

Special Issue

Recent Advances and Challenges in Carbon Fuel Cells

Message from the Guest Editor

The direct carbon fuel cell (DCFC) is a generator that converts the chemical energy of carbon directly to electricity through electrochemical oxidation of the fuel. The carbonaceous fuel (e.g., hard coals, biomass-derived biochars, active carbons, carbon black, graphite, coke) is an anode which oxidizes used oxygen from air. There are four basic types of DCFC based on the type of electrolyte: molten carbonates, solid oxygen ion conducting ceramics, aqueous and molten hydroxides. Further, composite electrolytes (so-called hybrid electrolytes) are widely used in DCFC prototypes. The purpose of this Special Issue is to present the idea of using new power generators, including direct carbon fuel cells. The work will cover all aspects that affect the efficiency, lifetime, and economy of electricity production using carbon-based fuels: types of DCFC dedicated fuels and methods of their preparation, sources (carbon black, graphite, biomass), design solutions of DCFC models and characteristics, types of electrolytes and methods of their cleaning, fuel oxidation mechanisms in DCFC, and corrosion and degradation processes of metal elements used to build the DCFC.

Guest Editor

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Message from the Editorial Board

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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