

Sisal fiber exhibits a fibrous and porous structure with significant surface roughness, making it highly suitable for storing phase change materials (PCMs). Its intricate morphology further aids in mitigating the risk of PCM leakage. This research successfully employs vacuum adsorption to encapsulate paraffin within sisal fiber, yielding a potentially cost ...

Flexible, stimuli-responsive and self-cleaning phase change fiber for thermal energy storage and smart textiles. Compos B Eng, 228 (2022), Article 109431. ... Preparation and characterization of paraffin/polyvinyl alcohol phase change fibers for energy storage. J Compos Mater, 25 (1) (2008), pp. 17-22. View in Scopus Google Scholar [42]

A novel phase change wood fiber-starch composite (WFC) was produced using microencapsulated PCM. ... Review on thermal energy storage with phase change materials (PCMs) in building applications. Appl. Energy, 92 (2012), pp. 593-605, 10.1016/J.APENERGY.2011.08.025. View PDF View article View in Scopus Google Scholar [41]

Among them, electrospinning under a high voltage has been proven to be an efficient technique to fabricate form-stable phase change energy storage fibers (PCFs) with diameters ranging from a few nanometers to micrometers, showing the merits of flexible structural controllability, simple equipment, cost-effectiveness, and convenient manufacture [[19], [20], ...

Pure PEG displayed a phase change temperature of 45.9-65.6 °C with high phase-change enthalpies 168.4 J/g-180.5 J/g, which confirmed that PEG had outstanding thermal energy storage capacity (Meng, Zhao, Zhang, & Tang, 2020; Wang, Tang, & Zhang, 2013). Only one endothermic peak of melting or solidifying was obtained in all PCF composites ...

Consequently, intelligent PCFs with comfortable properties, temperature regulation capabilities, and energy storage performances are favourable for daily life. In general, a phase change working substance is flowable and amorphous above the phase change temperature, whereas, it is rigid, brittle, and fragile below the melting point [11].

Phase Change Energy Storage Elastic Fiber: A Simple Route to Personal Thermal Management. Weipei Li, 1 Liqing Xu, 1 Xiangqin Wang, 2 Ruitian Zhu, 1, 2, * and Yurong Yan 1, * ... Among them, the latent heat storage technology of phase change materials (PCMs) with high energy storage density, high phase change enthalpy, constant temperature ...

Phase change material (PCM) has drawn much interest in the field of thermal energy storage (TES) such as waste heat recovery [5], solar energy utilization [6], thermal conserving and insulation buildings [7], electric

appliance thermoregulation [8] and thermal comfortable textiles [9,10], because it can store a large amount of thermal energy ...

The global energy transition requires new technologies for efficiently managing and storing renewable energy. In the early 20th century, Stanford Olshansky discovered the phase change storage properties of paraffin, advancing phase change materials (PCMs) technology []. Photothermal phase change energy storage materials (PTPCESMs), as a ...

An J, Liang W, Mu P, et al. Novel sugar alcohol/carbonized kapok fiber composites as form-stable phase-change materials with exceptionally high latent heat for thermal energy storage. ACS Omega 2019; 4: 4848-4855.

Thermal energy storage based on phase change materials (PCMs) can improve the efficiency of energy utilization by eliminating the mismatch between energy supply and demand. It has become a hot research topic in recent years, especially for cold thermal energy storage (CTES), such as free cooling of buildings, food transportation, electronic cooling, ...

Photothermal phase change energy storage materials (PTPCESMs), as a special type of PCM, can store energy and respond to changes in illumination, enhancing the efficiency of energy systems and ...

A novel thermoplastic polyurethane (TPU) PCFs possessing a high loaded ratio and high elasticity was simply prepared by vacuum absorption following wet spinning, then coated by waterborne polyurethane (WPU). Octadecane (OCC), hexadecanol (HEO), and stearic acid (SA), which have different tendencies to form hydrogen bonds with TPU, were selected ...

Smart textiles have emerged as potential part for wearable devices and protective systems. Integrating phase change materials (PCMs) into stimuli-responsive fibers offers exciting opportunities for smart clothing to realize instant energy conversion/storage and temperature regulation. However, the production of flexible and efficient smart energy storage fiber is still ...

This study provides a new production route for such magnetic phase change fiber composites with double stimuli-responsive magnetic-to-light thermal energy conversion. ... Induced dipole force driven PEG/PPEGMA form-stable phase change energy storage materials with high latent heat. Chemical Engineering Journal (2020)

The high thermal energy storage density of TPCF/2 showed an outperformance than other phase change fibers, for instance, electrospinning paraffin/phosphor/PAN fibers with an enthalpy of 64.08 J/g, melting spinning paraffin/PP filament with an enthalpy of 48 J/g, paraffin wax/PVB core-shell microfiber with an enthalpy of 128.2 J/g and PEG ...

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