



Enhanced Oil Recovery by ASP (Alkaline, Surfactant and Polymer) Flooding

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Abstract

Remaining oil in the reservoir can be divided into two classes, firstly residual oil to the water flood and secondly oil bypassed by the water flood. Residual oil mainly contains capillary trapped oil. Water flooding only is not able to produce capillary trapped oil so that there is a need for additional technique and force to produce as much as residual oil. One way of recovering this capillary trapped oil is by adding chemicals such as alkaline, surfactant and polymer to the injected water. This article presents different aspects of SAP combination flooding and discusses about one real case which SAP process successfully have been done. The crucial role of alkali in an alkaline surfactant process is to reduce adsorption of surfactant during displacement through the formation. Also alkali is beneficial for reduction of oil-water IFT by in situ generation of soap, which is an anionic surfactant. Generally alkali is injected with surfactant together. Surfactants are considered for enhanced oil recovery by reduction of oil-water interfacial tension (IFT). On the other hand, polymer is very effective addition by increasing water viscosity which controls water mobility thus improving the sweep efficiency. SAP combination flooding to enhance oil recovery is effective and economic, it can increase oil recovery rate by about 20% (OOIP) for many years. Crude oil characteristics, brine characteristics, bottom-hole temperature, alkali, well history, and treatment design are considered to maximize the treatment results.

Key Words: Alkaline, Surfactant, Polymer, Interfacial Tension, Enhance Oil Recovery.