Self-discharge of zinc-bromine flow battery

Despite these advantages, challenges such as the polybromide ion shuttle effect, self-discharge, and zinc anode instability hinder their widespread applications.

Here, we discuss the device configurations, working mechanisms and performance evaluation of ZBRBs. Both non-flow (static) and flow-type cells are highlighted in detail in this review.

Dendritic zinc deposits could easily short-circuit the cell, and the high volubility of bromine allows diffusion and direct reaction with the zinc electrode, resulting in self-discharge of the cell.

Systematic electrochemical investigations of the origin of the self-discharge phenomena in non-flow (stationary) Zn-Br 2 batteries have clearly highlighted the leading role of the uncontrolled ...

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 challenges ...

Aqueous zinc bromine batteries (ZBBs) attract extensive research interest owing to their high theoretical energy density, high operating voltage, and low cost. However, they suffer from ...

While the high solubility of bromine and its derivatives (e.g. Br 3-) enhances their redox kinetics in the system, bromine can easily diffuse through the membrane to the zinc side causing severe self ...

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 ...

We here introduce a practical Zn-Br battery that harnesses the synergy effects of complexation chemistry in the electrode and the salting-out effect in the aqueous electrolyte.

Here we introduce a Br 2 scavenger to the catholyte, reducing the Br 2 concentration to an acceptable level (~7 mM). The scavenger, sodium sulfamate (SANa), reacts rapidly with Br 2 to ...

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