**Investigation on the Effect of Annealing Period on the Structural and Optical Properties of ZnO Thin Films Prepared Using a Polymer Precursor**

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**Abstract**: Several synthesis methods such as sputtering,molecular beam epitaxy,chemical vapour deposition, pulsed laser deposition etc., have been reported to grow high quality ZnO thin films[1]. But among these established synthesis methods, simple and cost effective route to grow ZnO thin films by utilization of inexpensive, non toxic and environmentally benign precursors are still the key issues. This work suggest a simple and novel approach to the fabrication of ZnO thin films by using poly vinyl alcohol (PVA) as precursor. This article also investigate the effect of annealing period on the structural and optical properties of grown films by analyzing XRD, UV absorption and photo luminescence spectra. For that, the synthesized films were annealed at 4500C at different duration viz., 0.5hr,1 hr,1.5hr and 2 hr

The XRD pattern reveals poly crystalline hexagonal wurtzite structure with reflections from (100),(002), (101),(102),(110),(103) and (200)planes. The particle size and stress values varies with changes in annealing period. The values of UV absorption spectra are utilized to plot Tauc plot to determine band gap of the films. The band gap shows significant decrease from 3.35ev to 3.10ev due to the decrease in the discorded nature of the films with increase in annealing period [2-4] The films shows good transmittance >75% and transmittance increase as the annealing parameter increases. The PL spectra of the peaks corresponds to UV,violet and blue regions, but as the annealing period increases to 1.5hr and 2 hr, the violet emission peaks disappears. The mechanism behind these emission peaks are due to the presence of defects in the energy gap[5]



XRD, Tauc, PL Plots of prepared Samples

**References**

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