Interfacial tension measurement of sodium sulfosuccinates of dodecyl ethoxylates for chemical enhanced oil recovery application

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Surfactant flooding has been considered to be one of the most feasible technologies to increase oil production through enhanced oil recovery (EOR) practices. The principle of surfactant flooding is to extract the capillary-trapped residual oil by reducing the interfacial tension (IFT). The surfactant solution should be formulated to form microemulsions with oil phase in the moving front of slug water under the reservoir condition. The most important mechanism of surfactant flooding is reducing interfacial tension (IFT), which is closely related to the phase behavior of oil-brine emulsions. In this study, a pendant drop tensiometer was used to measure the interfacial tension between oil and 3.5 wt.% brine lowered by sodium sulfosuccinate surfactants. Structural effects on the IFT is examined for surfactants synthesized with linear or branched dodecyl ethoxylates with ethoxy group numbers from 4 to 7. The optimal surfactant structures and the ethoxylation numbers were validated with critical micelle concent ration and excess surface concentration.