Contribution ID: **215** Type: **Poster (+) Presentation**

Pore-scale analysis of gas injection in gas-condensate reservoirs

Thursday, 3 June 2021 20:00 (1 hour)

Production from gas condensate reservoirs can be significantly improved with gas injection. Several approaches to the method have been proposed in the literature, aiming pressure maintenance in the reservoir and/or re-evaporation of the deposited condensate, with promising results. However, the effects of complex phase behavior arisen from the interaction between injected gas and accumulated fluids in the porous medium are often overlooked. Local changes in composition can alter significantly both bulk and interfacial properties of gas and liquid phases, affecting, therefore, their displacement in porous media. In order to investigate these effects at the micro-scale, we used a compositional pore-network model to reproduce gas injection into porous media after condensate accumulation. The flow of a representative gas-condensate fluid through a sandstone-based network at different depletion levels was followed by the injection of CO2, N2, CH4 and C2H6, and the flow improvement was evaluated. Final saturations, relative permeabilities and recovery of heavy hydrocarbon components were quantified to compare the efficacy of each injection scenario. Results indicated that CO2 and C2H6 had the greatest potential to re-evaporate condensate banking and restore flow capacity, among the tested gases. Contrarily, insufficient amounts of CH4 and N2 injection could even lead to flow impairment, due to the observed gain in liquid dropout and increased interfacial tension. Additionally, N2 injection could not mobilize the heaviest condensate components in any tested scenario.

Time Block Preference

Time Block B (14:00-17:00 CET)

References

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