Supporting Information

Slot-die coated copper indium disulfide as hole-transport material for perovskite solar cells

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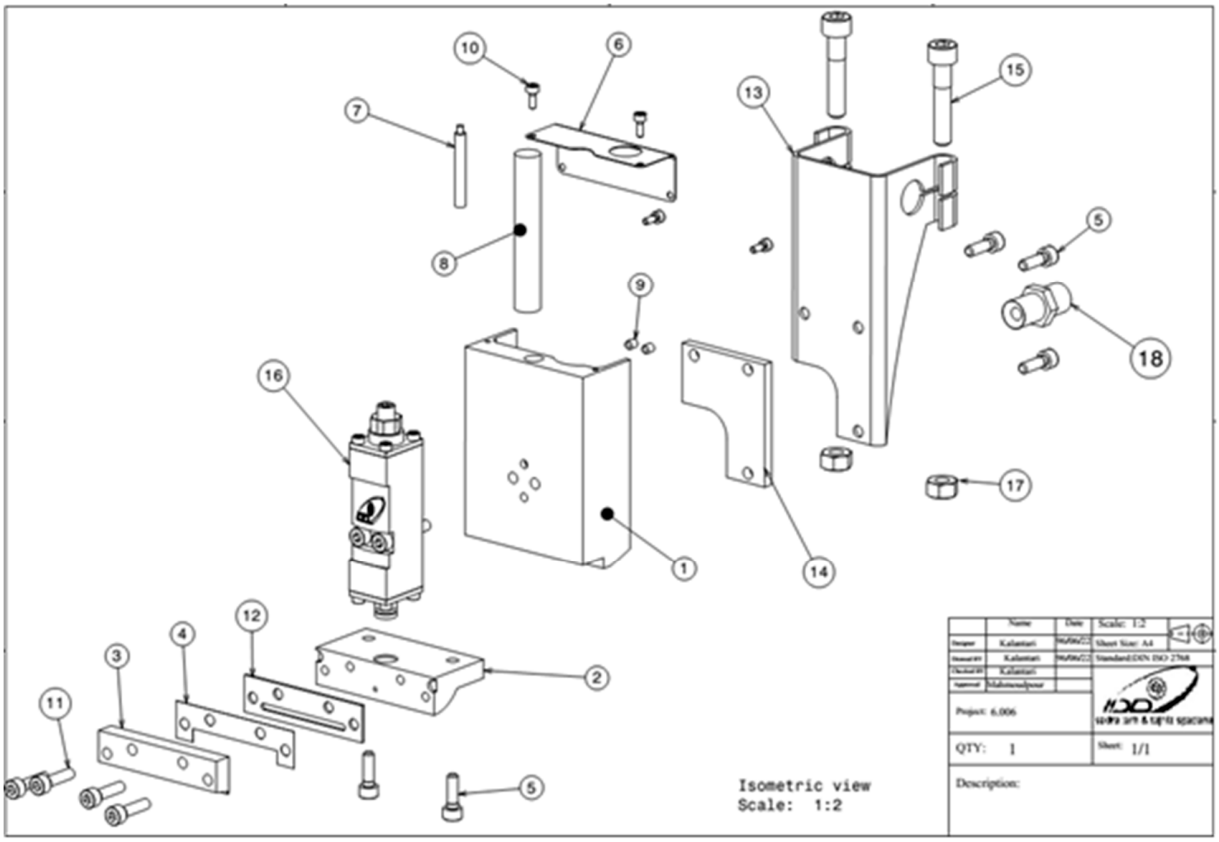
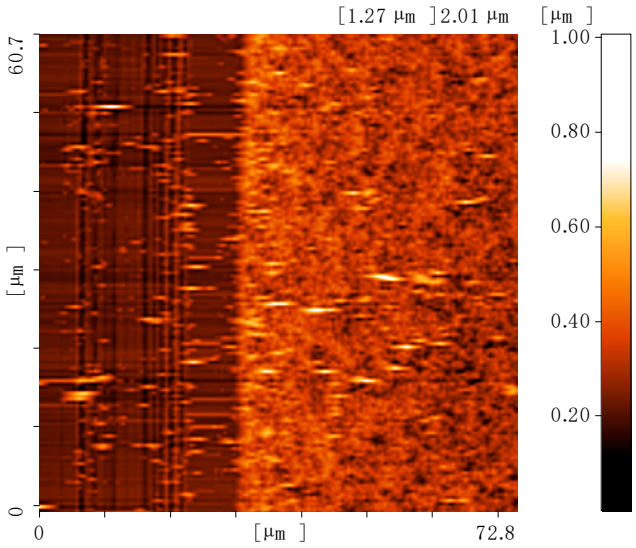


