

Thus, this article presents a detailed review of the synthetic materials, preparation methods, and application fields of phase-change microcapsules, focusing on the types of core and shell materials ...

In recent years, significant progress has been made in the types of PCMs, methods for preparing phase change micro-nanocapsules, and their applications in solar thermal systems.

Microencapsulation is a process of coating individual particles or droplets with a continuous film to produce capsules in a micrometer to millimeter in size, known as a microcapsule ...

Microencapsulation technique of phase change materials (phase change materials, PCM) is considered as one of the most prospective and useful methods for thermal energy storage. ...

Herein, we designed and fabricated a type of phase-change microcapsule system based on an n -docosane core and $\text{CaCO}_3/\text{Fe}_3\text{O}_4$ composite shell using a nonaqueous emulsion ...

Phase change materials, as effective energy storage materials, can pollution-freely regulate room temperature. Regarding the leakage, phase change materials are encapsulated into ...

This experiment not only underscores the superiority of PMC in preventing phase-change material leakage but also provides a reliable pathway for the application of microcapsule ...

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 transitions. ...

This paper systematically reviews recent progress in the selection of phase change materials tailored for solar applications, innovative encapsulation techniques, and the development of ...

Phase change materials (PCMs), which store and release energy through phase transition processes, have become widely used for temperature regulation owing to the excellent ...

Encapsulation technology for phase change materials can facilitate the maintenance of shape in solid-liquid PCMs and can overcome phase segregation and low thermal conductivity. It effectively ...

Phase change materials (PCMs) are considered one of the most promising energy storage methods owing to their beneficial effects on a larger latent heat, smaller volume change, and ...

Microcapsules containing phase change materials (MPCMs) can be integrated with polymeric matrices to develop intelligent thermoregulating composites for applications in temperature ...

However, a significant drawback of this method is the considerable volume required for containment, attributed to material expansion and heat dissipation to the surroundings [3]. In contrast, ...

This innovative combination enhances solar absorption rates and enables energy storage, thereby enabling all-day, all-weather freshwater production. Waste beverage aluminum cans ...

Currently, there are methods that exist to increase the latent heat capacity of organic phase change materials [15]; this involves increasing the degree of PCM crystallization with the ...

: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 transitions. ...

The fabrication and formulation of phase change materials (PCMs) aim to improve their performance by increasing heat transfer, avoiding supercooling, accommodating the volume ...

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