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Relative Permeabilities: a pore-level model study of the capillary number dependence MARTIN FERER, GARY MASON, Physics, West Virginia University, GRANT BROMHAL, DUANE SMITH, U.S.; D. O. E.; National Energy Technology Laboratory — Relative permeabilities are widely used by the petroleum industry in reservoir simulations of recovery strategies. In recent years, pore level modeling has been used to determine relative permeabilities at zero capillary number for a variety of more and more realistic model porous media. Unfortunately, these studies cannot address the issue of the observed capillary number dependence of the relative permeabilities. Several years ago, we presented a method for determining the relative permeabilities from pore-level modeling at general capillary number. We have used this method to determine the relative permeabilities at several capillary numbers and stable viscosity ratios. In addition, we have determined these relative permeabilities using one of the standard dynamic methods for determining relative permeabilities from core flood experiments. Our results from the two methods are compared with each other and with experimental results.

Martin Ferer
Physics, West Virginia University

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