

Supplementary Information

Easy accessible polymer additive in tuning the crystal-growth of perovskite thin-film for high efficient solar cell

Qingqing Dong, Zhaowei Wang, Kaicheng Zhang, Hao Yu, Peng Huang, Xiaodong Liu,
Yi Zhou*, Ning Chen*, and Bo Song*

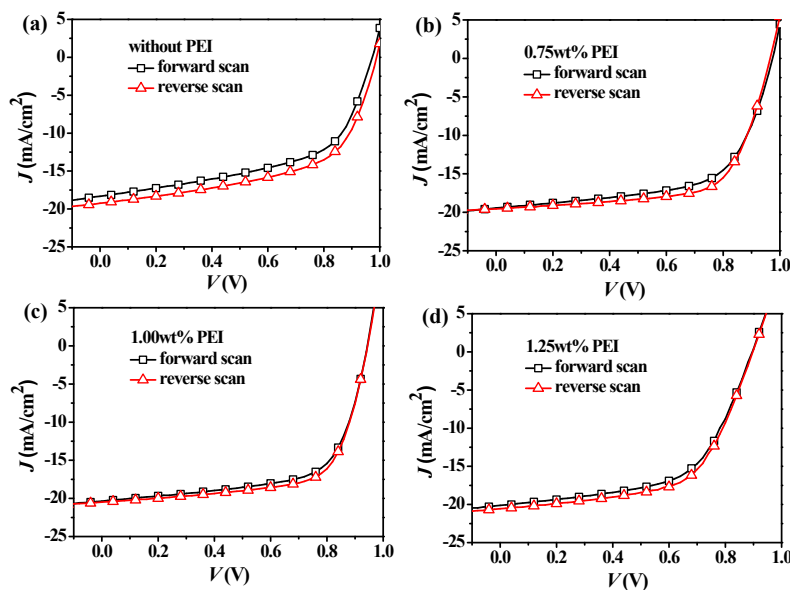


Fig. S1. J - V curves of Pero-SCs obtained by reverse and forward scanning directions with different amount of PEI additives: (a) 0, (b) 0.75 wt%, (c) 1.00 wt%, (d) 1.25 wt%.

Table S1. J - V characteristics of Pero-SCs obtained by reverse and forward scanning directions with different amount of PEI additives: (a) 0, (b) 0.75 wt%, (c) 1.00 wt%, (d) 1.25 wt%.

Weight ratios of PEI (wt%) (scan directions)	V_{oc} (V)	J_{sc} (mA cm^{-2})	FF (%)	PCE (%)
0 (forward)	0.97	18.33	54.9	9.79
0 (reverse)	0.98	19.24	56.8	10.80

0.75 (forward)	0.97	19.43	62.4	11.82
0.75 (reverse)	0.96	19.60	66.9	12.64

1.00 (forward)	0.94	20.36	65.3	12.55
1.00 (reverse)	0.94	20.48	67.8	13.09

1.25 (forward)	0.89	20.12	57.9	10.45
1.25 (reverse)	0.90	20.56	59.6	10.99

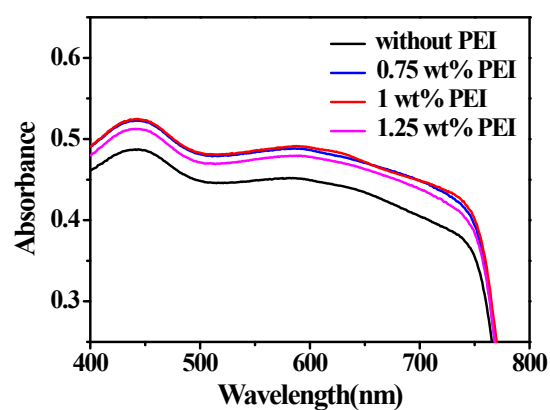


Fig. S2. Absorption spectra of ITO/PEDOT:PSS/perovskite (430 nm) thin-films (a) without PEI (b) with 1.00 wt% of PEI.

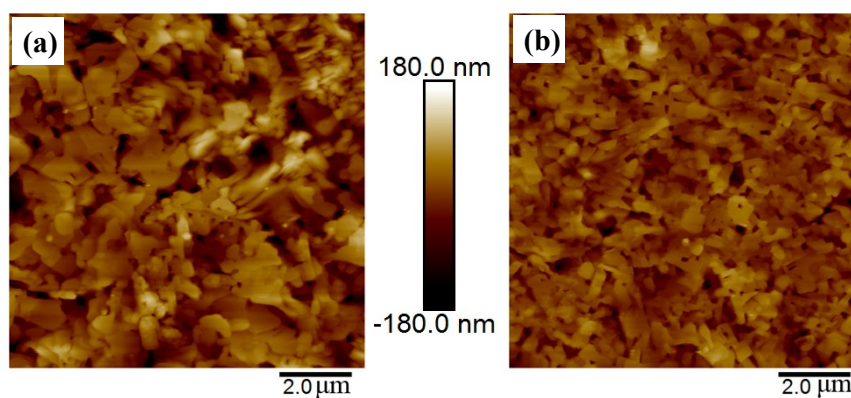


Fig. S3. AFM height images of perovskite thin-films on ITO/PEDOT:PSS (a) without PEI (b) with 1.00 wt% of PEI. The rms values extracted from the respective images are 43.29 and 18.43 nm.