

Synthesis of CdSe nanoparticles immersed in an organic matrix of Amylopectin by means of r.f. sputtering

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Abstract

CdSe nanoparticles immersed in an organic matrix of Amylopectin have been synthesized by means of the r.f. magnetron-sputtering growth technique. The target was elaborated employing high CdSe and Amylopectin powders. X-ray diffraction (XRD) shows that the amylopectin thin film is amorphous, and the Raman spectrum reveals that the organic material crystalline structure (at short range) is not affected by the sputtering-process. CdSe nanoparticles grow with the hexagonal wurtzite structure. The average radius of the grains, calculated by using the Sherrer's formula radius in XRD peaks, is of the order of 7 nm. The band gap of CdSe nanoparticles measured from optical absorption measurements is 1.9 eV. Atomic force images allow observe well defined spherical regions scattered in a uniform background of the organic material, which indicate the location of CdSe nanoparticles. Synthesis of semiconducting nanoparticles in organic biocompatible matrices is an important topic of research due to its important applications in human and animal medicine.