

Electronic Supplemental Information for

Hydrogen Plasma–Treated MoSe₂ Nanosheets Enhance the Efficiency and Stability of Organic Photovoltaics

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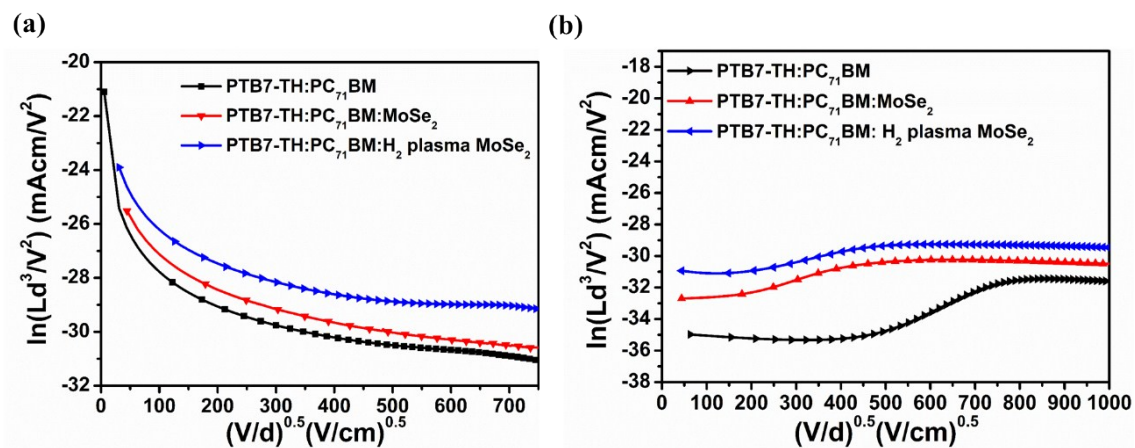


Fig. S1. $J-V^2$ characteristics of devices, allowing calculations of the (a) hole and (b) electron mobilities using the Mott–Gurney equation.

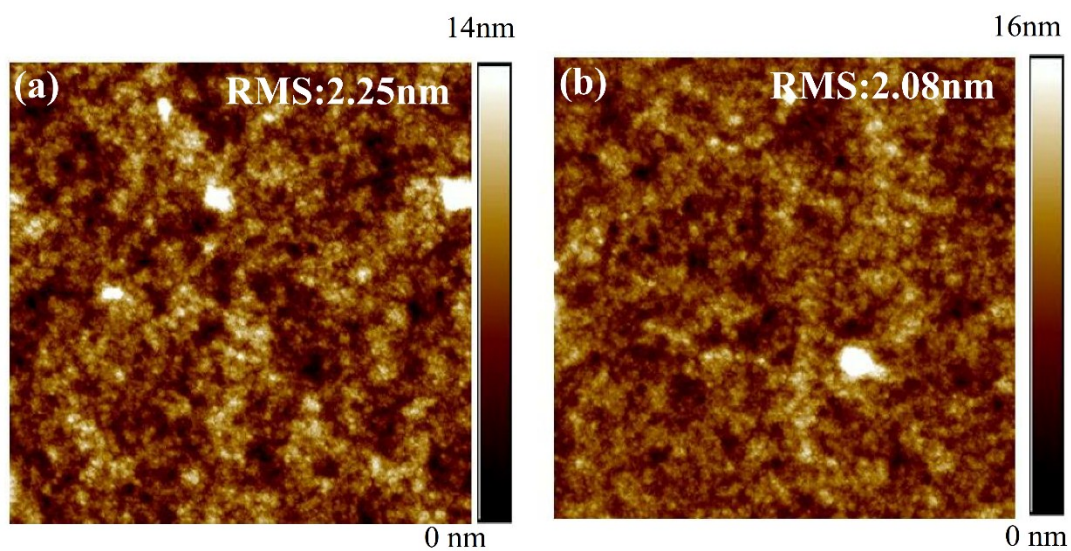


Fig. S2. AFM topographic images ($5 \times 5 \mu\text{m}$) of blend films: (a) PTB7-TH:PC₇₁BM:10%MoSe₂, (b) PTB7-TH:PC₇₁BM:20%MoSe₂.

