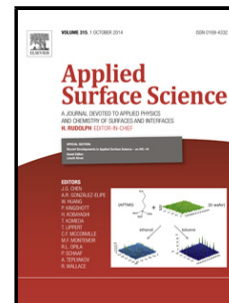


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Electroless Nickel Plating of Arc Discharge Synthesized Carbon Nanotubes for Metal Matrix Composites

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Abstract

Electroless nickel (EN) plating was performed on arc discharge synthesized multiwalled carbon nanotubes (MWCNTs) for various deposition times. X-ray diffraction (XRD), Transmission electron microscopy (TEM), and Raman spectroscopy characterization techniques are used to identify the presence of nickel deposition on the carbon nanotubes (CNTs) and the degree of graphitization. The results indicate that impurities are less in the purified CNTs as compared to raw carbon soot. Increasing deposition time up to 60 minutes increases uniform deposition of nickel throughout the length of the CNTs. However, for deposition time longer than 60 minutes, nickel particles are seen separated from the surface of the CNTs. Uniformly coated nickel CNTs throughout their length are potential candidates for reinforcements in composite materials. Magnetic properties of the nickel coated CNTs, with deposition time of 30 and 60 minutes were also evaluated. The magnetic saturation of nickel coated CNTs with deposition time of 30 minutes is less compared to nickel coated CNTs with deposition time of 60 minutes.

Keywords: *Carbon nanotubes, EN coatings, Deposition time, TEM, Metal Matrix Composites, Magnetic Properties*

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