SolarGrid Energy Solutions

Heterostructure photovoltaic glass

Overview

How are 3D/2D perovskite heterostructures formed?

3D/2D perovskite heterostructures are formed by dissolving suitable ligands in polar solvents, such as isopropanol (IPA), and spin-coating the ensuing solution onto the pre-deposited 3D perovskite layer, followed by thermal annealing at 80 °C or higher temperatures.

Are organic-inorganic metal halide perovskite solar cells viable?

Organic-inorganic metal halide perovskite solar cells (PSCs) have a verified power conversion efficiency (PCE) above 26%, making them a viable photovoltaic technology 1, 2, 3. However, in terms of operational stability, the commercialization of PSCs faces considerable challenges.

Can tin-based perovskite solar cells achieve high open circuit voltage?

Wang, T. et al. High open circuit voltage over 1 V achieved in tin-based perovskite solar cells with a 2D/3D vertical heterojunction. Adv. Sci. 9, 2200242 (2022). Sun, C. et al. Well-defined fullerene bisadducts enable high-performance tin-based perovskite solar cells. Adv. Mater. 35, 2205603 (2023).

Why do 3D phase-segregated heterostructures deteriorate the optoelectronic properties of 2D/3D?

More importantly, the delayed maturation of 2D phases during crystallization leads to the uncontrolled growth of 3D THP grains with abundant trap states and pronounced pinholes in the upper region, greatly deteriorating the optoelectronic properties of these 2D/3D phase-segregated heterostructures 17, 24.

Are fullerene bisadducts suitable for tin-based perovskite solar cells?

Well-defined fullerene bisadducts enable high-performance tin-based perovskite solar cells. Adv. Mater. 35, 2205603 (2023). We acknowledge K. Wang, C.-H. Lin and M. Lyu for characterization discussions.

Why do we need two-dimensional/three-dimensional heterostructures for THP thin films?

Constructing two-dimensional/three-dimensional (2D/3D) heterostructures can effectively regulate crystallization and suppress defect formation for developing high-quality THP thin films.

Heterostructure photovoltaic glass

Photovoltaic device performance of electron beam evaporated Glass...

Dec 1, 2017 · In this work, we report on substrate temperature and Cu addition induced changes in photovoltaic device performance of Glass/TCO/CdS/CdTe/Au heterostructure prepared by ...

Overcoming lattice mismatch for core-shell ...

Apr 24, 2025 · Lattice mismatches are a difficult obstacle in the formation of core-shell heterostructures. Here, the authors develop a strategy to overcome the lattice mismatch and ...

Heterostructures based on two-dimensional layered ...

Jul 1, 2016 · Lee and co-workers have extended the range of these vertical stacking heterostructure through inducing p-n junction into the photovoltaic device, where the MoS 2 ...

Hydrophilic and Superhydrophilic Self-Cleaning ...

Jan 8, 2020 · Transparent, superhydrophilic materials are indispensable for their self-cleaning function, which has become an increasingly popular research ...

Structure and ferroelectric photovoltaic effect modulation in ...

Nov 1, 2024 · Therefore, in this paper, Pt/BFO/LSCO were framed on epitaxial La 0.5 Sr 0.5 CoO 3 (LSCO) bottom electrodes using off-axis magnetron sputtering, and the modulation of ...

Glass Application in Solar Energy Technology

Apr 28, 2025 · Glass-glass encapsulation, low-iron tempered glass, and anti-reflective coatings improve light management, durability, and efficiency. ...

Development of photovoltaic solar cells based on heterostructure ...

May 11, 2021 · Two-dimensional (2D) van derWaals layered materials created new avenue for the last decade in the field of optoelectronics for showing

promising new and diverse applications. ...

Heterostructured materials

Jan 1, 2023 · Heterostructured (HS) materials are a new class of materials that are composed of heterogeneous zones with dramatically different (>100 %) mechanical ...

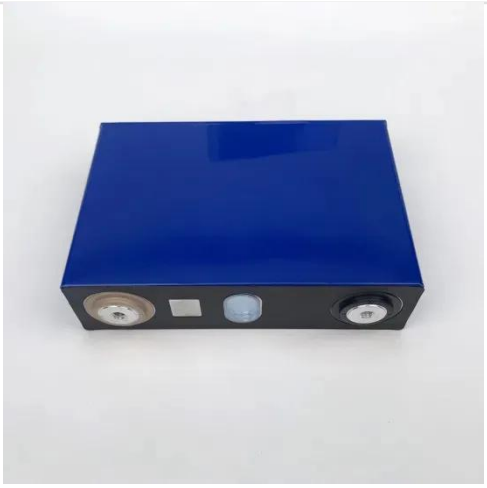
Homogeneous 2D/3D heterostructured tin halide perovskite ...

Apr 16, 2025 · Constructing two-dimensional/three-dimensional (2D/3D) heterostructures can effectively regulate crystallization and suppress defect formation for developing high-quality ...

Glass Application in Solar Energy Technology

Apr 28, 2025 · This chapter examines the fundamental role of glass materials in photovoltaic (PV) technologies,

emphasizing their structural, optical, and ...



Heterostructure of TiO2 and SnS for enhancing the ...

Apr 1, 2024 · In this article a novel heterostructure of TiO2@SnS has been prepared by sol-gel technique for increase the current density and performance of solar cells. The main objective ...

Type-II heterostructure of semiconducting CdS nanoparticle ...

