

Enhanced perovskite morphology and crystallinity for high performance perovskite solar cells using porous Hole Transport Layer from polystyrene nanospheres

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Supplementary Figures

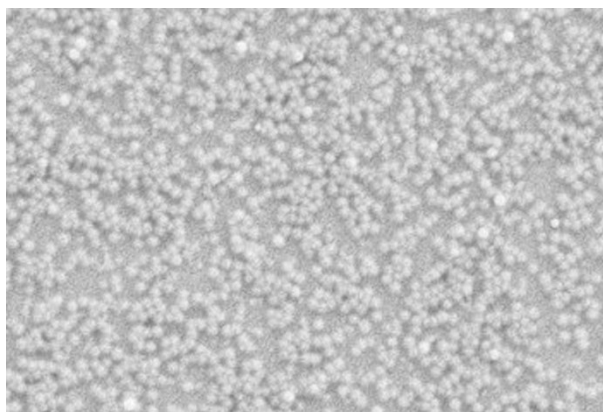


Figure S1 Top-view SEM image for the PS/PEDOT:PSS films with the PS/PEDOT: PSS volume ratio of 1:5.

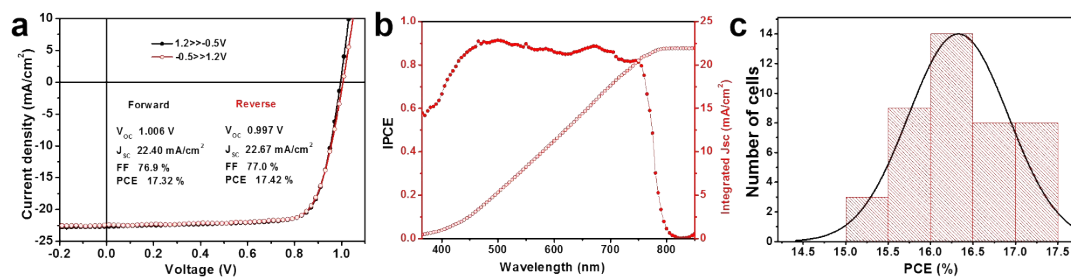


Figure S2 (a) J–V curves and (b) incident photon to current conversion efficiency (IPCE) spectrum together with IPCE data based integrated short-circuit current density (J_{sc}) for the best performing perovskite solar cell. (c) Histograms of the PCE parameters in 40 cells.

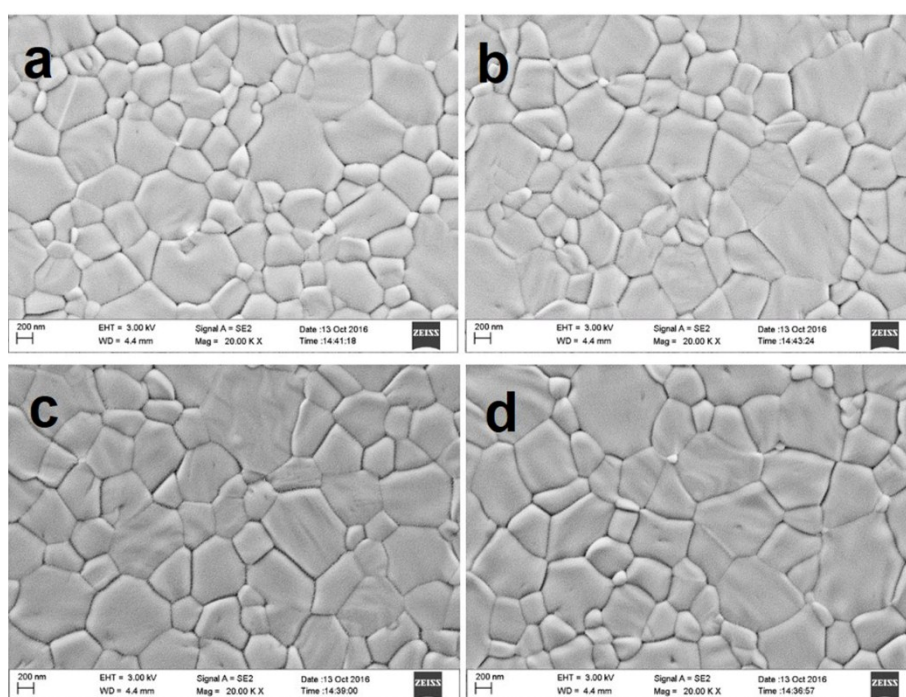


Figure S3 Top-view scanning electron microscope (SEM) images for the CH₃NH₃PbI perovskite films on porous PEDOT:PSS with PS/PEDOT:PSS volume ratio of 1:15, 1:9, 1:5 and 1:3, respectively.