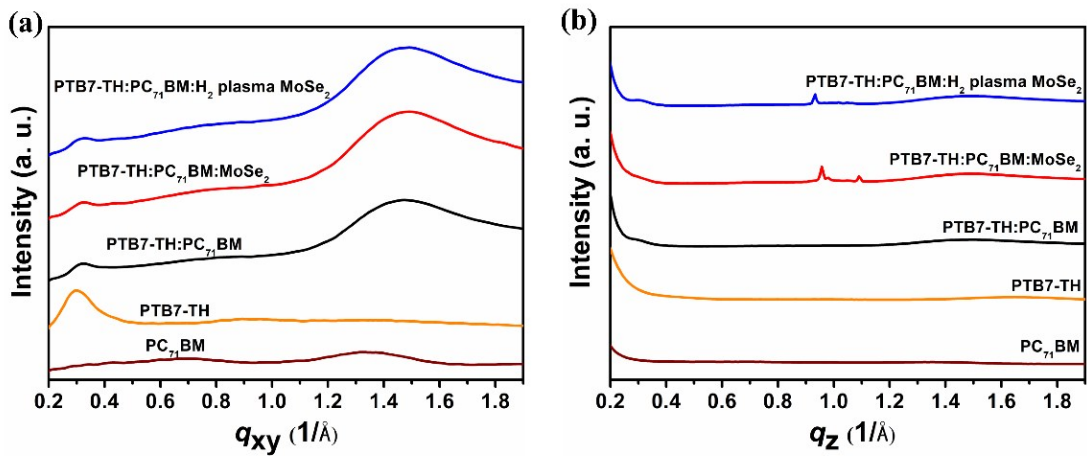


Fig. S3. Corresponding 1D GIWAXS profiles reduced from the (a) in-plane and (b) out-plane directions.

