

Supplementary Information

Inverted flexible $\text{CH}_3\text{NH}_3\text{PbI}_3$ perovskite hybrid solar cells with improved flexibility by introduction of polymeric electron conductor

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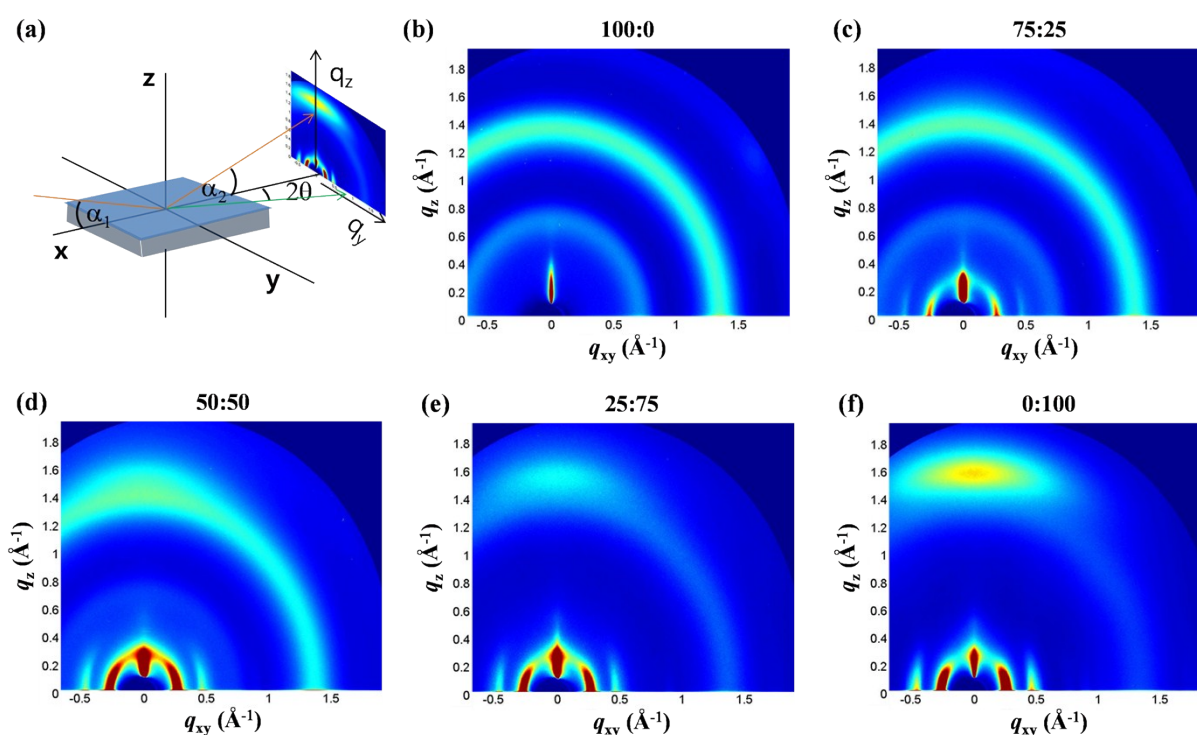


Fig. S1. GIWAX scattering images of PCBM:PNDI-2T films with different compositional ratio. (a) schematic illustration for explaining GIWAX scattering image, (b) 100:0, (c) 75:25, (d) 50:50, (e) 25:75, and (f) 0:100.

Electron Transport Layer (PC ₆₁ BM:PNDI-2T)	μ_e [cm ² /V s] ^a
100:0	2.60×10^{-4}
75:25	2.08×10^{-4}
50:50	1.29×10^{-4}
25:75	2.63×10^{-5}
0:100	2.07×10^{-5}

^aElectron-only device is ITO/ZnO/Active Layer/LiF/Al.

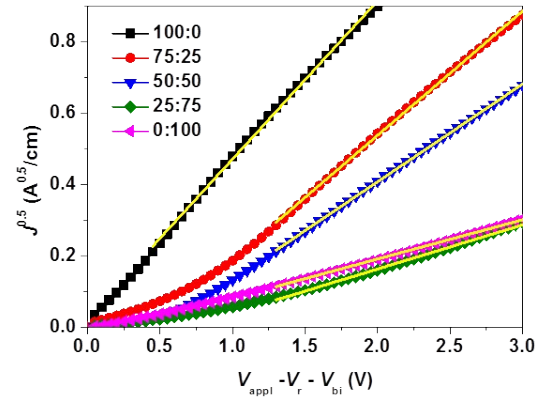


Fig. S2. The space charge limited current (SCLC) electron mobility for PCBM:PNDI-2T electron conductor films with content ratios of 100:0, 75:25, 50:50, 25:75 and 0:100.

