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Advancing solar energy research with perovskite materials

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Perovskite materials used for solar cell, demonstrated remarkable PCE, that increased from 3.8% in 2009 to approximately 19.44% in 2019. However, challenges such as stability and scalability remain significant obstacles to commercialization. Improvement of the perovskite solar cell stability includes material composition and crystal quality, using both intrinsic and extrinsic methods. Researchers have reported that utilizing strategies like multi-cations, multi-halides, doping, altering crystal structure and incorporating chalcogenides have improved PCE. In addition, extrinsic methods such as encapsulation, interfacial engineering and buffer layers have been used to improve stability of perovskite materials system. Furthermore, engineering solar cell systems, which include Si-tandems are reported to be capable of improving both stability and scalability. This paper will present the results from published work towards achieving stability of perovskite solar cell.

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