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Synthesis and particle size control of CdSe nanoparticles by soft chemical methods

Martínez, N.¹, G. Oncins², F. Chalé¹, E. Rodríguez¹ and F. Caballero-Briones^{1,*}

¹Instituto Politécnico Nacional, Laboratorio de Materiales Fotovoltaicos, CICATA Unidad Altamira. Km 14.5 Carretera Tampico-Puerto Industrial Altamira, 89600 Altamira, Tamaulipas, México

²Centres Científics i Tecnològics, Universitat de Barcelona. Lluís Solé i Sabaris, 1-3, 08028 Barcelona, España.

*fcaballero@ipn.mx

ABSTRACT

The development of third generation solar cells requires the preparation of nanoparticulated material to increase the efficiency of carrier generation. However there are still fundamental research challenges, such as control of particle size, size distribution and controlled particle agglomeration and the electrical interaction between the nanoparticles. In this work CdSe nanoparticles were prepared from aqueous precursors by a soft method as controlled precipitation in gelatin a) and glycerin solutions b). Films were obtained introducing a glass slide in the liquid gelatin and glycerin colloidal preparations. The morphology of gelatin-prepared films was studied by atomic force microscopy. Nanoparticles 20 nm to 100 nm under the gelatin layer were obtained. The structure of nanoparticles in gelatin bulk was studied by x-ray diffraction compared with gelatin alone and CdSe prepared without gelatin. UV-Vis absorbance was compared during CdSe formation and on the deposited films. Gelatin-stabilized CdSe films show a more pronounced blue-shifted absorbance than that of glycerin ones, suggesting a better control in particle growth.

Key words: Third generation solar cell; CdSe nanoparticles, gelatin; particle size control

[1] S. Dayal, M.O. Reese, A.J. Ferguson, D.S. Ginley, G. Rumbles and N. Kopidakis, *Adv. Funct. Mater.* 20, 2629 (2010).

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