

Effect of Substrates on the Properties of ZnO Thin Films Grown by Pulsed Laser Deposition

Adel TAABOUCHE, Abderrahmane BOUABELLOU, Fouad KERMICHE, Faouzi HANINI, Sarah MENAKH, Yacine BOUACHIBA, Tahar KERDJA, Chawki BENAZZOUZ, Mohamed BOUAFIA, Saad AMARA

Abstract: Polycrystalline zinc oxide (ZnO) thin films have been deposited at 450°C onto glass and silicon substrates by pulsed laser deposition technique (PLD). The used source was a KrF excimer laser (248 nm, 25 ns, 5 Hz, 2 J/cm²). The effect of glass and silicon substrates on structural and optical properties of ZnO films have been investigated. X-ray diffraction patterns showed that ZnO films are polycrystalline with a hexagonal wurtzite-type structure with a strong (103) orientation and have a good crystallinity on monocrystalline Si(100) substrate. The thickness and compositional depth profile were studied by Rutherford Backscattering spectrometry (RBS). The average transmittance of ZnO films deposited on glass substrate in the visible range is 70%.

Keywords : ZnO, Thin films, PLD, Silicon, X-ray diffraction, Optical transmittance, RBS