

Graphene Reinforced Polymer Nanocomposites: Recent Development and Opportunities

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Graphene is a unique material with a Young's modulus of 1 TPa and a strength of 130 GPa which has emerged as a subject of enormous scientific interest due to its exceptional electron transport, mechanical and thermal properties, and high surface area. Graphene can be incorporated into the polymer matrices by different techniques, such as in situ polymerization, solution casting and melt blending method. When incorporated appropriately into the polymer matrices, these thin carbon sheets can significantly improve the properties of host polymers at extremely small content. Various studies have been reported on the effects of graphene on different types of polymers such as polyethylene terephthalate (PET), polycarbonate (PC), polypropylene (PP), and polymer blends such as PET/PP and PC/acrylonitrile butadiene styrene. It can be noted that the dispersion of the graphene fillers is an important issue that needs to be addressed as it influences the properties of the polymer nanocomposites. This presentation will provide an overview of the recent studies of effect of graphene on various properties of polymer nanocomposites properties. The properties covered are mechanical, thermal, flammability and electrical. Potential applications of graphene reinforced polymer composites will also be provided.