

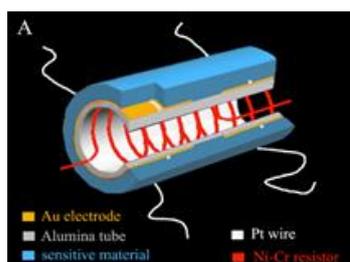
The application of metal oxide nanoparticles in gas sensing devices

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Metal oxide nanoparticles constitute an outstanding class of functional materials with potential applications in almost all fields of technology. Concerning gas sensing materials research, the focus is on the development of sensing materials with new structures or morphologies to improve sensitivity, selectivity, and stability of sensors, and also on the development of new and better fabrication techniques to ensure reliability, safety, reproducibility, and cost reduction. Typical gas sensor is sketched below with active sensitive material (metal oxide nanoparticles) shown in light blue. Several successfully researched examples will be presented: i) Mixed phases SnO₂ nanorods are highly promising for gas sensor applications, as the gas response for isopropanol was significantly enhanced by the presence of orthorhombic phase (S=61.5 to 1000 ppm isopropanol and response time and recovery time of 4 and 10 s).¹ ii) Pt activated SnO₂ shows the gas response toward 500 ppm of ammonia from 6.48 to 203.44 through the activation by Pt.² Moreover, the formation mechanisms of the unique nanoparticle clusters and highly enhanced sensitivity mechanism are also discussed.



References

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