E1-13: Photoelectric properties of CdS thin films doped with aluminium and indium

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Polycrystalline thin films of CdS have received considerable attention in a variety of semiconductor devices such as solar cells, transistors and more recently in light-activated valves for large-screen liquid crystal displays. Photoelectric properties of thin films of CdS required in these devices differ considerably. Modification of these properties can be achieved through doping of the material with different dopants. We investigated the photoelectric properties of CdS thin films doped with aluminium and indium. Thin films of CdS doped with aluminium and indium were prepared on glass slides using the chemical bath technique. The doping level of CdS:Al was 0.1% wt. while CdS:In samples were doped with 0.1%, 0.05% and 0.025% wt. concentrations. Current-Voltage measurements were carried out on all samples under dark and illuminated conditions. The results indicate that the In-doped CdS films have a high dark current. Under similar intensity and bias-voltage conditions the doped-CdS films showed high photo response compared to pure CdS. Also Al-doped films showed higher photoconductivity compared to In-doped films. These experimental observations could be explained by taking into consideration, the generation/recombination rates and the density of donor centres in the material.