



Contribution ID: 296

Type: **Invited Speaker**

Ultrasonic and Molecular Interaction Studies of Nanofluids

Thursday, 25 May 2017 08:40 (25 minutes)

Nano fluids are engineered colloidal suspensions of nanoparticles in a base fluid. These nanoparticles are typically made of carbides or carbon nanotubes, metals, oxides and so on. Nanofluids are potential heat transfer fluids with enhanced thermo physical properties and heat transfer performance can be applied in many devices for better performances (i.e. energy, heat transfer and other performances). Nanofluid in solar collectors is another application where nanofluids are employed for their tunable optical properties. Using sonication, the dispersion of nano particles in the base fluid is made uniform. Ultrasonic velocity in a nanofluid depends on material density and elasticity. It can be measured using nanofluid Interferometer. The viscosity of nanofluids can be determined BROOKFIELD viscometer. The density studies are made using Pycnometric method. Refractive index studies are done using Abbe Refractometer. Various molecular interaction parameters [1-3] like adiabatic compressibility, viscous relaxation time, inter molecular free length, free volume, internal pressure, etc can be analysed with the knowledge of ultrasonic velocity, viscosity and density and the results are discussed in the light of solute-solvent interaction. This kind of study helps to understand the behavior of nano-molecules with respect to changing concentration. Molecular interaction studies of Zinc oxide nanofluid will be discussed in this paper.

Keywords: Adiabatic Compressibility, Free volume, Nanofluids, Sonication, Ultrasonic velocity

Primary author: VENKATRAMANAN, K (Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya)

Presenter: VENKATRAMANAN, K (Sri Chandrasekharendra Saraswathi Viswa Mahavidyalaya)

Session Classification: A8: Instrument I

Track Classification: Instrumentation, Metrology and Standards