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Development of NO₂ sensor by fungal-ZnFe₂O₄ at room temperature

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Hybrid nanomaterial (powdered fungi and ZnFe₂O₄) was developed and studied for gas sensing application, specifically for NO₂ gas detection. In this study, powdered *Rhizopus* species W3 and ZnFe₂O₄ nano-powder were mixed at equal proportion to carryout sensing experiments. The conjugated material film was coated on the interdigitated electrodes (IDEs) by drop drying method, to determine the NO₂ gas sensing characteristics. It was found that the response of these hybrid materials decrease resistance, thereby resembling the p-type semiconductor. The fungi W3 - ZnFe₂O₄ hybrid composite sensor showed better response, sensitivity, selectivity, stability and reproducibility at room temperature towards 30 ppm of NO₂. N. Miura *et al.* reported in 2002 ZnFe₂O₄ showed good sensitivity for NO₂ (436 ppm) at 700°C operating temperature. Therefore, in this present work effort was made to prepare novel hybrid material that is feasible, eco-friendly, flexible, cost-effective, low maintenance and light weight new device.

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