

In this review, principles of solar cells are presented together with the photovoltaic (PV) power generation. A brief review of the history of solar cells and present status of photovoltaic ...

In terms of performance, organic solar cells have witnessed a rapid increase in power conversion efficiency driven primarily by materials development, physical understanding and device ...

There are at least four design principles in natural photosynthesis which are employed to stimulate the development of bioinspired solar photovoltaic cells. Biomimetically textured surfaces of...

We show that β -carotene (BC), an inexpensive and green, naturally occurring antioxidant, dramatically improves OPV stability.

In this review, the concept of organic solar cells is outlined; the device structure, operating principles and performance characteristics are detailed along with an overview of the recent...

Organic solar cells (OSCs) are promising for low emissive photovoltaic technology. Excitonic absorption and charge generation to transport process OSC energy loss lessening are central.

Details of few model catalytic systems that lead to clean oxidation of water to H_2 and O_2 , photoelectrochemical solar cells for the direct conversion of sunlight to electricity, solar cells for total decomposition of water and catalytic systems for fixation of CO_2 to fuels such as methanol and methane are reviewed here.

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Therefore, this paper presents various aspects of solar cell for electricity production. Subsequently, it gives the brief introduction and working principle of organic solar cells (OPV). Besides this, classification of different solar cell structures is also discussed in depth because structure of OPV has significant impact on the performance ...

The working principle of solar cells is based on the photovoltaic effect, i.e. the generation of a potential difference at the junction of two different materials in response to electromagnetic radiation. The photovoltaic effect is closely related to the photoelectric effect, where electrons are emitted from a material that has absorbed light with a frequency above a material-dependent ...

Principle of biomimetic organic solar cells

Photovoltaic cells are semiconductor devices that can generate electrical energy based on energy of light that they absorb. They are also often called solar cells because their primary use is to generate electricity specifically from sunlight, but there are few applications where other light is used; for example, for power over fiber one usually uses laser light.

The fundamental philosophy of improved PV cells is light trapping, wherein the surface of the cell absorbs incoming light in a semiconductor, improving absorption over several passes due to the layered surface structure of silica-based PV cells, reflecting sunlight from the silicon layer to the cell surfaces [36]. Each cell contains a p-n ...

In this review we present an overview of the different organic solar cells families. After recalling shortly the specificities of organic materials, the band structure, the electronic ...

To address these challenges, leaf-like biomimetic electrodes are proposed to achieve an efficient light capture and glossy surface for a high-efficiency flexible OSC. To ...

organic solar cells (OSCs) and dye-sensitized solar cells (DSSCs) are now competing with silicon-based solar technologies to make efficient, stable and low cost solar cells (Polman et al., 2016).

In this review, we first briefly introduce the development of OSCs and then summarize and analyze the working principle, performance parameters, and structural features of OSCs. Finally, we highlight some breakthrough related to OSCs in detail.

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