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RHEOLOGICAL AND ELECTRICAL PROPERTIES IN EPOXY RESIN REINFORCED WITH CARBON NANOTUBES

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Multi-walled carbon nanotube (MWNT)/Epoxy nanocomposites were prepared using high shear mixing to achieve uniform dispersion of the nanotubes in the polymer matrix. Rheological, mechanical properties and electrical conductivity of these nanocomposites were investigated. At low frequencies, the storage modulus becomes almost independent of the frequency as nanotube loading increases, suggesting an onset of solid-like behavior. A Payne effect was observed and explained in terms of filler interaction. The rheological threshold was determined by using a power law equation of percolation and compared to the threshold of electrical conductivity. The rheological threshold nearly coincides with the electrical conductivity threshold and was found to be less than 0.5 wt% nanotubes