

## **Influence of pH on Tin Doped Zinc Selenide(SnZnSe) via Electrochemical Deposition Technique**

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**Abstract :** Synthesis of Tin doped Zinc Selenide (SnZnSe) thin film materials was carried out using the cationic precursor, which was an aqueous solution of 0.035 mol solution of  $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$  while the anionic precursor was 0.1mol solution of selenium metal powder was prepared by dissolving with 4ml of Hydrogen chloride (HCl) and Ammonium ( $\text{NH}_3$ ) was used to vary the pH of the solution. The XRD of the films deposited on FTO substrates at different pH shows the reflection peaks at (220), (221), (300), (310), (311), (222) and (320) with the lattice constant of  $a = 7.189\text{\AA}$ . SEM shows random distribution of tiny nano-grains on the substrate, the nano-grains were observed to agglomerate due to the presence of large free energy characteristic of small particles. The optical band gap of the deposited material increases from 2.0 eV – 2.3 eV as the pH increases from 8, 9, 10 and 11.

**Key word :** Electrochemical deposition, FTO, pH, Thin films,  $\text{ZnSO}_4 \cdot 7\text{H}_2\text{O}$  and  $\text{SnCl}_2 \cdot 2\text{H}_2\text{O}$ .

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