Special Issue

Advanced Materials and Degradation Mechanisms in Beyond-Lithium-Ion Batteries

Message from the Guest Editors

While Li-ion batteries have dominated the market for decades, they face challenges such as resource scarcity, environmental impact, safety concerns, and the need for better performance in emerging applications such as electric vehicles and grid storage. To overcome these challenges, researchers are exploring post-Li-ion batteries, such as Na-ion batteries, lithium metal batteries, metal–air batteries, solid-state batteries, etc., to achieve higher energy density, lower cost, improved safety profiles and greater sustainability.

To uncover the fundamental relationships governing battery degradation, systematic in situ and operando measurements are needed to capture real-time changes in structure, chemistry, and interfaces during operation. These insights are essential for bridging the gap between laboratory research and commercial implementation.

Therefore, this Special Issue highlights recent progress in advanced materials, along with the development of effective in situ and operando characterisation techniques for mechanism investigations.

Guest Editors

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Take the opportunity to publish your original scientific work or a review paper concerning battery materials, battery technology or battery application within this new open access journal. Along with material science, the journal also addresses engineering and multidisciplinary research topics, such as cell and system design or storage system integration. Publishing proffers visibility for the benefit of other experts and facilitates discussion of the research results within the field. You are invited to publish your work, read published papers and to participate in topical discussions.

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