

What is organic solar cell research?

Organic solar cell research has developed during the past 30 years, but especially in the last decade it has attracted scientific and economic interest triggered by a rapid increase in power conversion efficiencies. This was achieved by the introduction of new materials, improved materials engineering, and more sophisticated device structures.

Who are the authors of a review on organic solar cells?

Y. Li, W. Huang, D. Zhao, L. Wang, Z. Jiao, Q. Huang, P. Wang, M. Sun and G. Yuan, Recent Progress in Organic Solar Cells: A Review on Materials from Acceptor to Donor, *Molecules*, 2022, 27(6), 1800, DOI: 10.3390/molecules27061800.

Are organic solar cells a viable alternative to inorganic solar cells?

Organic solar cells (OSCs) have been gaining attention as a promising alternative to traditional inorganic solar cells due to their unique advantages, such as low-cost manufacturing, flexibility, and light weight.

Can a molecular design strategy improve the performance of organic solar cells?

Effective molecular design strategies for each type of OSC are discussed and promising research directions highlighted, particularly those relevant to facilitating the industrial manufacturing of OSCs. Advances in photoactive-layer materials have contributed to the increase in the performance of organic solar cells.

Can small molecules be used for organic solar cells?

Small molecules have also been investigated as potential materials for organic solar cells. Compared to polymers, small molecules have a well-defined structure and higher purity, which can improve the reproducibility and efficiency of the solar cells.

What is the maximum theoretical efficiency of an organic solar cell?

However, depending on the ratio between the energy band gap and radiative recombination coefficient, the maximum theoretical efficiency of an organic solar cell is 33%. Societal requirement for more flexible energy has ushered to the origin of research fields like organic photovoltaics (OPVs).

Organic solar cells - otherwise known as organic photovoltaic cells (OPV) - are the latest advancement in solar cell technology, and one quickly gaining the attention of industry professionals. This is mainly due to their high ...

Organic photovoltaics have attracted considerable interest in recent years as viable alternatives to conventional silicon-based solar cells. The present study addressed the increasing demand for ...

Organic solar cells (OSCs) are the emerging photovoltaic devices in the third-generation solar cell

technologies and utilized the conductive organic polymers or small organic molecules for ...

4 ???· In the field of photovoltaics, organic and, to a larger extent, perovskite solar cells have shown promising performance in academic laboratories, and thus have attracted the interest of ...

However, silicon solar cells are not yet economically competitive with fossil fuels, necessitating further cost reduction. Research explores alternatives like organic/polymeric ...

Organic photovoltaic (OPV) cells, also known as organic solar cells, are a type of solar cell that converts sunlight into electricity using organic materials such as polymers and small molecules. 83,84 These materials are ...

We review here the current status of the field of organic solar cells and discuss different production technologies as well as study the important parameters to improve their performance.

This Review summarizes the types of materials used in the photoactive layer of solution-processed organic solar cells, discusses the advantages and disadvantages of ...

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The performance of organic solar cells (OSCs) has increased substantially over the past 10 years, owing to the development of various high-performance organic ...

Organic or plastic solar cells use organic materials (carbon-compound based) mostly in the form of small molecules, dendrimers and polymers, to convert solar energy into electric energy. ...

During past several years, the photovoltaic performances of organic solar cells (OSCs) have achieved rapid progress with power conversion efficiencies (PCEs) over 18%, ...

Dye-sensitized solar cells are composed of n-type inorganic layer (TiO₂, SnO₂, ZnO)/organic dye (LHL)/redox shuttle I⁻/I³⁻ in solution (corresponding to p-type layer) as ...

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Organic solar cells have emerged as promising alternatives to traditional inorganic solar cells due to their low cost, flexibility, and tunable properties. This mini review ...

Organic solar cells are characterized by low price, easy shaping, and performance control by chemical modification. In organic solar cells, the most important type is the dye-sensitized ...

Due to the mechanical flexibility, light weight, aesthetics, absorption tunability and environmental friendliness, organic solar cells (OSCs) have superior application potential ...

The creation of excitons in molecular materials as a consequence of light absorption, as opposed to free electrons and holes as illustrated in Fig. 4.3, is a key distinction ...

What are organic solar cells? Organic solar cells, also known as organic photovoltaic (OPV) cells, represent an exciting advancement in solar technology. Organic ...

Organic or plastic solar cells use organic materials (carbon-compound based) mostly in the form of small molecules, dendrimers and polymers, to convert solar energy into electric energy. These semi conductive organic molecules have ...

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