Optik

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

Annealing duration in?uence on dip-coated CZTS thin ?lms properties obtained by sol-gel method

M. C. Benachour, R. Bensaha, R. Morenoc

Abstract: The e?ect of annealing duration on structural and optical properties of dip-coated crystallineCZTS thin ?lms was studied. The obtained samples were investigated by several techniques suchas XRD, Raman spectroscopy, SEM, UV–vis spectroscopy and Photoluminescence. Being con-?rmed 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 con?rmed by SEM. The last shows smooth, uniform, homo-geneous and densely packed grains. Optical measurement analysis reveals that layers have re- latively high absorption coe?cient 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.

Keywords : Kesterite, sol-gel, Thin films, Dip-coating CZTS, Photoluminescence