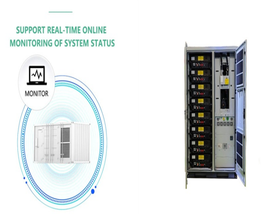
SUPERHYDROPHOBIC SURFACE ENERGY STORAGE

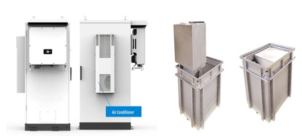
The STES coating has both great phase change behaviors and remarkable superhydrophobic properties to resist the erosion of the natural environment, which will pave the way for its application in practice. We propose a facile and effective route for large-scale fabrication of a superhydrophobic thermal energy storage (STES) sprayable coating with heat storage ???



Superhydrophobic nanocomposite coatings, prepared using adhesive and fillers, offer advantages including ease of fabrication and suitability for large-scale applications, but compared with other types of artificial superhydrophobic surfaces, poor durability still limits these surfaces from practical applications. The utilization of micro/nanoscale particles with both ???

Methods for fabricating biomimetic superhydrophobic surfaces are usually divided into two categories: the creation of layered structures (micro/nanostructures) on substrates; and the chemical modification of layered structures using low surface free energy materials [45].The methods of preparing superhydrophobic coatings are varied and complex, ???

Abstract Superhydrophobic surface (SHS) has been well developed, as SHS renders the property of minimizing the water/solid contact interface. Water droplets deposited onto SHS with contact angles exceeding 150?, allow them to retain spherical shapes, and the low adhesion of SHS facilitates easy droplet collection when tilting the substrate. These ???



Traditional methods, such as mechanical and chemical de-icing, are often associated with high energy consumption and environmental concerns for anti-icing [10], [11] per-hydrophobic surfaces, on the other hand, exhibit remarkable anti-icing properties that can delay or even prevent the formation of ice [12], [13], [14].This offers a more efficient and ???

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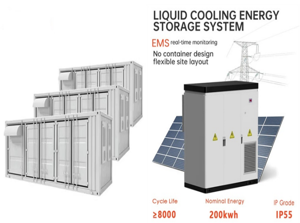
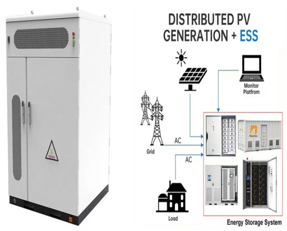
In general, there are two approaches for fabricating hydrophobic surfaces and SH surfaces: 1) using materials with low surface energy to form a rough surface that is converted ???

To overcome the poor durability, the self-healing ability of natural water-repellent surfaces can be realized in them by reconstructing their microscale/nanoscale textures and applying epicuticular wax on the damaged region [13], [14], [15], [16].An effective strategy in this vein is to design biomimetic and self-healing superhydrophobic materials that can store ???

The development of advanced multifunctional phase change materials (PCMs) for solar energy harvesting and storage is an important alternative to conventional energy sources. Herein, a novel flexible superhydrophobic thermal energy storage (FSTES) coating without fluoride is prepared by spraying mesoporous C@SiO 2 nanotubes (NTs) supporting materials, ???



Although self-healing superhydrophobic surfaces have aroused much attention due to their repairable wetting properties and wide applications, the realization of dual healing of both microstructure and surface chemistry remains challenging. Herein, we develop a novel superhydrophobic surface composed of a shape memory micropillar array decorated by pH ???



CE between coalescence-induced jumping droplets and superhydrophobic surfaces. One typical example of liquid-solid CE is that condensed water droplets on cold superhydrophobic surfaces can acquire

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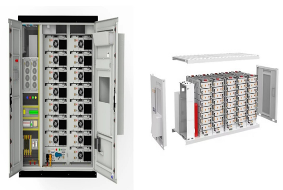
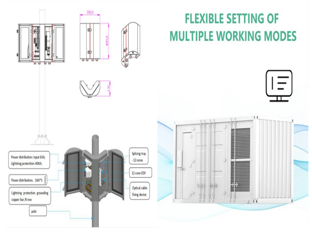
One of the challenges for the application of energetic materials is their energy-retaining capabilities after long-term storage. In this study, we report a facile method to fabricate superhydrophobic Al/Fe 2 O 3 nanothermite film by combining electrophoretic deposition and surface modification technologies. Different concentrations of dispersion solvents and ???

Generally, solid particulate matter suspend in the air with a particle size of less than 500 ? 1/4 m is called dust. The dust gather on the surface of the panel mainly comes from two aspects, one is the dust floating in the atmosphere, and the other is the dust originally deposit on the ground due to natural activities or human factors are brought into the atmosphere [[18], ???