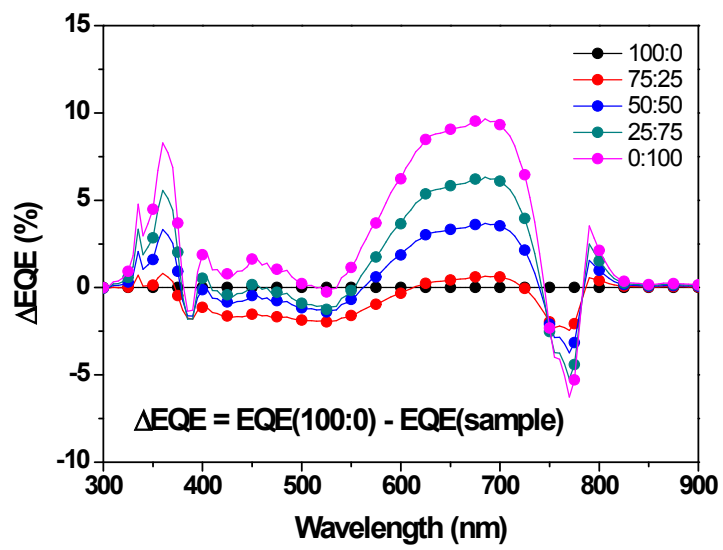


Fig. S3. ΔEQE (= $EQE(100:0) - EQE(\text{sample})$) spectra of inverted type MAPbI₃ perovskite solar cells.

