Solar cell anode

Why is anode modification important in organic solar cells (OSCs)?
Anode modification is vital for improving device performanceof organic solar cells (OSCs). PEDOT:PSS is the most widely applied hole transport layer (HTL) in OSCs.

How efficient are flexible organic solar cells with a doped graphene transparent anode?
Extremely efficientflexible organic solar cells with a doped graphene transparent anode are demonstrated. 3 layer graphene is determined to be optimal for the cell design. A 0.2 cm 2 cell achieves a high power conversion efficiency of 6.85%. The thick photoactive layer enables production of a 1.6 cm 2 -large flexible cell with graphene anode.

Why do we need a thick anode interlayer?
In the inverted cell, controlling the thickness of AIL is very essential, where the solvent of silver ink can diffuse into the active layer leading to damage photoactive layer. Therefore, a thick anode interlayer can efficiently protect the device against the diffusion of the solvent of silver paste into the active layer.

What is the PCE of a graphene anode?
As a result,a 0.2 cm 2 cell based on a BI-doped graphene anode was found to have a PCE of 6.85%,which was 96% of the best efficiency (7.12%) for the equivalent device with an ITO on glass anode. Furthermore,a 1.6 cm 2 flexible OSC was fabricated and found to have a PCE of 1.8%.

What is the role of anode interlayer in NF-PSCs?
The anode interlayer (AIL) plays a vital role in improving the efficiency and stabilityof PSCs. The challenges and opportunities in this research area encourage researchers to pursue great innovation in developing new materials and strategies for highly efficient NF-PSCs.

How to improve performance of organic solar cells (OSCs)?
Volume 20, December 2024, 100338 Anode modification and optimization is crucial towards improving performance of organic solar cells (OSCs). PEDOT:PSS is the most common choice as a hole transport layer (HTL) material, but suffers from issues including low conductivity.

Photovoltaic cells are devices that directly convert sunlight into electricity and it is very simple method to utilize the solar energy. Development of low-cost and high-efficiency solar cell is necessary for the large-scale adaption of solar energy. O"Regan and Gratzel in 1991, developed a new cell called Dye Sensitized Solar Cell (DSSC). Inexpensiveness and easy ...

The AEM electrolyzer was operated at 55 °C. To more accurately calculate the Solar-to-Hydrogen Efficiency (STH) of an integrated system of AEM electrolyzer and silicon solar cells, STH was recalculated ...

Recently, the power conversion efficiency (PCE) of single-junction non-fullerene polymer solar cells (NF-PSCs) has surpassed 19% due to the fast development of novel donor polymers, NF-acceptors, device engineering, and interlayer ...

Highly efficient organic solar cells (OSCs) are often obtained with a multilayer structure, in which active layer is sandwiched between anode and cathode interlayer. Here we present a simple strategy to simultaneously obtain anode interlayer and boost performances of ...

Among these interfacial materials, the anode interfacial layers (AILs) play a crucial role in improving photovoltaic performance. This review expresses a detailed conclusion of the development of anode interfacial materials and an ...

Thickness-insensitive anode interface layer materials are extremely crucial for commercial applications of organic solar cells (OSCs). Here, we have demonstrated a solution-processed and thickness-insensitive anode ...

Abstract: Antimony selenide (Sb 2 Se 3) is an emerging solar cell material.Here, we demonstrate that an organic small molecule of 4, 4", 4""-tris(carbazol-9-yl)-triphenylamine (TCTA) can efficiently passivate the anode interface of the Sb 2 Se 3 solar cell. We fabricated the device by the vacuum thermal evaporation, and took ITO/TCTA (3.0 nm)/Sb 2 Se 3 (50 nm)/C ...

Anode modification and optimization is crucial towards improving performance of organic solar cells (OSCs). PEDOT:PSS is the most common choice as a hole transport layer (HTL) material, but suffers from issues including low conductivity. In this work, three alkyl amine derivatives - methylamine hydrochloride (MA), ethylamine hydrochloride (EA ...

Highly efficient organic solar cells (OSCs) are often obtained with a multilayer structure, in which active layer is sandwiched between anode and cathode interlayer. Here we present a simple strategy to simultaneously obtain anode interlayer and boost performances of OSCs by directly adding a tiny small molecule [2-(9H-carbazol-9-yl ...

Thickness-insensitive anode interface layer materials are extremely crucial for commercial applications of organic solar cells (OSCs). Here, we have demonstrated a solution-processed and thickness-insensitive anode interfacial layer PCPDT-2Ph-H and employed it in large-area OSCs.

The anode is the negative terminal of the solar cell. It bears a continuous network of sintered titanium dioxide nanoparticles. This porous network offers an actual surface area that is a thousand times greater than the apparent surface area and acts like a "light sponge" where sunlight is "trapped." Bulk titanium dioxide is a white colored semiconductor that is not ...

The critical role of anode work function in non-fullerene organic solar cells unveiled by

counterion-size-controlled self-doping conjugated polymers Chem. Mater., 30 (2018), pp. 1078 - 1084 Crossref View in Scopus Google Scholar

Among these interfacial materials, the anode interfacial layers (AILs) play a crucial role in improving photovoltaic performance. This review expresses a detailed conclusion of the development of anode interfacial materials and an outlook on future trends for OSCs.

Anode modification is vital for improving device performance of organic solar cells (OSCs). PEDOT:PSS is the most widely applied hole transport layer (HTL) in OSCs. In this work, three kinds of modified HTLs, namely ...

Recently, the power conversion efficiency (PCE) of single-junction non-fullerene polymer solar cells (NF-PSCs) has surpassed 19% due to the fast development of novel donor polymers, NF-acceptors, device engineering, and interlayer materials. The anode interlayer (AIL) plays a vital role in improving the efficiency and stability of PSCs.

A solar cell is a device that converts light into electricity via the "photovoltaic effect". They are also commonly called "photovoltaic cells" after this phenomenon, and also to differentiate them from solar thermal devices. The photovoltaic effect is a process that occurs in some semiconducting materials, such as silicon. At the most basic level, the semiconductor ...

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