



GEOCHEMICAL SERVICE REPORT

Prepared for
STATOIL

GEOCHEMICAL EVALUATION OF STATOIL'S 34/10-21
GULLFAKS WELL
APPENDIX II

January 1985

CHESTER STREET · CHESTER CH4 8RD · ENGLAND

COMPANY PROPRIETARY

FIGURE 1

RATING

WELL 34/10-21

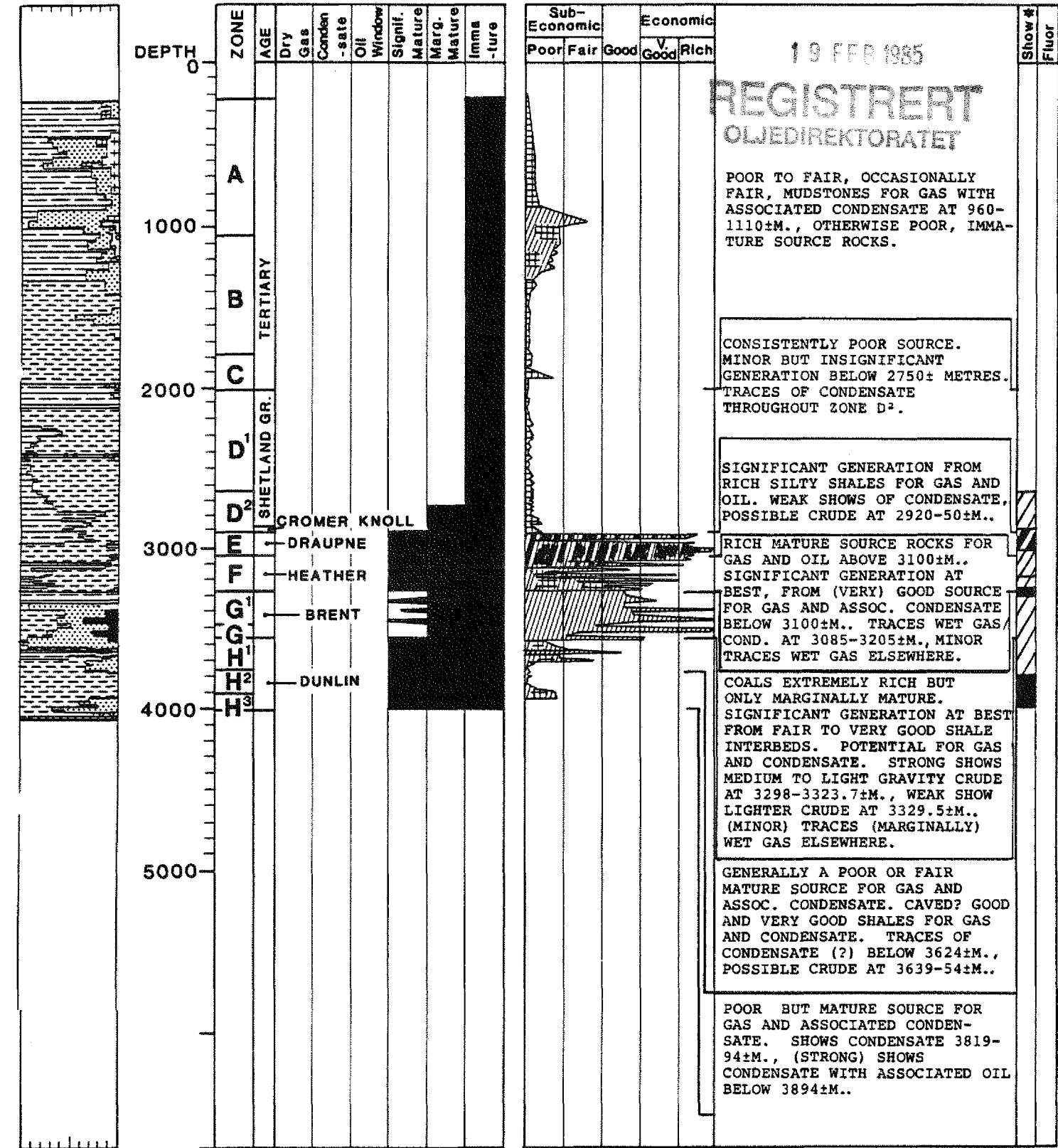
3

LITHO % LOG

MATURITY

PRESENT AND POTENTIAL RICHNESS

COMMENTS



19 FEB 1985

**REGISTRERT
OLJEDIREKTORATET**

POOR TO FAIR, OCCASIONALLY FAIR, MUDSTONES FOR GAS WITH ASSOCIATED CONDENSATE AT 960-1110±M., OTHERWISE POOR, IMMATURE SOURCE ROCKS.

CONSISTENTLY POOR SOURCE. MINOR BUT INSIGNIFICANT GENERATION BELOW 2750± METRES. TRACES OF CONDENSATE THROUGHOUT ZONE D².

SIGNIFICANT GENERATION FROM RICH SILTY SHALES FOR GAS AND OIL. WEAK SHOWS OF CONDENSATE, POSSIBLE CRUDE AT 2920-50±M..

RICH MATURE SOURCE ROCKS FOR GAS AND OIL ABOVE 3100±M.. SIGNIFICANT GENERATION AT BEST, FROM (VERY) GOOD SOURCE FOR GAS AND ASSOC. CONDENSATE BELOW 3100±M.. TRACES WET GAS COND. AT 3085-3205±M., MINOR TRACES WET GAS ELSEWHERE.

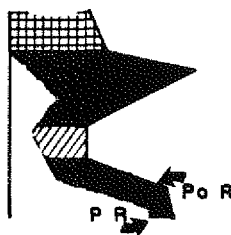
COALS EXTREMELY RICH BUT ONLY MARGINALLY MATURE. SIGNIFICANT GENERATION AT BEST FROM FAIR TO VERY GOOD SHALE INTERBEDS. POTENTIAL FOR GAS AND CONDENSATE. STRONG SHOWS MEDIUM TO LIGHT GRAVITY CRUDE AT 3298-3323.7±M., WEAK SHOW LIGHTER CRUDE AT 3329.5±M.. (MINOR) TRACES (MARGINALLY) WET GAS ELSEWHERE.

GENERALLY A POOR OR FAIR MATURE SOURCE FOR GAS AND ASSOC. CONDENSATE. CAVED? GOOD AND VERY GOOD SHALES FOR GAS AND CONDENSATE. TRACES OF CONDENSATE (?) BELOW 3624±M., POSSIBLE CRUDE AT 3639-54±M..

POOR BUT MATURE SOURCE FOR GAS AND ASSOCIATED CONDENSATE. SHOWS CONDENSATE 3819-94±M., (STRONG) SHOWS CONDENSATE WITH ASSOCIATED OIL BELOW 3894±M..

- Limestone
- Dolomite
- Shale
- Mudstone/Claystone
- Coal

- Siltstone
- Sandstone
- Evaporite
- Igneous
- L.C.M.



- GAS PRONE
- GAS AND CONDENSATE
- OIL PRONE
- Shows Recognised by Analysis
- Po R Potential Richness
- PR Present Richness

FIGURE 2

C₁-C₇ HYDROCARBONS

WELL 34/10-21

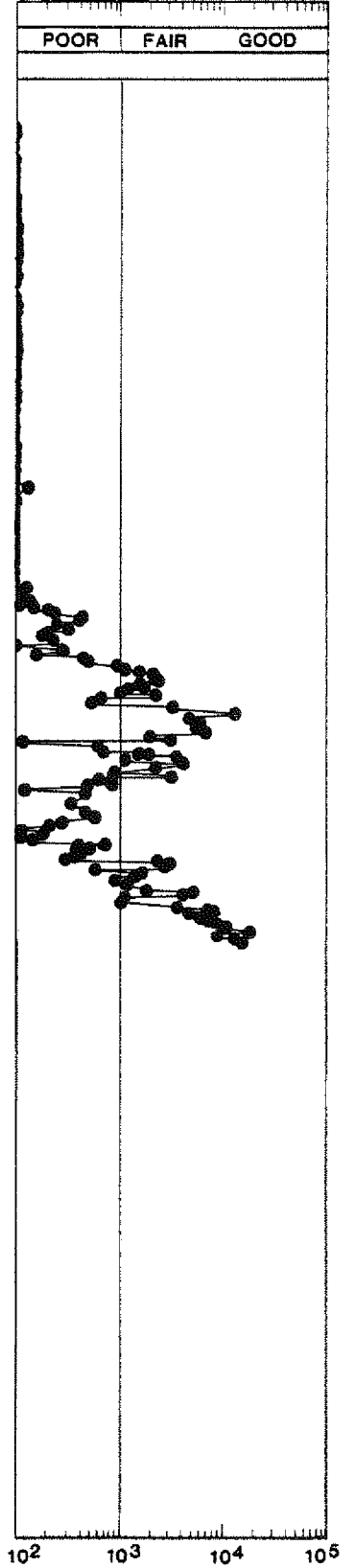
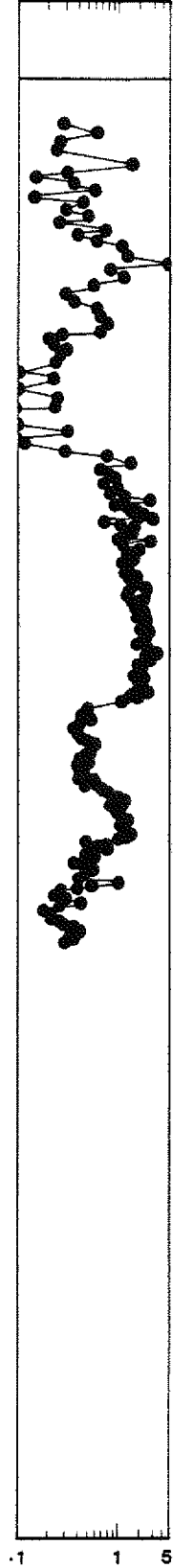
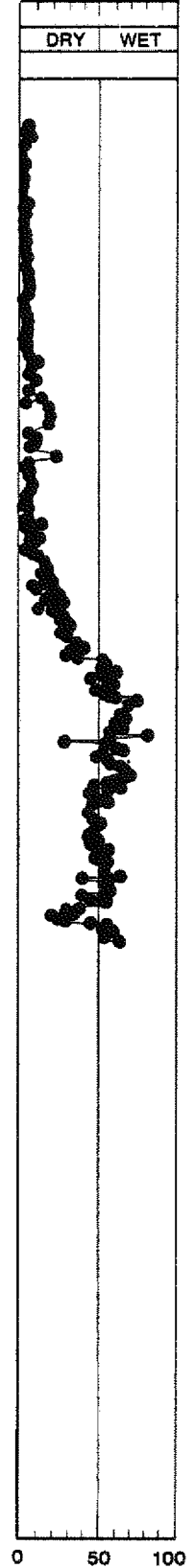
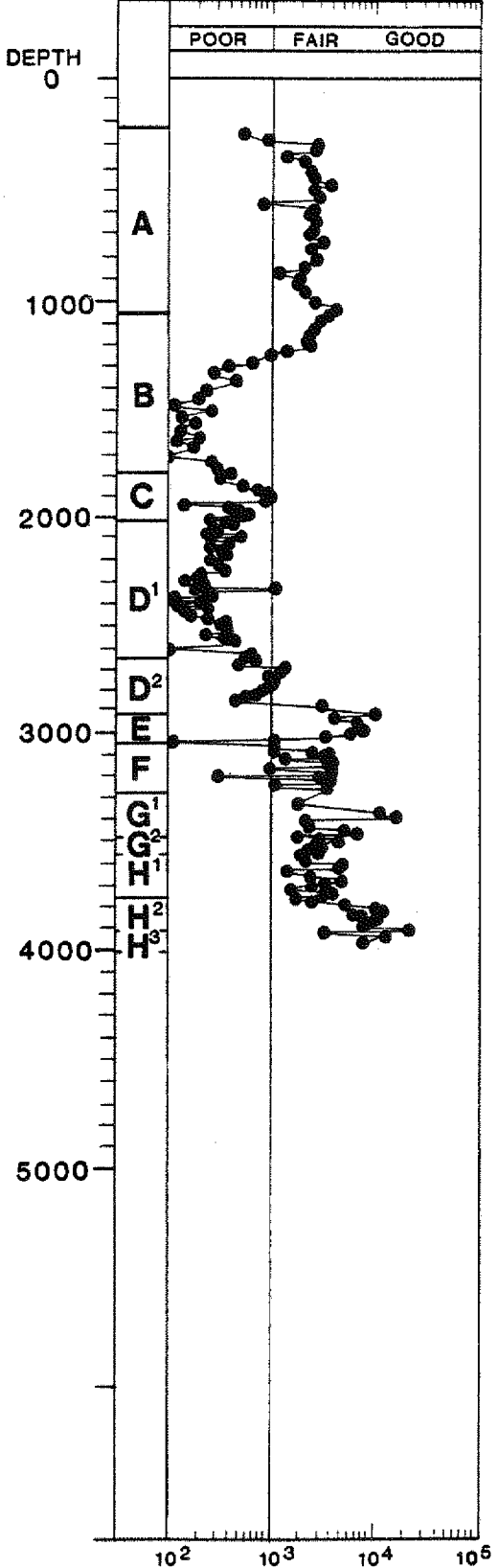
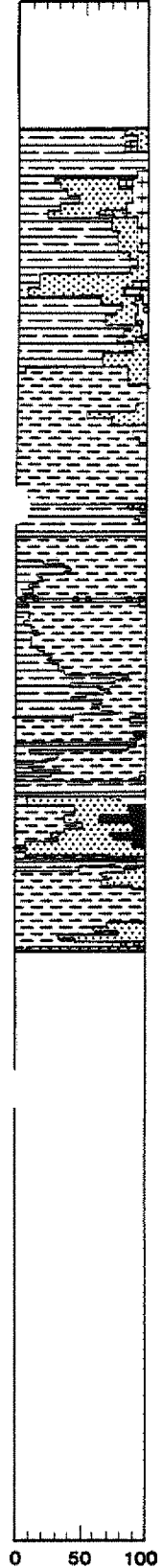
LITHO % LOG
0 50 100

ZONE ABUNDANCE
10² 10³ 10⁴ 10⁵

WETNESS
0 50 100

iC₄/nC₄
1 1 5

C₅-C₇₊ HYDROCARBONS
ABUNDANCE
10² 10³ 10⁴ 10⁵



- Limestone
- Dolomite
- Shale
- Mudstone/Claystone
- Coal

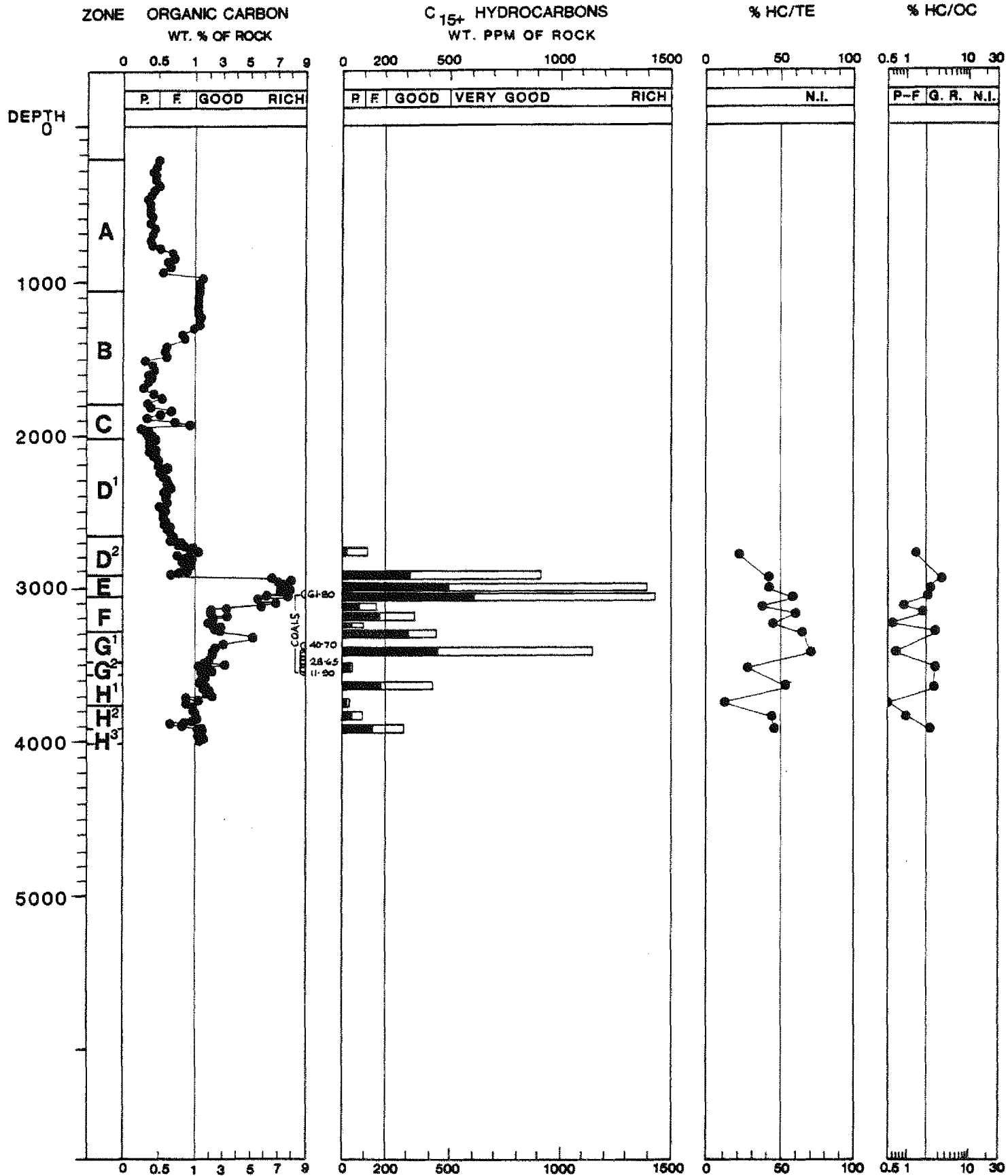
- Siltstone
- Sandstone
- Evaporite
- Igneous
- L.C.M.

- iC₄ - ISOBUTANE
- nC₄ - NORMAL BUTANE
- ABUNDANCE - VOLUME PPM OF ROCK
- WETNESS - % C₂-C₄ IN C₁-C₄

FIGURE 3

RICHNESS

WELL 34/10-21



- SHALE/MUDSTONE
- OTHER LITHOLOGIES

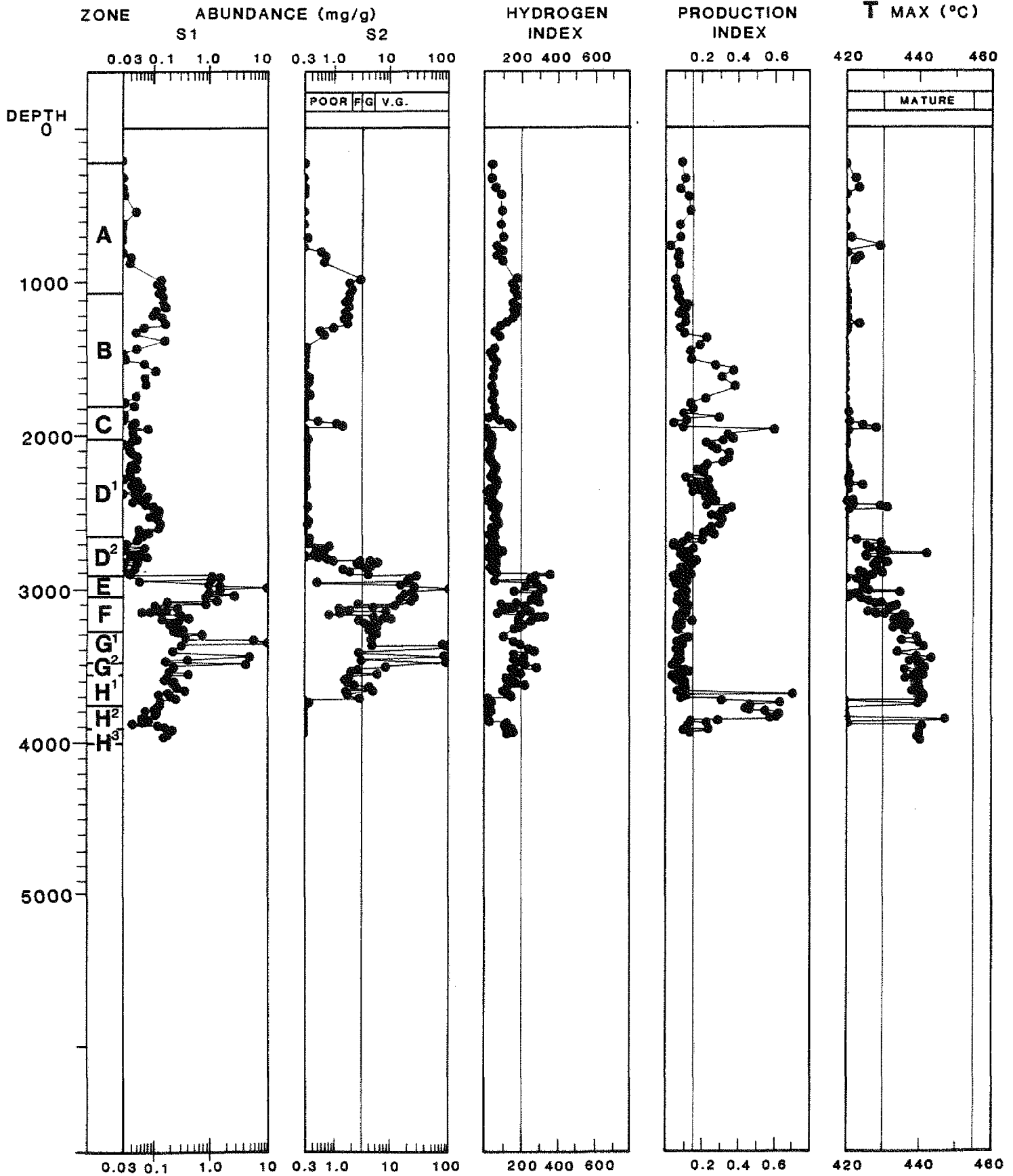
- P-N - PARAFFIN - NAPHTHENES
- AROM - AROMATICS
- HC - C₁₅₊ HYDROCARBONS
- OC - ORGANIC CARBON
- TE - TOTAL C₁₅₊ EXTRACT

- P - POOR
- F - FAIR
- G - GOOD
- R - RICH
- N.I. - NON-INDIGENOUS HYDROCARBONS

FIGURE 4

ROCKEVAL DATA

WELL 34/10-21



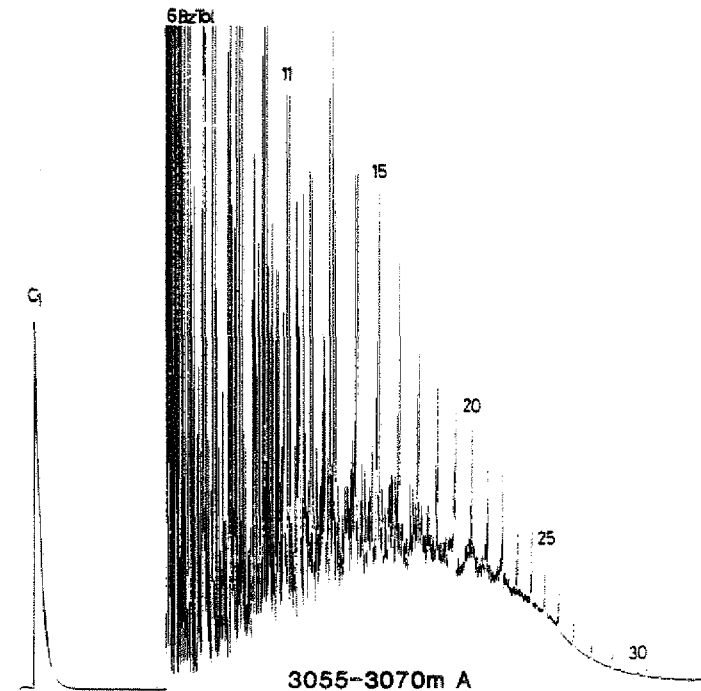
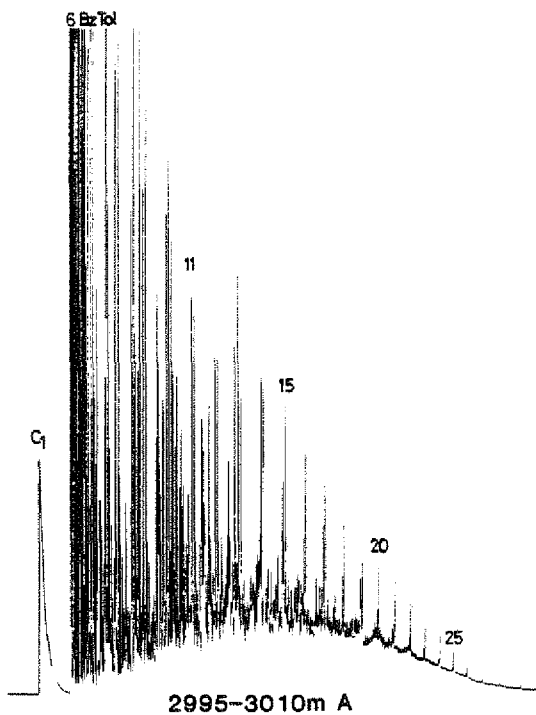
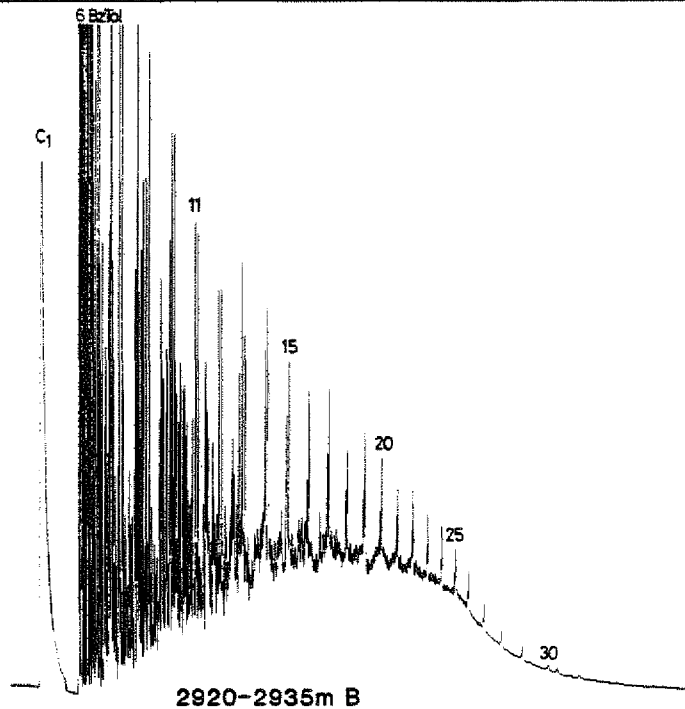
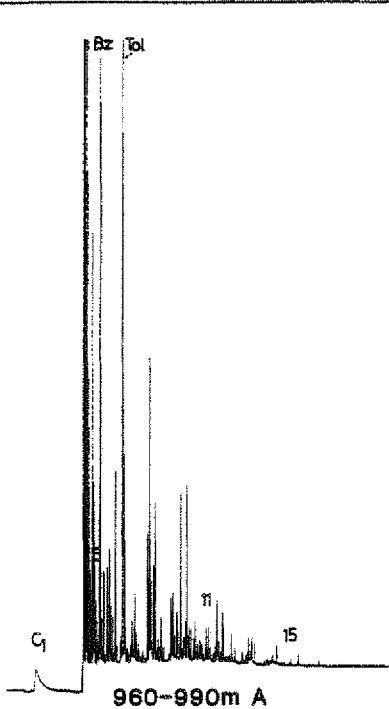
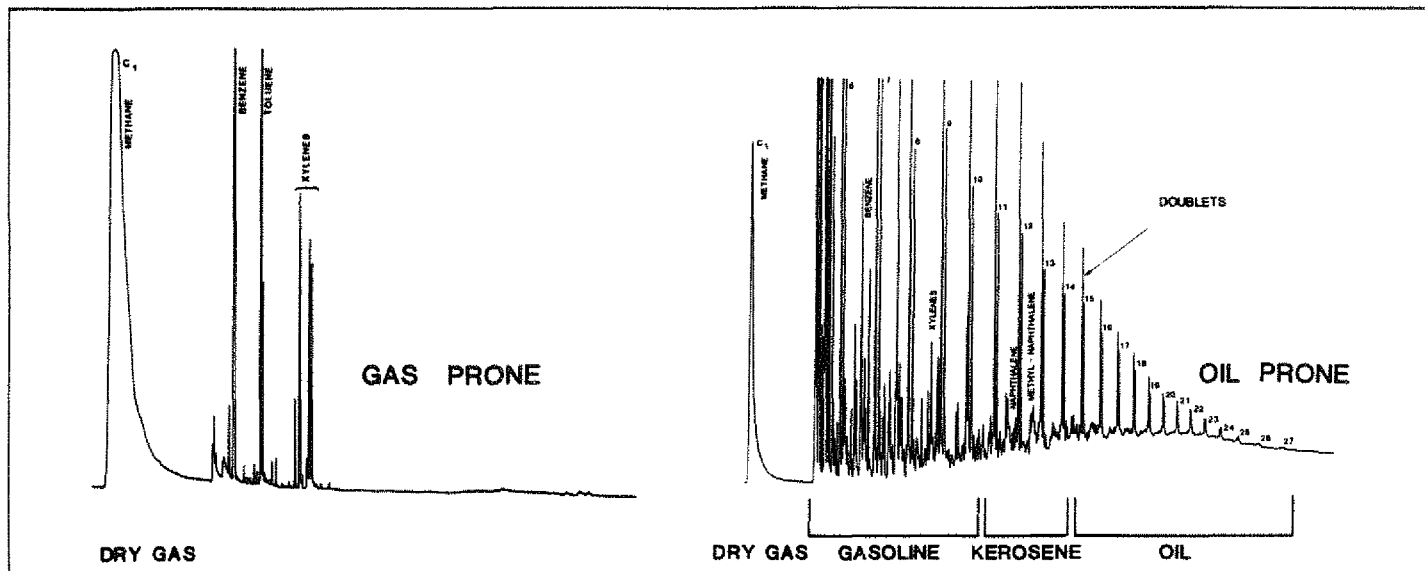
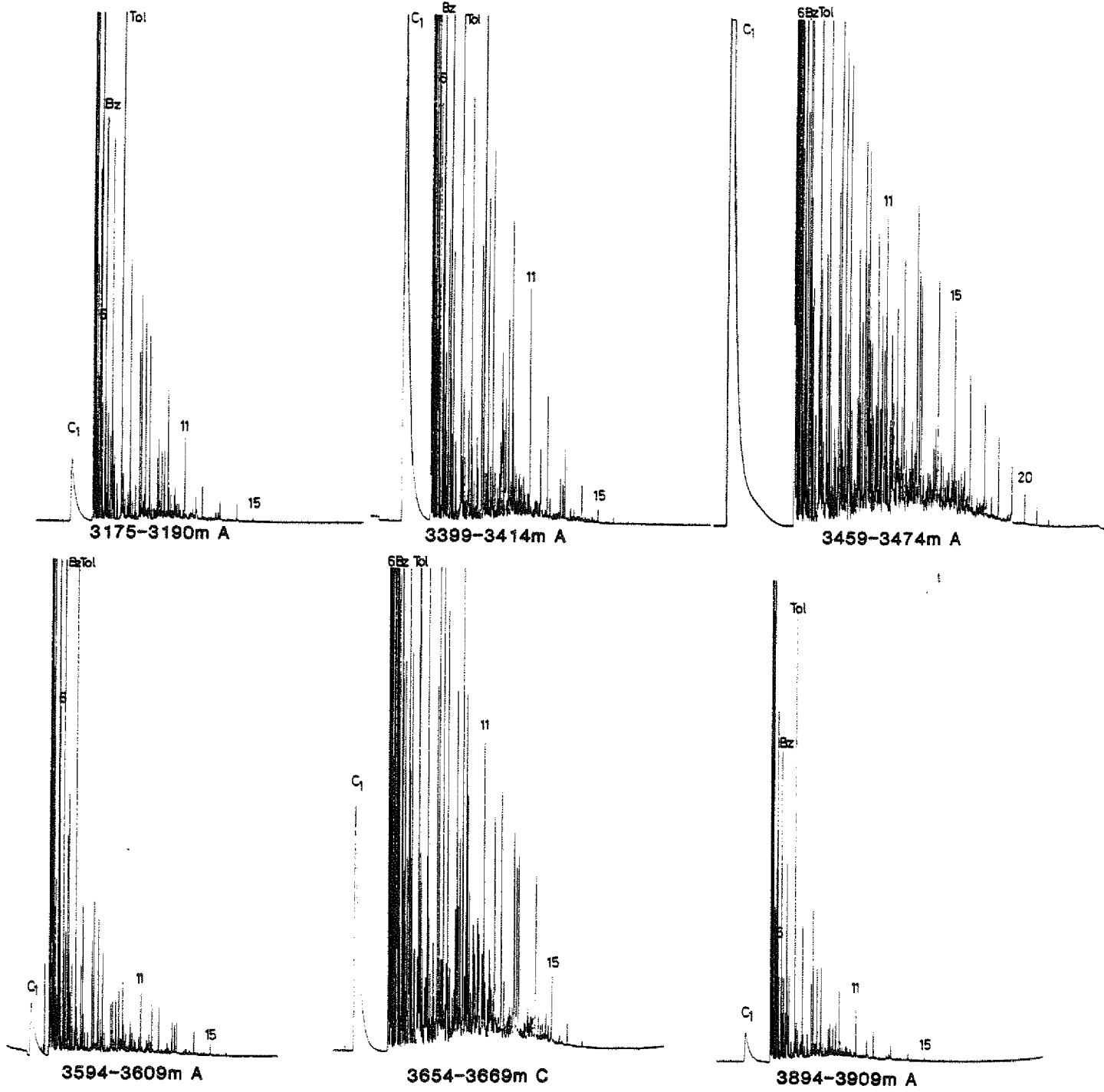
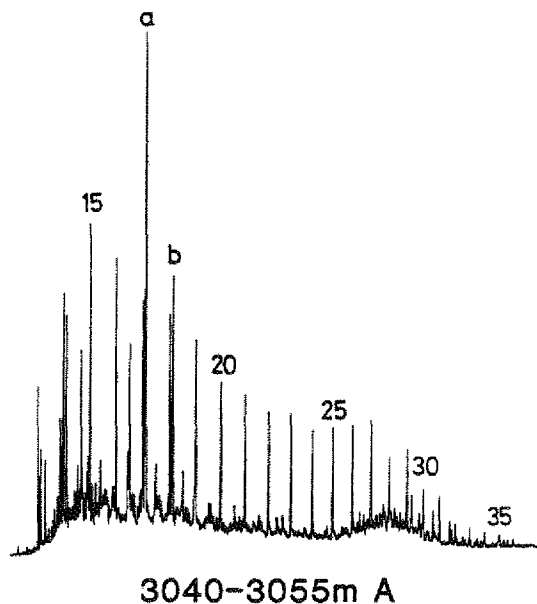
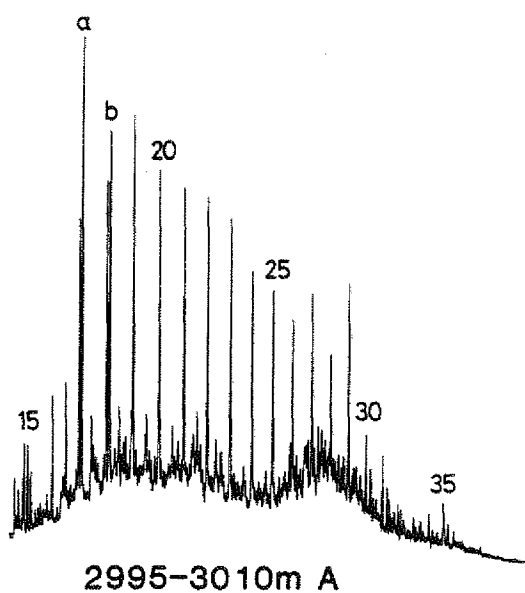
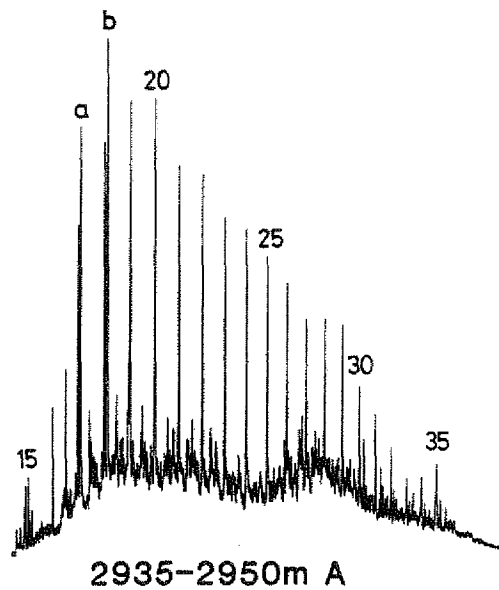
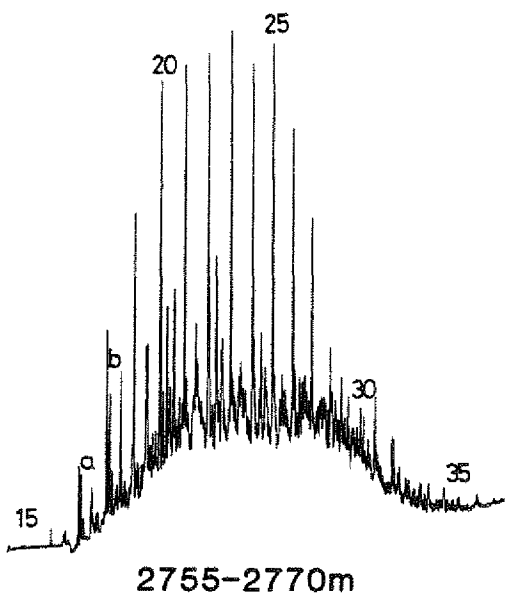
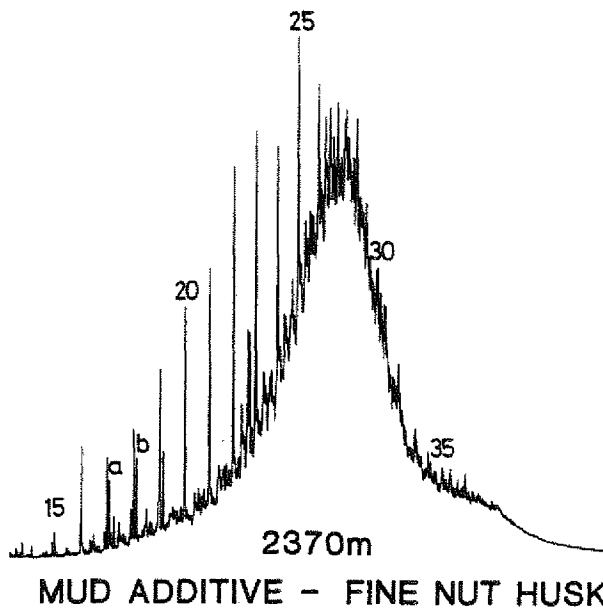
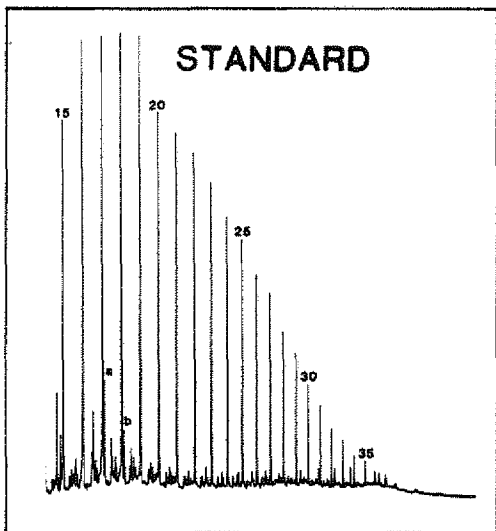


FIGURE 5b

PYROLYSIS GC

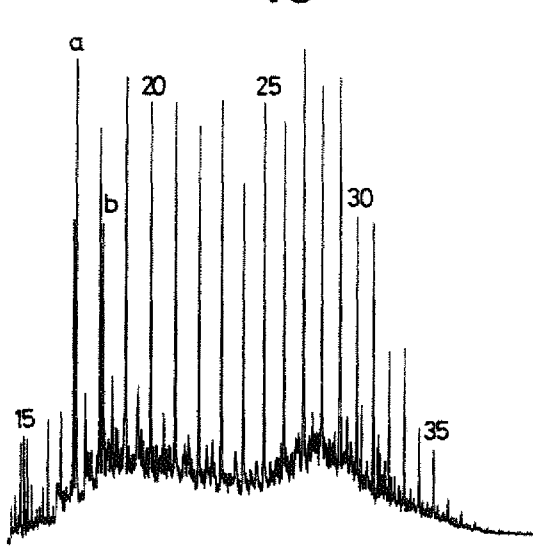
WELL 34/10-21



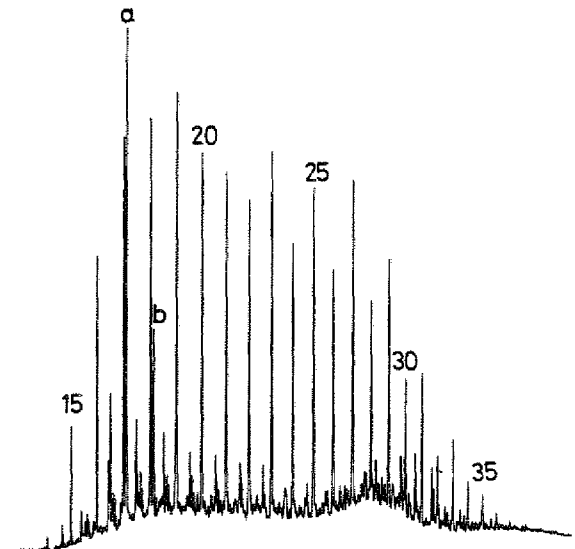


a - PRISTANE
b - PHYTANE

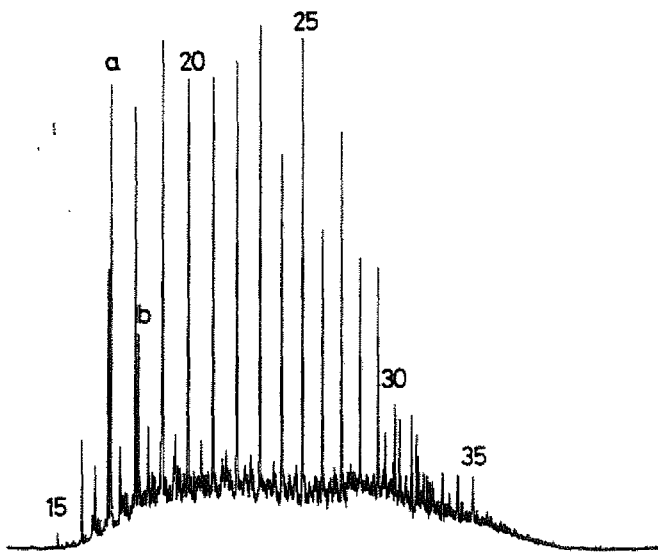
CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)



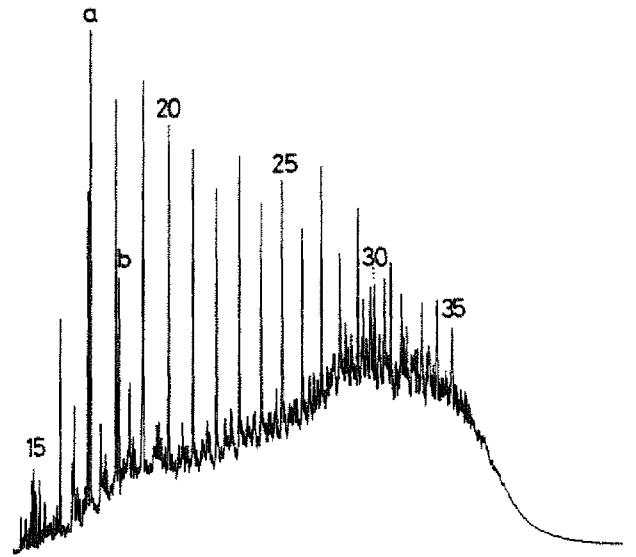
3115-3130m



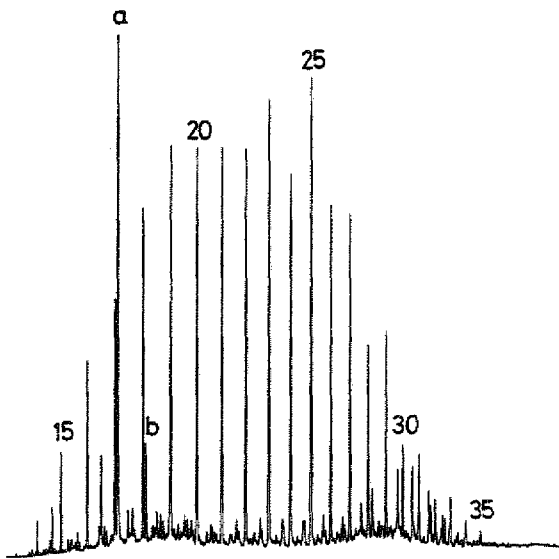
3160-3175m



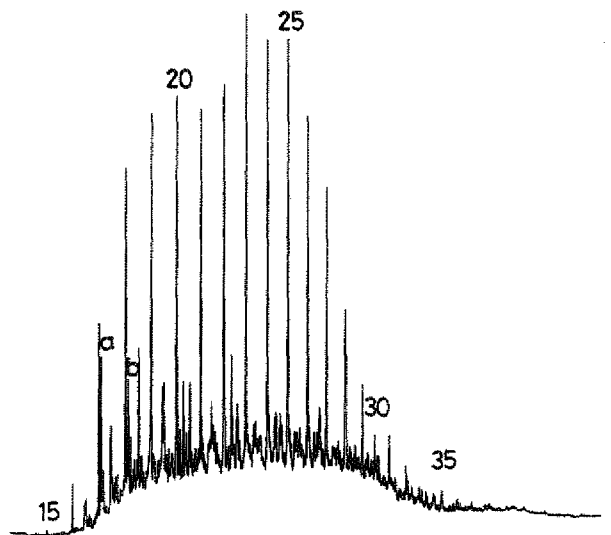
3205-3219m



3264-3279m A



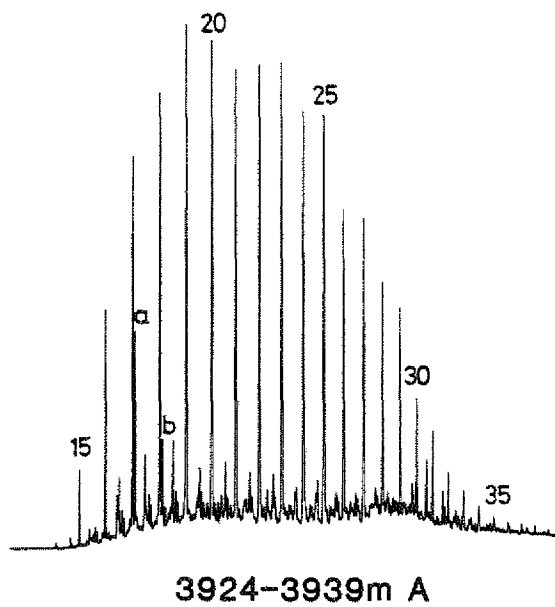
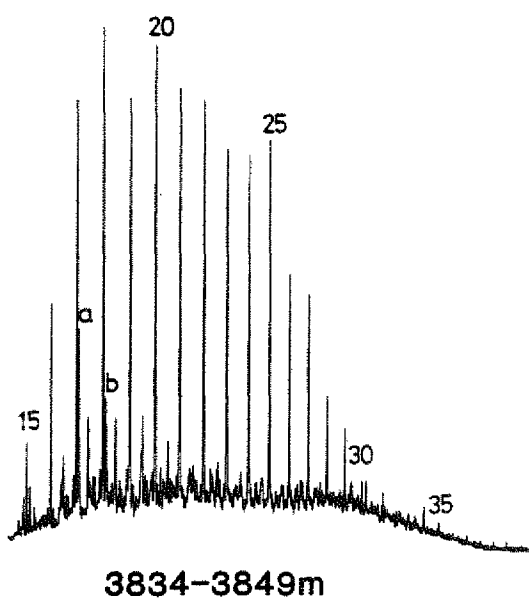
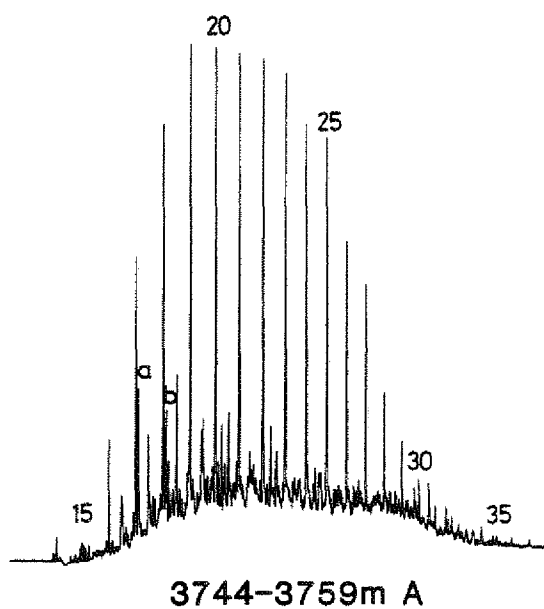
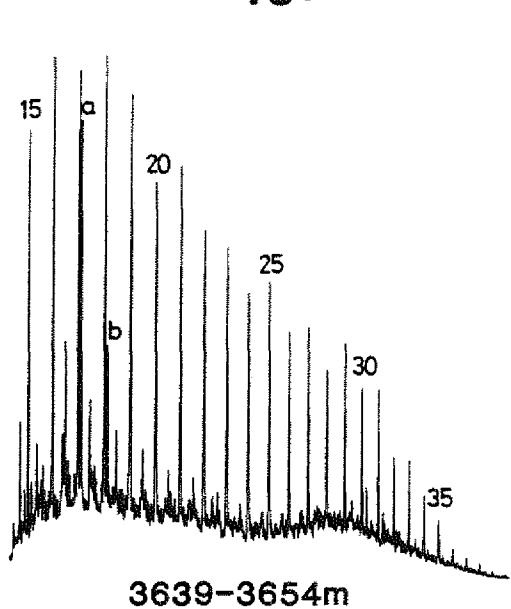
3399-3414m



3504-3519m A

a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)



a - PRISTANE
b - PHYTANE

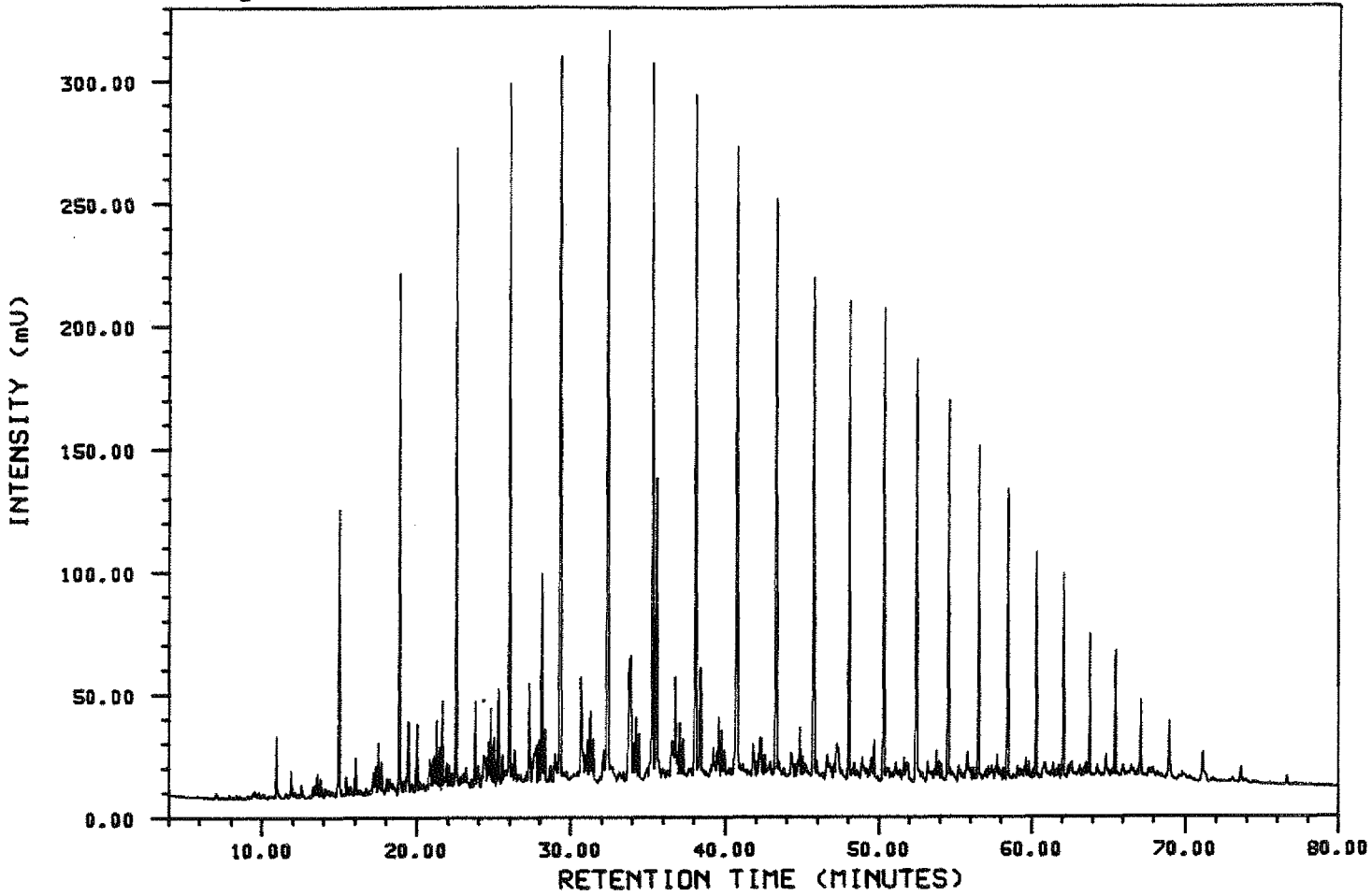
CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 6d

Analysis S404I

4,1,1

34/10-21 3298m



Analysis S405I

4,1,1

34/10-21 3309m

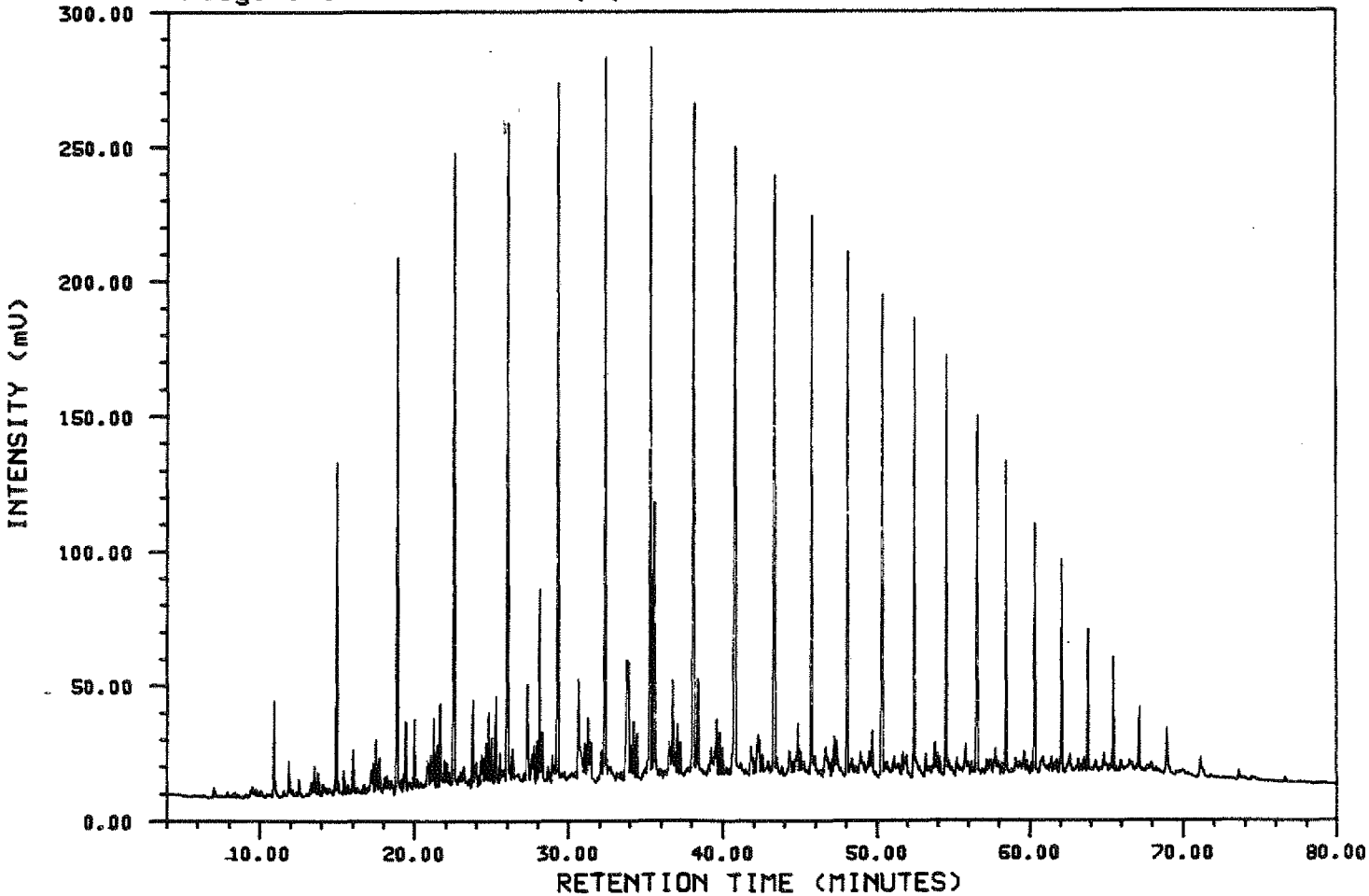
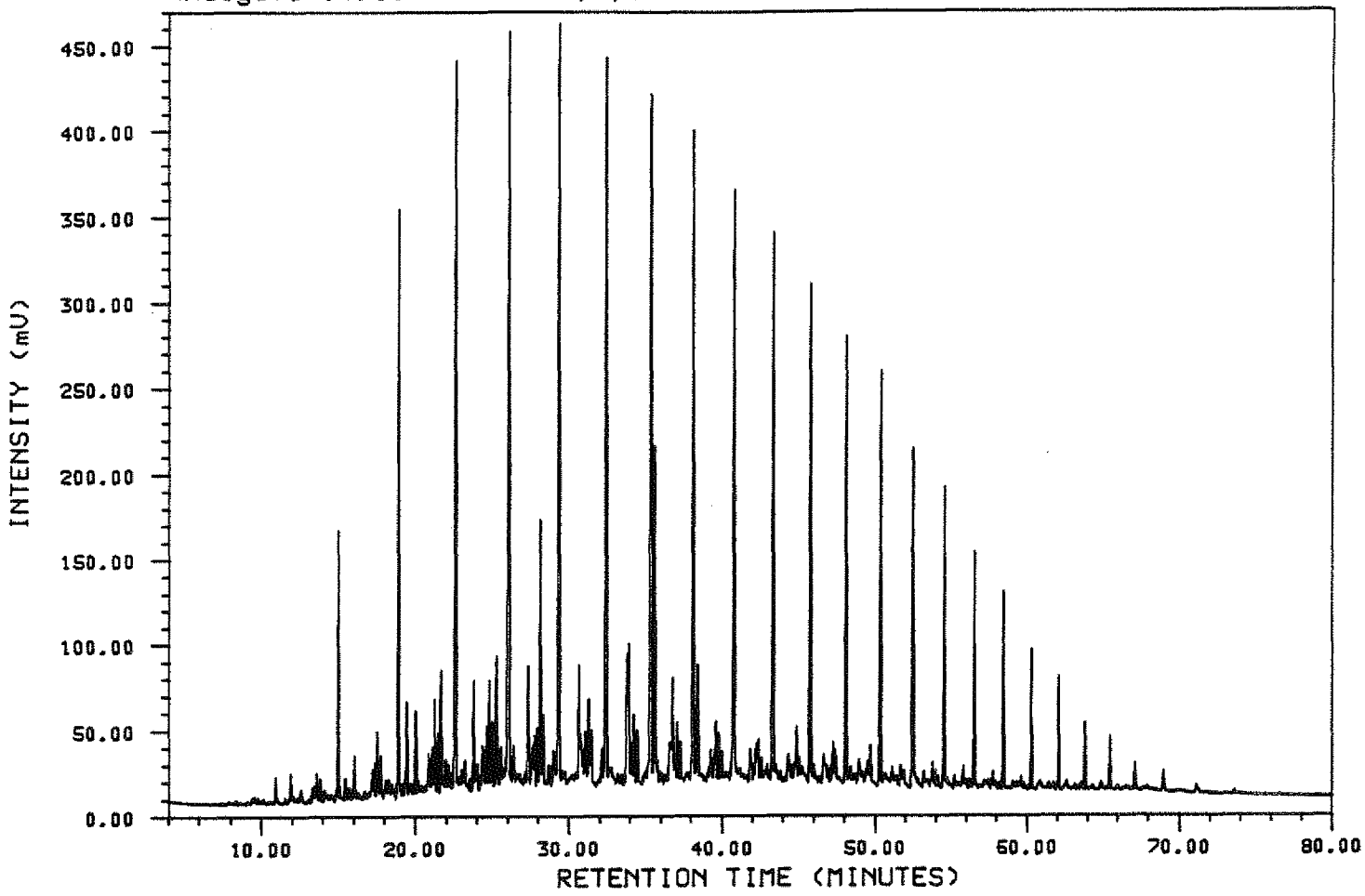


FIGURE 6e

Analysis S406I

4,1,1

34/10-21 3314m



Analysis S410I

4,1,1

34/10-21 3319m

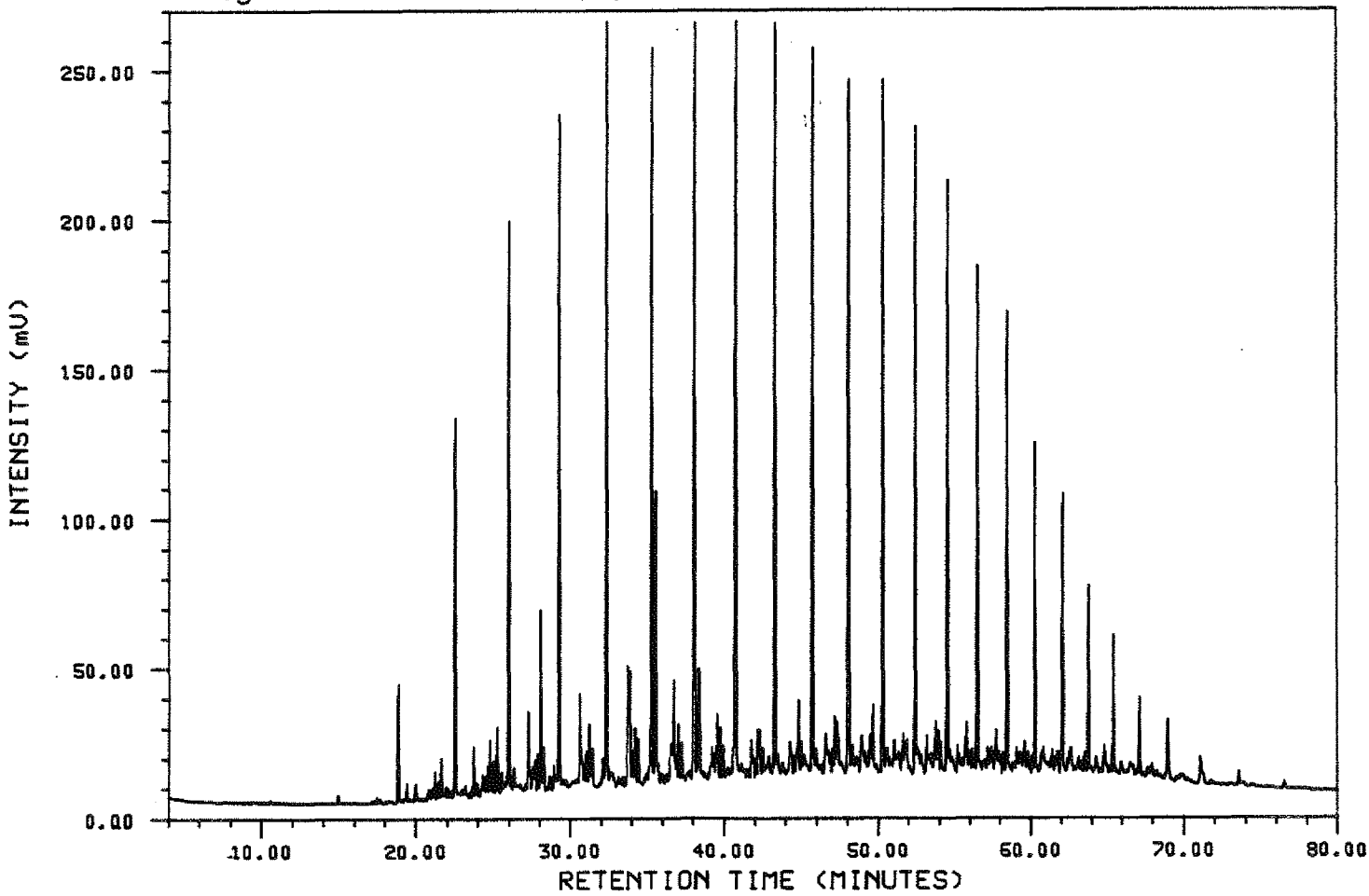


FIGURE 6f

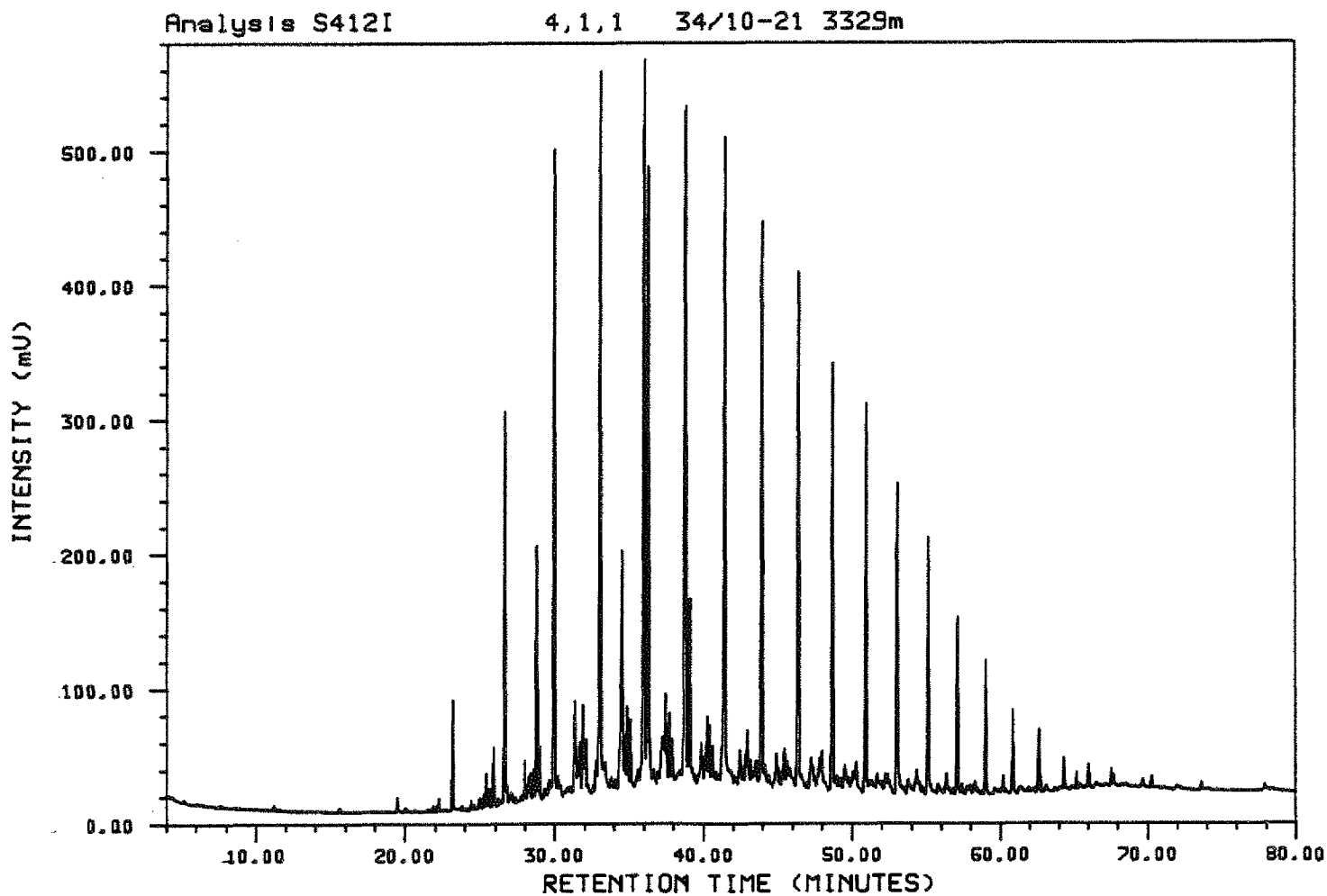
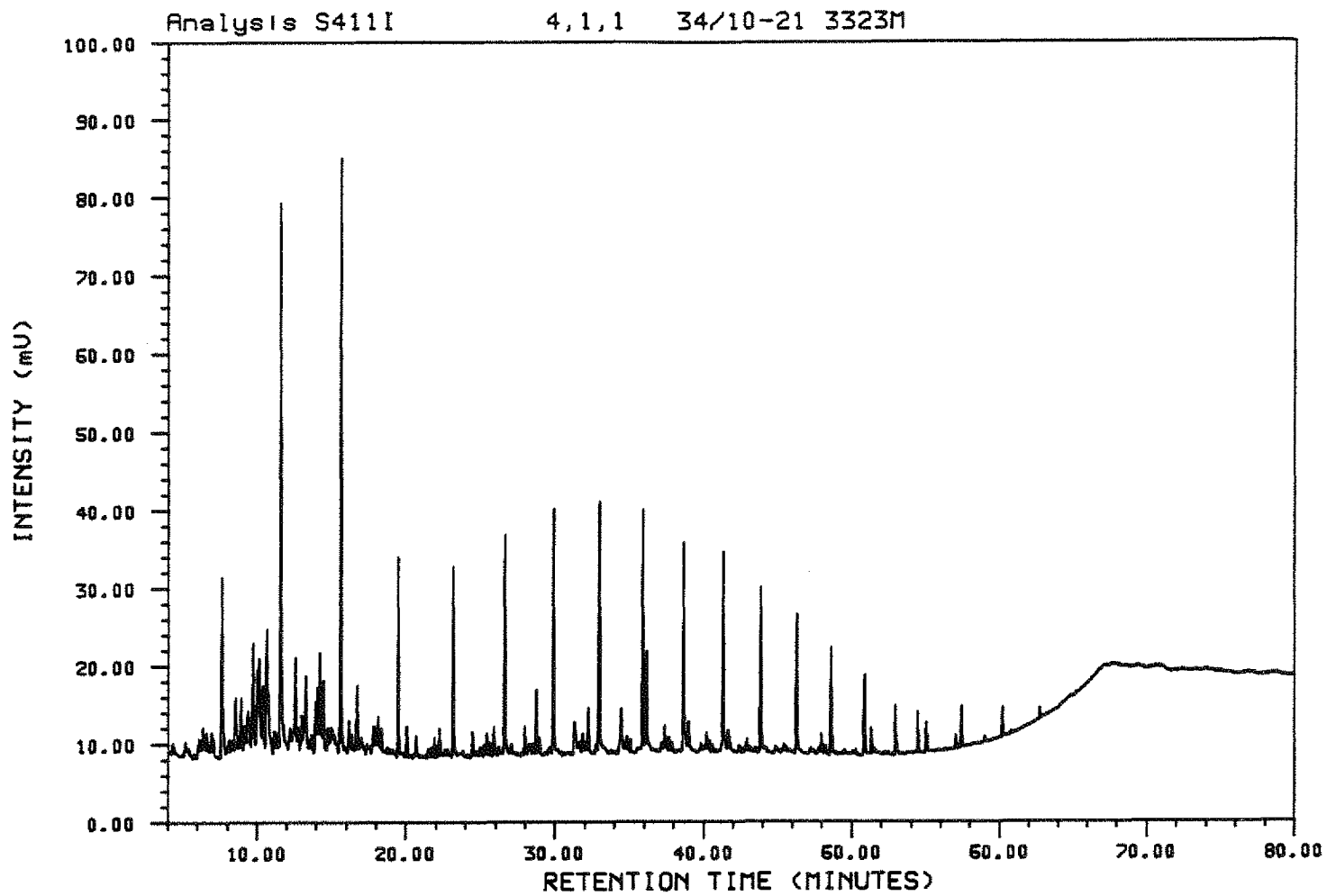
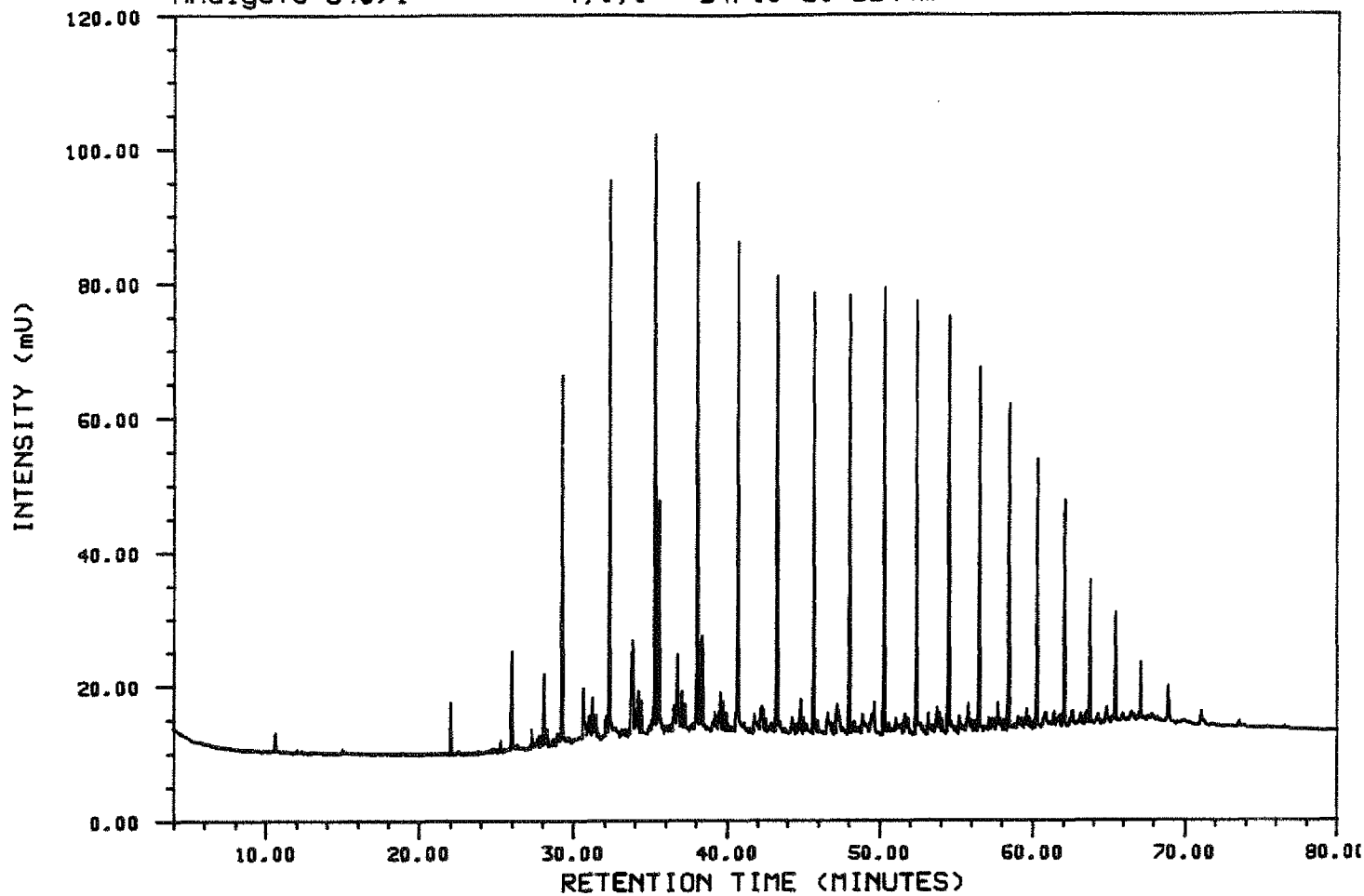


FIGURE 6g

Analysis S407I

4,1,1

34/10-21 3344m



Analysis S413I

4,1,1

34/10-21 3352m

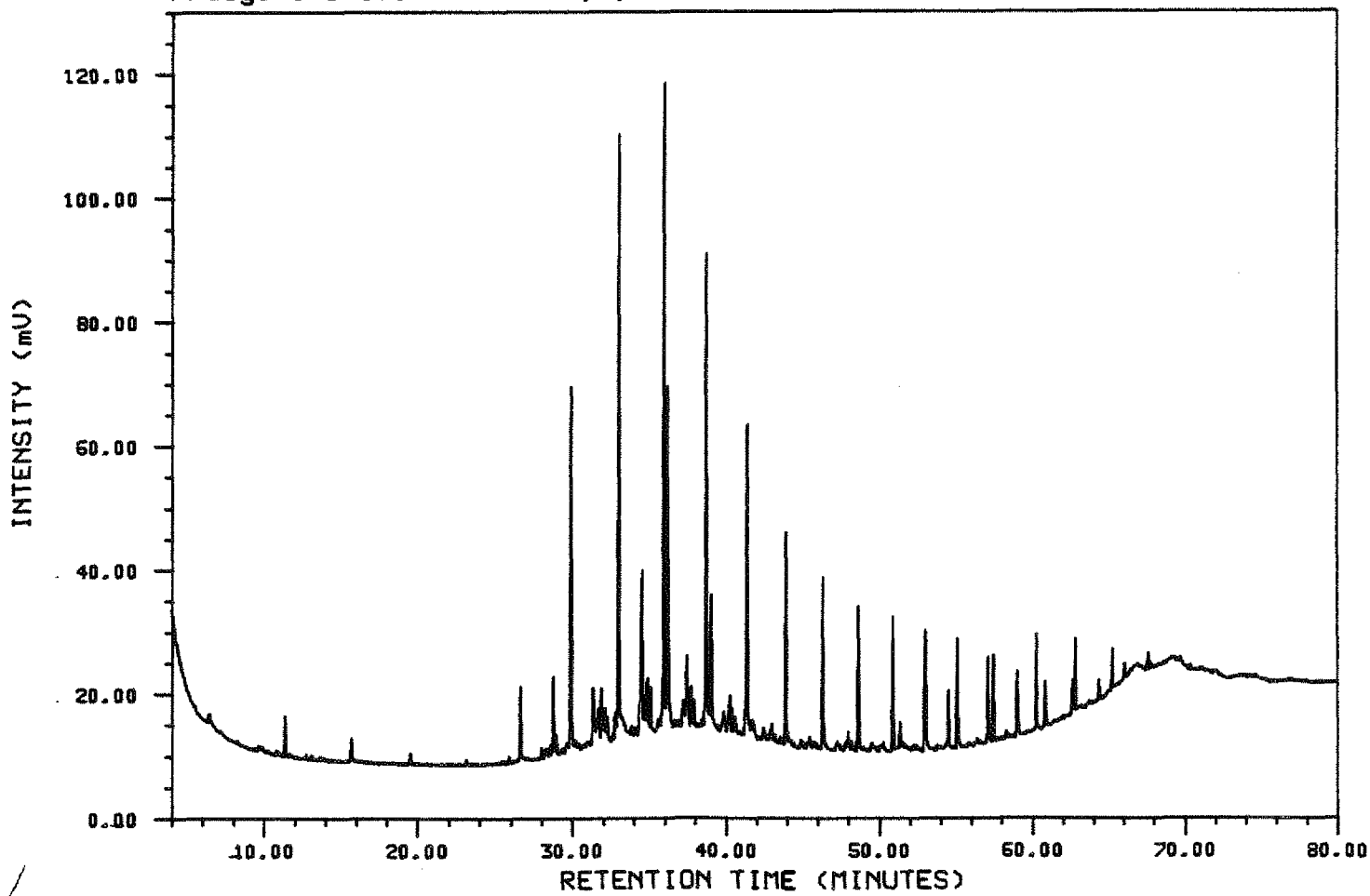
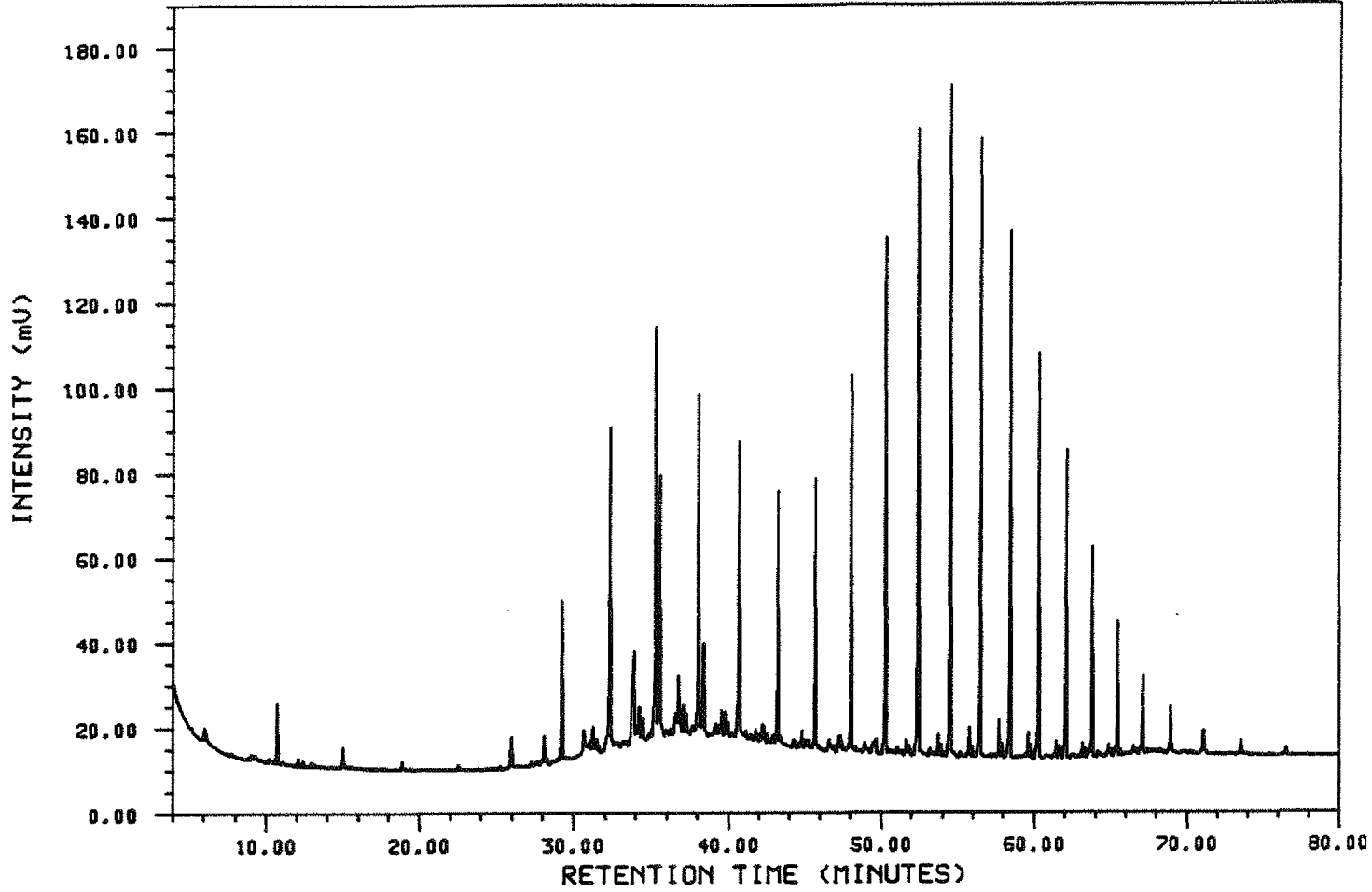


FIGURE 6h

Analysis S408I

4,1,1 34/10-21 3354m



Analysis S409I

4,1,1 34/10-21 3363m

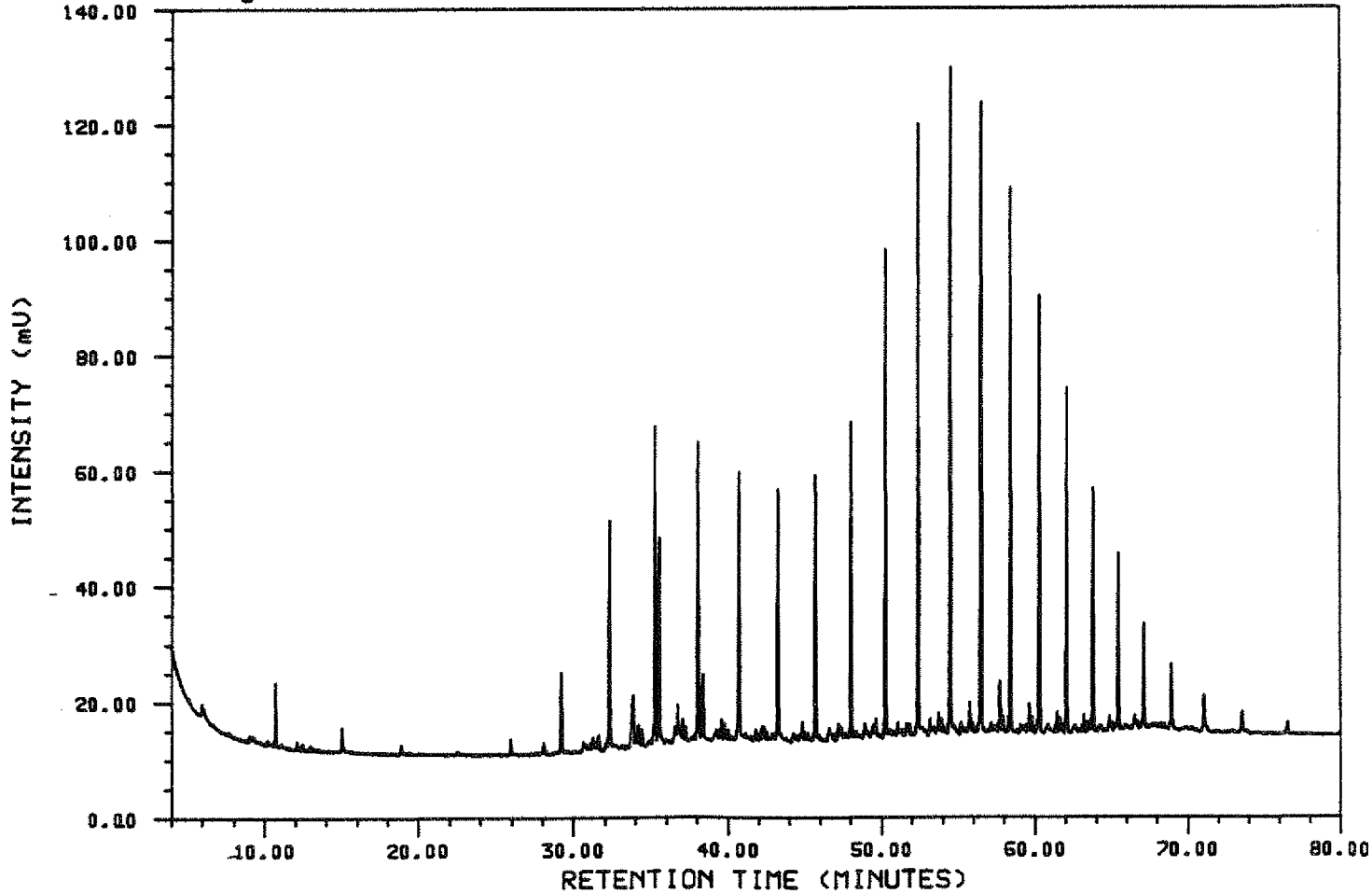
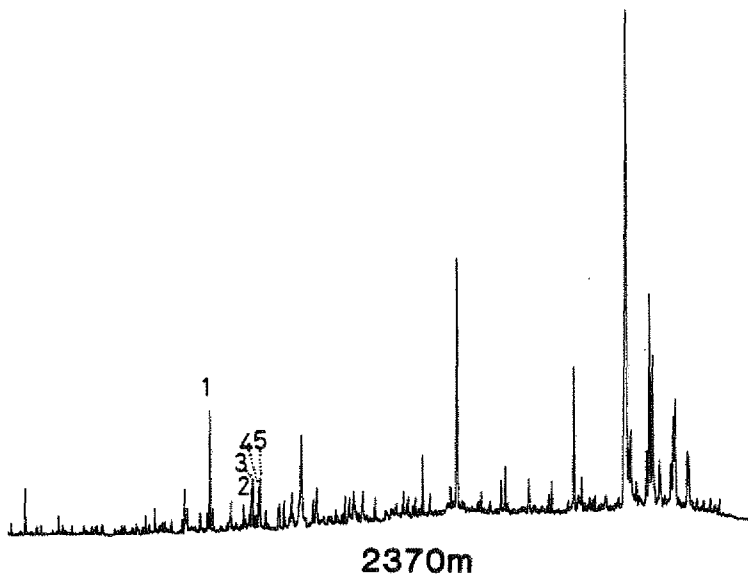
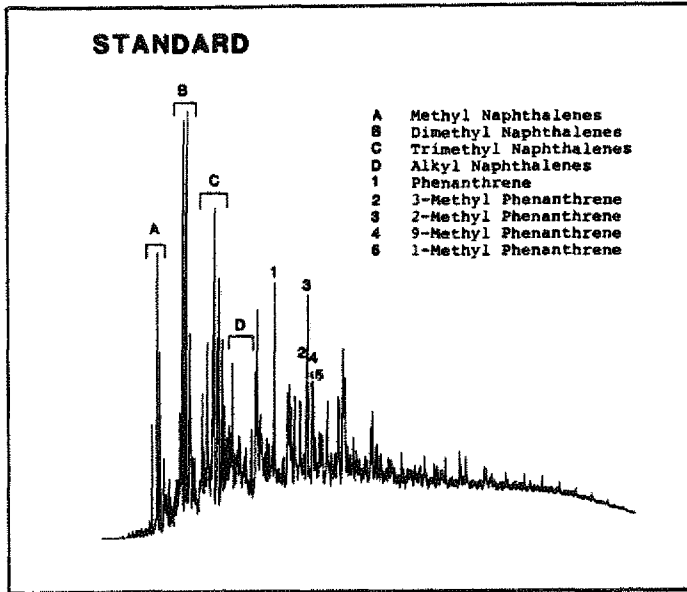
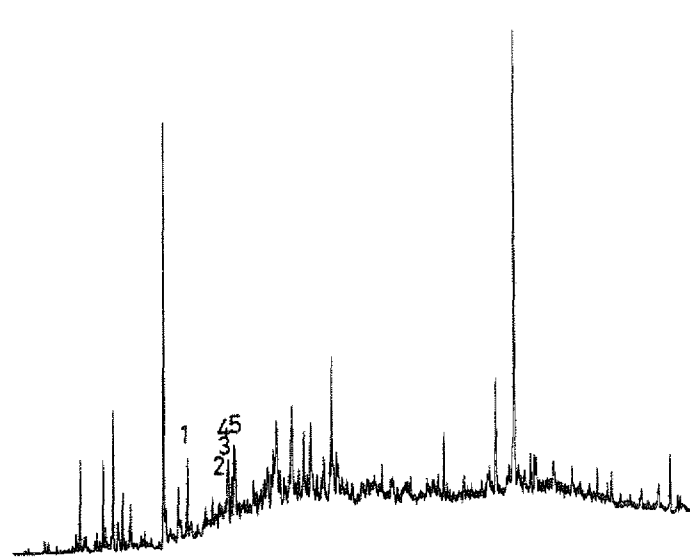


