Viscosity, electrical and thermal conductivities of ethylene and propylene glycol-based β-SiC nanofluids

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ABSTRACT

This paper reports experimental investigation on the viscosity, electrical and thermal conductivities of ethylene glycol and propylene glycol based β-SiC nanofluids. Two-step technique was used to formulate stable nanofluids at room temperature. The properties of nanofluids were measured at temperatures between 298.15 K and 353.15 K for different concentrations up to 3.0 wt.% loading (1.0 vol.%). The effect of temperature and base liquid was analysed on each of nanofluid sample. The experimental results showed that both electrical and thermal conductivity increase while viscosity decreases with temperature. The properties of the base liquid are found to influence the nanofluid properties. The underlying mechanisms have been established and discussed. Furthermore, some new empirical equations are derived to correlate the measured properties data. The results can be applied to predict the viscosity, electrical and thermal conductivities of ethylene glycol and propylene glycol-based β-SiC nanofluids.

KEYWORDS

SiC; Viscosity; Electrical conductivity; Thermal conductivity; Nanofluid

ACKNOWLEDGEMENTS

This research is supported by URIF Grant No. (0153AA-G01) and partly by PRF Grant awarded to Dr. Eswaran Padmanabhan. The first author is thankful to Universiti Teknologi PETRONAS for the award of Graduate Assistantship (GA) under the project.