Optik - International Journal for Light and Electron Optics

Volume 187, Issue 1, 2019, Pages 1-8

Annealing duration influence on dip-coated CZTS thin films properties obtained by sol-gel method

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Abstract: The effect of annealing duration on structural and optical properties of dip-coated crystallineCZTS thin films was studied. The obtained samples were investigated by several techniques suchas XRD, Raman spectroscopy, SEM, UV–vis spectroscopy and Photoluminescence. Being con-firmed by Raman spectroscopy, XRD analysis reveals the formation of kesterite tetragonal phasewith preferential orientation along (112) direction. The grain size tends to increase as the an- nealing duration increases, a result confirmed by SEM. The last shows smooth, uniform, homo-geneous and densely packed grains. Optical measurement analysis reveals that layers have re- latively high absorption coefficient in the visible spectrum with a band gap reduction of1.62?1.50 eV which is quite close to the optimum value for a solar cell. The photoluminescence distinguishes broad bands that have maximums of intensity limited between 1.50 and 1.62 eV,corresponding to the optical band gap of the CZTS.Kesterite,Sol-gel,Thin-film,Dip-coating,CZTS,Photoluminescence

Keywords : Kesterite, sol-gel, Thin-film, Dip-Coating, CZTS, Photoluminescence