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Multiple functionalization of multi-walled carbon nanotubes with carboxyl and amino groups

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Abstract

In this paper, carboxyl and amino groups have been introduced onto the surface of the multi-walled carbon nanotubes (MWCNTs) by the mixed acid treatment and the diazonium reaction, respectively. The presence of multifunctionality groups on the MWCNTs has been characterized by Fourier transform infrared (FT-IR) spectroscopy, thermogravimetric (TGA) analysis, Raman spectra, scanning electron microscopy (SEM) and energy dispersive X-ray spectrum (EDS). The multifunctionalized carbon nanotubes were further utilized to react with acetyl chloride and ethylenediamine (EDA). The formation of the amide bond in the grafting reaction has been confirmed by FT-IR spectroscopy. The result indicates that the further grafting is successful. The

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