Supplementary Materials

Effect of Polarization on Performance of Inverted Electron Transport Layer-Free Solar Cells Based on Molecular Ferroelectric Hexane-1,6-Diammonium Pentaiodobismuth

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*   Correspondence: xpzou2014@163.com (X.Z.); jlzhu@bistu.edu.cn (J.Z.); Tel.: +86-1364-105-6404 (X.Z.)
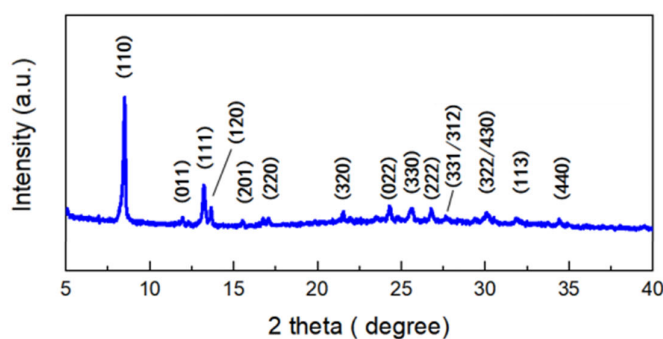
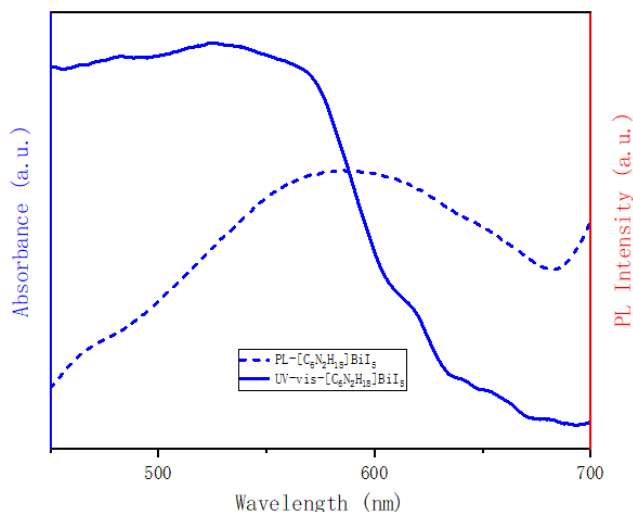**Figure S1.** X-ray diffraction spectra of organic-inorganic hybrid ferroelectric materials.

Figure S2. Ultraviolet-visible light (UV-vis) absorption spectra and photoemission spectra (PL) of organic-inorganic hybrid ferroelectric films.
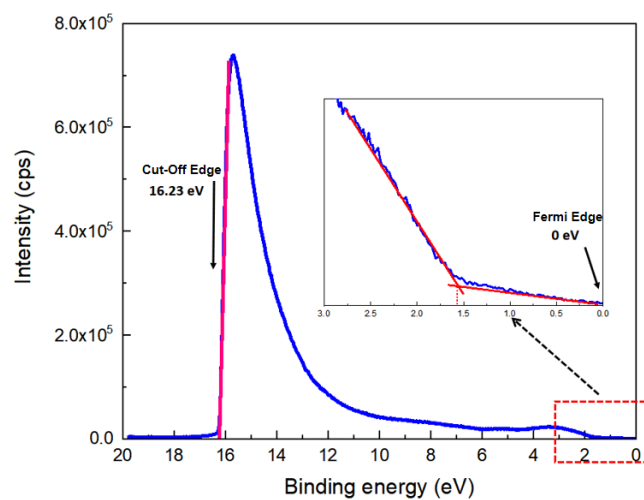
Figure S3. Ultraviolet Photoelectron Spectroscopy (UPS) of Organic-inorganic Hybrid Ferroelectric Material HDA-BiI$_5$.
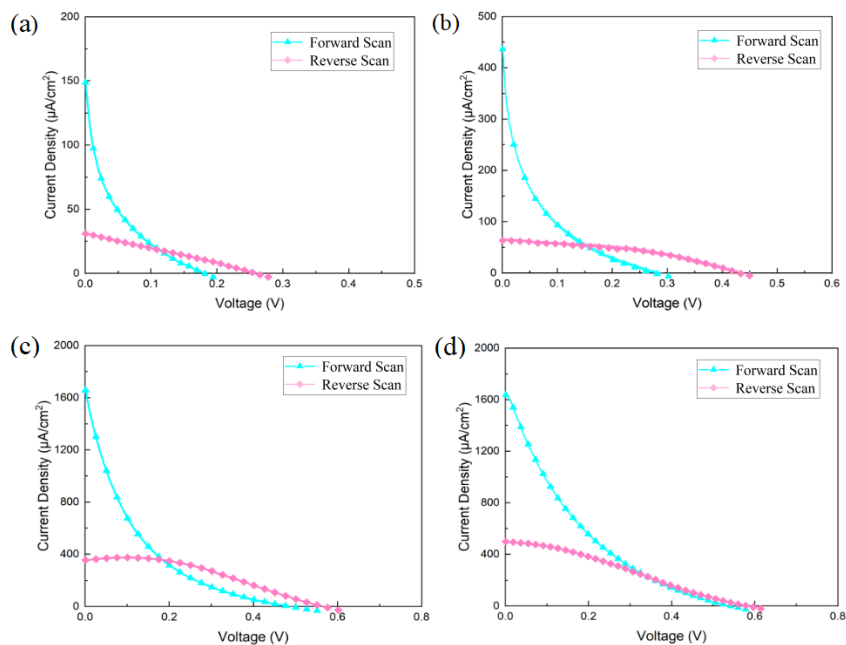

