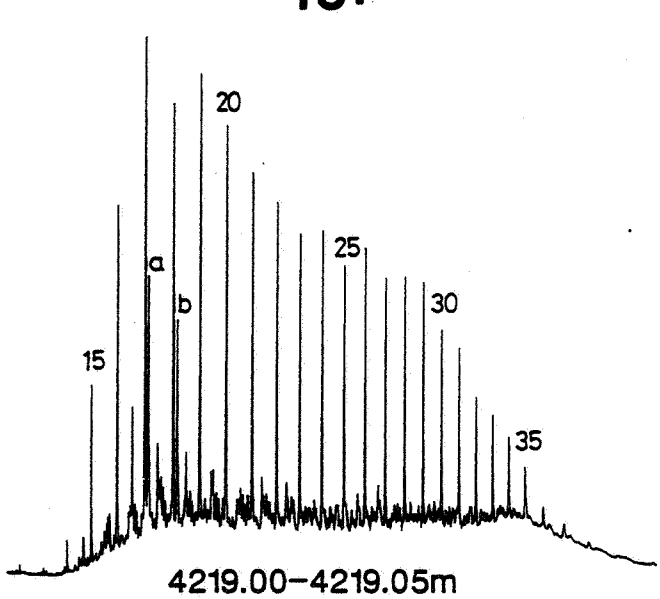


4202.00-4202.06m
CORE

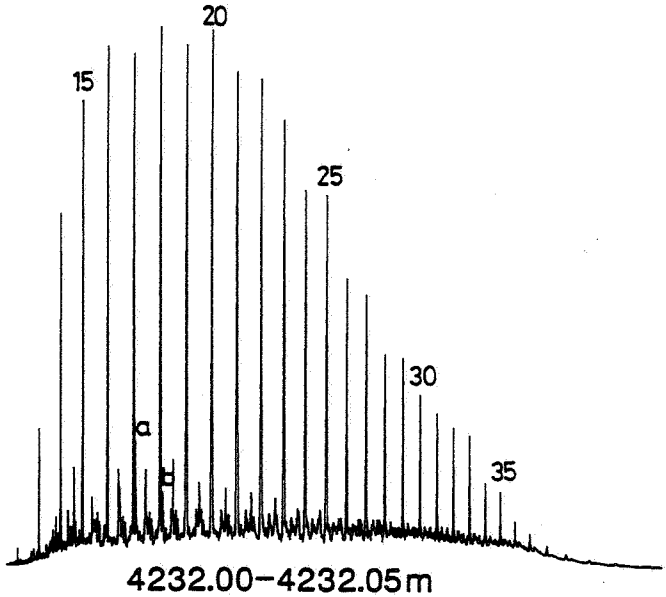
a - PRISTANE
b - PHYTANE

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

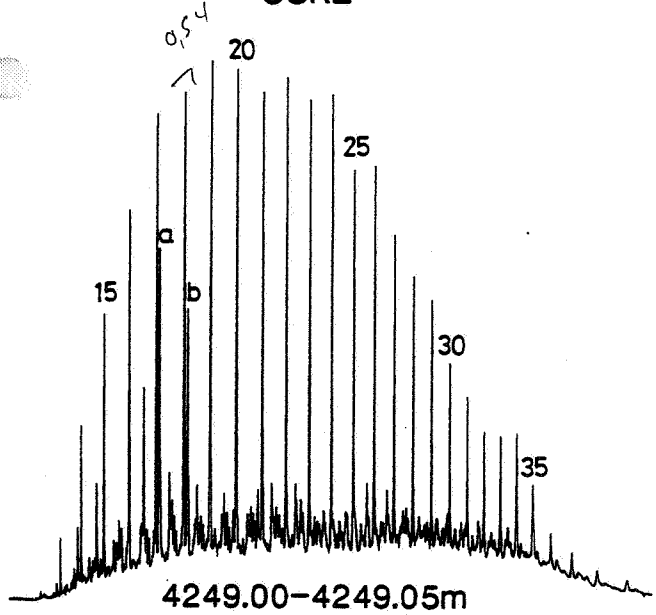
FIGURE 2d C_{15+} PARAFFIN-NAPHTHENES WELL 6506/12-3



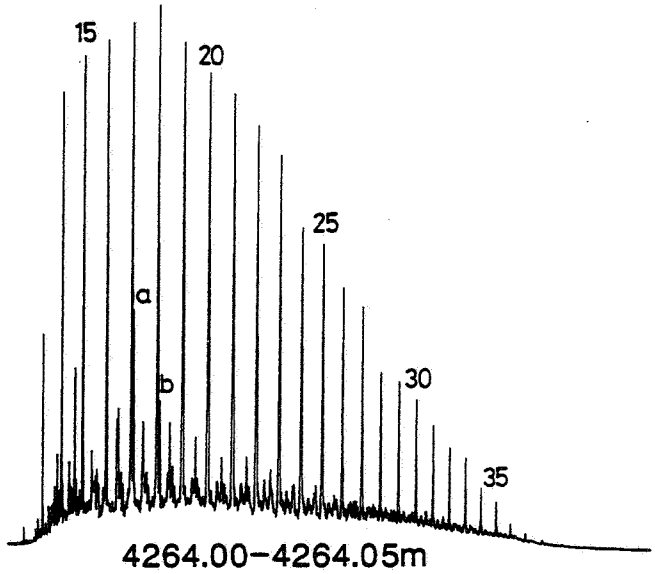
4219.00–4219.05m
CORE



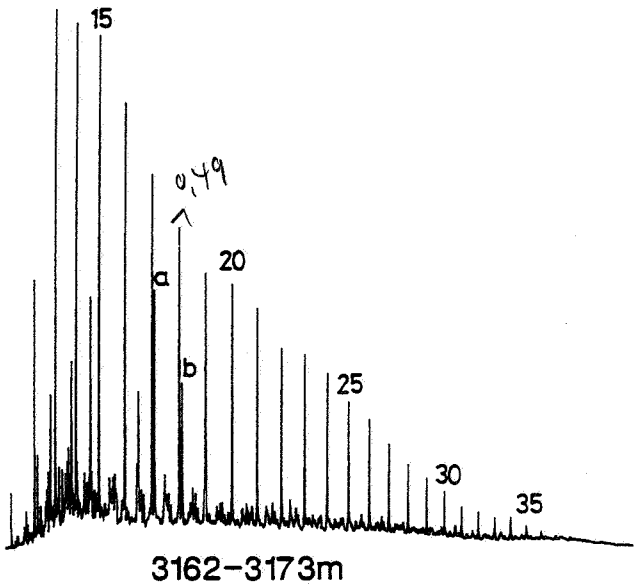
4232.00–4232.05m
CORE



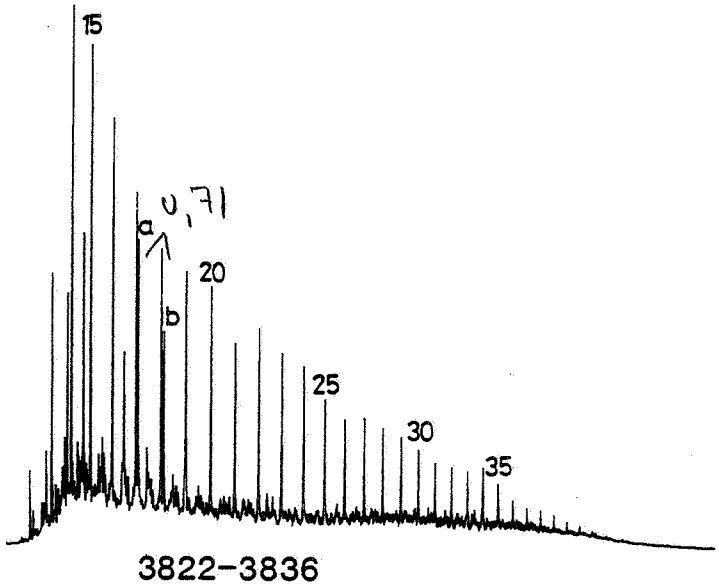
4249.00–4249.05m
CORE



4264.00–4264.05m
CORE



3162–3173m
DST 6 OIL SAMPLE

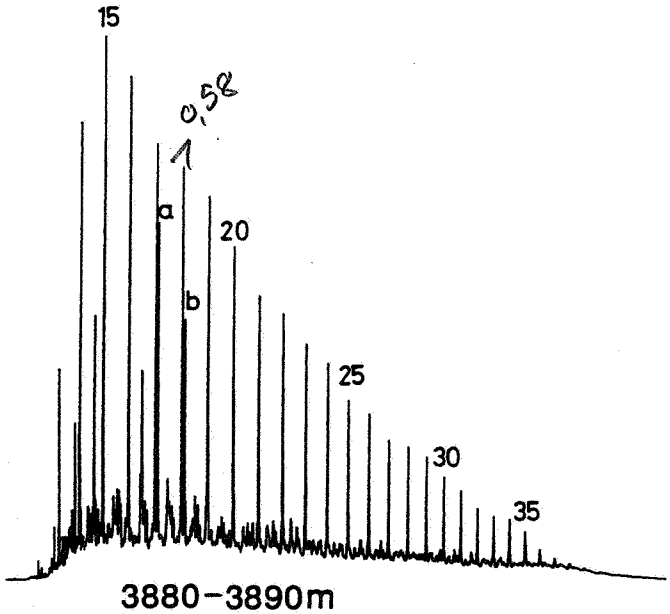


3822–3836
DST 5 OIL SAMPLE

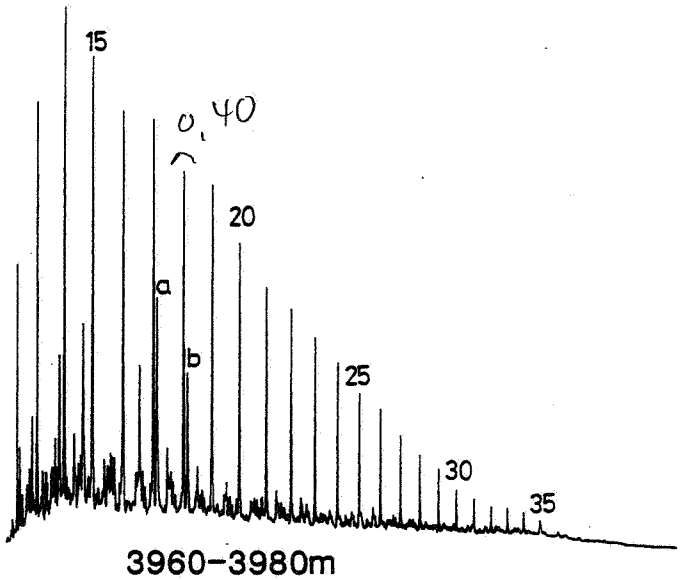
a – PRISTANE
b – PHYTANE

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

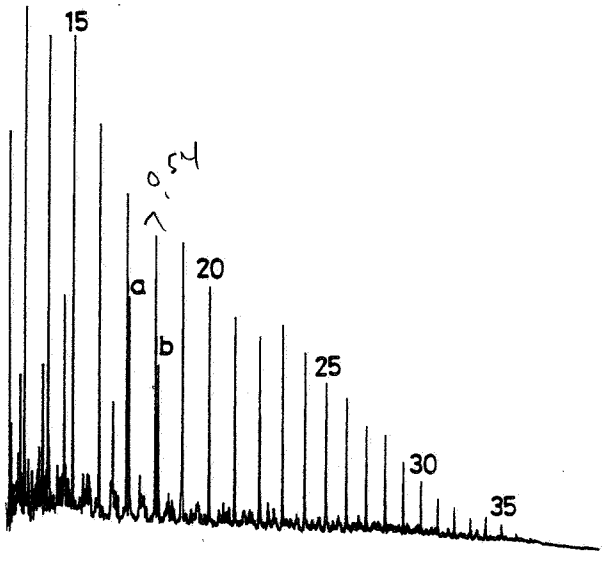
FIGURE 2e C_{15+} PARAFFIN - NAPHTHENES WELL 6506/12-3



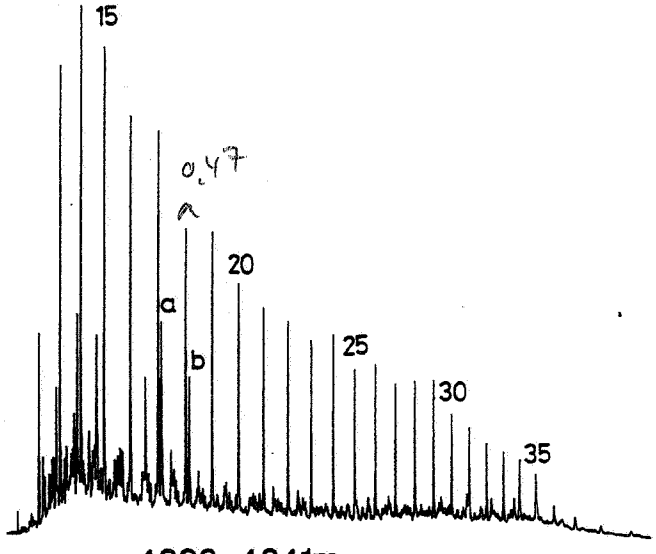
3880–3890m
DST 4 OIL SAMPLE



3960–3980m
DST 3 OIL SAMPLE



4165–4170m
DST 2 OIL SAMPLE

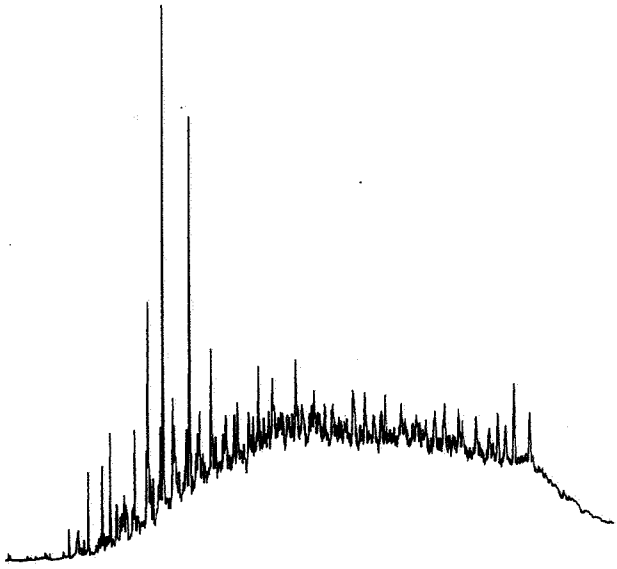


4222–4241m
DST 1 OIL SAMPLE

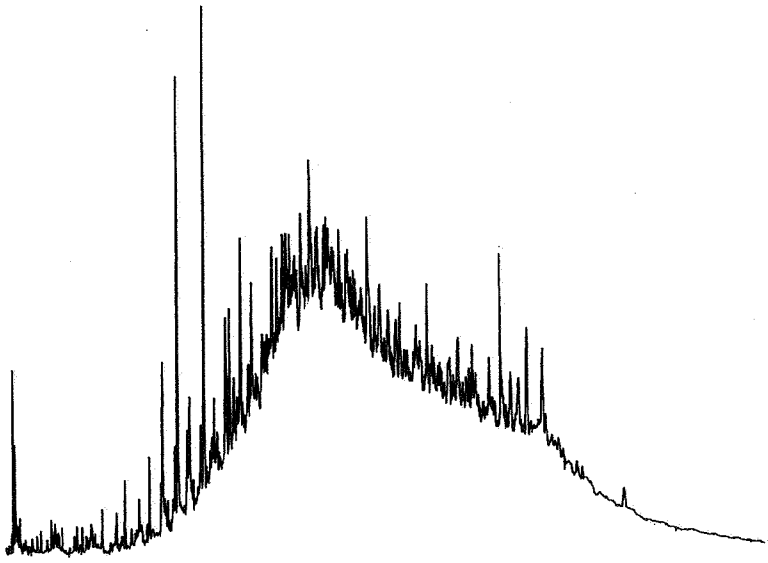
a – PRISTANE
b – PHYTANE

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

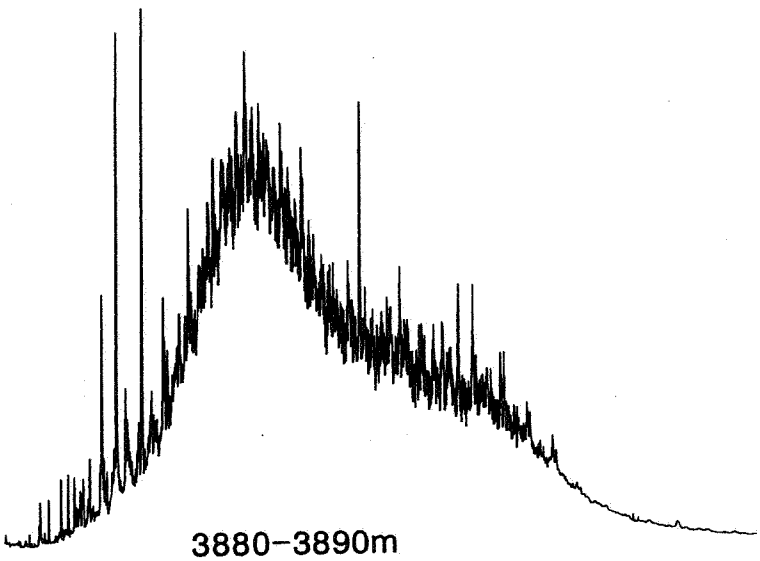
FIGURE 3 **BRANCHED CYCLICS** WELL 6506/12-3



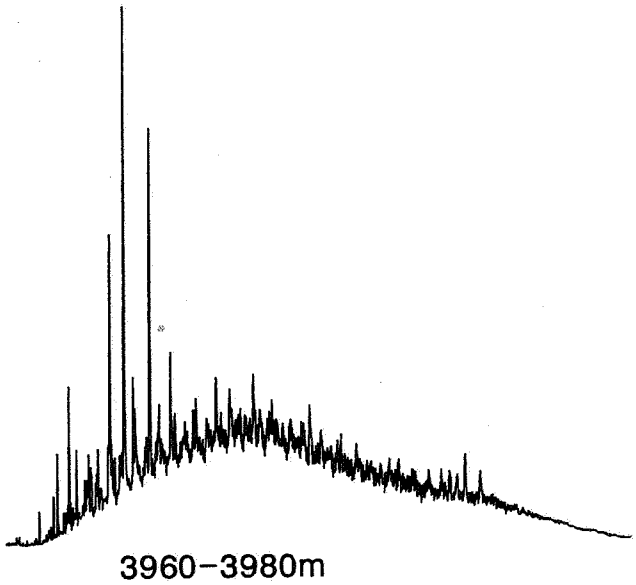
3162–3173m
DST 6 OIL SAMPLE



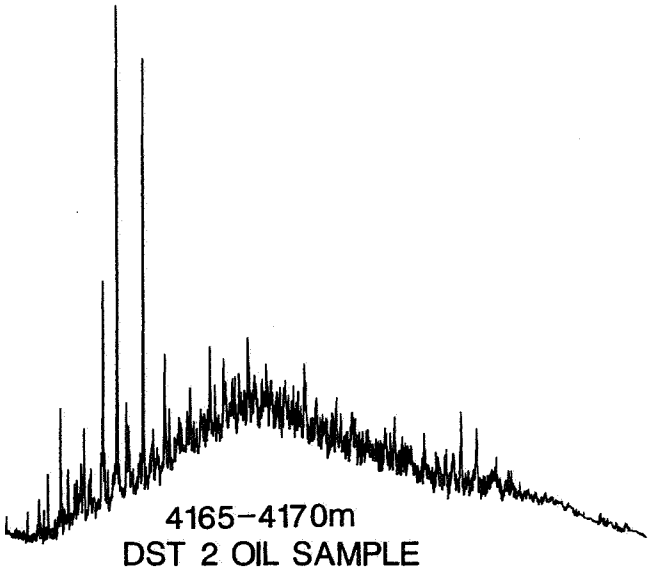
3822–3836m
DST 5 OIL SAMPLE



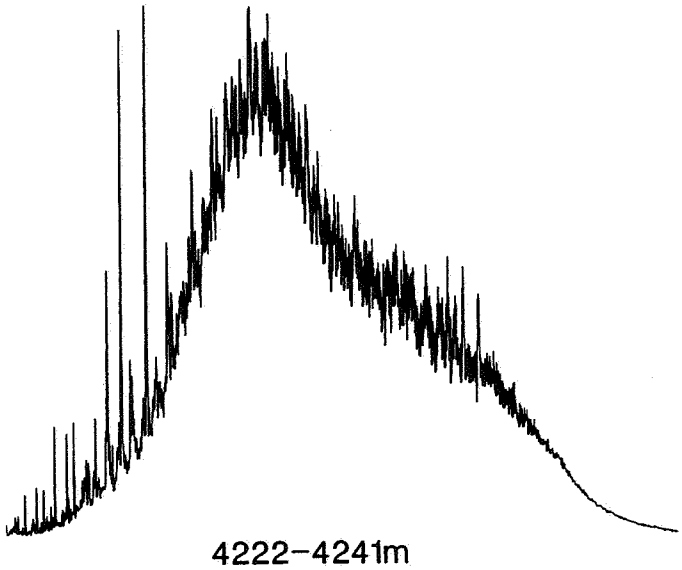
3880–3890m
DST 4 OIL SAMPLE



3960–3980m
DST 3 OIL SAMPLE

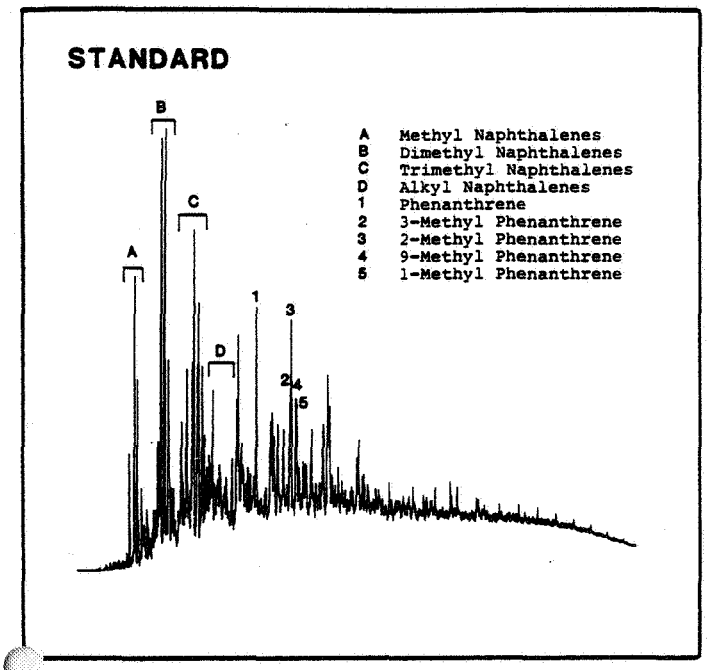


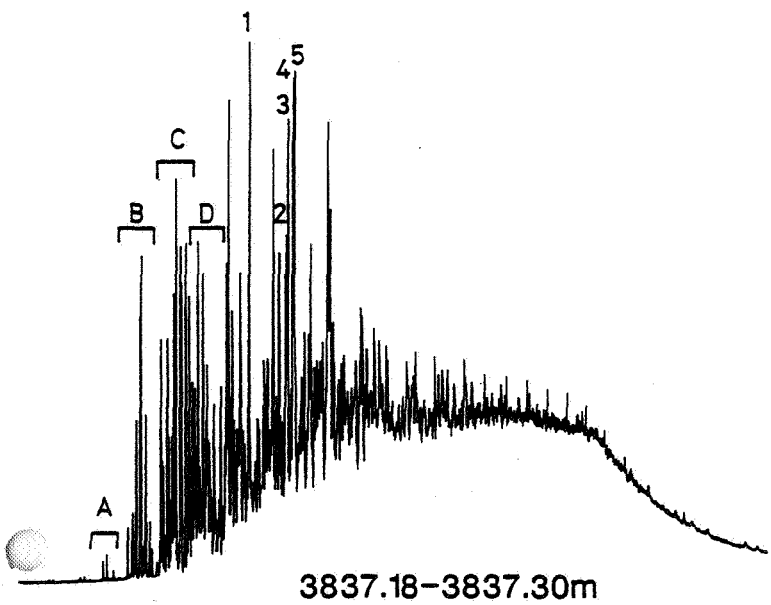
4165–4170m
DST 2 OIL SAMPLE



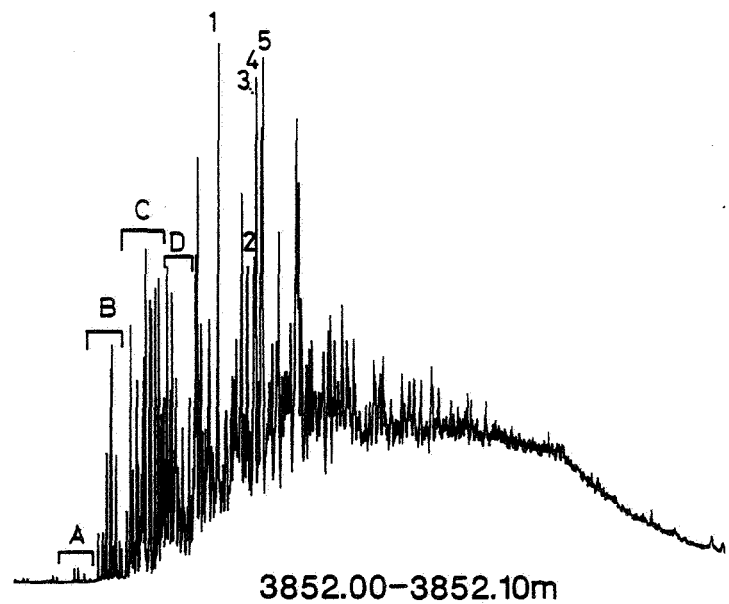
4222–4241m
DST 1 OIL SAMPLE

FIGURE 4a **AROMATIC CHROMATOGRAMS** WELL 6506/12-3

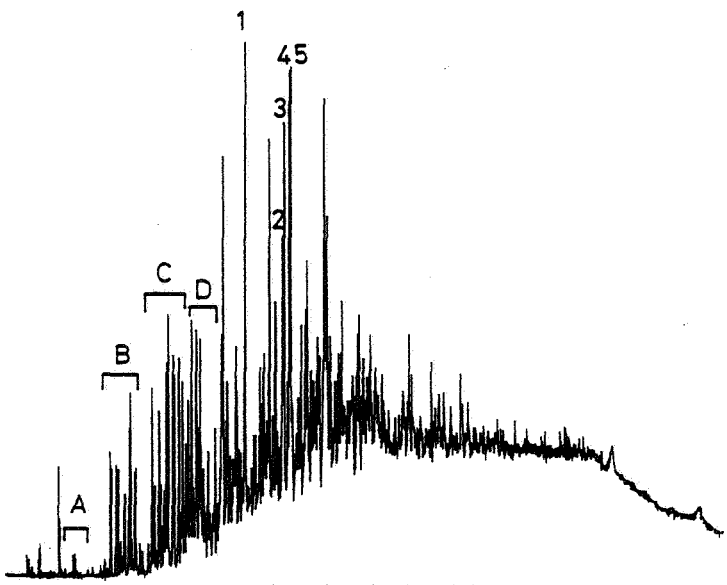




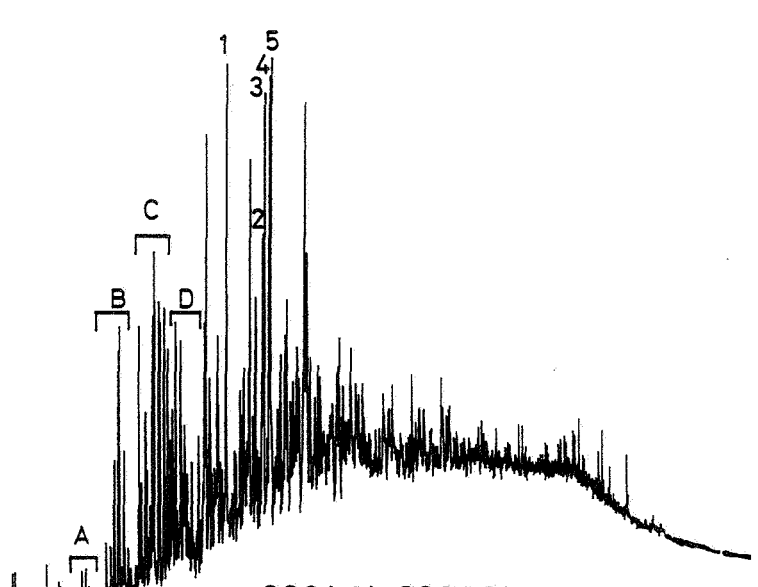
3837.18-3837.30m
CORE



3852.00-3852.10m
CORE

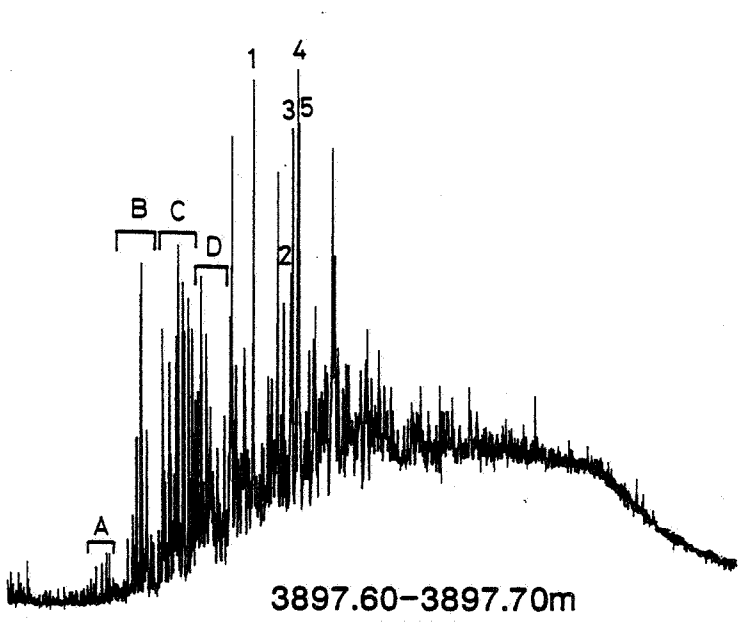


3867.10-3867.20m
CORE

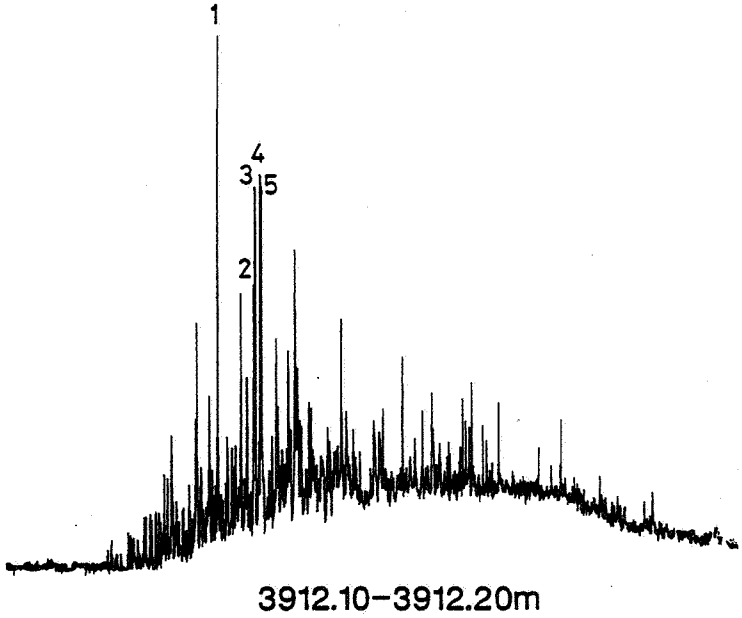


3881.41-3881.51m
CORE

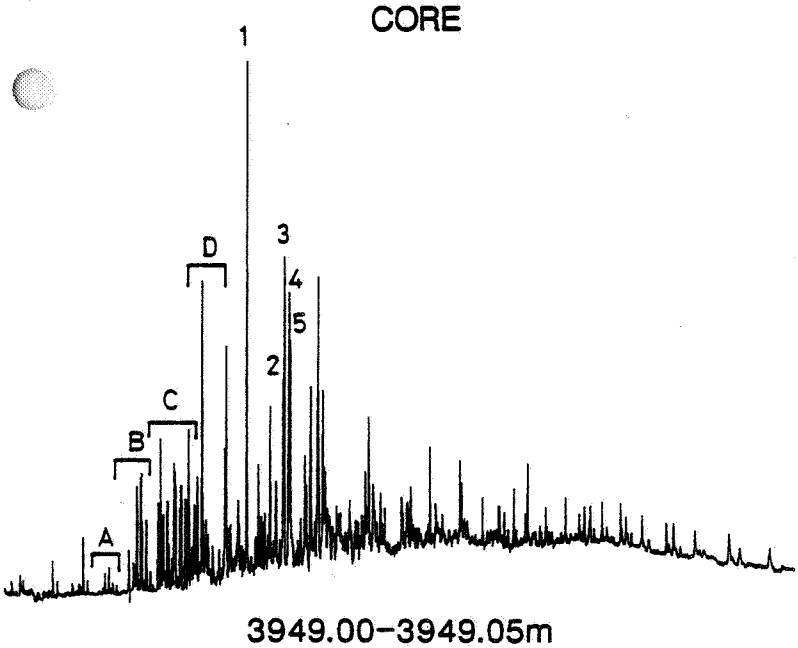
FIGURE 4b **AROMATIC CHROMATOGRAMS** WELL 6506/12-3



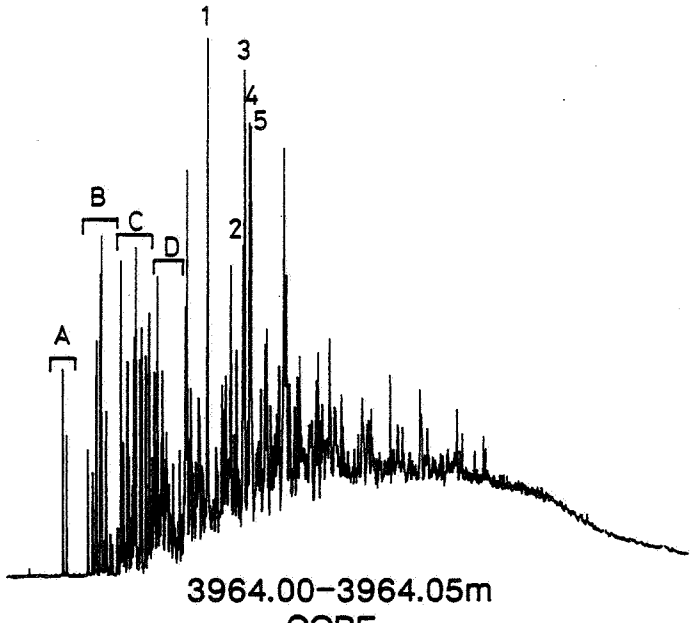
3897.60-3897.70m
CORE



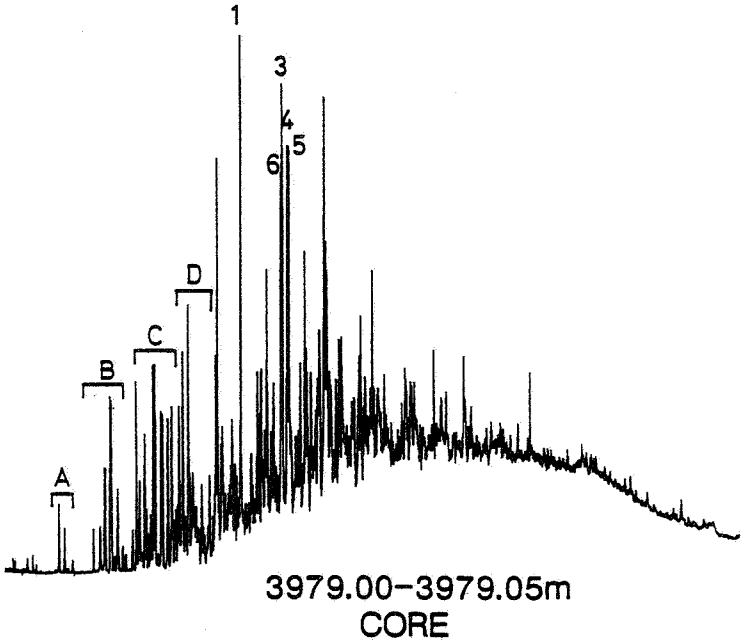
3912.10-3912.20m
CORE



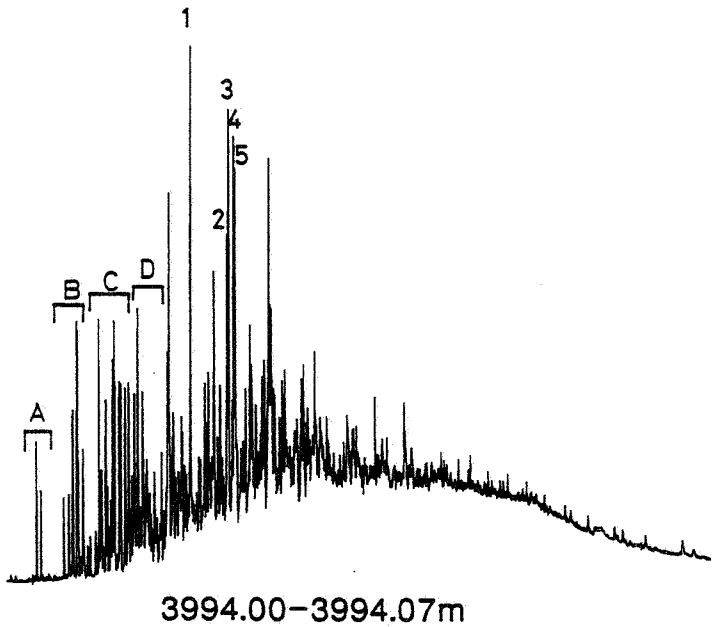
3949.00-3949.05m
CORE



3964.00-3964.05m
CORE

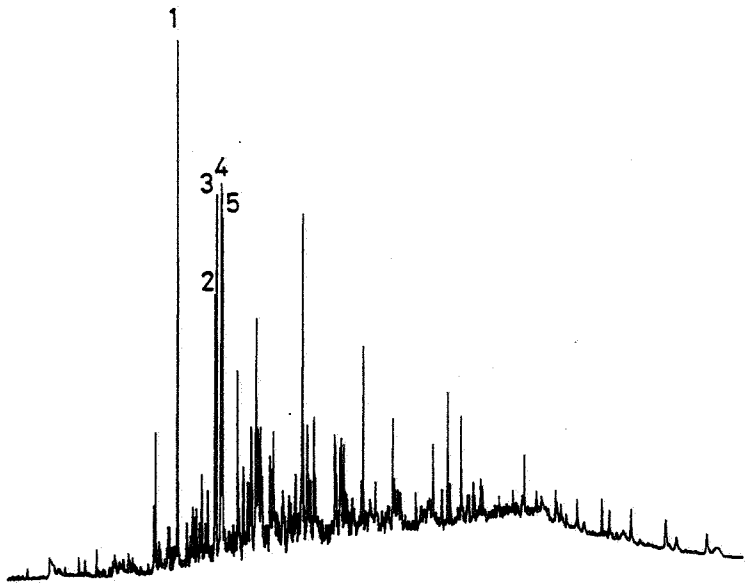


3979.00-3979.05m
CORE

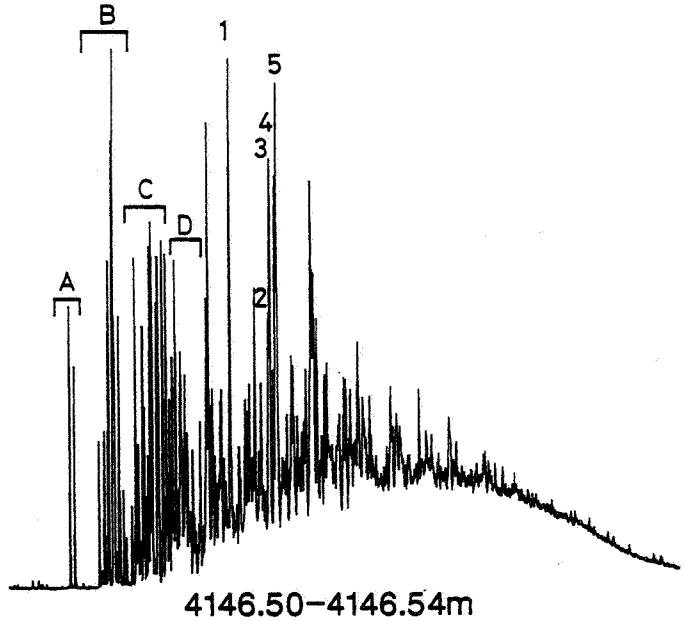


3994.00-3994.07m
CORE

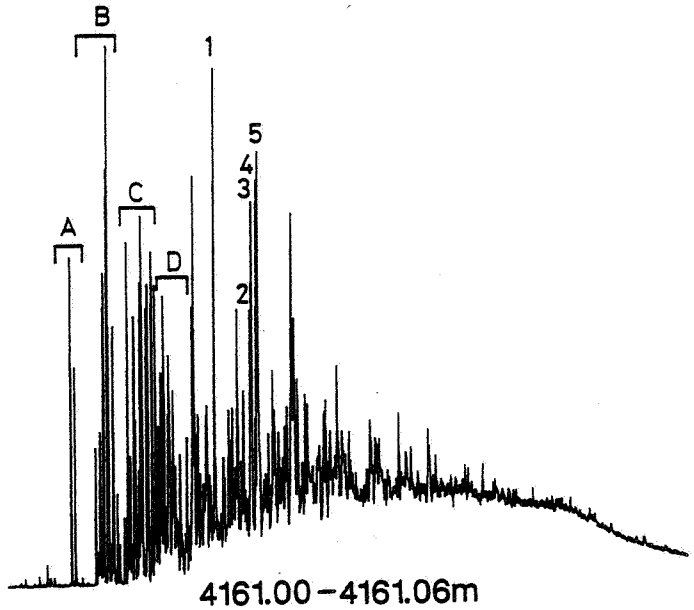
FIGURE 4c **AROMATIC CHROMATOGRAMS** WELL 6506/12-3



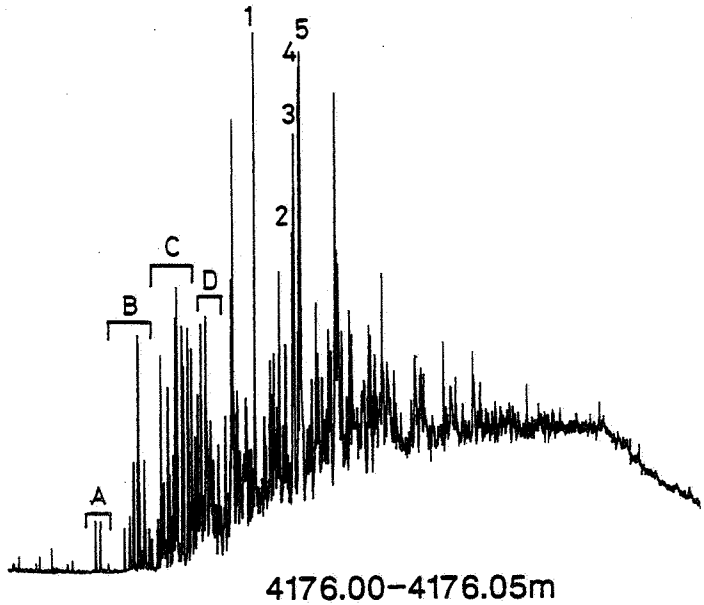
4009.00–4099.07m
CORE



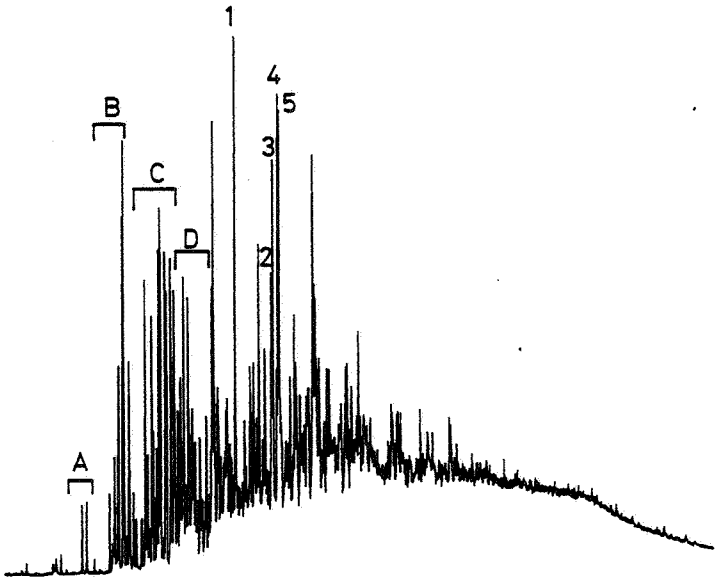
4146.50–4146.54m
CORE



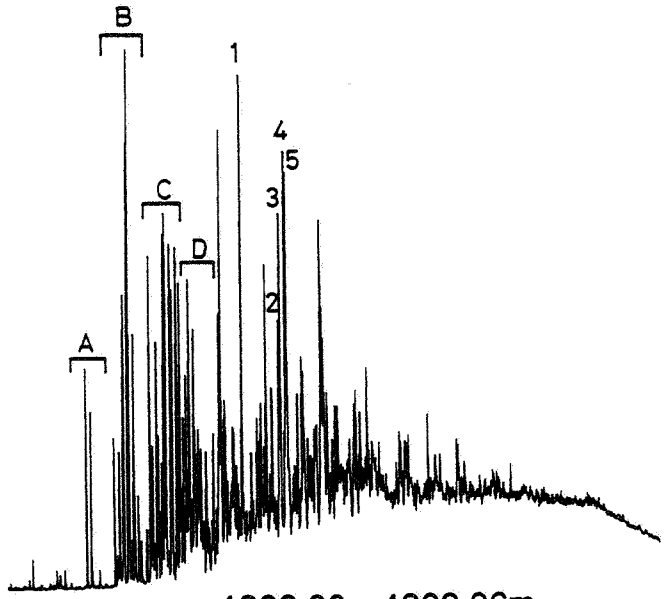
4161.00–4161.06m
CORE



4176.00–4176.05m
CORE

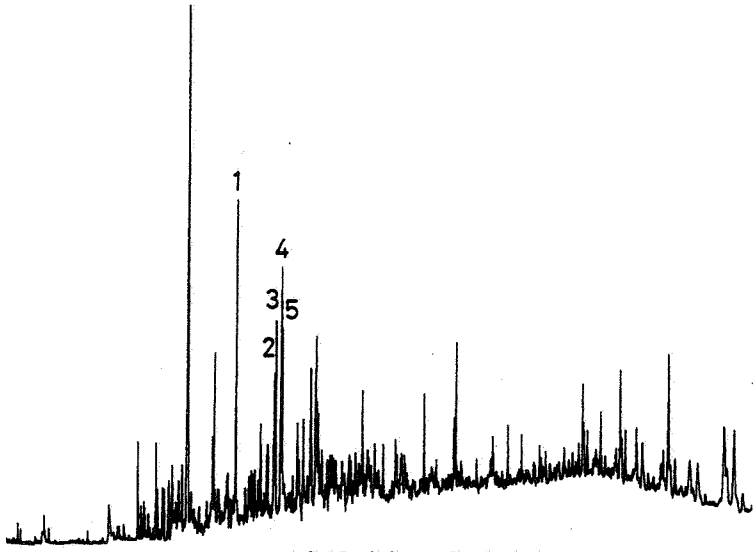


4187.00–4187.05m
CORE

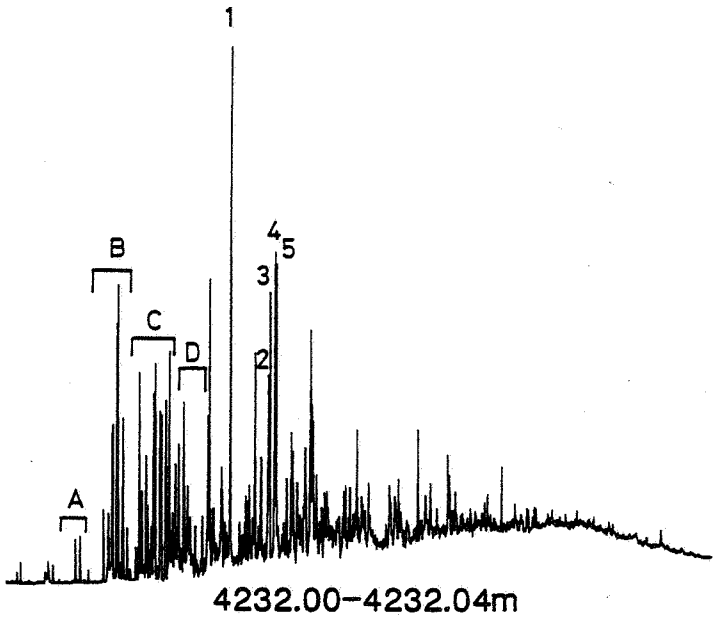


4202.00 – 4202.06m
CORE

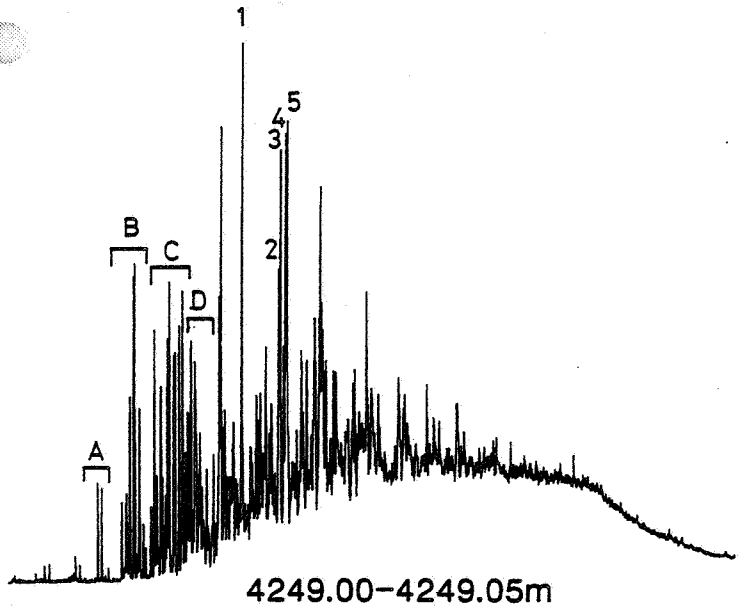
FIGURE 4d **AROMATIC CHROMATOGRAMS** WELL 6506/12-3



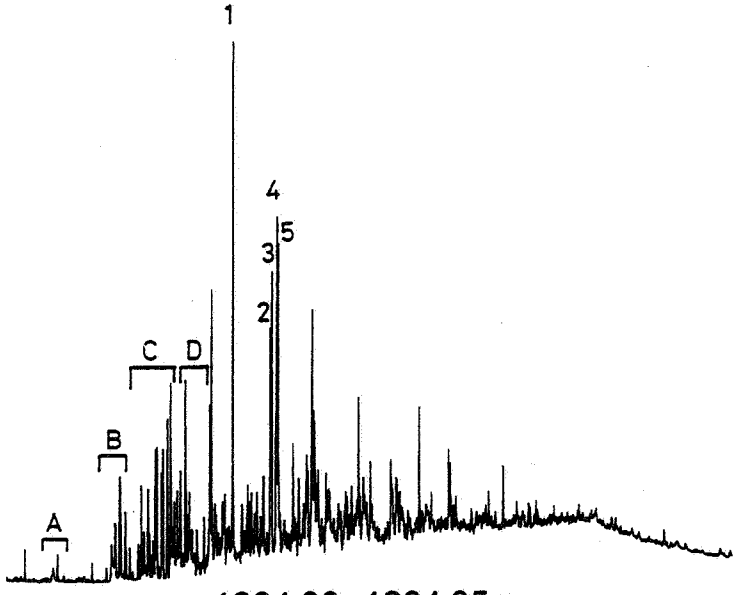
4219.00–4219.05m
CORE



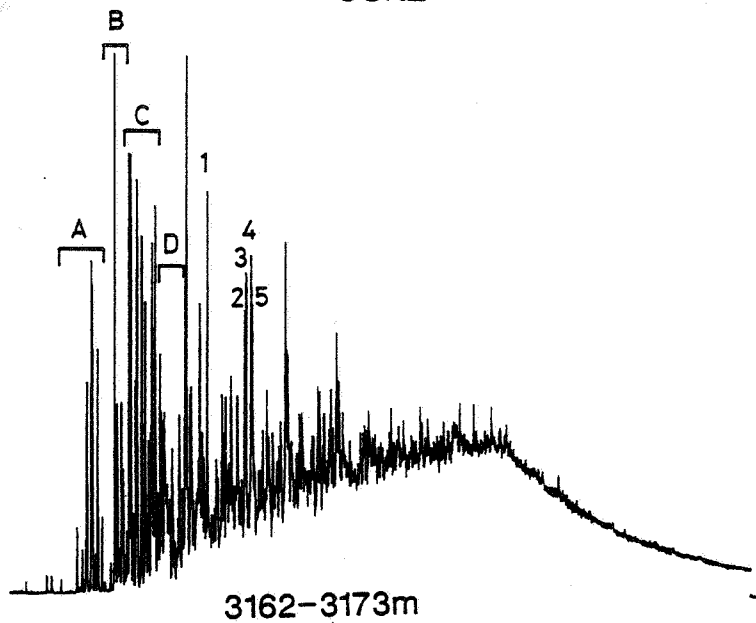
4232.00–4232.04m
CORE



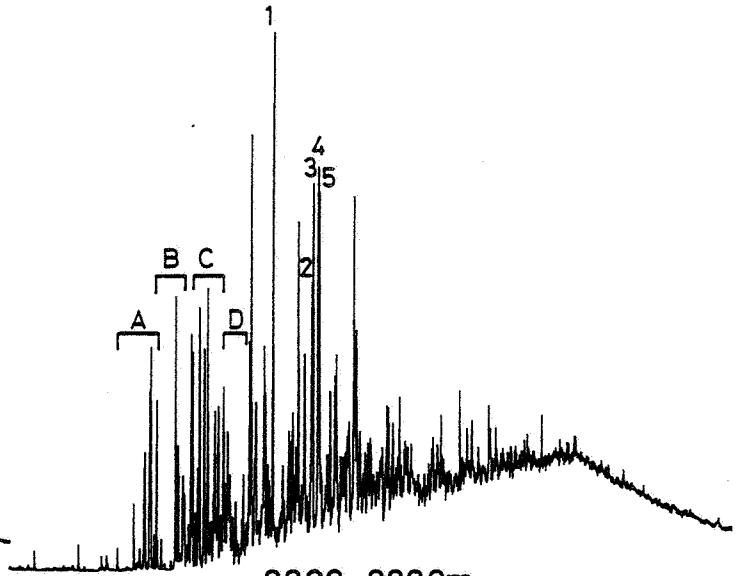
4249.00–4249.05m
CORE



4264.00–4264.05m
CORE

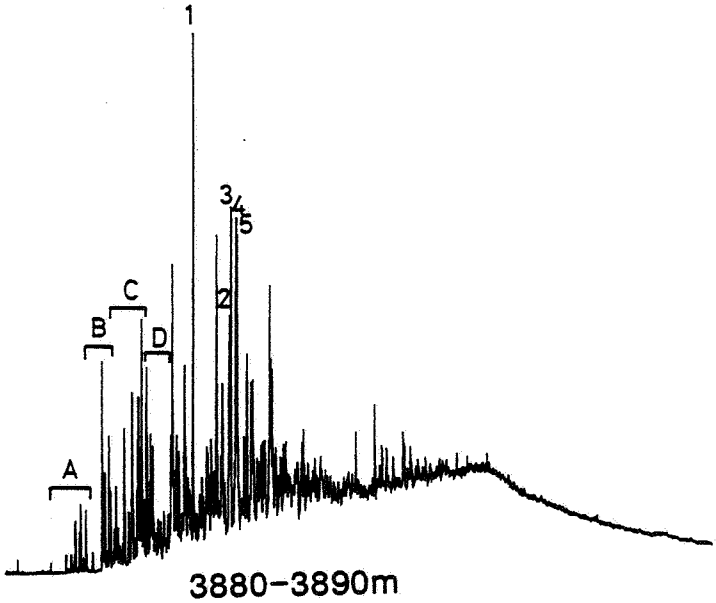


3162–3173m
DST 6 OIL SAMPLE

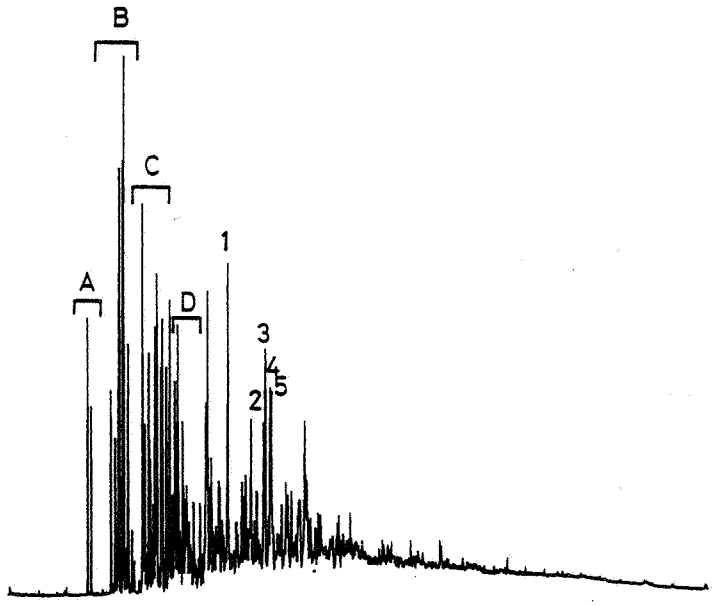


3822–3836m
DST 5 OIL SAMPLE

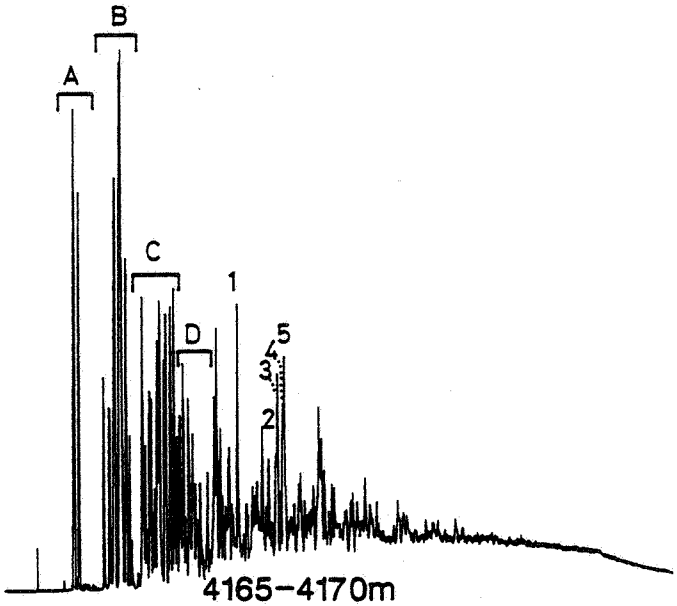
FIGURE 4e **AROMATIC CHROMATOGRAMS** WELL 6506/12-3



