

## Sensing Properties of (In<sub>2</sub>O<sub>3</sub>: Eu) Thin Films

Thin films of iridium doped indium oxide (In<sub>2</sub>O<sub>3</sub>:Eu) with different doping ratio (0, 3, 5, 7, and 9%) are prepared on glass and single crystal silicon wafer substrates using spray pyrolysis method. The goal of this research is to investigate the effect of doping ratio on the structural, optical and sensing properties. The structure of the prepared thin films was characterized at room temperature using X-ray diffraction. The results showed that all the undoped and doped (In<sub>2</sub>O<sub>3</sub>:Eu) samples are polycrystalline in structure and nearly stoichiometric. UV-visible spectrophotometer in the wavelength range (200-1100nm) was used to determine the optical energy gap and optical constants. The optical transmittance of 83% and the optical band gap of 5.2eV for pure In<sub>2</sub>O<sub>3</sub> declare drastic reduction as Eu dopant introduce to the indium oxide and then return to increase with further increase of doping ratio. The best figure of merit of the films was achieved for pure sample