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PETROLEUM TECHNOLOGY

86-5732-BA

12 SEPT. 1986

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Grading

Title Correlation Study involving Crude Oil and Extracted Hydrocarbon Shows from the Statoil 6506/12-5 Well.

Requested by

Ivar Morvik, LET-B

Project**Date**

18th August 1986

Number of pages**No. of encs.****Key words**

Correlation, crude oils, extracts, shows, source

Abstract

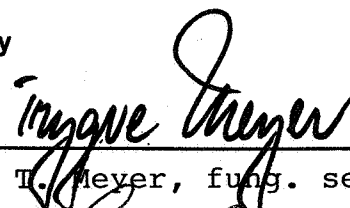
A source rich in a mixture of terrestrial and marine organic matter, moderately mature is believed to have generated the two tested crude oils. Differences between the two oils are minor, and facies variations combined with migrational pathways may account for compositional differences. The oils are light and similar traces of hydrocarbons have been detected in the SST of the Flatøy Gp., the Tomma Fm and also the Aldra Fm.

Prepared by

Geochem Labs

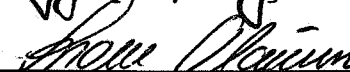
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CORRELATION STUDY INVOLVING CRUDE OIL AND
EXTRACTED HYDROCARBON SHOWS FROM THE
STATOIL 6506/12-5 WELL

EXECUTIVE SUMMARY

Samples of the DST-4 and DST-2 crude oils have been analysed and compared with hydrocarbons extracted from sandstones in the Flatoey Group, Tomma and Aldra Formations.

Minor differences in the composition of the two tested crudes are attributed to variations in migrational pathway and to inferred source type. The source is moderately mature and rich in a mixture of marine and terrestrial organic matter.

Hydrocarbons closely resembling the DST-4 crude were detected at 3174.48-3176.48 metres in the Flatoey Group sands whilst those at 3969.89-4011.67 metres resemble the DST-2 oil. A weaker show of the latter oil is also present at 4069± metres. The shows at 4012± metres and at 4013± metres are atypical and water washing is suspected; although traces of drilling introduced hydrocarbons interfere.

M.J. Sauer

GEOCHEM LABORATORIES LIMITED

CONTENTS

	PAGE
EXECUTIVE SUMMARY	1
INTRODUCTION	3
CONCLUSIONS	5
Text Figure 1 - Show Detection	
RESULTS AND DISCUSSION	7
Text Figure 2 - Carbon Isotopes	
Text Figure 3 - Show Characterisation	
Text Figure 4 - Galimov Isotope Plot	
HYDROCARBON CHARACTERISATION	10
COMPARISON BETWEEN SPONGE AND CONVENTIONAL CORES	11
BRIEF DESCRIPTION OF ANALYTICAL TECHNIQUES	

TABLES

- 1 Gross lithologic descriptions
- 2 Detailed Gasoline Analysis
- 3a Concentration (ppm) of extracted C₁₅₊ material in rock
- 3b Composition (norm. %) of C₁₅₊ material
- 4 Significant ratios (%) of C₁₅₊ fractions and organic carbon
- 5 Composition (norm. %) of C₁₅₊ saturated hydrocarbons
- 6 Carbon isotope compositions
- 7 Methyl Phenanthrene Indices
- 8 Biomarker molecular ratios

APPENDIX 1 FIGURES

- 5 C₁₅₊ Saturates (Paraffin-Naphthene) Chromatograms
- 6 C₁₅₊ Aromatic Chromatograms
- 7 Mass Fragmentograms - Steranes m/z 217
- 8 Mass Fragmentograms - Steranes m/z 218
- 9 Mass Fragmentograms - Monoaromatic Steranes m/z 231
- 10 Mass Fragmentograms - Rearranged Steranes m/z 259
- 11 Mass Fragmentograms - Terpanes m/z 191
- 12 Mass Fragmentograms - Demethylated Hopanes m/z 177
- 13 Mass Fragmentograms - Methyl Hopanes m/z 205
- 14 Whole Oil Chromatogram

APPENDIX 2

SPONGE CORE STUDY DATA

INTRODUCTION

This report presents a geochemical correlation study involving sandstone extracts and tested crude oils from the Statoil 6506/12-5 well.

The study was designed to investigate the relationships between the tested crudes and reservoired hydrocarbons and to characterise the oils from DST-4 and DST-2.

This project was authorised by E. Mydland-Carlsen, Statoil, Stavanger.

A. ANALYTICAL

A total of twenty one (21) samples of core fragments from the 3163-3178 metres, 3952-4125 metres and 4287± metres intervals were received. They were supplemented by samples of the DST-4 (at 3174-3177.5 metres) and DST-2 (at 4004-4009.5 metres) crude oils.

Geochem were instructed to analyse the samples in accordance with a telexed specification (11.4.86).

ANALYSIS	NUMBER OF ANALYSES
Sample preparation	21
C ₁₅₊ extraction and chromatography	23
Capillary GC - paraffin-naphthenes	23
Capillary GC - aromatics	23
Carbon isotopes - extract fractions	107
GC-MS biomarker analysis	11

Results of these analyses are listed in tables 1 to 8 and presented graphically in figures 1 to 14.

A brief description of the analytical methods employed is included in the back of this report.

B. GENERAL INFORMATION

Ten (10) copies of this report have been forwarded to E. Mydland Carlsen at Statoil and a copy of the data has been retained by Geochem for future consultation with authorised Statoil personnel.

The remaining sample material will be handled as directed.

The results of this study are proprietary in Statoil.

CONCLUSIONS

Two crude oils and extracted hydrocarbons from a suite of sandstone core samples from the 6506/12-5 well have been evaluated and correlations between them investigated.

The oils, DST-4 at 3174.0-3177.5 metres and DST-2 at 4004.0-4009.5 metres, are light (38.5-39.0 °API) crudes.

Although the benzene and toluene contents are slightly greater in the DST-2 fluid the detailed gasoline range hydrocarbon analyses reveal a degree of similarity between the two fluids. This conclusion is supported by the whole oil and C_{15+} paraffin-naphthene fraction chromatograms. Minor differences in the acyclic isoprenoids and in the C_{20+} hydrocarbons content may be due to variations in migrational pathway or to small changes in inferred source type.

Carbon isotope ratios of $-29.7^{\circ}/_{\text{oo}}$ and $-28.2^{\circ}/_{\text{oo}}$, for the C_{15+} saturates and aromatics from the crude oils, suggest a mixture of marine and terrestrial organic matter in the source. This is consistent with the distribution of C_{27} , C_{28} and C_{29} , steranes - which indicate a somewhat greater contribution from marine organic matter.

Shows of crude oil resembling the DST-4 fluid were detected at 3174.48-3176.48 metres whilst intermittent shows of the DST-2 oil occur between 3969.89 metres and 4069.76 metres. Loss of C_{20-} hydrocarbons at 4011.5-4012.4± metres for example may be due to water washing - possibly associated with an oil-water contact, although some contamination is suspected at 4012± metres and at 4013± metres. The oil at 4069.8± metres appears, however, to be relatively unaltered. Some segregation of the reservoirs, possibly by shaly horizons, is suspected.

Extracts from the sponge core at 3995.23-3997.61 metres are slightly richer in C_{15+} hydrocarbons than the adjacent conventional cores. There is, however, a significant increase in the aromatics content of the sponge core extracts. The saturates fraction from the conventional core is more naphthenic - due possibly to contamination by mud additives. Both the C_{15+} saturates and aromatics from the sponge core samples are enriched in the lighter components. Mass fragmentograms are not visibly different for the two sets of samples. Available

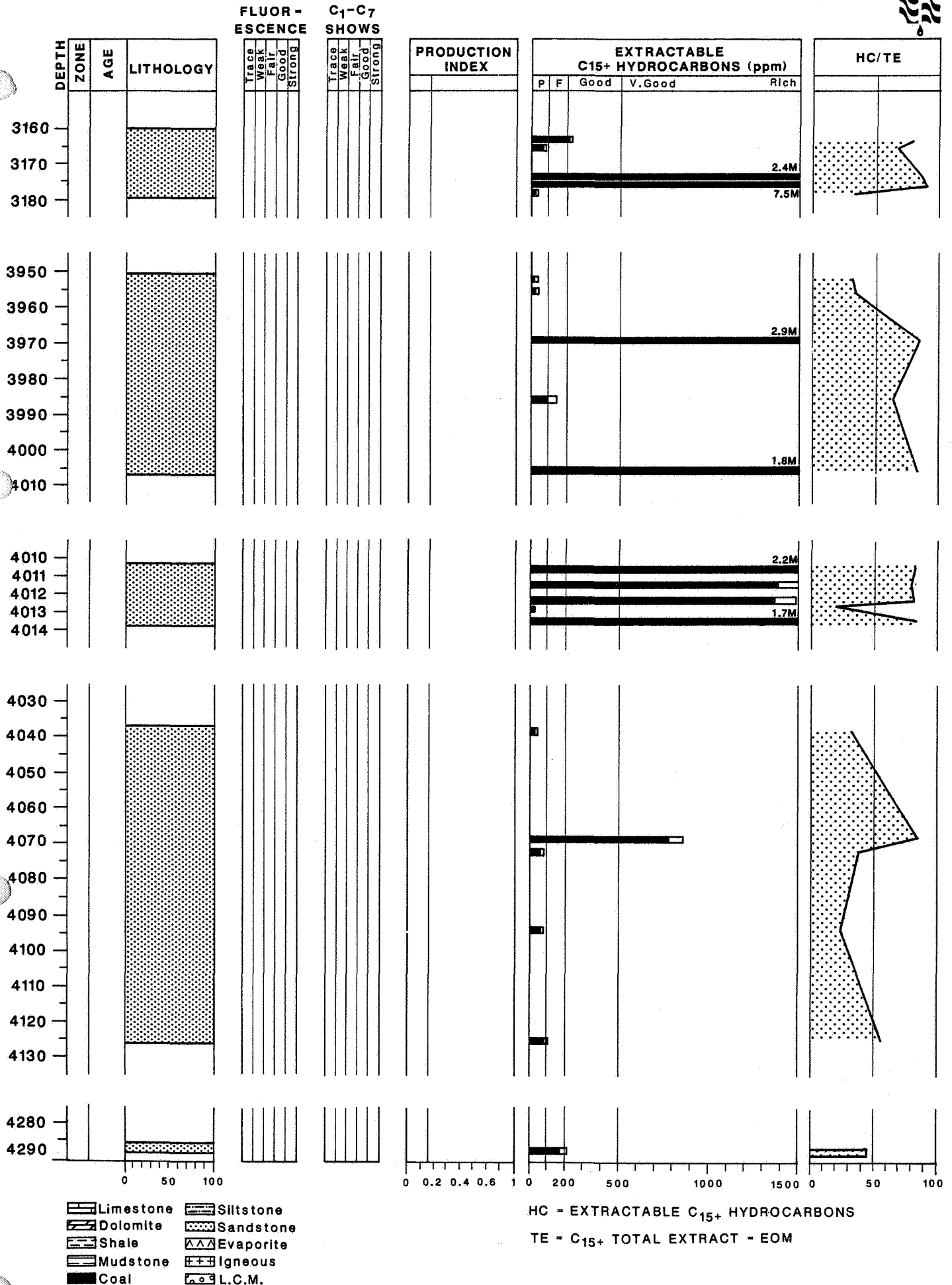


data suggest that there is loss of the lighter hydrocarbons and, possibly, less contamination from the drilling mud for the sponge core samples.

FIGURE 1

SHOW DETECTION

WELL 6506/12-5



RESULTS AND DISCUSSION

Show Detection

Sandstones are represented by core samples at 3163.37-3178.67 metres (Flatoey Group), at 3952.43-4125.50 metres (Tomma Formation) and at 4287.00-4287.11 metres (Aldra Formation).

C_{15+} hydrocarbon abundances peak at 3174.48-3176.48 metres (2424-7501 ppm) in the Flatoey sands and it is from this interval that the DST-4 crude oil was tested. Similarly the richest "shows" (1495-2886 ppm) occur at 3969.89-4012.42 metres in the Tomma, with weaker shows at 4069.76-4069.87 metres (849 ppm), and at 4287.0-4287.11 metres (208 ppm) in the Aldra sands. With these exceptions less than 222 ppm C_{15+} hydrocarbons were extracted from the analysed sandstones.

Chromatograms of the C_{15+} paraffins correlate the show at 3174.5-3176.5 metres with the DST-4 crude (tested at 3174-3177.5 metres). The paraffins display a slight, irregular carbon number preference - extending out to nC_{35} - whilst pristane, phytane and the lower acyclic isoprenoids are relatively abundant. Overall these traces suggest a moderately mature slightly waxy oil. This relationship between the DST-4 oil and the extracted hydrocarbons is supported by the C_{15+} aromatics chromatograms - which are depleted in methyl naphthalenes but have strong dimethyl - and trimethyl - naphthalene peaks. The methyl phenanthrenes are relatively less abundant than the substituted naphthalenes.

The DST-2 oil, when compared to the DST-4 crude is richer in pristane and phytane but otherwise is closely similar to the latter. Hydrocarbons of this type were extracted from the sands at 3969.89-3970± metres at 4006.1-4010.87 metres at 4013.61-4013.71 metres and at 4069.76-4069.87 metres. Between 4072.66 metres and 4125.50 metres the hydrocarbons resemble traces of drilling introduced contamination. The same contamination is suggested by the saturates chromatogram at 4039.68-4039.82 metres and at 4012.59-4012.71 metres. At 4011.52-4012.42 metres the paraffin-naphthene chromatograms are depleted in C_{20-} components; which may be due to water washing and the presence of an oil water contact. In other respects these traces resemble those in the overlying sands and the DST-2 crude.



LEGEND

SATURATES vs AROMATICS PLOT

- CRUDE OIL
- SOURCE ROCK
- ◐ EXTRACTED SHOW

- 1 3174.00-3177.50m
DST # 4
- 2 4004.00-4009.50m
DST # 2
- 3 3163.37m
- 4 3164.70-3164.80m
- 5 3174.48-3174.59m
- 6 3178.60-3178.67m
- 7 3955.79m
- 8 3969.89-3970.00m
- 9 4006.10-4006.25m
- 10 4010.76-4010.87m
- 11 4011.52-4011.67m
- 12 4039.68-4039.82m
- 13 4069.76-4069.87m
- 14 4125.38-4125.50m

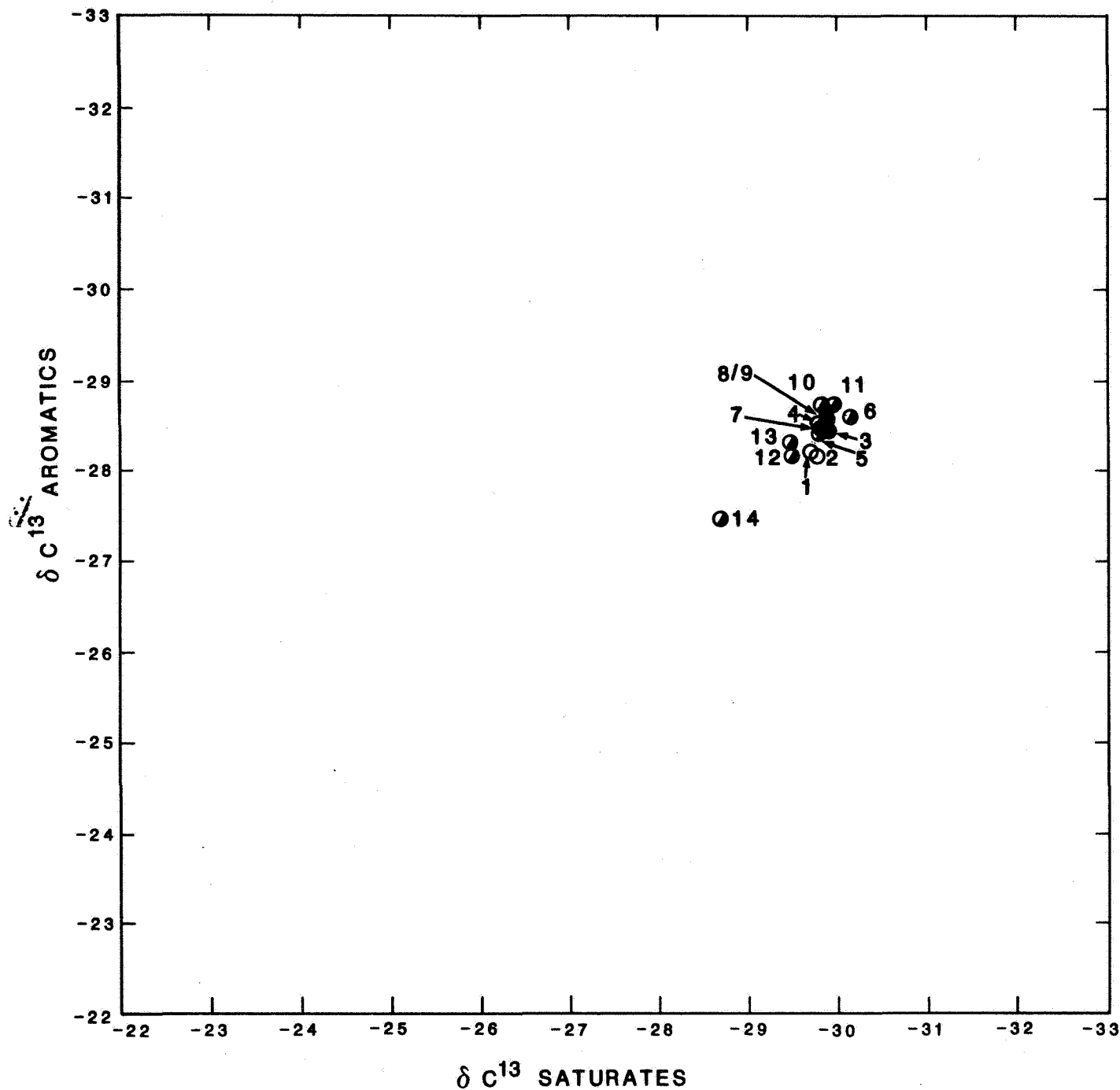
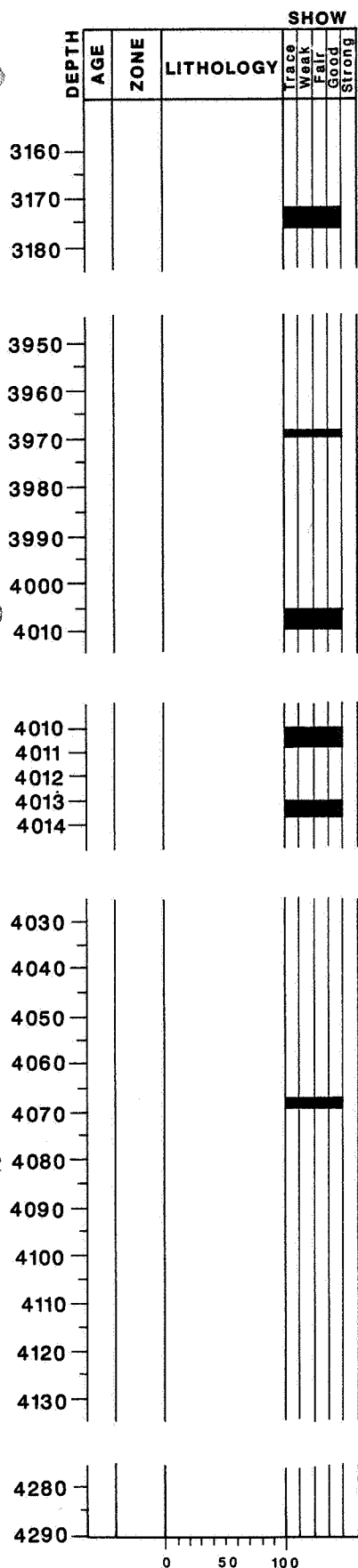


FIGURE 3

WELL 6506/12-5

SHOW CHARACTERISATION



- | | |
|-----------|-----------|
| Limestone | Siltstone |
| Dolomite | Sandstone |
| Shale | Evaporite |
| Mudstone | Igneous |
| Coal | L.C.M. |

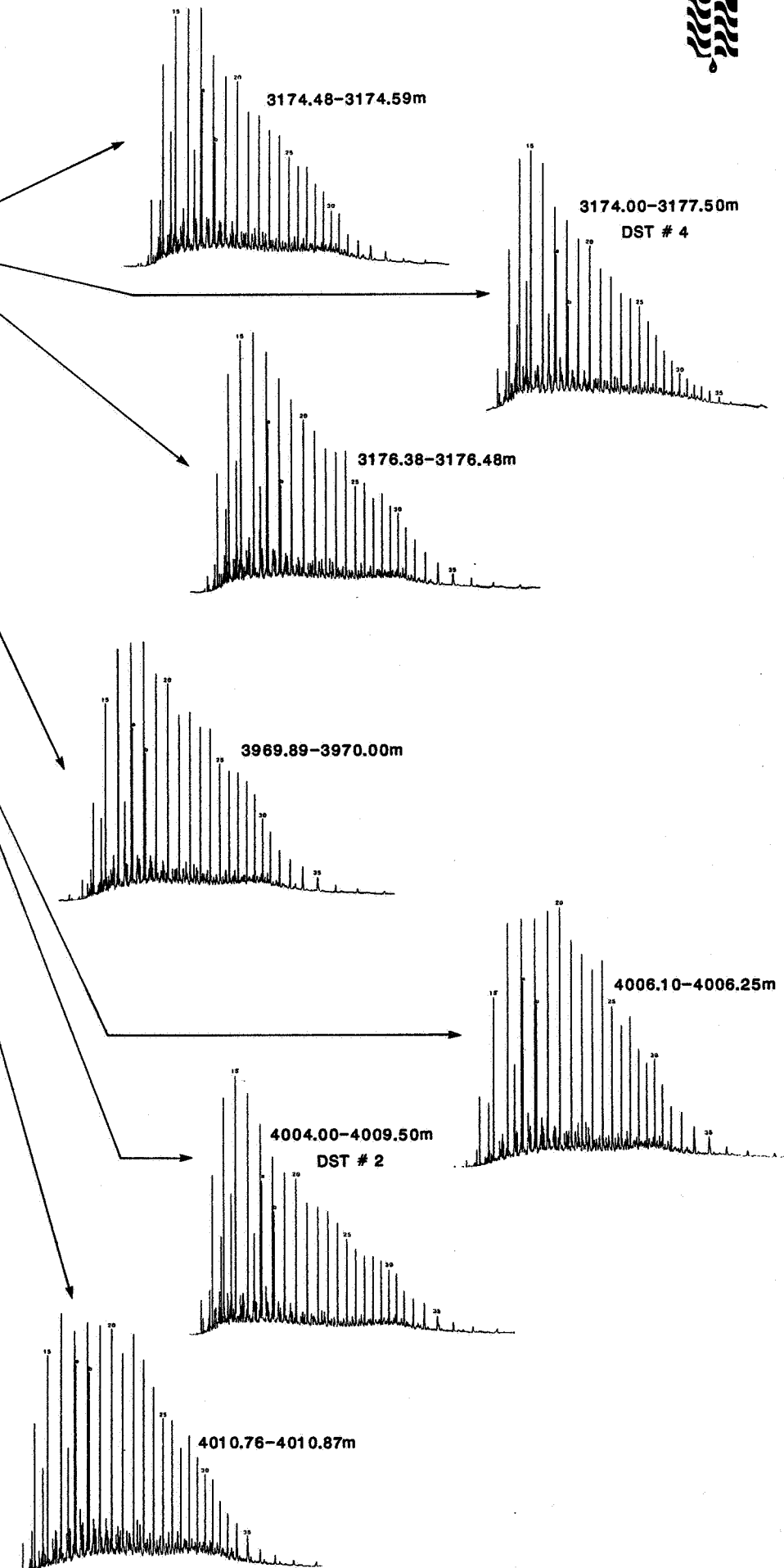
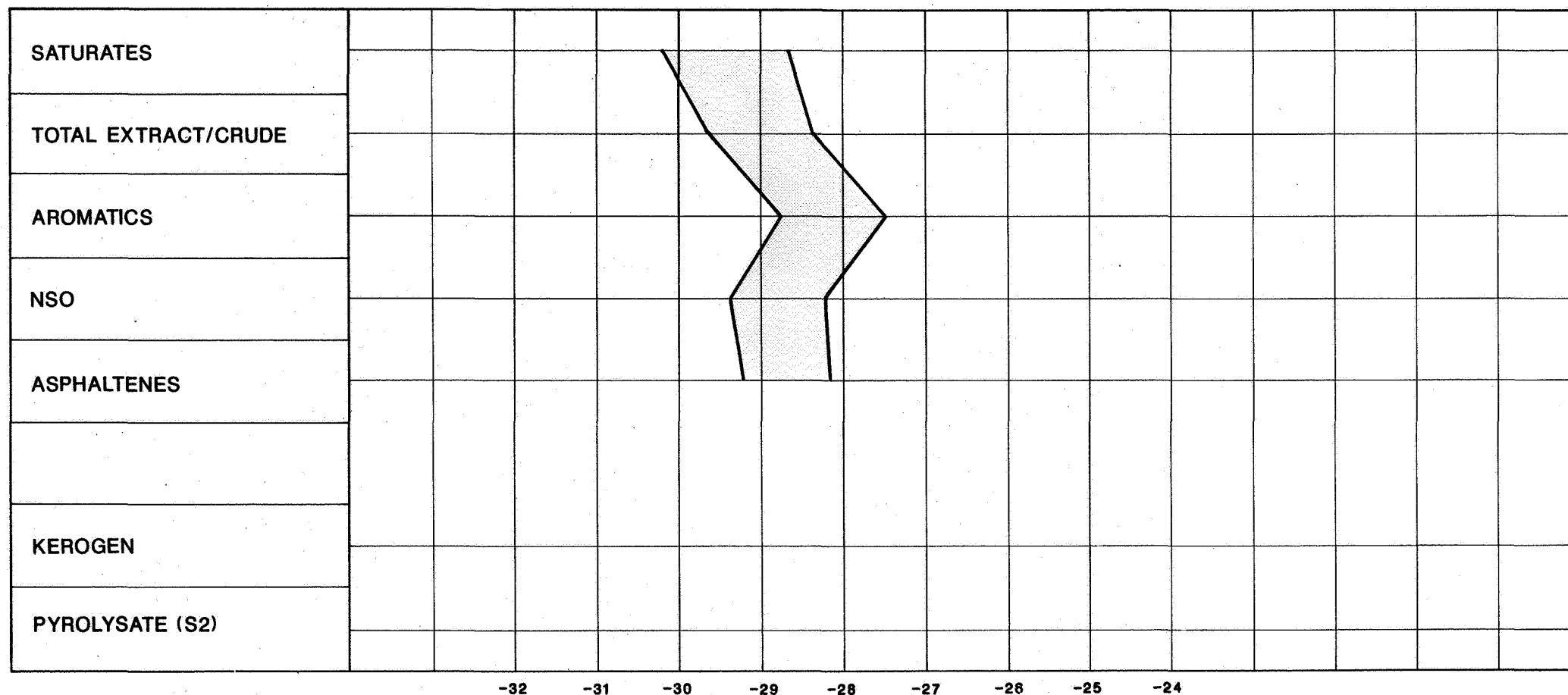


FIGURE 4
WELL 6506/12-5

GALIMOV CARBON ISOTOPE PLOT (‰, PDB)



Aromatic hydrocarbons extracted from the shows in the sandstones below 3969± metres, and from the DST-2 crude, are relatively depleted in the alkyl naphthenes, and phenanthrene is the most abundant component. These traces do, however, resemble those from the shallower shows associated with the DST-4 oil. Sands where traces of hydrocarbons - largely drilling associated - were recovered yielded a distinct series of aromatics traces.

From the foregoing discussion it will be apparent that the shows within the analysed sandstone intervals are intermittent in nature and are separated by intervals of lean sands. It is strongly suspected that there is some segregation of the reservoirs - possibly by shaly horizons.

Carbon isotope ratios offer an independent correlation parameter. Near identical values for the corresponding fractions, particularly for the saturates ($-29.68^{\circ}/\text{oo}$ and $-29.70^{\circ}/\text{oo}$) and aromatics ($-28.22^{\circ}/\text{oo}$ and $-28.21^{\circ}/\text{oo}$), indicate that the two oils correlate. Hydrocarbons extracted from the show at 3174.48-3176.48 metres differ by less than $0.2^{\circ}/\text{oo}$ from the above values - confirming the identity of the migrated hydrocarbons at this depth. Similarly the shows detected in the Tomma sands (below 3969± metres) also correlate with the crude oil carbon isotopes, although the aromatic hydrocarbons are up to $0.5^{\circ}/\text{oo}$ lighter (more negative) than those from the oil. This difference may be due to the very low abundances of aromatic hydrocarbons extracted from the shows - resulting in a greater measurement error in the isotope ratios. Overall, the carbon isotope ratios correlate the tested crude oils with the shows in the Flatoey and Tomma sands.

More detailed correlation between tested crude oil and hydrocarbons extracted from shows are possible from an inspection of the steranes and triterpanes mass fragmentograms. At m/z 191 the triterpanes of the DST-4 and DST-2 crude oils are closely identified with the hydrocarbons from the shows at 3174.48-3176.48 metres and at 3969.89-4011.67 metres respectively. There is, however, little difference between the distributions of triterpanes in the two oils. Both display an abundance of C_{30+} hopanes and strong C_{28} bisnorhopane and an unknown C_{30} hopane (peak X). At $4012\pm$ metres and $4013\pm$ metres the triterpanes are atypical in that they display dominantly C_{30+} hopanes. At $4069\pm$ metres these traces are, however, similar to the tested crudes although C_{28} bisnorhopane is absent and normoretane (D) very small. Fragmentograms of the steranes (m/z 217) extracted from the show at 3174.48-3176.48 metres most



closely resemble the DST-4 crude and differ minimally from the DST-2 oil. The same is true of the corresponding traces at 3969.89-4011.67 metres although the C_{29} diacholestane (peak H) is more abundant and correlates better with the DST-2 oil. A moderately mature source is suggested by the relative abundances of the C_{29} cholestanes (peaks Q, R and T). The steranes at 4012 $\pm$ metres do not resemble those of the tested crudes nor do those at 4013 $\pm$ metres, where the abnormal C_{28} diacholestane peak (A & B) configuration suggests contamination.

At 4069.76-4069.87 metres the steranes extracted from the core and those of the tested oils display a slight similarity. To a large extent, the m/z 218 fragmentograms of the $\beta\beta$ steranes follow the same pattern as the steranes (at m/z 217). In general, the R and S isomers of the C_{28} and C_{29} steranes, are approximately of equal abundance (suggesting a fairly, mature source) but the C_{27} (20R) cholestane peak (A) is commonly more abundant than the S form.

To summarise:

- the DST-4 and DST-2 crude differ minimally from each other
- they correlate with hydrocarbon shows at 3174.48-3176.48 metres and at 3969.89-4001.67 metres
- contamination hinders the interpretation of the "shows" at 4012 $\pm$ metres and at 4013 $\pm$ metres but the show at 4069 $\pm$ metres is closely similar to the tested crudes.



Hydrocarbon Characterisation

The DST-4 (3174.0-3177.5 metres) and DST-2 (4004.0-4009.5 metres) oils are light (38.5-39.0 °API gravity) crude oils. Their whole oil chromatograms display a high degree of similarity although the aromatics (e.g. benzene and toluene) are less abundant in the DST-4 fluid. This effect is apparent in the detailed gasolines analyses although the ratios of selected hydrocarbons and the analyses of the non-aromatic hydrocarbons suggest that the two oils are similar to each other but not identical.

The C₁₅₊ saturates chromatograms also correlate although the DST-2 fluid is slightly, richer in pristane and phytane, and has a greater abundance of C₂₀₊ paraffins - suggesting a more waxy nature. These differences may be due to a lesser inferred maturity for the DST-2 oil source but could equally be the result of variations in migrational pathway. In general the paraffin-naphthene fraction chromatograms suggest a mature but not highly mature source.

Carbon isotope ratios of -29.68 and -29.70⁰/oo for the saturates and of -28.20 and -28.21⁰/oo for the aromatics correspond to a nearshore depositional environment for source rocks which contain a mixture of land plant and marine organic debris. Detailed GC-MS analyses of the steranes (at m/z 217 and 218) support the concept of a mixed kerogen type although the relatively strong C₂₇ peaks suggest a relatively greater abundance of marine material. R:S isomer ratios at m/z 191 and 217 suggest a relatively mature source. C₂₈ bisnorhopane (peak Z) and the unknown C₃₀ hopane (peak X) characterise both the tested crudes and the shows where the same oil is suspected in the core (see previous section).

COMPARISON BETWEEN SPONGE AND CONVENTIONAL CORES

This comparison is based upon data from conventional cores immediately above and below the sponge core interval at 3995.23-3997.61 metres. The conventional core sample at 3986.08-3986.18 metres is unusually lean, and when compared to the adjacent samples, appears to have a waxy contaminant. Samples of conventional core at 3969.89-3970.00 metres and at 4006.10-4000.25 metres are, therefore, preferred.

The sponge core samples yielded 645-1046 ppm C_{15+} hydrocarbons and are leaner than the selected conventional cores at 2886 ppm and 1766 ppm. Hydrocarbon to total extract ratios are marginally higher for the former 86.6-92.4% compared to 86.6 and 84.3% for the conventional cores. These differences may be due to a greater proportion of drilling introduced hydrocarbons in the conventional core samples but are not considered significant. More significant is the higher aromatics content of the sponge core extract averaging 16% compared to 8.5% for the conventional cores. This difference is partially accommodated in the NSO contents, which are 2.8% and 7.6-7.4% respectively.

Analysis of the C_{15+} saturates by gas chromatography reveals a greater paraffin content in the sponge core 43.5-57.1% compared to 26.2-34.0% in the conventional core. This is reflected in the naphthene content 36.6-51.2% as opposed to 62.3-70.1% for the conventional core, greater invasion of the conventional cores by naphthenic mud additives is suspected. This difference is visible in the chromatograms but apart from an improvement in the lighter C_{20-} fraction of the sponge core samples there are no other significant differences between the two sets of traces.

Similarly the C_{15+} aromatic hydrocarbons show a slight enhancement in the "front ends" although there are sample to sample variations within each set.

Mass fragmentograms - represented by those at m/z 191, 217 and 218 show little if any systematic differences in the hydrocarbons extracted from the two types of core.



Summarising:-

Direct comparisons between sponge and conventional core samples are not possible but the properties of conventional cores adjacent to the sponge cored interval may be compared.

Variations in hydrocarbon yield and hydrocarbon to total extract yield are not significant.

Hydrocarbons extracted from the sponge core are richer in aromatic hydrocarbons whereas the conventional cores yielded extracts which contained a greater proportion of NSO polar compounds - possibly from the mud system.

The C_{15+} saturate fraction is richer in naphthenes and contains less paraffins than the sponge core samples and this effect may also be attributed to drilling mud additives.

There is no observable difference between the mass fragmentograms from the two sets of cores.

From the available data it would appear that there is less loss of lighter components from the sponge core samples and, possibly, less contamination from the mud system.

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)
1334-003 CORE	3163.37m	A 98% Sandstone, coarse grained, sub-angular to sub-rounded, fairly well sorted, occ. glauconitic, visible porosity, very light grey	N8	
1334-004 CORE	3164.70-.80m	A 98% Sandstone, coarse grained, sub-angular to sub-round, fairly well sorted, occ. glauconitic, visible porosity, argillaceous lens, very light grey	N8	
1334-005 CORE	3174.48-.59m	A 98% Sandstone, coarse grained, sub-angular to sub-round, fairly well sorted, glauconitic, visible porosity, milky cut, very light grey to light greenish grey	N8-5G8/1	
1334-006 CORE	3176.38-.48m	A 98% Sandstone, coarse grained, sub-angular to sub-rounded, fairly well sorted, glauconitic, visible porosity, pale yellow F., milky cut, very light grey	N8	
1334-007 CORE	3178.60-.67m	A 98% Sandstone, coarse grained, sub-angular to sub-rounded, fairly well sorted, glauconitic, visible porosity, pale yellow F., milky cut, very light grey	N8	
1334-008 CORE	3952.43-.60m	A 98% Sandstone, argillaceous, fine grained sub-rounded, fairly, poorly sorted, micaceous, medium grey to light grey	N5-7	
1334-009 CORE	3955.79m	A 98% Sandstone, as 1334-008A	N5-7	
1334-010 CORE	3969.89- 3970m	A 98% Sandstone, med. grained, sub-angular to sub-rounded, well sorted, micaceous, pale yellow F., milky cut, very light grey	N8	
1334-011 CORE	3986.08-.18m	A 98% Sandstone, as 1334-010A	N8	
1334-012 CORE	4006.10-.25m	A 98% Sandstone, coarse grained, sub-angular to sub-rounded, fairly well sorted, visible porosity, pale yellow F., milky cut, very light grey	N8	
1334-013 CORE	4010.76-.87m	A 98% Sandstone, coarse sand to gravel size grain, with anhydrite and mudstone, lithoclasts, rounded to sub-angular, poorly sorted, visible porosity, pale yellow F., milky cut, very light grey	N8	

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)
1334-014 CORE	4011.52-.67m A	98% Sandstone, coarse sand to gravel size grain, with anhydrite and mudstone, lithoclasts, rounded to sub-angular, poorly sorted, visible porosity, pale yellow F., milky cut, very light grey	N8	
1334-015 CORE	4012.32-.42m A	98% Sandstone, as 1334-014A, pale yellow F., milky cut	N8	
1334-016 CORE	4012.59-.71m A	98% Sandstone, med. grained, sub-angular to sub-rounded, well sorted, occ. argillaceous laminations, occ. mudstone lithoclasts, very light grey	N8	
1334-017 CORE	4013.61-.71m A	98% Sandstone, med. grained, sub-angular to sub-rounded, fairly well sorted, occ. mudstone, lithoclasts, very light grey	N8	
1334-018 CORE	4039.68-.82m A	98% Sandstone, coarse grained, sub-angular to sub-rounded, occ. mudstone, lithoclasts, yellow F., milky cut, very light grey to pinkish grey	N8-5YR8/1	
1334-019 CORE	4069.76-.87m A	98% Sandstone, as 1334-018A, pale yellow F., milky cut		
1334-020 CORE	4072.66-.80m A	98% Sandstone, med. grained, sub-angular to sub-rounded, well sorted, pale yellow F., milky cut, very light grey	N8	
1334-021 CORE	4094.76-.87m A	98% Sandstone, med. to coarse grained, sub-angular, fairly well sorted, very light grey	N8	
1334-022 CORE	4125.38-.50m A	98% Sandstone, med. grained, sub-angular to sub-rounded, fairly well sorted, micaceous, occ. argillaceous lenses, white	N9	
1334-023 CORE	4287.00-.11m A	98% Sandstone, med. grained, sub-angular to sub-rounded, fairly well sorted, occ. argillaceous lenses, very light grey	N8	



TABLE 2

DETAILED GASOLINE (C4-C7) ANALYSIS

GEOCHEM SAMPLE		
NUMBER	001	002
DEPTH	DST-4	DST-2
isobutane	1.47	1.45
n-butane	5.14	4.23
isopentane	6.63	4.53
n-pentane	8.78	7.19
2,2-dimethylB	0.32	0.38
cyclopentane(CP)	1.59	2.02
2,3-dimethylB	0.10	0.04
2-methylP	5.92	4.38
3-methylP	3.75	2.78
n-hexane	10.48	8.83
methylCP(MCP)	4.81	5.06
2,2-dimethylP	0.60	0.34
2,4-dimethylP	0.02	0.00
2,2,3-trimethylB	0.04	0.04
benzene	0.44	3.20
cyclohexane(CH)	6.99	8.41
3,3-dimethylP	0.00	0.00
1,1-dimethylCP	0.00	0.00
2-methylH	4.88	3.96
2,3-dimethylP	0.62	0.53
3-methylH	4.07	3.35
1,c,3-dimethylCP	1.29	1.29
1,t,3-dimethylCP	1.13	1.22
1,t,2-dimethylCP	2.44	2.25
3-ethylP	0.00	0.00
n-heptane	11.10	10.05
methylCH(MCH)	14.71	14.16
1,c,2-dimethylCP	0.00	0.00
toluene	2.68	10.32
ABUNDANCE		
nC7/C7nap x100	56.75	53.12
MCP/Bz	10.86	1.58
MH/DMCP	1.84	1.54
nC6/MCP	2.18	1.74
%n-PARAFFINS	35.50	30.30
%iso-PARAFFINS	28.42	21.77
% NAPHTHENES	32.96	34.41
% AROMATICS	3.12	13.51

TABLE 3a
CONCENTRATION (PPM) OF EXTRACTED C₁₅₊ MATERIAL IN ROCK

JOB	LITHO	DEPTH	TOTAL EXTRACT	HYDROCARBONS			NON HYDROCARBONS			
				Saturates	Aromatics	TOTAL	Precipd. Asphaltenes	Eluted NSO's	Non-eluted NSO's	TOTAL
1334-003A		3163.37	272	204	18	222	40	8	2	50
1334-004A		3164.70-.80	122	75	8	83	28	10	1	39
1334-005A		3174.48-.59	2771	2104	319	2424	107	186	54	347
1334-006A		3176.38-.48	8329	6686	815	7501	175	571	82	828
1334-007A		3178.60-.67	70	20	3	23	41	5	1	47
1334-008A		3952.43-.60	74	15	8	23	40	9	1	51
1334-009A		3955.79	86	22	7	30	46	8	1	56
1334-010A		3969.89-3970	3333	2601	285	2886	161	(254)	32	447
1334-011A		3986.08-.18	228	100	45	145	44	39	0	83
1334-012A		4006.10-.25	2094	1588	178	1766	109	198	21	328
1334-013A		4010.76-.87	2638	1963	221	2184	183	245	25	454
1334-014A		4011.52-.67	1890	1337	170	1507	82	(252)	49	384
1334-015A		4012.32-.42	1837	1359	136	1495	138	187	18	342
1334-016		4012.59-.71	60	8	3	12	39	9	1	49
1334-017A		4013.61-.71	2035	1530	151	1681	145	189	20	354
1334-018A		4039.68-.82	107	26	8	35	51	21	0	72
1334-019A		4069.76-.87	1021	764	85	849	77	(85)	11	172
1334-020A		4072.66-.80	207	59	17	77	91	38	1	130
1334-021A		4094.76-.87	334	60	18	78	152	104	1	256
1334-022A		4125.38-.50	185	91	13	104	56	22	3	81
1334-023A		4287.00-.11	456	175	33	208	154	94	1	248



TABLE 3b
COMPOSITION (NORMALISED %) OF C₁₅₊ MATERIAL

JOB	LITHO	DEPTH	HYDROCARBONS		NON HYDROCARBONS		
GEOCHEM SAMPLE NUMBER			Saturates	Aromatics	Precipd. Asphaltenes	Eluted NSO's	Non eluted NSO's
1334-001		DST-4	85.83	6.04	2.46	4.87	0.79
1334-002		DST-2	82.01	8.51	2.21	6.35	0.92
1334-003A		3163.37	74.87	6.76	14.73	2.95	0.69
1334-004A		3164.70-.80	61.48	6.56	22.95	8.20	0.82
1334-005A		3174.48-.59	75.95	11.53	3.86	6.73	1.93
1334-006A		3176.38-.48	80.27	9.79	2.10	6.85	0.99
1334-007A		3178.60-.67	27.97	4.90	58.04	7.69	1.40
1334-008A		3952.43-.60	20.81	10.74	54.36	12.75	1.34
1334-009A		3955.79	26.01	8.67	53.76	9.83	1.73
1334-010A		3969.89-3970	78.03	8.55	4.84	7.61	0.97
1334-011A		3986.08-.18	43.73	19.96	19.20	16.92	0.19
1334-012A		4006.10-.25	75.83	8.51	5.19	9.48	0.99
1334-013A		4010.76-.87	74.43	8.36	6.95	9.29	0.97
1334-014A		4011.52-.67	70.70	9.01	4.35	13.35	2.59
1334-015A		4012.32-.42	73.99	7.38	7.49	10.19	0.95
1334-016		4012.59-.71	13.91	5.22	65.22	14.78	0.87
1334-017A		4013.61-.71	75.21	7.41	7.14	9.27	0.98
1334-018A		4039.68-.82	24.45	7.86	47.60	19.65	0.44
1334-019A		4069.76-.87	74.86	8.29	7.52	8.29	1.04
1334-020A		4072.66-.80	28.61	8.41	43.75	18.51	0.72
1334-021A		4094.76-.87	17.88	5.37	45.45	31.00	0.30
1334-022A		4125.38-.50	49.34	6.82	30.45	11.81	1.57
1334-023A		4287.00-.11	38.31	7.24	33.81	20.53	0.11

TABLE 4
SIGNIFICANT RATIOS (%) OF C₁₅₊ FRACTIONS AND ORGANIC CARBON

JOB	LITHO	DEPTH	ORGANIC CARBON (wt. %)	HYDROCARBONS		TOTAL EXTRACT ORG. CARBON	SATURATES AROMATICS
GEOCHEM SAMPLE NUMBER				TOTAL EXTRACT	ORG. CARBON		
1334-003A		3163.37	0.17	81.63	13.07	16.02	11.08
1334-004A		3164.70-.80	0.09	68.03	9.19	13.50	9.37
1334-005A		3174.48-.59	0.21	87.47	115.41	131.94	6.59
1334-006A		3176.38-.48	0.05	90.06	1520.50	1665.80	8.20
1334-007A		3178.60-.67	0.06	32.87	3.84	11.68	5.71
1334-008A		3952.43-.60	0.54	31.54	0.43	1.37	1.94
1334-009A		3955.79	0.27	34.68	1.10	3.18	3.00
1334-010A		3969.89-3970	0.05	86.58	577.23	666.70	9.12
1334-011A		3986.08-.18	0.04	63.69	36.26	56.93	2.19
1334-012A		4006.10-.25	0.05	84.34	353.16	418.73	8.91
1334-013A		4010.76-.87	0.04	82.79	545.98	659.45	8.90
1334-014A		4011.52-.67	0.07	79.71	215.26	270.06	7.85
1334-015A		4012.32-.42	0.04	81.37	373.69	459.23	10.03
1334-016		4012.59-.71	0.04	19.13	2.88	15.03	2.67
1334-017A		4013.61-.71	0.04	82.62	420.27	508.71	10.15
1334-018A		4039.68-.82	0.05	32.31	6.91	21.37	3.11
1334-019A		4069.76-.87	0.05	83.15	169.83	204.23	9.03
1334-020A		4072.66-.80	0.07	37.02	10.96	29.60	3.40
1334-021A		4094.76-.87	0.05	23.25	15.54	66.83	3.33
1334-022A		4125.38-.50	0.03	56.17	34.71	61.80	7.23
1334-023A		4287.00-.11	0.09	45.55	23.09	50.69	5.29

TABLE 5
COMPOSITION (NORMALISED %) OF C₁₅+ SATURATE (PARAFFIN – NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-001	-002	-003	-004	-005	-006	-007
DEPTH	DST 4	DST 2	3163.37m	3164.70-.80m	3174.48-.59m	3176.38-.48m	3178.60-.67m
SAMPLE TYPE	OIL	OIL	CORE	CORE	CORE	CORE	CORE
nC ₁₅	11.28	9.07	2.87	0.76	10.07	9.51	16.74
nC ₁₆	10.35	8.42	6.84	1.94	10.43	9.83	25.19
nC ₁₇	9.51	9.30	11.20	5.87	11.52	9.70	19.71
nC ₁₈	8.27	7.91	9.93	8.26	9.33	8.47	16.19
nC ₁₉	8.70	8.64	12.41	11.02	9.64	7.46	11.48
nC ₂₀	7.41	7.64	10.20	9.82	6.71	7.87	5.52
nC ₂₁	6.35	6.30	7.17	8.00	6.37	5.93	1.41
nC ₂₂	6.47	5.52	6.40	6.54	6.47	5.69	0.59
nC ₂₃	4.82	5.57	5.41	7.68	4.86	4.82	0.81
nC ₂₄	5.58	5.56	5.85	6.88	4.81	4.47	0.32
nC ₂₅	4.91	4.78	5.18	6.18	4.43	4.97	0.35
nC ₂₆	3.86	4.26	3.42	4.74	3.83	3.64	0.21
nC ₂₇	3.17	3.06	2.92	4.66	2.57	3.53	0.23
nC ₂₈	1.96	2.61	2.54	4.24	2.19	3.07	0.16
nC ₂₉	1.81	2.41	2.37	3.29	1.95	2.74	0.18
nC ₃₀	1.26	1.78	1.77	1.93	1.64	2.11	0.32
nC ₃₁	0.91	1.46	0.77	1.53	1.10	2.14	0.13
nC ₃₂	0.66	1.16	1.05	1.52	0.85	1.68	0.12
nC ₃₃	1.06	1.51	0.83	0.99	0.74	0.93	0.20
nC ₃₄	1.08	1.65	0.55	1.36	0.32	0.96	0.08
nC ₃₅	0.56	1.40	0.33	2.80	0.17	0.47	0.05
PARAFFIN	30.70	27.65	30.96	30.87	25.61	26.06	28.73
ISOPRENOID	3.61	2.97	2.84	3.38	3.47	3.22	22.67
NAPHTHENE	65.60	69.38	66.20	65.75	70.92	70.72	48.60
CPI INDEX 1	0.95	0.98	0.97	1.07	0.94	1.01	1.31
CPI INDEX 2	1.12	1.01	1.06	1.07	0.99	1.14	1.00
CPI INDEX 3	1.09	0.89	0.98	1.04	0.85	1.05	1.23
PRISTANE/PHYTANE	1.81	1.40	1.48	1.34	1.61	1.44	1.87
PRISTANE/nC ₁₇	0.79	0.67	0.49	0.58	0.73	0.75	2.61
PHYTANE/nC ₁₈	0.49	0.65	0.40	0.36	0.55	0.45	0.66

$$\text{C.P.I. 1} = \frac{1}{2} \frac{\text{C}_{21}+\text{C}_{23}+\text{C}_{25}+\text{C}_{27}}{\text{C}_{20}+\text{C}_{22}+\text{C}_{24}+\text{C}_{26}} + \frac{\text{C}_{21}+\text{C}_{23}+\text{C}_{25}+\text{C}_{27}}{\text{C}_{22}+\text{C}_{24}+\text{C}_{26}+\text{C}_{28}}$$

$$\text{C.P.I. 2} = \frac{1}{2} \frac{\text{C}_{25}+\text{C}_{27}+\text{C}_{29}+\text{C}_{31}}{\text{C}_{24}+\text{C}_{26}+\text{C}_{28}+\text{C}_{30}} + \frac{\text{C}_{25}+\text{C}_{27}+\text{C}_{29}+\text{C}_{31}}{\text{C}_{26}+\text{C}_{28}+\text{C}_{30}+\text{C}_{32}}$$

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

TABLE 5
COMPOSITION (NORMALISED %) OF C₁₅+ SATURATE (PARAFFIN – NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-008	-009	-010	-011	-012	-013	-014
DEPTH	3952.43- .60m	3955.79m	3969.89- 3970m	3986.08- .18m	4006.10- .25m	4010.76- .87m	4011.52- .67m
SAMPLE TYPE	CORE	CORE	CORE	CORE	CORE	CORE	CORE
nC ₁₅	23.53	20.53	5.88	0.13	5.32	7.59	0.27
nC ₁₆	26.36	23.59	8.03	0.74	7.46	7.32	0.99
nC ₁₇	18.88	19.81	9.22	2.27	8.14	8.17	3.99
nC ₁₈	11.48	12.05	8.70	2.41	8.01	7.24	5.43
nC ₁₉	6.27	7.29	7.51	10.90	7.45	6.84	4.91
nC ₂₀	3.56	2.63	7.85	8.34	7.96	7.95	6.63
nC ₂₁	1.89	1.98	6.66	1.67	6.32	7.08	5.96
nC ₂₂	1.76	1.97	6.15	1.69	6.57	7.94	7.27
nC ₂₃	1.11	1.12	5.37	1.72	5.35	5.67	6.00
nC ₂₄	0.93	1.02	5.41	1.85	5.20	6.03	6.40
nC ₂₅	0.73	1.11	5.14	8.15	5.31	4.70	7.29
nC ₂₆	0.80	0.89	4.40	9.57	4.29	3.20	5.78
nC ₂₇	0.53	0.82	3.57	5.50	3.62	3.83	5.45
nC ₂₈	0.48	0.88	3.49	7.47	3.18	2.79	4.98
nC ₂₉	0.39	0.74	3.06	7.20	2.83	2.33	5.11
nC ₃₀	0.30	0.59	2.54	8.41	2.52	2.93	4.49
nC ₃₁	0.36	0.87	1.86	5.47	2.12	2.60	3.89
nC ₃₂	0.27	0.62	2.18	1.72	1.97	1.97	4.17
nC ₃₃	0.20	0.59	1.79	5.16	2.16	1.56	4.06
nC ₃₄	0.12	0.51	0.75	5.75	2.34	1.32	4.07
nC ₃₅	0.06	0.41	0.43	3.87	1.87	0.95	2.87
PARAFFIN	32.94	27.11	26.15	38.68	33.96	46.59	26.11
ISOPRENOID	5.82	6.83	3.77	5.47	3.78	6.41	1.24
NAPHTHENE	61.24	66.06	70.08	55.85	62.26	47.00	72.66
CPI INDEX 1	0.84	0.92	0.97	0.81	0.96	0.96	0.98
CPI INDEX 2	0.94	1.12	0.97	0.97	1.04	1.07	1.06
CPI INDEX 3	0.82	0.93	0.91	0.65	0.97	1.28	1.01
PRISTANE/PHYTANE	1.98	2.11	1.39	0.70	1.22	1.01	0.61
PRISTANE/nC ₁₇	0.62	0.86	0.91	2.57	0.75	0.85	0.45
PHYTANE/nC ₁₈	0.60	0.64	0.53	1.03	0.62	0.78	0.86

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

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

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

TABLE 5
COMPOSITION (NORMALISED %) OF C₁₅+ SATURATE (PARAFFIN – NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-015	-016	-017	-018	-019	-020	-021
DEPTH	4012.32- .42m	4012.59- .71m	4013.61- .71m	4039.68- .68m	4069.76- .87m	4072.66- .80m	4094.76- .87m
SAMPLE TYPE	CORE	CORE	CORE	CORE	CORE	CORE	CORE
nC ₁₅	1.90	15.44	4.56	5.80	2.15	13.79	1.71
nC ₁₆	4.14	30.02	4.76	15.71	3.74	25.01	3.08
nC ₁₇	7.38	13.95	5.00	12.45	6.75	13.79	3.83
nC ₁₈	8.38	17.33	4.46	5.80	3.87	25.01	7.94
nC ₁₉	11.03	8.66	9.87	15.71	7.10	15.61	2.16
nC ₂₀	9.77	8.68	9.05	4.96	9.07	2.53	3.59
nC ₂₁	8.43	1.91	8.84	2.59	7.38	0.95	2.76
nC ₂₂	9.77	0.73	6.47	1.52	7.10	0.44	2.77
nC ₂₃	8.43	0.44	5.71	1.61	6.39	0.34	3.18
nC ₂₄	7.97	0.35	5.13	1.68	7.61	0.27	4.23
nC ₂₅	5.89	0.29	5.11	2.52	5.51	0.36	5.97
nC ₂₆	4.09	0.29	5.22	1.80	5.38	0.23	4.52
nC ₂₇	2.88	0.29	3.54	1.98	4.92	0.26	4.34
nC ₂₈	2.34	0.29	3.55	2.32	4.38	0.15	6.85
nC ₂₉	2.39	0.29	3.42	2.61	3.61	0.32	6.87
nC ₃₀	1.95	0.26	2.90	3.00	3.67	0.20	8.10
nC ₃₁	1.18	0.22	2.58	3.65	1.85	0.26	5.53
nC ₃₂	0.87	0.19	2.36	4.35	2.76	0.22	6.55
nC ₃₃	0.75	0.15	2.21	3.55	2.73	0.14	5.84
nC ₃₄	0.33	0.11	2.95	3.61	2.38	0.08	6.65
nC ₃₅	0.15	0.09	2.30	2.80	1.64	0.05	3.54
PARAFFIN	25.79	33.76	25.53	25.37	35.54	34.24	24.88
ISOPRENOID	2.41	28.94	5.94	5.12	6.79	7.36	2.57
NAPHTHENE	71.81	37.30	68.53	69.52	57.67	58.39	72.55
CPI INDEX 1	0.94	1.02	1.02	1.03	0.91	1.15	0.98
CPI INDEX 2	1.04	0.99	0.96	1.08	0.87	1.47	0.92
CPI INDEX 3	0.90	1.01	0.81	0.96	1.01	1.39	0.76
PRISTANE/PHYTANE	0.97	3.60	0.56	1.70	0.56	2.01	0.51
PRISTANE/nC ₁₇	0.62	4.81	1.67	1.02	1.01	1.04	0.92
PHYTANE/nC ₁₈	0.59	1.11	0.71	0.74	0.56	0.59	2.15

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

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

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

TABLE 5
COMPOSITION (NORMALISED %) OF C₁₅+ SATURATE (PARAFFIN – NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-022	-023
DEPTH	4125.38- .50m	4287.00- .11m
SAMPLE TYPE	CORE	CORE
nC ₁₅	5.63	1.27
nC ₁₆	17.64	4.41
nC ₁₇	17.95	5.45
nC ₁₈	16.88	3.75
nC ₁₉	13.20	3.21
nC ₂₀	7.35	2.18
nC ₂₁	2.74	2.06
nC ₂₂	2.19	2.48
nC ₂₃	3.27	2.87
nC ₂₄	1.64	3.60
nC ₂₅	2.88	4.82
nC ₂₆	1.10	3.96
nC ₂₇	1.85	4.48
nC ₂₈	1.42	5.04
nC ₂₉	1.12	5.60
nC ₃₀	0.82	7.14
nC ₃₁	0.62	7.72
nC ₃₂	0.82	9.53
nC ₃₃	0.62	8.61
nC ₃₄	0.20	9.93
nC ₃₅	0.06	1.89
PARAFFIN	21.30	35.66
ISOPRENOID	4.76	1.53
NAPHTHENE	73.94	62.80
CPI INDEX 1	1.28	1.05
CPI INDEX 2	1.43	1.01
CPI INDEX 3	1.47	1.00
PRISTANE/PHYTANE	1.60	1.50
PRISTANE/nC ₁₇	0.77	0.47
PHYTANE/nC ₁₈	0.75	0.53

$$\text{C.P.I. 1} = \frac{1}{2} \frac{\text{C}_{21} + \text{C}_{23} + \text{C}_{25} + \text{C}_{27}}{\text{C}_{20} + \text{C}_{22} + \text{C}_{24} + \text{C}_{26}} + \frac{\text{C}_{21} + \text{C}_{23} + \text{C}_{25} + \text{C}_{27}}{\text{C}_{22} + \text{C}_{24} + \text{C}_{26} + \text{C}_{28}}$$

$$\text{C.P.I. 2} = \frac{1}{2} \frac{\text{C}_{25} + \text{C}_{27} + \text{C}_{29} + \text{C}_{31}}{\text{C}_{24} + \text{C}_{26} + \text{C}_{28} + \text{C}_{30}} + \frac{\text{C}_{25} + \text{C}_{27} + \text{C}_{29} + \text{C}_{31}}{\text{C}_{26} + \text{C}_{28} + \text{C}_{30} + \text{C}_{32}}$$

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

NBS 22 STANDARD

TABLE 6
CARBON ISOTOPE COMPOSITIONS (‰, PDB)

GEOCHEM SAMPLE NUMBER	DEPTH	TOTAL EXTRACT WHOLE OIL	SATURATES	AROMATICS	NSO	ASPHALTENES	KEROGEN	PYROLYSATE S2
1334-001	DST #4	-29.38	-29.68	-28.22	-28.37	-29.25		
1334-002	DST #2	-29.53	-29.70	-28.21*	-28.20	-29.11		
1334-003	3163.37m	-29.16	-29.85	-28.44	-28.41*	-29.00		
1334-004	3164.70-.80m	-29.19	-29.73	-28.51	-28.56	-28.79		
1334-005	3174.48-.59m	-29.47	-29.72	-28.39	-29.16*	-29.07		
1334-006	3176.38-.48m	-29.38	-29.58	TOO SMALL	-28.70	-29.04		
1334-007	3178.60-.67m	-29.30	-30.18*	-28.57	-28.54	-28.21		
1334-009	3955.79m	-29.08	-29.78	-28.49*	-28.36	-28.22		
1334-010	3969.89- 3970m	-29.36	-29.82	-28.56	-28.82	-28.48		
1334-011	3986.08-.18m	-29.61	-29.98*	TOO SMALL	TOO SMALL	-29.98		
1334-012	4006.10-.25m	-29.44	-29.85	-28.69	-29.09	-28.72		
1334-013	4010.76-.87m	-29.40	-29.79	-28.71*	-28.83*	-28.73		
1334-014	4011.52-.67m	-29.42	-29.89	-28.71	-29.39	-28.67		
1334-015	4012.32-.42m	-29.34	-29.79	TOO SMALL	-29.13	-28.14		
1334-017	4013.61-.71m	-29.36	TOO SMALL	TOO SMALL	-28.52*	TOO SMALL		
1334-018	4039.68-.82m	-28.98	-29.47	-28.20	TOO SMALL	-28.33		
1334-019	4069.76-.87m	-28.75	-29.43	-28.36	-28.29*	-28.50		
1334-022	4125.38-.50m	-28.35	-28.65	-27.49	-28.70*	-28.85		

* - SMALL SAMPLE



TABLE 7

METHYL PHENANTHRENE INDEX (1)

GEOCHEM SAMPLE NUMBER	DEPTH	% AREA	% HEIGHT
1334-001	DST 4	0.75	0.89
1334-002	DST 2	0.74	0.77
1334-003	3163.37m	1.03	0.97
1334-004	3164.70-.80m	0.72	1.03
1334-005	3174.48-.59m	0.82	0.90
1334-006	3176.38-.48m	0.73	0.43
1334-007	3178.60-.67m	0.89	1.03
1334-008	3952.43-.60m	0.95	0.95
1334-009	3955.79m	0.98	0.94
1334-010	3969.89-3970m	0.48	0.73
1334-011	3986.08-.18m	1.09	1.04
1334-012	4006.10-.25m	0.67	0.73
1334-013	4010.76-.87m	0.76	0.57
1334-014	4011.52-.67m	0.85	0.84
1334-015	4012.32-.42m	0.65	0.46
1334-016	4012.59-.71m	0.75	0.79
1334-017	4013.61-.71m	0.76	0.61
1334-018	4039.68-.82m	0.78	0.94
1334-019	4069.76-.87m	0.74	3.63
1334-020	4072.66-.80m	0.72	0.94
1334-021	4094.76-.87m	0.70	0.79
1334-022	4125.38-.50m	0.80	0.83
1334-023	4287.00-.11m	0.62	0.73

TABLE 8
BIOMARKER MOLECULAR RATIOS

GEOCHEM SAMPLE NUMBER	SAMPLE DEPTH/ IDENTITY	SAMPLE TYPE	STERANES (m/z 217, 218,				TERPANES (m/z 191, 177)					
			$C_{29} \frac{\alpha\alpha\alpha \text{ 20S [Q]}}{\alpha\alpha\alpha \text{ 20R [T]}}$	$C_{29} \frac{\alpha\beta\beta \text{ 20R [R]}}{\alpha\alpha\alpha \text{ 20R [T]}}$	$C_{27} \frac{20SDIAST [A]}{20RDIAST [B]}$	$\frac{C_{27} \beta\beta}{C_{29} \beta\beta} (218)$	$\frac{Tm [B]}{Ts [A]}$	$\frac{C_{29} 17\alpha\text{-NH [C]}}{[C] + C_{30} 17\alpha\text{-H [E]}}$	$C_{29} \frac{NM [D]}{[D] + NH [C]}$	$\frac{28, 30\text{-BNH [Z]}}{[Z] + C_{29} 17\text{-NH [C]}}$	$\frac{28, 30\text{-BNH [Z]}}{[Z] + 25, 28, 30\text{-TNH [177]}}$	$C_{31} \frac{20S [G]}{[G] + 20R [H]} \%$
1334-001 DST #4	3174-3177.5m		1.06	1.09	1.48	0.90	0.56	0.37	0.14	0.28	0.44	0.57
1334-005	3174.48-.59m		1.83	1.83	1.43	1.20	0.75	0.38	0.15	0.35	0.62	0.65
1334-006	3176.38-.48m		1.82	1.64	1.21	1.02	0.65	0.35	0.15	0.30	0.57	0.64
1334-010	3969.89-970m		1.65	2.15	1.36	0.95	0.56	0.32	0.11	0.30	0.30	0.60
1334-002 DST #2	4004-4009.5m		1.75	1.85	1.53	1.22	0.57	0.34	0.09	0.30	0.29	0.59
1334-012	4006.10-.25m		1.77	2.00	1.84	1.09	0.70	0.34	0.07	0.26	0.29	0.63
1334-013	4010.76-.87m		1.30	1.96	1.47	0.81	0.68	0.34	0.10	0.20	0.31	0.59
1334-014	4011.52-.67m		1.50	1.86	1.41	0.93	0.66	0.36	0.09	0.26	0.33	0.59
1334-015	4012.32-.42m		1.00	1.69	1.39	0.38	0.71	0.23	0.11	0.24	----	0.63
1334-017	4013.61-.71m		2.00	2.30	0.94	0.95	0.71	0.34	0.07	0.31	0.33	0.62
1334-019	4069.76-.87m		1.50	2.08	0.98	0.75	1.17	0.36	0.04	0.10	0.22	0.61

[A] etc. REFERS TO IDENTIFICATION ON APPROPRIATE MASS FRAGMENTOGRAM

CT — ditch cuttings CO — core SWC — sidewall core

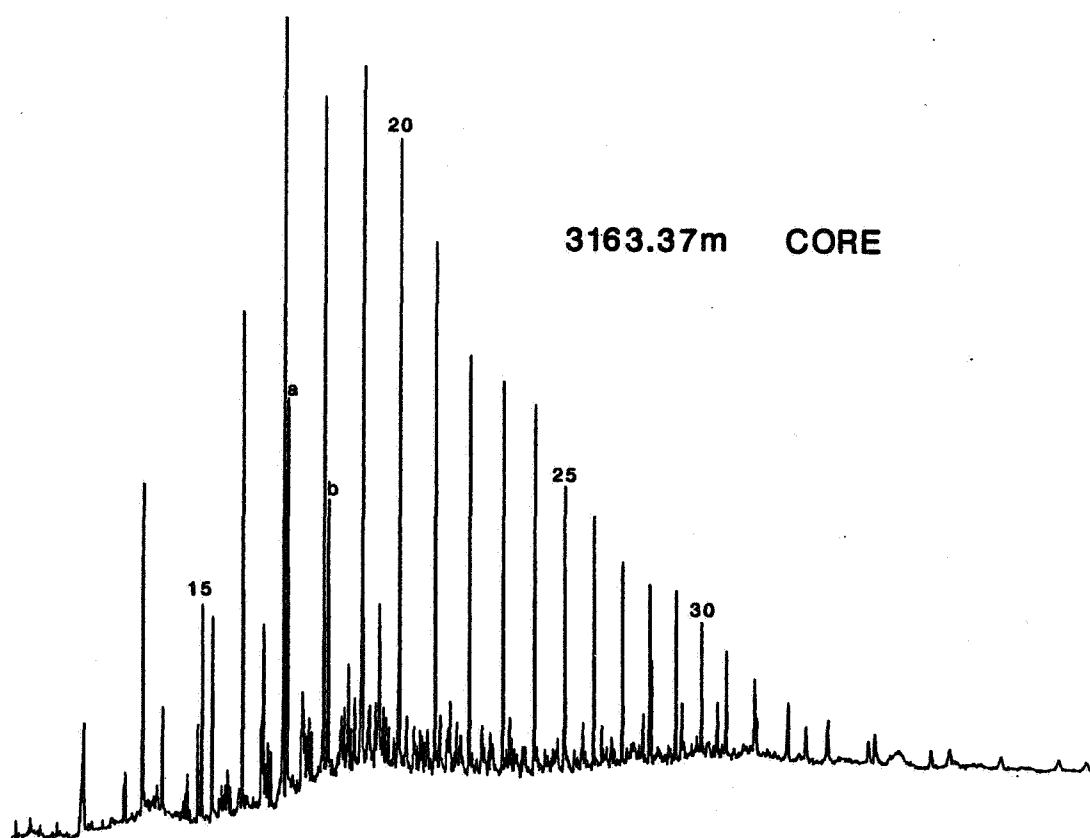
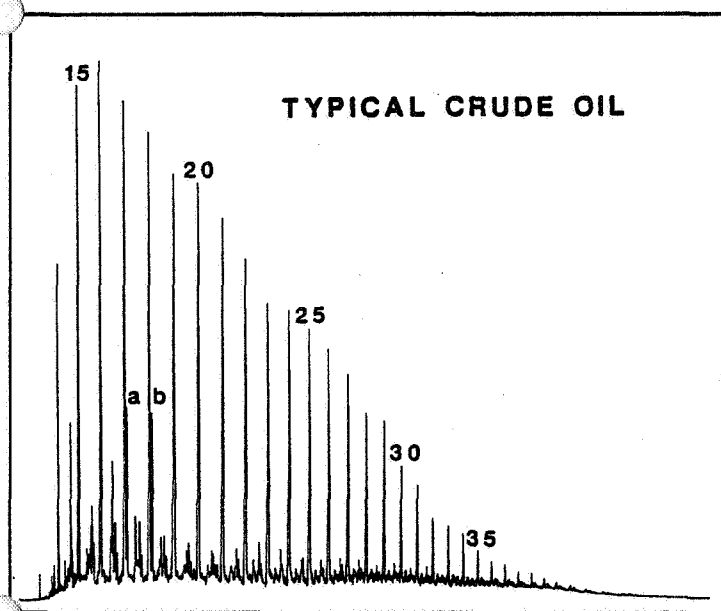
DIAST — DIASTERANES H — HOPANE NH — NORHOPANE BNH — BISNORHOPANE

TNH — TRISNORHOPANE NM — NORMORETANE



FIGURE 5a **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5



a - PRISTANE

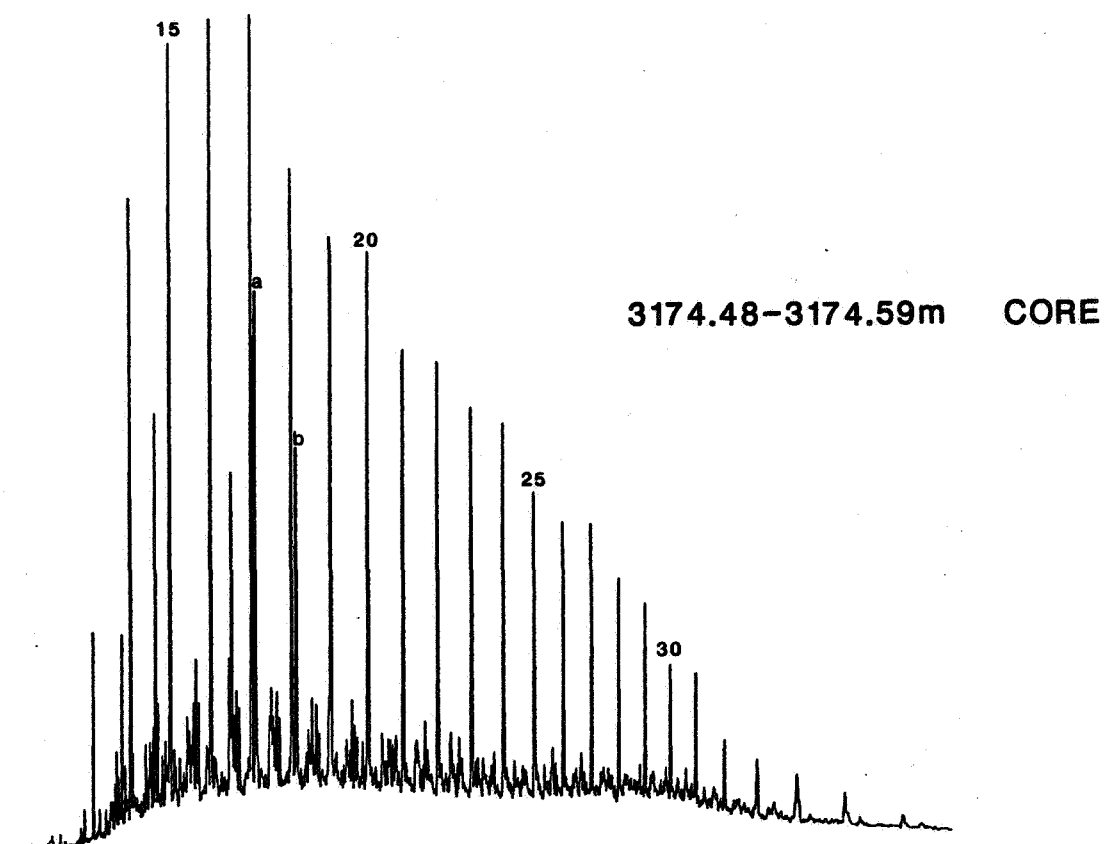
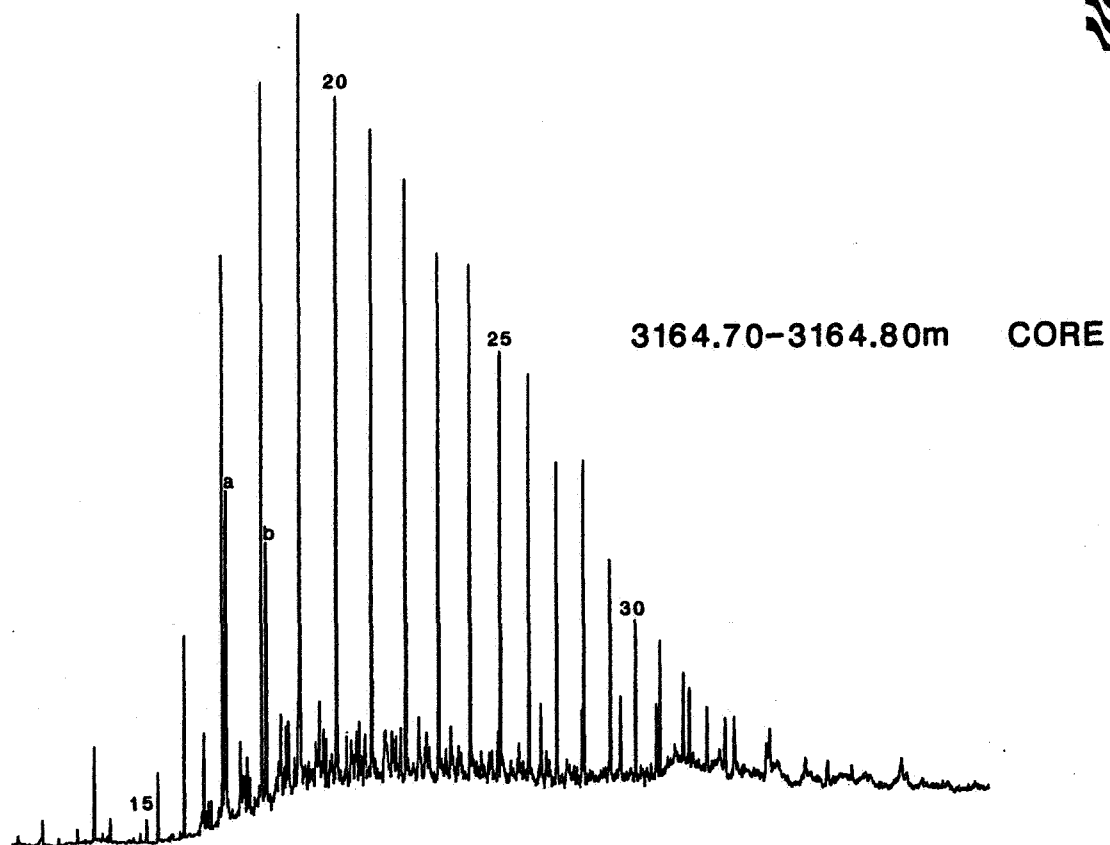
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20-nC₂₀)

FIGURE 5b

C₁₅+ SATURATES CHROMATOGRAMS

WELL 6506/12-5



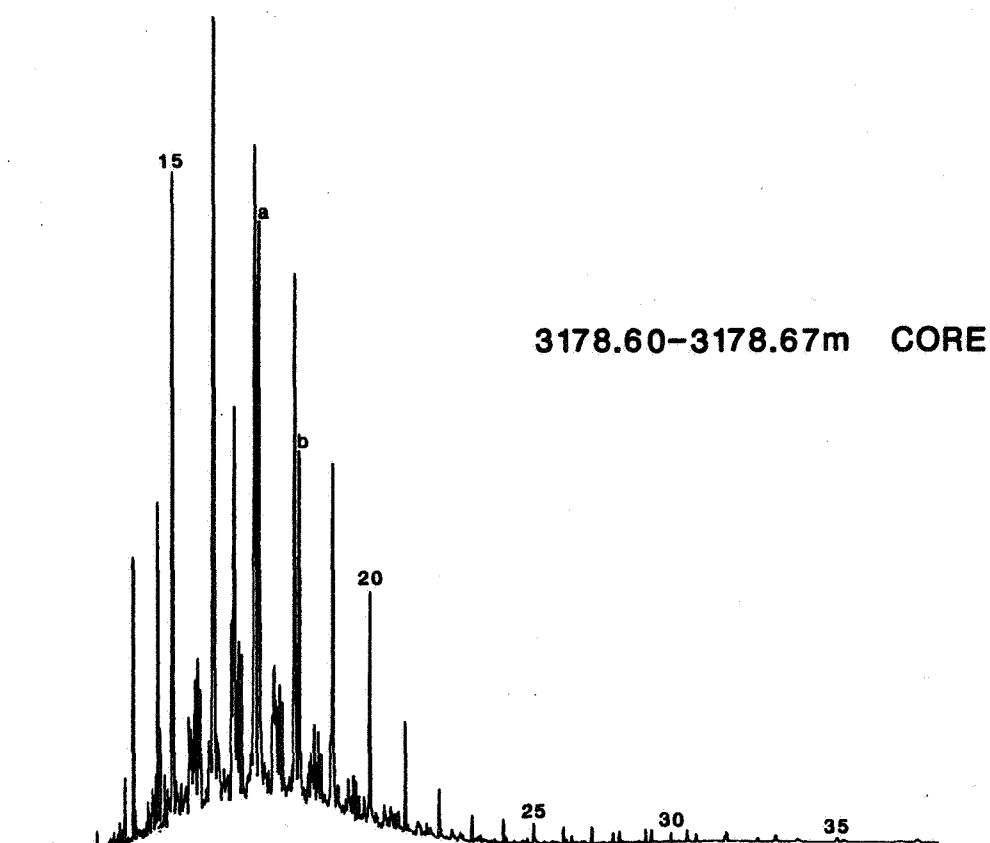
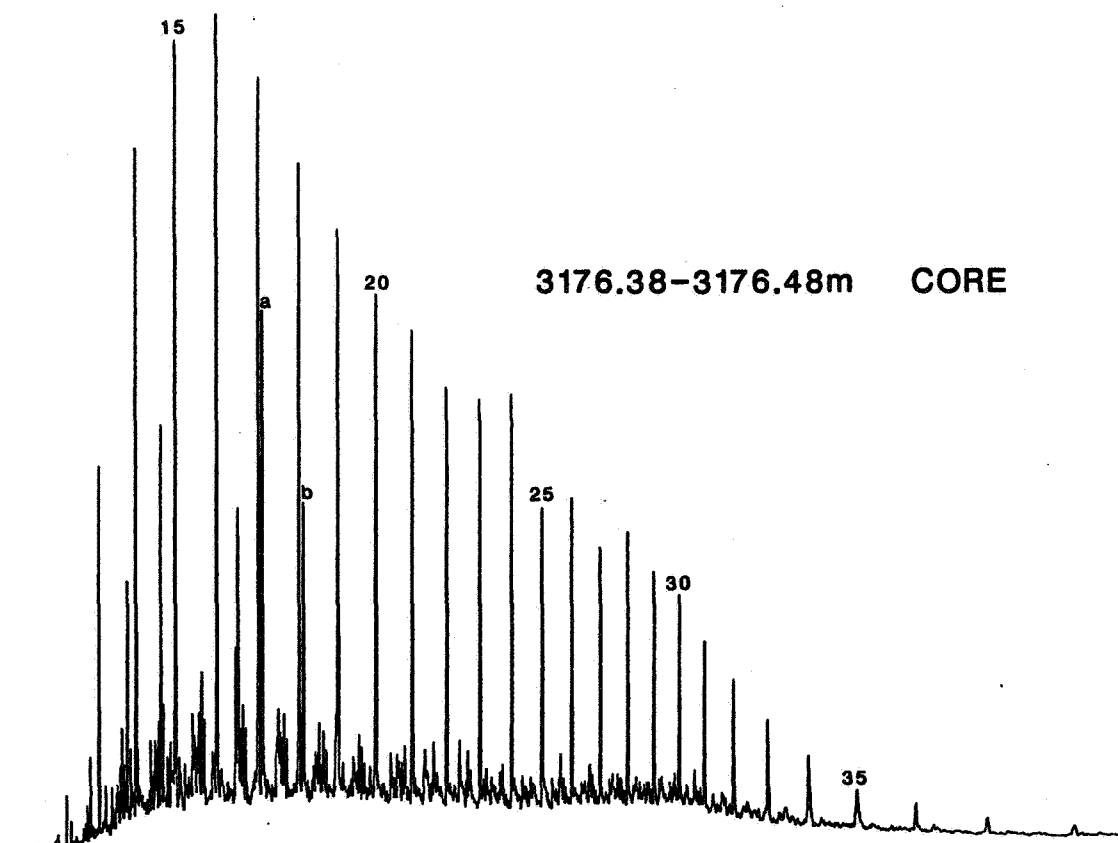
a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5c **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5



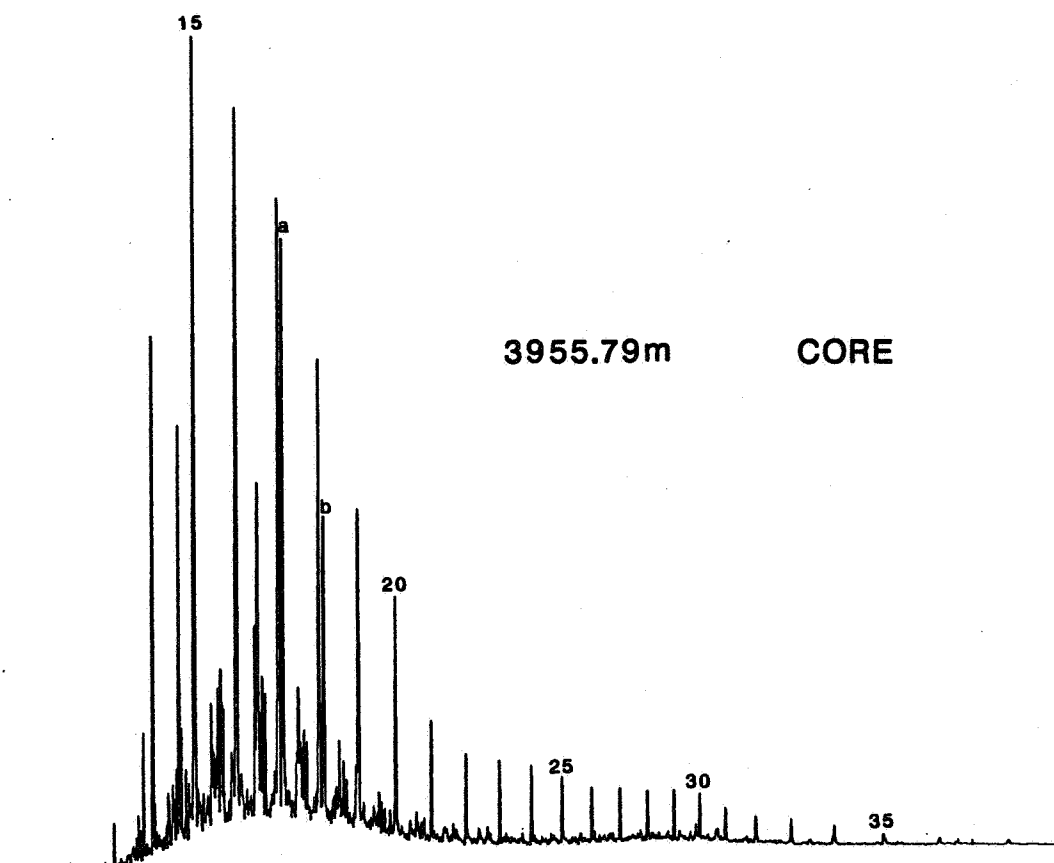
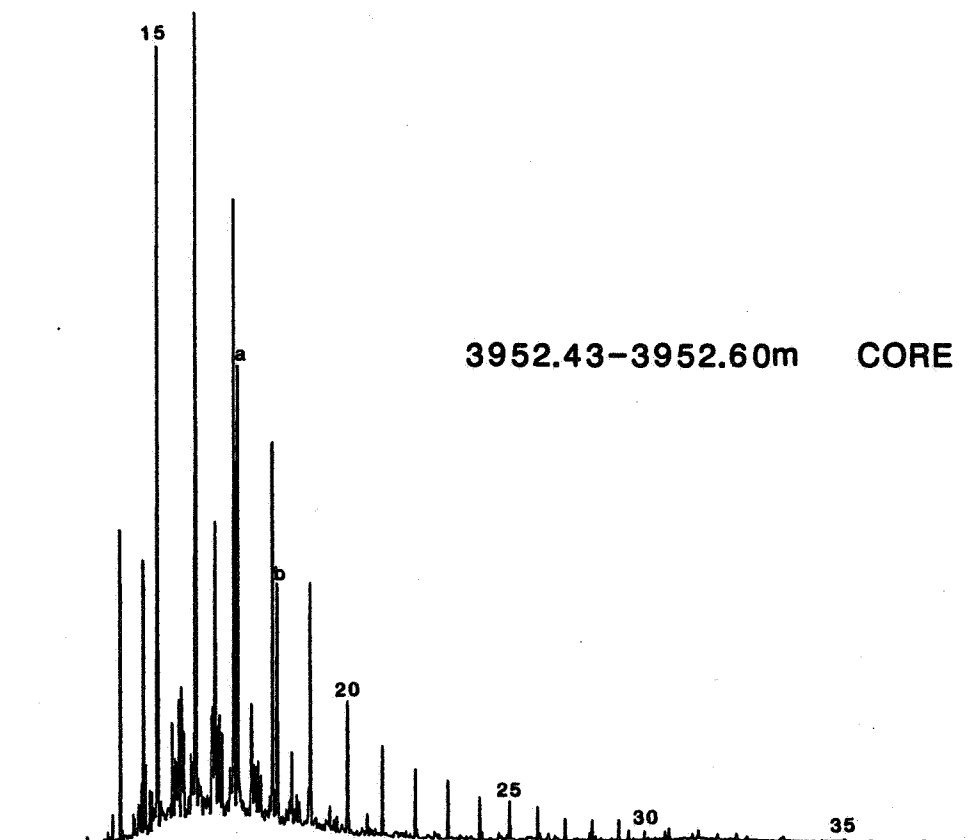
a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5d **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5



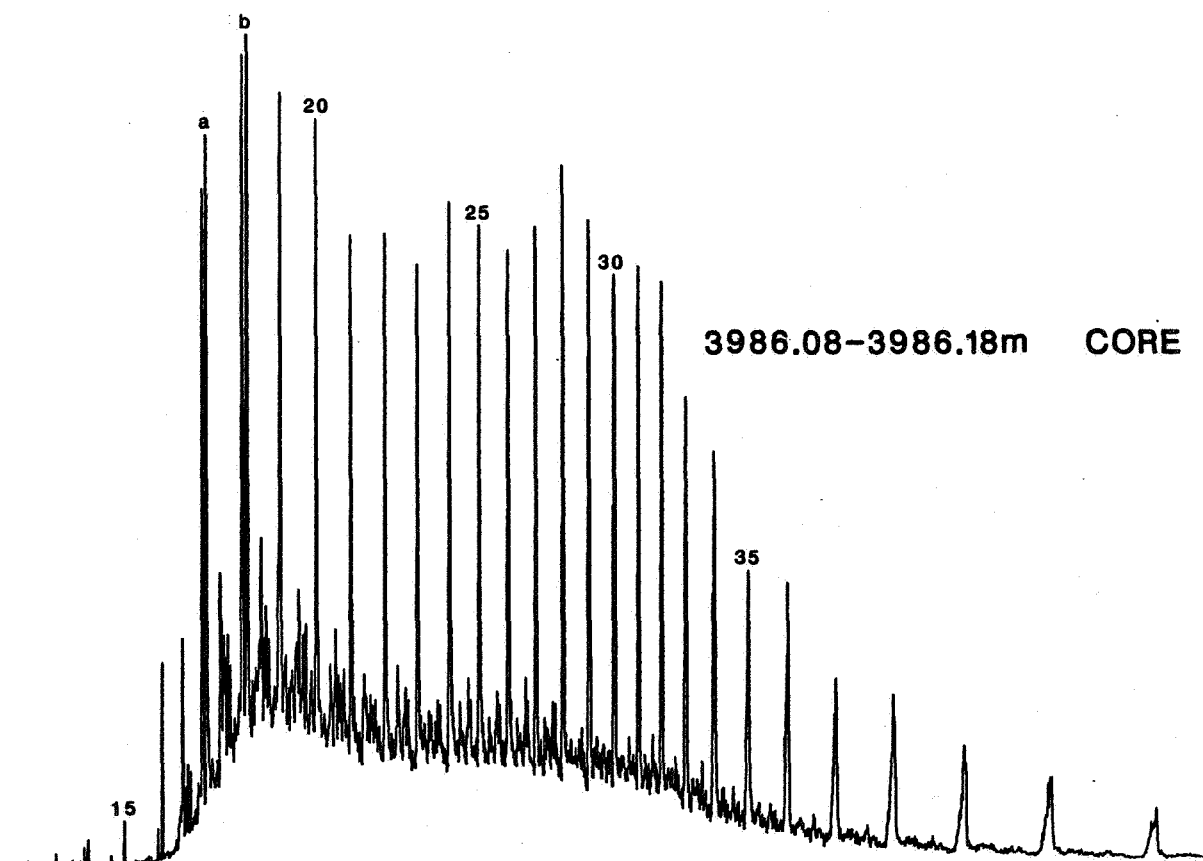
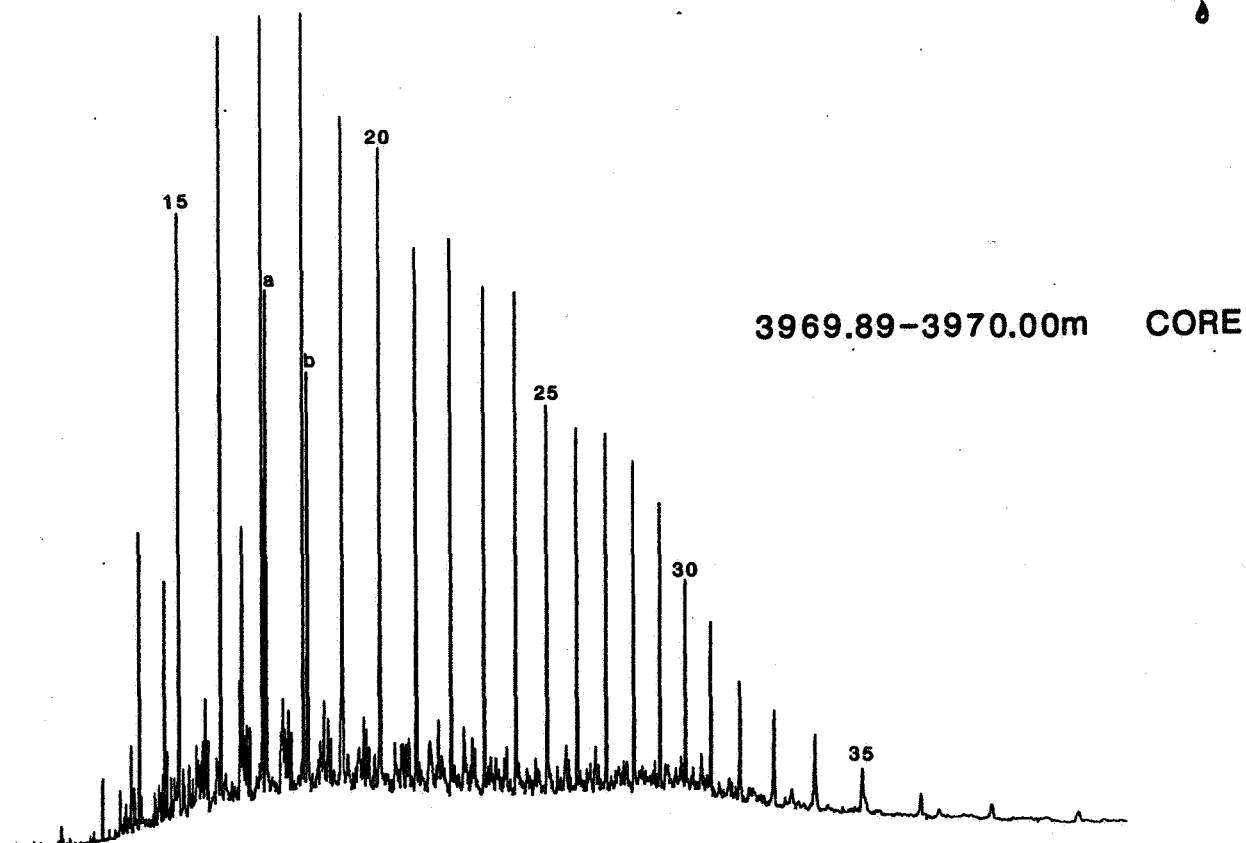
a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5e **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5



a - PRISTANE

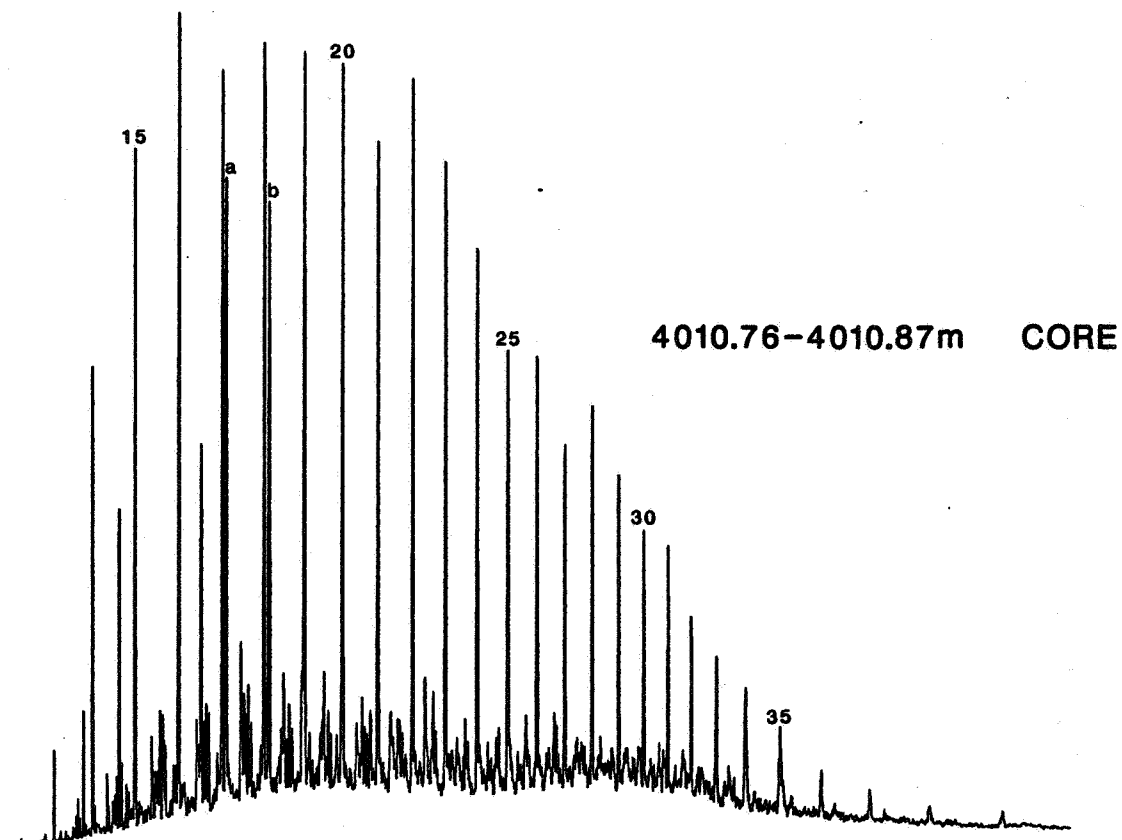
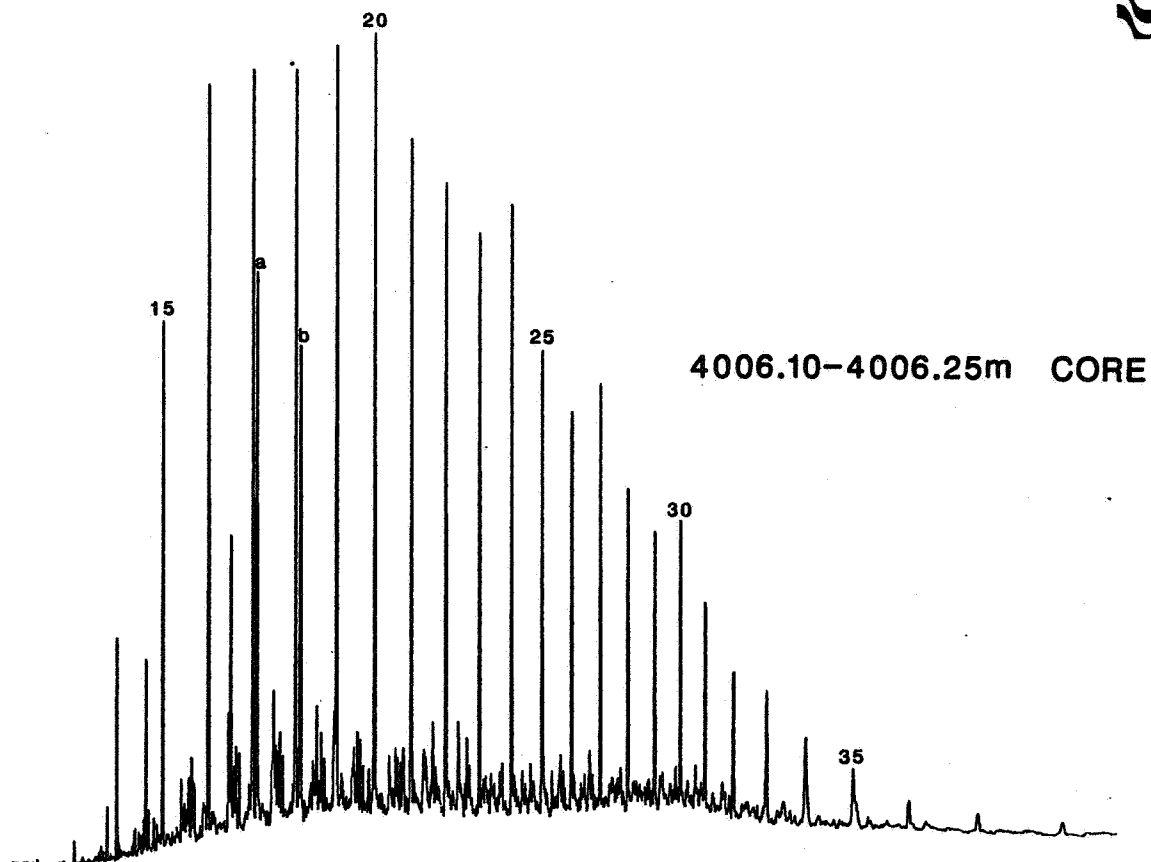
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5f

C₁₅+ SATURATES CHROMATOGRAMS

WELL 6506/12-5



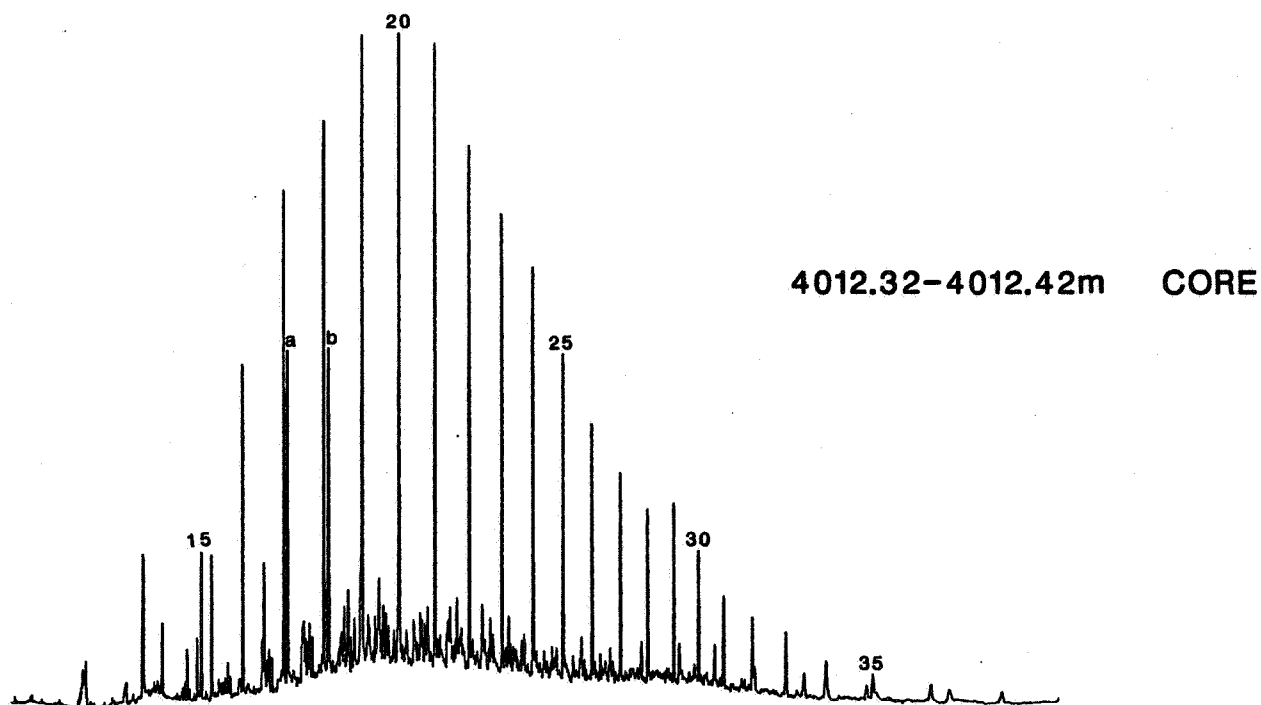
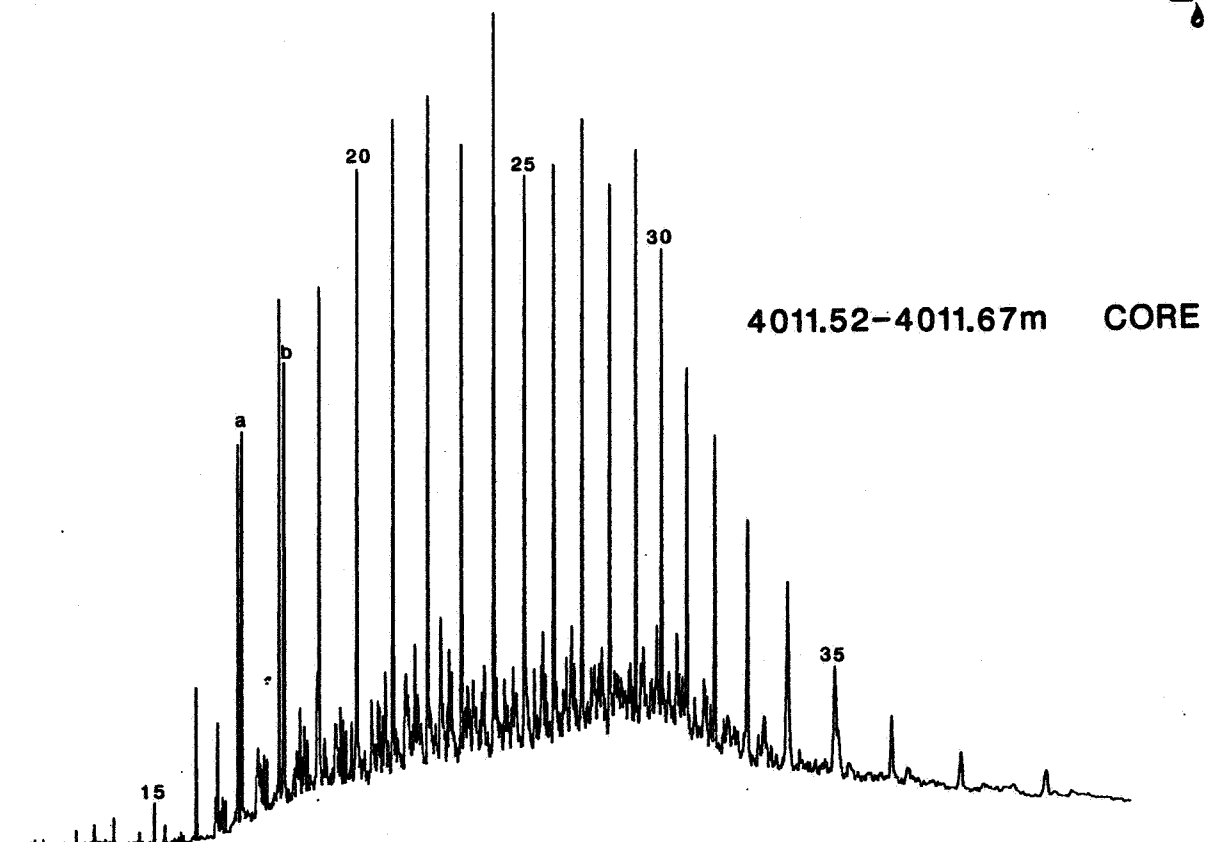
a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5g **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5

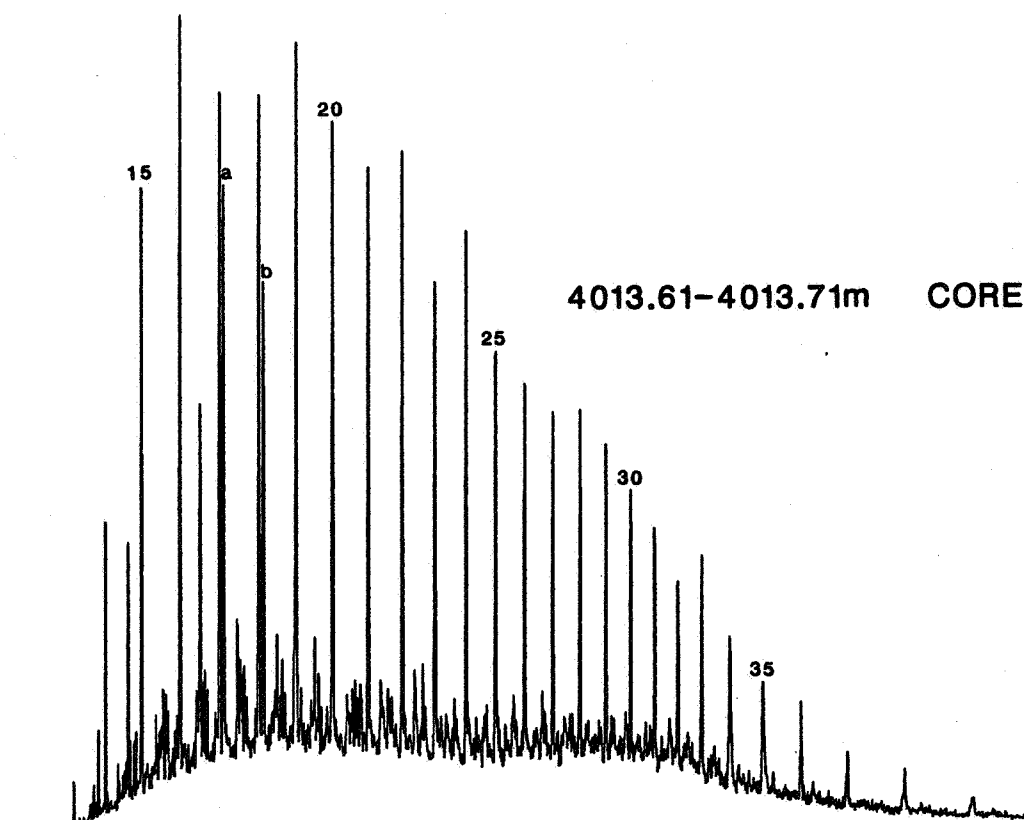
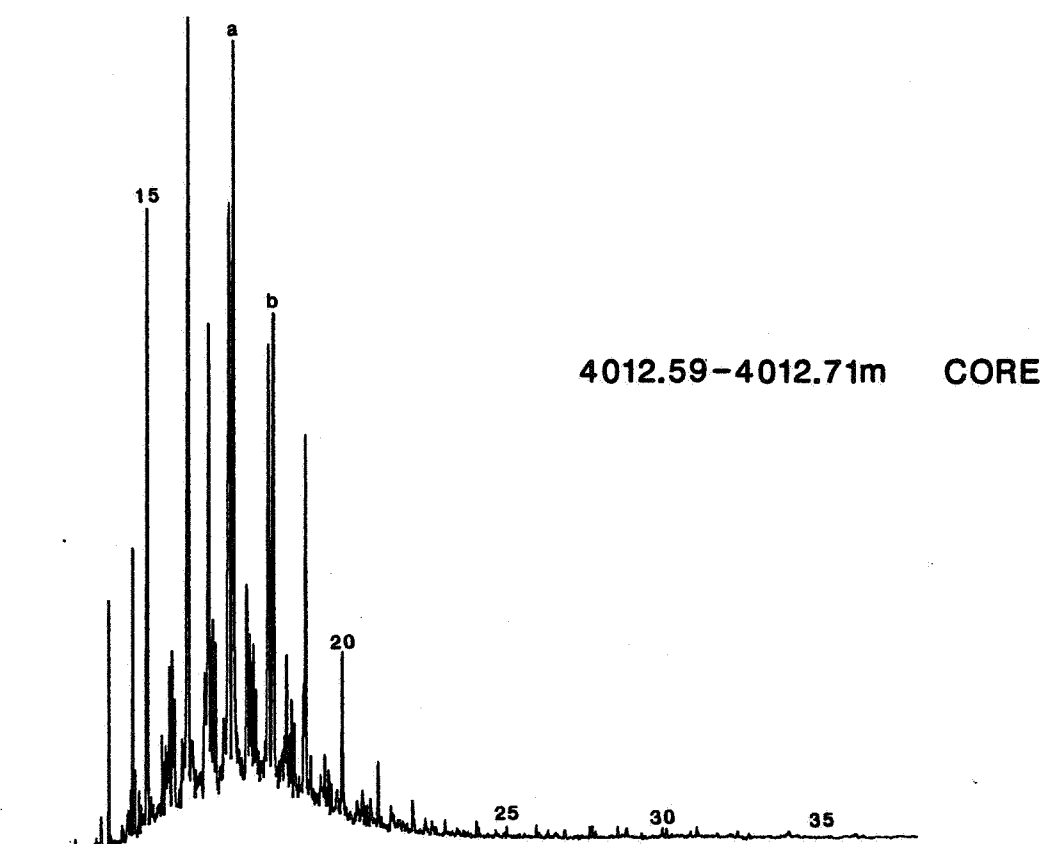


a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5h **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5

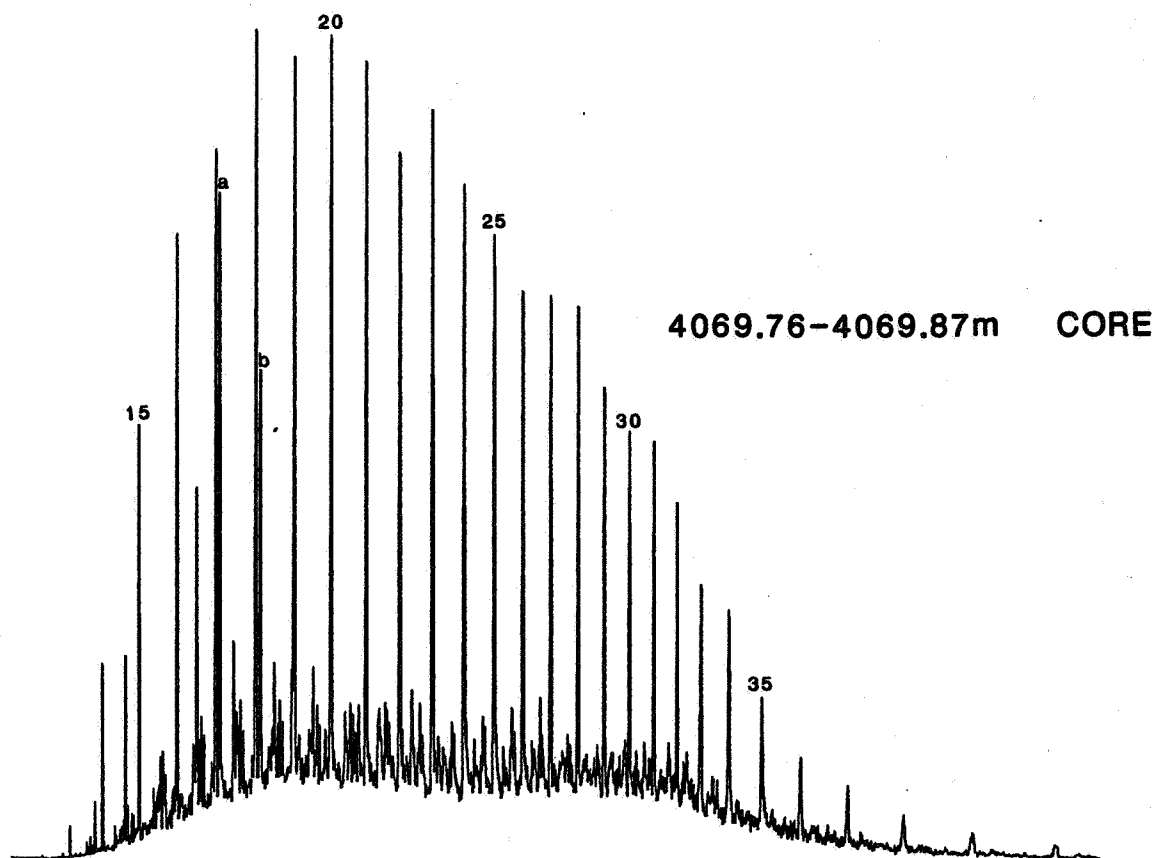
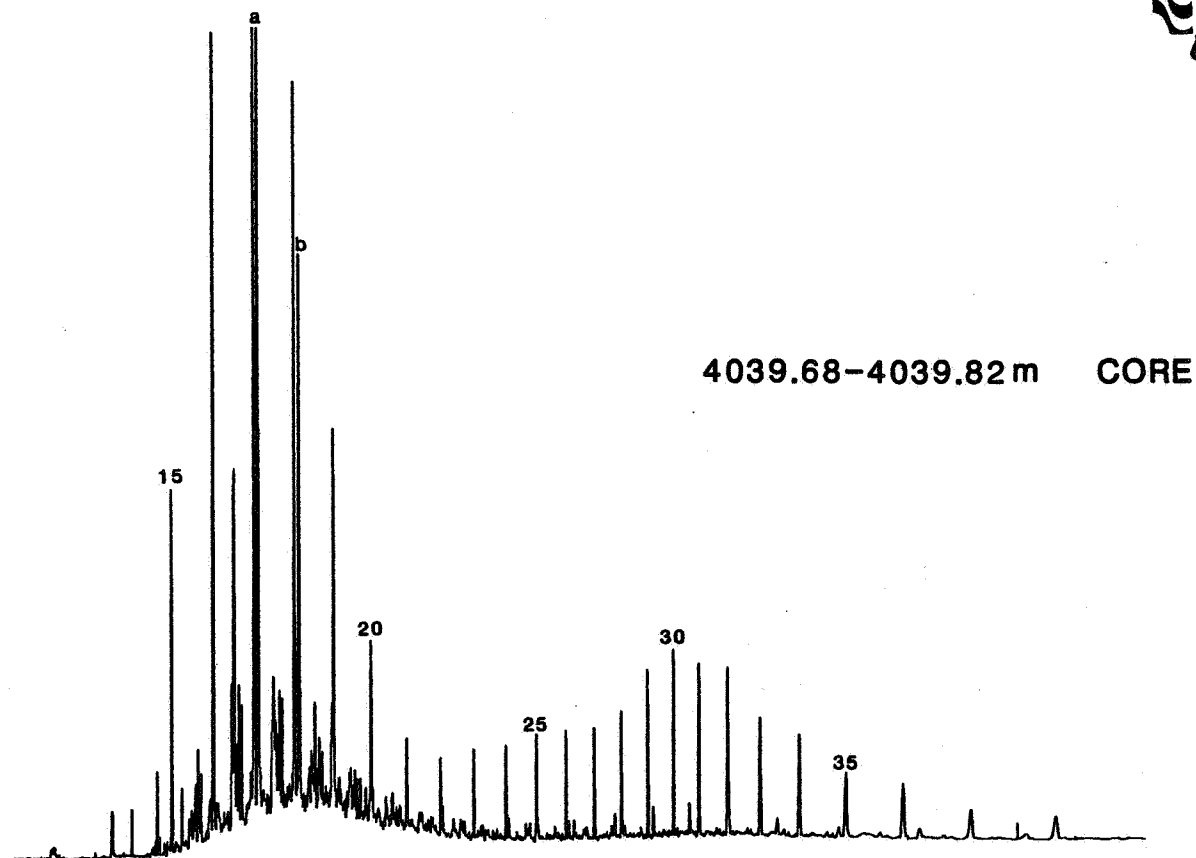


a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5i **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5

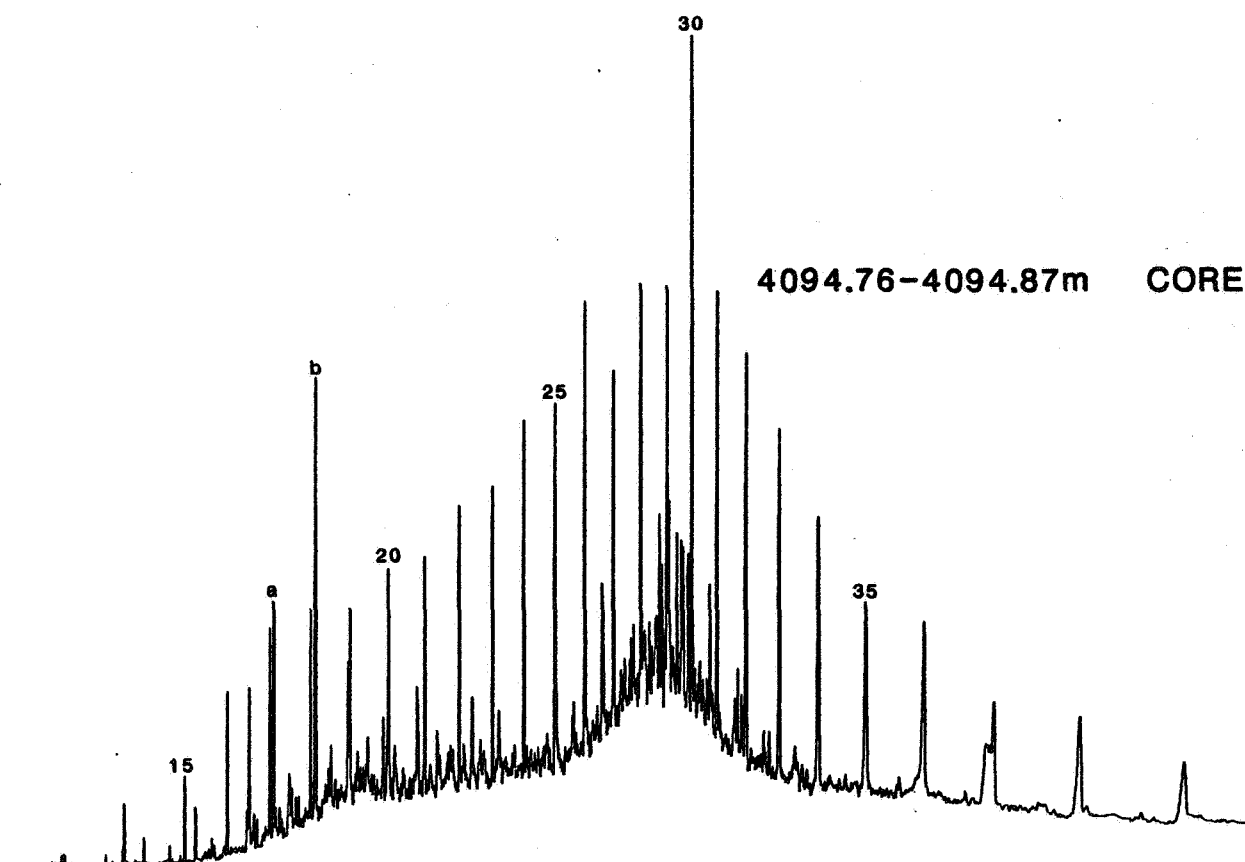
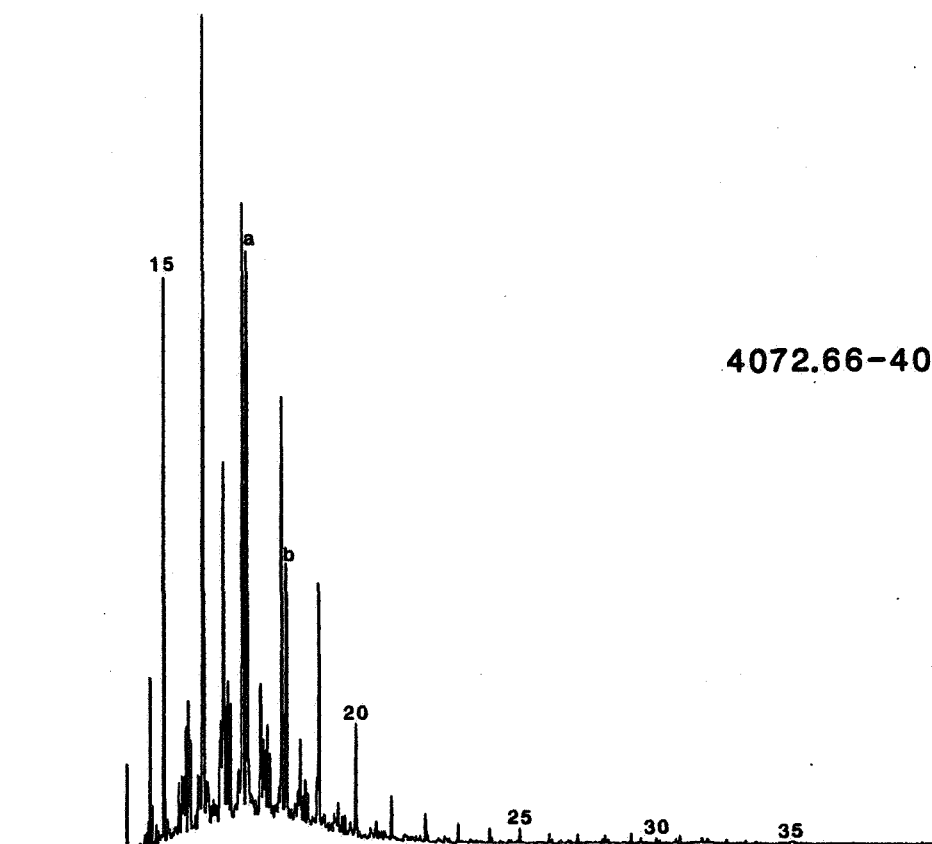


a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5j **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5

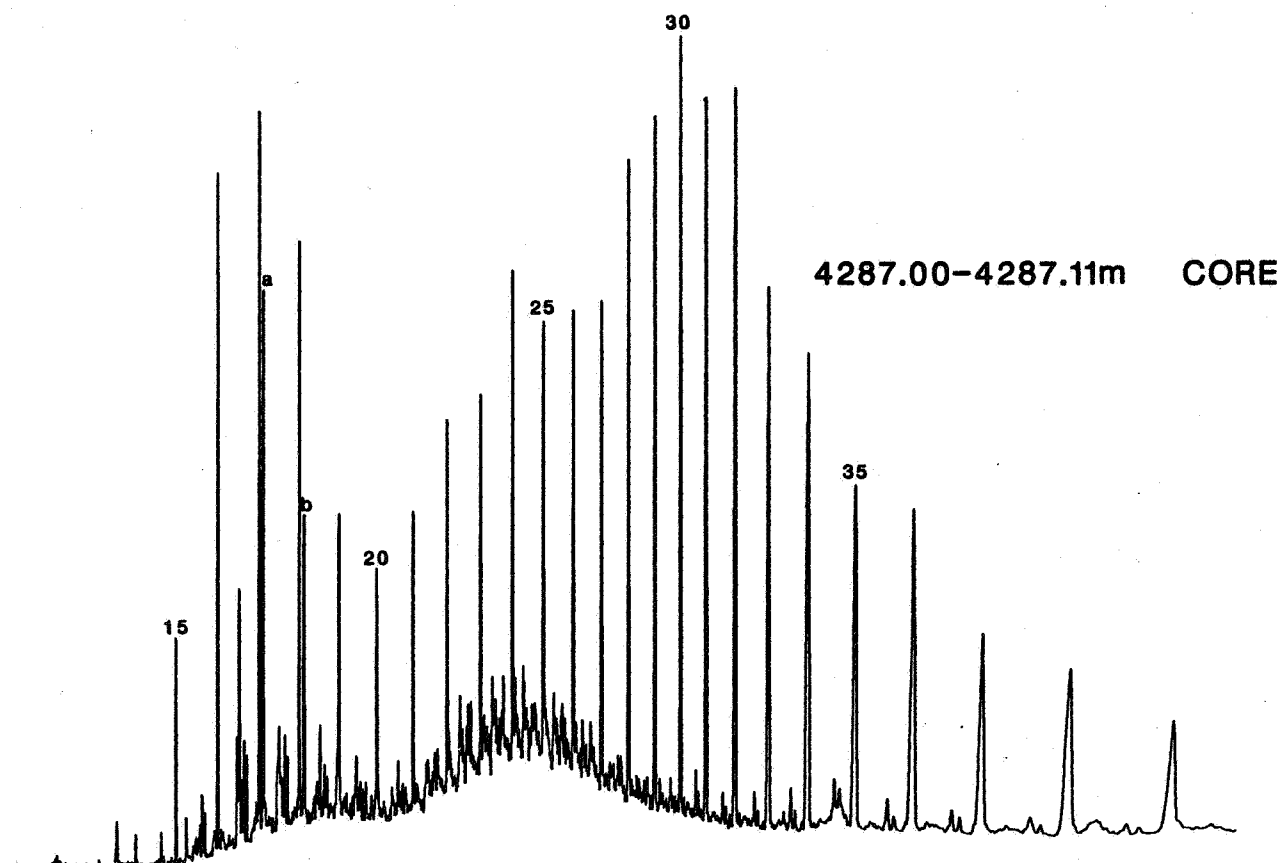
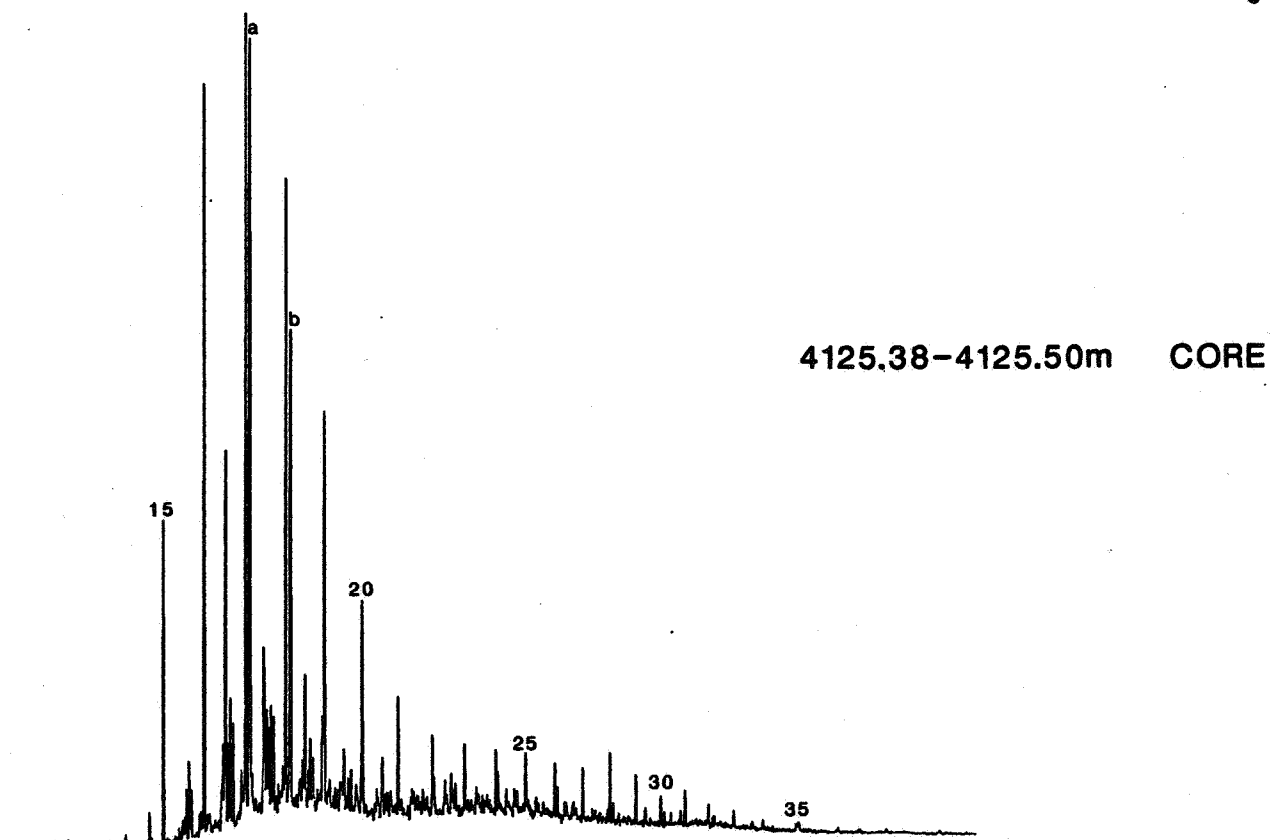


a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5k **C₁₅+ SATURATES CHROMATOGRAMS**

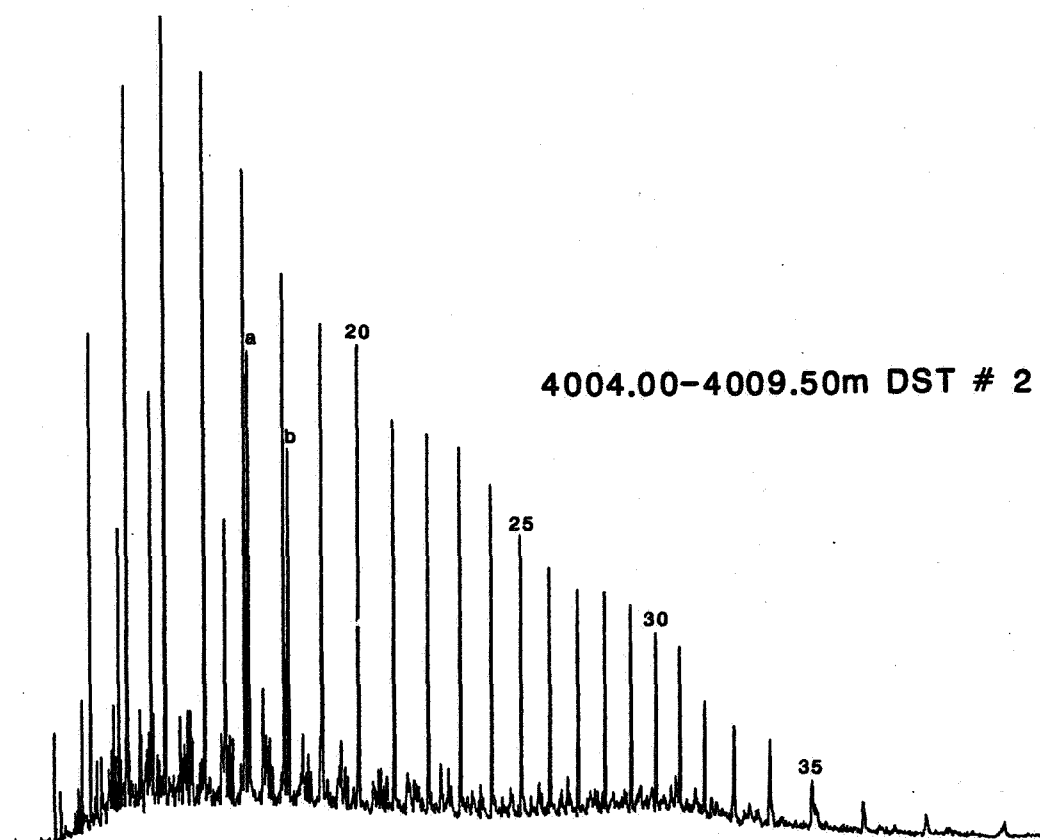
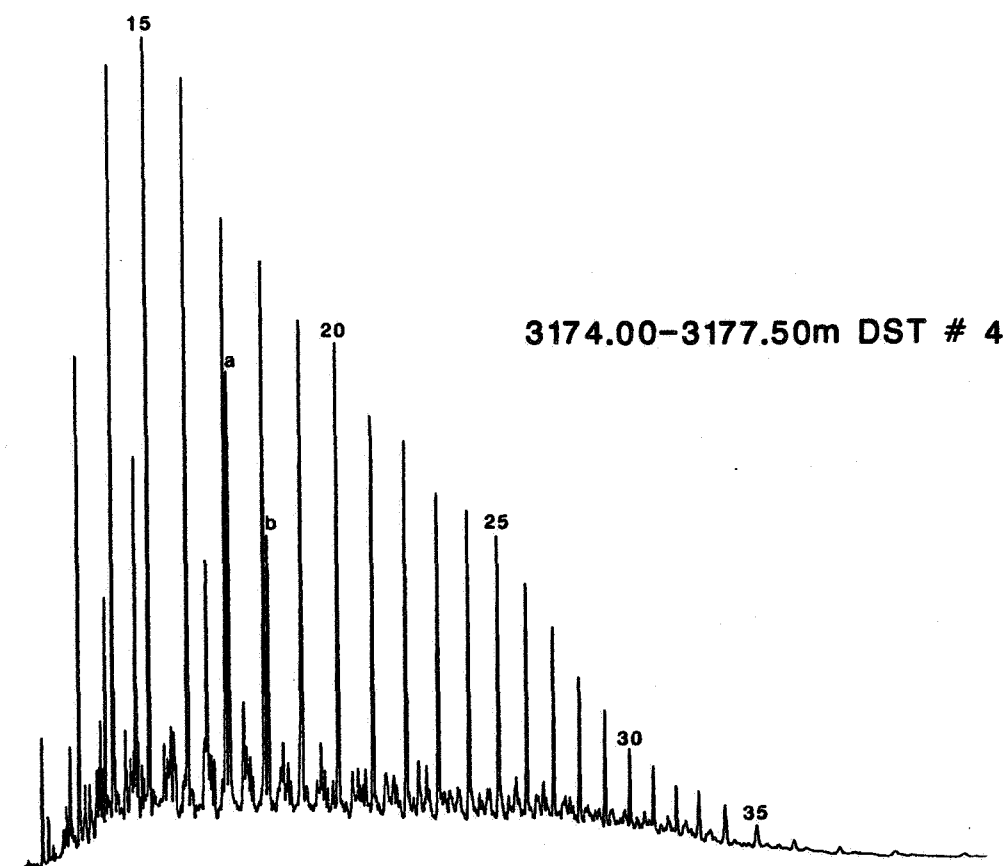
WELL 6506/12-5



a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 51 **C₁₅+ SATURATES CHROMATOGRAMS**
WELL 6506/12-5



a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 6a **C₁₅+ AROMATIC CHROMATOGRAMS**
WELL 6506/12-5



STANDARD

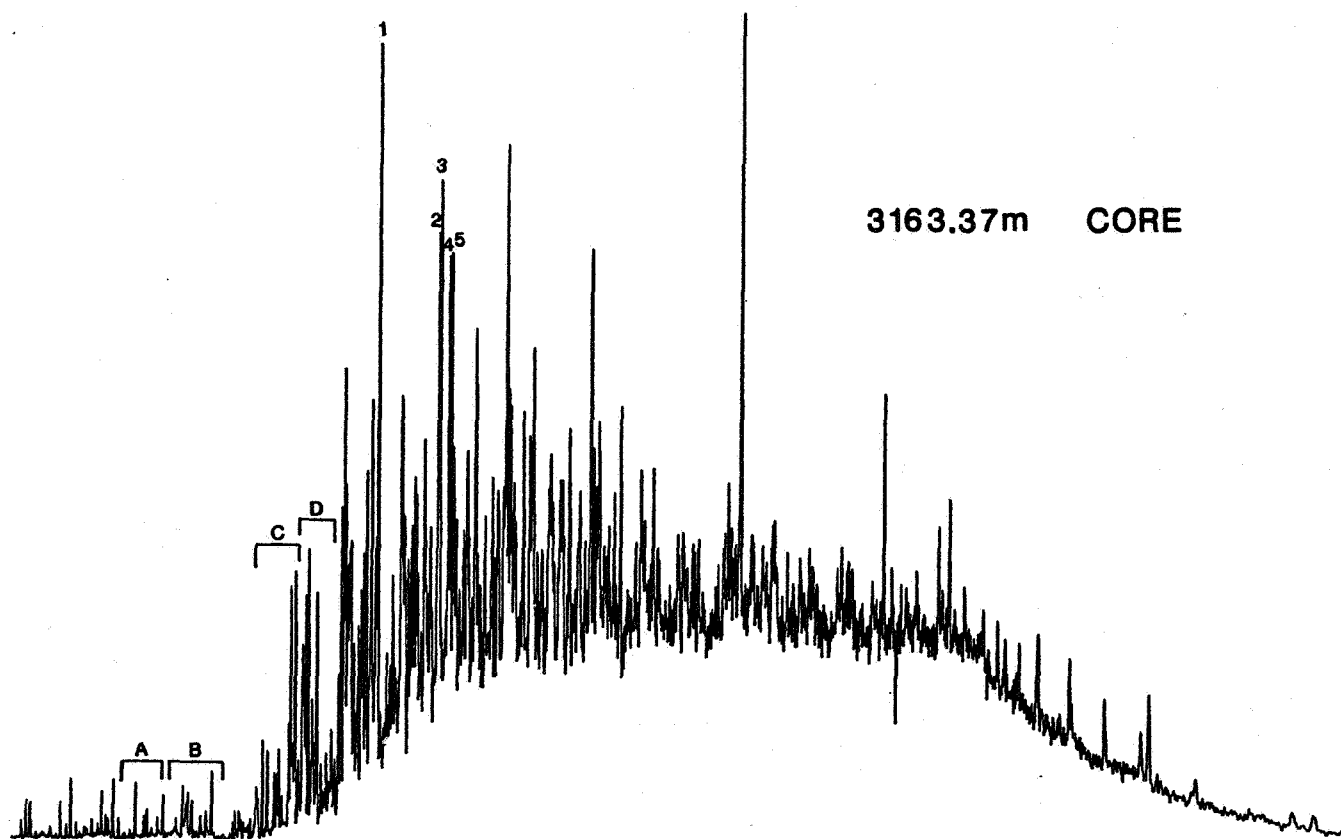
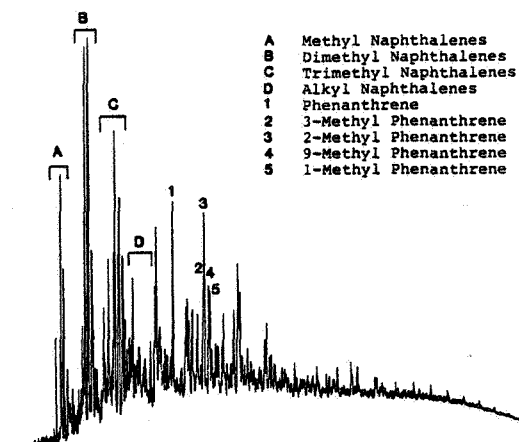
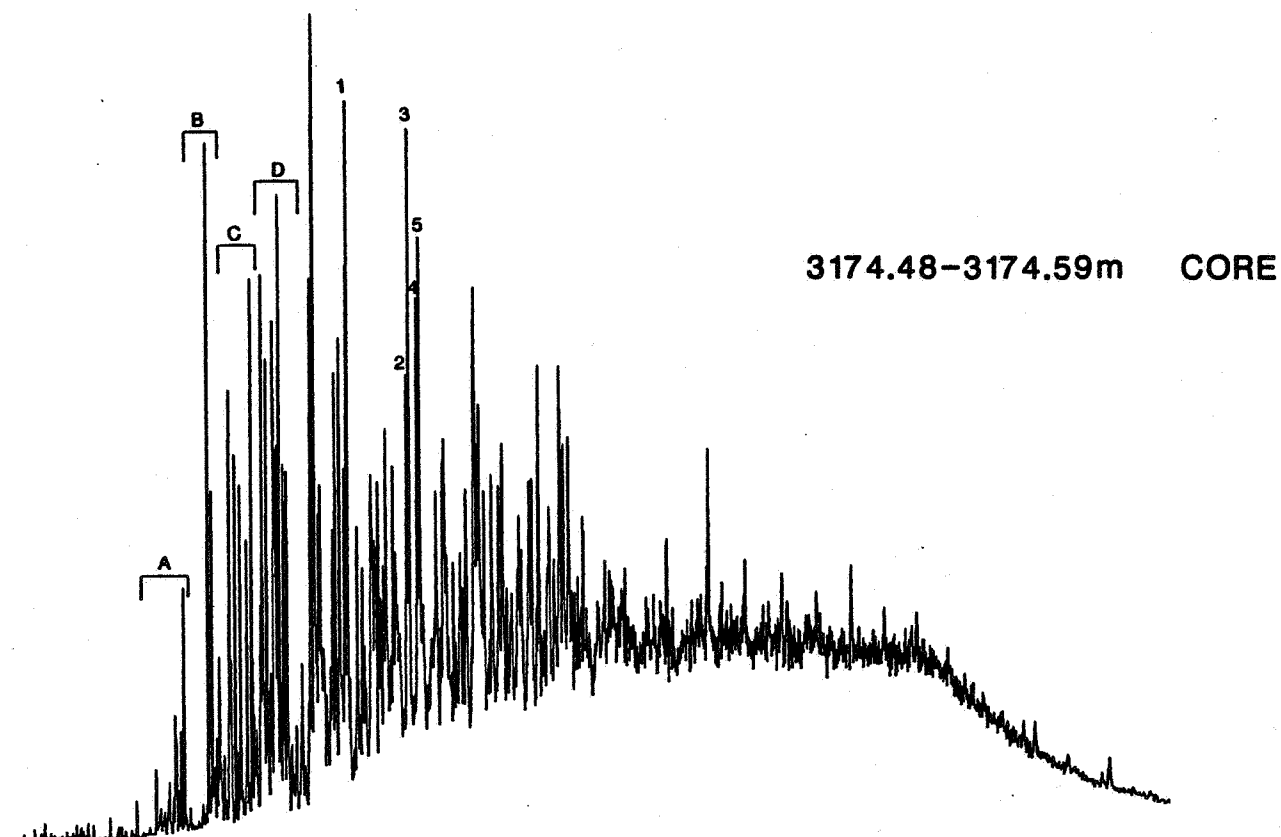
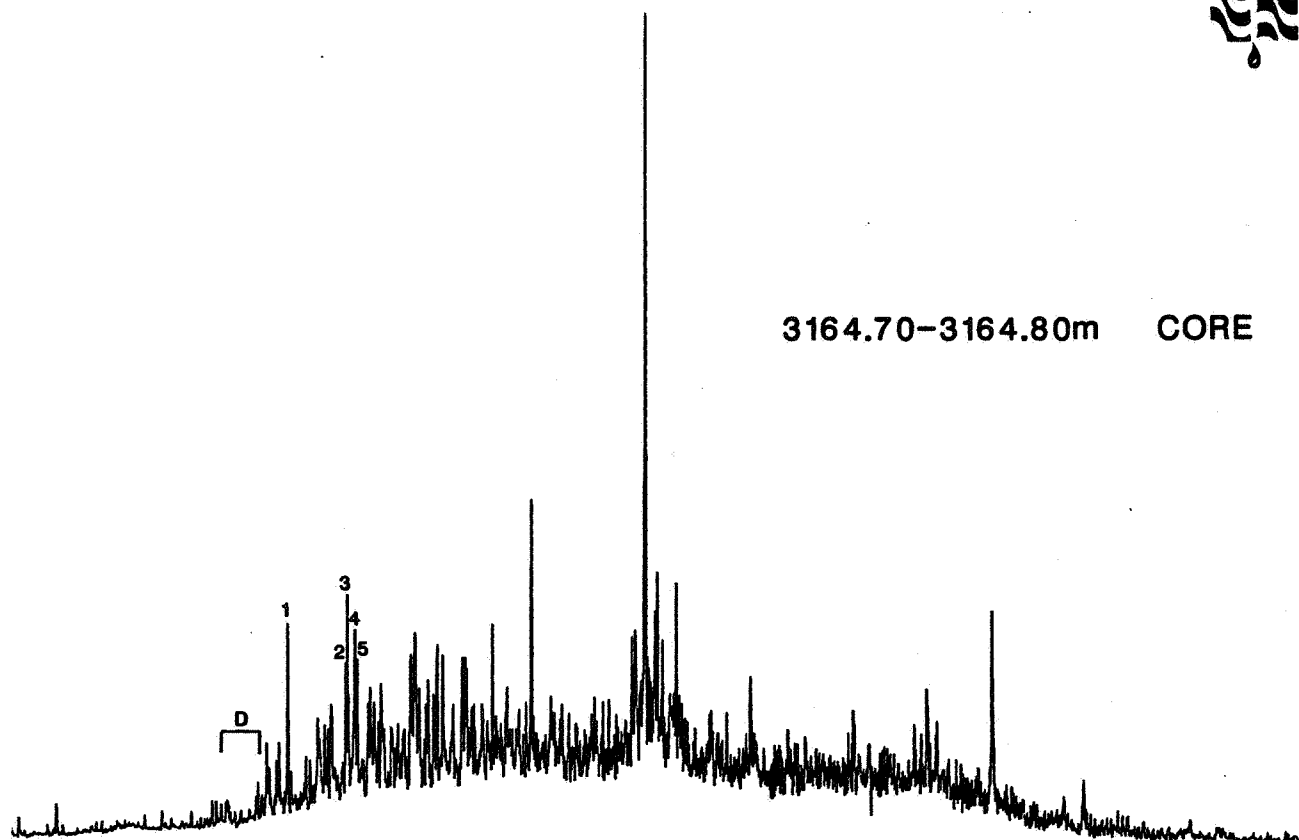


FIGURE 6b

C₁₅+ AROMATIC CHROMATOGRAMS

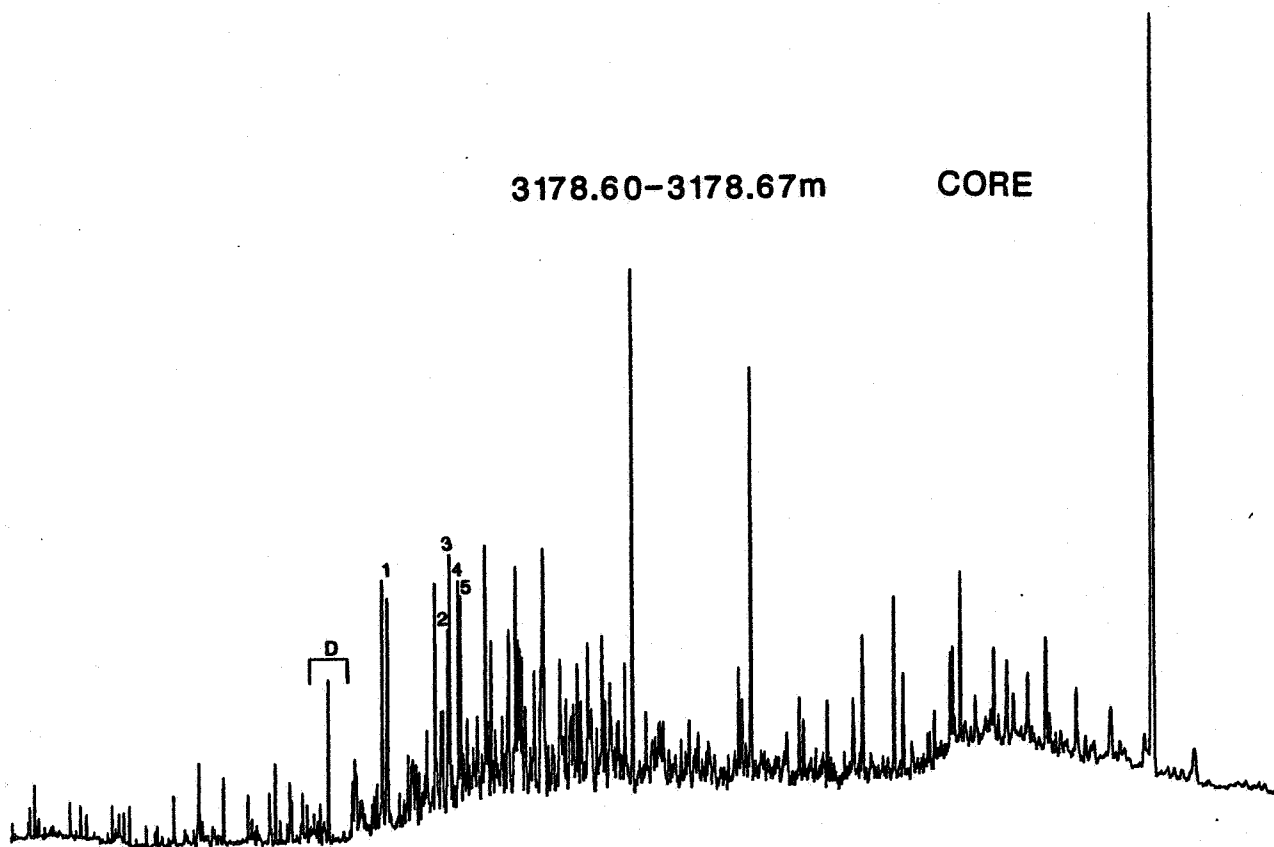
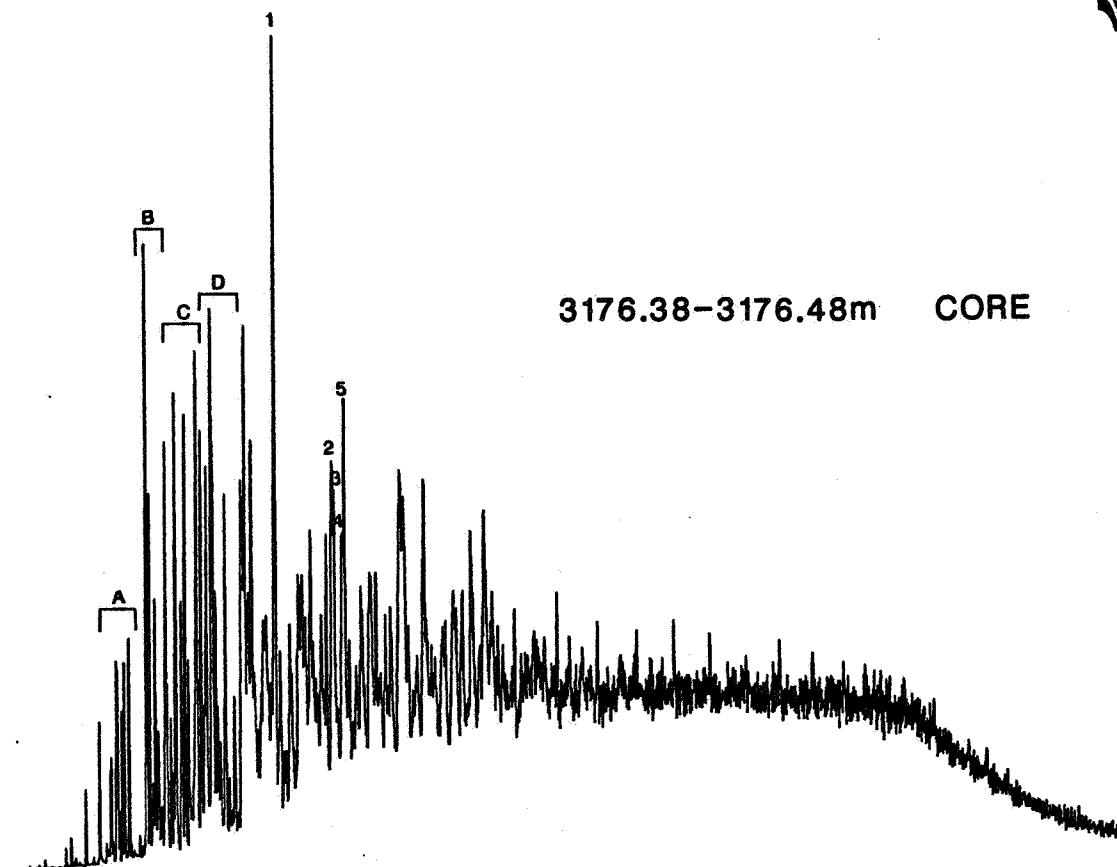
WELL 6506/12-5



PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6c **C₁₅+ AROMATIC CHROMATOGRAMS**

WELL 6506/12-5

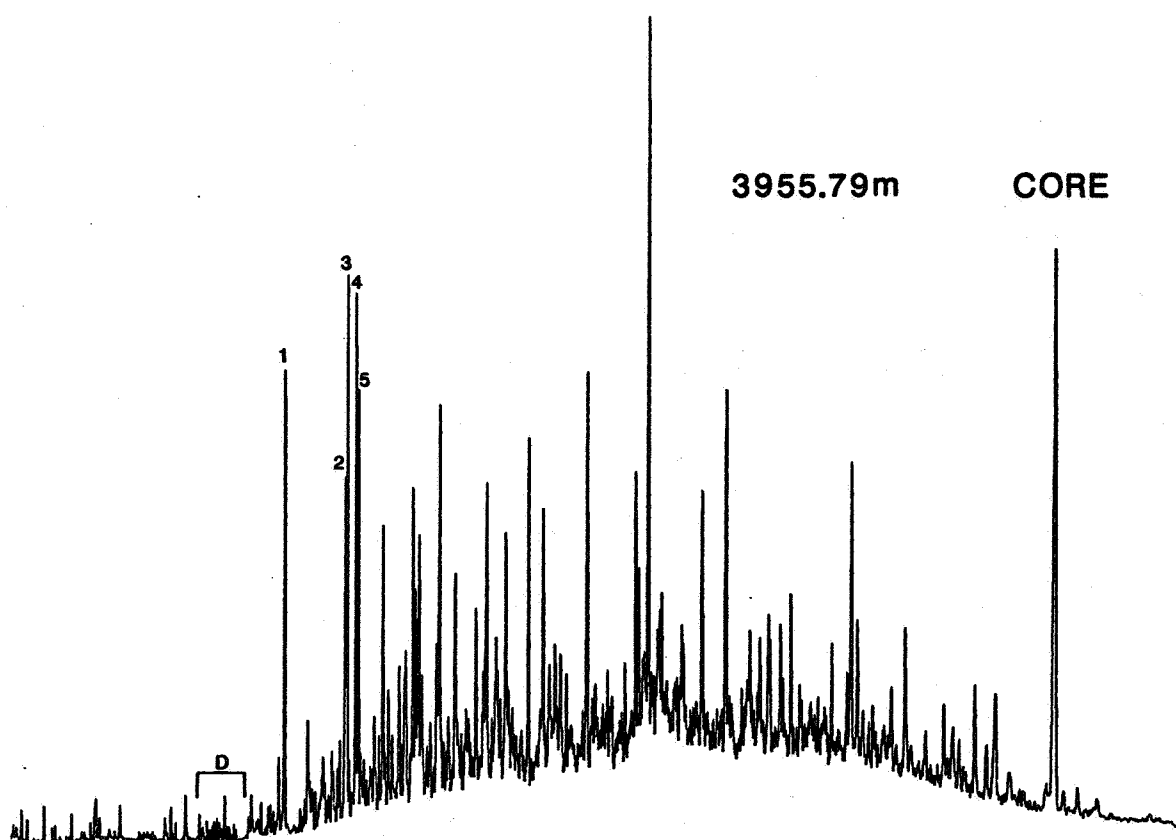
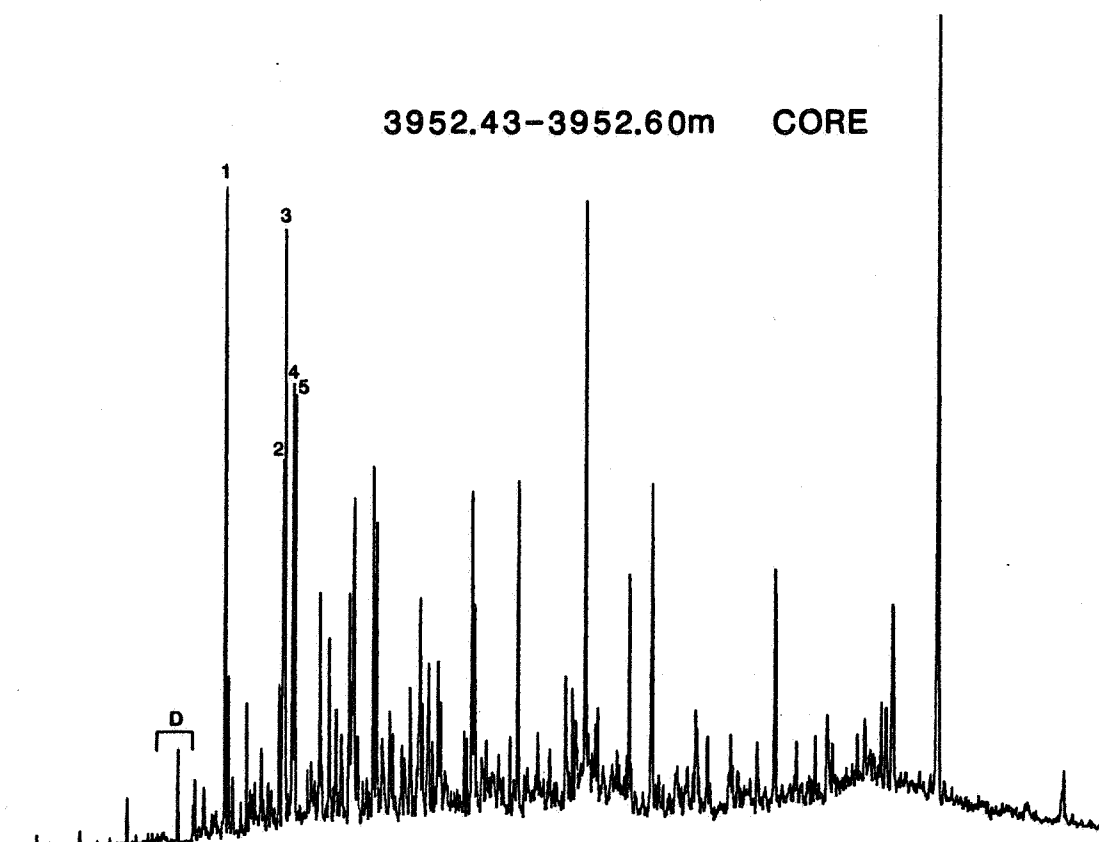


PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6d

C₁₅+ AROMATIC CHROMATOGRAMS

WELL 6506/12-5

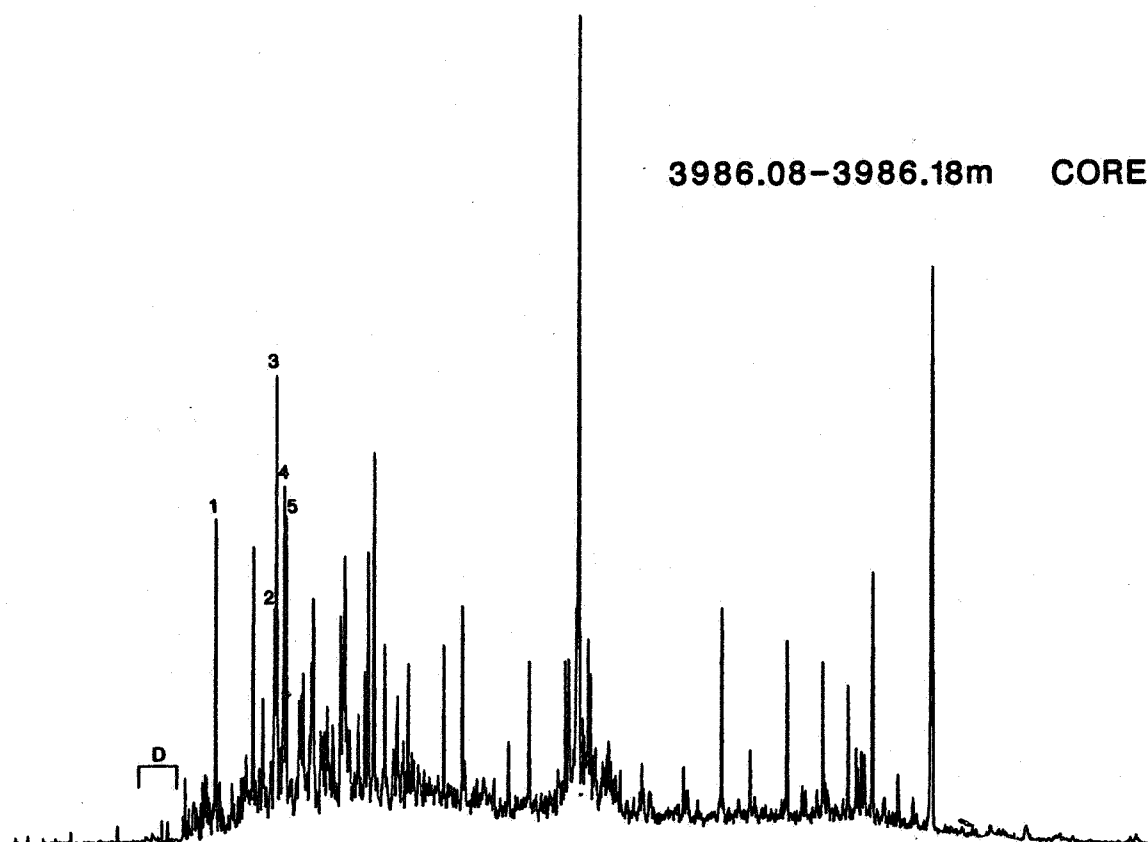
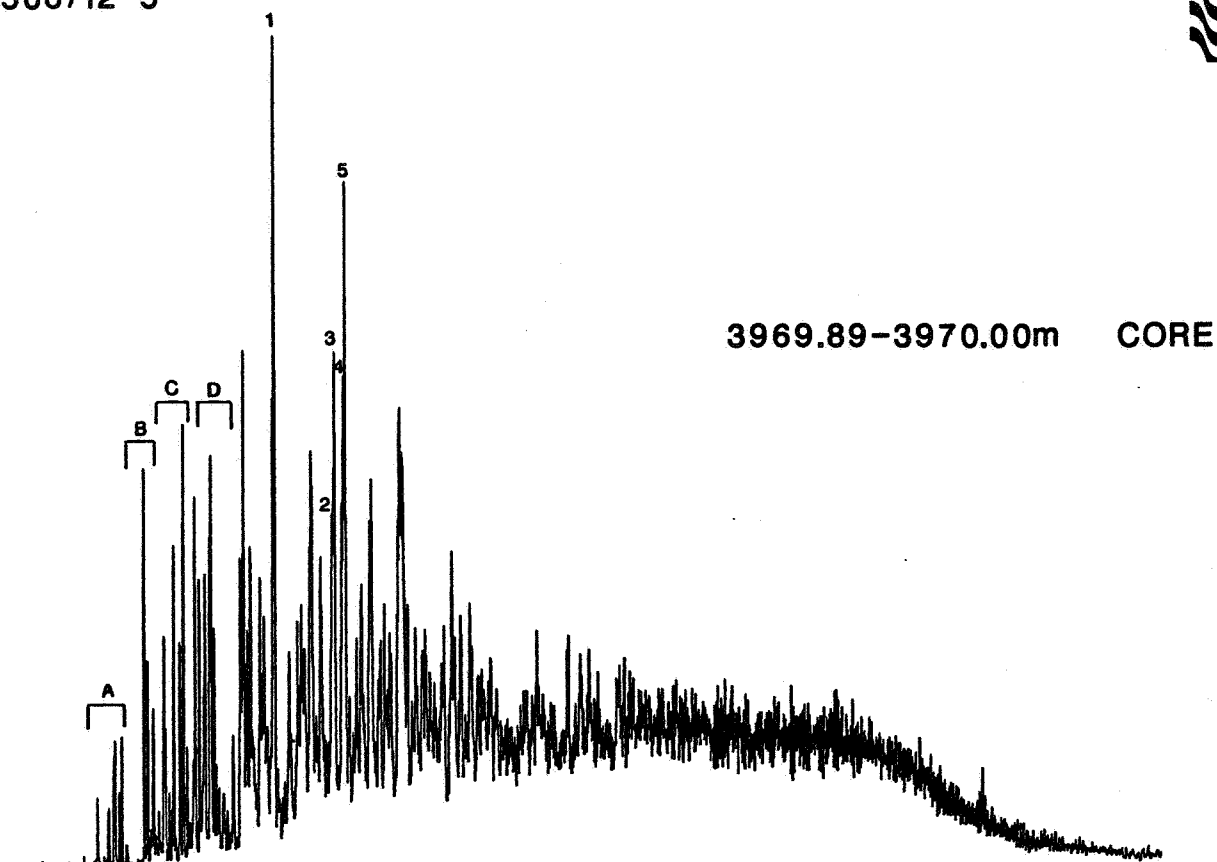


PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6e

C₁₅+ AROMATIC CHROMATOGRAMS

WELL 6506/12-5

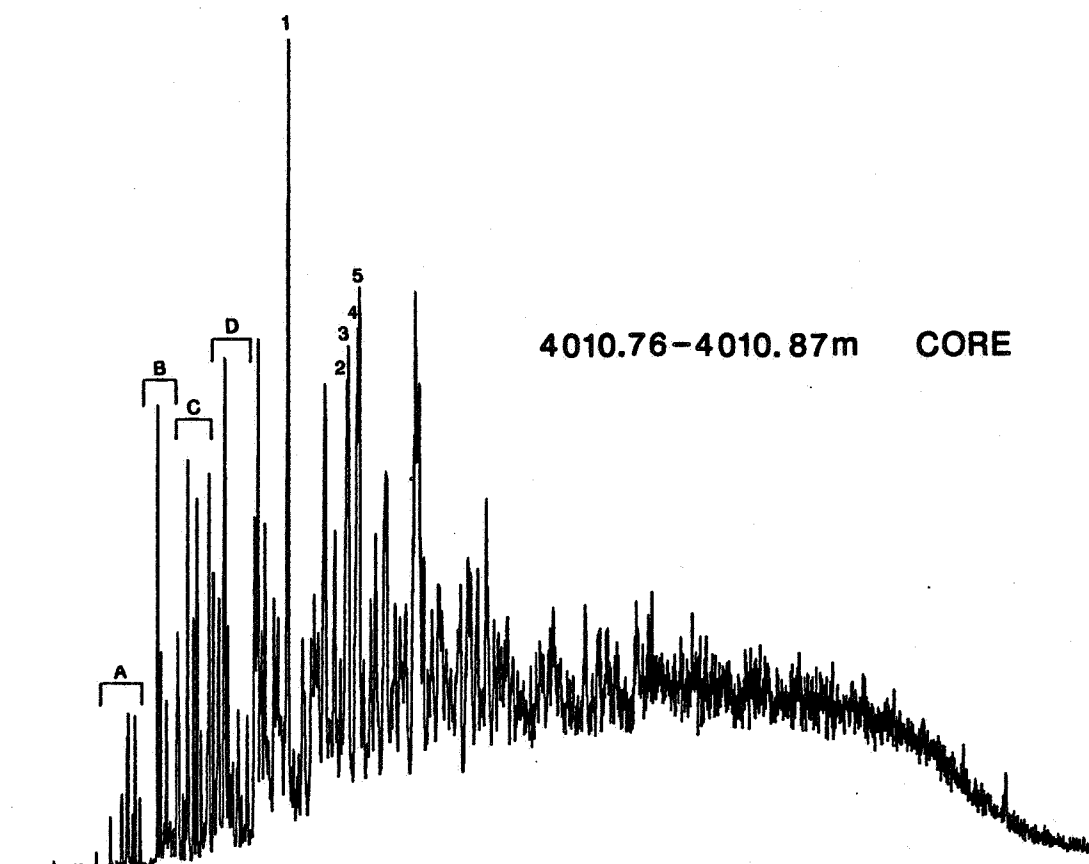
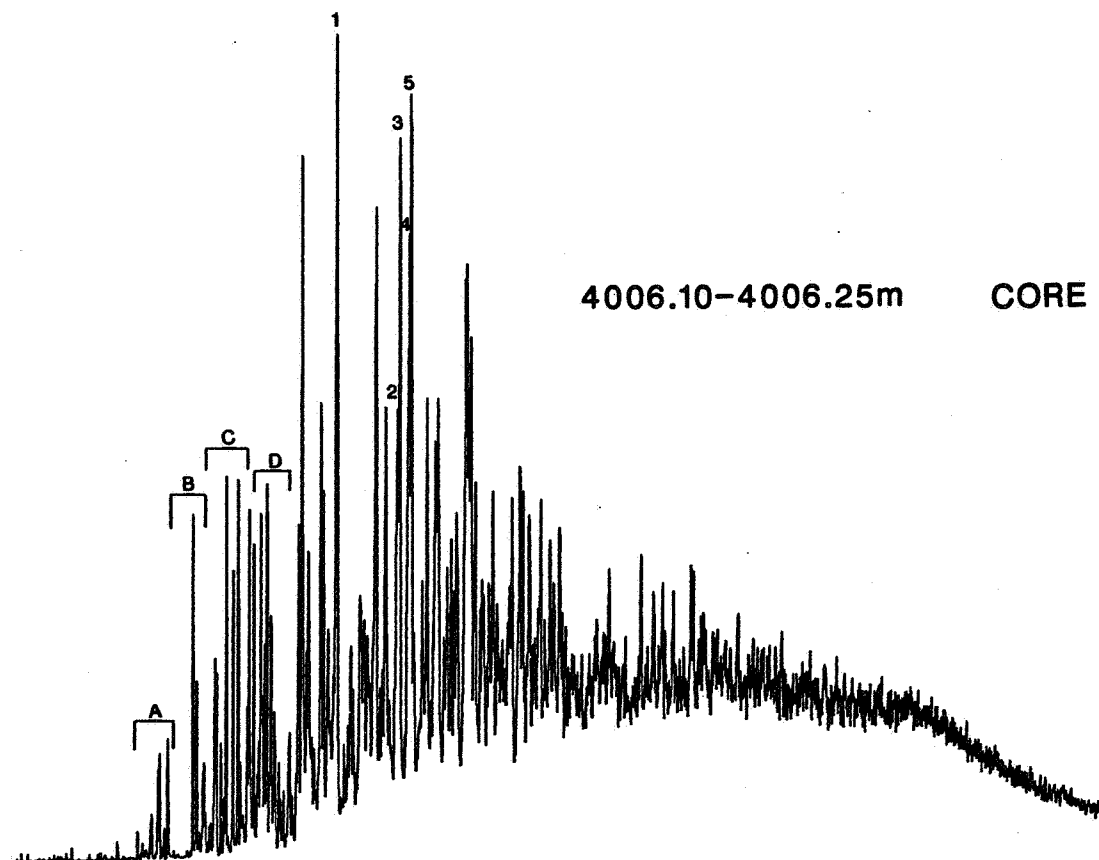


PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6f

C₁₅+ AROMATIC CHROMATOGRAMS

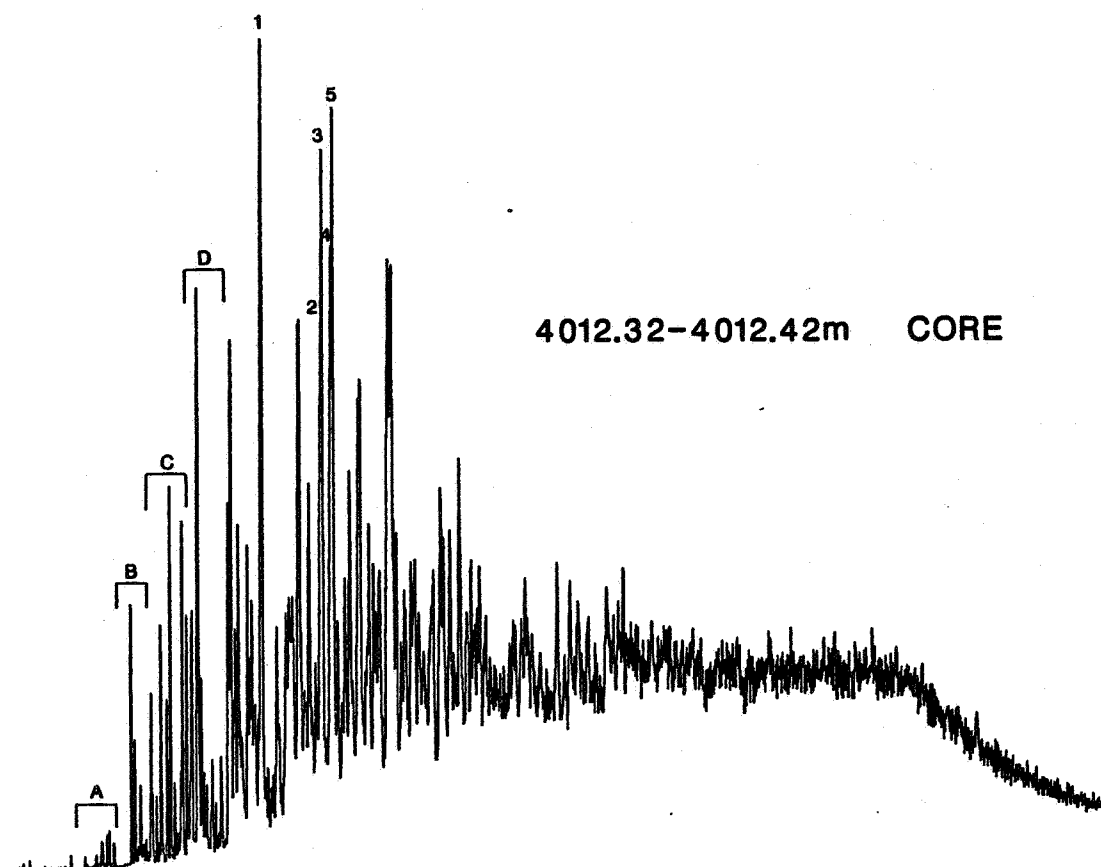
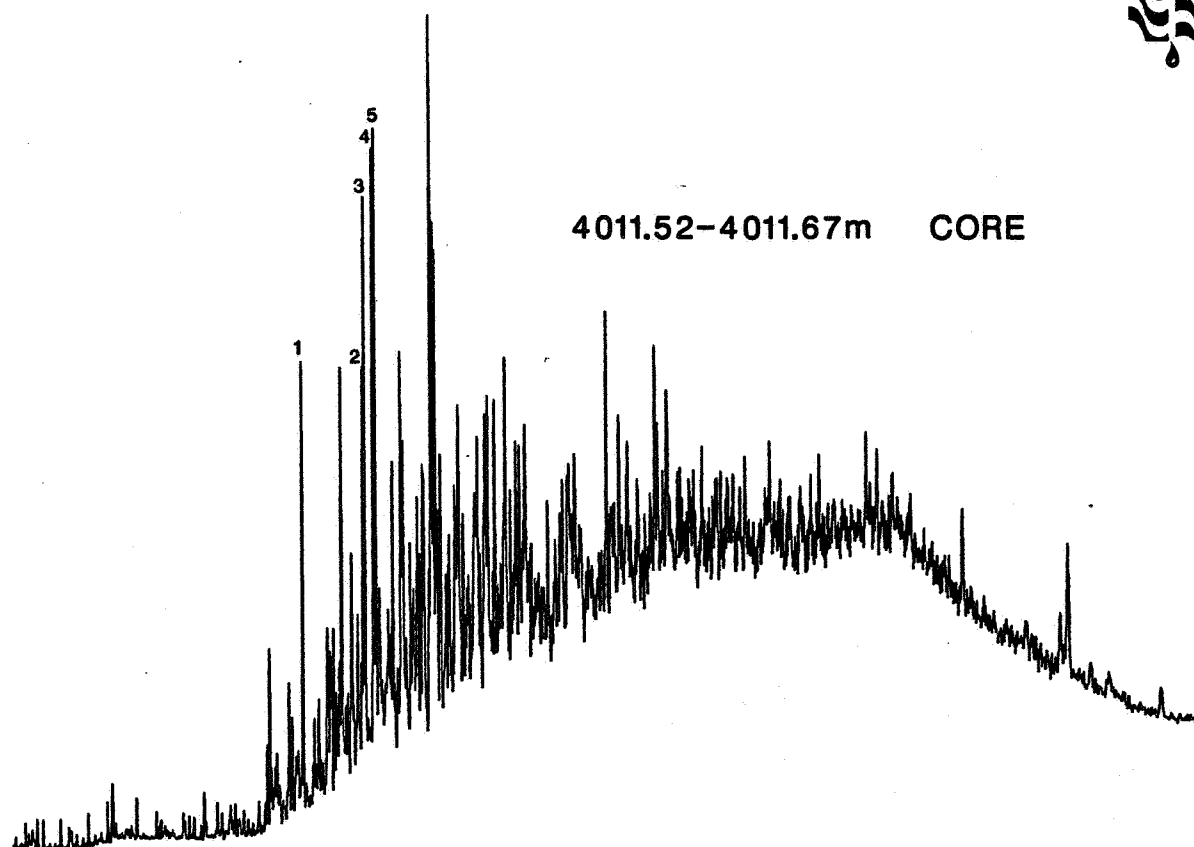
WELL 6506/12-5



PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6g **C₁₅+ AROMATIC CHROMATOGRAMS**

WELL 6506/12-5

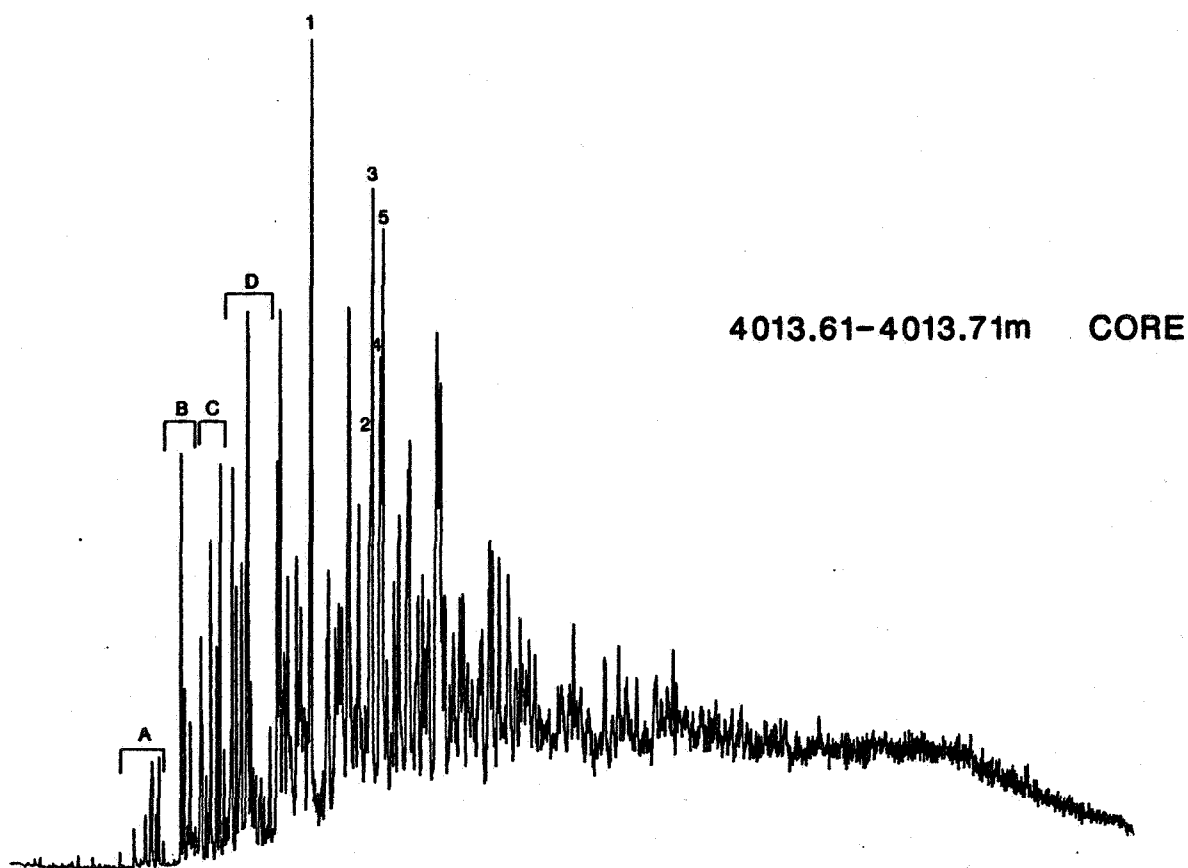
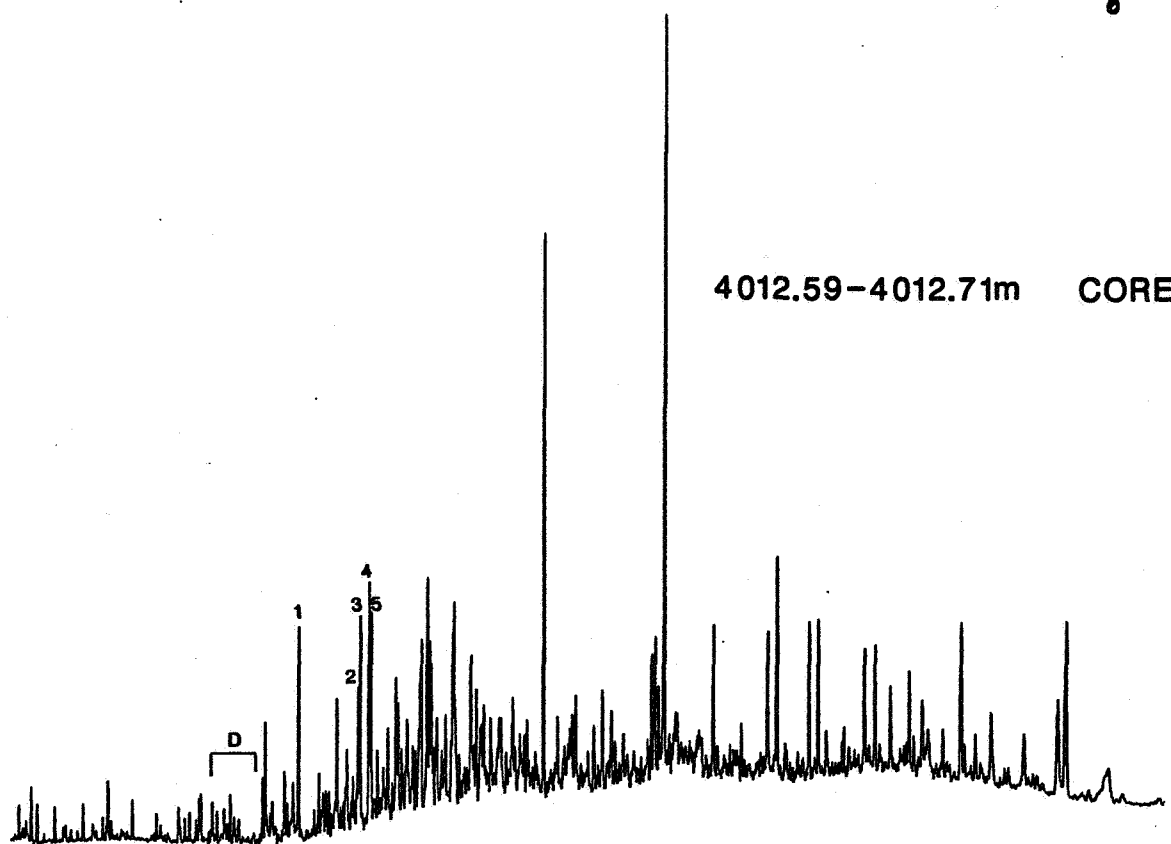


PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6h

C₁₅+ AROMATIC CHROMATOGRAMS

WELL 6506/12-5

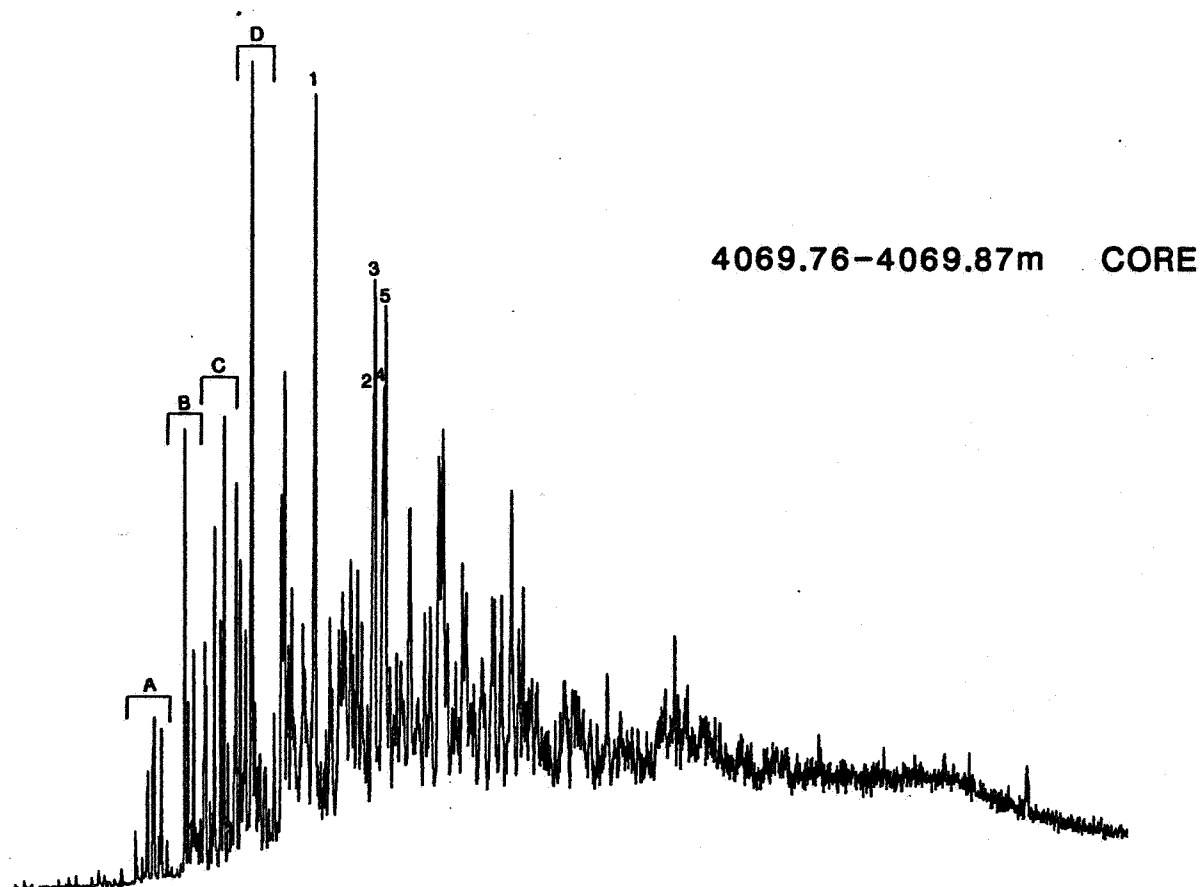
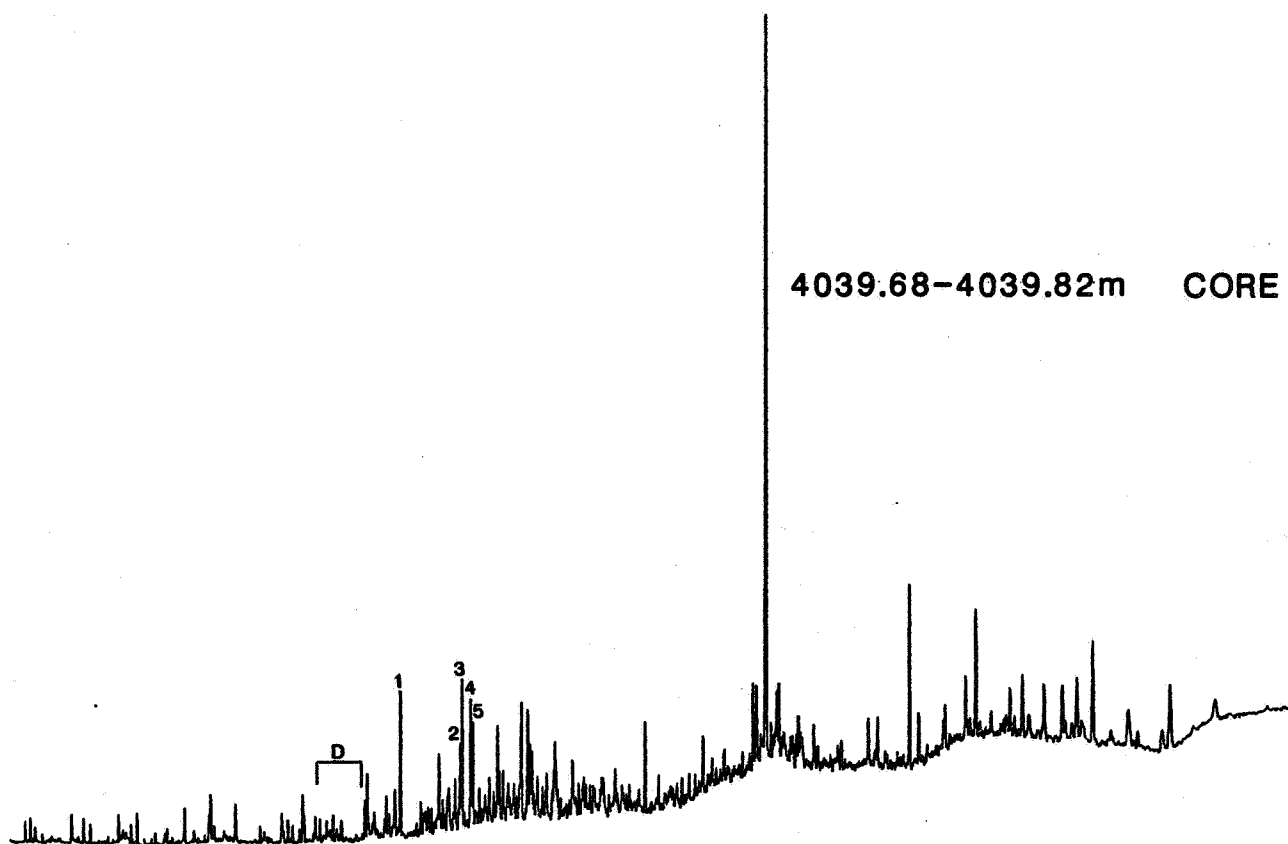


PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6i

C₁₅+ AROMATIC CHROMATOGRAMS

WELL 6506/12-5

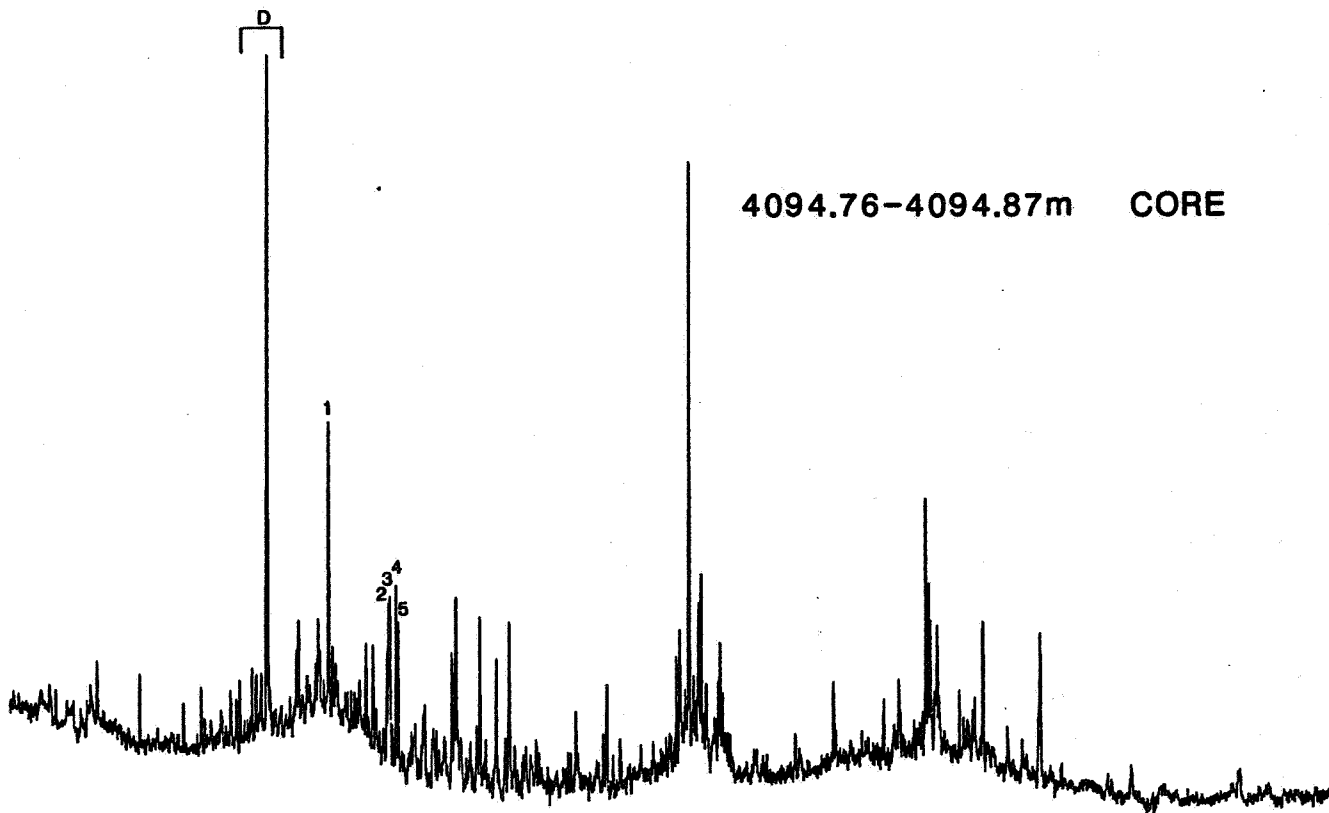
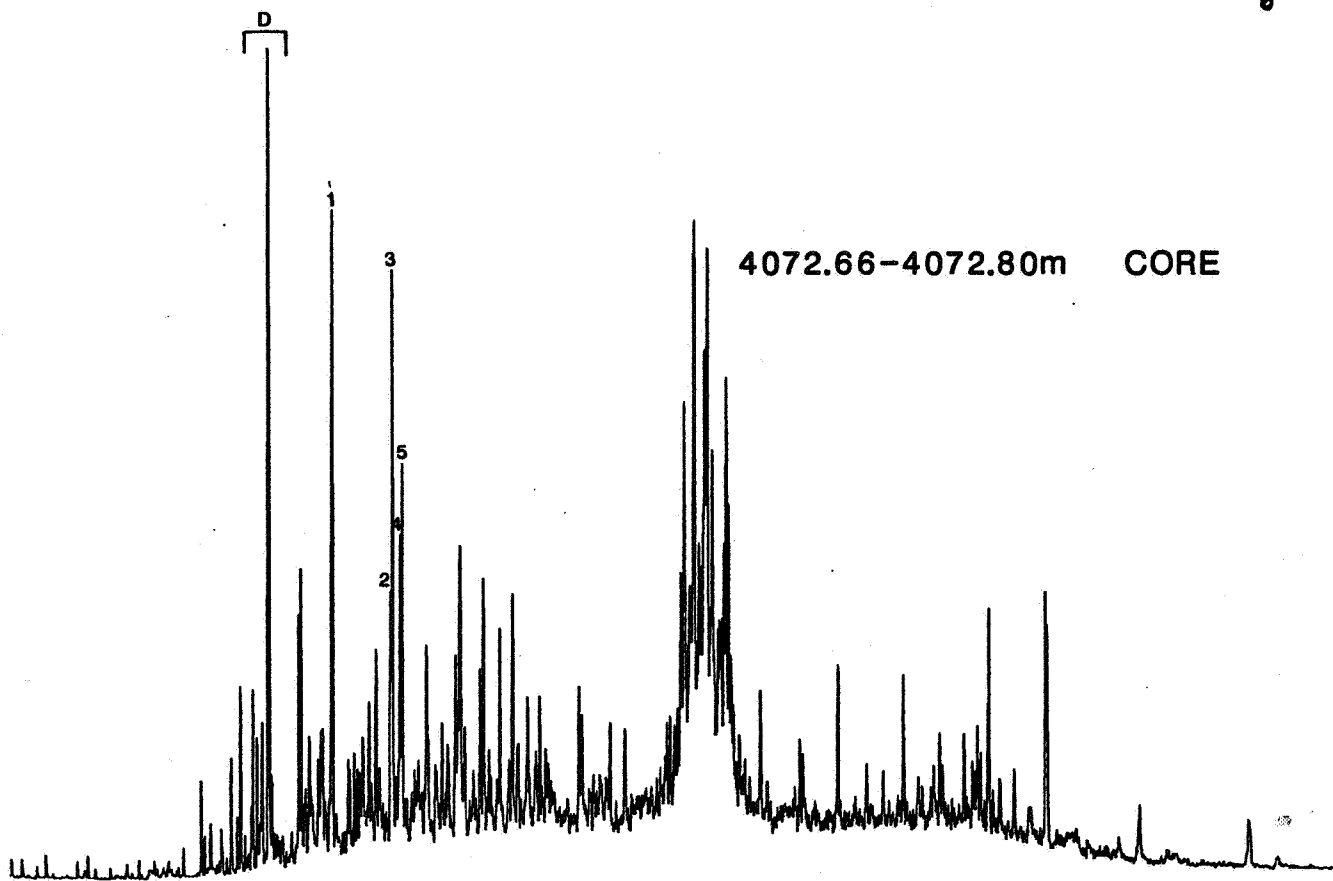


PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6j

C₁₅+ AROMATIC CHROMATOGRAMS

WELL 6506/12-5

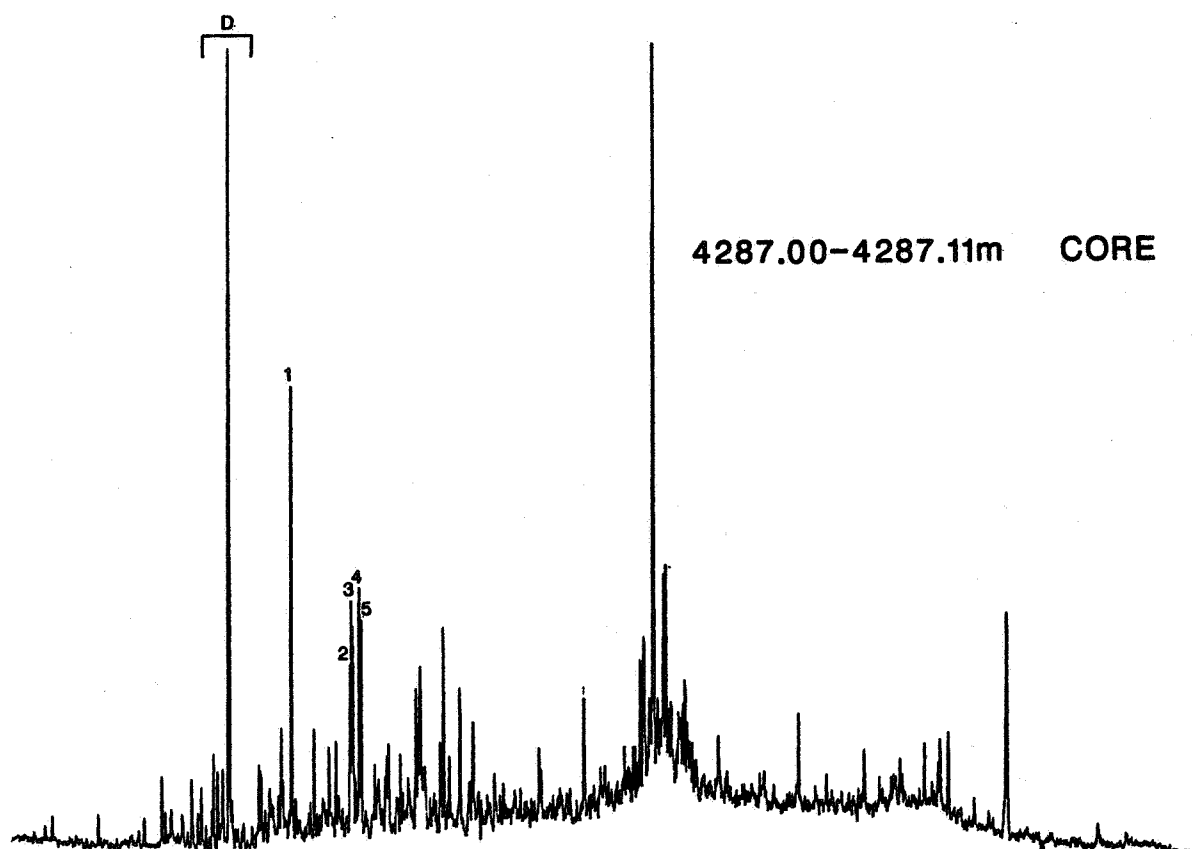
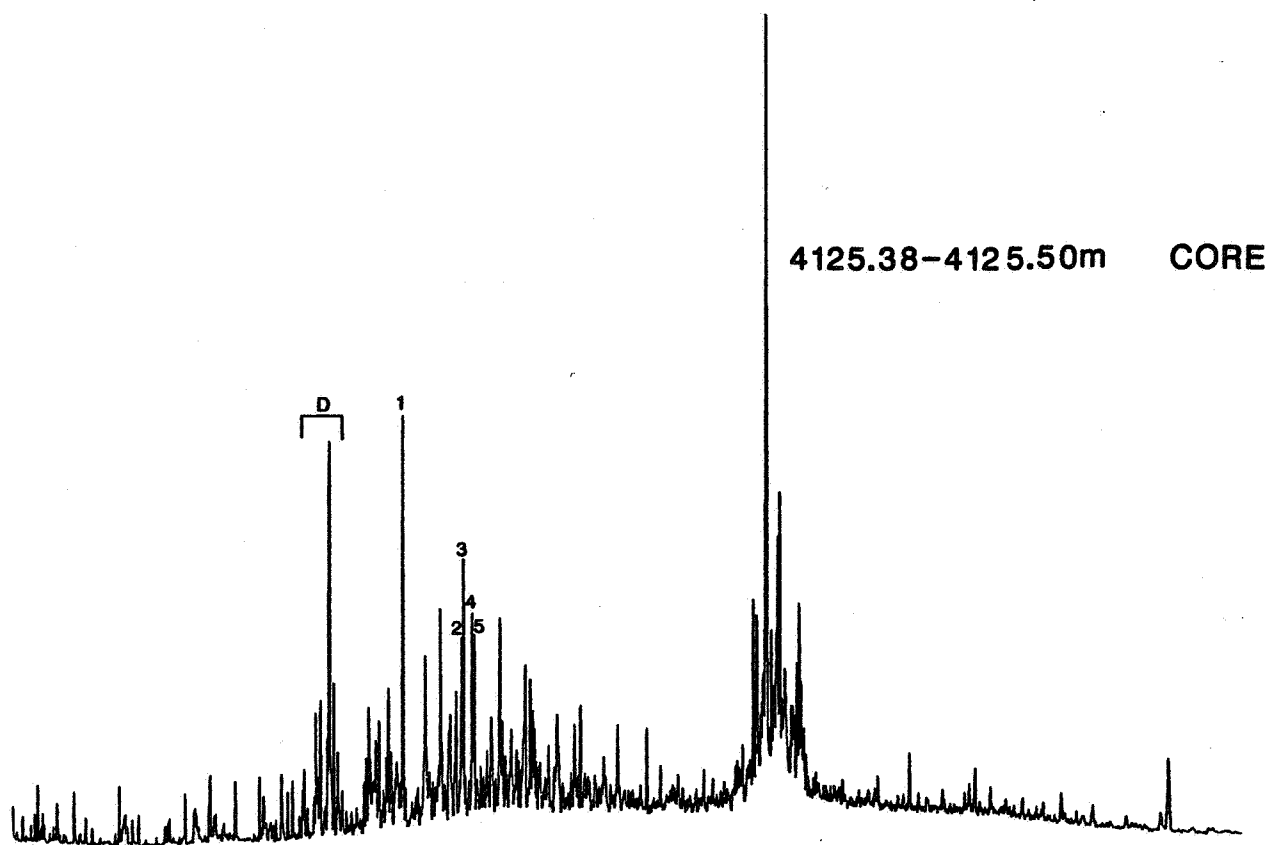


PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6k

C₁₅+ AROMATIC CHROMATOGRAMS

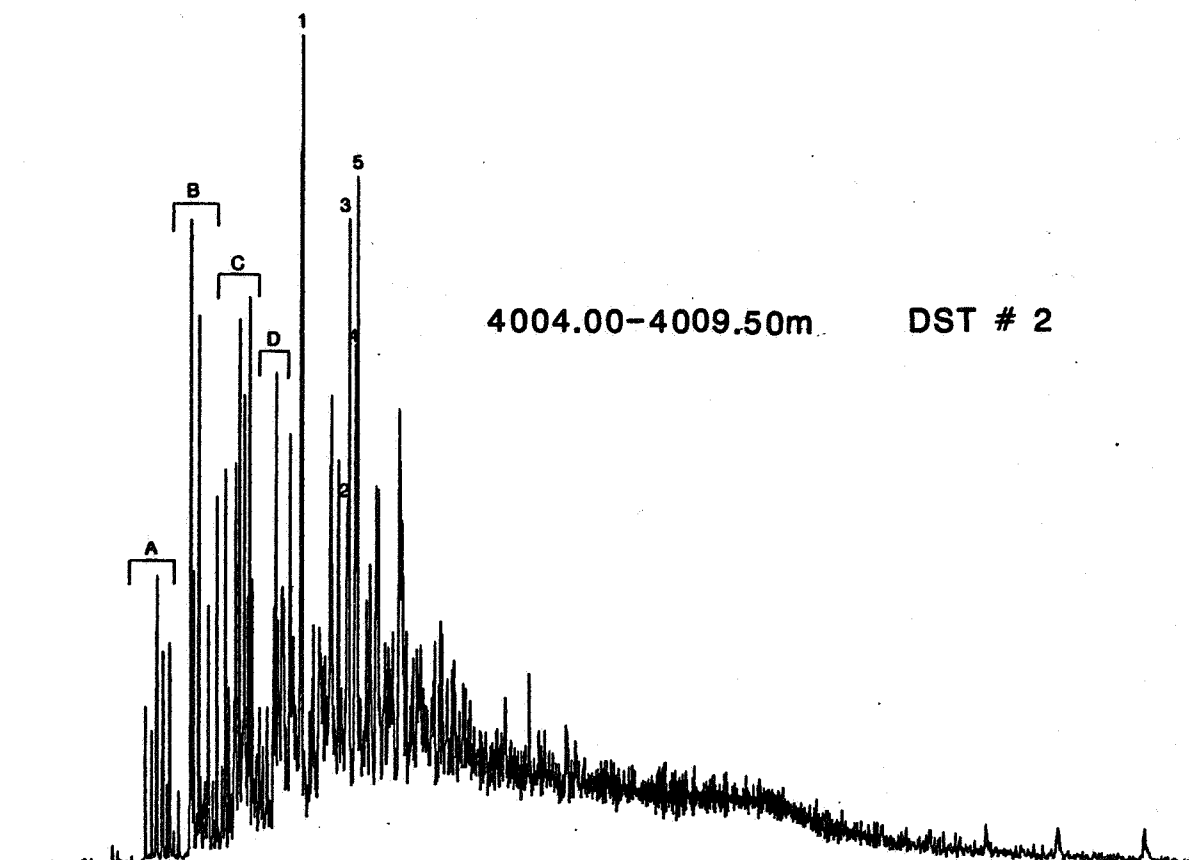
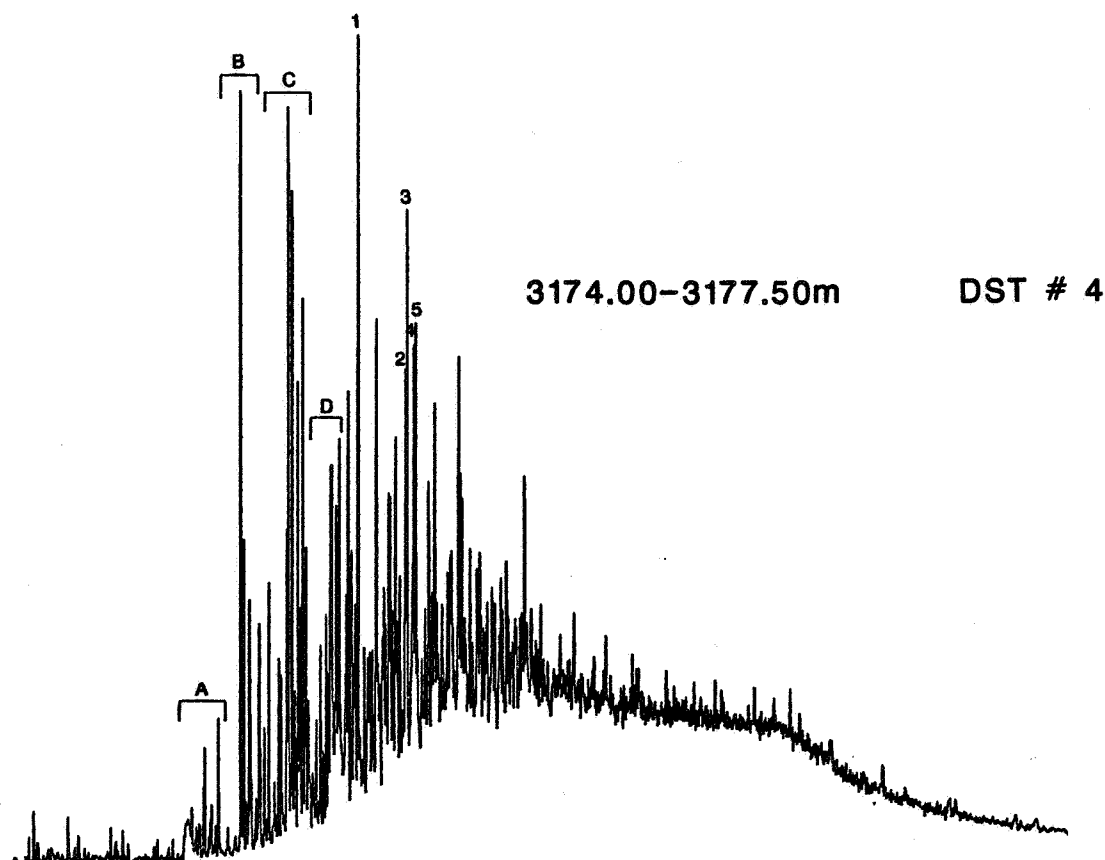
WELL 6506/12-5



PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 61 **C₁₅+ AROMATIC CHROMATOGRAMS**

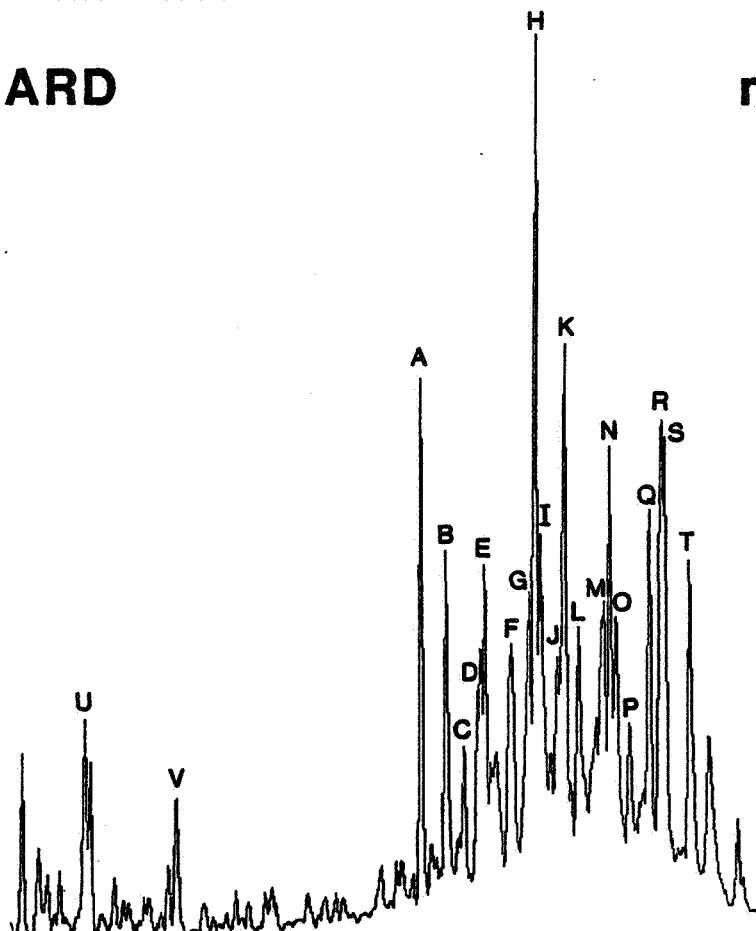
WELL 6506/12-5



PEAK IDENTIFICATION ON FIRST SPLIT

STANDARD

m/z 217



STERANE IDENTIFICATION

(M/Z 217 FRAGMENTOGRAM)

COMPOUND

ELEMENTAL COMPOSITION

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

FIGURE 7a

MASS FRAGMENTOGRAMS

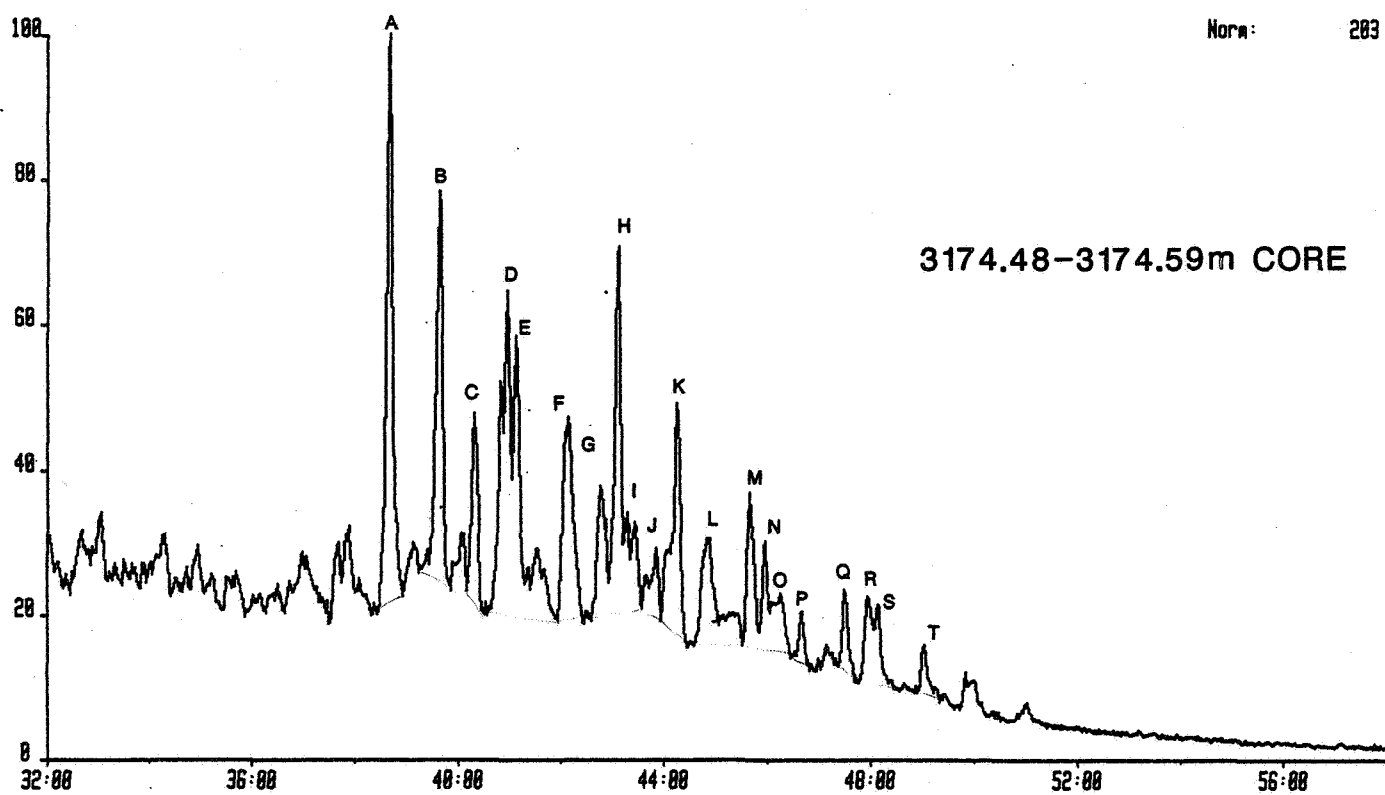


WELL 6506/12-5

STERANES m/z 217

1334885 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



GEOART 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

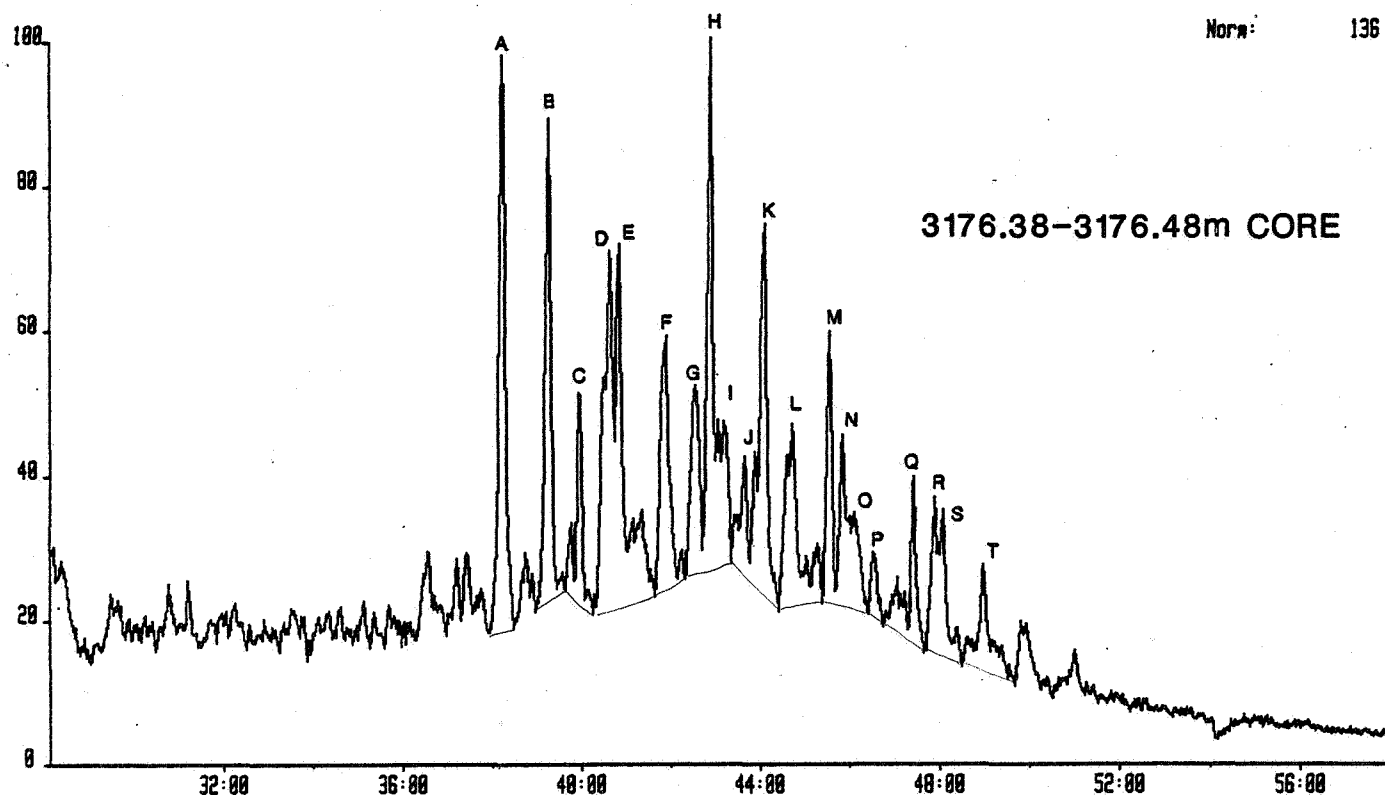


FIGURE 7b

MASS FRAGMENTOGRAMS



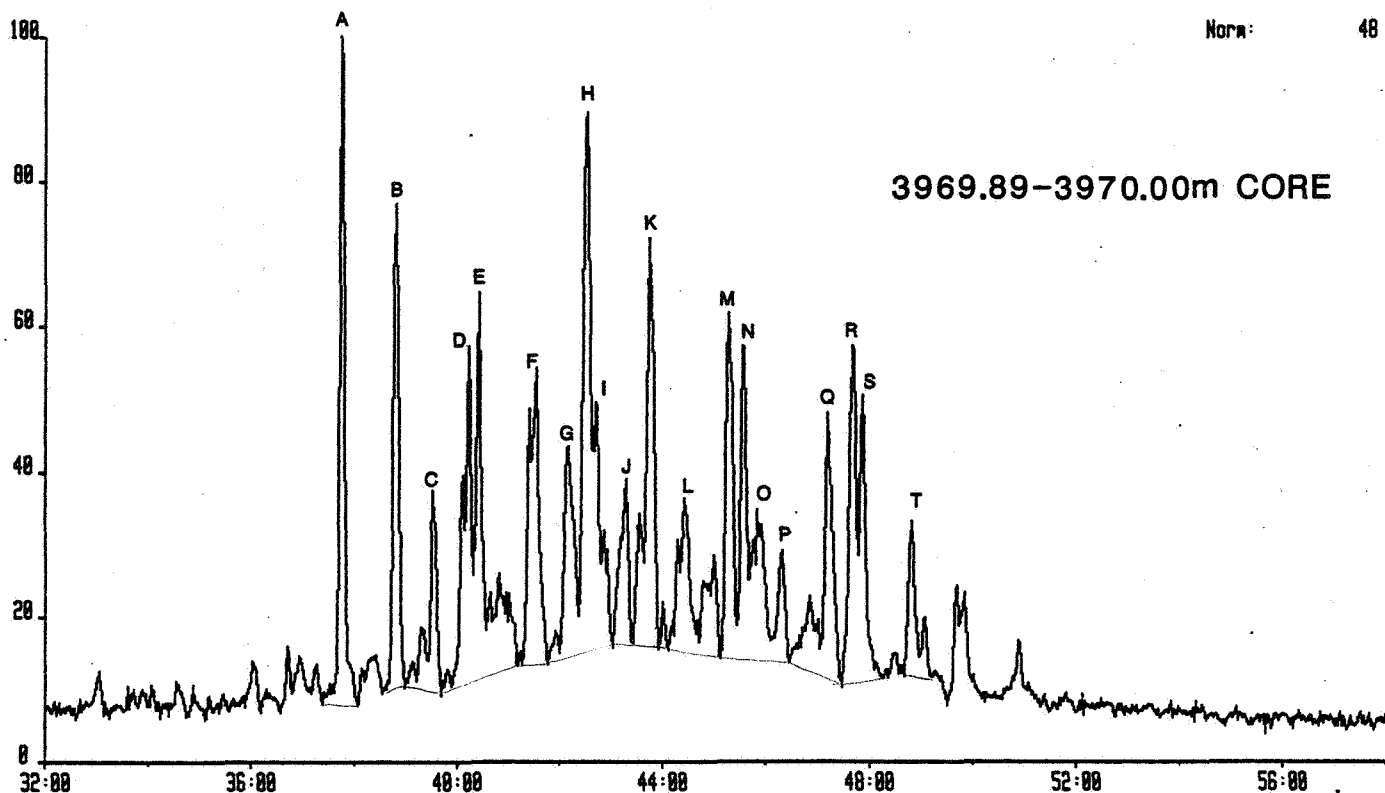
WELL 6506/12-5

STERANES m/z 217

1334010 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 48



1334012 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 488

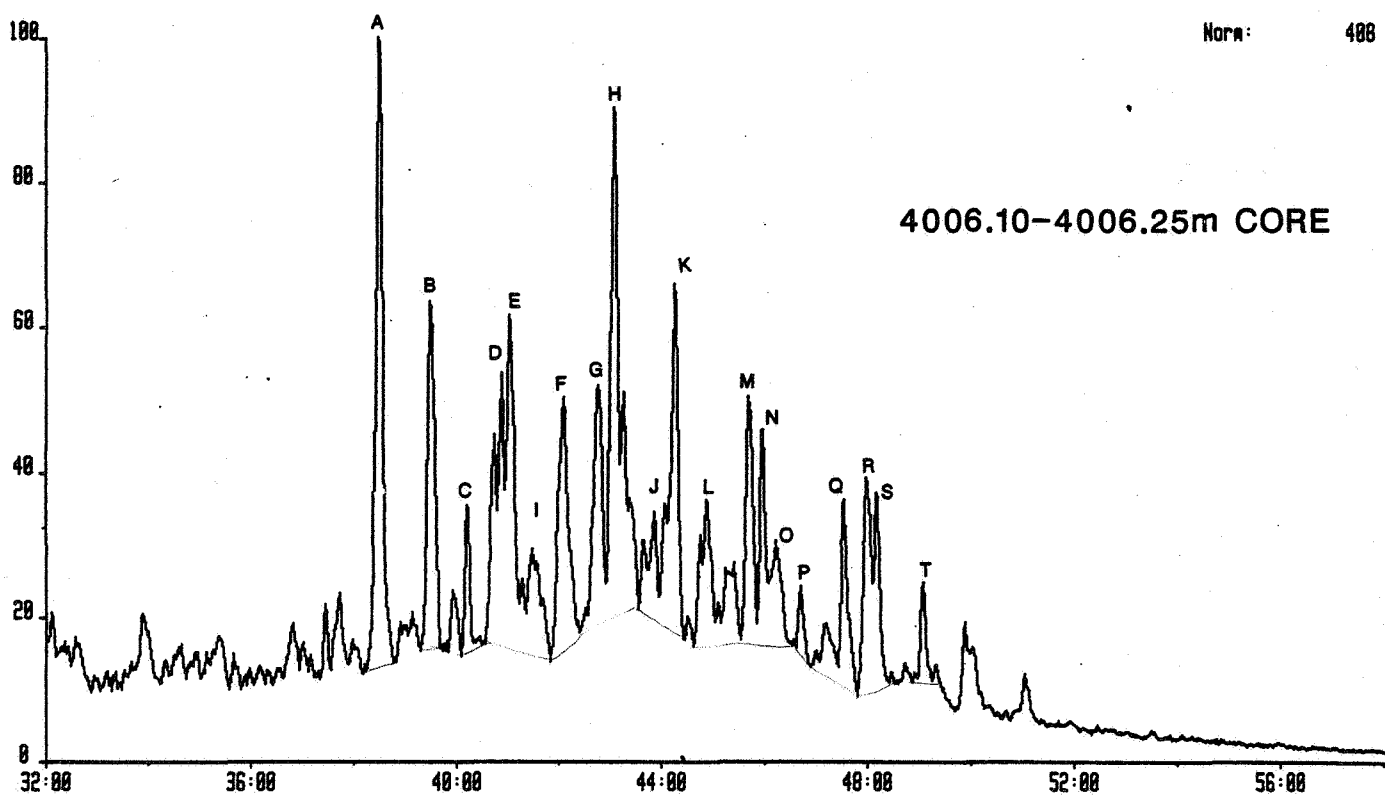


FIGURE 7c

MASS FRAGMENTOGRAMS



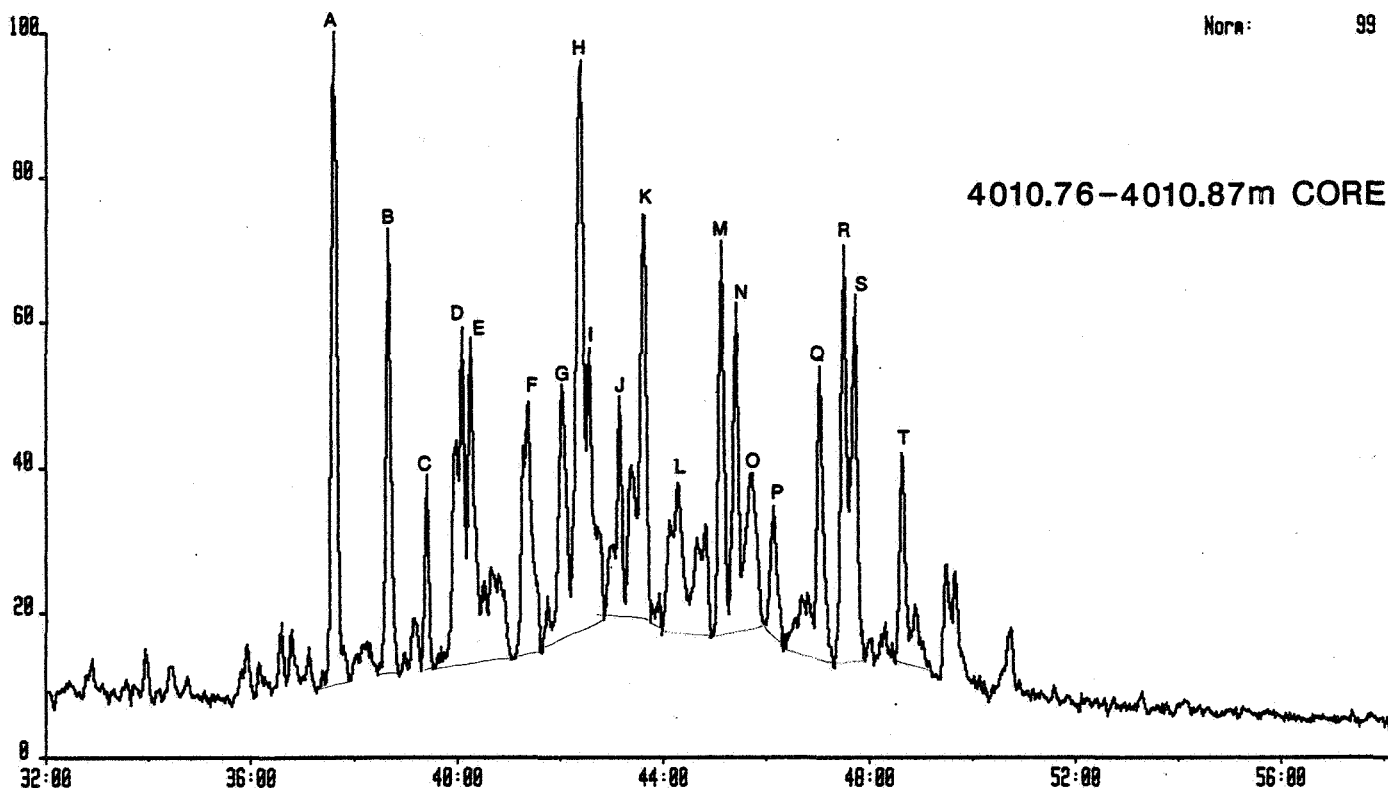
WELL 6506/12-5

STERANES m/z 217

1334813 15-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

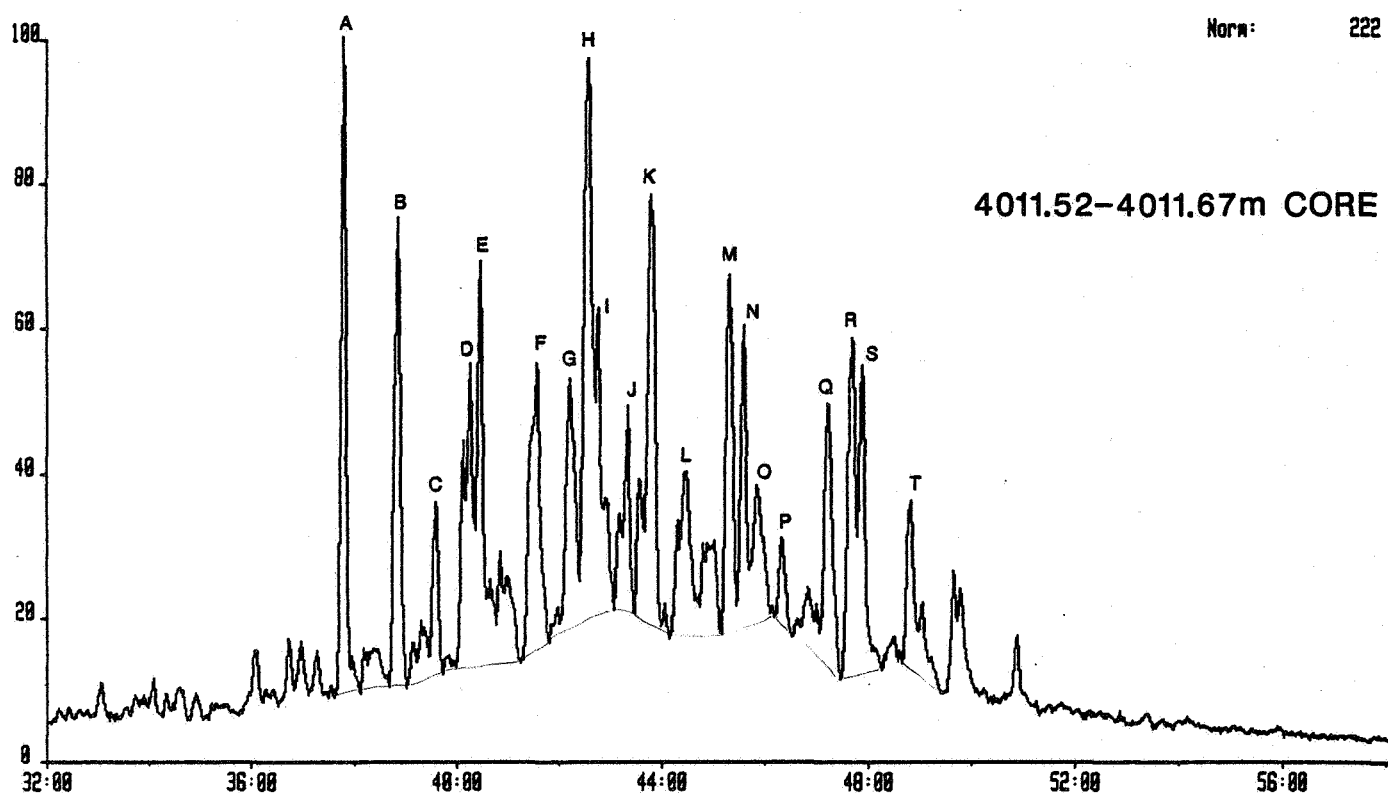
Norm: 99



1334814 15-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 222



MASS FRAGMENTOGRAMS



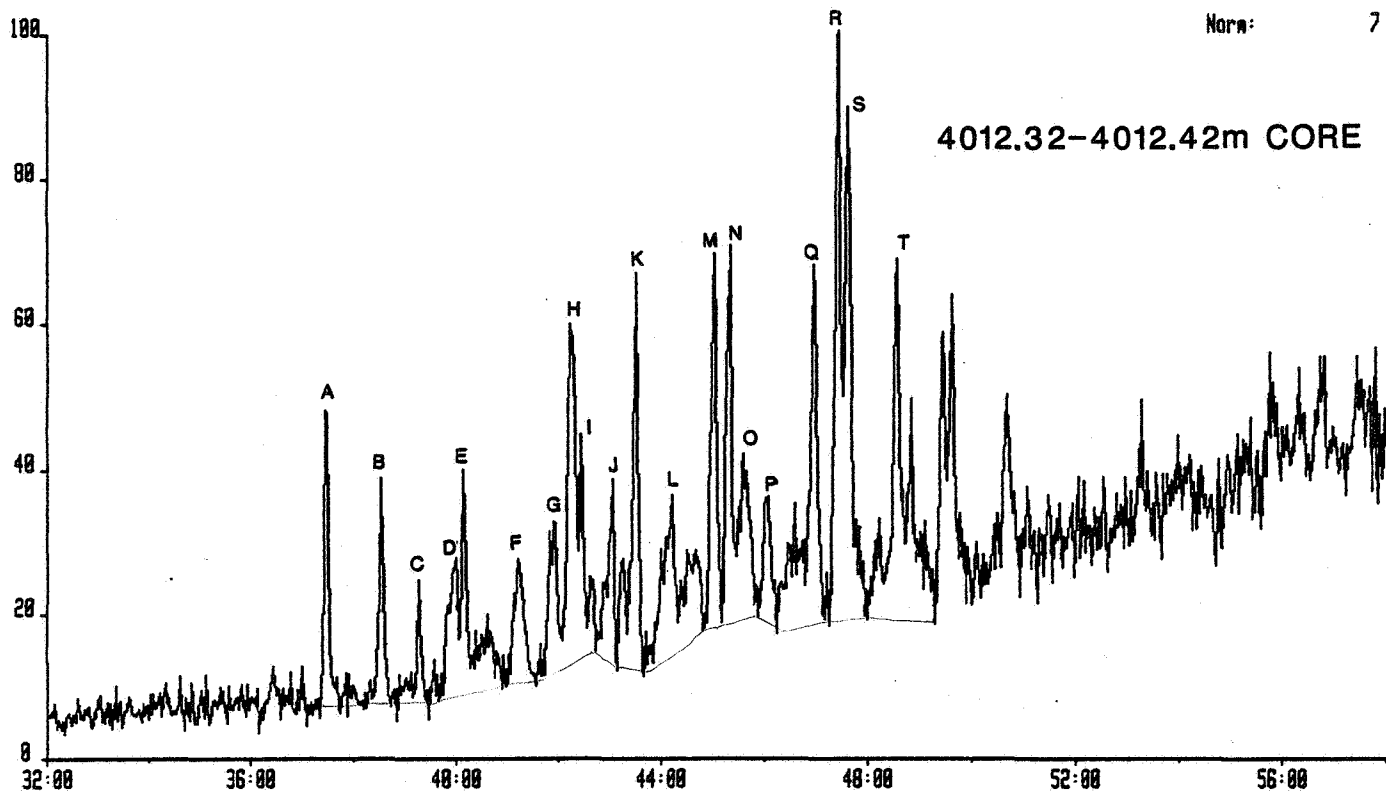
WELL 6506/12-5

STERANES m/z 217

1334015 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 7



1334017 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 300

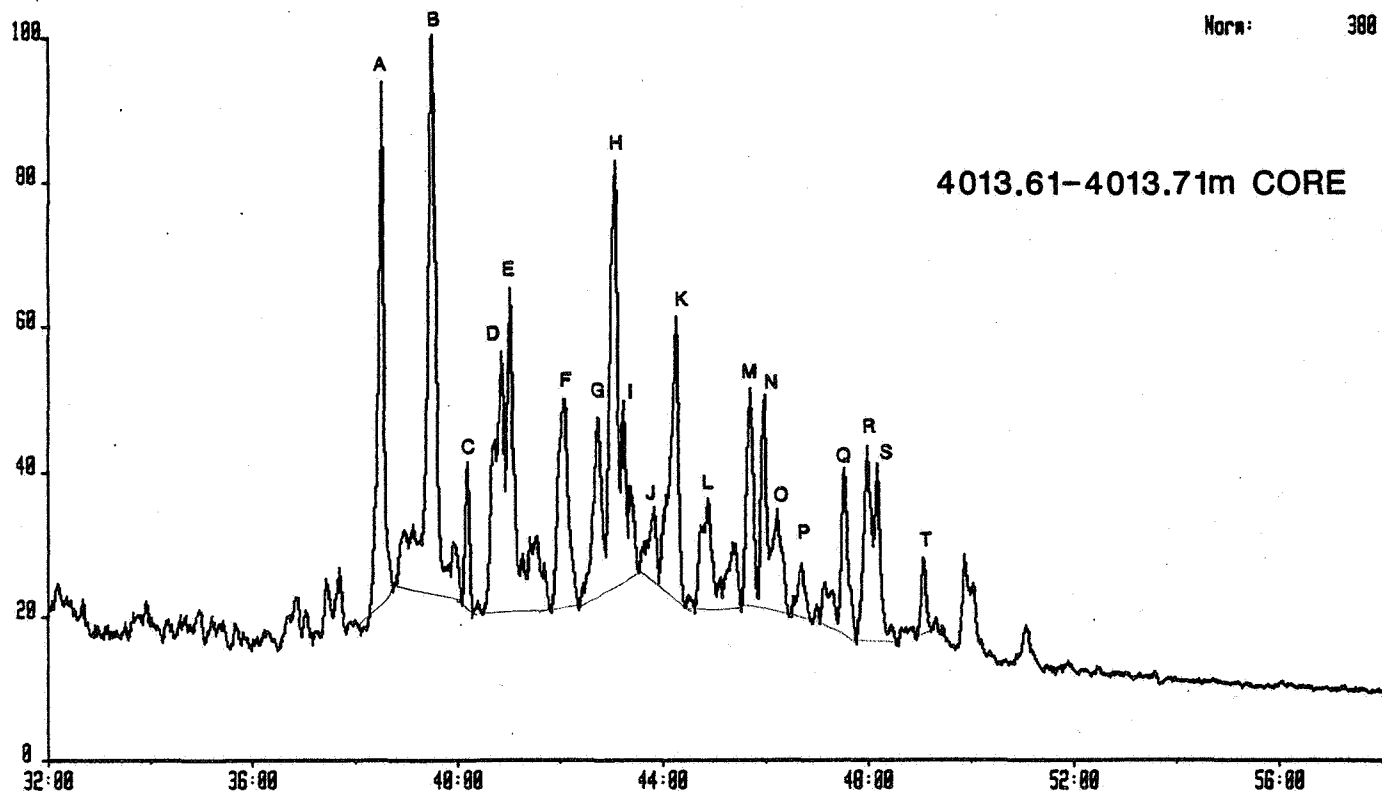


FIGURE 7e

MASS FRAGMENTOGRAMS

WELL

6506/12-5

STERANES m/z 217



1334019 15-JUL-86 Site: Magnetic TS250 Acct: System: STETRITRP
Sample 1 Injection 1 Group 1 Mass 217.1956
Text: TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System: STETRITRP

Norm: 214

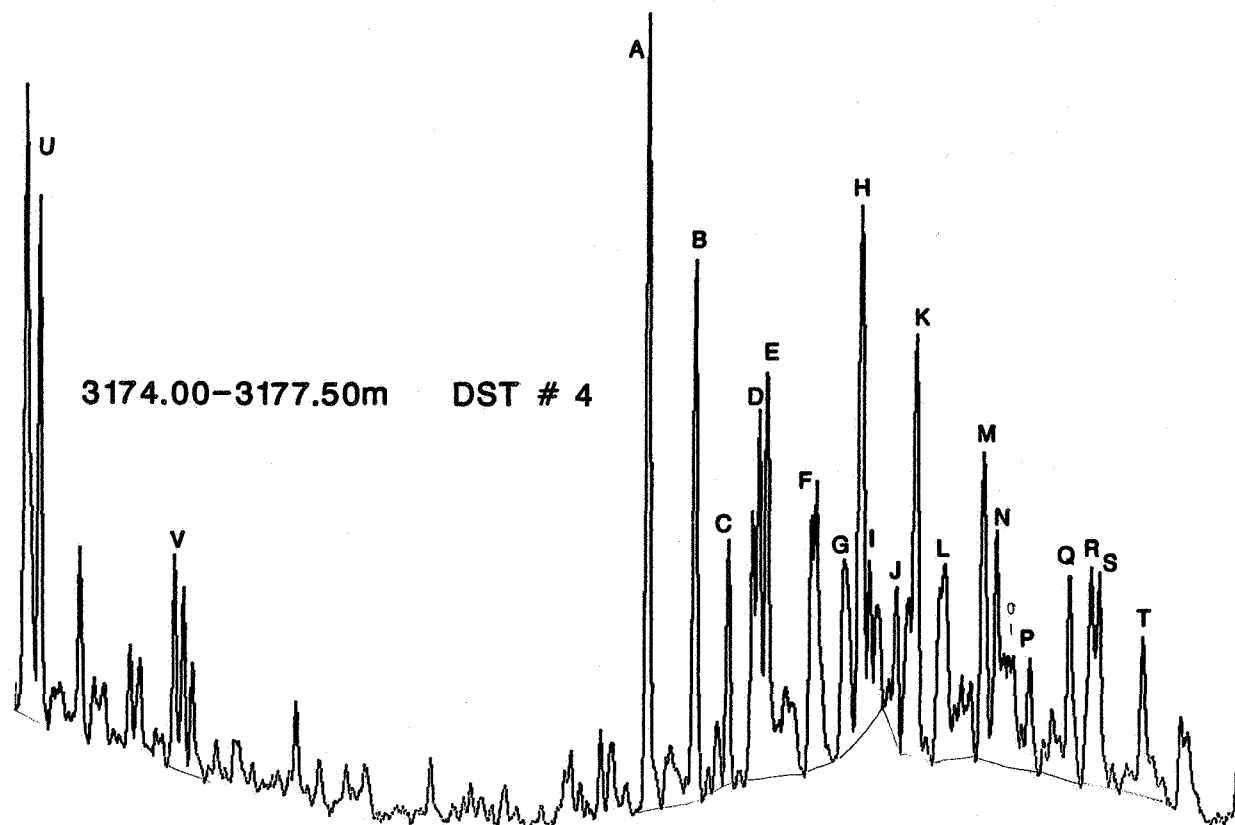
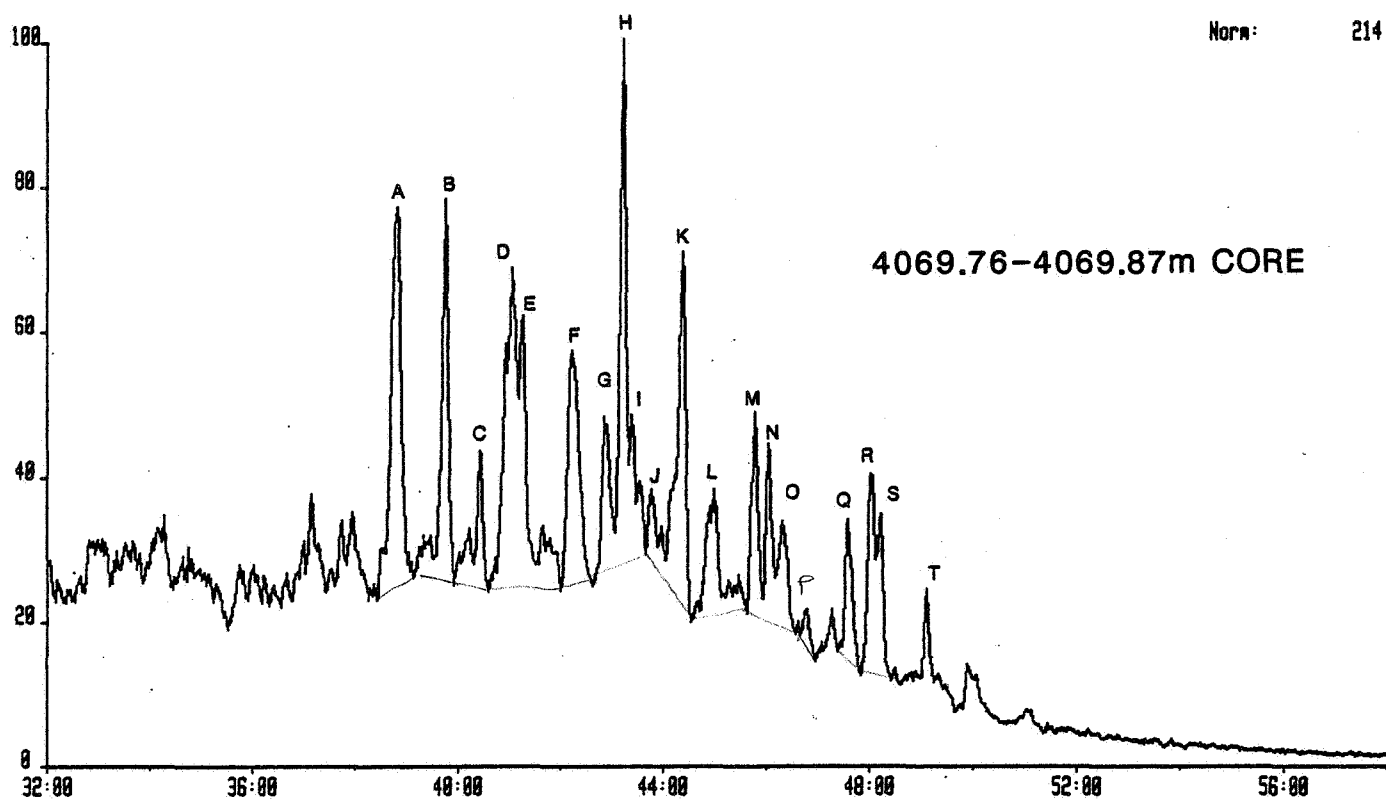
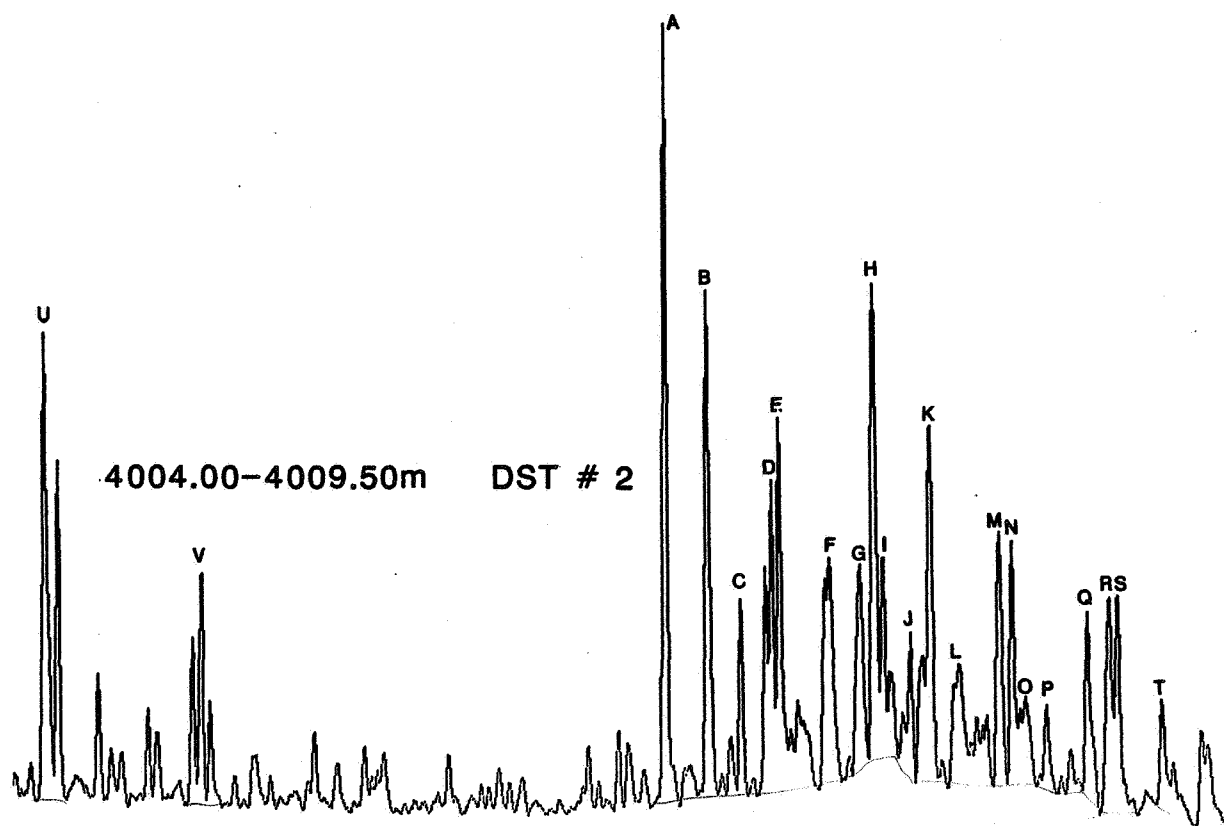


FIGURE 7f

MASS FRAGMENTOGRAMS

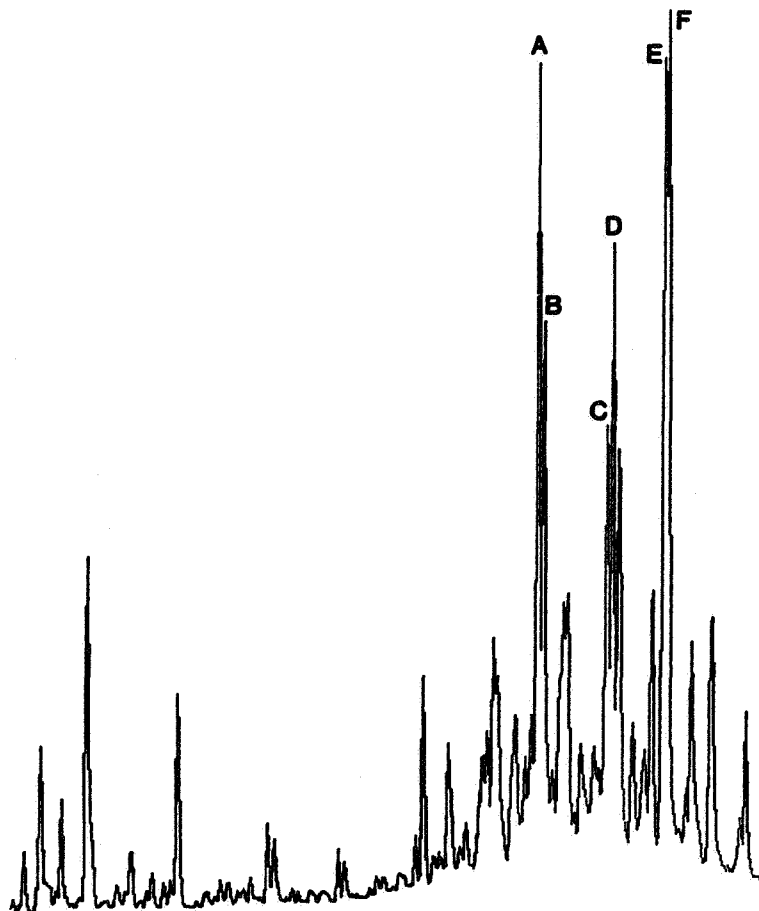
WELL 6506/12-5

STERANES m/z 217



STANDARD

m/z 218



STERANE IDENTIFICATION

(M/Z 218 FRAGMENTOGRAM)

<u>COMPOUND</u>		<u>ELEMENTAL COMPOUND</u>
A	14 β ,17 β -cholestane (20R)	C ₂₇ H ₄₈
B	14 β ,17 β -cholestane (20S)	C ₂₇ H ₄₈
C	24-methyl-14 β ,17 β -cholestane (20R)	C ₂₈ H ₅₀
D	24-methyl-14 β ,17 β -cholestane (20S)	C ₂₈ H ₅₀
E	24-ethyl-14 β ,17 β -cholestane (20R)	C ₂₉ H ₅₂
F	24-ethyl-14 β ,17 β -cholestane (20S)	C ₂₉ H ₅₂

FIGURE 8a

MASS FRAGMENTOGRAMS

WELL 6506/12-5

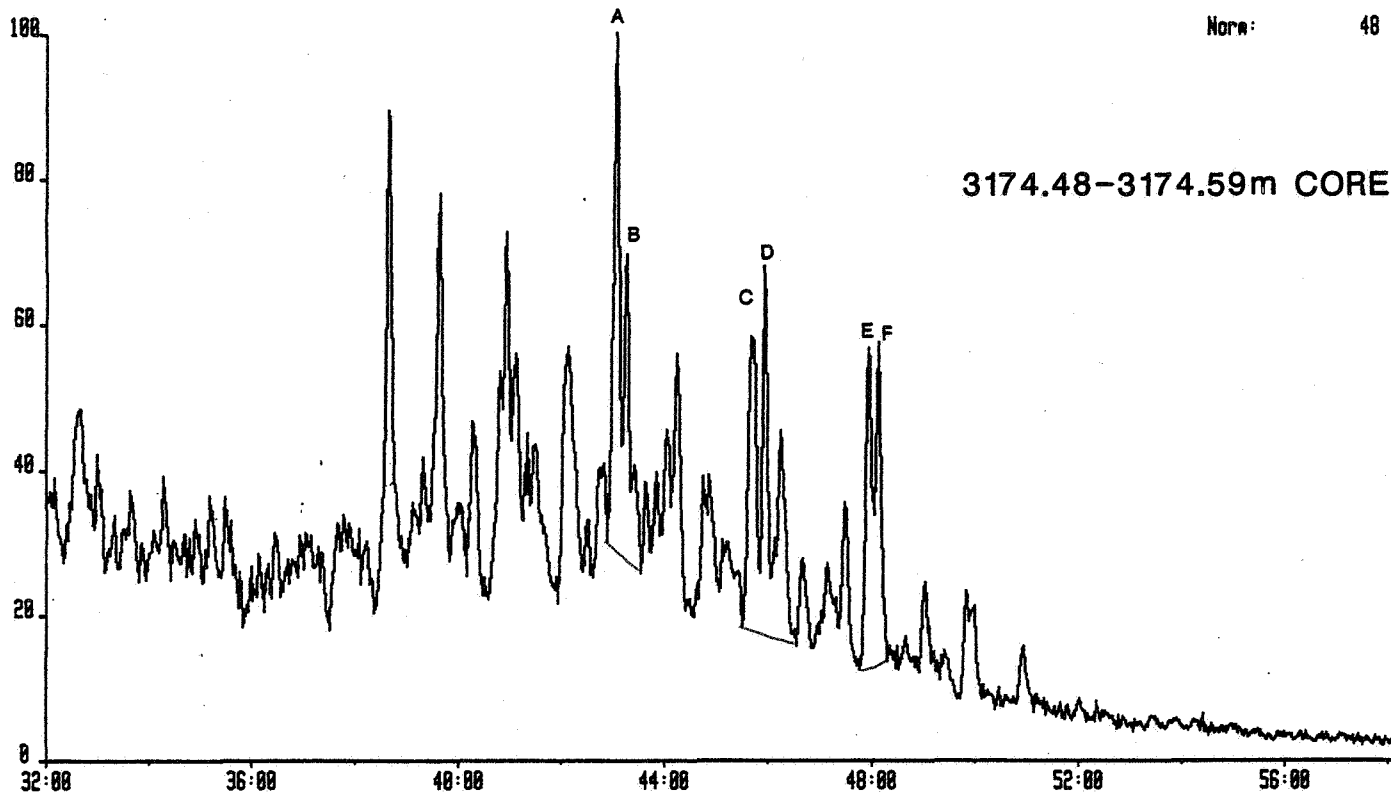
$\beta\beta$ STERANES m/z 218



1334005 15-JUL-86 Sir:Magnetic TS250 Acnt:
 Sample 1 Injection 1 Group 1 Mass 218.2034
 Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

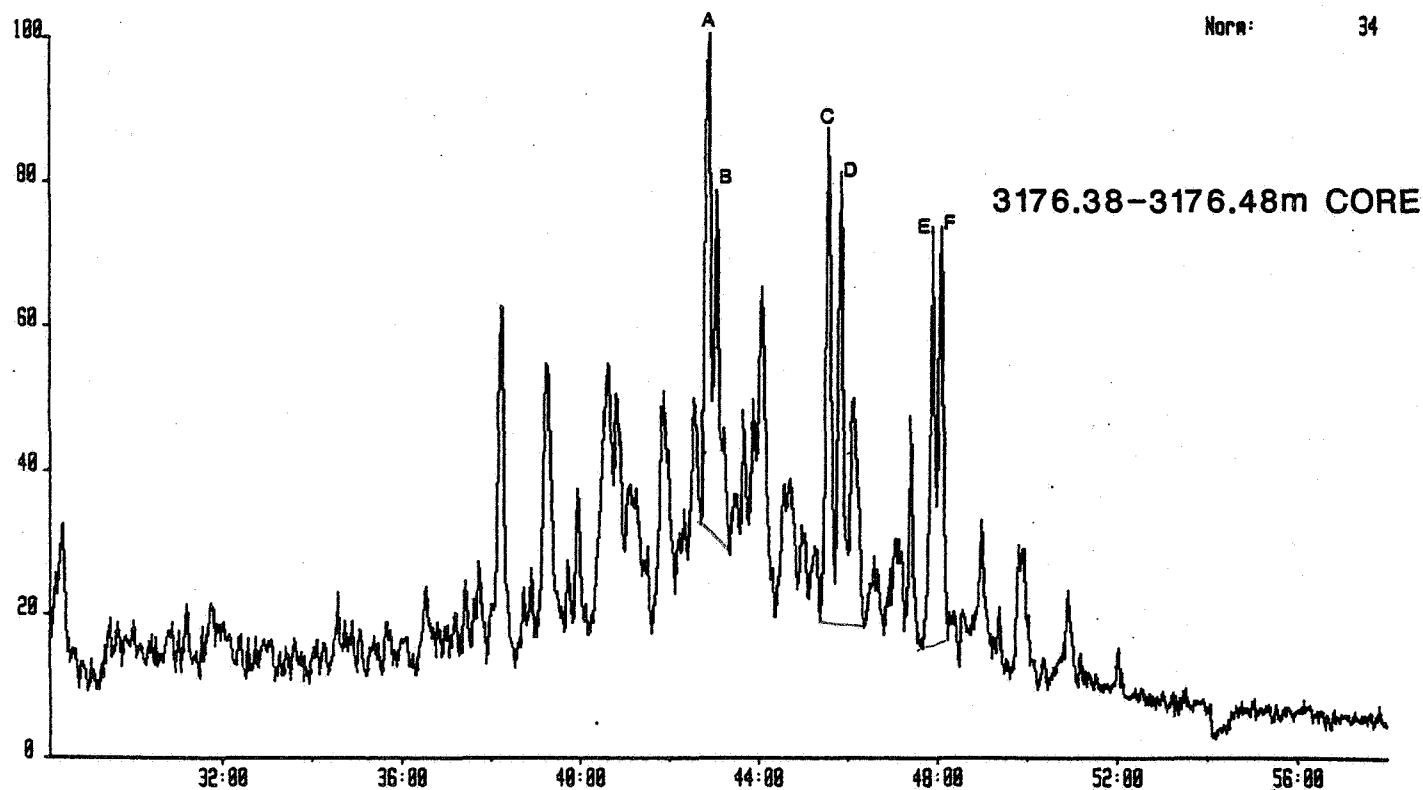
Norm: 48



GEOBAT 11-JUL-86 Sir:Magnetic TS250 Acnt:
 Sample 1 Injection 1 Group 1 Mass 218.2034
 Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 34



MASS FRAGMENTOGRAMS



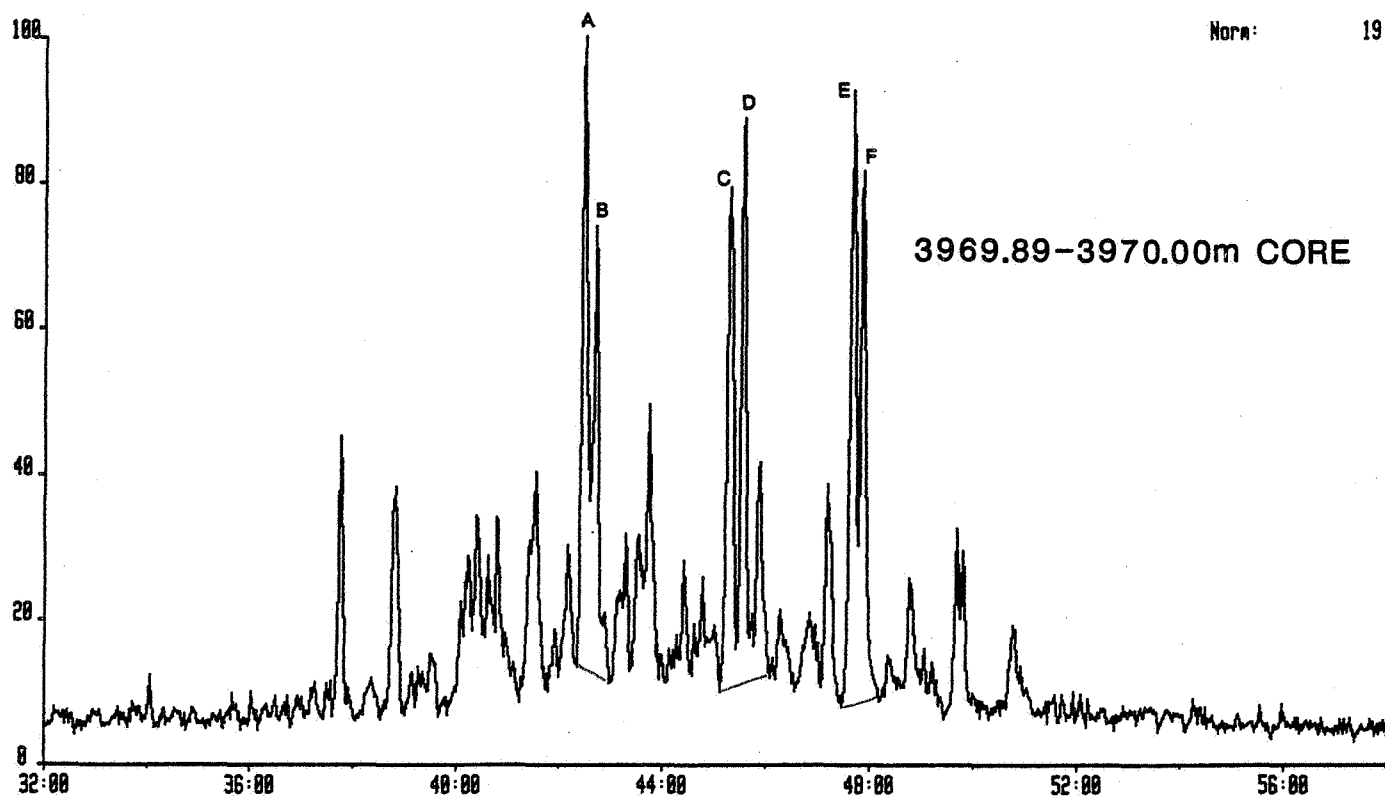
WELL 6506/12-5

 $\beta\beta$ STERANES m/z 218

1334810 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 19



1334812 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 121

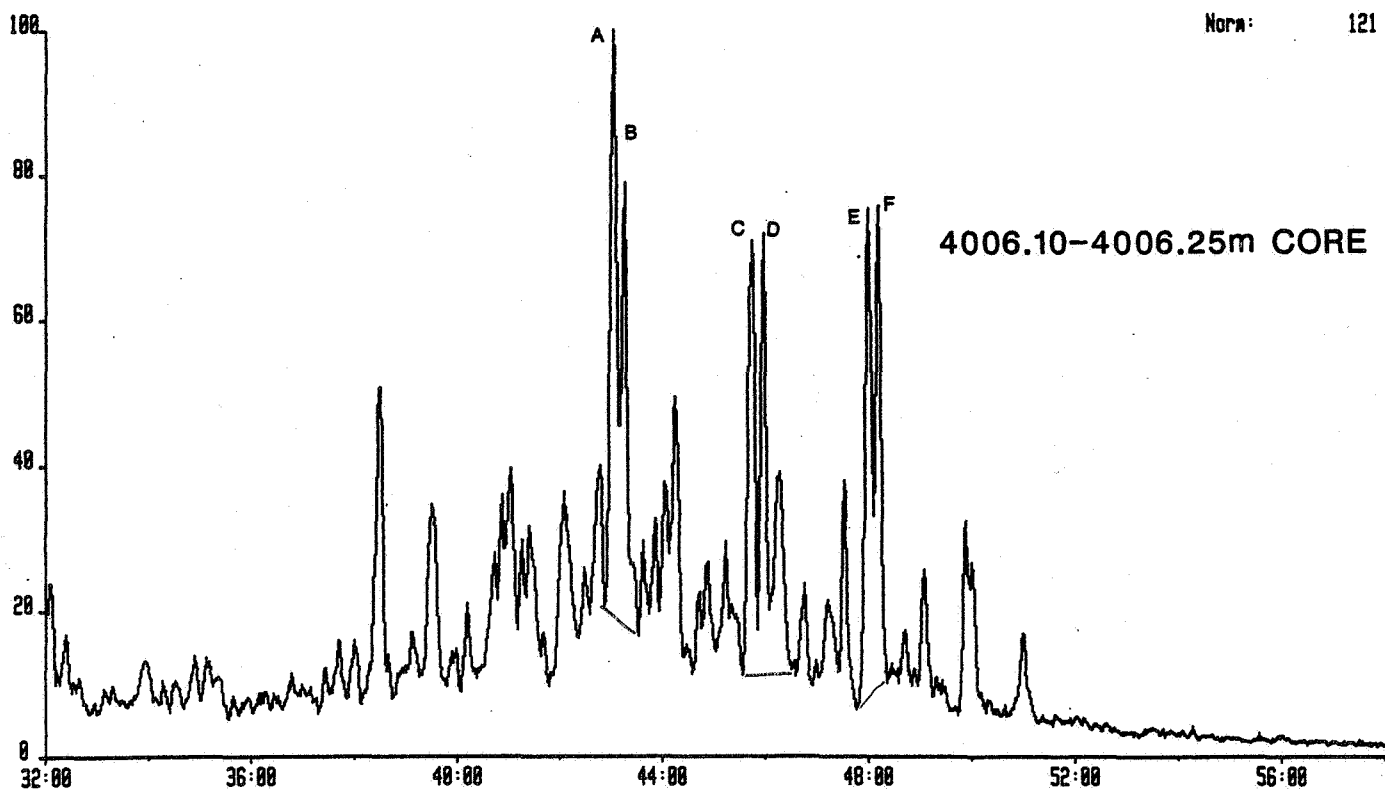


FIGURE 8c

MASS FRAGMENTOGRAMS



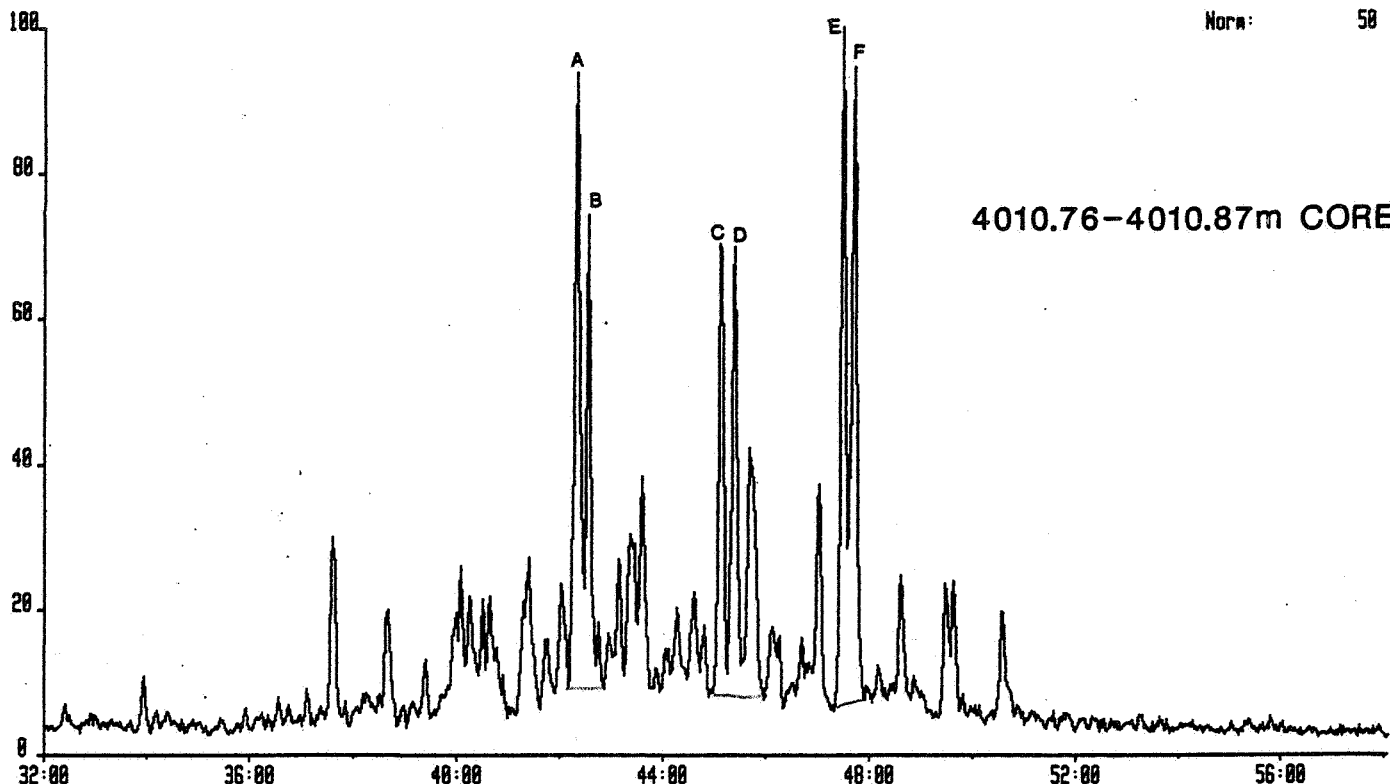
WELL 6506/12-5

 $\beta\beta$ STERANES m/z 218

1334013 15-JUL-86 Sir:Magnetic TS250 Rcnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 50



1334014 15-JUL-86 Sir:Magnetic TS250 Rcnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 83

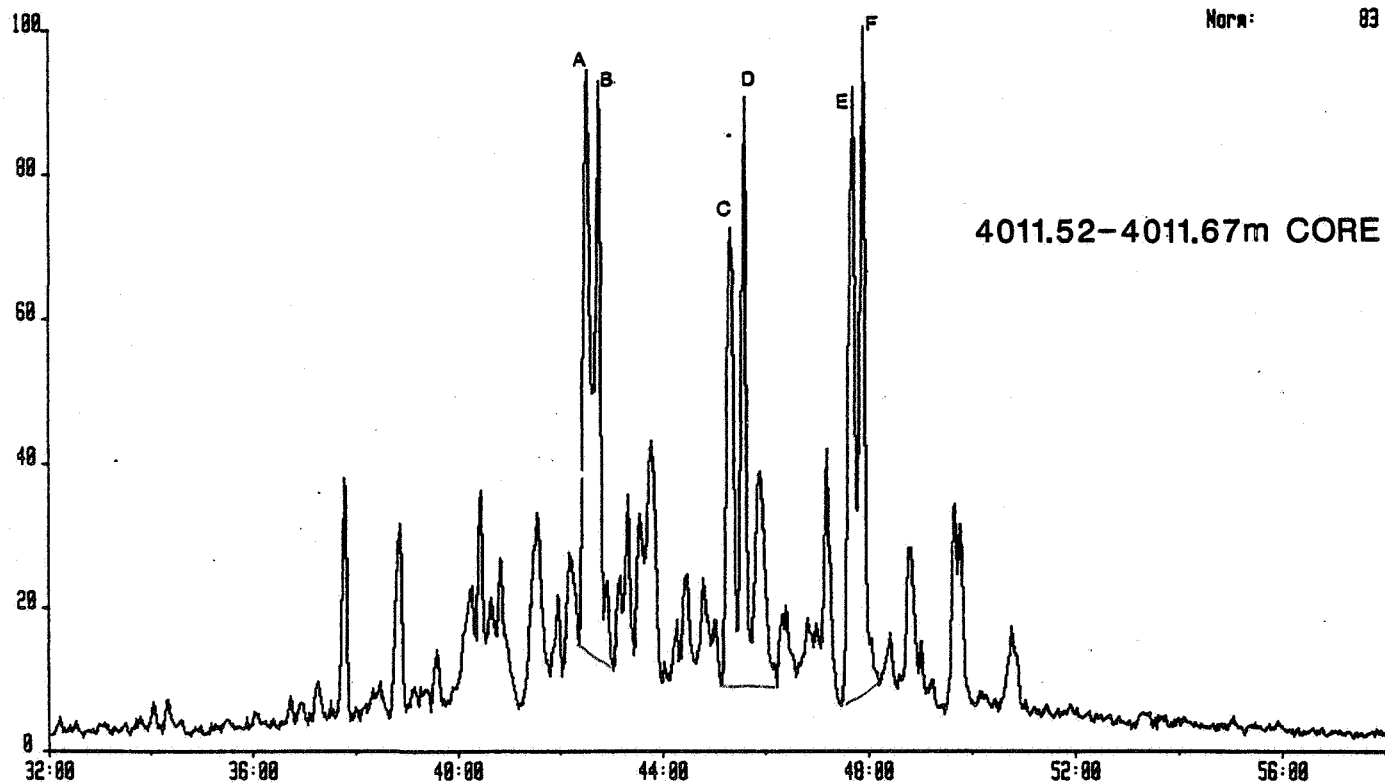


FIGURE 8d

MASS FRAGMENTOGRAMS

WELL 6506/12-5

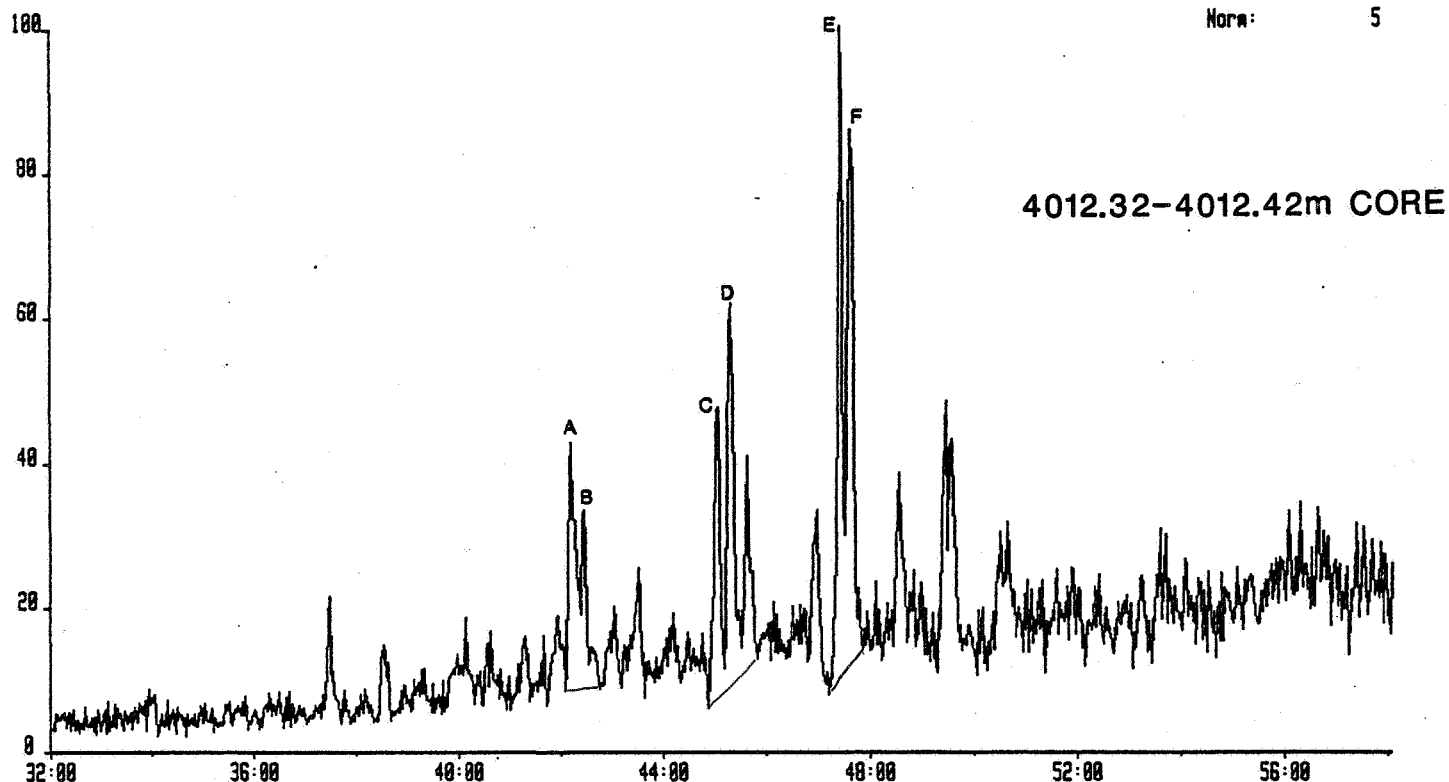
$\beta\beta$ STERANES m/z 218



1334015 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 5



1334017 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 110

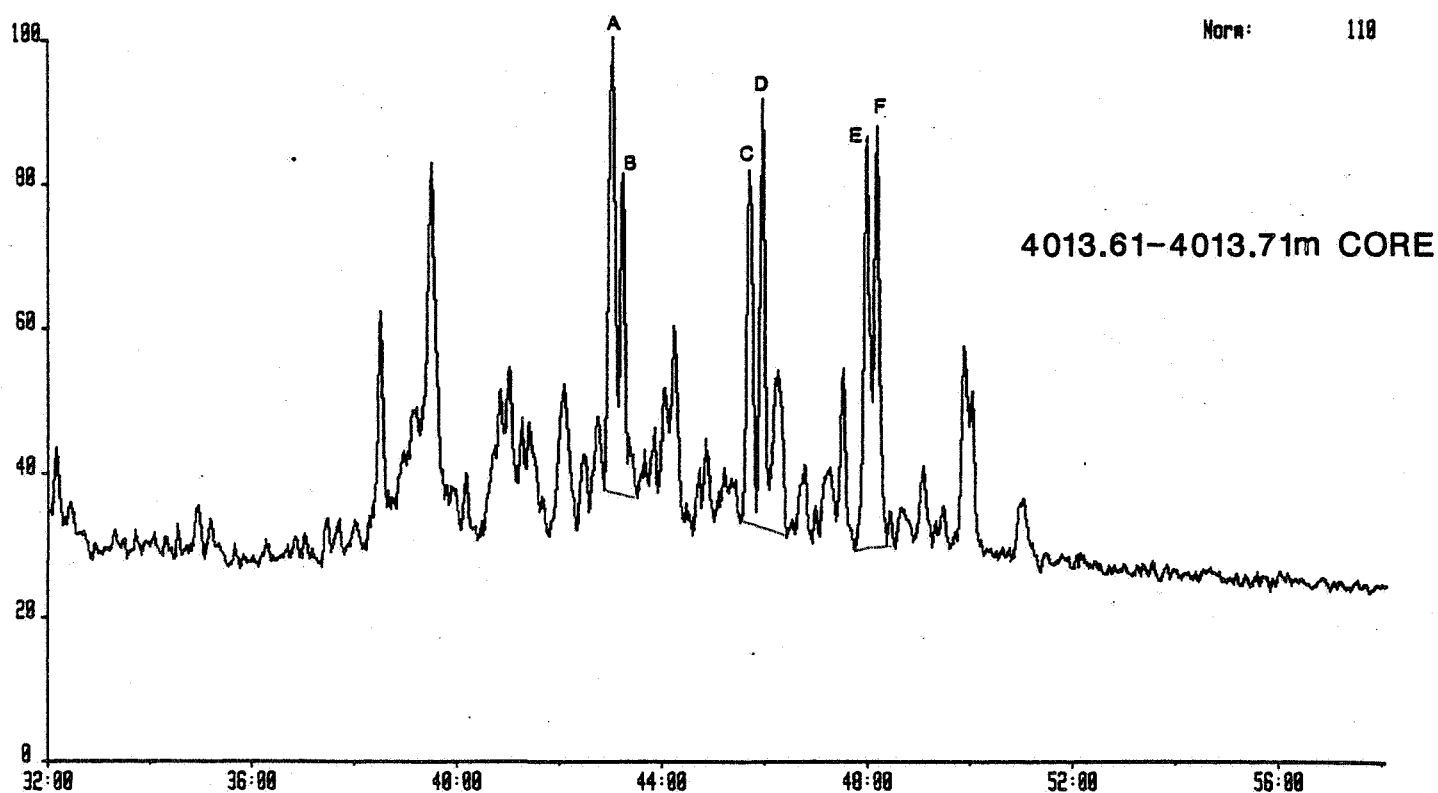


FIGURE 8e

MASS FRAGMENTOGRAMS

WELL 6506/12-5

$\beta\beta$ STERANES m/z 218



1334019 15-JUL-86 Sir:Magnetic TS250 Rcnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 68

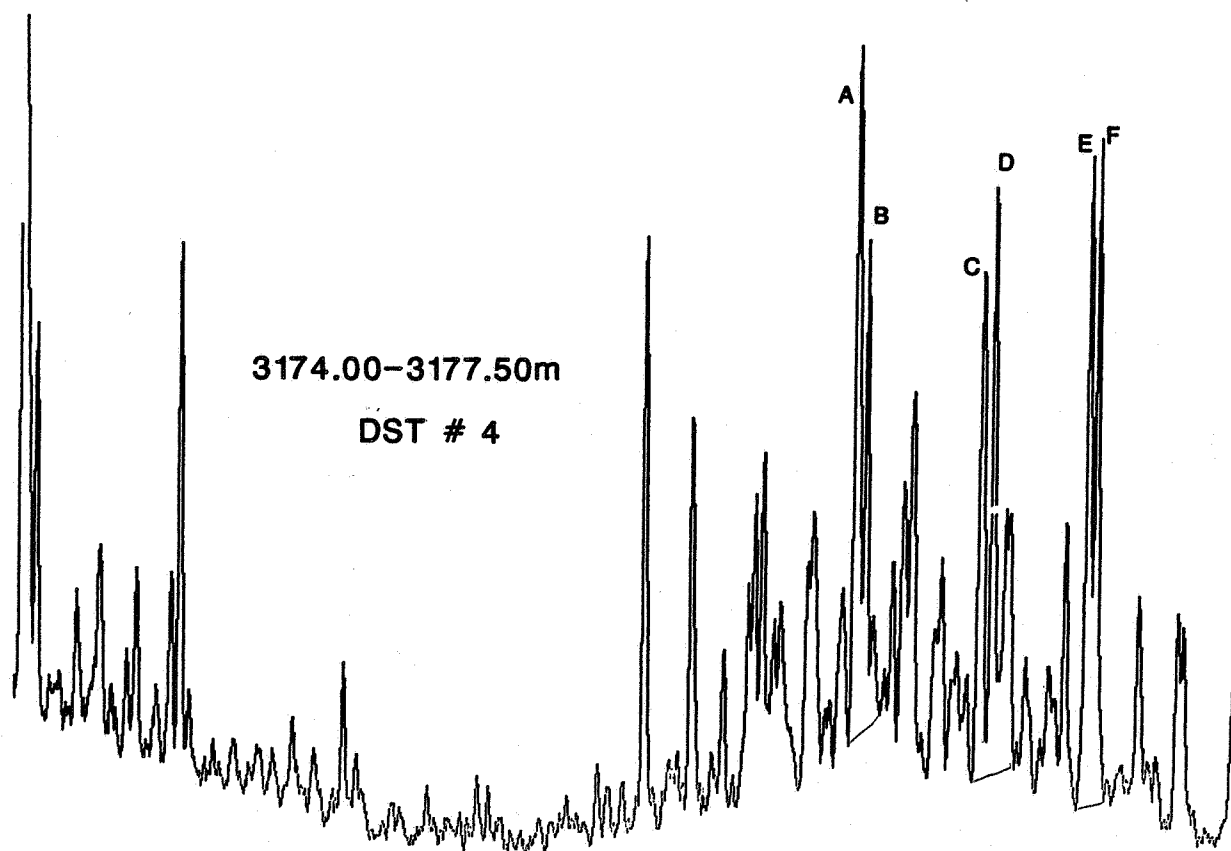
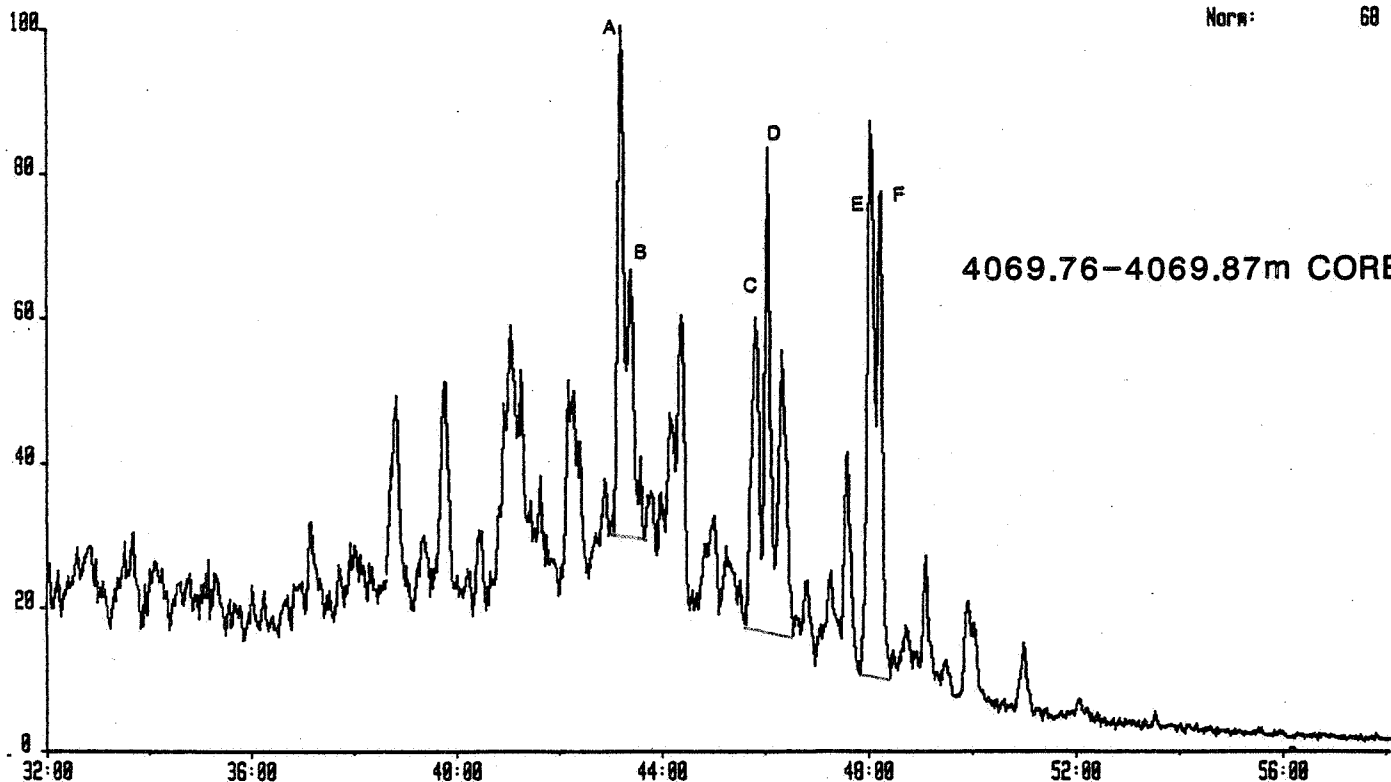


FIGURE 8f

MASS FRAGMENTOGRAMS

WELL 6506/12-5

$\beta\beta$ STERANES m/z 218

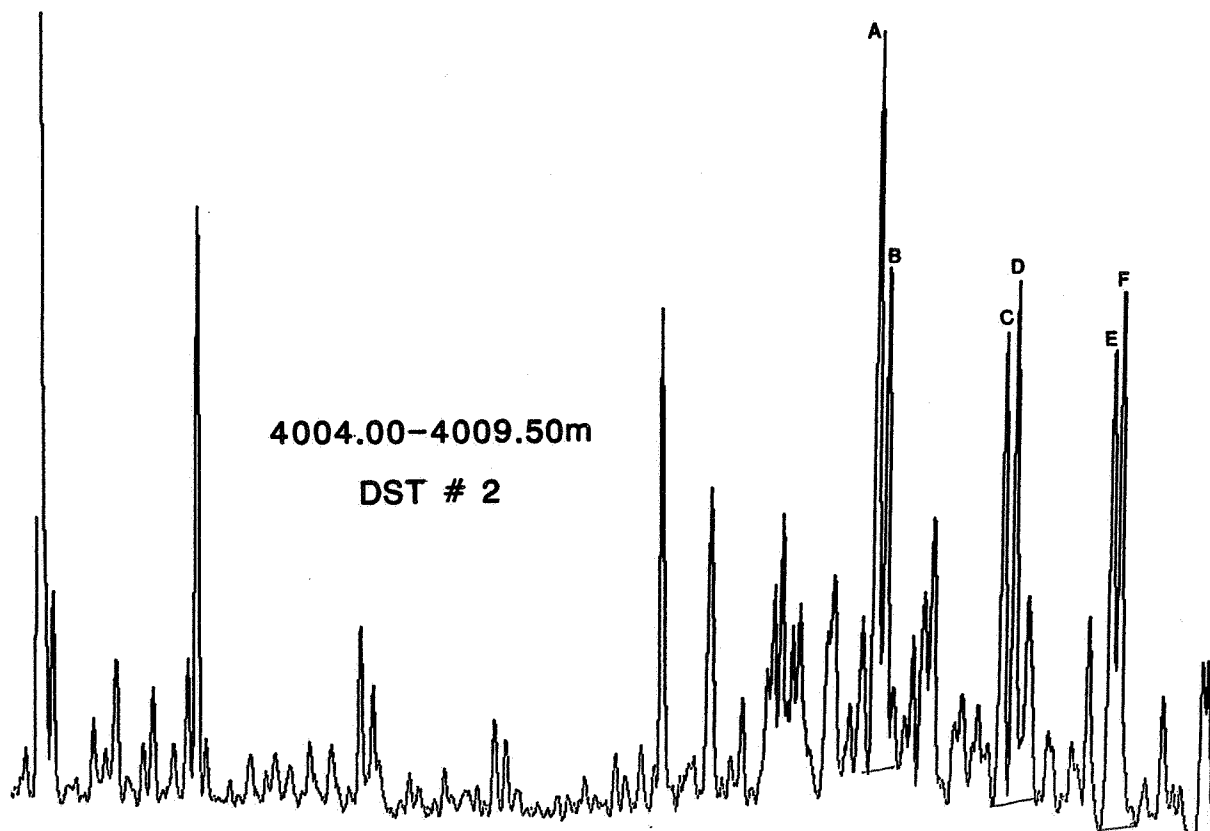


FIGURE 9a

MASS FRAGMENTOGRAMS



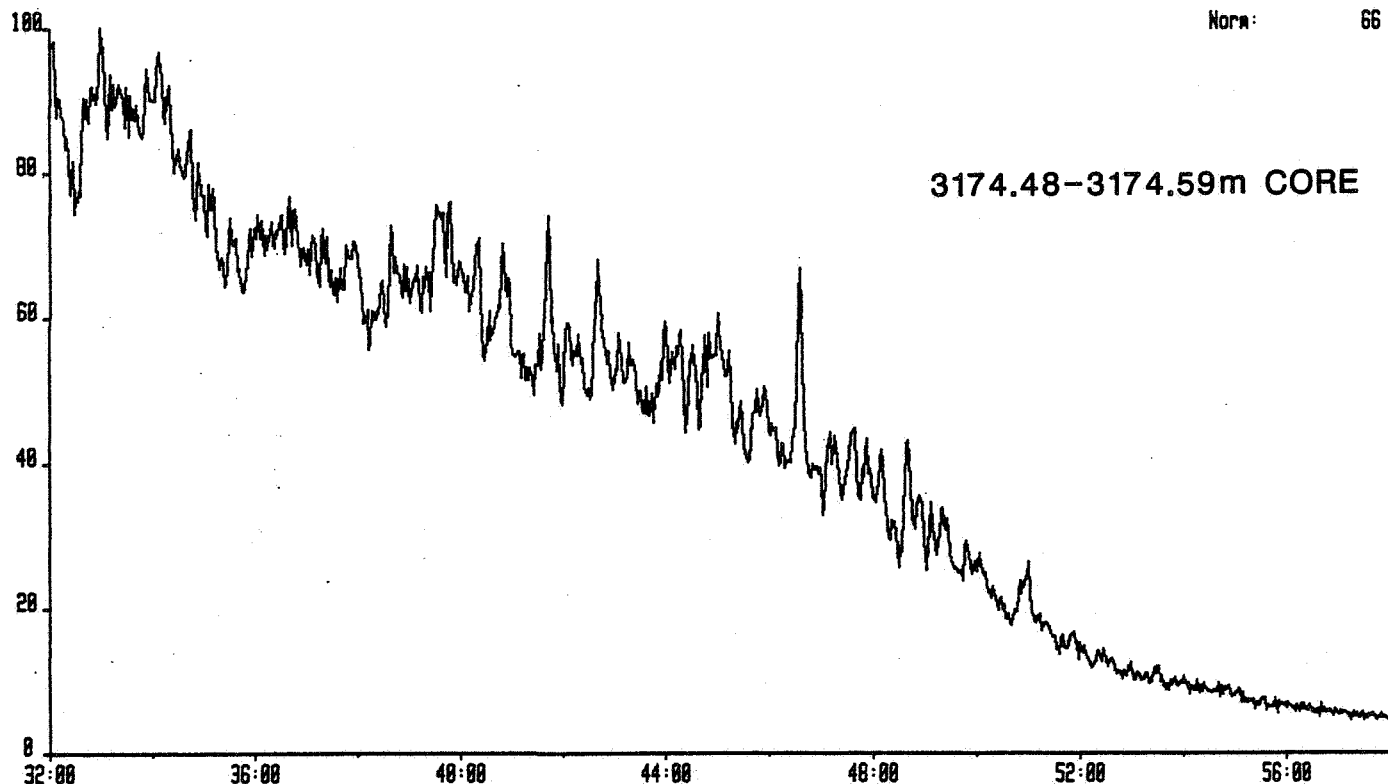
WELL 6506/12-5 TRIAROMATIC STERANES m/z 231

1334005 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm:

66



GEOBAT 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm:

45

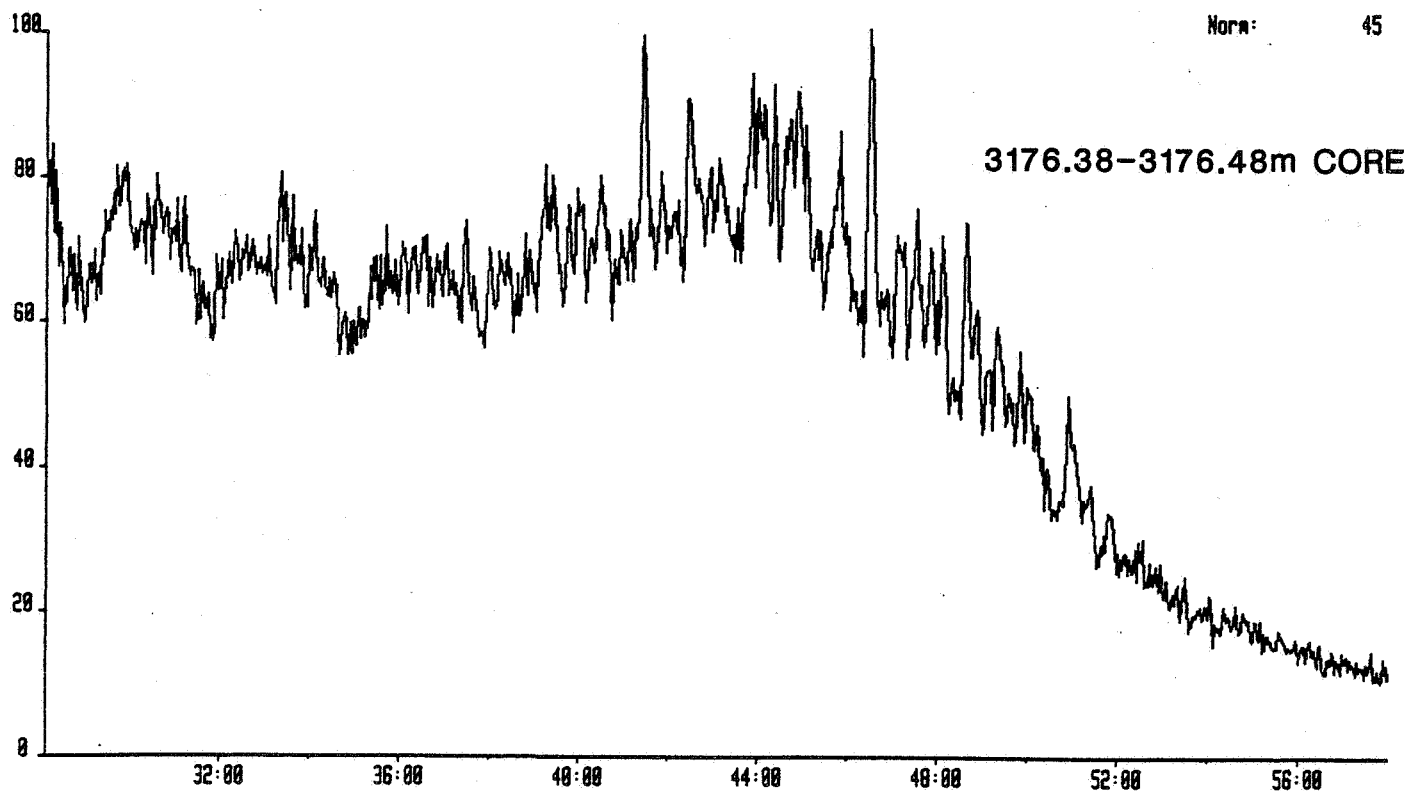


FIGURE 9b

MASS FRAGMENTOGRAMS

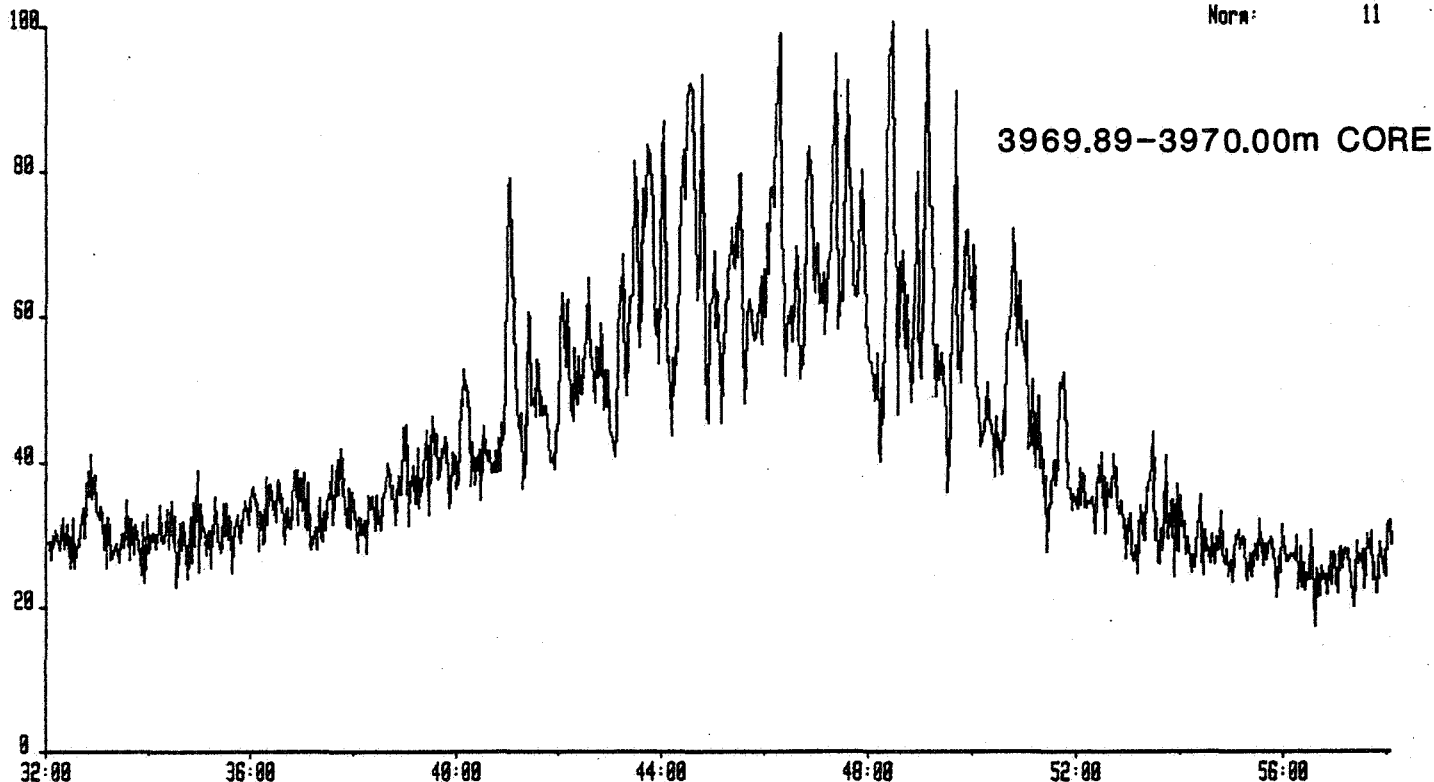
WELL 6506/12-5 TRIAROMATIC STERANES m/z 231



1334010 11-JUL-86 Sir:Magnetic TS250 Acnt:
 Sample 1 Injection 1 Group 1 Mass 231.1200
 Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

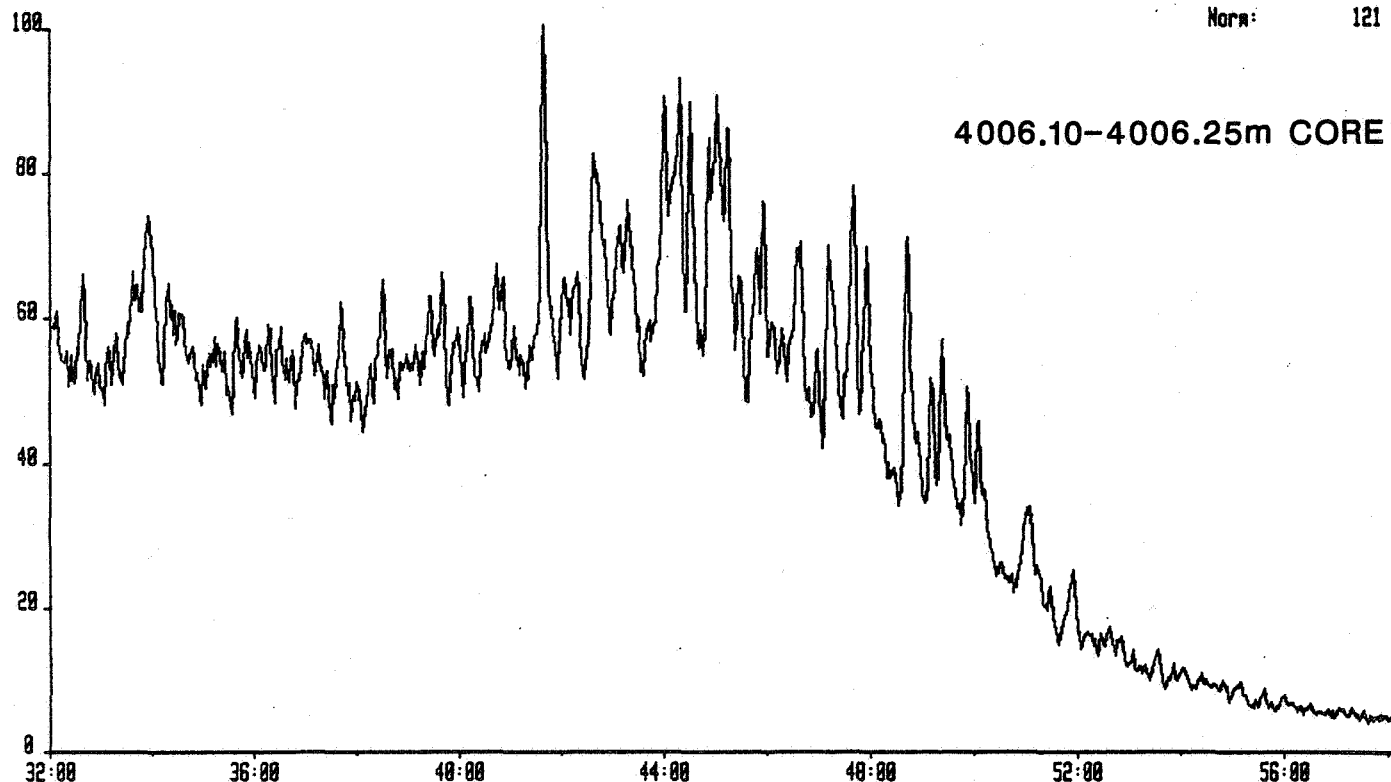
Norm: 11



1334012 15-JUL-86 Sir:Magnetic TS250 Acnt:
 Sample 1 Injection 1 Group 1 Mass 231.1200
 Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 121



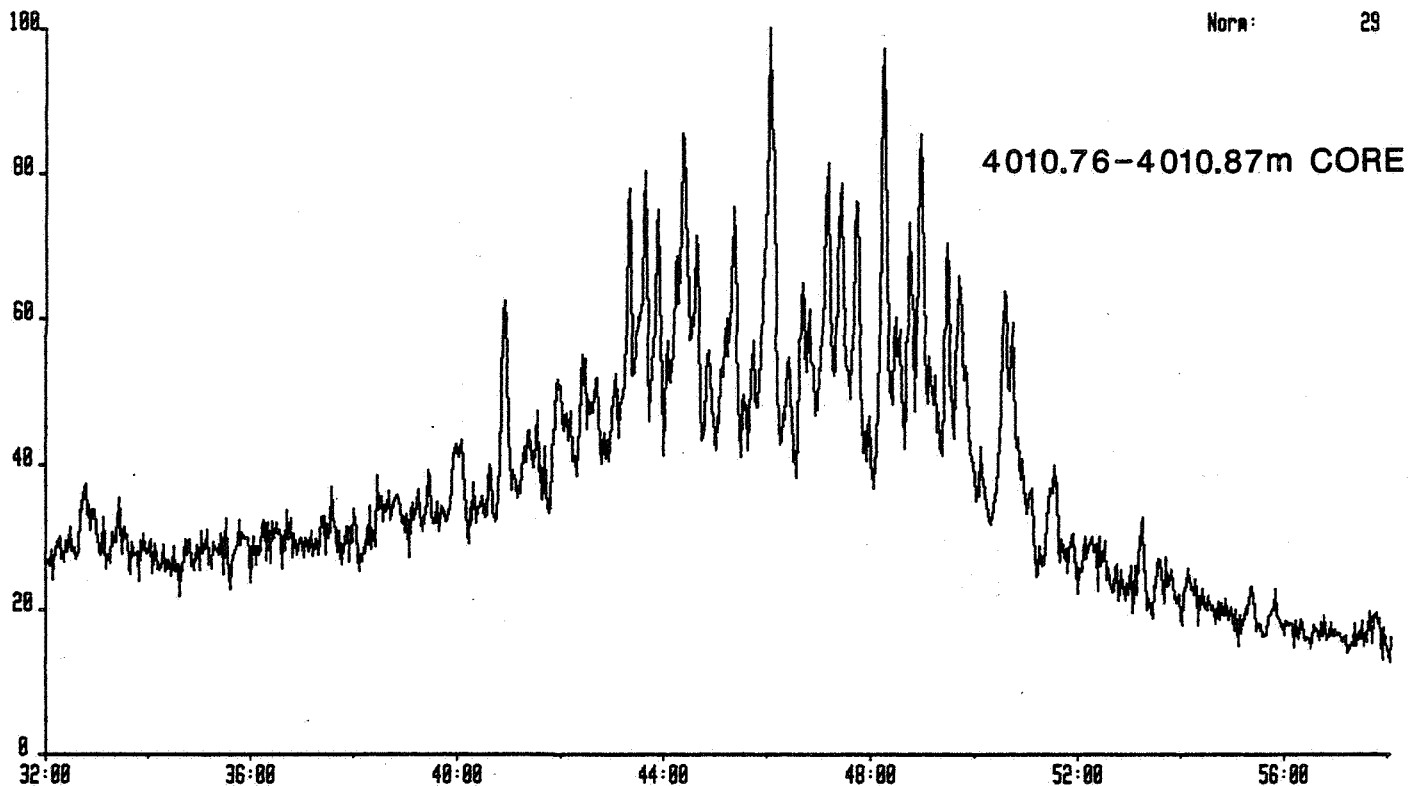


WELL 6506/12-5 TRIAROMATIC STERANES m/z 231

1334013 15-JUL-86 Sir:Magnetic TS250 Rcnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 29



1334014 15-JUL-86 Sir:Magnetic TS250 Rcnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 66

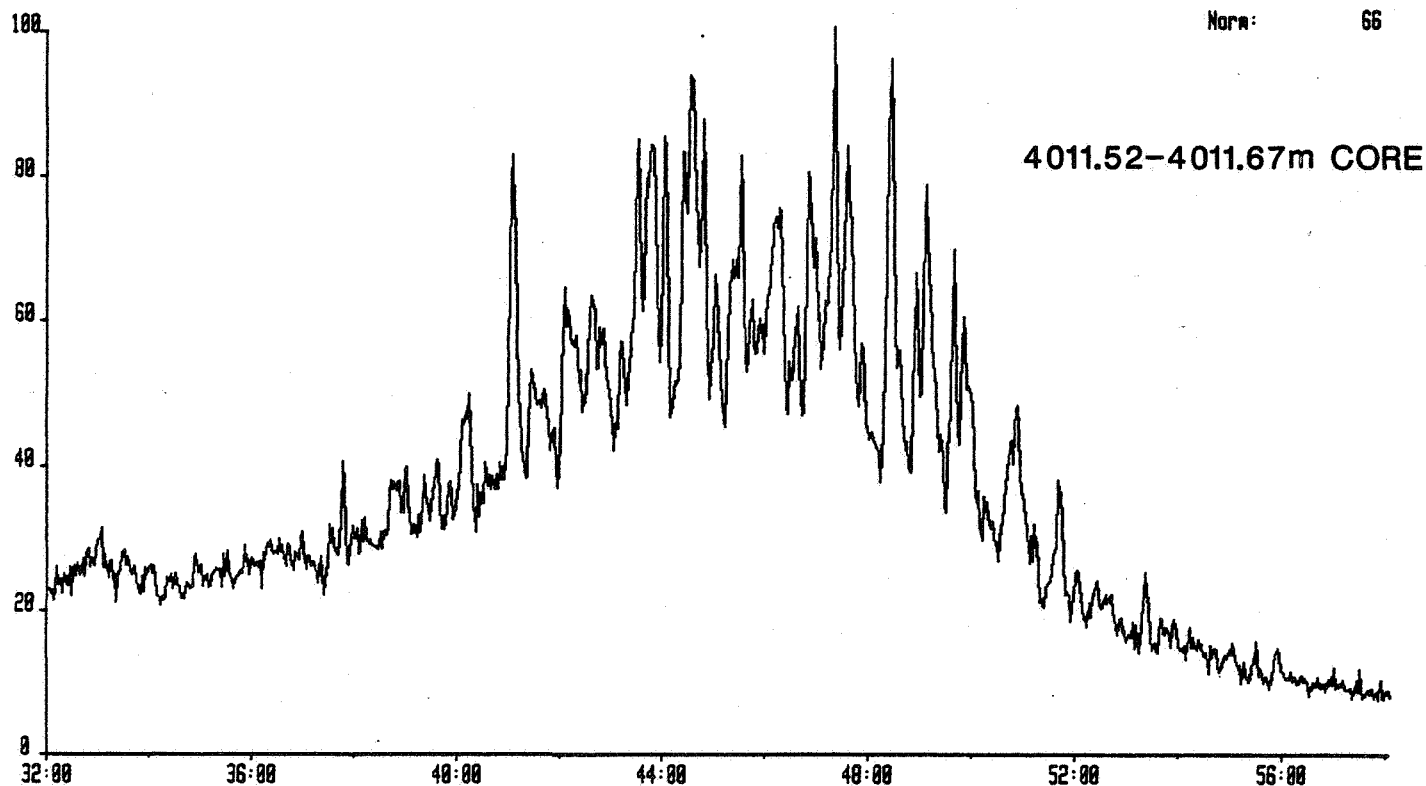


FIGURE 9d

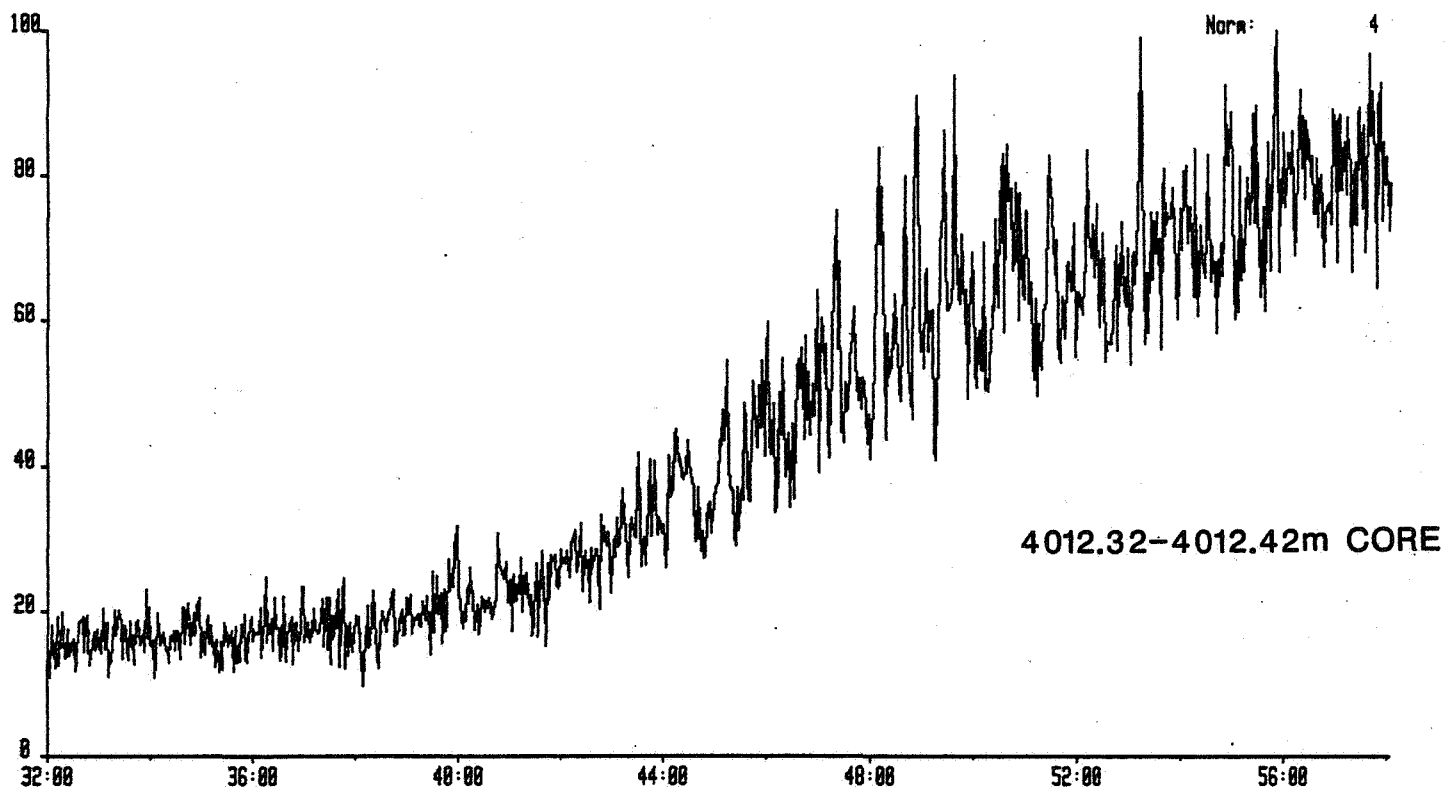
MASS FRAGMENTOGRAMS

WELL 6506/12-5 TRIAROMATIC STERANES m/z 231



1334815 14-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



1334817 14-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

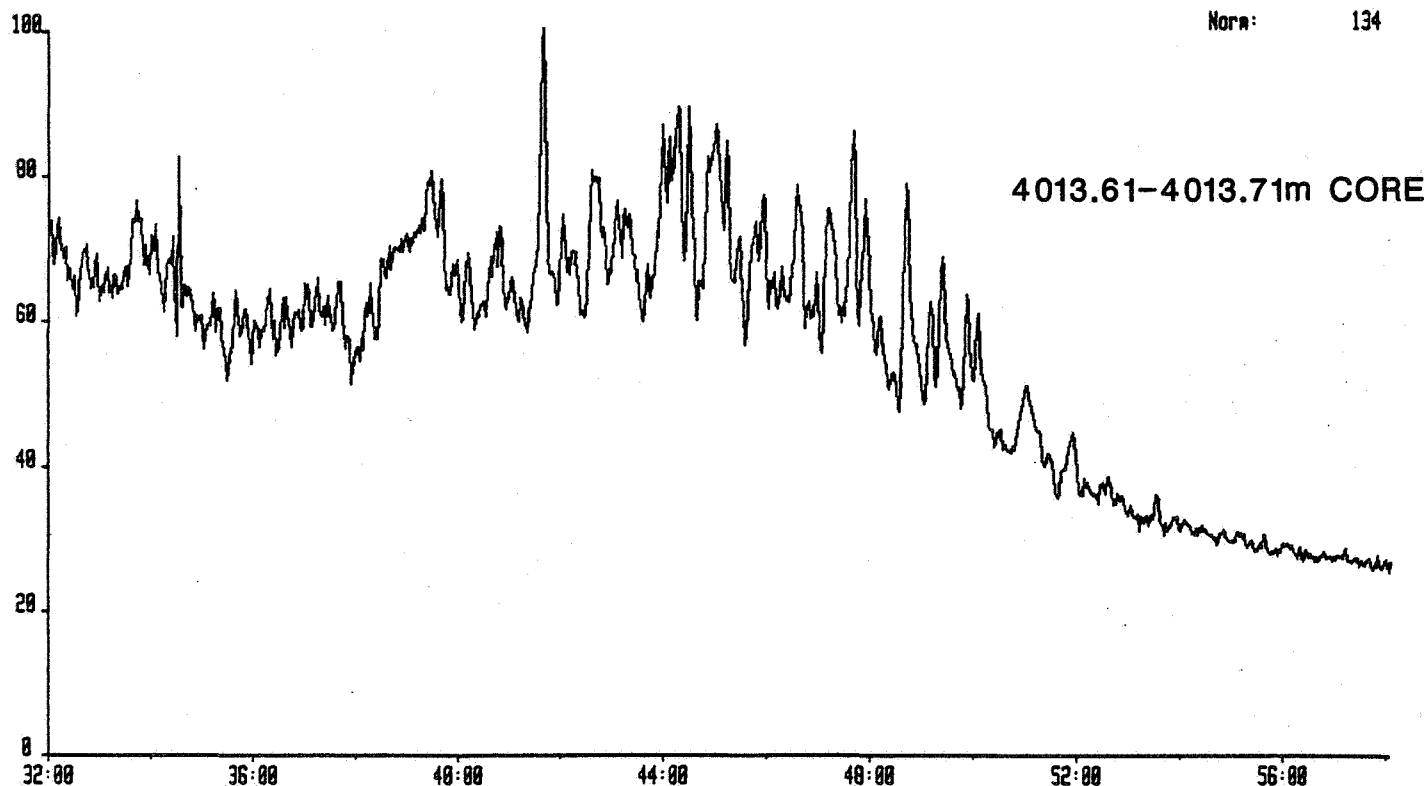


FIGURE 9e

MASS FRAGMENTOGRAMS

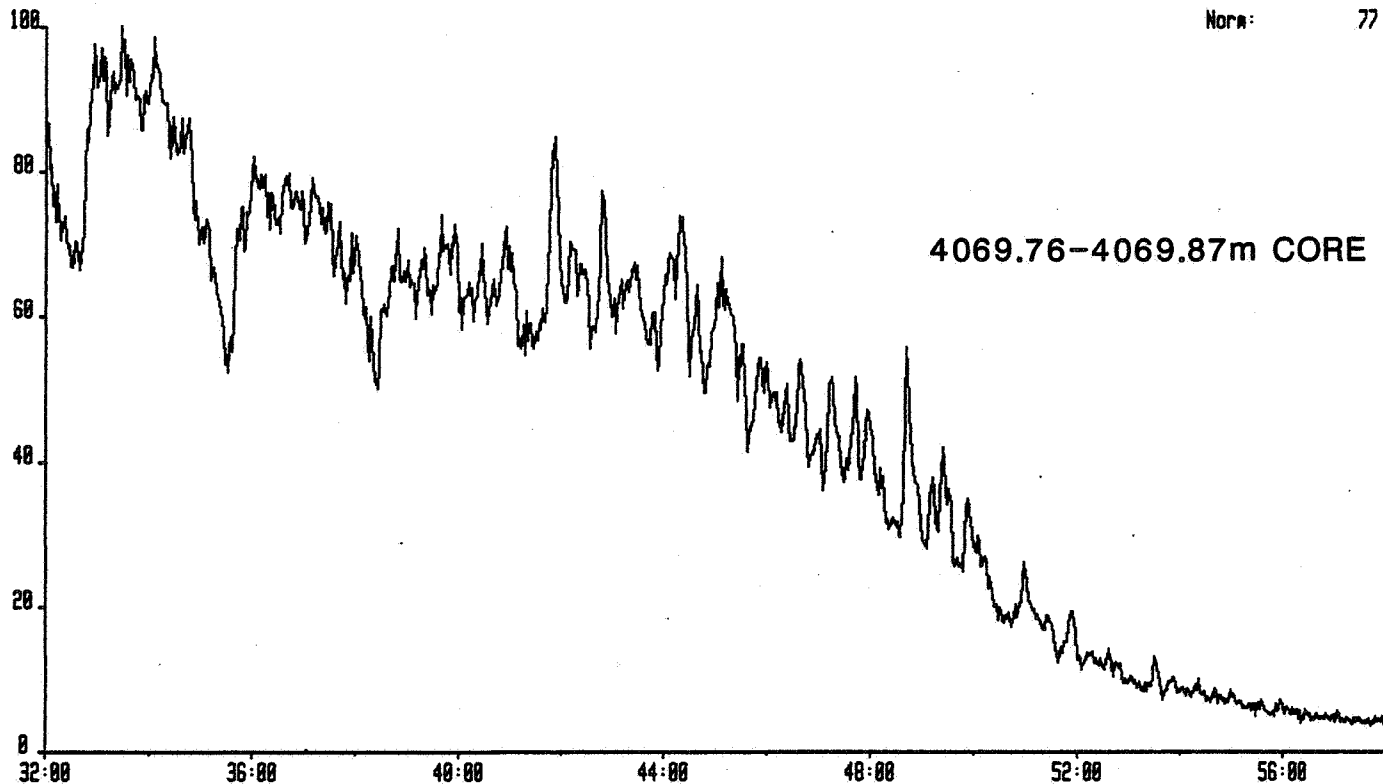


WELL 6506/12-5 TRIAROMATIC STERANES m/z 231

1334819 15-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 231.1288
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

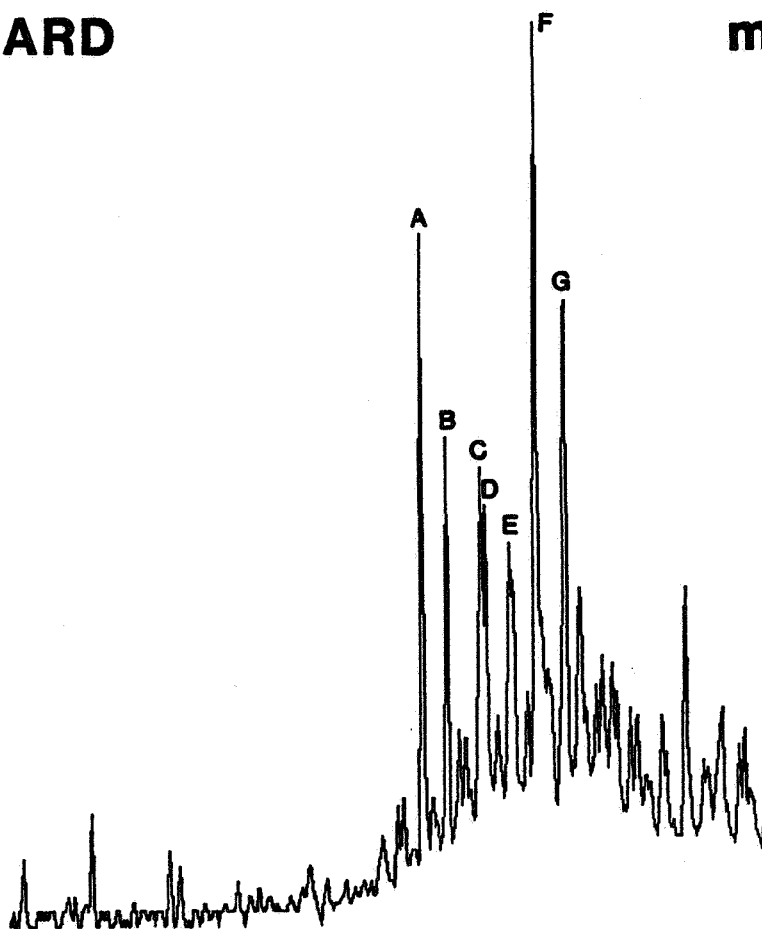
System:STETRITRP

Norm: 77



STANDARD

m/z 259



STERANE IDENTIFICATION

(M/Z 259 FRAGMENTOGRAM)

COMPOUND

ELEMENTAL COMPOSITION

A	13 β ,17 α -diacholestane (20S)	C ₂₇ H ₄₈
B	13 β ,17 α -diacholestane (20R)	C ₂₇ H ₄₈
C	13 α ,17 β -diacholestane (20R)	C ₂₇ H ₄₈
D	24,-methyl-13 β ,17 α -diacholestane (20S)	C ₂₈ H ₅₀
E	24,-methyl-13 β ,17 α -diacholestane (20R)	C ₂₈ H ₅₀
F	24,-ethyl-13 β ,17 α -diacholestane (20S)	C ₂₉ H ₅₂
G	24,-ethyl-13 β ,17 α -diacholestane (20R)	C ₂₉ H ₅₂

FIGURE 10a

MASS FRAGMENTOGRAMS

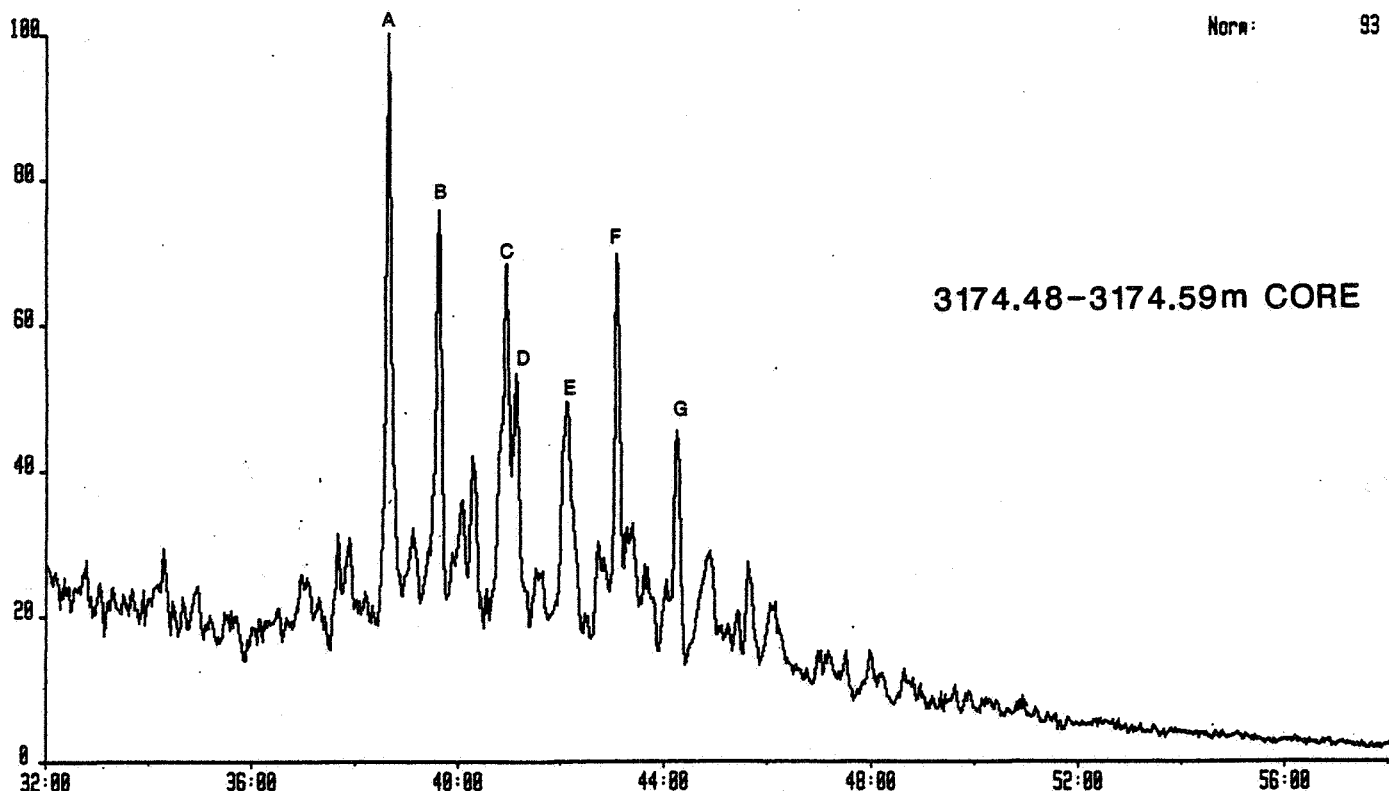
WELL 6506/12-5 REARRANGED STERANES m/z 259



1334885 15-JUL-86 Sr:Magnetic TS258 Rcnt:
 Sample 1 Injection 1 Group 1 Mass 259.2427
 Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 93



GEODAT 11-JUL-86 Sr:Magnetic TS258 Rcnt:
 Sample 1 Injection 1 Group 1 Mass 259.2427
 Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 60

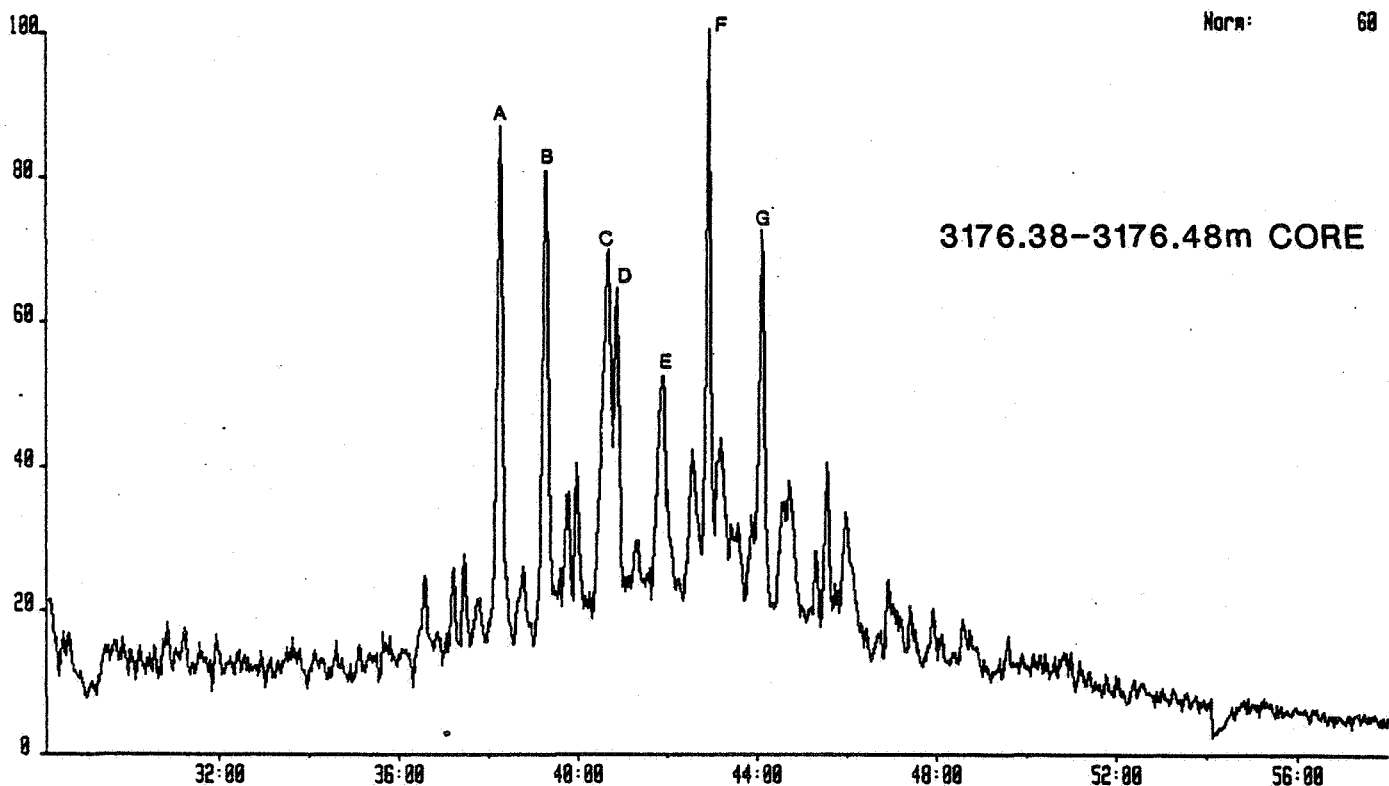


FIGURE 10b

MASS FRAGMENTOGRAMS

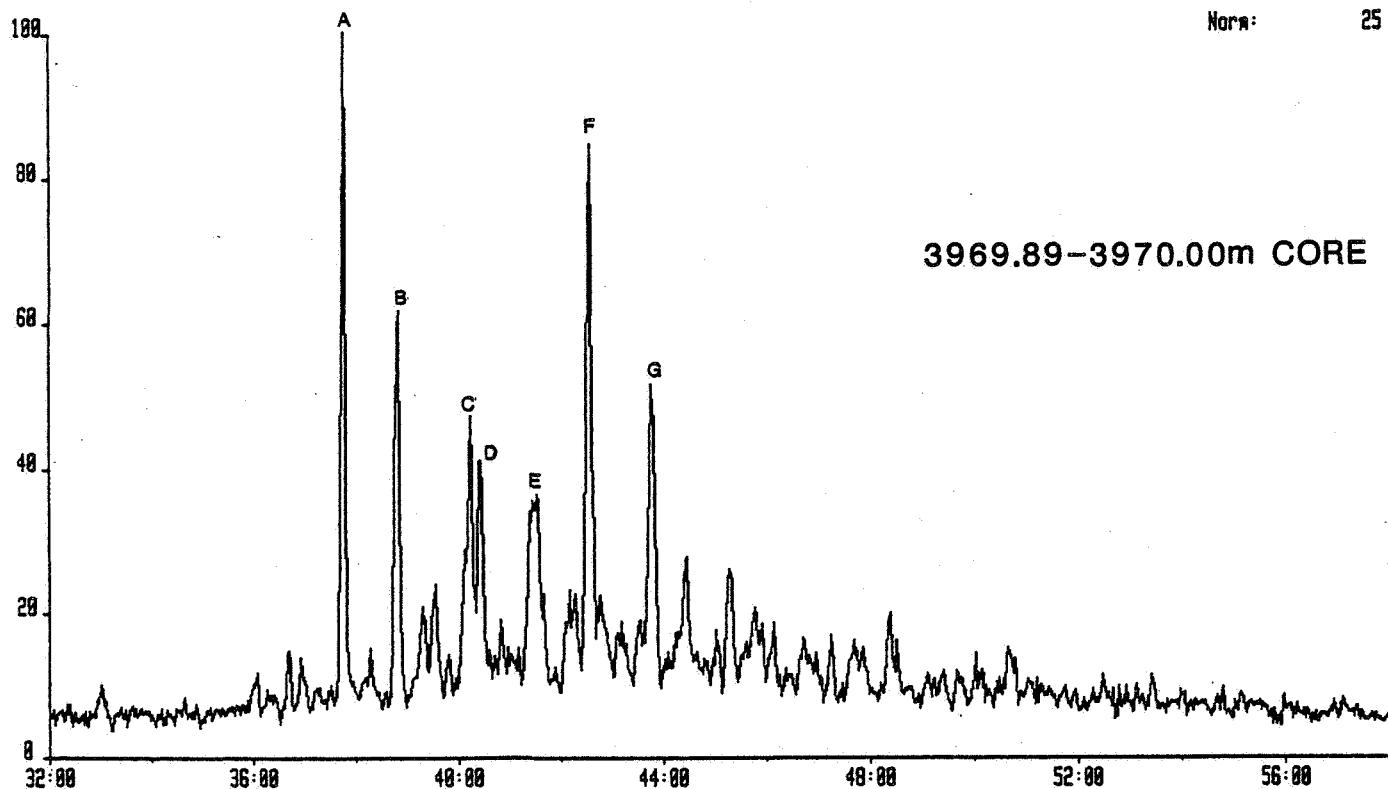


WELL 6506/12-5 REARRANGED STERANES m/z 259

1334010 11-JUL-86 Sir:Magnetic TS250 Acnt:
 Sample 1 Injection 1 Group 1 Mass 259.2427
 Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 25



1334012 15-JUL-86 Sir:Magnetic TS250 Acnt:
 Sample 1 Injection 1 Group 1 Mass 259.2427
 Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 154

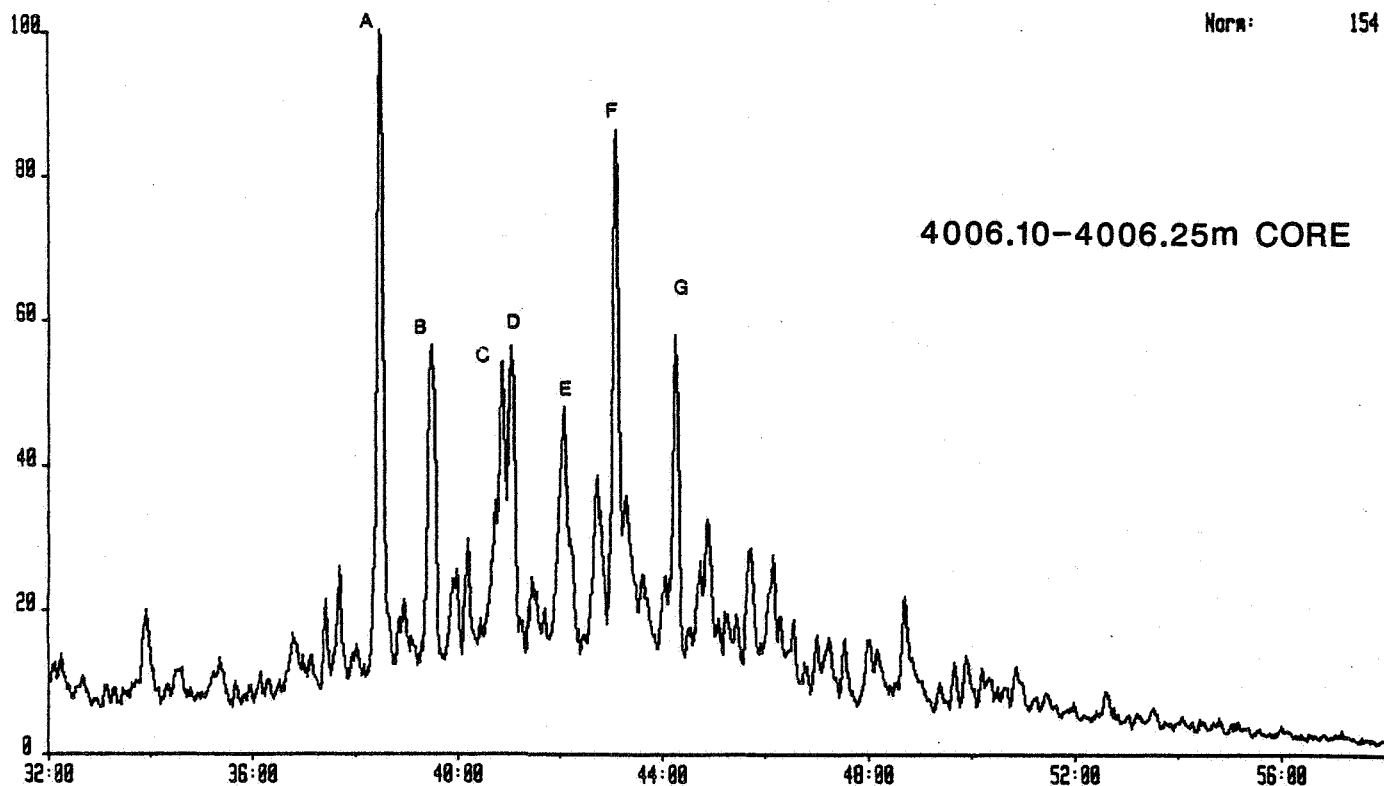


FIGURE 10c

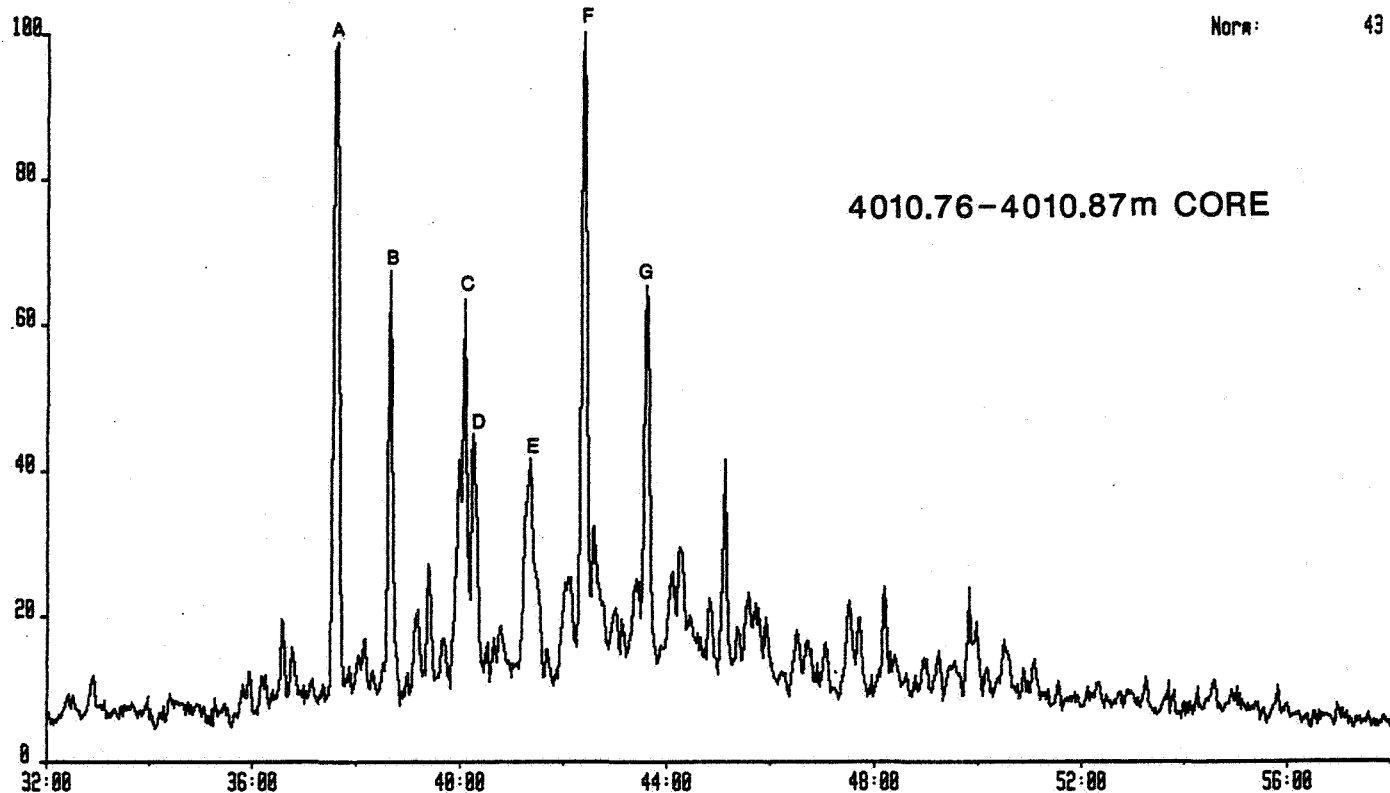
MASS FRAGMENTOGRAMS



WELL 6506/12-5 REARRANGED STERANES m/z 259

1334013 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



1334014 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

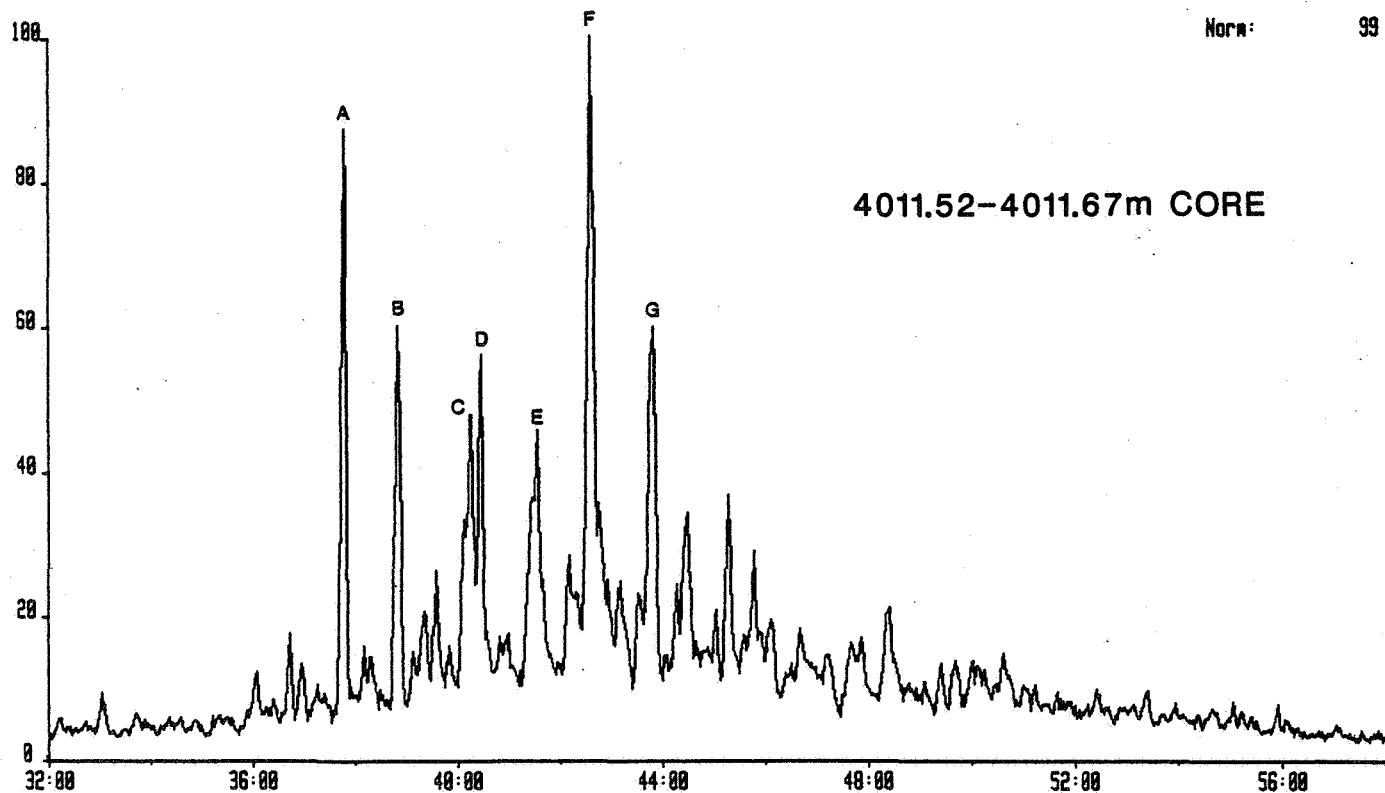


FIGURE 10d

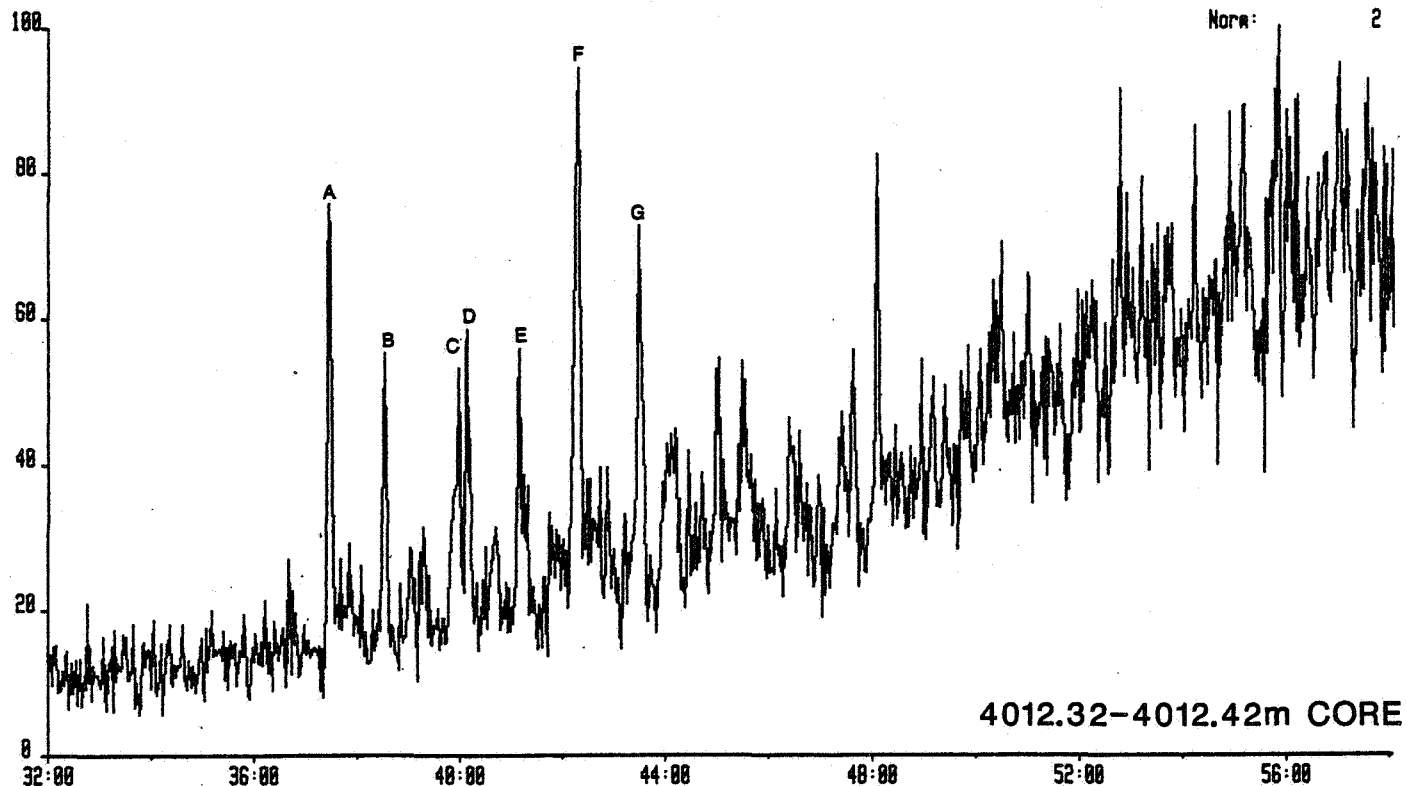
MASS FRAGMENTOGRAMS



WELL 6506/12-5 REARRANGED STERANES m/z 259

1334015 14-JUL-86 Sir:Magnetic TS250 Rcnt:
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



1334017 14-JUL-86 Sir:Magnetic TS250 Rcnt:
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

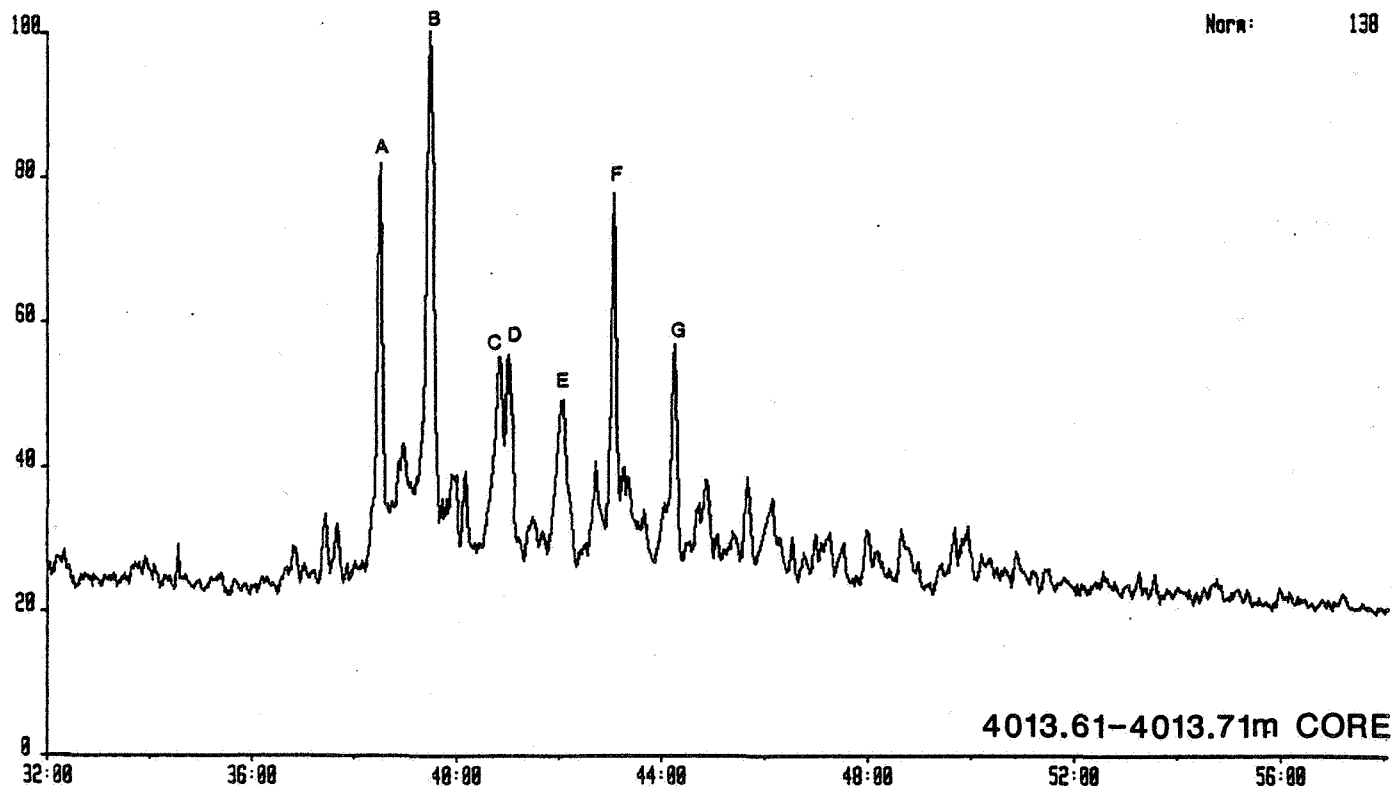


FIGURE 10e

MASS FRAGMENTOGRAMS

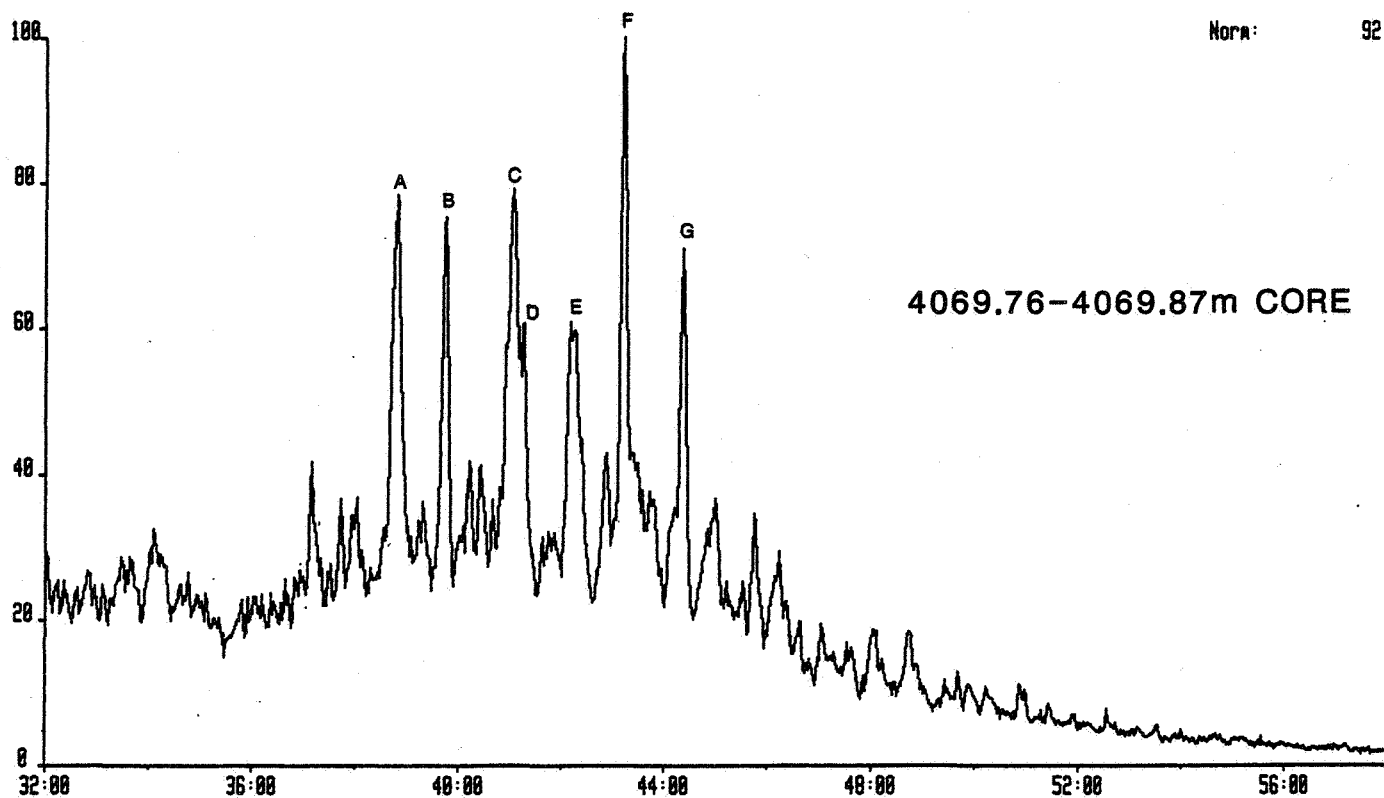
WELL 6506/12-5 REARRANGED STERANES m/z 259



1334019 15-JUL-86 Sr:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 92



3174.00-3177.50m DST # 4

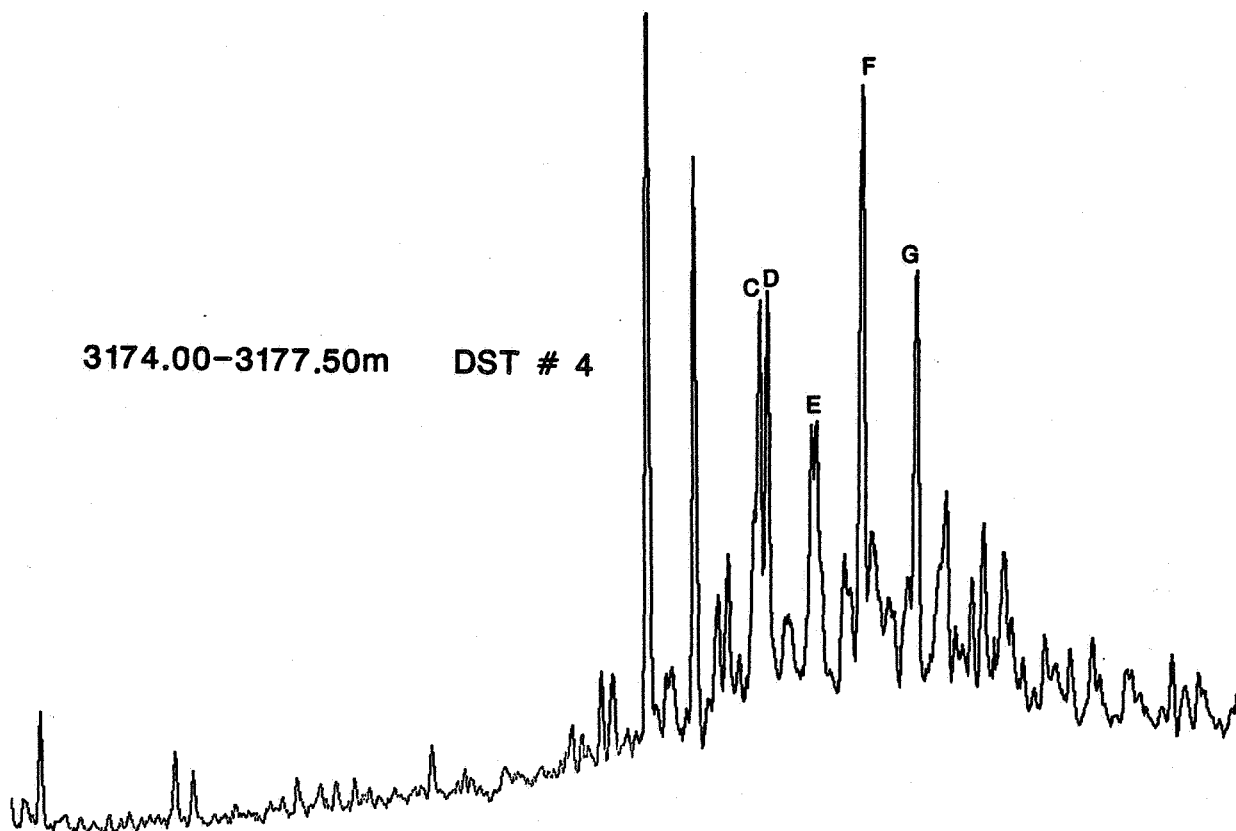
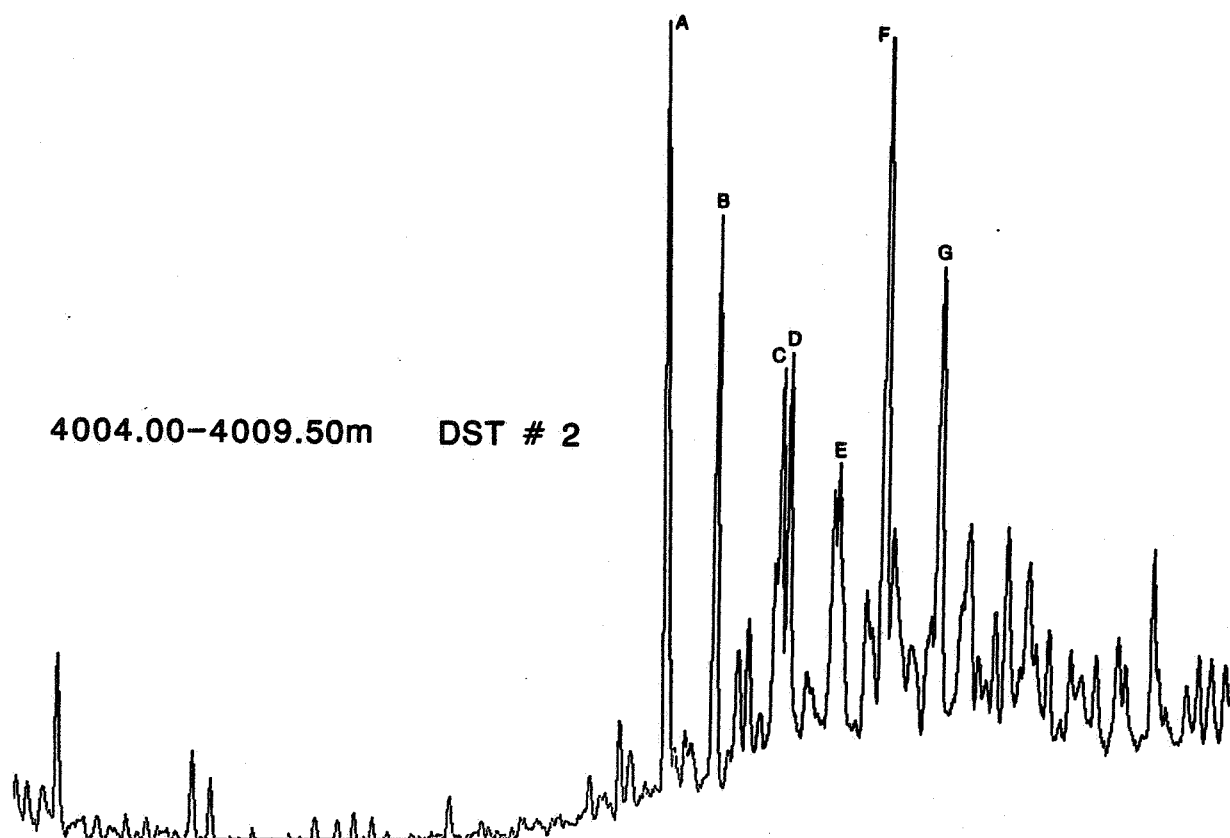


FIGURE 10f

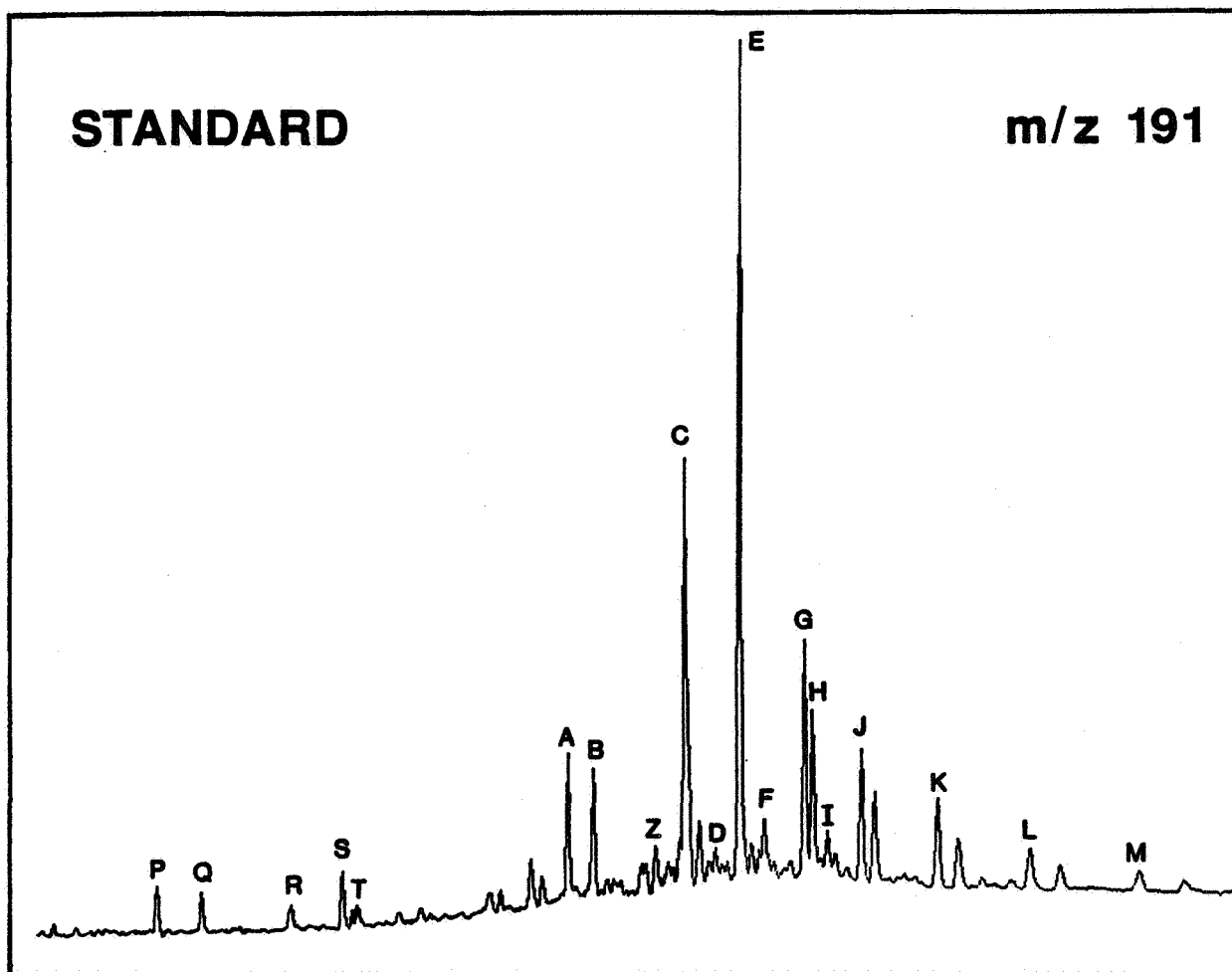
MASS FRAGMENTOGRAMS

WELL 6506/12-5 REARRANGED STERANES m/z 259



STANDARD

m/z 191



TRITERPANE IDENTIFICATION

(M/Z 191 FRAGMENTOGRAM)

COMPOUND	ELEMENTAL COMPOSITION
A 18 (H), 21 (H)-trisinorneohopane (Ts)	C ₂₇ H ₄₆
B 17 (H), 21 (H)-trisinorhopane (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 11a