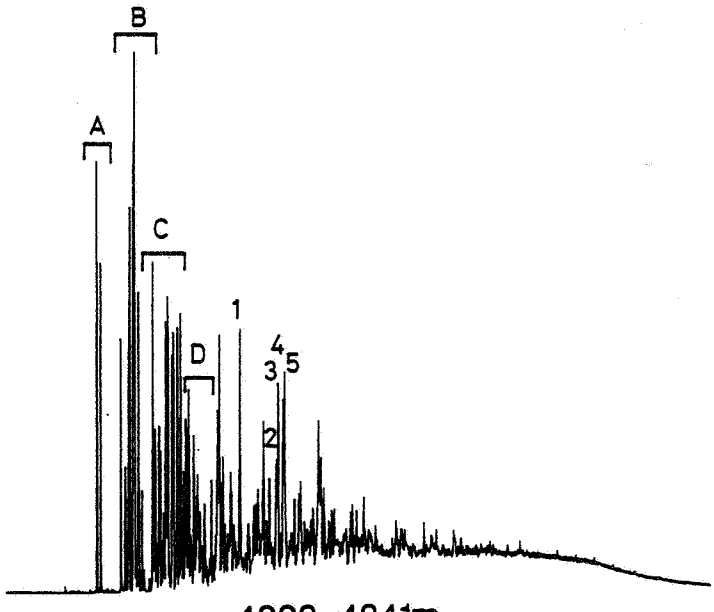
3880-3890m
DST 4 OIL SAMPLE



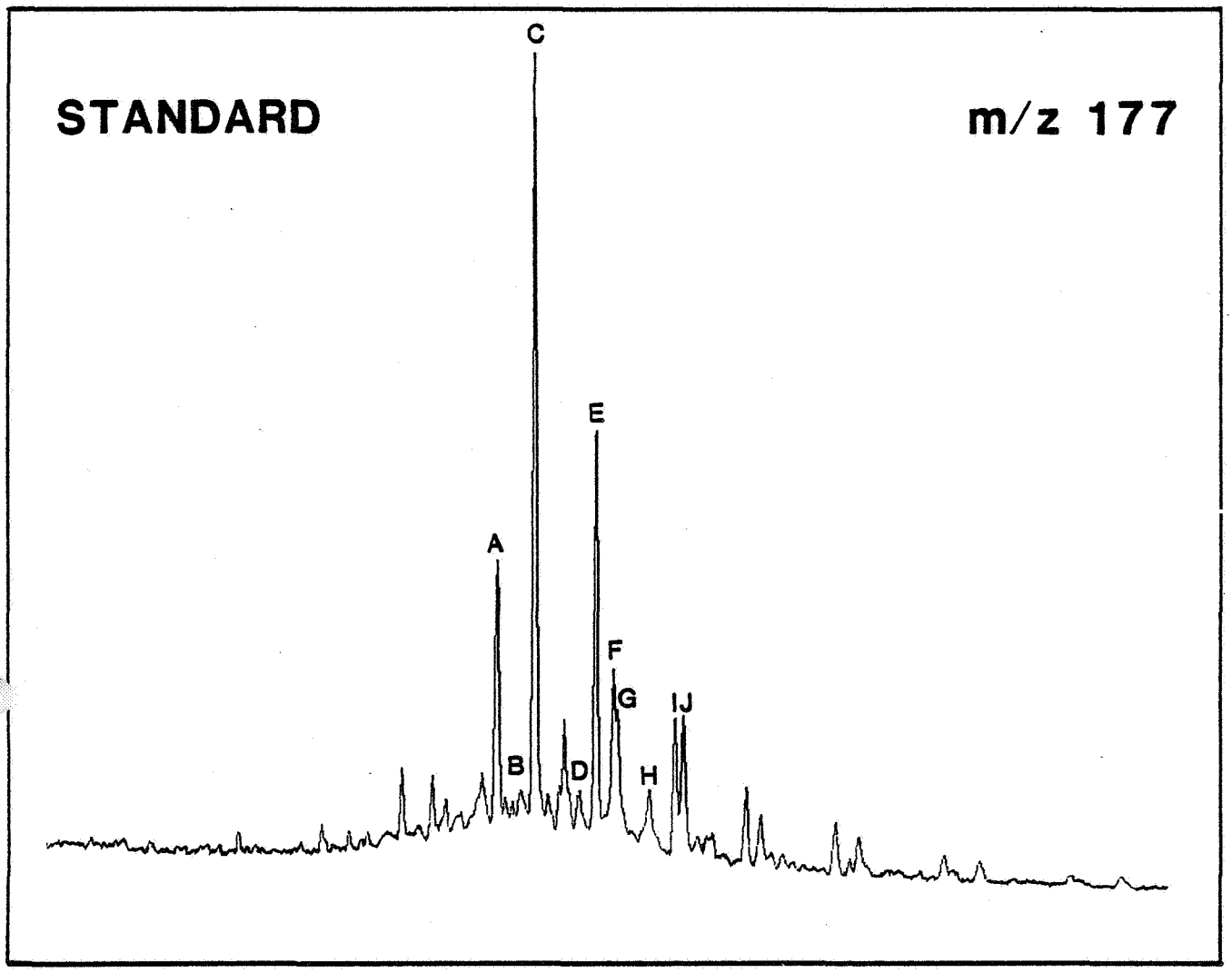
3960-3980m
DST 3 OIL SAMPLE



4165-4170m
DST 2 OIL SAMPLE



4222-4241m
DST 1 OIL SAMPLE



DEMETHYLATED HOPANES

(m/z 177 FRAGMENTOGRAM)

	COMPOUND	
A	17 ∝ (H), 18 ∝ (H), 21 ß (H) 25, 28, 30 - trisnorhopane	C_{27}
B	17 ß (H), 18 ∝ (H), 21 ∝ (H) 25, 28, 30 - trisnormoretane	
C	17 ∝ (H) -25, 30 - bisnorhopane	C_{28}
D	17 ∝ (H), 18 ∝ (H), 21 ß (H) -28, 30 bisnorhopane	
E	17 ∝ (H) -25 - norhopane	
F	17 ∝ (H) -30 - norhopane	
G	?	
H	17 ß (H) -30 - normoretane	
I	(22S) -17 ∝ (H) -25 - norhomohopane	
J	(22R) -17 ∝ (H) - homohopane	

FIGURE 5a

MASS FRAGMENTOGRAMS

WELL 6506/12-3

TRITERPANES m/z 177

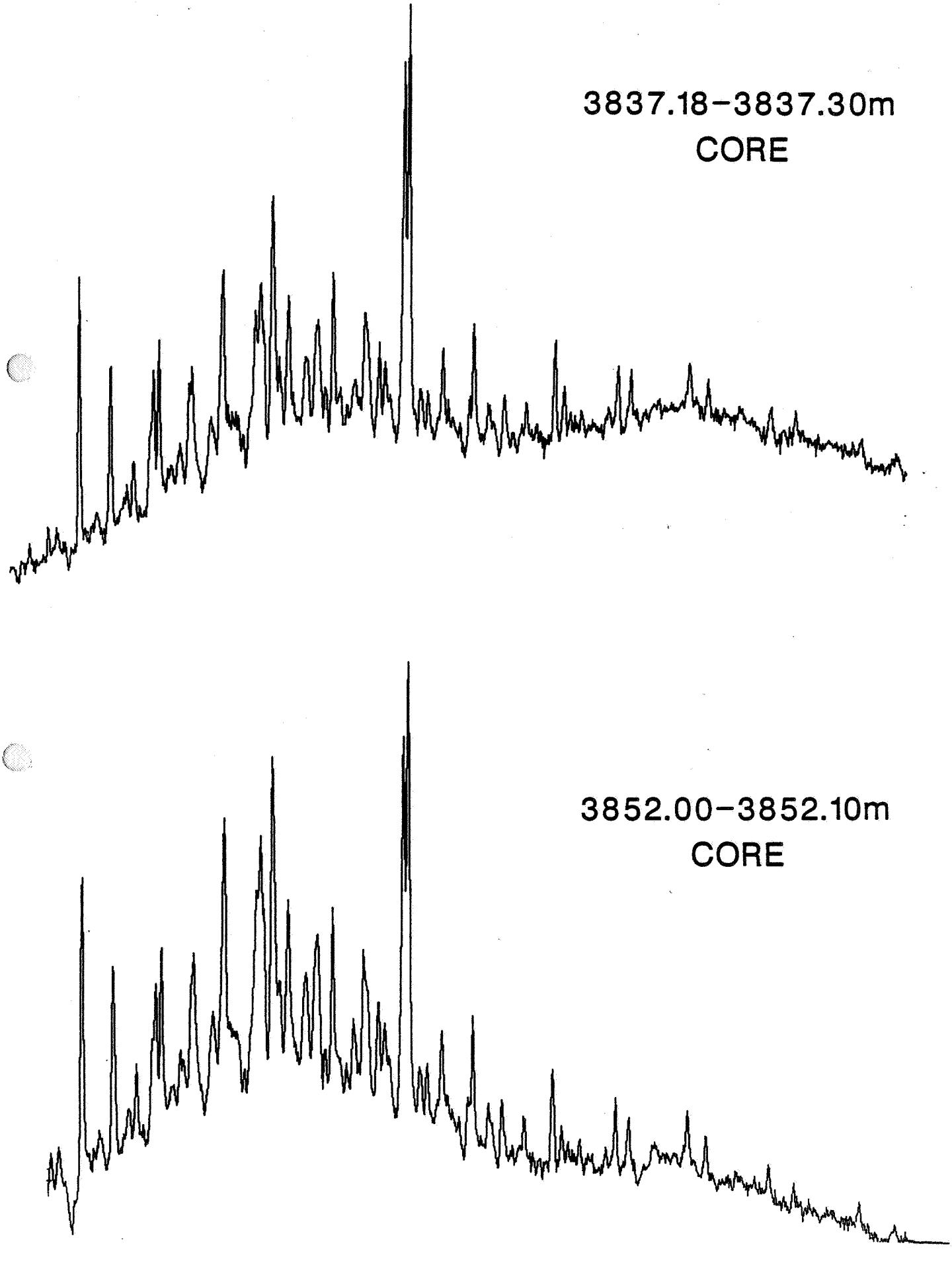


FIGURE 5b **MASS FRAGMENTOGRAMS** WELL 6506/12-3

TRITERPANES m/z 177

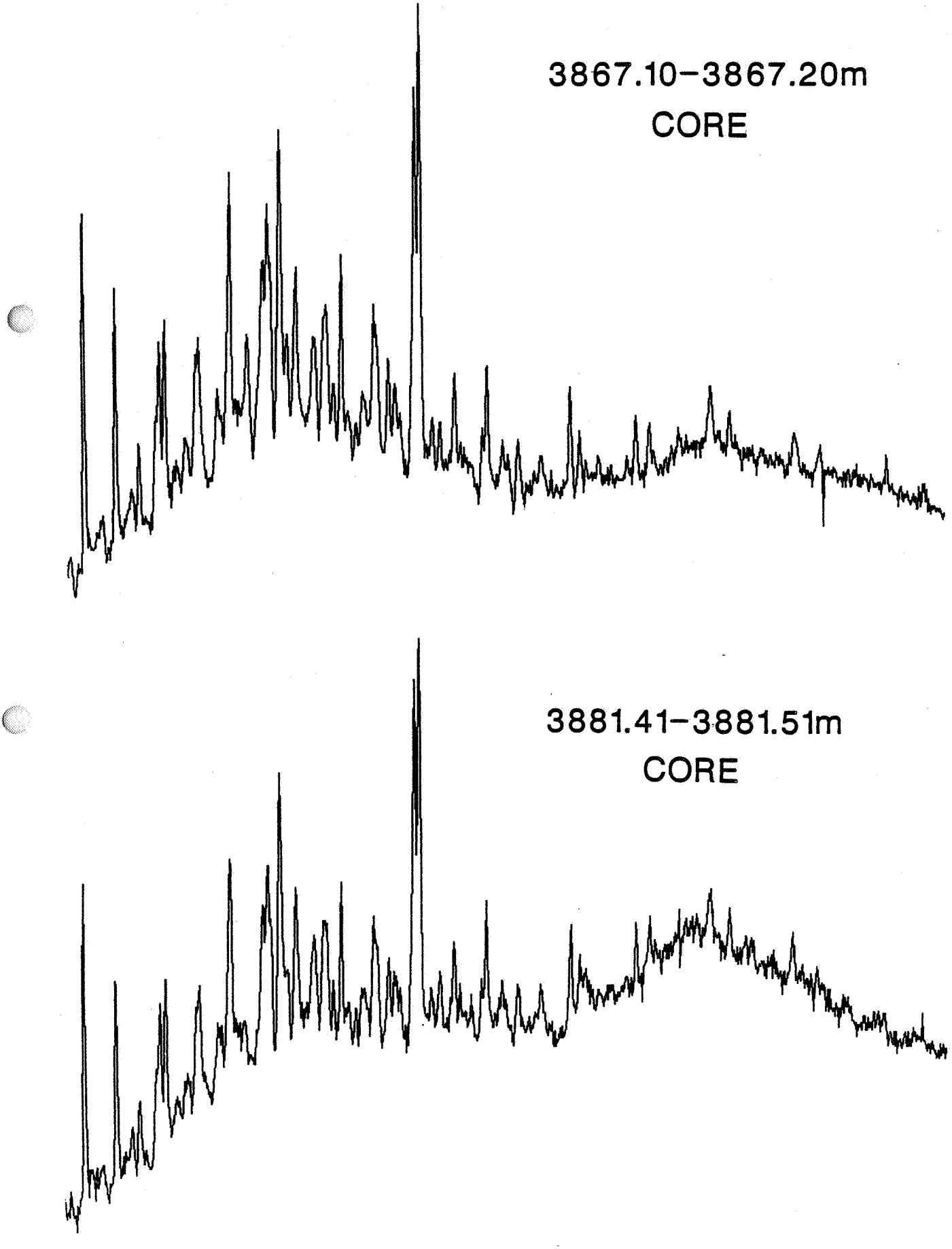


FIGURE 5c

MASS FRAGMENTOGRAMS

WELL 6506/12-3

TRITERPANES m/z 177

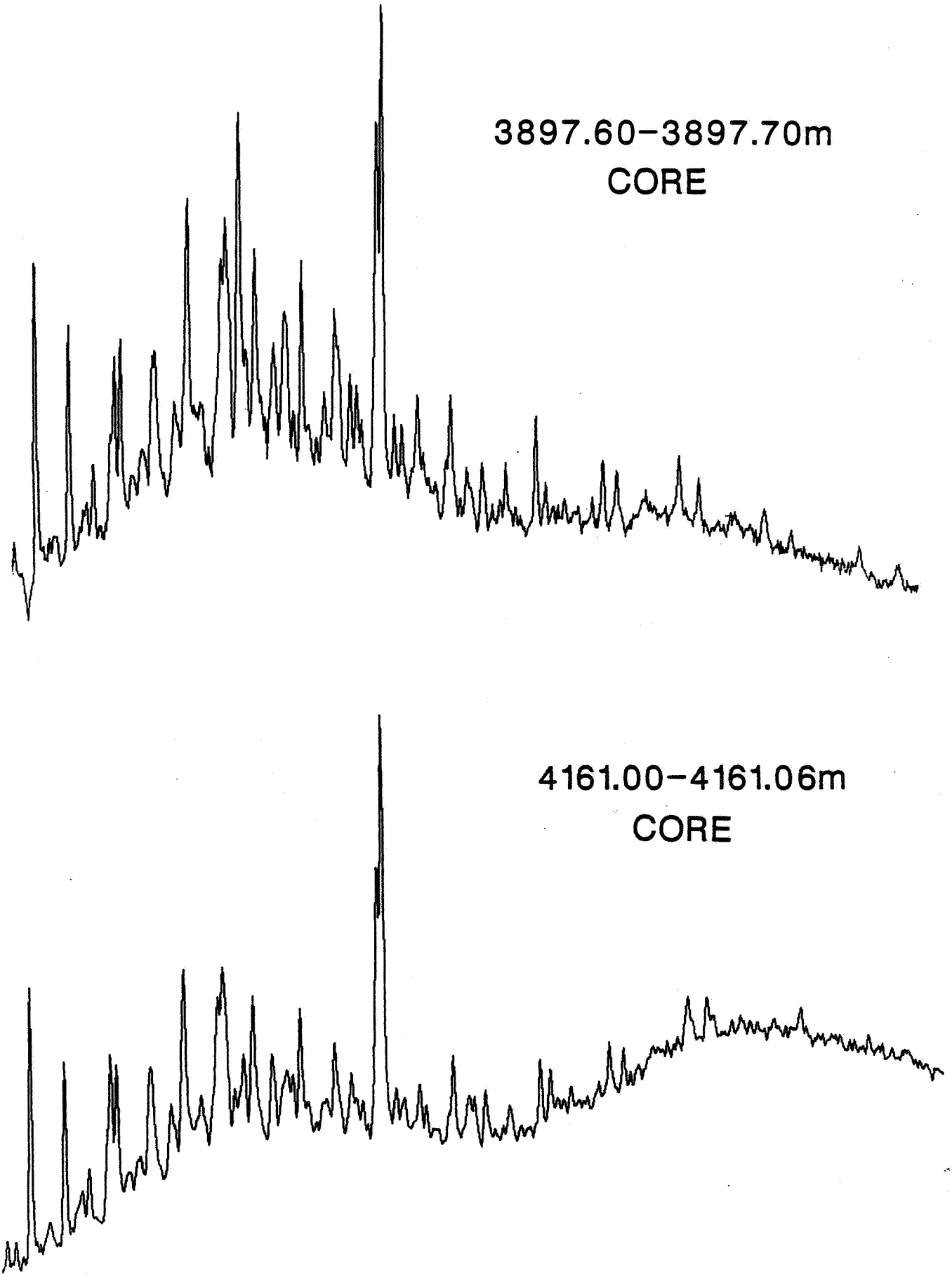


FIGURE 5d

MASS FRAGMENTOGRAMS

WELL 6506/12-3

TRITERPANES m/z 177

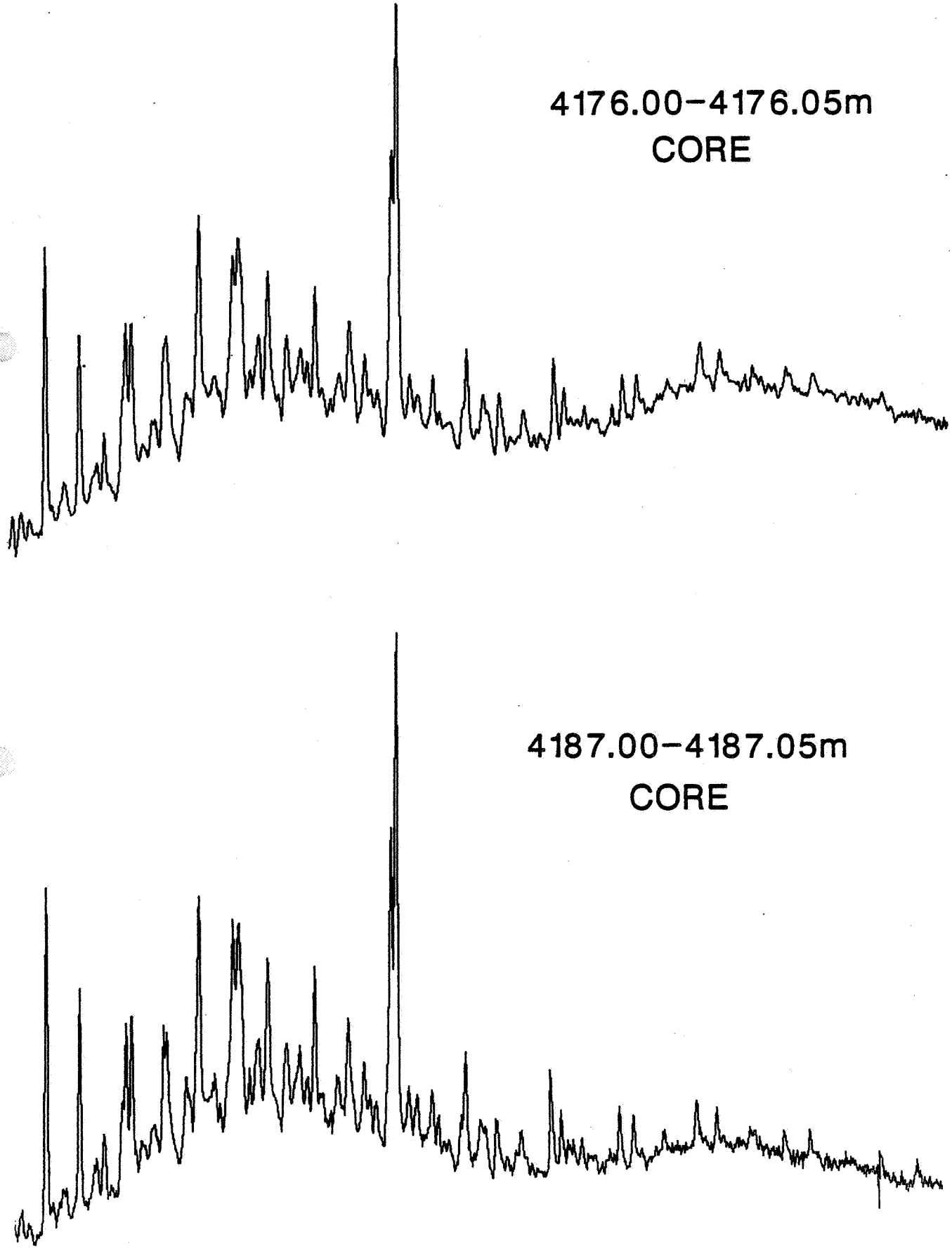


FIGURE 5e

MASS FRAGMENTOGRAMS

WELL 6506/12-3

TRITERPANES m/z 177

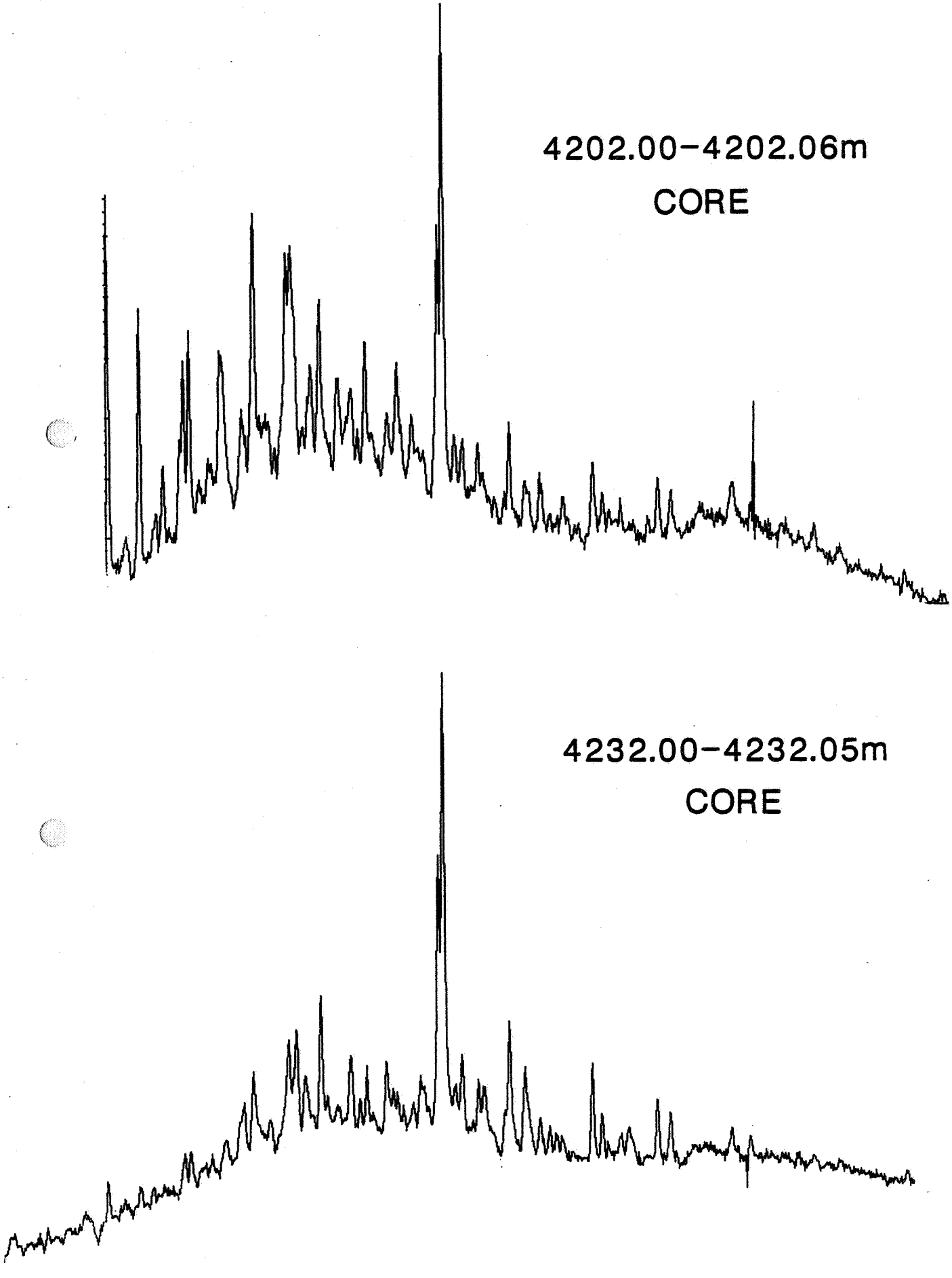


FIGURE 5f

MASS FRAGMENTOGRAMS

WELL 6506/12-3

TRITERPANES m/z 177

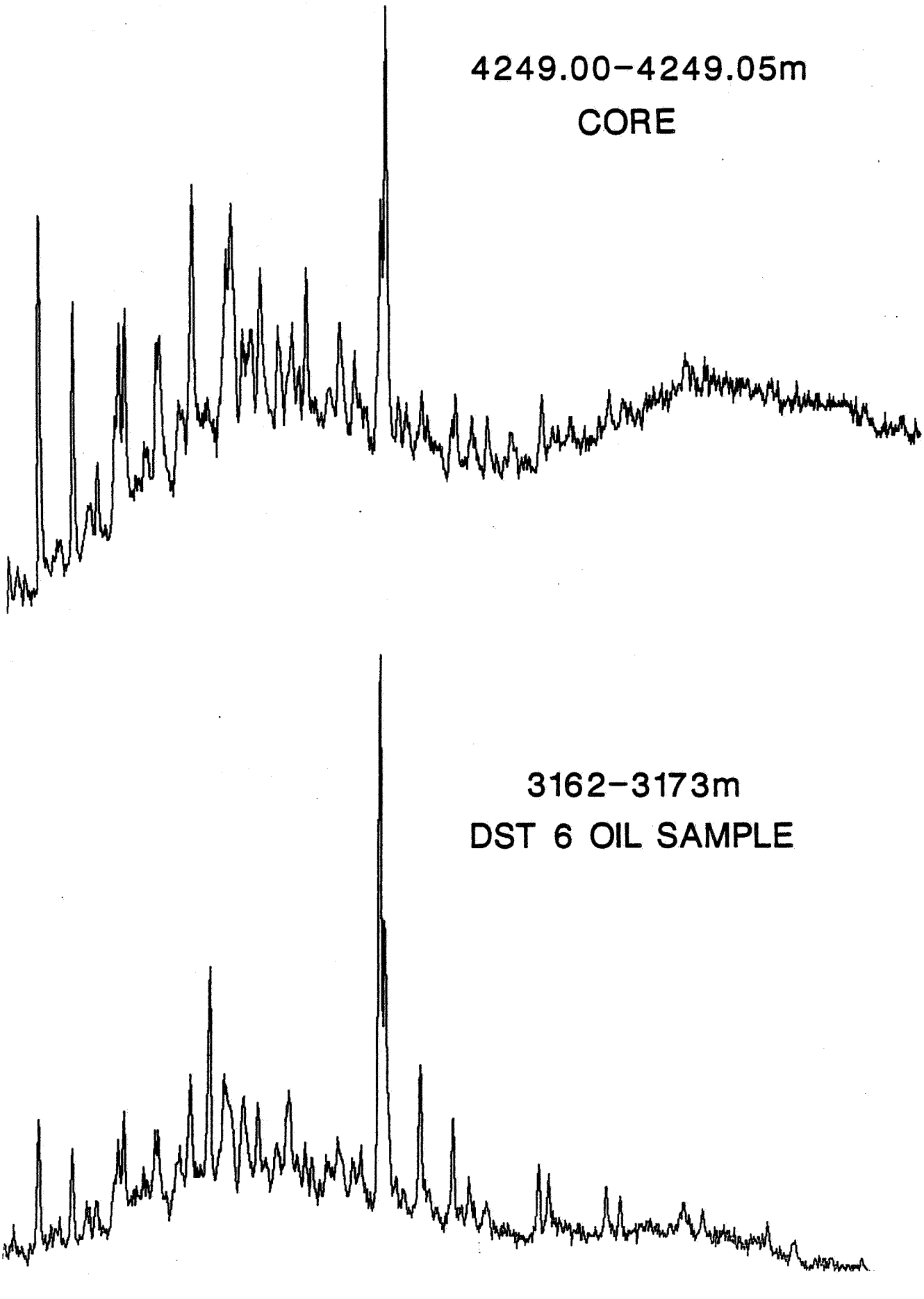


FIGURE 5g MASS FRAGMENTOGRAMS WELL 6506/12-3

TRITERPANES m/z 177

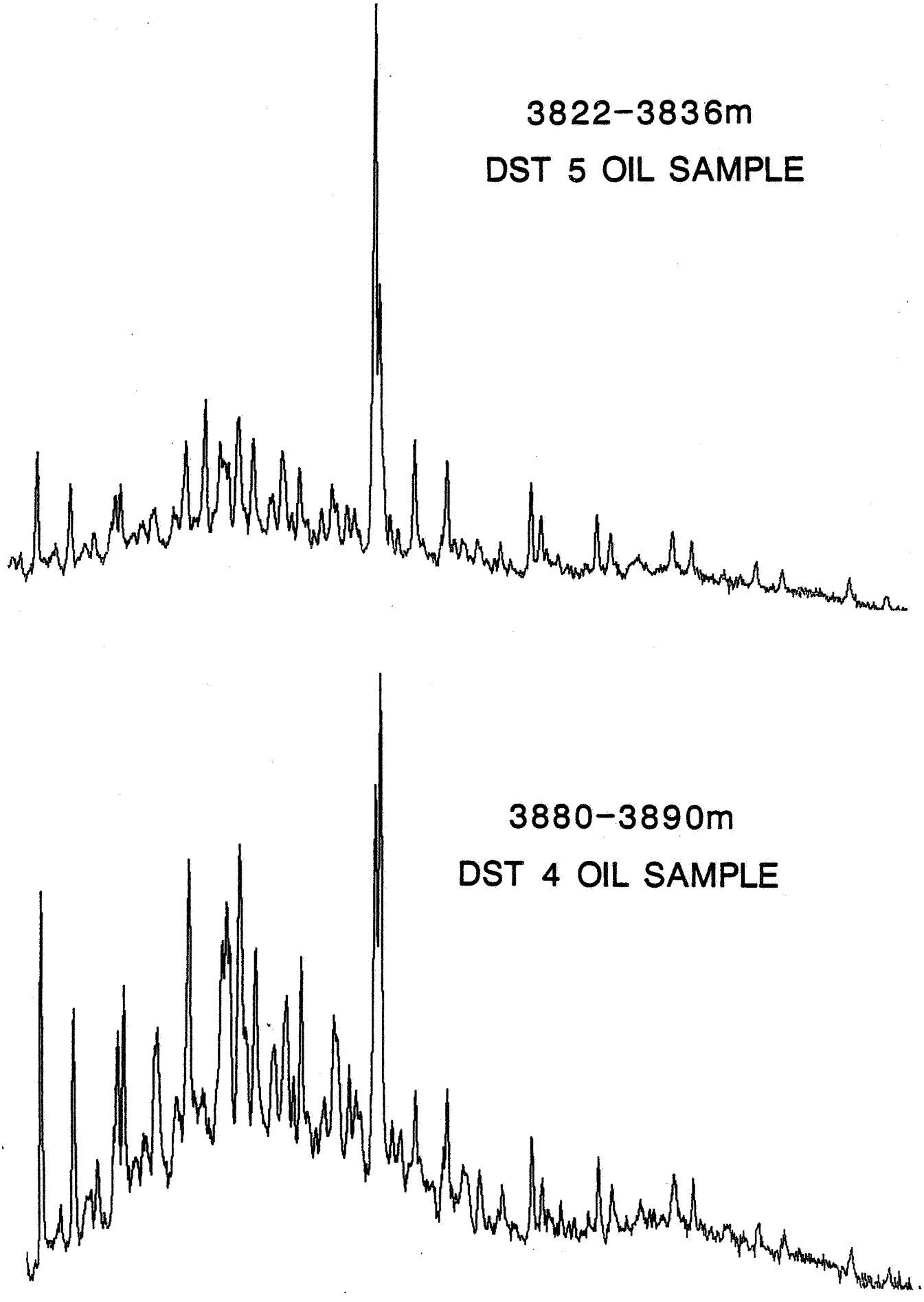


FIGURE 5h **MASS FRAGMENTOGRAMS** WELL 6506/12-3

TRITERPANES m/z 177

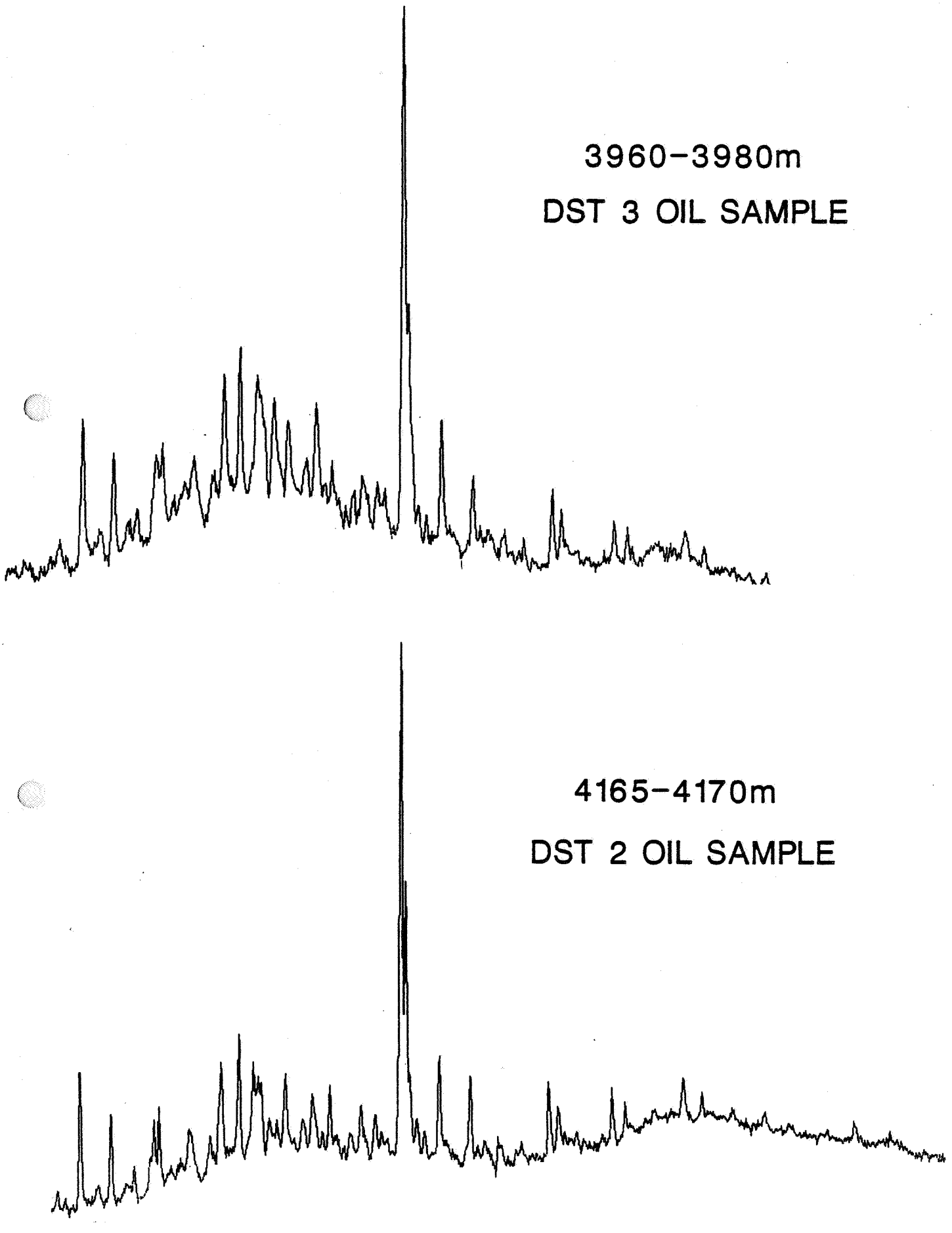
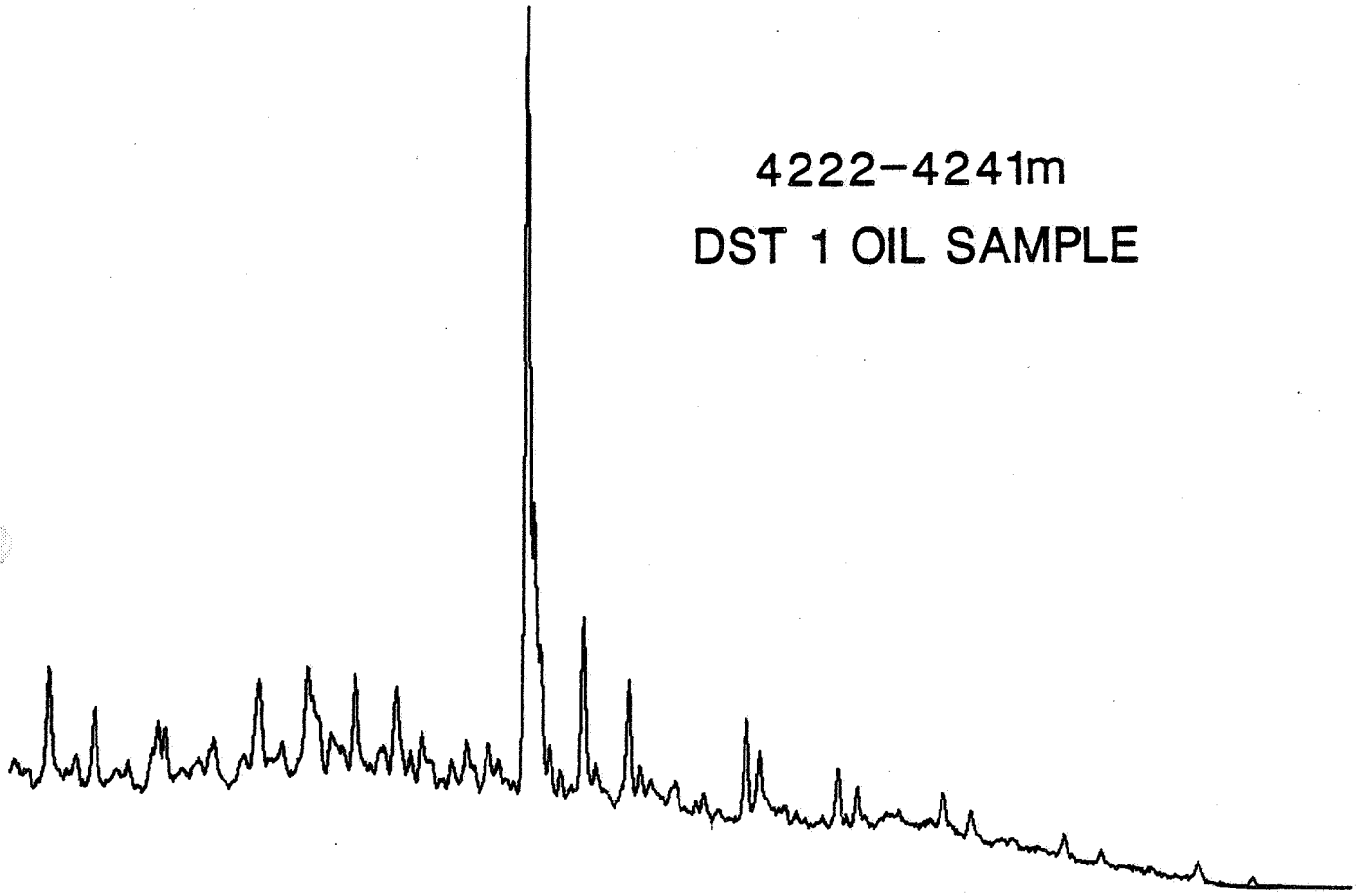
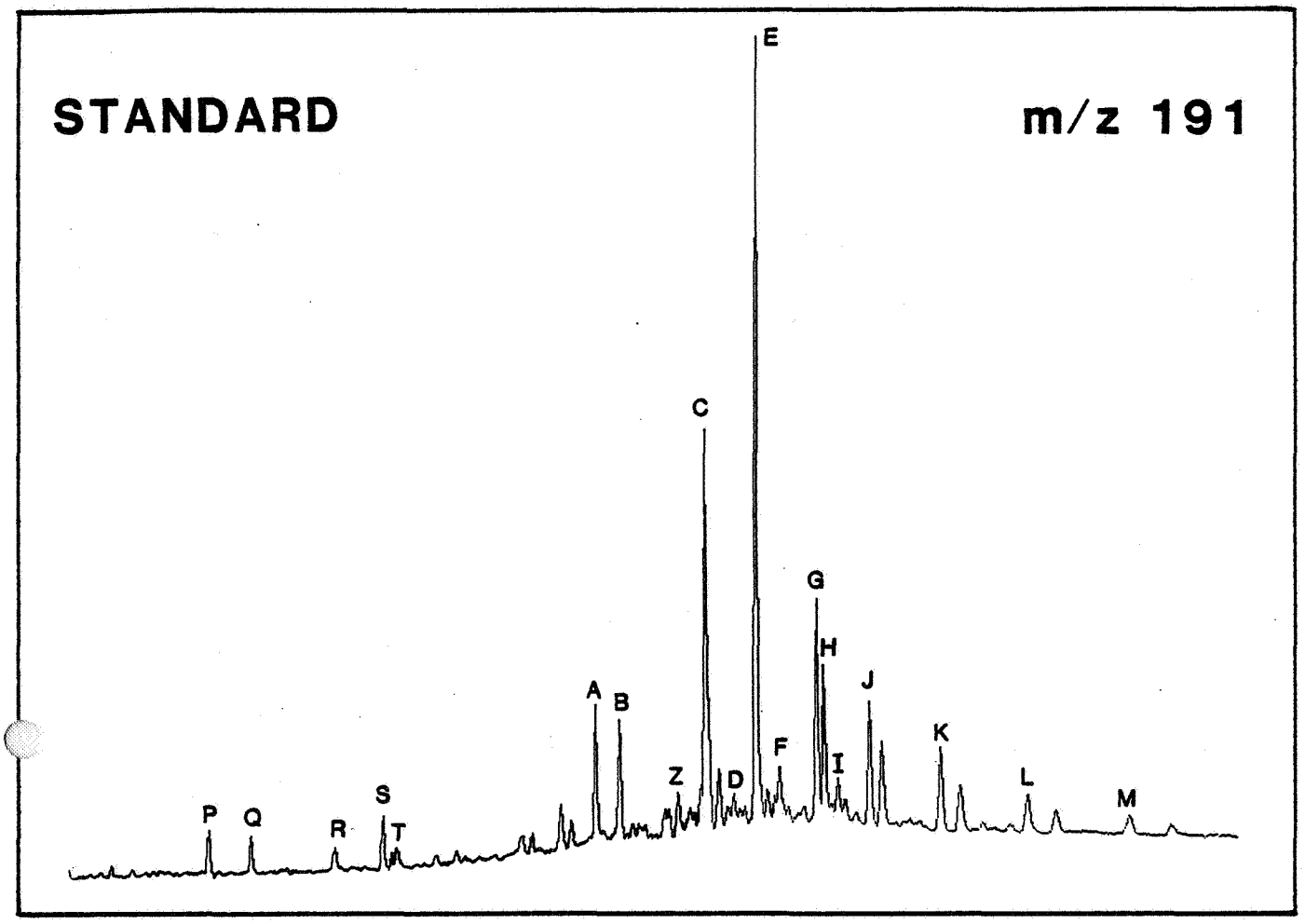


FIGURE 5i **MASS FRAGMENTOGRAMS** WELL 6506/12-3

TRITERPANES m/z 177





TRITERPANE IDENTIFICATION

(M/Z 191 FRAGMENTOGRAM)

	COMPOUND	ELEMENTAL COMPOSITION
A	18 (H),21 (H)-trisnorneohopane (Ts)	$C_{27}H_{46}$
B	17 (H),21 (H)-trisnorhopane (Tm)	$C_{27}H_{46}$
C	17 (H),21 (H)-norhopane	$C_{29}H_{50}$
D	17 (H),21 (H)-norhopane (normoretane)	$C_{29}H_{50}$
E	17 (H),21 (H)-hopane	$C_{30}H_{52}$
F	17 (H),21 (H)-hopane (moretane)	$C_{30}H_{52}$
G	17 (H),21 (H)-homohopane (22S)	$C_{31}H_{54}$
H	17 (H),21 (H)-homohopane (22R)	$C_{31}H_{54}$
I	17 (H),21 (H)-homohopane (homomoretane)	$C_{31}H_{54}$
J	17 (H),21 (H)-bishomohopane (22S and 22R)	$C_{32}H_{56}$
K	17 (H),21 (H)-trishomohopane (22S and 22R)	$C_{33}H_{58}$
L	17 (H),21 (H)-tetrakishomohopane (22S and 22R)	$C_{34}H_{58}$
M	17 (H),21 (H)-pentakishomohopane (22S and 22R)	$C_{35}H_{60}$

Z = C_{28} bisnorhopane

TRICYCLIC AND TETRACYCLIC TERPANES (M/Z 191)

