

Turkish Journal of Physics



Turkish Journal

of
Physics

Tunneling-Enhanced Recombination in Polycrystalline CdS/CdTe Solar Cells

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Abstract: The dominant dark current transport mechanism in as-grown and CdCl₂ processed CdS/CdTe heterojunction solar cells for temperatures below 300-K was investigated. The current-voltage properties of these solar cells is explained via tunnelling enhanced bulk and interface recombination models which give a quantitative description of the electronic loss mechanisms in the chalcopyrite-based heterojunction solar cells. The temperature dependence of the saturation current and the diode ideality factors of the as-grown and CdCl₂ processed CdTe solar cells are shown to be well described by this model.

Key Words: CdS/CdTe; Solar cell; Tunnelling; Recombination.

Turk. J. Phys., **30**, (2006), 109-114.

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