Batteries

an Open Access Journal by MDPI

CiteScore: 6.6
Impact Factor: 4.8

Special Issue Reprint

Lithium-Ion Batteries

Edited by: Zhenbo Wang , Tingfeng Yi and Gang Sun

This Reprint, titled “Lithium-Ion Batteries: Design, Preparation, Reaction Mechanisms of Electrode Materials, and Battery Life Evaluation,” collates cutting-edge research focused on overcoming the performance limitations of current energy storage systems. This collection addresses critical challenges in the field, from the development of next-generation silicon and composite anodes to the engineering of high-capacity cathodes and stable interfacial architectures. A significant emphasis is placed on elucidating the complex reaction mechanisms and degradation pathways that govern cell performance and longevity. Advanced preparation techniques and innovative electrode design strategies are explored to enhance ionic conductivity, mechanical stability, and cycling durability. Furthermore, this Reprint highlights the application of sophisticated in situ and operando characterization methods, alongside robust modeling frameworks, for precise state-of-health monitoring and accurate battery life prediction. By integrating fundamental material insights with practical engineering solutions, this compilation serves as a vital resource for developing more efficient, reliable, and commercially viable lithium-ion batteries for the future of electrified transportation and grid storage.

mdpi.com/books/reprint/12035