

Solid state photovoltaic cell made from n-Cu₂O thin films and activated carbon upper electrode

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A thin film solar cell was prepared by using n-type Cu₂O layers and coconut shell activated carbon (CAC). Cu₂O layers were prepared by boiling the copper plates in a CuSO₄ (10⁻³M) solution for a certain time. The band gap of n-Cu₂O was ≈ 1.9 eV. The coconut shell charcoal was activated by the steam method and it served as an upper electrode of this particular photoelectrode. Diffuse reflectance spectra, photocurrent action spectra, V-I characteristics and stability curves were used to discuss the characteristics of this solid state thin film solar cell. The power conversion efficiency was largely influenced by the surface area of CAC. The maximum power efficiency of 2.5% was observed when the surface area of CAC powder was 1157.2 m²g⁻¹, and that was used for constructing of the upper electrode of this thin film solar cell.

Key words: Activated carbon, CAC, n-Cu₂O, thin film solar cell

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