Photothermal phase change energy storage microgel

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 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.

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.

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.

Can photothermal materials improve the quality of energy utilization?
Therefore,the development of photothermal materials with multi-source storage,based on solar energy and environmental heat,is significanttoward improving the quality of energy utilization.

Can graphene improve photothermal conversion efficiency?
For instance,Atinafu et al. developed a graphene derived from solid sodium acetate to enhance the photothermal conversion efficiency,thermal conductivity,and energy storage capacity of PCMs. The reduction in supercooling increased the composite material's energy storage capacity by 157.6 kJ/kg,which is 101.4% higher than expected.

Two-dimensional (2D) minerals show enormous potential in the field of phase change energy storage due to their unique structure and excellent properties. First, thermal ...

Latent heat storage systems based on organic phase change materials (PCMs) are considered to be an efficient solar energy utilization strategy, but leakage vulnerability and insensitivity to ...

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Photo-thermal conversion phase-change composite energy storage materials (PTCPCESMs) are widely used in various industries because of their high thermal conductivity, ...

Firstly, nanoscale poly (p-phenylenediamine) (PPPD) as stabilizer and photothermal conversion material was synthesized and used in the encapsulation of lauryl ...

Phase change materials (PCMs) have attracted significant attention in thermal management due to their ability to store and release large amounts of heat during phase ...

Pristine organic phase change materials (PCMs) suffer from liquid leakage and weak solar absorption in solar energy utilization. To address these deficiencies, we prepared ...

Photothermal materials can convert the received solar irradiation into thermal energy due to the inherent photothermal conversion characteristic [7].However, it is worth ...

can passively store energy and respond to changes in light exposure, thereby enhancing the efficiency of energy systems. Photothermal phase change energy storage materials show ...

During cis-to-trans phase transitions, isomerization and phase-change enthalpies can be released upon external triggering, with higher energy storage capacities [32]. ...

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 ...

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 ...

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