

Preparation and characterization of boron doped zinc oxide thin films by an electro spraying method

Khalid Mahmood, 송동수, 박승빈*

KAIST

(SeungBinPark@kaist.ac.kr*)

Boron doped ZnO thin films were deposited on the silicon and glass substrates by using electro spraying method at atmospheric pressure. The effect of annealing and the Boron doping contents on the structural, electrical and optical properties of BZO were investigated. It was observed that the films show the c-axis orientation with compact hexagonal wurtzite structure. With the increase in annealing temperature the intensity of (002) peak, grain size, transmittance and the optical band gaps were increased. The annealed films show the better crystallinity than as-deposited films. The results show that annealing and the Boron doping enhances the electrical conductivity and optical properties as well. The films show the high transmittance above than 95 % in the visible region and the lower resistivity. The prepared films also show the good crystalline structure, homogenous surface, transparency and less resistivity which is most suitable for optical devices. Annealing also enhances the Raman peak intensity which shows the better crystallinity. Under atmospheric conditions the highly transparent and conductive BZO films could be prepared by using electro spraying method.