

Can perovskite photovoltaics be integrated with other systems?

Integrating perovskite photovoltaics with other systems can substantially improve their performance. This Review discusses various integrated perovskite devices for applications including tandem solar cells, buildings, space applications, energy storage, and cell-driven catalysis.

Can perovskite solar cells be used on steel?

While many state-of-the-art perovskite solar cells (PSCs) have been realized on rigid glass substrates, demonstrating perovskite cells on other types of surfaces may give rise to new applications. Here, we successfully demonstrate efficient PSCs on steel.

Are perovskite-based Tandem solar cells stable?

Table 1 The best-performing perovskite-based tandem solar cells. The long-term stability of PSCs represents a key obstacle for their commercial deployment. Perovskite materials typically used in solar cells have been shown to be unstable when exposed to oxygen, water, heat, and light.

Is a substrate configuration a viable option for all-perovskite tandem solar cells?

Substrate configuration offers a promising route to unleash the commercial potential of all-perovskite tandem solar cells. The superstrate configuration in all-perovskite tandem solar cells is disadvantageous for long-term stability.

How efficient are layered 2D perovskite solar cells?

Huang, Y. et al. Stable layered 2D perovskite solar cells with an efficiency of over 19% via multifunctional interfacial engineering. J.

Are perovskite solar cells better than silicon solar cells?

In contrast, perovskite materials can be solution processed, enabling low-embedded energy manufacturing using commercial coating technologies. Compared to silicon solar cells, some emerging solar cells, such as organic solar cells (OSCs), tend to be more cost-effective and wet-processable.

With the superior OER activity, we achieved an unassisted solar water splitting by series ...

After optimization of processing conditions, PSCs yielded PCE up to 12.1 % ...

The substrate configuration also widens the choice of flexible substrates: we achieve 24.1% and 20.3% efficient flexible all-perovskite tandem solar cells on copper-coated ...

The ability to grow perovskite solar cells in substrate configuration, where light enters the devices from the film side, allows the use of non-transparent flexible polymer and metal substrates.

With the superior OER activity, we achieved an unassisted solar water splitting by series connected perovskite solar cells (PSCs) of 2 cm² aperture area with NiFe/ITO//Pt electrodes, ...

Zheng et al. report a 17.1% efficient perovskite solar cell on steel, elucidating the important role of an indium tin oxide interlayer as a barrier against iron diffusion from the ...

Here, we demonstrate the fabrication of perovskite solar cells in the substrate configuration using vacuum-deposition methods. The best cells have a power conversion efficiency (PCE) of ~19%, which is comparable to ...

From the beginning of perovskite PV research until today, the most efficient PSCs have been based on titanium dioxide (TiO₂) as EEL. 39. ... Up-scalable sheet-to-sheet production of high ...

In general, photovoltaic performance of the perovskite solar cells is ascribed from their intrinsic properties like high absorption coefficient [23], tunable band gap [24], large ...

By using guanidinium tetrafluoroborate additive in wide-bandgap perovskite ...

A direct effect of the CISS effect on solar cells was demonstrated in 2020. 118 It was shown that the photovoltaic response of chiral 2D perovskite-based solar cells at short ...

Here, we demonstrate the fabrication of perovskite solar cells in the substrate configuration using vacuum-deposition methods. The best cells have a power conversion ...

This study investigated the integration of perovskite solar cells (PSCs) on stainless steel (SS) substrates for application in building-integrated photovoltaics (BIPV).

Although perovskite solar cells (PSCs) are promising next generation photovoltaics, the production of PSCs might be hampered by complex and inefficient ...

An international research group demonstrated the first perovskite solar cells on polycarbonate substrates, suitable for flexible PV applications. Using an industrially compatible ...

The advent of metal-halide perovskite solar cells has revolutionized the field of photovoltaics. The high power conversion efficiencies exceeding 26% at laboratory ...

5 ???· Inverted (p-i-n structured) metal halide perovskite solar cells (PVSCs) have emerged ...

5 ???· Inverted (p-i-n structured) metal halide perovskite solar cells (PVSCs) have emerged as one of the most attractive photovoltaics regarding their applicability in tandem solar cells and ...

By using guanidinium tetrafluoroborate additive in wide-bandgap perovskite subcell, we achieve an efficiency of 25.3% for the substrate-configured all-perovskite tandem ...

4 ???· In the field of photovoltaics, organic and, to a larger extent, perovskite solar cells have shown promising performance in academic laboratories, and thus have attracted the interest of ...

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