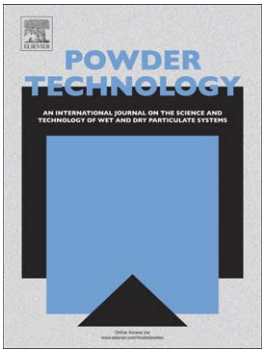

Preparation of CNT/Cu nano composite powder with uniform dispersion and strong interface bonding by SP method

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Preparation of CNT/Cu nano composite powder with uniform dispersion and strong interface bonding by SP method

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Abstract: Uniform dispersion of carbon nanotube (CNT) and strong interface combination between nano-carbon reinforcement and metal matrix are of extremely importance to fabricate CNT/metals composite by powder metallurgy method due to the hereditary effects. Therefore, in this paper, CNT/Cu composite powder was fabricated through Spray Pyrolysis (SP) to improve the dispersity and interface property. Nucleation and growth of Cu grains on the CNT surface occurred in the ultrasonic atomization of acetate ($Cu(CH_3COO)_2 \cdot H_2O$) solution droplets with mono-dispersed CNT. The microstructures of composite powder were investigated by TGA, Raman, XRD, FESEM and TEM analysis methods. Results show that structural integrity and purity of CNT can be enhanced by SP process at 500℃. And CNT/Cu composite powder with uniform dispersion and good combination between CNT and Cu particles could be obtained by SP even though high composition of CNT was added. At last, the mechanisms of nucleation and growth were estimated based on the microstructure analysis.

Keywords: Carbon nanotube, copper, composite powder, spray pyrolysis, dispersity

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