Energy storage fluorescent agent

Due to their structural similarity to graphene, MXenes have gained tremendous attention since its discovery in 2011 [].The MAX phase (M n+1 AX n) is composed of M which signifies an early transition metal with n = 1-3, A represents elements from group 13 and 14 of the periodic table, and X is carbon/nitrogen. MXenes are synthesized using selective etching of A ...

The CaO-B 2 O 3 -SiO 2 glass system selected in this study has a lower melting temperature than other glass systems, such as SiO 2, P 2 O 5 and B 2 O 3 -SiO 2 glass systems. Common energy storage glass-ceramics are mainly titanate-glass ceramics and niobate glass-ceramics. The second phase of titanate glass ceramics prepared by the traditional melt ...

Anions serve as an essential component of electrolytes, whose effects have long been ignored. However, since the 2010s, we have seen a considerable increase of anion chemistry research in a range ...

Allowed the solution to dry at room temperature for seven days and then at 65°C for 12 h to get PTPU films.,The flexible PU films with photothermal conversion and energy storage performances were successfully synthesized and the functional films presented both excellent energy storage and mechanical property when the molecular weight of PEG ...

Depending on whether there is an efficient secondary energy transfer (SET) between the fluorescent agent and the photosensitizer, the ultimate afterglow emission spectrum could be close to that of ...

In a nowadays world, access energy is considered a necessity for the society along with food and water [1], [2].Generally speaking, the evolution of human race goes hand-to-hand with the evolution of energy storage and its utilization [3].Currently, approx. eight billion people are living on the Earth and this number is expected to double by the year 2050 [4].

The fluorescent hybrid textile supercapacitor exhibited enhanced energy storage performance relative to the EDLC-type analogue containing the undoped electrolyte, namely 20% higher working voltage ...

Here, a cooperative optimization strategy of microstructure control and superparaelectric regional regulation is proposed to simultaneously achieve excellent energy storage performance and ...

As for the pumping source, ultraviolet-visible (UV-Vis) light is the most widely used source to charge persistent luminescent phosphors; however, persistent luminescent phosphors that can be charged with deep-red and even NIR light sources are highly desirable for biological applications.

Latent heat (DH) and phase change temperature are two of the most important parameters of PCMs, which directly determines their thermal energy storage capacity and potential application scenarios.The phase change temperature is usually tuned by phase transition constituents; the DH can be controlled by the content of phase

transition constituents ...

Nature Communications 13, Article number: 797 (2022) Cite this article We propose a new concept exploiting thermally activated delayed fluorescence (TADF) molecules as photosensitizers, storage units and signal transducers to harness solar thermal energy.

Herein, we report a facile one-step wet spinning method to fabricate red persistent luminous fiber with reversible photochromic performance, by integrating the red luminescent Y ...

Three kinds of commonly used fluorescent agents were tested as the afterglow relay units (Fig. 1e), which included semiconducting polymers (SPs), small-molecule dyes (SMDs), and inorganic fluorophores (IFs), such as semiconductor quantum dots (QDs), graphene quantum dots (GQDs), and carbon quantum dots (CQDs).

Among all flexible energy storage devices, supercapacitors and Li-based batteries (e.g., Li-ion, ... To enhance the brightness of paper, fluorescent whitening agents (e.g. stilbenes) are added in the process of fabrication. The mechanical properties of paper can be readily tuned by adjusting the length, diameter and physical and chemical nature ...

Thermal energy storage (TES) techniques are classified into thermochemical energy storage, sensible heat storage, and latent heat storage (LHS). ... carbon dots can be used to develop fluorescent functional composite PCMs. In terms of the leakage issue and ... Na 2 HPO 4 served as an effective nucleating agent that greatly promoted the ...

A new fluorescent agent, FITC labeling agarose is designed to determine whether it can act as an effective fluorescent labeling agent of cell or not. ... Surfaces & Membranes Compact Modeling Composite Materials Diagnostics & Bioimaging Energy Storage Environmental Health & Safety of Nanomaterials Fuel cells & Hydrogen Graphene & 2D ...

Energy, water, and healthy air are the basic needs to survive, and all these resources are intricately connected. Modern lifestyle activities and growing energy demands cause more consumption of fossil fuels and contamination of water and air. The inappropriate discharge of a substantial biomass waste byproduct worsened these problems, mainly in ...

Xue prepared a core-shell structured red luminescent fiber by applying the fluorescent agent to the outer of the fiber and long afterglow green emission phosphor SrAl 2 O 4:Eu 2+, Dy 3+ to the inner of the fiber respectively(Xue et al. 2021). However, the complicated fabrication process and unique equipment largely limit the production of the ...

Therefore, storing that energy attains utmost importance. There are numerous energy storage devices, such as supercapacitors, 2,3 batteries, 4 Fuel cells, and PCMs, 5 etc., which can help to store and utilize energy on

demand. In energy storage applications, too, biomass has gained high popularity due easy accessibility and environment ...

This study presents a generic approach to transforming ordinary optical agents (including fluorescent polymers, dyes, and inorganic semiconductors) into afterglow luminescent nanoparticles (ALNPs).

Nature Materials 22, 289-304 (2023) Cite this article Persistent luminescent phosphors can store light energy in advance and release it with a long-lasting afterglow emission.

Khanchaitit, P. et al. Ferroelectric Polymer Networks with High Energy Density and Improved Discharged Efficiency for Dielectric Energy Storage, Nat. Commun. 12, 2845; 10.1038/ncomms3845 (2013).

The energy storage application using the FeNP@MIL -101(Fe)/CNT composite as a supercapacitor electrode was implemented for the firsttime. Various techniques ... Herein, DMF acts as a reducing agent of Fe3+ metal centers to Fe2+. DMF plays an important role in MOF synthesis; thermally decomposing to release a base (dimethylamine) that ...

Electrochemical energy storage (EES) devices, in which energy is reserved by transforming chemical energy into electrical energy, have been developed in the preceding decades. Typically, lithium-ion batteries (LIBs), supercapacitors (SCs), and hybrid supercapacitors are the three vital devices that have been in the spotlight to suffice the purpose.

Fluorescent probes are sensitive, selective, nontoxic in detection and thus provided a new solution in biomedical, environmental monitoring, and food safety. In order to expand the application of fluorescent probes in various fields, the paper discusses the design, synthesis, and characterization of fluorescent probes, explores new design and development ...

Advanced multifunctional composite materials have been a significant force in the advancement of efficient solar-thermal energy conversion and storage, which is critical to address current energy shortage problems. In this study, novel phase change material (PCM) composite fiber films, composed of Py-CH (one novel pyrene-based aggregation-induced ...

A new smart multifunctional fluorescent textile SC featuring UV light-switchable properties and, simultaneously, high energy storage ability and excellent cyclability (100% after ...

Graphene quantum dots, carbon nanomaterials with excellent fluorescence characteristics, are advantageous for use in biological systems owing to their small size, non-toxicity, and biocompatibility. We used the hydrothermal method to prepare functional N-doped carbon quantum dots (N-CQDs) from 1,3,6-trinitropyrene and analyzed their ability to ...

Design and synthesis of bifunctional conjugated microporous polymers containing tetraphenylethene and

bisulfone units for energy storage and fluorescent sensing of p-nitrophenol Author links open overlay panel Mohamed Gamal Mohamed a b 1, Huan-Yu Hu a 1, S. Santhoshkumar c, Manivannan Madhu c, Tharwat Hassan Mansoure b, Ching-Wen Hsiao a ...