May 2, 2025 · In this report, the heterostructure (Hs) semiconductor nanocrystalline CdS-ZnO was grown by a cost-effective chemical precipitation method and study of photocatalytic ...

Relevant photovoltaic effect in N-doped CQDs/MoS

May 15, 2022 · In summary, N-CQDs/MoS 2, a 0D/2D quantum dimensional heterostructure was fabricated on ITO

coated glass substrate for solar photovoltaic application. The MoS 2 layer ...

Enhanced photovoltaic behavior of thickness-dependent BiFeO

Apr 4, 2019 · In contrast, the photovoltaic parameters of TiO 2 /BFO and ZnO/BFO heterostructure thin films are significantly improved. For the TiO 2 /BFO heterostructure thin ...

Enhanced photovoltaic-pyroelectric coupled effect of BiFeO

Jul 1, 2021 · Compared with merely the photovoltaic effect found in BFO films and BFO/ZnO heterostructures, BFO/Au/ZnO heterostructures display the photovoltaic-pyroelectric coupled ...

Optical characterization of GaAs-based Schottky photovoltaic

Sep 27, 2024 · N-type GaAs photovoltaic heterostructures with embedded GaNxAs1-x/GaAs multi-quantum well nanostructures are proposed to develop

a Schottky-junction photod

A Type-II BiTeCl/SnSe2 Heterostructure with High ...

Sep 6, 2024 · In this study, a Janus BiTeCl/SnSe 2 van der Waals (vdW) heterostructure is constructed and systematically investigated for its potential in solar cell applications using first ...

Type-II lateral SnSe/GeTe heterostructures for solar ...

In this work, we propose a novel lateral SnSe/GeTe heterostructure (LHS) with high photovoltaic performance and systematically investigate the structural, electronic and optical properties of ...

Solvent-dripping modulated 3D/2D heterostructures for ...

Jan 26, 2025 · The random orientation of spontaneously formed 2D phase atop 3D perovskites limits the performance of

solar cells. Here, authors introduce a meta-amidinopyridine ligand ...

A WSe2/MoSe2 heterostructure photovoltaic ...

FIG. 2. (a) Schematic and (b) optical micrograph of the device showing the transparent glass substrate with a multilayer graphene and h-BN flake serving ...

Photovoltaic Properties of Bismuth Vanadate/Bismuth Ferrite

Jan 1, 2025 · The heterostructure of bismuth vanadate and bismuth ferrite material for photovoltaic analysis are used in this study. Bismuth vanadate (BiVO 4, BVO) is a n-type ...

Investigation of photovoltaic properties of poly(3 ...

Nov 1, 2024 · All the materials were used without any application of heat or any other modifications. For photovoltaic characterization, Indium Tin Oxide (ITO)

coated glass ...

Performance analysis and optimization of SnSe thin-film ...

Dec 1, 2024 · The first FTO/SnSe heterostructure PV device is presented in 1990 [11]. As stated in a study, multiple methods have been employed to improve the performance of the SnSe ...

Development of metal oxide heterostructures for photovoltaic ...

Jan 1, 2023 · To analyze the photovoltaic performance of the ZnO-CuO heterostructure, the authors irradiated the produced SCs with a Xe lamp. Finally, the authors commented that the ...

FePS3-MoS2 p-n junctions for broadband ...

Mar 13, 2025 · Furthermore, our heterostructure devices show a broadband photovoltaic response to

visible light, where a short-circuit current (ISC) of up ...

Bulk photovoltaic effect in partial overlap MoSe2-WSe2 van ...

Nov 1, 2022 · We observed photo-responsivity in the full overlap structure only when non-zero built-in potential is applied, thus showing the traditional photovoltaic effect. The present results ...

Solvent-dripping modulated 3D/2D heterostructures for ...

Jan 26, 2025 · Here, we introduce a meta-amidinopyridine ligand and the solvent post-dripping step to generate a highly ordered 2D perovskite phase on the surface of a 3D perovskite film. ...

Dual polarization-enabled ultrafast bulk photovoltaic ...

Jun 25, 2024 · Moreover, the heterostructure device possesses an extrinsic response time of approximately

2.2 ns and a bulk photovoltaic coefficient of 0.6 V-1, which is among the ...

An Embedding 2D/3D Heterostructure Enables ...

Oct 8, 2021 · It is found that the use of binary solvents DMF:NMP, rather than the conventional DMF:DMSO, enables to deposit dense and uniform FA-alloyed ...

High-performance, self-powered photodetectors based on ...

Jul 1, 2025 · For instance, the MoS 2 /WSe 2 heterostructure has been extensively documented to demonstrate ultrafast interlayer charge transfer and a pronounced photovoltaic effect [17], ...

Band Offset Engineering in ZnSnN2-Based Heterojunction ...

May 8, 2018 · Figure S1: The schematic illustration of P-N and P-i-N heterostructure photovoltaic devices fabricated on ITO glass. Figure S2: The

optical band gaps of as-deposited and ...

Development of photovoltaic solar cells based on ...

Aug 12, 2022 · Therefore, researchers have paid much attention to the photovoltaic (PV) technology to restore the remaining fossil fuels [4, 5]. The photovoltaic solar cells consist of ...

Photovoltaic device performance of electron beam evaporated Glass...

Mar 1, 2018 · We report on substrate temperature and Cu addition induced changes in the photovoltaic device performance of Glass/TCO/CdS/CdTe/Au heterostructures prepared by ...

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