

**INVESTIGATION OF THE EFFECT OF BROWNIAN MOTION ON THE FLOW
CHARACTERISTIC IN NATURAL CONVECTION USING DIFFERENT
NANOFLUIDS**

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ABSTRACT

This paper reports the effect of the Brownian motion on the fluid flow and heat transfer performance using various nanofluids in a natural convection in square enclosure. The energy equation and Navier-Stokes equation are solved numerically using finite volume approach. The effect of the Brownian motion was employed based on thermal conductivity model with Brownian motion effect. The effect of volume concentration on the enhancement of heat transfer has been studied incorporating the Brownian motion; the influence of effective thermal conductivity on the enhancement was also investigated for a range of volume fraction concentration. Various volume concentrations were tested in the present study; 2%, 3%, 4% and 6%. Different Raleigh numbers were investigated for different nanoparticles. The results revealed that the increase in the volume fraction deteriorates the heat transfer. The velocity gradients were also found to be affected by the volume fractions. The temperature profile for different Rayleigh number is presented. Three different nanofluids Cu-Water, Tio₂-water and AL₂O₃-water were studied.