Solar Energy

Photo-induced solar container phosphor

Overview

The charged phosphor exhibits solar-blind ultraviolet (200–280 nm) emission under sunlight, while its persistent luminescence is nearly absent in a dark environment, revealing the role of sunlight in releasing the stored energy of the phosphor. Herein, we introduce a glow-in-the-daylight phenomenon, which is essentially photostimulated luminescence of ultraviolet phosphor upon stimulation by polychromatic daylight. As a proof of concept, imaging and spectral experiments are carried out using an x-ray-charged L u P O 4: P r 3 + phosphor to. Storage phosphors, known for their delayed emission after charging, have shown great potential for applications in radiation detection, bio-imaging, and medical diagnosis. Despite their promise, the underlying mechanisms governing their charging behavior have not been sufficiently investigated. In. Phosphor-converted LEDs (pc-LEDs) have gained significant attention since they could act both as an energy source for photosynthesis and a power source in sprouting, blossoming, fruiting, and other photomorphogenesis. The evolution of plant illumination and the advantages and disadvantages of. Abstract: In natural photosynthesis, light-driven electron transfer across the thylakoid membrane enables efficient charge separation and the confinement of reaction spaces for generating NADPH and CO2 and oxidation of water. These reactions are complementary redox reactions and require different.

Photo-induced solar container phosphor

Rapid synthesis of phosphor-glass composites in seconds based on

Phosphor-glass composites can serve as efficient and stable photonic converters, but their synthesis generally requires harsh and time-consuming procedures. Here, the authors report an ...

Photoinduced electron transfer and its applications--Study on

The applications of photoinduced electron transfer, one in solar energy storage and the other in polymeric photorefractive materials are reported. In the former case, two new kinds of ...

Sm3+ induced-SrWO4 phosphor: analysis of photoluminescence and

Therefore, quest for novel and highly efficient phosphor material is quite challenging to the researchers [4]. In recent decades, inorganic nano-structured materials have gained more ...

Phosphors for Solar Cells , 21 , v3 , Phosphor Handbook , Donglei Zhou

Solar cells (SCs), which can convert the sunlight into electricity, have been considered as the promising routes to green and renewable energy generation.

Photostimulable Storage Phosphor Materials and Their Application to

Storage phosphor materials have a function to record the incident radiation dose, and they are often used for personal dose monitoring applications and imaging plates (IPs).

Sunlight stimulated solar-blind ultraviolet phosphor

The charged phosphor exhibits solar-blind ultraviolet (200-280 nm) emission under sunlight, while its persistent luminescence is nearly absent in a dark environment, revealing the role of sunlight in ...

Photoinduced Electron Transfer Across Phospholipid Bilayers in

This process is crucial for solar energy conversion and the development of more advanced systems with robust and sturdy membranes. Additionally, it is important for the design of artificial cells and cellular ...

Harnessing Solar Energy for Polymer Synthesis: Recent Advances in

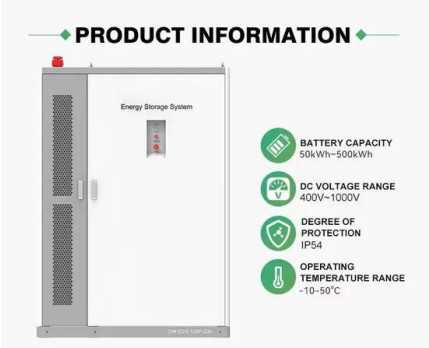
In the pursuit of green polymer chemistry, natural sunlight represents the ideal energy source for photopolymerization due to its abundance and sustai...

Degradation Mechanisms in LED Packages , Springer Nature Link

Lumen depreciation is one of the major failure modes in light-emitting diode (LED) systems. It originated from the degradation of the different components within the package, being the ...

Optimized photoluminescence quantum yield in upconversion ...

In this work, a photoluminescence quantum yield (PLQY) increase of 270% was observed when hexagonal NaYF4: (18%)Yb3+, (2%)Er3+ phosphor is in air compared to a refractive index ...



Photoinduced absorption spectroscopy as a tool in the study of dye

Photoinduced absorption (PIA) spectroscopy, where the excitation is provided by a square-wave modulated (on/off) monochromatic light source, is a vers...

