

Supporting Information

Thermally deposited copper(I) thiocyanate thin film: an efficient and sustainable approach for hole transport layer in perovskite solar cells

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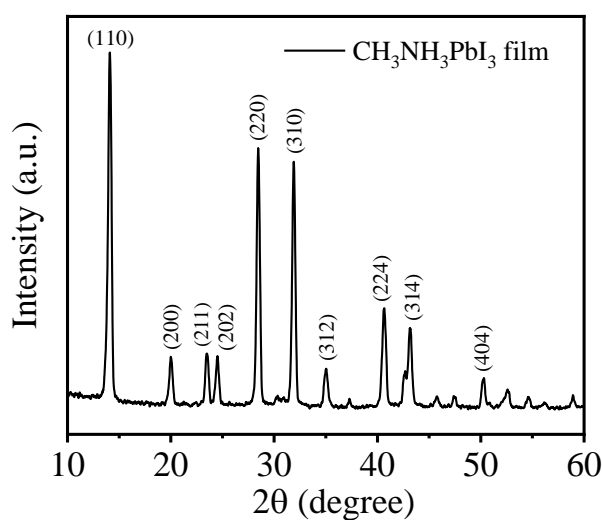


Figure S1. XRD patterns of $\text{CH}_3\text{NH}_3\text{PbI}_3$ film spin-casted on ITO-coated glass substrate.

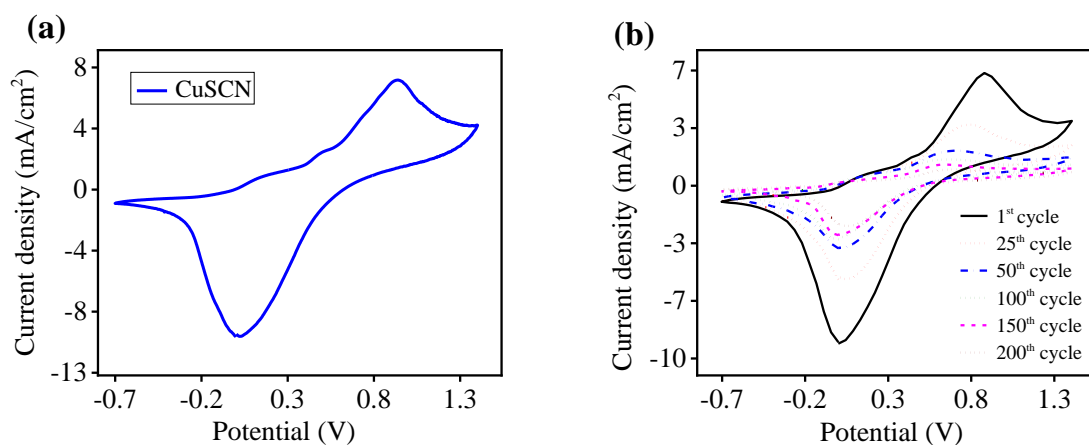


Figure S2. a) CV curve of thermally deposited CuSCN film on GC electrode in the potential range of -0.7 to 1.3 V at 100 mV/s in DMF solution containing 0.1 M TBAClO₄ as a supporting electrolyte. b) Electrochemical stability test of CuSCN film on GC in the same potential window, indicating dissolution of the film in DMF solution.

Table S1 The percentage (%) charge and (%) total charge loss of thermally deposited CuSCN film on GC during the repetitive cycling between -0.3 and 0.3 V for 500 cycles.

No. of cycles	% Charge	% Total charge loss
1	100	0
50	90	10
100	83	17
200	79	21
300	77	23
500	75	25

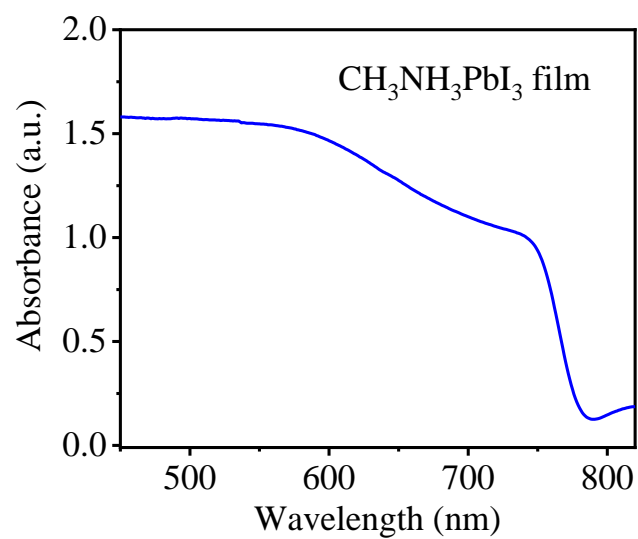


Figure S3. UV-visible spectrum of perovskite film spin-casted on quartz substrate.

