

Disadvantages of zinc-iron flow batteries





Overview

However, the development of zinc-iron redox flow batteries (RFBs) remains challenging due to severe inherent difficulties such as zinc dendrites, iron (III) hydrolysis, ion-crossover, hydrogen evolution reactions (HER), and expensive membranes which hinder commercialization. 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 $\text{Fe}(\text{CN})_6^{3-}/\text{Fe}(\text{CN})_6^{4-}$ catholyte suffer from $\text{Zn}_2\text{Fe}(\text{CN})_6$ precipitation due to the Zn^{2+} crossover from the anolyte.

What are the advantages of zinc-based flow batteries?

Benefiting from the uniform zinc plating and materials optimization, the areal capacity of zinc-based flow batteries has been remarkably improved, e.g., 435 mAh cm^{-2} for a single alkaline zinc-iron flow battery, 240 mAh cm^{-2} for an alkaline zinc-iron flow battery cell stack, 240 mAh cm^{-2} for a single zinc-iodine flow battery.

What are the problems of zinc based flow batteries?

Secondly, the deposition of zinc on the negative electrode side still suffers from various common problems of zinc-based flow batteries, which are manifested in technical difficulties such as serious zinc dendrite problems, easy hydrolysis to form precipitation under neutral conditions, and poor cycle stability.

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.



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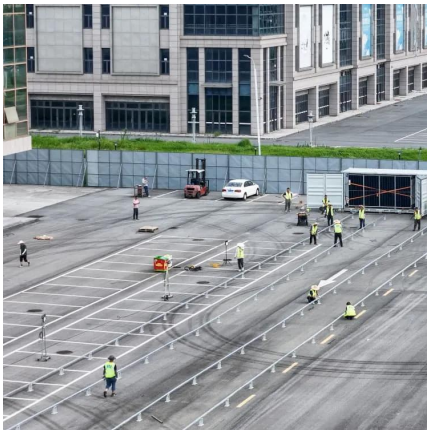
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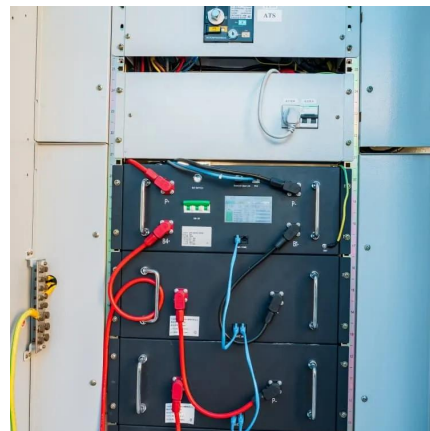


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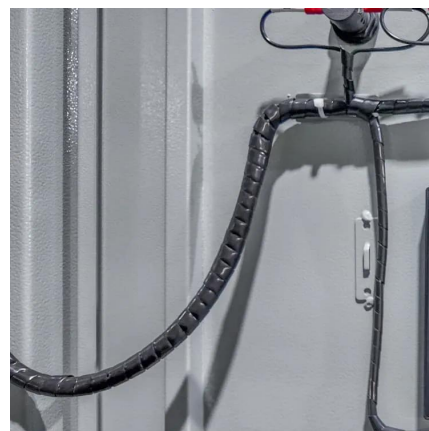


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