

Special Issue

Nanostructured Materials for Low-Carbon Hydrogen Energy

Message from the Guest Editors

The urgent global imperative for carbon neutrality has positioned hydrogen as a cornerstone of the future energy landscape. Current technologies face significant challenges in cost, efficiency, and durability, creating a pressing need for material-level breakthroughs.

Nanomaterials, with their exceptional properties such as high surface area and tunable electronic structures, offer transformative solutions to these challenges by enhancing reaction kinetics, storage capacity, and separation efficiency. In this Special Issue, original research articles and reviews are welcome. Research areas may include (but are not limited to) the following:

- The design of novel nanostructured catalysts (e.g., single-atom catalysts, nanoalloys, 2D materials) for hydrogen production.
- The development of nanoporous materials (MOFs, COFs) and nanocomposites for hydrogen storage.
- Nanostructured electrodes and catalyst supports for proton-exchange membrane (PEM) fuel cells.
- Synthesis of membranes and thin-film nanocomposites for hydrogen separation (e.g., from syngas) and CO₂ removal.

We look forward to receiving your contributions.

Guest Editors

Dr. Quan Zhang

Dr. Bo Huang

Dr. Guoji Huang

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Nanomaterials
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
nanomaterials@mdpi.com

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Message from the Editor-in-Chief

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. We are proud of our increasing impact factor and ability to provide rapid decisions to authors.

Editor-in-Chief

Prof. Dr. Eugenia Valsami-Jones

School of Geography, Earth and Environmental Science, University of
Birmingham, Birmingham B15 2TT, UK

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