

What are solar collectors and thermal energy storage systems?

In these applications, solar collectors and thermal energy storage systems are the two core components. This paper focuses on the latest developments and advances in solar thermal applications, providing a review of solar collectors and thermal energy storage systems.

What is a solar energy collector?

Solar energy collectors are crucial for converting solar radiation into usable forms like heat or electricity. There are two main types of collectors: non-concentration and concentrating collectors. In non-concentration collectors, the collector area and absorber area are the same.

How does a solar collector work?

It is a modified version of a flat plate collector, where a reflecting or refracting surface (known as a concentrator) is introduced between the solar radiation and the absorber. These collectors can significantly increase the radiation intensity from a low value to a much higher value, sometimes up to 10,000 times.

Is there a porous current collector for energy-dense and fast-charging batteries?

Traditional current collectors, being impermeable to electrolytes, hinder the movement of Li^+ ions and restrict the high-rate capability of thick electrodes. Here we conceptualize a porous current collector for energy-dense and extremely fast-charging batteries.

What is a focusing collector?

A focusing collector is designed to capture solar energy with high intensity by using optical systems like reflectors or refractors. It is a modified version of a flat plate collector, where a reflecting or refracting surface (known as a concentrator) is introduced between the solar radiation and the absorber.

Why do batteries need a current collector?

The current collectors play a direct role in the heat transfer from internal batteries to the external environment. Current collectors with efficient heat dissipation ensure the elimination of locally accumulated heat and effectively reduce the elevated temperature to mitigate thermal runaways of batteries.

The rapid consumption of fossil fuels in the world has led to the emission of greenhouse gases, environmental pollution, and energy shortage. ^{1,2} It is widely acknowledged that sustainable ...

The review provides a comprehensive overview of carbon-coated current collectors across various types of metal and nonmetal substrates in lithium-ion batteries and supercapacitors, ...

Current collectors play a very crucial role in the performance of an energy storage device. Regarding supercapacitors, material design, processing, and current collectors' surface properties can result in substantial

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Herein, the use of a multijunction MOST device that combines various photoswitches with different onsets of absorption to push the efficiency limit on solar energy collection and storage is explored.

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Interdigital electrochemical energy storage (EES) device features small size, high integration, and efficient ion transport, which is an ideal candidate for powering integrated ...

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