Special Issue

Progress in Materials for Solid Oxide Fuel Cells (SOFCs): Structure-Performance Correlation

Message from the Guest Editors

Fuel cells can operate at low and high temperatures depending on the electrolyte used. Among the high-temperature cells, solid oxide fuel cells (SOFCs) show high potentiality due to their total efficiency, which is up to 85% when heat cogeneration is considered. These devices can convert various kinds of fuels into electricity with high efficiency and low levels of catalyst degradation. In addition, if the syngas produced from the biomass gasification process is used as fuel, in order to preserve the performance of the catalyst, hot gas conditioning is normally performed in order to reduce the number of typical contaminants. Thus, for the durable operations of SOFC fuel cells, an efficient gas cleaning phase is essential to remove the critical pollutants that significantly deteriorate the fuel cell systems. In particular, the purpose of this Special Issue is to publish high-quality research papers and review articles that address the study, synthesis, and characterization of advanced materials for SOFC fuel cells, as well as the materials and processes enable to perform a gas cleaning treatment with high efficiency and low cost for the fuel conditioning stage in SOFC applications.

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Materials (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

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