INFLUENCE OF GRAPHENE NANO FILLER ON THERMAL AND DYNAMIC MECHANICAL PROPERTIES OF GLASS FIBRE POLYMER COMPOSITES

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ABSTRACT
Enhancement of various nano fillers in the glass fibre polymer composites has been studied in many fields of science and engineering with the aim of strengthening glass fibres and obtaining better performance with addition of nano fillers. To study and evaluate the visco elastic parameters in composites, dynamic mechanical analysis technique was adopted. In the present work, glass fibre reinforced epoxy composites with different graphene nano filler loadings were fabricated using the hand lay-up technique, by incorporating different graphene weight percentage (2%, 4%, 6%) of glass fibres into the epoxy matrix. The fabricated graphene reinforced glass fibre polymer composites were subjected to a series of dynamic mechanical tests with varying test frequencies (0.5 Hz, 1 Hz, 2 Hz, 5 Hz and 10 Hz) over a range of testing temperatures (20°C to 150°C). Various dynamic mechanical properties such as storage modulus (E′), Loss modulus (E″) and Glass Transition temperature (Tg) were predicted at different test frequencies (0.5 Hz, 1 Hz, 2 Hz, 5 Hz and 10 Hz). It was observed that thermal stability was found to improve on increase in graphene nano filler weight percentage in the glass fibre polymer composites. Moreover, it was noticed that, it had a significant effect on dynamic mechanical behaviour of graphene reinforced glass fibre polymer composites by varying test frequencies.

KEYWORDS: Nano Filler, Graphene, DMA & Glass Fibre

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