Zinc-oxygen flow battery electrode reaction

In this paper, we initially carried out a selection of high performing ORR catalysts by comparing a number of transition metal oxides, carbonaceous materials and benchmark ...

In order to facilitate electrochemical oxygen reactions in electrically rechargeable zinc-air batteries (ZABs), there is a need to develop innovative approaches for efficient ...

The negative electrode of zinc-air flow batteries generally uses the alkaline zinc electrolyte, and the positive electrode is an alkaline oxygen electrode, where the reciprocal transformation ...

However, the irregular deposition of zinc on electrodes hinders the widespread utilization of rechargeable ZABs due to limited durability and stability. This study investigates ...

Here, oxygen (O 2) in zinc-air (O 2) batteries (ZABs) is shown to adversely impact the anodic process, leading to early cell failure, though its amount limiting can affect the ...

The benefits and limitations of zinc negative electrodes are outlined with examples to discuss their thermodynamic and kinetic characteristics along with their practical aspects. Four ...

Besides, the specific discharge capacity is improved from 623 to 767 mAh g Zn-1 due to the alleviation of zinc oxide passivation in the presence of flowing electrolyte. Therefore, ...

In flow batteries, the electrolyte is stored in external tanks and circulated through the cell. This study provides the requisite experimental data for parameter estimation as well as model ...

In zinc-based hybrid flow batteries, the negative and positive electrode reactions tend to take place under mixed control due to the distribution of current, potential and ...

The inherent slow kinetics of the ORR at air electrodes frequently constrains their operational efficiency. Here, we develop a new self-catalytic approach for in situ growth of ...

Zn-air batteries generate electricity through the electrochemical reaction of Zn and oxygen. During discharge of the battery, Zn anode is oxidized and produces zincate and later ...

In this contribution we studied oxygen evolution reaction electrodes for alkaline zinc-air flow battery. At first, NiCo 2 O 4 /Ni electrodes were successfully prepared and ...

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In the present contribution we demonstrate an electrically rechargeable alkaline zinc-oxygen flow cell on the basis of copper foam as substrate for zinc deposition and nickel ...

The kinetics and underlying mechanism of the AQDS-mediated oxygen reduction reaction at different pH are scrutinized both computationally and experimentally to delineate ...

The uniquely developed bi-layer structure plays crucial roles for flow batteries, that supporting layer with graphite fiber ensures the stability of flow battery while catalyst layer with ...

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