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Temperature dependent viscosity of cobalt ferrite / ethylene glycol ferrofluids

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In the present work, cobalt ferrite / ethylene glycol ferrofluid is prepared in 0 to 1 (in the step of 0.2) volume fraction of cobalt ferrite nanoparticles synthesized by co-precipitation method. The XRD results confirmed the formation of single phase spinel structure. The Raman spectra have been deconvoluted into individual Lorentzian peaks. Cobalt ferrite has cubic spinel structure with Fd3m space group. FT-IR spectra consist of two major absorption bands, first at about 586 cm^{-1} (ν_1) and second at about 392 cm^{-1} (ν_2). These absorption bands confirm the formation of spinel-structured cobalt ferrite. Brookfield DV-III viscometer and programmable temperature-controlled bath was used to study the relationship between viscosity and temperature. Viscosity behavior with respect to temperature has been studied and it is revealed that the viscosity of cobalt ferrite / ethylene glycol ferrofluids increases with an increase in volume fraction of cobalt ferrite. The viscosity of the present ferrofluid was found to decrease with increase in temperature.

Topics

[Crystal structure](#), [Nanoparticle](#), [Raman spectroscopy](#), [Precipitation method](#), [Chemical compounds](#), [Absorption band](#), [Magnetic fluids](#), [Viscosity measurements](#)

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