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Solar cell one-to-ten system

Overview

What is the power conversion efficiency of organic solar cells (OSCs)?

As a result, single-junction organic solar cells (OSCs) have achieved power conversion efficiencies (PCE) exceeding 19%.
5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22 The peak external quantum efficiencies (EQE) and fill factor (FF) for organic solar cells have surpassed 80%.

Is ternary charge transfer state disorder a bottleneck for organic solar cells?

The high non-radiative energy loss is a bottleneck issue for efficient organic solar cells. Here, the authors regulate the charge transfer state disorder and rate of back charge transfer through a ternary system, achieving low non-radiative energy loss of 0.183 eV and device efficiency of 20.25%.

How efficient are single-junction organic solar cells?

China Chem. 65, 1457–1497 (2022). Zhu, L. et al. Single-junction organic solar cells with over 19% efficiency enabled by a refined double-fibril network morphology. Nat. Mater. 21, 656–663 (2022).

How efficient are organic solar cells?

Fu, J. et al. Rational molecular and device design enables organic solar cells approaching 20% efficiency. Nat. Commun. 15, 1830 (2024). Guan, S. et al. Self-assembled interlayer enables high-performance organic photovoltaics with power conversion efficiency exceeding 20%. Adv. Mater. 36, 2400342 (2024). Wei, Y. et al.

What is ternary organic solar cell assembly?

Furthermore, the ternary organic solar cell assembly using C8-IC can regulate the crystallization behaviour of the active layer, boosting phase continuity and improving donor–acceptor miscibility. This results in superior charge management, improving the PCE to 20.7% which is amongst the highest

reported values for similar structures.

Are ternary organic solar cells efficient?

Phys. Chem. Chem. Phys. 16, 20321–20328 (2014). Cai, Y. et al. A well-mixed phase formed by two compatible non-fullerene acceptors enables ternary organic solar cells with efficiency over 18.6%. Adv. Mater. 33, 2101733 (2021). Gao, J. et al.

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