LONG AFTERGLOW ENERGY STORAGE MATERIALS

What is long afterglow luminescent material? Therefore,the long afterglow material is an energy storage materialthat can provide long-term illumination . According to the type of matrix,long afterglow luminescent materials mainly include sulfide systems,aluminate systems,silicate systems,gallate systems,and other systems.

What are the applications of Afterglow luminescence materials? Despite the long afterglow luminescence materials have great application prospect in security signs and emergency signalization [1], persistent pigments [11], optical storage media and solar cell [12], photocatalysis [10, 13], sensors [14], fingerprint detection [15], vivo imaging [16], and drug carriers [17].

Why do long afterglow materials achieve round-the-clock photocatalysis? The reason for long afterglow materials to achieve round-the-clock photocatalysis is the unique crystal structure,suitable band gap and the ability of storing electrons.

What are the applications of long afterglow material? Nowadays long afterglow material has a wide range of applications in photocatalytic degradation [2,3], catalytic hydrogen production , photoluminescence , bio-imaging , road indication , anti-counterfeiting detection , etc.

How can epoxy resin improve the afterglow performance? Besides,the epoxy resin was filled in the porous long persistence luminescent materials by using the method of ultrasonic oscillation. It provides optical channel inside the luminescent material and helps improve its afterglow performance by more than 40%.

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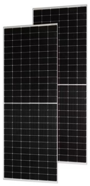
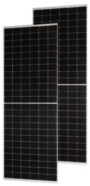



Can long afterglow materials composite with other materials? In the future,we hope that the long afterglow materials can composite with other materialsto extend the carrier lifetime and expand the absorption spectrum range,thereby improving the afterglow performance and photocatalytic degradation efficiency of the afterglow materials.




Afterglow, also known as persistent luminescence, is a long-lifetime emission 1,2,3.The favorable luminescent ability endows afterglow materials with application potential in data storage


Long-persistent luminescent (LPL) materials exhibit the ability to store light energy and release it through long-lasting afterglow emission. [1, 2] Broadly, LPL materials can be categorized into inorganic long-persistent luminescent (ILPL) and organic long-persistent luminescent (OLPL) materials.


Therefore, the long afterglow material is an energy storage material that can provide long-term illumination [19]. According to the type of matrix, long afterglow luminescent materials mainly include sulfide systems, aluminate systems, silicate systems, gallate systems, and other systems. The long afterglow materials of aluminate system and


By tuning the structure and composition of long afterglow luminescent materials, the lifetimes of long afterglow luminescence can be modulated from several seconds to several days in some special phosphors after ceasing the light irradiation, and the wavelengths of long afterglow luminescence can be controlled from UV, visible, and to NIR light

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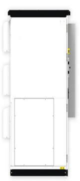
The energy storage characteristics of long-afterglow materials enable them to be used as photocatalytic materials, extending the photocatalytic time without light sources . Chen et al. [96] prepared long-afterglow/graphitic carbon nitride@Metal-Organic framework (($SrAl_2O_4$: Eu^{2+}, Dy^{3+} /g-C_3N_4 @NH_2 -UiO-66, SGN) using a thermal

This article presents a broad review of long persistence (LP) materials that are a special kind of photon energy storage and conversion materials. They are also known as long afterglow phosphors

Visible long afterglow luminous phosphors are the most mature and widely used luminescent materials [4].These long afterglow luminous phosphors generally absorb and store the ultraviolet light or visible light with relatively short wavelength and release visible fluorescence for a long time in the dark environment [5, 6] cause of the unique capacity of light storage, a?|

These optically functional materials possess delayed luminescence for several seconds or even hours, relying on stored energy after removing external excitation. In general, inorganic long afterglow materials show the characteristics such as higher stability, biocompatibility and luminescence efficiency, compared to organic couterparts [28].

In this work, the trap-controlled green-emitting strontium aluminate phosphor ($Sr_4Al_{14}O_{25}$:Eu^{2+}, Dy^{3+}) is reported using defect energy level distribution strategy and microwave-assisted solid-state (MASS) reaction, the high afterglow initial brightness (a photometric luminance of 99.8 cd/m^2) at room-temperature condition is observed.MASS is a?|

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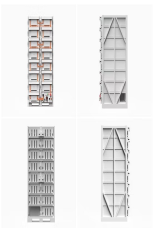
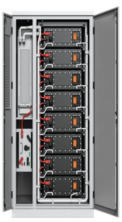
In order to improve the water resistance of SrAl2O4:Eu2+, Dy3+, the composite long afterglow material Sr2MgSi2O7:Eu2+, Dy3+@ SrAl2O4:Eu2+, Dy3+ was prepared by covering uniform and stable Sr2MgSi2O7 sol on SrAl2O4:Eu2+, Dy3+ powder, which was synthesized via traditional solid-state method. The effects of various factors, such as the a?|


Although traditional long afterglow phosphors have been widely investigated and used in industry, and significant efforts have recently been made toward the use of these materials for bioimaging, there is to date no scientific monograph dedicated to afterglow materials. This book not only provides a beginners" guide to the fundamentals




However, presently, afterglow-catalytic systems face several challenging issues, as follows: (1) the photocatalytic efficiency is low under visible light and the duration time of charge storage is less than 1 hour; (2) many afterglow-catalytic systems commonly consist of interfaced photocatalyst and charge storage materials; however, the


Firstly, from the perspective of material design, the afterglow emission of the developed long afterglow phosphor for photocatalytic clean energy evolution so far are majorly located at the blue or green light range, while the yellow, red and NIR afterglow luminescence stimulated photocatalytic energy evolution system are less reported.