Figure S1. Fabricated Slot-die coater head. (1- Heating element housing 2- front lip 3- Back lip 4- shim 5- screw 6- heating element stopper 7- temperature sensor 8- heating element 9- alignment pins 10.11- screw 12- dispensing channel 13- 15 mounting accessories 16-electromagnetic valve 18- ink syringe pump connector



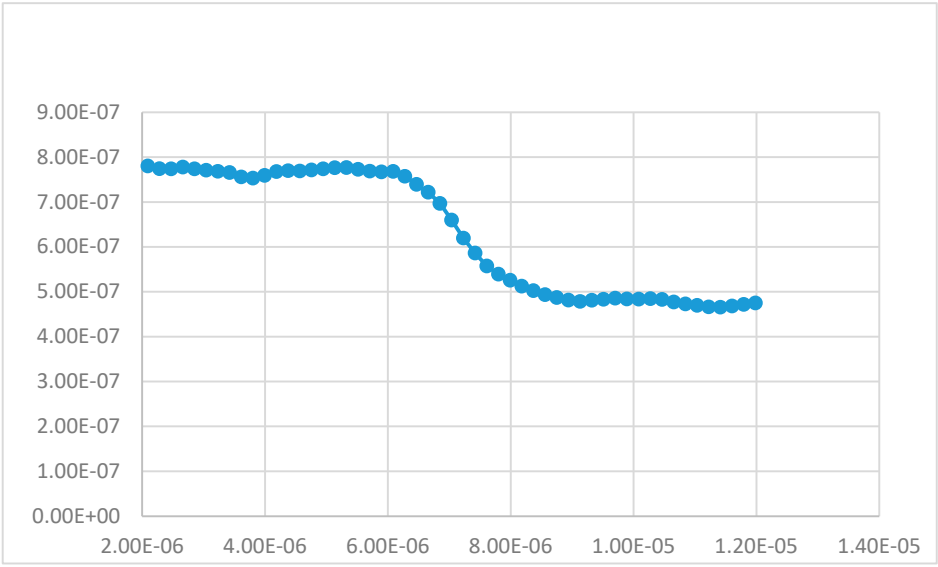


Figure S2. AFM profilometry of printed Block TiO_2 film.

