

Is luminescent solar power a low-cost thermal energy storage?

Low-cost thermal energy storage (TES) exists but relies on expensive heat engines. Here, we introduce the concept of luminescent solar power (LSP), where sunlight is absorbed in a photoluminescent (PL) absorber, followed by red-shifted PL emission matched to an adjacent PV cell's band edge.

Are luminescent solar concentrators based on fluorescent proteins eco-friendly?

Sadeghi, S. et al. Ecofriendly and efficient luminescent solar concentrators based on fluorescent proteins.

What are luminescent solar concentrators?

This way, the luminescent solar concentrators offer a practical path to reduce the expensive PV material consumption and enhance the spectra response range.

Can luminescence detect processing faults in high-efficiency solar cells?

Although these new solar cell architectures require a more complex manufacture, the use of the luminescence techniques to characterize these high-efficiency solar cells is rather straightforward, and there are already a few examples of the use of EL and PL to detect processing faults in these [46,47,48].

Can luminescent solar concentrators convert passive glass windows into self-sustaining energy sources?

Luminescent solar concentrators (LSCs) [17,18] represent a promising strategy for converting passive glass windows into self-sustaining energy sources [15]. By harnessing solar energy and transforming it into low-energy photons capable of generating electricity in solar cells, LSCs offer a revolutionary approach to energy generation (Fig. 1 a) [15].

What is the basic phenomenon of photovoltaic energy?

The basic phenomenon of the photovoltaic energy is the absorption of photons by a semiconductor that will promote the passage of one electron from the valence band (VB) to the conduction band (CB).

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This feature increases the energy collection capacity and reliability of the PV system. Excess energy stored within LPL materials can be released as luminescent light at night, making self ...

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Thermophotovoltaic conversion utilizes thermal radiation to generate electricity in a photovoltaic cell. On a solar cell, the addition of a highly reflective rear mirror maximizes the extraction of ...

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