Photothermal phase change energy storage materials

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 photothermal phase change materials (ptpcms)?
Photothermal phase change materials (PTPCMs) represent a novel type of composite phase change material(PCM) aimed at improving thermal storage efficiency by incorporating photothermal materials into traditional PCMs and encapsulating them within porous structures.

What is photo-thermal conversion phase-change composite energy storage?
Based on PCMs, photo-thermal conversion phase-change composite energy storage technology has advanced quickly in recent years and has been applied to solar collector systems, personal thermal management, battery thermal management, energy-efficient buildings and more. The future research should address:

What are photo-thermal conversion materials & PCMs?
They consist of photo-thermal conversion material and PCMs,which can store or release a large amount of thermal energy during the solid-liquid phase-change process. These materials have great potential for applications in desalination,heating,construction,and solar energy storage systems.

Are phase change materials suitable for solar thermal storage?
Phase change materials (PCMs) have garnered considerable interest owing to their capacity to store and release substantial amounts of heat during phase transitions [5 - 8],particularly for solar thermal storage[9 - 11]. Nevertheless,the low thermal conductivity and leakage problems associated with pure PCMs limit their practical use .

What is thermal energy storage based on phase change materials?
Thermal energy storage based on phase change materials (PCMs) is of particular interest in many applications,such as the heating and cooling of buildings,battery and electronic thermal management,and thermal textiles.

In this study, we prepared CNT-BN-SA-1, a photothermal phase change energy storage material with excellent stability, long life, and high enthalpy value. The OHm of CNT-BN-SA-1 is 143.5

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 ...

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In this study, CNT-BN-SA-1 composites were prepared by vacuum impregnation using stearic acid (SA) as a phase change material (PCM), multi-walled carbon nanotubes ...

By combining photo-thermal materials with PCMs, PCPCMs with high photo-thermal conversion efficiency can be prepared. Under the irradiation of sunlight, PCPCMs can ...

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PCM is a type of thermal storage material that uses the phase change to store energy. The common low-temperature PCM possesses an ability to change from a solid to a ...

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Phase change materials (PCMs) are promising for thermal energy storage due to their high latent enthalpy and constant phase change temperature. However, organic PCMs suffer from ...

Intrinsic photothermal block polyurethane solid-solid phase-change materials with high mechanical toughness and multi-recyclability controlled by crosslinking density

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

The integration of CuS into phase change material (PCM) enables the unification of photothermal conversion and thermal energy storage. In this study, to avoid ...

Photothermal phase change energy storage materials show immense potential in the fields of solar energy and thermal management, particularly in addressing the intermittency issues of ...

The preparation of phase change materials (PCMs) with high energy storage, thermal conductivity, and photothermal conversion capability is essential for improving solar ...

There are many reports in the literatures on the use of phase change materials (PCMs) with photothermal conversion to store and harness solar energy. However, few works ...

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