Additives For Steam Foam

**Description:** Surfactants are used as additives to generate steam foams in thermal EOR. Steam foams improve the efficiency of heavy oil recovery thermal processes. The EOR Alliance developed a workflow to design efficient combinations of additives for steam.

**Application:** SAGD and continuous or cyclic steam injection

**Results:** Thermal stability of specific surfactants has been demonstrated up to 250 °C in anaerobic conditions. Good foam stability has been demonstrated up to 200°C.

**Proposed Workflow**

- Using high temperature/high pressure anaerobic screening tests, various surfactants are tested for thermal stability of chemical structures.

- Stability is evaluated through the comparison of NMR spectrums (signature of the chemical structure) before and after thermal treatment.

- A custom high pressure/high temperature sapphire view cell is utilized to measure foam life time at reservoir pressure and steam temperature.

- The maximum temperature at which surfactants give stable foams is determined. Best foamers are prone to stabilize lamellae in a core during steam injection and to improve the energy efficiency of heavy oil recovery processes.

References: SPE 16729, SPE 35692