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Final Report

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CORE ANALYSIS PROGRAMME

Conventional core analysis has been performed on the core material from well EHRE: 415 samples and BRAG: 210 samples.

WELL INFORMATION

Well : EHRE and BRAG
Operator : Statoil

EHRE and BRAG in accordance with the analysis programme requested by Statoil. EHRE:

Well	EHRE	BRAG
Gas permeability	X	X
Helium porosity.	X	X

ANALYSIS PROCEDURESPlugs handling

The plugs was drying at 60 degrees Celsius for at least 48 hours before measuring of the plugs.

Gas Permeability

Gas permeability (horizontal and vertical core plugs) was determined flowing nitrogen gas through the samples. At steady state conditions, the gas flow rate, the pressure drop over the plug sample and the upstream pressure were recorded. The confining pressure applied during the measurement was 20 bar. The gas permeability K_{n2} was then calculated using Darcy's law.

The Klinkenberg corrected permeability value, K_1 , was determined empirically.

Empirical Klinkenberg correction:

1. K_{n2} range 0-2.0 mD

$$K_1 = 0.68 \times K_{n2}^{1.06}$$

2. K_{n2} range 2.0 - x mD

Iteration loop

$$K_{11} = 0.68 \times K_{n2}^{1.06}$$

$$m_1 = 0.777 \times K_{11}^{0.61}$$

$$K_{12} = K_{n2} - m_1/P_m$$

$$m_2 = 0.777 \times K_{12}^{0.61}$$

$$K_{13} = K_{n2} - m_2/P_m$$

which gives

$$K_{ln+1} = K_{n2} - m_n/P_m$$

When $K_{ln+1} - K_{ln}$ is approx. 0,

then K_{ln+1} is approx. K_1 .

Two iterations is found to give proper result, giving

$$K_{13} = K_1$$

Porosity and grain density

Grain volume was measured by helium injection using a Boyle's law porosimeter.

Bulk volume was determined by using a slide caliper measured length and diameter.

Recording also the weight of the samples, porosity were then calculated.