

Effect of Multi Walled Carbon Nanotubes on Pyrolysis Behavior of Unsaturated Polyester Resin

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Abstract : In the case of advance polymeric materials reinforcement and thermal stability of matrix is a focused arena of researchers. The distribution of carbon nanotubes (CNTs) in polymer matrix influences material properties. In this study, multi-walled carbon nanotubes (MWCNTs) have been dispersed in unsaturated polyester resin (UPR) through solution mixing and sonication techniques using tetra hydro furan (THF) solvent. Nanocomposites have been fabricated with solution mixing and without solution mixing. Viscosity, Fourier-transform infrared spectroscopy, Field emission scanning electron microscopy (FESEM) investigations have been conducted to study the distribution as well as interaction between matrix and MWCNT. The differential scanning calorimetry (DSC), thermogravimetric analyses (TGA) and pyrolysis behavior have been conducted to study the thermal degradation and stability of nanocomposites. In addition, the SEM micrographs of nanocomposite residual chars were exhibited more packed together. Incorporation of CNT enhances crystallinity and mechanical and thermal properties of the nanocomposites. Correlations among MWCNTs dispersion, nucleation, fracture morphology and various properties have been made.

Keywords : char, multiwall carbon nanotubes, nano composite, pyrolysis

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