

A review of flexible energy storage devices

Do flexible energy storage devices integrate mechanical and electrochemical performance?

However, the existing types of flexible energy storage devices encounter challenges in effectively integrating mechanical and electrochemical performances.

What are flexible energy storage devices?

To date, numerous flexible energy storage devices have rapidly emerged, including flexible lithium-ion batteries (LIBs), sodium-ion batteries (SIBs), lithium-O₂ batteries. In Figure 7E,F, a Fe_{1-x}S@PCNWs/rGO hybrid paper was also fabricated by vacuum filtration, which displays superior flexibility and mechanical properties.

What is the mechanical reliability of flexible energy storage devices?

As usual, the mechanical reliability of flexible energy storage devices includes electrical performance retention and deformation endurance. As a flexible electrode, it should possess favorable mechanical strength and large specific capacity. And the electrodes need to preserve efficient ionic and electronic conductivity during cycling.

Are flexible energy storage devices the future of wearable electronics?

Full text access Abstract Flexible energy storage devices have received much attention owing to their promising applications in rising wearable electronics.

Do flexible energy storage devices have high energy density?

Although Li-ion fiber batteries with a high energy density of 80 Wh/kg had been achieved, the energy density of flexible energy storage devices lags far behind conventional LIBs (~250 Wh/kg), which is the stumbling block on the path of their practical applications.

Do flexible energy storage devices face challenges in 2024?

However, the existing types of flexible energy storage devices encounter challenges in effectively 2024
Chemical Science Perspective & Review Collection

In this review, we focus on pioneering works of flexible aqueous energy storage devices for flexible electronics, covering the material designs for essential components of the ...

The classification of hydrogels is presented in detail. Herein, the state-of-art advances in hydrogel materials for flexible energy storage devices including supercapacitors ...

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Energy storage devices are the key element in all above mentioned fields, which can be of high capacitance, light weighted and flexible too. Fiber based supercapacitors are ...

With the continuous growth of energy demand and the pursuit of sustainable energy systems, the development of efficient, reliable and environmentally friendly energy storage devices has ...

Electrospun nanofibers have become an important component in fabricating flexible electronic devices because of their permeability, flexibility, stretchability, and ...

This review presents a comprehensive overview of the advances in flexible fabric-type energy-storage devices for wearable electronics, including their significance, ...

This review highlights flexible graphene-based two-dimensional film and one-dimensional fiber supercapacitors and various batteries including lithium-ion, lithium-sulfur and ...

Given the advancements in modern living standards and technological development, conventional smart devices have proven inadequate in meeting the demands for ...

Flexible energy-storage devices are indispensable to the development of flexible electronics. This review surveys recent achievements, focusing on flexible lithium-ion batteries ...

In recent years, flexible/stretchable batteries have gained considerable attention as advanced power sources for the rapidly developing wearable devices. In this article, we ...

In this review, the application scenarios of FESDs are introduced and the main representative devices applied in disparate fields are summarized first. More specifically, it ...

This review is intended to provide novel perspectives on the combination of nanocellulose with other electrochemical materials to design and fabricate nanocellulose ...

The integration of flexible and/or stretchable electrode materials, electrolytes and substrates with rationally designed structural configurations can be a promising approach to ...

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