

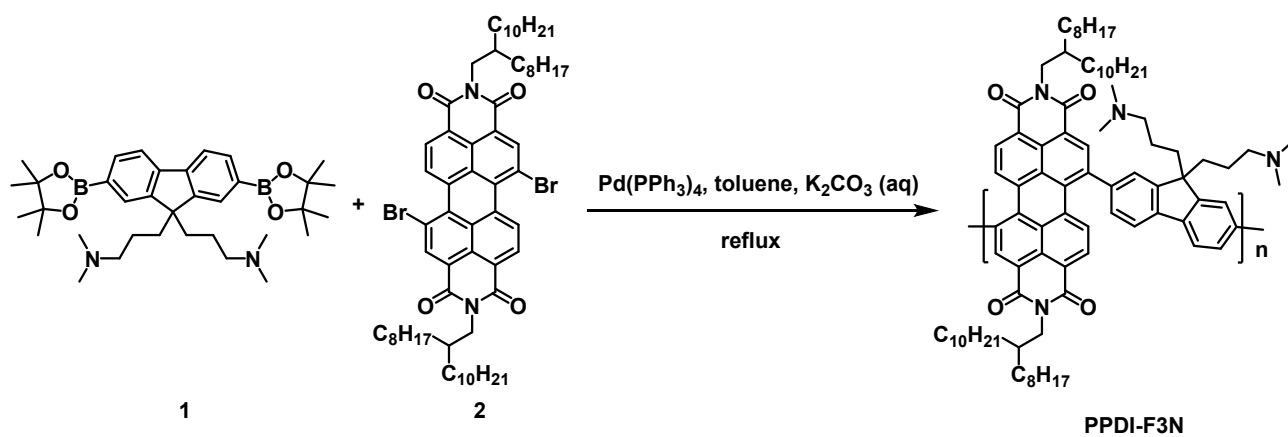
Electronic Supplementary Information

## **Amino-substituted perylene diimide polymer for conventional perovskite solar cells**

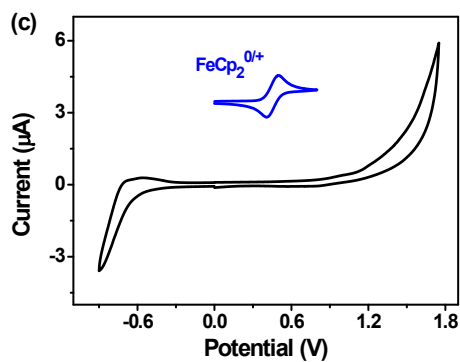
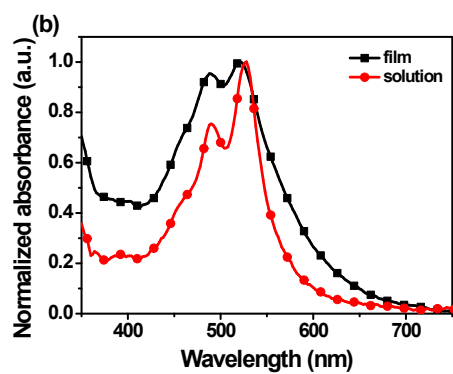
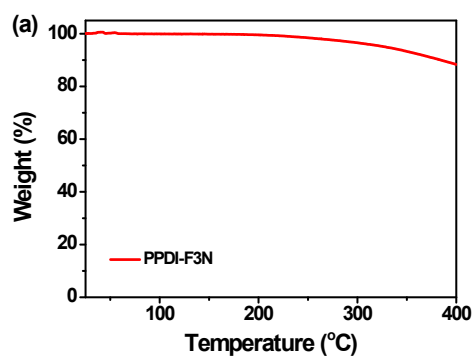
Mingyu Zhang,<sup>a</sup> Tengfei Li,<sup>a</sup> Guanhaojie Zheng,<sup>a</sup> Liang Li,<sup>a</sup> Meng Qin,<sup>a</sup> Shiming Zhang,<sup>b</sup> Huanping Zhou\*<sup>a</sup> and Xiaowei Zhan\*<sup>a</sup>