MASS FRAGMENTOGRAMS



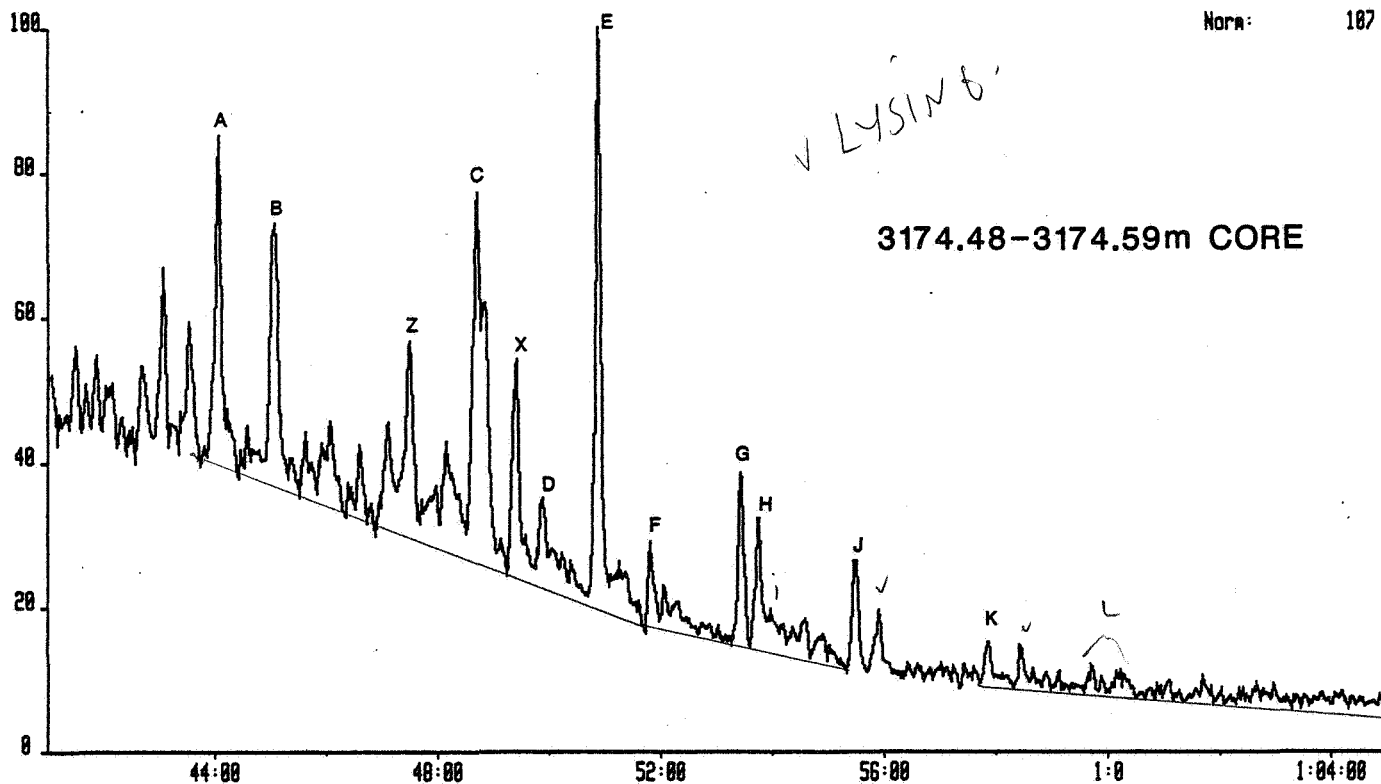
WELL 6506/12-5

TRITERPANES m/z 191

1334005 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

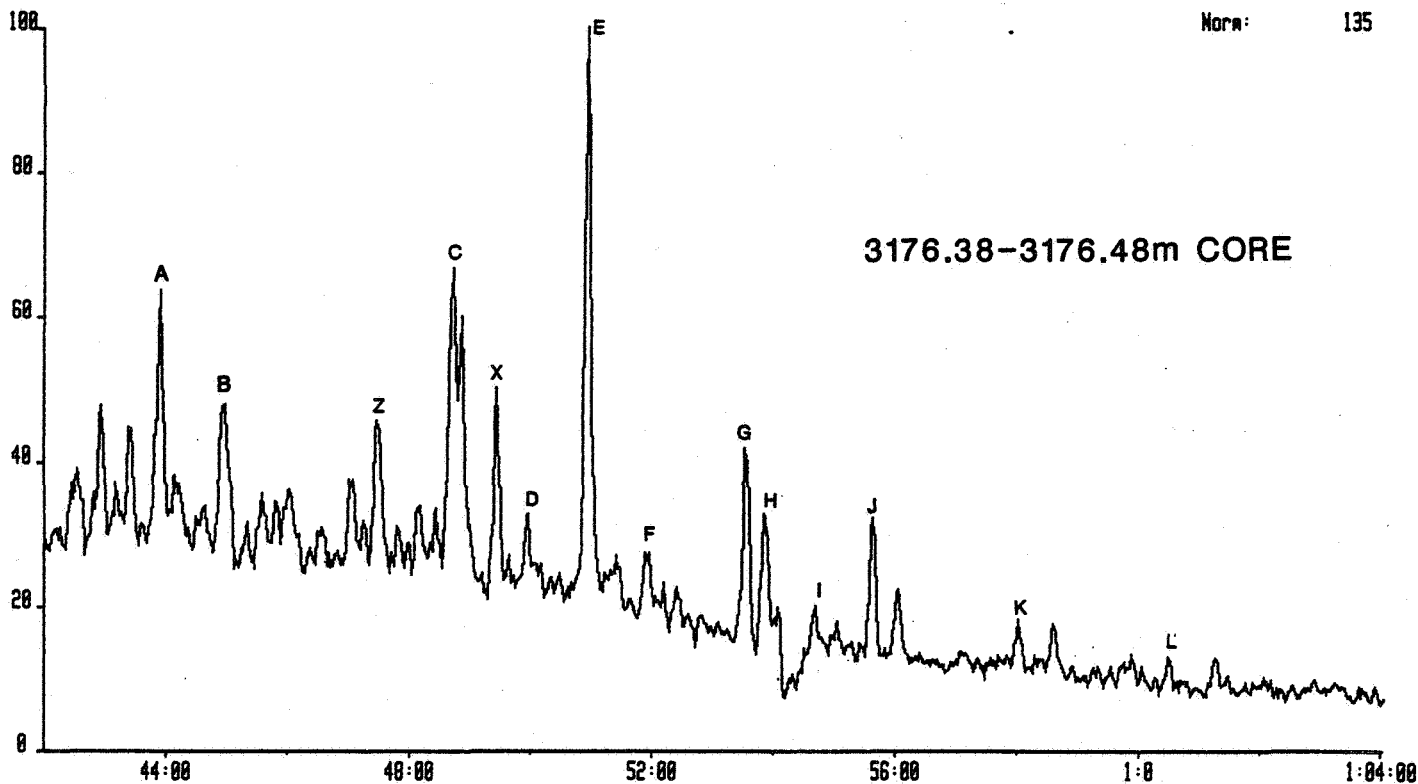
Norm: 187



GEOBAT 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 135





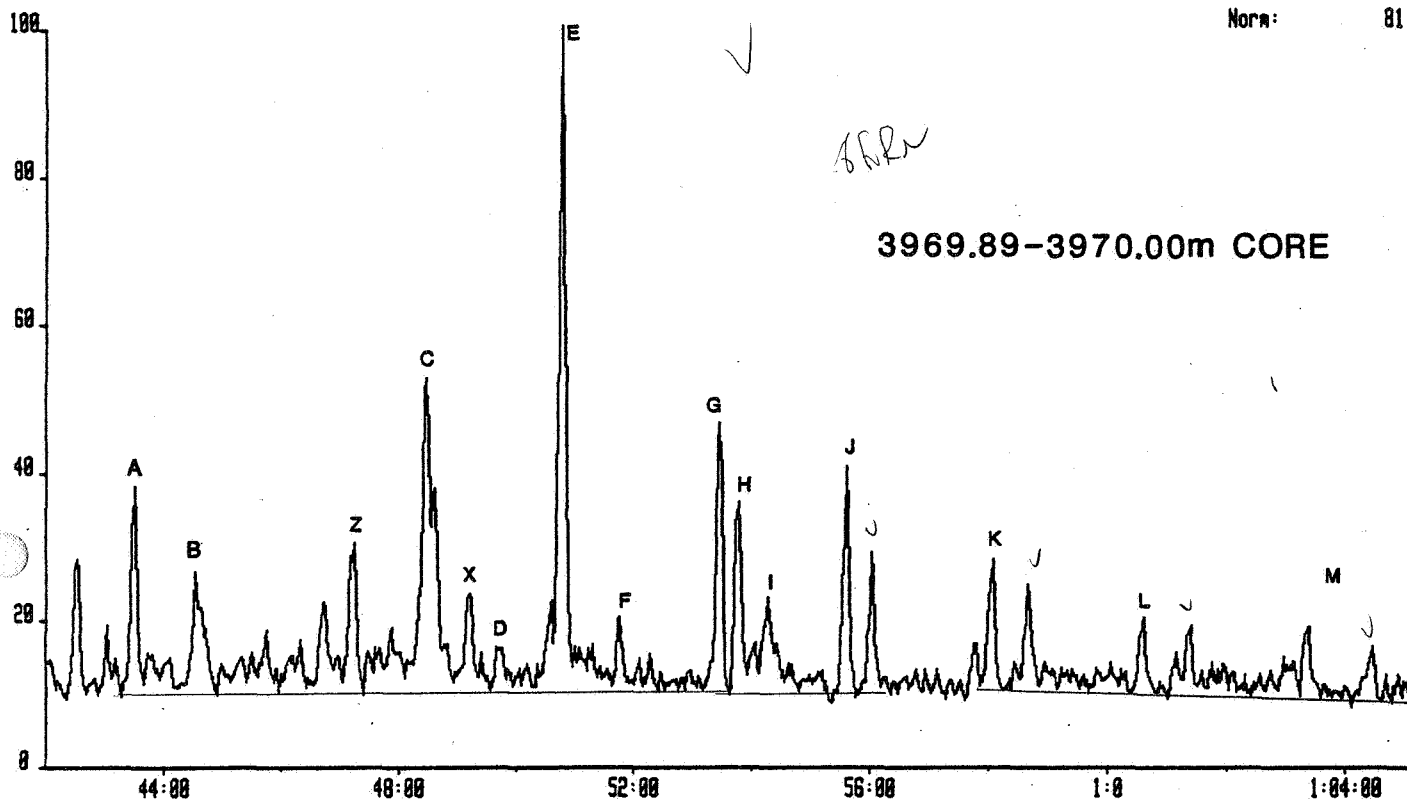
WELL 6506/12-5

TRITERPANES m/z 191

1334010 11-JUL-86 Sr:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

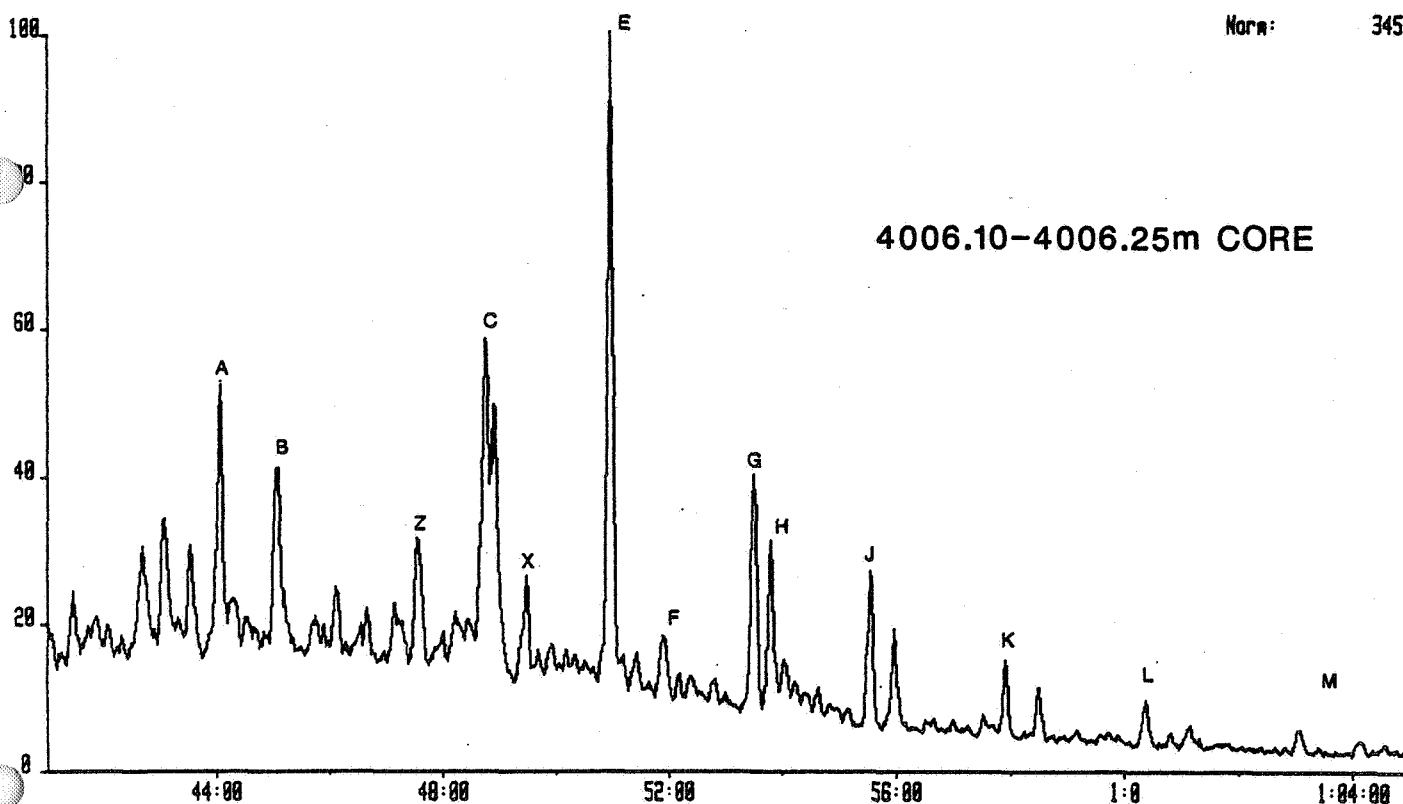
Norm: 81



1334012 15-JUL-86 Sr:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 345





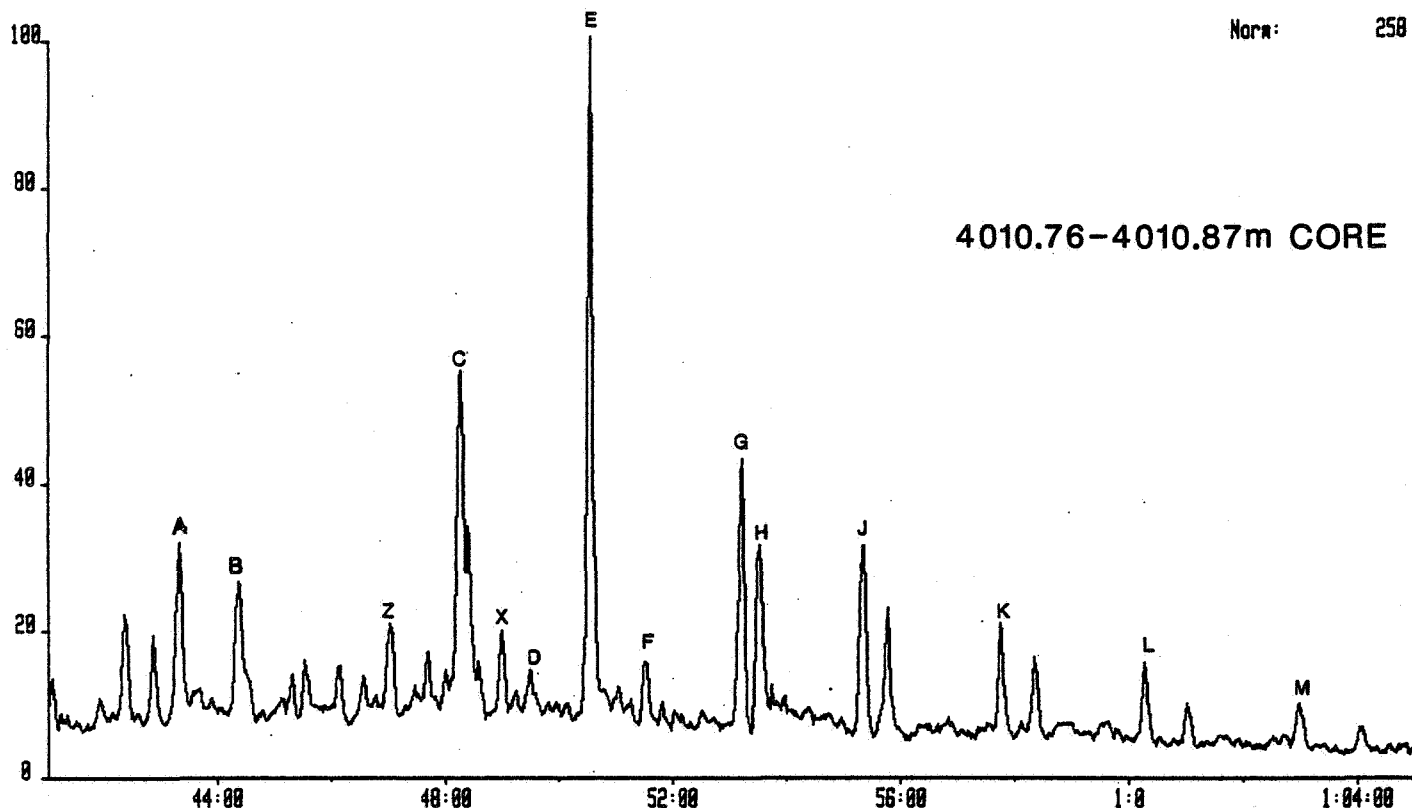
WELL 6506/12-5

TRITERPANES m/z 191

1334013 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

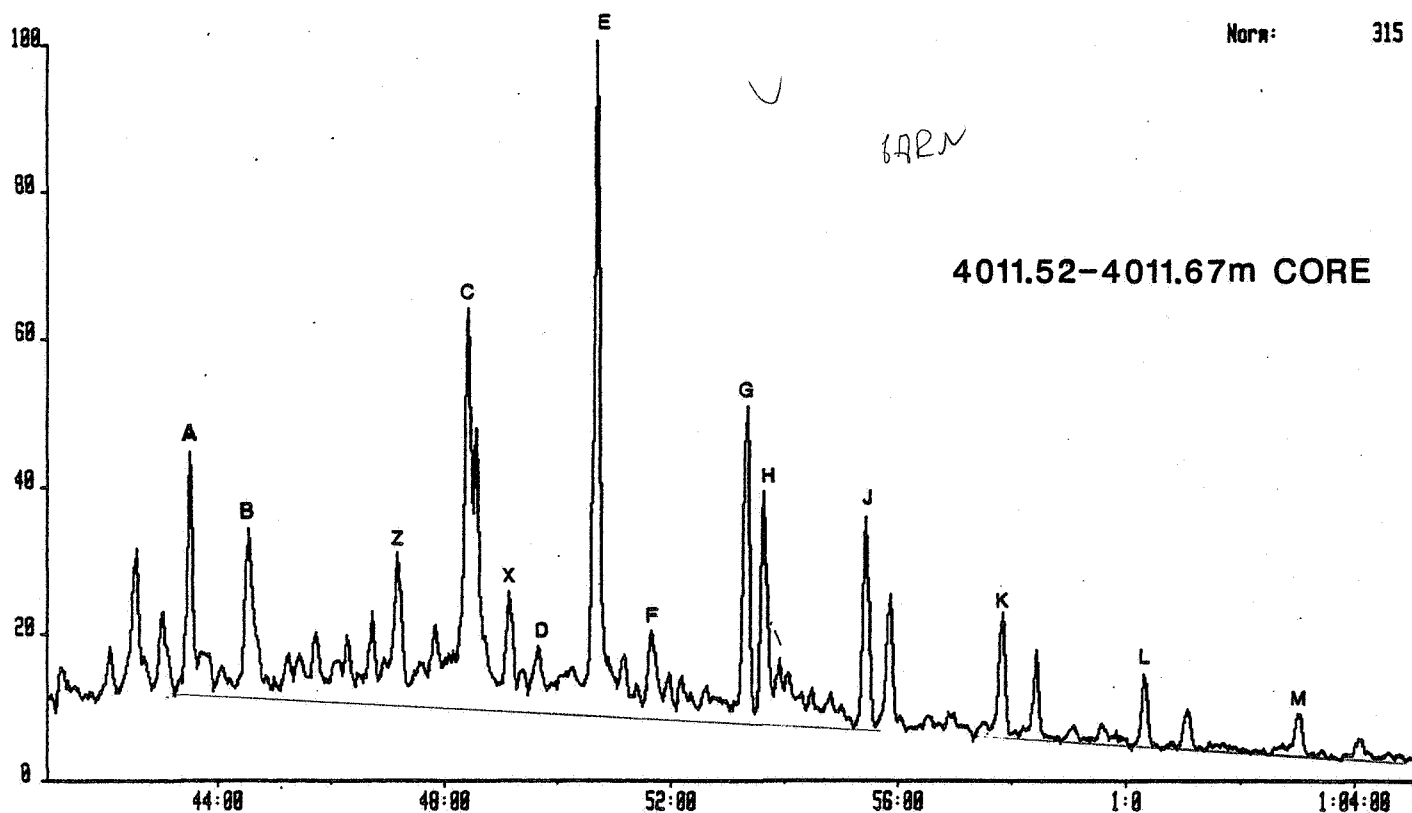
Norm: 258



1334014 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 315





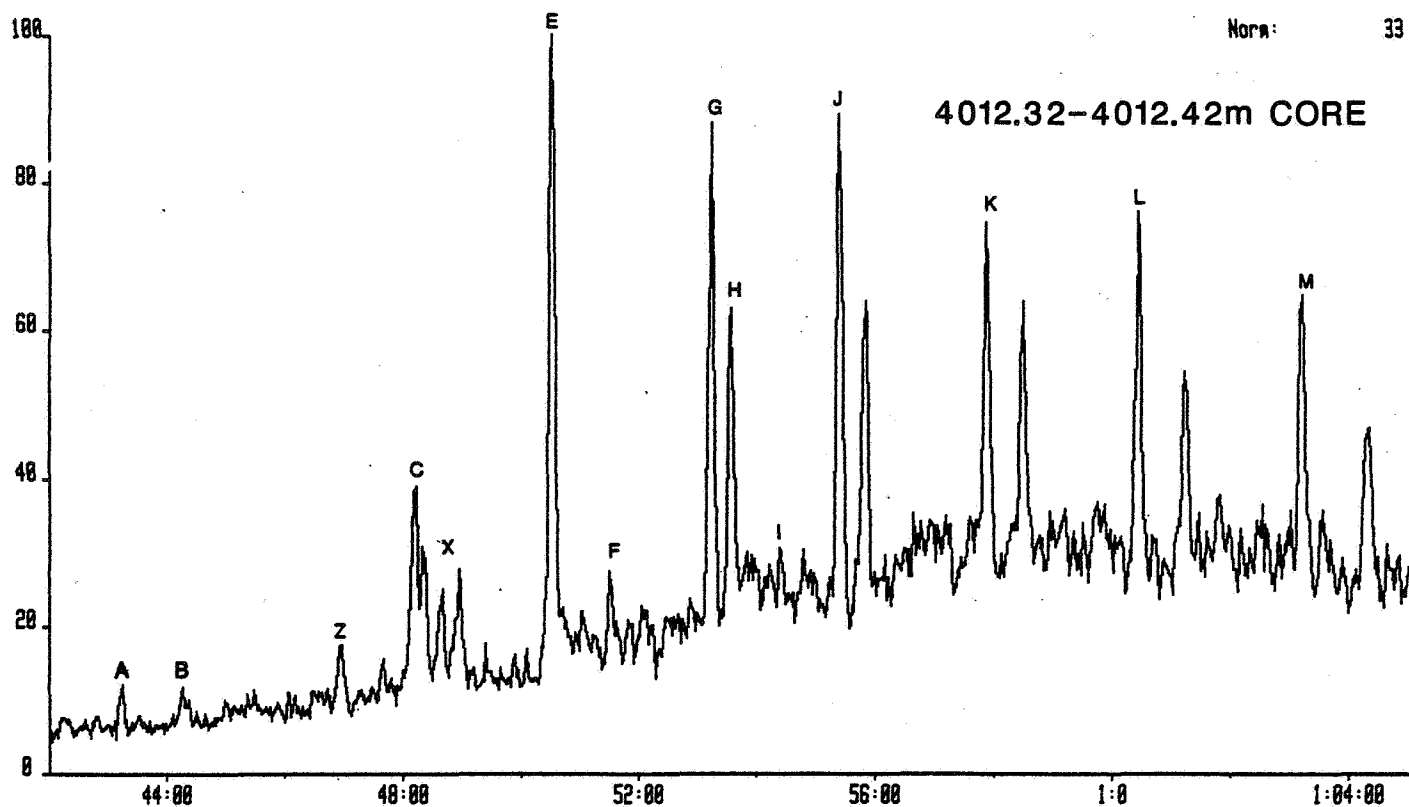
WELL 6506/12-5

TRITERPANES m/z 191

1334815 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

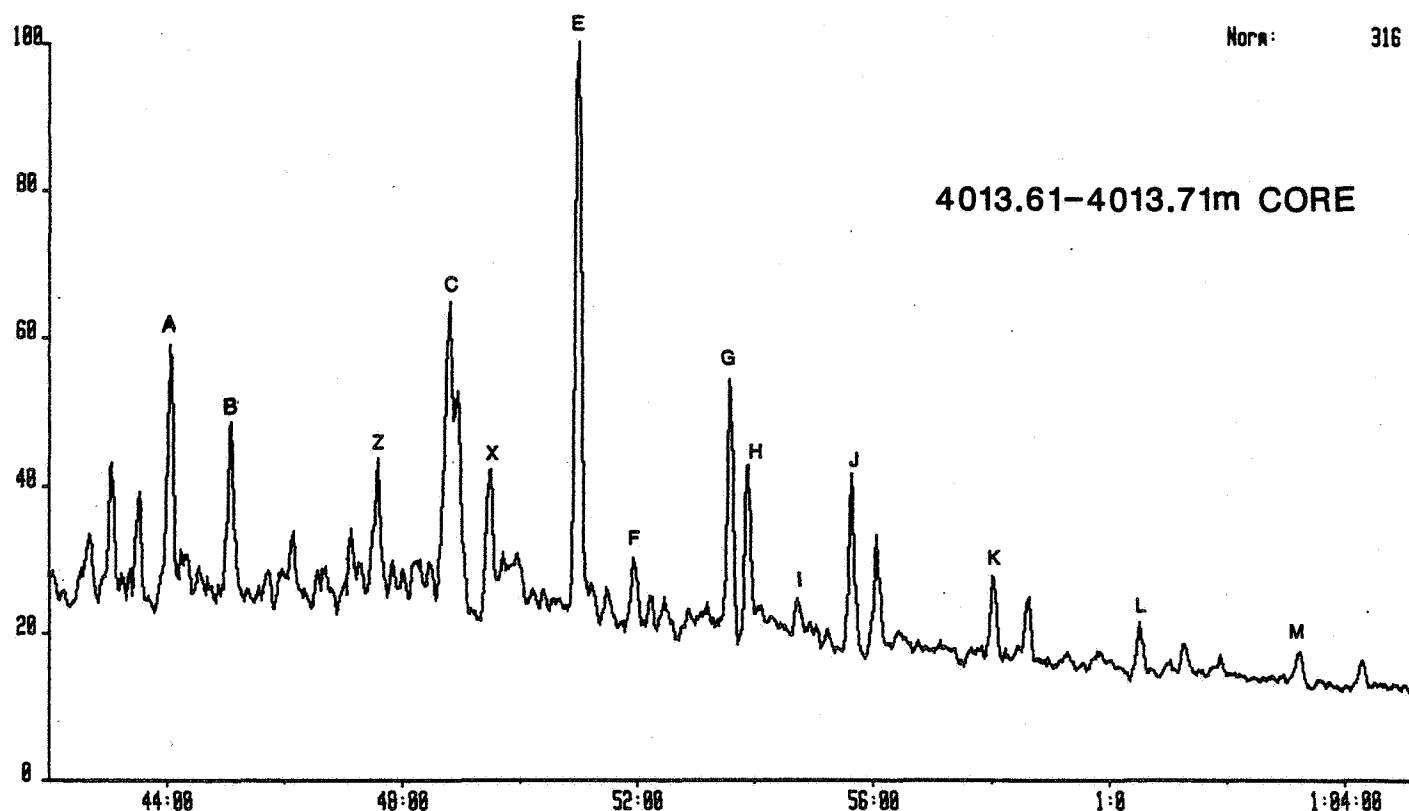
Norm: 33



1334817 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 316





WELL 6506/12-5

TRITERPANES m/z 191

1334019 15-JUL-86 Str:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 221

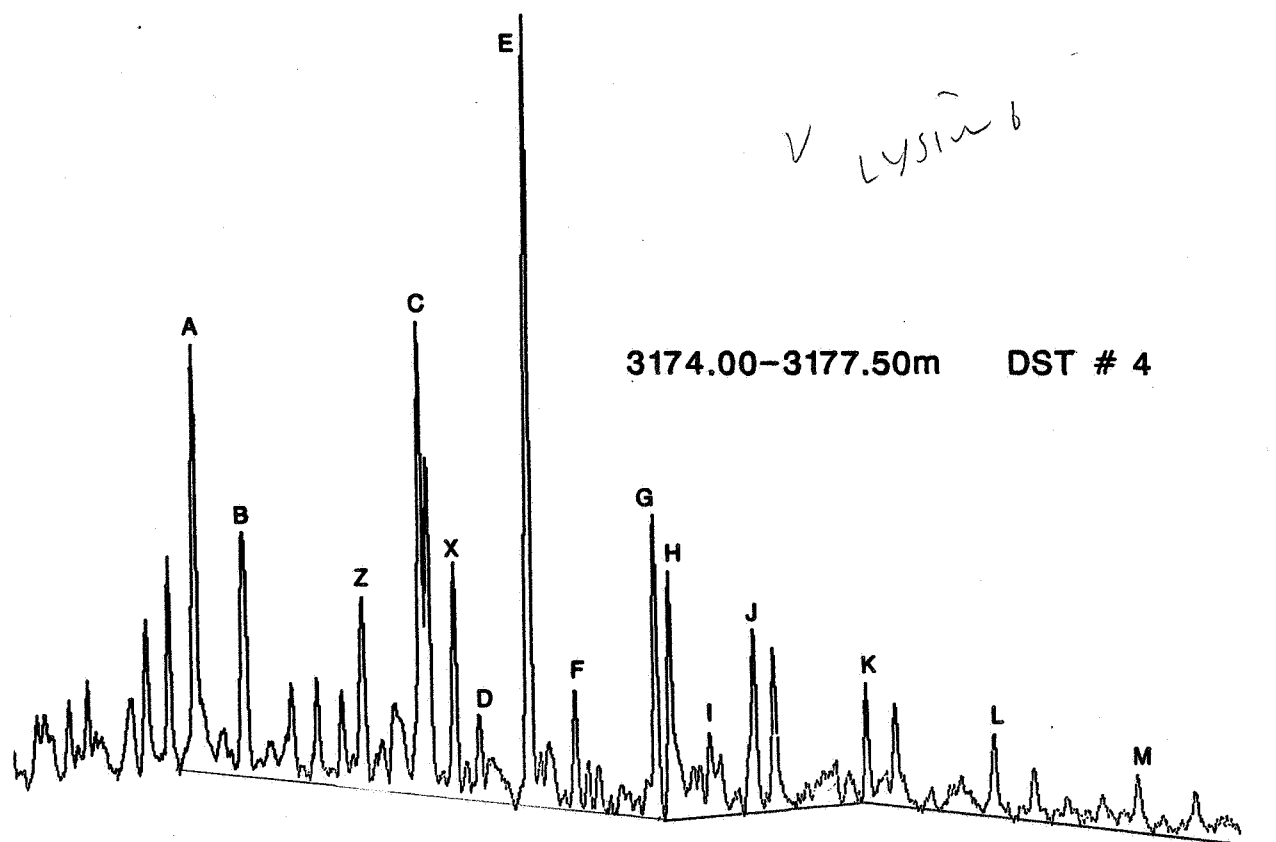
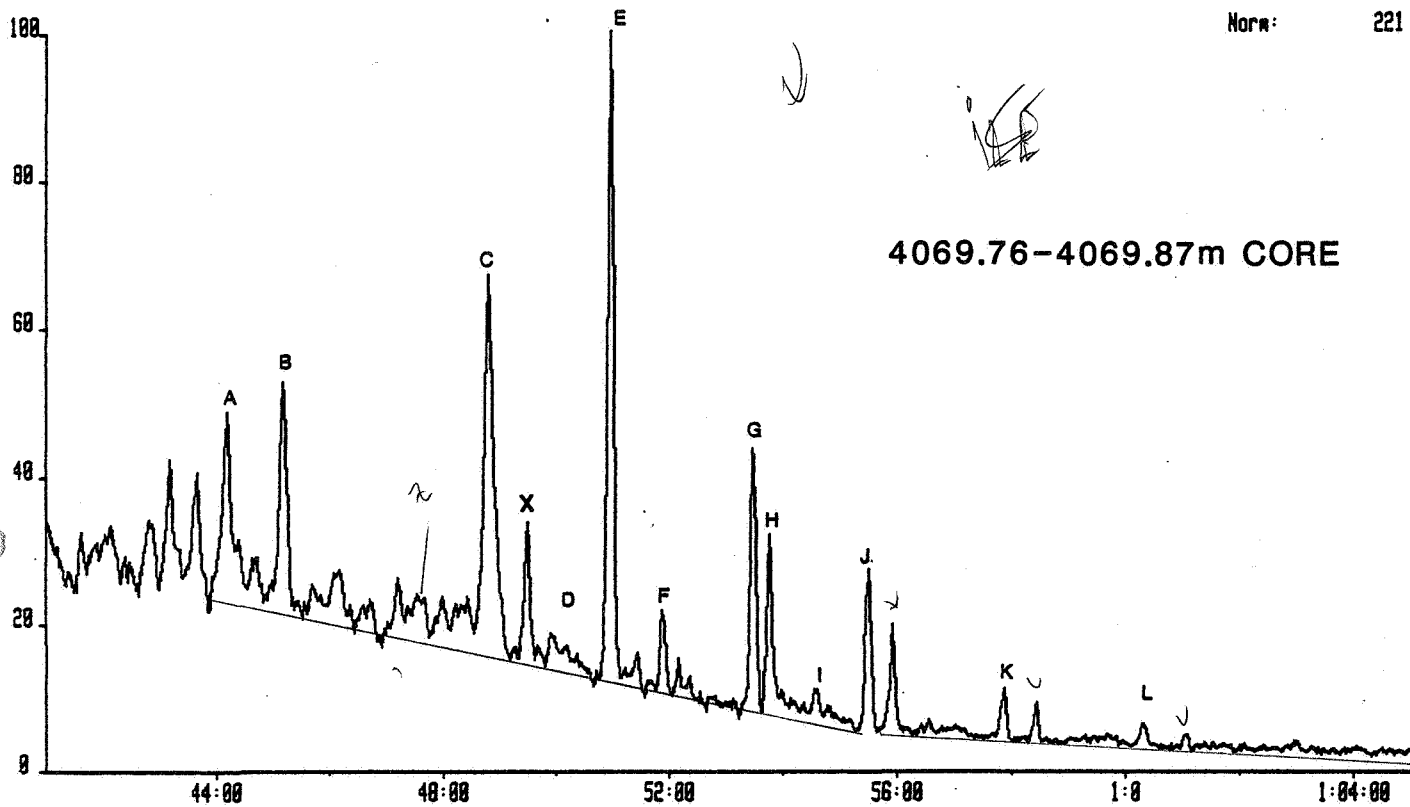
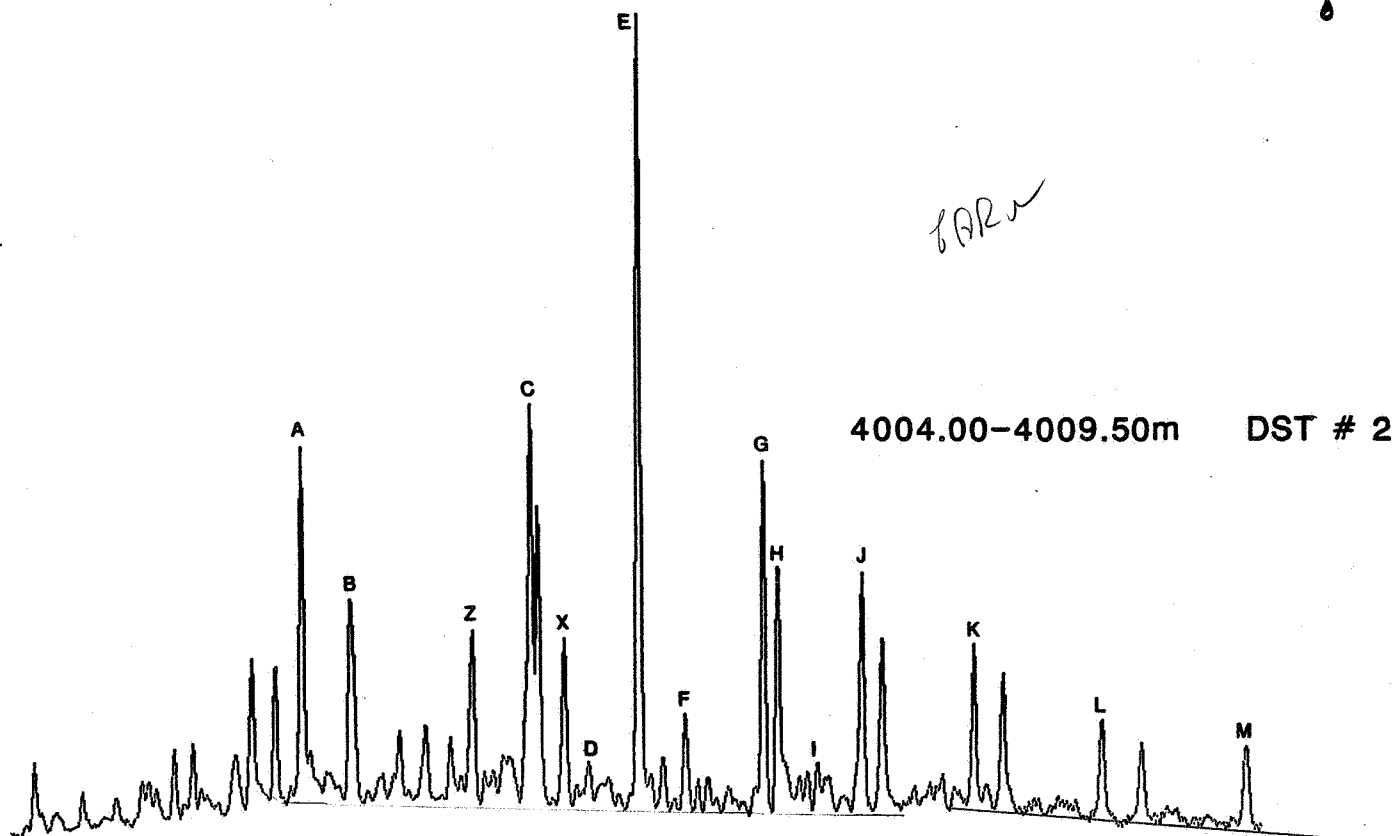


FIGURE 11f

MASS FRAGMENTOGRAMS

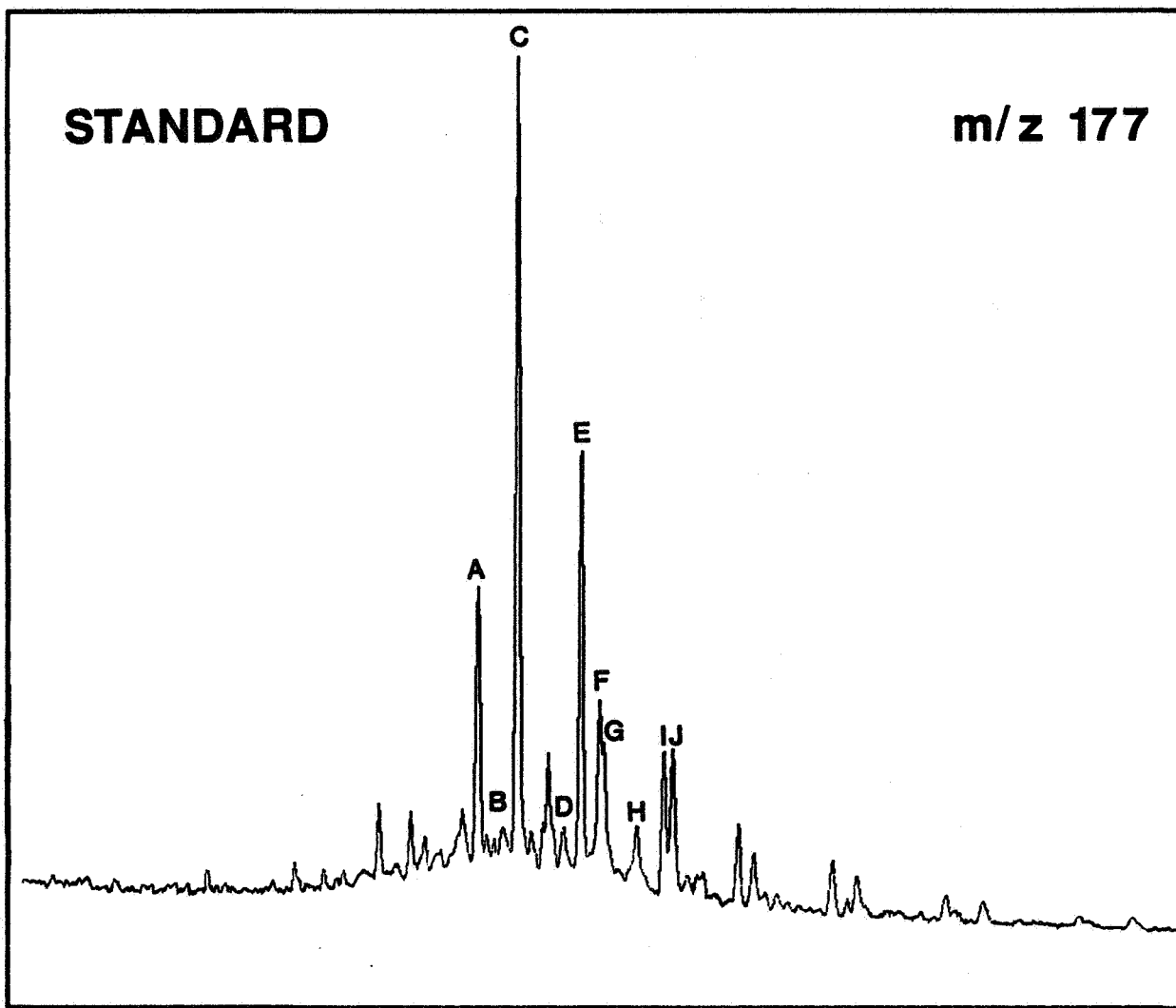
WELL 6506/12-5

TRITERPANES m/z 191



STANDARD

m/z 177



DEMETHYLATED HOPANES

(m/z 177 FRAGMENTOGRAM)

COMPOUND

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

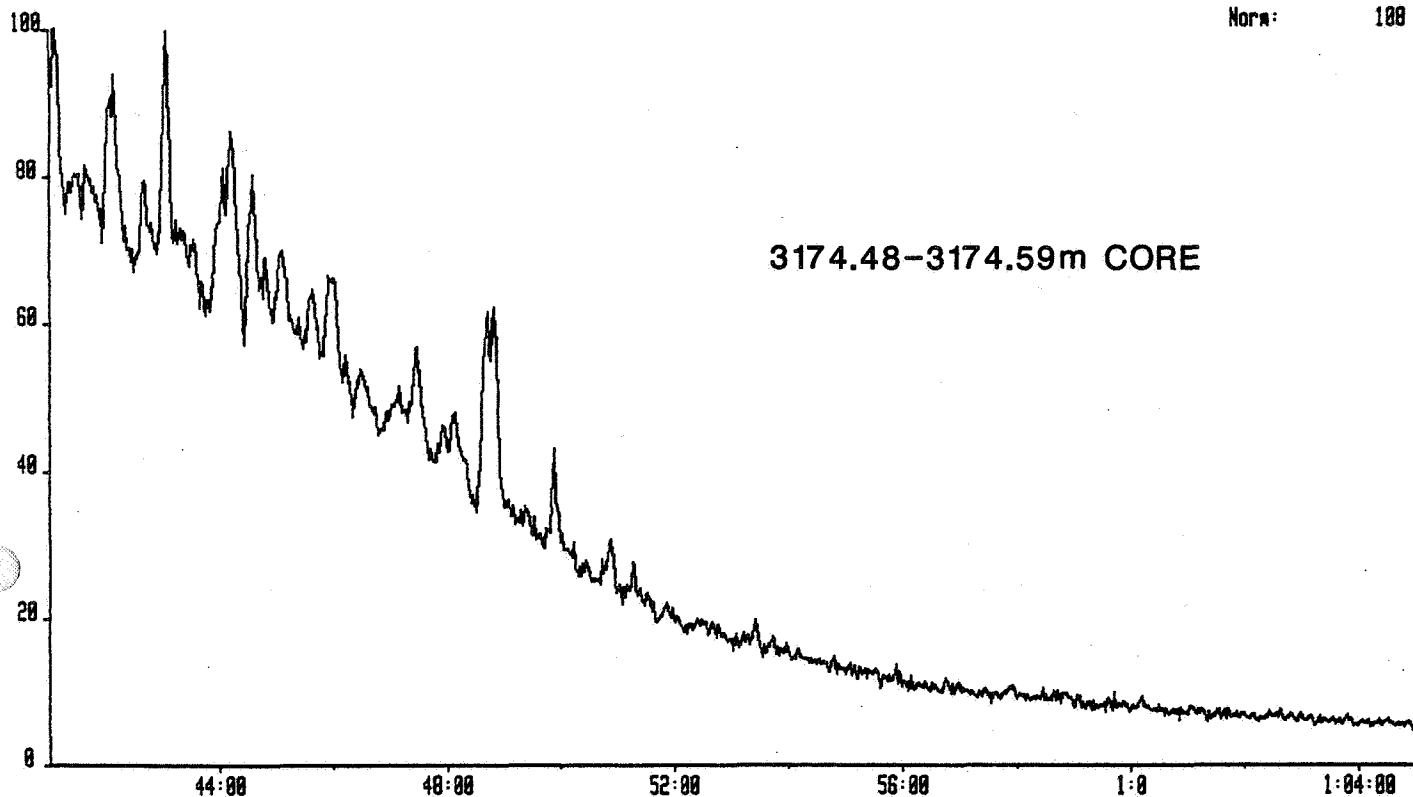


WELL 6506/12-5 DEMETHYLATED HOPANES m/z 177

1334005 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 100



GEOBAT 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 105

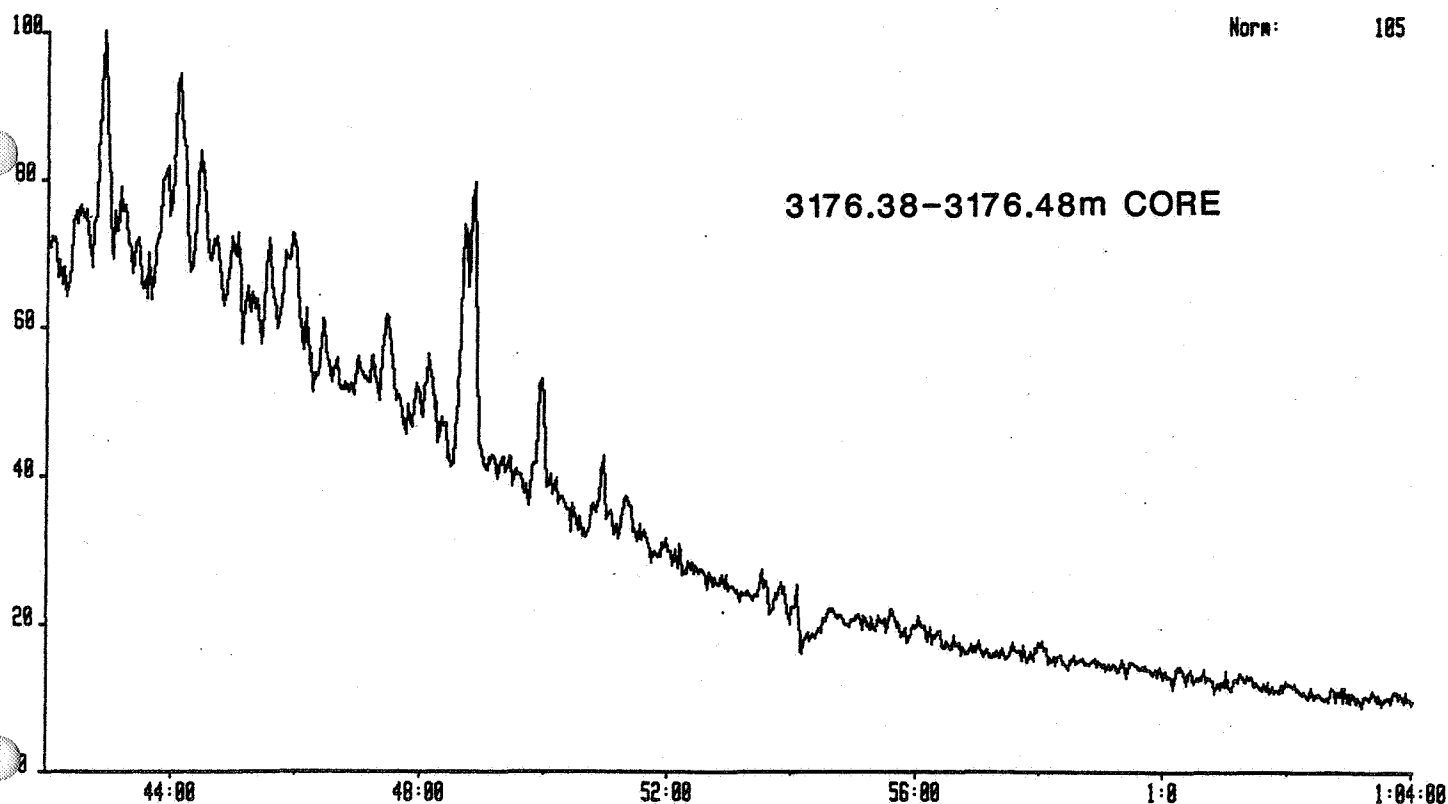


FIGURE 12b

MASS FRAGMENTOGRAMS



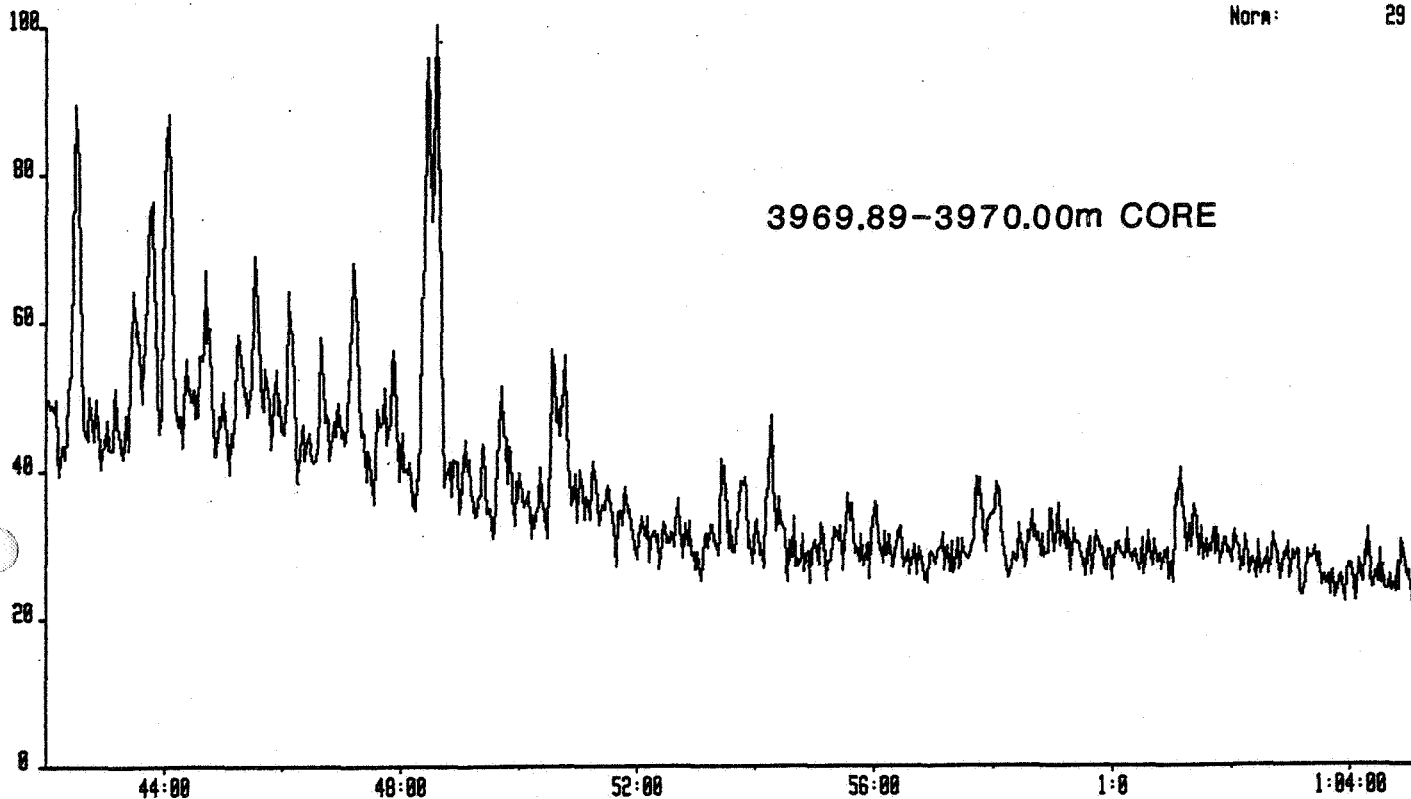
WELL 6506/12-5 DEMETHYLATED HOPANES m/z 177

1334818 11-JUL-86 Sir:Magnetic TS258 Acnt: .
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm:

29

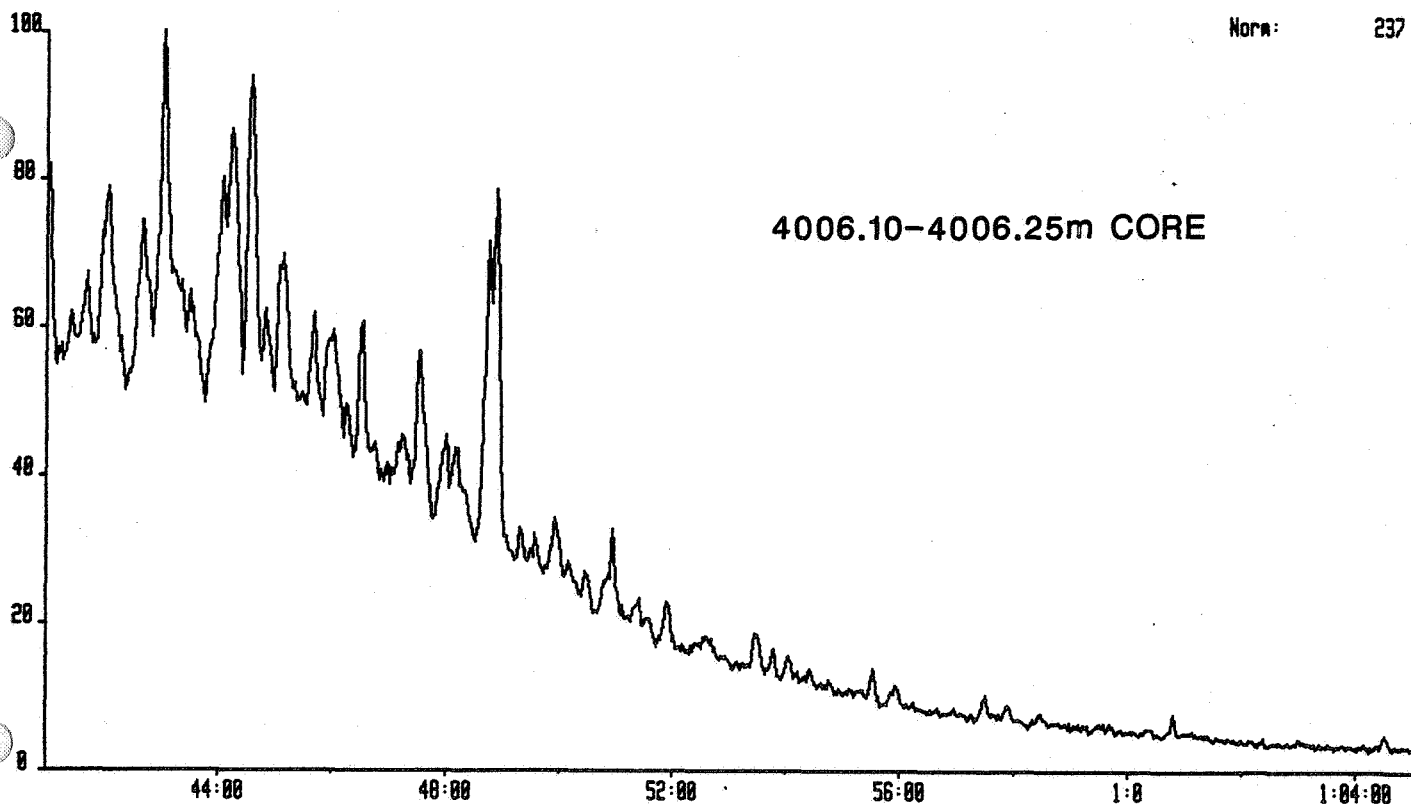


1334812 15-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm:

237





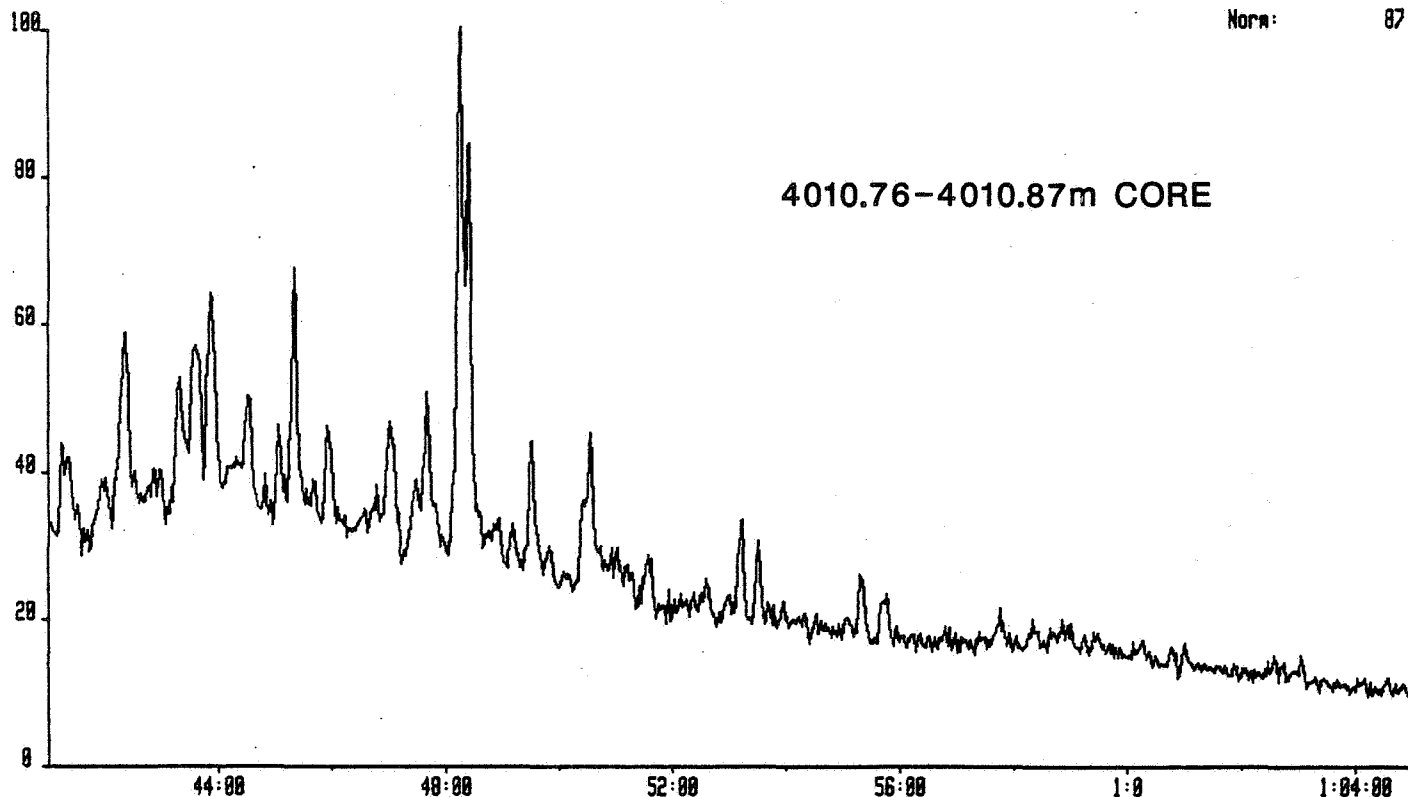
WELL 6506/12-5 DEMETHYLATED HOPANES m/z 177

1334013 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm:

87

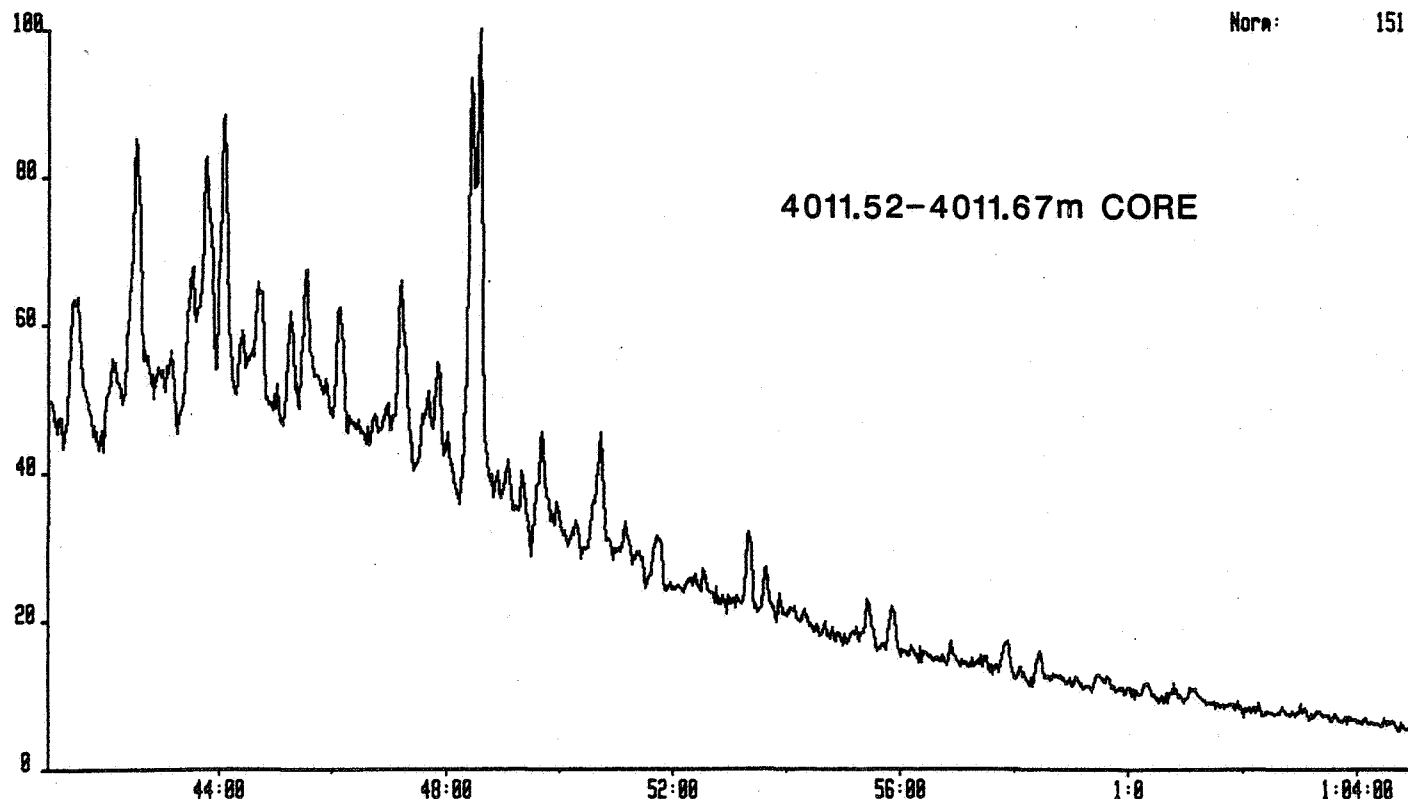


1334014 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm:

151

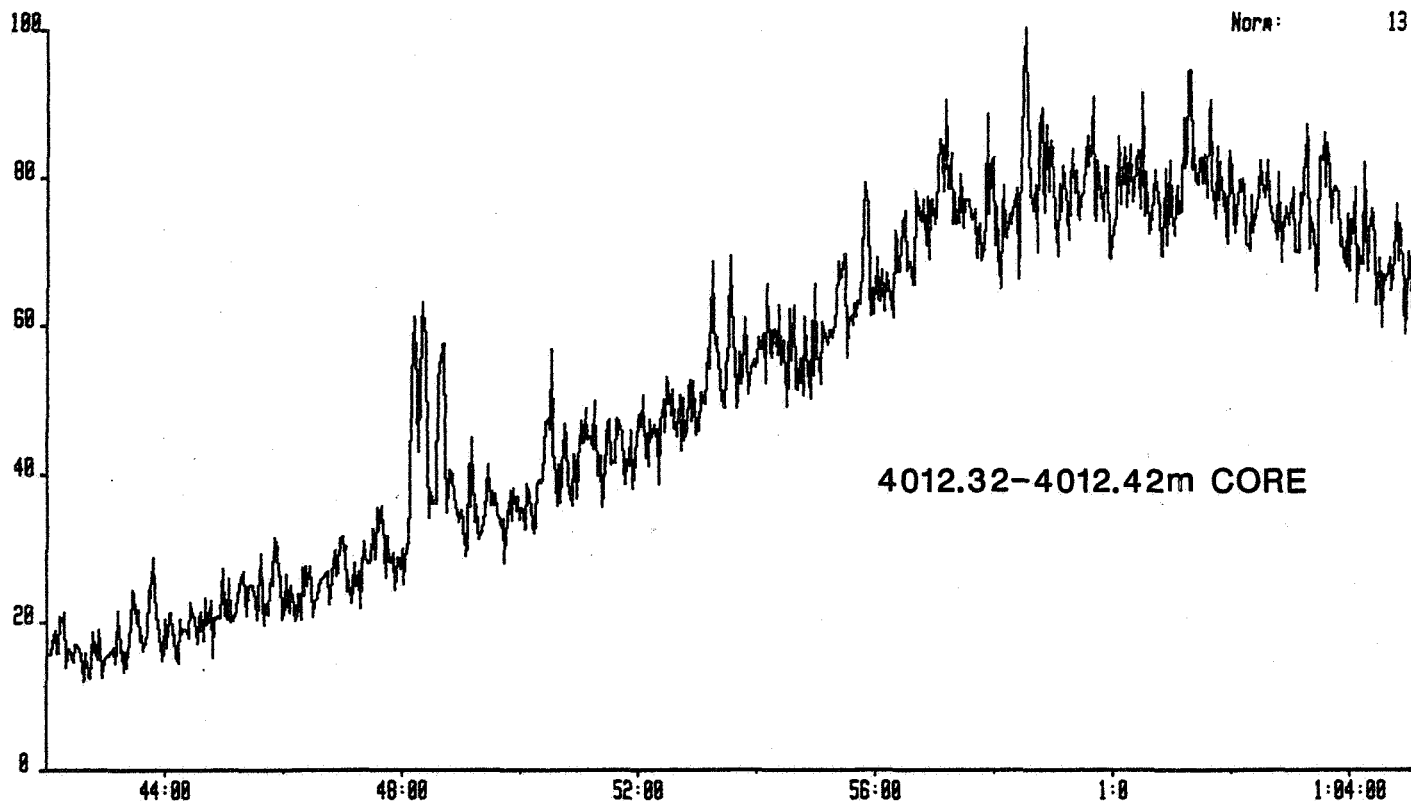




WELL 6506/12-5 DEMETHYLATED HOPANES m/z 177

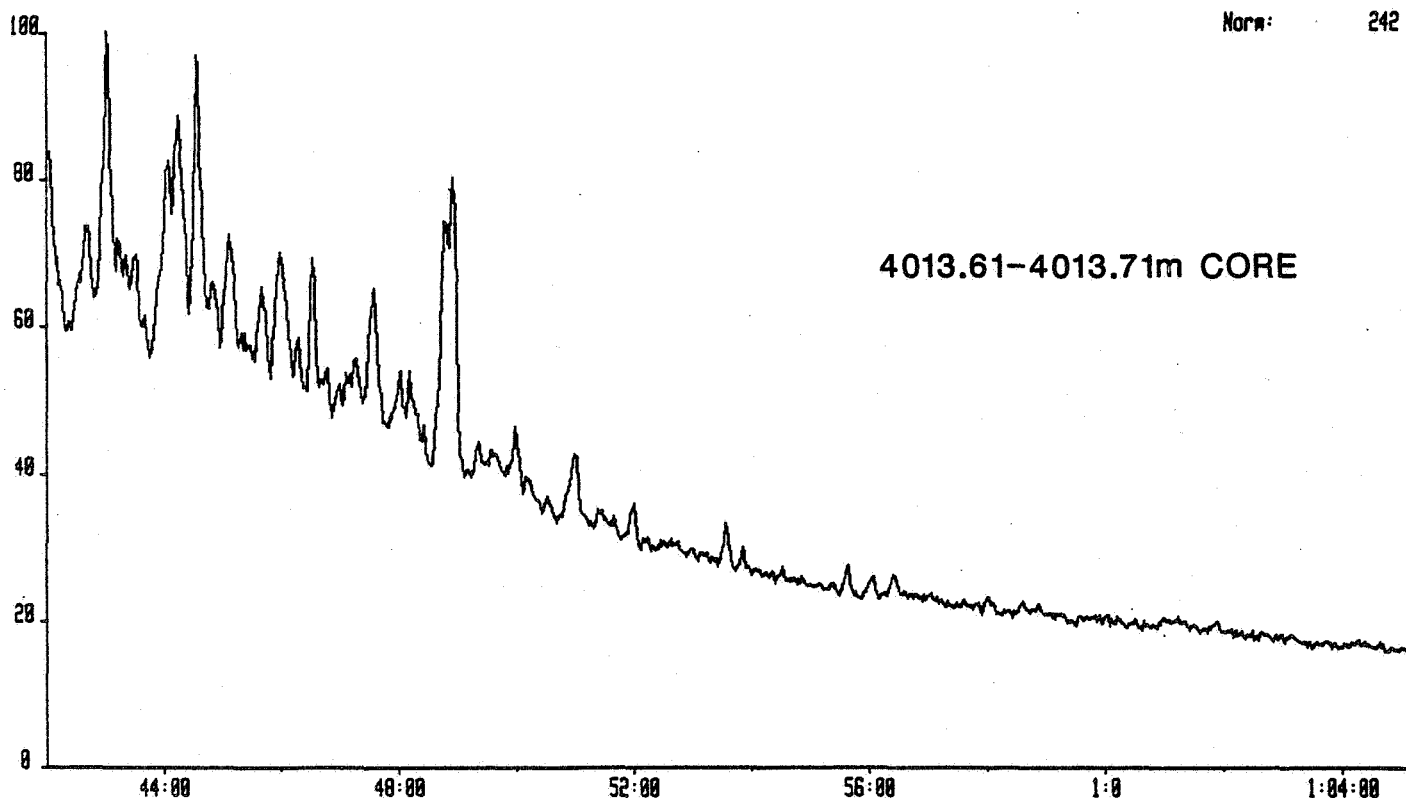
1334815 14-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



1334817 14-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP





WELL 6506/12-5 DEMETHYLATED HOPANES m/z 177

1334819 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 155

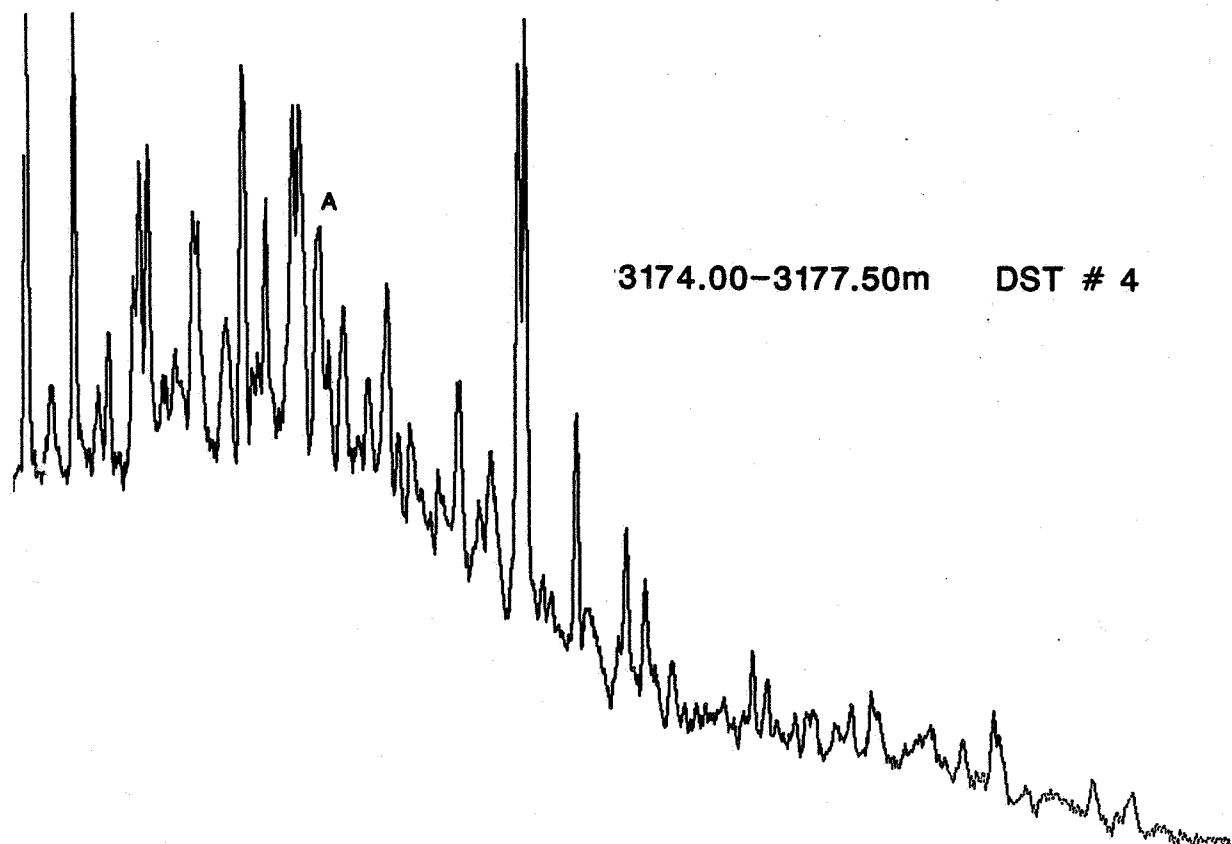
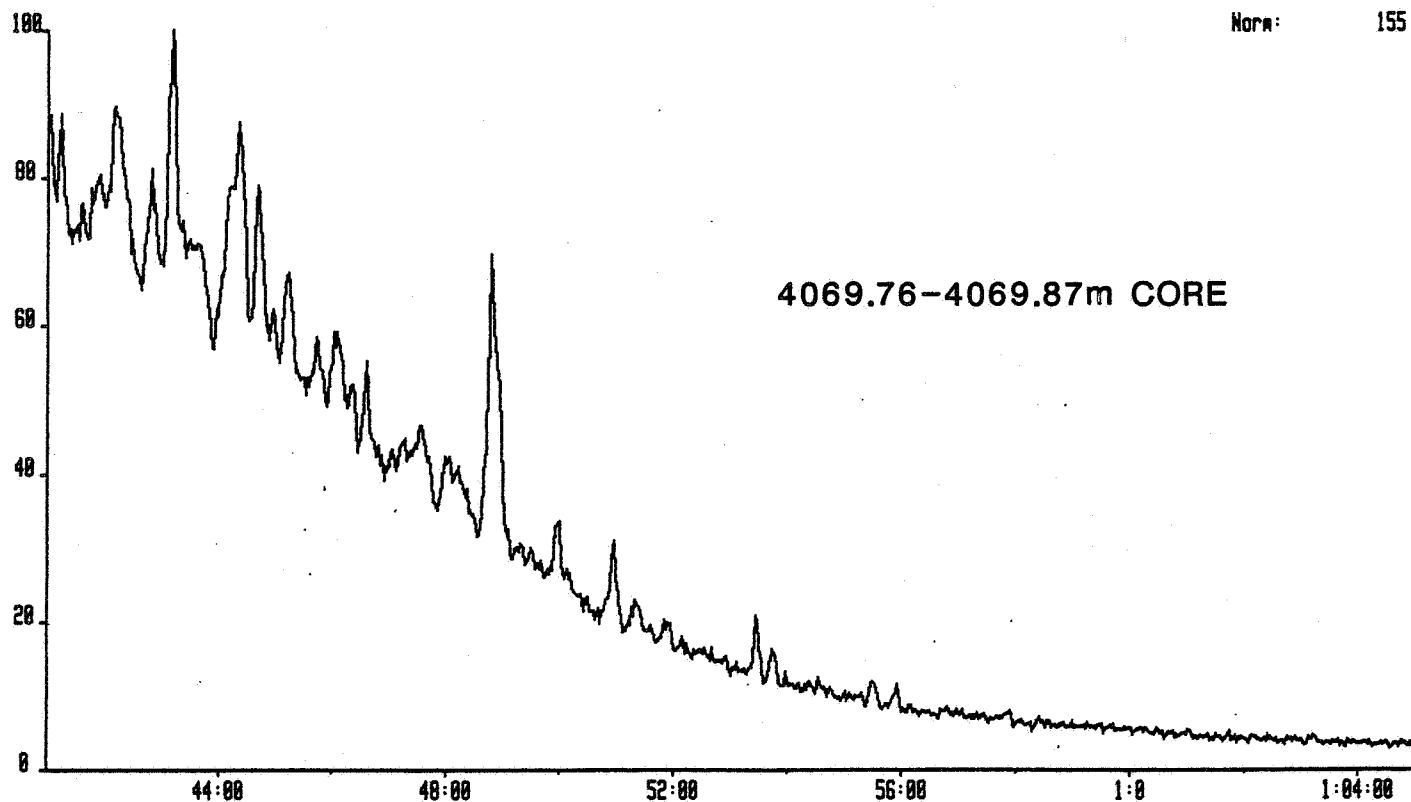


FIGURE 12f

MASS FRAGMENTOGRAMS



WELL 6506/12-5 DEMETHYLATED HOPANES m/z 177

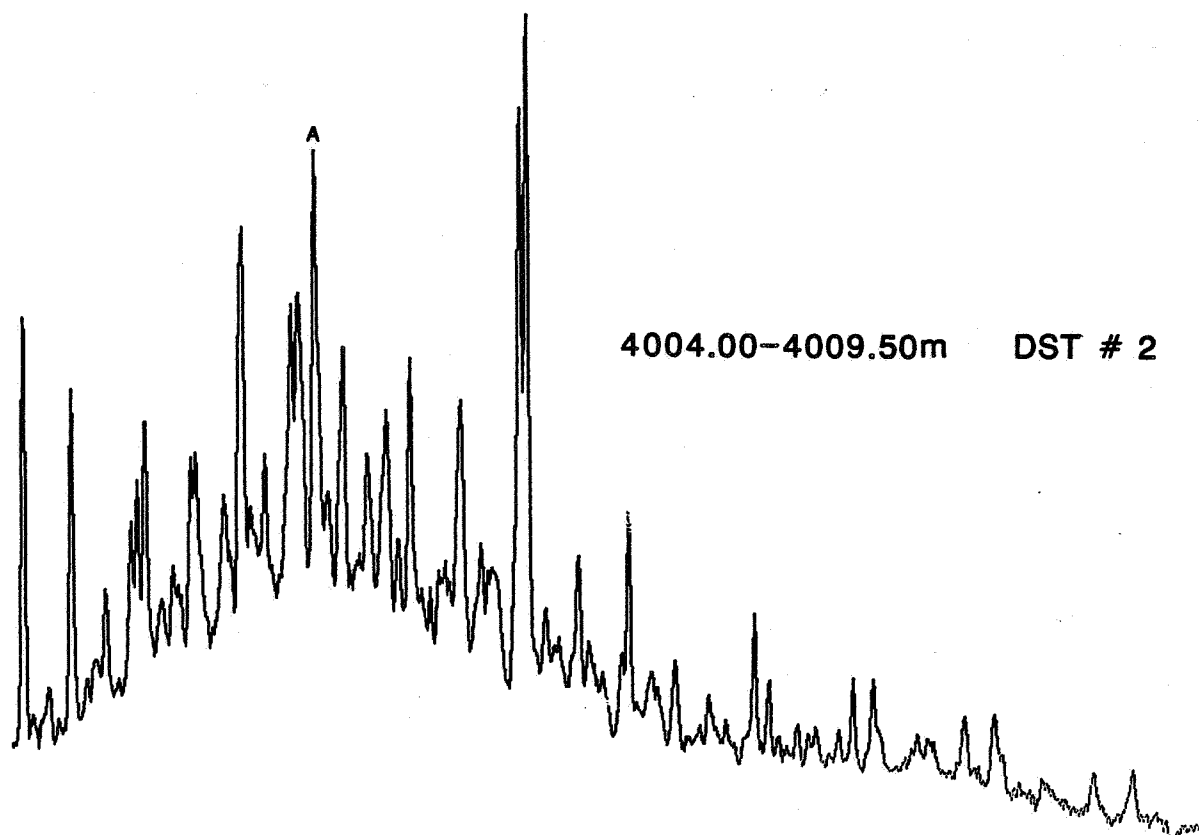


FIGURE 13a

MASS FRAGMENTOGRAMS



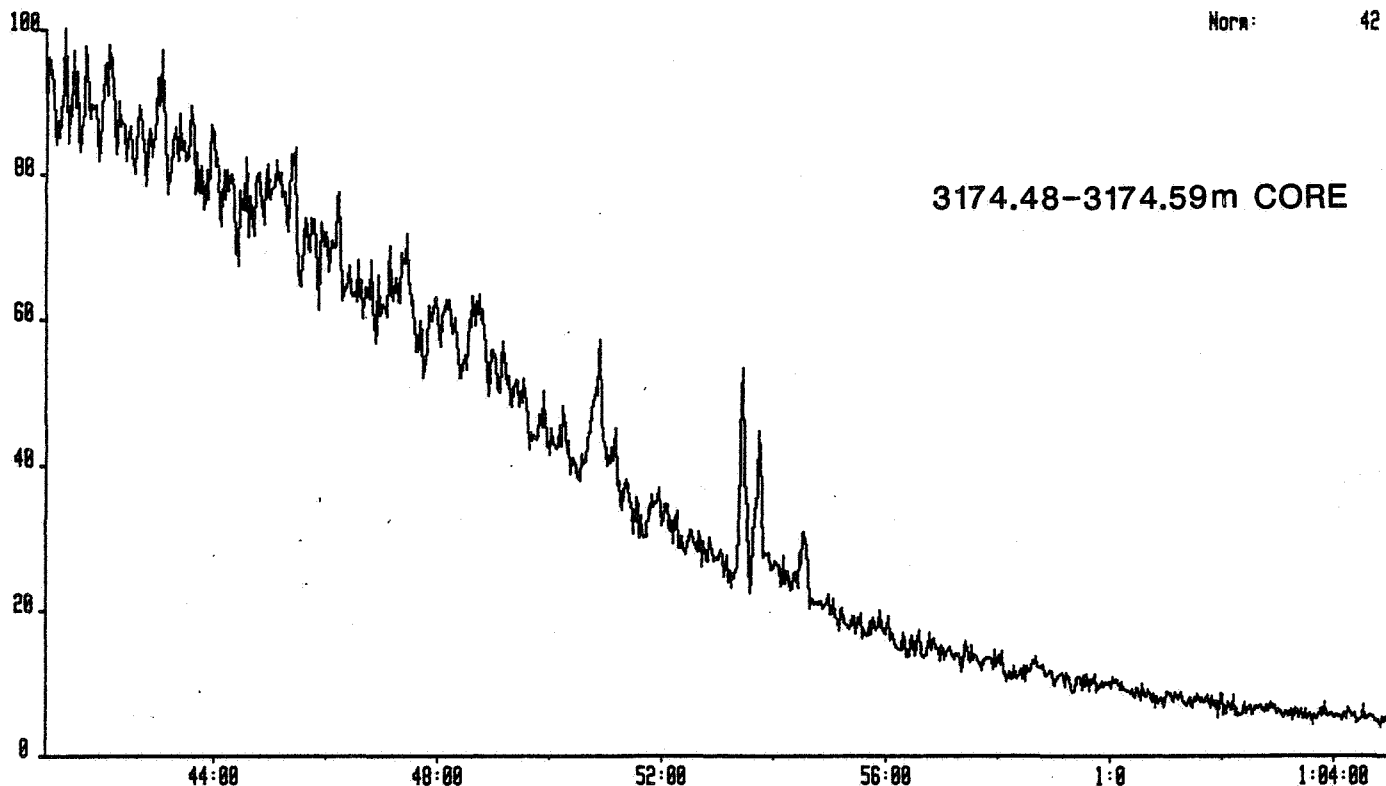
WELL 6506/12-5

METHYL HOPANES m/z 205

1334005 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 42



GEOBAT 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 37

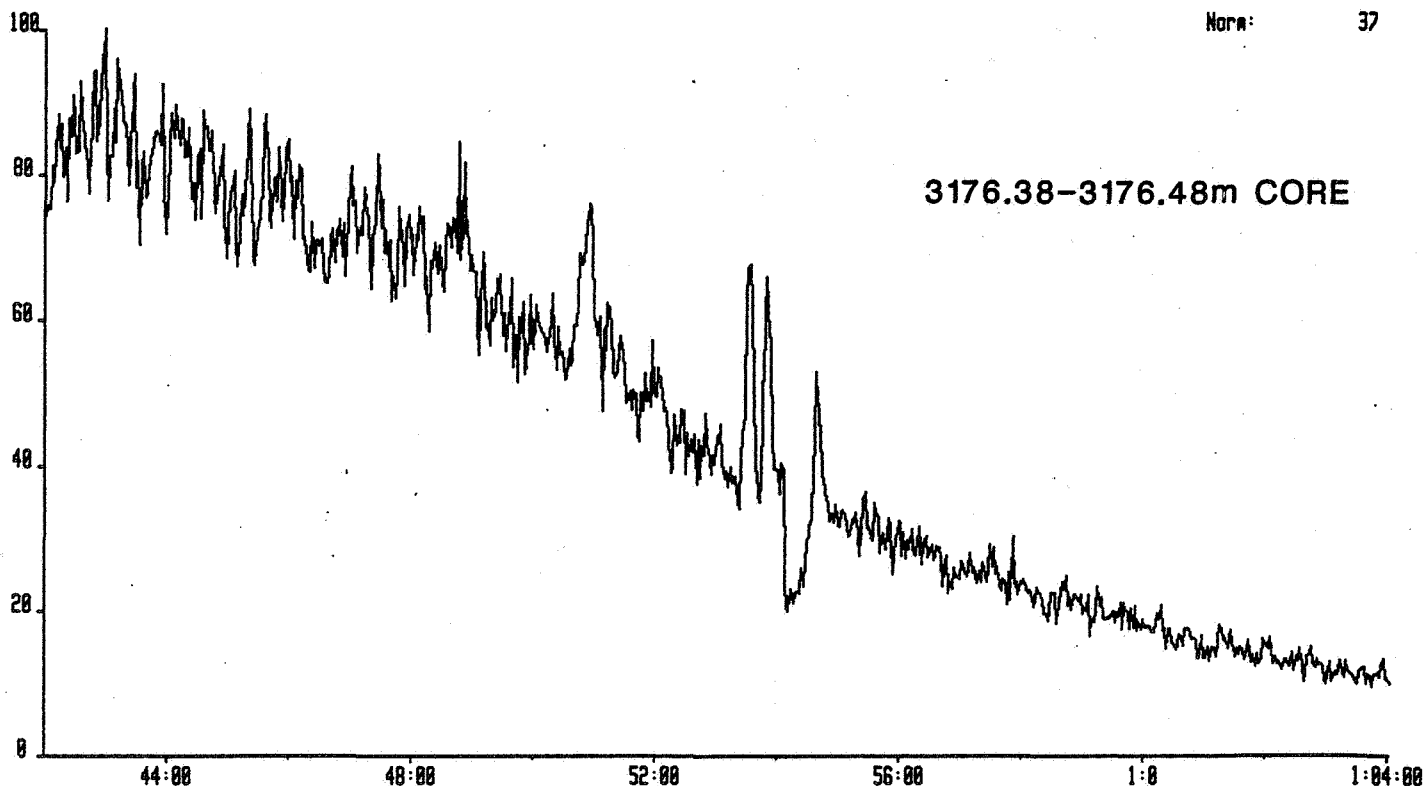


FIGURE 13b

MASS FRAGMENTOGRAMS



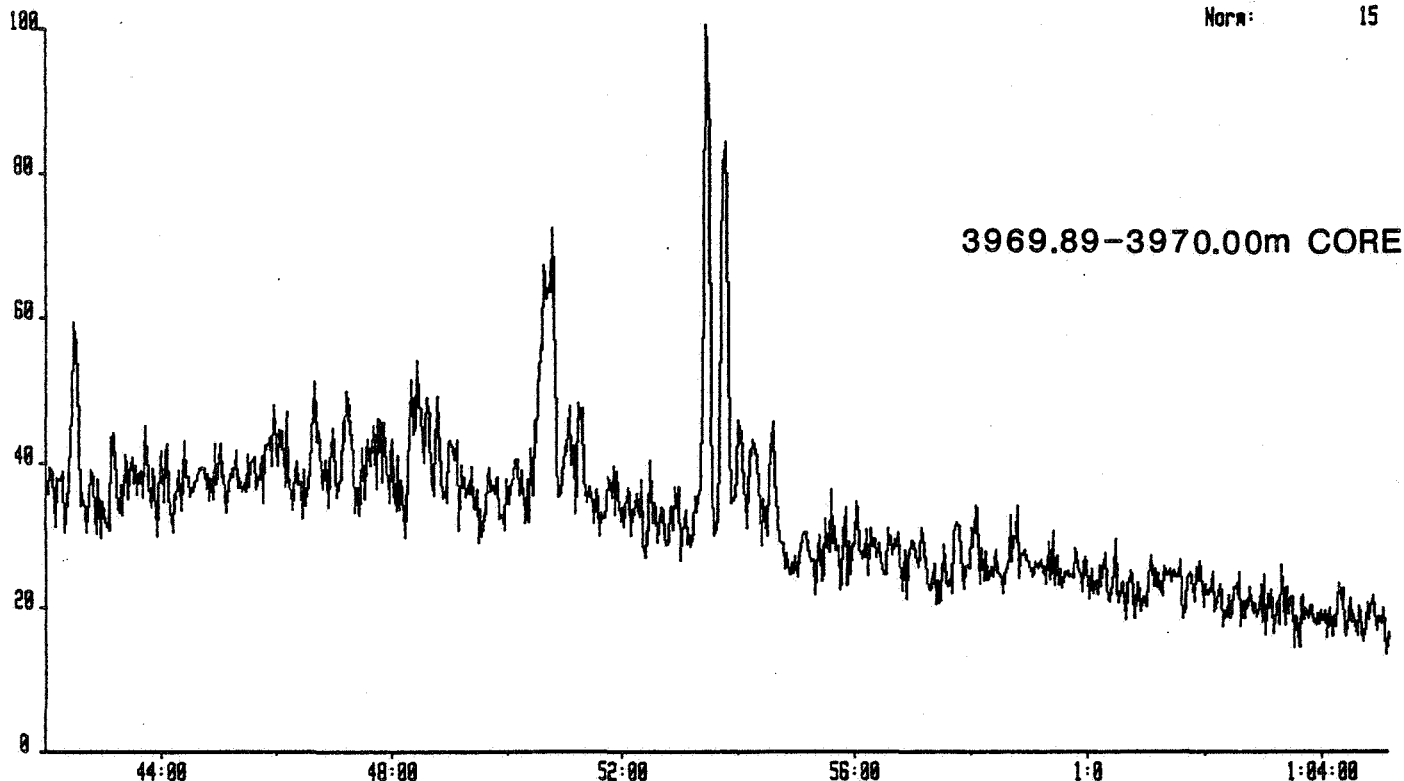
WELL 6506/12-5

METHYL HOPANES m/z 205

1334010 11-JUL-86 Sr:Magnetic TS250 Rcnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 15



1334012 15-JUL-86 Sr:Magnetic TS250 Rcnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 63

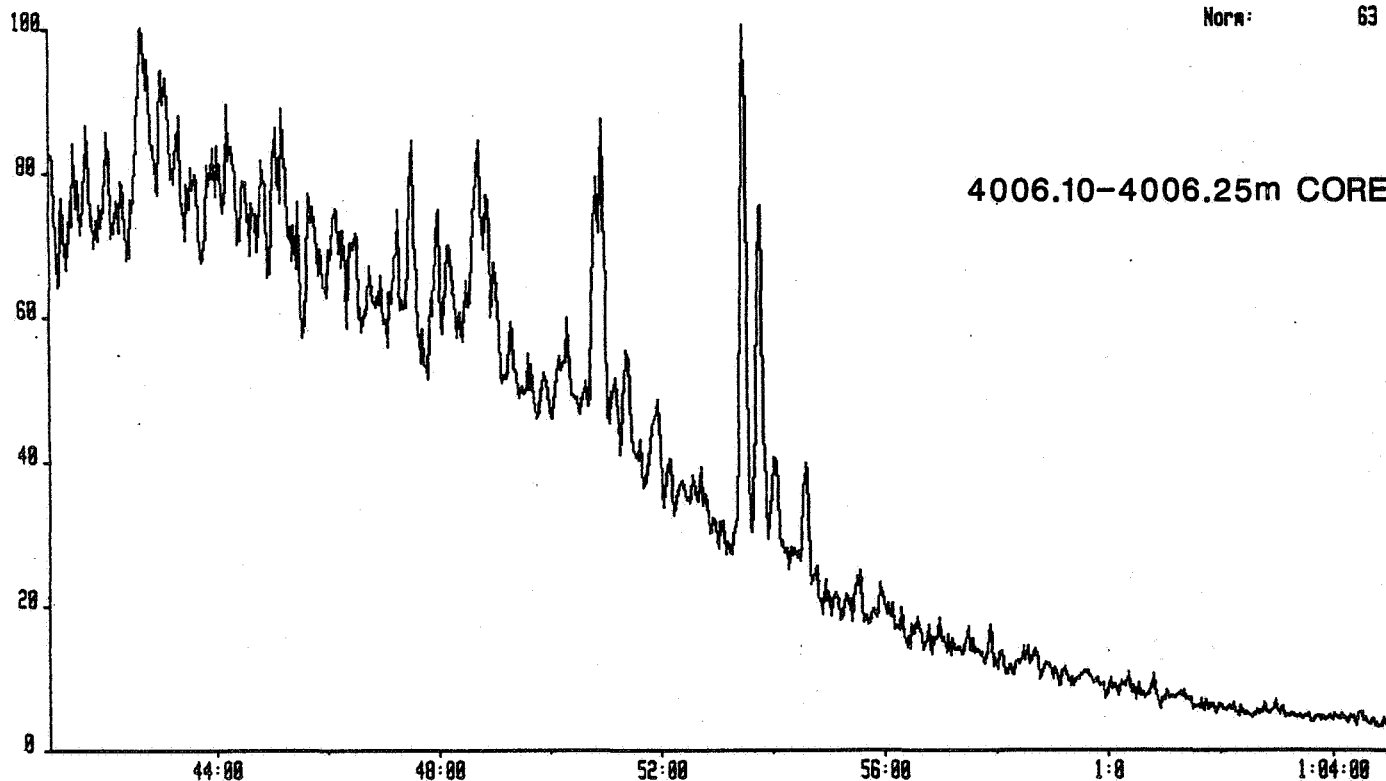


FIGURE 13c

MASS FRAGMENTOGRAMS

WELL 6506/12-5

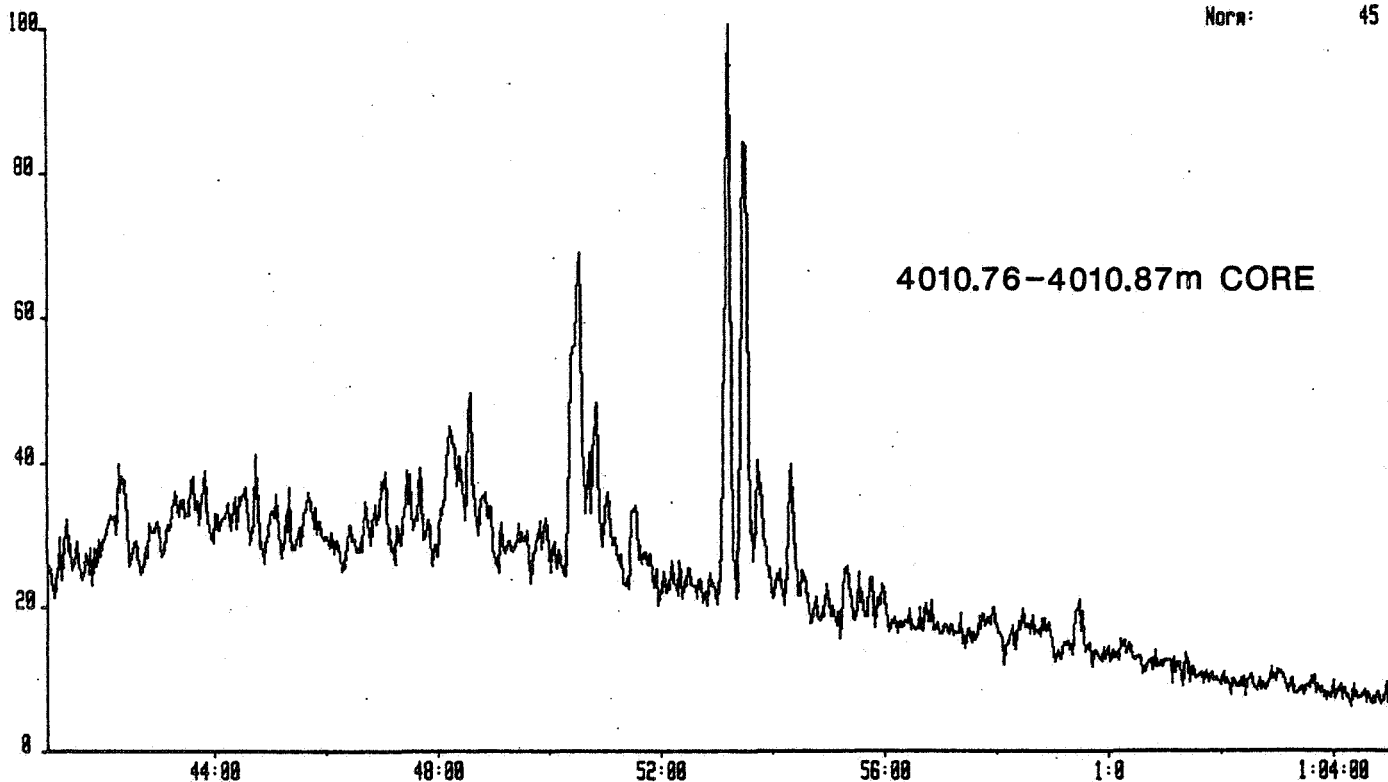
METHYL HOPANES m/z 205



1334013 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 45



1334014 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 66

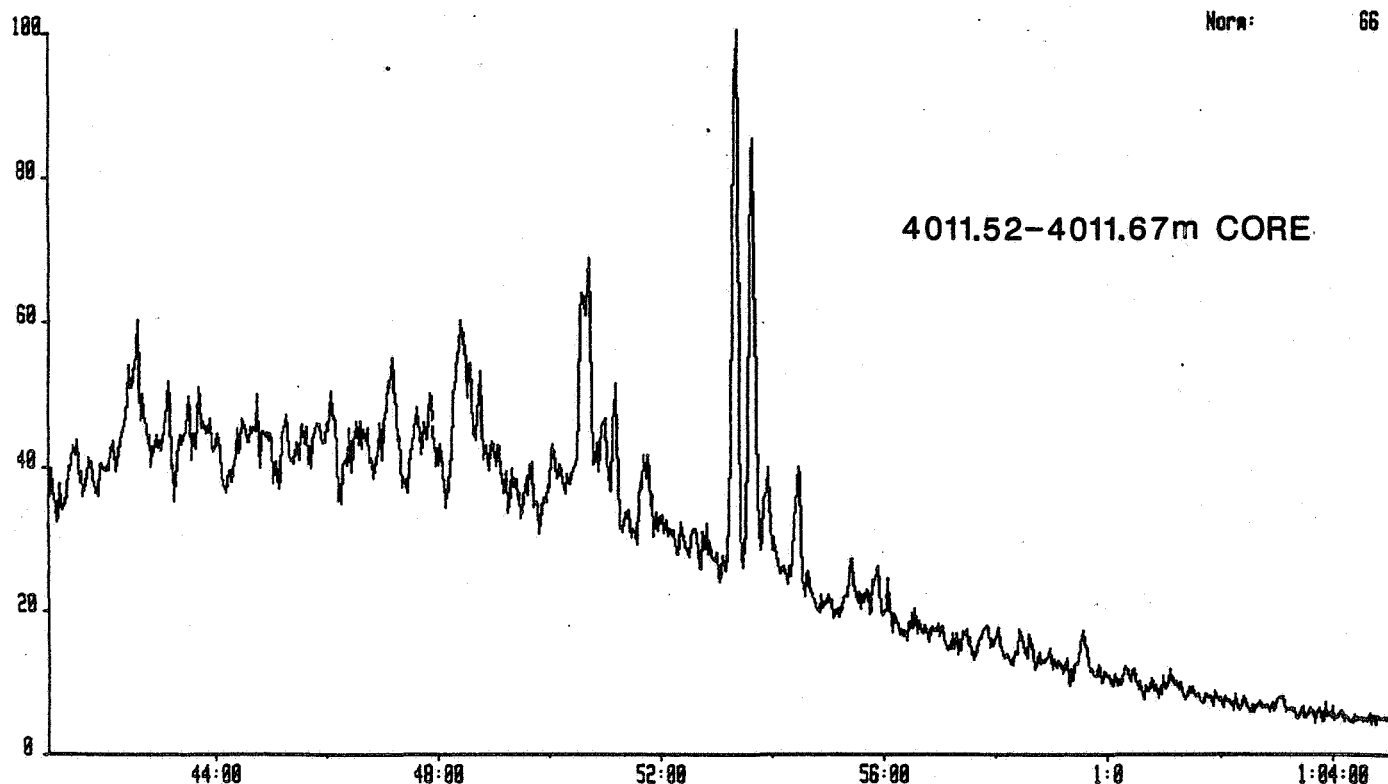


FIGURE 13d

MASS FRAGMENTOGRAMS



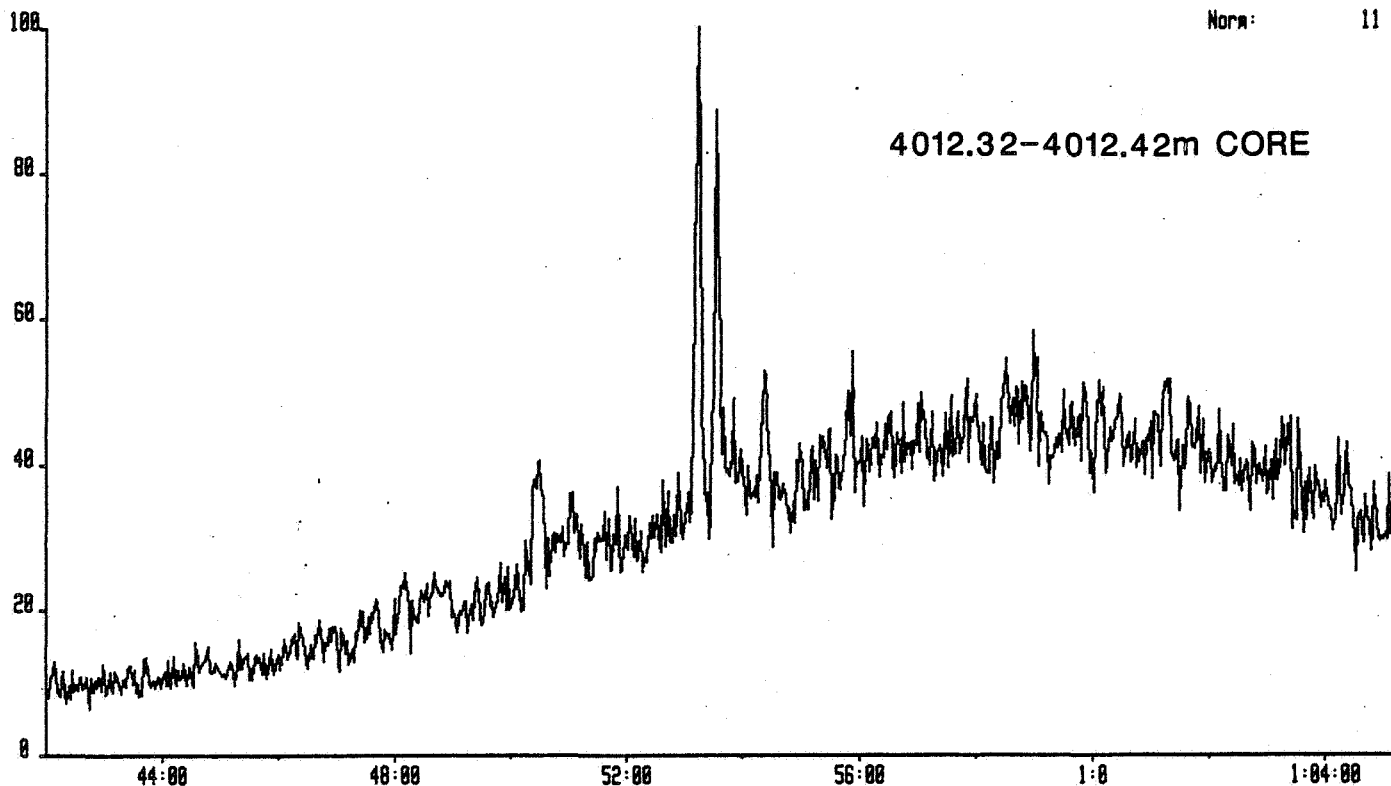
WELL 6506/12-5

METHYL HOPANES m/z 205

1334015 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 11



1334017 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 88

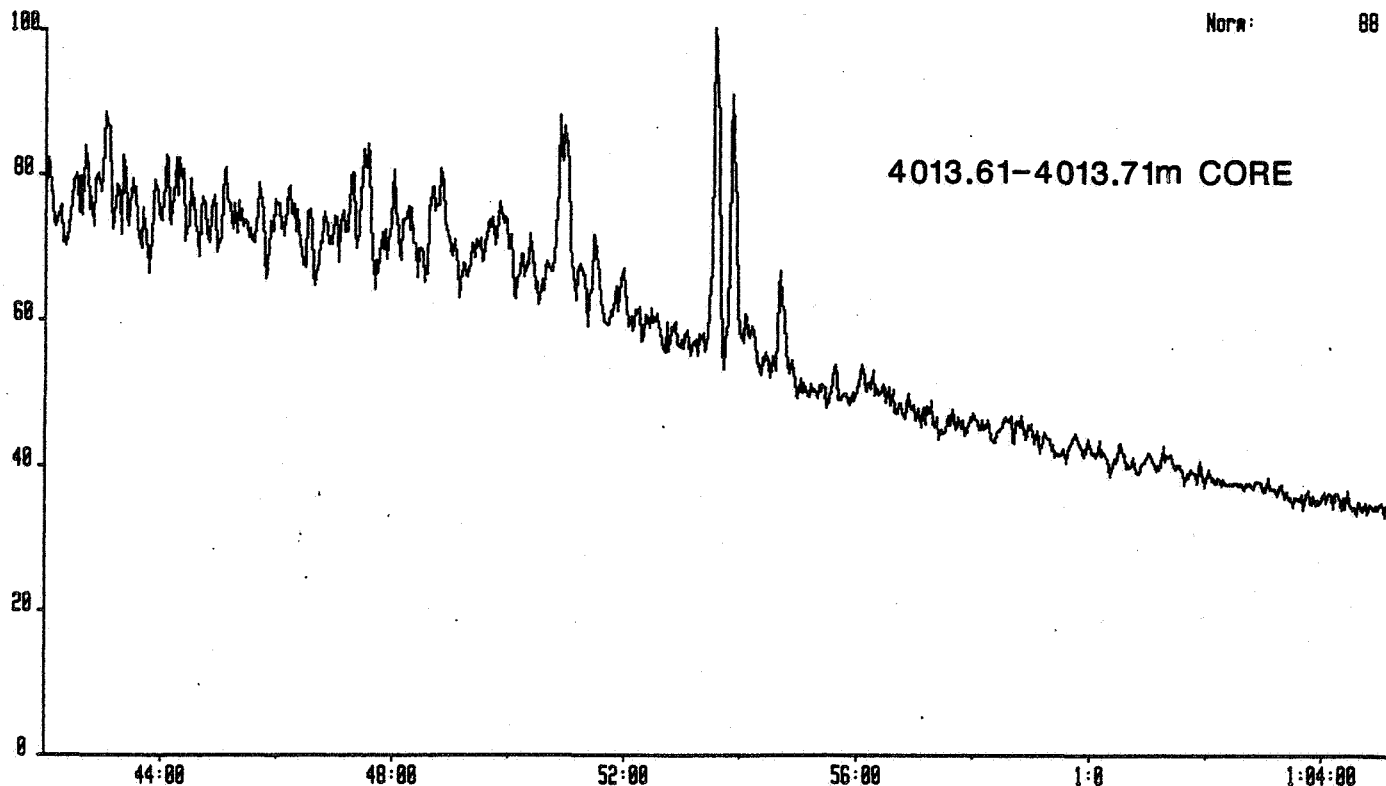


FIGURE 13e

MASS FRAGMENTOGRAMS

WELL 6506/12-5

METHYL HOPANES m/z 205

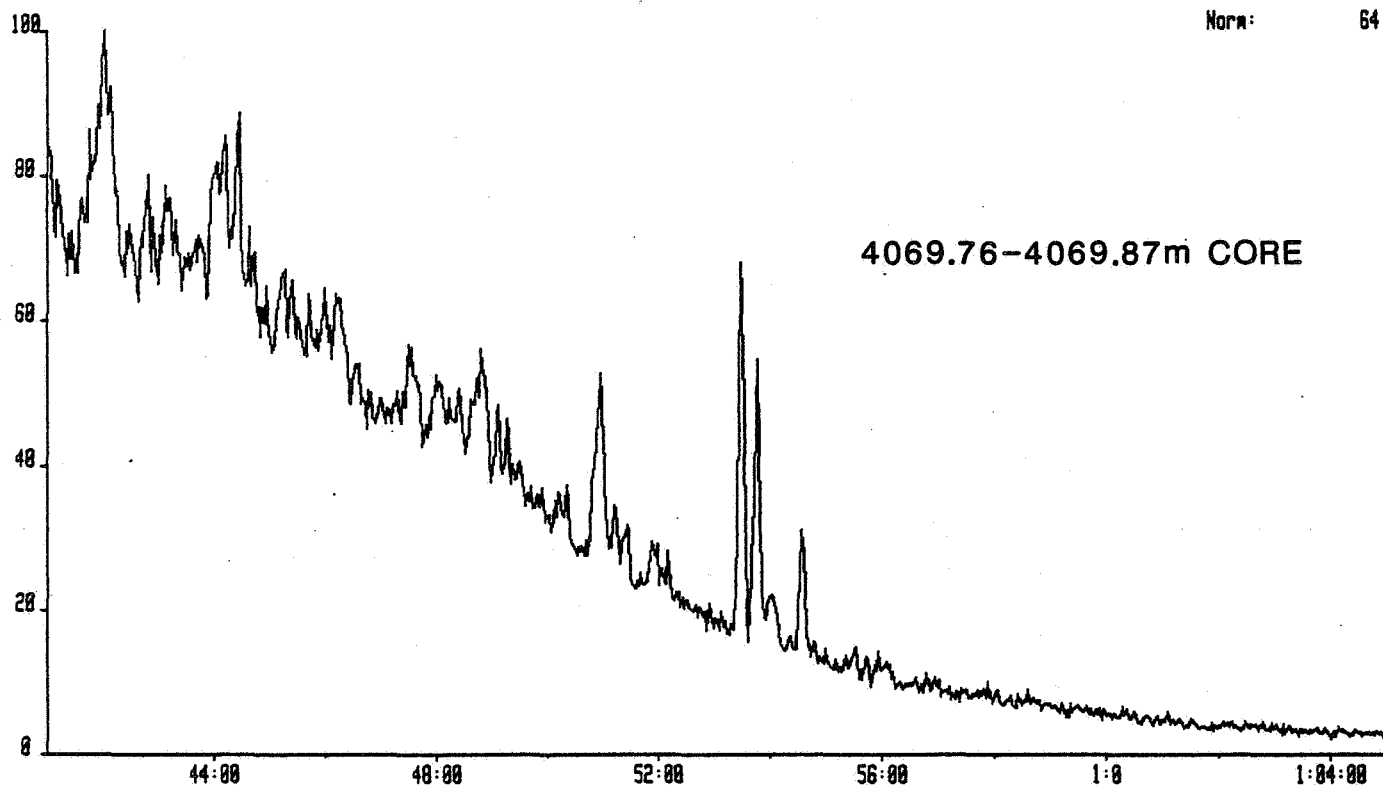


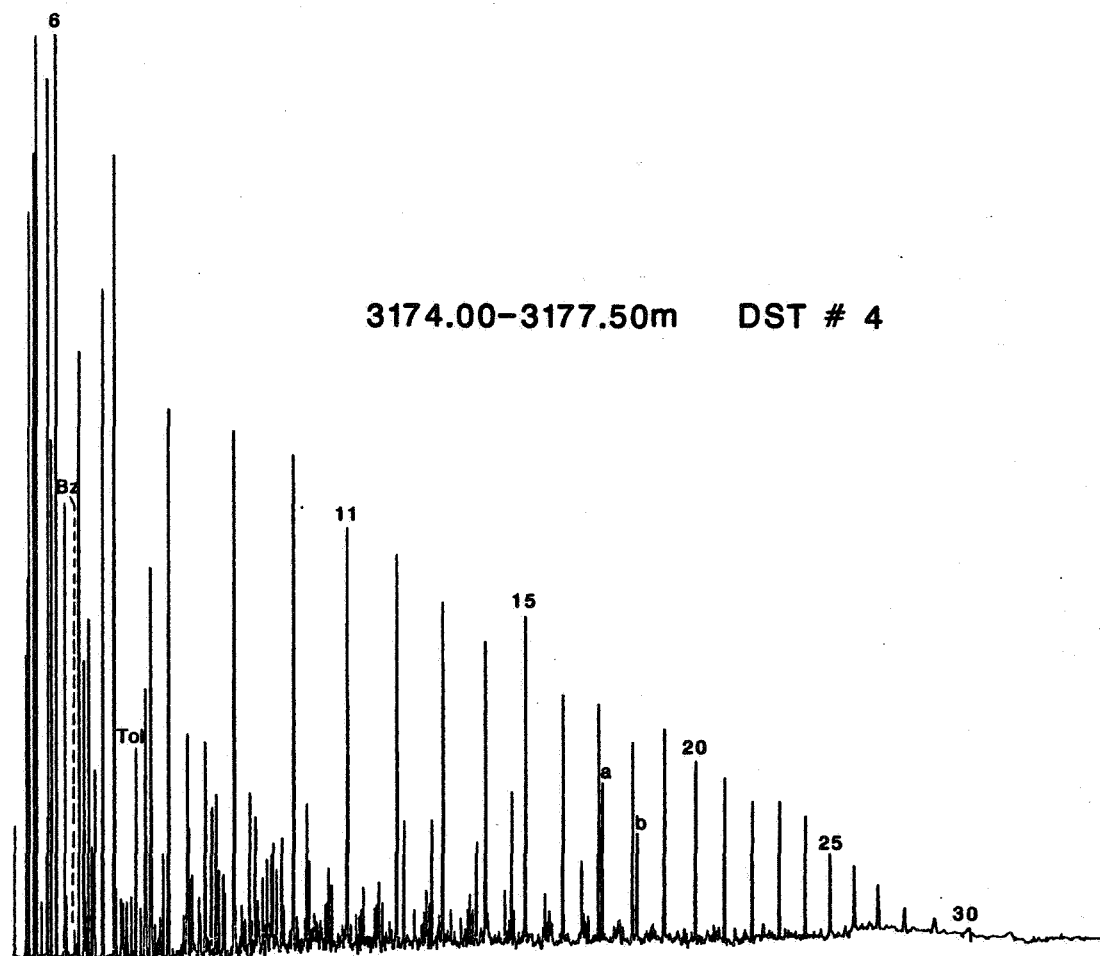
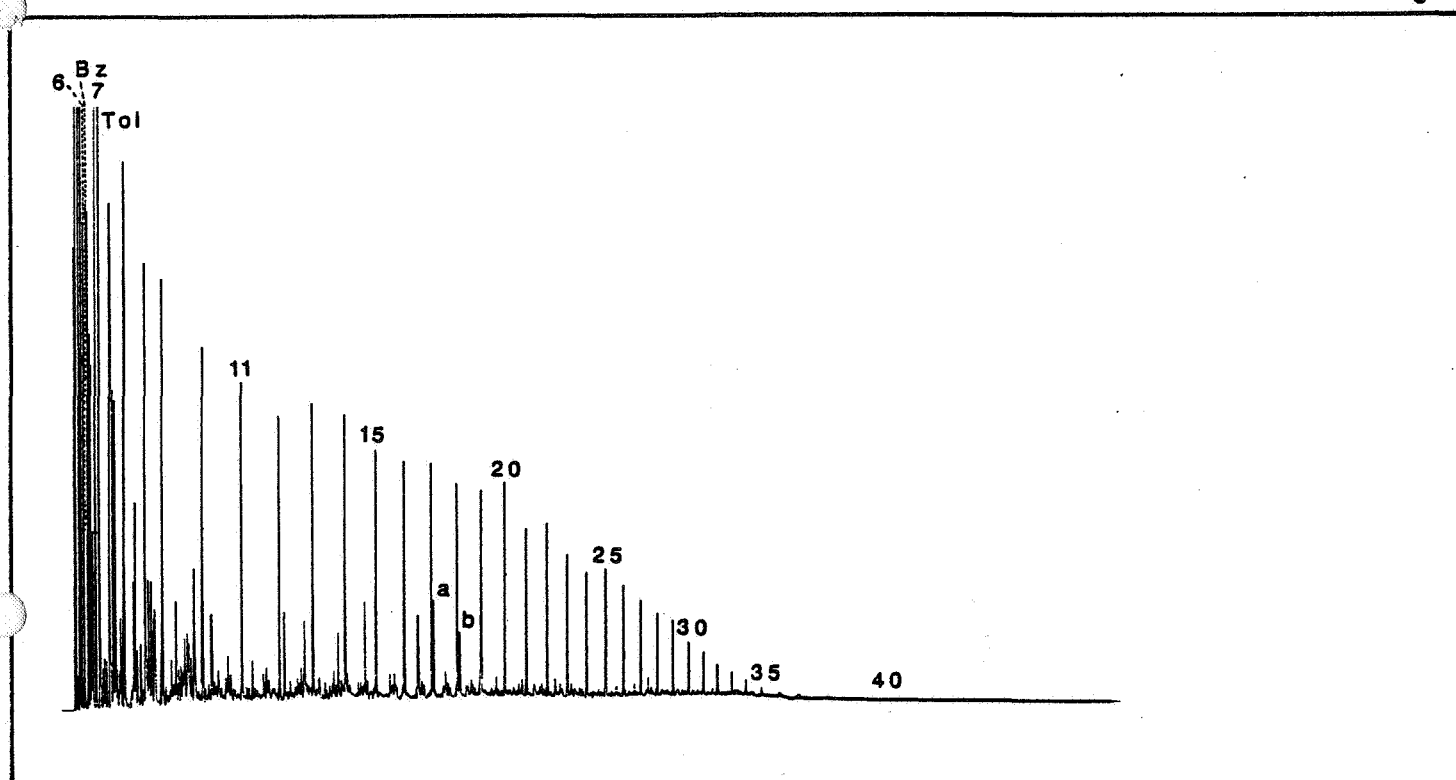
1334019 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm:

64





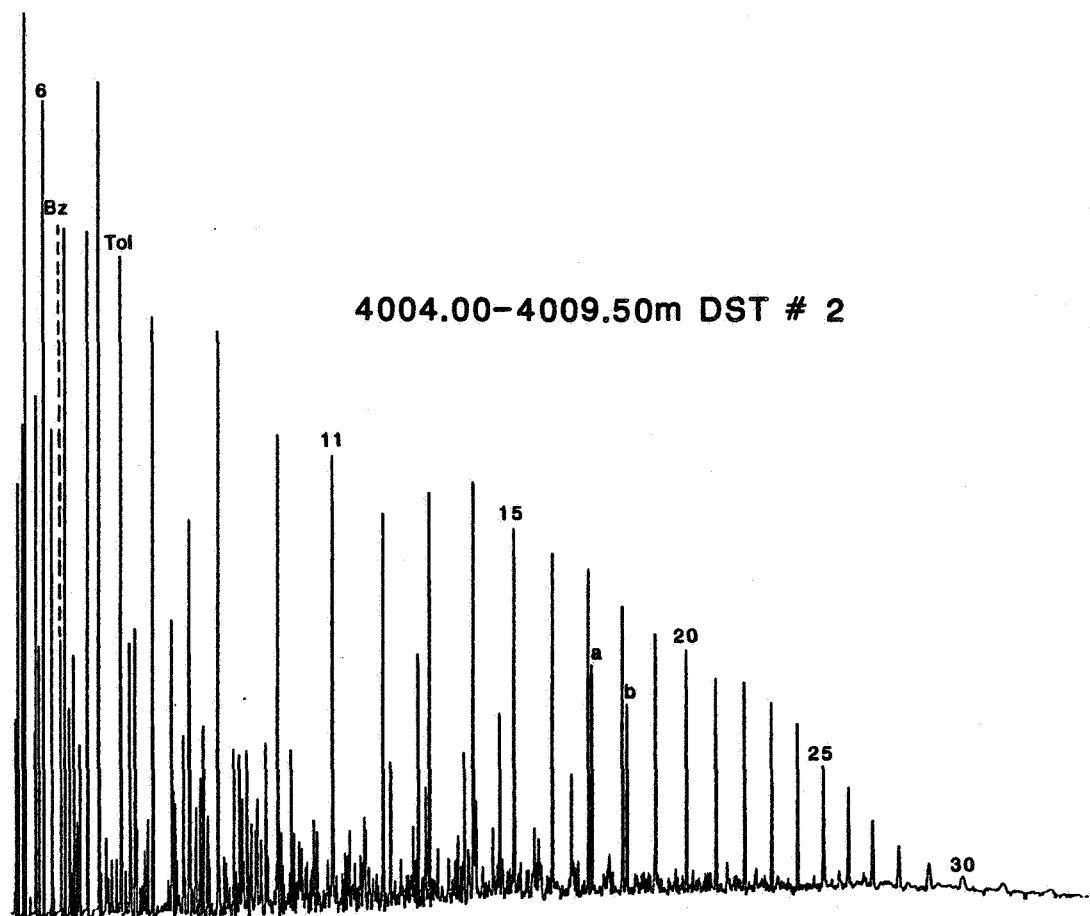
a - PRISTANE
b - PHYTANE

Bz - BENZENE
To - TOLUENE

NORMAL PARAFFINS IDENTIFIED
BY CARBON NUMBERS



WELL 6506/12-5



a - PRISTANE
b - PHYTANE

Bz - BENZENE
To - TOLUENE

NORMAL PARAFFINS IDENTIFIED
BY CARBON NUMBERS

APPENDIX 2

SPONGE CORE STUDY DATA

CONTENTS

TABLES

1. GASOLINE RANGE - CORES
2. TOTAL EXTRACT COMPOSITION (CORE)
3. COMPOSITION C₁₅₊ PPM (CORE)
4. NORMALISED COMPOSITION % (CORE)
5. SATURATES (INNER AND OUTER CORE)
6. MPI INDICES (CORE)
7. CARBON ISOTOPES (CORE)
8. GC-MS INTEGRATED PEAKS AREA (CORE)
9. GASOLINE RANGE - SPONGE
10. 3" SPONGE COMPOSITION
11. NORMALISED % COMPOSITION (SPONGE)
12. SATURATES (SPONGE)
13. MPI INDICES (SPONGE)
14. CARBON ISOTOPES (SPONGE)
15. GC-MS INTEGRATED AREAS (SPONGE)
16. MOLECULAR RATIOS
17. OIL SATURATIONS

TABLE 1

DETAILED GASOLINE (C4-C7) ANALYSIS (OUTER CORES)

GEOCHEM SAMPLE NUMBER	001	002	003
DEPTH	3995.25 -0.34	3996.10 -0.24	3997.52 -0.61
isobutane	3.33	3.67	0.62
n-butane	9.24	6.91	1.25
isopentane	10.55	9.88	1.07
n-pentane	14.22	11.28	2.66
2,2-dimethylB	0.30	0.28	0.20
cyclopentane(CP)	1.60	1.07	1.86
2,3-dimethylB	0.01	0.01	0.03
2-methylP	8.00	8.72	3.91
3-methylP	4.44	4.57	3.26
n-hexane	11.85	12.78	10.79
methylCP(MCP)	5.44	6.03	6.30
2,2-dimethylP	0.05	0.03	0.08
2,4-dimethylP	0.00	0.00	0.00
2,2,3-trimethylB	0.00	0.00	0.00
benzene	0.02	0.06	0.08
cyclohexane(CH)	5.64	6.56	9.10
3,3-dimethylP	0.00	0.00	0.00
1,1-dimethylCP	0.00	0.00	0.00
2-methylH	3.48	4.33	6.25
2,3-dimethylP	0.01	0.01	0.03
3-methylH	0.92	1.09	2.11
1,c,3-dimethylCP	3.19	3.17	6.28
1,t,3-dimethylCP	0.62	0.49	1.12
1,t,2-dimethylCP	2.02	2.49	3.97
3-ethylP	0.00	0.00	0.00
n-heptane	5.93	7.26	14.15
methylCH(MCH)	7.23	8.88	18.44
1,c,2-dimethylCP	0.00	0.00	0.00
toluene	1.90	0.43	6.47
ABUNDANCE			
nC7/C7nap x100	45.36	48.28	47.45
MCP/Bz	329.70	105.00	80.72
MH/DMCP	0.75	0.88	0.73
nC6/MCP	2.18	2.12	1.71
%n-PARAFFINS	41.24	38.22	28.85
%iso-PARAFFINS	31.10	32.60	17.54
% NAPHTHENES	25.74	28.70	47.07
% AROMATICS	1.92	0.48	6.55



TABLE 2

COMPOSITION OF TOTAL EXTRACT OF INNER AND OUTER CORES

<u>GEOCHEM</u>		<u>C1</u>	<u>C2</u>	<u>C3</u>	<u>iC4</u>	<u>nC4</u>	<u>C₅-C₇</u>	<u>C₇-C₁₄</u>	<u>C₁₅+</u>	<u>TOTAL</u>	<u>WT. OF</u>	<u>H₂O</u>	<u>OIL</u>		<u>H₂O</u>
<u>SAMPLE</u>	<u>DEPTH</u>	<u>μl</u>	<u>μl</u>	<u>μl</u>	<u>μl</u>	<u>μl</u>	<u>μl</u>	<u>μl</u>	<u>MLS</u>	<u>OIL</u>	<u>CORE</u>	<u>CONTENT</u>	<u>SATⁿ</u>		<u>SATⁿ</u>
<u>NUMBER</u>										<u>MLS</u>	<u>GRMS</u>	<u>MLS</u>			
1212-001(O)	3995.27-0.34	2.96	1.10	16.36	29.72	98.39	55.45	63.37	0.52	0.787	528.1	13.72	2.4%	2.1%	41.9%
1212-001(I)	3995.27-0.34	-	-	-	-	-	-	-	0.07	-	111.5	2.99	1%		43.3%
1212-002(O)	3996.10-0.24	6.77	8.88	93.69	121.49	275.27	81.23	154.74	1.25	1.99	1208.9	30.20	4.1%	3.8%	63.8%
1212-002(I)	3996.10-0.24	-	-	-	-	-	-	-	0.27	-	265.9	6.63	2.6%		63.7
1212-003(O)	3997.52-0.61	8.15	9.93	11.28	7.31	18.06	42.28	98.97	0.73	0.93	727.7	19.33	2.20%	2.0%	45.9%
1212-003(I)	3997.52-0.61	-	-	-	-	-	-	-	0.13	-	191.6	4.78	1.20%		43.5%

TABLE 3
CONCENTRATION (PPM) OF EXTRACTED C₁₅₊ MATERIAL IN ROCK

GEOCHEM SAMPLE NUMBER	DEPTH	TOTAL EXTRACT	HYDROCARBONS			NON HYDROCARBONS			
			Paraffin Naphthenes	Aromatics	TOTAL	Precipd. Asphaltenes	Eluted NSO's	Non-eluted NSO's	Sulphur
1212-001(O)	3995.25-0.34m	1093	823	175	998	63	31	0	0
1212-001(I)	3995.25-0.34m	698	530	114	645	26	20	7	0
1212-002(O)	3996.10-0.24m	1148	848	194	1042	69	33	3	0
1212-002(I)	3996.10-0.24m	1141	873	173	1046	58	33	4	0
1212-003(O)	3997.52-0.61m	1112	784	180	963	113	30	6	0
1212-003(I)	3997.52-0.61m	769	545	147	692	42	29	6	0

TABLE 4
COMPOSITION (NORMALISED %) OF C₁₅₊ MATERIAL EXTRACTED FROM ROCK

GEOCHEM SAMPLE NUMBER	DEPTH	HYDROCARBONS		NON HYDROCARBONS			
		Paraffin – Naphthenes	Aromatics	Precipd. Asphaltenes	Eluted NSO's	Non eluted NSO's	Sulphur
1212-001(0)	3995.25-0.34m	75.37	16.02	5.78	2.80	0.04	0.00
1212-001(1)	3995.25-0.34m	76.01	16.36	3.72	2.87	1.04	0.00
1212-002(0)	3996.10-0.24m	73.86	16.92	6.02	2.90	0.29	0.00
1212-002(1)	3996.10-0.24m	76.52	15.20	5.05	2.85	0.38	0.00
1212-003(0)	3997.52-0.61m	70.48	16.15	10.17	2.69	0.51	0.00
1212-003(1)	3997.52-0.61m	70.92	19.08	5.46	3.79	0.75	0.00

TABLE 5
COMPOSITION (NORMALISED %) OF C₁₅+ SATURATE (PARAFFIN – NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-001 (I)	-001 (O)	-002 (I)	-002 (O)	-003 (I)	-003 (O)
DEPTH	3995.27-0.34	3995.27-0.34	3996.10-0.24	3996.10-0.24	3997.52-0.61	3997.52-0.61
SAMPLE TYPE						
nC ₁₅	9.43	10.59	11.17	10.99	10.18	11.02
nC ₁₆	10.11	10.26	10.71	10.91	9.95	11.02
nC ₁₇	9.43	9.78	9.70	9.08	9.28	9.50
nC ₁₈	7.69	8.50	8.96	8.66	8.75	8.66
nC ₁₉	7.92	7.78	8.31	7.91	7.32	7.99
nC ₂₀	6.86	7.78	7.11	7.16	6.64	7.32
nC ₂₁	6.03	6.01	6.56	6.83	5.58	6.22
nC ₂₂	5.81	5.69	6.19	5.91	6.18	6.06
nC ₂₃	5.43	5.13	4.89	5.33	5.28	5.47
nC ₂₄	5.28	4.73	4.34	5.16	4.90	4.88
nC ₂₅	4.07	3.85	3.60	4.00	4.37	3.95
nC ₂₆	3.62	3.29	2.95	3.75	3.70	3.62
nC ₂₇	2.94	2.81	2.68	2.91	3.32	2.86
nC ₂₈	2.94	2.57	2.31	2.33	2.64	2.35
nC ₂₉	2.64	2.41	2.31	2.25	2.56	2.27
nC ₃₀	2.49	2.00	1.94	1.83	2.11	1.77
nC ₃₁	1.81	1.68	1.66	1.33	1.96	1.35
nC ₃₂	1.58	1.68	1.29	1.17	1.43	1.09
nC ₃₃	1.58	1.28	1.20	0.92	1.36	1.01
nC ₃₄	1.36	1.20	1.20	0.92	1.51	0.93
nC ₃₅	0.98	0.96	0.92	0.67	0.98	0.67
PARAFFIN	54.50	47.56	43.29	48.27	57.11	43.49
ISOPRENOID	6.04	5.35	5.56	5.91	6.29	5.30
NAPHTHENE	39.46	46.91	51.16	45.82	36.61	51.21
CPI INDEX 1	0.95	0.96	0.99	0.99	0.97	0.97
CPI INDEX 2	0.94	0.99	1.05	0.98	1.08	1.00
CPI INDEX 3	0.90	0.96	1.02	0.96	1.05	0.96
PRISTANE/PHYTANE	1.37	1.34	1.32	1.33	1.28	1.30
PRISTANE/nC ₁₇	0.68	0.68	0.75	0.77	0.67	0.73

$$\text{C.P.I. 1} = \frac{1}{2} \frac{\text{C}_{21}+\text{C}_{23}+\text{C}_{25}+\text{C}_{27}}{\text{C}_{20}+\text{C}_{22}+\text{C}_{24}+\text{C}_{26}} + \frac{\text{C}_{21}+\text{C}_{23}+\text{C}_{25}+\text{C}_{27}}{\text{C}_{22}+\text{C}_{24}+\text{C}_{26}+\text{C}_{28}}$$

$$\text{C.P.I. 2} = \frac{1}{2} \frac{\text{C}_{25}+\text{C}_{27}+\text{C}_{29}+\text{C}_{31}}{\text{C}_{24}+\text{C}_{26}+\text{C}_{28}+\text{C}_{30}} + \frac{\text{C}_{25}+\text{C}_{27}+\text{C}_{29}+\text{C}_{31}}{\text{C}_{26}+\text{C}_{28}+\text{C}_{30}+\text{C}_{32}}$$

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



TABLE 6
METHYL PHENANTHRENE INDEX
CORES

<u>GEOCHEM</u> <u>SAMPLE</u> <u>NUMBER</u>	<u>DEPTH</u>	<u>% AREA</u>	<u>% HEIGHT</u>
1212-001 (I)	3995.27-0.34	0.62	0.68
1212-001 (O)	3995.27-0.34	0.61	0.68
1212-002 (I)	3996.10-0.24	0.57	0.60
1212-002 (O)	3996.10-0.24	0.77	0.64
1212-003 (I)	3997.52-0.61	0.70	0.74
1212-003 (O)	3997.52-0.61	0.63	0.71



TABLE 7
CARBON ISOTOPE (CORE)
°/°° PDB

<u>GEOCHEM SAMPLE NUMBER</u>	<u>CORE</u>	<u>DEPTH</u>	<u>PARAFFIN- NAPHTHENE</u>	<u>AROMATICS</u>	<u>NSO'S</u>	<u>ASPHALTENES</u>	<u>TOTAL EXTRACT</u>
1212-001	INNER	3995.27-0.34	-30.58	-28.24	-29.02	-27.52	-29.77
1212-001	OUTER	3995.27-0.34	-30.01	-28.51	-29.10	-28.25	-29.75
1212-002	INNER	3996.10-0.24	-32.44	-28.53	-28.01	-27.90	-30.04
1212-002	OUTER	3996.10-0.24	-30.42	-28.29	-28.29	-28.94	-29.81
1212-003	INNER	3997.52-0.61	-30.14	-28.53	-26.81	-28.72	-30.14
1212-003	OUTER	3997.52-0.61	-30.31	-28.48	-28.22	-28.24	-29.48

TABLE 8a

GC-MS DATA INTEGRATED PEAK AREAS

STERANES (M/Z 217)

CORE SAMPLES

<u>GEOCHEM</u> <u>SAMPLE</u> <u>NUMBER</u>	<u>DEPTH</u>	<u>A</u>	<u>B</u>	<u>Q</u>	<u>R</u>	<u>S</u>	<u>T</u>
1212-001 (I)	3995.27-0.34	12895	9932	6547	6647	6312	3230
1212-001 (O)	3995.27-0.34	5715	4093	2226	2703	2362	1343
1212-002 (I)	3996.10-0.24	5401	3862	2296	2534	2571	1560
1212-002 (O)	3996.10-0.24	12439	10121	6296	7256	6532	3311
1212-003 (I)	3997.52-0.61	9695	7222	4635	5557	4224	2740
1212-003 (O)	3997.52-0.61	21144	15823	9957	12176	10981	6943

TABLE 8b

GC-MS INTEGRATED PEAK AREAS

STERANES (M/Z 218)

CORE SAMPLES

<u>GEOCHEM</u> <u>SAMPLE</u> <u>NUMBER</u>	<u>DEPTH</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>Q</u>	<u>T</u>
1212-001 (I)	3995.27-0.34	10324	7543	7720	7982	7532	8865	3159	1909
1212-001 (O)	3995.27-0.34	3837	2514	2790	3127	2820	3534	1322	737
1212-002 (I)	3996.10-0.24	4081	2787	2983	3086	2945	3356	1316	798
1212-002 (O)	3996.10-0.24	9296	6516	7348	7502	7616	7781	3057	1849
1212-003 (I)	3997.52-0.61	7084	4713	5235	5692	5278	6136	2392	1491
1212-003 (O)	3997.52-0.61	14204	10457	11115	12186	5407	6241	2439	1526



TABLE 8c

GC-MS DATA INTEGRATED PEAK AREASTERPANES (M/Z 191)CORE SAMPLES

<u>GEOCHEM</u> <u>SAMPLE</u> <u>NUMER</u>	<u>DEPTH</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>X</u>	<u>Z</u>	<u>G</u>	<u>H</u>
1212-001(I)	3995.27-0.34	14030	11793	20467	2003	35608	3412	6920	7248	16287	13408
1212-001(O)	3995.27-0.34	8190	6885	9926	1200	19852	2197	3862	4440	9350	6605
1212-002(I)	3996.10-0.24	6904	6321	11816	1229	70774	2242	3091	3719	8320	6066
1212-002(O)	3996.10-0.24	11649	9682	16645	1567	29117	3002	5042	6127	12829	12001
1212-003(I)	3997.52-0.61	9132	7229	10402	924	21514	2449	4094	4893	9830	7886
1212-003(O)	3997.52-0.61	9183	7529	10481	924	22080	2323	3952	5058	10342	8038



TABLE 8d

GC-MS DATA INTEGRATED PEAK AREASTERPANES (M/Z 177)CORE SAMPLES

<u>GEOCHEM SAMPLE NUMBER</u>	<u>DEPTH</u>	<u>A</u>
1212-001 (I)	3995.27-0.34	10425
1212-001 (O)	3995.27-0.34	4186
1212-002 (I)	3996.10-0.24	3971
1212-002 (O)	3996.10-0.24	7519
1212-003 (I)	3997.52-0.61	6043
1212-003 (O)	3997.52-0.61	6178

TABLE 9

DETAILED GASOLINE (C4-C7) ANALYSIS (SPONGE)

GEOCHEM SAMPLE NUMBER	001	002	003
DEPTH	3995.25 -0.34m	3996.10 -0.24m	3997.52 -0.61m
isobutane	0.11	0.10	0.05
n-butane	0.92	0.30	0.32
isopentane	1.35	0.84	0.45
n-pentane	3.12	3.21	6.81
2,2-dimethylB	0.07	0.07	0.05
cyclopentane(CP)	0.83	1.16	1.27
2,3-dimethylB	0.09	0.05	0.00
2-methylP	2.03	2.74	2.86
3-methylP	1.39	2.00	1.77
n-hexane	4.79	6.77	5.54
methylCP(MCP)	4.77	6.30	5.00
2,2-dimethylP	0.15	0.17	0.50
2,4-dimethylP	0.00	0.00	0.00
2,2,3-trimethylB	0.00	0.00	0.00
benzene	4.14	4.28	8.81
cyclohexane(CH)	9.61	10.90	9.81
3,3-dimethylP	0.00	0.00	0.00
1,1-dimethylCP	0.00	0.00	0.00
2-methylH	4.73	4.70	3.72
2,3-dimethylP	0.04	0.00	0.00
3-methylH	3.68	3.66	2.63
1,c,3-dimethylCP	1.61	1.66	1.36
1,t,3-dimethylCP	1.13	1.24	0.86
1,t,2-dimethylCP	2.83	3.06	2.23
3-ethylP	0.00	0.00	0.00
n-heptane	10.74	11.44	6.09
methylCH(MCH)	18.50	18.88	13.35
1,c,2-dimethylCP	0.00	0.00	0.00
toluene	23.36	16.46	26.52
ABUNDANCE			
nC7/C7nap x100	44.62	46.07	34.18
MCP/Bz	1.15	1.47	0.57
MH/DMCP	1.51	1.40	1.43
nC6/MCP	1.00	1.07	1.11
%n-PARAFFINS	19.57	21.73	18.76
%iso-PARAFFINS	13.64	14.34	12.03
% NAPHTHENES	39.29	43.20	33.88
% AROMATICS	27.50	20.74	35.33



TABLE 10

3" SPONGE EXTRACTION

<u>GEOCHEM</u> <u>SAMPLE</u> <u>SAMPLE</u>	<u>DEPTH</u>	<u>VOLUME</u> <u>LIGHTS</u> (C ₁ -C ₁₄)	<u>VOLUME</u> <u>HEAVY</u> (C ₁₅ +)	<u>TOTAL</u> <u>OIL</u>	<u>TOTAL</u> <u>H₂O</u>
1212-001	3995.27-0.34m	0.16mls	0.10mls	0.26	160ml
1212-002	3996.10-0.24m	0.07mls	0.13mls	0.20	180ml
1212-003	3997.52-0.61m	0.31mls	0.06mls	0.37	175ml

TABLE 11
COMPOSITION (NORMALISED %) OF C₁₅+ MATERIAL EXTRACTED FROM ROCK

GEOCHEM SAMPLE NUMBER	DEPTH	HYDROCARBONS		NON HYDROCARBONS			
		Paraffin – Naphthenes	Aromatics	Precipd. Asphaltenes	Eluted NSO's	Non eluted NSO's	Sulphur
1212-001	3995.25-0.34m	54.88	24.18	6.99	12.09	1.86	0.00
1212-002	3996.10-0.24m	69.38	18.62	1.96	9.80	0.24	0.00
1212-003	3997.52-0.61m	59.88	23.39	6.41	9.11	1.21	0.00

TABLE 12
COMPOSITION (NORMALISED %) OF C₁₅+ SATURATE (PARAFFIN – NAPHTHENE) HYDROCARBONS

GEOCHEM SAMPLE NUMBER	-001	-002	-003
DEPTH	3995.25- 0.34	3996.10- 0.24	3997.52- 0.61
SAMPLE TYPE			
nC ₁₅	9.84	2.35	11.20
nC ₁₆	5.85	3.08	6.40
nC ₁₇	8.74	5.25	7.68
nC ₁₈	7.97	8.24	8.48
nC ₁₉	6.72	9.95	8.32
nC ₂₀	6.72	10.59	8.96
nC ₂₁	4.98	8.42	7.04
nC ₂₂	4.23	8.42	6.40
nC ₂₃	3.86	6.24	5.12
nC ₂₄	4.61	5.34	4.80
nC ₂₅	5.85	5.25	5.28
nC ₂₆	5.35	5.70	4.64
nC ₂₇	3.86	4.07	4.68
nC ₂₈	3.99	3.44	2.56
nC ₂₉	3.74	3.08	1.92
nC ₃₀	3.11	2.53	1.76
nC ₃₁	2.86	1.99	1.60
nC ₃₂	2.24	1.81	1.28
nC ₃₃	1.87	1.54	1.12
nC ₃₄	2.12	1.54	1.12
nC ₃₅	1.74	1.18	0.64
PARAFFIN	20.32	26.56	17.32
ISOPRENOID	1.47	2.52	1.50
NAPHTHENE	78.21	70.91	81.19
CPI INDEX 1	0.95	0.92	1.00
CPI INDEX 2	1.03	0.96	1.06
CPI INDEX 3	0.83	0.90	1.30
PRISTANE/PHYTANE	0.87	0.88	0.93
PRISTANE/nC ₁₇	0.40	0.84	0.54

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

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

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



TABLE 13

METHYL PHENANTHRENE INDEX SPONGE

<u>GEOCHEM SAMPLE NUMBER</u>	<u>DEPTH</u>	<u>% AREA</u>	<u>% HEIGHT</u>
1212-001	3995.27-0.34	0.73	0.67
1212-002	3996.10-0.24	0.87	0.65
1212-003	3997.52-0.61	0.49	0.60



TABLE 14
CARBON ISOTOPE (SPONGE)
°/∞ PDB

<u>GEOCHEM</u> <u>SAMPLE</u> <u>NUMBER</u>	<u>DEPTH</u> (M)	<u>PARAFFIN-</u> <u>NAPHTHENE</u>	<u>AROMATICS</u>	<u>NSO'S</u>	<u>ASPHALTENES</u>
1212-001	3995.27-0.34	-30.48	-28.35	-29.34	-29.60
1212-002	3996.10-0.24	-30.02	-26.01*	-30.30	-26.64
1212-003	3997.52-0.61	-29.43	-27.77*	-29.40	-29.16

* - Low weights



TABLE 15a

GC-MS DATA INTEGRATED PEAK AREASSTERANES (M/Z 217)SPONGE

<u>GEOCHEM</u> <u>SAMPLE</u> <u>NUMBER</u>	<u>DEPTH</u>	<u>A</u>	<u>B</u>	<u>Q</u>	<u>R</u>	<u>S</u>	<u>T</u>
1212-001	3995.27-0.34m	8249	6160	2936	3286	3025	1756
1212-002	3996.10-0.24m	93199	71377	40094	36755	39470	25033
1212-003	3997.52-0.61m	50295	36427	21985	32531	29229	22591



TABLE 15b

GC-MS DATA INTEGRATED PEAK AREASSTERANES (M/Z 218)SPONGE

<u>GEOCHEM</u> <u>SAMPLE</u> <u>NUMBER</u>	<u>DEPTH</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>Q</u>	<u>T</u>
1212-001	3995.27-0.34m	4977	3556	3104	2992	2887	3333	1299	757
1212-002	3996.10-0.24m	73083	52173	38733	41467	37682	44880	19188	13486
1212-003	3997.52-0.61m	39717	32670	26136	26492	27448	29373	13229	8352



TABLE 15c

GC-MS DATA INTEGRATED PEAK AREASTERPANES (M/Z 191)SPONGE

<u>GEOCHEM</u> <u>SAMPLE</u> <u>NUMBER</u>	<u>DEPTH</u>	<u>A</u>	<u>B</u>	<u>C</u>	<u>D</u>	<u>E</u>	<u>F</u>	<u>X</u>	<u>Z</u>	<u>G</u>	<u>H</u>
1212-001	3995.27-0.34m	2702	3200	6420	933	10405	1294	896	1819	4106	3300
1212-002	3996.10-0.24m	34215	35085	59700	9014	103200	13575	12299	19503	42432	35044
1212-003	3007.52-0.61m	33584	47145	94197	18390	144797	21583	7815	20164	57186	51368



TABLE 15d

GC-MS DATA INTEGRATED PEAK AREAS

TERPANES (M/Z 177)

SPONGE

<u>GEOCHEM</u> <u>SAMPLE</u> <u>NUMBER</u>	<u>DEPTH</u>	<u>A</u>
1212-001	3995.27-0.34m	697
1212-002	3996.10-0.24m	8781
1212-003	3997.52-0.61m	13849



TABLE 16
MOLECULAR RATIOS

<u>GEOCHEM</u> <u>SAMPLE</u> <u>NUMBER</u>	<u>DEPTH</u>	<u>Tm/Ts</u>	<u>Q/T</u>
1212-001 (I)	3995.27- 0.34	0.84	2.03
1212-001 (O)	3995.27- 0.34	0.84	1.66
1212-002 (I)	3996.10- 0.24	0.91	1.47
1212-002 (O)	3996.10- 0.24	0.83	1.90
1212-003 (I)	3997.52- 0.61	0.79	1.69
1212-003 (O)	3997.52- 0.61	0.81	1.43
1212-001 (S)	3995.27- 0.34	0.75	1.66
1212-002 (S)	3996.10- 0.24	0.76	1.60
1212-003 (S)	3997.52- 0.61	0.72	0.97

TABLE 17

OIL SATURATIONSGEOCHEM

<u>SAMPLE</u> <u>NUMBER</u>	<u>DEPTH</u>	<u>HELIUM</u> <u>POROSITY</u>	<u>GRAIN</u> <u>DENSITY</u>	<u>GV/g</u>	<u>WEIGHT (g)</u>	<u>GV</u>	<u>BV</u>	<u>PV</u>	<u>OIL</u> <u>VOL. (ml)</u>	<u>OIL</u> <u>SAT.</u>	<u>H₂O</u> <u>VOL. (ml)</u>	<u>H₂O</u> <u>SAT.</u>	<u>SPONGE</u> <u>OIL (ml)</u>	<u>TOTAL</u> <u>OIL (ml)</u>	<u>MOBIL</u> <u>OIL %</u>
1212-001 INNER	3995.27-0.34m	14.1	2.64	0.378	111.5	42.14	49.05	6.91	0.07	1%	2.99	43.3%	-	-	-
1212-001 OUTER	3995.27-0.34m	14.1	2.64	0.378	528.1	199.62	232.38	32.76	0.78	2.4%	13.72	41.9%	-	-	-
1212-001 COMBINED	3995.27-0.34m	14.1	2.64	0.378	639.6	241.76	281.44	39.68	0.85	2.1%	16.71	42.1%	0.26	1.11	23%
1212-002 INNER	3996.10-0.24m	9.4	2.65	0.377	265.9	100.2	110.6	10.4	0.27	2.6%	6.63	63.7%	-	-	-
1212-002 OUTER	3996.10-0.24m	9.4	2.65	0.377	1208.9	455.8	503.1	47.3	1.94	4.1%	30.2	63.8%	-	-	-
1212-002 COMBINED	3996.10-0.24m	9.4	2.65	0.377	1474.8	555.9	613.7	57.7	2.21	3.8%	36.83	63.8%	0.20	2.41	8.3%
1212-003 INNER	3997.52-0.61m	13.3	2.65	0.377	191.6	72.23	83.31	10.98	0.13	1.2%	4.78	43.5%	-	-	-
1212-003 OUTER	3997.52-0.61m	13.3	2.65	0.377	727.7	274.34	316.42	42.08	0.93	2.2%	19.33	45.9%	-	-	-
1212-003 COMBINED	3997.52-0.61m	13.3	2.65	0.377	919.3	346.57	399.73	53.16	1.06	2.0%	24.11	45.3%	0.37	1.43	25.8%

FIGURES

- | | | | |
|-----|--|---|--------|
| 1 | TOTAL EXTRACT CHROMATOGRAMS | } | CORES |
| 2 | THERMAL BITUMEN CHROMATOGRAMS | | |
| 3 | C ₄ -C ₇ CHROMATOGRAMS | | |
| 4 | C ₁₅₊ SATURATES CHROMATOGRAMS | | |
| 5 | C ₁₅₊ AROMATIC CHROMATOGRAMS | | |
| 6 | ORGANO-SULPHUR CHROMATOGRAMS | | |
| 7a | DEMETHYLATED HOPANES M/Z 177 | } | CORES |
| 7b | DEMETHYLATED HOPANES M/Z 177 | | |
| 7c | DEMETHYLATED HOPANES M/Z 177 | | |
| 7d | TRITERPANES M/Z 191 | | |
| 7e | TRITERPANES M/Z 191 | | |
| 7f | TRITERPANES M/Z 191 | | |
| 7g | STERANES M/Z 217 | | |
| 7h | STERANES M/Z 217 | | |
| 7i | STERANES M/Z 217 | | |
| 7j | ββ STERANES M/Z 218 | | |
| 7k | ββ STERANES M/Z 218 | | |
| 7l | ββ STERANES M/Z 218 | | |
| 7m | REARRANGED STERANES M/Z 259 | | |
| 7n | REARRANGED STERANES M/Z 259 | | |
| 7o | REARRANGED STERANES M/Z 259 | | |
| 8 | 3" SPONGE C ₄ -C ₇ CHROMATOGRAMS | } | SPONGE |
| 9 | 3" SPONGE C ₁₅₊ SATURATES CHROMATOGRAMS | | |
| 10 | 3" SPONGE C ₁₅₊ AROMATIC CHROMATOGRAMS | | |
| 11 | 3" SPONGE ORGANO-SULPHUR CHROMATOGRAMS | | |
| 12a | DEMETHYLATED HOPANES M/Z 177 | | |
| 12b | DEMETHYLATED HOPANES M/Z 177 | | |
| 12c | TRITERPANES M/Z 191 | | |
| 12d | TRITERPANES M/Z 191 | | |
| 12e | STERANES M/Z 217 | | |
| 12f | STERANES M/Z 217 | | |
| 12g | ββ STERANES M/Z 218 | | |
| 12h | ββ STERANES M/Z 218 | | |
| 12i | REARRANGED STERANES M/Z 259 | | |
| 12j | REARRANGED STERANES M/Z 259 | | |
| 13 | GALIMOV PLOT | | |

FIGURE 1a

WELL 6506/12-5

TOTAL EXTRACT CHROMATOGRAMS



3995.27-3995.34m

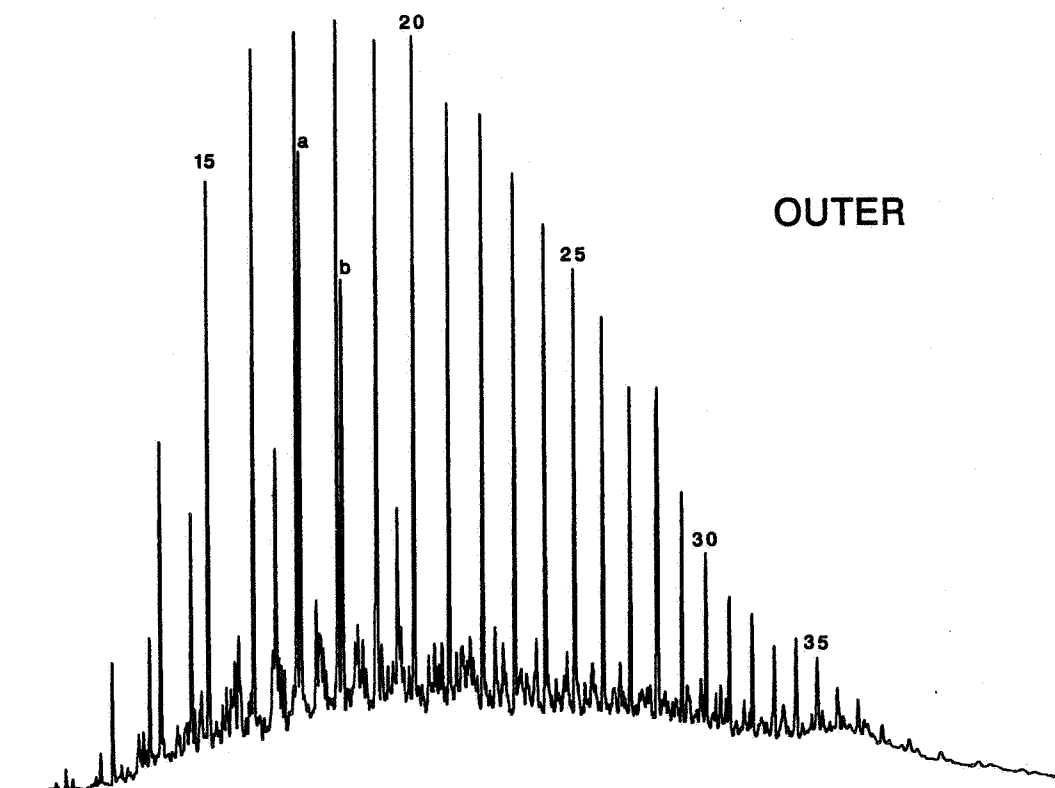
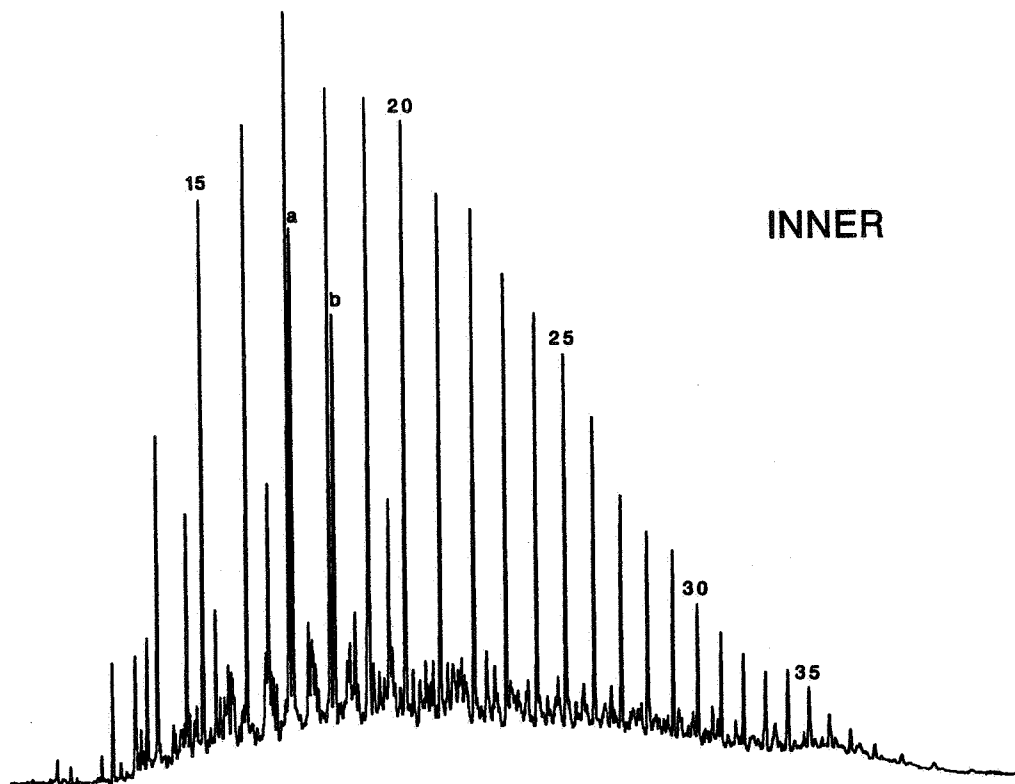


FIGURE 1b

WELL 6506/12-5

TOTAL EXTRACT CHROMATOGRAMS



3996.10-3996.24m

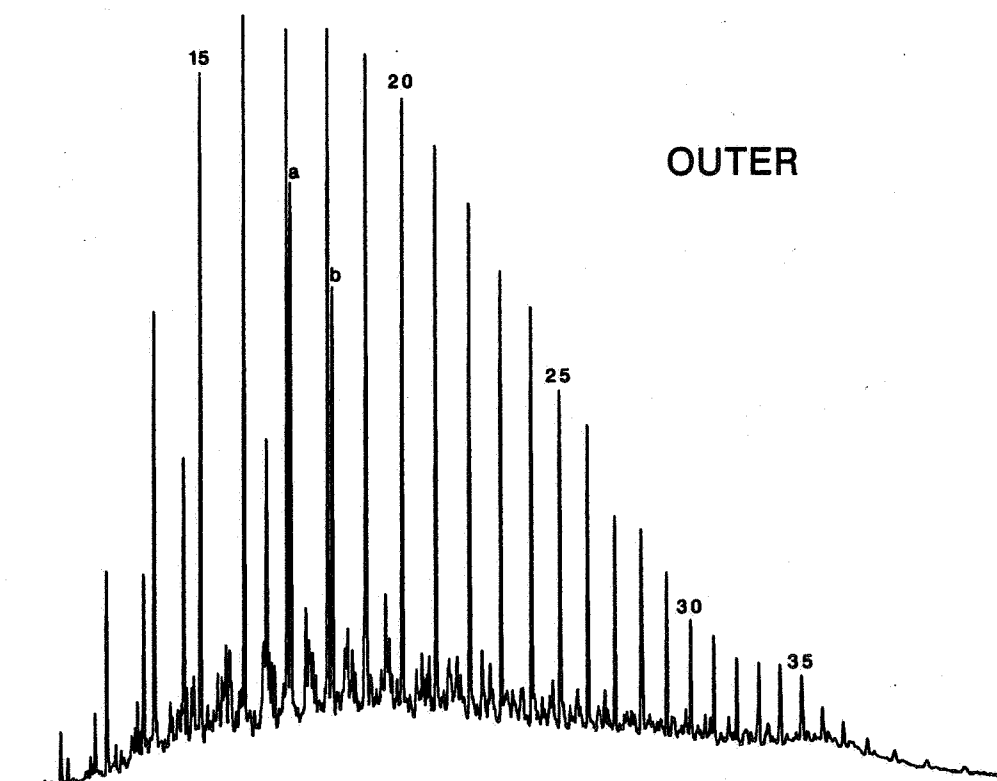
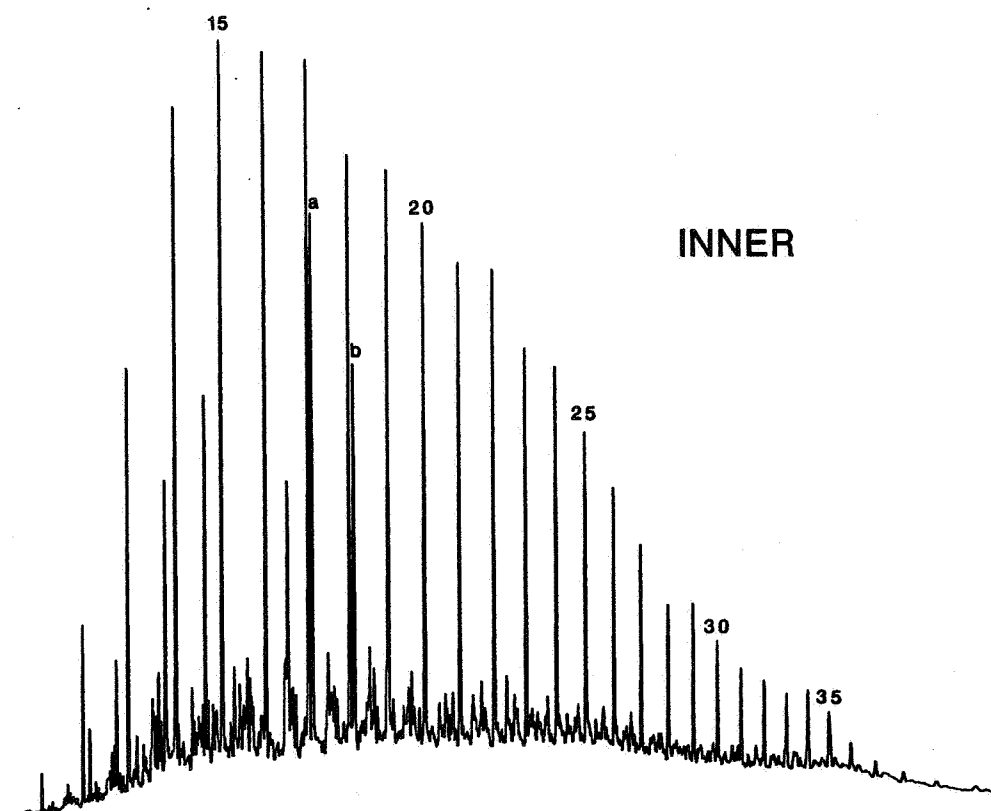


FIGURE 1c

WELL 6506/12-5

TOTAL EXTRACT CHROMATOGRAMS



3997.52-3997.61m

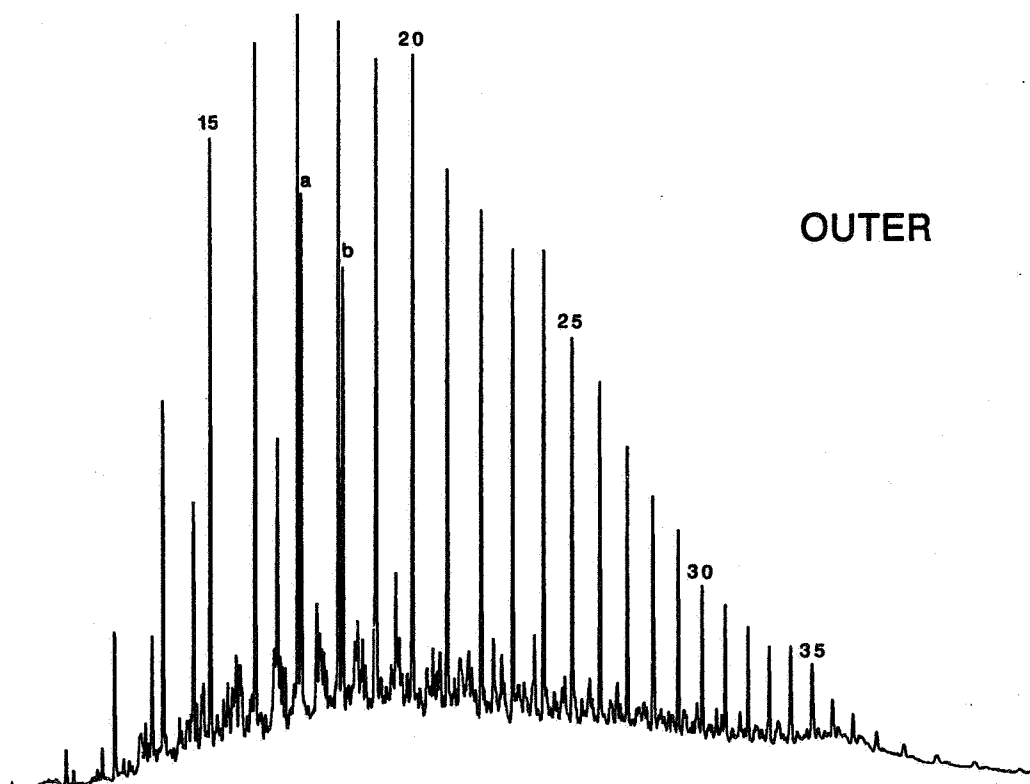
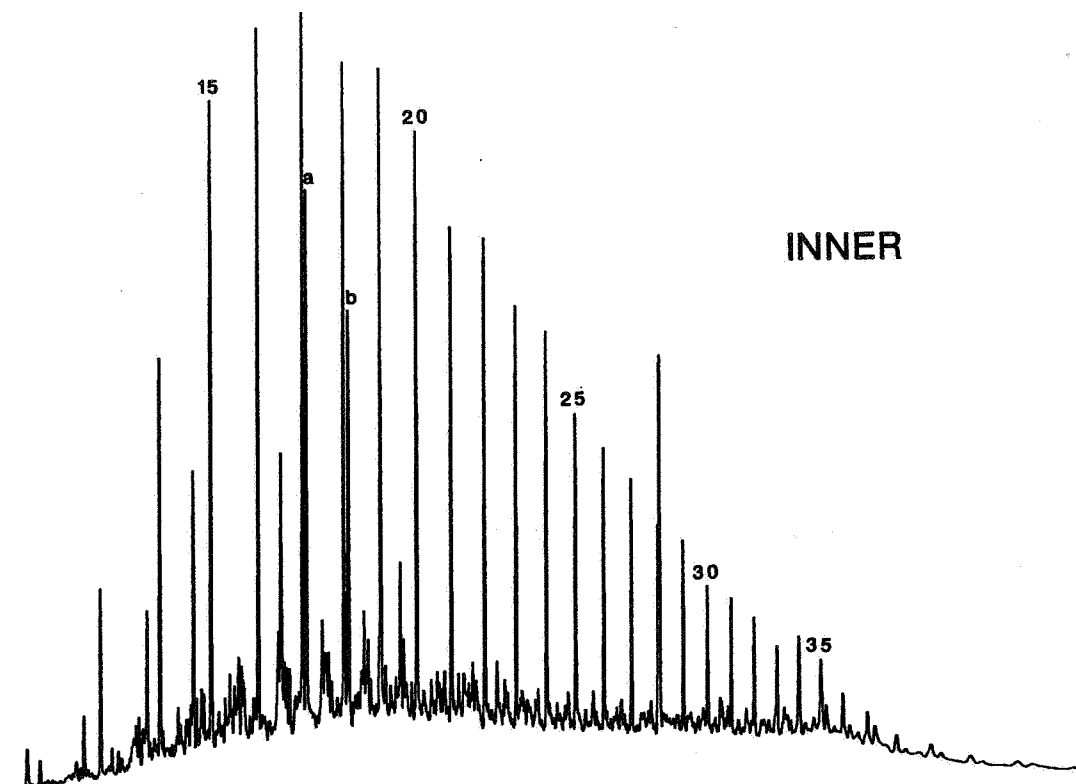


FIGURE 2a

WELL 6506/12-5

THERMAL BITUMEN CHROMATOGRAMS



3995.27-3995.34m

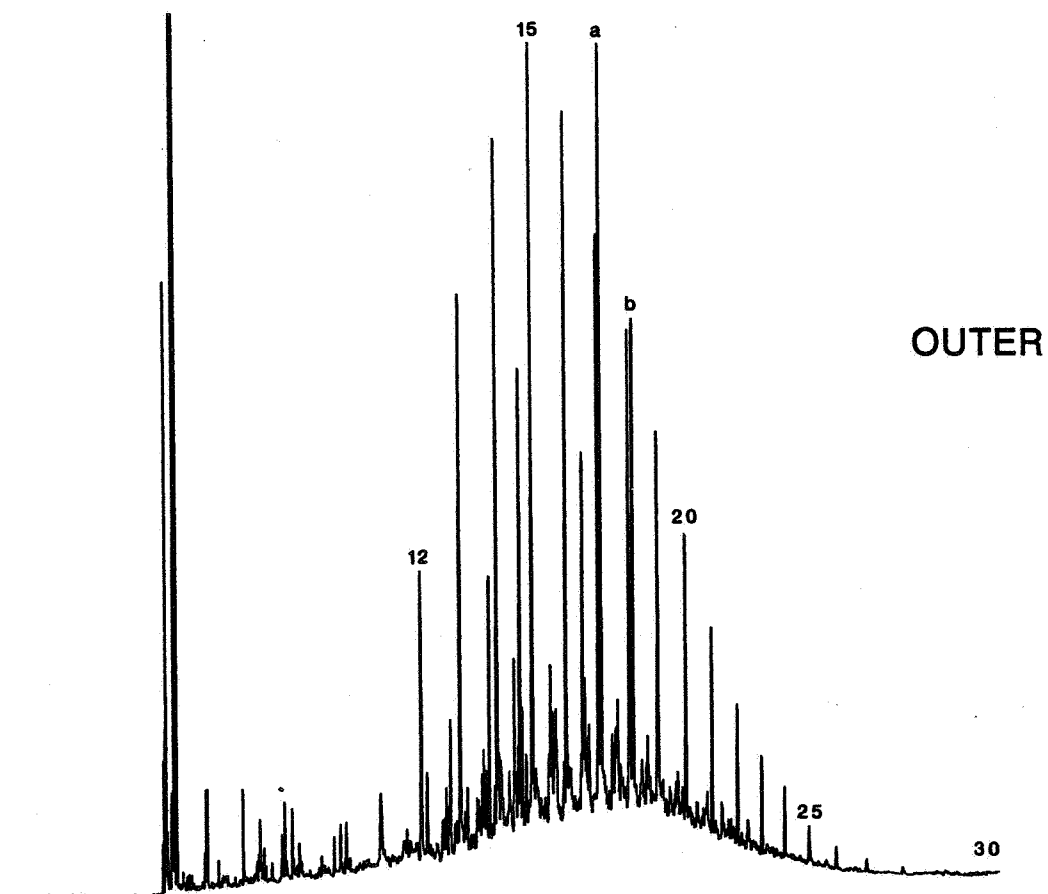
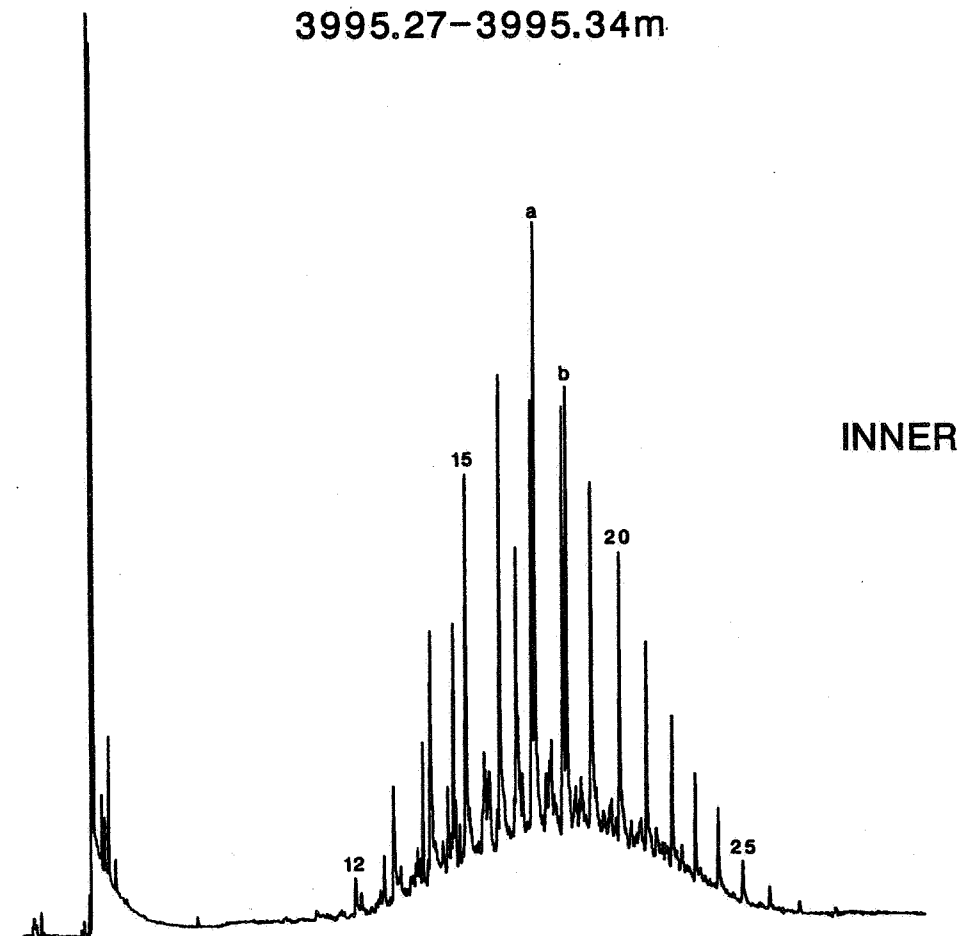


FIGURE 2b

WELL 6506/12-5

THERMAL BITUMEN CHROMATOGRAMS



3996.10-3996.24m

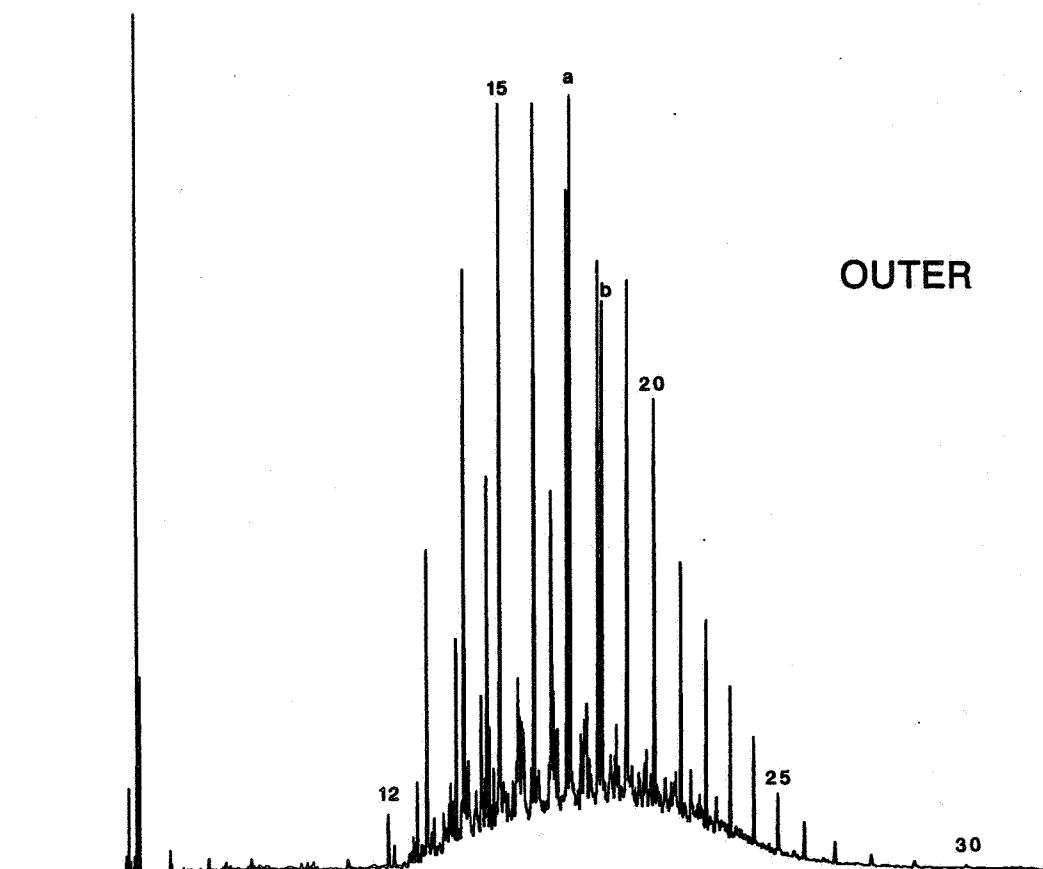
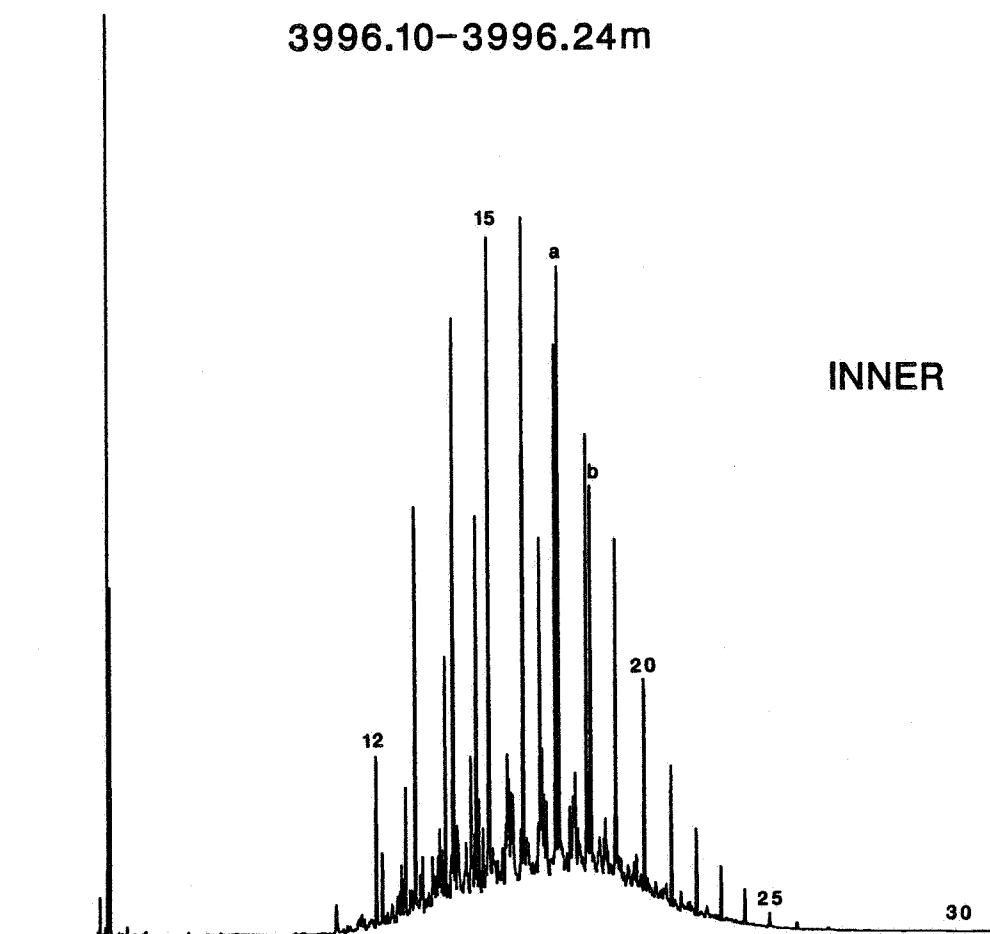


FIGURE 2c

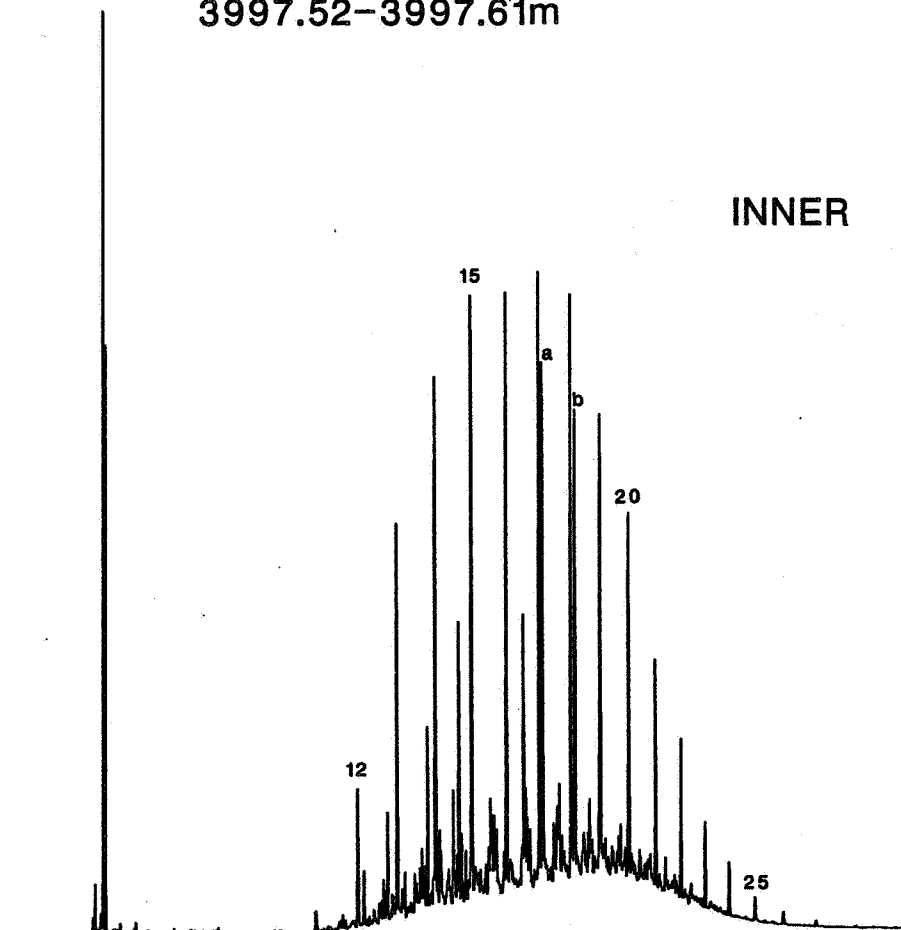
WELL 6506/12-5

THERMAL BITUMEN CHROMATOGRAMS



3997.52-3997.61m

INNER



OUTER

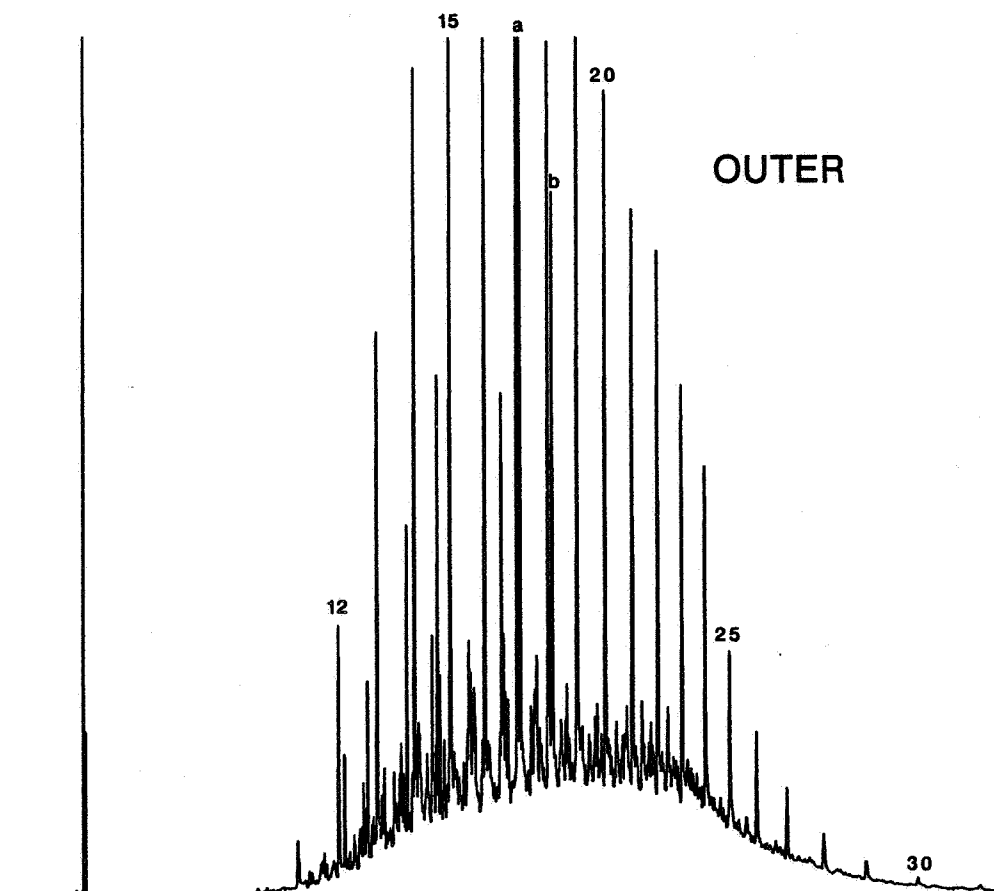


FIGURE 3a

C₄-C₇ CHROMATOGRAMS

WELL 6506/12-5

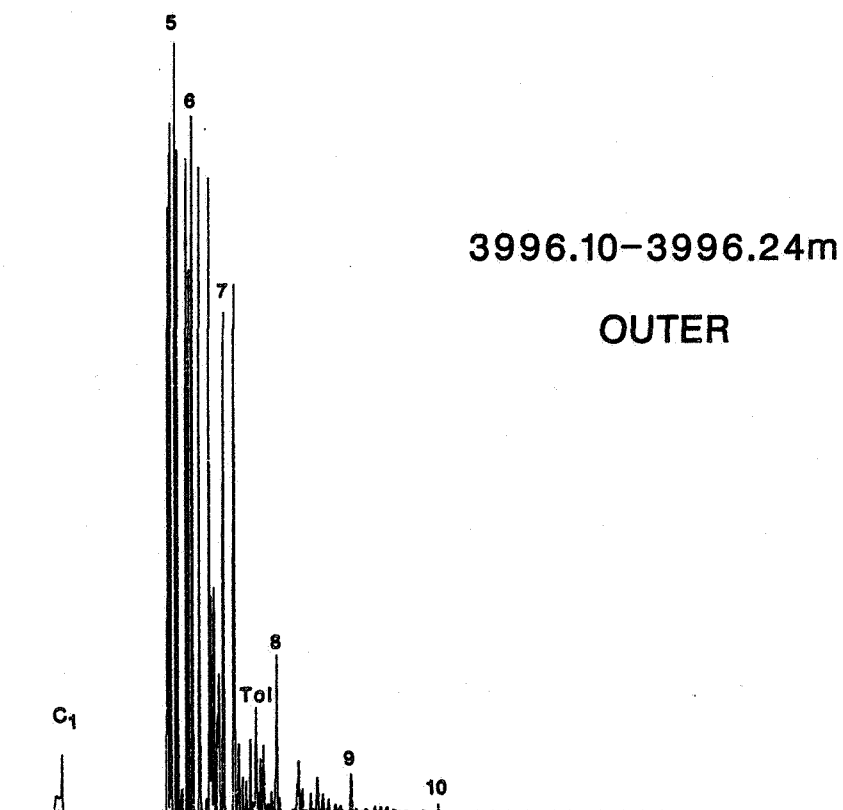
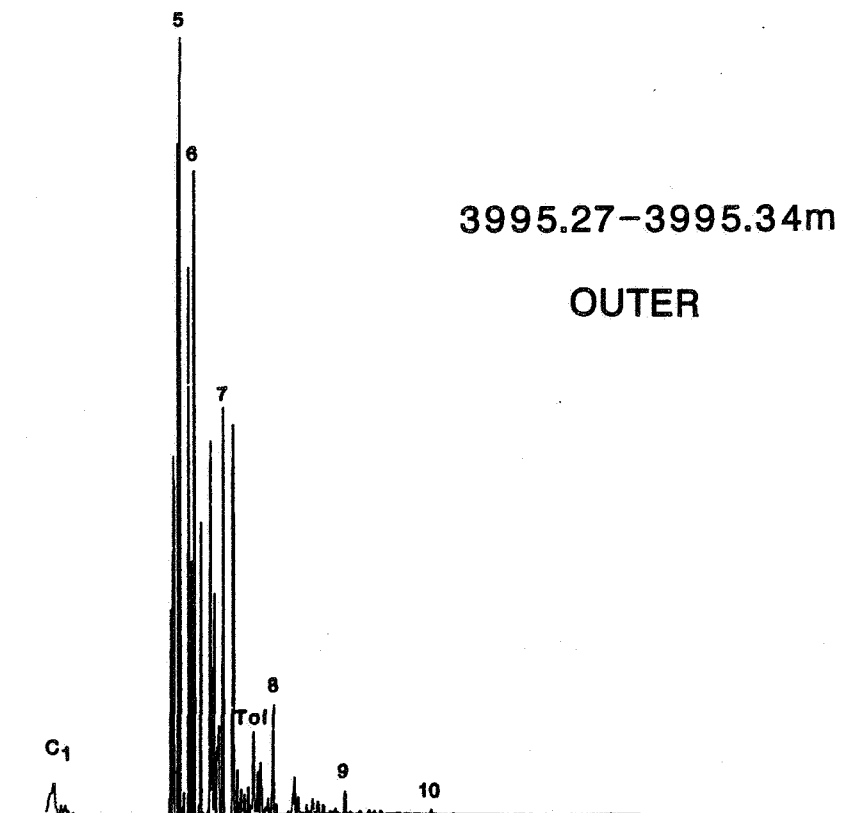
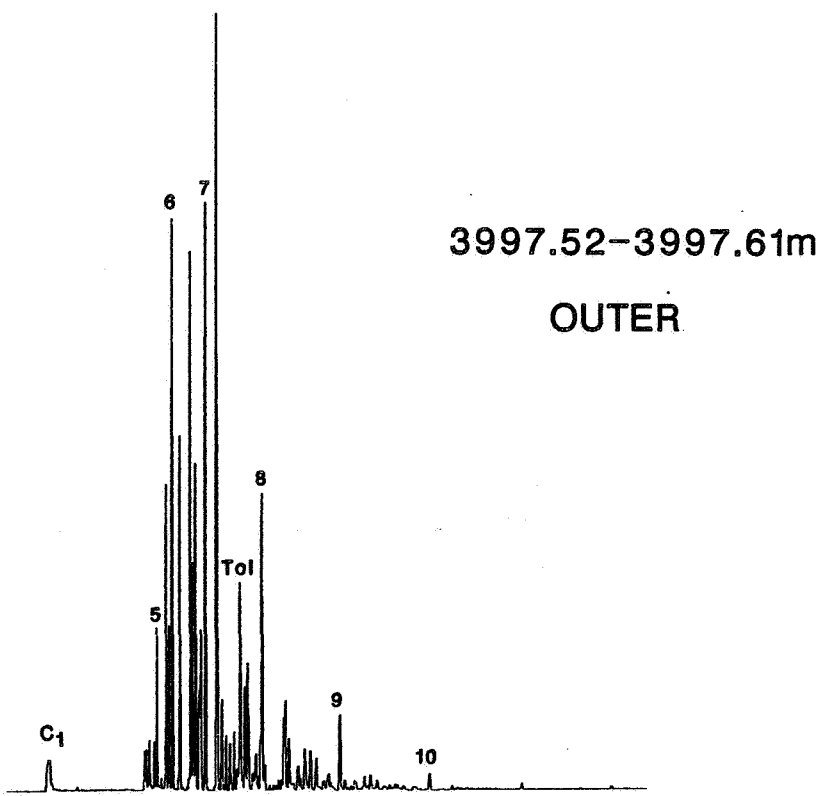


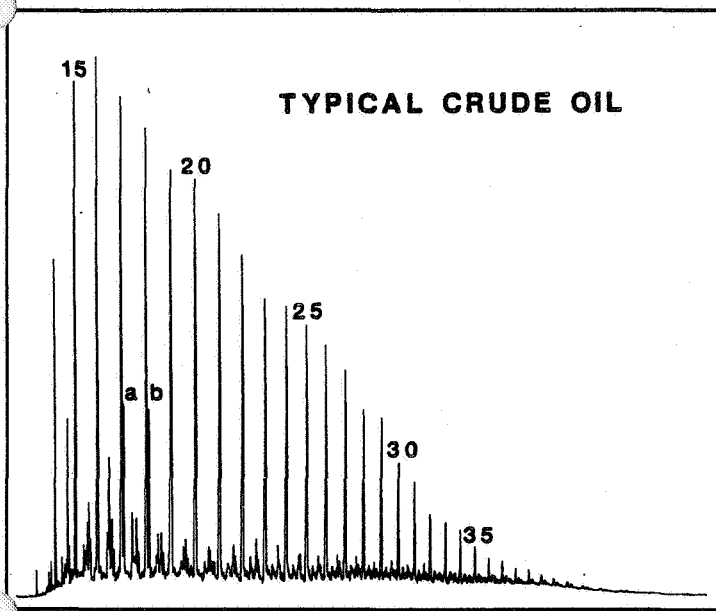
FIGURE 3b

C₄-C₇ CHROMATOGRAMS

WELL 6506/12-5



C₁₅+ SATURATES CHROMATOGRAMS

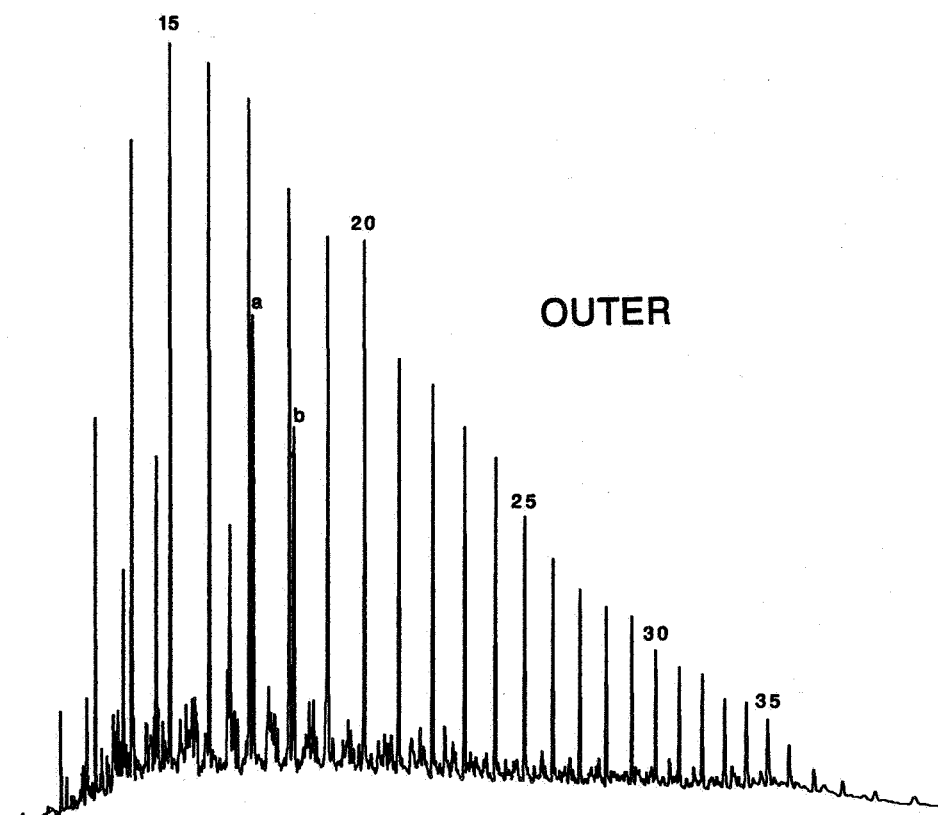
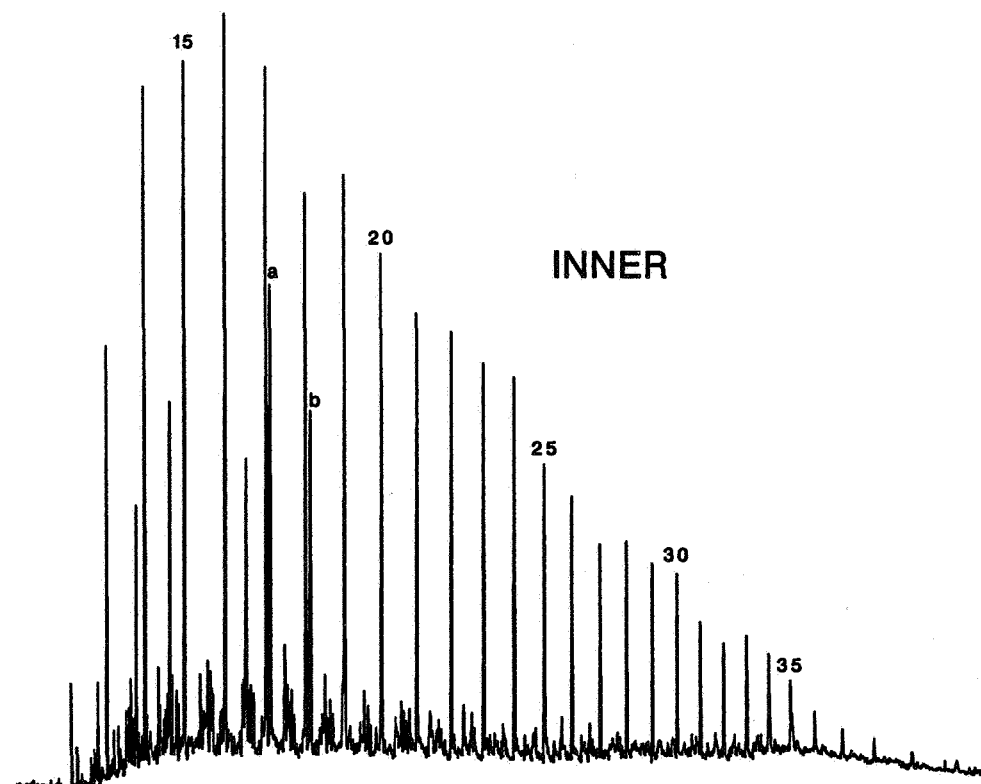


a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20-nC₂₀)



3995.27-3995.34m

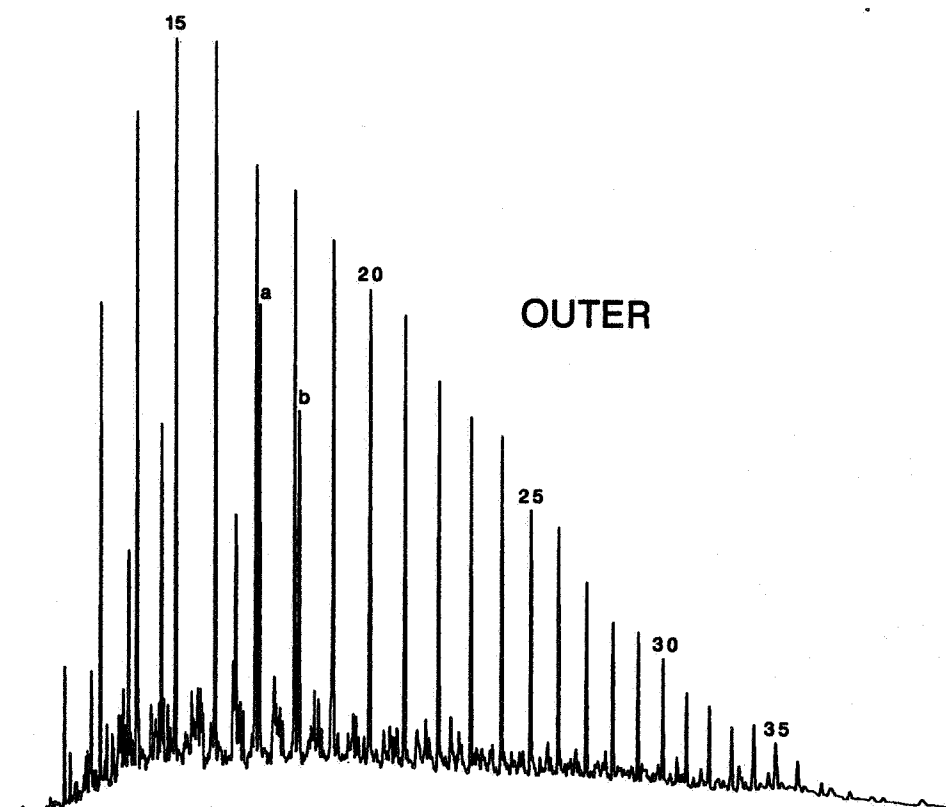
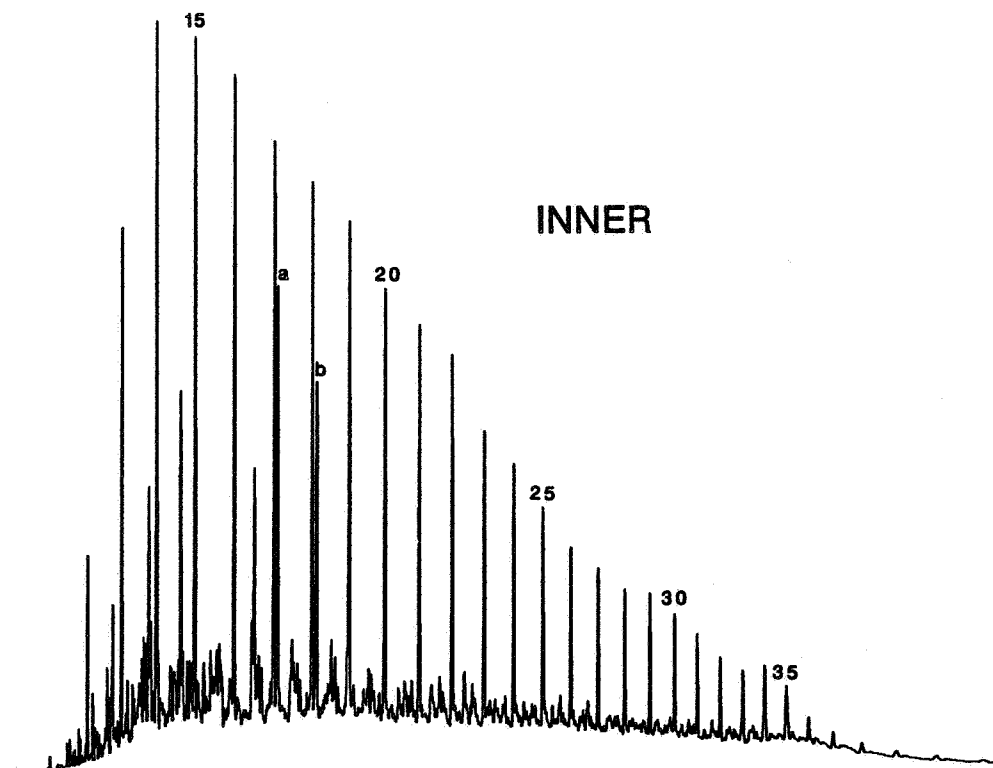


a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)



