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Energy storage zinc-bromine battery

Overview

Are aqueous zinc-bromine batteries the future of energy storage?

Aqueous zinc-bromine batteries (AZBBs) gain considerable attention as a next-generation energy storage technology due to their high energy density, cost-effectiveness and intrinsic safety. Despite these advantages, challenges such as the polybromide ion shuttle effect, self-discharge, and zinc anode instability hinder their widespread applications.

Are zinc–bromine rechargeable batteries suitable for stationary energy storage applications?

Zinc–bromine rechargeable batteries are a promising candidate for stationary energy storage applications due to their non-flammable electrolyte, high cycle life, high energy density and low material cost. Different structures of ZBRBs have been proposed and developed over time, from static (non-flow) to flowing electrolytes.

What are zinc-bromine flow batteries?

In particular, zinc-bromine flow batteries (ZBFBs) have attracted considerable interest due to the high theoretical energy density of up to 440 Wh kg−1 and use of low-cost and abundant active materials [10, 11].

Are aqueous rechargeable zinc-based batteries suitable for large-scale energy storage applications?

In this context, aqueous rechargeable zinc-based batteries (AZBs), which employ metallic zinc as the anode, have garnered considerable attention as promising candidates for large-scale energy storage applications.

What is a zinc-bromine static battery?

The initial configuration type of zinc–bromine static batteries, which was proposed by Barnartt and Forejt , consisted of two carbon electrodes immersed in a static ZnBr 2 electrolyte and separated by a porous diaphragm.

Why are static zinc-bromine batteries still in the infancy?

However, the ultrahigh solubility of polybromides causes significant shuttle effects, capacity deterioration, and self-discharge, rendering the study of static zinc-bromine batteries still in its infancy.

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