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(U-236)

Norsk Hydro A/S
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OSLO 2

Attention: Mr. Jan Erik Strand

Your ref:	Our ref:	Date:
	EPXE/22/ahp epx0463	06 December 1984

We refer to our telefax of 15/10 in which we asked for permission to publish geochemical results of an RFT oil sample from well 31/4-3. As agreed, we hereby forward a copy of the results of our geochemical analyses. You will appreciate that the report has been somewhat edited, as it contained details of a number of other oils

Yours faithfully,
A/S NORSKE SHELL

Per Møller-Pedersen
Exploration and Production

BA-84-1789-1

18 DES. 1984
REGISTRERT
OLJEDIREKTORATET

31/4-3.

July 1982

RKER.82.118

GEOCHEMICAL ANALYSIS OF NORWEGIAN CRUDE OIL FROM ~~BLOCK~~ well 31/4-3 NORTH SEA

by

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Investigation 9.12.523

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RIJSWIJK, THE NETHERLANDS

(Shell Research B.V.)

CONTENTS

GEOCYHEMICAL ANALYSIS OF NORWEGIAN CRUDE OILS
FROM BLOCK 31/4 NORTH SEA

1. RESULTS AND DISCUSSION

Geochemical analysis of the following crude oil has been carried out:

31/4-3	DST-2	2023-2040 m

The results of the analyses of the crude oil are shown in Tables 1 . and Figs. 1-3

The results indicate the following:

1.1 The crude oil have not been bacterially degraded (gas chromatogram . Figs. 1 and ; C_7-alkanes, Fig. 2).

1.2 crude oil . were generated from mature source rocks. This is indicated by the API gravities, sulphur contents, DOM of oil values (65-70) and gas chromatograms.

1.3 crude oil were generated from source rocks which contained structureless organic matter (indicated by the general shape of the gas chromatograms, Figs. 1 and the very similar M_1 and M_2 ring distributions, Fig. 3). There were also contributions of organic matter from the terrestrial environment to the source rocks of all crude oils (C_7-alkane/naphthene distribution, Fig. 2).

2. CONCLUSIONS

The crude oils analysed 31/4-3 have not been bacterially degraded.

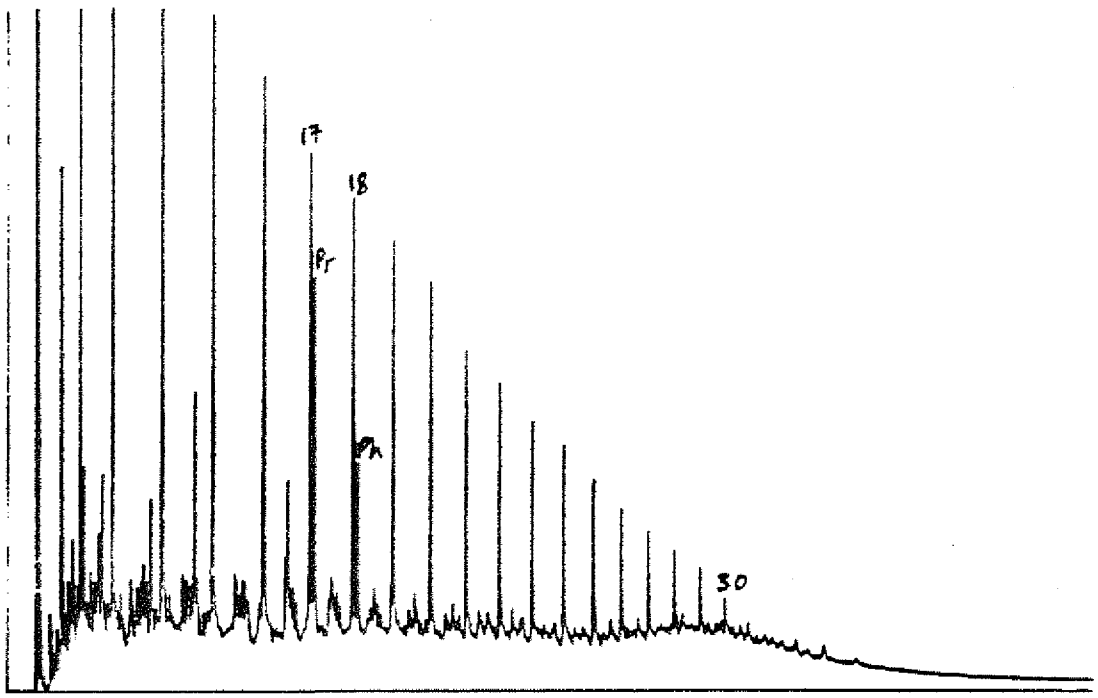
crude oil were generated from mature source rocks.

