

# Immiscible Recycle Gas Injection Scenario: Simulating Optimum Conditions in One of the Iranian Oil Reservoirs

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## Abstract

Immiscible gas injection is one of the most common EOR methods used for various reservoir conditions. In this work, immiscible recycle gas injection, as an enhanced oil recovery scenario for improving recovery efficiency in one of the south-west Iranian oil reservoirs, is simulated by commercial simulator, Eclipse. The reservoir fluid is light oil with gravity of 43 °API. The oil bearing formations are carbonate and so dual porosity/dual permeability behavior was chosen for better representation of the fracture system. Different sensitivity analysis with respect to several parameters like number and location of injection/production wells, production/injection rate, completion interval and etc is performed. It has been observed that in sensitivity with number of wells, 1 injection/3 production wells was the most efficient case. Also well oil production rate of 200 SM<sup>3</sup>/Day and well bottom-hole pressure of 75 bar provided higher oil recovery. Completing injection wells in fracture and production wells in matrix has a better field oil efficiency in comparison to other cases. Finally we proposed optimum conditions for immiscible recycle gas injection in this reservoir which maximizes oil recovery efficiency.

**Keywords:** Immiscible Gas Injection, Simulation, Oil Reservoirs, Sensitivity.

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