

(U-583)

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Arkivens 7/12-7.

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EXPLORATION AND PRODUCTION DIVISION

GEOCHEMISTRY
BRANCH

GCB/252/88

DECEMBER 1988

ULA FIELD RESERVOIR FLUID CHARACTERISATION
- 7/12-A12, 7/12-7 & 7/12-A01

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The report also contains some thermal volatile data for the wells 7/12-A12 and 7/12-7.

Formation of Late Jurassic age. This is supported by a low pristane/phytane ratio (1.5).

1.3 Conclusions

- Most of the oils supplied for this study were in fact diesel from the drilling mud.
- GC-MS maturity parameters indicate that the maximum expulsion temperature of the oil 7/12-7 (3797mbrt) is thought to be approximately 145°C.
- This oil is believed to be derived from the Late Jurassic Mandal Formation.

2.3 Conclusions

- The gases from 7/12-A-01 and 7/12-7 are virtually identical with respect to carbon isotope ratio.
- They were generated from labile kerogen contemporaneously with the generation of oil.
- The maximum palaeotemperatures to which the gases have been subjected (145-150°C) are too low for any significant quantities of gas to have formed from oil to gas cracking.

suggest that the formation waters throughout the field are constant in composition, irrespective of their position relative to the fault. This implies connectivity across the fault.

All samples are typical of formation waters, showing significant shifting isotopically to the right hand side, away from the meteoric water line, (Figure 8). There appears to be no major contamination from mud filtrate in any of the samples, possible maximum of 7% in A-12. This however would be consistent with relatively large amounts of diesel contamination. 7/12-3A is described as a DST flowing to surface and is therefore quite probably uncontaminated formation water. Comparison of this water therefore with other samples would indicate that water from A-12 3476mss (4030.5mbrt) is good formation water whilst the sample from 3494mss (4046.5mbrt) is slightly contaminated with mud filtrate water. Extrapolation of a line between the two samples would suggest admixture of a water with a deuterium isotopic composition similar to that measured in mud sample S0006. This is also consistent with analysis of the oil from 3494mss (4046.5mbrt) which was shown to be diesel. Analysis of the oil from 3476mss (4030.5mbrt) was not carried out. However on the basis of the water analysis, it may prove to be a useful sample for comparison of oil phase between 7/12-7 and A-12.

Both samples from 7/12-7 probably contain some mud filtrate contamination. Although similar isotopically the two samples are significantly different chemically. It would be difficult to differentiate between mud filtrate contamination and possible chemical variation in the formation waters without a good database of samples.

Formation waters from Ula are extremely saline and chemical variations in the samples are quite significant. Differences in ion concentrations between wells may be attributed to the local influences of the underlying salt body.

4. PYROLYSIS DATA FOR THE WELLS 7/12-A12 AND 7/12-7

Core samples from the wells 7/12-A12 and 7/12-7 were analysed by pyrolysis-gas chromatography (PGC) with the aim of observing the light ends (~C6-C12) of the bitumen present. The samples were not allowed to dry and not ground before analysis to minimise the loss of light ends by evaporation.

On examination of the PGC traces produced (Figures 9.01 to 10.20), no light ends were seen. The scale on the front end of some traces was increased and the resulting plot viewed on a computer terminal to see if light ends were present, but in significantly smaller quantities than the other alkanes; this was not the case.

In the well 7/12-A12 below a depth of ~4078mbrt, the P1 traces consist solely of diesel contamination with no sign of bitumen, possibly signifying the base of the residual oil leg in this well.

Gases

6.1-6.2 Carbon Isotope Ratio Plots

Waters

7 Well Location Map

8 Isotopic Composition

PYROLYSIS DATA (7/12-A12 AND 7/12-7)

9.1-9.11 PGC Traces-7/12-A12

10.1-10.20 PGC Traces-7/12-7

TABLE 2.1

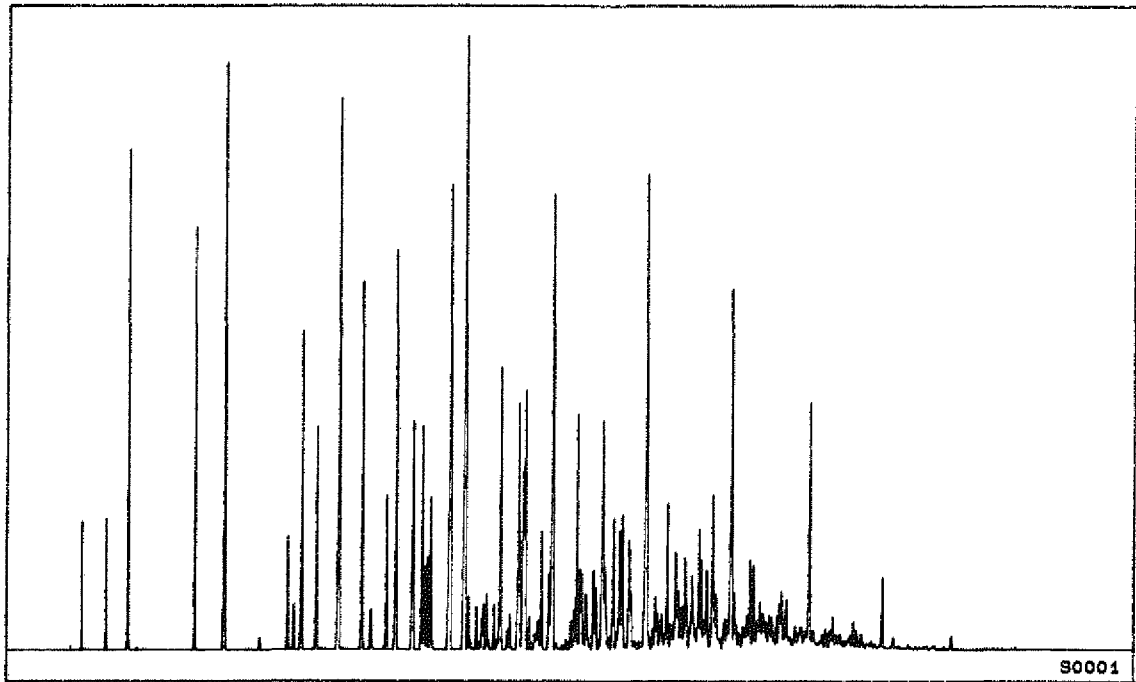
GAS ANALYSIS RESULTS

WELL: 7/12-A-01

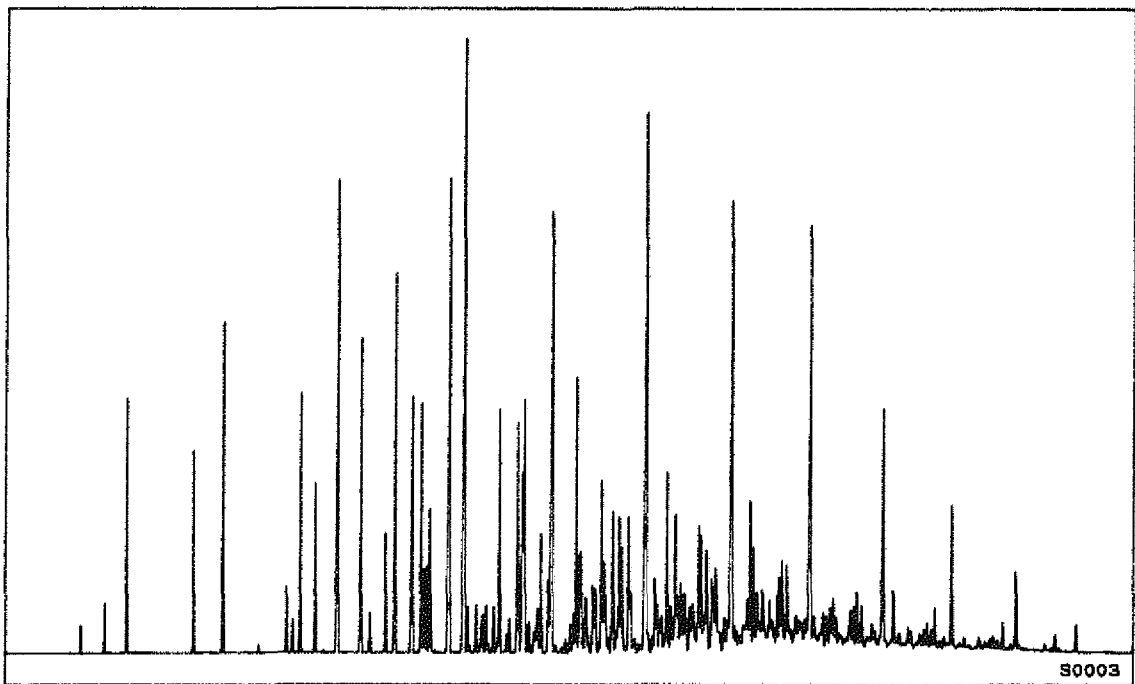
DEPTH:
DEPTHRANGE:

DST:

<u>Component</u>	<u>% mol</u>	<u>Del 13C per mil</u>
CH4	72.39	-49.43
C2H6	14.39	-34.61
C3H8	6.07	-31.25
iso-C4H10	0.48	
n-C4H10	0.92	-30.84
iso-C5H12	0.09	
n-C5H12	0.09	
C6	0.01	
CO2	2.86	-14.56
N2	0.01	
O2	2.67	
C1/C1-C5	0.767	
Del H/D CH4		



