

Electrical conductivity and relative permittivity of 15 nm Al₂O₃-water nanofluids.

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Abstract

In recent years were conducted numerous theoretical and experimental studies since Choi established the new concept of nanofluid in 1993^[1], since then, great progress has been made in the study of thermal properties and their applications^[2-3]. The presente work involves a study on the electrical conductivity and relative permittivity of aluminium oxide nanoparticles with milli-Ro and mili-Q water as base fluids. The effective electrical conductivity and permittivity have been measured as function of temperature, between 298.15 K and 328.15 K, for different volume fractions of aluminium oxide nanoparticles, Al₂O₃, of 15 nm. The experiment was performed at atmospheric pressure. The experimental results show the importance of volume fraction of the Al₂O₃ nanoparticles in the relative permittivity and effective electrical conductivity of these nanofluids with the temperature.^[4-6]. It is also shown as the purity of the base fluid (milli-Ro or mili-Q water) used influences on the effective electrical conductivity values.

Keywords: permittivity, electrical conductivity, aluminium oxide, nanofluids, nanoparticles

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