

Reducing Oil Bypassed during CO₂ Flooding in Fracture-Dominated Reservoirs

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Abstract

Injection rates play a very important role in affecting the recovery process, especially in the presence of fractures. At high injection rates faster CO₂ breakthrough of CO₂ and higher oil bypass were observed than at low injection rates. But very low injection rates are not attractive from an economic point of view. Hence water viscosified with a polymer was injected directly into the fracture, to divert CO₂ flow into the matrix and delay breakthrough, similar to the WAG process. Although the breakthrough time reduced considerably, water leak off into the matrix was very high. To alleviate this problem, a cross-linked gel was used in the fracture for conformance control. The gel was found to overcome leak off problems and effectively divert CO₂ flow into the matrix. This experimental research will serve to increase the understanding of fluid flow and conformance control methods in fractured reservoirs.

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