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Tandem-based perovskite solar cell research and development

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Perovskite (PK)-based tandem solar cells (TSCs) are an emergent photovoltaic (PV) technology with potential to surpass the Shockley-Queisser theoretical limit of efficiency (?) of single-junction (SJ) silicon solar cells.

Utilizing the advantages of perovskite materials--known for their direct bandgap, high absorption coefficient, and superior charge transport properties--researchers have been designing and optimizing tandem solar cells. These perovskite tandem solar cells typically consist of a perovskite top cell paired with a bottom cell, often composed of ...

Reviewing the development of all-perovskite TSCs, strategies to construct efficient all-perovskite tandems principally focus on enhancing the quality of WBG and/or LBG absorbers as well as optimizing the ...

Developing perovskite/Si tandem solar cells is one of the hottest research topics in current PV field since the device efficiencies of perovskite and Si single-junction cells are approaching their S-Q limits. With several years development, perovskite/Si tandems have achieved a certified efficiency of 29.5% for 2T tandem cells and 28.2% for 4T ...

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All-perovskite tandem solar cells (TSCs) consist of a wide-bandgap (WBG, 1.75-1.8 eV) top subcell and a low-bandgap (LBG, 1.2-1.3 eV) bottom subcell, exhibit superior ...

Perovskite-based tandem cells as clean photovoltaic conversion devices drive the transition to decarbonized energy. Recently in Nature, Tan and co-workers report a certified efficiency of 26.4%, a record-setting efficiency in all-perovskite tandem solar cells.

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