7/12-7 (CRU) RFT-5B 3797m

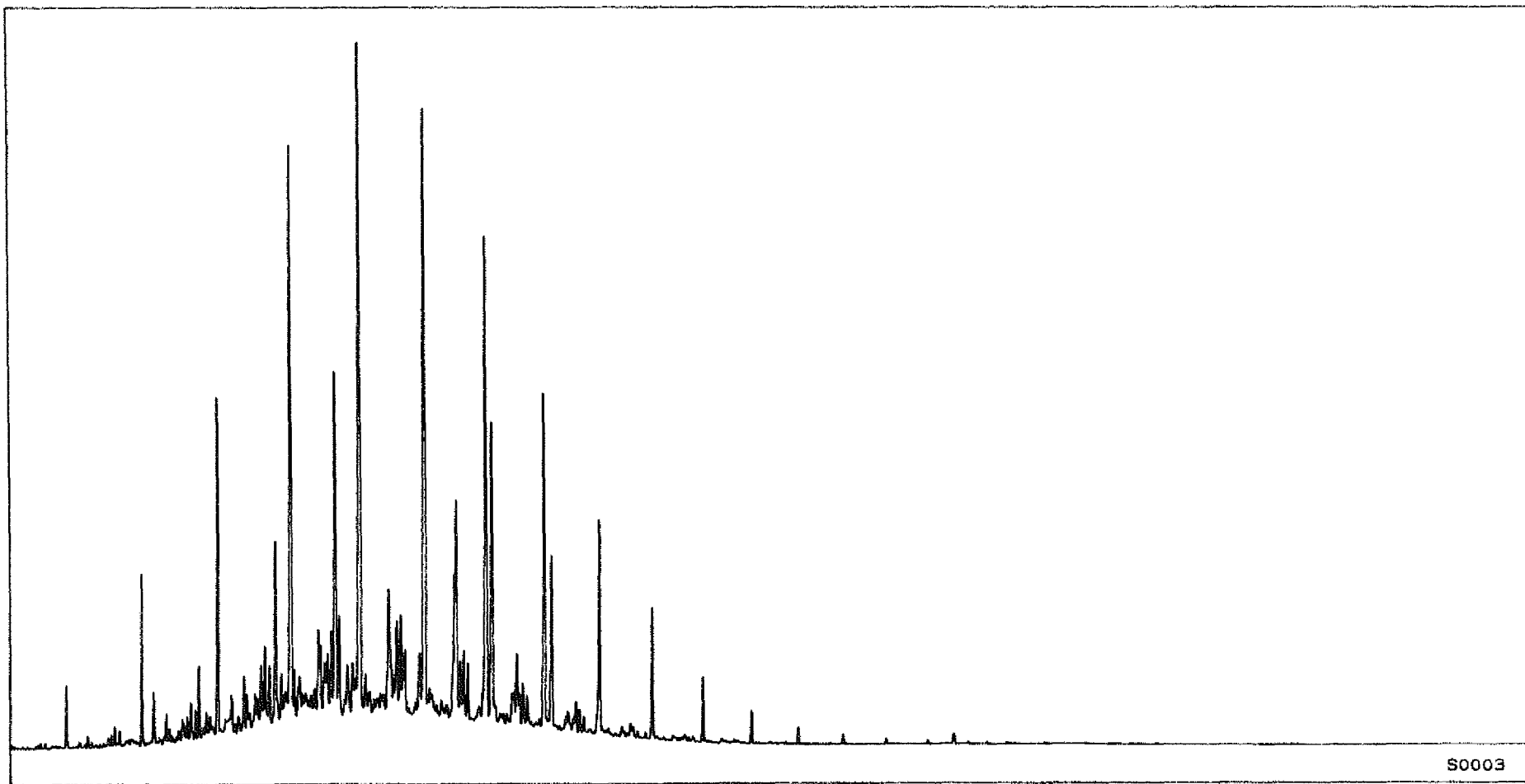


7/12-7 (CRU) RFT-6C 3842.2m

LIGHT HYDROCARBON DISTRIBUTION

GCB ref. 88090IL019

Figure 1.2

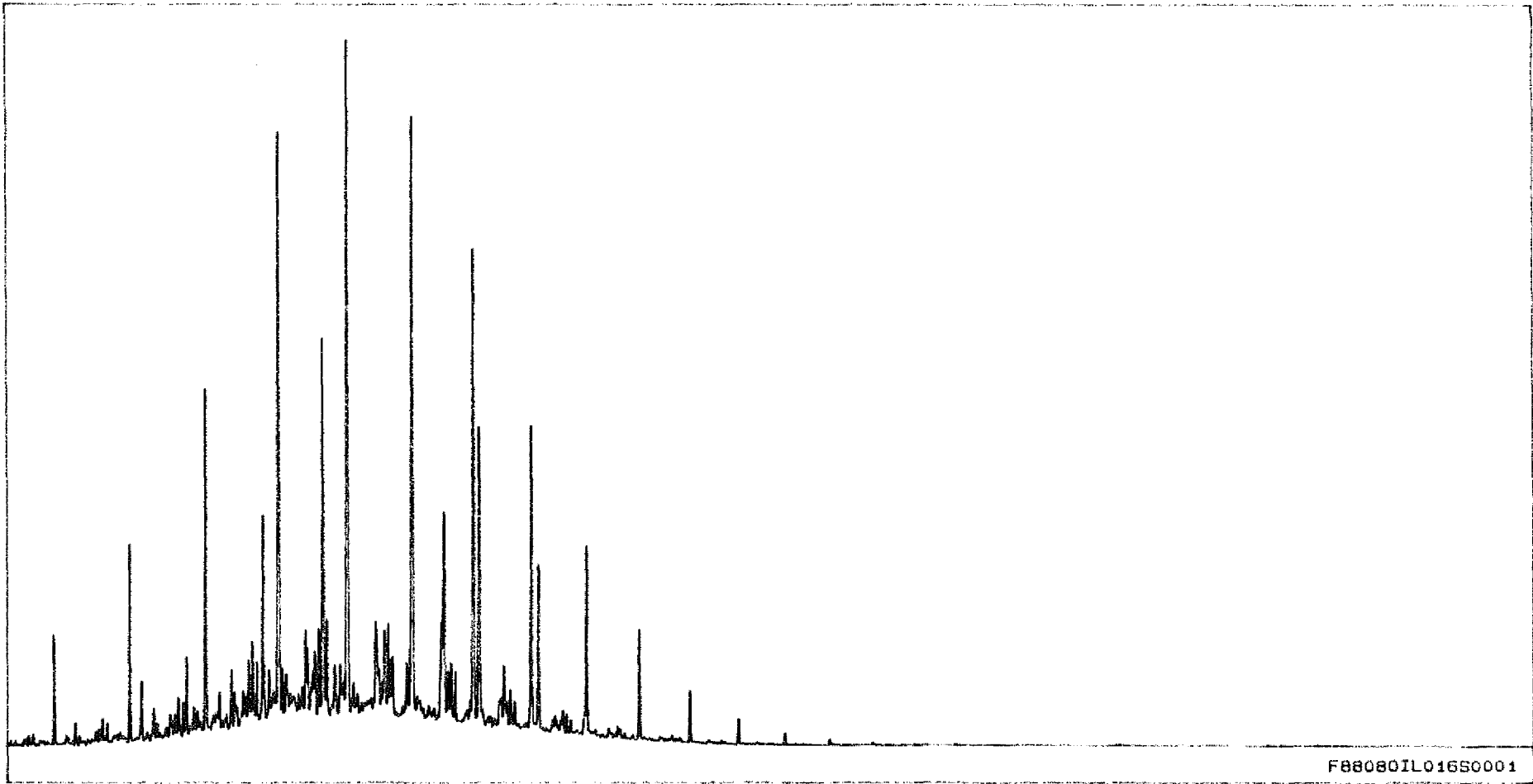


7/12-7 (CRU) RFT-6C 3842.2m

SAC FRACTION CHROMATOGRAMS

Figure 2.2

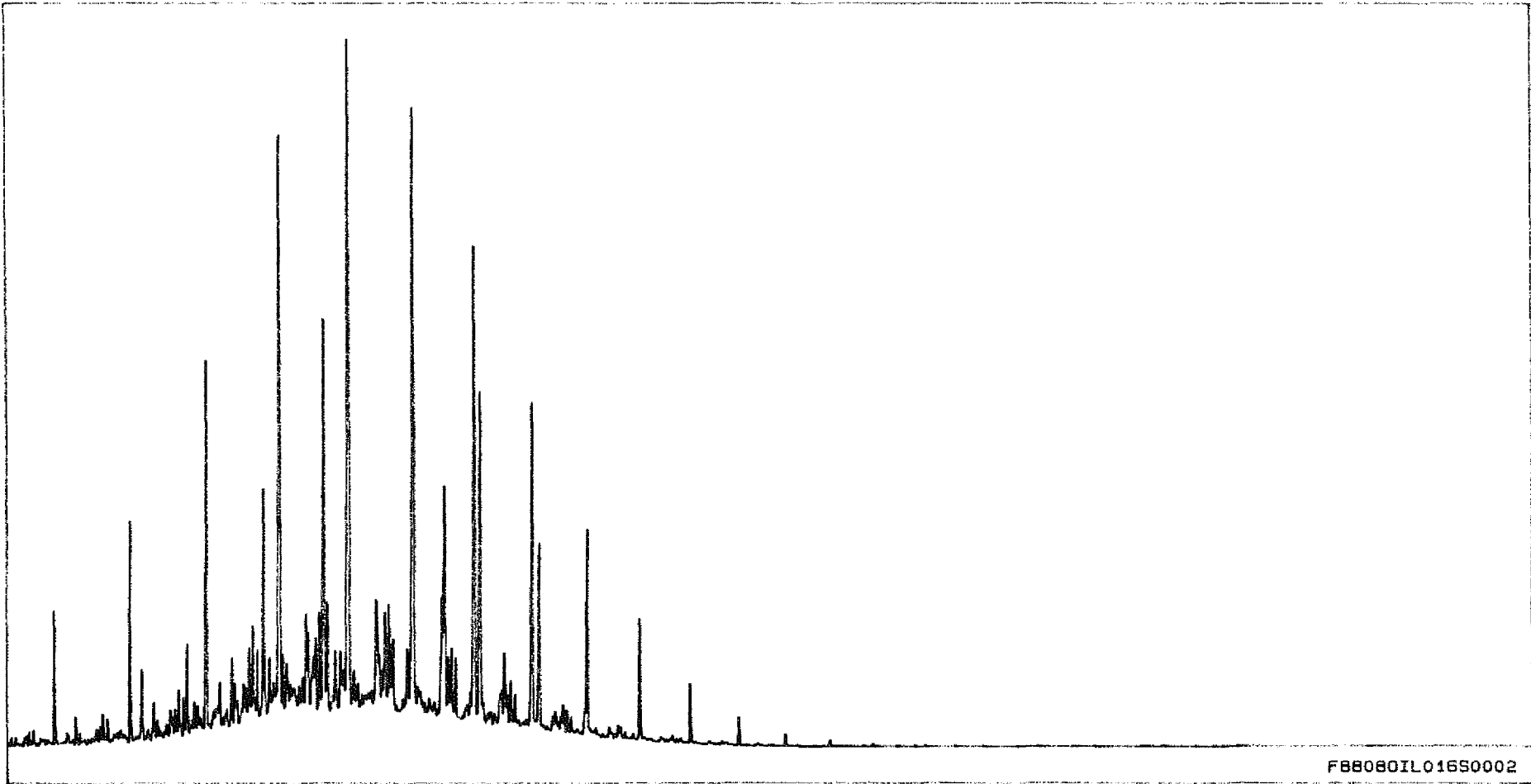
GCB ref. 88090ILO19



MUD FROM WELL 7/12-7

SATURATE FRACTION GAS CHROMATOGRAM

Figure 3.1



F88080IL016S0002

