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Wettability Alter of a Sandstone Rock by Graphene Oxide Adsorption

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Abstract : The wettability of the minerals present in a reservoir is a determining property in the recovery factor. One of the strategies proposed to increase recovery is based on altering the wettability of oil reservoir rocks. Approximately 60% of world crude oil reservoirs have sandstone-type host rocks; for that, it is very important to develop efficient methodologies to alter the wettability of these rocks. In this study, the alteration of the wettability of a sandstone rock due to graphene oxide (GO) adsorption was evaluated. The effect of GO concentration, salinity, Ca2+ ions, and pH on interfacial tension and contact angle was determined. The results show that GO adsorption induces significant changes in rock wettability. For high GO concentrations and low salinity, pH proved to be a determining factor in the alteration of wettability. Under certain conditions, surface wettability changes from highly oleophilic (144,8°) to intermediate oil wettability (91,2°).

Keywords : enhanced oil recovery, graphene oxide, interfacial tension, nanofluid, wettability
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