Special Issue

Research on Solid Oxide Fuel Cells for Energy Conversion and Storage

Message from the Guest Editor

Solid oxide fuel cells are a unique kind of energy conversion device that can convert chemical energy from fuel to electrical energy with high efficiency and almost zero pollution emissions at relatively high operating temperatures. Recently, it has attracted tremendous momentum due to the overwhelming superiorities of all-solid-state structure and practical fuel flexibility. Not only can gaseous fuels such as hydrogen, natural gas/methane, carbon monoxide, or propane and butane be fed into the anode fuel chamber for SOFC, but liquid fuels such as ethanol, octane, and even solid carbon fuels also can. Nevertheless, such a promising technology has not been applied practically or commercialized owing to its high manufacturing costs, durability, and robustness of the materials, including electrodes, electrolytes, and interconnects. In addition, theoretical studies including multiscale modeling, simulation, and in situ characterization are also necessary to achieve a rational design of materials and structures of SOFCs with unique functionalities for efficient energy conversion and storage.

Guest Editor

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