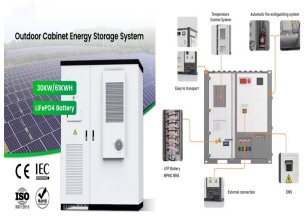
WEARABLE PHASE CHANGE ENERGY STORAGE FILM



DOI: 10.1016/j.cej.2024.153271 Corpus ID: 270600423; Flexible phase change film with motion sensing and tactile recognition for wearable thermal management @article{Liu2024FlexiblePC, title={Flexible phase change film with motion sensing and tactile recognition for wearable thermal management}, author={Lu Liu and Yuang Zhang and Yanan Wu and Shufen Zhang and ???

Semantic Scholar extracted view of "Hexagonal Boron Nitride-Induced Lamellar-Structured Flexible Phase Change Film for Temperature-Controlled Information Storage and Wearable Thermal Regulation" by Yukai Yang et al. Converting solar energy into storable thermal energy within organic phase change materials has emerged as a promising way to

Phase change materials (PCMs) are extensively employed as media for thermal energy storage and temperature regulation due to their remarkable capacity to absorb or release significant amounts of latent heat at constant phase transition temperatures. However, the inherent low thermal conductivity, solid-state rigidity and electric insulation issues of PCMs ???

Hence, the application of the prepared thermochromic membrane in thermal regulation, energy storage and wearable temperature sensor has great potential in the future, An intrinsically flexible phase change film for wearable thermal managements. Energy Storage Mater., 34 (2021), pp. 508-514, 10.1016/j.ensm.2020.10.014.

A flexible phase-change film with thermal management and microwave absorption capabilities was developed for use in wearable devices. A particularly promising avenue within solar energy lies in the utilization of phase-change materials for thermal energy storage and release due to their remarkable capacity to absorb This film is ideal

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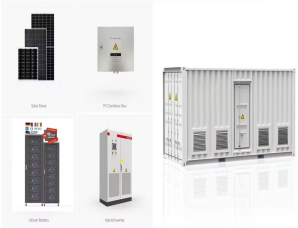
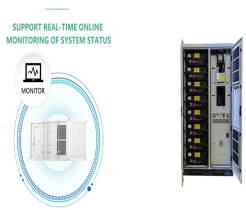


Developing phase change materials (PCMs) with solar-thermal energy conversion and storage for wearable personal thermal management is of significance but challenging, due to the difficulty of

Phase change materials (PCMs) have attracted tremendous attention in the field of thermal energy storage owing to the large energy storage density when going through the isothermal phase transition process, and the functional PCMs have been deeply explored for the applications of solar/electro-thermal energy storage, waste heat storage and utilization, ???

As a promising approach to thermal storage, phase change materials (PCMs) are widely deployed in the thermal management fields, including industrial waste heat recovery [1, 2], solar thermal utilization [3, 4] and building energy saving [5, 6], for their large thermal storage density [7, 8] and constant temperature [9] during the phase change

Phase change materials (PCMs) play an important role in thermal management technology due to their thermal storage capacity and stable phase change temperature 1, 2, 3.However, PCM-based wearable devices for personal thermal management are prone to problems such as liquid leakage and the lack of flexibility, solutions to which are necessary for ???



2.3. Material characterizations. The crystal structures of pure erythritol, PVP/PVA, and PVP m /PVA/Ery n phase change films were examined by an X-ray diffractometer (XRD) with a Cu Ka radiation (PANalytical Co. Empyrean-100, Netherlands) operated under a voltage of 40 kV and a current of 40 mA. The molecular interaction between erythritol and PVP/PVA was ???

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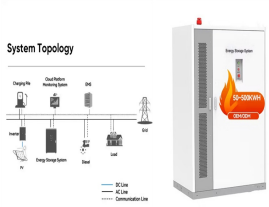
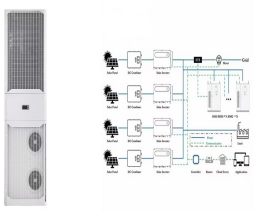
Semantic Scholar extracted view of "Flexible phase change materials for thermal energy storage" by Jinming Shi et al. {Flexible phase change materials for thermal energy storage}, author={Jinming Shi and Mulin Qin and Waseem Aftab and Ruqiang Zou}, journal={Energy Storage Materials}, year={2021}, volume={41}, pages={321-342}, url={https

An intrinsically flexible phase change film for wearable thermal managements. solvent in the compound TBB on the reversible thermochromic and phase change energy storage properties of TBB-DB

A flexible wearable phase change composite with electro-/photo-thermal heating for personal thermal management and human body motion detection (50.48 ?C) and Tc (35.24 ?C) of neat PEG. The relatively lower Tm facilitates heat storage in EP50 film to use for body heat management. Fig. 5 b shows the melting curves of EVA/PEG films with 30



The management or efficient utilization of thermal energy is an important topic for a sustainable world. The increasing use of flexible electronics, devices and systems with high power output requires a medium to alleviate thermal shock and ensure running stability. 1,2 Phase change materials (PCMs) with high thermal capacity, rapid thermal response, and ???



