Study of structural and optical properties of Fe doped ZnO thin films prepared by spray pyrolysis technique.

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Abstract

ZnO and Fe-doped ZnO thin films have been prepared by spray pyrolysis on glass substrates and the influence of Fe-doping concentration on the structural and optical properties of the films has been studied. The experiment results show that all samples synthesized by this method possess hexagonal wurtzite crystal structure with good crystallization, no other impurity phases are observed.The X-ray diffraction (XRD) analysis shows that Fe doping has a significant effect on crystalline quality, grain size and Lattice parameters of thin films. With increasing Fe doping percentage, the crystal quality deteriorated. Moreover, UV spectroscopy demonstrates the influence of Fe-incorporation on visible range transmittance of ZnO where the best transmittance is obtained for 2 at% doping, and in my actual work I study the texture for the precedent samples with the pole figure.

Keywords: Iron-doped zinc oxide, Spray pyrolysis, X-ray diffraction, optical proprieties, texture, pole figure.