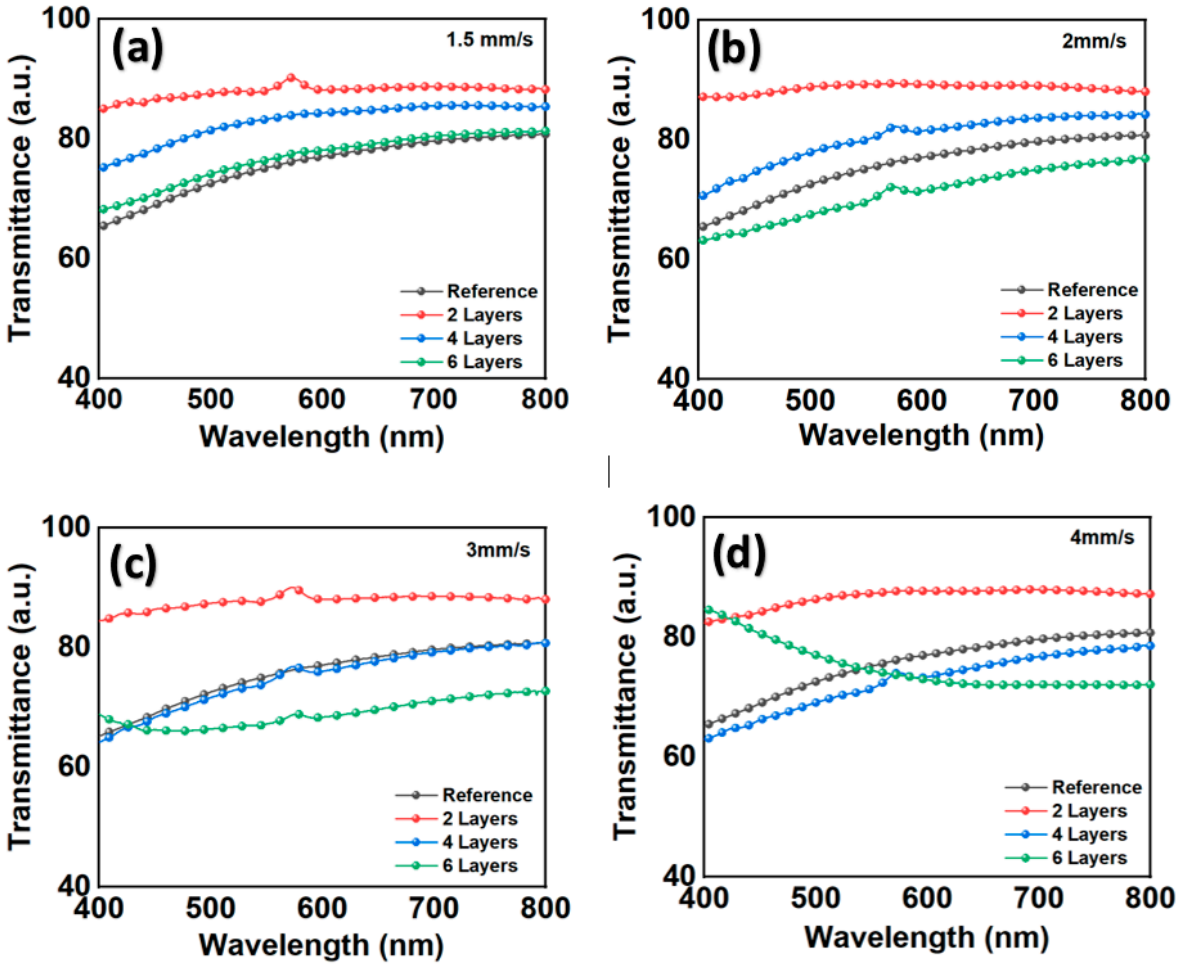


Figure S3. Transmittance spectra of the perovskite film at different printing speeds of (a) 1.5mm/s. (b) 2mm/s. (c) 3mm/s and (d) 4mm/s.

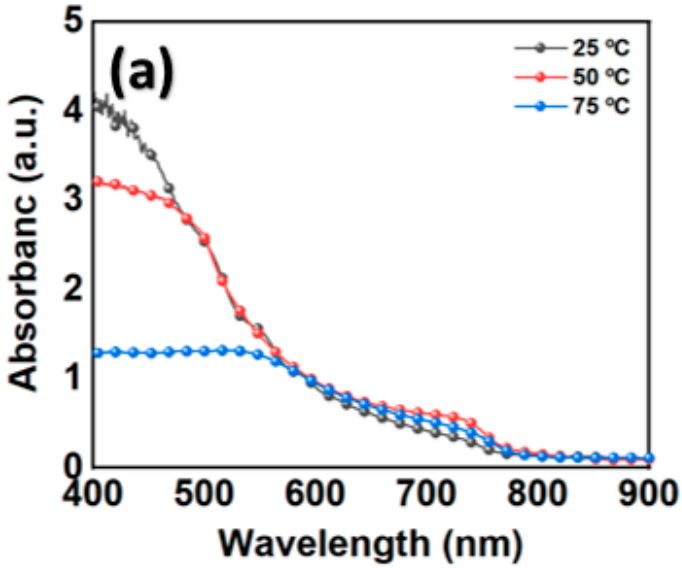
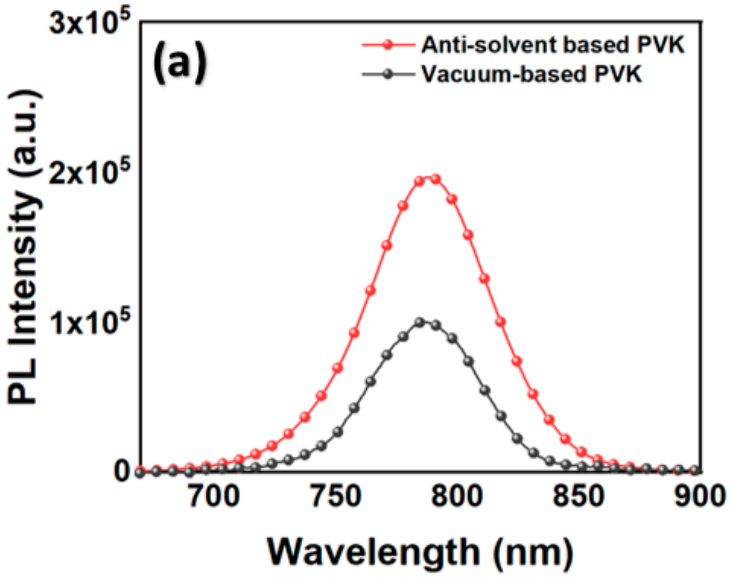




Figure S4. (a) Absorbance spectra and (b) Images of printed perovskite film at different substrate temperatures. An aluminum foil is placed under the layers for imaging with camera.



