Solar cell stacking mechanism

How does a solar cell work?
In its most simple form, the cell consists of a light absorber material with two carrier-selective layers located on each side, plus two electrodes with metallic properties (cathode and anode). Figure 1. a) Conceptual schematic of a solar cell delivering electric power to a resistive load.

What is superior end-group stacking in organic solar cells?
Li-Li Wang,Jin-Hong Han,Hai-Ping Zhou,Qing-Qing Pan,Zhi-Wen Zhao,Zhongmin Su. Superior End-Group Stacking Promotes Simultaneous Multiple Charge-Transfer Mechanismsin Organic Solar Cells with an All-Fused-Ring Nonfullerene Acceptor.

How do CdTe solar cells remove stacking faults?
In conclusion,we report in this paper for the first time the full mechanism by which stacking fault removal occurs when CdTe solar cells are treated with chlorine. This occurs through a Te cascade mechanismthat is triggered when the grain boundaries are saturated by chlorine.

What is the development of organic solar cells (OSCs)?
The most significant advances on the development of organic solar cells (OSCs) along the last three decades are presented. Key aspects of OSCs such as the photovoltaic principles regarding the mechanism for the generation of the exciton and the transport of the carriers to the respective electrodes are explained.

How are organic solar cells made?
Organic materials for photoactive layer Typically, organic solar cells are fabricated using a blend active layer composed by a p-type conjugated polymer used as donor component, and a n-type organic semiconductor as an acceptor component.

Do pbqx Y6 OSCs have molecular stacking and charge transfer mechanisms?
This work provides a systematic theoretical exploration of the molecular stacking and charge transfer mechanisms in PBQx:Y6 OSCs, which offer valuable theoretical insights for the development of high-performance photovoltaic devices. 1. Introduction

Cadmium telluride (CdTe) is a p-type semiconductor used in thin-film solar cells. To achieve high light-to-electricity conversion, annealing in the presence of CdCl2 is essential, but the underlying mechanism is still under debate. Recent evidence suggests that a reduction in the high density of stacking faults in the CdTe grains is a key process that occurs during the ...

Abstract We report a mechanical stacking technology with transparent conductive adhesive as intermediate conductive layer for multi-junction-solar cells. Transparent adhesive ...

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Planar heterojunction PSCs evolved from dye-sensitized solar cells, and have become a new direction for PSCs [7] pared with the n-i-p structure device, which commonly use TiO 2 and spiro-OMeTAD as electron and hole transport layers (ETL and HTL), the device with p-i-n structure (also called inverted planar structure) has a lower fabricating temperature ...

It was found using the AFRA is an effective strategy to enhance end-group stacking, enhancing the borrowing of oscillator strength to promote multiple CT mechanisms in the complexes, explaining the high performance of ...

Vapor-phase deposition dominates industry-scale thin-film manufacturing but remains less prevalent in halide perovskite photovoltaic research compared with solution-based processes. The challenges in vapor-phase processing of halide perovskites lie in the varying volatility of the precursors, necessitating the use of different sublimation sources to evaporate them. Here, we ...

Additive-assisted layer-by-layer deposition creates a bulk p-i-n structure and vertically segregated fibril network morphology in the active layer of organic solar cells. This morphology ...

Volatile solid additive is an effective and simple strategy for morphology control in organic solar cells (OSCs). The development of environmentally friendly new additives which can also be easily removed without high-temperature thermal annealing treatment is currently a trend, and the working mechanism needs to be further studied.

The efficiency of as-deposited CdTe solar cells is typically <5 %. An activation process involving the post-treatment of the CdTe surface with cadmium chloride at approximately 400 deg C improves the absorber microstructure by removing stacking faults, fills the grain boundaries with chlorine and leads to efficiencies of up to ~22 %.

The power conversion efficiency (PCE) of organic-inorganic hybrid perovskite solar cells (PSCs) has been improved significantly over the last decade, from an initial 3.8% to the current 26.7%, through structural optimization, preparation engineering, additives, and interface modification strategies [1], [2], [3], [4].Nevertheless, the susceptibility of organic-inorganic hybrid ...

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The conversion efficiency of as-deposited, CdTe solar cells is poor and typically less than 5%. A CdCl2 activation treatment increases this to up to 22%.

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