Nayan Medhi et al., Int J Petrochem Res. 2017
http://dx.doi.org/10.18689/2638-1974.a1.004

madridge CONFERENCES

International Conference on
Oil, Gas and Petrochemistry

April 3-5, 2017 Dubai, UAE

Low salinity water flooding in secondary recovery mode in a part of an oil field of upper Assam Basin

Nayan Medhi[1*] and **Minati Das**[2]
[1,2]Department of Petroleum Technology, Dibrugarh University, India

The objective of this work is to study the Low Salinity Effects (LSE) by conducting a set of laboratory Low Salinity Water flooding (LSW) experiments in Secondary Recovery Mode in a part of an oil field of Upper Assam Basin. LSW is an emerging Enhanced Oil Recovery (EOR) technique that injects water at significantly lower ionic strength as compared to the formation water.

LSW experiments were performed by flooding three core plugs by different saline water (two low saline water and one formation water) in the secondary recovery mode and the connate water saturation & oil recovery efficiency were determined. The pH of the injection & effluent water and Interfacial Tension (IFT) between oil-injection water & oil-effluent water were determined after the LSW experiments to see the LSE. The contact angles of the flooded core plugs were also determined to see the wettability states of the core plugs after LSW.

Increased oil recovery (01.11%–09.34 % of Original Oil In Place) with low salinity water as the invading brine was observed in the Secondary Recovery Mode of LSW above the high salinity formation brine flooding. The pH value of the effluent water was found to be increased from the injected low saline water by 0.29 and 00.73. We observed reduction of oil- effluent water IFT by 01.48mN/m and 03.56mN/m from the oil-injection water IFT. Alteration of the wettability states of the core plugs towards more water-wet state during LSW was observed from the measurement of Contact Angles (decreased by 03.60^0 and 06.30^0). Thus, some LSE were observed during Low salinity Water flooding in the Secondary Recovery Mode which shows increased oil recovery efficiency by wettability modification of the flooded core plugs.

The results of the laboratory investigations confirm that the area under study is a favourite candidate for Low Salinity Water flooding in Secondary Recovery Mode. Therefore, implementation of this EOR method in the similar reservoirs will lead to enhancement of production.

Keywords: LSE, LSW, EOR, Secondary Recovery Mode, IFT, Original Oil in Place, wettability, Contact Angle.