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Zn-Ion Batteries: Latest Advances and Prospects

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Message from the Guest Editors

Dear Colleagues,

Zinc-Ion Batteries (ZIBs) have garnered significant attention owing to their safety, cost-effectiveness, and environmentally friendly attributes. The rapid development of mild aqueous ZIBs has been a driving force behind the advancement of the energy storage system market. Challenges encompassing the suboptimal coulombic efficiency and limited cycle life of Zn anodes, influenced by the emergence of dendrites and concurrent side reactions such as hydrogen evolution and corrosion, have impeded their practical applicability. Strategies aimed at enhancing electrode stability, achieved through interface modifications, electrolyte additives, and separator design, have utilised to enhance the cycling longevity. Potential topics include, but are not limited to:

- Understand the energy storage mechanism for cathodes
- Develop strategies to stabilize the Zn anode
- Develop novel approaches to observing the growth of Zn anode dendrites
- Electrolyte modulation, using the lean additive strategy and deep-eutectic electrolytes
- Improve the stability of electrode–electrolyte interface
- Battery performance analysis for practical applications with high cathode mass loading

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