Improved thermal conductivity of TiO2-SiO2 hybrid nanofluid in ethylene glycol and water mixture

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IOP Conference Series: Materials Science and Engineering
2017, 257, 12067

The need to study hybrid nanofluid properties such as thermal conductivity has increased recently in order to provide better understanding on nanofluid thermal properties and behaviour. Due to its ability to improve heat transfer compared to conventional heat transfer fluids, nanofluids as a new coolant fluid are widely investigated. This paper presents the thermal conductivity of TiO2-SiO2 nanoparticles dispersed in ethylene glycol (EG)-water. The TiO2-SiO2 hybrid nanofluids is measured for its thermal conductivity using KD2 Pro Thermal Properties Analyzer for concentration ranging from 0.5% to 3.0% and temperature of 30, 50 and 70°C. The results show that the increasing in concentration and temperature lead to enhancement in thermal conductivity at range of concentration studied. The maximum enhancement is found to be 22.1% at concentration 3.0% and temperature 70°C. A new equation is proposed based on the experiment data and found to be in good agreement where the average deviation (AD), standard deviation (SD) and maximum deviation (MD) are 1.67%, 1.66% and 5.13%, respectively.