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Oxygen Evolution Reaction (OER) and Oxygen Reduction Reaction (ORR) Electrocatalysis

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Message from the Guest Editors

The electrocatalytic oxygen evolution reaction (OER) and oxygen reduction reaction (ORR), known as oxygen electrocatalysis, play a key role in sustainable energy conversion and storage devices, such as unitized regenerative fuel cells and rechargeable metal–air batteries, which has attracted the attention of many researchers in the past few decades. In fuel cells and metal–air batteries, the cathode of the battery transports oxygen ions and provides a site for the oxygen reduction reaction. However, due to a complex four proton-coupled electron transfer process, the sluggish kinetics still render OER/ORR catalysts less efficient for the practical efficiency of these sustainable electrochemical devices. Moreover, the complexity of the catalyst–electrolyte interface makes a comprehensive understanding of the intrinsic OER/ORR mechanisms challenging.

Submissions in the form of original research papers and review articles in the areas of designing novel OER/ORR electrocatalysts, developing new electrocatalytic systems, and finding new mechanisms for oxygen electrocatalysis are all welcome.