Stability of organic solar cells

Can organic solar cells solve the stability problem?
We expect that this review will contribute to solving the stability problem of OSCs, eventually paving the way for commercial applications in the near future. Organic solar cells (OSCs) have attracted a great deal of attention in the field of clean solar energy due to their advantages of transparency, flexibility, low cost and light weight.

How stable is a solar cell?
As per the international standards,in order to certify a solar cell as stable,the device must be able to withstand thermal cycling between -40°C and 85°C.40 Ideally,the miscibility and diffusion coefficients are known over the full temperature range.

How stable is organic photovoltaic?
As the power conversion efficiency of organic photovoltaic has been dramatically improved to over 18%, achieving long-term stability is now crucial for applications of this promising photovoltaic technology. Among the high-efficiency systems, most are using BTP-4F and its analogs as acceptors.

What are the advantages and disadvantages of organic solar cells?
Organic solar cells (OSCs) present some advantages,such as simple preparation,light weight,low cost and large-area flexible fabrication,and have attracted much attention in recent years. Although the power conversion efficiencies have exceeded 10%,the inferior device stability still remains a great challenge.

What are organic solar cells?
Organic solar cells (OSCs) have attracted a great deal of attention in the field of clean solar energydue to their advantages of transparency,flexibility,low cost and light weight. Introducing them to the market enables seamless integration into buildings and windows,while also supporting wearable,porta

What is organic solar cell (OSC)?
The organic solar cell (OSC) is a promising emerging low-cost thin film photovoltaics technology. The power conversion efficiency (PCE) of OSCs has overpassed 16% for single junction and 17% for organic-organic tandem solar cells with the development of low bandgap organic materials synthesis and device processing technology.

Organic solar cells have achieved rapid development over the last few years, benefitting from the emerging of new non-fullerene acceptors (NFAs). The reported power conversion efficiency of OSCs has achieved over 18% up to now, however, the inferior stability issue restricts its commercialization, which stimulates the interest of scientists to ...

The main causes of OSC instability stem from the poor intrinsic stability of materials, metastable morphology

of the multicomponent active layer, unstable interfaces, and sensitivity to moisture and oxygen. To address these issues, it ...

In accelerated lifetime tests, well encapsulated and UV-protected solar cells made of PCE-10:BT-CIC reached operational lifetimes over 30 years. A recent review discusses links between photoexcitation dynamics and stability, based on the resulting stationary density of unwanted degrading agents.

Organic solar cells degrade rapidly under both environmental and light exposure. In this paper, we review some of the changes in fundamental properties of organic solar cells under both photon-induced and environment-induced exposure which lead to changes in conversion efficiency. It is shown that the fundamental material properties, such as ...

The power conversion efficiency of organic solar cells has rapidly increased, yet significantly less attention has been paid to materials stability and device longevity. For ...

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After more than two decades of development, the power conversion efficiencies (PCEs) of organic solar cells (OSCs) have been greatly improved through materials development [1, 2], interface engineering [3-5], and device structure optimization [6, 7], and the PCEs of the state-of-the-art OSCs based on the bulk heterojunction (BHJ) concept have now ...

In this review, we carefully review important strategies employed to improve the stability of OSCs over the past three years from the perspectives of material design and device engineering....

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