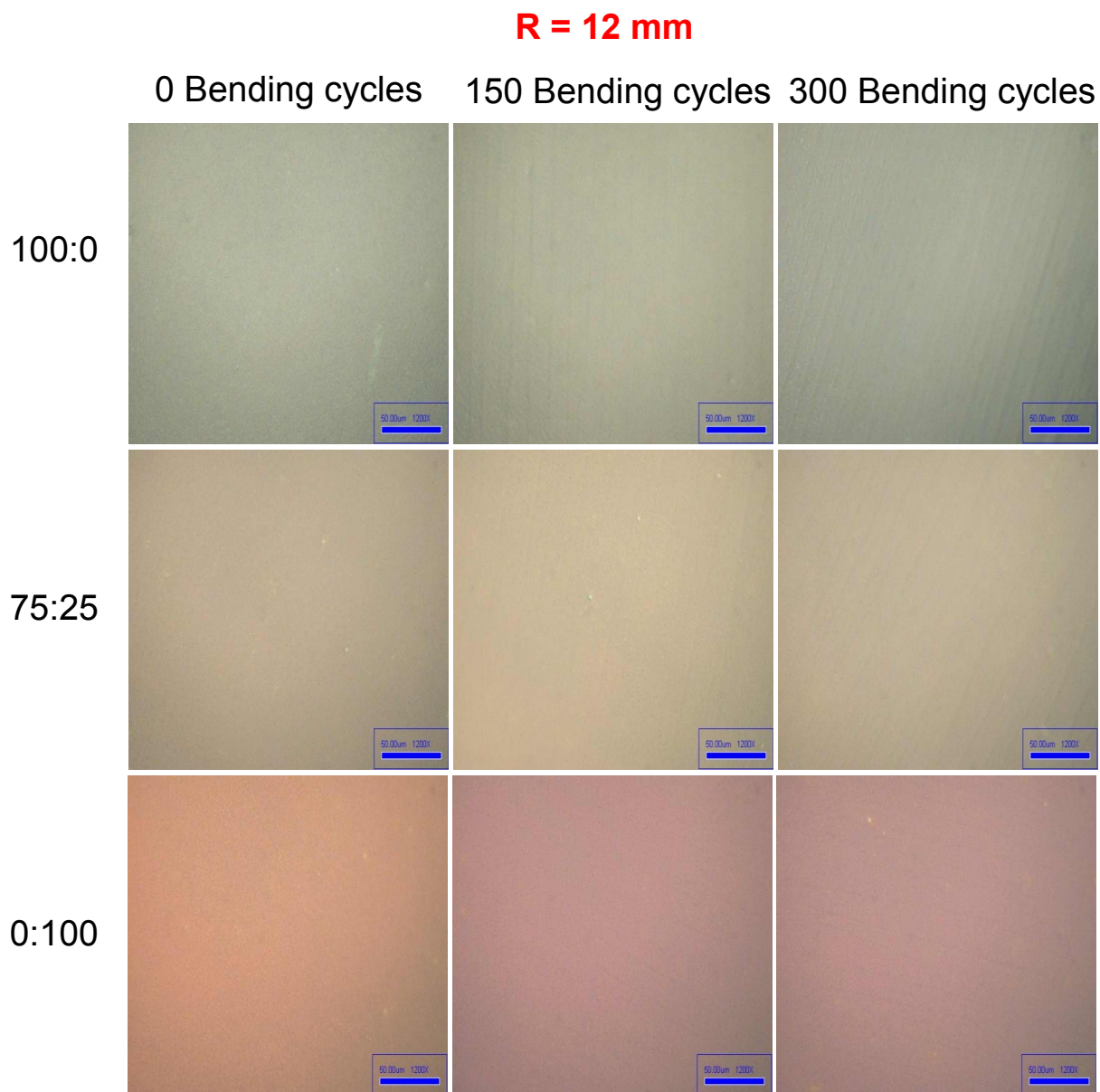


Fig. S4. The optical microscopy images of PCBM:PNDI-2T = 100:0, 75:25, and 0:100 electron conductor films with respect to bending curvature radius ($R = 12$ mm) and number of bending cycles (0, 150 and 300 cycles).

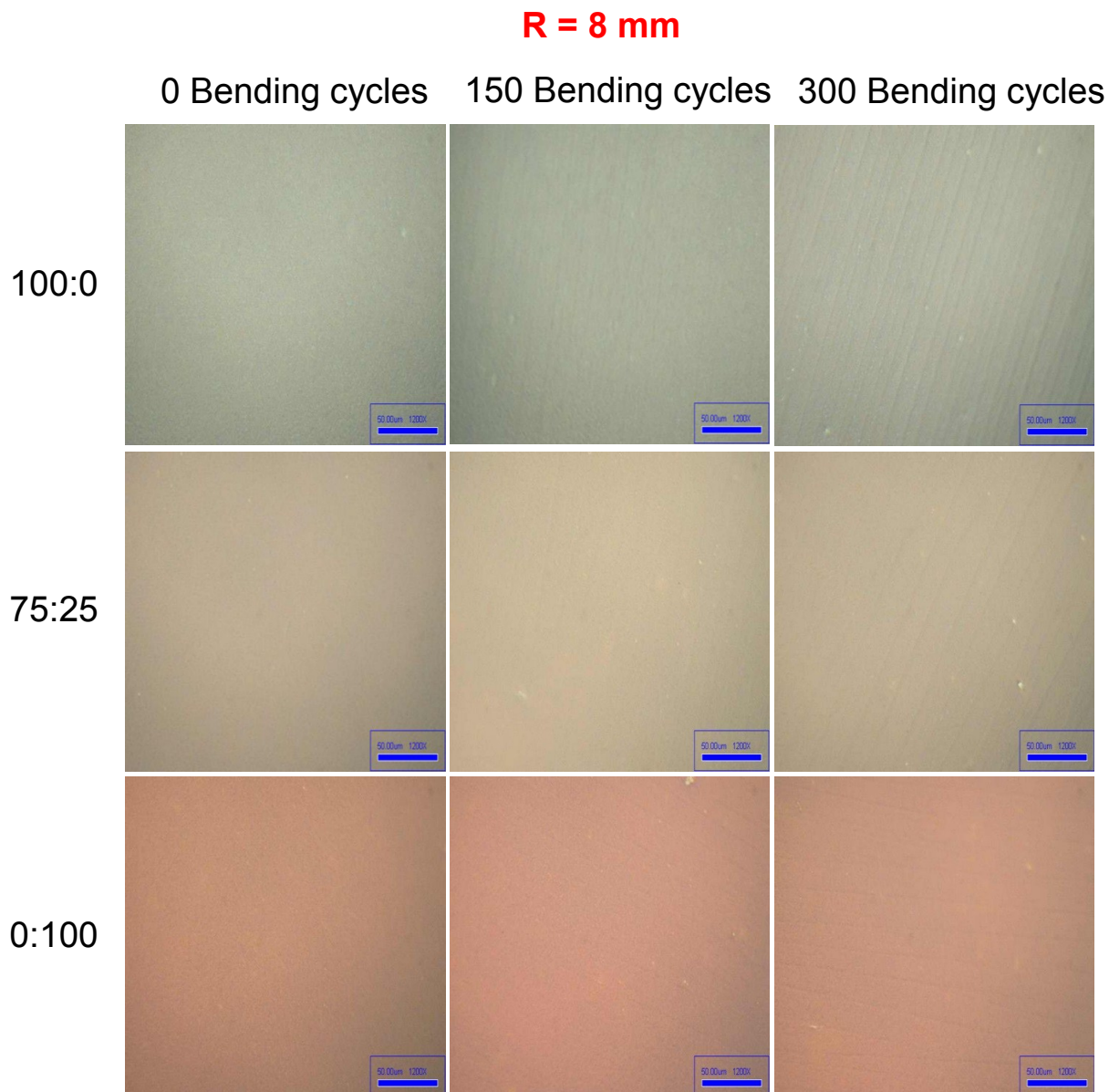


Fig. S5. The optical microscopy images of PCBM:PNDI-2T = 100:0, 75:25, and 0:100 electron conductor films with respect to bending curvature radius ($R = 8 \text{ mm}$) and number of bending cycles (0, 150 and 300 cycles).

