

Zinc Odorless Liquid Flow Battery





Overview

What is a zinc-based flow battery?

The history of zinc-based flow batteries is longer than that of the vanadium flow battery but has only a handful of demonstration systems. The currently available demo and application for zinc-based flow batteries are zinc-bromine flow batteries, alkaline zinc-iron flow batteries, and alkaline zinc-nickel flow batteries.

Are zinc-based flow batteries good for distributed energy storage?

Among the above-mentioned flow batteries, the zinc-based flow batteries that leverage the plating-stripping process of the zinc redox couples in the anode are very promising for distributed energy storage because of their attractive features of high safety, high energy density, and low cost .

How much does a zinc flow battery cost?

In addition to the energy density, the low cost of zinc-based flow batteries and electrolyte cost in particular provides them a very competitive capital cost. Taking the zinc-iron flow battery as an example, a capital cost of \$95 per kWh can be achieved based on a 0.1 MW/0.8 MWh system that works at the current density of 100 mA cm⁻² .

Are neutral zinc-iron flow batteries a good choice?

Neutral zinc-iron flow batteries (ZIFBs) remain attractive due to features of low cost, abundant reserves, and mild operating medium. However, the ZIFBs based on Fe (CN)⁶⁻ /Fe (CN)⁶⁻ catholyte suffer from Zn₂Fe (CN)₆ precipitation due to the Zn²⁺ crossover from the anolyte.



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This study breaks the solid-liquid working mode of the Zn anode, offering an effective solution for LDES applications with Zn-FBs. A liquid metal electrode enables dendrite-free, zinc-based ...

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Perspectives on zinc-based flow batteries

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