3996.10-3996.24m



a - PRISTANE

b - PHYTANE

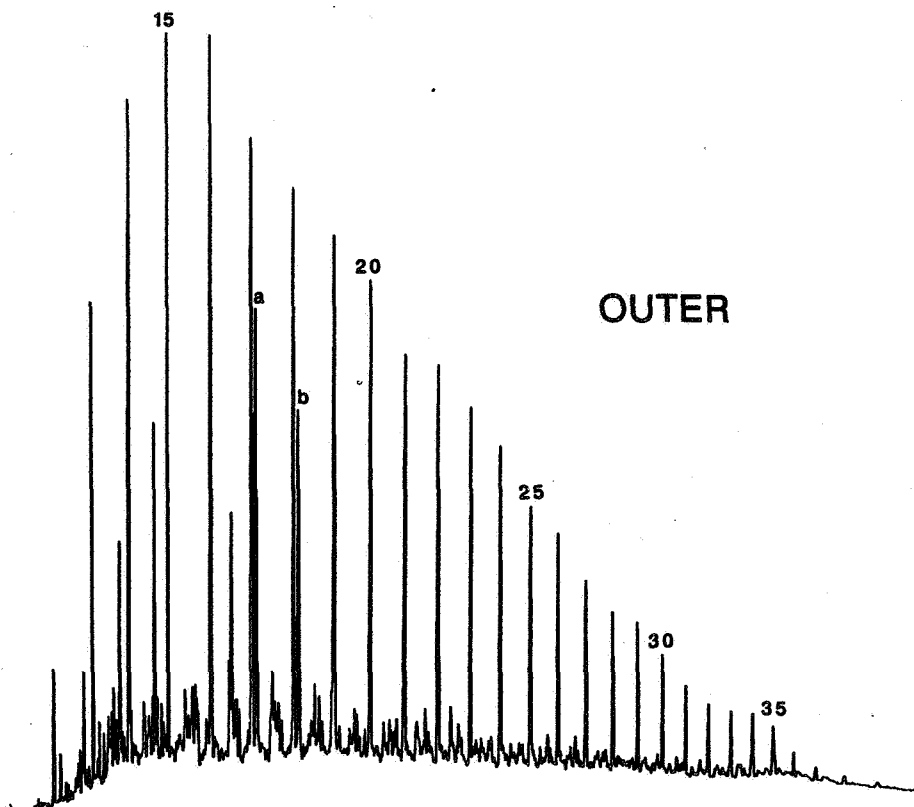
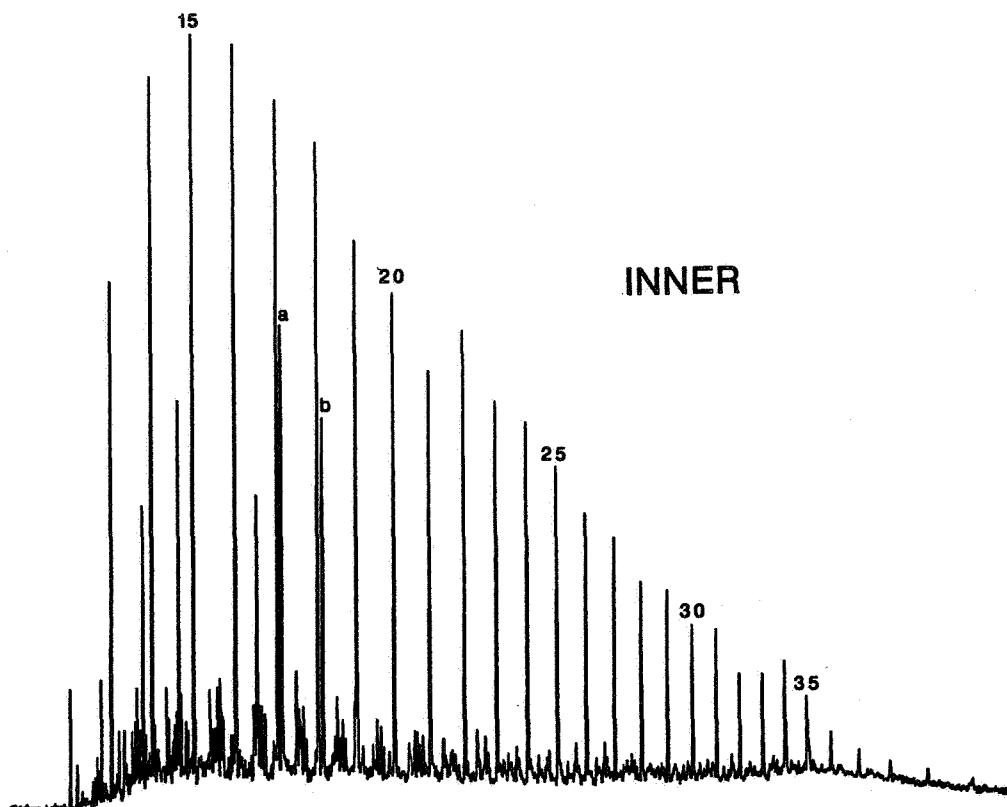
CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 4c **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5



3997.52-3997.61m



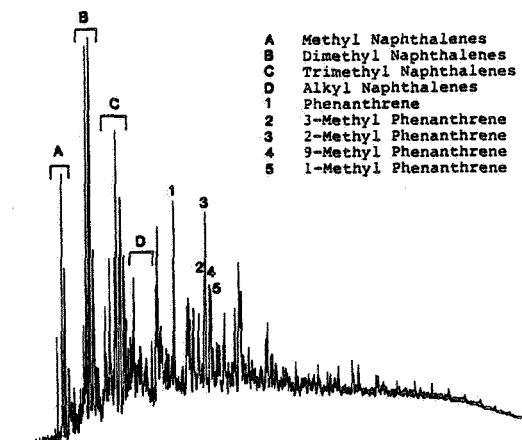
a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

C₁₅+ AROMATIC CHROMATOGRAMS



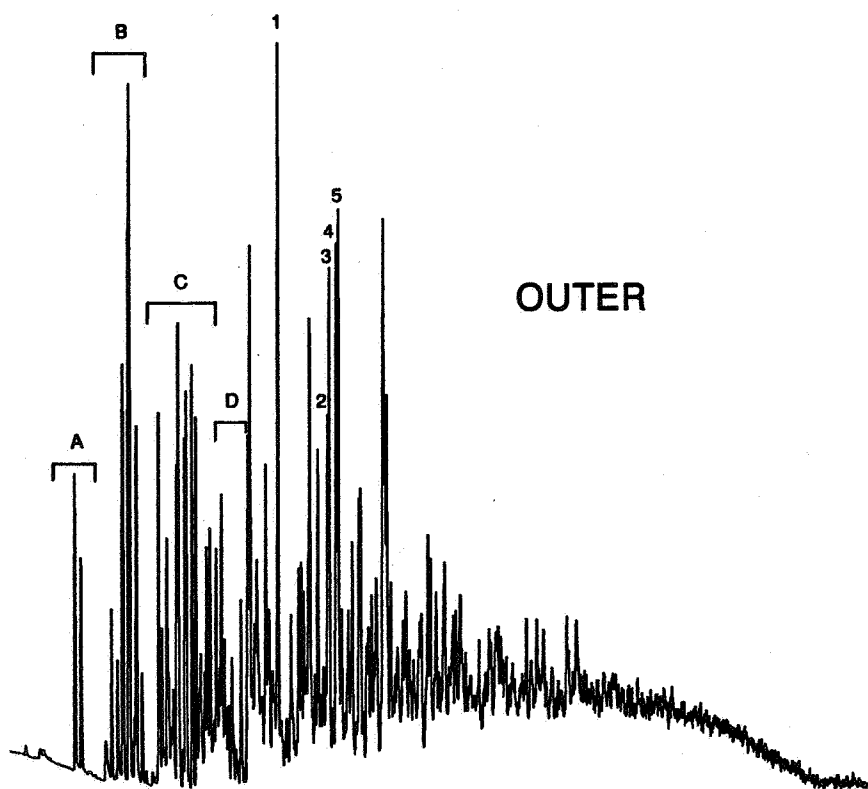
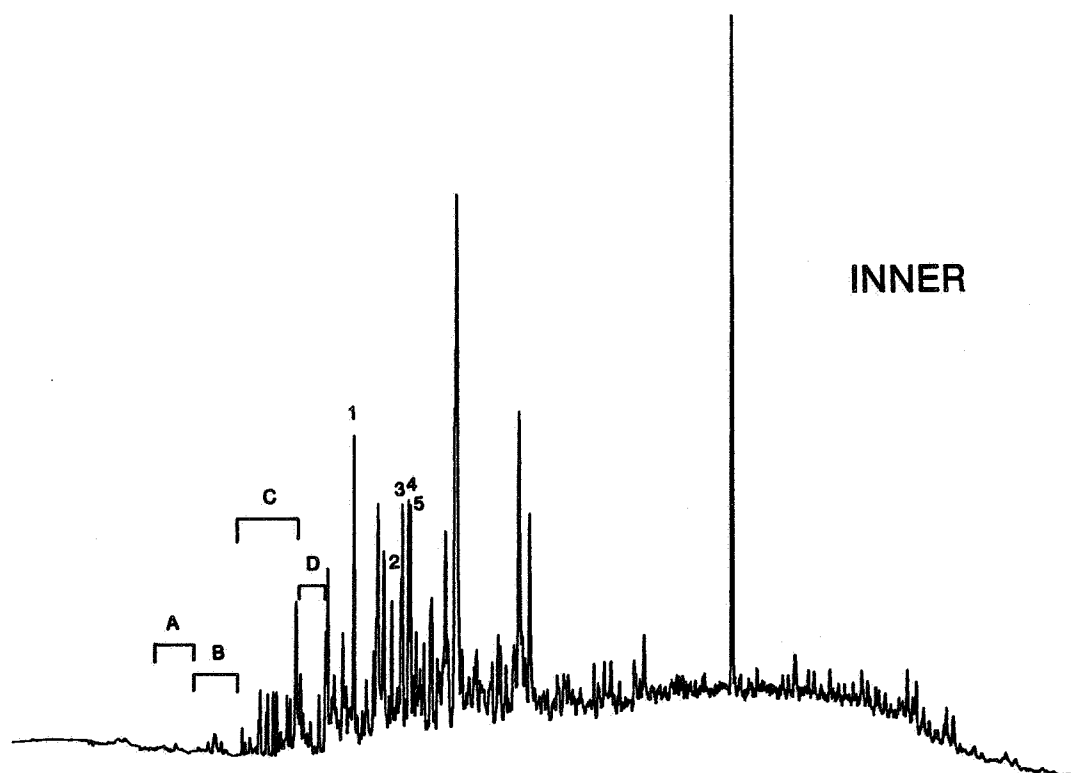
STANDARD



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

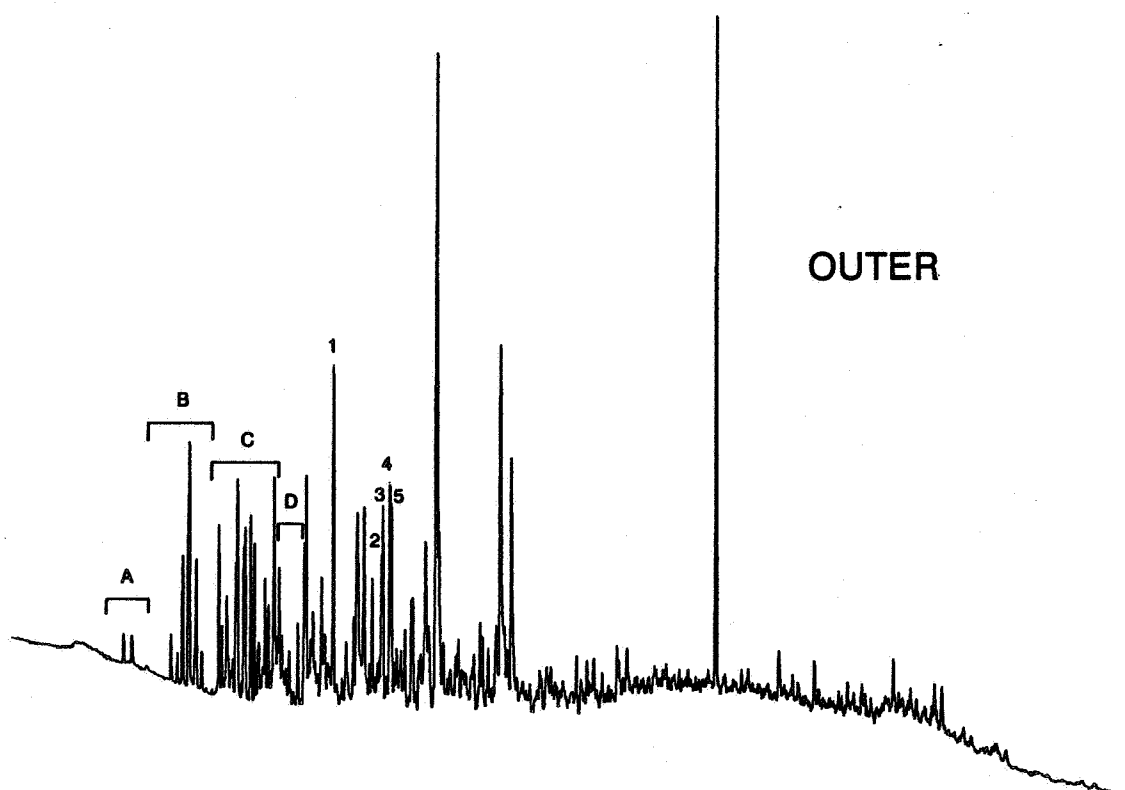
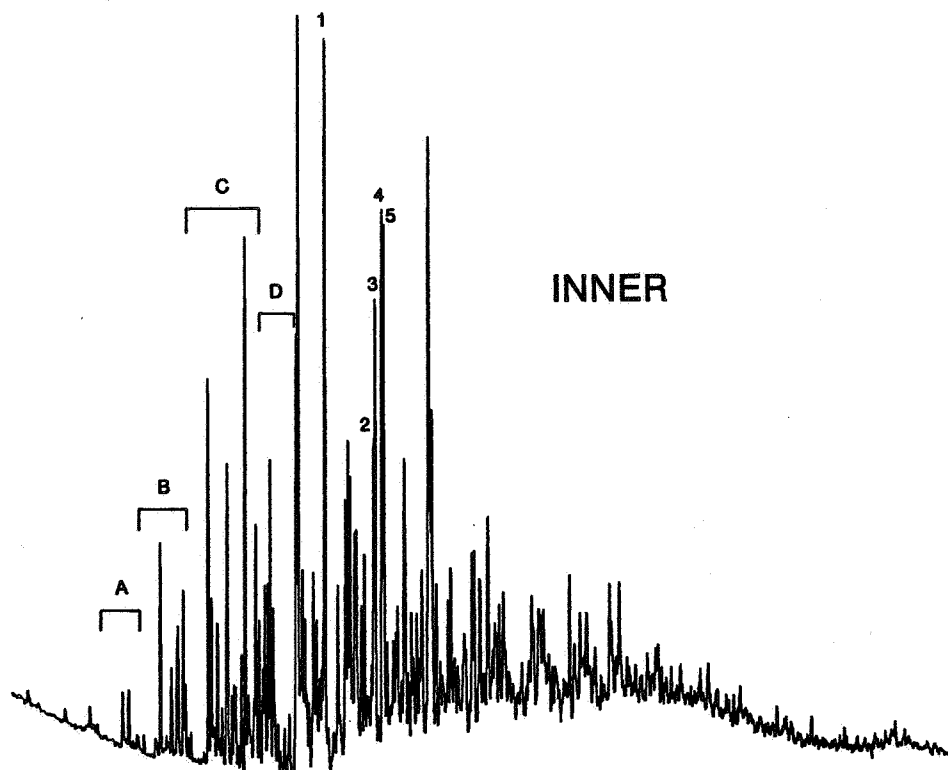


3995.27-3995.34m





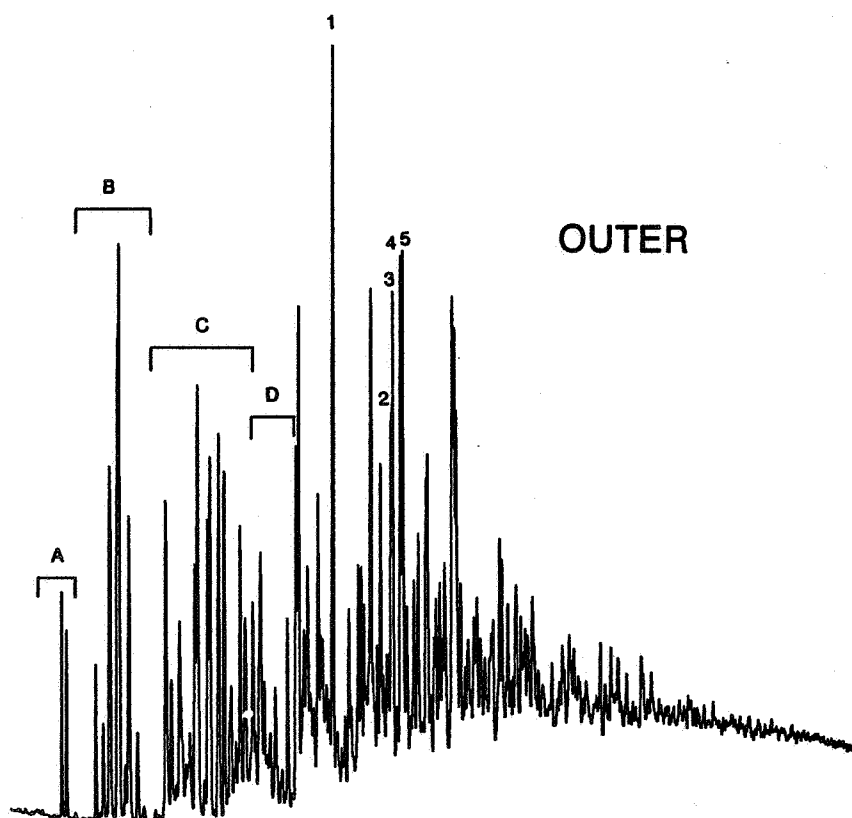
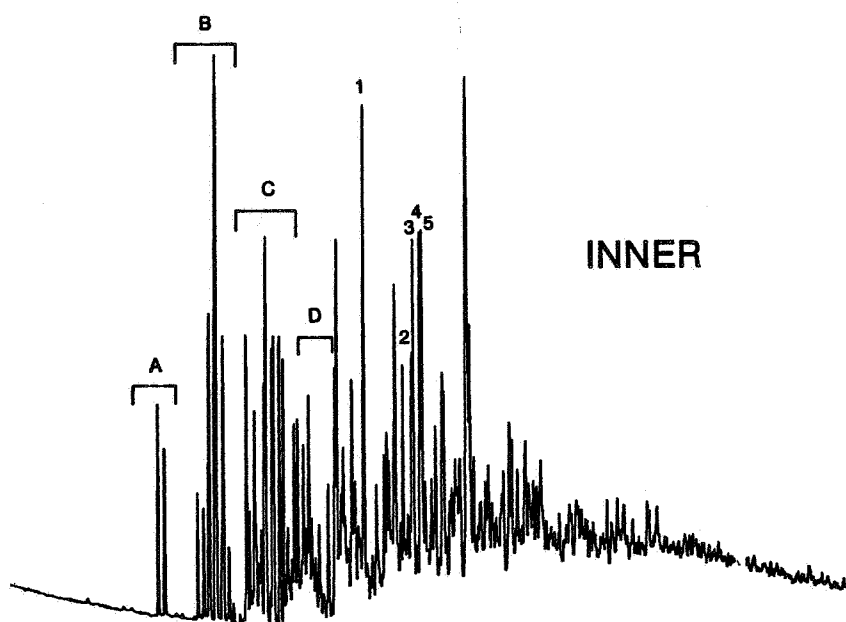
3996.10-3996.24m



PEAK IDENTIFICATION ON FIRST SHEET



3997.52-3997.61m



ORGANO-SULPHUR CHROMATOGRAMS

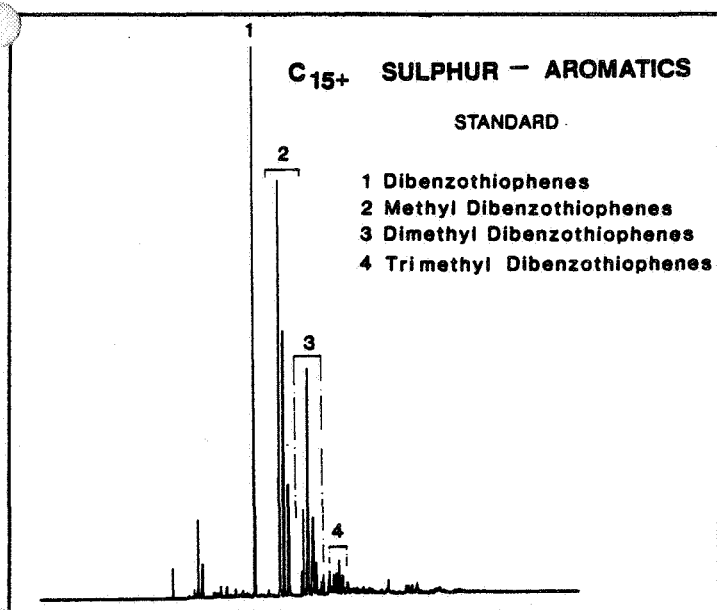
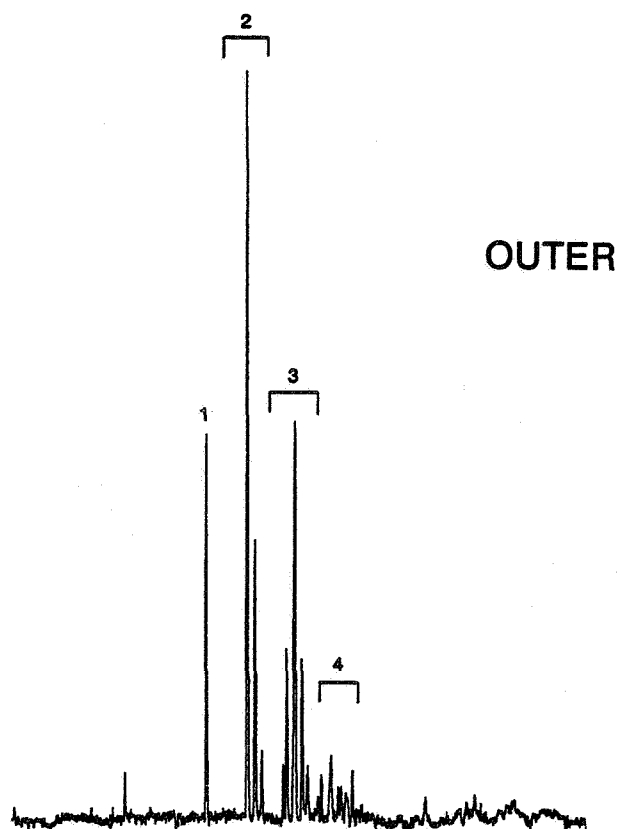
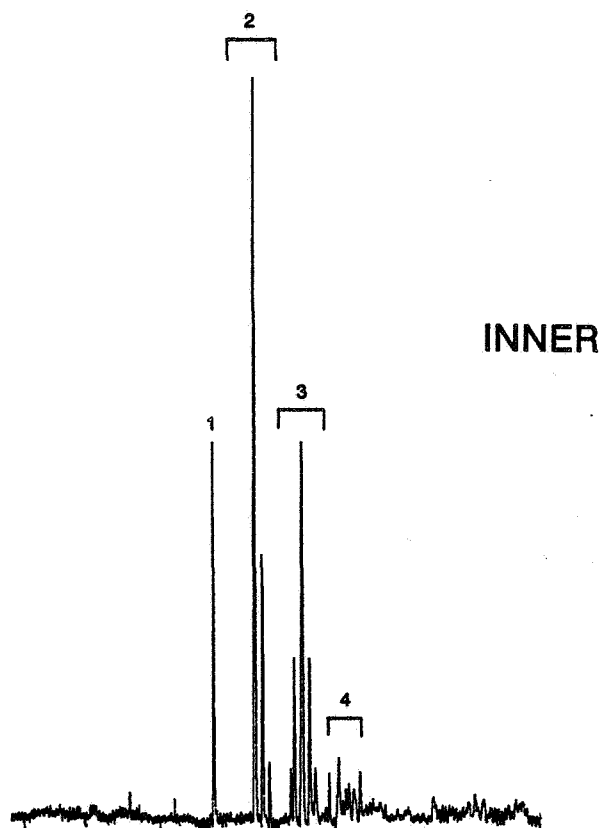


FIGURE 6a

WELL 6506/12-5

ORGANO-SULPHUR CHROMATOGRAMS

3995.27-3995.34m



PEAK IDENTIFICATION ON FIRST SHEET

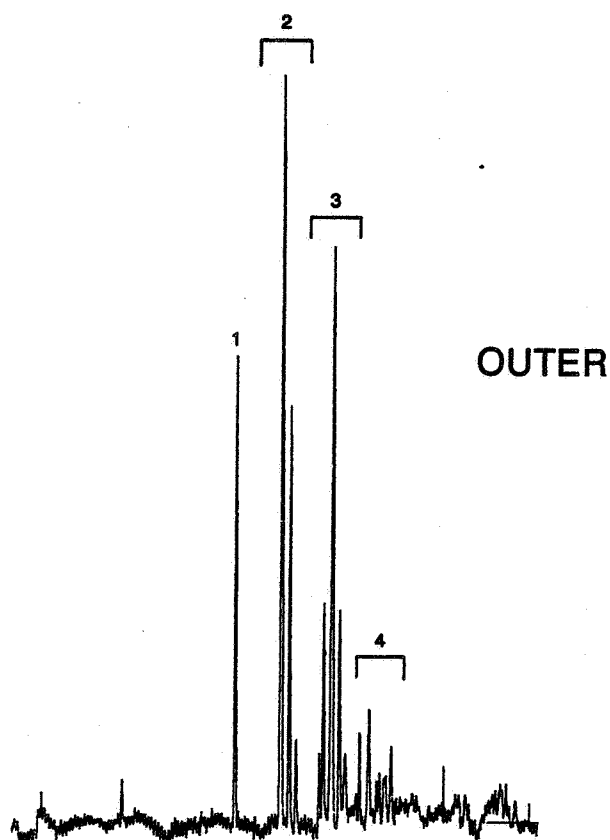
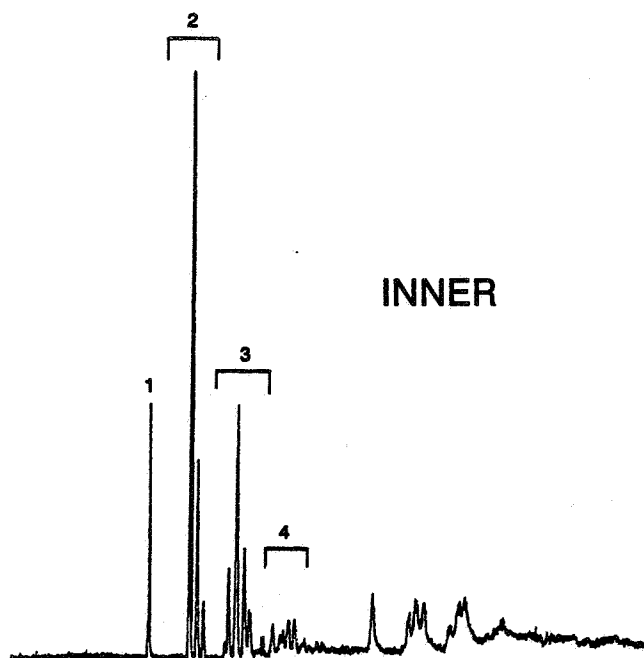
FIGURE 6b

WELL 6506/12-5

ORGANO-SULPHUR CHROMATOGRAMS



3996.10-3996.24m



PEAK IDENTIFICATION ON FIRST SHEET

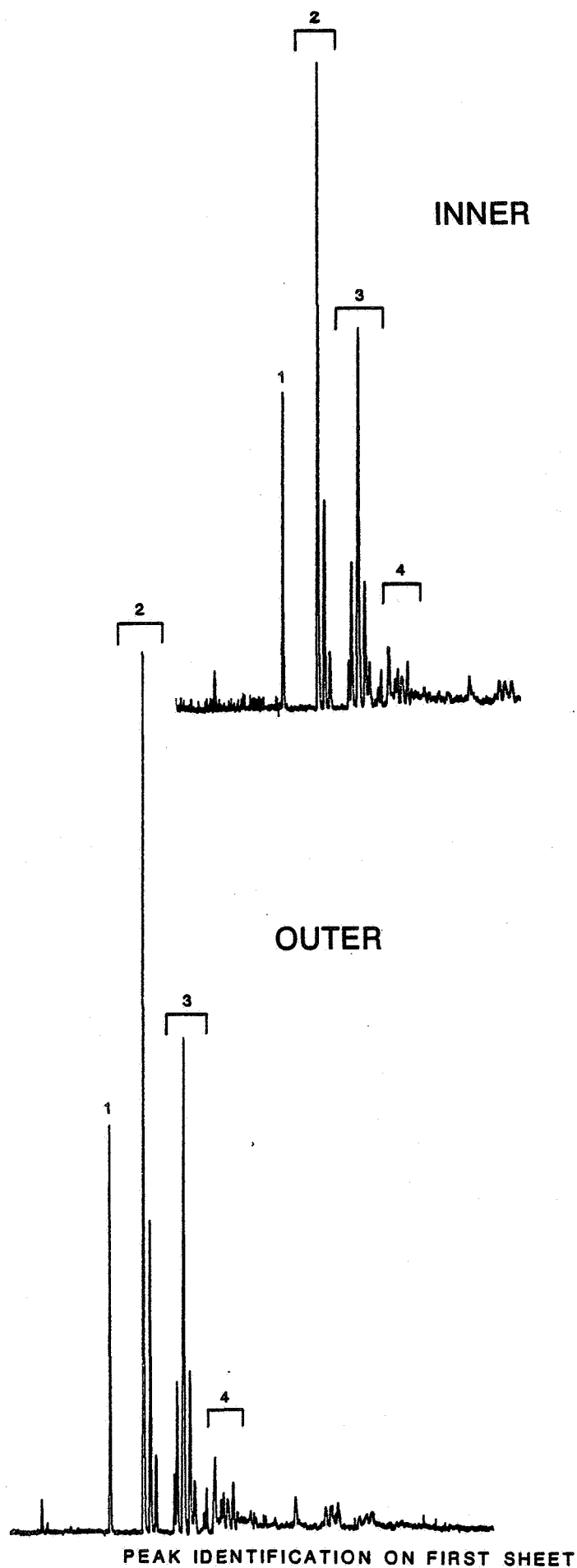
FIGURE 6c

WELL 6506/12-5

ORGANO-SULPHUR CHROMATOGRAMS

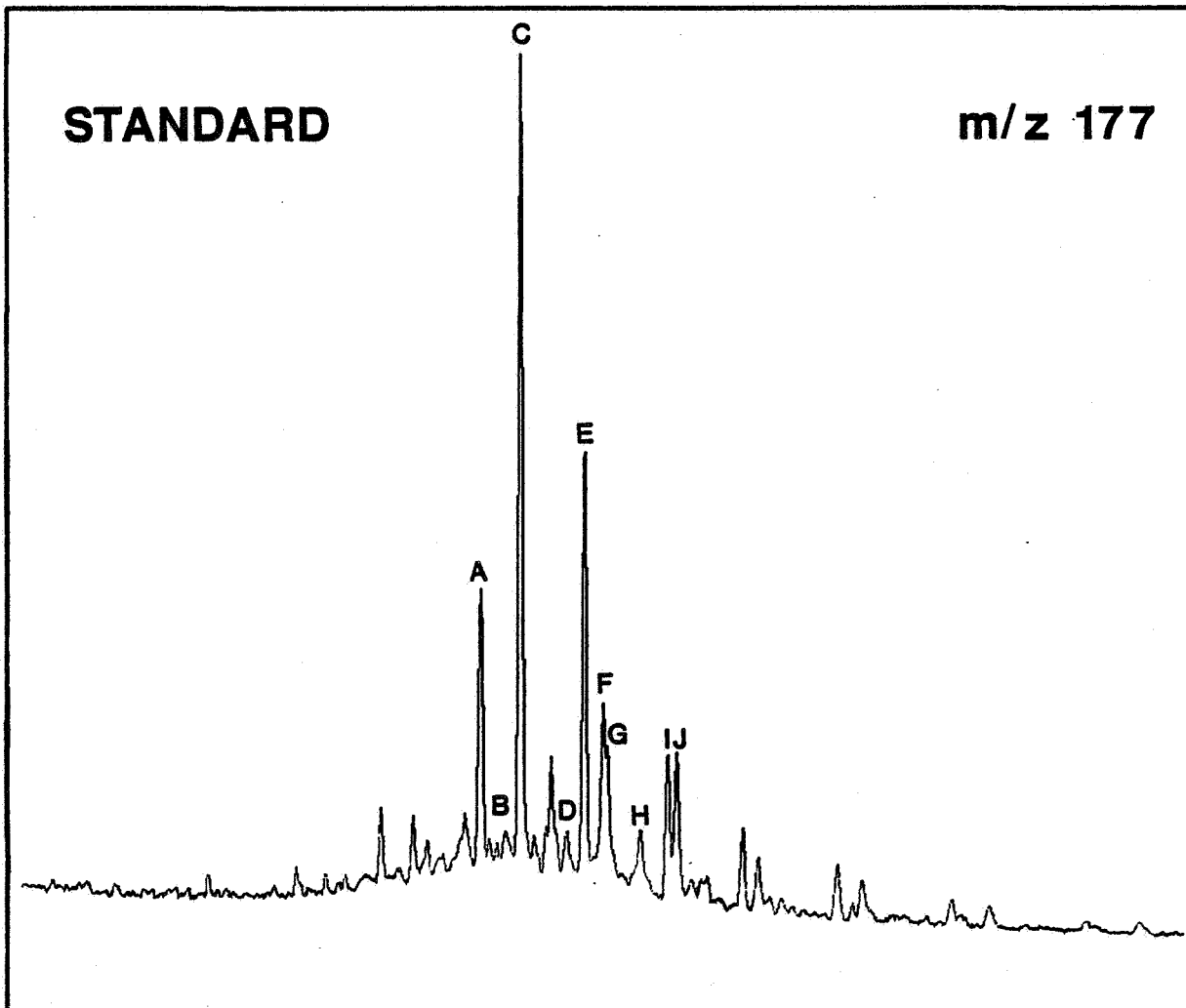


3997.52-3997.61m



STANDARD

m/z 177



DEMETHYLATED HOPANES

(m/z 177 FRAGMENTOGRAM)

COMPOUND

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

FIGURE 7a

MASS FRAGMENTOGRAMS

WELL 6506/12-5

DEMETHYLATED HOPANES m/z 177



3995.27-3995.34m

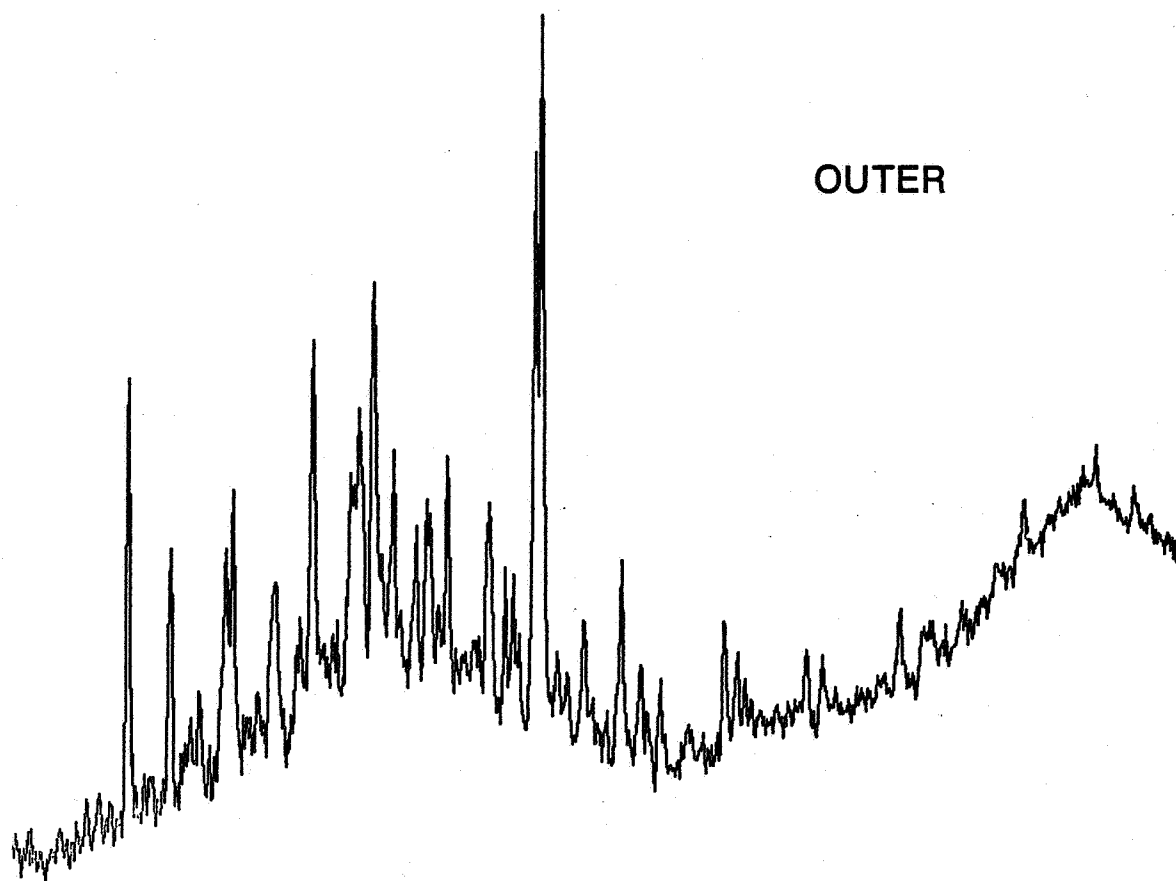
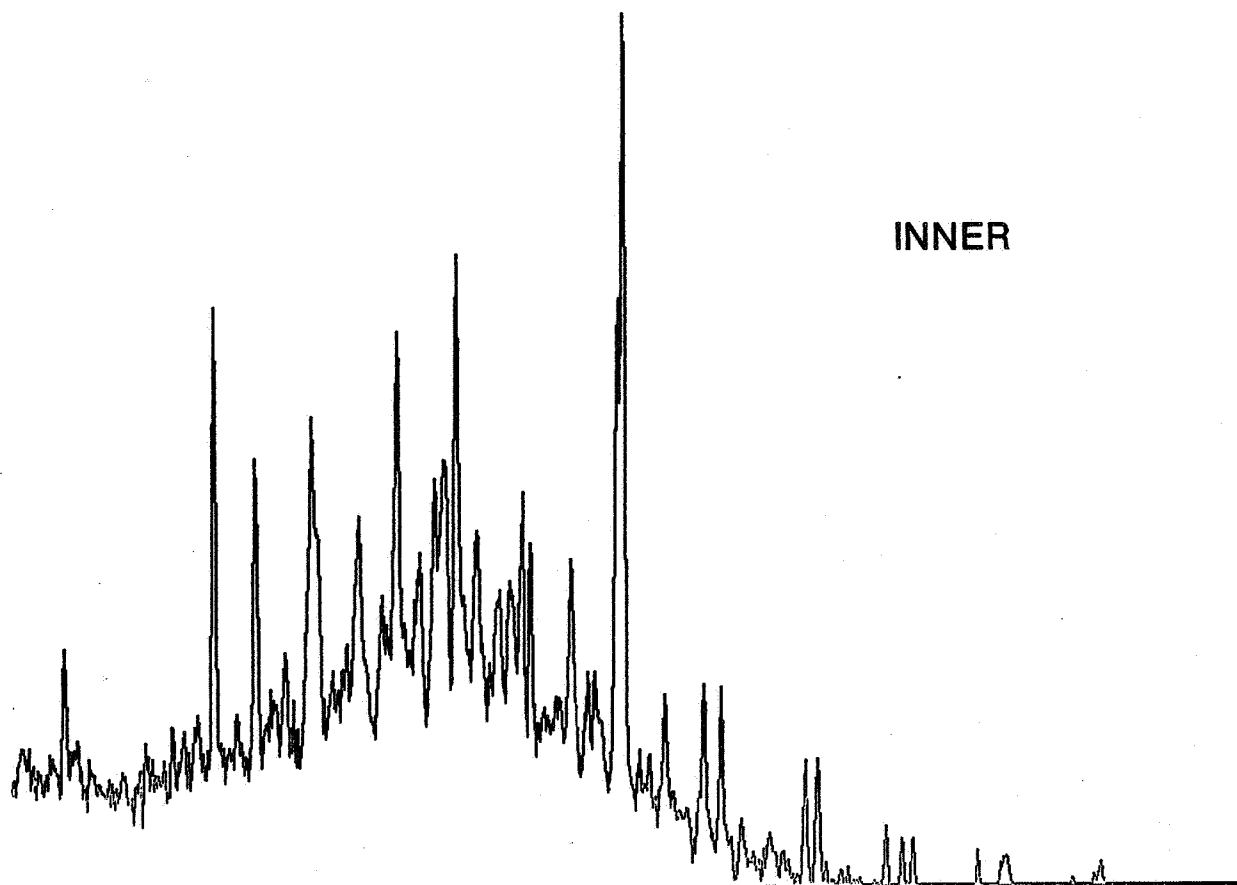


FIGURE 7b

MASS FRAGMENTOGRAMS

WELL 6506/12-5

DEMETHYLATED HOPANES m/z 177



3996.10-3996.24m

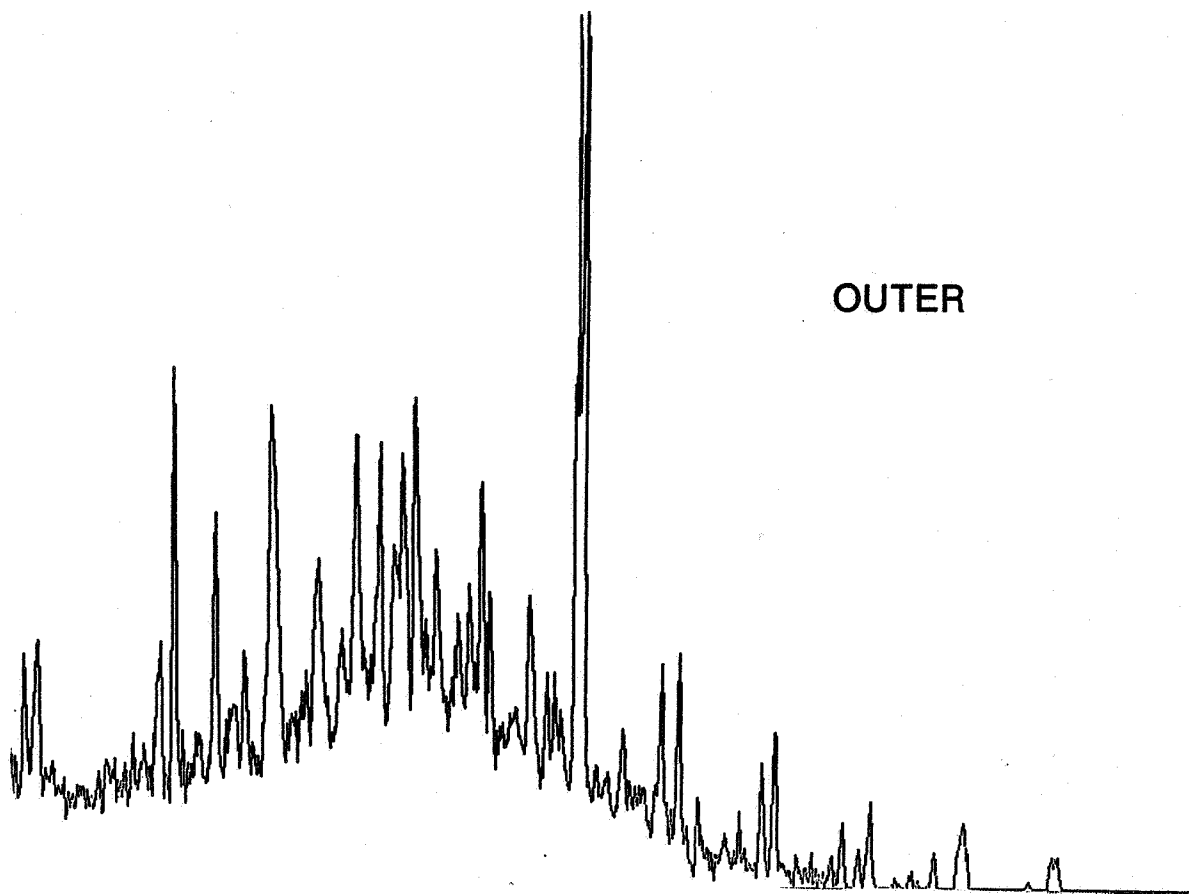
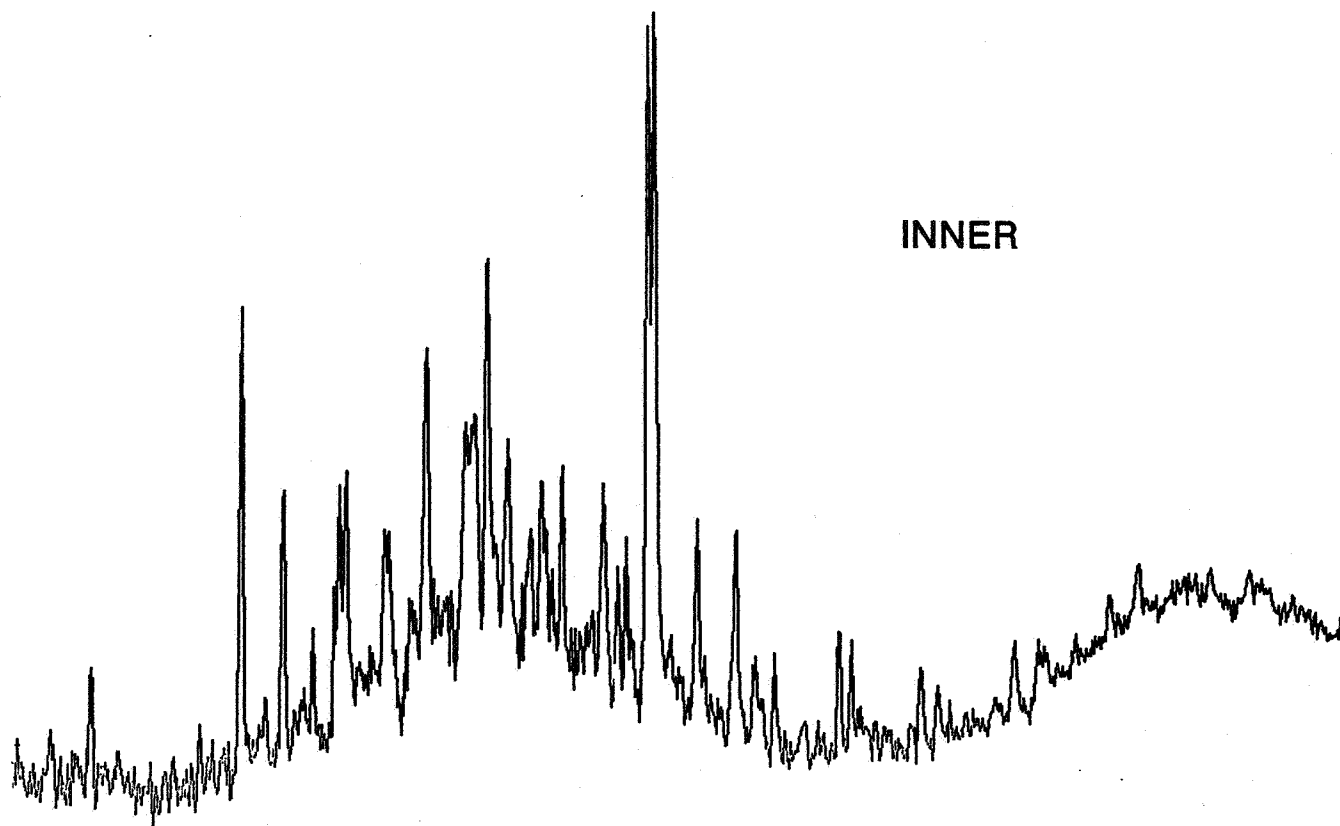


FIGURE 7c

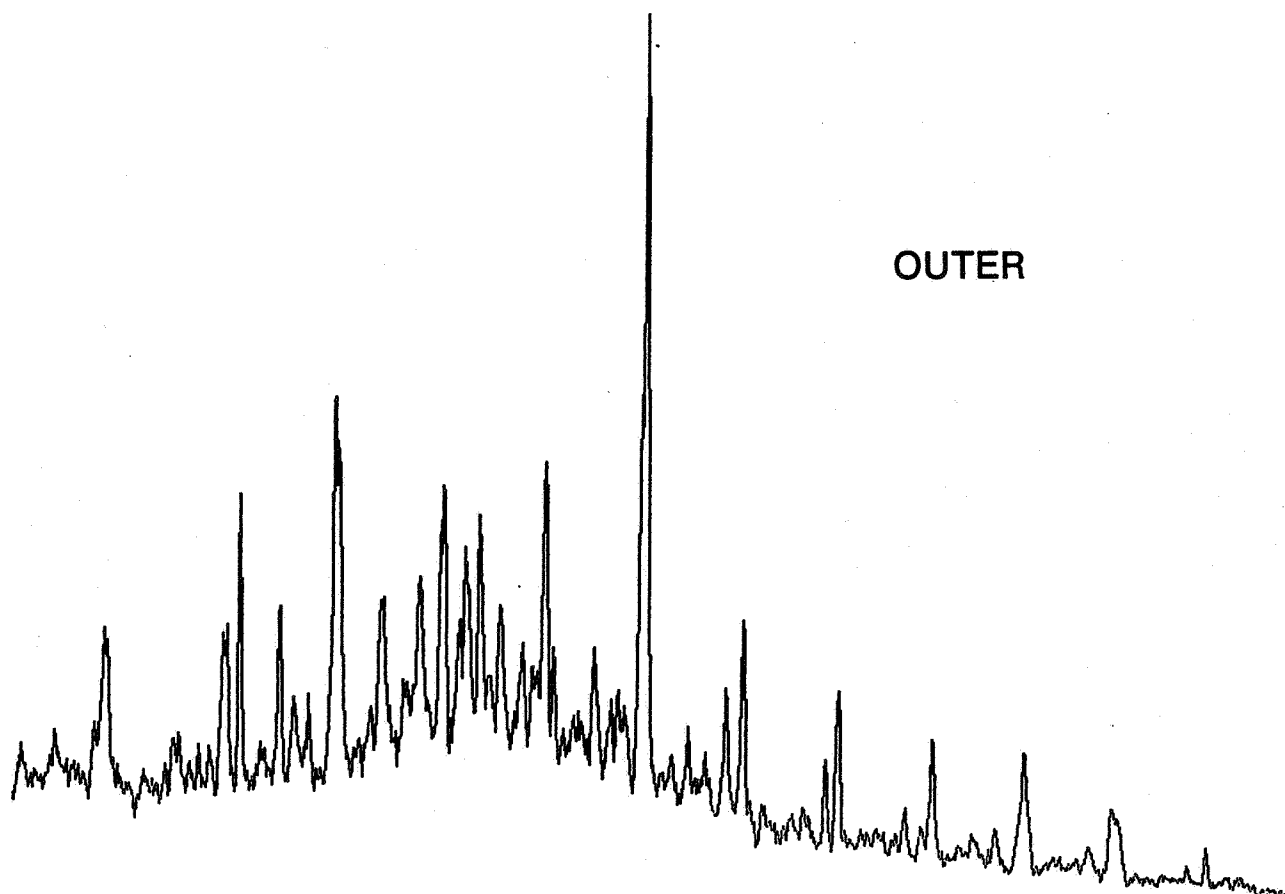
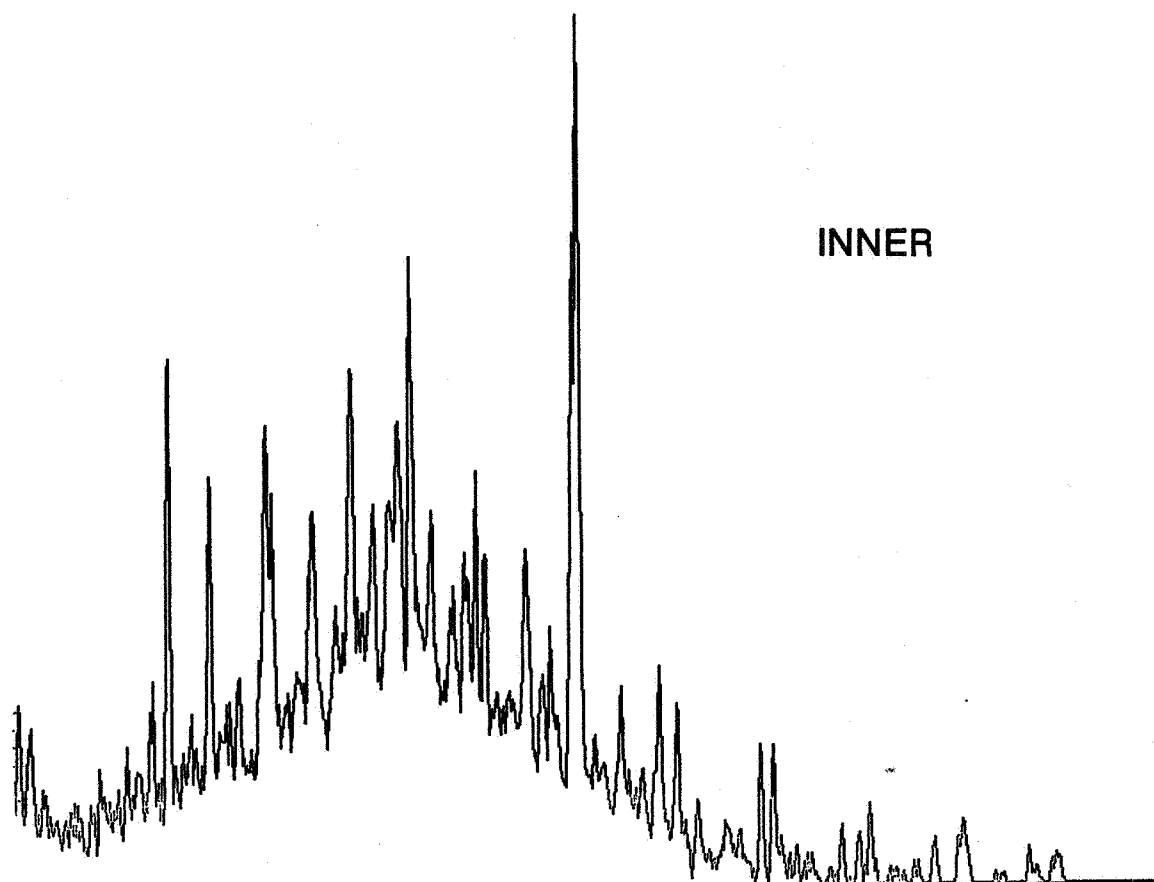
MASS FRAGMENTOGRAMS

WELL 6506/12-5

DEMETHYLATED HOPANES m/z 177

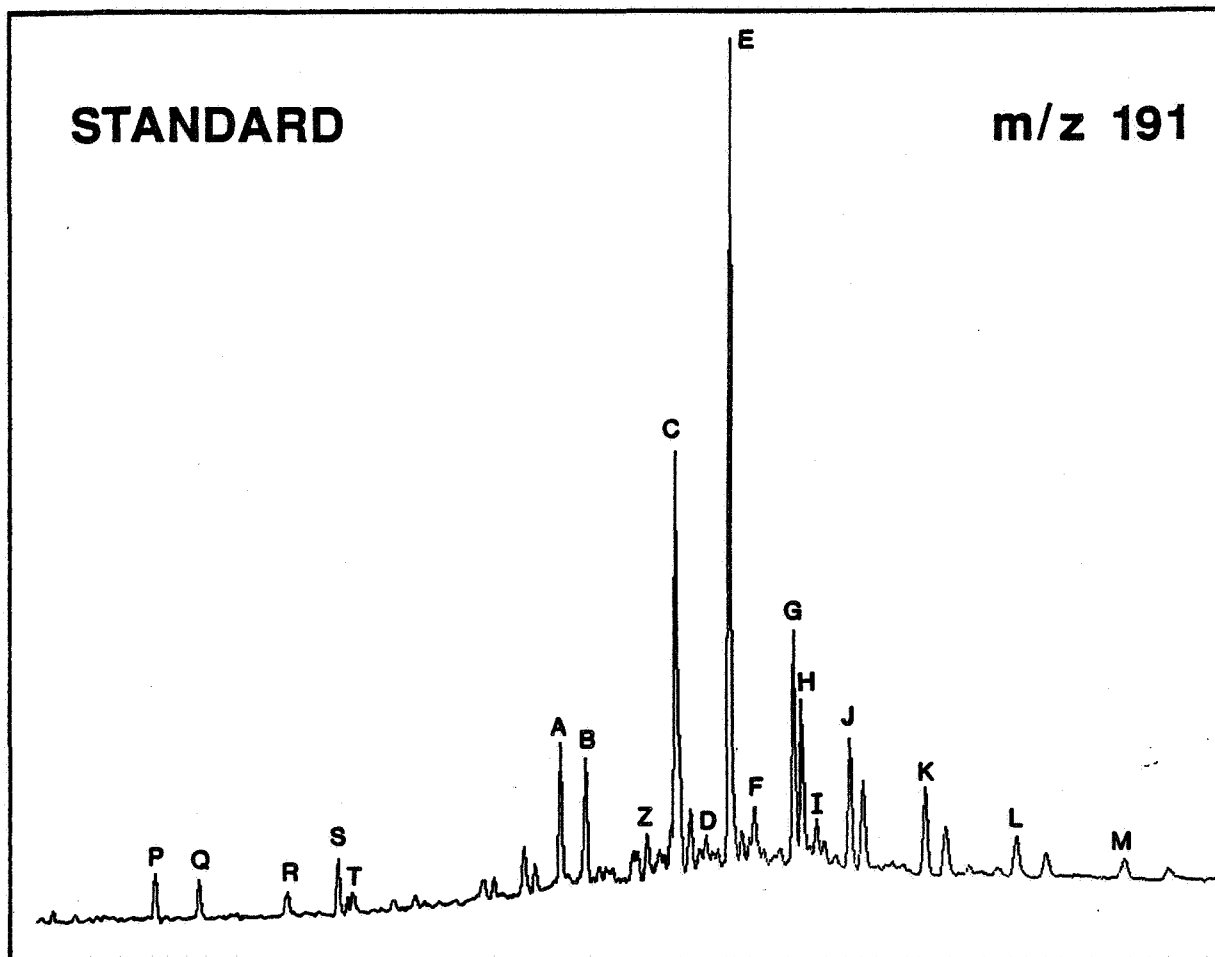


3997.52-3997.61m



STANDARD

m/z 191



TRITERPANE IDENTIFICATION

(M/Z 191 FRAGMENTOGRAM)

<u>COMPOUND</u>	<u>ELEMENTAL COMPOSITION</u>
A 18 (H),21 (H)-trisorneohopane (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 7d

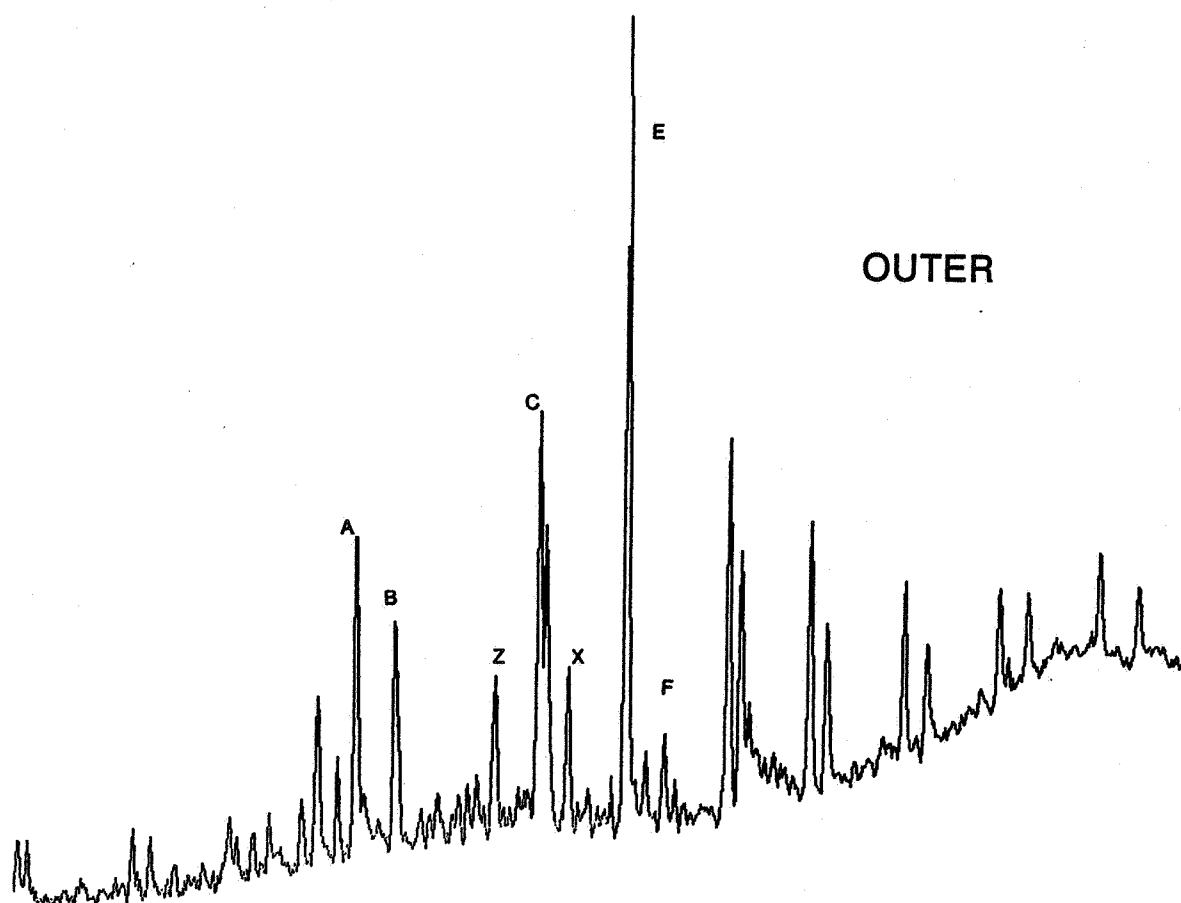
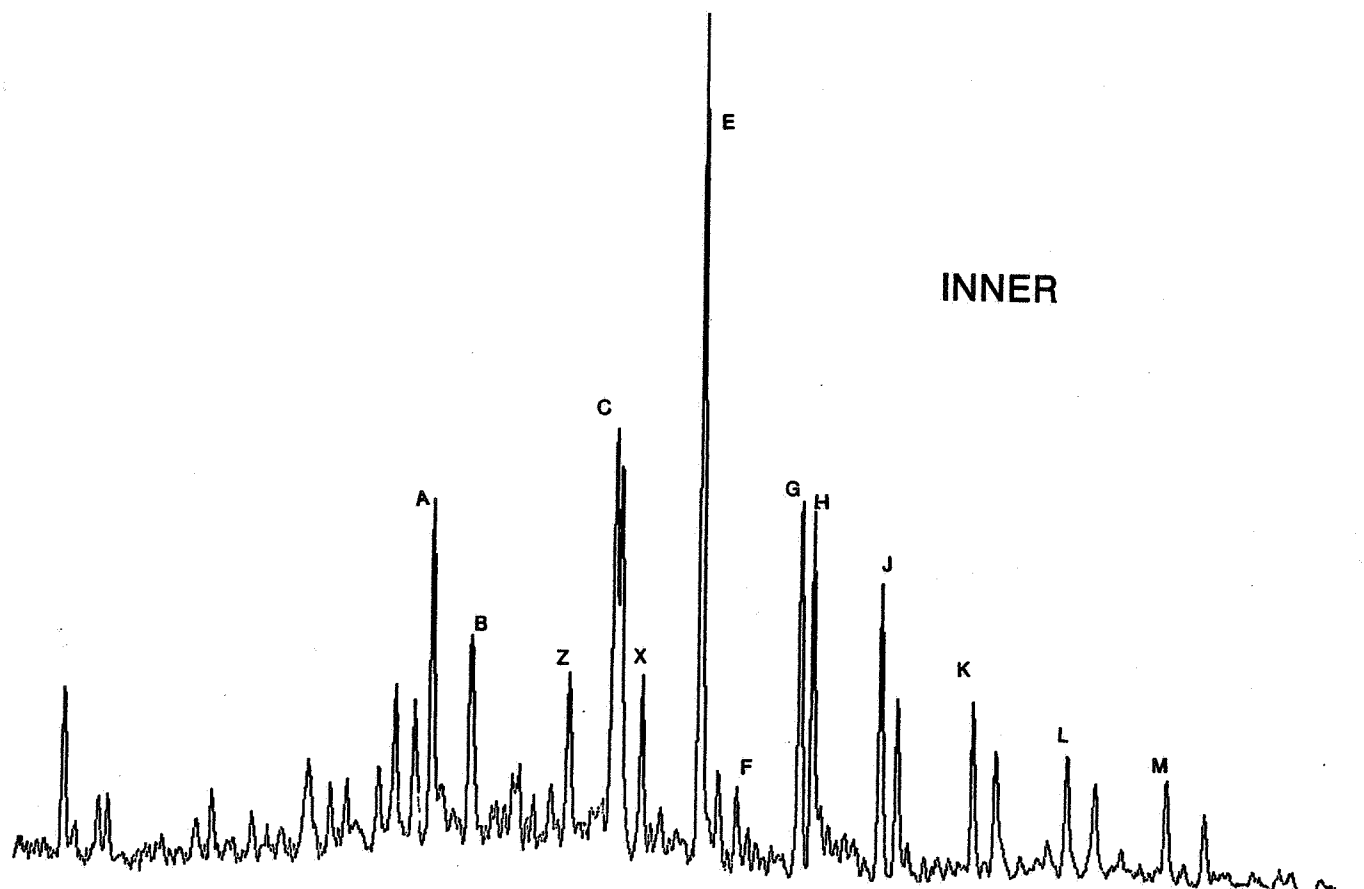
MASS FRAGMENTOGRAMS

WELL 6506/12-5

TRITERPANES m/z 191



3995.27-3995.34m





3996.10-3996.24m

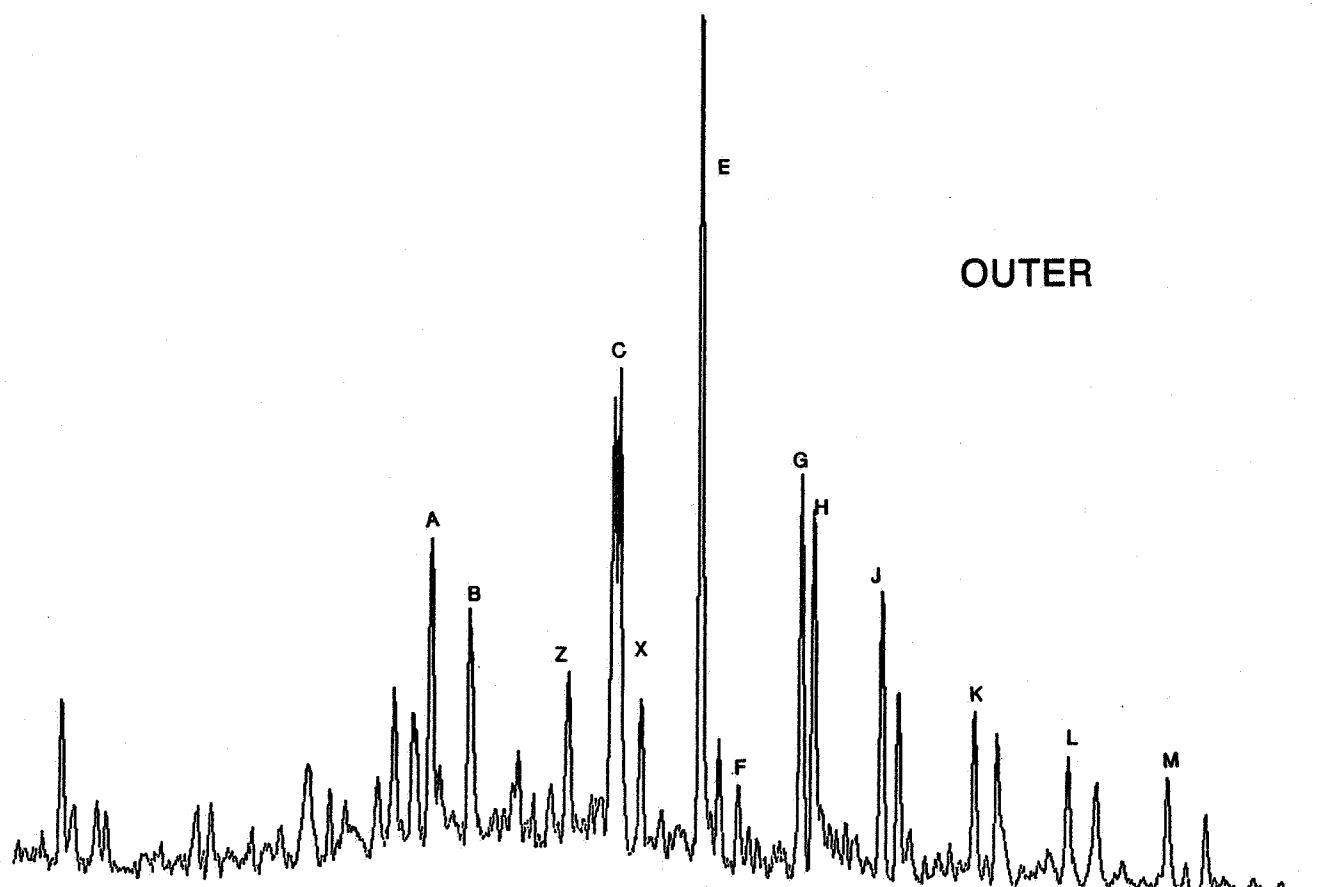
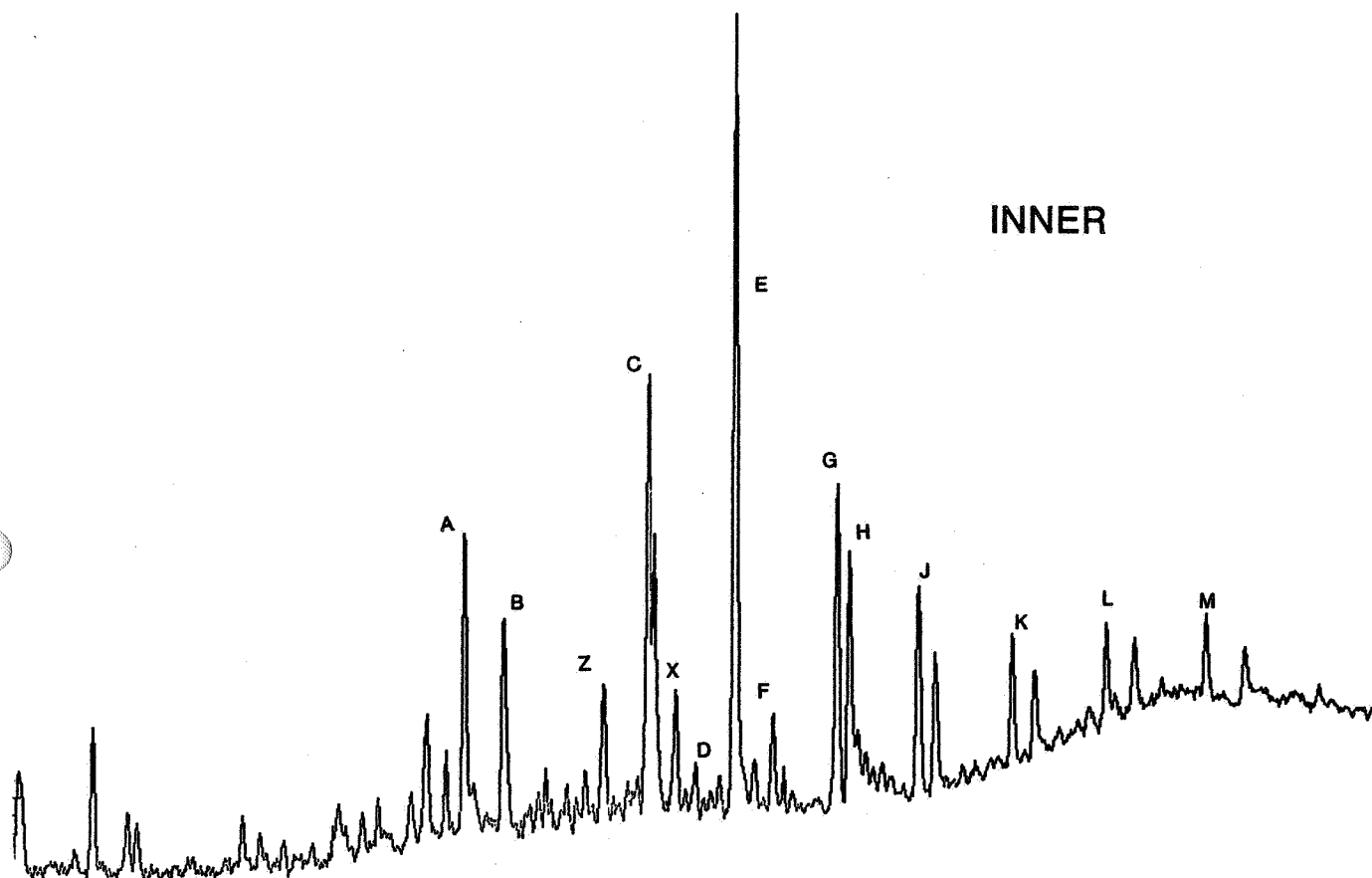


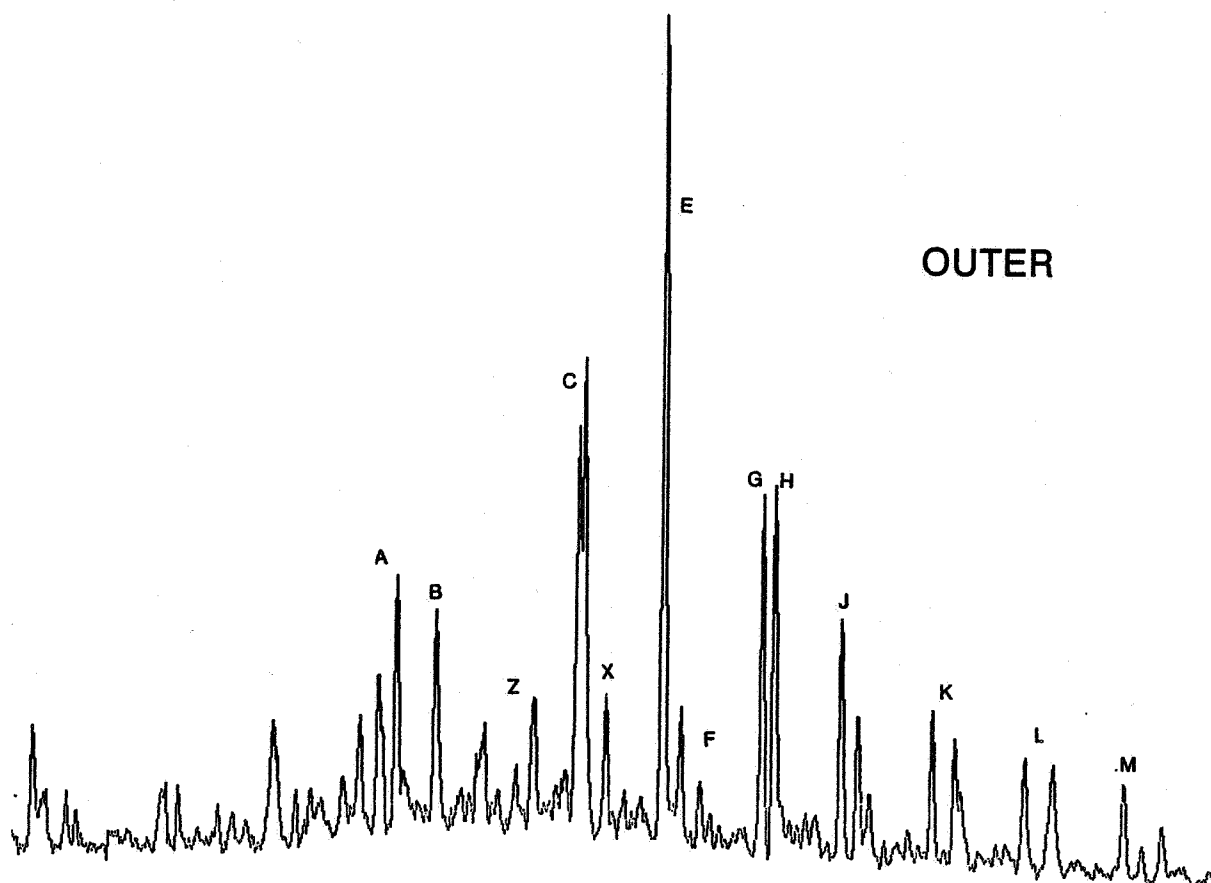
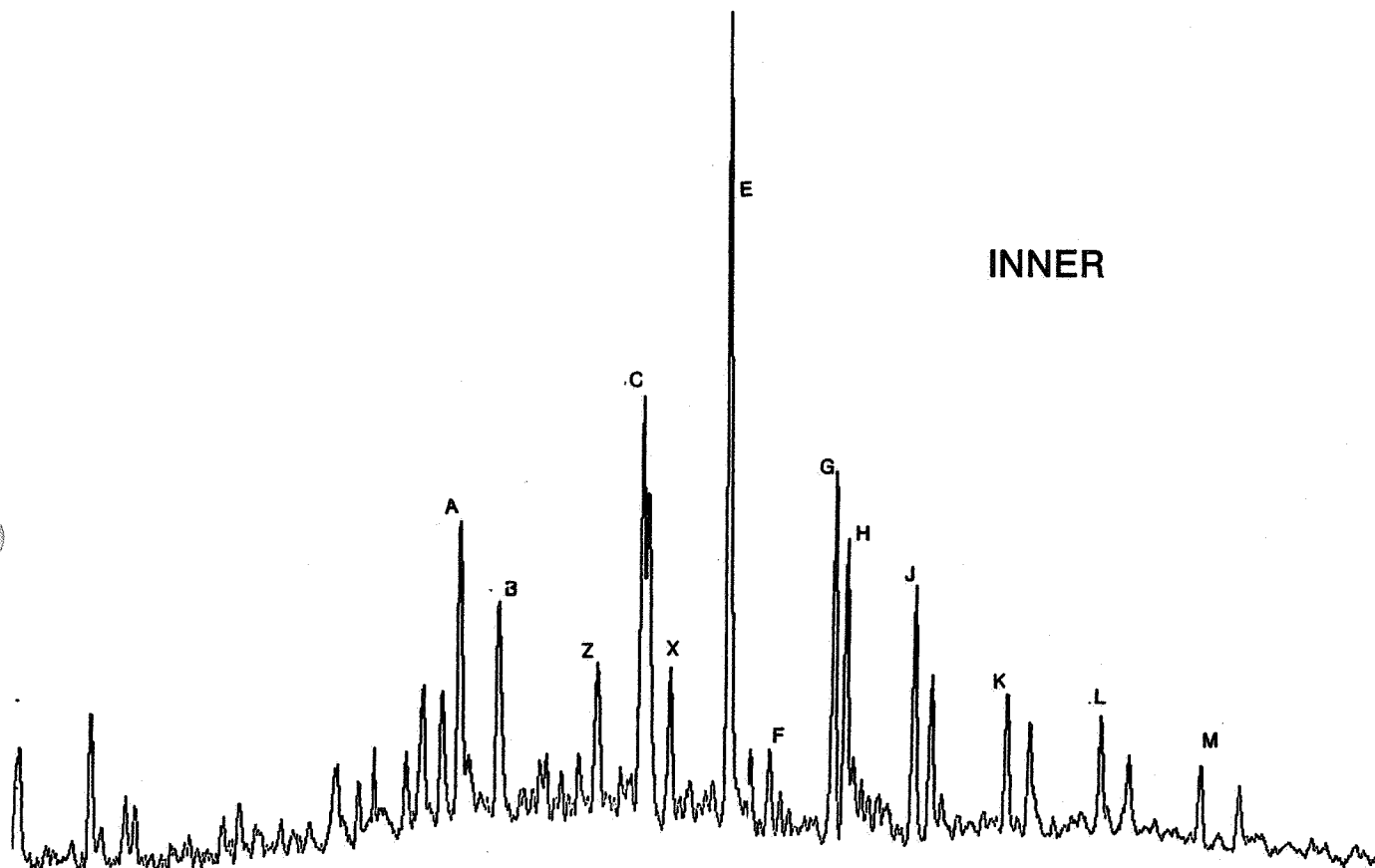
FIGURE 7f

MASS FRAGMENTOGRAMS

WELL 6506/12-5

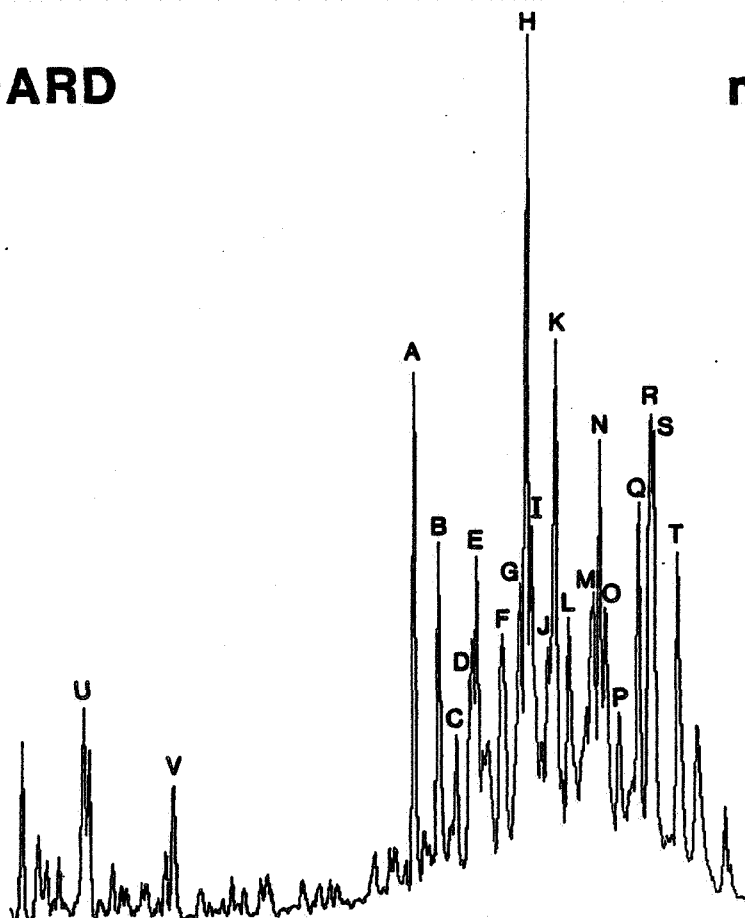
TRITERPANES m/z 191

3997.52-3997.61m



STANDARD

m/z 217



STERANE IDENTIFICATION

(M/Z 217 FRAGMENTOGRAM)

COMPOUND

ELEMENTAL COMPOSITION

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

FIGURE 7g

MASS FRAGMENTOGRAMS

WELL 6506/12-5

STERANES m/z 217



3995.27-3995.34m

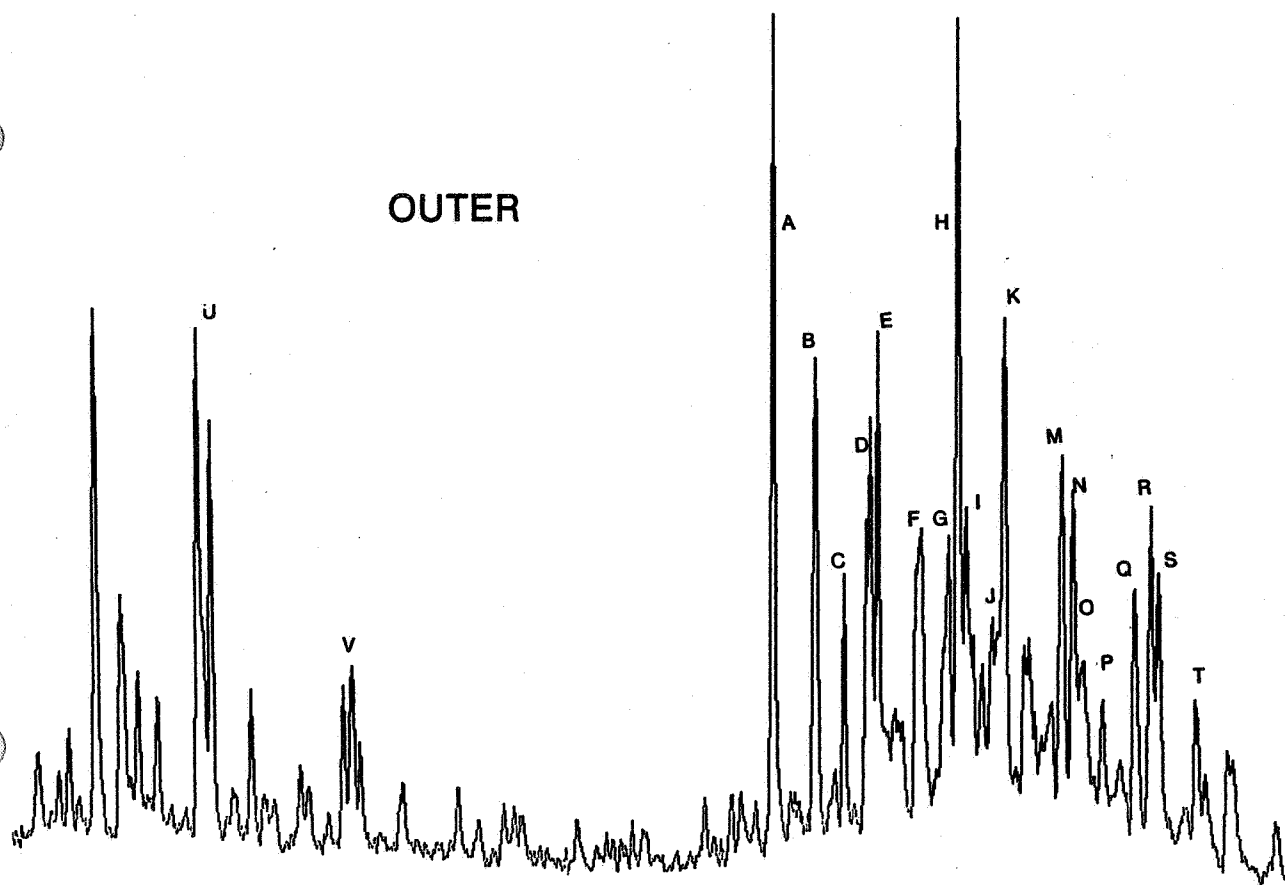
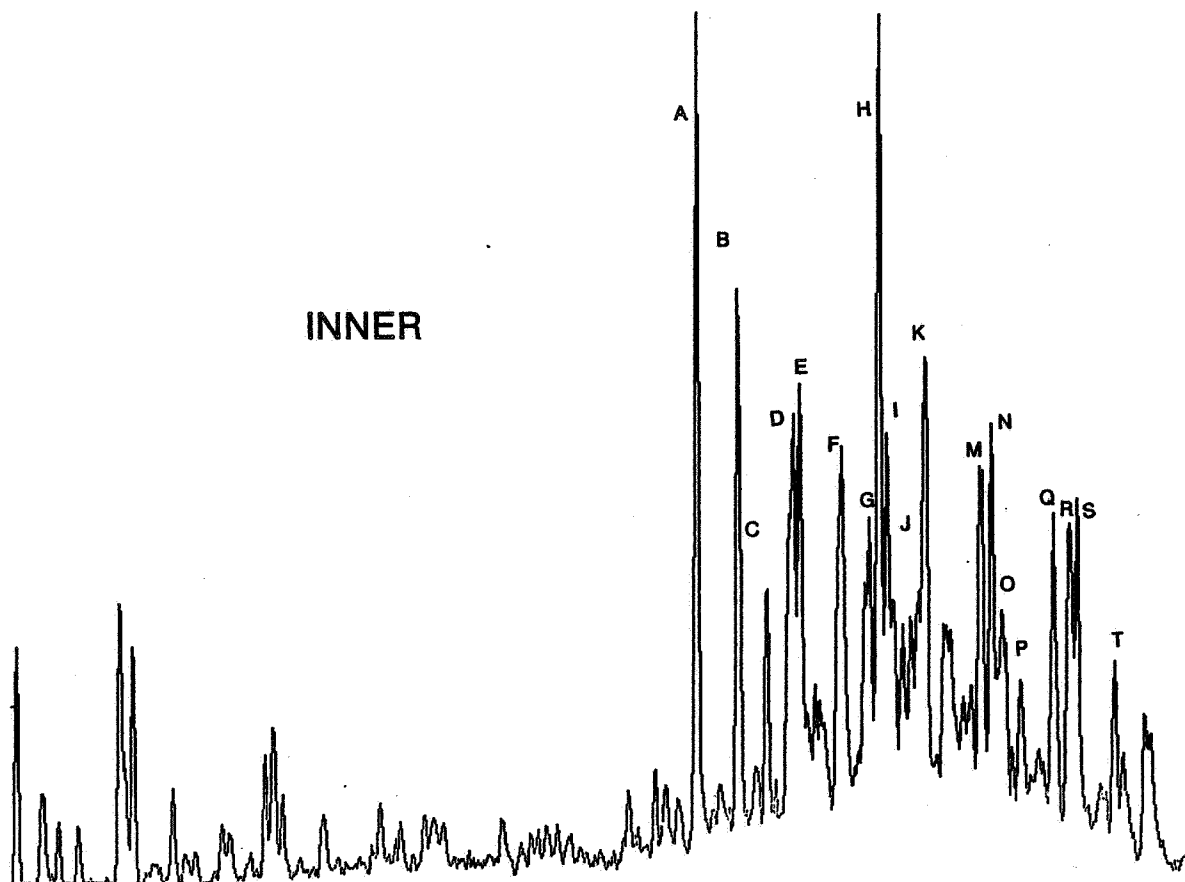


FIGURE 7h

MASS FRAGMENTOGRAMS

WELL 6506/12-5

STERANES m/z 217



3996.10-3996.24m

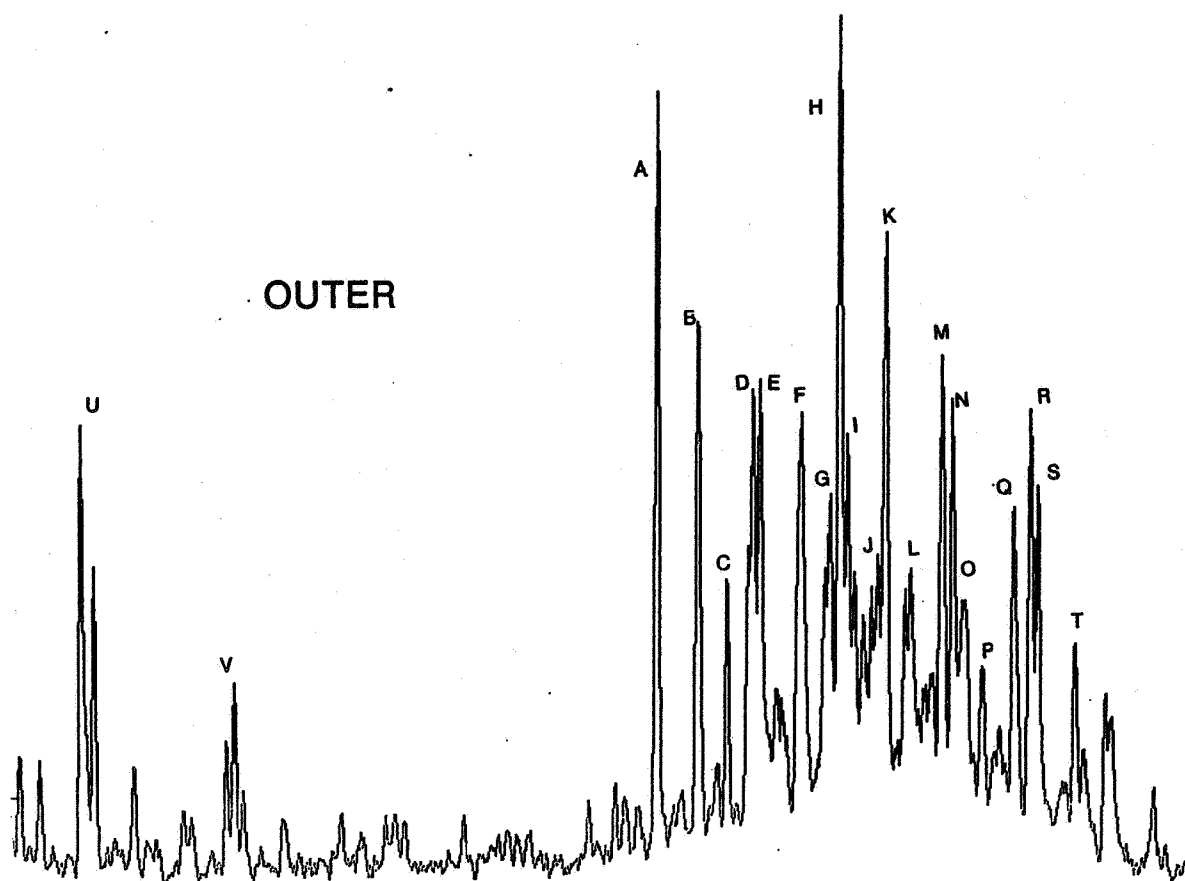
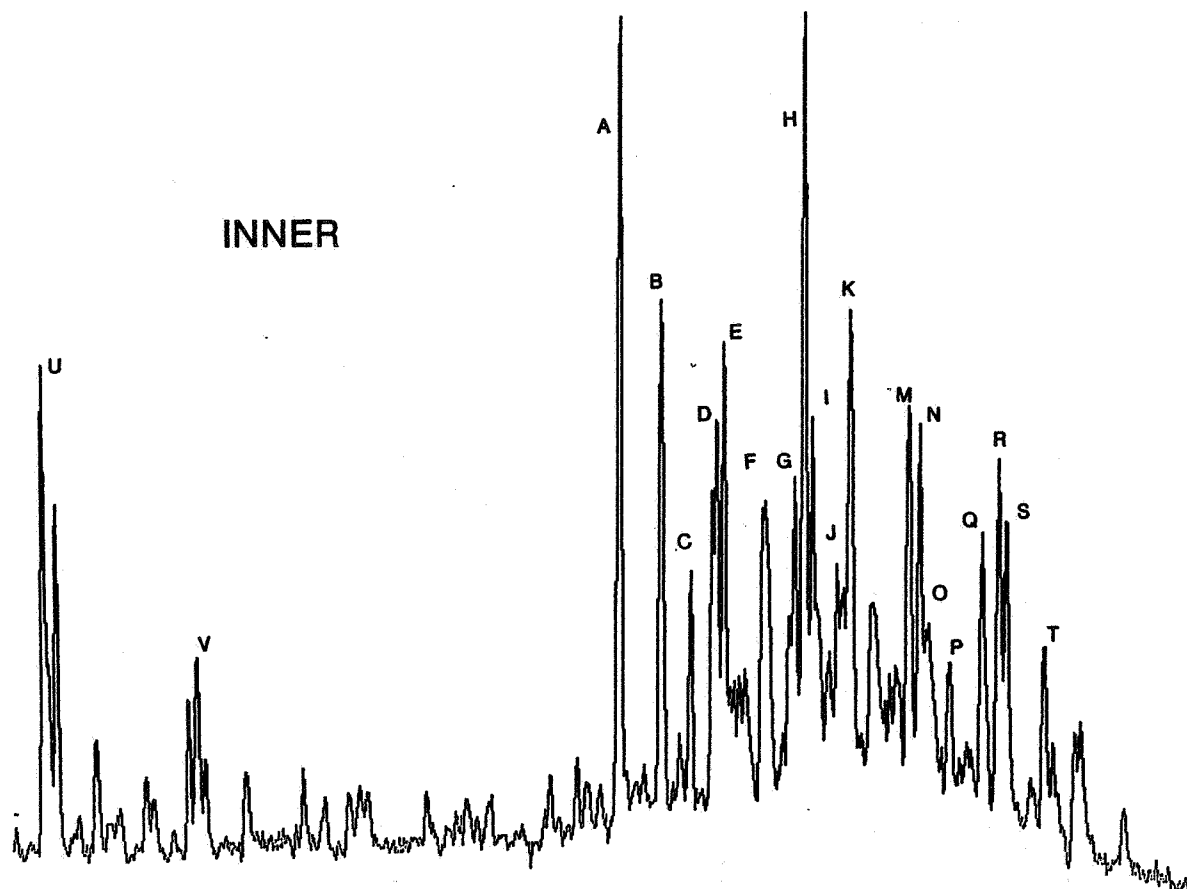


FIGURE 7i

MASS FRAGMENTOGRAMS

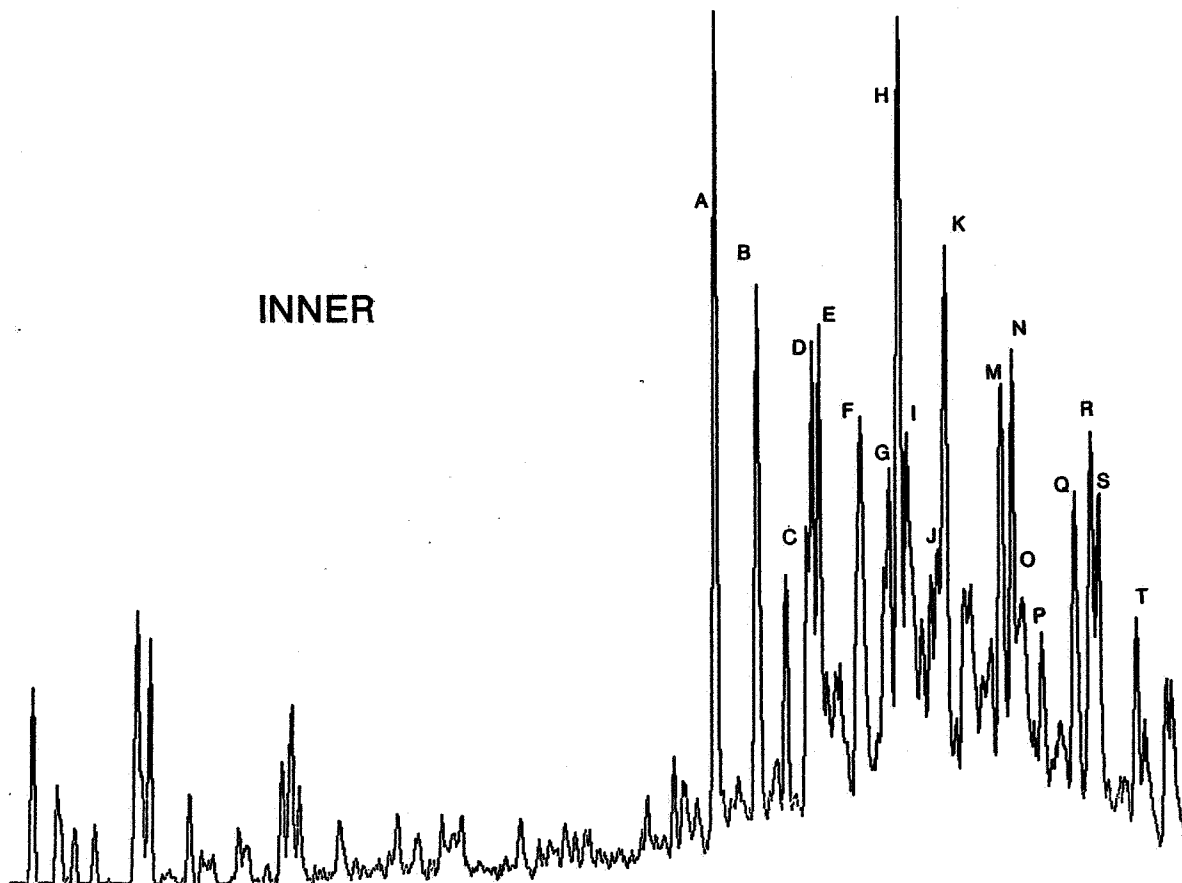
WELL 6506/12-5

STERANES m/z 217

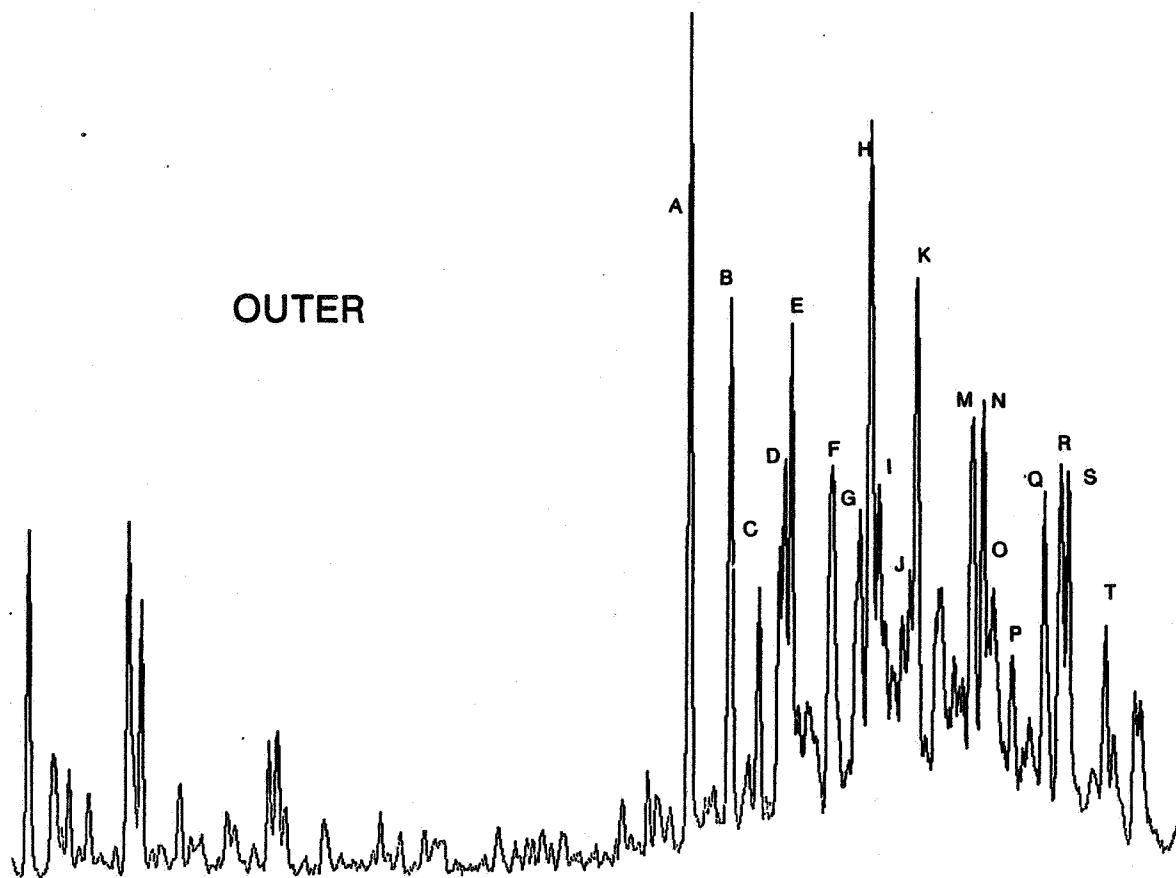
3997.52-3997.61m



INNER

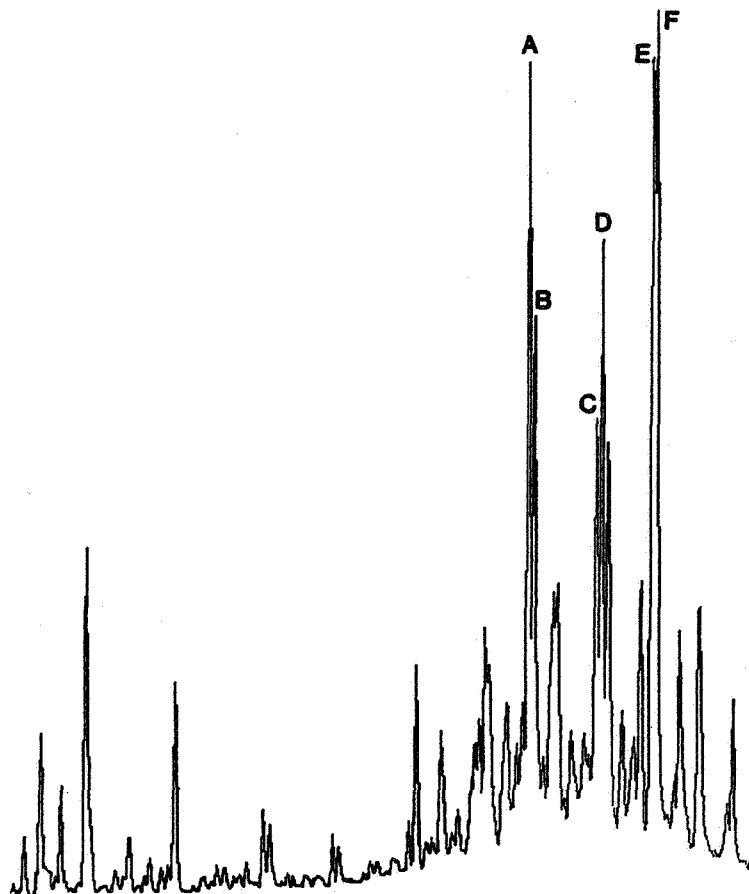


OUTER



STANDARD

m/z 218



STERANE IDENTIFICATION

(M/Z 218 FRAGMENTOGRAM)

<u>COMPOUND</u>		<u>ELEMENTAL COMPOUND</u>
A	14 β ,17 β -cholestane (20R)	C ₂₇ H ₄₈
B	14 β ,17 β -cholestane (20S)	C ₂₇ H ₄₈
C	24-methyl-14 β ,17 β -cholestane (20R)	C ₂₈ H ₅₀
D	24-methyl-14 β ,17 β -cholestane (20S)	C ₂₈ H ₅₀
E	24-ethyl-14 β ,17 β -cholestane (20R)	C ₂₉ H ₅₂
F	24-ethyl-14 β ,17 β -cholestane (20S)	C ₂₉ H ₅₂

FIGURE 7j

MASS FRAGMENTOGRAMS

WELL 6506/12-5

$\beta\beta$ STERANES m/z 218

3995.27-3995.34m

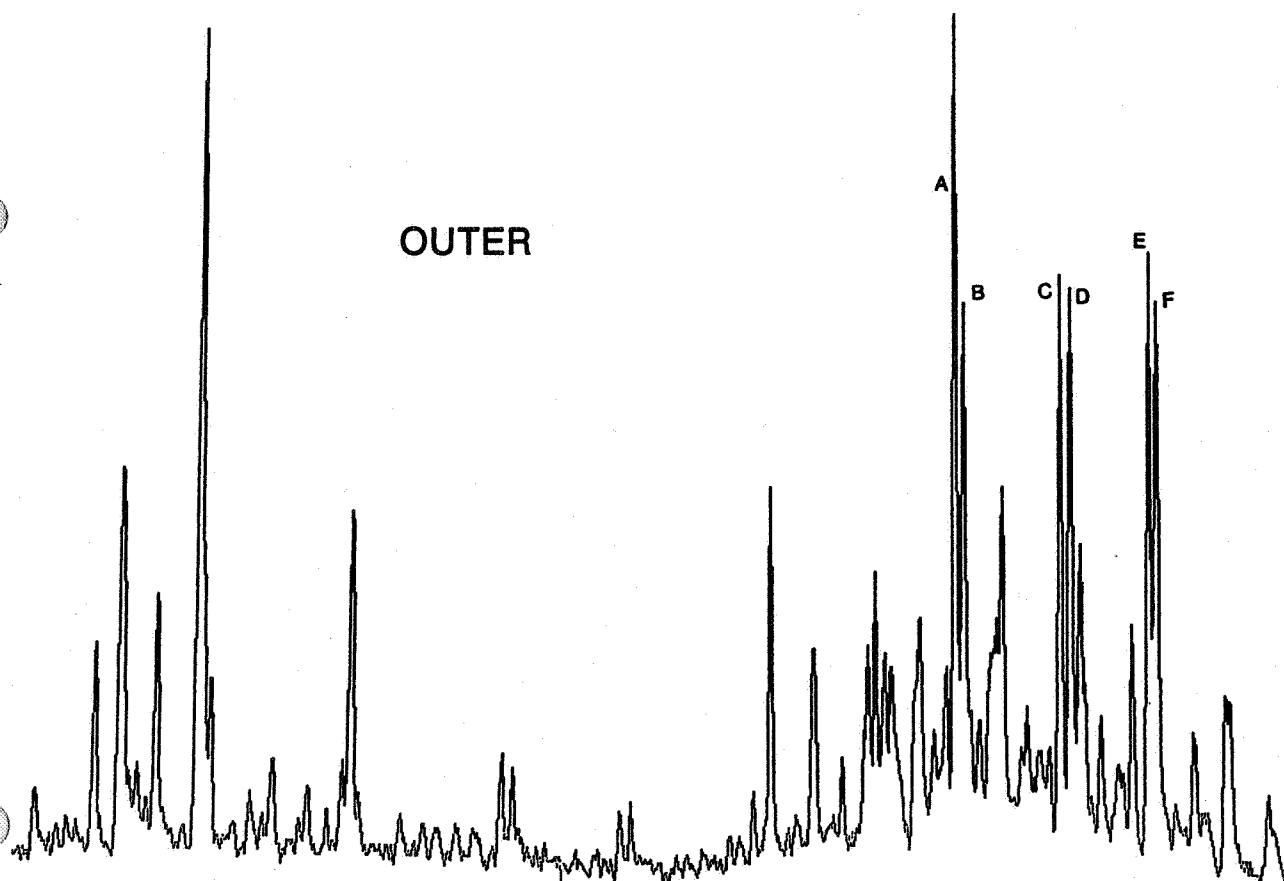
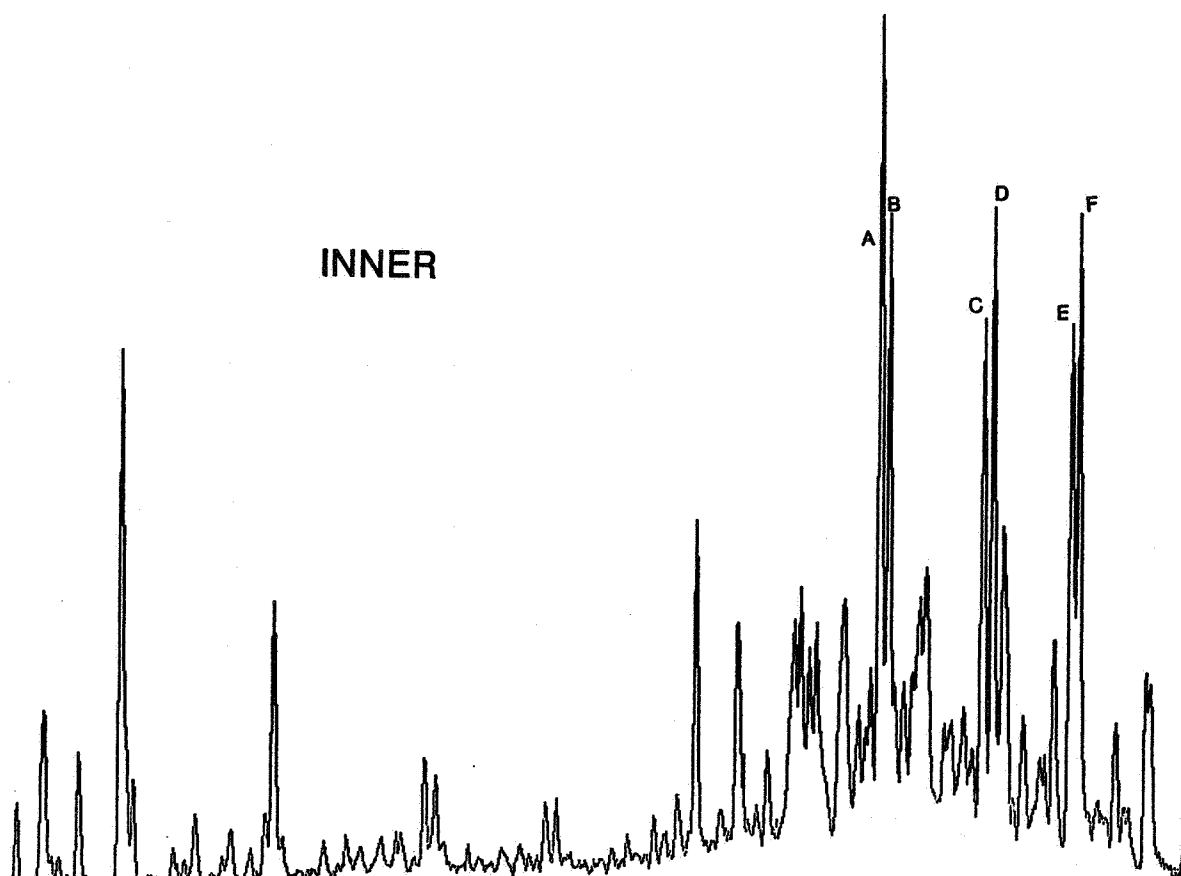


FIGURE 7k

MASS FRAGMENTOGRAMS

WELL 6506/12-5

$\beta\beta$ STERANES m/z 218

3996.10-3996.24m

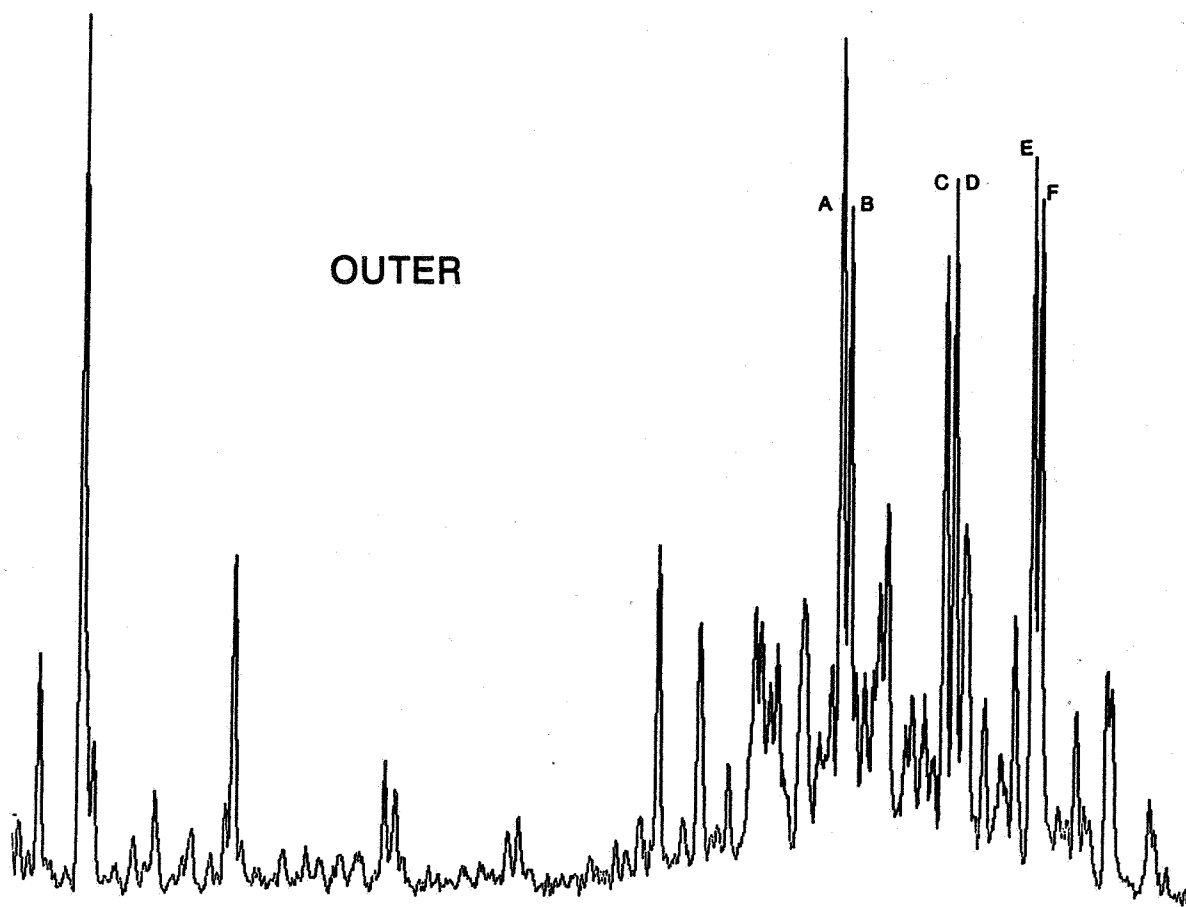
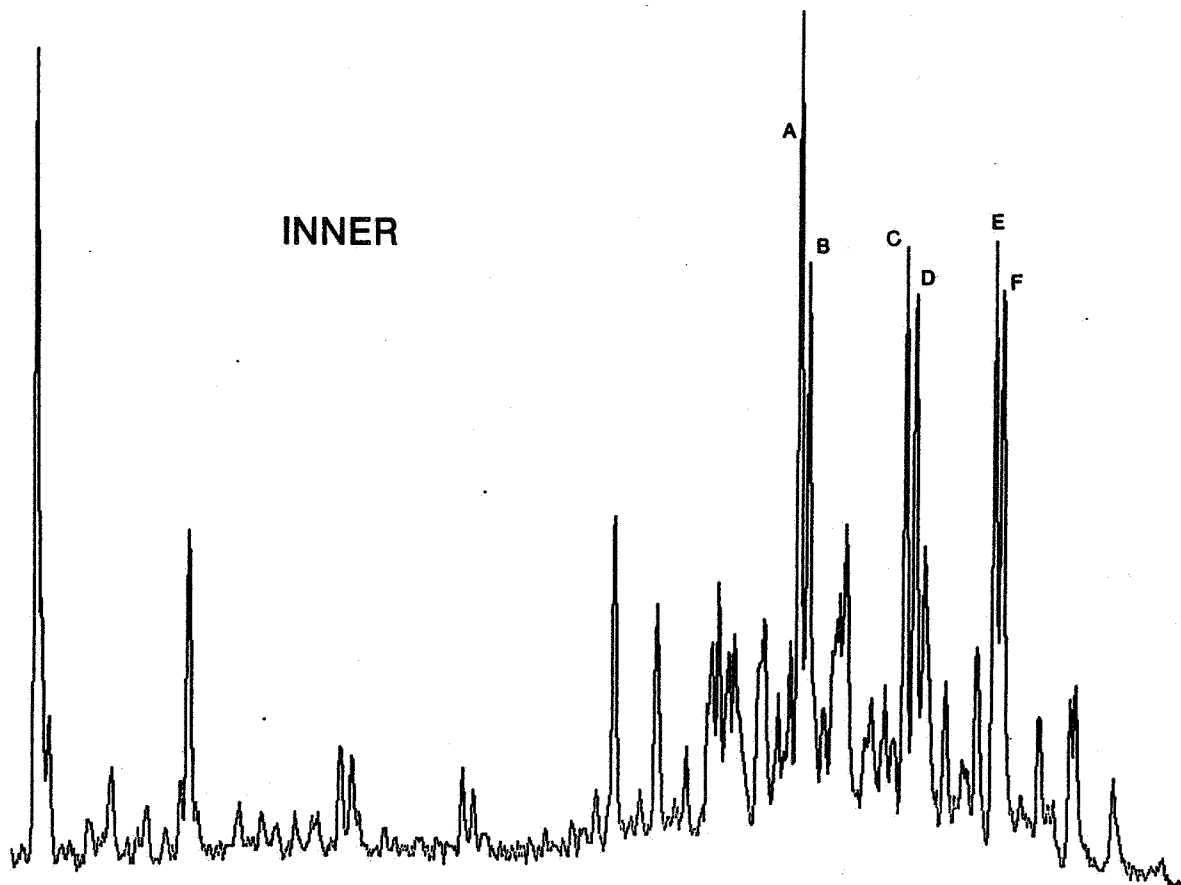


FIGURE 71

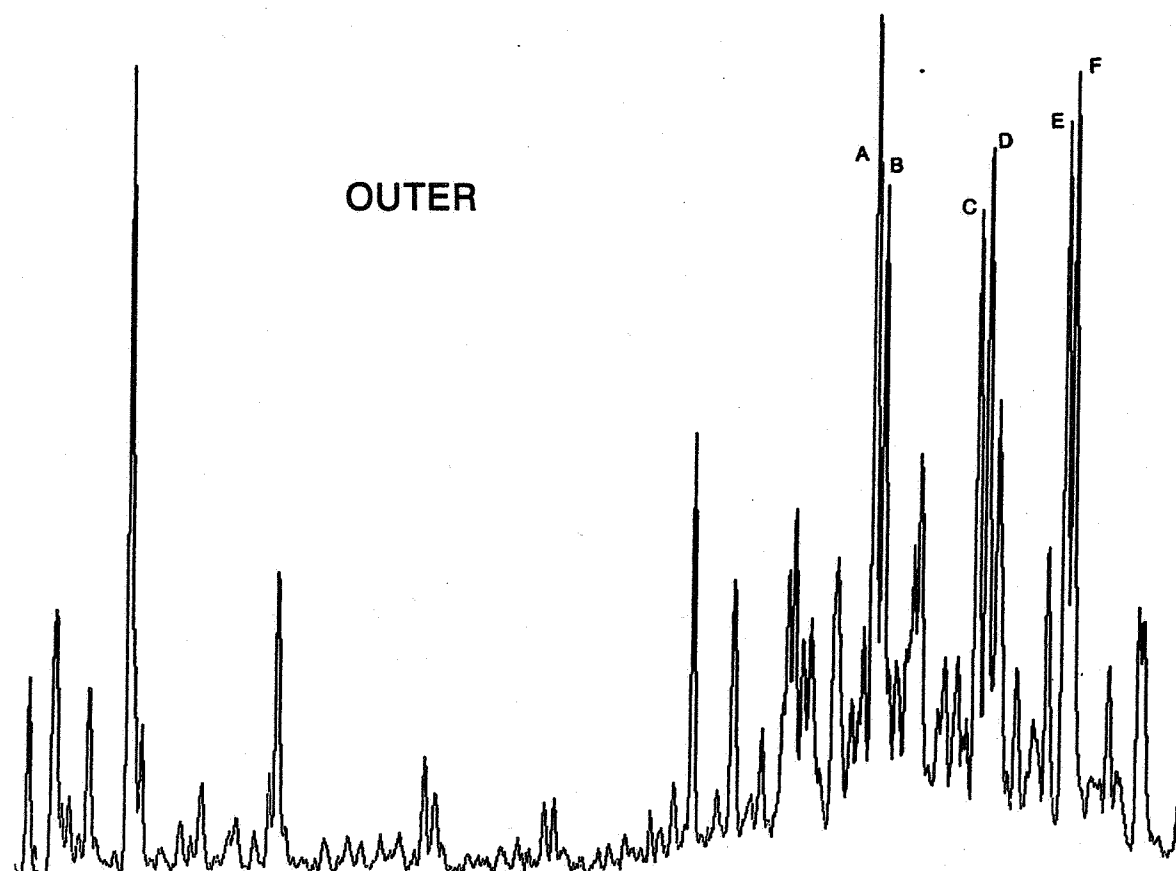
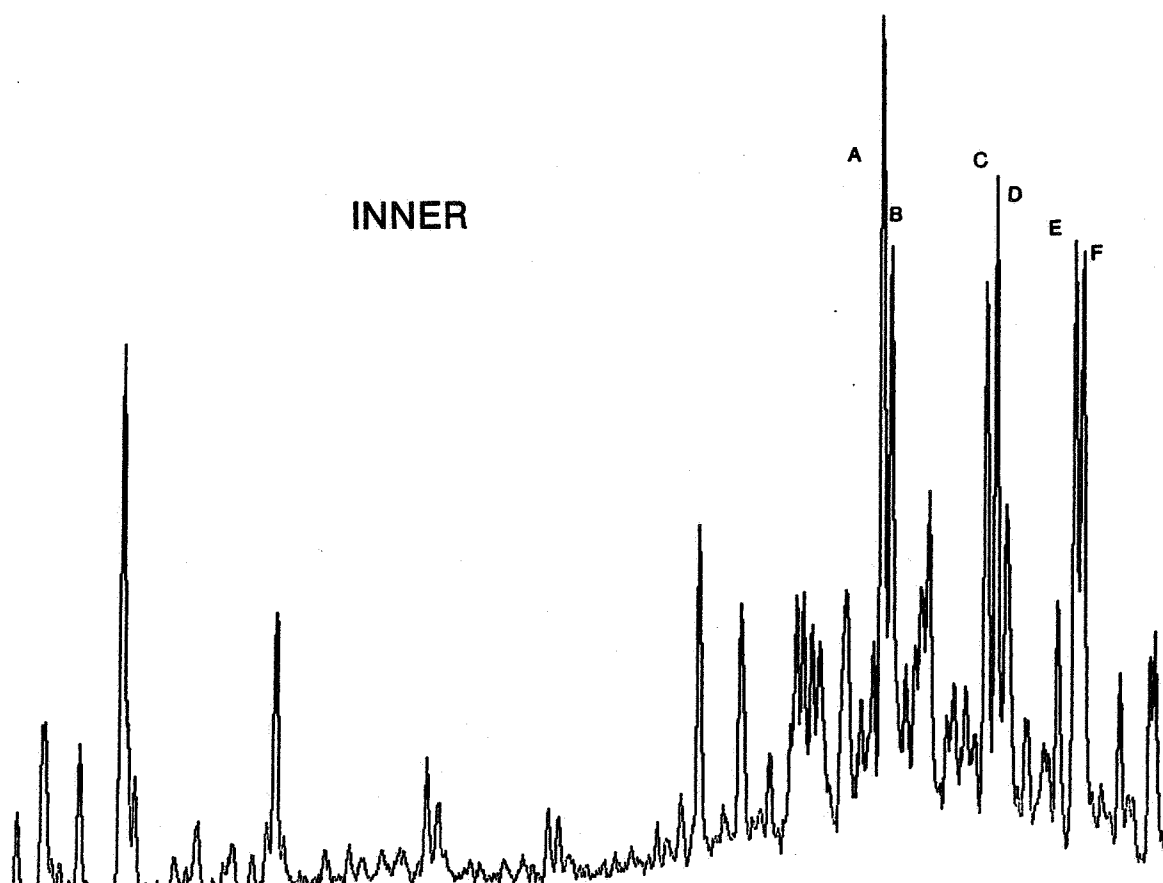
MASS FRAGMENTOGRAMS

WELL 6506/12-5

$\beta\beta$ STERANES m/z 218

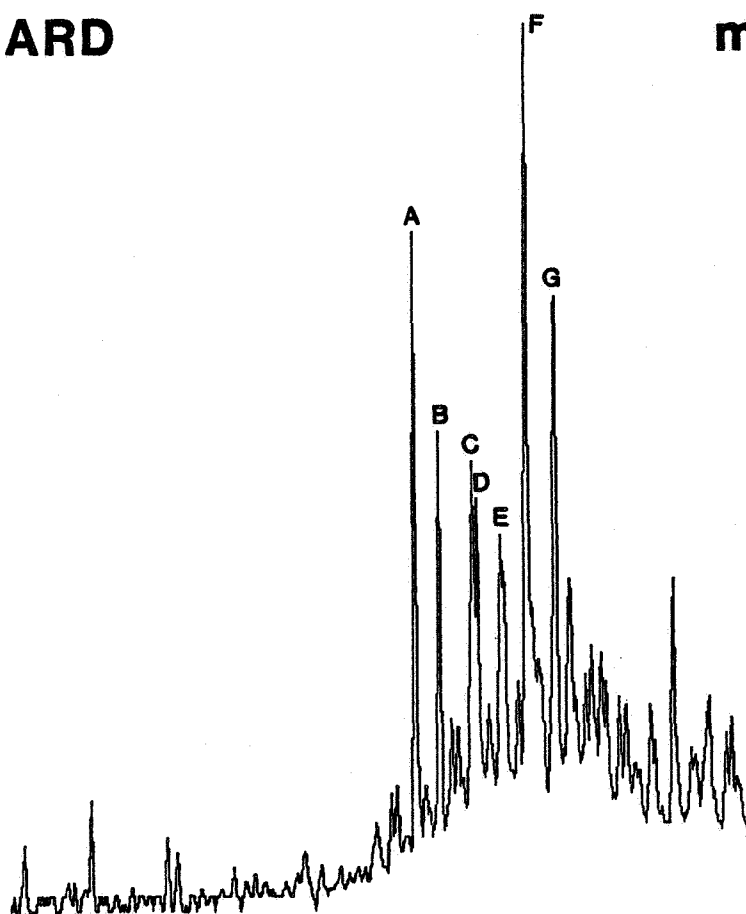


3997.52-3997.61m



STANDARD

m/z 259



STERANE IDENTIFICATION

(M/Z 259 FRAGMENTOGRAM)

<u>COMPOUND</u>		<u>ELEMENTAL COMPOSITION</u>
A	13 β ,17 α -diacholestane (20S)	C ₂₇ H ₄₈
B	13 β ,17 α -diacholestane (20R)	C ₂₇ H ₄₈
C	13 α ,17 β -diacholestane (20R)	C ₂₇ H ₄₈
D	24,-methyl-13 β ,17 α -diacholestane (20S)	C ₂₈ H ₅₀
E	24,-methyl-13 β ,17 α -diacholestane (20R)	C ₂₈ H ₅₀
F	24,-ethyl-13 β ,17 α -diacholestane (20S)	C ₂₉ H ₅₂
G	24,-ethyl-13 β ,17 α -diacholestane (20R)	C ₂₉ H ₅₂

FIGURE 7m

MASS FRAGMENTOGRAMS

WELL 6506/12-5

REARRANGED STERANES m/z 259



3995.27-3995.34m

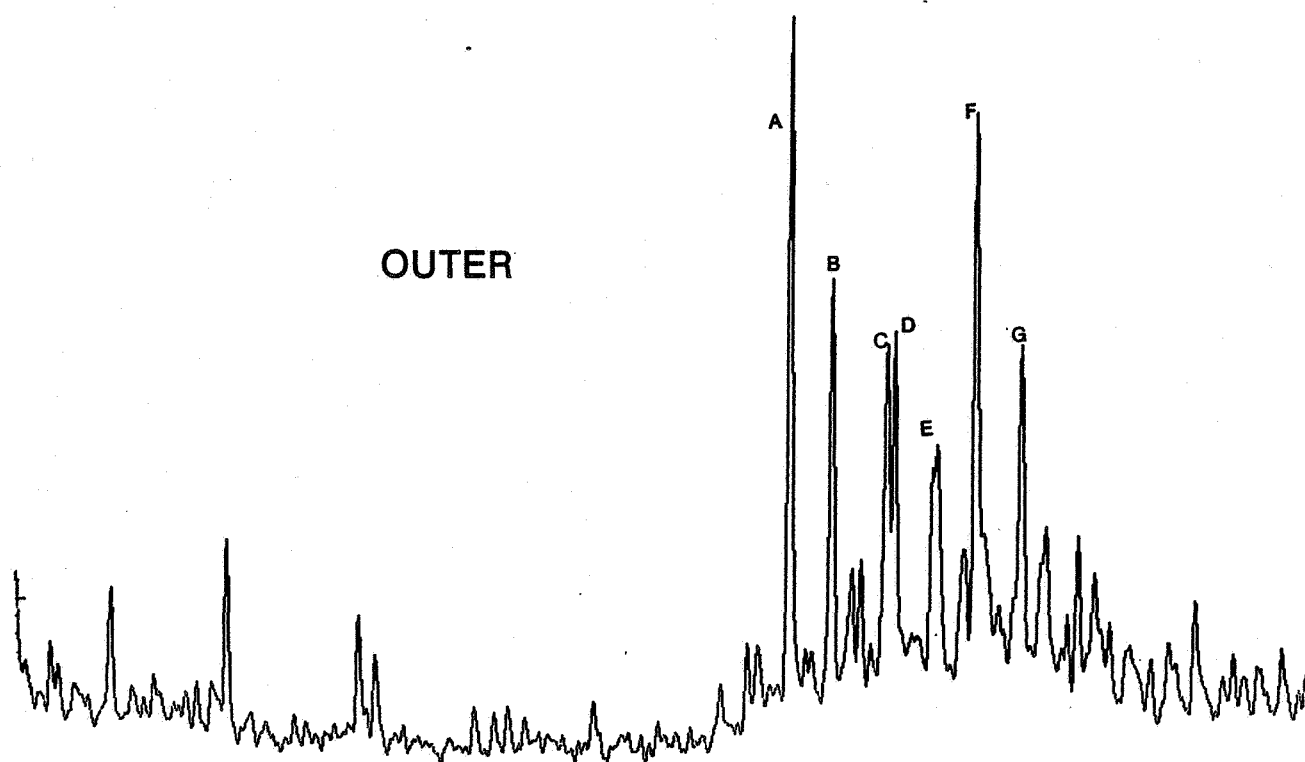
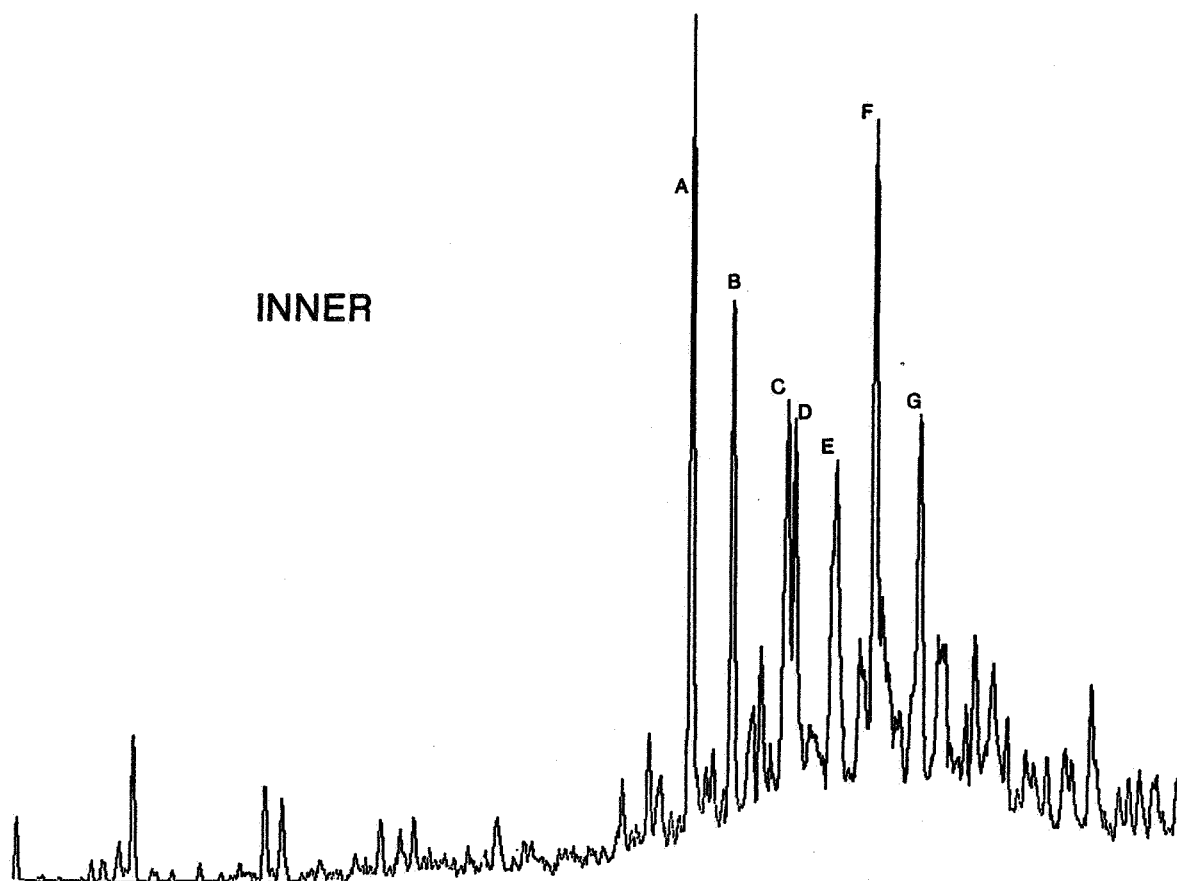


FIGURE 7n

MASS FRAGMENTOGRAMS

WELL 6506/12-5

REARRANGED STERANES m/z 259



3996.10-3996.24m

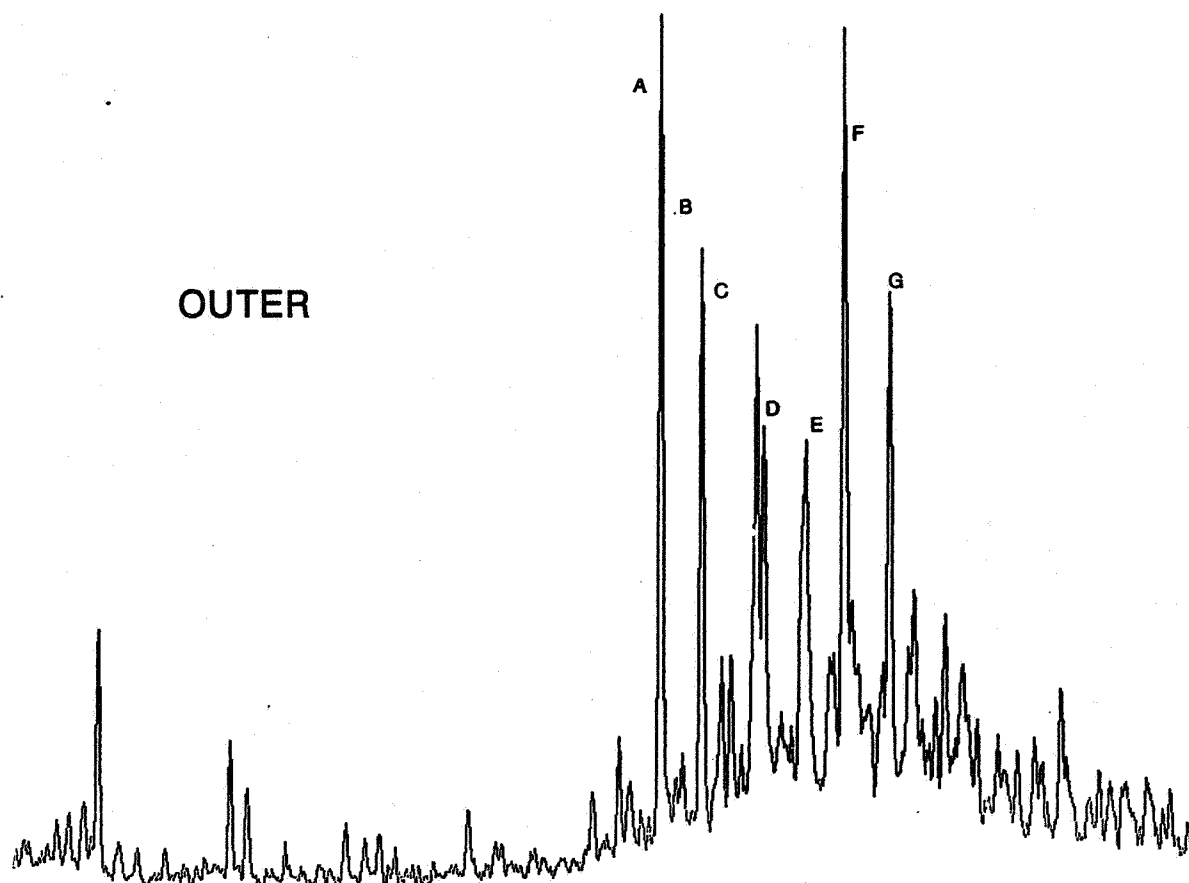
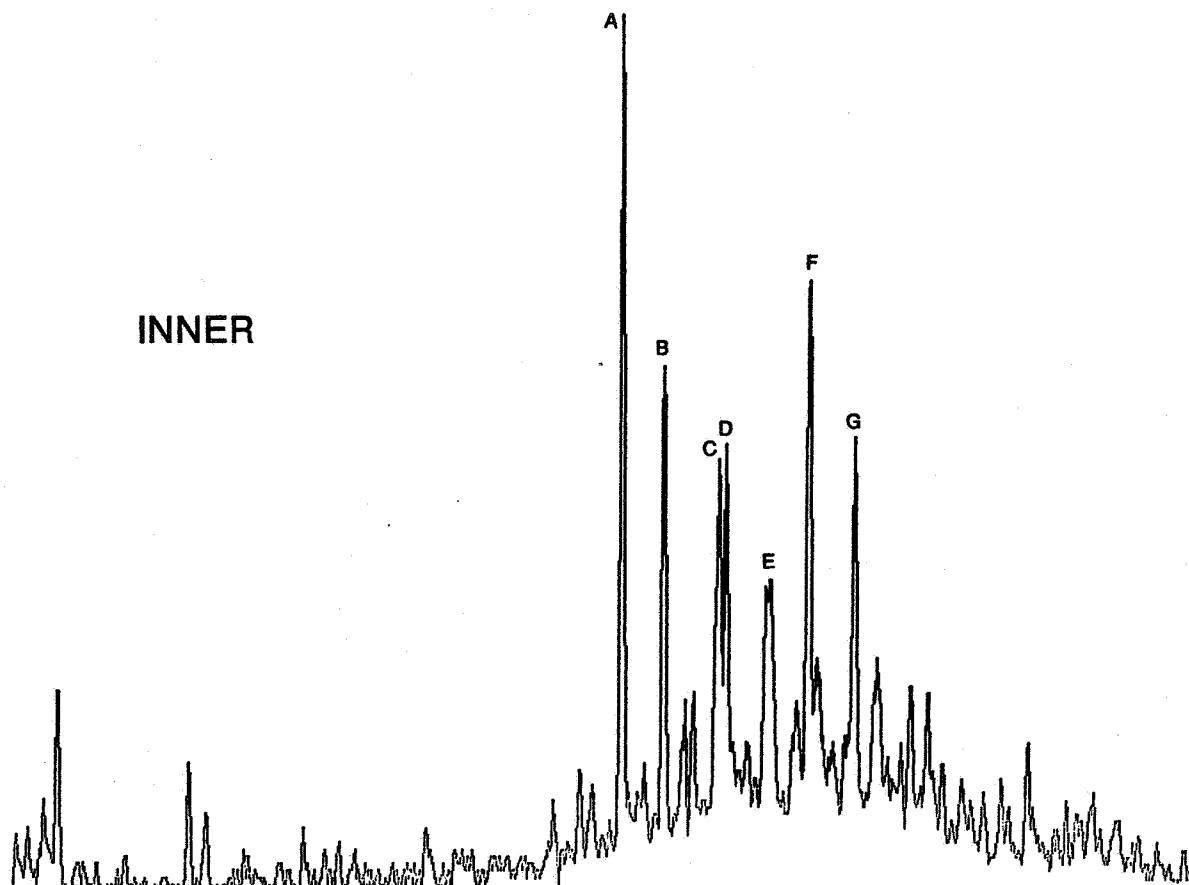


FIGURE 7o

MASS FRAGMENTOGRAMS

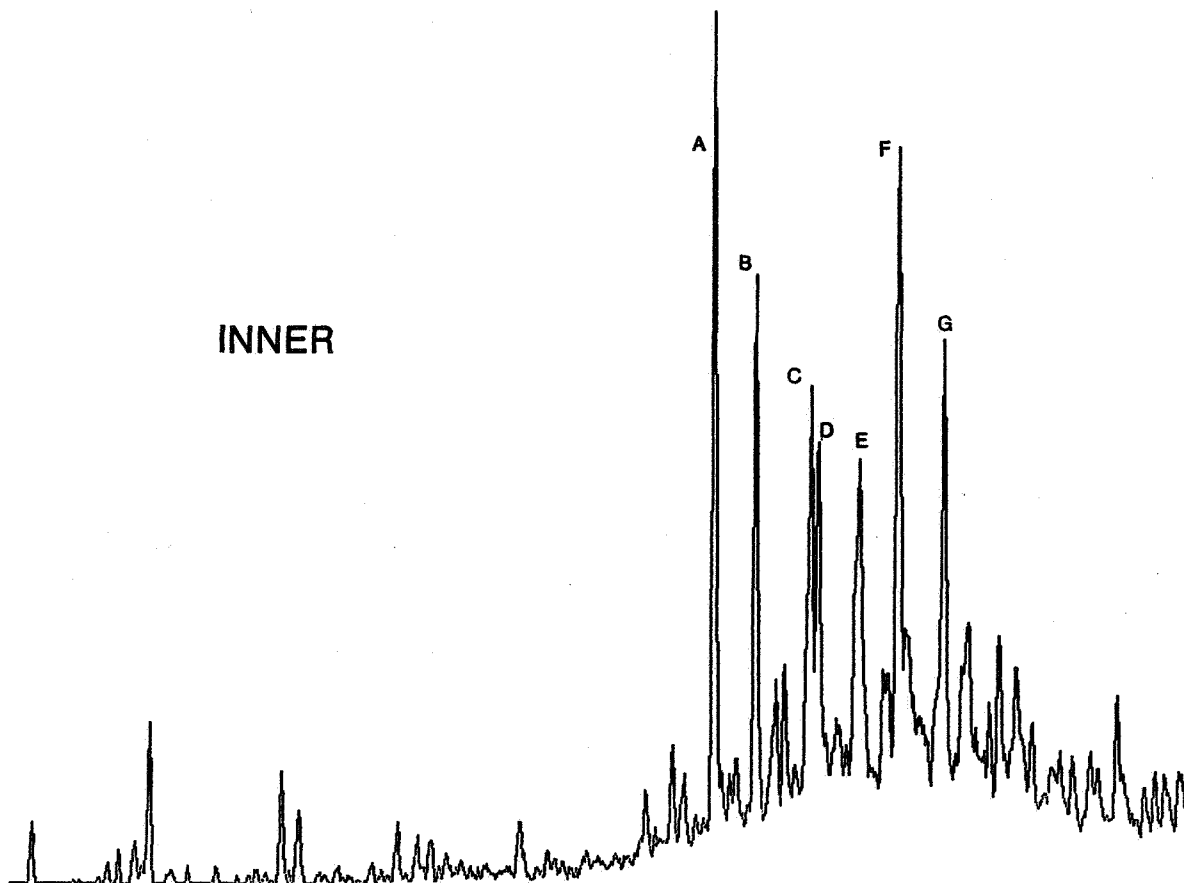
WELL 6506/12-5

REARRANGED STERANES m/z 259



3997.52-3997.61m

INNER



OUTER

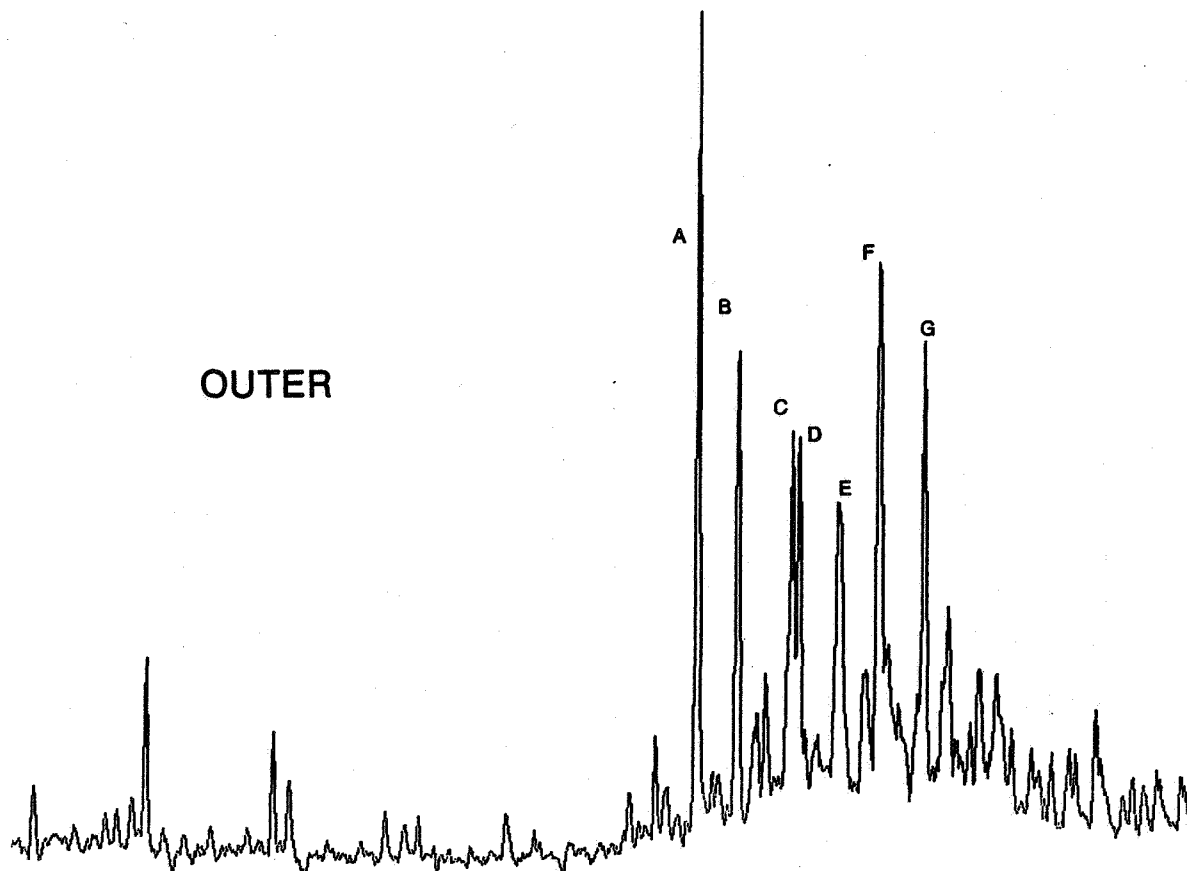


FIGURE 8a

C₄-C₇ CHROMATOGRAMS

WELL 6506/12-5

3" SPONGE

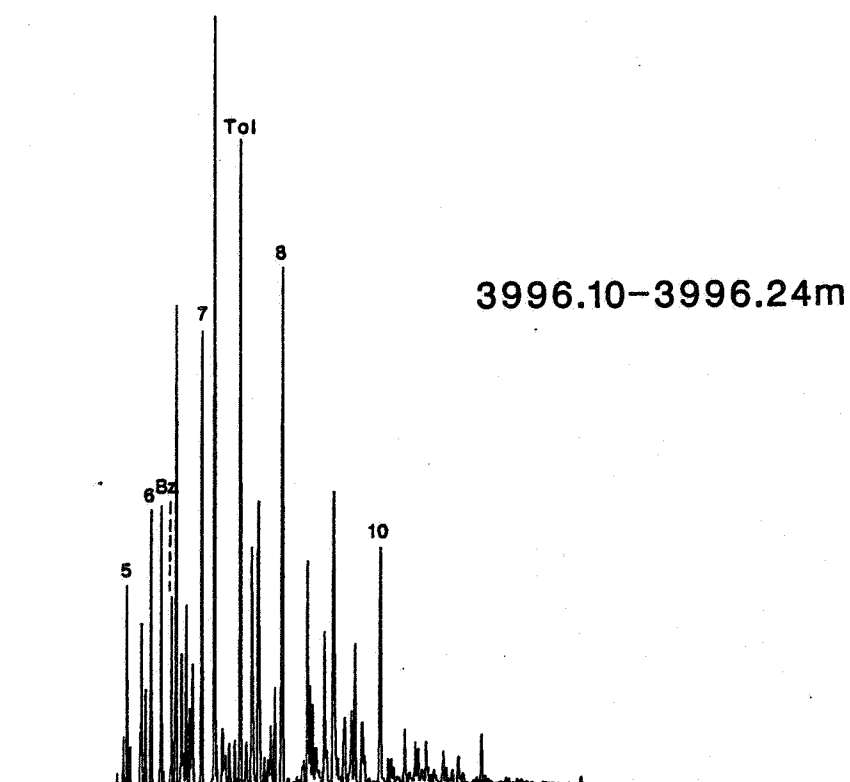
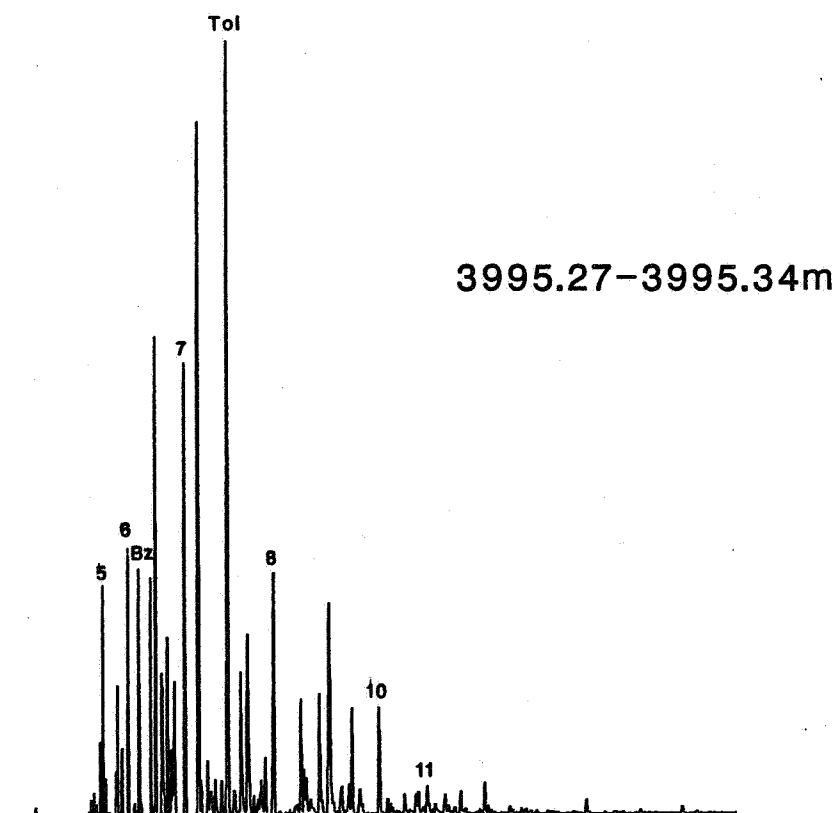


FIGURE 8b

C₄-C₇ CHROMATOGRAMS

WELL 6506/12-5



3" SPONGE

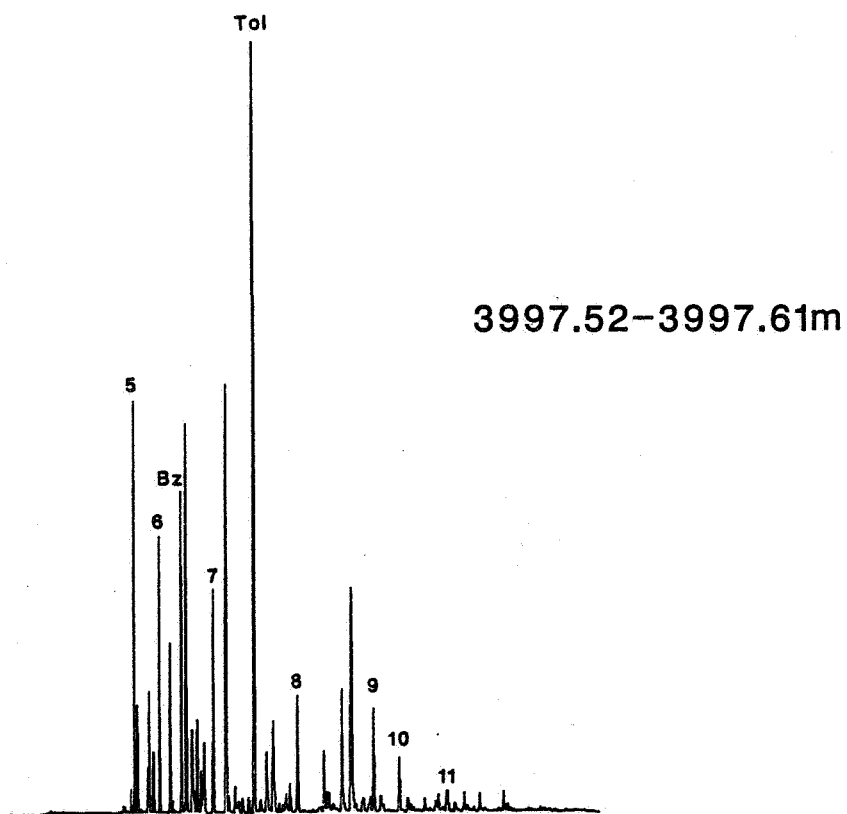
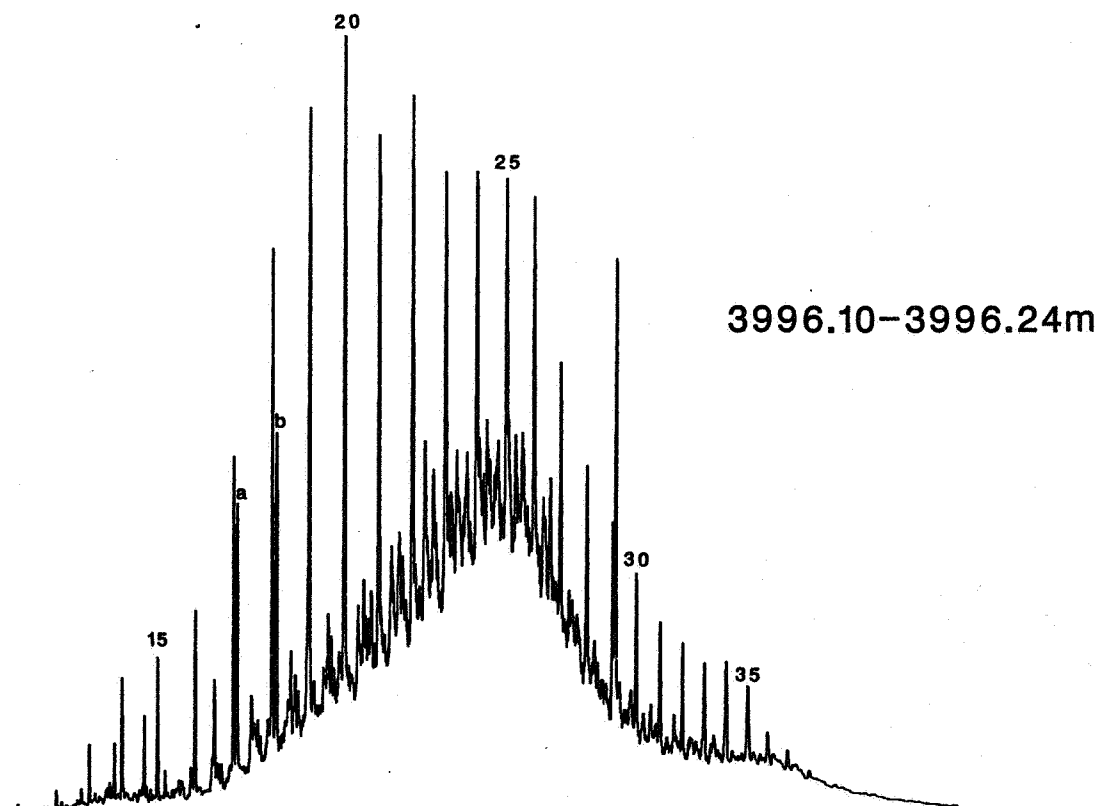
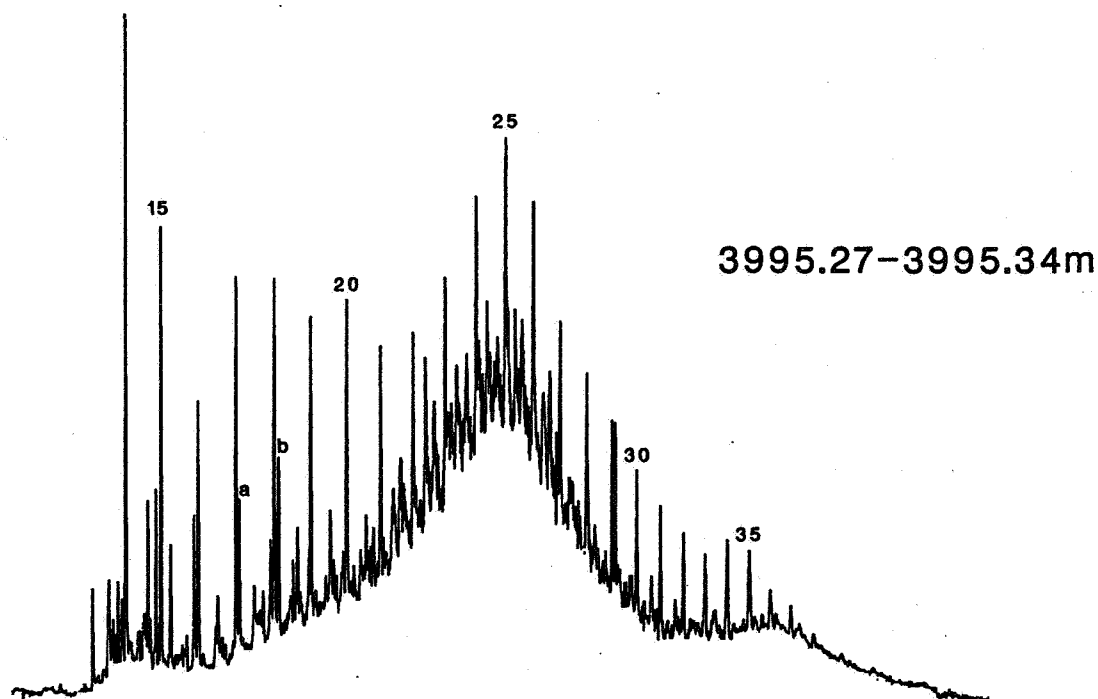


FIGURE 9a **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5



3" SPONGE



a - PRISTANE
b - PHYTANE

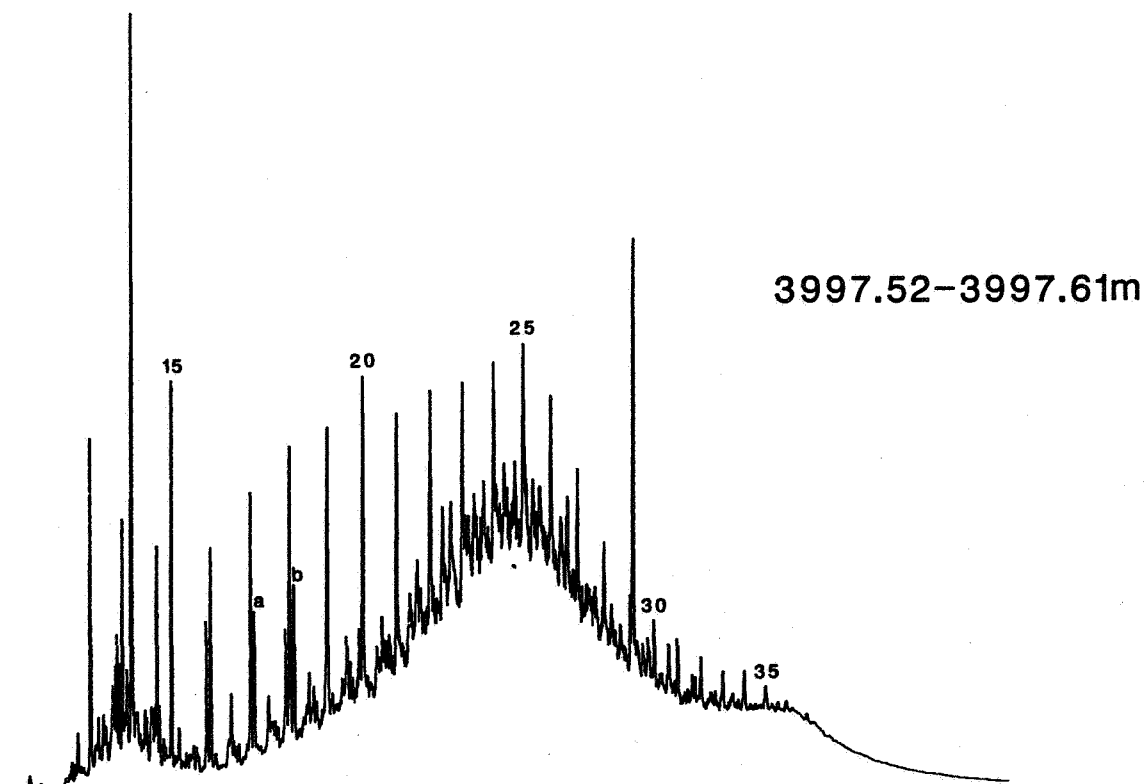
CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 9b

C₁₅+ SATURATES CHROMATOGRAMS

WELL 6506/12-5

3" SPONGE



a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

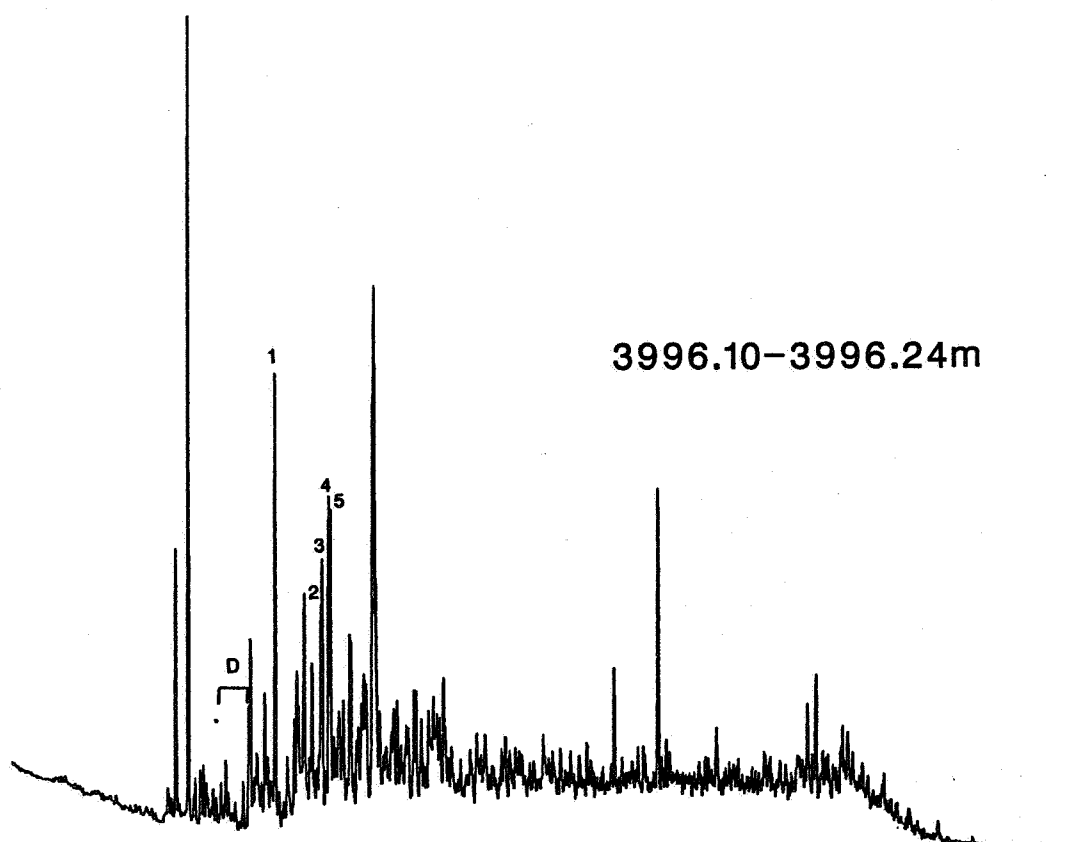
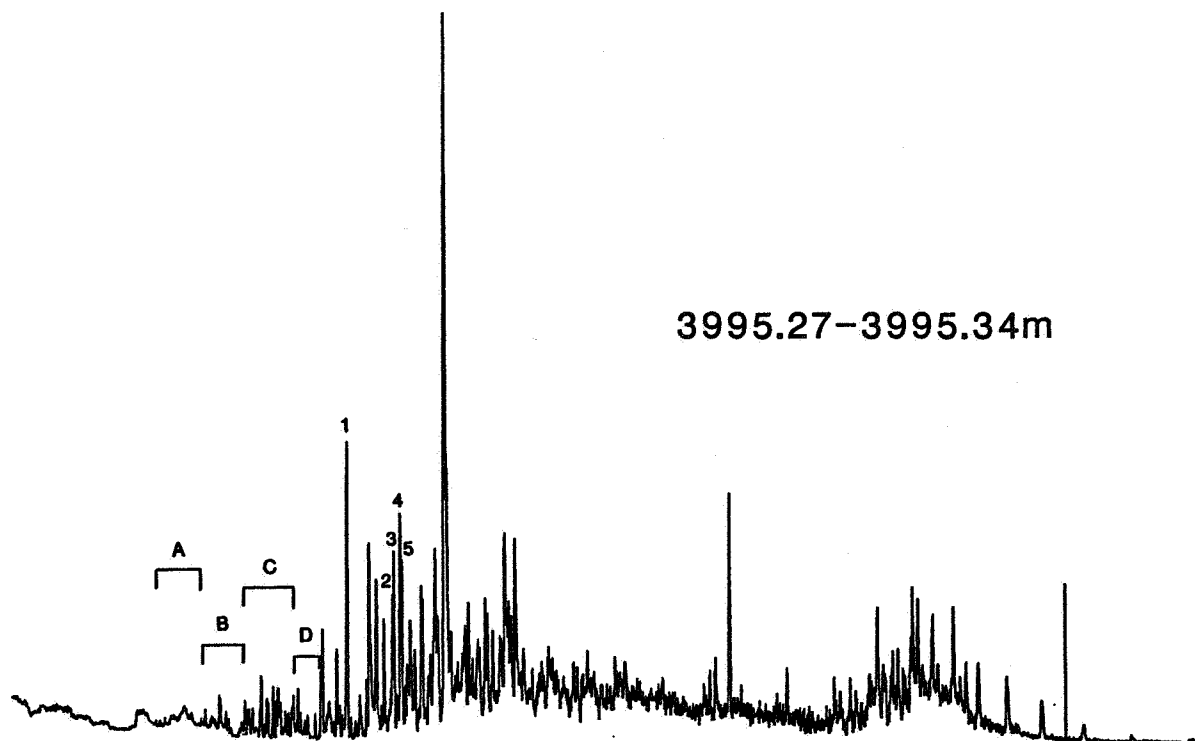
3" SPONGE

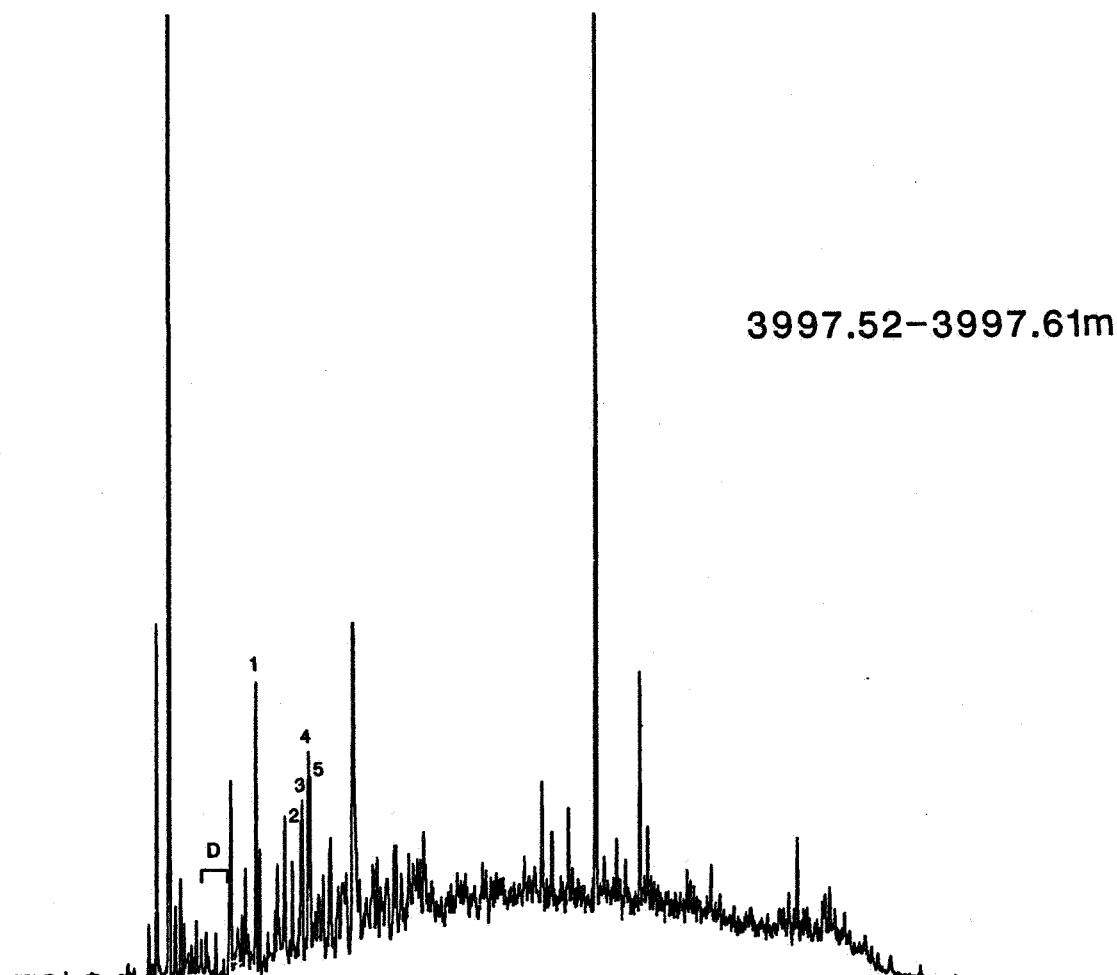
FIGURE 10b

C₁₅+ AROMATIC CHROMATOGRAMS

WELL 6506/12-5



3" SPONGE



PEAK IDENTIFICATION ON FIRST SHEET

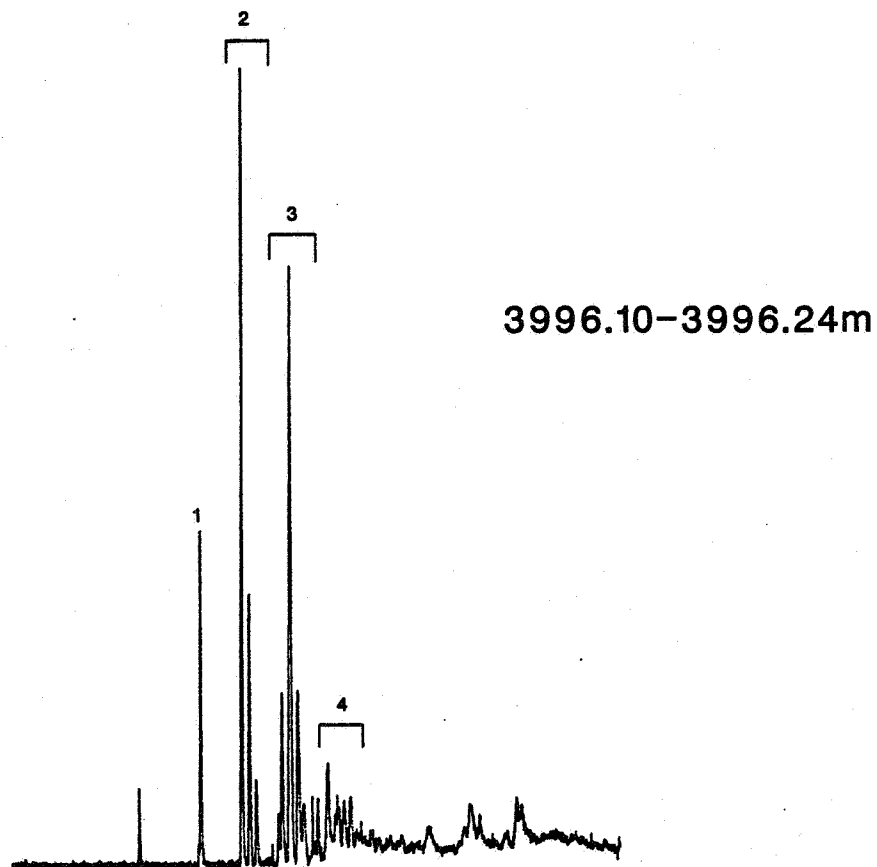
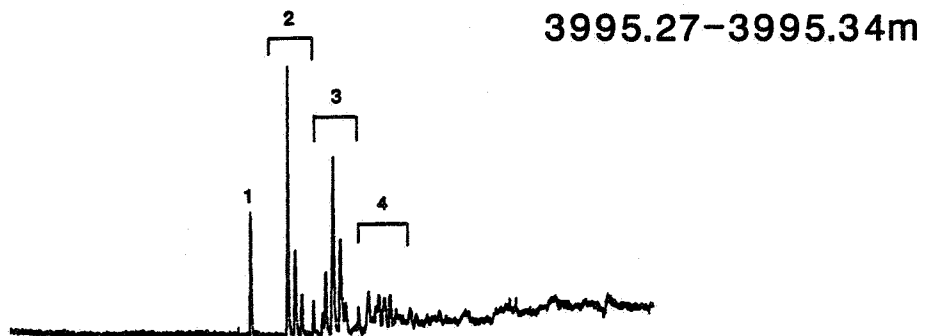
FIGURE 11a

WELL 6506/12-5

ORGANO-SULPHUR CHROMATOGRAMS



3" SPONGE



PEAK IDENTIFICATION ON FIRST SHEET

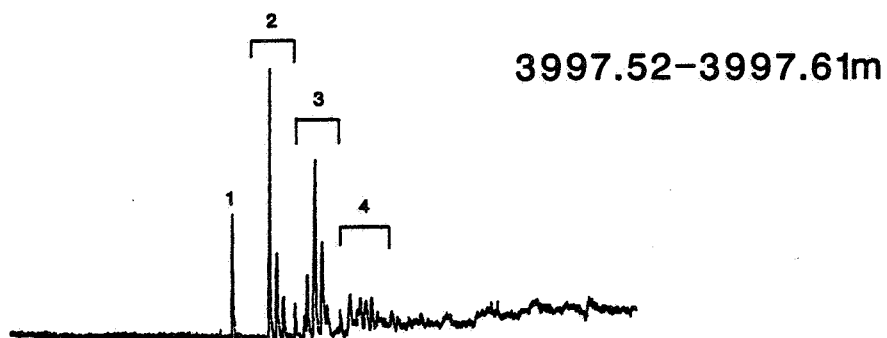
FIGURE 11b

WELL 6506/12-5

ORGANO-SULPHUR CHROMATOGRAMS



3" SPONGE



PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 12a

MASS FRAGMENTOGRAMS

WELL 6506/12-5

DEMETHYLATED HOPANES m/z 177



3" SPONGE

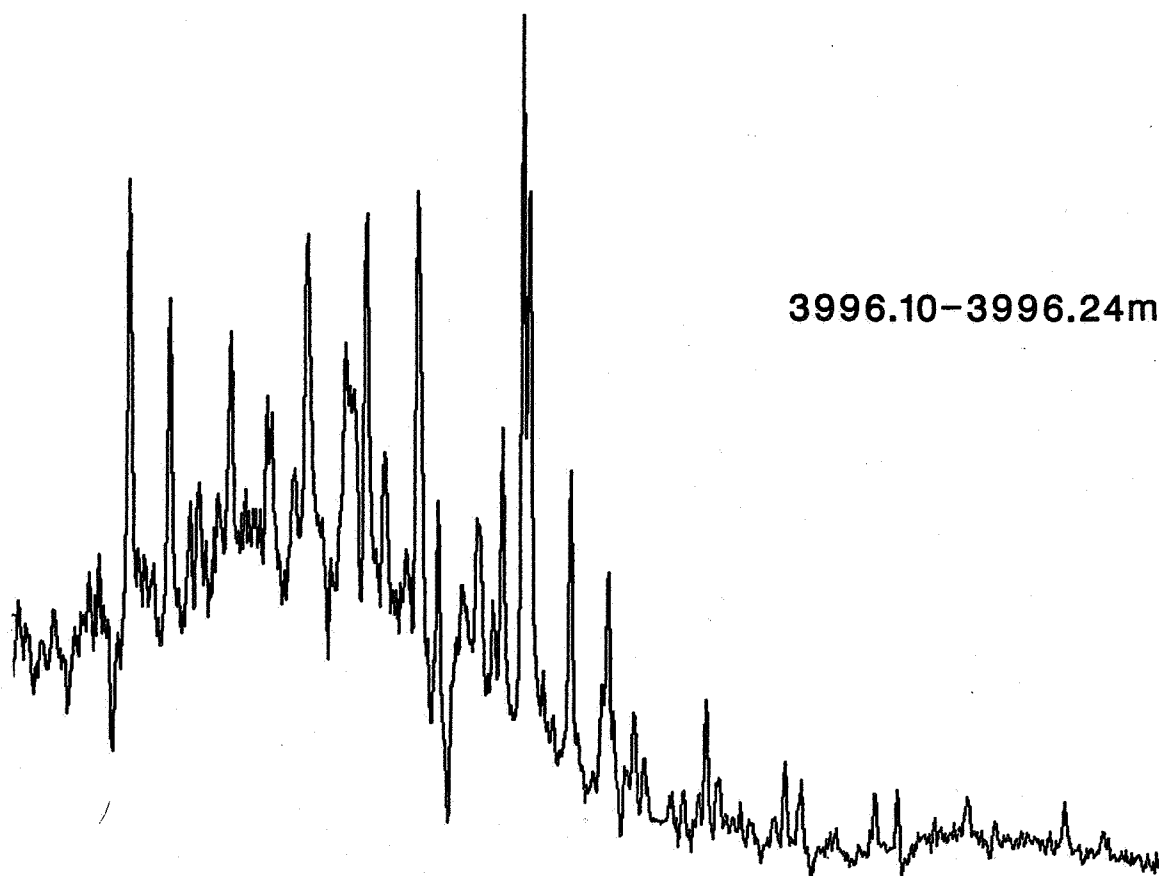
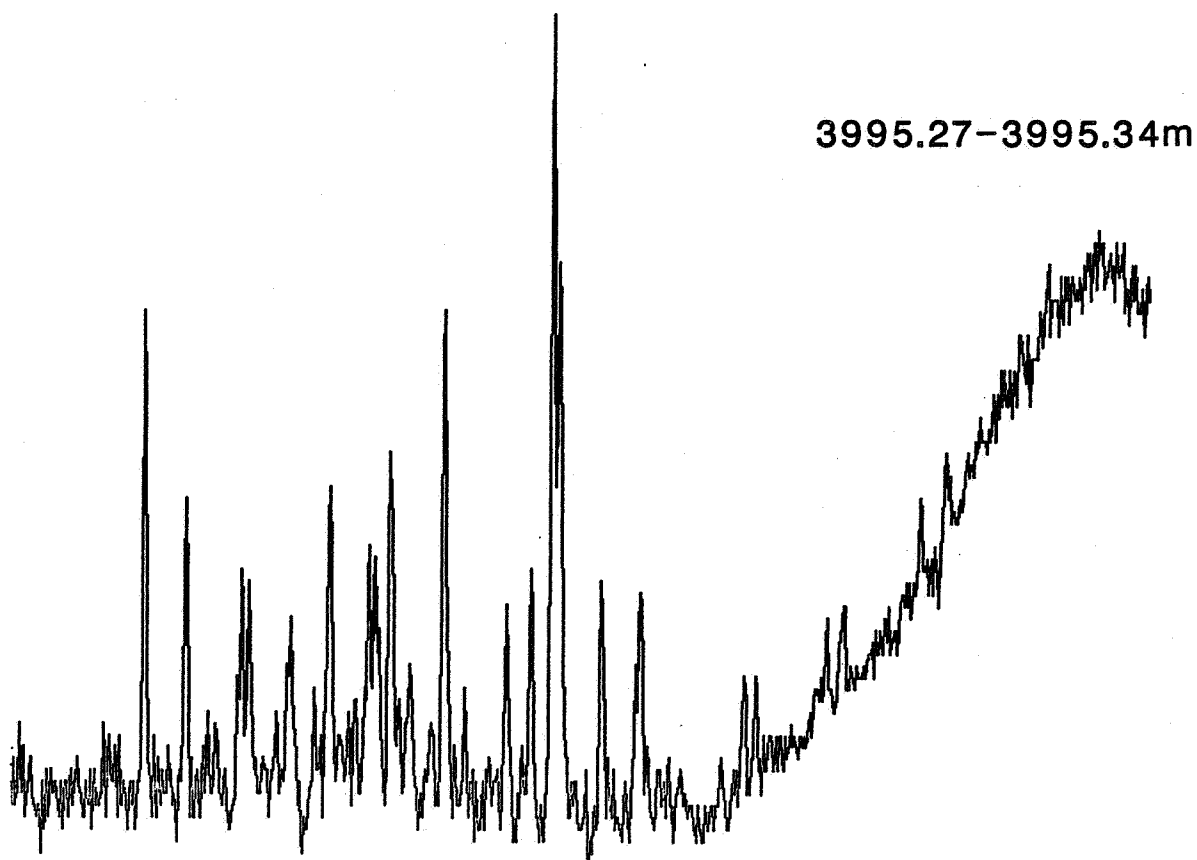