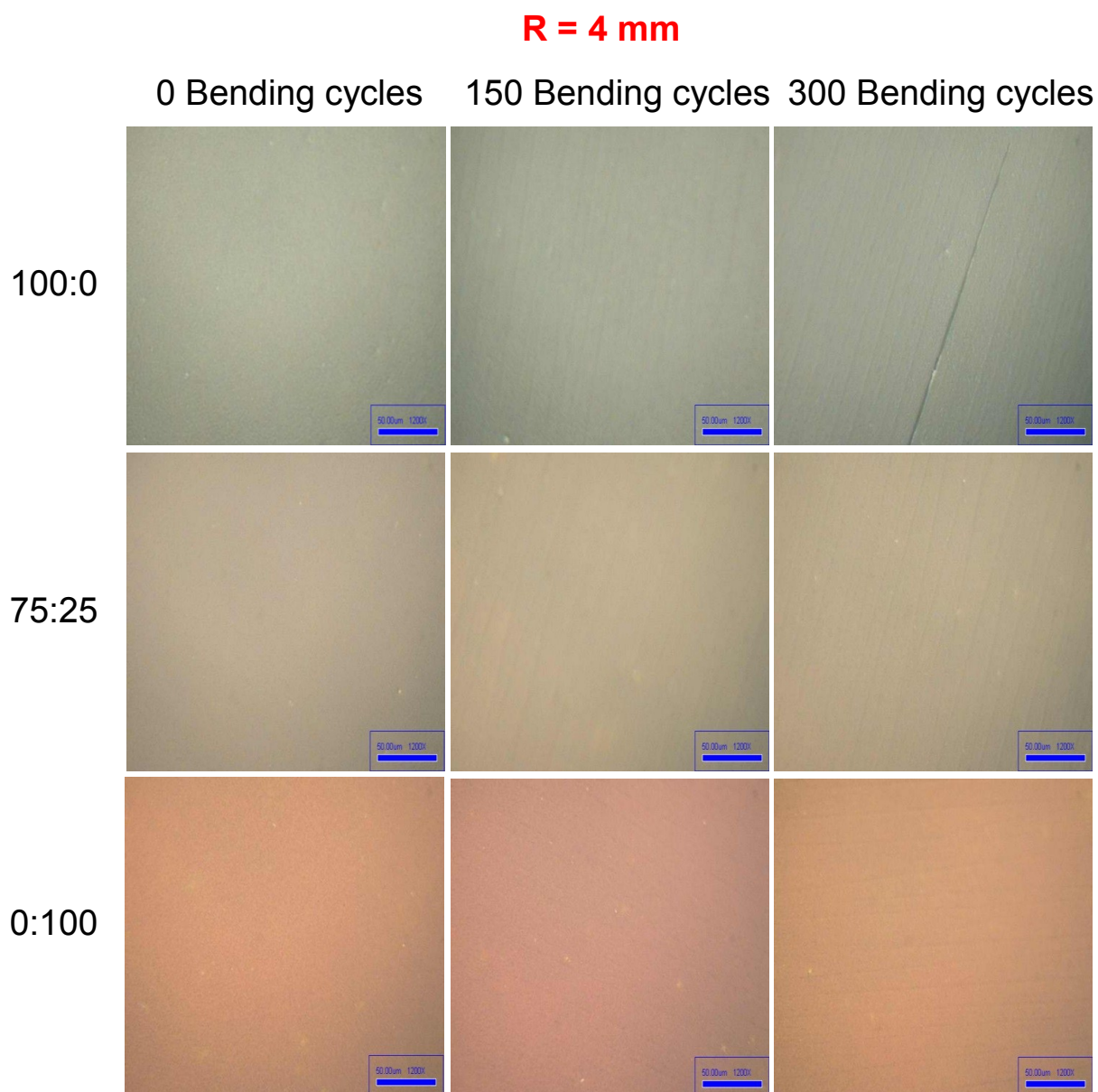


Fig. S6. The optical microscopy images of PCBM:PNDI-2T = 100:0, 75:25, and 0:100 electron conductor films with respect to bending curvature radius ($R = 4$ mm) and number of bending cycles (0, 150 and 300 cycles).