

JH Solar

Bionic table interface of energy storage materials



Overview

What is a bionic structure interface?

Imitating from and going beyond biological architectures, bionic designed structure interfaces reconstruct some unique interfacial functions on the renewable energy applications such as wetting state manipulation, energy conservation, and chemistry reaction.

Can Bionic interfaces be used for energy harvesting?

It is also worth to note that other bio-inspired structures such as woodpecker-inspired and leaf-inspired designs are intriguing and innovative, which hold the potential to use AM and further transform the development of bionic interfaces for energy harvesting , .

Can bioinspired materials be used for energy storage?

Recently, bioinspired materials have received intensive attention in energy storage applications. Inspired by various natural species, many new configurations and components of energy storage devices, such as rechargeable batteries and supercapacitors, have been designed and innovated.

What are the different types of Bionic interfaces?

The several major categories of AM methods include heat-powered AM , light-curing AM , extrusion-based AM , and their post treatments . The renewable energy applications of bionic interfaces include drag reduction , water/oil harvesting , , energy harvesting , batteries , catalyst and reactor , . 2.

What is bionic surface or interface electric-energy harvesting?

Bionic surface or interface electric-energy harvesting entails the design and fabrication of interface materials that demonstrate harmonious structure-function relationships inspired by biological surface or interface structures.

How can Am technologies improve Bionic interfaces?

We expect that AM techniques will contribute to intuitive innovations in wetting-controlled bionic interfaces, resulting in continual reductions in energy consumption and promotion of renewable resource production. 5.3. Energy harvesting

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Computational bioinspired structural design for sustainable and ...

As energy storage technologies advance rapidly, high-performance materials with higher electrochemical efficiency, mechanical robustness, and long-term durability are needed.

...

Highly stable and dendrite-free lithium metal batteries enabled by ...

The practical application of lithium metal batteries (LMBs) has been significantly hindered by two critical challenges: inferior cycling stability and potential safety risks arising ...



Biomimetic bone hydrogel enables a seamless interface for ...

Hydrogels offer promising avenues for developing advanced aqueous battery technology for sustainable energy storage and wearable electronic devices in future ...

A low-cost bionic interface modification strategy for enhancing the

This study devised a strategy of low-cost bionic interface modification based on phenol-amine chemistry for constructing desensitized EMs. During the synthetic process, ...



Bio-inspired thermoelectric cement with interfacial selective

By embedding thermoelectric capabilities within building materials, environmental energy can be harnessed, potentially enabling self-powered buildings and ...

Energy Storage Materials , Journal , ScienceDirect by Elsevier

is an international multidisciplinary journal for communicating scientific and technological advances in the field of materials and their devices for advanced energy storage and relevant ...



Optimizing heat transfer in phase change thermal energy storage ...

The development of clean energy technologies that can address the intermittency of solar energy is paramount in mitigating the impending energy crisis [2]. Phase change ...



Design and preparation of hierarchical porous carbon-based materials

By contrast, the electrode materials as key components play crucial roles to energy storage ability of supercapacitors. Therefore, a rational electrode design to improve ...



Additive manufacturing of bionic interfaces: From conceptual

Emerging AM of bionic interfaces has led to substantial advancements in renewable energy applications in recent years, but some challenges remain to be overcome. ...

Review: Application of Bionic-Structured Materials ...

This review provides an overview of typical bionic-structured materials in SSEs, particularly those mimicking plant and animal structures, with a focus on their latest advancements in applications of solid-state ...

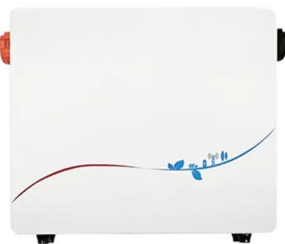


Advanced cellulose-based materials for flexible energy storage ...

Recently, the development of flexible and reliable electrochemical energy storage systems has garnered significant attention due to their critical roles in various applications, including ...

Hierarchical AlN/erythritol composite phase change ...

Introduction Phase change materials (PCMs) are becoming acceptable energy storage materials to tackle environmental problems and the energy crisis. Among them, ceramic-based composite ...



Microstructure and bionic engineering of triphase reaction interface

Zinc-air batteries (ZABs) hold immense promise for energy storage due to their potential advantages over existing technologies in terms of electrochemical performance, cost, and ...

Performance optimization of thermal storage device based on bionic ...

Latent heat energy storage technology garners widespread attention for its significant energy-saving benefits and high energy storage density. Nonetheless, the low ...

