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EXPLORATION DIVISION

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Title:

WELLSITE GEOCHEMICAL EVALUATION OF THE RESERVOIR, 6506/11-2

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Abstract:
Thirteen sandstone samples from 4632 - 4690 mRKB were thermal extracted and pyrolysed. The sandstones from the intervall 4632 - 4675.3 mRKB were tight, cemented and have low porosity. Very little or no hydrocarbons have migrated into this intervall. The samples from intervall 4678 - 4690 mRKB have Production Potential between 1.5 - 4.6 mg HC/g rock, except the sample from 4681.6, which has no traces of hydrocarbons. These values are about 1/10 of what has been seen for sandstones in an oil reservoir. The gas chromatogram of these migrated hydrocarbons indicate condensate/light oil type.

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3 RESULTS

Because of a production fault in the GHM instrument, voltage variation on the rig and a brakedown in the data aquisition system, the instrument was only functioning for two and a half days, see letter in appendix.

Since there is no porosity data available for these samples, the S1+S2-saturation can not be calculated.

Table 3.1. The GHM results of cores from well 6506/11-2.

Sample depth	Sample type	Lith.	S1	S2	PP	PI	Tmax C°
			mg HC/g rock				
4632	core	sst*	0.06	0.05	0.11	0.58	
4634.7	core	sst	0.01	0.00	0.01	0.86	
4641.4	core	sst	0.01	0.01	0.03	0.45	
4645	core	sst	0.01	0.01	0.03	0.53	
4650.6	core	sst	0.05	0.01	0.06	0.81	
4658.6	core	sst	0.03	0.02	0.05	0.58	
4667.1	core	sst	0.12	0.12	0.24	0.49	472
4675.3	core	sst	0.03	0.05	0.09	0.38	498
4678	core	sst	1.81	0.07	1.89	0.96	438
4681.6	core	sst	0.01	0.01	0.02	0.55	
4683	core	sst	1.44	0.06	1.50	0.96	
4683.5	core	sst	3.79	0.85	4.64	0.82	
4690	core	sst	1.30	0.18	1.48	0.88	478

* - lenses of dark claystone

The first sample analysed is at 4632 mRKB, and the last one at 4690 m RKB. The yield of thermal extractable matter is very low down to 4678 mRKB. The S1 value increases from 0.12 to 1.81 mg HC/g rock at 4678 mRKB. The sandstones in

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REPORT ON STABLE ISOTOPES
($\delta^{13}C$, δD) ON GAS SAMPLES FROM
WELL 6506/11-2

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SUMMARY

The gas components C_1 - C_5 and CO_2 have been separated from five gas samples from well 6506/11-2; DST 1A; 4668 - 4707 mRKB, DST 2; 4553.2 - 4597.2 mRKB, DST 4; 4371 - 4420 mRKB, DST 5; 4005 - 4048 mRKB and DST 6; 3373.5 - 3398.5 mRKB. The $\delta^{13}C$ value is measured on methane, ethane, propane, the butanes and CO_2. In addition the δD value is measured on methane.

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KEYWORDS

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1 INTRODUCTION

Five gas samples from well 6506/11-2; DST 1A; 4668 - 4707 mRKB, DST 2; 4553.2 - 4597.2 mRKB, DST 4; 4371 - 4420 mRKB, DST 5; 4005 - 4048 mRKB and DST 6; 3373.5 - 3398.5 mRKB were received and analysed October/November 1991.

On the samples C_1 - C_5 and CO_2 are quantified. The $\delta\ ^{13}C$ value is measured on methane, ethane, propane, the butanes and CO_2. In addition the δ D value is measured on methane.

2 ANALYTICAL PROCEDURE

The natural gas samples have been quantified and separated into the different gas components by a Carlo Erba 4200 gas chromatograph.

The hydrocarbon gas components were oxidised in separate CuO-ovens in order to prevent cross contamination. The combustion products CO_2 and H_2O were frozen into collection vessels and separated.

The combustion water was reduced with zinc metal in sealed quarts tubes to prepare hydrogen for isotopic analysis. The isotopic measurements were performed on a Finnigan Mat 251 and a Finnigan Delta mass spectrometer.
IFEs value on NBS 22 is 29.77 ± .06‰ PDB.

3 RESULTS

The volume composition of the gas samples is given in Table 1. The results have been normalised to 100%. The stable isotope results are given in Table 2.

The uncertainty on the $\delta\ ^{13}C$ value is estimated to be ± 0.3‰ PDB and includes all the different analytical steps. The uncertainty in the δ D value is likewise estimated to be ± 5‰.

Table 1: Volume composition of gas samples from well 6506/11-2.

Sample	IFE no	C_1 %	C_2 %	C_3 %	iC_4 %	nC_4 %	iC_5 %	nC_5 %	CO_2 %	ΣC_1-C_5	Wet-ness	iC_4/ nC_4/
DST 1A; 4668 - 4707 mRKB	10142	78.3	9.4	4.1	0.59	1.0	0.13	0.12	6.3	93.7	0.16	0.61
DST 2; 4553.2 - 4597.2 mRKB	10143	76.7	9.7	4.4	0.63	1.0	0.13	0.12	7.3	92.7	0.17	0.64
DST 4; 4371 - 4420 mRKB	10195	79.0	8.5	4.2	0.62	1.1	0.41	0.40	5.7	94.3	0.16	0.54
DST 5; 4005 - 4048 mRKB	10145	83.0	6.6	2.7	0.73	1.5	0.20	0.29	5.0	95.0	0.13	0.49
DST 6; 3373.5 - 3398.5 mRKB	10146	78.8	8.7	5.8	1.6	2.0	0.68	0.62	1.9	98.1	0.20	0.77

Table 2: Isotopic composition of gas samples from well 6506/11-2.

Sample	IFE no	C_1 $\delta^{13}C$ ‰ PDB	C_1 δD ‰ SMOW	C_2 $\delta^{13}C$ ‰ PDB	C_3 $\delta^{13}C$ ‰ PDB	iC_4 $\delta^{13}C$ ‰ PDB	nC_4 $\delta^{13}C$ ‰ PDB	CO_2 $\delta^{13}C$ ‰ PDB	CO_2 $\delta^{18}O$ ‰ PDB
DST 1A; 4668 - 4707 mRKB	10142	-42.8	-192	-29.9	-28.0	-25.1	-26.8	-12.3	-15.9
DST 2; 4553.2 - 4597.2 mRKB	10143	-43.5	-197	-29.9	-27.7	-25.2	-27.4	-14.4	-15.2
DST 4; 4371 - 4420 mRKB	10195	-46.2	-195	-30.6	-28.9	-25.2	-28.7	-11.1	-16.2
DST 5; 4005 - 4048 mRKB	10145	-44.6	-187	-30.0	-28.2	-26.9	-28.5	-13.3	-5.4
DST 6; 3373.5 - 3398.5 mRKB	10146	-45.2	-177	-29.0	-27.8	-26.0	-27.5	-17.8	-1.2