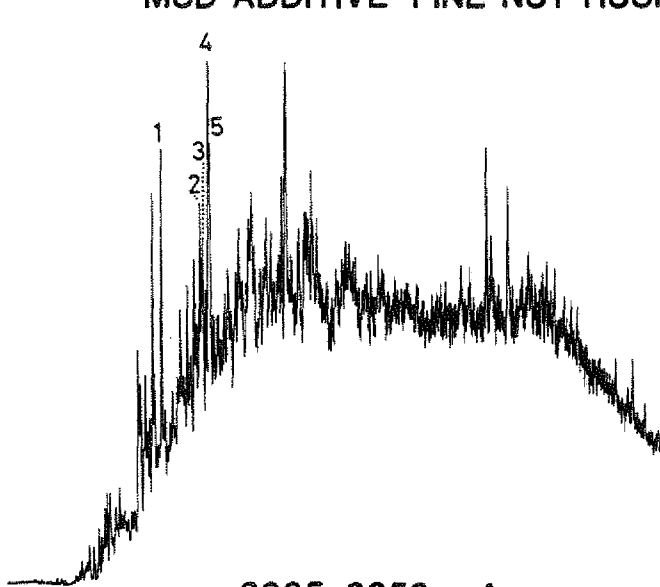
FIGURE 7a AROMATIC CHROMATOGRAMS WELL 34/10-21



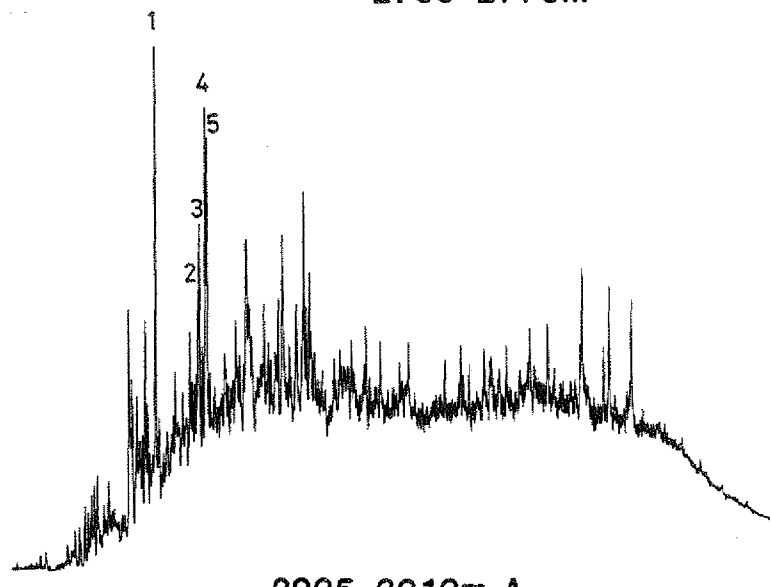
MUD ADDITIVE-FINE NUT HUSK



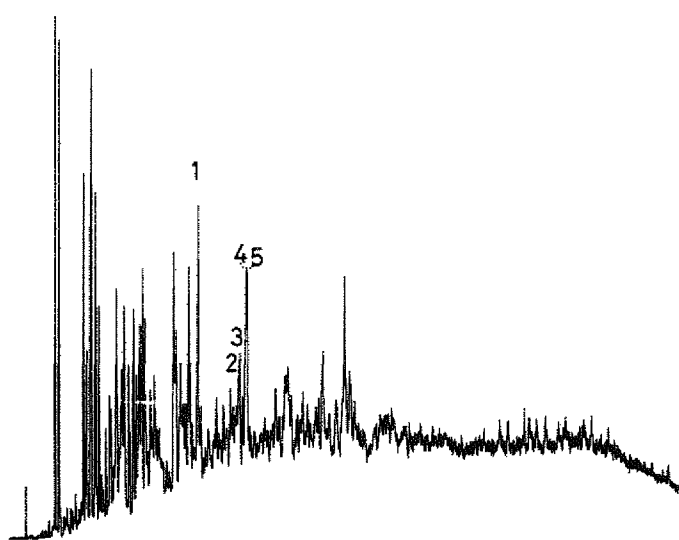
2755-2770m



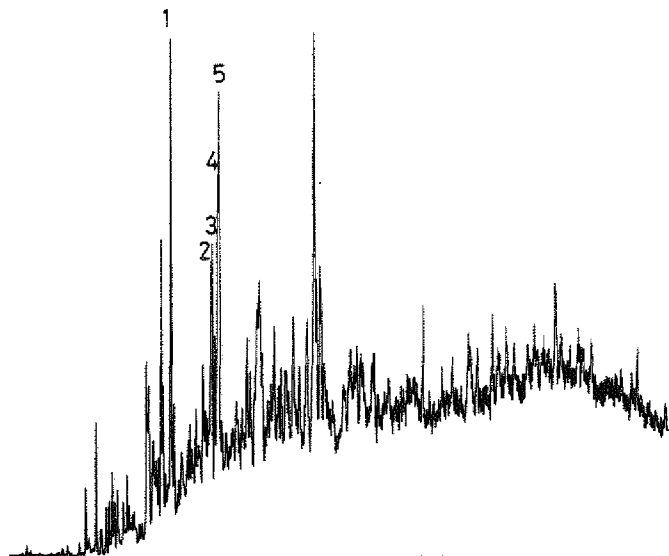
2935-2950m A



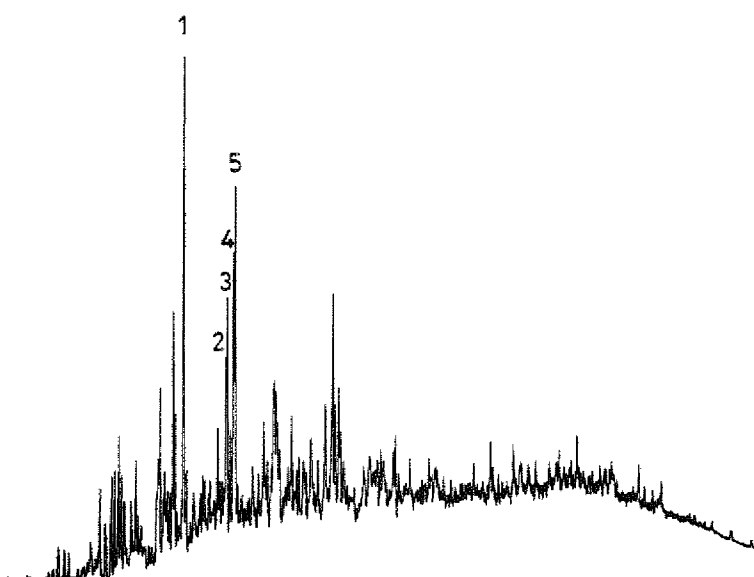
2995-3010m A



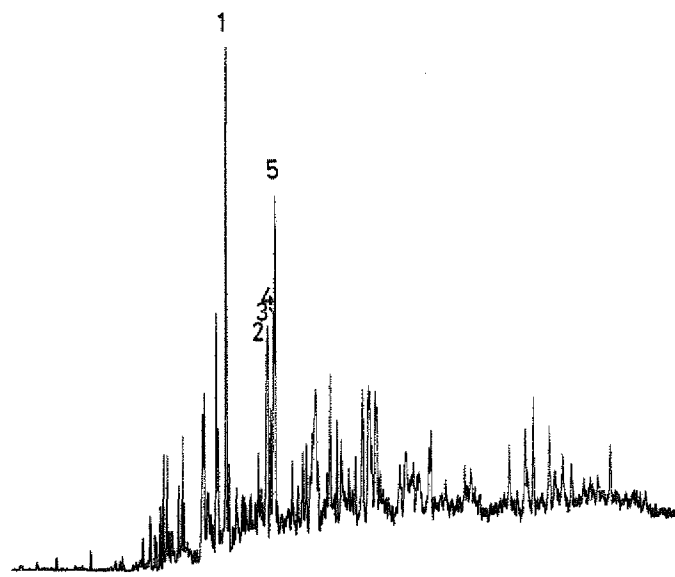
3040-3055m A



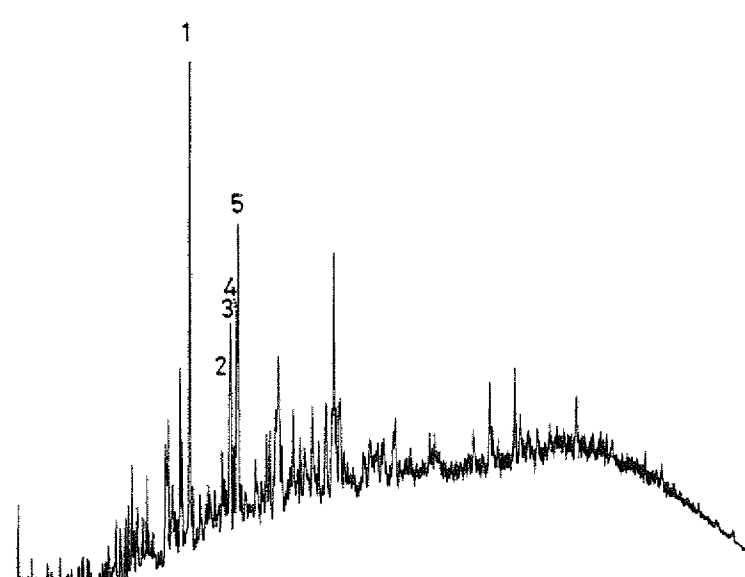
3115-3130m



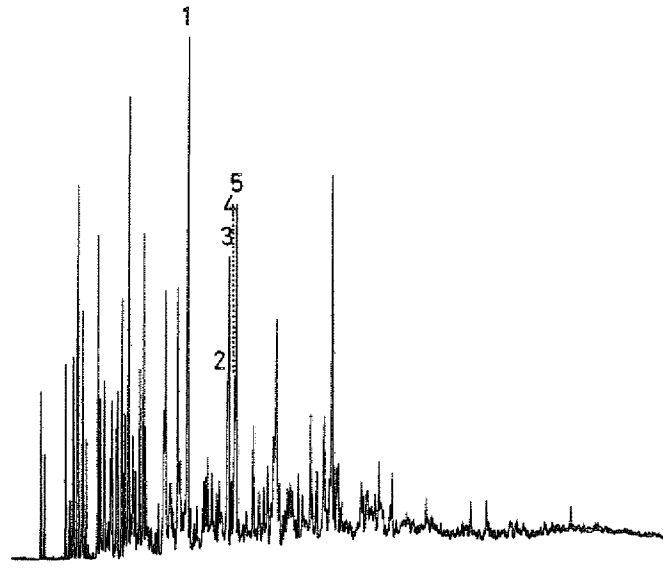
3160-3175m



3205-3219m



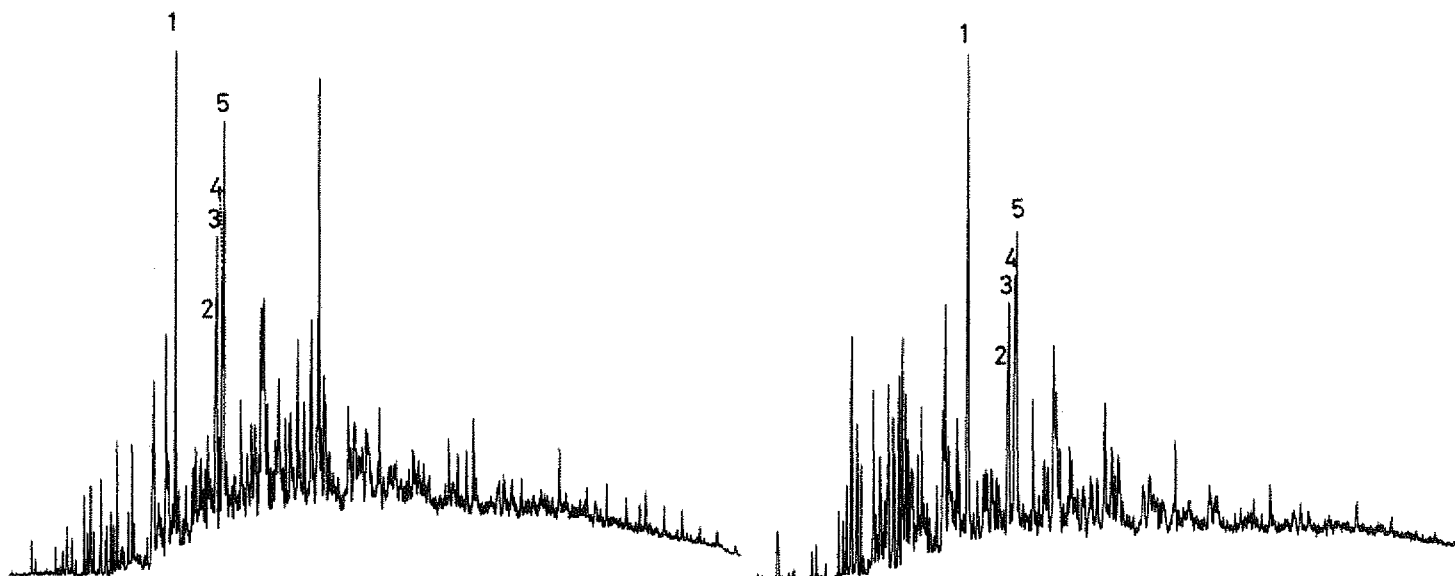
3264-3279m A



3399-3414m

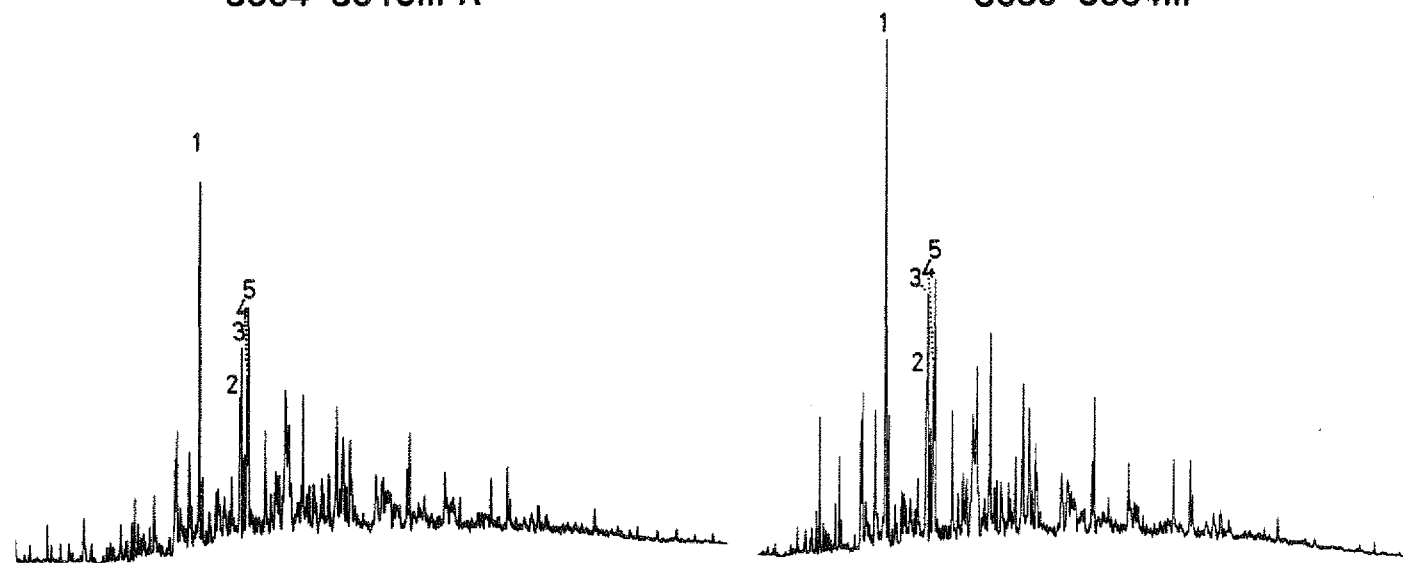
FIGURE 7c

AROMATIC CHROMATOGRAMS WELL 34/10-21



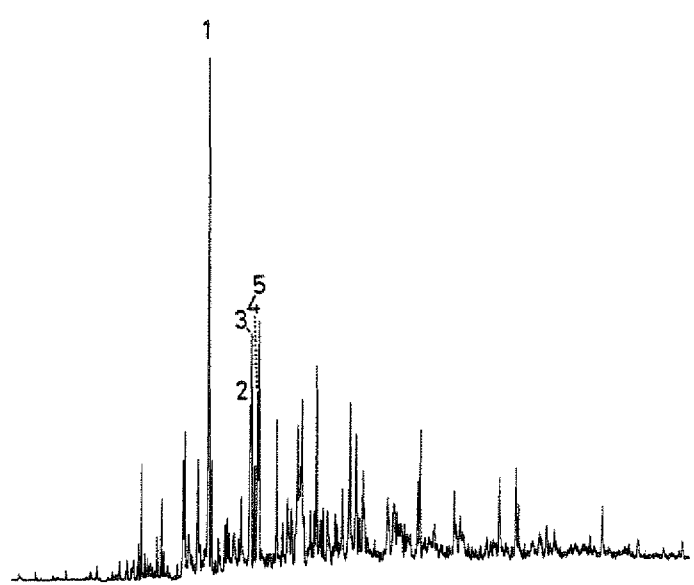
3504-3519m A

3639-3654m



3744-3759m A

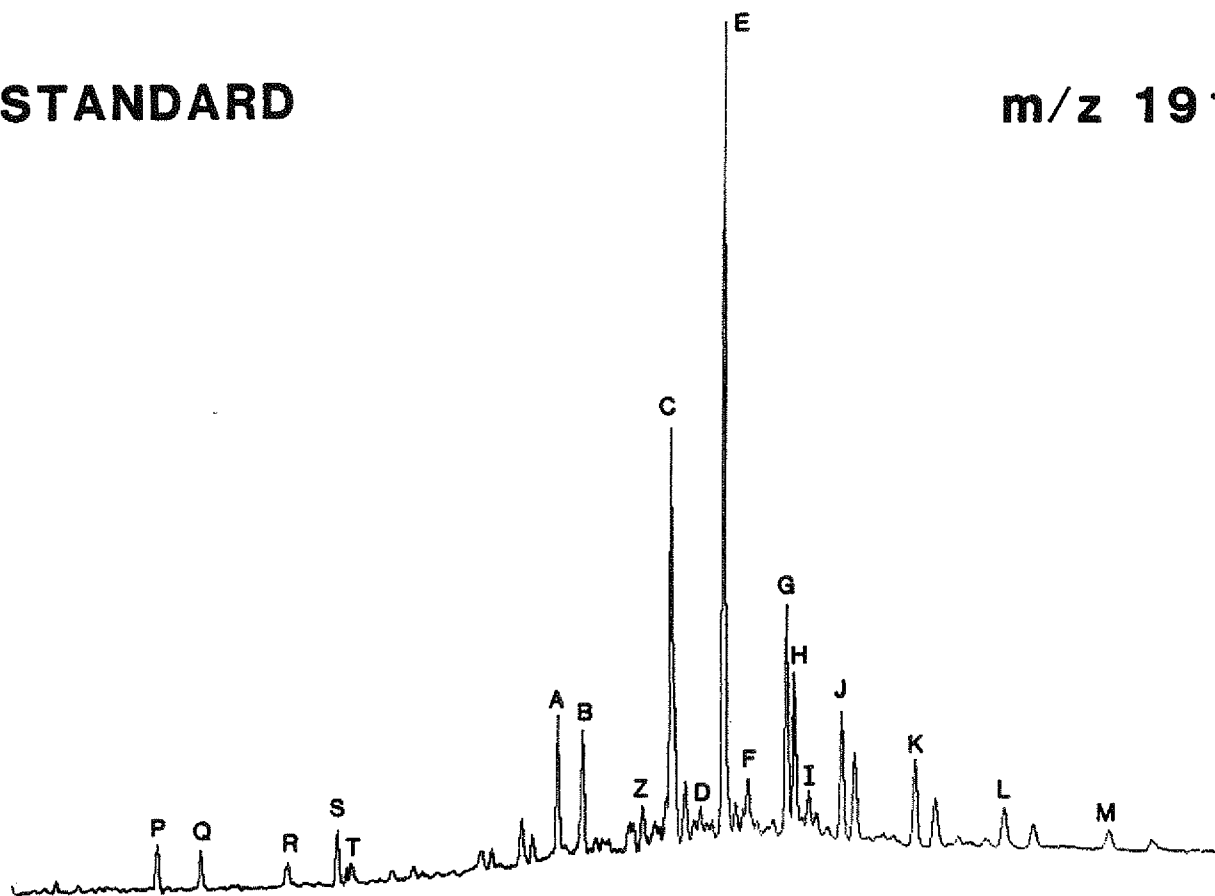
3834-3849m



3924-3939m A

STANDARD

m/z 191



TRITERPANE IDENTIFICATION

(M/Z 191 FRAGMENTOGRAM)

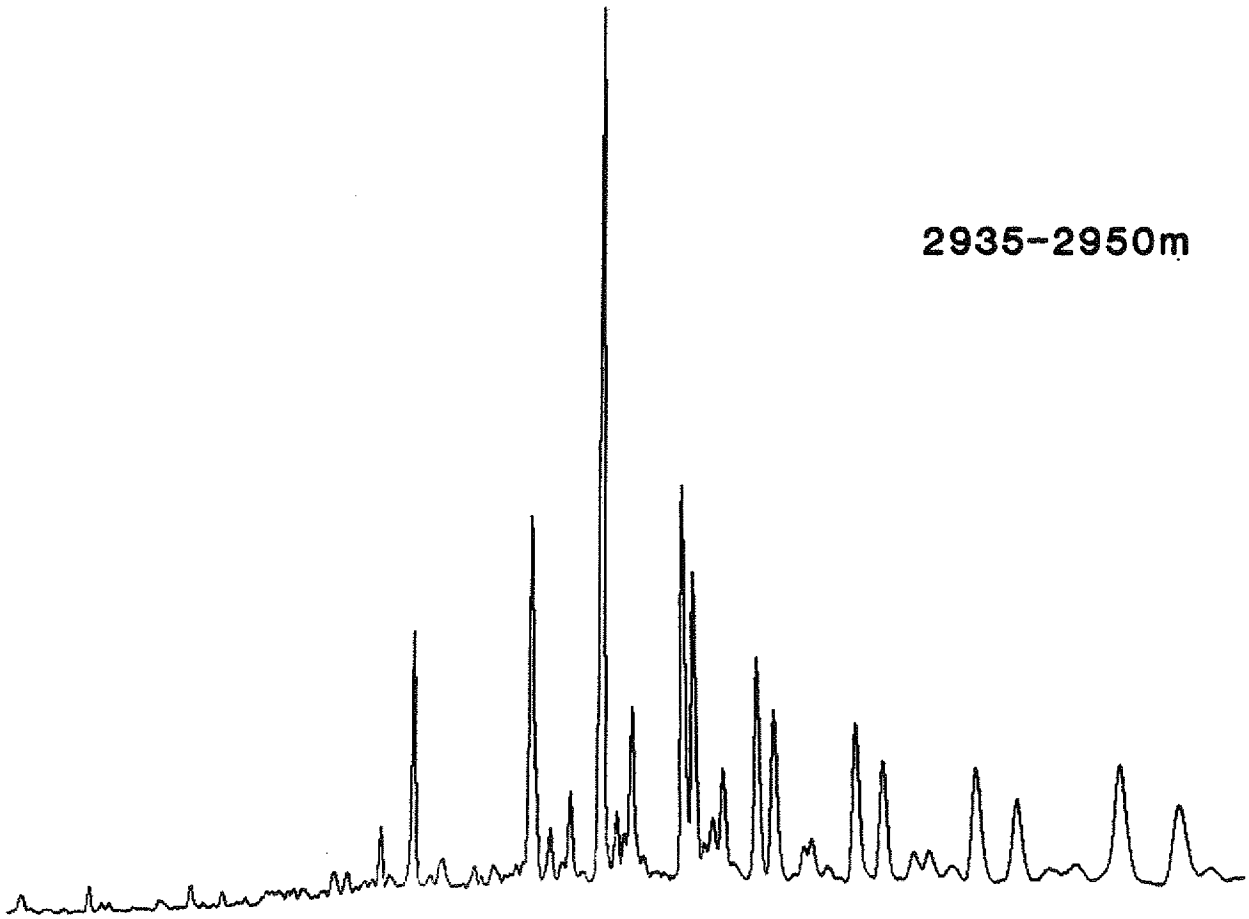
<u>COMPOUND</u>	<u>ELEMENTAL COMPOSITION</u>
A 18 (H),21 (H)-trisorneohopane (Ts)	C ₂₇ H ₄₆
B 17 (H),21 (H)-trisnorhopane (Tm)	C ₂₇ H ₄₆
C 17 (H),21 (H)-norhopane	C ₂₉ H ₅₀
D 17 (H),21 (H)-norhopane (normoretane)	C ₂₉ H ₅₀
E 17 (H),21 (H)-hopane	C ₃₀ H ₅₂
F 17 (H),21 (H)-hopane (moretane)	C ₃₀ H ₅₂
G 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)

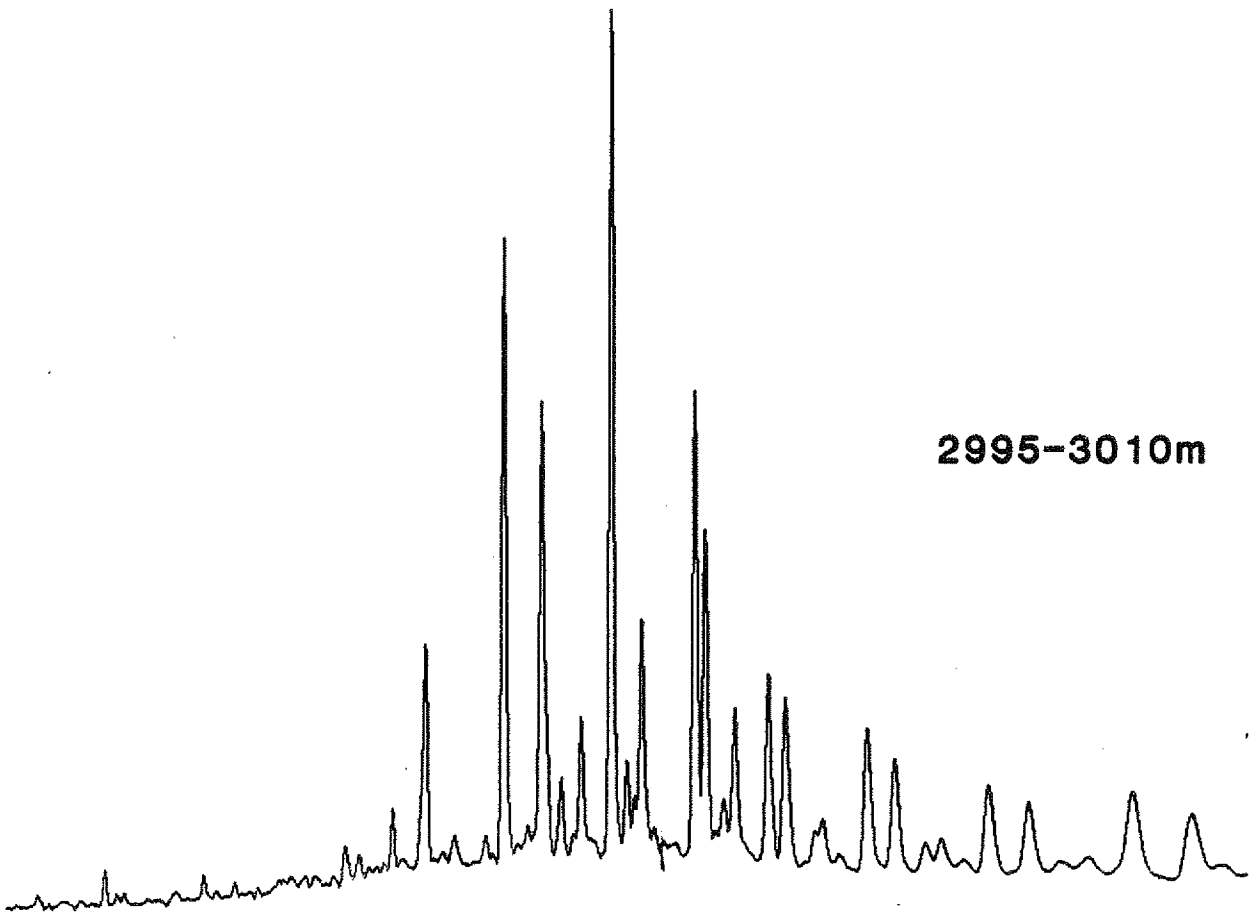
P	C ₂₃ H ₄₂
Q	C ₂₄ H ₄₄
R	C ₂₅ H ₄₆
S	C ₂₄ H ₄₂
T	C ₂₆ H ₄₈

TRITERPANES m/z 191

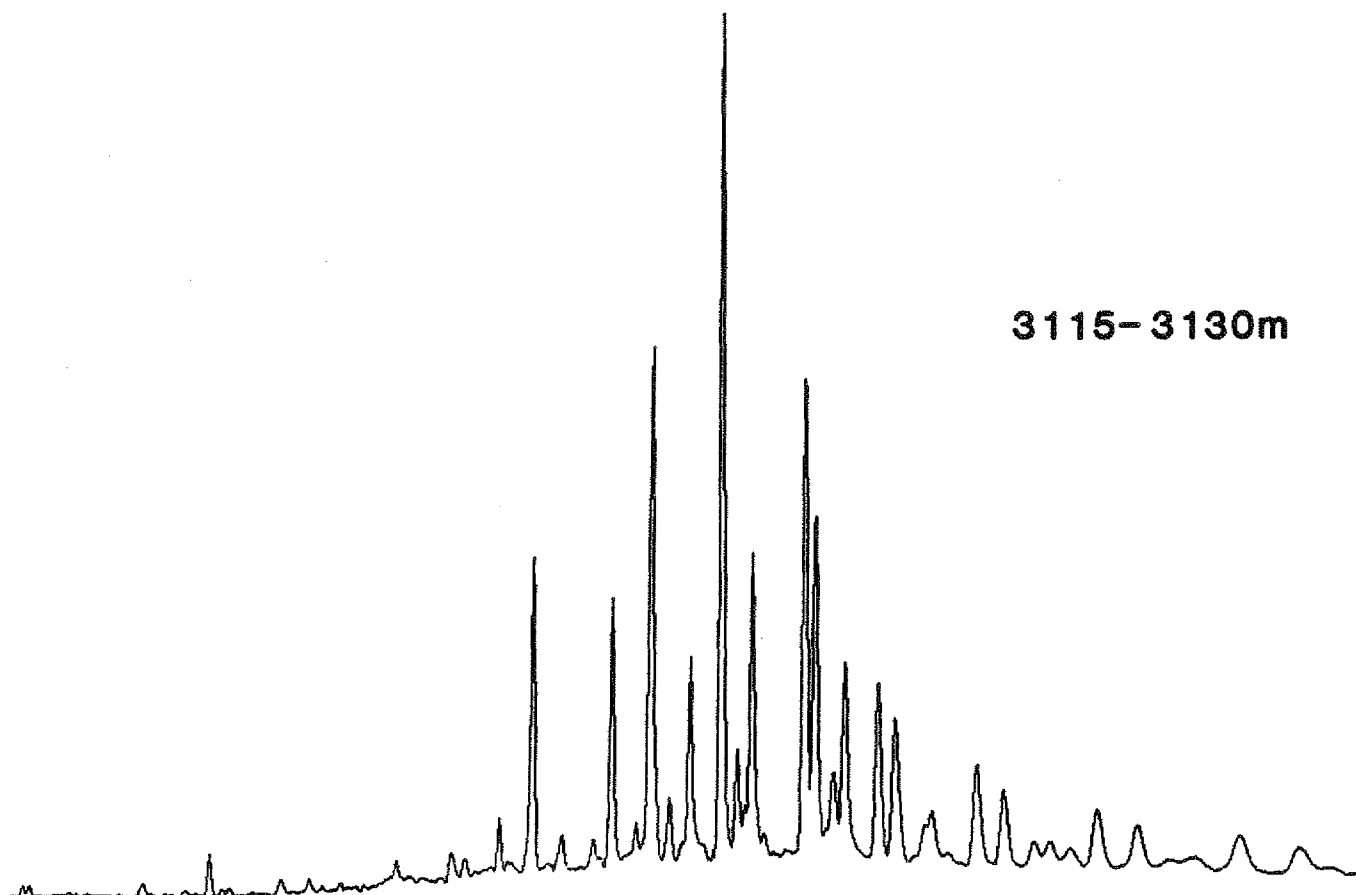
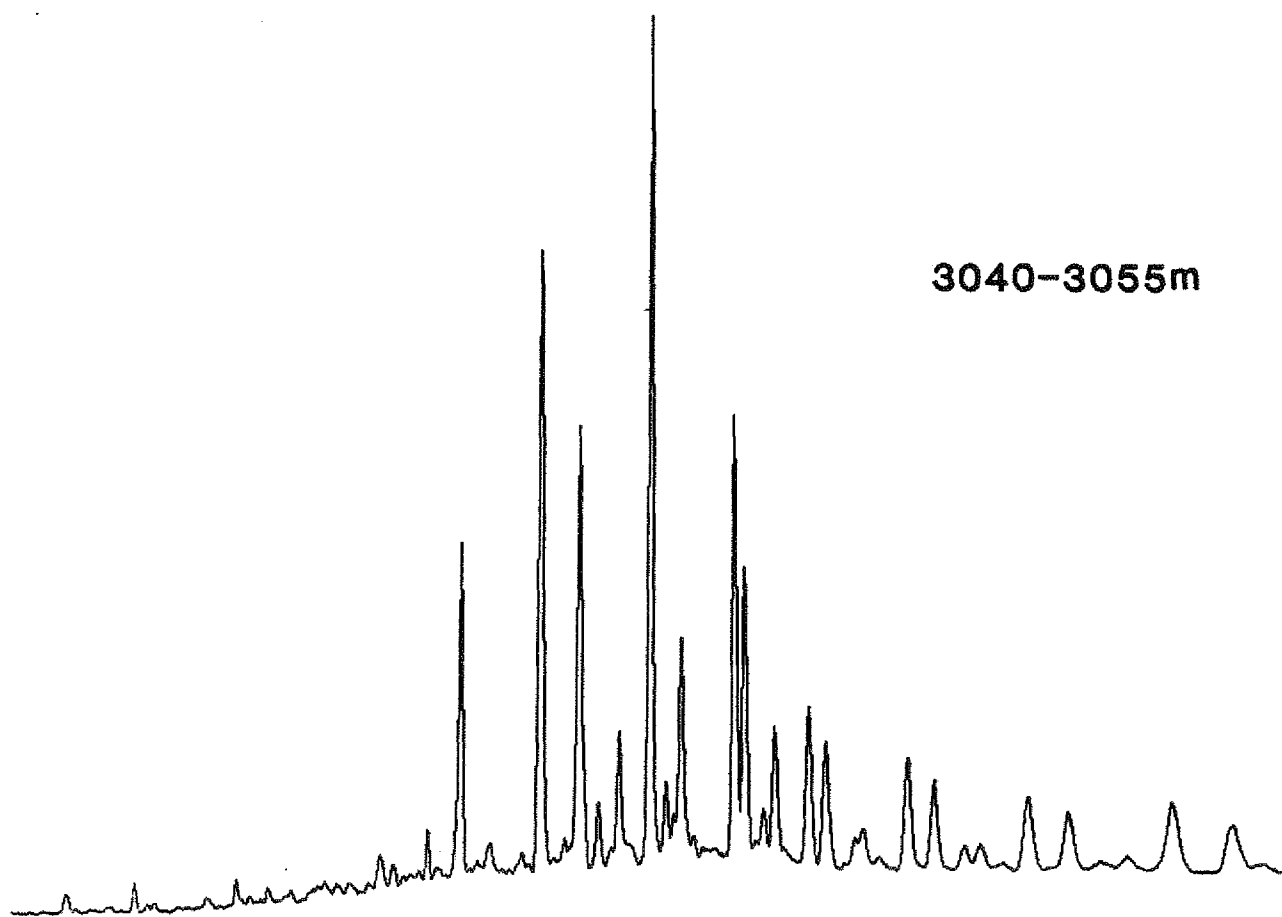
2935-2950m



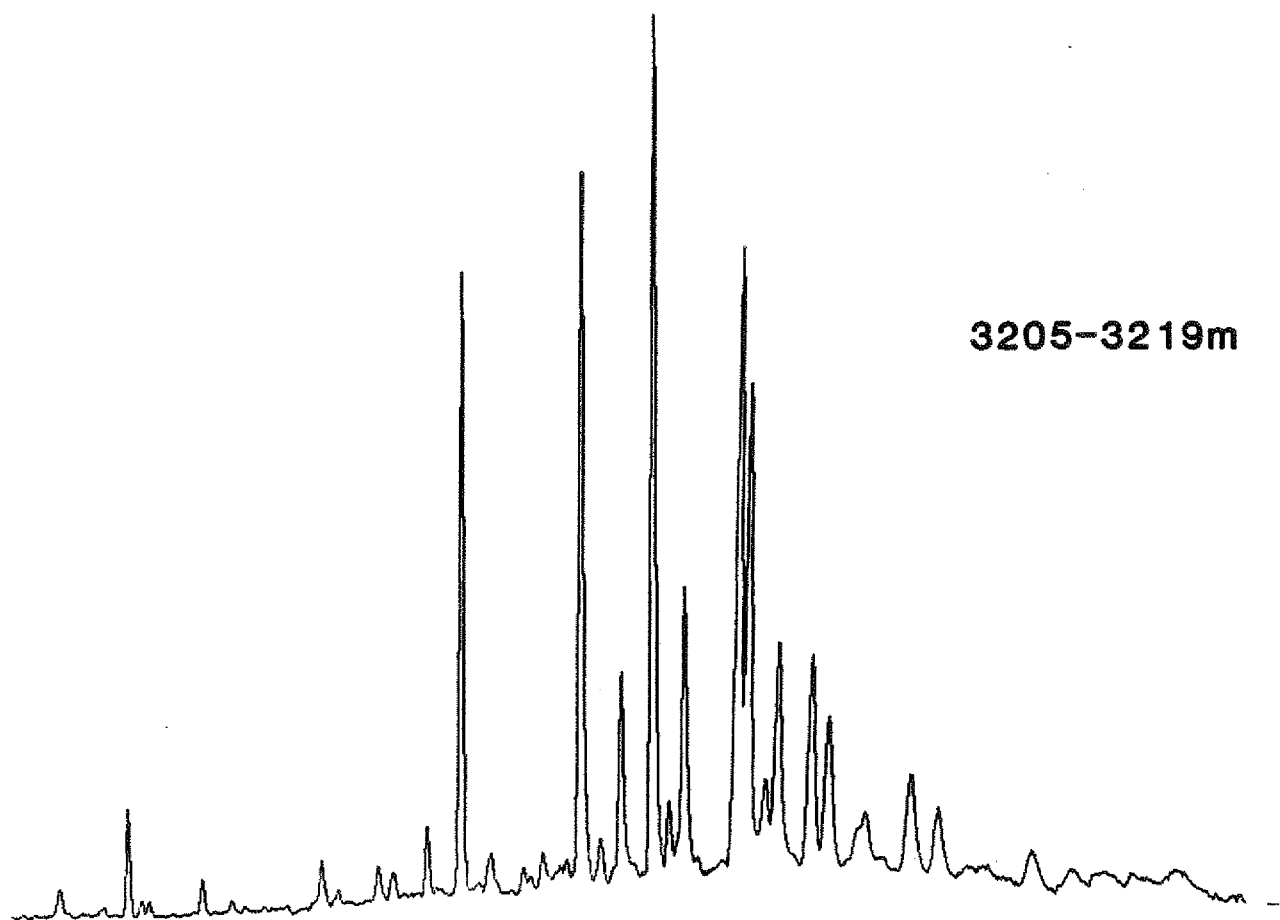
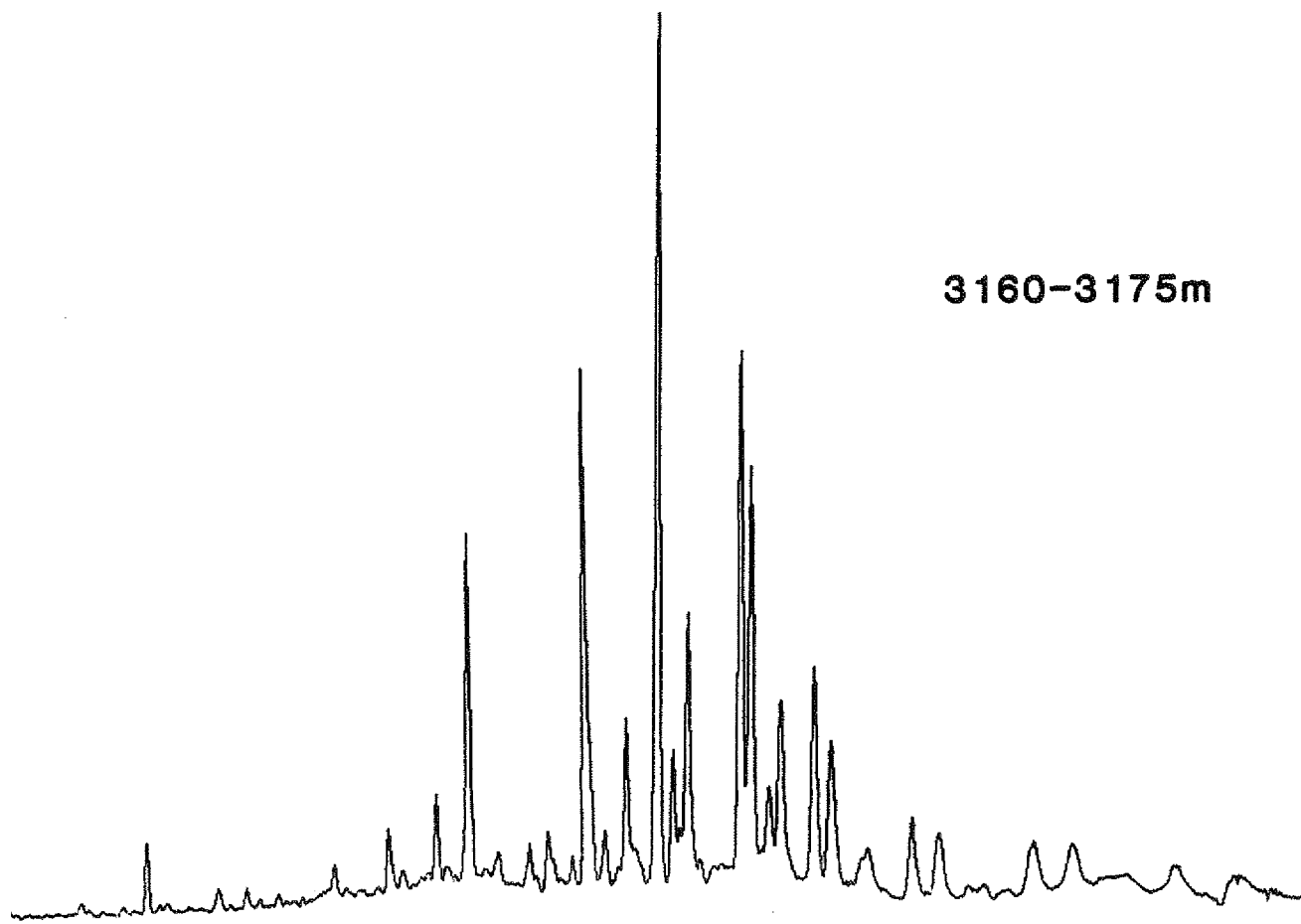
2995-3010m



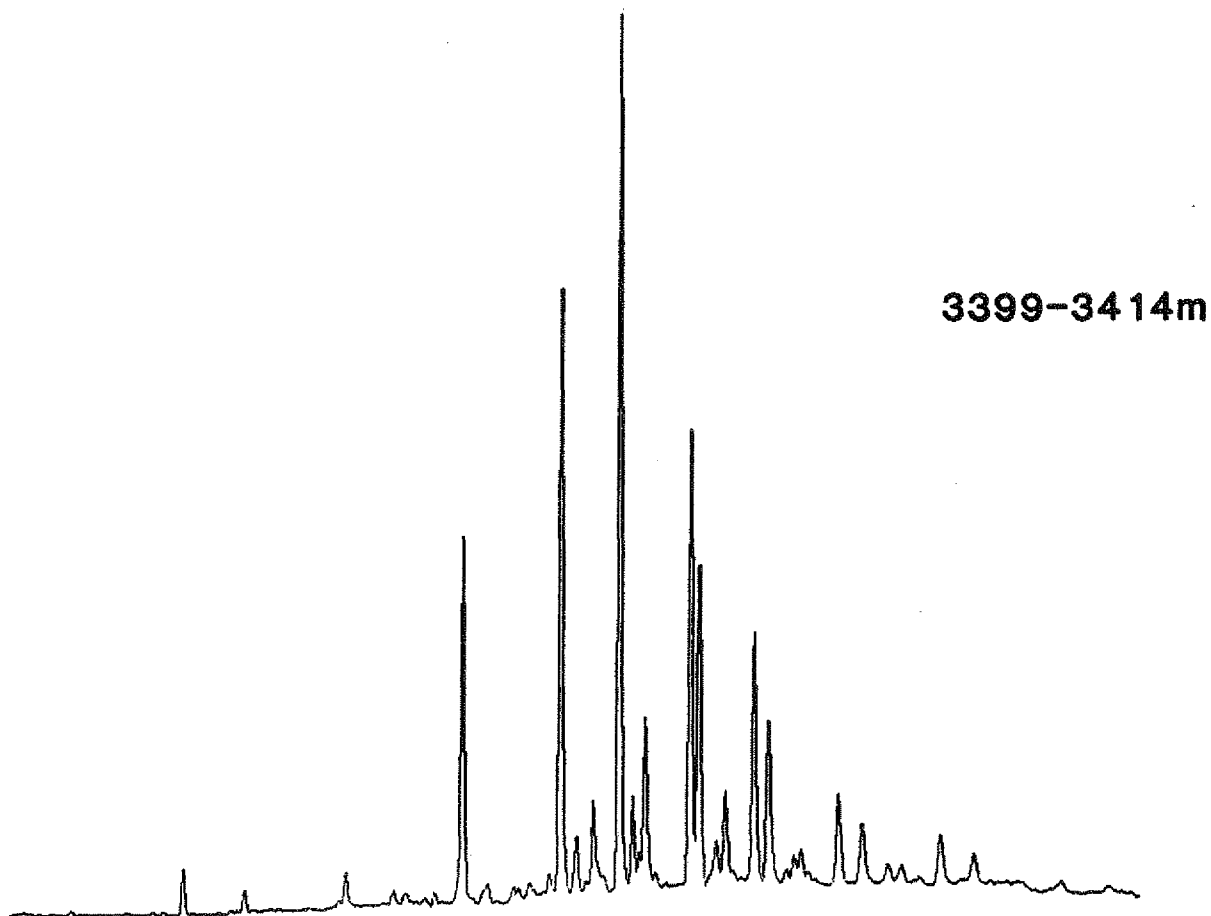
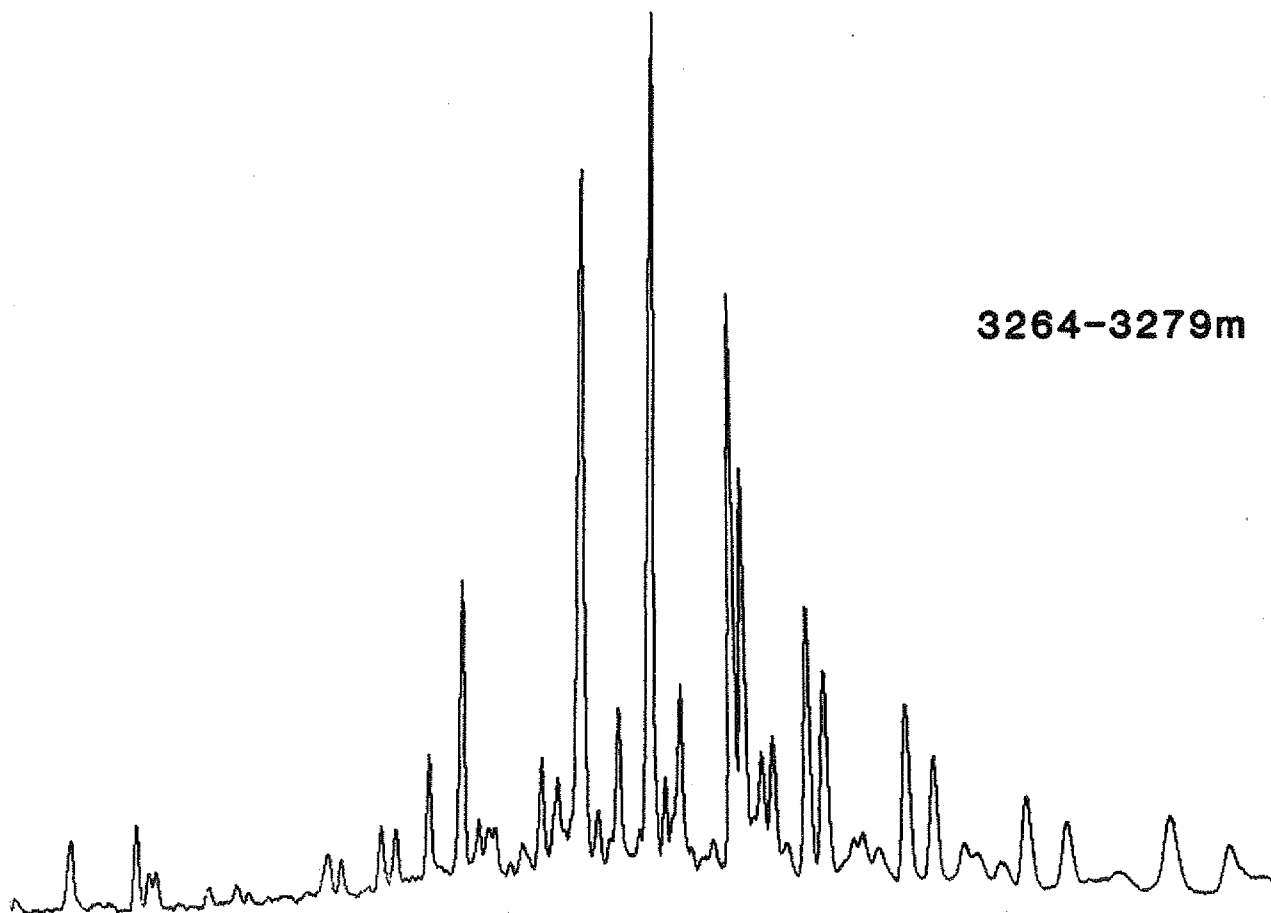
TRITERPANES m/z 191



TRITERPANES m/z 191



TRITERPANES m/z 191



TRITERPANES m/z 191

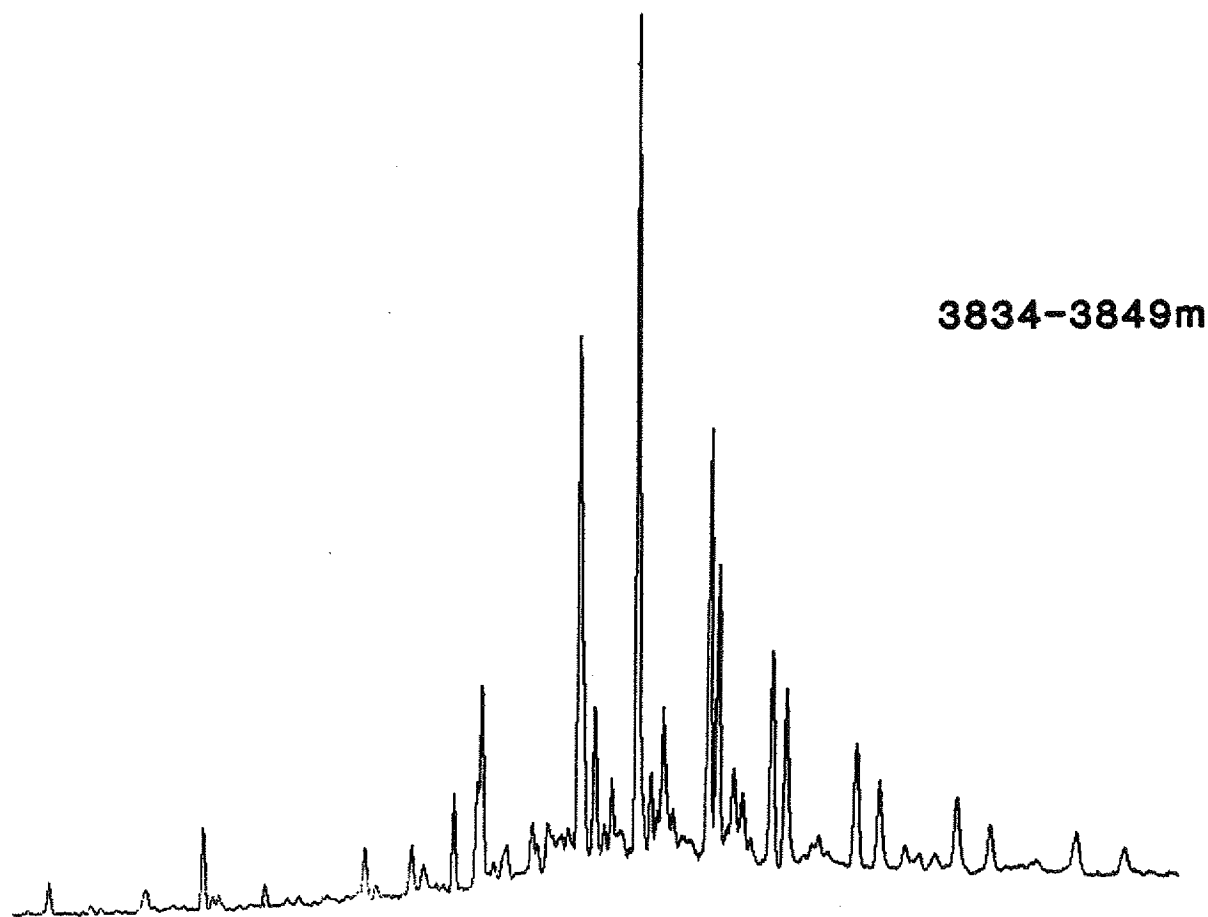
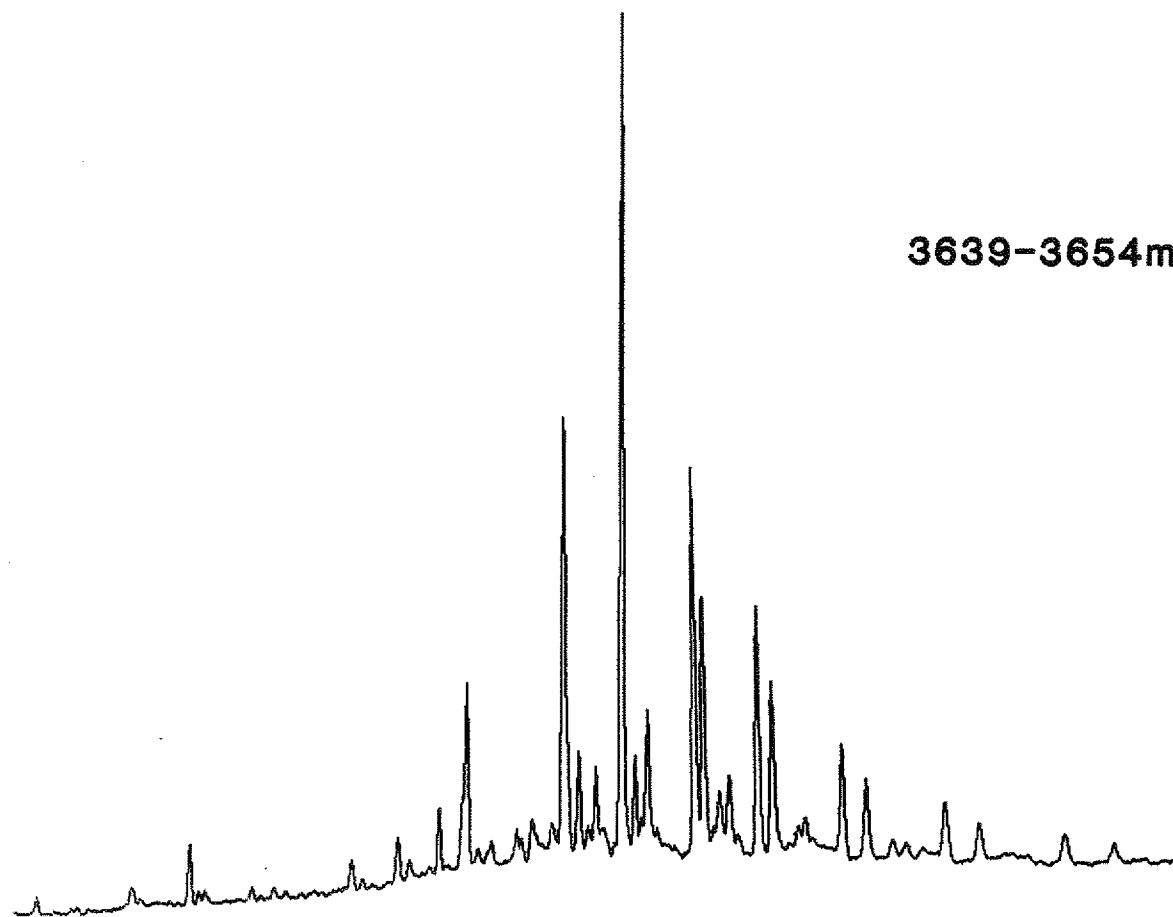
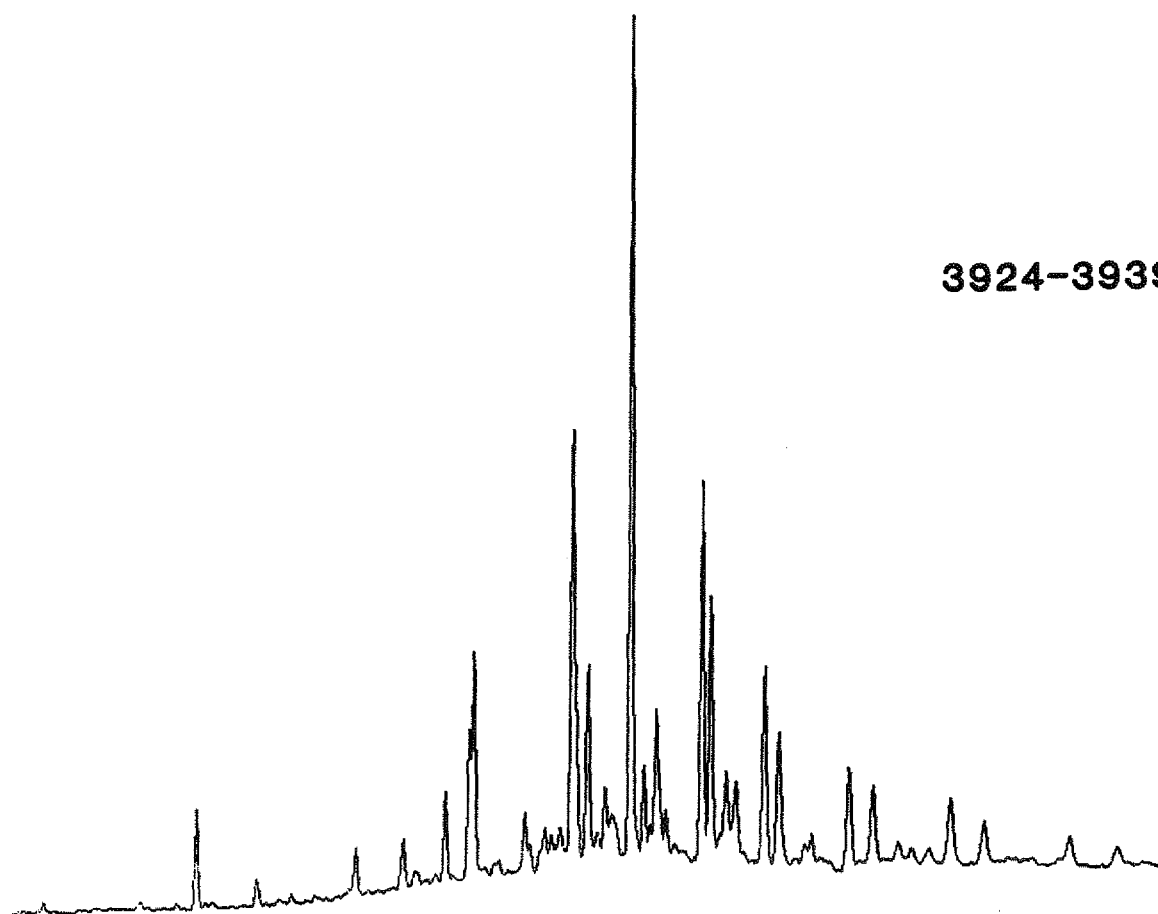


FIGURE 8f

MASS FRAGMENTOGRAMS

WELL 34/10-21

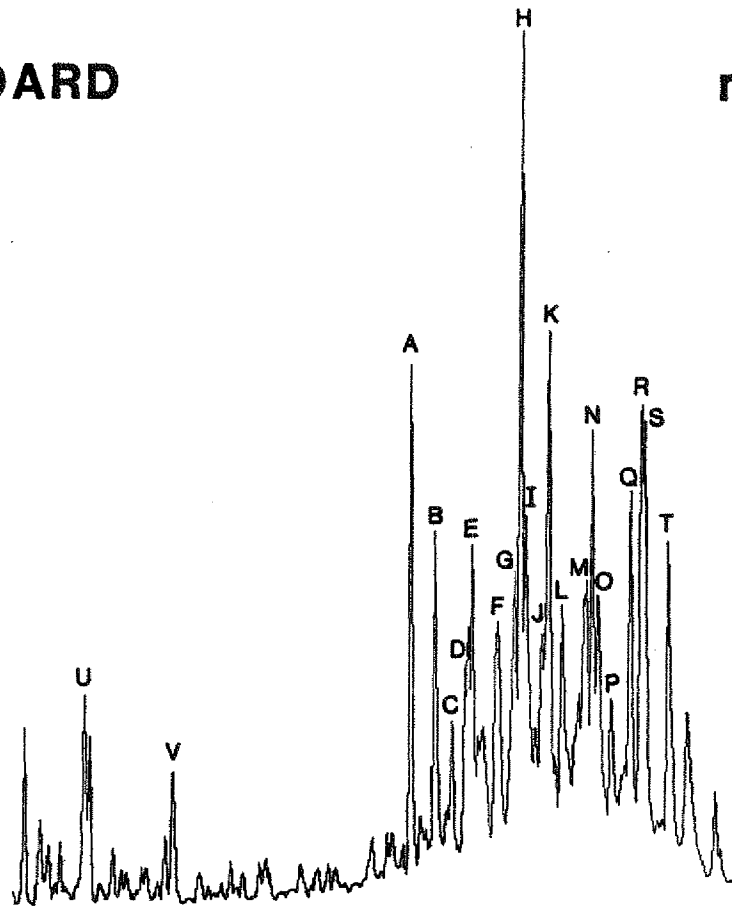
TRITERPANES m/z 191



3924-3939m

STANDARD

m/z 217

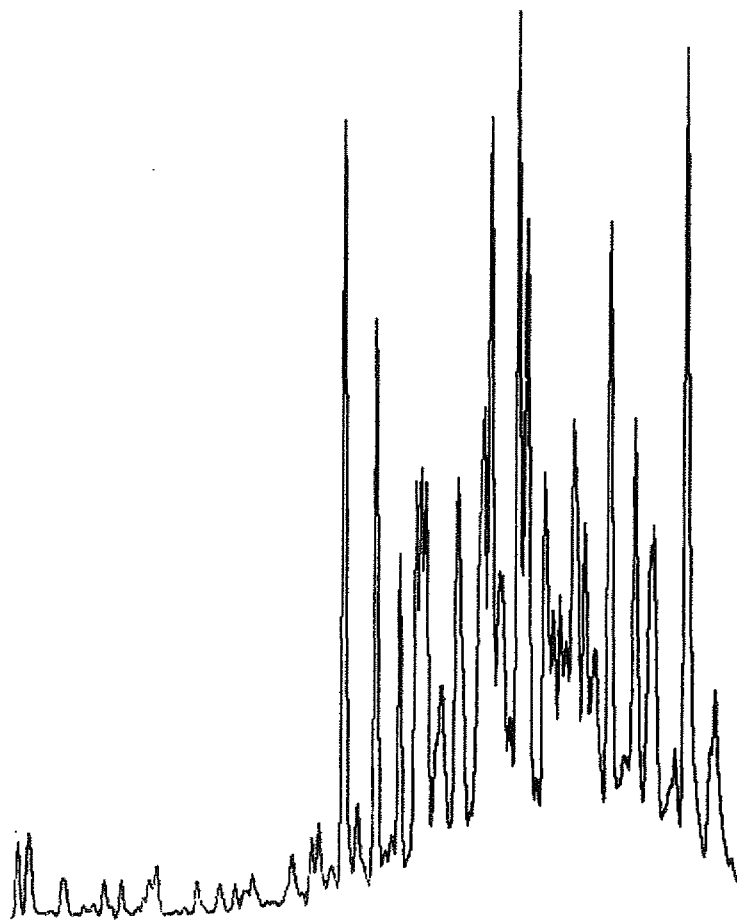


STERANE IDENTIFICATION

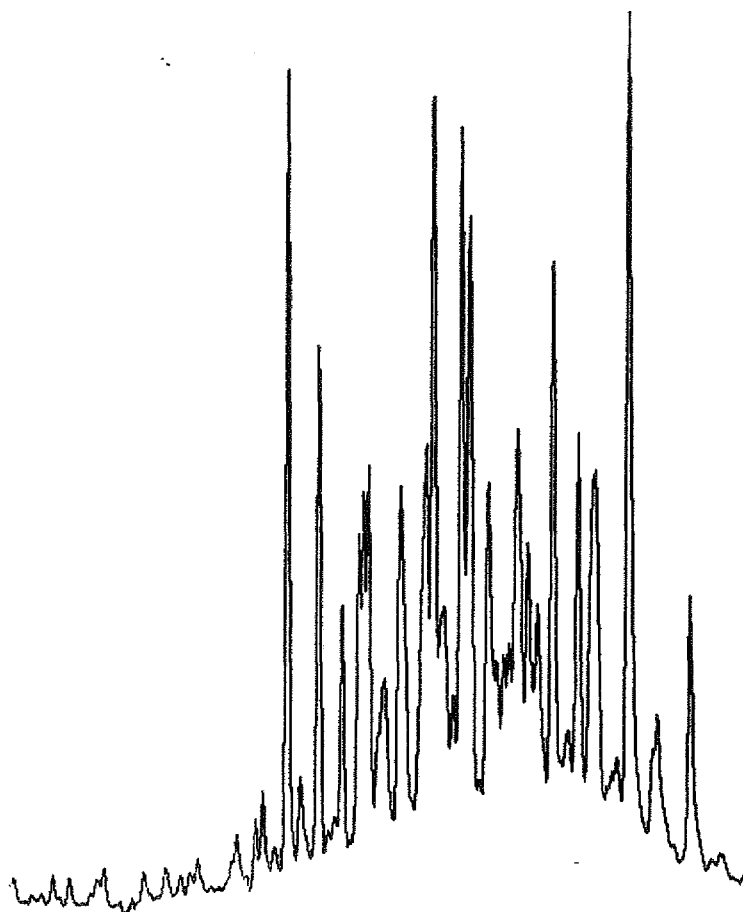
(M/Z 217 FRAGMENTOGRAM)

COMPOUND	(M/Z 217 FRAGMENTOGRAM)	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

STERANES m/z 217

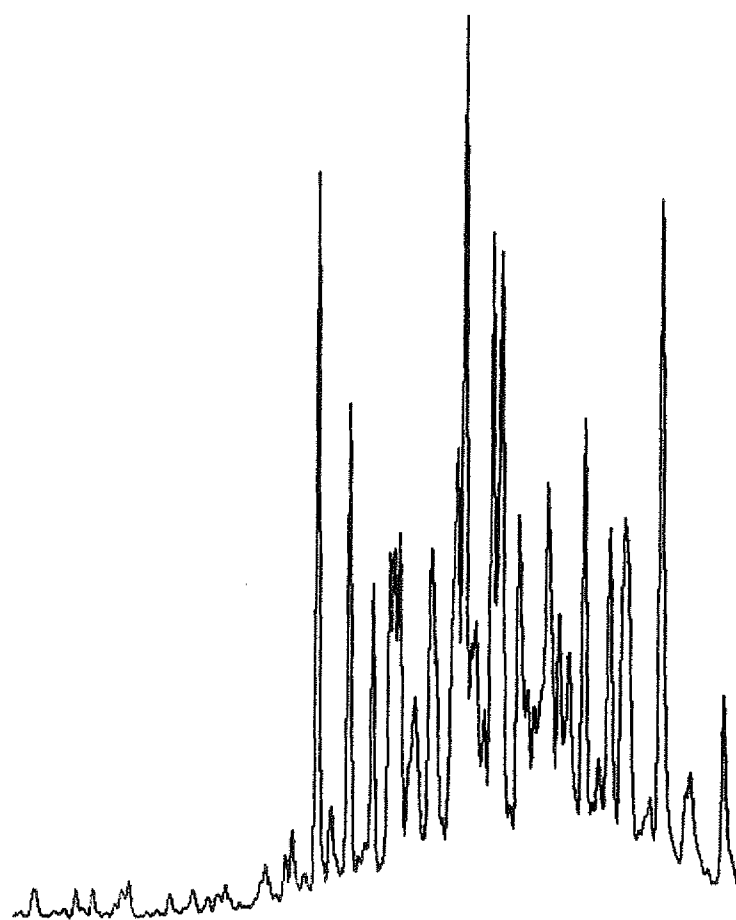


2935-2950m

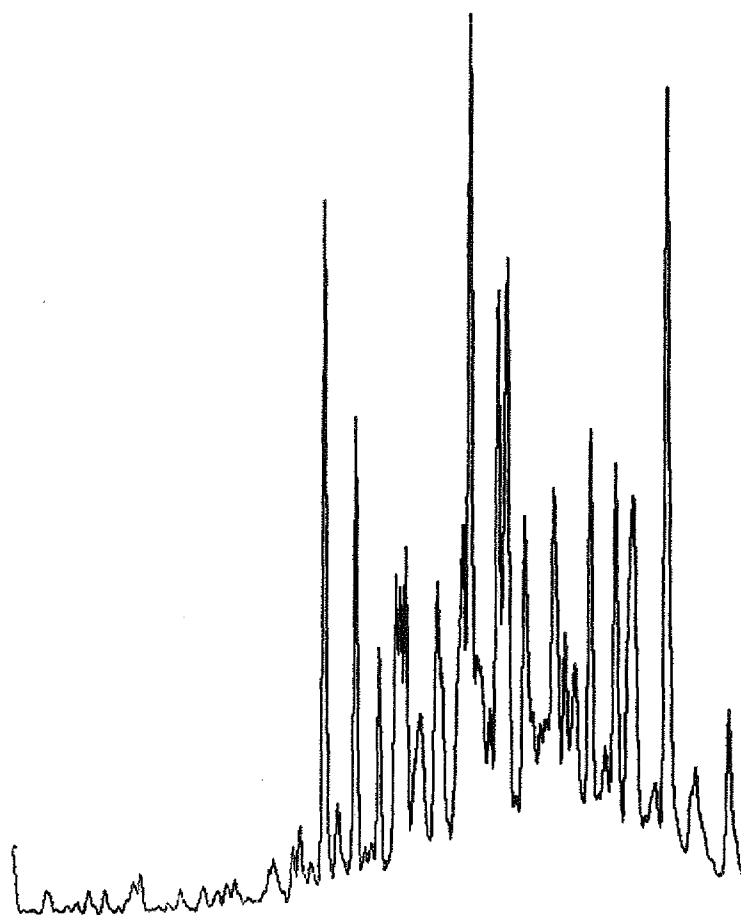


2995-3010m

STERANES m/z 217

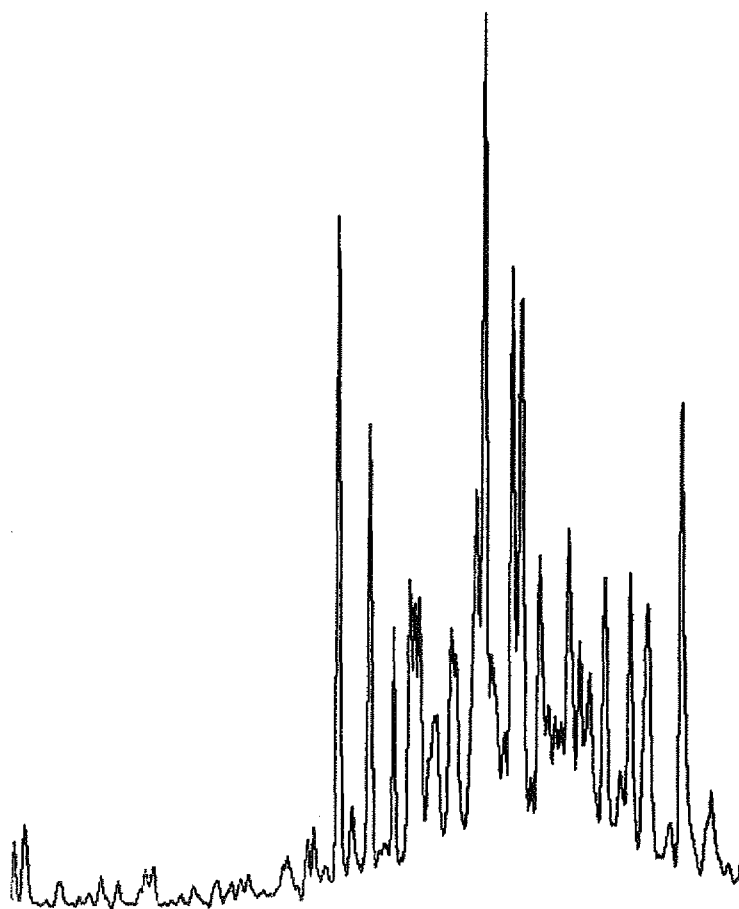


3040-3055m

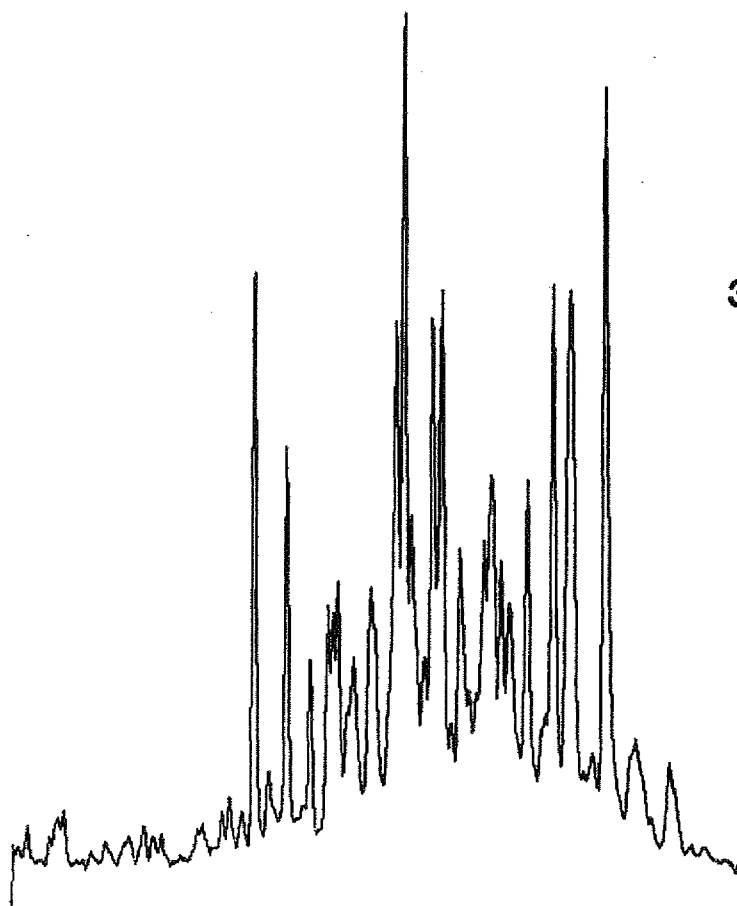


3115-3130m

STERANES m/z 217

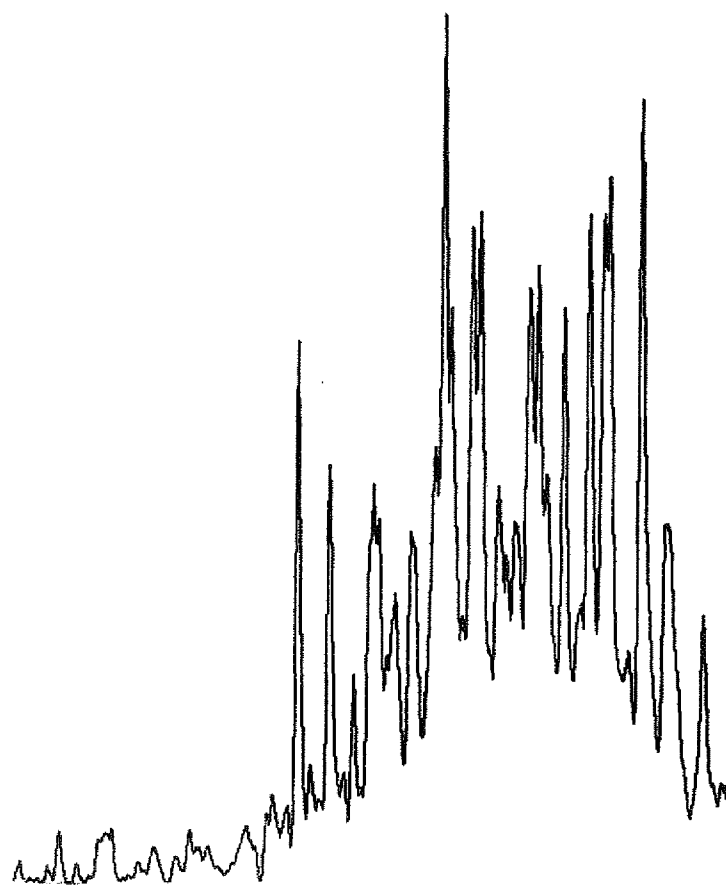


3160-3175m

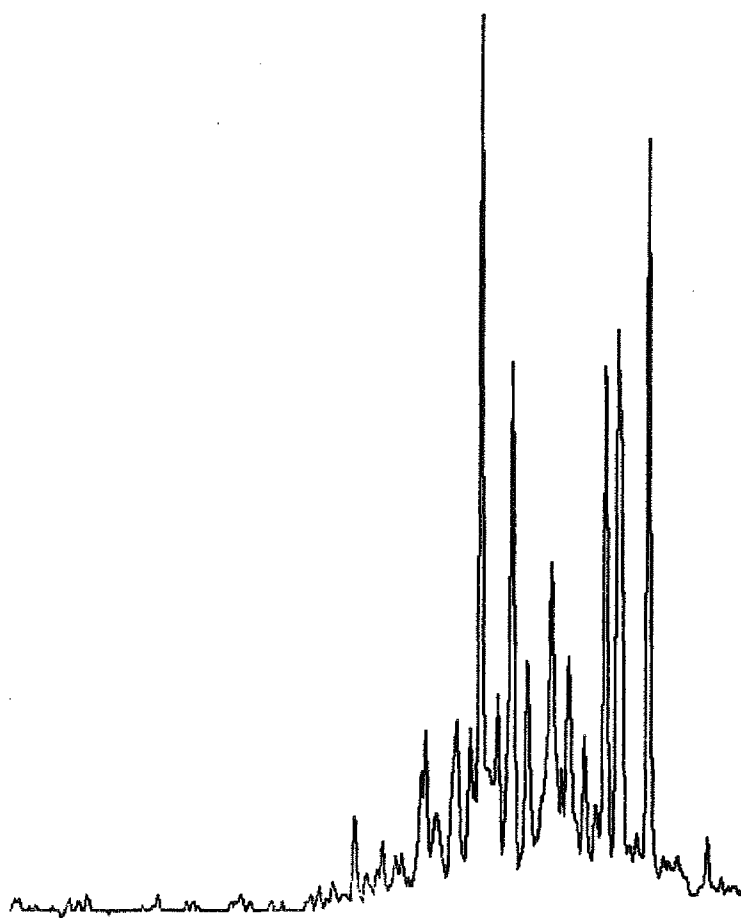


3205-3219m

STERANES m/z 217

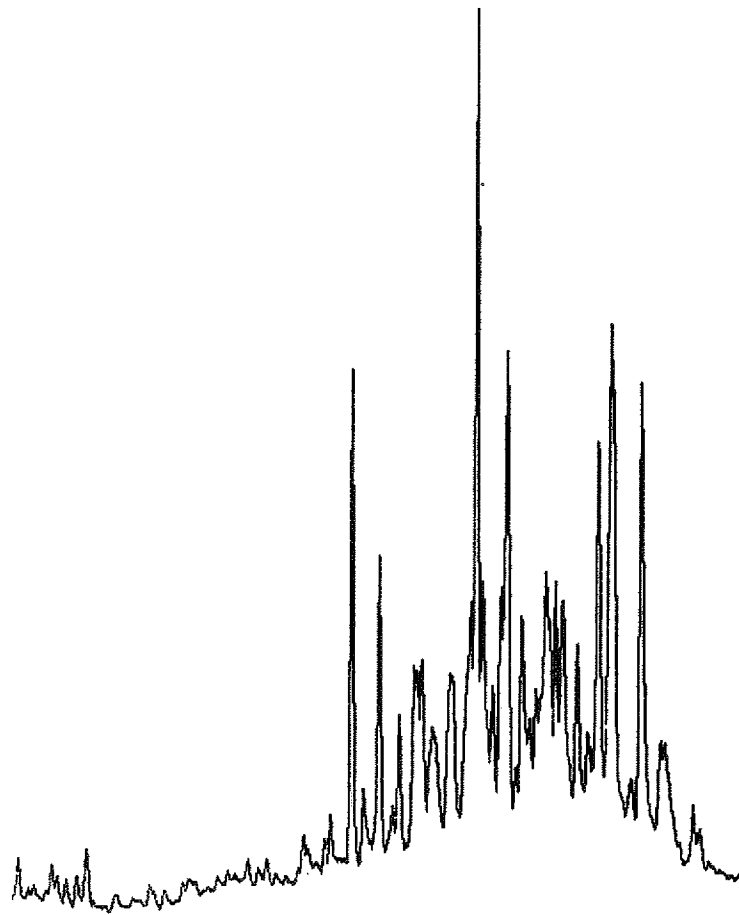


3264-3279m

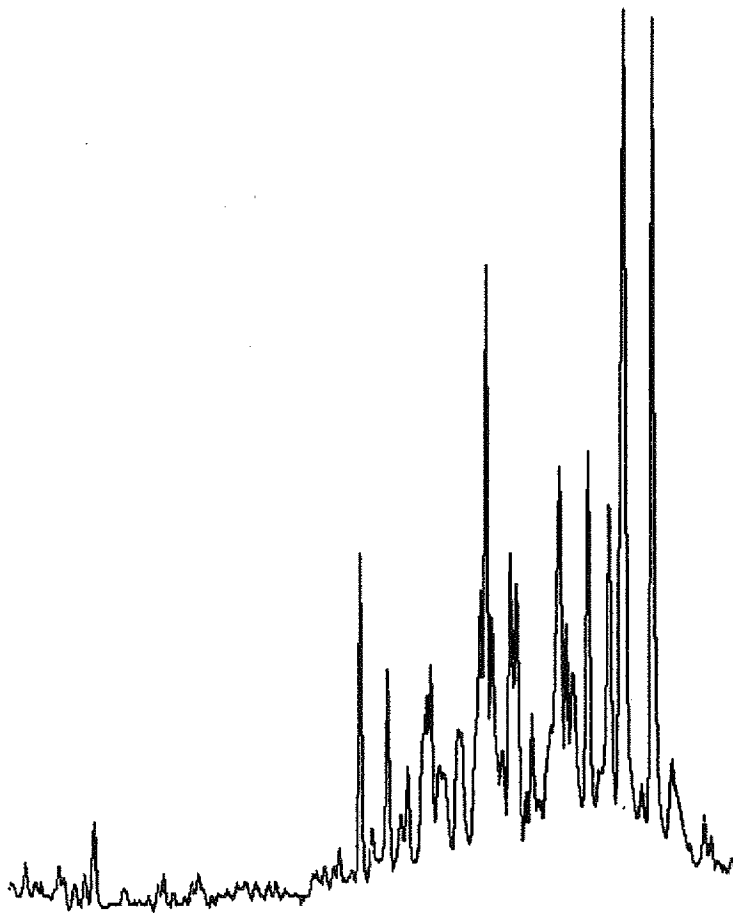


3399-3414m

STERANES m/z 217

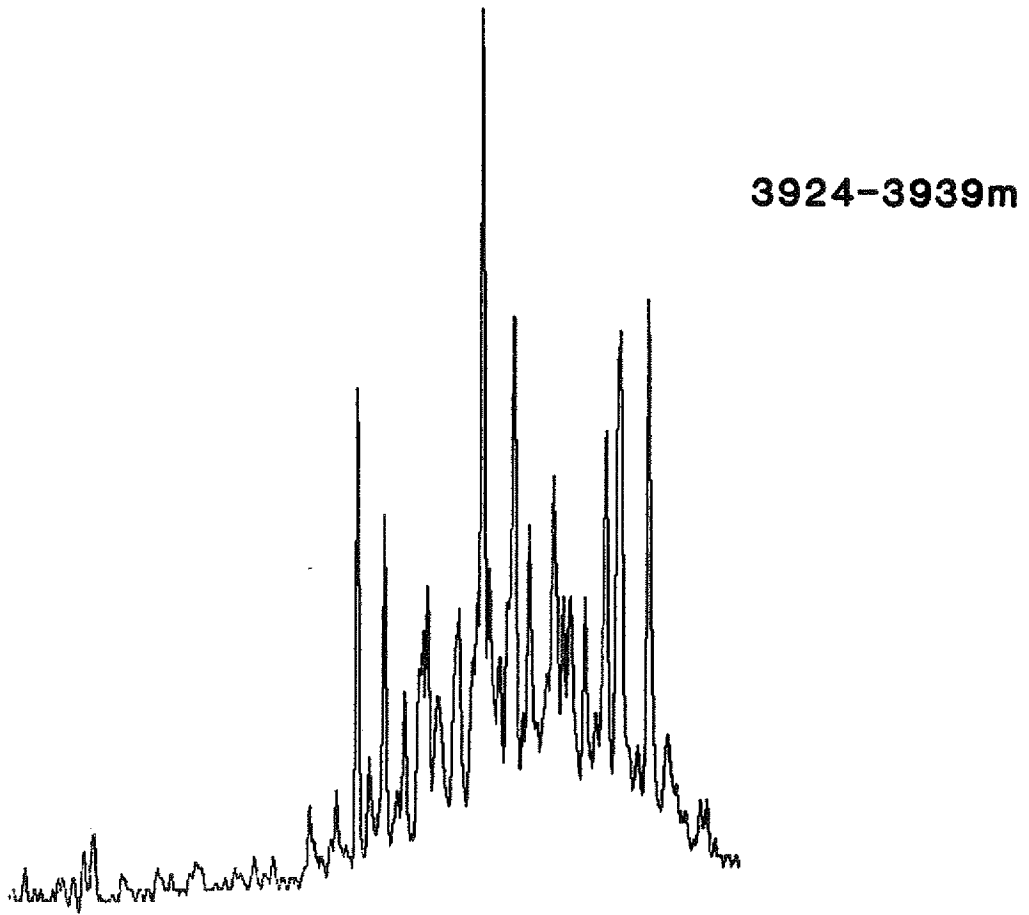


3639-3654m



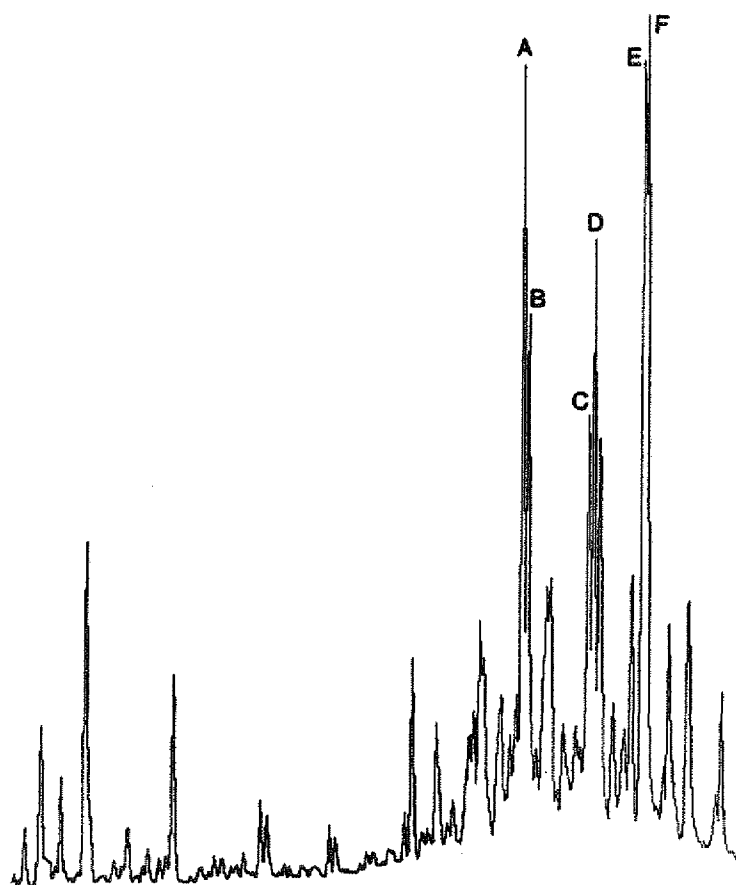
3834-3849m

STERANES m/z 217



STANDARD

m/z 218



STERANE IDENTIFICATION

(M/Z 218 FRAGMENTOGRAM)

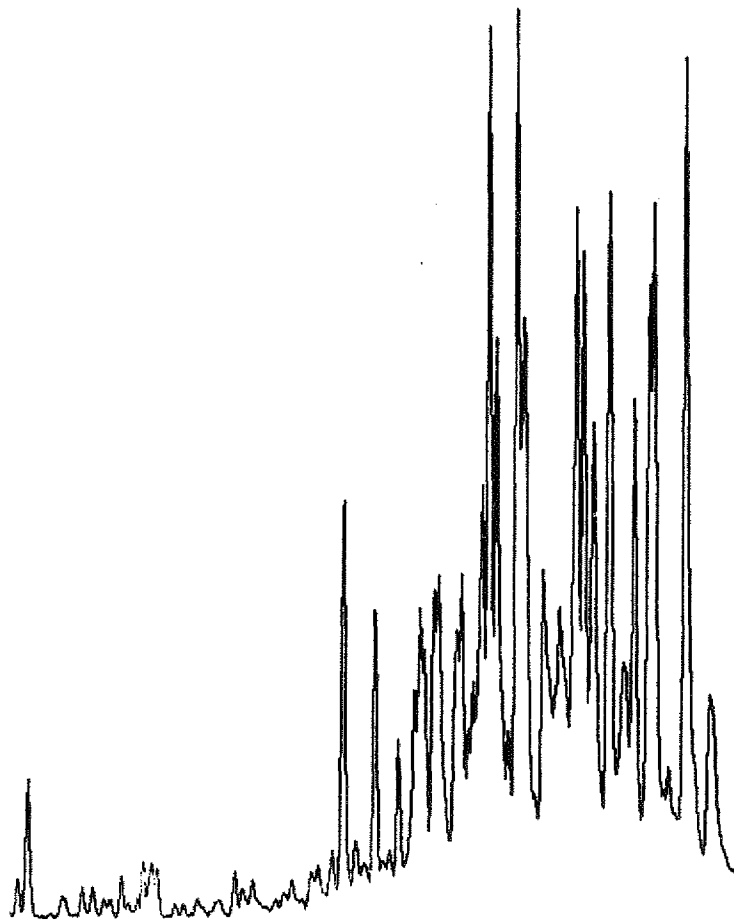
<u>COMPOUND</u>	<u>ELEMENTAL COMPOUND</u>
A 14 β ,17 β -cholestane (20R)	C ₂₇ H ₄₈
B 14 β ,17 β -cholestane (20S)	C ₂₇ H ₄₈
C 24-methyl-14 β ,17 β -cholestane (20R)	C ₂₈ H ₅₀
D 24-methyl-14 β ,17 β -cholestane (20S)	C ₂₈ H ₅₀
E 24-ethyl-14 β ,17 β -cholestane (20R)	C ₂₉ H ₅₂
F 24-ethyl-14 β ,17 β -cholestane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

