Optimization, Modeling of Thermal Conductivity and Viscosity of Cu/Engine Oil Nanofluids by NSGA-II Using RSM

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Abstract

This study provides the optimization of thermophysical properties of Cu/engine oil nanofluid. In this optimization, the objective functions were determined with the experimental data of viscosity and TC of nanofluid using RSM. Two equations for predicting thermal conductivity (TC) and viscosity data were presented which can accurately predict these properties. The NSGA-II method was used for multi-objective optimization (Mo-O) and Pareto's front was introduced to study optimal viscosity and TC responses. According to the results, the highest TC and the lowest viscosity occurs when the temperature and solid volume fraction (SVF) of the nanoparticle are at their maximum values. Among the results, those with the highest TC and the lowest viscosity are referred to as optimal points.

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FIG 5.docx available at https://authorea.com/users/337336/articles/462938-optimization-modeling-of-thermal-conductivity-and-viscosity-of-cu-engine-oil-nanofluids-by-nsga-ii-using-rsm

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