

Enhanced thermal conductive film with Carbon nanotube/Graphene composite prepared in a green way

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Due to the high thermal conductivity, carbon materials such as carbon nanotube and graphite has drawn interest for usage as a heat sink. However, existing studies required the usage of harsh chemical solvents, surfactants, stabilizers, and thermal expansion followed exfoliation for achieving stable dispersion of carbon nanotube (CNT) and graphene which limits its usage for the actual application. Herein, we demonstrate a novel green method of preparing CNT/graphene composite film with high thermal conductivity. By functionalization, stable dispersion of CNT in an aqueous solvent is achieved which also enhances the dispersion of graphite in an aqueous solvent by its strong interaction via π - π interaction, van der Waals interaction. The fabricated film showed high thermal conductivity due to the network formed by strong interaction between CNT and graphene.