

Highly sensitive InOx Gas Sensors on Flexible Substrates

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In₂O_{3-x} thin films with a thickness of the order of 100nm were grown by dc magnetron sputtering on Glass and Flexible (PET) substrates. The electrical conductivity of In₂O_{3-x} thin films exhibited a change of over six orders of magnitude during photoreduction with ultraviolet light and subsequent oxidation in ozone atmosphere at room temperature. Their structural and ozone sensing properties were analyzed. Structural investigations carried out by x-ray diffraction and Atomic Force Microscopy showed a strong correlation between stoichiometry, substrate topology and gas sensitivity. Optimization of growth conditions has lead to films with extremely low detection levels for Ozone down to 15ppb at room temperature, demonstrating the wide prospective of utilizing these metal oxides as gas sensors on flexible substrates for a variety of automotive and air-conditioning applications.

