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Title: Ion movement in zinc-bromine flow batteries

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Herein, we address these challenges by reshaping the Zn²⁺ ion solvation structures in zinc bromide (ZnBr₂) aqueous electrolytes using a robust hydrogen bond acceptor as a cosolvent ...

In the early stage of zinc-bromine batteries, electrodes were immersed in a non-flowing solution of zinc-bromide that was developed as a flowing electrolyte over time. Both ...

Initially, zinc ions are stored in the electrolyte. When the battery is charged, zinc plates out onto a collector. Simultaneously, bromine molecules convert into a liquid bromine ...

This article establishes a Zinc-bromine flow battery (ZBFB) model by simultaneously considering the redox reaction kinetics, species transport, two-step electron ...

During charging, zinc is electroplated onto conductive electrodes, while bromine is formed. On discharge, the process reverses: the metallic zinc plated on the negative electrodes dissolves ...

In this work, the effects of key design and operating parameters on the performance of ZBFBs are systematically analyzed and judiciously tailored to simultaneously minimize ...

This work contributes insights into the design of highly reversible Zn electrode in Zn-based flow batteries.

Theoretical and experimental results reveal that nitrogen-containing functional groups exhibit a high adsorption energy toward zinc atoms, while the microstructures promote ...

In this review, the focus is on the scientific understanding of the fundamental electrochemistry and functional components of ZBFBs, with an emphasis on the technical ...

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Therefore, it remains a great challenge to develop electrodes that can simultaneously address Zn dendrite formation and sluggish Br_2/Br^- reaction kinetics. Herein, a nitrogen-doped, ...

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