

Preparation and characterization of novel metal/multi-walled carbon nanotubes composites

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Combining two characteristic nanostructures such as metal nanoparticles and carbon nanotubes is expected to provide a versatile building block for the construction of modern nanodevices. Composites of metal (gold and silver) nanoparticles and multi-walled carbon nanotubes (MWNTs) were prepared with metal nanoparticles stabilized by poly(4-vinylpyridine) (PVP), sodium dodecyl sulfate (SDS) and poly(sodium 4-styrene sulfonate) in methanol and MWNTs modified by poly(diallyl dimethylammonium) chloride (PDDA). Metal/MWNT nanocomposites were characterized by transmission electron microscopy (TEM), x-ray photoelectron spectroscopy (XPS), x-ray diffraction (XRD), UV/vis spectroscopy. In addition, their electrical properties were investigated. The morphology-property relationship was deliberately studied on some metal/MWNT nanocomposites treated with various stabilizers.