MUD FROM WELL 7/12-A01

SATURATE FRACTION GAS CHROMATOGRAM

Figure 3.3

BP GEOCHEMISTRY BRANCH GC/MS ANALYSIS

SAMPLE: AROMS EX 7/12-7 3797 G1544 188090IL01950001\$
DATA FILE: AB805

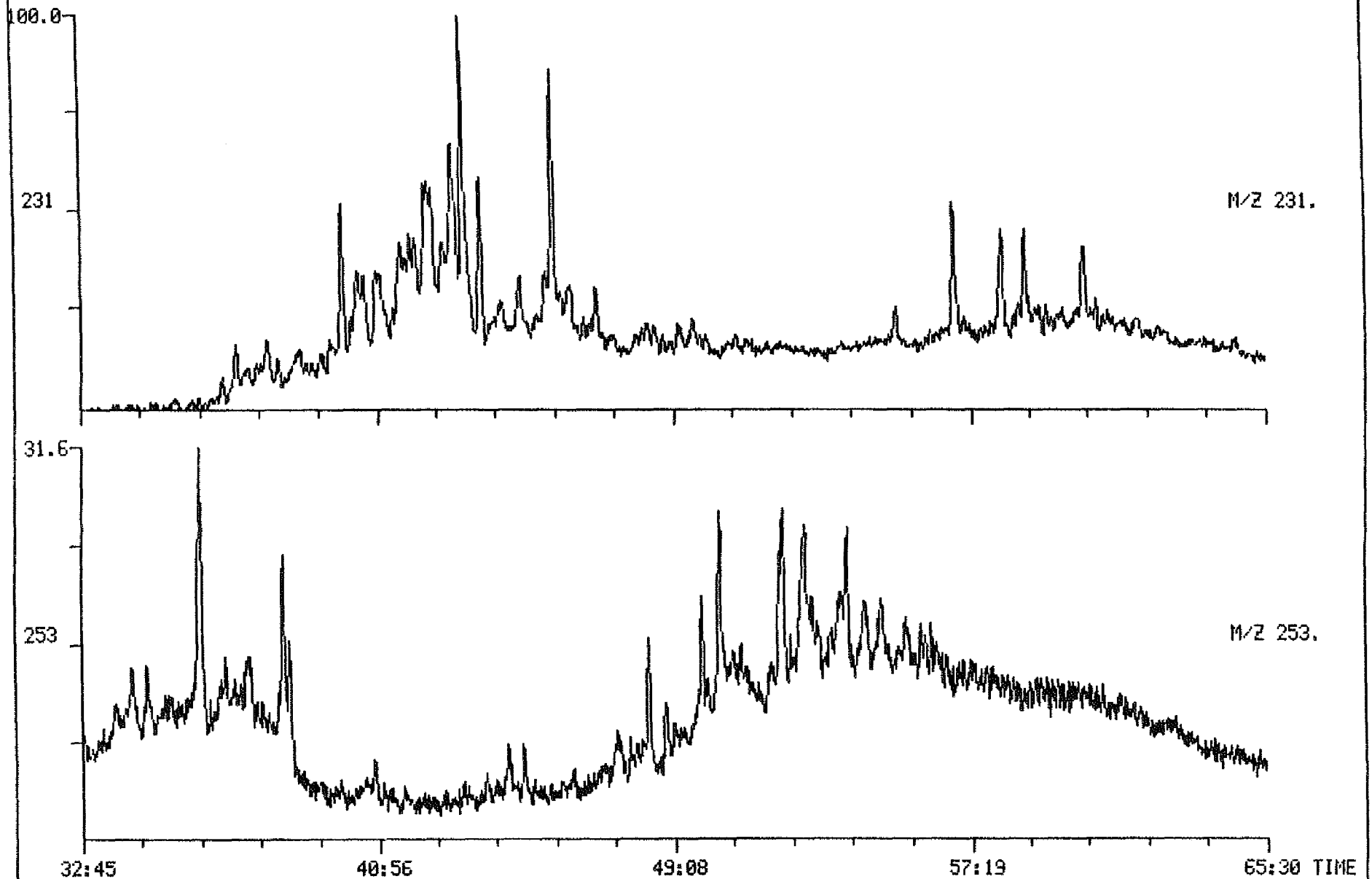


Figure 5.1

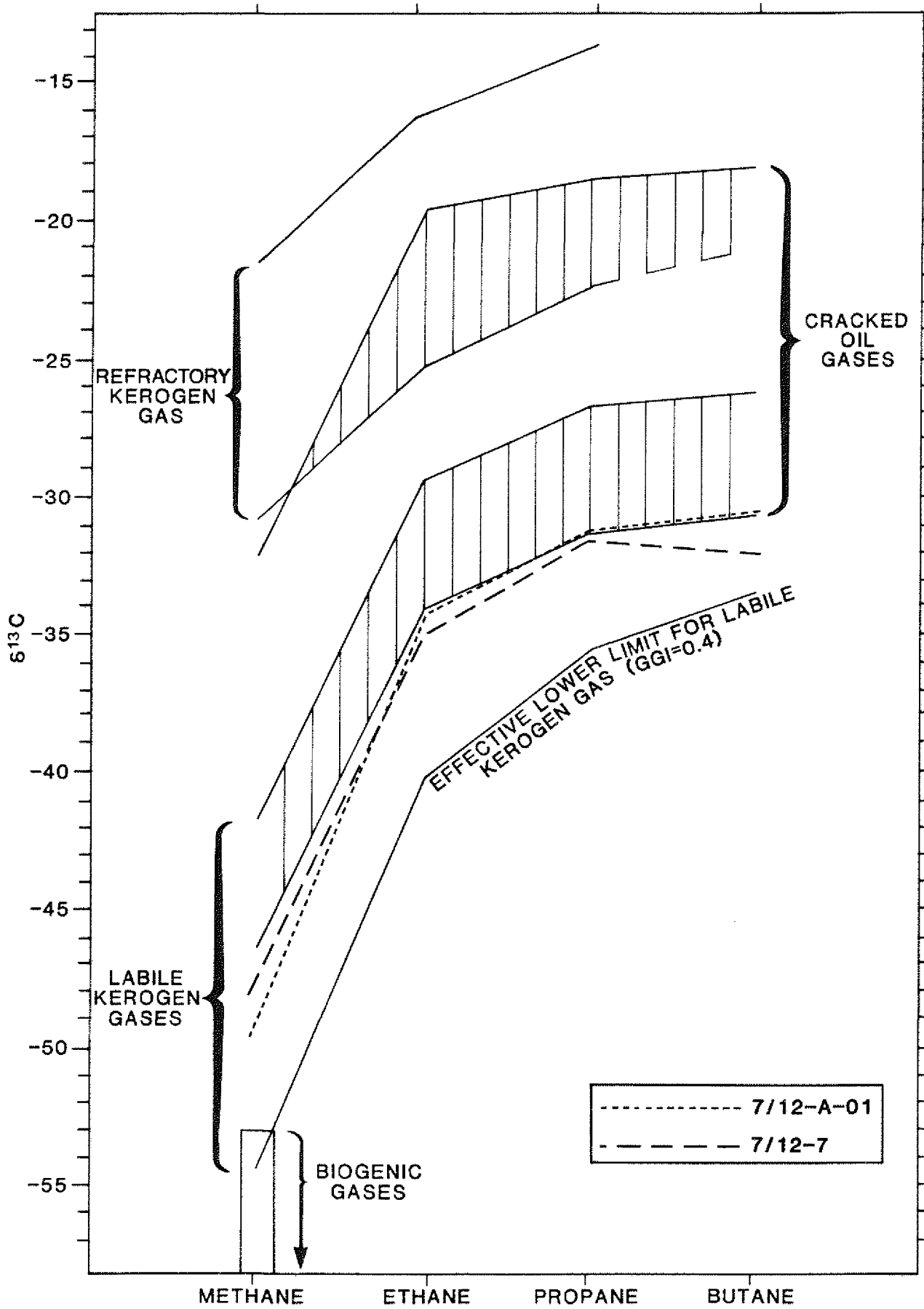


Figure 6.1

WELL LOCATION

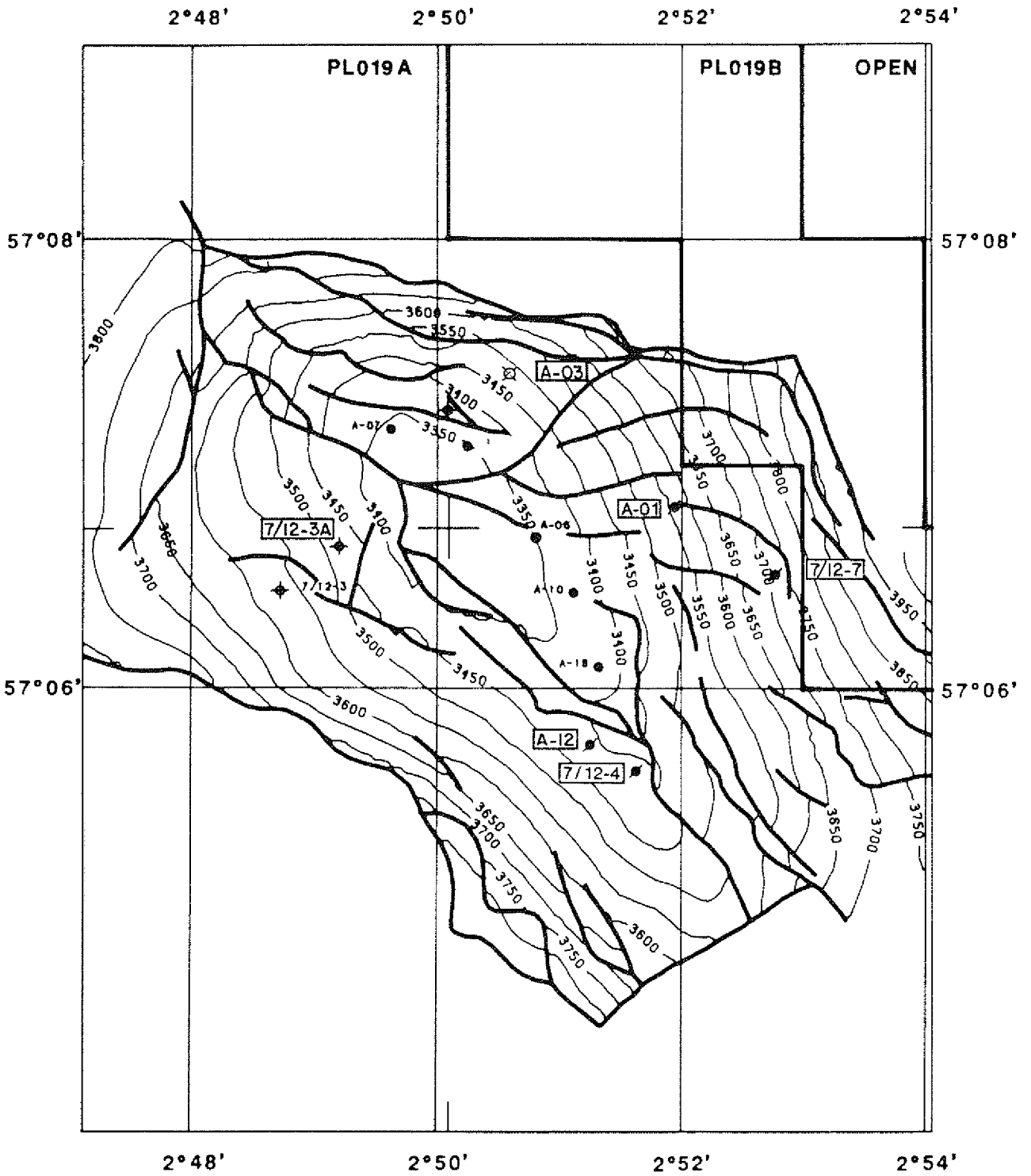
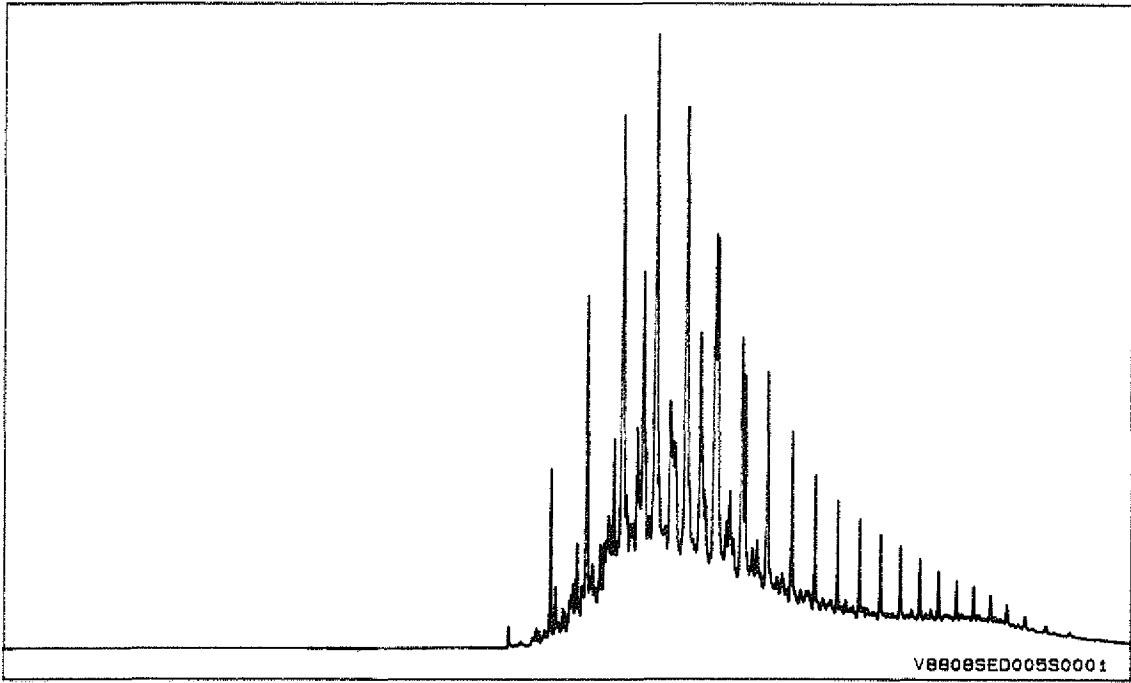
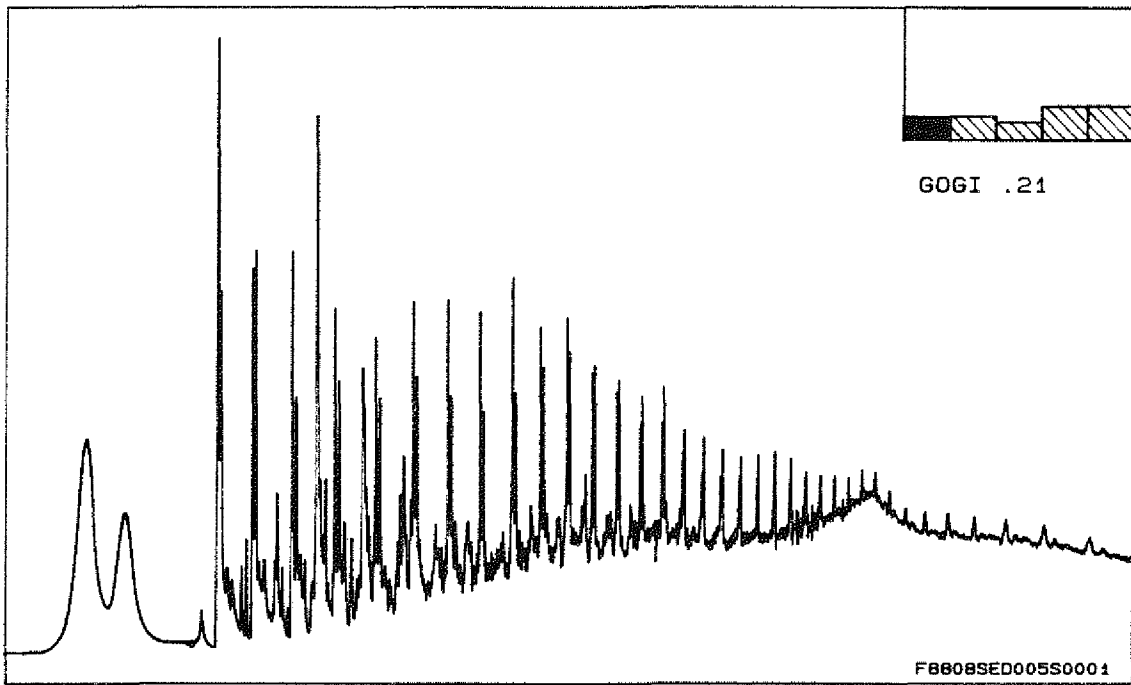


