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Alkaline surfactant enhanced oil recovery with special emphasis of chemical adsorption onto the porous media

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In Alkaline Surfactant Enhanced Oil Recovery (ASEOR) an alkali and surfactant/surfactants are used to recover the residual oil that remains after secondary brine flooding. The alkali, which is Sodium Hydroxide (NaOH) in this case, reacts with acidic components in the crude oil to form surface-active substances. A GC-MS spectrum of Upper Assam crude oil reveals the presence of carboxylic acid groups leading to in situ formation of surfactants, which in turn decreases the interfacial tension (IFT) between the oleic and aqueous phases for better oil recovery. While the anionic surfactants used were Black Liquor (BL) and Sodium Dodecyl Sulphate (SDS). The Critical Micellar concentration (CMC) of BL and SDS one at a time was added to NaOH to enhance the effectiveness of NaOH in further decreasing the IFT of the Alkali-Surfactant (AS) slugs. The paper also makes an attempt to study the adsorptive nature of the AS slugs. The best fit adsorption isotherm was derived by using SciDAVis scaled Levenberg-Marquaradt algorithm regression co-efficient.

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