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<u>PROCEEDINGS</u>

# Spontaneous Imbibition Considering Fractal Theory and Dynamic Contact Angle in Tight Sandstone

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**ABSTRACT**

In the process of tight oil reservoir development, there are a lot of spontaneous imbibition phenomena which are beneficial to achieving the purpose of enhancing oil recovery. It is of great significance to study the law of spontaneous imbibition of oil and water at the pore scale of tight sandstone. In this paper, we study the law of spontaneous imbibition at the pore scale of tight sandstone by combining theoretical research and numerical simulation. Based on the fractal theory and the capillary bundle model, we establish a mathematical model of spontaneous imbibition in porous media considering the dynamic contact angle. Moreover, we use real tight sandstone cores for simulation to verify the accuracy of the mathematical model and analyze the effect of tight sandstone pore structure parameters on the spontaneous imbibition process. Research shows that the increase of core porosity will increase the ultimate recovery factor and the increase of pore fractal dimension has little effect on the ultimate recovery factor.

**Conflicts of Interest**: The authors declare that they have no conflicts of interest to report regarding the present study.