P	$C_{23}H_{42}$
Q	$C_{24}H_{44}$
R	$C_{25}H_{46}$
S	$C_{24}H_{42}$
T	$C_{26}H_{48}$

FIGURE 6a

MASS FRAGMENTOGRAMS

WELL 6506/12-3

TRITERPANES m/z 191

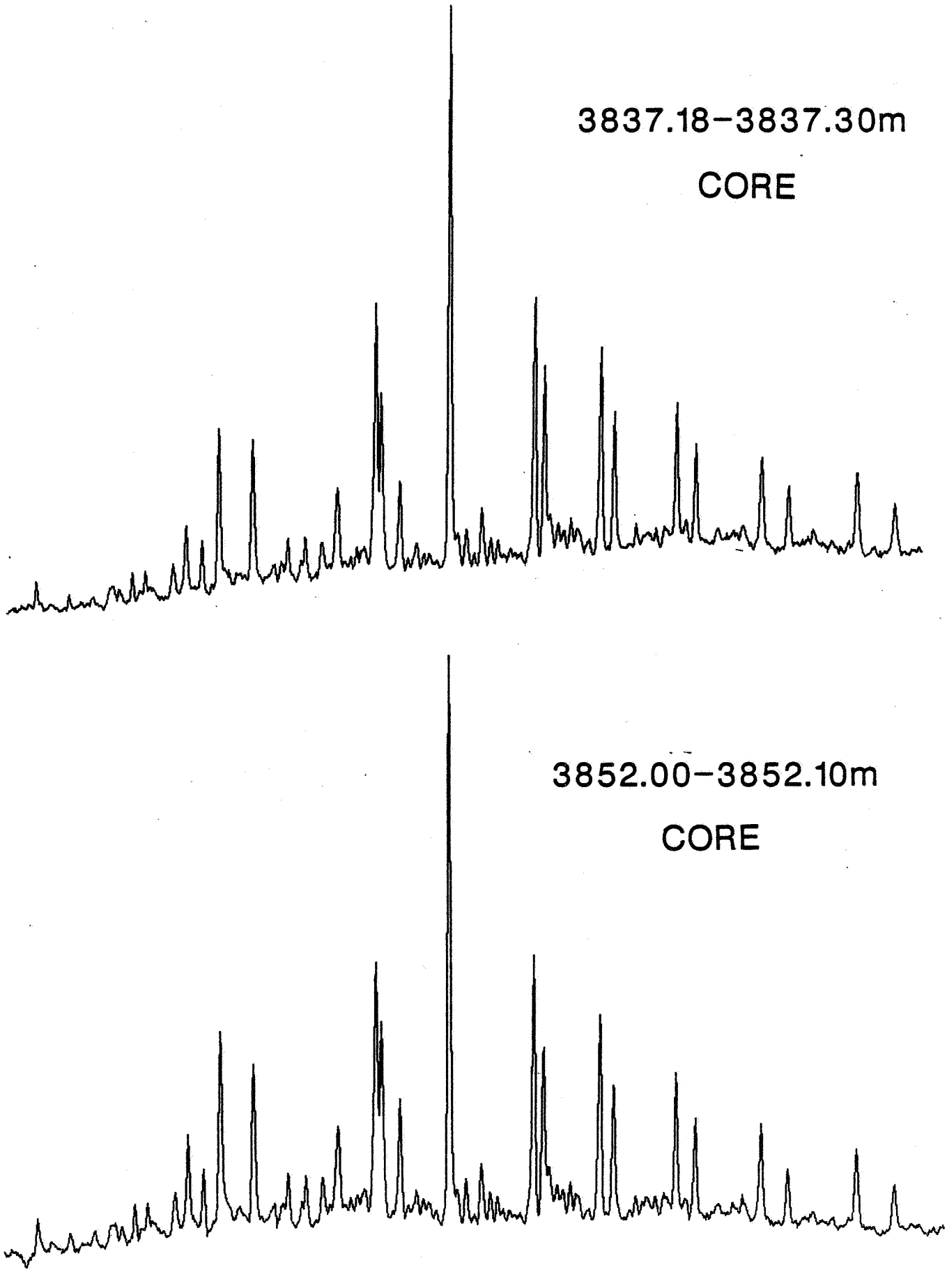


FIGURE 6b

MASS FRAGMENTOGRAMS

WELL 6506/12-3

TRITERPANES m/z 191

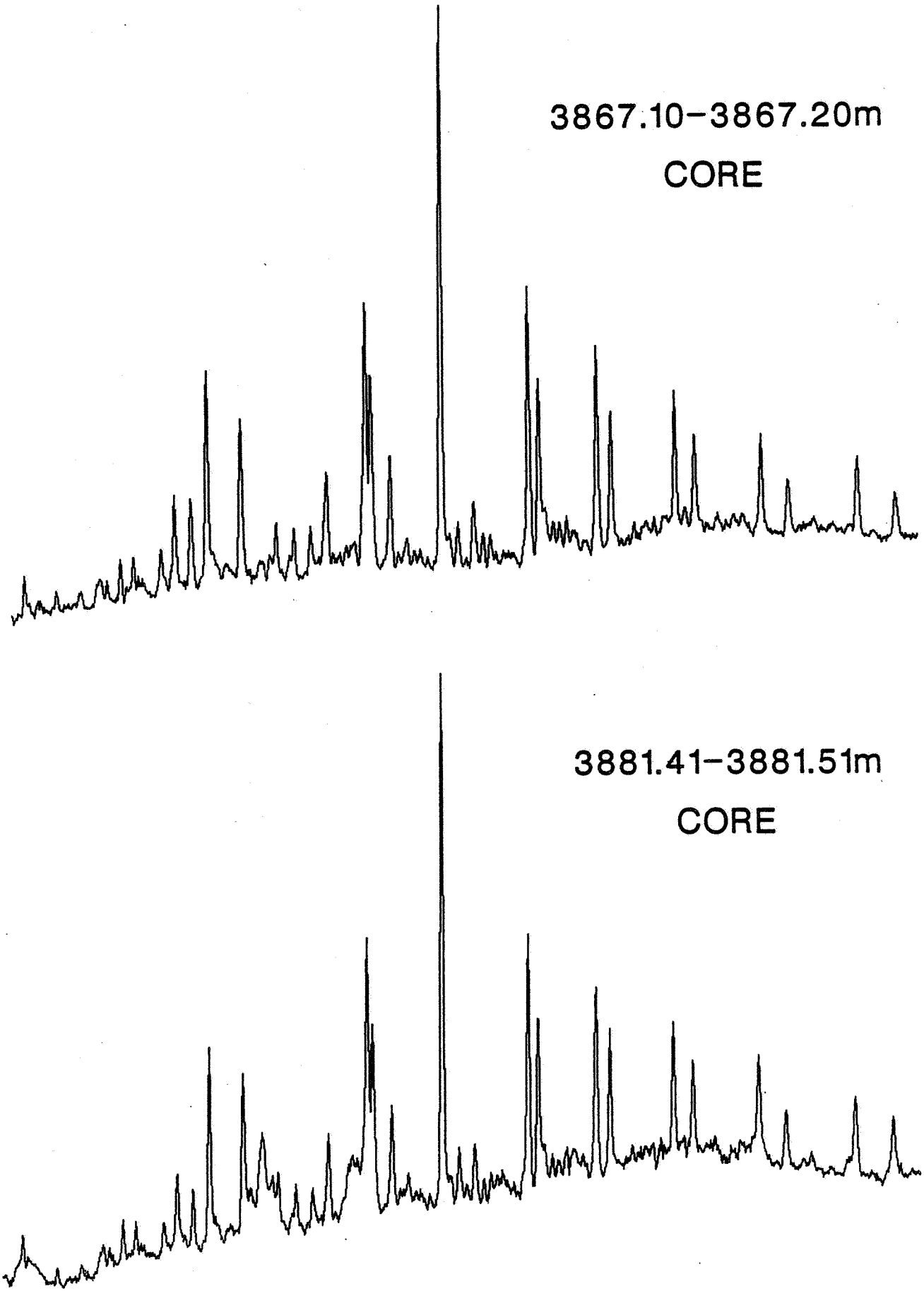


FIGURE 6c MASS FRAGMENTOGRAMS WELL 6506/12-3

TRITERPANES m/z 191

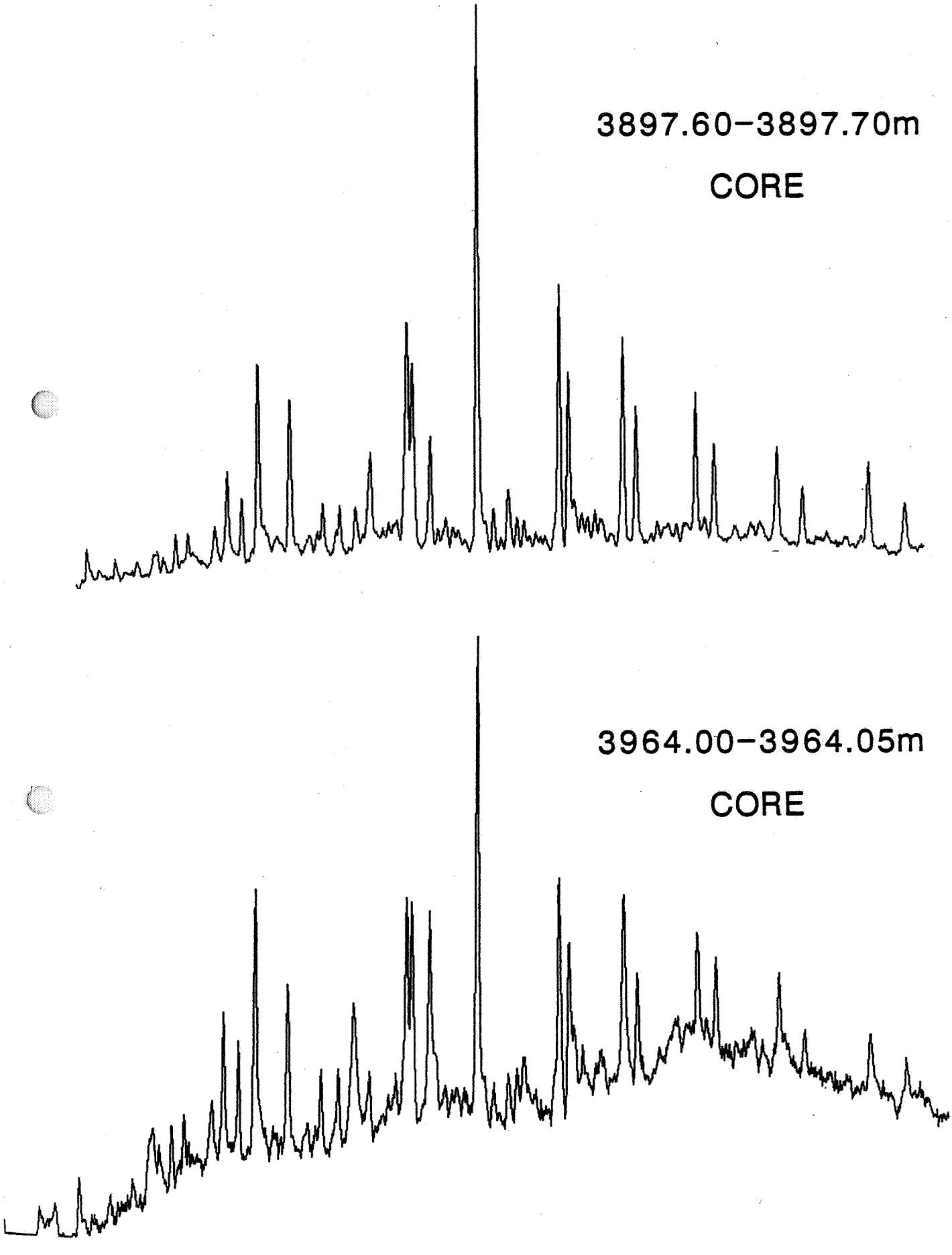


FIGURE 6d

MASS FRAGMENTOGRAMS

WELL 6506/12-3

TRITERPANES m/z 191

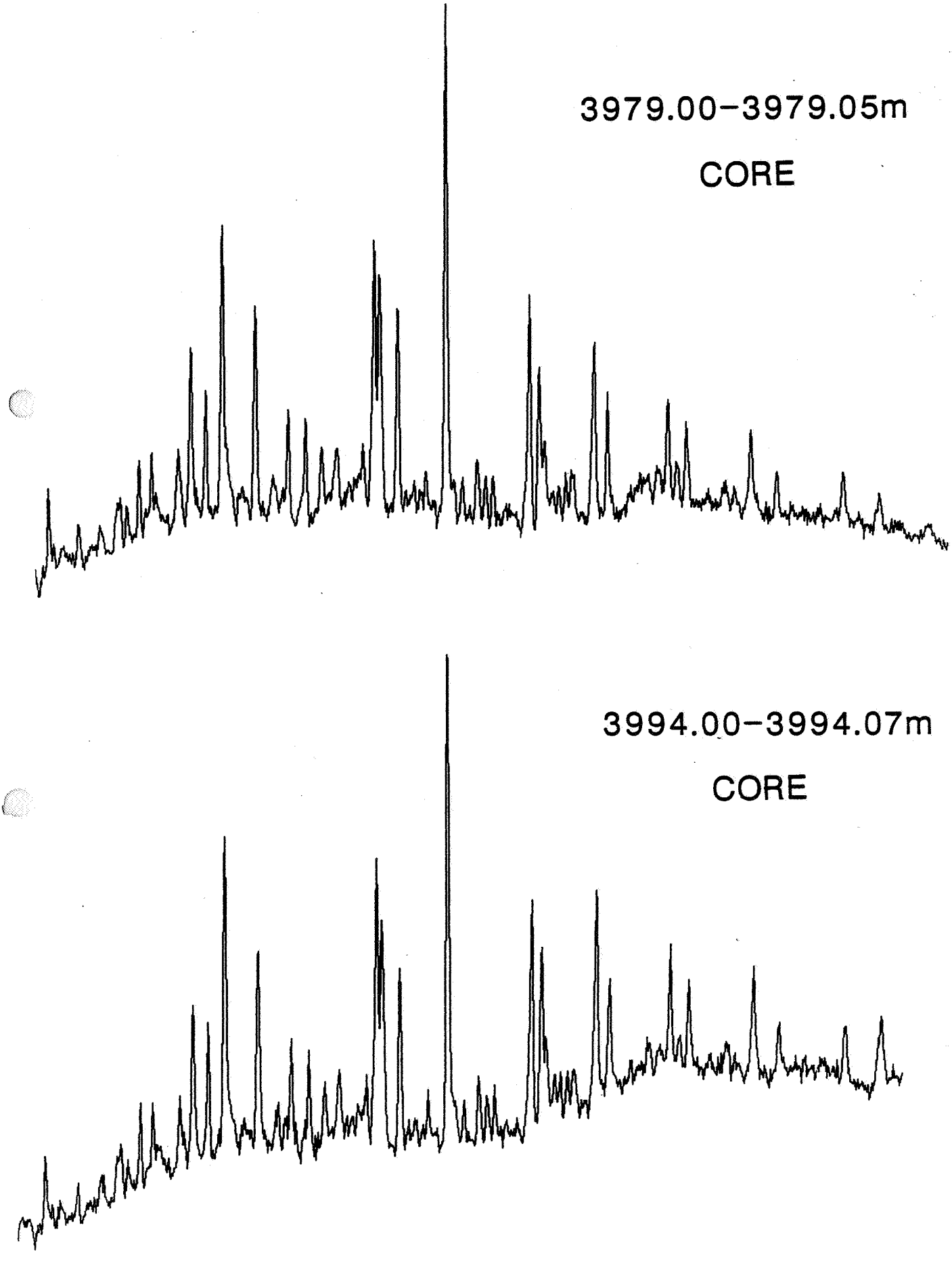


FIGURE 6e **MASS FRAGMENTOGRAMS** WELL 6506/12-3

TRITERPANES m/z 191

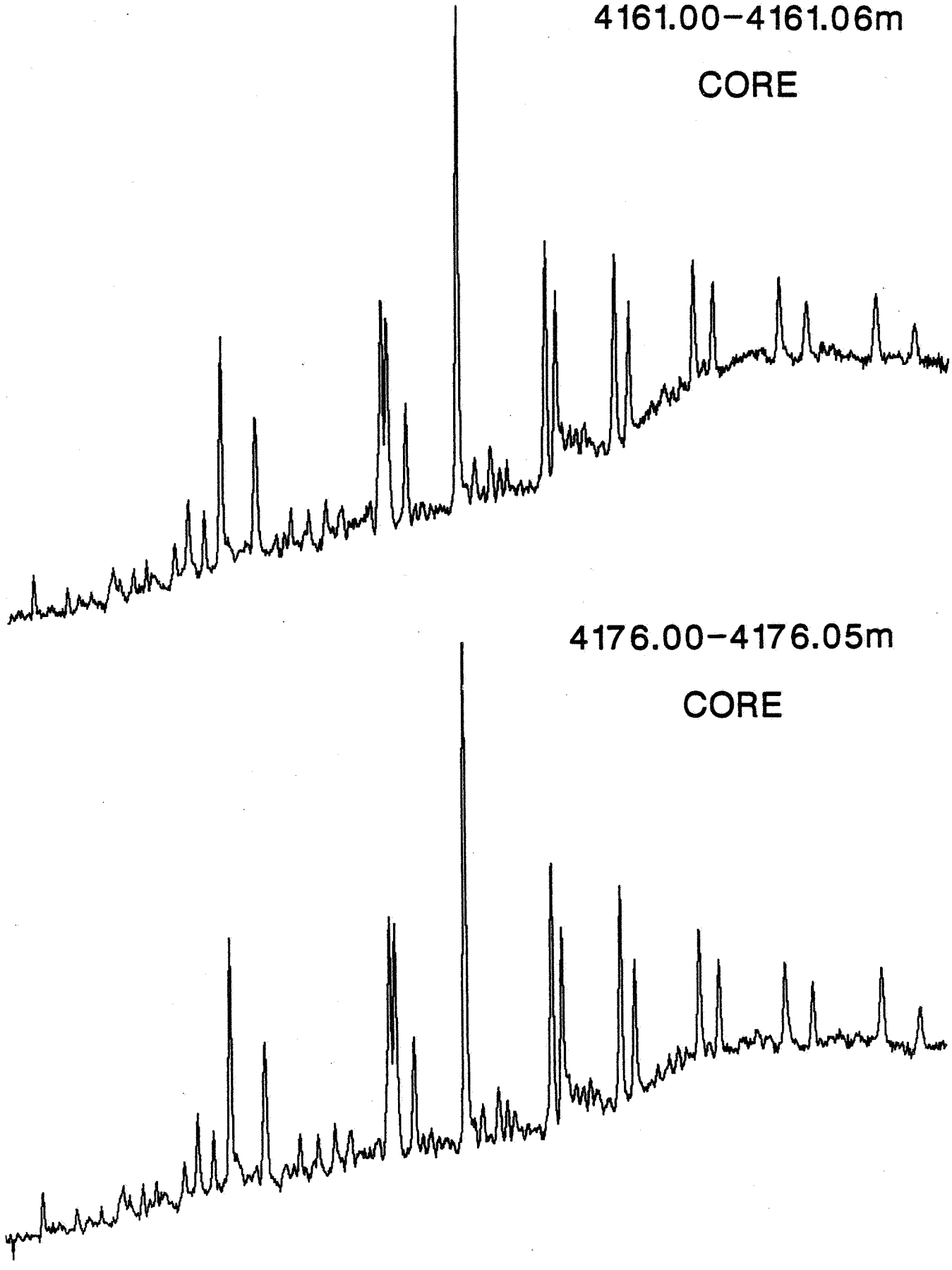


FIGURE 6f **MASS FRAGMENTOGRAMS** WELL 6506/12-3

TRITERPANES m/z 191

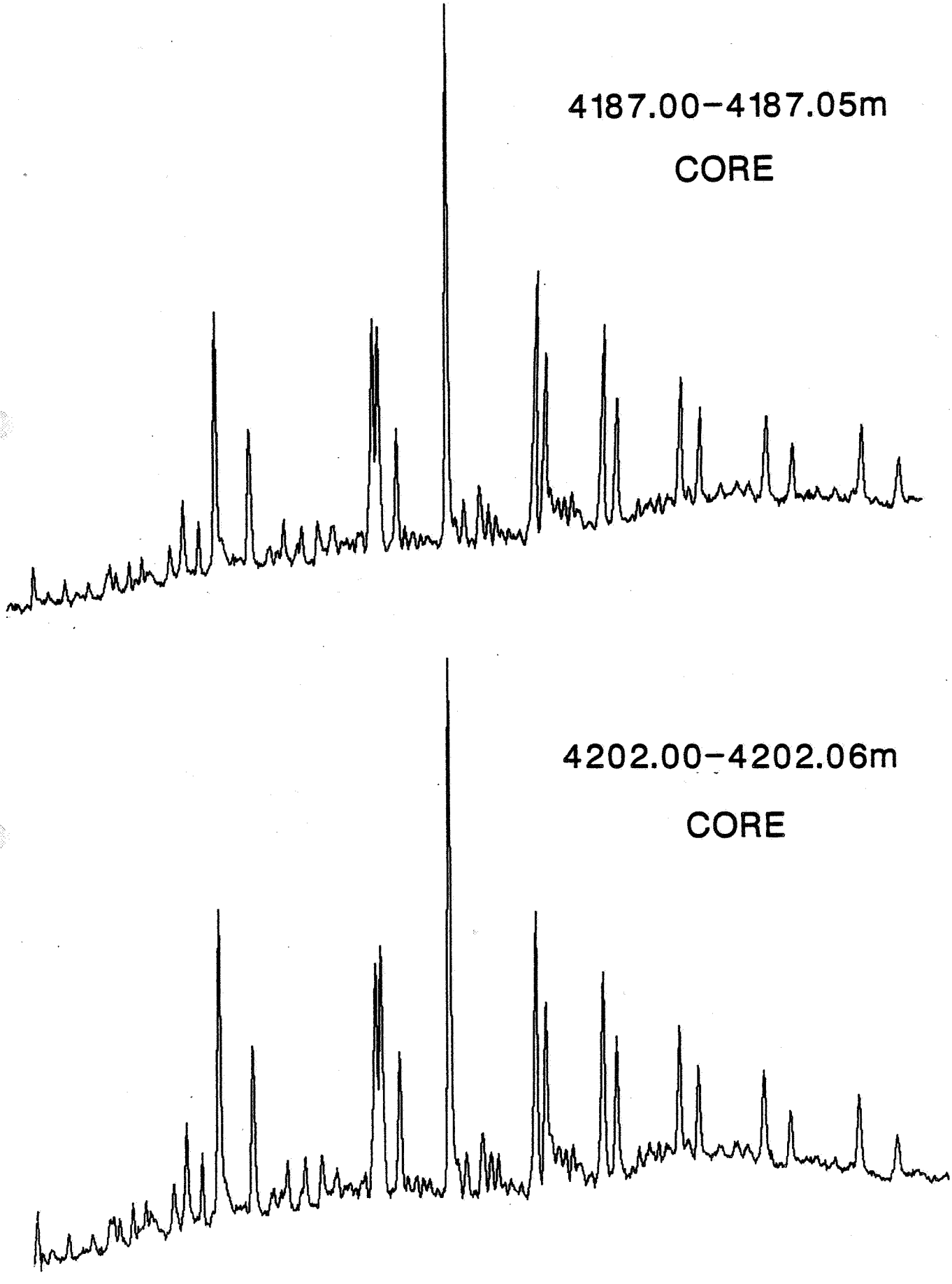


FIGURE 6g

MASS FRAGMENTOGRAMS

WELL 6506/12-3

TRITERPANES m/z 191

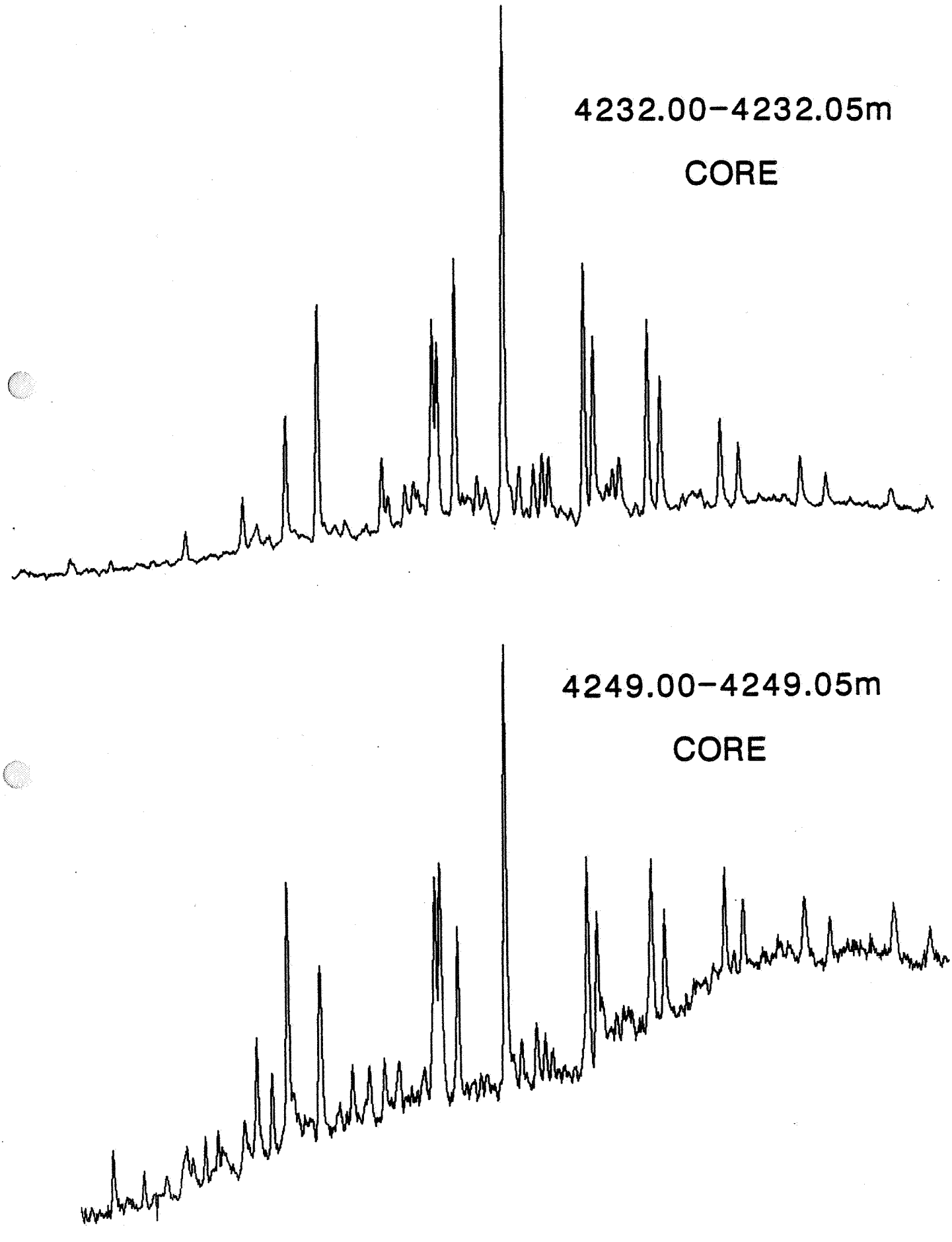


FIGURE 6h

MASS FRAGMENTOGRAMS

WELL 6506/12-3

TRITERPANES m/z 191

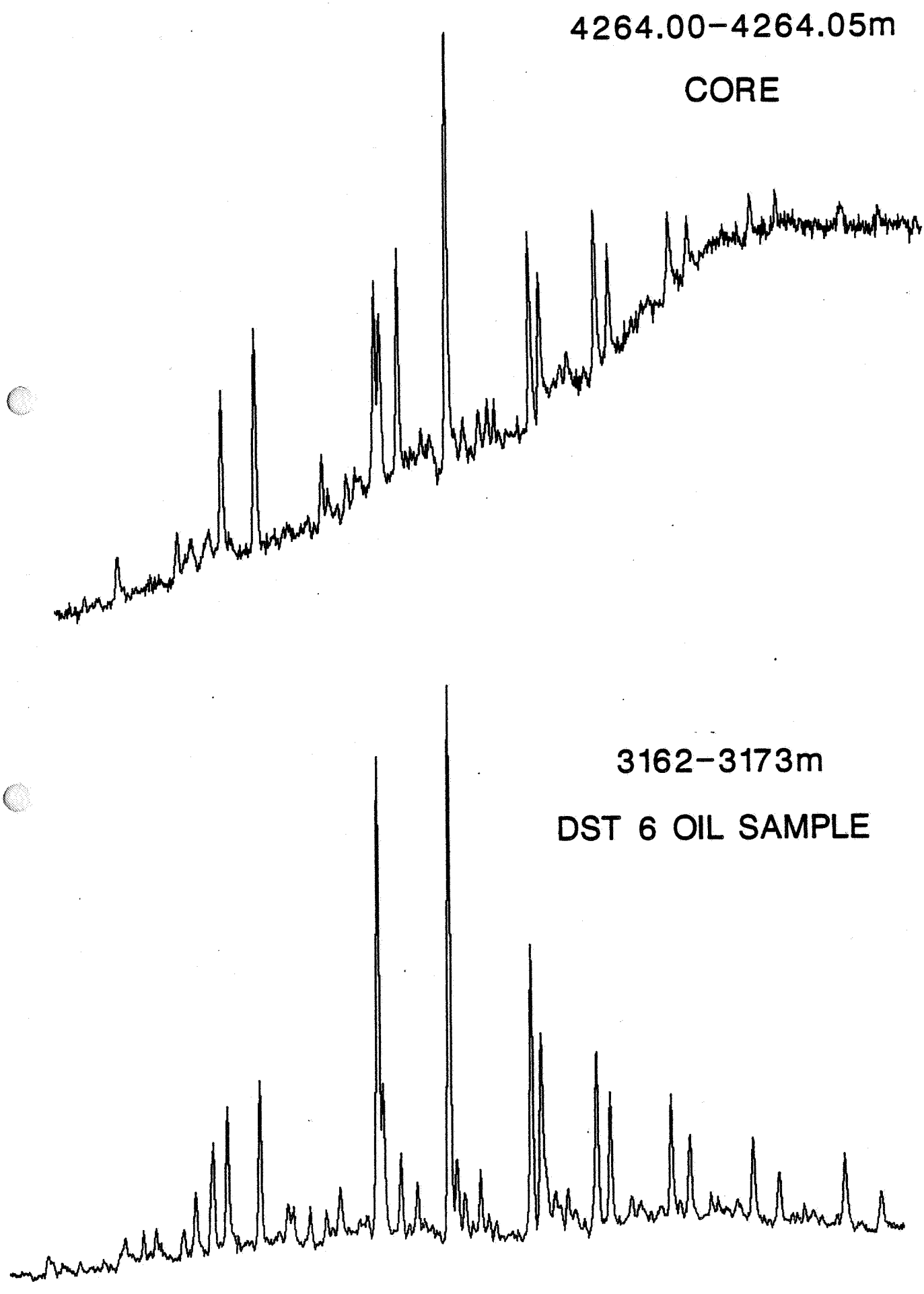


FIGURE 6i **MASS FRAGMENTOGRAMS** WELL 6506/12-3

TRITERPANES m/z 191

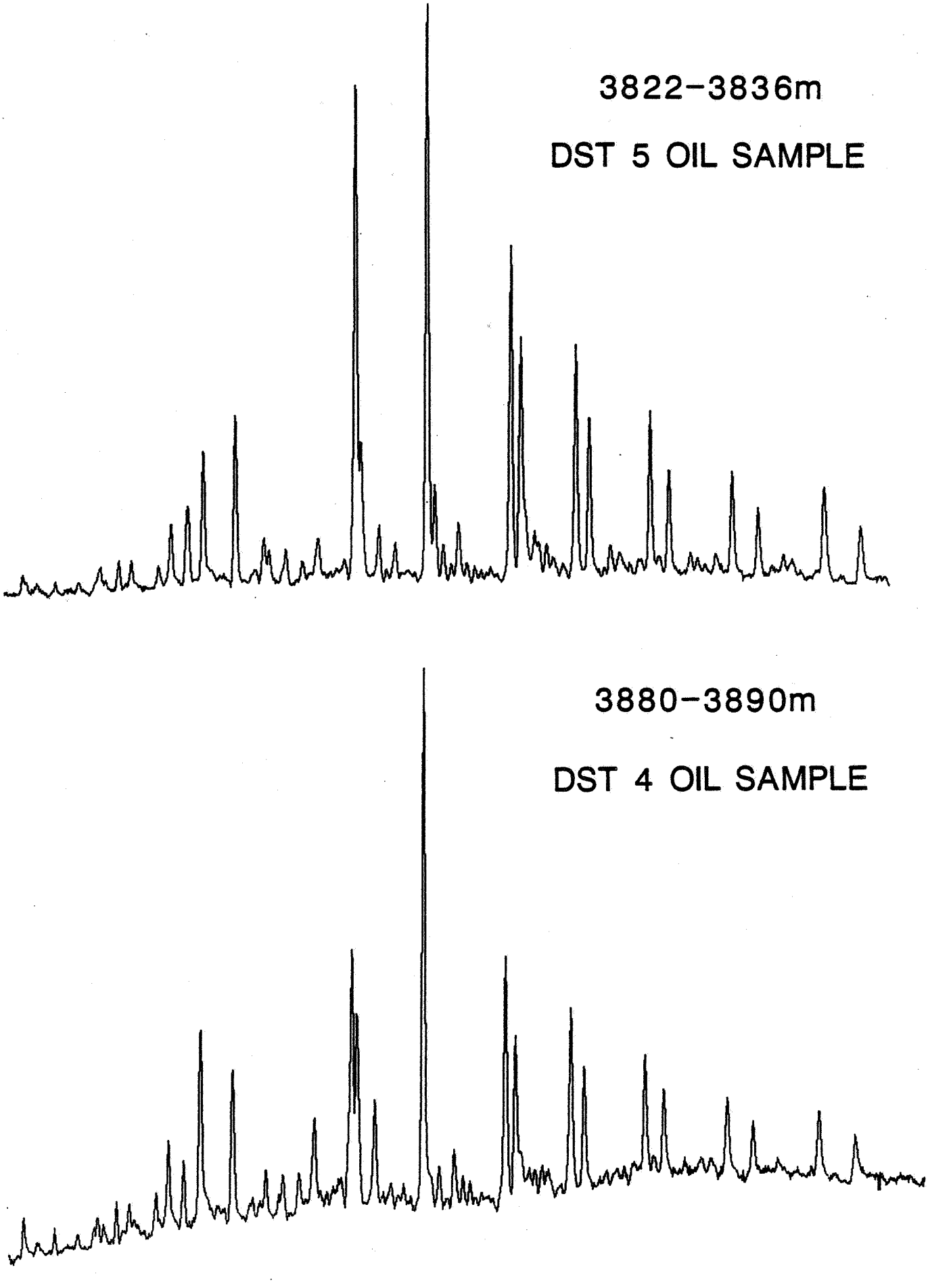


FIGURE 6j

MASS FRAGMENTOGRAMS

WELL 6506/12-3

TRITERPANES m/z 191

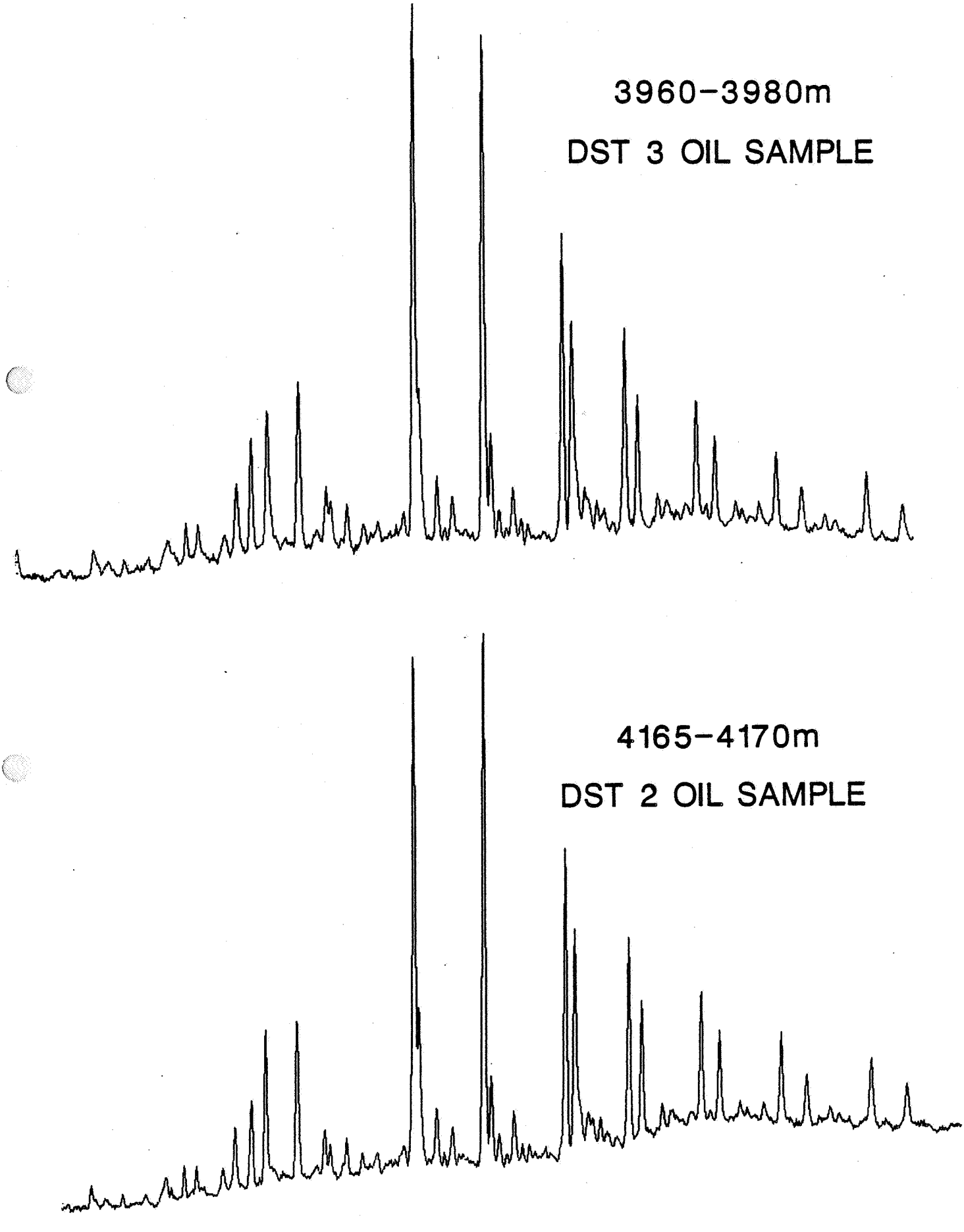
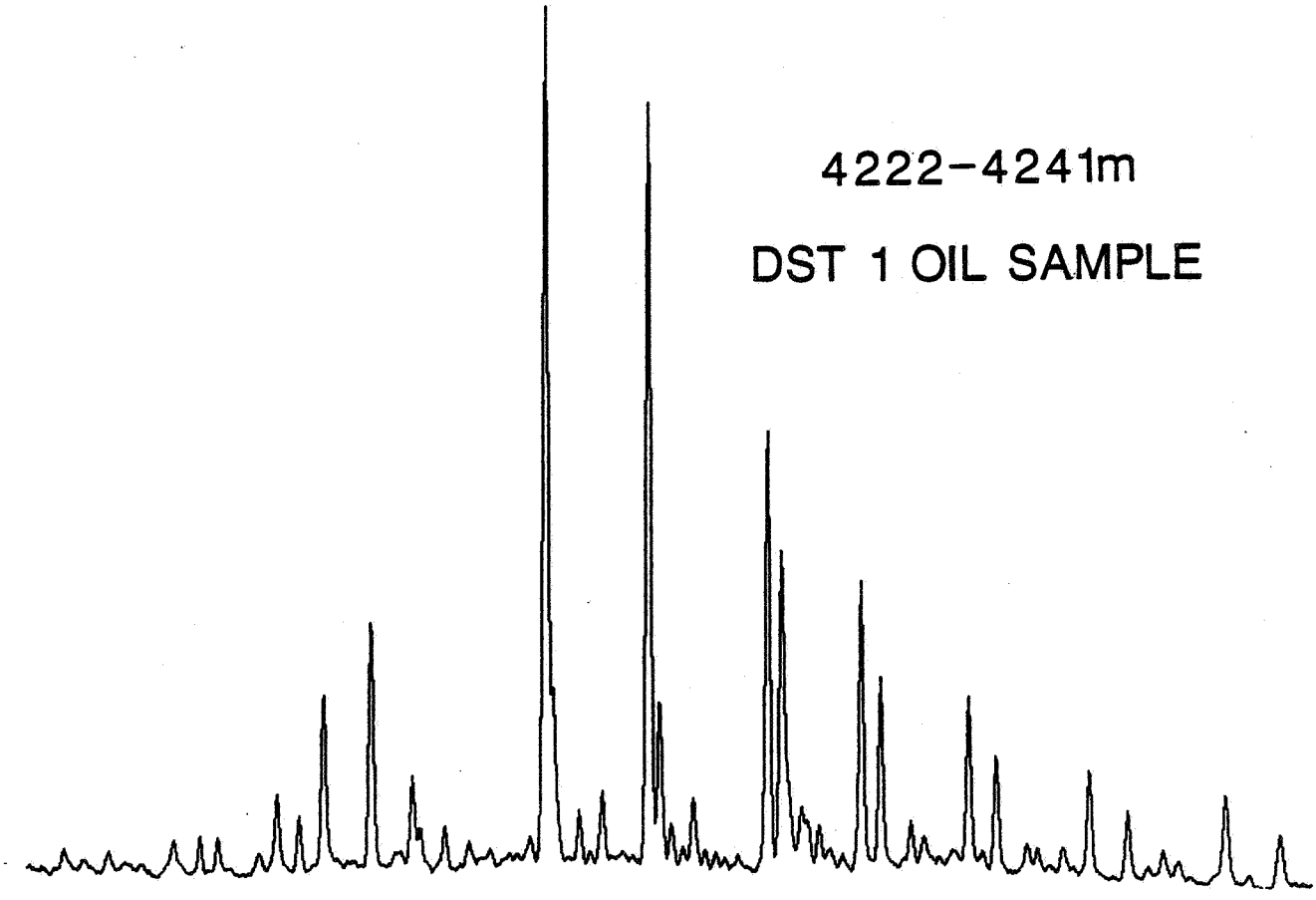


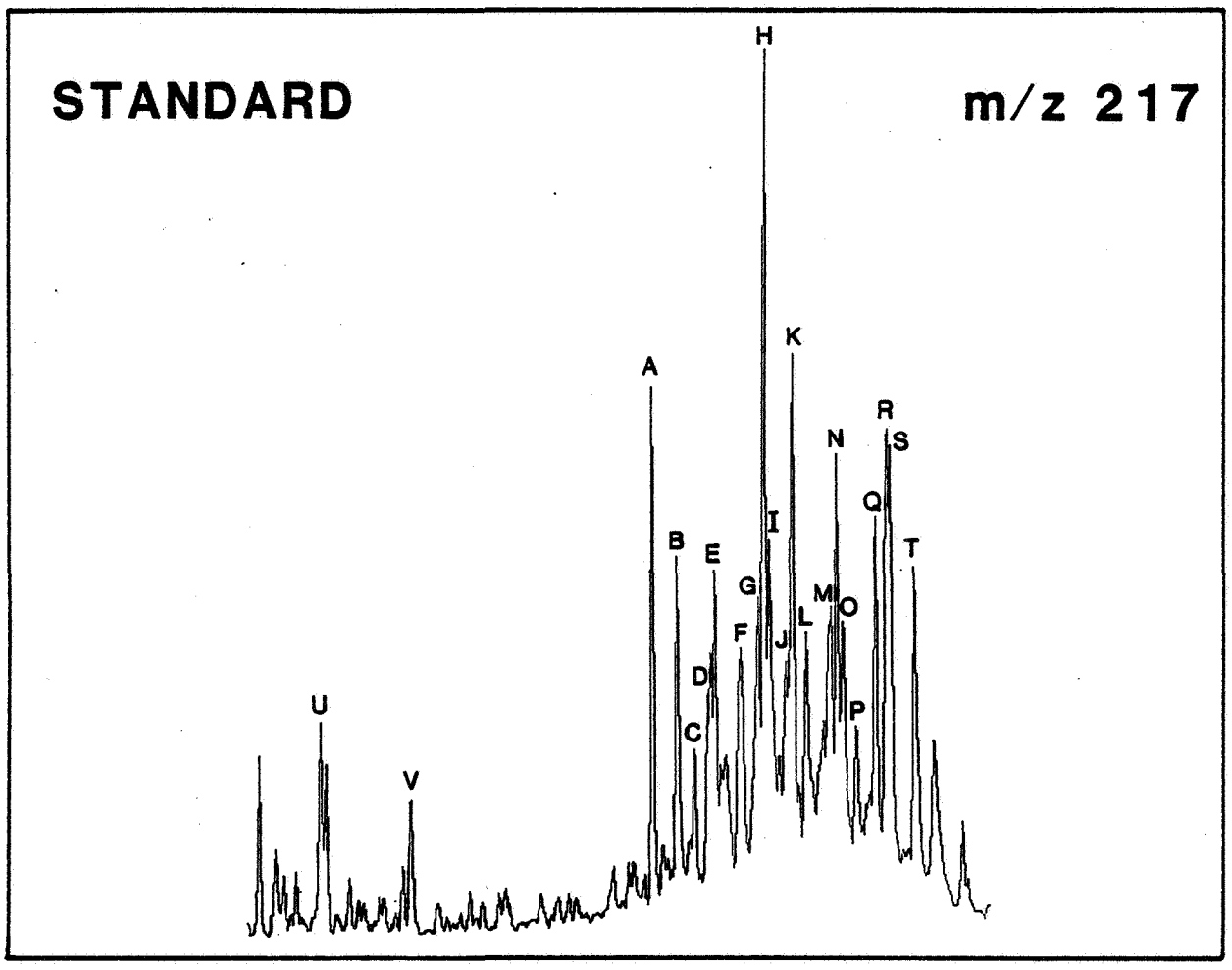
FIGURE 6k

MASS FRAGMENTOGRAMS

WELL 6506/12-3

TRITERPANES m/z 191





STERANE IDENTIFICATION

(M/Z 217 FRAGMENTOGRAM)

	COMPOUND	ELEMENTAL COMPOSITION
A	13β,17α-diacholestane (20S)	$C_{27}H_{48}$
B	13β,17α-diacholestane (20R)	$C_{27}H_{48}$
C	13α,17β-diacholestane (20S)	$C_{27}H_{48}$
D	13α,17β-diacholestane (20R)	$C_{27}H_{48}$
E	24-methyl-13β,17α-diacholestane (20S)	$C_{28}H_{50}$
F	24-methyl-13β,17α-diacholestane (20R)	$C_{28}H_{50}$
G	24-methyl-13α,17β-diacholestane (20S)	$C_{28}H_{50}$
+	14α,17α-cholestane (20S)	$C_{27}H_{48}$
H	24-ethyl-13β,17α-diacholestane (20S)	$C_{29}H_{52}$
+	14β,17β-cholestane (20R)	$C_{27}H_{48}$
I	14β,17β-cholestane (20S)	$C_{27}H_{48}$
+	24-methyl-13α,17β-diacholestane (20R)	$C_{28}H_{50}$
J	14α,17α-cholestane (20R)	$C_{27}H_{48}$
K	24-ethyl-13β,17α-diacholestane (20R)	$C_{29}H_{52}$
L	24-ethyl-14α,17β-diacholestane (20S)	$C_{29}H_{52}$
M	24-methyl-13α,17α-cholestane (20S)	$C_{28}H_{50}$
N	24-ethyl-13α,17β-diacholestane (20R)	$C_{29}H_{52}$
+	24-methyl-14β,17β-cholestane (20R)	$C_{28}H_{50}$
O	24-methyl-14β,17β-cholestane (20S)	$C_{28}H_{50}$
P	24-methyl-14α,17α-cholestane (20R)	$C_{28}H_{50}$
Q	24-ethyl-14α,17α-cholestane (20S)	$C_{29}H_{52}$
R	24-ethyl-14β,17β-cholestane (20R)	$C_{29}H_{52}$
+	UNKNOWN STERANE	
S	24-ethyl-14β,17β-cholestane (20S)	$C_{29}H_{52}$
T	24-ethyl-14α,17α-cholestane (20R)	$C_{29}H_{52}$
U	5α(H)-pregnane	$C_{21}H_{36}$
V	5α(H)-bisnorcholane	$C_{22}H_{38}$

FIGURE 7a **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 217

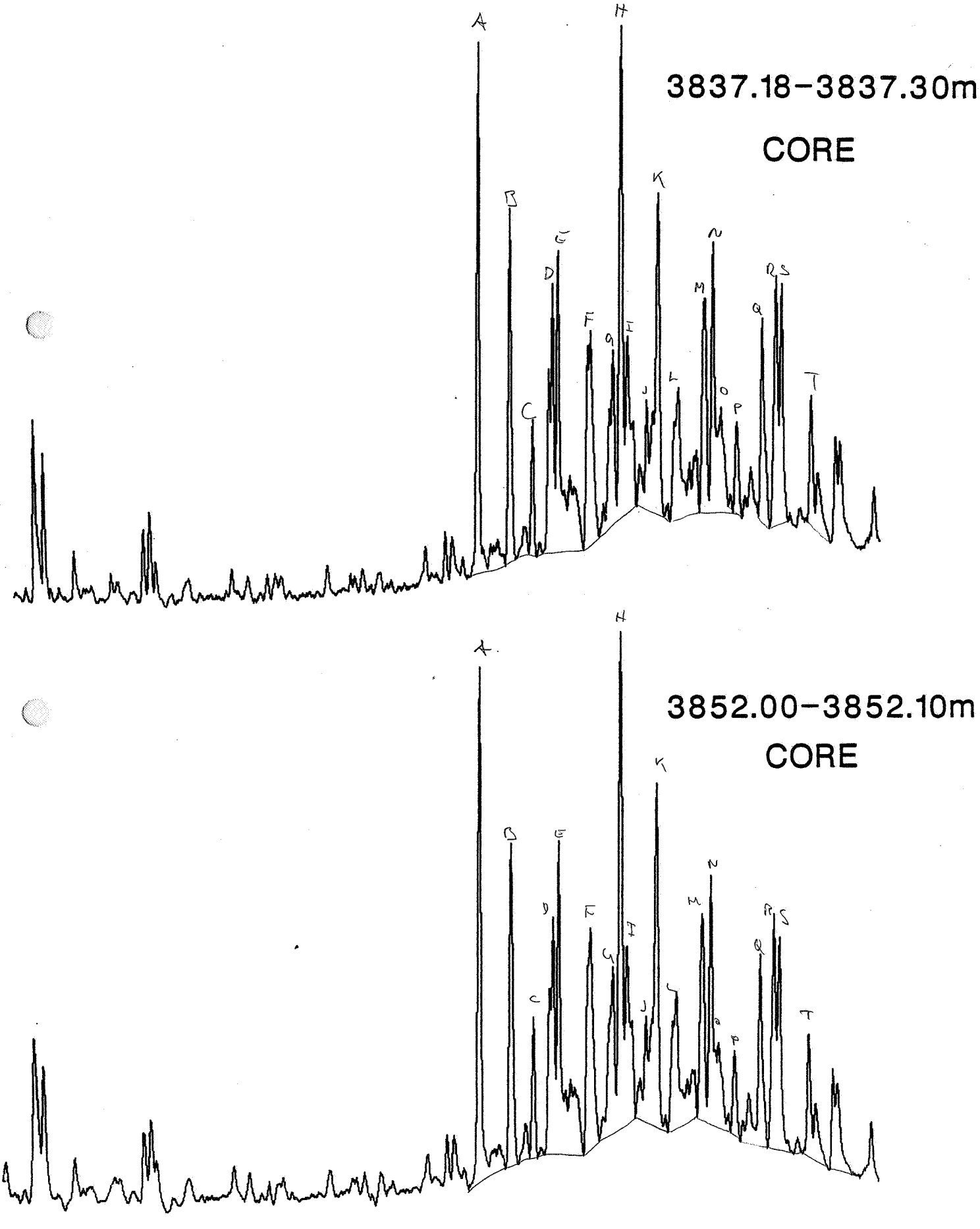
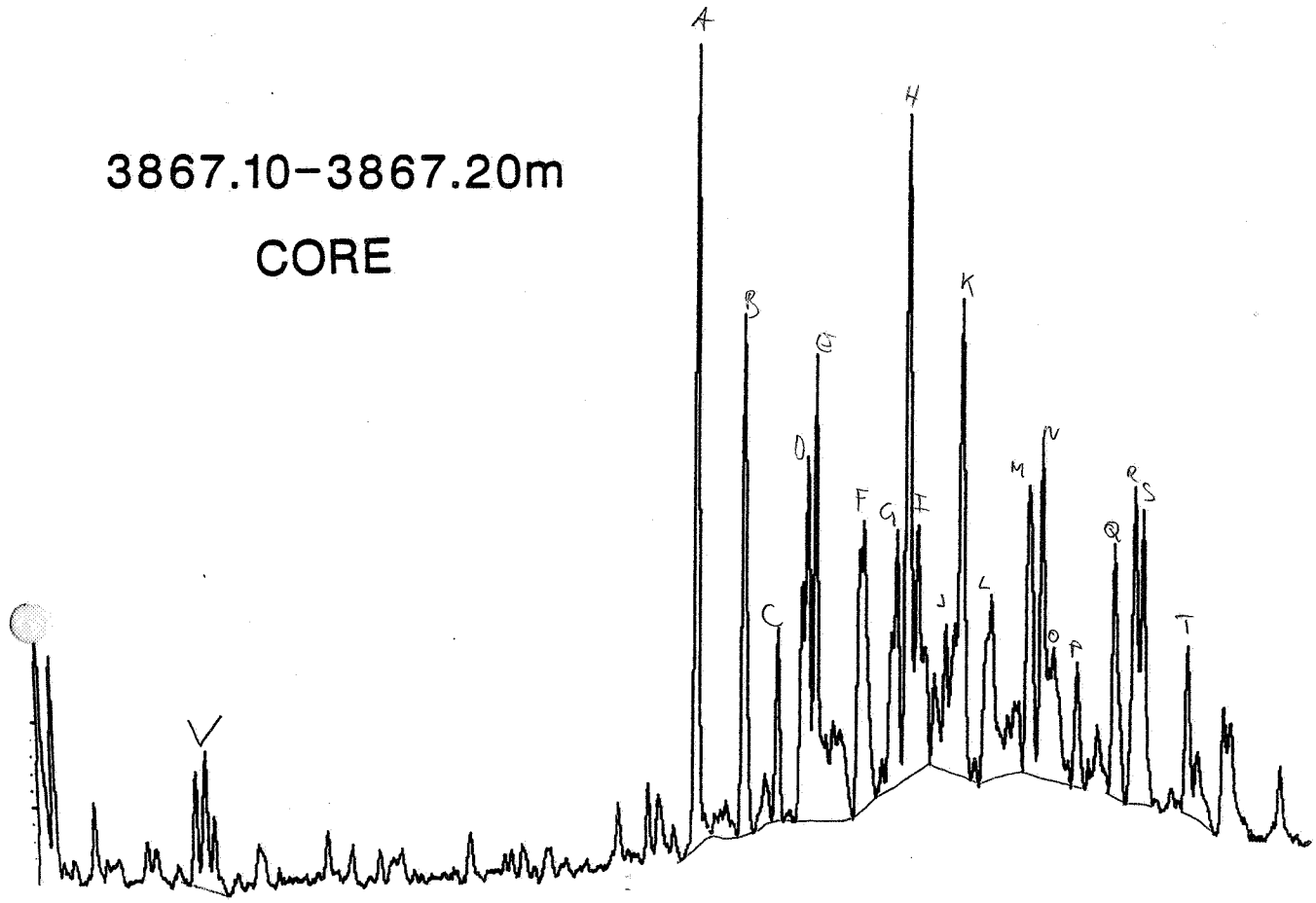


FIGURE 7b **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 217



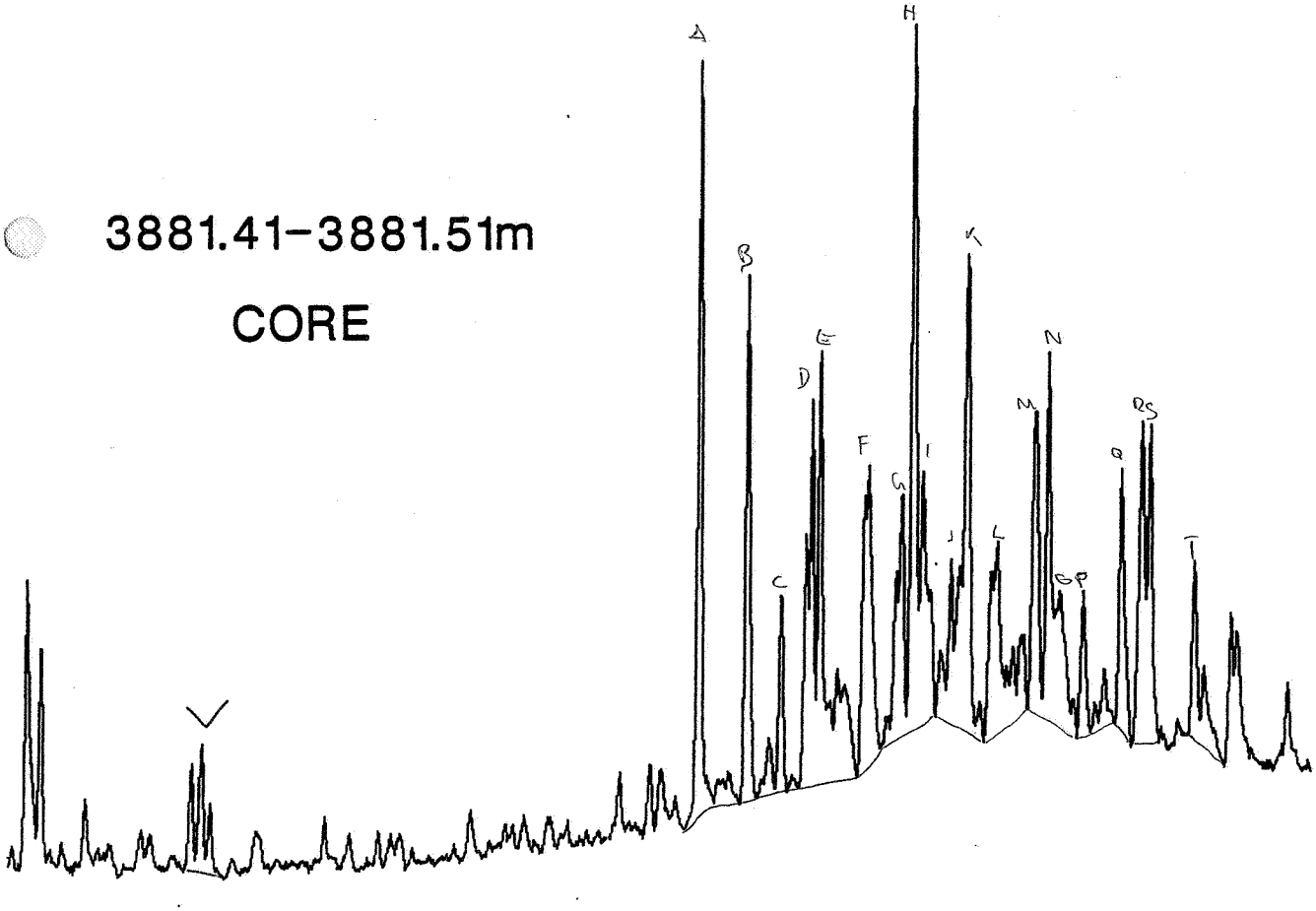


FIGURE 7c **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 217

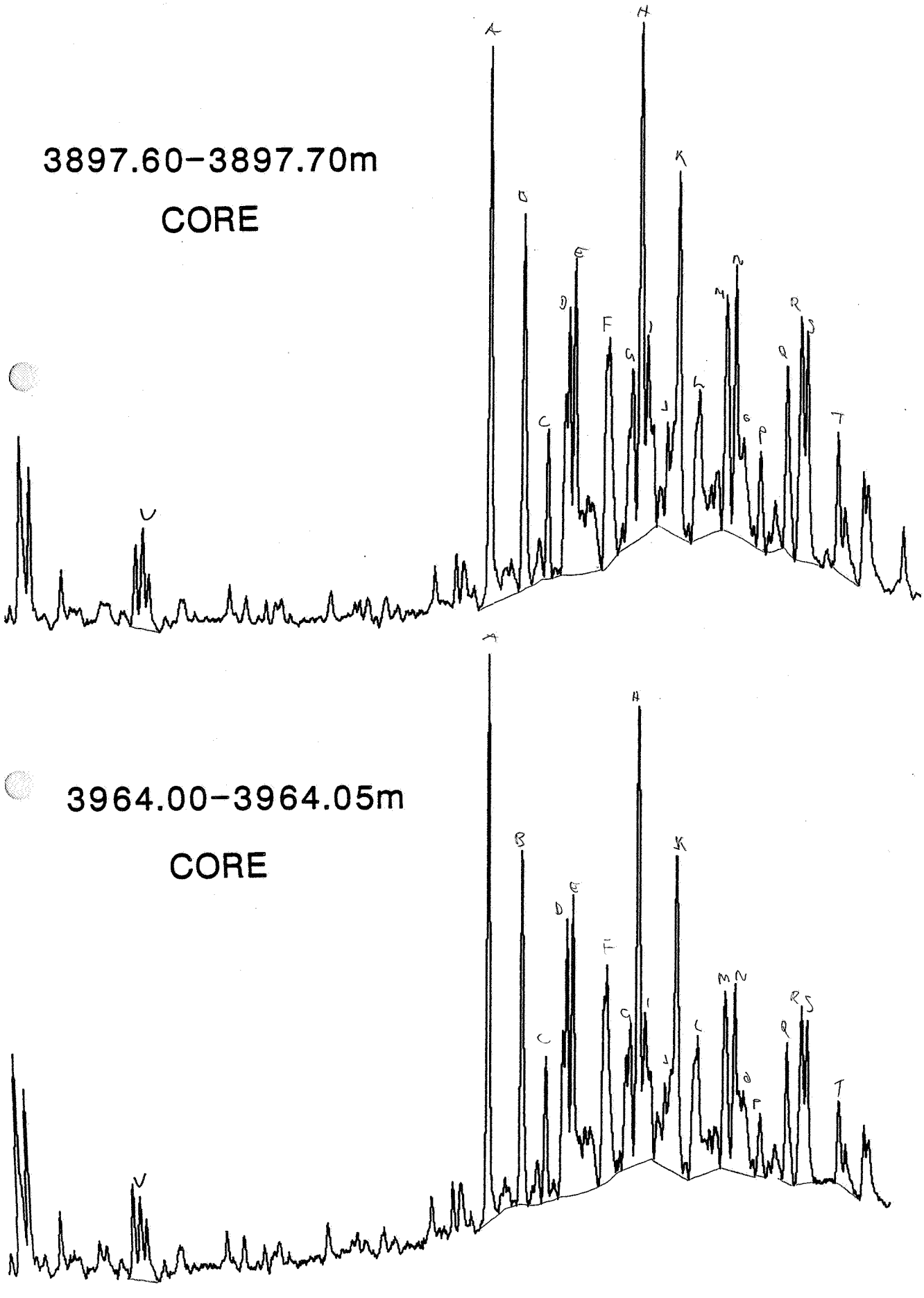
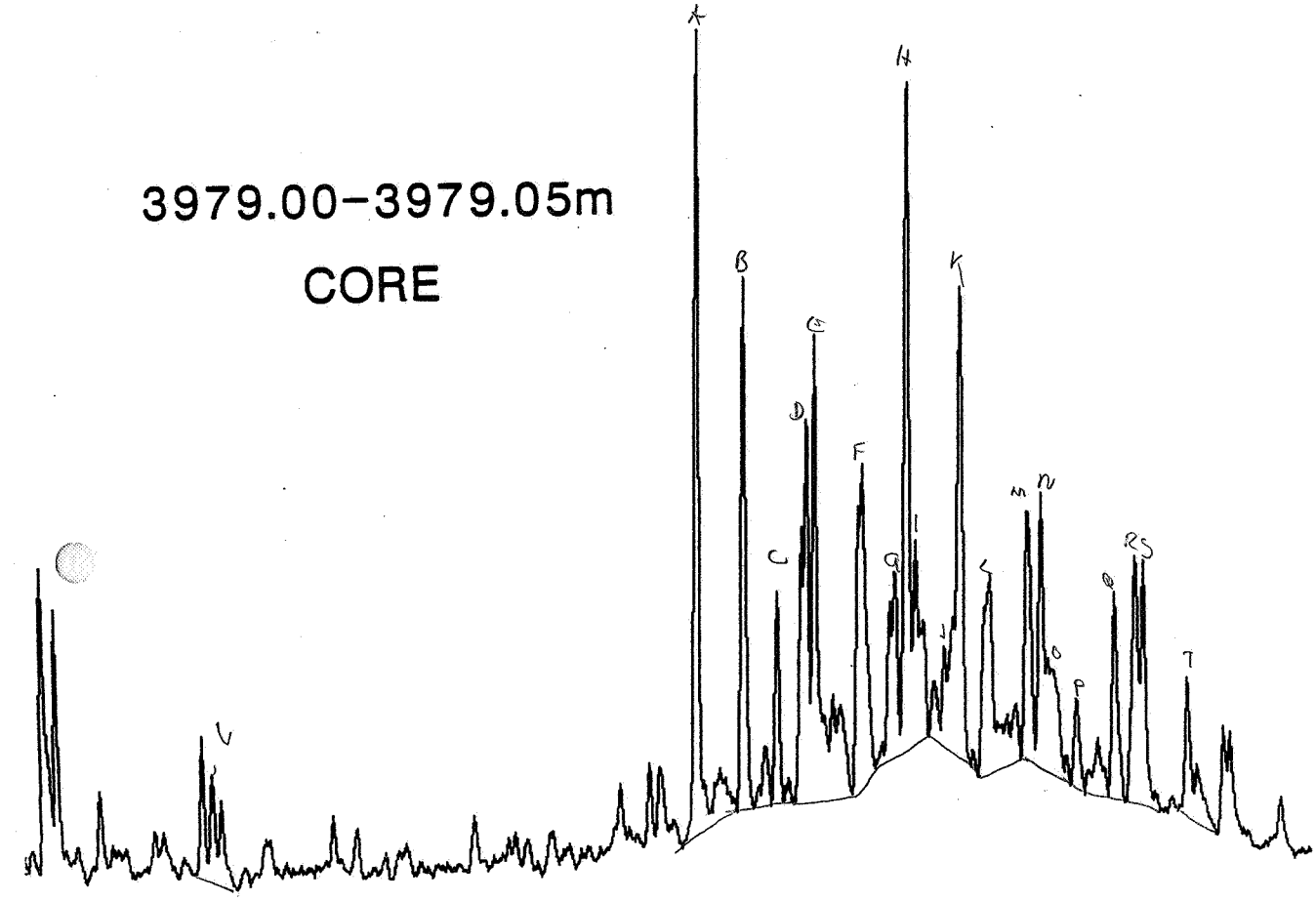


FIGURE 7d **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 217



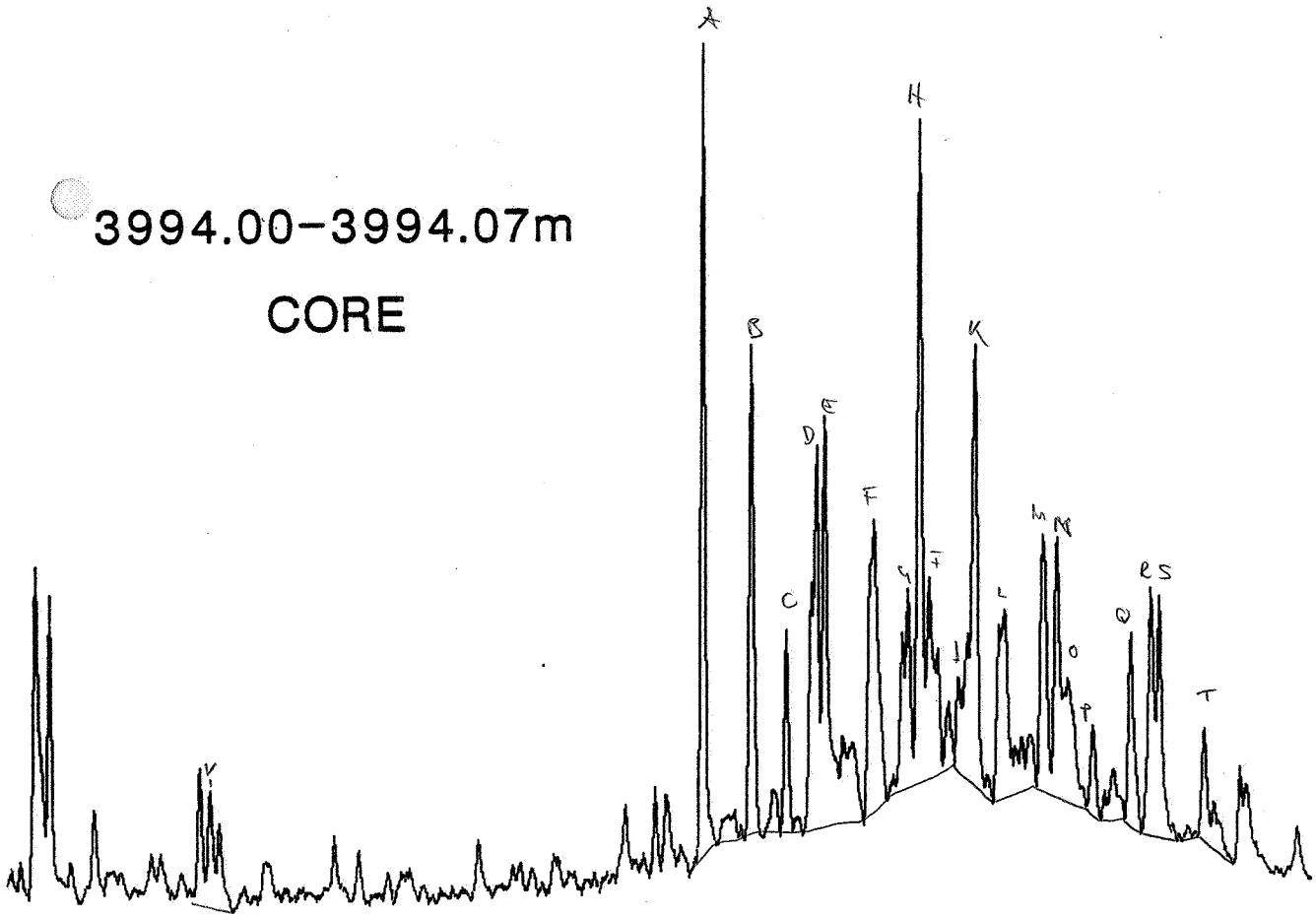
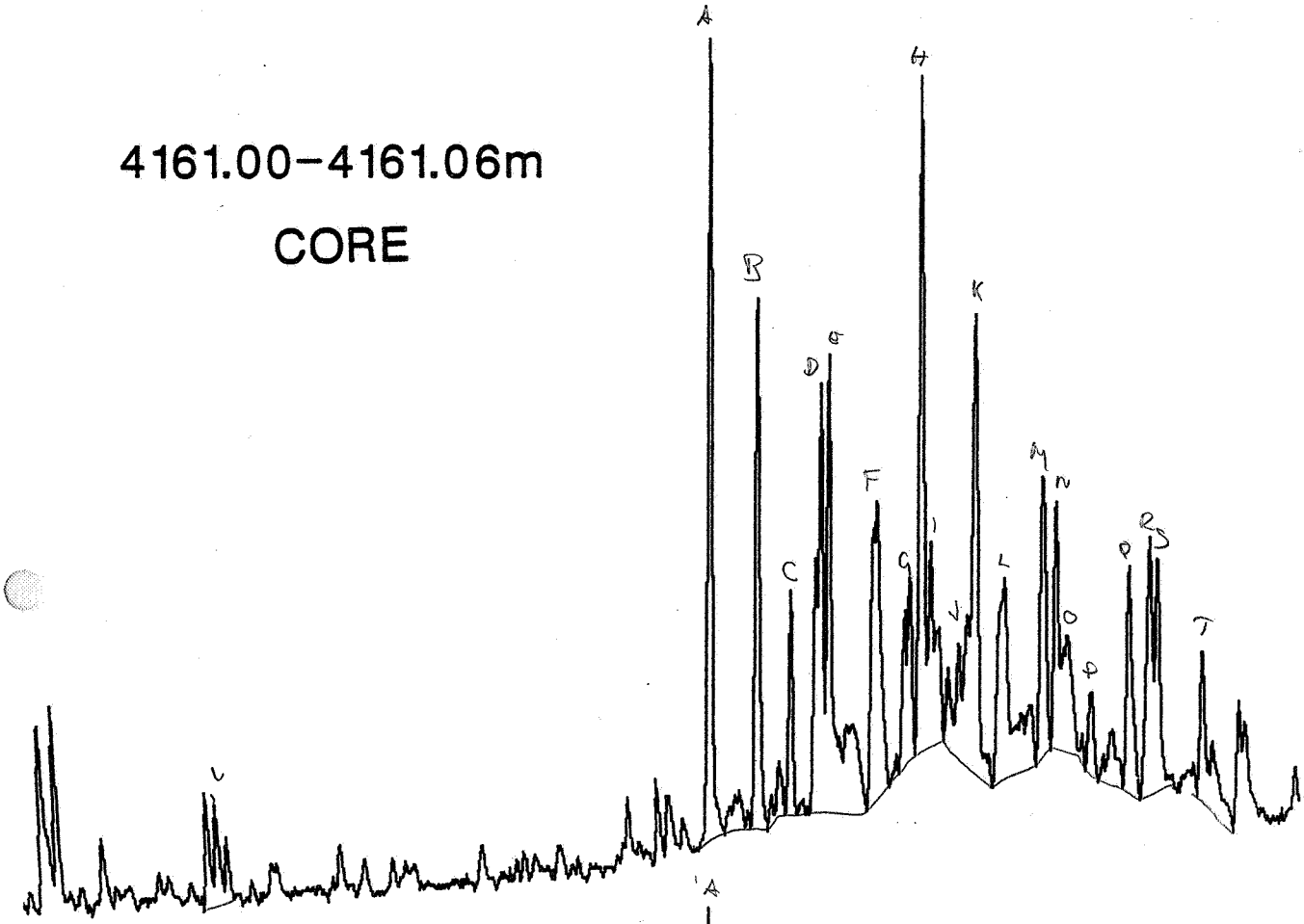


FIGURE 7e **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 217



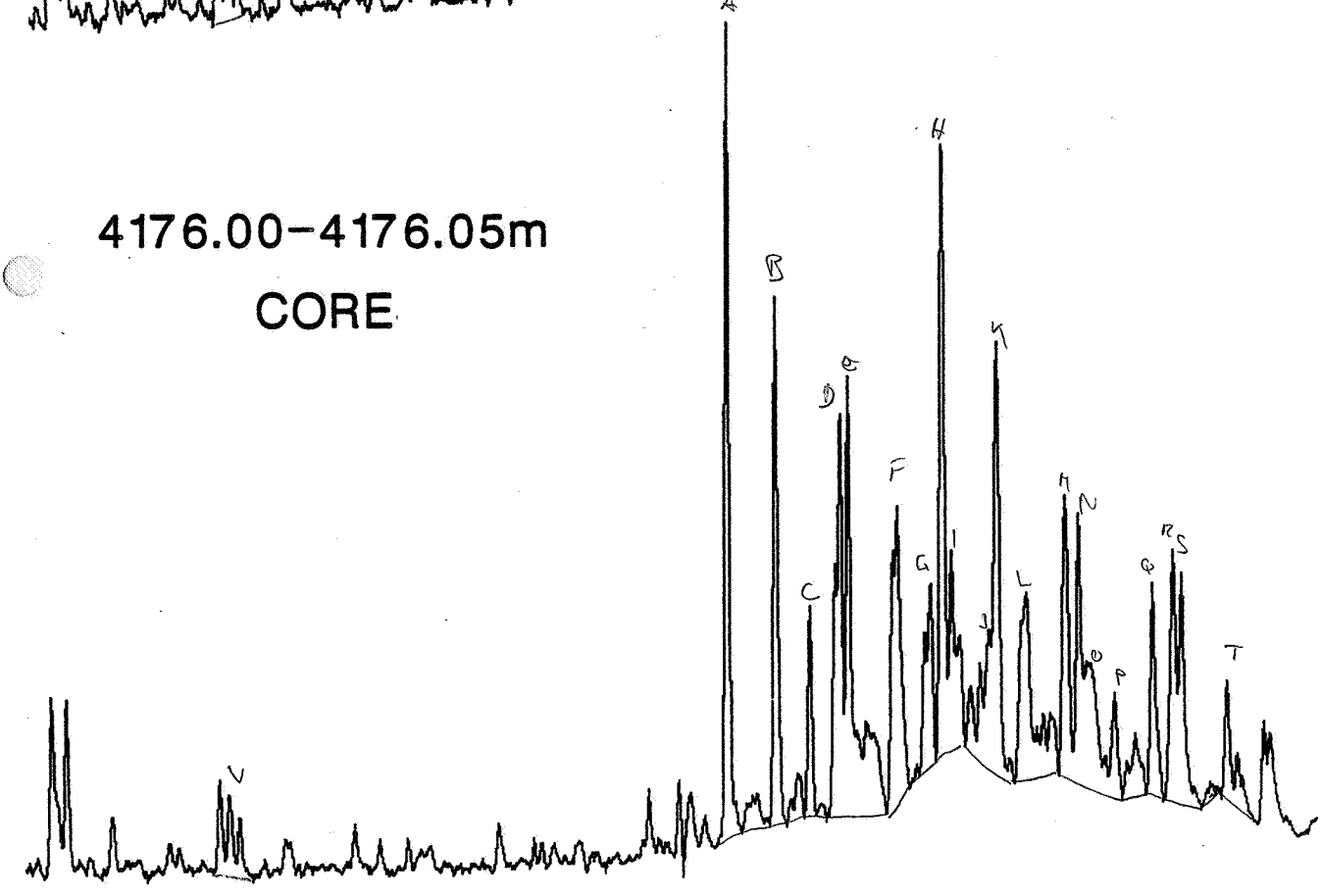
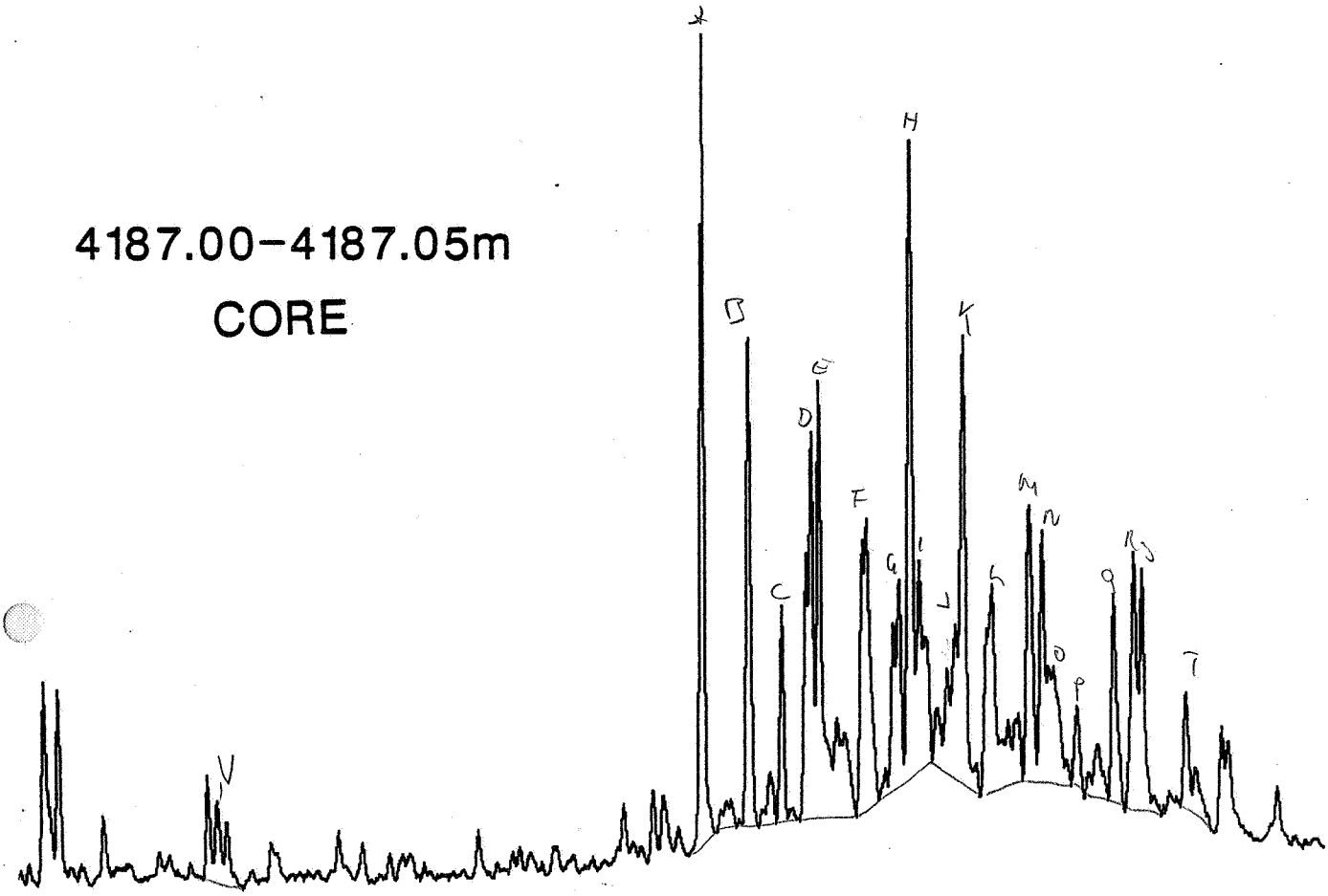