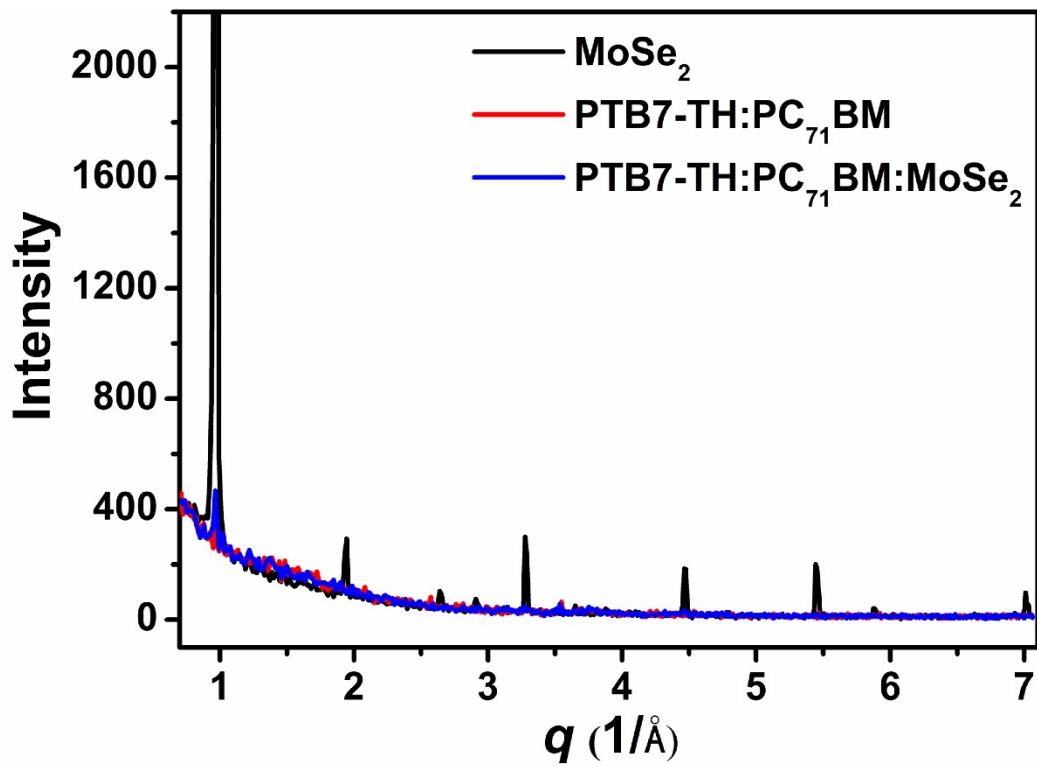


Fig. S4. Powder X-ray diffraction pattern of the films.

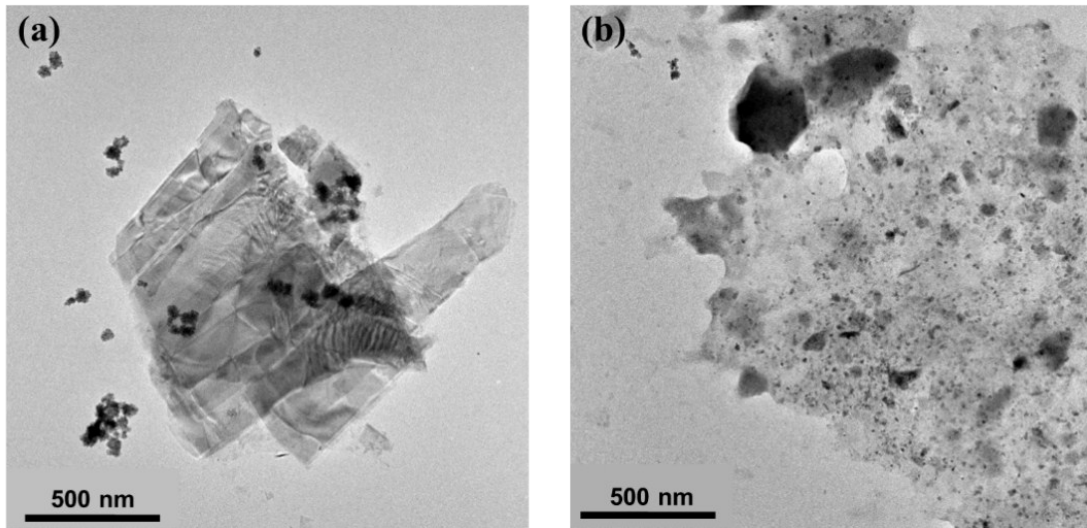


Fig. S5. TEM images of active layers incorporating (a) MoSe₂ and (b) hydrogen plasma-treated MoSe₂.

