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 recieved significant attention because of the fascinating synergistic effects of the interactive coupling between heterogeneous zones, resulting in high activity and long-term stability.

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Deadline for manuscript submissions

closed (31 August 2024)

Catalysts

an Open Access Journal by MDPI

Impact Factor 4.0
CiteScore 7.6

mdpi.com/si/186246

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