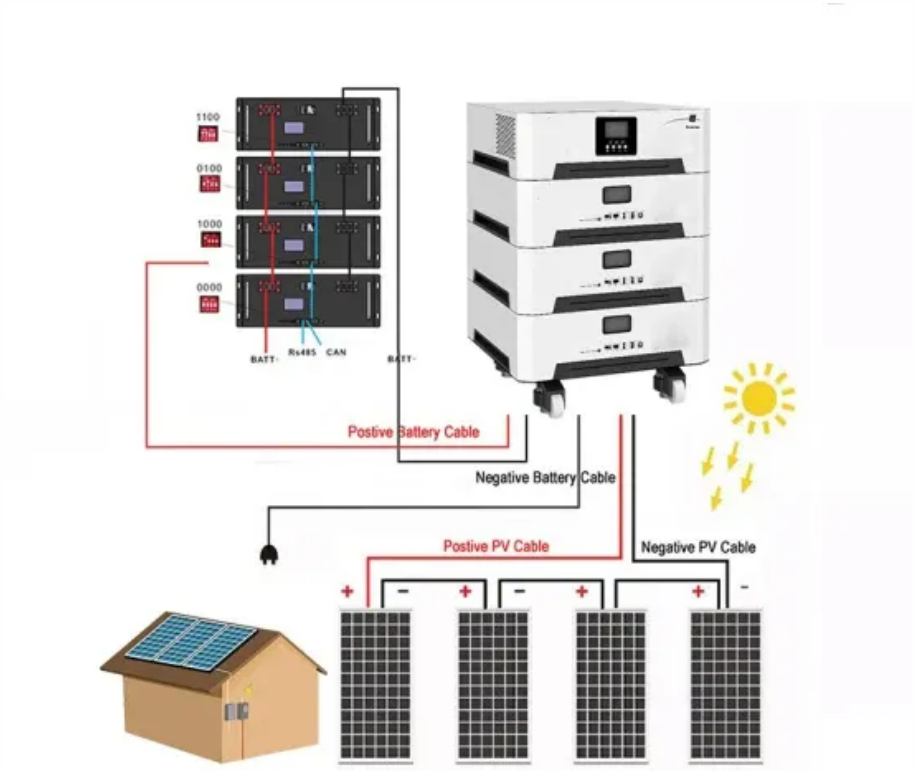
SolarInnovate Energy Solutions

Dual-component photovoltaic cells



Overview

Which ternary organic solar cells have the highest power conversion efficiency?

D18:D18-Cl:L8-BO ternary organic solar cells (TSCs) with dual-donor are fabricated, and the highest power conversion efficiency (PCE) of 19.13% is achieved. The open circuit voltage of D18:D18-Cl:L8-BO TSCs is 0.915 V, the short circuit current density is 26.22 mA cm−2, and the fill-factor is 79.75%.

How efficient are ternary organic photovoltaics?

Zhan, L. et al. Layer-by-layer processed ternary organic photovoltaics with efficiency over 18%. Adv. Mater. 33, 2007231 (2021). Zhu, C. et al. Tuning the electron-deficient core of a non-fullerene acceptor to achieve over 17% efficiency in a single-junction organic solar cell.

How efficient are organic solar cells?

You have full access to this open access article By modulating the crystalline properties of the active layer with dual donors, the efficiency of organic solar cells reaches 19.23%.

Does the dual-donor approach affect photovoltaic parameters?

The results, detailed in Fig. S15 and Table S17, show that the dual-donor approach positively impacts photovoltaic parameters, confirming its broad applicability.

Does ternary dual-donor strategy improve photovoltaic performance?

This article reports a promising ternary dual-donor strategy that obtains a power conversion efficiency of 19.13%. Good compatibility between D18 and D18-Cl promotes alloy donor models and improves charge transport kinetics. Improvement of crystallization behavior and surface morphology in the active layer can enhance photovoltaic performances.

Are ternary all-polymer organic photovoltaic blends efficient?

Ma, R. et al. Achieving high efficiency and well-kept ductility in ternary all-polymer organic photovoltaic blends thanks to two well miscible donors. Matter 5, 725–734 (2022). Wu, Y. et al. A conjugated donor-acceptor block copolymer enables over 11% efficiency for single-component polymer solar cells.

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