Supporting Information

Organic Bulk-Heterojunction Injected Perovskite Films for Highly Efficient Solar Cells

Ke-Hao Hu, Zhao-Kui Wang, Meng Li, Kai-Li Wang, Yue Zhang, and Liang-Sheng Liao**

Institute of Functional Nano & Soft Materials (FUNSOM), Jiangsu Key Laboratory for Carbon-Based Functional Materials & Devices, Soochow University, Suzhou, Jiangsu 215123, China

*Address correspondence to zkwang@suda.edu.cn (Z. K. Wang); lsliao@suda.edu.cn (L. S. Liao)

KEYWORDS: Perovskite solar cells; Crystallization; Passivation; Bulk-Heterojunction.

Table of Contents

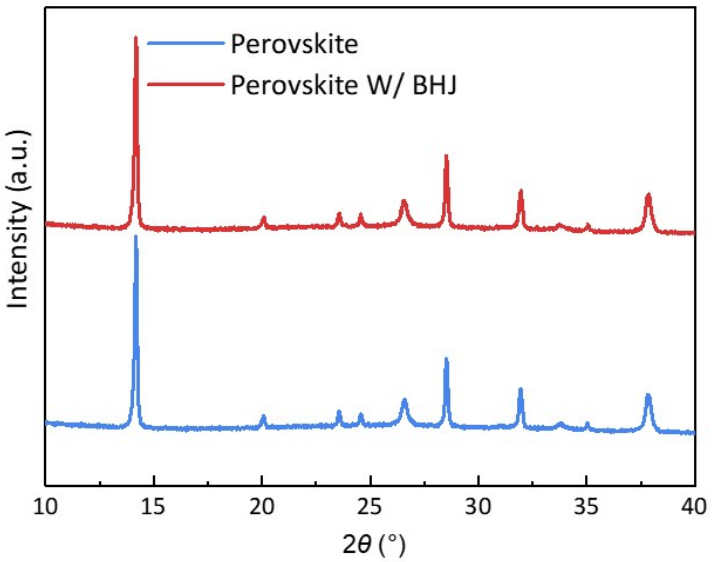


Figure S1. X-ray di□raction (XRD) pattern of $CH_3NH_3PbI_3$ and $CH_3NH_3PbI_3$: BHJ films.

