

Photothermal and Structural Characterization of $\text{Cu}_x(\text{CdTe})_{1-x}\text{O}_y$ Films Grown by Reactive RF Co-sputtering

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The interest in II-VI-based materials has been strongly enhanced due to their potential applications in optoelectronic devices such as photovoltaic cells. In this work we have grown a quaternary alloy made of Cu, CdTe and O. It has been demonstrated that with this alloy it is possible to achieve a good control over the band gap and charge transport properties. The samples used in this work were grown by reactive RF co-sputtering by using a Cu target and a CdTe target simultaneously and by introducing oxygen and argon in the chamber during growth. The carrier density as a function of the position was studied by using photocarrier radiometric spectroscopy (PCR). Optical and structural characterization was carried out by micro Raman spectroscopy and X-ray diffraction. The sample is polycrystalline with a CdTe-like structure consisting of a mixture of zincblende and wurtzite phases. Depending upon the Cu concentration, the films are highly resistive and reach resistivities of the order of $10^{-3} \text{ } \Omega\text{-cm}$. PCR and micro Raman images were used to study the carrier distribution and crystalline quality of the film.