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Paper Preview

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Title	**Laboratory Study on Precipitation of Calcium Sulphate in Berea Sandstone Cores**
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Preview

Abstract

Scale deposition is one of the most serious oil field problems that inflict water injection systems primarily when two incompatible waters are involved. Mixing of these waters could cause precipitation of $CaSO_4$, $BaSO_4$, and/or $SrSO_4$.

To generate reaction kinetics data, the rate of calcium sulphate deposition in porous rock was measured while flooding Berea core samples of uniform properties with super-saturated brine. The brine was formulated by mixing a Ca^{+2}-rich solution with a SO_4^{-2}-rich solution at the core inlet. The rate of $CaSO_4$ scale formation was estimated by monitoring the core effluent's Ca^{+2} ion concentration. Several parameters were varied including temperature, pressure, degree of brine super-saturation, and flooding velocity.

The results indicated increased rate of $CaSO_4$ precipitation at higher temperatures, higher flood velocities, and greater brine super-saturation, whereas pressure had a slight effect on $CaSO_4$ deposition. The results were utilized to build a general reaction rate equation to predict $CaSO_4$ deposition in Berea sandstone for a given temperature, brine super-saturation, and flooding velocity.

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