

Abstract

In this paper, we have investigated the annealing temperature influence on structural, morphological, optical and electrical properties for ZnO thin films deposited by spray pyrolysis technic. X-ray diffraction (XRD) results suggest that the preferred orientation changes from (1 0 1) direction in as-deposited films to (0 0 2) one after annealing and the crystallite size increases with annealing temperature. The scanning electron microscopy (SEM) shows that increasing annealing temperature improves the surface morphology. Optical studies reveal high transmittance (>80%) in annealed films. The direct optical band gaps calculated from the transmittance spectra of as-deposited and annealed films are about 3.49 eV and 3.26 eV, respectively. ZnO thin films prepared with high annealing temperature fulfil all the properties requested to a ZnO thin film for solar cells production. They have lower thickness, better cristallinity, higher transmittance and wide band gap suggesting that these conditions are optimal for the production of ZnO thin films intended for of TCO (transparent conductive oxide) layer in solar cells