FIGURE 12b

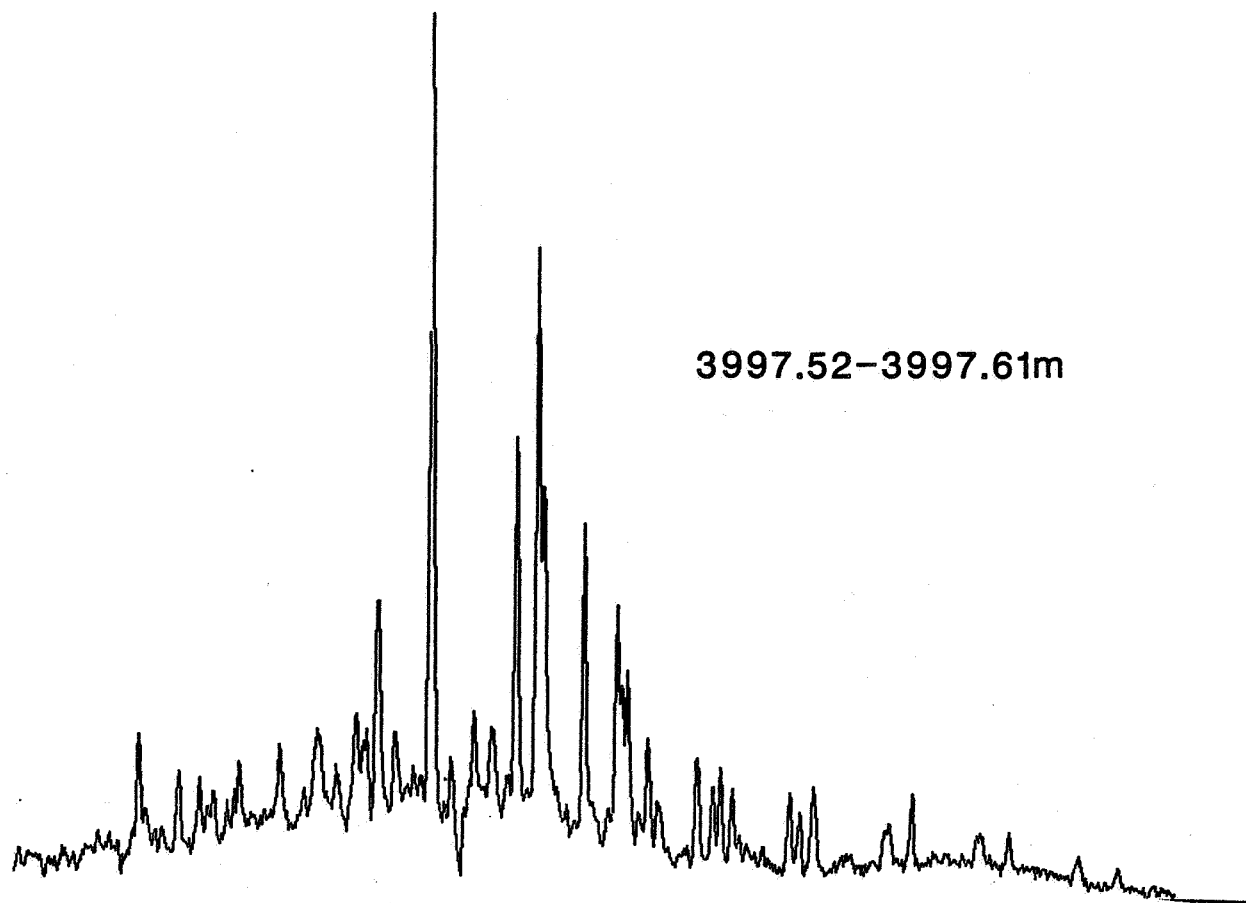
MASS FRAGMENTOGRAMS

WELL 6506/12-5

DEMETHYLATED HOPANES m/z 177



3" SPONGE





3" SPONGE

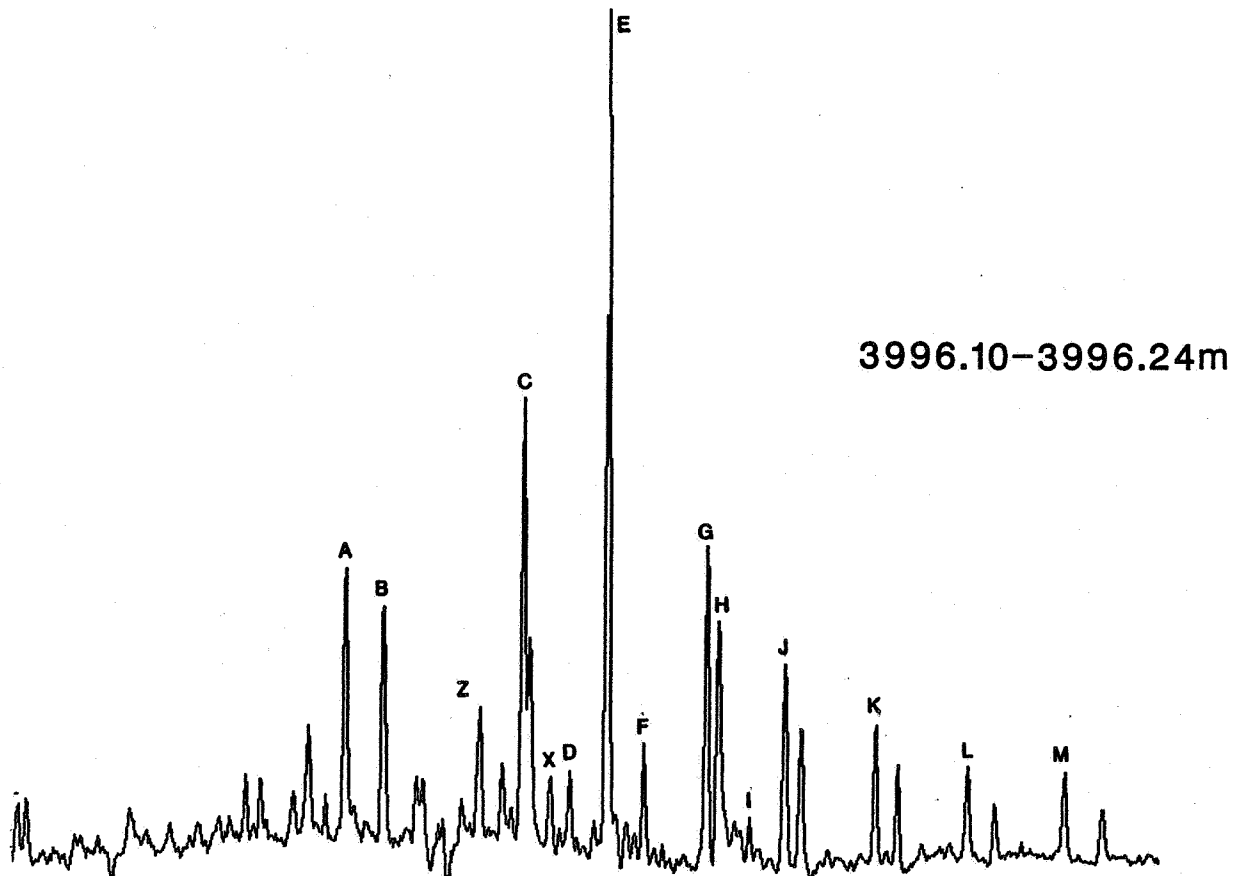
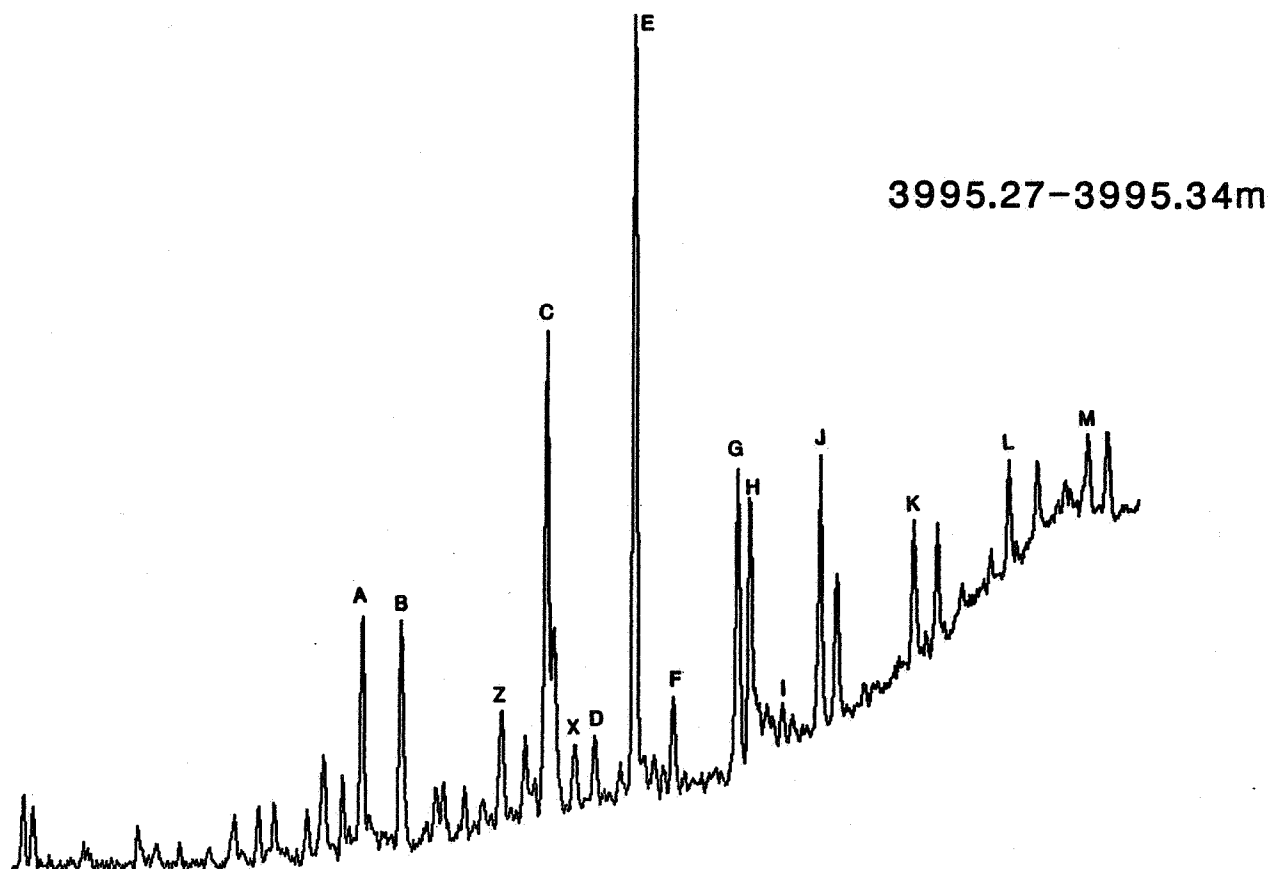


FIGURE 12d

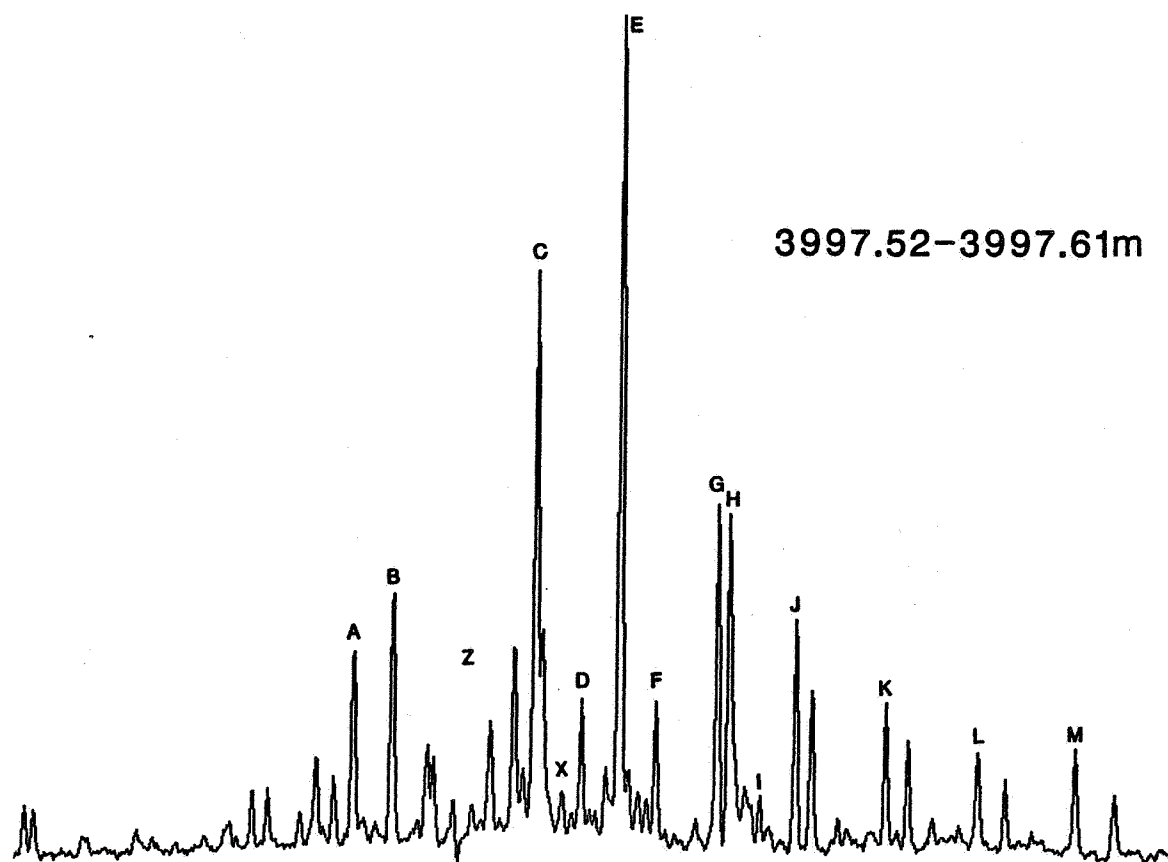
MASS FRAGMENTOGRAMS

WELL 6506/12-5

TRITERPANES m/z 191



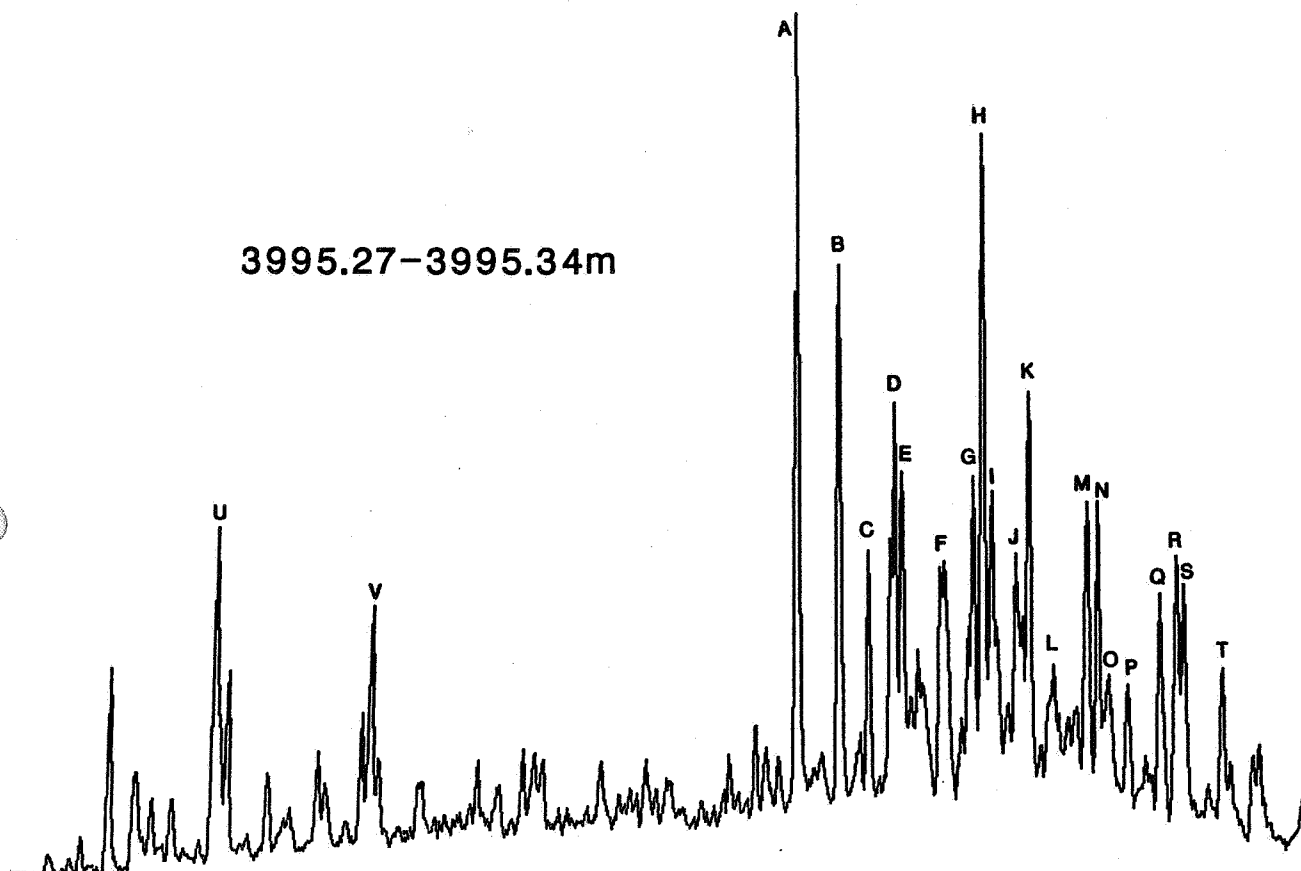
3" SPONGE





3" SPONGE

3995.27-3995.34m



3996.10-3996.24m

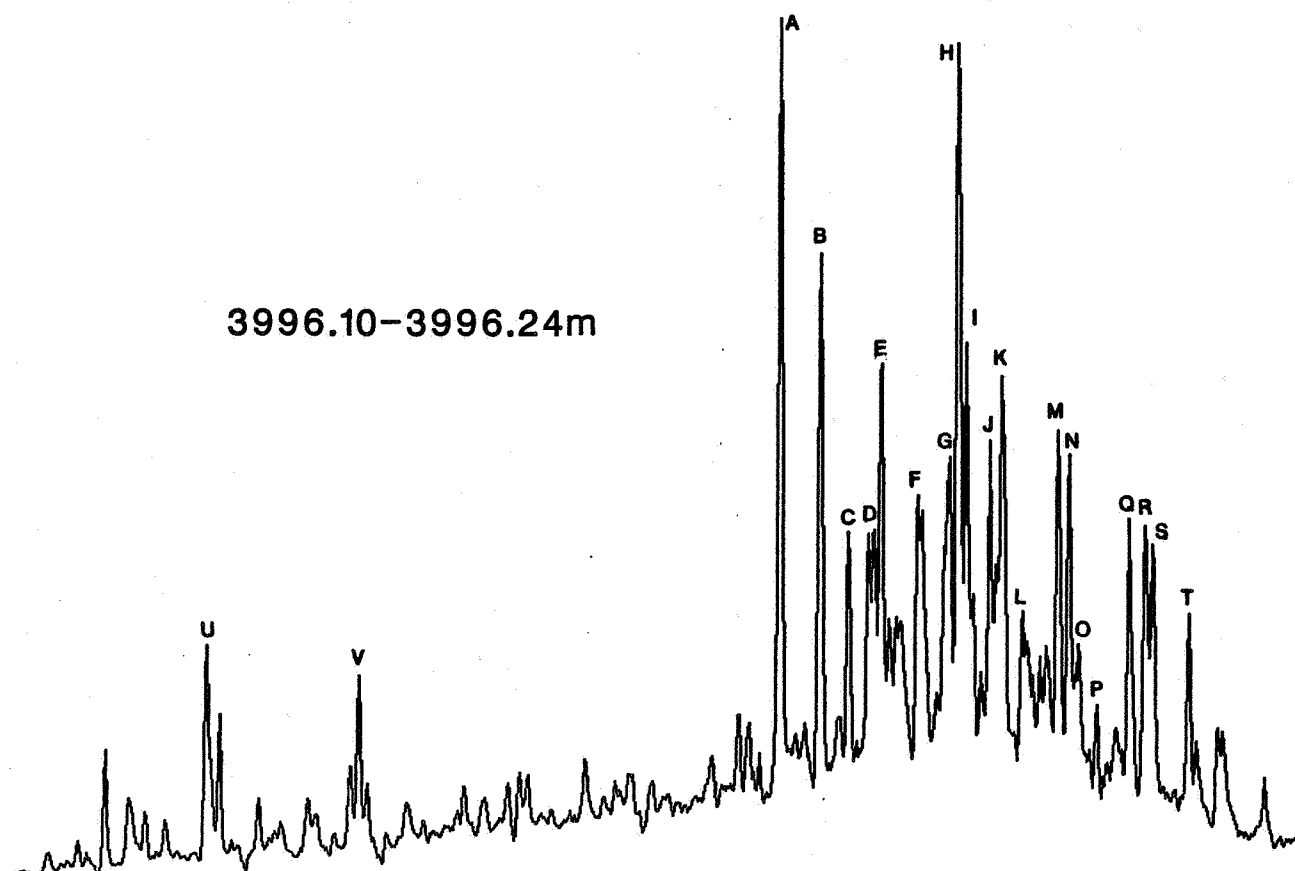


FIGURE 12f

MASS FRAGMENTOGRAMS

WELL 6506/12-5

STERANES m/z 217



3" SPONGE

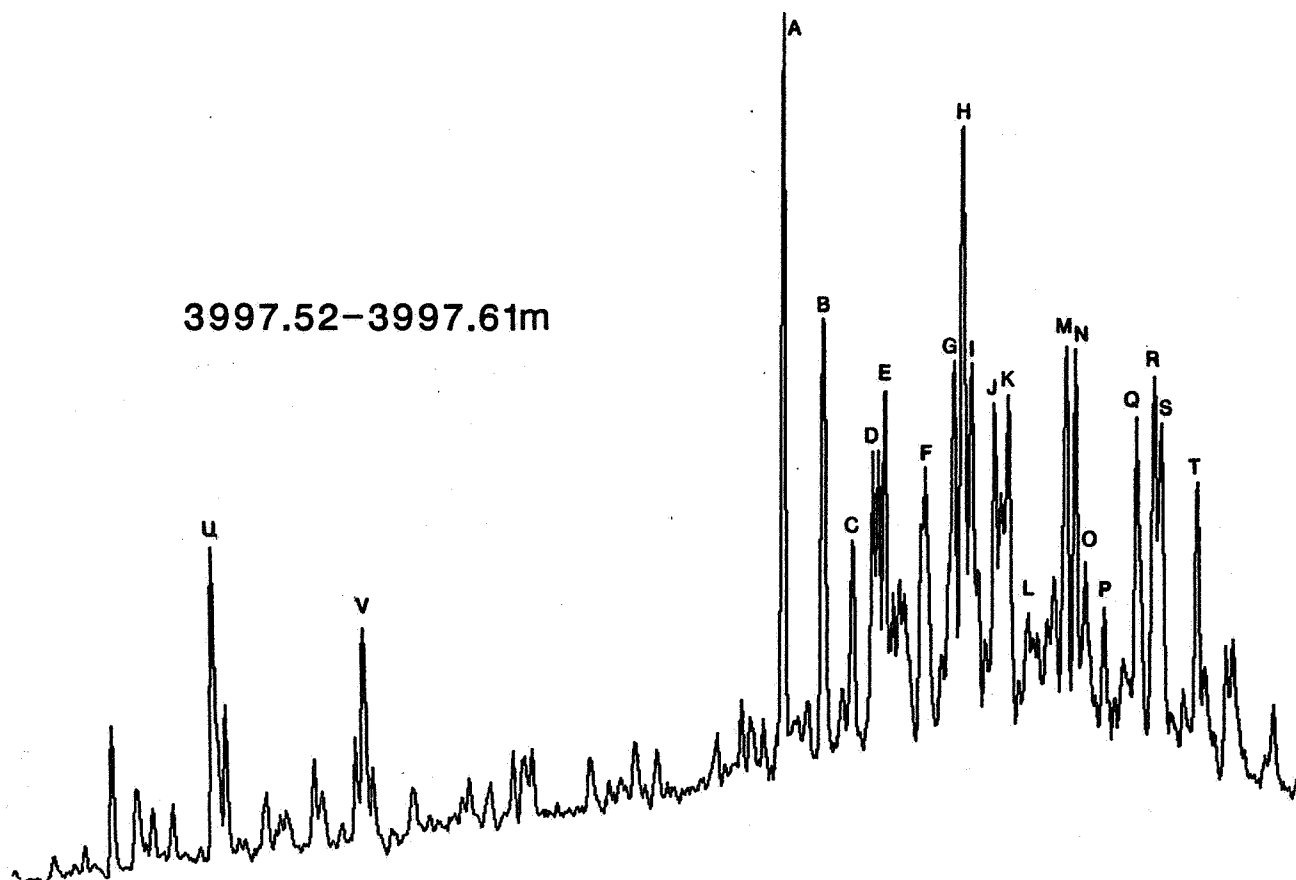


FIGURE 12g

MASS FRAGMENTOGRAMS

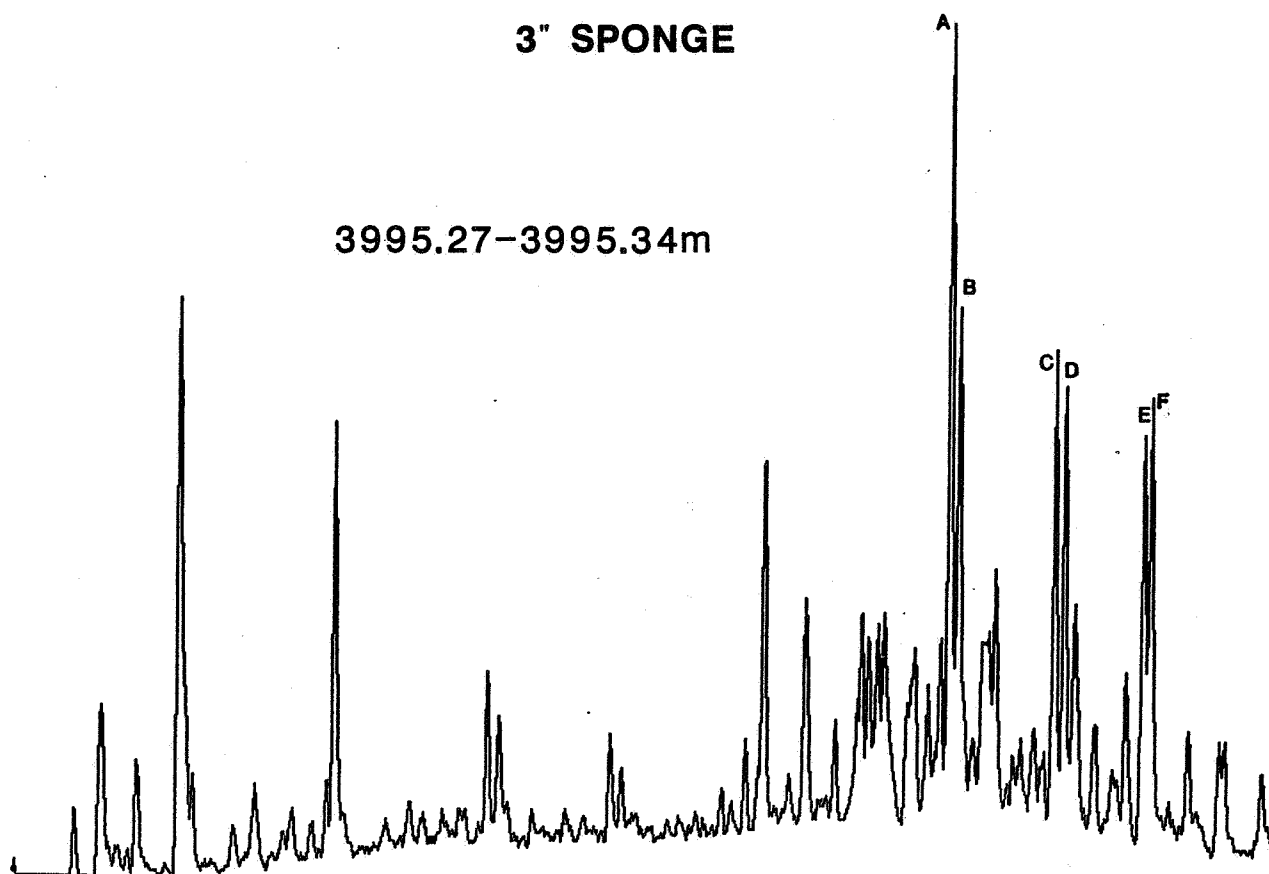
WELL 6506/12-5

$\beta\beta$ STERANES m/z 218



3" SPONGE

3995.27-3995.34m



3996.10-3996.24m

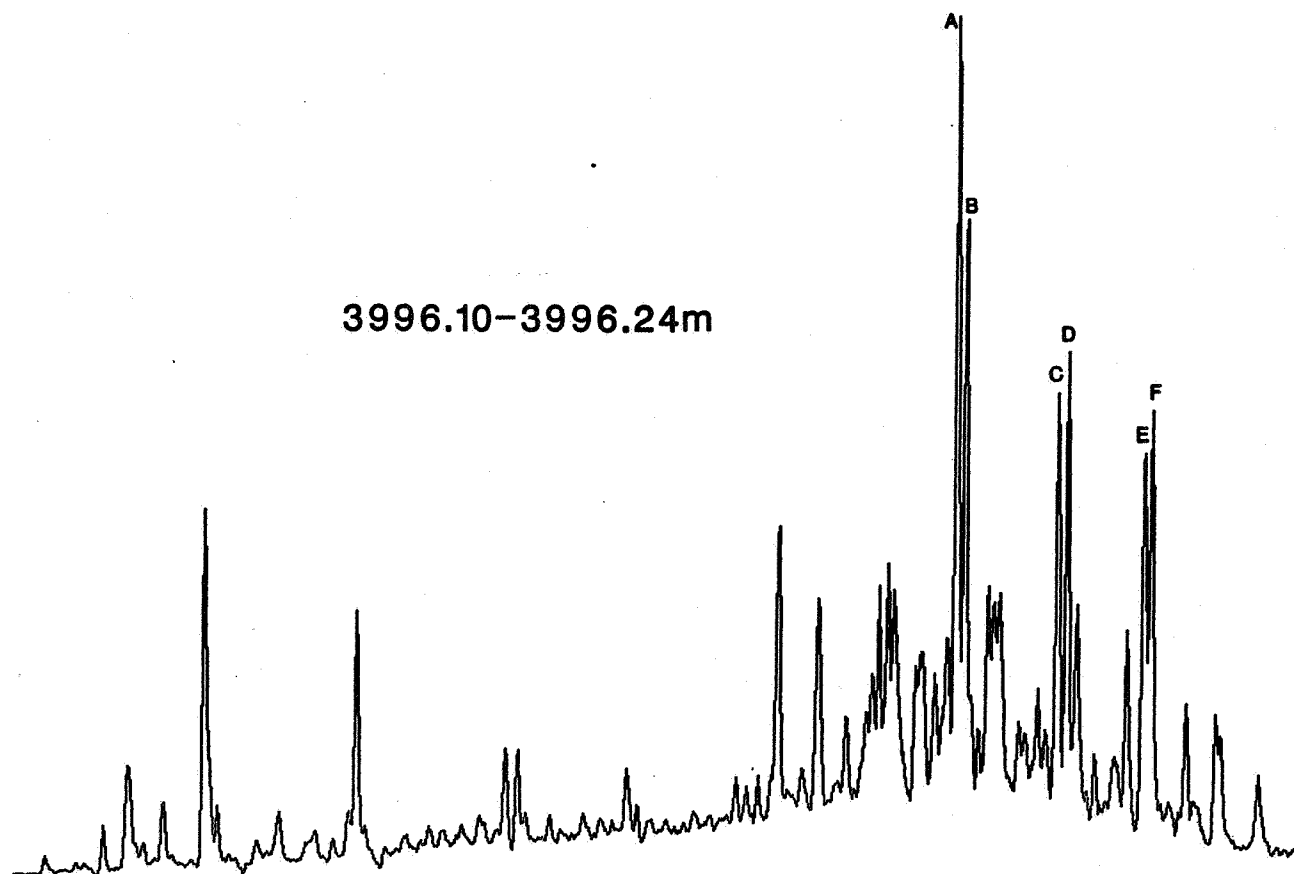


FIGURE 12h

MASS FRAGMENTOGRAMS

WELL 6506/12-5

$\beta\beta$ STERANES m/z 218



3" SPONGE

3997.52-3997.61m

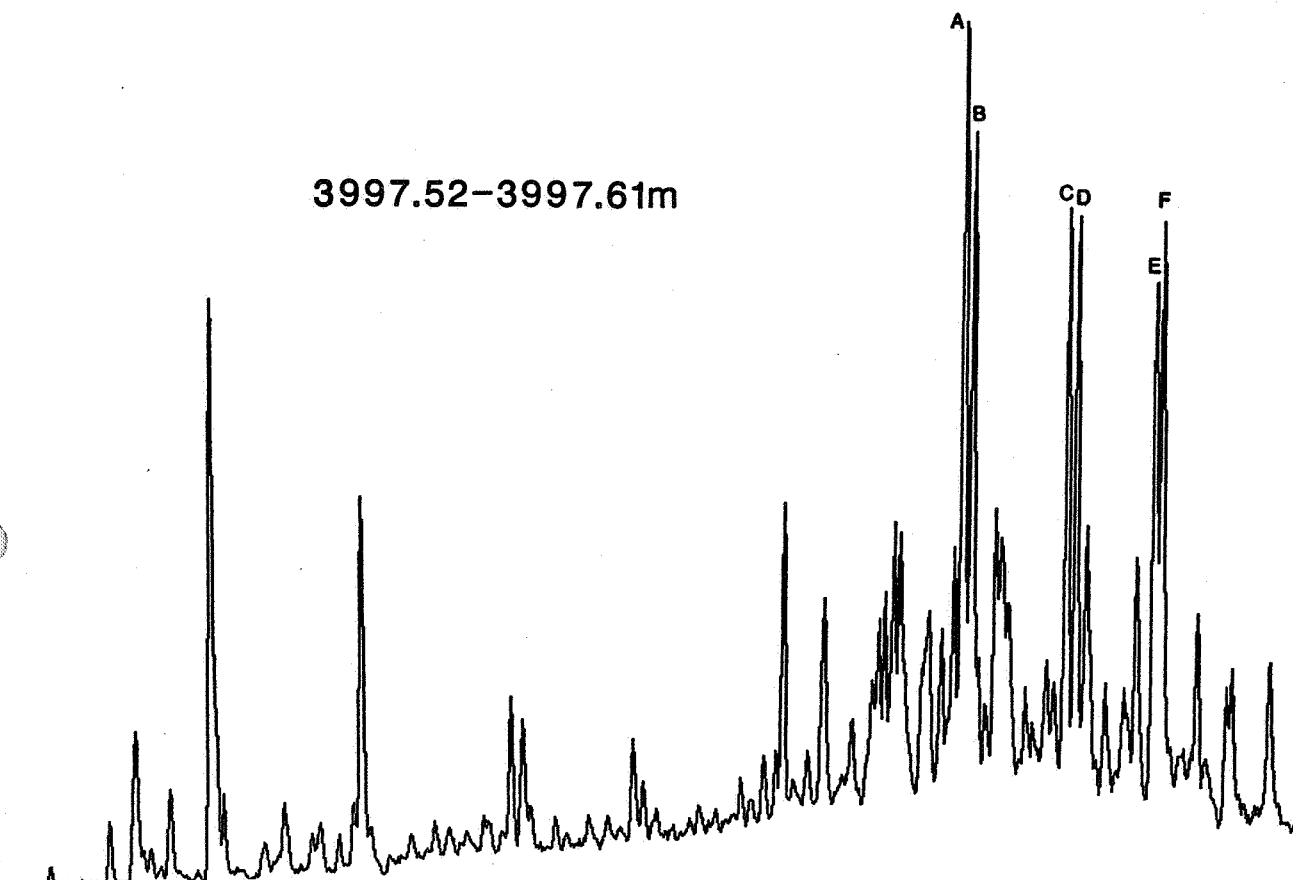


FIGURE 12i

MASS FRAGMENTOGRAMS

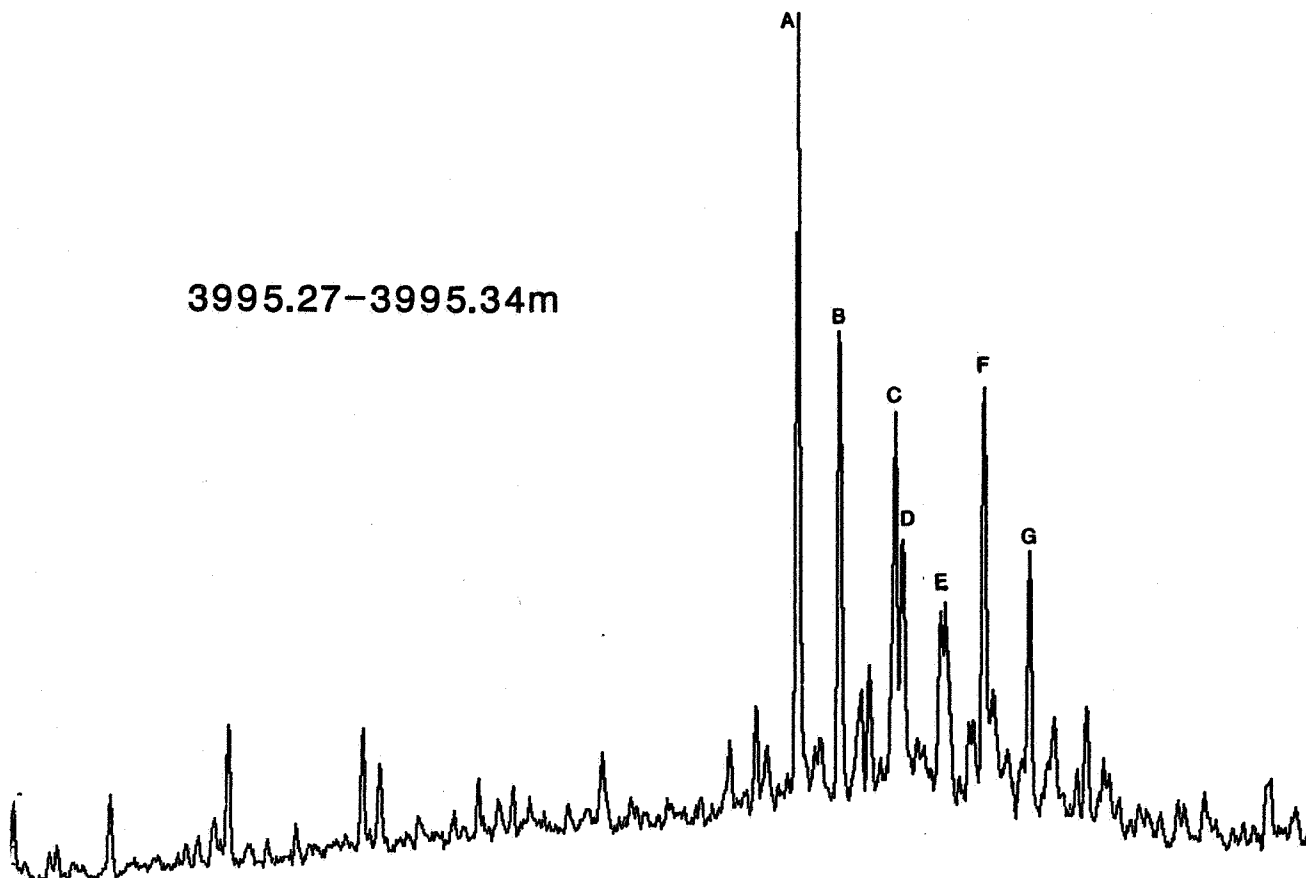
WELL 6506/12-5

REARRANGED STERANES m/z 259



3" SPONGE

3995.27-3995.34m



3996.10-3996.24m

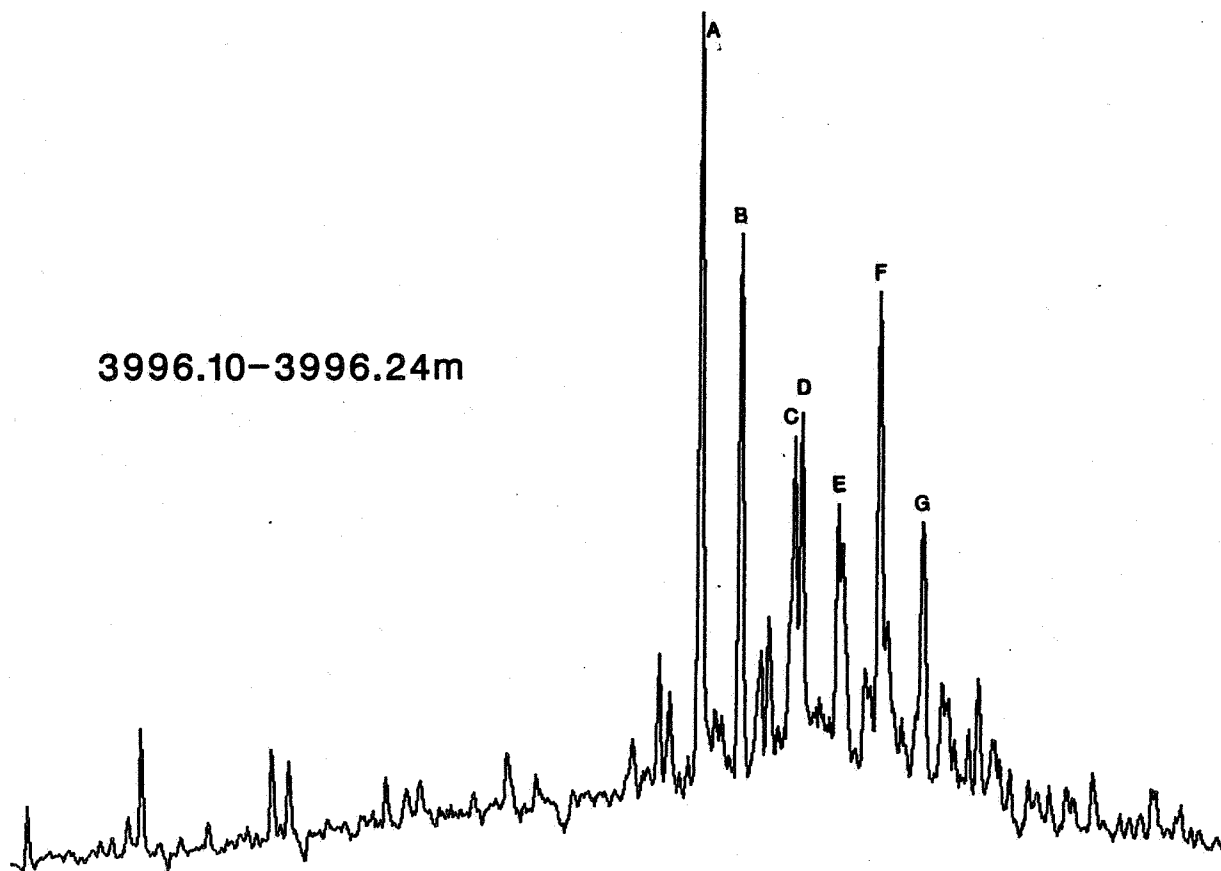


FIGURE 12j

MASS FRAGMENTOGRAMS

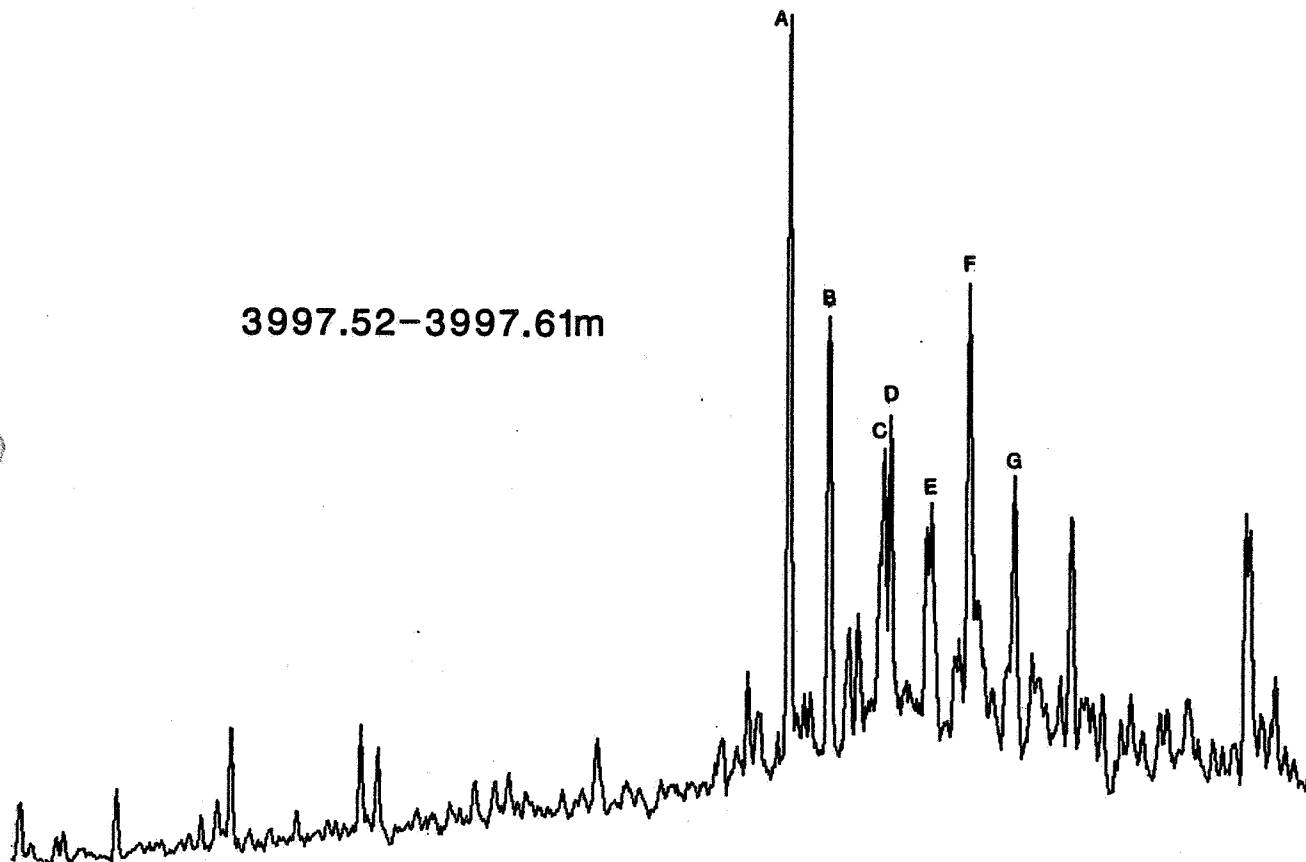
WELL 6506/12-5

REARRANGED STERANES m/z 259



3" SPONGE

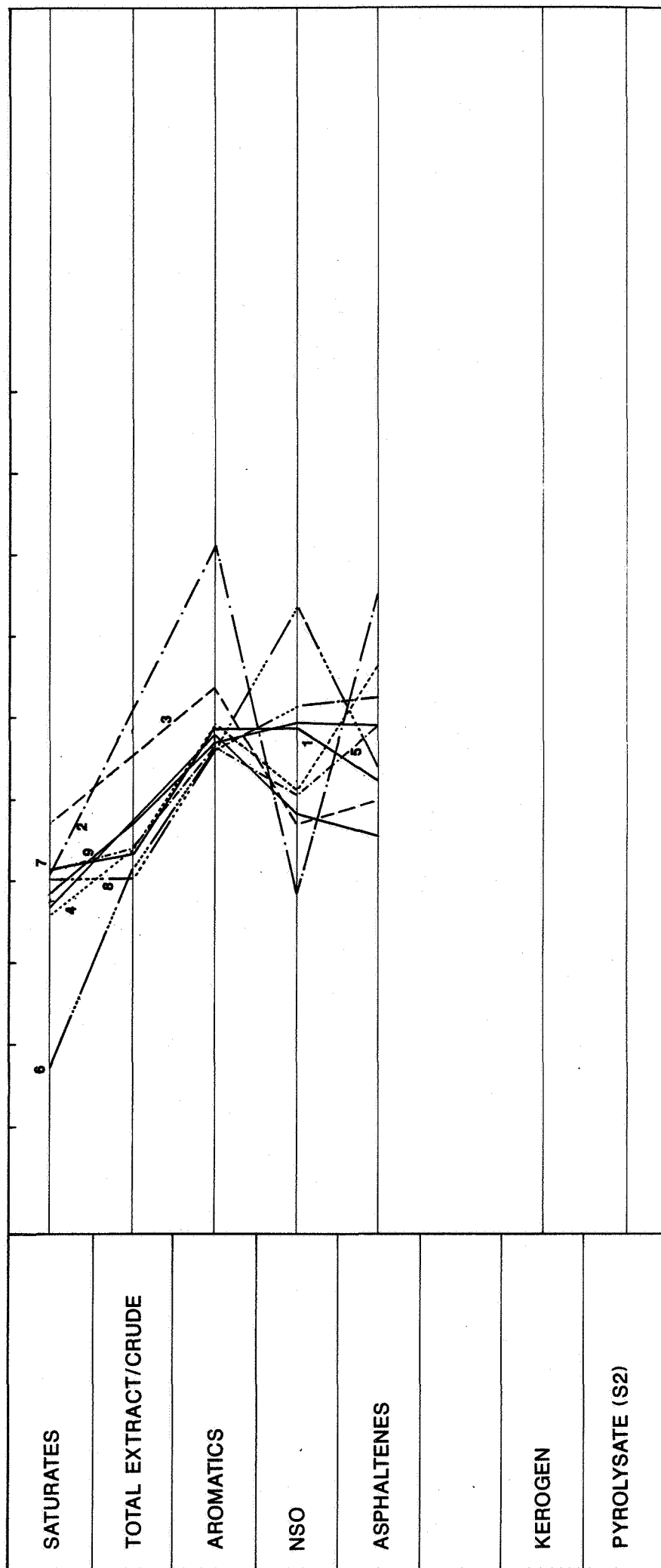
3997.52-3997.61m



GALIMOV CARBON ISOTOPE PLOT **(‰, PDB)**

FIGURE 13
 WELL 6506/12-5

- 1 3995.27-0.34
- 2 3996.10-0.24
- 3 3997.52-0.61
- 4 3995.27-0.34 INNER
- 5 3995.27-0.34 OUTER
- 6 3996.10-0.24 INNER
- 7 3996.10-0.24 OUTER
- 8 3997.52-0.61 INNER
- 9 3997.52-0.61 OUTER



APPENDIX 2

SPONGE CORE STUDY DATA

FIGURE 1a
WELL 6506/12-5

TOTAL EXTRACT CHROMATOGRAMS



3995.27-3995.34m

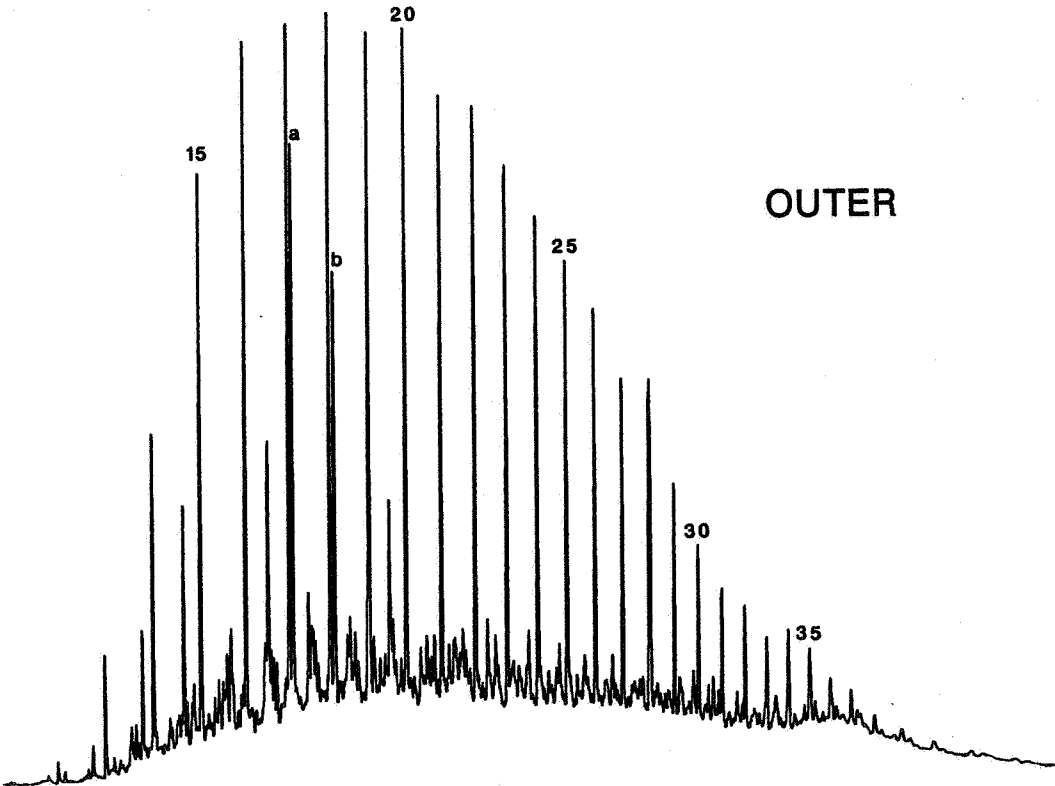
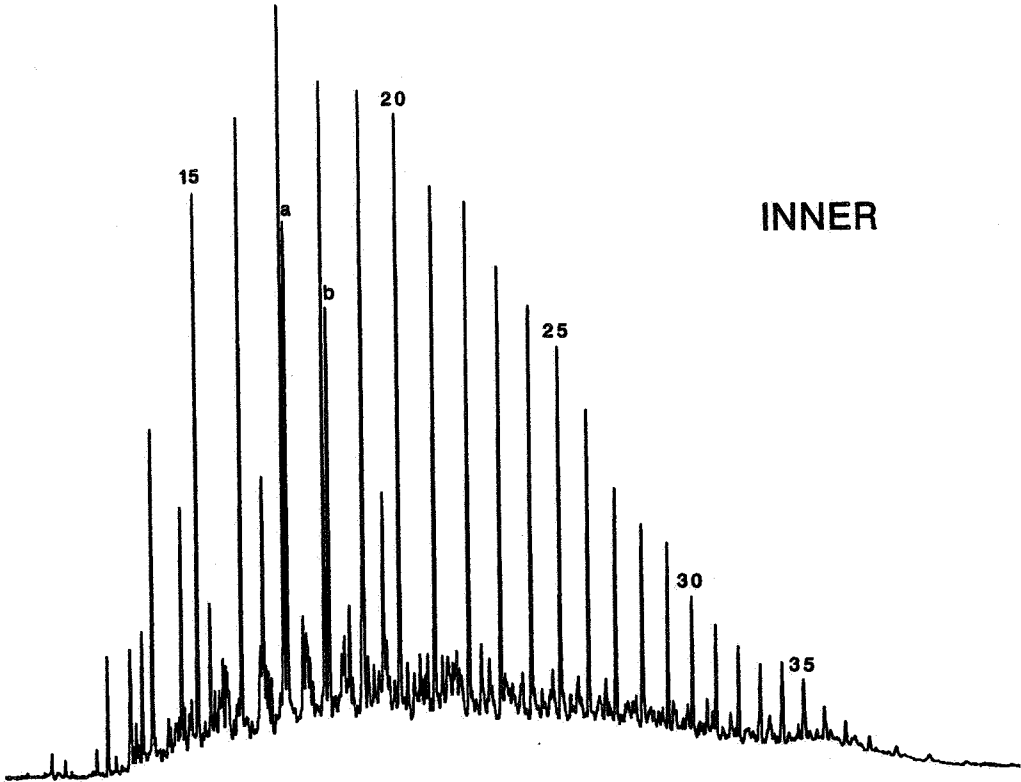


FIGURE 1b

WELL 6506/12-5

TOTAL EXTRACT CHROMATOGRAMS



3996.10-3996.24m

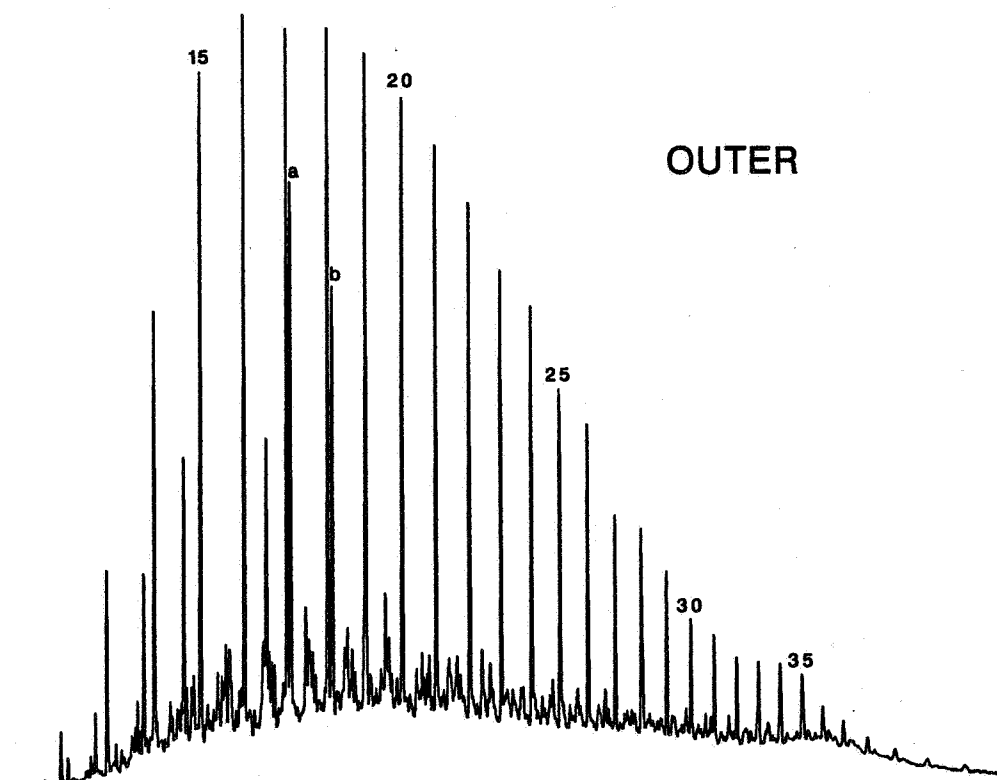
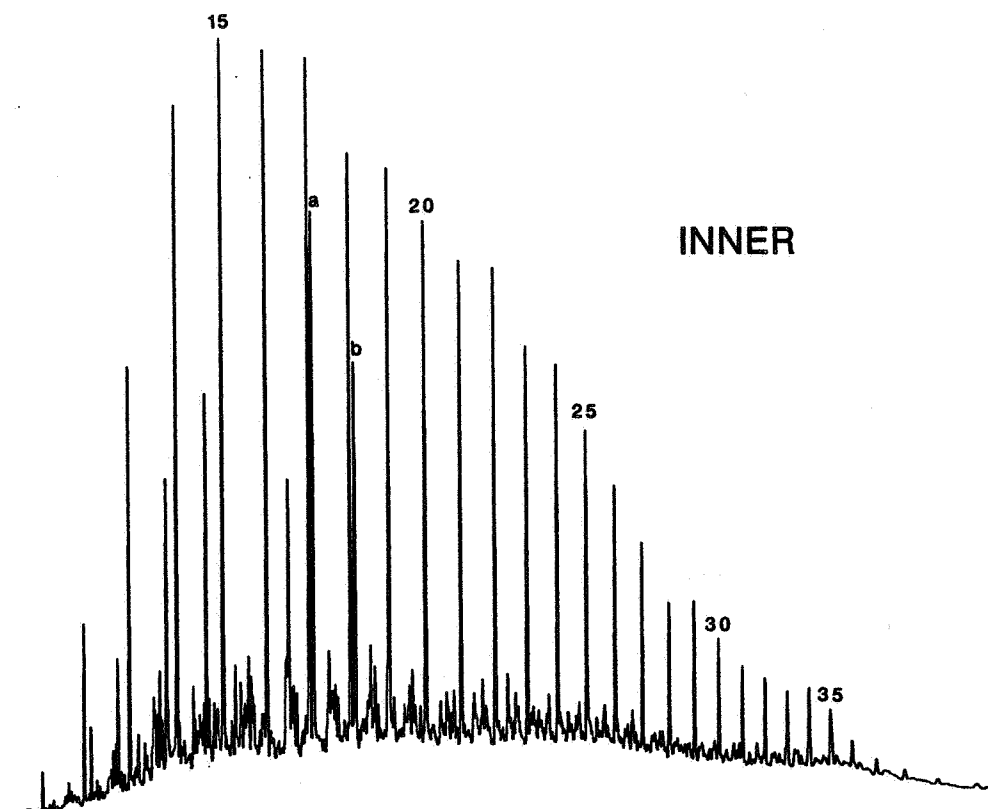


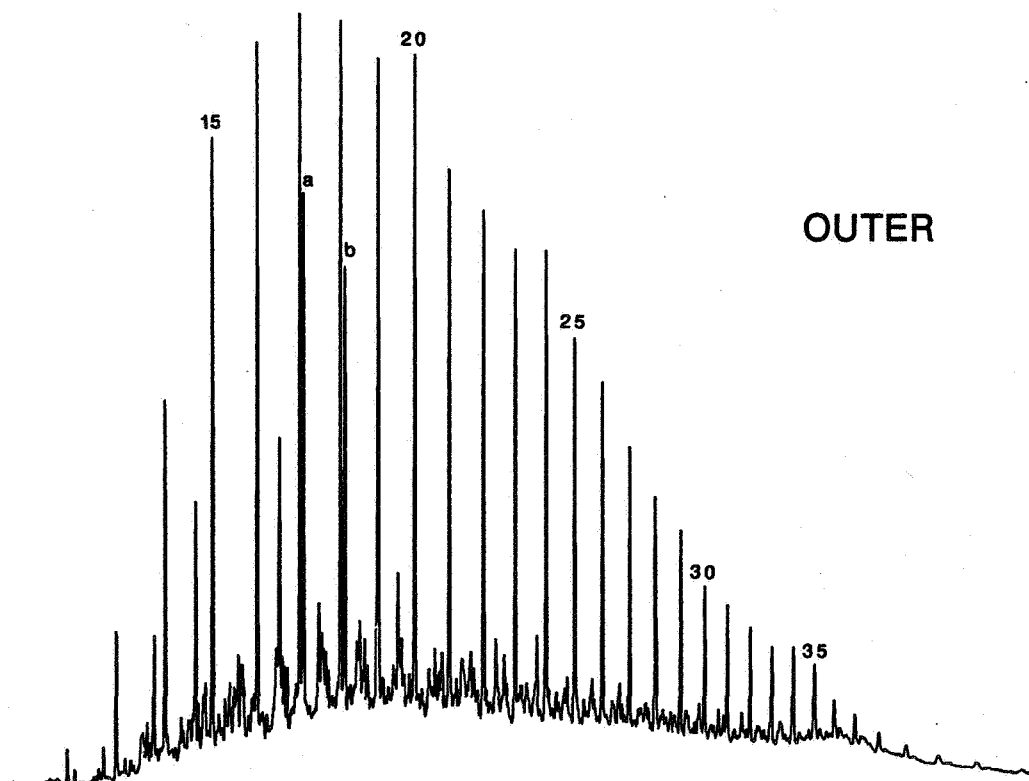
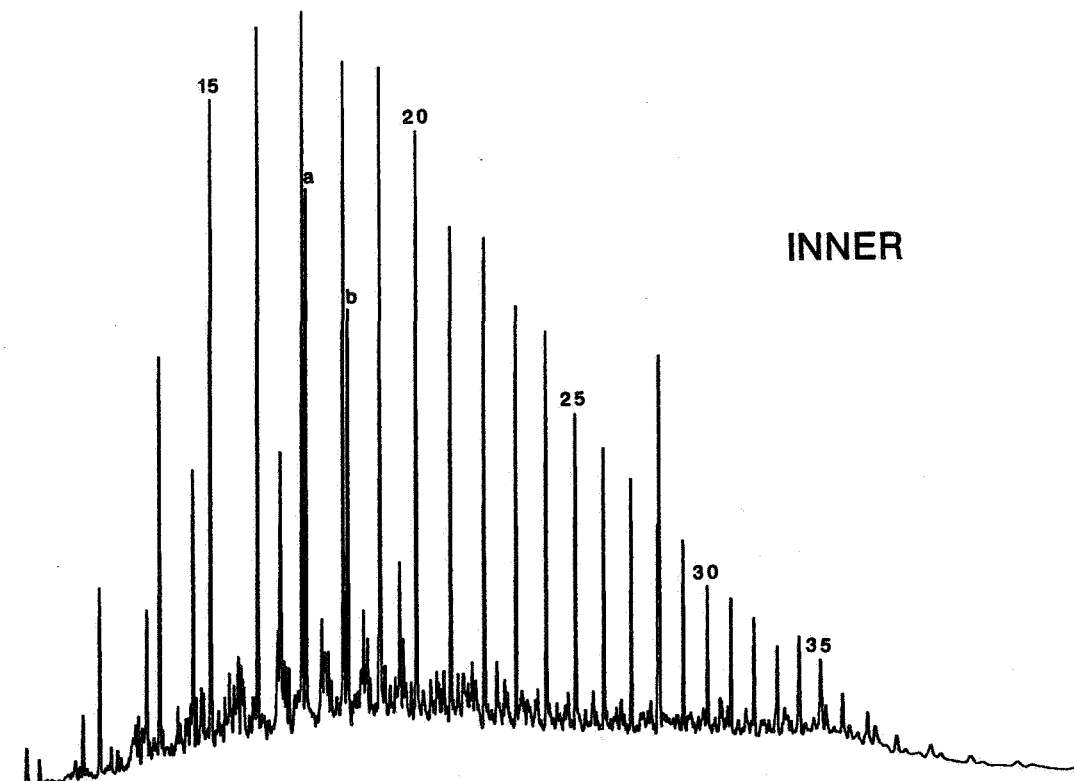
FIGURE 1c

WELL 6506/12-5

TOTAL EXTRACT CHROMATOGRAMS



3997.52-3997.61m



THERMAL BITUMEN CHROMATOGRAMS



3995.27-3995.34m

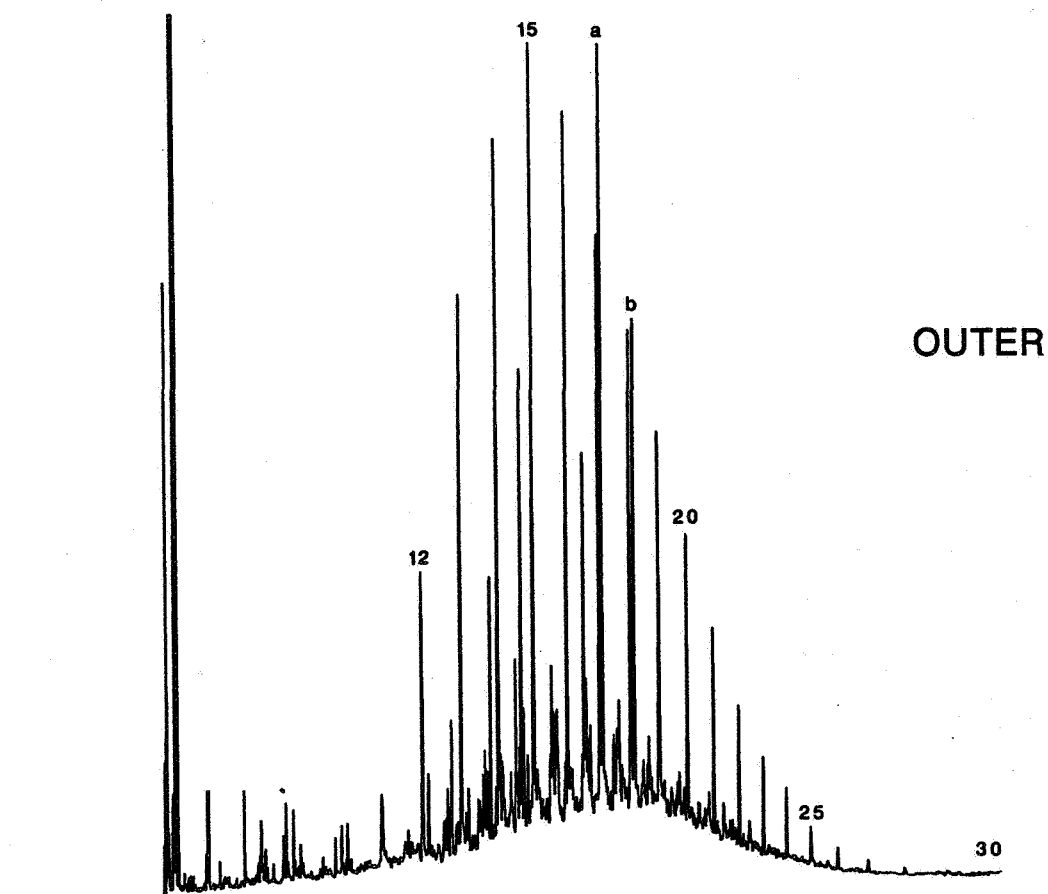
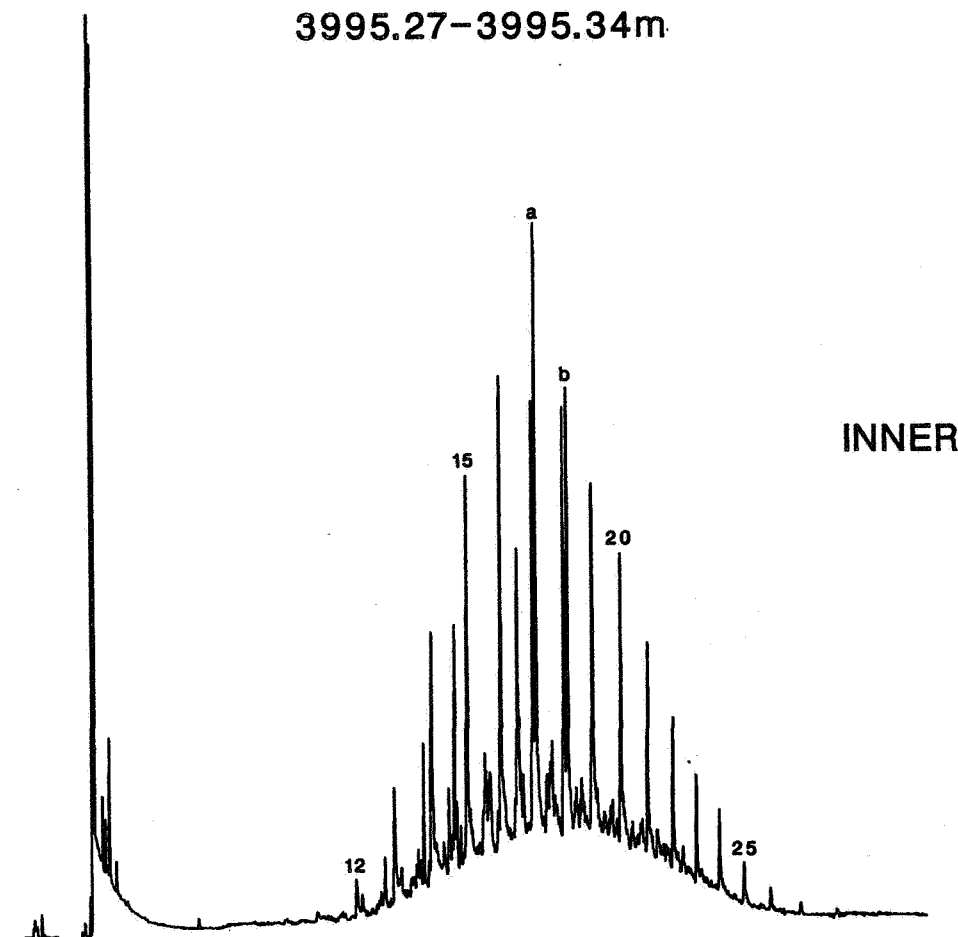


FIGURE 2b

WELL 6506/12-5

THERMAL BITUMEN CHROMATOGRAMS



3996.10-3996.24m

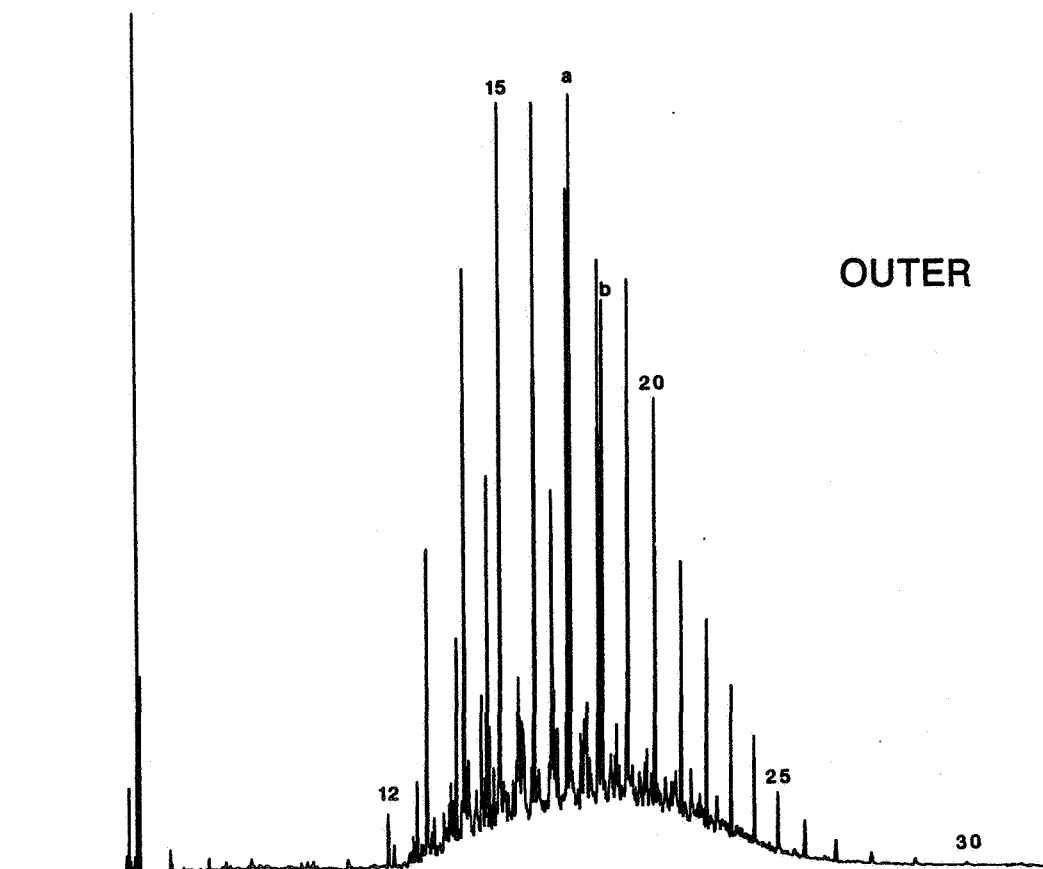
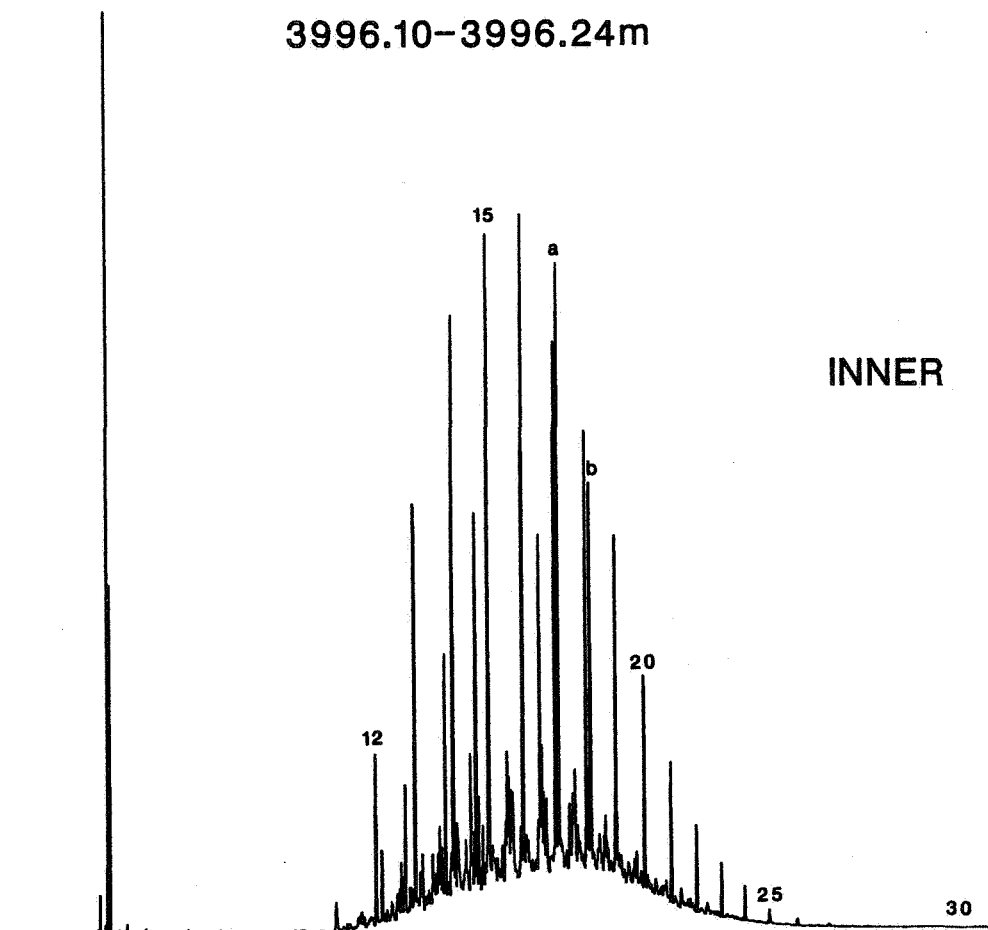


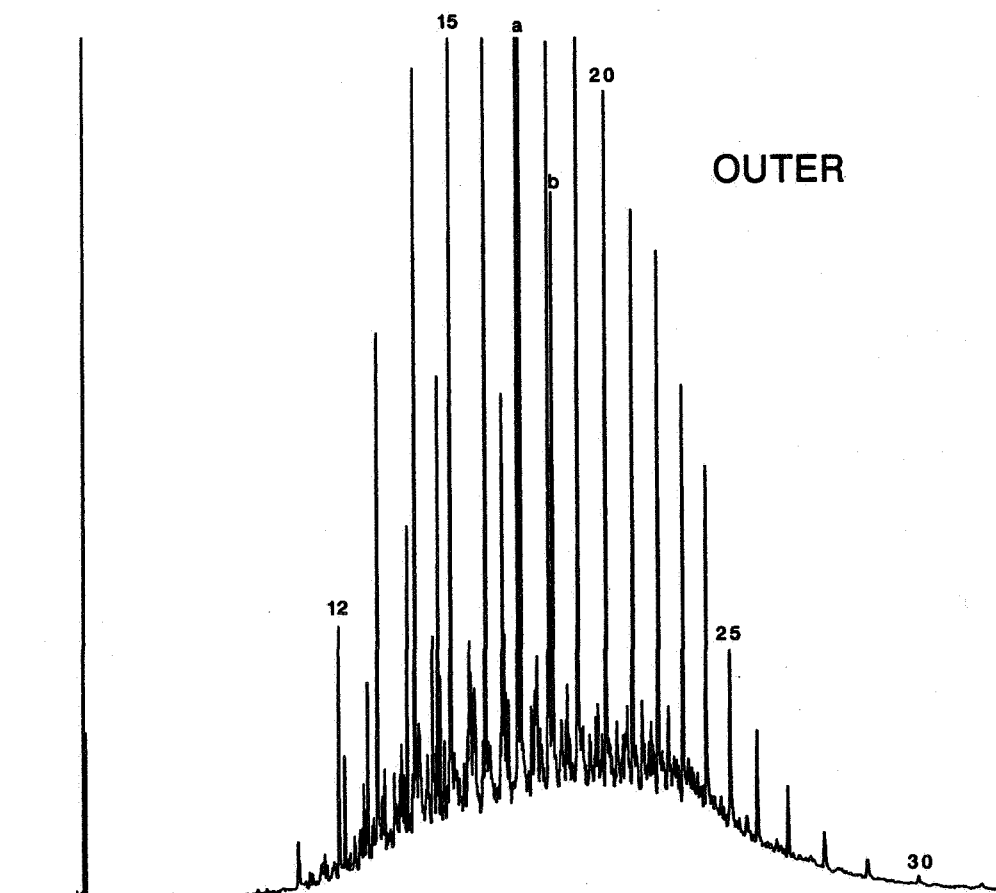
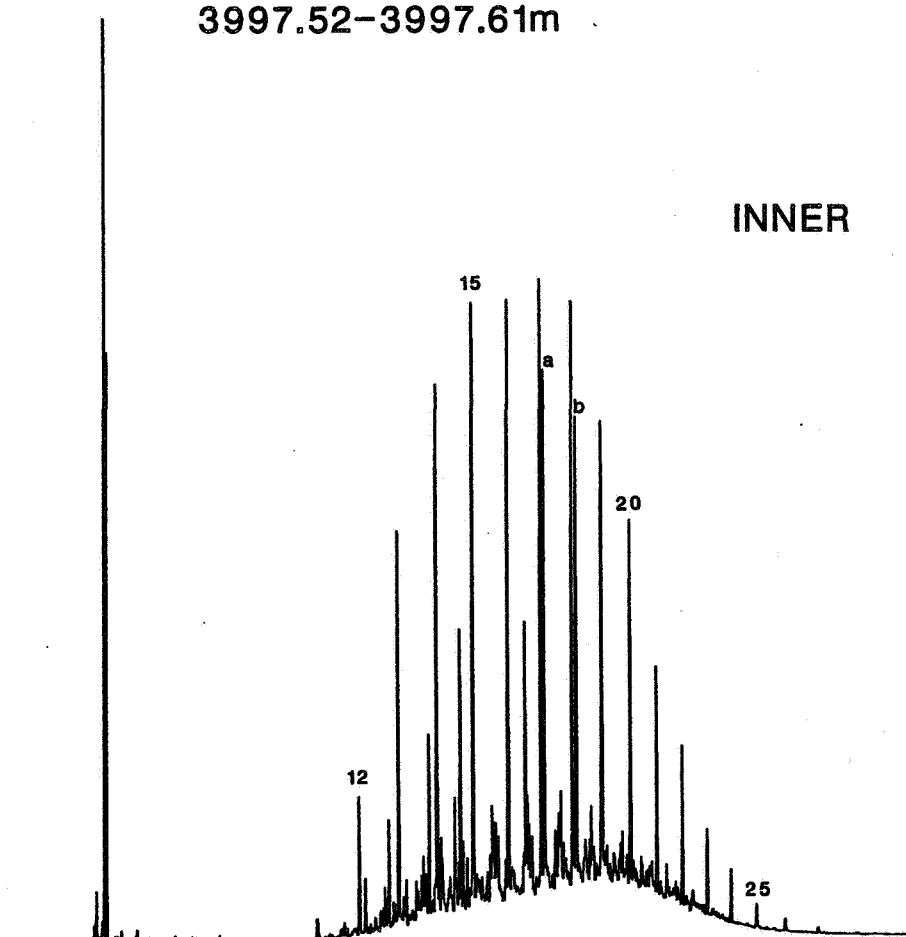
FIGURE 2c

WELL 6506/12-5

THERMAL BITUMEN CHROMATOGRAMS



3997.52-3997.61m





WELL 6506/12-5

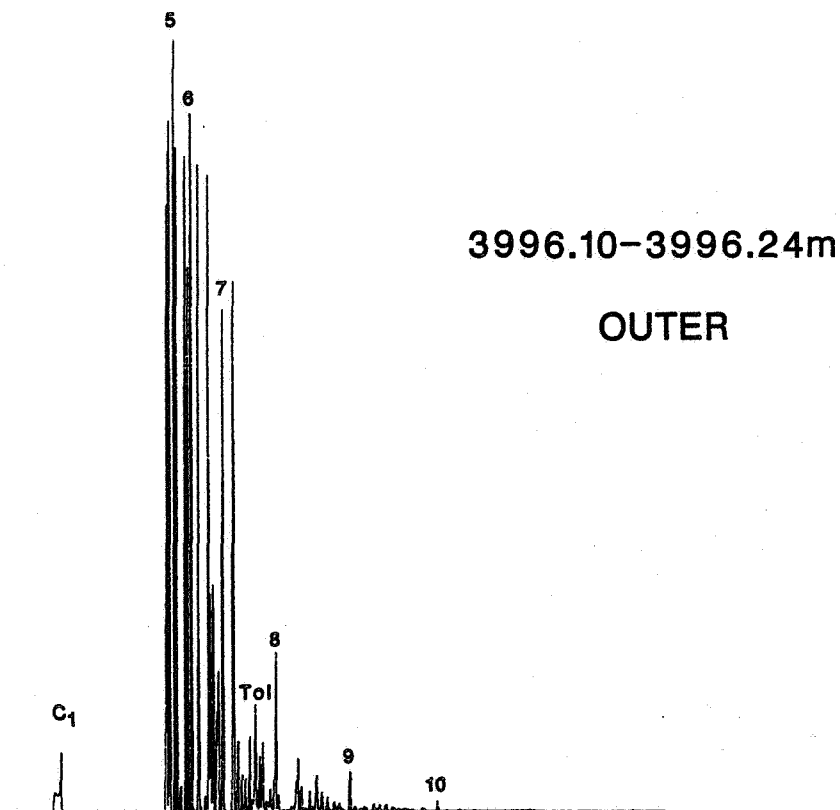
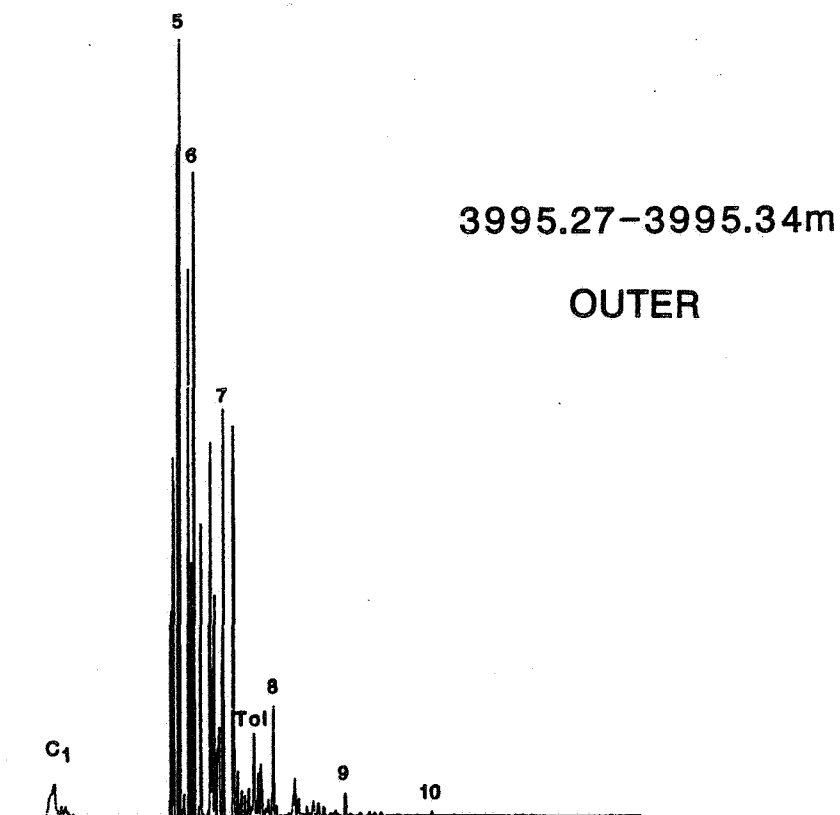
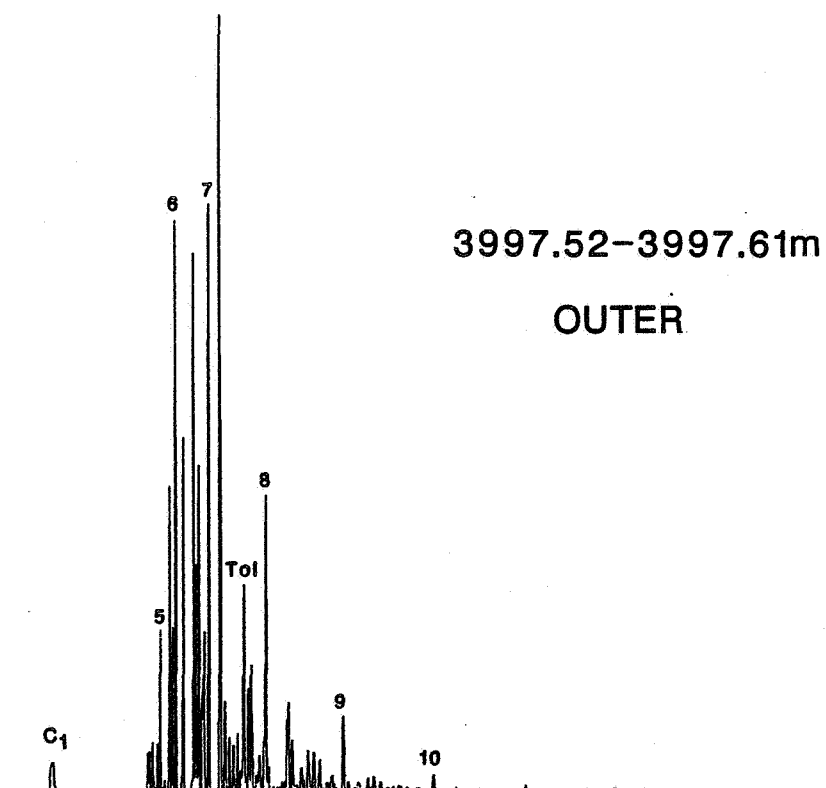


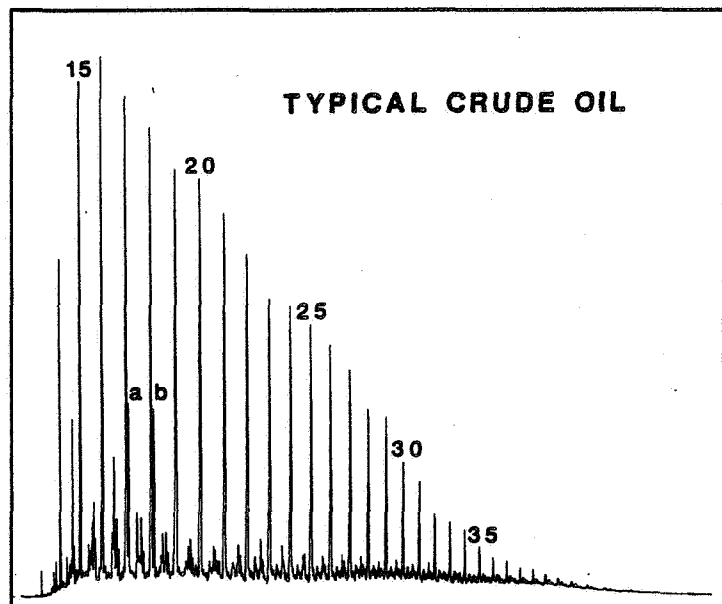
FIGURE 3b

C₄-C₇ CHROMATOGRAMS

WELL 6506/12-5



C₁₅+ SATURATES CHROMATOGRAMS



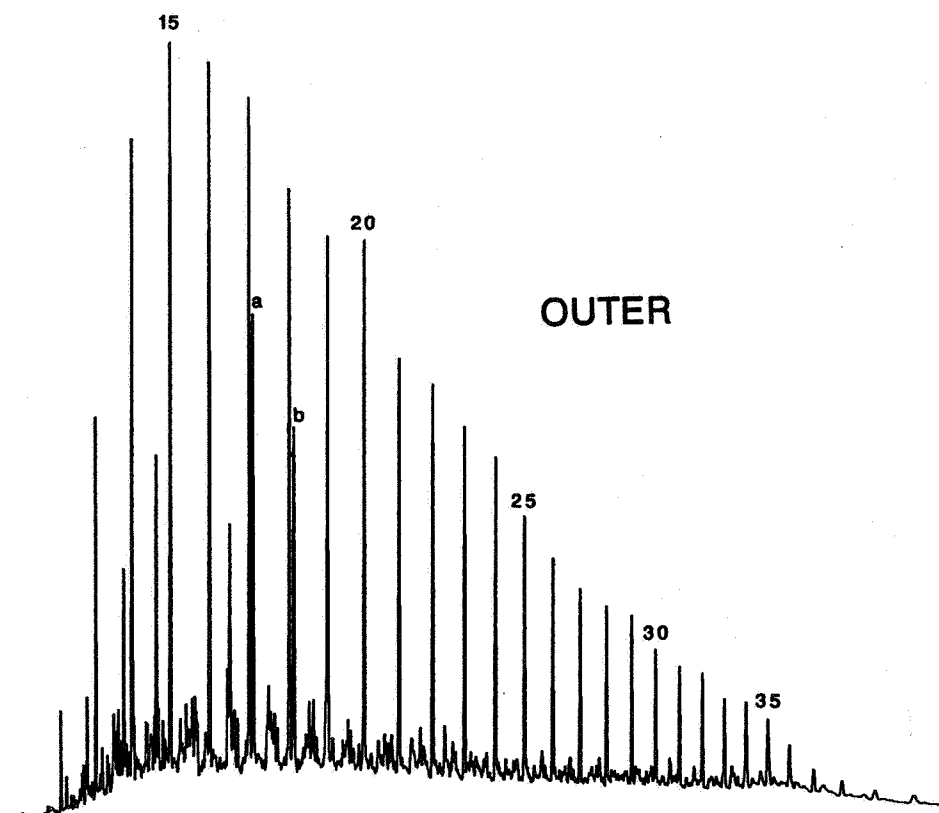
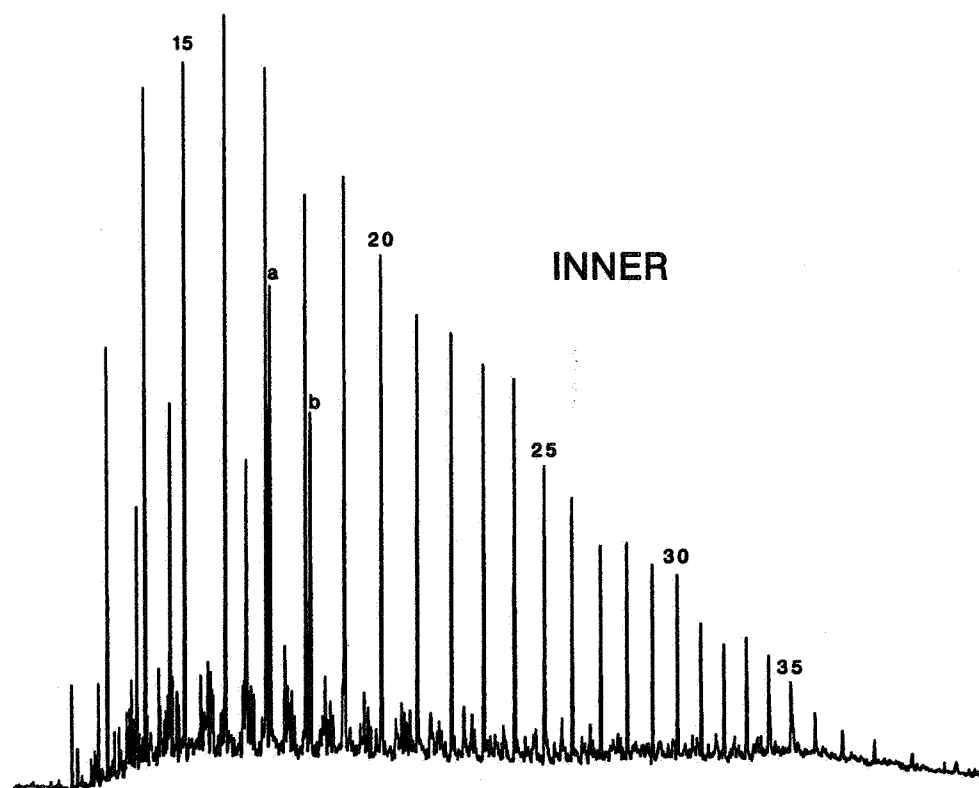
a - PRISTANE

b - PHYTANE

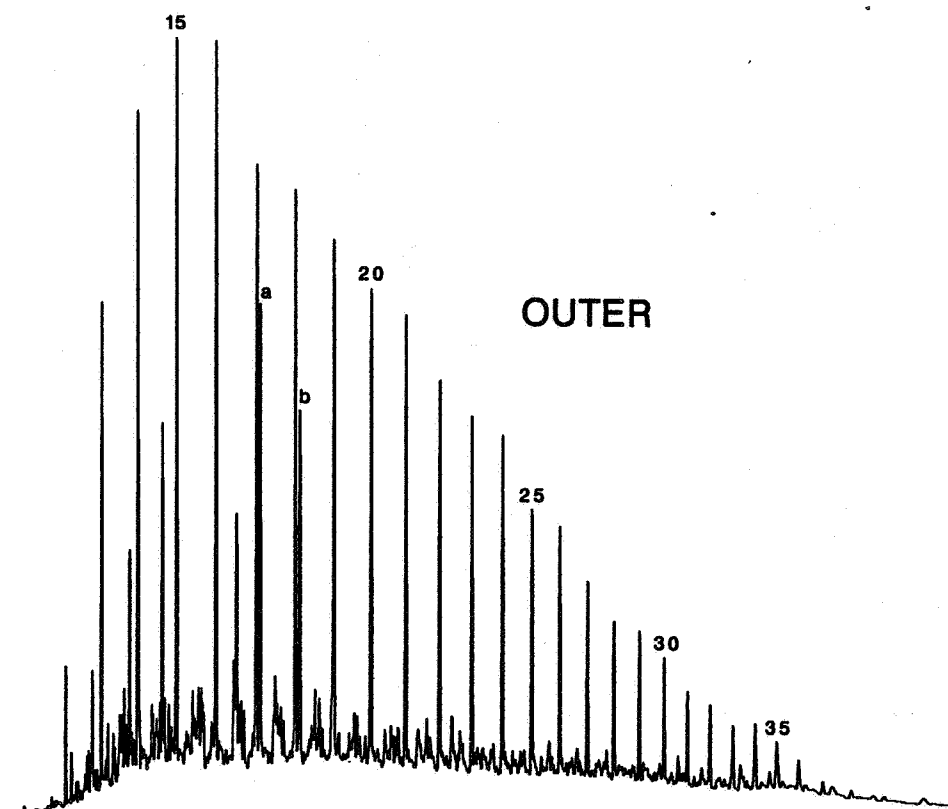
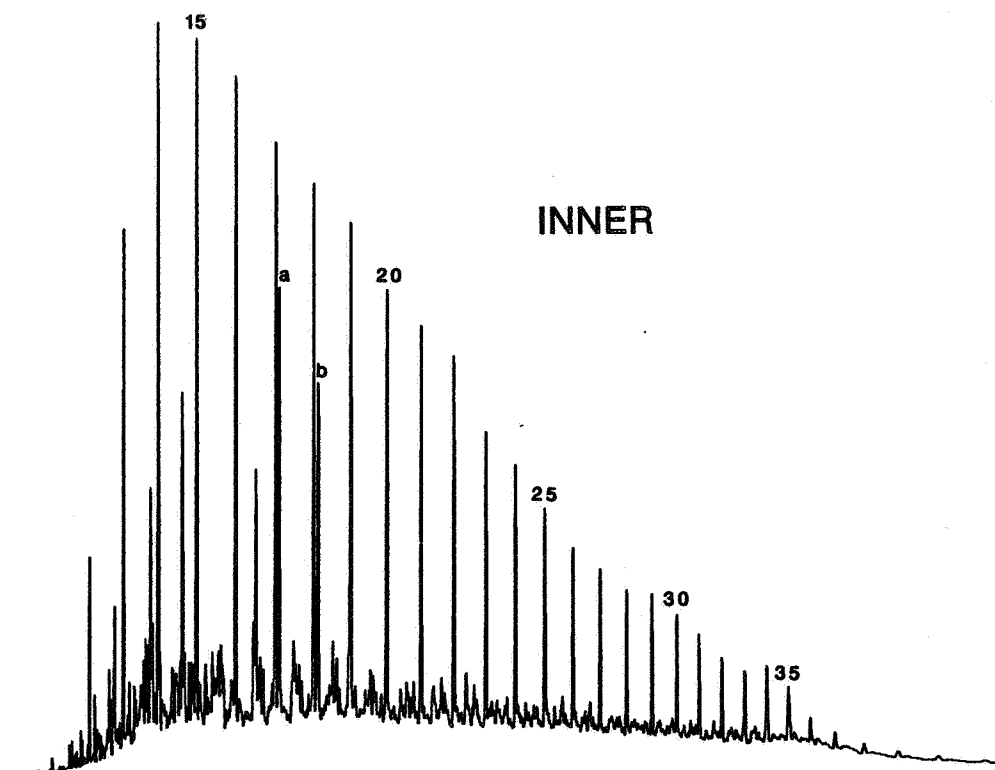
CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20-nC₂₀)



3995.27-3995.34m

**a - PRISTANE****b - PHYTANE****CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)**

3996.10-3996.24m



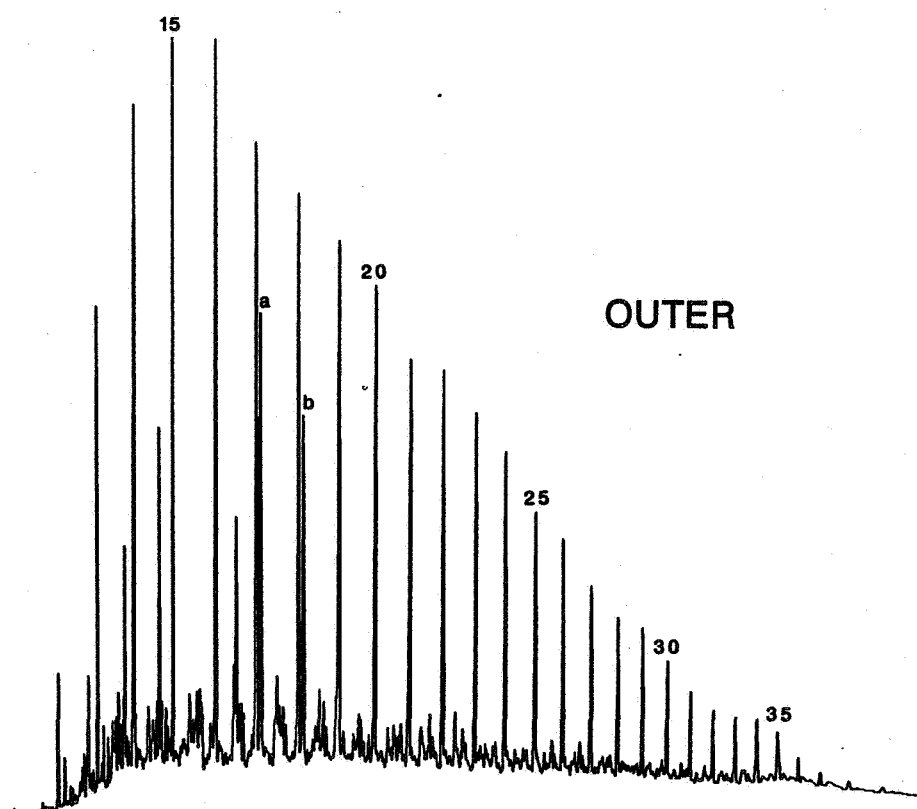
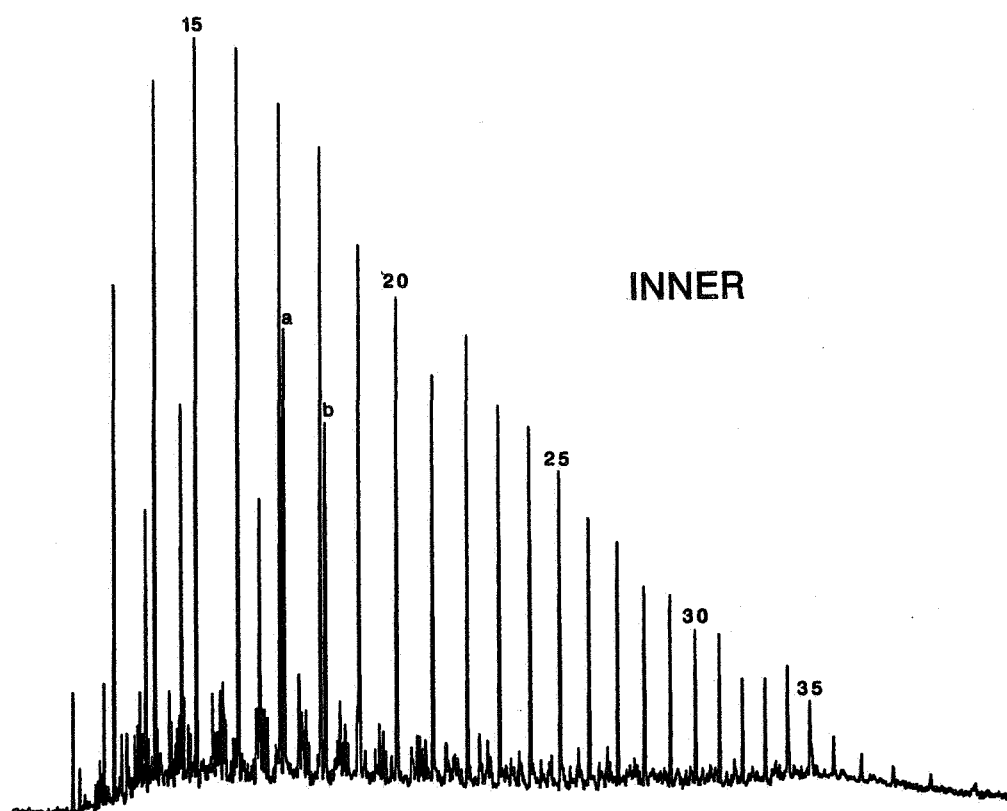
a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)



3997.52-3997.61m



a - PRISTANE

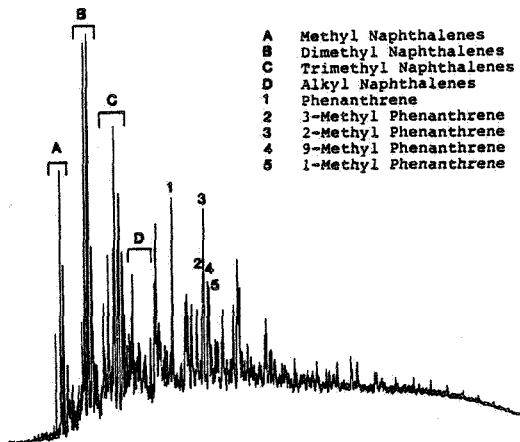
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

C₁₅+ AROMATIC CHROMATOGRAMS

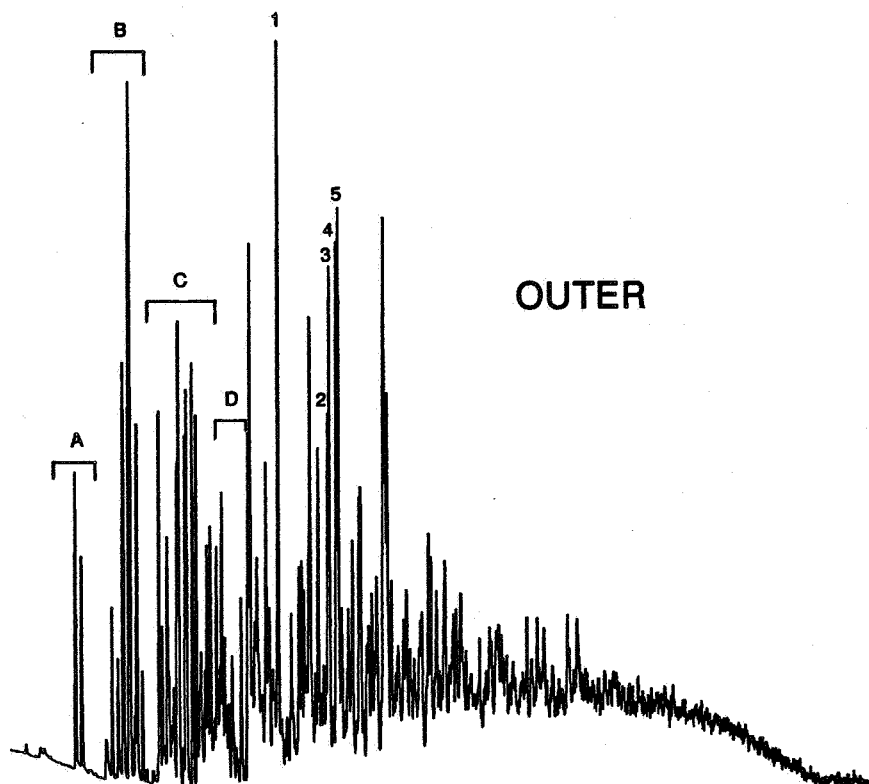
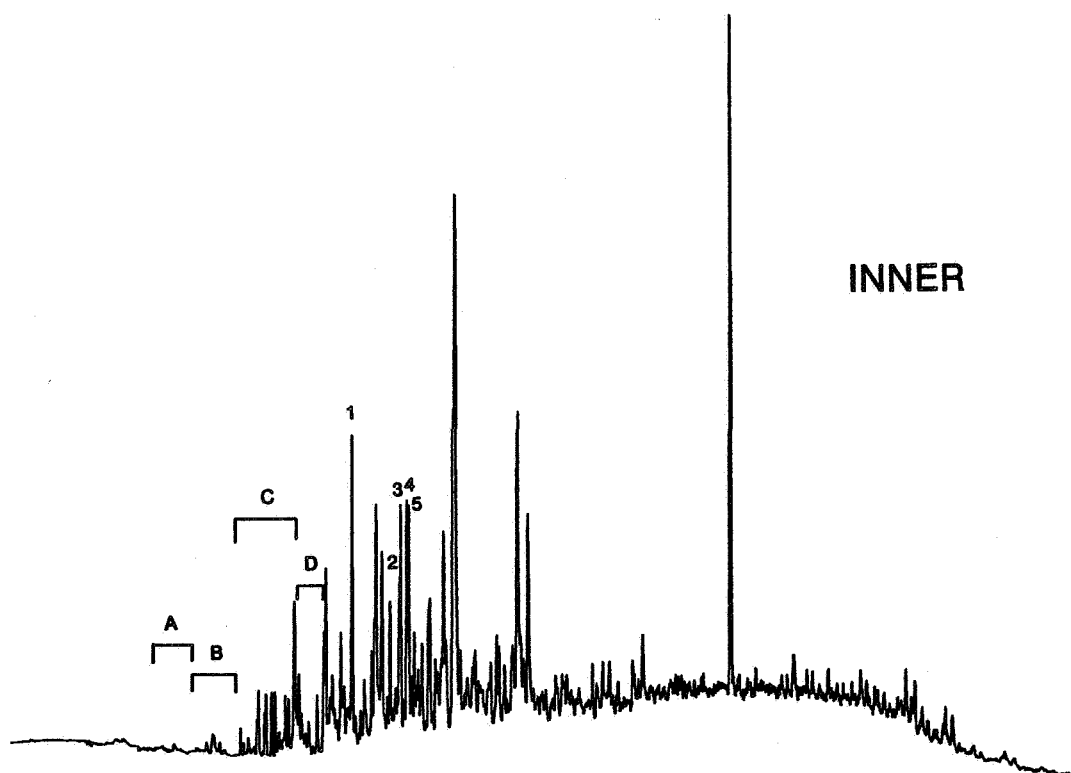


STANDARD



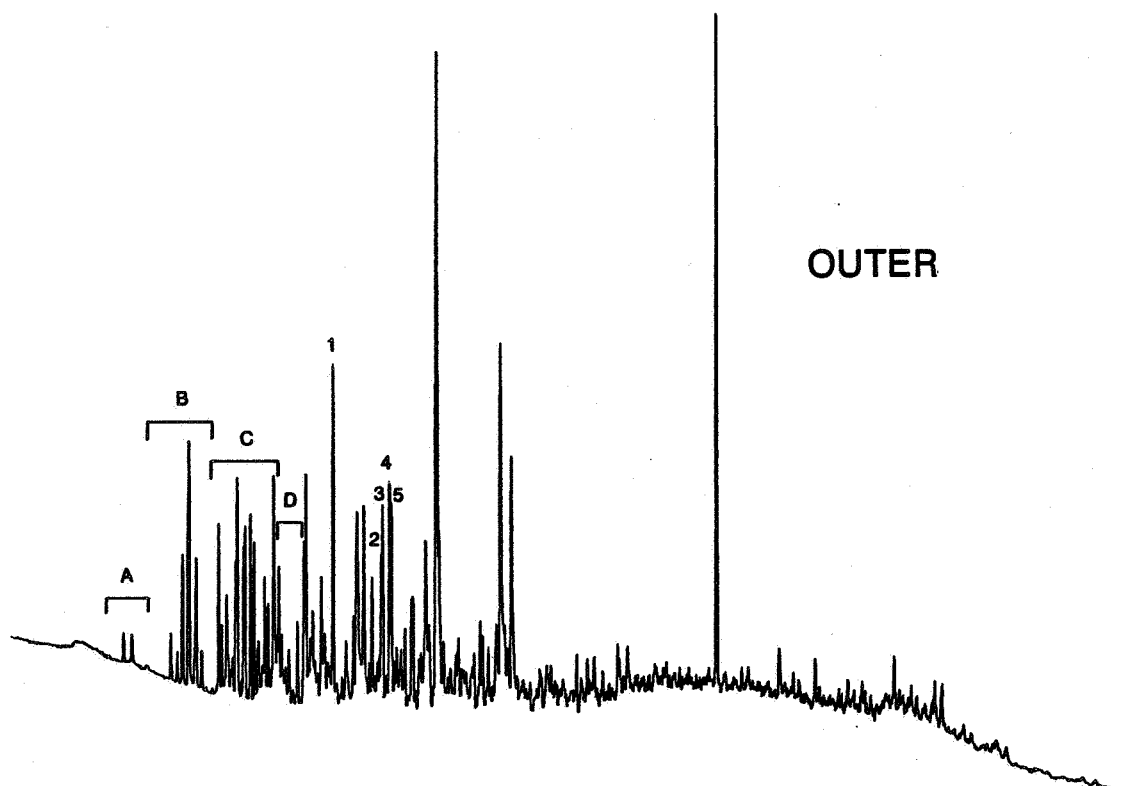
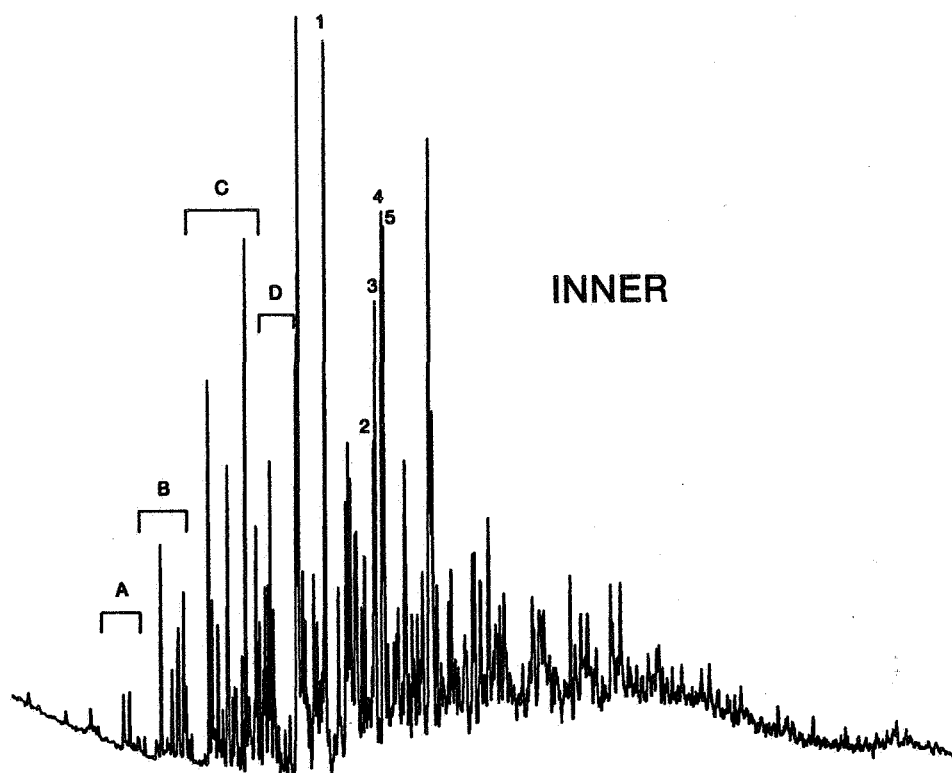


3995.27-3995.34m





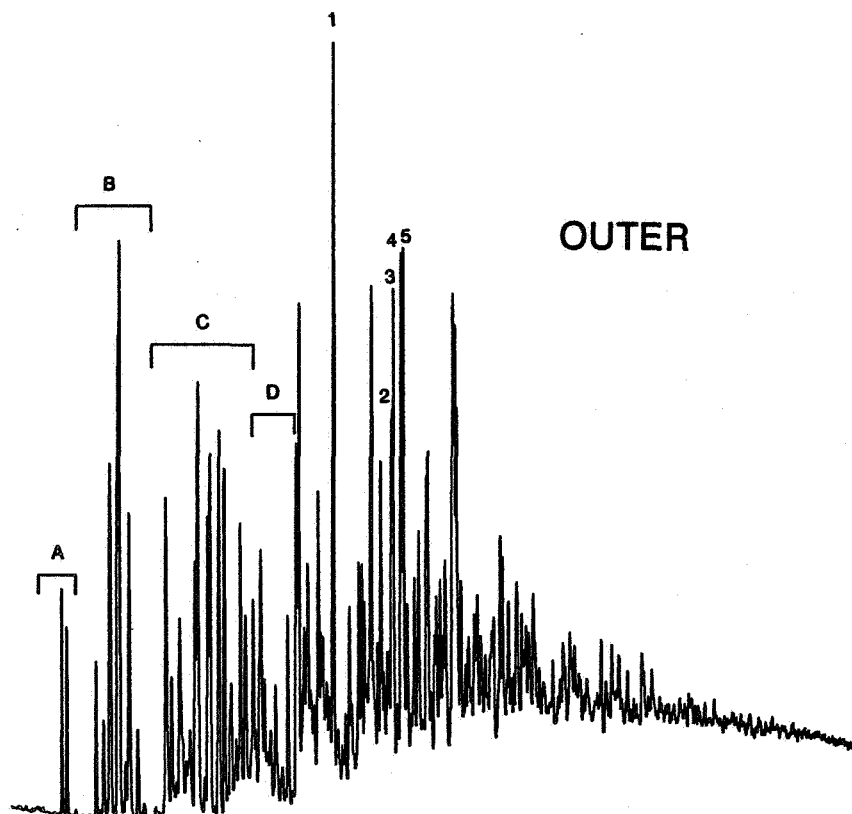
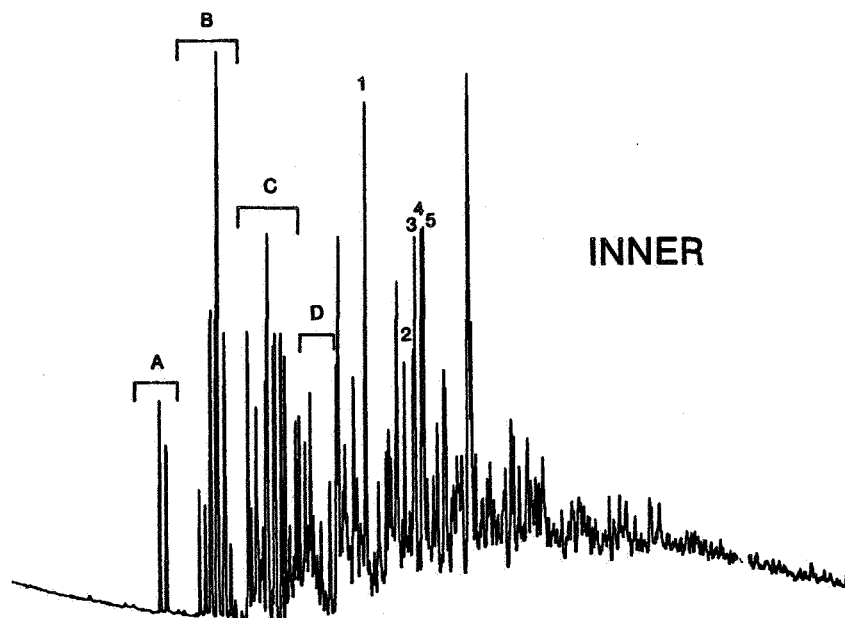
3996.10-3996.24m



PEAK IDENTIFICATION ON FIRST SHEET



3997.52-3997.61m



PEAK IDENTIFICATION ON FIRST SHEET

ORGANO-SULPHUR CHROMATOGRAMS

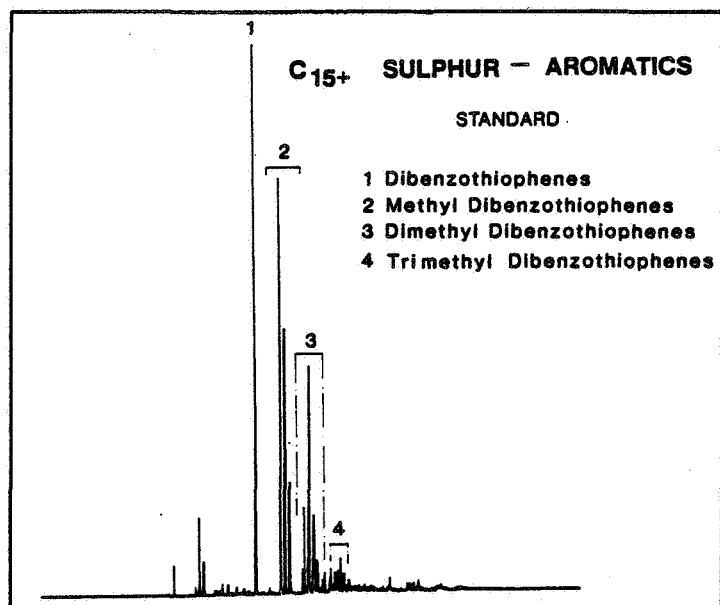
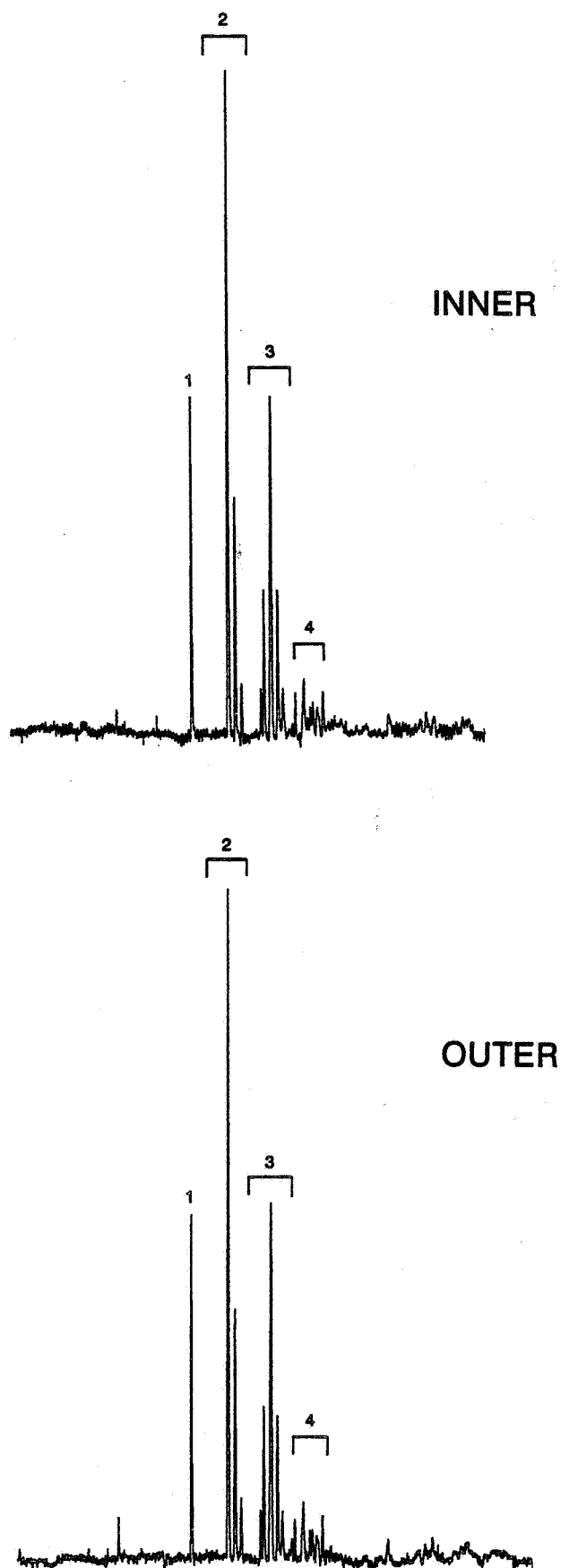


FIGURE 6a

WELL 6506/12-5

ORGANO-SULPHUR CHROMATOGRAMS

3995.27-3995.34m



PEAK IDENTIFICATION ON FIRST SHEET

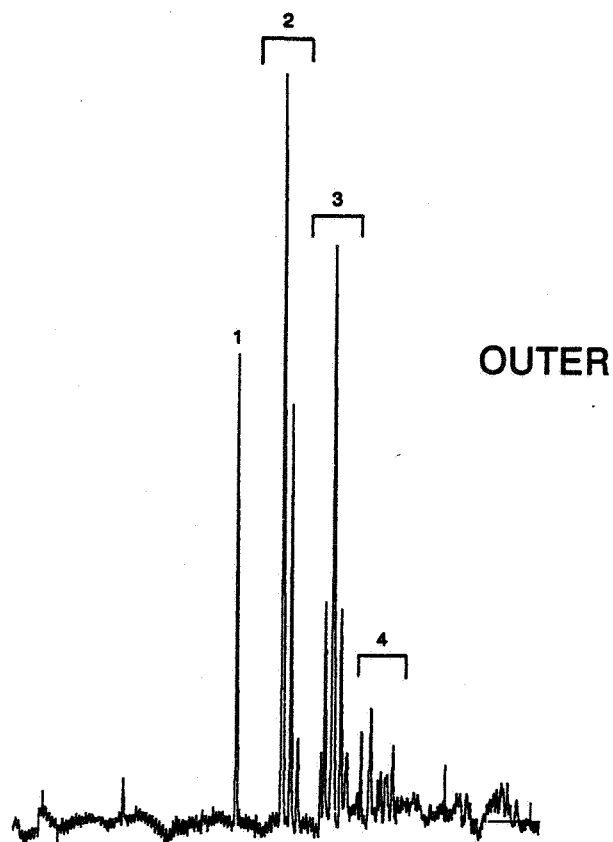
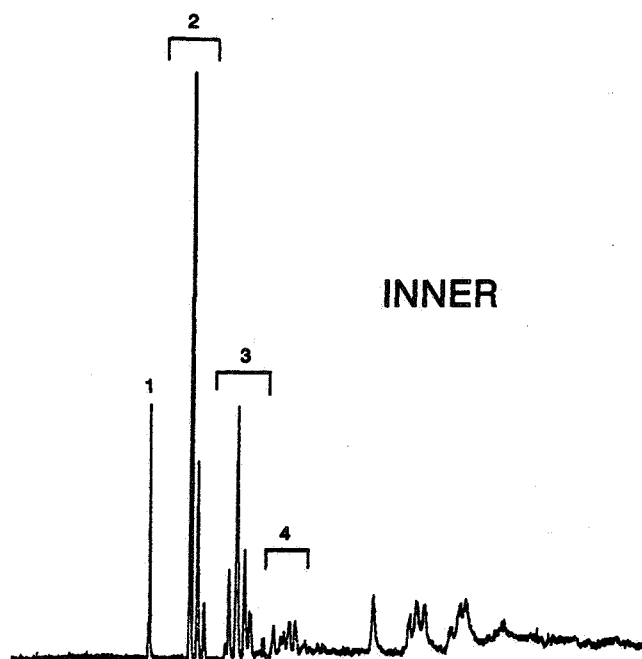
FIGURE 6b

WELL 6506/12-5

ORGANO-SULPHUR CHROMATOGRAMS



3996.10-3996.24m



PEAK IDENTIFICATION ON FIRST SHEET

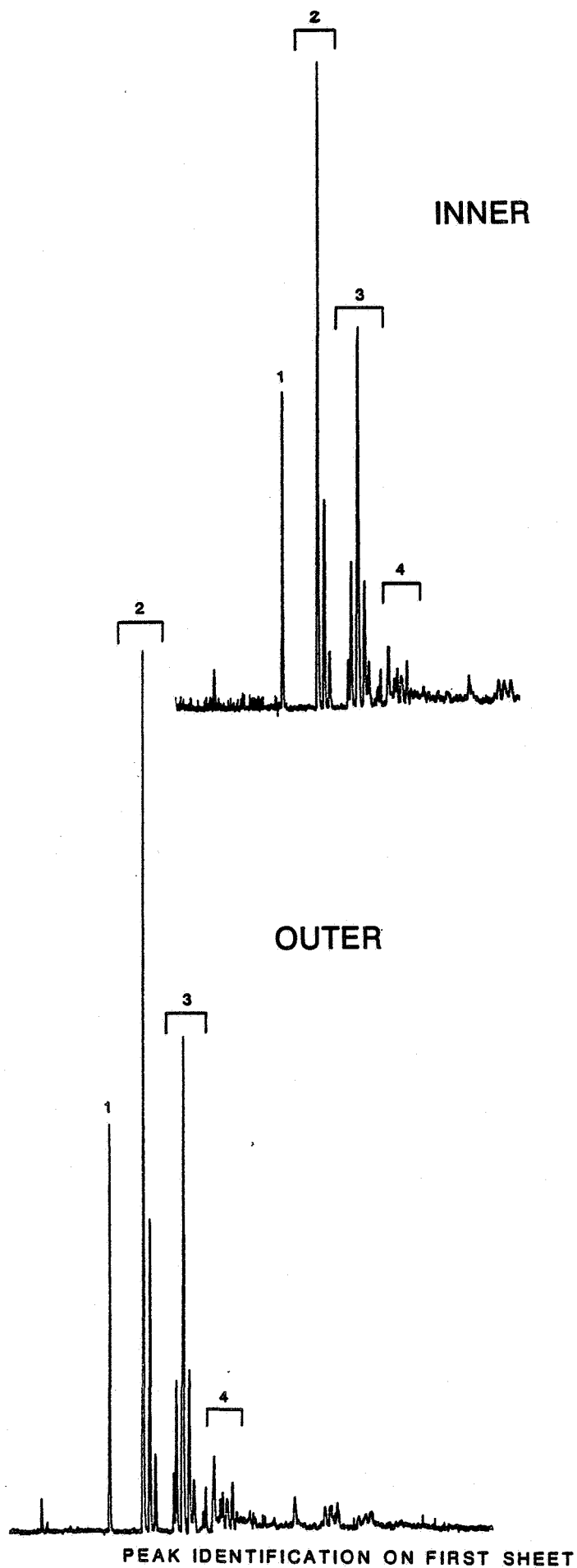
FIGURE 6c

WELL 6506/12-5

ORGANO-SULPHUR CHROMATOGRAMS



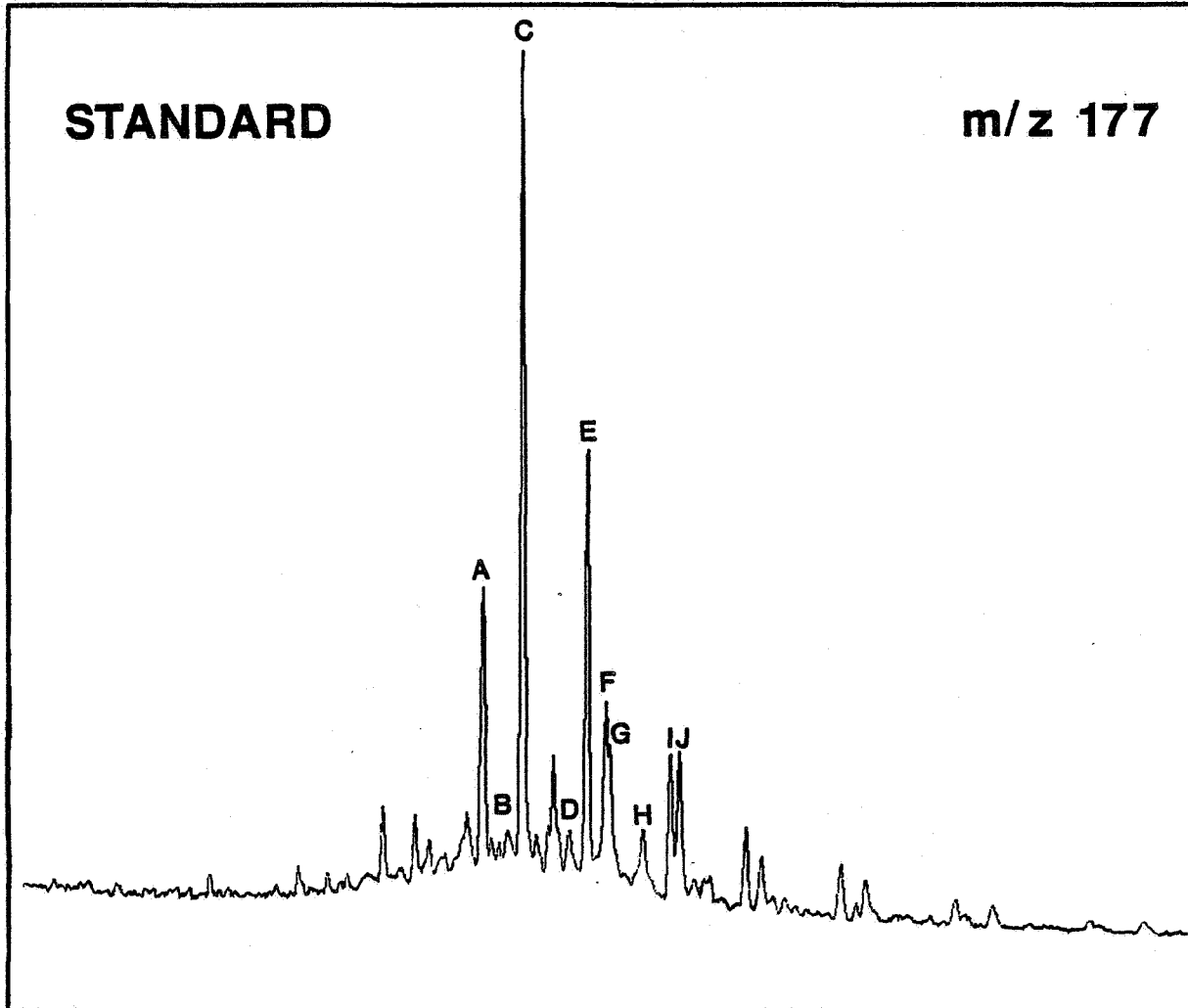
3997.52-3997.61m



PEAK IDENTIFICATION ON FIRST SHEET

STANDARD

m/z 177



DEMETHYLATED HOPANES

(m/z 177 FRAGMENTOGRAM)

COMPOUND

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

FIGURE 7a

MASS FRAGMENTOGRAMS

WELL 6506/12-5

DEMETHYLATED HOPANES m/z 177



3995.27-3995.34m

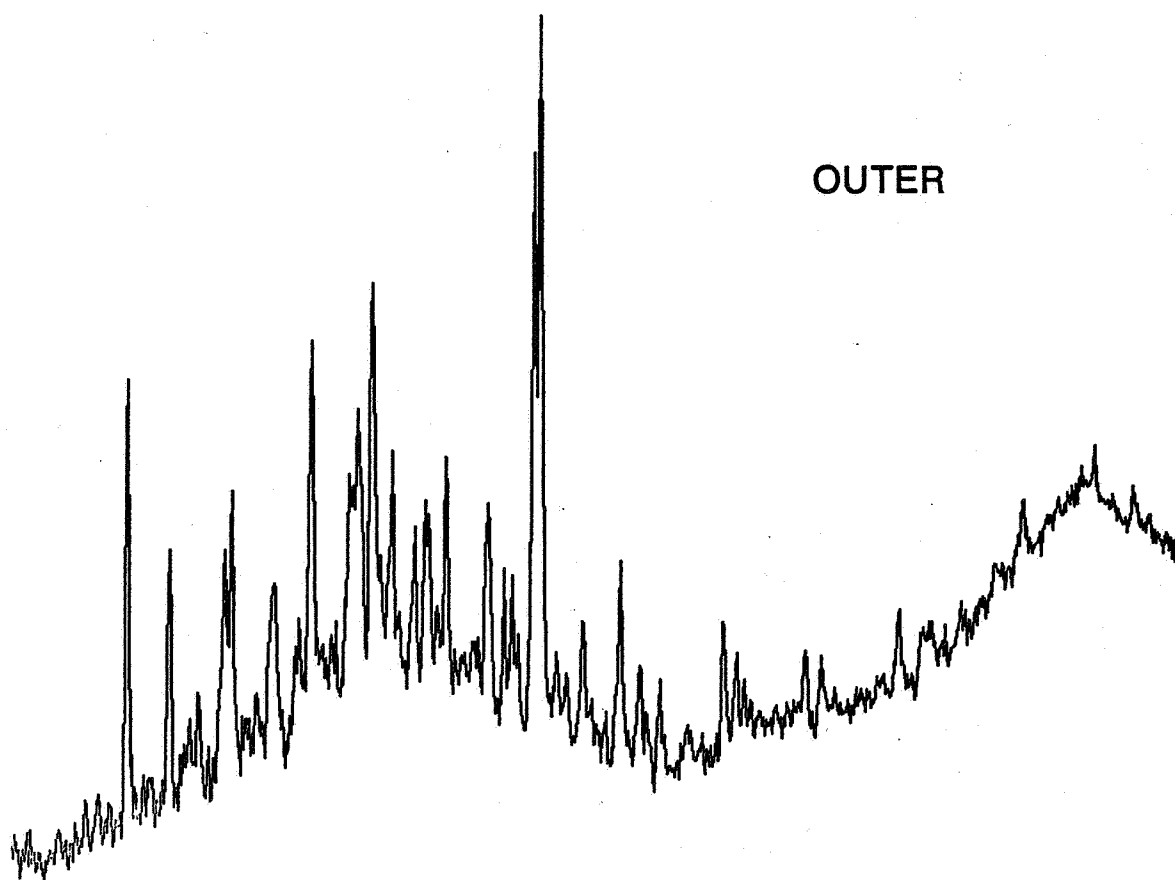
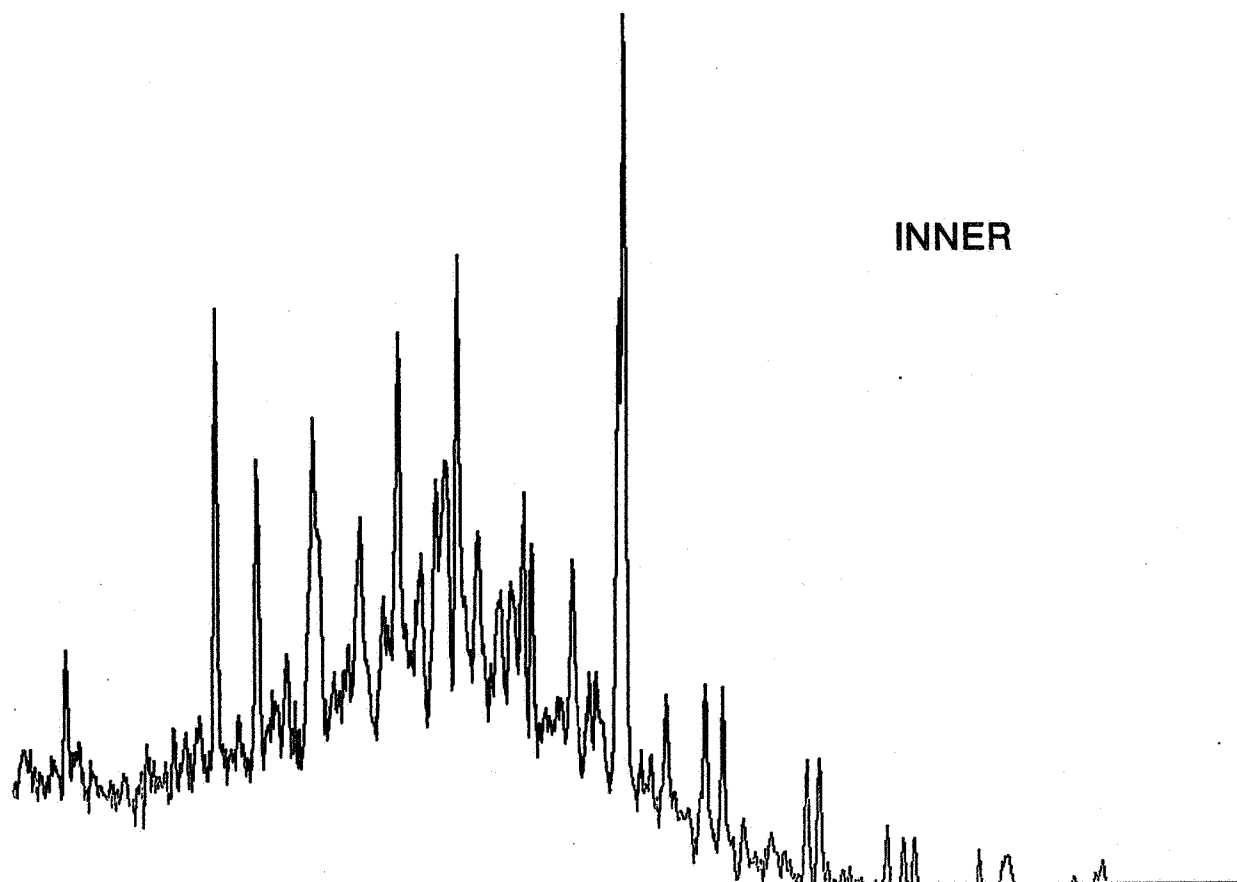


FIGURE 7b

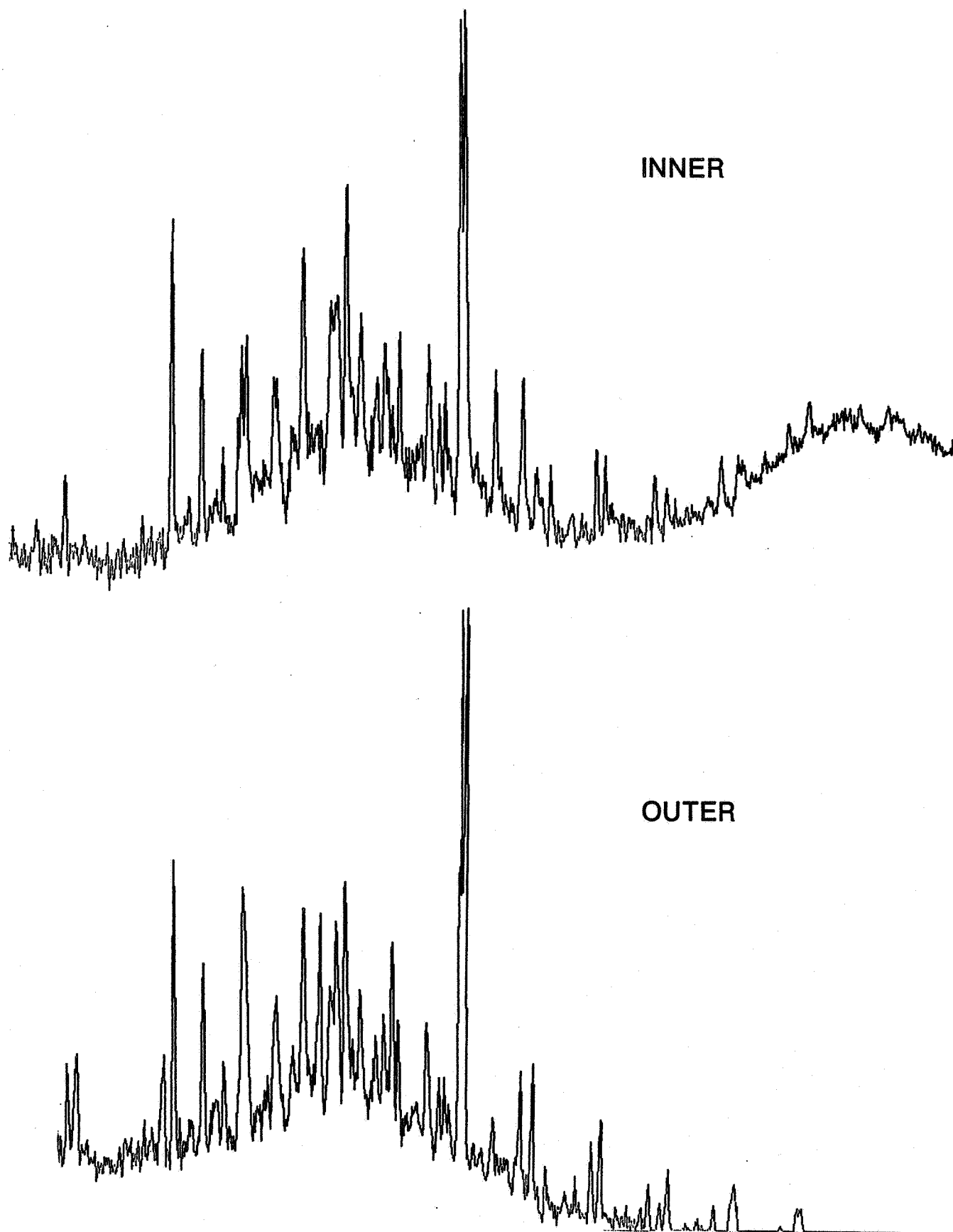
MASS FRAGMENTOGRAMS

WELL 6506/12-5

DEMETHYLATED HOPANES m/z 177

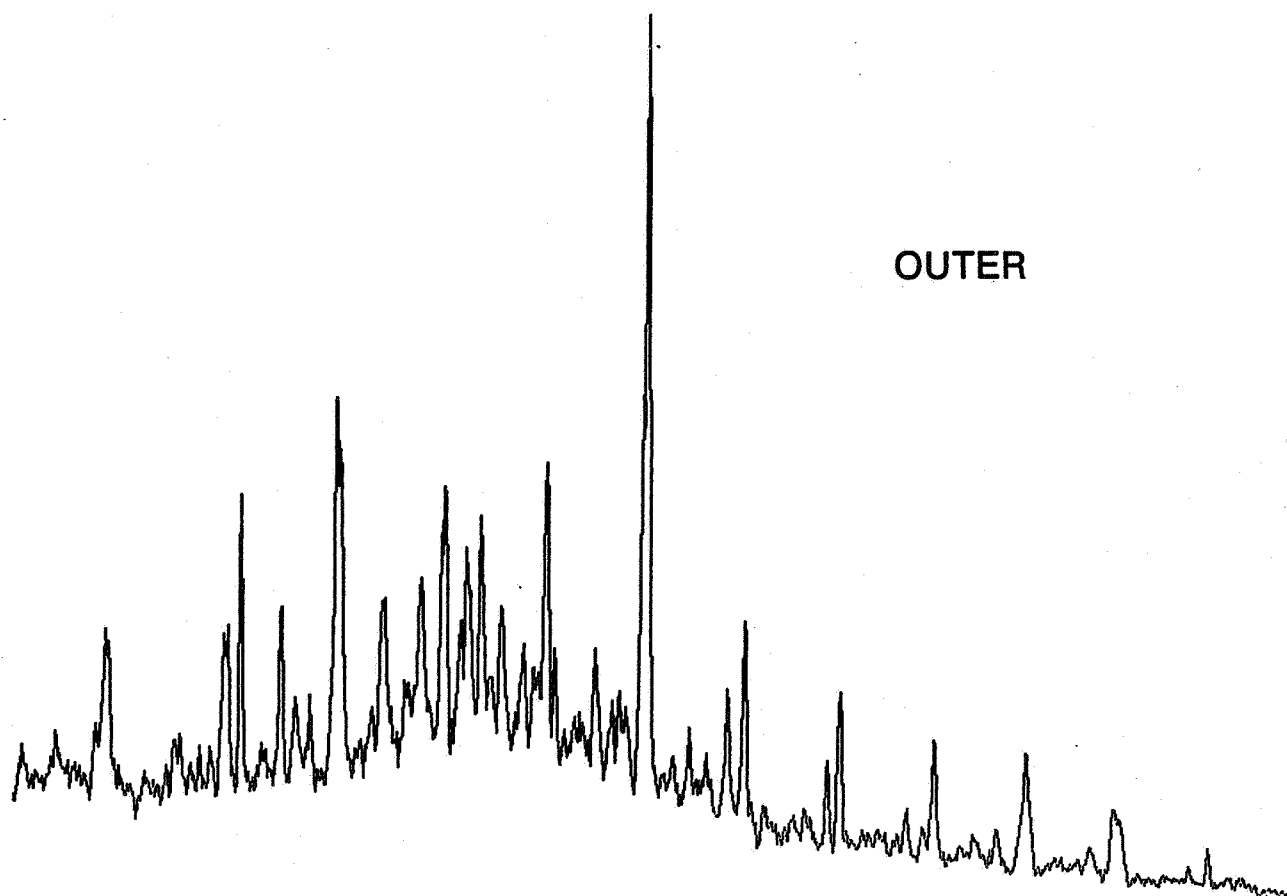
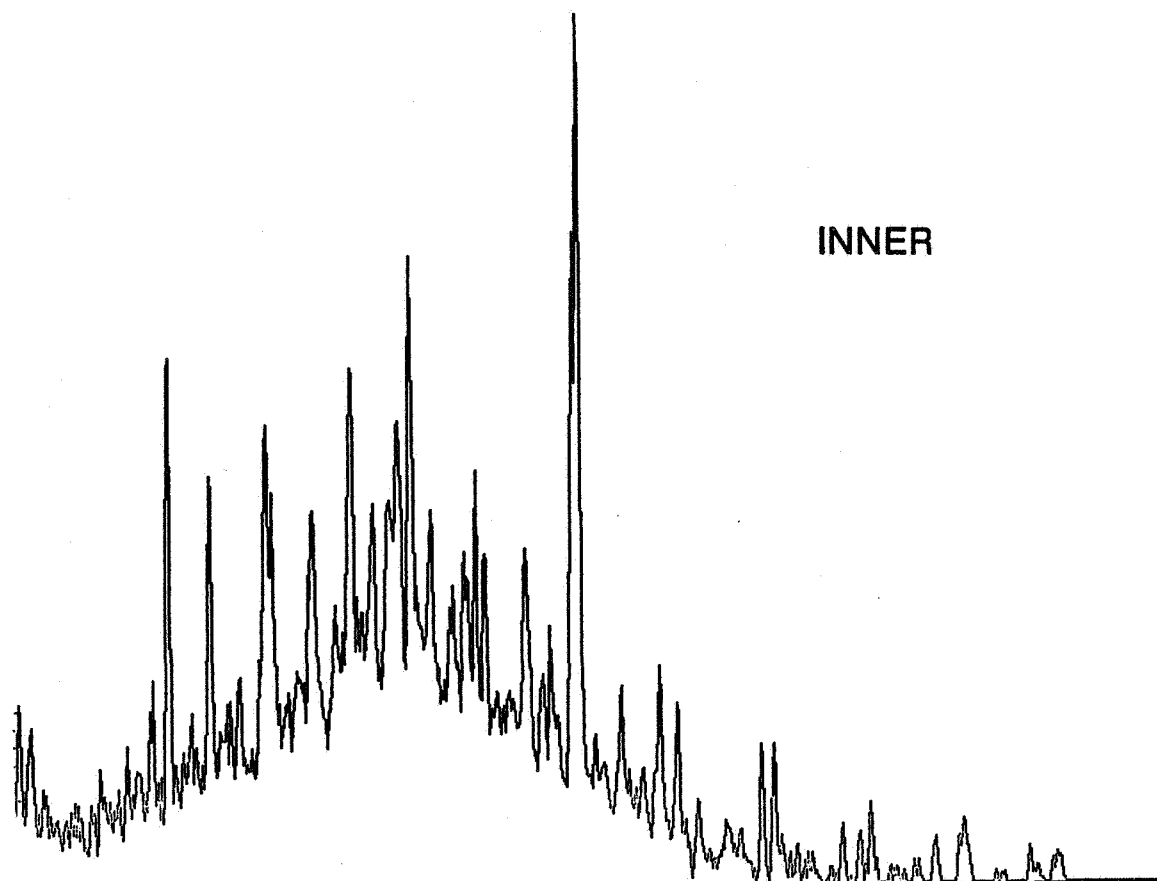


3996.10-3996.24m



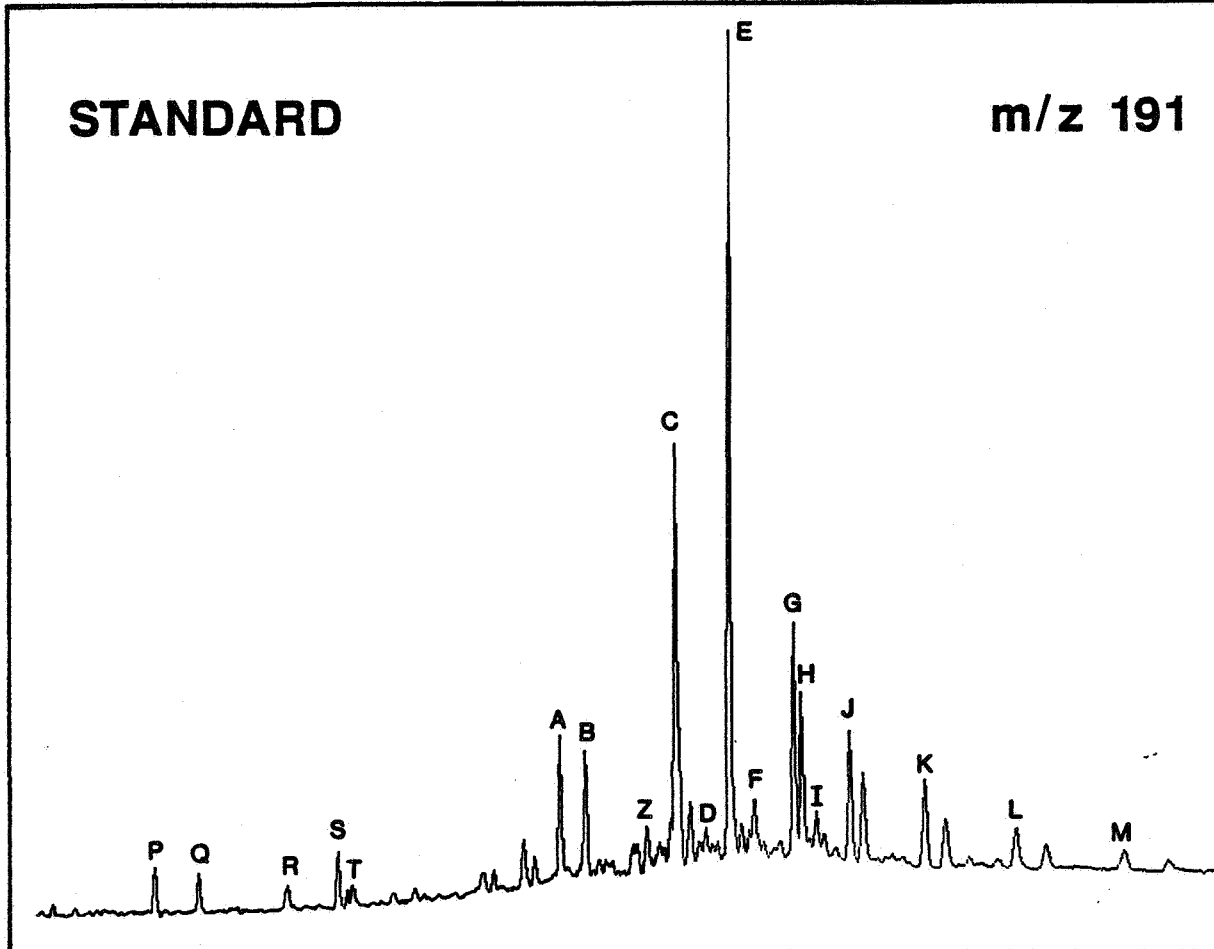


3997.52-3997.61m



STANDARD

m/z 191



TRITERPANE IDENTIFICATION

(M/Z 191 FRAGMENTOGRAM)

<u>COMPOUND</u>		<u>ELEMENTAL COMPOSITION</u>
A	18 (H), 21 (H)-trishomohopane (Ts)	$C_{27}H_{46}$
B	17 (H), 21 (H)-trishomohopane (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	

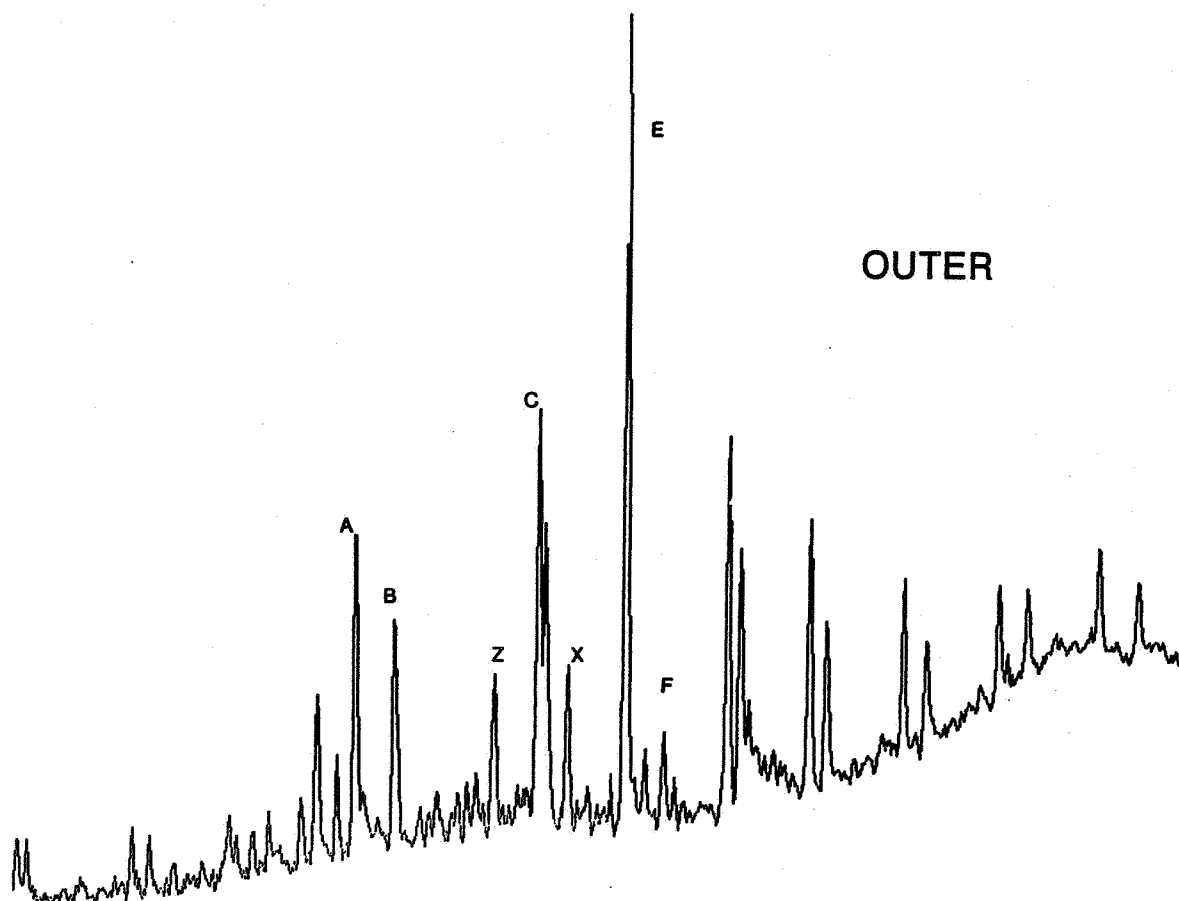
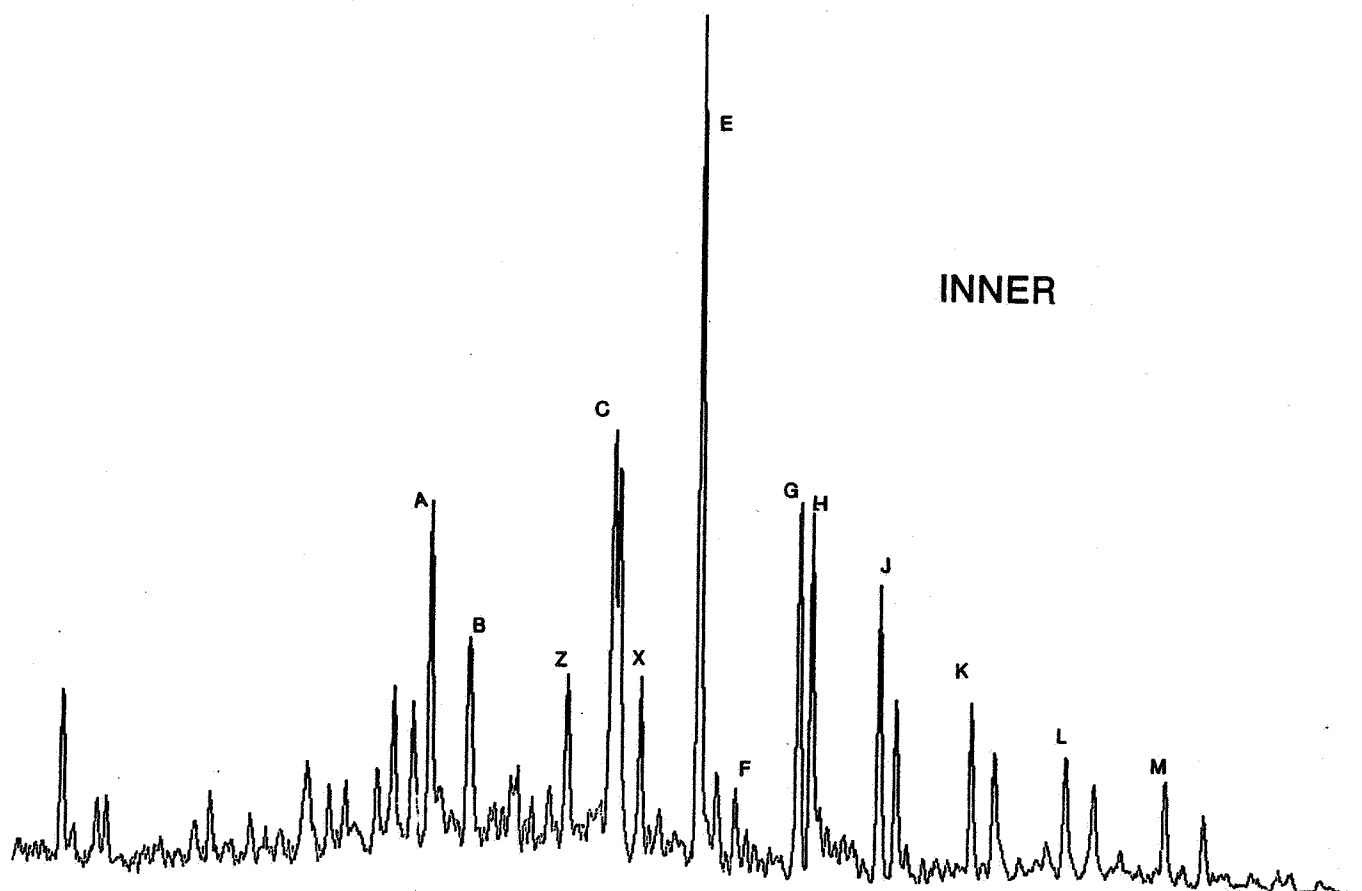
TRICYCLIC AND TETRACYCLIC TERPANES (M/Z 191)

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

WELL 6506/12-5

TRITERPANES m/z 191

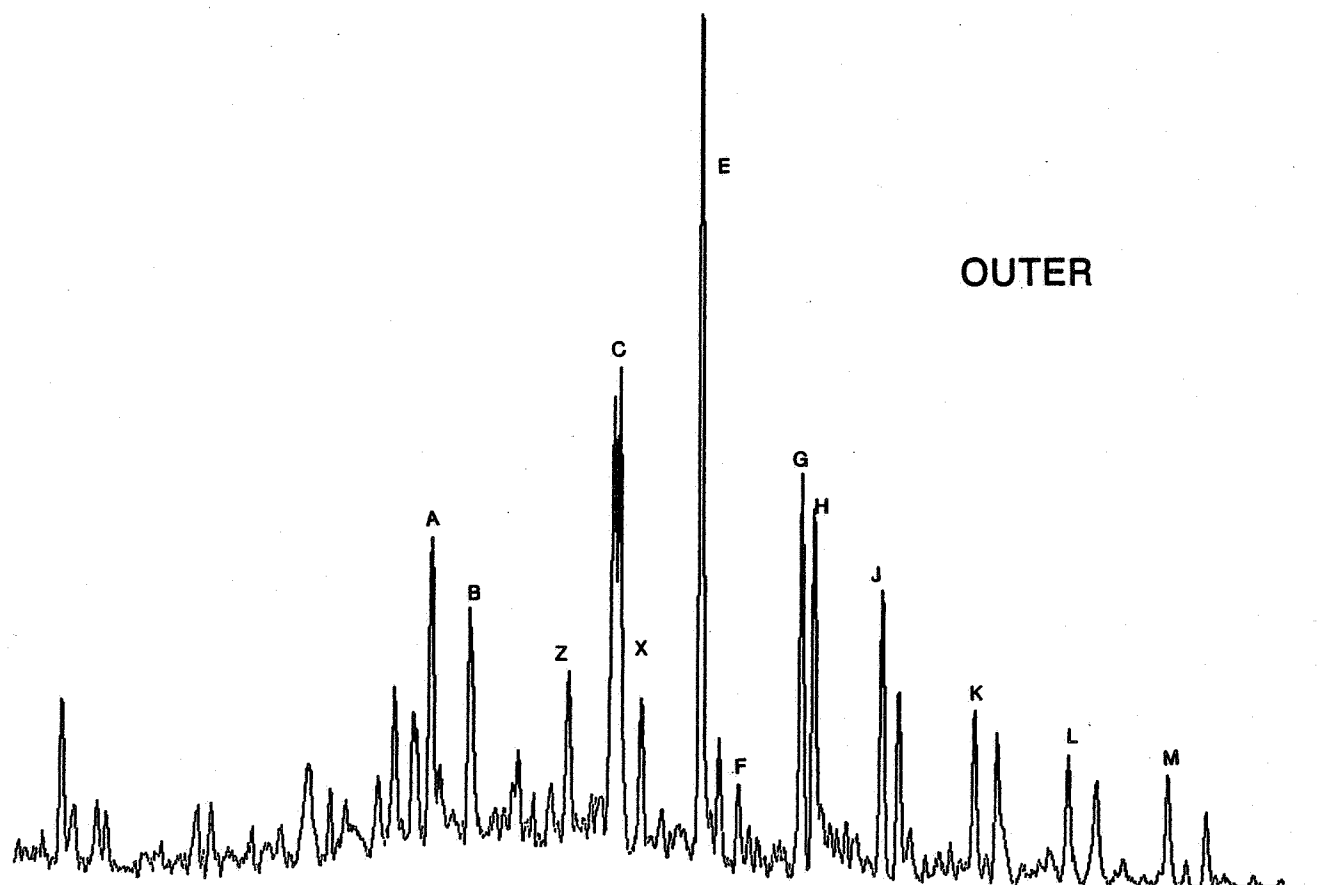
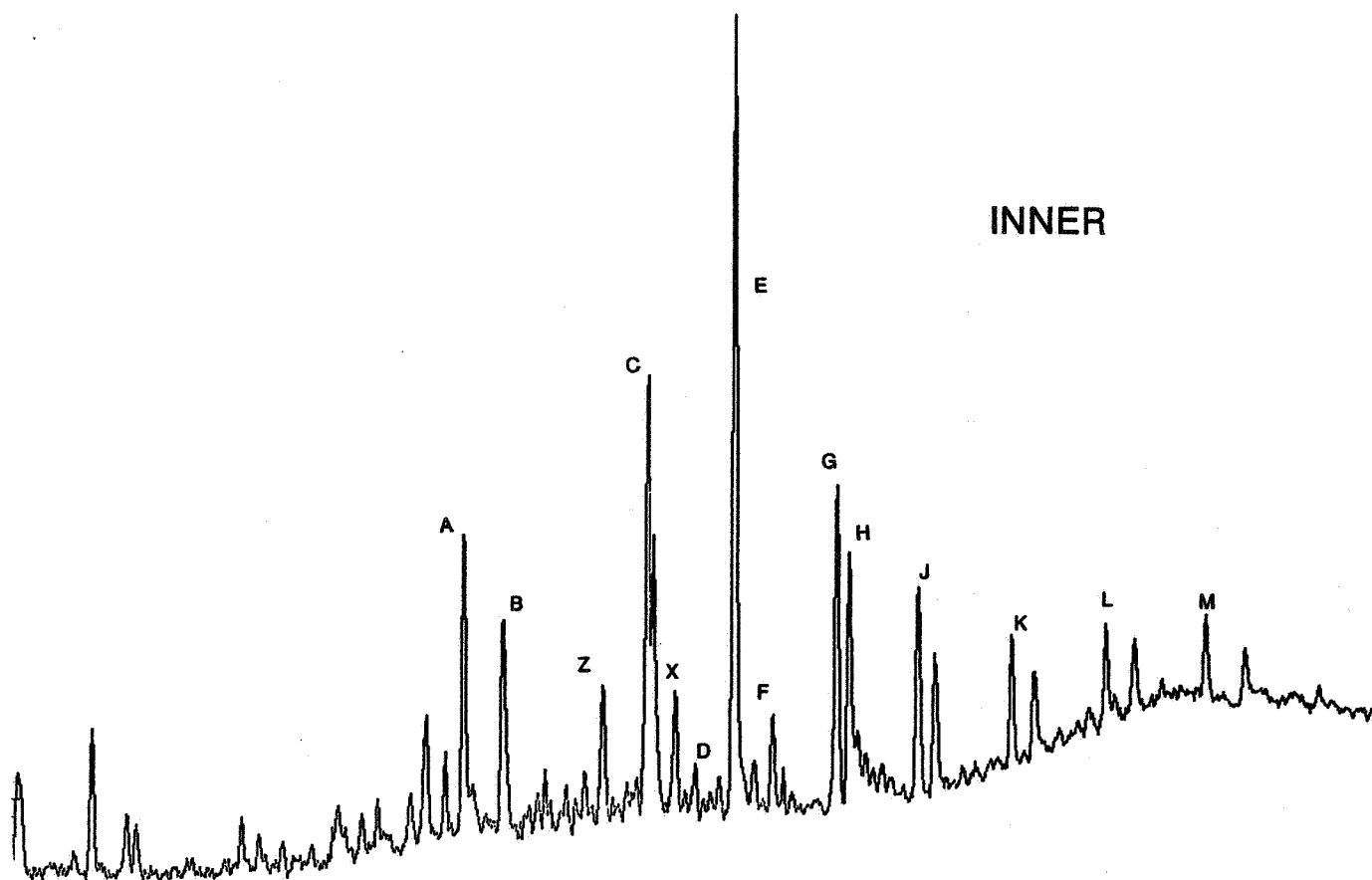
3995.27-3995.34m

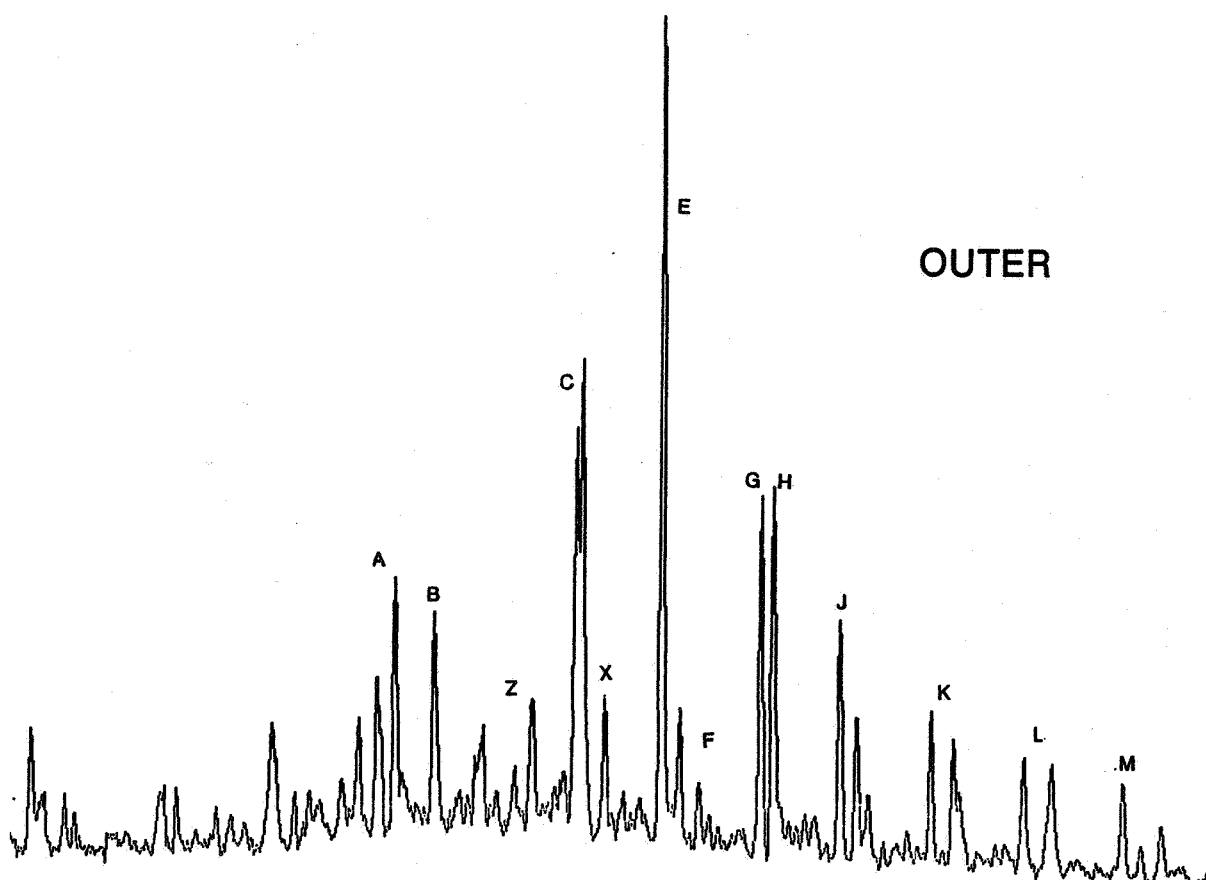
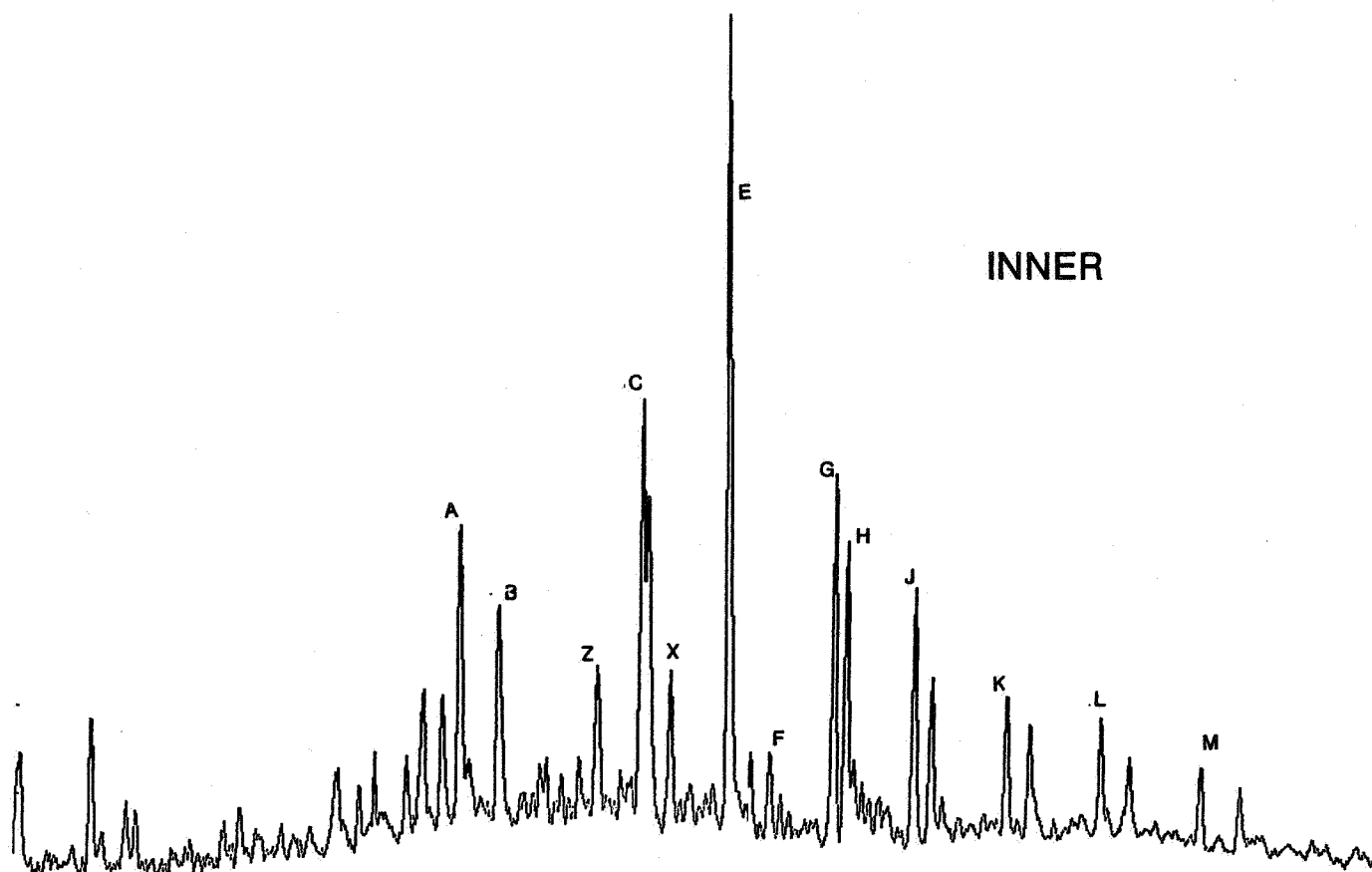


WELL 6506/12-5

TRITERPANES m/z 191

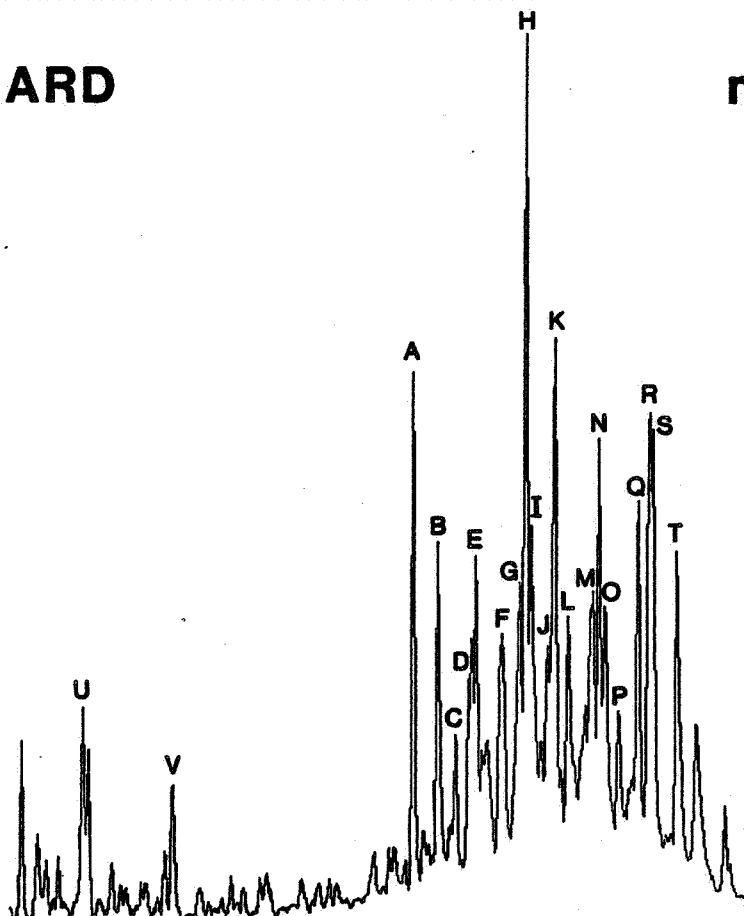
3996.10-3996.24m





STANDARD

m/z 217



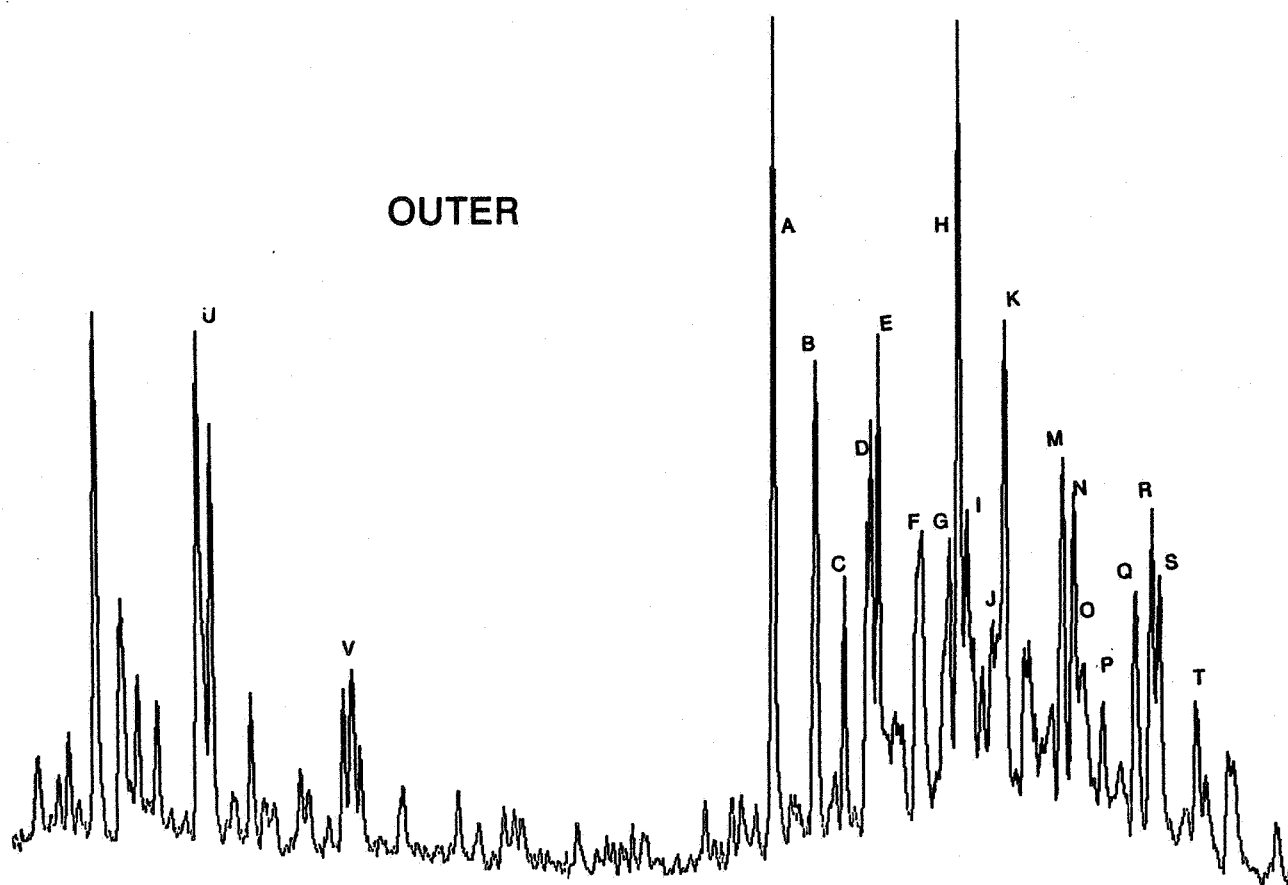
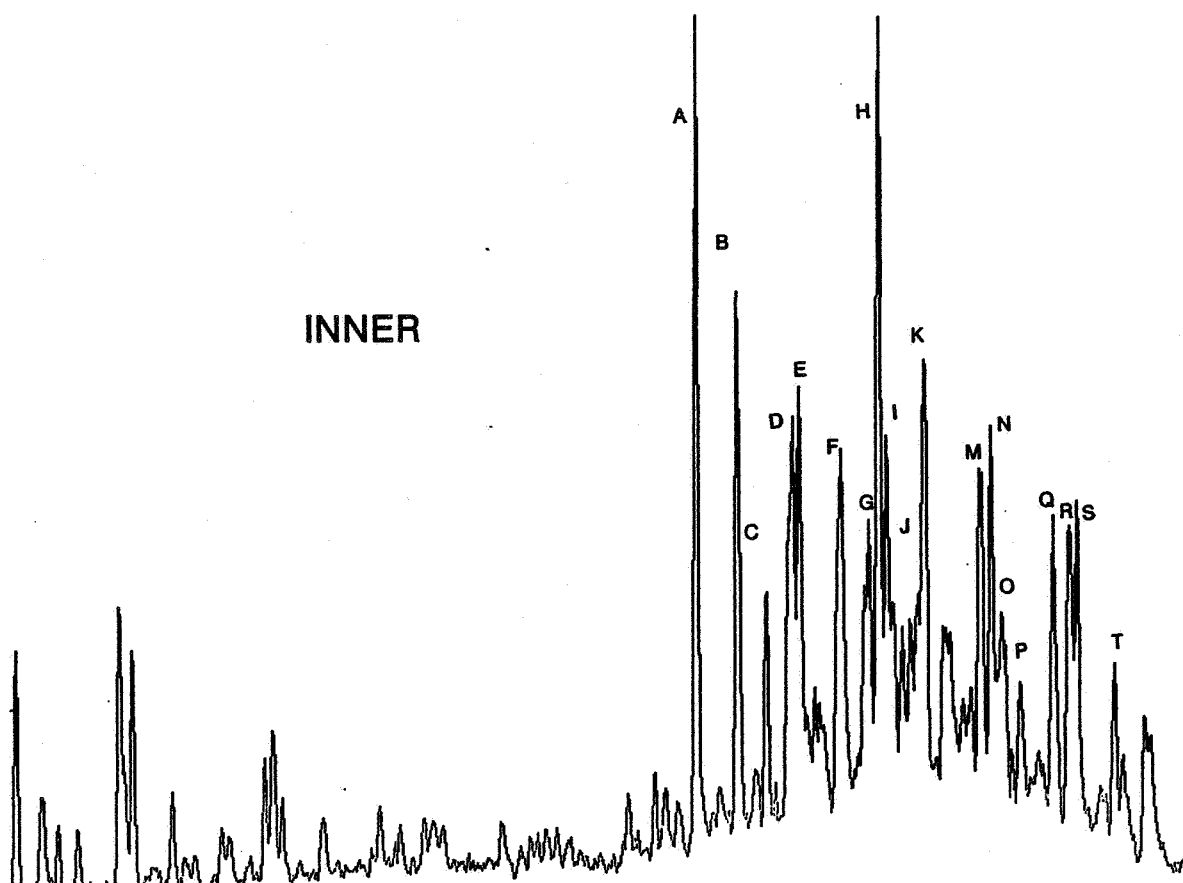
STERANE IDENTIFICATION

(M/Z 217 FRAGMENTOGRAM)

COMPOUND

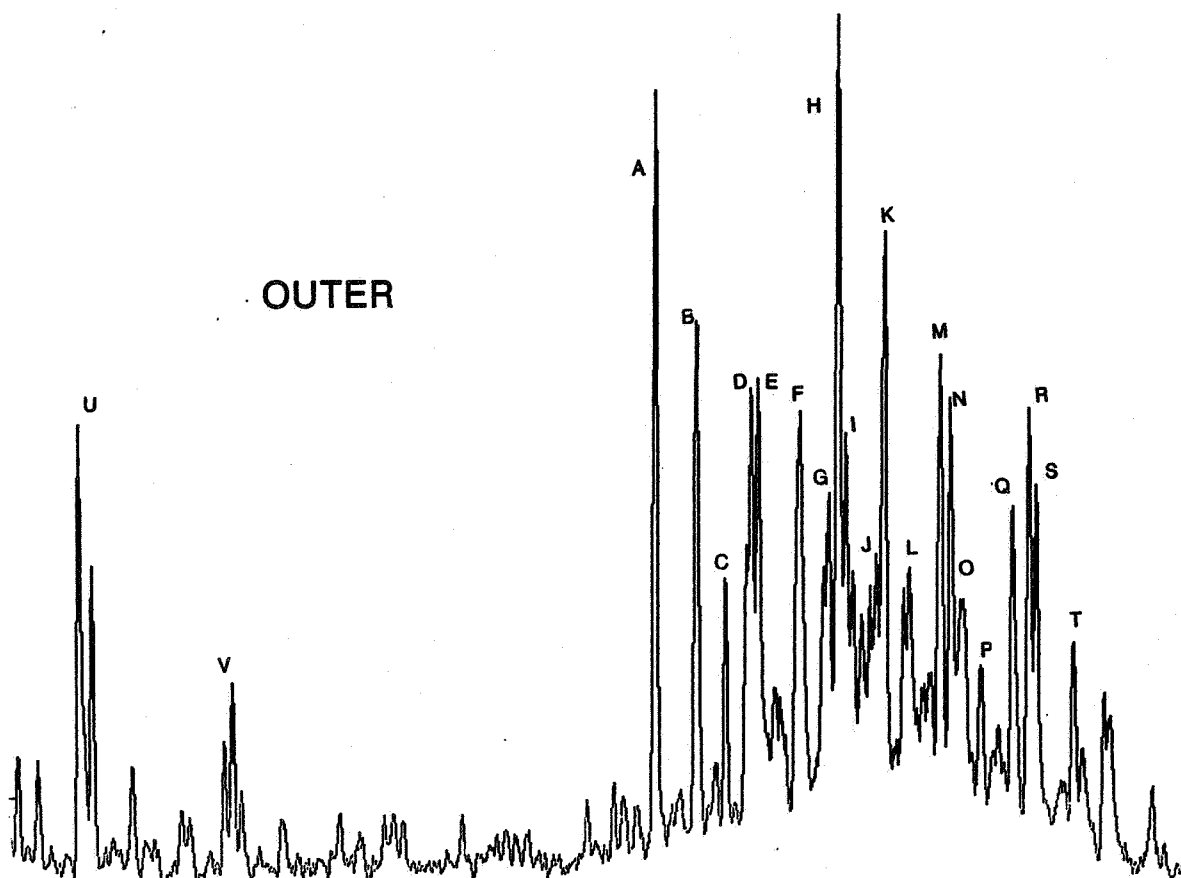
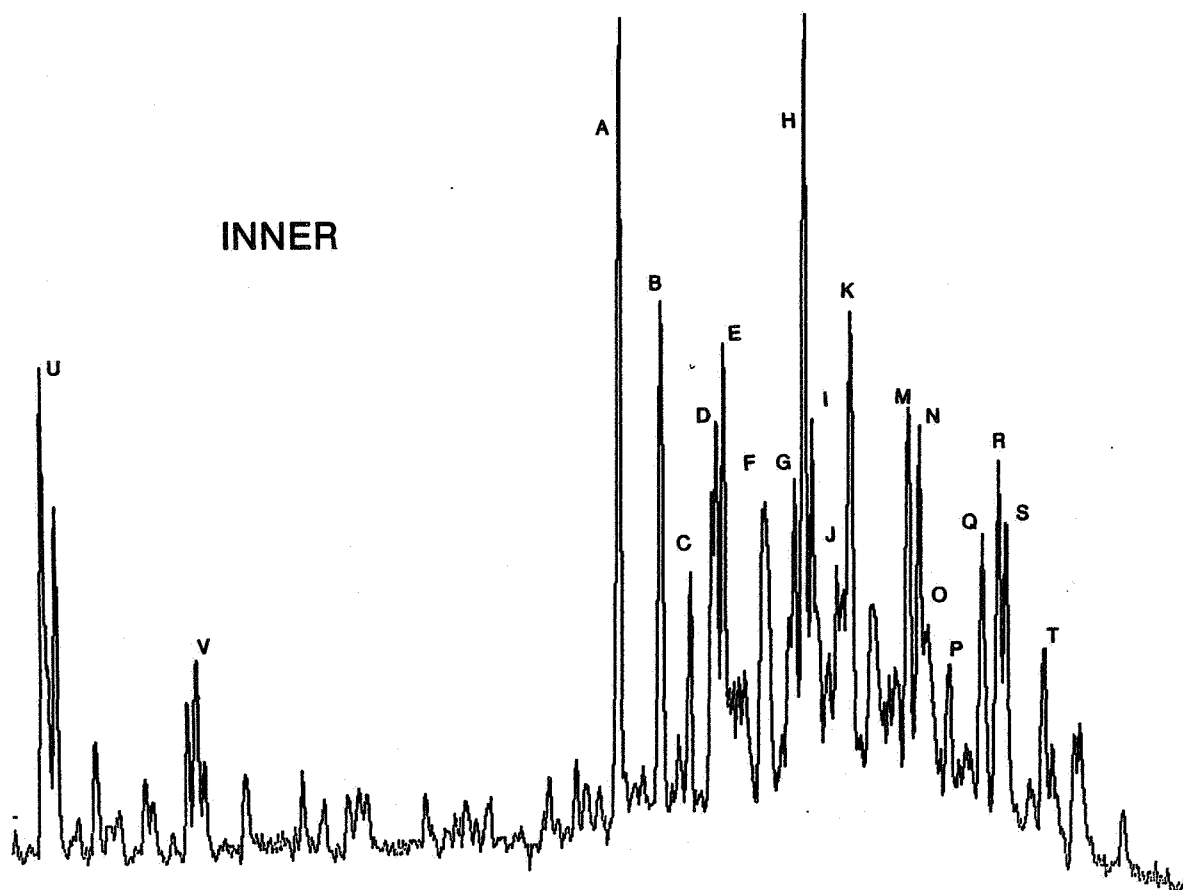
ELEMENTAL COMPOSITION

