

JH Solar

Photoelectric sensing and energy storage



Overview

What is photoelectric storage efficiency (PSE)?

Solar cells serve as energy harvesters, and lithium (Li) secondary batteries or capacitors serve as energy stores in integrated energy modules for self-charging. Within these integrated energy modules, the photoelectric storage efficiency (PSE) is a crucial property for continuous power supply to electronic devices.

What is integrated photoelectric battery?

The integrated photoelectric battery serves as a compact and energy-efficient form for direct conversion and storage of solar energy compared to the traditional isolated PV-battery systems. However, combining efficient light harvesting and electrochemical energy storage into a single material is a great challenge.

What is the photoelectric storage efficiency of PSC-LSB energy integrated module?

Photoelectric storage efficiency of PSC-LSB energy integrated module was 14.6 %. The PSC-LSB energy integrated module achieved an 87 % capacity retention after 200 cycles. As portable electronic devices typically rely on rechargeable batteries, it inherently limits their operational time.

Can energy conversion and storage improve semi-permanent use of portable electronics?

A promising approach to overcome this limitation is the integration of energy conversion and storage devices, thereby enabling semi-permanent usage of portable electronics. A novel integrated energy module is presented, which demonstrates a high photoelectric storage efficiency (PSE).

What is the PSE of the integrated PSC-LSB energy module?

The PSE of the integrated PSC-LSB energy module reached an impressive 14.6

%, surpassing any reported integrated energy devices. The PSC-LSB energy module exhibited an 87 % retention in discharge capacity, maintaining stable performance after 200 cycles.

What determines photoelectric conversion efficiency in PFC-based Spes?

In PFC-based SPES, the photoelectric conversion efficiency is mostly determined by the light absorption, photogenerated charge separation, photogenerated charge migration, photogenerated charge recombination and electrocatalytic activity of photoactive semiconductor materials .

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A review on MoS2 structure, preparation, energy storage ...

The overall amount of energy utilized by people and society is growing along with the global population and ongoing social and economic development. As a result, the ...

Advances in Photoelectric Detection Units for ...

In the field of photoelectric detection and imaging, perovskite materials show unique and excellent application potential of photoelectric detection and imaging. This paper overviews the recent advances of photoelectric ...



Emerging photoelectric devices for neuromorphic ...

The physical separation of light perception, information storage, and processing functions leads to severe consumption of energy, space, and time. In contrast, the photoelectric synapse integrates light sensing and ...

Energy management of a photoelectric system with a storage ...

The aim of the paper is to improve the energy management of a photoelectric system with a

storage battery for the needs of a local object with the planned gener



An integrated device for both photoelectric conversion and energy

An all-solid-state and integrated device in which photoelectric conversion and energy storage are simultaneously realized has been developed from free-standing and aligned carbon nanotube ...

Photoelectric dual mode sensing system based on one-step ...

With the growing demand for intelligent perception systems in the IoT and big data era, multimodal sensing technologies face challenges including complex device ...

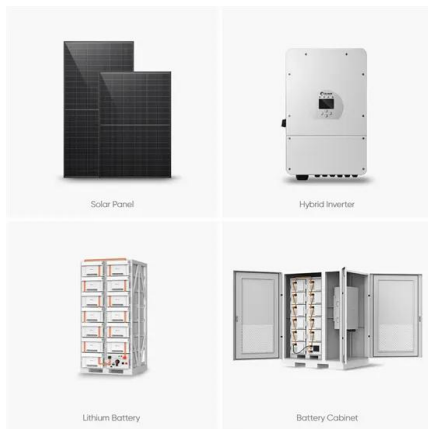


Photoactive materials and devices for energy-efficient soft ...

Despite numerous advantages of Si-based optoelectronics, alternative material systems with strong light-matter interaction are highly desired to enable next-generation ...

Photothermal conversion-enhanced thermoelectric generators ...

The depletion of fossil fuels and the soaring global energy demand have compelled humanity to explore renewable energy sources [1], [2], [3]. Solar energy, known as ...



Self-charging integrated energy modules: A record photoelectric storage

A promising approach to overcome this limitation is the integration of energy conversion and storage devices, thereby enabling semi-permanent usage of portable ...

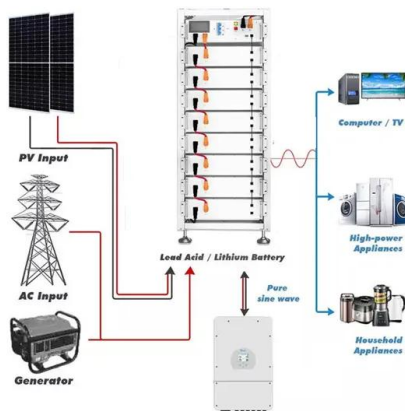
Near-ideal in-memory sensing and computing devices using

A compact, time- and energy-efficient computing architecture -- based on ferroelectric-defined reconfigurable two-dimensional photodiode arrays -- is shown to be ...



Self-powered electrochemical sensor based on photoelectrode: ...

Self-powered electrochemical sensor (SPES), an analytical sensing device without external power supply, is integrated with the dual functions of power supply and ...



Porous organic framework materials for photocatalytic H₂O₂ ...

