Energy storage material photothermal conversion efficiency

This study indicates the applicability of LDPE/Al recycling as an inexpensive alternative to neat polymers for preparing thermal energy storage materials with enhanced ...

However, PW faces challenges, such as solid-liquid leakage and low photothermal conversion efficiency, which hinder its applications in solar energy storage. In this ...

Amongst the various solar energy conversion pathways, solar-thermal energy conversion is the most straightforward and efficient. Photothermal materials form the key ...

PTCPCESMs can facilitate the conversion and storage of solar energy and can overcome the limitations of structural stability, thermal conductivity, light absorption capacity, ...

Our study presents a facile strategy for simultaneously enhancing the photothermal energy conversion and storage performance of phase change capsules, which ...

The composite photothermal PCM has robust full-spectrum absorption and highly efficient photothermal conversion capability, realizing both thermal energy storage and ...

Photothermal conversion phase change materials can combine the mechanisms of photothermal conversion and phase transformation to realize storage or release solar ...

Their performance is evaluated at the material characterization, kinetics analysis, photothermal conversion and practical application perspectives. The thermochemical energy ...

This material integrates phase change materials (PCMs) with photothermal conversion carriers, effectively enhancing energy utilization efficiency through a simple phase ...

The results show that the design of this structure achieves a high energy storage density and demonstrates excellent thermal stability and thermal cycling stability. Additionally, ...

To meet the demands of the global energy transition, photothermal phase change energy storage materials have emerged as an innovative solution. These materials, utilizing various ...

The design leverages the crystalline domains of poly (ethylene glycol) (PEG) as the phase-change functional component, while the aniline trimer serves a dual role: acting as a ...

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The solar-heat storage efficiency of devices based on phase change materials (PCMs) is limited due to the light absorption and internal heat transfer within the PCMs, unclear ...

Download Citation | On Feb 1, 2025, Rongjun Wei and others published Bioinspired wood-based composite phase change materials for efficient photothermal conversion and energy storage | ...

This paper reviews the research on PTCPCESMs from China and other abroad, which can improve the utilization and conversion rate of full-spectrum sunlight, address the ...

Given the substantial consumption of fossil fuels, there is an urgent need for energy storage materials that offer exceptional photothermal conversion efficiency and high ...

Phase change materials (PCMs) hold significant potential for thermal energy storage, yet their application is often hindered by leakage and structural instability. Therefore, a ...

The prepared thermochromic phase change materials (TC-PCMs) have the thermochromic function, which can automatically change their colors according to the ambient ...

Developing high-efficiency solar photothermal conversion and storage (SPCS) technology is significant in solving the imbalance between the supply and demand of solar ...

Preparation and properties of erythritol/exfoliated graphite nanoplatelets @ polyaniline microencapsulated phase change materials with improved photothermal conversion efficiency ...

To alleviate the predicament of resource shortage and environmental pollution, efficiently using abundant solar energy is a great challenge. Herein, we ...

Phase change materials (PCMs) are a crucial focus of research in the field of photothermal energy storage. However, due to their inherently low photothermal conversion ...

Solar-mediated PCMs had received extensive attention this past few years, deliberate attempts had been made to improve the photothermal energy conversion efficiency ...

Thermal energy storage (TES) systems with phase change materials (PCMs) can efficiently address the intermittency and uneven distribution of solar energy. However, easy ...

Phase change material (PCM) with outstanding thermal energy storage and temperature regulation, holds tremendous interest in energy conservation and management. ...

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