

Is attapulgite a carrier material for fatty acid phase change material?

Correspondence to Ruilong Wen. Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations. Wen,R.,Xu,Y.,Xu,Y. et al. Attapulgite: a promising natural mineralas carrier material for fatty acids phase change material.

Can spongy attapulgite be used as a composite phase change material?

Liang WD, Chen PS, Sun HX, Zhu ZQ, Li A. Innovative spongy attapulgite loaded with n-carboxylic acids as composite phase change materials for thermal energy storage. RSC Adv. 2014;4:38535-41.

What is pristine attapulgite (Atta)?

The pristine attapulgite (Atta) was pretreated by thermal and acid activation process in order to improve the loading capacity of phase change material (PCM). A series of pretreated Atta-based composite PCM was prepared combined with different kind of fatty acids.

What is attapulgite (ATP)?

Attapulgite (ATP) is a hydrous magnesium aluminum silicate clay mineral with layer-chain structures,which consists of a double chain of Si-O tetrahedra running parallel to the long axis,and at the upper and lower parts of each double chain are linked by a layer of octahedral magnesium atoms in 6-fold coordination.

Is diatomite a suitable carrier material for thermal energy storage?

Qian T,Li J,Min X,Deng Y,Guan W,Ning L. Diatomite: a promising natural candidateas carrier material for low,middle and high temperature phase change material. Energy Convers Manag. 2015;98:34-45. Han J,Liu S. Myristic acid-hybridized diatomite composite as a shape-stabilized phase change material for thermal energy storage.

Can attapulgite be used for multifunctional water remediation?

Three-dimensional attapulgite with sandwich-like architecture used for multifunctional water remediation. Sep Purif Technol. 2020;235:116210. Wang Y, Feng Y, Jiang J, Yao J. Designing of recyclable attapulgite for wastewater treatments: a review. ACS Sustain Chem Eng. 2018;7:1855-69.

As an important method to effectively improve energy efficiency, the study of thermal energy storage is particularly important. In this study, six types of clay mineral-based form-stable phase-change materials (FSPCMs) were prepared by the vacuum adsorption method. The adsorption capacity of vermiculite and diatomite was satisfactory, and sepiolite showed ...

The development of materials that reversibly store high densities of thermal energy is critical to the more efficient and sustainable utilization of energy. Herein, we investigate metal-organic compounds as a new class of solid-liquid phase-change materials (PCMs) for thermal energy storage. Specifically, we show that

isostructural series of divalent metal amide ...

Attapulgite (ATP) is a clay mineral with natural porous structures, which can be used to contain PCMs for thermal energy storage. However, the poor compatibility between ATP and PCMs is a ...

Attapulgite has special layer structure, chain structure and good absorption. Attapulgite is cheap and there is abundant resource of it. In addition, attapulgite can endow the prepared composite materials with the dimensional stability, thermostability and the property of barrier. ... Phase change energy storage technology, which can solve the ...

Downloadable (with restrictions)! Fatty acid phase change materials (PCMs) have some advantages such as less corrosivity, no separation of subcooling phase and low price. In this paper, capric acid and palmitic acid are composited according to a certain mass ratio to prepare binary fatty acid. Capric-palmitic acid are absorbed into attapulgite by vacuum method to ...

The thermal energy storage, thermal stability and durability of the composite PCMs were tested by differential scanning calorimetry and thermogravimetry. The PCM/spongy ATP composites had a high heat storage capacity between 72.57 and 82.36 J g⁻¹, corresponding to a mass fraction of n-carboxylic acids between 36.60% and 37.71%. The PCM ...

This paper briefly introduced the composition, structure, properties and resource distribution of attapulgite, then focused on the progresses in the research and application of attapulgite in the ...

Thermal energy storage is the easiest and most efficient method to increase energy use performance in buildings and thus provide energy savings. Thermal Energy Storage (TES) can be carried using a single phase medium as sensible heat (liquid or solid), and using phase changeable medium as latent heat or using a reversible chemical reaction as ...

The attapulgite clay with pore-network structures has favorable adsorption performance toward organic materials. According to its adsorption properties, the attapulgite clay was compounded with paraffin wax to produce phase change composites for energy storage (PCCES). As the paraffin was adsorbed into the pores and changed phase in a fixed ...

Higher grafting rate of the carrier results in the larger thermal energy storage capacity. Attapulgite based three-dimensional carriers were prepared via "grafting from" method. Pore size of 3D ...

Therefore, to solve the aforementioned problems, we incorporated attapulgite (ATP) nanofibers, a natural mineral, into sodium alginate (SA), a biodegradable polysaccharide extracted from brown algae, through a phase inversion process, whereby a porous separator was prepared. ... electric vehicles and other large-scale energy storage areas. The ...

@misc{etde_22159149, title = {Study on preparation, structure and thermal energy storage property of capric-palmitic acid/attapulgite composite phase change materials} author = {Li, Min, International Institute for Urban System Engineering, Southeast University, Southeast University, Nanjing 210096 (China)}, Wu, Zhishen, and Kao, Hongtao} abstractNote ...

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

Thus, energy management is of crucial importance for improving the energy efficiency in buildings [2], [3], [4]. Thermal energy management based on phase change materials (PCMs) is one of the most important effective technique [5]. PCMs are functional materials which can storage and release the thermal energy in a constant temperature [6], [7] ...

