

Special Issue

Hierarchically Catalysts for Water Splitting and Selective Hydrogenation

Message from the Guest Editors

The need for sustainable and renewable energy production, storage, and conversion technologies has never been more pressing than now. To address the energy and environmental crisis, electrochemical water splitting has emerged as a promising method for producing green hydrogen. Selective hydrogenation is an excellent method used to prepare these products in large quantities. These approaches require concerted efforts to design catalytic materials that are highly active, cost-effective, and have long-term stability. Heterostructures, commonly defined as composites consisting of interfaces in different components, have demonstrated exceptional catalytic performance in electrocatalysis and industrial catalysis, particularly in hydrogen evolution reactions (HERs), oxygen evolution reactions (OERs), and benzene selective hydrogenation (BSH). Heterostructured materials often show improved charge transfer because of the diverse arrangements of energy bands in different components and have received significant attention because of the fascinating synergistic effects of the interactive coupling between heterogeneous zones, resulting in high activity and long-term stability.

Guest Editors

Prof. Dr. Guangjie Shao

Hebei Key Laboratory of Applied Chemistry, College of Environmental and Chemical Engineering, Yanshan University, Qinhuangdao 066004, China

Dr. Ailing Song

Hebei Key Laboratory of Applied Chemistry, College of Environmental and Chemical Engineering, Yanshan University, Qinhuangdao 066004, China

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

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