

12 MARS 1980

RESERVOIR FLUID STUDY 34/10-4.**REGISTRERT
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In order to obtain good information about the properties of the reservoir fluid in 34/10-4-Alfa, eight bottom hole samples were taken in the test of 34/10-4. Four samples in DST # 1 and four in DST # 2.

To check the quality of the samples it was decided to run a shortened PVT program which included determination of: Bubble point, compressability, GOR, Bo, reservoir fluid composition and the density of saturated reservoir fluid. All data were available before the two samples were selected for full PVT analysis.

Table no. 1 present the results, one each of seven samples. No. 8 was found to have a bubble point in the shipping container of approx. 340 Bar, of-course indicating that this would be unrepresentative. For the purpose of process simulation a composition among the seven was chosen to be given as representative of 34/10. This was sample bottle marked 73FA230-26. The value of bubble point, GOR and Bo lay nearest to the mean of all the samples. The variation in composition throughout are only slight and within the error limits of the analysis.

Reported in table 2 are the extended analysis of the reservoir fluid which is calculated on the basis of chromatography and TBP distillation of 34/10-1 crude.

The analysis show that sampling condition and handling has been very good. Variation in bubble point show up with higher GOR and Bo, but overall changes are only very slight and are random. The samples show a uniform reservoir hydrocarbon system over the depth of reservoir and the data derived from these should be good.

Statoil Production Laboratory,



Per Thomassen

Groupleader PVT/Chemistry

Table 1: Summary of results from a short PVT program on eight bottom hole samples from 34/10-4.

DST # :	1	1	1	1	2	2	2	2
BHS # :	1	2	3	4	1	2	3	4
Bottle No.:	22024-68	<u>73FA230-26</u>	22024-73	2657/30	22226-116	20475-62	20475-66	14068/66

Components:

RESERVOIR FLUID COMPOSITION, MOLE %

	1	2	3	4	1	2	3
N ₂	0.52	0.50	0.50	0.54	0.52	0.49	0.49
CO ₂	0.94	0.93	0.92	0.92	0.98	1.00	1.00
C ₁	44.51	44.19	44.38	43.98	44.10	44.25	44.43
C ₂	3.74	3.71	3.75	3.70	3.79	3.63	3.73
C ₃	1.32	1.29	1.33	1.31	1.35	1.25	1.33
iC ₄	0.60	0.58	0.61	0.61	0.62	0.59	0.61
nC ₄	0.76	0.74	0.78	0.77	0.79	0.75	0.79
iC ₅	0.65	0.64	0.67	0.66	0.67	0.64	0.67
nC ₅	0.38	0.38	0.39	0.40	0.40	0.37	0.40
C ₆	1.00	1.00	0.98	1.01	0.97	0.94	1.00
C ₇₊	<u>45.57</u>	<u>46.05</u>	<u>45.69</u>	<u>46.10</u>	<u>45.81</u>	<u>46.08</u>	<u>45.56</u>
	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>	<u>100.00</u>
C ₇₊ mol. weight	238	238	238	238	238	238	238
C ₇₊ density	0.8859	0.8863	0.8869	0.8866	0.8863	0.8863	0.8863
Density of res.fl.	0.761	0.766	0.763	0.769	0.766	0.769	0.761
Bubble pt., Bar	244.3	243.0	243.7	241.0	243.4	241.5	242.0
C _o ***, vol/vol/bar 10 ⁻⁵	11.2	11.2	11.0	11.0	11.6	11.3	11.6
GOR SM ³ /M ³	101.2	99.7	100.8	99.3	100.6	98.7	100.9
Density of oil g/cc	0.8820	0.8827	0.8828	0.8828	0.8824	0.8821	0.8820
Gravity gas*	0.7034	0.7040	0.7043	0.7091	0.7098	0.6945	0.7049
Bo, M ³ /M ³ **	1.274	1.265	1.271	1.261	1.266	1.257	1.273
Form. temp.	72.2°C	72.2°C	72.2°C	72.2°C	71.7°C	71.7°C	71.7°C

SAMPLE NOT REPRESENTATIVE

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* ** *** see explanation next page

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- * γ_g , GOR, B_o from sigleflash of oil from reservoir condition to 1 atm., 15°C.
- ** B_o is M^3 of reservoir fluid pr. M^3 of stock tank fluid at 1 atm., 15°C.
- *** Average compressability to oil above saturation pressure.

Error limits on reported values:

GOR : $\pm 0.3 \text{ SM}^3/\text{M}^3$, 1.7 SCF/BBL
BO : $\pm 3 \times 10^{-3} \text{ M}^3/\text{M}^3$
 ρ res. fluid: $\pm 2 \times 10^{-3} \text{ g/cc}$

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Table 2: Extended Reservoir Fluid Analysis based on Chromatography and TBP distillation.

Components	Mole %	Mole weights	Spes. grav.g/cc at SC	
N ₂	0.50			
CO ₂	0.93			
C ₁	44.19			
C ₂	3.71			
C ₃	1.29			
iC ₄	0.58			
nC ₄	0.74			
iC ₅	0.64			
nC ₅	0.38			
<u>Groups</u>				
CUT1	C ₆	1.00	84	0.700
CUT2	C ₇	2.91	96	0.743
CUT3	C ₈	3.34	107	0.766
CUT4	C ₉	3.14	121	0.787
CUT5	C ₁₀	2.78	134	0.803
CUT6	C ₁₁	2.65	147	0.813
CUT7	C ₁₂	2.53	161	0.831
CUT8	C ₁₃	2.14	175	0.843
CUT9	C ₁₄	1.91	190	0.854
CUT10	C _{15,16,17}	5.30	221	0.871
CUT11	C _{18,19,20}	3.71	263	0.880
CUT12	C _{21,22,23}	2.86	303	0.900
CUT13	C ₂₄₊	<u>12.78</u>	393	0.946
		<u>100.00</u>		