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# Intelligent phase change energy storage device

Can artificial intelligence be used in phase change material energy storage?

This study provides a comprehensive review of the utilization of artificial intelligence (AI) technology in phase change material (PCM) energy storage. The review primarily focuses on its application in solar thermal utilization systems, electric vehicle/electronic device thermal management systems, and building energy efficiency systems.

What is phase change energy storage technology?

Phase change energy storage technology is based on phase change energy storage materials as the basis of high technology, phase change materials. Phase change latent heat is large, much larger than the apparent heat energy storage density.

Are phase change materials suitable for thermal energy storage?

Abstract: Thermal energy storage (TES) technology relies on phase change materials (PCMs) to provide high-quality, high-energy density heat storage. However, their cost, poor structural performance, and low heat conductivity restrict their practical use.

Are phase change thermal storage systems better than sensible heat storage methods?

Phase change thermal storage systems offer distinct advantages compared to sensible heat storage methods. An area that is now being extensively studied is the improvement of heat transmission in thermal storage systems that involve phase shift. Phase shift energy storage technology enhances energy efficiency by using RESs.

Phase change materials (PCMs), capable of reversibly storing and releasing tremendous thermal energy during nearly isothermal and isometric phase state transition, have received extensive ...

This article designs a high-altitude border guard post that can fully utilize the heat absorbed by solar collectors to continuously store thermal energy during the day and stably ...

With the rising global energy demand and worsening environmental challenges, the development of efficient energy storage and conversion technologies has become ...

Abstract Conventional thermal energy storage systems employing phase change materials (PCMs) intrinsically lack capabilities for real-time state monitoring, leading to ...

Peng Wang,<sup>1</sup> Xuemei Diao,<sup>2</sup> and Xiao Chen<sup>2,\*</sup> Conventional phase change materials struggle with long-duration thermal energy storage and controllable latent heat ...

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Abstract Phase change energy storage (PCES) materials have attracted considerable interest because of their capacity to store and release thermal energy by ...

Conventional phase change materials struggle with long-duration thermal energy storage and controllable latent heat release. In a recent issue of *Angewandte Chemie*, Chen et ...

Technical Terms Phase Change Material (PCM): A substance capable of storing and releasing thermal energy during a phase transition, typically from solid to liquid and vice ...

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