Fabrication of Cadmium Sulfide (p-type) Thin Film Semiconductor via Electrodeposition

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First ever electrodeposited p-type cadmium sulfide (CdS) semiconductor was witnessed in the previous research which was conducted at the Department of Chemistry, University of Kelaniya. This research is a continuation which could produce more stable p-type CdS semiconductor material. Several growth parameters namely; electrolyte concentration, growth temperature and deposition time were optimized while the rest of the parameters like deposition voltage (-700 mV, w.r.t. Ag/AgCl electrode), ratio between the cadmium and sulfur sources (3 : 4), pH (2.1) and stirring rate (125 rpm) were kept constant. Cadmium chloride and thiourea were used as cadmium source and sulfur source respectively. Obtained p-type semiconductors were further characterized by I-V analysis, PEC characterization, Band gap measurements and X-ray diffraction. Also the stability of the obtained p-type CdS semiconductors was investigated.

Keywords: *p-type CdS semiconductor; electrodeposition; electrolyte concentration; growth temperature; deposition time; deposition voltage; source concentration ratio; pH; stirring rate; Cadmium chloride; thiourea; I-V analysis; PEC characterization; Band gap measurements; X-ray diffraction*