Polymer solar cells

What are all-polymer solar cells?

All-polymer solar cells (all-PSCs) have garnered significant interest due to their unique advantages,including significantly improved device stability and mechanical stretchability compared with other types of organic solar cells. Recently,all-PSCs have achieved remarkable improvements in photovoltaic performance.

What is a polymer solar cell?

The first polymer solar cell is made of mixed poly [2-methoxy-5- (2?-ethylhexyloxy)-p-phenylene vinylene] (PPV), C60, and its numerous variants with high energy conversion efficiency . This technique contributed to a further increase in the age of polymer products for the capture of solar energy.

Why do solar cells need polymers?

The device structures and components of these solar cells are imperative to the device's efficiency and stability. Polymers can be used to adjust the device components and structures of these solar cells purposefully,due to their diversified properties.

Are polymer solar cells a promising energy technology for the future?

As a promising energy technology for the future,polymer solar cells have improved remarkably in recent years and power conversion efficiencies of up to 6.5% were reported for small area devices (1-10 mm 2) (Kim et al.,2007). Unfortunately,these values have not yet been sustained for the long lifetimes needed for commercial maturity.

Are all-polymer solar cells stretchable?

All-polymer solar cells (all-PSCs) have attracted significant research interest in the recent decade due to their great potential in stretchable electronic applications in terms of long-term stability and mechanical stretchability.

What are polymer-fullerene solar cells?

Polymer-fullerene solar cells have a huge elite among others. The accompanying polymer sun oriented cells have the best exhibitions of polymer solar cells and its properties like PCE--control transformation proficiency, Voc--open circuit voltage, FF--fill factor and Jsc--short out current, are given in Table 19.2.

All-polymer solar cells (all-PSCs) consisting of polymer donors (P D s) and polymer acceptors (P A s) have drawn tremendous research interest in recent years. It is due to not only their tunable optical, electrochemical, and ...

In this work, we develop highly efficient and mechanically robust all-polymer solar cells that are based on the PBDTTTPD polymer donor and the P (NDI2HD-T) polymer ...

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APSCs offer all: All-polymer solar cells have attracted great attention, owing to rational design, improved morphology, strong absorption, enhanced stability etc. This Minireview highlights the opportunities of APSCs, selected polymer families suitable for these devices with optimization to enhance the performance further, and ...

Here, we provide a systematic review on the evolution of n-type polymeric acceptors used in OSCs. In addition, we summarize the morphological and charge carrier ...

All-polymer solar cells (all-PSCs) exhibiting superior device stability and mechanical robustness have attracted considerable interest. Emerging polymerized small-molecule acceptors (PSMAs) have promoted the ...

Low-bandgap donor polymers are optimum for bulk heterojunction solar cells because they absorb most parts of the solar spectrum and are thus efficient light absorbers. Non-fullerene acceptors are more ...

Here, we provide a systematic review on the evolution of n-type polymeric acceptors used in OSCs. In addition, we summarize the morphological and charge carrier transport properties of all-polymer solar cells and compare ...

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