

Preparation and mechanism analysis of electrical and thermal conductive network DGEBA/PEI /HRGO nanocomposites

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Epoxy resin as a highly cross-linked thermosetting polymer with excellent chemical and corrosion resistance, outstanding adhesion, good dimensional stability and low cost. In this study, the highly reduced graphene oxide (HRGO) were fabricated from the chemical reduction. The highly reduced graphene oxide (HRGO) were incorporated into the diglycidyl ether of a bisphenol A/polyetherimide (DGEBA/PEI) binary system to build a electrical and thermal conductive network by Reaction Induced Phase Separation (RIPS) behavior. After the cure-reaction, the fractured surfaces of DGEBA/PEI/HRGO nanocomposites were observed by FE-SEM measurement to determine the final morphology. The electrical conductivity of the nanocomposites were measured by a four-point probe(CMT-100). The effects of HRGO on the RIPS behavior of the composites were analyzed by DSC measurement. The thermal properties of nanocomposites were measured by TGA measurement. The DGEBA/PEI/HRGO composites will be applied in coating and electromagnetic shielding field.