

Aerogel can be used as phase change solar container material

Are MXene aerogel-based phase change materials suitable for solar energy conversion?

A brand new concept of MXene aerogel-based phase change materials for solar energy conversion has been established. The MXene aerogel-based phase change materials are lightweight and shape-stable. The photothermal storage efficiency of Mxene@PEG aerogels reaches 92.5%.

Do aerogels support phase change materials?

Abstract With their low density and high porosity, aerogels are widely used as supporting frameworks for phase change materials (PCMs). However, the host-guest solid-liquid phase-change systems oft...

Are mxene@peg aerogels suitable for solar energy utilization?

Therefore, the MXene@PEG aerogels exhibit good form stability and thermal stability, high loading mass and phase change enthalpy, hence, demonstrating a promising application in solar energy utilization fields. 3.5. Photo-to-thermal conversion, thermal energy storage and release of MXene@PEG aerogels

What are aerogels used for?

Learn more. With their low density and high porosity, aerogels are widely used as supporting frameworks for phase change materials (PCMs).

Do aerogels improve thermal energy storage performance in host-guest solid-liquid phase-change systems?

However, the host-guest solid-liquid phase-change systems often encounter difficulties in optimizing the balance between mechanical properties and thermal energy storage performance, the intrinsic advantages of aerogels not being fully realized.

What is the photothermal storage efficiency of mxene@peg aerogels?

The photothermal storage efficiency of MXene@PEG aerogels reaches a relatively high value of 92.5%. This work provides a new type of scaffold for lightweight and shape-stable photothermal carrier and paves the way for the application of non-graphene 2D materials toward solar energy utilization. 1. Introduction

Three-dimensional montmorillonite/Ag nanowire aerogel supported stearic acid as composite phase change materials for superior solar-thermal energy harvesting and storage Hao Yi a ...

A novel homogeneity reinforced carbon aerogel with a well-interconnected porous structure was constructed by combining a flexible carbon resource from biomass guar gum with hard-brittle carbon ...

Herein, we developed a composite phase change material based on poly (vinyl alcohol-co-ethylene) (EVOH) nanofibers aerogel and polyethylene glycol (PEG) for sustainable seawater ...

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A green, robust, and versatile BN nanosheet unidirectional aerogel encapsulated phase change material for effective thermal management of electronics and solar ...

Abstract:Phase-change materials (PCMs) have gained more attention during the last few decades. As the main function of these materials is to store and release energy in the form of latent heat during ...

3D porous graphene aerogel (GA) has a capability to infiltrate plenty of phase-change materials (PCM) into the internal pore. Since carbon-based materials can offer excellent solar light absorption and ...

Halloysite-based aerogels for efficient encapsulation of phase change materials with excellent solar energy storage and retrieval performance Xuke Ma, Chunyan Yang, Xuejiao Feng, ...

Phase change materials (PCMs), such as paraffin (PW), are capable of harvesting and converting solar energy into thermal energy, thus playing a crucial role in solar energy utilization. ...

TD@CKF-PVA phase change materials also demonstrate outstanding thermal management capabilities in both time and space dimensions, effectively reducing the heat ...

Abstract Phase change materials (PCMs) are an excellent option for heat storage and temperature stability; however, their low thermal conductivity and potential for leakage significantly ...

Solar energy is an inexhaustible clean energy, and solar evaporation salt water desalination is a promising technology. However, the low evaporation efficiency caused by intermittent solar irradiation ...

Aerogels are one of the most interesting materials of the 21st century owing to their high porosity, low density, and large available surface ...

Phase change materials (PCMs) need to improve thermal conductivity and maintain stability to meet actual application requirements. Here, a novel composite based on hydroxylated ...

Over-exploitation of fossil-based energy sources is majorly responsible for greenhouse gas emissions which causes global warming and climate change. T...

In the present work, a composite form-stable phase change material (FSPCM) for use in gypsum board was developed based on methyl stearate and diatomite by a direct impregnation ...

Our strategy produces promising composite phase change materials for solar energy utilization using the MXene aerogels as the encapsulation and photothermal materials.

Polyimide/phosphorene hybrid aerogel-based composite phase change materials for high-efficient solar energy

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capture and photothermal conversion Zhiheng Zheng, Tao Shi, Huan Liu ...

The MXene@PEG aerogels are lightweight, with a density about 30 mg/cm³. The MXene skeleton is introduced as supporting materials to keep the shape of MXene@PEG aerogel ...

Energy storage materials play a crucial role in enhancing system efficiency by bridging the mismatch between energy supply and demand. Among them, organic phase change materials ...

Polypyrrole coated carbon nanotube aerogel composite phase change materials with enhanced thermal conductivity, high solar-/electro- thermal energy conversion and storage

To make use of solar energy, a new phase-change composite material (CNTs-MSA) based on carbon nanotubes (CNTs)-loaded silica aerogel (SA) and microcapsule phase-change ...

Phase change energy storage materials are widely used in thermal management because they reduce energy consumption and effectively address issues such...

Sustainable solar desalination through interfacial evaporation: Integration of chitosan aerogel-impregnated graphene nanoplatelets solar evaporator and phase change material T. ...

Phase change materials (PCMs), as energy storage materials, can reversibly store/release energy in the form of latent heat through phase transition, providing a feasible approach ...

Abstract Phase change Materials (PCMs) have a promising future in the energy fields of latent heat storage, solar energy conversion and building thermal management. In this work, two ...

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