

Acid-Based Surfactant-Aided Dispersion of Multi-Walled Carbon Nanotubes in Epoxy-Based Nanocomposites

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Abstract

In this study, the dispersion of multi-walled carbon nanotubes (MWCNTs) in epoxy was facilitated by an anionic surfactant, linear alkyl benzene sulfonic acid. Different types of composites were prepared using a fixed amount of MWCNTs (0.5 wt%), in absence of solvent/surfactant, in presence of solvent and solvent/surfactant. The composites were characterized using Fourier transform infrared spectrophotometer, thermogravimetric analyzer (TGA), differential scanning calorimeter (DSC), universal testing machine, pendulum impact system, X-ray diffraction, and scanning electron microscope. The epoxy/MWCNTs nanocomposite exhibited significantly higher mechanical properties due to the better dispersion in the presence of the surfactant. The tensile strength and flexural strength were increased by 75% and 108%, respectively. The thermal, structural, and morphological analyses were also excellent as a result of the better dispersion. In addition, the solvent/surfactant behavior was hypothesized for the epoxy/ MWCNTs system. POLYM. ENG. SCI., 9999:1–8, 2018. © 2018 Society of Plastics Engineers