FIGURE 10a

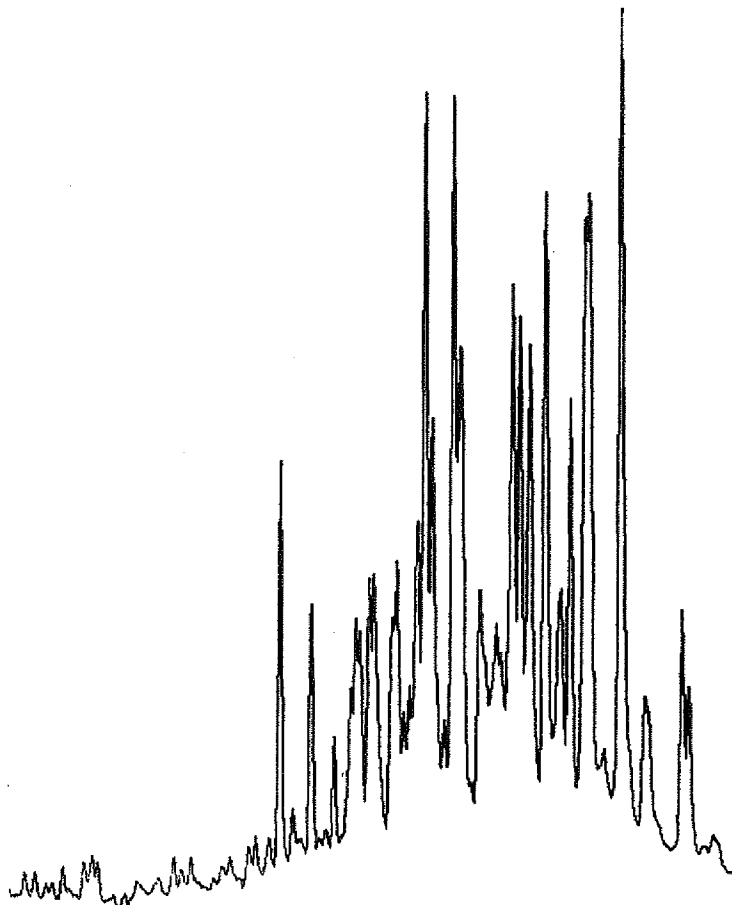
MASS FRAGMENTOGRAMS

WELL 34/10-21

STERANES m/z 218



2935-2950m



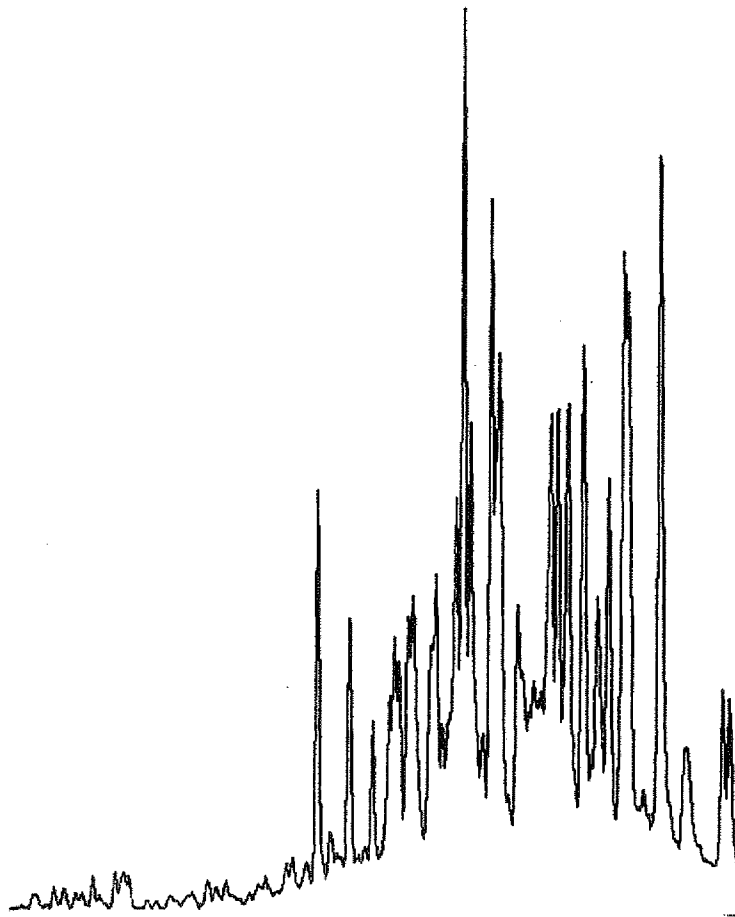
2995-3010m

FIGURE 10b

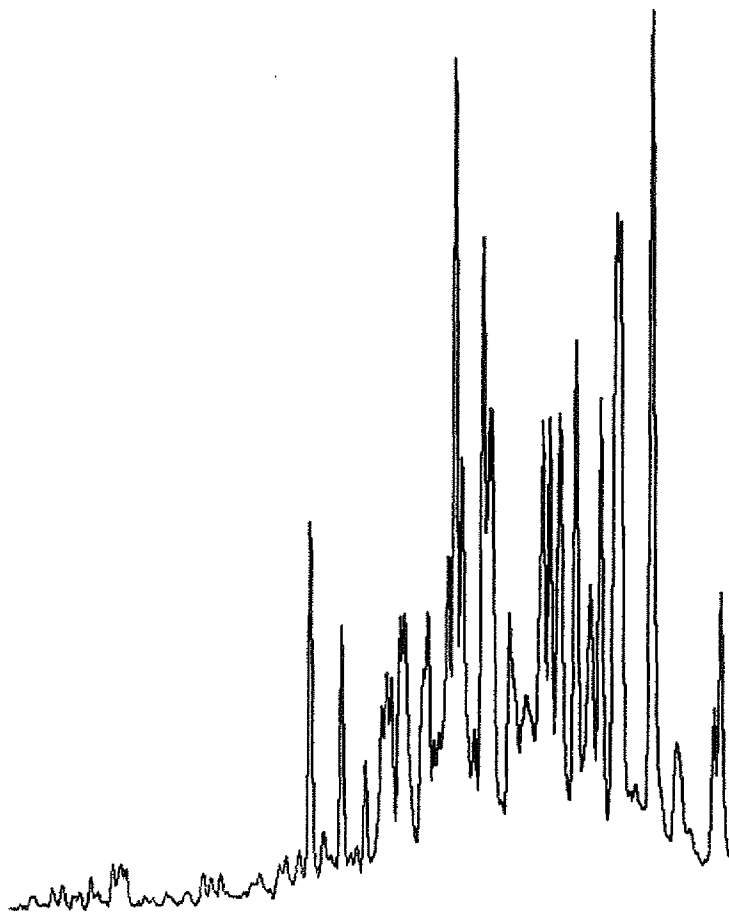
MASS FRAGMENTOGRAMS

WELL 34/10-21

STERANES m/z 218



3040-3055m



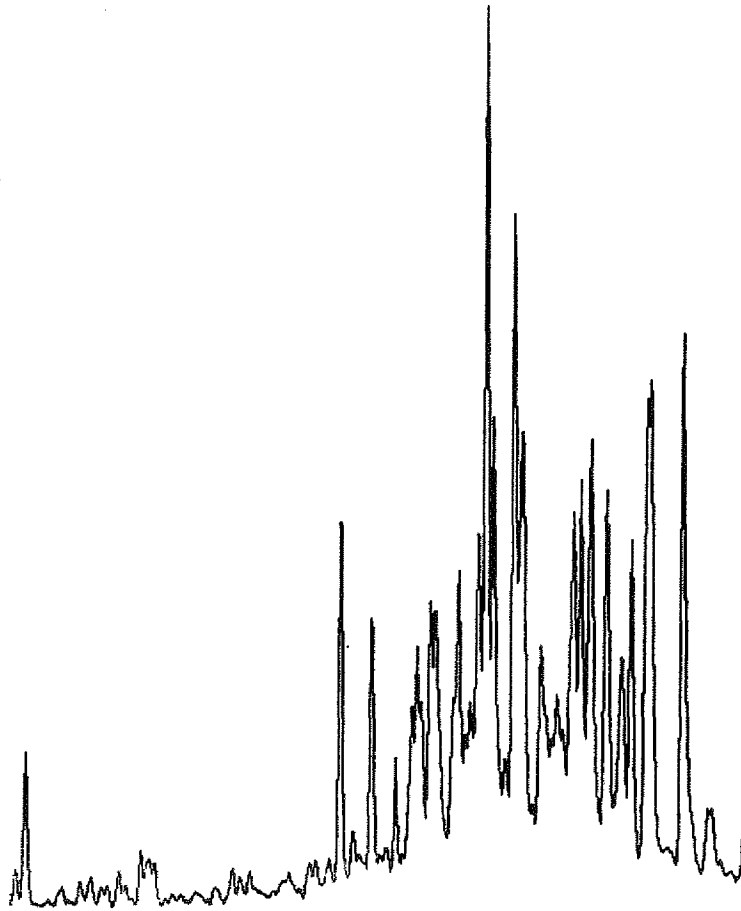
3115-3130m

FIGURE 10c

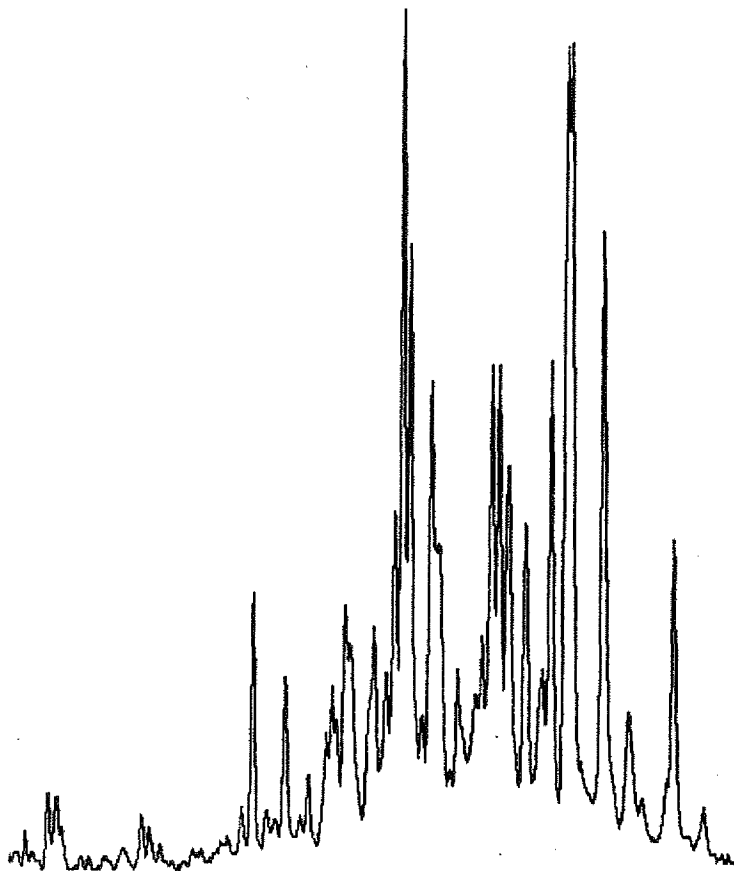
MASS FRAGMENTOGRAMS

WELL 34/10-21

STERANES m/z 218

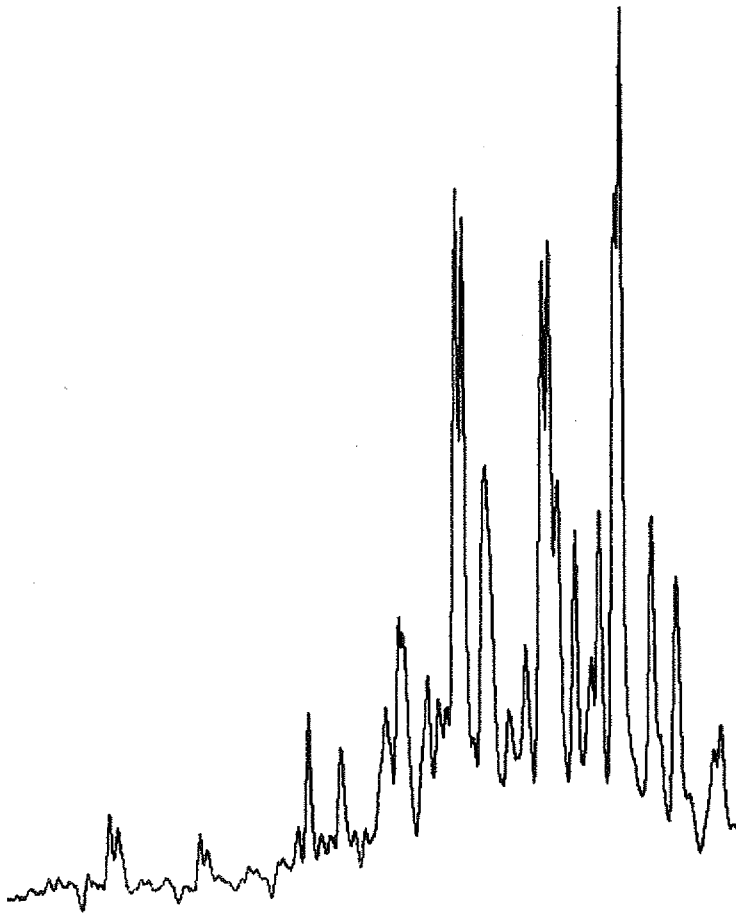


3160-3175m

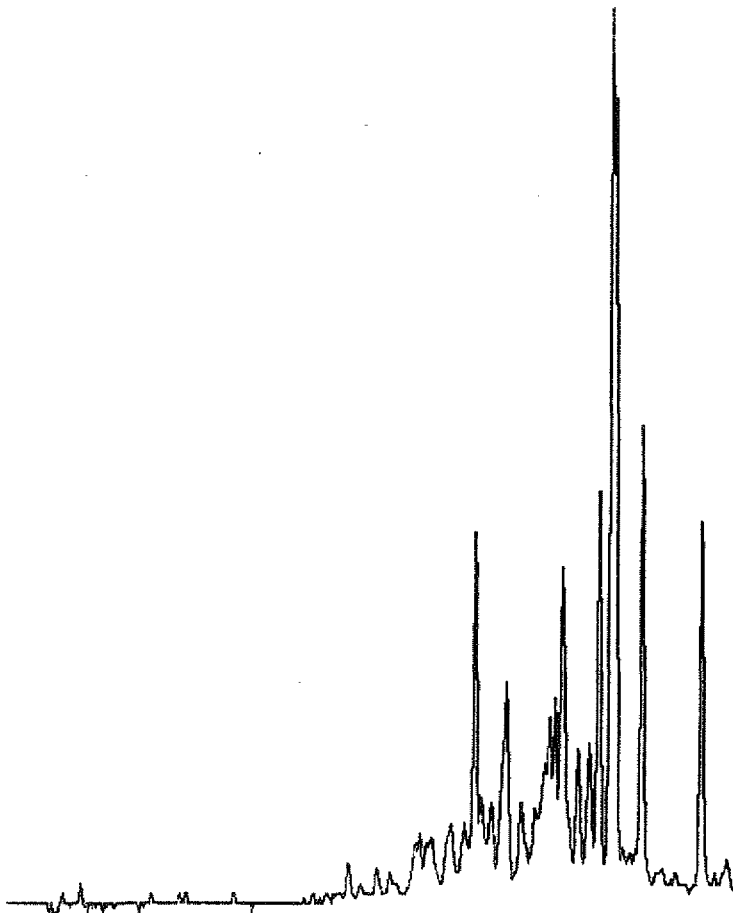


3205-3219m

STERANES m/z 218

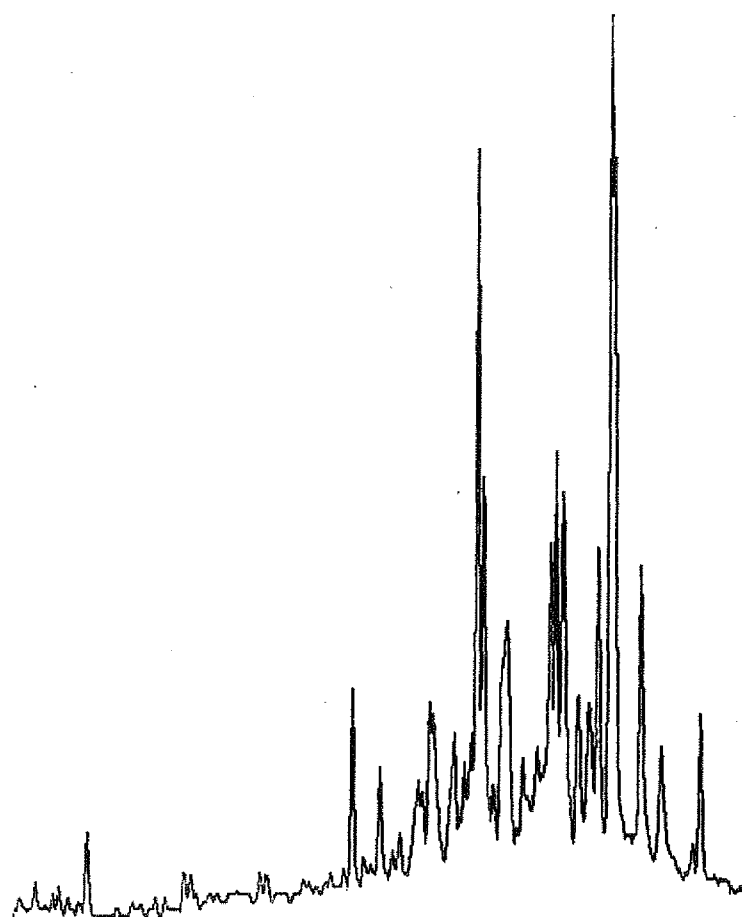


3264-3279m

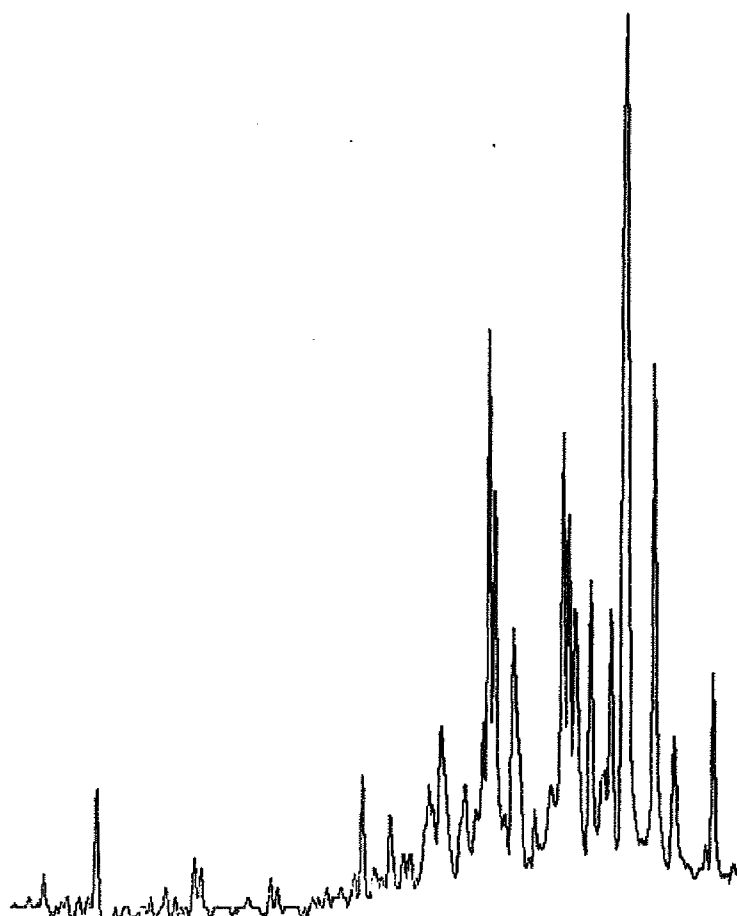


3399-3414m

STERANES m/z 218



3639-3654m



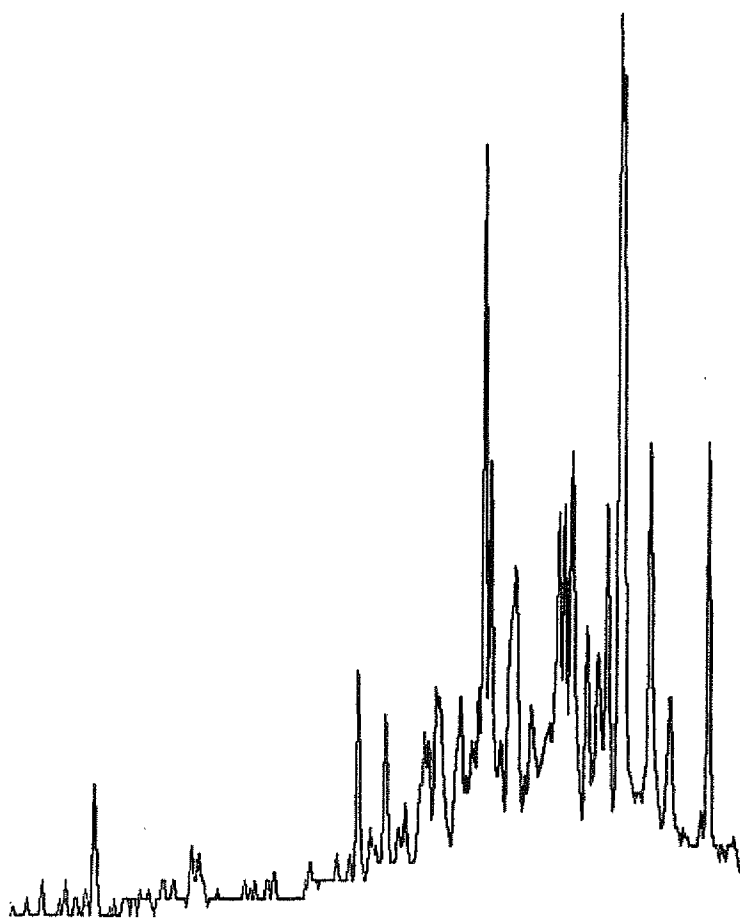
3834-3849m

FIGURE 10f

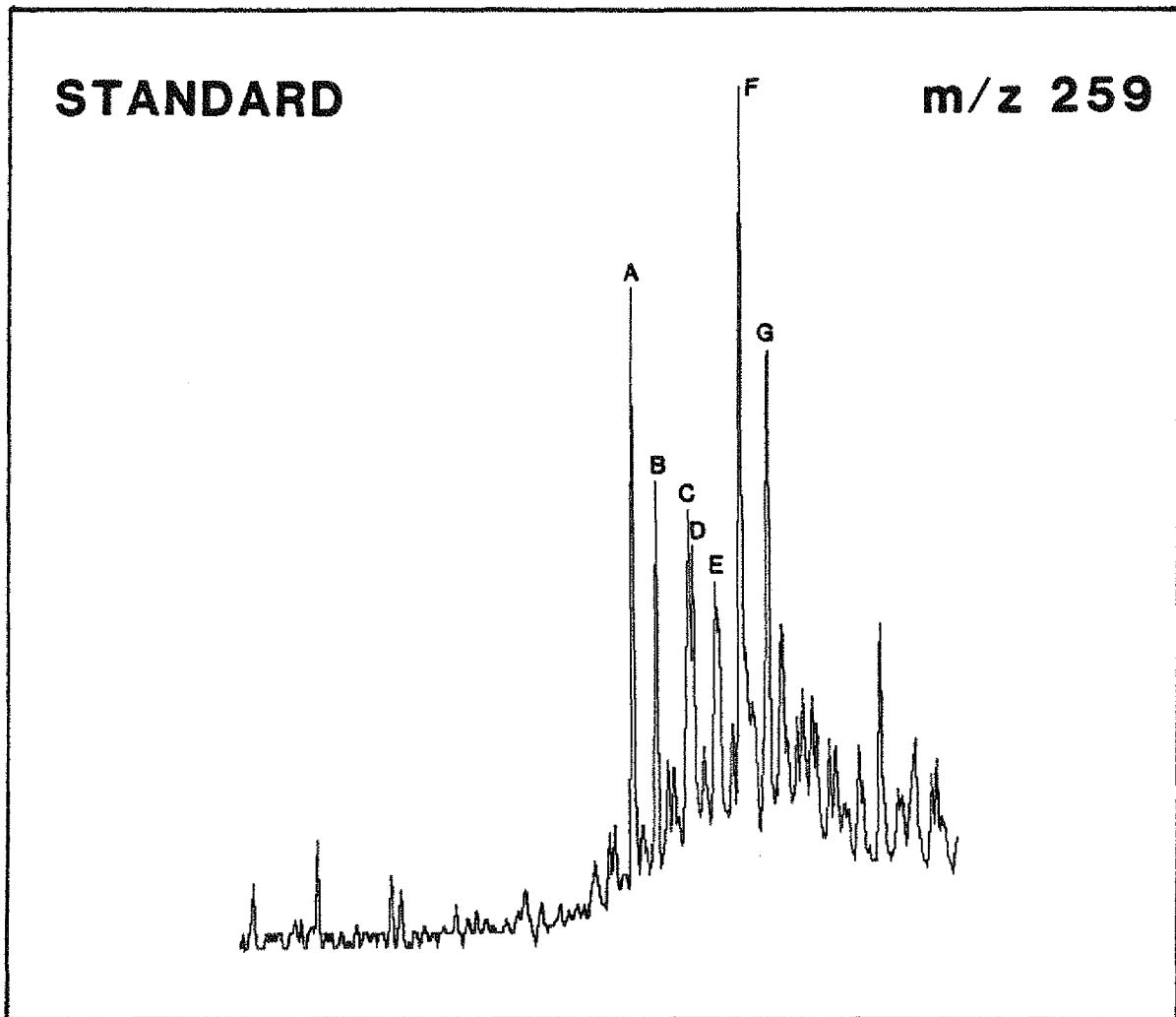
MASS FRAGMENTOGRAMS

WELL 34/10-21

STERANES m/z 218



3924-3939m

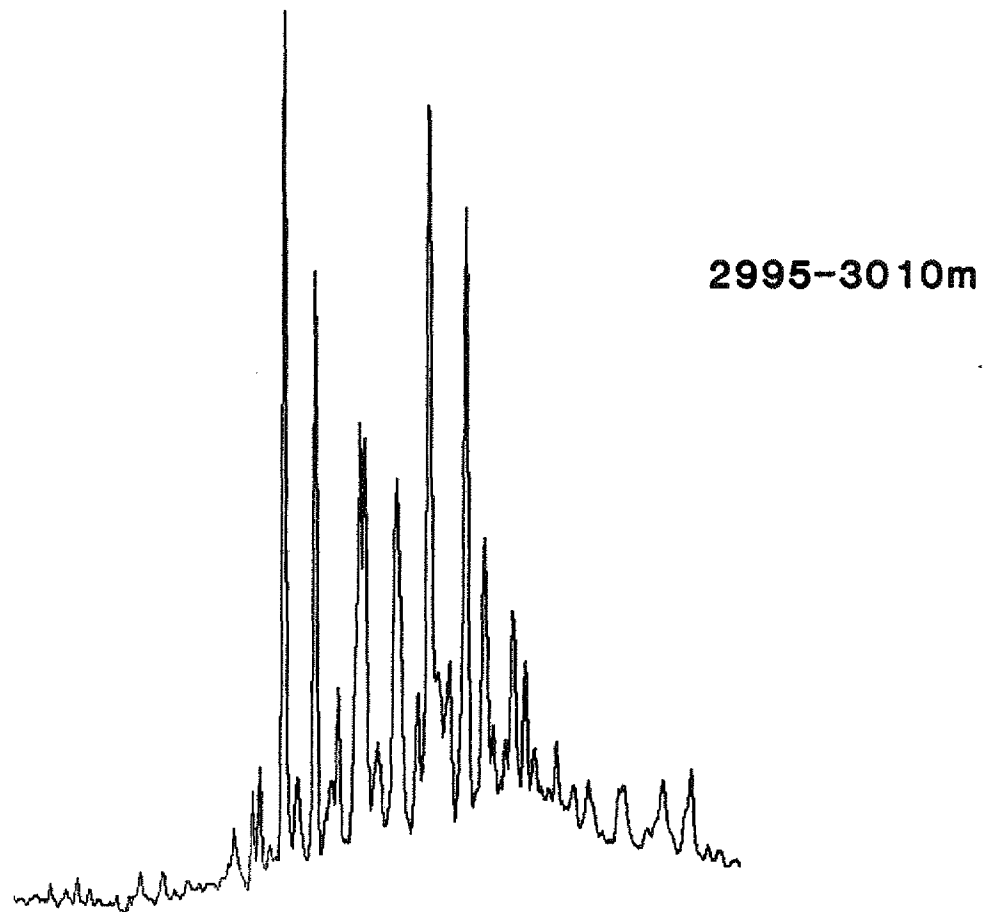
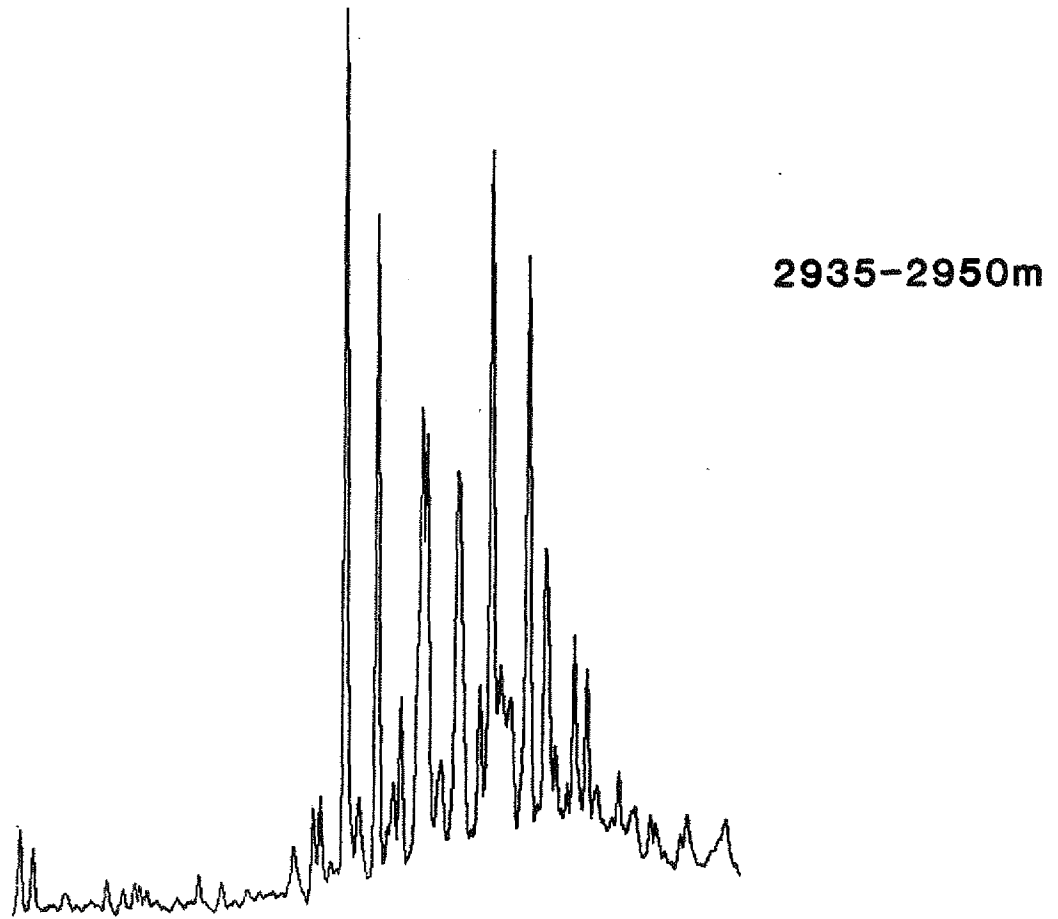


STERANE IDENTIFICATION

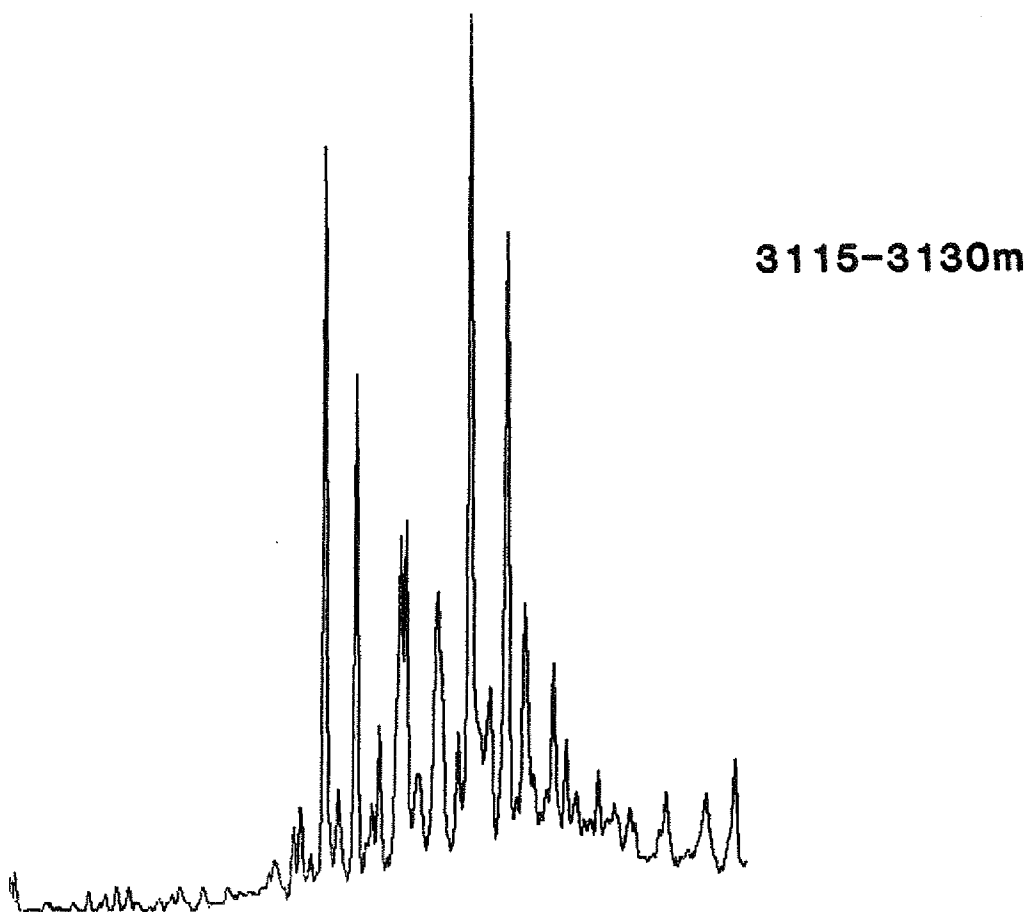
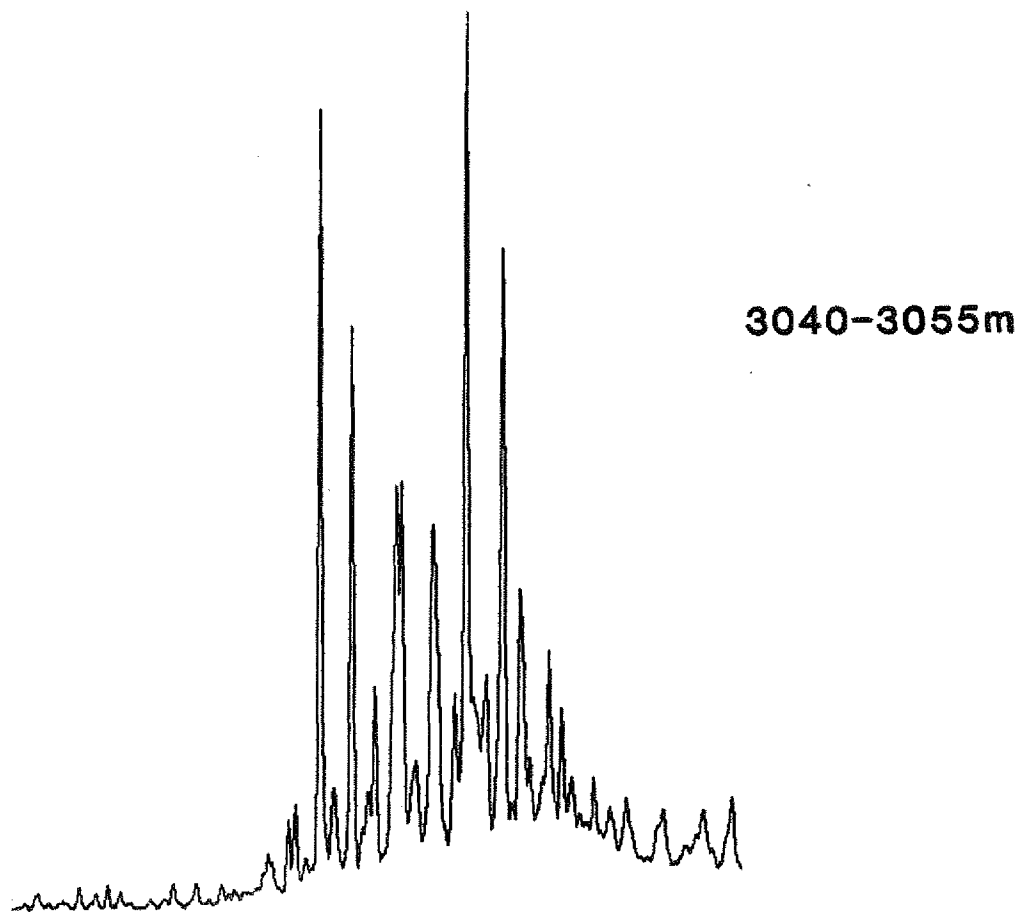
(M/Z 259 FRAGMENTOGRAM)

	<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

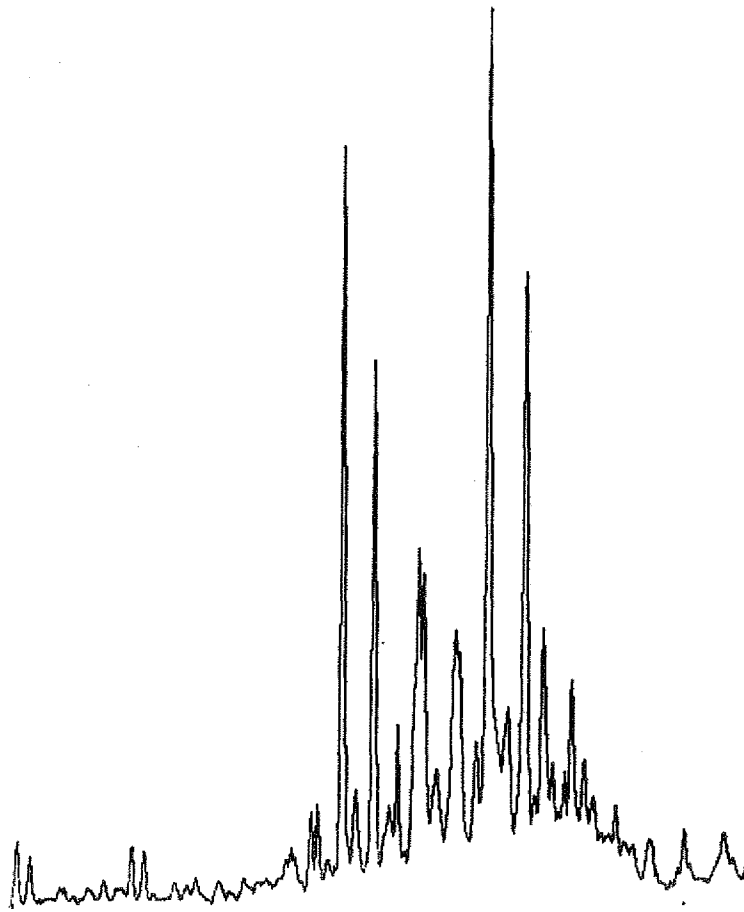
REARRANGED STERANES m/z 259



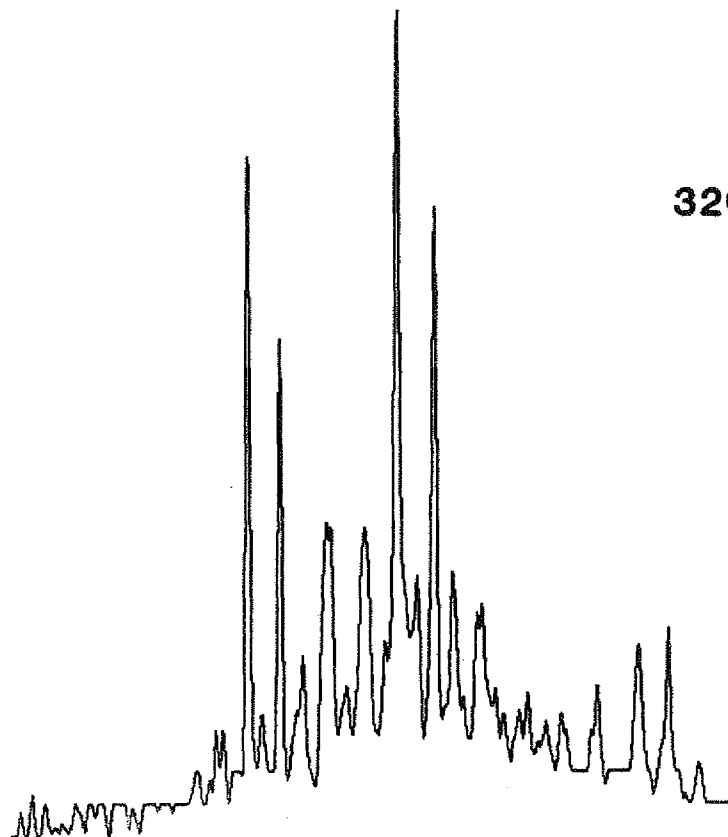
REARRANGED STERANES m/z 259



REARRANGED STERANES m/z 259



3160-3175m



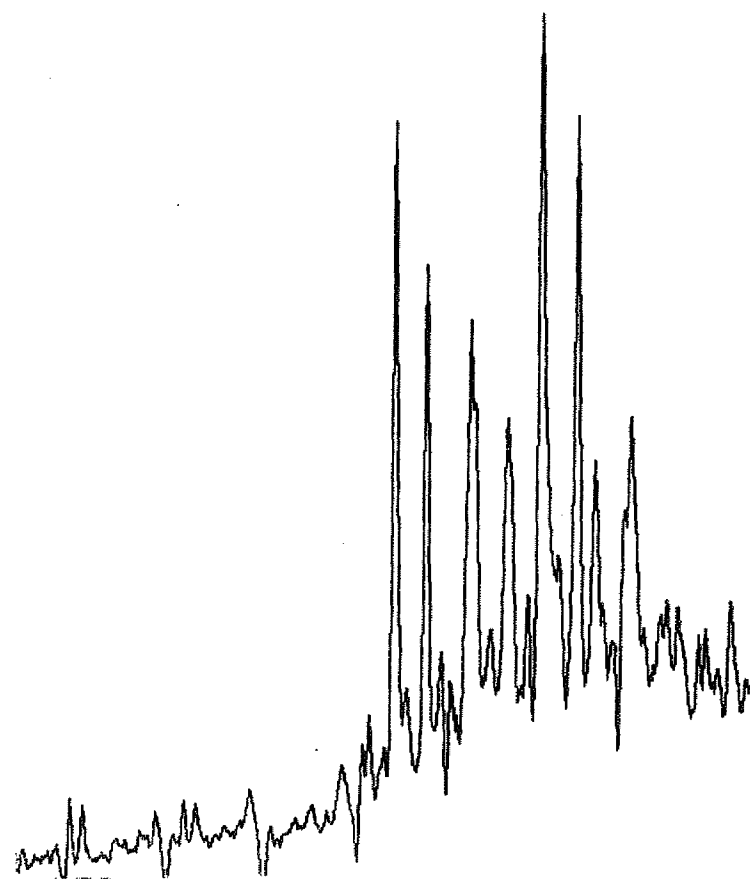
3205-3219m

FIGURE 11d

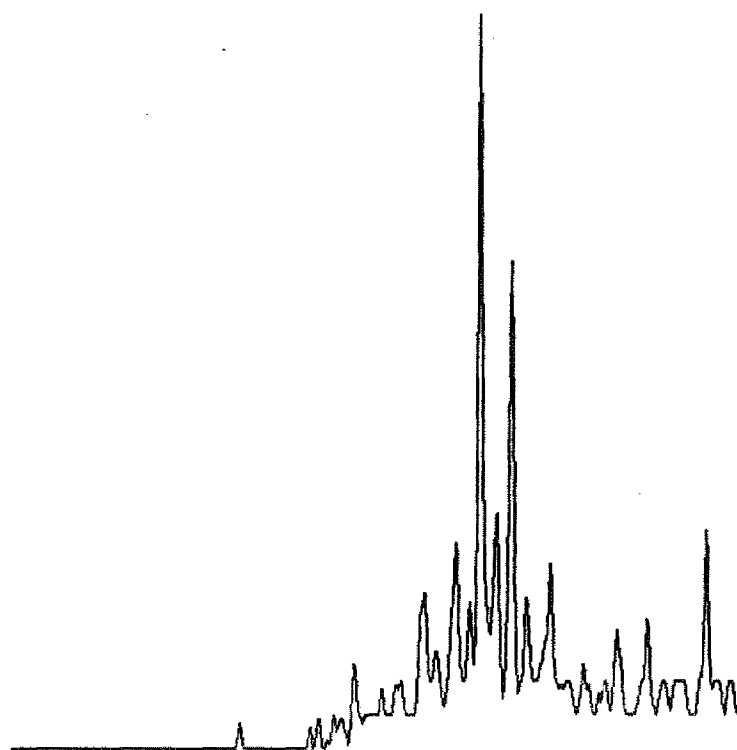
MASS FRAGMENTOGRAMS

WELL 34/10-21

REARRANGED STERANES m/z 259

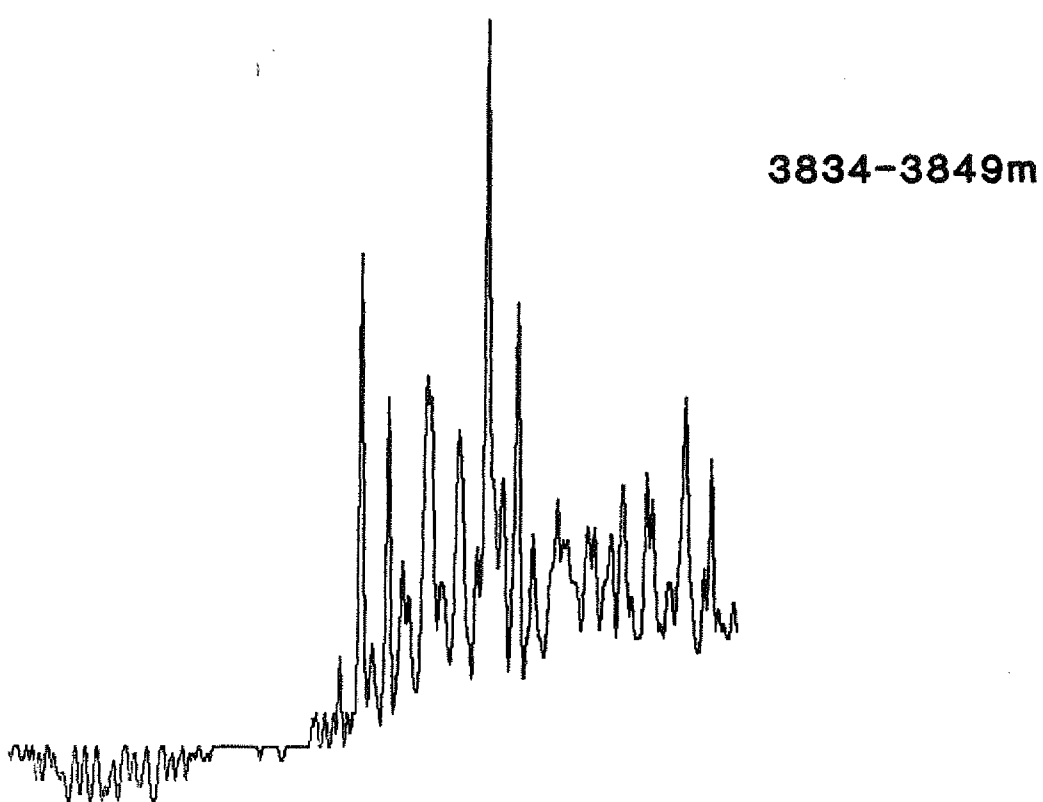
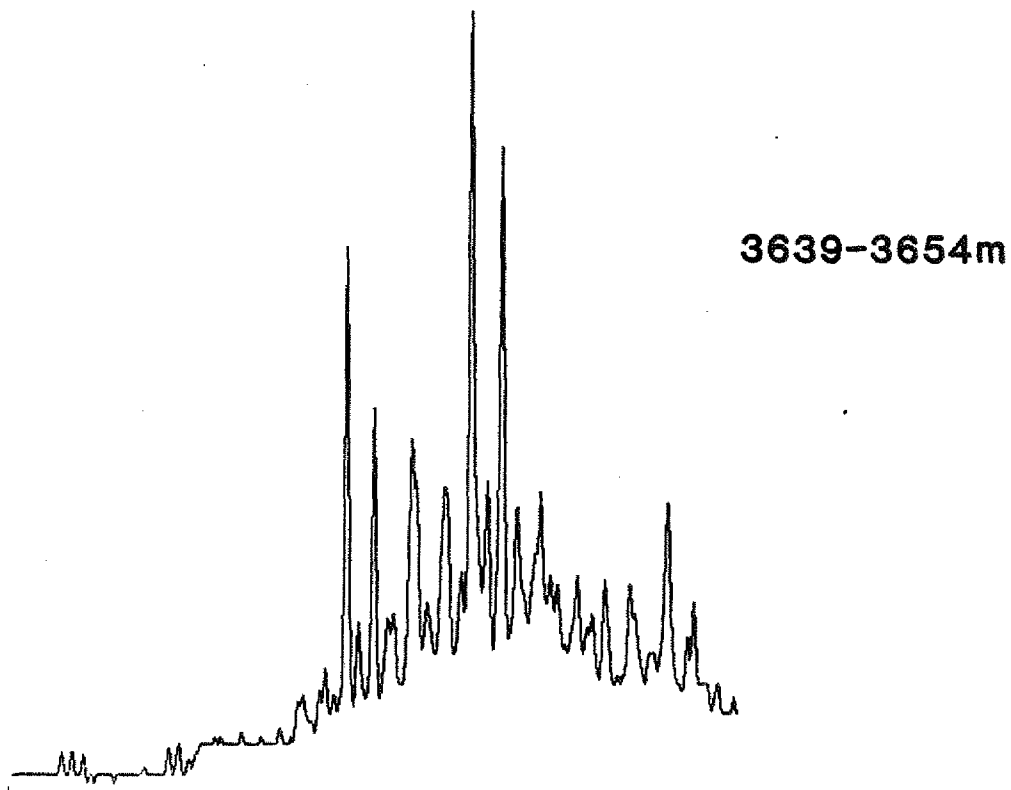


3264-3279m

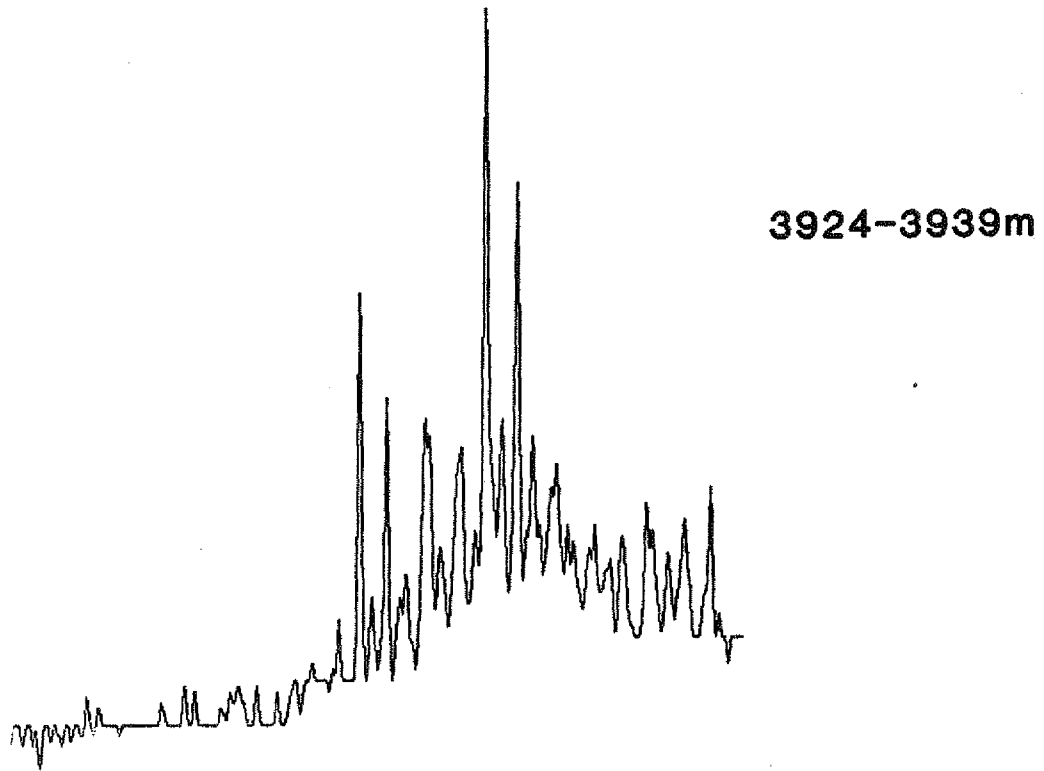


3399-3414m

REARRANGED STERANES m/z 259



REARRANGED STERANES m/z 259

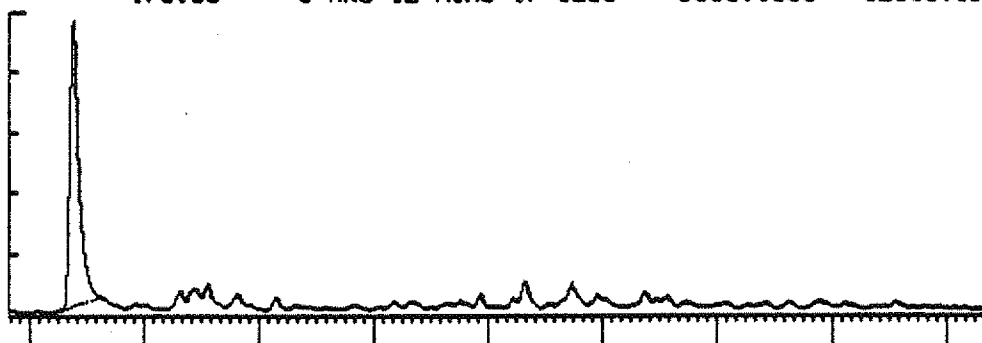


AROMATIC MASS FRAGMENTOGRAMS PHENANTHRENE SERIES

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

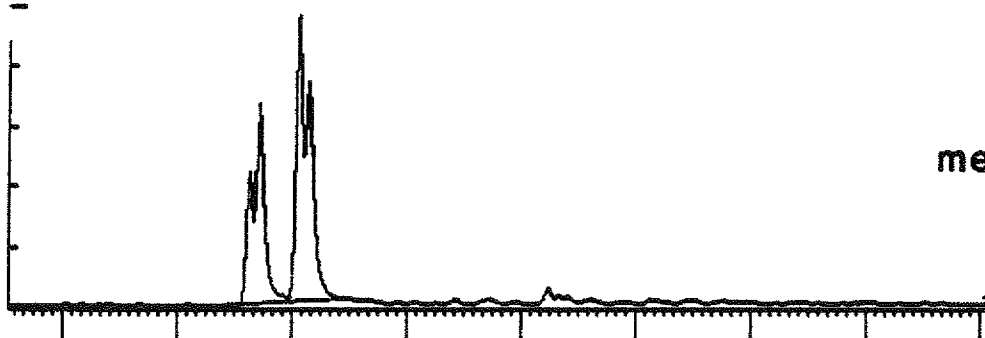
UNCALIBRATED.

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



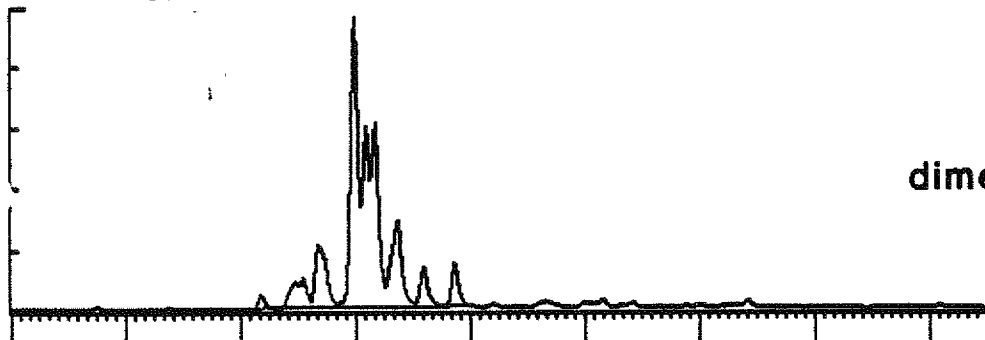
phenanthrene

192.00	0 HRS 14 MINS 41 SECS	9491.7360	122714.4000	0.0000	0.0000
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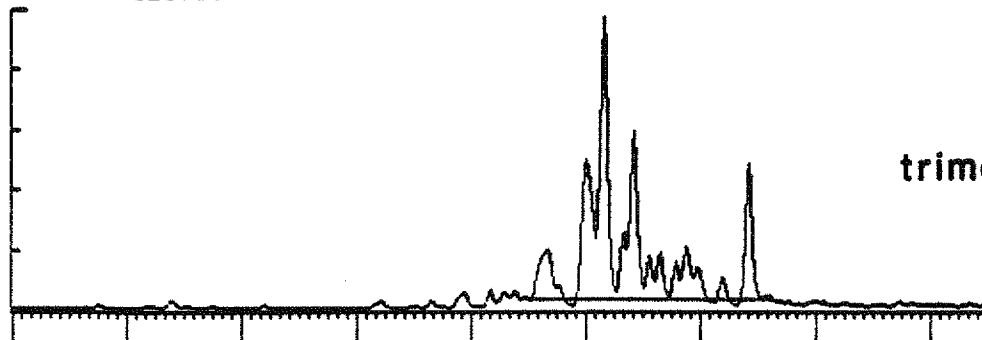
methyl phenanthrenes

206.00	0 HRS 16 MINS 31 SECS	7513.8950	112294.6000	0.0000	0.0000
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dimethyl phenanthrenes

228.00	0 HRS 18 MINS 21 SECS	3435.1420	60707.0400	0.0000	0.0000
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trimethyl phenanthrenes

0 HRS 13 MINS 59 SECS

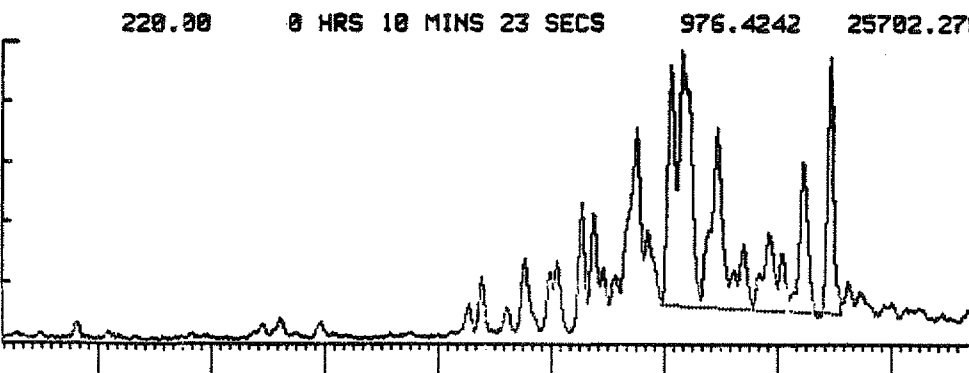
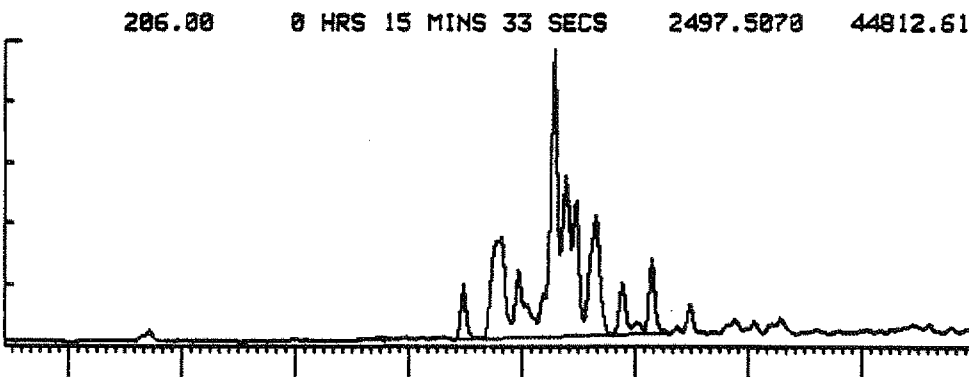
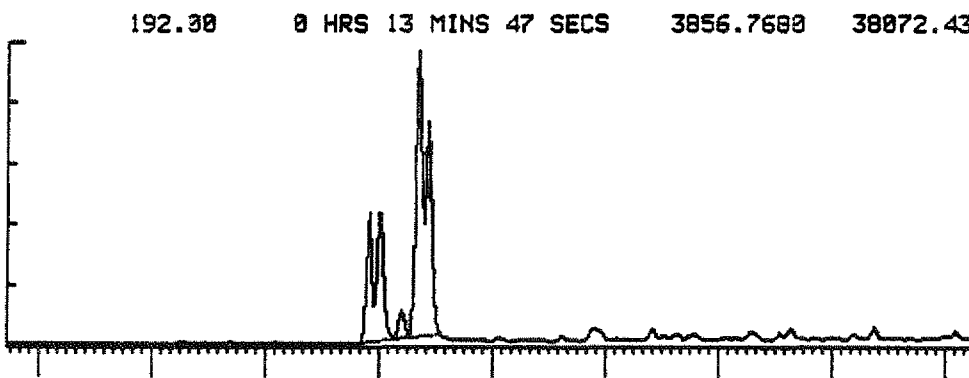
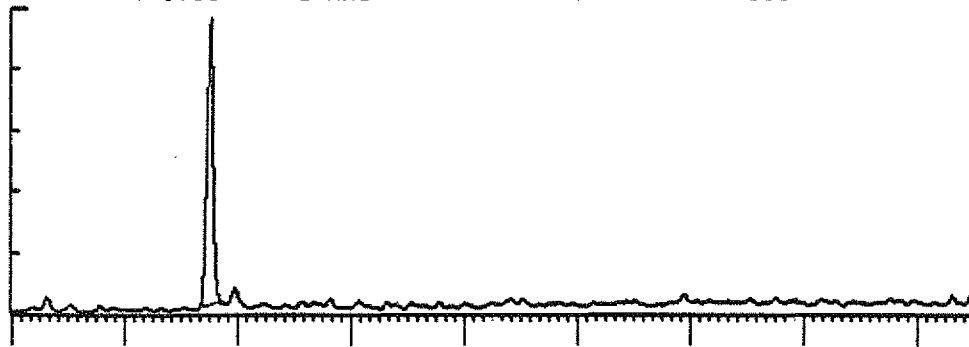
0 HRS 22 MINS 10 SECS

PHENANTHRENE SERIES

SIR REPORT. FILE - 972127 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 11 MINS 28 SECS	3999.9990	14969.9800	0.0000	0.0000
192.00	0 HRS 13 MINS 47 SECS	3856.7600	38072.4300	0.0000	0.0000
206.00	0 HRS 15 MINS 33 SECS	2497.5070	44812.6100	0.0000	0.0000
220.00	0 HRS 18 MINS 23 SECS	976.4242	25702.2700	0.0000	0.0000

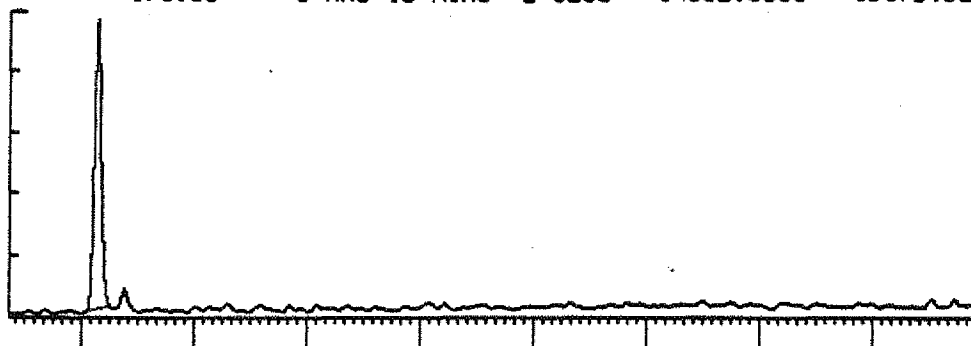


PHENANTHRENE SERIES

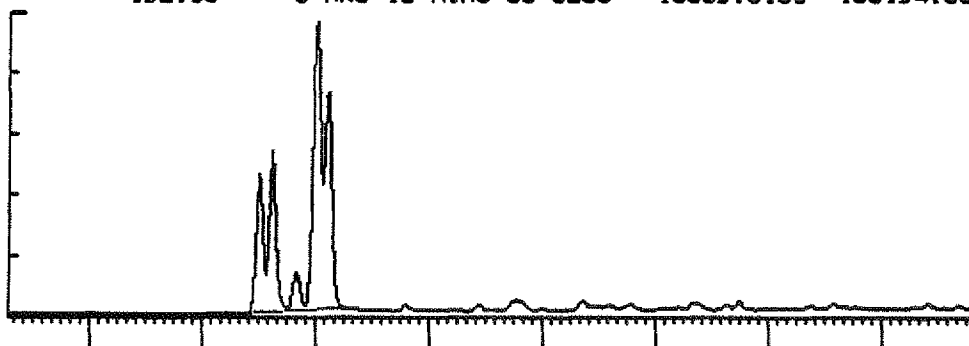
SIR REPORT. FILE - 972131 .SD RUN - 1

UNCALIBRATED.

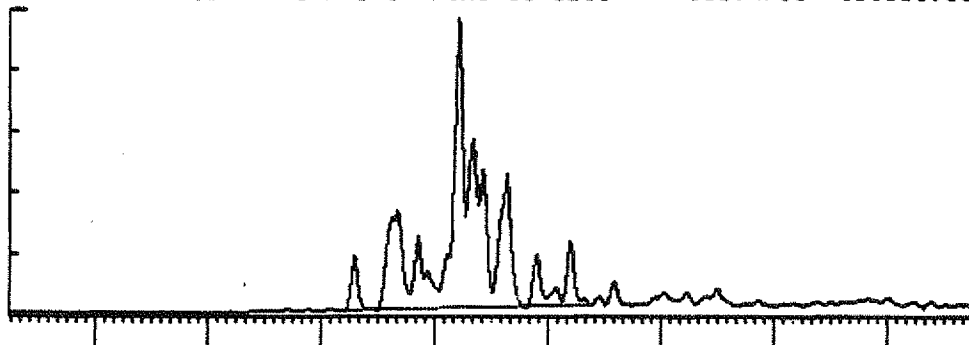
MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 10 MINS 2 SECS	14632.8000	59879.9200	0.0000	0.0000



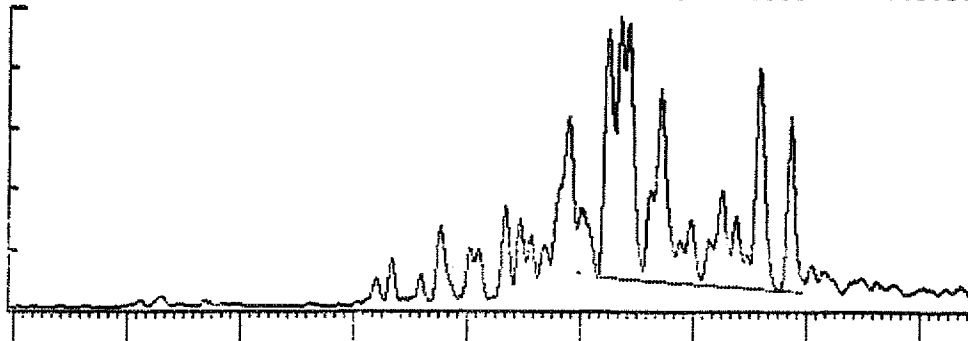
192.00	0 HRS 12 MINS 36 SECS	13039.5100	165194.5000	0.0000	0.0000
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206.00	0 HRS 14 MINS 36 SECS	7163.4760	151601.3000	0.0000	0.0000
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220.00	0 HRS 16 MINS 33 SECS	2484.5380	82158.3100	0.0000	0.0000
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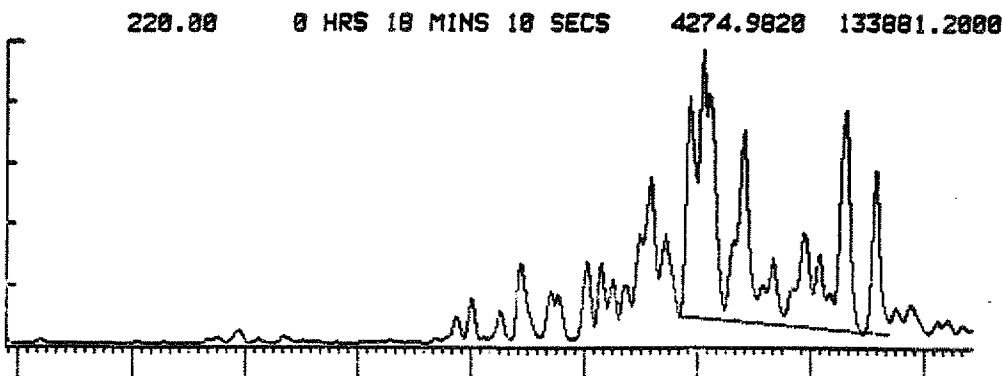
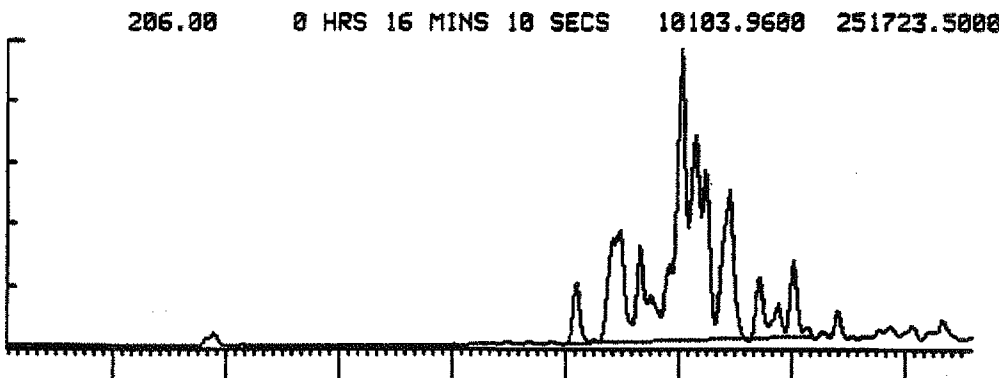
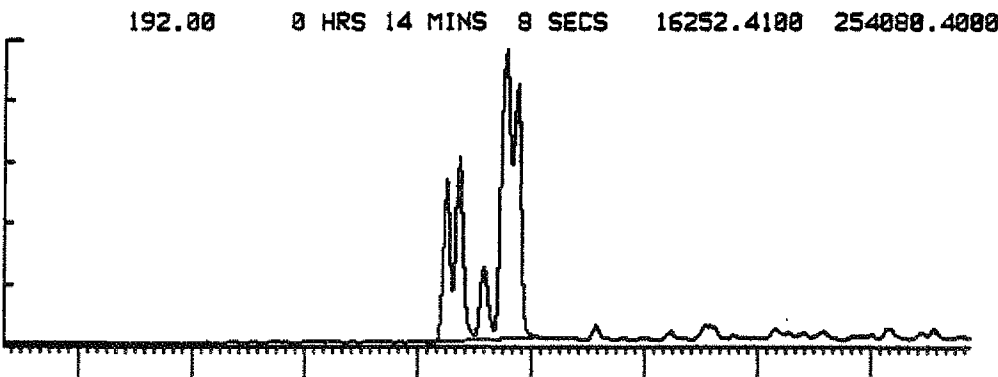
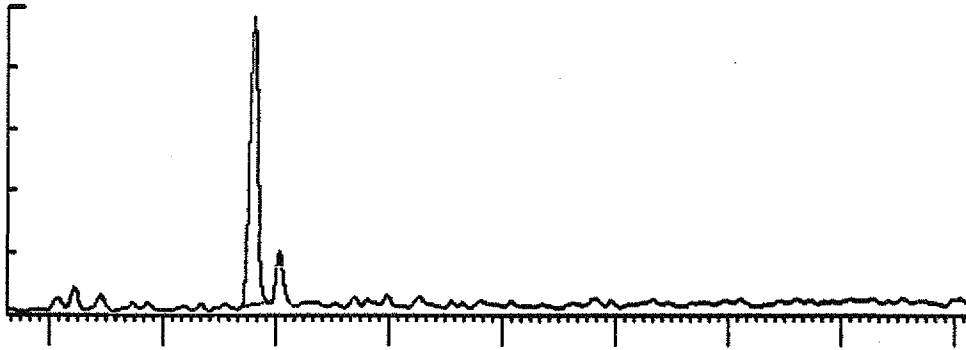


PHENANTHRENE SERIES

SIR REPORT. FILE - 972134 .SD RUN - 1

UNCALIBRATED.
MASS

RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00 0 HRS 11 MINS 29 SECS	20748.7800	100394.8000	0.0000	0.0000
192.00 0 HRS 14 MINS 0 SECS	16252.4100	254888.4000	0.0000	0.0000
206.00 0 HRS 16 MINS 10 SECS	10103.9600	251723.5000	0.0000	0.0000
220.00 0 HRS 18 MINS 10 SECS	4274.9820	133881.2000	0.0000	0.0000

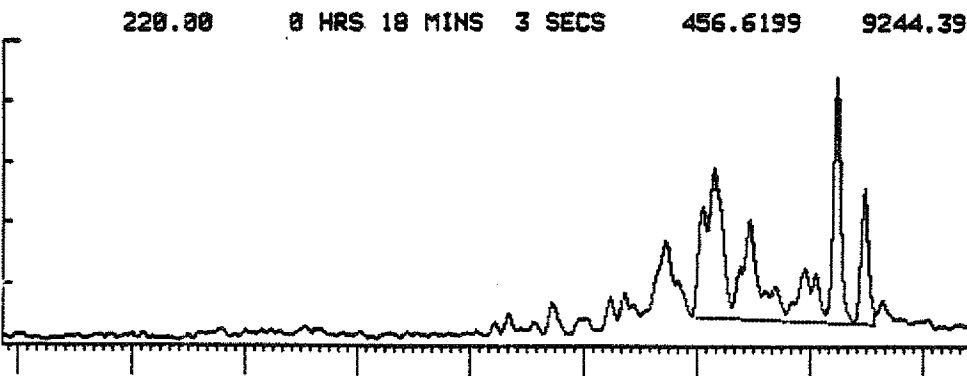
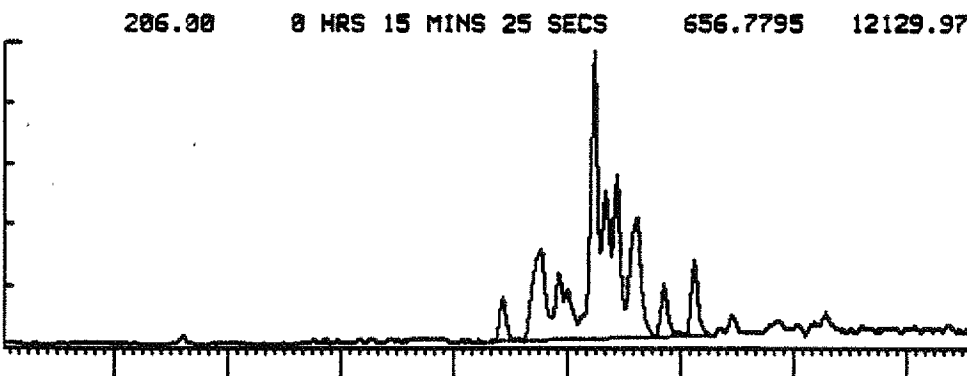
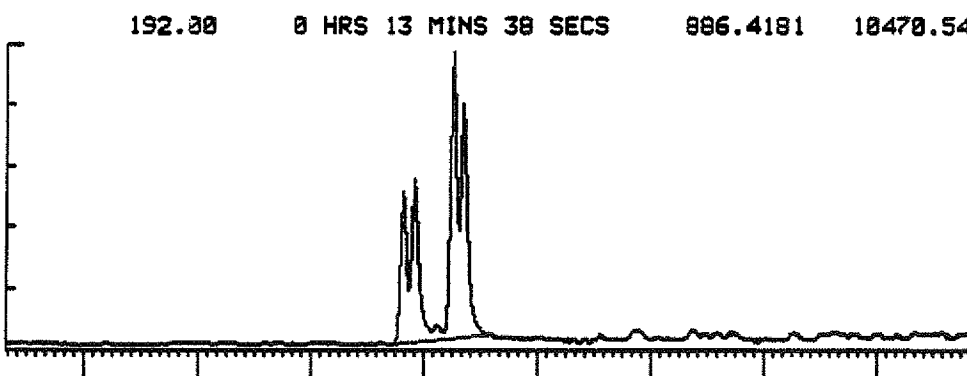
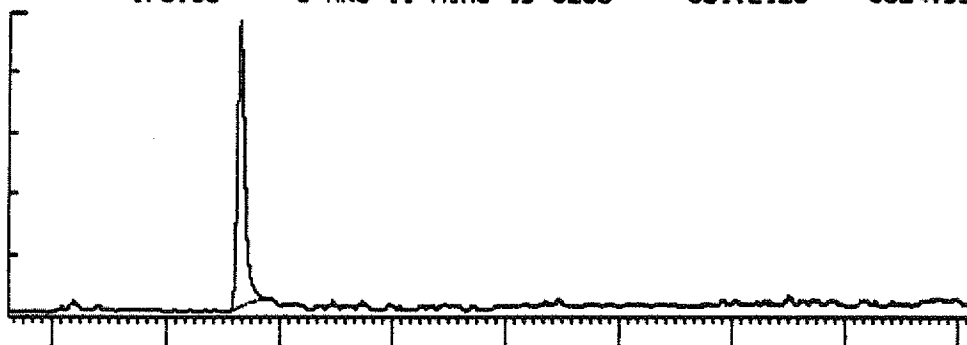


PHENANTHRENE SERIES

SIR REPORT. FILE - 972139 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 11 MINS 19 SECS	861.2128	3824.9940	0.0000	0.0000
192.00	0 HRS 13 MINS 30 SECS	986.4181	10470.5400	0.0000	0.0000
206.00	0 HRS 15 MINS 25 SECS	656.7795	12129.9700	0.0000	0.0000
220.00	0 HRS 18 MINS 3 SECS	456.6199	9244.3910	0.0000	0.0000

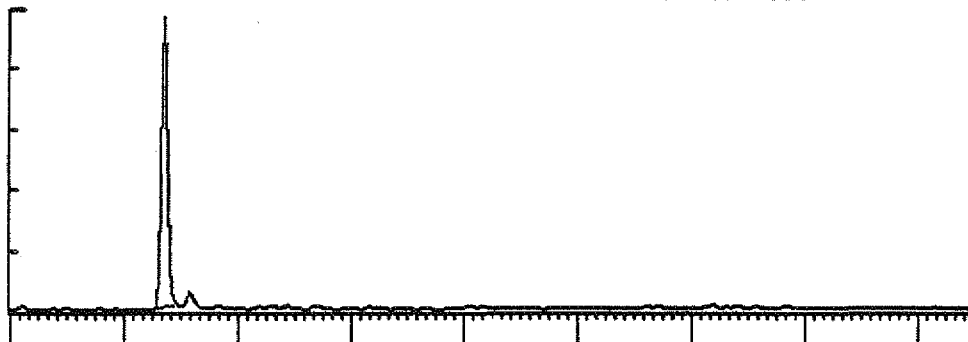


PHENANTHRENE SERIES

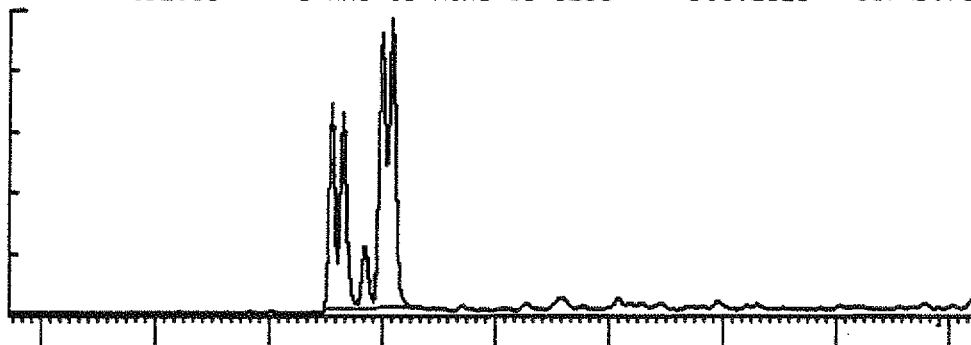
SIR REPORT. FILE - 972142 .SD RUN - 1

UNCALIBRATED.

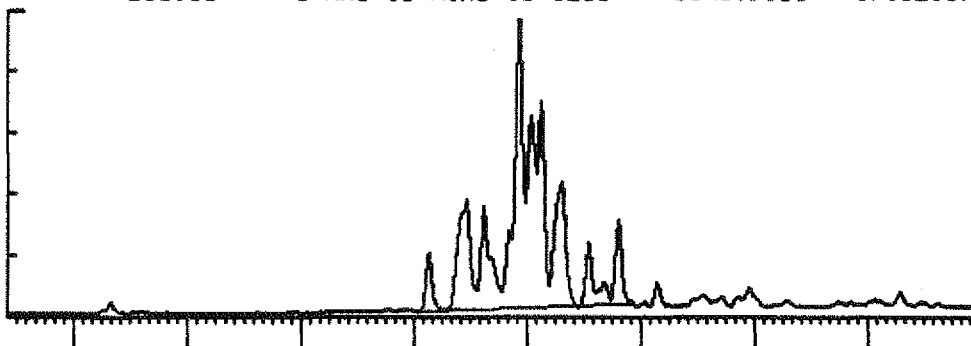
MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 11 MINS 9 SECS	11120.4300	40916.1900	0.0000	0.0000



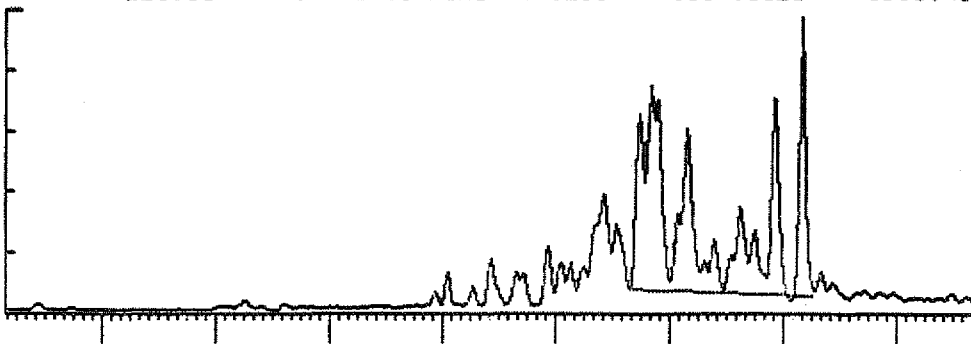
192.00	0 HRS 13 MINS 33 SECS	4956.2820	66749.7500	0.0000	0.0000
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206.00	0 HRS 15 MINS 13 SECS	3045.9930	67132.8700	0.0000	0.0000
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220.00	0 HRS 19 MINS 5 SECS	1064.3520	43938.4000	0.0000	0.0000
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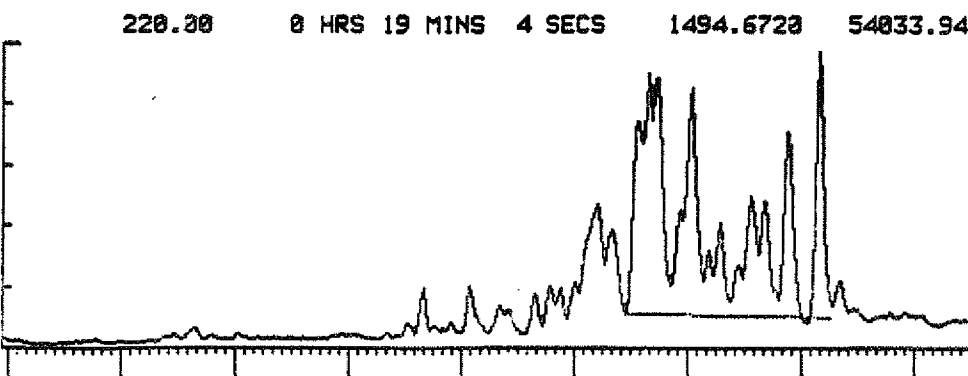
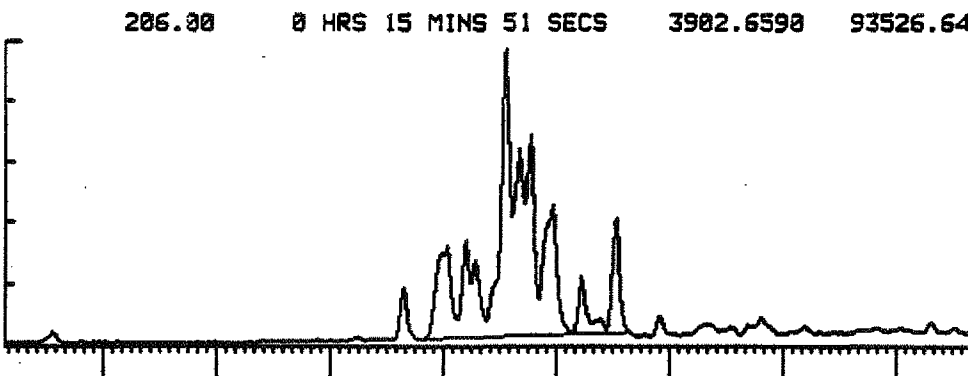
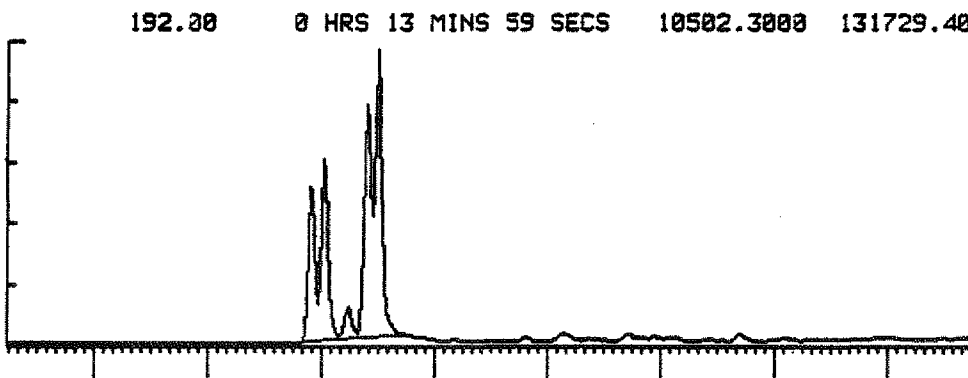
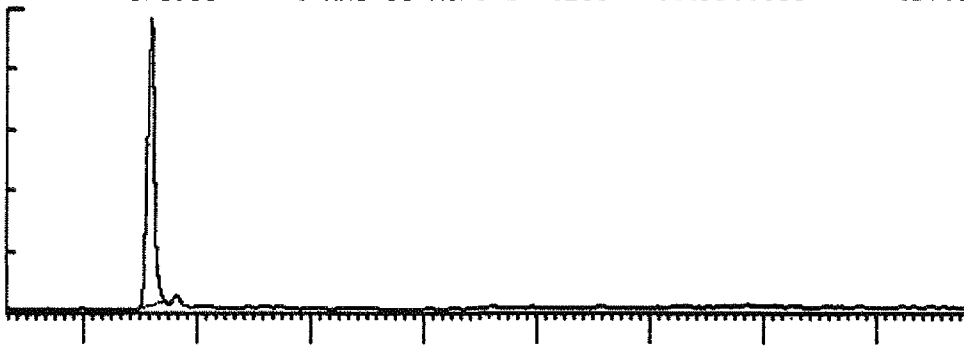


PHENANTHRENE SERIES

SIR REPORT. FILE - 972146 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 11 MINS 24 SECS	18199.5000	75419.8500	0.0000	0.0000
192.00	0 HRS 13 MINS 59 SECS	10502.3000	131729.4000	0.0000	0.0000
206.00	0 HRS 15 MINS 51 SECS	3902.6590	93526.6400	0.0000	0.0000
220.00	0 HRS 19 MINS 4 SECS	1494.6720	54033.9400	0.0000	0.0000

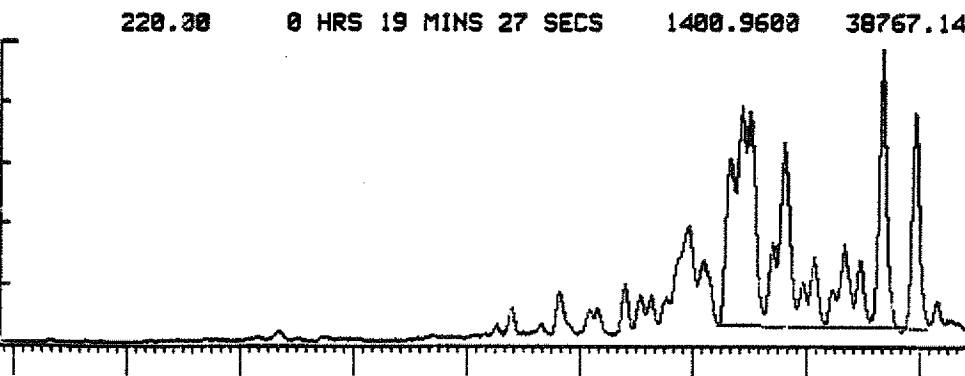
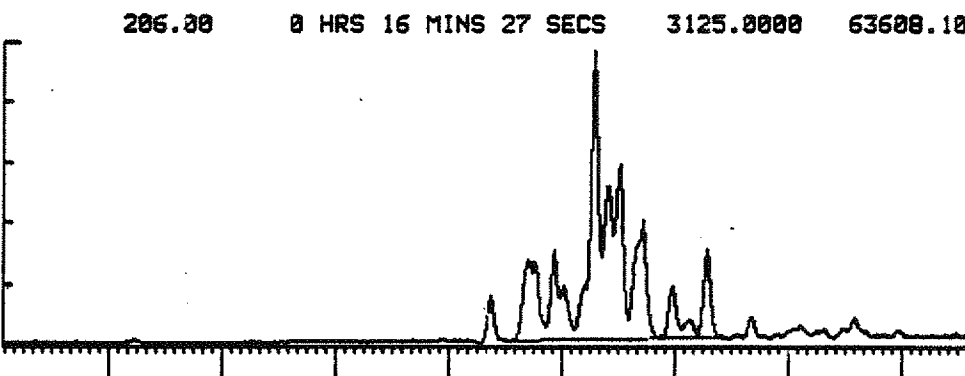
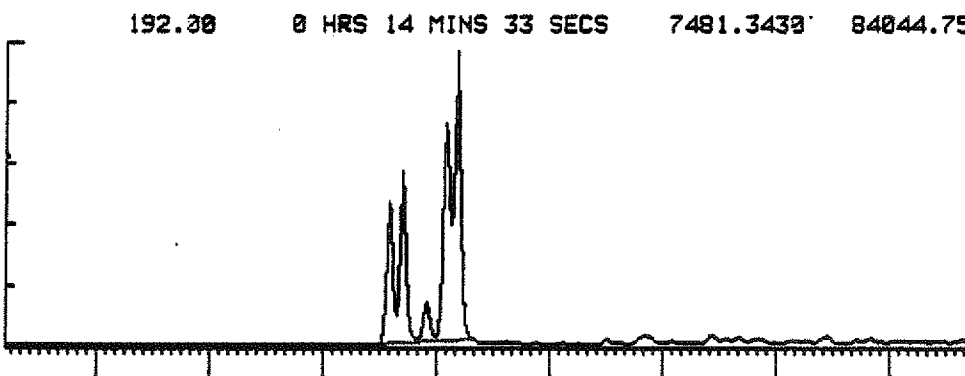
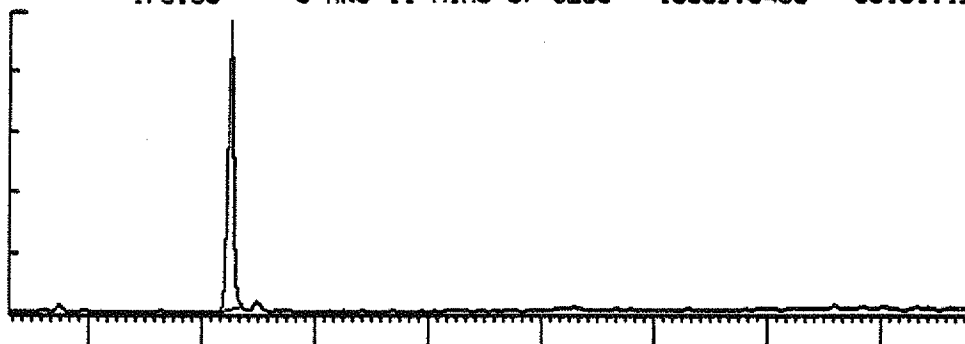


PHENANTHRENE SERIES

SIR REPORT. FILE - 972150 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 11 MINS 57 SECS	10839.8400	36101.1900	0.0000	0.0000
192.00	0 HRS 14 MINS 33 SECS	7481.3430	84044.7500	0.0000	0.0000
206.00	0 HRS 16 MINS 27 SECS	3125.0000	63608.1000	0.0000	0.0000
220.00	0 HRS 19 MINS 27 SECS	1400.9600	38767.1400	0.0000	0.0000

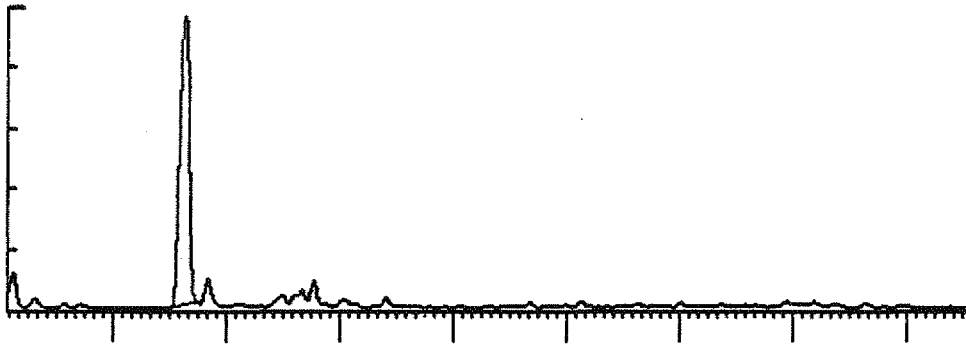


PHENANTHRENE SERIES

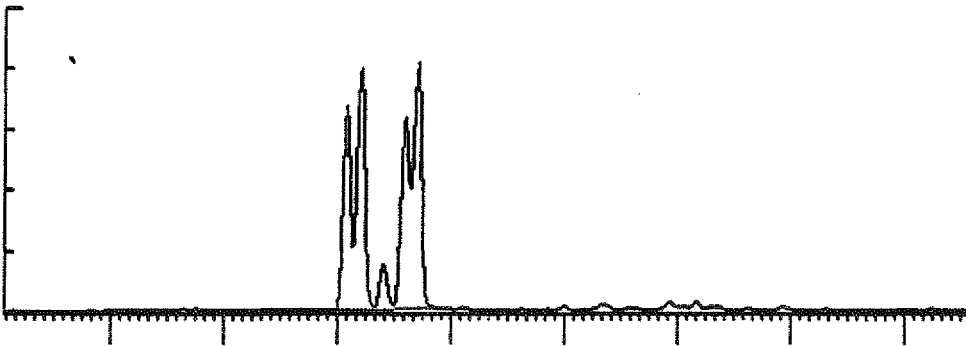
SIR REPORT. FILE - 972153 .SD RUN - 1

UNCALIBRATED.

