

# Disadvantages of zinc-cerium flow battery





## Overview

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What are zinc-cerium redox flow batteries (ZCBs)?

Zinc-cerium redox flow batteries (ZCBs) are emerging as a very promising new technology with the potential to store a large amount of energy economically and efficiently, thanks to its highest thermodynamic open-circuit cell voltage among all the currently studied aqueous redox flow batteries.

Why is zinc-cerium flow battery a good choice?

While the zinc-cerium flow battery has the merits of low cost, fast reaction kinetics, and high cell voltage, its potential has been restricted due to unacceptable charge loss and unstable cycling performance, which stem from the incompatibility of the Ce and Zn electrolytes.

What are the coulombic and voltage efficiencies of zinc-cerium redox flow batteries?

During charge/discharge cycles at  $50 \text{ mA cm}^{-2}$ , the coulombic and voltage efficiencies of the zinc-cerium redox flow battery are reported to be 92 and 68%, respectively .

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.,  $435 \text{ mAh cm}^{-2}$  for a single alkaline zinc-iron flow battery,  $240 \text{ mAh cm}^{-2}$  for an alkaline zinc-iron flow battery cell stack ,  $240 \text{ mAh cm}^{-2}$  for a single zinc-iodine flow battery .



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