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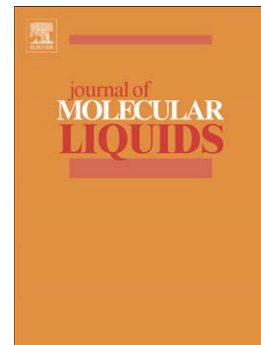
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Hybrid nanoparticles effects on rheological behavior of water-EG coolant under different temperatures: an experimental study

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Abstract

In this paper, an experimental study has been conducted on the rheological behavior of water-EG coolant in presence of MgO-MWCNTs hybrid nanomaterials. For this purpose, nanofluid samples were prepared by suspending the nanomaterials in a mixture of water and EG with solid volume fractions of 0.025%, 0.05%, 0.1%, 0.2%, 0.4%, 0.6% and 0.8%. Viscosity measurements were performed at various shear rates and in the temperatures (25-60°C). Experimental data showed that all hybrid nanofluid samples had Newtonian behavior. Results showed that nanofluid viscosity decreased with increasing temperature and augmented with increasing the volume fraction. Moreover, a comparison between the experimental results of this study and those of other studies showed that the viscosity ratio in the current study is higher than other studies. Eventually, a new accurate correlation was developed to assist the calculation of the viscosity of the MgO-MWCNTs/water-EG at different temperatures and volume fractions.

Keywords: Viscosity; Hybrid nanofluid; Water-EG; MgO nanoparticles; MWCNTs

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