

# Turkish Journal of Physics

Turkish Journal

of

Physics

Effect of Thermal Annealing on the Band GAP and Optical Properties of Chemical Bath Deposited ZnSe Thin Films

F. I. EZEMA<sup>1,2</sup>, A. B. C. EKWEALOR<sup>1</sup> and R. U. OSUJI<sup>1</sup>

<sup>1</sup>Department of Physics & Astronomy, University of Nigeria, Nsukka,  
Enugu State-NIGERIA

<sup>2</sup>School of General Studies, Natural Science Unit, University of Nigeria, Nsukka,  
Enugu State-NIGERIA

e-mail: fiezema@yahoo.com



[Keywords](#)

[Authors](#)



[phys@tubitak.gov.tr](mailto:phys@tubitak.gov.tr)

[Scientific Journals Home  
Page](#)

**Abstract:** Zinc selenide (ZnSe) thin films were deposited on glass substrate using the chemical bath deposition method at room temperature from aqueous solutions of zinc sulphate and sodium selenosulfate in which sodium hydroxide was employed as complexing agents. The 'as-deposited' ZnSe thin films are red in color and annealed in oven at 473 K for 1 hour and on a hot plate in open air at 333 K for 5 minutes, affecting the morphological and optical properties. Optical properties such as absorption coefficient  $\alpha$  and extinction coefficient  $k$ , were determined using the absorbance and transmission measurement from Unico UV-2102 PC spectrophotometer, at normal incidence of light in the wavelength range of 200-1000 nm. The films have transmittance in VIS-NIR regions that range between 26 and 87%. From absorbance and transmittance spectra, the band gap energy determined ranged between 1.60 eV and 1.75 for the 'as deposited' samples, and the annealed samples exhibited a band gap shift of 0.15 eV. The high transmittance of the films together with its large band gap made them good materials for selective coatings for solar cells.

**Key Words:** Chemical bath Deposition, ZnSe Thin film, band gap, Solar Cells.

---

Turk. J. Phys., **30**, (2006), 157-163.

Full text: [pdf](#)

Other articles published in the same issue: [Turk. J. Phys.,vol.30,iss.3.](#)