Developing phase change materials (PCMs) with solar-thermal energy conversion and storage for wearable personal thermal management is of significance but challenging, due to the difficulty of overcoming the liquid phase leakage, weak light adsorption, and solid phase rigidity of conventional phase change materials.

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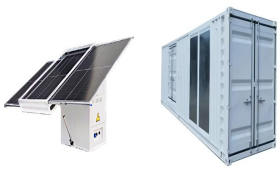
Solid-liquid phase-change materials (PCMs) are a type of latent heat-storage material. They can absorb and store a large quantity of thermal energy from different heat sources, such as solar and waste heat, and release it in a small range of temperature fluctuation through reversible solid-liquid phase transitions [1, 2] ch a distinguished feature enables ???

Herein, we report an intrinsically flexible PCM film with apparent solid-solid phase transition performance, outstanding self-support and shape-conformable property for wearable thermal ???

Therefore, this study develops a wearable phase-change film (FSPCF) that addresses these issues while providing high flexibility, superior solar thermal conversion efficiency and sensitive motion detection. A comprehensive review of phase change film for energy storage: Preparation, properties and applications. 2023, Journal of Energy Storage.

Energy storage: Phase change material based thermal energy storage applications for air conditioning: 2022 [38] Zheng et al. To demonstrate the flexibility and temperature control properties of the composite film, a wearable device based on the PCM film was attached to a finger and the temperature change was captured by an IR thermal camera



The development of wearable heat supply textiles in cold conditions utilizing the photothermal conversion effect is crucial for the advancement of wearable thermal Multi-field driven thermochromic films with phase change energy storage properties. Yuzhen Zhao Jiasong Zheng +7 authors Z. Miao. Materials Science, Physics. Dyes and Pigments

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The development of multifunctional composite phase change materials has emerged as a popular research field to achieve efficient thermal energy storage and management across diverse application scenarios. Herein, a novel flexible reversible thermochromic phase change film (TC-PCMs/nBN/OBC) has been proposed. The film comprises a thermochromic ???

Phase change film (PCF) has been extensively studied as a novel application form of energy storage phase change material (PCM). The emergence of PCF has made possible the application of PCM in highly flexible and space-constrained fields, which was hard to ???

An intrinsically flexible phase change film for wearable thermal managements , Y.-Y. Zhao, X.-Y. Li, Y.-l. Zhang, Y.-P. Dong, J.-l. Zhao, H. Zhang, B.o. Wang. Preparation of the polyvinyl alcohol thermal energy storage film containing the waste fly ash based on the phase change material Flexible graphene aerogel-based phase change film

Phase change materials (PCMs) involving significant amounts of latent heat absorbing and releasing at a constant transition temperature have been extensively utilized for thermal management of electronic devices. However, it is still a great challenge to apply thermal management for wearable devices using PCMs due to their solid rigidity and liquid leakage.

Aerogel-phase change material (PCM) host-gust composites (A-PHCs) [4], [12], [13] can absorb and release a large amount of thermal energy reversibly at a constant temperature via solid-liquid phase transition, and have attracted great attention in the fields of thermal regulation, thermal stealth, thermal management of electronics, etc. [14], [15], [16].

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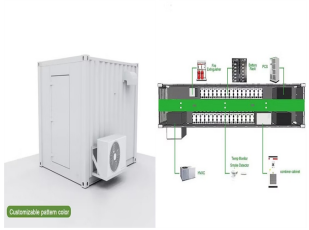
Phase change materials (PCMs) are ideal candidates for PTM technologies due to their high energy storage density and isothermal phase transition process [18], [19], [20]. PCM-based PTM materials can effectively regulate the surface temperature of the human body through latent heat storage/release process, creating an excellent thermal sensation



Introduction. Rapidly growing demand for wearable thermal energy management systems in various applications [1, 2], such as wearable sensors [3, 4], supercapacitors [5, 6] and clothing [7, 8], has accelerated the development of flexible multifunctional phase change materials (PCMs) [] particular, organic PCMs (such as polyethylene glycol (PEG) [], paraffin wax (PW) ???