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Surfactants and other factors input for the control of the reservoir Interfacial Tension (IFT)

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Investigation on pressure and essentially temperature and salinity might play an important role in the change of the IFT (Interfacial Tension) and CMC (Critical Micelles Concentration). The case of Saudi crude oil was approached in that regard. At various temperatures and up to the reservoir conditions, the use of defined aqueous phases (brine) was conducted. In the led investigation salinity solution of brine was established at a range of the following stages: 10% brine at 100% NaCl, 10% of brine consisting of 83% NaCl and 17% CaCl₂, 10% brine with 95% and 5% of CaCl₂. The brine solution was mixed to various selected surfactants at different concentration, subsequent to a large screening of these surfactants versus the IFT. As result, it has been found that significant effect was noticed with selected surfactants from a screening process. Results indicate that some surfactants concentration diluted in brine with different salinity variations have conducted to a relative quick IFT decline. After a certain concentration, the drop becomes very slight, and the infection point is reached and referred to as Critical Micelles Concentration (C.M.C) known to be the economical concentration for surfactant flooding. Weakening of intermolecular forces at the oil/surfactant solution interface related to synergetic effect can be one of the principal solutions for this outcome. The temperature effect on IFT measurement was not of responsive with the screened surfactant, except for one single type. This is illustrated trough the appearance of dark solution phenomenon. In addition to the overall and as targeted during the experimental investigation, pressure impact was also of neglected results.

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