

An Experimental Investigation of Microscopic and Macroscopic Displacement Behaviors of Branched-Preformed Particle Gel in High Temperature Reservoirs

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Abstract : Branched-preformed particle gel (B-PPG) is a newly developed profile control and oil displacement agent for enhanced oil recovery in major oilfields. To provide a better understanding of the performance of B-PPG in high temperature reservoirs, a comprehensive experimental investigation was conducted by utilizing glass micromodel and synthetic core. The microscopic experimental results show that the B-PPG can selectively flow and plug in large pores. In terms of enhanced oil recovery, the decrease of residual oil in the margin regions (24.6%) was higher than that in the main stream (13.7%), which indicates it enlarged the sweep area. In addition, the effects of B-PPG injection concentration and injection rate on enhanced oil recovery were implemented by core flooding. The macroscopic experimental results indicate that the enhanced oil recovery increased with the increasing of injection concentration. However, the injection rate had a peak value. It is significant to get insight into the behaviors of B-PPG in reservoirs.

Keywords : branched-preformed particle gel, enhanced oil recovery, micromodel, core flooding

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