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A modified Zinc Oxide (ZnO) gas sensor approach to detect oxidizing gases

Selective detection of gases such as nitrogen dioxide (NO₂), carbon monoxide (CO), carbon dioxide (CO₂), and various volatile organic components is necessary for air quality monitoring and safety. There are several metal oxide gas sensors (MOGS), but the focus of this study was Zinc Oxide (ZnO); an n-type MOGS. NO₂, an oxidising gas was the target gas. The aim of this study was to establish the possible enhancement of a gas sensor selectivity by the introduction of signal conditioning electronics circuitry such as the Wheatstone bridge in tandem with an operation amplifier circuit. Exposing electronics enhanced ZnO MOGS system to NO₂ resulted in a negatively increasing voltage output between 0 and -3.5 V. This range of voltages is sufficient to run a micro-controller, with the assumption that a reducing gas would result in a positively increasing voltage, a micro-controller could be conditioned to select between an oxidizing and a reducing gas.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

Hons

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