

Synthesis of carbon nanotube-carbon nanosphere on the CF surface by CVD

ABSTRACT

In the current work, the synthesis of carbon nanotubes (CNTs) and carbon nanospheres (CNS's) has been investigated by applying the chemical vapor deposition method in a one-step sample preparation. In this method, iron nitrate non-hydrate ($\text{Fe}(\text{NO}_3)_3 \cdot 9\text{H}_2\text{O}$) and acetylene (C_2H_2) have been used as the catalyst source and carbon source, respectively, to grow CNT directly on the CF surface at 700°C and then CNS's were synthesized on the CNT layers at 900°C under a 250sccm gas flow rate (40% N_2 , 40% H_2 , 20% C_2H_2). According to the SEM and TEM micrographs from the resultant carbon nanoparticles, the diameters of the CNTs and CNS's have been estimated about 30-50nm and 300-400nm, respectively.

Keyword: Carbon fiber; Carbon nanosphere; Carbon nanotube; Chemical vapor deposition