

Preparation and Mechanism analysis of 3D electrical and thermal conductive  
DGEBA/PEI/SiO<sub>2</sub>@RGO nanocomposites

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In this study, Reduced Graphene Oxide (RGO)-encapsulated SiO<sub>2</sub> hybrids (SiO<sub>2</sub>@RGO) were fabricated from the chemical reduction of electrostatically assembled SiO<sub>2</sub>@GO hybrids. The reduced graphene oxide (RGO)-encapsulated SiO<sub>2</sub> hybrids (SiO<sub>2</sub>@RGO) was incorporated into the Diglycidyl ether of a bisphenol A/polyetherimide (DGEBA/PEI) binary system to contribute a three-dimensional electrical and thermal conductive network and to regulate the Reaction Induced Phase Separation (RIPS) behaviour. After the cure-reaction was completed, the fractured surfaces of DGEBA/PEI/SiO<sub>2</sub>@RGO composites were observed by SEM measurement to determine the final morphology. DSC was used to analyze the effect of SiO<sub>2</sub>@RGO on the RIPS behaviour of the composites. The storage modulus and tan  $\delta$  of the composites were measured with Dynamic mechanical thermal analysis (DMA).