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Entitled

FABRICATION AND CHARACTERIZATION OF NANOSTRUCTURED HYBRID MATERIALS FOR GAS SENSING APPLICATIONS

by

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Abstract

The rapid increase in the environmental pollution has become a major concern, and its monitoring has evolved into a priority for human health. With the tremendous advances in technology, gas-sensing devices have become popularly used in environmental applications to detect various toxic gases at very low concentrations.

This work aims at developing high-performance gas sensors with enhanced sensitivity, selectivity, low response time, and low operating temperature. The proposed sensors are fabricated based on the integration of nanotechnology and conducting polymer technology. The fabricated sensors showed high sensitivity toward hydrogen sulfide (H_2S) gas, and low time response at room temperature. Considering this low operating temperature, external heating elements are not required hence the fabrication and operational costs are reduced. The sensors also showed excellent repeatability, long-term stability, and selectivity toward H_2S gas among other gases. Therefore, this study demonstrates the potential of fabricating high-performance gas sensors for monitoring H_2S gas in real-time with high efficiency.

Keywords: H_2S sensor, Metal oxide semiconductor, Metal organic framework, Organic polymer, ZnO NPs, Cu-MOF.