Special Issue

Advances in Electrocatalysts for the OER, HER and Biomass Conversion

Message from the Guest Editors

Hydrogen (H2) is considered as an ideal alternative to fossil fuels due to advantages such as high energy density, zero carbon emissions, and renewability. From a future perspective, H2 is expected to alleviate the energy crisis and achieve global carbon neutrality. Importantly, electrocatalytic overall water splitting (OWS), a clean and effective strategy to produce high-purity hydrogen, involves two half-cell reactions: cathodic hydrogen evolution reaction (HER) and the anodic oxygen evolution reaction (OER). OER kinetics are intrinsically sluggish and require relatively high potential to overcome the reaction energy barrier, resulting in excessive energy consumption. Therefore, developing cost-effective and efficient OER catalysts and replacing the OER with the HER-coupled biomass conversion are proposed to lower the energy consumption. This Special Issue aims to explore the latest advances in overall and hybrid water splitting, particularly in the context of the synthesis, characterization, and evaluation of electrocatalysts, the theoretical analysis of reaction mechanisms, and their potential in industrial applications.

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