

Research Paper

Conventional wet impregnation versus microwave-assisted synthesis of SnO₂/CNT composites

[Sarah Motshekga](#), [Sreejarani K. Pillai](#) and [Suprakas S. Ray](#)

Abstract

Carbon nanotubes decorated with SnO₂ nanoparticles were prepared by conventional and microwave-assisted wet impregnation. The composites were thoroughly characterized by X-ray diffraction, Raman spectroscopy, BET-surface area measurement, Scanning and transmission electron microscopy. The XRD studies revealed the formation of tetragonal phase of SnO₂. The microwave method produced CNTs heavily decorated with SnO₂ nanoparticles with average size 5 nm in a total reaction time of 10 min because of the rapid volumetric heating. DC conductivity increased significantly for the nanocomposite samples when compared with the pure CNTs. In electrical conductivity properties, sample prepared by microwave method was found to be superior to the one prepared by conventional procedure due to homogeneous distribution of nanoparticles.

Keywords: Wet impregnation–Microwave synthesis–SnO₂ nanoparticles–CNTs–Nanomaterials

<http://www.springerlink.com/content/7830n226182311tm/>