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High-sensitivity NO_2 sensor based on n-type InP epitaxial layers

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Abstract

The structure and sensing properties of a novel resistive NO_2 sensor based on *n*-type InP epitaxial layers have been presented. The studies of sensor resistance changes due to adsorbed gas NO_2 under exposures in the range from 20 to 100 ppb at a temperature of 80°C were performed. The thickness of the active InP layer changed from 0.2 to 0.4 μm. The response time and signal stability were also investigated. Furthermore, the influence of surface states and near-surface region on sensor parameters in terms of the resistance relative changes was shown from numerical simulations. The analysis of the measured photoelectron spectroscopy (XPS) spectra confirmed the complex chemical composition of the InP oxides, which gives rise to the high density of surface states.

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