

Effect of Annealing Temperatures and Pre-Heating on the Characteristics of a Nanocrystalline ZnO Thin Film Prepared by the Sol-Gel Dip-Coating Method

Mohammad Hossein Habibi and Mohammad Khaledi Sardashti

Catalysis Division, Department of Chemistry, University of Isfahan, Isfahan, 81746-73441, Iran

Reprint requests to M. H. H.; E-mail: habibi@chem.ui.ac.ir

Z. Naturforsch. **63a**, 440 – 444 (2008); received December 18, 2007

For effectively fabricating nanocrystalline ZnO thin films by the sol-gel method, the relationships between the temperature of the heat treatment and the quality of the ZnO thin films was observed. The decomposition of the sol was analyzed by TG-DTA. The orientation of the *c*-axis of the ZnO thin film was identified by XRD. The morphology was observed and estimated by SEM. The experimental results did show that the orientation of the *c*-axis is determined by the pre-heating and annealing temperatures, and that the grain size and roughness of the ZnO thin films are mainly influenced by the annealing temperature. A qualified ZnO thin film was prepared by using a sol-gel with a pre-heating temperature of 275 °C for 10 min and an annealing temperature of 550 °C for 60 min.

Key words: Zinc Oxide; Dip-Coating; Microstructure.