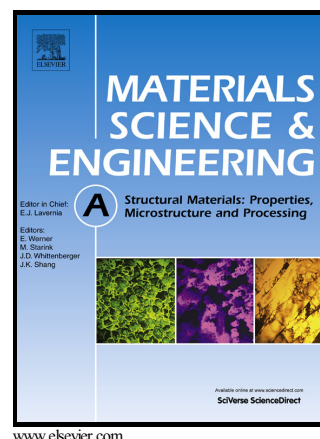


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Microstructure and Mechanical Behavior of Copper Coated Multiwall Carbon Nanotubes Reinforced Aluminum Composites

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Abstract

Electroless copper coatings were performed on purified carbon nanotubes (CNT), with varying deposition time and the optimum deposition time in terms of uniform deposition was determined to be 45 min. Different amounts of optimized Cu coated CNT (CNT (Cu)) and Al powders were ball milled. CNT (Cu) reinforced Al (Al-CNT (Cu)) composites were prepared by spark plasma sintering (SPS). Pure CNT reinforced Al (Al-CNT) composites were also prepared by SPS. The ball milled powders and composites were characterized using X-Ray diffraction, scanning electron microscopy, Raman spectroscopy, and transmission electron microscopy (TEM). Microhardness and compression properties of the composites were measured. TEM images of ball milled powders and composites revealed uniform distribution of CNT in matrix. Mechanical properties of Al-CNT (Cu) composites are superior to Al-CNT composites. The maximum enhancement in compressive strength of Al-CNT (Cu) composites is 154% for 2 wt. % reinforcement; this enhancement is attributed to the copper coating on CNT surface.

Keywords: *Nano structured materials; Composites; Powder Metallurgy; Electron Microscopy; Mechanical Characterization.*

1. Introduction

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