

GROWTH AND CHARACTERIZATION OF CDS NANOSTRUCTURES AND BI NANOPARTICLES

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CdS nanostructures, as nanowires (NW's) or nanobelts, are expected to have important applications at the nanoscale, in applications comprising sensorsⁱ, 3rd generation solar cellsⁱⁱ, photodetectorsⁱⁱⁱ and lasers^{iv}. In particular, it is expected that NWs of CdS, an important n-type II-VI semiconductor typically used as window material in thin film solar cells^v, would greatly raise the contact area with the absorber material in these devices. Moreover, reflection losses and photo-excited carrier mean free paths could be reduced with a consequent increase in efficiency.

In this work, CdS nanostructures were prepared with bismuth nanoparticles with sizes between 30 and 80 nm as a catalytic agent onto CdS layers grown on glass as substrates. The CdS nanowires and substrate layers were obtained using a sputtering growth system with three magnetrons. Scanning electron microscopy (SEM) and transmission electron microscopy (TEM) allowed observing the morphology, size and distribution of the bismuth nanoparticles and the obtained nanostructures that were also studied by energy-dispersive x-ray spectroscopy (EDS). The structure of CdS was identified by means of x-ray diffraction (XRD).

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