

Developing Generalised Capillary Pressure Curves and Saturation Height Function for Shuaiba Carbonate Reservoirs in Field A

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Abstract

Shuaiba carbonate reservoirs have wide variations in their basic petrophysical properties (porosity, permeability) and hence capillary pressure. These' properties require characterization since they have significant impact on hydrocarbon volumes estimations and production forecast. In addition, capillary pressure is one of the most important rock-fluid property that petroleum engineers use to estimate initial oil distribution in the reservoir by converting it into Saturation Height Functions (SHF). However, generating representative capillary pressure curves is very challenging often due to limited data, large variation in rock fabrics and that capillary pressure measurements often have to be made with non reservoir fluids. Corey Brooks and Lambda functions were compared in the analysis and a SHF was derived from both core and log results. The high level of heterogeneity was shown in field A even using one set of porosity classes. A general SHF was obtained for field A and saturations from Log and core data can be matched to the SHF for field A Shuaiba reservoirs. A very good match was observed in the good quality reservoir sections. However there was no match in some wells at the water leg and poor quality reservoir sections.