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





3996.10-3996.24m



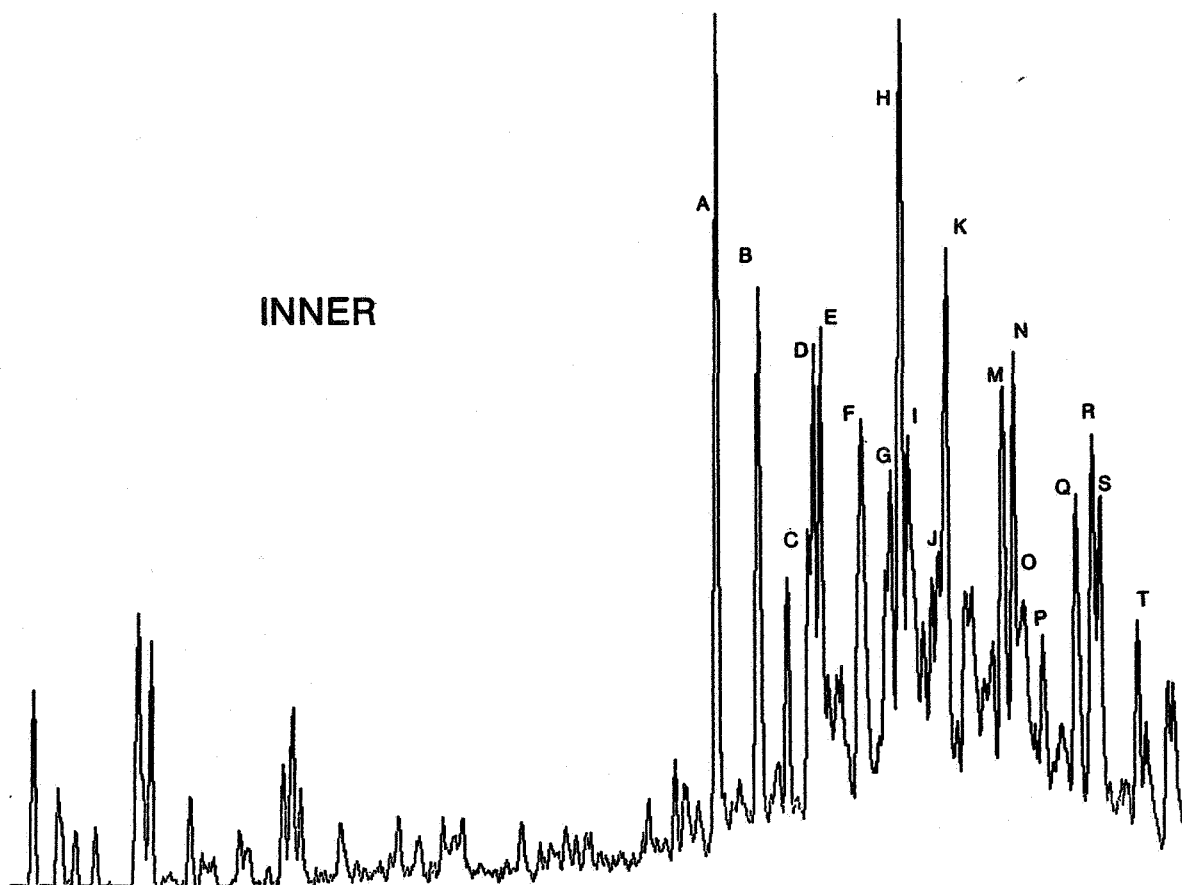


WELL 6506/12-5

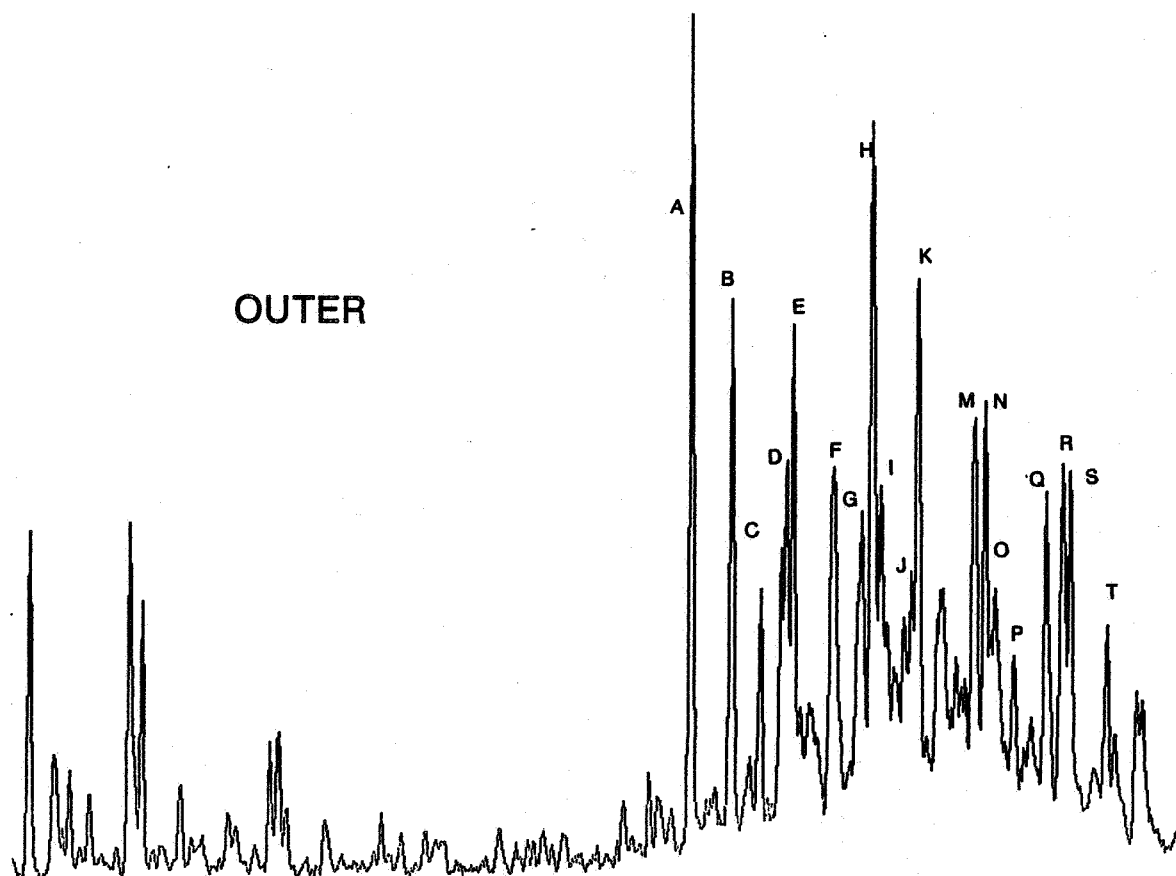
STERANES m/z 217

3997.52-3997.61m

INNER

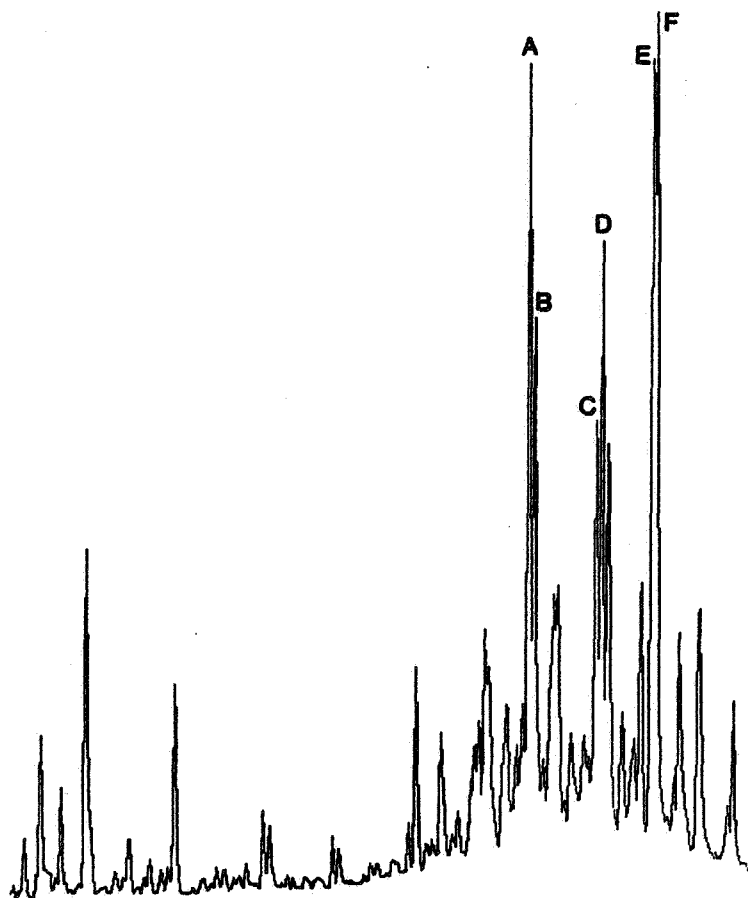


OUTER



STANDARD

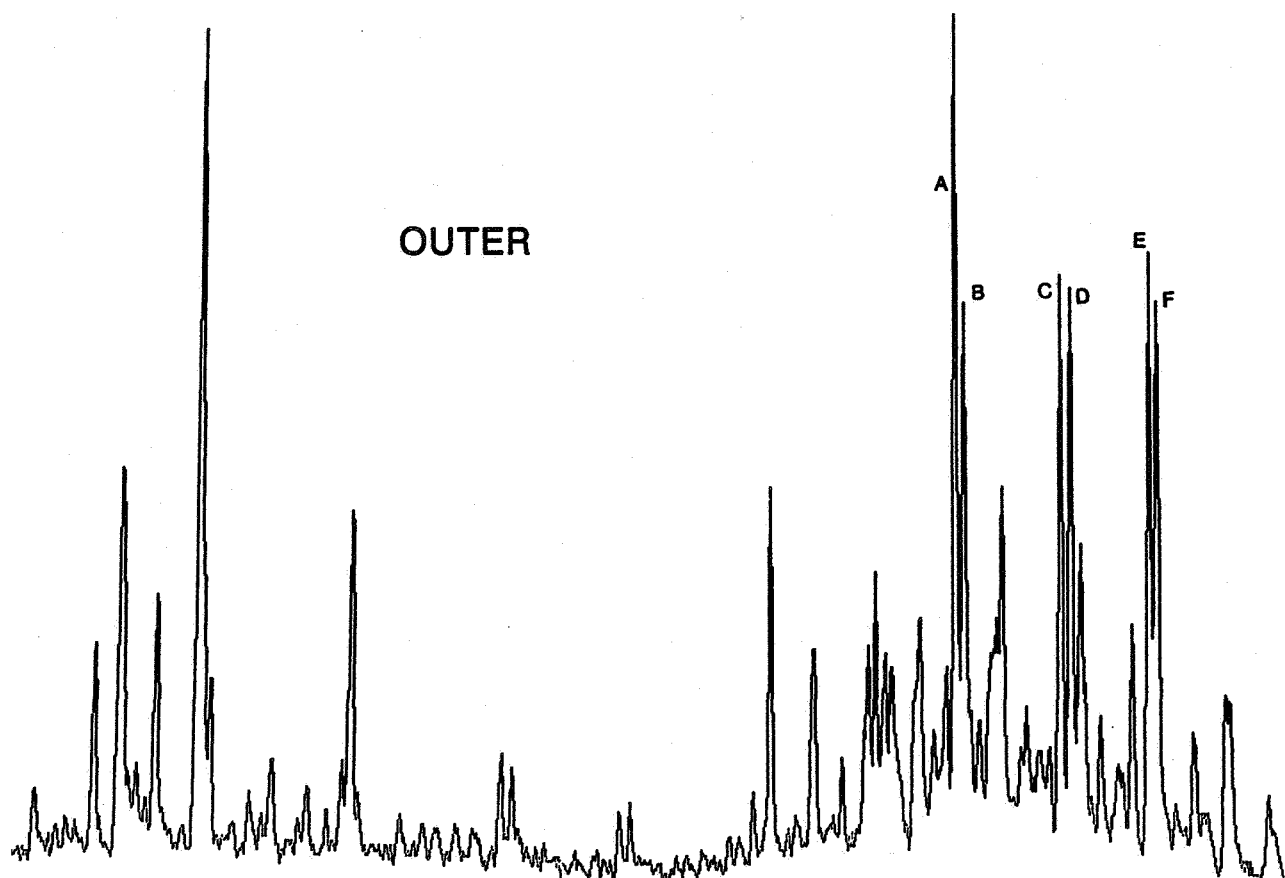
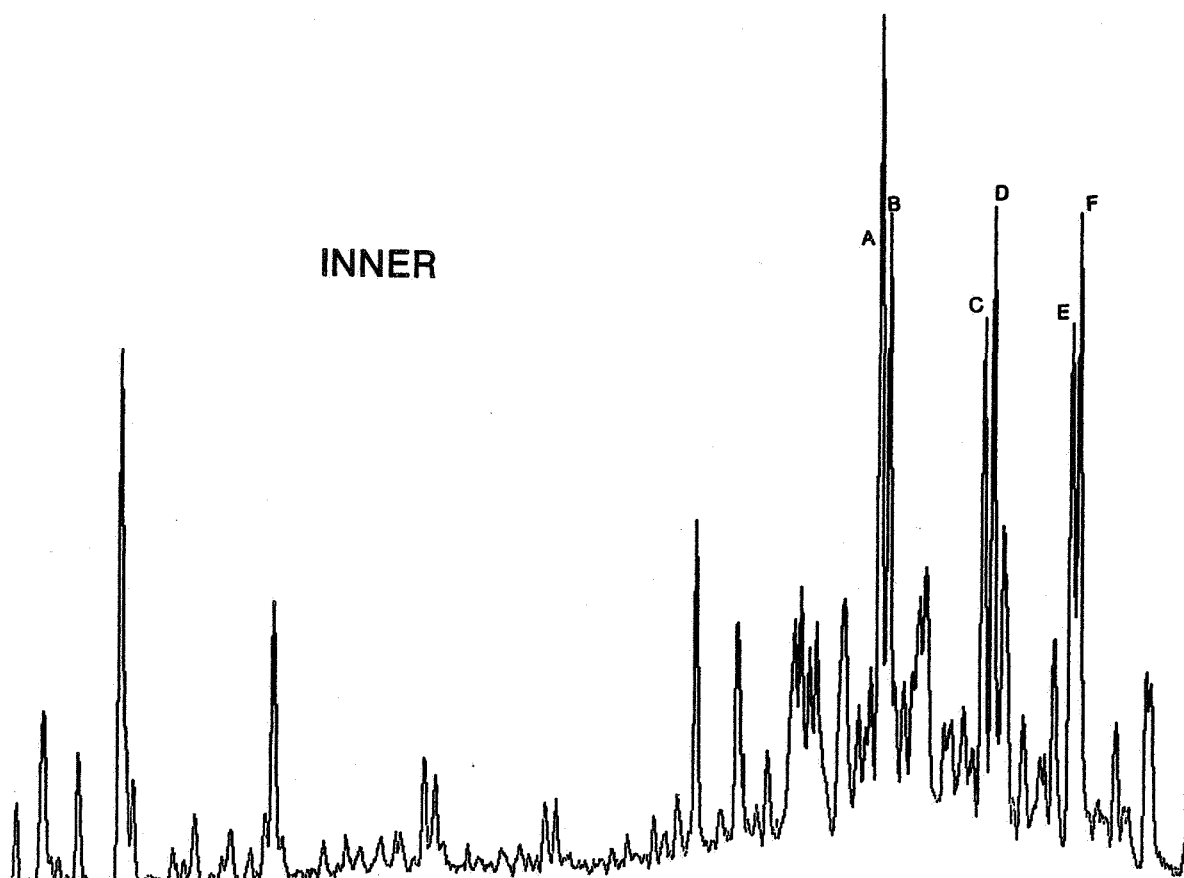
m/z 218

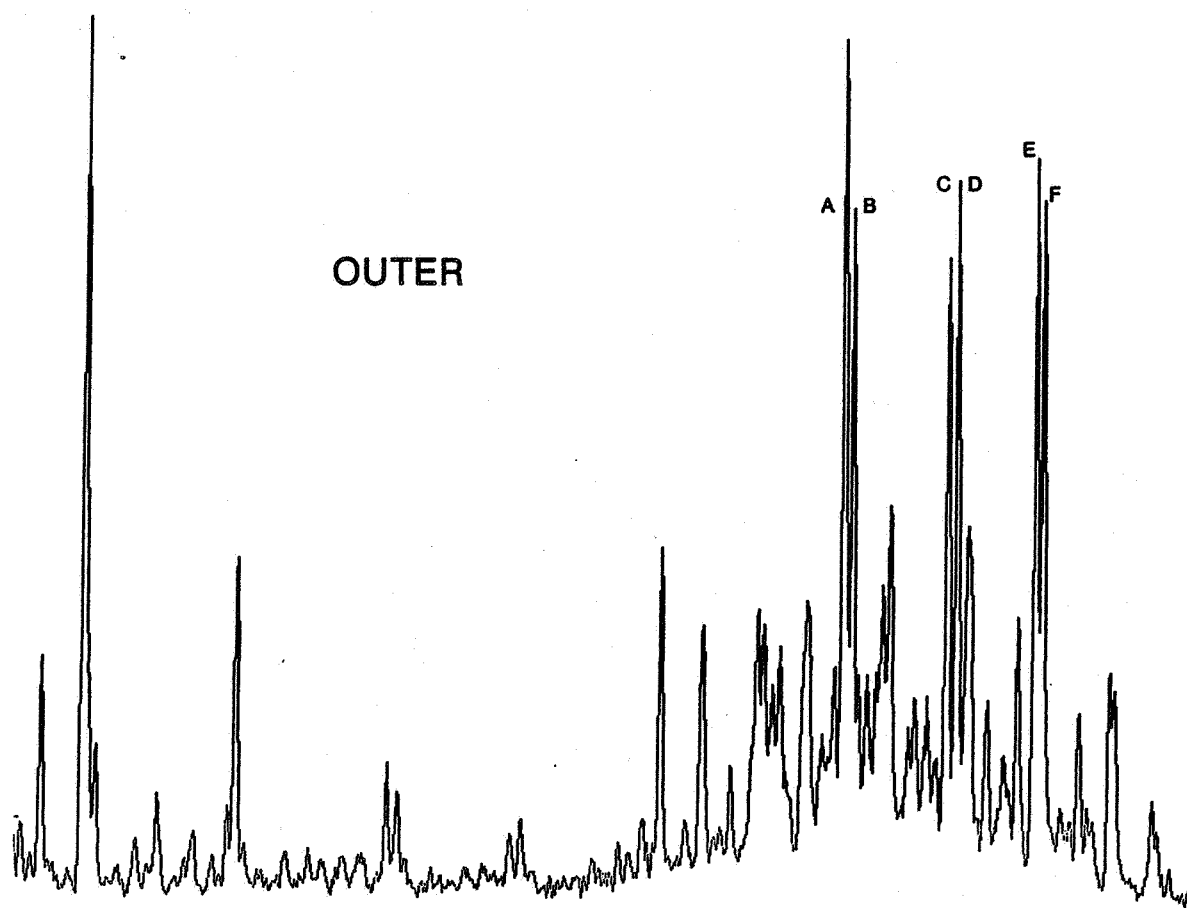
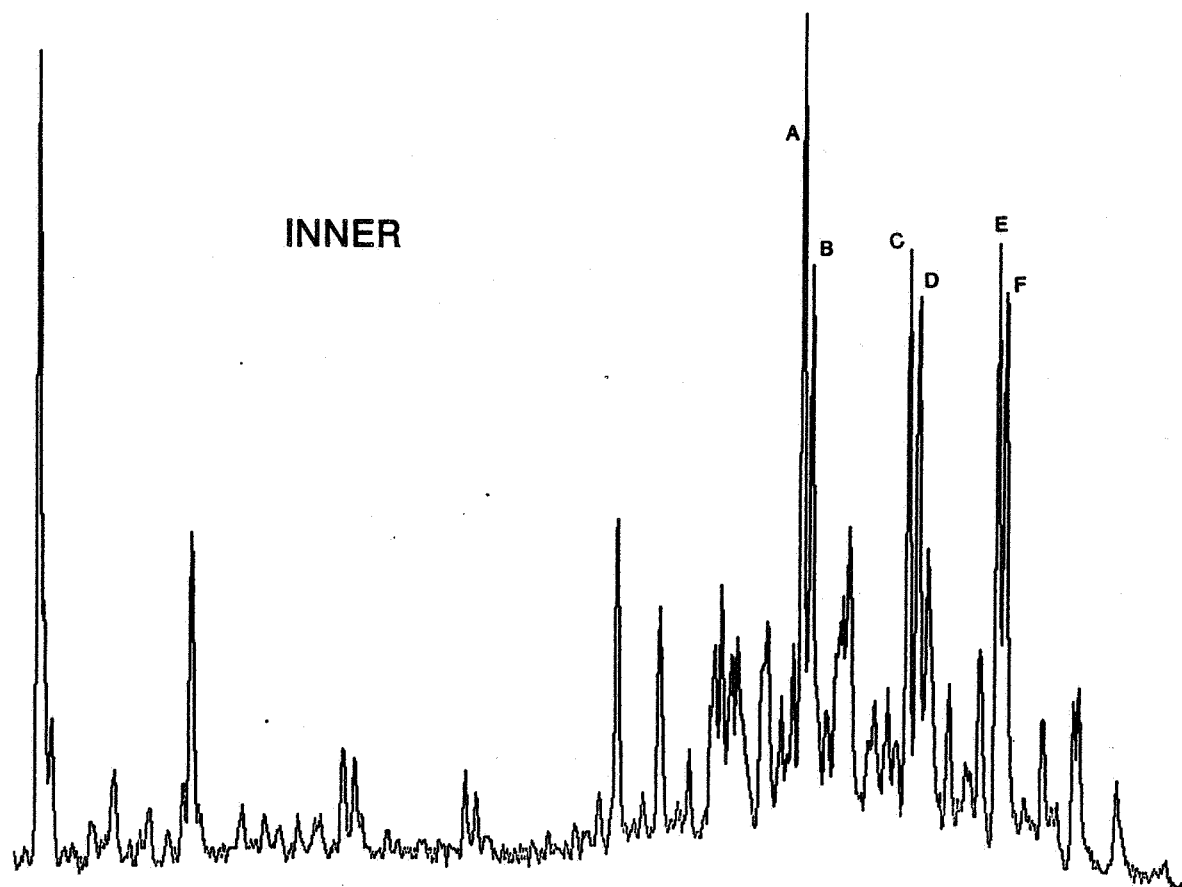


STERANE IDENTIFICATION

(M/Z 218 FRAGMENTOGRAM)

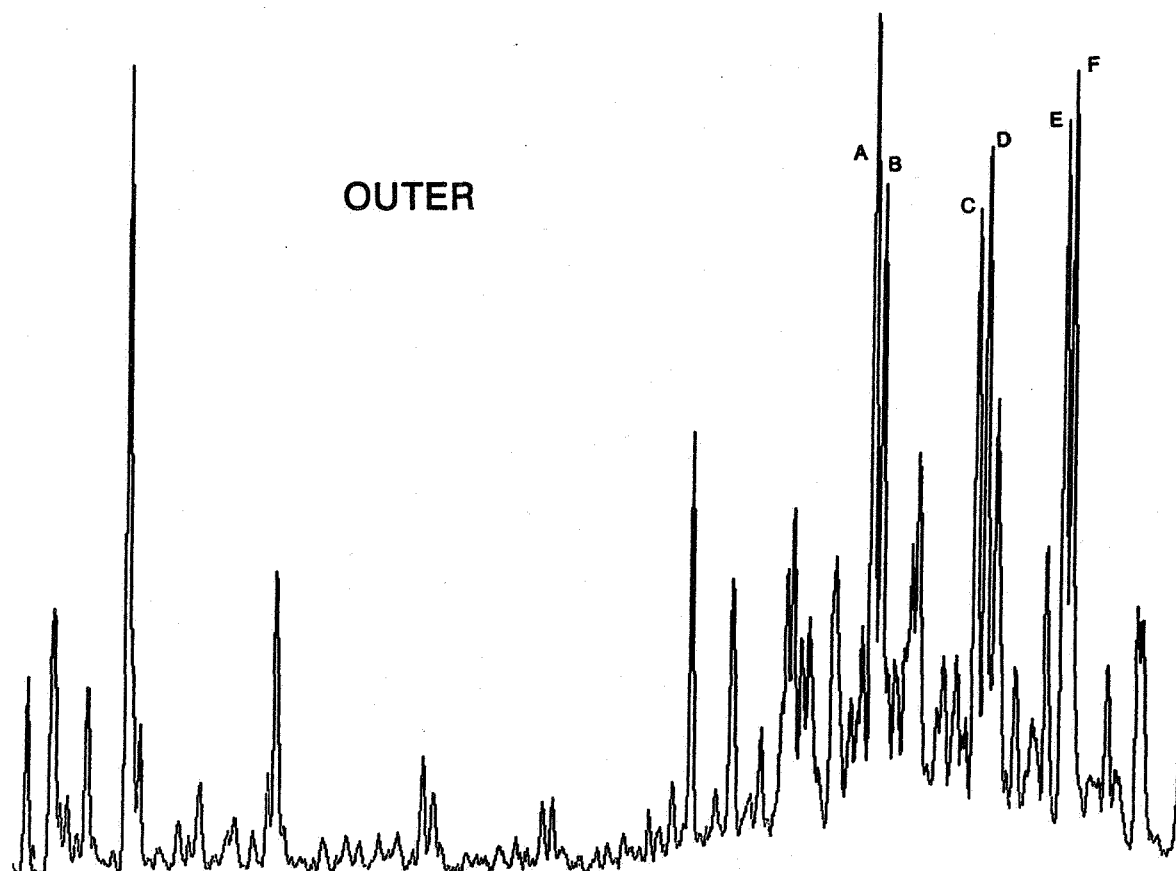
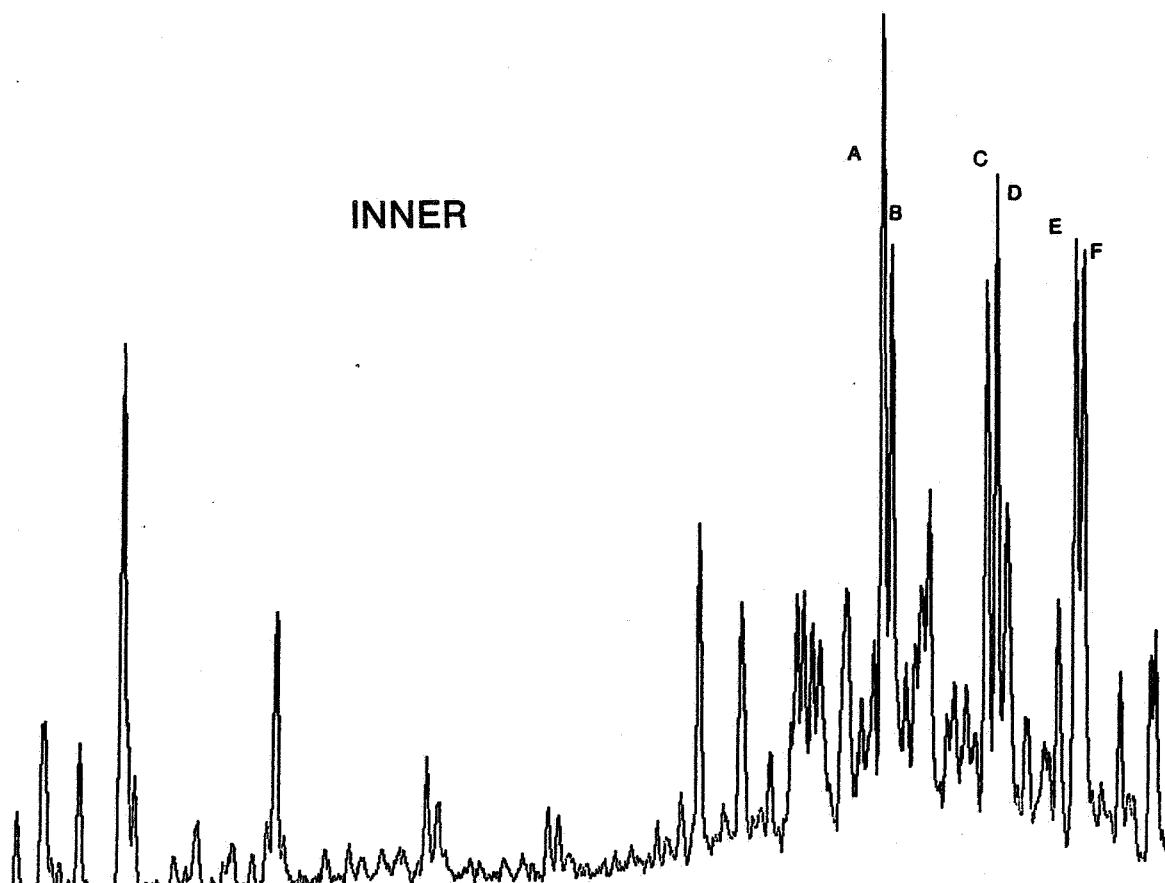
<u>COMPOUND</u>		<u>ELEMENTAL COMPOUND</u>
A	14 β ,17 β -cholestane (20R)	C ₂₇ H ₄₈
B	14 β ,17 β -cholestane (20S)	C ₂₇ H ₄₈
C	24-methyl-14 β ,17 β -cholestane (20R)	C ₂₈ H ₅₀
D	24-methyl-14 β ,17 β -cholestane (20S)	C ₂₈ H ₅₀
E	24-ethyl-14 β ,17 β -cholestane (20R)	C ₂₉ H ₅₂
F	24-ethyl-14 β ,17 β -cholestane (20S)	C ₂₉ H ₅₂





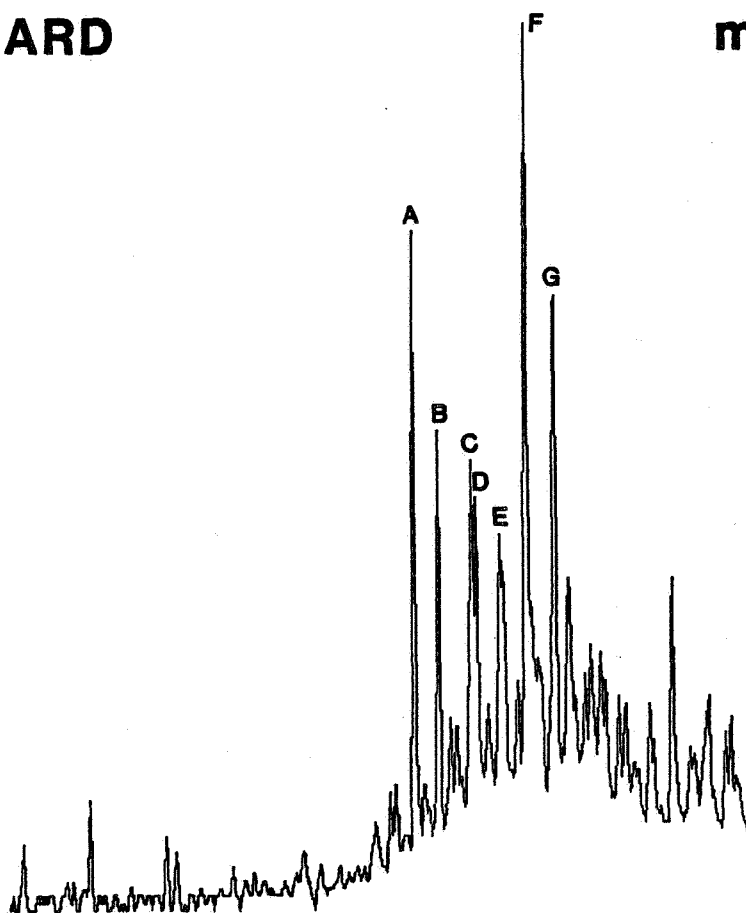


3997.52-3997.61m



STANDARD

m/z 259



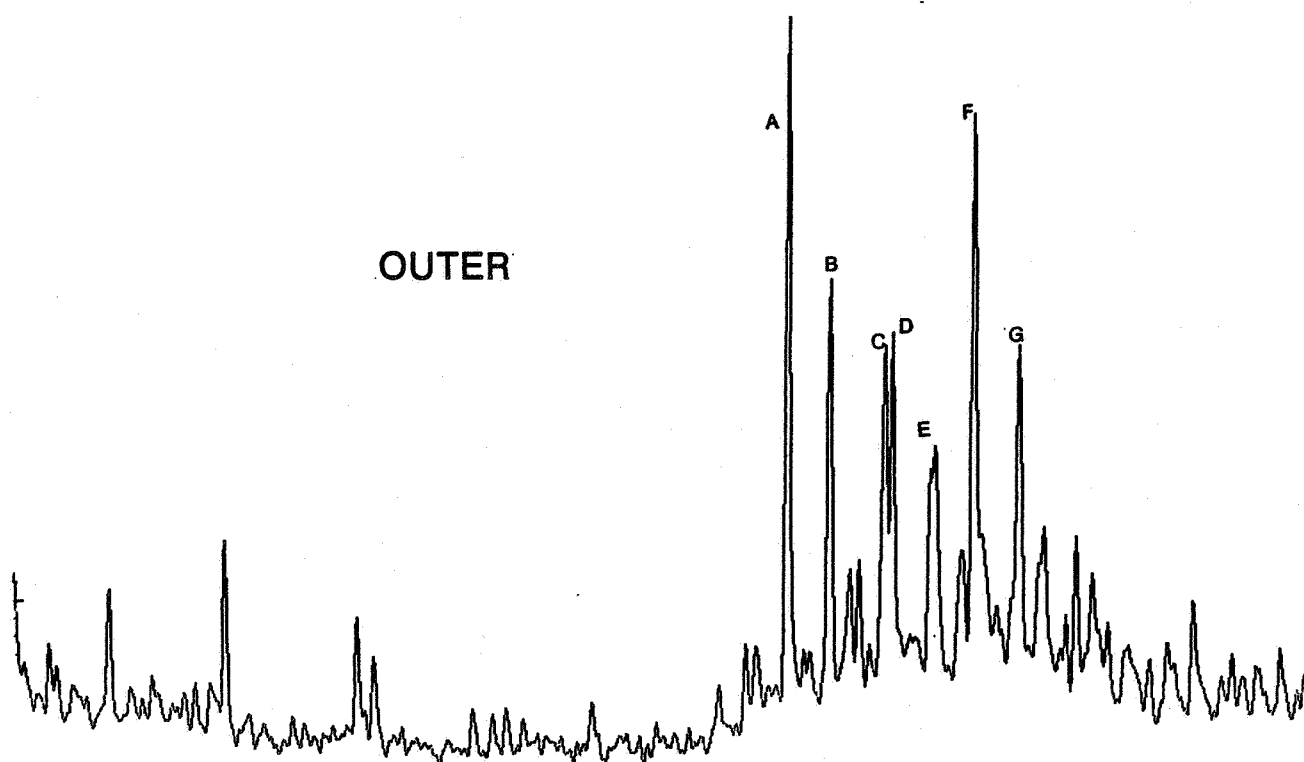
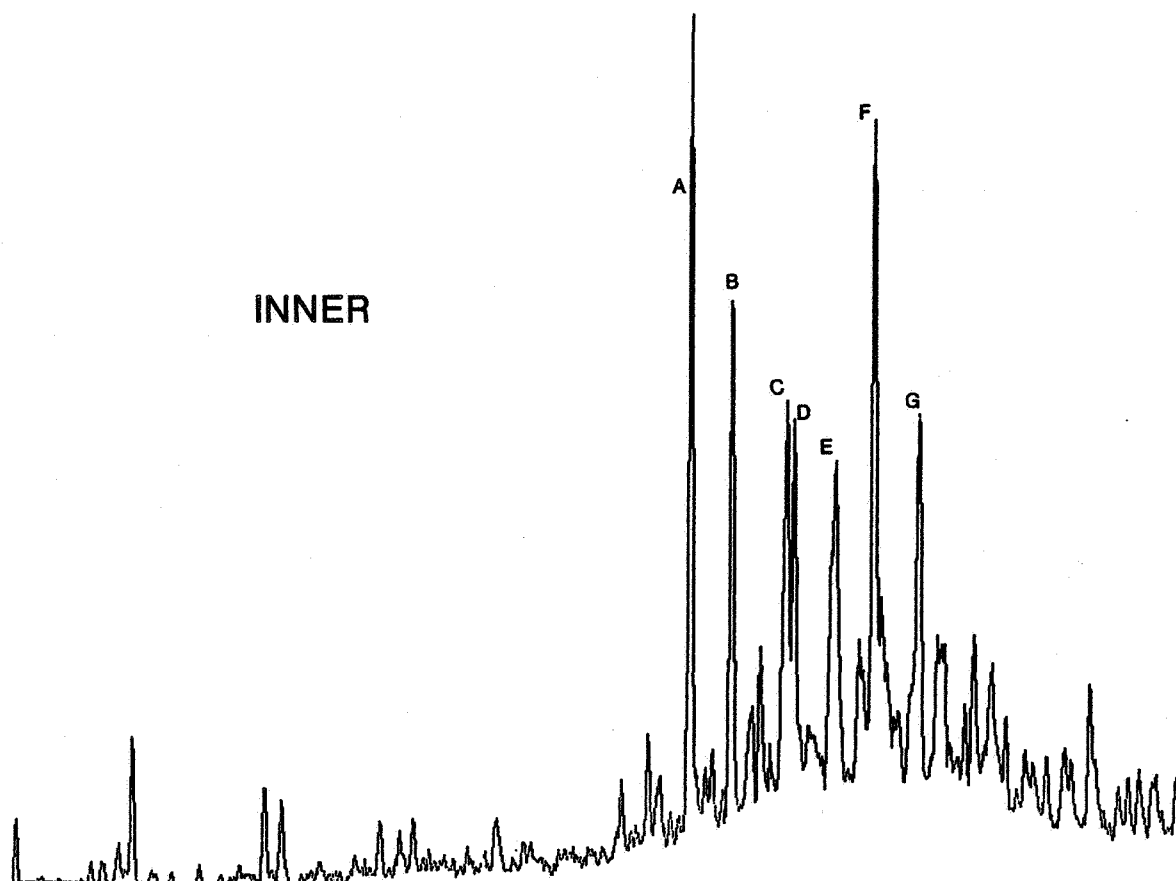
STERANE IDENTIFICATION

(M/Z 259 FRAGMENTOGRAM)

<u>COMPOUND</u>		<u>ELEMENTAL COMPOSITION</u>
A	13 β ,17 α -diacholestane (20S)	C ₂₇ H ₄₈
B	13 β ,17 α -diacholestane (20R)	C ₂₇ H ₄₈
C	13 α ,17 β -diacholestane (20R)	C ₂₇ H ₄₈
D	24,-methyl-13 β ,17 α -diacholestane (20S)	C ₂₈ H ₅₀
E	24,-methyl-13 β ,17 α -diacholestane (20R)	C ₂₈ H ₅₀
F	24,-ethyl-13 β ,17 α -diacholestane (20S)	C ₂₉ H ₅₂
G	24,-ethyl-13 β ,17 α -diacholestane (20R)	C ₂₉ H ₅₂

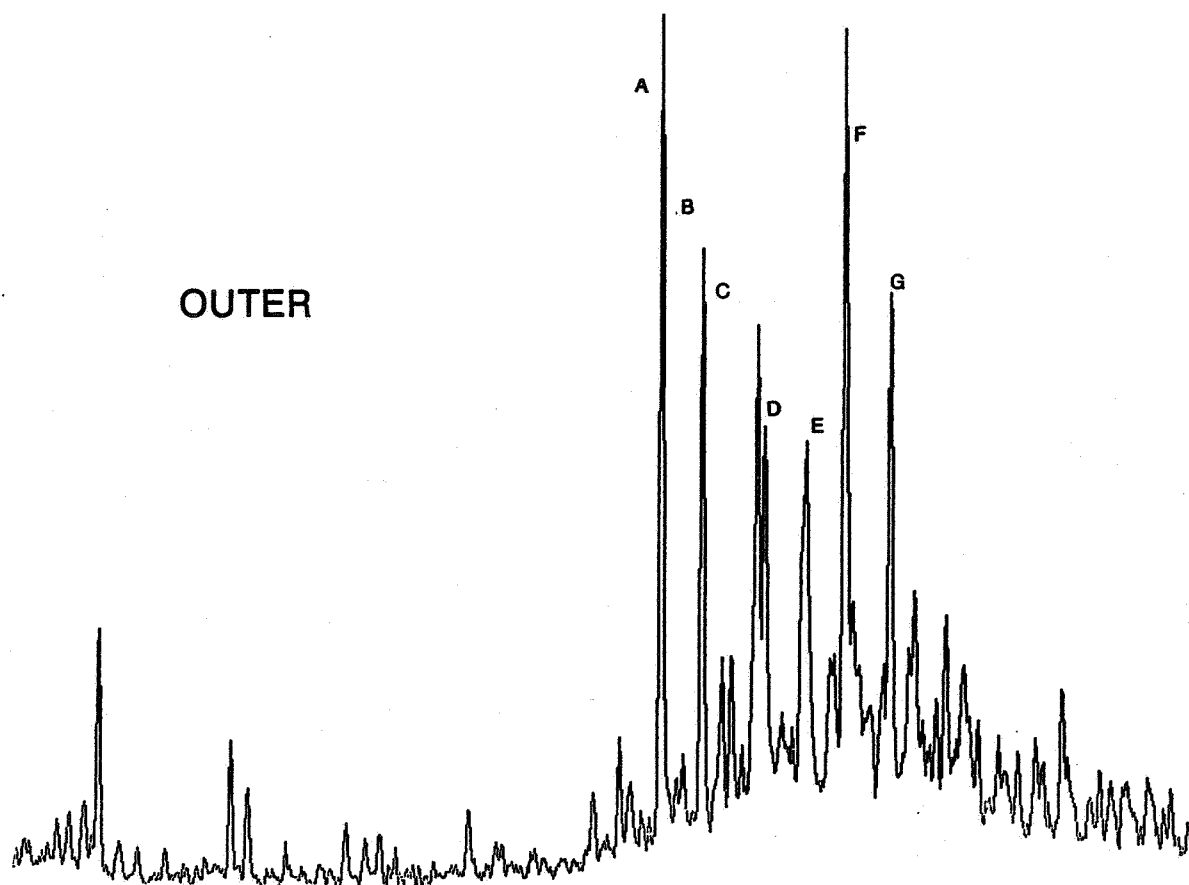
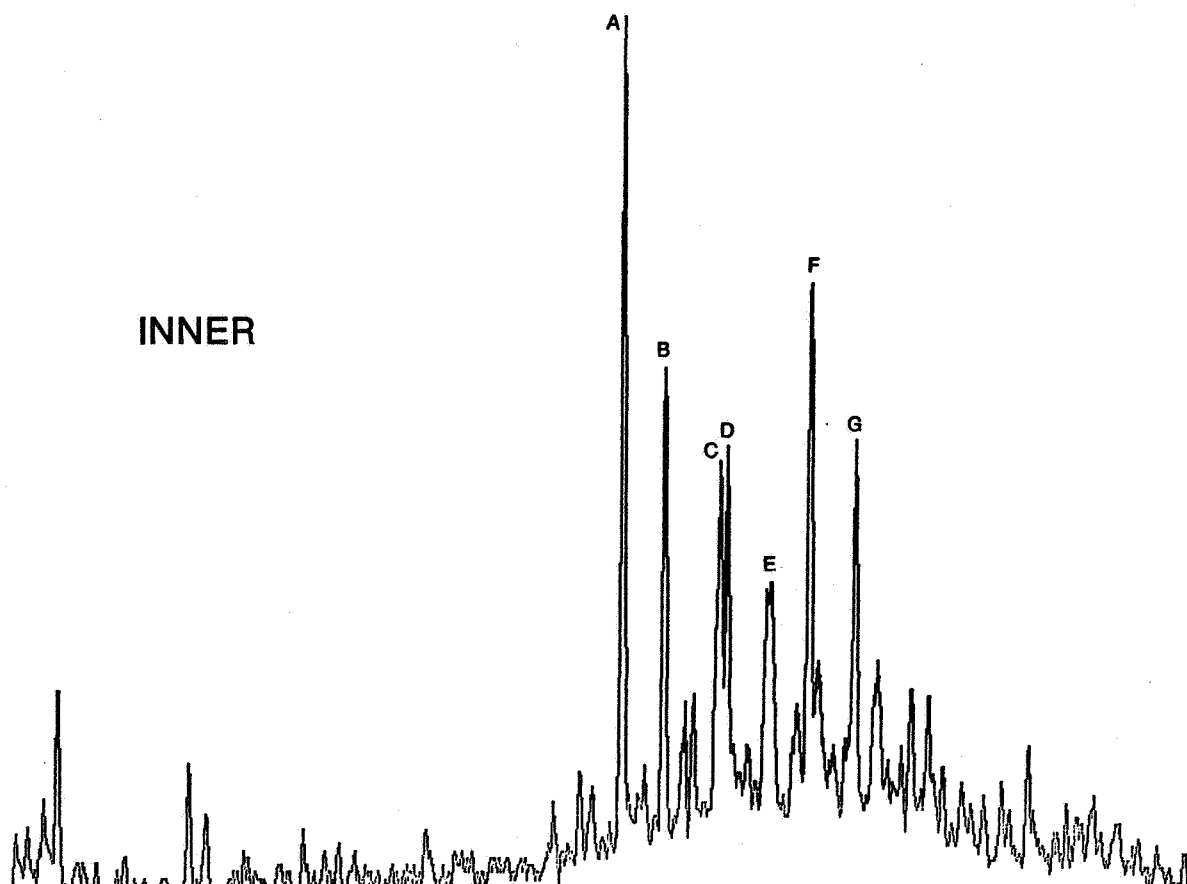


3995.27-3995.34m



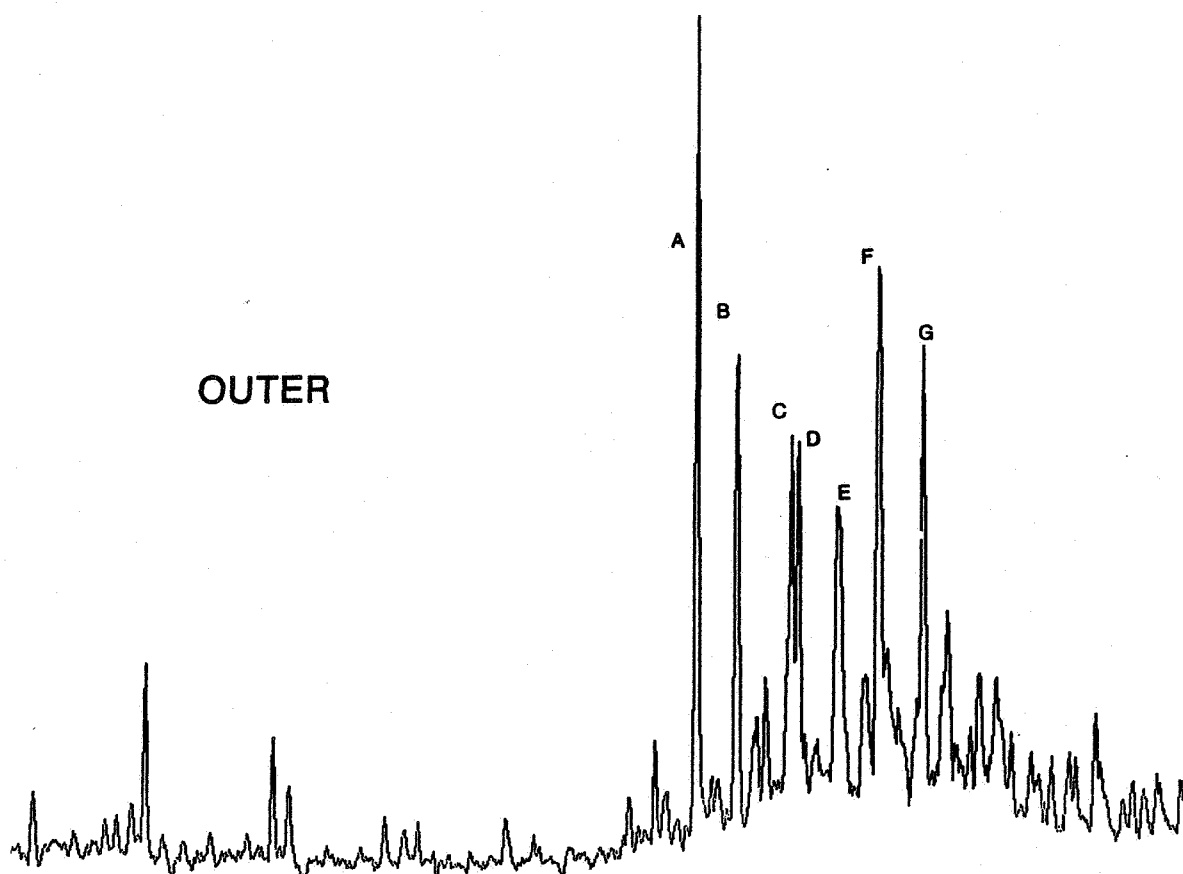
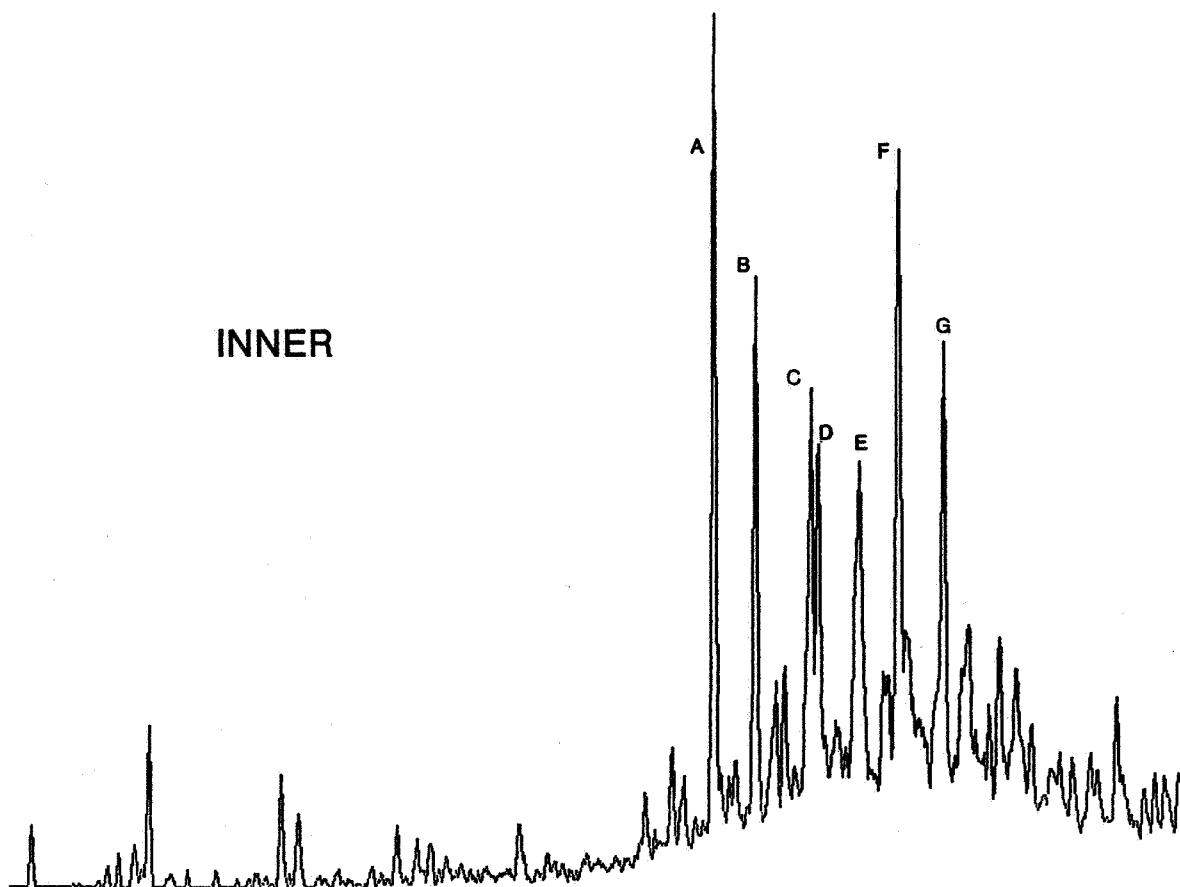


3996.10-3996.24m





3997.52-3997.61m





WELL 6506/12-5

3" SPONGE

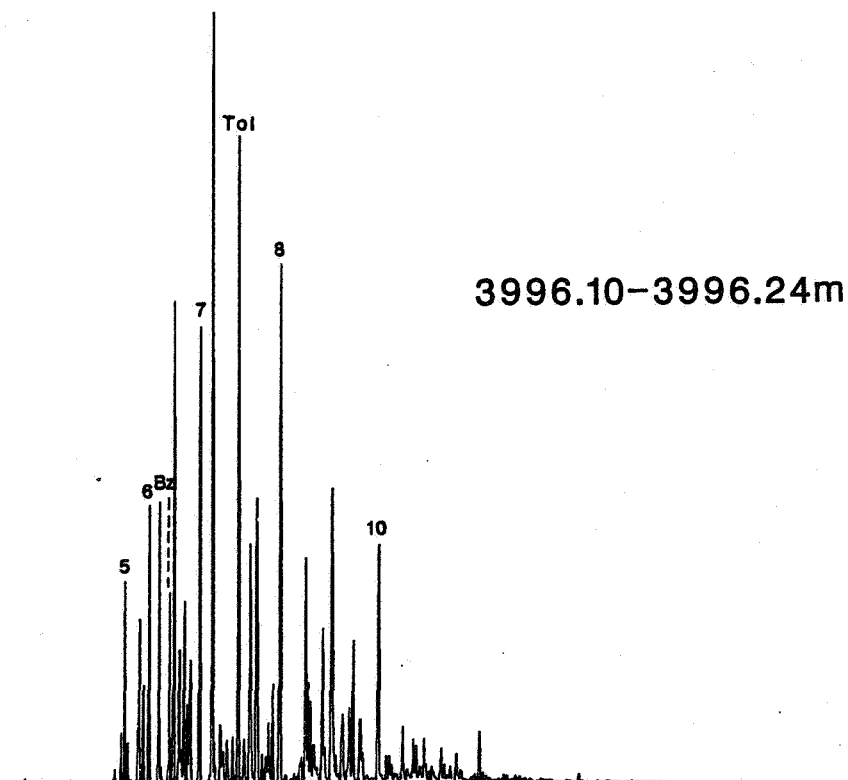
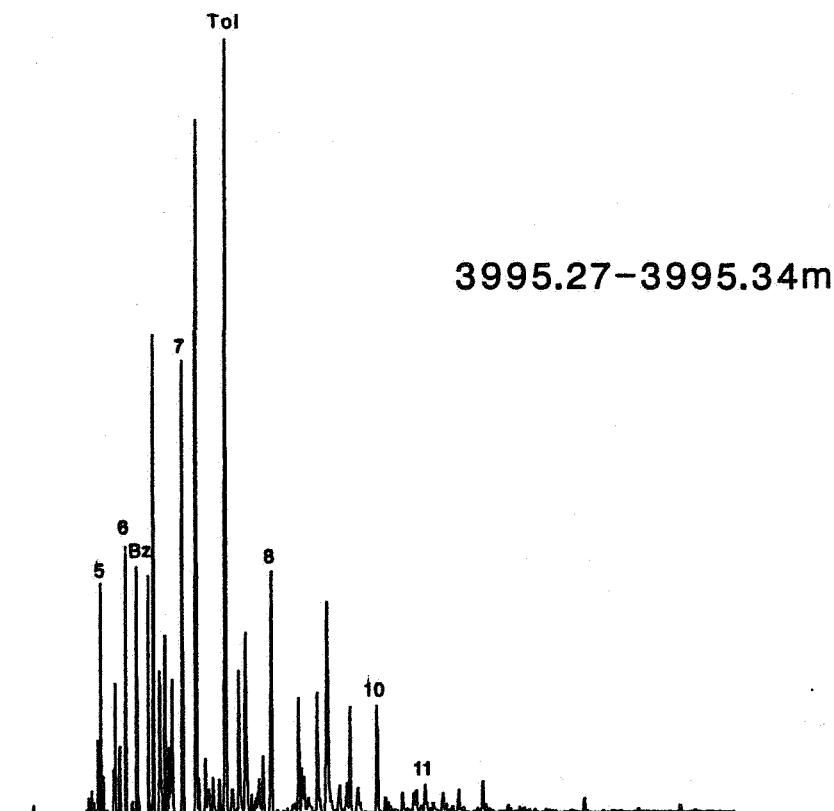
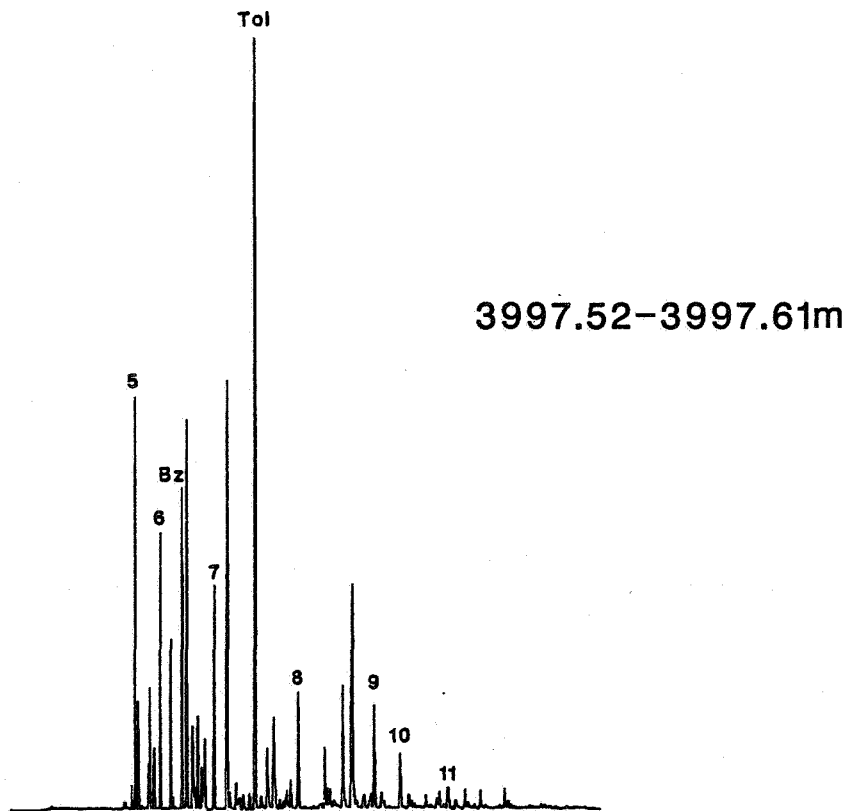


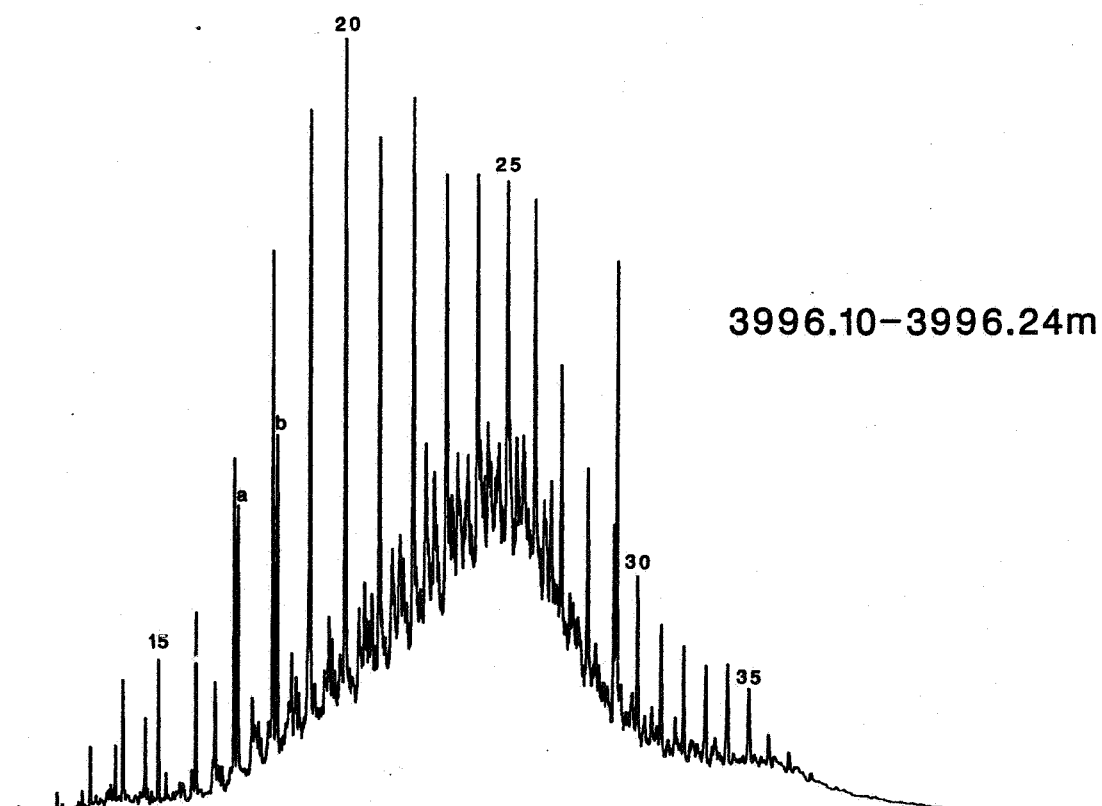
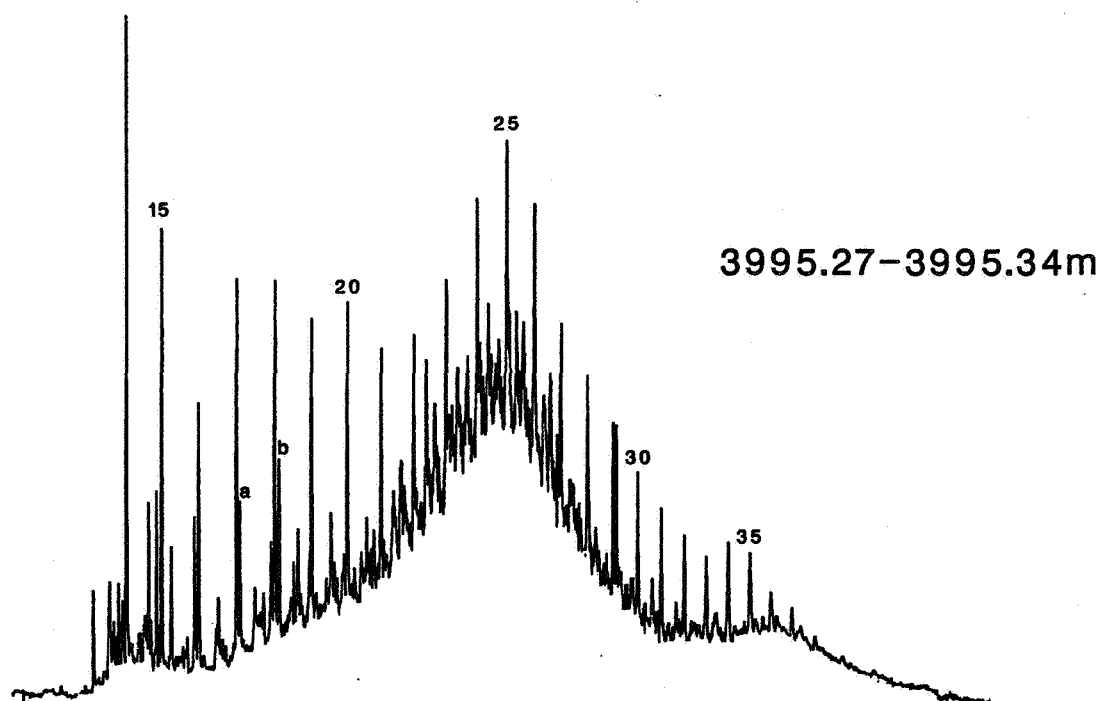
FIGURE 8b

C₄-C₇ CHROMATOGRAMS

WELL 6506/12-5

3" SPONGE



**3" SPONGE**

a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

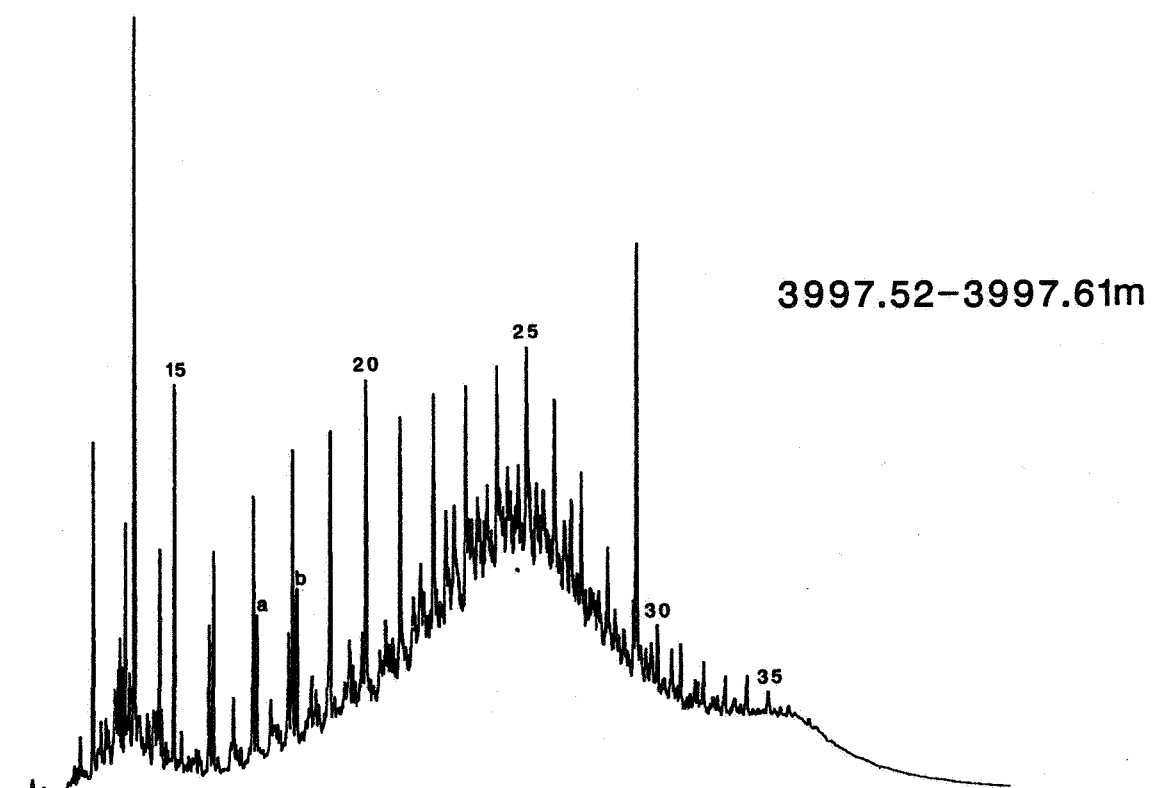
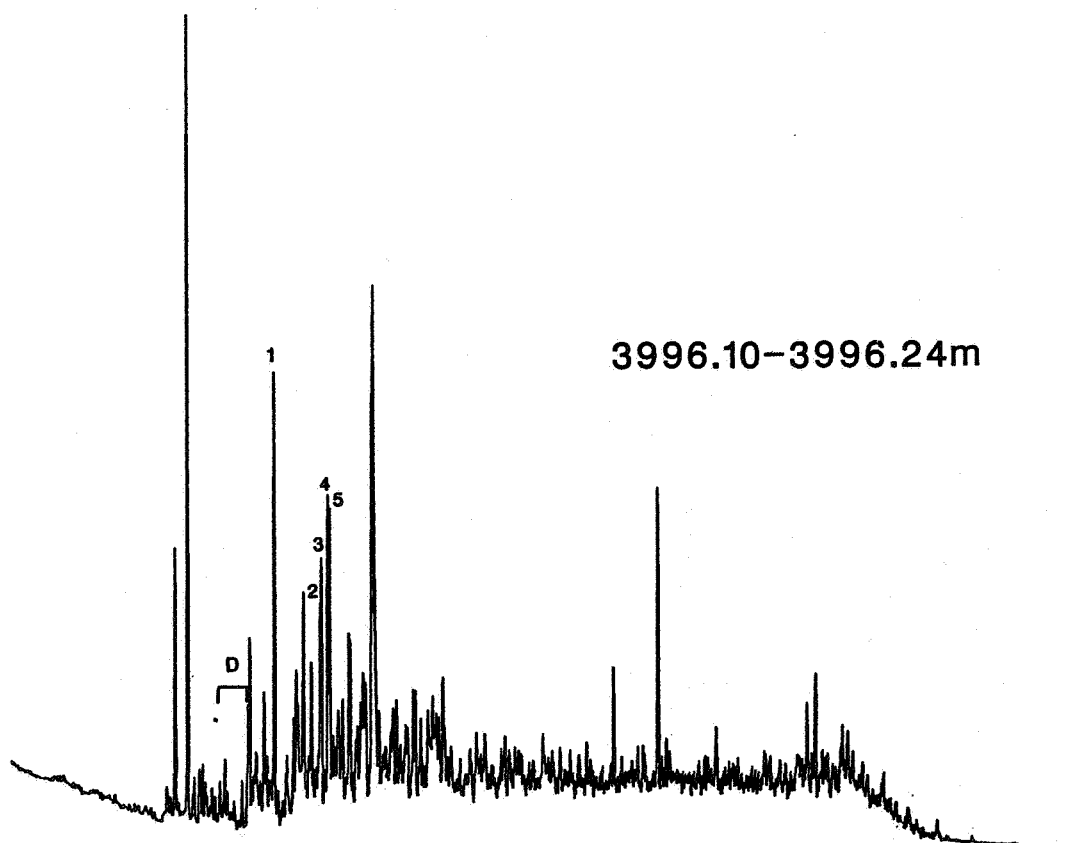
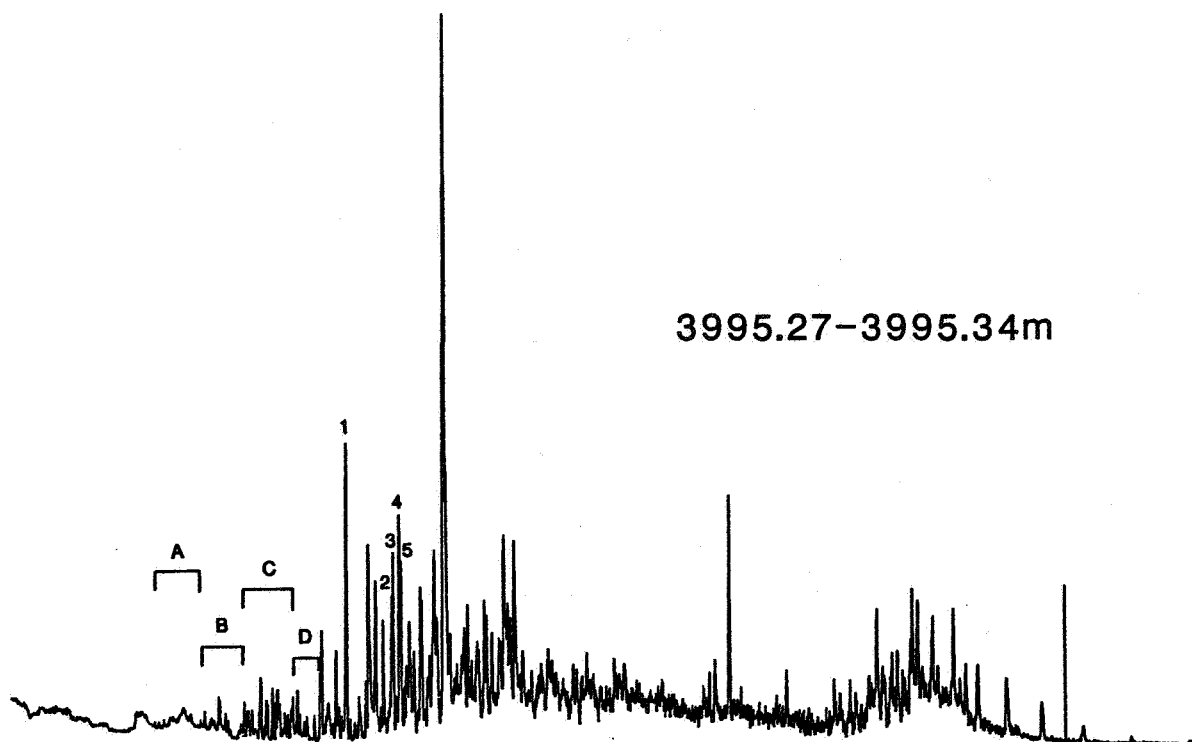
**3" SPONGE****a - PRISTANE****b - PHYTANE****CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)**

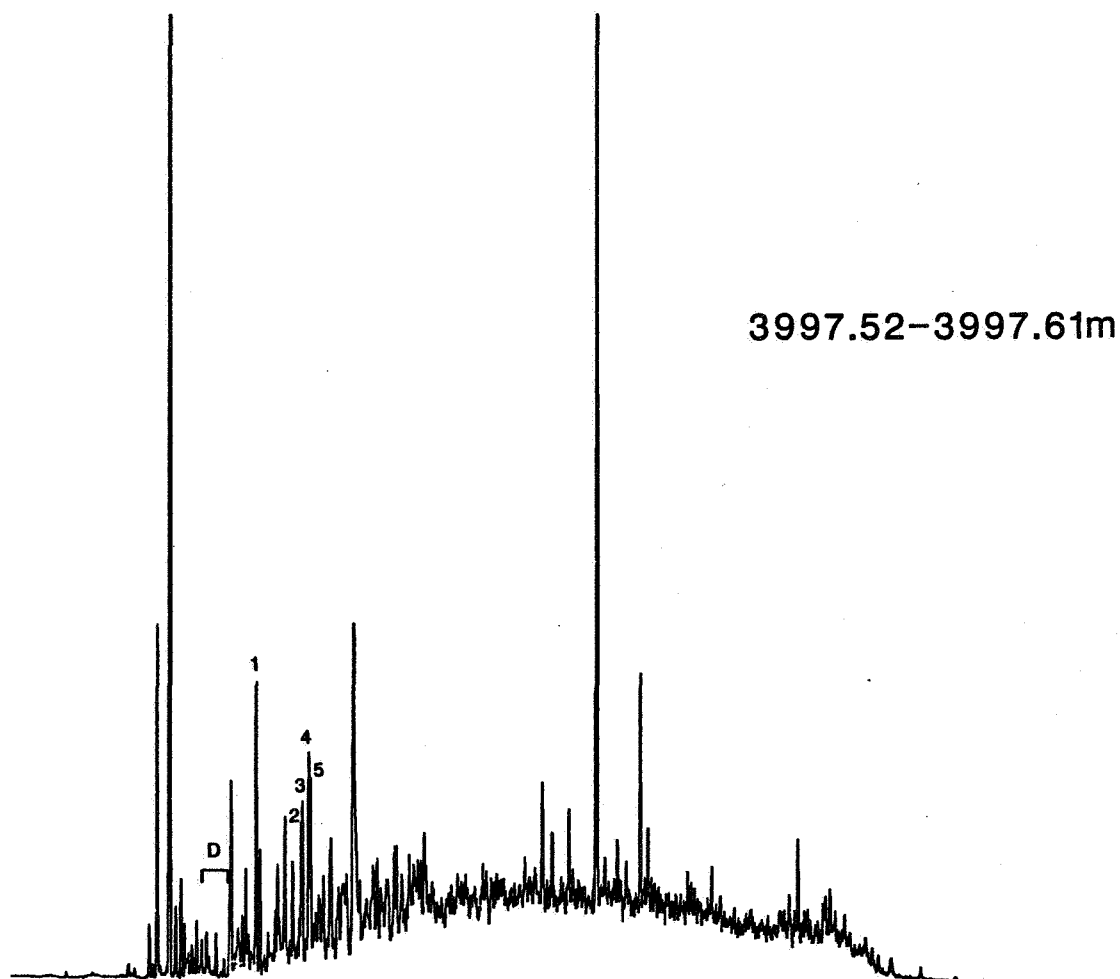
FIGURE 10a **C₁₅+ AROMATIC CHROMATOGRAMS**

WELL 6506/12-5

3" SPONGE



PEAK IDENTIFICATION ON FIRST SHEET

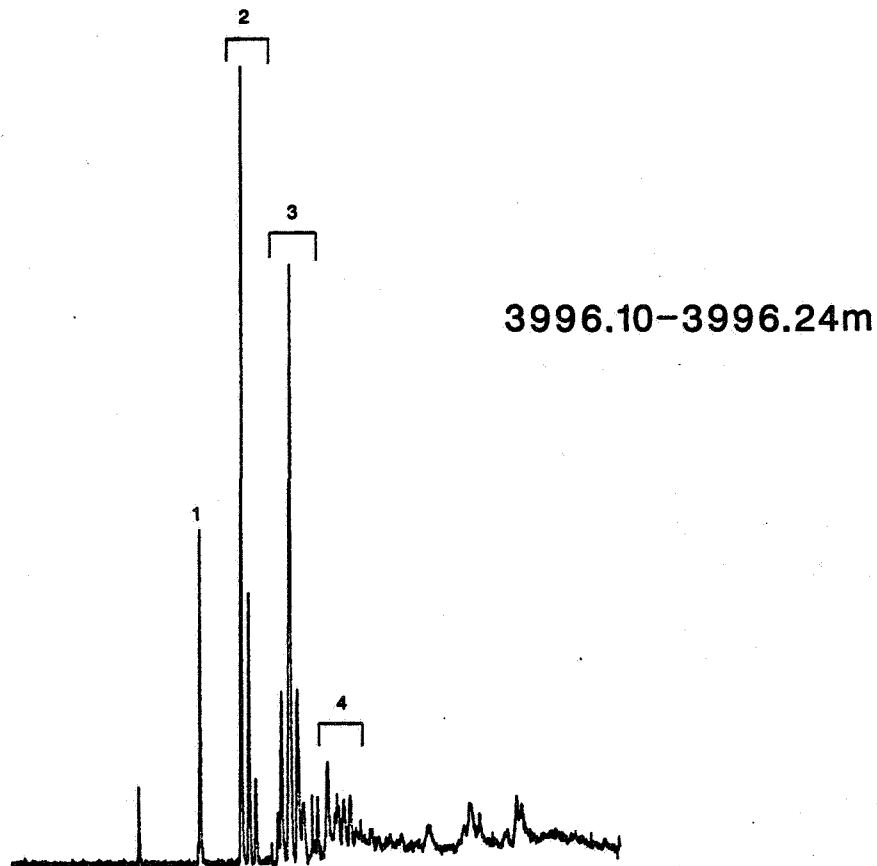
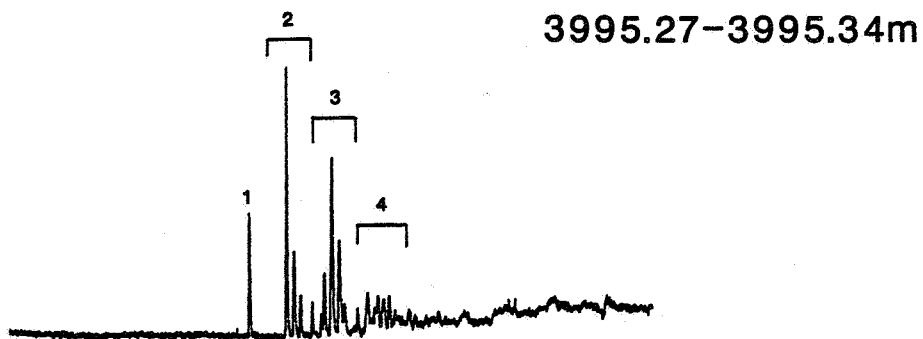
**3" SPONGE**

PEAK IDENTIFICATION ON FIRST SHEET

ORGANO-SULPHUR CHROMATOGRAMS



3" SPONGE



PEAK IDENTIFICATION ON FIRST SHEET

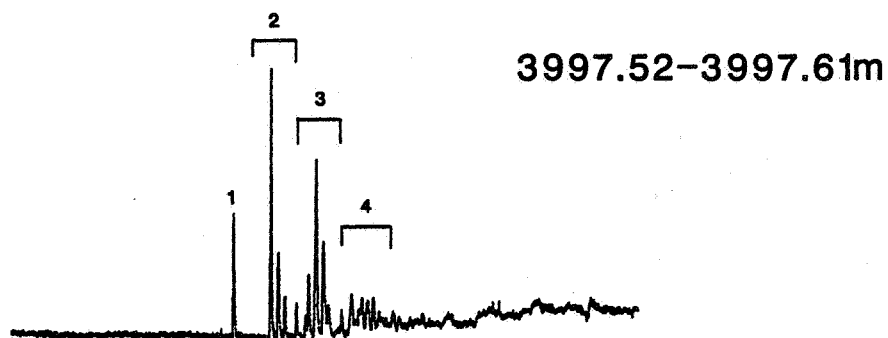
FIGURE 11b

WELL 6506/12-5

ORGANO-SULPHUR CHROMATOGRAMS



3" SPONGE



PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 12a

MASS FRAGMENTOGRAMS

WELL 6506/12-5

DEMETHYLATED HOPANES m/z 177



3" SPONGE

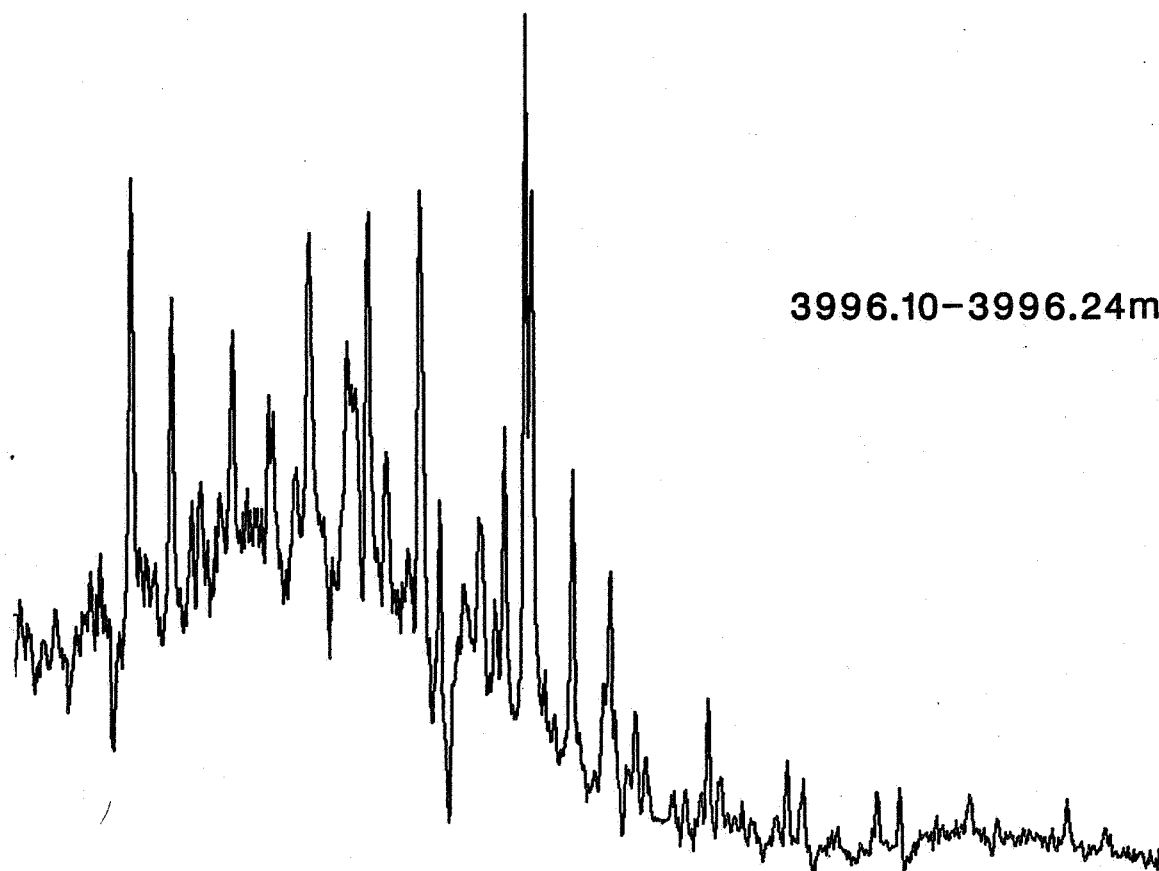
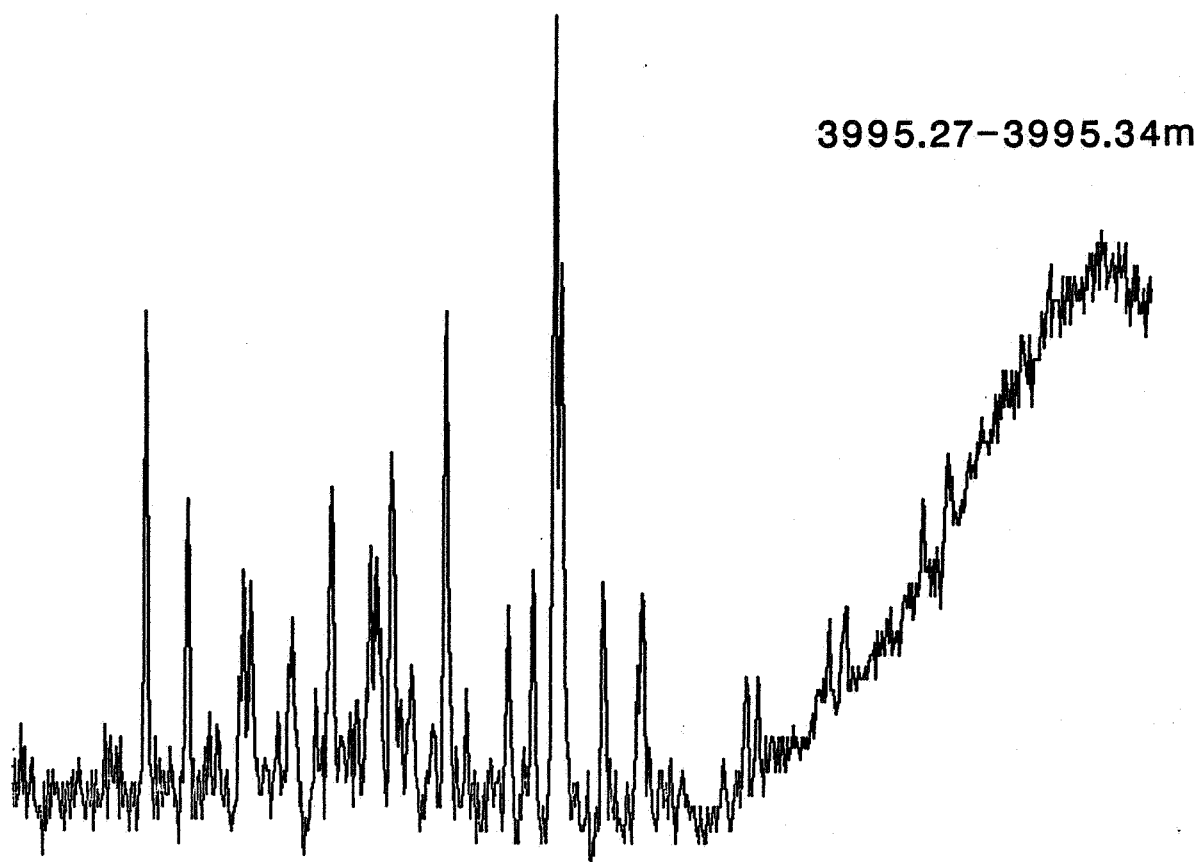


FIGURE 12b

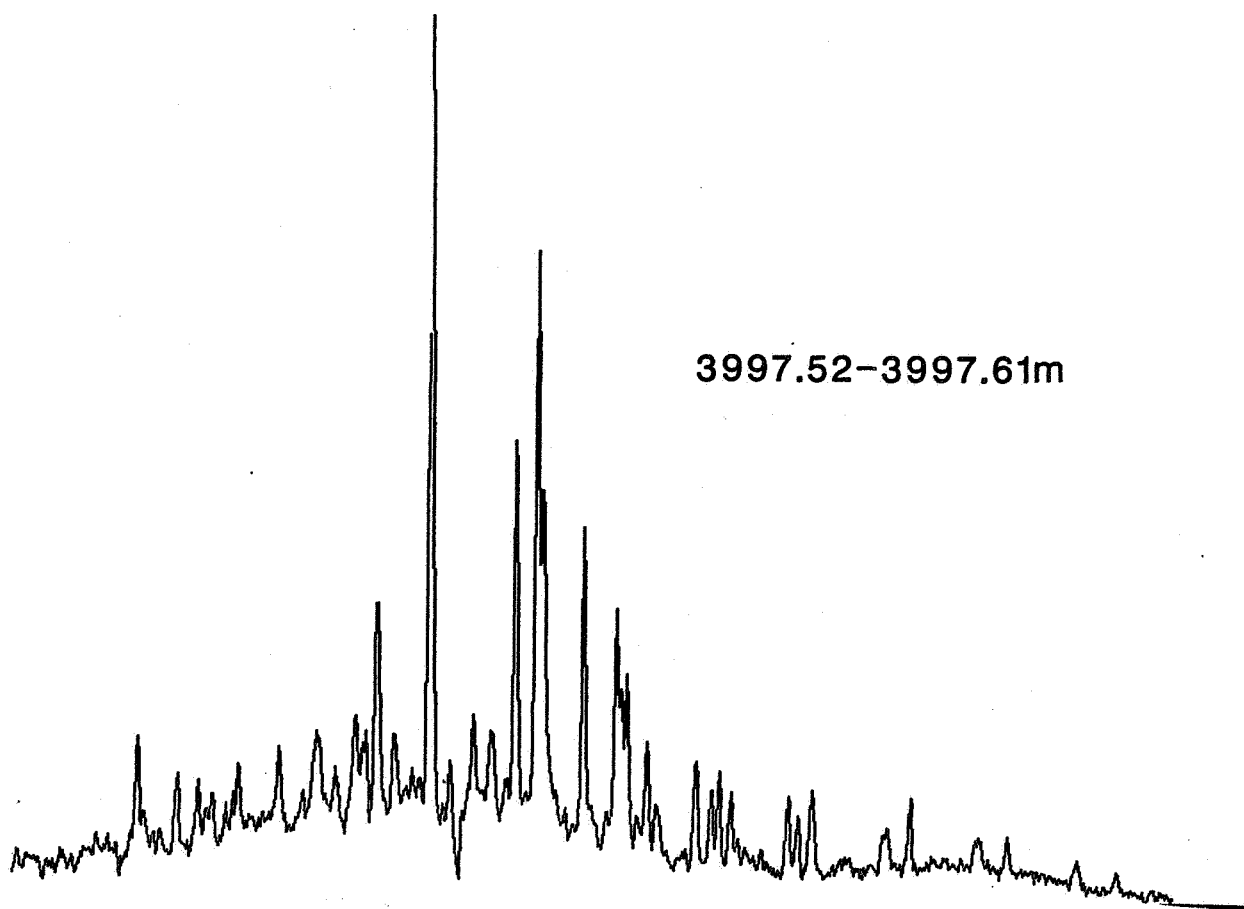
MASS FRAGMENTOGRAMS

WELL 6506/12-5

DEMETHYLATED HOPANES m/z 177



3" SPONGE

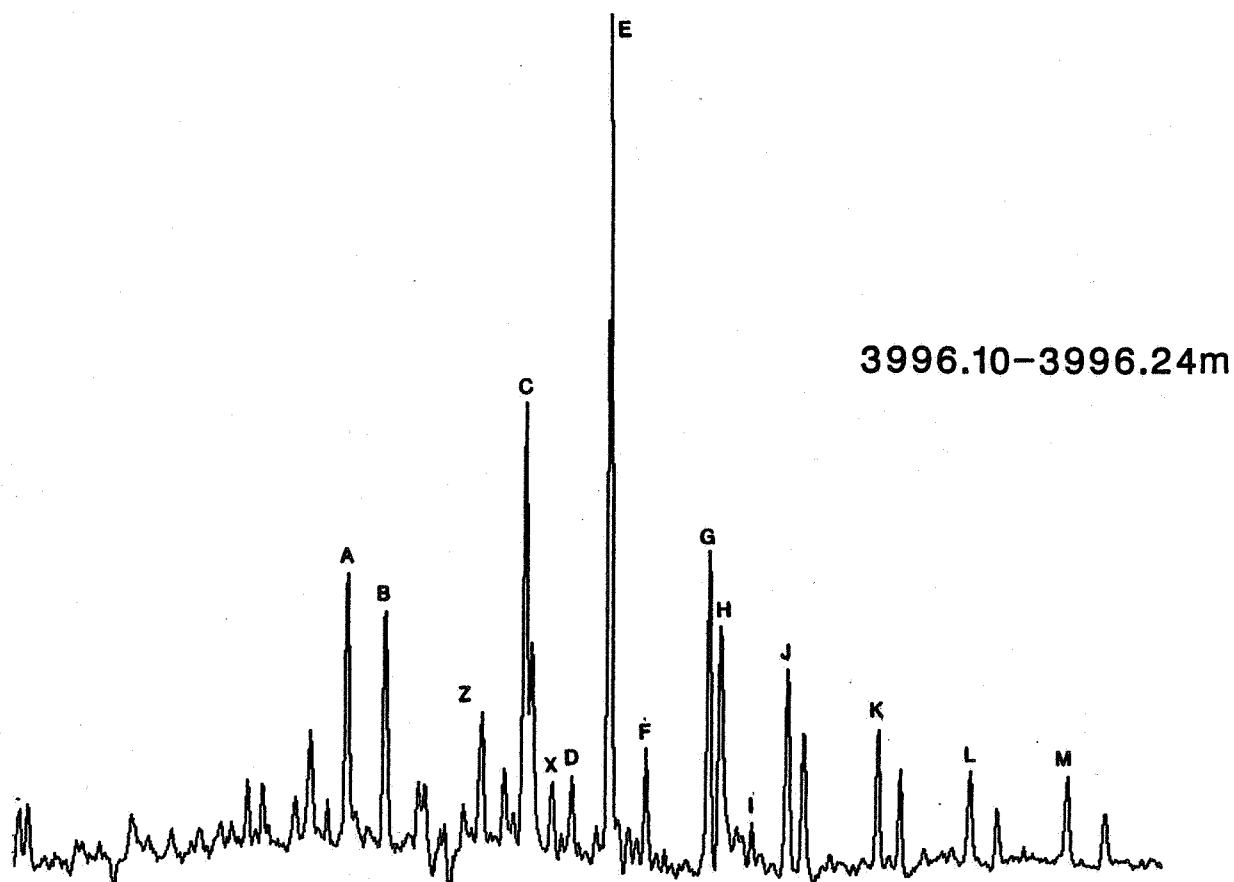
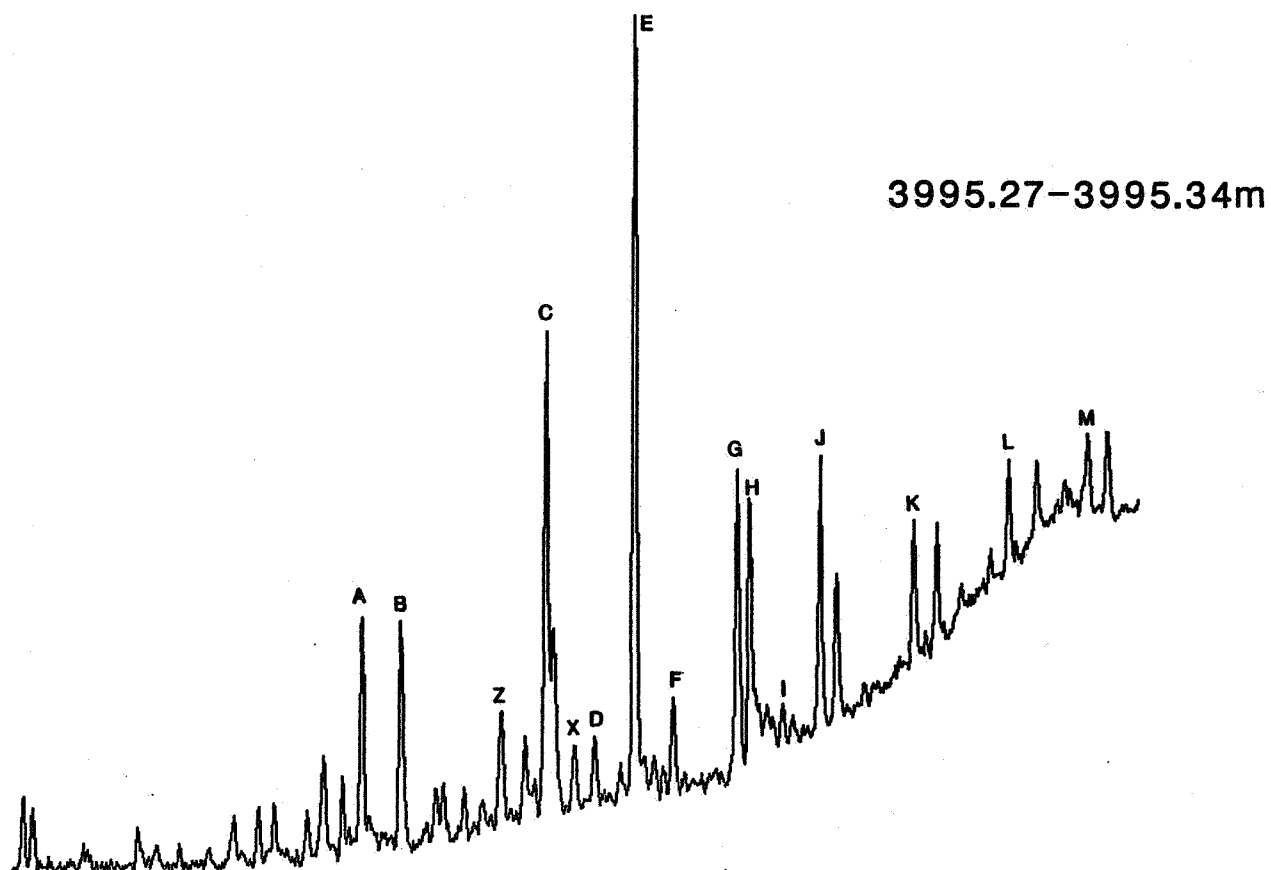




WELL 6506/12-5

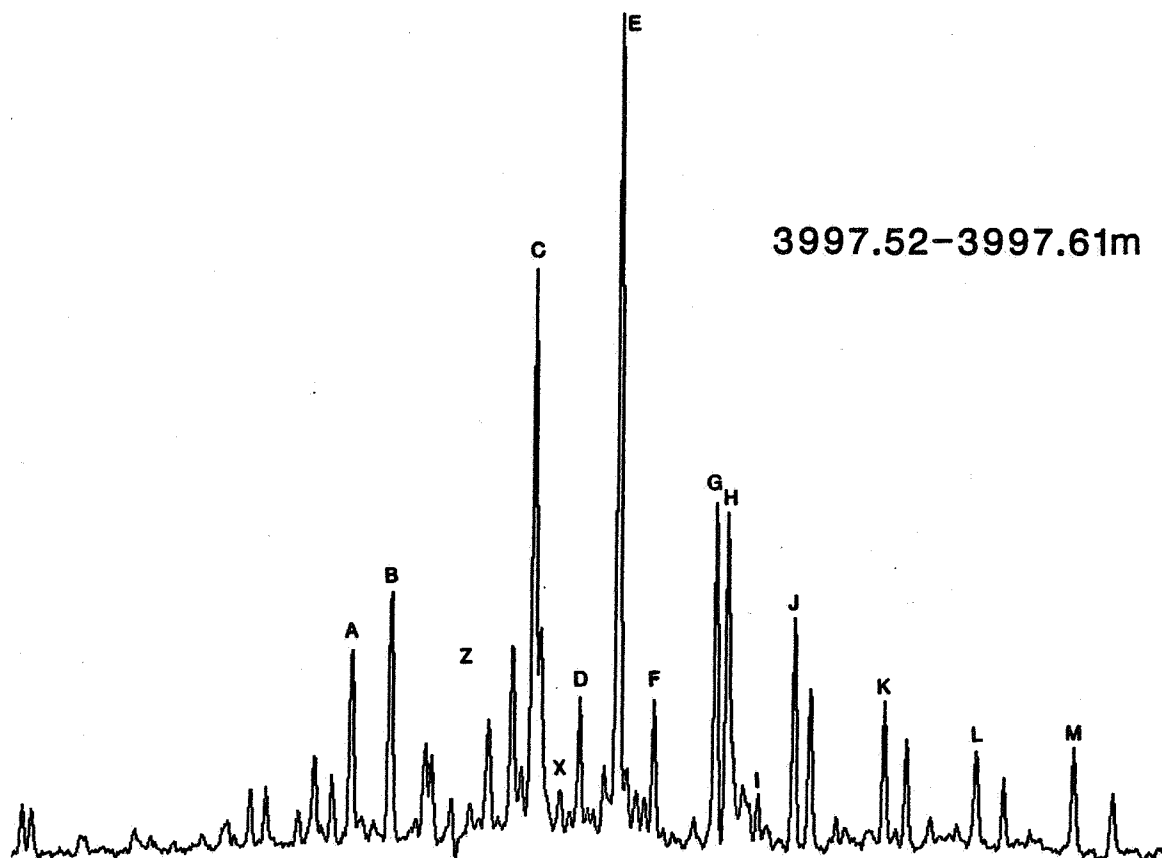
TRITERPANES m/z 191

3" SPONGE





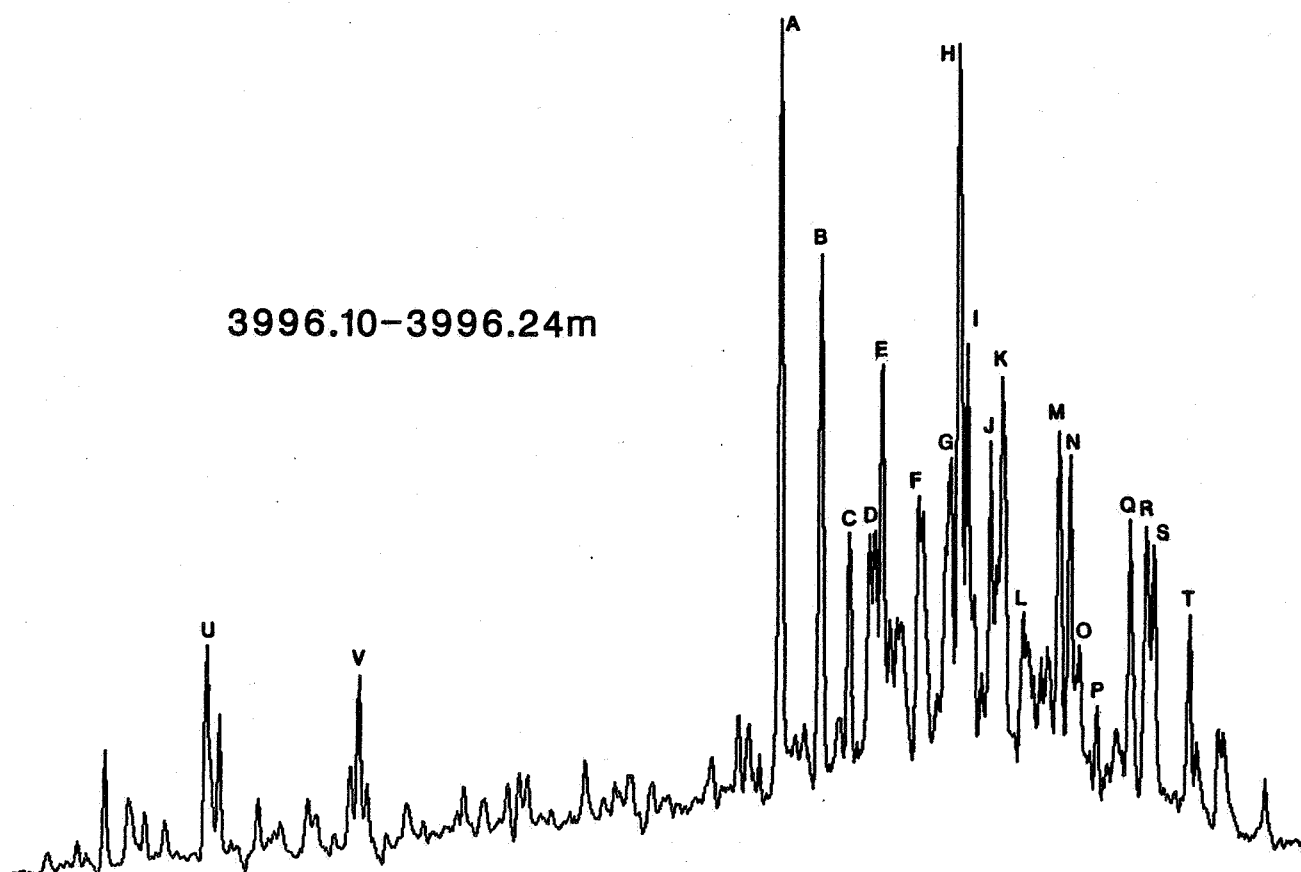
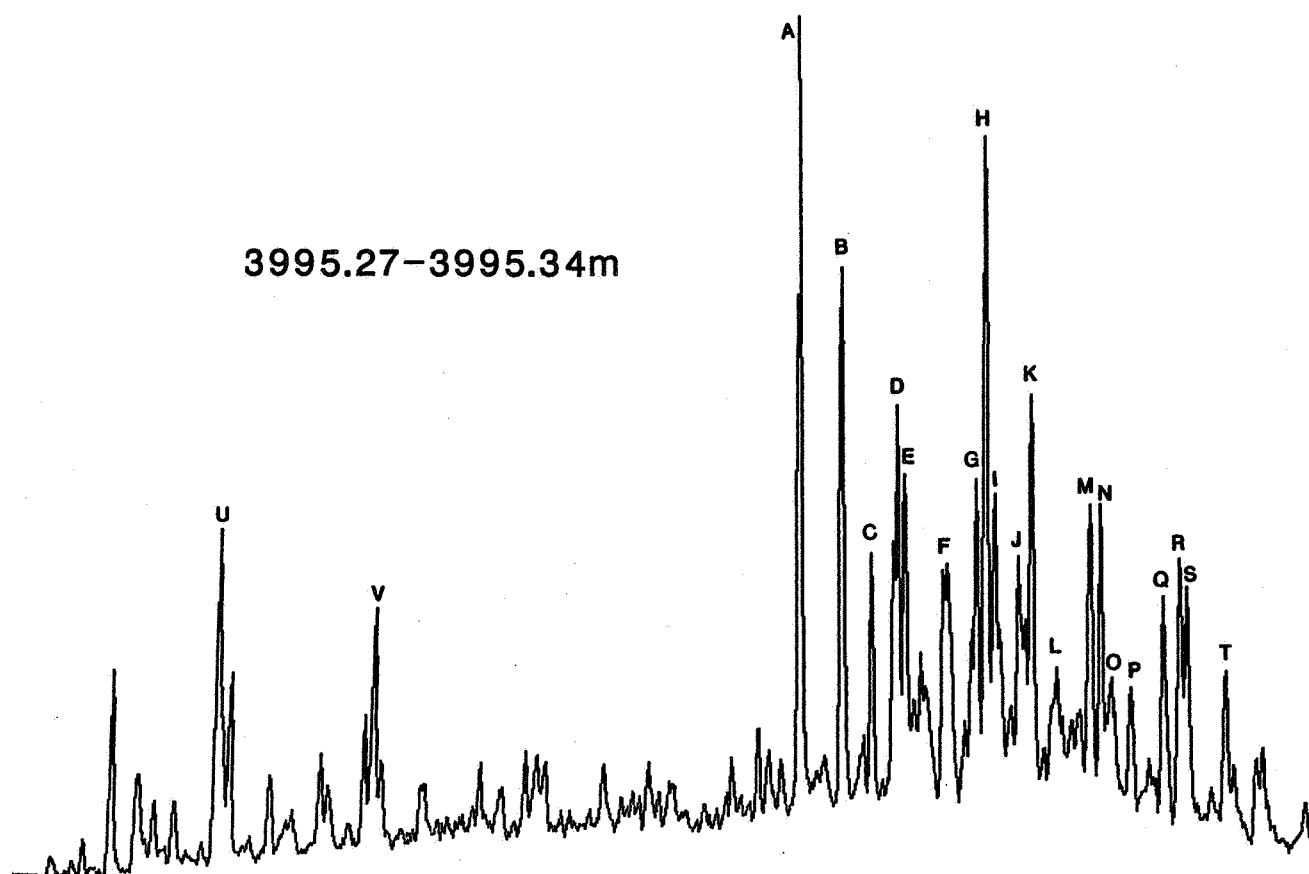
3" SPONGE



WELL 6506/12-5

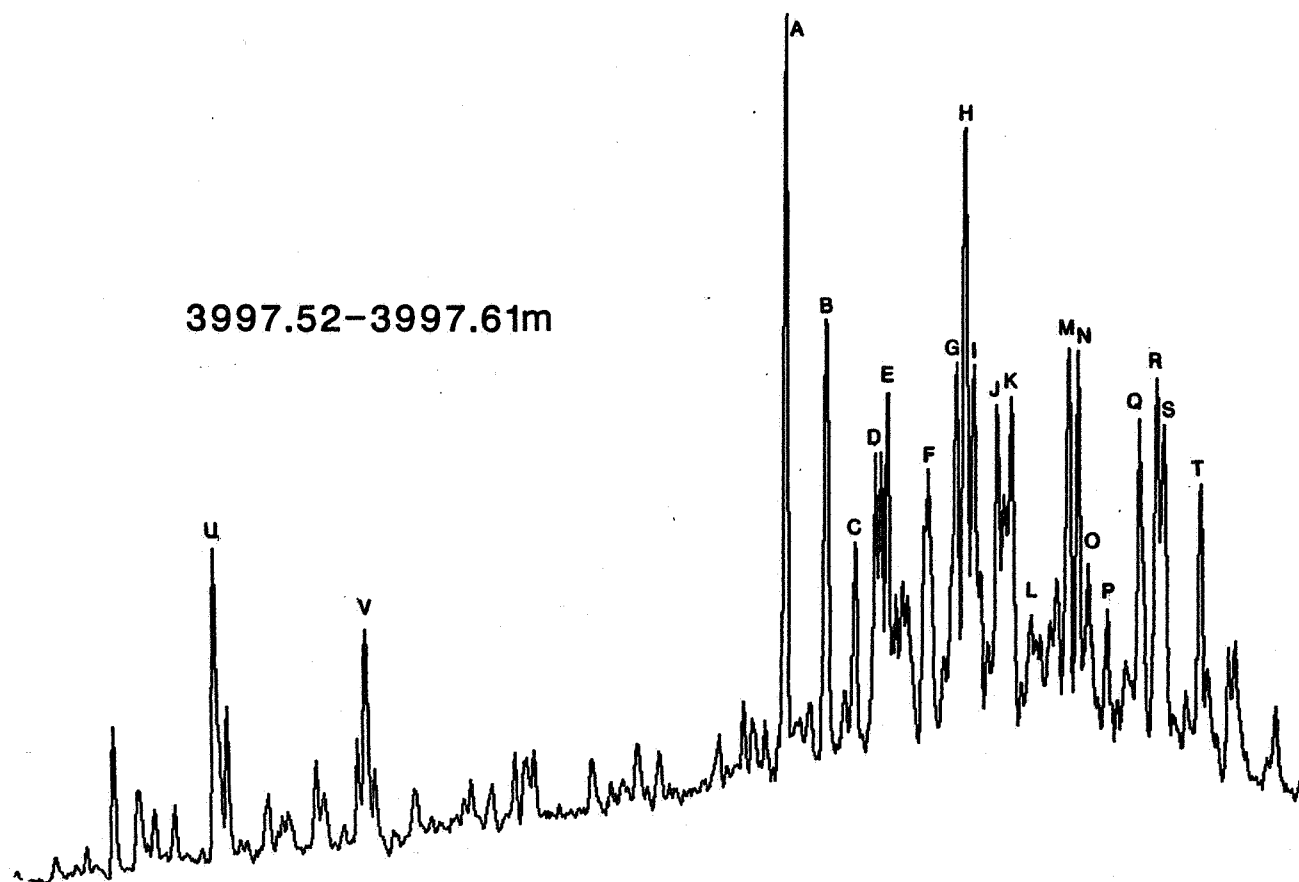
STERANES m/z 217

3" SPONGE



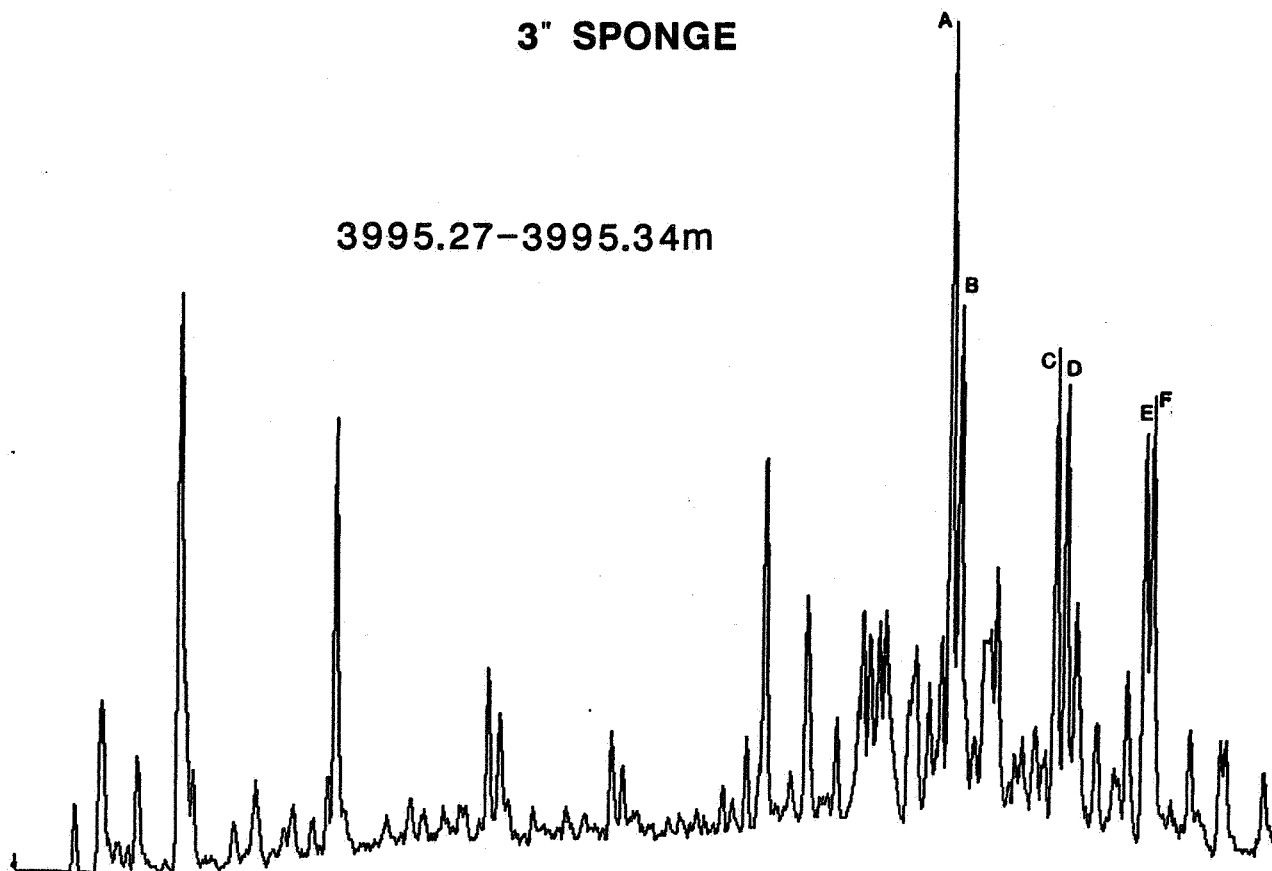


3" SPONGE



3" SPONGE

3995.27-3995.34m



3996.10-3996.24m

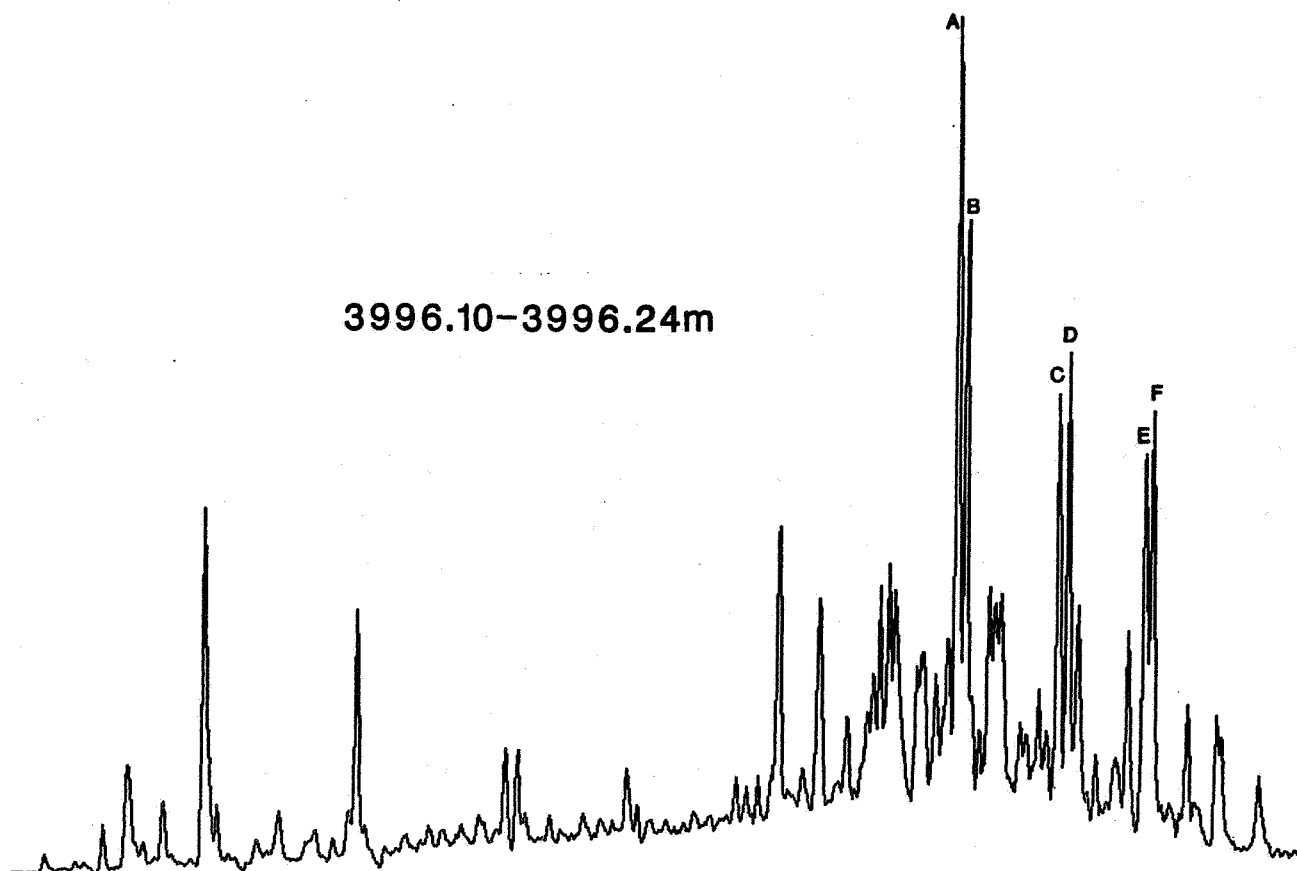


FIGURE 12h

MASS FRAGMENTOGRAMS

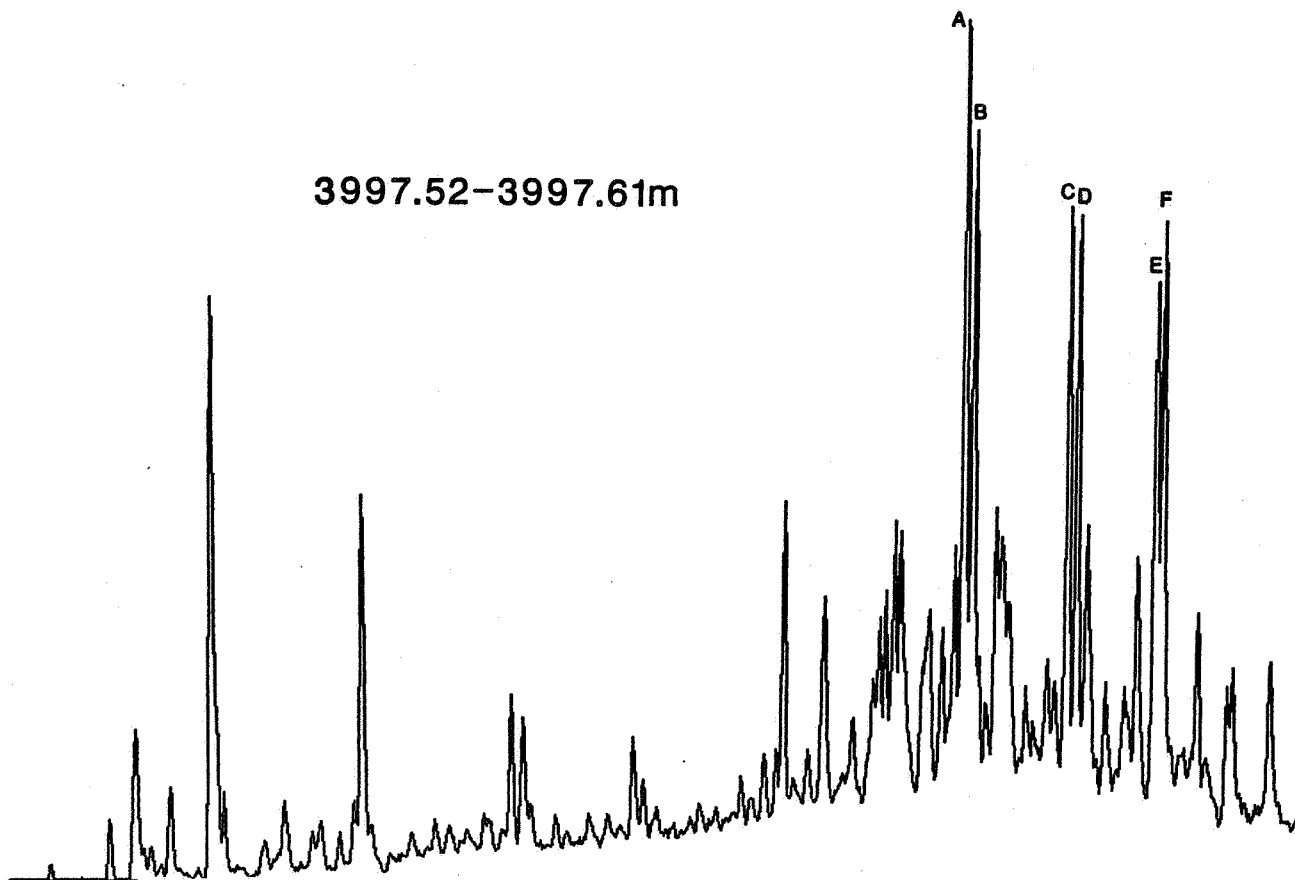
WELL 6506/12-5

$\beta\beta$ STERANES m/z 218



3" SPONGE

3997.52-3997.61m





3" SPONGE

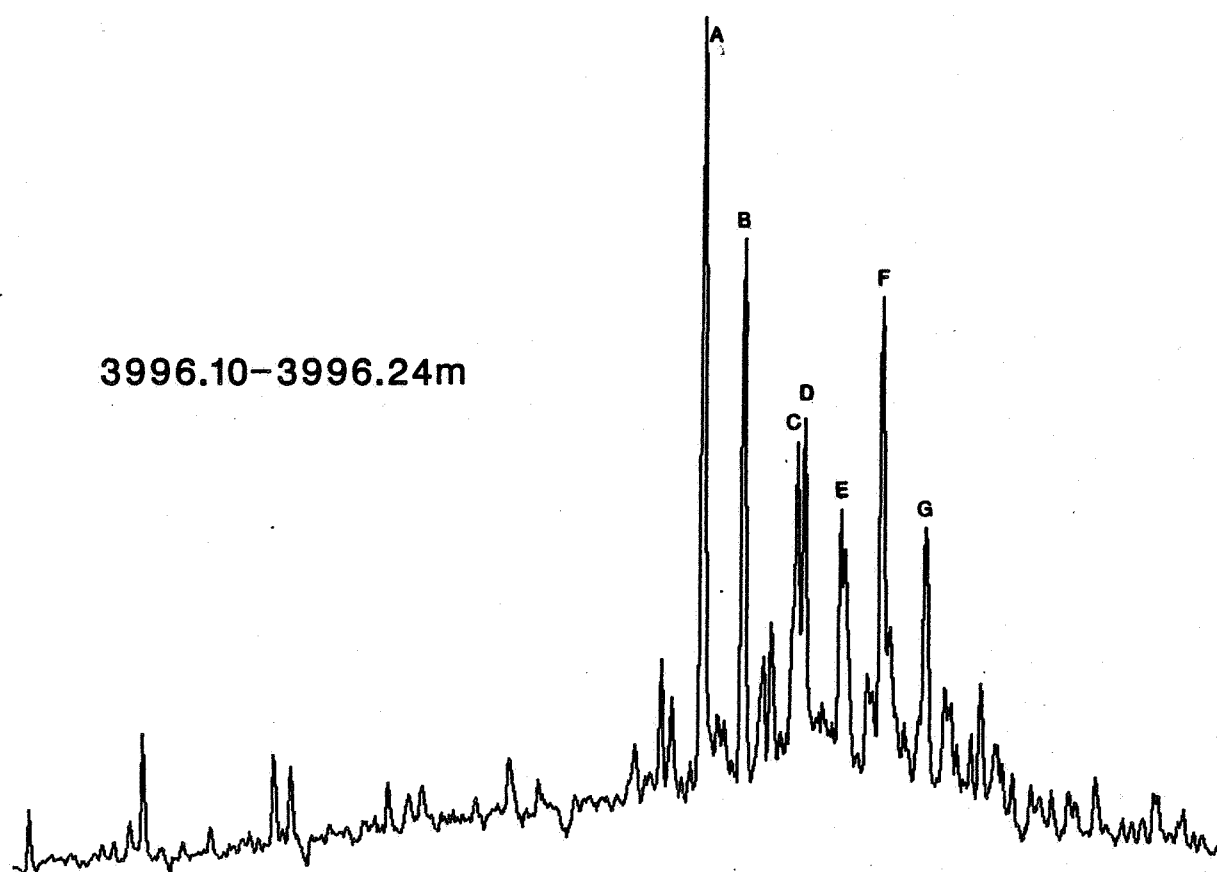
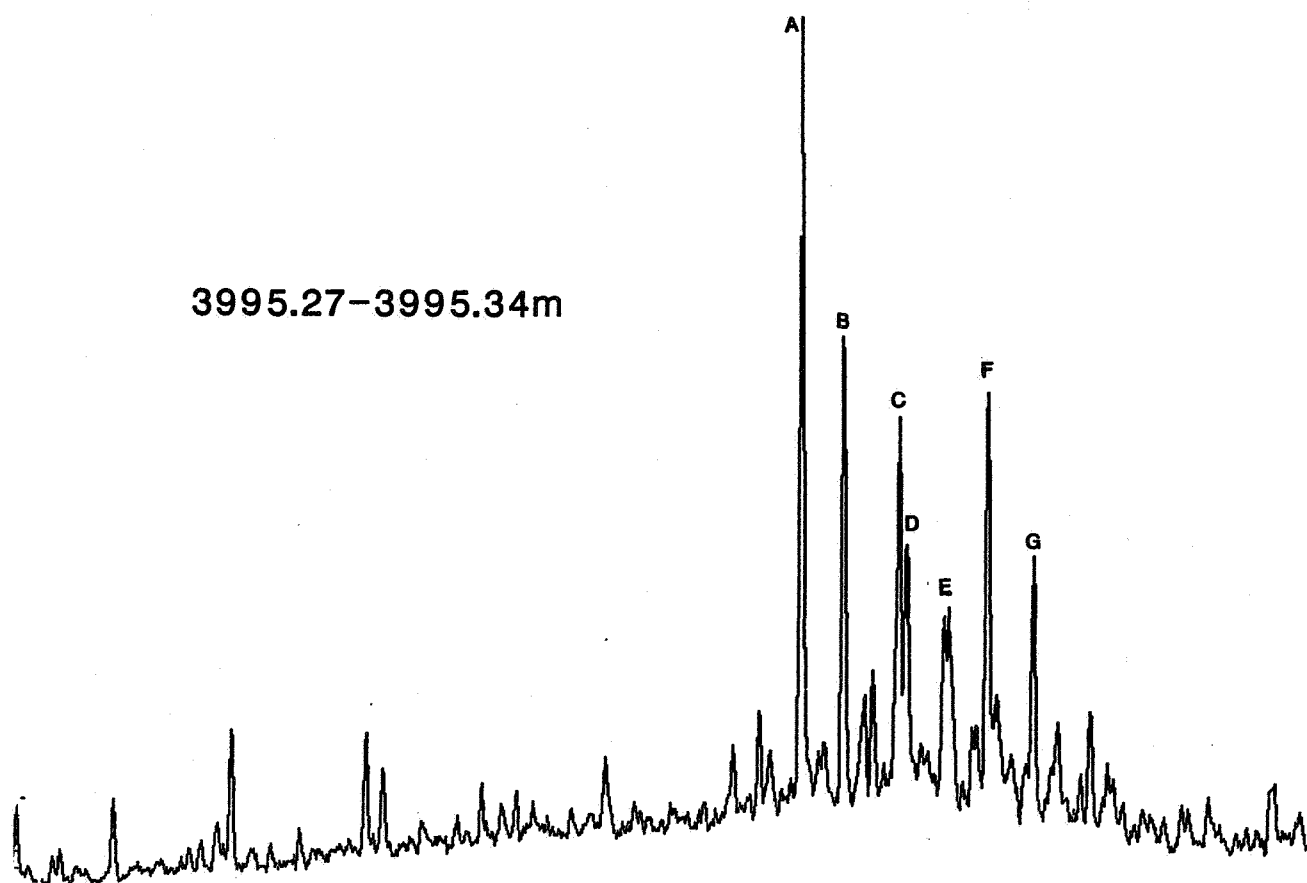


FIGURE 12j

MASS FRAGMENTOGRAMS

WELL 6506/12-5

REARRANGED STERANES m/z 259



3" SPONGE

3997.52-3997.61m

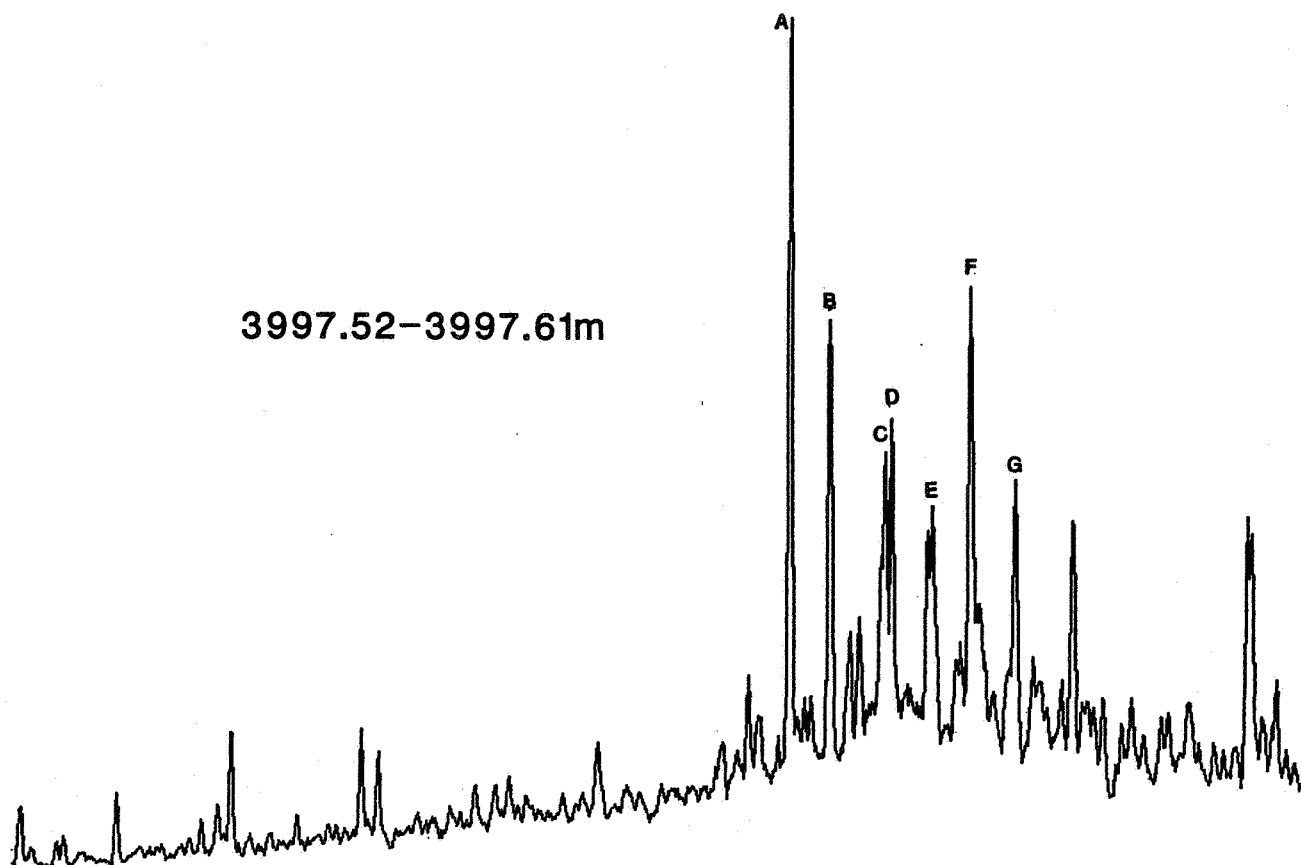


FIGURE 13

WELL 6506/12-5

GALIMOV CARBON ISOTOPE PLOT
(‰, PDB)



- 1 3995.27-0.34
- 2 3996.10-0.24
- 3 3997.52-0.61
- 4 3995.27-0.34 INNER
- 5 3995.27-0.34 OUTER
- 6 3996.10-0.24 INNER
- 7 3996.10-0.24 OUTER
- 8 3997.52-0.61 INNER
- 9 3997.52-0.61 OUTER

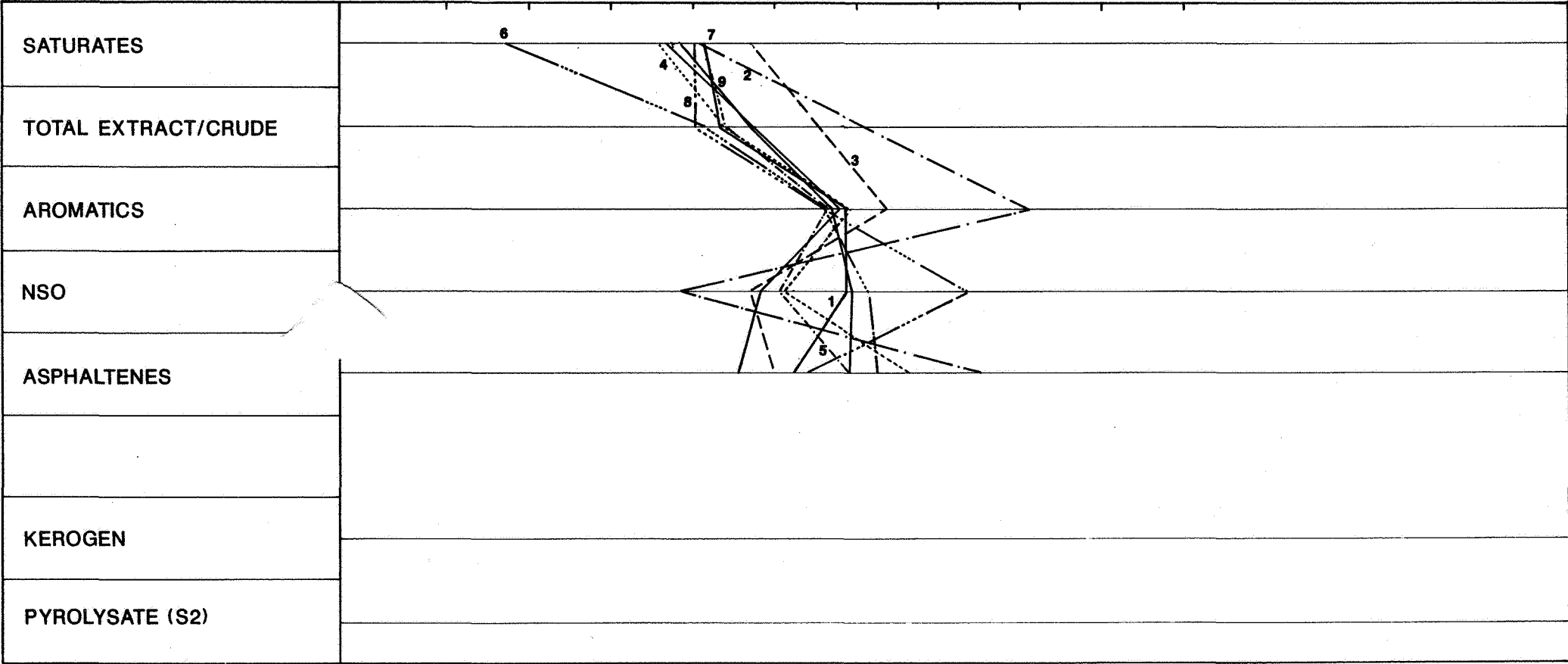


FIGURE 1

SHOW DETECTION

WELL 6506/12-5

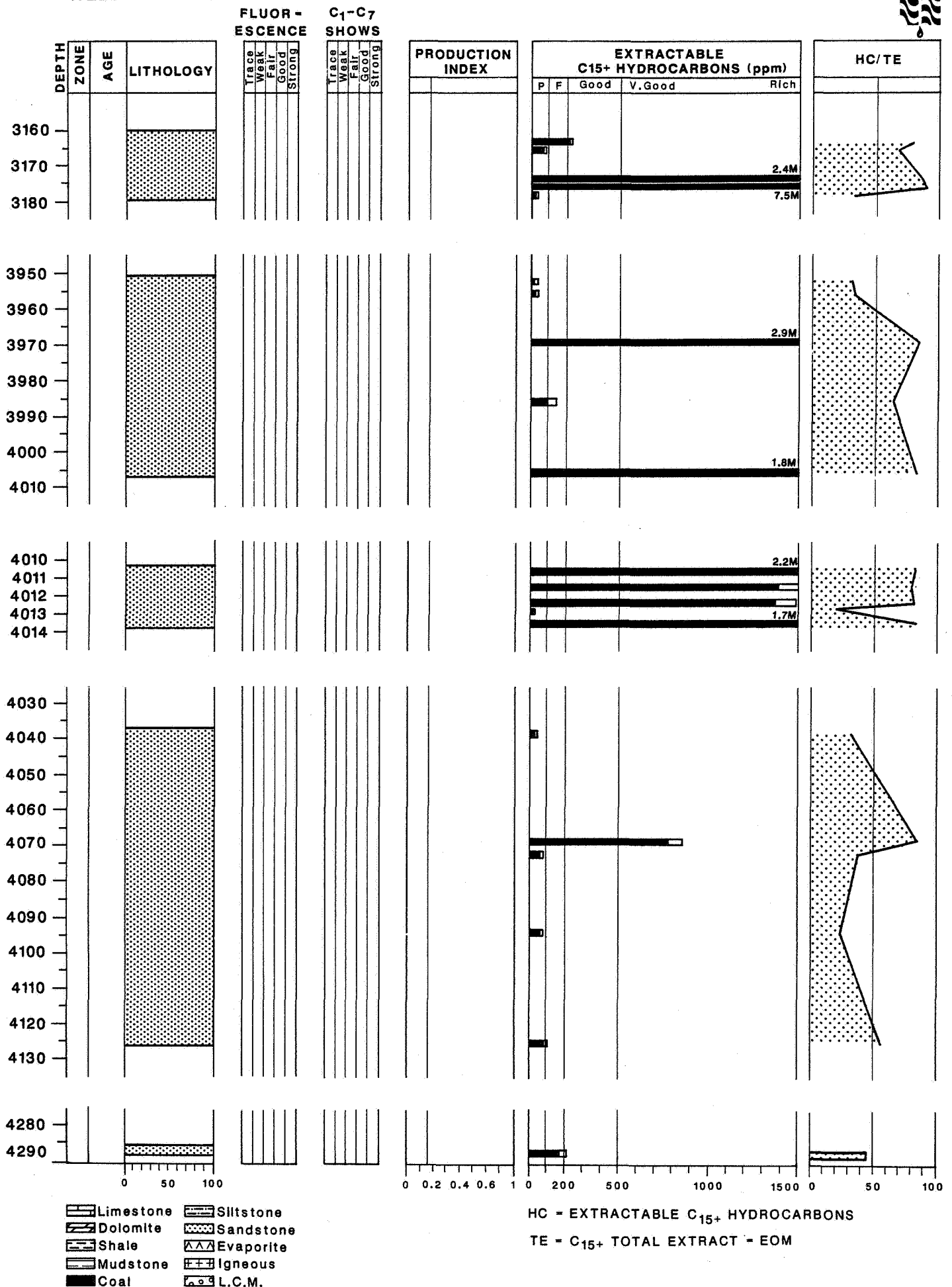


FIGURE 2
WELL 6506/12-5

CARBON ISOTOPES

(‰ PDB)

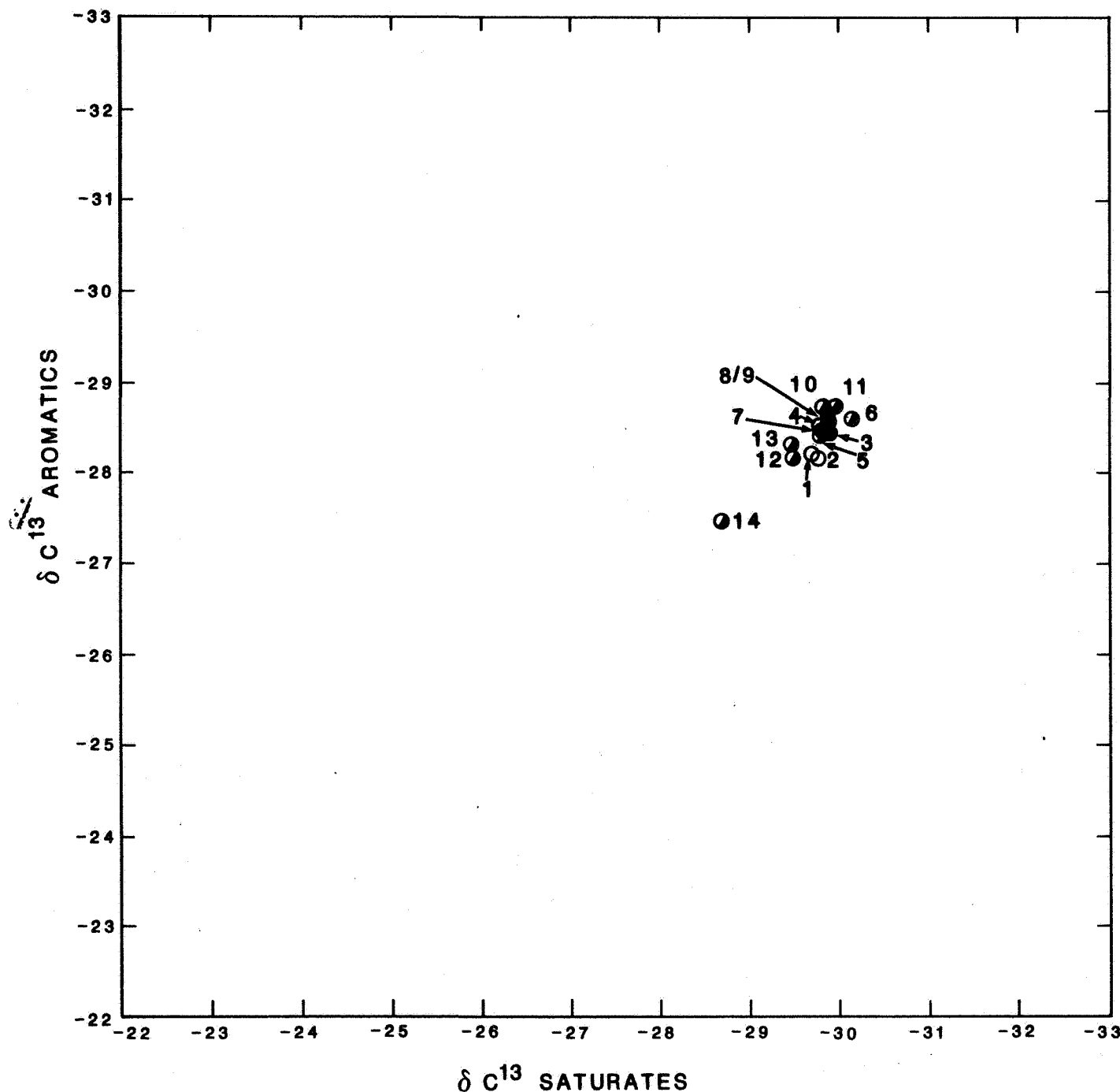


LEGEND

SATURATES vs AROMATICS PLOT

- CRUDE OIL
- SOURCE ROCK
- ◐ EXTRACTED SHOW

- 1 3174.00-3177.50m
DST # 4
- 2 4004.00-4009.50m
DST # 2
- 3 3163.37m
- 4 3164.70-3164.80m
- 5 3174.48-3174.59m
- 6 3178.60-3178.67m
- 7 3955.79m
- 8 3969.89-3970.00m
- 9 4006.10-4006.25m
- 10 4010.76-4010.87m
- 11 4011.52-4011.67m
- 12 4039.68-4039.82m
- 13 4069.76-4069.87m
- 14 4125.38-4125.50m



SHOW CHARACTERISATION

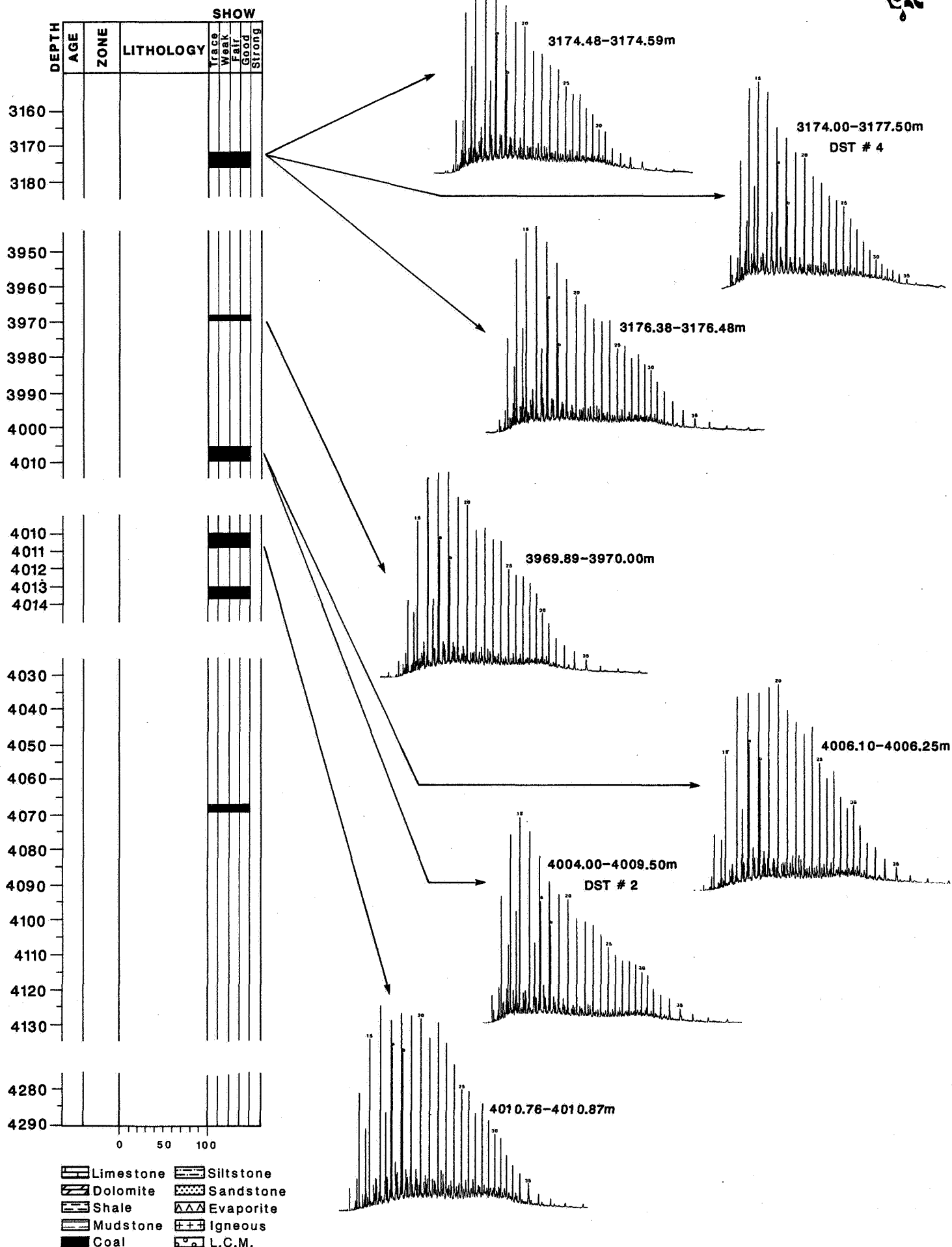


FIGURE 4
WELL 6506/12-5

GALIMOV CARBON ISOTOPE PLOT (‰, PDB)

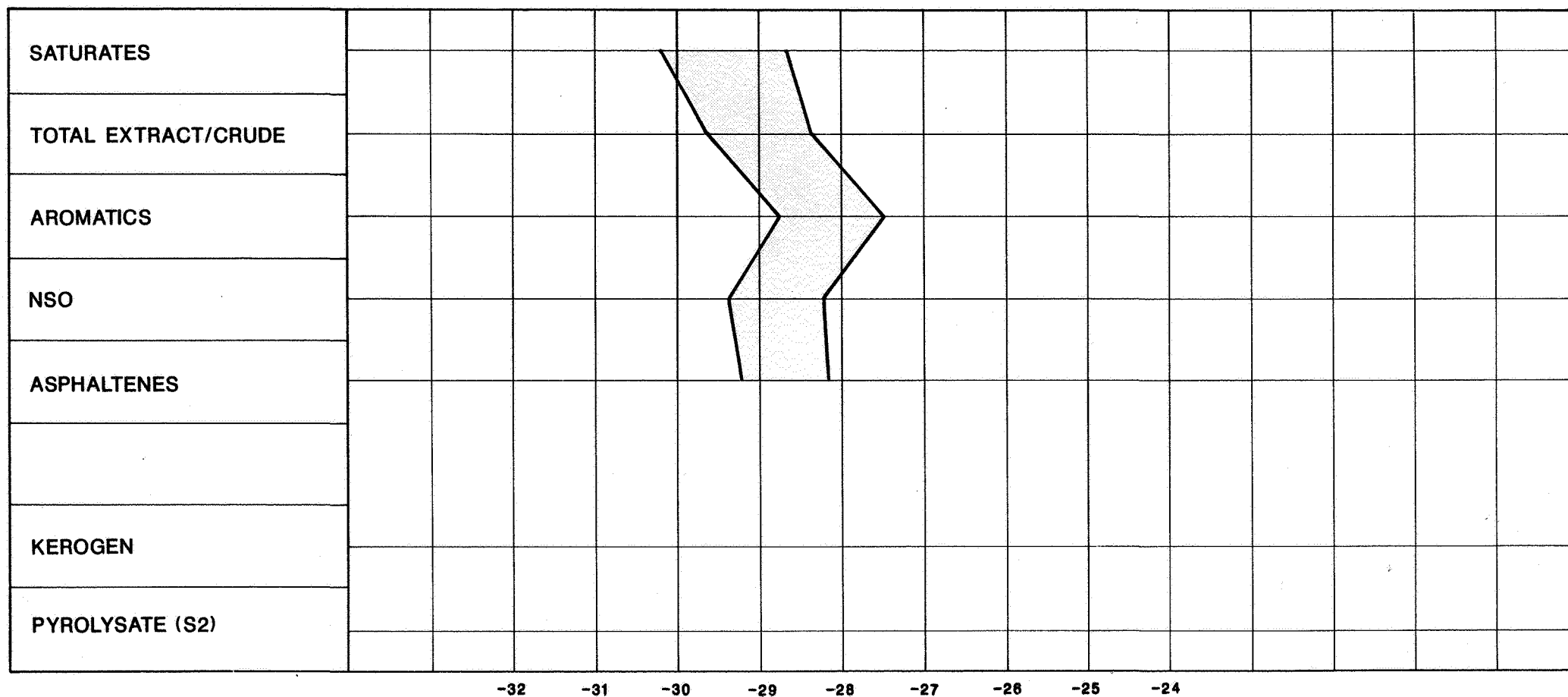
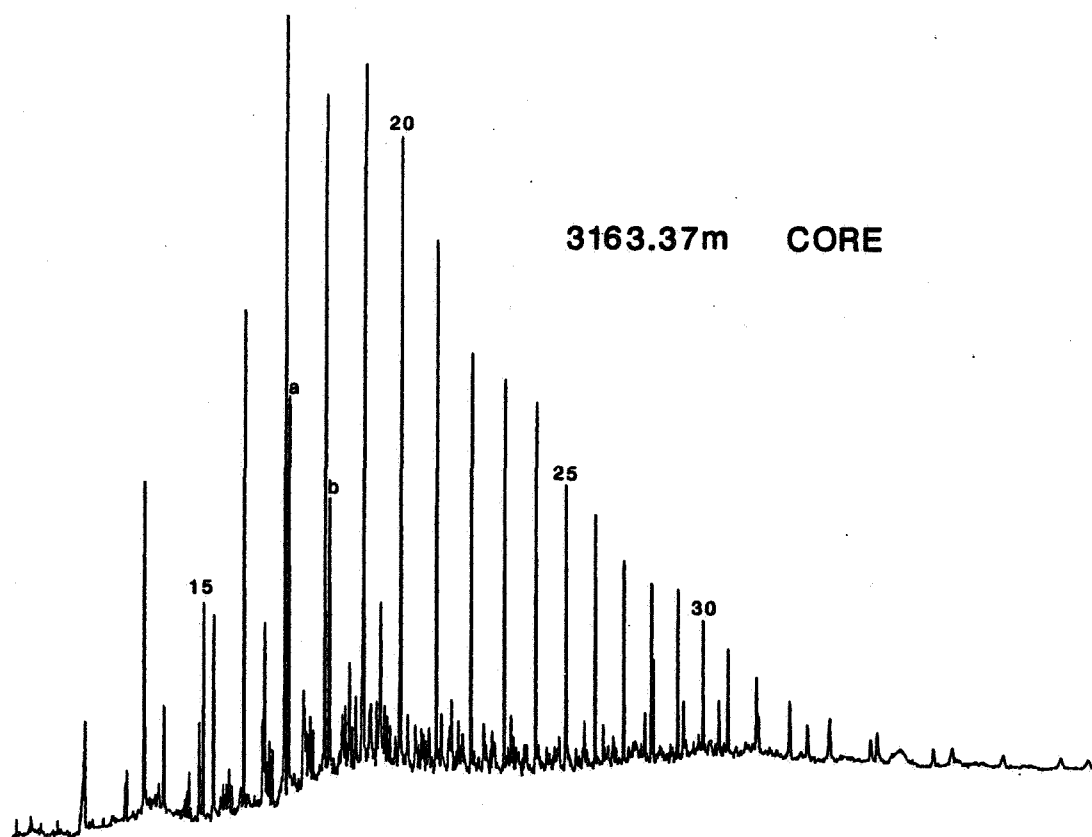
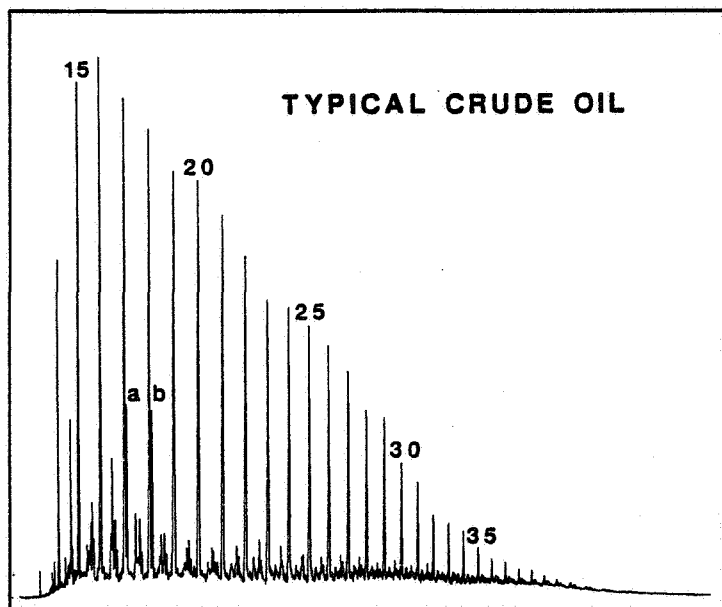


FIGURE 5a **C₁₅+ SATURATES CHROMATOGRAMS**
WELL 6506/12-5

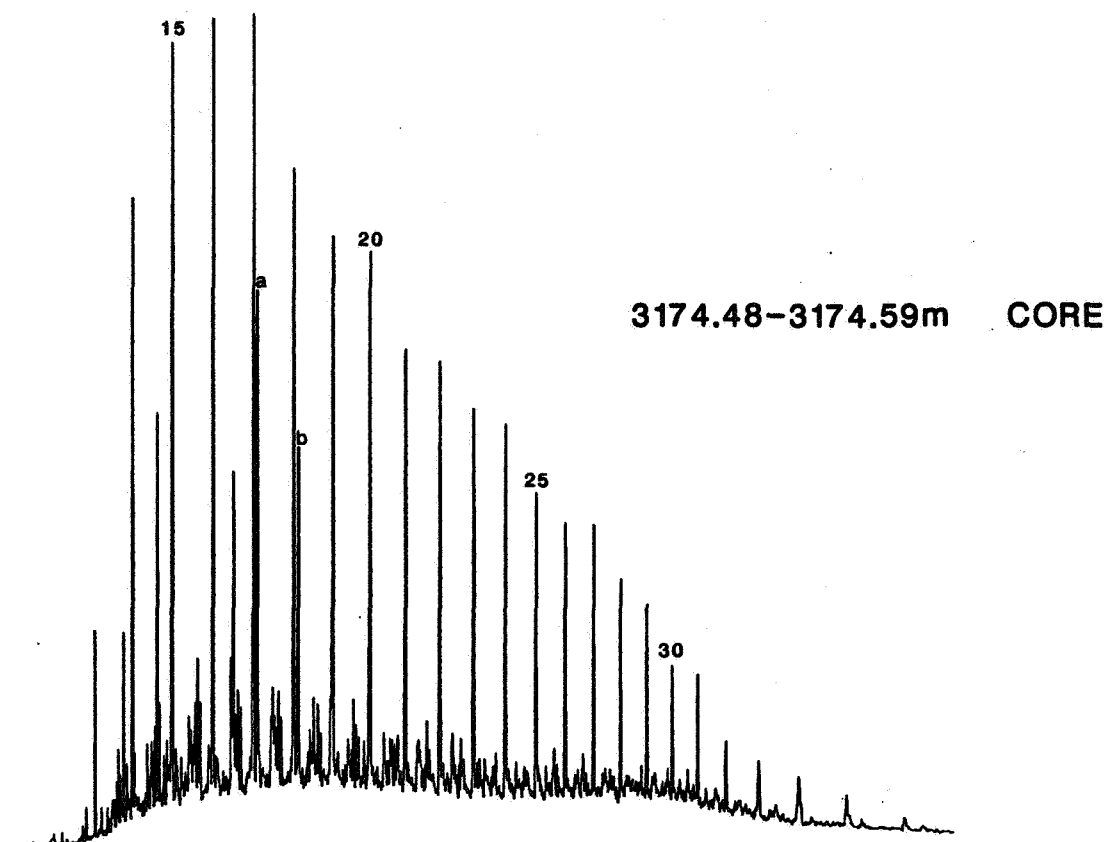
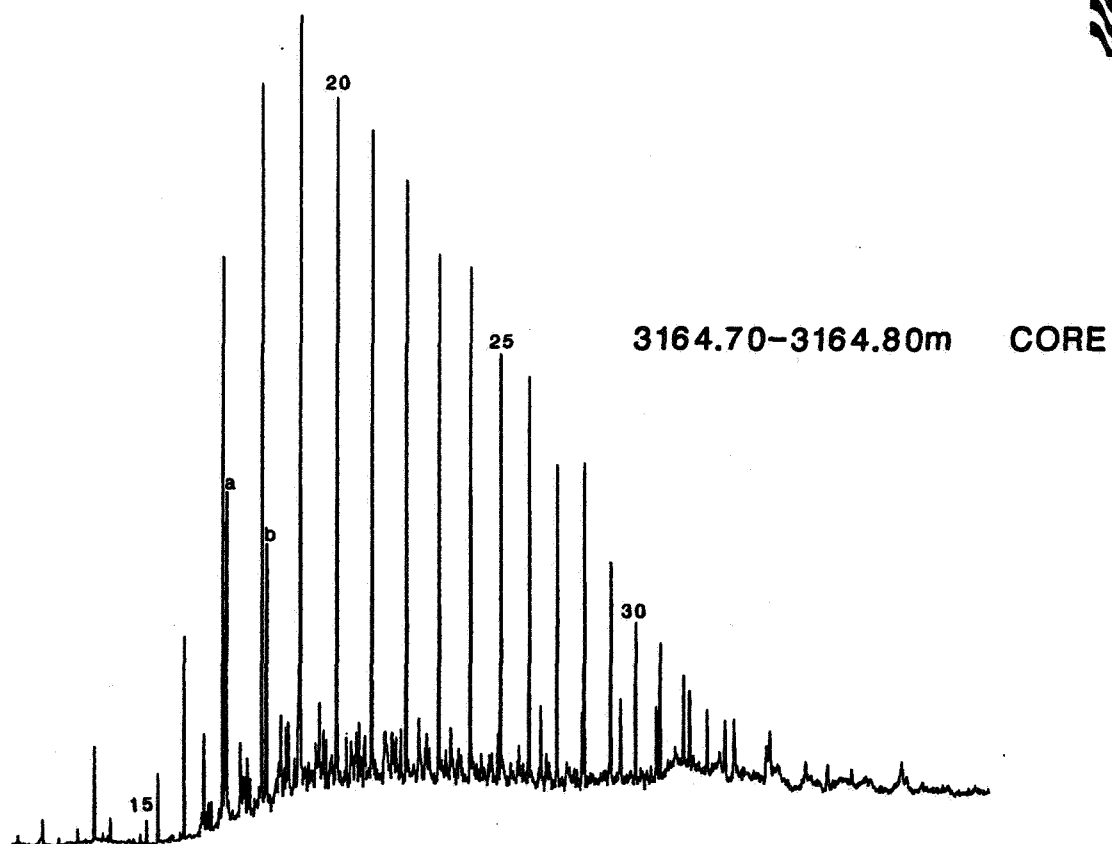


a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20-nC₂₀)

FIGURE 5b **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5



a - PRISTANE

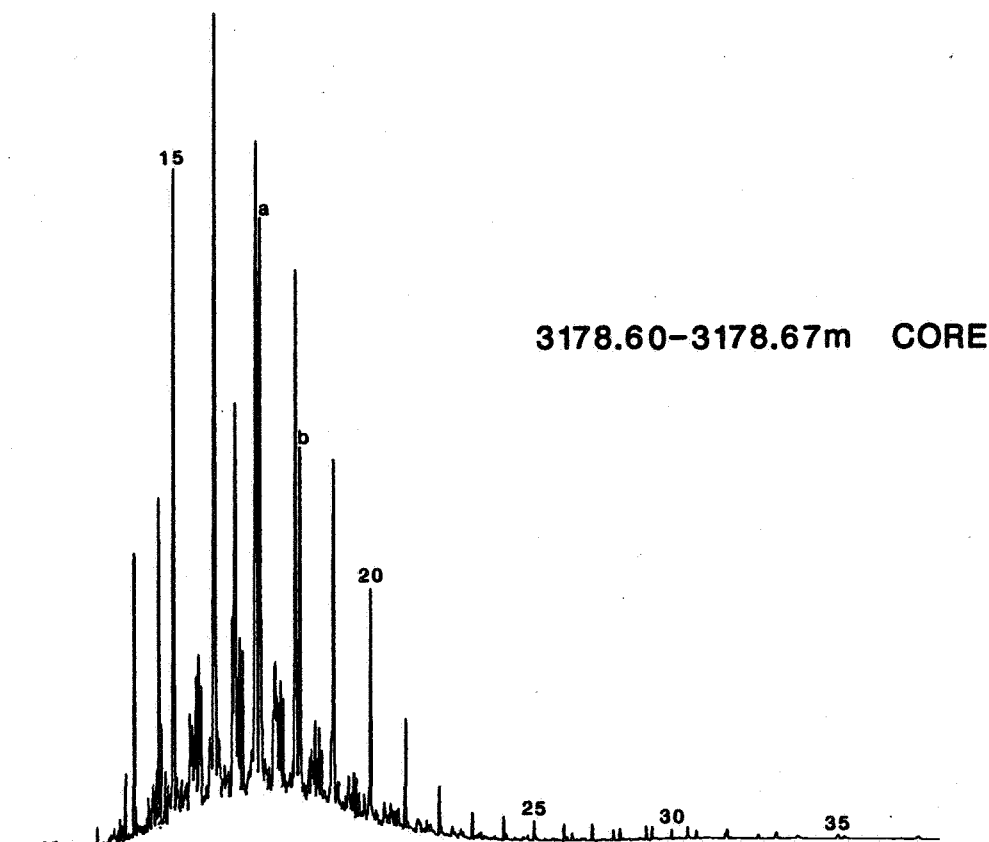
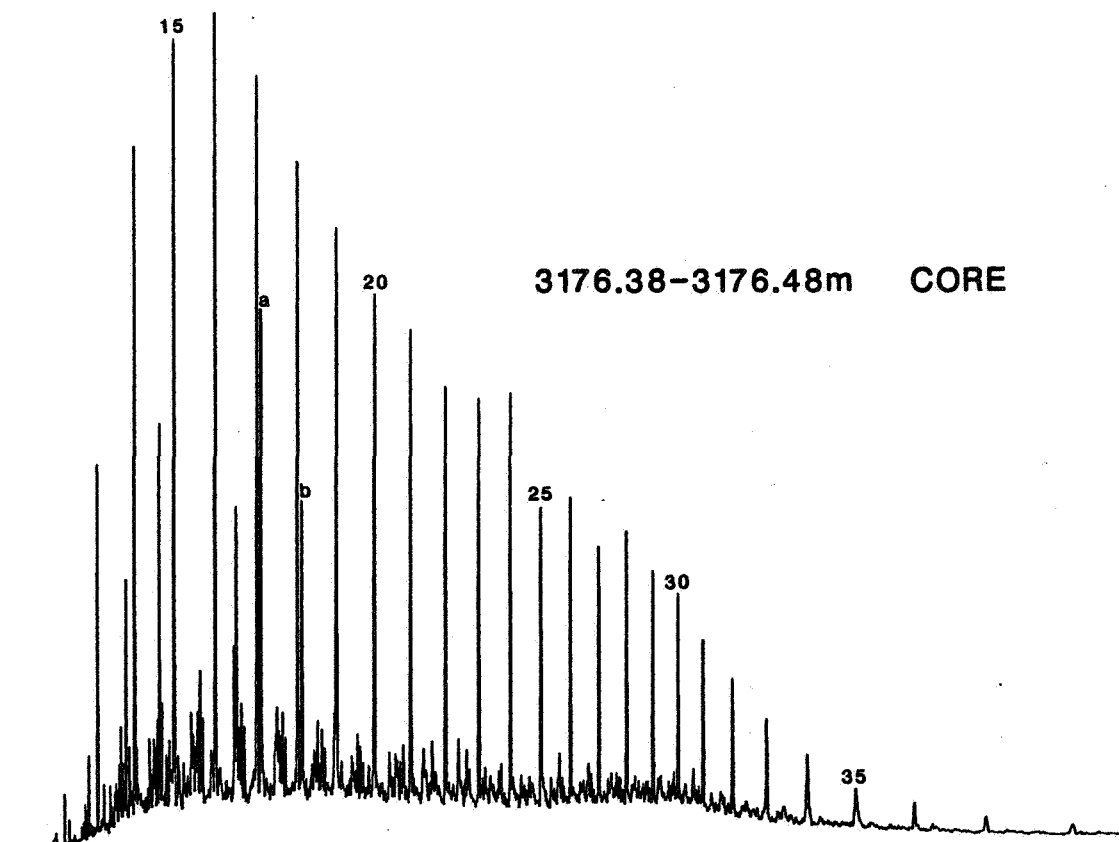
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5c

C₁₅+ SATURATES CHROMATOGRAMS

WELL 6506/12-5



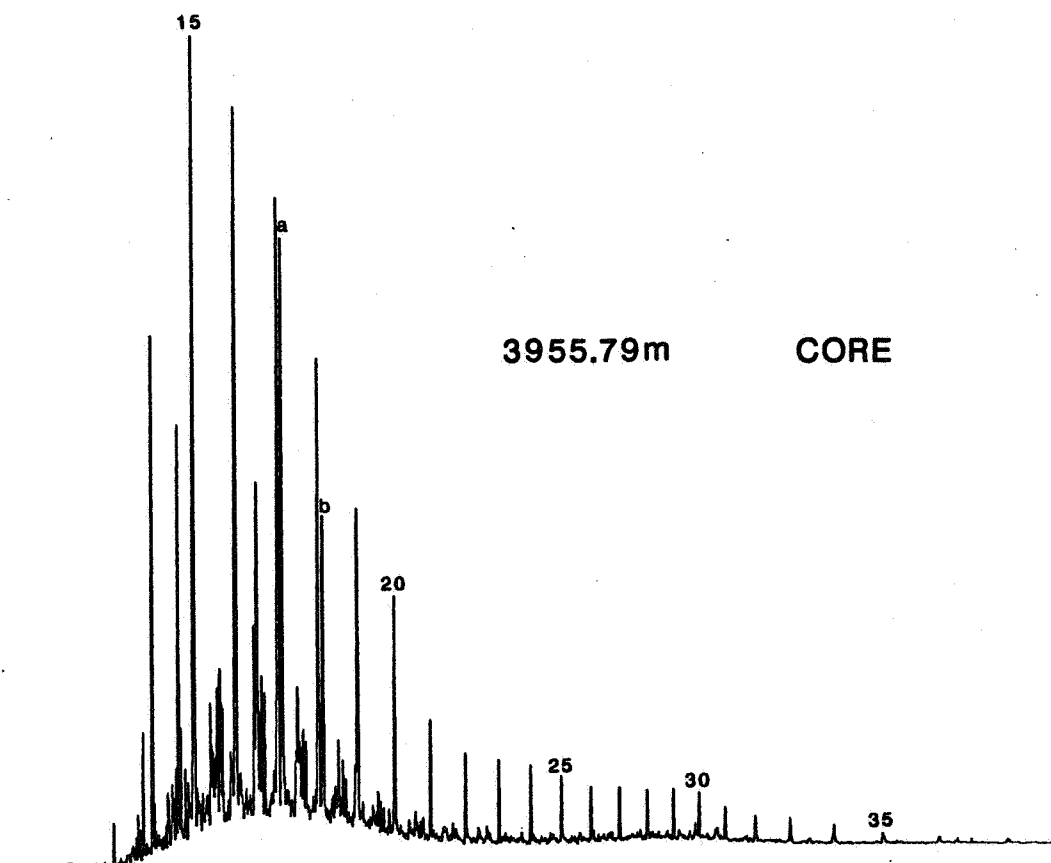
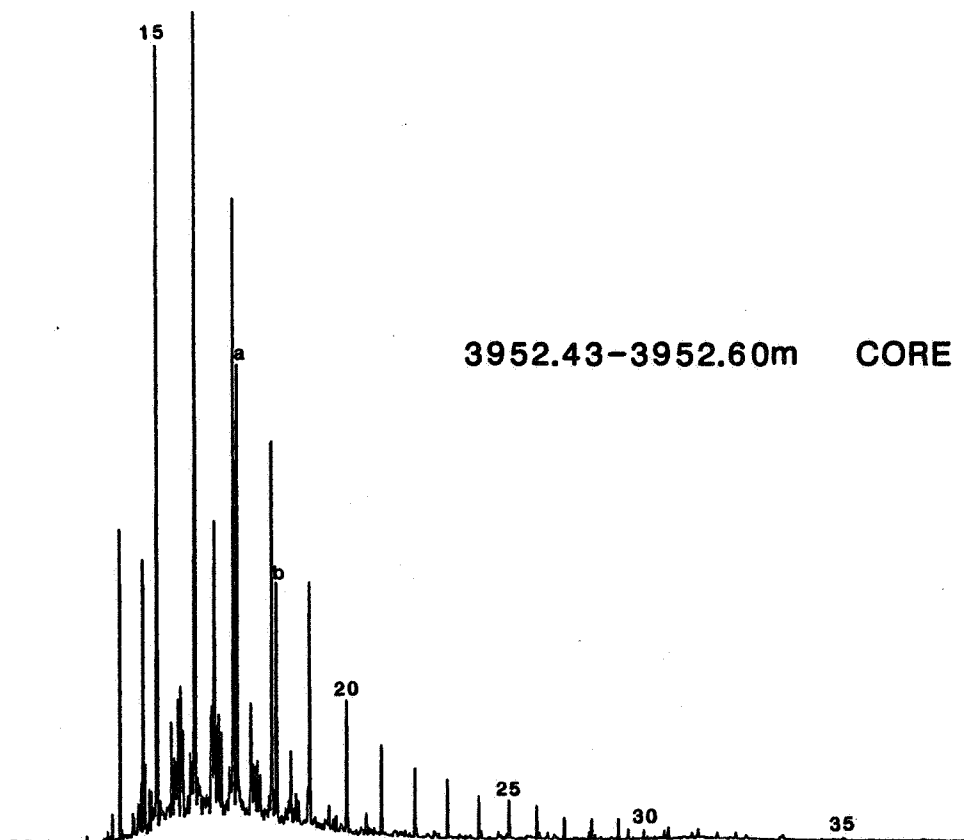
a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5d **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5



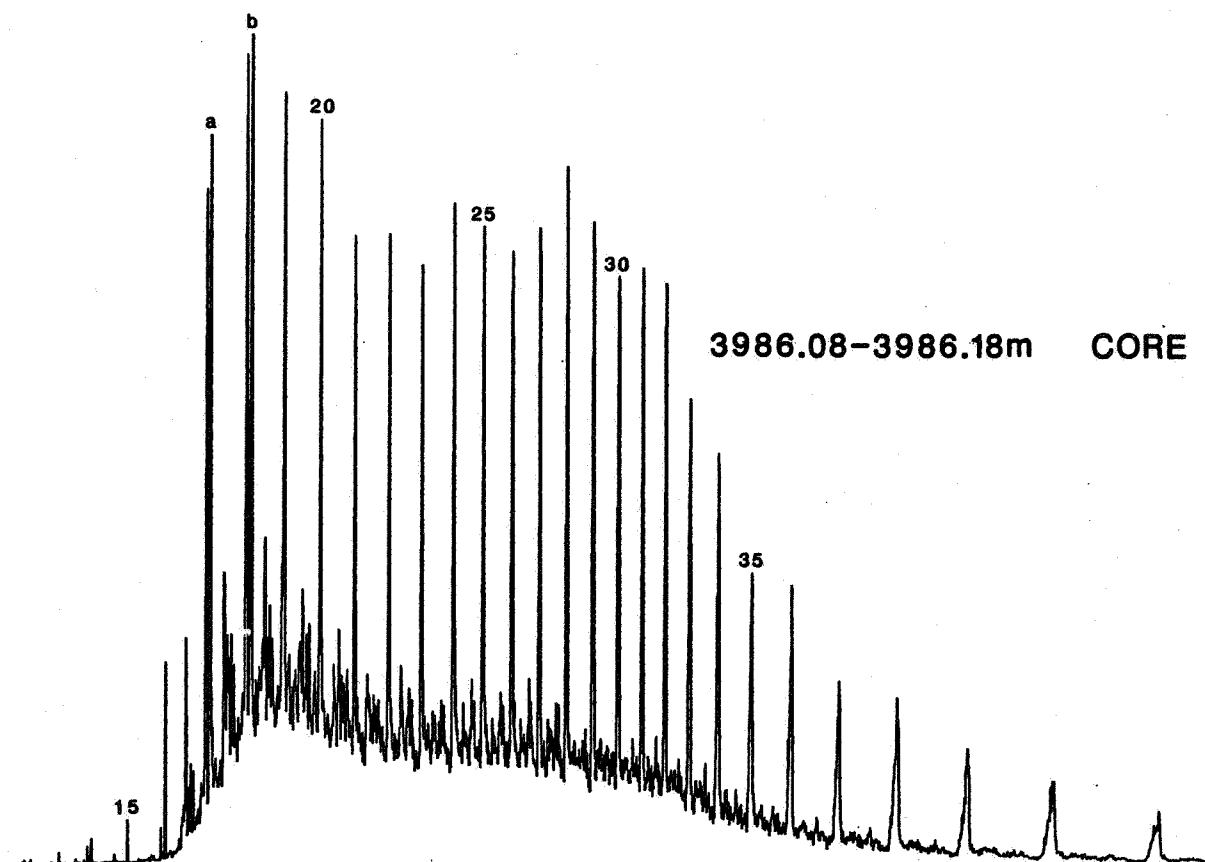
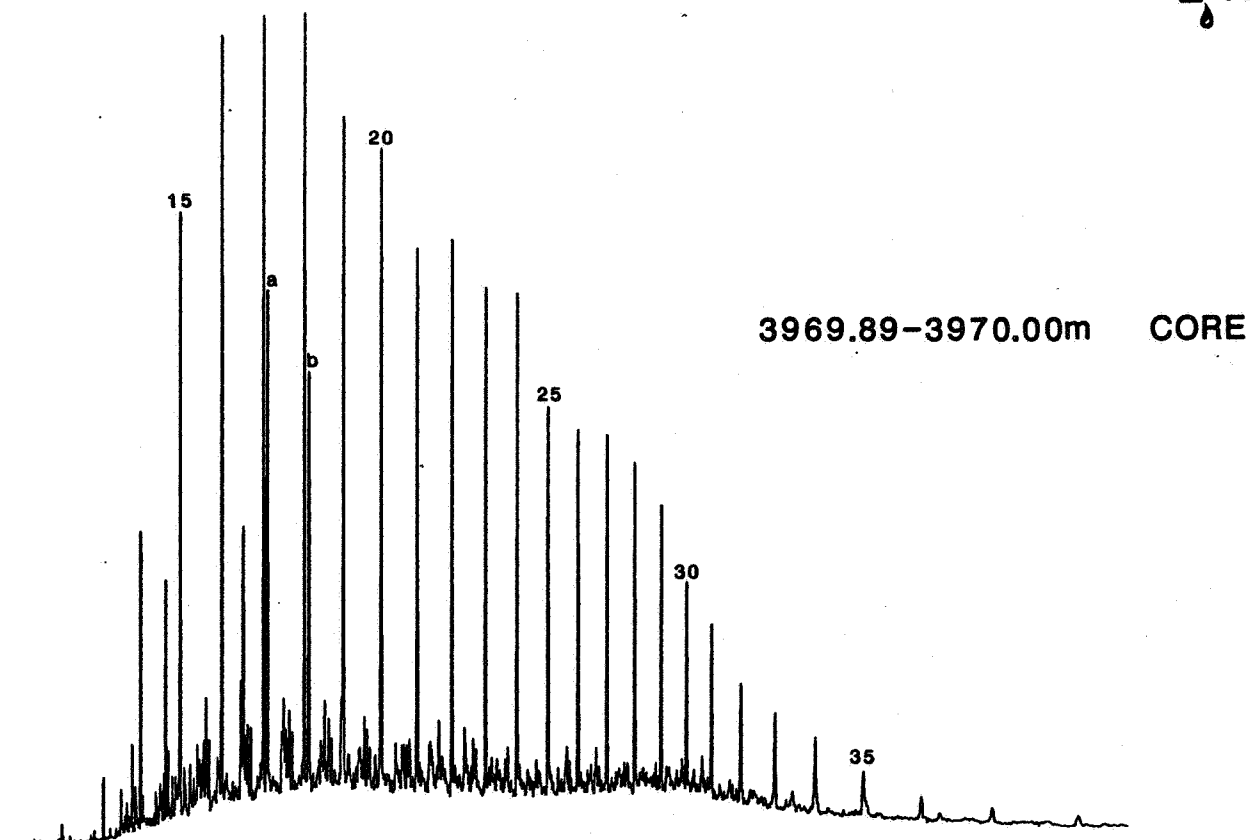
a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5e **C₁₅+ SATURATES CHROMATOGRAMS**

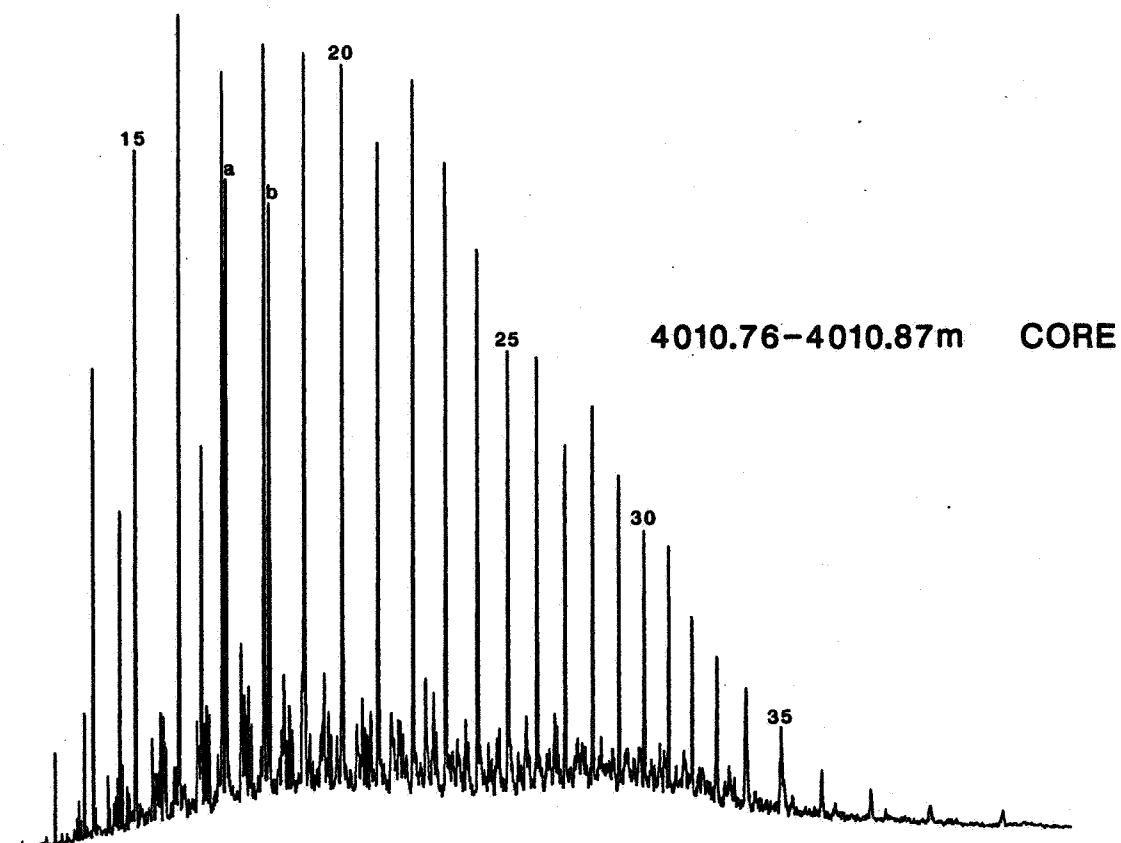
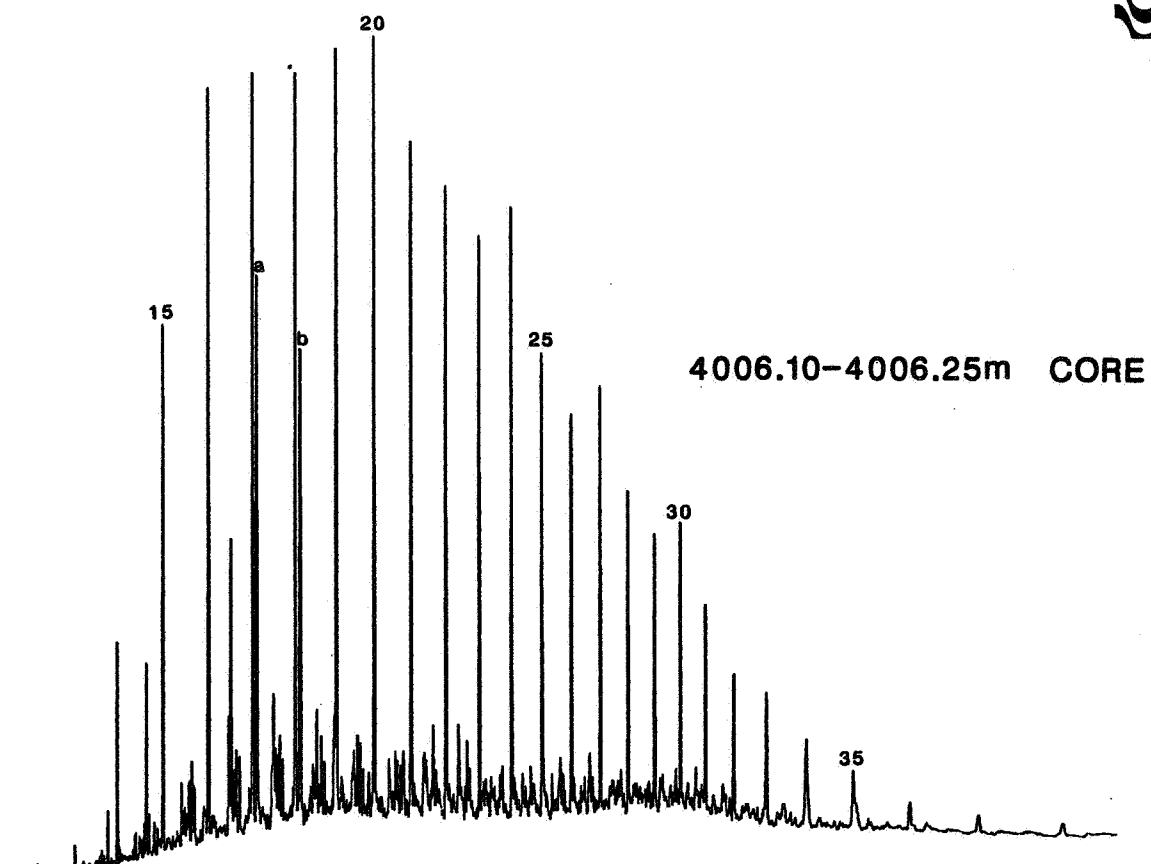
WELL 6506/12-5



a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)



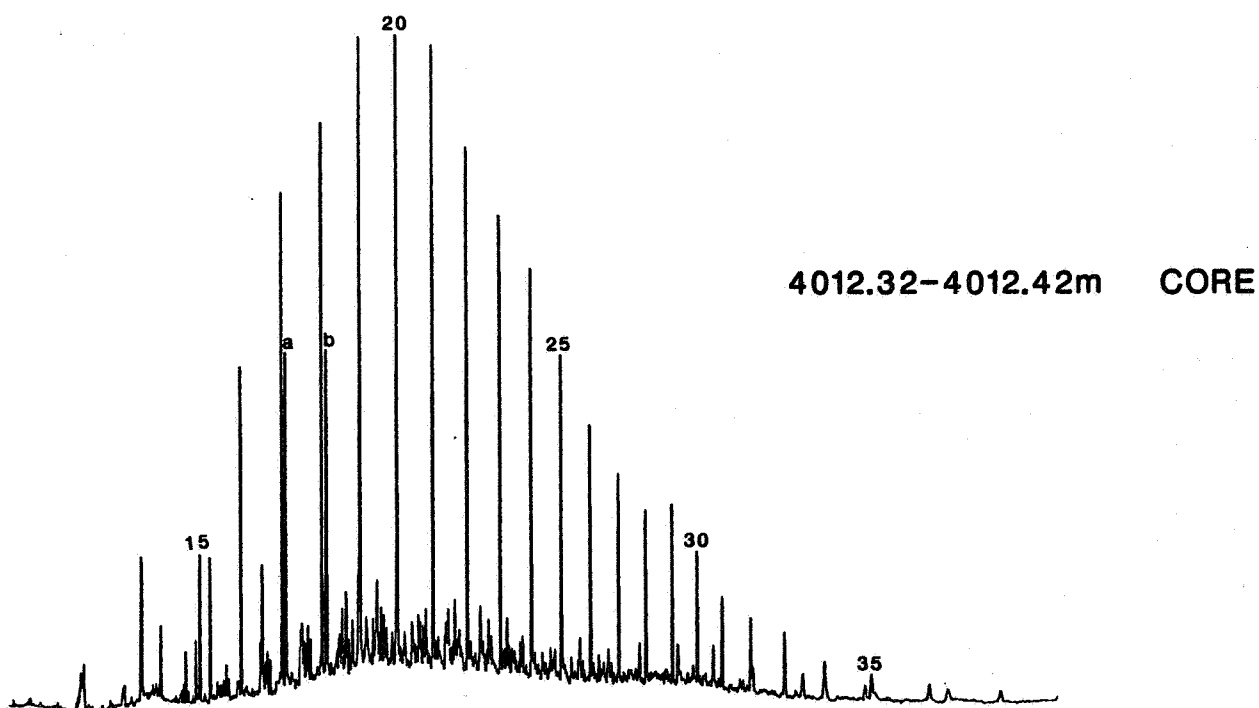
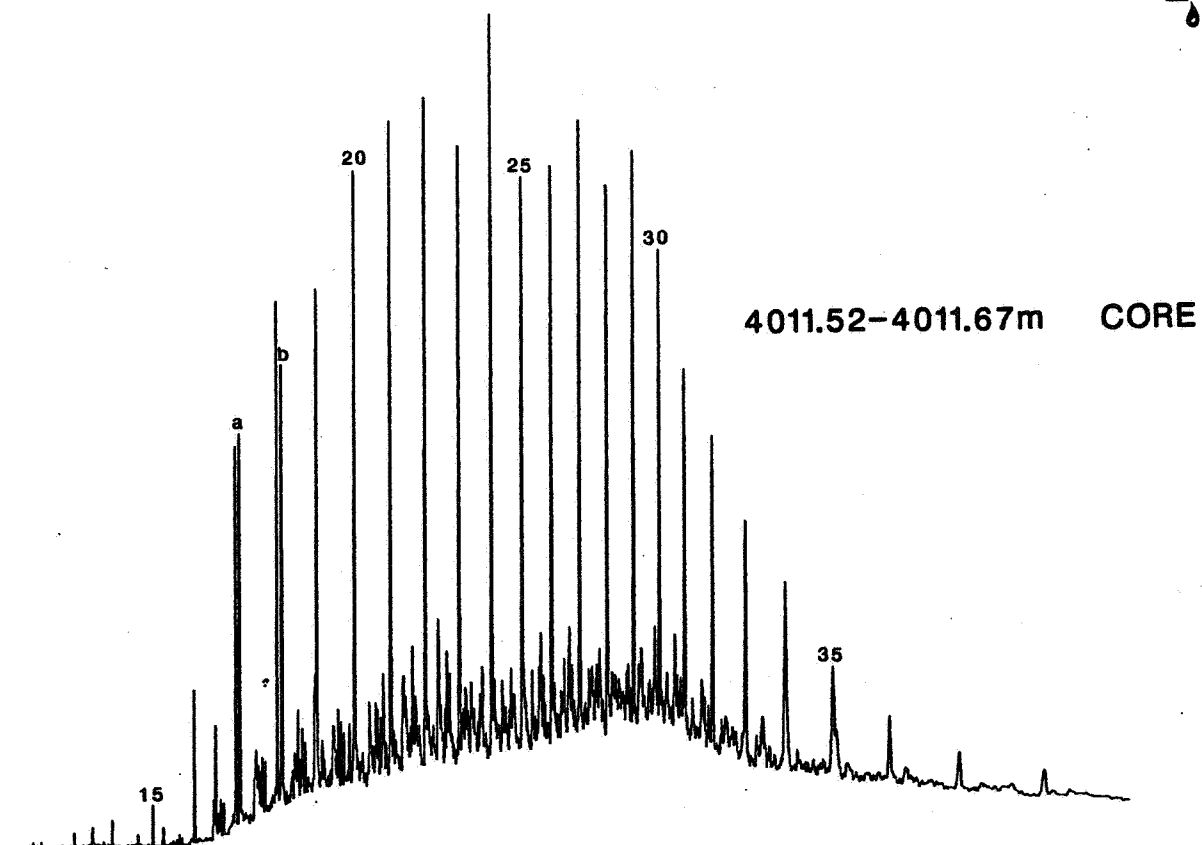
a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5g **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5



