Energy storage fluorescence phosphorescence

Can phosphorescence energy transfer achieve afterglow fluorescence through delayed sensitization?
A new strategy of phosphorescence energy transfer was proposed to achieve afterglow fluorescence from water-processable and purely organic dyes through delayed sensitization. Wang, Y. et al. Förster Resonance Energy Transfer: An Efficient Way to Develop Stimulus-Responsive Room-Temperature Phosphorescence Materials and Their Applications.

What is phosphorescence energy transfer?
Kuila, S. & George, S. J. Phosphorescence energy transfer: ambient afterglow fluorescence from water-processable and purely organic dyes via delayed sensitization. Angew. Chem. Int. Ed. Engl. 59, 9393-9397 (2020).

Can phosphorescence-type energy transfer expand organic afterglow materials?
Inspired by natural photosynthesis,artificial light-harvesting systems based on the phosphorescence-type energy transfer (ET) from the triplet excited states of organic RTP emitters have emerged as promising candidatesto expand organic afterglow materials and promote practical applications.

How is ultralong phosphorescence achieved?
Ultralong Phosphorescence was achieved via Triplet-Triplet Energy Transferin crystalline hydrogen-bonded organic chains. Li,Z. et al. Polymeric ultralong organic phosphorescence with excellent humidity and temperature resistance via hydrophobic effect. Aggregate 5,e440 (2024).

How does fluorescence differ from phosphorescence?
Fluorescence differs from phosphorescence in that the electronic energy transition that is responsible for fluorescence does not change in electron spin,which results in short-live electrons (<10 -5 s) in the excited state of fluorescence.

Is Förster resonance energy transfer reversible between fluorescence and phosphorescence?
This work reports the simultaneous singlet-to-singlet and triplet-to-singlet Förster resonance energy transfer from a biluminescent donor molecule in an amorphous polymeric film. Wang, X. et al. Reversible photoswitching between fluorescence and room temperature phosphorescence by manipulating excited state dynamics in molecular aggregates.

Kuila, S. & George, S. J. Phosphorescence energy transfer: ambient afterglow fluorescence from water-processable and purely organic dyes via delayed sensitization.

Combined with a unique thermally activated delayed phosphorescence (TADP) process, highly efficient capture and conversion of high-energy carriers are realized.

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Whereas fluorescence is a fast relaxation process in which excited molecules in the singlet state emit energy back to the ground state [9, 10], rendering the fluorescence ...

Persistent luminescent phosphors can store light energy in advance and release it with a long-lasting afterglow emission. With their ability to eliminate in situ excitation and ...

Fluorescence is the property of some atoms and molecules to absorb light at a particular wavelength and to subsequently emit light of longer wavelength after a brief interval, termed ...

Long-lasting phosphorescence (LLP), a well-known energy absorption-storage-releasing phenomenon, has stimulated extensive research interest for a long time. Various ...

An Agilent 8453 spectrophotometer was used for the UV-vis absorption spectra measurement while a Hitachi F-7000 Fluorescence Spectrometer for the steady fluorescence ...

In this Review, we highlight cucurbituril-based host-guest assemblies demonstrating fluorescence (singlet-singlet, FRET) and phosphorescence (triplet-singlet, TS-FRET) resonance energy transfer.

In essence, both FRET and triplet energy transfer can be considered as indirect photoexcitation of the acceptor followed by releasing the excited-state energy via fluorescence ...

Fluorescence and phosphorescence are two mechanisms that emit light or examples of photoluminescence. However, the two terms don"t mean the same thing and don"t occur the same way. In both ...

Abstract Organic room-temperature phosphorescence (RTP) materials have attracted considerable attention for their extended afterglow at ambient conditions, eco-friendliness, and wide-ranging ...

Quantitative results are presented on the light-emitting and storage properties of silver chloride activated sodium chloride crystals excited with high-energy radiation. The characteristic of the ...

A new strategy of phosphorescence energy transfer was proposed to achieve afterglow fluorescence from water-processable and purely organic dyes through delayed ...

We discuss in detail possible energy transfer processes within a MOF structure or between MOFs and guest materials. Finally, the possible sensing applications of the ET-LMOF-based sensors are ...

Making full use of the captured energy by phosphorescence light-harvesting systems (PLHSs) and the tunable photoluminescence in energy transfer proces...

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Jablonski diagram of an energy scheme used to explain the difference between fluorescence and phosphorescence. The excitation of molecule A to its singlet excited state (1 A*) may, after a short time between absorption ...

Fluorescence differs from phosphorescence in that the electronic energy transition that is responsible for fluorescence does not change in electron spin, which results in short-live electrons (<10 -5 s) in ...

The impact of an electric field on the energy transfer between Fir6 and rubrene in the PL process of the PVK:Fir6:rubrene films was explored by steady-state PL spectra in electric field and electric field modulated ...

This work demonstrates a photoreversible fluorescence and room-temperature phosphorescence switching based on a photo-controlled triplet-to-singlet Förster resonance ...

Abstract Organic room-temperature phosphorescence (RTP) materials have attracted considerable attention for their extended afterglow at ambient conditions, eco ...

Supporting: 1, Mentioning: 40 - Carbon dots with fluorescence from blue to green have been prepared by a microwave-assisted hydrothermal reaction of a chitosan and sodium hydroxide ...

Room-temperature phosphorescence in organic solids is attractive for practical applications but remains rare. Now, highly phosphorescent boroxine-linked covalent organic ...

The excited state energy levels of DPS and BTDA are determined from their fluorescence and phosphorescence emission spectra. In contrast, the energy levels of pentacene are obtained from relevant ...

The possible emission process of phosphorescence is further analyzed by Scheme 1 C, which shows that after absorbing UV energy, most of the energy returns from the ...

Fig. 1 Schematic illustration of different energy transfer (ET) processes showing how phosphorescence energy transfer (PET) leads to more efficiency than conventional fluorescence energy transfer (FET).

In photovoltaics, they enhance the efficiency of dye-sensitized solar cells by serving as photosensitizers [3]. Medical imaging techniques such as fluorescence microscopy ...

We propose a new concept exploiting thermally activated delayed fluorescence (TADF) molecules as photosensitizers, storage units and signal transducers to harness solar ...

Experimental, TEM images, high-resolution XPS spectra, fluorescence emission spectra, photographs of CD powders, phosphorescence emission spectra, reproducibility, low-temperature (77 ...

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Compared to the common resonance energy transfer process, the PRET system in this paper excites the acceptor through a longer-lived triplet state, and thus the ...

Transformation of organic afterglow mechanism from room-temperature phosphorescence to thermally-activated delayed fluorescence in intramolecular charge transfer ...