Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Dual function of interface passivation and n-doping using 2,6-dimethoxypyridine for enhanced reproducibility and performance of planar perovskite solar cells

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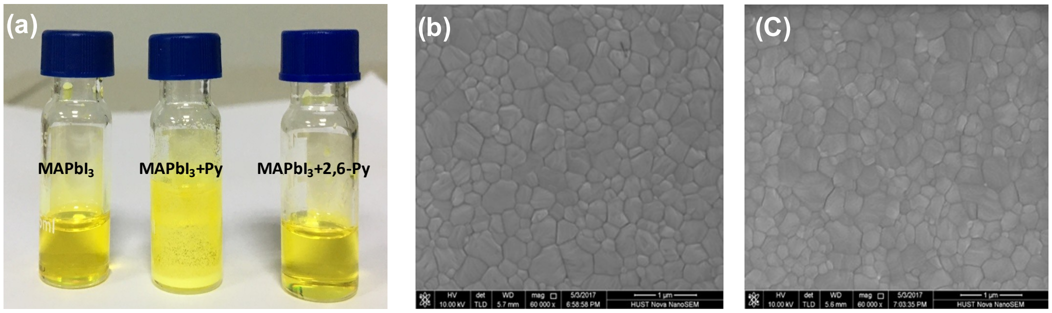

Fig. S1. (a) Photo images of DMF solutions with pristine $MAPbI_3$, mixture of $MAPbI_3$+Py, and $MAPbI_3$+2,6-Py; Top-view SEM images of $MAPbI_3$ films without (b) and (c) with 2,6-Py treatment.

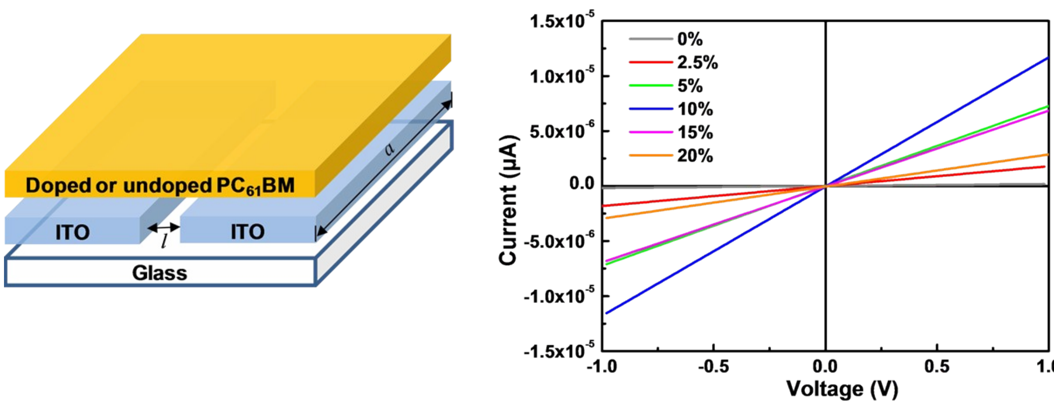

Fig. S2. (a) Structure of the device for conductivity measurements. (b) I-V characteristics of doped $PC_{61}BM$ films at varied doping ratios, respectively.

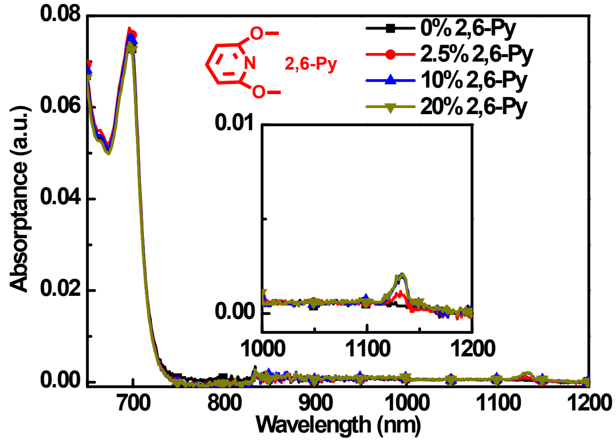

Fig. S3. The optical absorption of 2,6-Py doped $PC_{61}BM$ at varied dopant concentrations in CB solution.

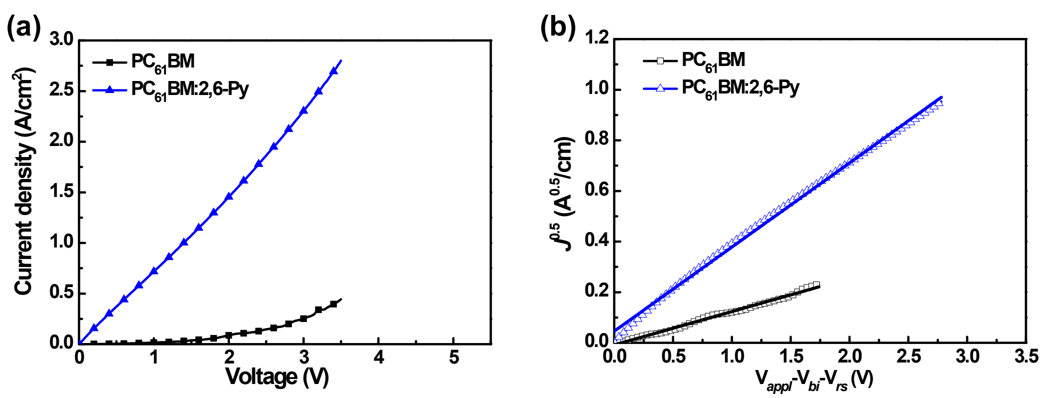

Fig. S4. (a) J vs V_{appl} and (b) $J^{0.5}$ *vs* V_{appl}-V_{rs}-V_{bi} plots for electron only devices of ITO/ZnO (20 nm)/PCBM or doped PCBM/Ca (20 nm)/Al (80 nm).

