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Natural Products Chemistry & Research

Specific enthalpy fractal dimension for characterizing shajara reservoirs of the permo-carboniferous shajara formation

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Abstract

The quality and assessment of a reservoir can be documented in details by the application of specific enthalpy. This research aims to calculate fractal dimension from the relationship among specific enthalpy, maximum specific enthalpy and wetting phase saturation and to approve it by the fractal dimension derived from the relationship among capillary pressure and wetting phase saturation. Two equations for calculating the fractal dimensions have been employed. The first one describes the functional relationship between wetting phase saturation, specific enthalpy, maximum specific enthalpy and fractal dimension. The second equation implies to the wetting phase saturation as a function of capillary pressure and the fractal dimension.

Two procedures for obtaining the fractal dimension have been utilized. The first procedure was done by plotting the logarithm of the ratio between specific enthalpy and maximum specific enthalpy versus logarithm wetting phase saturation. The slope of the first procedure = 3- Df (fractal dimension). The second procedure for obtaining the fractal dimension was determined by plotting the logarithm of capillary pressure versus the logarithm of wetting phase saturation. The slope of the second procedure = Df -3. On the basis of the obtained results of the fabricated stratigraphic column and the attained values of the fractal dimension, the sandstones of the Shajara reservoirs of the Shajara Formation were divided here into three units.

Biography

Khalid Elyas Mohamed Elameen AlKhidir is professor at king Saud University. He did his postdoctoral research at King Saud University, College of Engineering, Department of Petroleum and Natural Gas Engineering, Al-Amoudi Research Chair in Petroleum, Enhanced Oil Recovery. He published papers in sandstone reservoirs characterization, tight carbonate reservoirs characterization, and in an enhanced oil recovery.

2nd International Conference on Petro Chemical Engineering and Natural Resources| February 10-11, 2021

Citation: Khalid Elyas Mohamed Elameen Alkhidir, Specific Enthalpy Fractal dimension for Characterizing Shajara Reservoirs of the Permo-Carboniferous Shajara Formation. Petro Chemistry 2021, 2nd International Conference on Petro Chemical Engineering and Natural Resources, February 10-11, 2021, 05.