Figure 7

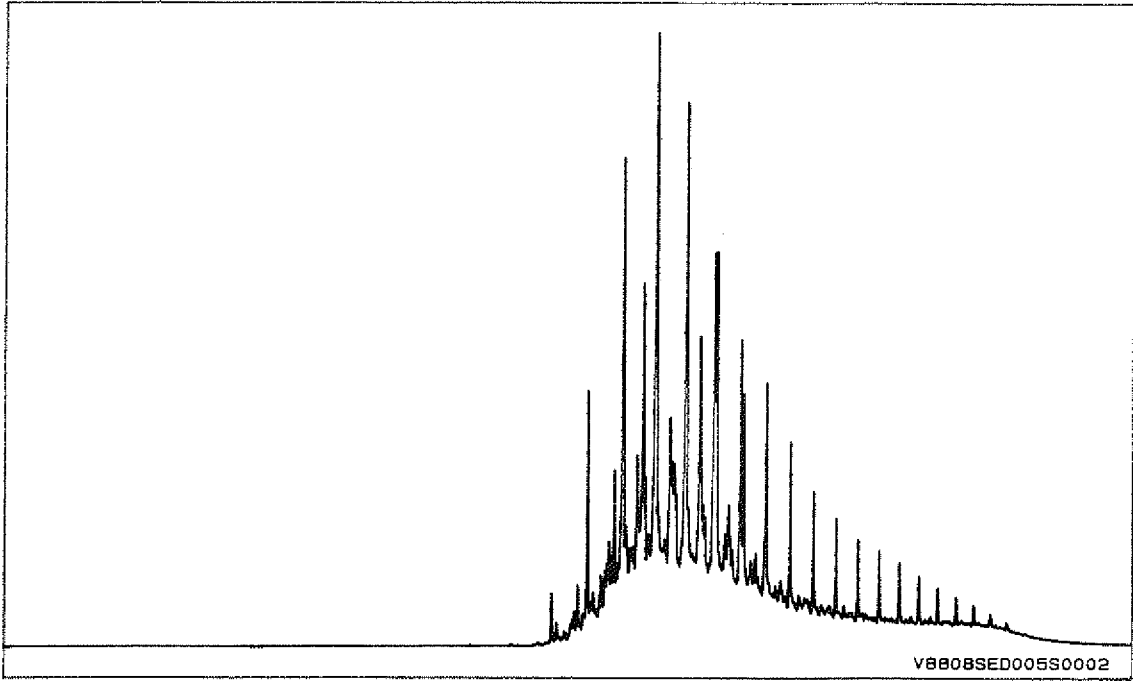


7/12-A12 (4058.80m) P1 DISTRIBUTION

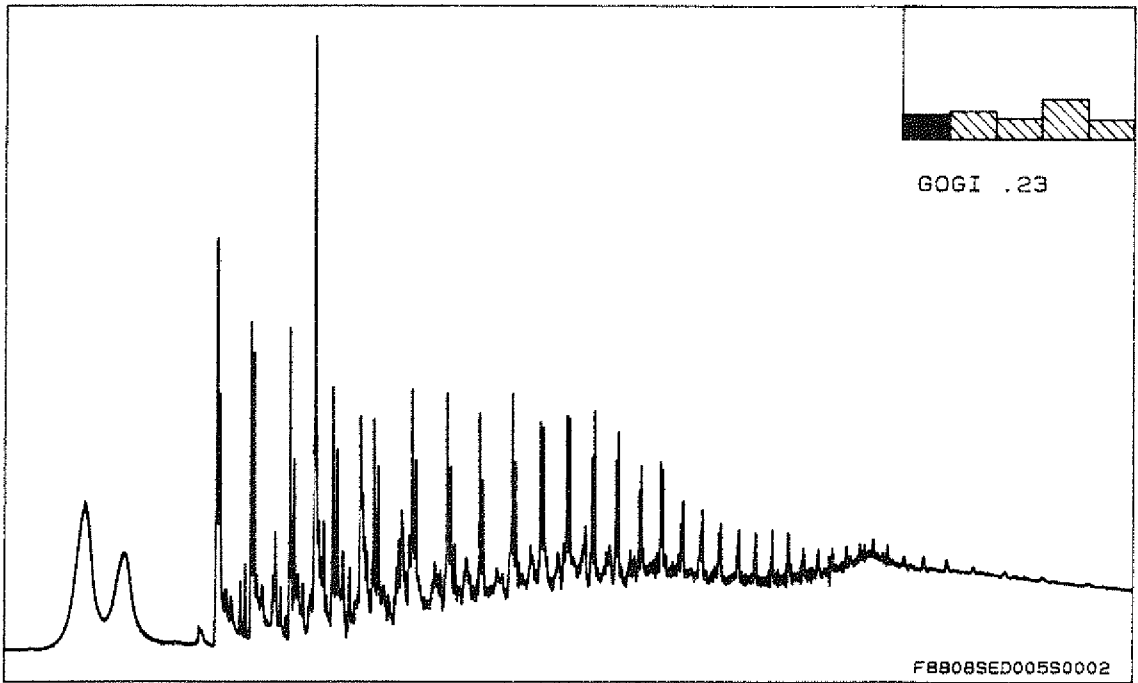


7/12-A12 (4058.80m) P2 DISTRIBUTION

PGC_DISTRIBUTIONS



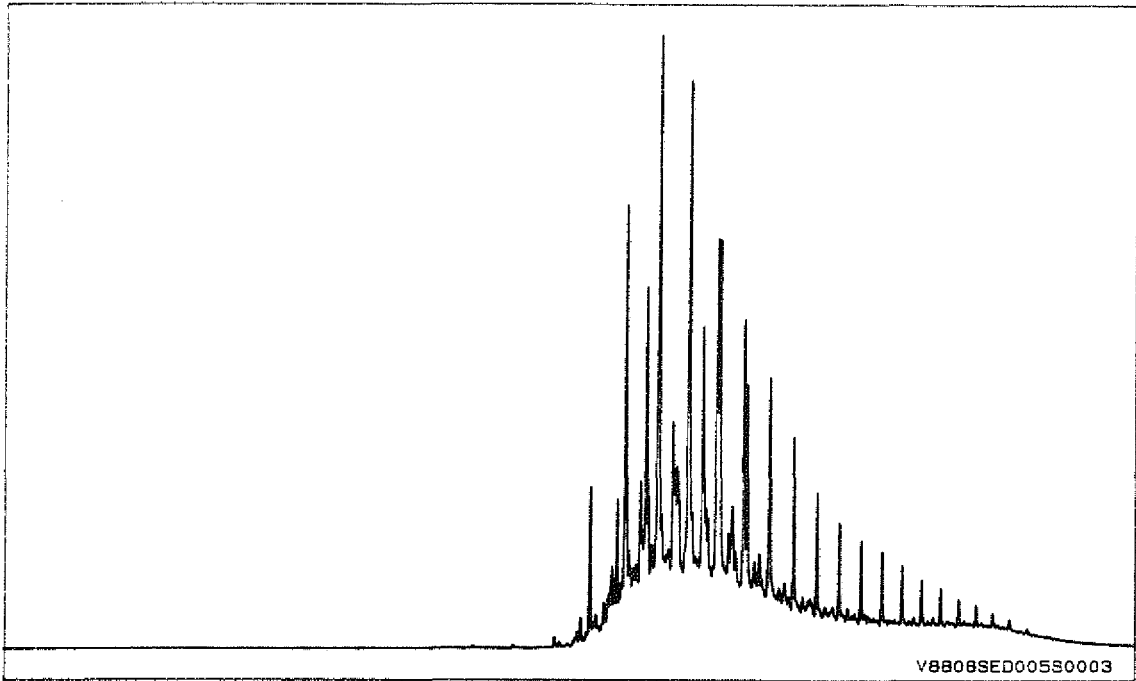
7/12-A12 (4062.80m)



7/12-A12 (4062.80m)

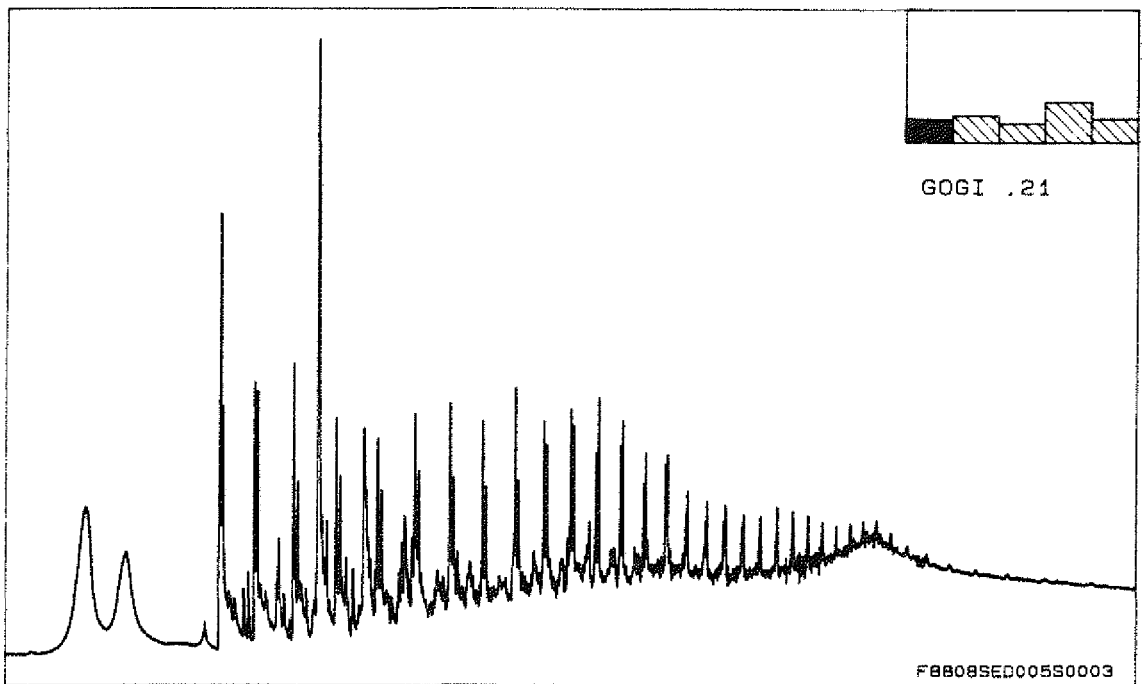
PGC DISTRIBUTIONS

Figure 9.3



V8808SED005S0003

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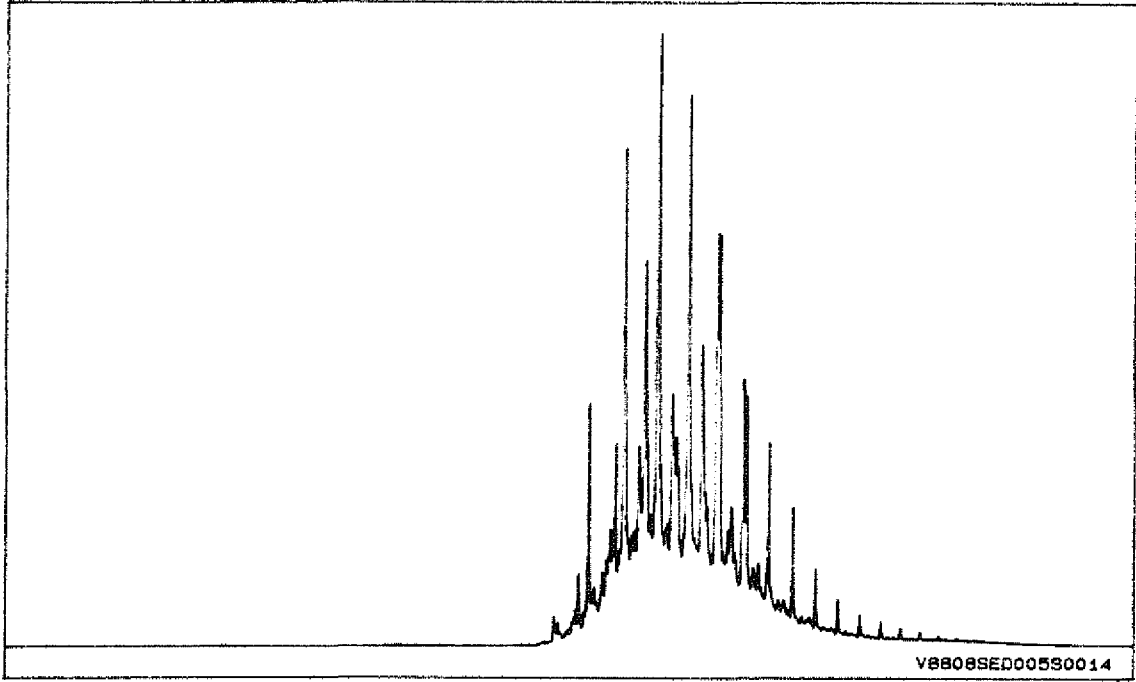


GOGI .21

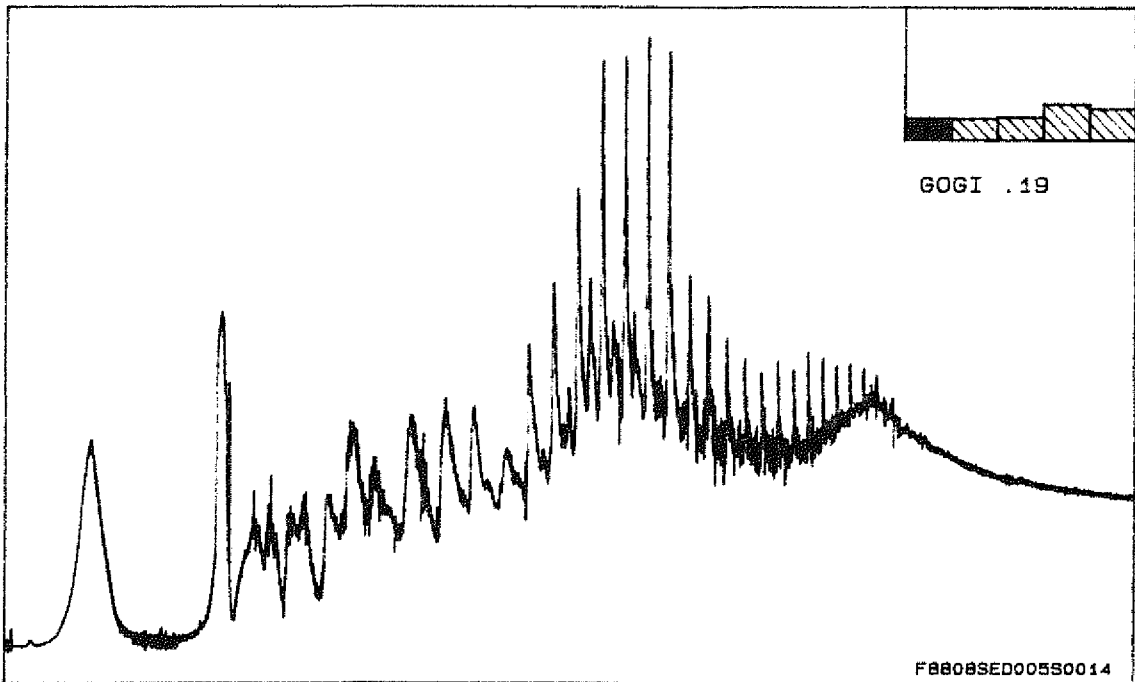
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7/12-A12 (4066.80m) P2 DISTRIBUTION

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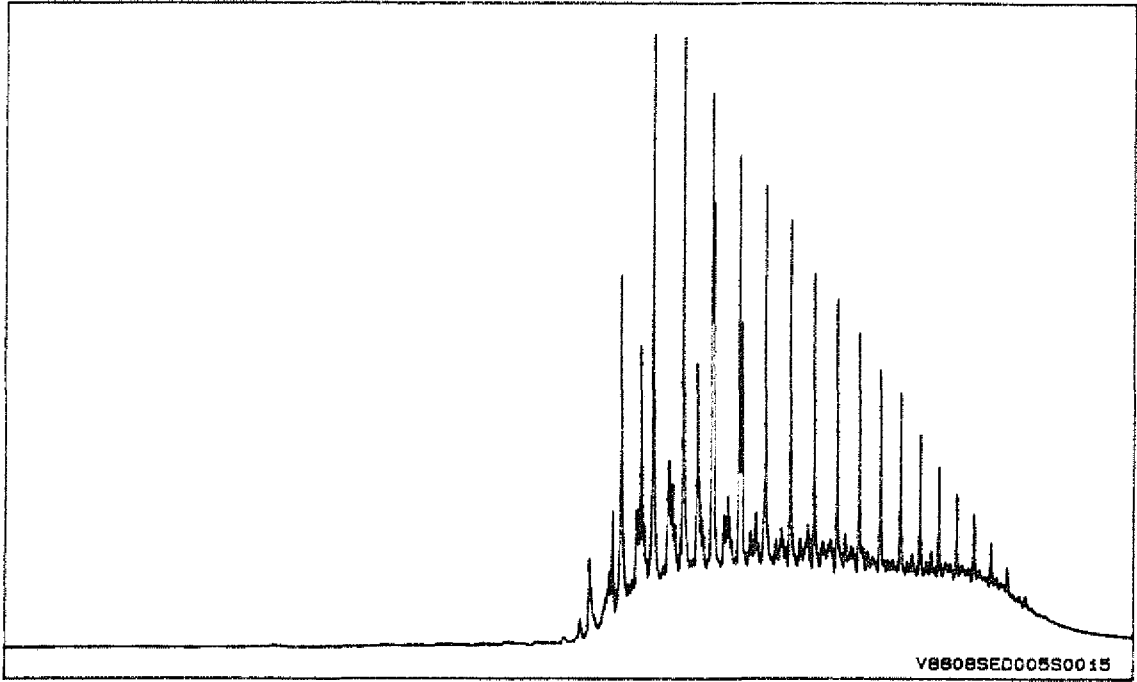


