Special Issue

Advanced Nanocatalysts: Design, Mechanism, and Performance

Message from the Guest Editor

Our modern society urgently requires meeting the fundamental needs involving sustainable development, clean energy, renewable polymers and CCUS (Carbon Capture, Utilization and Storage), all calling for novel catalytic tools with which synergies, optimized nano-catalysts, and designed interfaces between nanoparticles and supports must be developed. With their quantum size effect, surface free energy, and confinement-induced strain effects, nano-catalysts are believed to be the first choice for solving the above-mentioned challenges. However, nanoparticles with high surface free energy show lower stability in comparison to the bulk materials. Moreover, lack of fundamental understanding of dynamic evolution for supported metal nano-catalysts hinders the rational design of effective catalysts. Profiting from technological innovation, including in situ electron microscopy and synchrotron techniques for in situ catalytic studies, recent intensive effort has been devoted to developing advanced nano-catalysts and elucidating catalytic mechanism. This Special Issue aims to capture the recent breakthroughs and foster further innovation in this rapidly evolving field

Guest Editor

Dr. Bingfeng Chen
College of Chemical Engineering and Materials Science, Tianjin University of Science & Technology, Tianjin 300457, China

Deadline for manuscript submissions

31 October 2026

Nanomaterials

an Open Access Journal by MDPI

Impact Factor 4.3
CiteScore 10.3
Indexed in PubMed

mdpi.com/si/278746

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

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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. 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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