FIGURE 7f **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 217

4187.00–4187.05m

CORE



4202.00–4202.06m

CORE

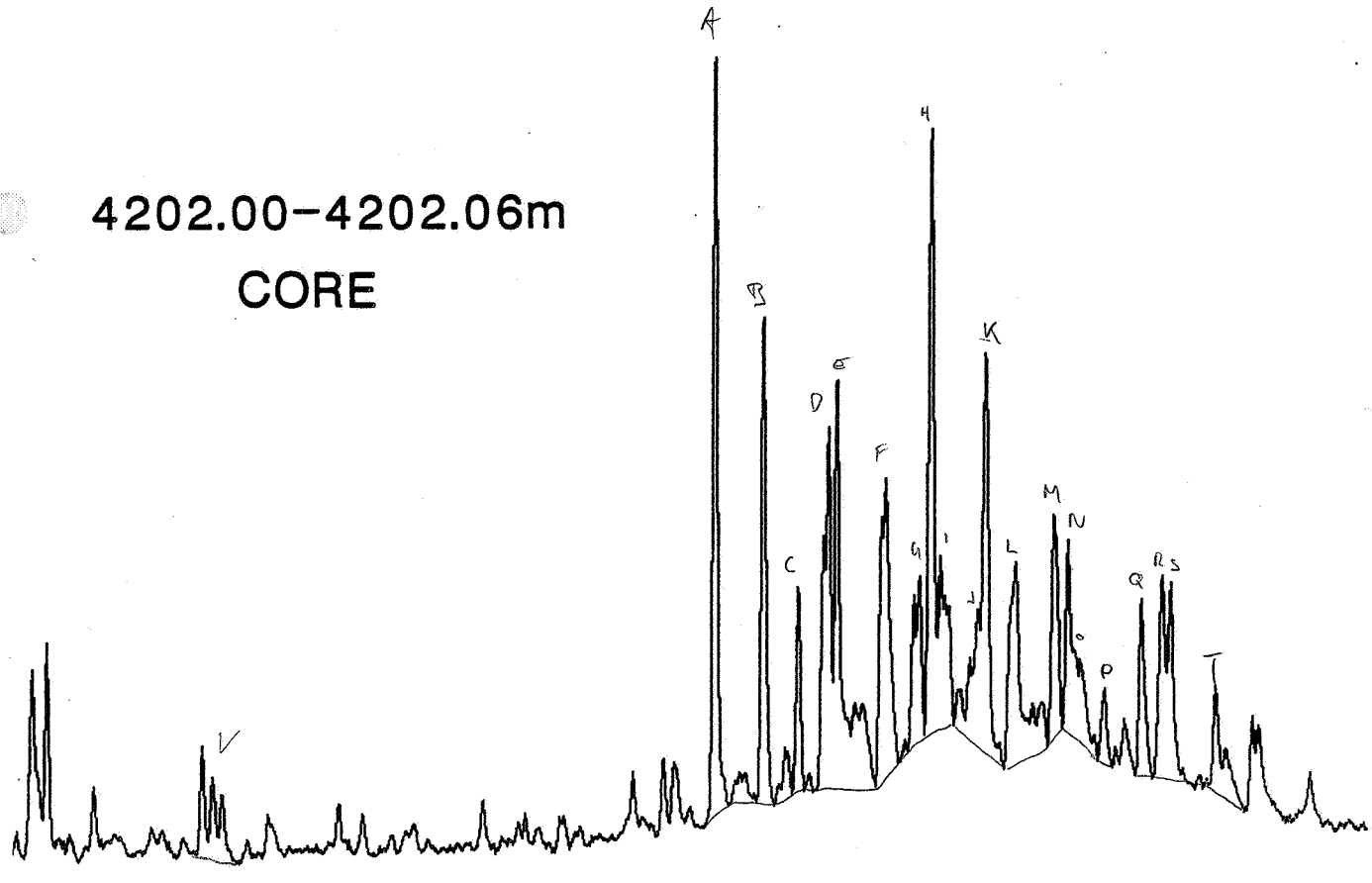
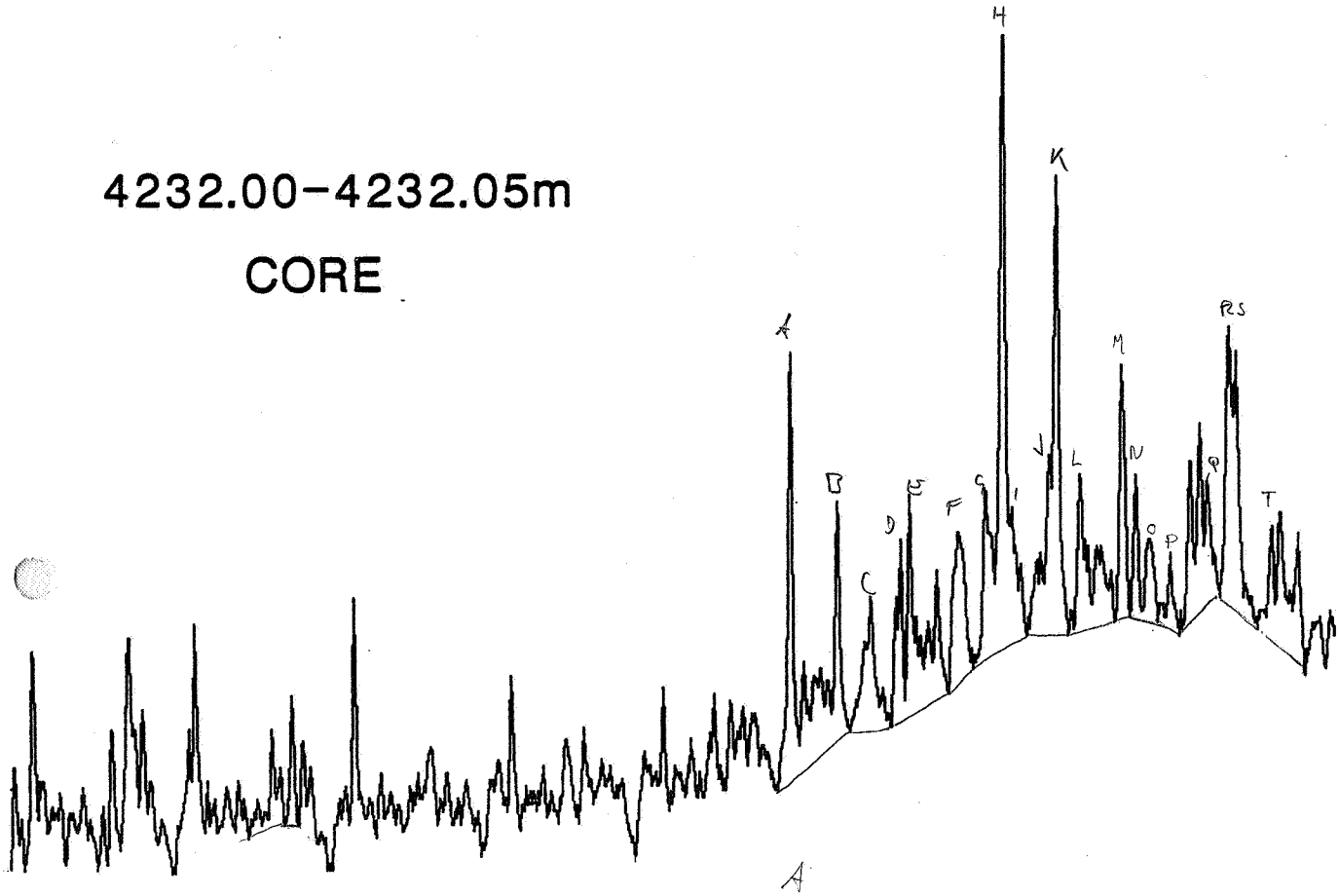


FIGURE 7g **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 217

4232.00-4232.05m

CORE



4249.00-4249.05m

CORE

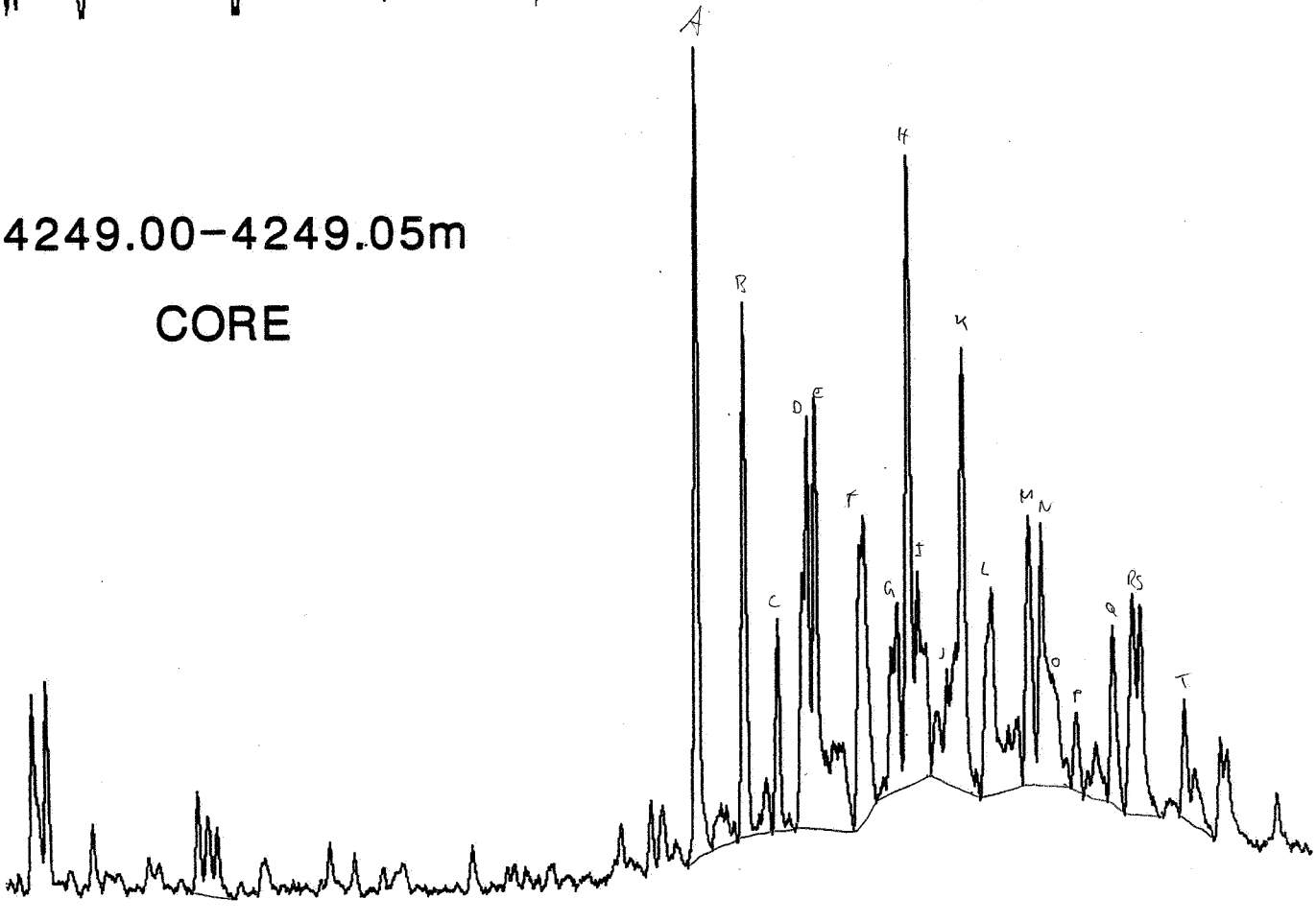
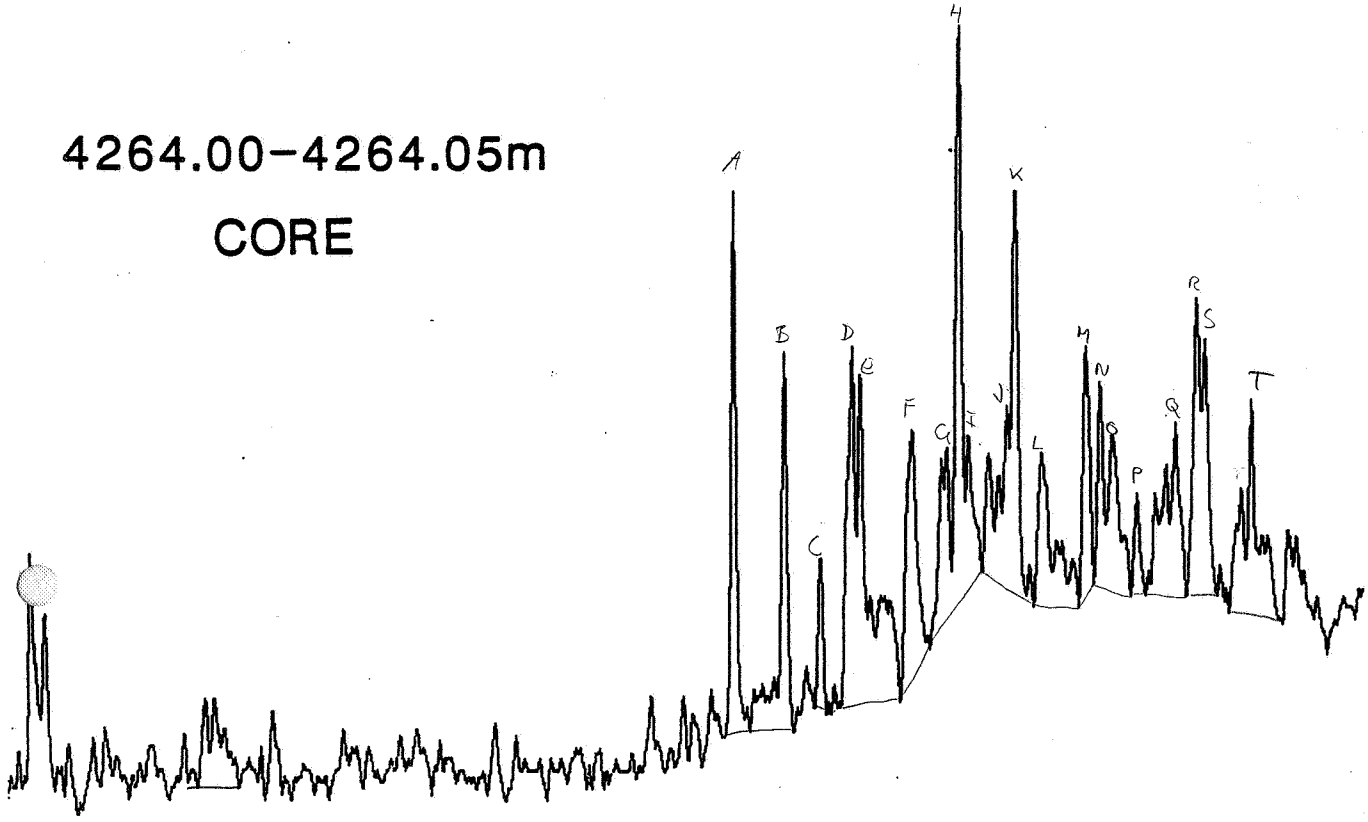


FIGURE 7h **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 217

4264.00–4264.05m

CORE



3162–3173m

DST 6 OIL SAMPLE

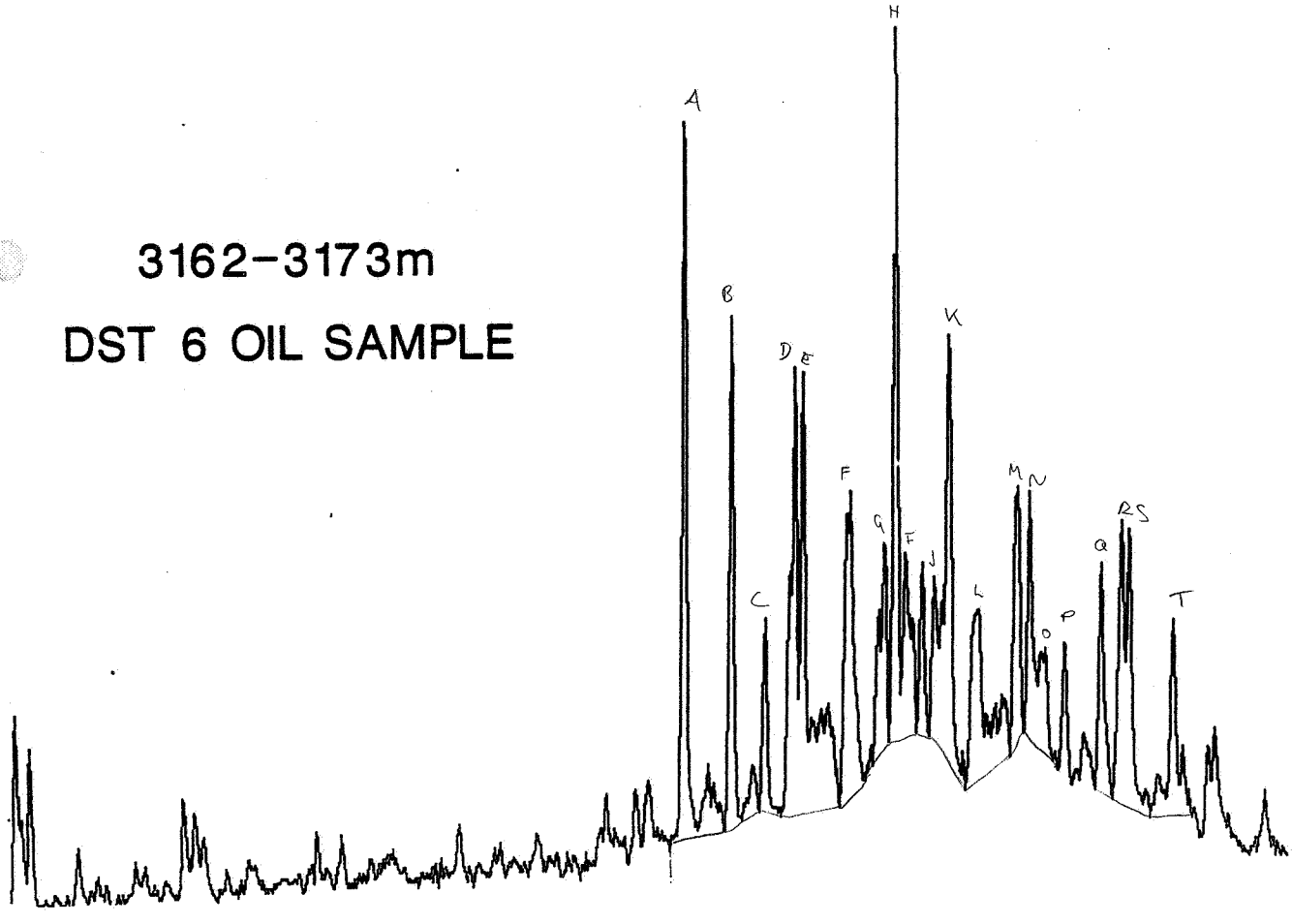
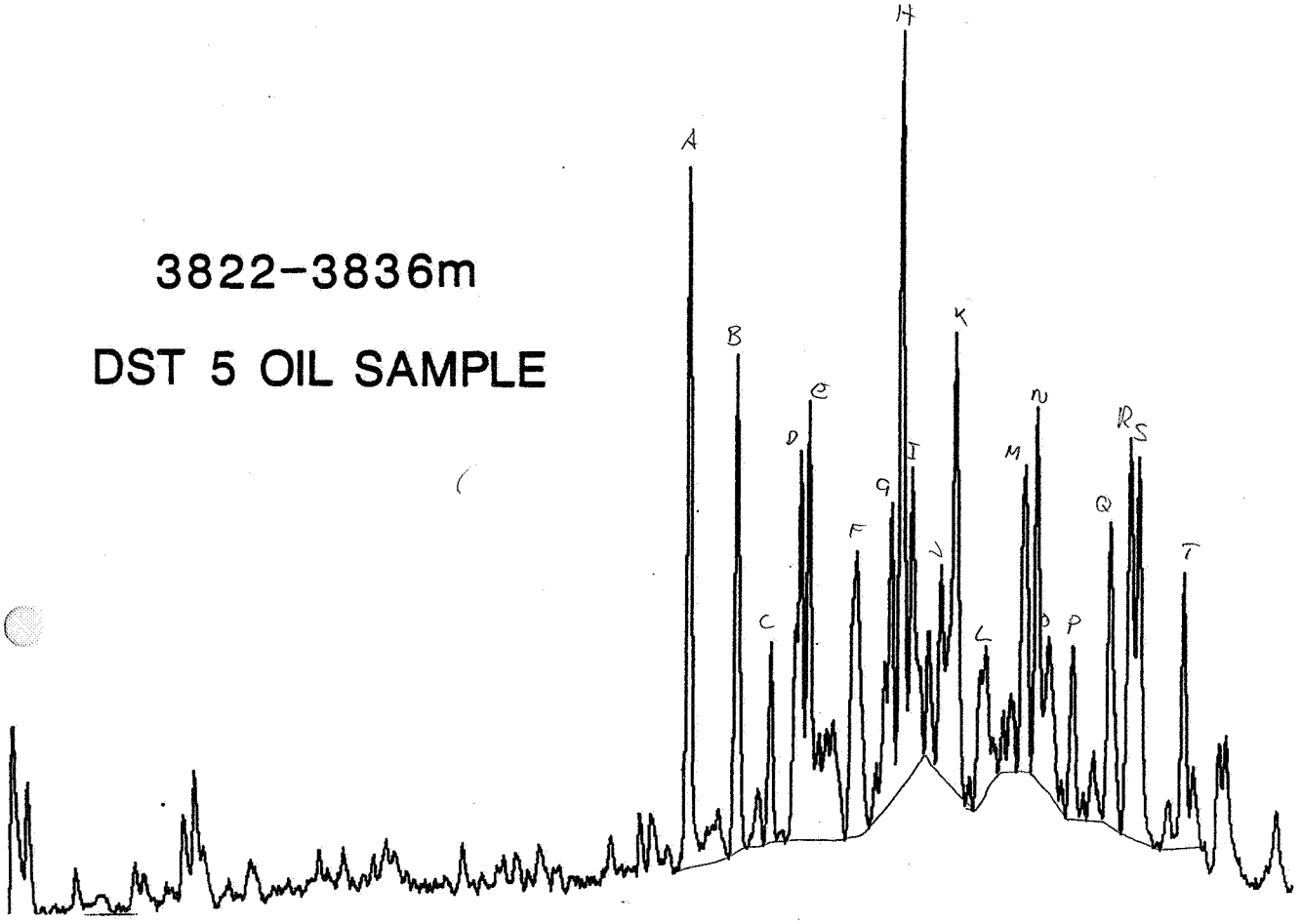


FIGURE 7i **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 217



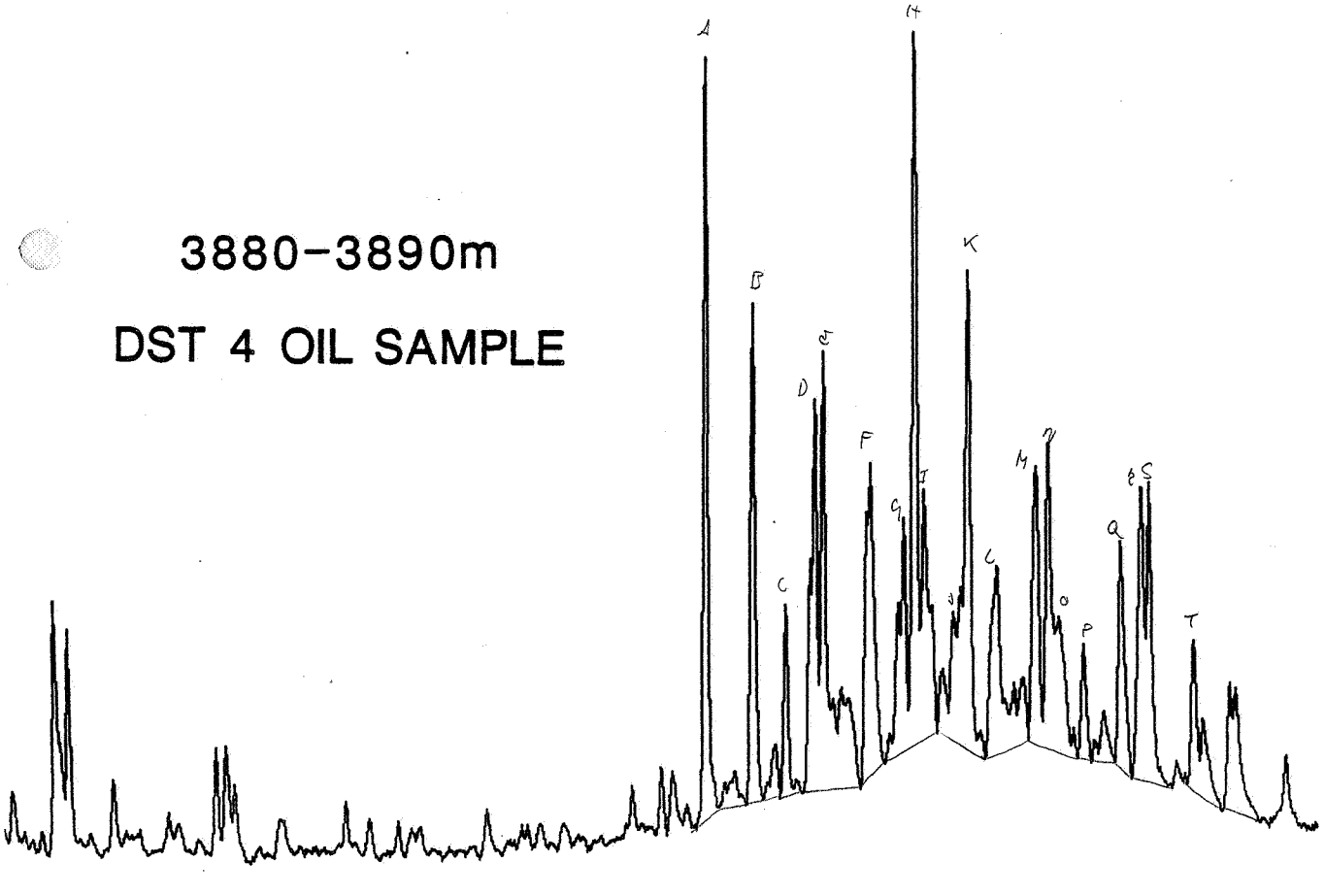
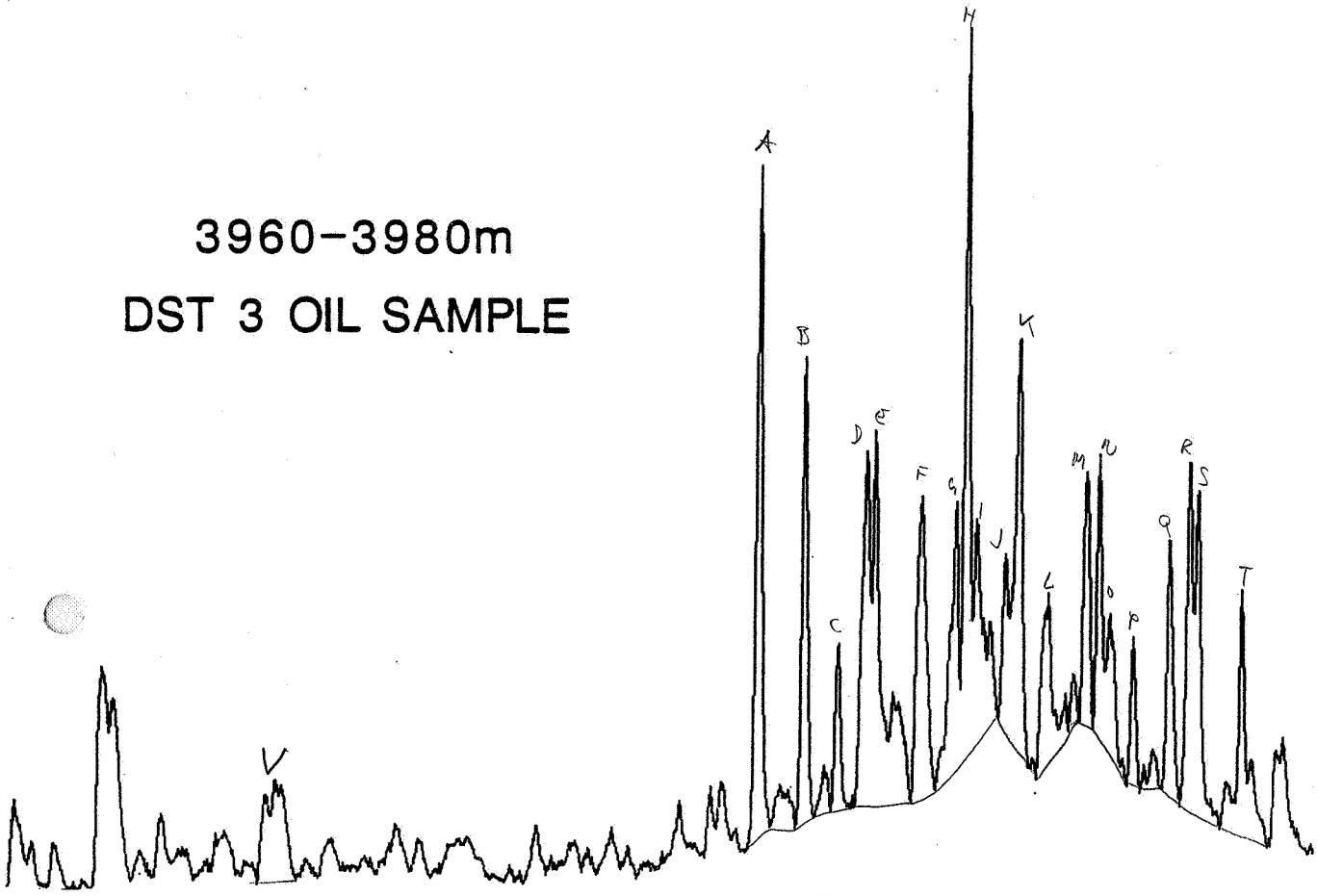


FIGURE 7j **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 217



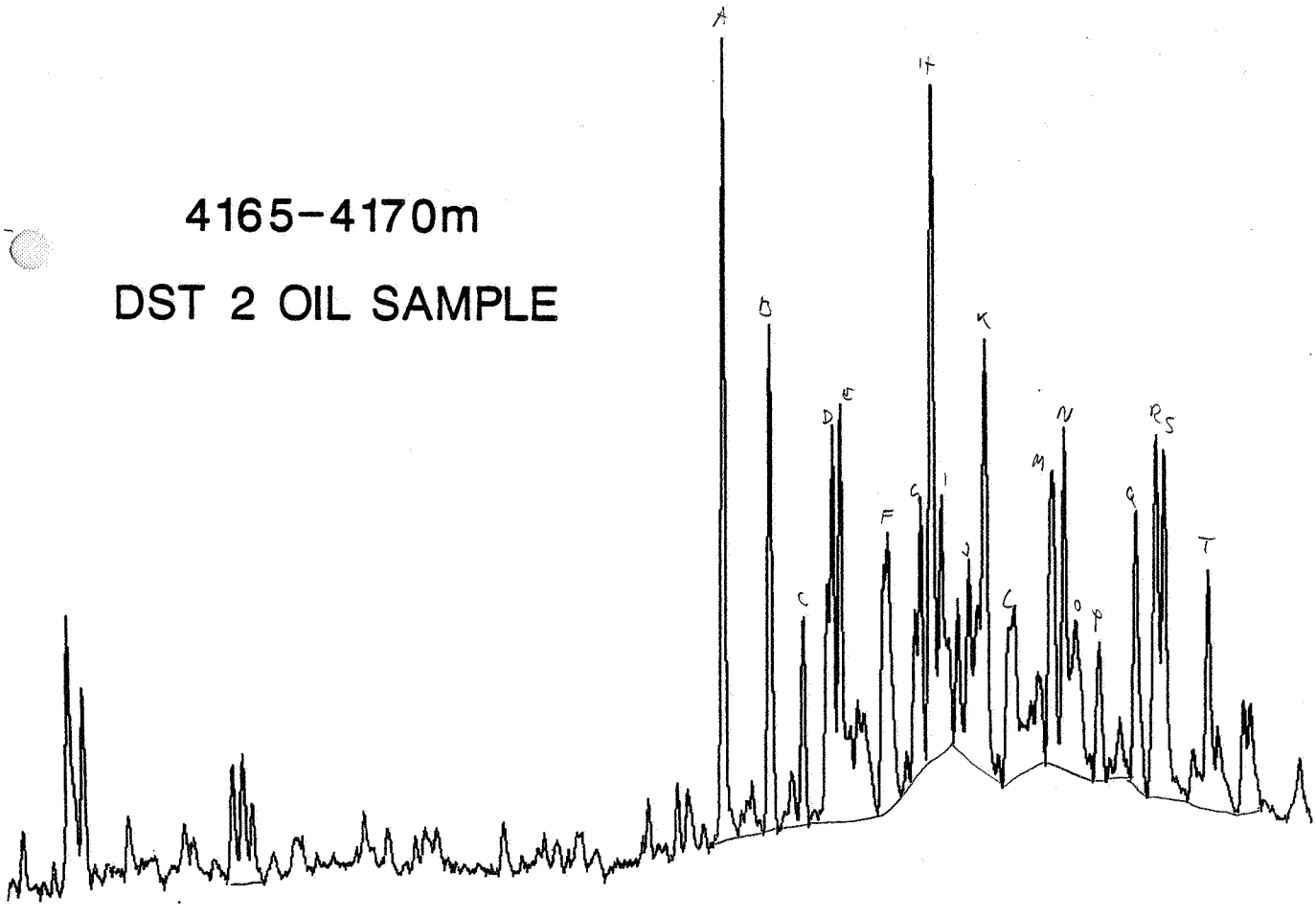
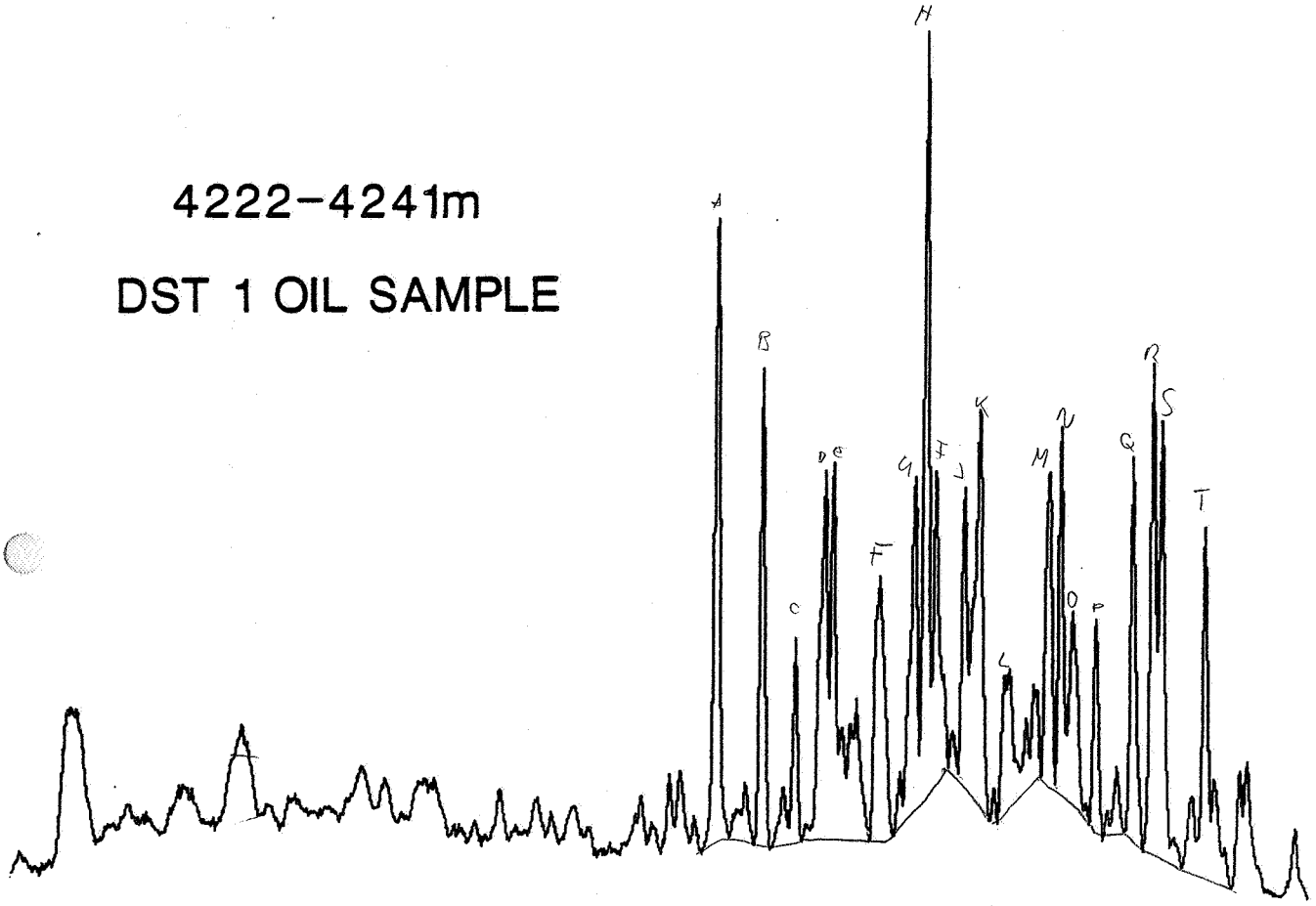
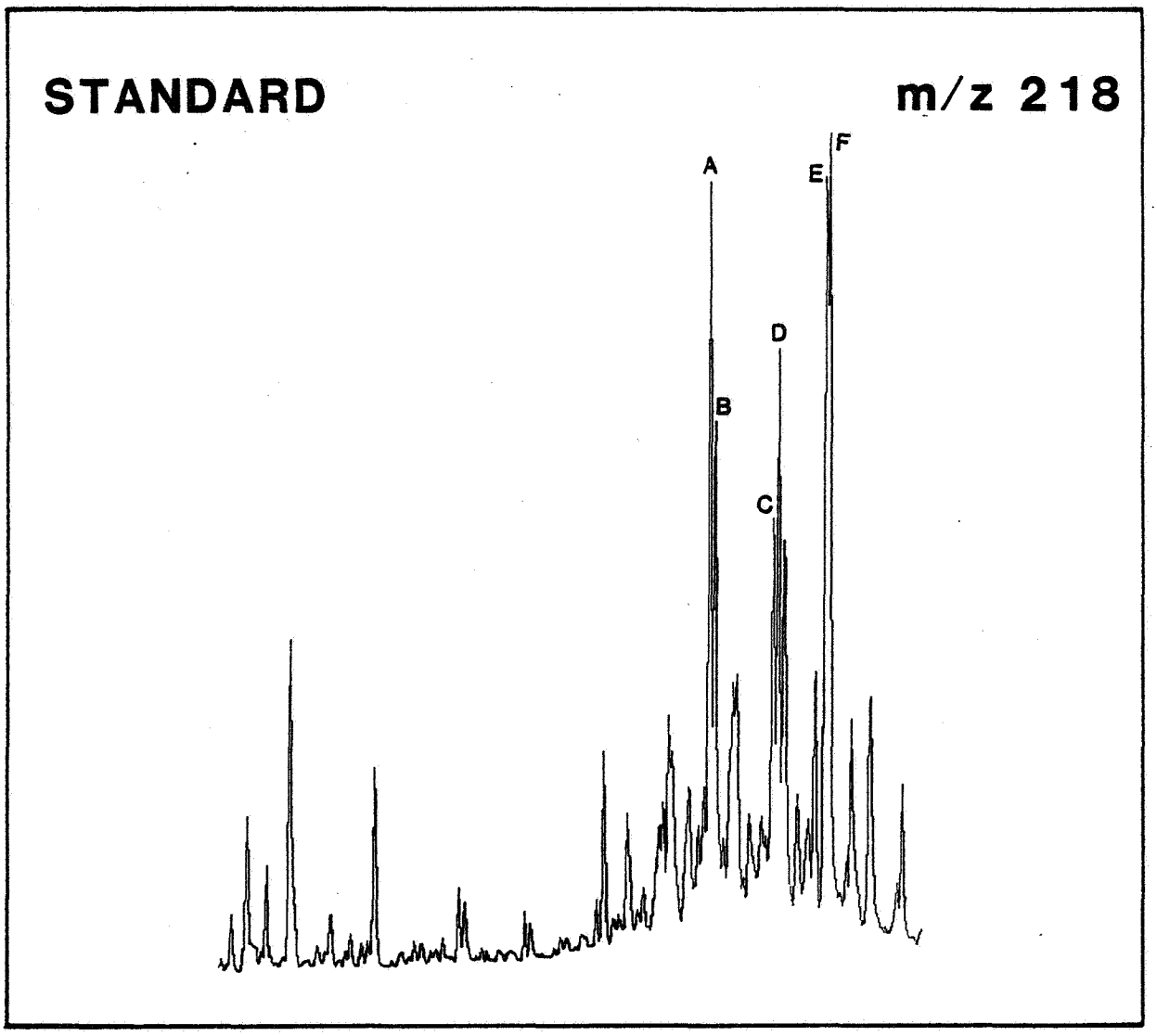


FIGURE 7k **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 217





STERANE IDENTIFICATION

(M/Z 218 FRAGMENTOGRAM)

	COMPOUND	ELEMENTAL COMPOUND
A	14β,17β-cholestane (20R)	C_{27} H_{48}
B	14β,17β-cholestane (20S)	C_{27} H_{48}
C	24-methyl-14β,17β-cholestane (20R)	C_{28} H_{50}
D	24-methyl-14β,17β-cholestane (20S)	C_{28} H_{50}
E	24-ethyl-14β,17β-cholestane (20R)	C_{29} H_{52}
F	24-ethyl-14β,17β-cholestane (20S)	C_{29} H_{52}

