Phosphor energy storage wavelength

Which phosphor is used for optical data storage based on photostimulated luminescence?
Wu, H. et al. Optical storage and operation based on photostimulated luminescence. Nano Energy 90, 106546 (2021). Zhang, J. M. et al. Giant enhancement of a long afterglow and optically stimulated luminescence phosphor BaCaSiO 4: Eu 2+ via Pr 3+ codoping for optical data storage. J. Lumin. 263, 119971 (2023).

What is a deep-trap ultraviolet storage phosphor?
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 maximum (FWHM) of 0.21 eV and excellent X-ray energy storage capabilities.

What are storage phosphors used for?
Storage phosphors as a kind of information storage materials have been widely used in computed radiography(CR) based on X -ray storage phosphor plate [1],dosimetry of X -rays,g -rays or electrons [2]and optical data storage [3],etc.

What are the optical properties of a phosphor?
The optical properties of a phosphor stem from crystal-chemical interactions between a crystalline host material, often an oxide, (oxy-)halide, (oxy-)sulfide or (oxy-)nitride, and a rare-earth or transition metal activator ion, which has been partially substituted within the host structure and acts as a luminescence centre 3, 6, 7 (Fig. 1a).

Which storage phosphor is best?
Recently,Lyu and Dorenbos et al. reported an excellent storage phosphor,Li (Y/Lu)SiO 4 :Ce 3+,Sm 3+,which is superior to the commercial storage phosphorescent materials in terms of carrier storage capacity,negligible attenuation of information storage and low hygroscopic property [,,].

Do storage phosphors emit in the deep ultraviolet region?
In this case,storage phosphors emitting in the deep ultraviolet region are preferred,considering that deep ultraviolet radiation encompassing the light spectrum over 200-300 nm,does not overlap with room light and can be detected with zero background noise in a bright indoor-lighting environment 34,35,36,37,38.

More importantly, high-entropy materials have been found to be useful as engineering materials with different potential applications, such as reversible energy storage (reversible lithium) [5, 9], lithium superionic conductor [10], low thermal conductivity materials [11], optical glasses with high refractive indices and low wavelength ...

Extensive research has been conducted on visible-light and longer-wavelength infrared-light storage phosphors, which are utilized as promising rewritable memory media for optical information storage

applications in dark environments. However, storage phosphors emitting in the deep ultraviolet spectral region (200-300 nm) are relatively lacking.

Energy storage phosphors @ Phosphor Global Summit 2019 - Download as a PDF or view online for free. Submit Search. ... 5µm Total CL intensity Peak emission wavelength (nm) FWHM nm) SrGa2S4:Eu2+ Highlight 2 - Cathodoluminescence for phosphor research (0.22eV) (0.17eV) (0.195eV)

An efficient energy transfer from Cr 3+ to Yb 3+ can be achieved in LiInP 2 O 7:Cr 3+,Yb 3+ phosphor, leading to the FWHM further increased to 225 nm, and the thermal stability as well quantum efficiency being significantly improved. Finally, LiInP 2 O 7: Cr 3+ phosphor and blue InGaN chip are combined to make a broadband near-infrared pc-LED ...

The La 4 GeO 8: Bi 3+, Er 3+ phosphor could emit white, blue-green, baby blue and orange-yellow at the different UV wavelength excitation. Moreover, the phosphor could also realize green UC luminescence under the NIR laser (980 nm or 808 nm) irradiation. ... The mapping and energy dispersive spectra were recorded by a FEI TecnaiF30 transmission ...

Radiation Sources and Detectors. C.W.E. van Eijk, in Comprehensive Biomedical Physics, 2014 8.16.4 Storage Phosphors - Thermoluminescence and Optically Stimulated Luminescence. In principle, a storage phosphor is a material analogous to an inorganic scintillator, with the difference that in a storage phosphor, a significant part of the energy released on interaction ...

Due to the unique and abundant energy levels of Pr 3+, it is usually selected as a promising emitter to realize versatile luminescence modes including photo-stimulated luminescence, upconversion luminescence, and persistent luminescence [40], [41].Additionally, Pr 3+-doped inorganic phosphors can emit invisible UVC light due to the effective 4f5d -> 4f inter ...

The synthesizer of a series of deep-trap persistent luminescent materials Y3Al5- xGa xO12:Ce3+,V3+ PiG films with a garnet structure and developed novel phosphor-in-glass (PiG) films which exhibited sufficiently deep traps, narrow trap depth distributions, high trap density, high quantum efficiency, and excellent chemical stability. Deep-trap persistent ...

Methods: A commercial BaFBrI:Eu 2+ storage phosphor detector (Model ST-VI, Fujifilm) was characterized with energy dispersive x-ray analysis (EDS) to obtain its elemental composition. The dosimeters were irradiated using both a Mevion S250 proton therapy unit (at the center of a spread-out Bragg peak, SOBP) and a Varian Clinac iX linear accelerator with the latter being a ...

Computed radiography (CR) uses storage phosphor imaging plates for digital imaging. Absorbed X-ray energy is stored in crystal defects. In read-out the energy is set free as blue photons upon optical stimulation. In the 35 years of CR history, several storage phosphor families were investigated and developed. An explanation is given as to why some materials ...

Linear charging-discharging of an ultralong UVA persistent phosphor for advanced optical data storage and wide-wavelength-range detector. Author links open overlay panel Chuanlong Wang a ... indicating electrons in different traps can be completely released upon a high-energy blue light. Therefore, the phosphor has potential applications in ...

Before the test of thermoluminescence spectrum, the phosphor samples were irradiated with a 365 nm UV lamp for 10 min for full excitation and energy storage. Fig. 10 shows the thermoluminescence curves of the sample. The shape of the spectrum conforms to the Gaussian distribution, and only one thermoluminescence peak is observed at 387.04 K ...

Radiolabeled samples are exposed to phosphor screens, which store energy in the photostimulable crystals (BaFBr : Eu 2+) by the mechanism shown in Fig. 13.2.The energy of the radioisotope ionizes Eu 2+ to Eu 3+, liberating electrons to the conduction band of the phosphor crystals.The electrons are then trapped in bromine vacancies, which are introduced during the ...

The performance and functionality of luminescent materials should be continuously developed to meet the demands of high-level information safety. In this work, a theoretical strategy for multi-mode luminescent color self-evolution in one structure was proposed by hierarchically utilizing the energy transfer processes from traps to luminescent centers. The strategy was further ...

In the current big data era, state-of-the-art optical data storage has become a front-runner in competing data storage technologies. In this work, we propose an information storage prototype using optical stimulated luminescent phosphor of SrAl 12 O 19: Mn 2+, Gd 3+, which converts the photon into trapped electrons and partially releases them in a form of ...

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