

Rheological and electrical properties of PS/PEDOT:PSS-modified CNT nanocomposites via latex technology

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Carbon nanotubes (CNTs) are used as conducting nanoscale fillers due to their outstanding electrical properties, but they exist as bundles caused by strong van der Waals force between them. A lot of works such as physical and chemical modification of CNTs have been performed to solve the dispersion problem. Chemically modified CNTs show good dispersion but deteriorate the intrinsic properties of CNT by the breakage of  $sp^2$  bond. Physical modification with low molecular weight surfactant renders good dispersion but shows adverse effect on mechanical properties of nanocomposites. In this study, we modified CNTs by the coating of polydopamine, PEDOT:PSS and EG-treated PEDOT:PSS on CNT surface and prepared the PS/CNT nanocomposites by using the surface-modified CNTs through latex technology. Their morphology and rheological and electrical properties were investigated. The nanocomposites showed good dispersion of CNTs, enhanced electrical conductivity and good mechanical properties, compared to the counterparts prepared with other methods.

Keywords: surface-modified CNT, nanocomposites, latex technology, rheological properties, electrical conductivity.