

PALLADIUM (Pd) DECORATED ZINC OXIDE (ZnO) NANOPARTICLES FOR GAS DETECTION: MEAT SPOILAGE GASES

The detection of odours emitted by meat products when they start to spoil remains a challenge. In response to this, materials of ZnO decorated with palladium nanoparticle was synthesised using the hydrothermal method for the purpose of testing its gas sensing properties. After the synthesis of these nanoparticles, various characterization techniques for the investigation of both physical and chemical properties were employed. Different percentages of Palladium ranges of between 0.2% and 0.7% from a PdCl₂ precursor with 99.9% purity were used during the synthesis. A gas sensor was fabricated through the drop casting method on a gold grid. These gas sensor samples were exposed to both reducing and oxidizing gases. Sensing was performed at a temperature from 25°C to 225°C. The best result was obtained at 150°C using 0.2%Pd-ZnO sensor when sensing NO₂ gas. A sensitivity of 3.8 was recorded, with both response time and recovery time of being 3.5 minutes. The 0.5%Pd-ZnO sensor performs well at room temperature for CO₂, SO₂, and ethanol gases.

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