

Are flexible lithium ion batteries the future of electronic devices?

Flexible lithium ion batteries (LIBs) have received considerable attention as a key component to enable future flexible electronic devices. A number of designs for flexible LIBs have been reported in recent years; in this article, we review recent progress. We focus on how flexibility can be introduced into

Why are flexible lithium-ion batteries so popular?

On the basis of these flexible components, batteries with different structures and shapes have been well designed to meet the various device configurations. Over the past few decades, there has been a significant surge in the popularity of flexible lithium-ion batteries (LIBs) owing to their high energy density and long cycle life.

What is a flexible lithium ion battery?

In contrast to conventional lithium-ion batteries necessitating the incorporation of stringent current collectors and packaging layers that are typically rigid, flexible batteries require the flexibility of each component to accommodate diverse shapes or sizes.

What are the latest developments in flexible battery technology?

Then recently proposed prototypes of flexible cable/wire type, transparent and stretchable lithium-ion batteries are highlighted. The latest advances in the exploration of other flexible battery systems such as lithium-sulfur, Zn-C (MnO<sub>2</sub>) and sodium-ion batteries, as well as related electrode materials are included.

Can flexible Li-ion batteries be used for flexible electronic devices?

In summary, flexible Li-ion batteries for flexible electronic devices are still at an early stage of development, particularly for high-capacity FLIBs. Due to the lack of intrinsically flexible active materials, the development of FLIBs must rely on creative designs of flexible electrodes and cell configurations.

What are the basic components of flexible batteries?

Herein, we systematically and comprehensively review the fundamentals and recent progresses of flexible batteries in terms of these important aspects. Specifically, we first discuss the requirements for constituent components, including the current collector, electrolyte, and separator, in flexible batteries.

Over the past few decades, there has been a significant surge in the popularity of flexible lithium-ion batteries (LIBs) owing to their high energy density and long cycle life. In parallel, other kinds of flexible batteries have also been rapidly developed, including flexible sodium-ion batteries (SIBs), flexible zinc-ion batteries (ZIBs ...

With the increasing demand for wearable electronic products and portable devices, the development and design of flexible batteries have attracted extensive attention in recent years [1].

Flexible and high-energy-density lithium-sulfur (Li-S) batteries based on all-fibrous sulfur cathodes and separators have structural uniqueness and chemical functionality, exhibit a high ...

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In this review, recent advances and progress on the development of FLIBs are concerned. Two specific research strategies of FLIBs are discussed in detail: preparation of flexible battery components (including electrodes, current collectors, and electrolytes) and flexible structure designs or assembly methods of FLIBs.

With the continuous development of flexible electronic devices, conventional energy storage equipment can hardly meet the demand. Flexible energy storage equipment is gradually coming into the vision of researchers, among which, flexible lithium-sulfur (Li-S) batteries have become the most promising energy storage devices due to their high energy ...

Here we report a flexible and high-energy lithium-sulfur full battery device with only 100% oversized lithium, enabled by rationally designed copper-coated and nickel-coated carbon fabrics as ...

Emerging flexible and wearable electronics such as electronic skin, soft displays, and biosensors are increasingly entering our daily lives. It is worth mentioning that the complexity of multi-components makes them face great challenges in operating a flexible electronic system, which involves energy storage and process engineering. The large-scale ...

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Lithium ion batteries are light, compact and work with a voltage of the order of 4 V with a specific energy ranging between 100 Wh kg<sup>-1</sup> and 150 Wh kg<sup>-1</sup> its most conventional structure, a lithium ion battery contains a graphite anode (e.g. mesocarbon microbeads, MCMB), a cathode formed by a lithium metal oxide (LiMO<sub>2</sub>, e.g. LiCoO<sub>2</sub>) and an electrolyte consisting ...

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