Special Issue

Advances in Solid Electrolytes and Solid-State Batteries

Message from the Guest Editors

Rechargeable batteries are becoming increasingly attractive for promoting a fossil fuel-free world. The most commonly cited battery systems that promise to deliver improved safety and increased energy density are those with a pure Li metal anode and a solid electrolyte (SE) to form a solid-state battery (SSB). Despite their potential, SSBs face critical challenges. Lithium dendrite growth through the SE can lead to battery failure due to electrical shorting, and unstable interactions at the cathode/SE interface can cause rapid capacity decay. Therefore, the focus of the Special Issue "Advances in Solid Electrolytes and Solid-State Batteries," is twofold. First, it seeks to explore the design of high-performance SSBs, leveraging the latest advances in materials science and engineering. Second, it aims to deepen the understanding of the electrolyte/electrode interface properties and the mechanisms underlying SSB failure. By addressing these critical areas, this SI contributes to the ongoing efforts to overcome the current limitations and unlock the potential of SSB technology for a more sustainable energy future.

Guest Editors

Dr. Changmin Shi
School of Engineering, Brown University, Providence, RI 02912, USA

Dr. Mingpeng Yu
Deparment of Applied Physics, University of Science and Technology Beijing, Beijing 100083, China

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Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
batteries@mdpi.com

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Editor-in-Chief

Prof. Dr. Karim Zaghib
Department of Chemical and Materials Engineering, Concordia University, Montréal, QC H3G 1M8, Canada

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