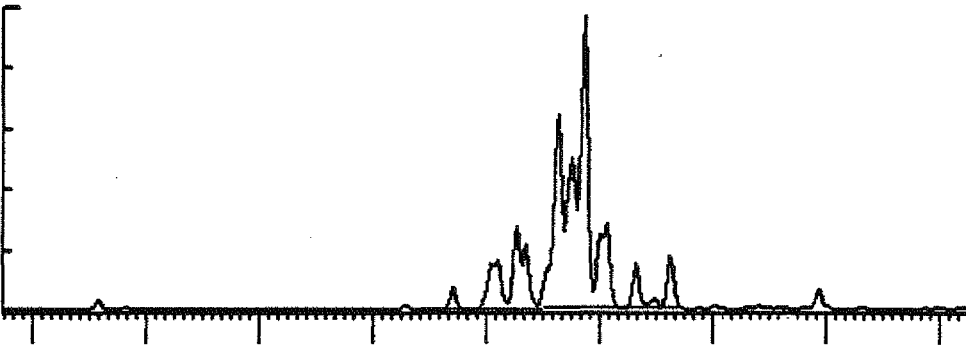
MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 12 MINS 23 SECS	28016.2000	158549.7000	0.0000	0.0000



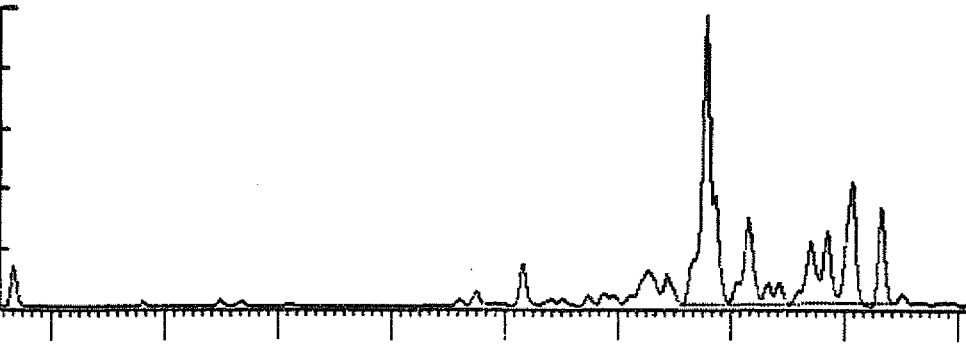
192.00	0 HRS 14 MINS 60 SECS	23879.5600	427746.0000	0.0000	0.0000
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206.00	0 HRS 17 MINS 6 SECS	19482.1100	340392.7000	0.0000	0.0000
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220.00	0 HRS 18 MINS 50 SECS	7282.6540	100098.2000	0.0000	0.0000
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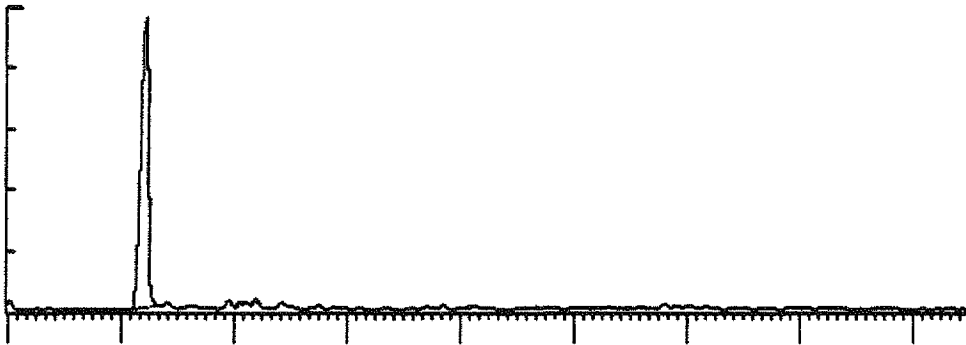


PHENANTHRENE SERIES

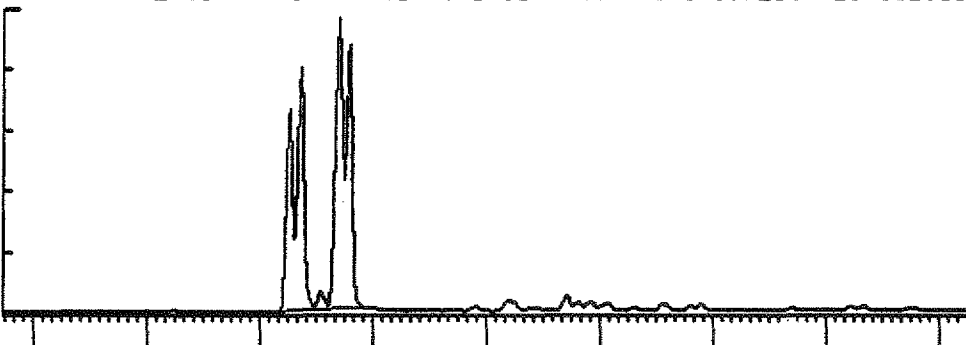
SIR REPORT. FILE - 972169 .SD RUN - 1

UNCALIBRATED.

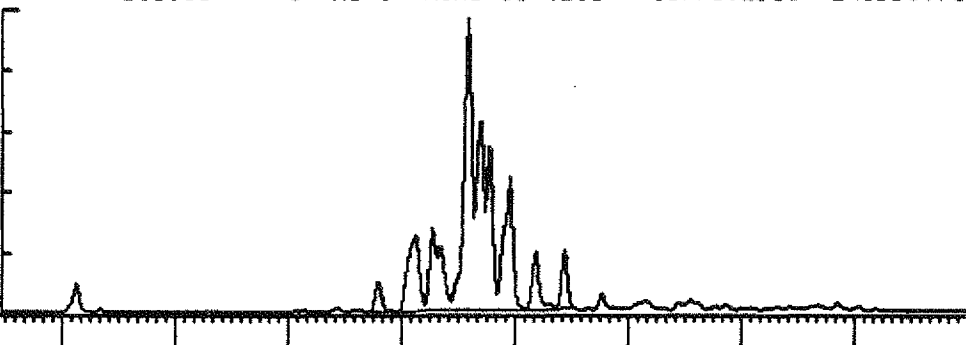
MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 11 MINS 3 SECS	29515.6200	136829.7000	0.0000	0.0000



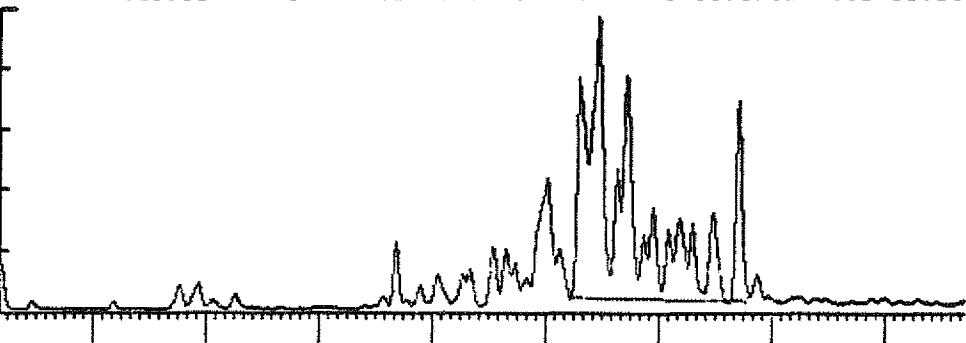
192.00	0 HRS 13 MINS 15 SECS	17378.7200	237332.5000	0.0000	0.0000
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206.00	0 HRS 14 MINS 56 SECS	13776.2900	246998.7000	0.0000	0.0000
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220.00	0 HRS 16 MINS 40 SECS	5488.5710	138755.6000	0.0000	0.0000
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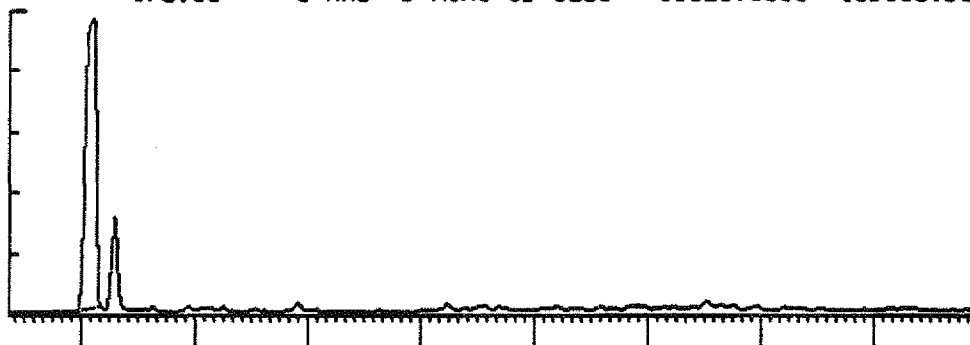


PHENANTHRENE SERIES

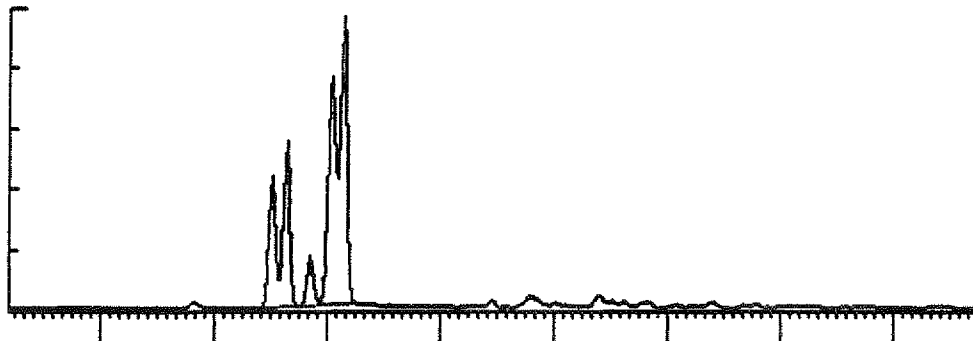
SIR REPORT. FILE - 972182 .SD RUN - 1

UNCALIBRATED.

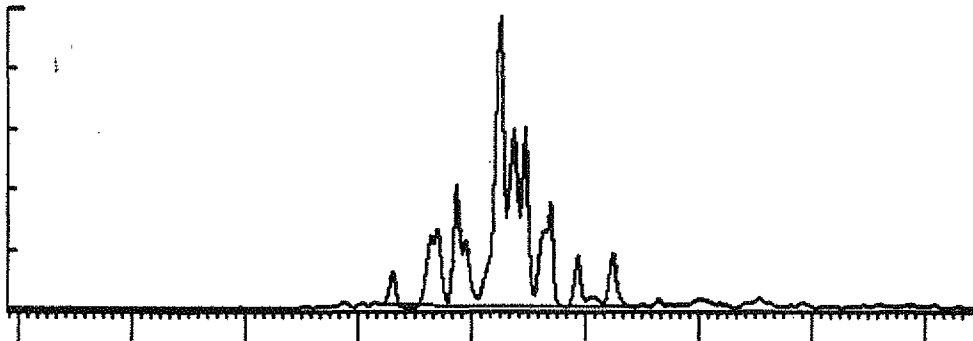
MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 9 MINS 59 SECS	30026.0300	189685.9000	0.0000	0.0000



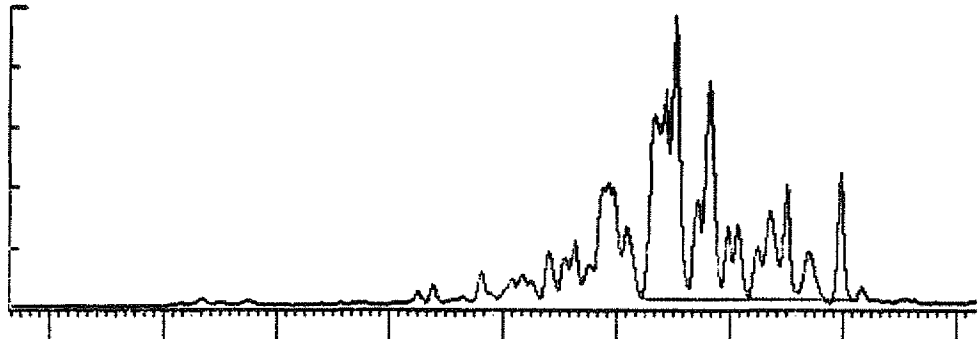
192.00	0 HRS 12 MINS 41 SECS	29169.3600	363385.6000	0.0000	0.0000
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206.00	0 HRS 14 MINS 36 SECS	18397.2400	365081.9000	0.0000	0.0000
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220.00	0 HRS 16 MINS 37 SECS	4245.9520	109805.5000	0.0000	0.0000
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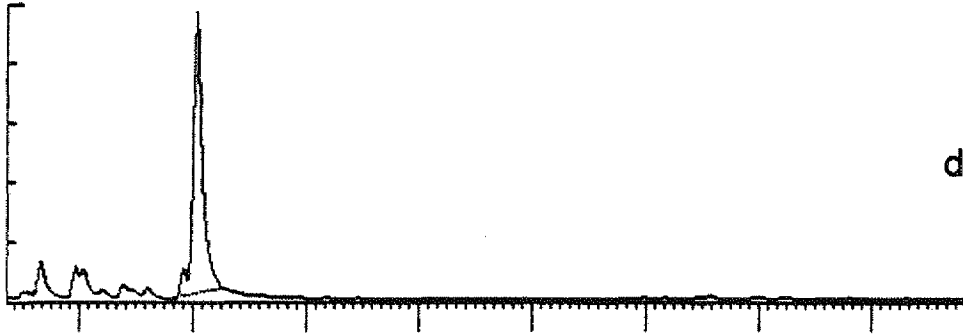
AROMATIC MASS FRAGMENTOGRAMS

DIBENZOTHIOPHENE SERIES

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

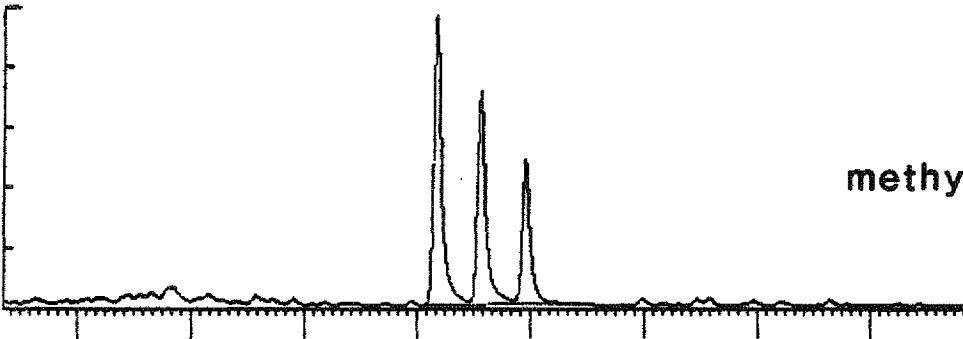
UNCALIBRATED.
MASS

RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	26003.8900	144753.9000	0.0000	0.0000



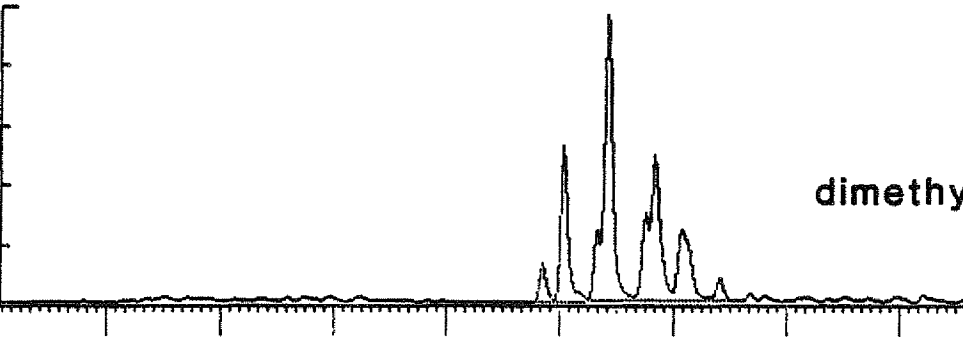
dibenzothiophene

198.00	0 HRS 13 MINS 36 SECS	16854.6700	187694.7000	0.0000	0.0000
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methyl dibenzothiophenes

212.00	0 HRS 15 MINS 36 SECS	14042.6900	208491.3000	0.0000	0.0000
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dimethyl dibenzothiophenes

0 HRS 11 MINS 4 SECS

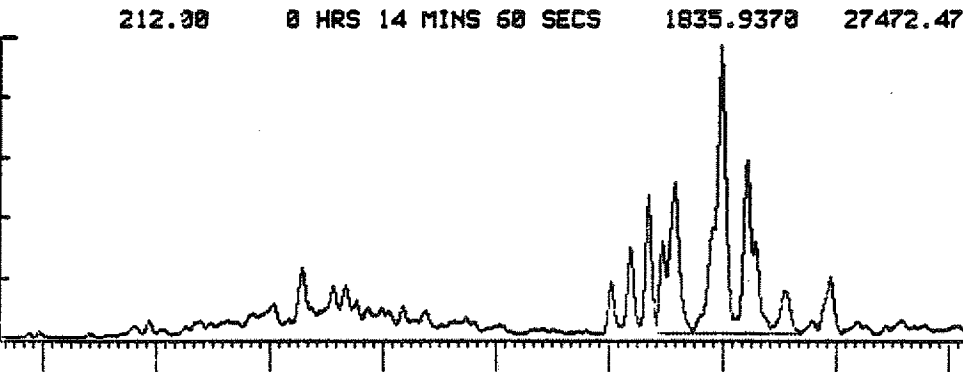
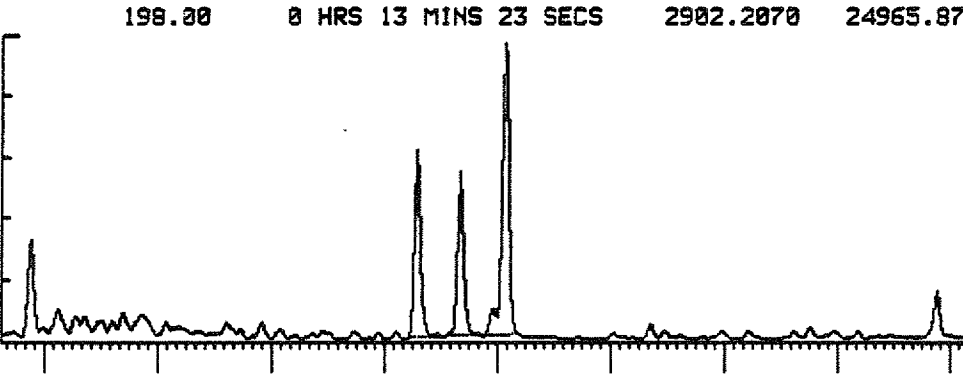
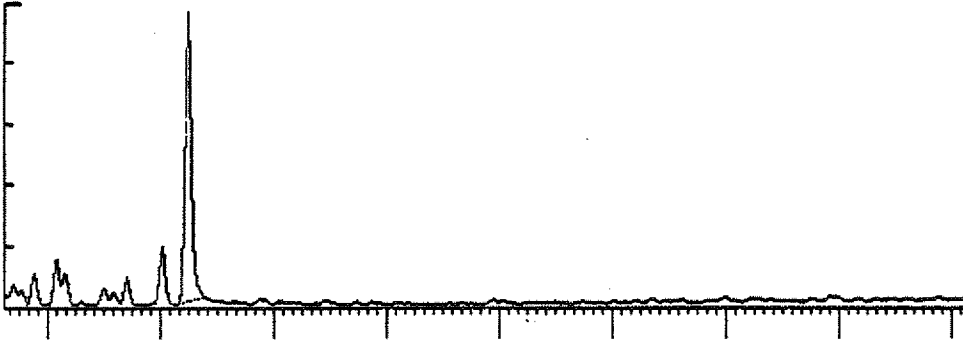
0 HRS 19 MINS 16 SECS

FIGURE 13a AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
 DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972127 .SD RUN - 1

UNCALIBRATED.
 MASS

RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00 0 HRS 10 MINS 59 SECS	3013.9490	11178.7300	0.0000	0.0000
198.00 0 HRS 13 MINS 23 SECS	2902.2070	24965.8700	0.0000	0.0000
212.00 0 HRS 14 MINS 50 SECS	1835.9370	27472.4700	0.0000	0.0000



0 HRS 9 MINS 37 SECS

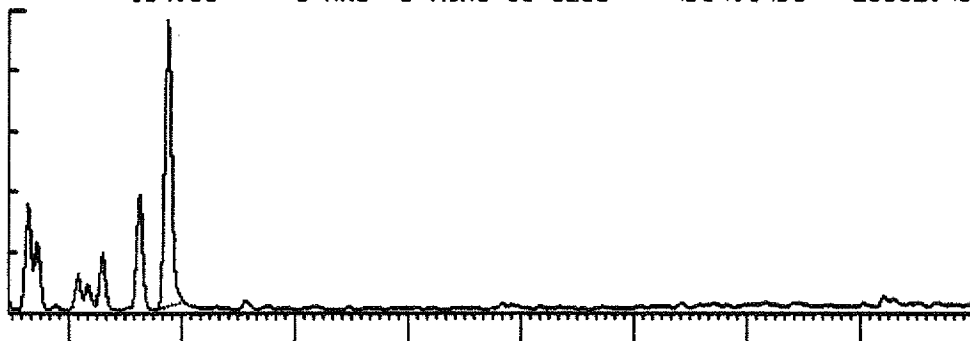
0 HRS 17 MINS 43 SECS

2935-2950m

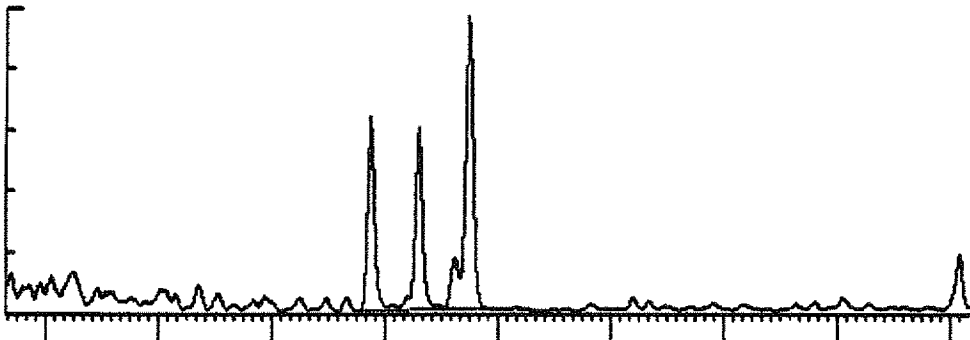
FIGURE 13b AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
 DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972131 .SD RUN - 1

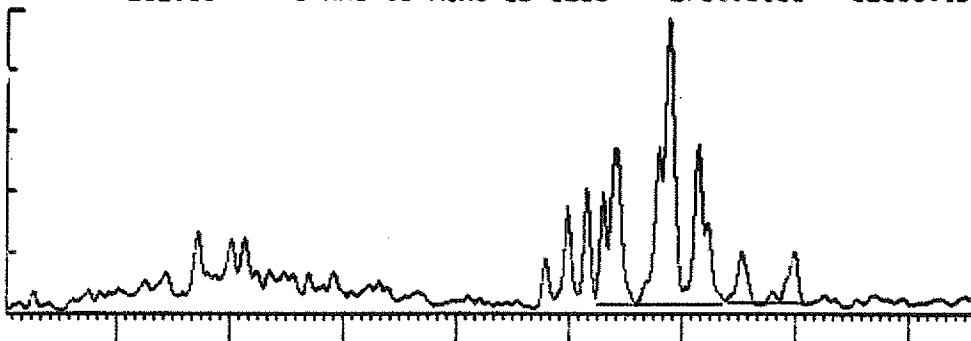
UNCALIBRATED. MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.30	0 HRS 9 MINS 30 SECS	4934.1490	20302.4600	0.0000	0.0000



198.30	0 HRS 12 MINS 8 SECS	5273.0790	57446.0000	0.0000	0.0000
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212.30	0 HRS 13 MINS 59 SECS	2701.6150	52000.1900	0.0000	0.0000
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0 HRS 9 MINS 2 SECS

0 HRS 17 MINS 13 SECS

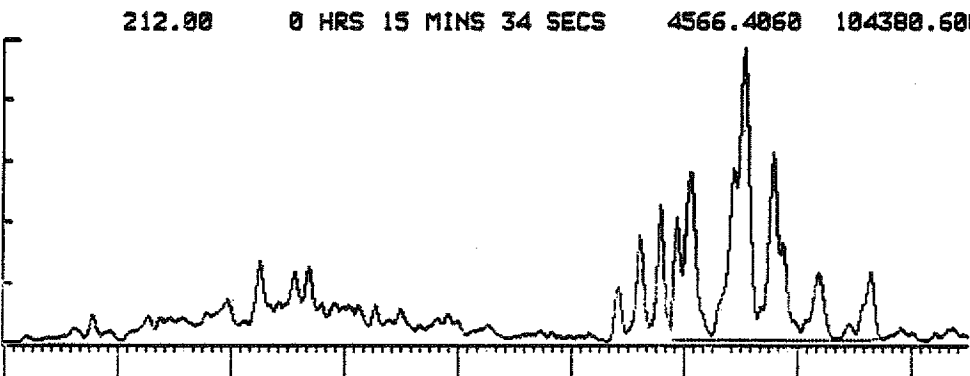
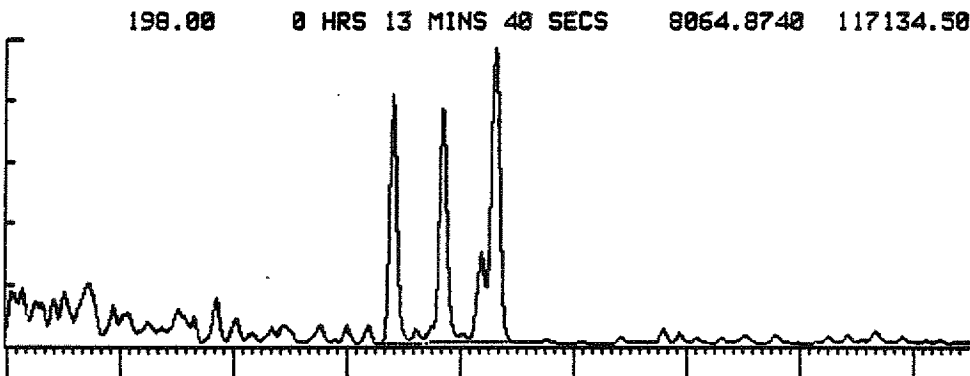
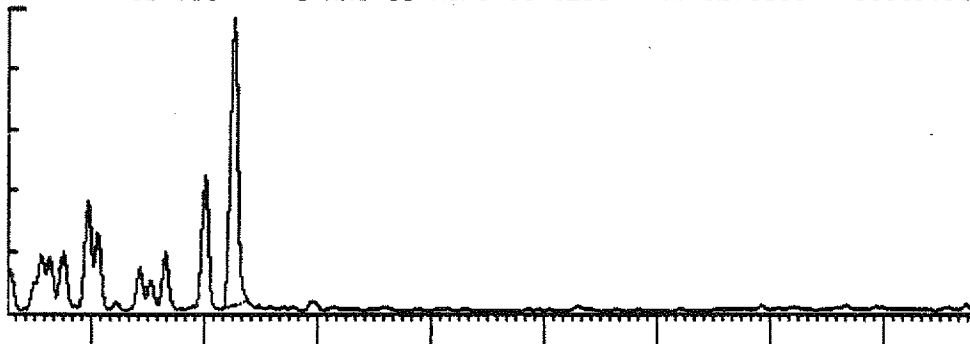
2995-3010m

DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972134 .SD RUN - 1

UNCALIBRATED.
MASS

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 10 MINS 56 SECS	11432.6800	50309.9300	0.0000	0.0000
198.00	0 HRS 13 MINS 40 SECS	8064.8740	117134.5000	0.0000	0.0000
212.00	0 HRS 15 MINS 34 SECS	4566.4060	104300.6000	0.0000	0.0000



0 HRS 9 MINS 59 SECS

0 HRS 19 MINS 10 SECS

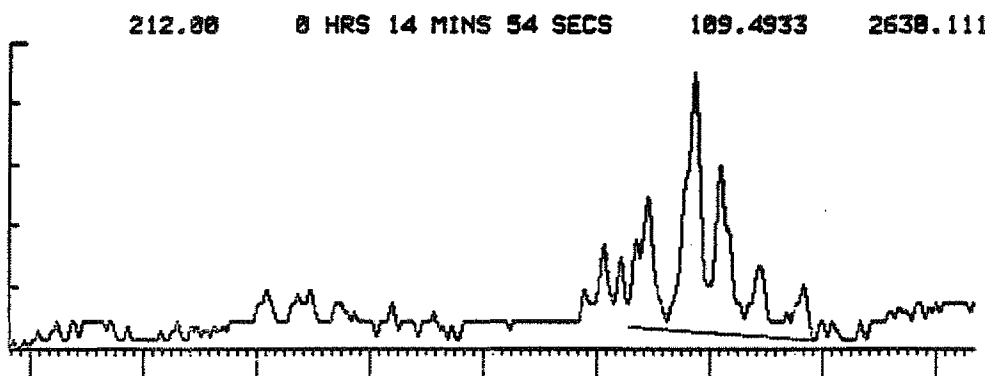
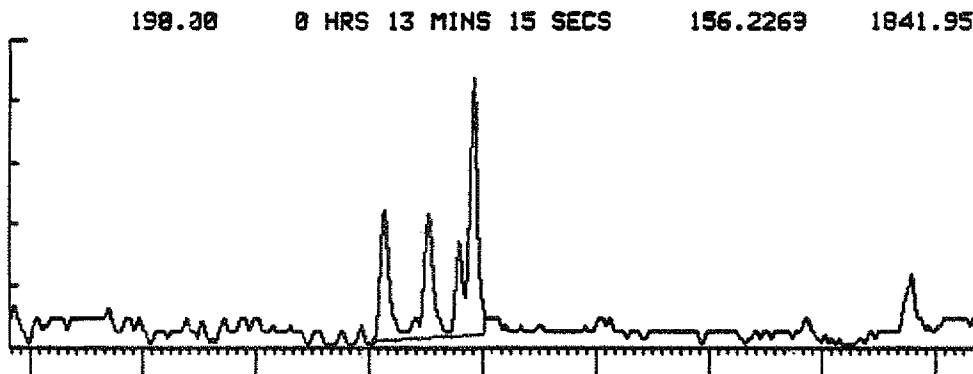
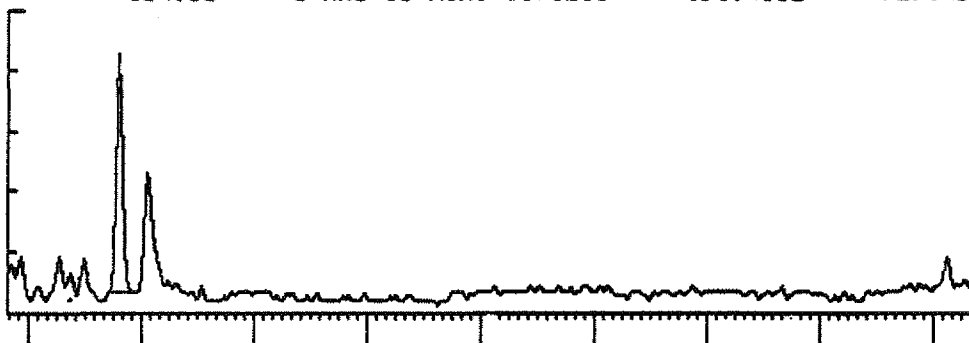
3040-3055m

DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972139 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 10 MINS 30 SECS	191.4062	727.4993	0.0000	0.0000
190.00	0 HRS 13 MINS 15 SECS	156.2269	1841.9530	0.0000	0.0000
212.00	0 HRS 14 MINS 54 SECS	109.4933	2630.1110	0.0000	0.0000



0 HRS 9 MINS 49 SECS

0 HRS 10 MINS 1 SECS

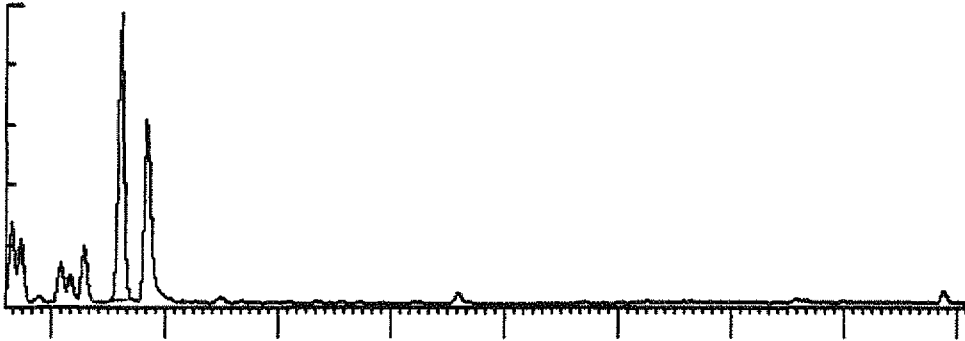
3115-3130m

FIGURE 13e AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
DIBENZOTHIOPHENE SERIES

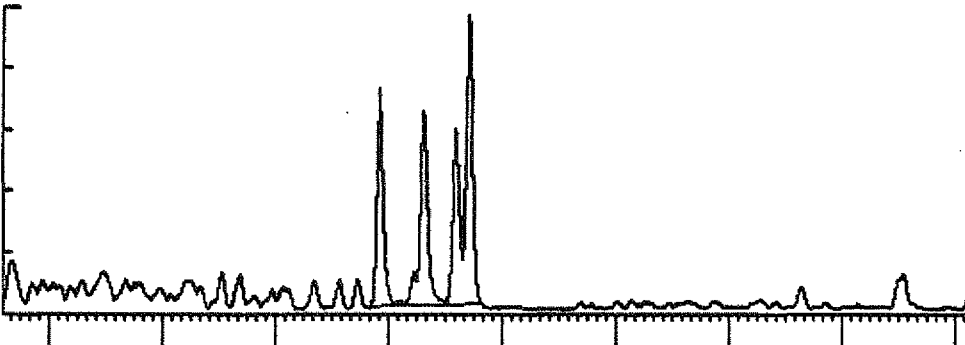
SIR REPORT. FILE - 972142 .SD RUN - 1

UNCALIBRATED.

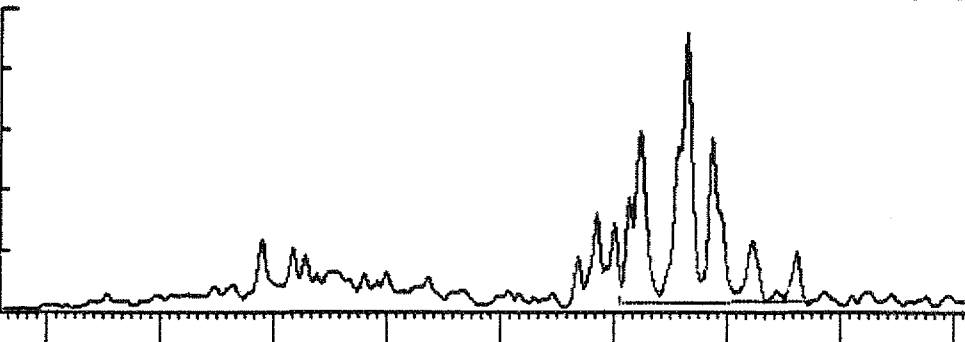
MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 10 MINS 28 SECS	2050.7010	6821.2430	0.0000	0.0000



198.00	0 HRS 13 MINS 5 SECS	899.3486	18909.0900	0.0000	0.0000
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212.00	0 HRS 14 MINS 43 SECS	503.8479	10525.4000	0.0000	0.0000
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0 HRS 9 MINS 36 SECS

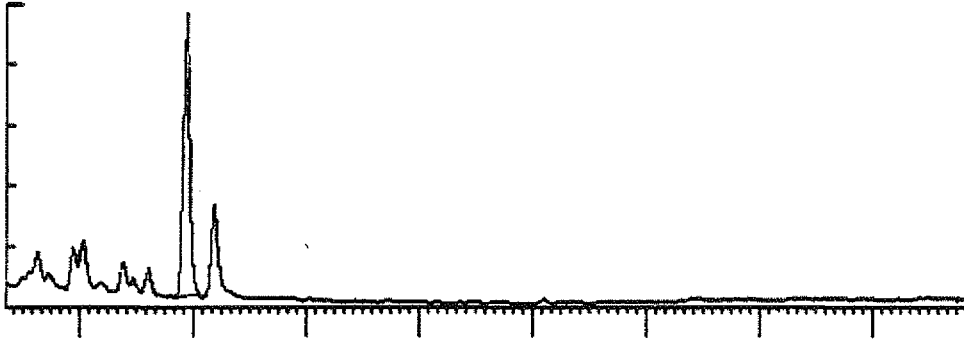
0 HRS 17 MINS 47 SECS

3160-3175m

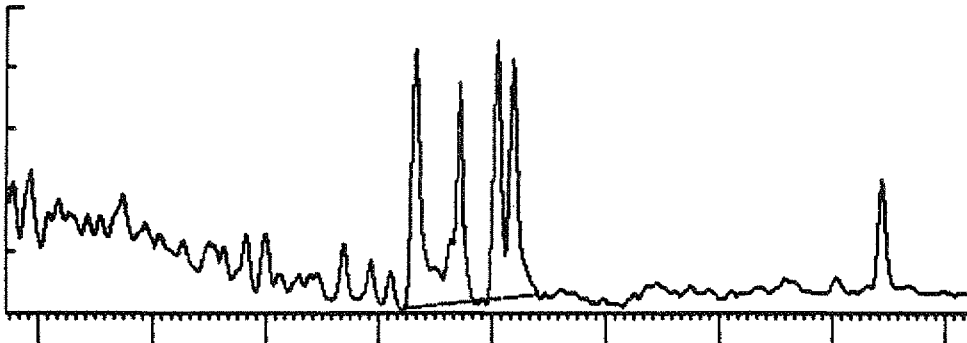
FIGURE 13f AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
 DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972146 .SD RUN - 1

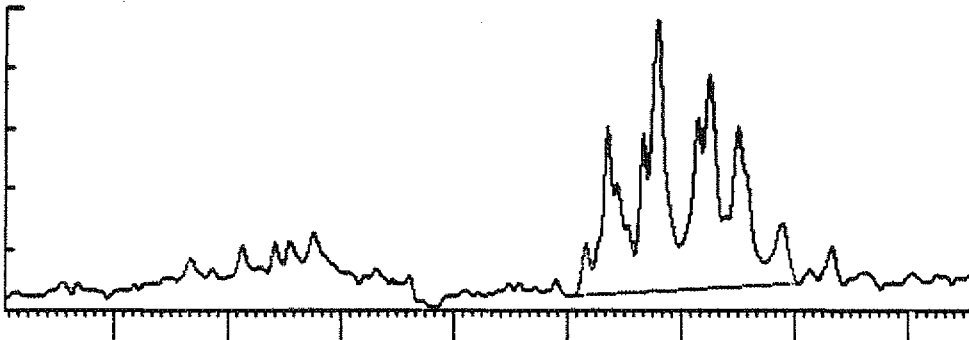
UNCALIBRATED. MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.30	0 HRS 10 MINS 41 SECS	2924.4780	10649.9700	0.0000	0.0000



198.30	0 HRS 13 MINS 21 SECS	361.9140	7201.8000	0.0000	0.0000
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212.30	0 HRS 14 MINS 53 SECS	364.4464	13335.3400	0.0000	0.0000
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0 HRS 10 MINS 3 SECS

0 HRS 18 MINS 14 SECS

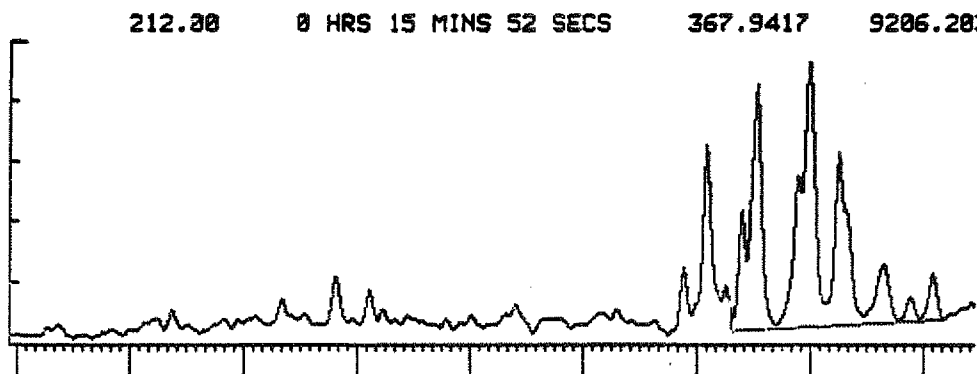
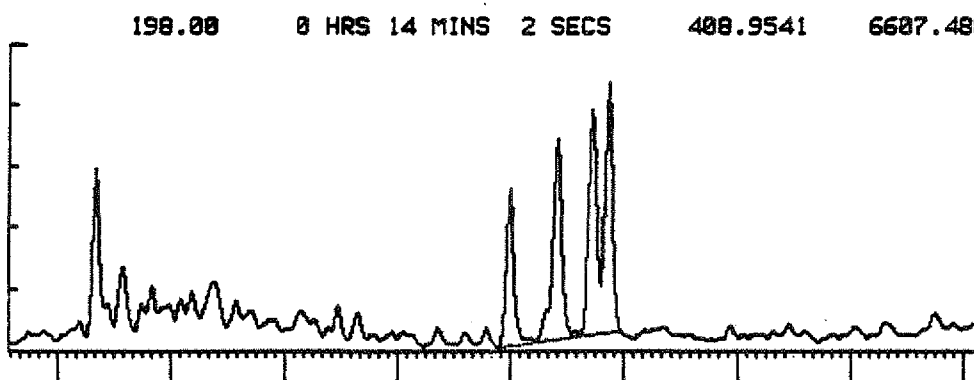
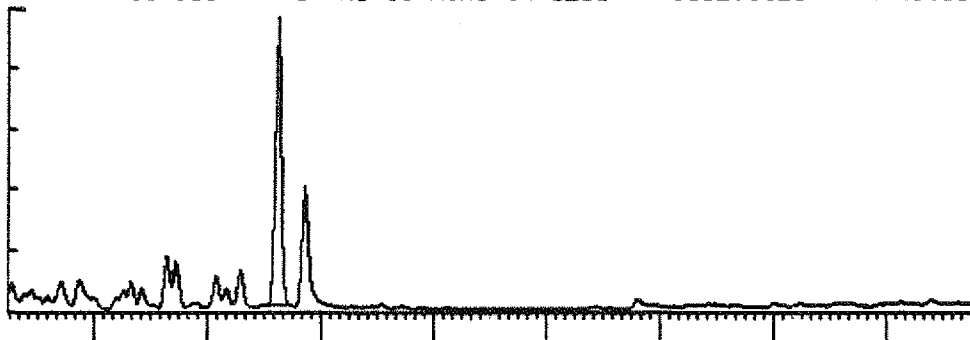
3205-3219m

DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972158 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 11 MINS 14 SECS	1632.8120	5489.9930	0.0000	0.0000
198.00	0 HRS 14 MINS 2 SECS	408.9541	6607.4800	0.0000	0.0000
212.00	0 HRS 15 MINS 52 SECS	367.9417	9206.2030	0.0000	0.0000



0 HRS 9 MINS 56 SECS

0 HRS 18 MINS 7 SECS

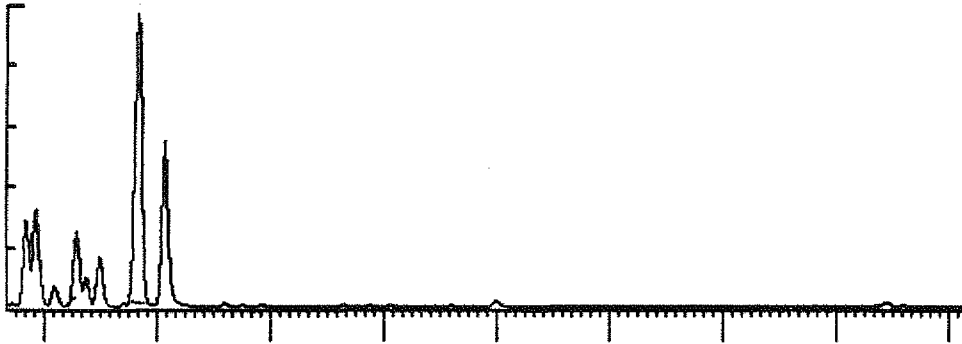
3264-3279m

FIGURE 13h AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
DIBENZOTHIOPHENE SERIES

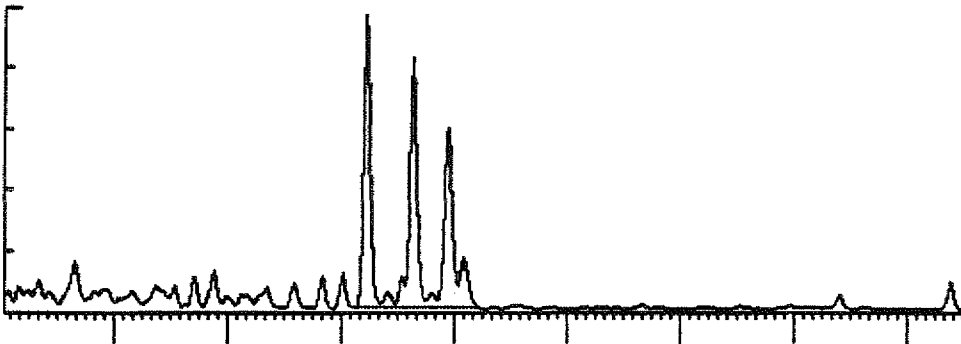
SIR REPORT. FILE - 972153 .SD RUN - 1

UNCALIBRATED.
MASS

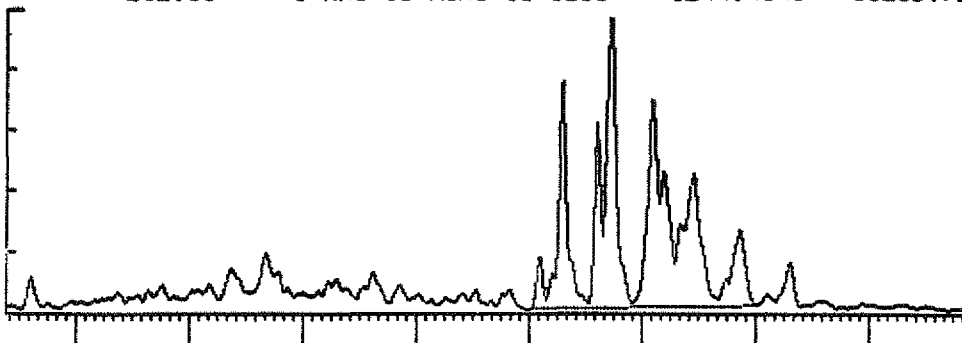
RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00 0 HRS 11 MINS 39 SECS	11867.1800	48877.4400	0.0000	0.0000



198.00 0 HRS 13 MINS 42 SECS	4248.1600	50193.5600	0.0000	0.0000
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212.00 0 HRS 15 MINS 53 SECS	1244.4840	33239.7900	0.0000	0.0000
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0 HRS 11 MINS 22 SECS

0 HRS 19 MINS 34 SECS

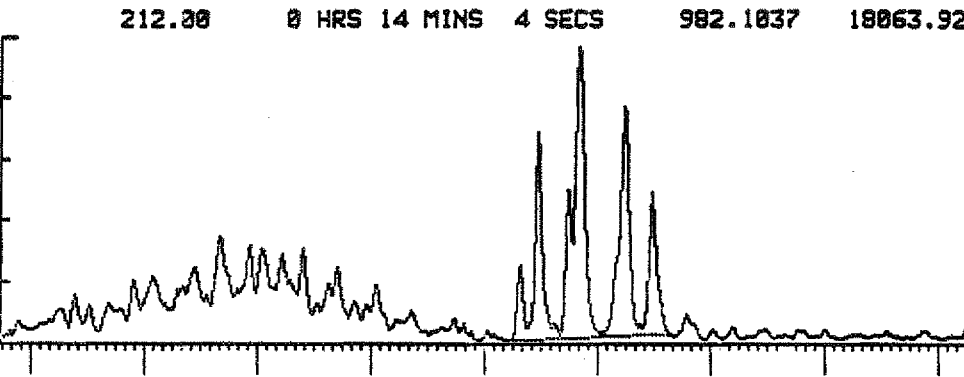
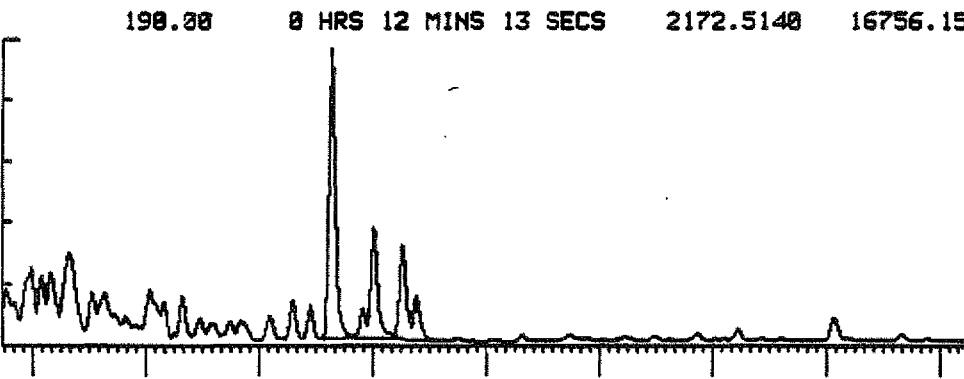
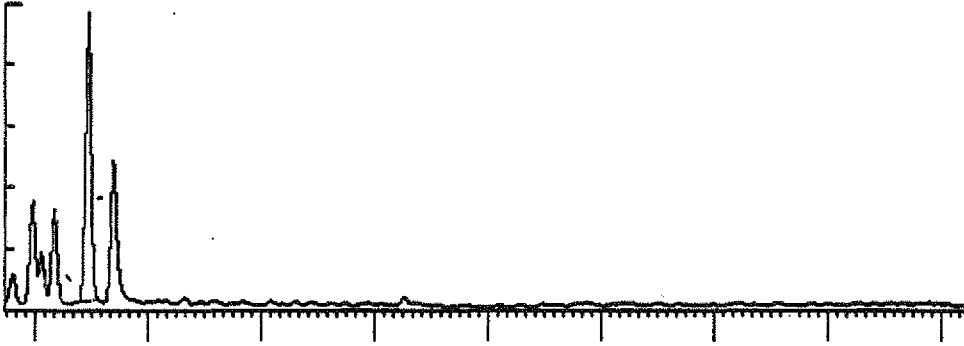
3399-3414m

DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972169 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 10 MINS 22 SECS	3074.2100	10046.2400	0.0000	0.0000
190.00	0 HRS 12 MINS 13 SECS	2172.5140	16756.1500	0.0000	0.0000
212.00	0 HRS 14 MINS 4 SECS	982.1037	18063.9200	0.0000	0.0000



0 HRS 9 MINS 44 SECS

0 HRS 17 MINS 56 SECS

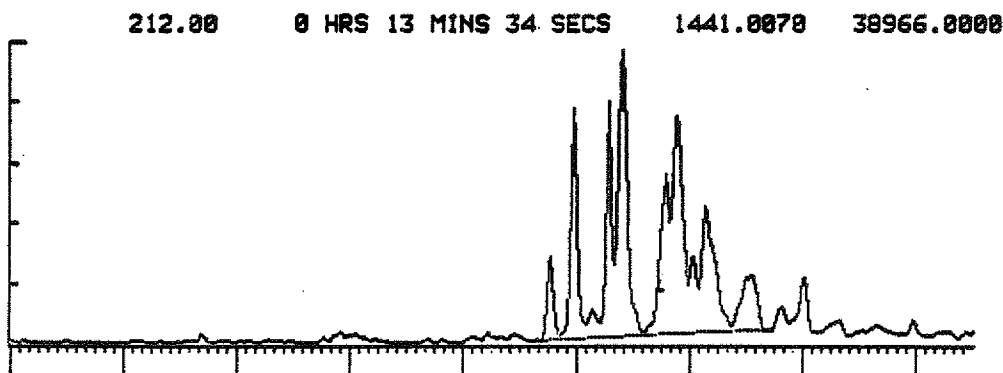
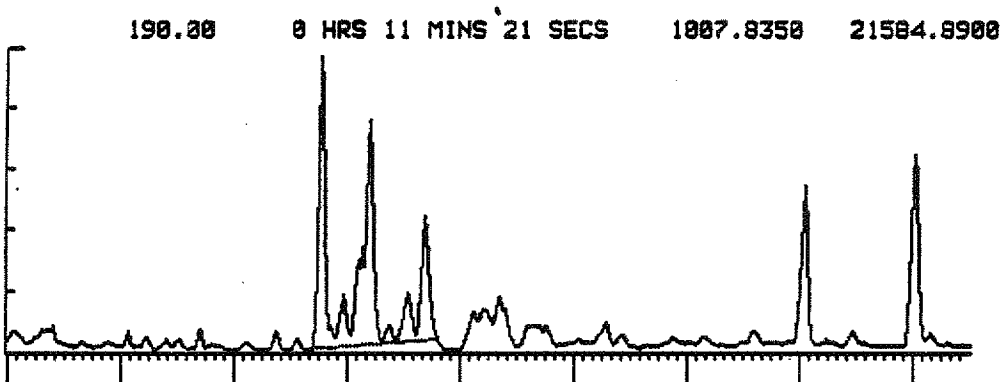
3639-3654m

DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972182 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 9 MINS 25 SECS	12105.0100	41032.4400	0.0000	0.0000
190.00	0 HRS 11 MINS 21 SECS	1007.8350	21584.8900	0.0000	0.0000
212.00	0 HRS 13 MINS 34 SECS	1441.0070	38966.0000	0.0000	0.0000



0 HRS 0 MINS 60 SECS

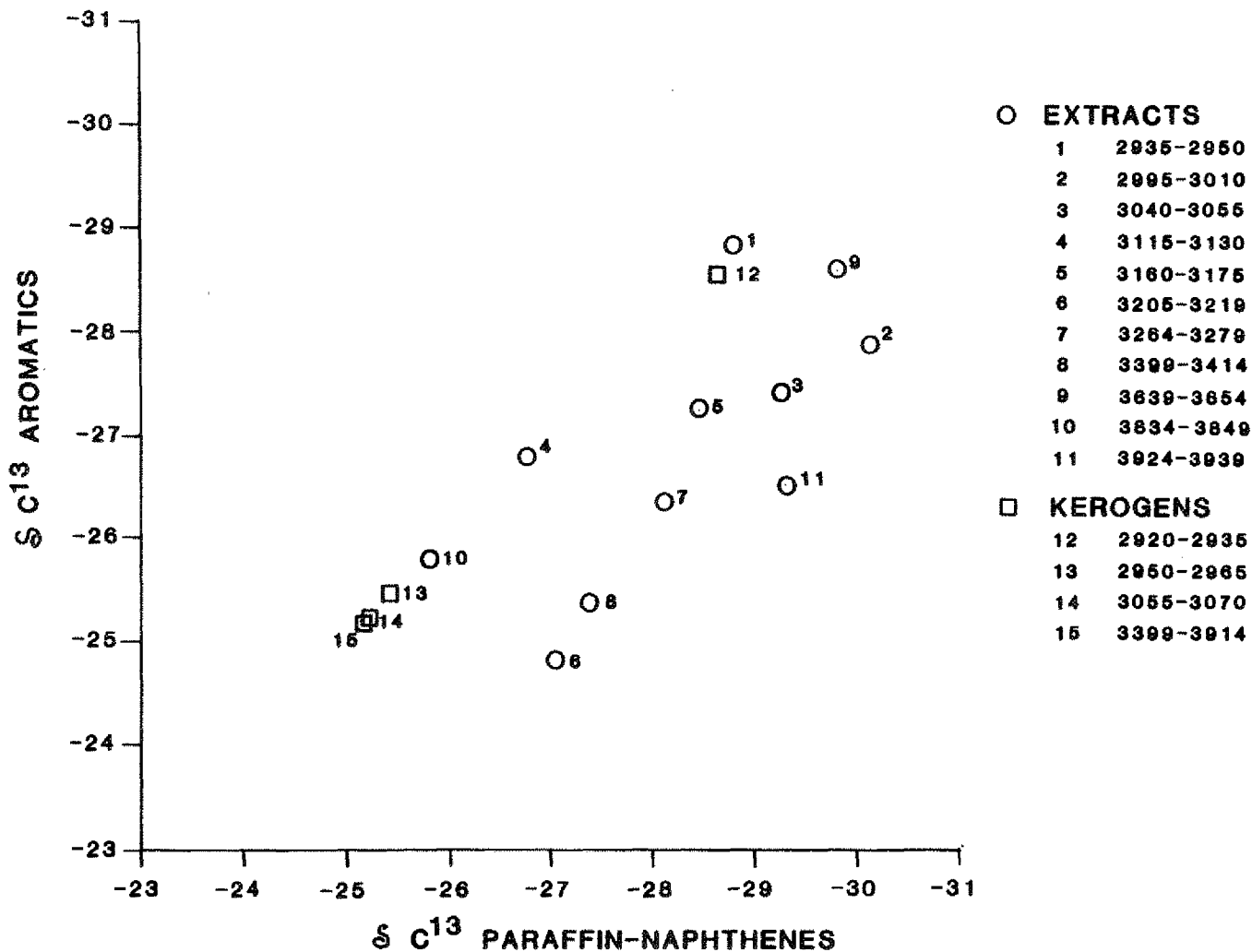
0 HRS 17 MINS 11 SECS

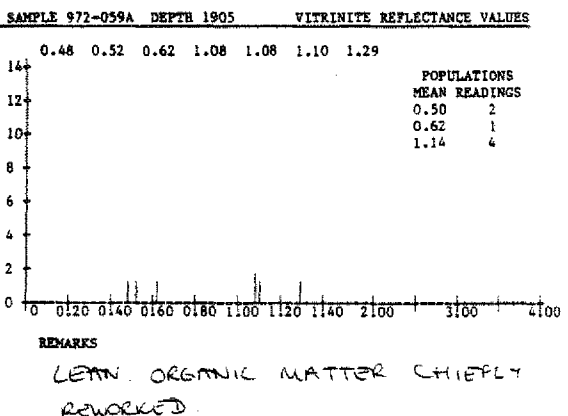
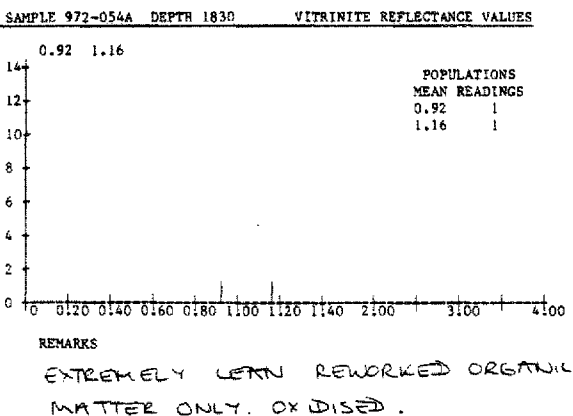
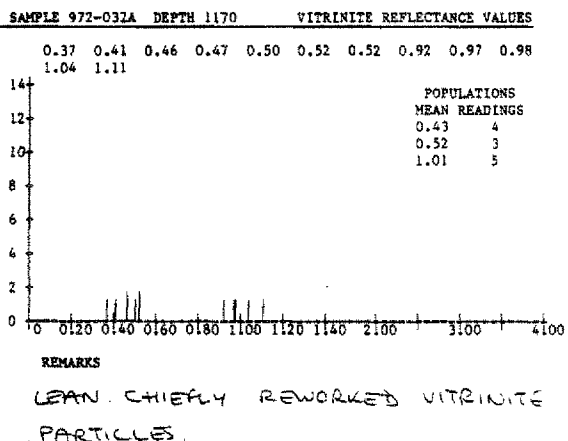
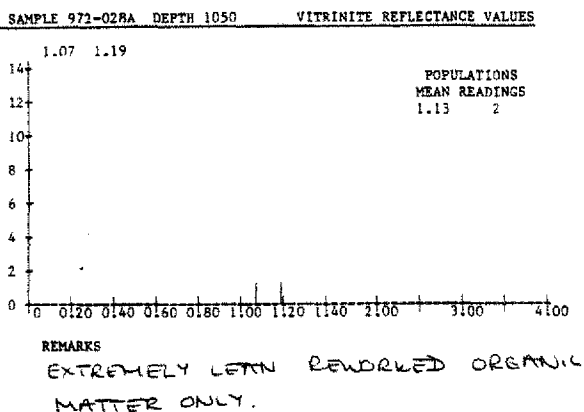
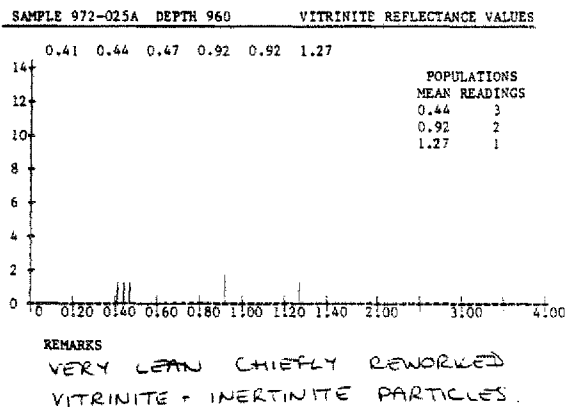
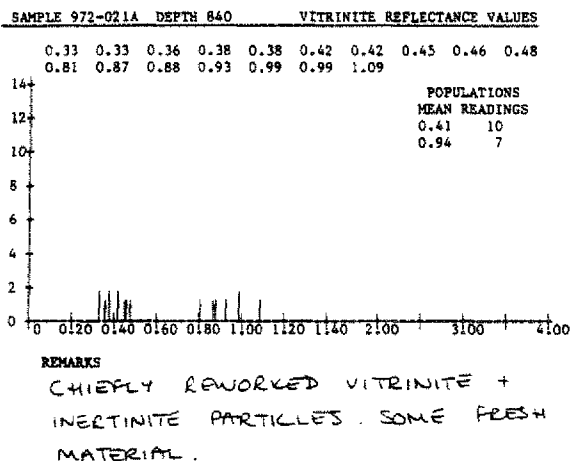
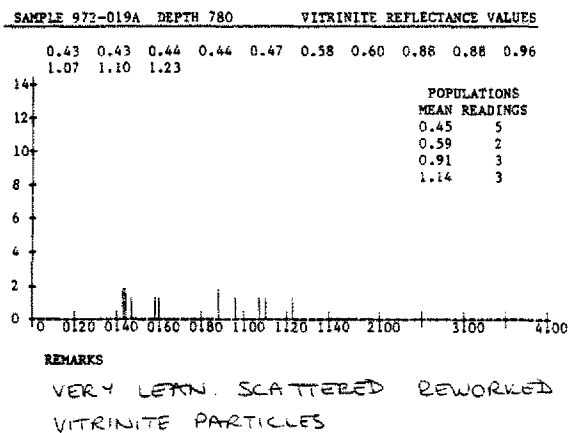
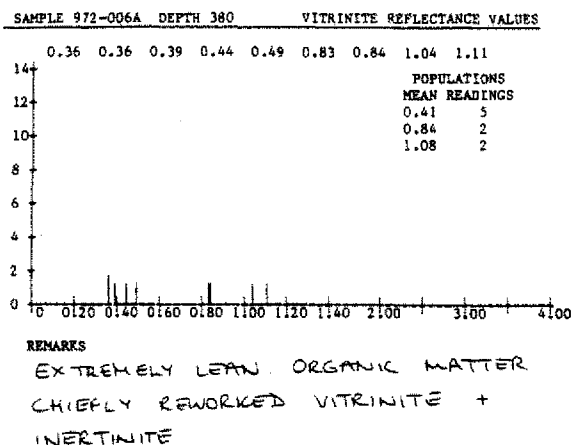
3834-3849m

FIGURE 14

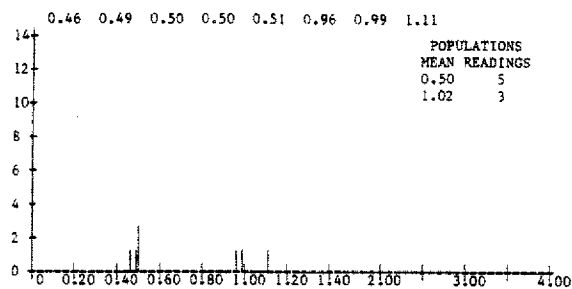
CARBON ISOTOPES
(‰, PDB)

WELL 34/10-21



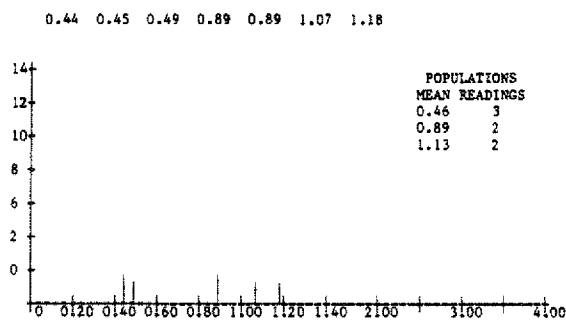


SAMPLE 972-066A DEPTH 2005 VITRINITE REFLECTANCE VALUES



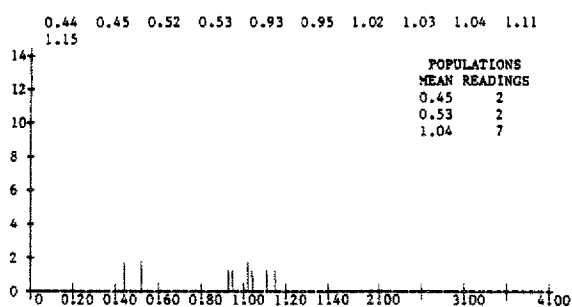
REMARKS
EXTREMELY LEAN MILD OXIDATION
OBSERVED.

SAMPLE 972-072A DEPTH 2095 VITRINITE REFLECTANCE VALUES



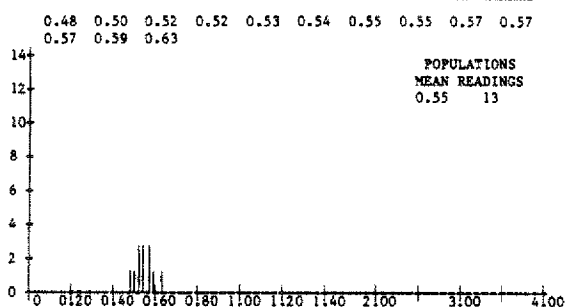
REMARKS
ORGANIC MATTER SPARSE +
CHIEFLY REWORKED MILD OXIDATION

SAMPLE 972-080A DEPTH 2230 VITRINITE REFLECTANCE VALUES



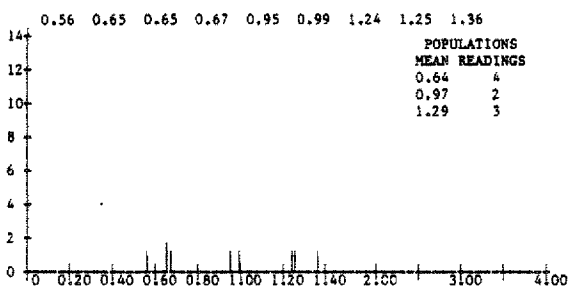
REMARKS
CHIEFLY SMALL, SCATTERED
REWORKED VITRINITE + INERTINITE
PARTICLES FAIRLY LEAN.

SAMPLE 972-084A DEPTH 2290 VITRINITE REFLECTANCE VALUES



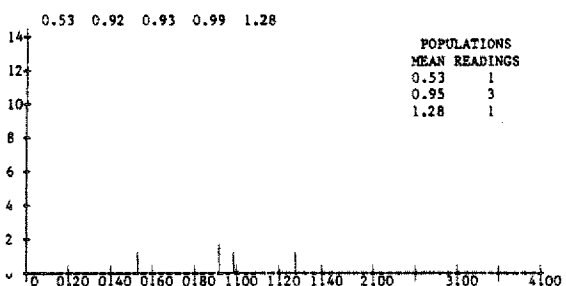
REMARKS
FAIRLY LEAN, SMALL, SCATTERED
VITRINITE PARTICLES.

SAMPLE 972-090A DEPTH 2365 VITRINITE REFLECTANCE VALUES



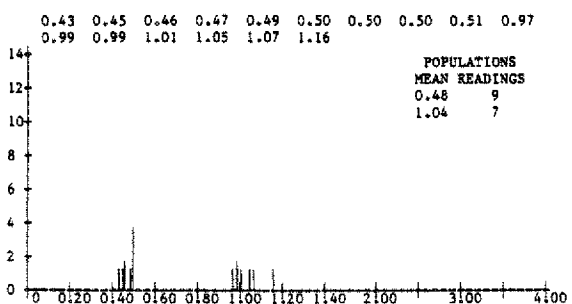
REMARKS
SCATTERED VITRINITE PARTICLES -
CHIEFLY REWORKED, MINOR INERTINITE

SAMPLE 972-095A DEPTH 2440 VITRINITE REFLECTANCE VALUES



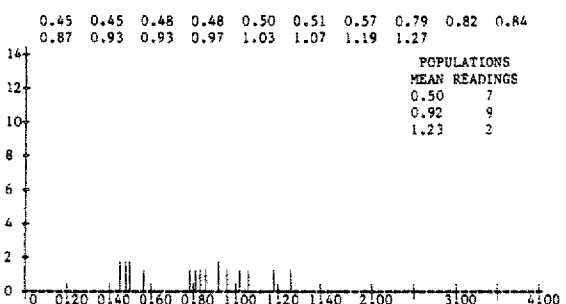
REMARKS
SCATTERED REWORKED VITRINITE +
INERTINITE PARTICLES LEAN.

SAMPLE 972-100A DEPTH 2515 VITRINITE REFLECTANCE VALUES



REMARKS
FAIRLY LEAN, PARTICLES CHIEFLY
REWORKED MINOR INERTINITE.

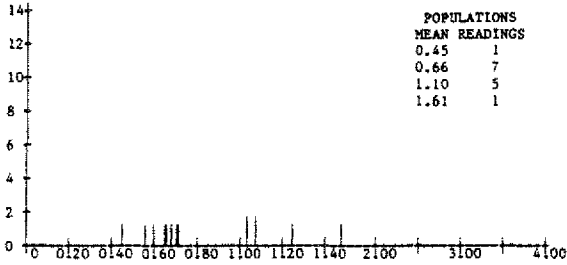
SAMPLE 972-103A DEPTH 2575 VITRINITE REFLECTANCE VALUES



REMARKS
SCATTERED VITRINITE PARTICLES -
CHIEFLY REWORKED.

SAMPLE 972-107A DEPTH 2435 VITRINITE REFLECTANCE VALUES

0.45 0.56 0.60 0.65 0.66 0.68 0.71 0.72 1.04 1.04
1.08 1.09 1.25 1.61



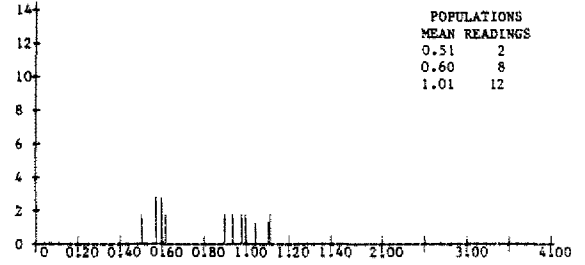
POPULATIONS	
MEAN READINGS	
0.45	1
0.66	7
1.10	5
1.61	1

REMARKS

SPARSE VITRINITE PARTICLES MAINLY REWORKED.

SAMPLE 972-113A DEPTH 2725 VITRINITE REFLECTANCE VALUES

0.50 0.51 0.57 0.57 0.57 0.60 0.61 0.61 0.62 0.63
0.90 0.91 0.94 0.94 0.98 0.99 1.00 1.01 1.05 1.11
1.12 1.13



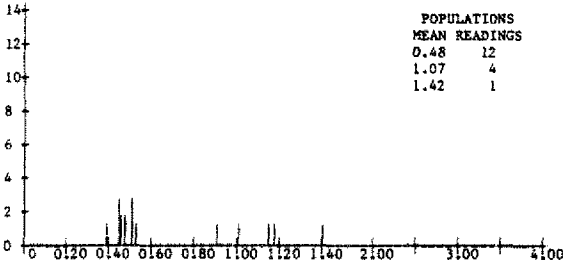
POPULATIONS	
MEAN READINGS	
0.51	2
0.60	8
1.01	12

REMARKS

VITRINITE PARTICLES COMMONLY REWORKED.

SAMPLE 972-118B DEPTH 2800 VITRINITE REFLECTANCE VALUES

0.39 0.45 0.45 0.45 0.46 0.46 0.48 0.49 0.51 0.51
0.51 0.53 0.91 1.01 1.15 1.18 1.42



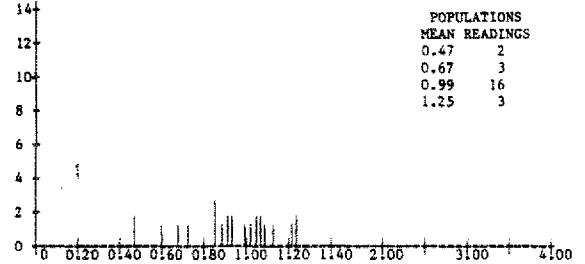
POPULATIONS	
MEAN READINGS	
0.48	12
1.07	4
1.42	1

REMARKS

ORGANIC MATTER CHIEFLY REWORKED

SAMPLE 972-123A DEPTH 2875 VITRINITE REFLECTANCE VALUES

0.47 0.47 0.60 0.68 0.73 0.86 0.86 0.87 0.89 0.92
0.92 0.94 0.95 1.00 1.03 1.06 1.07 1.08 1.09 1.10
1.14 1.23 1.25 1.25



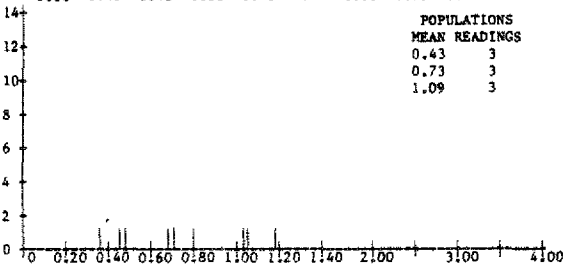
POPULATIONS	
MEAN READINGS	
0.47	2
0.67	3
0.99	16
1.25	3

REMARKS

VERY LARGELY REWORKED. SIGNIFICANT VARIATION IN REFLECTANCE APPARENT.

SAMPLE 972-126B DEPTH 2920 VITRINITE REFLECTANCE VALUES

0.36 0.45 0.48 0.68 0.71 0.80 1.03 1.05 1.18



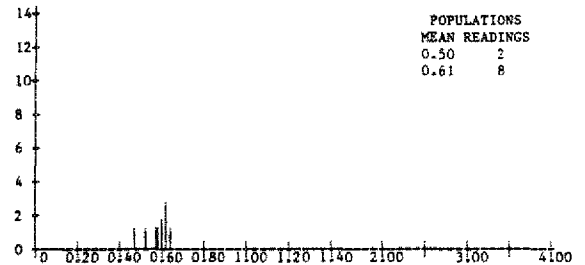
POPULATIONS	
MEAN READINGS	
0.43	3
0.73	3
1.09	3

REMARKS

DOMINANTLY ALGAL/AMORPHOUS. SIGNIFICANT INERTINITE + VITRINITE OF VARIABLE R_o.

SAMPLE 972-128A DEPTH 2950 VITRINITE REFLECTANCE VALUES

0.47 0.52 0.57 0.58 0.60 0.61 0.62 0.62 0.63 0.64



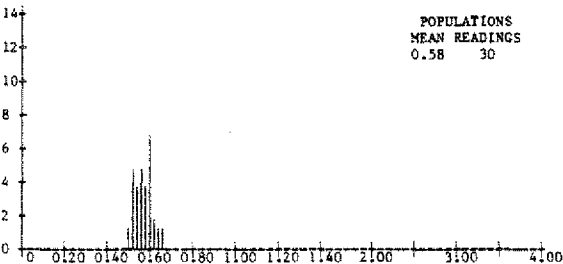
POPULATIONS	
MEAN READINGS	
0.50	2
0.61	8

REMARKS

LEWY MACERAL IDENTIFICATION DIFFICULT.

SAMPLE 972-131B DEPTH 2995 VITRINITE REFLECTANCE VALUES

0.50 0.52 0.52 0.52 0.53 0.53 0.54 0.55 0.55 0.55
0.56 0.56 0.56 0.57 0.57 0.58 0.58 0.59 0.59 0.60
0.60 0.60 0.60 0.61 0.61 0.61 0.62 0.62 0.64 0.66



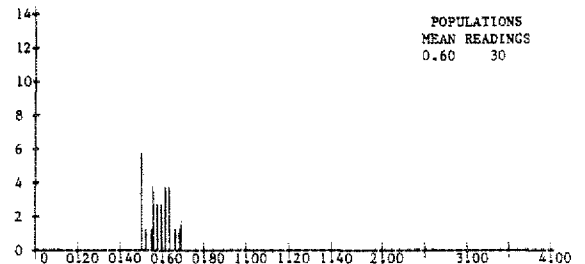
POPULATIONS	
MEAN READINGS	
0.58	30

REMARKS

INERTINITE DOMINANT. SIGNIFICANT FRESH VITRINITE.

SAMPLE 972-135A DEPTH 3055 VITRINITE REFLECTANCE VALUES

0.50 0.50 0.50 0.51 0.51 0.51 0.52 0.55 0.56 0.57
0.57 0.57 0.58 0.59 0.59 0.60 0.60 0.61 0.62 0.62
0.62 0.63 0.64 0.65 0.65 0.65 0.67 0.69 0.70 0.70



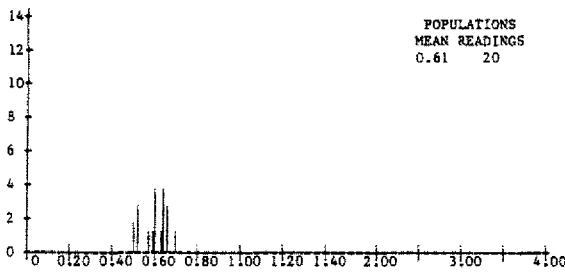
POPULATIONS	
MEAN READINGS	
0.60	30

REMARKS

MACERAL IDENTIFICATION DIFFICULT. RATHER VARIABLE VITRINITE REFLECTANCE APPARENT.

SAMPLE 972-138A DEPTH 3100 VITRINITE REFLECTANCE VALUES

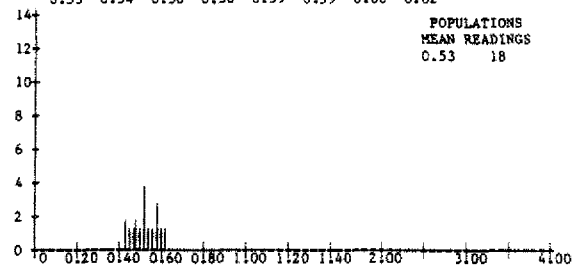
0.50	0.50	0.52	0.52	0.53	0.57	0.59	0.60	0.60	0.61
0.61	0.63	0.64	0.64	0.65	0.65	0.66	0.66	0.67	0.70



REMARKS
FAIRLY RICH. VITRINITE DOMINANT.
SIGNIFICANT INERTINITE

SAMPLE 972-143A DEPTH 3175 VITRINITE REFLECTANCE VALUES

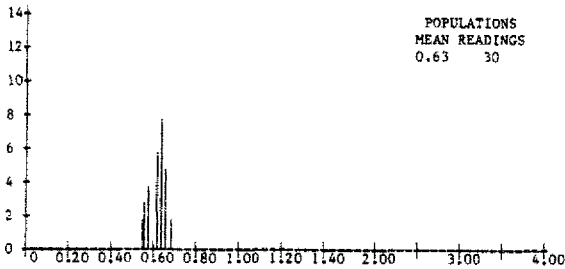
0.43	0.43	0.45	0.47	0.48	0.48	0.50	0.52	0.53	0.53
0.53	0.54	0.56	0.58	0.59	0.59	0.60	0.62		



REMARKS
FAIRLY RICH. VITRINITE DOMINANT
MILD OXIDATION OBSERVED.

SAMPLE 972-148A DEPTH 3234 VITRINITE REFLECTANCE VALUES

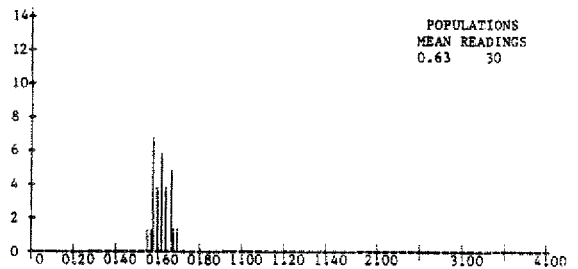
0.55	0.55	0.56	0.57	0.57	0.58	0.58	0.59	0.59	0.62
0.62	0.63	0.63	0.63	0.63	0.64	0.64	0.64	0.64	0.64
0.64	0.65	0.65	0.66	0.66	0.66	0.66	0.67	0.69	0.69



REMARKS
INERTINITE DOMINANT. SIGNIFICANT
VITRINITE.

SAMPLE 972-151B DEPTH 3339 VITRINITE REFLECTANCE VALUES

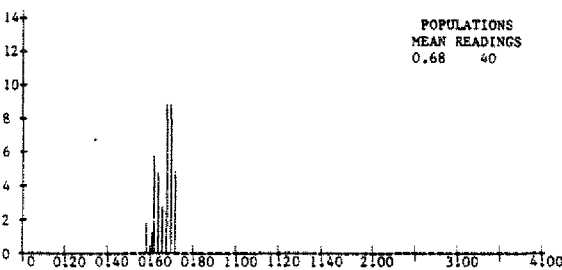
0.55	0.57	0.58	0.58	0.59	0.59	0.59	0.59	0.59	0.60
0.60	0.61	0.61	0.62	0.62	0.63	0.63	0.63	0.63	0.64
0.65	0.65	0.65	0.67	0.67	0.67	0.67	0.67	0.68	0.70



REMARKS
INERTINITE DOMINANT. SIGNIFICANT
VITRINITE.

SAMPLE 972-153A DEPTH 3399 VITRINITE REFLECTANCE VALUES

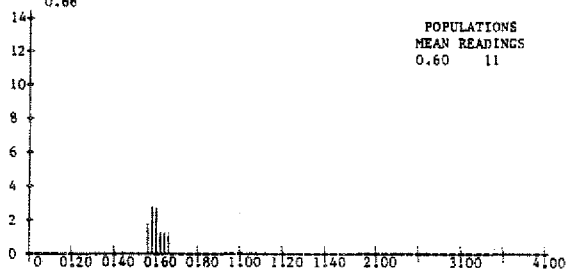
0.58	0.59	0.61	0.62	0.62	0.62	0.62	0.63	0.63	0.64
0.64	0.64	0.65	0.65	0.66	0.66	0.66	0.68	0.68	0.68
0.68	0.69	0.69	0.69	0.69	0.69	0.70	0.70	0.70	0.70
0.70	0.71	0.71	0.71	0.71	0.72	0.72	0.72	0.72	0.72



REMARKS
INERTINITE DOMINANT. SIGNIFICANT
VITRINITE. MILD OXIDATION.

SAMPLE 972-157A DEPTH 3459 VITRINITE REFLECTANCE VALUES

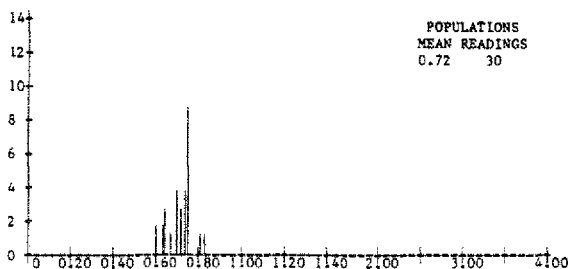
0.56	0.56	0.58	0.58	0.59	0.60	0.60	0.61	0.62	0.64
0.66									



REMARKS
LEAN. CHIEFLY INERTINITE. MINOR
VITRINITE PARTICLES.

SAMPLE 972-159B DEPTH 3489 VITRINITE REFLECTANCE VALUES

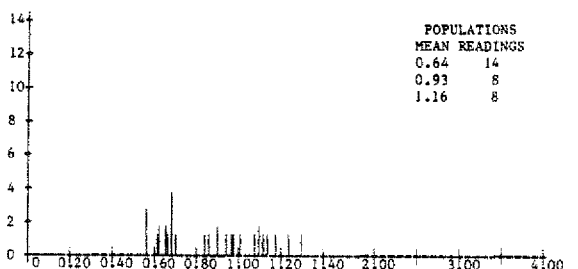
0.60	0.61	0.63	0.63	0.64	0.65	0.65	0.67	0.70	0.70
0.71	0.71	0.72	0.73	0.73	0.74	0.74	0.74	0.74	0.75
0.75	0.75	0.75	0.75	0.76	0.76	0.77	0.77	0.81	0.83



REMARKS
VITRINITE DOMINANT. SIGNIFICANT
INERTINITE + MINOR EXINITE.

SAMPLE 972-163A DEPTH 3549 VITRINITE REFLECTANCE VALUES

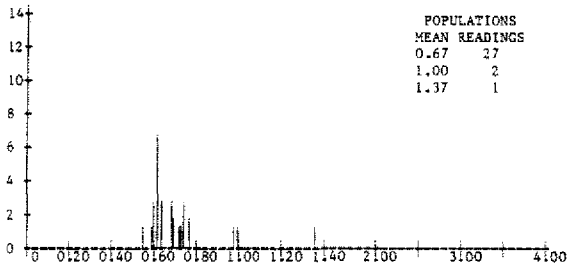
0.56	0.56	0.56	0.61	0.62	0.62	0.65	0.65	0.66	0.68
0.69	0.69	0.69	0.70	0.84	0.86	0.90	0.90	0.94	0.97
0.98	1.01	1.08	1.10	1.10	1.12	1.14	1.18	1.24	1.30



REMARKS
FAIRLY RICH. CHIEFLY REWORKED +
INERTINITE MATERIAL. MINOR
VITRINITE

SAMPLE 972-166A DEPTH 3594 VITRINITE REFLECTANCE VALUES

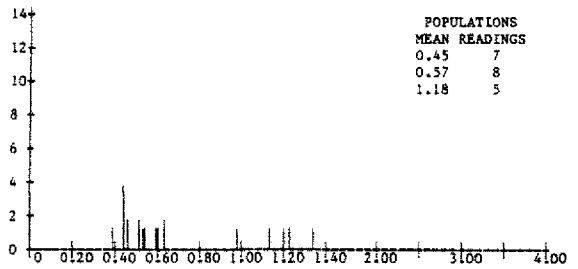
0.55	0.59	0.60	0.61	0.61	0.62	0.62	0.62	0.62	0.62
0.63	0.63	0.64	0.64	0.65	0.69	0.69	0.69	0.70	0.70
0.73	0.74	0.75	0.76	0.77	0.78	0.79	0.99	1.01	1.37



REMARKS
CHIEFLY RENORDED VITRINITE +
INERTINITE PARTICLES

SAMPLE 972-170A DEPTH 3694 VITRINITE REFLECTANCE VALUES

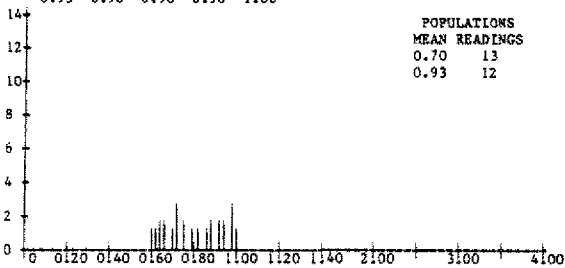
0.39	0.44	0.45	0.45	0.45	0.46	0.46	0.51	0.51	0.53
0.54	0.59	0.60	0.63	0.63	0.98	1.13	1.20	1.23	1.34



REMARKS
INERTINITE + RENORDED MATERIAL
DOMINANT. MINOR VITRINITE.

SAMPLE 972-174A DEPTH 3714 VITRINITE REFLECTANCE VALUES

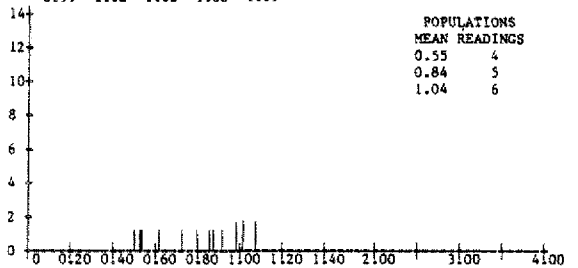
0.60	0.62	0.64	0.65	0.66	0.67	0.70	0.72	0.72	0.73
0.75	0.75	0.79	0.82	0.86	0.88	0.88	0.92	0.92	0.94
0.95	0.98	0.98	0.98	1.00					



REMARKS
ORGANIC MATTER FINELY COMMUNITED.
SCATTERED UNAFFECTED PARTICLES
WITH HIGH REFLECTANCE

SAMPLE 972-178A DEPTH 3774 VITRINITE REFLECTANCE VALUES

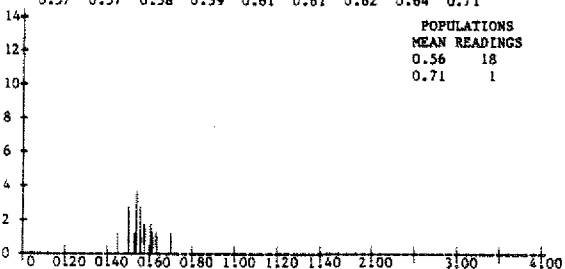
0.50	0.53	0.54	0.62	0.73	0.80	0.86	0.88	0.92	0.99
0.99	1.02	1.02	1.08	1.09					



REMARKS
ORGANIC MATTER FINELY COMMUNITED.
MINOR UNAFFECTED PARTICLES.

