

IKU



Continental Shelf Institute

Institutt for kontinentalsokkelundersøkelser

REPORT TITLE	
Analysis of oil from well 34/10-2	
CONTRACTOR	UND-ARKIVET
Statoil	Nr.: 22
CONTRACTORS REF.:	JOB. NO.:
B.A. Rasmussen	

SCIENTIST Hossein Alimi	DATE 14.8.1979	PROJECT NO. 0-231
DEPARTMENT Environment	NO. OF PAGES 8	NO. OF ENCLOSURE
RESPONSIBLE SCIENTIST		

SUMMARY
Oil from well 34/10-2 was analysed by gas chromatographil. The oil could be considered as paraffinic. The distribution pattern of n-alkanes and the CPI value with the Pristane/Phytane-, Pristane/n-C ₁₇ - and Phytane/nC ₁₈ -ratios of the oil indicate that the oil is mature and its hydrocarbons have developed in a normal or oxidating environment.

KEY WORDS

Oil analysis

Experimental procedure

The asphaltenes were precipitated by addition of n-pentane. After filtration, the pentane-soluble and asphaltenes were dried and weighed.

Chromatographic analysis

A certain amount of pentane-soluble fraction was redissolved in hexane and run through a column containing layer of silicagel and alumina. The column was eluted with hexane, benzene and finally with methanol to separate saturated hydrocarbon (SHC), aromatic hydrocarbon (AHC) and NSO fraction respectively.

0.1 l of the whole oil, SHC and AHC respectively were injected into a gas chromatograph equipped with 25 m glasscapillary column coated with OV101 and a flame ionization detector. The temperature program was from 60 to 260 at 4°C/min. with a He as carrier gas.

Results and discussion

While the column chromatographic data of oil 34/10-2 are shown in table 1, the result of gas chromatographic analysis of whole oil, SHC and AHC respectively are illustrated in figures 1, 2 and 3.

By inspection of the column chromatographic results, the analysed oil could be considered as a paraffinic oil.

The gas chromatogram of the whole oil demonstrate that the amount of the n-alkanes below nC₁₅ are small compared to the n-alkanes with larger chain. This could be caused due to sampling and also sample preparation in the laboratory.

The gas chromatogram of the SHC shows a equalized distribution of n-alkanes with a maximum in nC₁₈ - nC₁₉ area. It shows also a considerable amount of isoprenoids, among them Pristane (C₁₉) and Phytane (C₂₀). The Pristane/Phytane ratio is 1,72 while the Pristane/nC₁₇ and Phytane/nC₁₈ are 0,71 and 0,43 respectively. The calculated CPI (C₂₀ - C₃₀) for the oil 34/10-2 points out a value of 1,03, a value which is comparable with the most CPI value known from literatures for the mature oils marine origin.

The chromatogram of the aromatic fraction is bimodal distributed. The various compounds are not identified, but it is known that such a bimodal distribution of aromatic hydrocarbon is typical for a mature oil.

Conclusion

The maturation of crude oil can be examined in the light of many ways. An immature crude oil would show an odd carbon number predominance, with the higher molecular n-alkanes dominating, which led to the high CPI value (>1.0), in contrast the mature oils, which normally show a equalized distribution of the n-alkanes, point out a value equal to 1 or slightly higher than one.

It is known that crude oils contain a serie of isoprenoids. The C_{19} (Pristane) and C_{20} (Phytane) isoprenoids are generally present in crude oils.

The Phytol (C_{20}) - side chain of chlorophyll - could be oxidized in a normal or oxidating environment to Phytanic acid (C_{20}) and after decarboxylation to Pristane (C_{19}), while in a very reducing condition after reduction produces Phytane (C_{20}). Therefore, the Pristane/Phytane ratios, also Pristane/ nC_{17} - and Phytane/ nC_{18} -ratios are claimed to depend on the redox potential of the depositional environment of the source materials.

On the basis of this explanation and the published data from literatures, it could be concluded that the analysed oil (34/10-2) is a mature oil and has been developed during a normal or oxidating environment. Finally, the crude oil 34/10-2 could be considered as paraffinic.

