

## Enhancing the CO<sub>2</sub> sensor response of nickel oxide-doped tin dioxide thin films synthesized by SILAR method

The present article investigates the chemiresistive gas sensing characteristics of undoped and nickel oxide-doped tin oxide gas sensors at different concentrations synthesized by a SILAR technique. The structural analysis revealed a tetragonal crystal structure with (110) dominant diffraction peaks and crystallite sizes ranging between 26 and 32 nm. When the NiO dopant concentration was increased to 7% by volume, AFM analysis revealed the development of island-like stairs on the surface of the SnO<sub>2</sub> film, with the average grain size rising from 28.16 to 36.12 nm. FESEM micrographs revealed a porous surface with nano-spherical structures clustered together to form a sea stone-like structure with particle sizes ranging from 23.8 to 42.3 nm. When exposed to CO<sub>2</sub>, the developed sensor exhibits a rapid response time and strong stability properties. At an operating temperature of 323 K, the 5 percent nickel oxide ...