
Characterization of the diffusion within polycrystalline CdS: in thin films

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Indium doped CdS thin films were prepared by pyrolysis technique. Different ratios of Tellurium were introduced to the films during annealing processes. Evidence of formation of ternary stable compounds of the form $\text{CdS}_{1-x}\text{Te}_x$ is noted. The newly formed compounds were optically characterized through transmittance measurements and structurally analyzed by x-ray diffraction (XRD), Rutherford backscattering (RBS), Thermo- and Photo- luminescence (TL and PL) techniques. The analyses confirmed the formation of stable compounds. Results are discussed within the model of lowering the interface defect density and the formation of an intermixed interface layer resulting from various impurity and films species interdiffusion. Correlation amongst results obtained by various techniques for possible evolution of high efficiency solar cells is emphasized.