Room temperature gas sensor based on La2O3 doped CuO thin films

In this work, undoped and lanthanum doped cupric oxide (CuO:La) nanorods structured thin films were deposited at different concentrations (CLO) on p-type silicon substrates using the spray pyrolysis technique at 350 °C. XRD, AFM, SEM, and EDX techniques were used to investigate the structural, morphological, and compositional analysis, respectively. A decrease in crystallite size was observed from 13.4 to 7.75 nm and even the peak diffraction intensity decreased with an increase in La concentration. The hexagonal structure of the La_2O_3 phase with poor orientation planes was observed at 7 wt% La. Amplitude parameters, grain size, and atoms distribution were discussed from AFM analysis. SEM images show a uniform distribution and homogeneous crystalline construction supported by quadrilateral pillars with nanorods-like in shape. The sensitivity, recovery, and response time for CLO thin films as …