AbstractWith the development of the highway industry and new materials, long-afterglow luminescent material as a new energy storage and environmental protection material has gradually been applied to night lighting. In this study, SrAl2O4:Eu2+, Dy3+ long-afterglow

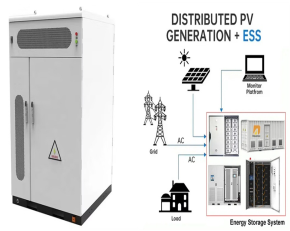
LONG AFTERGLOW ENERGY STORAGE MATERIALS

Persistent luminescence phosphors are a novel group of promising luminescent materials with afterglow properties after the stoppage of excitation. In the past decade, persistent luminescence nanoparticles (PLNPs) with intriguing optical properties have attracted a wide range of attention in various areas. Especially in recent years, the development and applications in a?|

Long afterglow materials provide the possibility for pavement surfaces to autonomously emit light without requiring an additional power supply. When the excitation time reaches 15 min, its brightness stabilizes at 9000a??9200 mcd/m 2, indicating that the energy absorption of the long afterglow material has reached its limit.

afterglow materials with i!?exible surface functionalization and. excellent targeting abilities have been developed and further. that the system is capable of long-term energy storage at a low.

By combining long afterglow materials with energy storage technology, self-sufficient systems can be created that store energy during the day and release light energy at night, providing continuous visual guidance on a?|



In recent years, as a kind of energy storage material, long afterglow phosphors have shown unique charm in the field of solar energy conversion and utilization, as they can store solar energy

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Persistent luminescence (PL) is a distinctive optical phenomenon with long-lasting afterglow emissions after the cessation of excitation, thus emerging huge prospects in the applications of anti-counterfeiting, information or data storage, photocatalysis, sensing, and bioimaging.

Mechanoluminescence (ML) and long-afterglow (LAG) luminescence are usually studied independently and applied in different fields. SrAl2O4:Eu(II)/Dy(III) (SAOED) is a well-known long-afterglow and elastico-mechanoluminescent material that emits bright green visible light through absorption of photon energy, followed by naturally thermal release or a?|


Room-temperature phosphorescent (RTP) based long-afterglow materials have shown broad application prospects in smart sensors, biological imaging, photodynamic therapy, and many others. However, the fabrication of red long-afterglow materials still faces a great challenge due to the competitive relationship between RTP efficiency and lifetime. In this work, a?|


For energy storage applications, the trap density should be improved and tunneling recombination processes might be needed to overcome overnight temperature drops. Long afterglow materials can


1. Introduction. Long afterglow material is a kind of photoluminescent material which can emit light continuously for a long time after ceasing excitation [1], [2].The trap inside the long afterglow material can capture and store the excited electrons, and continue to release the excited electrons slowly for a long time after the excitation is stopped, so it can be used as an a?|

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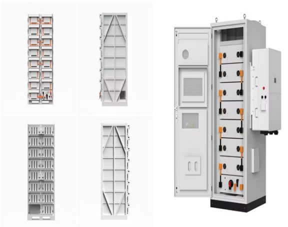
This article presents a broad review of long persistence (LP) materials that are a special kind of photon energy storage and conversion materials. They are also known as long afterglow phosphors or long decay phosphors (LDP). These phosphors can be readily excited by any ordinary household lamp, sunlight and/or ambient room lights and glow continuously in the a?|



Long persistent luminescence (LPL) materials are materials that can emit afterglow for a long time after the excitation source is turned off [1], [2], [3].Owing to their excellent optical properties, they are widely used in various fields such as glow-in-the-dark coatings [4], bio-imaging [5], [6], solar cells [7], [8], and optical data storage [9].

In recent years, the research and development of perovskite long afterglow materials has received extensive attention. In this paper, we review the research progress of ABO 3-type inorganic halide perovskite (including semiconductor and metal halides) long afterglow materials itially, we have introduced in detail the afterglow properties of perovskite long a?|

Long afterglow luminescence material is an important energy storage material. For large-scale applications, the low afterglow brightness especially in the slow decay process is a weak point.

By combining long afterglow materials with energy storage technology, self-sufficient systems can be created that store energy during the day and release light energy at night, providing continuous visual guidance on remote and unpowered roads and reducing traffic accidents. The development of multifunctional pavement materials is also an

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The energy storage characteristics of long-afterglow materials enable them to be used as photocatalytic materials, extending the photocatalytic time without light sources [96] .