

This paper presents the design and the characterisation of a high powered energy dense zeolite thermal heat storage system using water vapour sorbate....

As for the application of zeolite adsorption system in the energy storage and heat transfer field, zeolite-based heat exchanger (HX), energy storage system (ESS), dehumidifier, ...

The utilization of the water-zeolite pair as an adsorbate-adsorbent system has garnered significant attention in the realm of thermochemical energy storage, offering great ...

Membranes are at the heart of various technologies for water, energy and other sustainability relevant areas. Here the authors show a synthetic route to a polymeric ...

A sorption thermal energy storage (TES) device for domestic heating is presented in this article. The TES device adopts the new design scenario with v...

This study focused on a mobile thermal energy storage system for industrial use using a zeolite water vapor adsorption and desorption cycle that can utilize waste heat not only ...

Disclosed are systems and methods of flexibly cooling thermal loads by providing a thermal energy storage cooling system having a phase change material which includes a salt hydrate ...

This paper was aimed at exploring the merits of natural and environment friendly zeolites towards sustainable thermochemical energy storage. Sorption behaviour of selected zeolites were ...

In this work, four zeolite-bearing materials (three naturally occurring and one of synthetic origin) were considered for thermal energy capture and storage. Such materials can store thermal ...

Recent advances and future directions for developing zeolite-based solid electrolytes for solid-state batteries are presented, highlighting the ...

Using zeolite 13X as the matrix, zeolite 13X/MgSO₄ composite adsorbents were prepared, and the sorption-desorption performance was studied to reveal the potential heat ...

Zeolite thermal storage systems represent a significant step toward achieving true energy independence for homeowners. Unlike traditional battery systems, zeolite storage ...

Physisorption heat storage in buildings can be a key technology for a more effective use of heating energy.

However, a better understanding of key factors influencing the ...

The adsorption-based thermal energy storage system utilizes adsorbents such as zeolites or activated carbons to store and release heat. The system comprises ...

Using zeolites for thermochemical energy storage has been investigated under different charging and discharging conditions in a variety of reactor configurations in the literature.

We demonstrate a thermal energy storage (TES) composite consisting of high-capacity zeolite particles bound by a hydrophilic polymer. This innovation achieves record ...

Based on the derived analytical solution, the fluid temperature at different axial positions in the reactor and energy storage density (ED) of zeolite were calculated and ...

Lithium-ion batteries (LIBs) are the leading electrochemical energy storage systems used widely in portable electronic devices and electric vehicles (EVs) due to their ...

To prepare an upscaling of zeolite heat storage plants from the laboratory to the demonstration scale, experiments with binder-free NaY ...

The aim of this paper is to investigate zeolite-MgCl₂ composites as potential heat storage materials, studying the link between the composites physico-chemical properties ...

Zeolite storage is compared favourably with respect to capacity to water, stone, and heat of phase change systems. Compared to salt hydrates, acid solution, and salt ...

Zeolite-templated carbon (ZTC) materials have received significant attention in recent years. Their specific surface area is comparable to that of graphene, which is widely ...

Scientists of the German Fraunhofer Institute have harnessed a natural phenomenon to store heat indefinitely and without energy loss. Zeolite is a mineral that can ...

In this work, four zeolite-bearing materials (three naturally occurring and one of synthetic origin) were considered for thermal energy ...

This study examines impact of microencapsulated phase change material (MPCM) additives on physical and mechanical characteristics of geopolymers produced using ...

This work enables the design of membranes that combine otherwise mutually exclusively properties for many possible applications beyond energy storage.

In contrast to established heat storage systems based on water, zeolitic systems reach energy densities of 150-200 kWh m⁻³ and allow for ...

Thermochemical energy storage technology has the advantages of stability and cross-seasonal storage. Adsorption-type TES is a thermal energy storage technology with great development ...

Zeolite's have wide application areas. Zeolite's important but uncommon usage is solar storage. Solar energy is a kind of energy source used for heating house, heating ground and cooling, ...

Sorption thermal energy storage (STES) systems utilizing zeolite 13X present a promising solution to pressing global energy challenges. In this study, we explore the influence ...

The performance of sorption energy storage is influenced by operating conditions. Based on a zeolite/water reactor, a mathematical model of an open so...

Thermochemical storage of heat has general advantages: long-term storage without degradation, adjustable discharging temperature level, which can even be higher than ...

We demonstrate a thermal energy storage (TES) composite consisting of high-capacity zeolite particles bound by a hydrophilic polymer. ...

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