

Experimental and simulation investigation of enhanced oil recovery and asphaltene deposition using gas injection technology

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ABSTRACT:

The most important issue is the right management of hydrocarbon reservoirs, and knowing the effects of different factors related to the amount of oil recovery. The formation of asphaltene deposition in oil reservoirs has been always a big problem. The studies showed that the causes of lack of permeability in the reservoirs, closing shaft, main pipes, line pipes, and refinery's equipment, permeability and wettability alteration of reservoirs rock which lead to reduction of oil products, are related to some factors such as: asphaltene precipitation in reservoirs, wells and wellhead equipment's because of low pressure and injection of light hydrocarbon liquids. It is necessary to measure the effective parameters in the formation of asphaltene precipitation in order to prevent the sedimentation of asphaltene. The effects of injection of carbon dioxide on the formation of asphaltene have been studied in this research. At the first step, PVT model is prepared by Windrop and PVTI. Then, the dynamic model of the reservoir was made by GEM and Eclipse 300 simulators. The sensitivity analysis on the asphaltene deposition and permeability was also analyzed. It is concluded that the most important factor in the modeling of permeability was the level of gas injection. Furthermore, the effects of production rate have been investigated. Findings illustrated that in the 23000 flow rate, the amount of deposition was 0.008 and in the 5000 flow rate it was 0.001. All these findings happened 14 years after production. The process of asphaltene deposition on the reservoir was better after some promotion in flow rate production.

Keywords:

Asphaltene deposition, Permeability reduction, Gas injection, Simulation.