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Mechanism simulation on low salinity water flooding in high temperature sandstone reservoirs based on molecular simulation method

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Low salinity water flooding (LSWF) is novel technique which can be used to improve oil recovery for sandstone reservoirs. Although considerable experimental research has been conducted to identify the underlying pathways, there are a lot of debatable issues with the mechanics. On the basis of molecular simulation (MS) method, the models of rock, oil and brine in different salinity and ions compositions were constructed. The interactions among rock, oil and brine and the influence of brine salinity and concentrations of ions on the process of separating oil from sandstone surfaces were studied. The temperature range considered ranged from 298K to 373K. That altering of the wetting state of a sandstone induced the detachment of oil from the surface of the rock, even under elevated temperatures. The results will provide essential molecular state information for change in the wetting state of rock and increase in oil recovery.

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