

The nature of intramolecular energy transfer in a dye-end-capped conjugated polymer is explored by using atomistic nonadiabatic excited-state molecular dynamics and effective specific vibronic couplings between each monomer and the acceptor are identified. Polymer-based guest-host systems represent a promising class of materials for efficient light ...

The photoinduced spin crossover switched the energy transfer from the fluorophore to the Fe II ion, resulting in fluorescence modulation. The presented results provide a novel approach for developing optical memory and sensors via electron rearrangement of photoinduced spin crossover.

Cage Based on a Thermally Activate Delayed Fluorescence Ligand ... and the encapsulated Fluorescein and Photoinduced Energy Transfer (PET) from the cage to ... applications such as in sensing,⁹ for gas storage and purification,¹⁰ and for catalysis.¹¹⁻¹² In recent years, there has been an increasing exploration of the properties of photoactive ...

Large-scale utilization of solar-energy resources will require considerable advances in energy-storage technologies to meet ever-increasing global energy demands. Other than liquid fuels, existing ...

The correlation between the fluorescence and the spin state of the Fe II ions was studied to verify the photoinduced SCO tuning of the fluorescence emission intensity. As mentioned earlier, complex 1 was in the HS state at room temperature and the LS state at 90 K. With a temperature decrease from 300 to 200 K, the χT value decreased abruptly from 2.78 to 0.20 cm³ mol⁻¹ ...

An intense exploration of renewables, alternative energy storage, and conversion technologies are driven by the growing need for energy conversion and storage, coupled with environmental concerns about global warming and fossil fuel depletion [1], [2], [3]. The conventional energy conversion and storage systems are based on supercapacitors, ...

Consequently, the generation of photoinduced radicals is the cause of photochromism of Z-H solid, which quenches its fluorescence. E-H exhibits strong blue fluorescence but no photochromism ...

Spectroscopic techniques that confirm energy transfer from the fluorescent cage to dyes (e.g., NiR, R700, and R800) are efficient, which induce the red shift of fluorescence. ...

Conceptually, the typical photocatalytic process includes three steps, consisting of photon absorption, charge migration, and surface chemical reactions. [] The initial light absorption involves that the semiconductors would absorb photons with energy equal to or greater than the bandgap, thus to excite electrons from the

valence band (VB) of the semiconductor to the ...

Spectroscopic techniques that confirm energy transfer from the fluorescent cage to dyes (e.g., NiR, R700, and R800) are efficient, which induce the red shift of fluorescence. On the other hand, ultrafast photoinduced electron transfer from dyes (e.g., ICG, AG, and AV) to the fluorescent cage can induce fluorescence quenching. This study ...

Many different host systems have been successfully applied as a means of controlling the efficiency of energy storage by preventing rapid back electron transfer. ... Ultrafast transient absorption experiments allowed to identify the process of quenching of the Zn-porphyrin fluorescence as an efficient photoinduced electron transfer reaction ...

It demonstrates that energy storage and conversion to electrical energy is realized in the [CoGa] crystals, which is different from typical polar pyroelectric compounds that exhibit the conversion ...

The connection between grafting B dye and GO was close enough for fluorescence resonance energy transfer from B dye to GO. ... following photoinduced energy storage microcapsules were successfully ...

Fluorescence Modulation via Photoinduced Spin Crossover Switched Energy Transfer from Fluorophore to Fe II Ions ... in optical switches and storage. However, most of fluorescence modulation were ...

Chen, Zhang, and coworkers reported 7 in this issue direct observation of an unprecedented ground-state, photoinduced charge-transfer complex (PCTC) of an N-benzyl-1,8-naphthalimide (NNI), which has been widely used as an electron acceptor, 8 and an electron donor--triethylamine (TEA) (Figure 1 C). No evidence of ground-state EDA complex formation ...

Energy band gap modulation and photoinduced electron transfer fluorescence sensing properties of D-A conjugated polymers containing benzotriazole. Haoyue Luo, ... The addition of Fe 3+ and Cu 2+ caused significant quenching of fluorescence of polymers, and the polymer with high energy band gap exhibited higher fluorescence quenching ability.

This ligand shows strong fluorescence emission at 516 nm, thus overlapping with the typical absorption region of Fe II complexes.³⁸ Therefore, the fluorescence emission is expected to be quenched or increased depending on whether the resonant energy transfer from the fluorescent donor to the Fe II acceptor occurs in the photoinduced spin ...

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

Here we present two-colour fluorescence microscopy in combination with photoinduced electron transfer

(PET) probes as a method that simultaneously detects two structural coordinates in single ...

