Supplementary Information

Thermally Evaporated Two-Dimensional SnS as an Efficient and Stable Electron Collection Interlayer for Inverted Planar Perovskite Solar Cells

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Figure S1. Incident photon-to-current conversion efficiency (IPCE) and integrated photocurrent density of ITO/PTAA/perovskite/C₆₀/SnS (3nm)/Ag.

Figure S2. SEM mapping for (a) Sn and (b) S of SnS film coated on ITO/PTAA/perovskite/C₆₀.
In situ (a).

(b)

(c)
Figure S3. X-ray diffraction patterns of 45nm C\textsubscript{60}, 45nm C\textsubscript{60}/8nm BCP and 45nm C\textsubscript{60}/3nm SnS coated perovskite thin films kept in the air at (a) day 0, (b) day 1, (c) day 2, (d) day 5 and (e) day 10.
Figure S4. Ratio of undegraded perovskite derived from XRD spectra for 45nm C$_{60}$, 45nm C$_{60}$/3nm SnS and 45nm C$_{60}$/8nm BCP coated perovskite thin films, using the formula based on intensities ($I$) on Figure S3, $\text{Perovskite (\%)} = 100 \times \frac{I_{4.5\,\text{eV}}}{I_{4.5\,\text{eV}} + I_{3.7\,\text{eV}} + I_{0.0\,\text{eV}}}$ taking day 0 as a baseline.

![Graph showing XRD spectra for different perovskite thin films](image)

Figure S5. (a) Ag 3d region and (b) I 3d region of XPS spectra for ITO/PTAA/perovskite/C$_{60}$/Ag, ITO/PTAA/perovskite/C$_{60}$/BCP(8nm)/Ag and ITO/PTAA/perovskite/C$_{60}$/SnS(3nm)/Ag devices that are aged for 5 days at ambient atmosphere under the light.
Figure S6. \( J-V \) characteristics of PSCs, ITO/NiO\(_x\)/perovskite/C\(_{60}\)/SnS/Ag and ITO/PTAA/perovskite/C\(_{60}\)/SnS/Ag under AM1.5G illumination (100 mW cm\(^{-2}\)) for reverse and forward scan directions.