
Graphene-catalyzed zinc-iron flow battery

Are zinc-based flow batteries good for grid-scale energy storage?

Zinc-based flow batteries have attracted tremendous attention owing to their outstanding advantages of high theoretical gravimetric capacity, low electrochemical potential, rich abundance, and low cost of metallic zinc. Among which, zinc-iron (Zn/Fe) flow batteries show great promise for grid-scale energy storage.

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)₆³⁻/Fe(CN)₆⁴⁻ catholyte suffer from Zn₂Fe(CN)₆ precipitation due to the Zn²⁺ crossover from the anolyte.

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.

What is a graphene battery?

Graphene batteries utilize graphene materials as the primary electrodes for the efficient storage and release of electrical energy. Graphene itself consists of a single layer of carbon atoms that are tightly bound in a two-dimensional crystalline lattice, offering exceptional properties, such as high electrical and thermal conductivity.

This review latest research progress for graphene-based materials in zinc-ion batteries (ZIBs) is reviewed on the basis of the ...

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