

## **Morphology and optical investigations of ZnO pyramids and nanoflakes for optoelectronic applications**

### **Abstract**

Zinc-oxide (ZnO) pyramidal and nanoflakes were grown by electrochemical deposition of  $\text{Zn}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$  on n-type Si substrate with different crystallographic orientations and on indium tin oxide (ITO)-coated glass. Various morphological shapes of deposited ZnO nanostructures were observed, which were investigated by scanning electron microscopy (SEM) and X-ray diffraction (XRD). The bulk modulus was calculated to determine the material stiffness. Two peaks were observed at room temperature photoluminescence spectrum, i.e., a near-band-edge (NBE) emission in the UV region and a broad deep-level emission (DLE) in the green emission region. The optical properties were calculated to confirm the specific models validity of ZnO nanostructures for optoelectronics. The measured and calculated values show good agreement with other data.

**Keywords;** ZnO, Characterization, Optical properties