Table 1

Result of column chromatography of oil:

0,1 (mg)	Sat. Hc (mg)	Aro. Hc (mg)	NSO fraction (mg)
193.7 (%)	93.3 (48.2)	36.4 (18,8)	5.9

% of asphaltenes: 1,30

Whole oil 34/10-21
5h/0.1

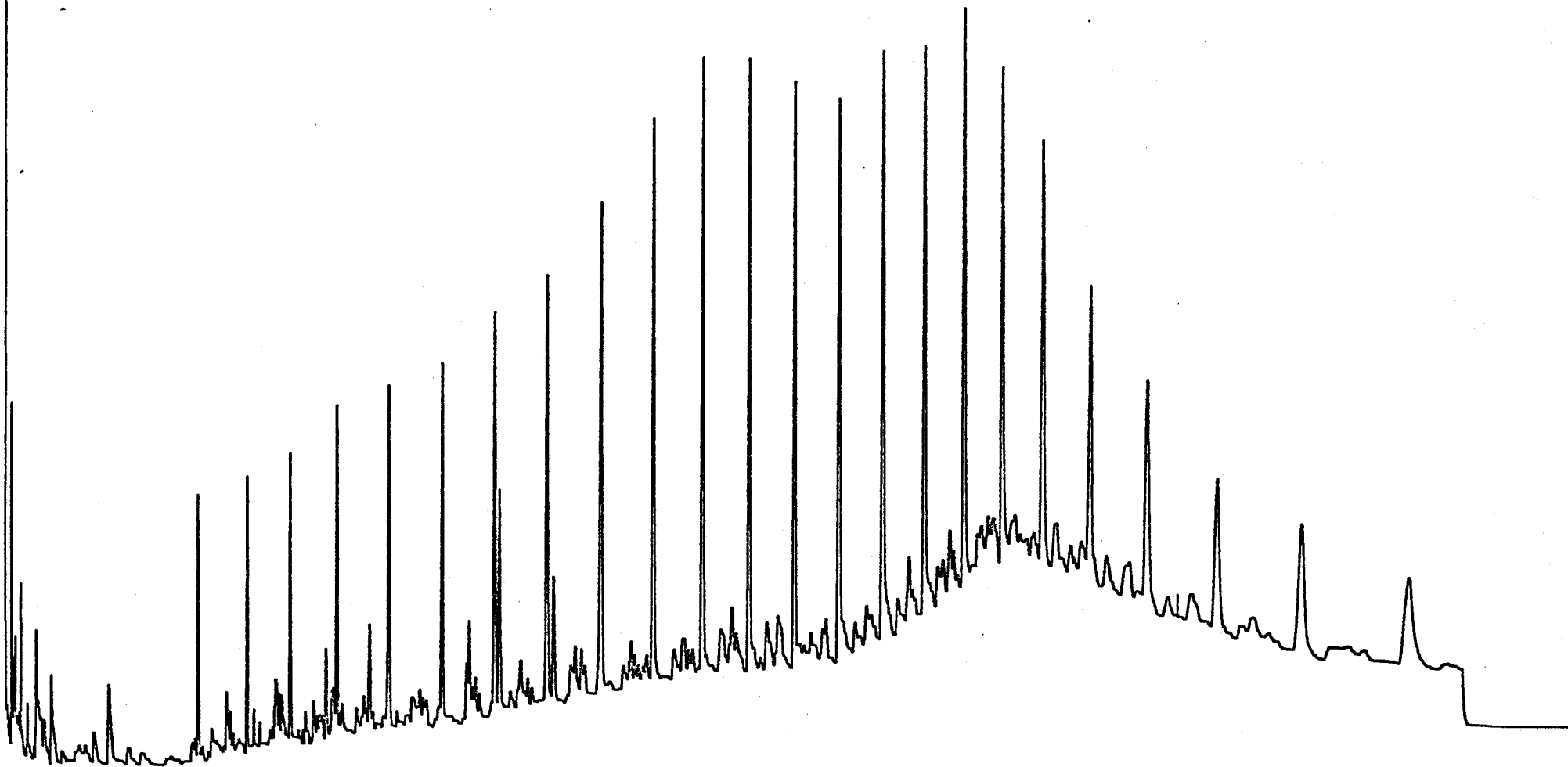


Fig. 1. Gas chromatogram of whole oil.

