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REPORT



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REPORT

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REPORT TITLE:

COMPOSITIONAL ANALYSIS OF OIL AND GAS SEPARATOR SAMPLES FROM EXPLORATION WELL 2/7-19R, INCLUDING WAX ANALYSIS

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SUMMARY:

A recombination of separator samples from this well has been performed earlier at IKU, followed by a brief pVT analysis (saturation point, GOR, formation volume factor and compositional analysis up to C₁₀₊).

In this study the separator oil is studied more in detail including a separate wax analysis and compositional analysis up to C₃₀₊.

KEY WORDS:	
Compositional analysis	
Gas chromatography	
Wax analysis	

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1. BACKGROUND

An earlier recombination of gas and oil from the well 2/7-19R resulted in an unexpected high GOR in the single flash separation. The gas and oil samples will therefore be thoroughly examined again to find possible explanation to this result.

2. GAS ANALYSIS

The gas bottle (A-15767) was heated to separator temperature (117.1 °F) and drained for a possible liquid phase. No such was observed. The bottle was then heated to 163°F (73°C), and a gas sample was taken and analysed on a gas chromatograph. The results are given in Table 1.

Table 1. Analysis of Separator Gas

Component	Separator Gas [mole%]
Nitrogen	0.85
Carbon dioxide	4.42
Methane	71.15
Ethane	12.23
Propane	6.08
i-Butane	0.97
n-Butane	2.07
i-Pentane	0.58
n-Pentane	0.67
Hexanes	0.51
Heptanes	0.38
Octanes	0.09
Total	100.00

The results agree well with the analysis from Geco.

3. OIL ANALYSIS

The sample bottle with oil (0093) was heated to 140°F (60°C), and then separated in a single flash at 59°F (15°C) and atmospheric pressure. Samples of gas and stock tank oil from this operation were collected and analysed on the gas chromatograph. Stock tank oil density and average molecular weight were measured. The results are given in Table 2.

Table 2. Separation of Separator Oil

Component	Stock tank gas [mole%]	Stock tank oil			Rec. Sep. Oil [mole%]
		[weight%]	M.wt.	[mole%]	
Nitrogen	0.53		28.02		0.05
Carbon dioxide	4.04		44.01		0.42
Methane	36.59	0.01	16.04	0.11	3.88
Ethane	21.93	0.12	30.07	0.68	2.88
Propane	19.95	0.66	44.09	2.54	4.35
i-Butane	3.67	0.40	58.12	1.17	1.43
n-Butane	7.70	1.28	58.12	3.74	4.15
i-Pentane	1.90	1.02	72.15	2.40	2.35
n-Pentane	1.98	1.48	72.15	3.49	3.33
Hexanes	1.12	3.06	87	5.98	5.48
Heptanes	0.56	5.17	96	9.16	8.27
Octanes	0.03	7.36	108	11.59	10.39
Nonanes		6.22	125	8.46	7.58
Decanes		5.22	134	6.62	5.93
Undecanes		4.51	147	5.21	4.67
Dodecanes		4.38	161	4.62	4.14
C ₁₃		4.94	175	4.80	4.30
C ₁₄		4.28	190	3.83	3.44
C ₁₅		4.94	206	4.07	3.65
C ₁₆		3.43	222	2.62	2.35
C ₁₇		3.29	237	2.36	2.12
C ₁₈		3.22	251	2.18	1.95
C ₁₉		2.66	263	1.72	1.54
C ₂₀		1.05	275	0.65	0.58
C ₂₁		0.78	291	0.46	0.41
C ₂₂		0.77	300	0.44	0.39
C ₂₃		0.64	312	0.35	0.31
C ₂₄		0.47	324	0.25	0.22
C ₂₅		0.40	337	0.20	0.18
C ₂₆		0.24	349	0.12	0.10
C ₂₇		0.15	360	0.07	0.07
C ₂₈		0.09	372	0.04	0.04
C ₂₉		0.06	382	0.03	0.02
C ₃₀		0.04	394	0.02	0.02
C ₃₀₊		27.66	469	10.03	8.99
Total	100.00	100.00	100.00	100.00	100.00

Density of STO at standard conditions: 801.0 kg/m³
 Average molecular weight of STO: 170 g/mole
 Gas/oil ratio: 12.83 Sm³/m³

Except for a somewhat higher GOR, also these results agree well with the results obtained by Geco. The difference in GOR has no significance.

