Mechanism of scaling on reservoir formation damage by polymer-containing wastewater re-injection

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\textbf{A B S T R A C T}

The water quality of oilfield produced water from polymer flooding (PWPF) is one of the most pressing issues in polymer-flooded oilfields. In this study, Suizhong 36-1 oilfield in the Bohai Sea was taken as the research objective, the influence and mechanism of polymer on scaling were investigated through compatibility experiment. Scanning electron microscopy and nuclear magnetic resonance spectroscopy techniques were used to analyze the effect of PWPF scaling on pore throat structures of reservoir cores. The results show that the main composition of scale was calcium carbonate, and the output polymer could enhance the incompatibility of PWPF and formation water. PWPF exhibited higher reservoir damage than source water. Amorphous scale substances were adsorbed onto mineral surface and filled inter granular pores, resulting in plugging of macro pores and mesopores.

\textit{Keywords:} Polymer-containing wastewater; Wastewater reinjection; Scaling mechanism; Pore throat structure

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