

ABSTRACT

The need for energy saving and several environmental concerns in the past few decades have increased the demand for better thermal management in industrial equipment. In the last two decades, nanofluids emerged to be a potential candidate to meet this need. Nanofluids have better heat transfer characteristics when compared to the base fluid. And one of the problems encountered in nanofluids is the aggregation of nanoparticles due to the presence of van Der Waals forces. The aim of this project is to study the impact of aggregation on the heat transfer characteristics of the nanofluid. This has been studied for Al_2O_3 water based nanofluid with volume fraction in the range of 0.05% - 0.5% and for mean particle diameters in the range of 20nm-200nm. The Reynolds numbers in the range of 11000-47000 have been considered. The effect of increasing particle size on thermal conductivity, heat transfer coefficient and pressure drop has been studied.