

Carbon Nanotube-Coated Polymeric Microspheres

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Polymer composites reinforced with carbon nanotubes (CNTs) are believed to have many potential engineering uses, ranging from battery electrodes and electronic devices to much stronger composites. Furthermore, its electrorheological (ER) characteristics have recently been reported, in which a suspension polymerized particle of a CNT nanocomposite with poly(methyl methacrylate) (PMMA) was dispersed in silicone oil. ER fluids are mainly suspensions of particles with a higher dielectric constant and/or conductivity than that of the suspending medium fluids with a low dielectric constant and a low viscosity. In this study, surface-conductive microspheres consisting of PMMA core and CNTs-adsorbed shell were prepared using a simple process involving the blending of two colloidal solution, an aqueous CNT dispersion with surfactants and an aqueous PMMA microsphere colloid. These were adopted as the suspended particles for ER fluids, in which the electrical conductivity originated primarily from the surface-coated conducting CNT layers.