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A Study on the Effect of Pyrene Derivatives on the Noncovalent Sidewall Functionalisation of Carbon Nanotube Buckypapers

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Abstract

Four pyrene derivatives were designed and synthesised in order to examine the effect of noncovalent sidewall functionalisation on the mechanical and electrical properties of multiwalled carbon nanotube buckypapers. High-density, wellslightly-aligned carbon nanotube buckypapers were prepared by a wet-laid process from a homogeneous dispersion of carbon nanotubes treated with a high-pressure homogeniser. The prepared pyrene derivatives were added to the carbon nanotube dispersion in order to induce the noncovalent sidewall functionalisation before the wet-laid process. The electrical conductivities of the buckypapers increased dramatically after the noncovalent sidewall functionalisation because of the enhanced charge transfer efficiency. Some of the functionalised carbon nanotube

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