Micro-nano solar container materials

Interfacial solar evaporators have attracted increasing attention recently. Traditional photothermal absorbers typically rely on capillary wicking for ...

Phase change materials (PCMs) possess high latent heat during the solid-liquid phase transition, making them promising materials for thermal energy storage.

Selective absorber/emitter based on micro/nano materials can reshape the solar radiation spectrum and realize efficient energy conversion of solar the...

In addition, those capsules that are formed via chemical methods are more durable compared to other approaches. Given that micro- and nano-encapsulated phase change material ...

Nano-Micro Letters is an open-access journal focused on all aspects of nano- or microscale structure and systems from science to technologies. Publishing ...

Abstract Clean-water harvesting through solar interfacial evaporation technology has recently emerged as a strategy for resolving global water scarcity. In this study, rapid carbon-dioxide-laser-induced ...

A promising approach is through printing electronic technology, which offers rapid prototyping capability with numerous selections of functional inks and pastes made of micro and nano ...

Abstract Micro and Nano-encapsulated Phase Change Materials (M/N-ePCM) based fluids have garnered significant attention due to their dual benefit of high energy storage capacity and ...

Metal mesh-based transparent electrodes possess several notable advantages, including exceptional flexibility, high electrical conductivity, and excellent light transmittance, making ...

Clean-water harvesting through solar interfacial evaporation technology has recently emerged as a strategy for resolving global water scarcity. In this study, rapid carbon-dioxide-laser-induced ...

This paper systematically reviews recent progress in the selection of phase change materials tailored for solar applications, innovative encapsulation techniques, and the development of ...

Phase change materials (PCMs) possess high latent heat during the solid-liquid phase transition, making them promising materials for thermal ...

Solar-driven vapor generation by localized solar heating of a photothermal material is an environmentally

friendly approach for seawater desalination and wastewater purification. In this ...

Analyzing a combination of the solar-absorbing functions of metamaterials and the latent heat performance of phase change material (PCM), this paper seeks to formalize the thermal storage ...

A cellulose-based solar interfacial evaporator with micro-/nano-architecture is developed using ice-templating and carbon-dioxide-laser-induced ...

Scalable methods support low-cost production of solar thermal materials. Micro- and nano-encapsulated composite phase change material-based heat transfer fluids represent a ...

In this con- text, we propose a novel interfacial solar evaporator based on the micro-nano water film for high-efficiency solar desalina - tion. Porous polypyrrole (PPy)- and polydopamine (PDA)- coated ...

The functioning of micro/nano containers can be divided in two principal groups: autonomous (based on defect filling and corrosion inhibition) and non-autonomous (based on dynamic bonds and shape ...

Texturing silicon solar cells with micro/nano-structures is crucial for achieving outstanding optical performance in perovskite/silicon tandem solar cells (TSCs). However, ensuring excellent electrical ...

The effective utilization of solar energy is feasible by matching the energy supply to demand with selective solar collectors and energy storage. Solar thermal systems with thermal ...

"The thermal and electrical energy of a PVT system utilizing Nano PCM and Nanofluids in a Micro fins tube is more than that of any other system ...

Light diffusion film is a functional optical material designed to transform intense and non-uniform light from point or line sources into uniformly distributed, soft, and glare-free surface illumination ...

By dividing this study into four parts, we start with an overview of the material types, desired attributes, and key challenges of PCMs; the different types of PCM systems; and their potential applications in ...

Phase change materials (PCMs) possess high latent heat during the solid-liquid phase transition, making them promising materials for thermal energy storage. However, challenges such as ...

This review provides a concise evaluation of advancements in micro- and nano-encapsulated phase change materials (M/N-ePCMs) for improving the thermal efficiency and stability of solar water ...

This paper systematically reviews recent progress in the selection of phase change materials tailored for solar applications, innovative ...

Herein, we propose a novel interfacial evaporation structure based on the micro-nano water film, which demonstrates significantly improved evaporation performance, as experimentally ...

Among the techniques mentioned above, the dispersion of nanoparticles is reliable and economically viable. These materials are so-called nano-enhanced PCMs (NePCMs) that facilitate ...

Abstract Clean-water harvesting through solar interfacial evaporation technology has recently emerged as a strategy for resolving global ...

However, to promote the development and widespread adoption of Micro/Nano-encapsulated Phase Change Materials (M/N-ePCMs) as a highly efficient thermal, photothermal, and ...

Functional materials for micro/nano AM are also summarized. Micro/nano AM techniques, as well as fabricated micro/nano functional devices, are highlighted. Finally, limitations of ...

Due to the unique thermal absorption and release capabilities, phase-change materials (PCMs) are used in various industrial fields, such as ...

Web: https://www.lpsolar.co.za