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The Combination of Nickel Oxide (NiO) and Molybdenum Trioxide (MoO₃) for Pollutant Gas Detection

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Abstract

The prime objective of the current research was to analyze and utilize the coexistence of basic and acidic metal oxide semiconductors (MOS) for sensing pollutant gases. In the current work, 1 wt.%, 3 wt.%, 5 wt.%, 7 wt.%, and 9 wt.% NiO (basic MOS) was added to MoO₃ (acidic MOS), and thick films were prepared using the screen printing technique. Structural characterization was performed by x-ray diffraction (XRD), scanning electron microscopy (SEM), and energy-dispersive x-ray analysis (EDAX). The crystallite size was about 50 nm, with intermediate voids. EDAX analysis confirmed the non-stoichiometric composition of the films. The films were oxygen-deficient as per EDAX data. An electrical analysis