Special Issue

The 15th Anniversary of *Nanomaterials*: Single-Atom Catalysts in Electrocatalytic and Photocatalytic Processes

Message from the Guest Editors

Single-atom catalysts (SACs) are characterized by isolated metal atoms anchored on supports (e.g., carbon matrices, metal–organic frameworks, or metal oxides) via strong metal–support interactions (SMSIs), such as covalent bonding, coordination effects, or electronic coupling. Compared to conventional nanoparticle-based catalysts, SACs achieve atomic-level dispersion of metal species, thereby maximizing the exposure of catalytic active sites. Their unique architecture ensures near-100% atomic utilization efficiency and enables precise modulation of coordination environments (e.g., ligand type, coordination number adjustment) and electronic states (e.g., d-band center, oxidation state adjustment), which are critical for enhancing activity and selectivity in electrocatalysis (e.g., O2/H2 evolution reactions, CO2 reduction) and photocatalysis (e.g., water splitting, pollutant degradation).

This Special Issue seeks to showcase cutting-edge research in SACs, spanning from innovative synthetic strategies and mechanistic insights to their integration into practical catalytic systems. We welcome global contributions of original studies and reviews to advance this dynamic field.

Guest Editors

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Prof. Dr. Tierui Zhang

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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.

Editor-in-Chief

Prof. Dr. Eugenia Valsami-Jones
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