



What are the donors for solar cells

The performance of donor-acceptor (DA) organic solar cells based on the bulk-heterojunction (BHJ) concept 1,2 has been improving rapidly 3,4,5,6,7,8,9,10, as a result of the development of high ...

The exploration of high-performance and low-cost wide-bandgap polymer donors remains critical to achieve high-efficiency nonfullerene organic solar cells (OSCs) beyond current thresholds. Herein, the 1,2,3-benzothiadiazole (iBT), which is an isomer of 2,1,3-benzothiadiazole (BT), is used to design wide-bandgap polymer donor PiBT.

End-Group Engineering of Chlorine-Trialkylsilylthienyl Chain-Substituted Small-Molecule Donors for High-Efficiency Ternary Solar Cells. Jing Li, Jing Li. Institute of Flexible Electronics (IFE), Northwestern Polytechnical University (NPU), Xi'an, 710072 P. R. China ... architecture has been widely demonstrated as a facile and efficient strategy ...

The effective design and synthesis of novel small-molecule donors (SMDs) is extremely essential for the in-depth study of the scientific problems of bulk heterojunction morphology and the improvement of photovoltaic performance in ...

Ternary architecture has been widely demonstrated as a facile and efficient strategy to boost the performance of organic solar cells (OSCs). However, the rational design of the third component with ...

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

Imide-functionalized arenes have been one of the most promising acceptor (A) units in organic solar cells (OSCs). However, dithienophthalimide (DPI), a hybrid of thieno-[3,4-c]pyrrole-4,6-dione (TPD) and bithiophene imide (BTI) units, has not been revisited since its first synthesis, likely owing to the high synthetic cost of the reported ...

Ternary architecture has been widely demonstrated as a facile and efficient strategy to boost the performance of organic solar cells (OSCs). However, the rational design of the third component with suitable core and end-group modification is still a ...

The organic solar cells are typically based on a binary combination of polymeric donor and molecular acceptor. Here Zhang et al. develop alternative combination based on molecular donor and ...

Based on the type of molecular system used, OPV is divided into two classes: polymer-donor solar cells (PDSCs) and small molecule-donor solar cells (SMDSCs). Interestingly, the efficiency of SMDSCs have increased considerably from 0.001% in 1975 [7], through 1% in 1986 [8] to > 11.3% in 2017 [9, 10], which is very ...



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A lot of efforts have been devoted to the donor-acceptor SM structure design for solution processed solar cells due to the diversity of the donors and acceptors. With the different combination of the building blocks, a bunch of donor-acceptor SMs with different structures was prepared.

The active materials of organic solar cells are recognized to show a singlet ground state, and their photo-excited states have been widely investigated in previous work. Herein, we disclose the inherent open-shell singlet ground state of all the donors with obvious electron spin resonance signals. In contrast, the well-known highly ...

1. Introduction. As a new type of clean energy technology, solar cells have been considered as a good candidate for effectively utilizing solar energy [1] is remarkable that organic solar cells (OSCs), with their well-known advantages of low cost, lightweight, and capability to fabricate flexible large-area devices, have shown great research value ...

Designing new small molecule donors is a hot top in organic solar cell research. Theoretical simulations can help in avoiding trial-and-error based designing, ...

Organic solar cell (OSC) is an interesting type of photovoltaic device which converts solar energy into electricity. ... The two BDT donor polymers were subjected to photonic characterization using UV-vis absorption (Fig. 2). Chloroform solutions containing the two polymers show strong absorption under 600 nm with similar distinctive vibronic ...

Context The development of high-efficiency photovoltaic devices is the need of time with increasing demand for energy. Herein, we designed seven small molecule donors (SMDs) with A-p-D-p-A backbones containing various acceptor groups for high-efficiency organic solar cells (OSCs). Molecular engineering was performed by ...

The new era for organic solar cells: polymer donors. The new era for organic solar cells: polymer donors. The new era for organic solar cells: polymer donors Sci Bull (Beijing). 2020 Sep 15;65(17):1422-1424. doi: 10.1016/j.scib.2020.04.044. Epub 2020 Apr 30. Authors Chunhui Duan 1 ...

Alkoxythiophene additives are developed to induce the fibrillization of a series of BDT-type polymer donors for organic solar cells, demonstrating generally increased efficiency, with the PM6/L8-BO b...

Polymer solar cells (PSCs) could be fabricated on a large scale using solution processing at low cost, and thus are a promising energy source that can be exploited globally to contribute to worldwide electricity needs. ... We synthesized a chlorinated benzothiadiazole-T4 polymer donor PBT4T-Cl, in which a chlorine atom had ...

The application of polymer solar cells requires the realization of high efficiency, high stability, and low cost devices. Here we demonstrate a low-cost polymer donor poly[(thiophene)-alt-(6,7 ...



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The donor/acceptor weight ratio is crucial for photovoltaic performance of organic solar cells (OSCs). Here, we systematically investigate the photovoltaic behaviors of PM6:Y6 solar cells with diff...

Broadening the absorption bandwidth of polymer solar cells by incorporating multiple absorber donors into the bulk-heterojunction active layer is an attractive means of resolving the narrow ...

Film formation kinetics significantly impact molecular processability and power conversion efficiency (PCE) of organic solar cells. Here, two ternary random copolymerization polymers are reported, D18-N-p and D18-N-m, to modulate the aggregation ability of D18 by introducing trifluoromethyl-substituted pyridine unit at para- ...

Herein, a class of low-cost and fully unfused polymer donors with precisely regulated backbone planarity via halogenation was designed and synthesized, ...

Organic solar cells (OSCs) have attracted enormous attention due to their advantages including light-weight, flexibility, solution processability and semitransparency 1,2,3 recent years, the ...

The photoactive layer of organic solar cells consists of p-type electron donors and n-type electron acceptors, which phase separate to form fine and continuous ...

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