

Preliminary Studies of MWCNT/PVDF Polymer Composites

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Abstract : The combination of multi-walled carbon nanotubes (MWCNTs) with polymers offers an attractive route to reinforce the macromolecular compounds as well as the introduction of new properties based on morphological modifications or electronic interactions between the two constituents. As they are only a few nanometers in dimension, it offers ultra-large interfacial area per volume between the nano-element and polymer matrix. Nevertheless, the use of MWCNTs as a rough material in different applications has been largely limited by their poor processability, insolubility, and infusibility. Studies concerning the nanofiller reinforced polymer composites are justified in an attempt to overcome these limitations. This work presents one preliminary study of MWCNTs dispersion into the PVDF homopolymer. For preparation, the composite components were diluted in n,n-dimethylacetamide (DMAc) with mechanical agitation assistance. After complete dilution, followed by slow evaporation of the solvent at 60°C, the samples were dried. Films of about 80 μm were obtained. FTIR and UV-Vis spectroscopic techniques were used to characterize the nanocomposites. The appearance of absorption bands in the FTIR spectra of nanofilled samples, when compared to the spectrum of pristine PVDF samples, are discussed and compared with the UV-Vis measurements.

Keywords : composites materials, FTIR, MWNTs, PVDF, UV-vis

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