

This study investigates the effects of partial porous blocks integrated in a phase change material (PCM) in a rectangular cavity on the thermal performance of the system. Computational fluid dynamics simulations were used but validation was done by using experimental set-up and measurement of the results. Different thermal conditions of evolution ...

Energy storage exerts an extraordinary impact on balancing the energy supply and demand 1.Phase change materials (PCMs) has received considerable attention in energy area, because they could ...

The greater the adsorption of phase change material, the higher the phase change latent heat in PCM composite materials, underscoring the advantageous role of PCM in augmenting the energy storage capacity of buildings and mitigating energy consumption for cooling and heating purposes [29].

The development of phase change materials (PCMs)-based energy storage devices for both thermal and light energy has the potential to greatly enhance solar energy use efficiency, which is important in addressing the worldwide energy problem. Due to the environmentally friendly, good thermal and chemical stability, easy degradation, and good ...

Her research interests mainly focus on the synthesis and applications of flexible phase change materials for thermal energy storage and conversion. Ge Wang received her Ph.D. in Chemistry from the Michigan Technological University, United States, in 2002. Currently she is a professor and Ph.D. supervisor in the School of Material Science and ...

A battery thermal management system (BTMS) plays a significant role in the thermal safety of a power lithium-ion battery. Research on phase change materials (PCMs) for a BTMS has drawn wide attention and has become the forefront of this scientific field. Several evident limitations exist in pure PCMs, such as poor thermal conductivity and low structural ...

Phase change material (PCM)-based thermal energy storage significantly affects emerging applications, with recent advancements in enhancing heat capacity and cooling power. This perspective by Yang et al. discusses PCM thermal energy storage progress, outlines research challenges and new opportunities, and proposes a roadmap for the research community from ...

1 ??&#0183; It provides a theoretical basis for solving the problem of low internal thermal conductivity of hierarchically porous ceramic skeleton phase change composites. ... properties and ...

The research on phase change materials (PCMs) for thermal energy storage systems has been gaining

# Phase change energy storage in porous materials

momentum in a quest to identify better materials with low-cost, ease of availability, improved thermal and chemical stabilities and eco-friendly nature. The present article comprehensively reviews the novel PCMs and their synthesis and characterization techniques ...

Phase change materials (PCMs) are ideal carriers for clean energy conversion and storage due to their high thermal energy storage capacity and low cost. During the phase transition process, PCMs are able to store thermal energy in the form of latent heat, which is more efficient and steadier compared to other types of heat storage media (e.g ...

Organic phase change materials (PCMs) have been widely used in the thermal energy storage field, but melt leakage above the phase change temperature has greatly hindered their practical application...

Phase change materials (PCMs) can store thermal energy as latent heat through phase transitions. PCMs using the solid-liquid phase transition offer high 100-300 J g<sup>-1</sup> enthalpy at constant temperature. However, pure compounds suffer from leakage, incongruent melting and crystallization, phase separation, and supercooling, which limit their heat storage capacity and ...

As a kind of phase change energy storage materials, organic PCMs (OPCMs) have been widely used in solar energy, building energy conservation and other fields with the advantages of appropriate phase change temperature and large latent heat of phase change. However, low thermal conductivity and liquid leakage problem restrict the further ...

Inorganic porous material is usually a good adsorption carrier serving for storage of solid-liquid phase change materials. As one of the largest types of industrial waste resource, reutilization of fly ash (FA) is an important way to protect environment, save energy and reduce emissions. In this study, a novel shape-stabilized phase change material (SSPCM) composed ...

With the continuous implementation of China's rural revitalization strategy, it is urgent to use new materials and technologies to improve the quality of housing construction in rural areas, improve indoor thermal environment in villages, and reduce building energy consumption [1].Phase change materials (PCMs) as one of potential thermal energy storage ...

A novel polyethylene glycol (PEG)/SiO<sub>2</sub> shape-stabilized composite phase change material (ss-CPCM) was prep'd. with the "hazardous waste" oil shale ash. In this composite, PEG serves as the phase change material for thermal energy storage and SiO<sub>2</sub> acts as the carrier matrix to provide structural strength and prevent the leakage of melted PEG.

Web: <https://arcingenieroslaspalmas.es>