7/12-A12 (4072.800m) P1 DISTRIBUTION

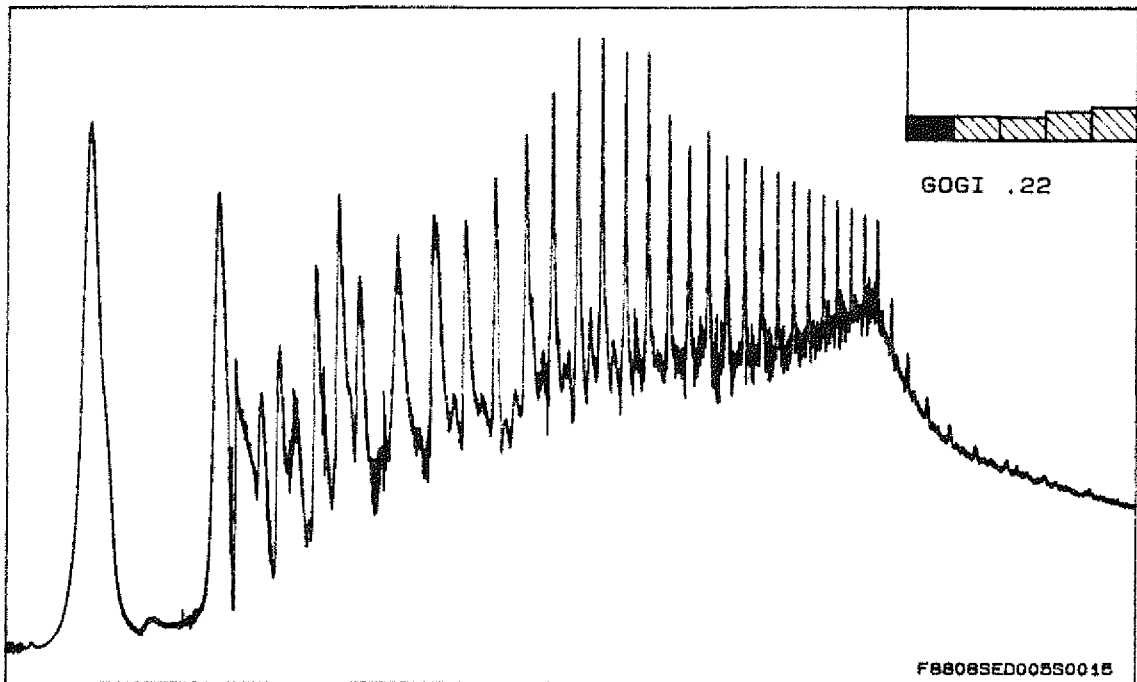


7/12-A12 (4072.800m) P2 DISTRIBUTION

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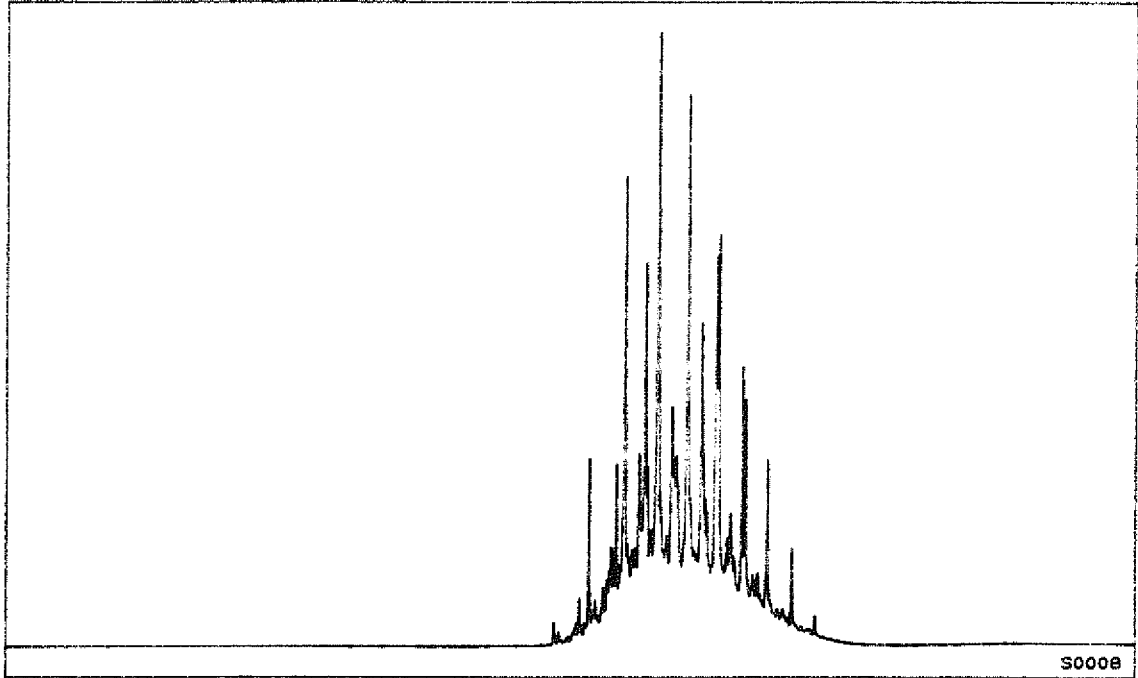


7/12-A12 (4076.800m) P1 DISTRIBUTION

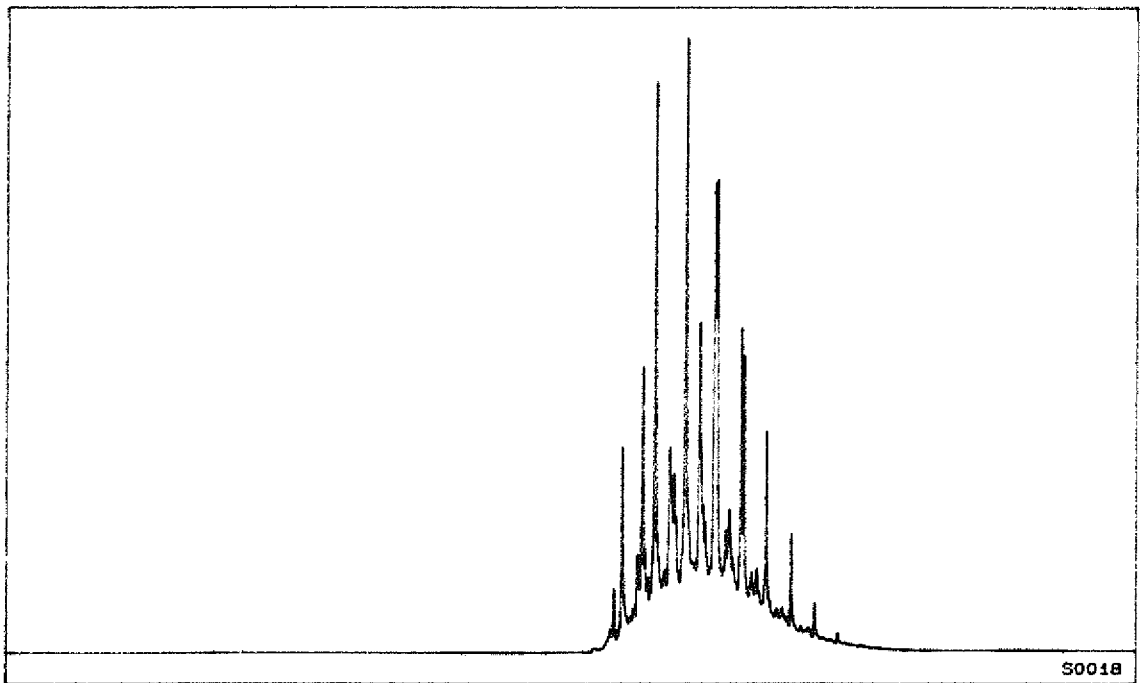


7/12-A12 (4076.800m) P2 DISTRIBUTION

PGC DISTRIBUTIONS



4086.600m (COR)



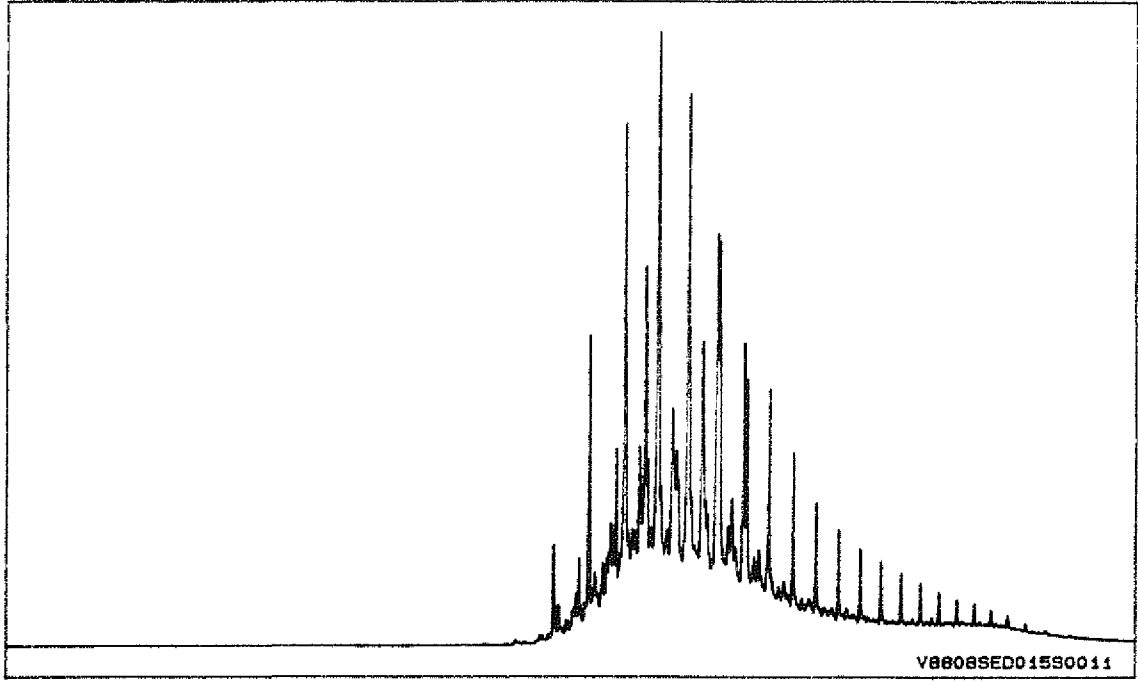
4088.700m (COR)

