HJ Solar

Phase change solar container wood preparation technology

Overview

To address the low efficiency and flammability of wood-based phase change materials (WPCMs) in solar energy storage, this study developed a series of WPCMs (PEG/TPP/DW-P) with both flame retardancy and solar-thermal energy storage properties by vacuum-impregnating. Herein, a multifunctional composite phase change material (CPCM) is developed using a balsa-derived morphology genetic scaffold, engineered via bionic catechol surface chemistry. The scaffold undergoes selective delignification, followed by a simple, room-temperature polydopamine (PDA) modification.

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Phase Change Materials in Food Packaging: A Review

Phase change materials (PCMs) are a class of thermoresponsive or thermoregulative materials that can be utilized to reduce temperature fluctuations and provide cutting-edge thermal ...

Use of phase change materials in wood and wood-based composites ...

"Solvent-free preparation of bio-based polyethylene glycol/wood flour composites as novel shape-stabilized phase change materials for solar thermal energy storage," Solar Energy Materials and ...

Bio-based poly (lactic acid) shaped wood-plastic phase change

In order to overcome the drawbacks of solid-liquid phase transition such as large volume change and requirement for container for the liquid phase, the exploration of preparing shape-stable ...

Composite phase-change materials for photo-thermal conversion and

Organic phase-change materials can absorb or release a large amount of latent heat during the solid-liquid phase transition, whereas a functional carrier material can enhance the ...

Wood products with advanced solar-to-thermal conversion and phase

This smart wood product provides a cost-effective, highly stable, and easy-to-implement solution for energy conversion and thermal management technologies.

Form-Stable Phase Change Material with Wood-Based Materials as ...

Building shape-stable phase change materials (PCMs) are crucial for their practical applications. Particularly, it is vital to utilize renewable/recyclable biomass media as the support ...

Wood products with advanced solar-to-thermal conversion and ...

The weight and density of Fe3+@DP-wood were unchanged compared with DP-wood.PEGandHDI, wereimpregnatedintotheporesoftheFe3+@DP-woodundervacuum,leading to in ...

Carbonized-wood based composite phase change materials loaded ...

The combined microscopic and macroscopic test results showed that the modified carbonized-wood provided a good support structure for the paraffin wax (PW) to prepared ...

Wood-based phase change energy storage composite material with

With the continuous increase in global energy demand and environmental challenges, the efficient utilization and storage of energy have become critical areas of scientific research. This ...

Preparation of phase change Heat storage wood with in-situ ...

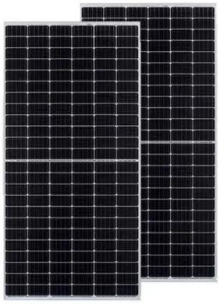
Wood has been developed with phase change heat storage function using balsa as a natural packaging material, and PEG was employed as a material for phase change heat storage ...

A novel approach for constructing plantation wood-based phase change

This novel approach, designed to simultaneously achieve robust phase-change energy storage, superior mechanical performance and dimensional stability without relying on ...

Flame-retardant wood-based composite phase change materials ...

The current research has very broad application potential in the practical application of WPCMs as buildings. Graphical Abstract Wood-based composite phase change materials based on ...



Experimental investigation of solar chimney with phase change ...

The effect of latent heat storage (LHS) on a solar chimney pilot was studied experimentally. Two kinds of experiments including with and without phase change material (PCM) ...

Scalable Fabrication of Light-Responsive Superhydrophobic ...

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

Bioinspired wood-based composite phase change materials for ...

Here, a coupling solution based on microencapsulated phase change materials (MPCMs) that integrates photothermal effect and phase change thermal storage is proposed.

An ultrastrong wood-based phase change material for efficient

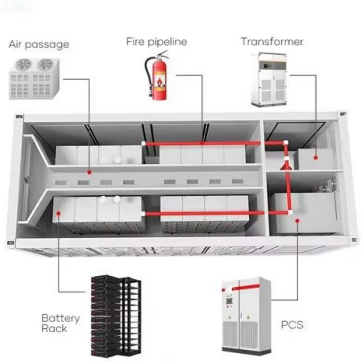
Phase change material is an energy storage substance that can store and release thermal energy via reversible crystalline transformation [8,9]. The application of PCM provides a ...

Flame-retardant wood-based composite phase change materials

Wood-based composite phase change materials based on polydopamine functionalized carbon dots for efficient solar-to-thermal energy storage and flame-retardant applications. Discover ...

Processing wood into a phase change material with high ...

In this work, a composite phase change material is prepared by introducing stable polyethylene glycol-based energy storage polymer (PGMA) into the porous structure of delignified ...



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