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Effects of Concentration of Precursor and Annealing Temperature on the Optical Properties of Nanostructured Al-doped Zinc Oxide (AZO) Thin films Prepared by Sol-Gel Spin Coating Technique¹ GBADEBO T. YUSUF, Osun state Polytechnic, Iree, AYODEJI O. AWODUGBA, Ladoke Akintola University of Technology Ogbomoso, ADEPOJU M. RAIMI, HEZEKIAH O. EFUNWOLE, TIMOTHY O. FAMILUSI, Osun state Polytechnic, Iree — This work investigates the effects of concentration of precursor and annealing temperature on the optical properties of nanostructured Al-doped (AZO) zinc oxide thin films prepared by sol-gel spin coating technique. The sols were prepared using concentration of zinc acetate dehydrate which was varied between 0.1 and 1.4 mole/liter. Aluminium chloride was used as dopant while the annealing temperature of 400° to 650° was chosen. The results show that the concentration between 0.3 to 0.6 moles/liter zinc acetate dehydrate in solution resulted in good thin films with high preferential c-axis orientation and optical transmission reveal a good transmittance within the visible wavelength spectrum region while the concentrations that fall outside this range did not yield films with good c-axis orientation. The films deposited at annealing temperatures 500° and 650° showed surface structures much smaller than 400°. The Spin coating technique creates ZnO films with potential for application as transparent electrodes in optoelectronic devices such as solar cell.

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