Tailoring graphene reinforced thermoset and biothermoset composites

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Abstract

The surge of knowledge among researchers pertaining to the excellent properties of graphene has led to the utilisation of graphene as a reinforced filler in poly-mer composites. Different methods of graphene prepara-tion, either bottom-up or top-down methods, are important requirements of starting materials in producing reinforced properties in the composites. The starting graphene mate-rial produced is either further functionalised or directly used as a filler in thermoset polymer matrixes. An effec-tive interaction between graphene and polymer matrixes is important and can be achieved by incorporating graphene into a thermoset polymer matrix through melt mixing, solu-tion mixing or *in situ* polymerisation processes. In addition, by taking into consideration the importance of green and sustainable composites, the details of previous work on graphene reinforced bio-thermoset polymer matrixes is dis-cussed. The resultant mechanical and thermal properties of the composites were associated to the chemical interaction between the graphene filler and a thermoset matrix. Explo-ration for further variations of graphene polymer compos-ites are discussed by taking the reinforcement properties in graphene composite as a starting point.

Keywords: biocomposite; functionalised graphene;graphene filler; graphite; thermoset resin.