Porous organic framework materials (POFs) including MOFs, COFs, CHFs, CTFs, and HOFs, characterized by diverse synthesis methods, flexible design, adjustable band ...



All-day solar power generation enabled by photo/thermoelectric

In this study, we propose an all-day solar power generator to achieve highly efficient and continuous electricity generation by harnessing the synergistic effects of ...

Photoresponsive CoNi-MOF@CoO₂@WSe₂ hybrid: A dual

Photoresponsive CoNi-MOF@CoO₂@WSe₂ hybrid: A dual-function platform for high-performance photo-hybrid supercapacitors and zearealenone sensing



Recent Advances in Energy Storage and Photoelectric ...

Manufacturing, design and testing of photoelectric conversion and energy storage materials, including various batteries, supercapacitors, various films and LEDs.

A wind vector detecting system based on triboelectric and photoelectric

A wide wind speed sensing range is achieved from 2.9 m/s to 24.0 m/s, within which the current frequency of ASTS shows a good proportional relationship with wind speed. ...



Optoelectronic array of photodiodes integrated with RRAMs for ...

This study highlights the great potential of the PD-RRAM optoelectronic array as an energy-efficient in-sensor computing primitive for future IoT applications.

The Photoelectric Sensing of a MoS

The potential to harness renewable energy through this device positions it as a valuable contributor to sustainable energy sources, aligning with the global push for clean and ...



Self-charging integrated energy modules: A record photoelectric ...

A novel integrated energy module is presented, which demonstrates a high photoelectric storage efficiency (PSE). This module comprises a perovskite solar cell (PSC) as ...

Porous organic framework materials for photocatalytic H

Porous organic framework materials (POFs) including MOFs, COFs, CHFs, CTFs, and HOFs, characterized by diverse synthesis methods, flexible design, adjustable band ...



Photothermal-thermoelectric synergy coupling localized surface ...

Therefore, developing a photoelectric sensing system that possesses high energy conversion efficiency, wide-spectrum absorption capacity, and significant heat recovery ...

Photoelectric sensor types and modes of detection

The ability of a photoelectric control to detect an object at a given distance is measured in units of "excess gain." Excess gain is a measure of energy available between the ...



Recent Advances and Challenges Toward Application of Fibers ...

Compelling aspects of fiber- and textile-based flexible electrodes are reviewed in detail from the point of view of fabrication, properties, and devices performance. The advances ...

Photoelectric Energy Conversion of Plasmon ...

Plasmonic excitation in metals has received great attention for light localization and control of light-matter interactions at the nanoscale with a plethora of applications in absorption enhancement, surface ...



Enhanced photoelectrochemistry for energy conversion, ...

Enhanced photoelectrochemistry for energy conversion, environmental remediation, detection, and sensing through single-atom catalysts modified photoelectrodes: a ...

Understanding Photoelectric Sensors: A Beginner's Guide

Learn about photoelectric sensors, how they work, and their various applications. Explore different types, including through-beam, retro-reflective, and diffuse ...



A new photoelectric niobate glass ceramic material: Up ...

All results show that $\text{Sr}_{0.75}\text{Ba}_{0.25}\text{Nb}_2\text{O}_6$ GCs as a new multifunctional photoelectric material, can be potentially applied to optical temperature sensing, transparent ...

A review on advances in photoelectrochemical (PEC-type) ...

Moreover, the multi-elemental compound two-dimensional nano-materials exhibits excellent electronic response and high specific surface areas which reveals their improved ...

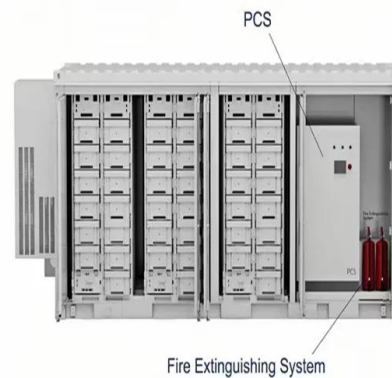


Sensors , Special Issue : Photoelectric ...

Potential topics include, but are not limited to, laser measurement and sensing, micro- and nano-photoelectric measurement, simultaneous measurement of multiple parameters, structured light ...

Photoelectric Measurement and Sensing: New Technology and

Potential topics include, but are not limited to, laser measurement and sensing, micro- and nano-photoelectric measurement, simultaneous measurement of multiple ...



Simultaneous energy harvesting and storage via ...

The effective use of such an intermittent energy source relies on development of affordable, inexhaustible and clean solar energy conversion and storage technologies. Here, we design a novel solar-driven ...

Composite phase-change materials for photo-thermal conversion ...

Photo-thermal conversion phase-change composite energy storage materials (PTPCESMs) are widely used in various industries because of their high therm...



Sensors , Special Issue : Photoelectric Measurement and Sensing...

Potential topics include, but are not limited to, laser measurement and sensing, micro- and nano-photoelectric measurement, simultaneous measurement of multiple ...

Advanced 3D-architected carbon-based photothermoelectric energy

Therefore, to self-power magnetic and UV response sensing in forest WSN detection systems, a closed-loop effect scheme is proposed, where, the thermoelectric and ...

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