

폴리올 공정을 이용한 탄소나노튜브/코발트 나노복합분말의 제조 공정

Fabrication Process of CNT/Co Nanocomposite Powders by Polyol Process

한국과학기술원 C. B. Mo*, S. I. Cha, K. T. Kim, and S. H. Hong

Since CNTs have relatively low threshold voltage and high current density owing to their high electric conductivity and high aspect ratio with a sharp top, researchers have been intensely focused on developing CNT-based field emission devices. However, CNTs deposited on substrates or metal electrodes using an arc discharge or chemical vapour deposition process are considered inadequate for large area display applications. Although researchers have proposed using screen printing of CNT pastes consisting of CNTs and organic binders for large area displays, critical problems remain, including low electric conductivity and weak bonding strength between screen-printed CNTs and metal layer.

In order to overcome previously encountered problems and to utilize the advantages of a metal layer, to be efficient electron emitters, perpendicularly aligned CNTs must be implanted within continuous metal layer and simultaneously exposed to the surface. In this study, we fabricated pearl-necklace-structured CNT/Co powders, in which Co nanoparticles are threaded by CNTs. Furthermore, the CNTs straightened and were aligned perpendicular to the substrate after sintering process. Therefore, the fabricated CNT/Co nanocomposite powders are considered to be promising for field emission device applications.