

Accepted Manuscript

Title: Experimental and Theoretical Study of Wettability Alteration during Low Salinity Water Flooding-an State of the Art Review

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PII: S0927-7757(17)30133-4
DOI: <http://dx.doi.org/doi:10.1016/j.colsurfa.2017.02.006>
Reference: COLSUA 21361

To appear in: *Colloids and Surfaces A: Physicochem. Eng. Aspects*

Received date: 10-10-2016
Revised date: 24-1-2017
Accepted date: 3-2-2017

Please cite this article as: Hongna Ding, Sheik Rahman, Experimental and Theoretical Study of Wettability Alteration during Low Salinity Water Flooding-an State of the Art Review, *Colloids and Surfaces A: Physicochemical and Engineering Aspects* <http://dx.doi.org/10.1016/j.colsurfa.2017.02.006>

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Experimental and Theoretical Study of Wettability Alteration during Low Salinity Water Flooding-an State of the Art Review

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Graphical abstract

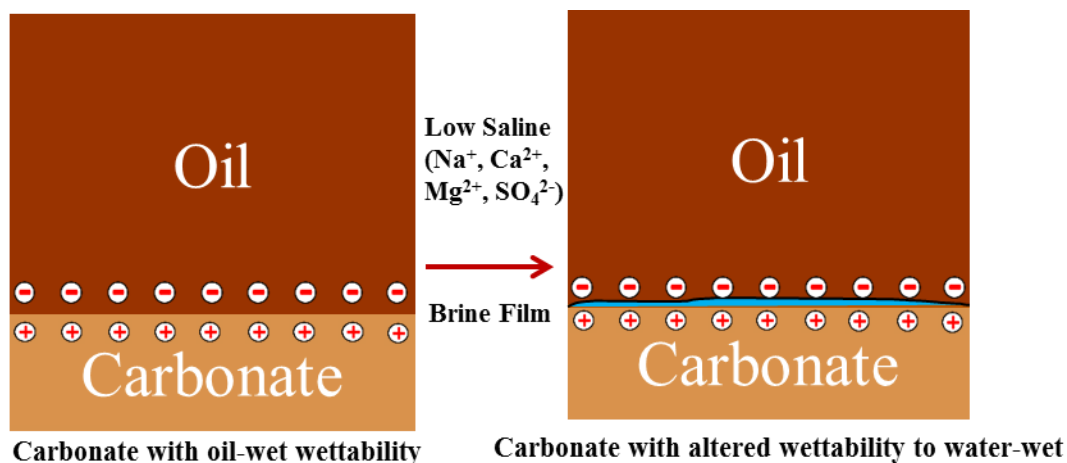


Fig.1. Initially oil-wet carbonate reservoirs. As carbonate rock is positively charged and crude oil is negatively charged at reservoir conditions (pH ~7-8, $T \approx 100^\circ\text{C}$), the oil adheres strongly onto the carbonate rock that makes it oil-wet (left). Low saline with potential determining ions (pdi) injected into carbonate reservoirs will increase the negative surface charge/potential due to chemisorption, therefore, enhance the repulsive part of disjoining pressure and changes the wettability to water-wet (right). At equilibrium, a stable thin film will be formed by double layer expansion mechanism [Reconstructed from Myint and Firoozabadi (2015)].

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