SOLARTECH
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European Solar Energy Storage

Super hydrophobic energy storage

Overview

Their unique characteristic of being non-wettable by water under ambient conditions enables the reversible and controllable intrusion and extrusion of liquids under high hydraulic pressures, effectively converting mechanical work into stored energy.How does a superhydrophobic electrode work?

In this research, the superhydrophobic electrode is constructed by a chemical modification. After the water droplets impale the electrode surface, they will eject, which prompts the surface dust to roll down and demonstrate a self-cleaning property.

What is a superhydrophobic supercapacitor?

The integrated superhydrophobic supercapacitor has a specific capacitance of 97.2 F/g at a current density of 0.8 mA/cm 2, and a capacitor retention rate of 95.5% after 3500 cycles. Furthermore, it can withstand bending 2000 times and 24 h of immersion with either strong acid or alkali and can achieve long-term underwater work (3500 h).

Are flexible supercapacitors good for portable energy storage?

Portable energy storage is developing rapidly with the miniaturization and integration of devices, and flexible supercapacitors are one of the important development directions. Nevertheless, the performance of most supercapacitors will be dramatically degraded after being eroded by water droplets or repeatedly stretched.

Why is ZnO a superhydrophobic layer?

Although the formation of the nanostructured ZnO layer can provide an enough rough surface for the microcapsules, the hydrophilic nature of ZnO cannot support a superhydrophobic behavior due to abundant hydroxyl groups on the surface of ZnO layer.

How do you test a super-hydrophobic surface?

The super-hydrophobic durability of the top layer is verified through tape peeling and sandpaper abrasion tests. The surface can be heated by applying on voltage or light illumination, showing efficient electro-/photo-thermal and all-day anti-icing/de-icing performance.

Can electrochemistry functionalization improve energy storage density?

Meanwhile, an electrochemistry functionalization strategy was applied onto the hydrogel, which not only enhanced the mechanical properties but also effectively improved the energy storage density.

Super hydrophobic energy storage

Innovative design of superhydrophobic thermal energy-storage materials

We reported an innovative design for a novel type of superhydrophobic thermal energy-storage material by microencapsulation of phase change material (PCM) with a nanostructured ZnO/SiO 2 shell.

Enhanced thermal conductivity of a superhydrophobic thermal energy

With high energy storage density, enhanced thermal conductivity, and good scalability, our superhydrophobic ss-PCM coating should find potential use in energy-saving building materials and thermal management of electrical devices, as ...

A Flexible Superhydrophobic Supercapacitor with Enhanced ...

In this research, the superhydrophobic electrode is constructed by a chemical modification. After the water droplets impale the electrode surface, they will eject, which prompts the surface dust to roll down and demonstrate a self-cleaning property.

A Flexible Superhydrophobic

Supercapacitor with ...

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The invention discloses a novel super-hydrophobic compressed air energy storage tube and a processing method thereof, comprising a base tube and a corrosion-resistant coating coated on the

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In this study, a composite material with energy storage, active electro-/photo-thermal de-icing ...

Advanced Anti-Icing Strategies and Technologies by ...

Here, recent advances in anti-icing by design and functionalization of superhydrophobic surfaces are reviewed. The mechanisms and advantages of conventional, macrostructured, and photothermal ...

Energy storage super hydrophobic

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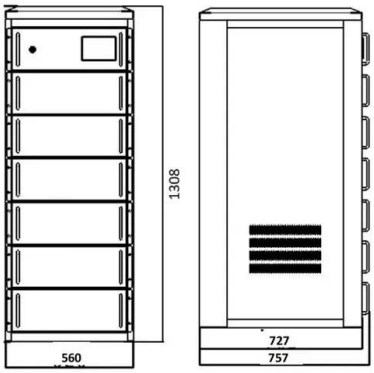

Advanced Anti-Icing Strategies and Technologies by ...

Here, recent advances in anti-icing by design and functionalization of superhydrophobic surfaces are reviewed. The mechanisms and advantages of conventional, macrostructured, and photothermal superhydrophobic surfaces are introduced in turn.

A New Composite Material with Energy Storage

In this study, a composite material with energy storage, active electro-/photo-thermal de-icing and passive super-hydrophobic anti-icing properties is proposed.

A New Composite Material with Energy Storage

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In this study, a composite material with energy storage, active electro-/photo-thermal de-icing and passive super-hydrophobic anti-icing properties is proposed.

A New Composite Material with Energy Storage, Electro/Photo

In this study, a composite material with energy storage, active electro-/photo-thermal de-icing and passive super-hydrophobic anti-icing properties is proposed.

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