

PETROFINA S.A.
EXPLORATION & PRODUCTION DEPARTMENT

NORWAY
REPORT ON ANALYSIS OF AN OIL SAMPLE
WELL EKOFISK 2/4-1AX

666/69-11C/md

22 December 1969.

1.

WELL EKOFISK 2/4-1AX

GENERAL DATA.

SAMPLE.

Quantity available for analysis : approximately one liter.
Collected : during DST n° 4 executed on November 19, 1969
Date received in laboratories : November 25, 1969
Analysed by : LABOFINA - 98-100, Ch. de Vilvorde - 1120 Brussels

TEST INTERVAL.

10363' - 10464' (6 inches open hole)

SUMMARY OF THE ANALYSIS.

- I. GENERAL CHARACTERISTICS OF THE CRUDE
- II. ANALYSIS OF THE PARAFFINS C₁ to C₁₁
- III. TBP DISTILLATION
 - A. Results
 - B. Characteristics of the Cuts
- IV. CONCLUSIONS.

I. GENERAL CHARACTERISTICS OF THE CRUDE OIL SAMPLE.

Sample description : brown colour, relatively sweet odor, great fluidity.

Methods	Characteristics	Results
ASTM D 1298	Density 15/4° C	0.838
	Density ° API/60° F	37.4
ASTM D 974	Strong acidity mg KOH/g	nil
ASTM D 664	Total acidity mg KOH/g	0.13
Martin Floret	Total sulphur % weight	0.18
ASTM D 130	Copper corrosion (3h.-100°C)	1a
ASTM D 189	Carbon Conradson, % weight	1.42
ASTM D 95	Water content, % volume	nil
IP 75	Water+sediments, % volume	nil
ASTM D 482	Ashes content, % weight	0.008
ASTM D 97	Pour point, ° F	+ 5
IP 77/66 T	NaCl content, % weight	traces(0.0004)
ASTM D 445	Viscosity (Cst) 0° C	18 [*]
	10° C	8.83
	30° C	5.18
	50° C	3.50
UOP 375-59	K Factor	12.1

* This viscosity is too high with respect to the one which would be obtained by extrapolation of the other 3 values. At 0° C the sample is probably not homogeneous.

II. ANALYSIS OF THE PARAFFINS C₁ TO C₁₁ IN CRUDE OIL SAMPLE
(by chromatography)

Hydrocarbons	% weight
Methane	-
Ethane	0.02
Propane	0.38
Iso-butane	0.23
n-butane	1.08
iso-pentane	0.69
n-pentane	1.23
n-hexane	1.32
n-heptane	1.65
n-octane	1.69
n-nonane	1.07
n-decane	1.08
n-undecane	1.04

III. TBP DISTILLATION.

A. Results.

Temperature ° C, 760 mm Hg	% Cumulative volume	% cumulative weight
30	P.I.	P.I.
54	1.5	
63	2.5	
68	3.5	
76	4.5	3.57
101	10.7	7.63
113.5	13.2	
125	15.7	12.11
147.5	20.2	16.23
150	20.6	16.53
163	23.1	
176.5	25.6	21.19
190.5	28.1	
200	29.4	24.70
229	34	29.36
250	38.1	33.54
272	42	37.60
281	44.3	39.72
300	47.4	42.07
311	49.9	45.47
340	54.7	50.39
350	56.4	52.21
380.5	61.4	57.48
400	64.1	60.45
Residue)		
Losses)	100	100

* The TBP distillation has been made considering a reflux rate of 10 to 1.
The quantity of crude loaded in the apparatus was 200 ml.
(see graph. n° 1)

B. Characteristics of the Cuts.

Temperature °C/760mm Hg	% volume	% weight	Density 15/4° C	K Factor	Refraction Index at 20° C	Sulphur content %weight	F.I.A.*			Doctor Test
							Aromatics % volume	Olefins % volume	Saturated % volume	
30 - 76	4.5	3.57	-	-	-	-	-	-	-	negative
76 - 101	6.2	4.06	0.7252	11.9	1.4034	-	5.2	traces	94.8	
101 - 150	9.93	8.90	0.7563	11.8	1.4210	traces	13.0	traces	87.0	
150 - 200	8.8	8.18	0.7649	11.8	1.4369	(0.0038) traces	17.2	traces	82.8	
200 - 250	8.7	8.84	0.8179	11.8	1.4542	0.014	19.7	nil	80.3	
250 - 300	9.3	9.33	0.8406	11.8	1.4680	0.040	33.3	nil	66.7	
300 - 350	9.0	9.34				0.14				
350 - 400	7.70	8.24				0.23				
Residue at 400		35.92				0.44				

* F.I.A. : Fluorescent Indicator Absorption.

IV. CONCLUSIONS.

The analysed crude oil sample is of the intermediate paraffinic type. It gives high yields in distillates of good quality. In this respect it can be compared to crude oils of the Middle East such as Agha Jari (Iran) and Irak.

On the other hand, the sulphur content is very low and is of the same order as that of African crudes such as Hassi-Messaoud (Algeria), Brega (Lybia) and Bomu (Nigeria). Further, the odor of the distillates is sweet. Sweetening treatments and desulphurizing would most likely not be necessary on this crude.

It is to be noted, that the conclusions of this analysis are limited due to the size of the sample available for distillation. Important characteristics such as naphta content in the naphthenes, smoke point of kerosene, diesel index, pour point and cloud point of gasoil, pour point and viscosity on residue could had been determined if a minimum quantity of two liters of crude had been available for loading the distillation apparatus.

TEMPERATURE °C

350

300

250

200

150

100

50

0

% weight

% volume

GRAPH N° 1

T.B.P. DISTILLATION

EKOFISK 2/4 - 1AX
(DST n° 4 sample)

% DISTILLATE ON CRUDE OIL

10

20

30

40

50

60

70

80

90

100