Perovskite solar devices

In recent years, the perovskite solar cells have gained much attention because of their ever-increasing power conversion efficiency (PCE), simple solution fabrication process, flyable, light-weight wearable and deployable for ultra-lightweight space and low-cost materials constituents etc.

Researchers worldwide have been interested in perovskite solar cells (PSCs) ...

Perovskite solar cells (PVSCs) have drawn unprecedented attention in the last decade due to their skyrocketed power conversion efficiency (PCE) (certified: 25.7%), low-temperature solution processibility, low cost, ...

Perovskite solar cells (PSCs) are gaining popularity due to their high efficiency and low-cost fabrication. In recent decades, noticeable research efforts have been devoted to improving the stability of these cells under ambient conditions. Moreover, researchers are exploring new materials and fabrication techniques to enhance the performance of PSCs ...

They established a two-step spin-coating process for producing high-quality perovskite films in ambient settings at room temperature. The solar device obtained significant performance metrics by integrating an improved PEDOT:PSS hole-transport layer and a PC71BM acceptor, including a PCE of 16.31 %, a high V oc of 1.05 V, and an FF of 0.78 ...

The perovskite solar cell devices are made of an active layer stacked between ultrathin carrier transport materials, such as a hole transport layer (HTL) and an electron transport layer (ETL). The band alignment depends on their energy level, electron affinity, and ionization potential. The ultra-thin layers with low electron affinities and ionization potential serve as hole ...

Lead-free hybrid organic-inorganic perovskite have gained remarkable interest for photovoltaic application due to their lack of toxicity. In this work, we design and simulate for the first all HTL-free non-toxic perovskite tandem solar device using SCAPS-1D. The (MAGeI3) with 1.9 eV band gap is employed as a top cell, while the bottom cell is FASnI3 with a band gap of ...

Co-deposition of copper thiocyanate with perovskite on textured silicon enables an efficient perovskite-silicon tandem solar cell with a certified power conversion efficiency of 31.46% for 1 cm2 ...

Perovskite solar cells (PSCs) are being rapidly developed at a fiery stage due to their marvelous and fast-growing power conversion efficiency (PCE). Advantages such as high PCE, solution processability, tunable band gaps, and flexibility make PSCs one of the research hot spots in the energy field.

Researchers worldwide have been interested in perovskite solar cells (PSCs) due to their exceptional

photovoltaic (PV) performance. The PSCs are the next generation of the PV market as they can produce power with performance that is on par with the best silicon solar cells while costing less than silicon solar cells.

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In comparison with Pb-based devices, the Sn-based perovskite solar cells exhibit superior carrier mobility, bandgap, low excitation binding energies, short circuit current density and theoretical PCE of 33%. Nevertheless, the efficiency of Sn-based perovskite solar-cells is much smaller (10%) than that of Pb-based perovskite solar-cells. Also, the stability of ...

Perovskite solar cells have shown remarkable progress in recent years with rapid increases in efficiency, from reports of about 3% in 2009 to over 26% today on small area devices (about 0.1 cm 2). Perovskite-silicon tandem cells have reached efficiencies of almost 34%.

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In this review, we explore the integration of state-of-the-art PSCs into a ...

Perovskite solar cells (PSC) have been identified as a game-changer in the world of photovoltaics. This is owing to their rapid development in performance efficiency, increasing from 3.5% to 25.8% in a decade. Further advantages of PSCs include low fabrication costs and high tunability compared to conventional silicon-based solar cells. This ...

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