



Carbonate Reservoiring Capability Evaluation Based on Multifractal Analysis of Micropore Structures

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It has been of great importance for evaluating the petrophysical properties of the reserves and then predicting the productivity of petroleum fields. In tradition, the petrophysical porosity and permeability are measured by experiments which were usually time-consuming and may even result in incorrect conclusions. The fractal and multifractal analysis of pore spaces based on digital images have been attracting much attention. For the pore-scale analysis, it is challenging to study the irregularities of pore shapes and the frequency distributions of pore sizes. In this paper, based on one program for fractal and multifractal analysis of two-dimensional binary images (<http://www.ird.fr/ur079/perso/perrier/multifractals/MF.htm>, Edith Perrier, Ana M. Tarquis, Annette Dathe) for soil pore space analysis, we studied the distribution patterns of the pore spaces of carbonate reservoiring rocks which are from the Tarim Basin in Xinjiang Province, China. In terms of the box-counting fractal dimensions, generalized fractal dimensions and multifractal spectra of the micropores, the reservoiring capacity of the rocks are quantitatively evaluated. The higher the fractal dimensions are, the greater the reservoiring capabilities would be. In this aspect, the fractal and multifractal parameters would be helpful for the quantitative evaluation of reservoiring capabilities.

Key Words: ESEM images, Micropore, Fractal and Multifractal, Carbonate Reservoir.