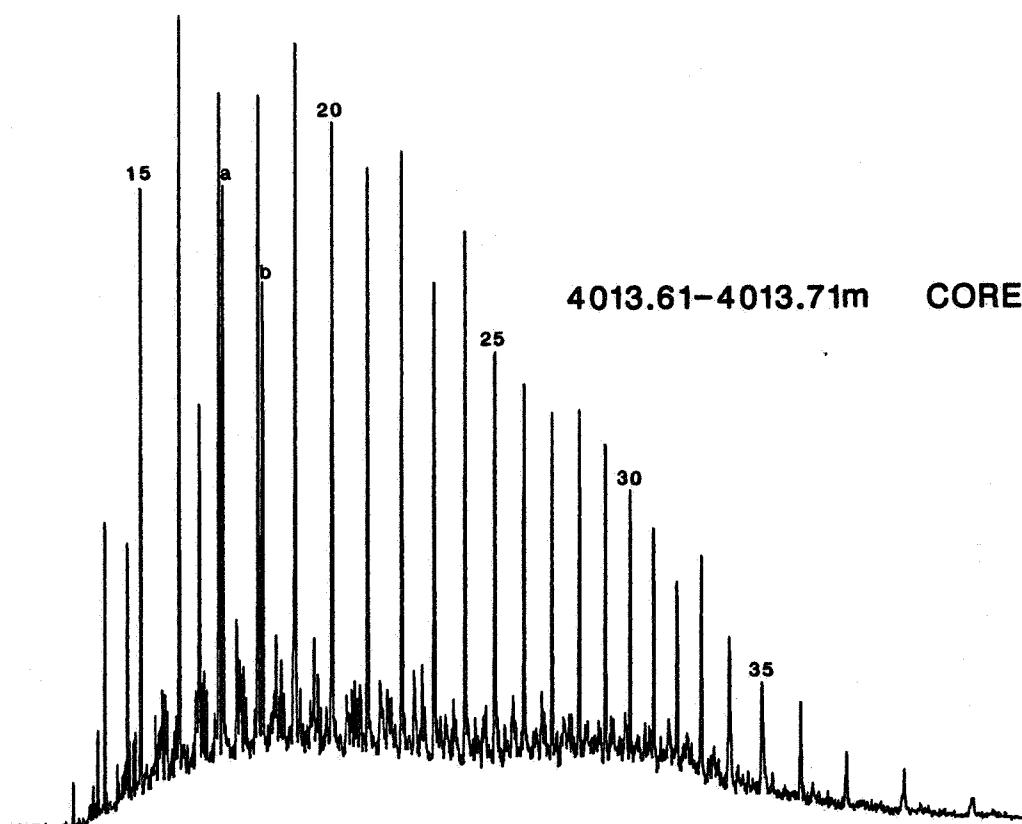
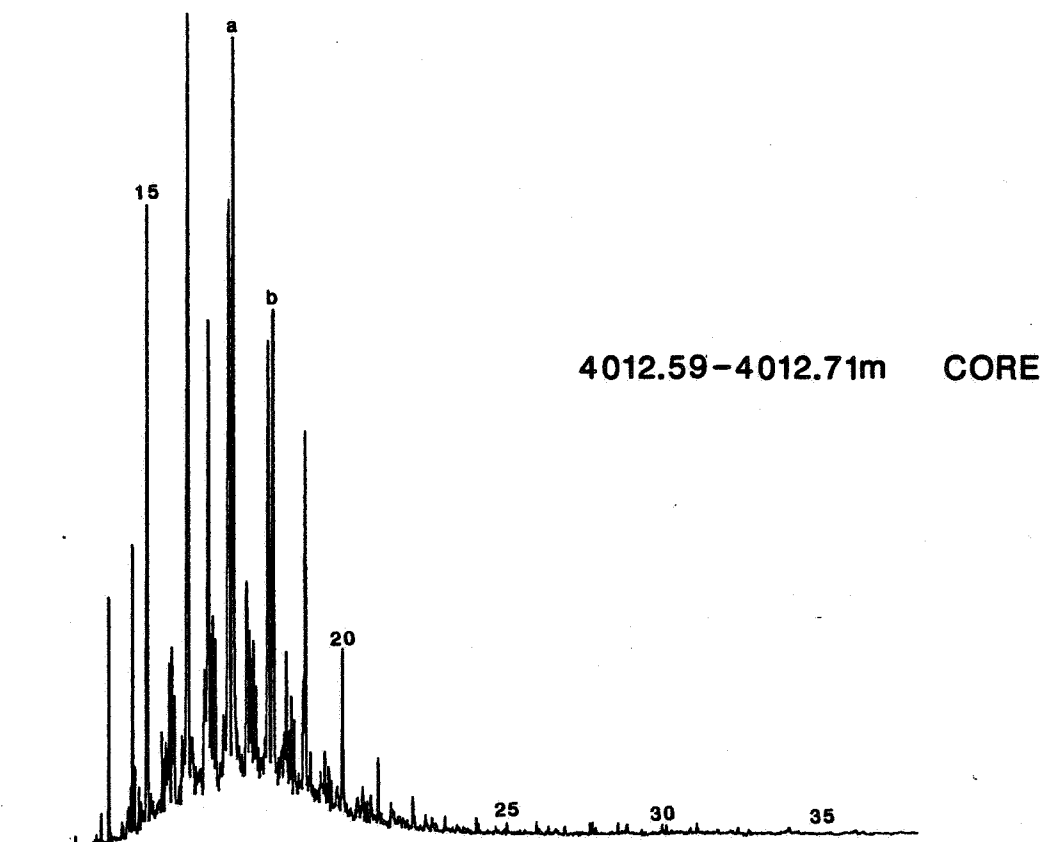
a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5h **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5



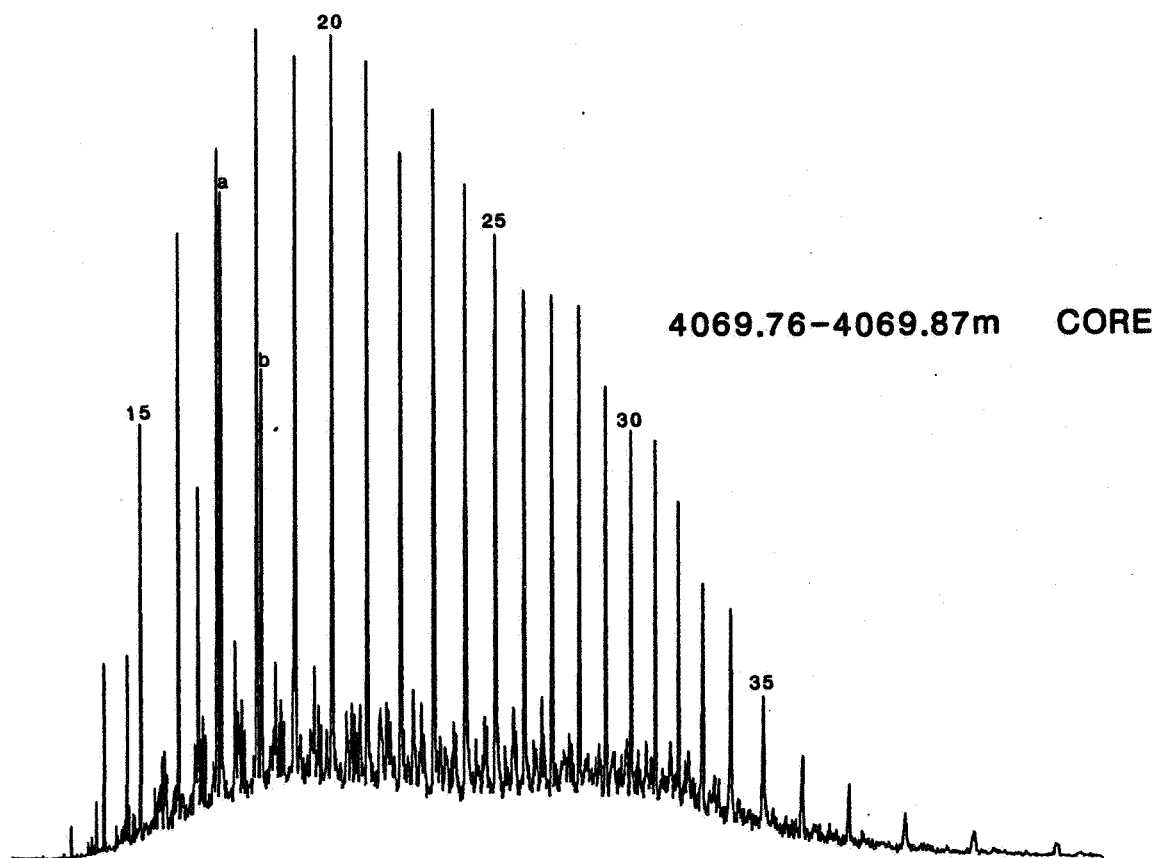
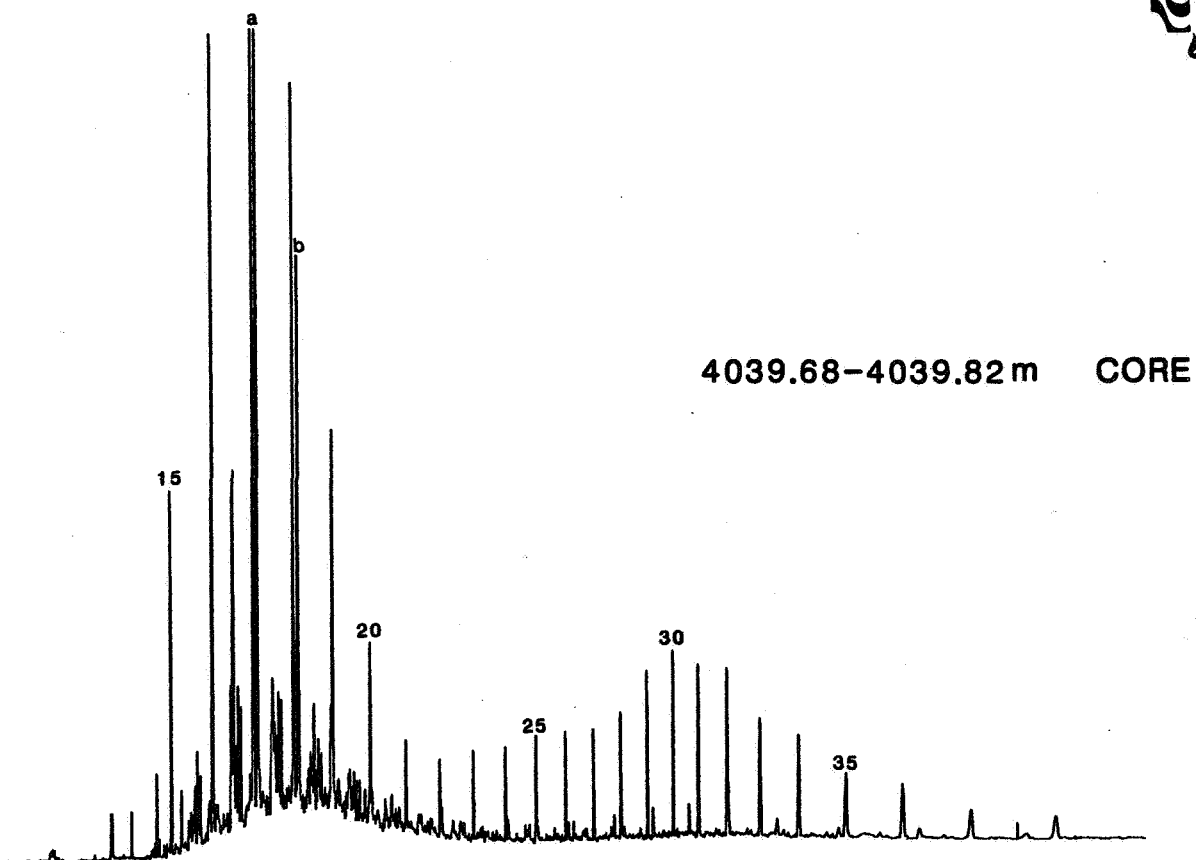
a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5i **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5



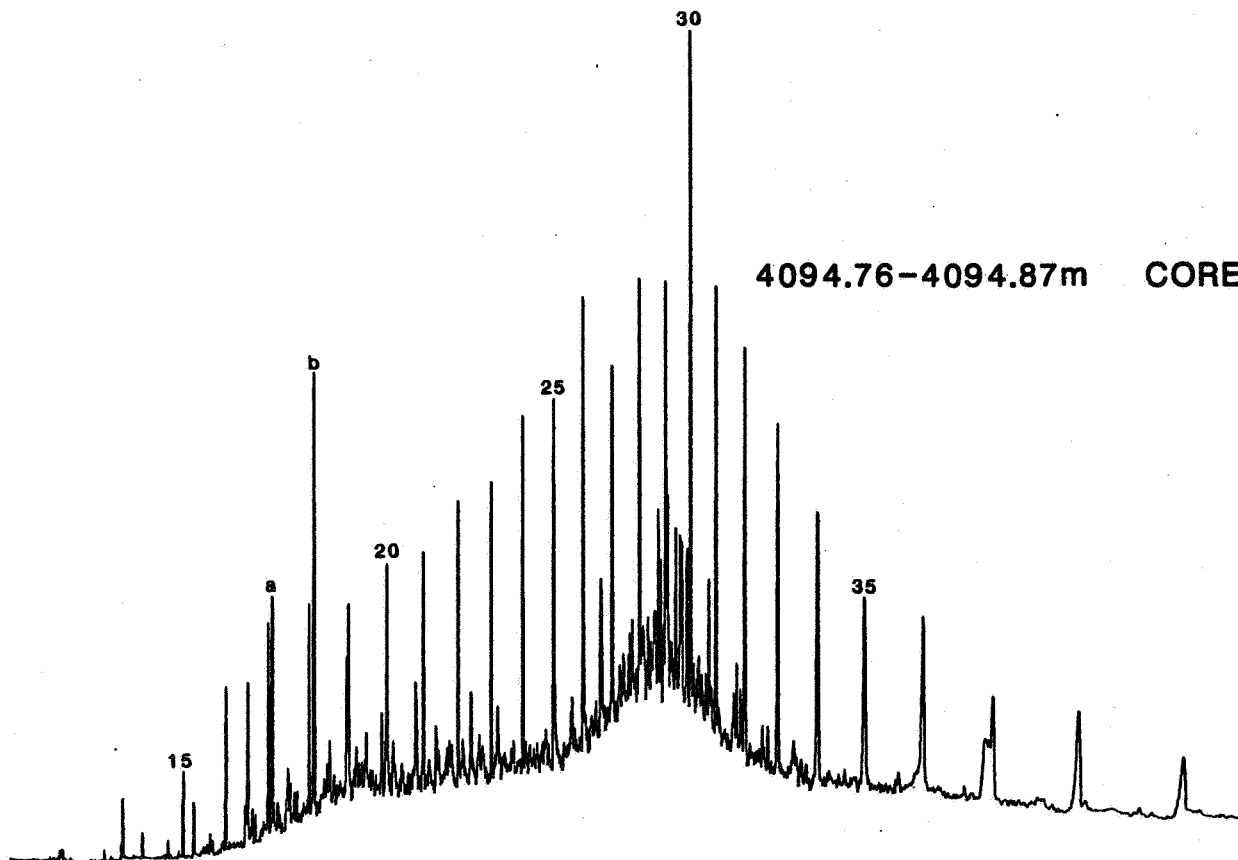
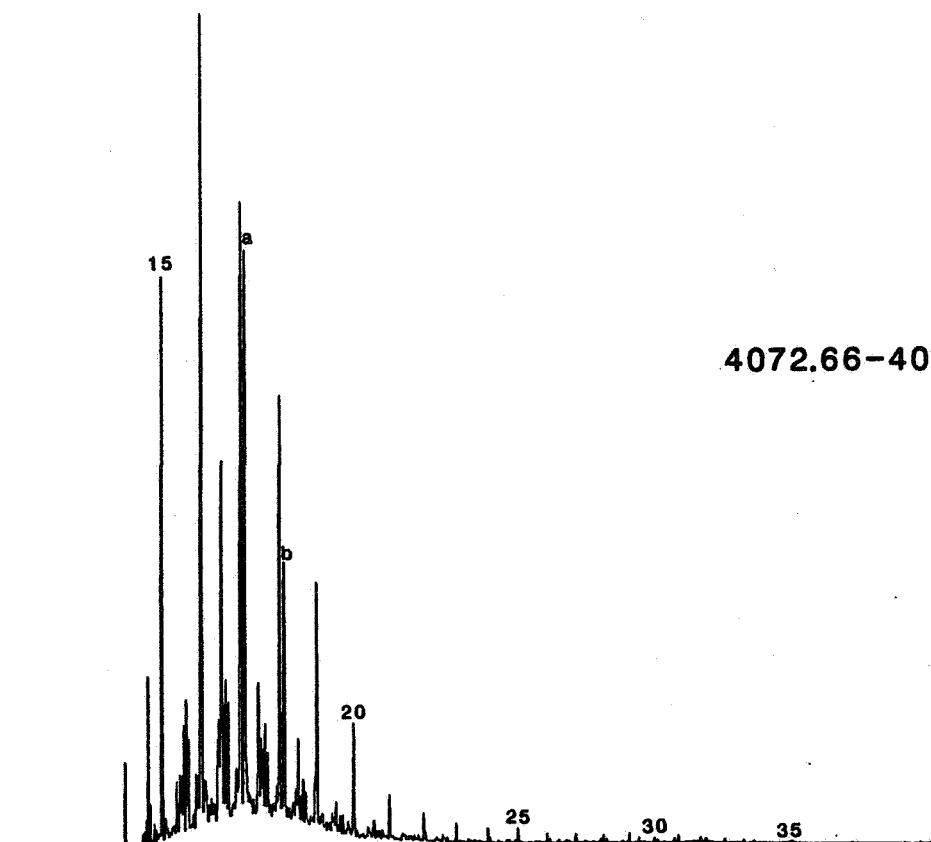
a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5j **C₁₅+ SATURATES CHROMATOGRAMS**

WELL 6506/12-5



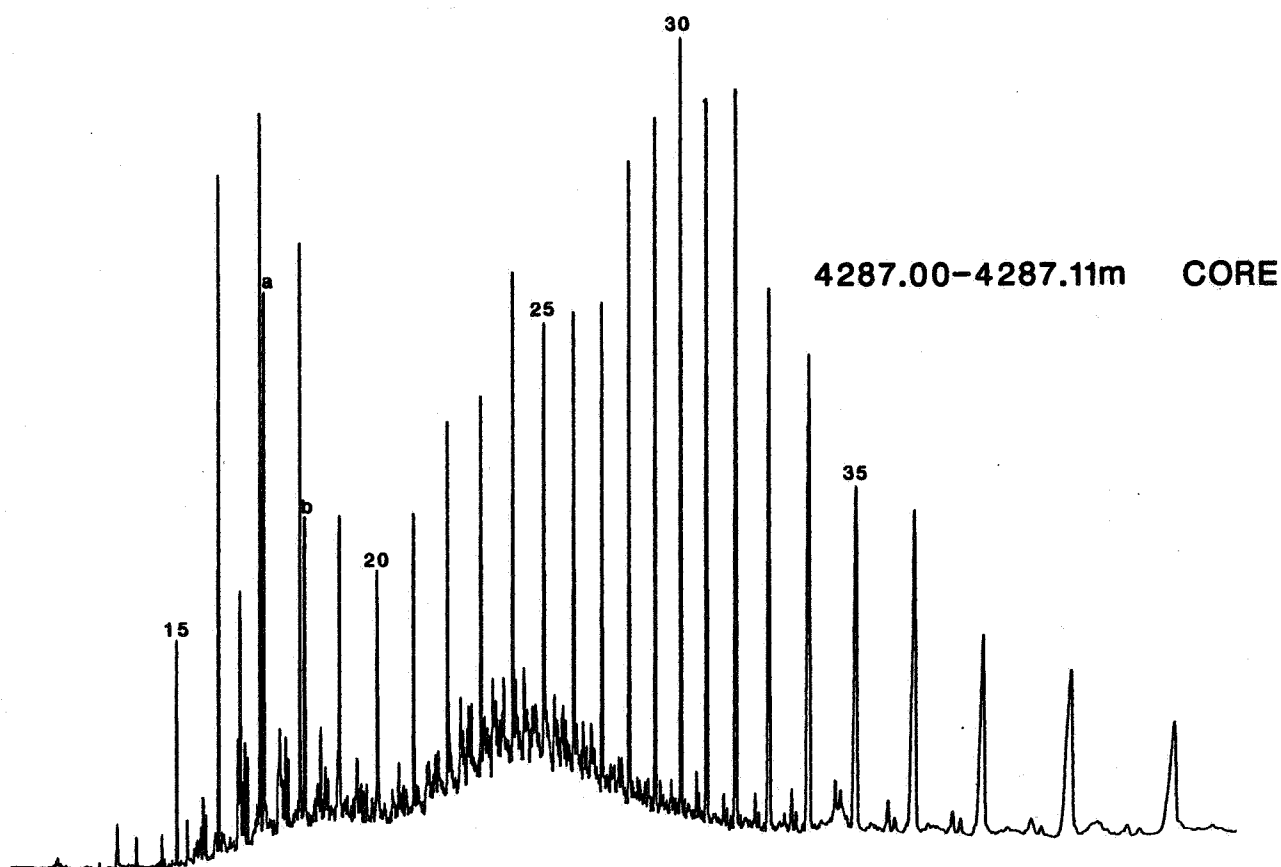
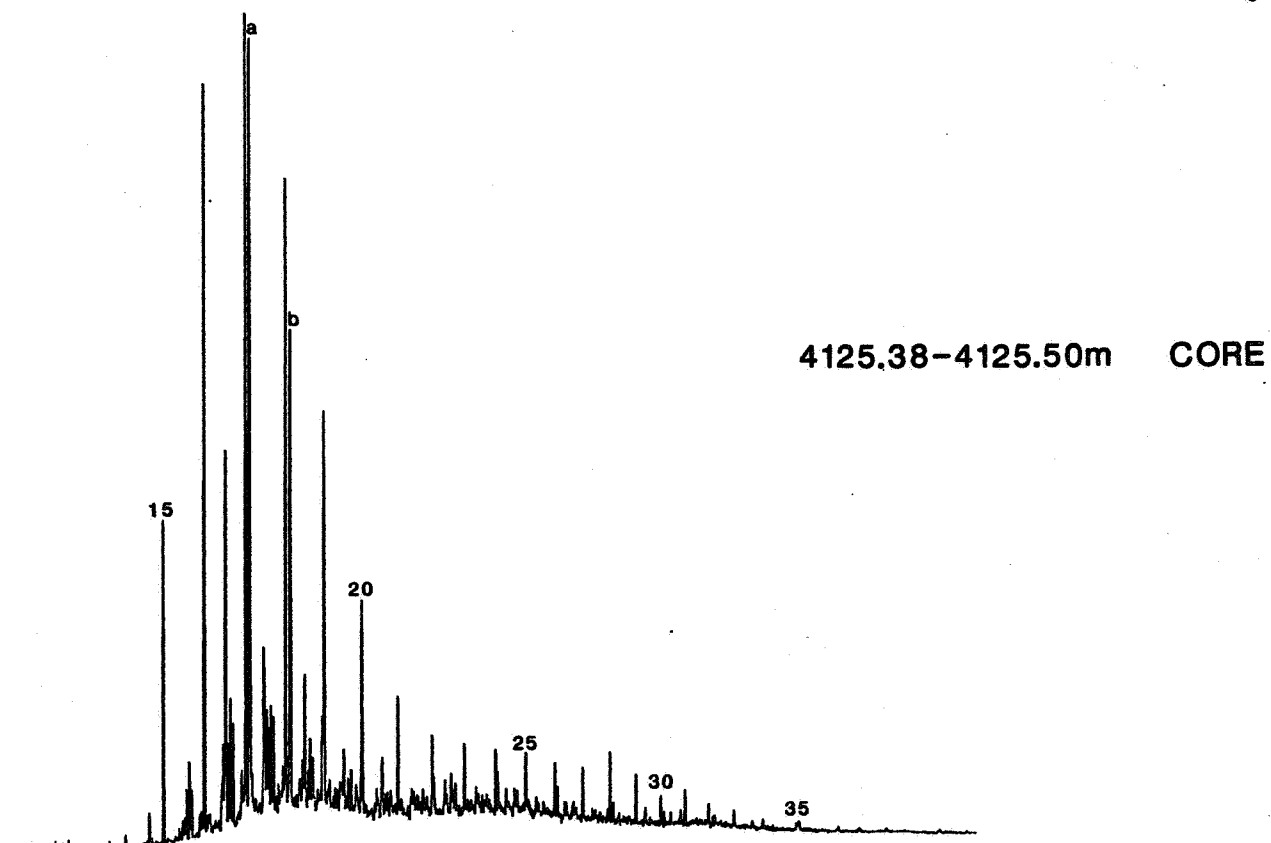
a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 5k **C₁₅+ SATURATES CHROMATOGRAMS**

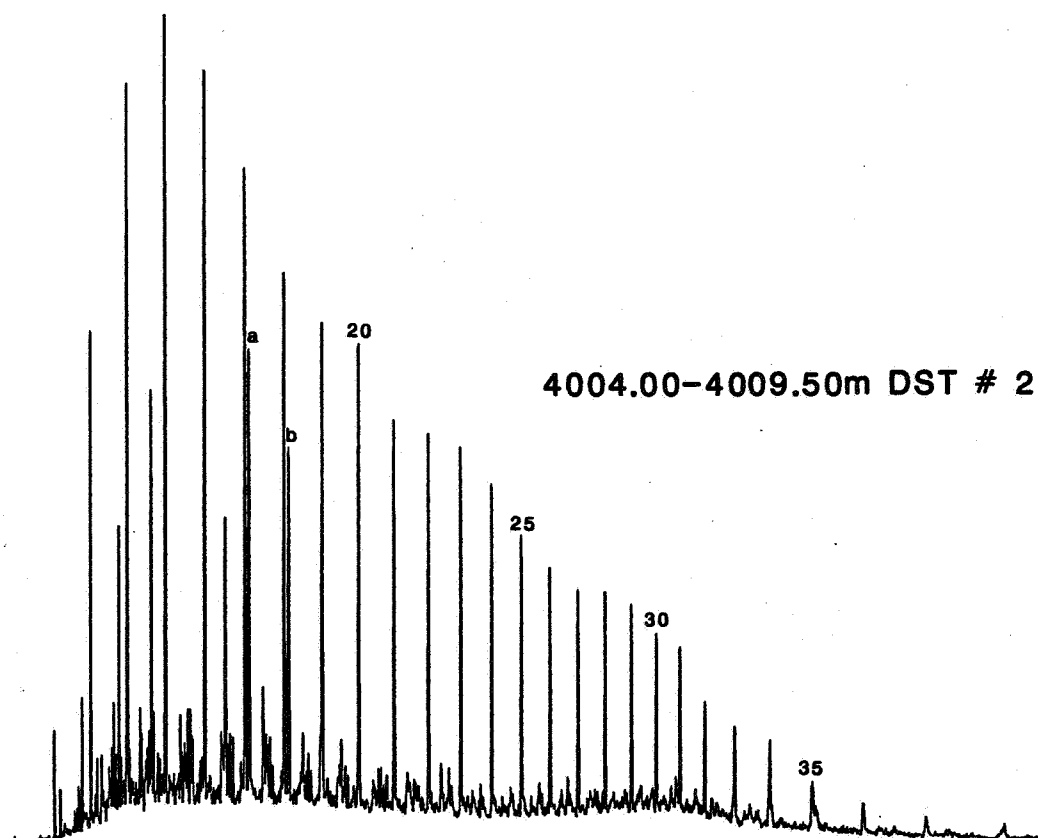
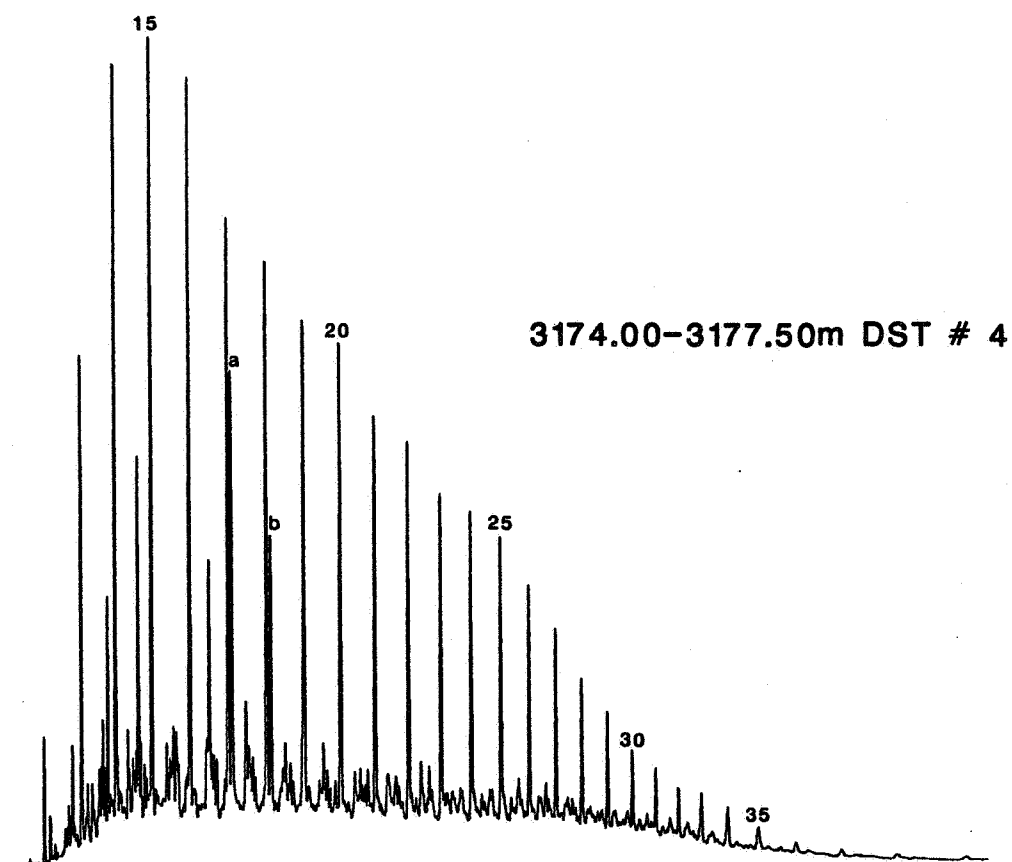
WELL 6506/12-5



a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)



a - PRISTANE

b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

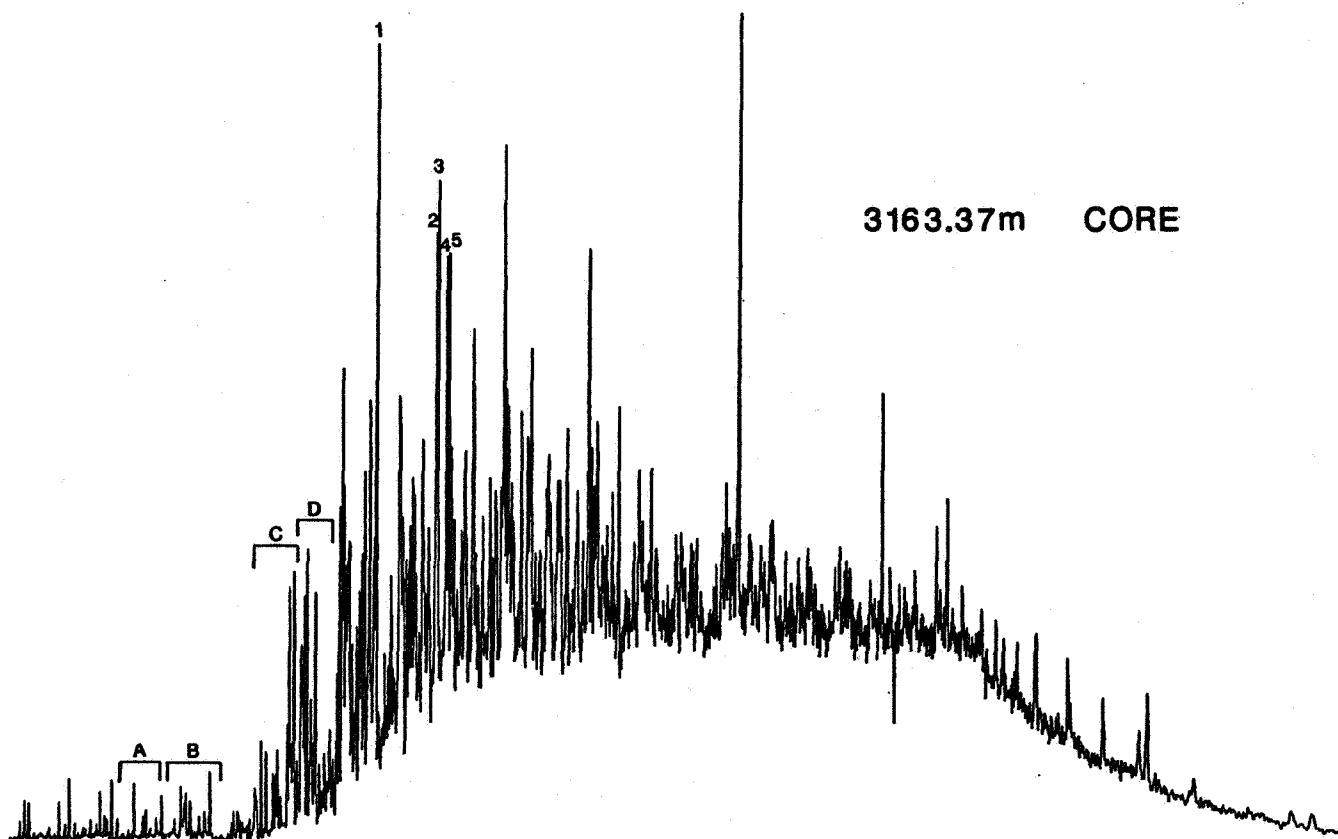
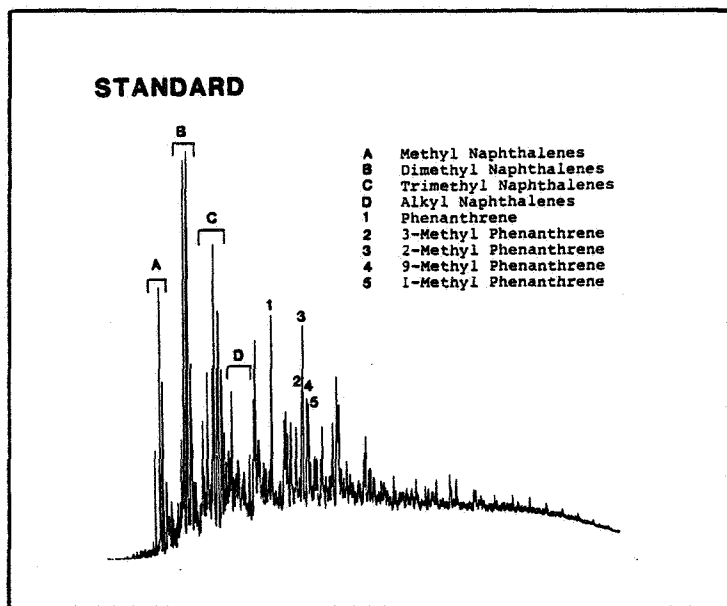
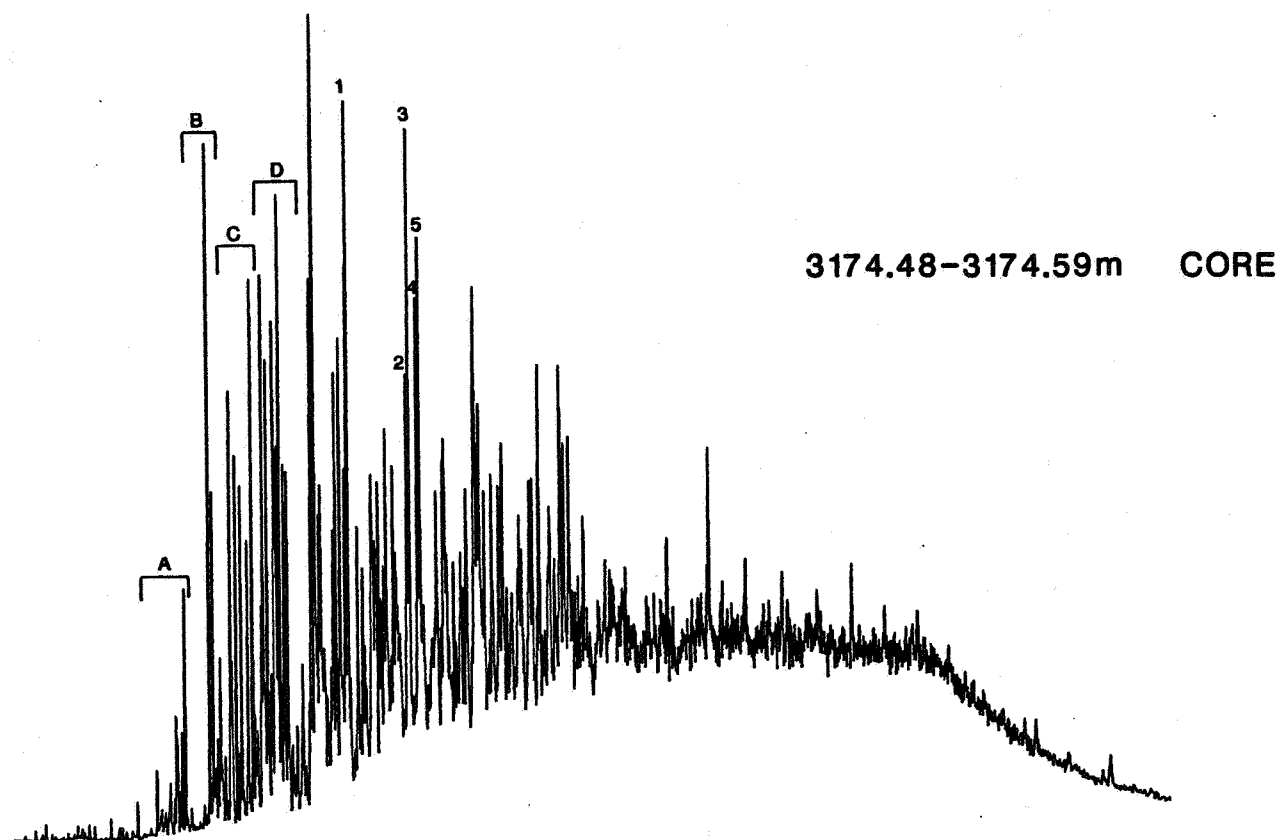
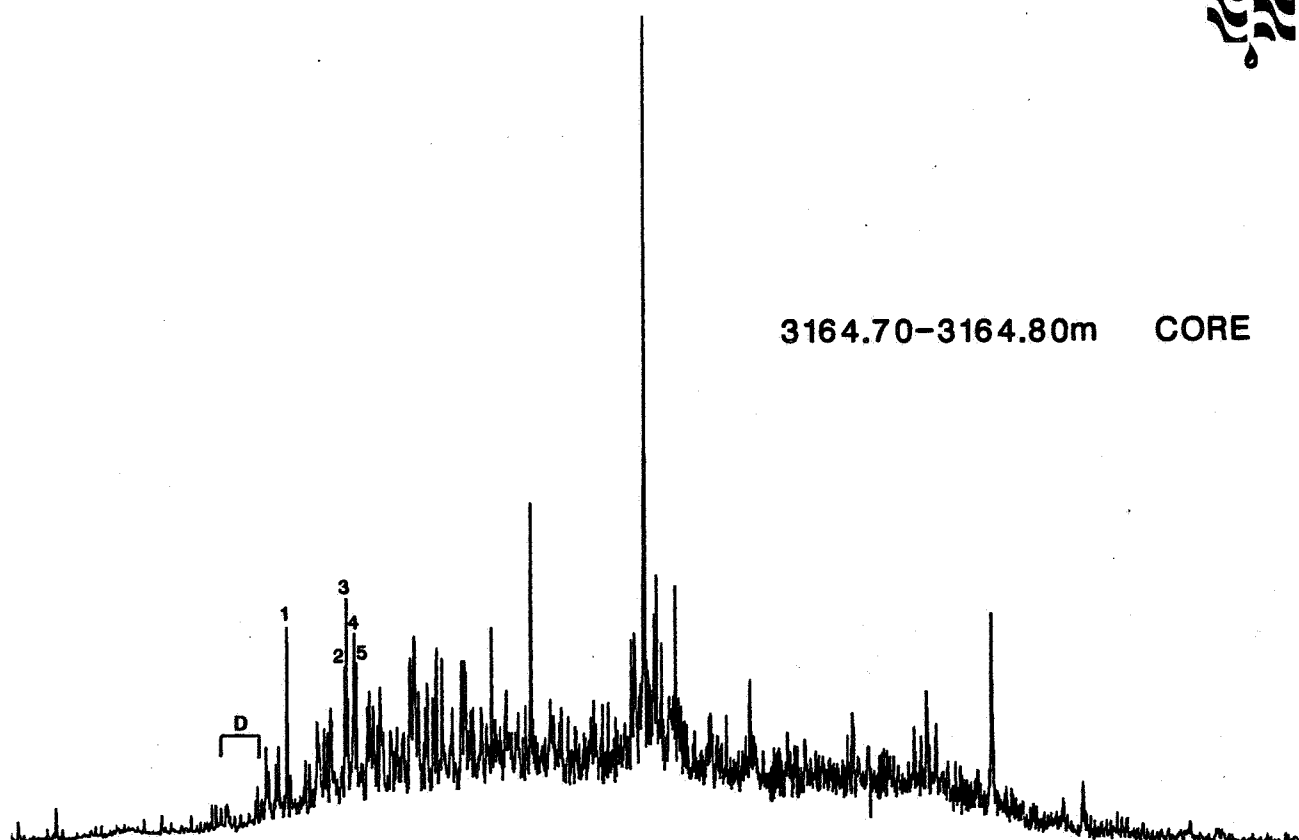


FIGURE 6b **C₁₅+ AROMATIC CHROMATOGRAMS**

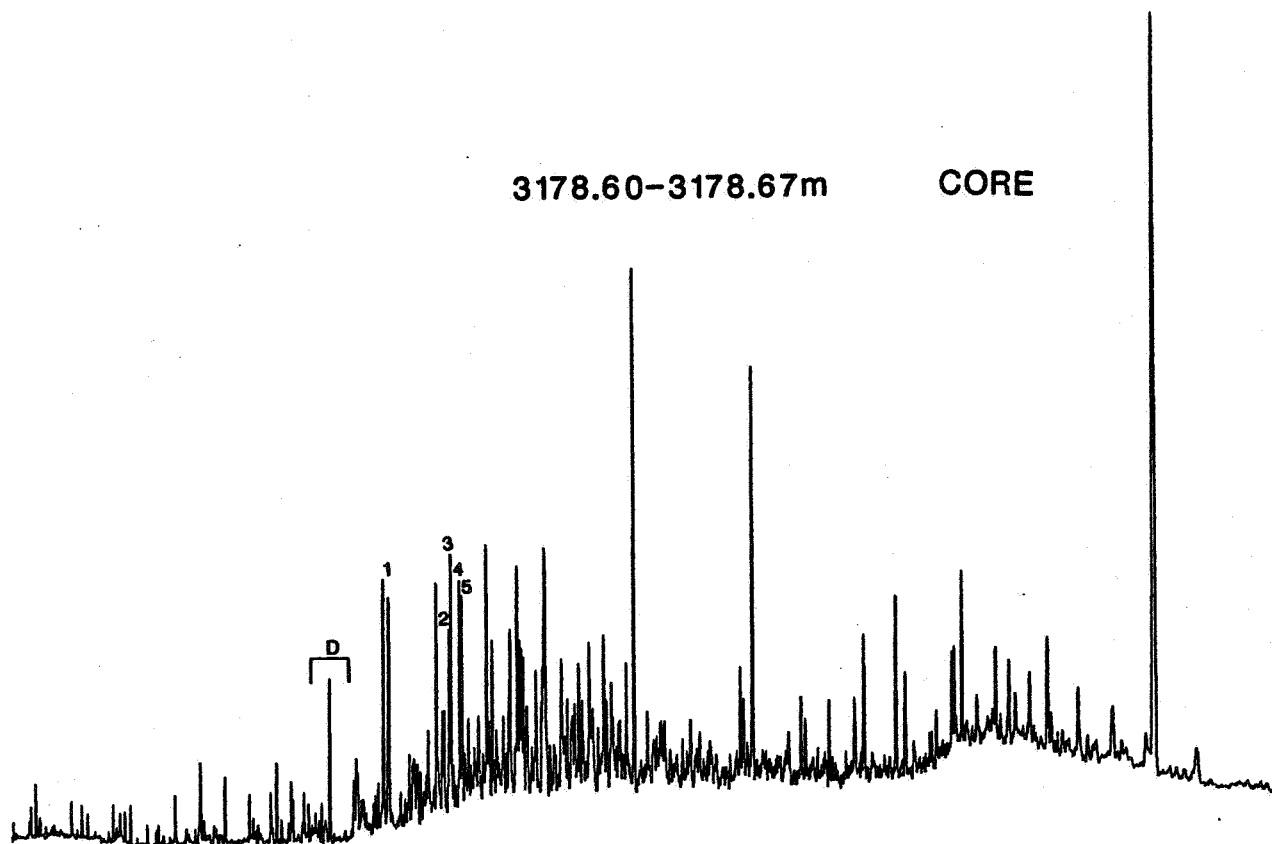
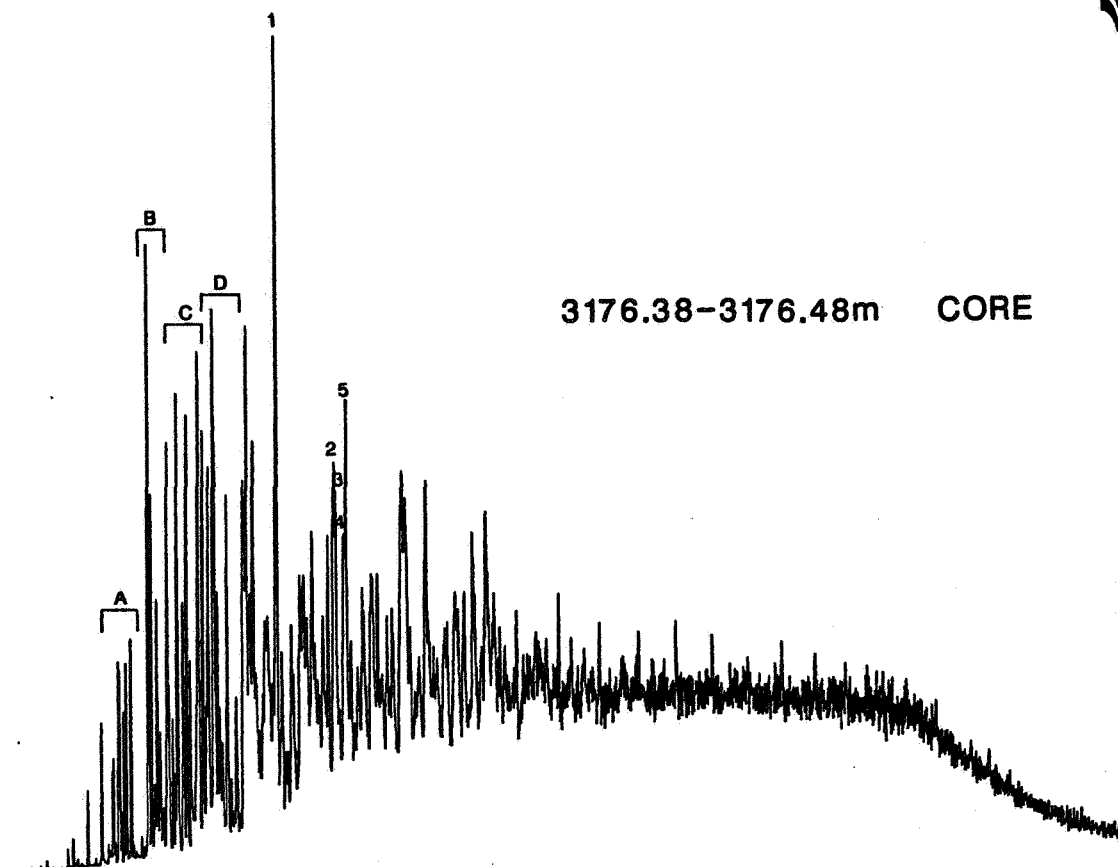
WELL 6506/12-5



PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6c **C₁₅+ AROMATIC CHROMATOGRAMS**

WELL 6506/12-5

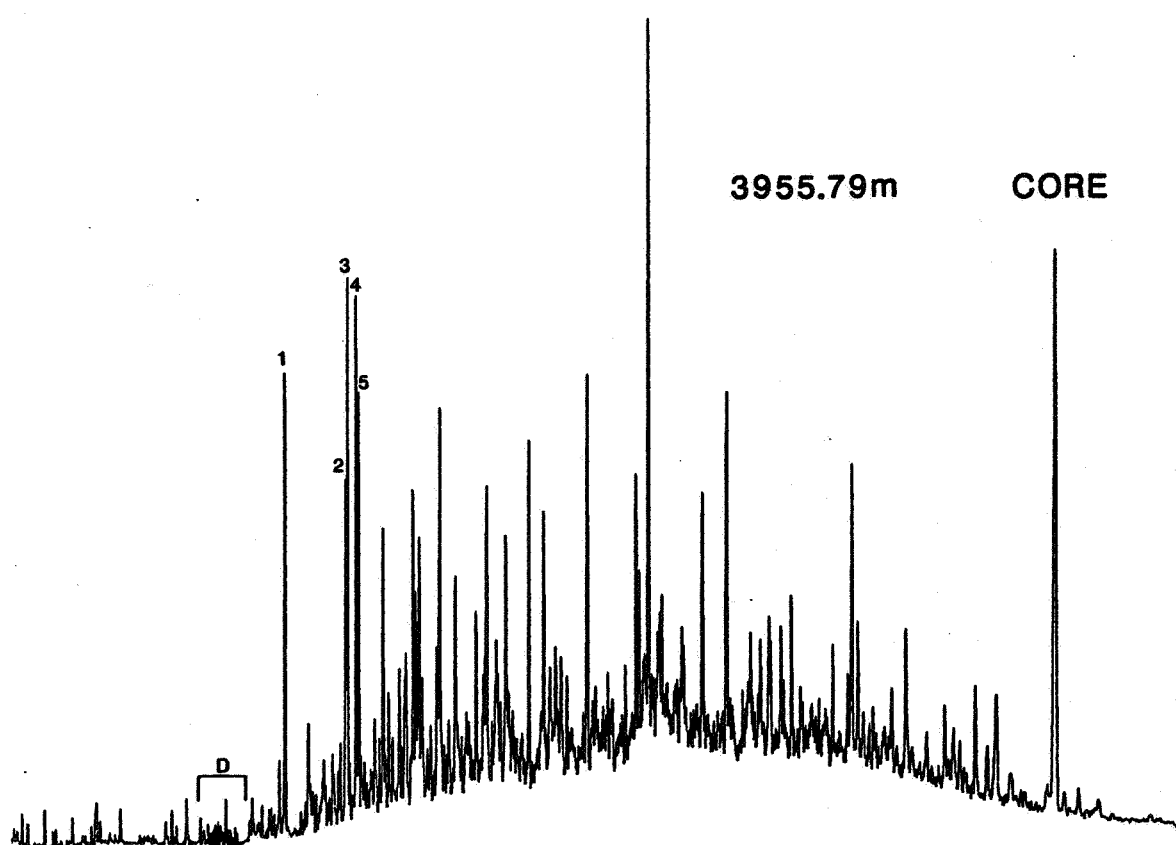
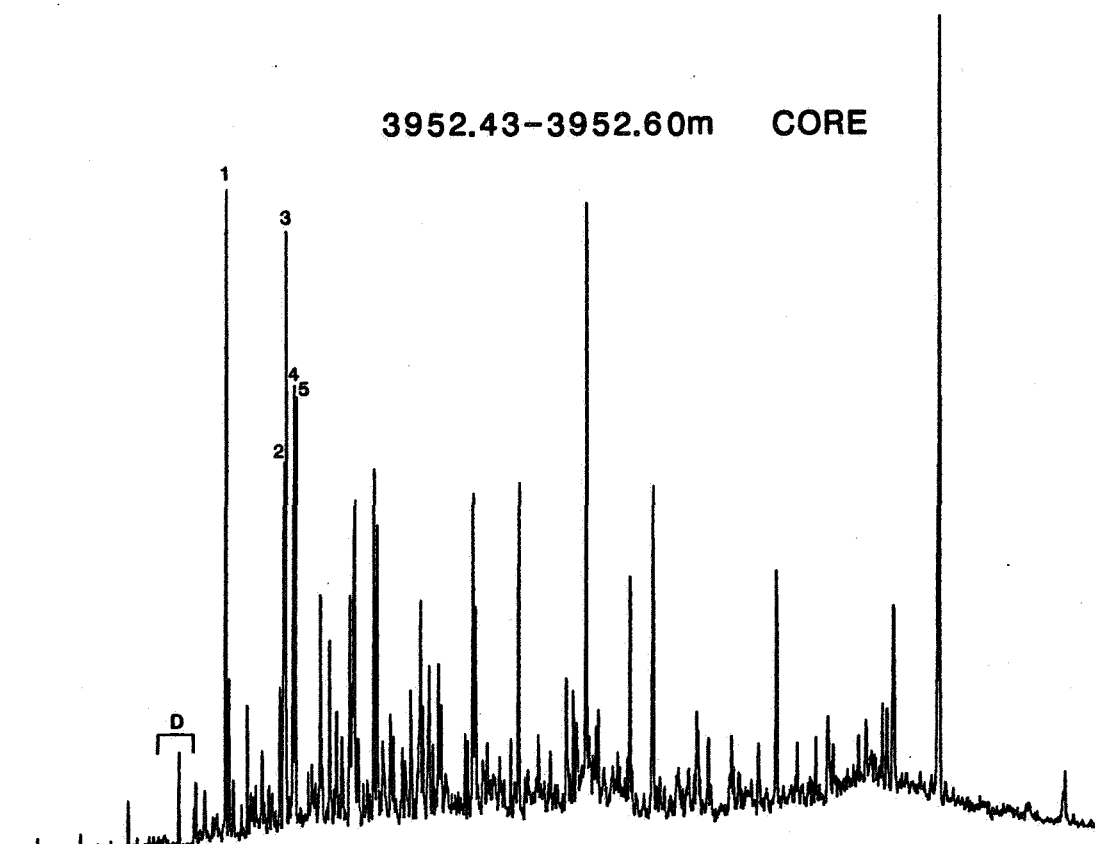


PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6d

C₁₅+ AROMATIC CHROMATOGRAMS

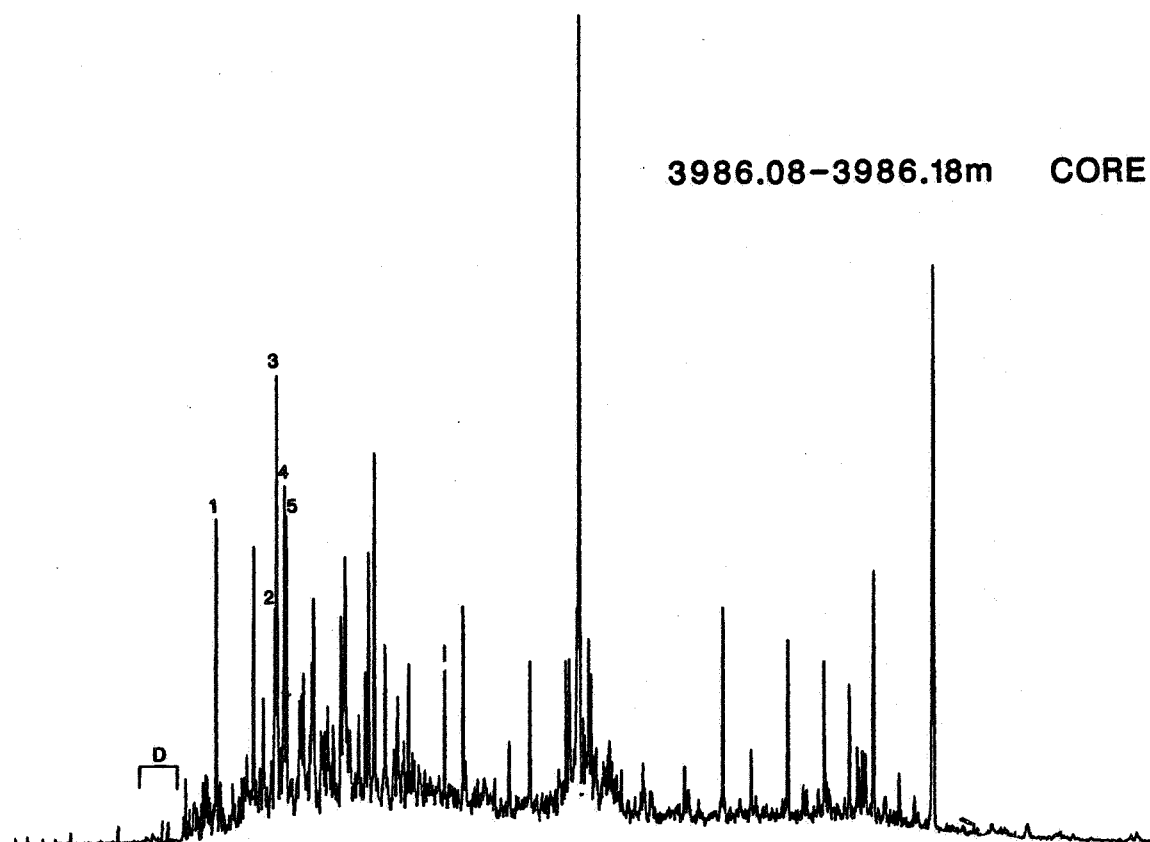
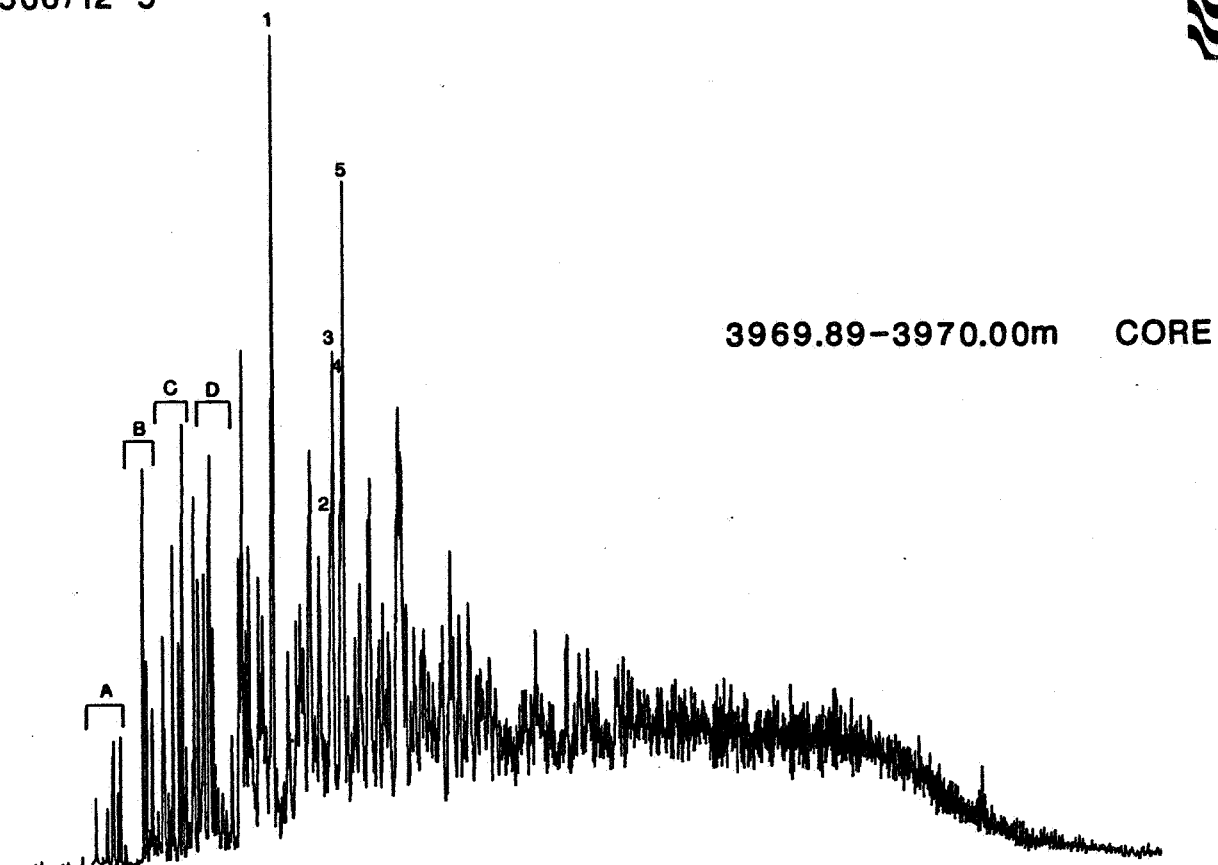
WELL 6506/12-5



PEAK IDENTIFICATION ON FIRST SHEET



WELL 6506/12-5

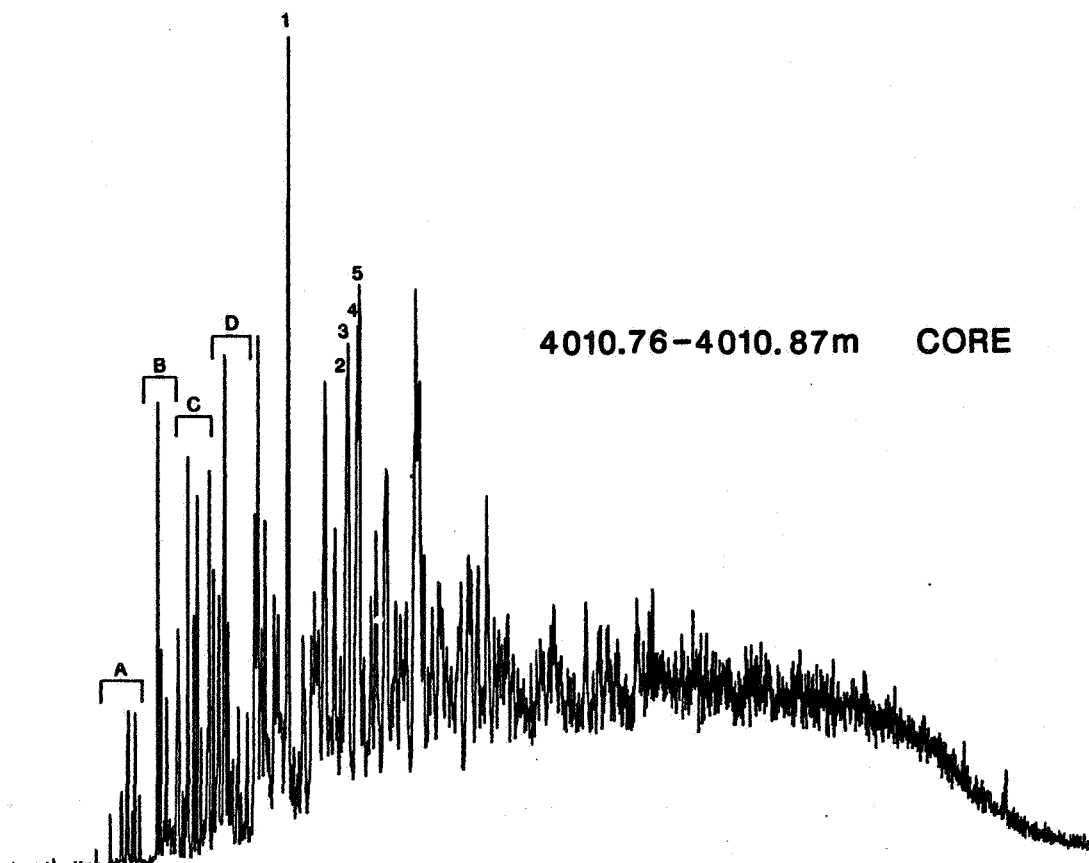
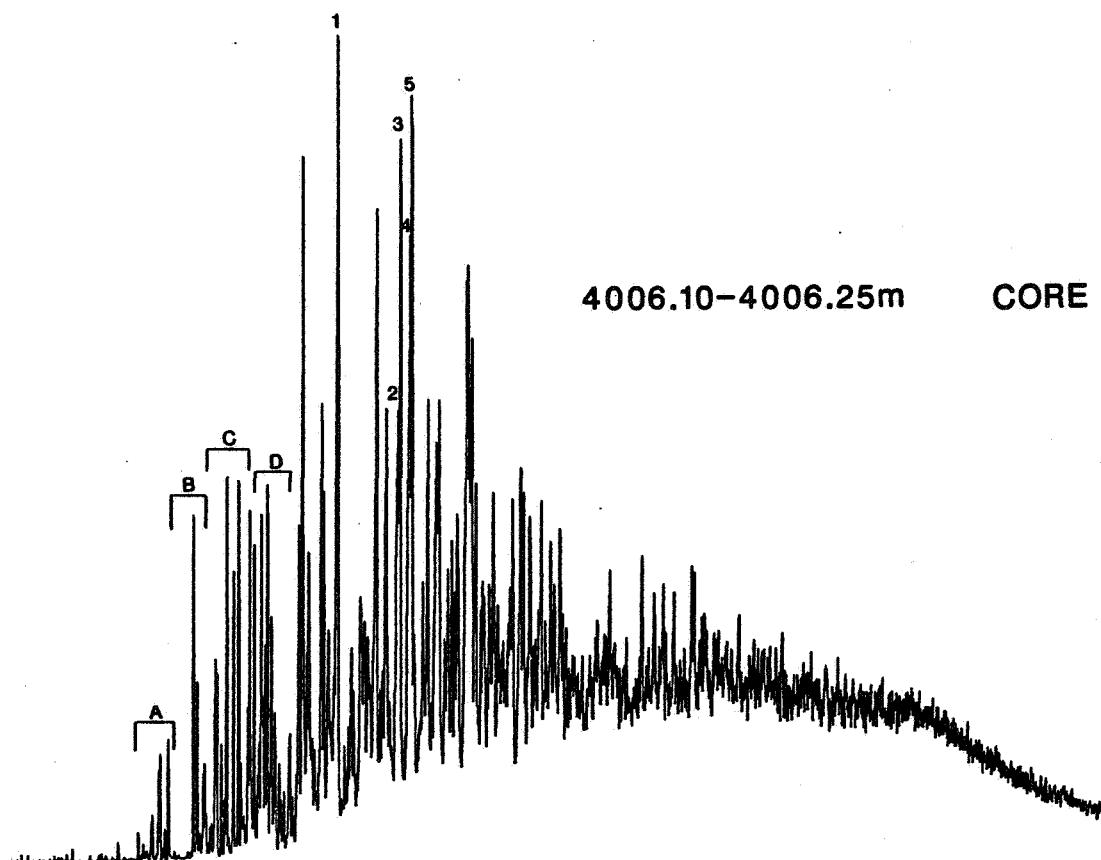


PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6f

C₁₅+ AROMATIC CHROMATOGRAMS

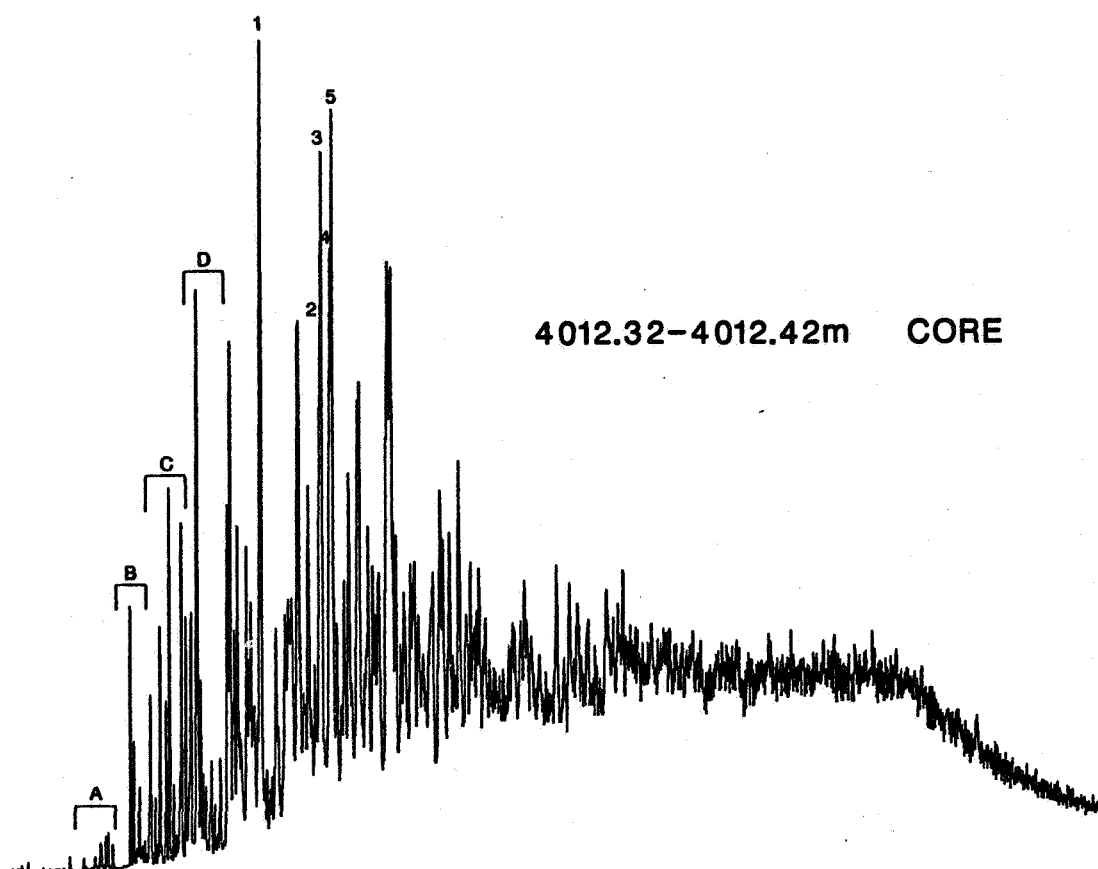
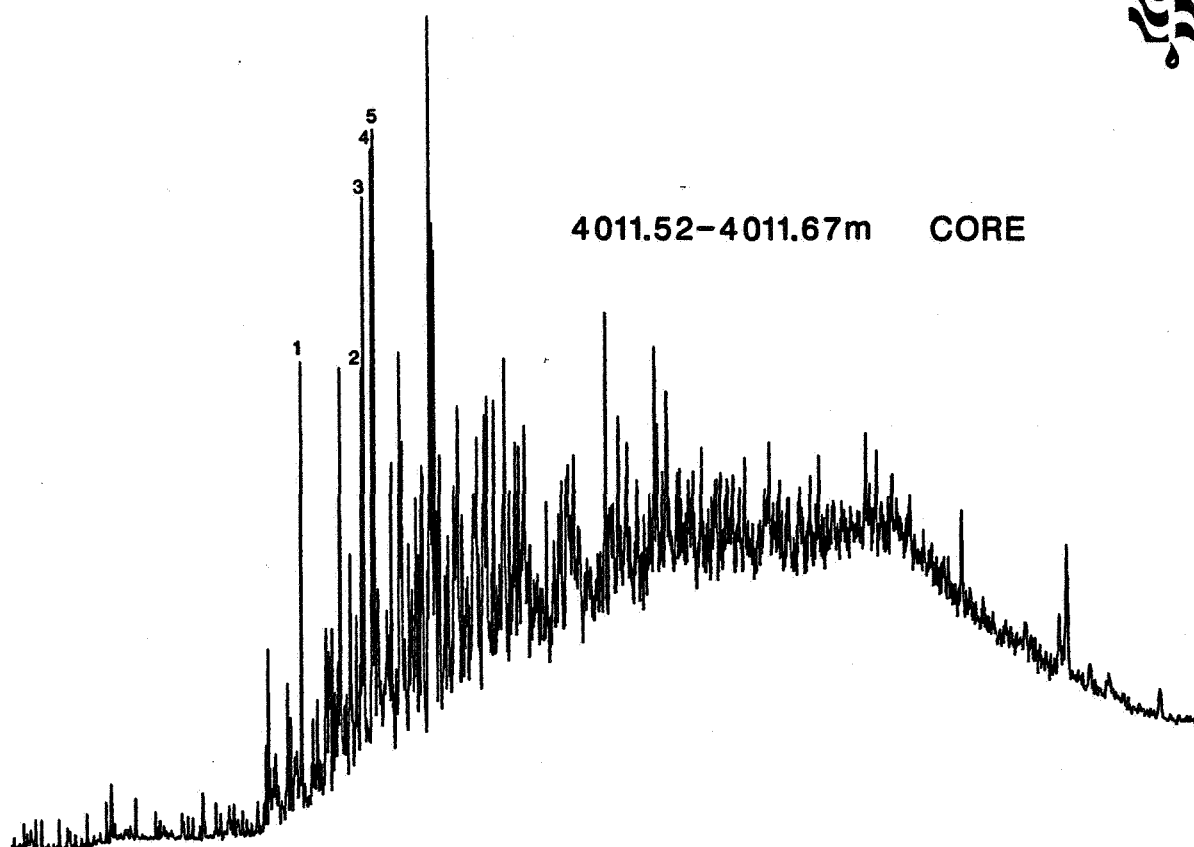
WELL 6506/12-5



PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 6g **C₁₅+** AROMATIC CHROMATOGRAMS

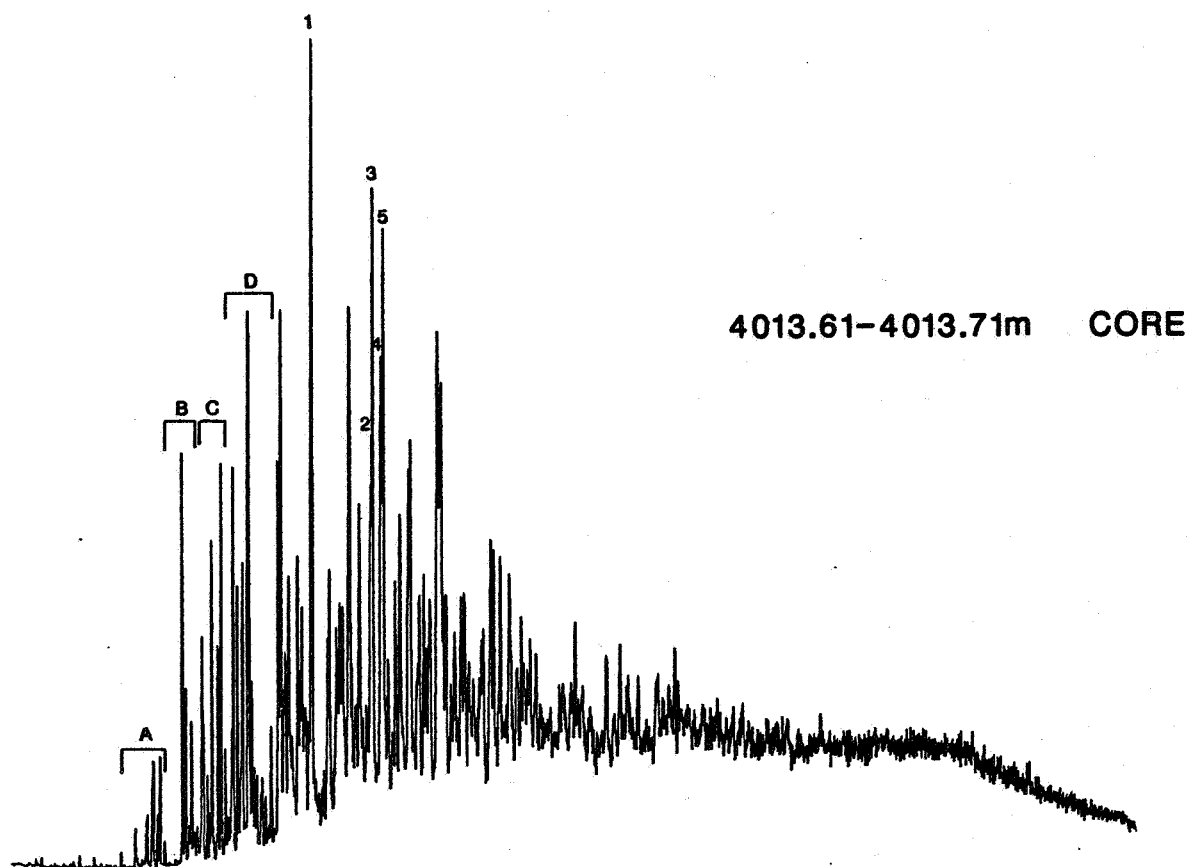
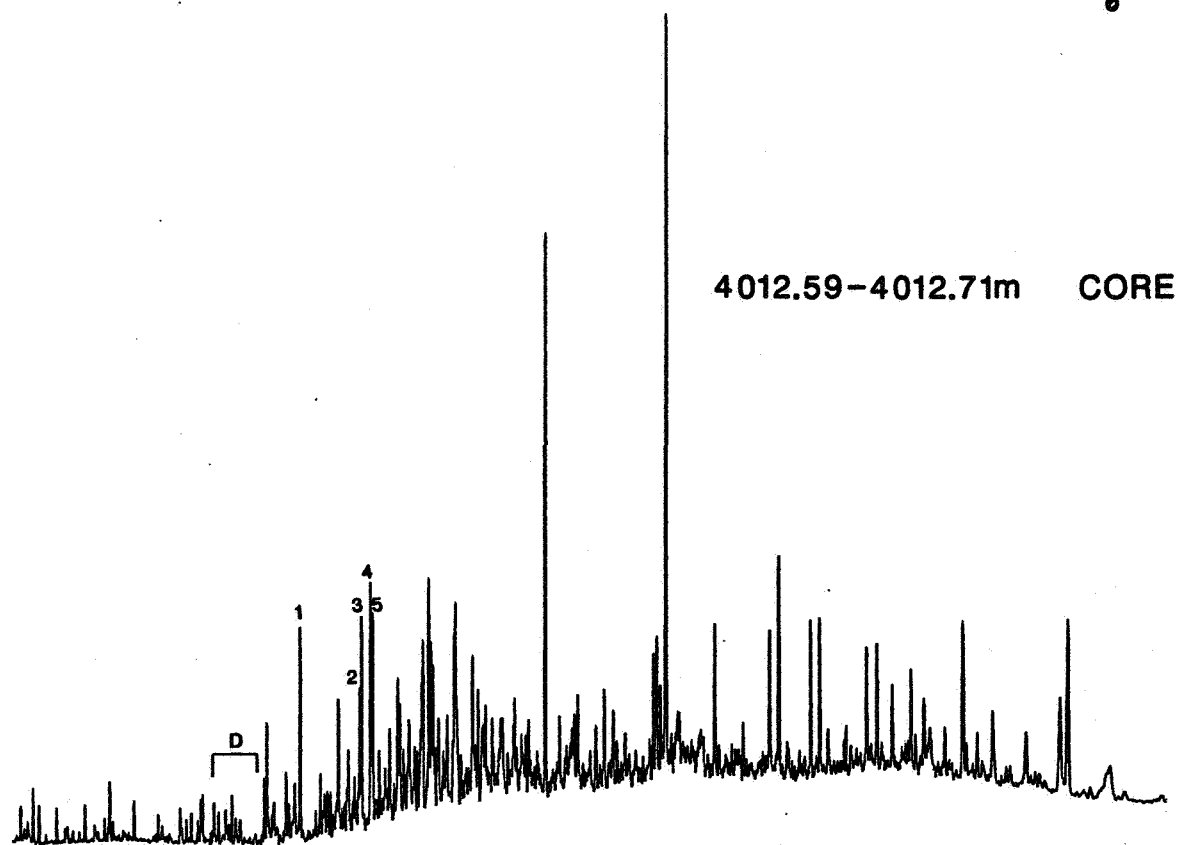
WELL 6506/12-5



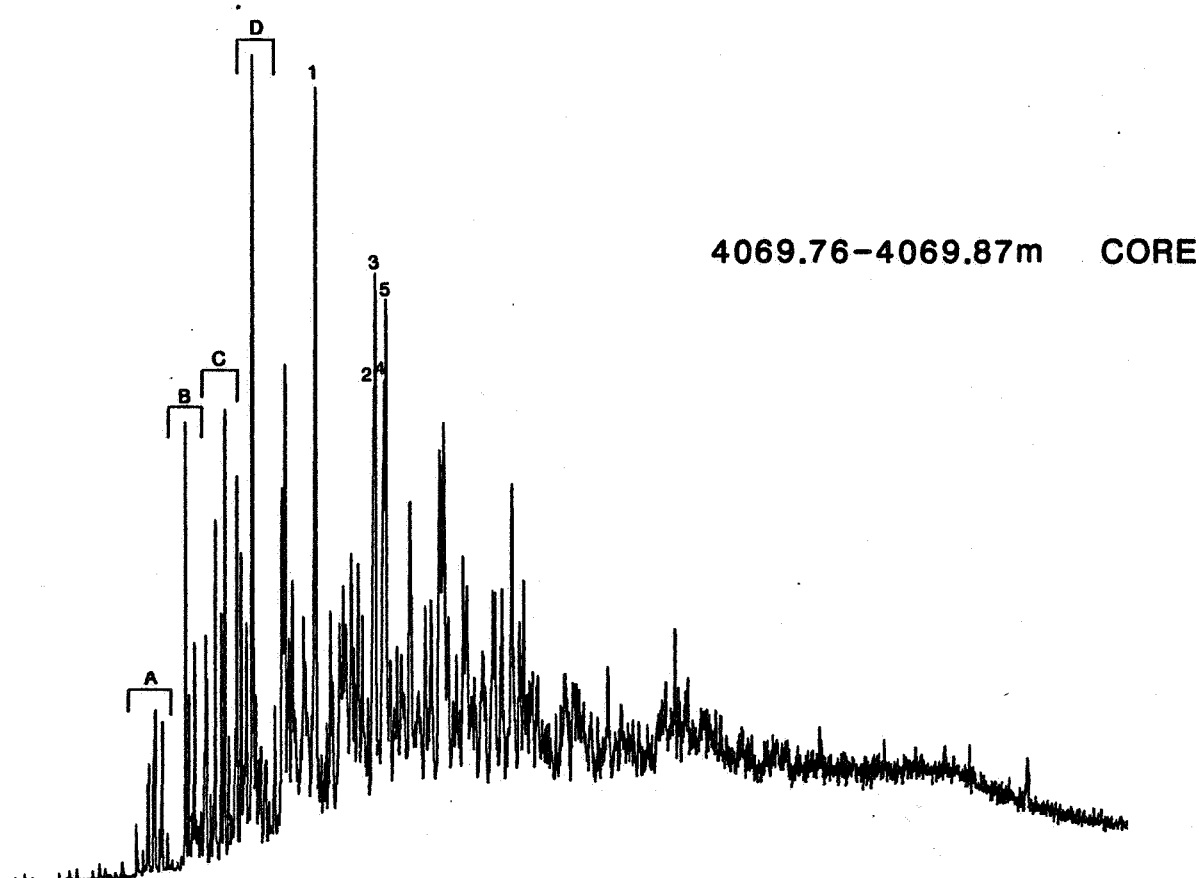
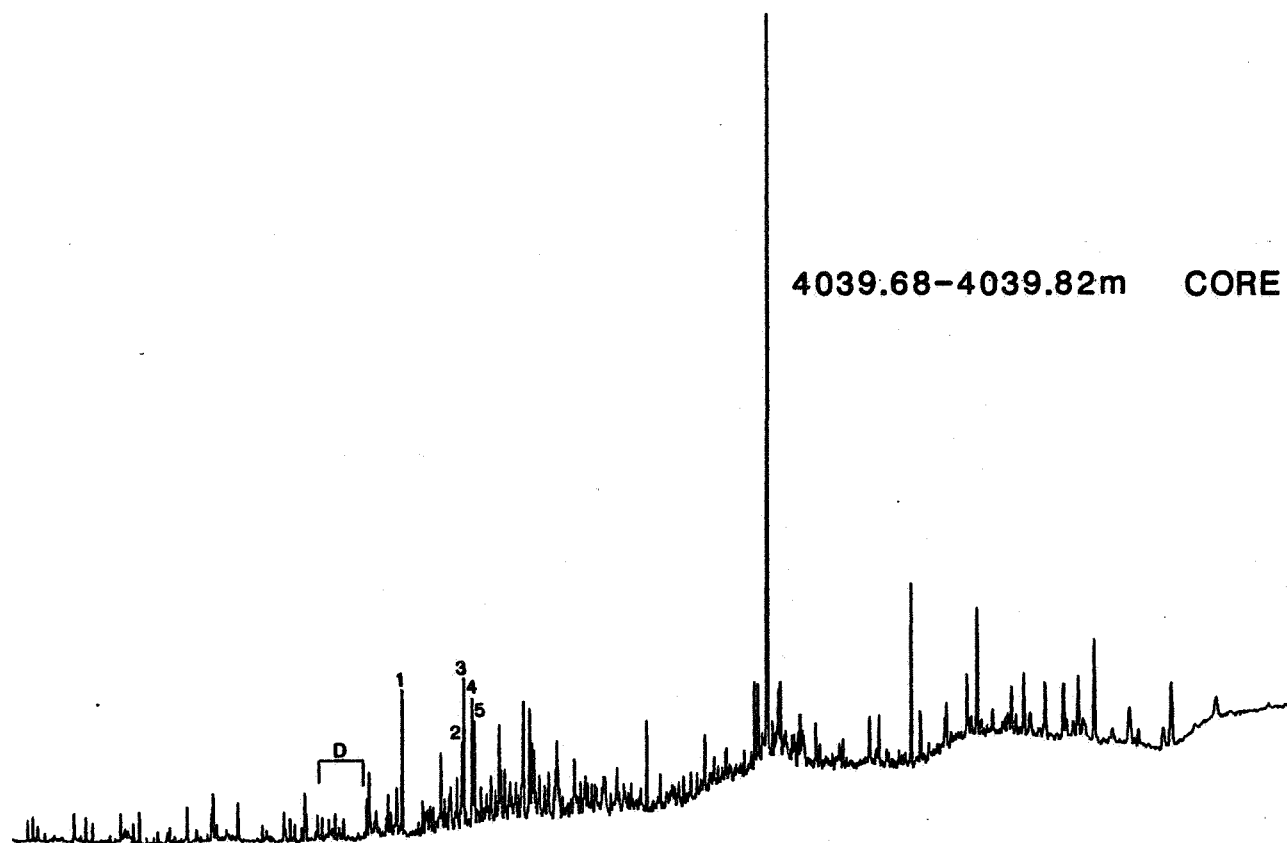
PEAK IDENTIFICATION ON FIRST SHEET



WELL 6506/12-5



PEAK IDENTIFICATION ON FIRST SHEET



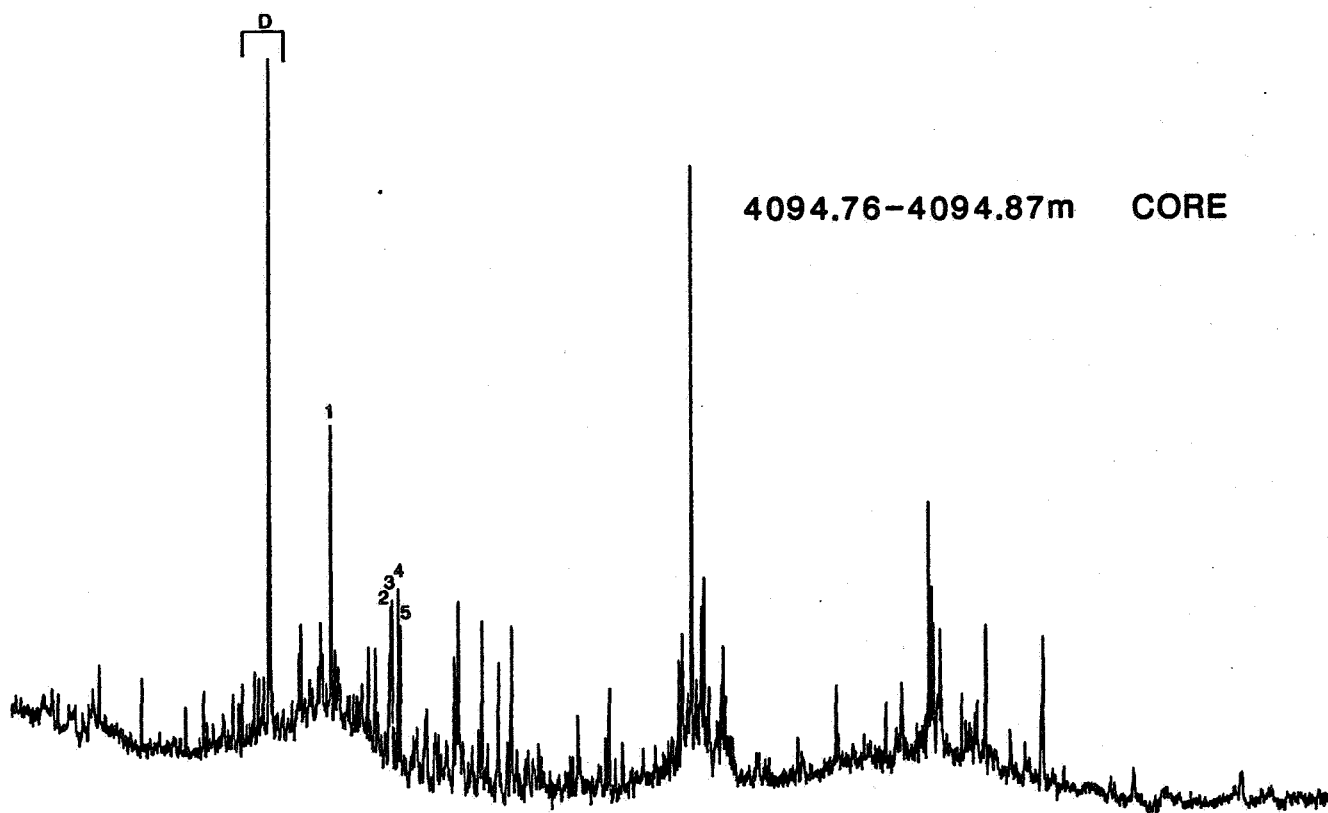
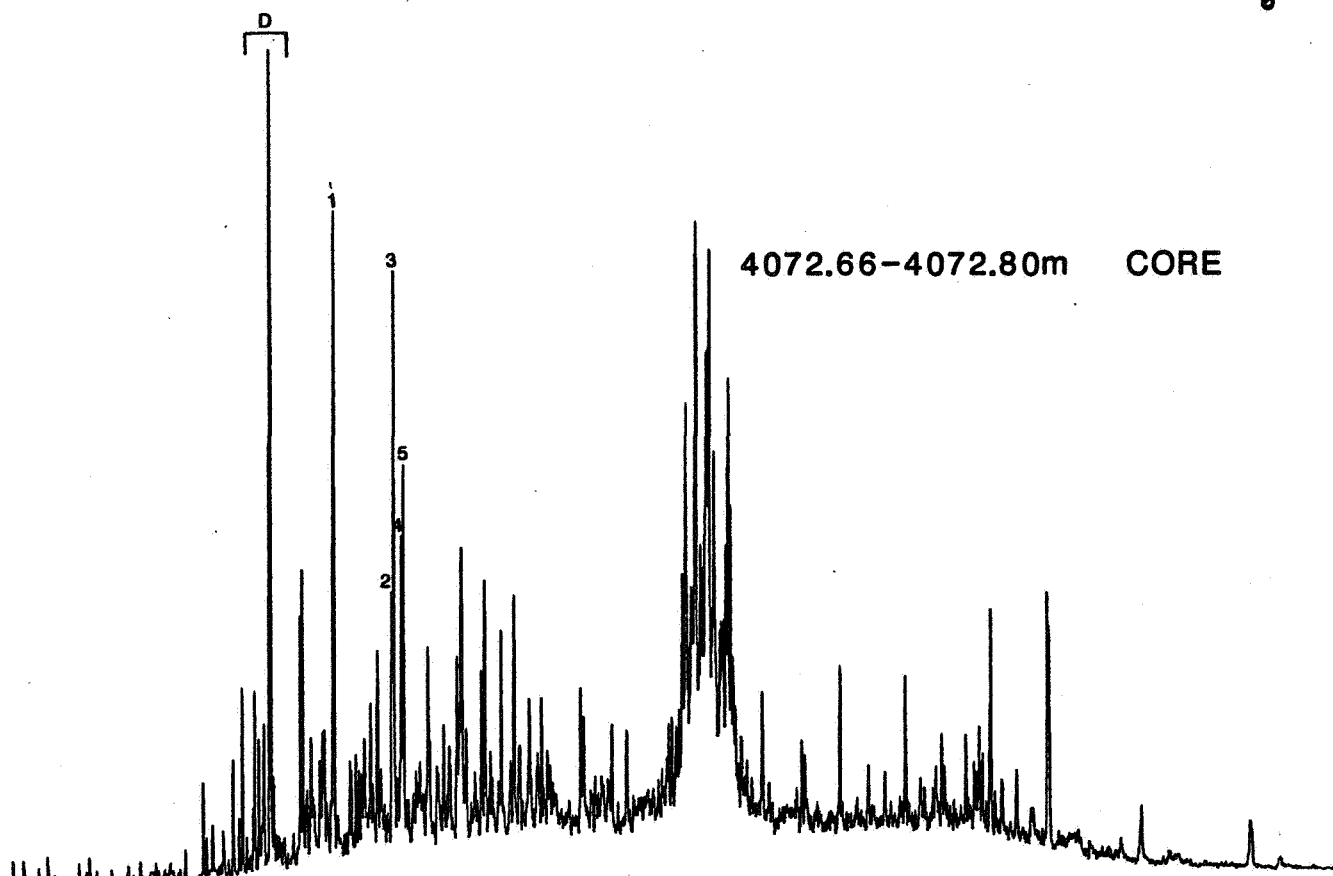
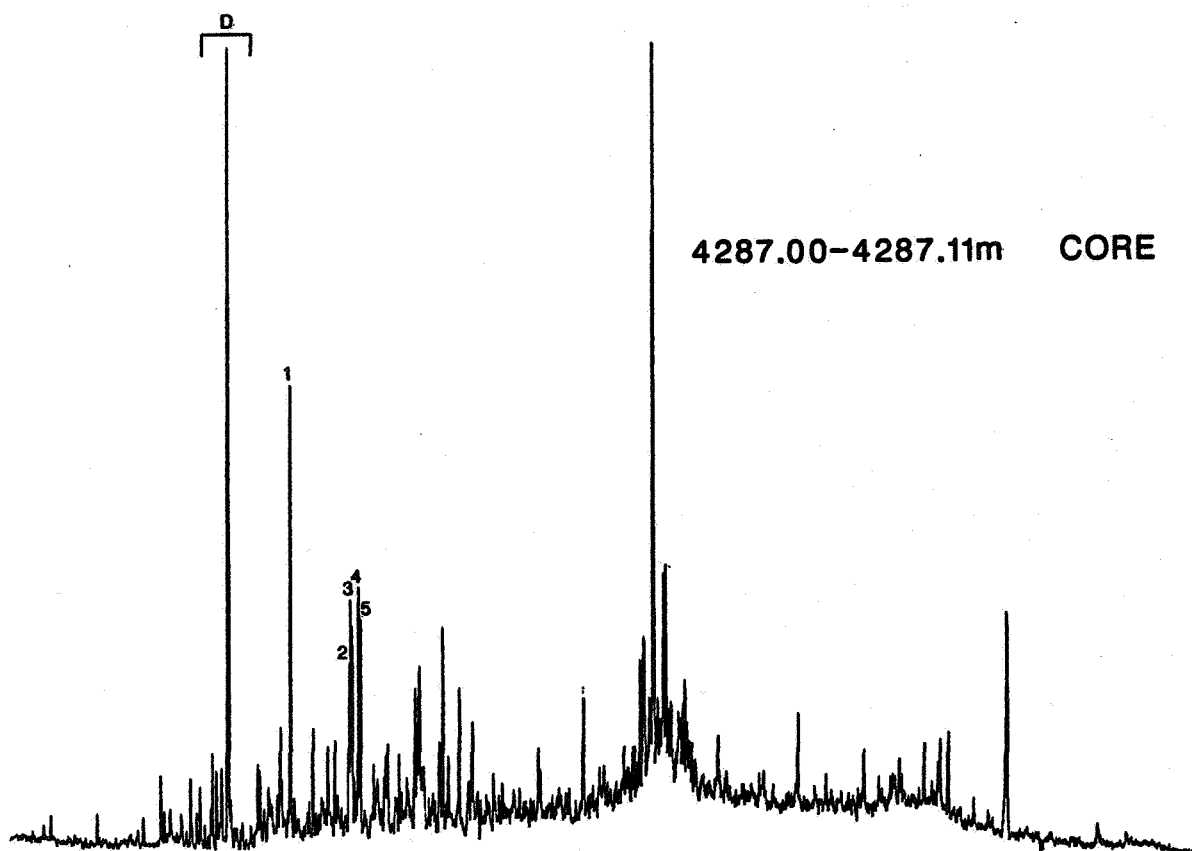
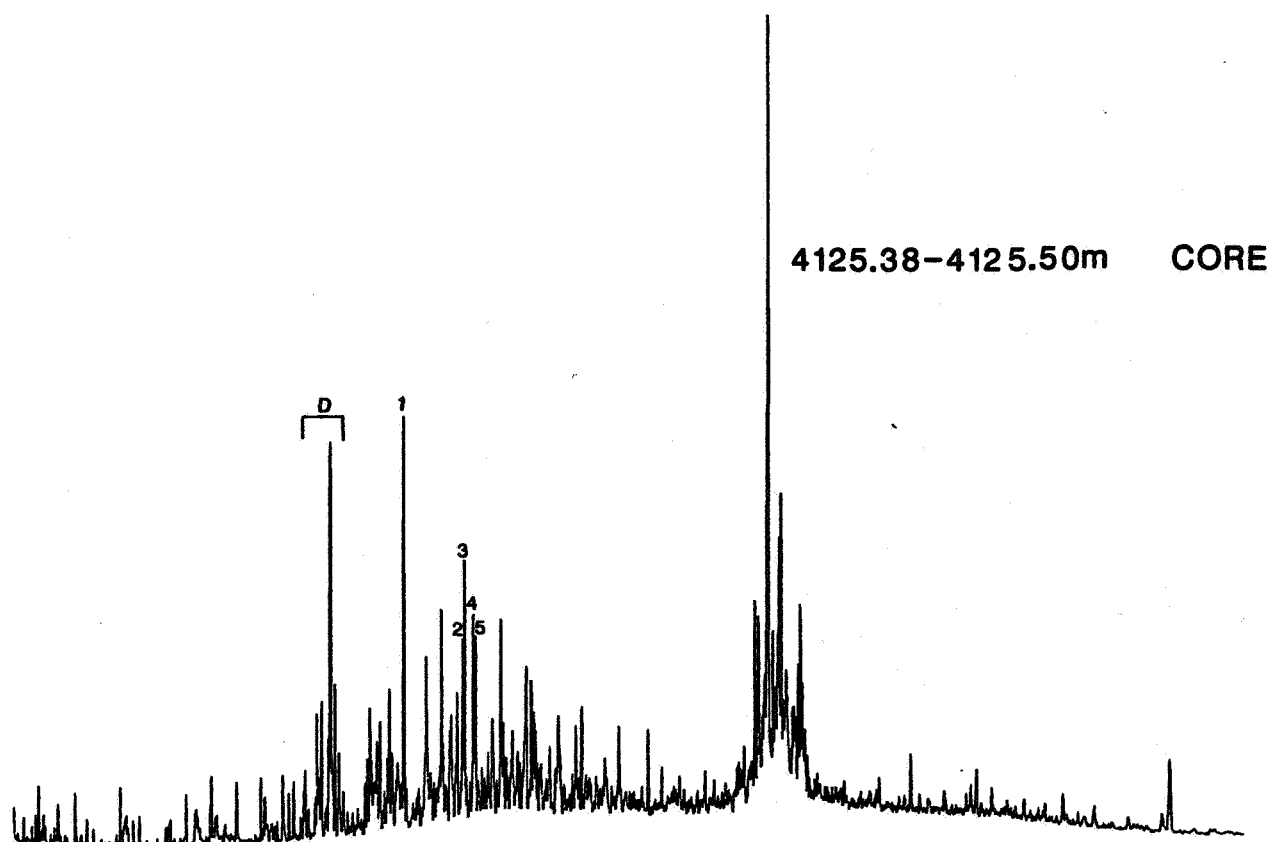


FIGURE 6k

C₁₅+ AROMATIC CHROMATOGRAMS

WELL 6506/12-5

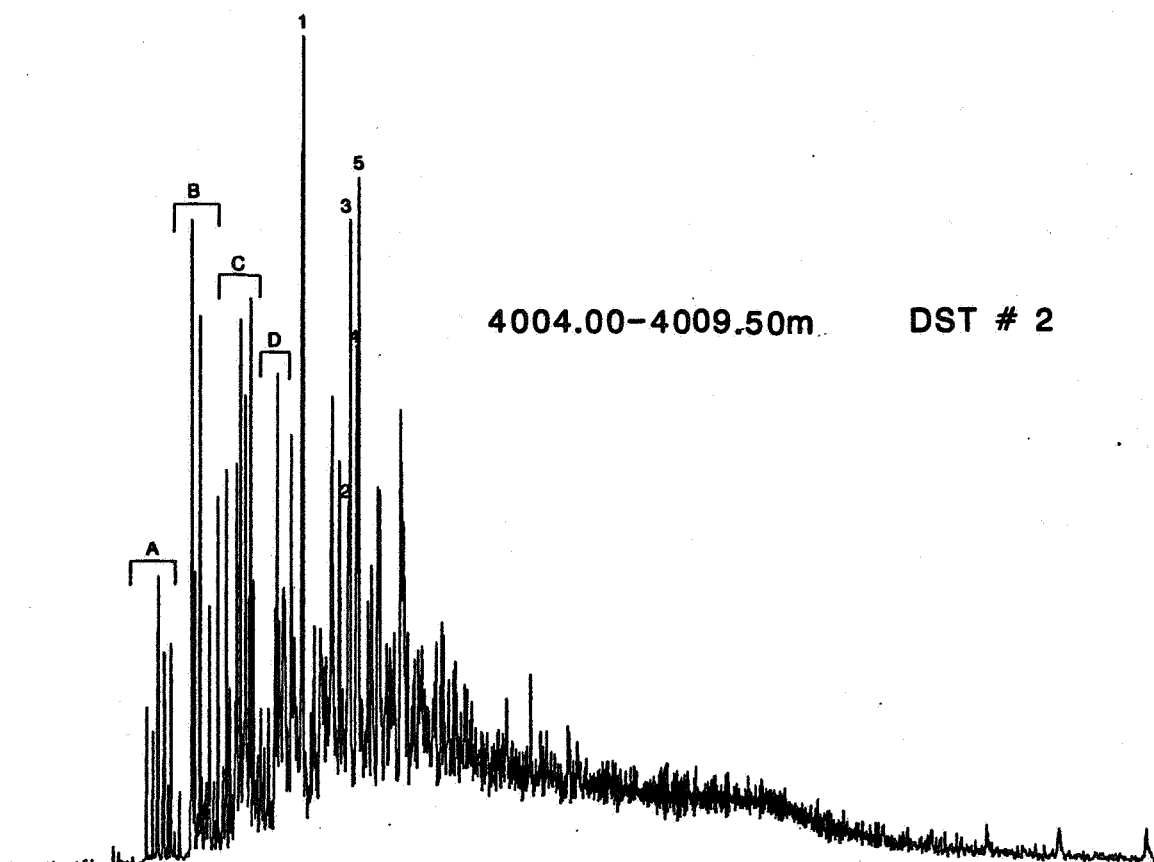
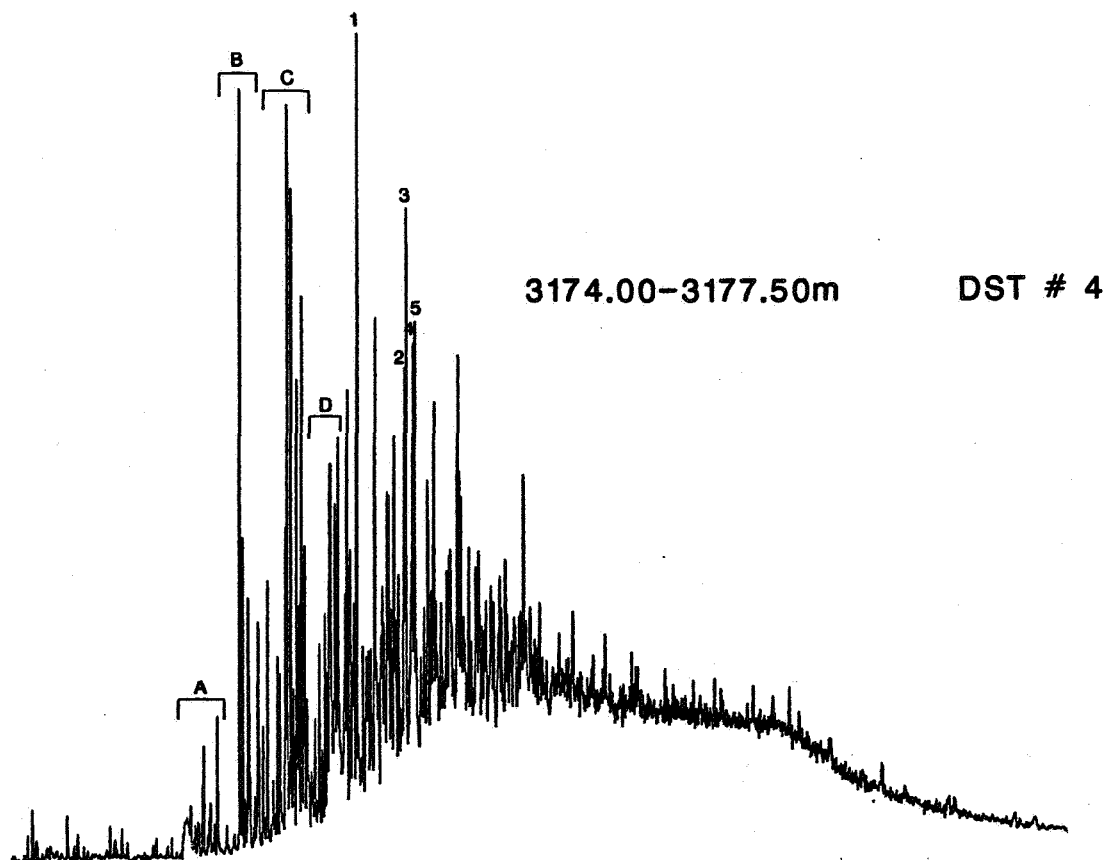


PEAK IDENTIFICATION ON FIRST SHEET

FIGURE 61

C₁₅+ AROMATIC CHROMATOGRAMS

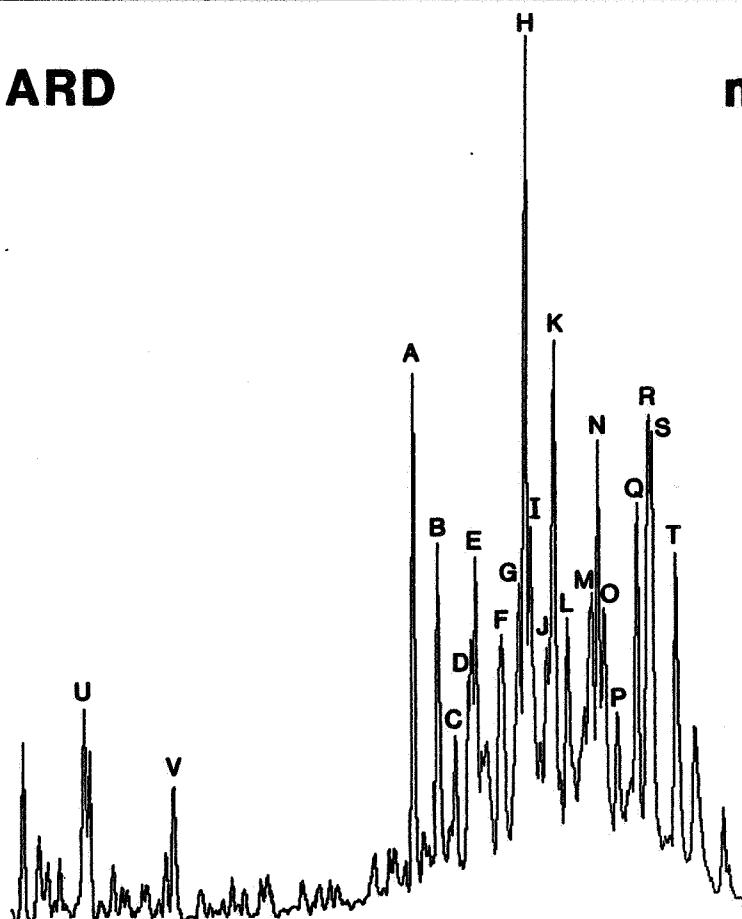
WELL 6506/12-5



PEAK IDENTIFICATION ON FIRST SHEL.

STANDARD

m/z 217



STERANE IDENTIFICATION

(M/Z 217 FRAGMENTOGRAM)

COMPOUND

ELEMENTAL COMPOSITION

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

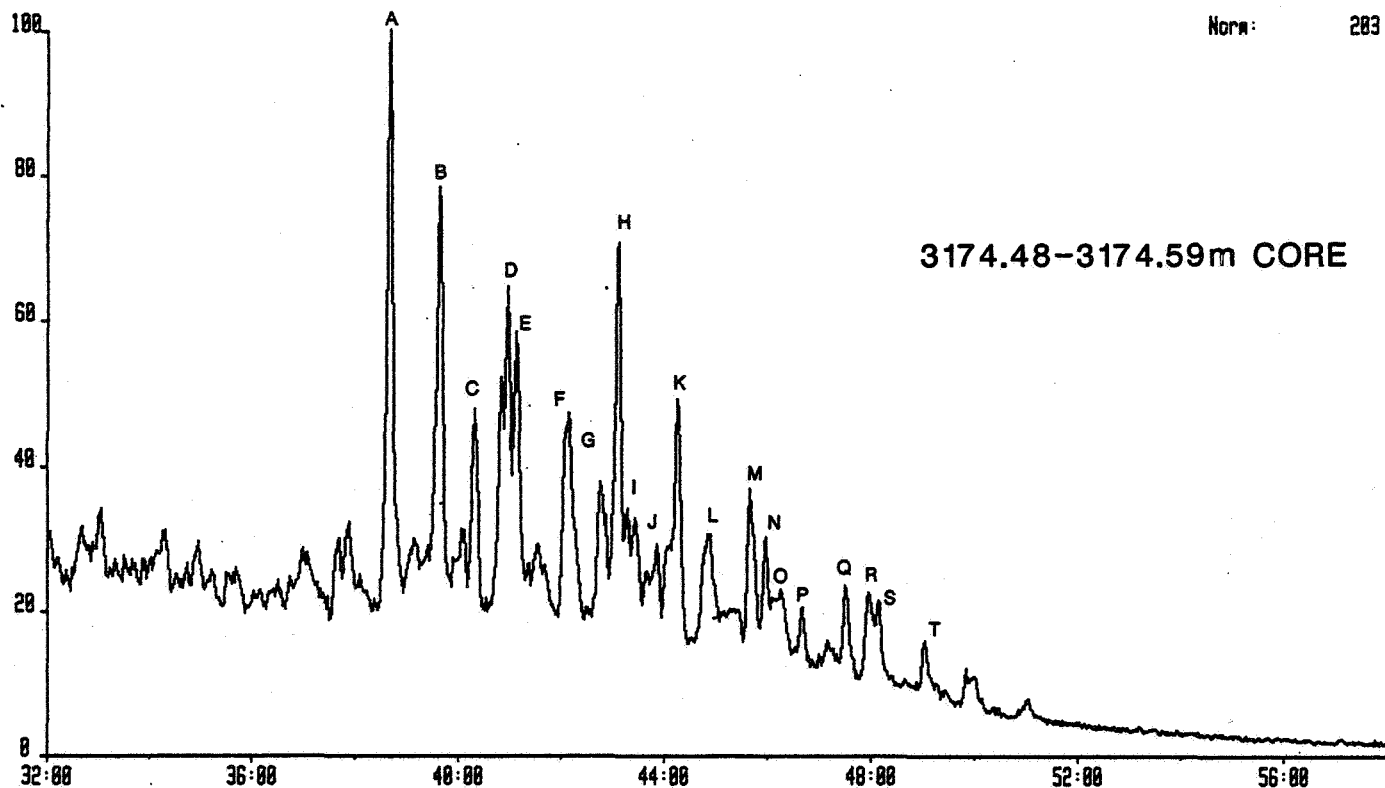


WELL 6506/12-5

STERANES m/z 217

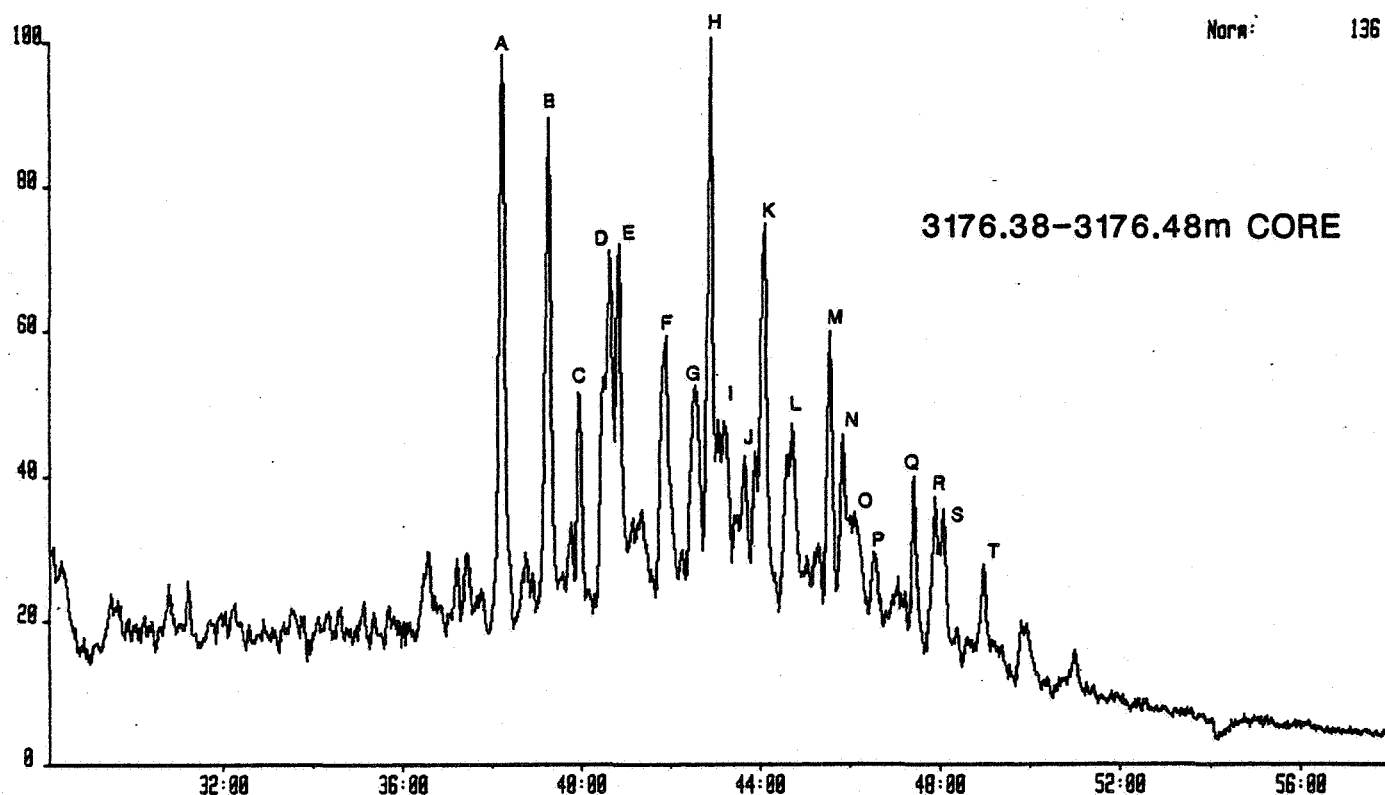
1334885 15-JUL-86 Sr:Magnetic TS258 Rcnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



GEOBAT 11-JUL-86 Sr:Magnetic TS258 Rcnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



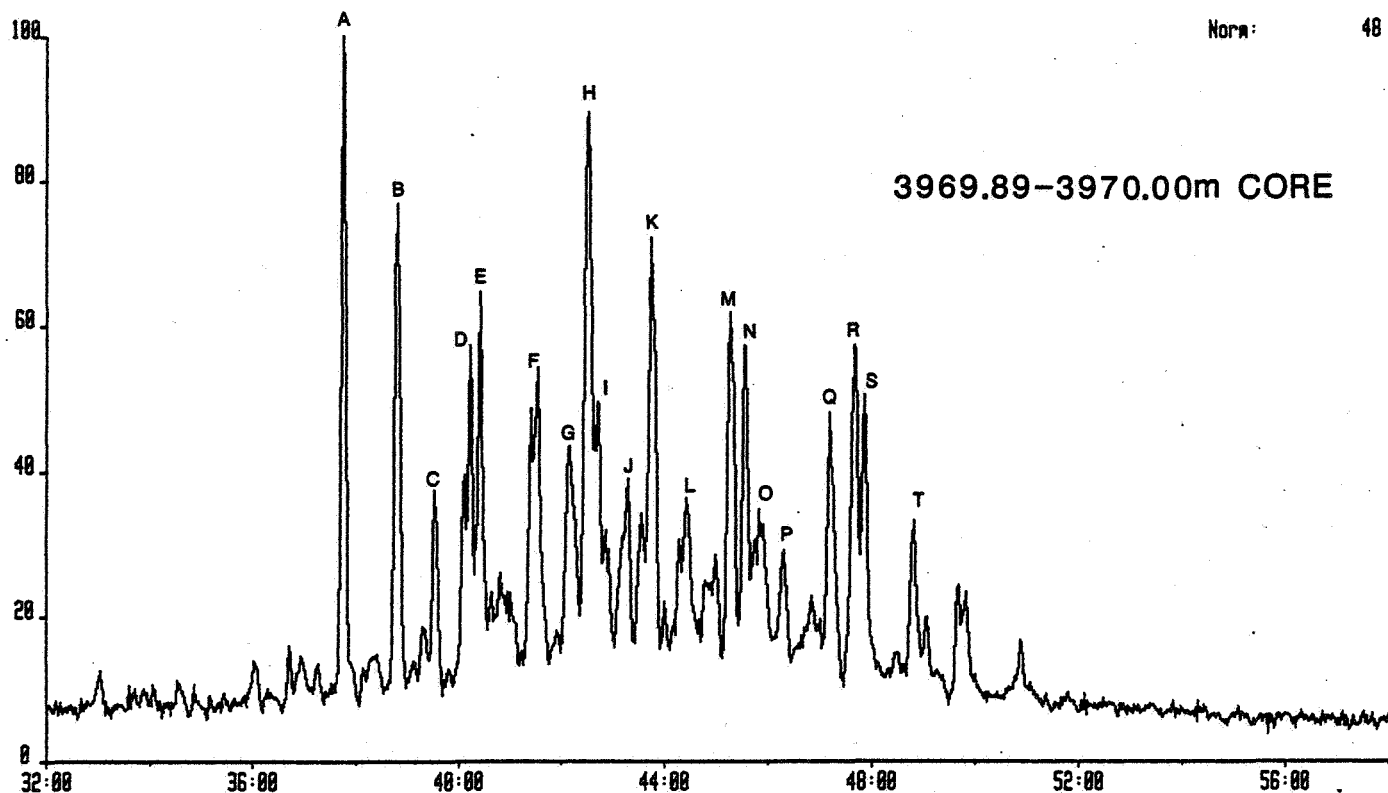


WELL 6506/12-5

STERANES m/z 217

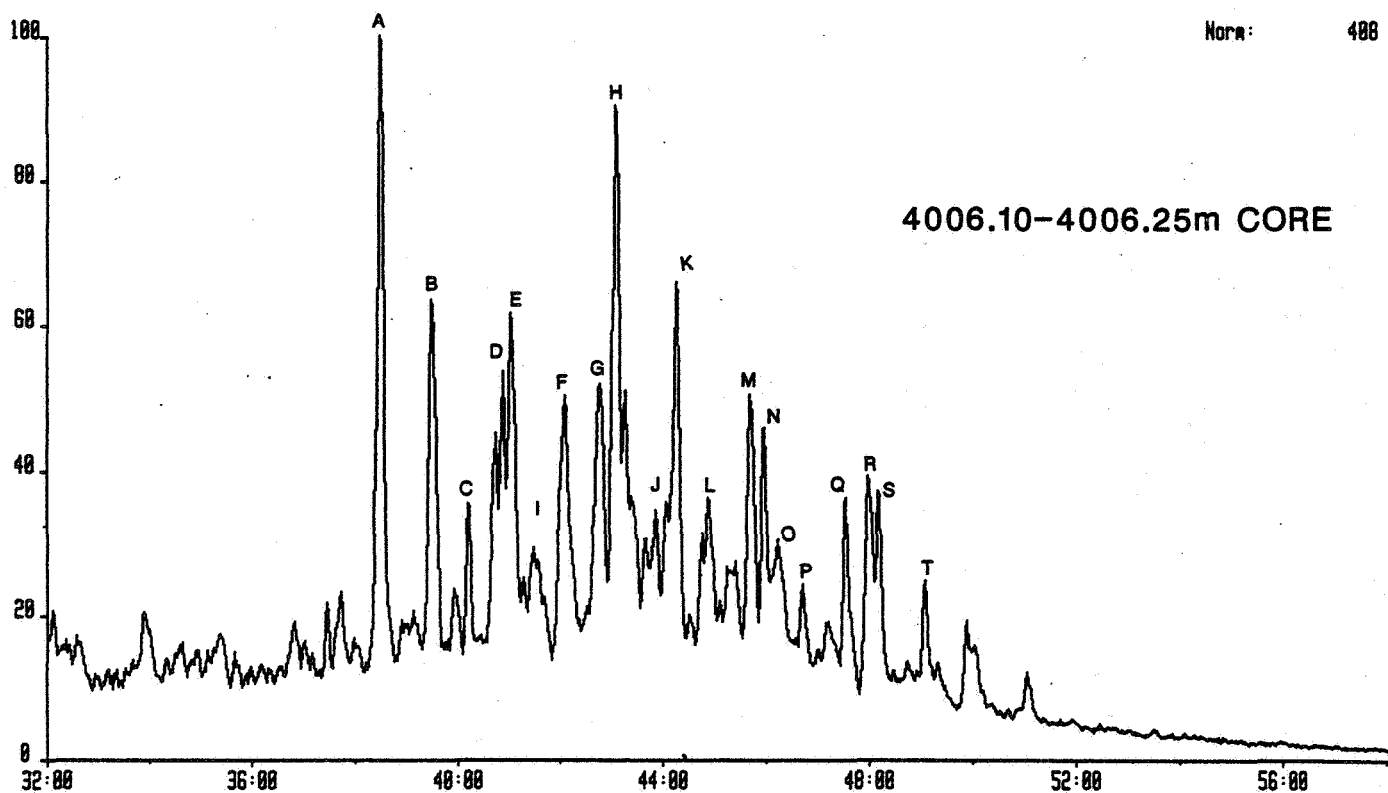
1334818 11-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



1334812 15-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP





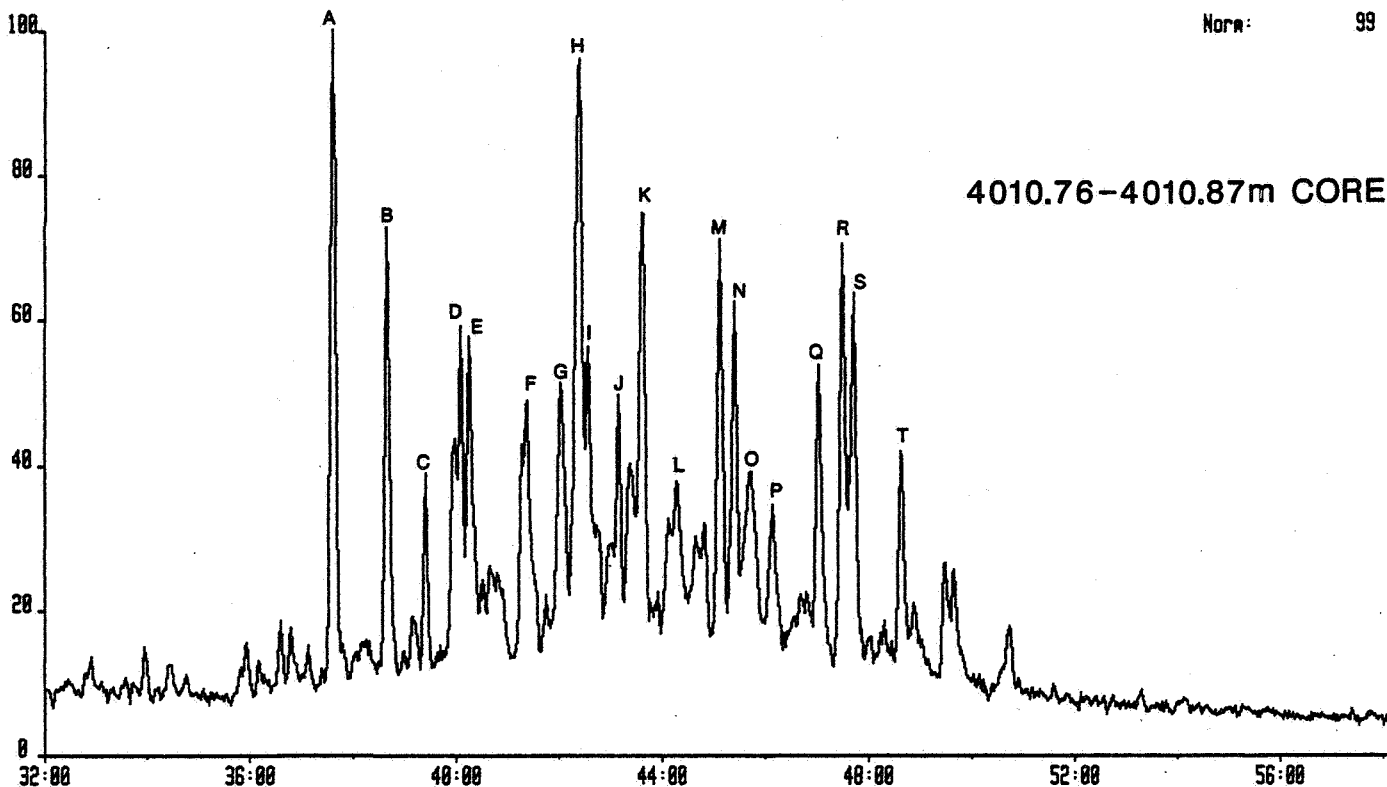
WELL 6506/12-5

STERANES m/z 217

1334013 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

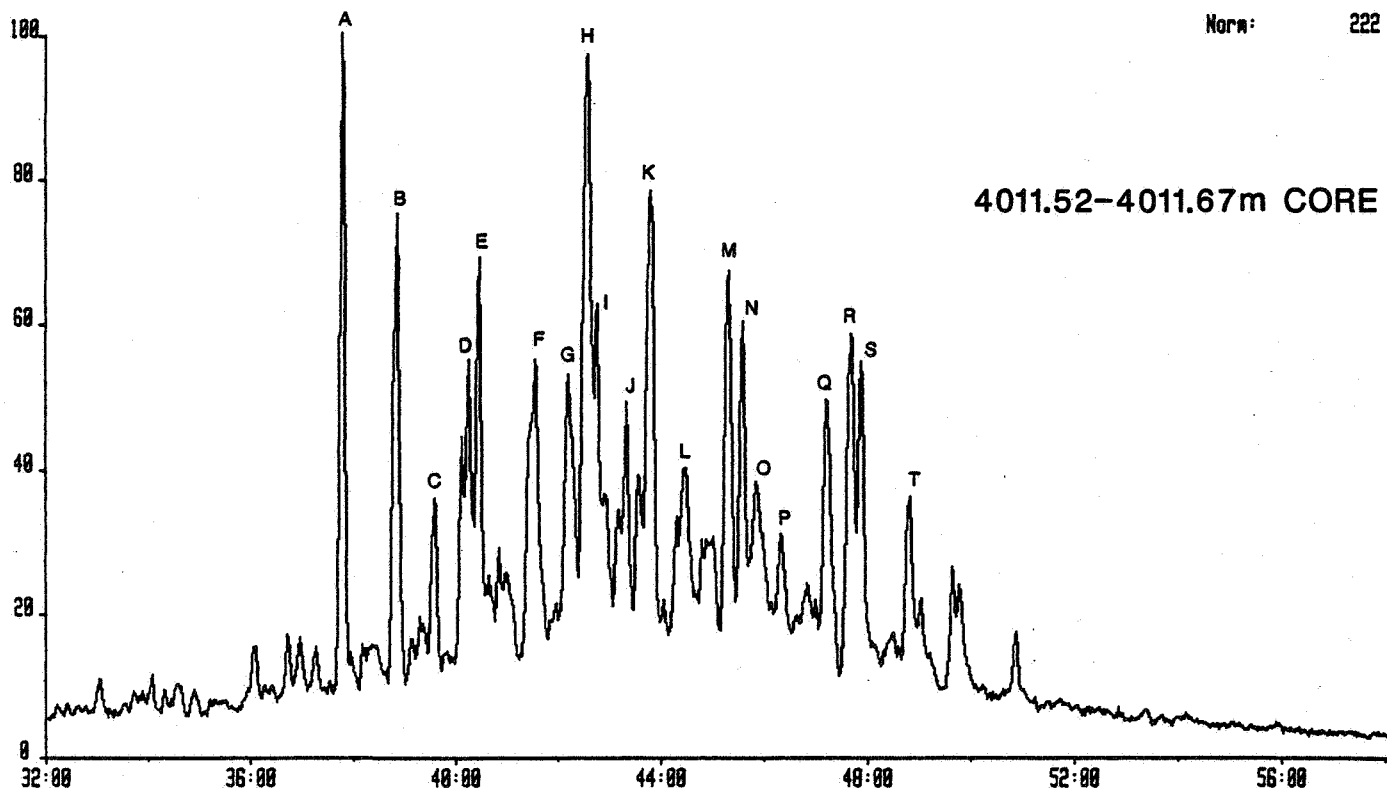
Norm: 99



1334014 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 222





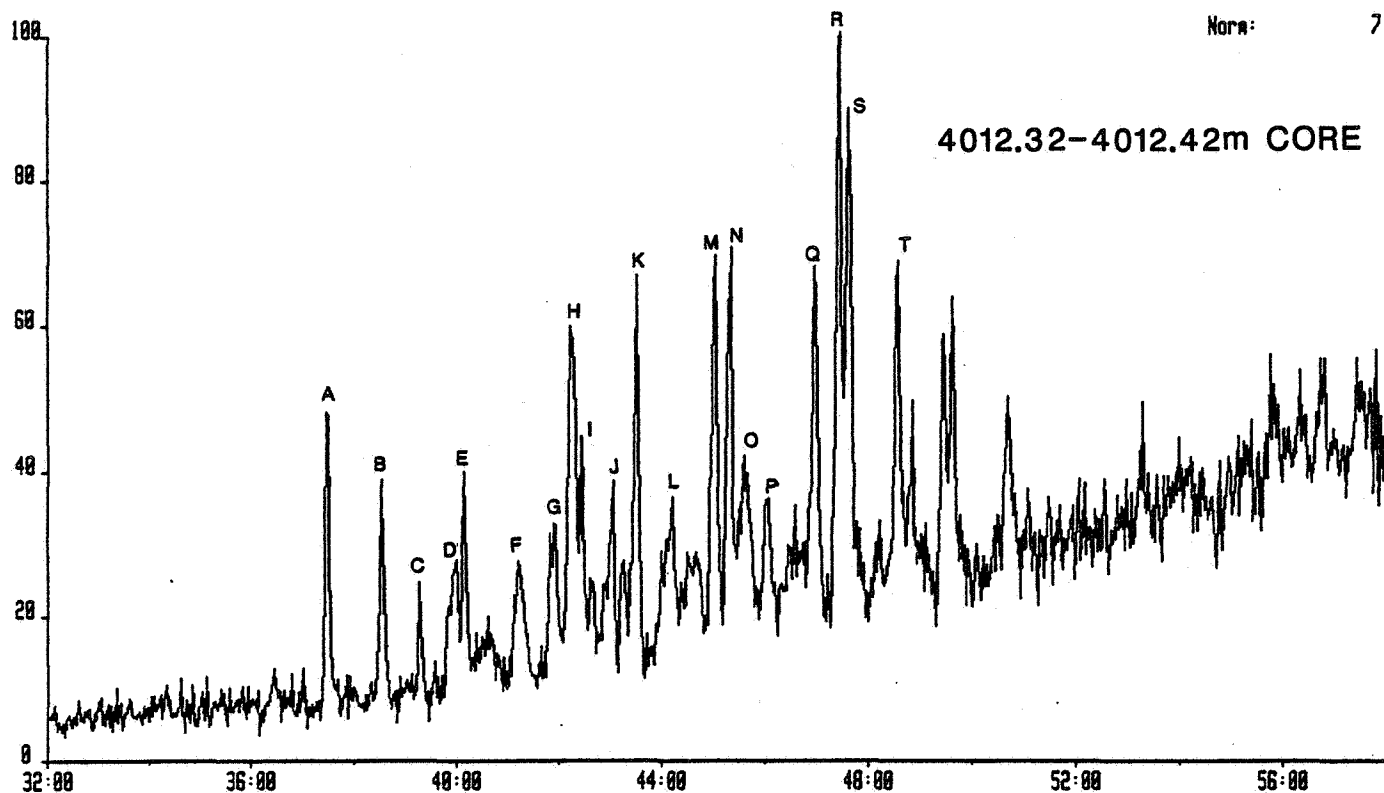
WELL 6506/12-5

STERANES m/z 217

1334015 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 7



1334017 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 217.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 388

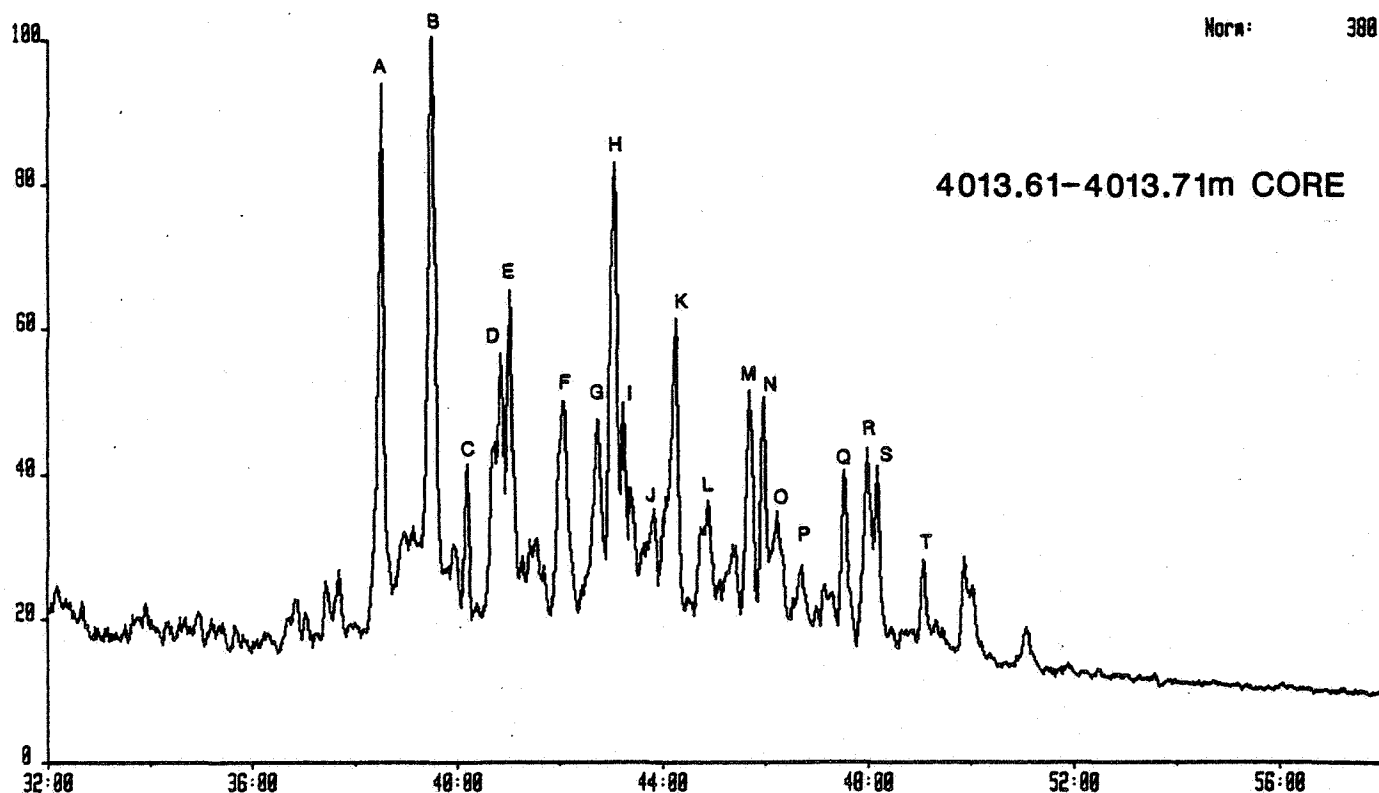
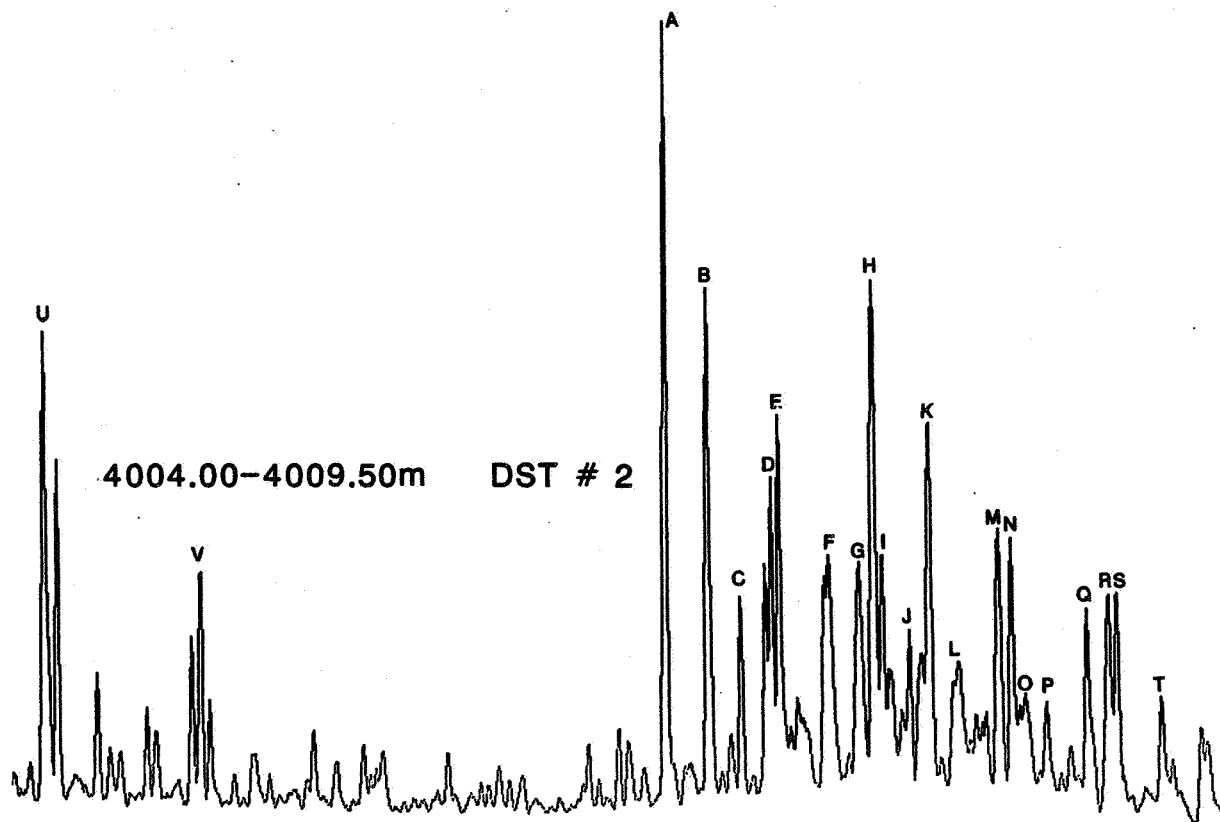


FIGURE 7f

MASS FRAGMENTOGRAMS

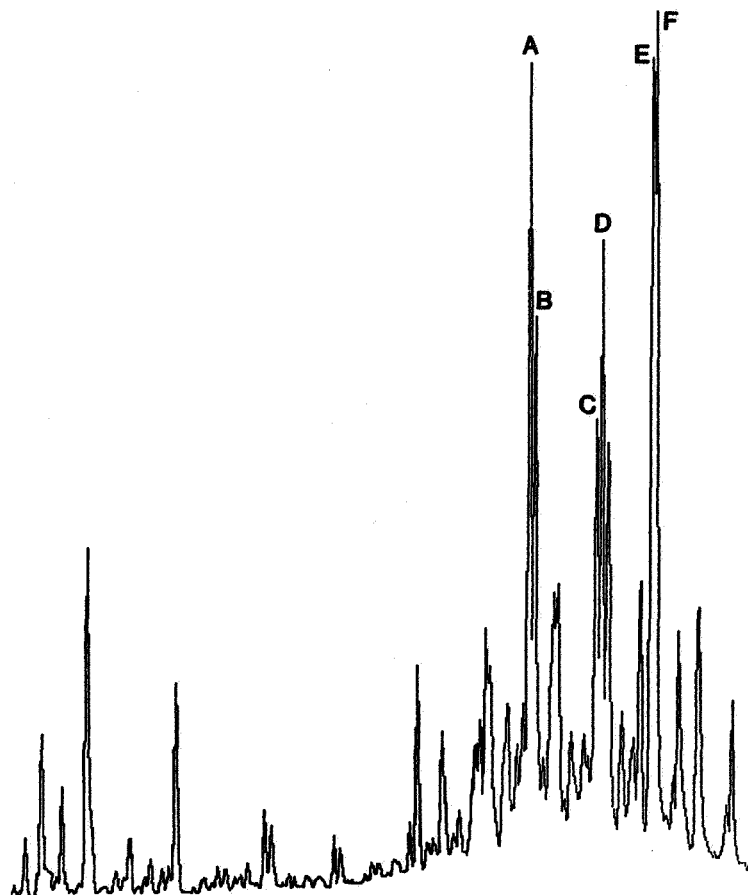
WELL 6506/12-5

STERANES m/z 217



STANDARD

m/z 218



STERANE IDENTIFICATION

(M/Z 218 FRAGMENTOGRAM)

<u>COMPOUND</u>	<u>ELEMENTAL COMPOUND</u>
A 14 β ,17 β -cholestane (20R)	C ₂₇ H ₄₈
B 14 β ,17 β -cholestane (20S)	C ₂₇ H ₄₈
C 24-methyl-14 β ,17 β -cholestane (20R)	C ₂₈ H ₅₀
D 24-methyl-14 β ,17 β -cholestane (20S)	C ₂₈ H ₅₀
E 24-ethyl-14 β ,17 β -cholestane (20R)	C ₂₉ H ₅₂
F 24-ethyl-14 β ,17 β -cholestane (20S)	C ₂₉ H ₅₂

FIGURE 8a

MASS FRAGMENTOGRAMS



WELL 6506/12-5

 $\beta\beta$ STERANES m/z 218

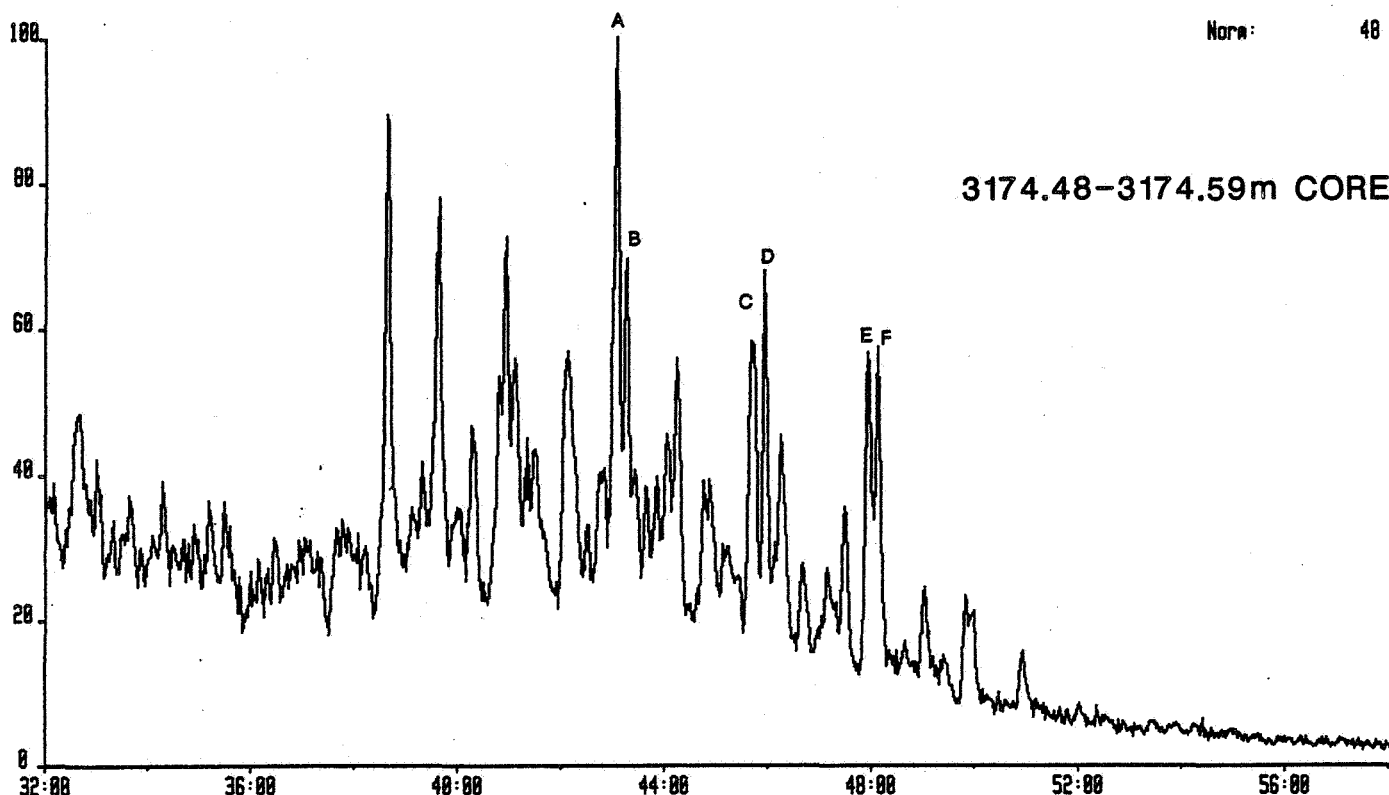
1334005 15-JUL-86 Sir:Magnetic TS250 Acnt:

System:STETRITRP

Sample 1 Injection 1 Group 1 Mass 218.2034

Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

Norm: 48



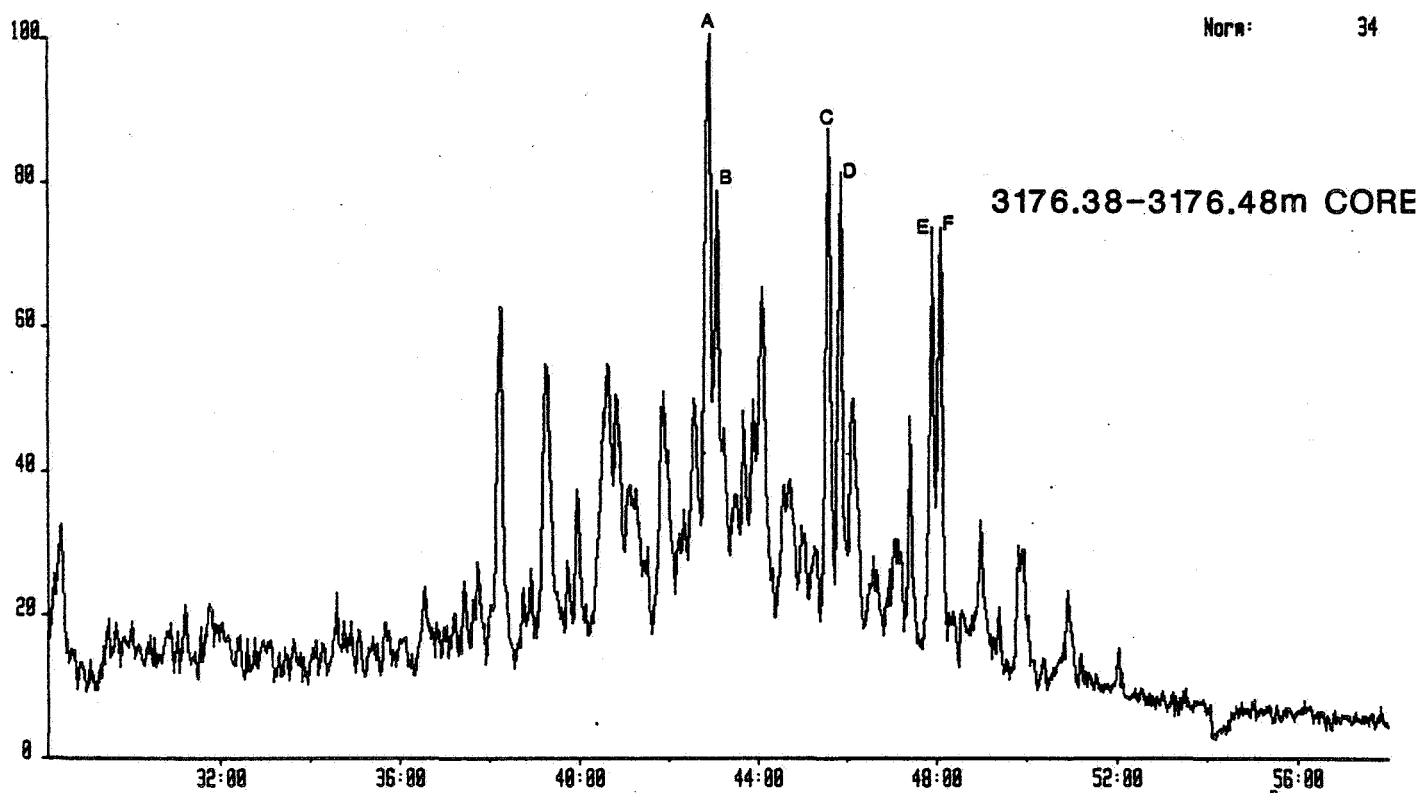
GEOBAT 11-JUL-86 Sir:Magnetic TS250 Acnt:

System:STETRITRP

Sample 1 Injection 1 Group 1 Mass 218.2034

Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

Norm: 34



MASS FRAGMENTOGRAMS



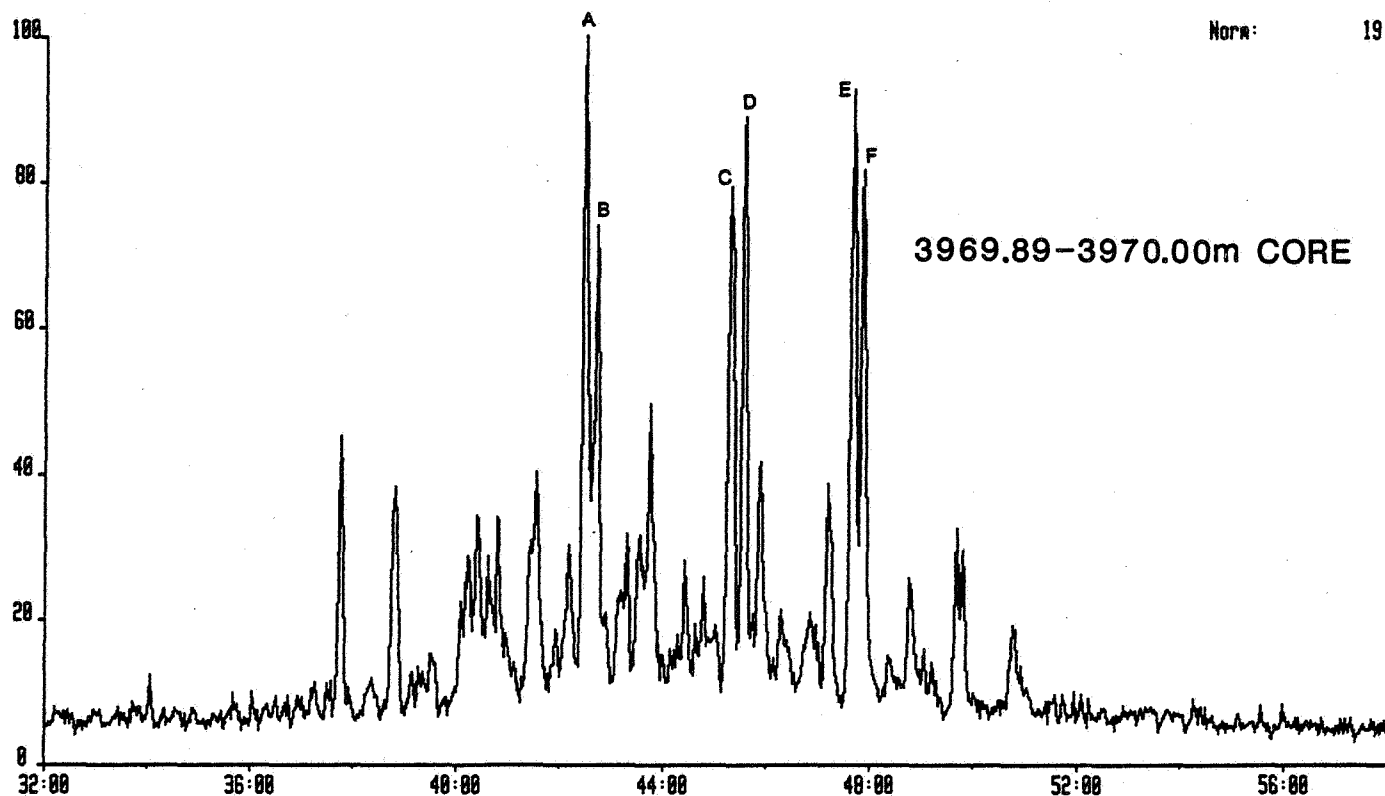
WELL 6506/12-5

 $\beta\beta$ STERANES m/z 218

1334010 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 19



1334012 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 121

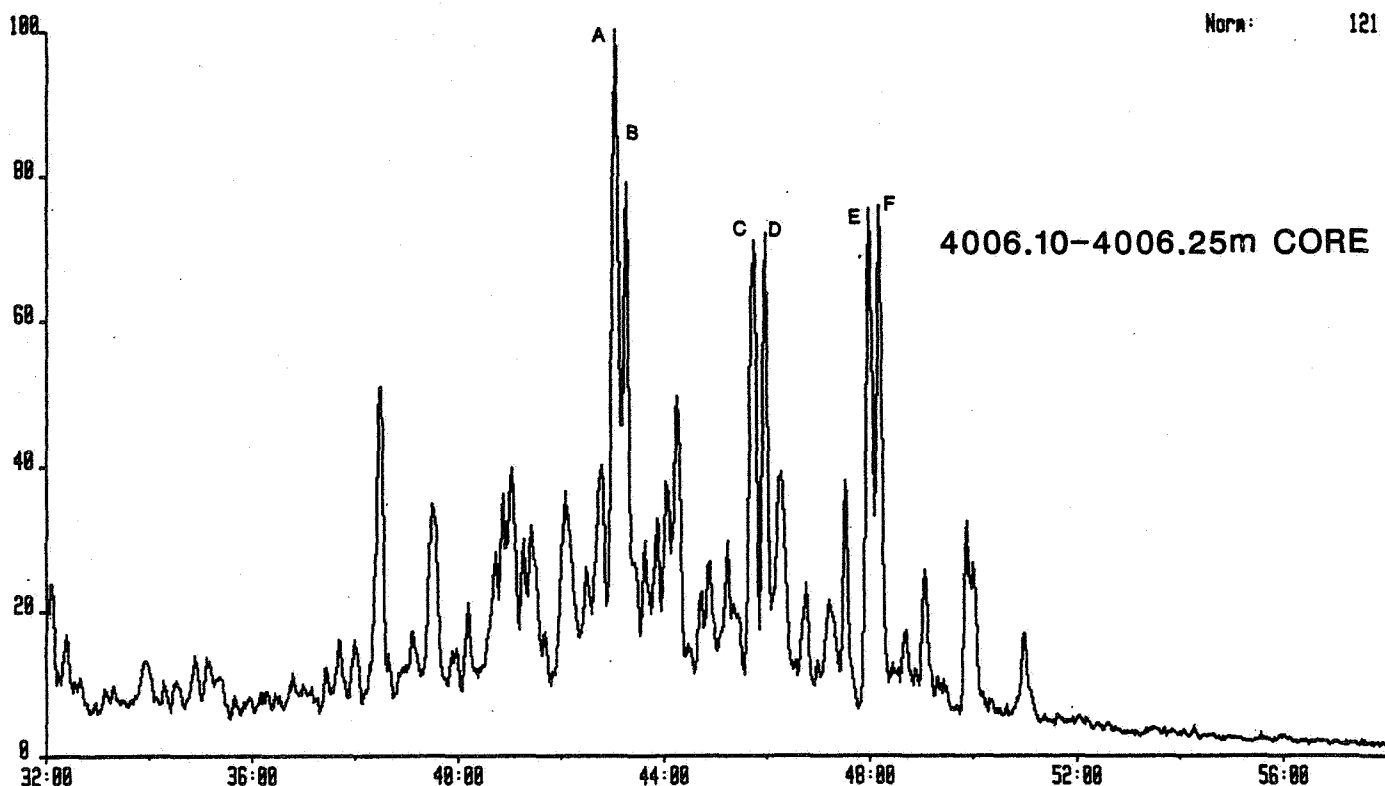


FIGURE 8c

MASS FRAGMENTOGRAMS



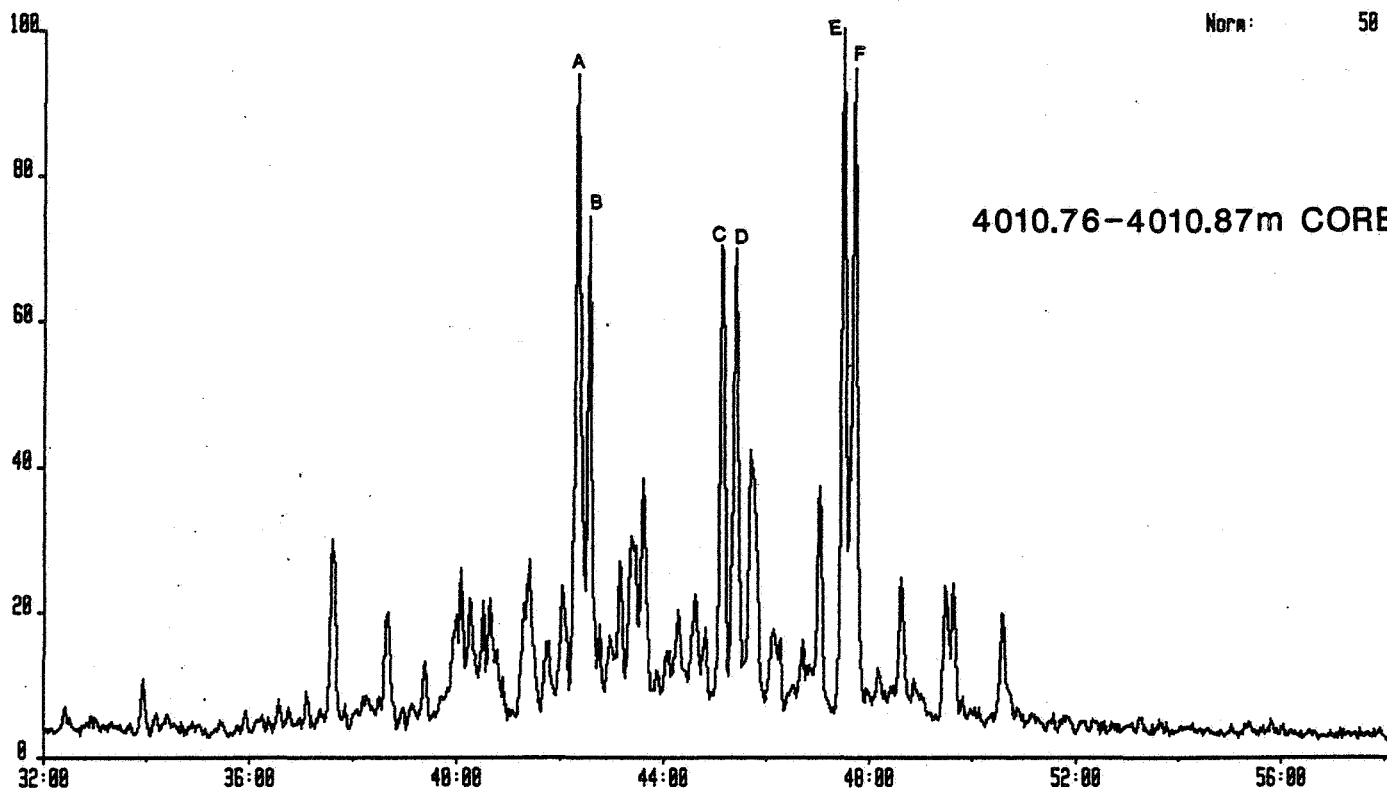
WELL 6506/12-5

 $\beta\beta$ STERANES m/z 218

1334813 15-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 58



1334814 15-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 83

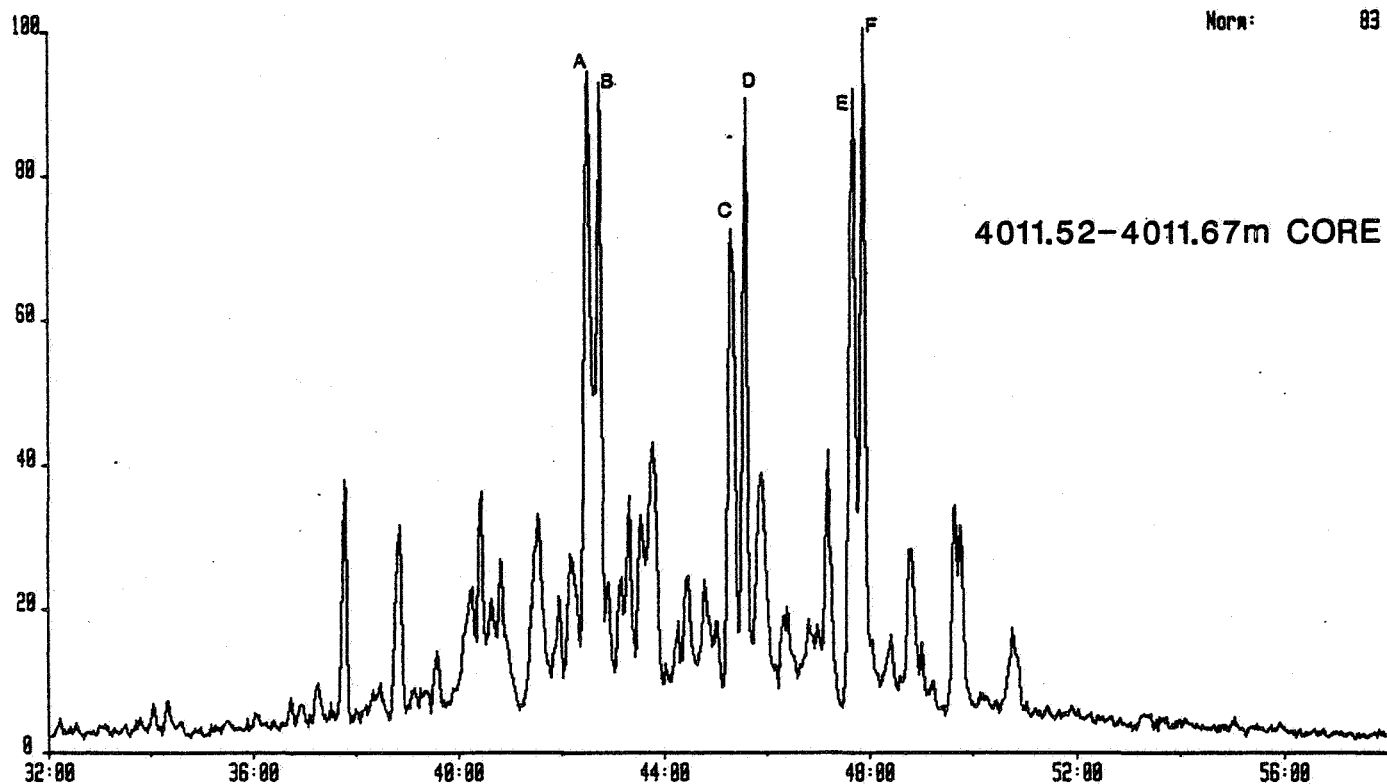


FIGURE 8d

MASS FRAGMENTOGRAMS

WELL 6506/12-5

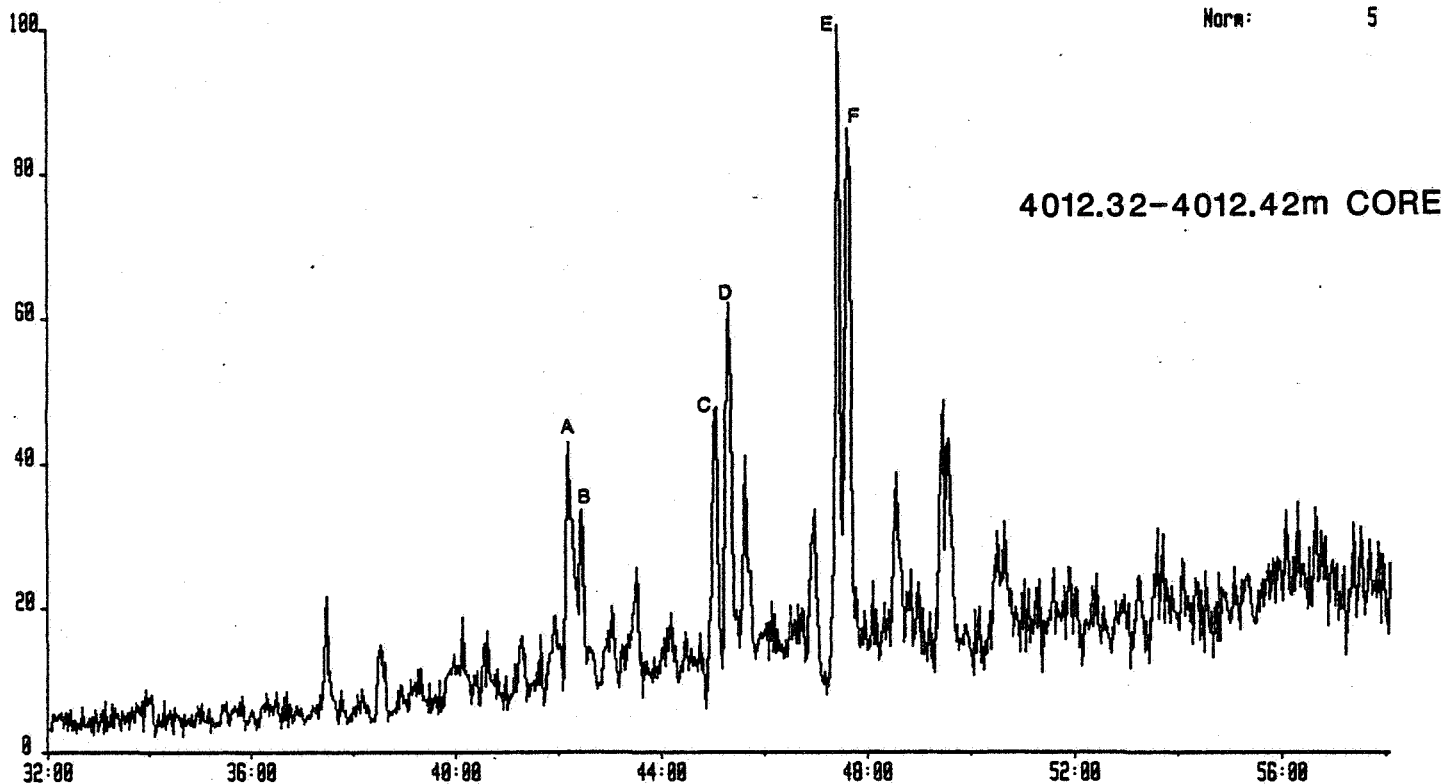
$\beta\beta$ STERANES m/z 218



1334015 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 5



1334017 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 110

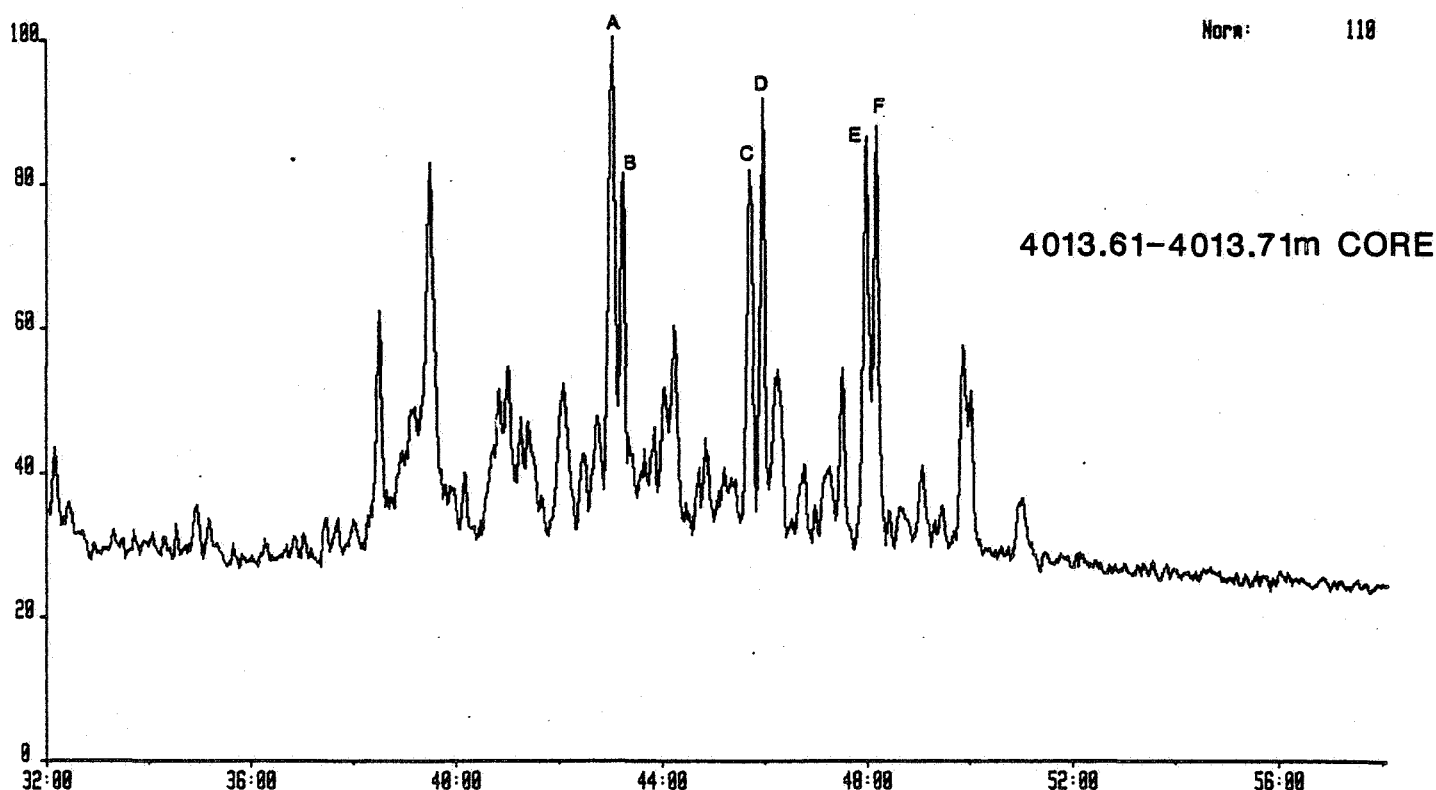


FIGURE 8e

MASS FRAGMENTOGRAMS

WELL 6506/12-5

$\beta\beta$ STERANES m/z 218



1334019 15-JUL-86 Sir: Magnetic TS250 Rcnt:
Sample 1 Injection 1 Group 1 Mass 218.2034
Text: TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System: STETRITRP

Norm: 60

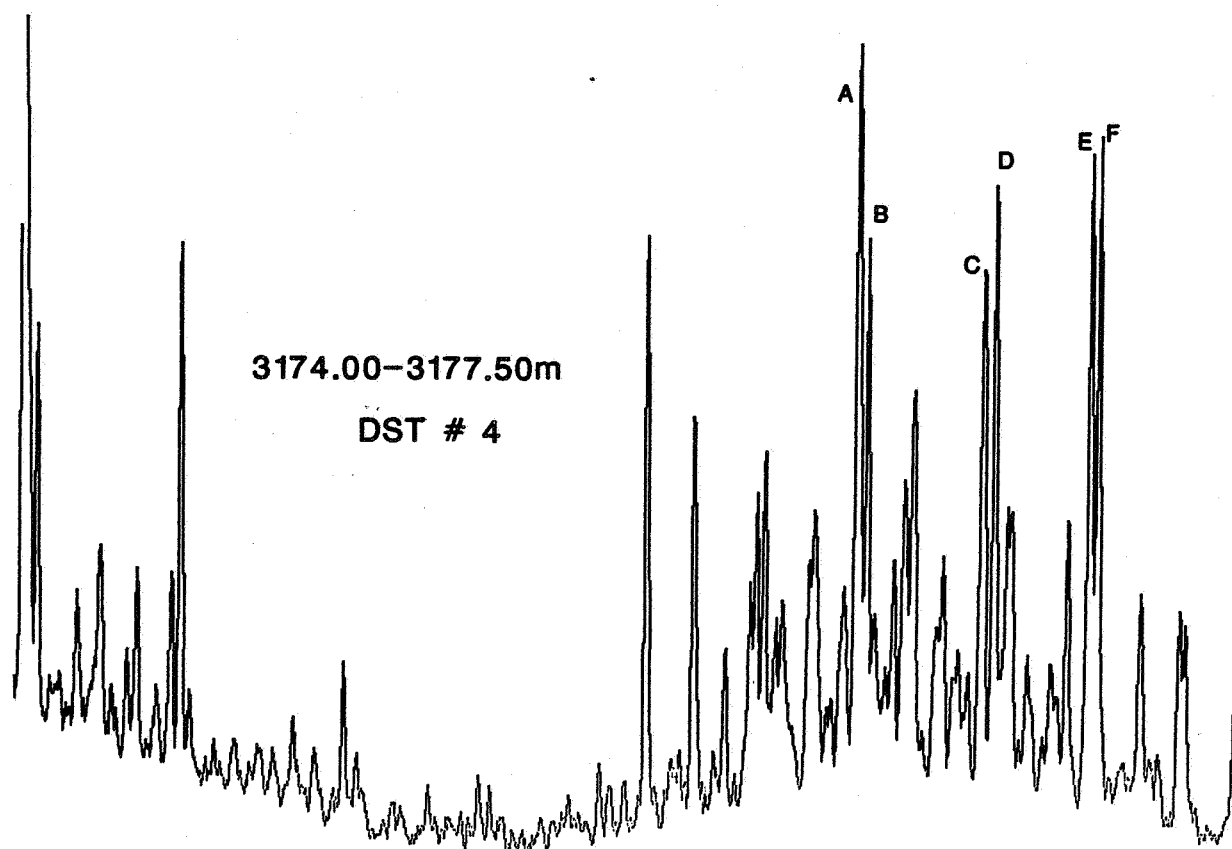
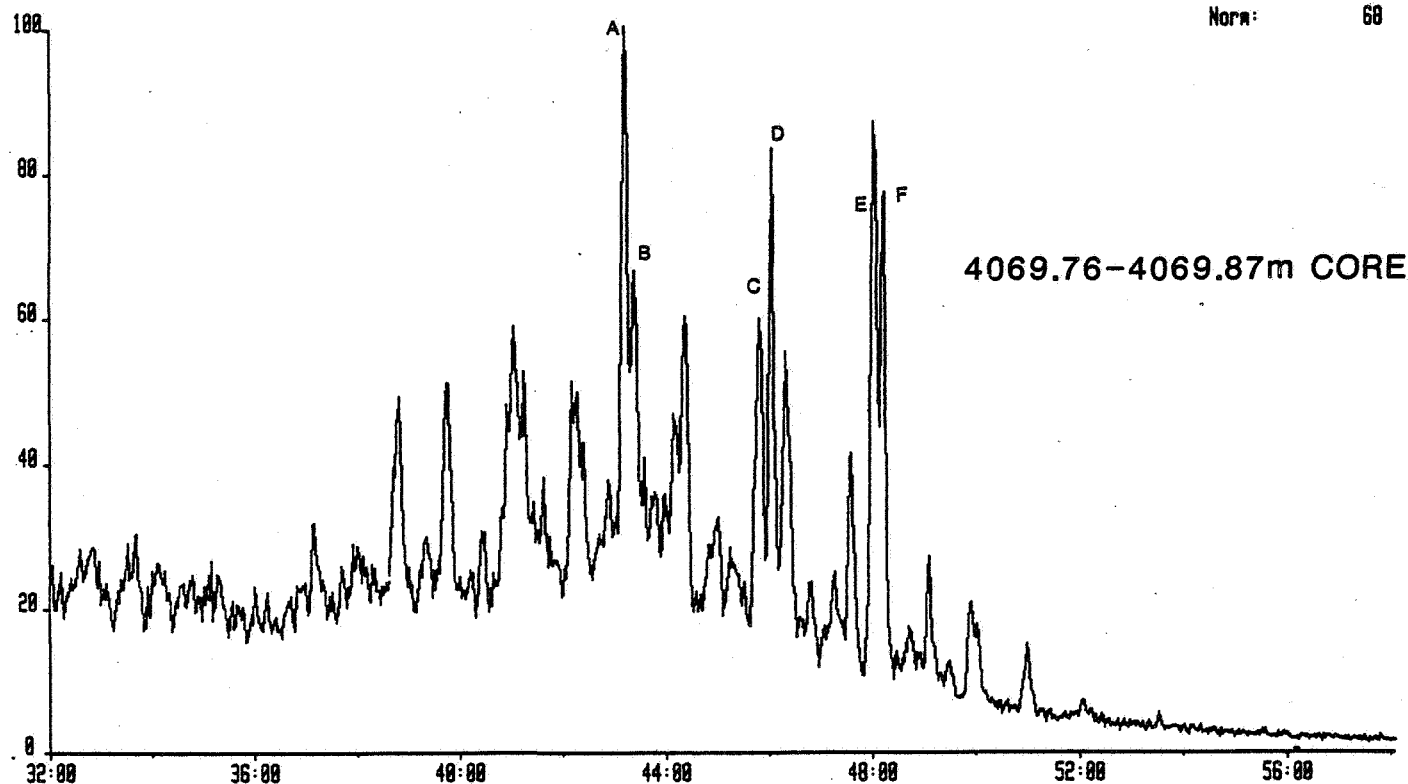


FIGURE 8f

MASS FRAGMENTOGRAMS

WELL 6506/12-5

$\beta\beta$ STERANES m/z 218

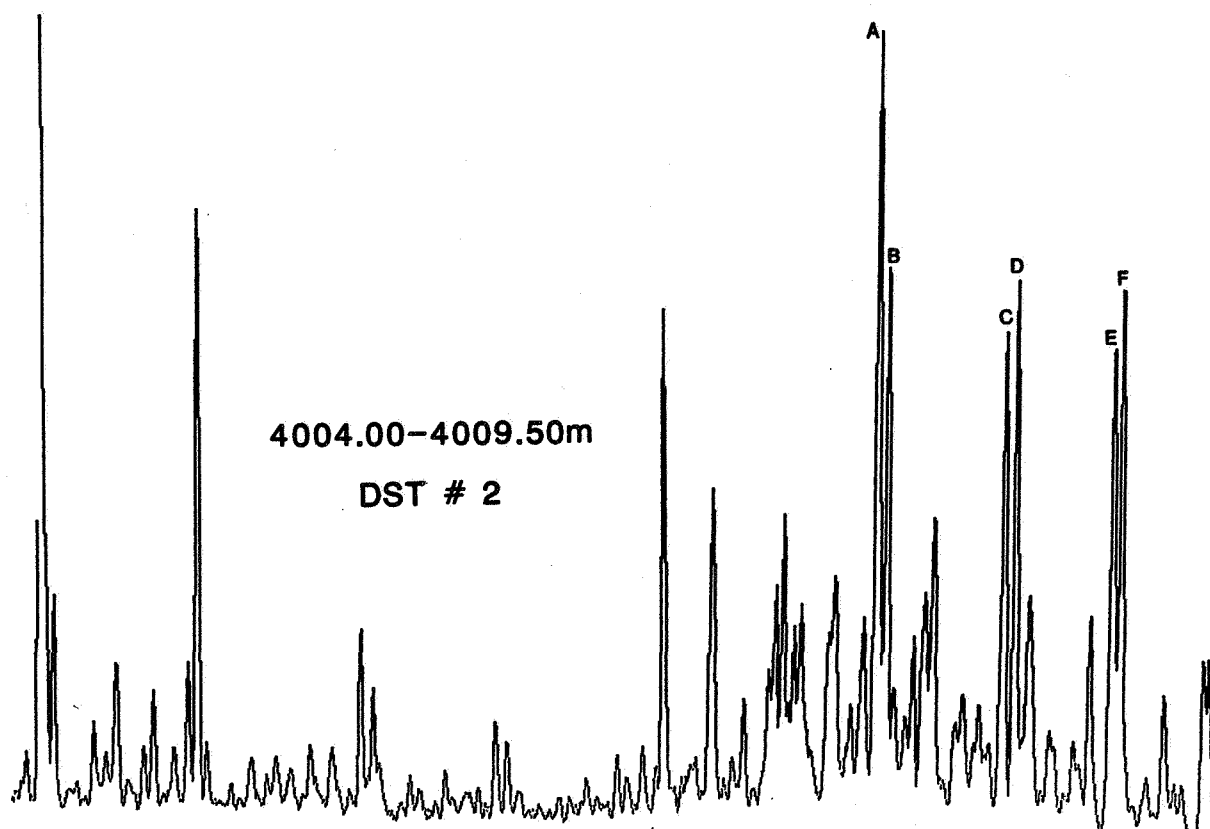


FIGURE 9a

MASS FRAGMENTOGRAMS

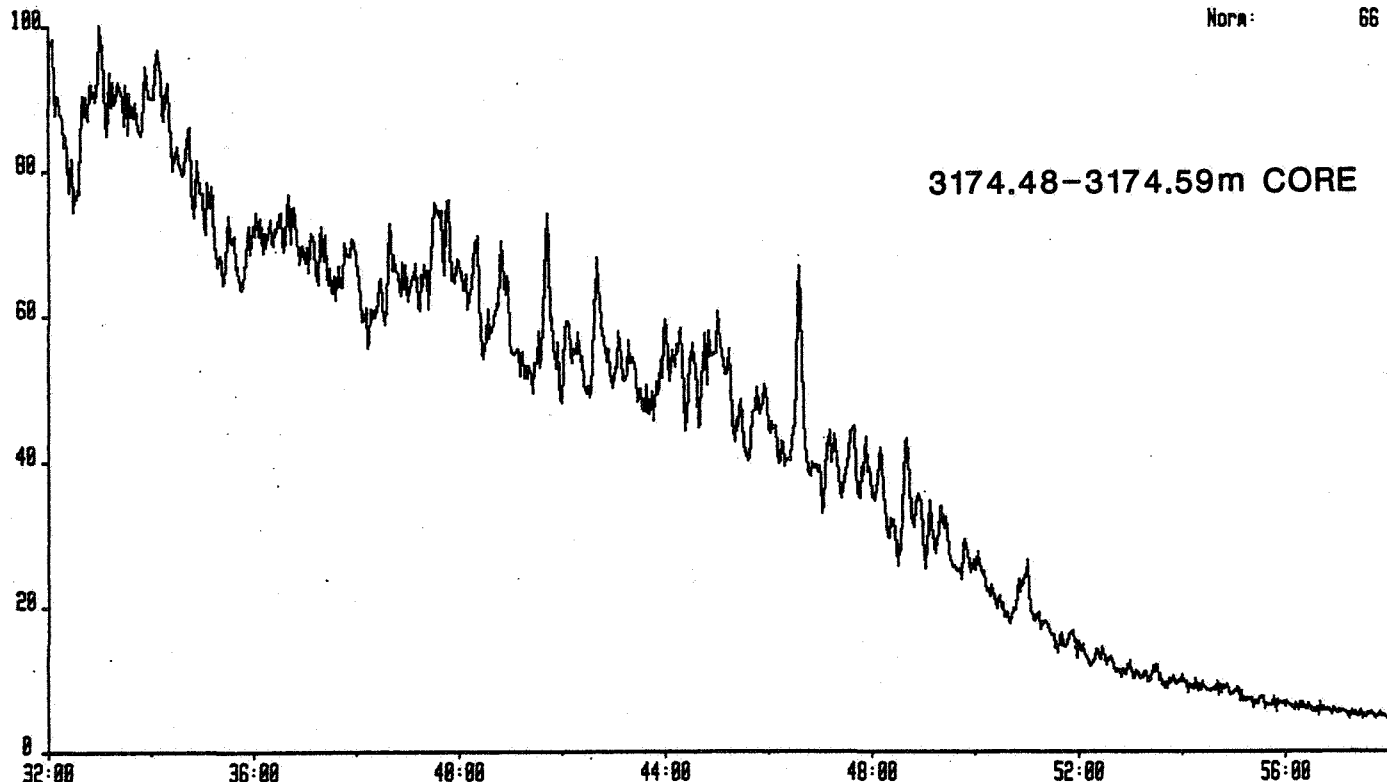


WELL 6506/12-5 TRIAROMATIC STERANES m/z 231

1334885 15-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 66



GEOBAT 11-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 45

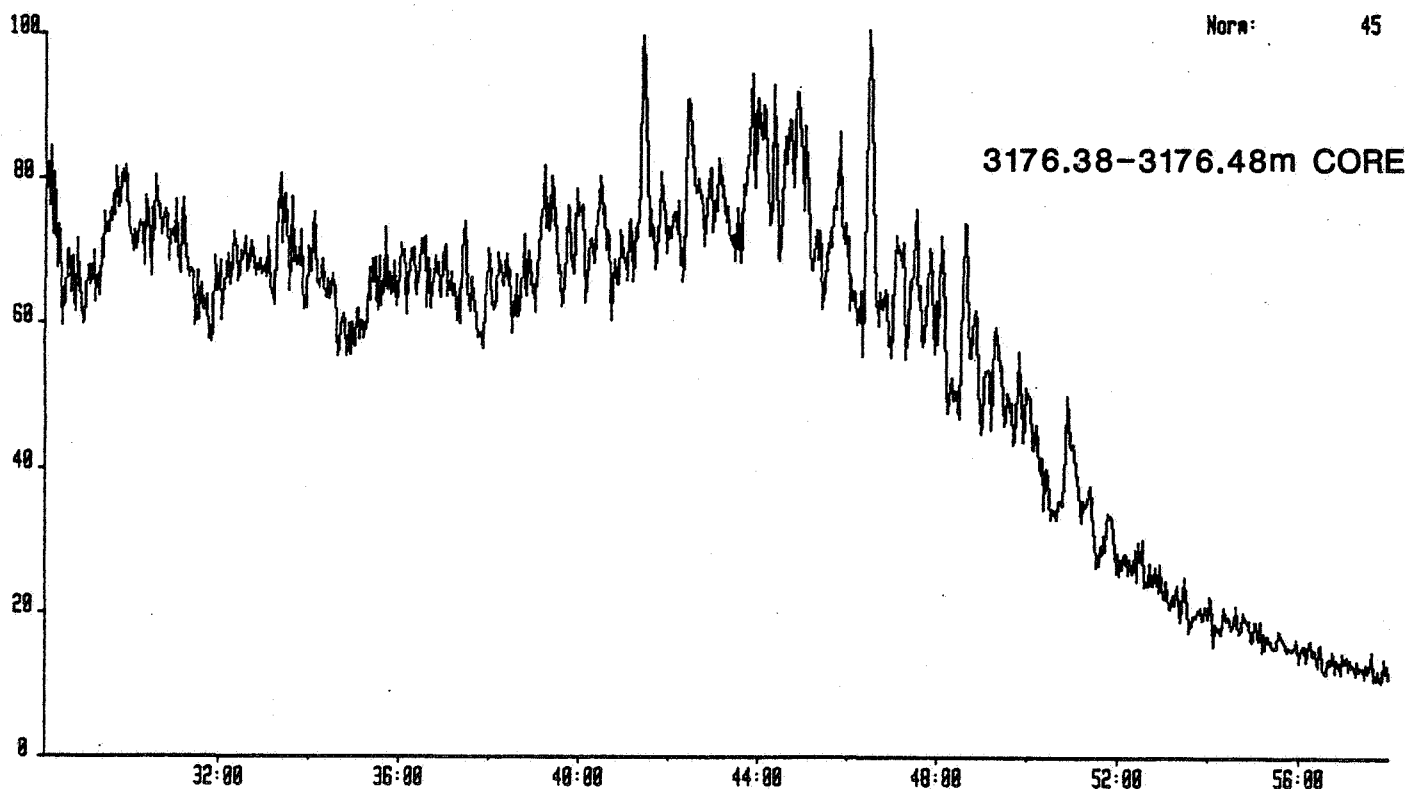


FIGURE 9b

MASS FRAGMENTOGRAMS

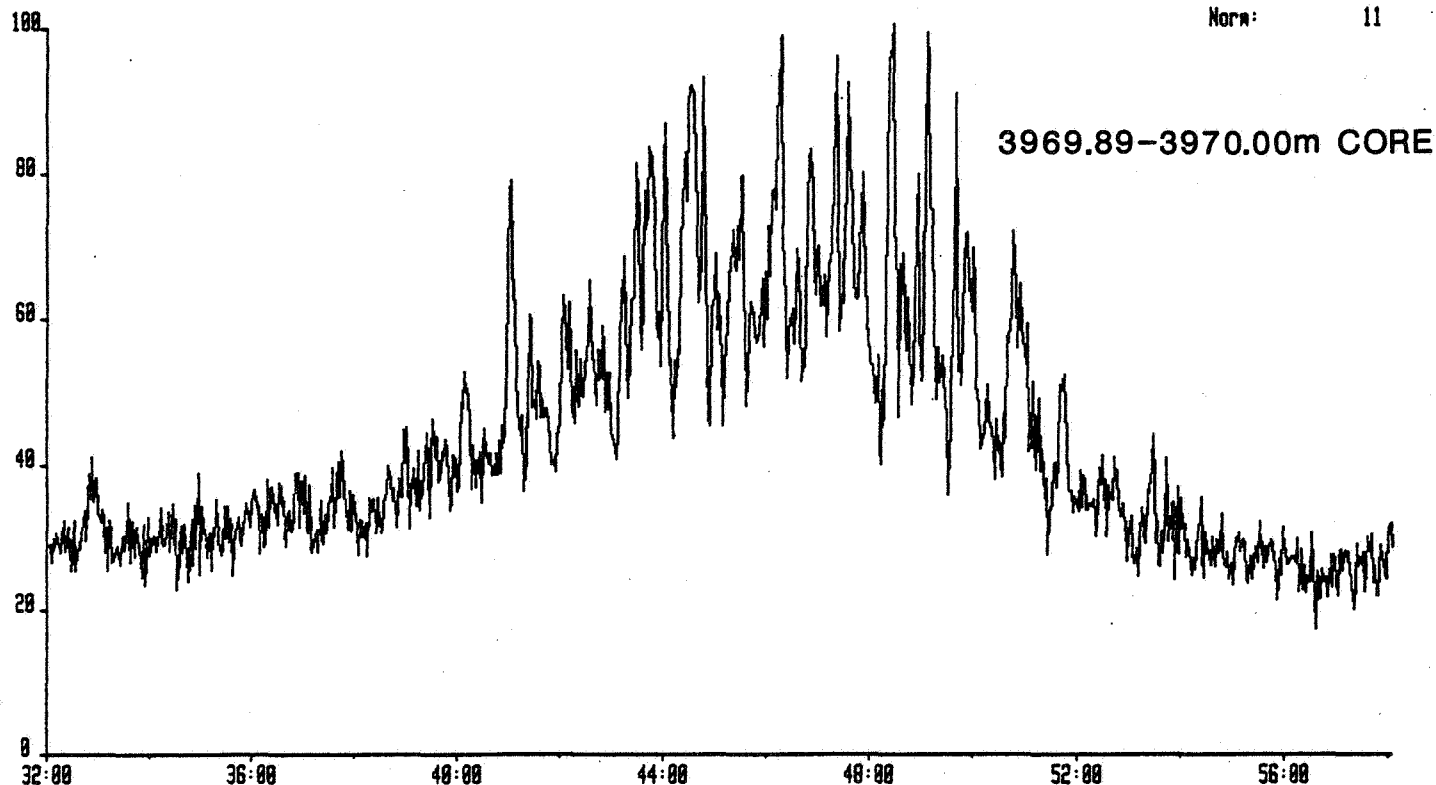


WELL 6506/12-5 TRIAROMATIC STERANES m/z 231

1334010 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

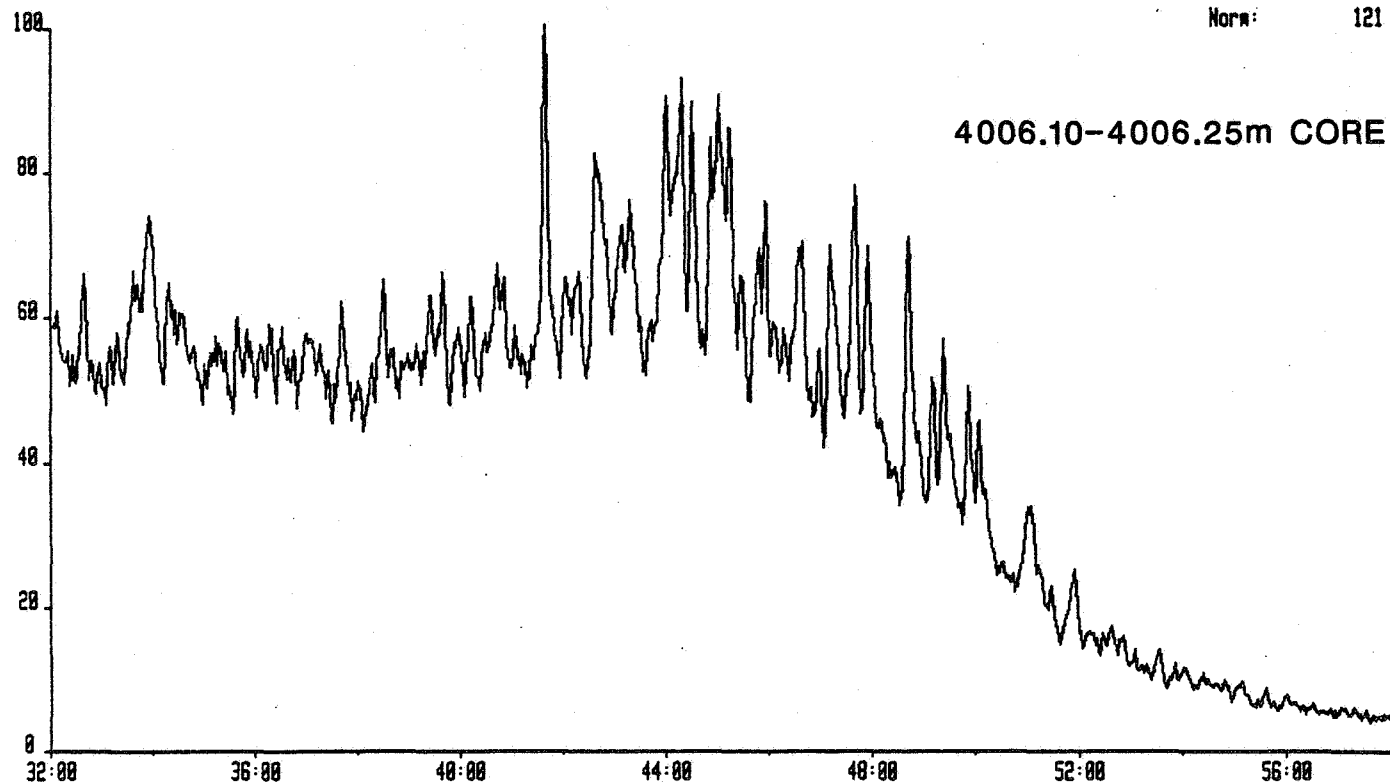
Norm: 11



1334012 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 121

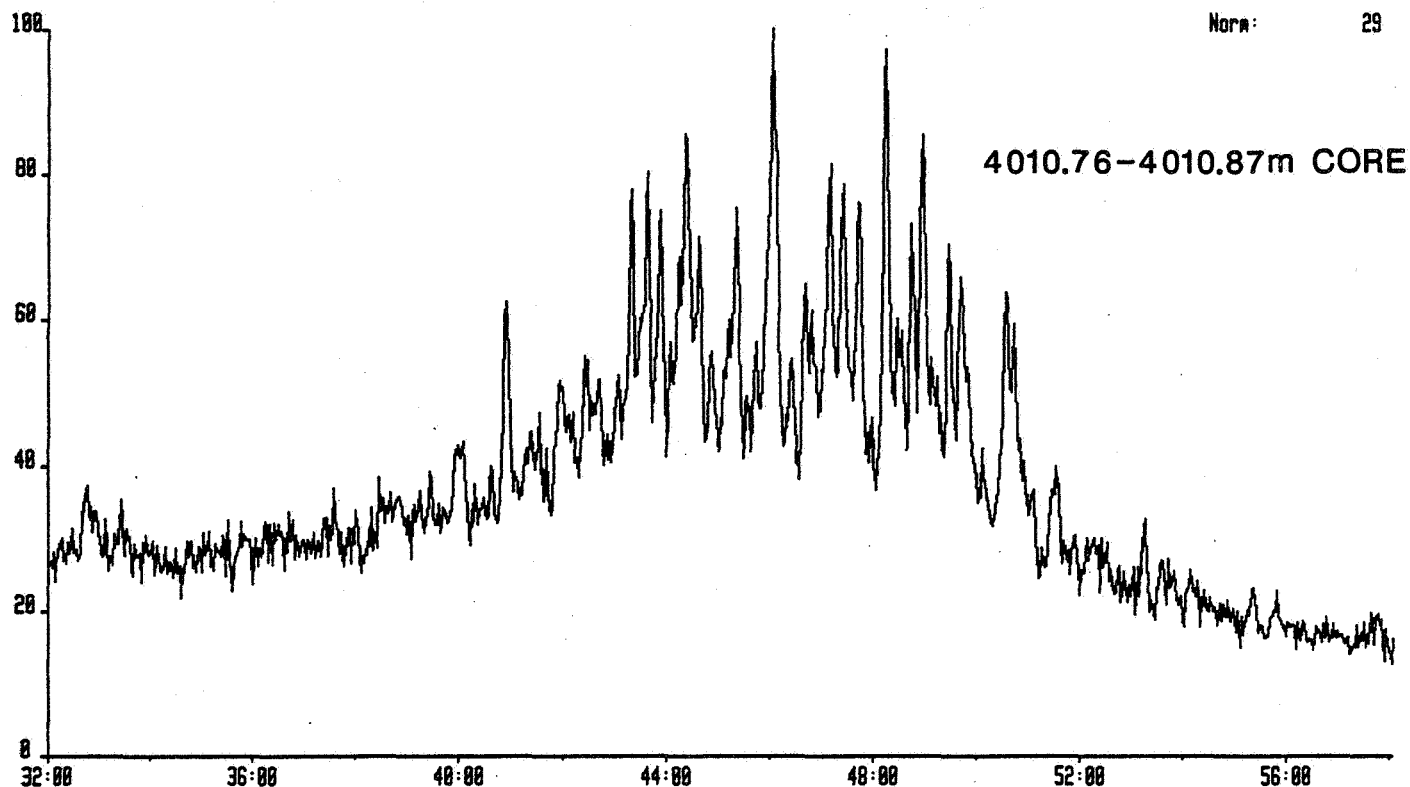




WELL 6506/12-5 TRIAROMATIC STERANES m/z 231

1334013 15-JUL-86 Str:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



1334014 15-JUL-86 Str:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

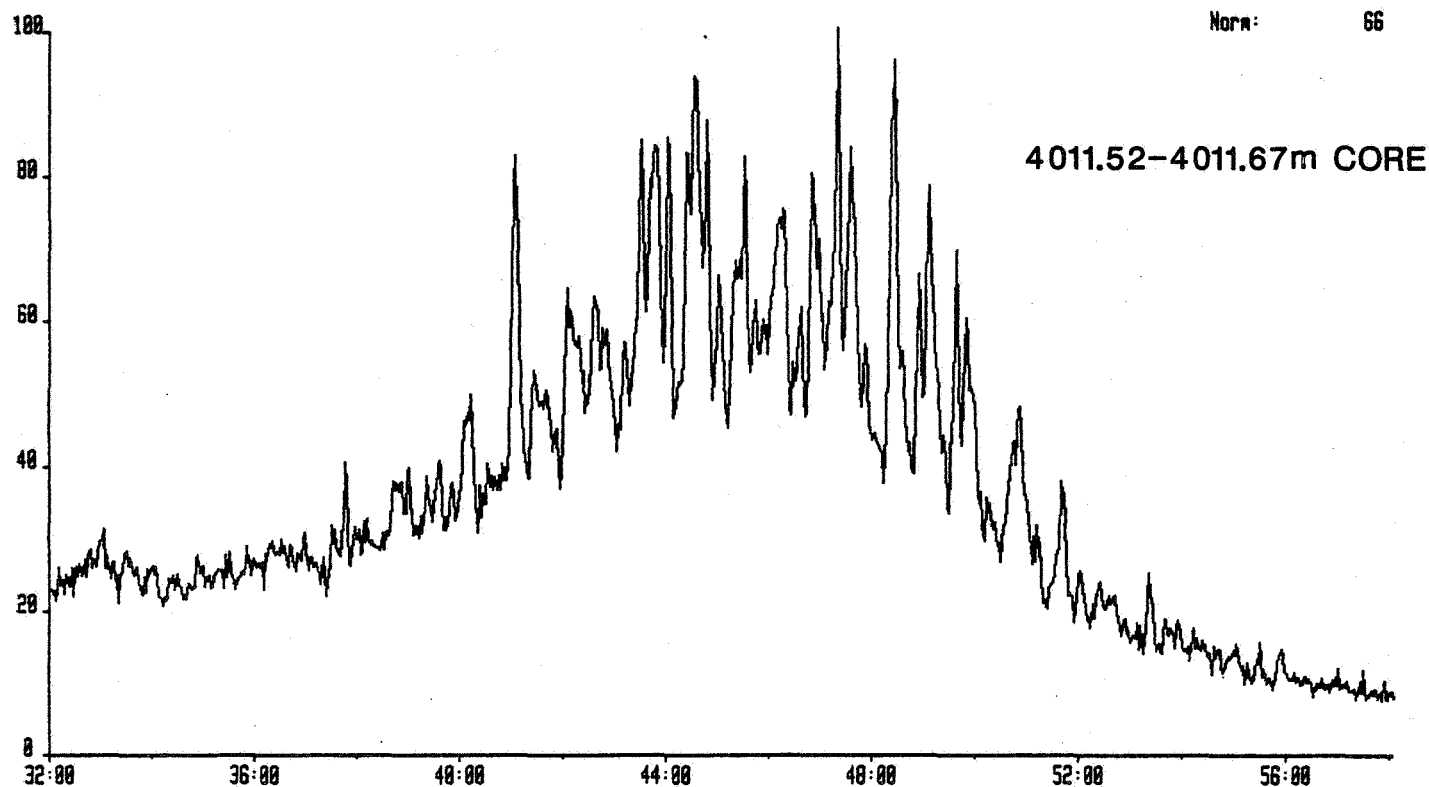


FIGURE 9d

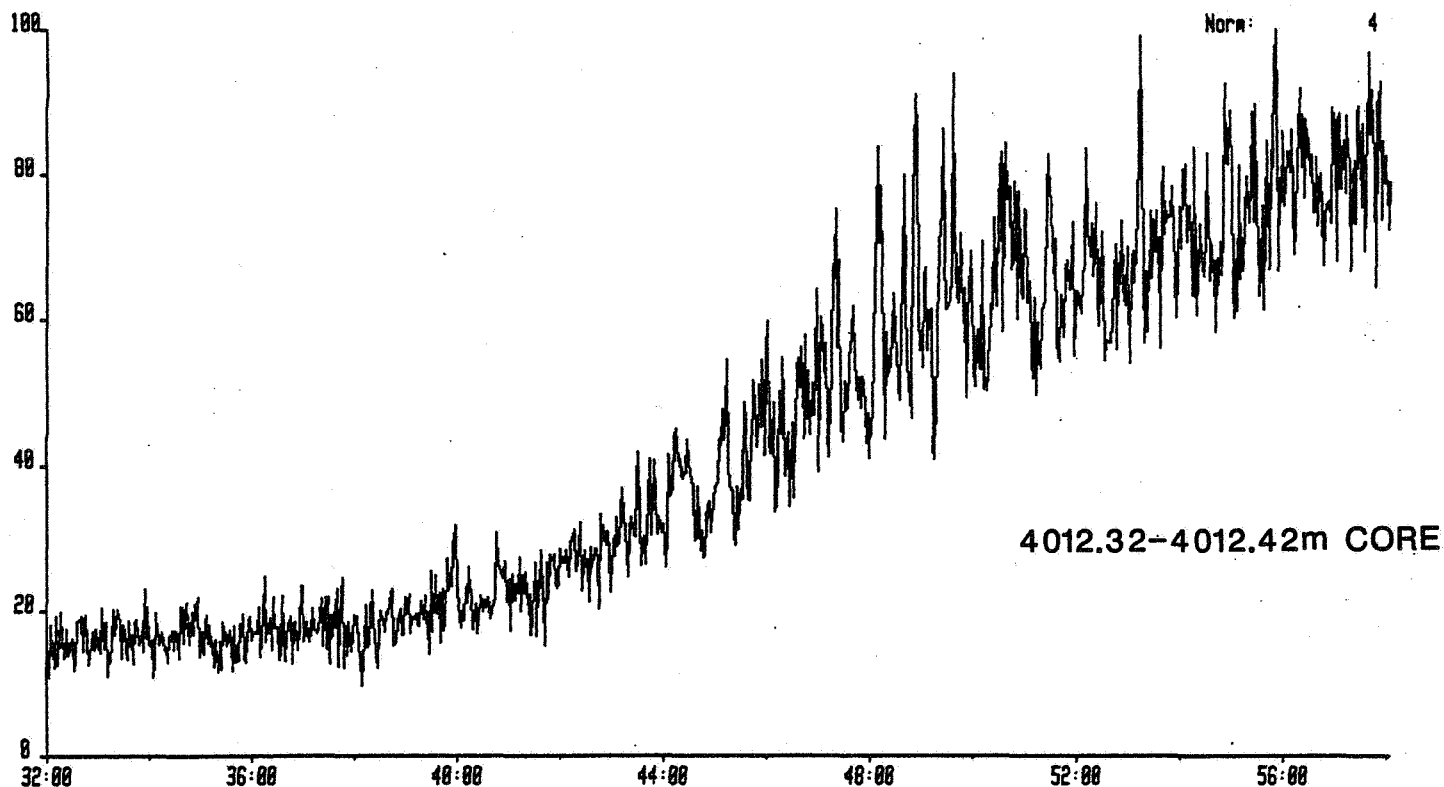
MASS FRAGMENTOGRAMS



WELL 6506/12-5 TRIAROMATIC STERANES m/z 231

1334815 14-JUL-86 Sir:Magnetic TS258 Rcnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



