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## Development of 2D/3D stable tin-based halide perovskite solar cell

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The successful use of Sn-based material as light absorber in Schottky barrier solar cell with a PCE efficiency of 0.9%, encouraged researchers to pursue the material as a possible replacement of lead for stability of perovskites. This led to the development of 2D/3D Sn-based perovskites as prospective future candidates for stable HaP solar cell, where the photo conversion efficiency (PCE) has steadily increased to 14.81%. However, the fast and easy oxidation of  $\text{Sn}^{(2+)}$  to  $\text{Sn}^{(4+)}$  in the system contributes to poor stability and low PCE of Sn-based perovskite solar cells. In this work,  $\text{SnF}_2$  was gradually introduced in the  $\text{FASnI}_3$  perovskite precursor solution alongside N-N'-diphenyl-P-phenylenediamine (DPP-DTT) antioxidant as a co-additive, and their effect on the performance and stability of the perovskite film studied. The results show improved stability from less than an hour with  $\text{SnF}_2$  alone to more than 1300 hours with DPP-DTT. A 3D planar inverted FTO/PEDOT:PSS/ $\text{FASnI}_3$ /PCBM:P3HT/Ag structure was fabricated. The results show improved stability from less than an hour with  $\text{SnF}_2$  alone to more than 1300 hours with DPP-DTT.

**Apply to be considered for a student ; award (Yes / No)?**

No

**Level for award;(Hons, MSc, PhD, N/A)?**

N/A

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