Hydrogen bond solar cells

Can hydrogen bonds improve the performance and stability of solar cells?
Furthermore, this review offers insights into the potential utilization of hydrogen bonds to further enhance the performance and stability of devices. In 2009, Tsutomu Miyasaka et al. prepared the first perovskite solar cell, which kicked off the research on perovskite light-absorbing materials.

What is a hydrogen bond in perovskite solar cells?
Hydrogen bond enables highly efficient and stable two-dimensionalperovskite solar cells based on 4-pyridine-ethylamine. Rapid development in two-dimensional layered perovskite materials and their application in solar cells. One-Year stable perovskite solar cells by 2D/3D interface engineering.

Why are hydrogen bonds directional?
Why are Hydrogen Bonds Directional ?. Hydrogen-bond-bridged intermediate for perovskite solar cells with enhanced efficiency and stability. Orientated crystallization of FA-based perovskite via hydrogen-bonded polymer net- work for efficient and stable solar cells.

How does hydrogen bonding work in PSCs?
Hydrogen bonding can act as a double-edged swordin PSCs. On the one hand,hydrogen bonds can stabilize the perovskite materials by inhibiting the organic cation volatilities and ion migration,enhancing the charge transport,and inhibiting the charge recombination.

Are hydrogen-bonding spacers good for organic solar cells?
Provided by the Springer Nature SharedIt content-sharing initiative An article in Advanced Materials presents polymer donors with hydrogen-bonding spacers that enable intrinsically stretchable organic solar cells with a high power conversion efficiency and good stretchability.

Why are 2D perovskite solar cells more efficient and stable?
The high efficiency and good stability are attributed to the improved intermolecular interaction among PyEA molecules via hydrogen bond,which enables the charge transport between inorganic slabs in 2D perovskite. This work provides a new strategy to construct 2D perovskite for highly efficient and stable perovskite solar cells via hydrogen bond.

Herein, an organic chemical compound 4,6-diamino-2-mercaptosine (DMP) is incorporated into the ETL/PVK interface in order to optimize the interfacial performance through a hydrogen bond bridging ...

Hydrogen Bond Induced Green Solvent Processed High Performance Ternary Organic Solar Cells with Good Tolerance on Film Thickness and Blend Ratios. ... For comprehensive development of organic solar cells ...

Introduction. The power conversion efficiency (PCE) of perovskite solar cells (PSCs), the leading

third-generation low-cost photovoltaic technology, has increased ...

It was found that HDT can not only form coordination bonds to cure the Pb 2+ defects in perovskite films by carbonyl groups (C O), but also formed hydrogen bonds with I - ...

Ternary bulk heterojunctions (BHJs) are efficient platforms for improving organic solar cell (OSC) performance. The third component in ternary OSCs is generally chosen such ...

The solar cell devices based on this 2D perovskite delivered the optimized efficiency of 9.05% with excellent ambient stability due to the improved charge transport ...

Formamidinum lead iodide perovskite solar cells commonly suffer from photoinduced phase segregation and humidity instability. Here, the authors design a ...

Lead halide perovskite solar cells (PSCs) have demonstrated power conversion efficiencies comparable to silicon-based solar cells, yet their instability under ...

A recent collaboration has led to the development of a technique to drastically enhance the performance of perovskite solar cells using hydrogen-bonding additives. This ...

Keywords: organic solar cells, ternary devices, hydrogen bond, ?-? stacking, energy transfer. Introduction. Solar energy is a promising alternative energy for future renewable energy.

This work offers a promising approach to diminishing the defects in perovskite grain boundaries and surfaces, enhancing optoelectronic properties and facilitating the creation of efficient and stable perovskite solar cells ...

While the perovskite solar cells (PSCs) have attracted wide attention, long-term stability is the most imperative issue to be addressed before commercialization. ... the diamino ...

introduce trifluoromethyl to enhance hydrogen bond which improve ?- stacking can achieve higher performance in OSCs. Keywords: organic solar cells, ternary devices, hydrogen bond, ? ...

greater difficulty of characterizing hydrogen bonds, understanding their influence on PSCs is lagging. This review focuses on the weak interaction of hydrogen bonding within PSCs.

Future research should address the existing gaps in assessment of the efficiency and energy requirements for solar cells incorporating imidazole (IM) or its derivatives such as 2-MeIM, 2-Et-4-MeIM, and 1,2,4,5-MeIM into the ...

Hydrogen bonding has a great effect on crystallization, stability, ion migration, phase transition, etc. in perovskite solar cells. However, the research on hydrogen bonding in ...

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