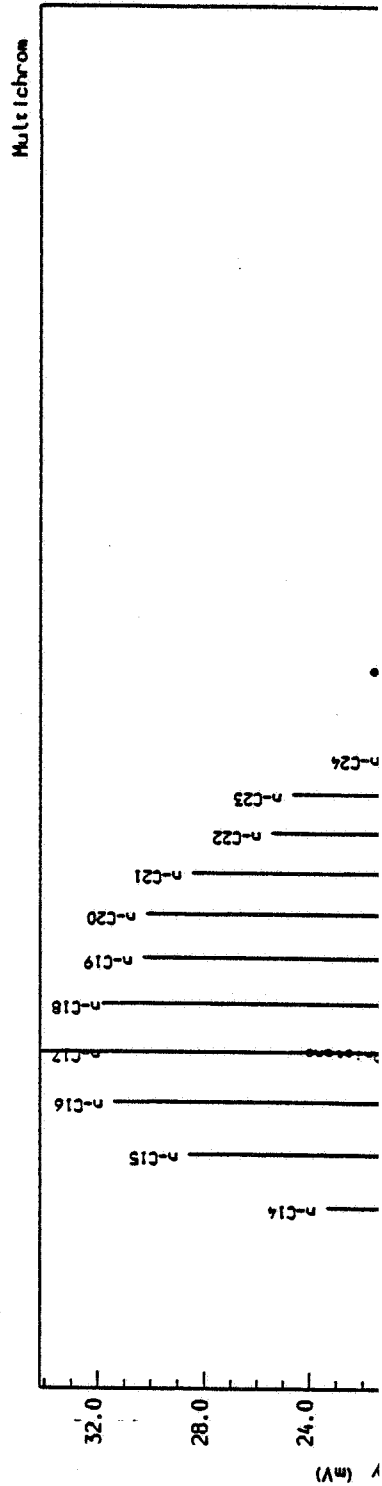
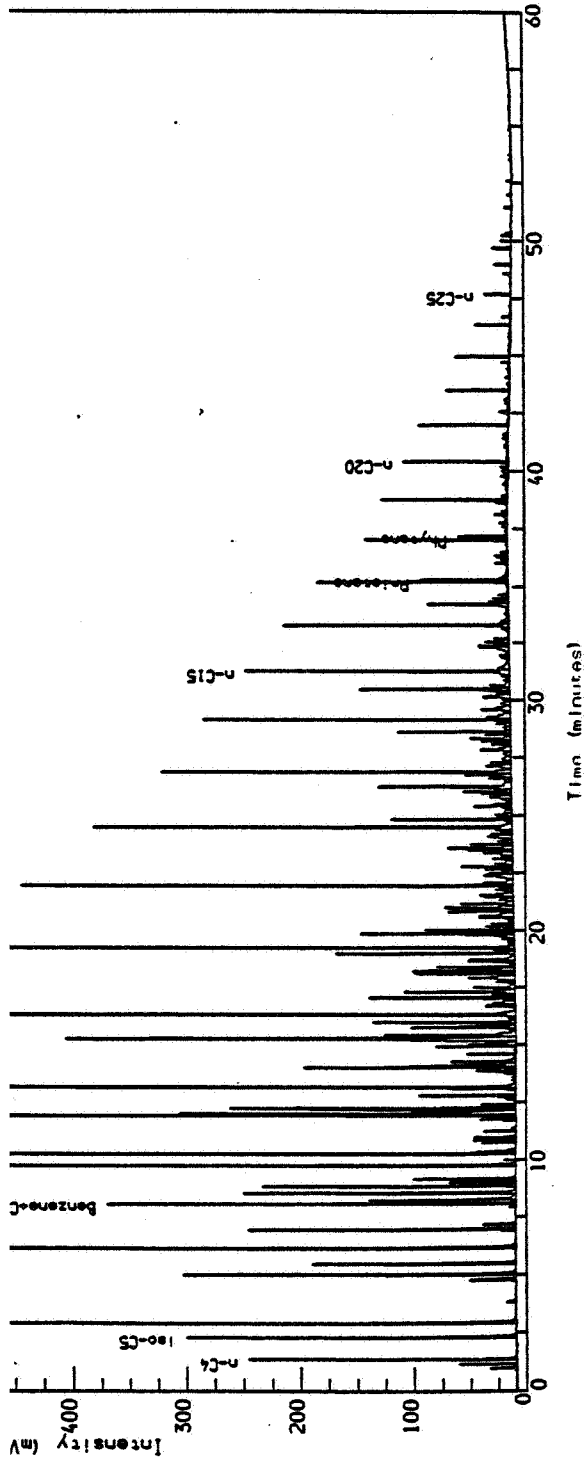
4. WAX ANALYSIS

In the previous study performed by IKU, a cloud point was detected at approximately 60°C. The wax content was therefor analysed explicitly.

A gas chromatography analysis was performed on the whole STO. The most of the light components (below C₁₅) were removed by evaporation at 410°F (210°C). The asphaltenes were removed by precipitation and a group separation performed by liquid chromatography. Finally a gas chromatogram was obtained on the fraction containing the saturated components and the n-alkanes were quantified. The two gas chromatograms are enclosed (Appendix 1 and 2).

APPENDIX 2

Chromatogram of the STO after prec of the light components.



Analysis Name : [ORGMETH] 6 34288702SAT.1.1.
G-3118, E00A, 80°C-2min-4°C/min-280°C