Special Issue

Structure Engineering of Metal Oxide Cathodes for Rechargeable Metal Batteries

Message from the Guest Editor

Metal oxide cathodes (e.g., LiCoO2, LiFePO4, and high-entropy oxides) are critical for next-generation rechargeable metal batteries due to their high theoretical capacity, stability, and cost-effectiveness. However, metal oxide cathodes face critical challenges, such as structural degradation during cycling, sluggish ion diffusion kinetics, and interfacial side reactions with electrolytes, which collectively limit their energy density, rate capability, and long-term stability. This Special Issue aligns with Metals' scope by addressing these issues through atomic-to-macro scale structural control—including lattice doping, surface modification, and bulk architecture design—to enhance electrochemical performance. Fundamental studies on failure mechanisms and applied research on scalable solutions are equally encouraged. We invite contributions exploring innovative approaches to tailor the microstructure, morphology, and interfaces of metal oxide cathodes.

Guest Editor

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Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

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