

Decoration of Multi-Walled Carbon Nanotubes by CdS Nanoparticles Using Magnetron Sputtering Method

Authors : Z. Ghorannevis, E. Akbarnejad, B. Aghazadeh, M. Ghorannevis

Abstract : Carbon nanotubes (CNTs) modified with semiconductor nanocrystalline particles may find wide applications due to their unique properties. Here Cadmium Sulfide (CdS) nanoparticles were successfully grown on Multi-Walled Carbon Nanotubes (MWNTs) via a magnetron sputtering method for the first time. The CdS/MWNTs sample was characterized with X-ray diffraction (XRD), Field Emission Scanning and High Resolution Transmission Electron Microscopies (SEM/TEM) and four point probe. The obtained images show clearly the decoration of the MWNTs by the CdS nanoparticles, and the XRD measurements indicate the CdS structure as hexagonal type. Moreover, the physical properties of the CdS/MWNTs were compared with the physical properties of the CdS nanoparticles grown on the silicon. Electrical measurements of CdS and CdS/MWNTs reveal that CdS/MWNTs has lower resistivity than the CdS sample which may be due to the higher carrier concentrations.

Keywords : CdS, MWNTs, HRTEM, magnetron sputtering

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