

Can dimerized small molecule acceptors be used for organic solar cells?

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<div class="df\_qntext">Can a polymerized small molecule acceptor improve the performance of solar cells?

Zhang, Z. et al. Polymerized small-molecule acceptor as an interface modulator to increase the performance of all-small-molecule solar cells. *Adv. Energy Mater.* 12, 2102394 (2022). Jin, K. et al. 18.69% PCE from organic solar cells. *J. Semiconduct.* 42, 060502 (2021).

<div class="df\_qntext">What is a typical organic solar cell device structure & representative photoactive materials?

Fig. 1: Typical organic solar cell device structure and representative photoactive materials used in organic solar cells. a, A typical organic solar cell (OSC) comprises an electron-transport layer (ETL), hole-transport layer (HTL), transparent conducting layer (TCL) and a photoactive layer.

<div class="df\_qntext">Can dimerized small molecule acceptors be used for organic solar cells?

Lee, J.-W. et al. Linker engineering of dimerized small molecule acceptors for highly efficient and stable organic solar cells. *ACS Energy Lett.* 8, 1344-1353 (2023). Sun, C. et al. Dimerized small-molecule acceptors enable efficient and stable organic solar cells. *Joule* 7, 416-430 (2023).

<div class="df\_qntext">What is the working principle of solar cells?

All the aspects presented in this chapter will be discussed in greater detail in the following chapters. 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.

<div class="df\_qntext">Are DSSCs a viable alternative to single-junction solar cells?

DSSCs have moderate environmental impacts but involve liquid electrolytes that complicate recycling and stability. Tandem solar cells, particularly perovskite-silicon configurations, have shown improved energy yield over single-junction devices in LCA metrics, but increased material and fabrication complexity can offset these gains.

<div class="df\_qntext">Are organic solar cells halogen-free?

Organic solar cells (OSCs) have emerged as one of the highly promising avenues in renewable energy due to their lightweight, flexible nature and the potential for low-cost manufacturing. This review provides a comprehensive overview about OSCs processed by halogen-free solvents.

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# Solar container cell selection principle and application

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

In this Review, we provide a concise overview of state-of-the-art perovskite/Si TSCs, with a specific focus on the two-terminal (2T) tandem configuration. The progress in efficiency, ...

**Real-World Example: The California Solar Fiasco** Remember when a major solar farm used standard Li-ion cells meant for EVs? They lasted 18 months instead of 10 years - a \$20 million lesson in ...

Solar cells are the device that directly converts light energy into electrical energy. The basic solar cell is a p-n junction diode. The cell is joined together to create a solar module and ...

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All in all, OSCs can be considered a mature scientific and technological area where organic materials efficiently collect the solar photons to transform them into electricity.

By synthesizing current and emerging trends, this review offers valuable insights into the future trajectory of solar PV systems, emphasizing the potential for improved efficiency, cost-effectiveness, and ...

Si solar cell technology is described for the production of solar-quality crystals and wafers, and design, improvements, and device structures are examined. Consideration is given to alternate ...

Thermal solar sorption cooling systems, a review of principle, technology, and applications Radwan A. Almasri a,\* , Nidal H. Abu-Hamdeh b, Khaled Khodary Esmaeil c, S. Suyambazhahan d

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