EXPERIMENTAL STUDY OF VISCOSITY AND SURFACE TENSION OF Al₂O₃-DEIONIZED WATER NANOFLOUIDS USING SDBS AS STABILIZING AGENT

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Nanofluids are nanoparticle colloidal dispersion commonly used to heat transfer applications. The characterization of their thermophysical properties is highly important in order to determine their potential use in different devices. Surfactant addition is a technique commonly used to improve the nanoparticles dispersion, however, their effect in the thermophysical properties is not study deeply. In this study, surface tension and viscosity of nanofluids using different concentrations of Al₂O₃ nanoparticles (0.1wt.%, 0.5wt.% and 1.0wt.%) and Sodium dodecyl benzene sulfonate (0.064wt.% and 0.32wt.%) were evaluated. Nanoparticles were dispersed using an ultrasonic probe and nanofluids surface tension and viscosity were measured using a pendant tensiometer (Drop Shape Analyzer – DSA25E, KRUSS) and a torque rheometer (DHR1, TA instruments), respectively. Results shows that surface tension of Al₂O₃/water nanofluids decreases with the increase of nanoparticles and surfactant concentration. Surface tension was decreased until 8% for 1.0wt.% nanoparticles concentration and until 57% for 0.5 wt.% of nanoparticles and 0.32 wt.% of surfactant concentration. Viscosity results showed increases with nanoparticles addition and was not affected with the surfactant presence.

Keywords: Nanofluids, Surface tension, viscosity

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