

Abstract Submitted
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Growth and characterization of CNT Forests using Bimetallic Nanoparticles as Catalyst¹ KYUNG-HWAN LEE, The University of Texas at Dallas, A. SRA, University of Texas Southwestern Medical Center at Dallas, H. JANG, The University of Texas at Dallas, B. CHOI, Korea Institute of Industrial Technology, L. OVERZET, G. LEE, D. YANG, The University of Texas at Dallas — We study the growth of Multiwall carbon nanotubes (MWCNT) using bimetallic nanoparticles (NP) as catalyst rather than zerovalent metal ions such as Fe, Ni, Co. One advantage of using bimetallic NP is that both the size and shape and composition (atomic ordering) can be controlled. We will describe a simple method of producing bimetallic Fe-Pt, Fe-Co alloy nanoparticles and compare MWCNT growth using them to Fe catalyst growth. The synthesis of Fe, Fe-Pt, Fe-Co NP was carried out using a bottom-up polyol process. Subsequent growth of MWCNT forests was accomplished by PECVD using acetylene as precursor. TEM and SEM analysis of the sample cross-section grown at substrate temperature of 680 °C indicates that the diameters of the CNTs are $\sim 10\text{-}20$ nm while height of the forest varies from 30 μm for Fe to 5 μm for Fe-Pt and 80-100 μm for Fe-Co. The number of walls in the CNTs and the graphitization content could be manipulated by varying the temperature (increasing to 760 °C) or by pre-treatment of the nanoparticles with oxygen plasma.

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