HJ Solar

Bionic phase change solar container

Overview

An international research team has designed a novel cooling system for PV modules involving a phase change material (PCM), heat sink fins, and water. Multifunctional phase change composites are in great demand for all kinds of industrial technologies and applications, which have both superior latent heat capacity and excellent solar-thermal conversion capability. We present a triple bio-inspired hierarchical solar absorber with a simulated 98.

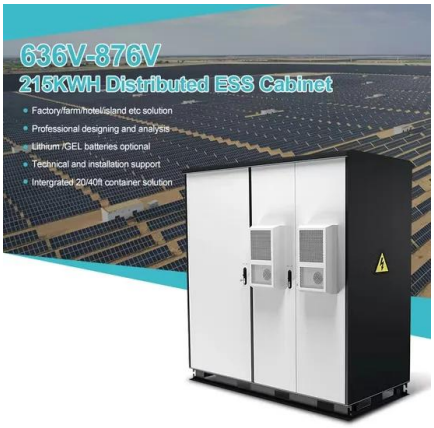
Bionic phase change solar container

Scalable Fabrication of Light-Responsive Superhydrophobic ...

Scalable Fabrication of Light-Responsive Superhydrophobic Composite Phase Change Materials via Bionic-Engineered Wood for Solar-Thermal Energy Management Yang Meng *, Jiangyu Zhang, ...

Experimental and numerical study on flow characteristic and thermal

To improve the flow characteristic and thermal performance of phase change material (PCM) capsules, the idea of heat storage unit with biomimetic oval structure is proposed. An ...



CN113154922B

The invention relates to a bionic phase-change energy-storage steam cavity module which comprises a tree-shaped steam cavity and a phase-change container. The tree-shaped steam cavity comprises at ...

Scalable Fabrication of Light-Responsive Superhydrophobic ...

The growing demand for sustainable energy storage solutions has underscored the importance of phase change materials (PCMs) for thermal energy management. However,

traditional ...

Optimisation of thermal energy storage systems incorporated with phase

Thermal energy storage systems, also known as thermal batteries integrated with phase change materials, have gained significant attention in recent ye...

Magnetic Field-induced Enhancement of Phase Change Heat ...

Multifunctional phase change composites are in great demand for all kinds of industrial technologies and applications, which have both superior latent heat capacity and excellent solar ...

Scalable Fabrication of Light-Responsive Superhydrophobic ...

Herein, a multifunctional composite phase change material (CPCM) is developed using a balsa-derived morphology genetic scaffold, engineered via bionic catechol surface chemistry.

Performance enhancement of a photovoltaic module by passive cooling

The enhancement of passive cooling for a photovoltaic (PV) module in a finned container heat sink was proposed. Palm wax was chosen as a phase change ...

Efficient-thermal conductivity, storage and application of bionic tree

Herein, a novel composite phase change material (CPCM) with high-thermal conductivity and stability based on bionic porous SiC skeleton is proposed, which is oriented by optimized freeze casting to ...

Scalable Fabrication of Light-Responsive Superhydrophobic ...

However, traditional PCMs are always inherently constrained by issues such as leakage, poor thermal conductivity, and lack of solar energy conversion capacity. Herein, a multifunctional ...

Efficient-thermal conductivity, storage and application of bionic tree

Herein, a novel composite phase change material (CPCM) with high-thermal conductivity and stability based on bionic porous SiC skeleton is proposed, which is oriented by optimized freeze ...

Leaf-vein bionic fin configurations for enhanced thermal energy ...

In the present study, we investigated the effect of different structures of a novel leaf vein bionic fin and various arrangements in the tube on the complete melting time of phase change ...

Experimental study on a new thermal storage tank with an embedded

Inorganic hydrated salt phase change materials, as an important material for phase change energy storage technology, have the advantages of high thermal storage density, high ...

Magnetic Field-induced Enhancement of Phase Change Heat

In this research, biomimetic phase change composites are made by inspired by natural systems, successfully getting the high thermal conductivity of carbon foam and magnetism of ...

Design and optimization of a novel phase change heat storage unit ...

Request PDF , On Jul 1, 2025, Yangkai Xia and others published Design and optimization of a novel phase change heat storage unit with a bionic nautilus-inspired structure , Find, read and cite all

Leaf-vein bionic fin configurations for enhanced thermal energy ...

Leaf vein bionic fins to enhance phase change material charging performance. Eficient melting performance is achieved in thermal energy storage systems.

Bioinspired flexible phase change composites for highly ...

Global energy security and carbon neutrality goals have accelerated research on renewable energy, but solar intermittency hinders large-scale solar application, making efficient thermal energy storage ...

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