Special Issue

Recent Progress in Electrocatalysis for Membrane-Driven Energy Technologies: Fuel Cells, Electrolysis, and Emerging Applications

Message from the Guest Editor

This Special Issue focuses on electrocatalysis within membrane-driven systems, highlighting recent progress in materials innovation, mechanistic understanding, and device engineering. Topics span a wide spectrum of applications, including proton exchange membrane fuel cells (PEMFCs) for clean power generation, water and CO2 electrolyzers for green hydrogen and carbonneutral fuel production, as well as emerging electrolytic processes such as nitrogen reduction for ammonia synthesis and organic electrosynthesis. We invite contributions that address challenges in ⊠catalystmembrane interactions, durability under industrial operating conditions, and cost-effective scaling strategies. Submissions may explore novel membrane materials (e.g., anion exchange membranes, hybrid composites), advanced characterization techniques, or system-level optimizations for integrating electrolysis with renewable energy sources. This issue aims to bridge fundamental research and industrial applications, providing a platform for researchers in chemistry, materials science, and energy engineering to share cutting-edge developments that accelerate the path toward a decarbonized future.

Guest Editor

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