FIGURE 8a MASS FRAGMENTOGRAMS WELL 6506/12-3

STERANES m/z 218

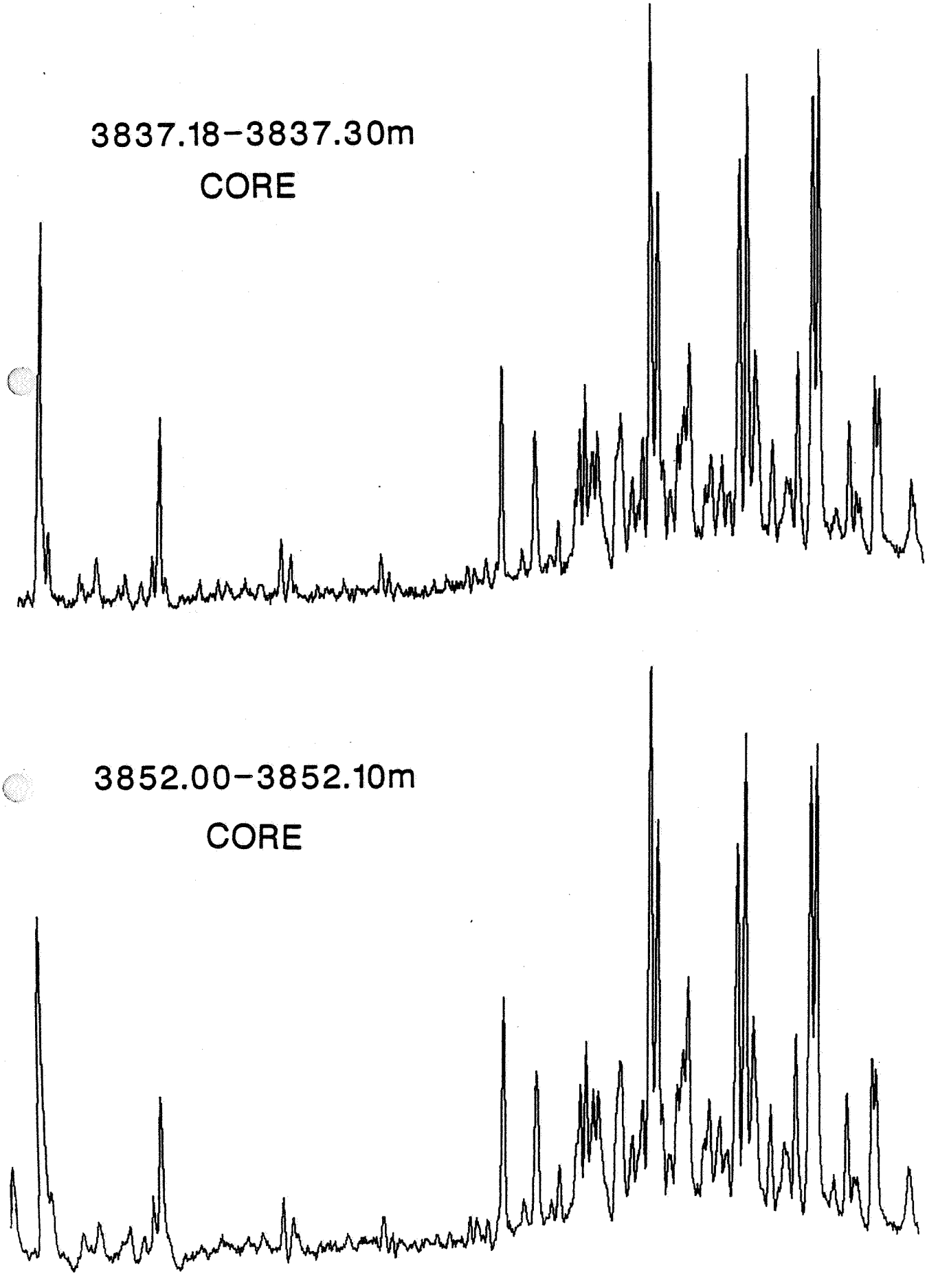


FIGURE 8b **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 218

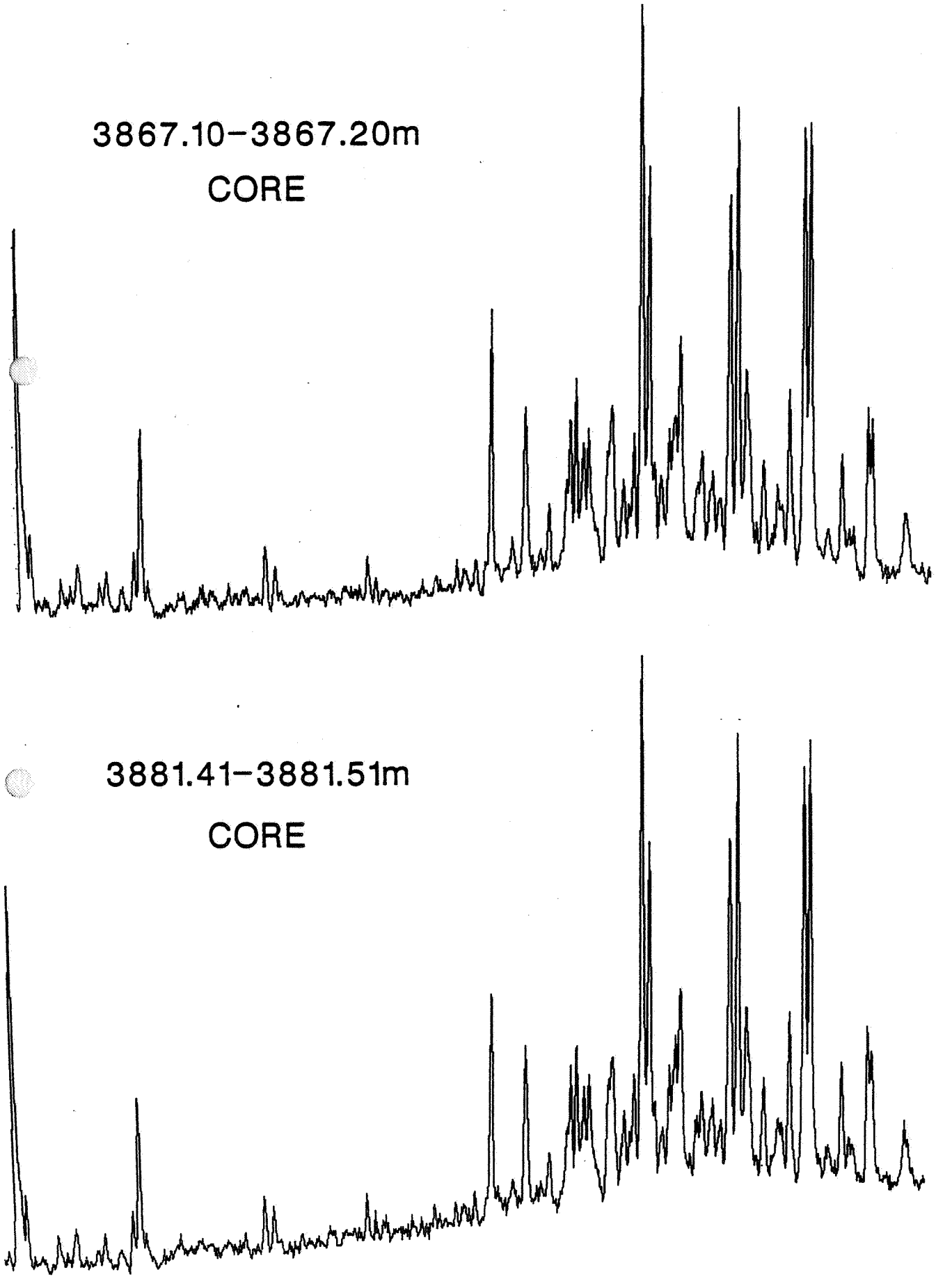


FIGURE 8c MASS FRAGMENTOGRAMS WELL 6506/12-3

STERANES m/z 218

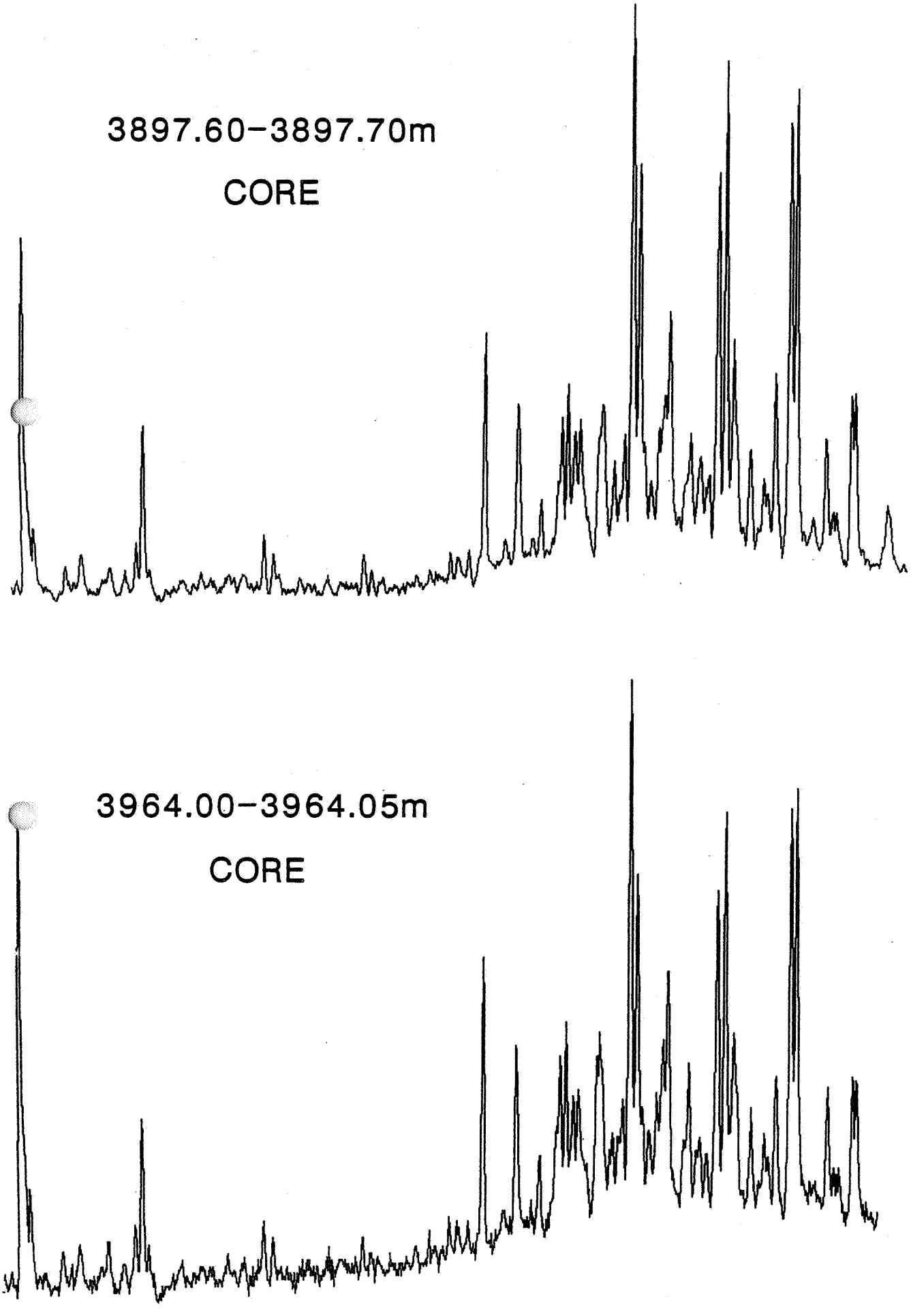


FIGURE 8d **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 218

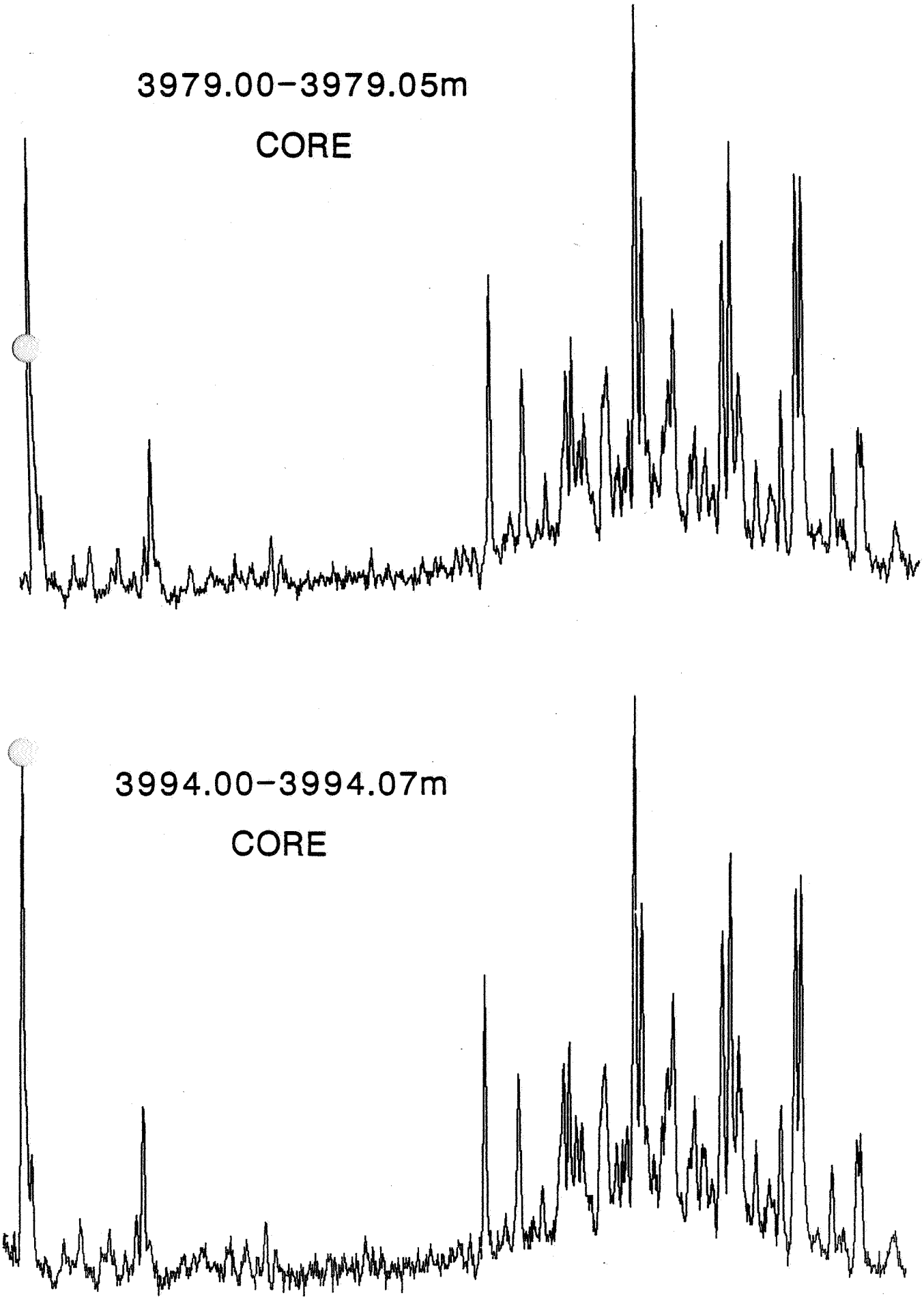


FIGURE 8e **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 218

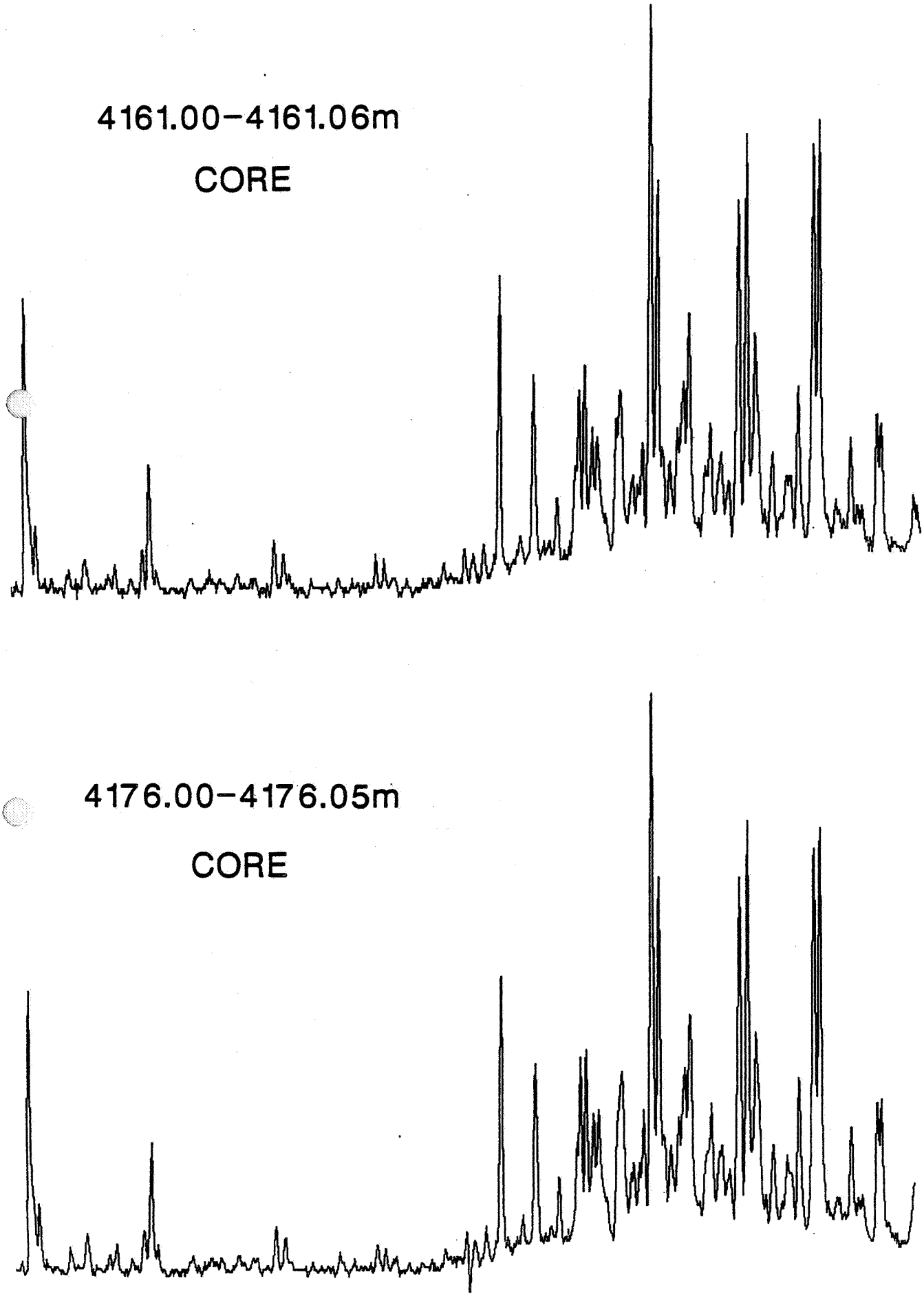


FIGURE 8f MASS FRAGMENTOGRAMS WELL 6506/12-3

STERANES m/z 218

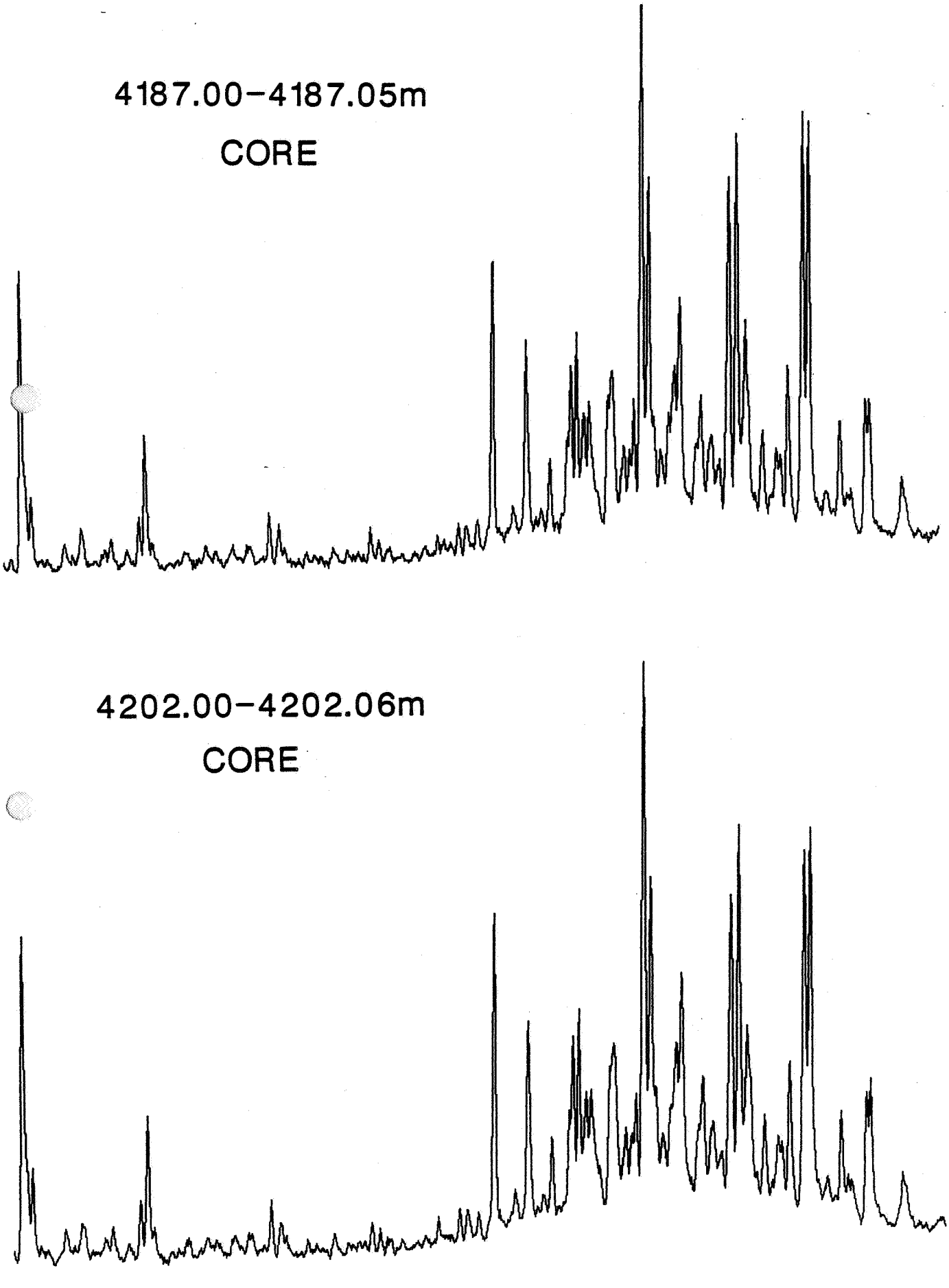


FIGURE 8g **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 218

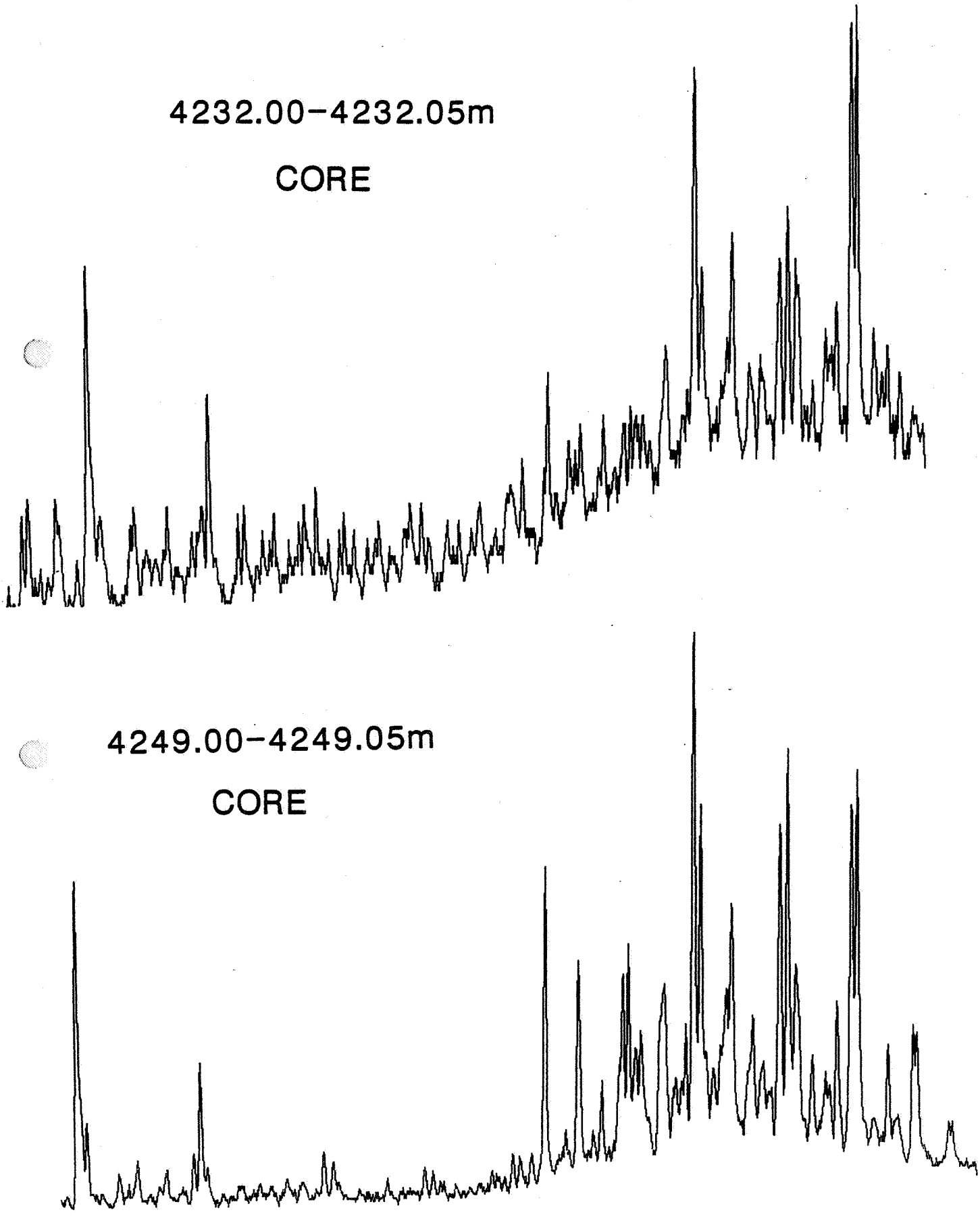
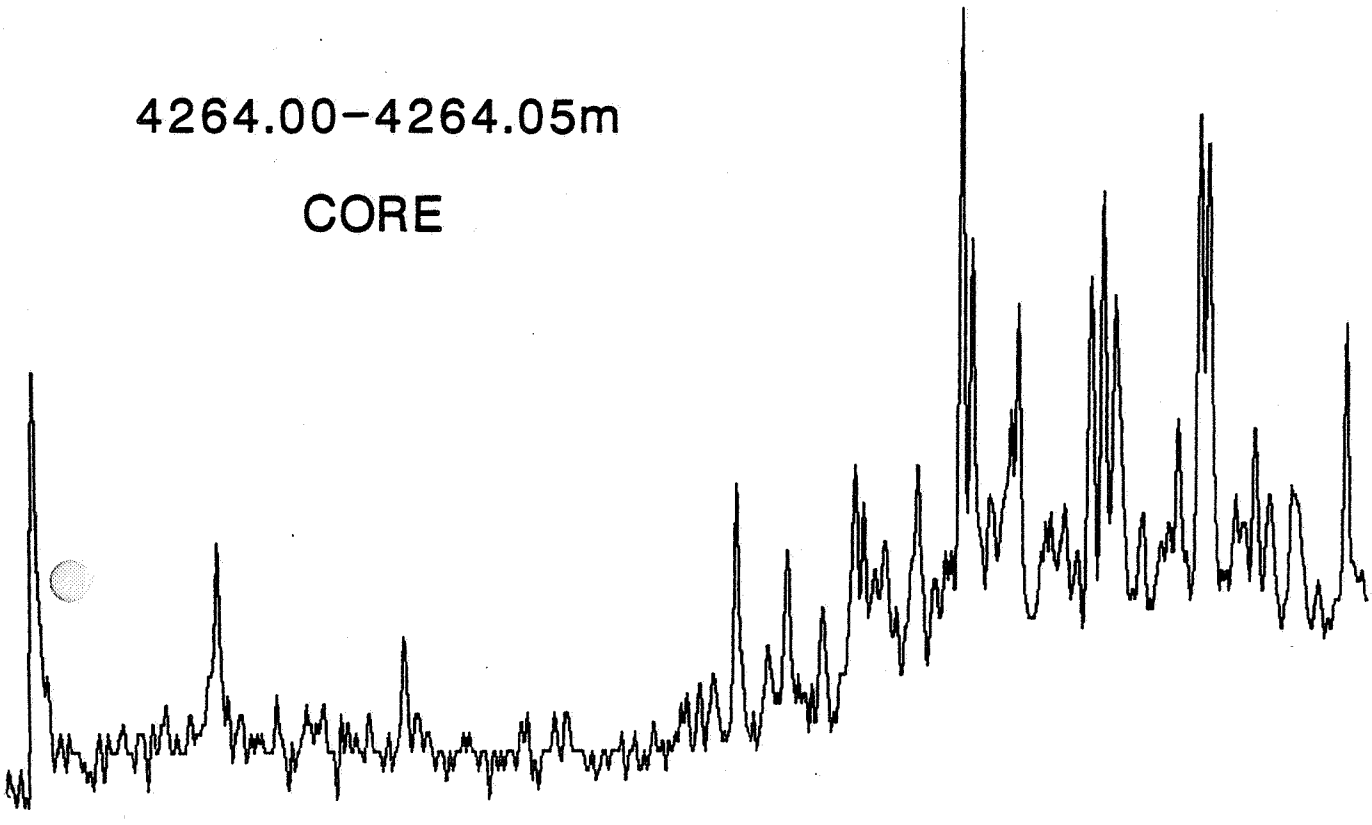


FIGURE 8h **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 218



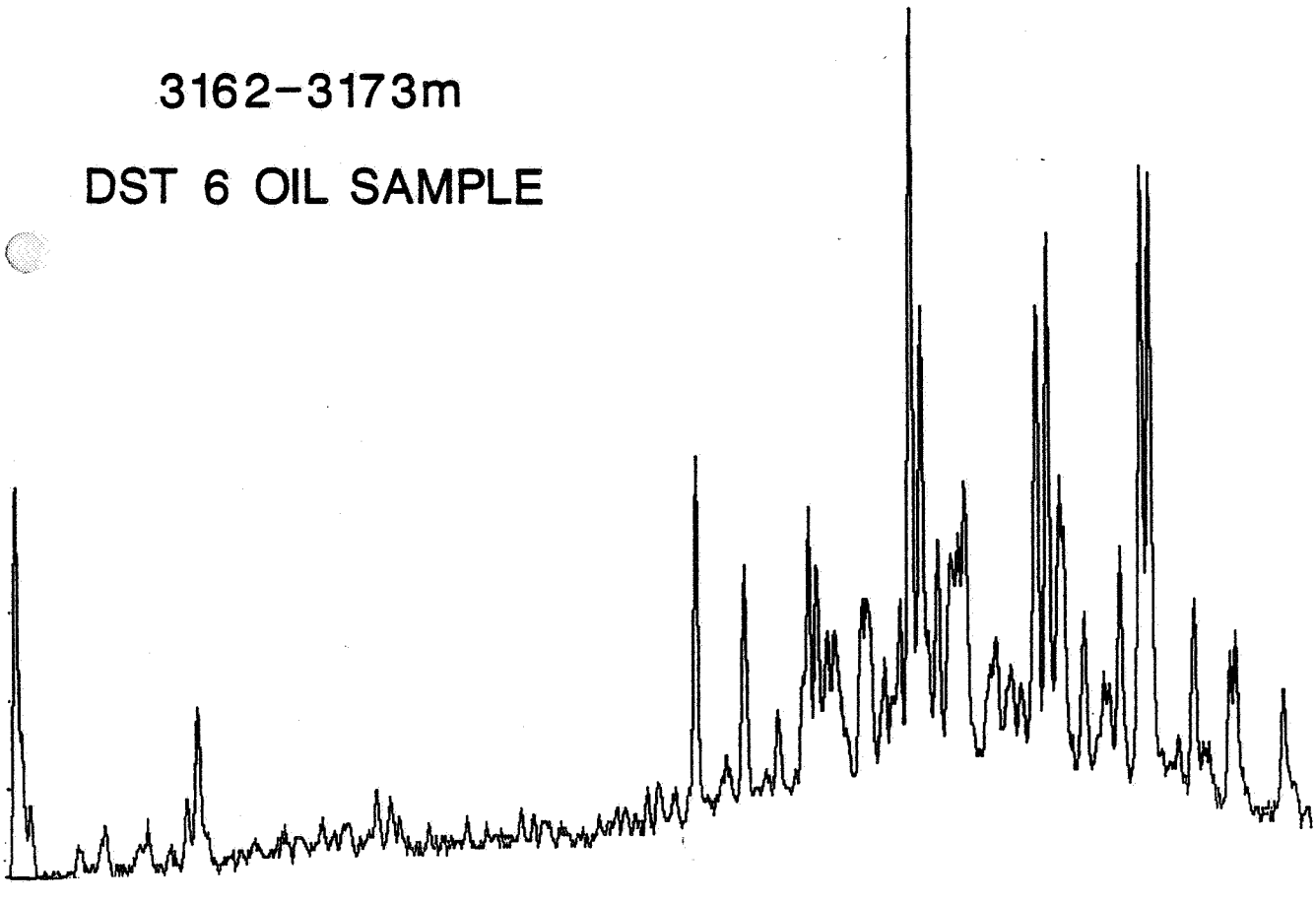


FIGURE 8i MASS FRAGMENTOGRAMS WELL 6506/12-3

STERANES m/z 218

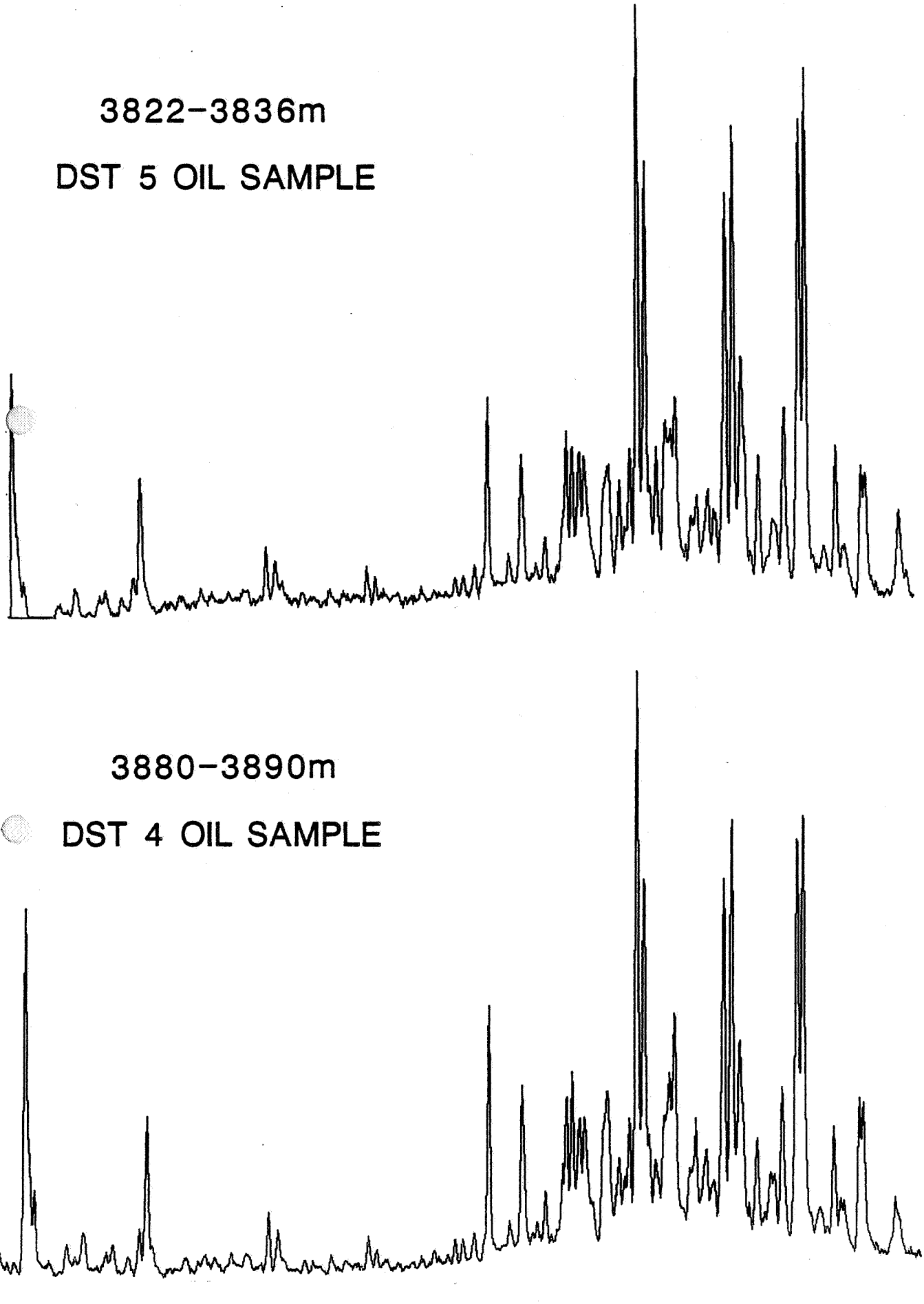


FIGURE 8j **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 218

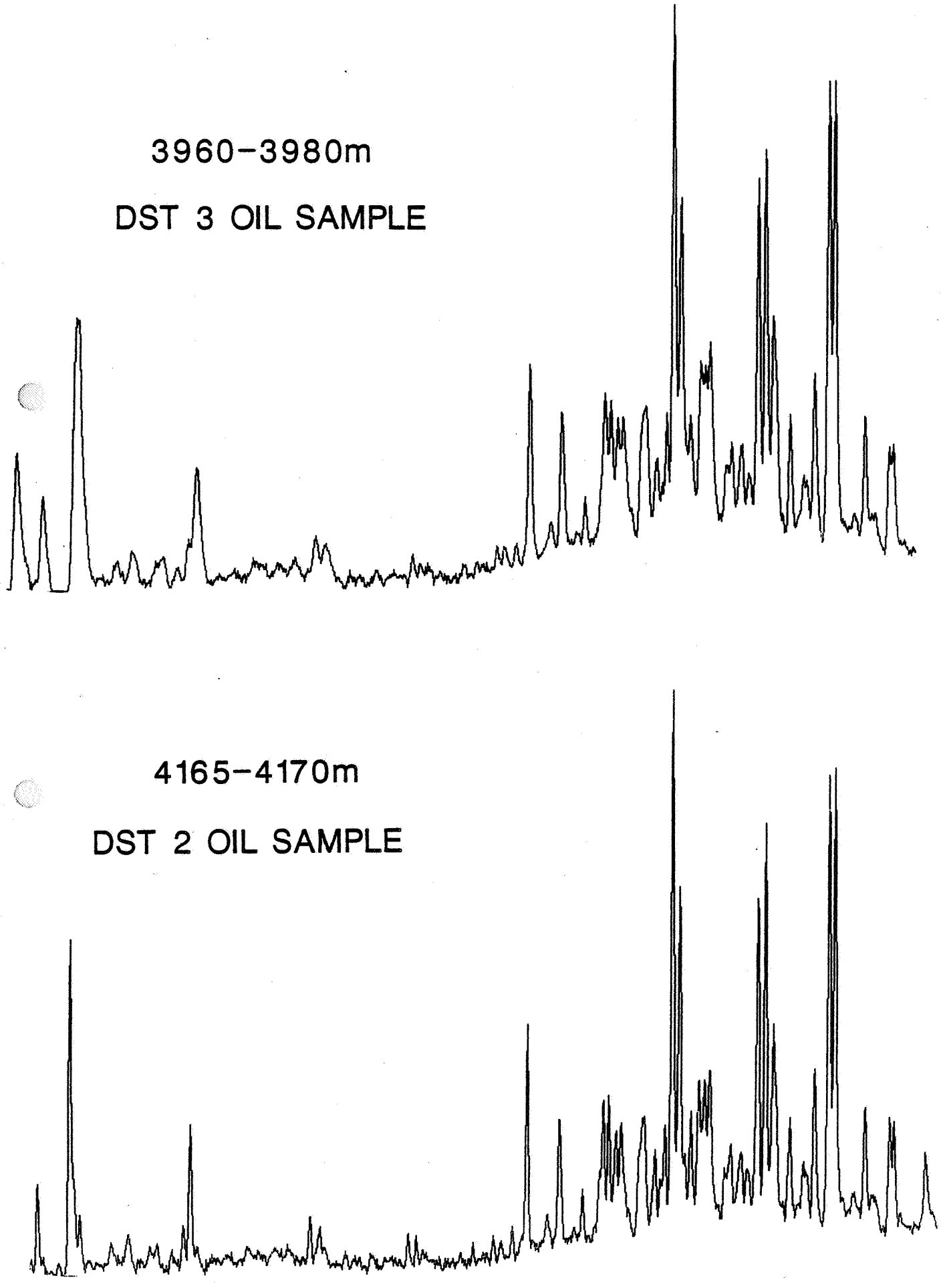
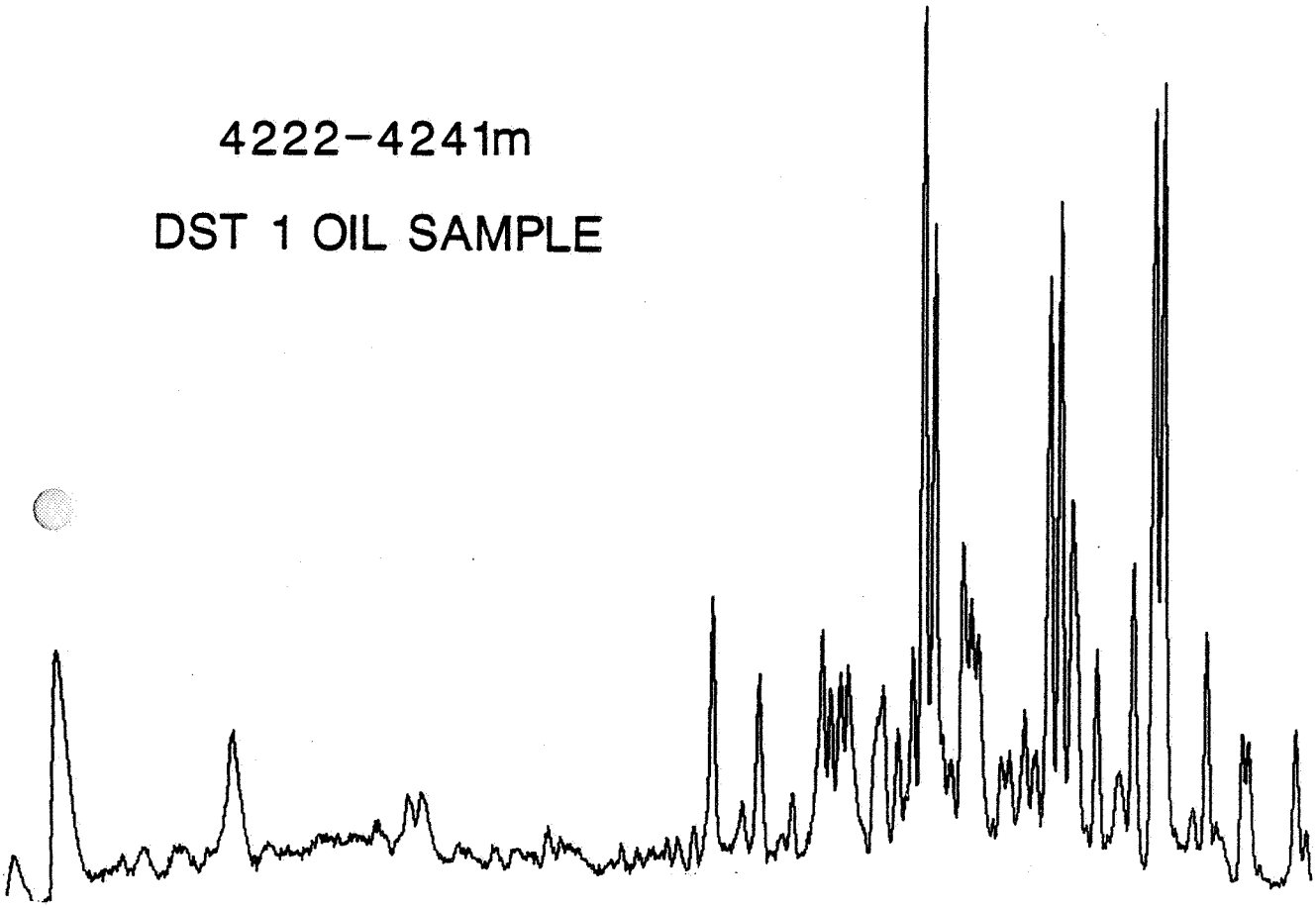
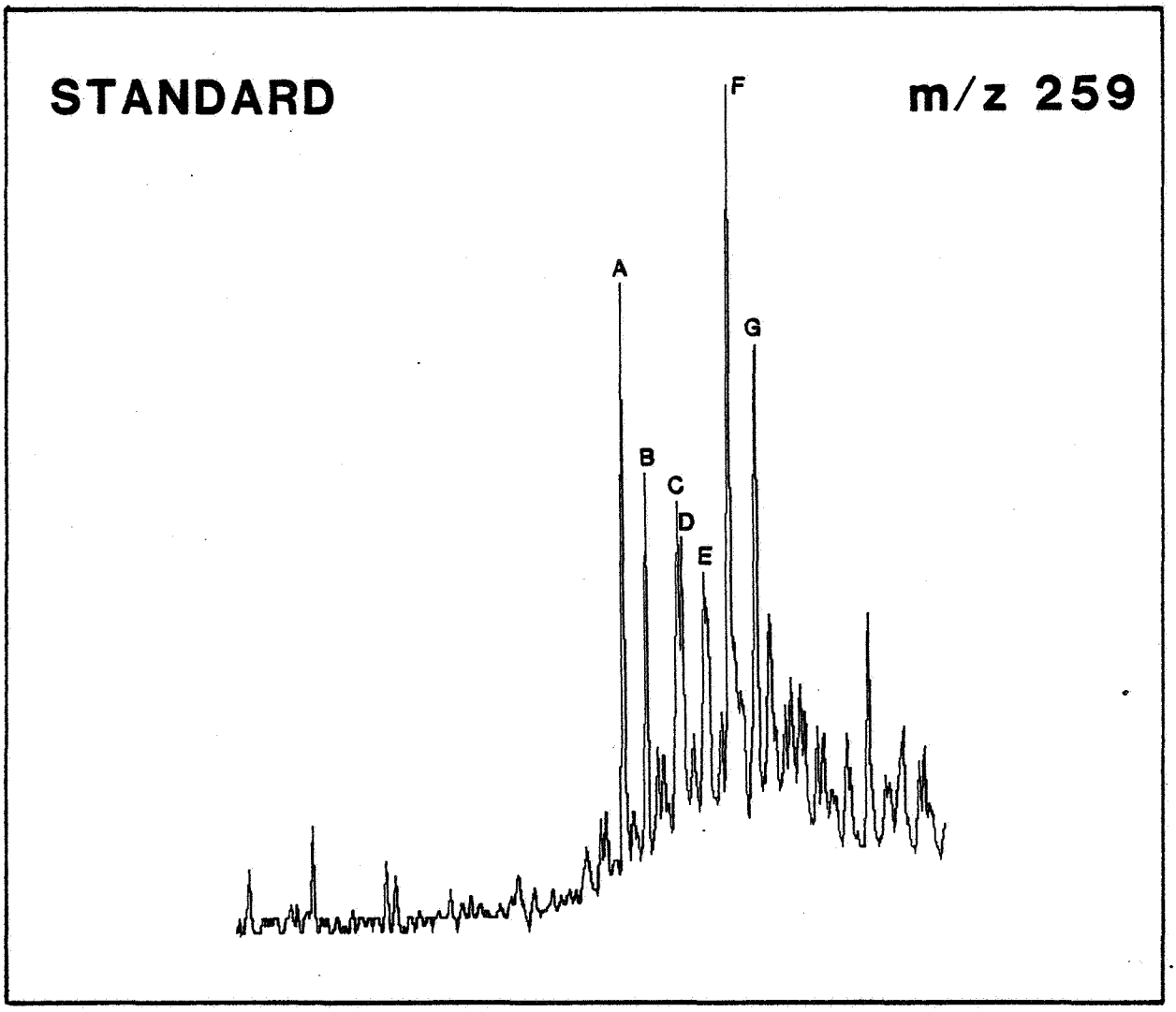


FIGURE 8k **MASS FRAGMENTOGRAMS** WELL 6506/12-3

STERANES m/z 218





STERANE IDENTIFICATION

(M/Z 259 FRAGMENTOGRAM)

	COMPOUND	ELEMENTAL COMPOSITION
A	13β,17α-diacholestane (20S)	$C_{27}H_{48}$
B	13β,17α-diacholestane (20R)	$C_{27}H_{48}$
C	13α,17β-diacholestane (20R)	$C_{27}H_{48}$
D	24,-methyl-13β,17α-diacholestane (20S)	$C_{28}H_{50}$
E	24,-methyl-13β,17α-diacholestane (20R)	$C_{28}H_{50}$
F	24,-ethyl-13β,17α-diacholestane (20S)	$C_{29}H_{52}$
G	24,-ethyl-13β,17α-diacholestane (20R)	$C_{29}H_{52}$

FIGURE 9a

MASS FRAGMENTOGRAMS

WELL 6506/12-3

REARRANGED STERANES m/z 259

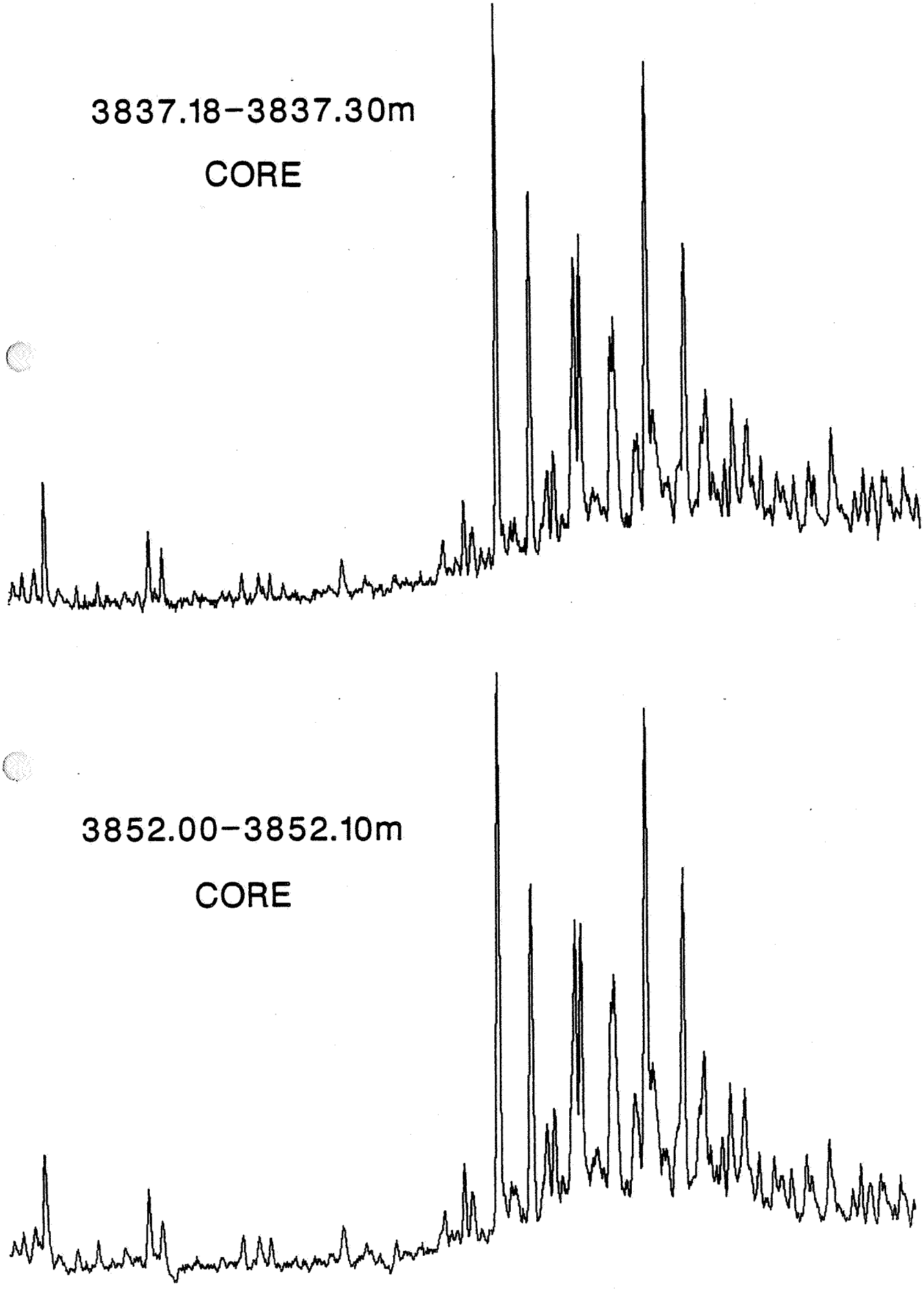


FIGURE 9b MASS FRAGMENTOGRAMS WELL 6506/12-3

REARRANGED STERANES m/z 259

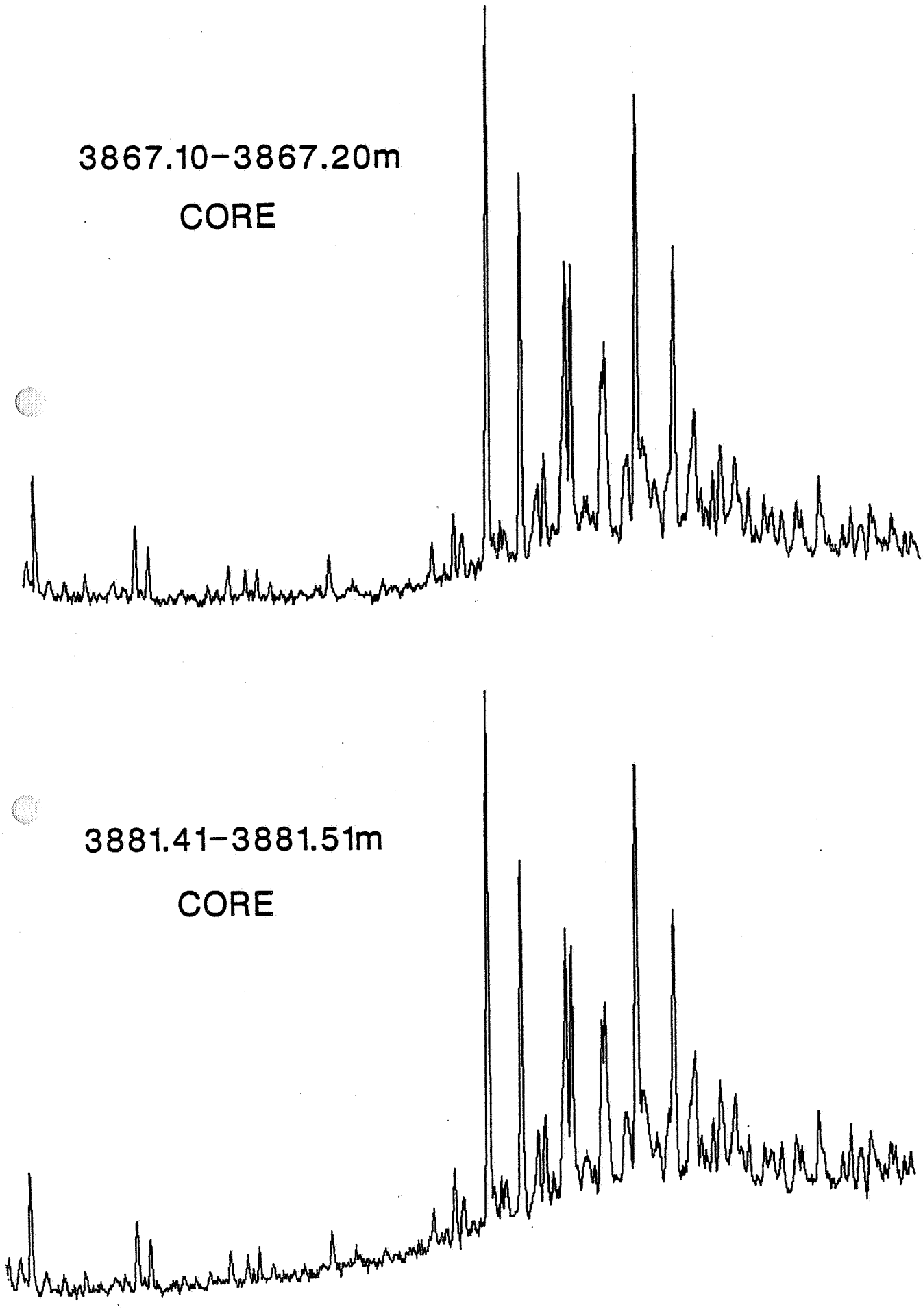


FIGURE 9c

MASS FRAGMENTOGRAMS

WELL 6506/12-3

REARRANGED STERANES m/z 259

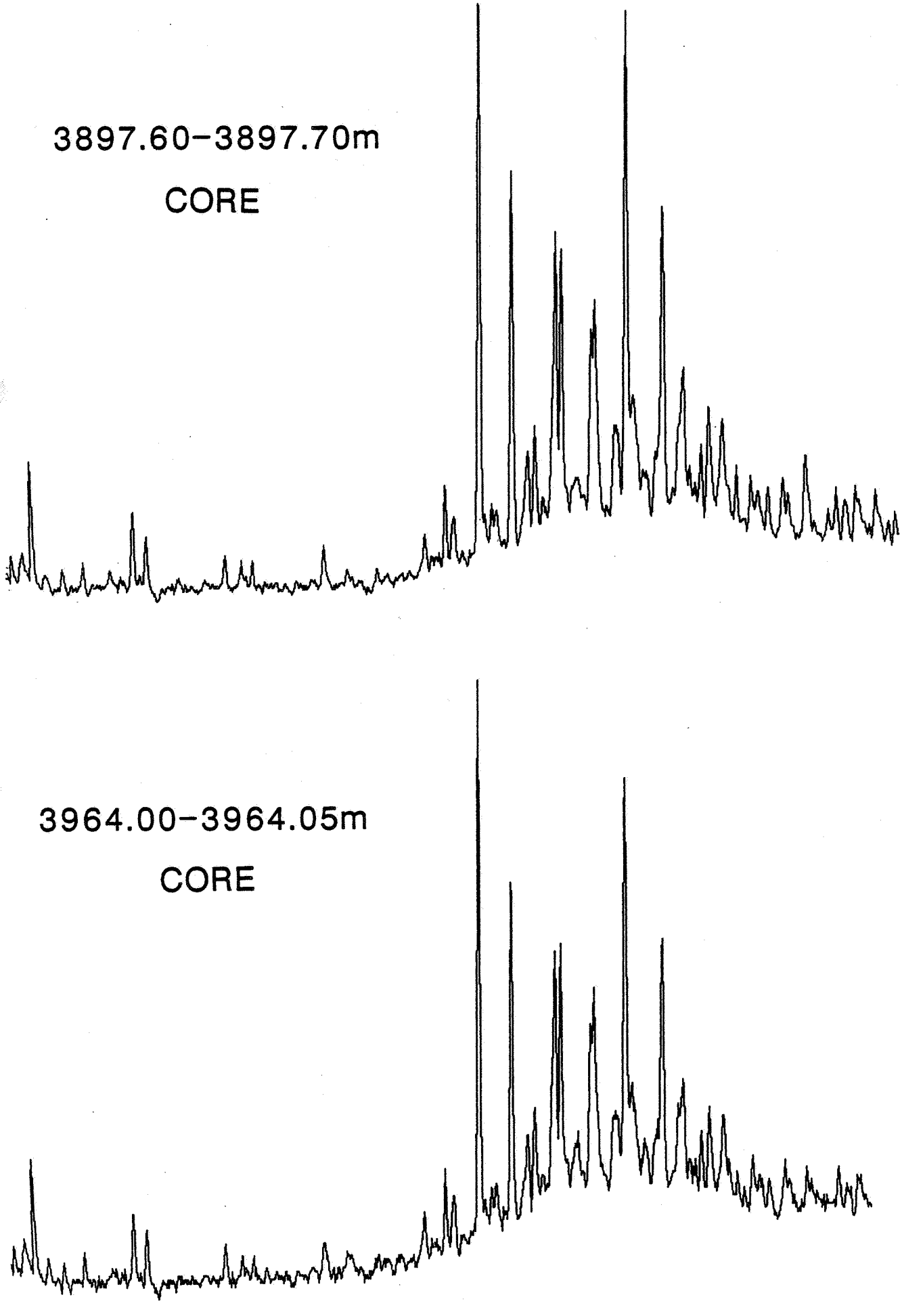


FIGURE 9d MASS FRAGMENTOGRAMS WELL 6506/12-3

REARRANGED STERANES m/z 259

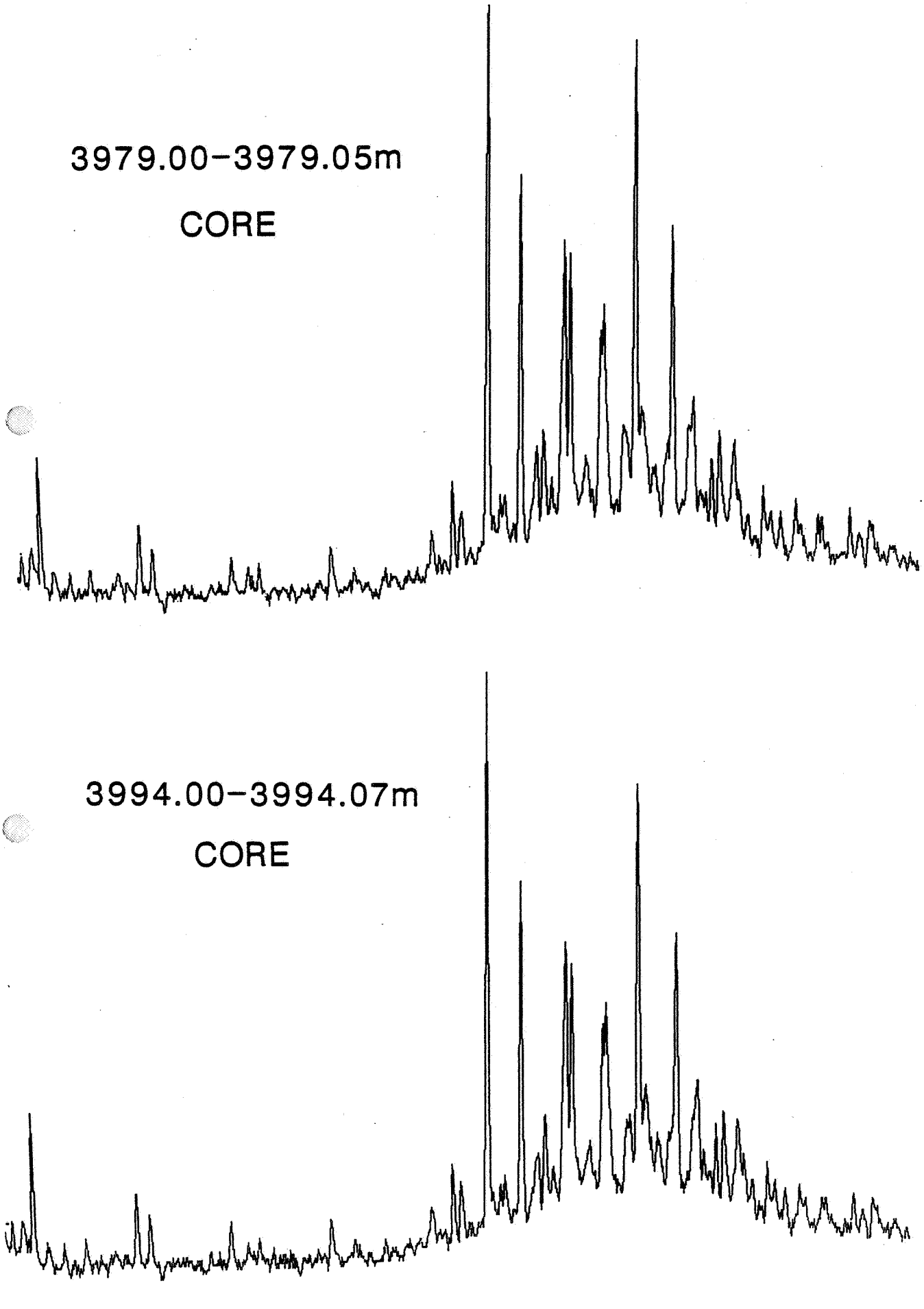
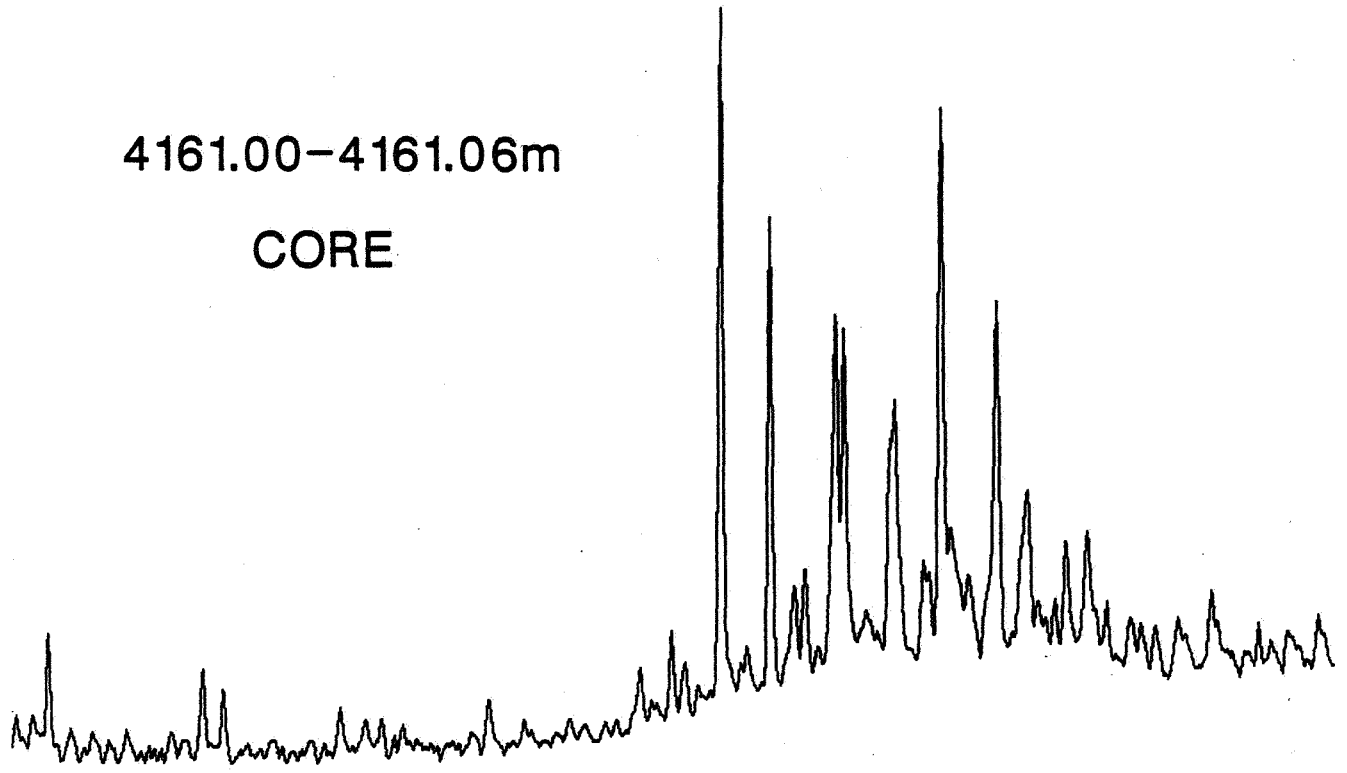


