

### **A Study of CuInS<sub>2</sub> Thin Films for Photovoltaic Applications**

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Thin films of copper indium disulphide (CuInS<sub>2</sub>) on Ti Substrate were prepared by annealing potentiostatically electrodeposited Cu-In alloy in H<sub>2</sub>S gas at 550<sup>0</sup> C. Films were characterised by X-ray diffraction (XRD), scanning electron microscopy (SEM), and spectral response in a polysulphide electrolyte. XRD measurements revealed the formation of the polycrystalline CuInS<sub>2</sub> thin films and the absence of any other phases. SEM showed the formation of crystallites having the size about 0.2 µm. Variations of spectral response, open-circuit voltage (V<sub>oc</sub>) and short circuit current (I<sub>sc</sub>) with annealing in air have been studied. As deposited CuInS<sub>2</sub> films exhibit a direct band gap of 1.5 eV, and shows n-type behaviour when used in a Photoelectrochemical (PEC) cell. Heat treatment shows a considerable enhancement of the photoresponse.