View metadata, citation and similar papers at core.ac.uk
brought to you by CORE
provided by The International Islamic University Malaysia Repository

Abstract

Natural convection heat transfer in nanofluids has been investigated numerically using computational fluid dynamics (CFD) approach. Analytical models that describe molecular viscosity, density, specific heat, thermal conductivity and coefficient of thermal expansion have been considered in terms of volume fraction and size of nanoparticles, size of base fluid molecule and temperature. The uniform suspensions of different concentrations of Al_2O_3 in base fluid (water) are considered as nanofluids. Thermal conductivity of the nanofluids has been obtained by solving the governing equations in conjunction with Kinetic model and interfacial layer model using FLUNET 6.3. Numerical simulations have been carried out in a closed pipe for L/D = 1.0. The numerical values of k have also been compared with the experimental values available in the literature. Both the models gave similar predictions with experimentally compared values of k.