Montmorillonite energy storage

What is montmorillonite (MMT)?
Montmorillonite (MMT),although it is a unremarkable traditional clay mineral material,has increasingly attracted widespread interest in the EES field,which is mainly attributed to its low cost,abundant resources,tuneable two-dimensional (2D) layered structure,unique ionic conductive properties,high specific surface area and so on.

How is natural montmorillonite modified?
In this work,natural montmorillonite (MMT) was modified by organic amine coupling agentthat was assembled into the interlayer of MMT. The energy storage performance and the stability of composite PCMs were significantly improved by using a novel frame of MMT encapsulated Paraffin (PA).

Can natural montmorillonite be used as a PCM?
However, due to the leakage and low heat storage capacity, the large-scale commercial application of PCMs is seriously limited. In this work, natural montmorillonite (MMT) was modified by organic amine coupling agent that was assembled into the interlayer of MMT.

How stearic acid/reduced graphene oxide modified montmorillonite composites are prepared?
Peng et al. prepared stearic acid/reduced graphene oxide modified montmorillonite composites by the vacuum impregnation. The composites possess high melting enthalpy of 159 J/g,encapsulation rate of 74.2% and low extent of supercooling of 1.4 °C.

Montmorillonite is widely applied in the field of electrochemical energy storage mainly due to its low cost, inherent high ionic conductivity, tuneable 2D layered structure, and ...

Phase change materials (PCMs) could take full advantage of clean and renewable energy, because of their ability to convert and store various energy. However, due ...

The thriving new energy industry has necessitated the centralized storage of common renewable energies such as solar, wind and geothermal. Efficient energy storage ...

Here, a versatile surface engineering method is presented to enhance the high-temperature electrical insulation and energy storage performance of polymer dielectric via dip ...

The energy-conversion storage systems serve as crucial roles for solving the intermittent of sustainable energy. But, the materials in the battery systems mainly come from ...

Using low cost and resource-rich natural materials to develop vital components, especially electrodes, separators, and solid/quasi-solid electrolytes, is of great significance for the ...

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Phase change materials (PCMs) offer significant advantages in energy conversion and storage by facilitating the storage and release of thermal energy during phase transition processes. ...

Using PEG as energy storage material, MDI as the framework, HQEE as chain extender and montmorillonite as crosslinking heterogeneous nucleating agent, the solid-solid ...

The energy storage performances of the Mt/SA microcapsules were superior to the Mt/SA composites prepared via vacuum impregnation. Excellent energy storage reliability ...

Energy conversion and storage devices are considered to be potential candidates for application in health monitoring, smart-sensor and clean-energy harvesting. In ...

Preparation and characterization of capric-stearic acid/montmorillonite/graphene composite phase change material for thermal energy storage in buildings

Combining the three-dimensional network structure of montmorillonite aerogel and the high thermal conductivity and stability of carbon materials could synchronously improve the thermal ...

A companion article has been published: Epoxy-based nanocomposites for electrical energy storage. II: Nanocomposites with nanofillers of reactive montmorillonite ...

Three-dimensional montmorillonite/Ag nanowire aerogel supported stearic acid as composite phase change materials for superior solar-thermal energy harvesting and storage

Exploring new electrode materials is the key to realize high performance energy storage devices for effective utilization of renewable energy. Natural clays with layered ...

This paper is the first study to present the long-term performance of a gypsum and cement plasters which can be used to retrofit existing buildings and reduce their energy consumption.

Web: https://www.mozgmalina.pl