

عنوان مقاله:

Nanofluid Thermal Conductivity Prediction Model Based on Artificial Neural Network

محل انتشار:

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خلاصه مقاله:

Heat transfer fluids have inherently low thermal conductivity that greatly limits the heat exchange efficiency. While the effectiveness of extending surfaces and redesigning heat exchange equipments to increase the heat transfer rate has reached a limit, many research activities have been carried out attempting to improve the thermal transport properties of the fluids by adding more thermally conductive solids into liquids. In this study, new model to predict nanofluid thermal conductivity based on Artificial Neural Network. A two-layer perceptron feedforward neural network and backpropagation Levenberg-Marquardt (BP-LM) training algorithm were used to predict the thermal conductivity of the nanofluid. To avoid the preprocess of network and investigate the final efficiency of it, 70% data are used for network training, while the remaining 30% data are used for network test and validation. Fe_2O_3 nanoparticles dispersed in waster/glycol liquid was used as working fluid in experiments. Volume fraction, temperature, nano particles and base fluid thermal conductivities are used as inputs to the network. The results show that ANN modeling is capable of predicting nanofluid thermal conductivity with good precision. The use of nanotechnology to enhance and improve the heat transfer fluid and the cost is exorbitant. It can play a major role in various industries, particularly industries that are involved in that heat

کلمات کلیدی:

Nanofluid, Neural Network, thermal conductivity

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