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Thermal Conductivity of Carbon Nanotube/Liquid Nanofluid
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Nanofluids have been shown to be a potential heat-transferring medium due to nanofillers superior thermal conductivity and larger surface areas. Multi-wall carbon nanotubes (MWNT) have quickly attracted much attention in this nanofluid field because of their unique thermal conductivity. Our studies on MWNT nanofluid show that there is a modest improvement in thermal conductivity at a high nanotube loading, $\sim$35% increase for a 1wt% MWNT nanofluid. We attribute this increase to the formation of a nanotube network with a higher thermal conductivity. However, at low nanotube loadings, < 0.03wt%, we observe a decrease in thermal conductivity with the increase of the loading, $\sim$30% decrease for a 0.02wt% nanofluid. A thermal void mechanism is proposed to explain this unexpected decrease. Molecular size and polarity of the matrix liquids have been studied to gain more insights on the heat transportation inside nanofluids.

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