

Functionalization and Dispersion of Multiwall Carbon Nanotubes in Waterborne Polyurethane

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Abstract : Multiwall carbon nanotubes were chemically modified with amide groups for the purpose of enhancing their chemical affinity with waterborne polyurethane. In this study, a thermoplastic nanocomposite containing functionalized multiwall carbon nanotube/waterborne polyurethane (WBPU/MWNT) via in situ polymerization has been prepared. The impacts of MWNT addition on the morphology and electrical properties of nanocomposites were investigated. Micrographs of Scanning Electron Microscopy (SEM) prove that functionalized CNT can be effectively dispersed in WBPU matrix. The electrical conductivity of nanocomposites increased with the CNT contents in as such the nanocomposites containing 1 wt% of MWNT exhibited a conductivity nearly five orders of magnitude higher than the WBPU film.

Keywords : chemical functionalization, electrical properties, in situ polymerization, morphology, multiwall carbon nanotubes, waterborne polyurethane

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