THERMAL VOLATILATES (P1) DISTRIBUTIONS

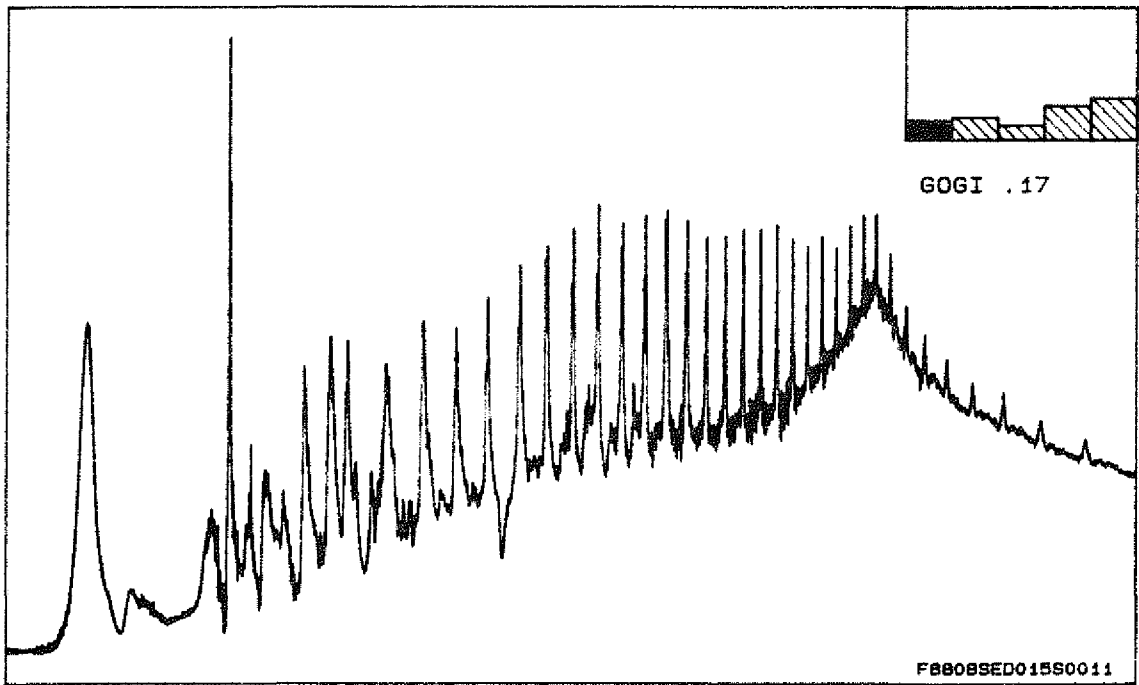
WELL NAME : 7/12-A12

GCB ref. 8808SED005

Figure 9.11

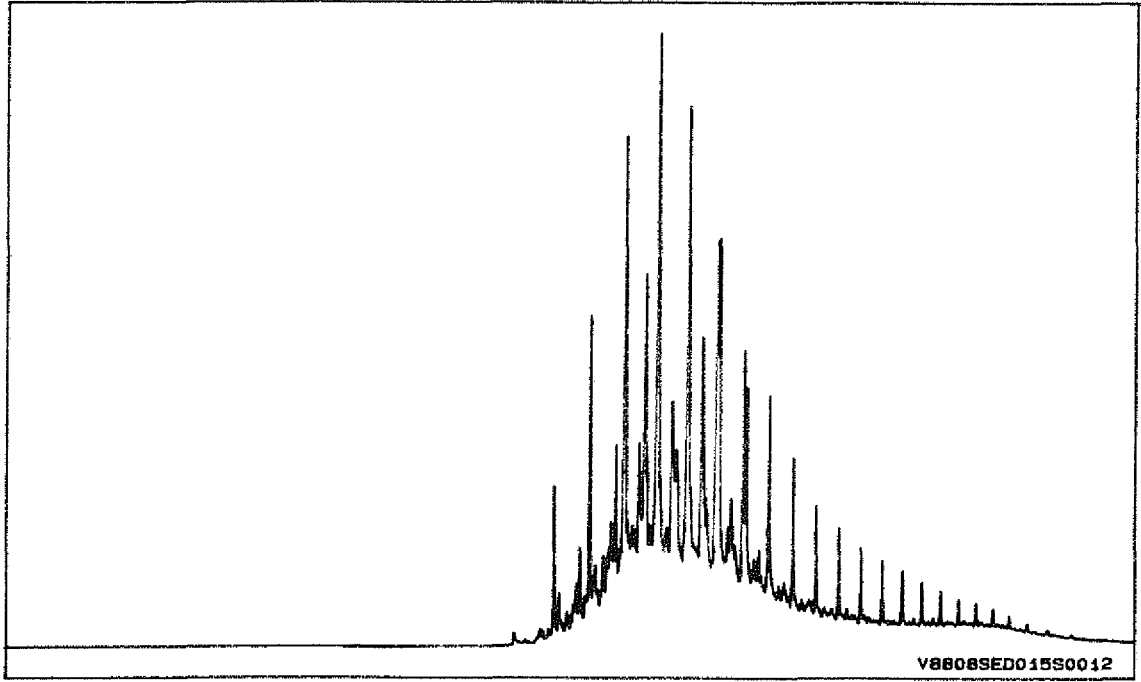


7/12-7 (3801.400m) P1 DISTRIBUTION

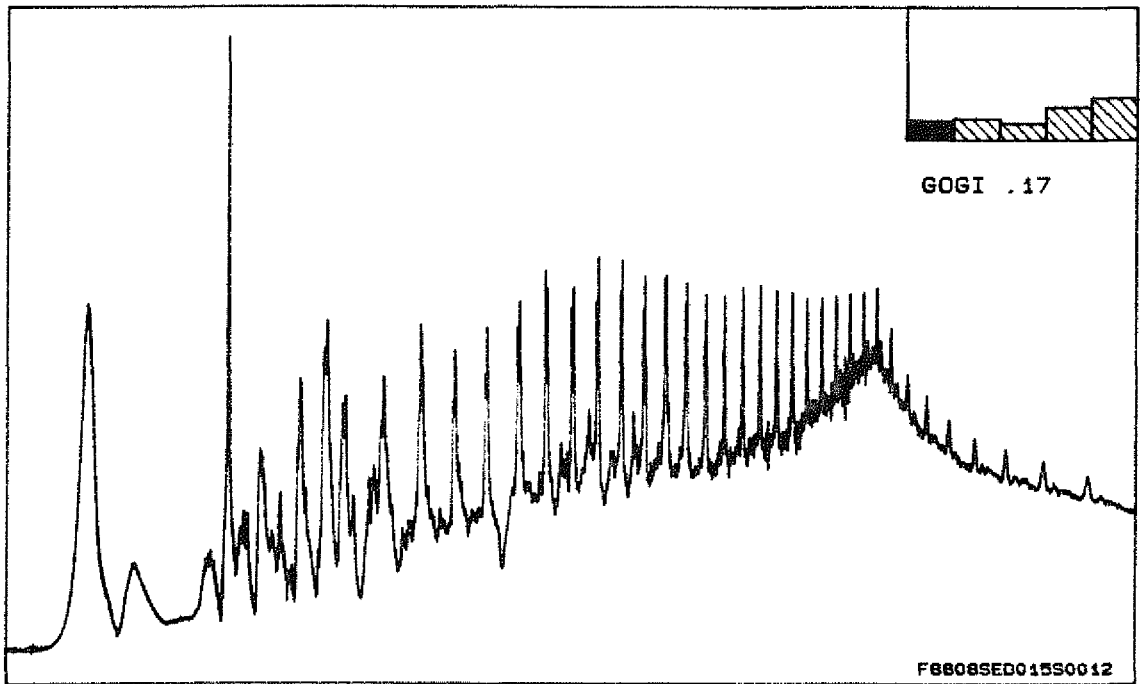


7/12-7 (3801.400m) P2 DISTRIBUTION

PGC DISTRIBUTIONS

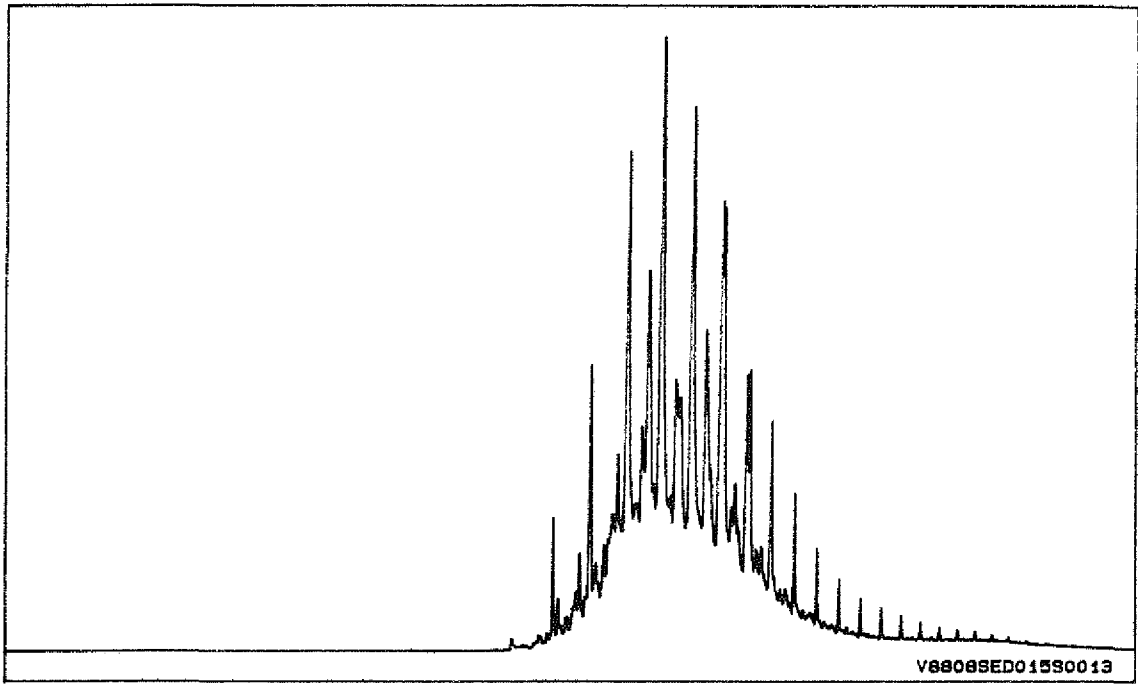


7/12-7 (3804.300m) P1 DISTRIBUTION

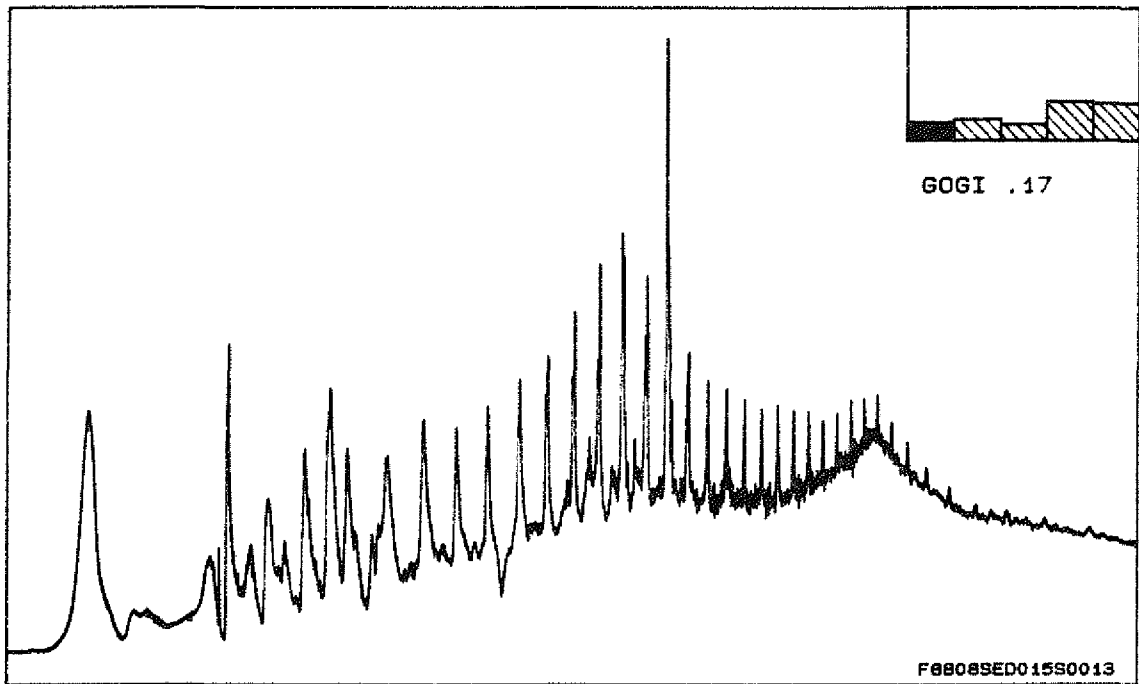


7/12-7 (3804.300m) P2 DISTRIBUTION

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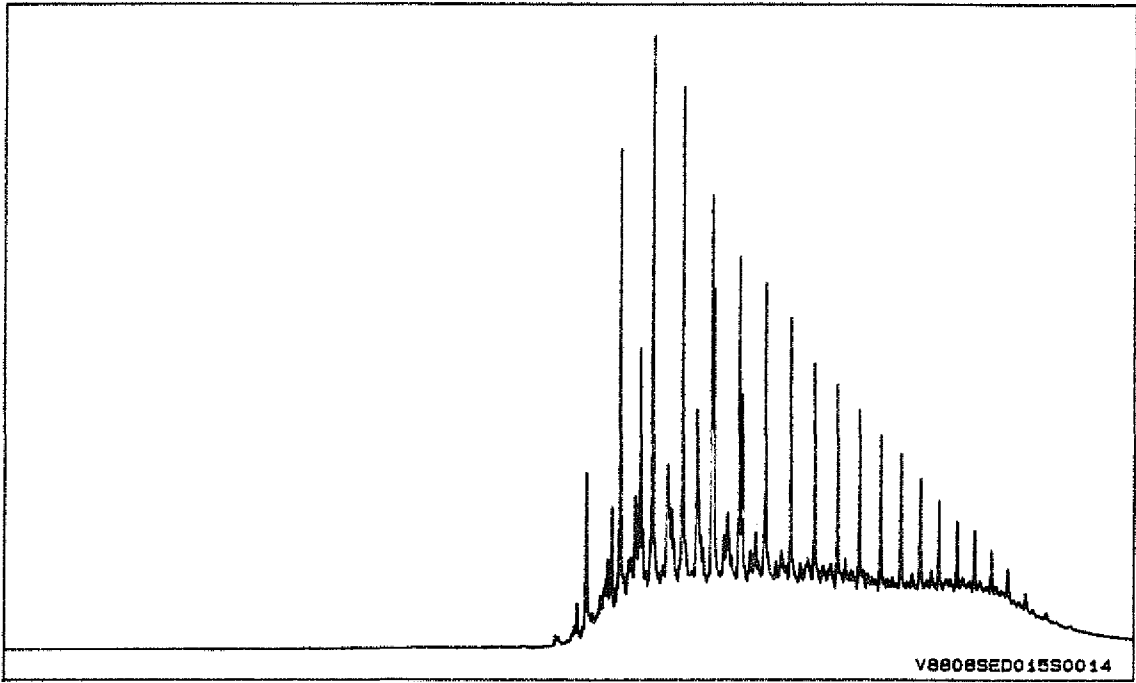