FIGURE 9e

MASS FRAGMENTOGRAMS

WELL 6506/12-3

REARRANGED STERANES m/z 259



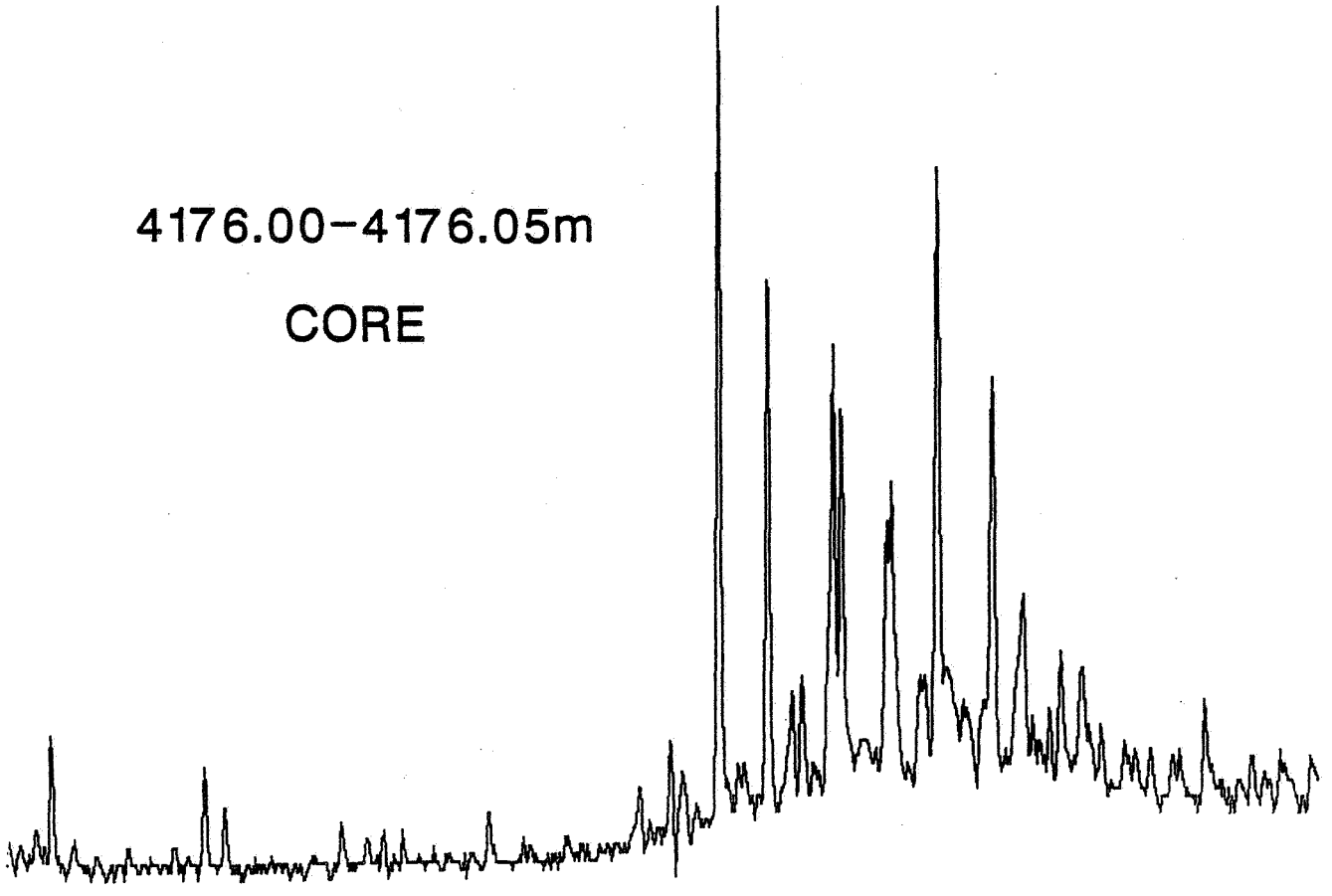


FIGURE 9f MASS FRAGMENTOGRAMS WELL 6506/12-3

REARRANGED STERANES m/z 259

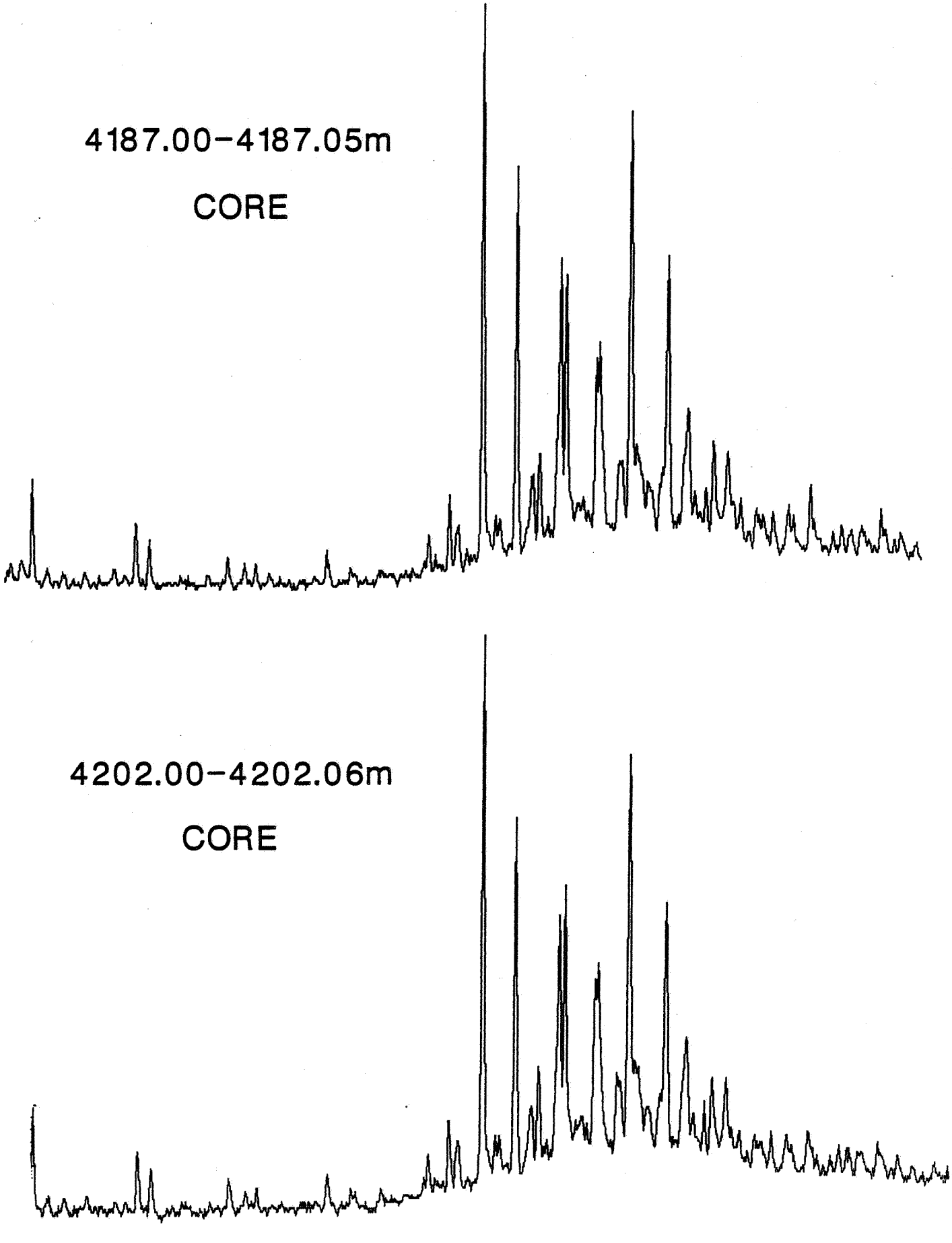


FIGURE 9g

MASS FRAGMENTOGRAMS

WELL 6506/12-3

REARRANGED STERANES m/z 259

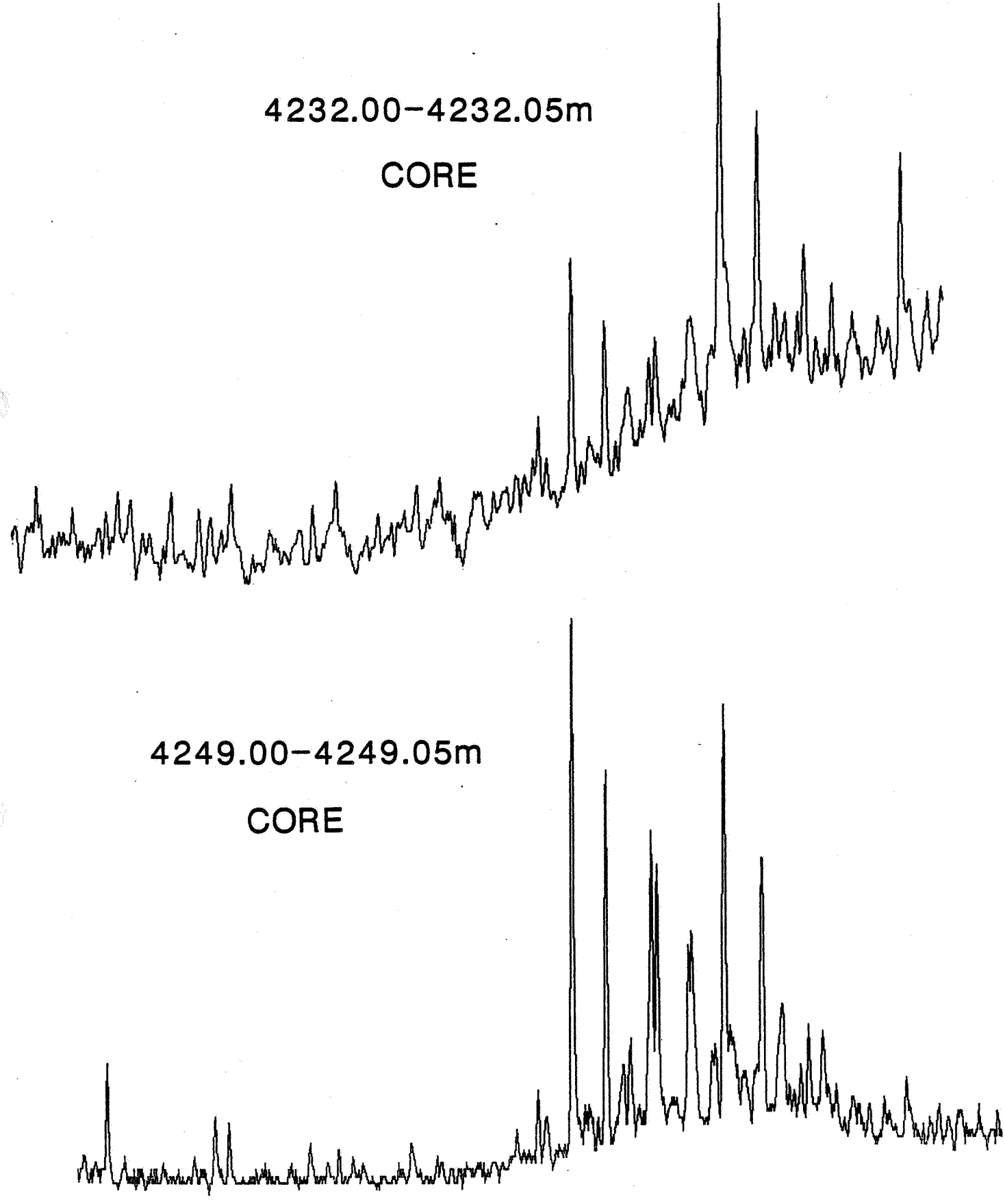


FIGURE 9h

MASS FRAGMENTOGRAMS

WELL 6506/12-3

REARRANGED STERANES m/z 259

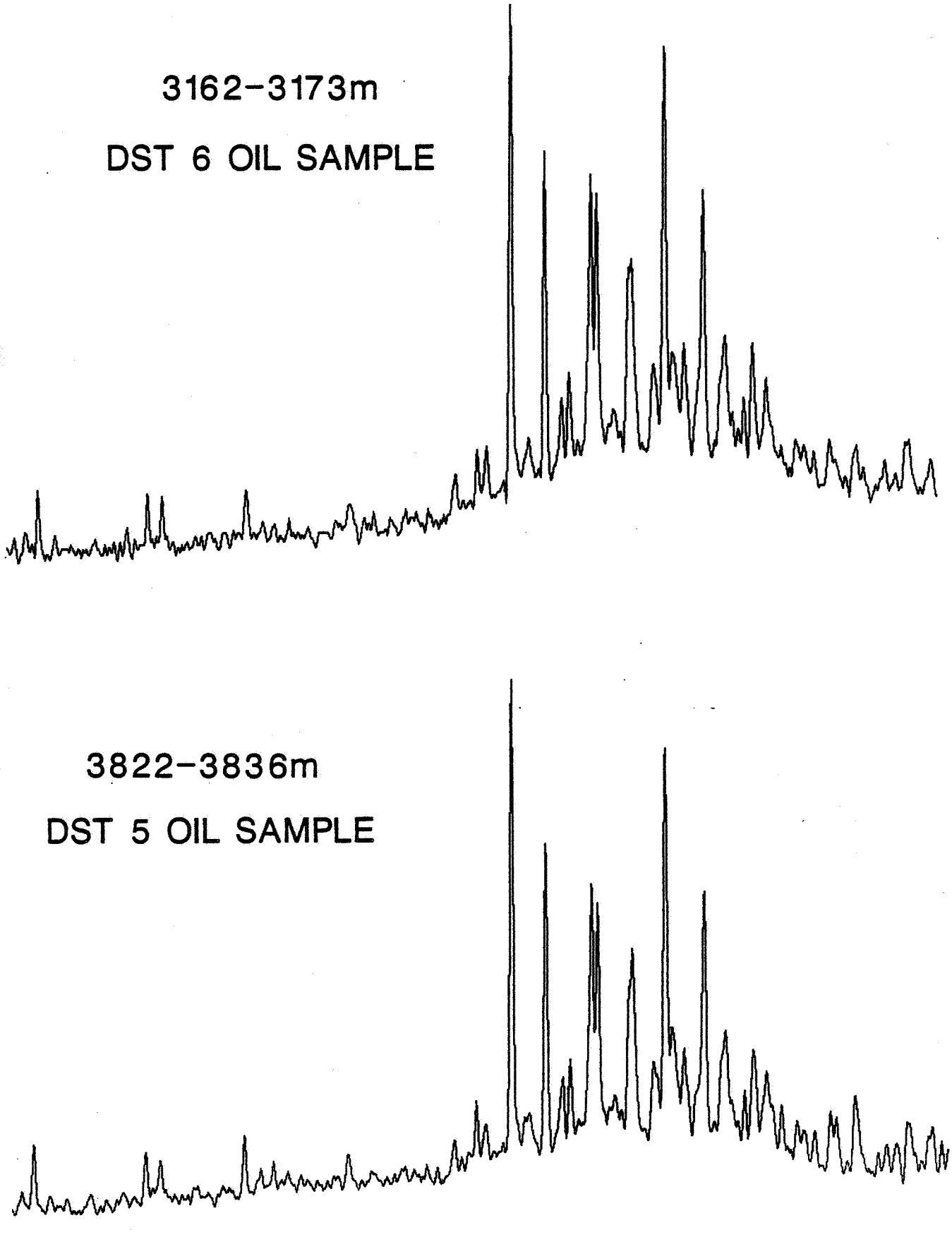


FIGURE 9i

MASS FRAGMENTOGRAMS

WELL 6506/12-3

REARRANGED STERANES m/z 259

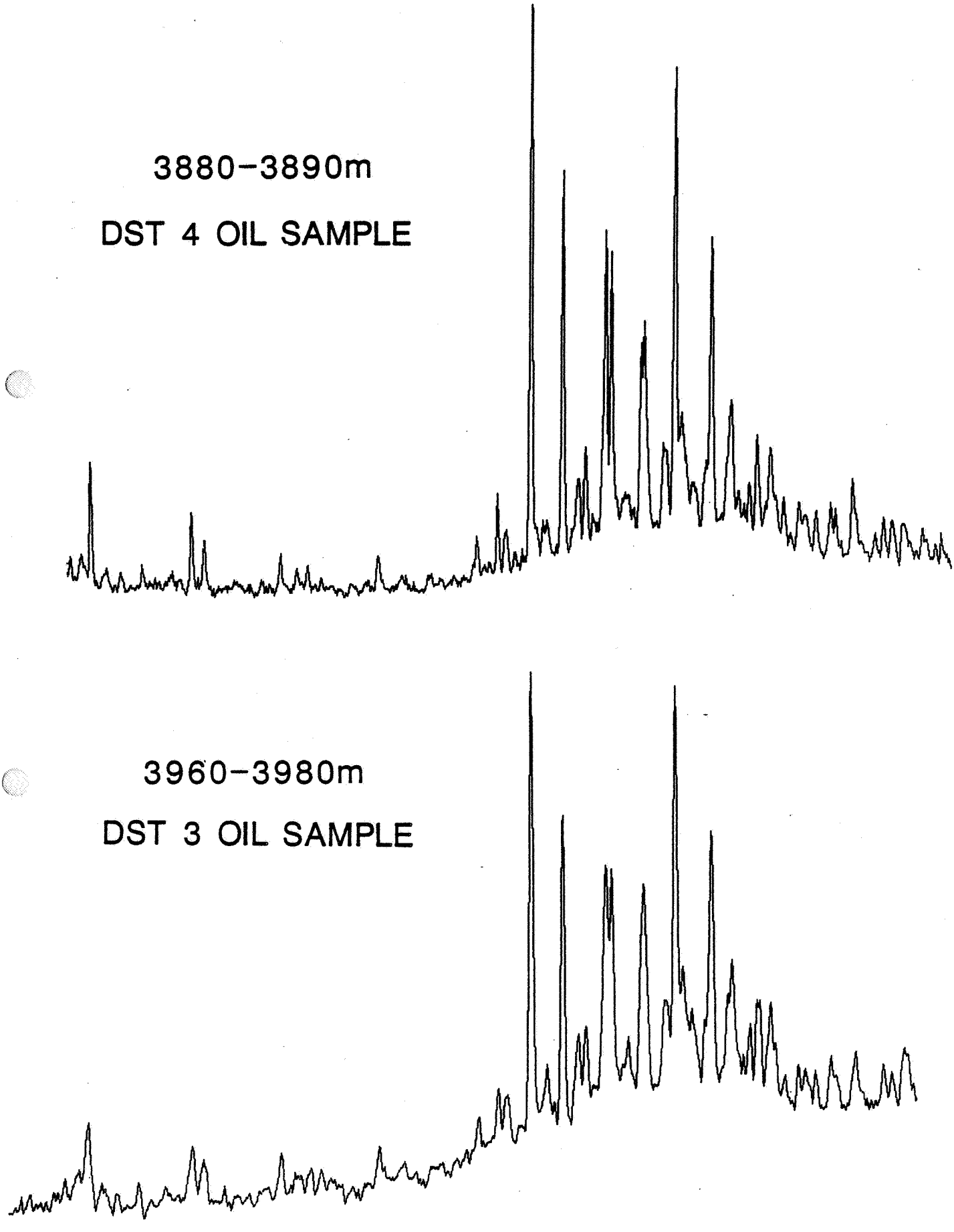
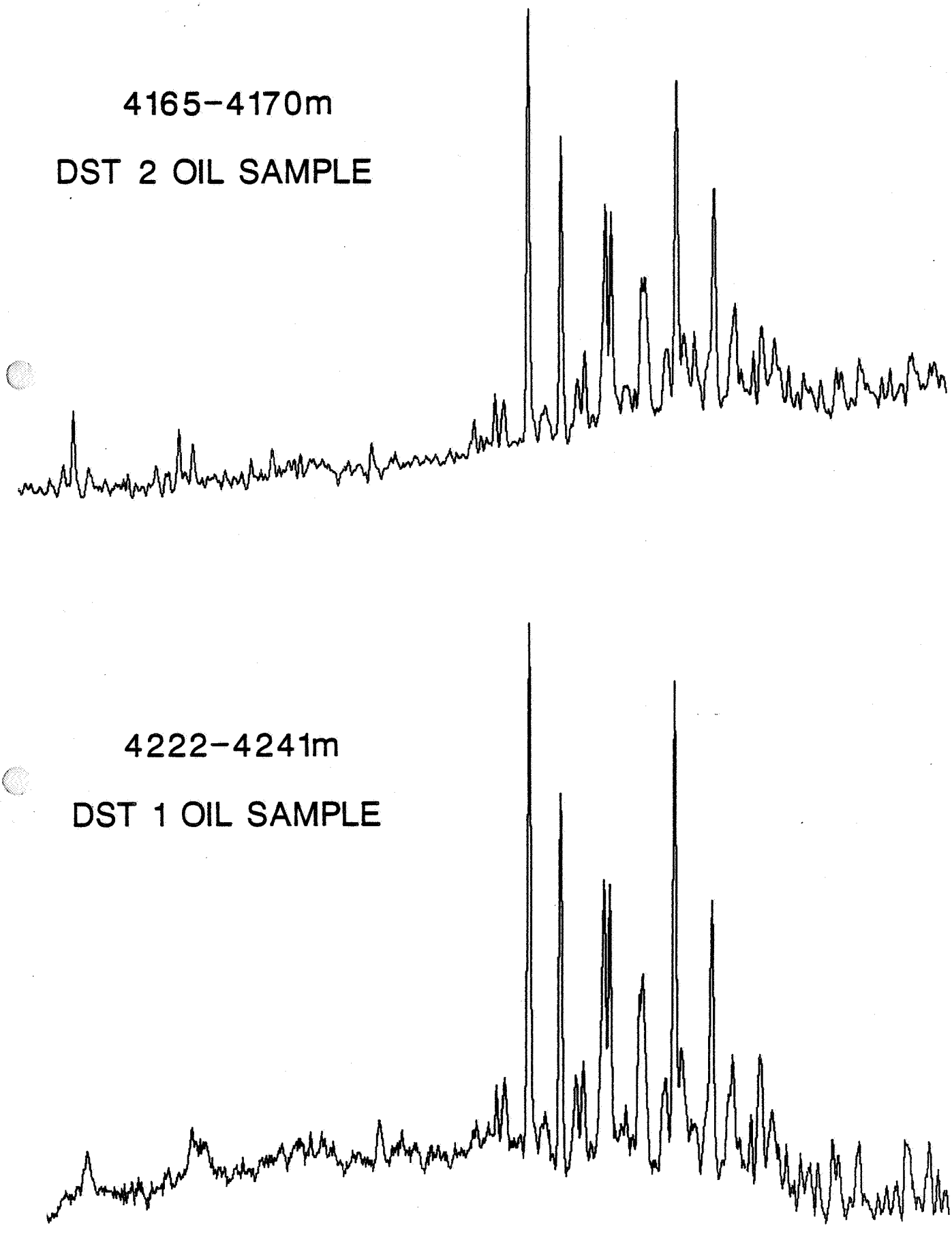


FIGURE 9j **MASS FRAGMENTOGRAMS** WELL 6506/12-3

REARRANGED STERANES m/z 259

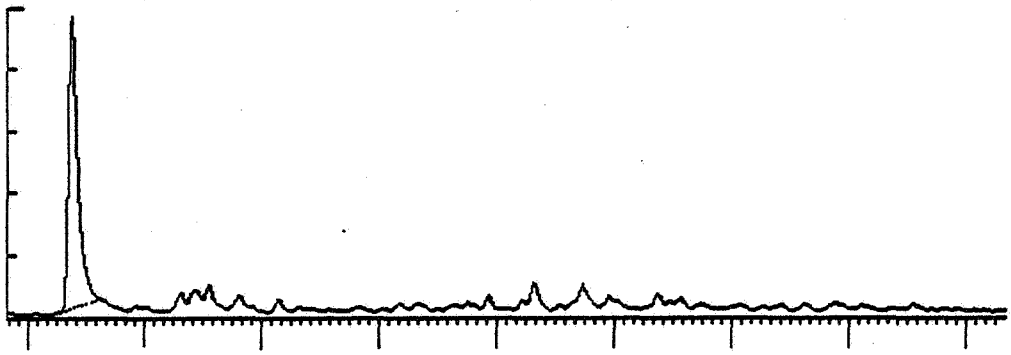


AROMATIC MASS FRAGMENTOGRAMS
PHENANTHRENE SERIES

SIR REPORT. FILE - STD. .SD RUN - 1

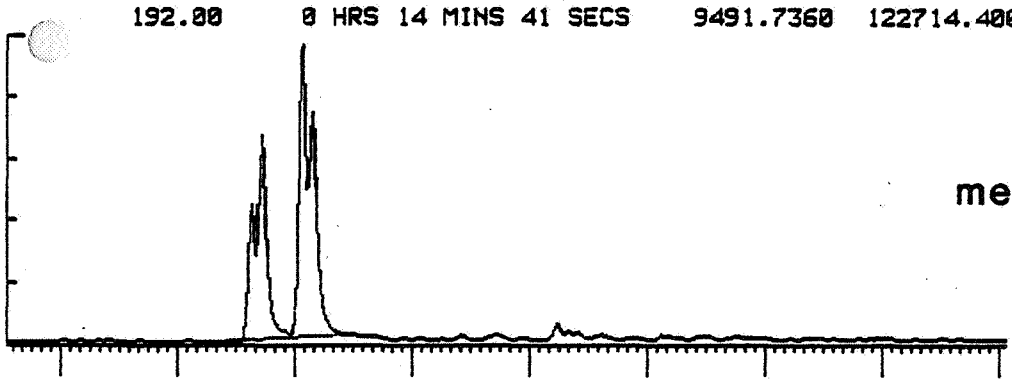
UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC.(H)	CONC.(A)
178.00	0 HRS 12 MINS 17 SECS	9885.1530	52863.6900	0.0000	0.0000



