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Photoelectrochemical Properties of Nanomaterials and Applications in Energy Conversion and Environmental Remediation

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Message from the Guest Editors

Since Fujishima's research on Electrochemical Photolysis of Water Using Nanomaterial-Based Photoelectrodes in 1972, the photoelectrochemical (PEC) properties of semiconducting nanomaterials have been attracting great attention based on expectations of clean, renewable, and sustainable technologies in energy and environmental fields. The novel PEC properties of semiconducting nanomaterials shed significant insights into emerging solar-driven research areas, including solar-to-fuel conversion by water splitting for H₂ and PEC reduction of CO₂, solar-to-energy conversion by solar cells and solar fuel cells, and environmental remediation by advanced oxidation process (AOP) along with their hybrid systems. In particular, the design of novel semiconducting nanomaterials and in-depth investigation of PEC mechanisms in the applied devices will be key drivers in achieving innovative solar-driven energy and environmental applications. This Special Issue of *Nanomaterials* will offer in-depth knowledge and new research findings on PEC characteristics of nanomaterials, contributing to advancing solar-driven energy conversion and environmental applications utilizing PEC mechanisms.



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Special Issue



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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.

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