

**WATER-BASED AND COOLANT-BASED CNT-OH
NANOFLUIDS: THERMAL CONDUCTIVITY
ENHANCEMENT STUDY**

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Water-based and Coolant-based CNT-OH Nanofluids: Thermal Conductivity Enhancement Study

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Over the past decade, nanofluids, which are liquids containing suspensions of nanoparticles (Figure. 1), have been reported to possess substantially higher thermal conductivity than anticipated from the effective medium theories. This makes them very attractive as heat transfer fluids in many applications for example as coolants in the automobile and electronics industries.

Thermal conductivity enhancement of water-based and coolant-based fluids composed of multiwalled carbon nanotubes functionalised with hydroxyl group (CNT-OH) have been experimentally studied at various temperatures ranging from 6°C to 45°C. Stable and homogeneous nanofluids have been produced using polyvinylpyrrolidone (PVP) as the dispersing agent and physical agitation process using homogenizer and ultrasonicator. The results have shown that both nanofluids are stable up more than 100 hours with no sedimentation occur. The present of CNT-OH enhances the thermal conductivity and heat transfer of the nanofluids considerably. The enhancement increase in temperature and CNT-OH loading in both base fluids.

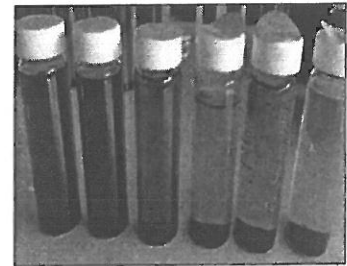


Figure 1 Water based nanoparticles suspensions.

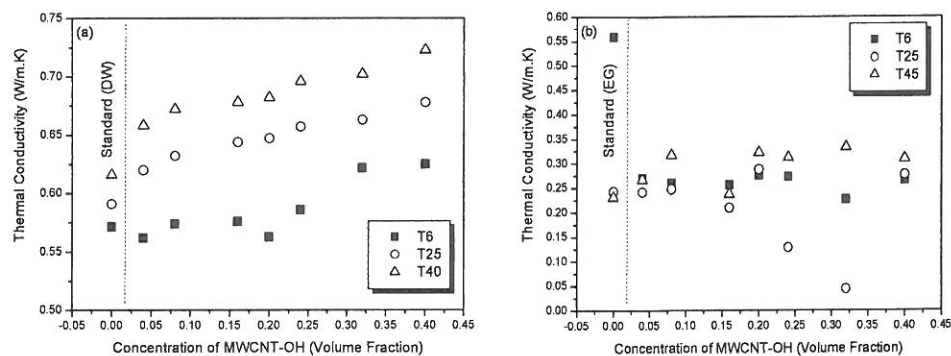


Figure 2 Thermal conductivity of MWCNT-OH-OH in (a) deionised water and (b) ethylene glycol.

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