

Structural, optical and electrical properties of TiO₂ thin films synthesized by sol–gel technique

F. Hanini, A. Bouabellou, Y. Bouachiba, F. Kermiche, A. TAABOUCHE, M. Hemissi, and D. Lakhdari

Abstract: The influence of annealing temperature on the structure, optical and electrical property of TiO thinfilms with (101) preferential orientation were deposited on glass substrates by sol–gel technique has been studied. As-deposited films were amorphous, and the XRD studies showed that the formation of anatase phase was initiated at annealing temperature close to 400 °C. The grain size of the film annealed at 550 °C was about 22 nm. The transmission spectra, recorded in the UV visible range reveal a relatively high transmission coefficient (~70%) in the obtained films. The transmittance data analysis indicates that the optical band gap (E_g) is closely related to the annealing temperature, an indirect band gap ranging from 3.43 eV to 3.04 eV was deduced. The electrical resistivity measurement that were carried out in function of the annealing temperature showed a sharp decrease in resistivity was found to be 0.0802 Ω.cm.2g

Keywords : TiO₂ Thin films, Annealing, DRX, anatase, Optical property, resistivity