Wood structure phase change solar container material

Can wood-based phase change materials save solar energy?
This indirect conversion method also improves the utilization rate of solar energy. Wood-based phase change materials (WPCMs) doped with photothermal agents, which can store the heat generated by solar radiation in the form of high latent heat, have been applied in the field of efficient solar-thermal energy storage [9, 10].

What are wood-based composite phase change materials?
Wood-based composite phase change materials based on polydopamine functionalized carbon dotsfor efficient solar-to-thermal energy storage and flame-retardant applications. Discover the latest articles,books and news in related subjects,suggested using machine learning.

Can a wood-based phase change thermal storage composite material reversible thermochromic properties?
In this study,a wood-based phase change thermal storage composite material with reversible thermochromic properties was developed using a drop-coating method. Electron microscopy images and infrared spectra confirmed that the TPW surface was coated with a microcapsule/PVA composite layer,tightly bonded to the wood without discernible boundaries.

Do phase change materials matter for thermal energy management?
Author to whom correspondence should be addressed. The growing demand for sustainable energy storage solutions has underscored the importanceof phase change materials (PCMs) for thermal energy management.

Can carbonized wood be used for long-term shape-stabilized composite phase change materials?
You, Z.P.; Dong, Y.; Tang, M.; Chen, M.Z.; Zhou, X.Y. Carbonized wood loaded with carbon dots for preparation long-term shape-stabilized composite phase change materials with superior thermal energy conversion capacity. Renew. Energy 2021, 174, 19-30. [Google Scholar] [CrossRef]

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

As a phase change material, Ga exhibits a low melting point, close to human body temperature, and high thermal conductivity. Wood"s unique anisotropic porous structure endows ...

In this study, the phase change cold storage materials, cold storage units and diversified cold storage box

applied to cold chain logistics are reviewed. Besides, based on the state ...

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

To broaden the application scope of wood-based phase change materials (PCMs) and increase their functional diversity, this research seeks to create a wood-based energy storage ...

In this work, we aimed to develop a fully biobased composite based on solid wood and 1-dodec-anol by a green fabrication process for sustainable thermal energy storage and passive thermal regulation in ...

In this work, we have innovatively crafted a type of wood-based composite phase change materials with multifunctional properties including highly efficient solar to thermal storage and conversion, excellent ...

In this study, a sustainable wood-based phase change material with high photothermal conversion efficiency was prepared successfully by combining wood, PEG and Fe 3 O 4 nanoparticle.

The flame-retardant mechanisms are elaborated, and the relationship between structure and performance is emphasized. Advanced applications of these CPCMs, including battery thermal ...

In this study, polymethyl methacrylate (PMMA) is innovatively employed as an encapsulation film on the surface of the wood-based phase change material, resulting in a recyclable ...

These properties create opportunities for the effective storage and conversion of solar energy. Current research primarily focuses on encapsulating phase change energy storage materials ...

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 ...

Abstract The potential for phase change materials (PCMs) has a vital role in thermal energy storage (TES) applications and energy management strategies. Nevertheless, these materials ...

Wood has poor thermal inertia and low energy storage density, which limits its effectiveness as a building envelope [7]. Therefore, it is necessary to combine wooden building envelopes with other ...

Phase change materials (PCM) are among the most effective and active fields of research in terms of long-term heat energy storage and thermal management. Due to their excellent ...

In this paper, a marine bioinspired wood-based composite phase change materials (DW-CI/EP/PEG) with effective photothermal conversion and energy storage capability was developed by cuttlefish ...

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Phase change energy storage materials prepared using wood as the substrate can store and convert solar energy, and have gained popularity in areas such as energy-saving buildings ...

Phase change materials (PCM) are employed to store thermal energy in solar collectors, heat pumps, heat recovery, hot and cold storage. PCMs are encapsulated primarily in shell-and-tube, ...

The integration of phase-change materials (PCM) into building enclosures can effectively improve the thermal performance of buildings. In this study, a novel phase-change wall of ...

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 ...

Abstract In this study, we propose a dual-layer, pipe-embedded phase change wall system for wooden structures that integrates sky radiation cooling and solar heat collection for cross ...