

용액코팅된 탄소나노튜브 전극의 광전기적 성질

우종석, 김선영, 한중탁, 이건웅*
한국전기연구원

Opto-electrical properties of solution based carbon nanotube electrode

Jong Seok Woo, Sun Young Kim, Joong Tark Han, Geon-Woong Lee*
Korea Electrotechnology Research Institute

Abstract : Transparent conductive films can serve as a critical component in displays, solar cells, lasers, optical communication devices, and solid state lighting. Carbon nanotube (CNT) based transparent conductive films are fabricated on glass and polymer substrates. CNTs typically exist in form of quasi-crystalline bundles or highly entangled bundles containing tens of individual nanotubes. To achieve full potential, CNTs must be dispersed in a solvent or other organic media. CNTs are acid treated with nitric acid then the stable dispersion of CNTs in polar solvent such as alcohols, DMF, etc. is achieved by sonication. The solubility of CNTs correlates well with the area ratio of the D and G bands from Raman spectrum. Thin films are formed from well dispersed CNT solutions using spray coating method. CNT thin films exhibit a sheet resistance (R_s) of nearby $10^3 \Omega/\text{sq}$ with a transmittance of around 80% on the visible light range, which is attributed by excellent dispersion and interaction among CNTs, solvents and polymeric binders.

Key words : Carbon nanotubes, Transparent electrode, Conductive films, opto-electrical property