

DOI: 10.1016/J.EST.2020.101847 Corpus ID: 224871397; Preparation and thermophysical properties of three-dimensional attapulgite based composite phase change materials @article{Wang2020PreparationAT, title={Preparation and thermophysical properties of three-dimensional attapulgite based composite phase change materials}, author={Yi Wang and Ziyi ...

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 ...

Shape-stabilized phase change materials (SSPCMs) have been extensively investigated in recent years. Due to the macroscopic shape stability, high-energy storage density and narrow temperature range during reversible storage/release thermal energy, the promising material applied for sustainable development is hopeful [[1], [2], [3]] SSPCMs, the porous ...

Keywords Attapulgite · Fatty acids · Composite PCMs · Thermal stability · Thermal reliability Introduction With the gradual depletion of fossil energy, developing renewable energy and improving existing energy efficiency have become a concern and research hotspot [, 2]. The 1 thermal energy storage system using phase change materials

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 ...

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 ...

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 ...

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

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 ...

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 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. The XRD, FT-IR and XRF results shown that the pretreated process increased the purity of ...

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 oriented carbon/polyaniline hybrid nanocomposites for electrochemical energy storage. Author links open overlay panel Wenbo Zhang a b, Bin Mu a, Aiqin Wang a, Shijun Shao a. Show more. Add to Mendeley. Share. ... According to the energy storage mechanism, supercapacitors can be generally classified into electrical double layer ...

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 ...

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.

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 ...

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 ...

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 ...

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 ...

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 ...

Among energy storage technologies, the thermal energy storage (TES) system can effectively alleviate the contradiction between energy supply and demand. ... (GO)-attapulgite aerogel by the hydrothermal method, and the latent heat of the material was 190.9 J g⁻¹, with no leakage when the SA content was 98 wt.%.

For high energy storage densities a high water uptake of the material and a high heat of adsorption/hydration is required. For a high thermal power output during discharging of the store a fast reaction kinetic of the material is desirable. ... AlPO₄'s and CaCl₂ impregnated attapulgite for thermochemical storage of heat. Thermochimica Acta, 434 ...

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 ...

Attapulgite based three-dimensional carriers were prepared via "grafting from" method. Pore size of 3D network can be adjusted by chain length and functional groups of connecting molecule. ... Higher grafting rate of the carrier results in the larger thermal energy storage capacity. Attapulgite based three-dimensional carriers were prepared via ...

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 ...

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 ...

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Attapulгите energy storage