



Paper Preview

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Title **The Effect of Overburden Pressure on Relative Permeability**

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Preview Abstract

In routine core analysis, porosity and permeability, both relative and absolute, are measured on rock samples which are not under net overburden (confining) pressure. Using these data to predict reservoir performance or estimate reserves can lead to serious errors since all reservoirs are under net overburden pressure.

Data collected from constant rate, dynamic displacement experiments were utilized to study the effect of net overburden pressure on porosity and absolute and relative permeabilities. These experiments were conducted on small, consolidated rock samples under net overburden pressures up to 41.37 MPa (6000 psi) and room temperature. The pore pressure was maintained atmospheric. Examination of the data shows a decrease in porosity and permeability with increase in overburden pressure. A correlation between porosity and pressure. A correlation between porosity and overburden pressure and also between permeability and overburden pressure has been developed using linear regression analysis. Both correlations are found to be logarithmic. The irreducible water saturation and residual oil saturation increase with increased overburden pressure levels. While the relative permeability to oil decreases with increasing overburden pressure, a corresponding negligible decrease in pressure, a corresponding negligible decrease in water relative permeability is observed.

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