

Thermal and Mechanical Interfacial Behaviors of Vapor Grown Carbon Nanofibers (VGCFs)/Epoxy Matrix Nanocomposites

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In this work, vapor grown carbon fibers were formulated in nanofiber weight fraction into the epoxy in the contents of 0, 0.1, 0.5, 1, and 2 wt%. The mechanical interfacial properties of the VGCFs/Epoxy nanocomposites were examined by the dynamic mechanical analysis (DMA), and falling impact test. The thermal stabilities of the VGCFs/Epoxy were also studied by the thermo mechanical analysis (TMA), thermogravimetric analysis (TGA). From the results storage modulus (E'), critical stress intensity factor (KIC), and thermal stabilities of the nanocomposites were higher than those of the pure epoxy resin. Moreover the coefficient of thermal expansion(CTE) of VGCFs/Epoxy nanocomposites were lower than that of the pure epoxy resin. Consequently, the mechanical interfacial behaviors and thermal stabilities could be enhanced in the presence of the suitable content of the VGCFs in the composite system.