7/12-7 (3808.300m) P1 DISTRIBUTION

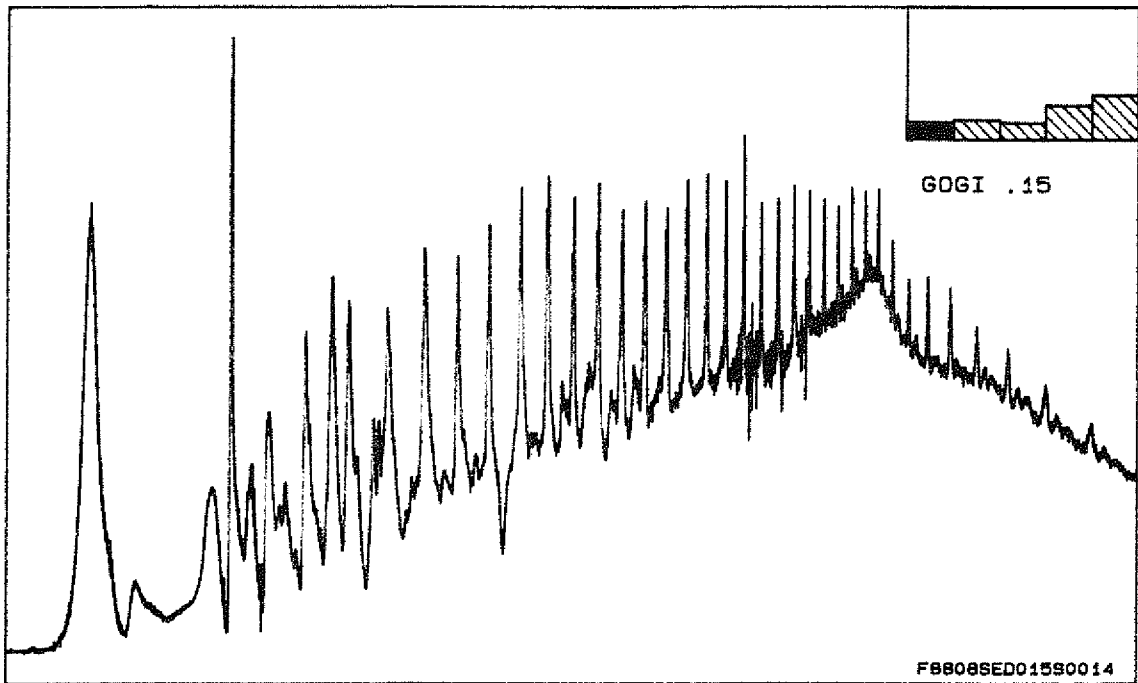


7/12-7 (3808.300m) P2 DISTRIBUTION

PGC DISTRIBUTIONS

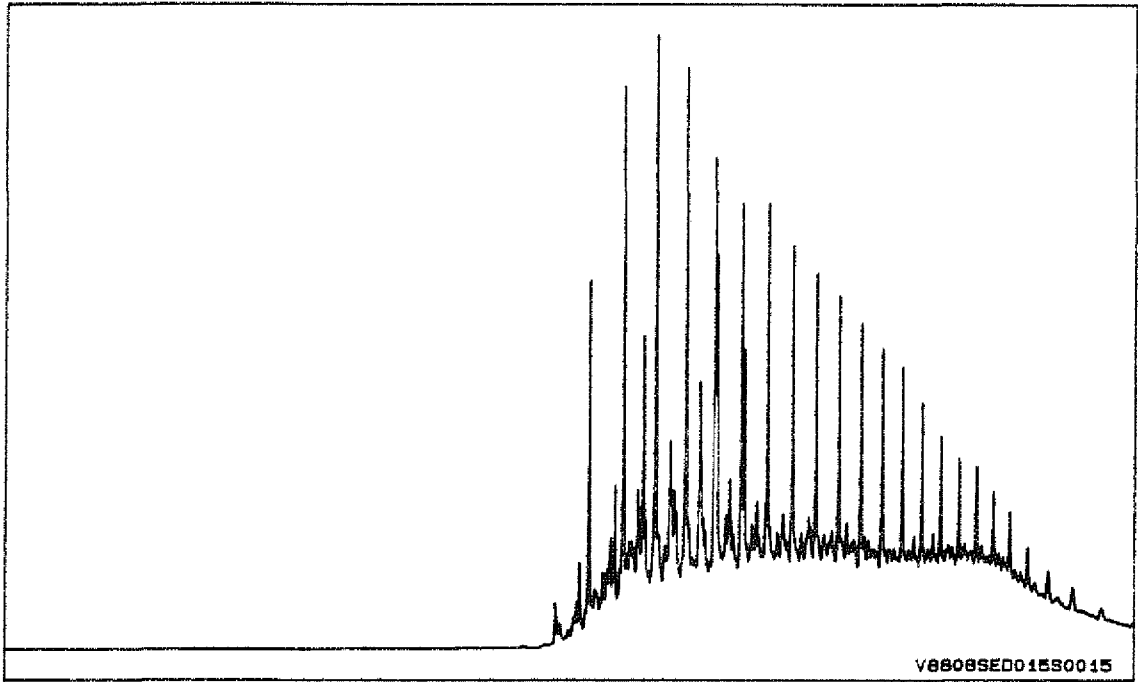


7/12-7 (3812.300m) P1 DISTRIBUTION

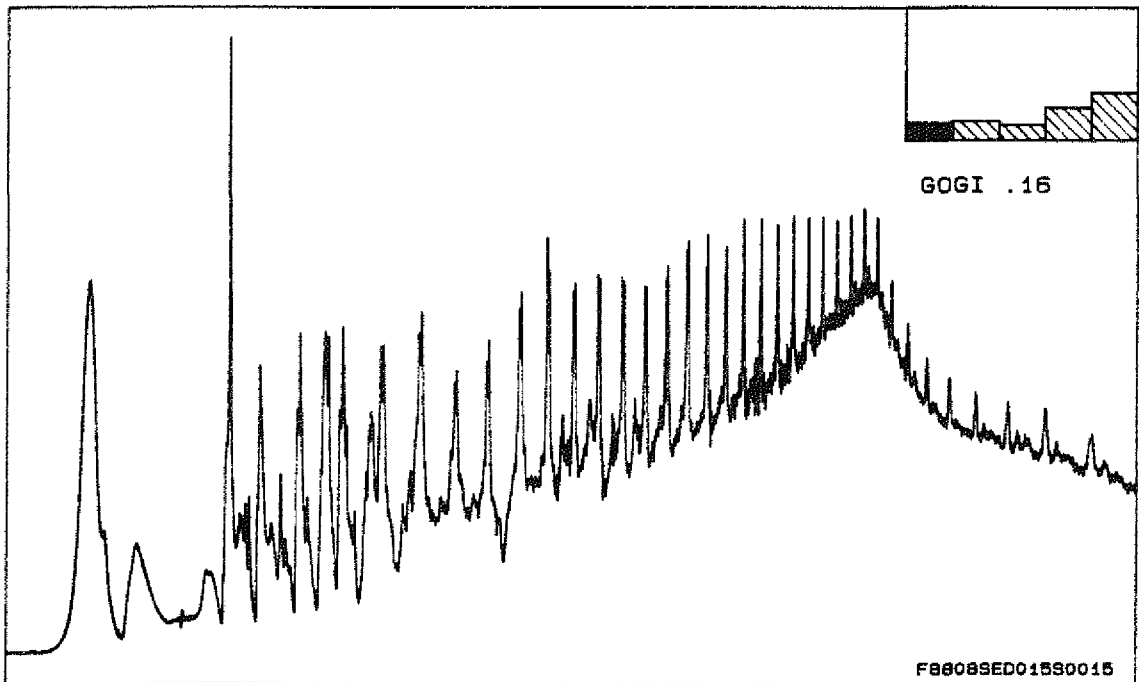


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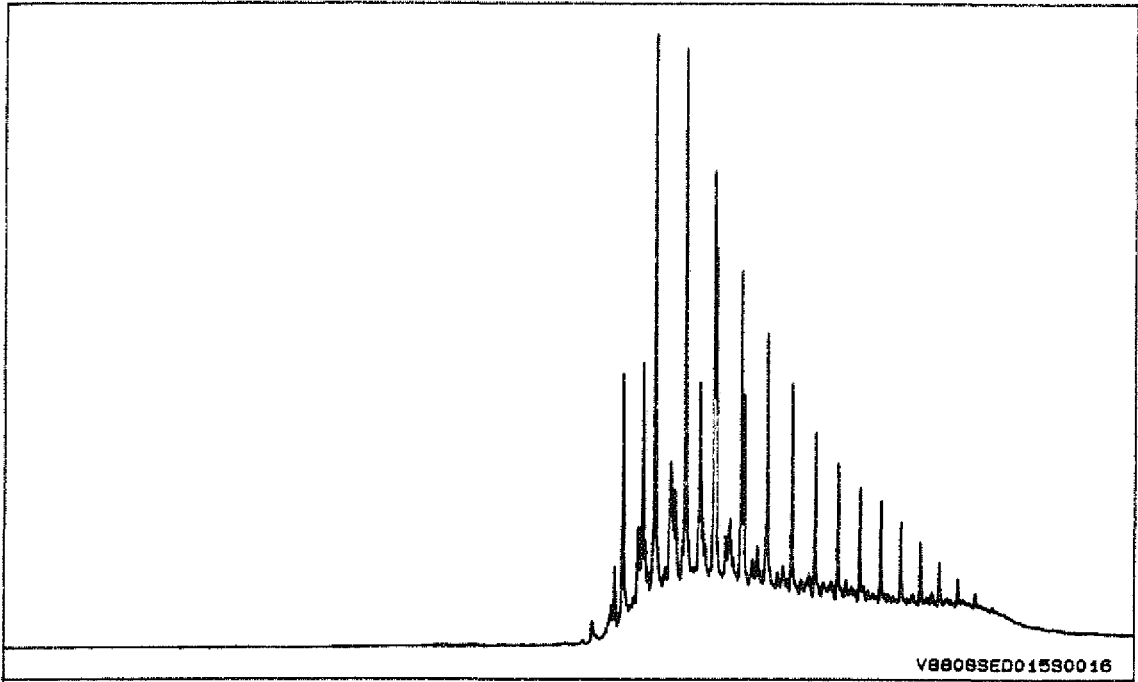


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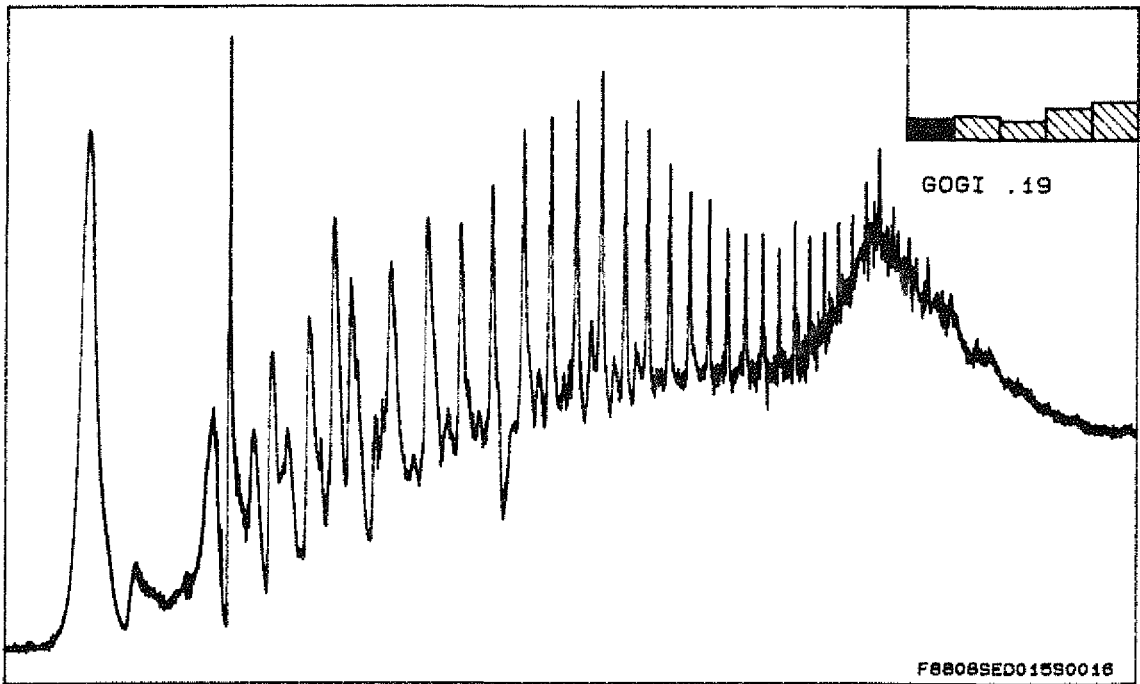


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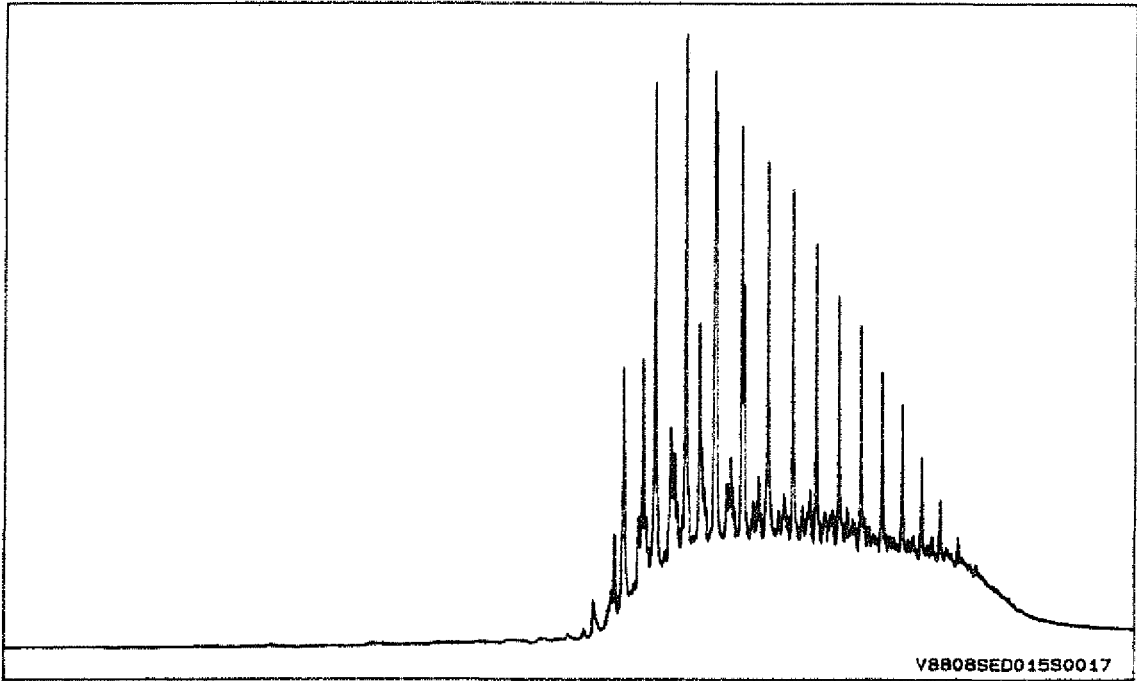


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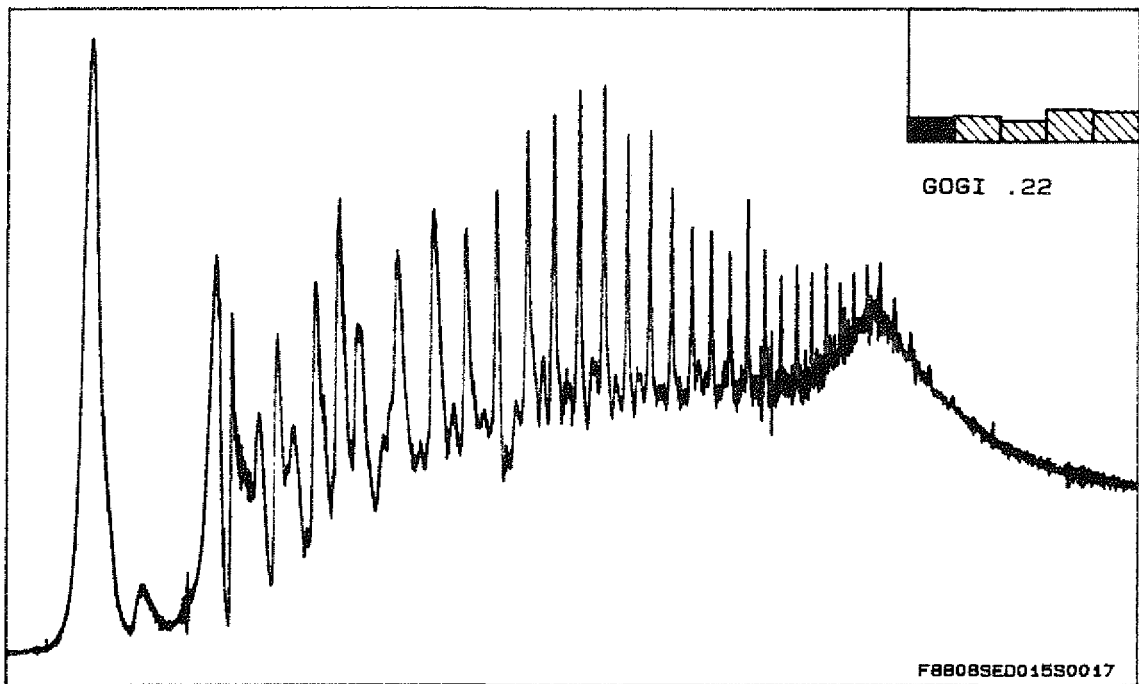


