


**CHARACTERIZATION OF  $p$ -SnO<sub>2</sub>: Al /  $n$ -ZnO: Al  $p$ - $n$   
JUNCTION DEPOSITED BY SPRAY PYROLYSIS  
TECHNIQUE FOR LED APPLICATIONS**

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## ABSTRACT

Transparent zinc oxide (ZnO) and tin oxide (SnO<sub>2</sub>) are of great importance due to their various applications in opto-electronic devices. Tin oxide (SnO<sub>2</sub>) shows *n*-type conductivity. However when there is a suitable dopant doped with it the carrier conversion takes place and changes to *p*-type semiconductor. Aluminium doped (ZnO:Al) and undoped Zinc oxide (ZnO) shows *n*-type conductivity. In this study, *p*-type transparent conducting oxides of SnO<sub>2</sub>:Al and *n*-ZnO:Al thin films will be separately deposited on glass substrates by spray pyrolysis technique at different deposition temperatures and doping atomic percentages. Carrier gas pressure and substrate nozzle distance will also be varied. Optical characterization of the thin films will be done using optical spectrum analyzer. The data obtained will be used to calculate the transmittance, reflectance, absorbance, and the bandgap of the material. In electrical characterization I-V characterization of the thin films will also be done to obtain rectifying current -voltage characteristics and the turn-on voltage. The optimized conditions of *p*-SnO<sub>2</sub>:Al and *n*-ZnO:Al will be used to prepare *p*-SnO<sub>2</sub>:Al /*n*-ZnO:Al PN junction. The resulting junction will be optically and electrically characterized for LED application.