Special Issue

Gas-Sensing Properties of Nanostructured Materials

Message from the Guest Editors

This Special Issue explores the unique abilities of nanostructures in detecting gases. Nanostructured materials, due to their increased surface area and altered electronic properties at the nanoscale, exhibit enhanced gas-sensing characteristics compared to bulk materials. These nanomaterials, often composed of metals, metal oxides, or carbon-based substances, interact differently with various gases, leading to changes in electrical, optical, or mass-related properties. This alteration allows for the sensitive and selective detection of target gases, crucial in environmental monitoring, industrial safety, and medical diagnostics. Researchers are investigating the fabrication techniques and mechanisms underlying gas-sensing behavior to optimize sensor performance. Tailoring nanostructures' size, morphology, and composition enables the customization of sensors for specific gas detection requirements. Understanding these properties will contribute to advancing gas-sensing technologies for diverse applications, offering more efficient, sensitive, and reliable detection methodologies.

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Nanoscience and nanotechnology are exciting fields of research and development, with wide applications to electronic, optical, and magnetic devices, biology, medicine, energy, and defense. At the heart of these fields are the synthesis, characterization, modeling, and applications of new materials with lower nanometer-scale dimensions, which we call “nanomaterials”. These materials can exhibit unusual mesoscopic properties and include nanoparticles, coatings and thin films, metal–organic frameworks, membranes, nano-alloys, quantum dots, self-assemblies, 2D materials such as graphene, and nanotubes. Our journal, *Nanomaterials*, has the goal of publishing the highest quality papers on all aspects of nanomaterial science to an interdisciplinary scientific audience. All of our articles are published with rigorous refereeing and open access.

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