The source rocks of the analysed crude oil contained mainly structureless organic matter plus some organic matter from the terrestrial environment.

TABLE I - GEOCHEMICAL DATA OF CRUDE OIL

	31/4-3* DST-2 2023-2040 m
API	36.7
specific gravity	0.8412
%w. boil. <120°C	15.0
% sulphur	0.24
ppm V as metals	2
ppm Ni as metals	2
pristane/phytane	2.2
pristane/nC17	0.7
phytane/nC18	0.4
C_7-distribution	
C_7-alkane	
nC7	44
monobranched	43
polybranched	13
C_7-alk/naphthene	
nC7	21
naphthenes	53
branched alkanes	26
C_7-alk/naphth/arom	
nC7	44
naphthenes	48
aromatics	8
Parameter M_1	
A	45
B	39
C	16
Parameter M_2	
P	24
Q	50
R	26
DOM of oil	65
% asphaltenes	0
% saturates**	37
% aromatics	27
% heterocompounds	6
% rest	30
$\delta^{13}C^{o}/oo$	-28.7

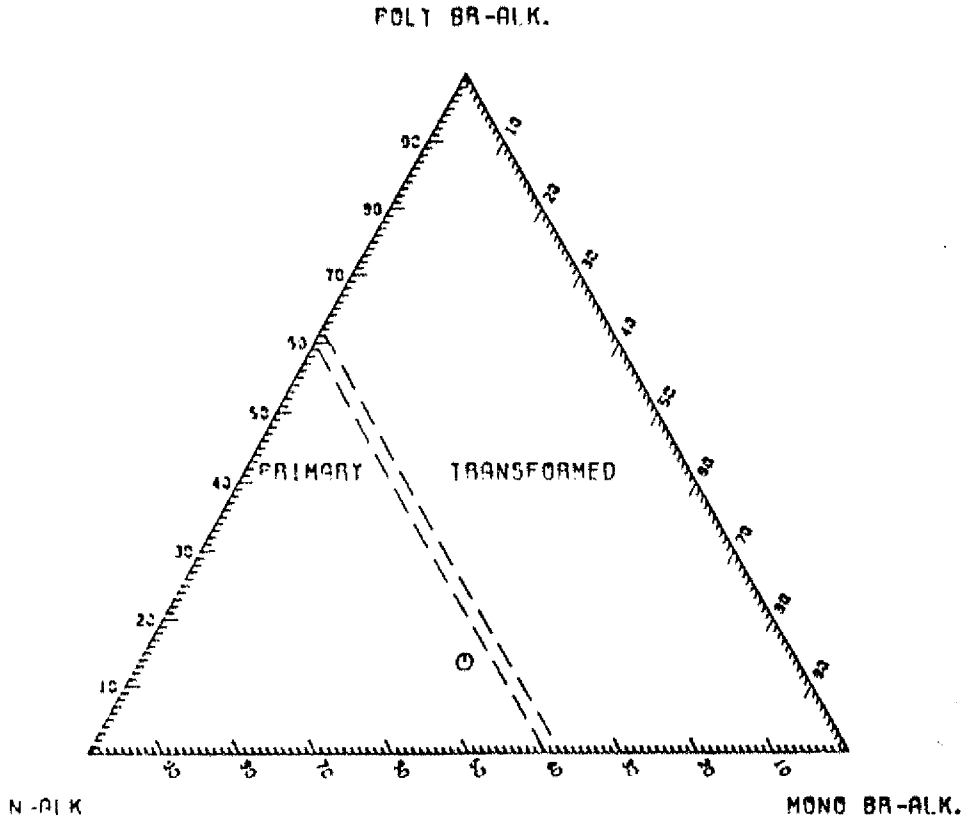
** determined by column chromatography.



