

## Improve Surfactant Efficiency by Water Salinity Modification after Surfactant EOR

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Harsh salinity formation brine has always put a challenge on surfactant EOR. Reduction of efficiency of the technique has been reported by many researchers. The main causes are the high adsorption and precipitation of surfactant. This experimental study investigates and provides a possible way to enhance oil production after surfactant has been adsorbed onto rock surface. Sodium dodecylbenzene sulfonate (SDBS), anionic type surfactant, was used to measure its adsorption onto Berea sandstone with the effect of formation salinity (3 and 5 wt. % NaCl). After that, degree of SDBS desorption was compared between using soft brine (1 wt. % NaCl) and synthesized formation brines. Study of effect salinity modification on oil recovery was then performed by spontaneous imbibition tests. Spontaneous imbibition test begins with synthesized brine (1<sup>st</sup> stage), followed by SDBS solution (2<sup>nd</sup> stage) and finished by synthesized brine or soft brine (3<sup>rd</sup> stage) on oil saturated cores.

The results revealed that 1.8% and 5% improve in oil recovery was observed in the 3<sup>rd</sup> stage by using soft brine over 3 and 5 wt.% synthetic brine respectively. This increment was attributed to increase in SDBS desorption and better IFT reduction. Up to 32% of desorption was mitigated and it further lower IFT by 82% in using soft brine comparing to no salinity modification cases.

### Biography:

Ichhuy Ngo had done his Bachelor degree in Geo-resources and Geotechnical Engineering at Institute of Technology of Cambodia and Master Degree in Petroleum Engineering at Chulalongkorn University, Thailand. He is currently pursuing his doctoral degree in Resources Production laboratory in Kyushu University, Japan. His main research interest is enhanced oil recovery by using surfactant as chemical EOR.