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# Chemical Bath Deposition and Characterization of CdS layer for CZTS Thin Film Solar Cell

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**Abstract:** CZTS is a new type of an absorber and abundant materials for thin film solar cells (TFSC). Cadmium sulfide (CdS) is the n-type buffer layer of it with band gap of 2.42 eV. Cadmium sulfide (CdS) buffer layer of CZTS solar cell was deposited on soda-lime glass substrates by the Chemical Bath Deposition (CBD) method, using anhydrous Cadmium chloride (CdCl<sub>2</sub>) and Thiourea (CS(NH<sub>2</sub>)<sub>2</sub>). Deposition of CdS using CBD is based on the slow release of Cd<sup>2+</sup> ions and S<sup>2-</sup> ions in an alkaline bath which is achieved by adding complexing agent ammonia (NH<sub>3</sub>). The influence of bath temperature and deposition time on the structural, morphological, and optical properties of these films were investigated. The deposited films were studied by means of XRD, SEM, and UV-Vis spectrometry. The films deposited under optimum conditions (Bath temperature, T<sub>b</sub> = 80°C, Deposition time, t<sub>d</sub> = 70 min [S]/[Cd] = 3.5) were well crystallized.

**Keywords:** Cadmium Sulfide; Chemical bath deposition; Absorbance; XRD; SEM.