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Low saline water-alkaline-surfactant/alternated/CO, flooding in Reservoir Cores

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The discovery of new oil reserves has steadily declining over the years, so increasing the recovery factors from the oil fields is the only logical way to meet the growing demands. With this objective the different enhanced oil recovery (EOR) methods are designed. It has been observed that oil recovery by water flooding is influenced by the salinity and composition of injected water. Although low saline waterflooding (LSW) has the potential to recover additional oil, its recovery is less compared to chemical and gas EOR methods. The purpose of this study is to investigate the EOR potential of the novel low saline water-alkaline-surfactant/alternated/CO₂ (LSWASG) method in an oilfield of Assam, India. Reservoir cores and crude oils from an Upper Assam depleted oilfield were analysed for their characterization and for preparing the synthetic formation brine (SFB). Chemical formulations that will best recover crude oil were next screened based on interfacial tension (IFT) measurements. Finally, lab-scale core flooding experiments were conducted to evaluate the oil recovery potential of the proposed method. From the coreflooding experiments, it was observed that secondary waterflooding of crude oil saturated core plugs resulted in recovery of about 33% oil initially in place (OIIP). Additional oil recovery by low saline waterflooding in the tertiary mode was 4.8 % OIIP. However, the oil recovery with LSW combined with the selected formulation (0.5 wt% SDS + 1 wt% Na $_2$ CO $_3$) with and without alternated CO $_2$ gas injection increased to 19.34% and 22.57% OIIP respectively. Higher oil recovery by the synergic combination of LSW, chemicals and CO $_2$ gas, highlighted the EOR potential of the novel LSWASG process in the Assam oilfield producing medium gravity crudes

Biography

Chinmoy Dutta is a M.Tech student specialized in Petroleum Exploration & Production Department under Dibrugarh University, India. His interested area of research is Enhanced oil recovery of Petroleum. In 2017 He published an paper titled "Phase behavior study for Chemically Enhanced water flooding" international journal IJESM, Volume 6, Issue 7, November 2017. He also presented two paper in oral presentation in two different international conferences. This approach is responsive to surfactant and alkali flooding in EOR analyzed with the Low saline brine.

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