<sup>a</sup> *Department of Materials Science and Engineering, College of Engineering, Peking University, Beijing 100871, P. R. China. E-mail: xwzhan@pku.edu.cn, happy\_zhou@pku.edu.cn*

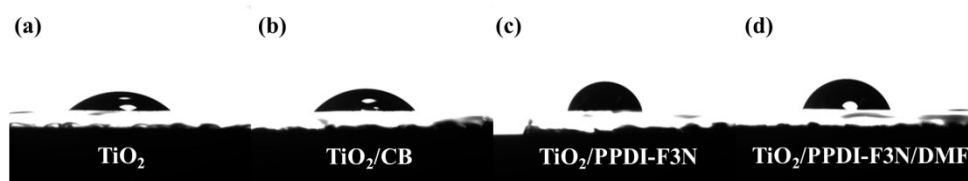
<sup>b</sup> *Key Laboratory of Flexible Electronics & Institute of Advanced Materials, Jiangsu National Synergetic Innovation Center for Advanced Materials, Nanjing Tech University, Nanjing 211816, China*



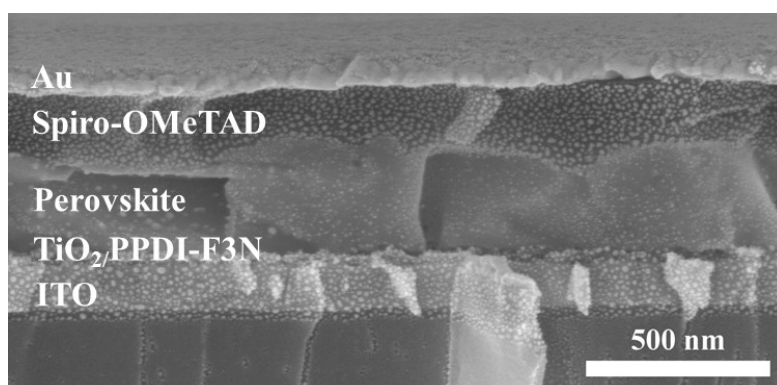
Scheme S1 Synthesis route of PPDI-F3N.



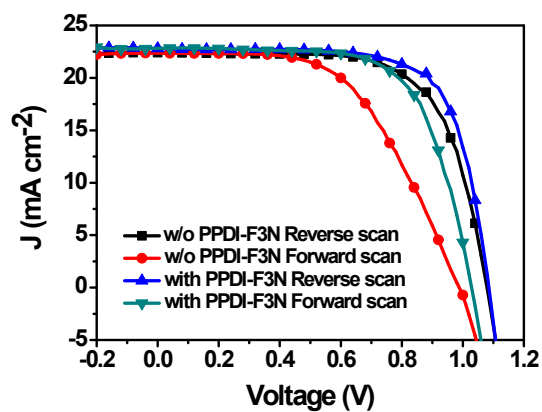
**Fig. S1** (a) TGA curve; (b) normalized UV-vis absorption spectra; (c) CV diagram of PPDI-F3N.



**Fig. S2** Contact angles of water drops on different substrates: (a) ITO/TiO<sub>2</sub>, (b) ITO/TiO<sub>2</sub>/CB, (c) ITO/TiO<sub>2</sub>/PPDI-F3N, and (d) ITO/TiO<sub>2</sub>/PPDI-F3N/DMF.



**Fig. S3** SEM image of cross-sectional structure of PSCs.



**Fig. S4**  $J$ - $V$  hysteresis curves of PSCs without and with PPDI-F3N.

**Table S1** Photovoltaic parameters of the modified devices with PPDI-F3N interfacial layer under different concentrations.

PPDI-F3N (mg mL <sup>-1</sup> )	$J_{SC}$ (mA cm <sup>-2</sup> )	$V_{OC}$ (V)	FF (%)	PCE (%)
1	20.9	1.02	70.8	15.1
0.5	20.9	1.04	70.5	15.4
0.3	22.3	1.04	72.4	16.9
0.1	22.8	1.06	71.7	17.4
0.05	22.6	1.03	72.0	16.7