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Evaluation of thermal conductivity of the NiFe₂O₄ ferrofluids under influence of magnetic field

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The co-precipitating method was used to synthesize magnetic nickel ferrite (NiFe₂O₄) nanoparticles. The structural, morphological and magnetic properties of the nickel ferrite nanoparticles were measured by the X-ray diffraction (XRD), Scanning Electron Microscopy (SEM) and the Vibrating Sample Magnetometer (VSM) respectively. The prepared nanoparticles were used to prepare stable nickel ferrite (NiFe₂O₄)/ water (H₂O) nanofluids were prepared using a two step method. Nickel ferrite nanofluids of various concentrations (0.2%, 0.4%, 0.6%, 0.8%, and 1% by volume) are prepared by dispersing appropriate amount of nanoparticles in water. Further, we attempt to study the thermal conductivity of the NiFe₂O₄/Water nanofluids under the influence of the magnetic fields ranging from 0G to 150G at the 300K. The thermal conductivity of the nanofluid was found to be increasing with increasing volume fraction and magnetic field strength. The nanofluids at smaller magnetic field strength show faster growth in the thermal conductivity.

Topics

[Thermal conductivity](#), [Ferromagnetic materials](#), [Magnetic equipment](#), [X-ray diffraction](#), [Magnetic fields](#), [Scanning electron microscopy](#), [Nanoparticle](#), [Nanofluidics](#), [Magnetic fluids](#)

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