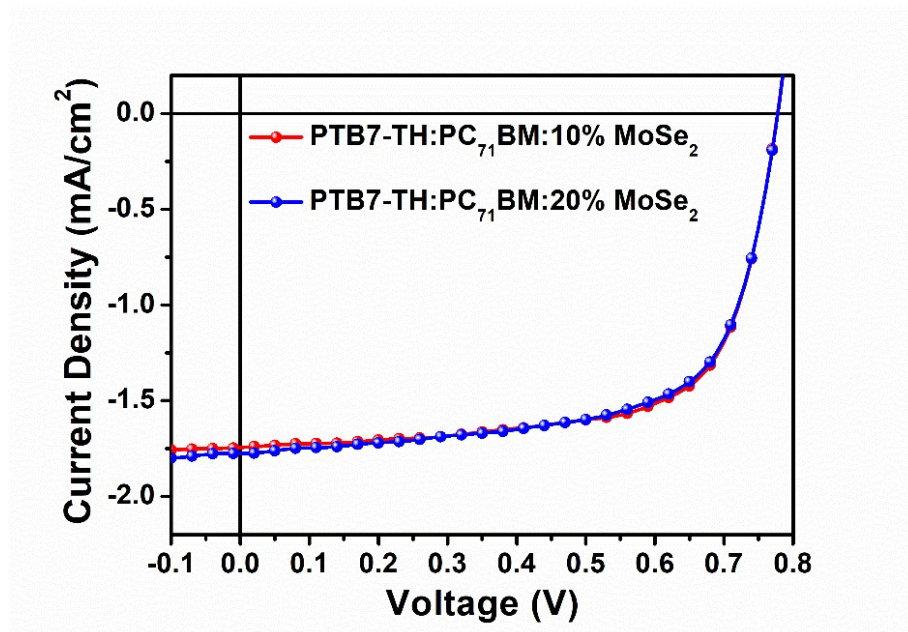


Fig. S6. J-V characteristics incorporating MoSe₂ prepared with different concentration.

Table S1 Different concentration of ternary blends devices' photovoltaic performances.

Active layer ^a	$V_{oc}(V)$	$J_{sc}(mA\ cm^{-2})$	FF(%)	PCE _{max} (%)
PTB7-TH:PC ₇₁ BM:10% MoSe ₂	0.78 ± 0.01	17.23 ± 0.2	0.7 ± 0.2	9.32
PTB7-TH:TH:PC ₇₁ BM:20% MoSe ₂	0.78 ± 0.01	17.6 ± 0.3	0.67 ± 0.3	9.26

a) Weight ratio of D:A = 1:1.5 Twenty devices were fabricated.

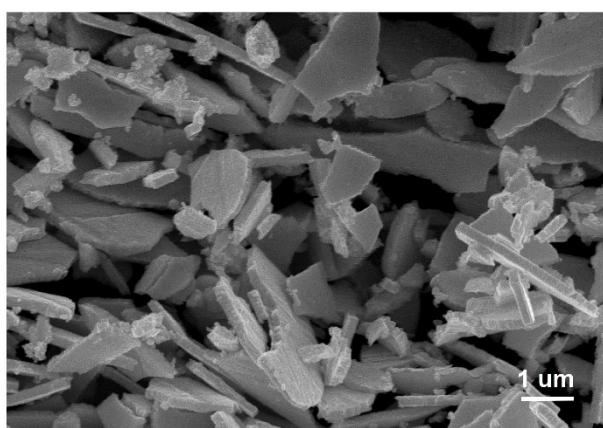


Fig. S7. SEM image of MoSe₂.

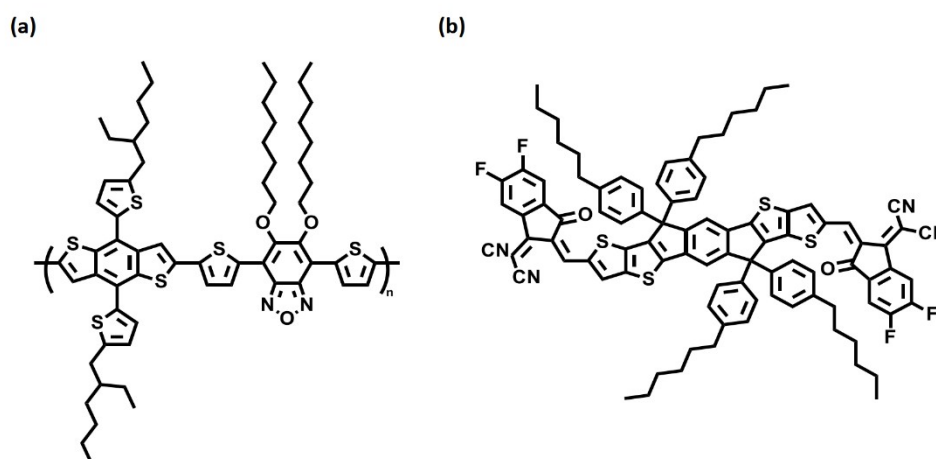


Fig. S8. Schematic representation of the chemical structures of (a) PBDTTBO, and (b) IT-4F.