Meetings International SciTechnol

Essa Georges Lwisa et al., J Chem Appl Chem Eng 2018, Volume: 2
DOI: 10.4172/2576-3954-C1-002

International Conference on

PETROLEUM ENGINEERING

August 06-07, 2018 | Dubai, UAE

Enhanced oil recovery in carbonate reservoirs by carbonated water flooding (CWF)

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Over the years, CO_2 injection has become a leading EOR method, the method can significantly increase the oil recovery while at the same time reduces CO_2 emission. CO_2 is considered as an excellent fluid for enhanced oil recovery due to its favorable interaction with the reservoir oil. The relative low density and viscosity of CO_2 compared to reservoir oil that result in poor sweep efficiency has been a problem in CO_2 floods, another scheme of injection can be used to mitigate this problem, like alternating (WAG) or simultaneous injection of CO_2 and water (SWAG). An alternative, more efficient CO_2 injection scheme is carbonated (CO_2 -enriched) water injection. The objective of this study is to experimentally examine the residual oil recovery performance by carbonated water injection in low permeability carbonate reservoirs. Two EOR flooding test were conducted on a selected tight carbonate core sample, taken from Zakuum oil field in Abu Dhabi. First test was done by flooding the sample with carbonated sea water followed by sea water. another test was done by sea water flooding followed by low salinity water. The results show that, the improvement in residual oil recovery is higher when CW is injected in the secondary recovery mode, compared to the injection of low salinity water injection in the tertiary recovery mode.

Biography

Essa Georges Lwisa has a Master's degree in Petroleum Engineering, he works as a Core Analysis lab instructor at the Chemical & Petroleum Engineering dept. UAE University. He published 15 scientific papers in Enhanced Oil Recovery methods, and honored with IAAM Scientist Medal of year 2017 for notable research in the Advanced Material Science and Technology during award ceremony of International Association of Advanced Materials, Stockholm, Sweden.

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