SAMPLE 972-182A DEPTH 3834 VITRINITE REFLECTANCE VALUES

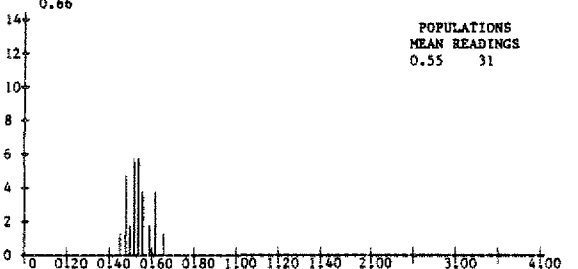
0.45	0.50	0.50	0.50	0.53	0.54	0.54	0.54	0.55	0.56
0.57	0.57	0.58	0.59	0.61	0.61	0.62	0.64	0.71	



REMARKS
VITRINITE PARTICLES SPARSE -
CHIEFLY RENORDED ORGANIC MATTER
FREQUENTLY COMMUNITED.

SAMPLE 972-186A DEPTH 3894 VITRINITE REFLECTANCE VALUES

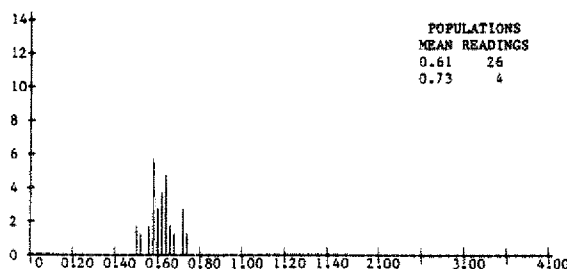
0.45	0.48	0.48	0.48	0.48	0.49	0.50	0.50	0.52	0.52
0.52	0.52	0.53	0.53	0.54	0.54	0.54	0.55	0.55	0.55
0.56	0.56	0.57	0.57	0.59	0.59	0.62	0.63	0.63	0.63
0.66									



REMARKS
FAIRLY RICH VITRINITE PARTICLES
CHIEFLY FRESH SIGNIFICANT INERTINITE

SAMPLE 972-191A DEPTH 3969 VITRINITE REFLECTANCE VALUES

0.50	0.51	0.52	0.56	0.57	0.58	0.58	0.59	0.59	0.59
0.59	0.60	0.61	0.61	0.62	0.62	0.63	0.63	0.64	0.65
0.65	0.65	0.65	0.66	0.67	0.68	0.72	0.73	0.73	0.74



REMARKS
FAIRLY RICH VITRINITE CHIEFLY
RENORDED

FIGURE 16 ORGANIC FACIES & MATURITY WELL 34/10-21

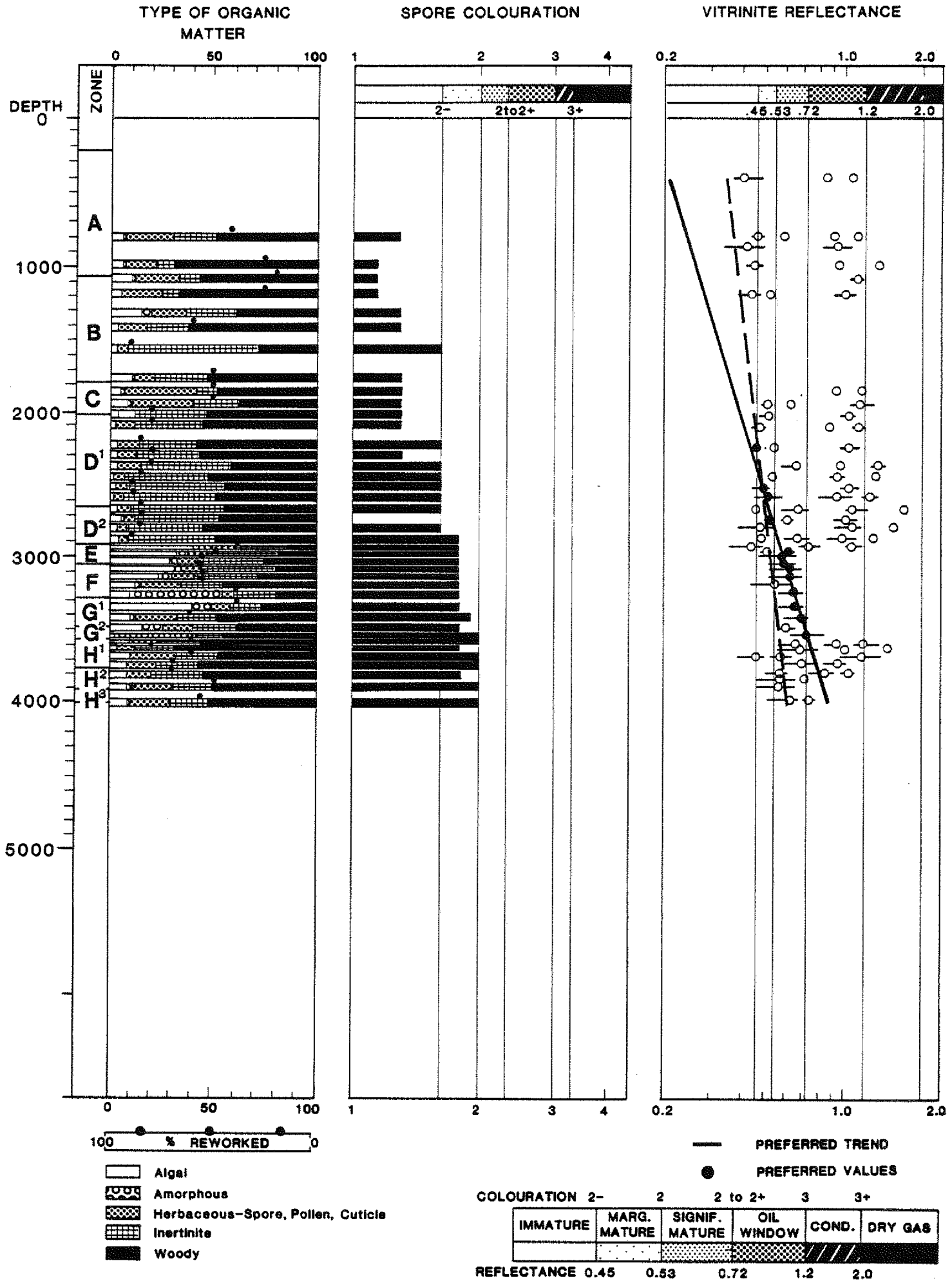


FIGURE 1

RATING

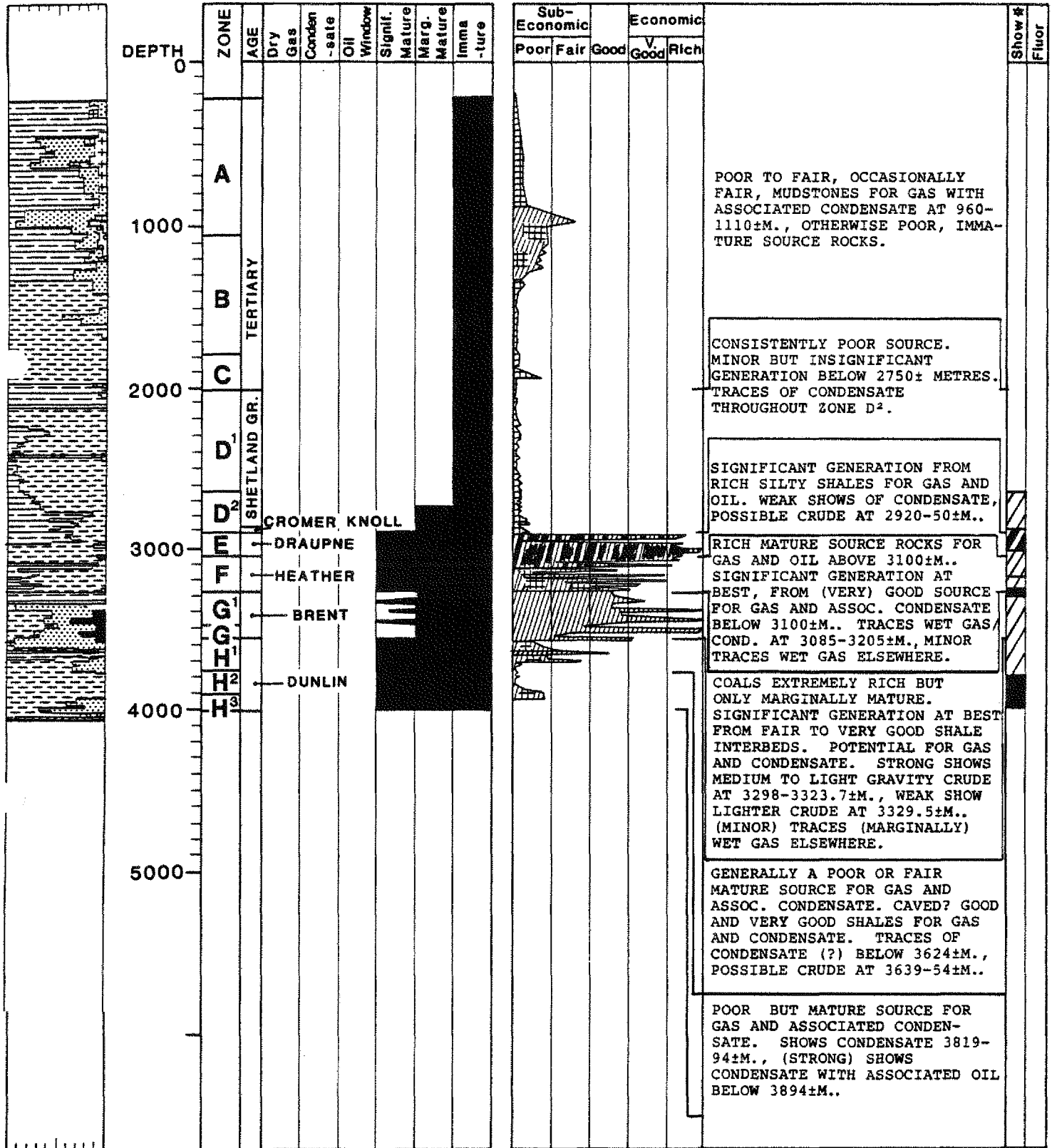
WELL 34/10-21

LITHO % LOG

MATURITY

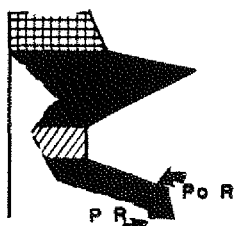
PRESENT AND POTENTIAL RICHNESS

COMMENTS



- Limestone
- Dolomite
- Shale
- Mudstone/Claystone
- Coal

- Siltstone
- Sandstone
- Evaporite
- Igneous
- L.C.M.



- GAS PRONE
- GAS AND CONDENSATE
- OIL PRONE
- Shows Recognised by Analysis
- Po R Potential Richness
- PR Present Richness

FIGURE 2

C₁-C₇ HYDROCARBONS

WELL 34/10-21

C₁ - C₄ HYDROCARBONS

C₅ - C₇₊ HYDROCARBONS

LITHO % LOG
0 50 100

ZONE ABUNDANCE
10² 10³ 10⁴ 10⁵

WETNESS
0 50 100

iC₄/nC₄
-1 1 5

ABUNDANCE
10² 10³ 10⁴ 10⁵

DEPTH
0

POOR FAIR GOOD

DRY WET

POOR FAIR GOOD

0

1000

2000

3000

4000

5000

A

B

C

D¹

D²

E

F

G¹

G²

H¹

H²

H³

4000

5000






0 50 100

10² 10³ 10⁴ 10⁵

0 50 100

-1 1 5

10² 10³ 10⁴ 10⁵

-  Limestone
-  Dolomite
-  Shale
-  Mudstone/Claystone
-  Coal

-  Siltstone
-  Sandstone
-  Evaporite
-  Igneous
-  L.C.M.

iC₄ - ISOBUTANE

nC₄ - NORMAL BUTANE

ABUNDANCE - VOLUME PPM OF ROCK

WETNESS - % C₂-C₄ IN C₁-C₄

FIGURE 3

RICHNESS

WELL 34/10-21

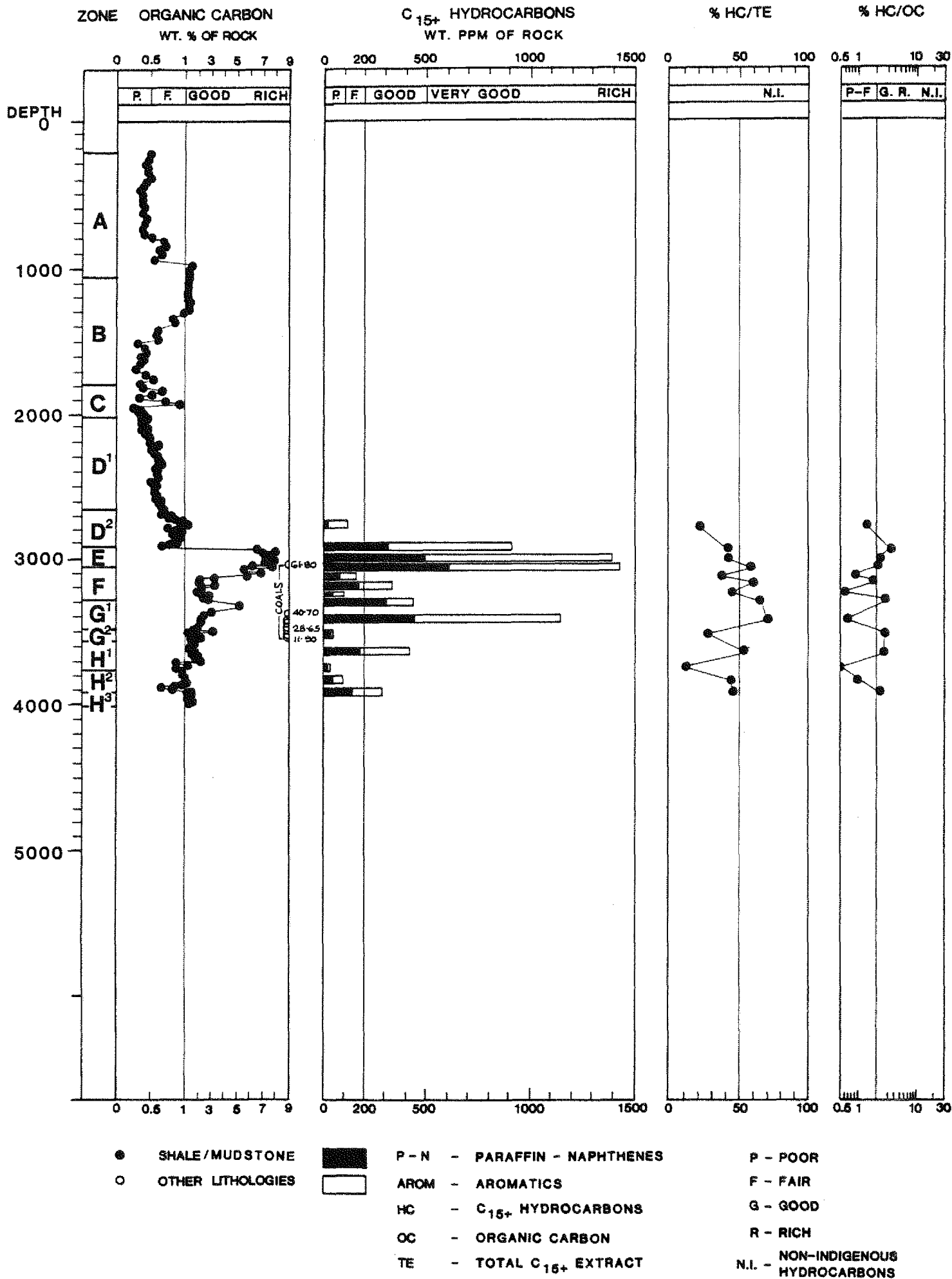
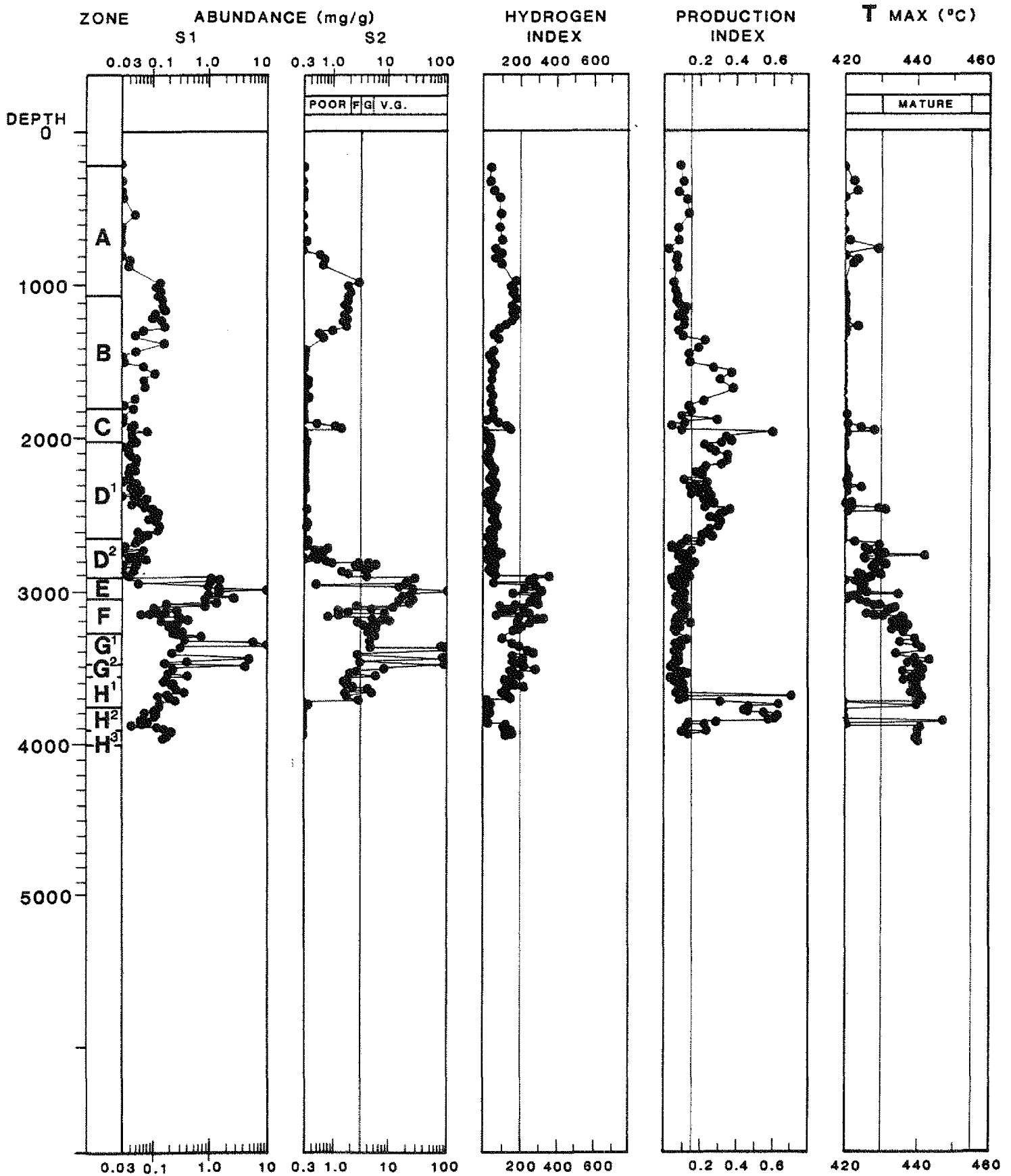


FIGURE 4

ROCKEVAL DATA

WELL 34/10-21



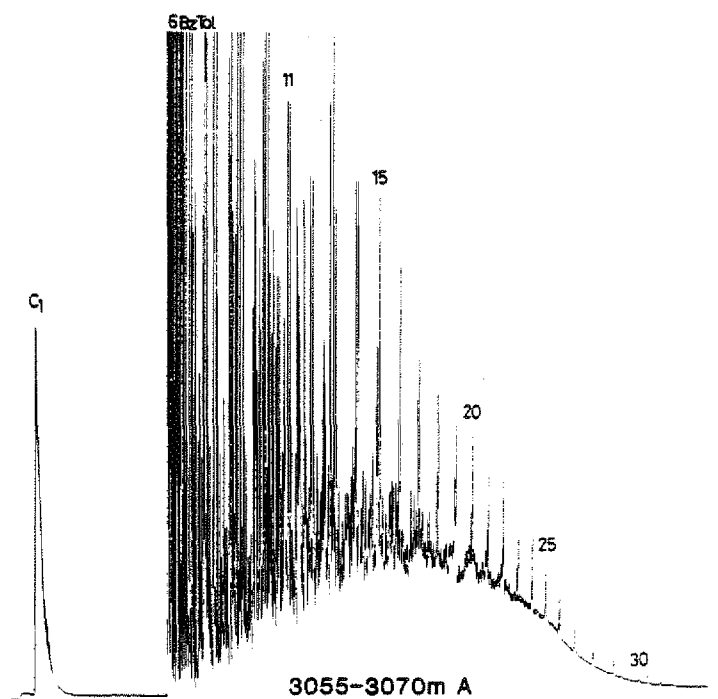
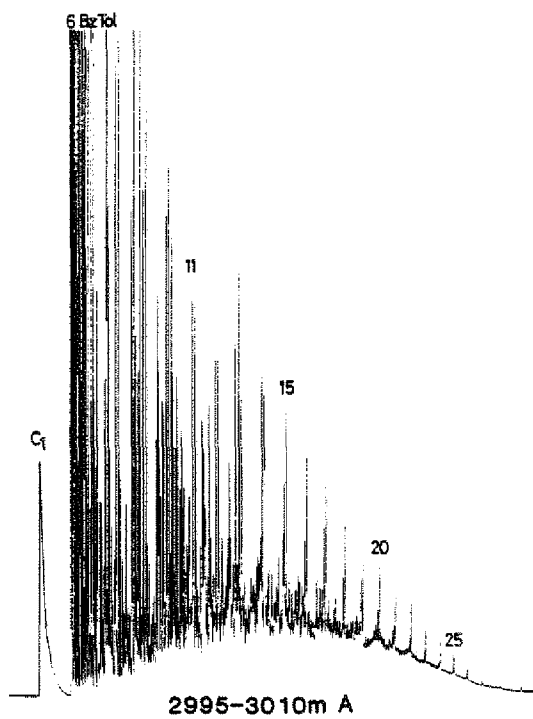
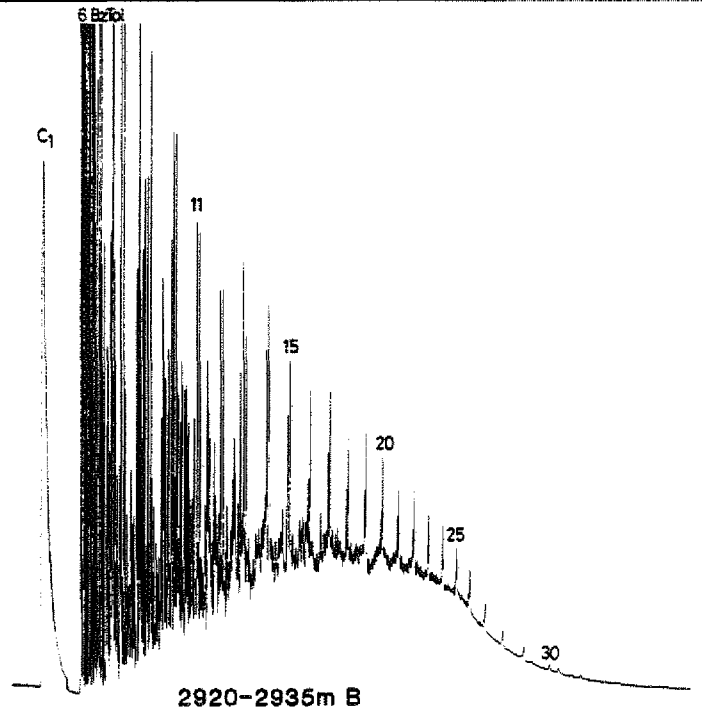
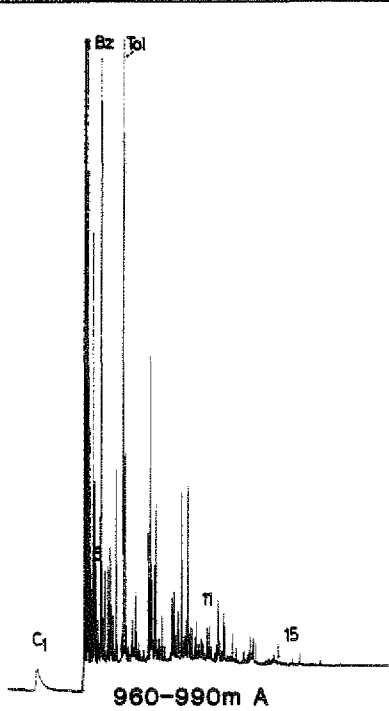
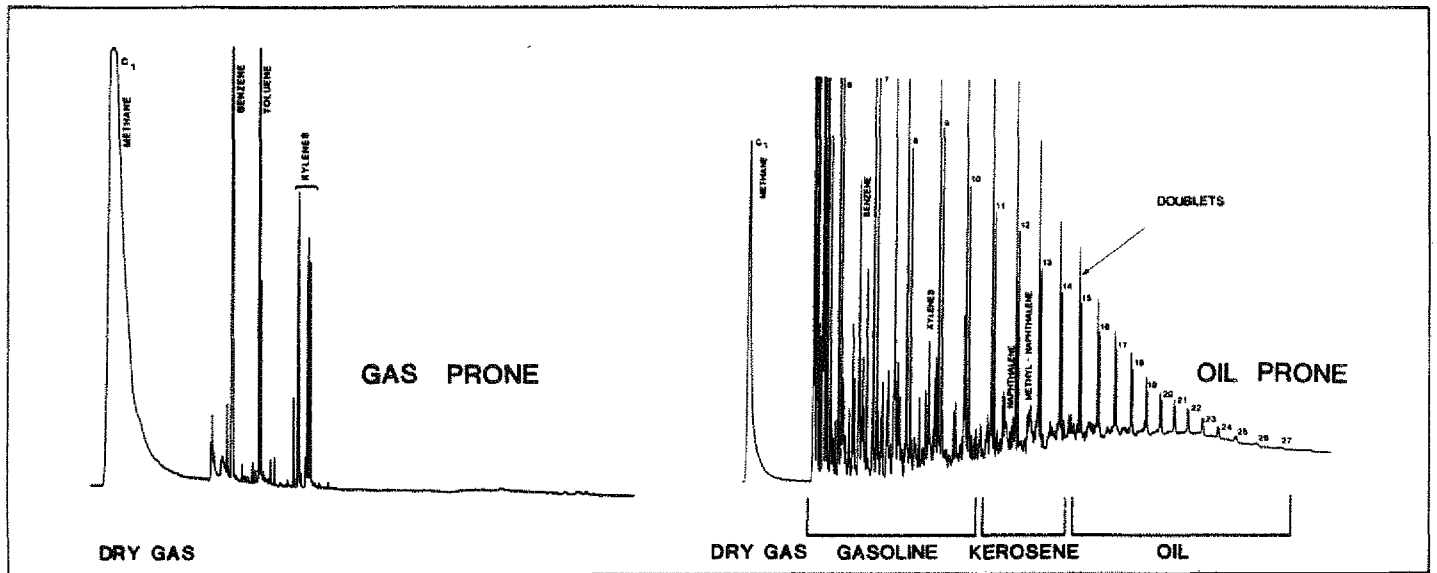


FIGURE 5b

PYROLYSIS GC

WELL 34/10-21

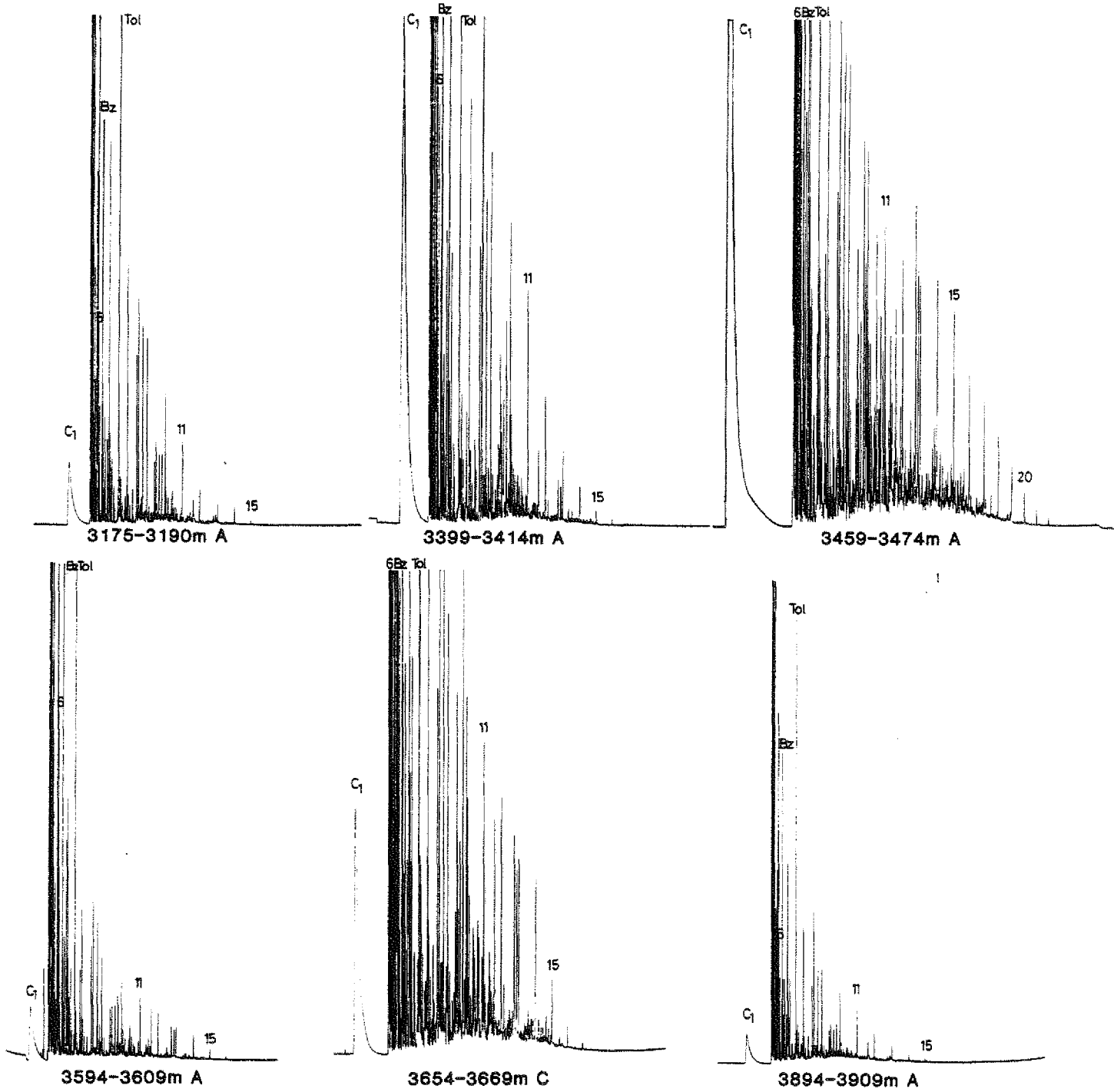
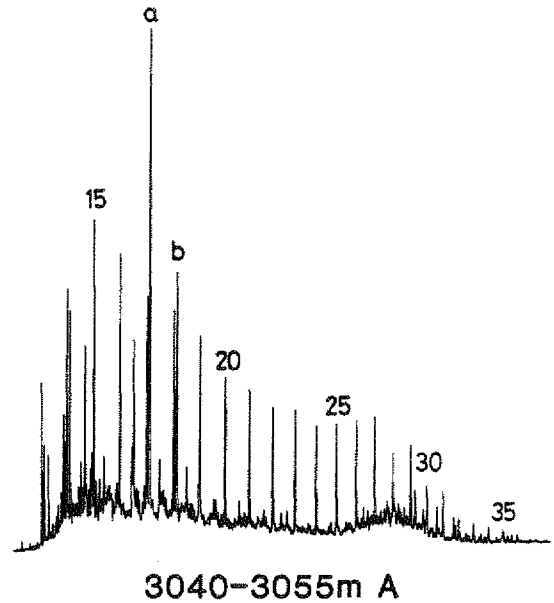
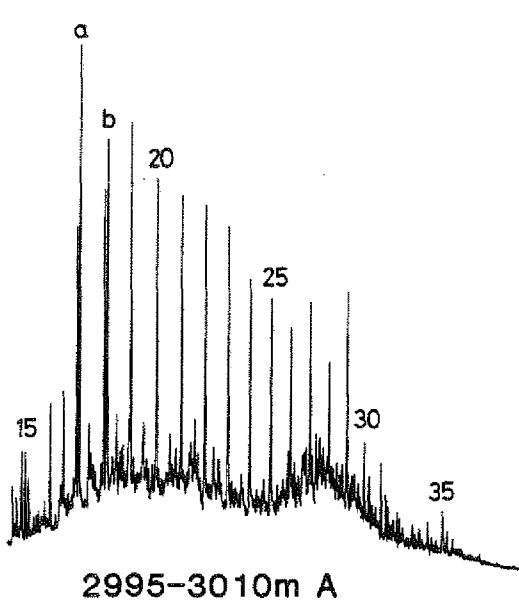
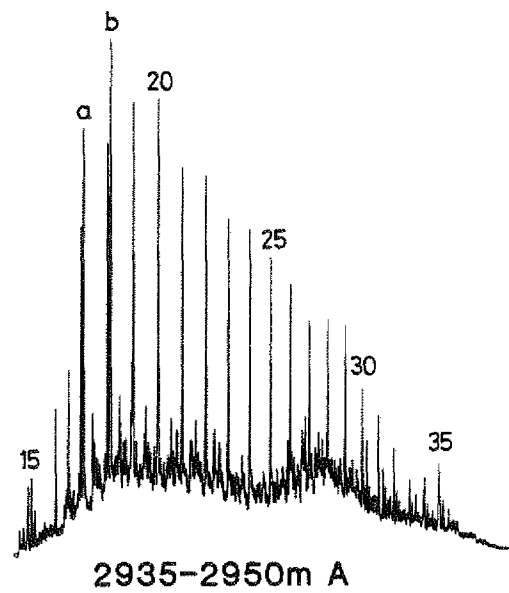
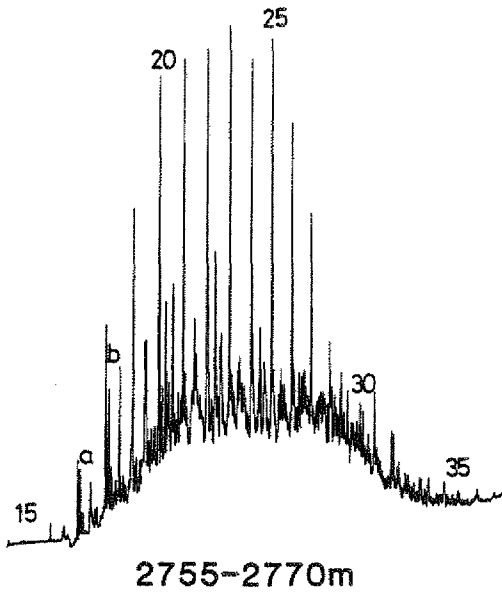
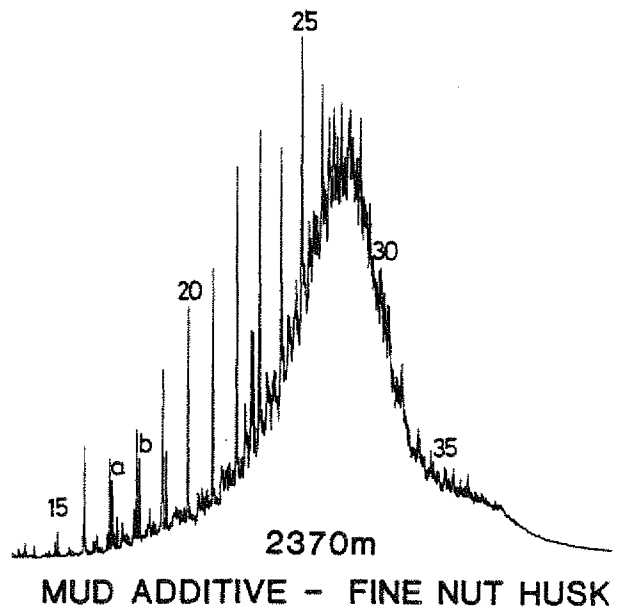
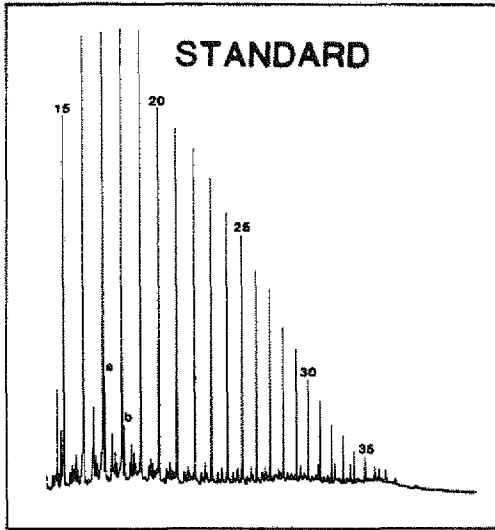


FIGURE 6a **C₁₅₊ PARAFFIN - NAPHTHENES** WELL 34/10-21



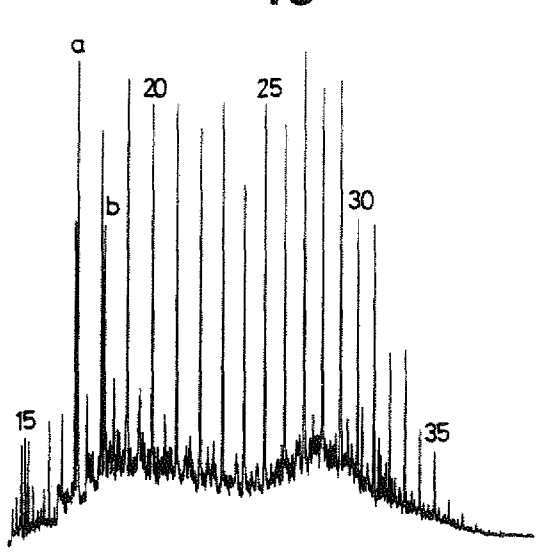
a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

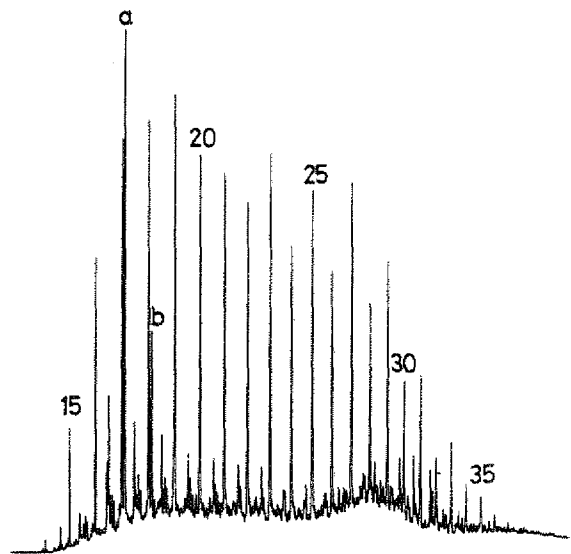
FIGURE 6b

C₁₅₊ PARAFFIN - NAPHTHENES

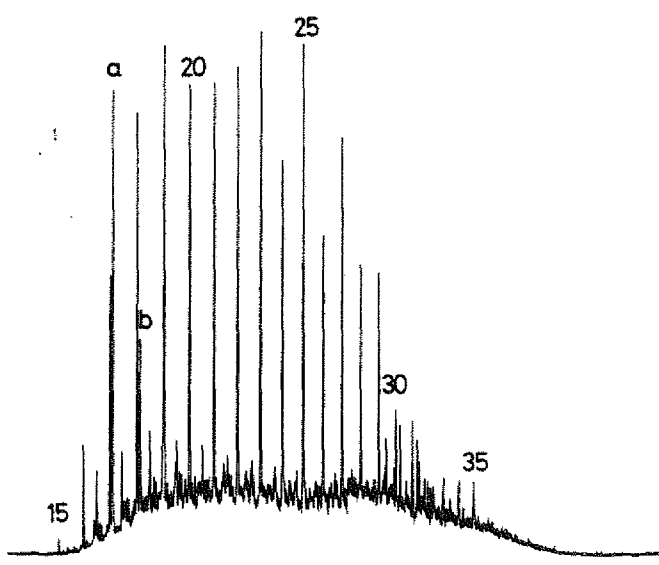
WELL 34/10-21



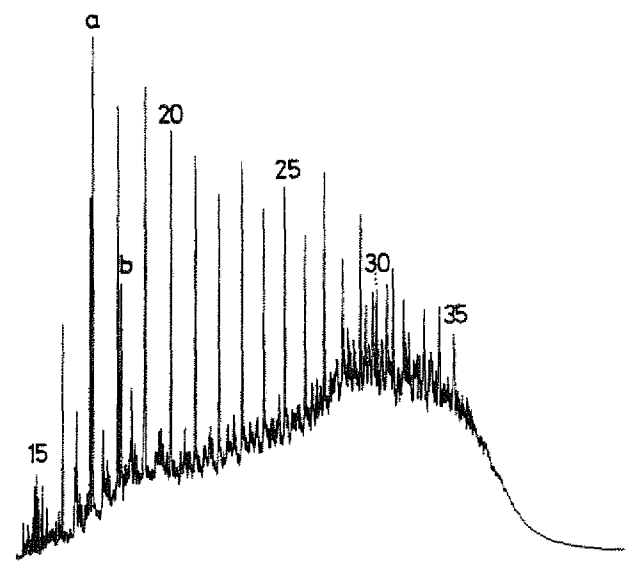
3115-3130m



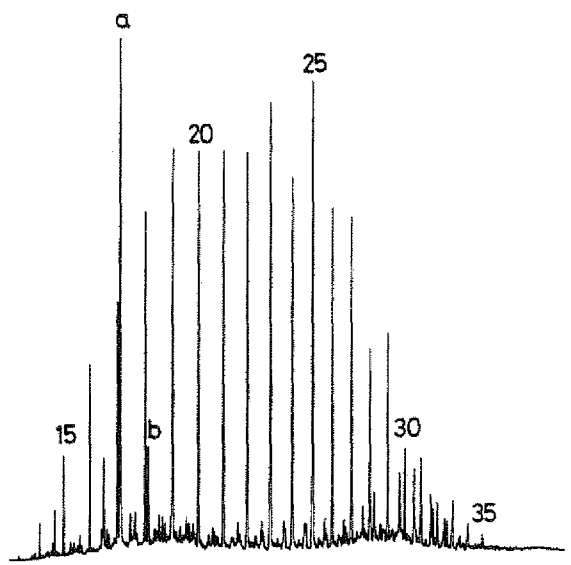
3160-3175m



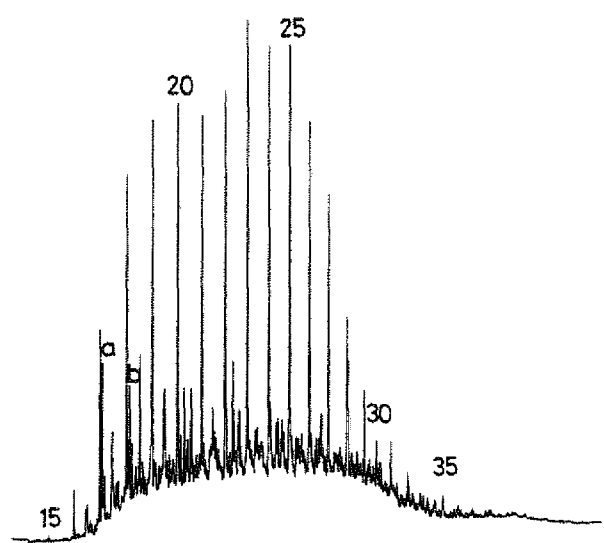
3205-3219m



3264-3279m A



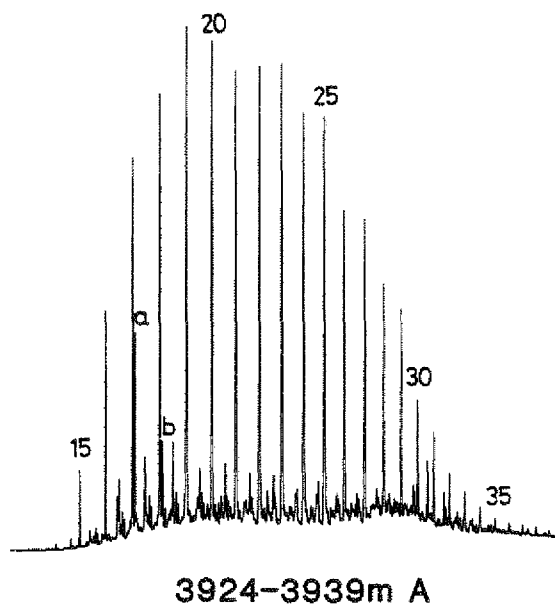
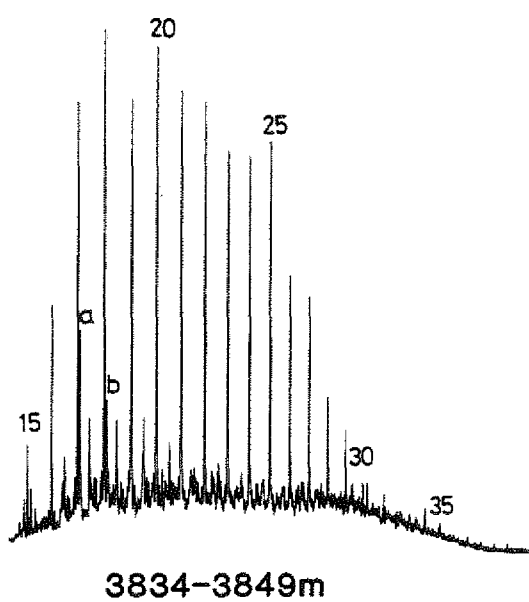
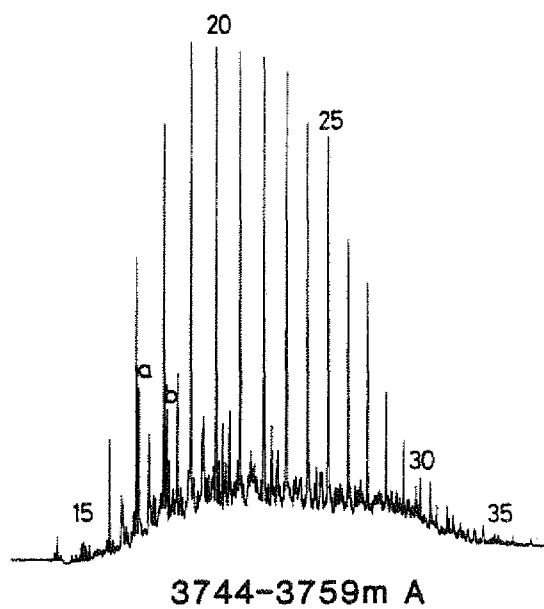
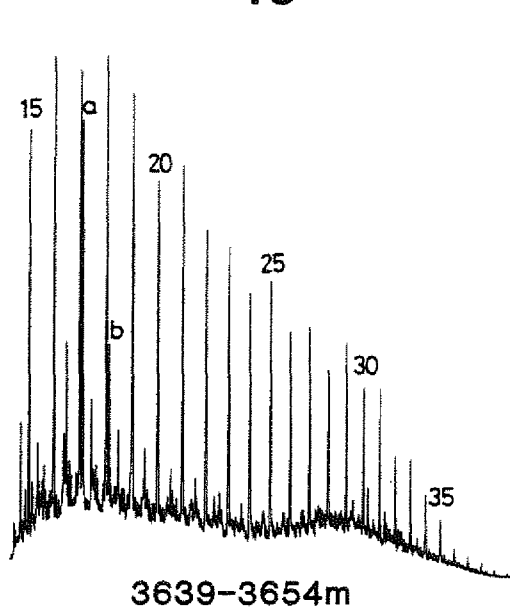
3399-3414m



3504-3519m A

a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)



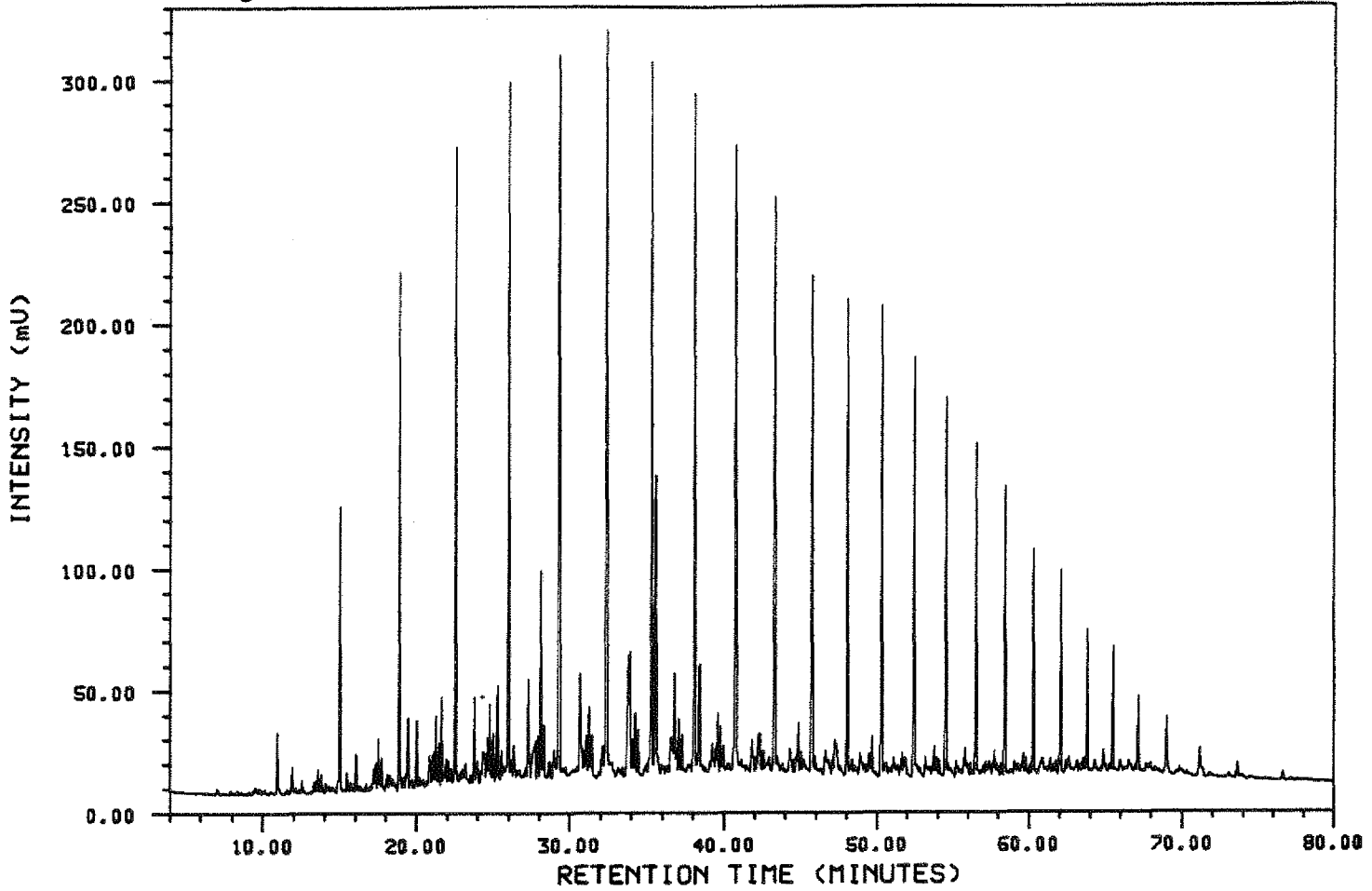
a - PRISTANE
b - PHYTANE

CARBON NUMBERS OF NORMAL PARAFFINS INDICATED (20 - nC₂₀)

FIGURE 6d

Analysis S404I

4,1,1 34/10-21 3298m



Analysis S405I

4,1,1 34/10-21 3309m

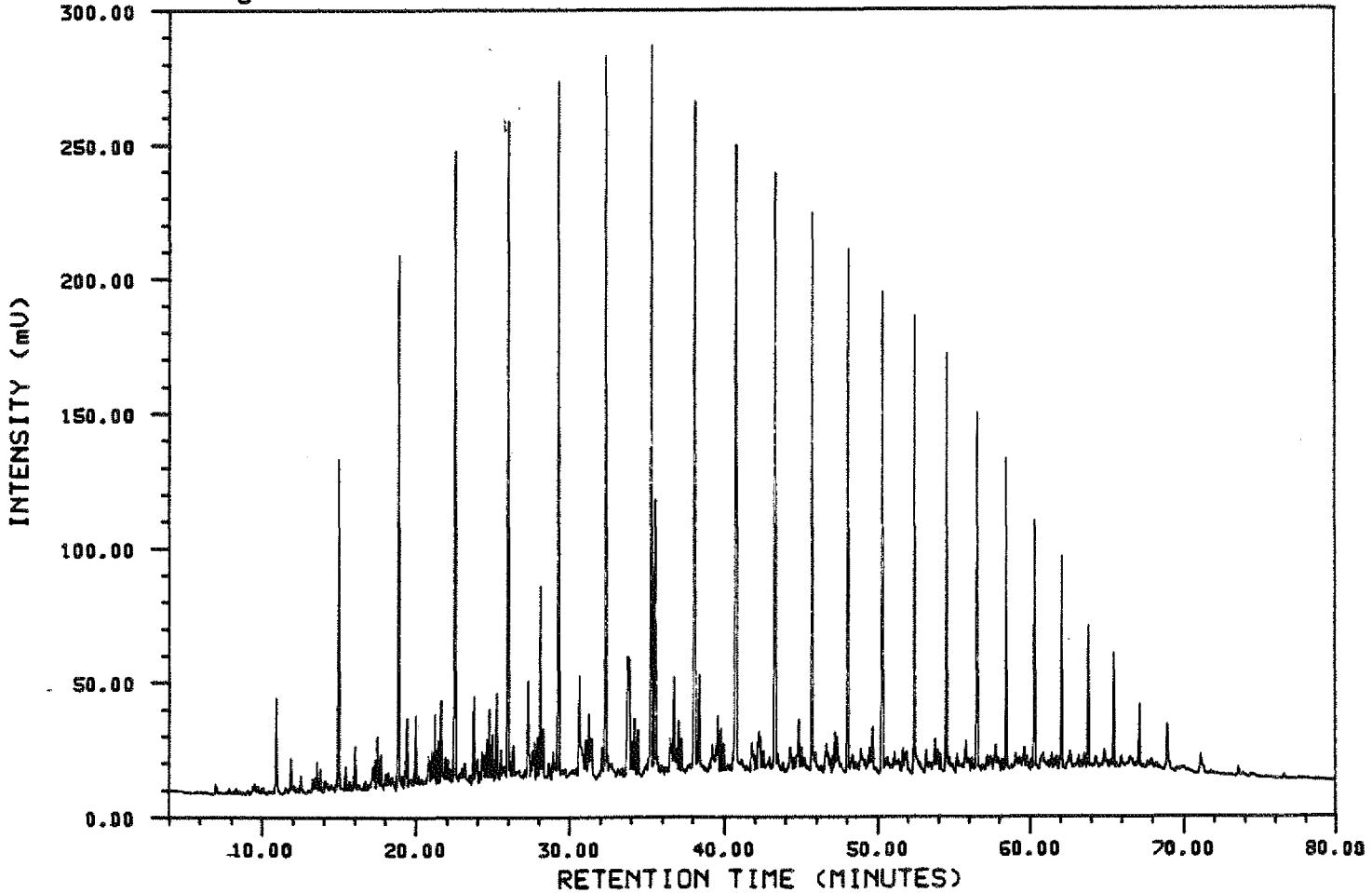
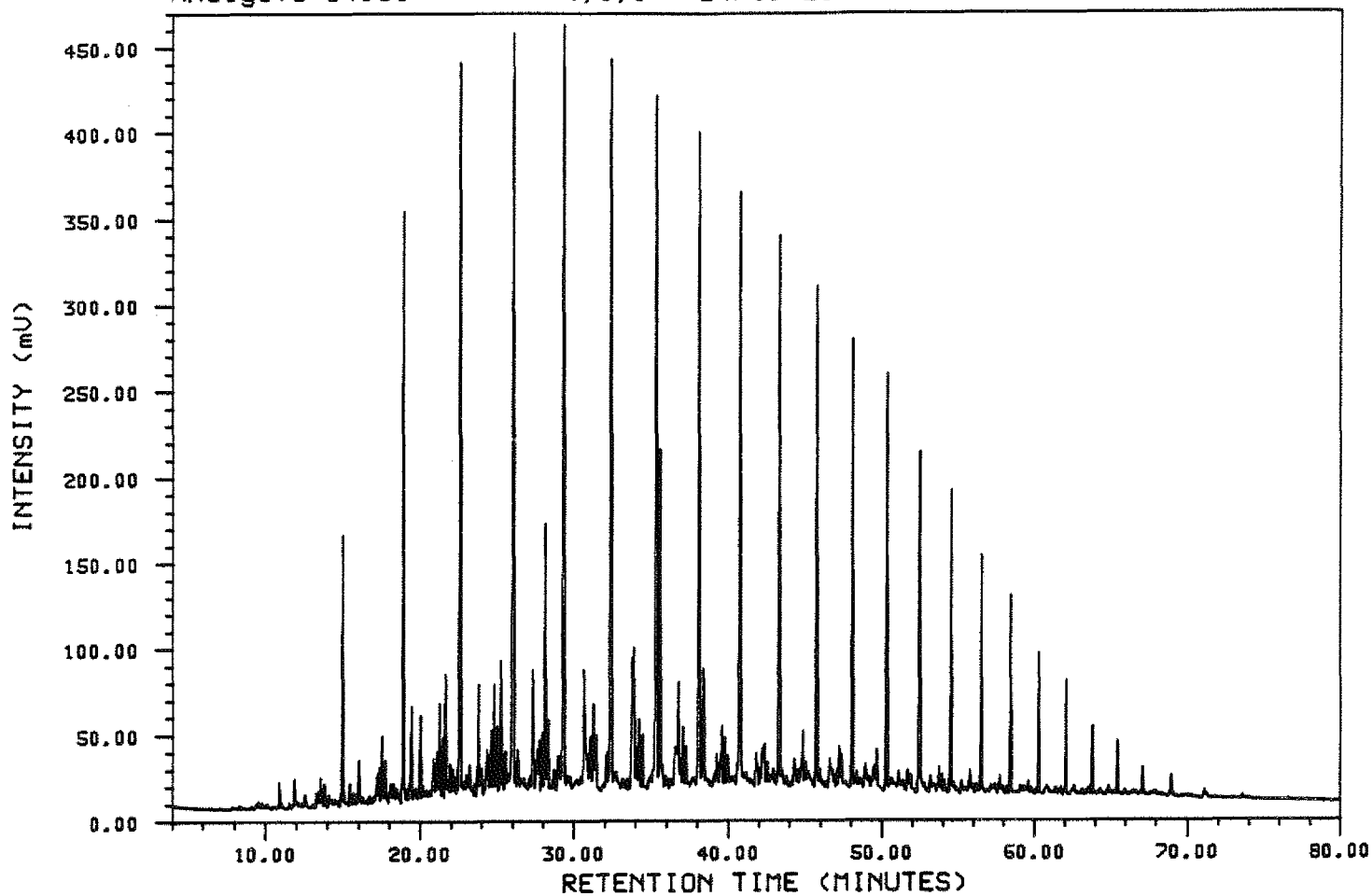


FIGURE 6e

Analysis S406I

4,1,1

34/10-21 3314m



Analysis S410I

4,1,1

34/10-21 3319m

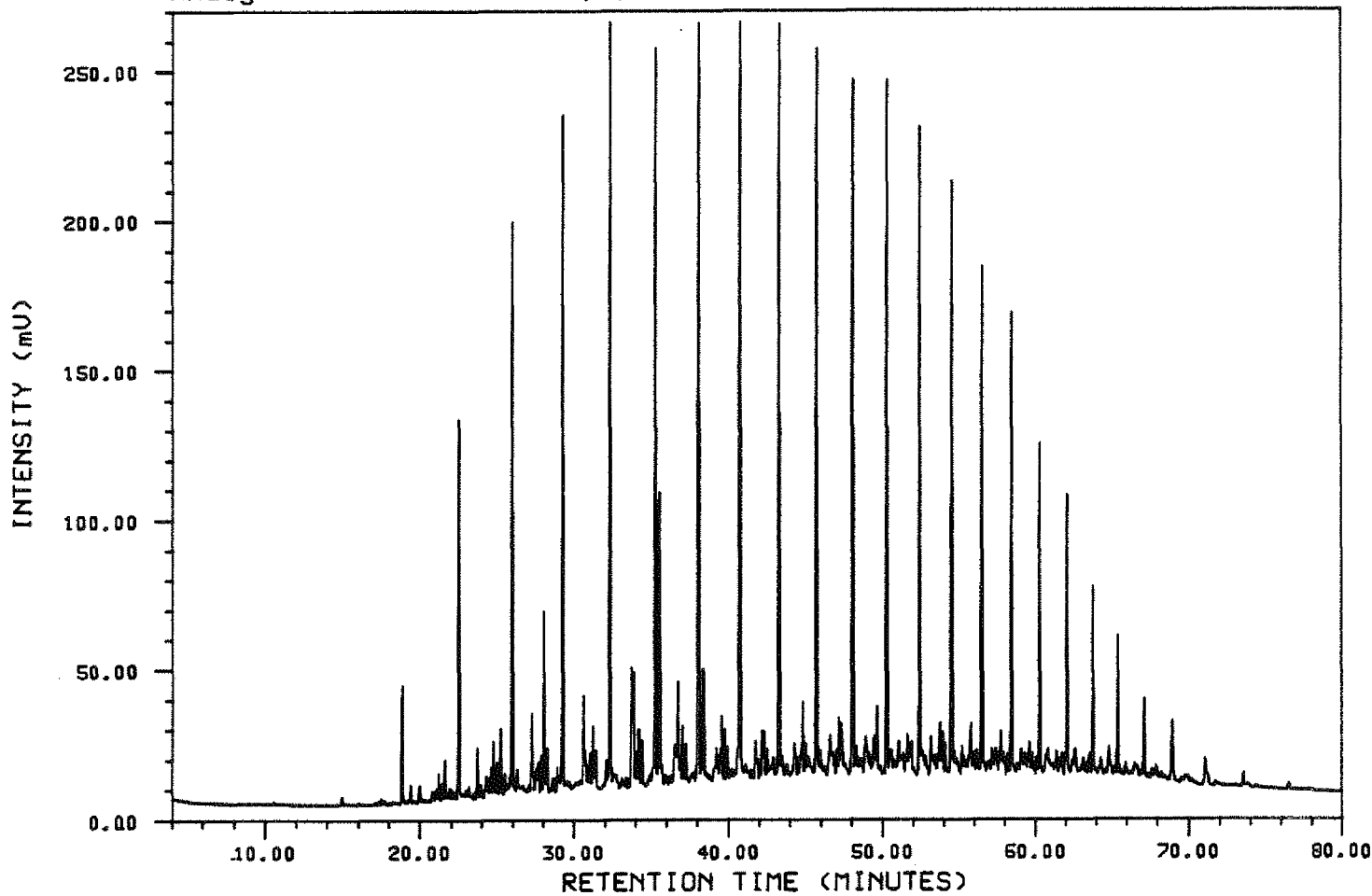


FIGURE 6f

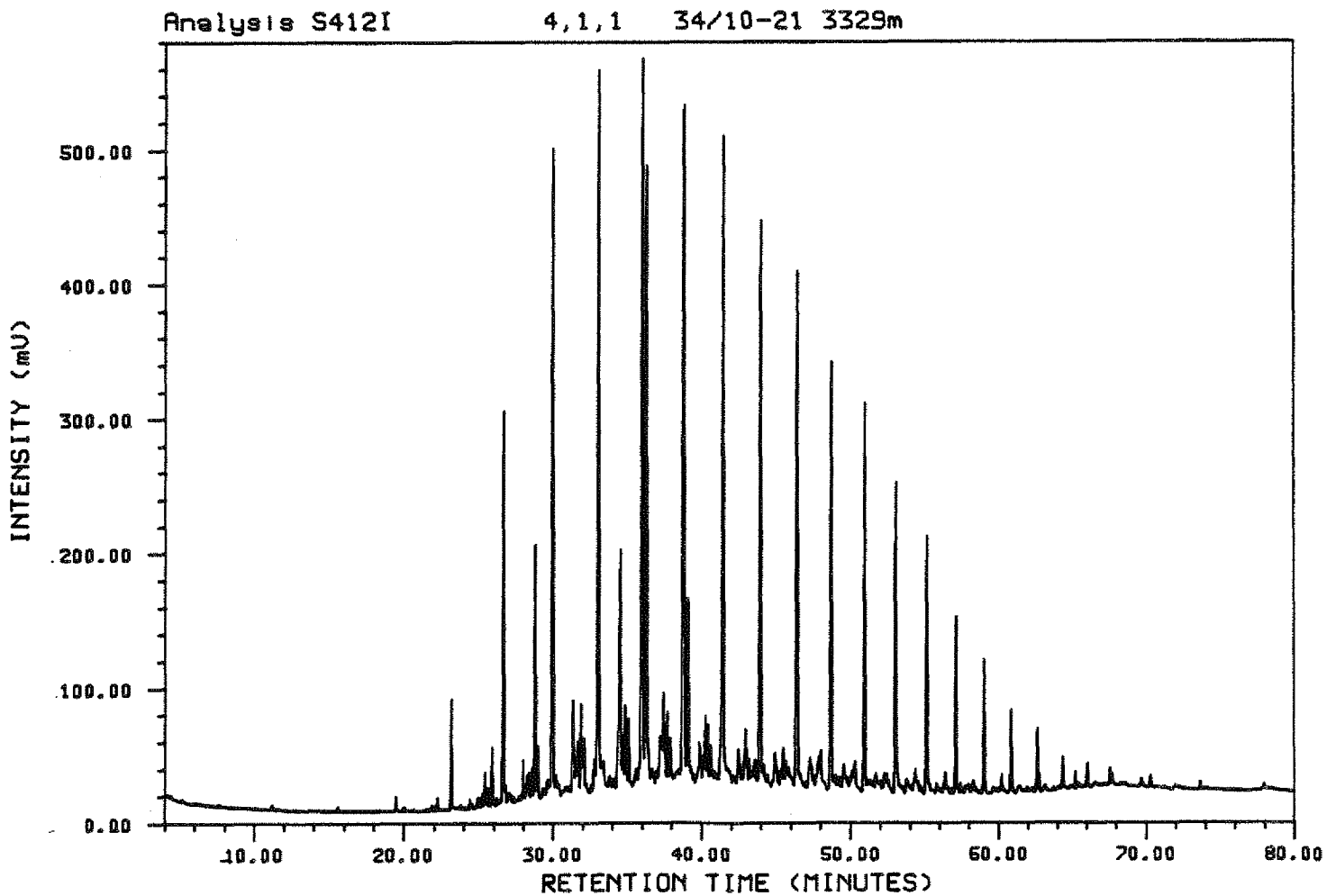
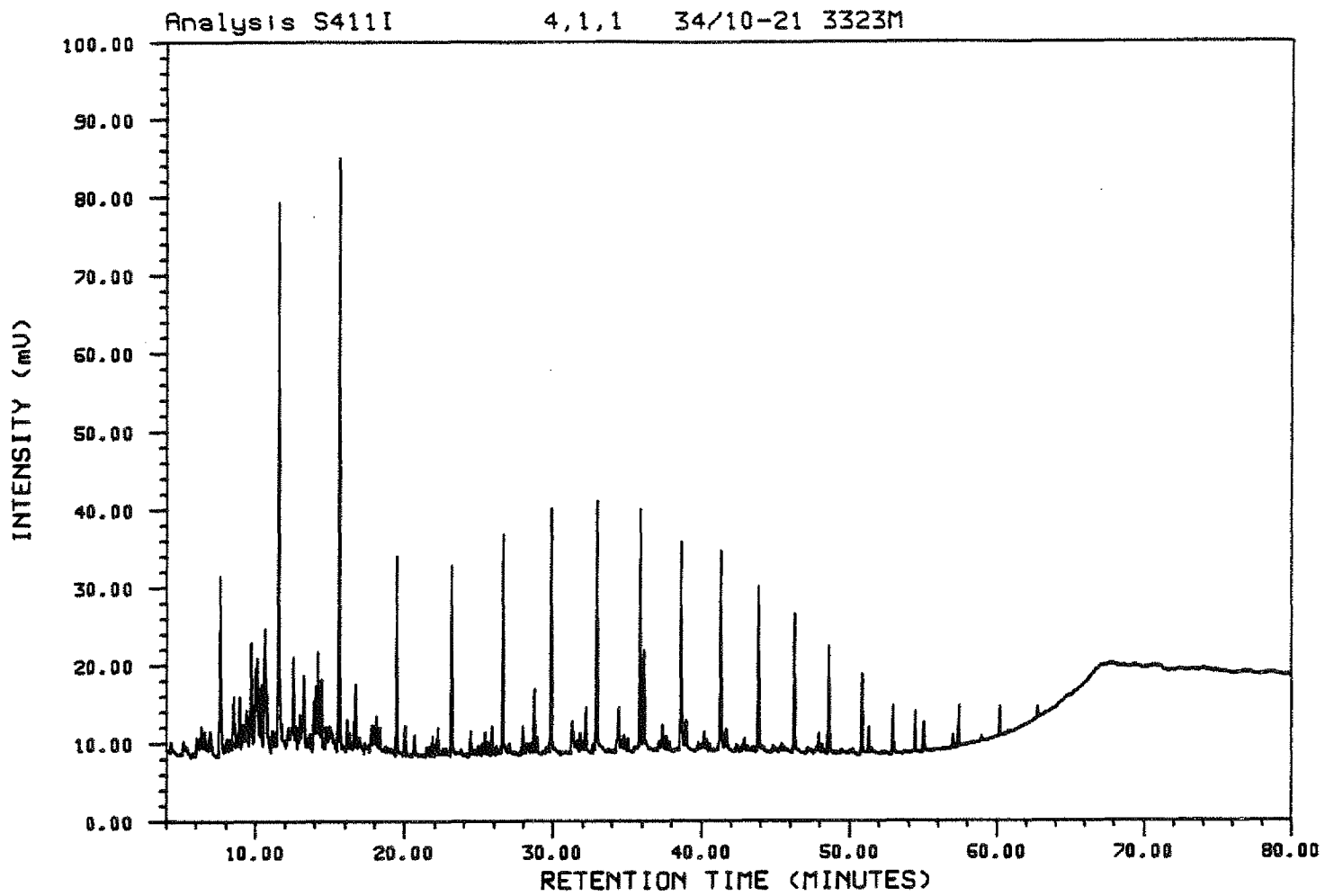
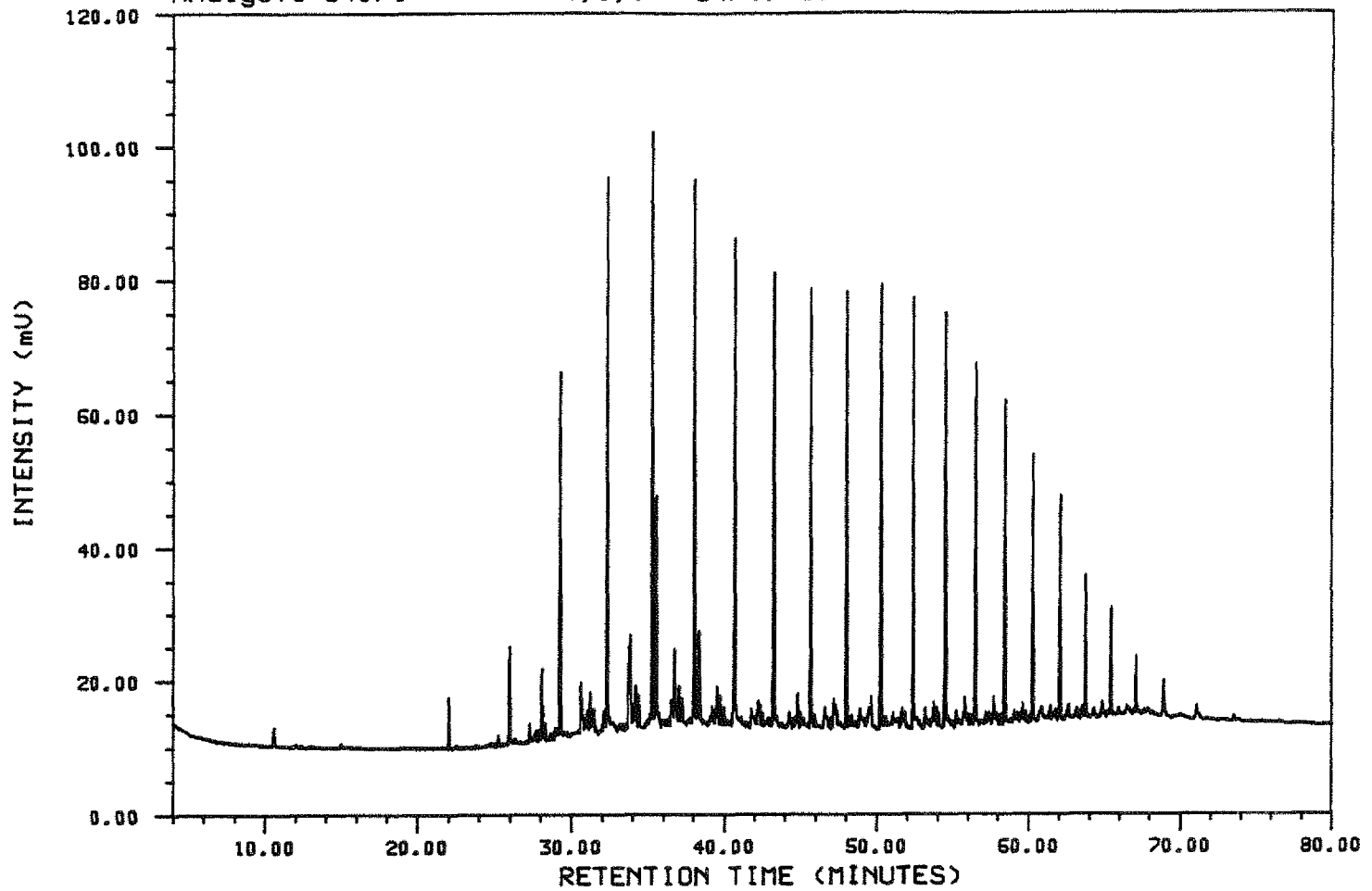


FIGURE 6g

Analysis S407I

4,1,1 34/10-21 3344m



Analysis S413I

4,1,1 34/10-21 3352m

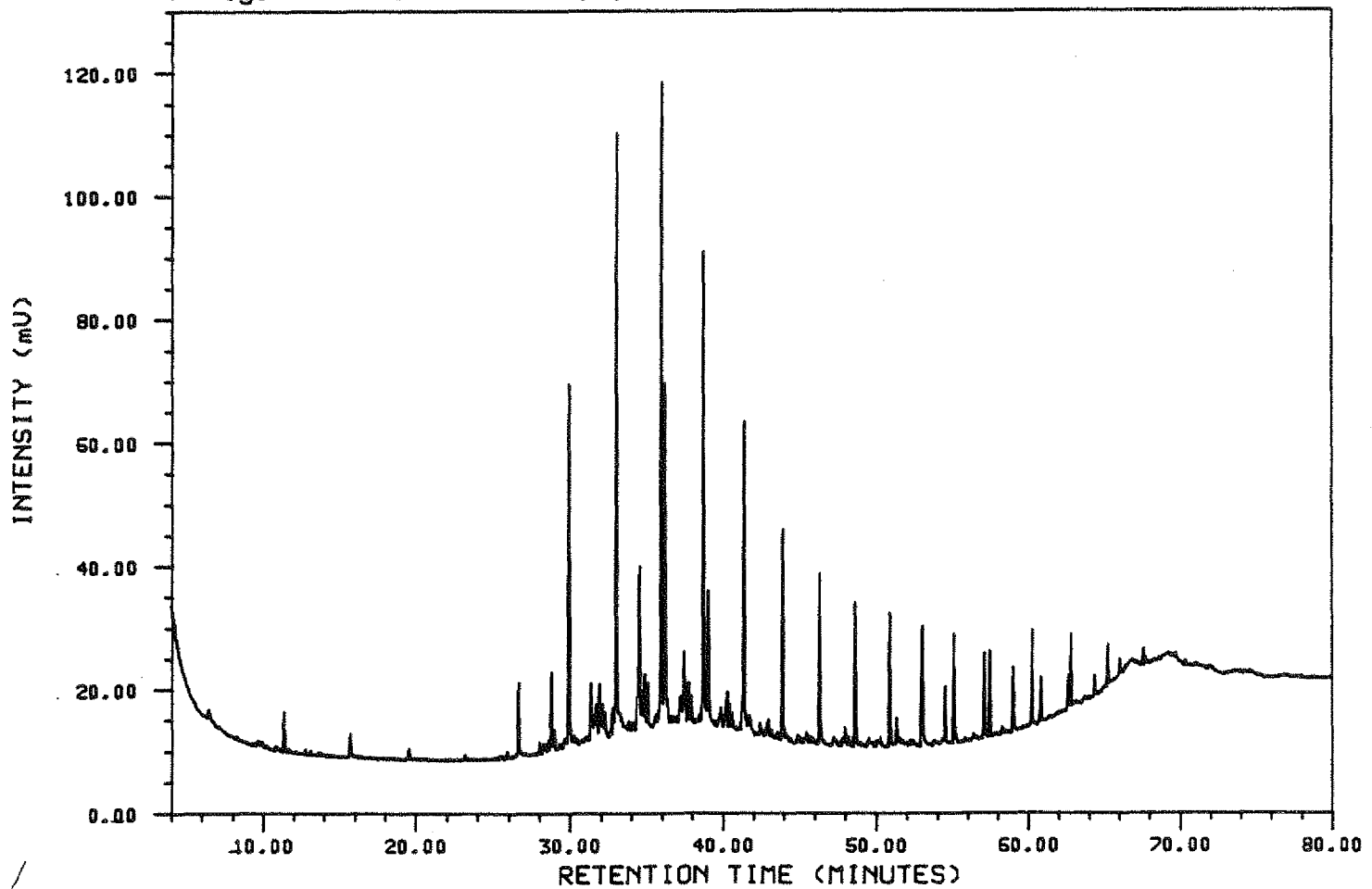
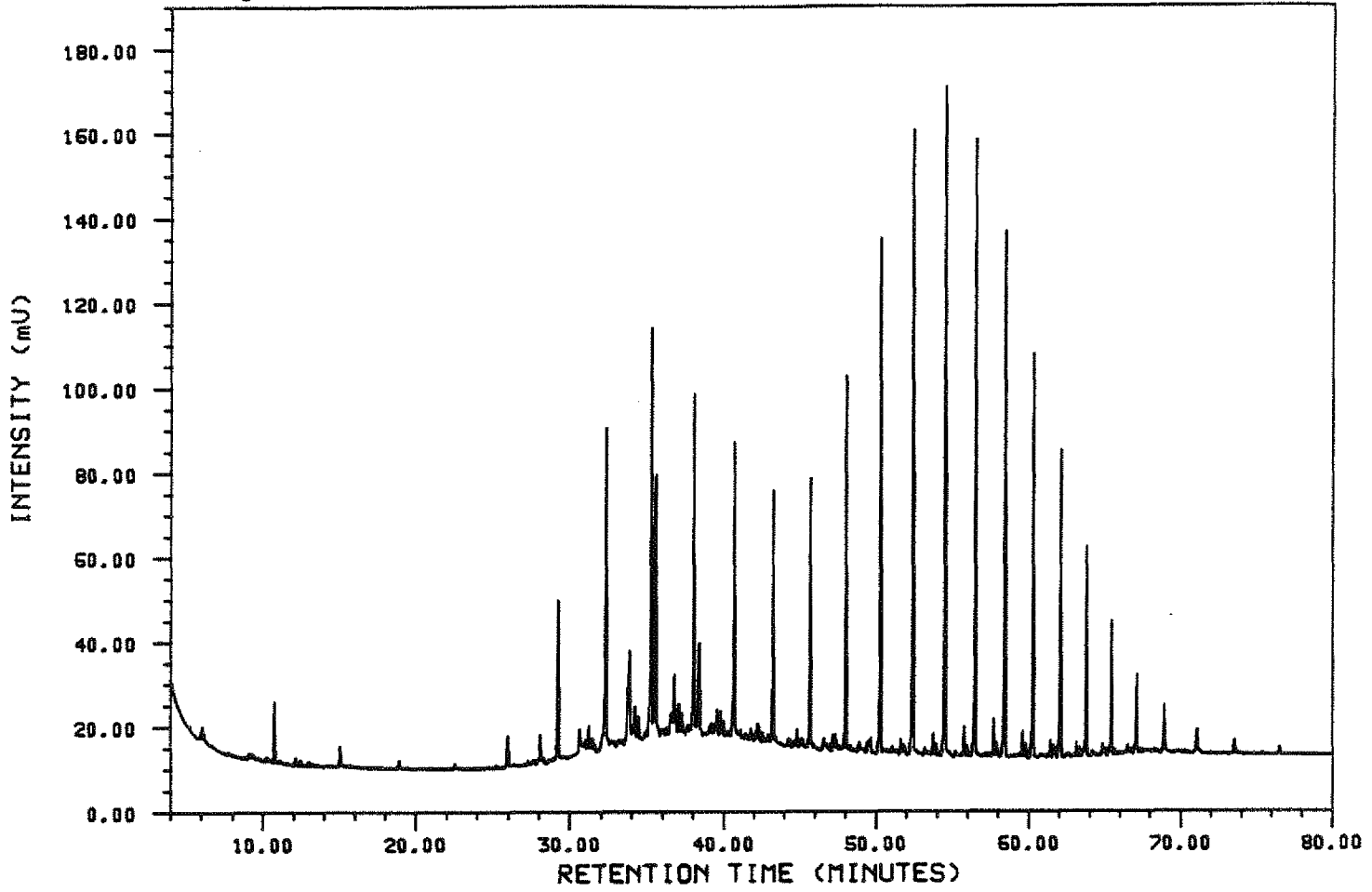


FIGURE 6h

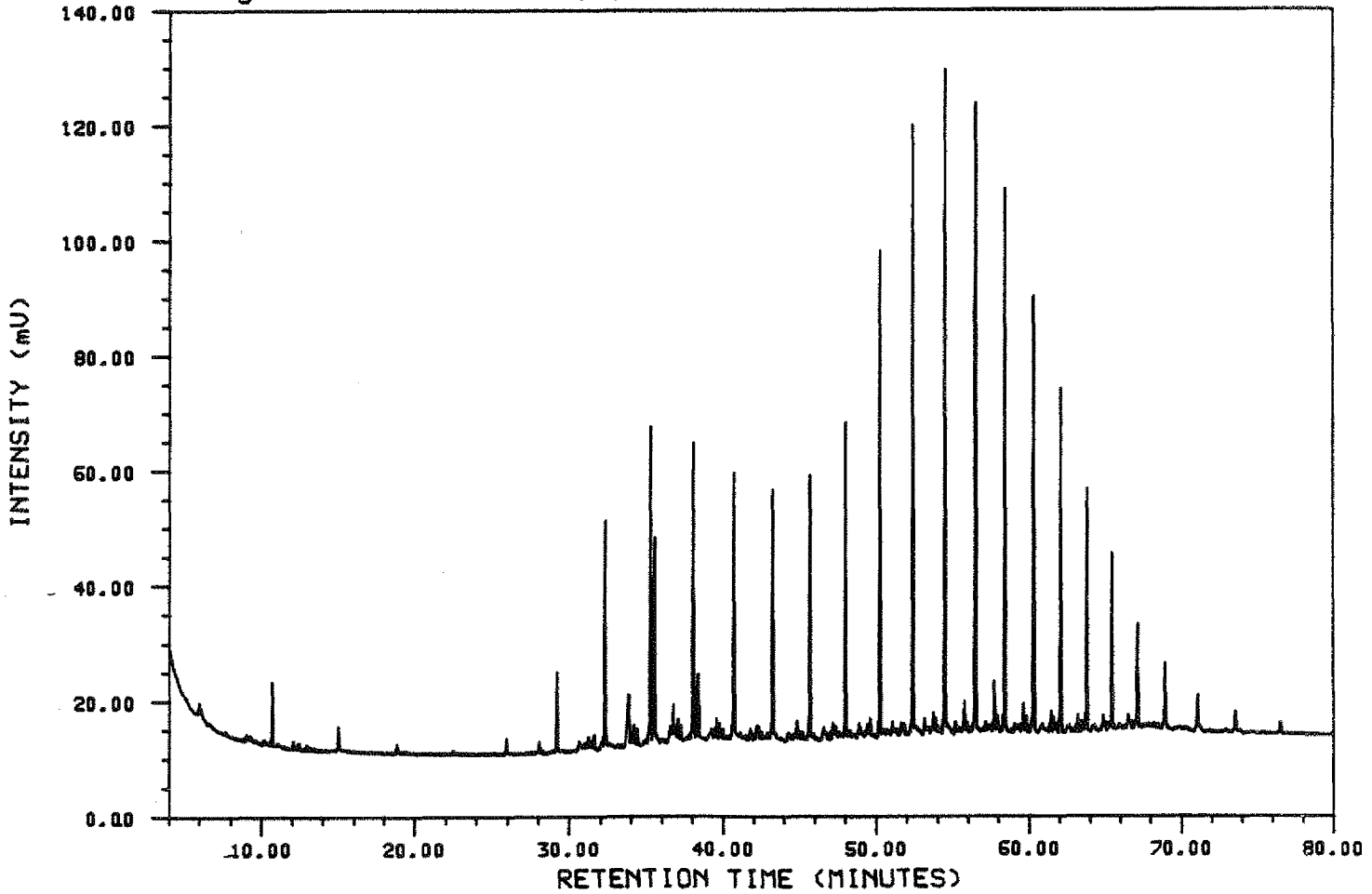
Analysis S408I

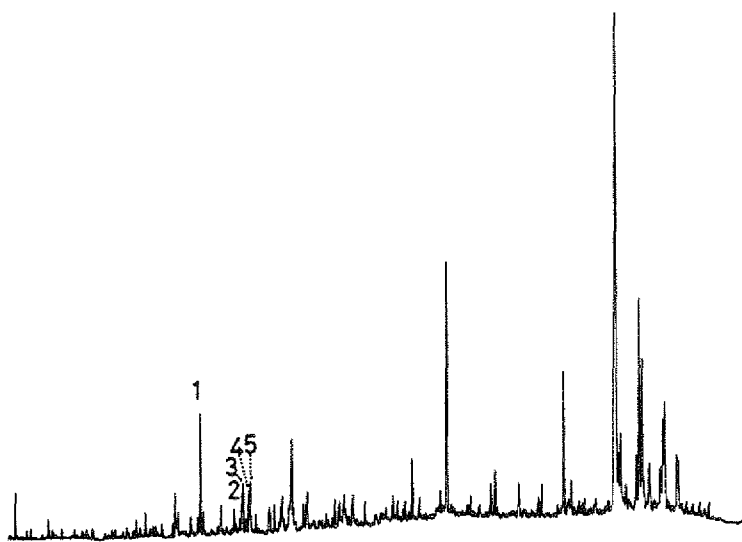
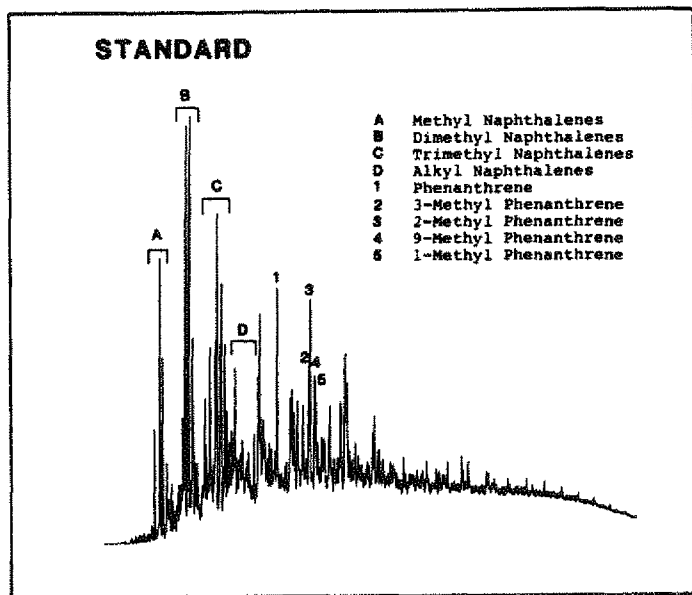
4,1,1 34/10-21 3354m



