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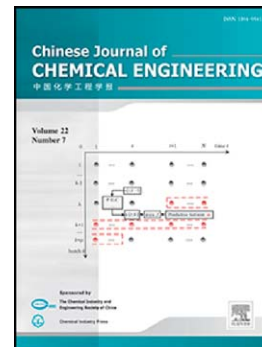
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Experimental investigation and development of new correlation for influences of temperature and concentration on dynamic viscosity of MWCNT-SiO₂ (20-80)/20W50 hybrid nano-lubricant

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Abstract

In current research, MWCNT-SiO₂/oil hybrid nano-lubricant viscosity is experimentally examined. By dispersing 0.05, 0.1, 0.2, 0.4, 0.8 and 1% volume of MWCNTs and SiO₂ nanoparticle into the engine oil SAE 20W50, the temperature and solid volume fraction consequences were studied. At 40 to 100 °C temperature, the viscosities were assessed. The results indicated Newtonian behavior for the hybrid nano-lubricant. Moreover, solid volume fraction augmentation and temperature enhanced the viscosity enhancement of hybrid nano-lubricant. At highest solid volume fraction and temperature, nano-lubricant viscosity was 171% greater compared to pure 20W50. Existed models lack the ability to predict the hybrid nano-lubricant viscosity. Thus, a new correlation regarding solid volume fraction and temperature was suggested with R-squared of 0.9943.

Key words: Hybrid nano-lubricant, Dynamic viscosity, Temperature, Solid volume fraction, New correlation.

1. Introduction

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