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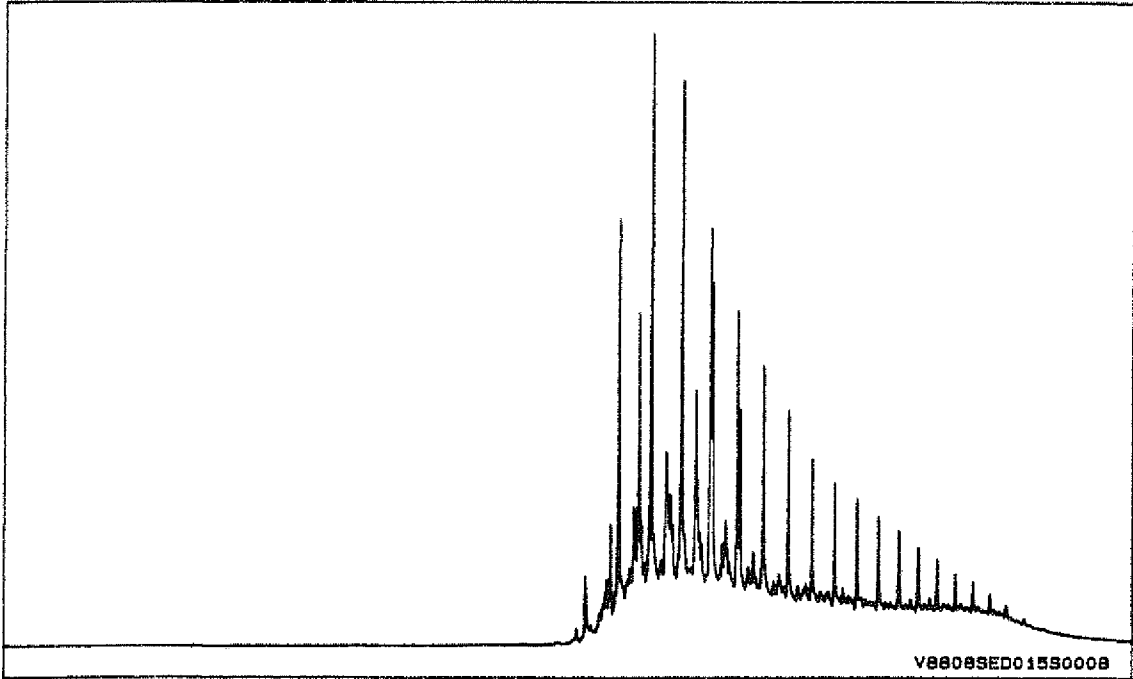


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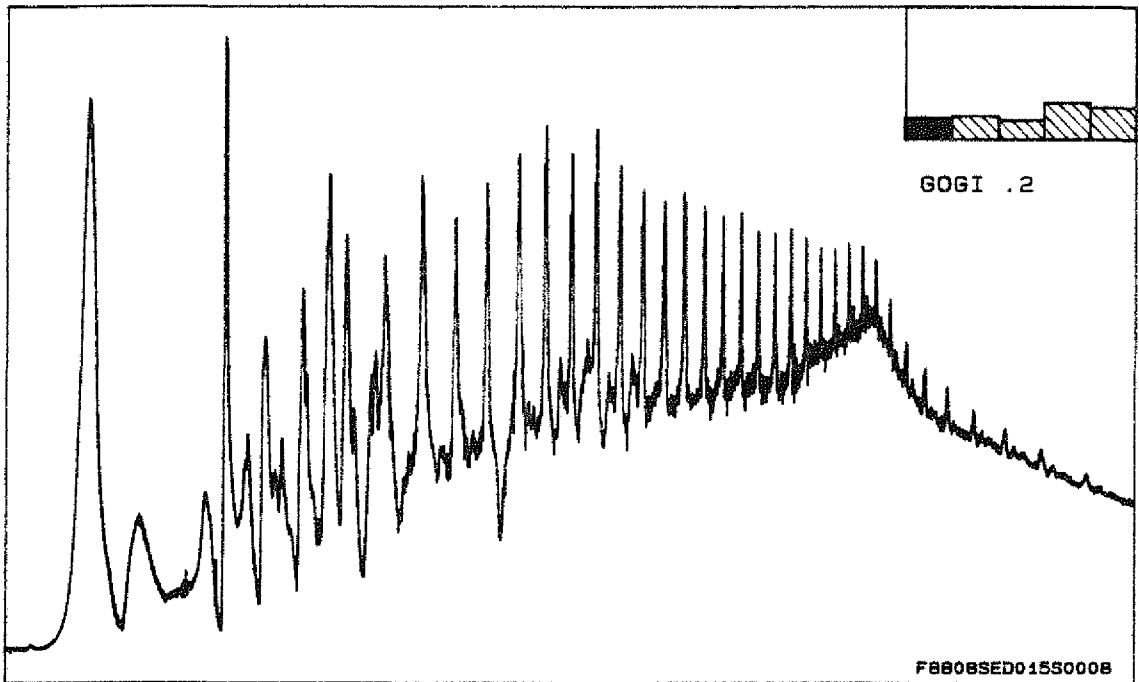


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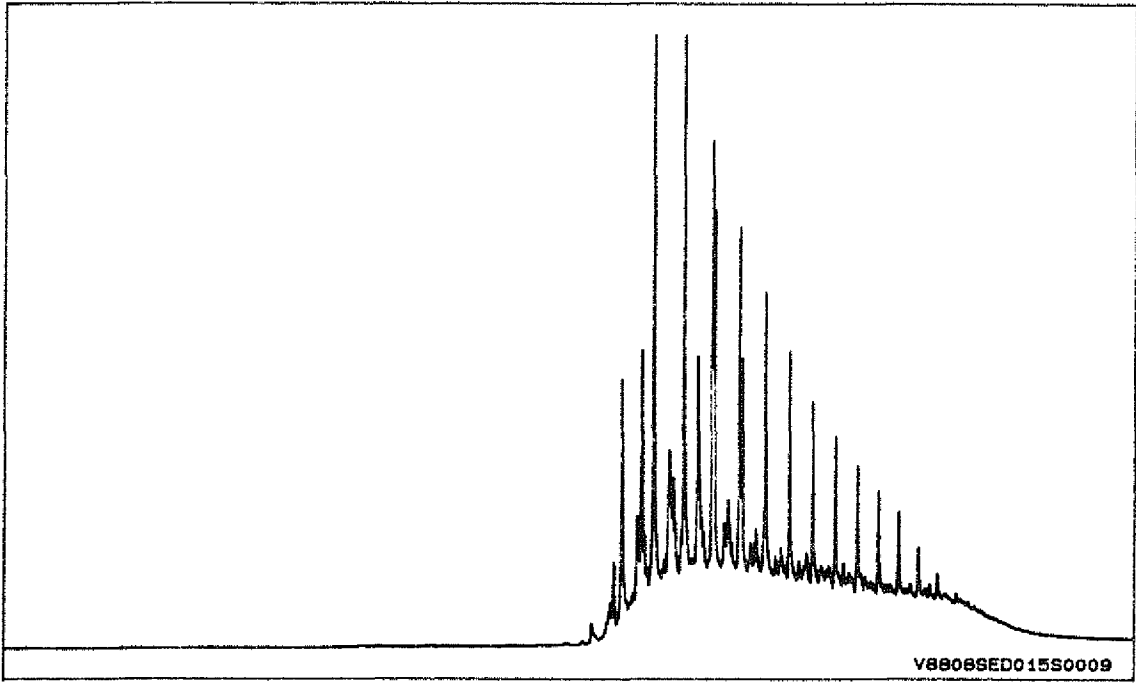


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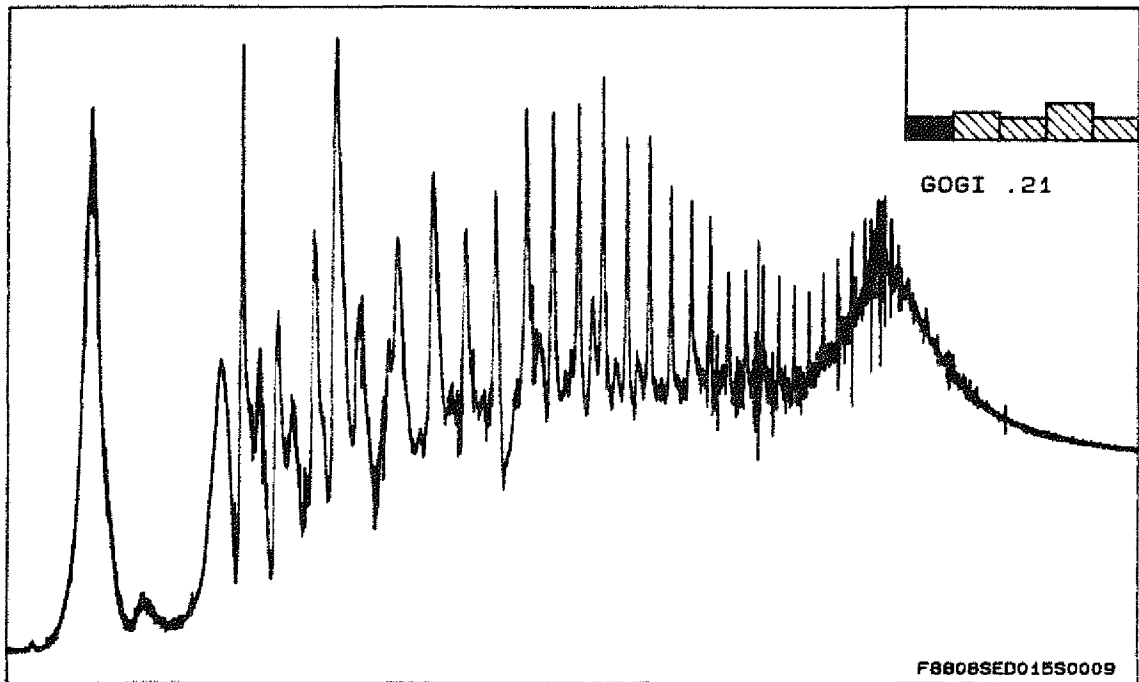


7/12-7 (3832.300m) P2 DISTRIBUTION

PGC DISTRIBUTIONS



7/12-7 (3836.300m) P1 DISTRIBUTION



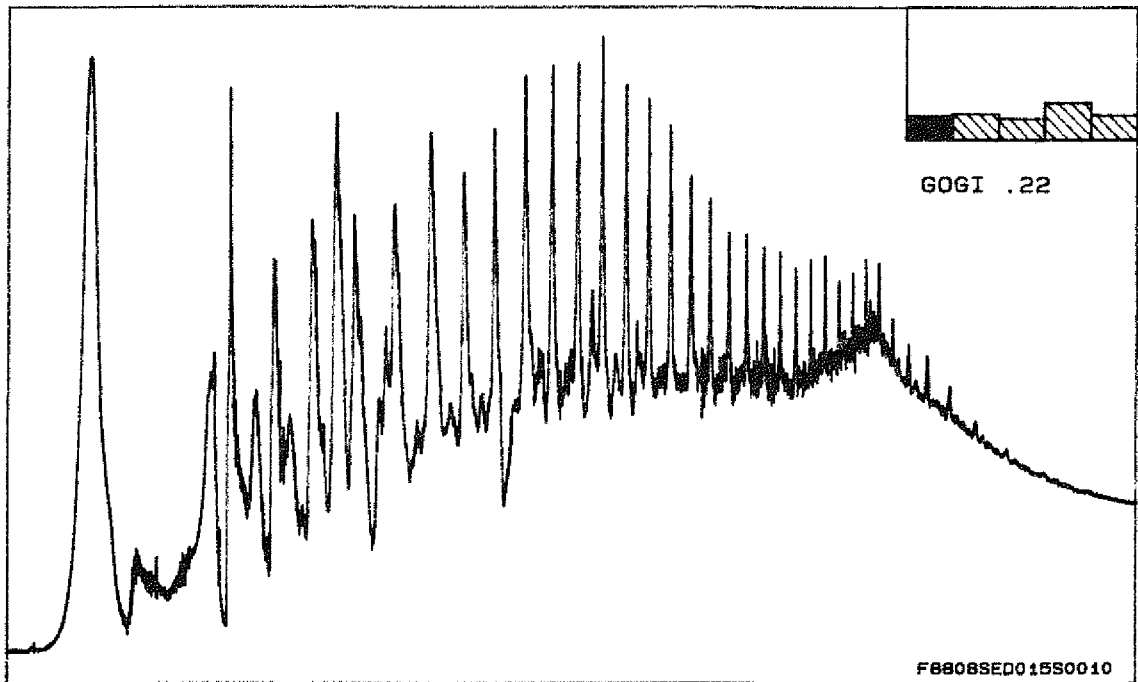
7/12-7 (3836.300m) P2 DISTRIBUTION

PGC DISTRIBUTIONS



V8808SED015S0010

7/12-7 (3840.300m) P1 DISTRIBUTION



F8808SED015S0010

7/12-7 (3840.300m) P2 DISTRIBUTION

PGC DISTRIBUTIONS