

**A STUDY OF THE CORRELATION BETWEEN RELATIVE
PERMEABILITY, AIR PERMEABILITY AND DEPOSITIONAL
ENVIRONMENT ON THE CORE-PLUG SCALE**

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Abstract

The main objectives of this study have been to derive relationships between petrophysical properties, which are crucial for reservoir simulations. Furthermore, in order to get representative data, and thereby to conclude upon the range in the rock properties within each environment, it has been important to use a sufficient number of samples from different depositional environments.

Determination of relative permeability curves on 85 core plugs from one single well in a highly heterogeneous North Sea field have been carried out at ambient conditions.

The data have been analysed with respect to relationships between the variables. A number of significant correlations have been found. Linear regression on log-transformed air permeability within each depositional environment gives very good fit for the permeability related variables, as expected, and acceptable fit for the porosity and the irreducible water saturation. For the remaining variables the fit is satisfactory in some of the depositional environments and very bad in others, without any clear pattern.