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Zinc-based flow battery energy storage

Overview

In this perspective, we first review the development of battery components, cell stacks, and demonstration systems for zinc-based flow battery technologies from the perspectives of both fundamental research and engineering applications.

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Zinc-based redox flow batteries (Zinc-RFBs) differ from conventional redox flow systems by utilizing a solid zinc anode, where energy is stored through the reversible electrodeposition and dissolution of metallic zinc.

Abstract Zinc-based flow batteries (Zn-FBs) are promising candidates for large-scale energy storage because of their intrinsic safety and high energy density.

However, zinc-based batteries are emerging as a more sustainable, cost-effective, and high-performance alternative. 1,2 This article explores recent advances, challenges, and future directions for zinc-based batteries. Zinc-based batteries are rechargeable, using zinc as the anode material.

Zinc-based flow batteries (Zn-FBs) have emerged as promising candidates for large-scale energy storage (ES) systems due to their inherent safety and high energy density.

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