

Semiconductor gas sensors / edited by Raivo Jaaniso and Ooi Kiang Tan

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Abstrak

Semiconductor gas sensors have a wide range of applications in safety, process control, environmental monitoring, indoor or cabin air quality and medical diagnosis. This important book summarises recent research on basic principles, new materials and emerging technologies in this essential field.

The first part of the book reviews the underlying principles and sensing mechanisms for n- and p-type oxide semiconductors, introduces the theory for nanosize materials and describes the role of electrode–semiconductor interfaces. The second part of the book describes recent developments in silicon carbide- and graphene-based gas sensors, wide bandgap semiconductor gas sensors and micromachined and direct thermoelectric gas sensors. Part 3 discusses the use of nanomaterials for gas sensing, including metal oxide nanostructures, quantum dots, single-walled carbon nanotubes and porous silicon. The final part of the book surveys key applications in environmental monitoring, detecting chemical warfare agents and monitoring gases such as carbon dioxide.