Dual fluorescence enhancement of loratidine by photoinduced electron transfer blocking and micellization: Application to the development of novel highly sensitive microwell spectrofluorimetric assay for analysis of dosage forms and urine samples. *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* 2024, 305, 123458.

Photoinduced electron transfer (PET) is a term reserved to describe the transfer of an electron between photoexcited and ground-state molecules. ... energy storage and conversion systems, utilizing transition metal complexes [3]. Molecular biologists are investigating photosynthesis and electron-transport in biological systems on the basis of ...

Förster-type resonance energy transfer (FRET) or photoinduced intramolecular electron transfer (IET) mechanisms are adopted to reversibly switch the fluorescence property.

Trapping highly reactive photoinduced charge-transfer complex between amine and imide by light. ... and photon-energy storage. Summary. Complexation between two organic molecules can occur either for strong electron donor-acceptor pairs in the ground state, known as charge-transfer complexes (CTCs), or for pairs of lesser strength in the ...

Worldwide energy consumption, which is predicted to double within the next 40 years, demands a shift toward widespread use of renewable energy. Light is a facilitative and inexhaustible ...

Fast photochromic and fluorescent switchable organohydrogels based on photoinduced electron transfer for display and storage. Author links open overlay panel Na Chen a 1, Wanxiong Yong a 1, Tuodong Xiong a, Guodong Fu a. ... appropriate energy band positioning, non-toxicity and biocompatibility [34], [35]. ... enabling the dual functionality of ...

Porphyrin-based molecular systems that can undergo efficient photoinduced electron transfer (PET) and/or excitation energy transfer (EET) processes are attracting interest currently not only for the development of solar energy conversion systems, but also for the rational design of fluorescent sensors, photocatalysts, novel drugs for ...

Harnessing and utilizing solar energy is one of the most promising ways to reduce the mismatch between energy supply and demand [1]. Phase change materials (PCMs), as advanced thermal energy storage (TES) materials, are widely applied to storage energy due to their large latent heat and isothermal phase transition temperature during the phase change ...

Herein, an intelligent photo-responsive blue anthraquinone-grafted GO nanoconjugate (GO-Bdye) system was developed, which can improve the photothermal conversion efficiency and reduce the fluorescence effect via

exhibiting fluorescence resonance energy transfer (FRET) effect between blue anthraquinone dyes (Bdye) and GO (Fig. 1).GO ...

Molecular materials possessing phototunable fluorescence properties have attracted great interest owing to their potential applications in optical switches and storage. However, most fluorescence modulation is realized through light-responsive structural isomerization in solution. It is a formidable ...

where $E_{ox}(D)$ and $E_{red}(A)$ are the oxidative and reductive potential of donor and acceptor, respectively; R is the distance between the ions; ϵ is the solvent dielectric constant; e^2/eR is the Coulombic energy which is related with the solvent polarity, and E^* is the excited energy of a donor or acceptor. It can be seen from the equation that electron transfer depends ...

(a) Fluorescence spectra of PVA /V 1 2+ /0.52 wt% ZnO OGHs under UV exposure at various time intervals. (b) UV-vis absorption spectra of ZnO NPs. (c) $(\alpha h\nu)^2$ versus energy ($h\nu$) and (d) VB-XPS spectra of ZnO. (e) Schematic representation of photoinduced electron transfer and fluorescence quenching between ZnO and viologens. (f) Mechanism ...

storage of their genetic information as encoded by the sequence. Exposure of DNA to solar light, in particular energy-rich UV light, is as frequent and serious threat for the integrity of the genetic information. UV light induces different types of photodamages[1] that cause mutations,[2] and, in the worst case, cancer.[3]

a Schematic representation of the energy storage and conversion mechanism upon light irradiation. Due to the crystallization in a polar space group, molecular dipole switching is manifested as ...

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 polymers containing norbornadiene and carbazole pendants were synthesized. The photoisomerization of norbornadiene pendants were achieved by irradiation with the light ...

photoinduced phase, which can be determined based on the time decay of the magnetization after irradiation (Fig. S7+). The Scheme 1 Modulation of fluorescence emission via energy transfer photoinduced phase showed considerable stability with with a photoinduced spin transition from Fe LS II to Fe HS II. Fig. 1 The crystal structure of complex ...

The reversible photoisomerization of azobenzenes has been extensively studied to construct systems with optical responsiveness; however, this process limits the luminescence of these compounds. Recently, there have been many efforts to design and synthesize fluorescent azobenzene compounds, such as inhibition of electron transfer, inducing ...

Transitions between solids (crystals and some elastomers with crystalline or glassy regions), glasses (frozen



**Photoinduced
fluorescence**

energy

storage

liquids), and flowing liquids at room temperature induced by photoirradiation and ...

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