Figure S4. J-V curves of ITO/NiO$_x$/HDA-BiI$_5$/PCBM/Ag structure devices after different constant voltage polarization. (a) 0.6V, (b) 0.8V, (c) 1.0V, (d) 1.2V.
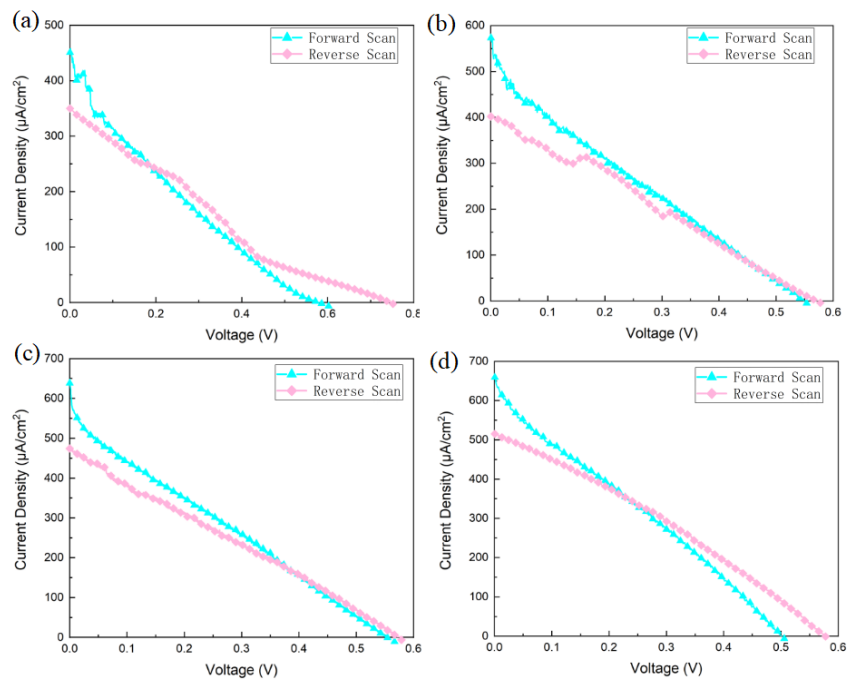
Figure S5. J-V curves of the optimized device after different voltage polarization. (a) 0.6V, (b) 0.8V,(c) 1.0V, (d) 1.2V.
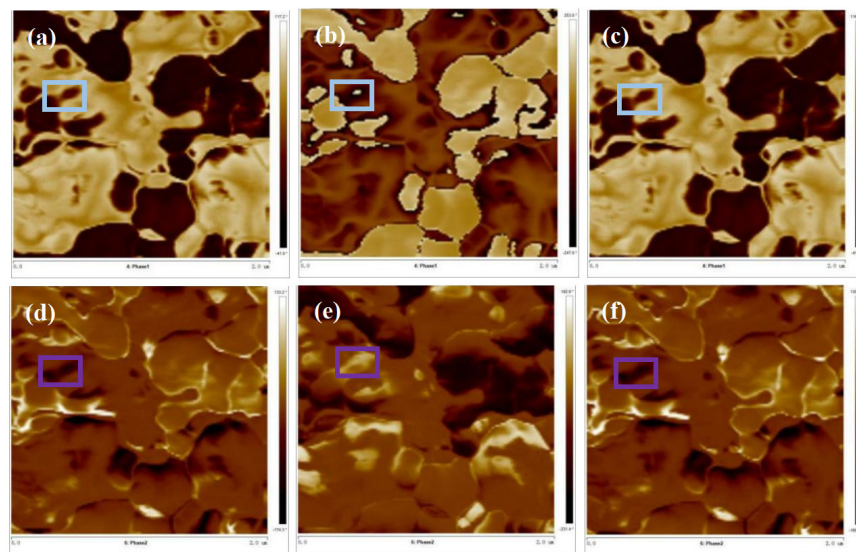

Figure S6. The vertical PFM phase angles of ferroelectric films are (a) -10 V, (b) 10 V, (c) -10 V and the horizontal PFM phase angles are (d) -10 V, (e) 10 V, (f) -10 V.