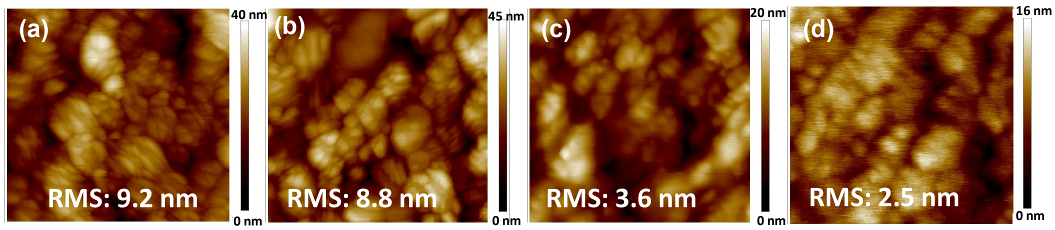

Fig. S5. AFM topographical height images of (a) pristine $MAPbI_3$ film, (b) 2,6-Py treated $MAPbI_3$ film, (c) $MAPbI_3/PC_{61}BM$ film, and (d) $MAPbI_3$(2,6-Py)/$PC_{61}BM$:2.6-Py film, respectively.

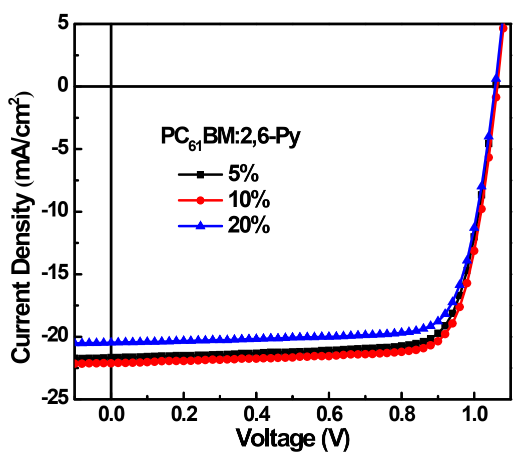

Fig. S6. The *J-V* curves of perovskite solar cells with 2,6-Py doped $PC_{61}BM$ at varied dopant concentrations.

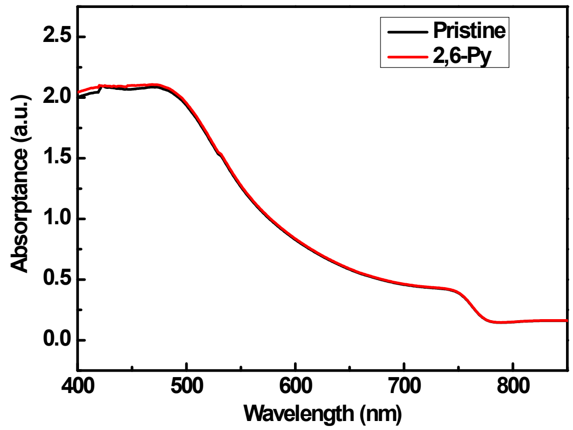

Fig. S7. The absorption spectra of $MAPbI_3$ films without and with 2,6-Py treatment.

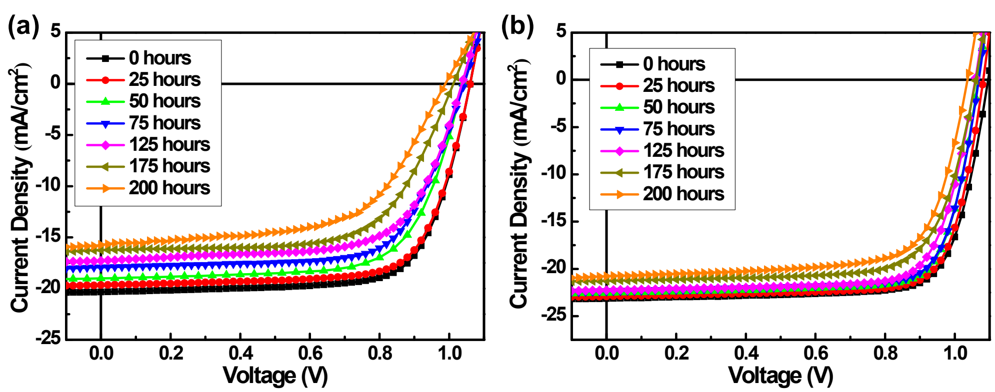

Fig. S8. *J*-*V* curves of the best $MAPbI_3$-based devices with pristine $PC_{61}BM$ and (2,6-Py)/$PC_{61}BM$:2,6-Py as a function of storage time under ambient conditions (25^{o}C, 40% relative humidity).