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Low Salinity Waterflooding in Tertiary Recovery Mode in a Part of Geleki Oil Field of Upper Assam Basin, India

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The present work aims to study the Low Salinity Waterflooding (LSW) in Tertiary Recovery Mode and its role on oil recovery efficiency in a part of Geleki Oil Field of Upper Assam Basin, India. It is a water based Enhanced Oil Recovery (EOR) method which can be made by optimizing the ion composition of the injected water in such a way that the change in equilibrium of the initial Crude Oil/Brine/Rock (COBR) system affects the oil recovery.

The LSW experiments were conducted in the laboratory by flooding oil saturated core plugs using high saline water followed by low saline water. The oil recovery efficiency after high saline waterflooding and additional oil recovery efficiency after low saline waterflooding were determined. The wettability state of the core plugs was determined based on the 'Relative Permeability Curves'.

During high saline waterflooding, oil recovery efficiency of 33.12% (using 2500 ppm water), 35.85% & 34.48% (using 1404 ppm water) of Original Oil in Place (OOIP) was observed. Additional oil recovery efficiency of 04.46% & 02.83% of OOIP using 800 ppm water and 01.38% of OOIP using 500 ppm water was observed during LSW in the Tertiary Recovery Mode. From the study of the 'Relative Permeability Curves', it is observed that the wettability states of the core plugs were oil-wet before the LSW.

The LSW experiments in the Tertiary Recovery Mode have found to play a significant role on oil recovery in the study area. A proper design of the chemistry of the injection water will help the researchers to apply this mechanism in most of the oil fields of Upper Assam Basin.

Keywords: LSW, Tertiary Recovery Mode, COBR, Relative Permeability Curves, OOIP

Biography:

Dr. Nayan Medhi is an Assistant Professor in the Department of Petroleum Engineering, Dibrugarh University, Assam, India. He received his Ph.D. from the Department of Petroleum Technology, Dibrugarh University. He has one year of industrial experience in 'Schlumberger Asia Services Limited' and more than eight years of teaching experience as Assistant Professor in the Department of Petroleum Engineering, Dibrugarh University. He also has one year of teaching experience as Lecturer in the Department of Petroleum Technology, Dibrugarh University. He has published a number of research papers in National & International Journal. His research area of interest is Enhanced Oil Recovery.