Analysis S409I

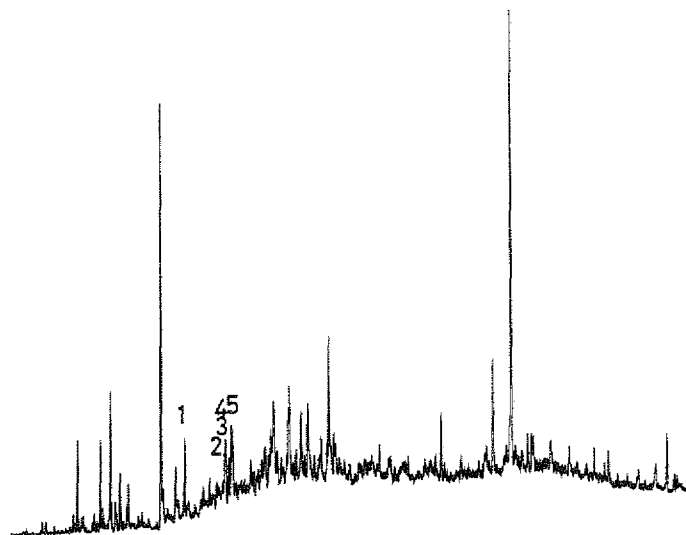
4,1,1 34/10-21 3353m



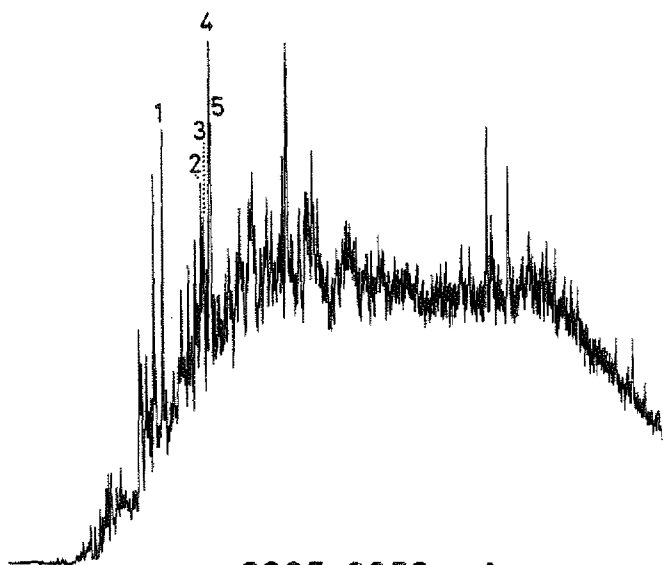


2370m

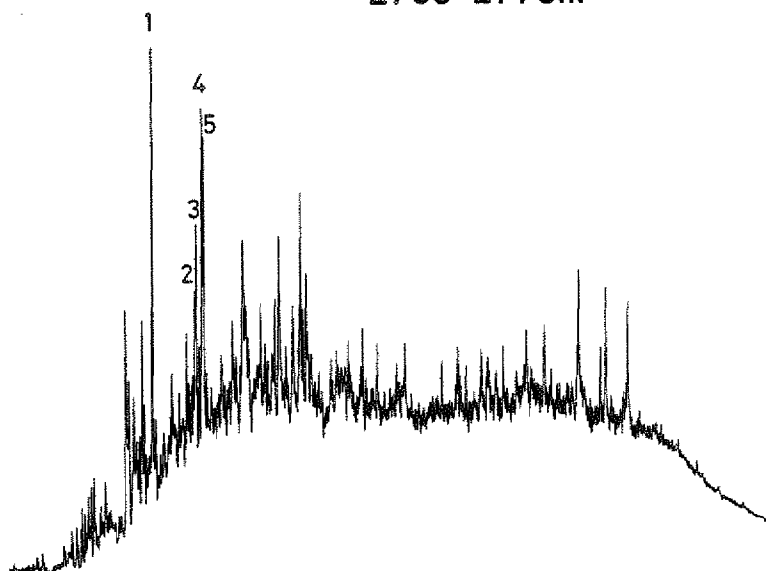
MUD ADDITIVE-FINE NUT HUSK



2755-2770m



2935-2950m A

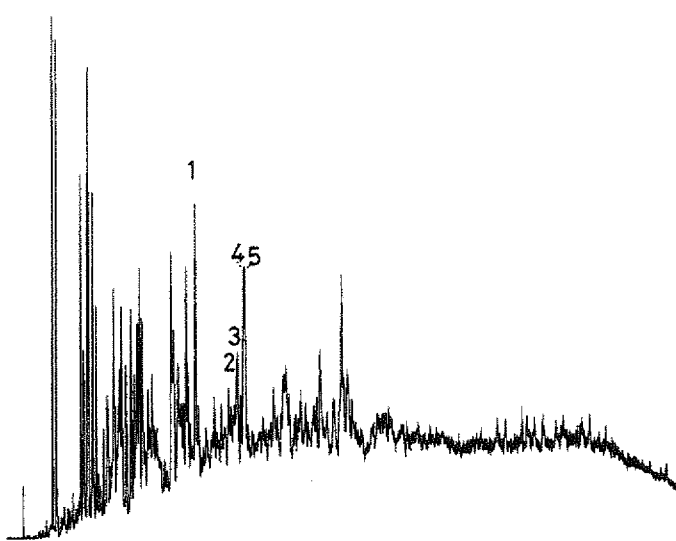


2995-3010m A

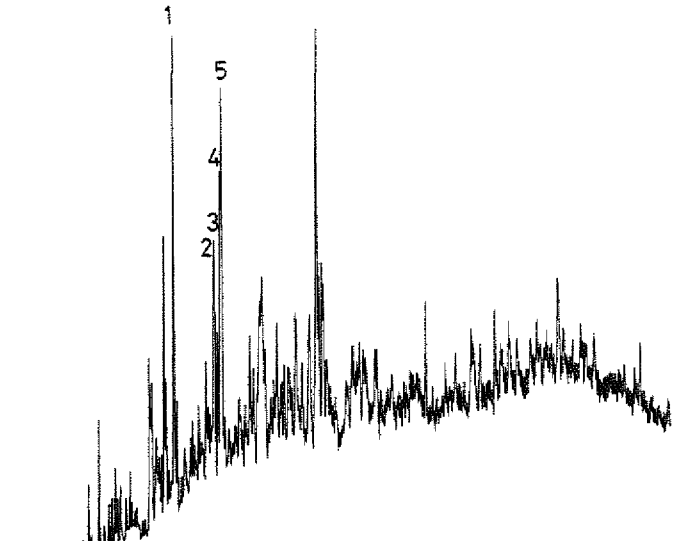
FIGURE 7b

AROMATIC CHROMATOGRAMS

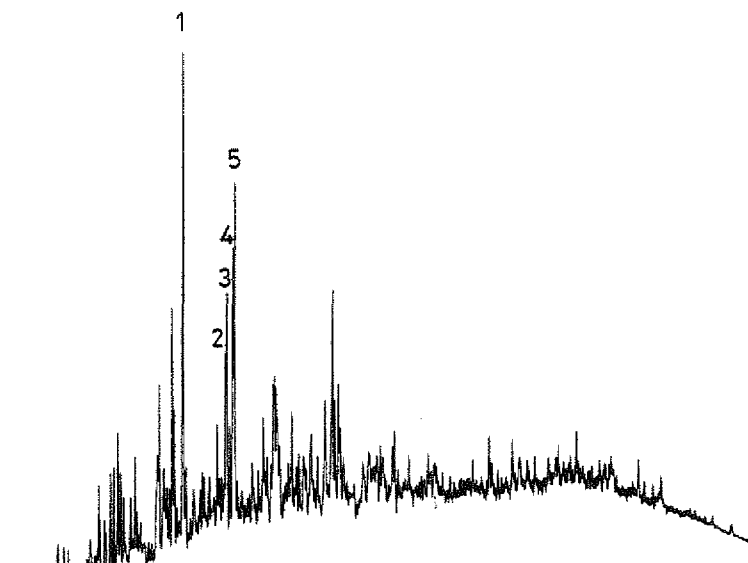
WELL 34/10-21



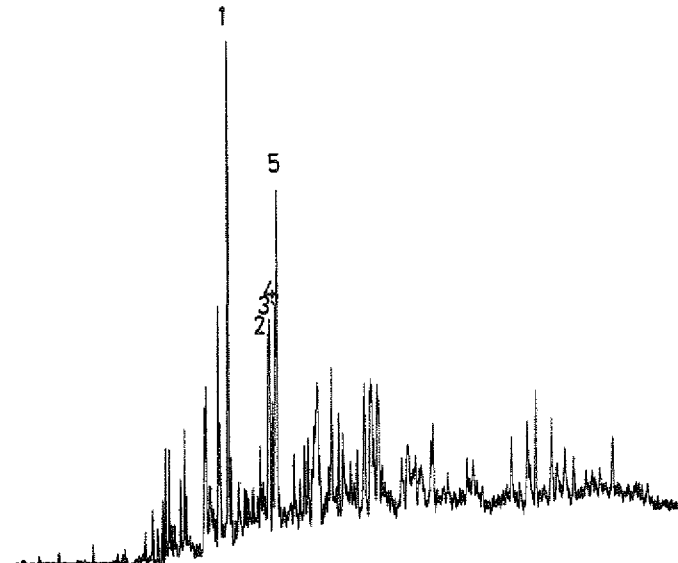
3040-3055m A



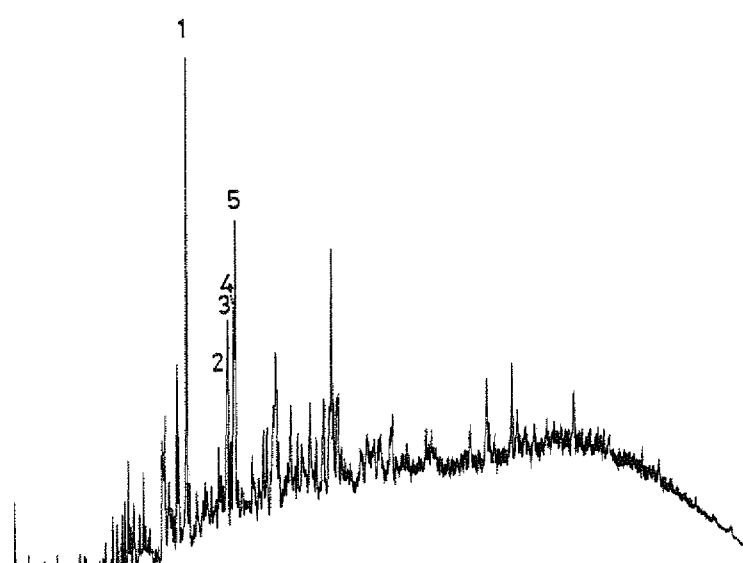
3115-3130m



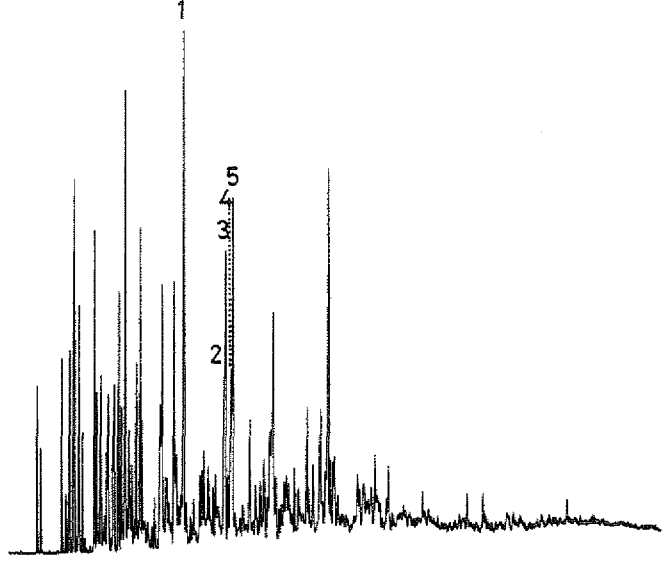
3160-3175m



3205-3219m



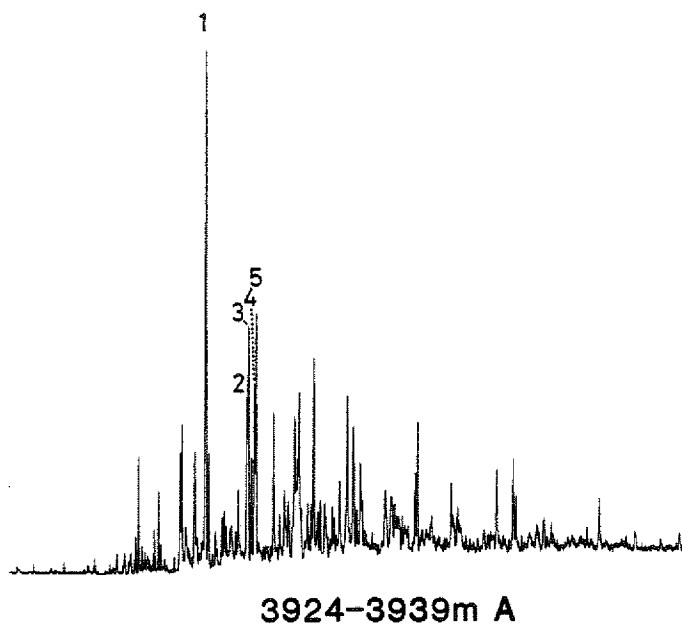
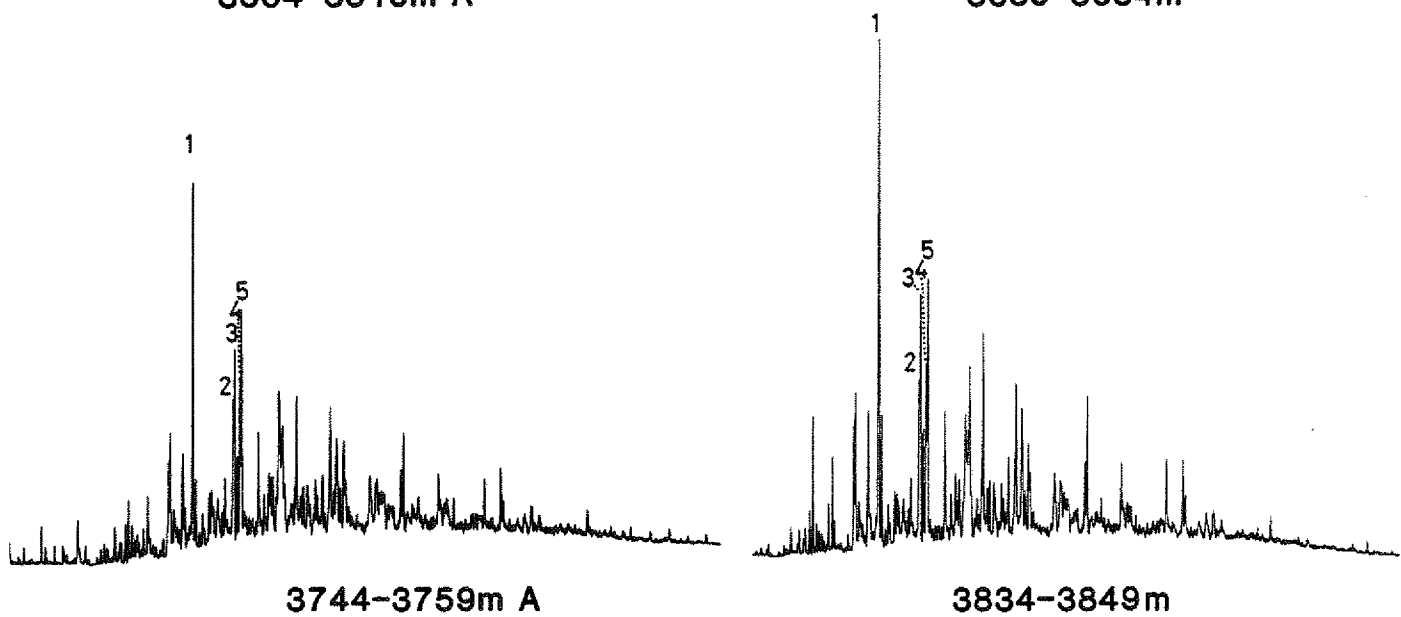
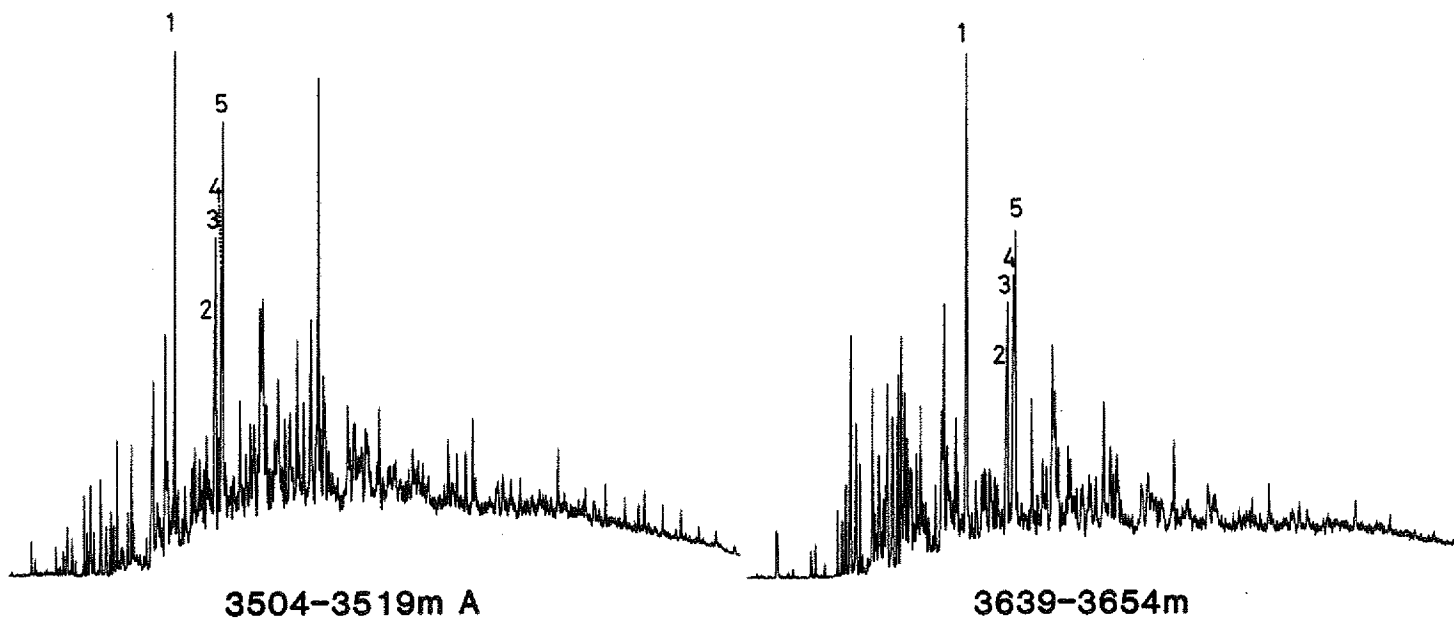
3264-3279m A



3399-3414m

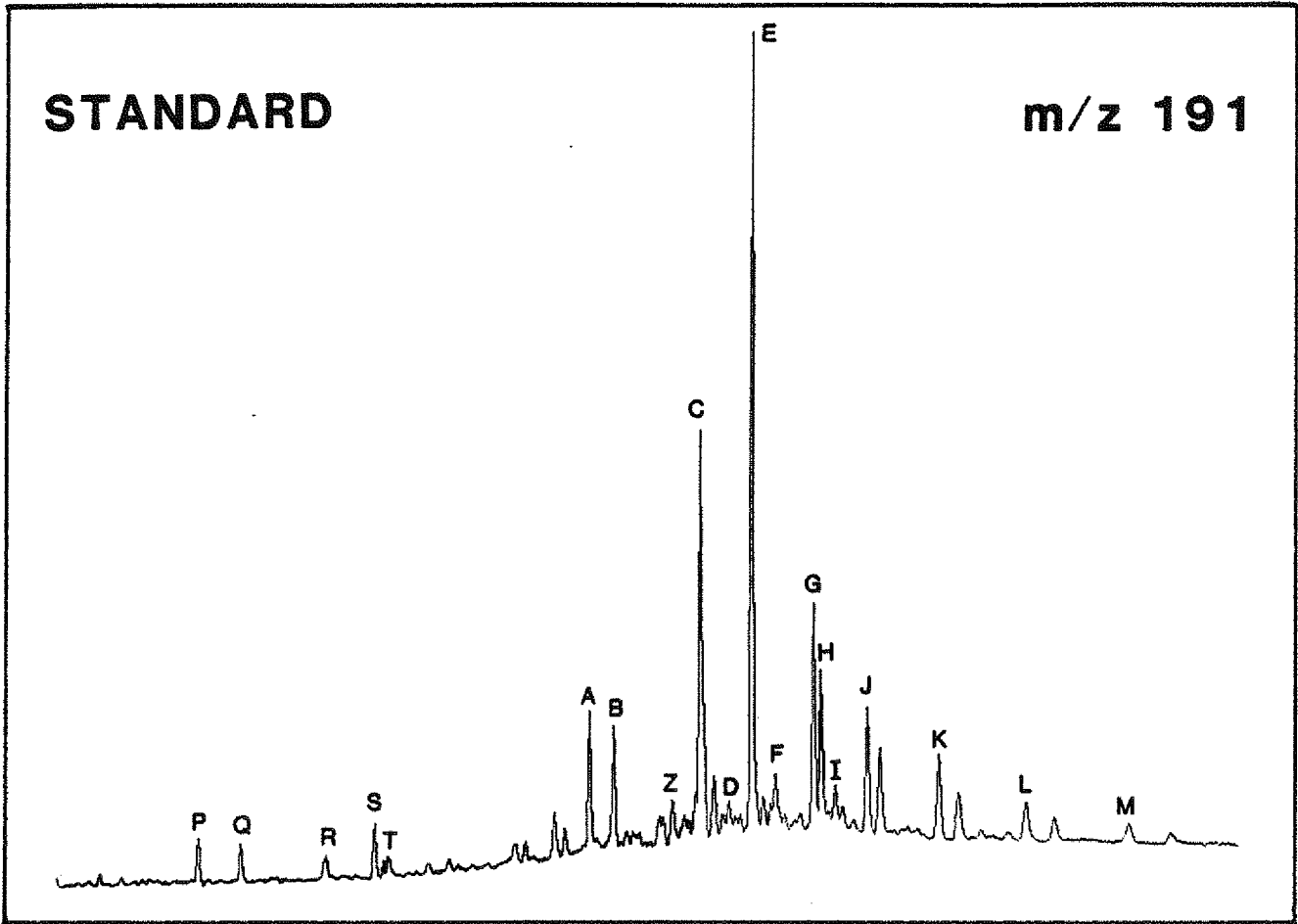
FIGURE 7c

AROMATIC CHROMATOGRAMS WELL 34/10-21



STANDARD

m/z 191



TRITERPANE IDENTIFICATION

(M/Z 191 FRAGMENTOGRAM)

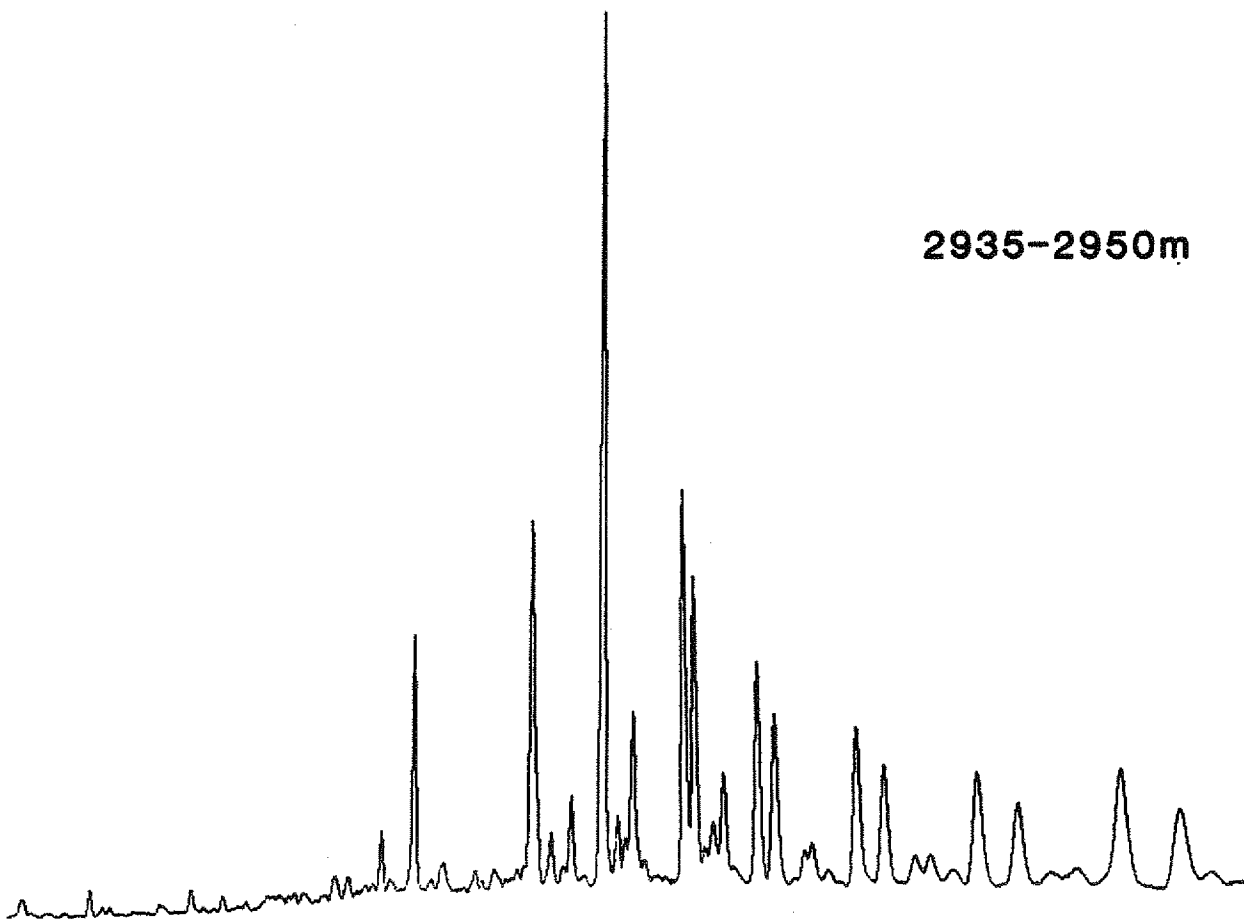
<u>COMPOUND</u>	<u>ELEMENTAL COMPOSITION</u>
A 18 (H), 21 (H)-trisinorneohopane (Ts)	C ₂₇ H ₄₆
B 17 (H), 21 (H)-trisinorhopane (Tm)	C ₂₇ H ₄₆
C 17 (H), 21 (H)-norhopane	C ₂₉ H ₅₀
D 17 (H), 21 (H)-norhopane (normoretane)	C ₂₉ H ₅₀
E 17 (H), 21 (H)-hopane	C ₃₀ H ₅₂
F 17 (H), 21 (H)-hopane (moretane)	C 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

TRITERPANES m/z 191

2935-2950m



2995-3010m

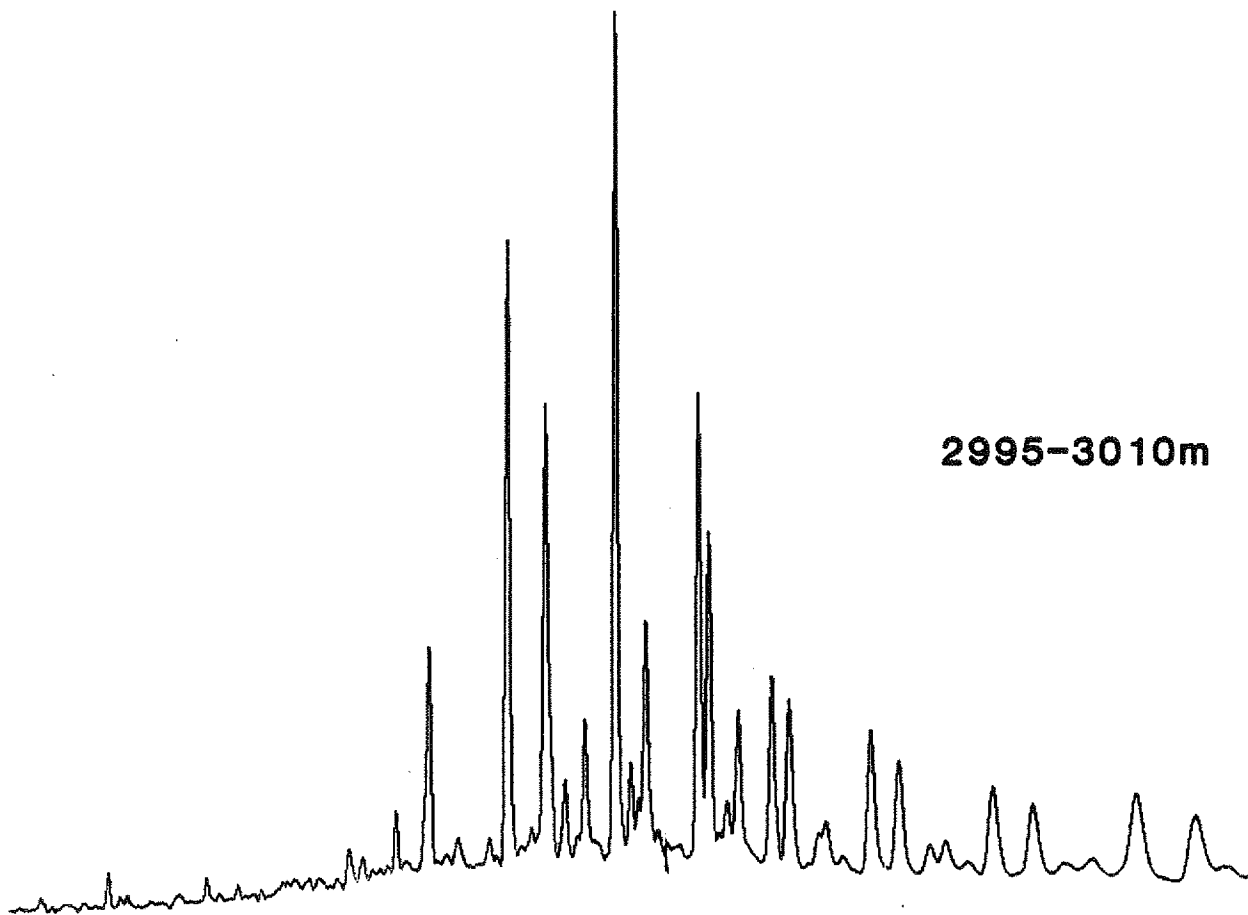
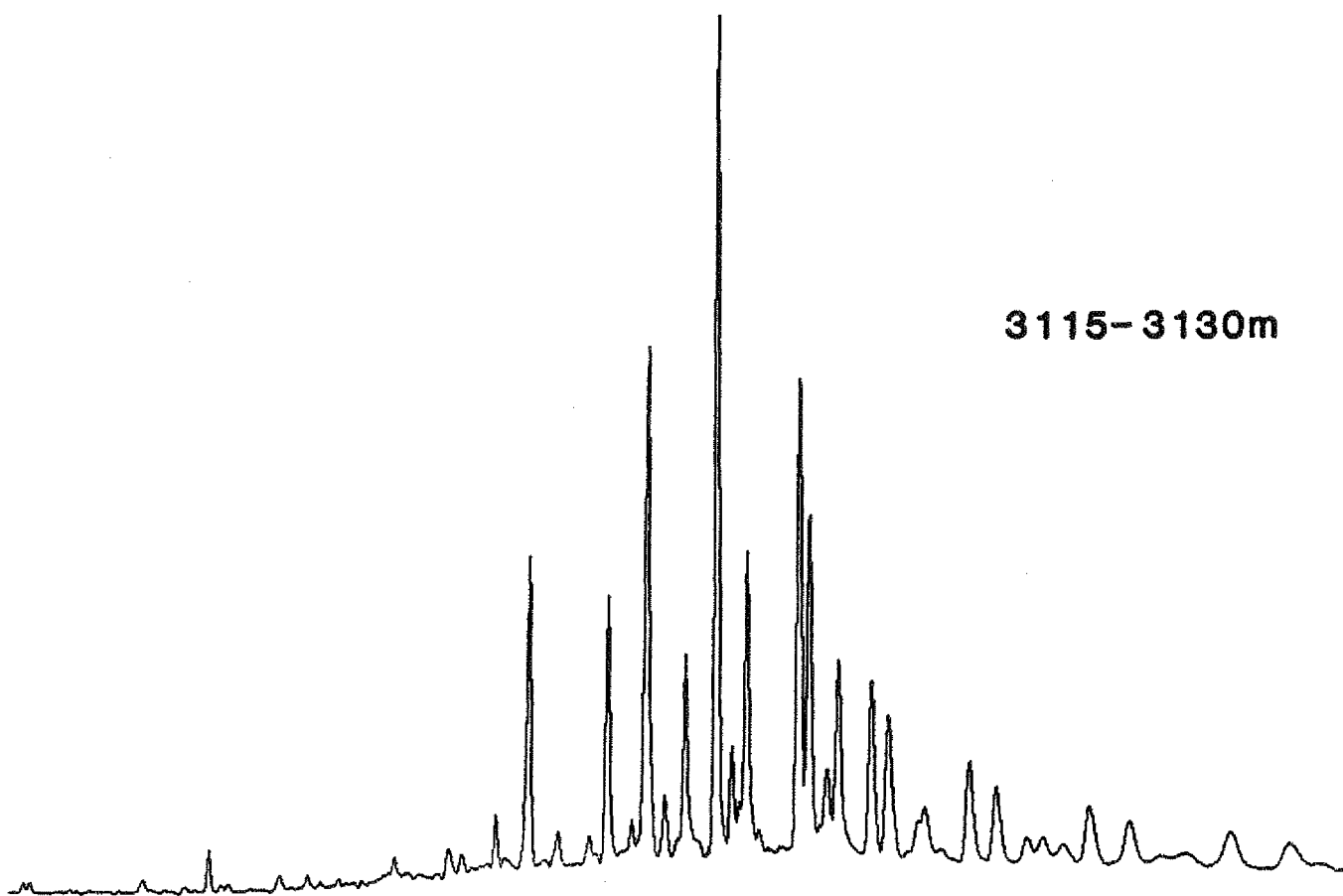
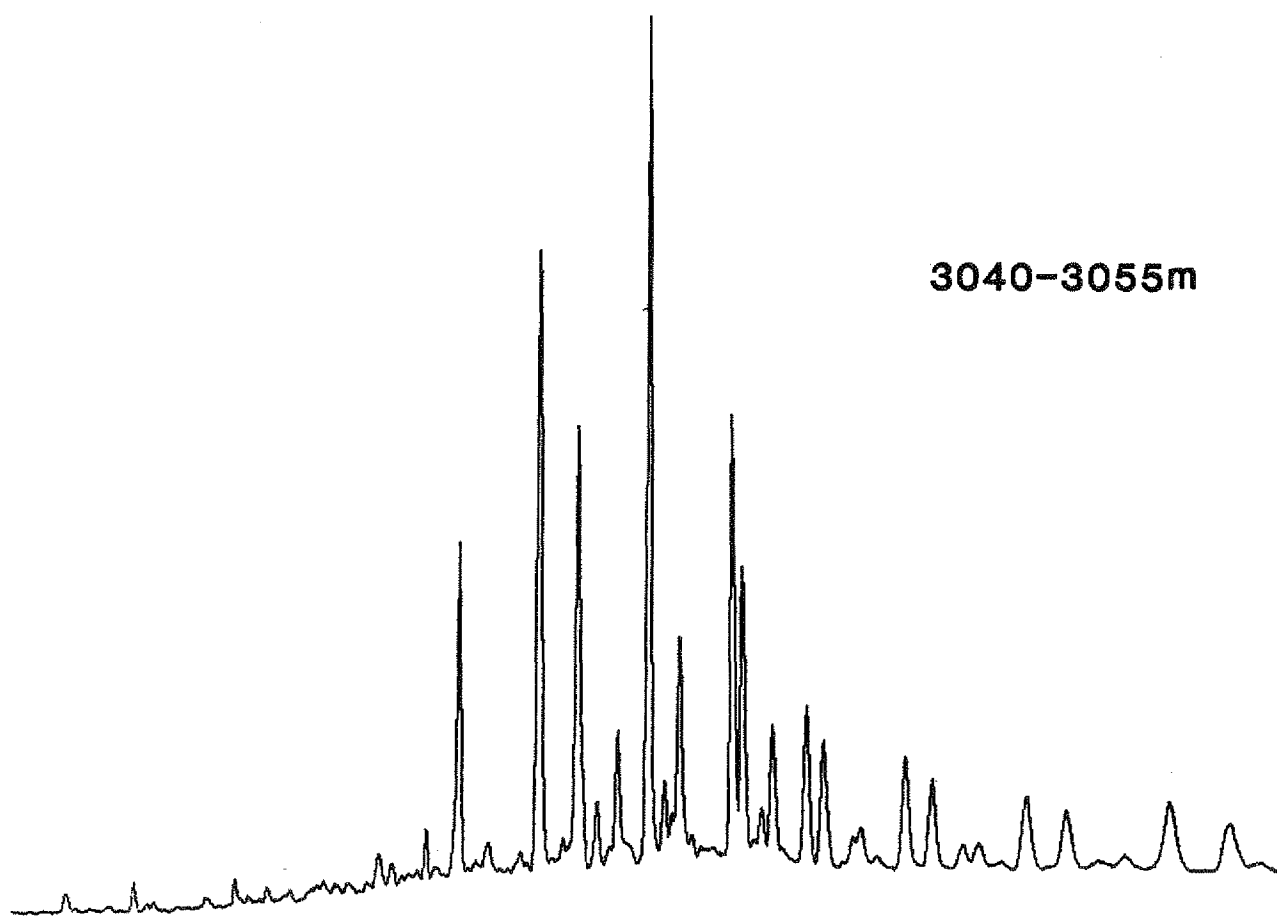


FIGURE 8b

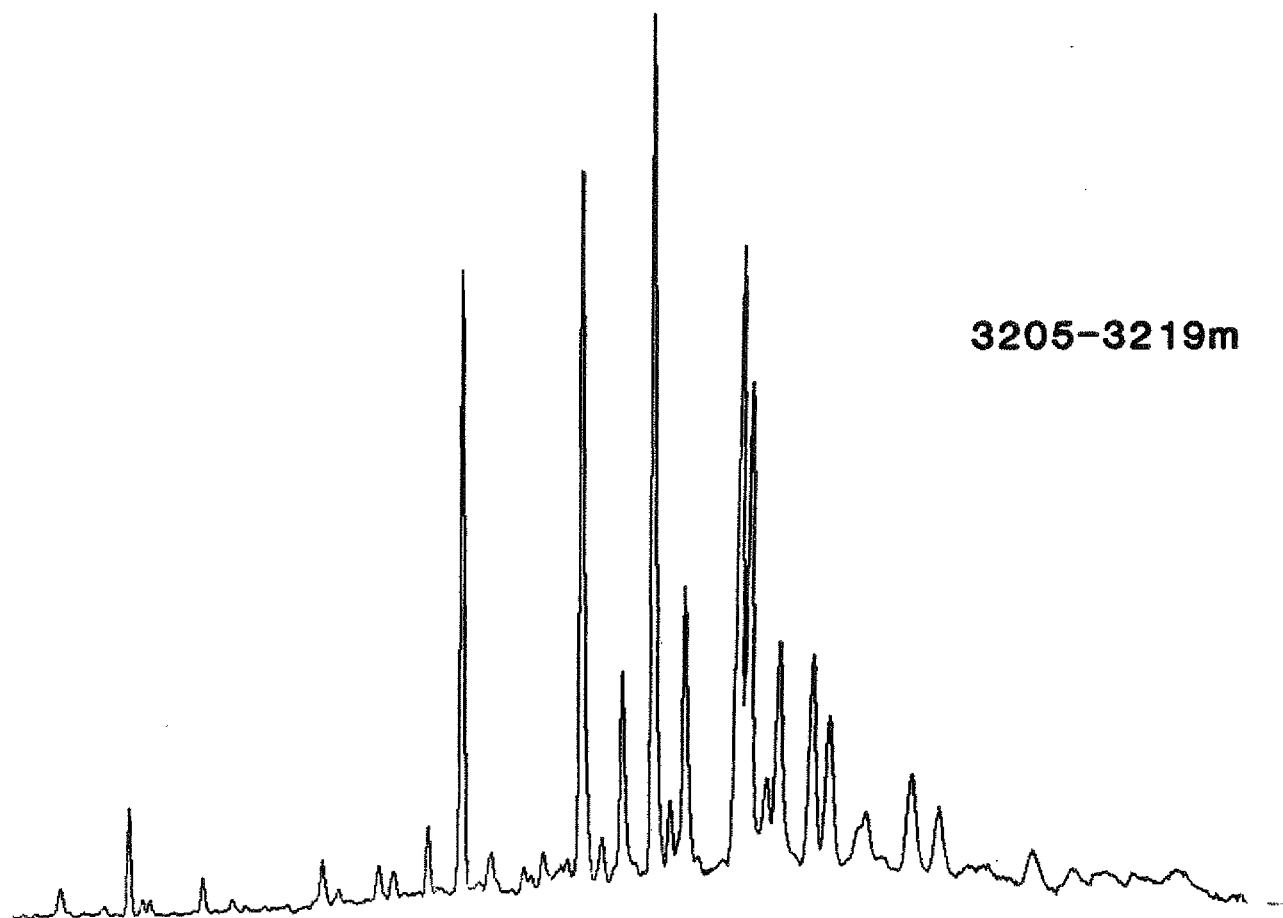
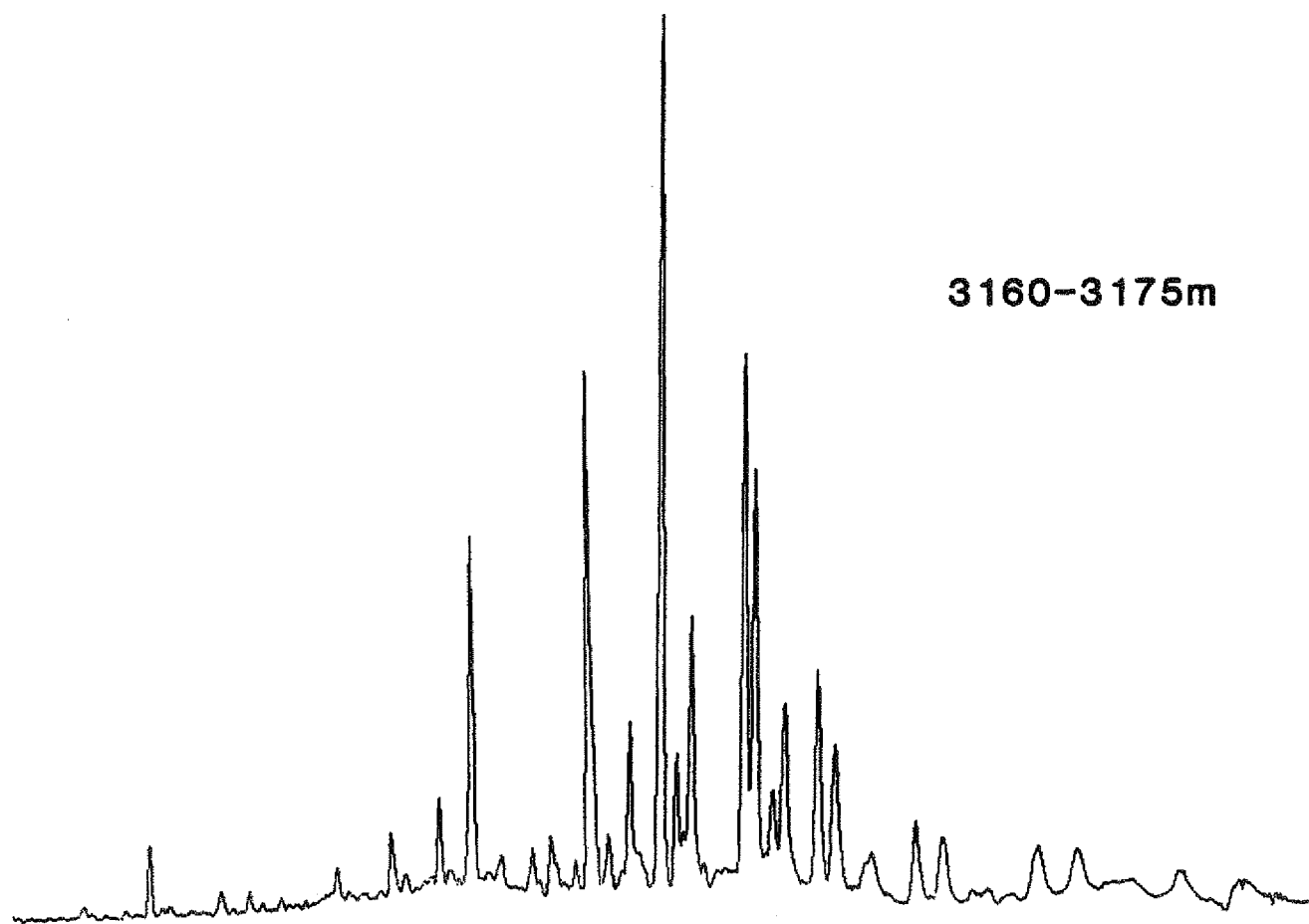
MASS FRAGMENTOGRAMS

WELL 34/10-21

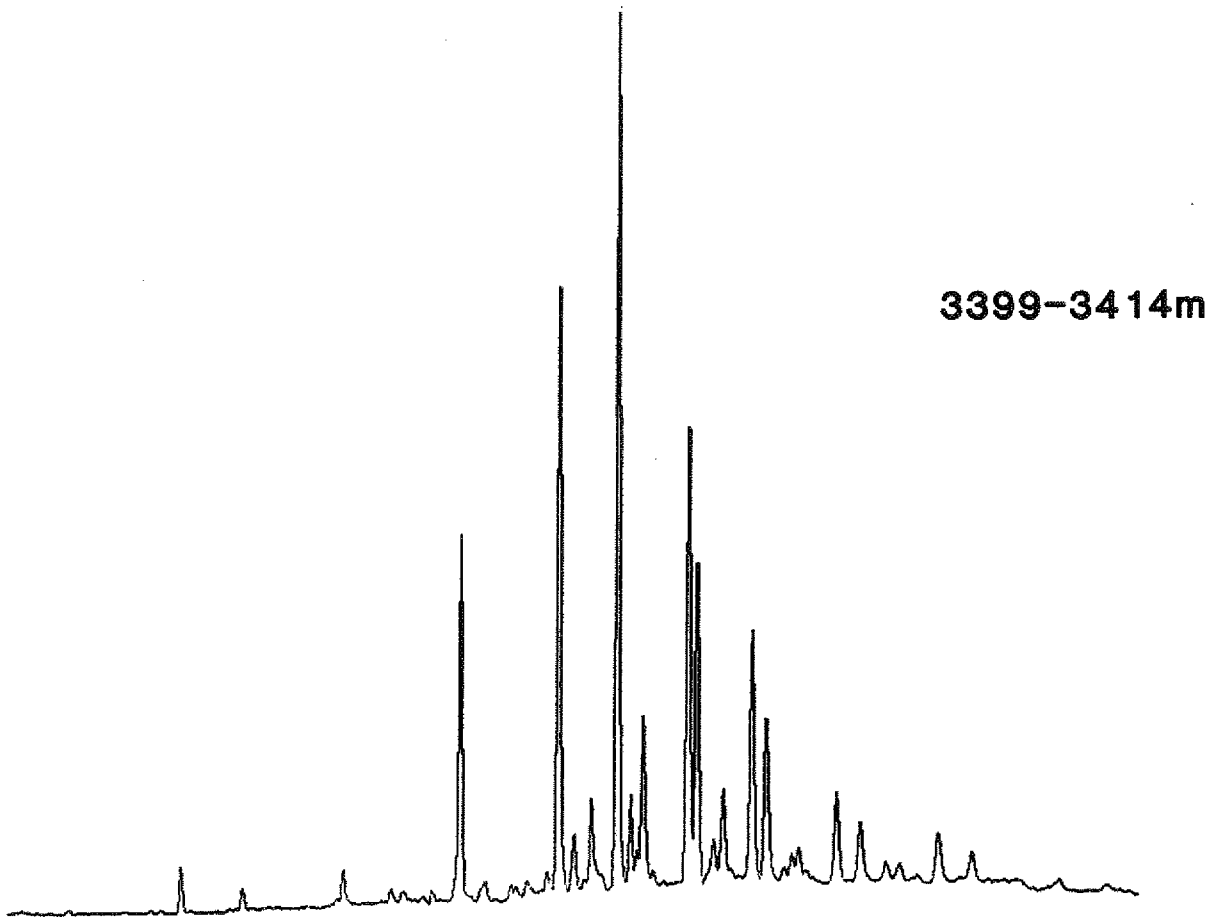
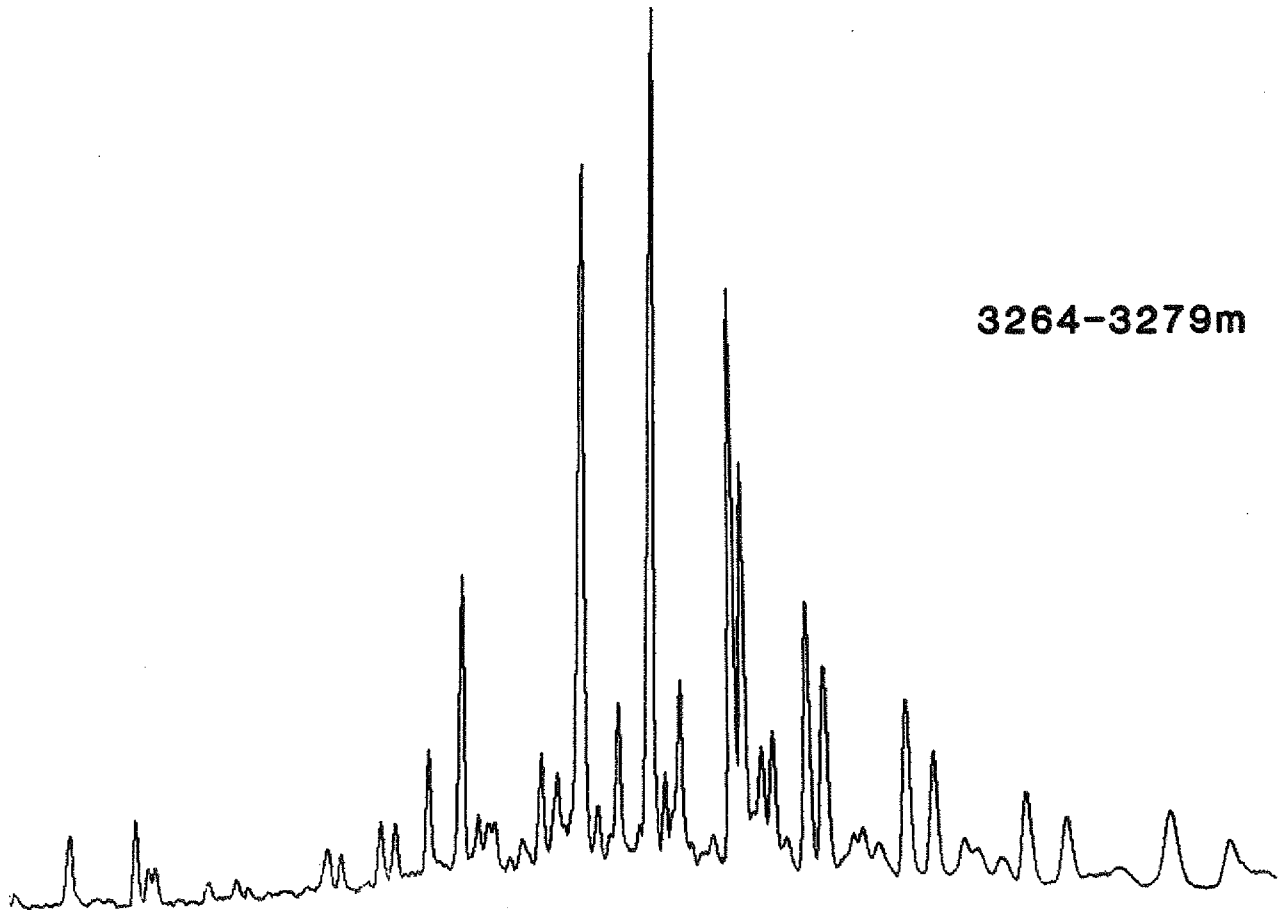
TRITERPANES m/z 191



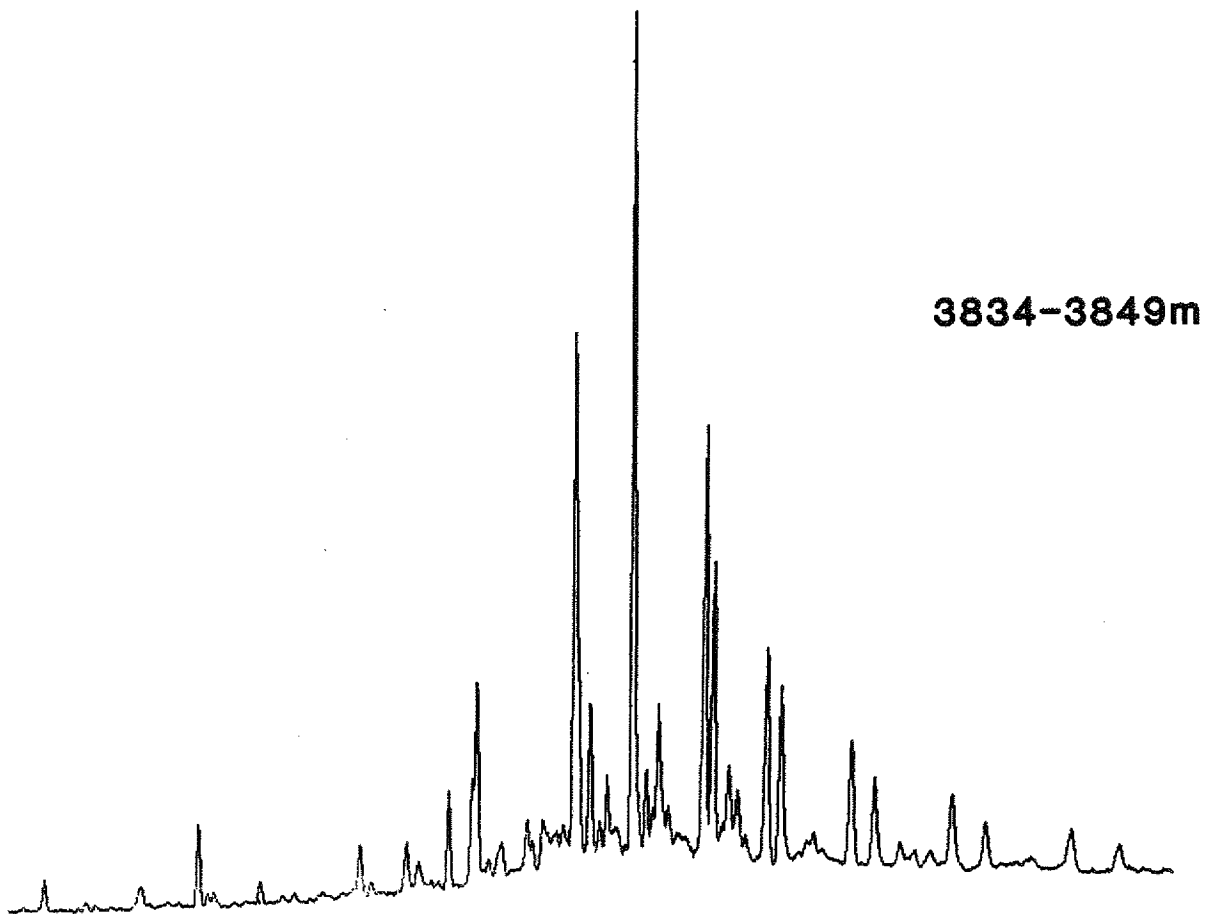
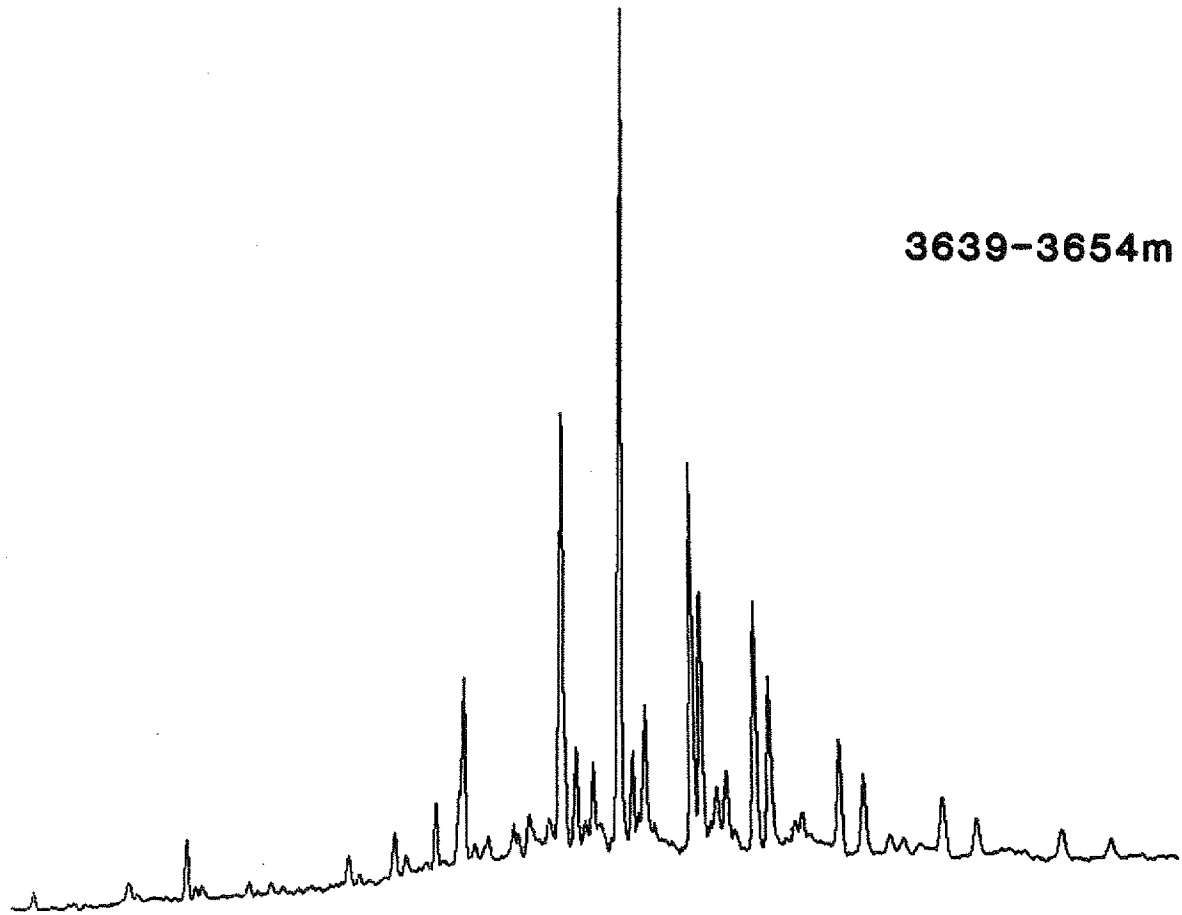
TRITERPANES m/z 191



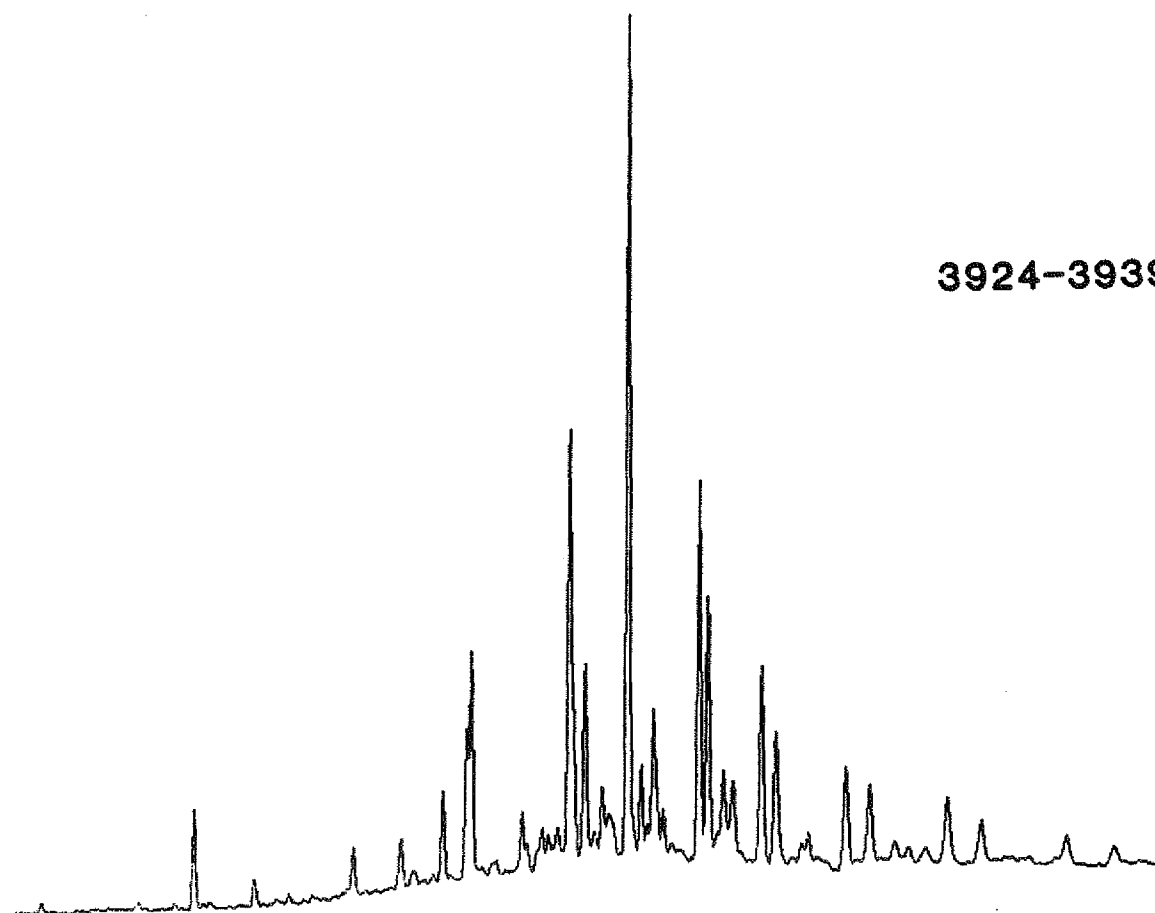
TRITERPANES m/z 191



TRITERPANES m/z 191



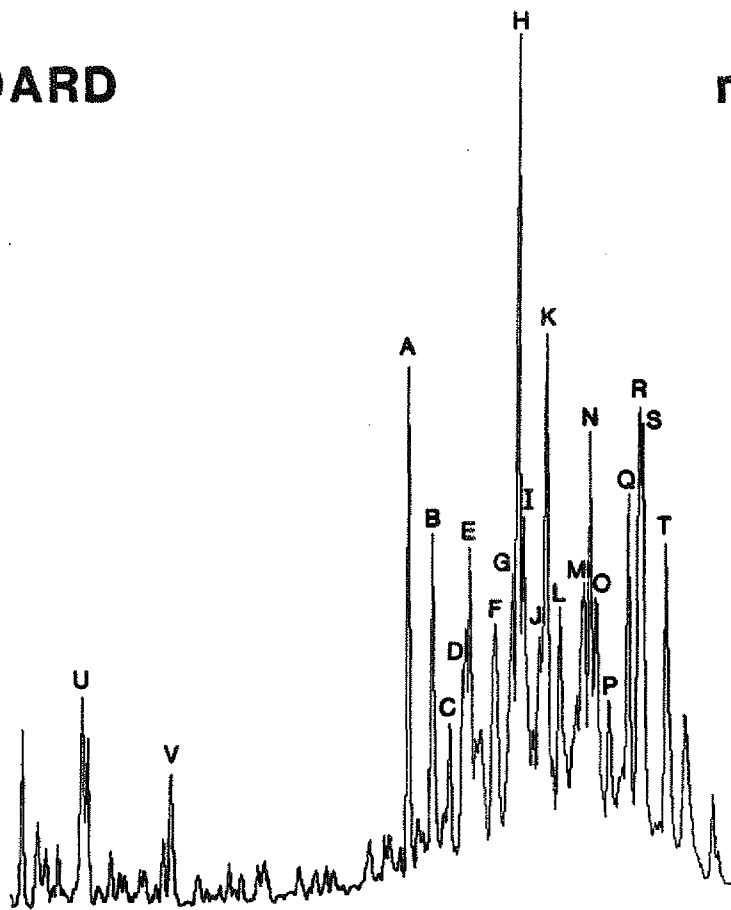
TRITERPANES m/z 191



3924-3939m

STANDARD

m/z 217

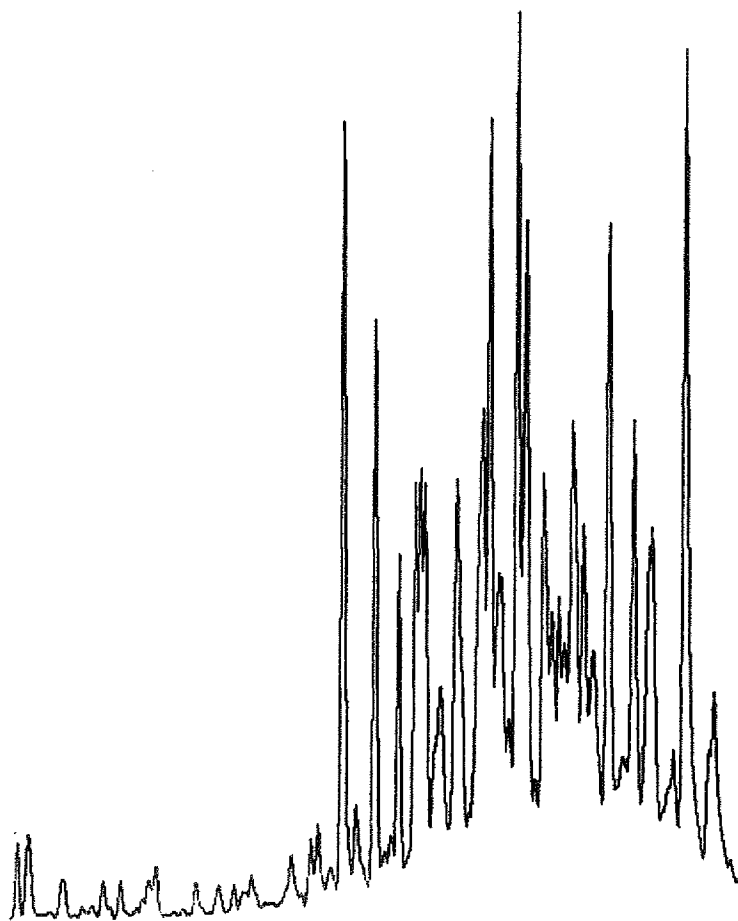


STERANE IDENTIFICATION

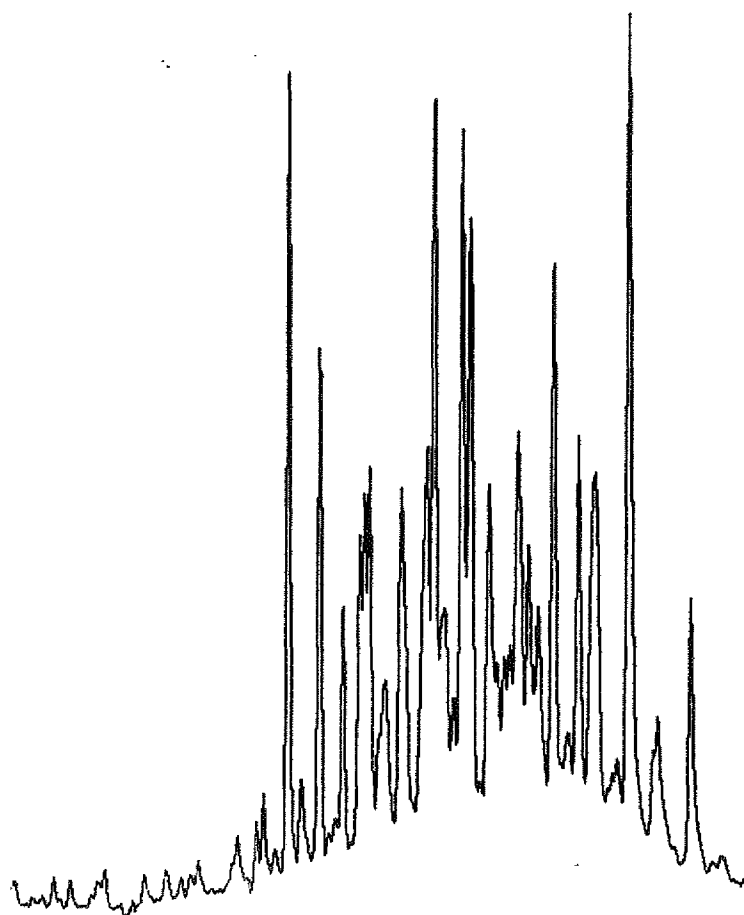
(M/Z 217 FRAGMENTOGRAM)

<u>COMPOUND</u>	<u>(M/Z 217 FRAGMENTOGRAM)</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 (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 β ,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)-bisorcholane	C ₂₂ H ₃₈

STERANES m/z 217

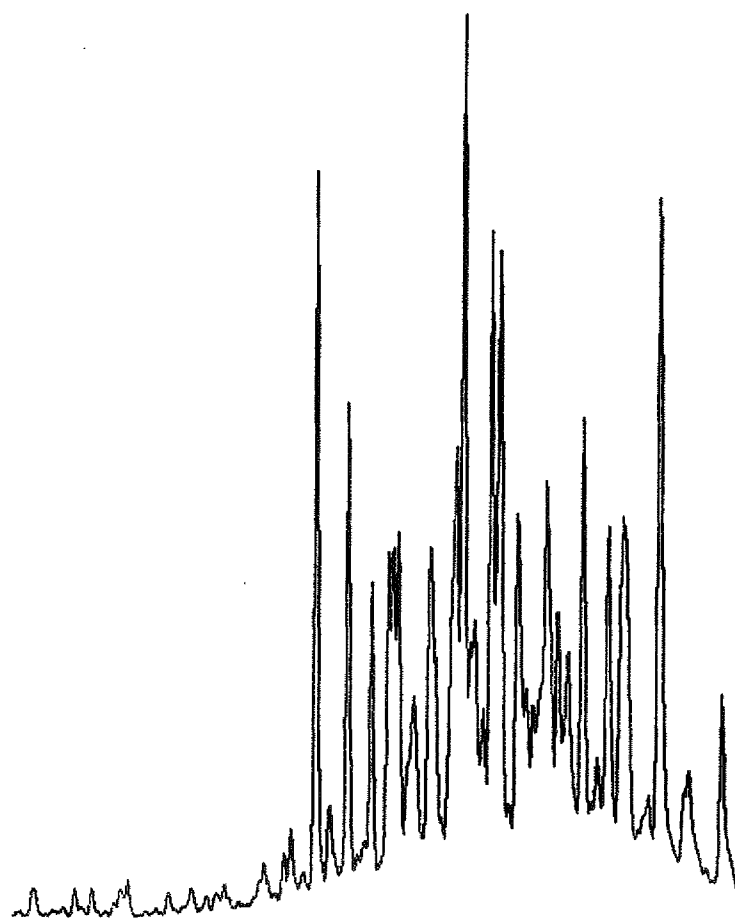


2935-2950m

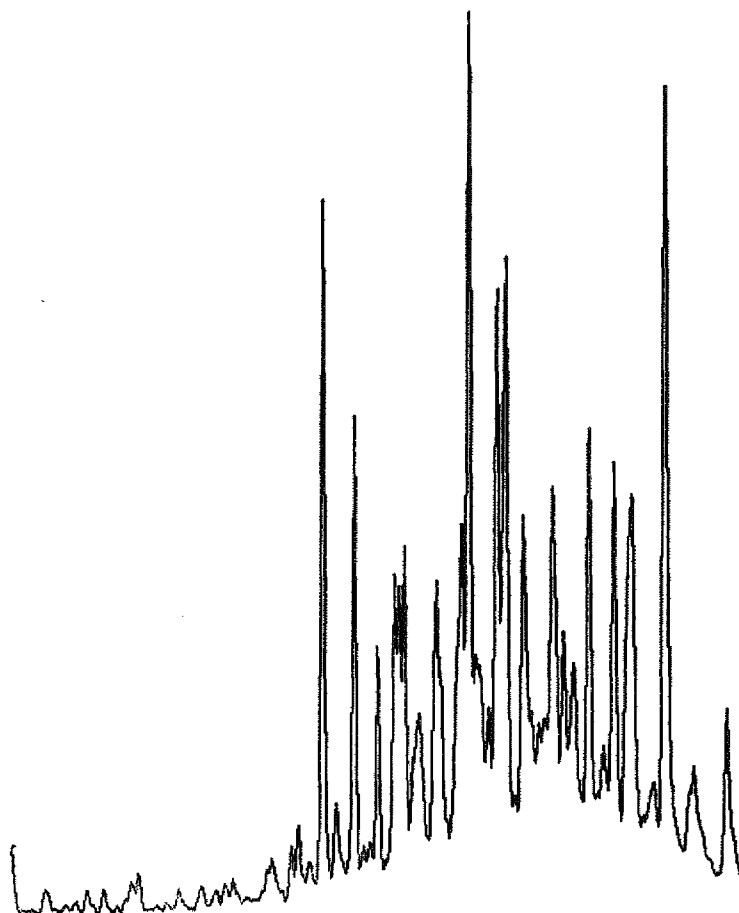


2995-3010m

STERANES m/z 217

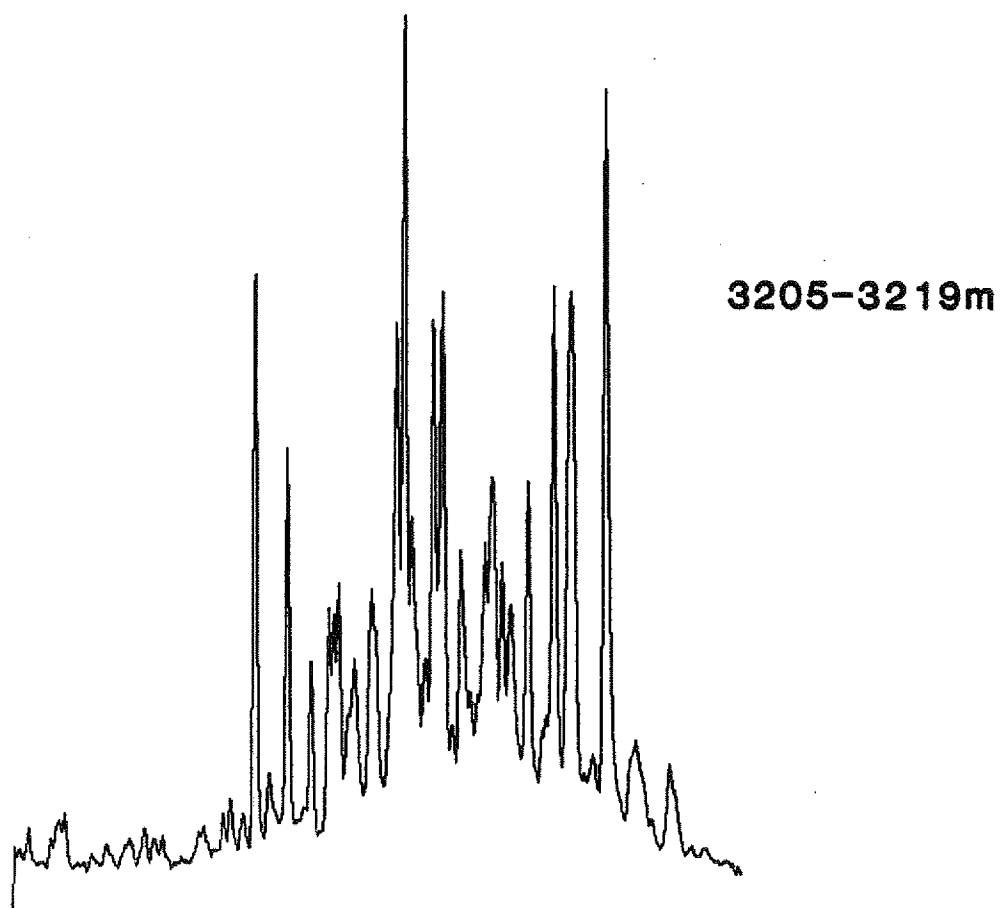
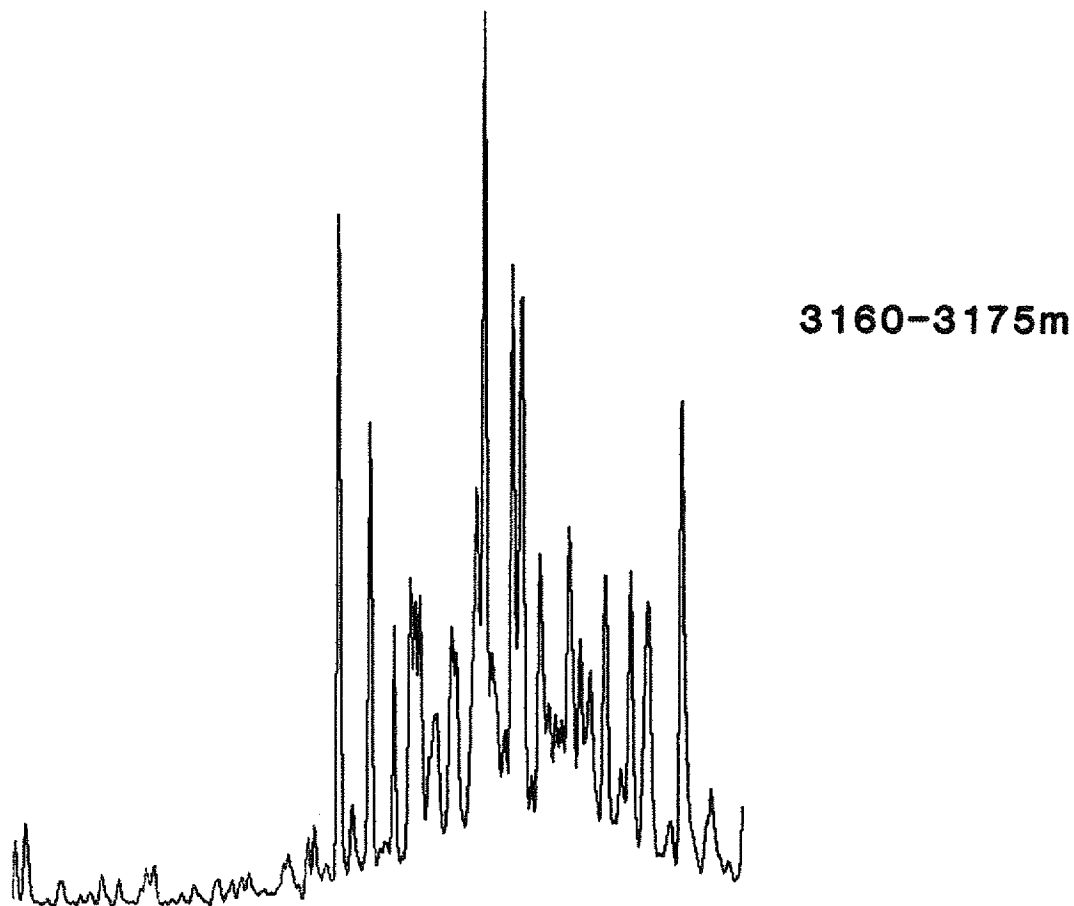


3040-3055m

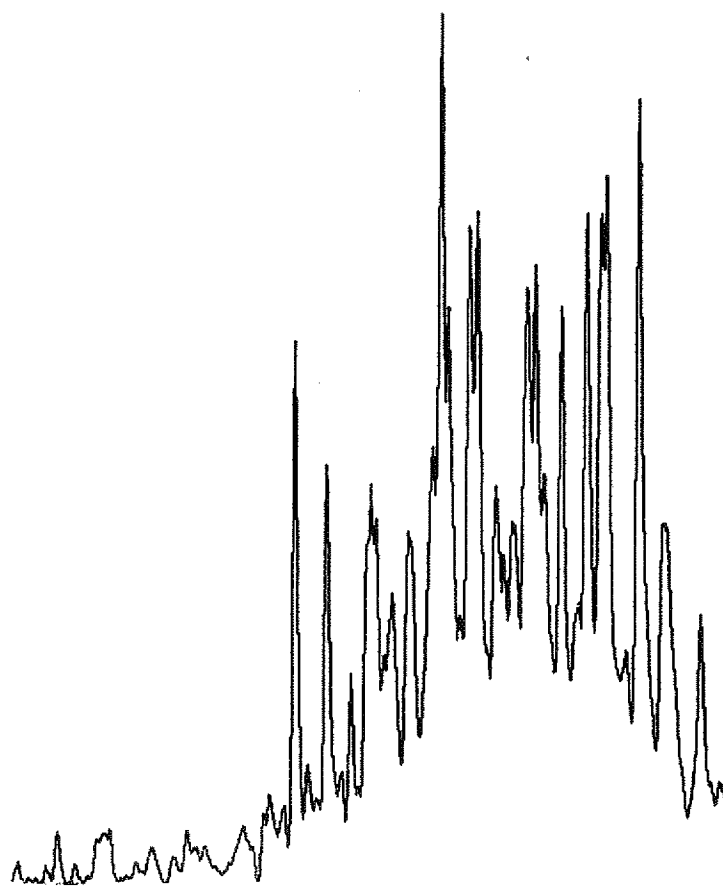


3115-3130m

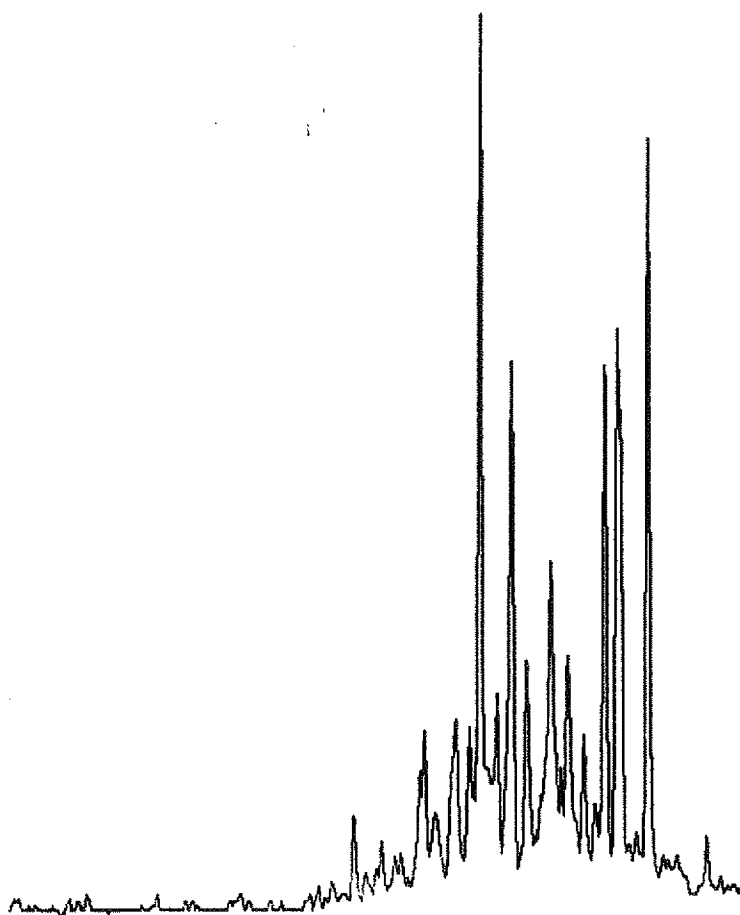
STERANES m/z 217



STERANES m/z 217

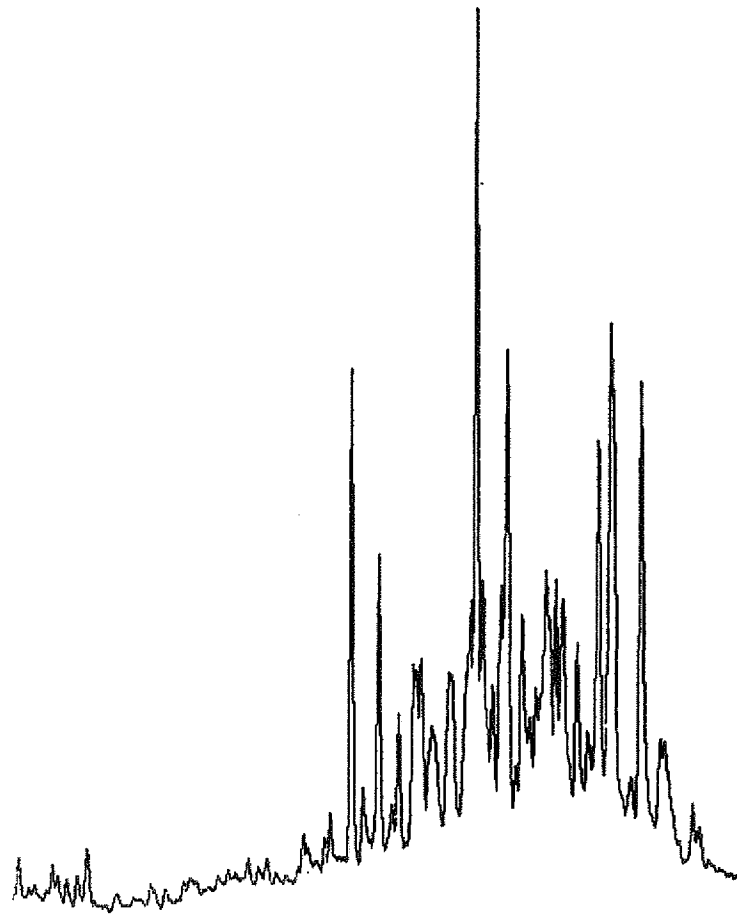


3264-3279m

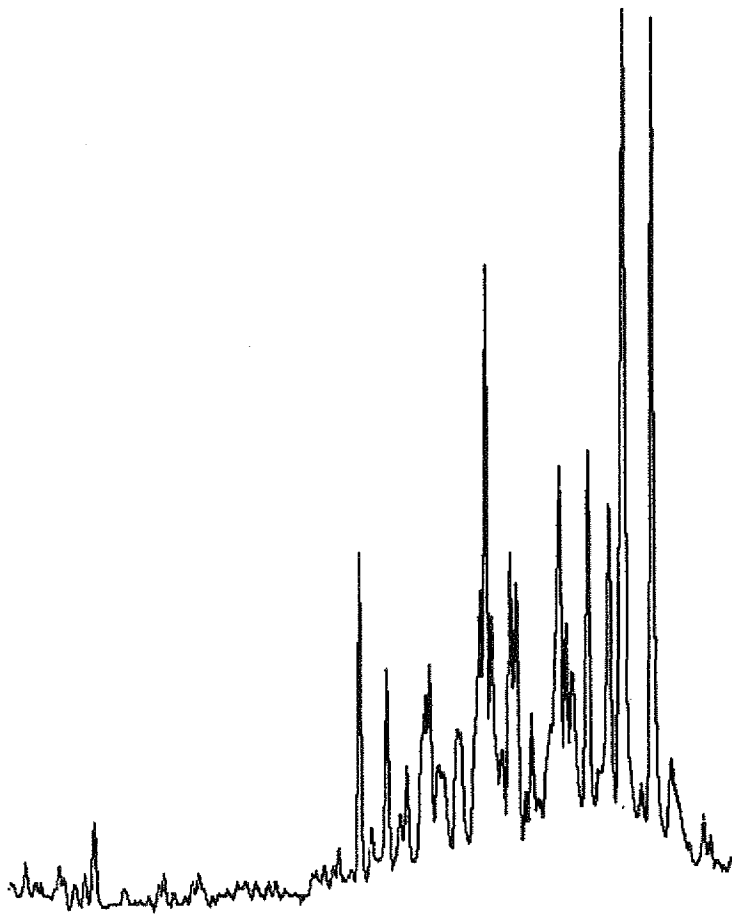


3399-3414m

STERANES m/z 217

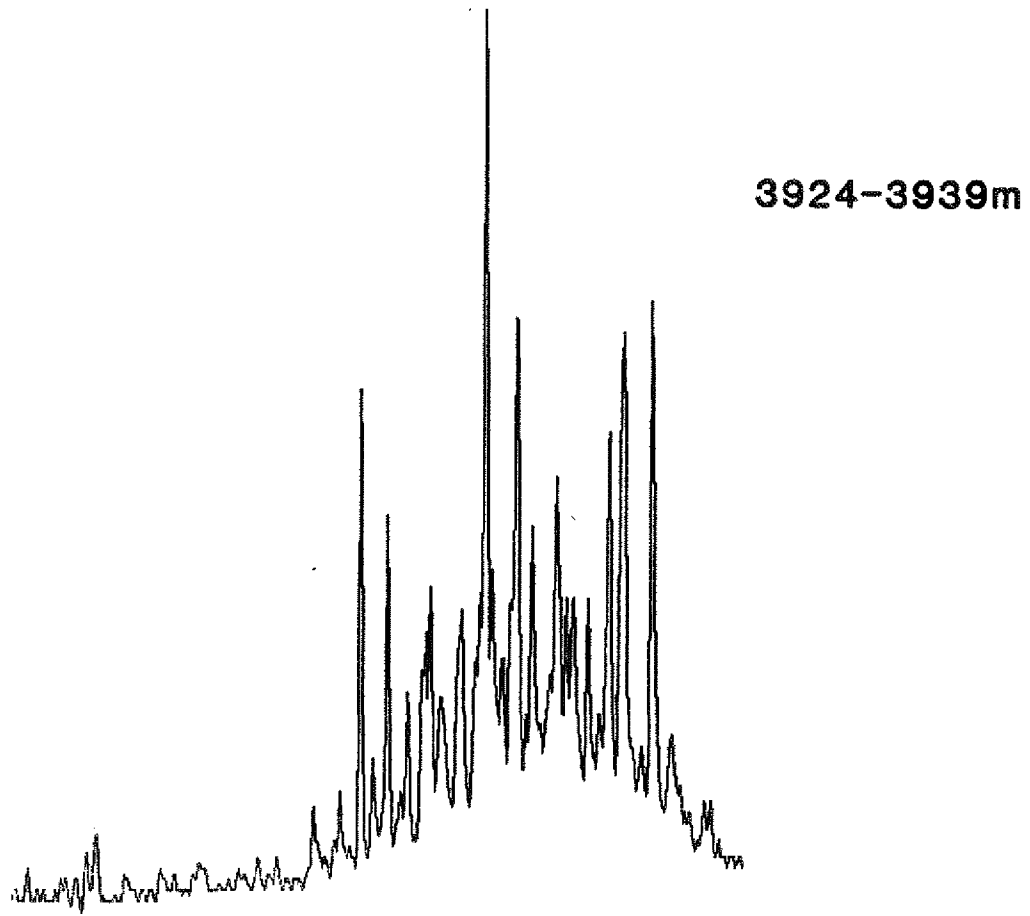


3639-3654m



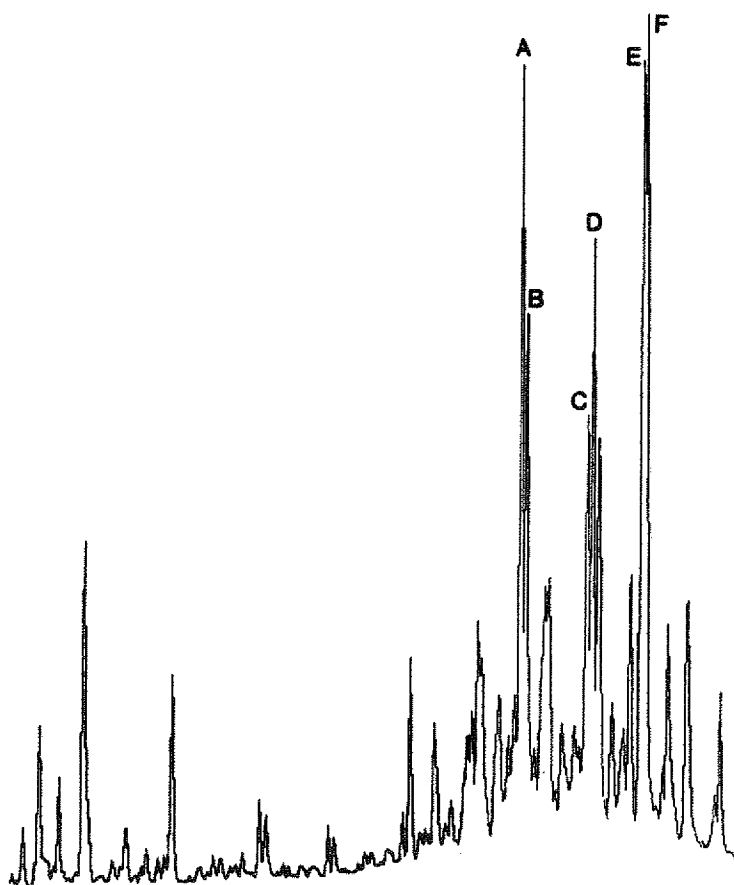
3834-3849m

STERANES m/z 217



STANDARD

m/z 218



STERANE IDENTIFICATION

(M/Z 218 FRAGMENTOGRAM)

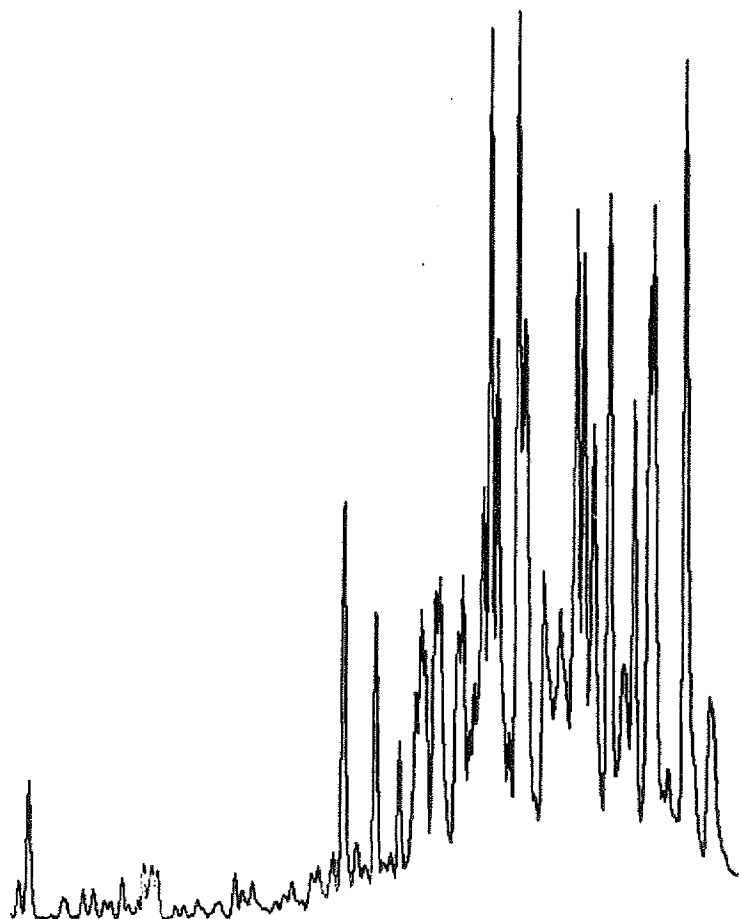
<u>COMPOUND</u>	<u>ELEMENTAL COMPOUND</u>
A 14 β ,17 β -cholestane (20R)	C ₂₇ H ₄₈
B 14 β ,17 β -cholestane (20S)	C ₂₇ H ₄₈
C 24-methyl-14 β ,17 β -cholestane (20R)	C ₂₈ H ₅₀
D 24-methyl-14 β ,17 β -cholestane (20S)	C ₂₈ H ₅₀
E 24-ethyl-14 β ,17 β -cholestane (20R)	C ₂₉ H ₅₂
F 24-ethyl-14 β ,17 β -cholestane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