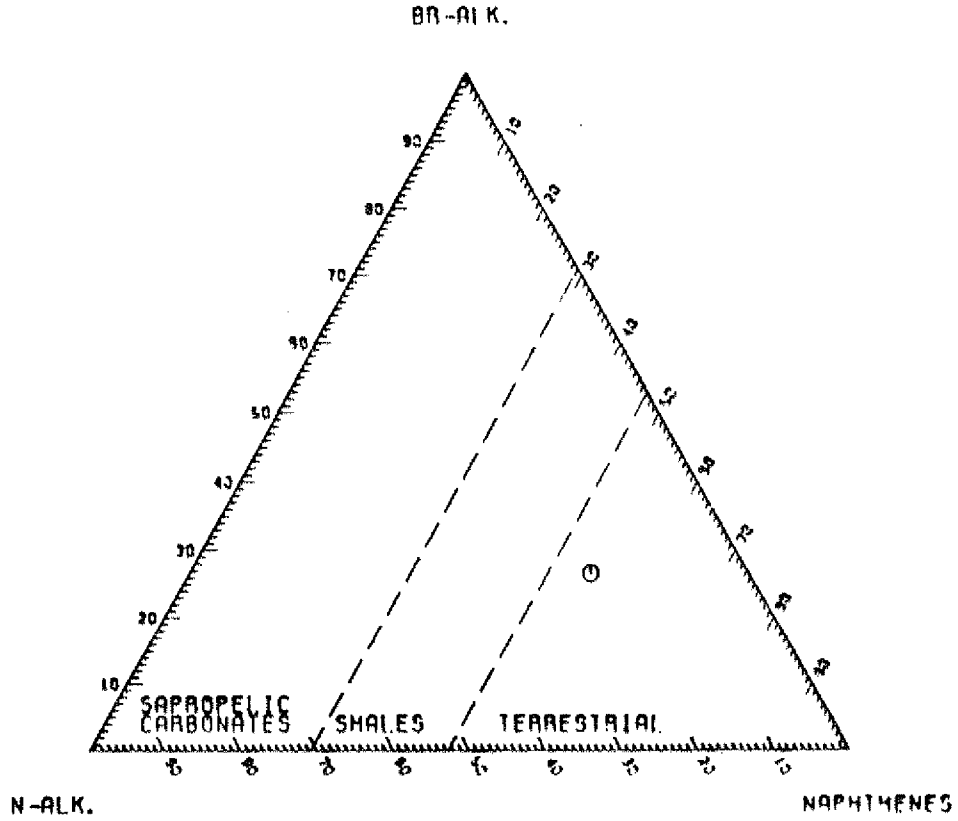
GAS CHROMATOGRAM OF SATURATED HYDROCARBONS

