

## European Solar Energy Storage

# Mirabilite as phase change energy storage material



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## Overview

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Given its issues with phase stratification and supercooling degree, mirabilite phase-change energy storage material, a type of inorganic hydrated salt with a high latent heat value and abundant source, has been restricted in its wide application in the field of energy storage.

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As a kind of essential hydrated salt phase change energy storage materials, mirabilite with high energy storage density and mild phase-transition temperature has excellent application potential in the problems of solar time and space mismatch. However, there are some disadvantages such as.

Preparation and thermal performance of nitrogen-doped porous carbon sponge-type mirabilite-based composite phase-change material 1. New Energy Photovoltaic Industry Research Institute, Qinghai University, Xining 810016, Qinghai, China 2. School of Materials Science and Engineering, Qinghua. Is mirabilite a good energy storage material?

Volume 16, article number 220619, ( 2022 ) As a kind of essential hydrated salt phase change energy storage materials, mirabilite with high energy storage density and mild phase-transition temperature has excellent application potential in the problems of solar time and space mismatch.

What is mirabilite used for?

Mirabilite, commonly known as Glauber's salt, is a typical inorganic hydrated salt used as phase change material. Its natural abundance, high latent heat and convenient phase change temperature (32°C) make it an attractive material for storing low grade solar heat and building heating applications .

Can biobased phase change materials revolutionise thermal energy storage?

Low, medium-low, medium, and high temperature applications. An upcoming focus should be life cycle analyses of biobased phase change materials. Harnessing the potential of phase change materials can revolutionise thermal energy storage, addressing the discrepancy between energy generation and consumption.

What is the latent heat of crystallization of CGCA-supported mirabilite phase change materials?

The latent heats of melting and crystallization of CGCA-supported mirabilite phase change materials (CGCA-PCMs) are 157.1 and 114.8 J·g<sup>-1</sup>, respectively. Furthermore, after 1500 solid—liquid cycles, there is no leakage, and the retention rate of crystallization latent heat is 45.32%, exhibiting remarkable thermal cycling stability.

Can organic phase change materials be used in thermal energy storage?

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 applications.

Are phase change materials effective latent heat storage?

In particular, latent heat storage through phase change materials has attracted extensive attention for its large storage capacity. Phase change materials (PCM's) are effective latent heat thermal storage materials because they store and release thermal energy during the process of melting and freezing.

## Mirabilite as phase change energy storage material

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### Preparation and thermal performance of nitrogen-doped porous ...

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### Hierarchically Porous PVA Aerogel for Leakage-Proof Phase Change

Abstract 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 applications.



### Hierarchically porous CMC/rGO/CNFs aerogels for leakage-proof

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### Preparation and Thermal

## Performance of Nano-Graphene Oxide/Mirabilite

To solve the problem of the shortened cycle life of phase-change latent heat storage due to the large subcooling degree and serious phase stratification of mirabilite phase-change materials, a graphene oxide/mirabilite composite phase-change material (GO-MCPCM) was prepared with  $\text{Na}_2\text{SO}_4 \cdot 10\text{H}_2\text{O}$   $\cdot$   $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$   $\cdot$   $\text{NaCl}$  phase-change



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## Hierarchically porous CMC/rGO/CNFs aerogels for leakage-proof

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## Phase transition behaviour of hydrated Glauber's salt based phase

Melting behaviour of inorganic hydrated salts plays an important role in their application as phase change energy storage materials. Particularly, the phase transition temperature and latent heat are determining factors for their application in specific areas for building heating.



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The preparation method has the advantages of solving the supercooling degree and phase layering phenomenon of the mirabilite phase change energy storage material and prolonging

the



## Hierarchically porous CMC/rGO/CNFs aerogels for leakage-proof

In this work, for the preparation of shaped mirabilite phase change materials (MPCMs), graphene (GO), sodium carboxymethyl cellulose (CMC), and carbon nanofibers (CNFs) were used as



## Biobased phase change materials in energy storage and thermal

With an analysis of 180 selected works, this review paints a vivid picture of the capabilities and promising prospects of biobased phase change materials, whilst highlighting the future research questions needing to be addressed.

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