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A STUDY ON FINE'S MIGRATION DURING LOW SALINITY WATER FLOODING IN GELEKI OILFIELD OF UPPER ASSAM BASIN

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Abstract

The present work aims to study the migration of fines and their effects on wettability alteration and oil recovery during Low Salinity Waterflooding (LSW) in Geleki Oilfield of Upper Assam Basin. The study includes the analysis of migrated fines during laboratory scale LSW experiments and their effects on wettability alteration and oil recovery efficiency in the study area.

Clay minerals were studied and identified with the help of X-Ray Diffraction (XRD) analysis and Scanning Electron Microscopic (SEM) study. The LSW experiments were conducted by flooding oil saturated core plugs in the laboratory using different saline waters (1404 ppm, 500 ppm & 200 ppm as NaCl) and the recovery efficiencies were determined. The migration of clays with effluent low saline water (500 ppm & 200 ppm) was studied with the help of SEM analysis of the migrated fine sediments. The variation of wettability states of the flooded core plugs was determined through a study of the Contact Angle.

Petrographic study shows the presence of smectite, kaolinite and illite in the rock matrix. Higher oil recovery efficiencies were observed during coreflooding using 500 ppm and 200 ppm (as NaCl) water compared to 1404 ppm (as NaCl) flooding. SEM analysis of the migrated fine sediments shows the presence of kaolinite and illte. The Contact Angles of the core plugs flooded by low saline water are found to be lower (37.55^0 & 35.65^0) compared to the Contact Angle (41.85^0) measured for the core plug flooded by 1404 ppm water.

Studies have shown that migration of kaolinite and illite occurs during LSW in the study area which is one of the LSW mechanisms that contributes to oil recovery efficiency through wettability modification.

Keywords: Low Salinity Waterflooding, Wettability, XRD, SEM, Contact Angle.