

Abstract Three strategies for enhancing the melting rate of phase change materials (PCMs) are analyzed numerically: natural convection, thermocapillary convection, and variations in ...

This paper presents a numerical study of unconstrained melting of nano-enhanced phase change materials (NEPCM) inside a spherical container using RT27 and copper particles as ...

This study presents a comprehensive review of the latest advancements in enhancing the efficiency and performance of solar-assisted heat pumps through the integration of nano ...

Phase change materials and nano-enhanced phase change materials for thermal energy storage in photovoltaic thermal systems: a futuristic approach and its technical challenges

This study provides an innovative and scalable materials design strategy for overcoming the key limitations of traditional PCMs, offering broad potential for next-generation solar ...

In recent years, researchers are fascinated to counter problem of PV-efficiency decline arising from high operating temperatures, especially in hot climates. This article conducts a ...

Toward accelerated latent heat storage, the unconstrained melting heat transfer in spherical capsules was revisited experimentally in the presence of nano-enhanced phase-change ...

Abstract In this paper, for the packaging structure of phase change materials (PCMs) for solar thermal utilization, a cylindrical phase-change heat-storage rod (HSR) is proposed, and multi ...

The potential for phase change materials (PCMs) has a vital role in thermal energy storage (TES) applications and energy management strategies. Nevertheless, these materials suffer ...

In order to analyse the phase change process taken place in the PCM container, the temperature distribution, melting fraction and velocity field for the middle cross-section of the PCM ...

Phase change materials (PCMs) have emerged as a viable technology for thermal energy storage, particularly in solar energy applications, due to their ability to efficiently store and ...

Phase change materials (PCM) are employed to store thermal energy in solar collectors, heat pumps, heat recovery, hot and cold storage. PCMs are encapsulated primarily in shell-and-tube, ...

In this study, a nanofluid-based photovoltaic thermal system integrated with nano-enhanced phase change

Enhanced phase change solar container

material is numerically simulated using a transient three-dimensional model. ...

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In order to address this challenge, this study explores the integration of passive cooling systems by using Phase Change Materials (PCM), specifically focusing on the enhanced capabilities provided by ...

In this study, the thermal performance of a solar still was enhanced by encapsulating PCM within a tube container integrated into the absorber plate. Paraffin wax served as the PCM, and ...



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