

ZnO thin films deposition by spray pyrolysis: Influence of precursor solution properties

Current Applied Physics, Volume 12, Issue 5, September 2012, Pages 1283–1287

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Abstract

Zinc oxide (ZnO) thin films were deposited by spray pyrolysis technique using different precursors. Three starting solutions salts namely: zinc acetate, zinc chloride and zinc nitrate were used. The properties of these solutions and their influence upon ZnO films growth rate are investigated. The obtained results indicate that the dissociation energy of the starting solution plays an important role on films growth rate. A linear relationship between the solution dissociation energy and the growth rate activation energy was found. However, the surface tension of the used solution controls the droplet shape impact. Both solution surface tension and dissociation enthalpy alter the microstructure of the formed film. Films deposited with zinc acetate are characterized by a smooth surface, dense network and high transparency, while films deposited with zinc chloride have a better crystallinity and low optical transmittance.

Keywords : Zinc oxide; Spray pyrolysis; Coatings; Thin films

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