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Optimization ethanol detection performance manifested by gas sensor based on In₂O₃/ZnS rough microspheres

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Highlights

- Heterostructure In₂O₃/ZnS composites microspheres are synthesized by two-step hydrothermal process.
- The sensor based on In₂O₃/ZnS composites microspheres presents superior sensing performance to 100 ppm ethanol at 260°C, and possess fast response and recovery time (21 and 34 s).
- The modulation of the potential barrier height in the In₂O₃/ZnS heterostructure are the main reasons for the enhanced sensing performance

Abstract

For traditional resistance-type gas sensor, introducing heterostructures was an effective way to enhance the sensing performance. In this work, heterostructure In₂O₃/ZnS composites material with rough spherical morphology was synthesized by two-step hydrothermal process in which pure ZnS microspheres acted as substrate for the coating of In₂O₃ nanoparticles. The obtained products were

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