Special Issue

Engineering of Solid Oxide Fuel Cells: From Powder to Power

Message from the Guest Editors

Solid oxide fuel cells (SOFCs) convert the chemical energy of fuels directly into electricity through electrochemical reactions, delivering higher efficiency and lower emissions than conventional generators. Their exceptional fuel flexibility—accepting hydrogen, methane, ammonia, methanol, and more—makes them attractive for distributed and mobile power. Yet laboratory promise is not enough; moving from laboratory cells to industrial power plants demands mastery of the entire value chain—ceramic powder synthesis, electrode microstructure control, stack thermal management, balance-of-plant component development, and system-level integration. At the system level, integration must guarantee both safe operation and long-term durability under real-world transients. Only by addressing these interconnected challenges—from powder to power—can SOFC technology achieve reliable, cost-effective deployment.

We welcome original contributions from both academia and industry to explore the latest advances and cutting-edge developments in the industrialization of solid oxide fuel cells (SOFC) engineering.

Guest Editors

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