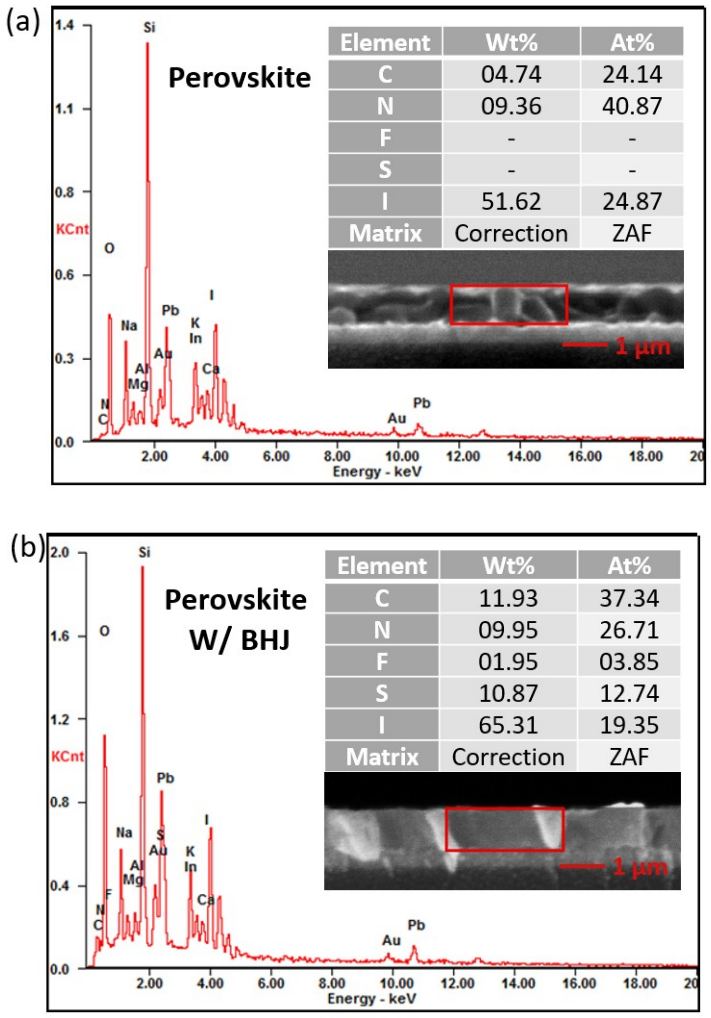


Figure S2. EDAX spectra of a) $CH_3NH_3PbI_3$ and b) $CH_3NH_3PbI_3$: BHJ films.

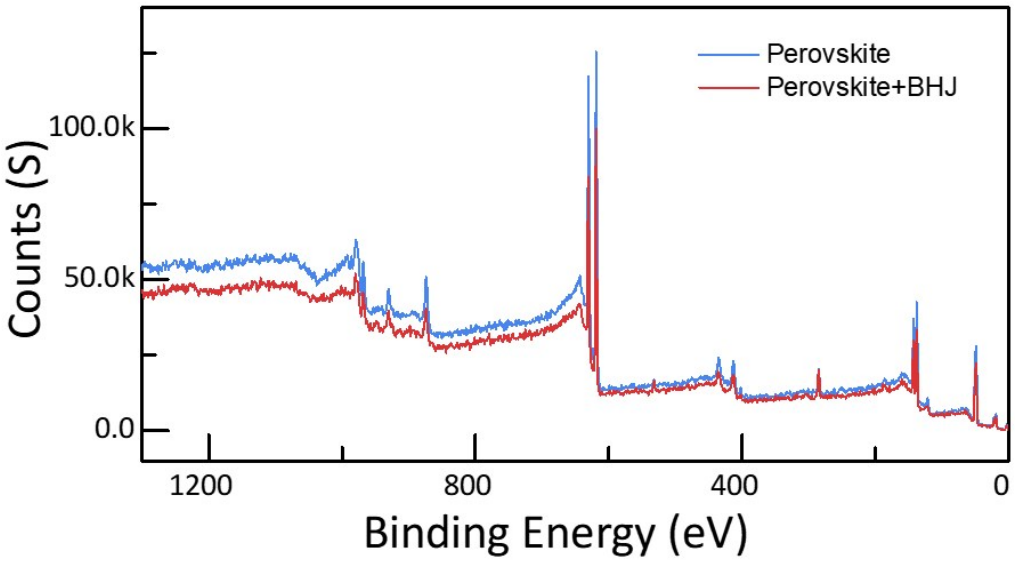


Figure S3. X-ray photoelectron spectroscopy (XPS) measurements. The survey spectra of $CH_3NH_3PbI_3$ and $CH_3NH_3PbI_3$: BHJ films.

