عنوان مقاله:

Experimental and theoretical investigation on low salinity brine injection timing in high water cut reservoirs for residual oil reduction and improved oil recovery

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خلاصه مقاله:

In this research, low salinity water flooding was used to investigate its low salinity effect in a high water cut sandstone reservoir to improve oil recovery. The application was done to five different sandstone cores in high water cut levels of ۷۰%, ۷۵%, ۸۰%, ۸۵% and ۹۰% by injecting low salinity brines of ۲۰۰۰mg/L – ۲۰,۰۰۰mg/L NaCl concentrations. These Cores chosen for research had ۲۷%-۲۸% porosity and ۲۸۰mD – ۳۰۰ mD permeability. Different brine injection rates were considered from ۰.۵cm۳/s to ۳cm۳/s in each experiment. The results showed that low salinity flooding can be used to harness more oil from high water cut reservoirs. However, water should be injected earlier to avoid porous particle dislodge by continuous flooding. Brines of ۲۰۰mg/L-۵,۰۰۰mg/L NaCl yielded the highest Oil recovery compared to higher salinities of ۱۰,۰۰۰mg/L-۲۰,۰۰۰mg/L. This was partly due to increased jamin effect created as fluids flow at high water cut levels. Three water cut rising model levels were discussed for better timing to avoid porous particle detachment from the sandstone matrix. Early injection timing was discussed to be critical for low salinity injection to avoid the mentioned Particles phenomena and hence high water cut levels and low oil recovery.

کلمات کلیدی:

low salinity flooding. High water cut, Sandstone, Residual oil saturation, Fines migration