Abstract Submitted
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The impact of monovalent and divalent ions on the viscosity of a solution with silica nanoparticles[1] SAHEED OLAWALE OLAYIWOLA, MORTEZA DEJAM, Department of Petroleum Engineering, University of Wyoming, 1000 E. University Avenue, Laramie, WY 82071-2000, USA — Nanoparticles (NPs) are injected into the reservoirs for enhanced oil recovery. Several mechanisms like wettability alteration, reduction in the interfacial tension, and change in the rheological properties of the fluid are involved in this process. The rheological properties of the fluid depend on the interaction between the ionic components of the brine and the injected silica NPs. As a result, the flow is affected by the interaction of NPs and salt ions. The viscosity of fluid reduces with an increase in the temperature but the impact of the ionic components of brine on the viscosity of nanofluid is rarely investigated. Therefore, this study focuses on the effect of ionic components of brine (Na^+, K^+, Ca^{2+}, Mg^{2+}, Cl^-, and SO_4^{2-}) at different concentrations of silica NPs (0.01-1 wt%) on the viscosity of fluid. It was observed from the experimental data that the viscosity of fluid is increased by the divalent anions while it is reduced by the divalent cations. The interaction between the ions of NPs and the salt ions, which causes the variation in the viscosity of fluid, is further investigated by measuring the zeta potential and the particle size distributions.

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