Thermo-mechanical properties of di-and tetra-functional epoxy hybrid/graphite nanoplatelets nanocomposites

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Graphite nanoplatelets(GNP) have exceptional mechanical strength, thermal conductivity, specific surface area and ultra high electron transport properties. When used as fillers in nanocomposites, these thin carbon sheets can significantly improve physical properties of polymers at exceedingly small loading. In this study, possibility of enhancing the mechanical and thermal properties of DGEBA based epoxy resin through dispersion of GNP within the polymer matrix was investigated. Tetra-functional epoxy resin was employed as additive resin to produce high performance epoxy/GNP composite with high modulus and glass transition temperature. Epoxy/GNP nanocomposites were prepared and their characteristics were investigated by DSC, DMA and TMA. Incorporation of GNP and tetra-functional epoxy resin into DGEBA resulted in high nanocomposites.