ANCHORAGE OF INORGANIC NANOPARTICLES ON NITROGEN DOPED MULTIWALLED CARBON NANOTUBES

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In this work we report a novel method to anchor inorganic nanoparticles such as alumina and zirconia on the surface of N-doped multi-walled carbon nanotubes (CNx-MWNTs). The process is carried out using a wet chemical approach in conjunction with thermal treatments. We noted that during the metal particle anchoring process, individual CNx nanotubes agglomerate into bundles, thus resulting in arrays of aligned CNx tubes coated with metal oxides. Extensive characterization of the resulting nanobundles was performed using scanning electron microscopy (SEM), transmission electron microscopy (TEM), high-resolution transmission electron microscopy (HRTEM), and electron energy loss spectroscopy (EELS). A mechanism explaining the alignment is also discussed, as well as possible applications of these materials for the fabrication of ceramic composites using CNx-MWNTs.