Photothermal solar container core

What is photothermal energy storage structure (PESS)?
It consisted of inner multi-scale pyramidal photothermal structures with microscale gradient porous copper foams, CuS nanowires and reduced graphene oxide (rGO) composite materials, and outer photothermal energy storage structures (PESS) of CuS-rGO/CF@ Paraffin.

Does a composite photothermal structure with energy storage improve water evaporation and desalination?
Herein,we proposed a composite photothermal structure with energy storage (CPSES) to achieve efficient water evaporation,energy storage/release,and effective thermal management for continuous seawater desalination in the intermittent sunlight.

How do pyramidal photothermal structures convert solar energy to thermal energy?
In the sunlight, both pyramidal photothermal structures and PESS absorbed solar energy and convert to thermal energy.

Does multi-scale photothermal structure contribute to favorable solar evaporation performance?
It suggests that the excellent photothermal performance of multi-scale CuS-rGO pyramidal photothermal structure,the gradient heating effect and energy storage of CuS-rGO/CF@Paraffin contributed to the favorable solar evaporation performance.

How does a photothermal energy storage structure affect evaporation rate?
For example,when the width of the photothermal energy storage structure increased from 2.5 mm to 15 mm,the surface temperature increased from 46.4 °C to 58.6 °C and the evaporation rate increased from 3.2 kg/m 2 h to 6.0 kg/m 2 hfor the CPSES.

Can photothermal membranes be used for solar water production?
Moreover,the unique photothermal feature of the as-prepared Cu 2-x Se nanoparticles,the natural hydrophilicity,and the linking properties of bacterium offer a convenient way to tailor photothermal membranes for solar water production.

Abstract CeO2 based semiconductor are widely used in solar-driven photothermal catalytic dry reforming of methane (DRM) reaction, but still suffer from low activity and low light utilization ...

Additionally, the paper reviews strategies for the integration of solar thermal energy into solar-coupled hydrogen production systems. Subsequently, evaluation metrics for photothermal ...

Besides, hybrid solar absorbers featuring semi-conductor nanoparticle@metal-organic frameworks (MOFs) core-shell structures were designed to function as nanoheaters for enhanced photothermal ...

Abstract Nanoparticles (NPs) have attracted much attention recently because of their excellent photothermal properties. In particular, nanofluids (NFs) based on core-shell plasmon NPs ...

Here, we harvest solar energy in a dual mode for Cu 2-x Se nanoparticles biomineralization and seawater desalination by integrating the merits of Shewanella oneidensis MR-1 ...

Hydrogen is increasingly recognized as a pivotal energy storage solution and a transformative alternative to conventional energy sources. This review summarizes the evolving ...

A photothermal reservoir composed of a water storage core encapsulated by a graphene-based aerogel sheet is designed for solar-steam generation without bulk water. The ...

The Au-carbon core-shell nanospheres, acting as a general design of solar-driven photothermal agent, have a unique property of effectively heating of bulk surroundings, and they can be extensively ...

Based on this, a combined form of difunctional phase change composites (PCCs) integrated with phase change materials (PCMs) and ...

In this review, Ding and colleagues summarize the functioning principles and categories of photothermal catalysis, catalyst design criteria and ...

It is highly desirable to seek green and sustainable technologies, such as employing photothermal effects to drive energy catalysis processes to address the high energy demand and ...

?? Nanoparticles (NPs) have attracted much attention recently because of their excellent photothermal properties. In particular, nanofluids (NFs) based on core-shell plasmon NPs ...

In solar interfacial evaporation, photothermal materials exhibit a wide range of additional characteristics, but a systematic overview is lacking. This paper encompasses an examination of ...

Herein, we proposed a composite photothermal structure with energy storage (CPSES) to achieve efficient water evaporation, energy storage/release, and effective thermal management for ...

Developing efficient and stable photocatalysts for hydrogen generation still remains a huge challenge. Herein, we adopted Cynanchum fibers as a carbon source and substrate to construct ...

For practical use in solar water evaporation, photothermal materials must have long service life, excellent corrosion resistance, high thermal stability, and strong weatherability, in addition ...

Interfacial solar steam generation (ISSG) has recently been a sustainable approach to seawater desalination and purification. Our work mainly aims to enhance light-to-heat conversion by ...

In addition, the approach is also a sustainable solution for arid regions with high water shortage but possess high solar irradiance. Recently, the interfacial solar steam generation (SSG) ...

1. Introduction Interfacial solar evaporation is a flourishing water purification technology with a minimized carbon footprint. As a representative application, solar-driven desalination, which ...

By using common techniques like reverse osmosis and multi-stage flash distillation. Solar desalination is the solution, but solar desalination has a limited outcome, for that solution is ...

A water splitting system capable of operating stably using contaminated water sources for decentralized H2 production would be a more practical approach towards solar H2 ...

A solid photothermal reservoir is designed to implement solar-steam generation in the absence of bulk water. The photothermal reservoir is composed of a water absorbing core encapsulated by a ...

Inspired by Paradisaeidae"s feather and electric kettle, the biomimetic design of photothermal/electrothermal fabrics for realizing all-weather ...

A solid photothermal reservoir is designed to implement solar-steam generation in the absence of bulk water. The photothermal reservoir is composed of a water absorbing core encapsulated by a ...

This work demonstrates a synergistic utilization of photothermal effect and photonic crystal structure for efficient photocatalytic CO 2 reduction and revealing more potential applications.

However, the photothermal conversion efficiency in the solar evaporation process under natural conditions typically falls below 20 % [13, 14]. This low efficiency primarily stems from ...

Photothermal material applied in environmental governance has attracted growing attention. By combining the Stöber method and dopamine-triggered coating strategy, Co-Mn ...

In this study, a MoO 3-x @ZnIn 2 S 4 composite with a core-shell structure is designed for the first time, and the combination of an S-scheme ...

It is pivotal to improving the photothermal catalytic conversion by exploring efficient photothermal catalysts with intense broadband solar energy absorption and high efficiency of solar-to-heat ...

The key to the solar photothermal-powered interfacial evaporators lies in the design and development of photothermal materials with good wettability, efficient water transport, and high ...

Solar energy, the most promising renewable energy, suffers from intermittency and discontinuity. Phase

change material (PCM)-based energy ...

Recent advances in photothermal materials including carbon-based structures, semiconductors, polymers and plasmonic composites have significantly improved solar absorption, heat conversion ...

Web: https://lpsolar.co.za