

다중벽 탄소나노튜브와 금나노입자를 사용한 나노박막의 특성연구

김정수, 배종성*, 고창현** 오원태
동의대학교, *한국기초과학지원연구원, **한국에너지기술연구원

Characterization of Au-MWNT nanocomposite in thin films

Jungsoo Kim, Jong-SeongBae*, Chang Hyun Ko**, Wontea Oh
Donggeui Univ, *Korea Basic Science Institute, **Korea Institute of Energy Research

Abstract : Nanocomposites of gold nanoparticles and multi-walled carbon nanotubes (MWNTs) were prepared by electrostatic interaction. Gold nanoparticles were stabilized by polyvinylpyrrolidone (PVP), sodium dodecyl sulfate (SDS) and poly(sodium-4-styrenesulfonate) (PSS) in aqueous medium, and MWNTs were modified by poly(diallyldimethylammonium)chloride (PDDA) in water. The as-prepared Au-MWNT nanocomposites were structurally and electrically characterized by transmission electron microscopy (TEM), field emission scanning electron microscopy (FE-SEM), X-ray diffraction (XRD), UV/Vis spectroscopy, X-ray photoelectron spectroscopy (XPS) and cyclic voltammetry (CV). UV/Vis spectra of Au-MWNT nanocomposites showed the characteristic surface plasmon bands in the range of $\sim 515\text{nm}$, depending on the stabilizers. There is only slight change on the band shape with variation of stabilizing agents for gold nanoparticles. Through FE-SEM and TEM images, the distribution of gold nanoparticles on the sidewalls of MWNTs was deliberately investigated on Au-MWNT nanocomposites treated with different stabilizers. XPS and CV showed redistribution of electron densities and changes in the binding energy states of nanoparticles in nanocomposite respectively.

Key Words : Multi-walled carbon nanotube, gold nanoparticle, thin film, nanocomposite