Quantification of the Relationship Between Pore Geometry and Permeability Based on Fractal Theory and Petrophysical Methods in Carbonates

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ABSTRACT

In this study, we use several petrophysical methods, which are scanning-electron-microscope (SEM), thin sections, mercury injection capillary pressure (MICP) and nuclear magnetic resonance (NMR), to scale the fractal geometries of carbonates and develop conductivity and permeability models in carbonates using fractal dimensions. We hypothesize our fractal analysis and petrophysical approach will better review microstructure of carbonate and improve the permeability estimation, which will lead to better interpretation of well log and field data.

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