Potential Use of Photo-Excited Phosphors in Energy-Efficient Plant

Phosphor-converted LEDs (pc-LEDs) have gained significant attention since they could act both as an energy source for photosynthesis and a power source in sprouting, blossoming, ...

Enhanced charge transport and photovoltaic performance ...

Cite this Phys em em.Phys., 2014, 16, 24499 Enhanced charge transport and photovoltaic performance induced by incorporating rare-earth phosphor into organic-inorganic hybrid solar cells+

Temperature

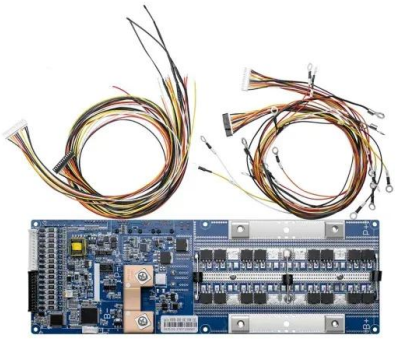
Abstract We present the analytic workflow to understand the temperature and illumination-intensity-dependent recombination of the photoinduced charge carriers in organic-inorganic hybrid perovskite ...

Efficient Photoinduced Energy and Electron Transfers in a

Herein, we report a host-guest approach by using a tetraphenylethene-based octacationic cage and fluorescent dyes to construct artificial photofunctional systems with energy and ...

Sunlight stimulated solar-blind ultraviolet phosphor

In this work, we report a glow-in-the-daylight phenomenon of storage phosphors, whose ultraviolet emission is outside the spectral range of outdoor sunlight illumination.



Reduced ultraviolet light induced degradation and enhanced light

We report a simple method to mitigate ultra-violet (UV) degradation in TiO2 based perovskite solar cells (PSC) using a transparent luminescent down-shifting (DS) YVO4:Eu3+ nano ...

"Light battery" role of long afterglow phosphor for round-the-clock

To be specific, long-afterglow phosphor or long-afterglow phosphor/semiconductor composite can be used as a photocatalyst to simultaneously promote the photoredox processes and ...

Preparation of photoluminescent and photochromic smart glass ...

Long-persistent photoluminescent and photochromic glass material capable of changing color under UV irradiation has been produced. With the simple imm...

A biomimetic phosphor that can build a rigid microenvironment for its

Here, the authors report a biomimetic phosphor that builds a rigid microenvironment to restrain non-radiative decay of triplet excitons, achieving long-lived organic afterglow in water.

Insights of phosphor charging upon exposure to intense illumination

In this Letter, we elucidate the response of storage phosphors, focusing on the Y 3 Sc 2 Ga 3 O 12:Pr 3+ composition, when subjected to intense illumination.

Recent Advances and Challenges in Light Conversion Phosphor ...

The incorporation of light conversion phosphor materials (LCs) in QDSCs is a promising technology to absorb the whole part of the solar spectrum and enhance the PCE of these SCs.

Light-conversion phosphor nanoarchitectonics for improved light

Many progressive studies have been conducted to expand the family of light-conversion phosphors and exploit their application in sensitized solar cells, bringing emerging opportunities to ...

Role of long persistence phosphors on their enhancement in ...

The lower enhancement (compared to 38.6% from silicon solar cells) could be due to the recombination of photo-induced holes and electrons caused by the doping-induced defects in TiO 2 ...

Multi-level phosphor storage enabled by synergistic up-conversion and

Phosphor-based optical storage technologies have made significant strides in encoding and decoding processes, yet persistent challenges in flexible, multi-level storage remain.

Deep-trap ultraviolet persistent phosphor for advanced optical storage

Here, we report an appealing deep-trap ultraviolet storage phosphor, ScBO 3:Bi 3+, which exhibits an ultra-narrowband light emission centered at 299 nm with a full width at half ...

N, S-doped carbon quantum dot for long persistence phosphor ...

Traditional solar cells can only work during the daytime. The solar cells that can harvest energy in all weather conditions are favorable to solving the energy crisis and ecological issues. We ...

Efficient Photoinduced Energy and Electron Transfers in a

Artificial photofunctional systems with energy and electron transfer functions, inspired from photosynthesis in nature, have been developed for many promising applications including solar ...

Photoionization-induced charge separation for efficient solar energy

Based on our understanding of alkane solutions and in aromatic organic crystals, the charge separation mechanism in dye-sensitized solar cells is discussed as a photoionization-induced ...

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