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Modelling and simulation study of carbonated water injection for enhanced oil recovery

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Carbonated water injection (CWI) has been known to improve oil recovery when compared to other secondary and tertiary oil recovery methods. Additional oil recovery and CO₂ sequestration associated with CWI have been investigated through several experimental and modelling studies. There have not been a lot of modelling studies of CWI because of the complex multi-physics involved with fluid-fluid and fluid-rock interaction during CWI process. However, further experimental and modelling studies need to be conducted on CWI in order to fully capture and comprehend the complex physics involved. The focus of this research will be to investigate important aspects such as oil recovery mechanisms, fluids distribution, effect of operational parameters, effect of fractures, changes

in Petro physical properties and the capability of CWI for sequestration of CO₂. A new approach of using the grid local pressure to model CO₂ solubility during CWI was adopted and the moles of CO₂/water are controlled by their injection rates.

Speaker Biography

Cleverson Esene is a Ph.D candidate at Memorial University of Newfoundland Canada, whose interest lies in reservoir simulation, reservoir modeling and optimization of enhanced oil recovery methods. He has few years of industrial experience with Transocean and ExxonMobil as a drilling supervisor trainee and field engineer intern respectively. This industry exposure has added to his theoretical, logical and quantitative reasoning in his research abilities. He has been involved with a lot of research project using commercial and open access reservoir simulation packages such as CMG, ECLIPSE, PETREL, MATLAB etc.

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