FIGURE 10a

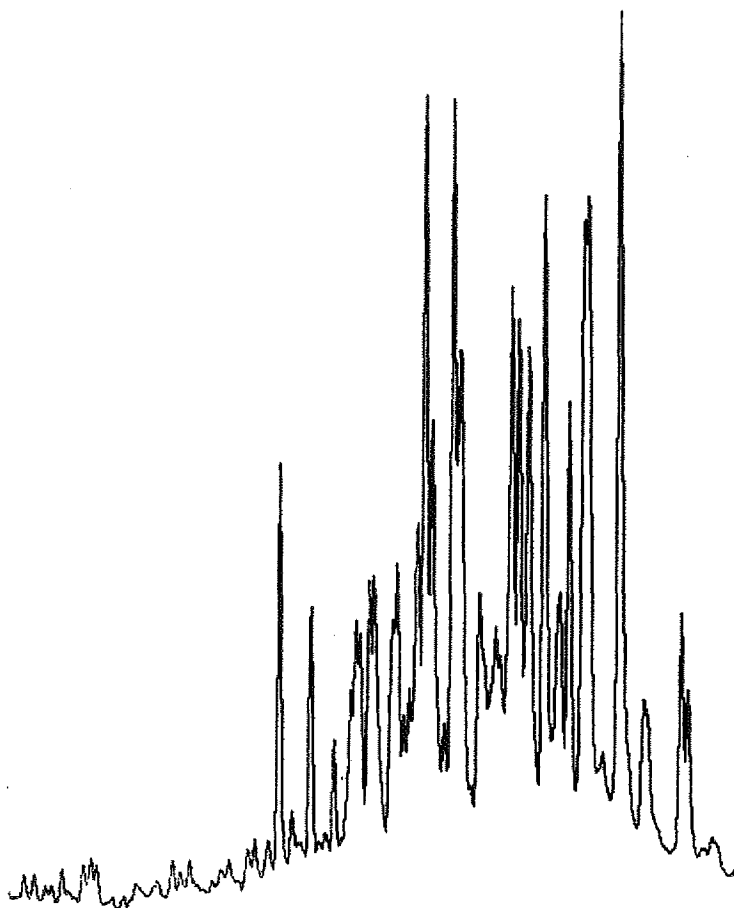
MASS FRAGMENTOGRAMS

WELL 34/10-21

STERANES m/z 218

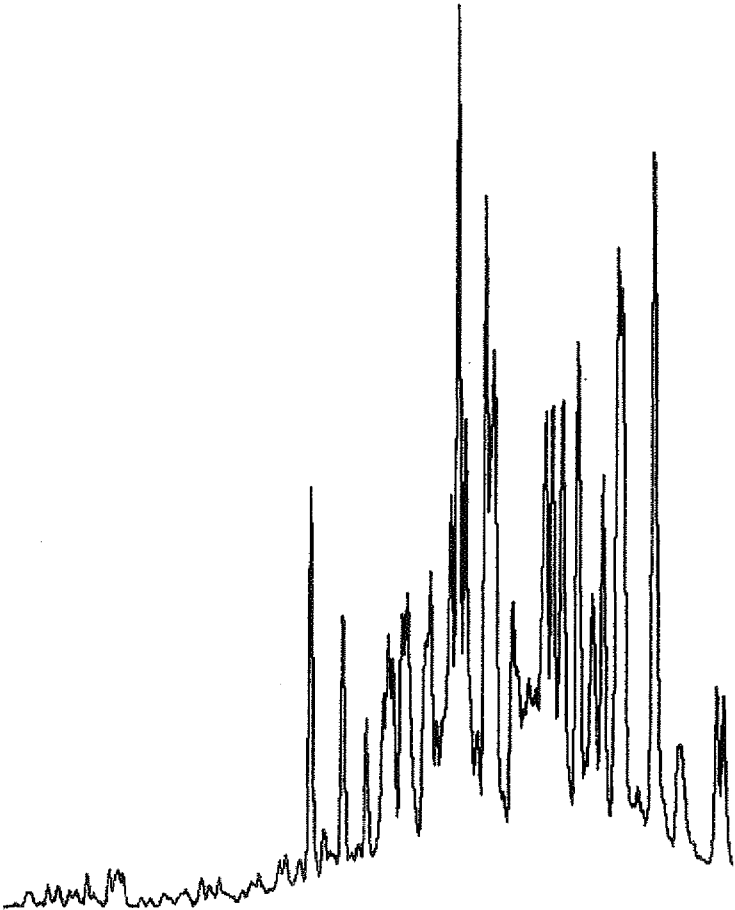


2935-2950m

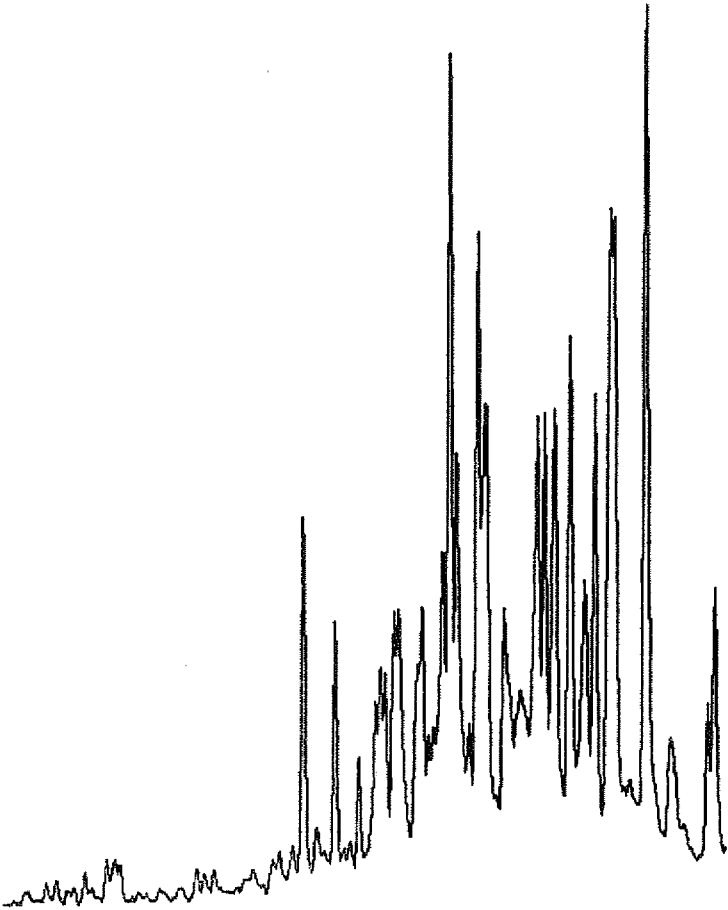


2995-3010m

STERANES m/z 218



3040-3055m



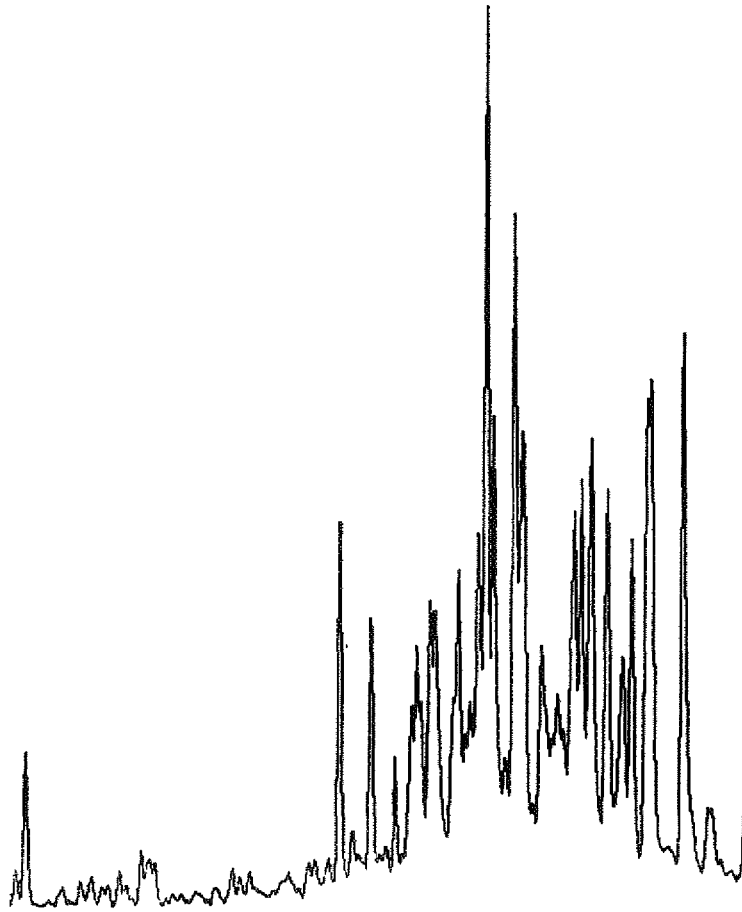
3115-3130m

FIGURE 10c

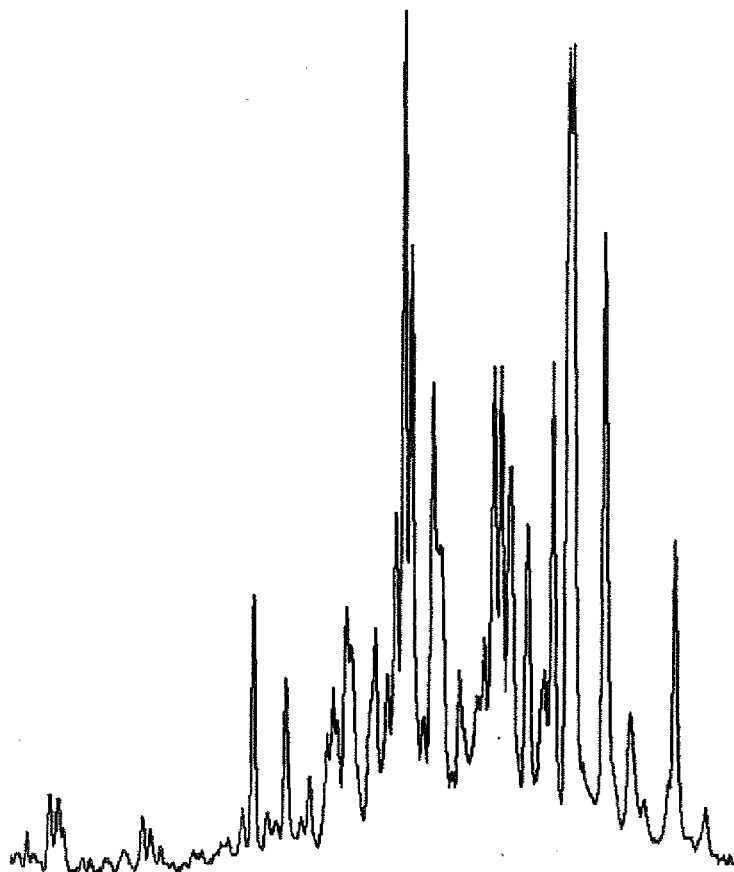
MASS FRAGMENTOGRAMS

WELL 34/10-21

STERANES m/z 218



3160-3175m



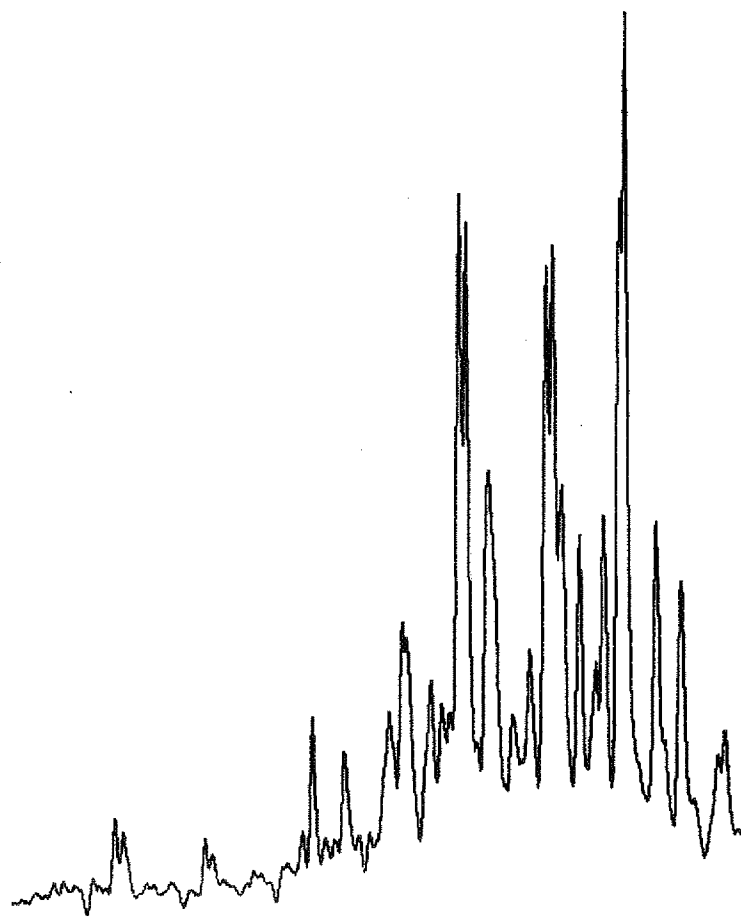
3205-3219m

FIGURE 10d

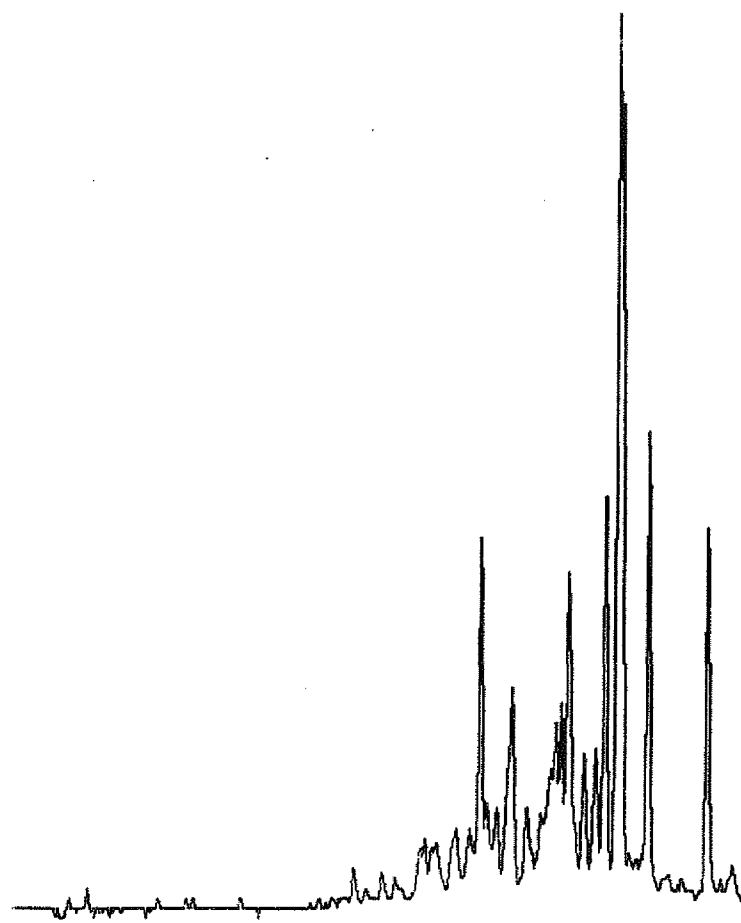
MASS FRAGMENTOGRAMS

WELL 34/10-21

STERANES m/z 218

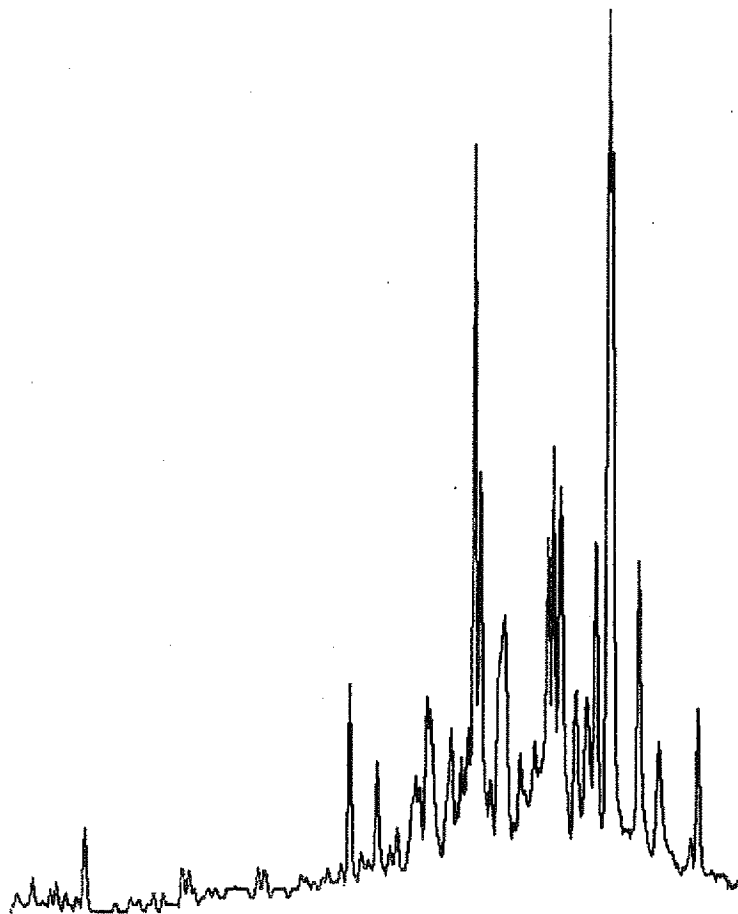


3264-3279m

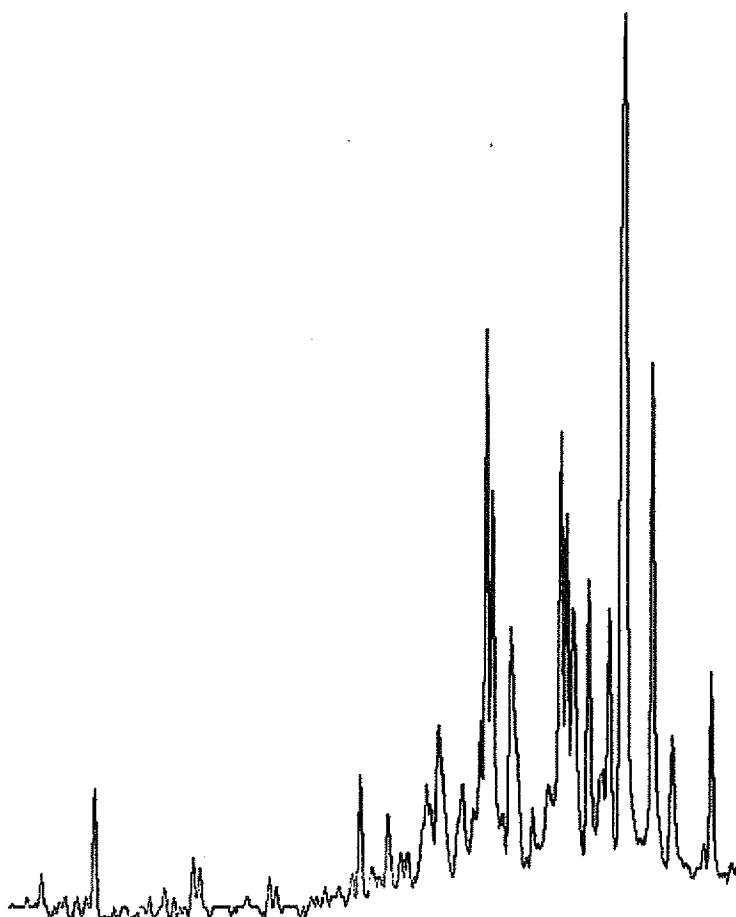


3399-3414m

STERANES m/z 218



3639-3654m



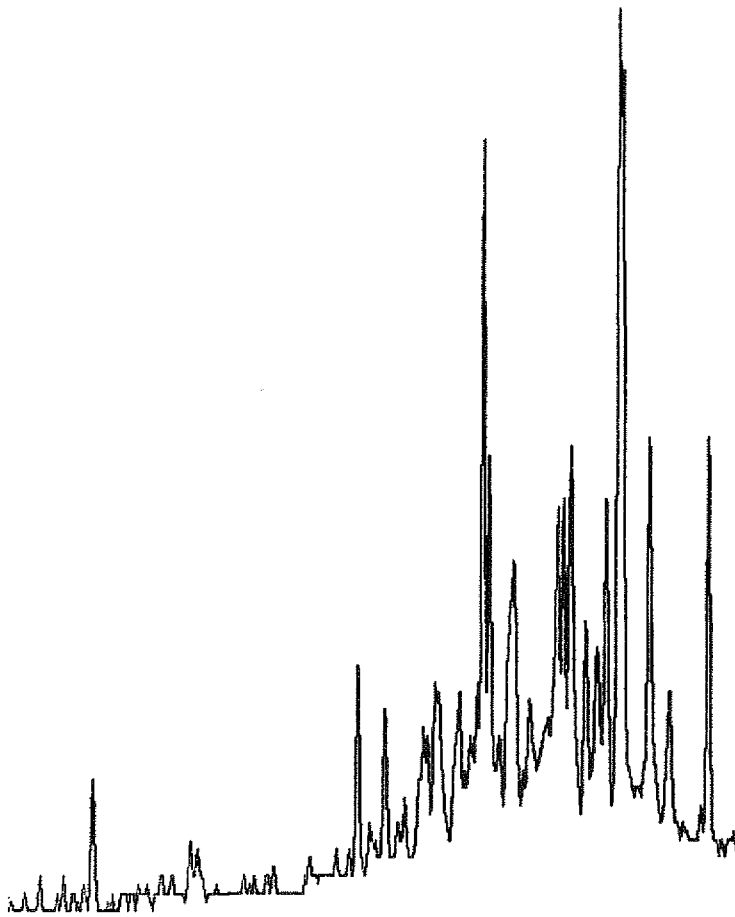
3834-3849m

FIGURE 10f

MASS FRAGMENTOGRAMS

WELL 34/10-21

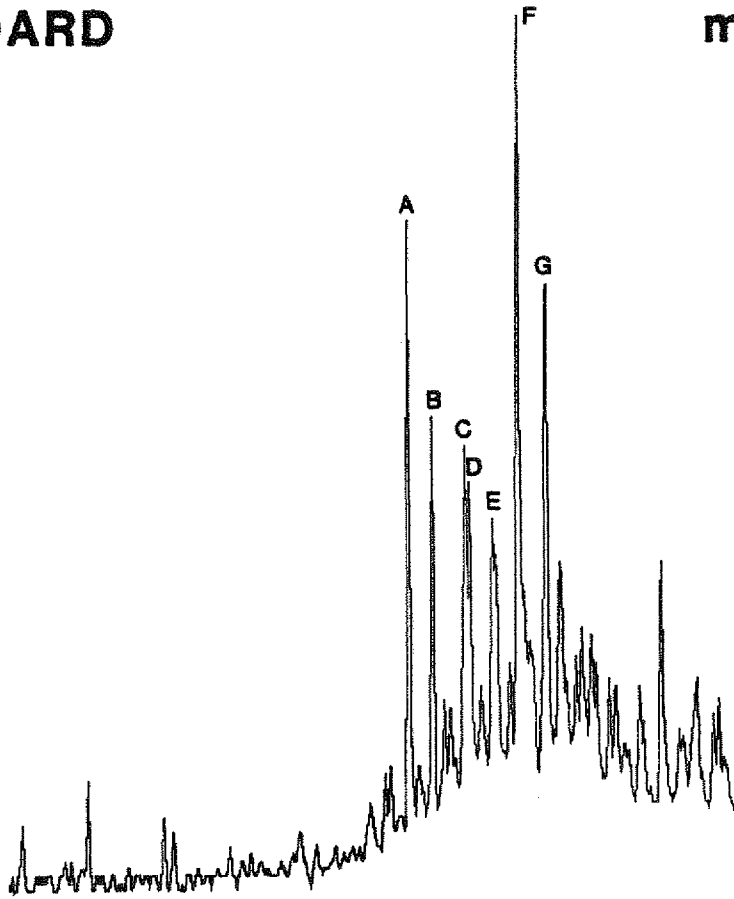
STERANES m/z 218



3924-3939m

STANDARD

m/z 259

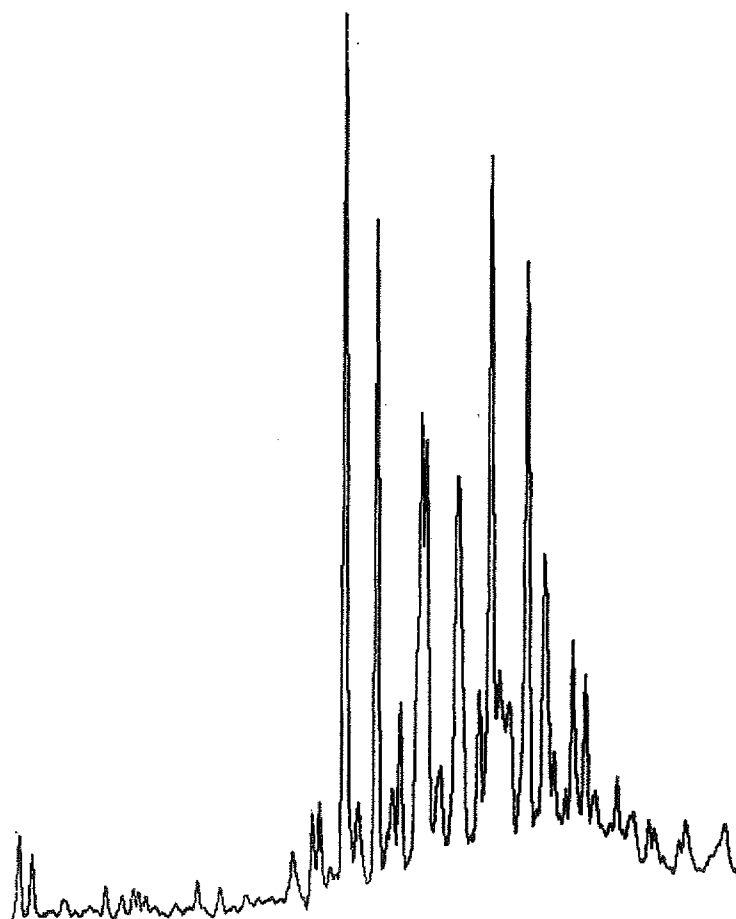


STERANE IDENTIFICATION

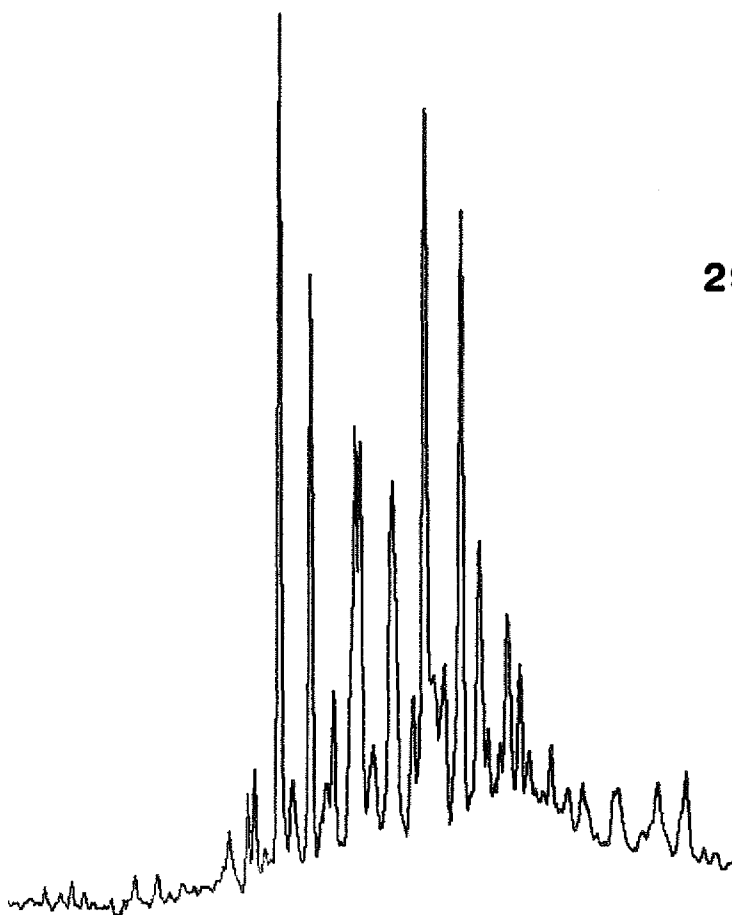
(M/Z 259 FRAGMENTOGRAM)

	<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

REARRANGED STERANES m/z 259

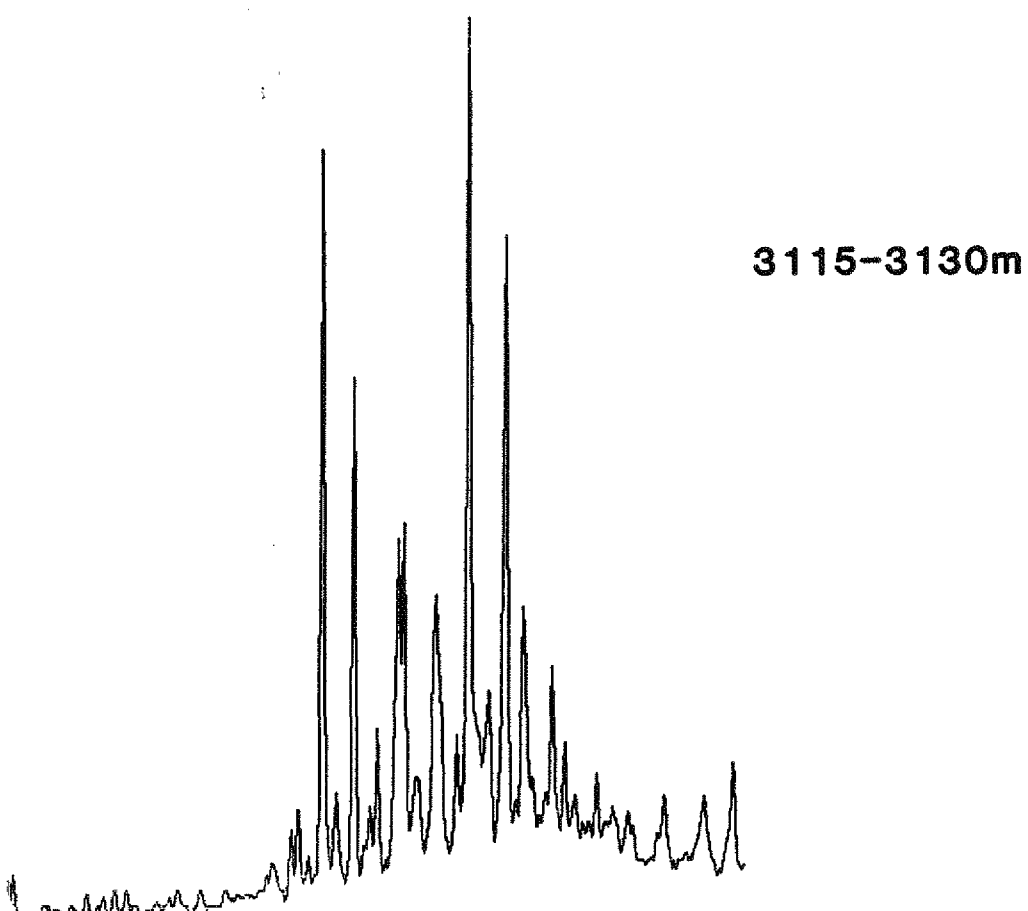
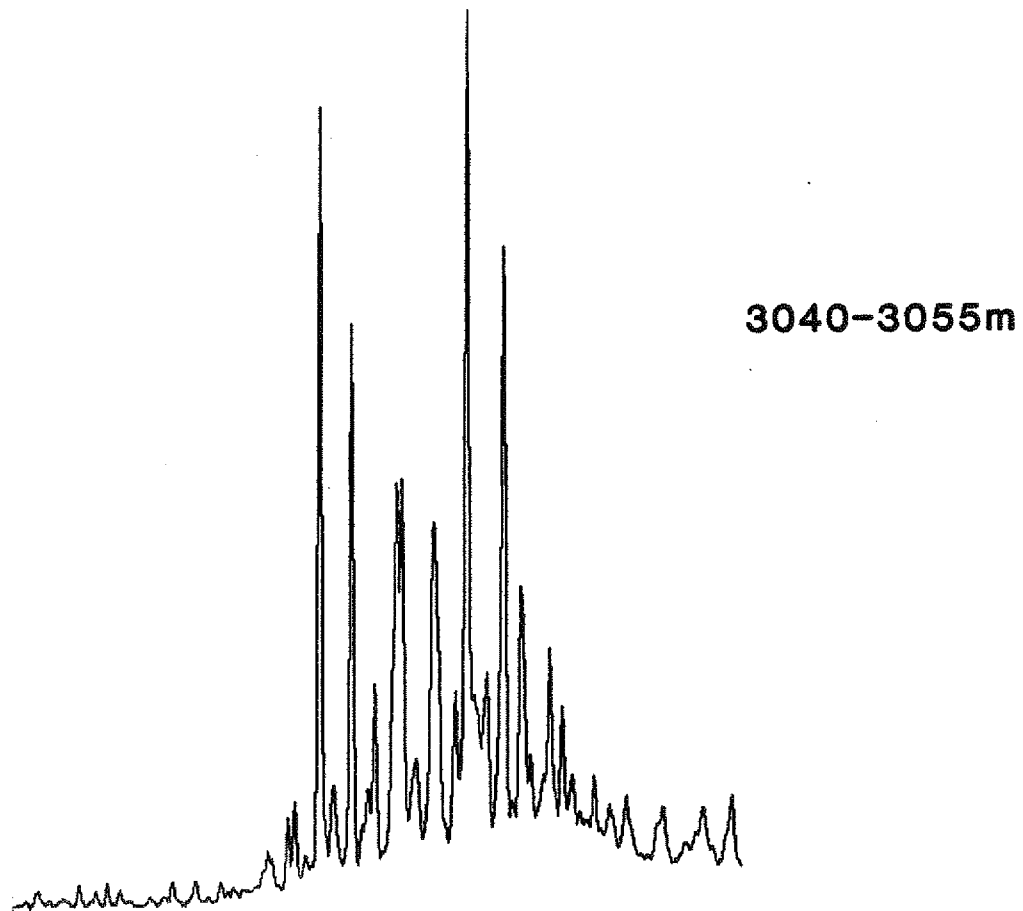


2935-2950m

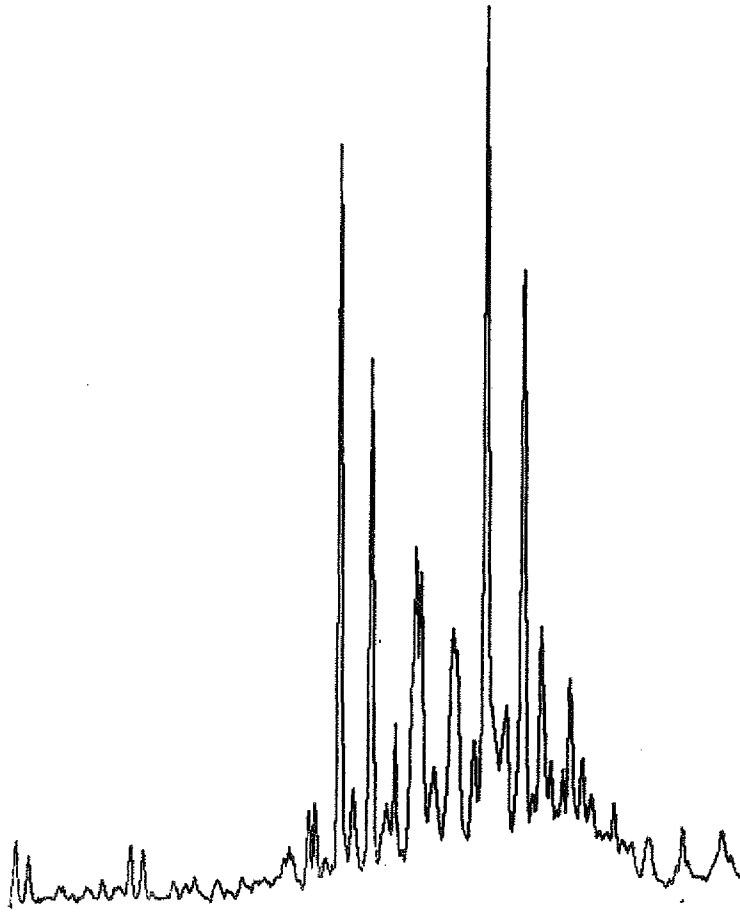


2995-3010m

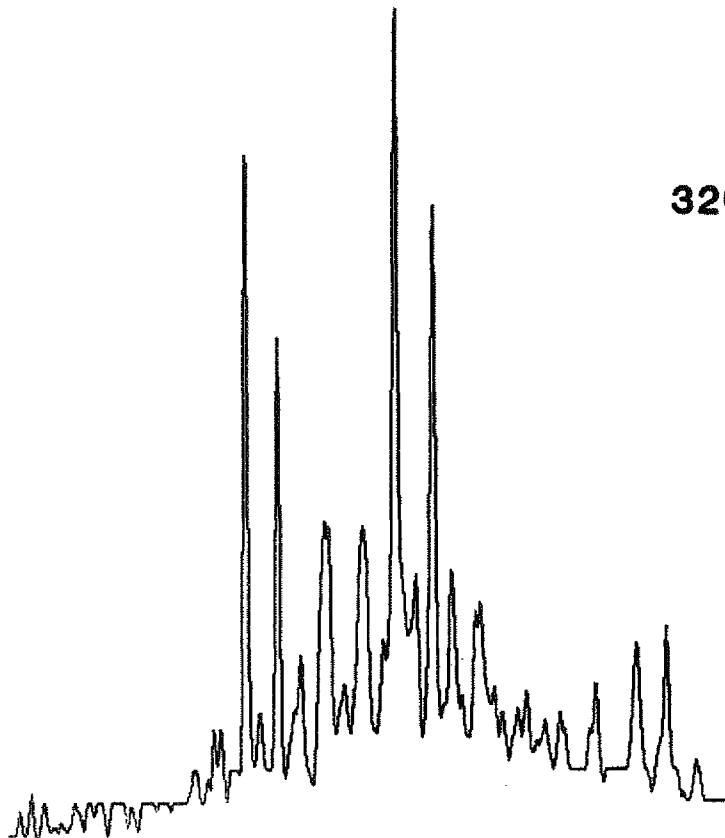
REARRANGED STERANES m/z 259



REARRANGED STERANES m/z 259

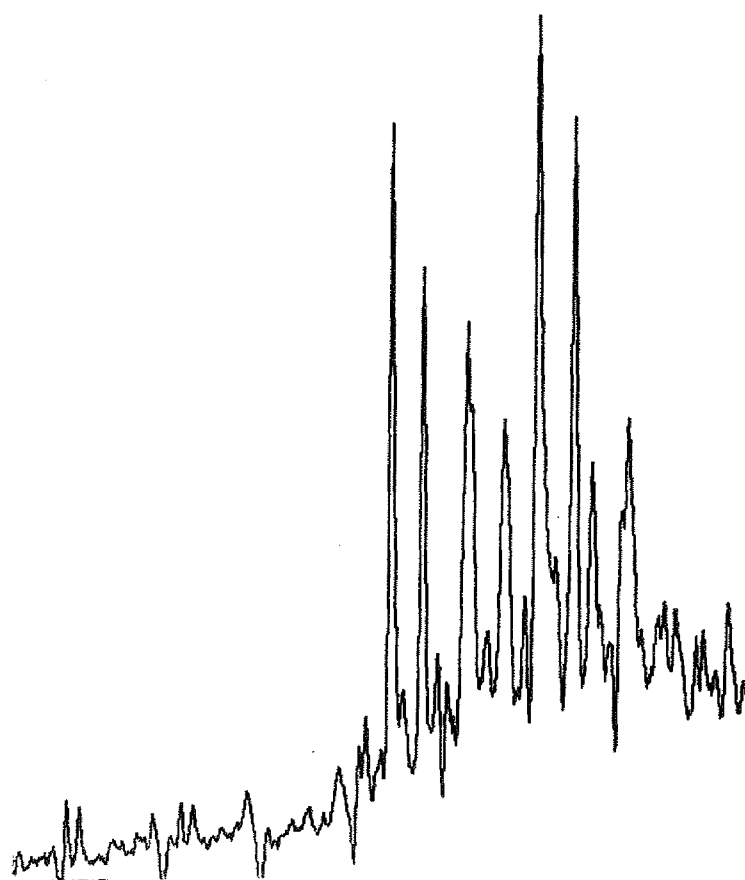


3160-3175m

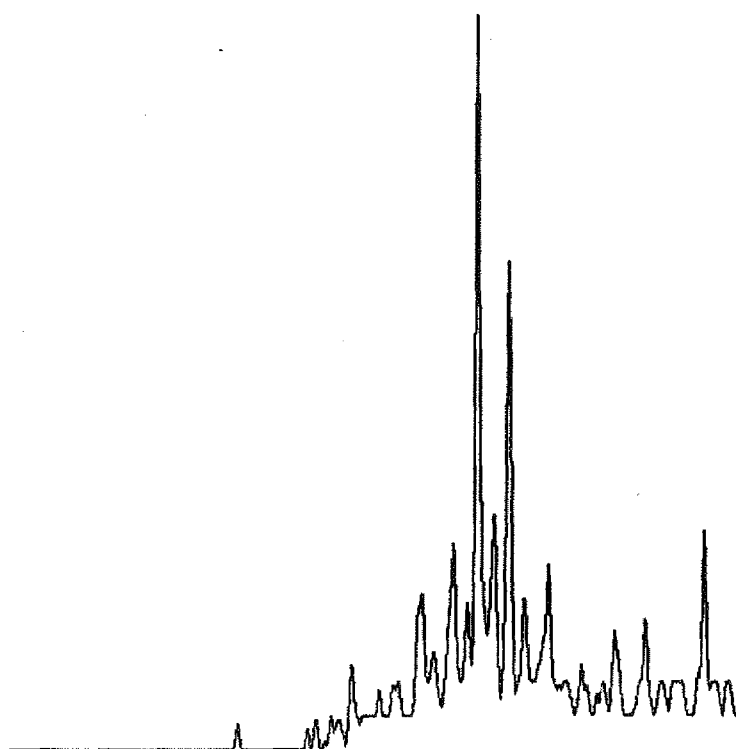


3205-3219m

REARRANGED STERANES m/z 259



3264-3279m



3399-3414m

REARRANGED STERANES m/z 259

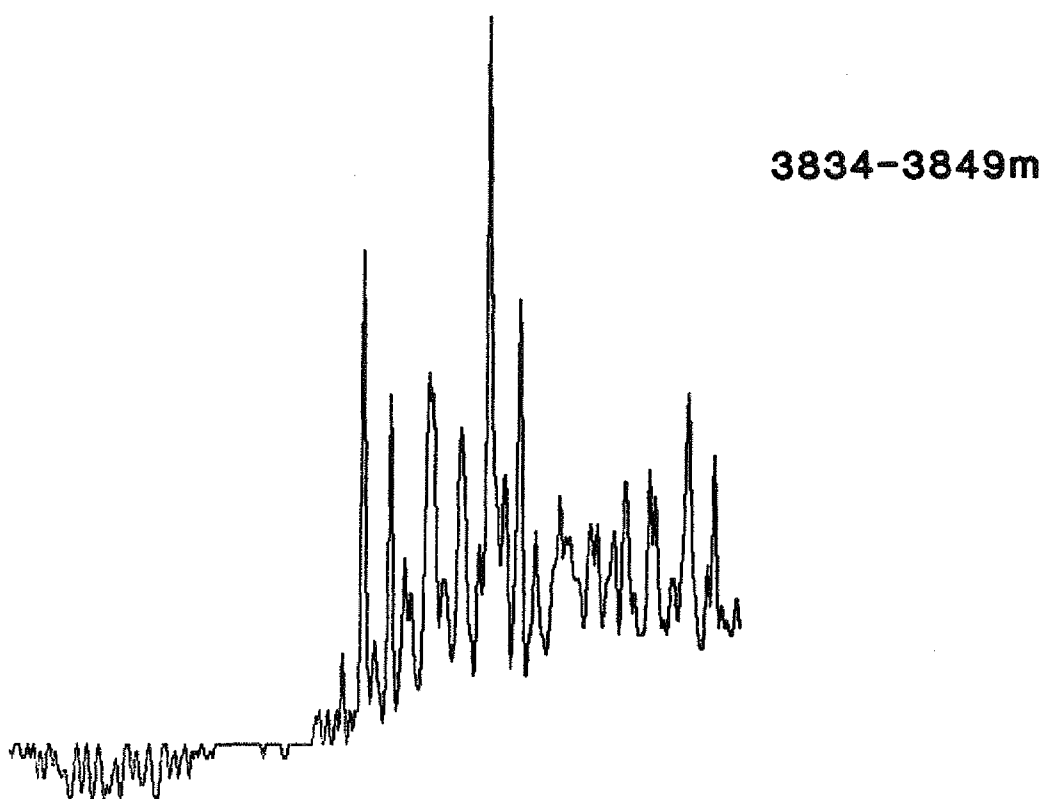
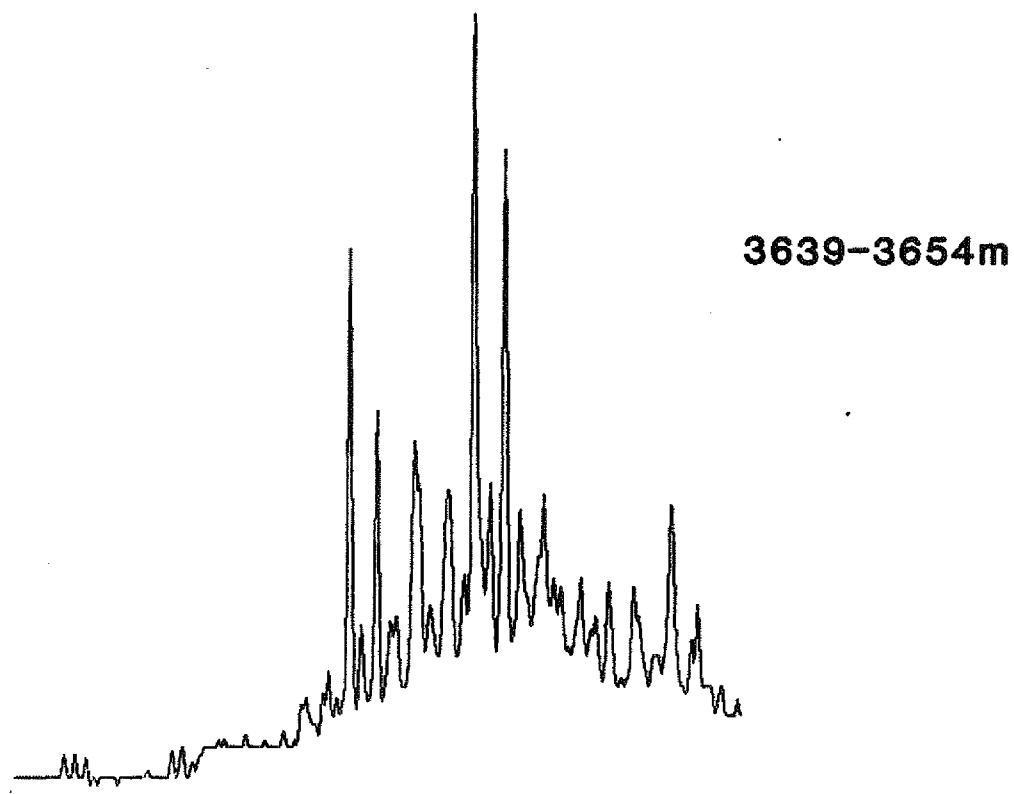
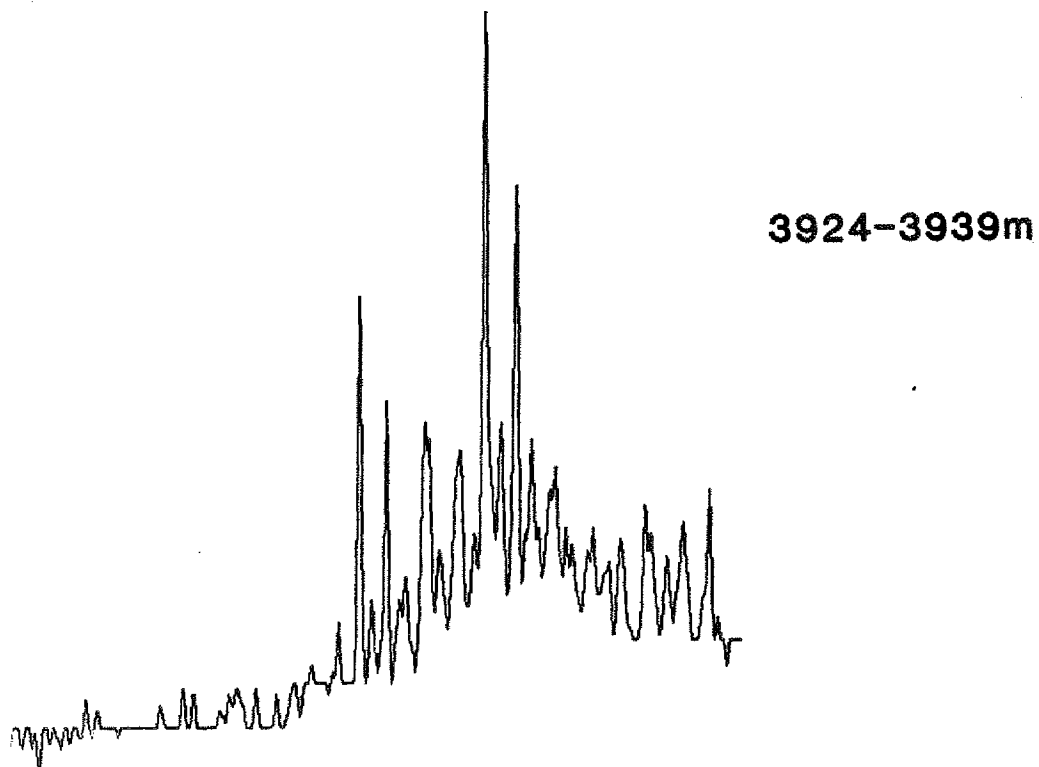


FIGURE 11f

MASS FRAGMENTOGRAMS

WELL 34/10-21

REARRANGED STERANES m/z 259



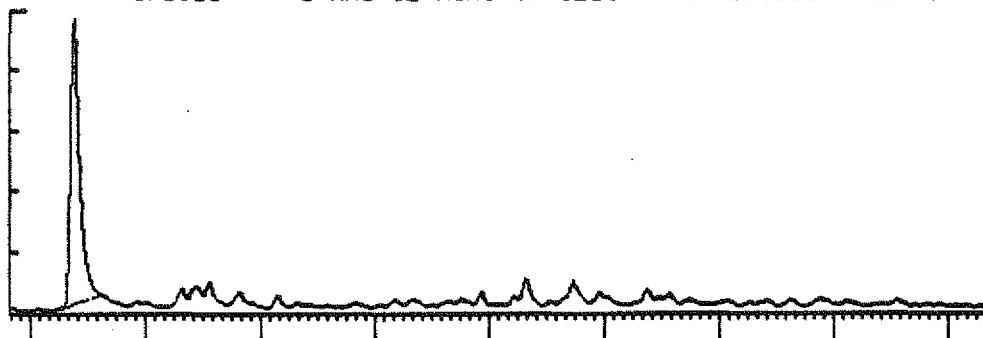
AROMATIC MASS FRAGMENTOGRAMS

PHENANTHRENE SERIES

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

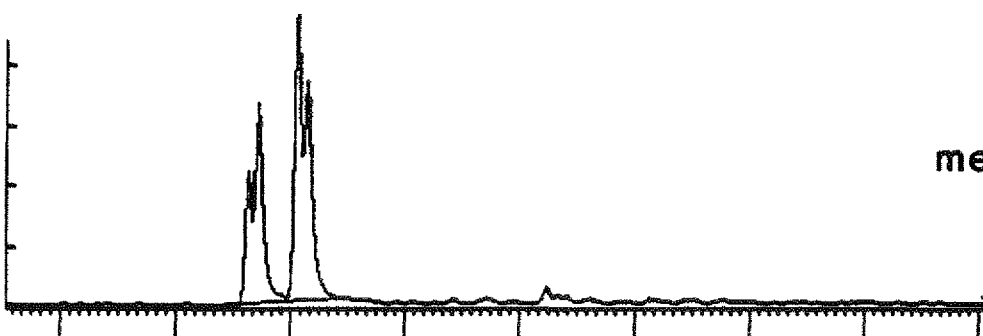
UNCALIBRATED.

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



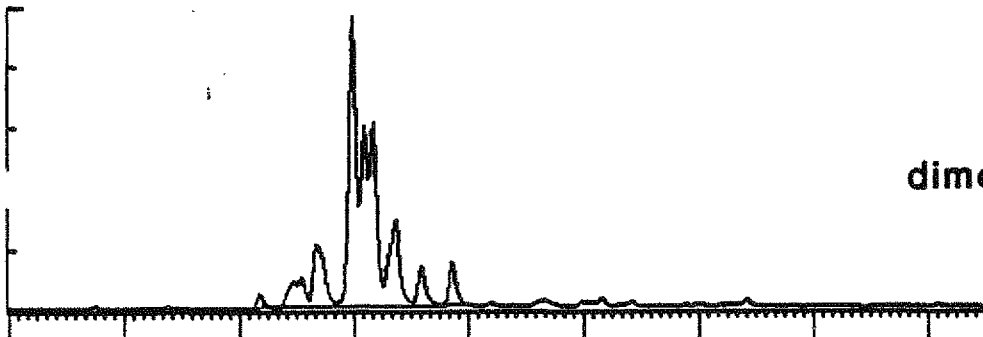
phenanthrene

192.00	0 HRS 14 MINS 41 SECS	9491.7360	122714.4000	0.0000	0.0000
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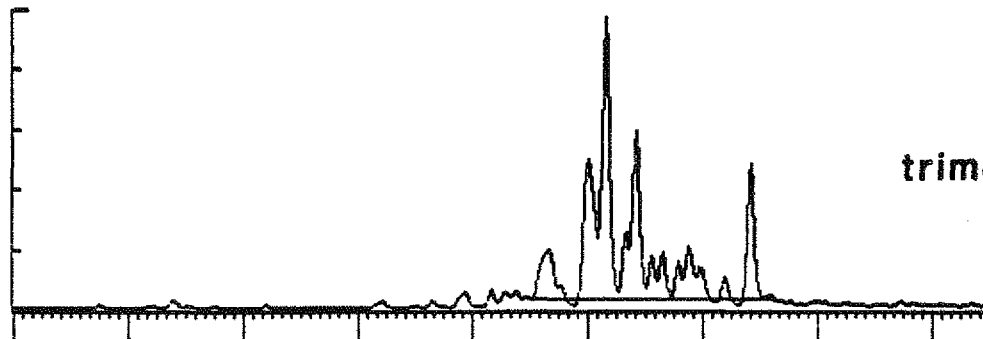
methyl phenanthrenes

206.00	0 HRS 16 MINS 31 SECS	7513.8950	112294.6000	0.0000	0.0000
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dimethyl phenanthrenes

220.00	0 HRS 18 MINS 21 SECS	3435.1420	60707.0400	0.0000	0.0000
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trimethyl phenanthrenes

0 HRS 13 MINS 59 SECS

0 HRS 22 MINS 10 SECS

PHENANTHRENE SERIES

SIR REPORT. FILE - 972127 .SD RUN - 1

UNCALIBRATED.
MASS

RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	3999.9990	14969.9800	0.0000	0.0000
192.00	3856.7680	38872.4300	0.0000	0.0000
206.00	2497.5870	44812.6100	0.0000	0.0000
220.00	976.4242	25782.2700	0.0000	0.0000

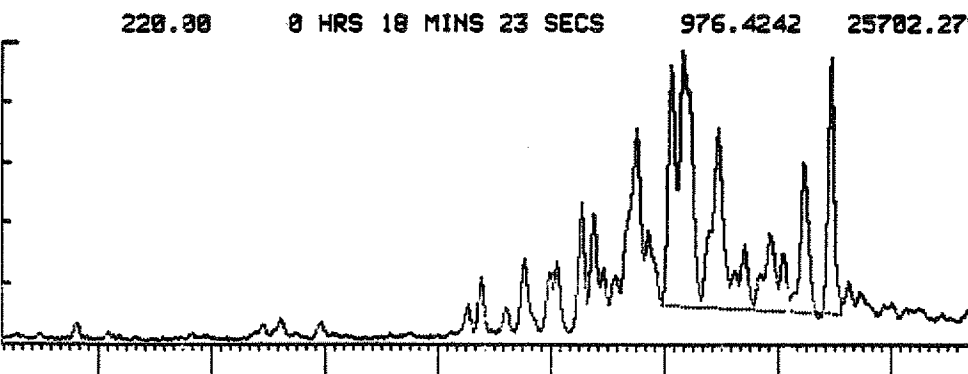
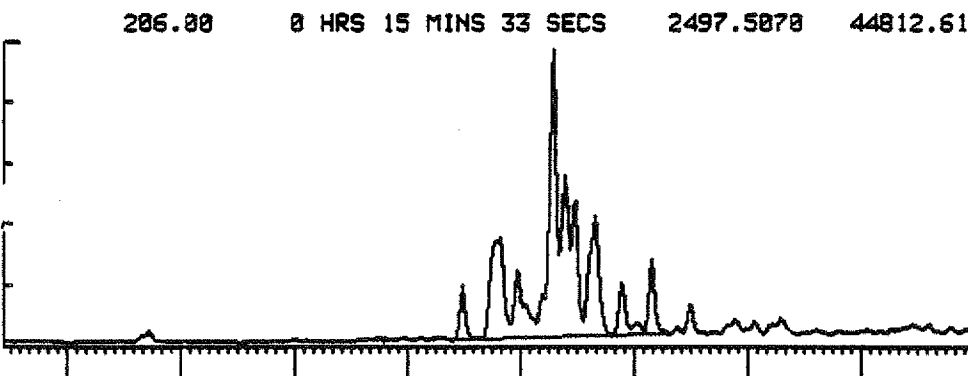
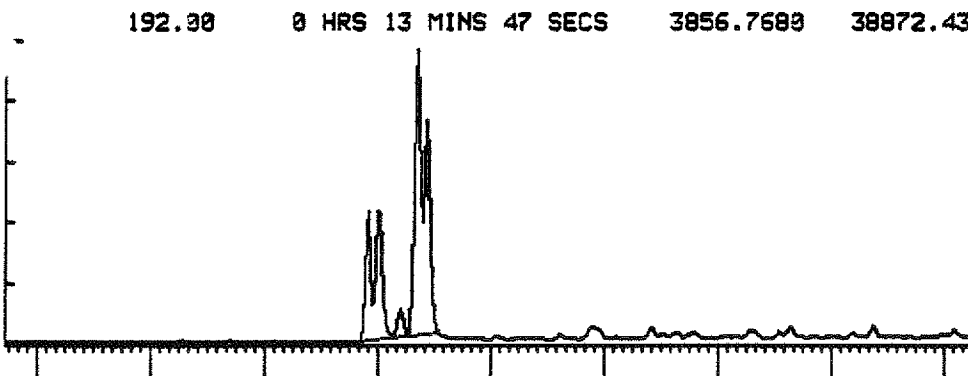
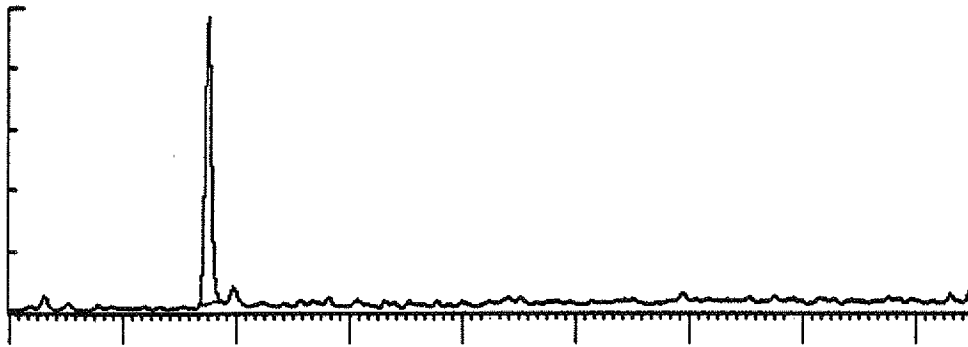


FIGURE 12b AROMATIC MASS FRAGMENTOGRAMS

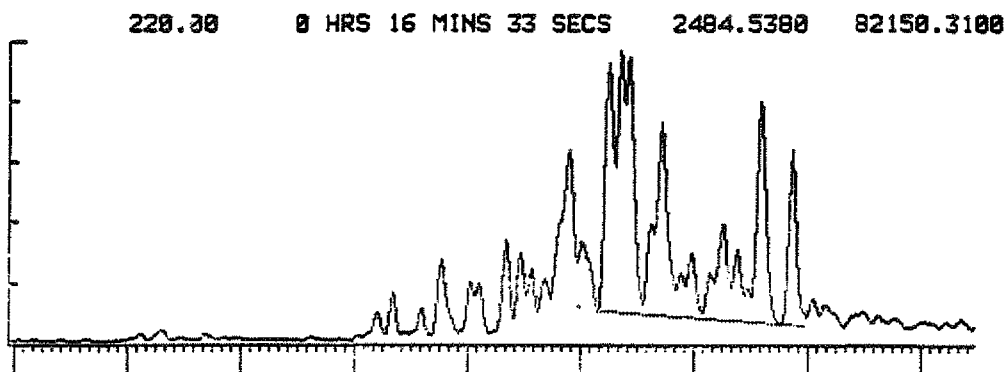
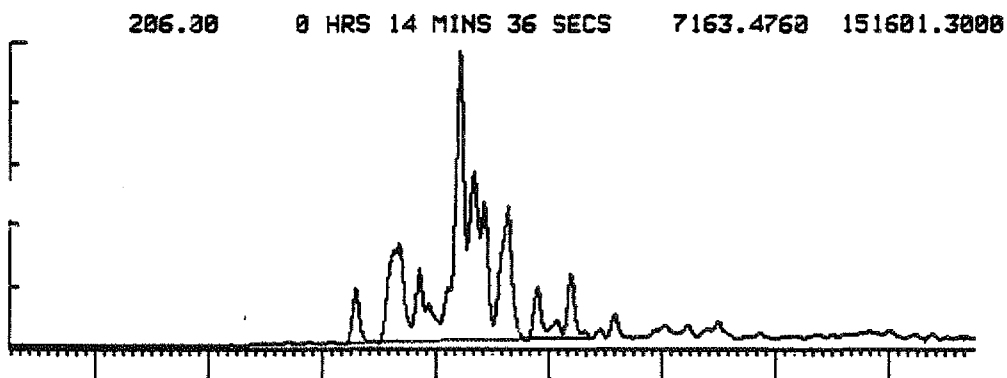
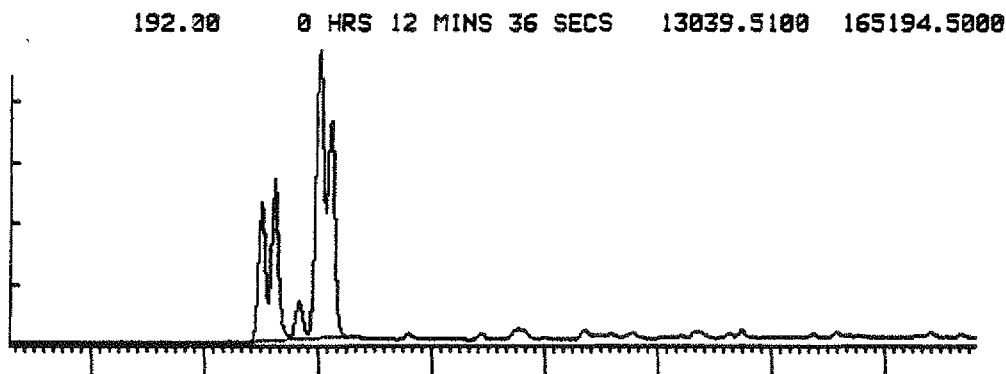
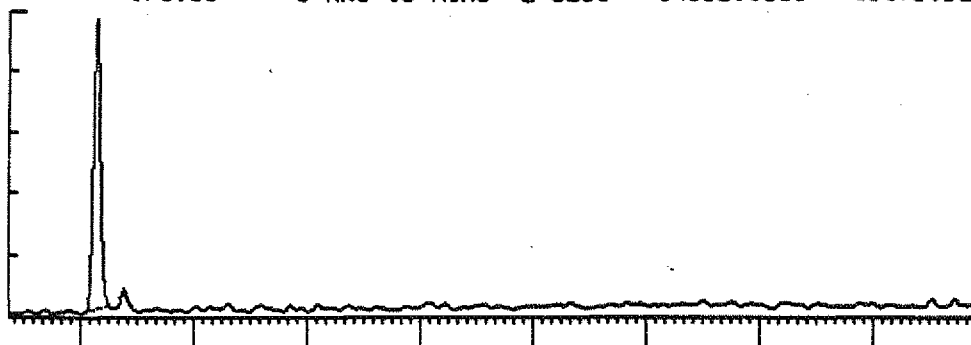
WELL 34/10-21

PHENANTHRENE SERIES

SIR REPORT. FILE - 972131 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 10 MINS 2 SECS	14632.8000	59879.9200	0.0000	0.0000
192.00	0 HRS 12 MINS 36 SECS	13039.5100	165194.5000	0.0000	0.0000
206.00	0 HRS 14 MINS 36 SECS	7163.4760	151601.3000	0.0000	0.0000
220.00	0 HRS 16 MINS 33 SECS	2484.5300	82150.3100	0.0000	0.0000



0 HRS 11 MINS 56 SECS

2995-3010m

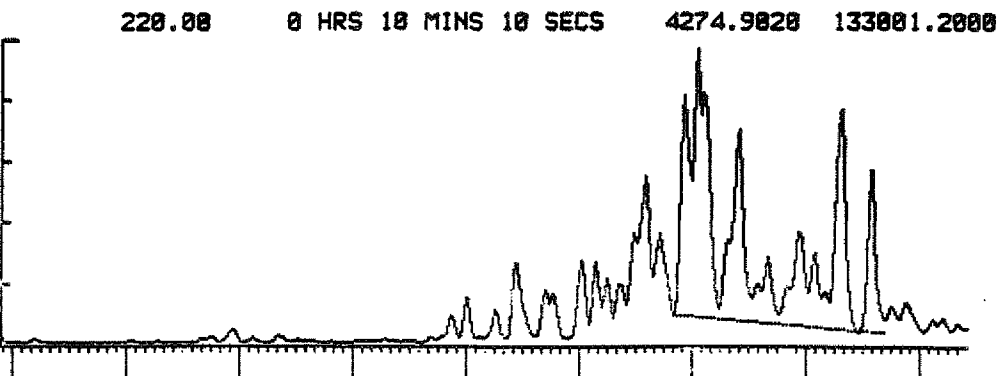
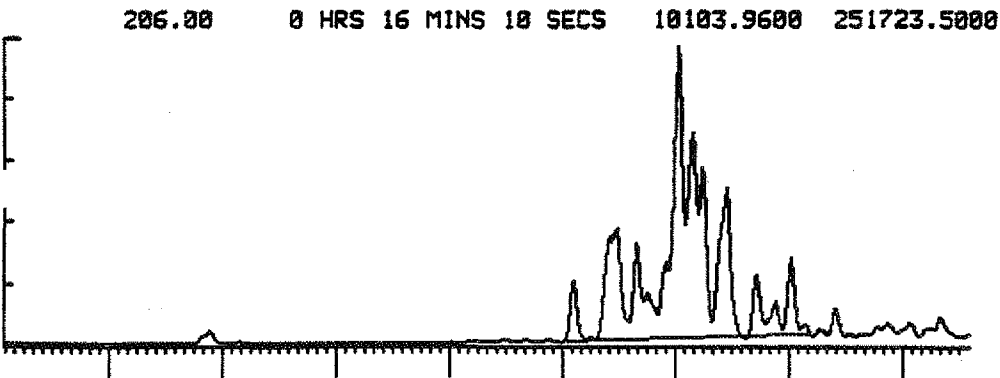
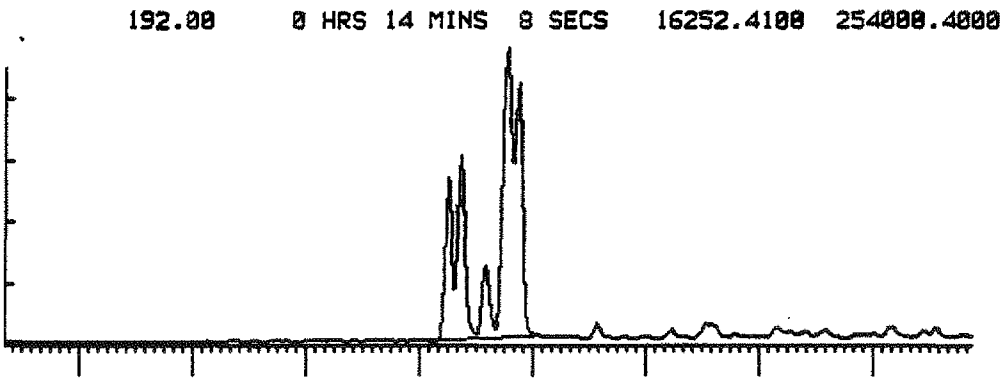
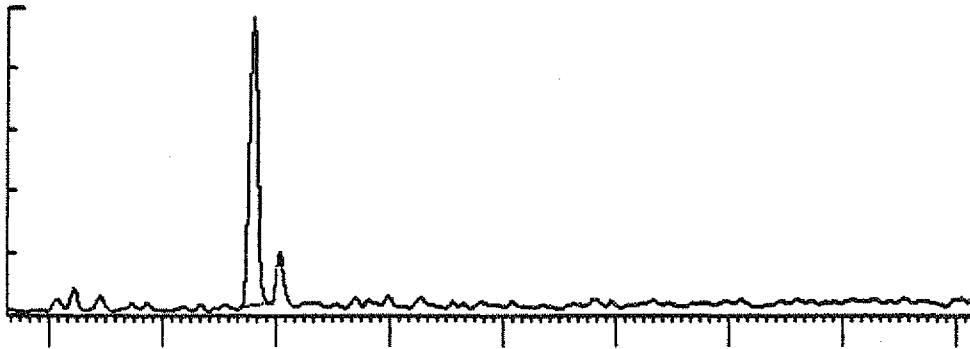
0 HRS 20 MINS 3 SECS

PHENANTHRENE SERIES

SIR REPORT. FILE - 972134 .5D RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 11 MINS 29 SECS	28748.7800	100394.8000	0.0000	0.0000
192.00	0 HRS 14 MINS 8 SECS	16252.4100	254000.4000	0.0000	0.0000
206.00	0 HRS 16 MINS 10 SECS	10103.9600	251723.5000	0.0000	0.0000
220.00	0 HRS 18 MINS 10 SECS	4274.9800	133001.2000	0.0000	0.0000

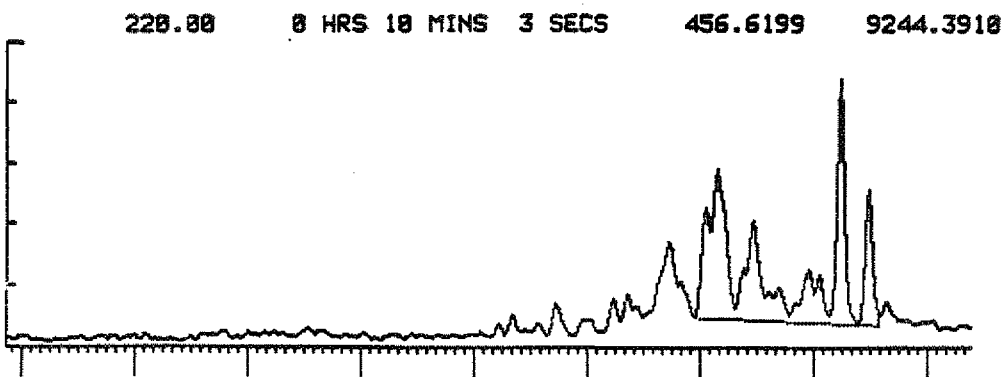
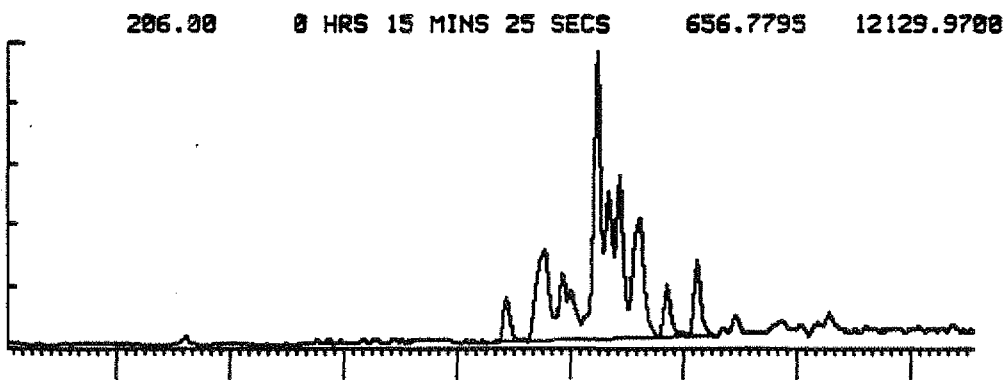
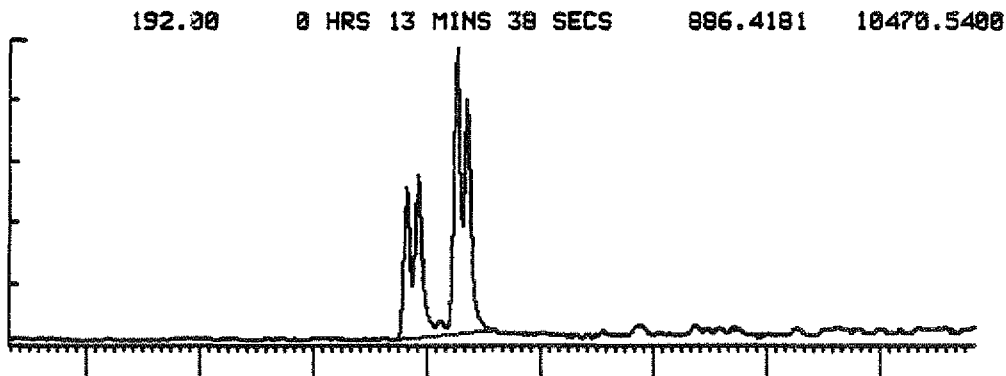
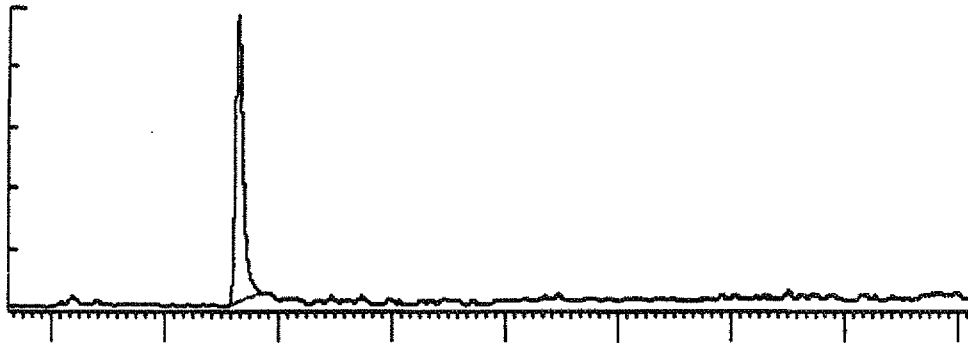


PHENANTHRENE SERIES

SIR REPORT. FILE - 972139 .SD RUN - 1

UNCALIBRATED.
MASS

RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
0 HRS 11 MINS 19 SECS	861.2128	3824.9948	0.0000	0.0000
0 HRS 13 MINS 38 SECS	886.4181	10470.5400	0.0000	0.0000
0 HRS 15 MINS 25 SECS	656.7795	12129.9700	0.0000	0.0000
0 HRS 18 MINS 3 SECS	456.6199	9244.3910	0.0000	0.0000

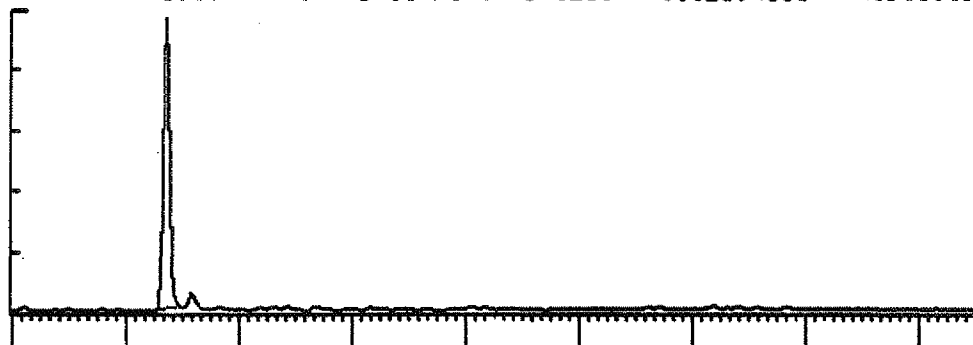


PHENANTHRENE SERIES

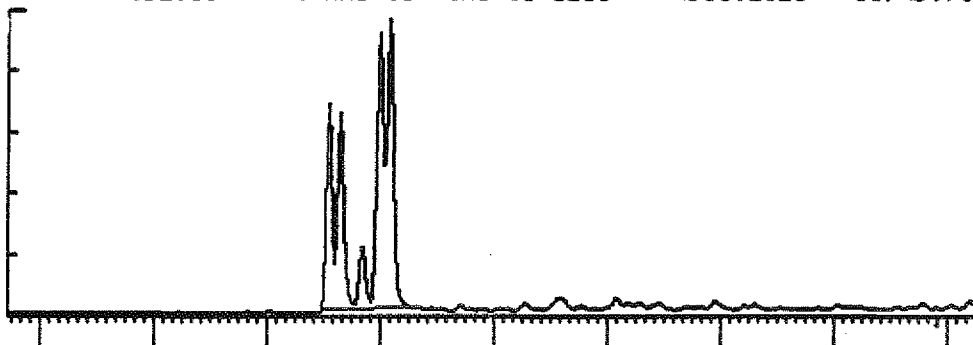
SIR REPORT. FILE - 972142 .SD RUN - 1

UNCALIBRATED.

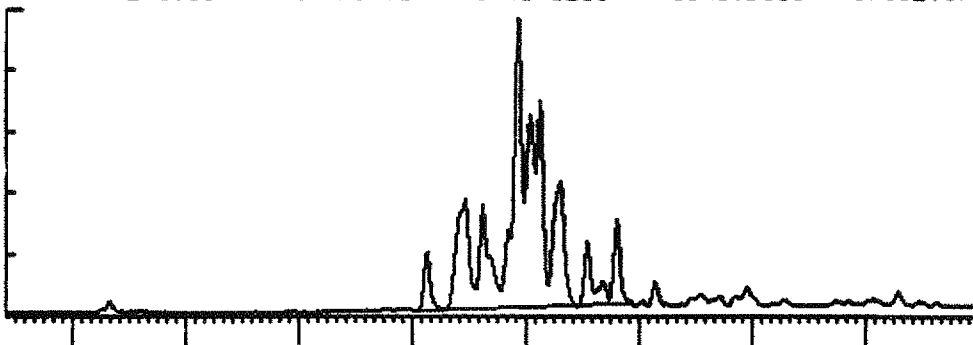
MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 11 MINS 9 SECS	11120.4300	40916.1900	0.0000	0.0000



192.00	0 HRS 13 MINS 33 SECS	4956.2820	66749.7500	0.0000	0.0000
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206.00	0 HRS 15 MINS 13 SECS	3045.9830	67132.8700	0.0000	0.0000
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228.00	0 HRS 18 MINS 5 SECS	1864.3520	43938.4800	0.0000	0.0000
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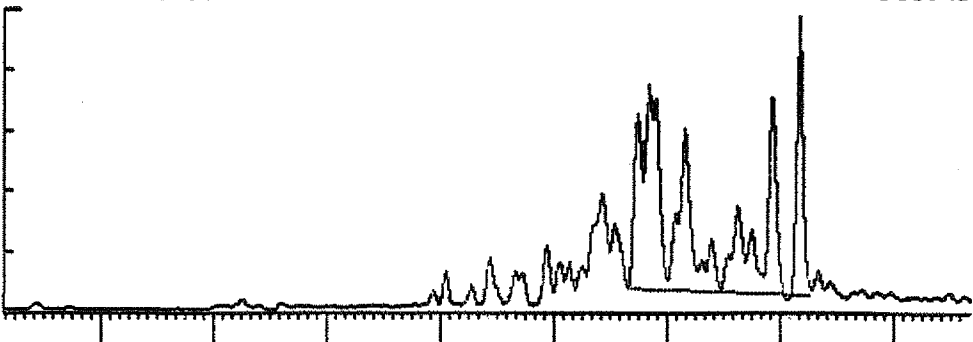


FIGURE 12f AROMATIC MASS FRAGMENTOGRAMS

WELL 34/10-21

PHENANTHRENE SERIES

SIR REPORT. FILE - 972146 .SD RUN - 1

UNCALIBRATED.
MASS

RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
179.30 0 HRS 11 MINS 24 SECS	18199.5000	75419.8500	0.0000	0.0000
192.30 0 HRS 13 MINS 59 SECS	10502.3000	131729.4000	0.0000	0.0000
206.30 0 HRS 15 MINS 51 SECS	3902.6590	93526.6400	0.0000	0.0000
220.30 0 HRS 19 MINS 4 SECS	1494.6720	54033.9400	0.0000	0.0000

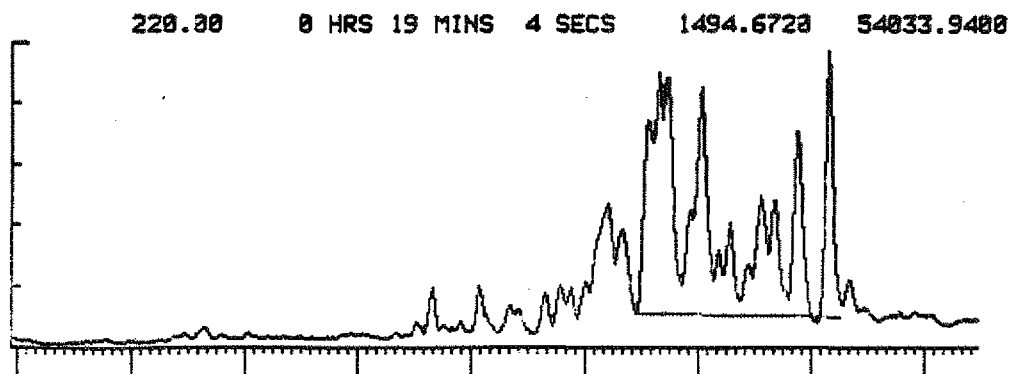
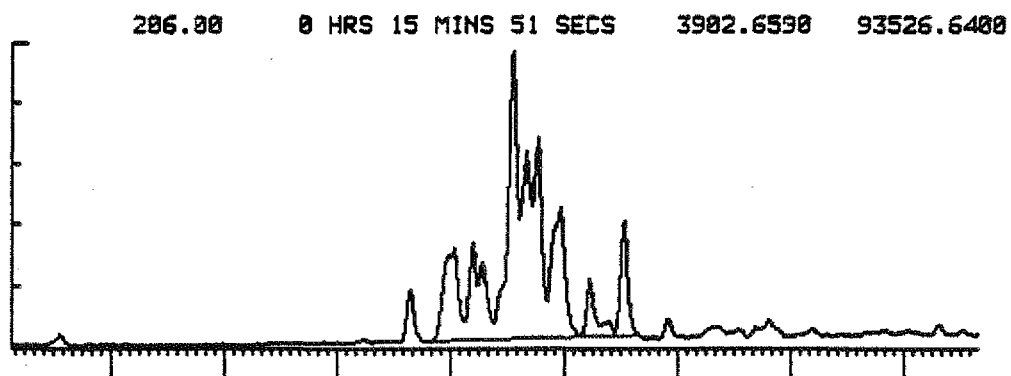
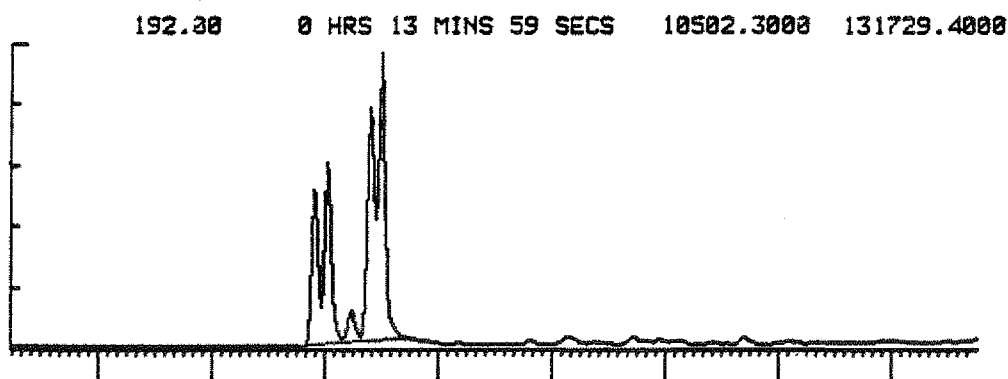
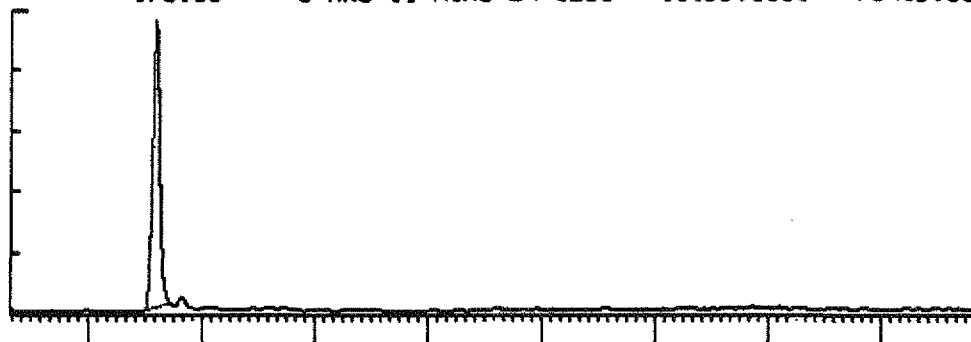


FIGURE 12g AROMATIC MASS FRAGMENTOGRAMS

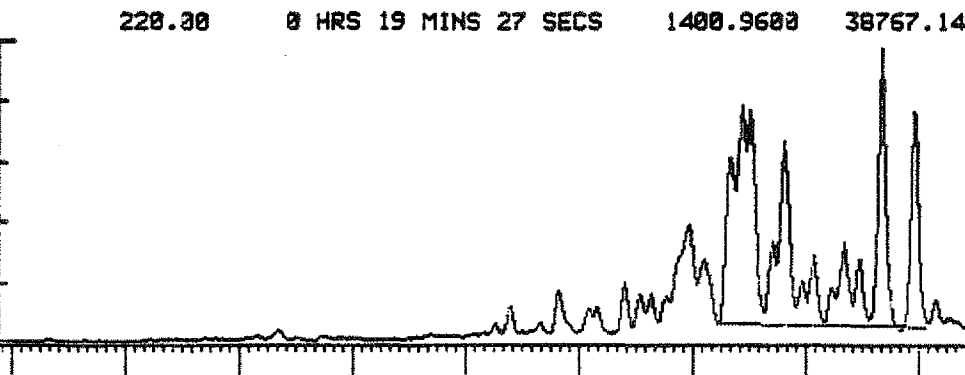
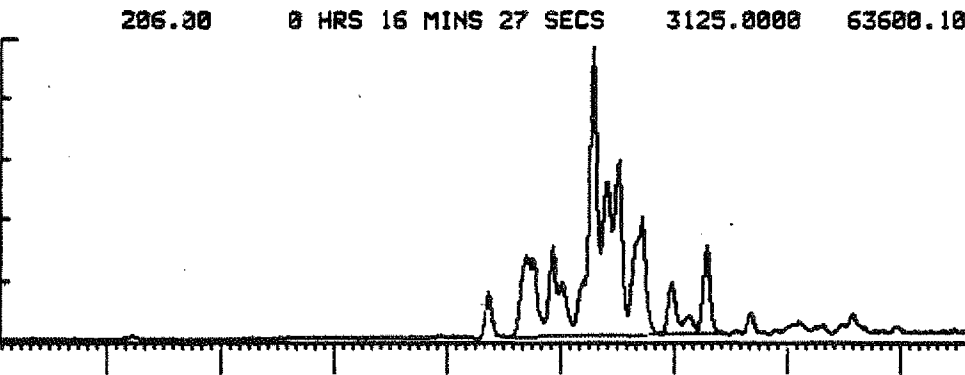
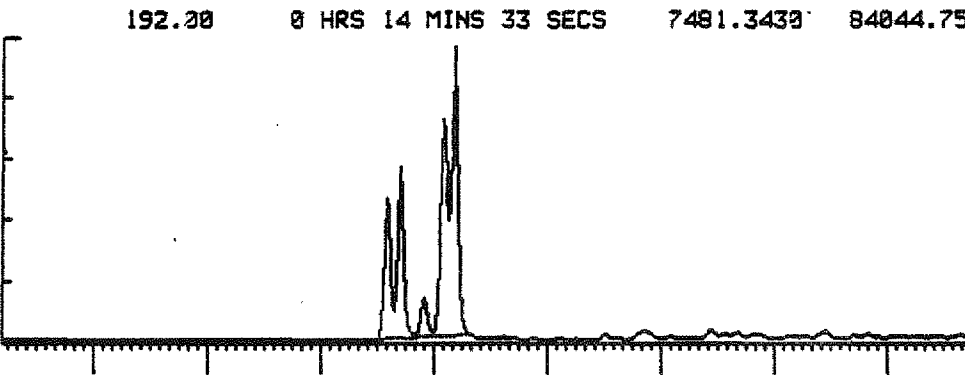
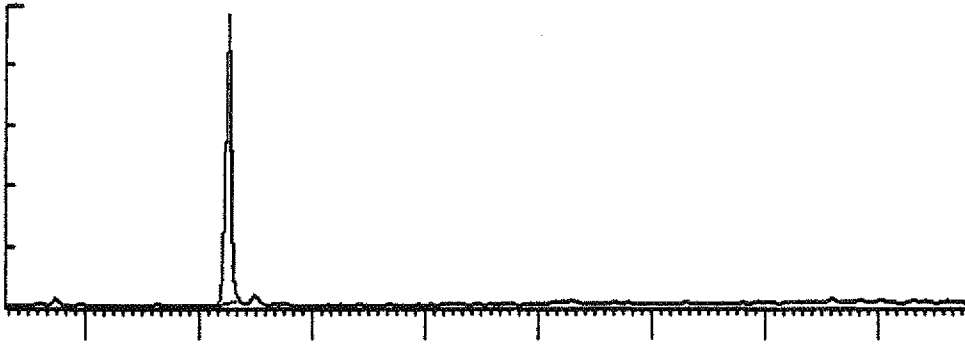
WELL 34/10-21

PHENANTHRENE SERIES

SIR REPORT. FILE - 972158 .SD RUN - 1

UNCALIBRATED.
MASS

RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.20	10839.8400	36101.1900	0.0000	0.0000
192.20	7481.3430	84044.7500	0.0000	0.0000
206.20	3125.0000	63600.1000	0.0000	0.0000
220.20	1400.9600	38767.1400	0.0000	0.0000



0 HRS 12 MINS 52 SECS

3264-3279m

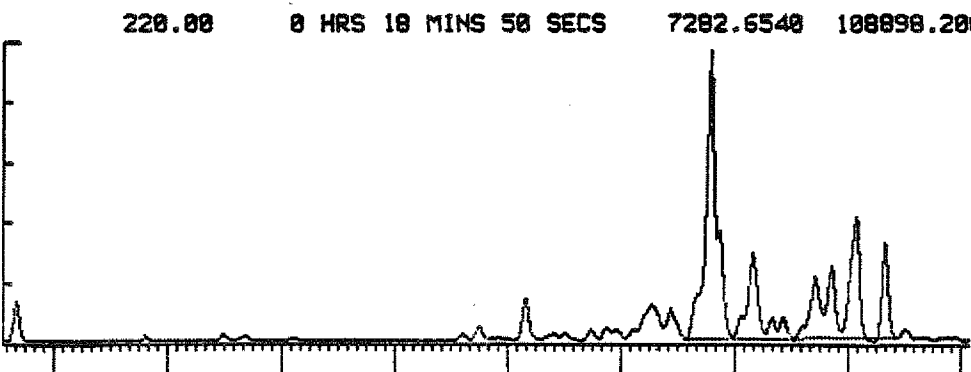
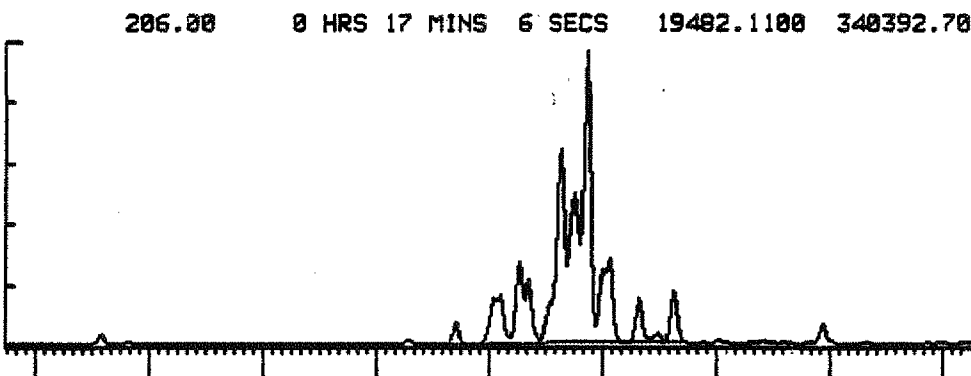
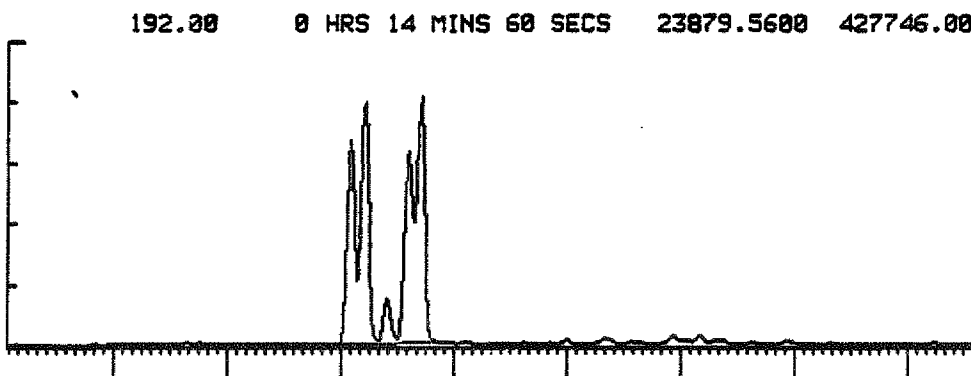
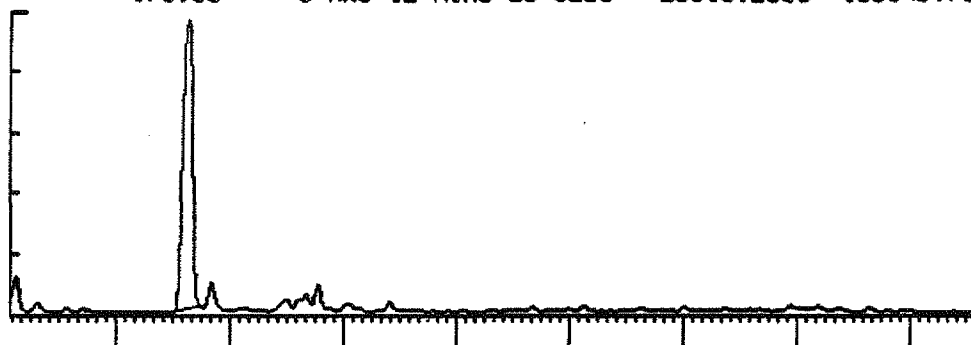
0 HRS 21 MINS 4 SECS

PHENANTHRENE SERIES

SIR REPORT. FILE - 972153 .SD RUN - 1

UNCALIBRATED.
MASS

RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	28016.2000	158549.7000	0.0000	0.0000
192.00	23879.5600	427746.0000	0.0000	0.0000
206.00	19482.1100	340392.7000	0.0000	0.0000
220.00	7282.6540	108898.2000	0.0000	0.0000

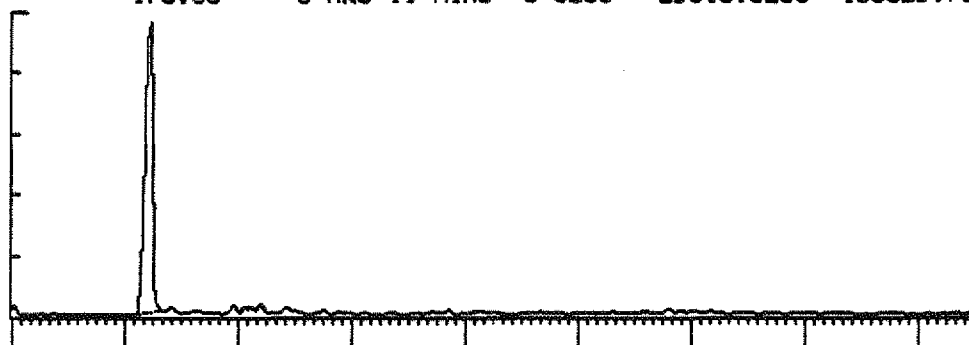


PHENANTHRENE SERIES

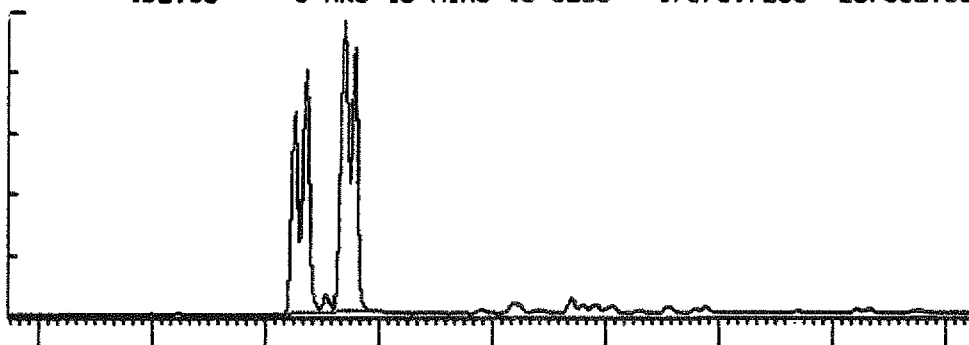
SIR REPORT. FILE - 972169 .SD RUN - 1

UNCALIBRATED.