FIG.1. NORWAY 31/4-3 2023-2040 M

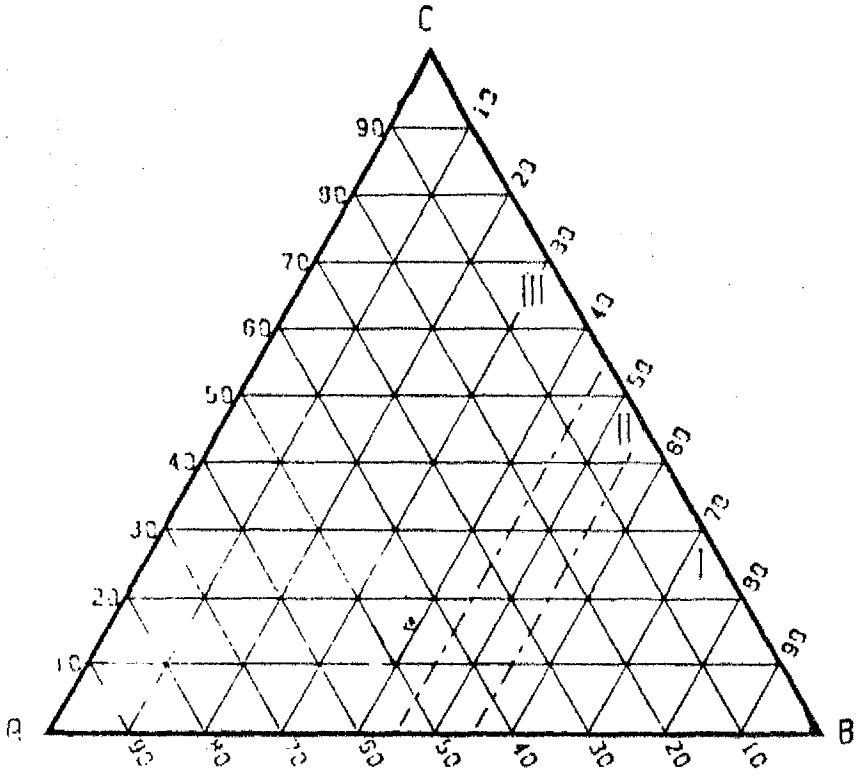
C7-ALKANE DISTRIBUTION

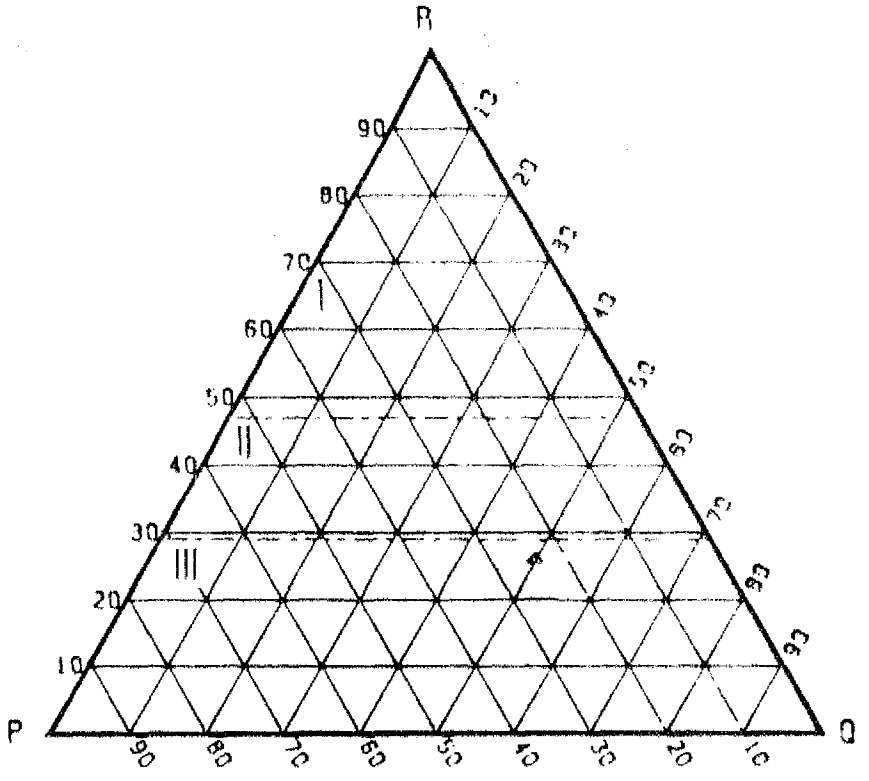


C7-ALKANE/NAPHTHENE DISTRIBUTION



	COUNTRY	WELL/OUTCROP	DEPTH/ SAMPLE NR.
⊙	NORWAY	31/4-3	2023 M





I LANDPLANT-DERIVED CRUDES WITH SUBSTANTIAL RESIN CONTRIBUTION TO SOURCE MATTER

II CRUDES OF MIXED ORIGIN

III CRUDES DERIVED FROM SOM AND/OR ALGAL MATTER

LEGEND
▲ - 31/4-3 2023-2040 M