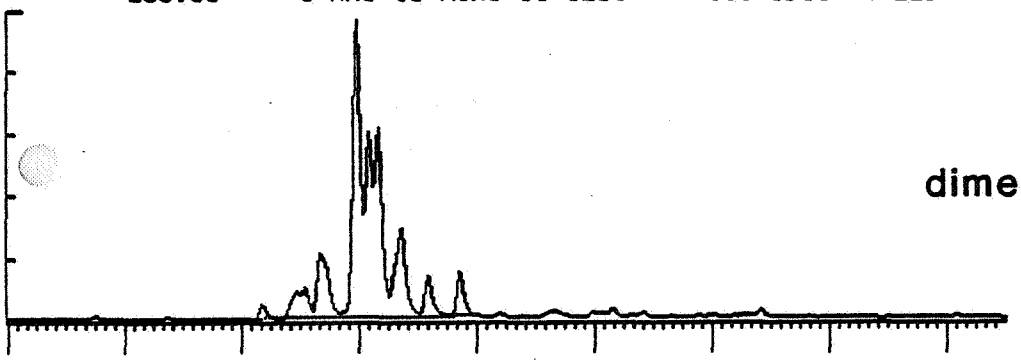
phenanthrene

192.00	0 HRS 14 MINS 41 SECS	9491.7360	122714.4000	0.0000	0.0000



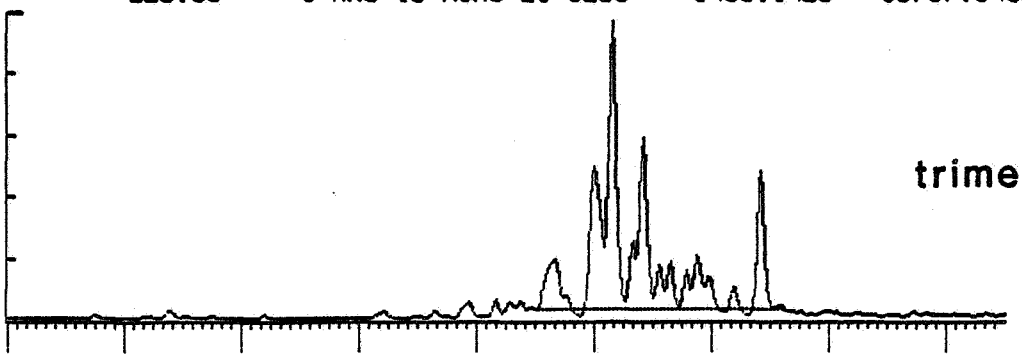
methyl phenanthrenes

206.00	0 HRS 16 MINS 31 SECS	7513.8950	112294.6000	0.0000	0.0000



dimethyl phenanthrenes

220.00	0 HRS 18 MINS 21 SECS	3435.1420	60707.0400	0.0000	0.0000



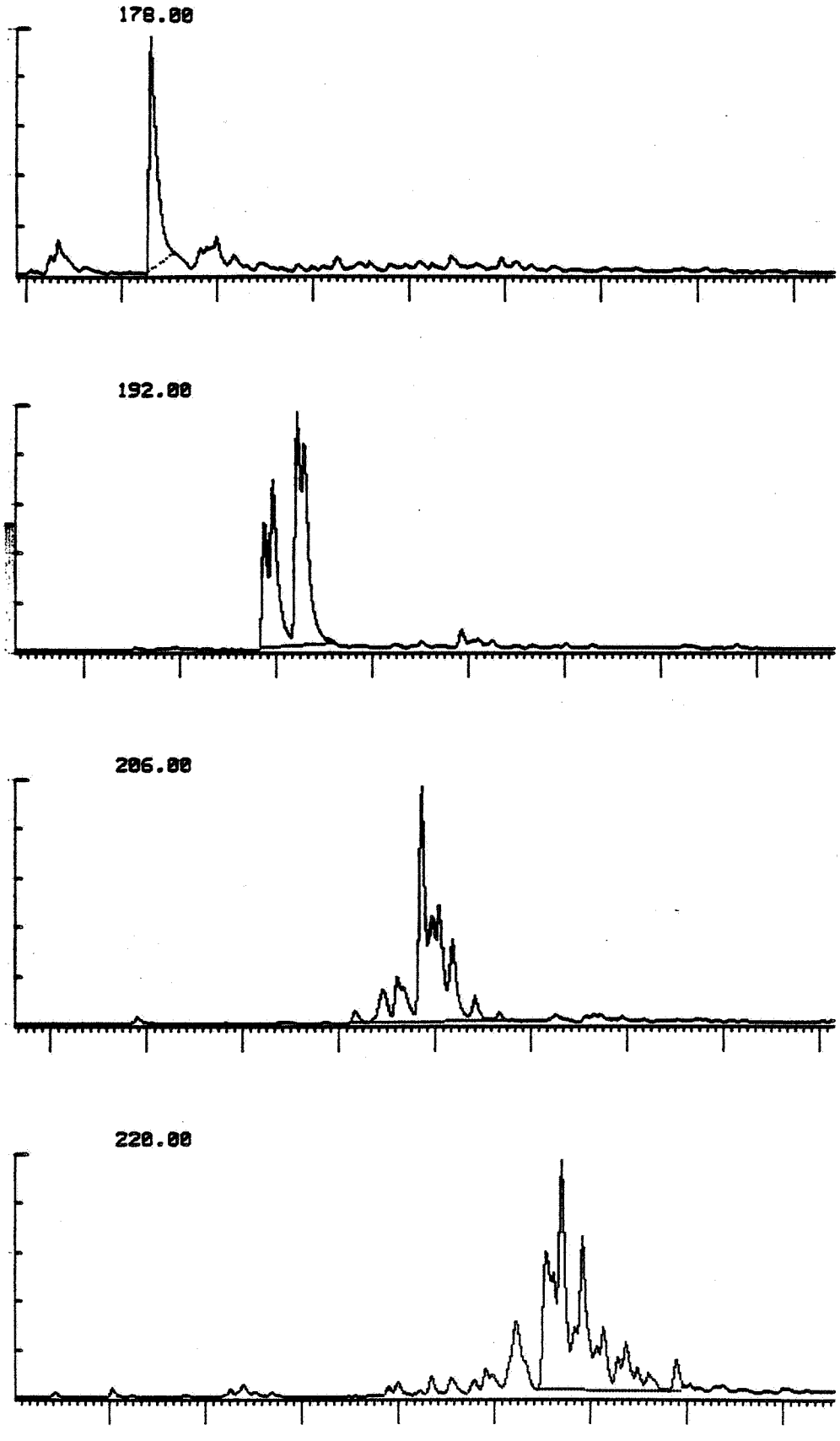
trimethyl phenanthrenes

0 HRS 13 MINS 59 SECS

0 HRS 22 MINS 10 SECS

FIGURE 10a AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

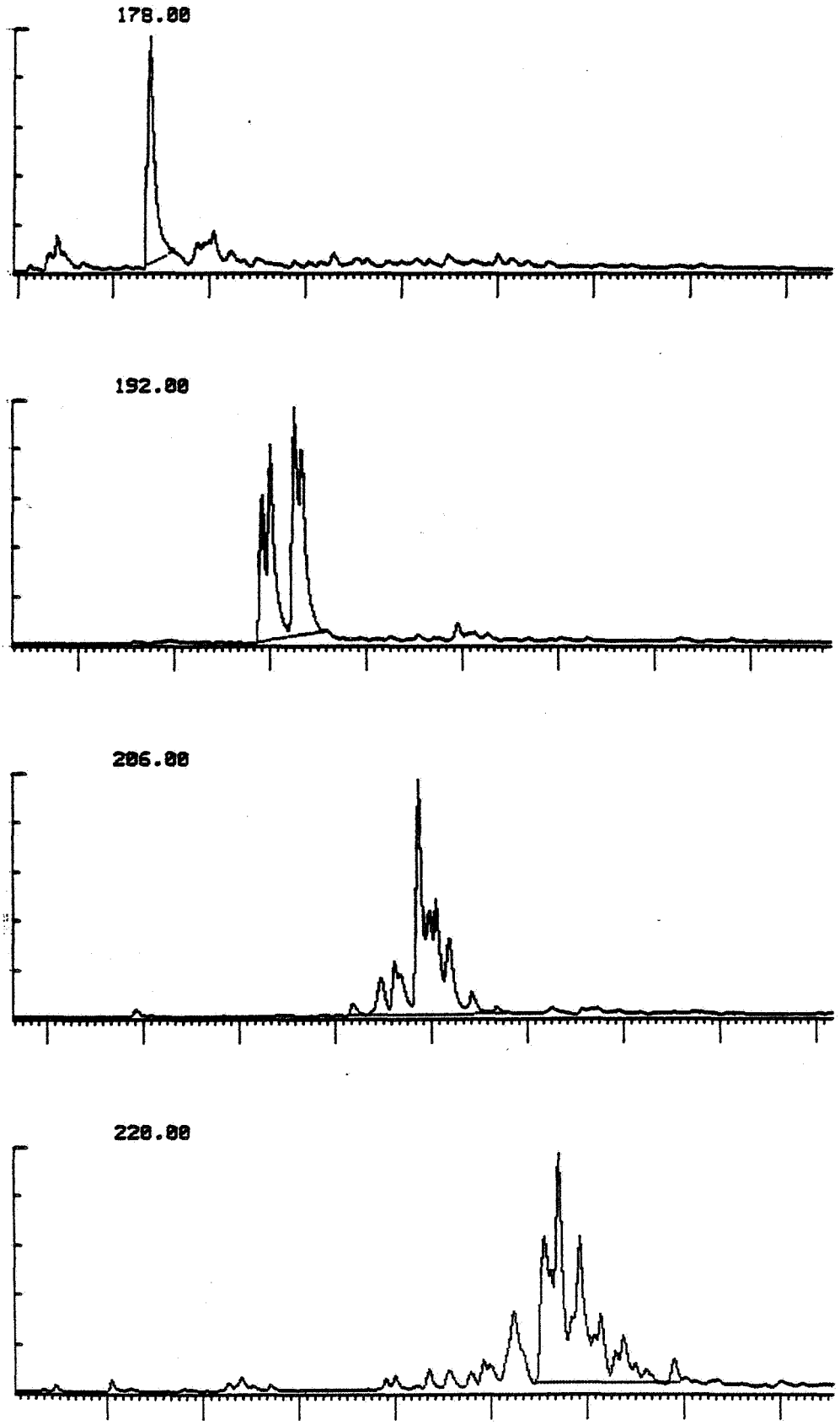
PHENANTHRENE SERIES



3837.18-3837.30m CORE

FIGURE 10b AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

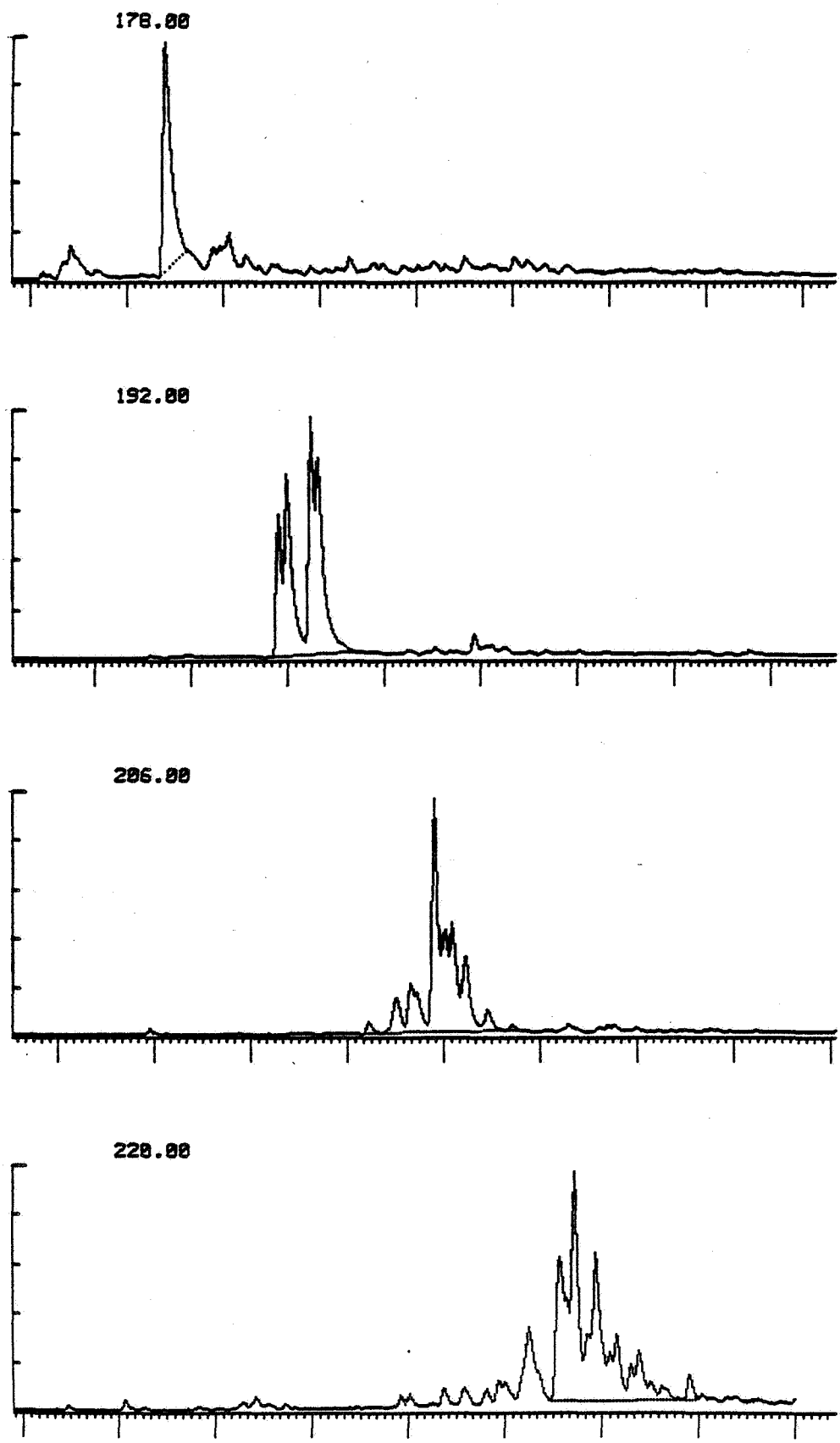
PHENANTHRENE SERIES



3852.00-3852.10m CORE

FIGURE 10c AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

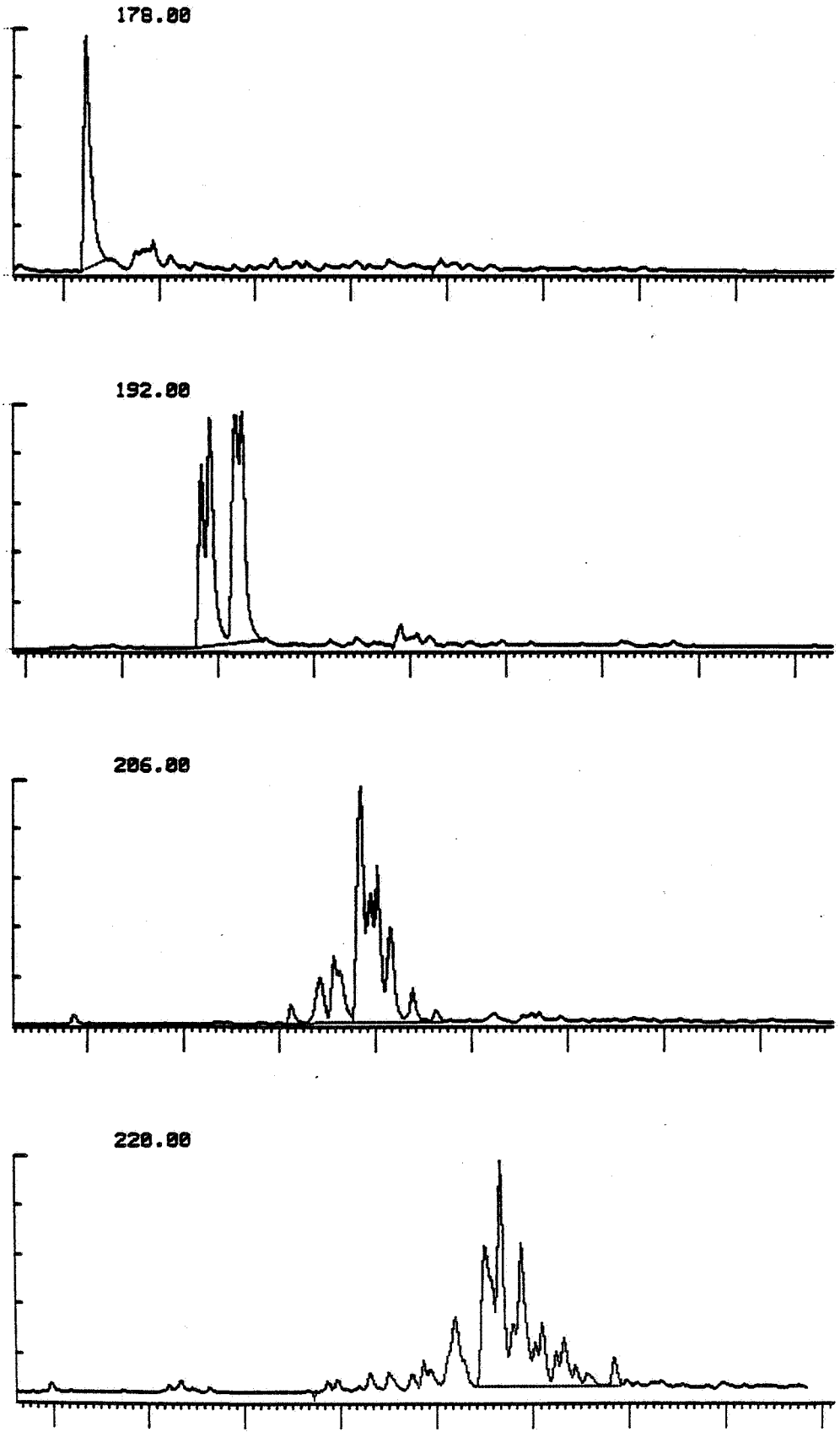
PHENANTHRENE SERIES



3867.10-3867.20m CORE

FIGURE 10d AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

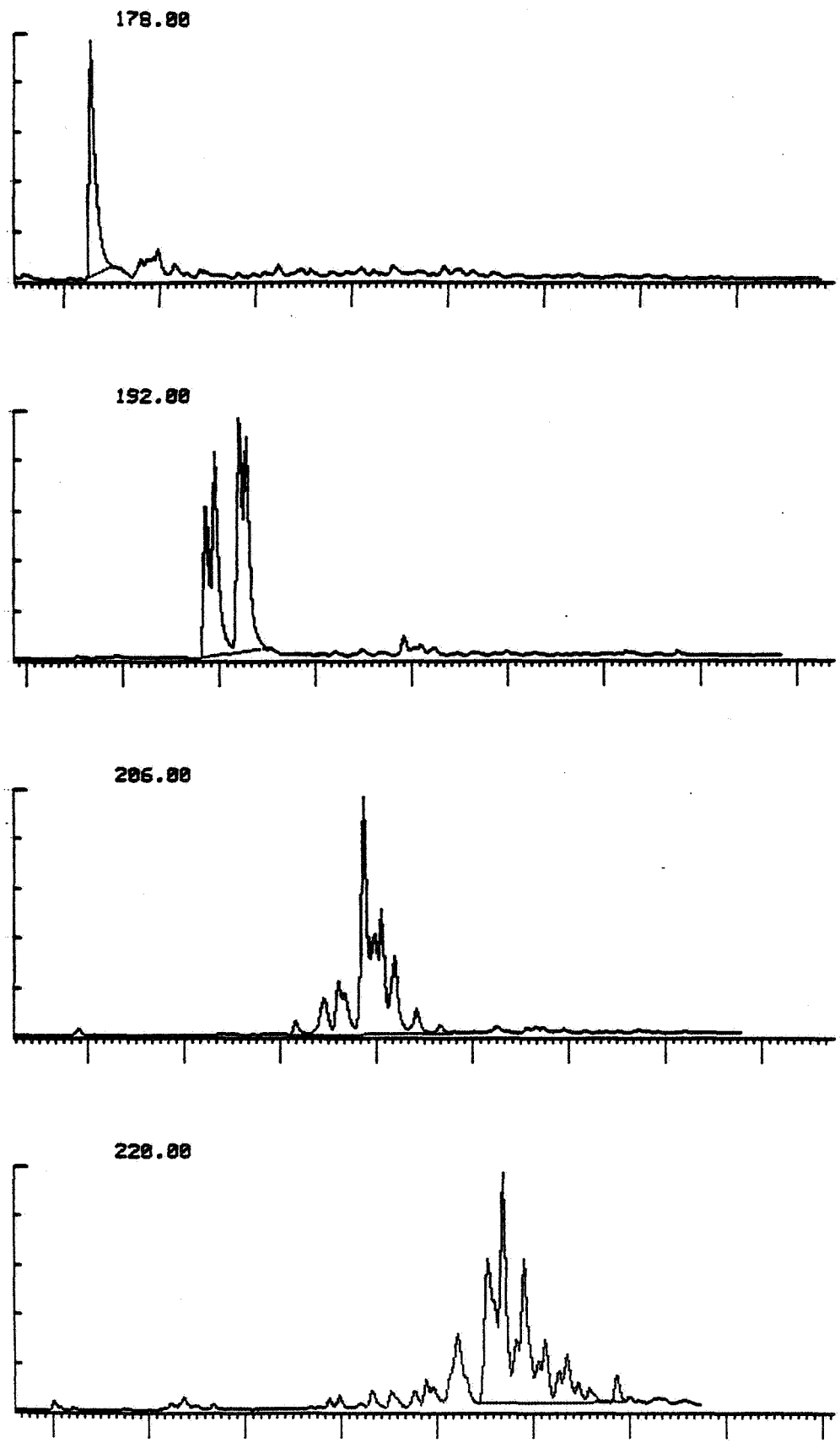
PHENANTHRENE SERIES



3881.41-3881.51m CORE

FIGURE 10e AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

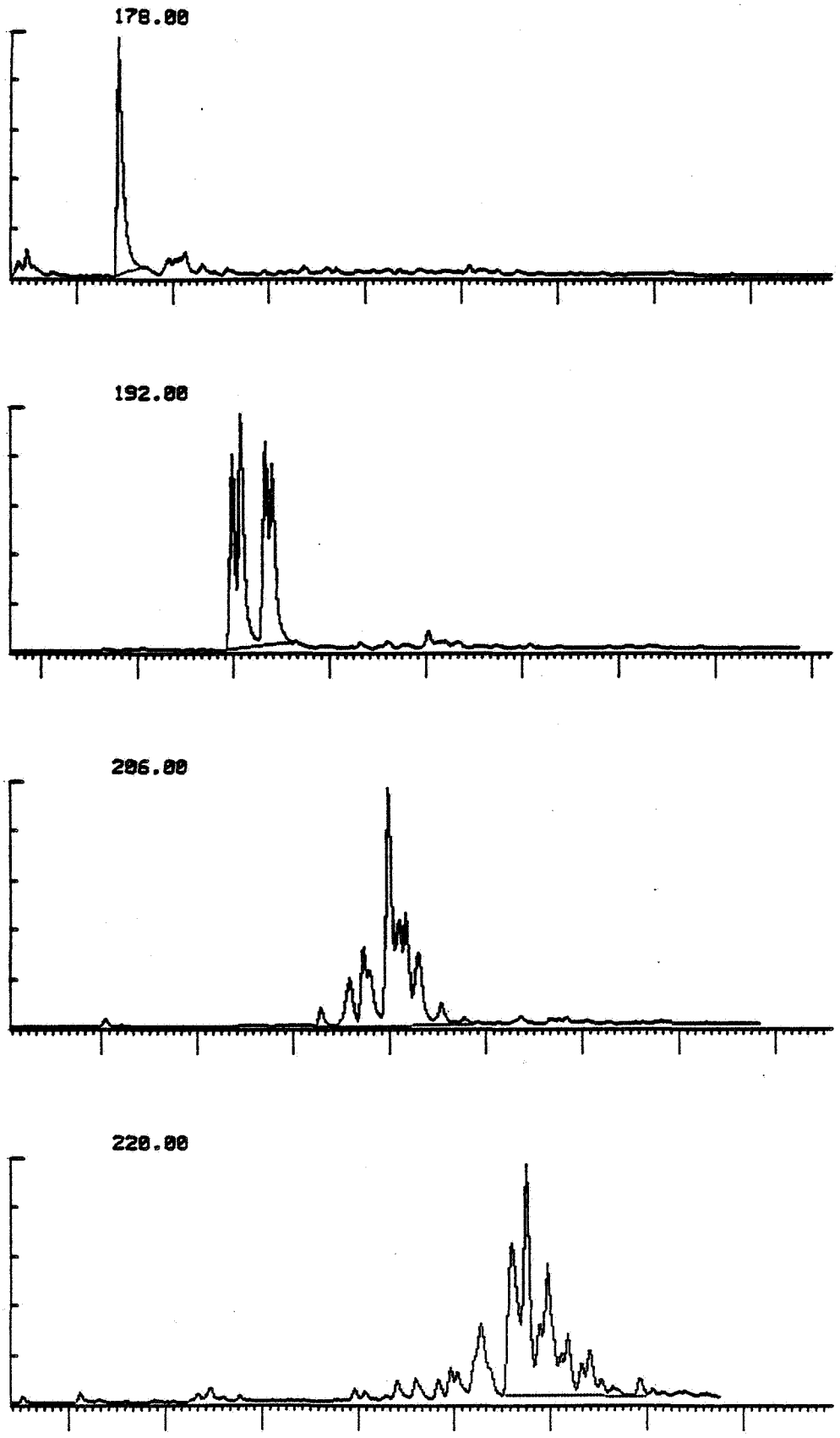
PHENANTHRENE SERIES



3897.60-3897.70m CORE

FIGURE 10f **AROMATIC MASS FRAGMENTOGRAMS** WELL 6506/12-3

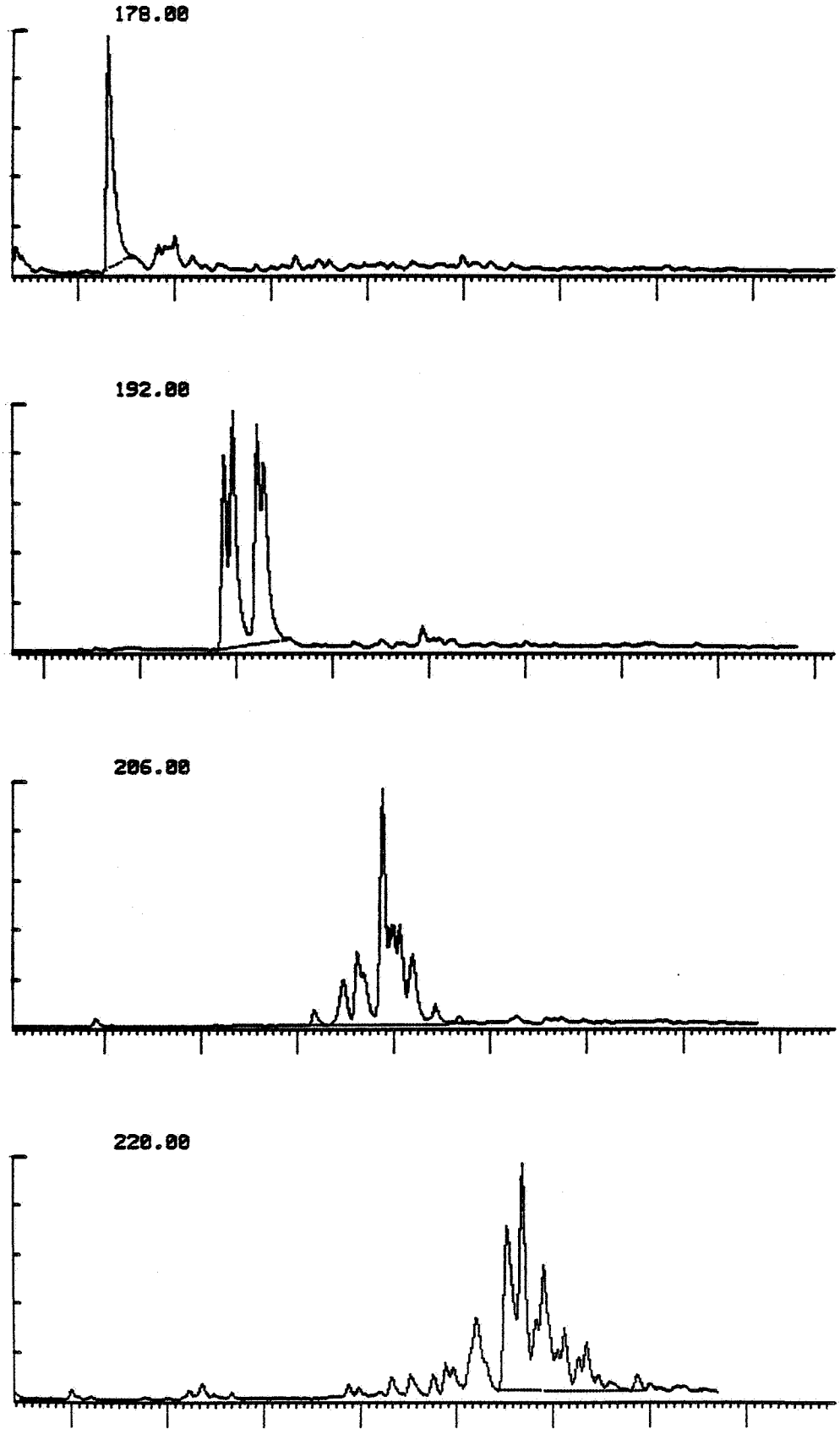
PHENANTHRENE SERIES



3964.00-3964.05m CORE

FIGURE 10g AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

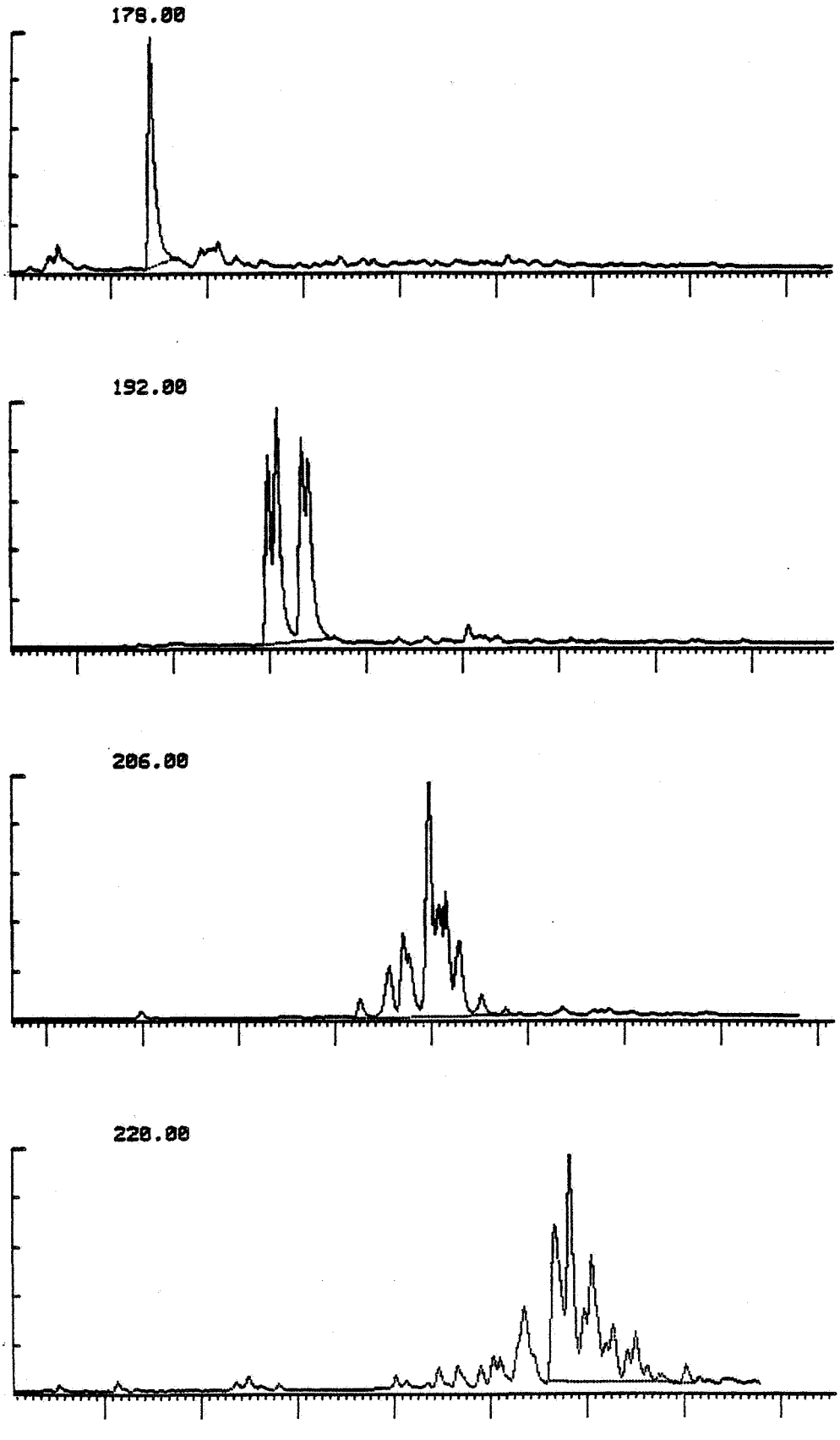
PHENANTHRENE SERIES



3979.00-3979.05m CORE

FIGURE 10h AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

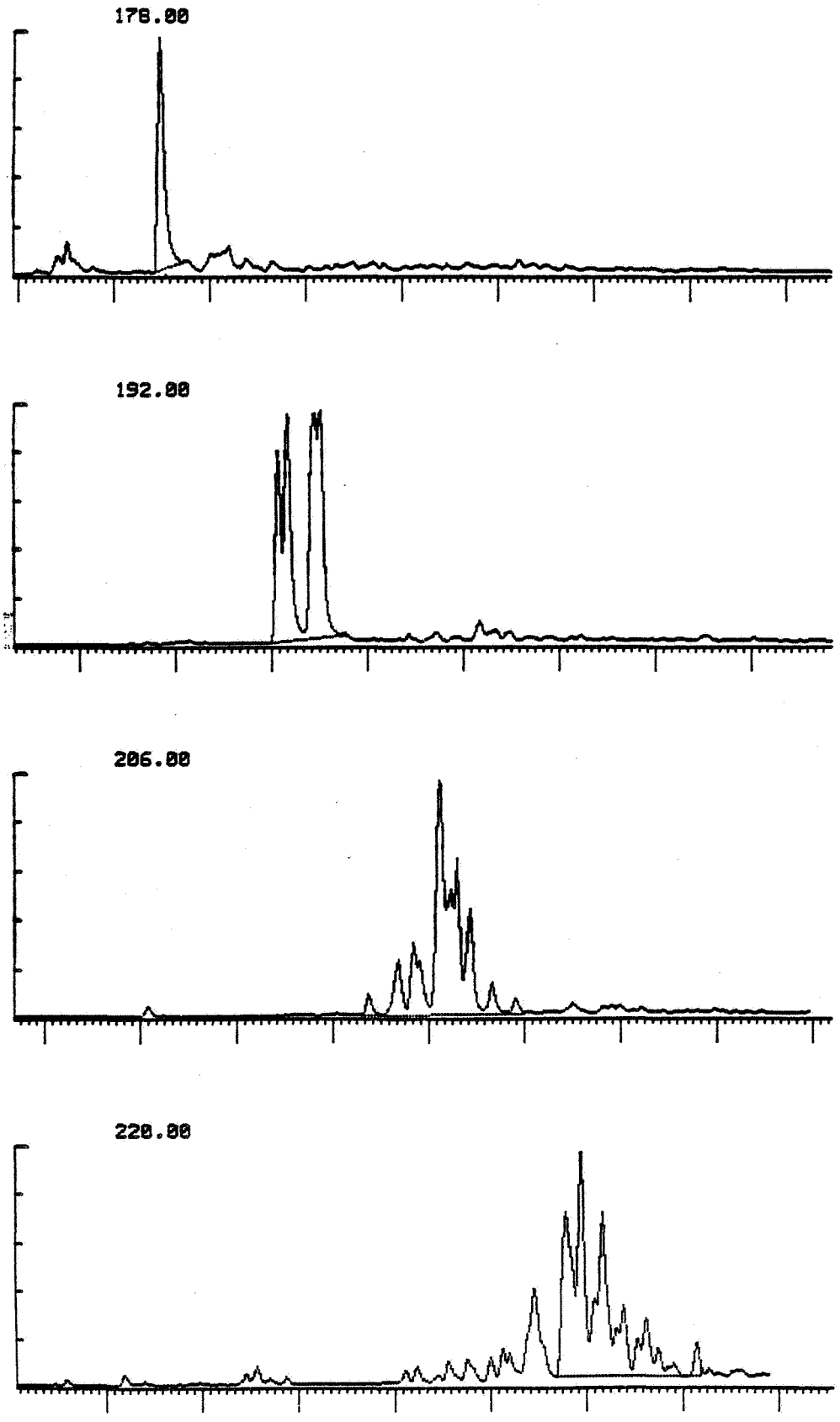
PHENANTHRENE SERIES



3994.00-3994.07m CORE

FIGURE 10i AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

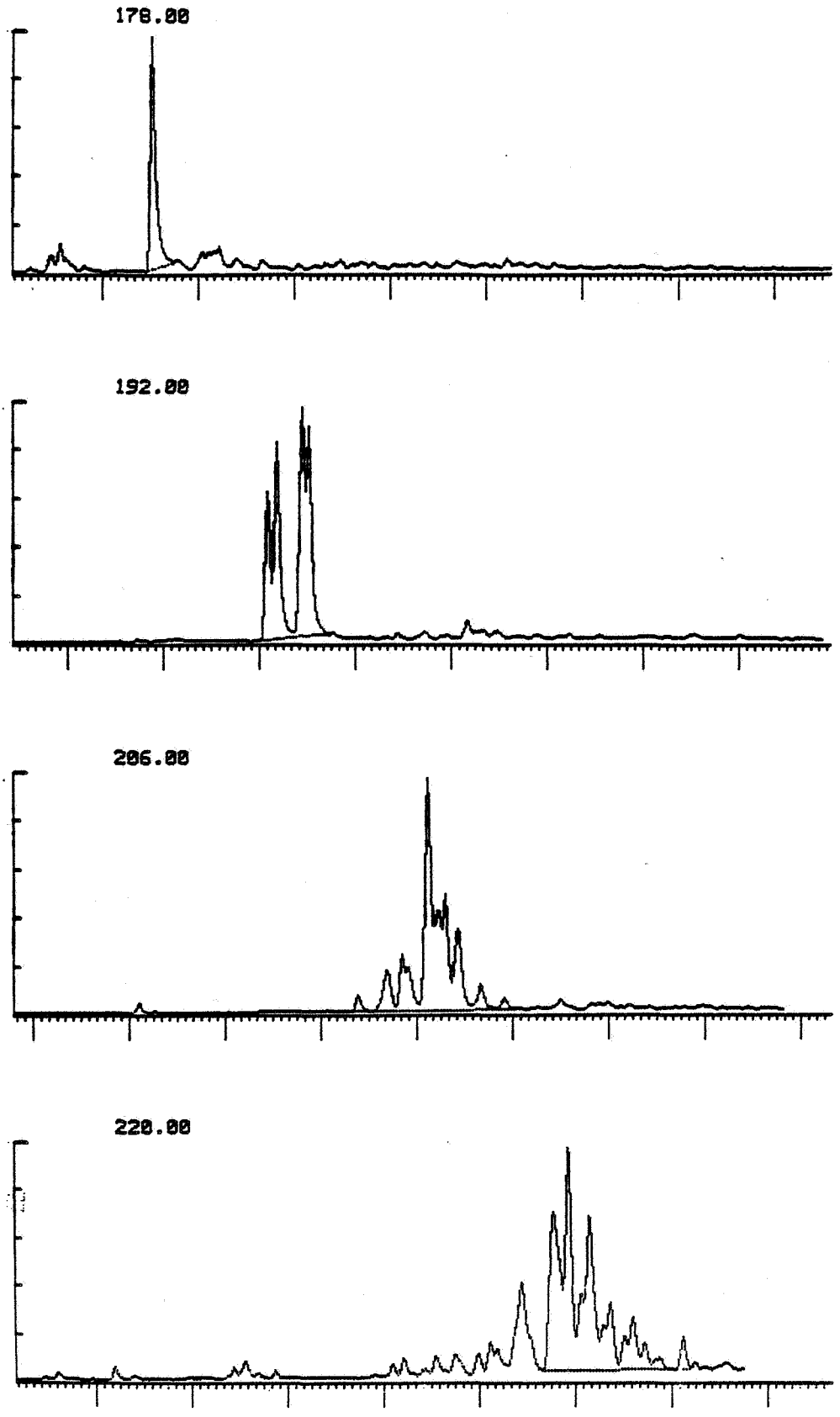
PHENANTHRENE SERIES



4161.00-4161.06m CORE

FIGURE 10j AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

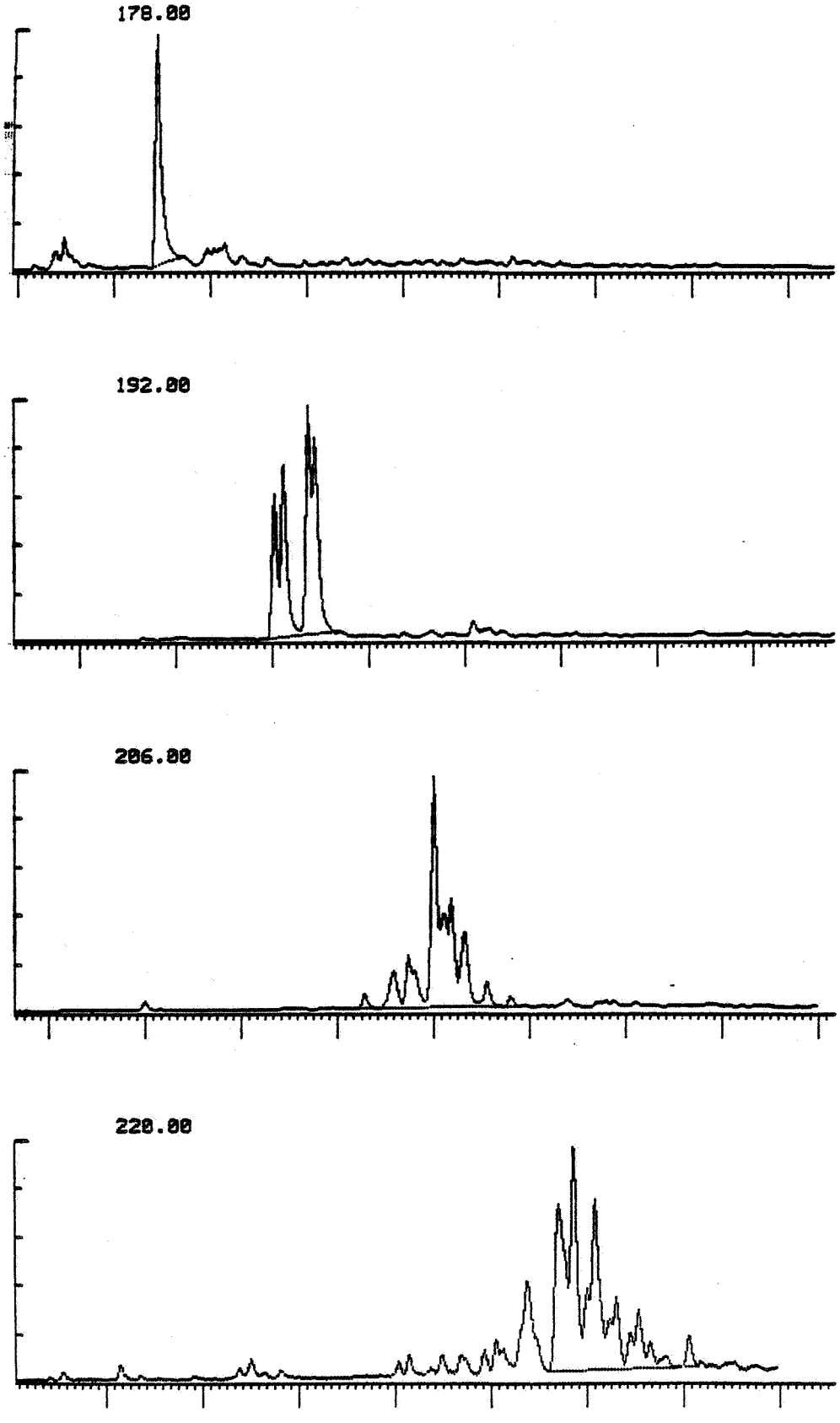
PHENANTHRENE SERIES



4176.00-4176.05m CORE

FIGURE 10k **AROMATIC MASS FRAGMENTOGRAMS** WELL 6506/12-3

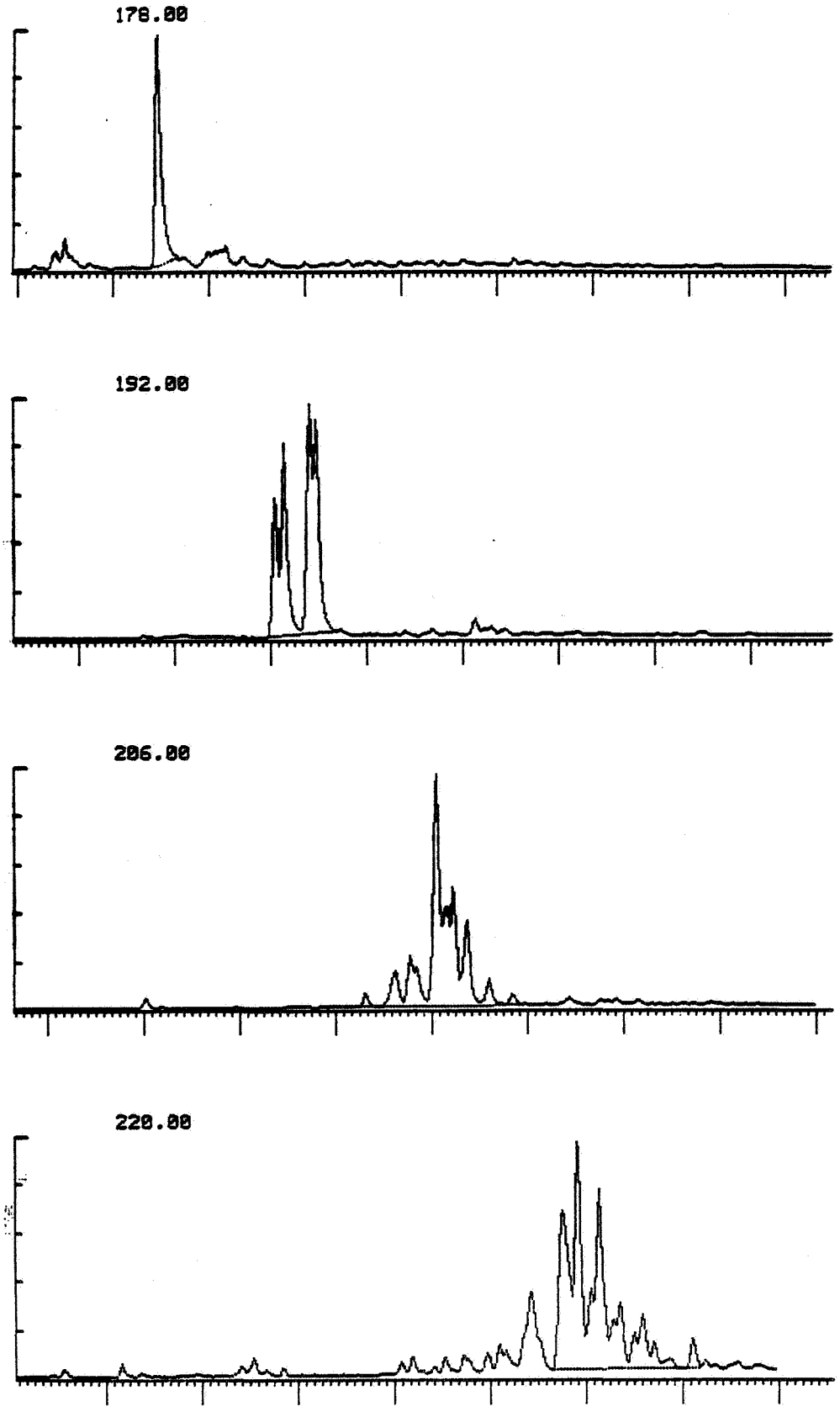
PHENANTHRENE SERIES



4187.00-4187.05m CORE

FIGURE 10l AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

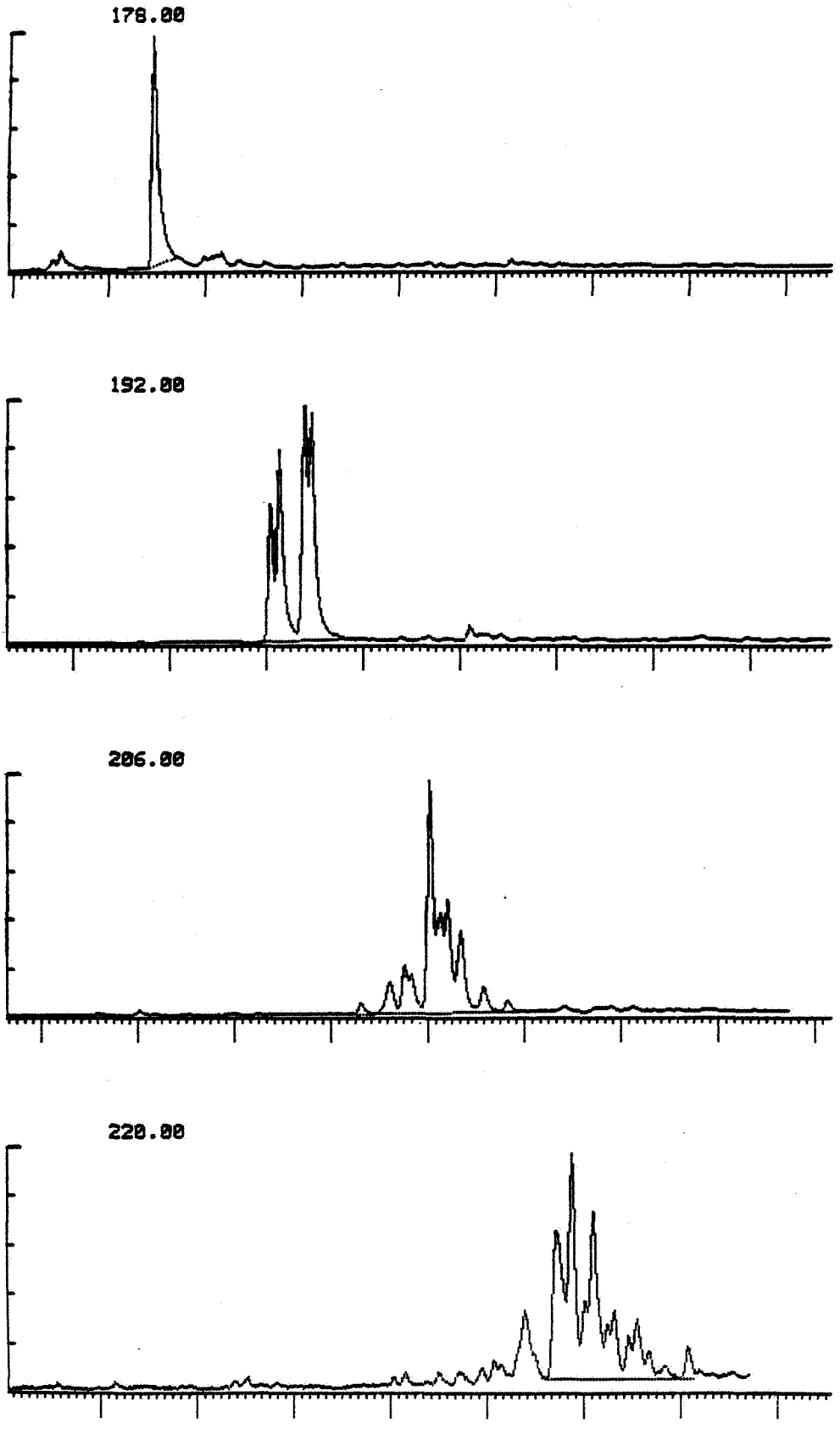
PHENANTHRENE SERIES



4202.00-4202.06m CORE

FIGURE 10m AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

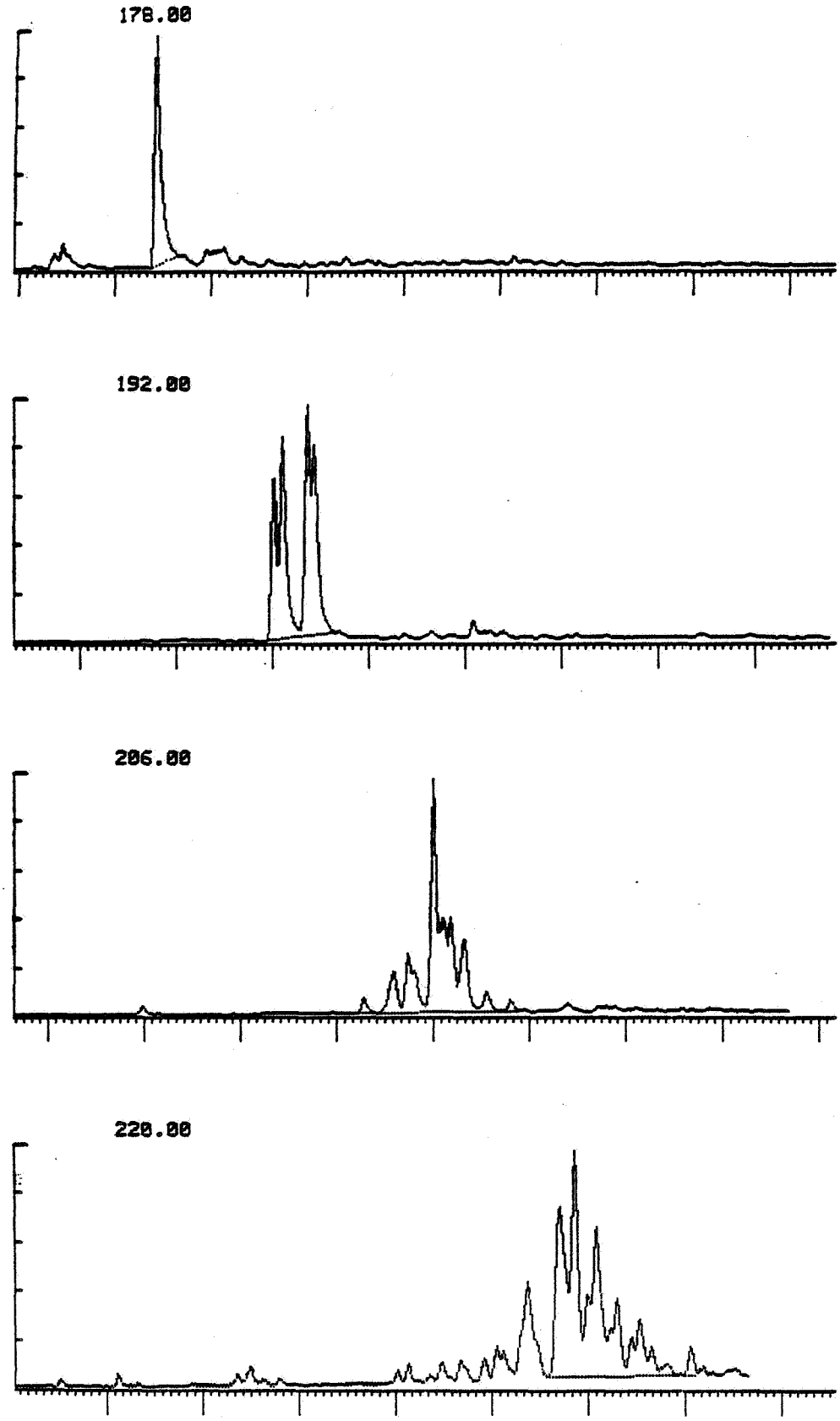
PHENANTHRENE SERIES



4232.00-4232.05m CORE

FIGURE 10n AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

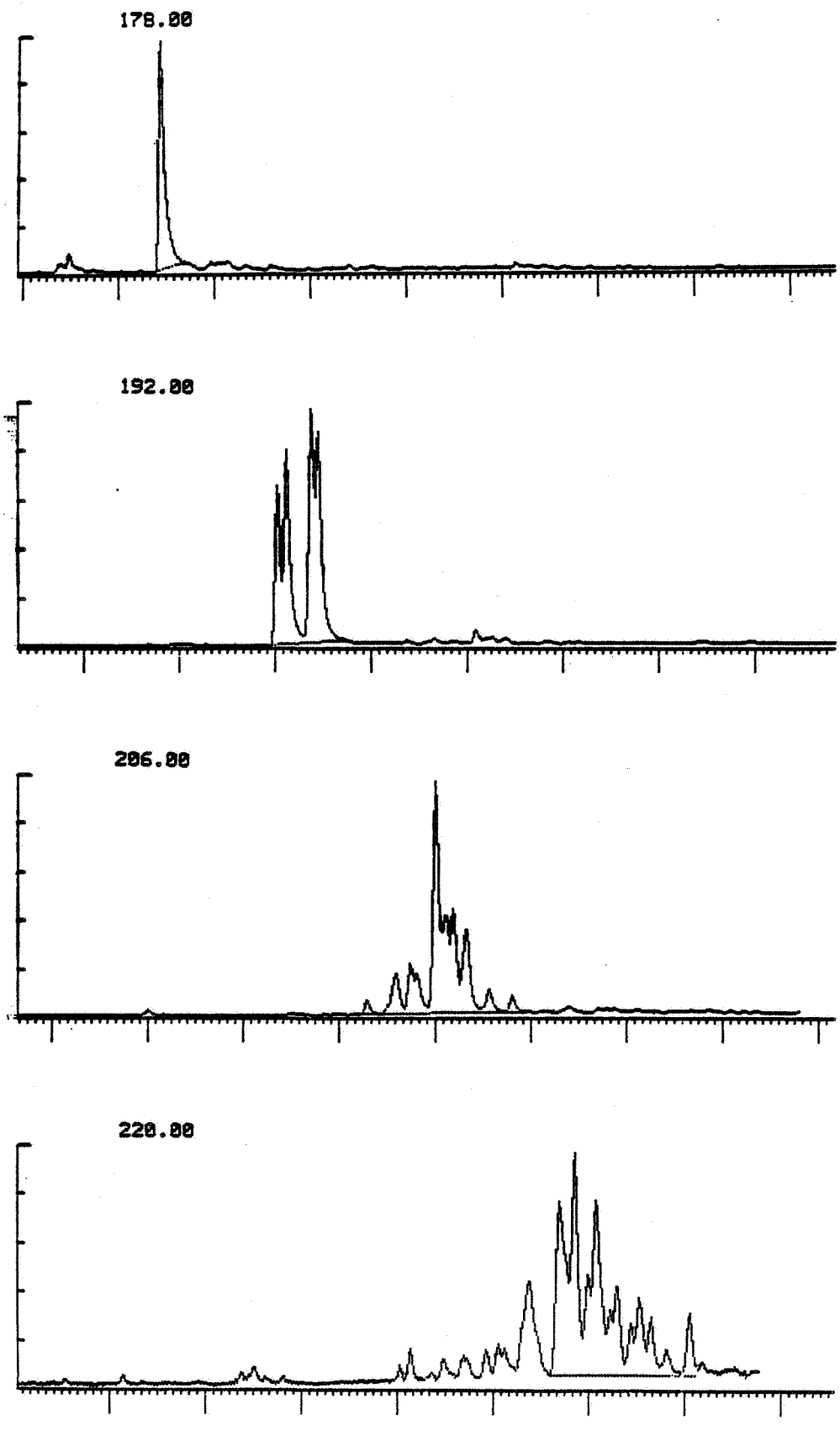
PHENANTHRENE SERIES



4249.00-4249.05m CORE

FIGURE 10o AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

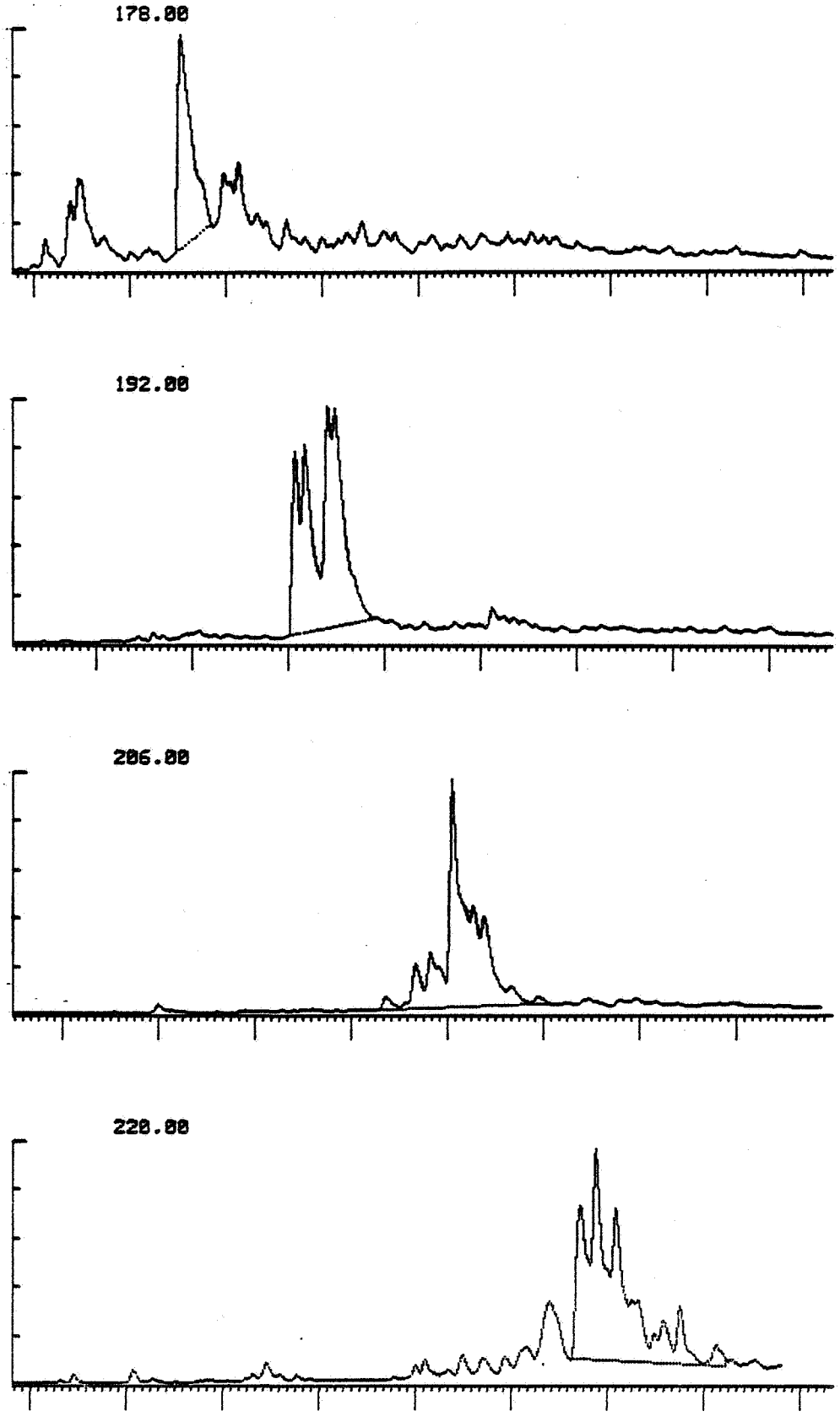
PHENANTHRENE SERIES



4264.00-4264.05m CORE

FIGURE 10p AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

PHENANTHRENE SERIES

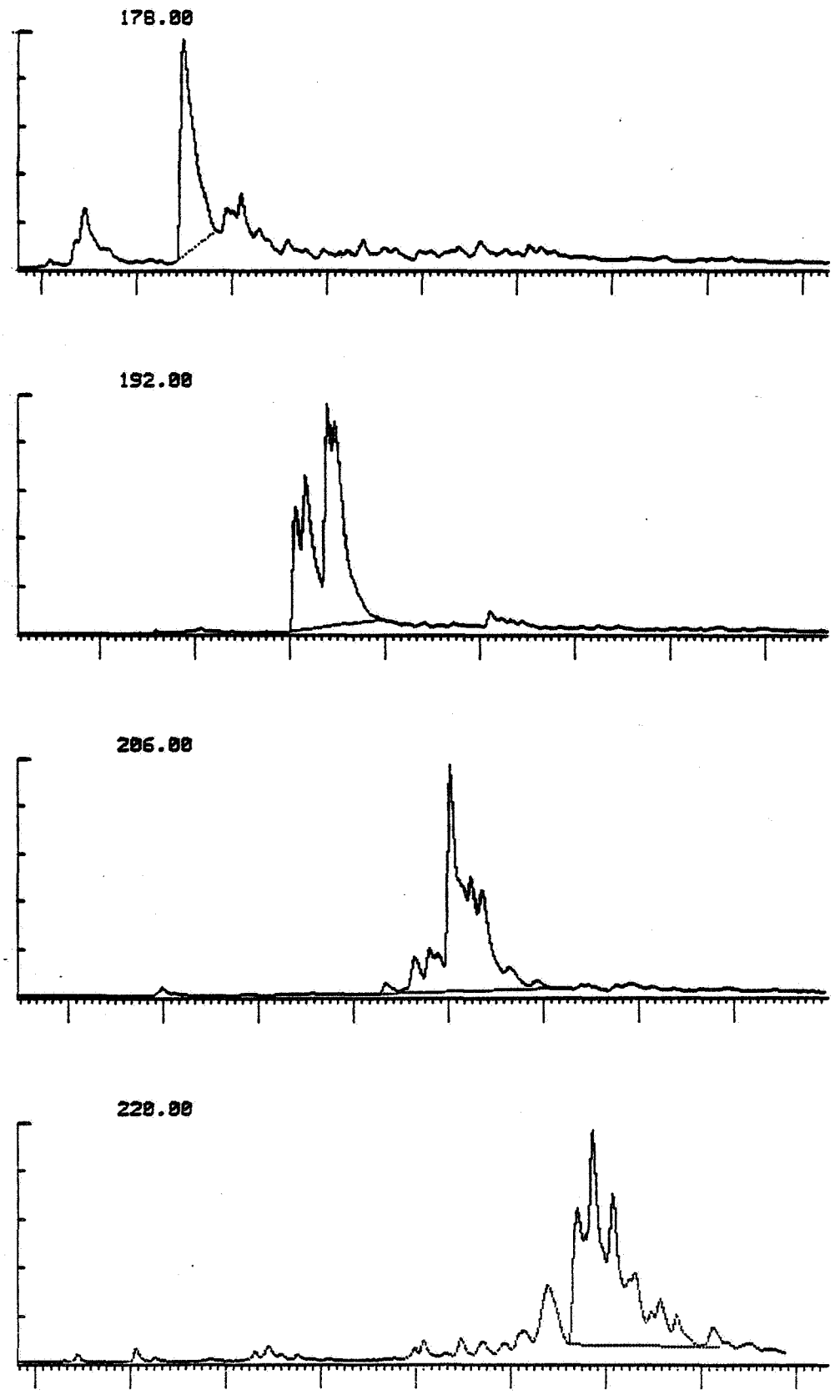


3162-3173m

DST 6 OIL SAMPLE

FIGURE 10q AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

PHENANTHRENE SERIES

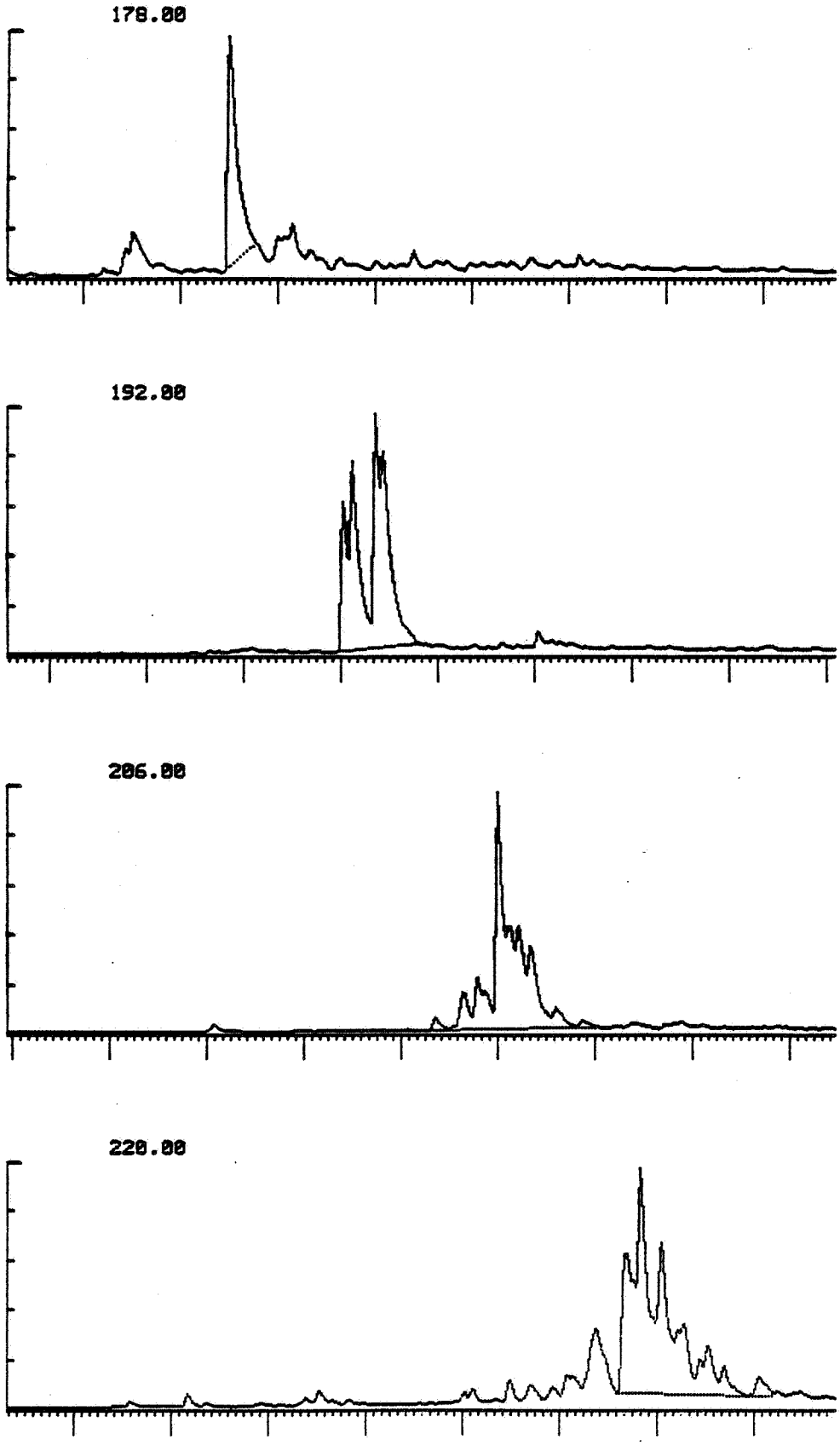


3822-3836m

DST 5 OIL SAMPLE

FIGURE 10r AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

PHENANTHRENE SERIES

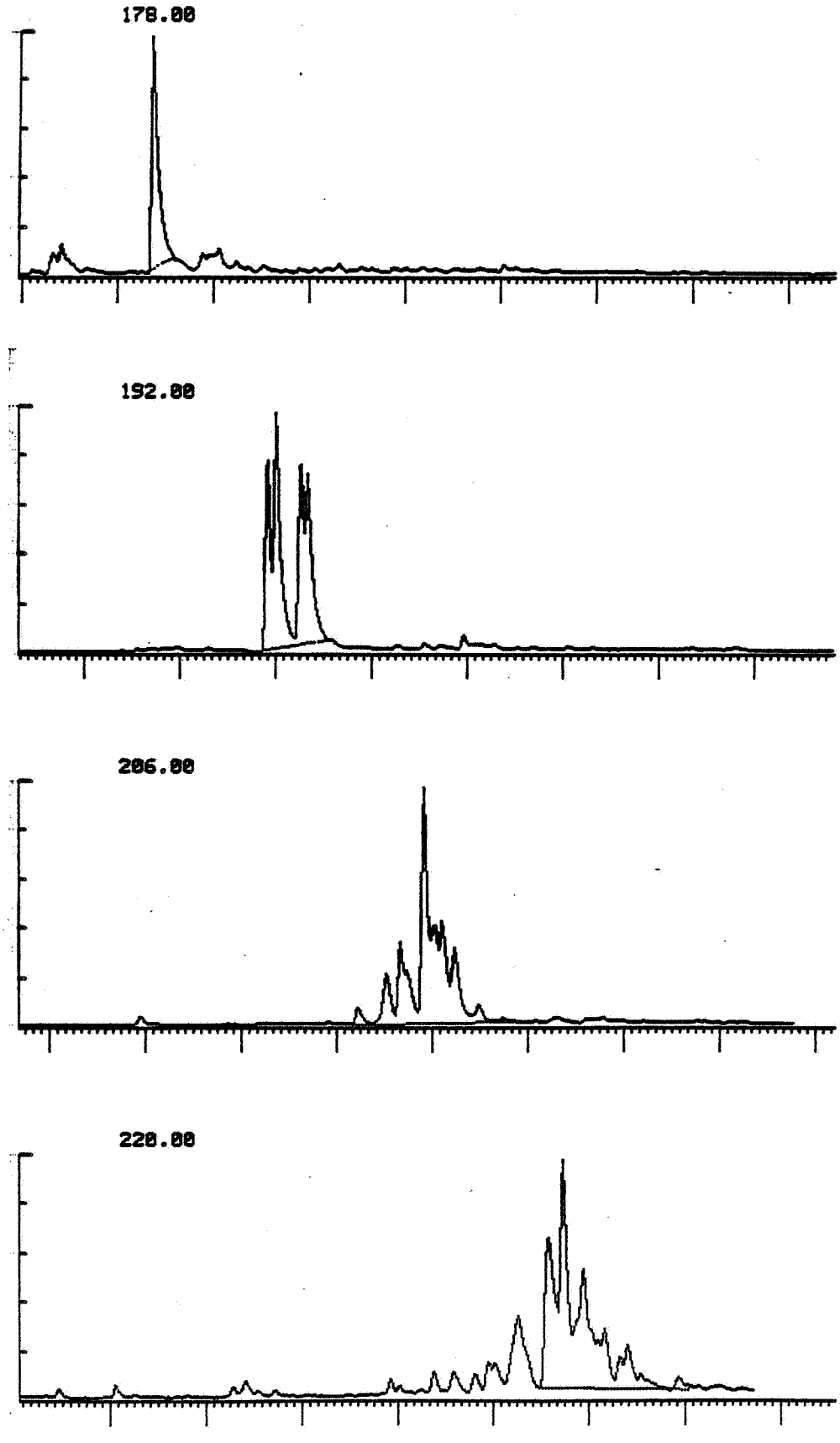


3880-3890m

DST 4 OIL SAMPLE

FIGURE 10s AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

PHENANTHRENE SERIES

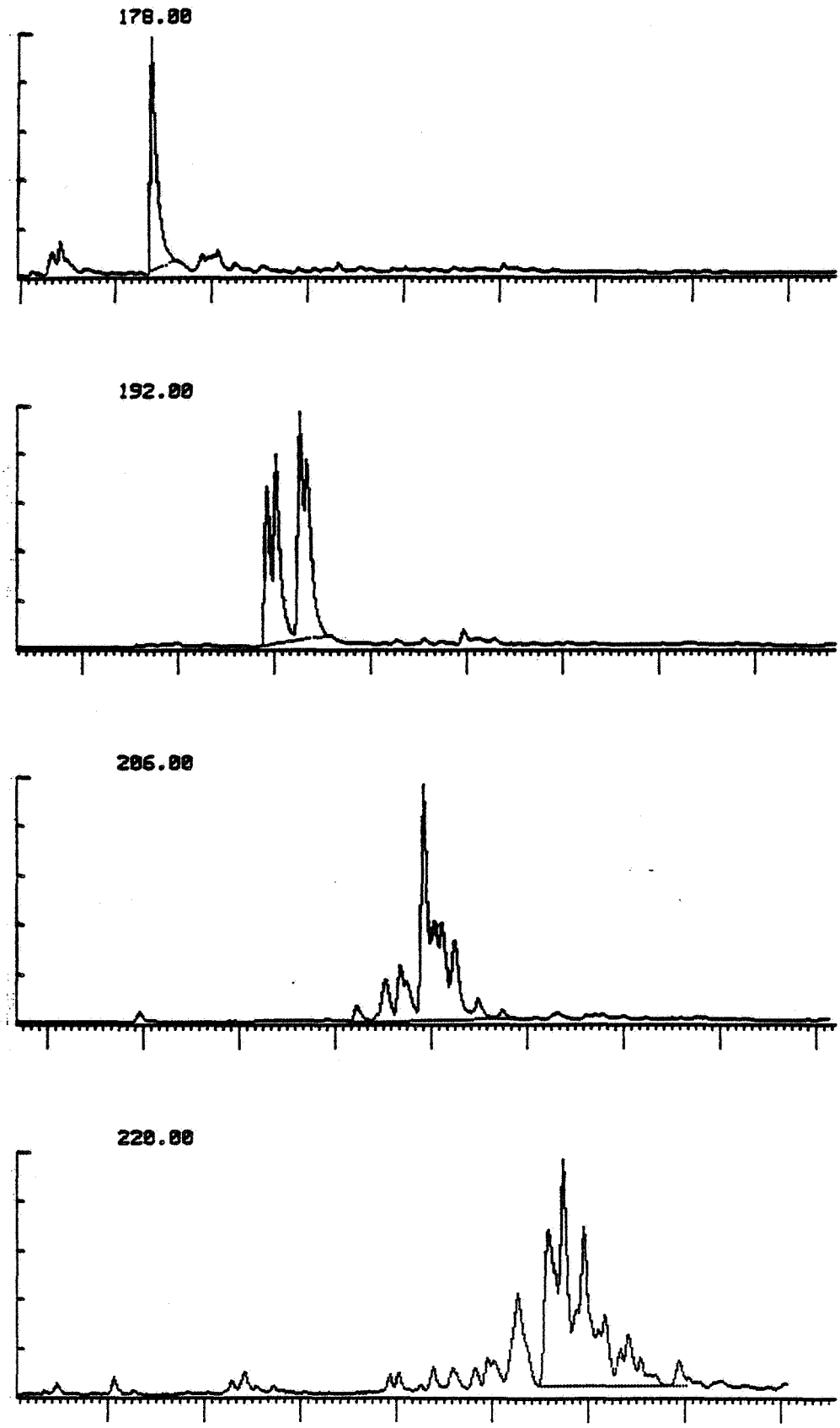


3960-3980m

DST 3 OIL SAMPLE

FIGURE 10t AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

PHENANTHRENE SERIES

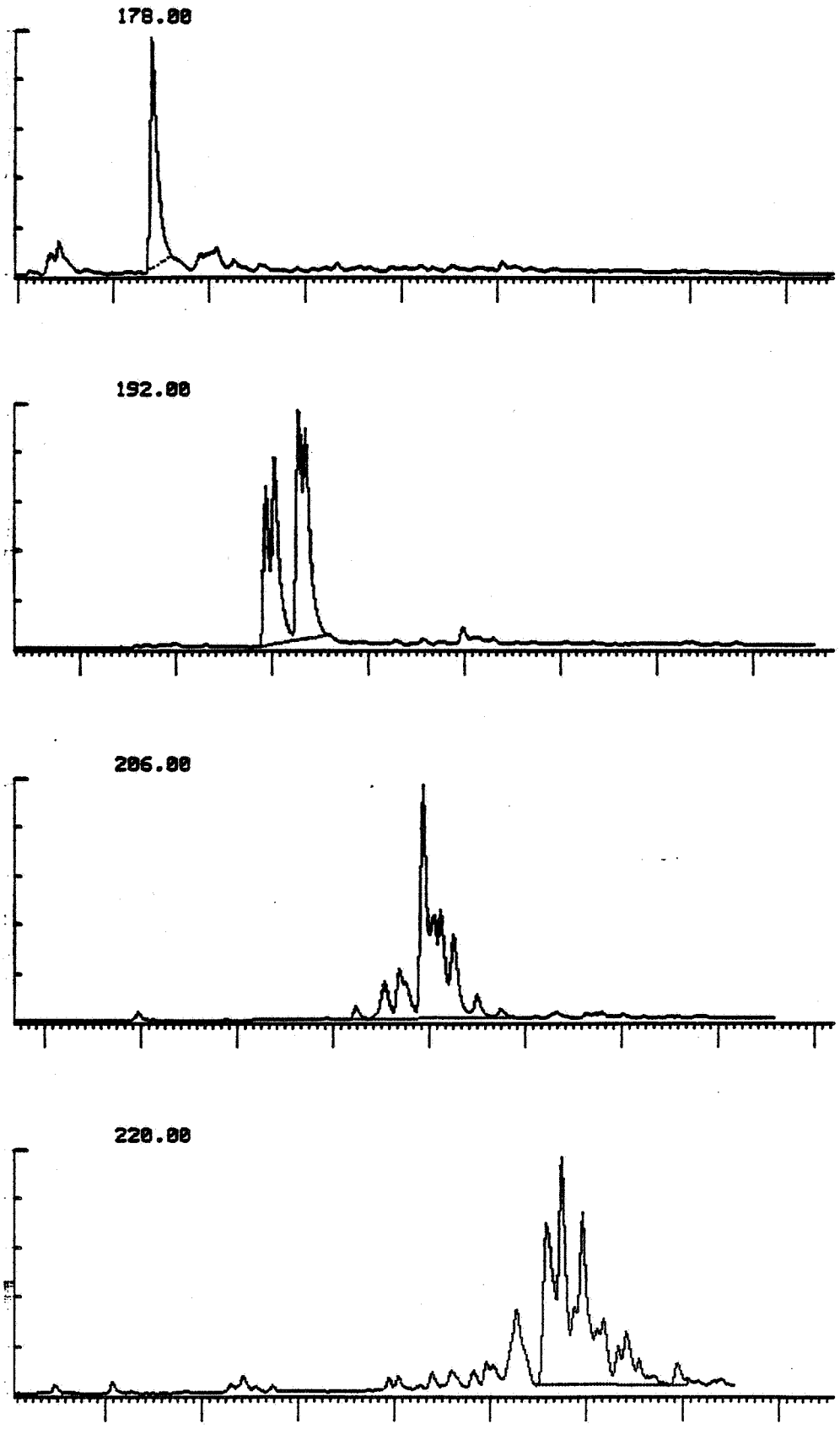


4165-4170m

DST 2 OIL SAMPLE

FIGURE 10u AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

PHENANTHRENE SERIES



4222-4241m

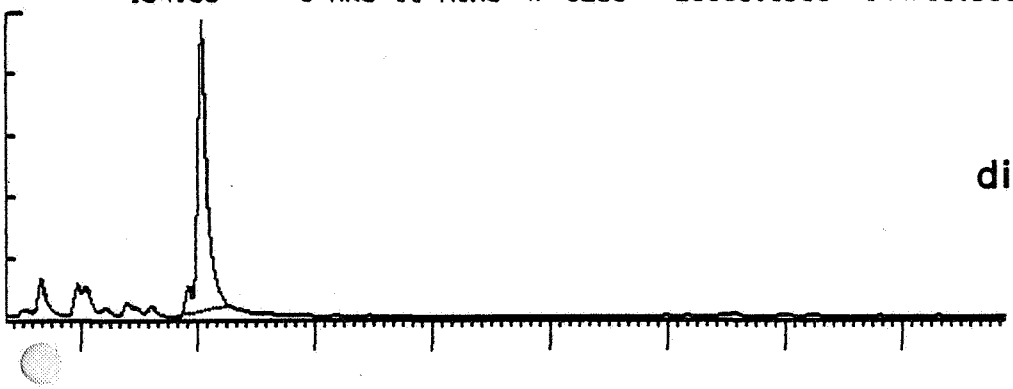
DST 1 OIL SAMPLE

AROMATIC MASS FRAGMENTOGRAMS
DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - STD. .SD RUN - 1

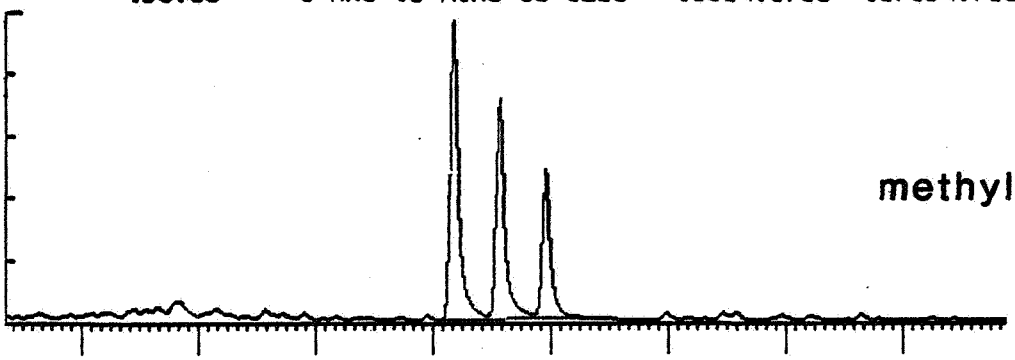
UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC.(H)	CONC.(A)
184.00	0 HRS 11 MINS 47 SECS	26003.8900	144753.9000	0.0000	0.0000



