

Impact Factor of Annealing on Electrical Properties of Zinc Selenide (ZnSe) Thin Films

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Abstract : ZnSe thin films in an aqueous solution of zinc acetate and hydrazine hydrate (HH) using the non-toxic complexing agent EDTA along with the films were annealed at 200, 300, and 400°C. This research aimed to investigate the effect of annealing on the structural, optical, and electrical properties of the films. X-ray diffraction (XRD) analysis was used to study the structure and crystallite size of the ZnSe thin film. The ZnSe thin films are annealed in an oven at various temperatures which are characterized by structural and optical properties. An increase in annealing temperature distorted the nanocrystallinity and made the ZnSe thin films amorphous. The variation of resistivity indicates the semiconducting nature of the thin film. The electrical resistivity of the films decreases with increasing annealing temperature. In this study, the Band gap of ZnSe decreases from 2.8eV to 2.65eV with the increase in temperature and decreases for as-deposited to 2.5eV. As a result of this research, ZnSe is used for certain applications; it has been widely utilized in various optoelectronic devices such as thin film solar cells, green-blue light emitting diodes, lasers, photo-luminescent, and electro-luminescent devices.

Keywords : chemical bath deposition, ZnSe thin film, band gap, solar cells

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