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

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Abstract: Polycrystalline zinc oxide (ZnO) thin films have been deposited at 450?C onto glass and silicon substrates by pulsedlaser deposition technique (PLD). The used source was a KrF excimer laser (248 nm, 25 ns, 5 Hz, 2 J/cm^2). The effectsof 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 depthprofile 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