

# Physical, electrical and optical characterizations of $\text{Ba}_{0.5}\text{Sr}_{0.5}\text{TiO}_3$ (BST) thin films

## **Abstract**

Single layer Barium Strontium Titanate ( $\text{Ba}_x\text{Sr}_{1-x}\text{TiO}_3$ ) thin films were deposited on P type Silicon (Si) and thin Silicon Dioxide ( $\text{SiO}_2$ ) layer grown on Silicon (Si) substrate (1.5 cm x 1.5 cm) using spin coating technique were investigated in this work. The thin films were crystallized by annealing at 950 °C for 4 hours. Physical characterization was performed using XRD. Electrical and optical characterizations were aided by depositing Aluminum (Al) using Physical Vapor Deposition (PVD) on the thin films as electrode metal. I-V profile was obtained using Semiconductor Parametric Analyzer (SPA). A high impedance multimeter, light meter and a variable light source were introduced for optical characterizations including optical sensitivity, current density and I-V profile under variable light intensity from 0 to 900 Lux. Results show BST has diode like characteristics. The results which were compared with those from commercial solar cells and light sensors indicated that the BST thin films have potential as solar power generator and sensor.

## **Keywords**

Barium Strontium Titanate; Light intensity; Spin coating