

P04

## EFFECT OF POST-ANNEALING IN OXYGEN ENVIRONMENT ON ITO THIN FILMS DEPOSITED USING RF MAGNETRON SPUTTERING

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**ABSTRACT-** This work demonstrated the effect of post-annealing on electrical and optical properties of indium tin oxide (ITO) thin films. ITO with 100 nm thickness successfully deposited using radio frequency (RF) magnetron sputtering in oxygen-free environment on soda-lime glass substrate without substrate heating. Post-annealing treatment was performed on ITO thin films in oxygen environment. Different annealing temperature were studied on the films from 300°C up to 600°C. The annealing time and oxygen flow rate were constant. As the annealing temperature increased, the structure of the thin films changes from amorphous to polycrystalline which lead to the effect of enhanced hall mobility. The optical transmission in visible region strongly related to the annealing temperature. This leads to higher transmittance of ITO thin films and suitable for blue light emitting diode (LED) application. In addition, higher annealing temperature also improves the film electrical properties. Further characterization of the deposited films was done using Hall Effect measurement, UV-Vis spectrophotometer and Atomic Force Microscopic (AFM) to show the improvement on their electrical and optical characteristic. The optical and electrical properties of the films are compared with each other.

**Keywords:** annealing, RF magnetron sputtering, indium tin oxide, thin films, resistivity.