



Fiber current collector materials for zinc batteries

Carbon-based cathode materials for rechargeable zinc-air batteries: From current collectors to bifunctional integrated air electrodes ... a metal mesh current collector, and a catalyst layer that are rigidly pressing ...

Binder-Free α -MnO₂ Nanowires on Carbon Cloth as Cathode Material for Zinc-Ion Batteries. ... carbon fiber composite at different current densities of 50, 100, 150, and 200 mA \cdot g⁻¹ and the ...

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Flexible electrode material of V₂O₅ carbon fiber cloth ... -CFC) is successfully synthesized by means of electrospinning and high-temperature calcination. As a cathode material for aqueous zinc-ion batteries, ... (V₂O₅-CFC) by means of electrospinning method, which shows excellent flexibility and adopted binder-free and current collector ...

Wearable fiber-based lithium-ion batteries (LiBs) made with textile-like functional electrode materials are key to realizing smart energy options for powering wearable electronics. However, the process of attenuating the existing functional materials commonly used in planar and solid-state batteries to functional fiber or yarn electrodes tends to deteriorate the material ...

The ink was uniformly coated on a stainless steel foil current collector with an active material mass loading of 1 mg cm⁻². The full cell ZIB was fabricated using unmodified zinc and PAA-nZn modified zinc anode, MnO₂-coated stainless-steel foil cathode with glass fiber separator soaked in ZnSO₄ (2 m) + MnSO₄ (0.2 m) electrolyte ...

DOI: 10.6023/a22100413 Corpus ID: 256714758; Anode Current Collector for Aqueous Zinc-ion Batteries: Issues and Design Strategies @article{Ji2023AnodeCC, title={Anode Current Collector for Aqueous Zinc-ion Batteries: Issues and Design Strategies}, author={Huimin Ji and Chunling Xie and Qi Zhang and Yixin Li and Huanhuan Li and Haiyan Wang}, journal={Acta Chimica ...

In addition to optimizing active materials, reducing the mass of inactive components can also improve the energy density of batteries [[13], [14], [15]]. As a typical inactive component of LIBs, the current collector provides mechanical support to the electrodes and facilitates electron transfer but delivers no capacity, so the mass of the current collector can be identified as dead weight ...

A facile fabrication of lightweight current collector based on used newspaper for flexible zinc-ion hybrid supercapacitors ... Building better zinc-ion batteries: a materials perspective. EnergyChem, 1 (2019) ... H. Xu, W. Wang, Q. Huang, Z. Zheng, Metallic glass fiber fabrics: A new type of flexible, super-lightweight, and



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three-dimensional ...

As a potential electrochemical energy storage device, zinc-air batteries (ZABs) received considerable interest in the field of energy conversion and storage due to its high energy density and eco-friendliness. Nevertheless, the sluggish kinetics of the oxygen reduction and oxygen evolution reactions limit the commercial development of ZABs, so it is of great ...

Preparation of current collector of fiber battery. ... Vanadium oxide derivatives as cathode materials of aqueous zinc-ion batteries have received incremental attention owing to their ...

The mechanical properties of the functionalized separator mainly include puncture strength and tensile strength. The separator not only has to withstand the piercing force of zinc dendrites during battery operation, but also ...

The modification of zinc anodes with carbon materials can serve as (1) protective coating; (2) interlayer material; (3) host material; (4) current collectors; (5) zinc-free anode; (6) electrolyte additives and materials used to modify separator (Fig. 1). These versatile characteristics of carbon materials make them widely employed for ...

1 Introduction. Light-battery interactions have gained increasing attention in recent years, either for optical operando measurements or for photoenhanced energy storage. ...

These materials are mainly graphene-based ... where the CNT sheets functioned as a gas diffusion layer, a catalyst layer and a current collector, ... Xu YF, Zhang Y, Guo ZY, Ren J, Wang YG, Peng HS (2015) Flexible, stretchable, and rechargeable fiber-shaped zinc-air battery based on cross-stacked carbon nanotube sheets. *Angew Chem Int Ed* 54(51) ...

The comparison of the performance of the current collector made from different materials was summarized in-depth by Zhu et al. [128]. Six different types of current collector materials, including Al, Cu, Ni, Ti, stainless steel, and carbonaceous materials, which were commonly reported and used for batteries were evaluated (Fig. 8 a). Although ...

Inspired by the various superior merits, MXenes and their derivatives for aqueous rechargeable batteries have presented a sharply rise as satisfying candidates for active materials of cathodes, active materials of anodes, current collector, conductive binder, etc. ...

Here, we report a gold-furnished mesh as the current collector for Zn electrodeposition, which is used as the anode in aqueous zinc-ion batteries. The anode exhibits excellent cycling performance without obvious dendrite growth, and the full cell shows an outstanding specific capacity and long-term durability, surpassing those of bare Zn.



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The last several years have witnessed the prosperous development of zinc-ion batteries (ZIBs), which are considered as a promising competitor of energy storage systems thanks to their low cost and high safety. However, the reversibility and availability of this system are blighted by problems such as uncontrollable dendritic growth, hydrogen evolution, and ...

By optimizing the CNT/CNF weight ratio, this all-fiber current collector can be made very thin while maintaining high conductivity ($\approx 700 \text{ S cm}^{-1}$) and strength ($> 60 \text{ MPa}$), making it an ideal replacement for heavy metal current collectors in aqueous battery systems.

Lithium-ion batteries (LIBs), as the most widely used energy storage devices, are now powering our world owing to their high operating voltages, competitive specific capacities, and long cycle lives [1], [2], [3]. However, the increasing concerns over limited lithium resources, high cost, and safety issues of flammable organic electrolytes limit their future applications in ...

Rechargeable aqueous zinc-ion batteries (AZIBs) have developed into one of the most attractive materials for large-scale energy storage owing to their advantages such as ...

Enhancing the interaction of PANI and carbonaceous current collectors via strong covalent linkages such as N O and N H can assure the integrity and strong binding of the ...

The review is divided into five parts: i) cathode material design, synthesis, and reaction mechanism; ii) electrolyte development and characterization; iii) zinc anode, current ...

The lithium-ion (Li-ion) battery has received considerable attention in the field of energy conversion and storage due to its high energy density and eco-friendliness. Significant academic and commercial progress has been made in Li-ion battery technologies. One area of advancement has been the addition of nanofiber materials to Li-ion batteries due to their ...

Although lithium metal is an ideal anode material for achieving high-energy-density lithium-based batteries, the uneven deposition/exfoliation process of lithium during cycling easily triggers the formation of lithium dendrites and dead lithium, which leads to a low Coulombic efficiency and safety issues. In this paper, a lithiophilic 3D copper mesh current collector is ...

Fiber-shaped Zn-air batteries, are realized for the first time by designing aligned, cross-stacked and porous carbon nanotube sheets simultaneously that behave as a gas diffusion layer, a catalyst layer, and a current collector. The fabrication of flexible, stretchable and rechargeable devices with a high energy density is critical for next-generation electronics. ...

For the selection of the appropriate current collector material, some specific parameters that are necessary to



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examine according to the need of a supercapacitor cell. The objectives of the current collector material selection are divided into three categories according to the priorities as tabulated in Table 8.6. Primary objectives are the ...

In terms of self-designed materials, Liu et al 50 employed pyrolysis of electrospun polyimide to synthesize a flexible nanoporous carbon fiber film, which exhibited excellent bifunctional electrocatalytic activities and facilitated the flexible ...

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