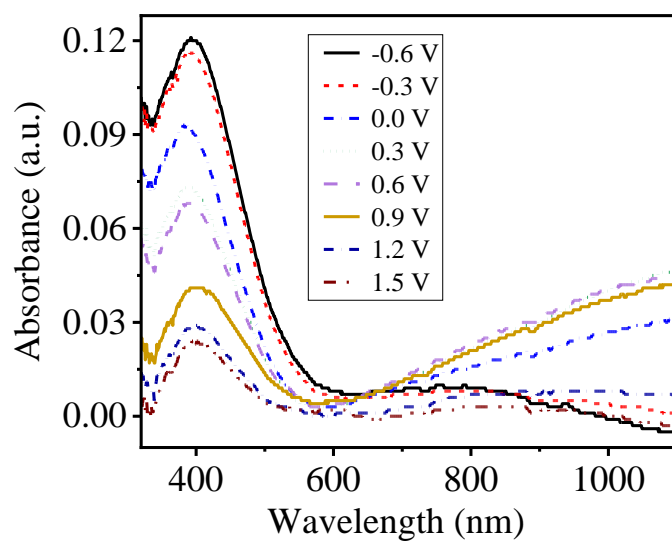


Figure S4. Spectroelectrochemistry of thermally deposited CuSCN film on ITO surface.

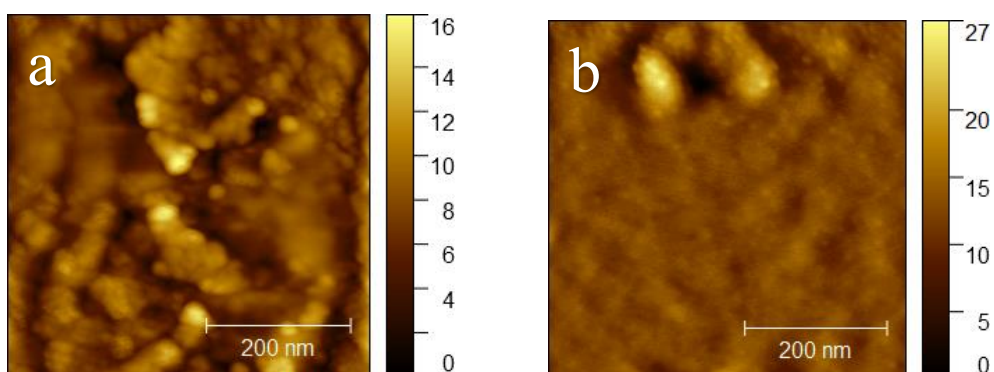


Figure S5. AFM height images (scan area of $0.5 \mu\text{m}^2$) of thermally deposited CuSCN thin films on ITO-coated glass substrates and then annealed at (a) $150 \text{ }^\circ\text{C}$ and (b) $200 \text{ }^\circ\text{C}$, which exhibits the surface R_{RMS} value of 5.2 and 6.4 nm, respectively.

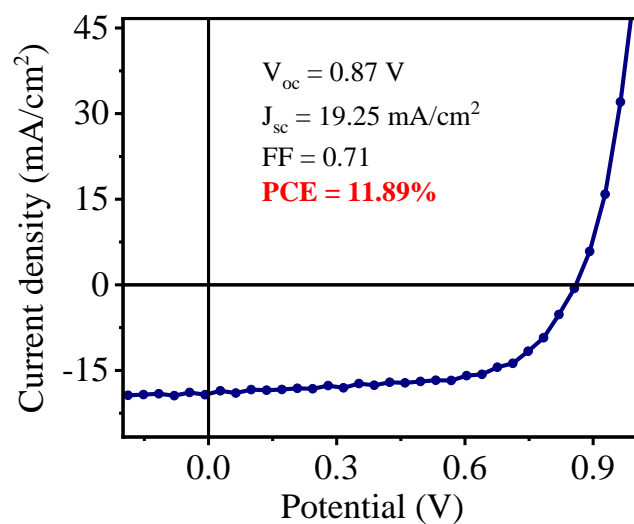


Figure S6. J-V curve of solution-processed CuSCN-based perovskite solar cells.