NMR analysis of a bimodal pre-Khuff clastic pore system

Andrea Valori[1], David Forsyth[2], Gabor Hursan[2], Wael Abdallah[1]

[1]SAUDI ARABIA
[2]Saudi Aramco, Dhahran, SAUDI ARABIA

ABSTRACT

The pre-Khuff clastic reservoirs in Saudi Arabia are one of the main gas resources in the Kingdom. The best/target prolific gas intervals are characterized from core studies as clean quartz with very low clay content and excellent reservoir quality. Yet, unexpectedly, despite the apparent high rock quality, water saturations — calculated from log data — over these intervals can be high. Special Core Analysis measurements, particularly mercury injection capillary pressure (MICP) and particle size analysis, show that the primary saturation controlling factor is the variability in particle size, which gives these clean quartz rocks a bimodality in pore size distribution. The work presented here extends this core based analysis of bimodality to improve its log based characterization using nuclear magnetic resonance (NMR) data.