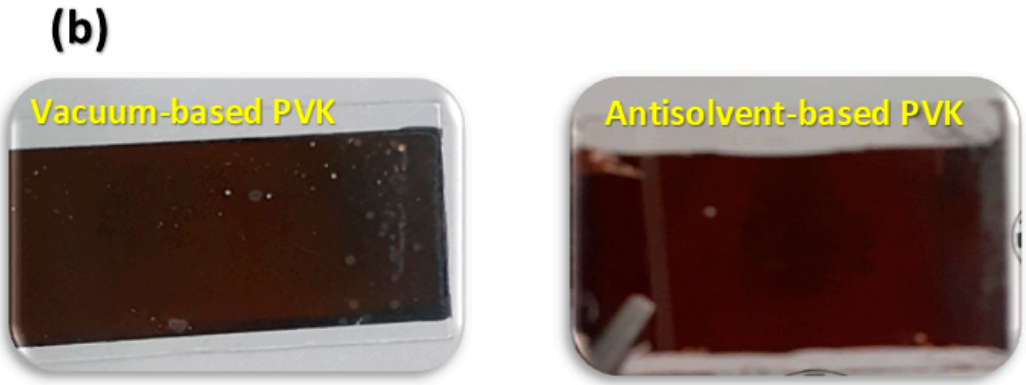


Figure S5. (a) PL spectra of printed perovskite films fabricated by anti-solvent and vacuum methods. (b) Camera Image of vacuum-based and anti-solvent-based printed perovskite films.

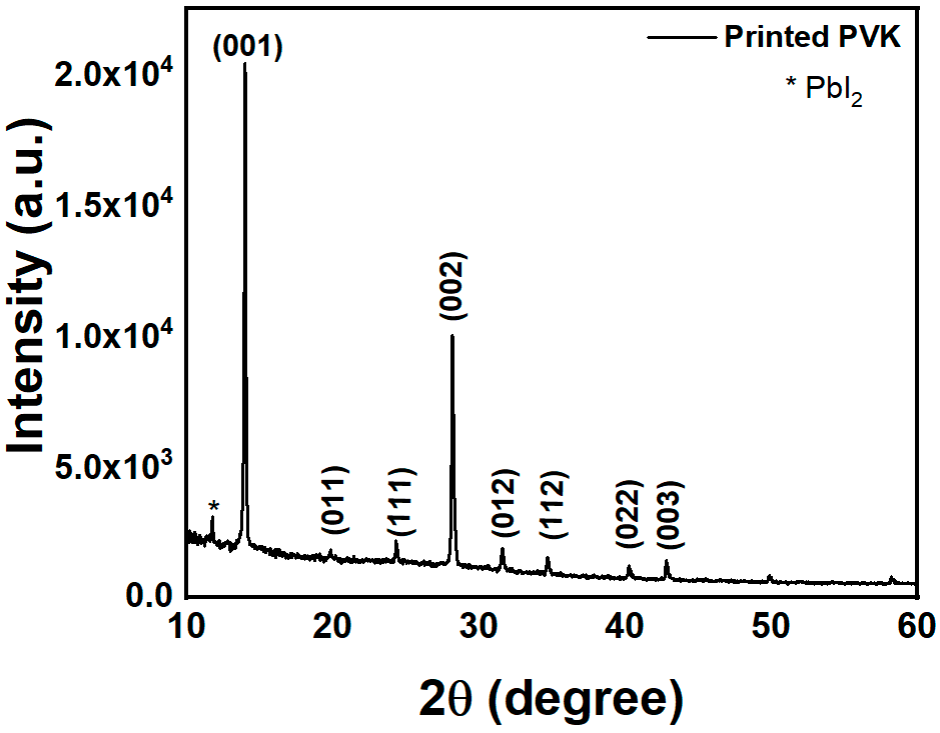


Figure S6. XRD data of printed perovskite film.