

## **Electrical Characterization of Cu<sub>2</sub>O and Cu<sub>2</sub>S layers deposited by electro-deposition method**

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Cuprous oxide (n-Cu<sub>2</sub>O) and copper sulfide (p-Cu<sub>2</sub>S) layers were deposited on indium tin oxide (ITO) substrates using electro-deposition method. Also copper sulfide layers were deposited on cuprous oxide layers to form p-n junctions. Here, three-electrode electrochemical cell consisting of working electrode (WE), counter electrode (CE) and the reference electrode (RE) was used with the help of a potentiostat (HD HOKUTO DENKO HB – 301). In the deposition bath, 0.1M NaOOCCH<sub>3</sub> and 0.01M CuSO<sub>4</sub> solutions were used. The glass plate was used as the working electrode (WE), the platinum plate was used as the counter electrode (CE) and the doubled chamber saturated calomel electrode (SCE) was used as the reference electrode. Hot plate with a magnetic stirrer was used to maintain constant temperature of 60 °C inside the deposition bath. The deposition voltage was -0.2V with respect to SCE. The electro-deposition was carried out for 45 minutes. The Cu<sub>2</sub>O films were annealed at 200°C in air for 15 minutes. Electrical properties of the above layers were studied using current-voltage (I-V) characteristic measurements. The current-voltage characteristics of the as deposited and annealed n-Cu<sub>2</sub>O layers on ITO substrates were compared. It was found that the annealed Cu<sub>2</sub>O layers produce higher current than that of the as deposited Cu<sub>2</sub>O layers deposited by electro-deposition technique.

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