

# EFFECT OF TIN OXIDE CONCENTRATION IN ZNO/SNO<sub>2</sub> NANOSTRUCTURED COMPOSITE THIN FILMS FOR XYLENE DETECTION

**P Nagaraju<sup>1</sup>, Y Vijayakumar<sup>1</sup> and M V Ramana Reddy<sup>2</sup>**

<sup>1</sup>Nanosensor Research Laboratory- CMR Technical Campus, India

<sup>2</sup>Osmania University, India

**Z**nO/SnO<sub>2</sub> nanocomposite thin films were synthesised by spray pyrolysis technique with optimised deposition parameters by varying the concentration of tin oxide. XRD results have shown that ZnO/SnO<sub>2</sub> nanocomposite thin films are polycrystalline nature with wurtzite type structure with hexagonal phase of ZnO and tetragonal phase of rutile SnO<sub>2</sub>. The morphological studies have been investigated with field emission electron microscopy and transmission electron microscopy (TEM). Microstructures of the deposited thin films have been confirmed by Raman spectroscopy. Optical characterizations of the prepared samples were investigated using UV-Vis spectrophotometer. X-ray photoelectron spectroscopy (XPS) analysis has been carried out to confirming the oxidation states of elements existing on the surface of the composites thin film. The gas sensing properties of composite thin films towards toluene gas have been carried out at room temperature. The sensing mechanism of xylene gas has been reported and the response and recovery times were determined from the transient response curve.

nagarajuphysics@gmail.com