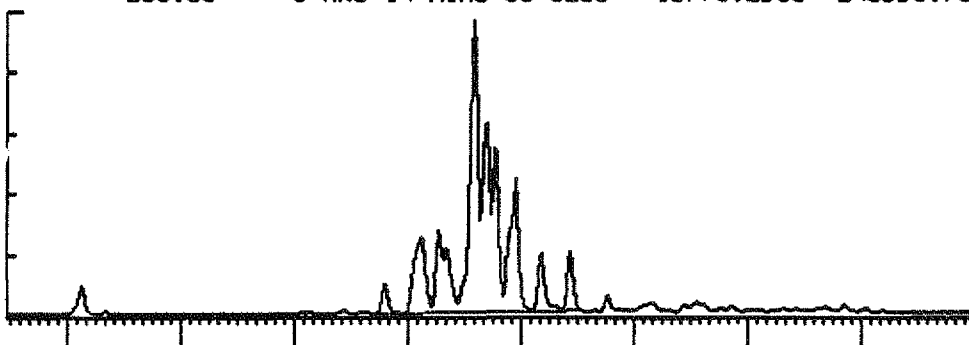
MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	0 HRS 11 MINS 3 SECS	29515.6200	136829.7000	0.0000	0.0000



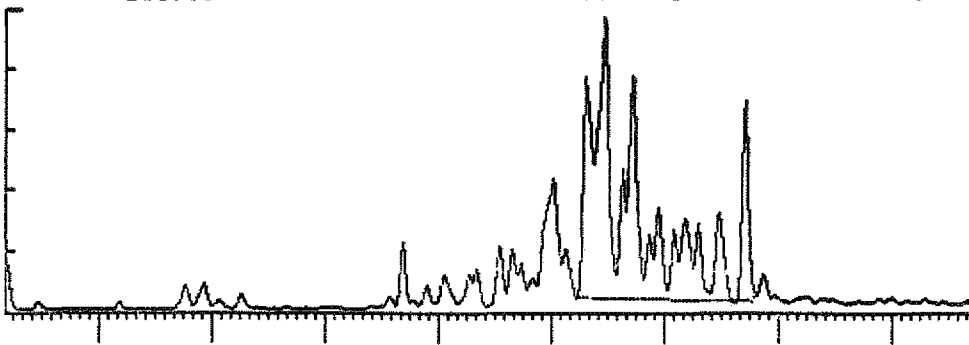
192.00	0 HRS 13 MINS 15 SECS	17378.7200	237332.5000	0.0000	0.0000
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206.00	0 HRS 14 MINS 56 SECS	13776.2900	246990.7000	0.0000	0.0000
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220.00	0 HRS 16 MINS 40 SECS	5480.5710	138755.6000	0.0000	0.0000
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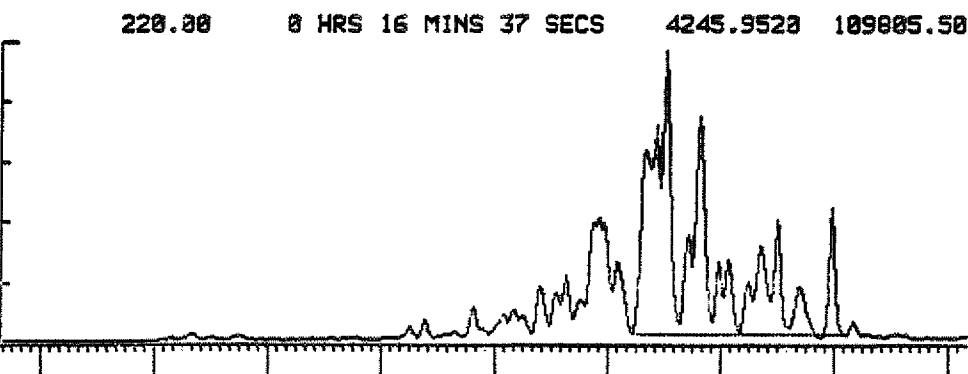
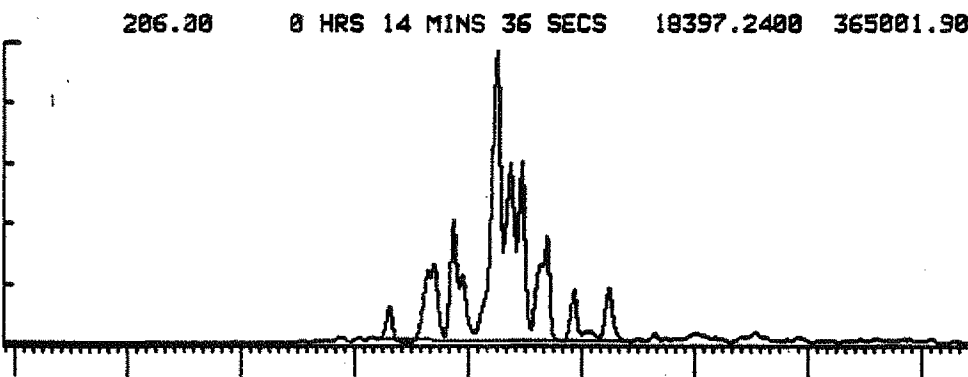
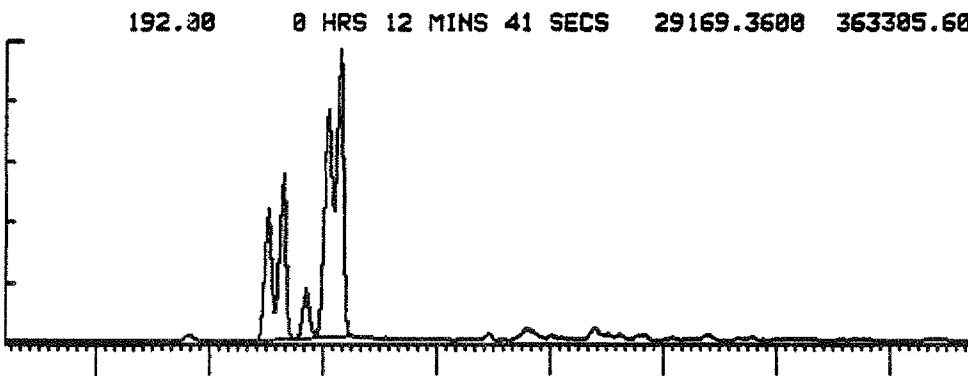
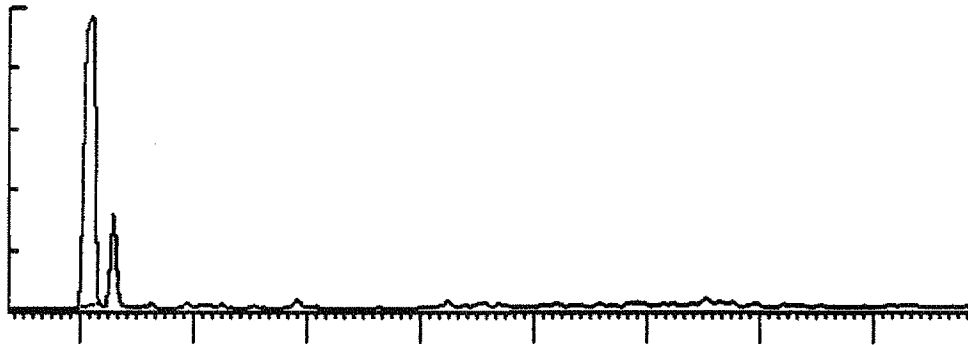


PHENANTHRENE SERIES

SIR REPORT. FILE - 972182 .SD RUN - 1

UNCALIBRATED.
MASS

RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
178.00	30026.0300	189685.9000	0.0000	0.0000
192.00	29169.3600	363385.6000	0.0000	0.0000
206.00	18397.2400	365001.9000	0.0000	0.0000
220.00	4245.9520	109005.5000	0.0000	0.0000



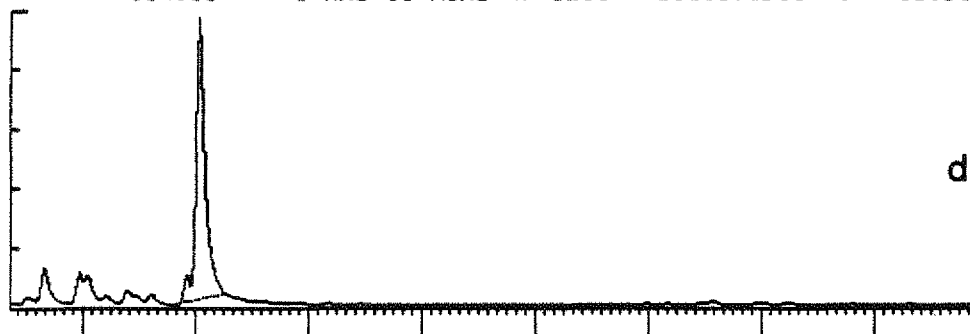
AROMATIC MASS FRAGMENTOGRAMS

DIBENZOTHIOPHENE SERIES

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

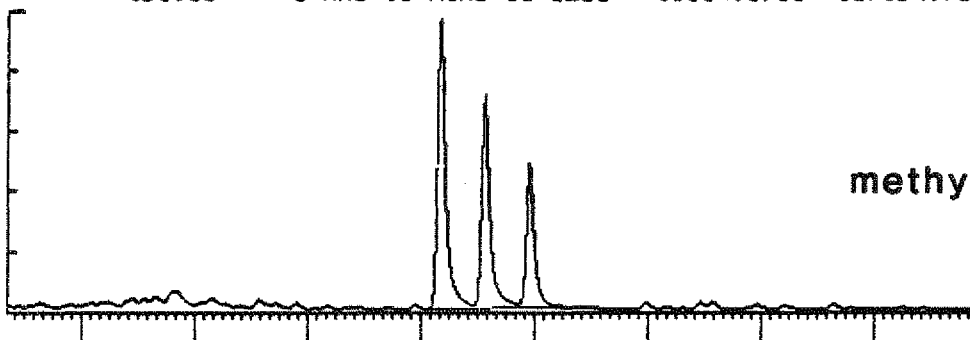
UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 11 MINS 47 SECS	26803.8900	144753.9000	0.0000	0.0000



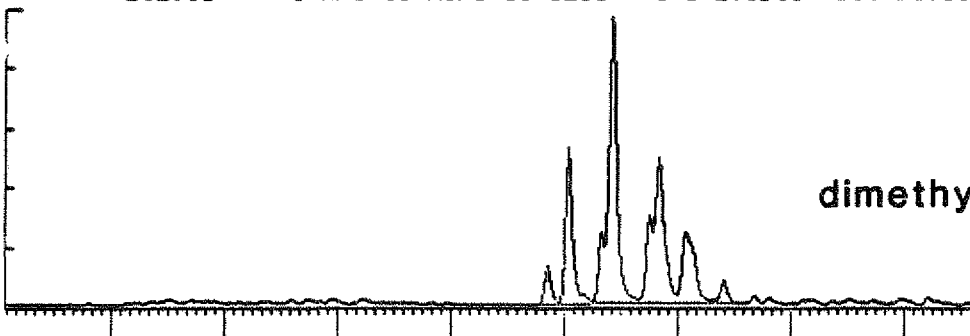
dibenzothiophene

198.00	0 HRS 13 MINS 36 SECS	16854.6700	187694.7000	0.0000	0.0000
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methyl dibenzothiophenes

212.00	0 HRS 15 MINS 36 SECS	14042.6900	208491.3000	0.0000	0.0000
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dimethyl dibenzothiophenes

0 HRS 11 MINS 4 SECS

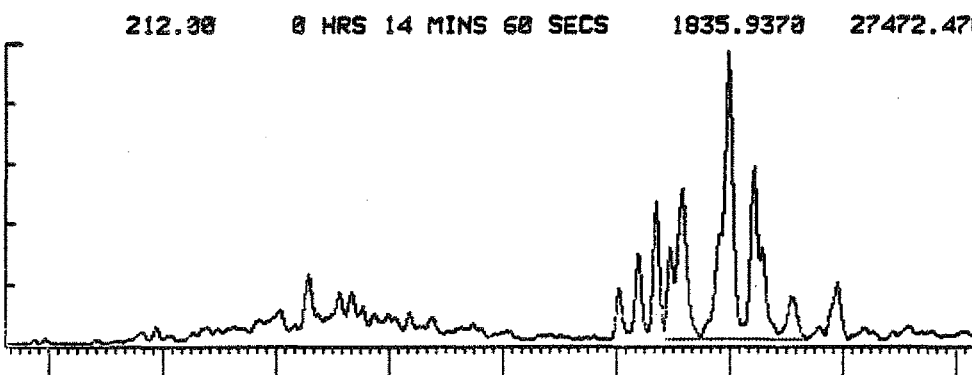
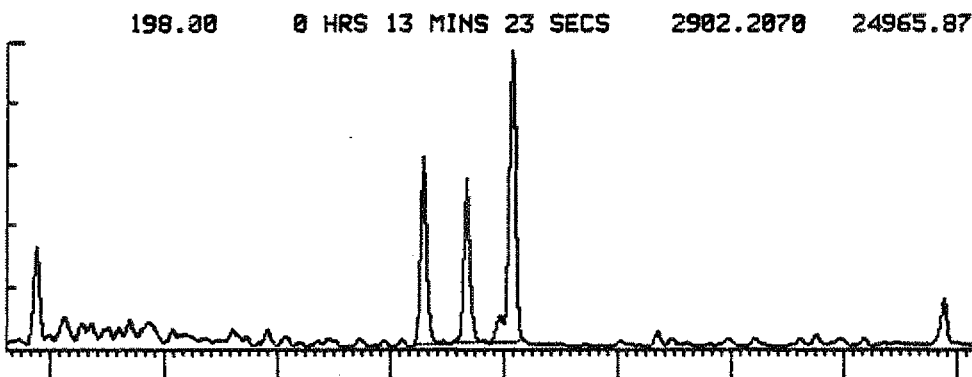
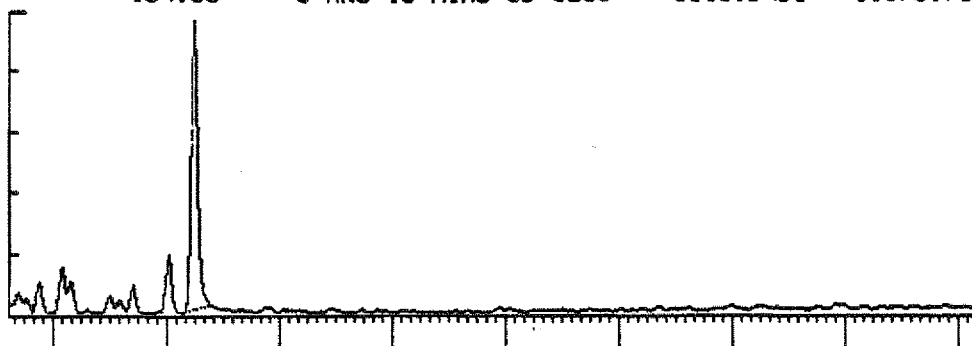
0 HRS 19 MINS 16 SECS

FIGURE 13a AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
 DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972127 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 10 MINS 59 SECS	3013.9490	11178.7300	0.0000	0.0000
198.00	0 HRS 13 MINS 23 SECS	2902.2070	24965.8700	0.0000	0.0000
212.00	0 HRS 14 MINS 60 SECS	1835.9370	27472.4700	0.0000	0.0000



0 HRS 9 MINS 37 SECS

0 HRS 17 MINS 49 SECS

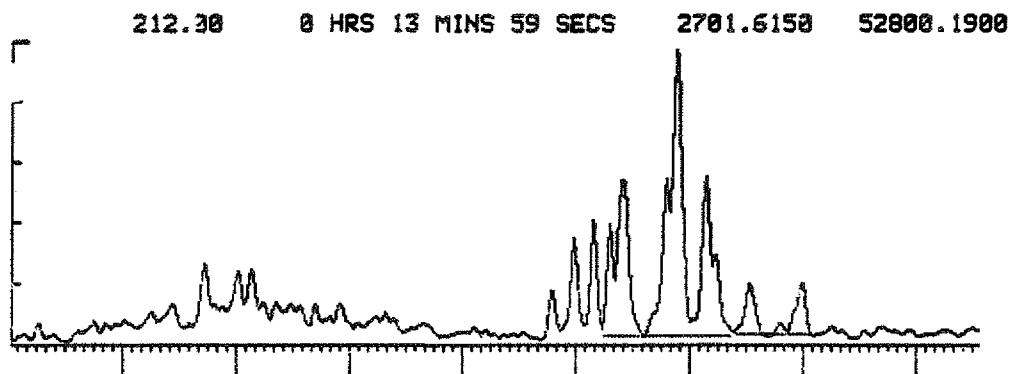
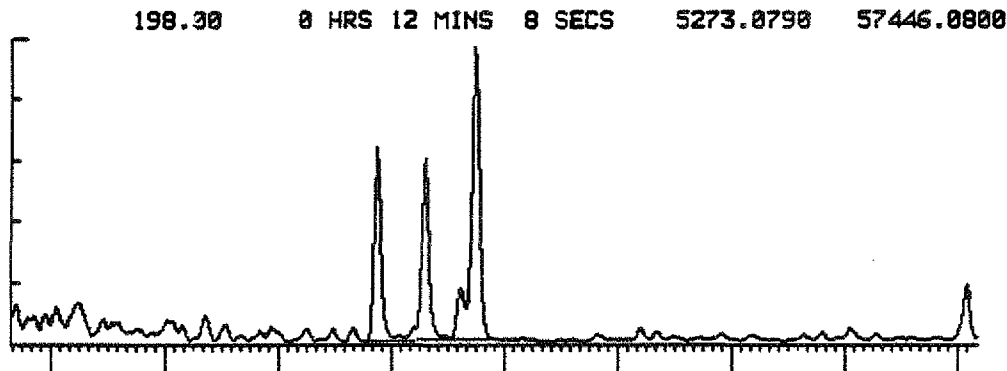
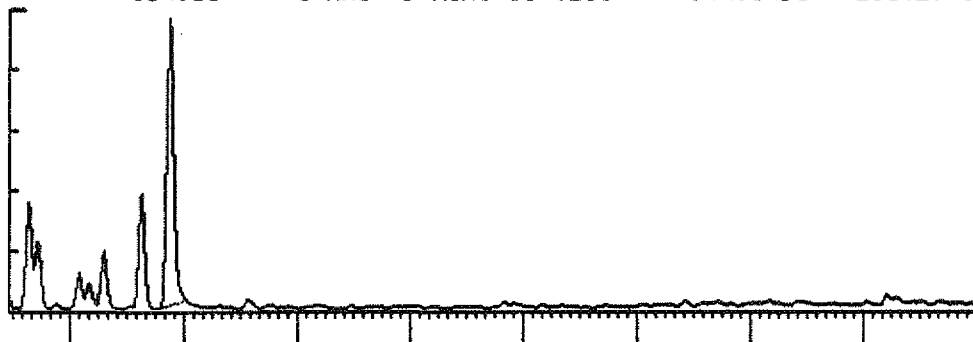
2935-2950m

FIGURE 13b AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972131 .SD RUN - 1

UNCALIBRATED.
MASS

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.30	0 HRS 9 MINS 30 SECS	4934.1490	20302.4600	0.0000	0.0000
198.30	0 HRS 12 MINS 8 SECS	5273.0790	57446.0000	0.0000	0.0000
212.30	0 HRS 13 MINS 59 SECS	2701.6150	52000.1900	0.0000	0.0000



0 HRS 9 MINS 2 SECS

0 HRS 17 MINS 13 SECS

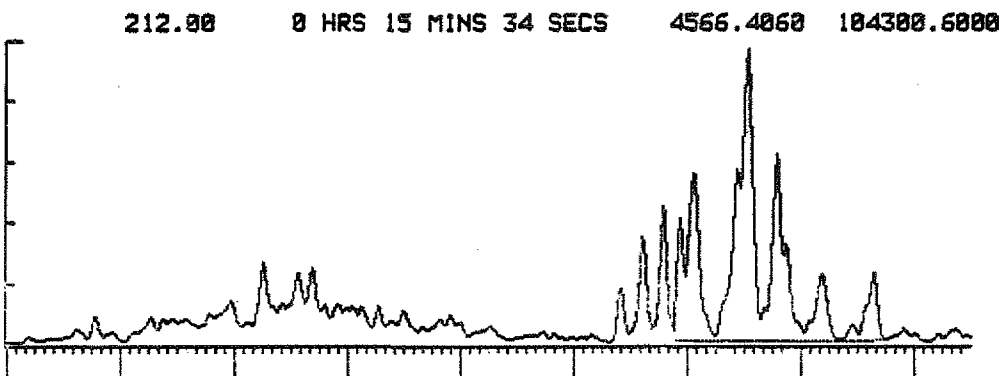
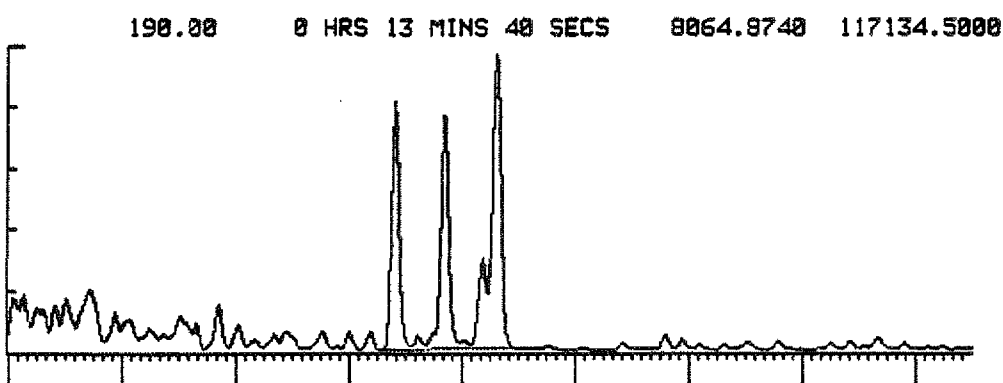
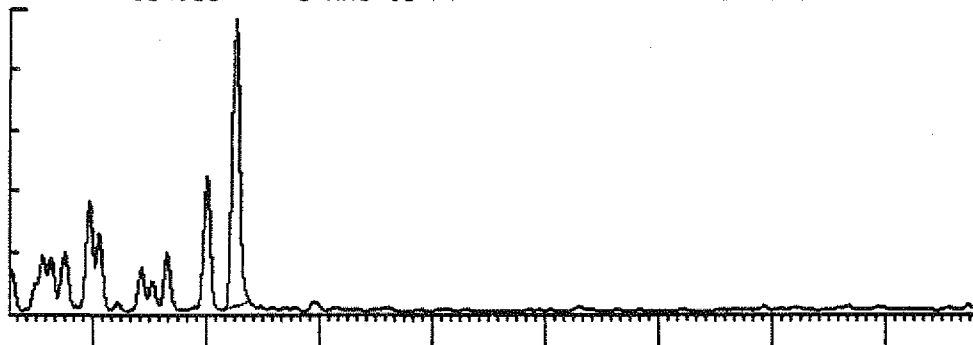
2995-3010m

FIGURE 13c AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
 DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972134 .SD RUN - 1

UNCALIBRATED.
 MASS

RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00 0 HRS 10 MINS 56 SECS	11432.6000	50309.9300	0.0000	0.0000
190.00 0 HRS 13 MINS 40 SECS	8064.8740	117134.5000	0.0000	0.0000
212.00 0 HRS 15 MINS 34 SECS	4566.4060	184300.6000	0.0000	0.0000



0 HRS 9 MINS 59 SECS

0 HRS 19 MINS 10 SECS

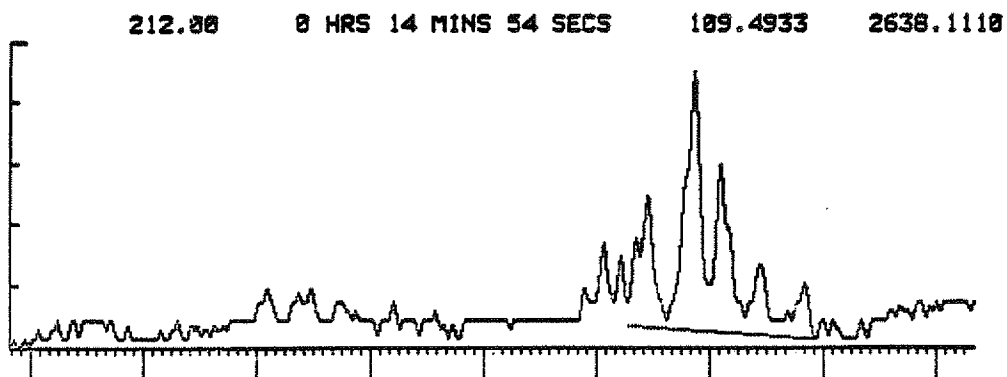
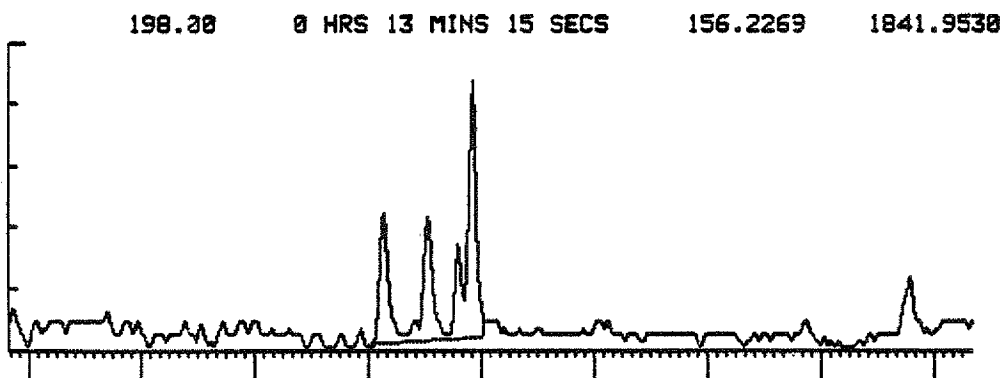
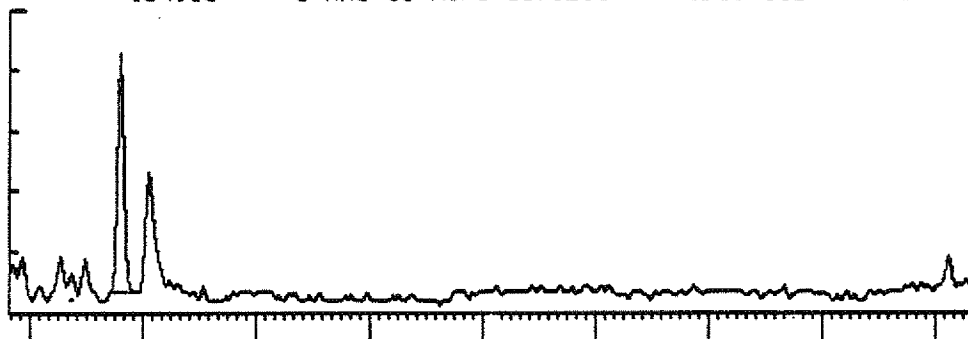
3040-3055m

FIGURE 13d AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
 DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972139 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 10 MINS 38 SECS	191.4062	727.4993	0.0000	0.0000
198.00	0 HRS 13 MINS 15 SECS	156.2269	1841.9530	0.0000	0.0000
212.00	0 HRS 14 MINS 54 SECS	109.4933	2638.1110	0.0000	0.0000



0 HRS 9 MINS 49 SECS

0 HRS 18 MINS 1 SECS

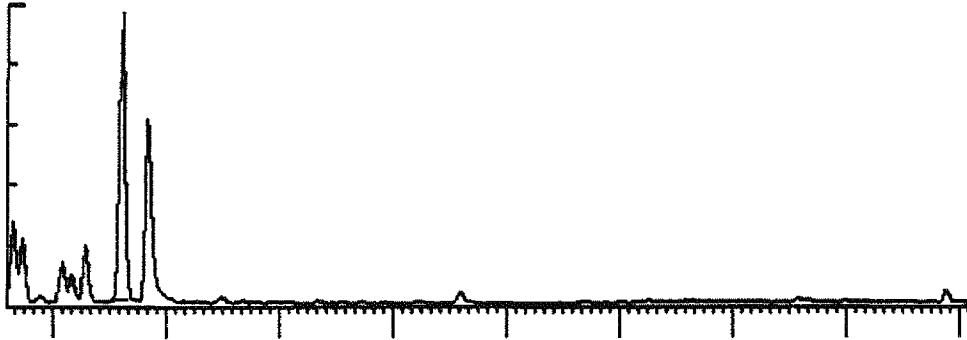
3115-3130m

FIGURE 13e AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
 DIBENZOTHIOPHENE SERIES

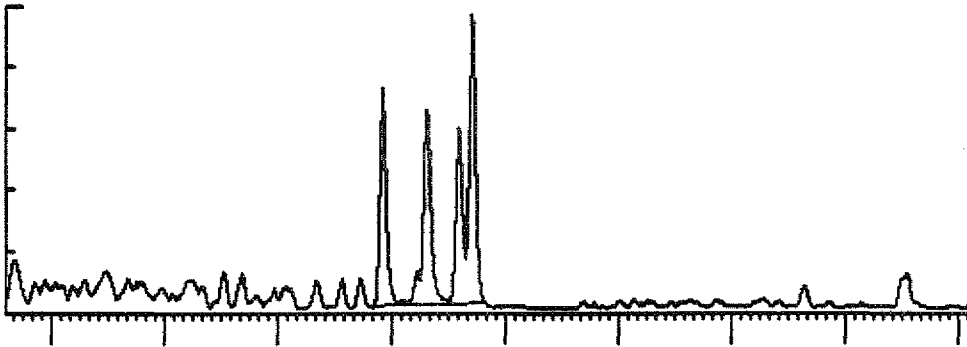
SIR REPORT. FILE - 972142 .SD RUN - 1

UNCALIBRATED.
 MASS

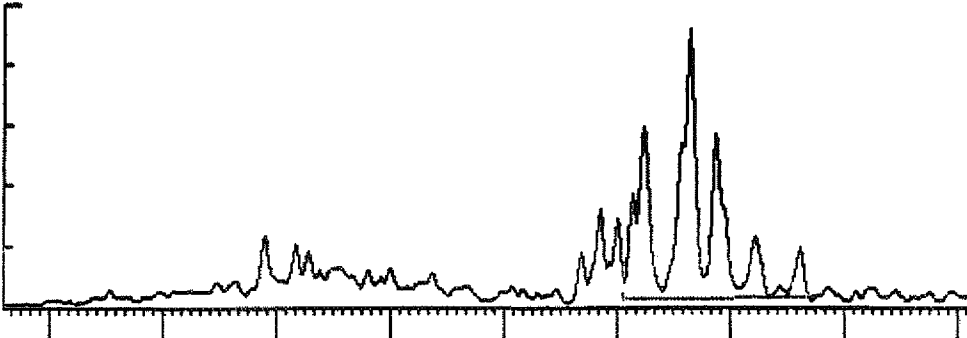
RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
0 HRS 10 MINS 28 SECS	2050.7810	6821.2430	0.0000	0.0000
0 HRS 13 MINS 5 SECS	899.3486	10909.0900	0.0000	0.0000
0 HRS 14 MINS 43 SECS	503.8478	10525.4800	0.0000	0.0000



0 HRS 13 MINS 5 SECS	899.3486	10909.0900	0.0000	0.0000
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0 HRS 14 MINS 43 SECS	503.8478	10525.4800	0.0000	0.0000
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0 HRS 9 MINS 36 SECS

0 HRS 17 MINS 47 SECS

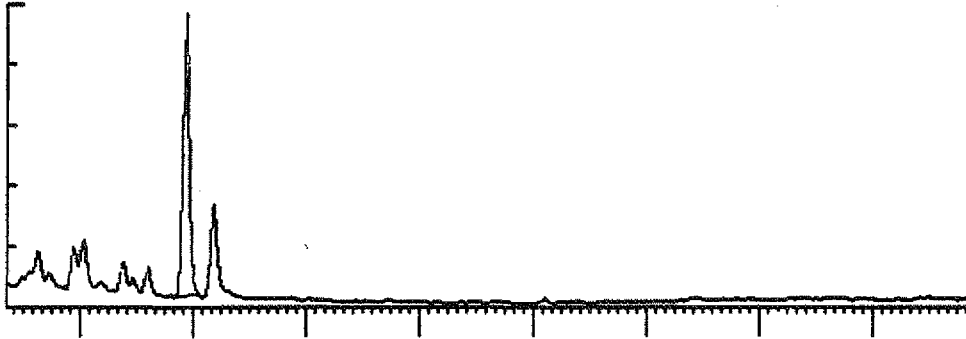
3160-3175m

FIGURE 13f AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
 DIBENZOTHIOPHENE SERIES

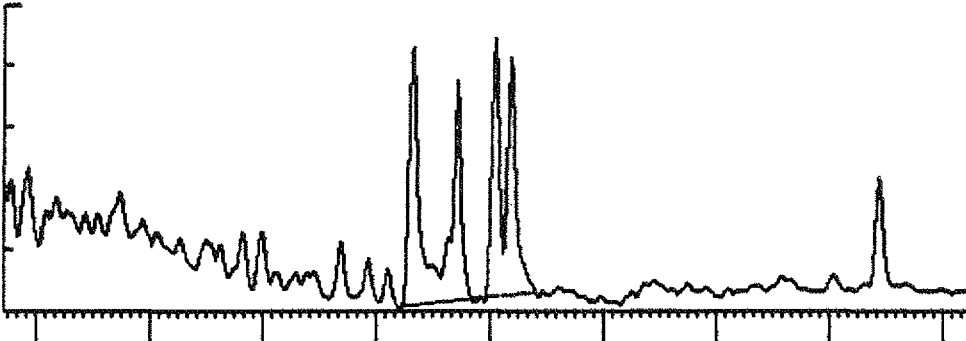
SIR REPORT. FILE - 972146 .SD RUN - 1

UNCALIBRATED.

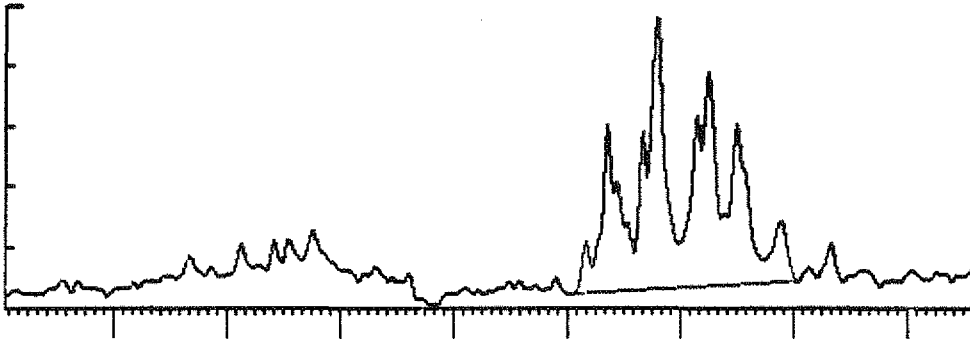
MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 10 MINS 41 SECS	2924.4700	10649.9700	0.0000	0.0000



198.00	0 HRS 13 MINS 21 SECS	361.9140	7201.8000	0.0000	0.0000
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212.00	0 HRS 14 MINS 53 SECS	364.4464	13335.3400	0.0000	0.0000
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0 HRS 10 MINS 3 SECS

0 HRS 18 MINS 14 SECS

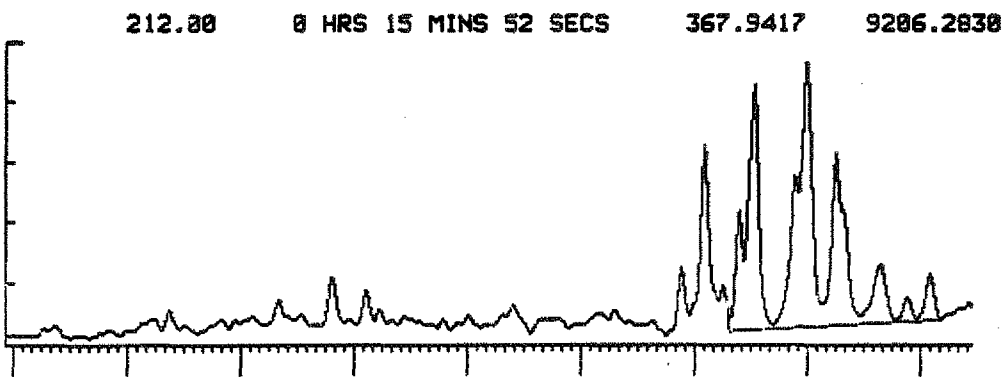
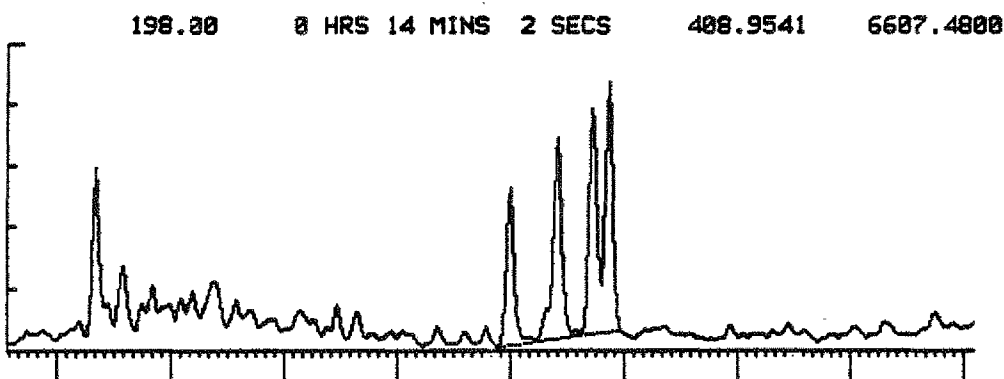
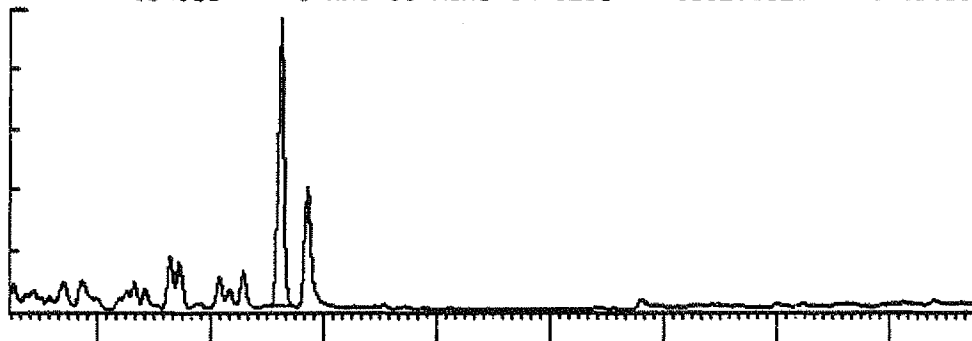
3205-3219m

FIGURE 13g AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
 DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972158 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC.(H)	CONC.(A)
184.00	0 HRS 11 MINS 14 SECS	1632.8120	5489.9930	0.0000	0.0000
198.00	0 HRS 14 MINS 2 SECS	408.9541	6607.4800	0.0000	0.0000
212.00	0 HRS 15 MINS 52 SECS	367.9417	9206.2830	0.0000	0.0000



0 HRS 9 MINS 56 SECS

0 HRS 18 MINS 7 SECS

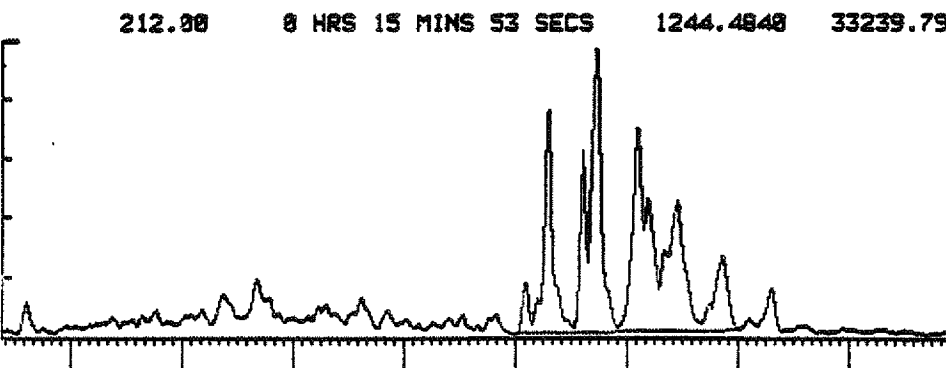
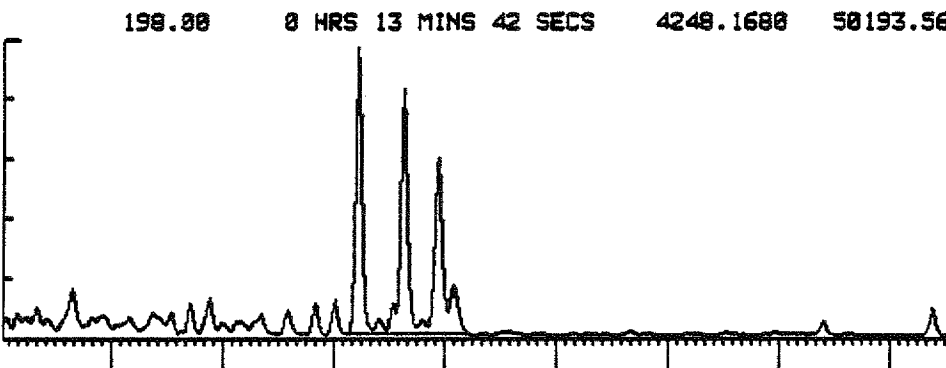
3264-3279m

FIGURE 13h AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
 DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972153 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 11 MINS 39 SECS	11867.1800	48877.4400	0.0000	0.0000
198.00	0 HRS 13 MINS 42 SECS	4248.1688	50193.5600	0.0000	0.0000
212.00	0 HRS 15 MINS 53 SECS	1244.4848	33239.7900	0.0000	0.0000



0 HRS 11 MINS 22 SECS

0 HRS 19 MINS 34 SECS

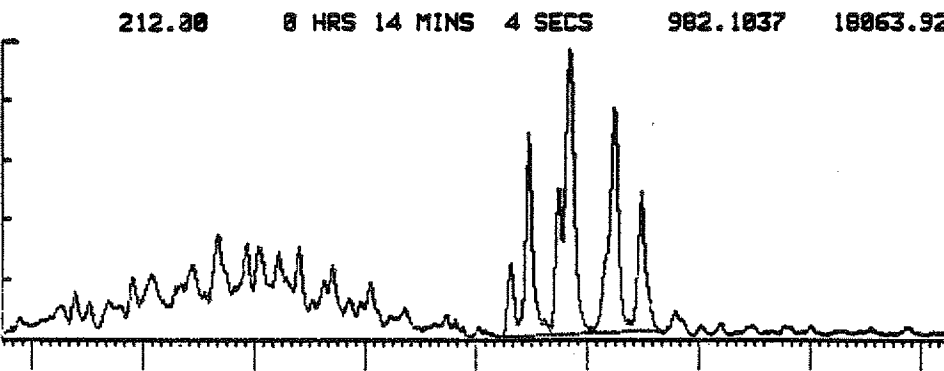
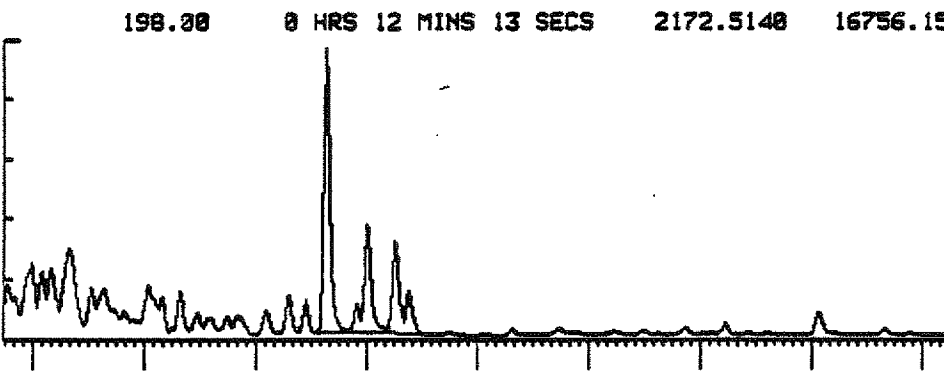
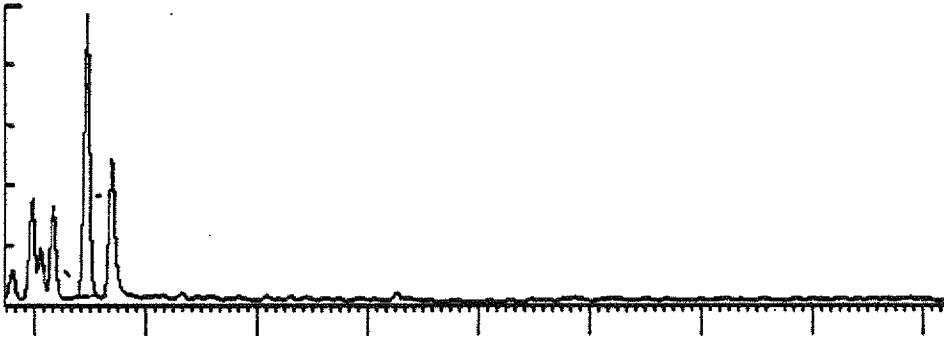
3399-3414m

DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972169 .SD RUN - 1

UNCALIBRATED.

MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 10 MINS 22 SECS	3074.2100	10046.2400	0.0000	0.0000
198.00	0 HRS 12 MINS 13 SECS	2172.5140	16756.1500	0.0000	0.0000
212.00	0 HRS 14 MINS 4 SECS	982.1037	10063.9200	0.0000	0.0000



0 HRS 9 MINS 44 SECS

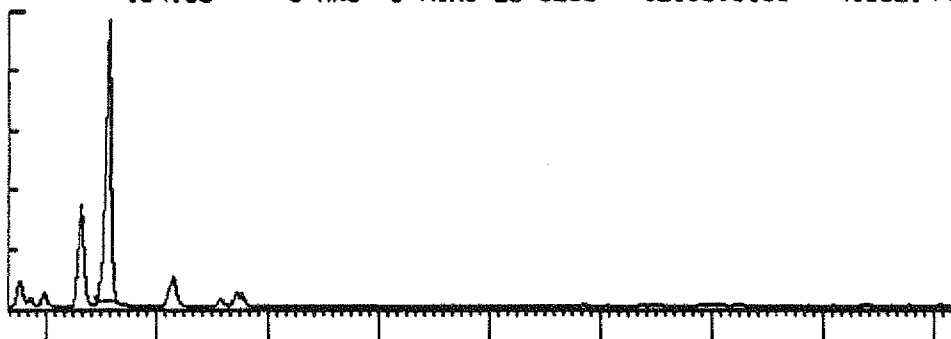
0 HRS 17 MINS 55 SECS

3639-3654m

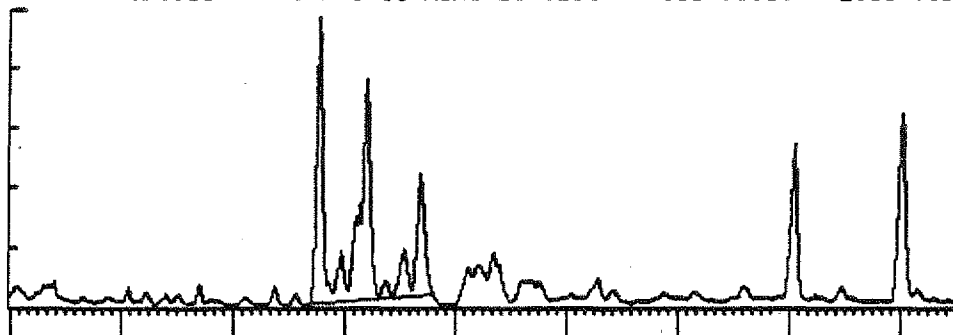
FIGURE 13j AROMATIC MASS FRAGMENTOGRAMS WELL 34/10-21
 DIBENZOTHIOPHENE SERIES

SIR REPORT. FILE - 972182 .SD RUN - 1

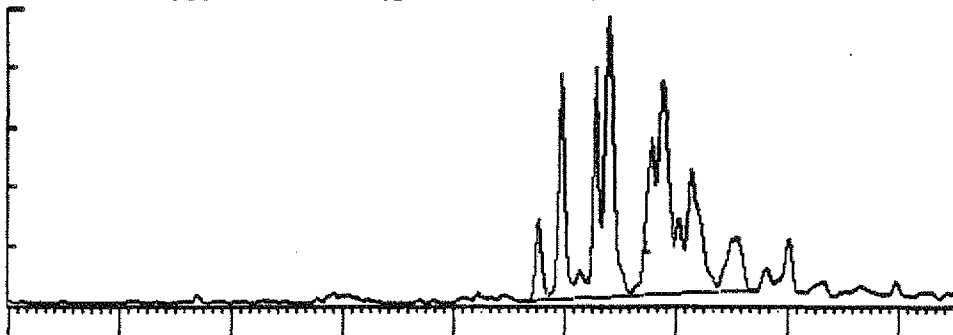
UNCALIBRATED. MASS	RETENTION TIME	HEIGHT	AREA	CONC. (H)	CONC. (A)
184.00	0 HRS 9 MINS 25 SECS	12105.8100	41032.4400	0.0000	0.0000



198.00	0 HRS 11 MINS 21 SECS	1807.8350	21584.8900	0.0000	0.0000
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212.00	0 HRS 13 MINS 34 SECS	1441.0070	38966.0000	0.0000	0.0000
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0 HRS 8 MINS 60 SECS

0 HRS 17 MINS 11 SECS

3834-3849m

FIGURE 14

CARBON ISOTOPES
(‰, PDB)

WELL 34/10-21

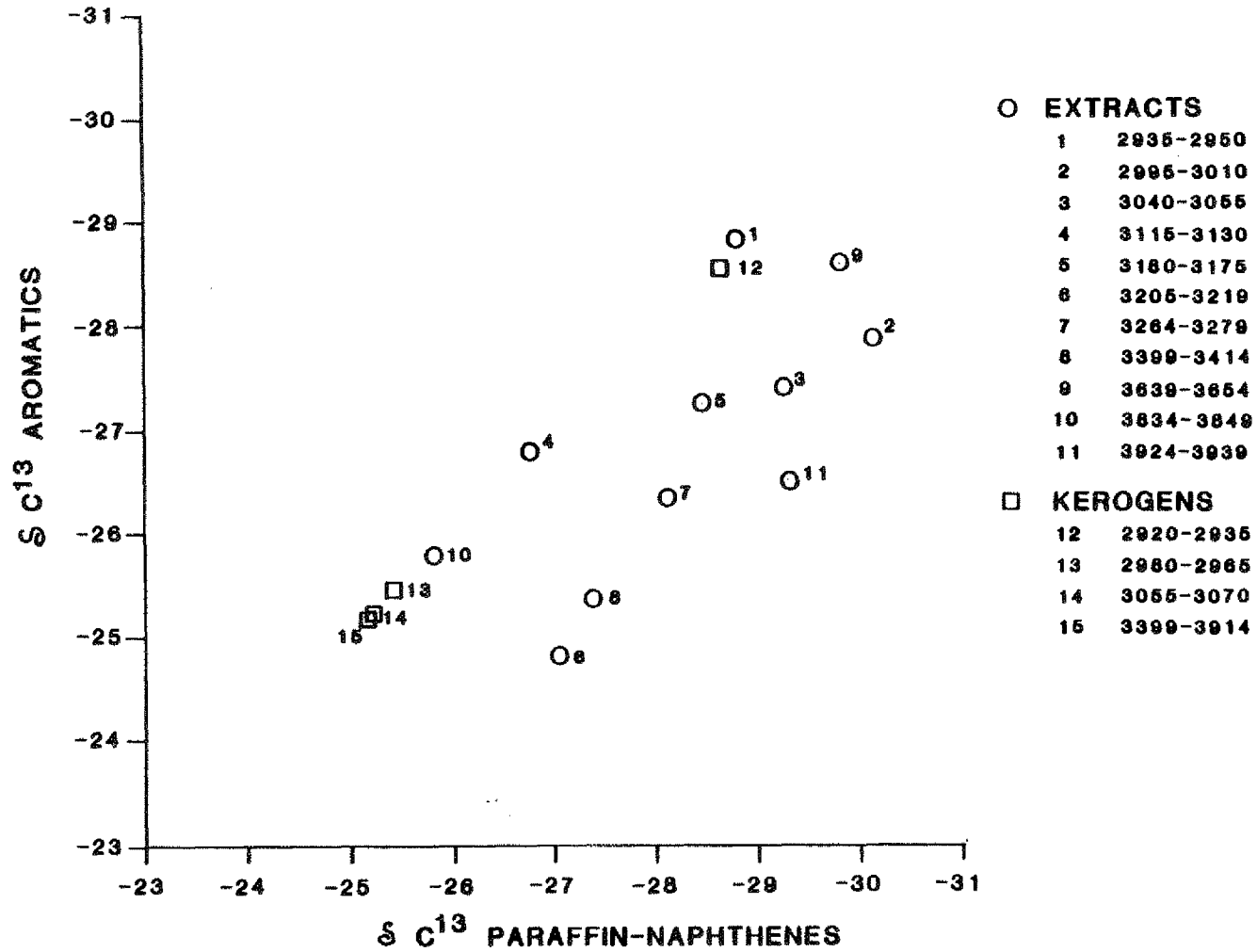


FIGURE 15a

VITRINITE REFLECTANCE

WELL 34/10-21

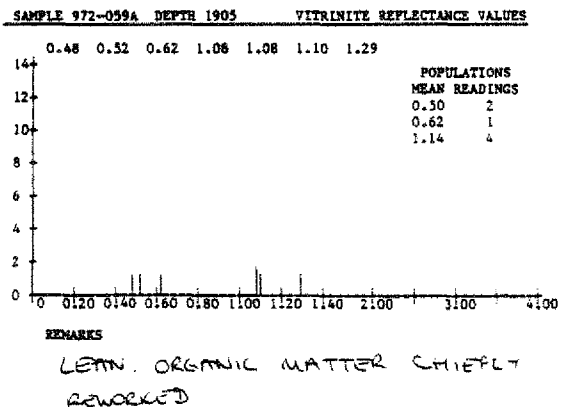
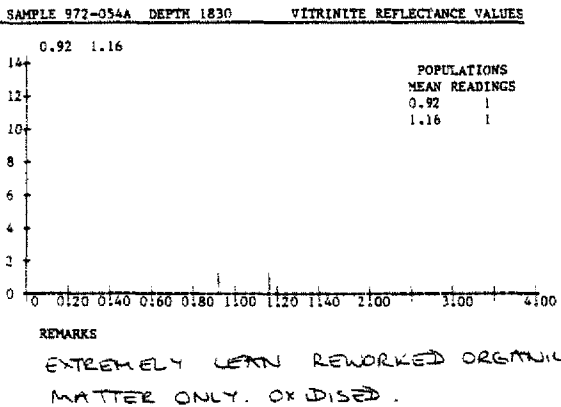
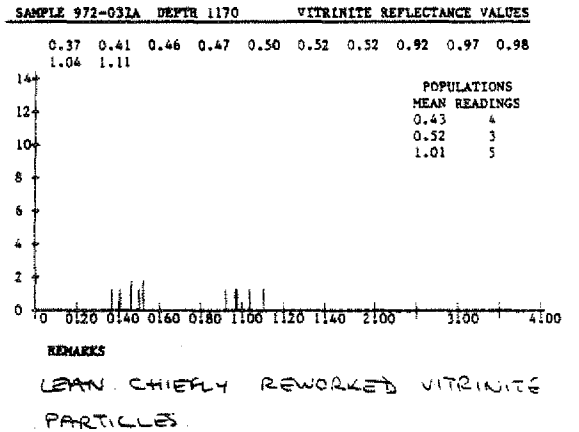
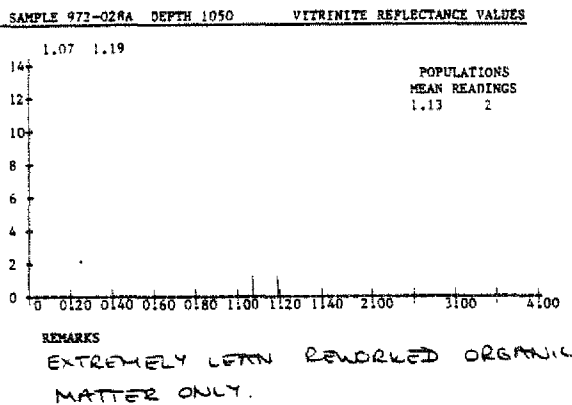
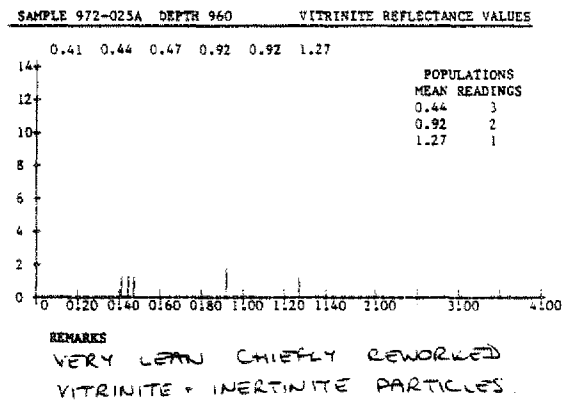
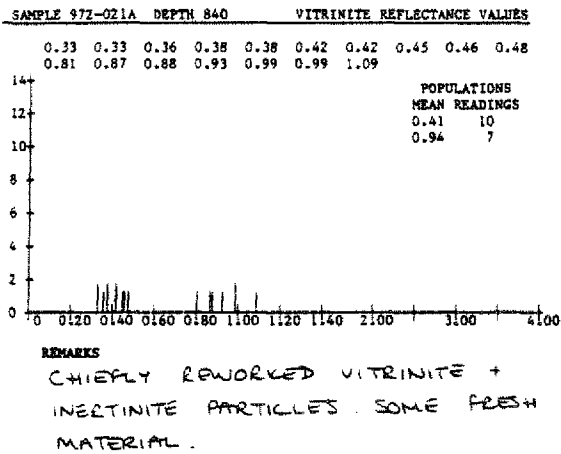
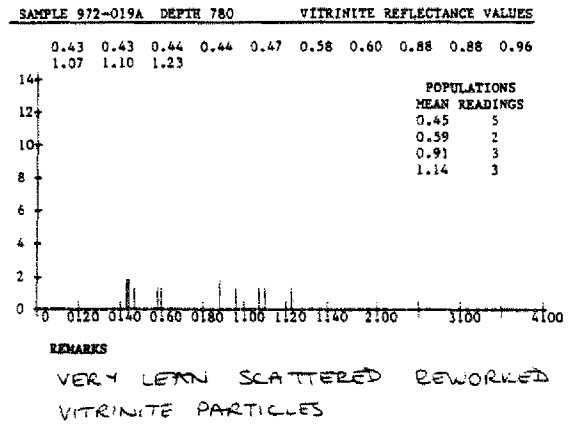
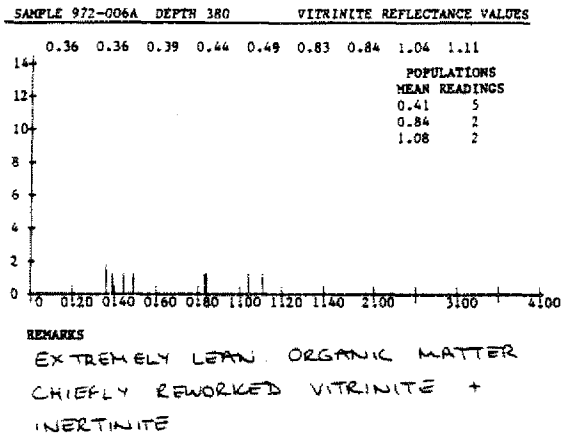
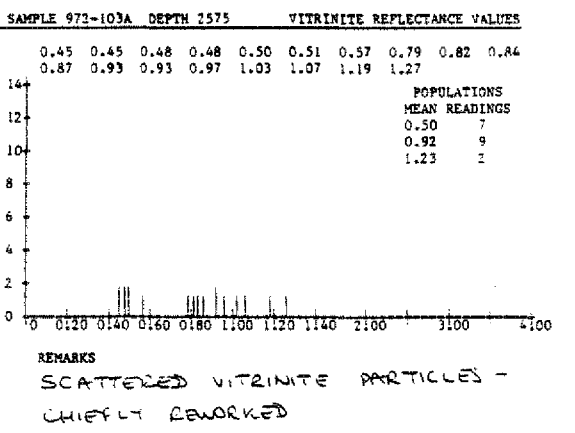
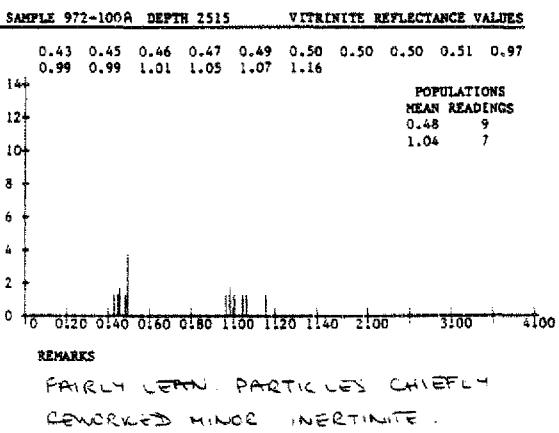
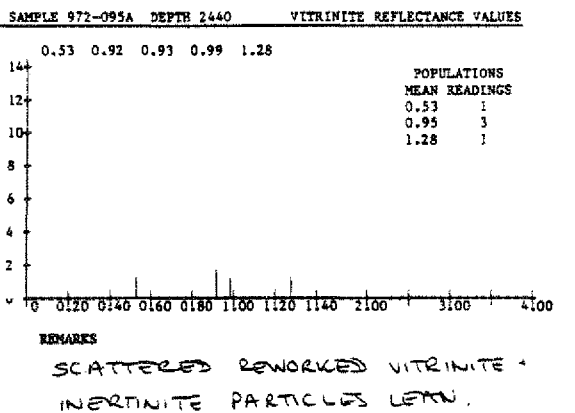
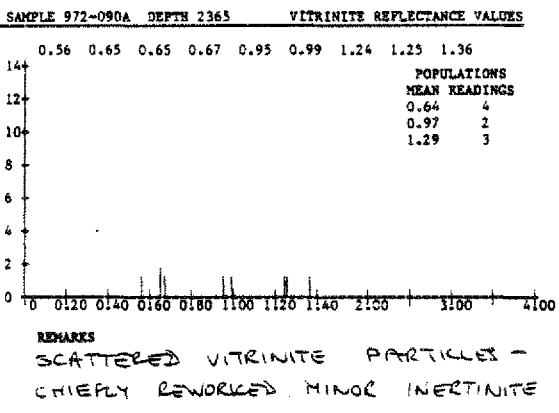
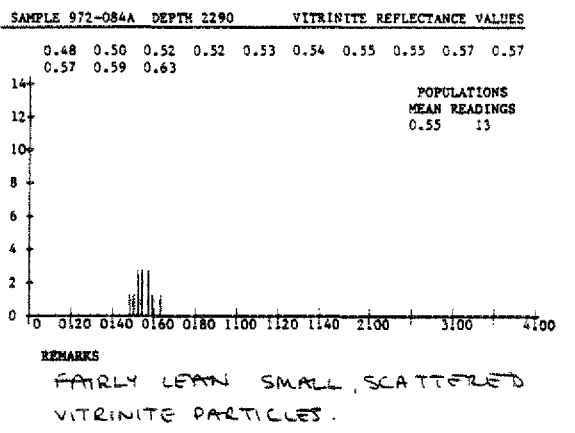
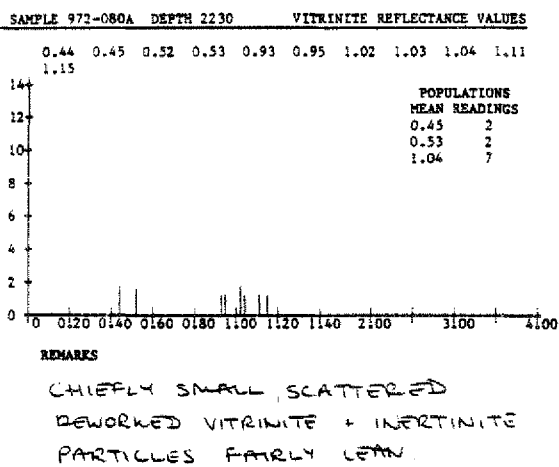
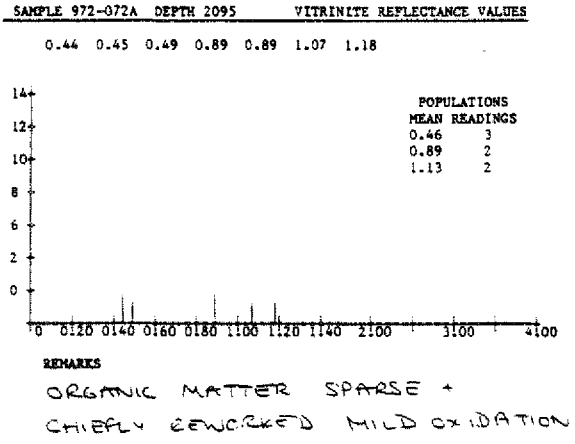
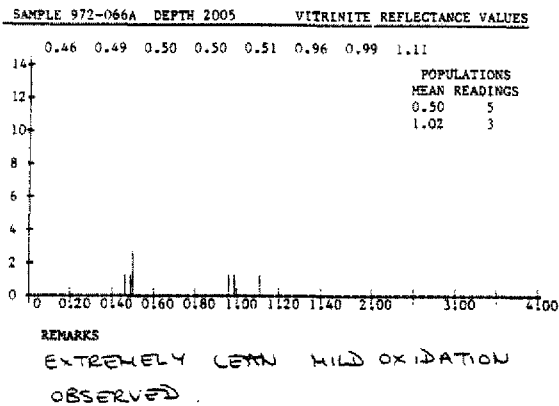


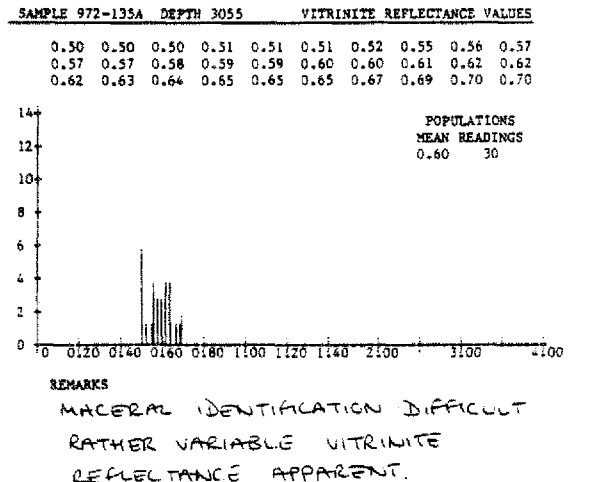
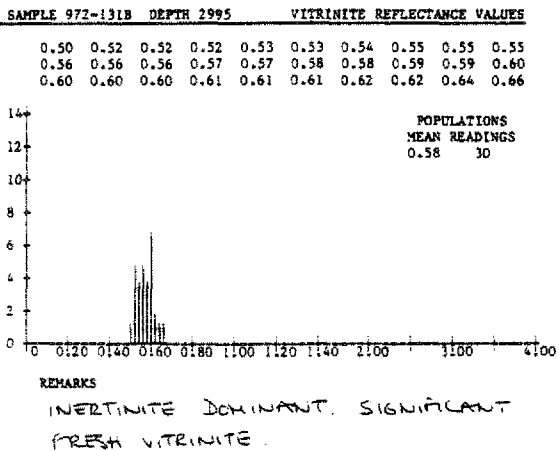
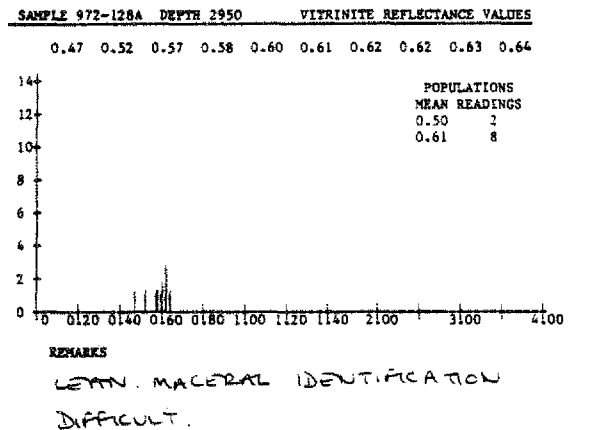
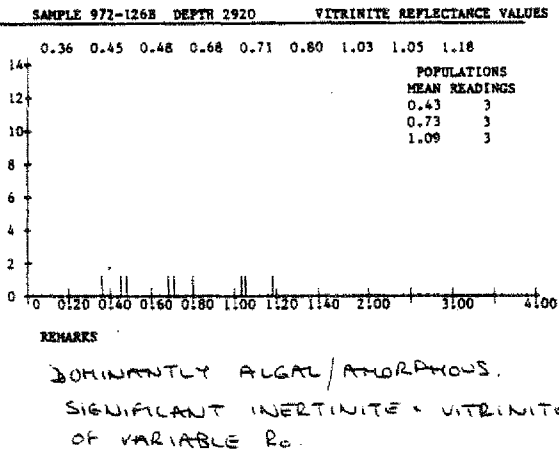
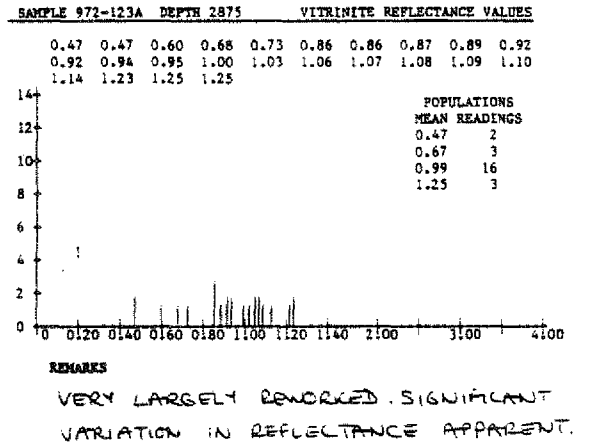
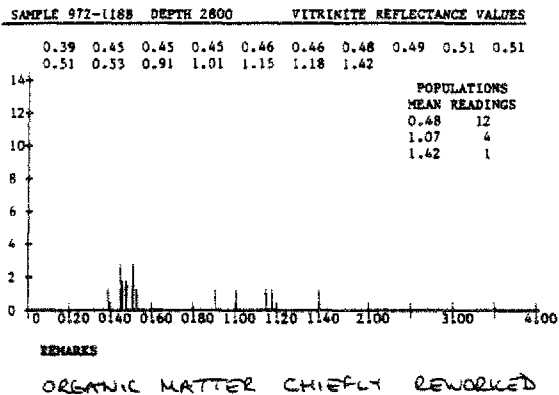
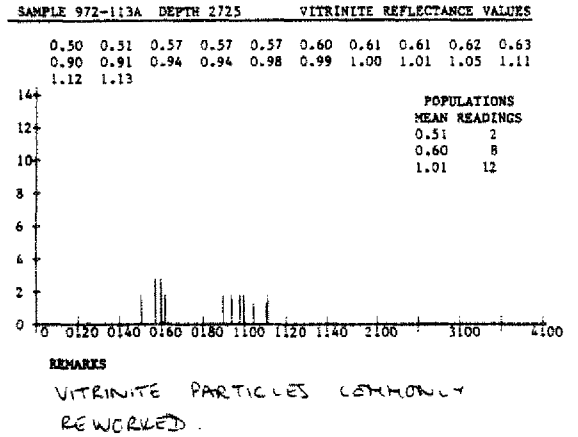
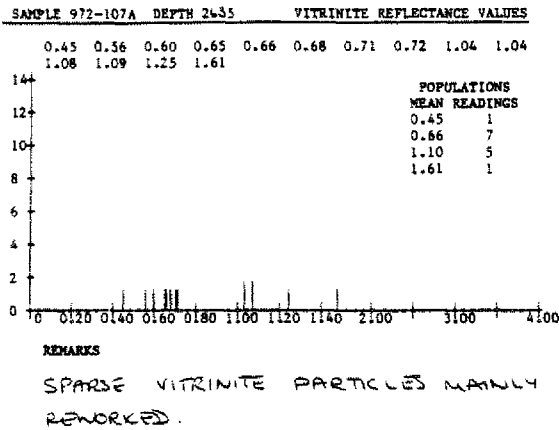
FIGURE 15b

VITRINITE REFLECTANCE

WELL

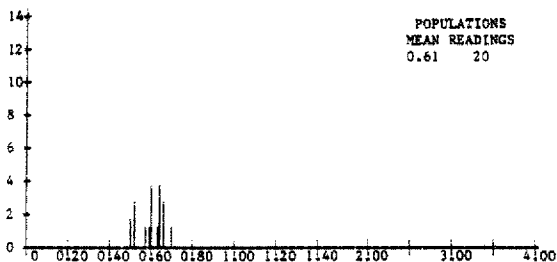
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SAMPLE 972-138A DEPTH 3100 VITRINITE REFLECTANCE VALUES

0.50	0.50	0.52	0.52	0.53	0.57	0.59	0.60	0.60	0.61
0.61	0.63	0.64	0.64	0.65	0.65	0.66	0.66	0.67	0.70



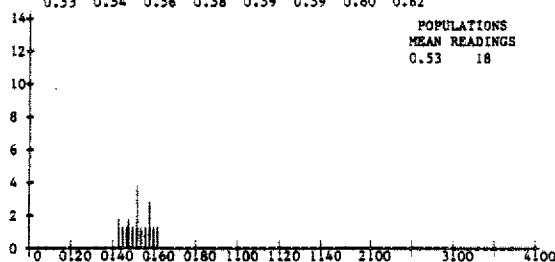
POPULATIONS
MEAN READINGS
0.61 20

REMARKS

FAIRLY RICH VITRINITE DOMINANT.
SIGNIFICANT INERTINITE

SAMPLE 972-143A DEPTH 3175 VITRINITE REFLECTANCE VALUES

0.43	0.43	0.45	0.47	0.48	0.48	0.50	0.52	0.53	0.53
0.53	0.54	0.56	0.58	0.59	0.59	0.60	0.60		



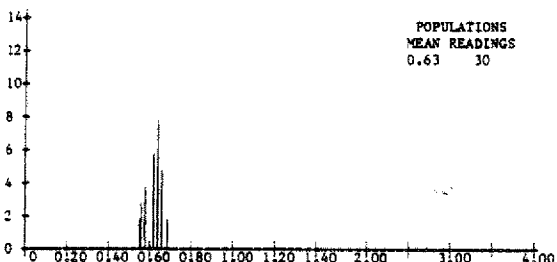
POPULATIONS
MEAN READINGS
0.53 18

REMARKS

FAIRLY RICH VITRINITE DOMINANT
MILD OXIDATION OBSERVED.

SAMPLE 972-148A DEPTH 3234 VITRINITE REFLECTANCE VALUES

0.55	0.55	0.56	0.57	0.57	0.58	0.58	0.59	0.59	0.62
0.62	0.63	0.63	0.63	0.63	0.64	0.64	0.64	0.64	0.64
0.64	0.65	0.65	0.66	0.66	0.66	0.66	0.67	0.69	0.69



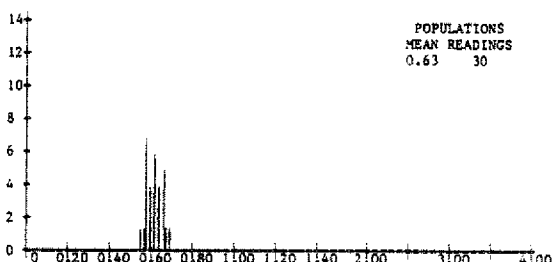
POPULATIONS
MEAN READINGS
0.63 30

REMARKS

INERTINITE DOMINANT. SIGNIFICANT
VITRINITE.

SAMPLE 972-151B DEPTH 3339 VITRINITE REFLECTANCE VALUES

0.55	0.57	0.58	0.58	0.59	0.59	0.59	0.59	0.59	0.60
0.60	0.61	0.61	0.62	0.62	0.63	0.63	0.63	0.63	0.64
0.65	0.65	0.65	0.67	0.67	0.67	0.67	0.67	0.68	0.70



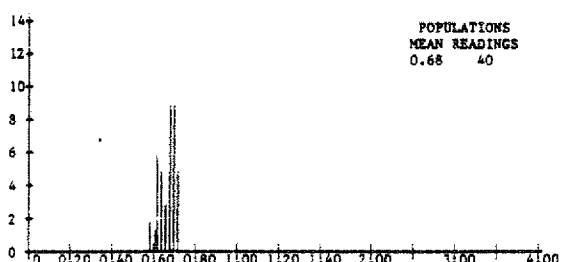
POPULATIONS
MEAN READINGS
0.63 30

REMARKS

INERTINITE DOMINANT. SIGNIFICANT
VITRINITE.

SAMPLE 972-153A DEPTH 3399 VITRINITE REFLECTANCE VALUES

0.58	0.59	0.61	0.62	0.62	0.62	0.62	0.63	0.63	0.64
0.64	0.64	0.65	0.65	0.66	0.66	0.66	0.68	0.68	0.68
0.68	0.69	0.69	0.69	0.69	0.69	0.70	0.70	0.70	0.70
0.70	0.71	0.71	0.71	0.71	0.72	0.72	0.72	0.72	0.72



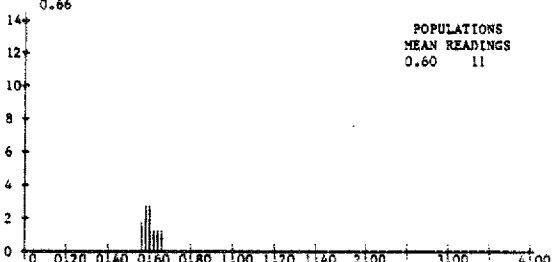
POPULATIONS
MEAN READINGS
0.68 40

REMARKS

INERTINITE DOMINANT. SIGNIFICANT
VITRINITE MILD OXIDATION.

SAMPLE 972-157A DEPTH 3459 VITRINITE REFLECTANCE VALUES

0.56	0.56	0.58	0.58	0.59	0.60	0.60	0.61	0.62	0.64
0.66									



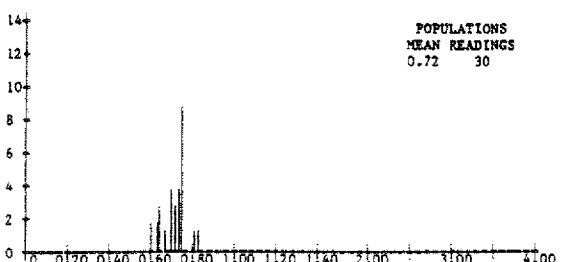
POPULATIONS
MEAN READINGS
0.60 11

REMARKS

LEAN CHIEFLY INERTINITE MINOR
VITRINITE PARTICLES.

SAMPLE 972-159B DEPTH 3489 VITRINITE REFLECTANCE VALUES

0.60	0.61	0.63	0.63	0.64	0.65	0.65	0.67	0.70	0.70
0.71	0.71	0.72	0.73	0.73	0.74	0.74	0.74	0.74	0.75
0.75	0.75	0.75	0.75	0.76	0.76	0.77	0.77	0.81	0.83



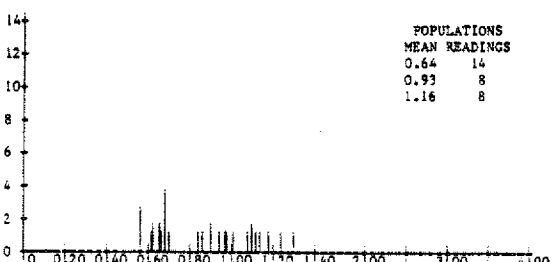
POPULATIONS
MEAN READINGS
0.72 30

REMARKS

VITRINITE DOMINANT. SIGNIFICANT
INERTINITE + MINOR EXINITE.

SAMPLE 972-163A DEPTH 3549 VITRINITE REFLECTANCE VALUES

0.56	0.56	0.56	0.61	0.62	0.62	0.65	0.65	0.66	0.68
0.69	0.69	0.69	0.70	0.84	0.86	0.90	0.90	0.94	0.97
0.98	1.01	1.08	1.10	1.10	1.12	1.14	1.18	1.24	1.30



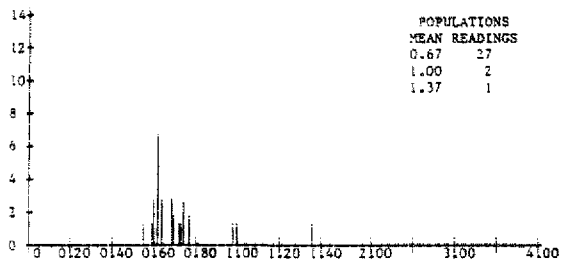
POPULATIONS
MEAN READINGS
0.64 14
0.93 8
1.16 8

REMARKS

FAIRLY RICH CHIEFLY REWORKED +
INERTINITE MATERIAL. MINOR
VITRINITE

SAMPLE 972-166A DEPTH 3594 VITRINITE REFLECTANCE VALUES

0.55	0.59	0.60	0.61	0.61	0.62	0.62	0.62	0.62	0.62
0.63	0.63	0.64	0.64	0.65	0.69	0.69	0.69	0.70	0.70
0.73	0.74	0.75	0.76	0.77	0.78	0.79	0.99	1.01	1.37



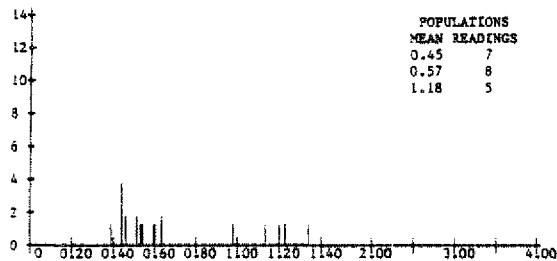
POPULATIONS	
MEAN READINGS	
0.67	27
1.00	2
1.37	1

REMARKS

CHIEFLY REWORKED VITRINITE +
INERTINITE PARTICLES

SAMPLE 972-170A DEPTH 3494 VITRINITE REFLECTANCE VALUES

0.39	0.44	0.45	0.45	0.45	0.46	0.46	0.51	0.51	0.53
0.54	0.59	0.60	0.63	0.63	0.98	1.13	1.20	1.23	1.34



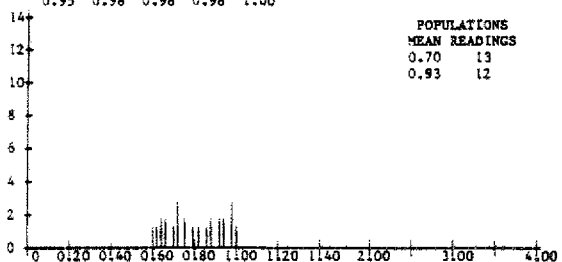
POPULATIONS	
MEAN READINGS	
0.45	7
0.57	8
1.18	5

REMARKS

INERTINITE + REWORKED MATERIAL
DOMINANT. MINOR VITRINITE.

SAMPLE 972-174A DEPTH 3714 VITRINITE REFLECTANCE VALUES

0.60	0.62	0.64	0.65	0.66	0.67	0.70	0.72	0.72	0.73
0.75	0.75	0.79	0.82	0.86	0.88	0.88	0.92	0.92	0.94
0.95	0.98	0.98	0.98	1.00					



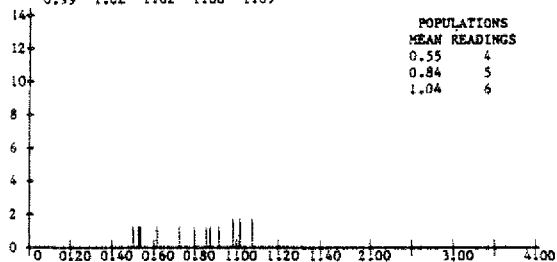
POPULATIONS	
MEAN READINGS	
0.70	13
0.93	12

REMARKS

ORGANIC MATTER FINELY COMMINUTED.
SCATTERED UNAFFECTED PARTICLES
WITH HIGH REFLECTANCE

SAMPLE 972-178A DEPTH 3774 VITRINITE REFLECTANCE VALUES

0.50	0.53	0.54	0.62	0.73	0.80	0.86	0.88	0.92	0.99
0.99	1.02	1.02	1.08	1.09					



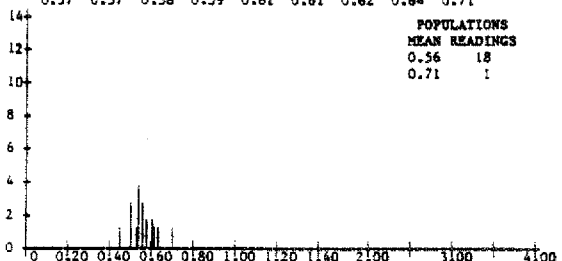
POPULATIONS	
MEAN READINGS	
0.55	4
0.84	5
1.04	6

REMARKS

ORGANIC MATTER FINELY COMMINUTED.
MINOR UNAFFECTED PARTICLES.

SAMPLE 972-182A DEPTH 3834 VITRINITE REFLECTANCE VALUES

0.45	0.50	0.50	0.50	0.53	0.54	0.54	0.54	0.55	0.56
0.57	0.57	0.58	0.59	0.61	0.61	0.62	0.64	0.71	



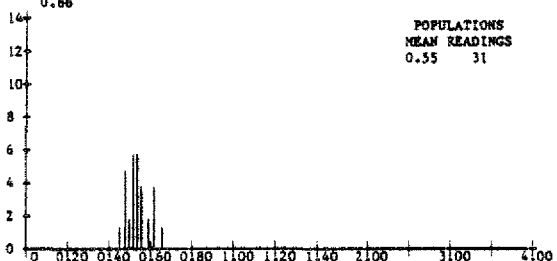
POPULATIONS	
MEAN READINGS	
0.56	18
0.71	1

REMARKS

VITRINITE PARTICLES SPARSE +
CHIEFLY REWORKED ORGANIC MATTER
FREQUENTLY COMMUNUTED.

SAMPLE 972-186A DEPTH 3894 VITRINITE REFLECTANCE VALUES

0.45	0.48	0.48	0.48	0.48	0.49	0.50	0.50	0.52	0.52
0.52	0.52	0.53	0.53	0.54	0.54	0.54	0.55	0.55	0.55
0.56	0.56	0.57	0.57	0.59	0.59	0.62	0.63	0.63	0.63
0.66									



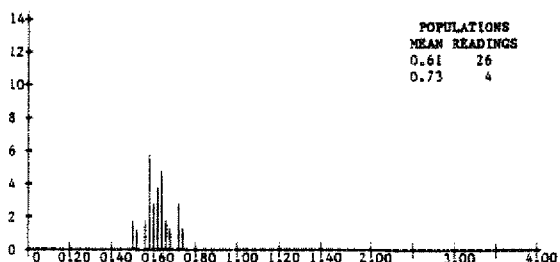
POPULATIONS	
MEAN READINGS	
0.55	31

REMARKS

FAIRLY RICH VITRINITE PARTICLES
CHIEFLY FRESH SIGNIFICANT INERTINITE

SAMPLE 972-191A DEPTH 3969 VITRINITE REFLECTANCE VALUES

0.50	0.51	0.52	0.56	0.57	0.58	0.58	0.59	0.59	0.59
0.59	0.60	0.61	0.61	0.62	0.62	0.63	0.63	0.64	0.65
0.65	0.65	0.65	0.66	0.67	0.68	0.72	0.73	0.73	0.74



POPULATIONS	
MEAN READINGS	
0.61	26
0.73	4

REMARKS

FAIRLY RICH VITRINITE CHIEFLY
REWORKED

FIGURE 16 ORGANIC FACIES & MATURITY WELL 34/10-21

