Spray rate effects on the NO< sub> 2</sub> gas sensor properties of Ni-doped SnO< sub> 2</sub> nanoflakes

Nickel-doped Tin dioxide (NSO) nanostructured thin films were deposited using chemical spray pyrolysis at 450 C at various spray rates. The structural, morphological, and optical properties of the prepared nanostructured thin films were investigated to determine the effect of these parameters on the sensing properties of NSO film. X-ray diffraction revealed a polycrystalline structure with an increasing crystallite size as the deposition rate increased, which resulted in a gradual decrease in the bandgap. The FE-SEM images demonstrate that the deposition rate significantly influences the surface morphology and gas sensitivity performance. The sensitivity of the NO< jats: sub> 2 gas sensor fabricated employing NSO thin films increased as the deposition rate, and NO< jats: sub> 2 concentration was increased. At an optimal sensing temperature of 373 K, the maximum sensitivity was 120%, with a response and …