Extended Abstract Journal of Chemical Technology and Application 2020

Vol.3 No.3

Relative Permeability Prediction Considering Complex Pore Geometry and Wetting Characteristics in Carbonate Reservoirs

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More than 60% of the world's oil reserves are made of carbonate, and more than 80% of carbonate rock has wet air elements. Carbonate oil-resistant rock has wet marks. In carbonate rocks, secondary pores such as molten pores, vugs, rings, and ice well developed. Thus, carbonate rocks have heterogonies pore systems in place carbonate dienais. Most carbonate storage containers have water-repellent, non-abrasive properties fluid flows not only to the heterogeneous pore system but also to oil production. In carbonate dams, the measurement of weight measurement is very difficult due toheterogenible pore networks and carrying signals. In addition, the time-lapse detection rate is time consuming and shows significant variability in all experimental results, or samples taken from the same number of correlation formats previously developed to describe multilingual flow, however, cannot accurately predict the associated frequency of carbonates because they usually take the system of homogeneous pomo with a single pore size. In carbonate rocks, no detection of capillary pressure is considered for both micropore and macropore simultaneously.

The measurement of kr (related permissions) in carbonate rock is difficult and there is considerable uncertainty due to complex pore systems such as molten pore, cavity and fractures. Several kr-calculation scales are developed, but they think a single pore system cannot be used directly in a complex pore system. In addition, wet properties should be considered because most carbonate rocks are naturally wet. This study presents a kr-measurement method with respect to a heterogeneous pore network. First, the wet characteristics are determined by the contact angle measurement. On a case-by-case basis, pore size distribution, Pc (capillary pressure) and residual oil filling are measured. From the measured contact angle, all samples are cut as oil water. It is evident that the Pc has a different curve in terms of macro and micro-pore, respectively. After that, kr is produced from Pc using the Brook-Corey equation for each pore size. As a result, in macro-pores, water has a higher level than oil that can be easily transported by a small reduction in oil filling. In the contract, the micro-pore has a typical kr curve shape. As a result, it is found that oil flows differently using macro and micro-pore depending on the oil satellite. This study presents a method of measurement of equilibrium relative to a heterogenible pore network that considers capillary pressure, contact angle, pore size distribution, and residual oil filling. The results of this study with regard to capillary pressure based on λ and Pd suggest that the size of the carbonate sample may be affected by pore size. Therefore, oil and water were observed to flow differently through micropore and macropore, according to oil lubricants and stable water migration is not guaranteed, leading to premature deviation.

This work is partly presented at Joint Event 2nd International Conference and Expo on Oil and Gas October 27-28, 2016 Rome, Italy