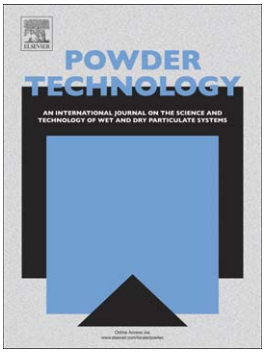

Prediction of viscosity of several alumina-based nanofluids using various artificial intelligence paradigms - Comparison with experimental data and empirical correlations

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Prediction of viscosity of several alumina-based nanofluids using various artificial intelligence paradigms - comparison with experimental data and empirical correlations

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ABSTRACT

Nanofluids have recently been considered as one of the most popular working fluid in heat transfer and fluid mechanics. Viscosity is one of the most important thermo-physical properties that influence both momentum and heat transported by the nanofluids. Accurate estimation of this parameter is required for investigation the heat transfer performance of nanofluids. Therefore, in this study 1- the most influential variables on viscosity of the nanofluids are determined 2- various artificial intelligence (AI) models are developed for prediction of viscosity of alumina nanoparticle in various base fluids, 3- by comparing predictive accuracy of the developed models and available empirical correlations, the best one is selected. Correlation matrix analyses confirmed that the reduced pressure, invers of reduced temperature, acentric factor of the base fluids, and diameter and volume concentration of the nano particles in base fluids are the most influential independent variables on viscosity of nanofluids. Various statistical indices including mean square errors

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