



CONFERENCE PROCEEDINGS
7TH INTERNATIONAL CONFERENCE
ON SENSORS & TRANSDUCERS, 2025
(UEMCOS'25)

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High-Performance Hydrogen Sensing using ZnO Nanoflake-Modified MEMS Gas Sensor

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Abstract

Herein, a high performance H₂ gas sensing by nanoflake ZnO based MEMS sensor is reported. The sensor has comparatively lower sensing temperature (200°C) due to embedding Dilver-P1 microheater. The gas sensing performance was evaluated in terms of response magnitude (RM), response time (RT) and recovery time that are recorded as 91.28%, 30s and 70s respectively. The sensor exhibited fairly stable resistance both for N₂ and for 1% H₂ in N₂ atmosphere, evident from a time dependent stability study. The fast and high performance H₂ sensing is realized by the defect induced luminescence property of 2D ZnO thin film that enable generation of new e-h⁺ pair.