

Why is photo-thermal energy storage important?

Photo-thermal energy storage is a crucial component of sustainable photo-thermal conversion applications[,],and improving both the solar absorption ability and heat storage capacity of the materials utilized is essential for its widespread adoption [10 ].

What is photothermal phase change energy storage?

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 photothermal conversion carriers,can passively store energy and respond to changes in light exposure,thereby enhancing the efficiency of energy systems.

What are the applications of photothermal materials?

Explore the broad spectrum of applications for photothermal materials, including their transformative roles in photothermal catalysis, sterilization and therapy, desalination, and the generation of electric energy through photothermal conversion.

Does photo-thermal conversion and energy storage improve phase change performance?

Photo-thermal conversion and energy storage experiments were carried out to evaluate the phase change characteristics. It was shown that the enhanced PCM had higher thermal conductivity, better heat transfer performance, and higher heat storage efficiency when illuminated in the direction of the vertical compression plane.

What are photothermal conversion and energy storage microcapsules?

In order to maintain thermal comfort in the human body,photothermal conversion and energy storage microcapsules were designed,developed,and applied in a light-assisted thermoregulatory system.

What is PCM based photothermal conversion and storage system?

The PCM-based photothermal conversion and storage system is composed of photothermal conversion unit(PPy),latent heat storage unit (ODA),and supporting framework (MOF). High content (6%) of PPy is more conducive to the improvement of these thermophysical properties of ODA@MOF/PPy composite PCMs.

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Photothermal phase change energy storage materials (PTCPCEsMs), as a special type of PCM, can store energy and respond to changes in illumination, enhancing the efficiency of energy systems and ...

Thermal energy storage (TES) techniques are classified into thermochemical energy storage, sensible heat

storage, and latent heat storage (LHS). ... [91-96] Therefore, 2D graphene is a ...

The CCNT layer provided excellent photothermal conversion and self-cleaning properties. The experimental results show that the latent heat of the PCM can reach 124.2 J/g, the water contact angle is 144°; the ...

An azobenzene-based photothermal energy storage system for co-harvesting photon energy and low-grade ambient heat via a photoinduced crystal-to-liquid transition ... the heat produced by ...

1 ?&#0183; Beijing University of Chemical Technology, Institute of Advanced Technology and Equipment, CHINA. Search for more papers by this author. Bo Yuan, Bo Yuan. ... (STFs) for ...

This work focuses on the key equipment selection and design points of concentrating the heat collection system, heat storage system, and steam generation system. ... The results showed ...

Owing to the excellent photothermal performance of the PANI, the thermal energy will be generated under sunshine and simultaneously transferred to the microcapsules for energy storage. As a result, the MEPCM-PTMPTA/PANI ...

All-weather, high-efficiency solar photothermal anti-icing/deicing systems are of great importance for solving the problem of ice accumulation on outdoor equipment surfaces. ...

heat stored with energy-storage materials in a heat exchanger [1, 3, 12]. This complicate process is expected to be substituted by a one-step system, direct solar-thermal conversion and ...

1 INTRODUCTION. Renewable, abundant, and clean solar energy is expected to replace fossil fuels and alleviate the energy crisis. However, intermittence and instability are the deficiencies of solar energy due to its ...