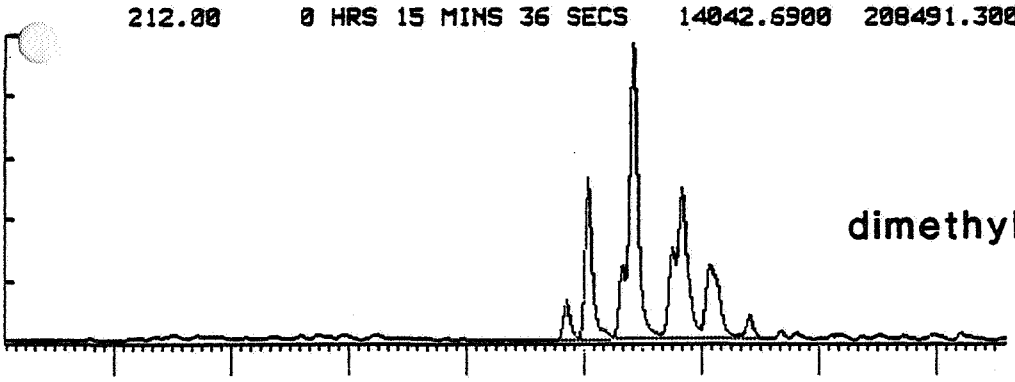
dibenzothiophene

198.00	0 HRS 13 MINS 36 SECS	16854.6700	187694.7000	0.0000	0.0000



methyl dibenzothiophenes

212.00	0 HRS 15 MINS 36 SECS	14042.6900	208491.3000	0.0000	0.0000



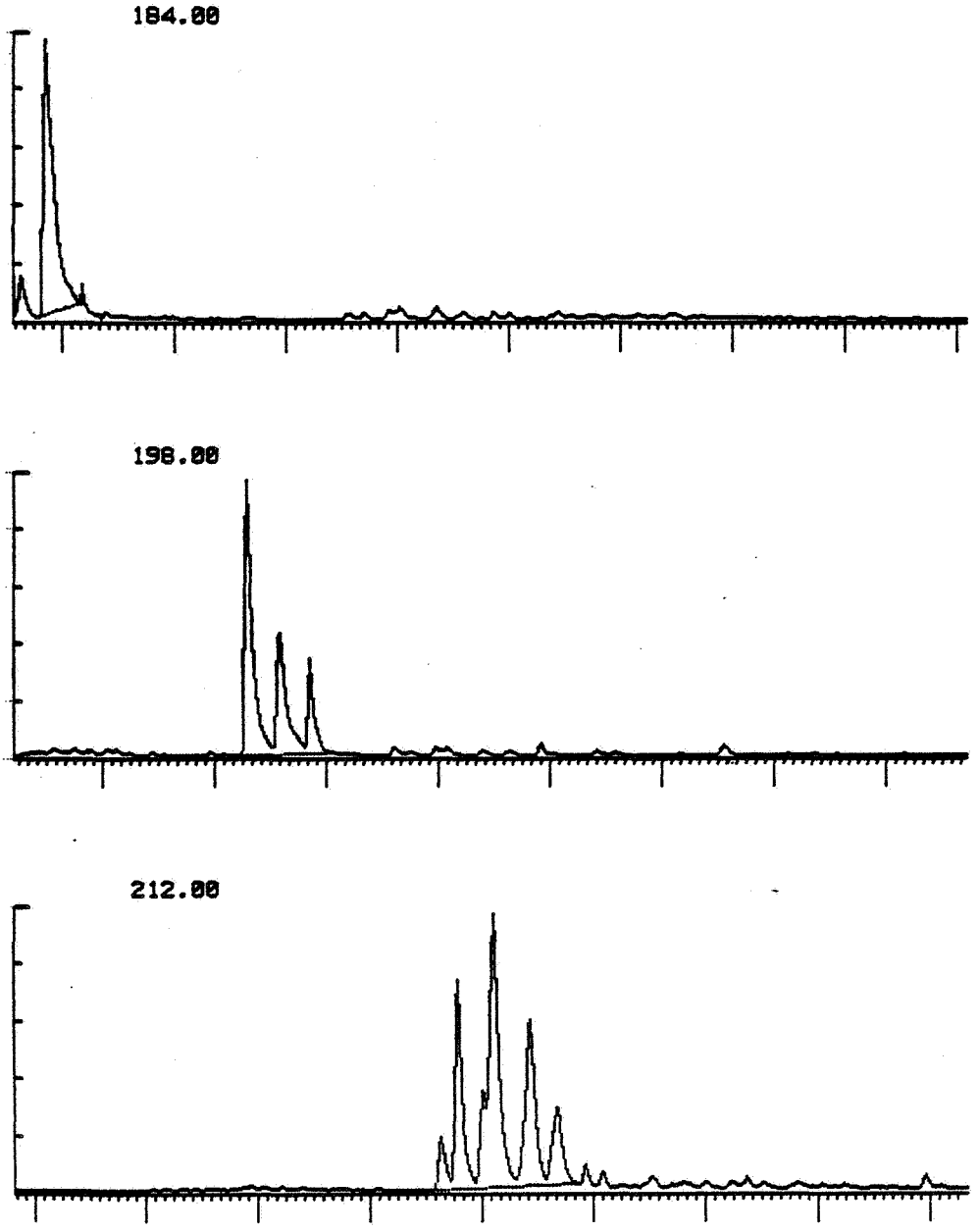
dimethyl dibenzothiophenes

0 HRS 11 MINS 4 SECS

0 HRS 19 MINS 16 SECS

FIGURE 11a AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

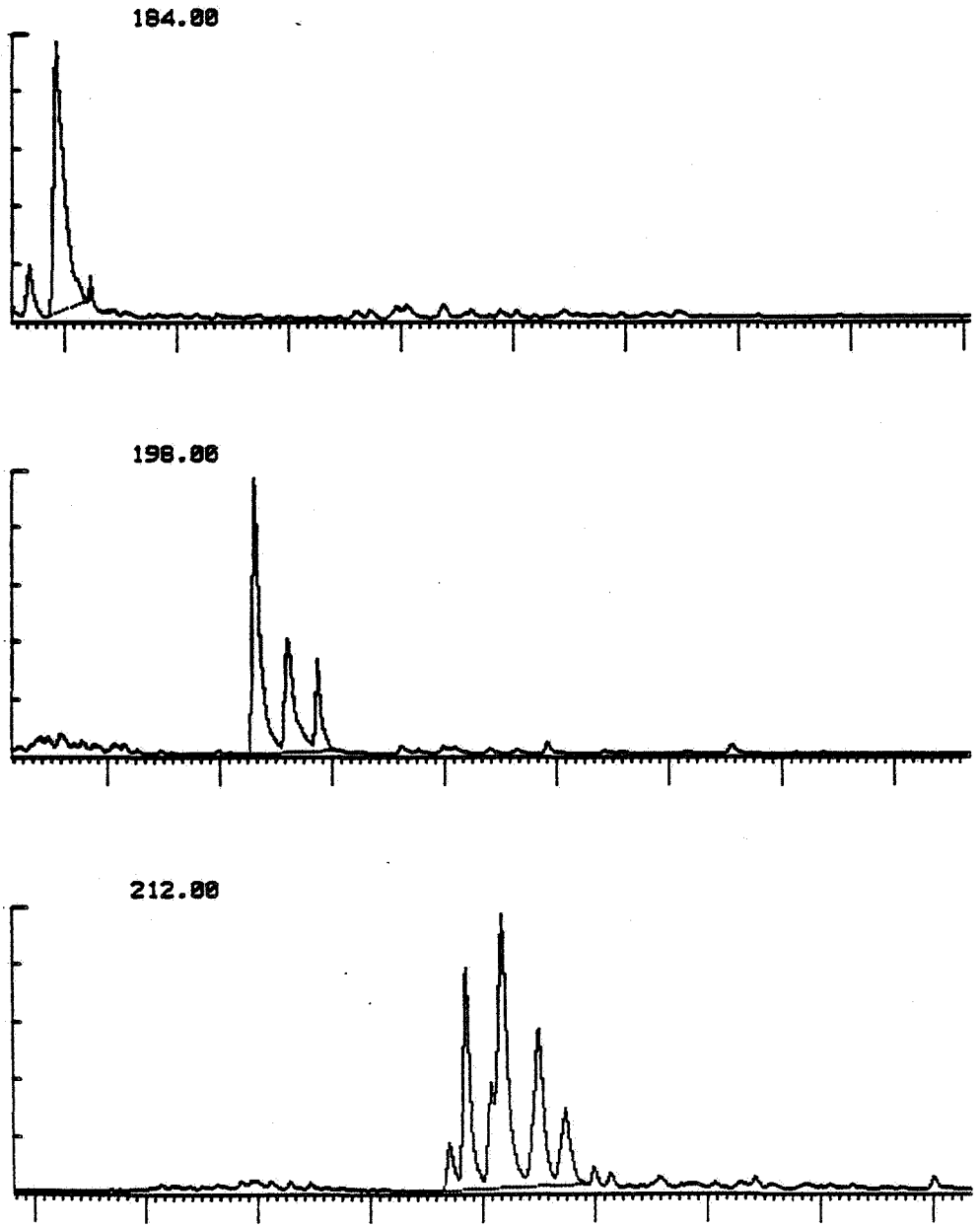
DIBENZOTHIOPHENE SERIES



3837.18-3837.30m CORE

FIGURE 11b AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

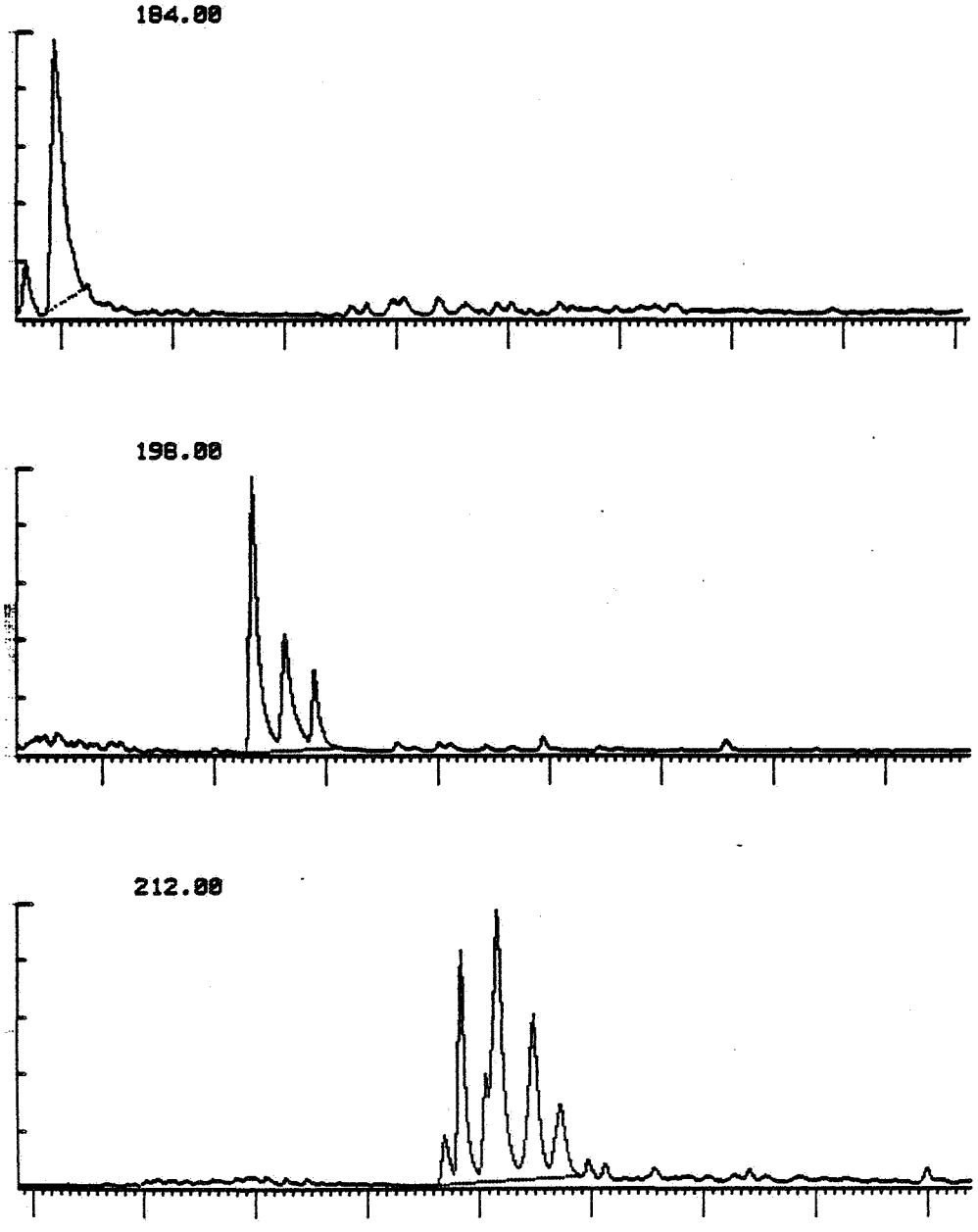
DIBENZOTHIOPHENE SERIES



3852.00-3852.10m CORE

FIGURE 11c AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

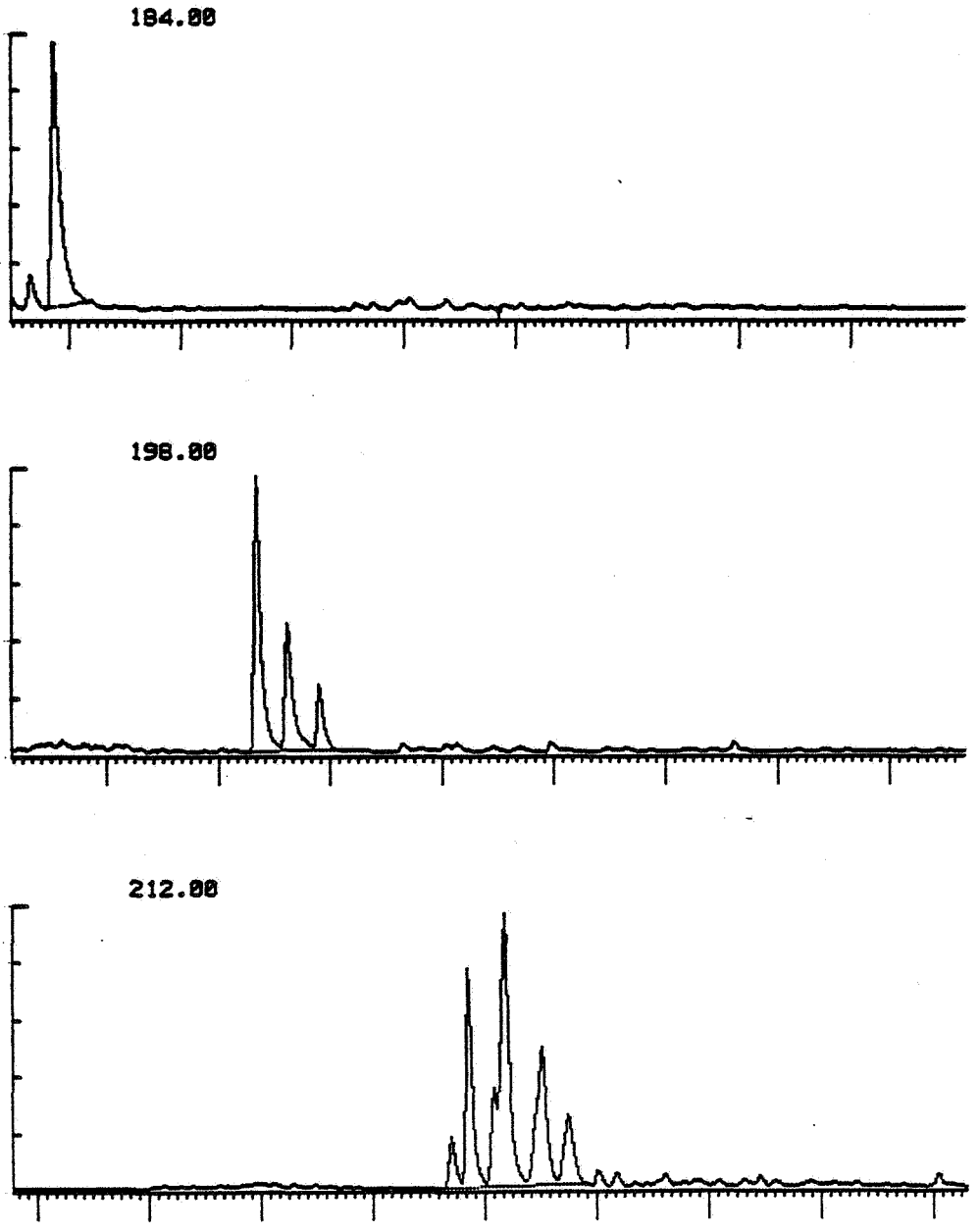
DIBENZOTHIOPHENE SERIES



3867.10-3867.20m CORE

FIGURE 11d **AROMATIC MASS FRAGMENTOGRAMS** WELL 6506/12-3

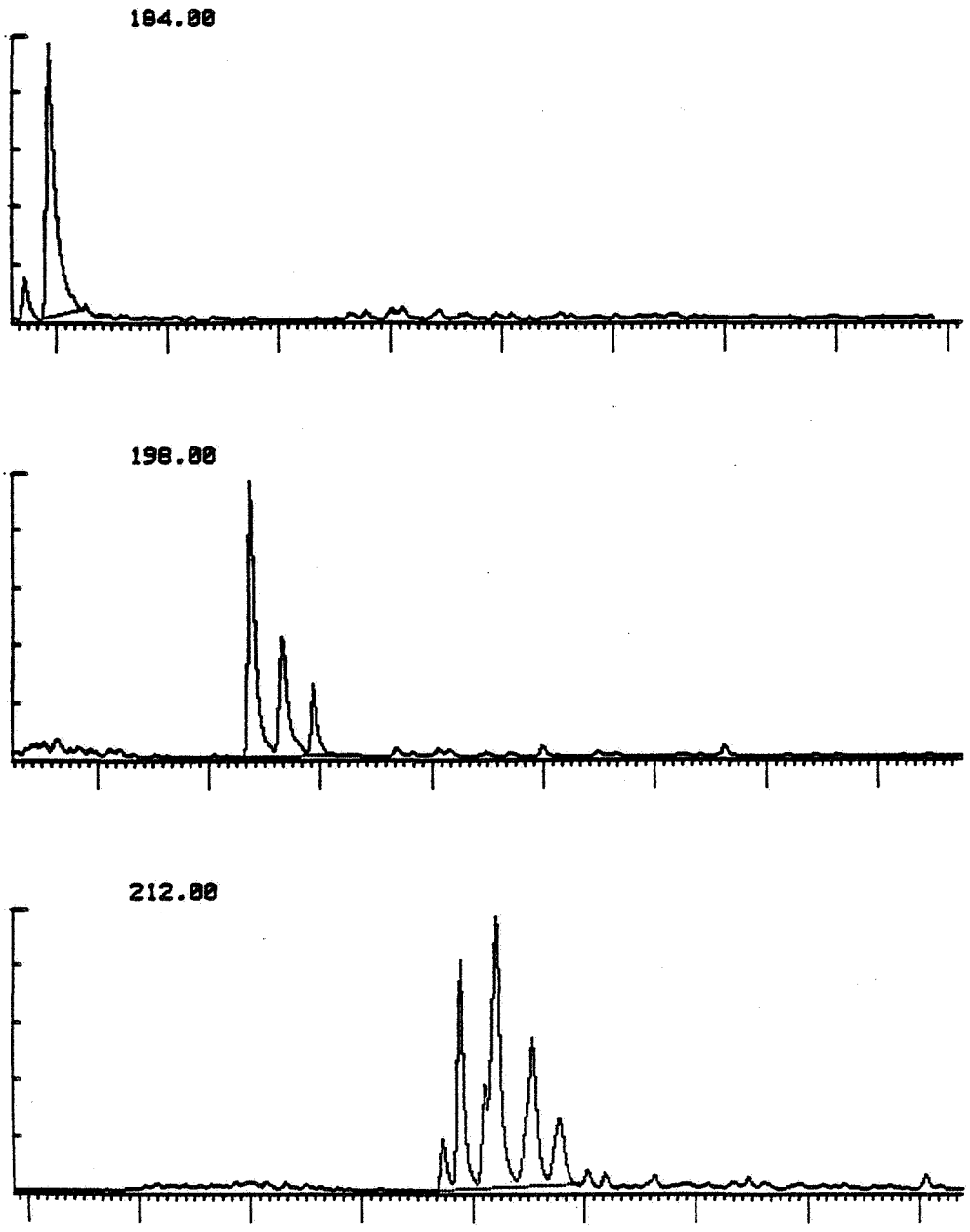
DIBENZOTHIOPHENE SERIES



3881.41-3881.51m CORE

FIGURE 11e **AROMATIC MASS FRAGMENTOGRAMS** WELL 6506/12-3

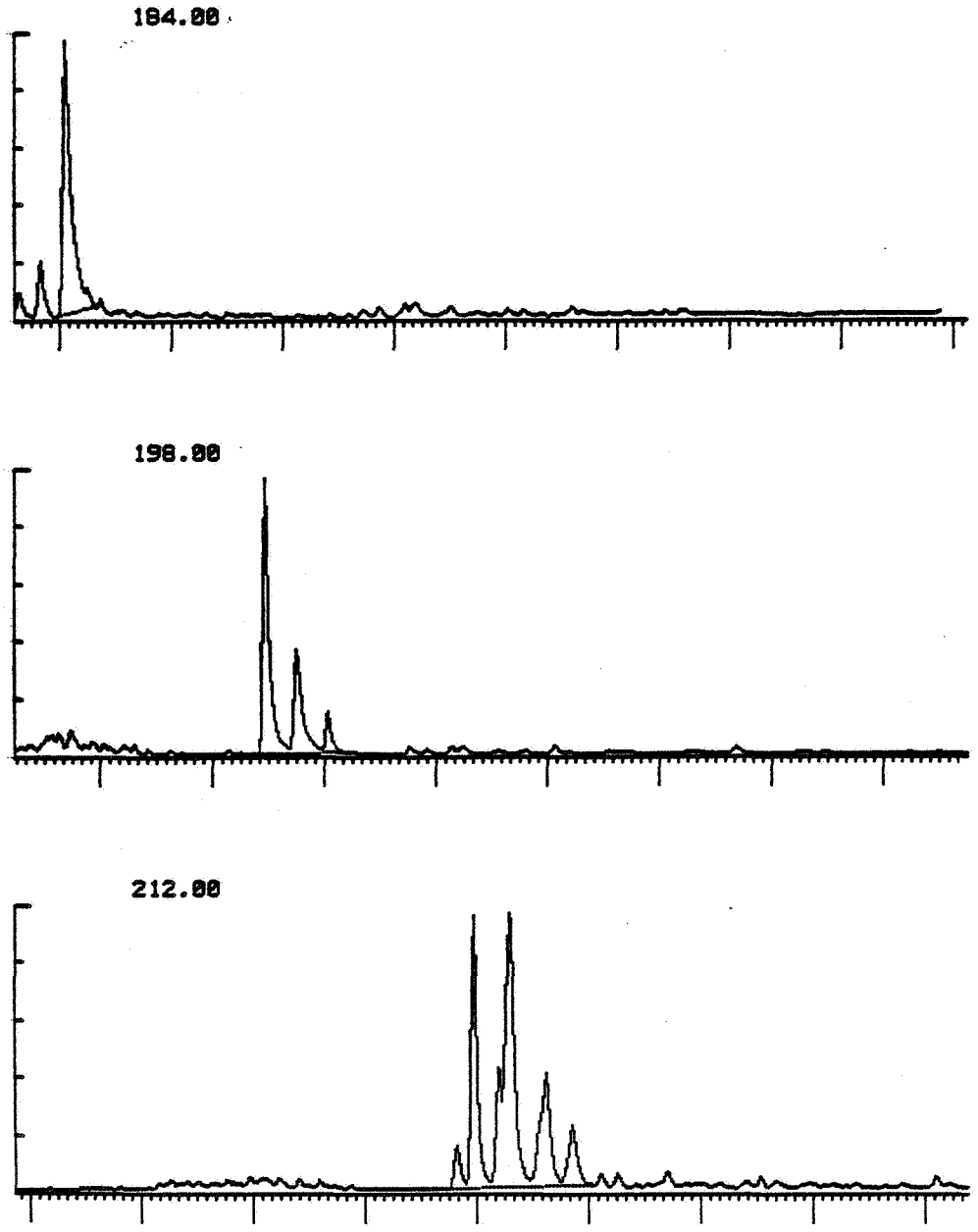
DIBENZOTHIOPHENE SERIES



3897.60-3897.70m CORE

FIGURE 11f AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

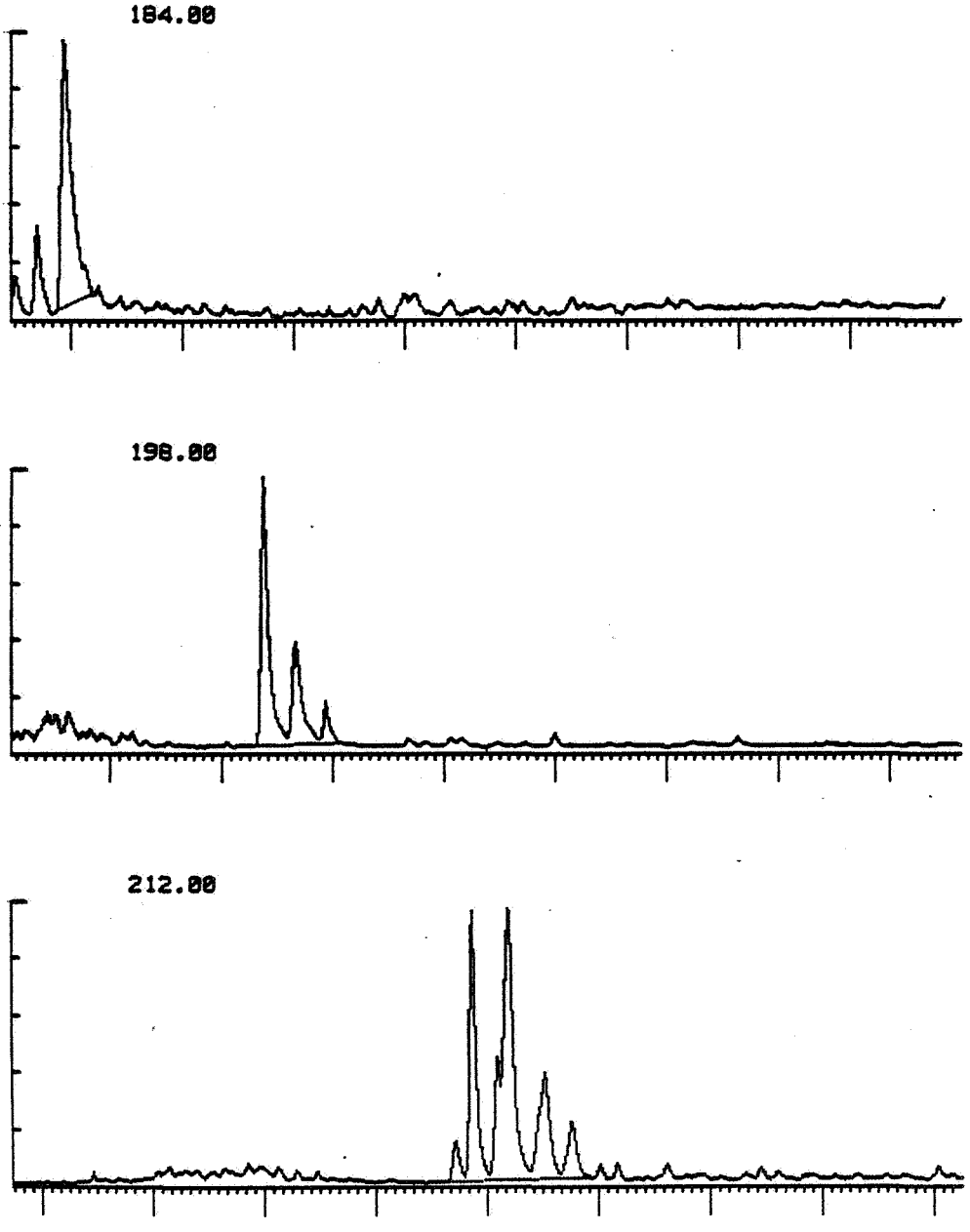
DIBENZOTHIOPHENE SERIES



3964.00-3964.05m CORE

FIGURE 11g AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

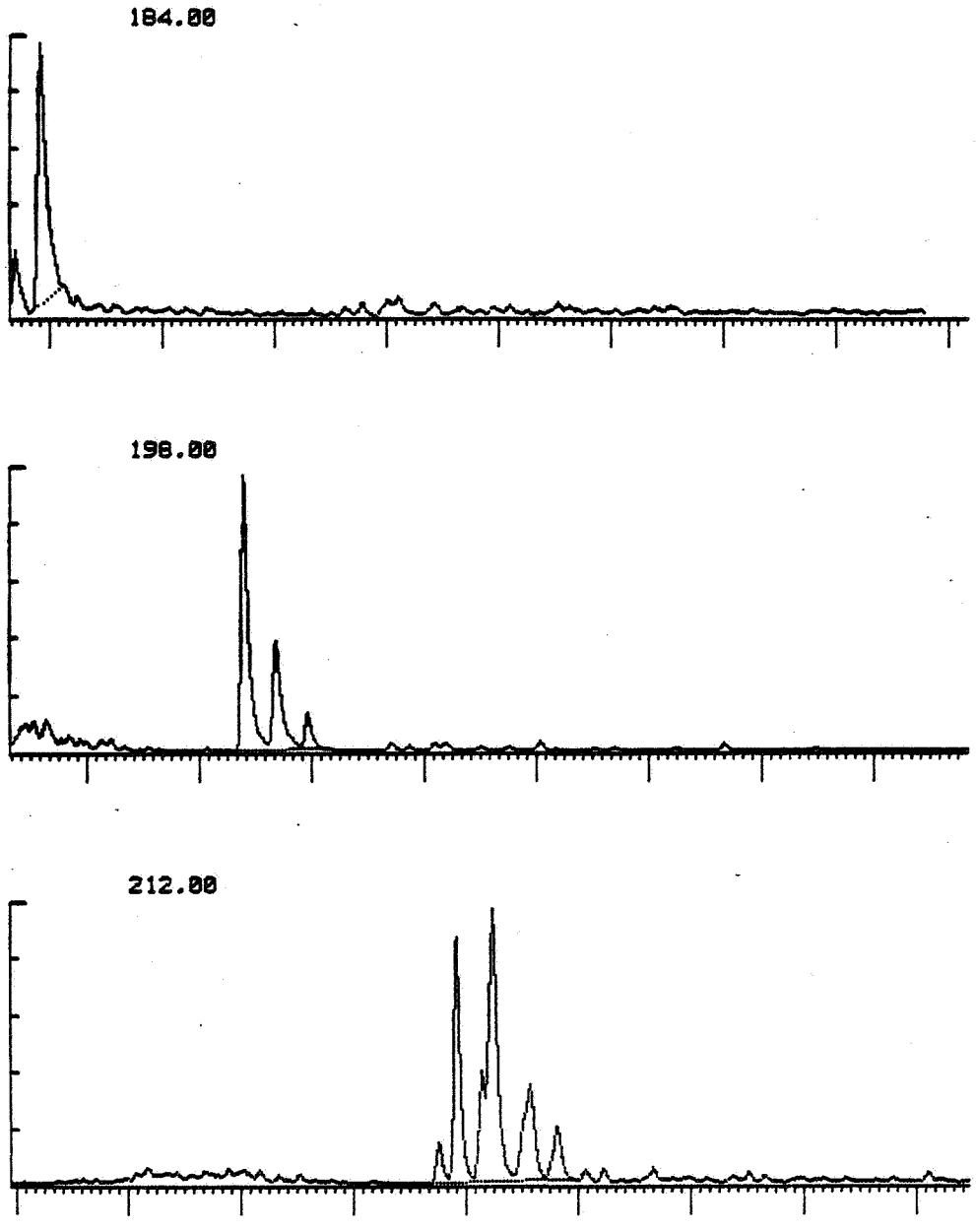
DIBENZOTHIOPHENE SERIES



3979.00-3979.05m CORE

FIGURE 11h AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

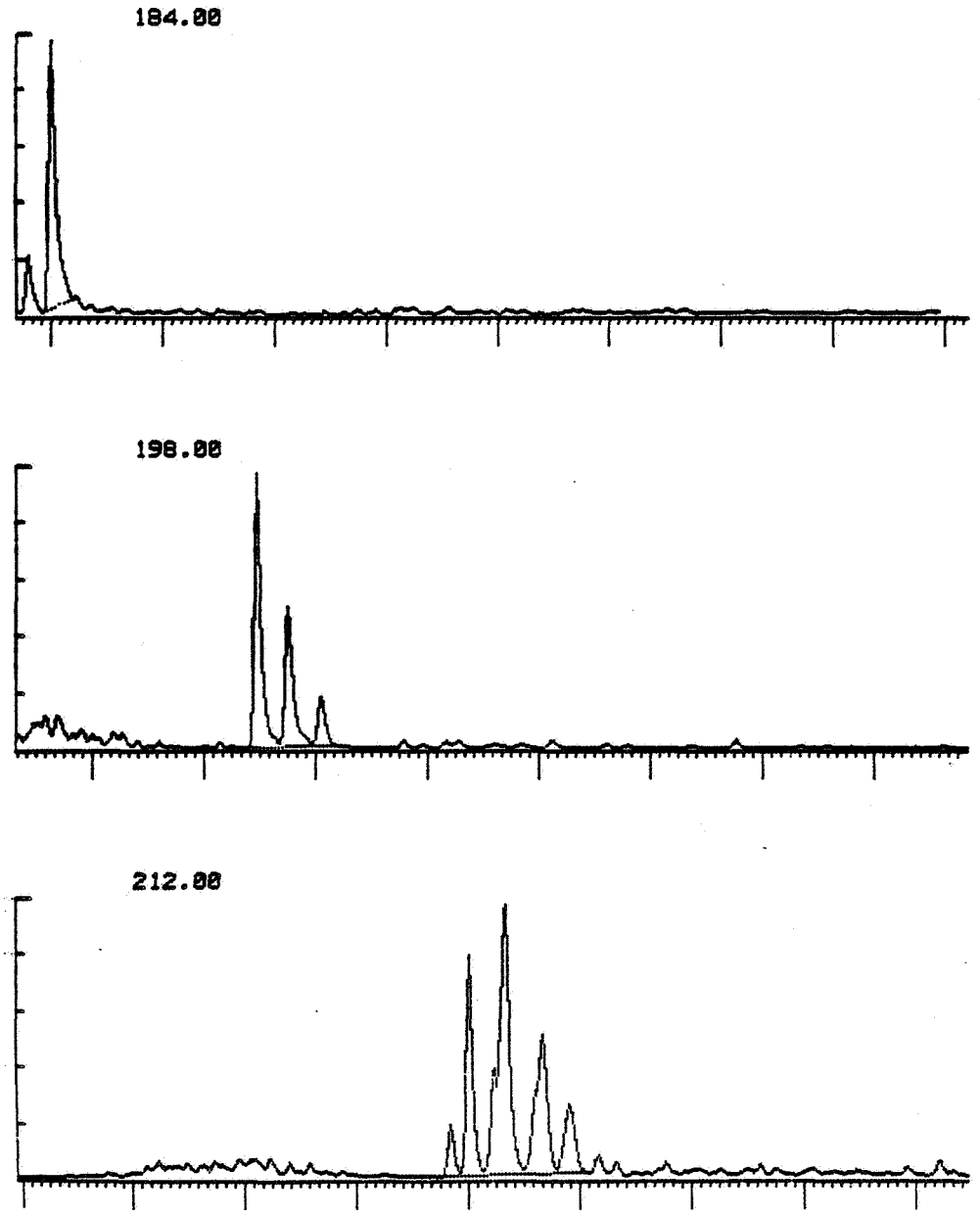
DIBENZOTHIOPHENE SERIES



3994.00-3994.07m CORE

FIGURE 11i **AROMATIC MASS FRAGMENTOGRAMS** WELL 6506/12-3

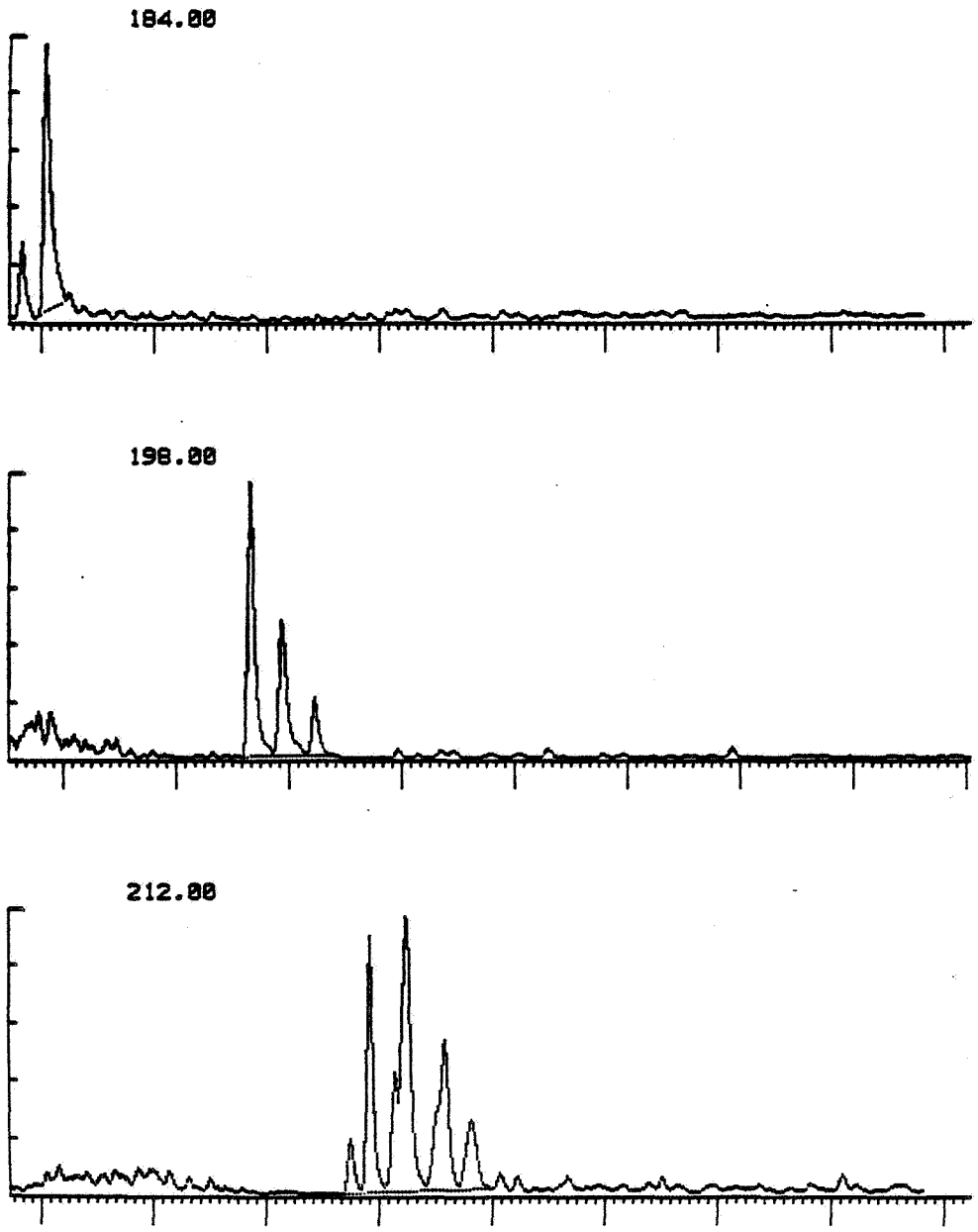
DIBENZOTHIOPHENE SERIES



4161.00-4161.06m CORE

FIGURE 11j AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

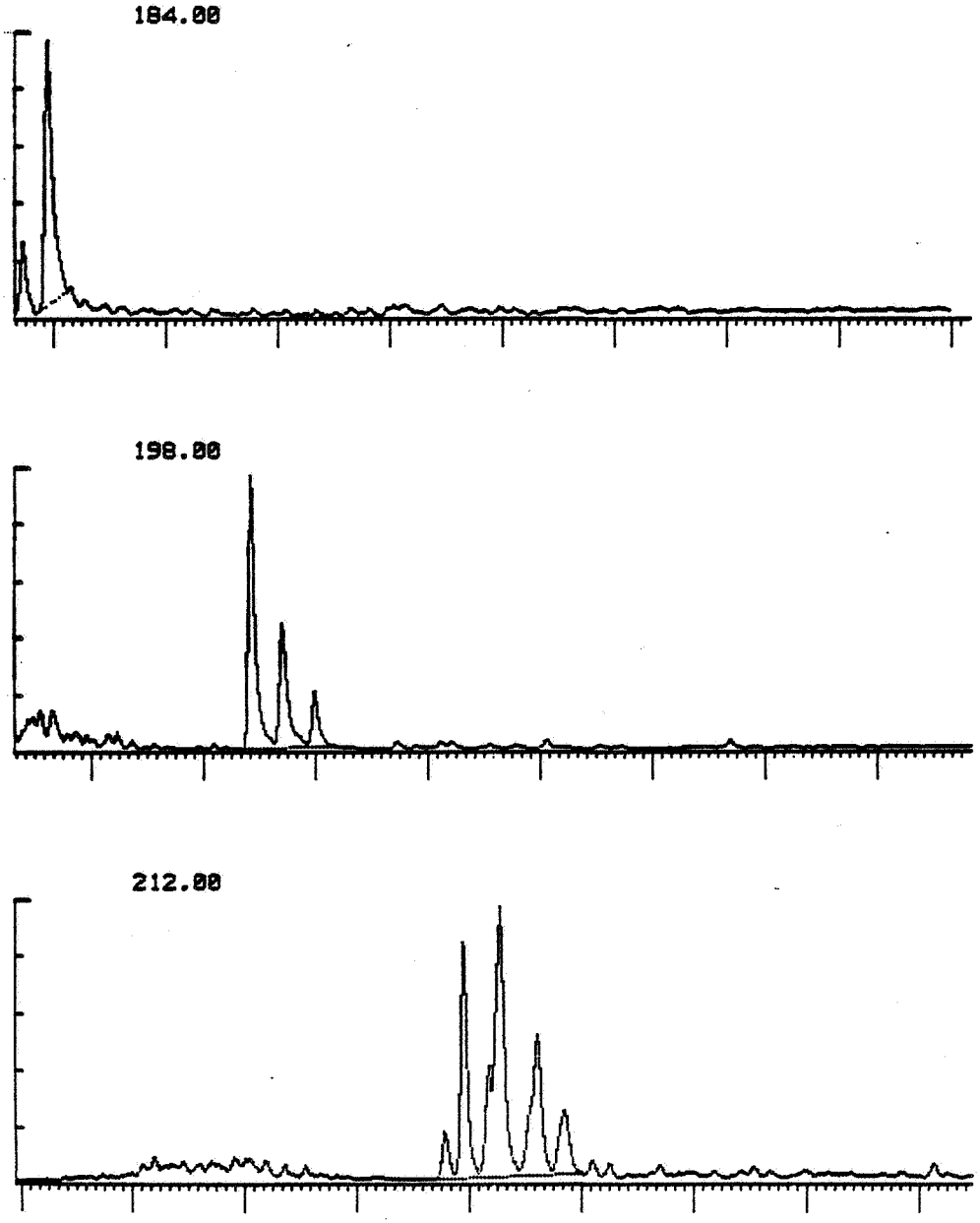
DIBENZOTHIOPHENE SERIES



4176.00-4176.05m CORE

FIGURE 11k AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

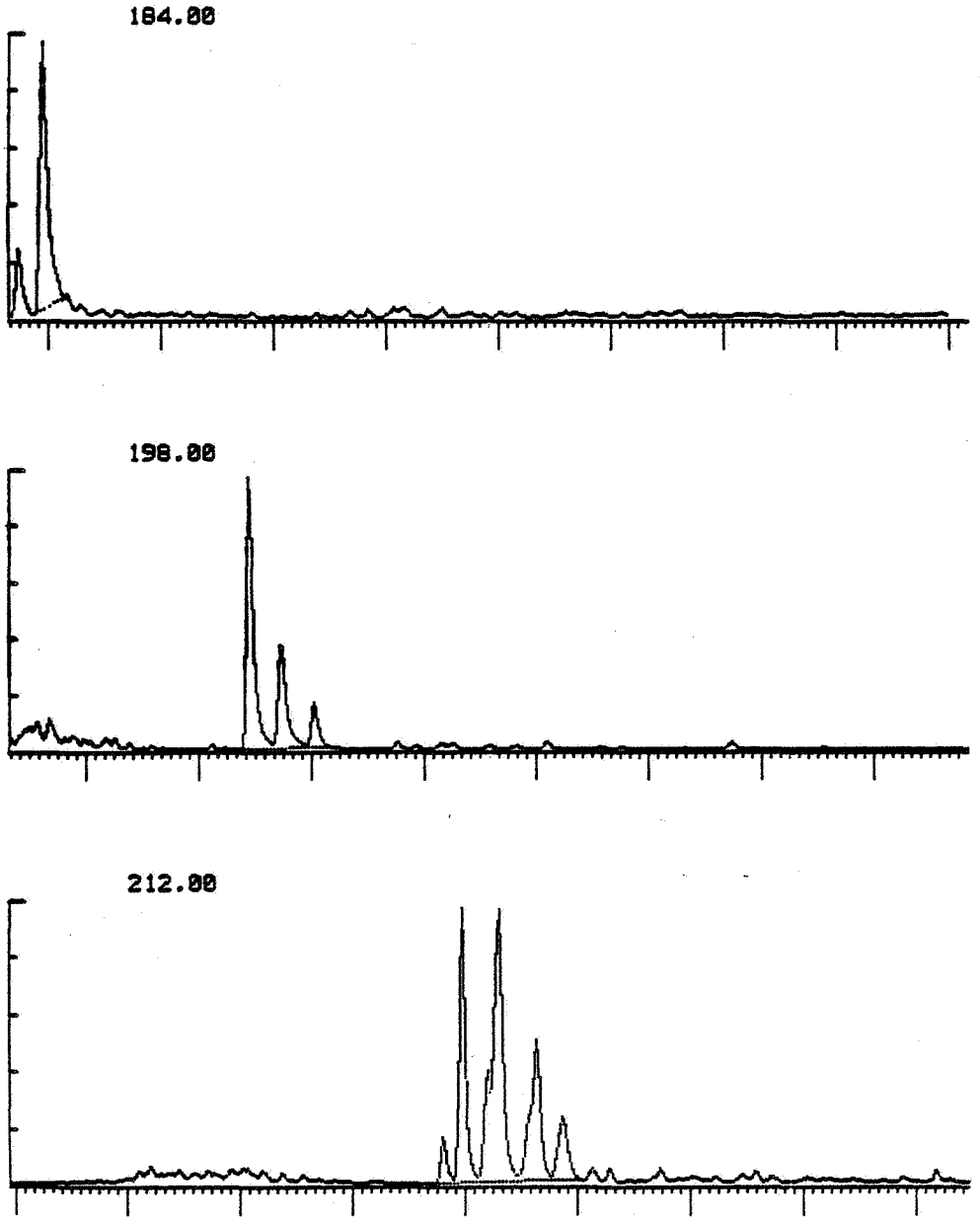
DIBENZOTHIOPHENE SERIES



4187.00-4187.05m CORE

FIGURE 11l AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

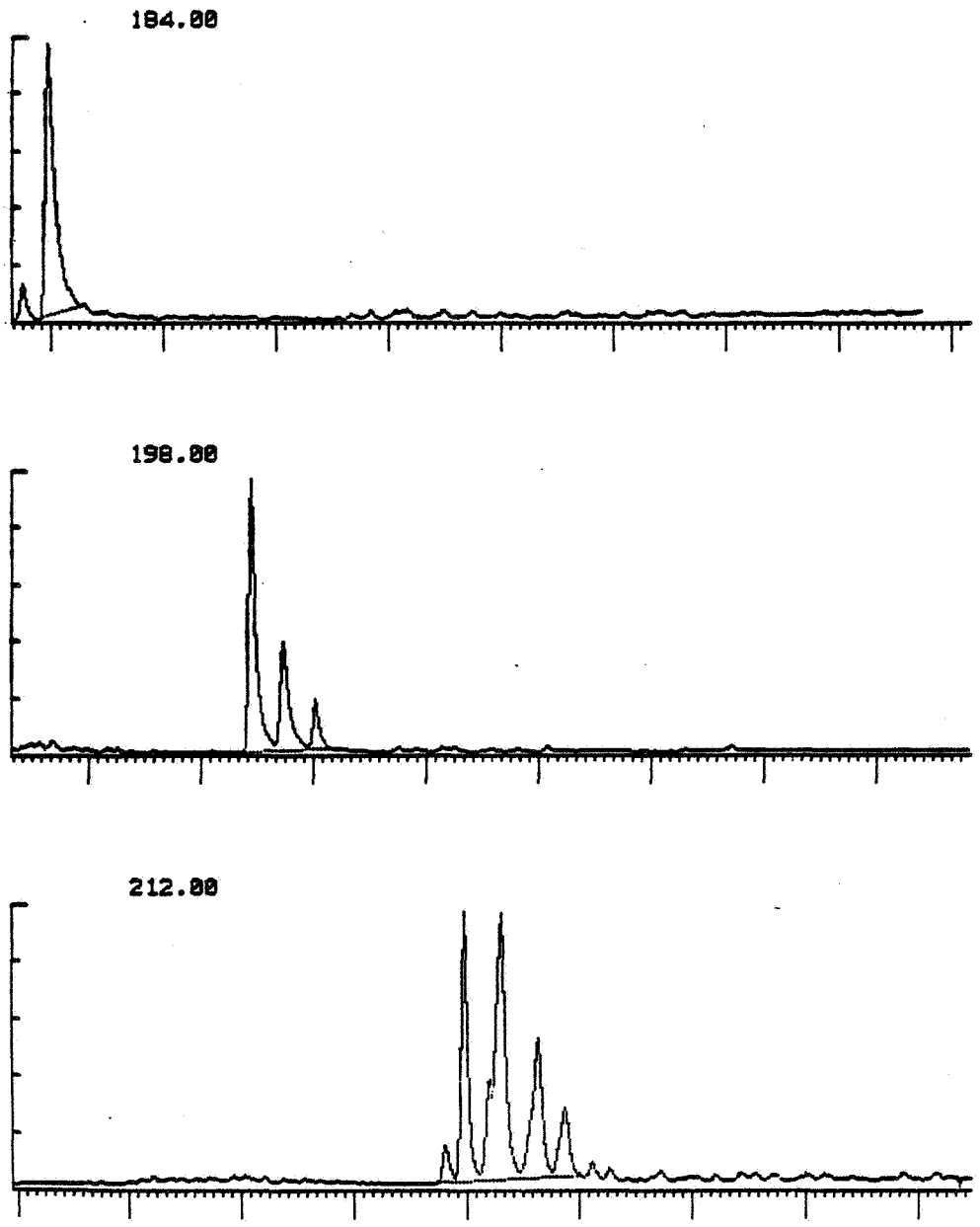
DIBENZOTHIOPHENE SERIES



4202.00-4202.06m CORE

FIGURE 11m AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

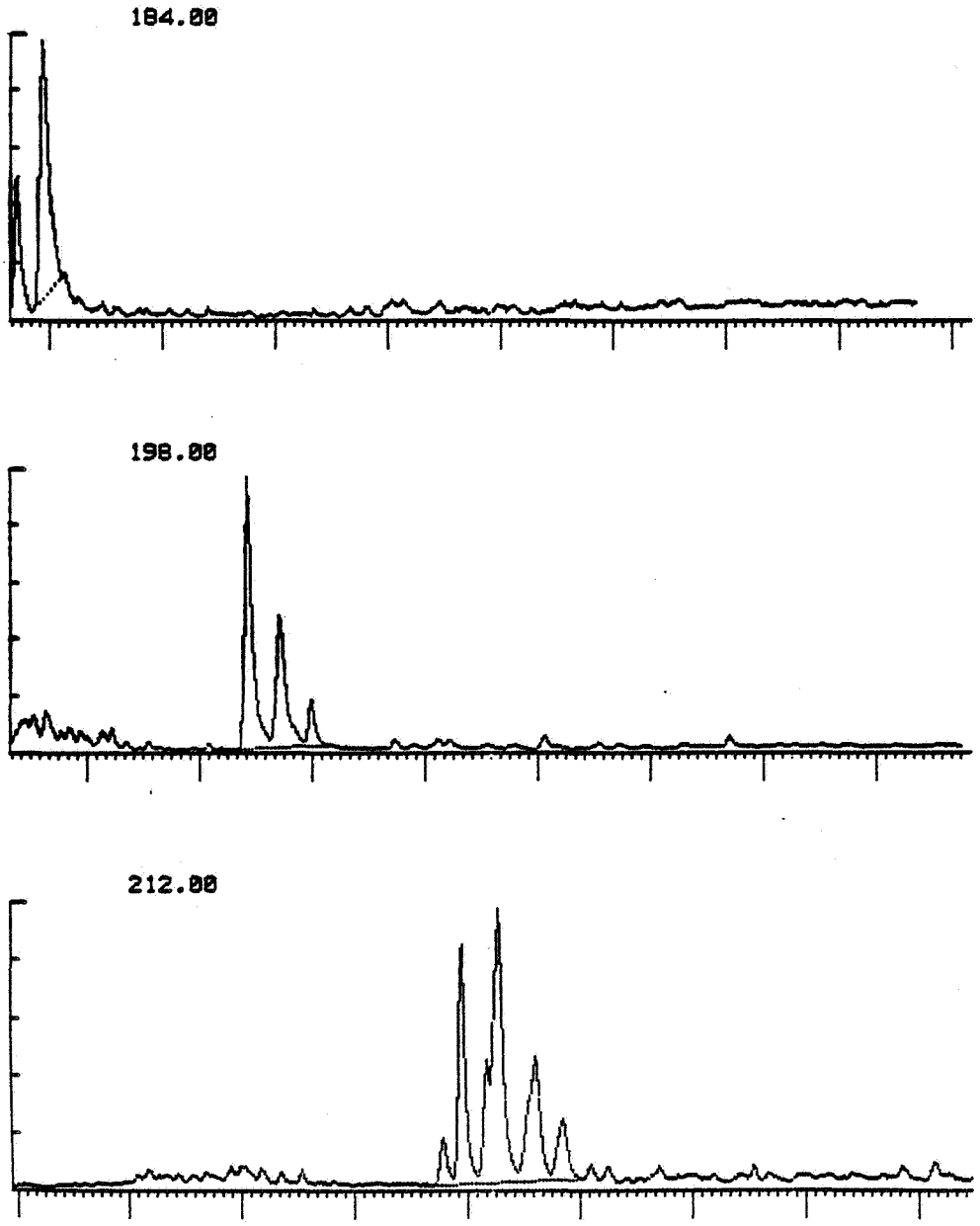
DIBENZOTHIOPHENE SERIES



4232.00-4232.05m CORE

FIGURE 11n AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

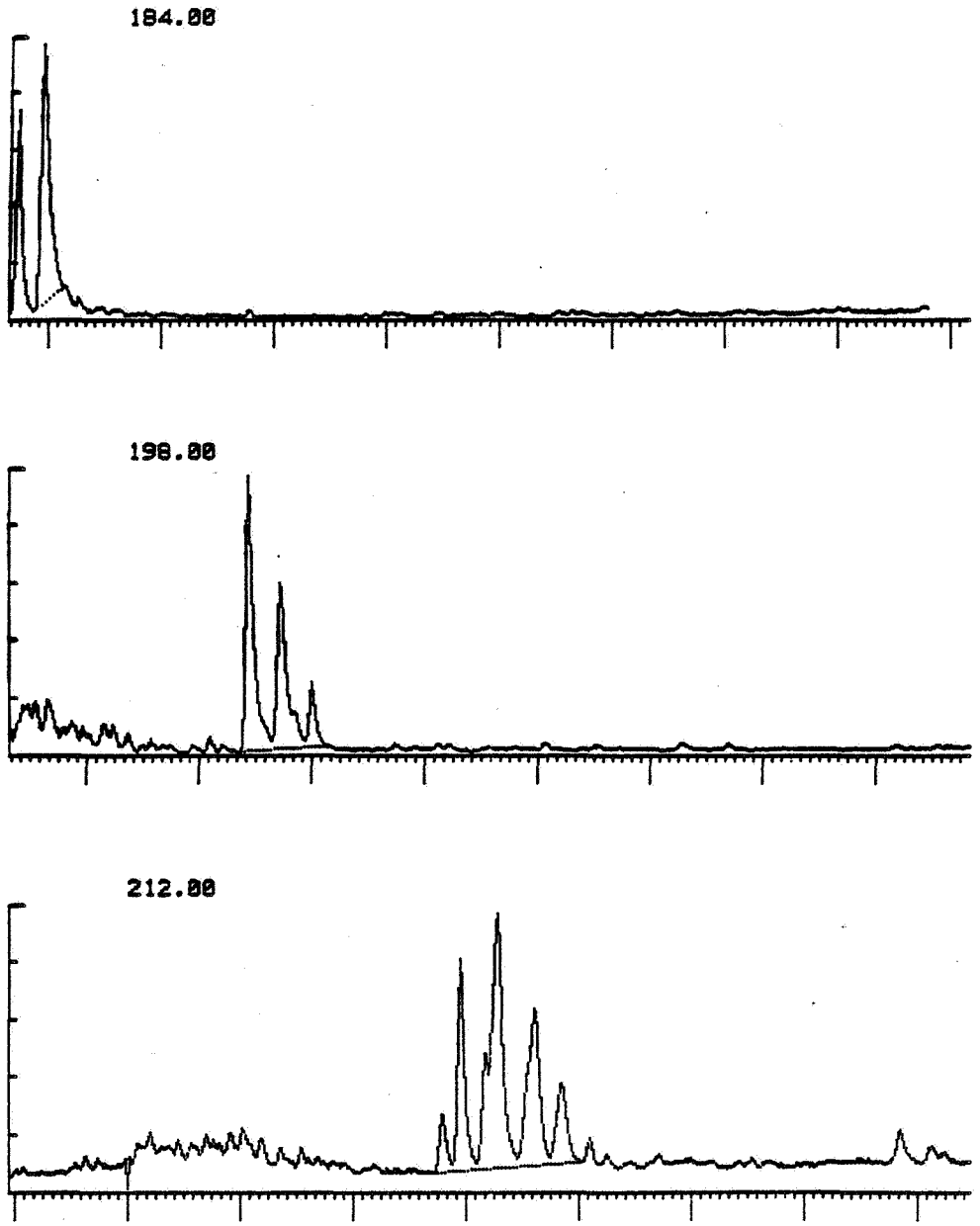
DIBENZOTHIOPHENE SERIES



4249.00-4249.05m CORE

FIGURE 11o AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

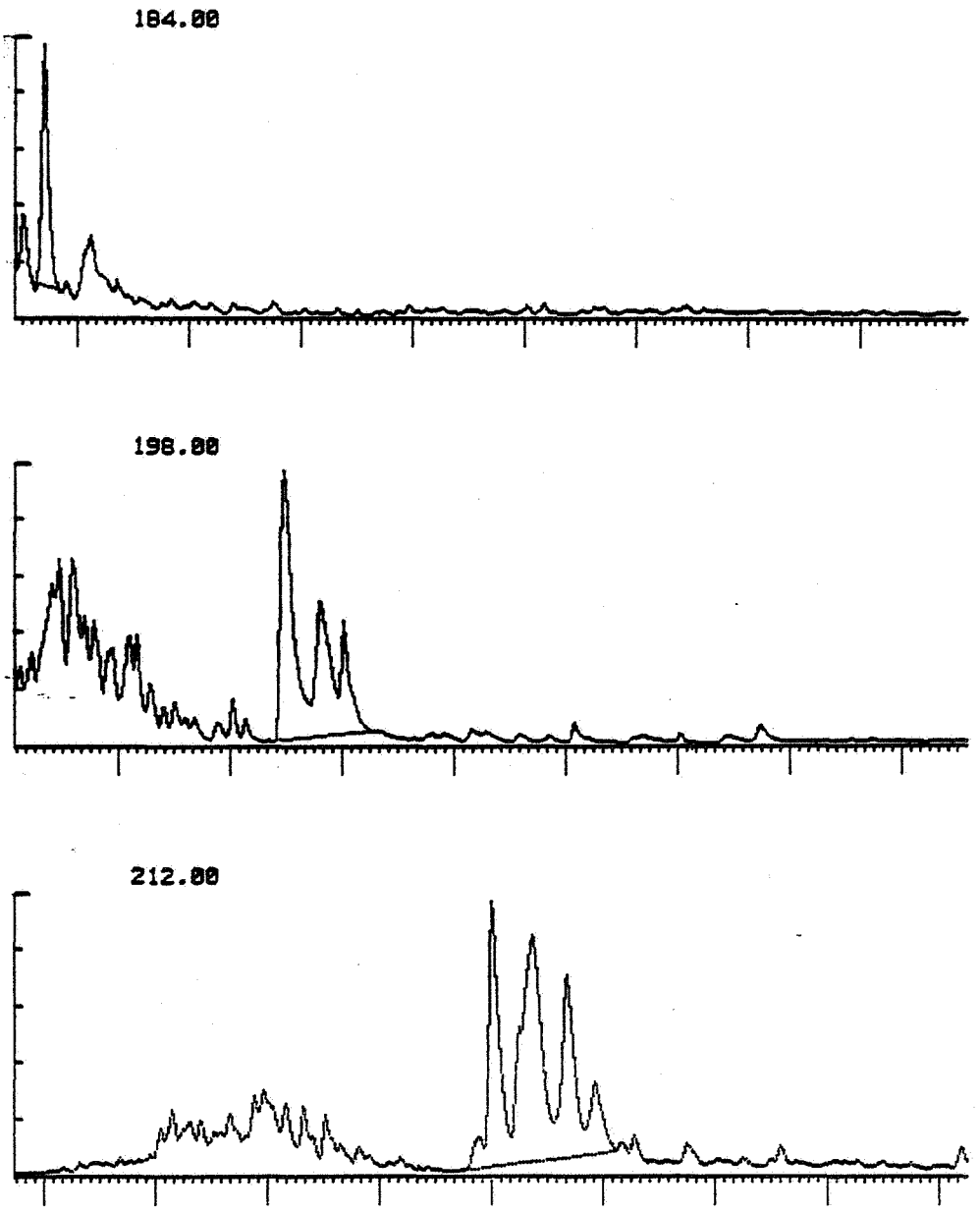
DIBENZOTHIOPHENE SERIES



4264.00-4264.05m CORE

FIGURE 11p AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

DIBENZOTHIOPHENE SERIES

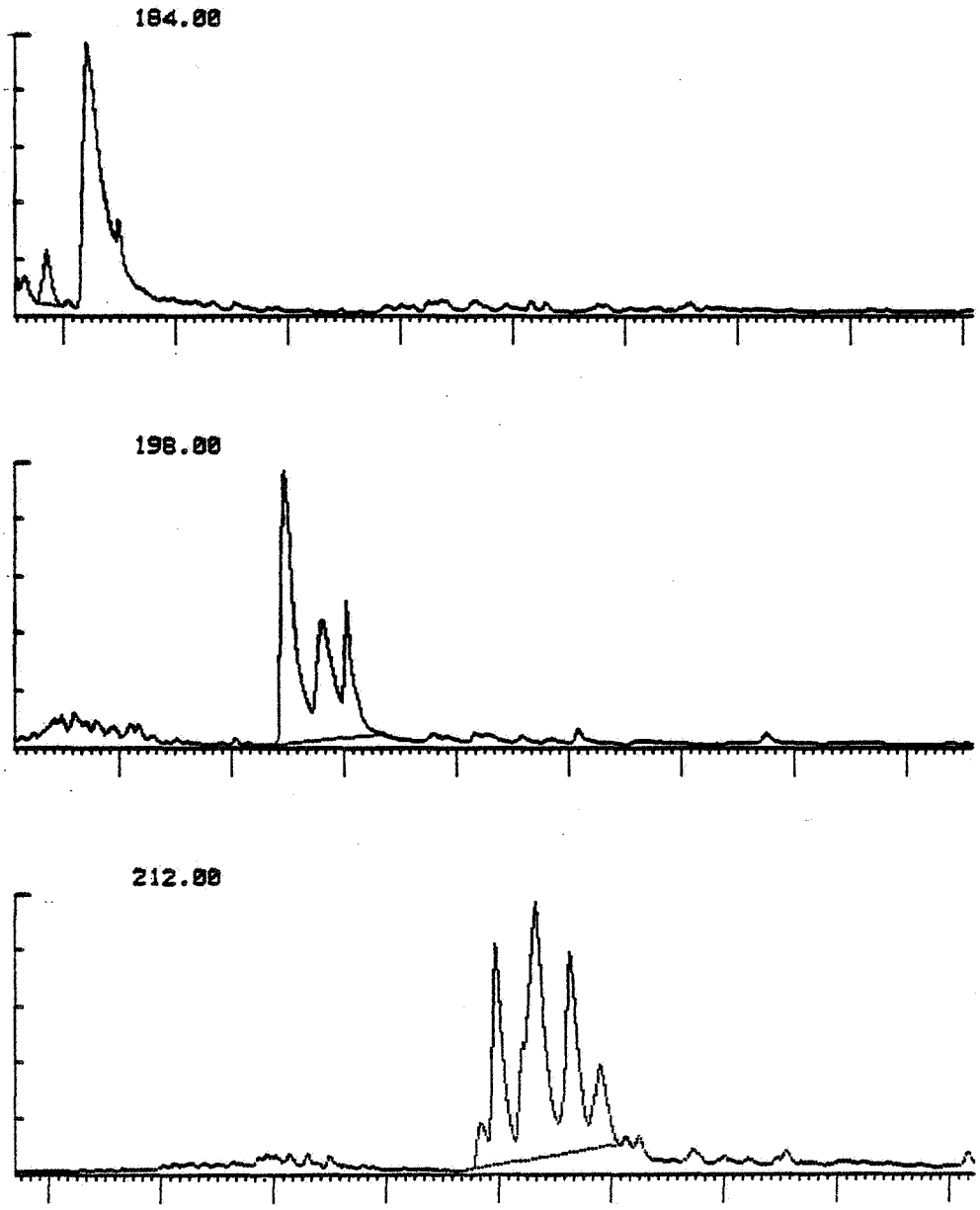


3162-3173m

DST 6 OIL SAMPLE

FIGURE 11q **AROMATIC MASS FRAGMENTOGRAMS** WELL 6506/12-3

DIBENZOTHIOPHENE SERIES

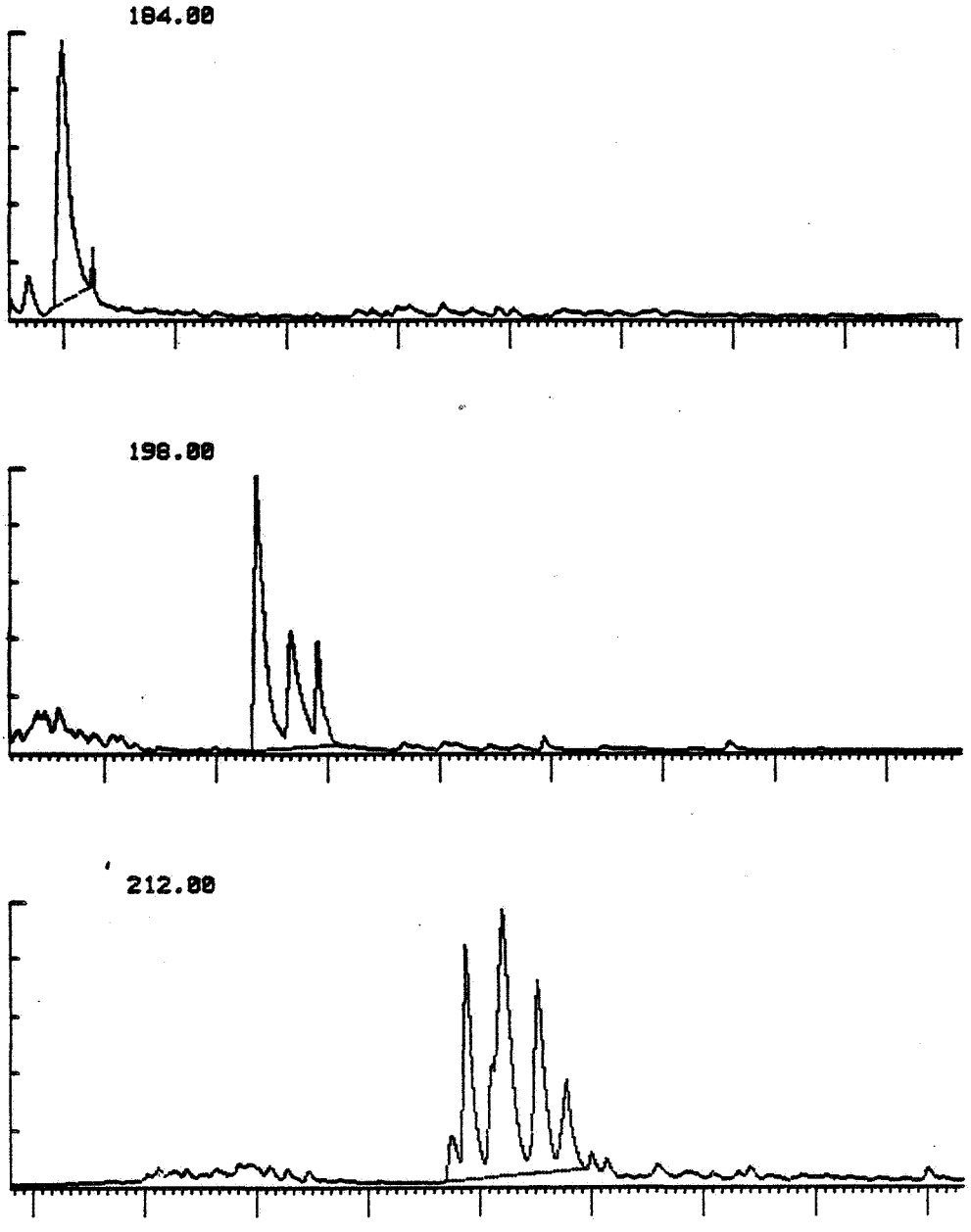


3822-3836m

DST 5 OIL SAMPLE

FIGURE 11r **AROMATIC MASS FRAGMENTOGRAMS** WELL 6506/12-3

DIBENZOTHIOPHENE SERIES

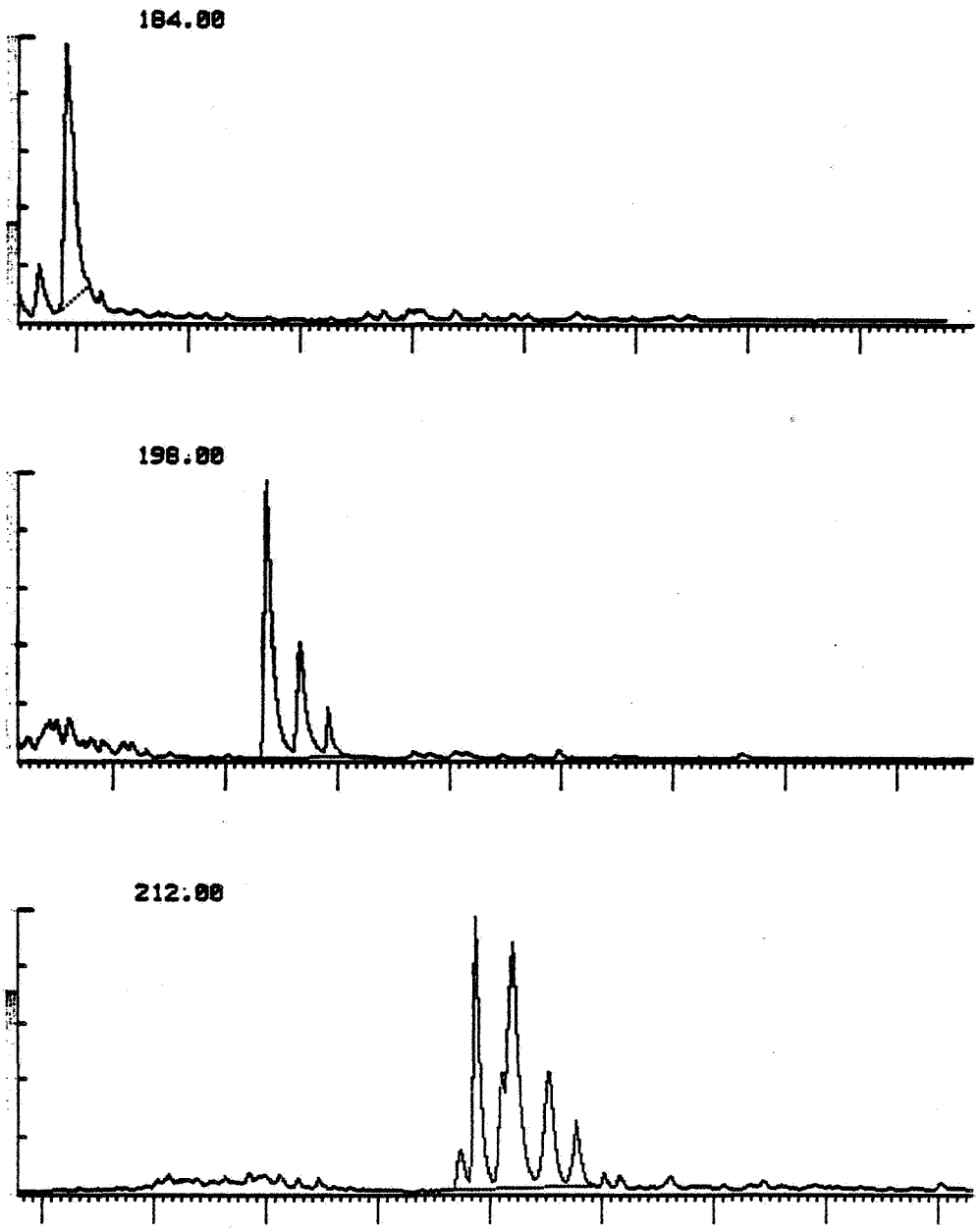


3880-3890m

DST 4 OIL SAMPLE

FIGURE 11s AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

DIBENZOTHIOPHENE SERIES

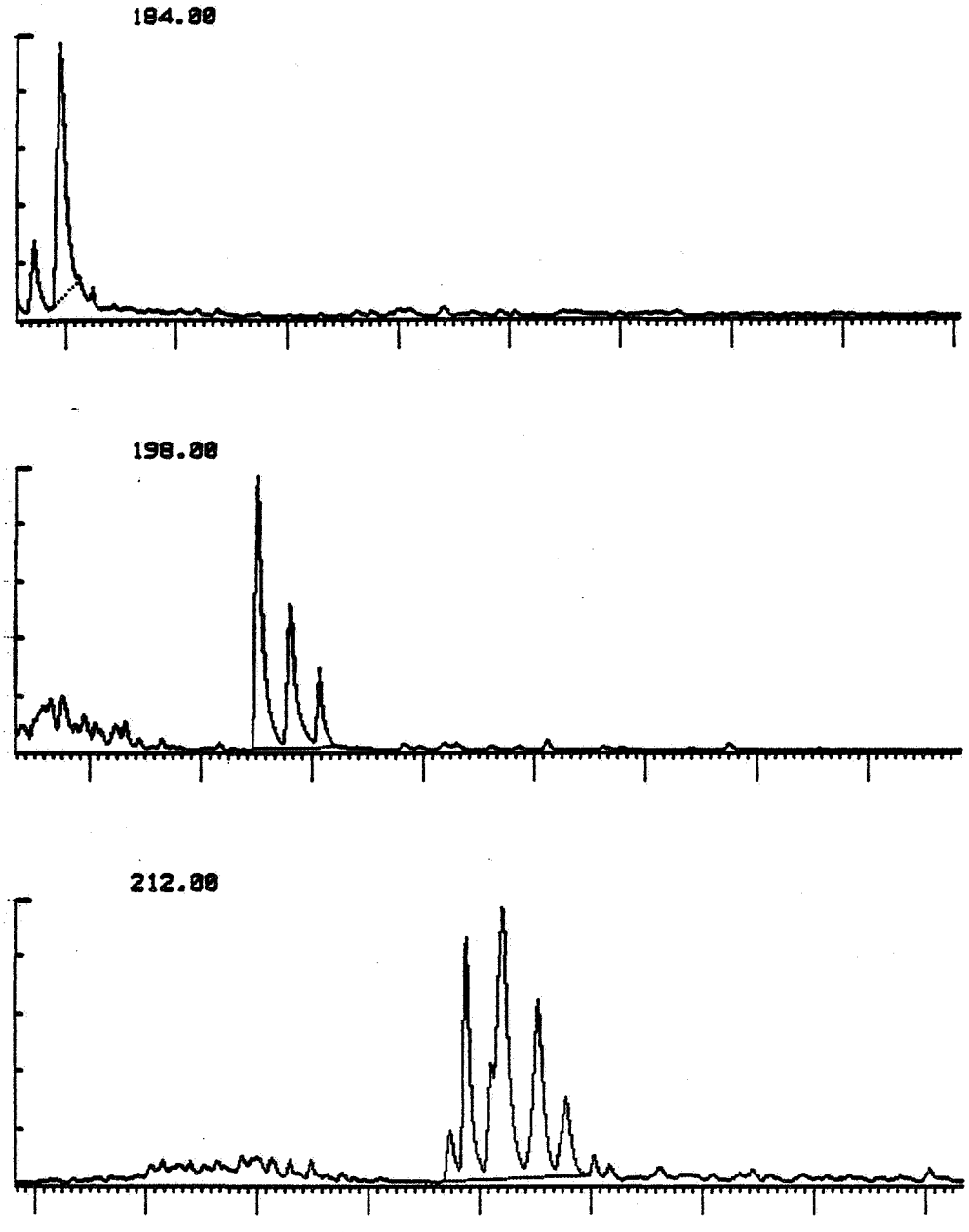


3960-3980m

DST 3 OIL SAMPLE

FIGURE 11t AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

DIBENZOTHIOPHENE SERIES

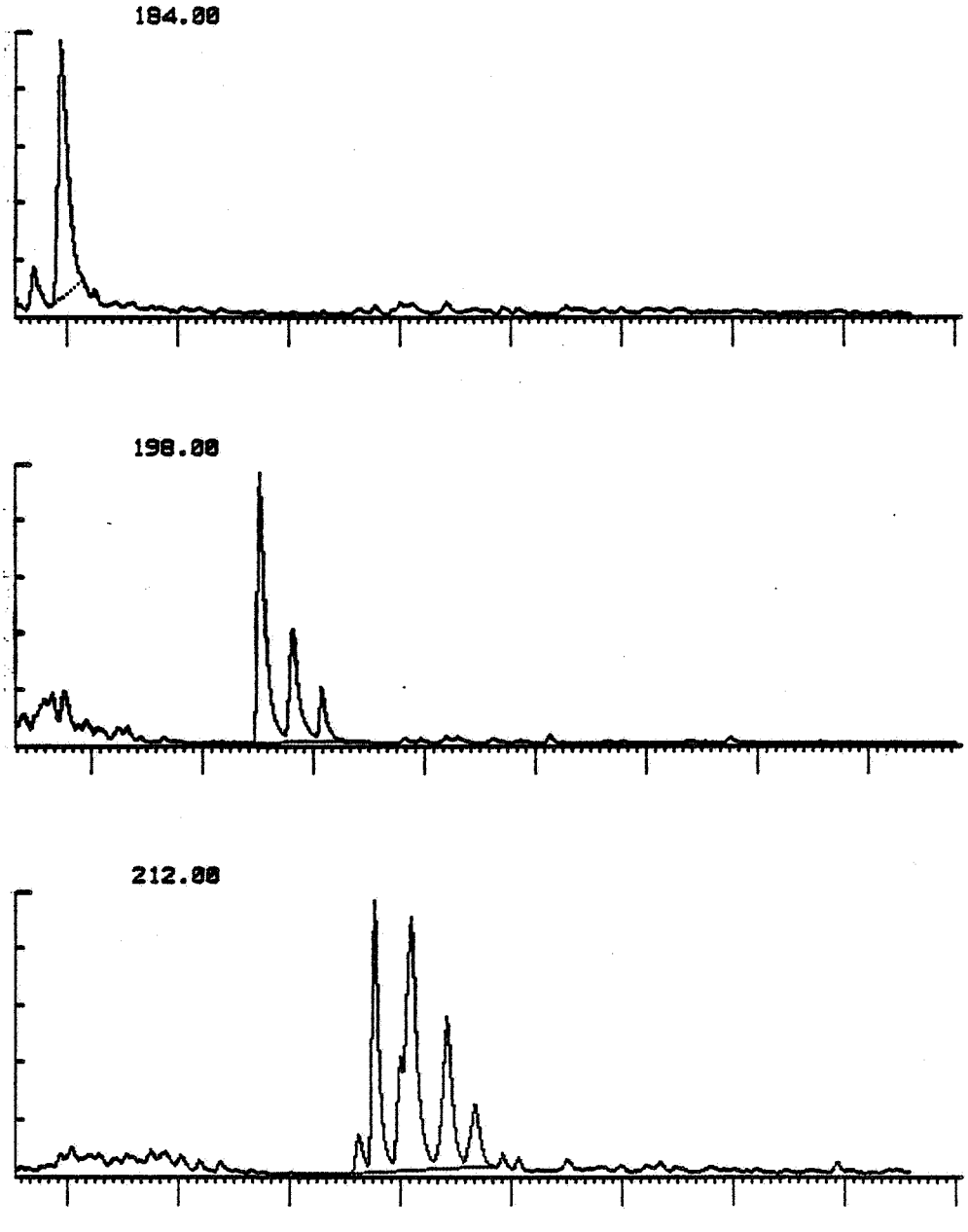


4165-4170m

DST 2 OIL SAMPLE

FIGURE 11u AROMATIC MASS FRAGMENTOGRAMS WELL 6506/12-3

DIBENZOTHIOPHENE SERIES



4222-4241m

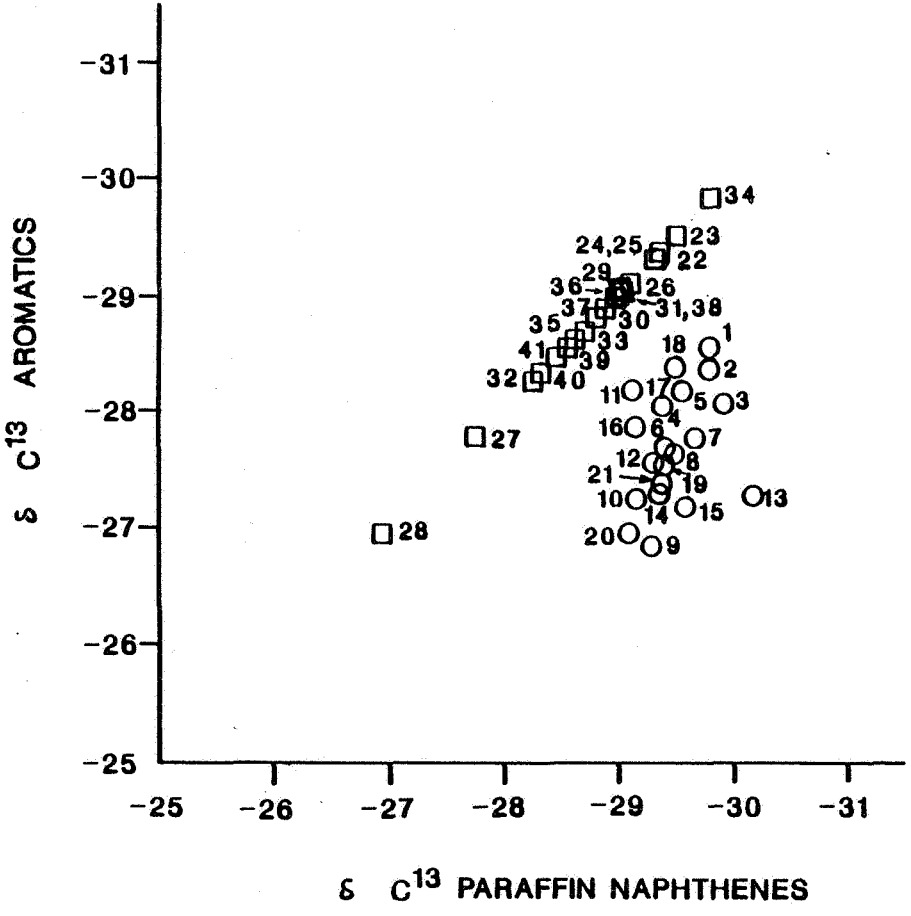
DST 1 OIL SAMPLE

FIGURE 12

CARBON ISOTOPES

{ ‰, PDB }

WELL 6506/12-3



	HYDROCARBONS		TOTAL EXTRACTS
1	3837.18–3837.30m CORE	22	3837.18–3837.30m CORE
2	3852.00–3852.10m CORE	23	3852.00–3852.10m CORE
3	3867.10–3867.20m CORE	24	3867.10–3867.20m CORE
4	3881.41–3881.51m CORE	25	3881.41–3881.51m CORE
5	3897.60–3897.70m CORE	26	3897.60–3897.70m CORE
6	3964.00–3964.05m CORE	27	3912.10–3912.20m CORE
7	3979,00–3979.05m CORE	28	3949.00–3949.05m CORE
8	3994.00–3994.07m CORE	29	3964.00–3964.05m CORE
9	4161.00–4161.06m CORE	30	3979.00–3979.05m CORE
10	4176.00–4176.05m CORE	31	3994.00–3994.07m CORE
11	4187.00–4187.05m CORE	32	4009.00–4009.07m CORE
12	4202.00–4202.06m CORE	33	4146.50–4146.54m CORE
13	4232.00–4232.05m CORE	34	4161.00–4161.06m CORE
14	4249.00–4249.05m CORE	35	4176.00–4176.05m CORE
15	4264.00–4264.05m CORE	36	4187.00–4187.05m CORE
16	3162–3173m DST 6	37	4202.00–4202.06m CORE
17	3822–3836m DST 5	38	4219.00–4219.05m CORE
18	3880–3890m DST 4 OIL	39	4232.00–4232.05m CORE
19	3960–3980m DST 3	40	4249.00–4249.05m CORE
20	4165–4170m DST 2	41	4264.00–4264.05m CORE
21	4222–4241m DST 1		