

Phase change solar container nonwoven fabric

<div class="df_qntext">Are solid-solid phase change fibers recyclable through wet-spinning?

This work presents intrinsically flexible solid-solid phase change fibers through wet-spinning for the first time. The fibers also exhibit excellent knittability, dyeability, recyclability, heat-induced shape recovery, washing resistance, and long-term thermal cycle stability.

<div class="df_qntext">Can flexible single-wall carbon nanotube non-woven fabric be used as a skeleton?

In this study, a novel flexible single-wall carbon nanotube non-woven fabric (SWNWF) with high mechanical and electrical properties as well as high volume of interconnected micropores is used as a skeleton for fabricating flexible and mechanically stable PCMs.

<div class="df_qntext">How efficient is a photothermal evaporator based on Pani/CNT fabric?

The hanging photothermal evaporator based on the PANI/CNT fabric can achieve an evaporation rate of $2.81 \text{ kg} \cdot \text{m}^{-2} \cdot \text{h}^{-1}$ and a photothermal efficiency of 91.74% under a solar illumination of $1 \text{ kW} \cdot \text{m}^{-2}$.

<div class="df_qntext">How efficient is a Pani/CNT fabric solar evaporator?

The hanging mode provides efficient evaporation at both interfaces by greatly reducing the heat dissipation area. The hanging mode PANI/CNT fabric solar evaporator can achieve an evaporation rate of $2.81 \text{ kg} \cdot \text{m}^{-2} \cdot \text{h}^{-1}$ and a photothermal efficiency of 91.74% under a solar illumination of $1 \text{ kW} \cdot \text{m}^{-2}$.

<div class="df_qntext">Are solid-liquid phase change materials suitable for energy storage and conversion?

Solid-liquid phase change materials (PCMs) are considered promising candidates for use in energy storage and conversion devices. However, the drawbacks of liquid phase leakage, low thermal conductivity, and poor electro/solar-thermal conversion ability have limited their practical application.

<div class="df_qntext">Are phase change materials a wearable thermal management material?

However, the phase change materials involved in the existing PCFs still experience a solid-liquid transition process, severely restricting their practicality as wearable thermal management materials.

For instance, Li et al. reported on carbon nanotubes as an efficient solar steam generator. The composite evaporator, prepared by embedding multi-armed carbon nanotubes (CNTs) ...

Phase-change energy storage nonwoven fabric (413.22 g/m^2) was prepared, and the morphology, solid-solid exothermic phase transition, mechanical properties, and the structures were ...

Maintaining the match between input solar energy and required energy through evaporator density

management is crucial for efficient solar steam generation compared to ...

However, these reported flexible phase change fabrics via onestep electrospinning process also exhibit low enthalpy value of less than 150 J g⁻¹ [31]. Therefore, to further meet practical requirement, the ...

We fabricated 2D/3D micro- and nanostructured graphene nanosheets/copper sulphide nanowires with a synergistic photothermal effect by coating graphene nanosheets on needle-punched ...

Herein, form-stable phase change material fibrous composite containing nanoparticles was prepared via a single-step green approach using single-nozzle electrospinning for the first time.

Flexible and intelligent electronics are highly demanded in wearable devices and systems, but it is still challenging to fabricate conductive textiles with good stretchability, ...

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Phase change materials (PCMs) have been proven to be promising electronic packaging materials to passively control electronics heating and cooling, but the poor thermal stability ...

Phase change materials (PCMs) are characterized with unique properties of absorbing or releasing heat often referred to as latent heat when the material undergoes phase transition. ...

HIGHLIGHTS The first assembled flexible phase change nonwoven is reported by wet-spinning. The unprecedented thermal properties of such flexible phase change nonwoven are achieved. Such ...

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Functional phase-change fabrics hold great promise as wearable clothing. However, how to enable a phase-change fabric with the combined features of excellent structural flexibility and robustness, ...

Thermal and moisture properties play a significant role in the packaging materials in the form of a container. This study deals with the effect of microencapsulated phase change material ...

The phase change of the core material occurs with the change of temperature. After the phase change material absorbs and releases a large quantity of energy, the microcapsule can keep ...

Therefore, it is essential to develop multi-functional CPCMs to address the inherent shortcomings of PCMs. Forming shape-stabilized phase change materials (SSPCMs) can solve the ...

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In this work, a phase-change energy storage nonwoven fabric was made of polyurethane phase-change material (PUPCM) by a non-woven melt-blown machine. Polyethylene glycol 2000 was used as the ...

It has a suitable phase-change temperature, relatively high latent heat, negligible supercooling, good thermal reliability, and no phase separation at high temperatures. It can ...

Encapsulating phase change materials can greatly improve their utilization and lifespan. To address the dispersion issues of phase change materials in the matrix and the problem of ...

Solar-driven interfacial water evaporation is a low-carbon footprint strategy for addressing global water scarcity. However, the operation of the evaporator requires continuity of solar ...

Building upon this foundation, this study develops a solar-driven evaporation system (PPy/fabric-PCP) integrated with a phase-change heat storage mechanism, aiming to achieve highly ...

Phase change materials (PCMs) provide indoor thermal comfort without powered equipment, ideal for passive building heating and cooling. This study developed a novel approach to ...

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