Herein, we reported an effective strategy to construct attapulgite, expanded perlite, and graphite ... [6,7]. Developing thermal energy storage technology is the most attractive strategy to obtain solar energy and improve the energy efficiency [8,9]. The introduction of phase-change materials (PCMs) into energy storage technology to improve the ...

Composite Phase-Change Materials for Thermal Energy Storage Shangxiao Liu, Song Xin,* and Shibin Jiang Cite This: ACS Omega 2021, 6, 24650-24662 Read Online ... Attapulgite has a unique layer chain structure, vermiculite has an ion-exchange capacity, and sepiolite is a type of magnesium-rich fibrous silicate clay mineral. The above-

Download Citation | Synthesis and characterization of polyethylene glycol/modified attapulgite form-stable composite phase change material for thermal energy storage | Attapulgite with a ...

Attapulgite (ATP) is a clay mineral with natural porous structures, which can be used to contain PCMs for thermal energy storage. However, the poor compatibility between ATP and PCMs is a significant defect that has rarely been studied.

Calcined attapulgite clay can reduce the energy consumption of the cement industry and promote the sustainable development of attapulgite clay. ... Energy storage concrete was prepared by the ...

Attapulgite can not only provide a large specific surface area for transition metal oxide materials, but also provide a skeleton on which nano-sized materials can be grown or dispersed. ... At the same time, the energy storage devices such as supercapacitors are also used in different fields such as automobile power supply, energy storage grid ...

Phase change energy storage technology, which can solve the contradiction between the supply and demand of thermal energy and alleviate the energy crisis, has aroused a lot of interests in recent years. ... Expanded perlite, sepiolite, attapulgite and expanded vermiculite have large specific surface areas [[98], [99] ...

Thermal energy storage (TES) by means of phase change materials (PCM) is of great concern to decrease heating and cooling loads. ... Aim of this research was to develop novel foam concretes containing shape-stable attapulgite (ATP) based composite PCM as TES material. Shape-stable ATP/Capric-Myristic acid eutectic mix composite (ATP/C-M) was ...

The fast responsive energy storage technologies, i.e., battery energy storage, supercapacitor storage technology, flywheel energy storage, and superconducting magnetic energy storage are ...

DOI: 10.1016/j.ijhydene.2022.12.151 Corpus ID: 255361912; Hydrothermal synthesis of nano-sized MnO₂ supported on attapulgite electrode materials for supercapacitors @article{Lin2022HydrothermalSO, title={Hydrothermal synthesis of nano-sized MnO₂ supported on attapulgite electrode materials for supercapacitors}, author={Tao Lin and Jiacheng Lin and ...

In this work, an environmentally friendly bacterial cellulose and attapulgite composite separator (BA@ATP) with low cost, high ionic conductivity and excellent flame retardant performance is designed by papermaking method. ... In recent decades, lithium-ion batteries have gained a foothold firmly in the field of new energy storage due to their ...

Attapulgite with a nanoporous structure is an excellent supporting material to solve leakage of polyethylene glycol (PEG). However, when raw attapulgite is used as a supporting material, the latent heat storage capacity of PEG/ raw attapulgite form stable composite phase change material (FSCPCM) cannot be fully utilized. In this work, N-(2 ...

Attapulgite is a kind of chain/layered silicate mineral, which has one-dimensional channels in the structure and is needle-like in shape. It is widely used due to its special structure and properties. ... energy storage, colloidal material, carrier material, filling material, biomedicine and agricultural production in the past ten years ...

The various energy storage methods are mechanical energy storage, electrical energy storage, thermal energy storage, etc. It is well known that thermal energy is one of the most significant end-use energy forms. Therefore, storing thermal energy will provide significant support to energy conservation.

supported phase change energy storage materials Weijun Hu,^a Shaohui Lin, ^a Yufeng Cao,^b Xianshe Fengc and Qinmin Pan ^{*a} Phase change materials (PCMs) for the charge and discharge of thermal energy at a nearly constant ... Attapulgite (ATP) is a clay mineral with natural porous structures, which can be used to contain PCMs for thermal energy ...

Abstract Attapulgite with a nanoporous structure is an excellent supporting material to solve leakage of polyethylene glycol (PEG). However, when raw attapulgite is used as a supporting material, the latent heat storage capacity of PEG/ raw attapulgite form stable composite phase change material (FSCPCM) cannot be fully utilized. In this work, N-(2-aminoethyl)-3 ...

Sorption thermal energy storage is a promising technology for effectively utilizing renewable energy, industrial waste heat and off-peak electricity owing to its remarkable advantages of a high energy storage density and achievable long-term energy preservation with negligible heat loss. ... including attapulгите [34, 35], expanded vermiculite ...

DOI: 10.1016/J.APENERGY.2011.02.030 Corpus ID: 111073043; Study on preparation, structure and thermal energy storage property of capric-palmitic acid/attapulгите composite phase change materials

Compared with sensible heat storage and thermo-chemical energy storage [8], latent heat thermal energy storage (LHTES) using phase change material (PCM) as medium is the most competitive form [8], [9], [10] because of its high energy storage density, constant temperature, chemical stability, non-toxic and non-corrosive advantages [11, 12].As a key link ...

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