1334817 14-JUL-86 Sir:Magnetic TS258 Rcnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

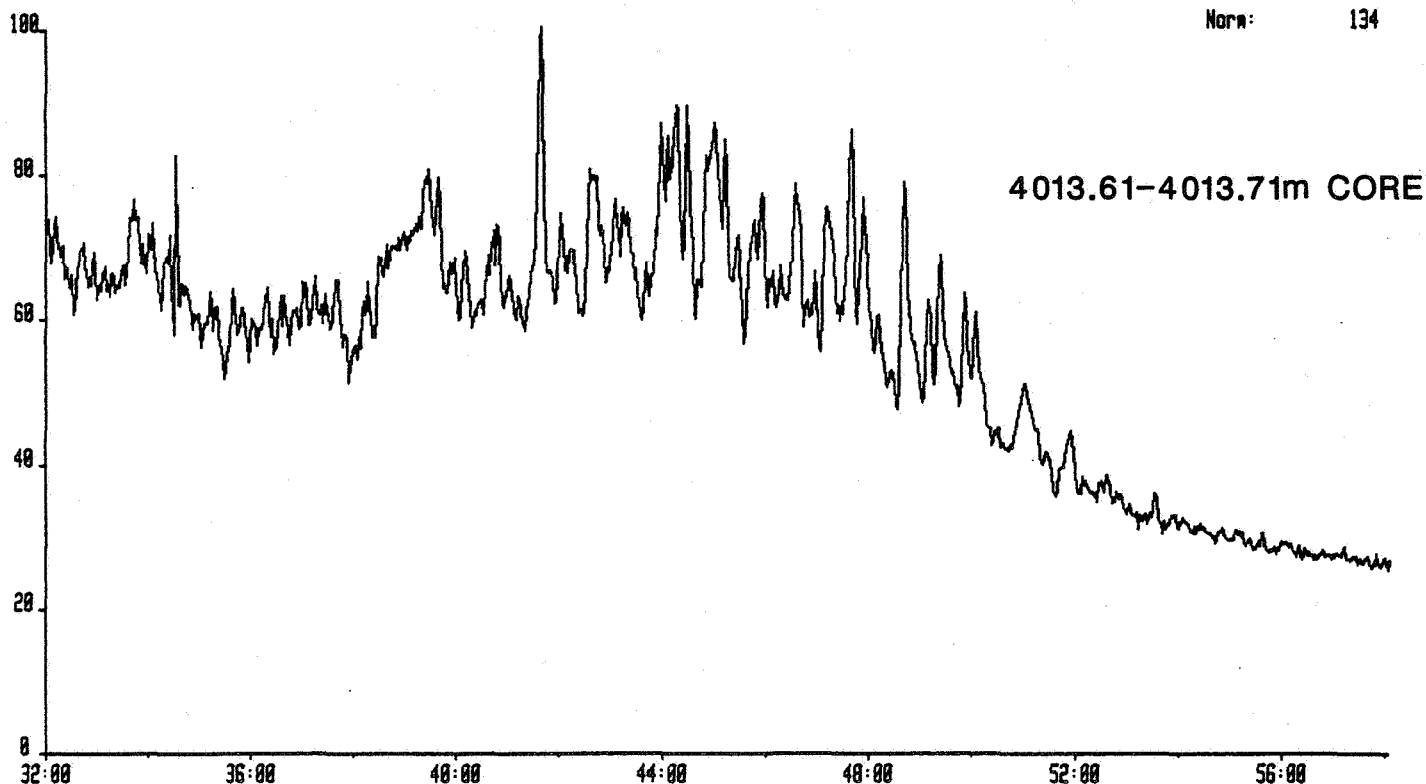


FIGURE 9e

MASS FRAGMENTOGRAMS

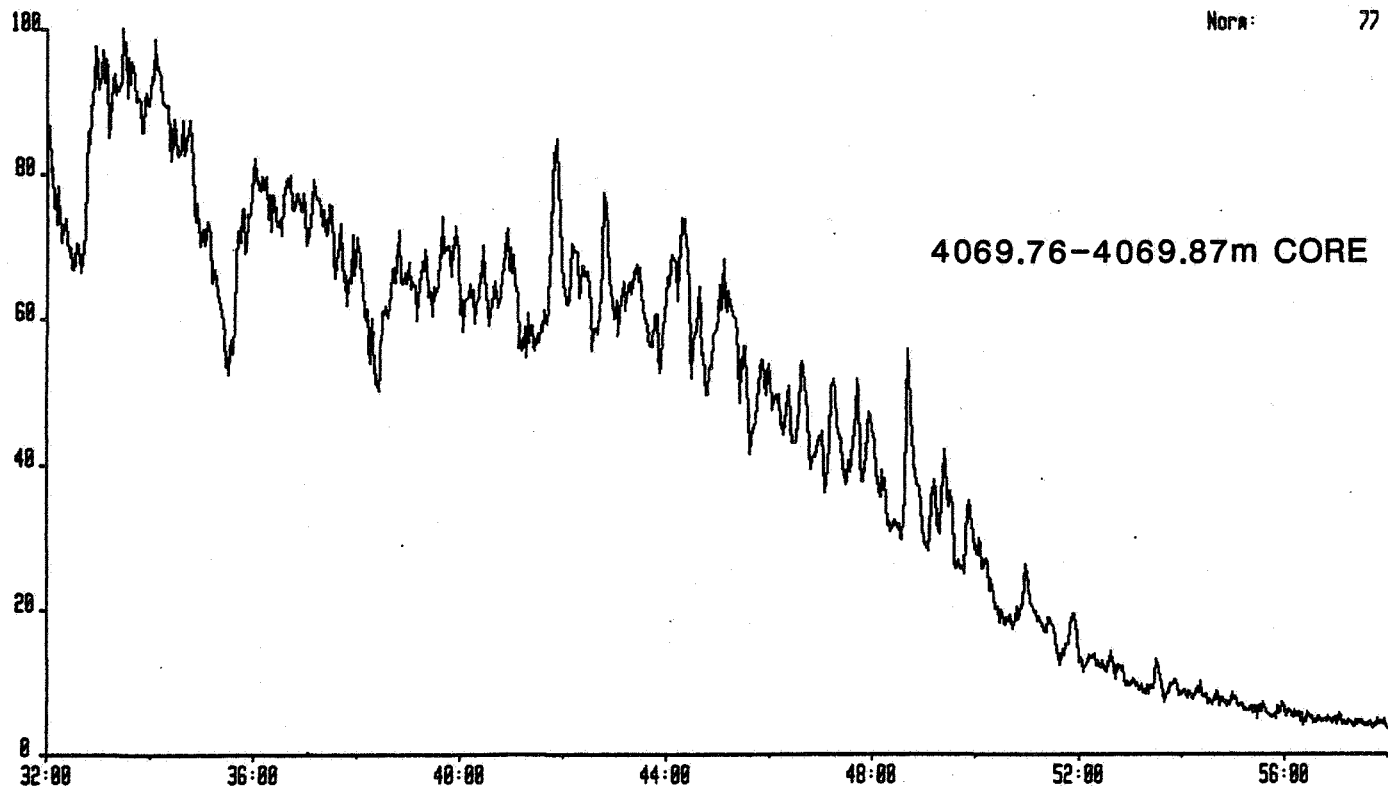


WELL 6506/12-5 TRIAROMATIC STERANES m/z 231

1334019 15-JUL-86 Str:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 231.1200
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

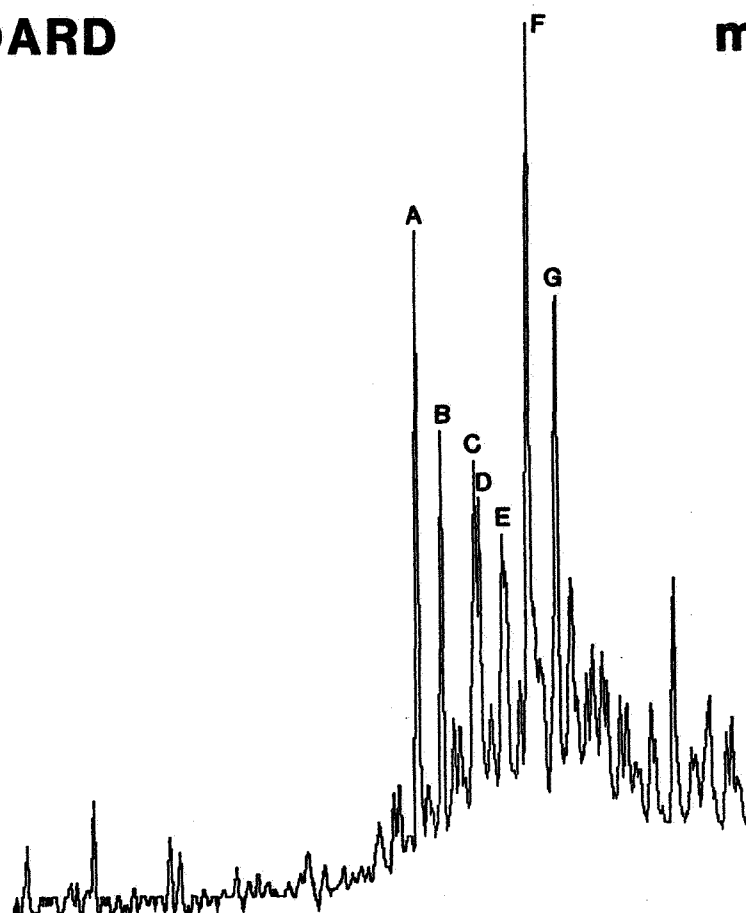
System:STETRITRP

Norm: 77



STANDARD

m/z 259



STERANE IDENTIFICATION

(M/Z 259 FRAGMENTOGRAM)

COMPOUND

ELEMENTAL COMPOSITION

A	13 β ,17 α -diacholestane (20S)	C ₂₇ H ₄₈
B	13 β ,17 α -diacholestane (20R)	C ₂₇ H ₄₈
C	13 α ,17 β -diacholestane (20R)	C ₂₇ H ₄₈
D	24,-methyl-13 β ,17 α -diacholestane (20S)	C ₂₈ H ₅₀
E	24,-methyl-13 β ,17 α -diacholestane (20R)	C ₂₈ H ₅₀
F	24,-ethyl-13 β ,17 α -diacholestane (20S)	C ₂₉ H ₅₂
G	24,-ethyl-13 β ,17 α -diacholestane (20R)	C ₂₉ H ₅₂

FIGURE 10a

MASS FRAGMENTOGRAMS

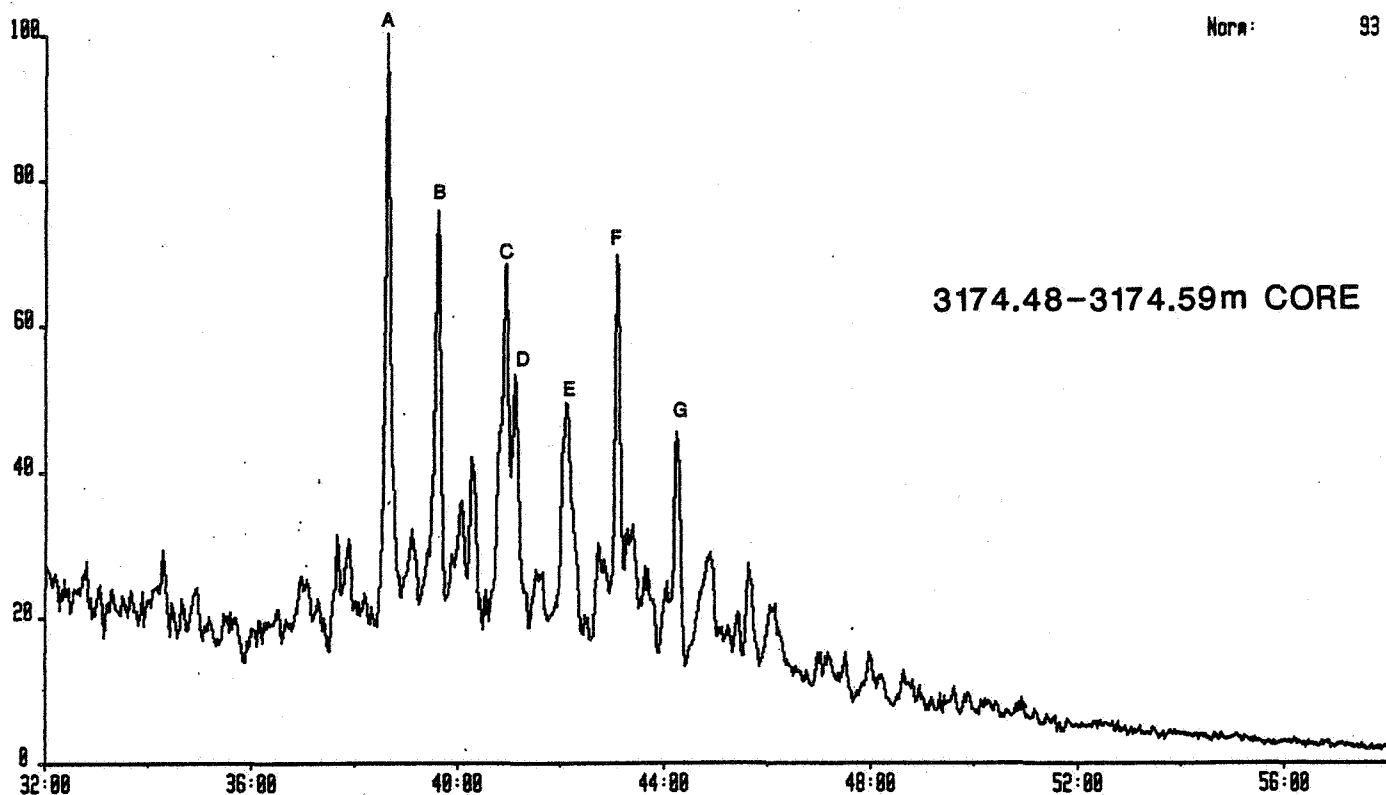


WELL 6506/12-5 REARRANGED STERANES m/z 259

1334885 15-JUL-86 Str:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 93



GEOBAT 11-JUL-86 Str:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 60

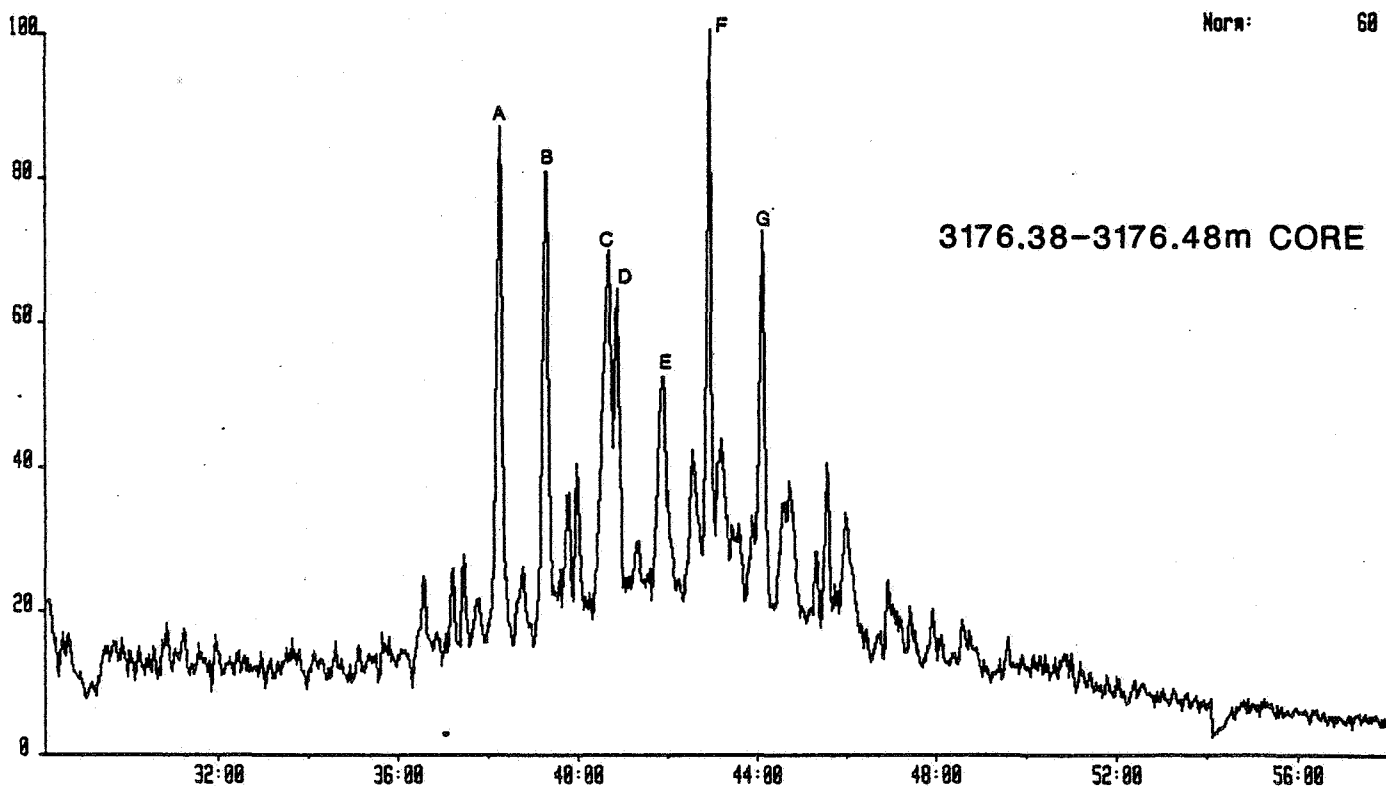


FIGURE 10b

MASS FRAGMENTOGRAMS

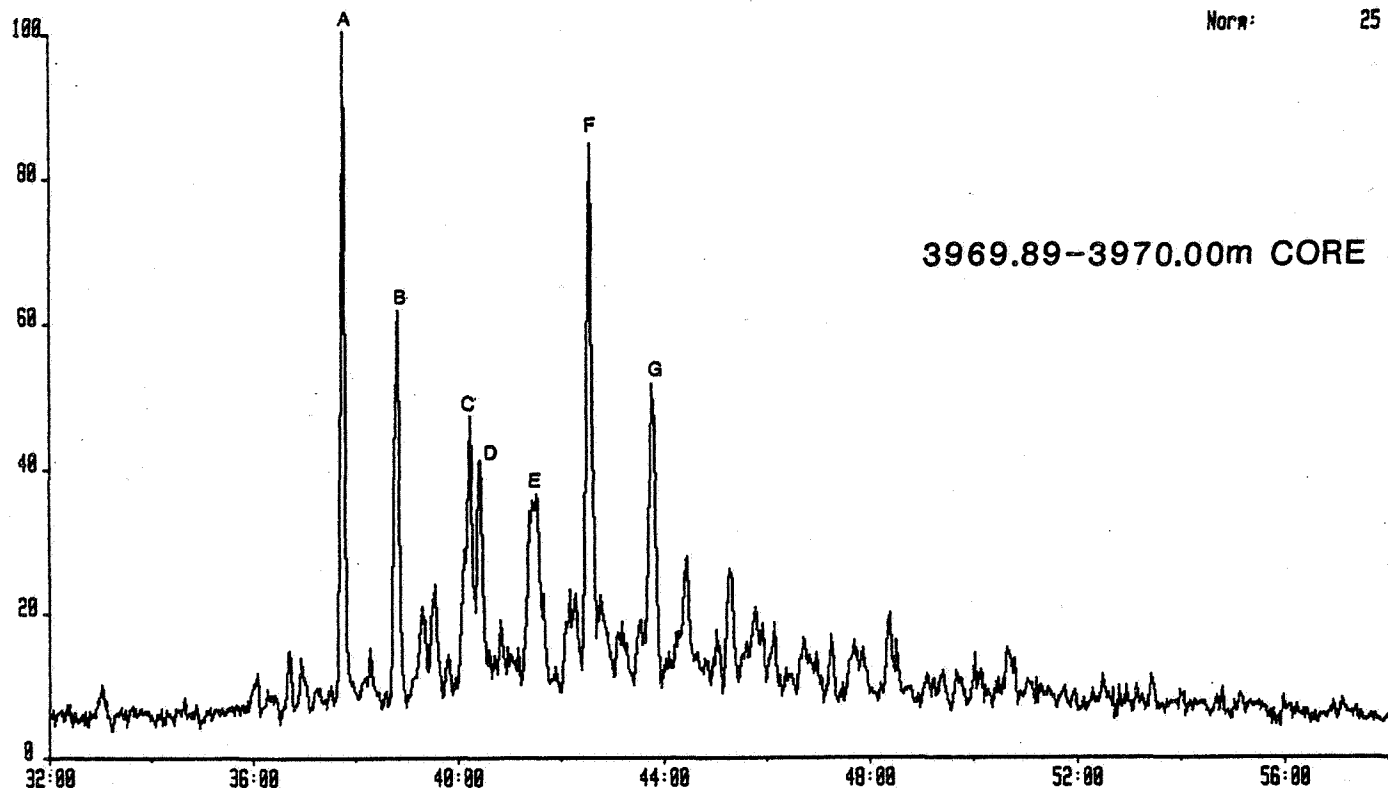


WELL 6506/12-5 REARRANGED STERANES m/z 259

1334010 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 25



1334012 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 154

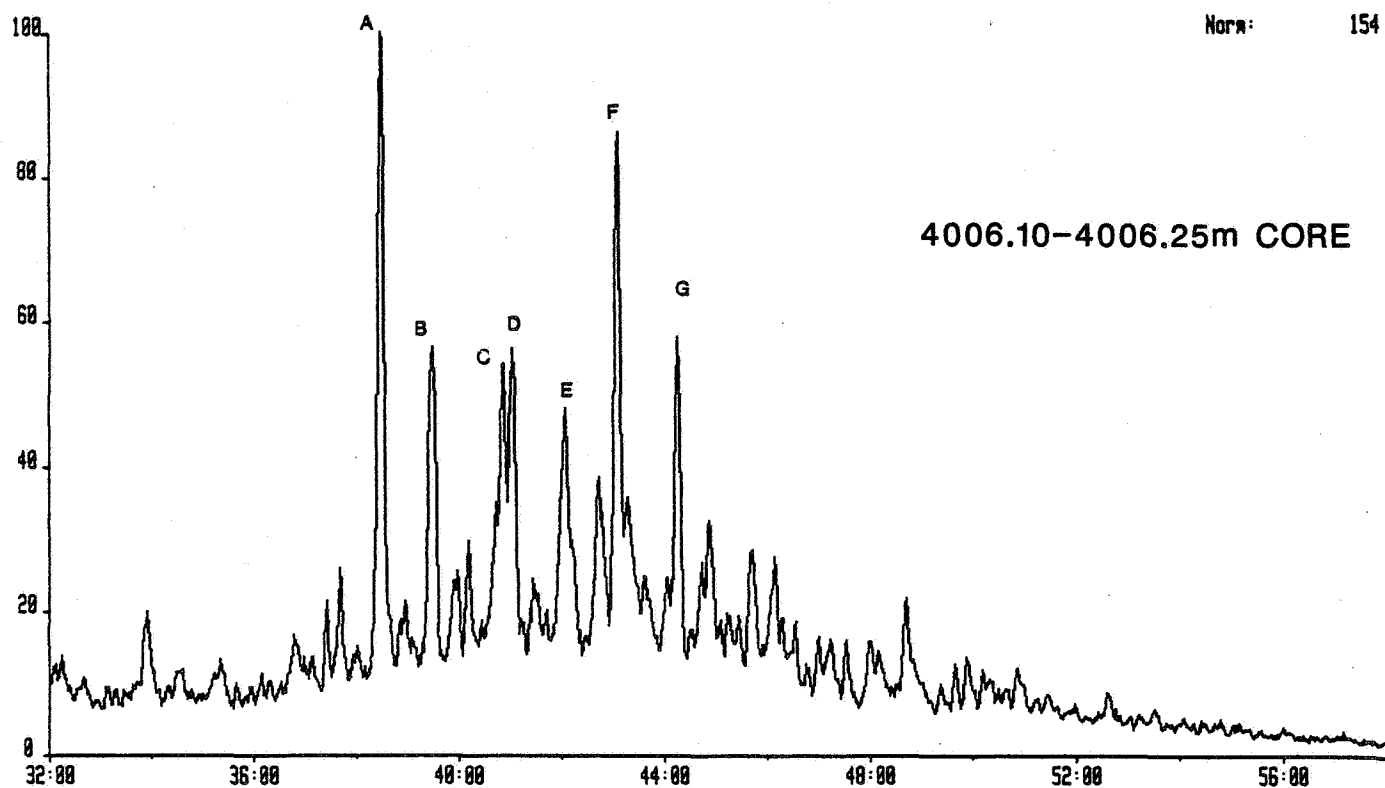


FIGURE 10c

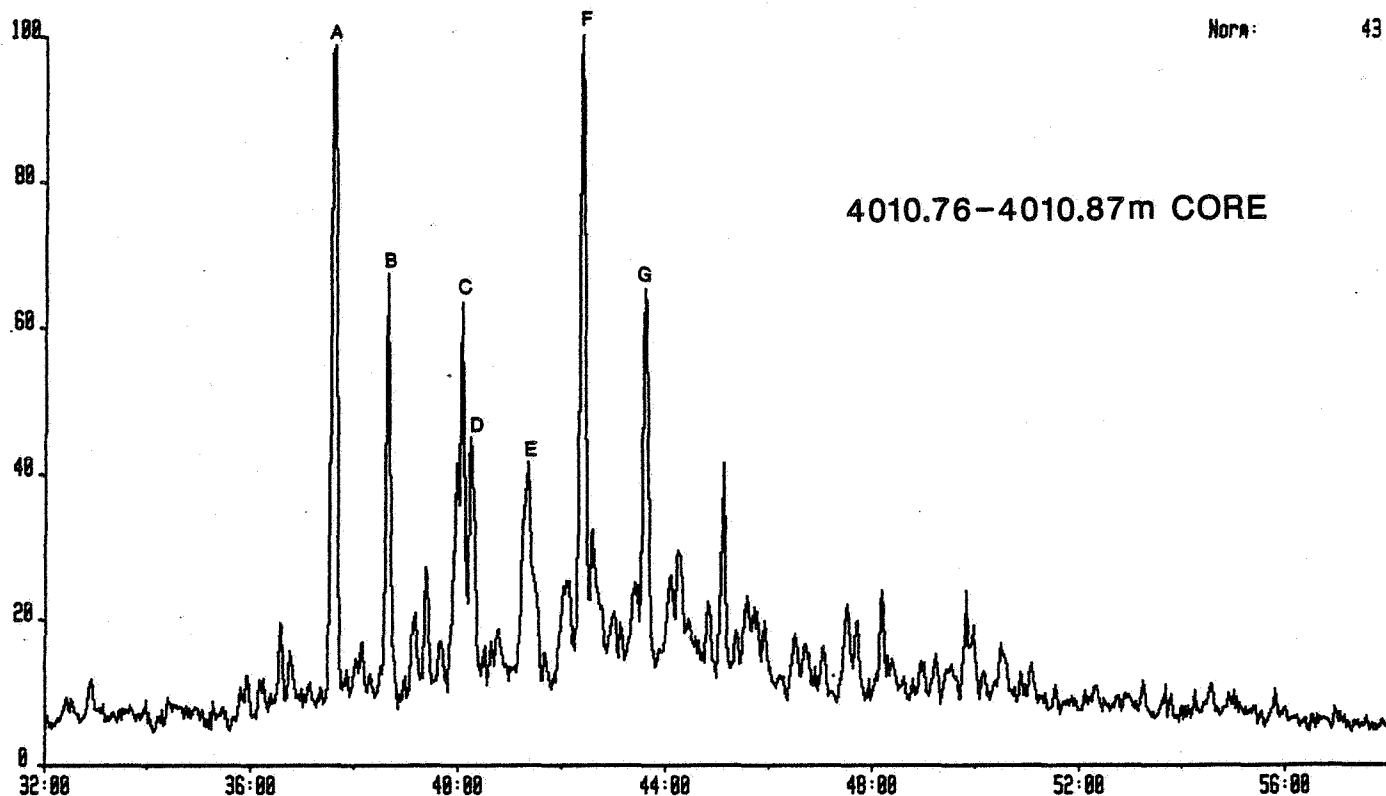
MASS FRAGMENTOGRAMS



WELL 6506/12-5 REARRANGED STERANES m/z 259

1334013 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



1334014 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

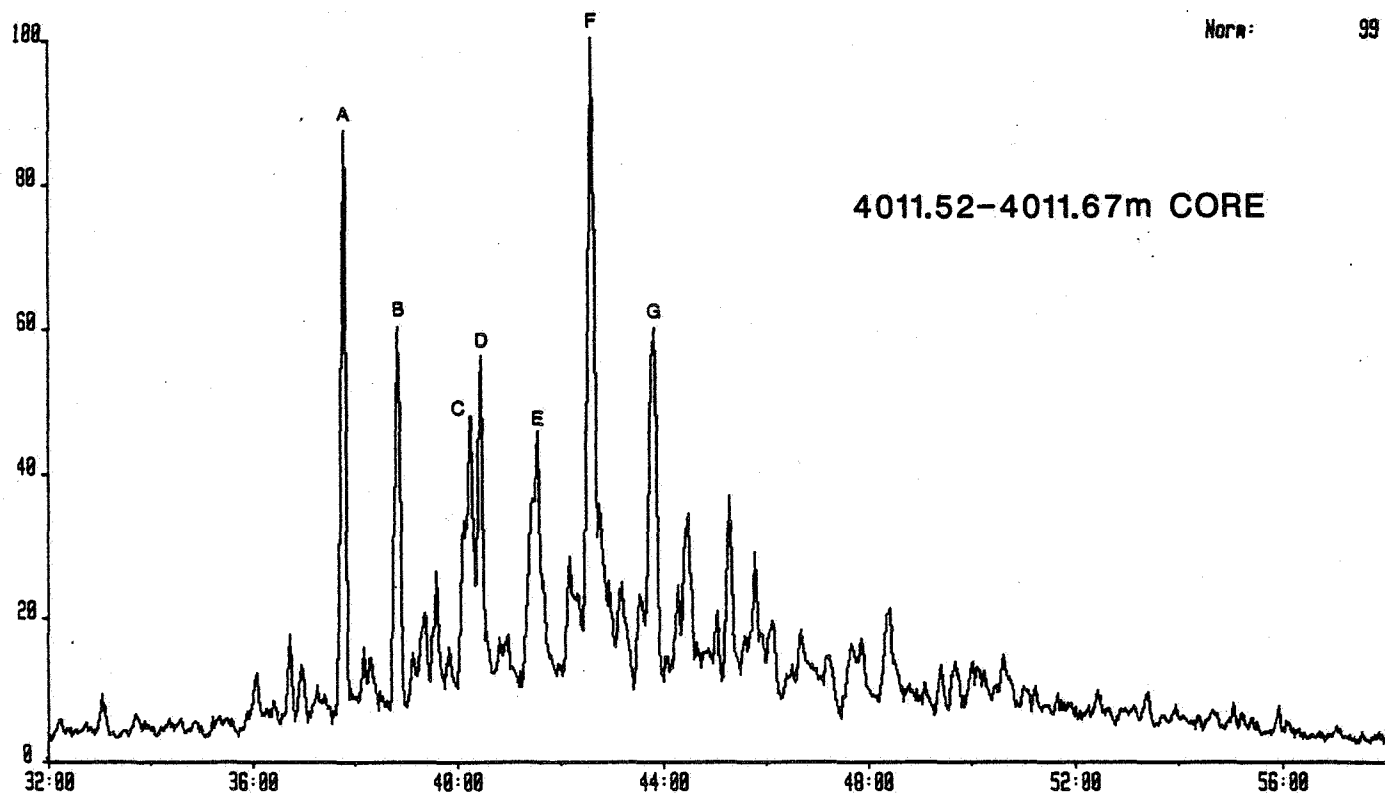


FIGURE 10d

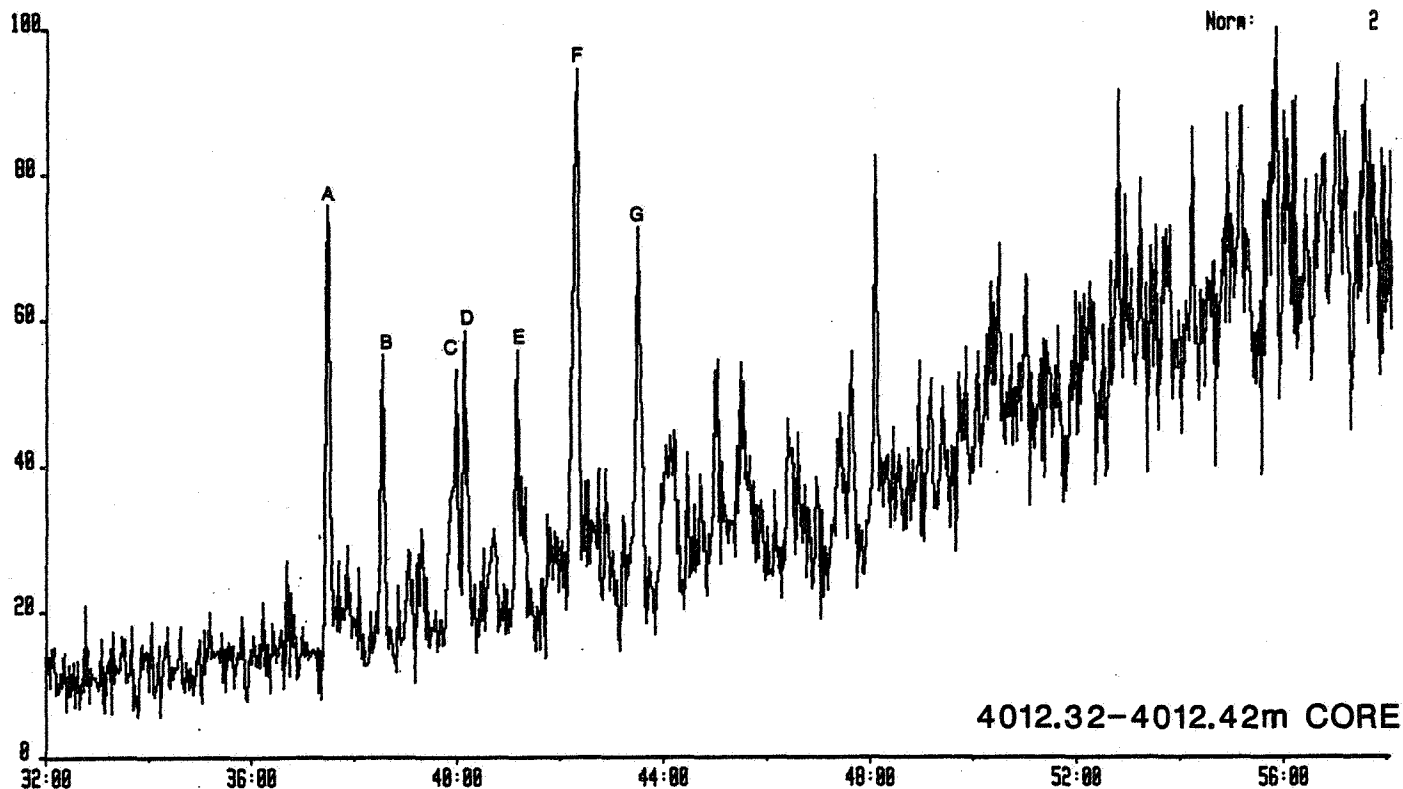
MASS FRAGMENTOGRAMS



WELL 6506/12-5 REARRANGED STERANES m/z 259

1334815 14-JUL-86 Sir:Magnetic TS258 Acnt:
 Sample 1 Injection 1 Group 1 Mass 259.2427
 Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

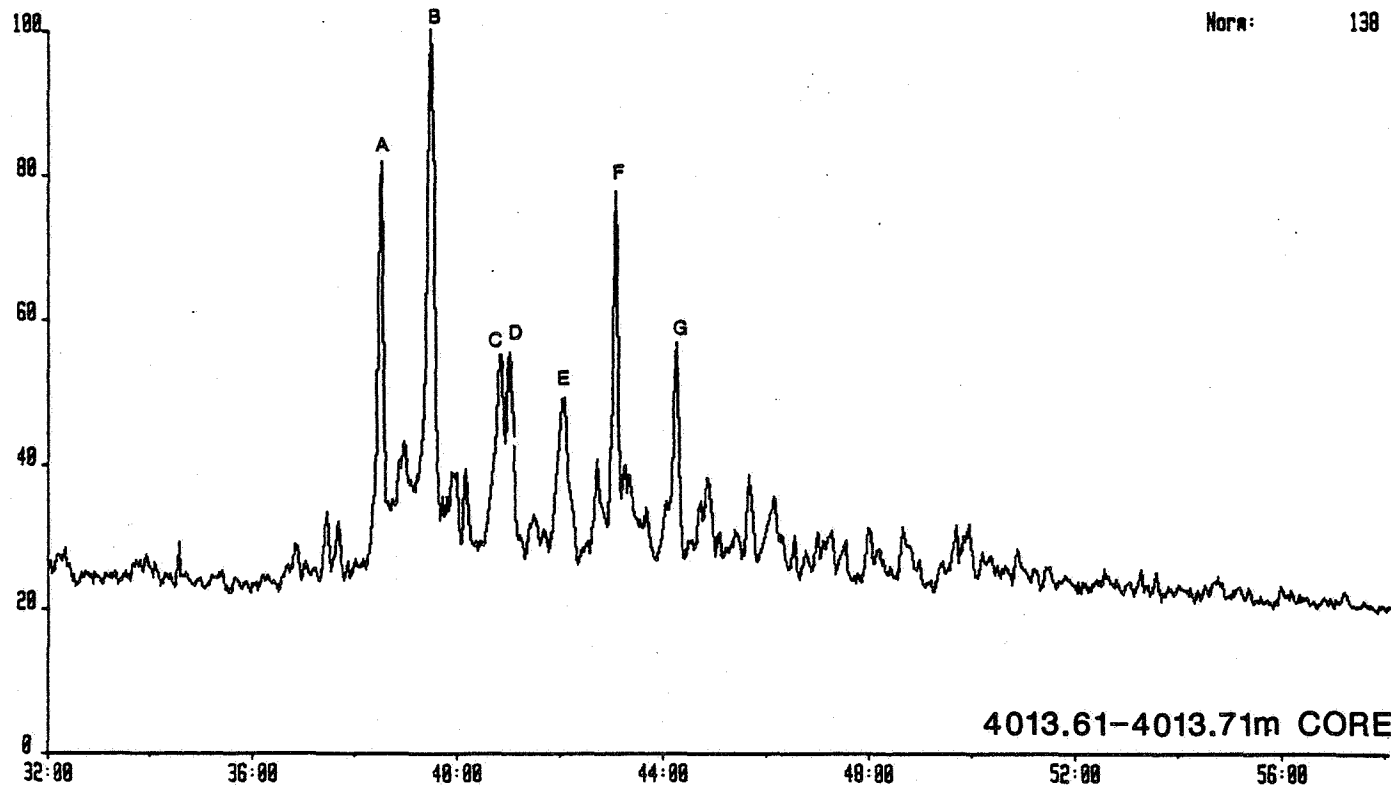


4012.32-4012.42m CORE

Norm: 2

1334817 14-JUL-86 Sir:Magnetic TS258 Acnt:
 Sample 1 Injection 1 Group 1 Mass 259.2427
 Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



4013.61-4013.71m CORE

Norm: 138

FIGURE 10e

MASS FRAGMENTOGRAMS

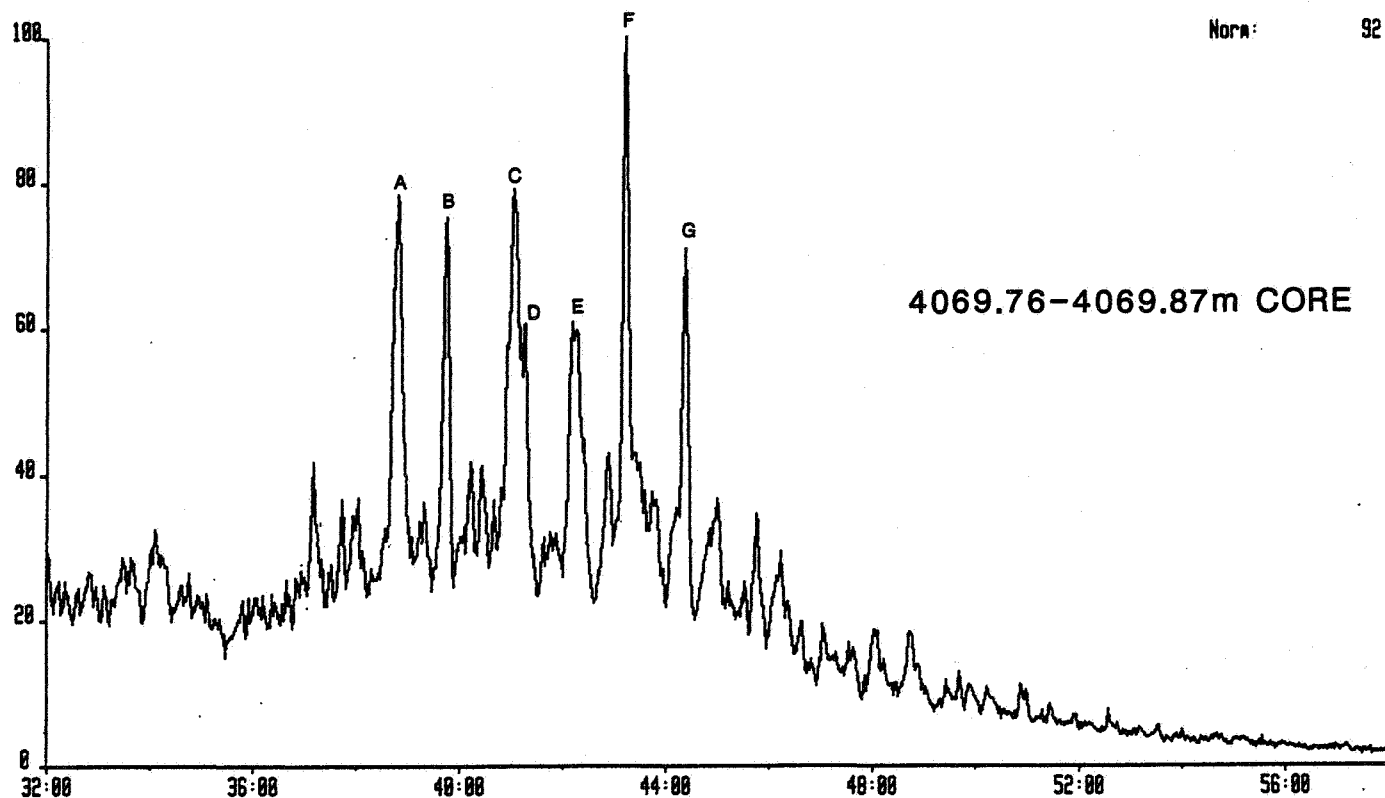
WELL 6506/12-5 REARRANGED STERANES m/z 259



1334019 15-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 259.2427
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 92



3174.00-3177.50m DST # 4

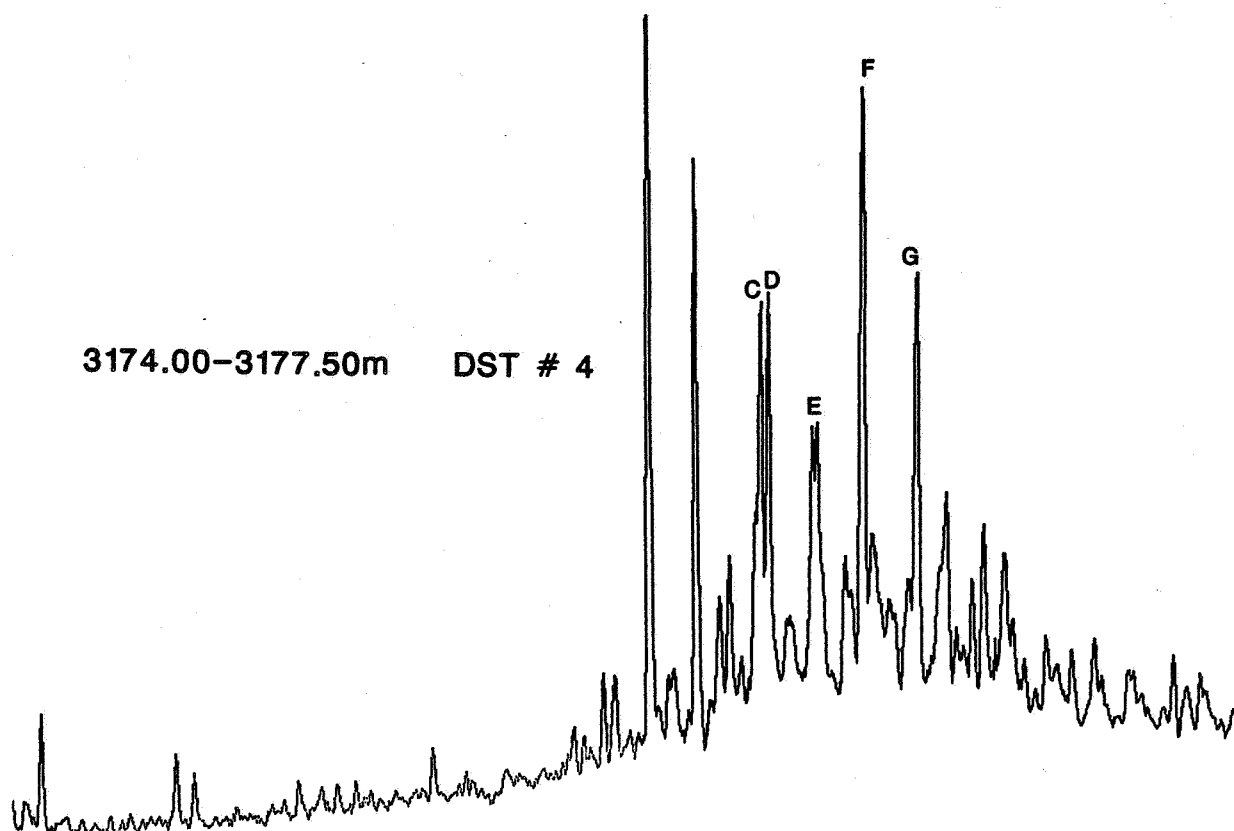
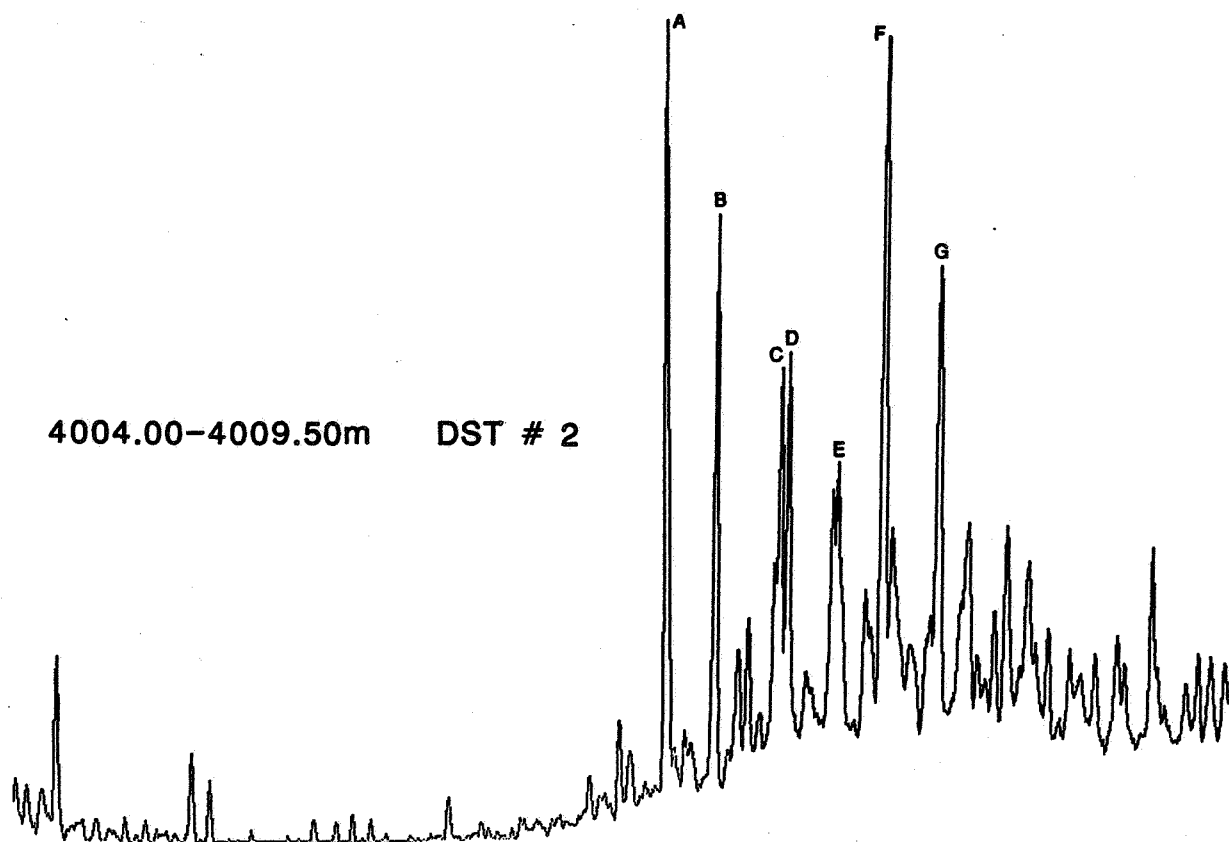


FIGURE 10f

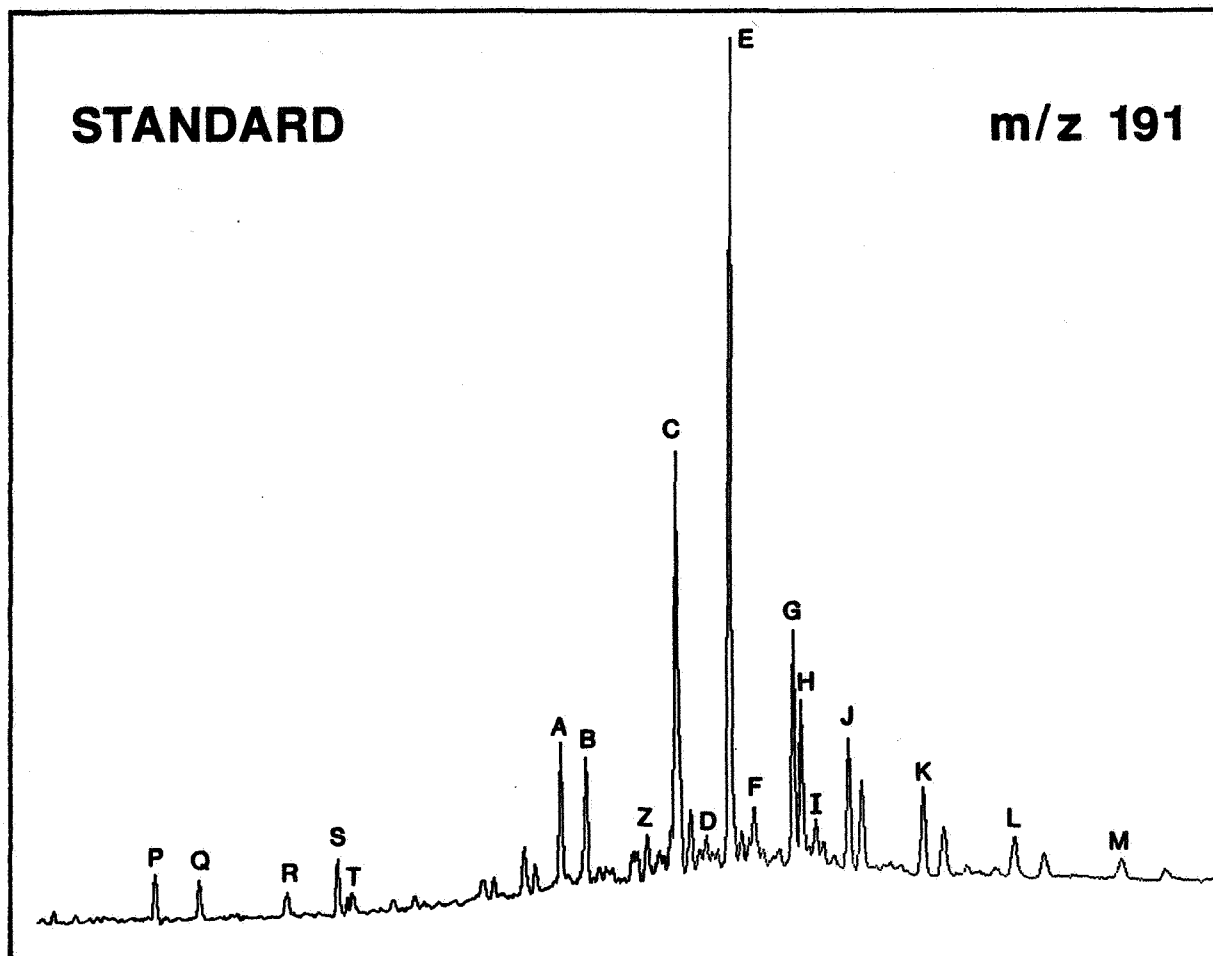
MASS FRAGMENTOGRAMS

WELL 6506/12-5 REARRANGED STERANES m/z 259



STANDARD

m/z 191



TRITERPANE IDENTIFICATION

(M/Z 191 FRAGMENTOGRAM)

COMPOUND		ELEMENTAL COMPOSITION
A	18 (H), 21 (H)-trishomohopane (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	$C_{26}H_{48}$



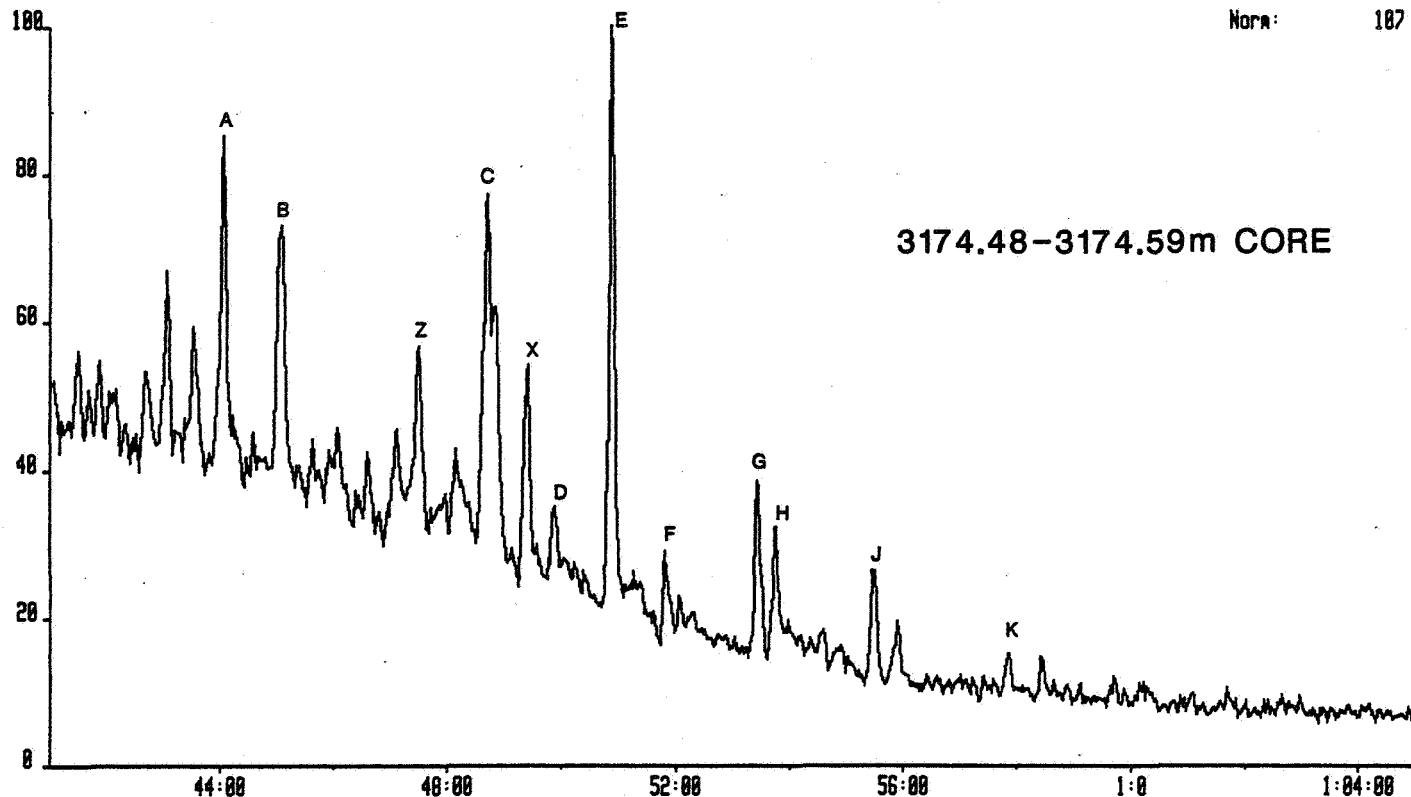
WELL 6506/12-5

TRITERPANES m/z 191

1334885 15-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

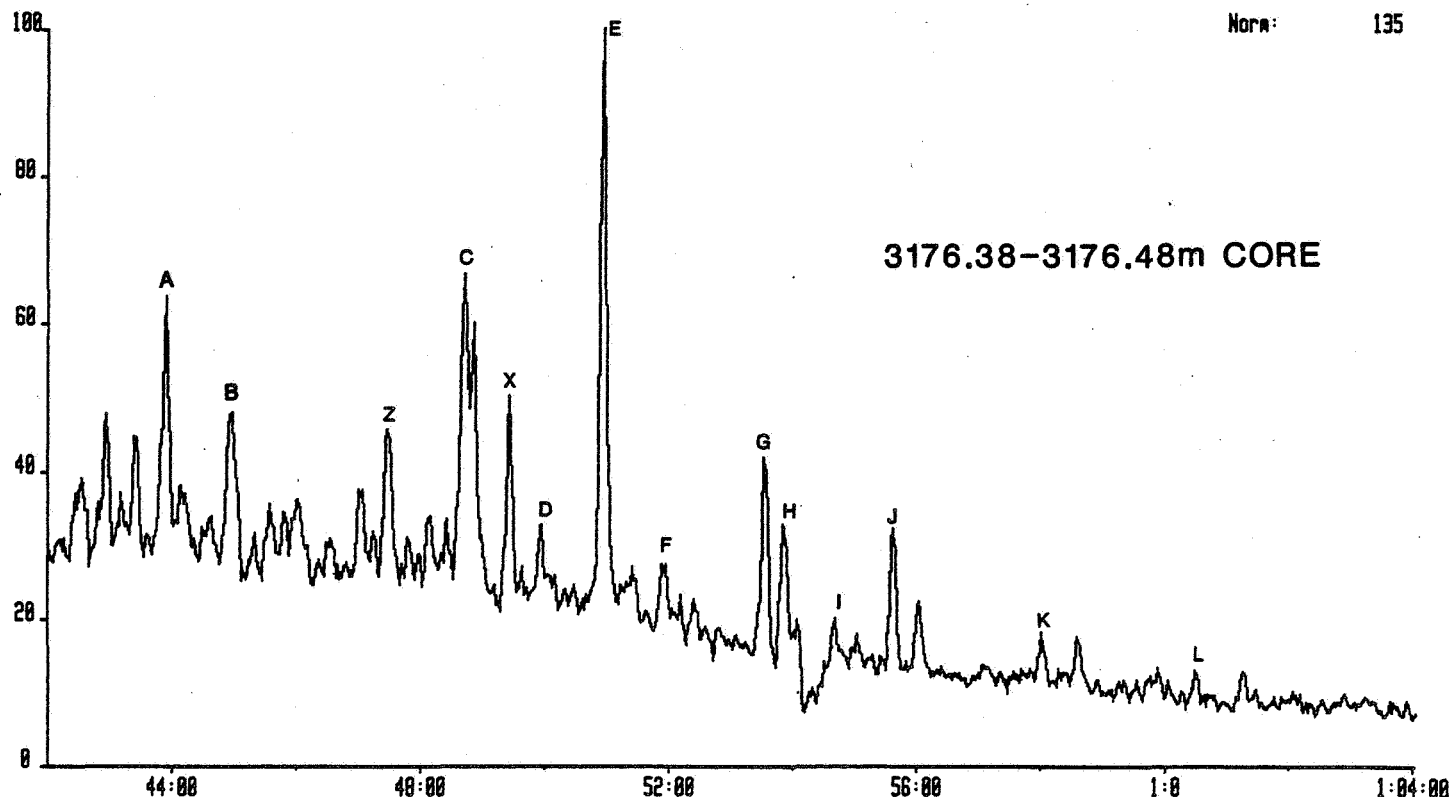
Norm: 187



GEOBAT 11-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 135





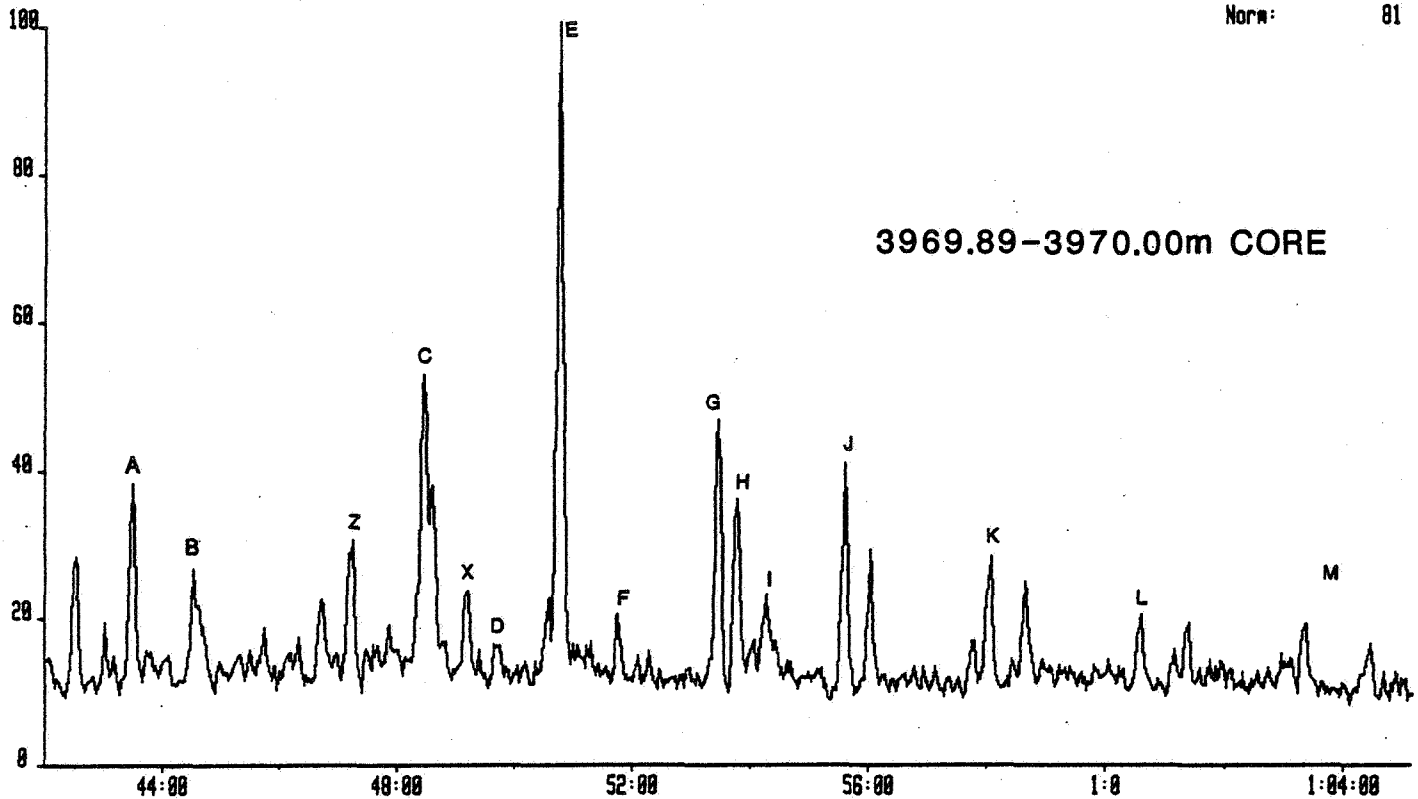
WELL 6506/12-5

TRITERPANES m/z 191

1334018 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

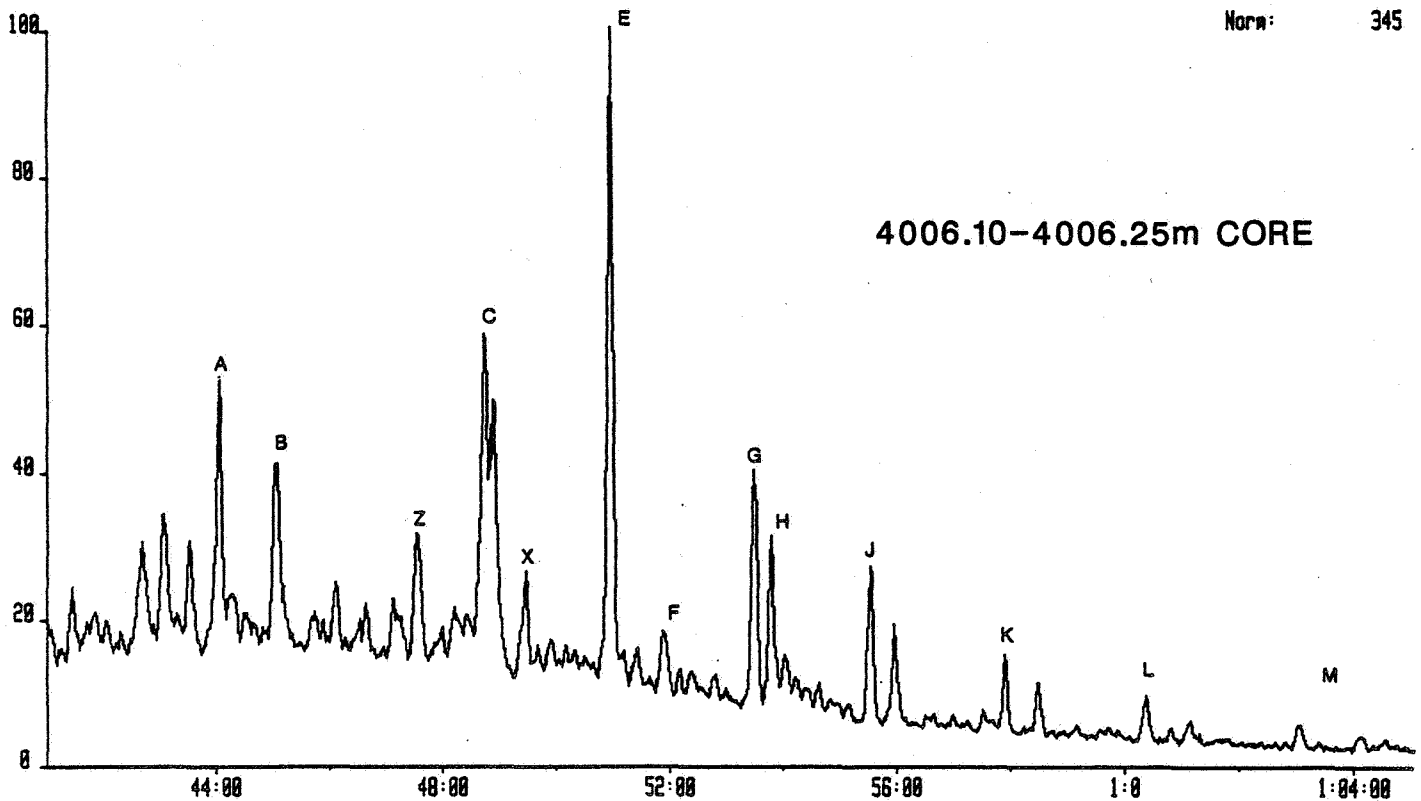
Norm: 81



1334012 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 345





WELL 6506/12-5

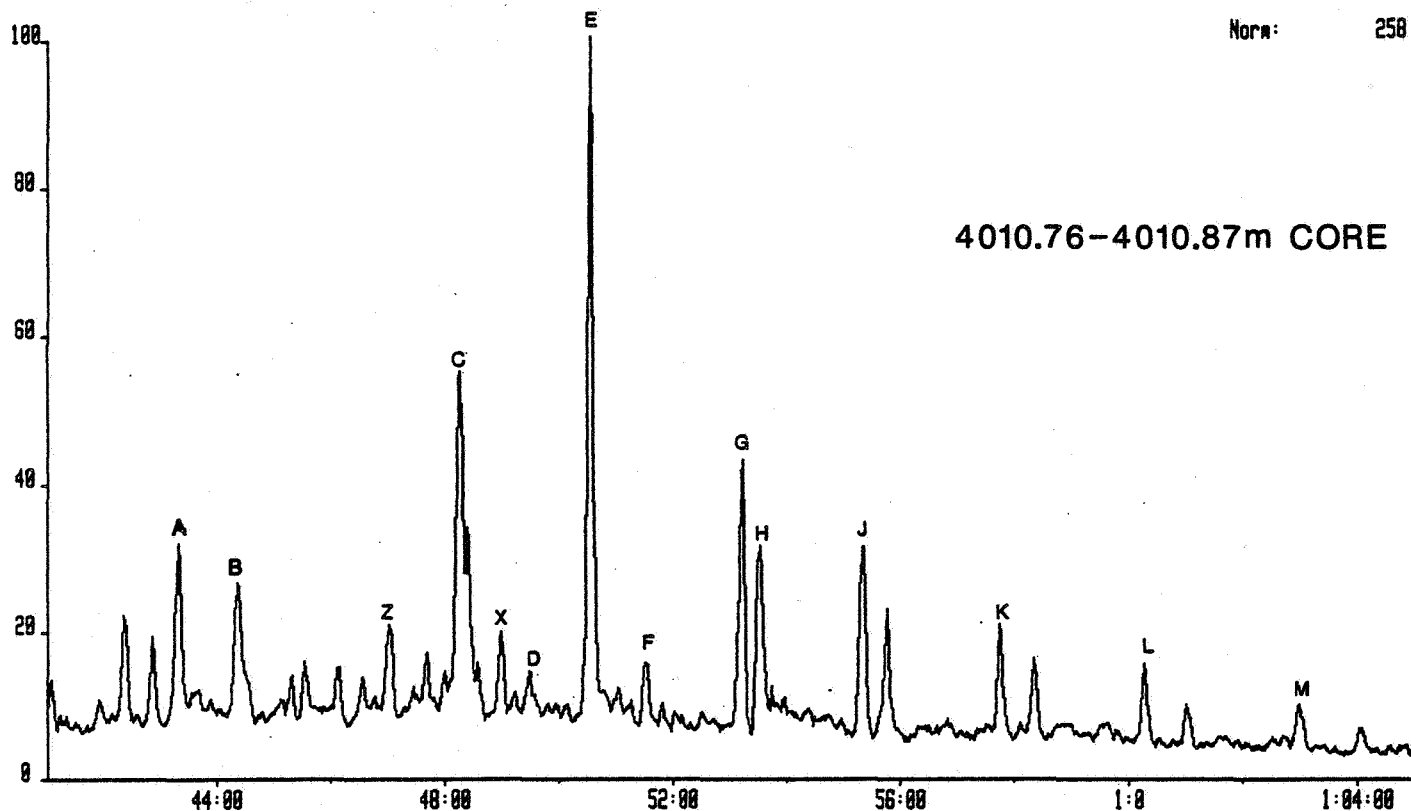
TRITERPANES m/z 191

1334013 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 258

4010.76-4010.87m CORE

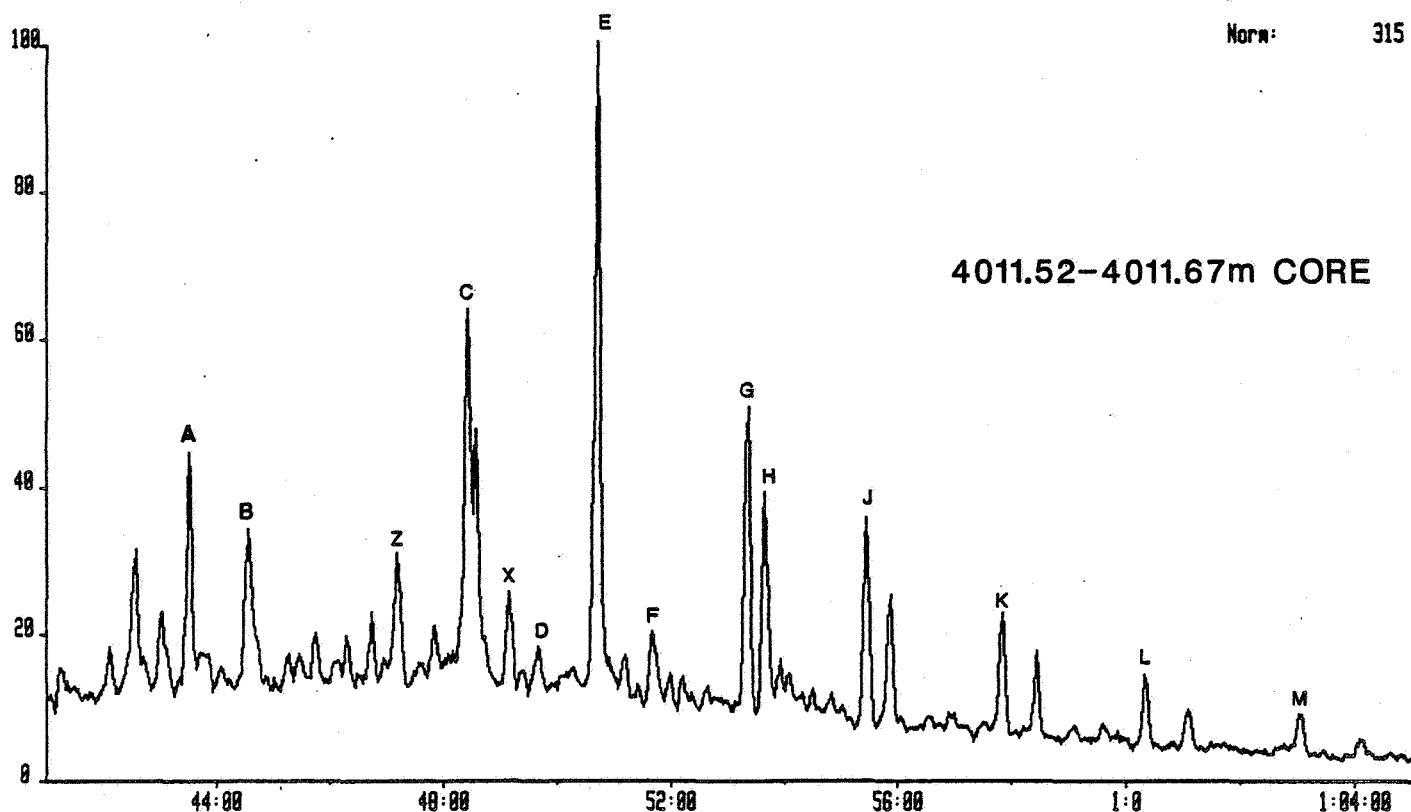


1334014 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 315

4011.52-4011.67m CORE





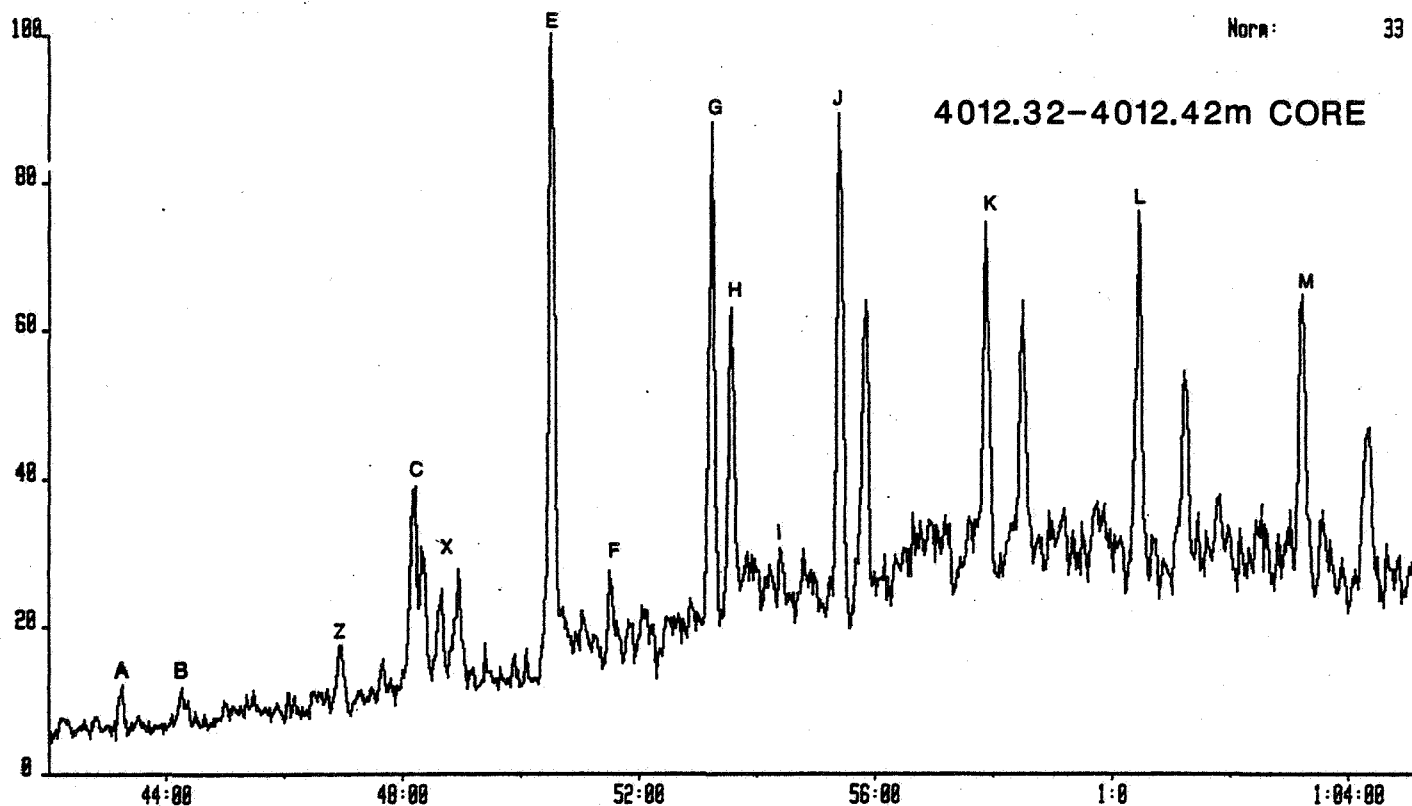
WELL 6506/12-5

TRITERPANES m/z 191

1334815 14-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

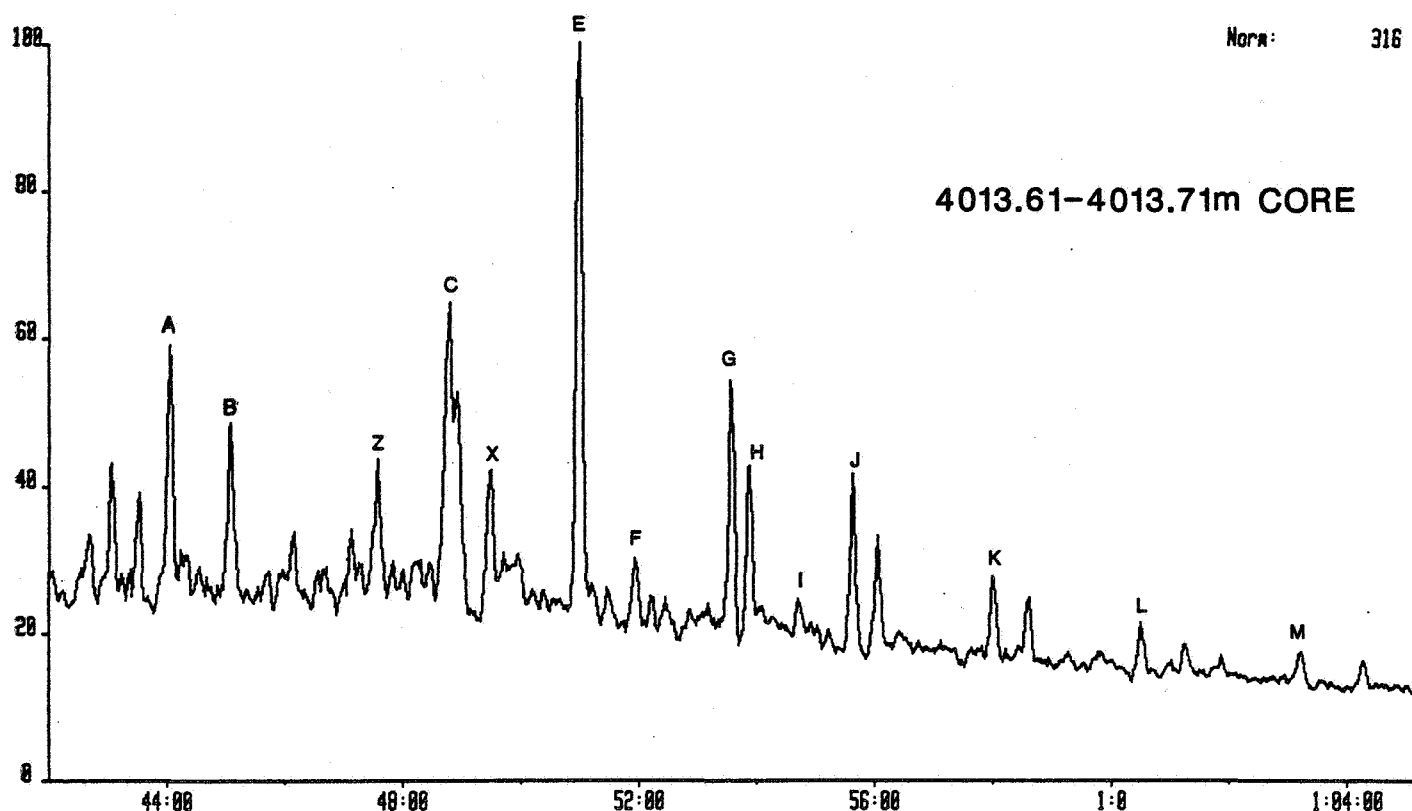
Norm: 33



1334817 14-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 316





WELL 6506/12-5

TRITERPANES m/z 191

1334019 15-JUL-86 Site: Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 191.1798
Text: TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System: STETRITRP

Norm: 221

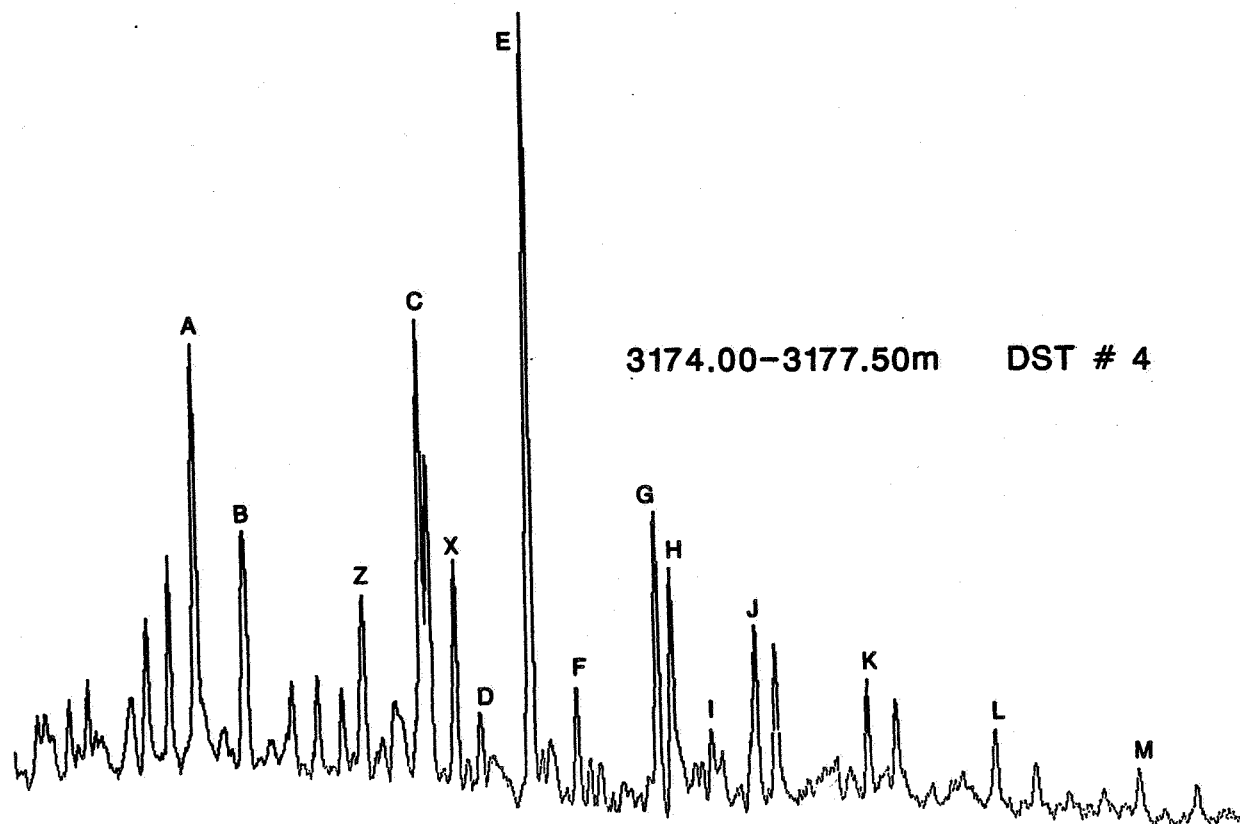
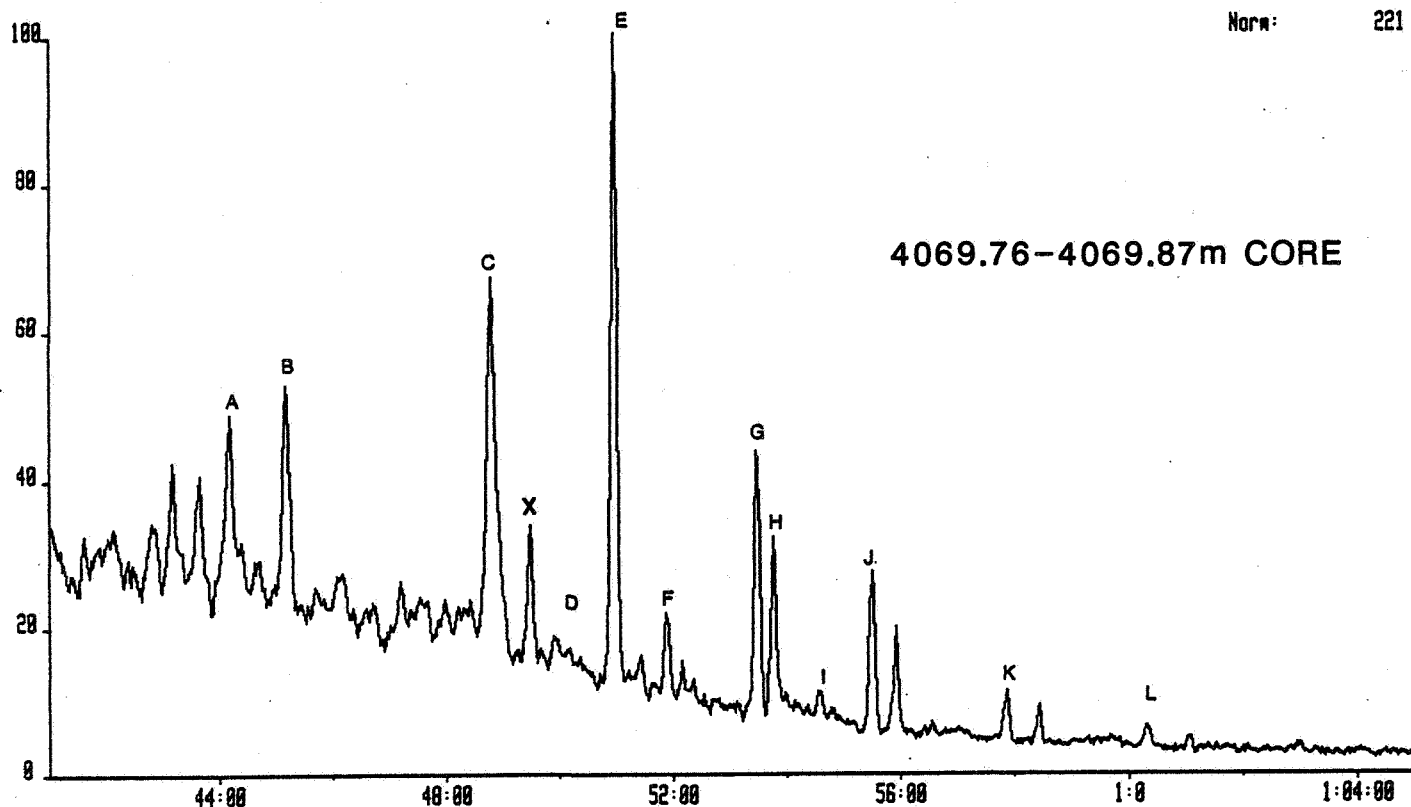


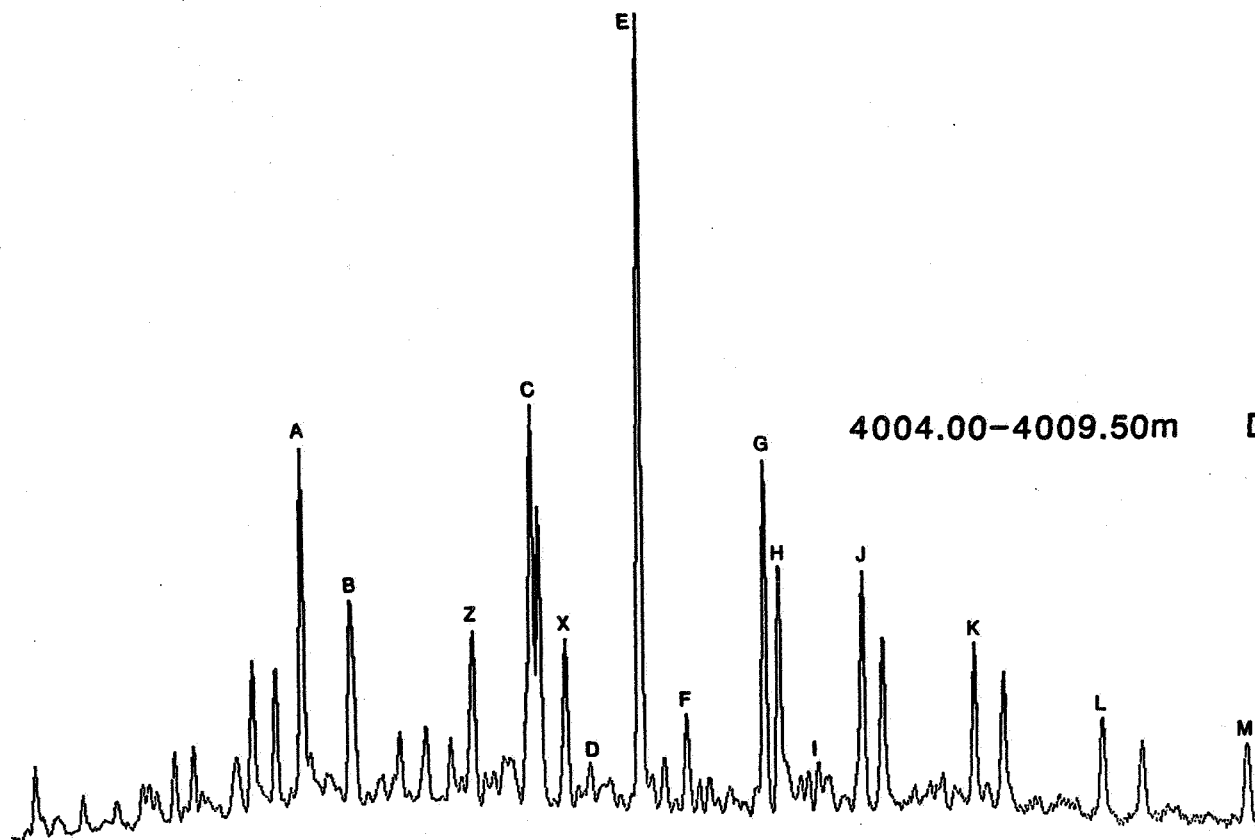
FIGURE 11f

MASS FRAGMENTOGRAMS



WELL 6506/12-5

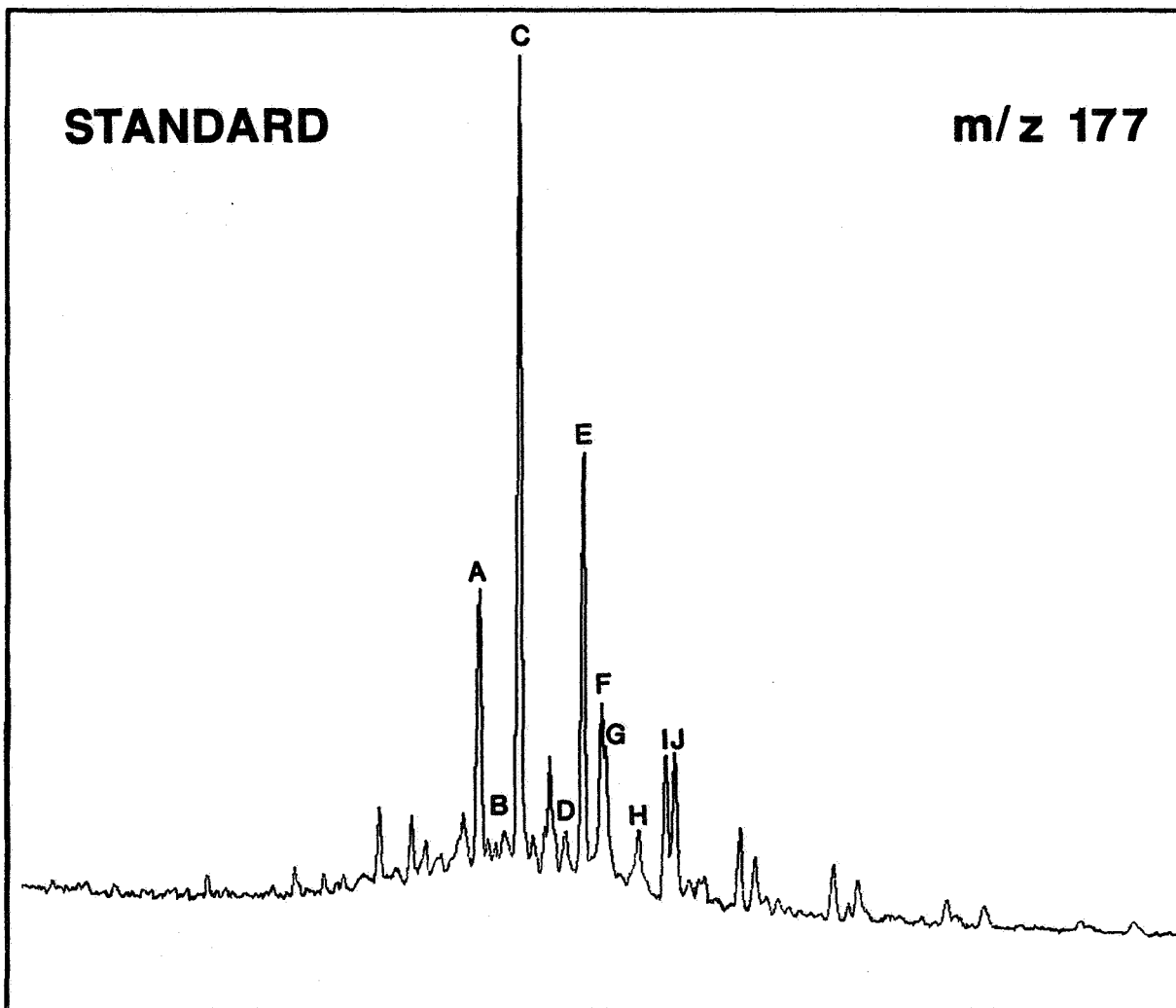
TRITERPANES m/z 191



4004.00-4009.50m DST # 2

STANDARD

m/z 177



DEMETHYLATED HOPANES

(m/z 177 FRAGMENTOGRAM)

COMPOUND

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

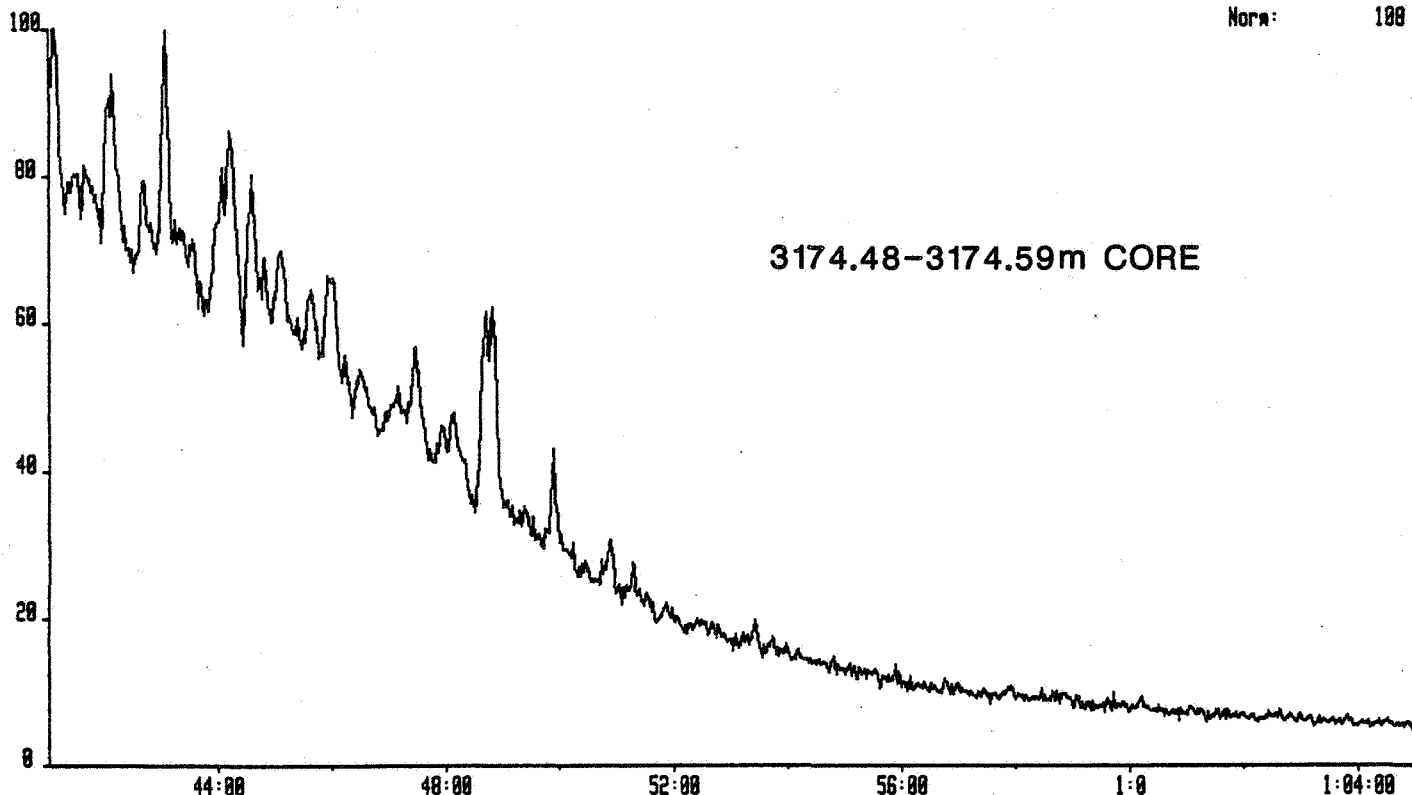


WELL 6506/12-5 DEMETHYLATED HOPANES m/z 177

1334005 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

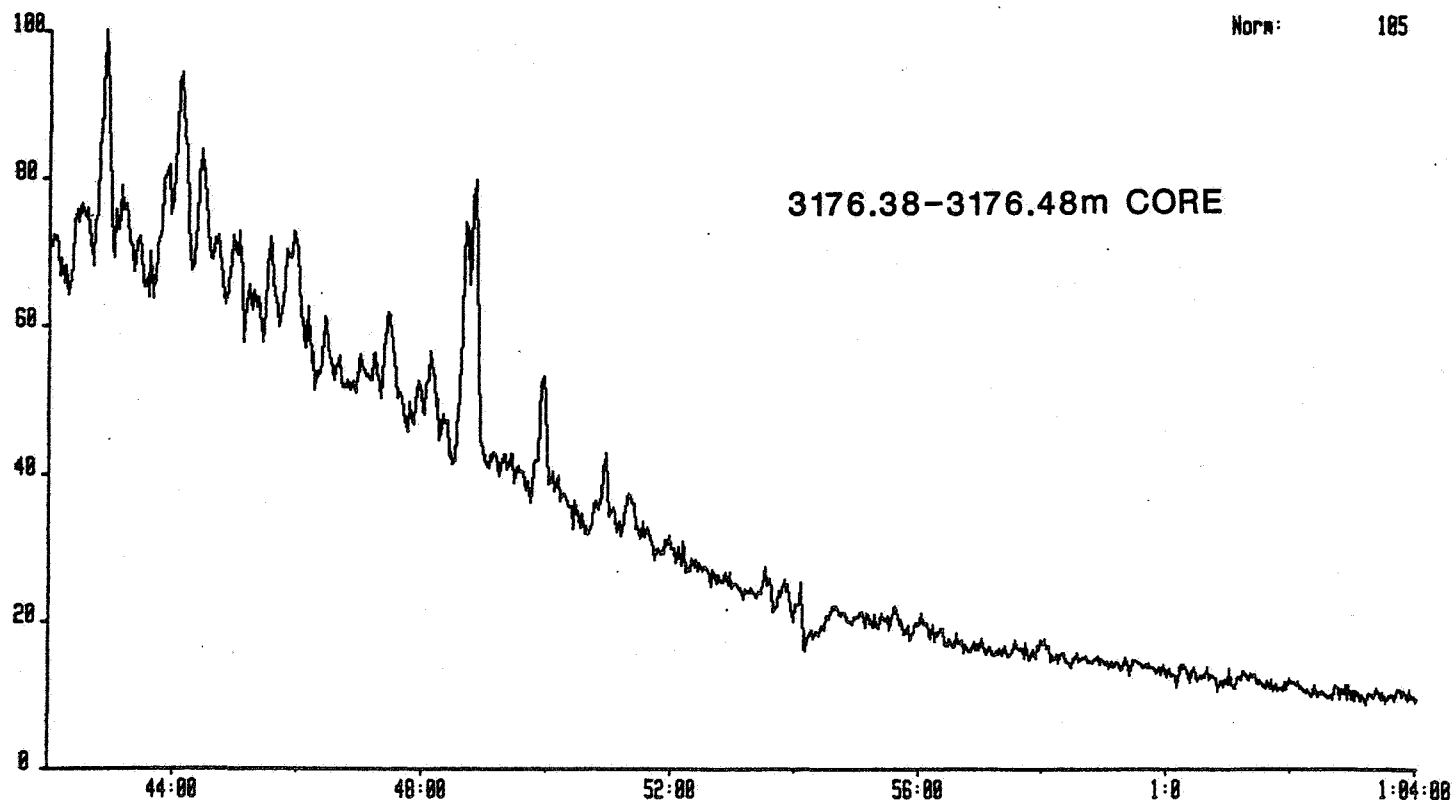
Norm: 100



GEODAT 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 100



MASS FRAGMENTOGRAMS

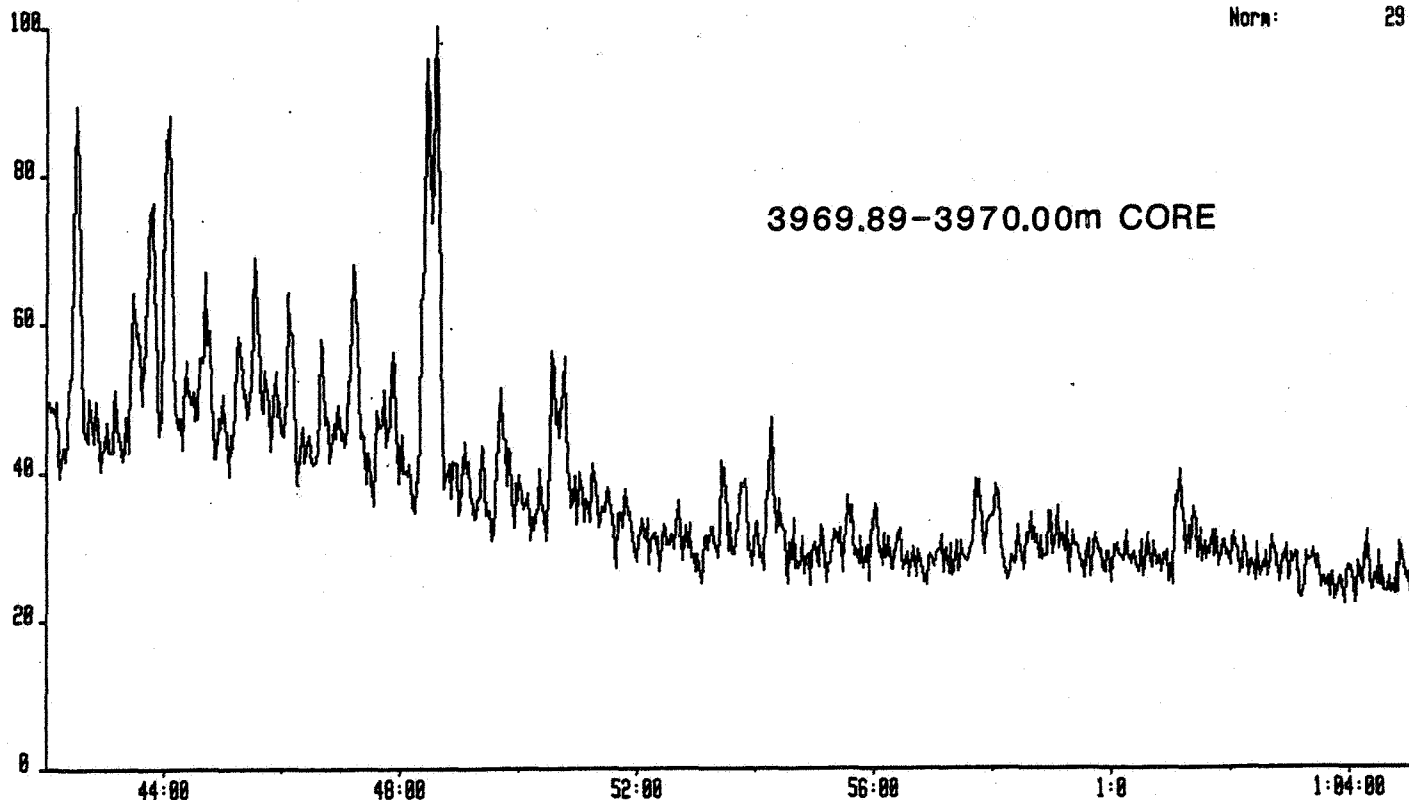


WELL 6506/12-5 DEMETHYLATED HOPANES m/z 177

1334810 11-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

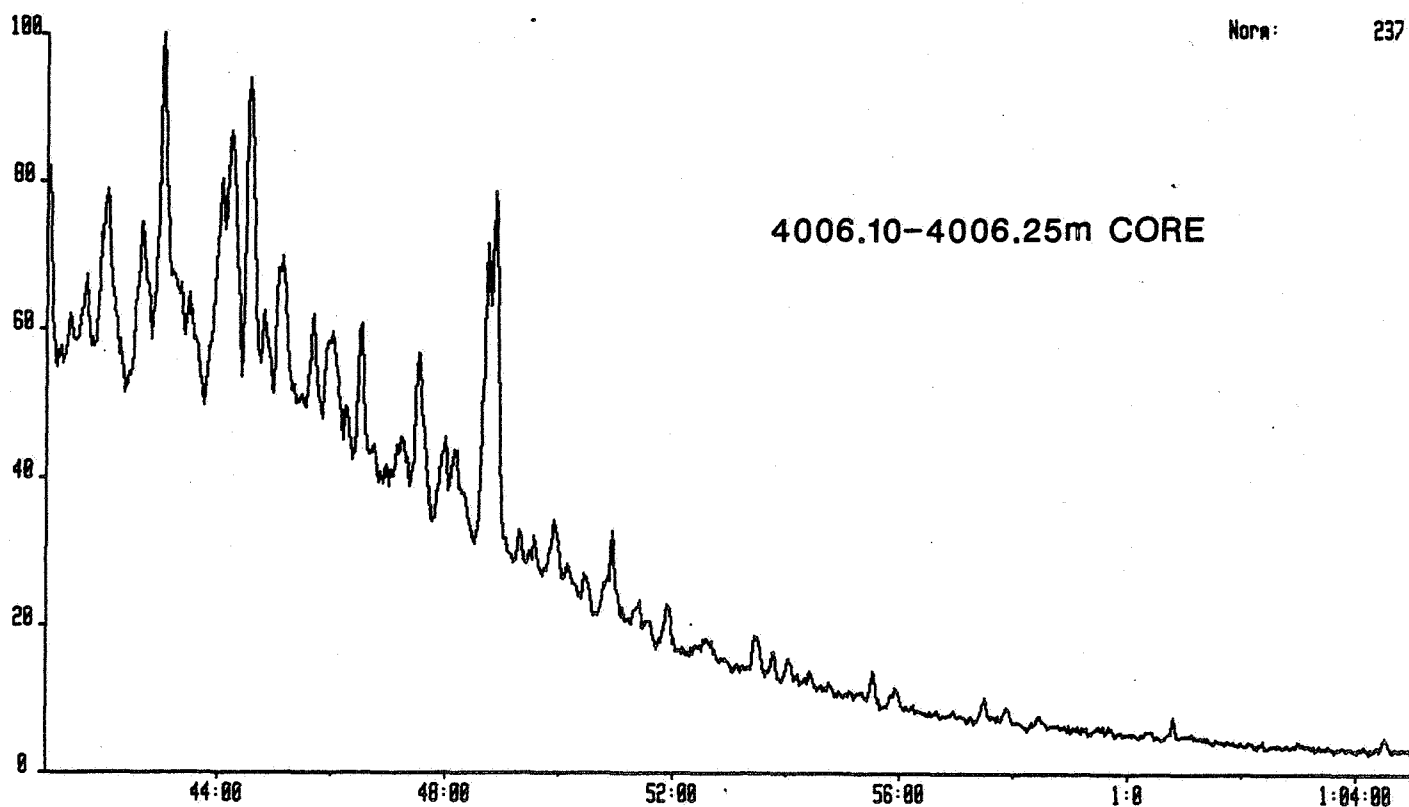
Norm: 29



1334812 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 237



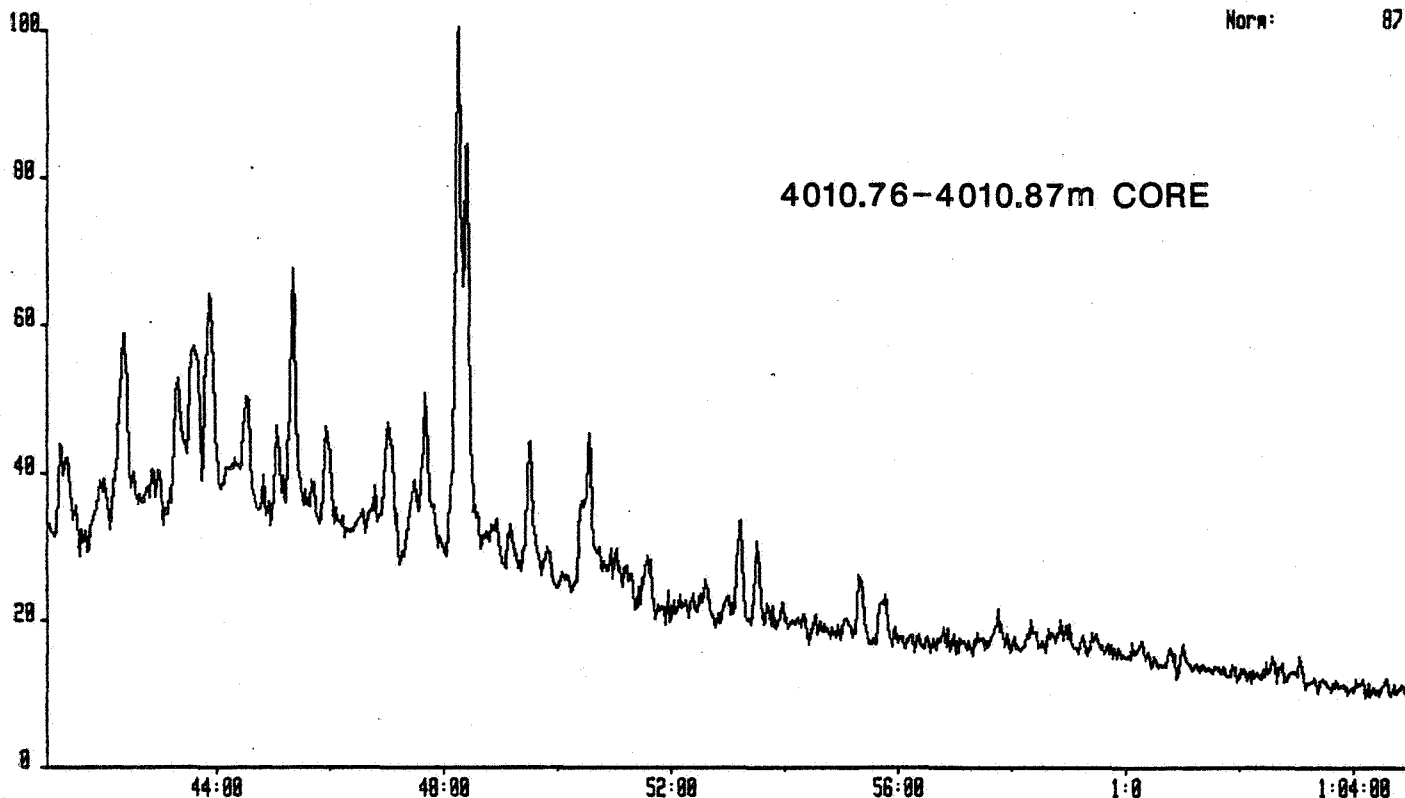


WELL 6506/12-5 DEMETHYLATED HOPANES m/z 177

1334013 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

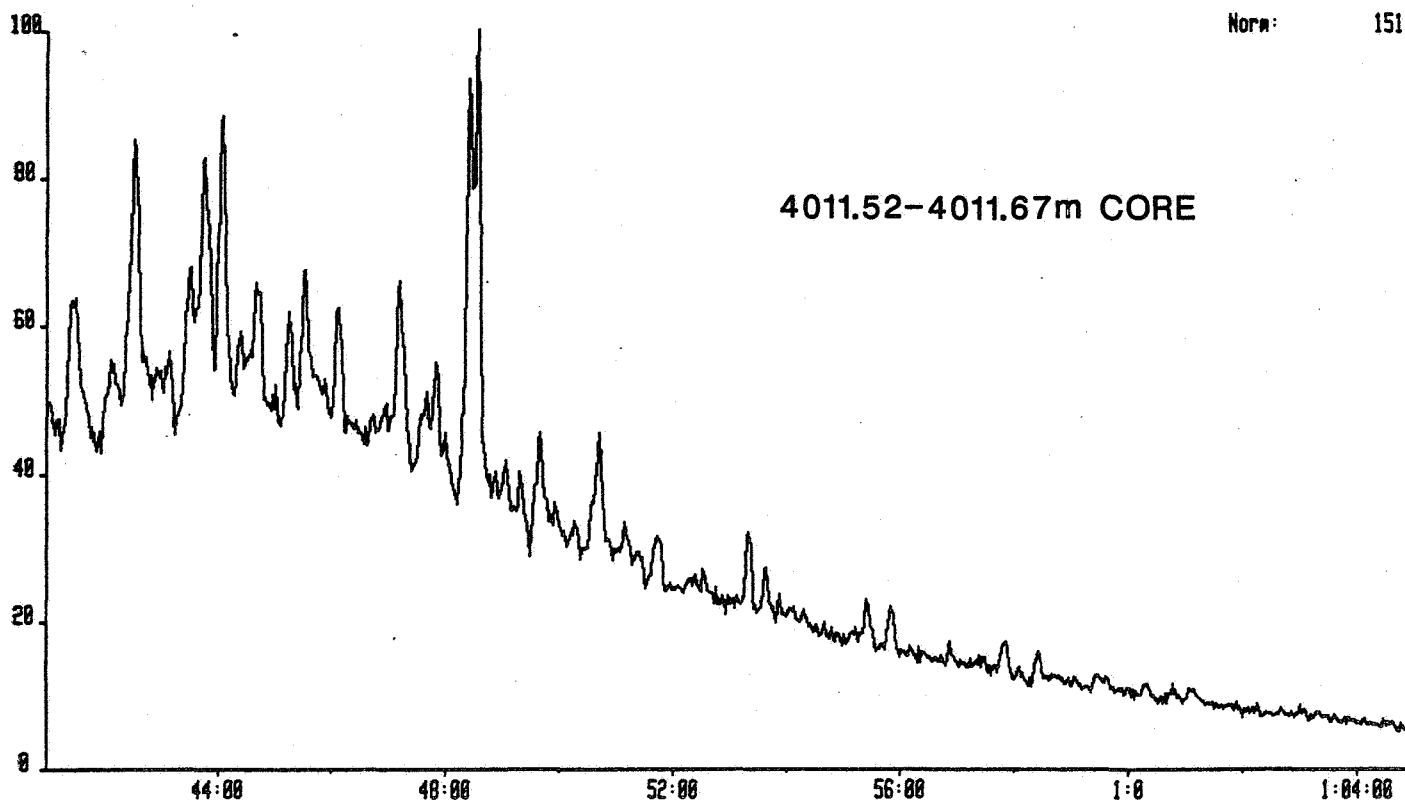
Norm: 87



1334014 15-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 151

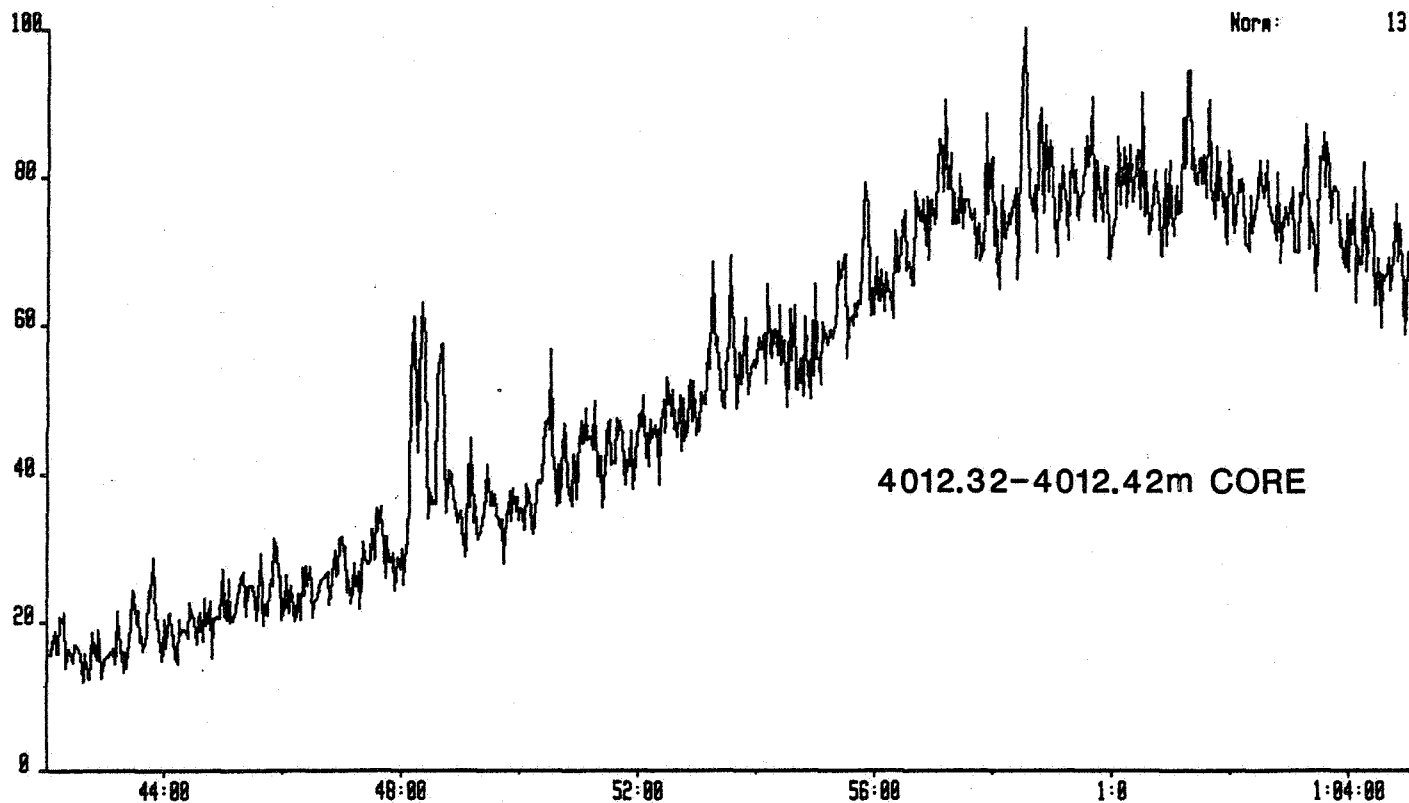




VELL 6506/12-5 DEMETHYLATED HOPANES m/z 177

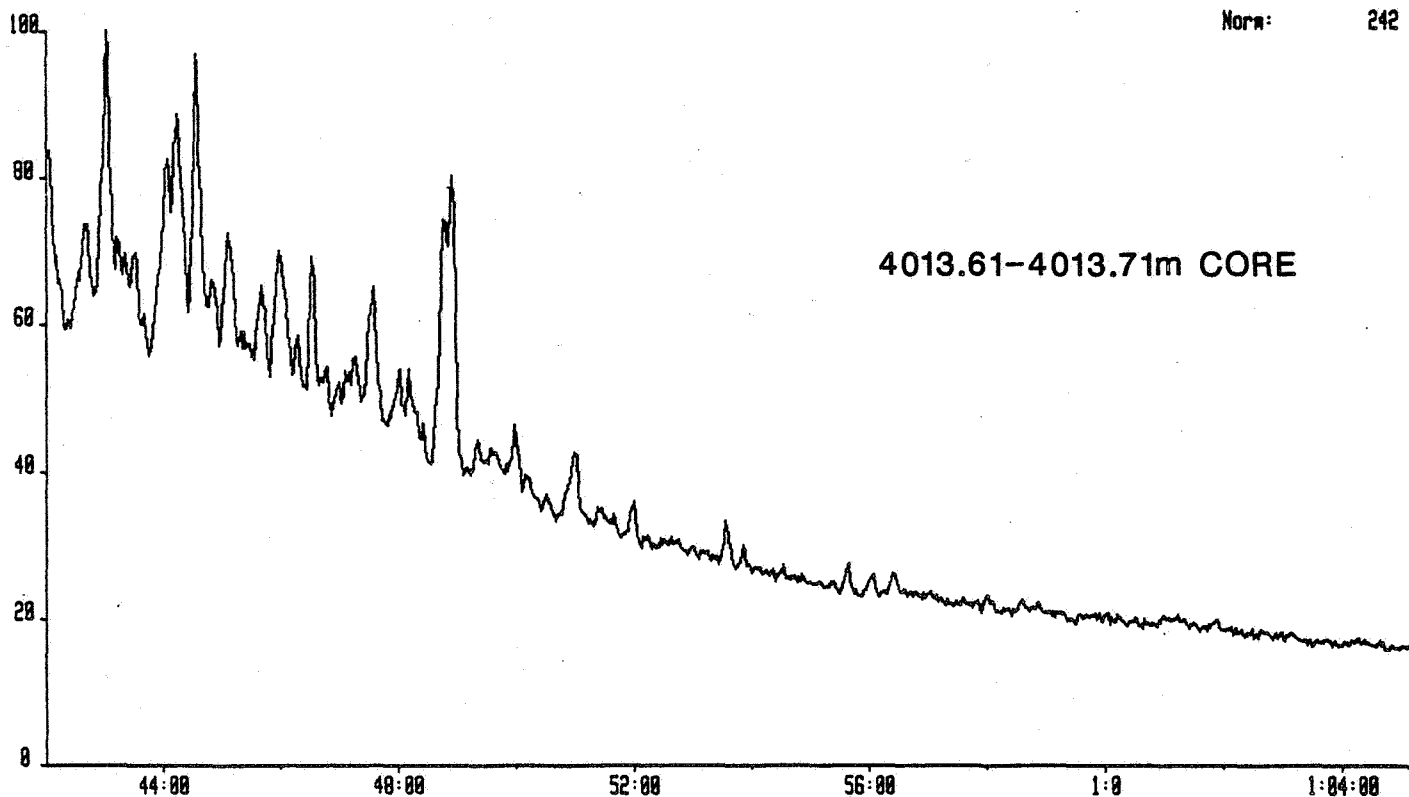
1334015 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP



1334017 14-JUL-86 Sir:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP





WELL 6506/12-5 DEMETHYLATED HOPANES m/z 177

1334019 15-JUL-86 Site: Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 177.1642
Text: TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System: STETRITRP

Norm: 155

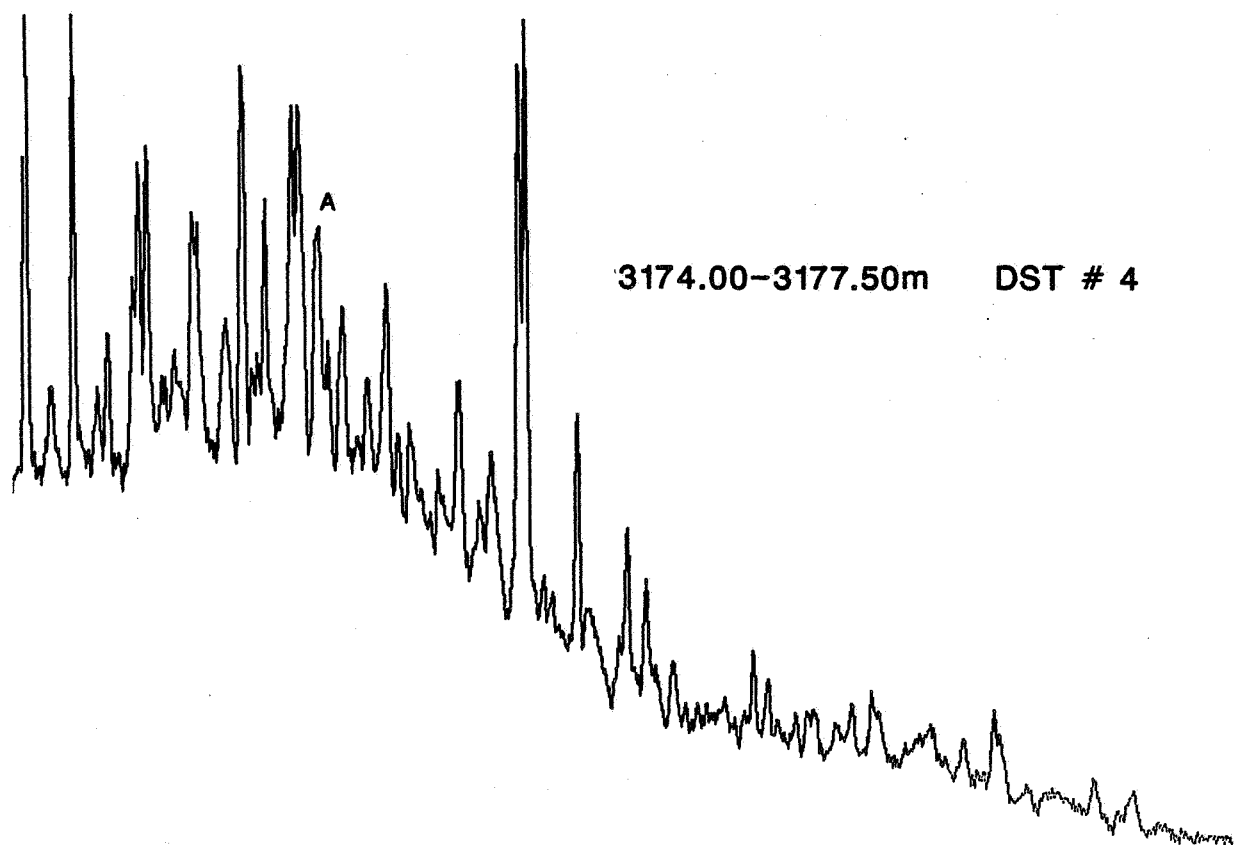
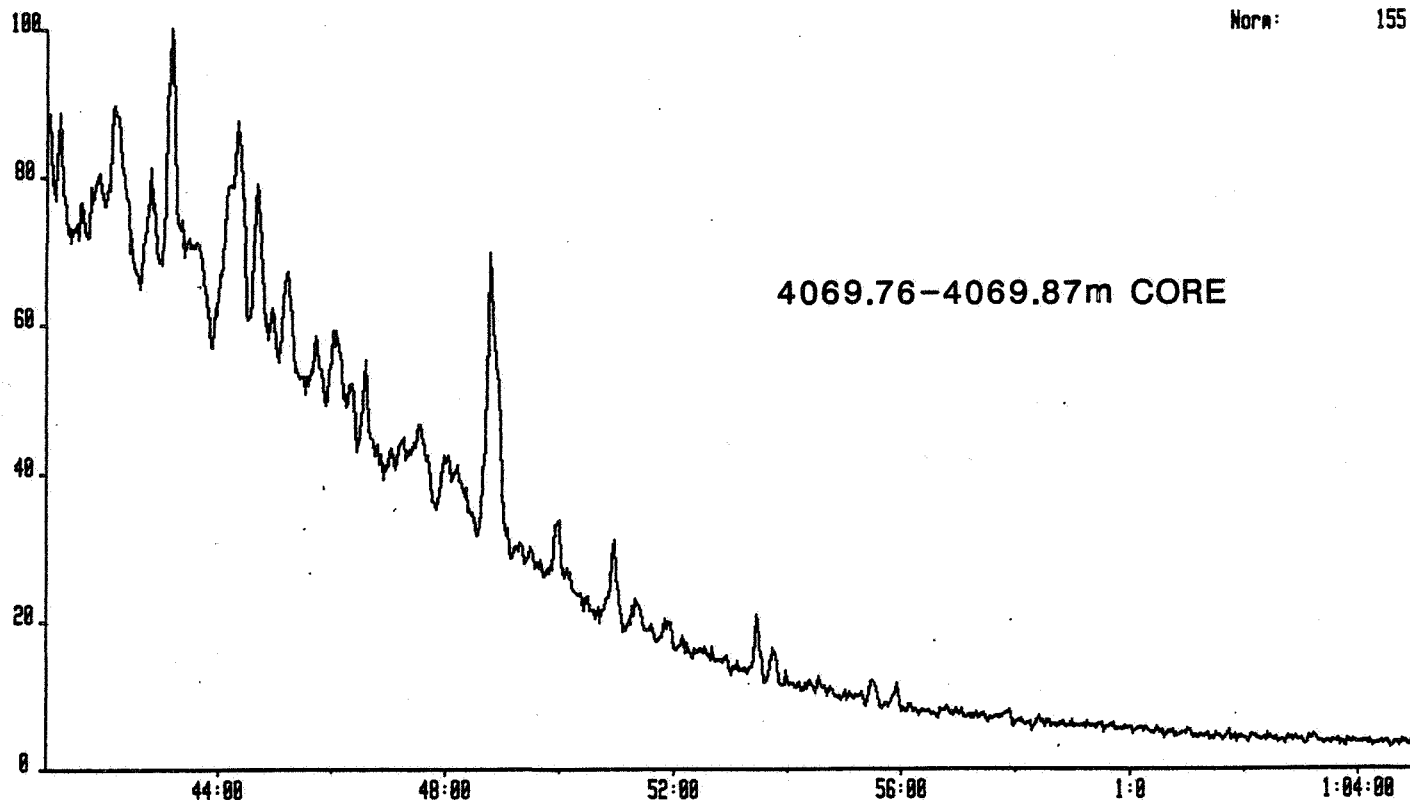


FIGURE 12f

MASS FRAGMENTOGRAMS



WELL 6506/12-5 DEMETHYLATED HOPANES m/z 177

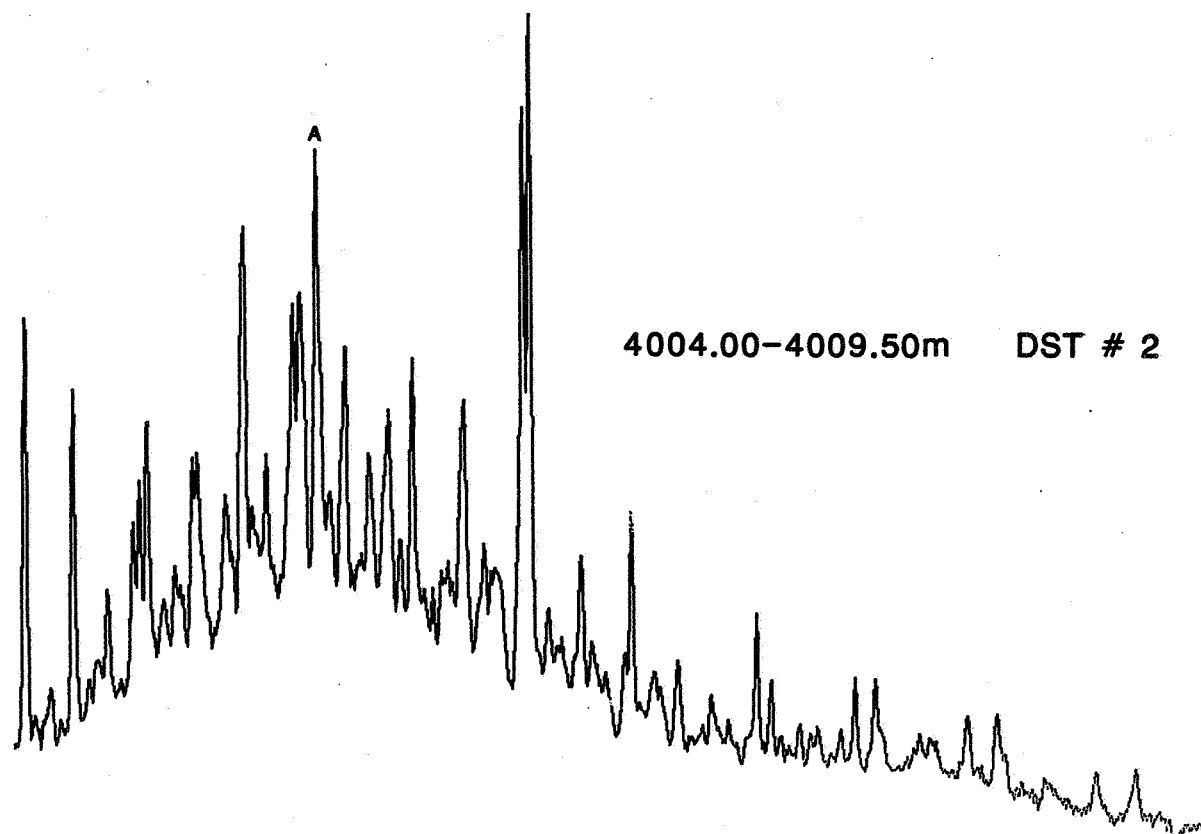


FIGURE 13a

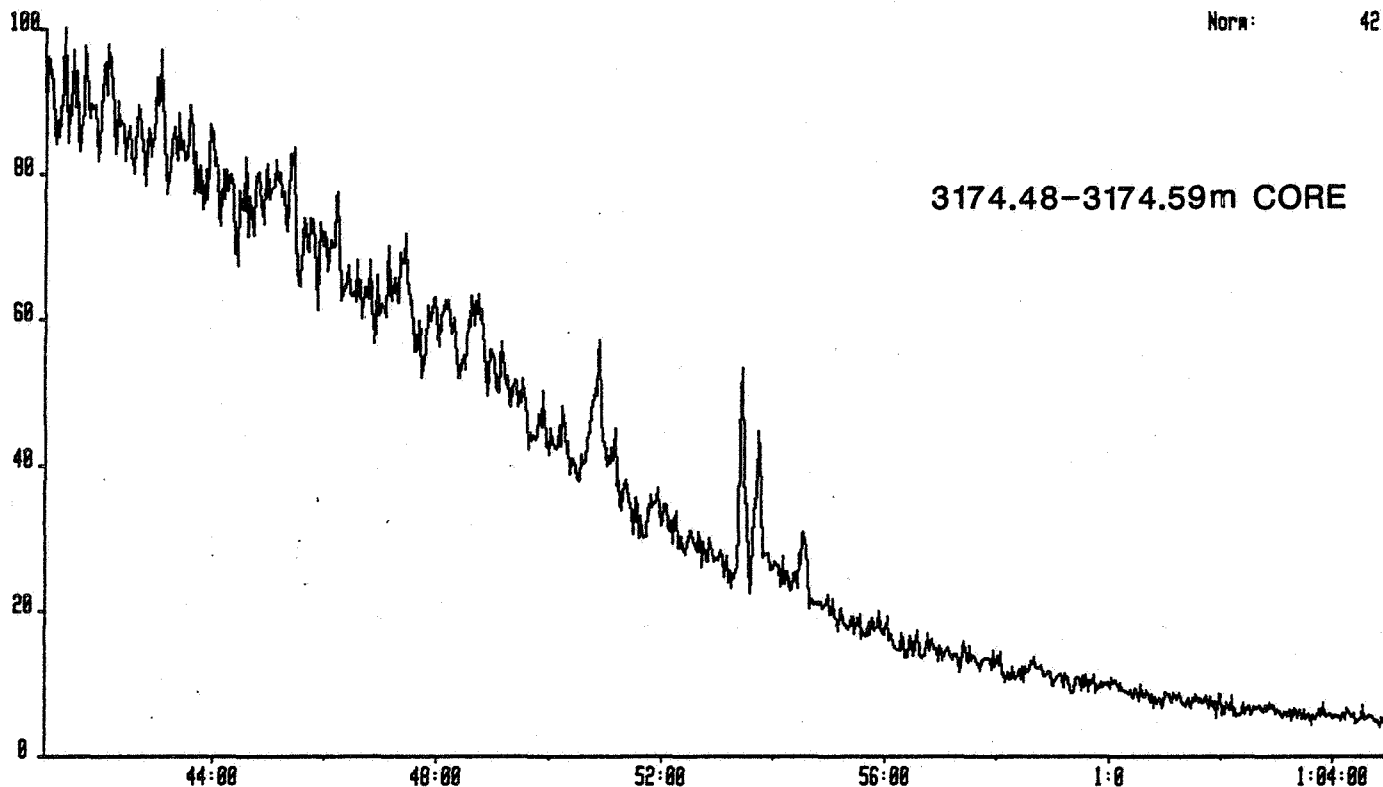
MASS FRAGMENTOGRAMS



WELL 6506/12-5 METHYL HOPANES m/z 205

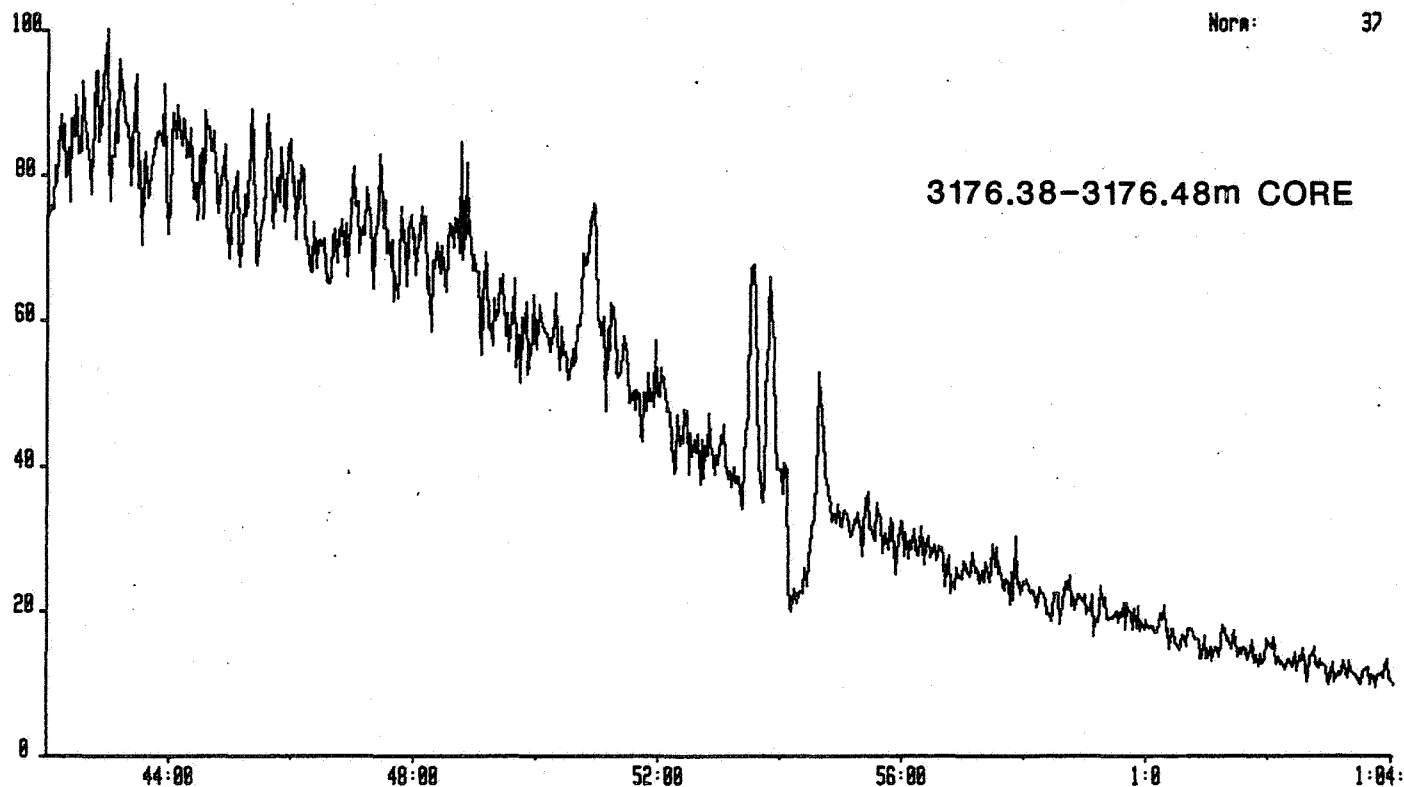
1334885 15-JUL-86 Sir:Magnetic TS258 Acnt: System:STETRITRP
 Sample 1 Injection 1 Group 1 Mass 205.1956
 Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

Norm: 42



GEOBAT 11-JUL-86 Sir:Magnetic TS258 Acnt: System:STETRITRP
 Sample 1 Injection 1 Group 1 Mass 205.1956
 Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

Norm: 37



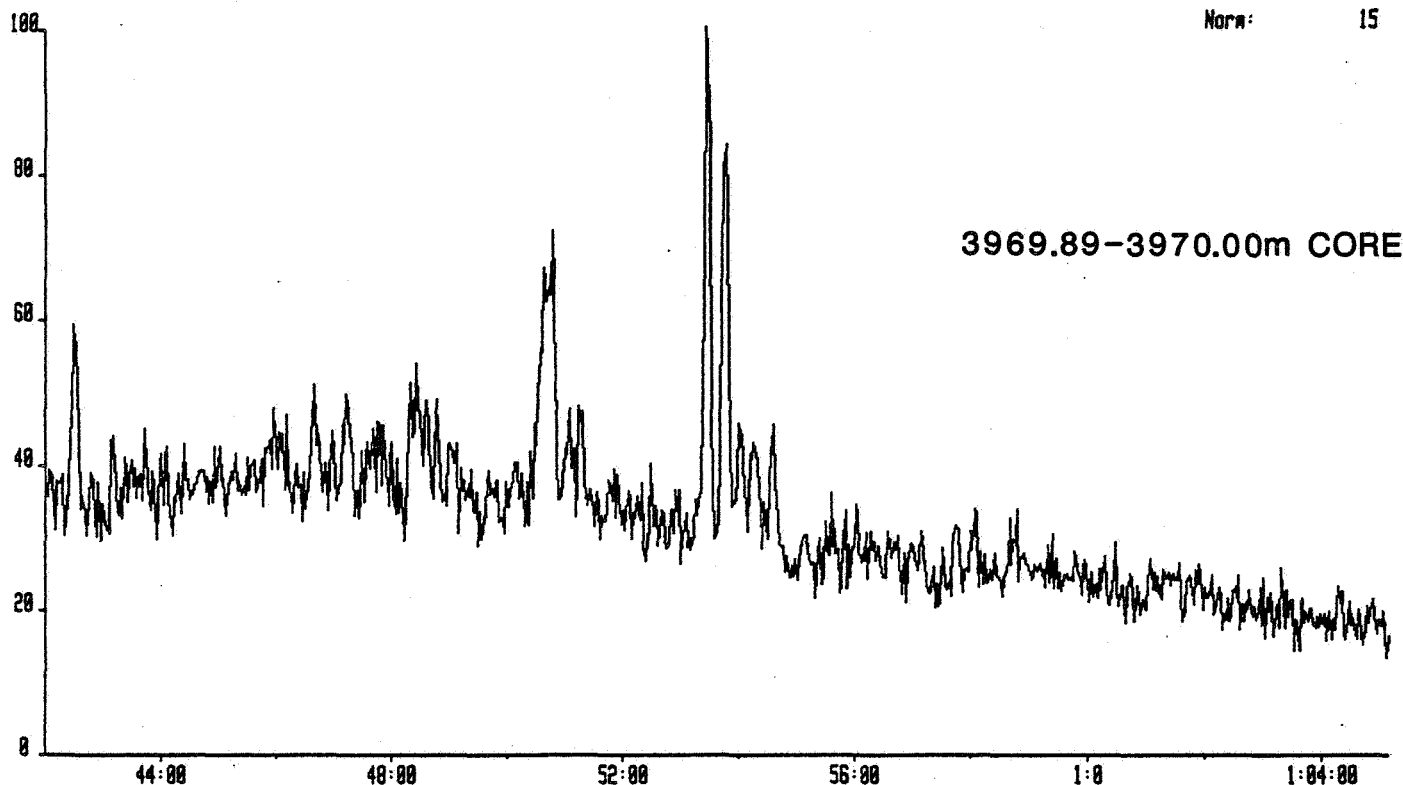


WELL 6506/12-5 METHYL HOPANES m/z 205

1334010 11-JUL-86 Str:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 15



1334012 15-JUL-86 Str:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 63

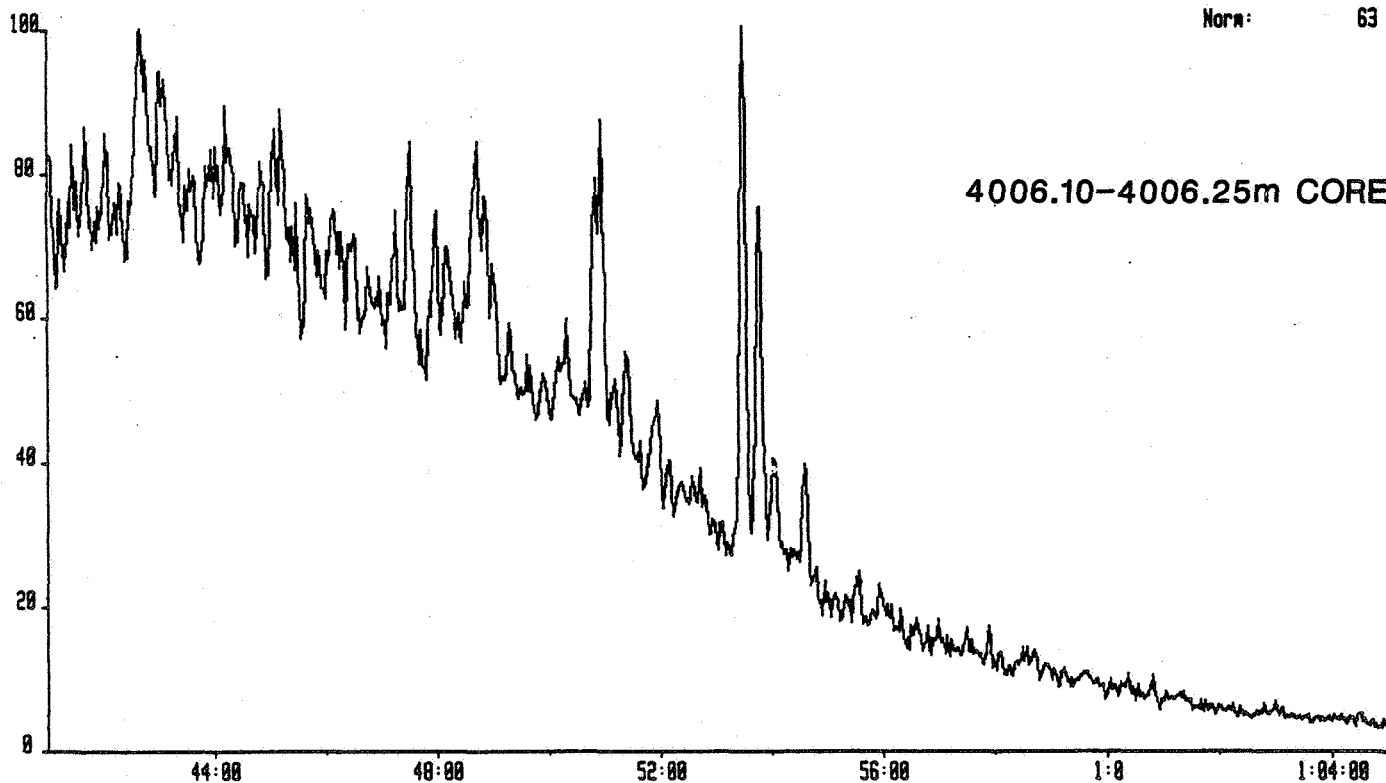


FIGURE 13c

MASS FRAGMENTOGRAMS

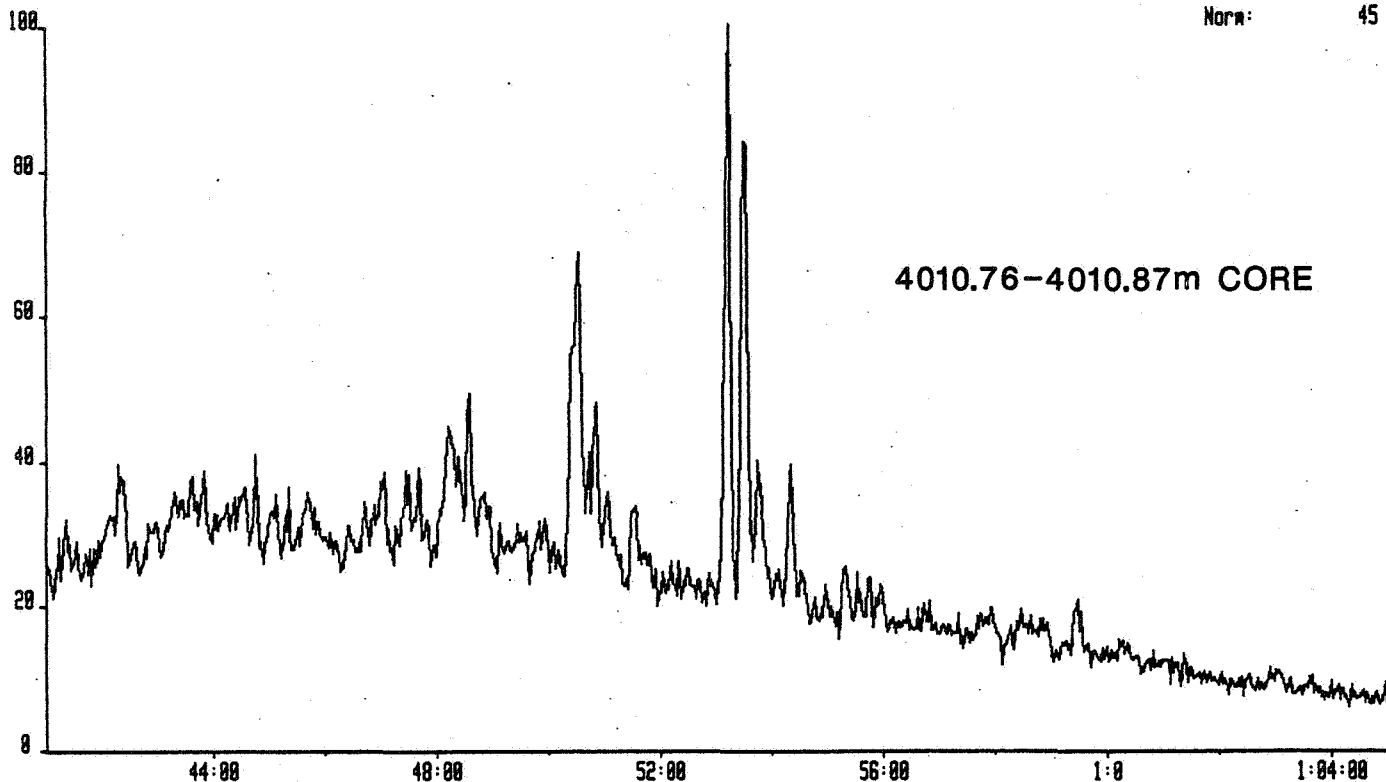


WELL 6506/12-5

METHYL HOPANES m/z 205

1334013 15-JUL-86 Sir:Magnetic TS250 Acnt: System:STETRITRP
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

Norm: 45



1334014 15-JUL-86 Sir:Magnetic TS250 Acnt: System:STETRITRP
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

Norm: 66

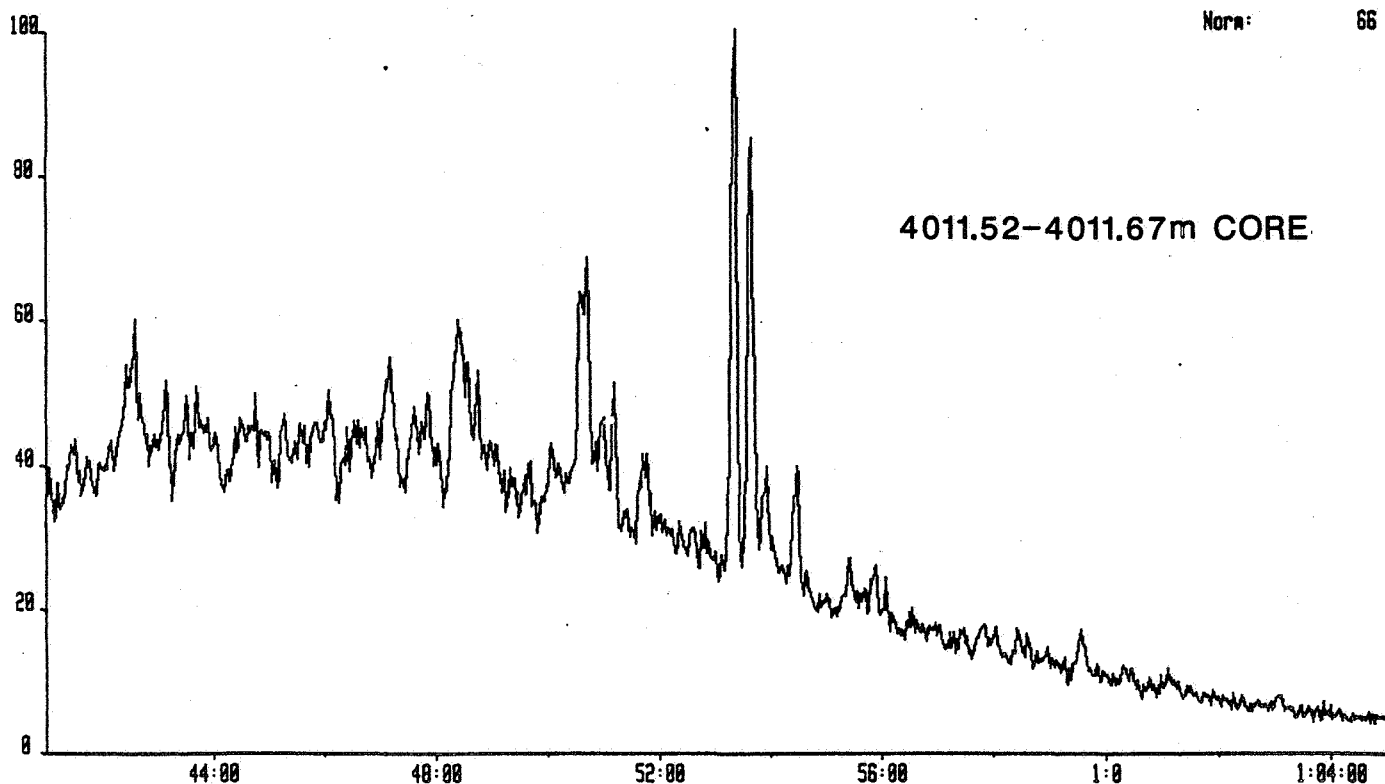


FIGURE 13d

MASS FRAGMENTOGRAMS



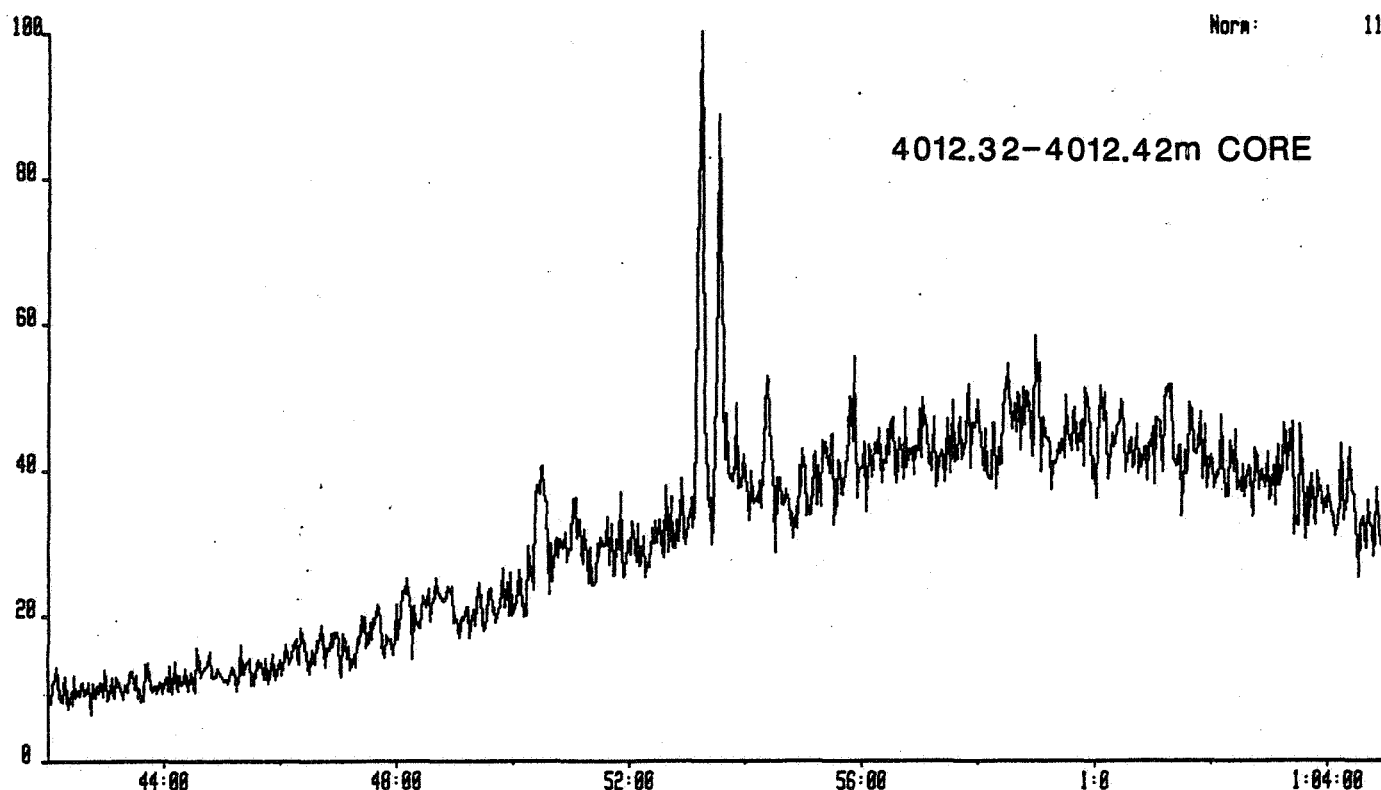
WELL 6506/12-5

METHYL HOPANES m/z 205

1334815 14-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 11



1334817 14-JUL-86 Sir:Magnetic TS258 Acnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

System:STETRITRP

Norm: 88

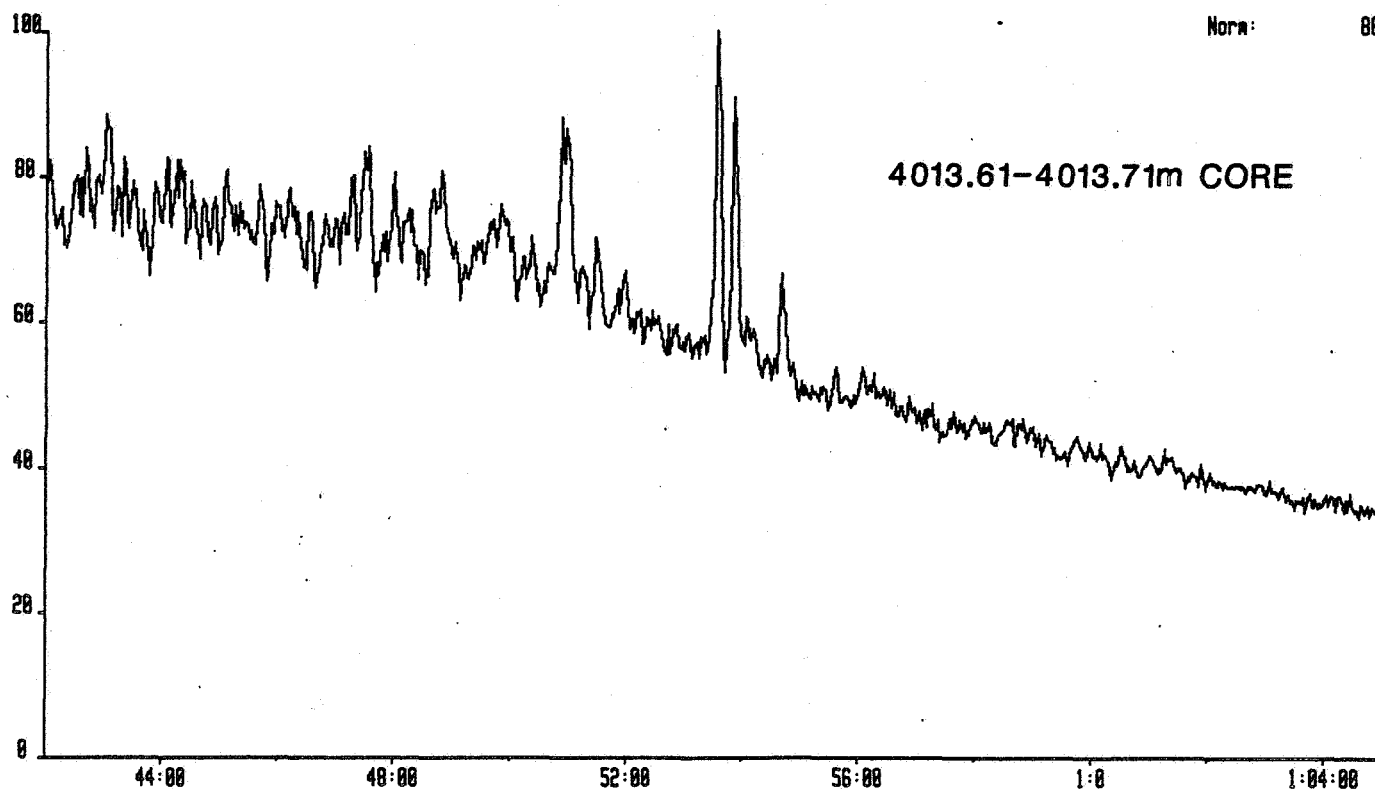


FIGURE 13e

MASS FRAGMENTOGRAMS



WELL 6506/12-5

METHYL HOPANES m/z 205

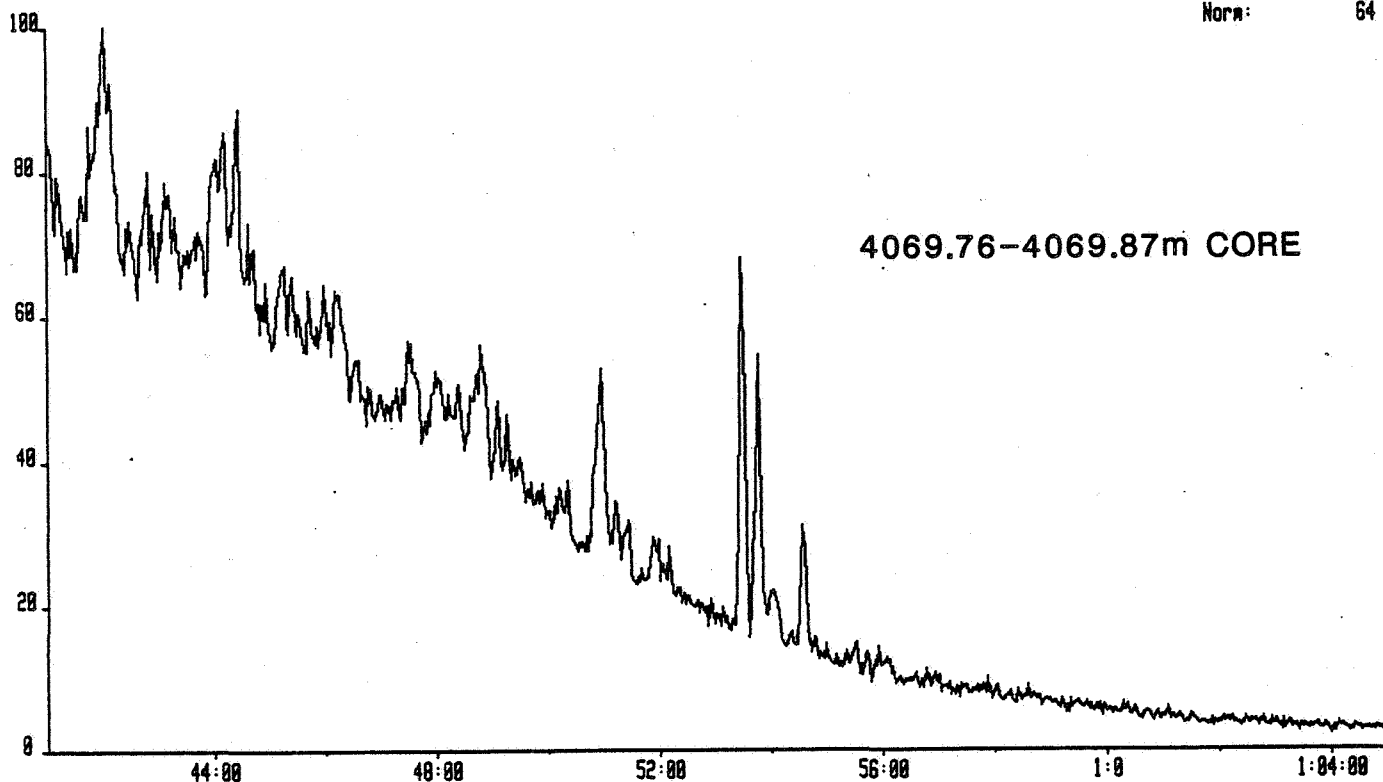
1334019 15-JUL-86 Site:Magnetic TS250 Acnt:
Sample 1 Injection 1 Group 1 Mass 205.1956
Text:TEST SYSTEM FILE FOR ROUTINE GEOCHEM ANALYSIS OF 22 IONS

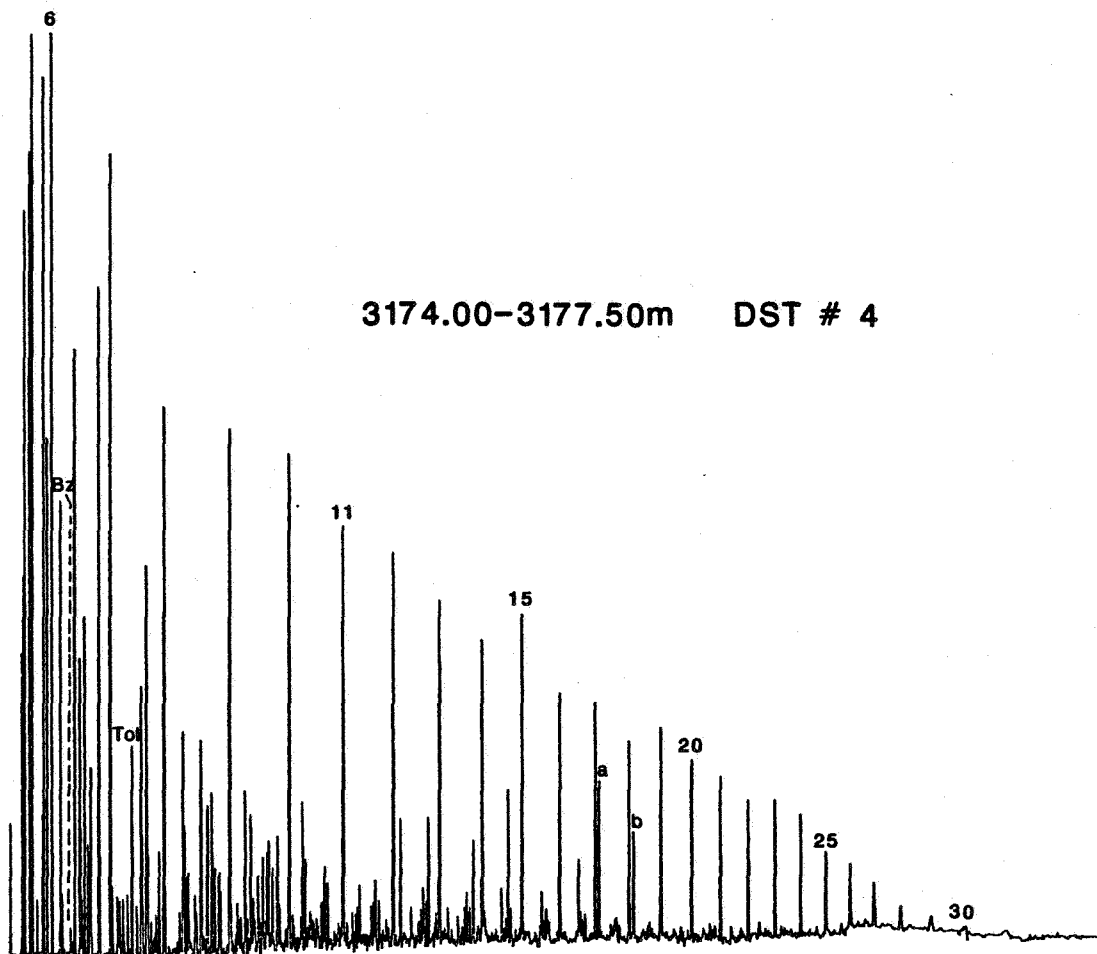
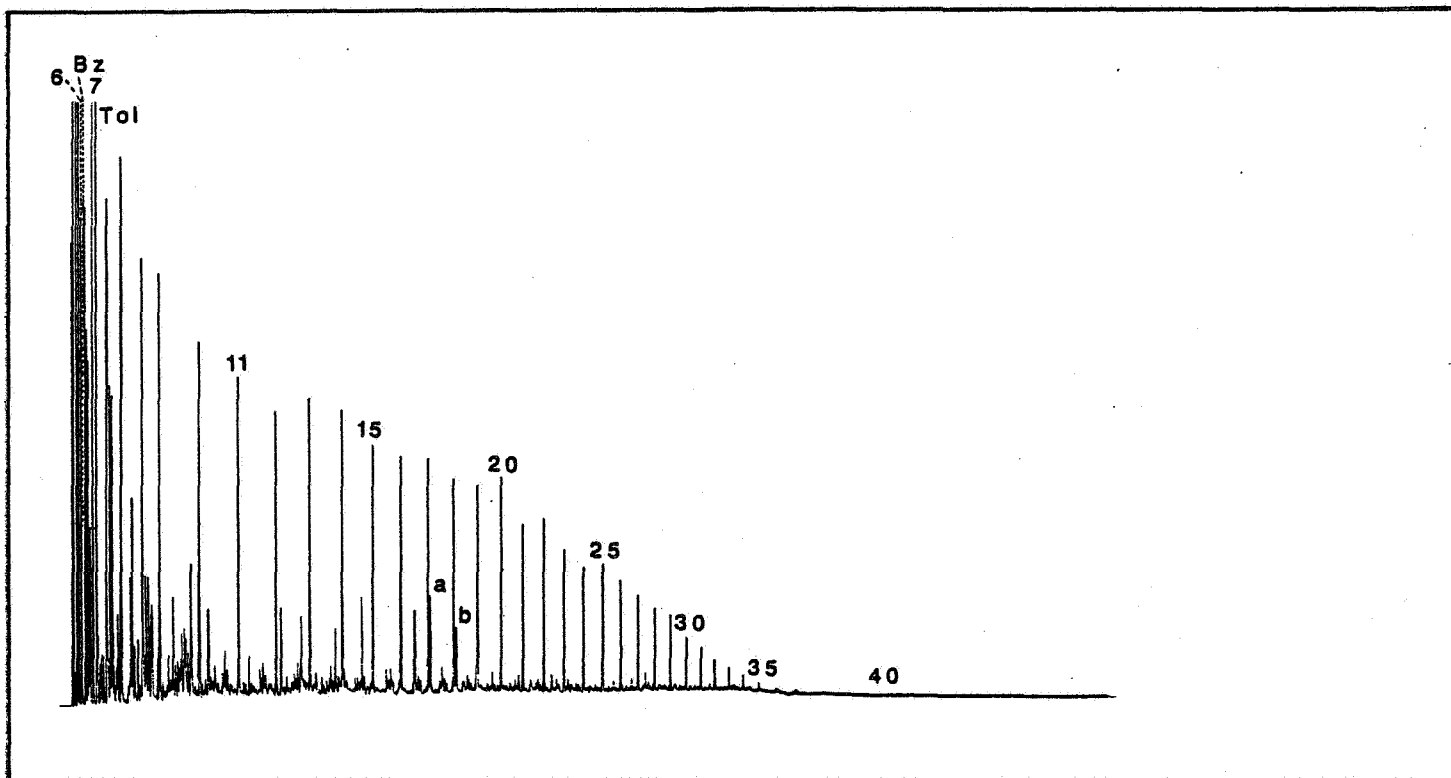
System:STETRITRP

Norm:

64

4069.76-4069.87m CORE





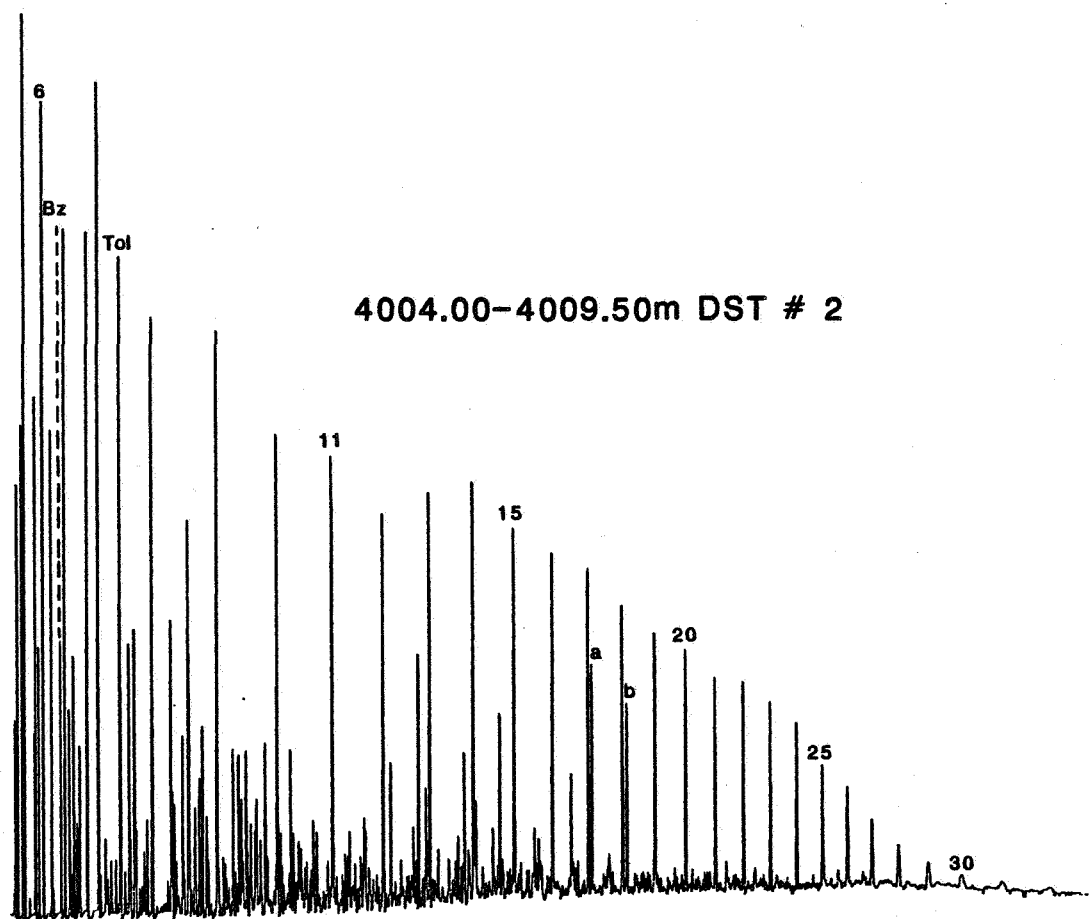
a - PRISTANE
b - PHYTANE

Bz - BENZENE
To - TOLUENE

NORMAL PARAFFINS IDENTIFIED
BY CARBON NUMBERS



WELL 6506/12-5



a - PRISTANE
b - PHYTANE

Bz - BENZENE
To - TOLUENE

NORMAL PARAFFINS IDENTIFIED
BY CARBON NUMBERS