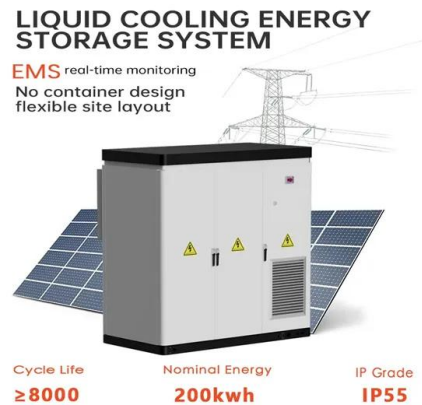


Bionic topology optimization of fins for rapid latent heat thermal

The latent heat storage (LHS) technique has been widely applied in various thermal energy conversion and management fields. However, LHS device suffers from very ...

Leaf-vein bionic fin configurations for enhanced thermal energy storage

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 ...



Design of multi-pipe latent heat storage device based on bionic

Latent heat thermal energy storage systems hold great potential for efficient thermal energy storage, but their development is limited by the low thermal conductivity of ...

Introduction: Bioinspired and Biomimetic Materials

Weder and co-workers summarize bioinspired stimuli-responsive materials that exhibit tunable mechanical properties. (14) Materials with tunable mechanical properties pave the way for the ...



Bioinspired Materials for Energy Storage

In this review, the design principles for bioinspired materials in terms of structures, synthesis, functionalization, and integration for advanced energy storage systems, including rechargeable batte

Thermal performance analysis of novel bionic fins in a concentric ...

Thermal energy storage (TES) is a critical technology that enables the capture and storage of thermal energy for use at different times and locations [8]. It plays an important ...



Battery thermal management enhancement based on bionics

Phase-change material cooling, in contrast to the previously mentioned air or liquid cooling techniques, is a passive thermal management method that leverages the ...



Bionic Hydrogel-based Stretchable Devices for Bioelectronics

This review first introduces a variety of materials used in the fabrication of bionic hydrogels, including natural polymers, synthetic polymers, and other materials. Then different ...



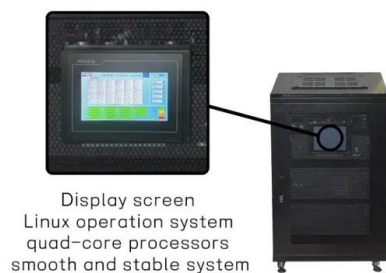
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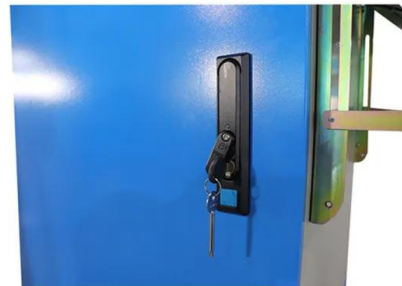


Leaf-vein bionic fin configurations for enhanced ...

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 materials

Self-assembled supramolecular pillared arrays as bionic interface ...

Aqueous zinc-ion batteries (AZIBs) are appealing devices for cost-effective and environmentally sustainable energy storage. However, irreversible issues such as dendrites, ...



Magnetically-accelerated photo-thermal conversion and energy storage

Therefore, this magnetically-accelerated method demonstrated the superior solar-thermal energy storage characteristics within a hierarchical bionic porous structure which ...

A Perspective of Bioinspired Interfaces Applied in Renewable ...

Currently, bioinspired interfaces have attracted much attention in practical applications of renewable energy storage and conversion devices including rechargeable ...



Optimizing heat transfer in phase change thermal energy storage ...

More specifically, PCM act as the thermal batteries, storing energy by absorbing heat during melting and releasing it during solidification [5]. Notably, PCM exhibit minimal ...

Bionic structures and materials inspired by plant leaves: A

The investigation of bionic structures and materials inspired by plant leaves has resulted in numerous research results, a wide range of applications, and excellent problem ...



Beyond biomimicry: Innovative bioinspired materials strategies ...

This review provides a comprehensive overview of bioinspired materials strategies that go beyond biomimicry to enable transformative advances in diverse storage ...

bionic energy storage material table interface

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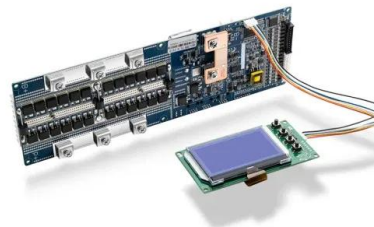


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Bionic Hollow Porous Carbon Nanofibers for Energy-Dense and ...

This investigation offers a novel strategy for designing high-efficiency zinc ion storage carbon nanomaterials and provides insights into the cathodic storage mechanisms ...



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