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Effect of Fracture Properties on WAG and SWAG process In fractured reservoirs

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Abstract

A considerable portion of the world's hydrocarbon endowment is in carbonate reservoirs. Carbonate formations are naturally fractured reservoirs, known as NFR. In this reservoir most of the oil is stored in matrix due to its higher storage capacity than fracture network. As most of the oil is stored in matrix, reservoir development plans will aim at maximizing the matrix oil recovery. An enhanced oil recovery (EOR) application principally targets (a) to minimize the residual oil in matrix depleting as effective as possible and/or (b) to accelerate the recovery rate for rapid production of oil. For reservoirs with high recovery factor, minimizing matrix residual oil saturation is a critical issue to extend the life of the reservoir. For reservoirs with low recovery factor, accelerating the production rate is more vital. For each of the reservoir types, different EOR methods should be considered. The present paper discusses the different EOR methods in naturally fractured reservoirs, namely water injection, gas injection, water alteration gas injection (WAG) and simultaneous water and gas (SWAG), but the focus is specifically on water alteration gas and simultaneous water and gas processes.

