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## **Experimental and Simulation Studies on Verification of Oil Recovery Enhancement by Film Flow**

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Oil recovery enhancement of gasflood by oil film flow was verified. Film flow phenomena involve the formation of a thin film by residual oil blobs in water-wet media which becomes continuous between water and gas under certain conditions, and consequently recovers mobility. A core flood experiment assuming film flow was carried out under the same conditions as actual reservoirs. Since the oil film is supposed to be formed after the interfacial tensions are balanced, a soak period was set during gasflood to balance the interfacial tensions. The oil production behavior was different between before and after the soak period and the oil production rate rose after the soak period, which indicates that the film flow phenomena occurred. History matching was performed using typical three-phase relative permeability models which reproduce the experimentally observed production behavior before the soak period, but could not reproduce the behavior after the soak period because these models did not consider film flow. Therefore, a modified relative permeability model considering film flow was developed to simulate the production behavior. By applying this model during the soak period when film flow was formed, the simulation could reproduce incremental oil recovery after the soak period.

**Keywords:** [Oil recovery](#), [Film flow](#), [Relative permeability](#), [Three-phase flow](#), [History matching](#)

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