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Mixed-dimensional halide perovskite solar cells with enhanced moisture stability

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In recent years, organic-inorganic halide perovskite has emerged as one of the most promising materials for low-cost and efficient solar cells. Despite its rapidly boosting power conversion efficiency in only several years,¹ the developed perovskite solar cells (PSCs) still face a major challenge of poor stability in ambient conditions, which hinders its further commercialization into marketplace. In contrast to their high-performance three-dimensional counterparts, the layered two-dimensional perovskites have shown promising stability, but poor efficiency.² Herein, we developed a facile solution method to deposit stable 2D perovskite material onto moisture-sensitive 3D perovskite film, which can enhance the long-term stability of devices against different levels of humidity without any detrimental effect on power conversion efficiency.

References

¹ Correa-Baena, J.-P.; Abate, A.; Saliba M. et al. *Energy Environ. Sci.* **2017**, *10*, 710-727. The rapid evolution of highly efficient perovskite solar cells.

² Tsai, H.; Nie, W.; Blancon, J.-C.; Stoumpos, C. C. et al. *Nat.* **2016**, *536*, 312-316. High-efficiency two-dimensional Ruddlesden-Popper perovskite solar cells.

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