Special Issue

Structure and Performance Regulation of Supercapacitors

Message from the Guest Editors

The rapid expansion of renewable energy technologies and the global push for zero-emission solutions have intensified research into advanced energy storage systems like supercapacitors. These devices, with their high power density and fast charge–discharge cycles, hold great promise for applications requiring efficient energy storage. Supercapacitors are primarily categorized as electric double-layer capacitors (EDLCs) and pseudocapacitors. While EDLCs are widely commercialized due to their cycling stability and simplicity, pseudocapacitors, which offer higher energy densities, face challenges related to their complex manufacturing and material degradation. This Special Issue, "Structure and Performance Regulation of Supercapacitors", aims to explore the critical factors influencing supercapacitor performance, including electrode material composition, structural design, and electrolyte optimization. The Issue will also cover the latest research on degradation mechanisms and strategies for enhancing the scalability and sustainability of supercapacitors, providing insights into future research directions.

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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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