SHC 34/10-2

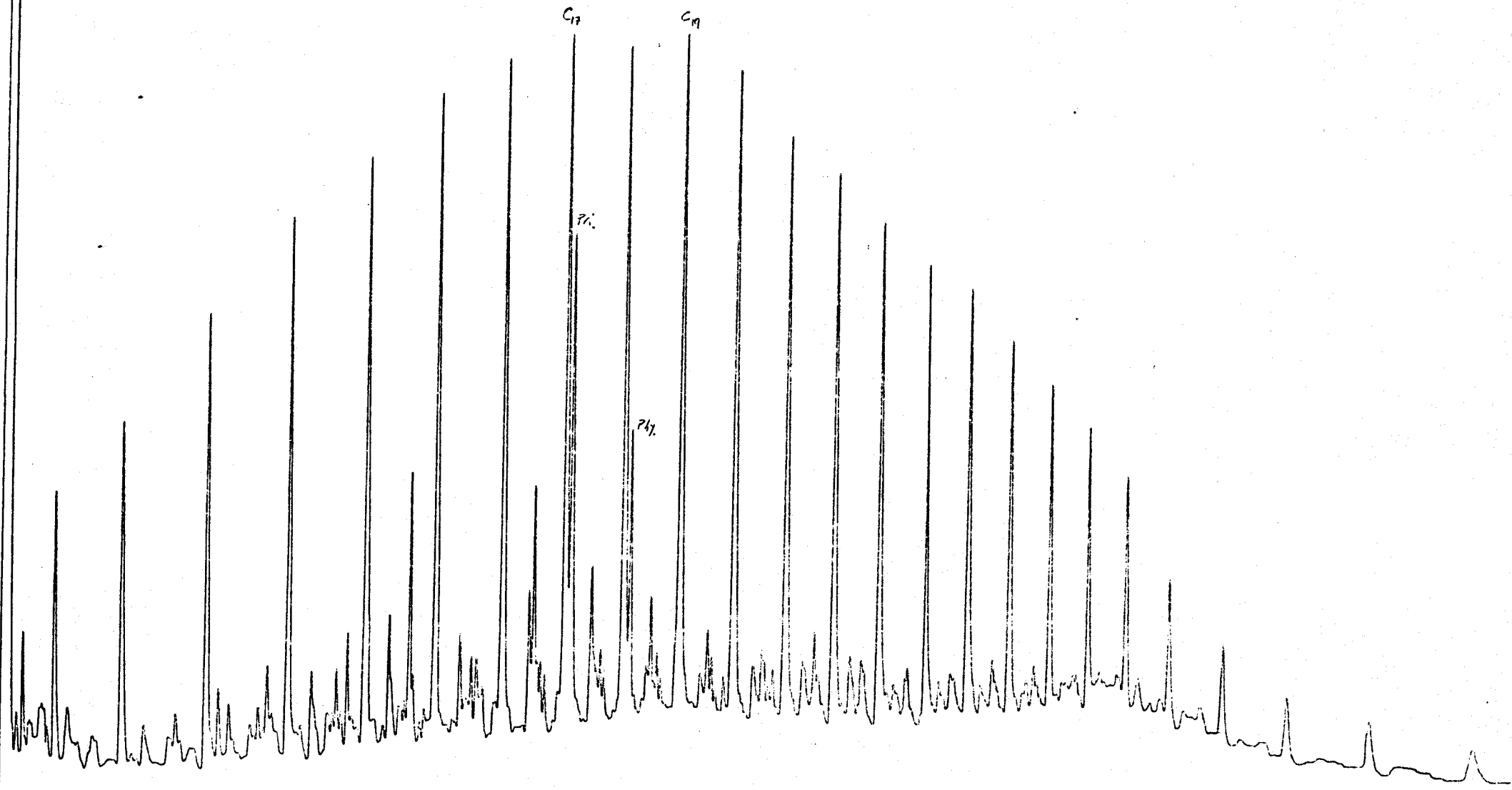
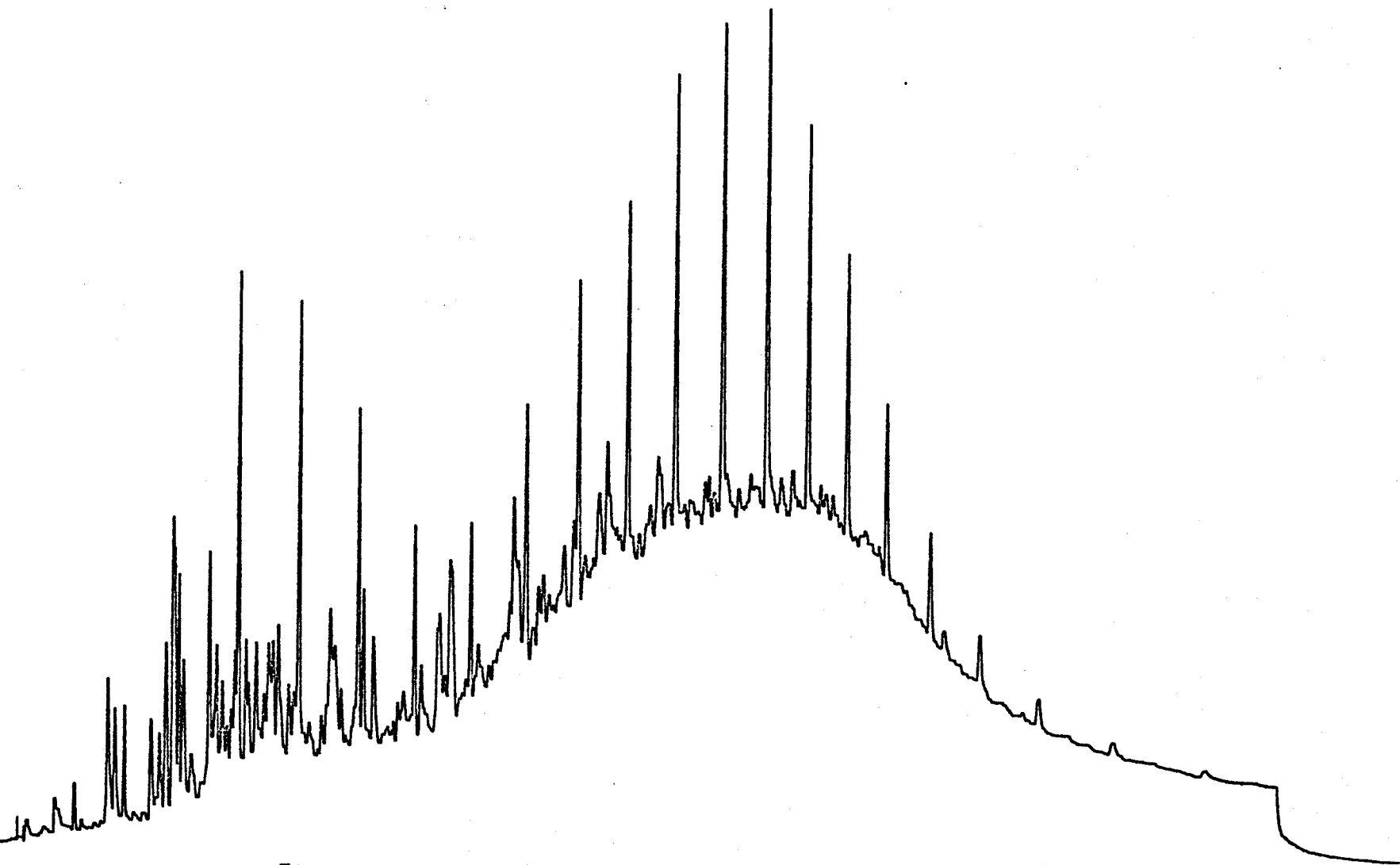
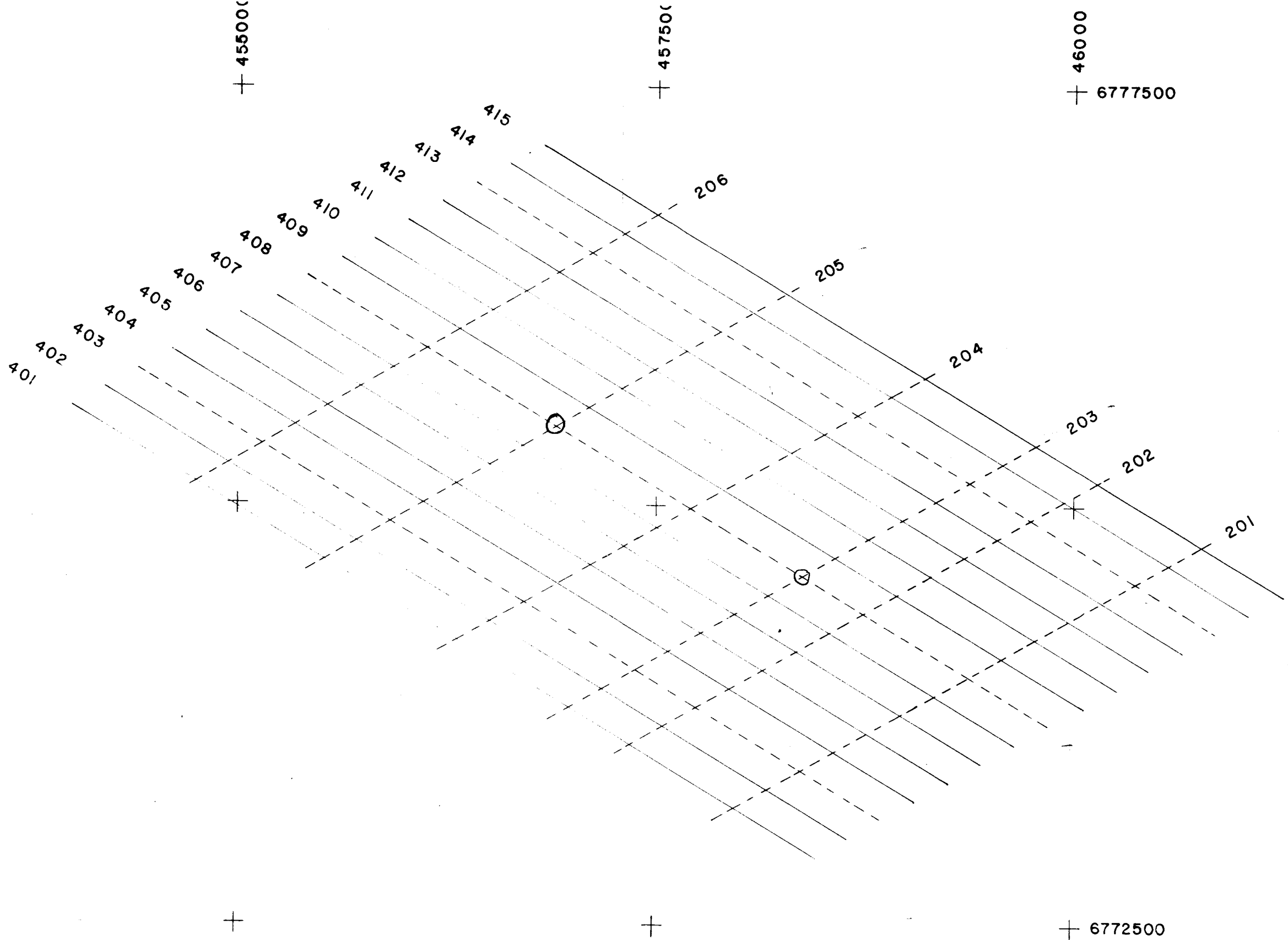


Fig. 2. Gas chromatogram of SHC.

AHC 34/10-2


Fig. 3. Gas chromatogram of AHC.





----- Deep sparker, echosounder side-scan sonar,
(boomer.)

_____ Shallow sparker, echosounder
side-scan sonar.

 statoil Den norske stats oljeselskap a.s.	34/10-2 Program Site survey	12500 23.
		ECH 2 CONTROL 23.