Abstract

The paper studies experimentally the enhancement in thermal conductivity of Nano fluid / distilled water (10 nm particle size) at four different volume fractions (0.13, 0.24, 1 and 1.7%). The Alumina powder posses the following specifications: spherical, 99% purity, white appearance, 3700 bulk density, 160m2/g specific surface area, 880J/kg. K specific heat, 46W/m. K thermal conductivity. The tests performed at average temperatures (37.9 and 44.23°C). The effect of both temperature and Nano fluid volume fraction on its thermal conductivity is investigated. The fluid is allowed to flow in annulus cooling channel subjected to constant heat fluxes (20693W/m2 and 27752W/m2) which corresponds to Nano fluid temperature, Tnf (37.9°C and 44.23°C). Thermal conductivity of the fluid is measured using Decagon KD2-senser. The experimental results showed an enhancement in the ratio of Nano fluid thermal conductivity to distilled water thermal conductivity, of about (0.3-4.5%). The experimental results are then compared with those related to other results obtained using correlations elaborated from previous works.


Index Terms

Computer Science

Applied Sciences

Keywords

Nano fluid enhancement preparing suspension.