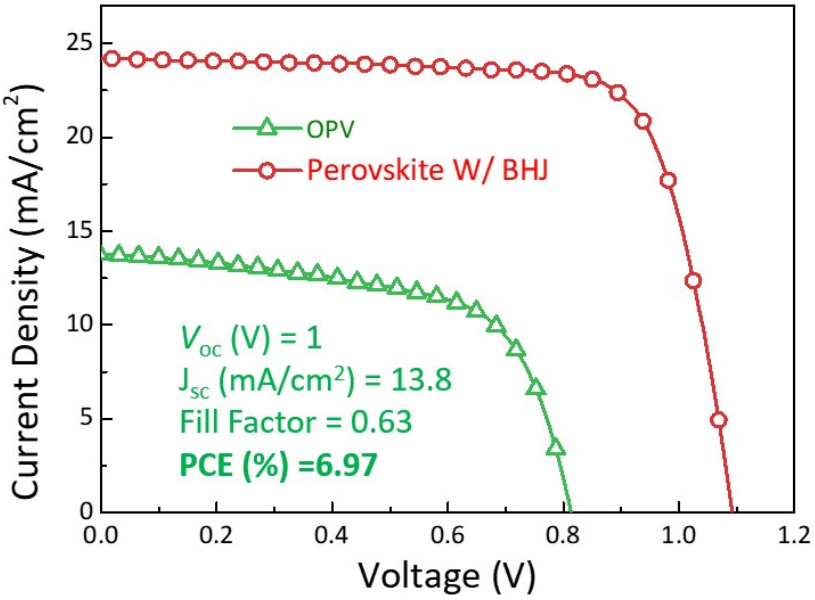
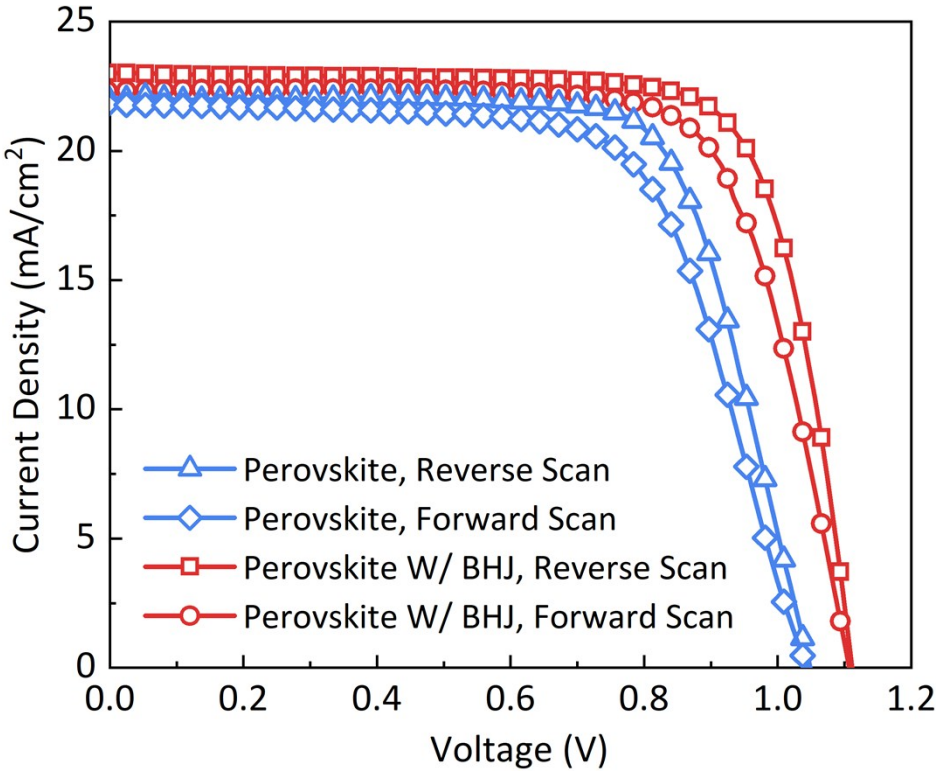


Figure S4. *J-V* characteristics of organic solar cell device using PTB7: ITIC (1:1) as active layer and $CH_3NH_3PbI_3$: BHJ-based champion device.



Device	***Scan Direction***	V_{oc} **(V)**	J_{sc} **(mA/cm^2)**	**FF(%)**	**PCE (%)**
Reference	Reverse	1.06	22.0	71	16.69
	Forward	1.05	21.8	67	15.28
Perovskite W/ BHJ	Reverse	1.11	23.2	76	19.54
	Forward	1.11	22.3	73	18.17

Figure S5. *J-V* characteristics of representative $CH_3NH_3PbI_3$- and $CH_3NH_3PbI_3$: BHJ-based devices under different scan directions

Table S1. The performance of perovskite solar cells based on different concentration of PTB7: ITIC in chlorobenzene.

Device	V_{oc} (V)	J_{sc} (mA/cm^2)	FF	PCE (%)
0.12 mg/ml	1.11	23.0	74	18.99
0.24 mg/ml	1.10	24.2	76	20.00
0.48 mg/ml	1.00	22.6	74	18.49