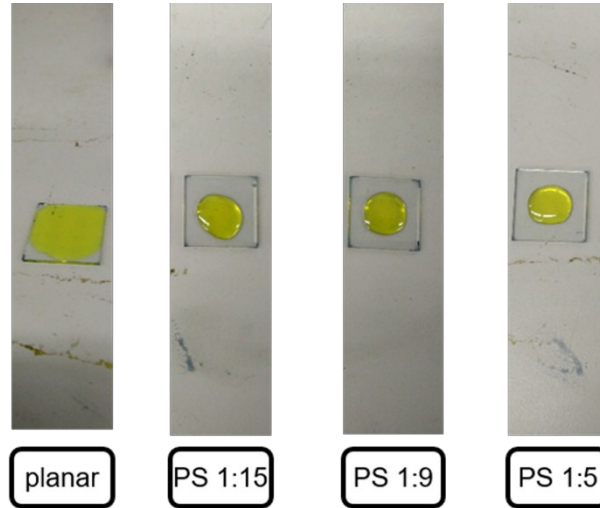


Figure S4 Photographs of the precursor solution (100 μL) on planar and porous PEDOT:PSS layer.

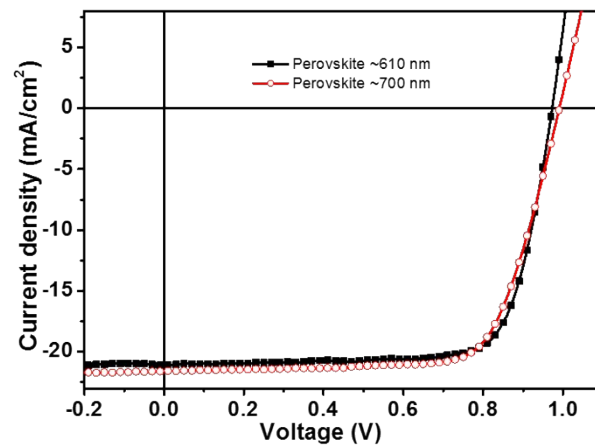


Figure S5 J-V curves of the PSCs with perovskite thickness about 610 nm and 700 nm, the perovskite were all deposited on planar-PEDOT:PSS layer.

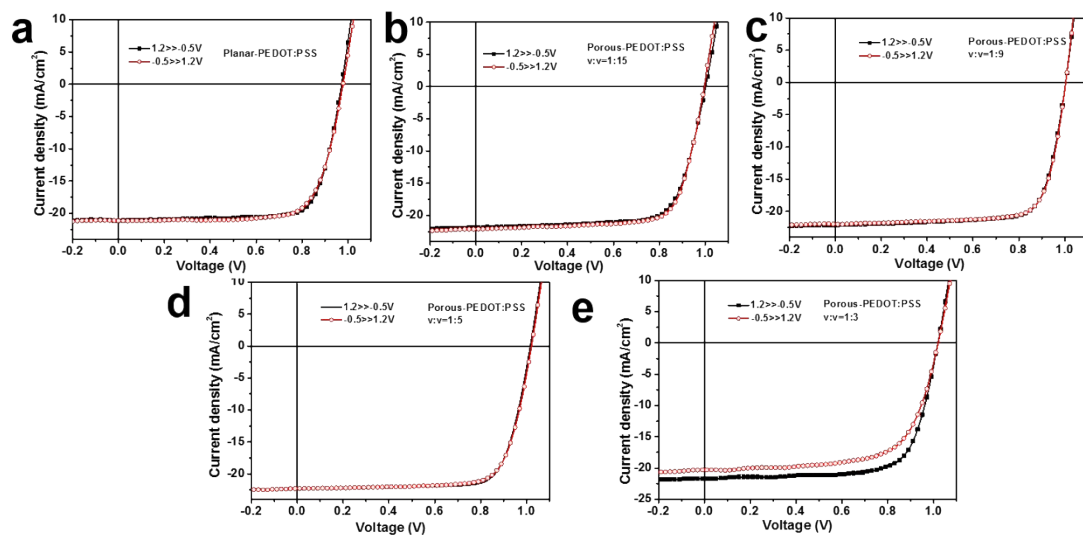


Figure S6 J-V curves of devices with different PEDOT:PSS layer, (a) planar-PEDOT:PSS, (b, c, d, e) porous-PEDOT:PSS with PEDOT:PSS volume ratio of 1: 15, 1:9, 1:5 and 1:3, measured using forward and backward scans.