Photothermal and Structural Characterization Of $Cu_X(CdTe)_YO_Z$ Grown by Reactive RF Cosputtering

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The interest in II-VI based materials have been strongly enhanced due to their potentials 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 change transport properties. The samples used this work were grown by reactive RF co-sputtering 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 are polycrystalline with a CdTe-like structure consisting of a mixture of the Cu concentration the films are highly resistive and reach resistivities of the order of 10-3 ohm-cm. PCR and micro Raman images were used to study the carrier distribution and crystalline quality of the carrier distribution and crystalline quality of the film. An evident relation between the signals from the Photocarriers Radiometry (PCR), with the images from Crystallinity Quality (CQ) by the measurement of inverse Full Width Maximum (1/FWHM) and the energy Dispersive Spectroscopy (EDS) distribution of Cd, Te and O exist. The highest part on PCR corresponds to the best CQ and be assure with the images of distribution that shows the presence of Cd and Te. The growing of the film as well as the oxygen distribution is not uniform. Due to the non destructive and non contact characteristics, the PCR is an excellent technique; it allows us to obtain electronic distributions and also can be used at in-situ applications