

Growth and Characterization of ZnO and Al-Doped ZnO Thin Films by a Homemade Spray Pyrolysis

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In this work, we have prepared the undoped and Al-doped ZnO thin films by a homemade spray pyrolysis method at 450°C onto glass substrates. The XRD patterns of undoped ZnO and aluminized zinc-oxide (AZO) thin films exhibit hexagonal wurtzite crystal structure with high crystalline quality, the crystallite size is nanometric. The morphology of the undoped and Al-doped ZnO thin films also indicate that all samples have a nanoscale grain size around 50 nm, and the microstructure of ZnO films is highly influenced by the aluminum doping. The two films are characterized by UV-visible spectrophotometry showing that the films have a whole optical transmission above 85% in the visible range. The composition of our films is obtained by energy dispersive spectrum, confirmed by Auger electron spectroscopy (AES) and by Rutherford back-scattering spectrometry (RBS) techniques.

Keywords: ZnO, AZO spray, AES, RBS.

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