	KJELLER	HALDEN
ADDRESS	Box 40, N-2007 Kjeller, Norway	N-1751 Halden, Norway
TELEPHONE	+47 63 806000	+47 69 183100
TELEX	76 361 isotp n	76 335 energ n
TELEFAX	+47 63 815553	

Institutt for energiteknikk
Institute for Energy Technology

AVAILABILITY

In Confidence

REPORT TYPE

REPORT NO.
IFE/KR/F-98/012

DATE
1998-01-26

REPORT TITLE

DATAREPORT ON STABLE ISOTOPES,
GAS SAMPLE FROM WELL 15/5-5
(ref. IFE no. 2.5.001.98)

DATE OF LAST REV.

REV. NO.

CLIENT
Statoil/Geolab Nor

NUMBER OF PAGES
5

CLIENT REF.
Ann Elin Gilje/Ger van Graas

NUMBER OF ISSUES
15

SUMMARY

One gas sample from well 15/5-5 is analysed for gas and isotopic composition.

The work is done in accordance with the "The Norwegian Industry Guide to Organic Geochemical Analyses", Third Edition 1993.

DISTRIBUTION

Statoil/Geo Lab Nor (8)
Andresen, B.
Bjørnstad, T.
Johansen, H.
Sieglé, S.
File (3)

KEYWORDS

	NAME	DATE	SIGNATURE
PREPARED BY	Bjørg Andresen Sylviane Sieglé	1998-01-26	Bjørg Andresen Sylviane Sieglé
REVIEWED BY	Harald Johansen	1998-01-26	Harald Johansen
APPROVED BY	Tor Bjørnstad	1998-01-26	Tor Bjørnstad

1 Introduction

One gas sample from well 15/5-5, Test 1 is analysed for gas and isotopic composition.

On the sample 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 δD value is measured on methane.

2 Analytical procedures

Aliquots of 0.5 ml are sampled with a syringe for analysis on a Poraplot Q column connected with flame ionisation (FID) and thermal conductivity (TCD) detectors. The detection limit for the hydrocarbon gas components is 0.01 µl/ml, for CO_2 0.2 µl/ml.

For the isotope analysis 5-10 ml of the gas is sampled with a syringe and then separated into the different gas components by a Carlo Erba 4200 gas chromatograph. The hydrocarbon gas components are oxidised in separate CuO-ovens in order to prevent cross contamination. The combustion products CO_2 and H_2O are frozen into collection vessels and separated.

The combustion water is reduced with zinc metal in a sealed quarts tube to prepare hydrogen for isotopic analysis. The isotopic measurements are performed on a Finnigan MAT 251 and a Finnigan Delta mass spectrometer.

IFEs value on NBS 22 is -29.77 ± .06‰ PDB.

The uncertainty in the $\delta^{13}C$ value is estimated to be ± 0.3‰ PDB and includes all the different analytical steps. The estimate is based on repeated analysis of a laboratory standard gas mixture. The uncertainty in the δD value is likewise estimated to be ± 5‰.

3 Results

The normalised volume composition of the gas sample is shown in Table 1. The stable isotope composition is shown in Table 2. Due to an analytical problem the uncertainty in the reported iC_4 isotope value is larger than indicated by repeated analysis of the laboratory standard gas mixture.

The analytical system has been tested with the standard gas mixture both in advance and after the analysis of the present samples, with acceptable results.

Table 1 Volume composition of gas samples (normalised values) from well 15/5-5

Sample	IFE no GEO	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/
Test 1	980005	80.2	7.6	6.6	1.1	3.0	0.62	0.73	0.12	99.9	0.20	0.38

Table 2 Isotopic composition of gas samples from well 15/5-5

Sample	IFE no GEO	C_1 $\delta^{13}C$ ‰ PDB	C_1 δ D ‰ 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
Test 1	980005	-50.9	-213	-28.9	-29.8	-29.1	-32.1	-21.1	-7.7
				-28.8	-29.7		-32.1	-23.5	-7.7

4 Literature

James, A.T. (1983). Correlation of natural gas by use of carbon isotopic distribution between hydrocarbon components. *The American Association of Petroleum Geologists Bulletin*, **67**, 1176-1191.

Robert, P. (1985) methods and means of paleothermal analysis. *Organic methamorphism and Geothermal History*, Elf-Aquitaine and D. Reidel Publishing Company.

Schoell, M. (1983). Genetic characterisation of natural gases. *The American Association of Petroleum Geologists Bulletin*, **67**,2225-2238.