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Opto-Electrical Properties of Copper-Indium-Selenium Thin Films

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Abstract: Copper-Indium-Selenium (CIS) thin films have been characterised using various experimental techniques. These compounds are extensively used in solar cell technology as absorber layers due to their exciting characteristics. Optical transmission measurements on different compositions of CIS films are observed and the absorption coefficient is determined. The Van der Pauw technique is used to divulge the electrical characteristics of these films. The electrical conductivity is found relatively high for the films annealed in vacuum but decreases for films synthesised optimally. It is observed that p-type films have higher conductivity than n-type films. The grain size, composition, structure and the spacing of the elements of CIS thin films are revealed by XRD. The reaction temperature of CIS formation is 270 °C in vacuum. These properties are of great significance in manufacturing solar cell devices.

Key Words: Solar cell devices, thin films

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