

A NEW TECHNIQUE TO OBTAIN THE REAL CAPILLARY PRESSURE-SATURATION CURVE DIRECTLY FROM CENTRIFUGE EXPERIMENTS

Giovanna Ragazzini, Carlo Venturini
Agip SpA, S. Donato Milanese MILANO, ITALY

Abstract Determination of the true capillary pressure vs. saturation curve by the centrifuge method has been and still is object of several studies. This problem was first solved with mathematical algorithms whose solutions are derived using some assumptions and approximations which are not always correct. The new approach, described in this paper, enables the analyst to obtain hard saturation data directly from centrifuge experiments. The advantage of this technique is that saturation data have not to be corrected by complex mathematical equations. The new idea is to avoid having an average saturation, which is affected by the end effect in the sample. The far end of the centrifuged sample is equipped with a porous end-piece whose capillary contact with the rock sample is ensured by a layer of cellulose fibre. The whole assembly is then treated as a unique sample undergoing the very same activities as standard samples. The validation of this technique is demonstrated by the comparison of the capillary pressure curve of samples in capillary contact with the end-piece with that obtained through the application of the most recent mathematical formulae. This technique is supported also by comparison with the experimental capillary pressure curve of the inlet piece obtained subdividing the samples in several pieces.

Some experimental results of oil-brine and air-brine

drainage on Sandstone samples having different permeabilities are presented together with an analytical discussion of the results.