A novel flexible and fluoride-free superhydrophobic thermal energy storage coating for photothermal energy conversion. Author links open overlay panel Lingbo Kong a, YaJing Li a, Xiangfei Kong b, ZhiYong Ji a, Low surface energy and high surface roughness are two key factors for building superhydrophobic surfaces [35]. It is widely known



Wood-based composite phase change materials with self-cleaning superhydrophobic surface for thermal energy storage. Haiyue Yang, Siyuan Wang, Xin Wang, Weixiang Chao, Nan Wang, Xiaolun Ding, Feng Liu, Qianqian Yu, Tinghan Yang, Zhaolin Yang, Jian Li, Chengyu Wang and Guoliang Li. Applied Energy, 2020, vol. 261, issue C, No S0306261919321695



This jumping motion on the super-hydrophobic surface is created by gradient surface energy that exists between the coalesced water droplets and the superhydrophobic surface [31]. This jumping condensate mechanism is found in all the naturally occurring super-hydrophobic surfaces and therefore, the bio-mimicked surface will also possess the same

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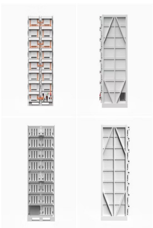
In the field of detection, superhydrophobic SMPs can be compounded with sensing materials [111???113], resulting in composites that can accurately control the mode and intensity of external stimuli (heat, electric field, light, magnetic field, etc.) by changing the hydrophobicity or adhesion of the surface. In the energy-storage field




The low surface energy substances were dissolved in 20 ml of absolute ethanol, stirred well and then an appropriate amount of APT was added, stirring was continued to make it completely dispersed to achieve an effective reaction between APT and low surface energy substances. The superhydrophobic surface coating of modified attapulgite was


These surface structuring approaches rely on the droplet to be the energy storage mecha-nism (surface energy) during impact and recoil. time on a rigid superhydrophobic surface. Energy


Inspired by the low surface energy sparse hairy structure of the water bug, Currently, her research focuses on multifunctional superhydrophobic surfaces and energy storage materials. Yali Li is an Associate Professor in Civil and Construction Engineering at Swinburne University of Technology. She is also an Australian Research Council's


Passive daytime radiative cooling (PDRC) is a non-consumptive and non-polluting cooling technology. As well as reflecting sunlight, it can also cool surfaces by emitting heat into space. A daytime radiative cooling coating with both phase change energy storage (PCES) function and self-cleaning performance was prepared by using polydimethylsiloxane ???

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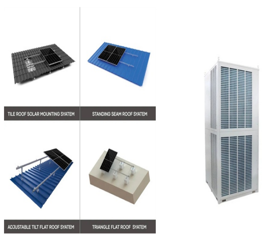
Li et al. [54] developed a black micro/nanostructured aluminum surface with superhydrophobic and photothermal properties through nanosecond laser ablation and low-surface-energy material modification. The multifunctional aluminum exhibited strong anti-icing and rapid deicing capabilities.

Typically, in 2004, Lodziana et al. discovered that the surfaces of ?,-Al 2 O 3 have much lower SE after hydration, especially the (10-2) plane which has a negative SE by DFT calculation [].The negative surface energy of ?,-Al 2 O 3 is induced by the dissociation of water molecules over the (10-2) surfaces, as shown in Figure 1(a). When a water molecule is placed ???

Through a further surface modification with a low-surface-energy alkane chains, the resultant microencapsulated n-docosane was expected to achieve a superhydrophobic surface as well as good thermal energy-storage performance. The aim of this study is to open the door for design and development of superhydrophobic thermal energy-storage materials.



All weather, high-efficiency, energy-saving anti-icing/de-icing materials are of great importance for solving the problem of ice accumulation on outdoor equipment surfaces. In this study, a composite material with energy storage, active electro-/photo-thermal de-icing and passive super-hydrophobic anti-icing properties is proposed.

Inspired by the "Lotus Leaf Effect" in nature, the phenomenon of superhydrophobia has attracted tremendous attention from researchers. Due to their special surface wettability, the superhydrophobic surfaces have been found to have broad potential applications in the fields of marine engineering, medical equipment, and aerospace. Based on ???

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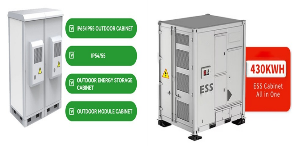

Shape memory superhydrophobic surface with switchable transition between "Lotus Effect" to "Rose Petal Effect" via a CVD method to endow the surface with low surface energy [53] Superhydrophobic surface with shape memory micro/nanostructure and its application in rewritable chip for droplet storage. ACS Nano, 10 (2016), pp. 9379