

Supporting Information for:

Non-Halogenated Diphenyl-Chalcogenide Solvent
Processing Additives for High-Performance Polymer
Bulk-Heterojunction Solar Cells

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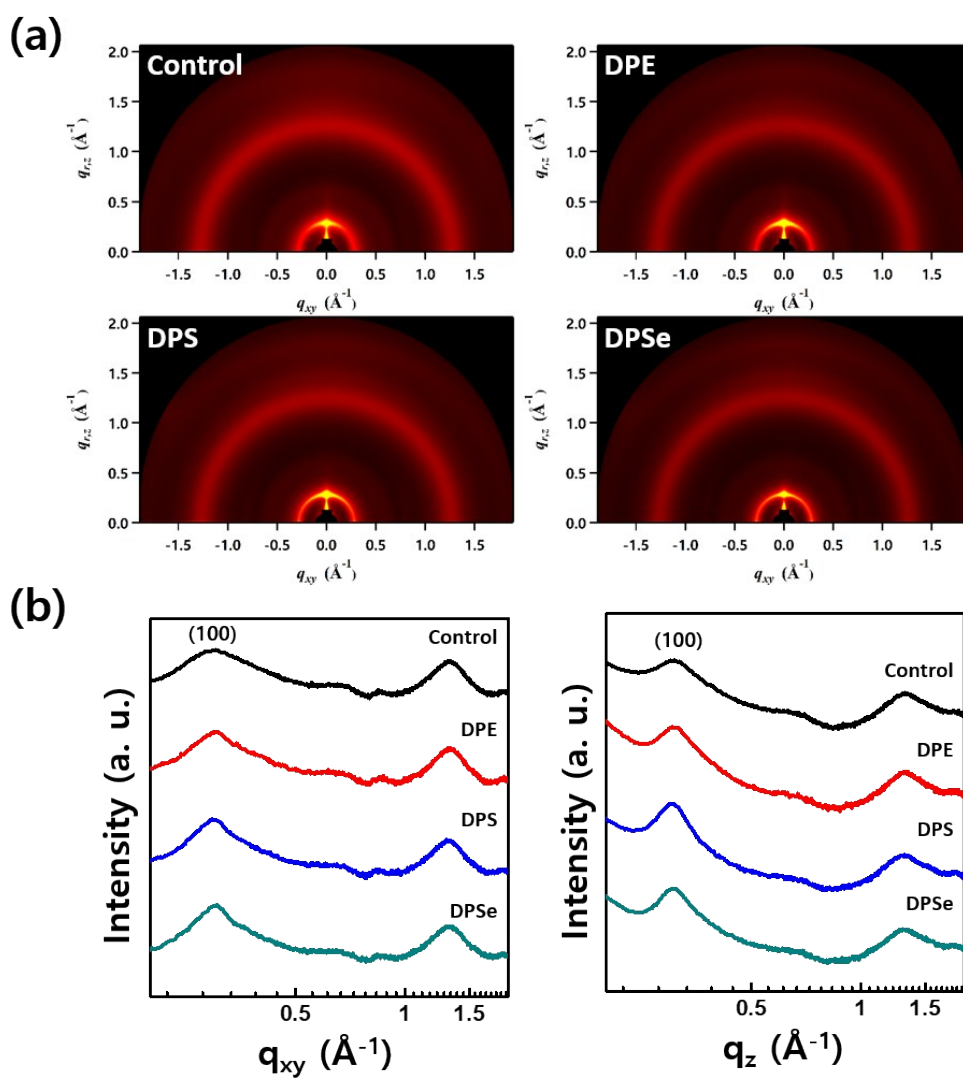


Figure S1. (a) 2D GIWAXS images and (b) line-cut profiles for PTB7-Th:PC₇₁BM blend films processed with different solvent additives.

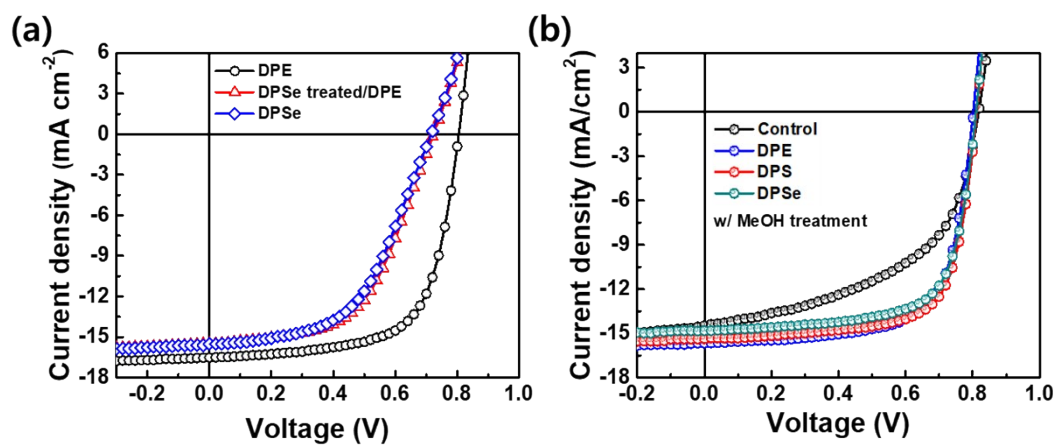


Figure S2. J - V characteristics of PTB7-Th:PC₇₁BM PSCs processed (a) under various conditions and (b) with methanol treatment.

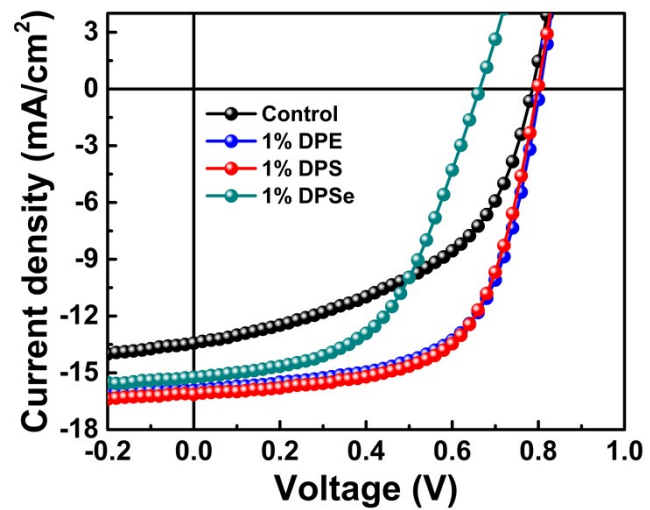


Figure S3. *J-V* characteristics of PTB7-Th:PC₇₁BM PSCs with 1 vol% of DPX additives.

Table S1. Summary of photovoltaic parameters for PTB7-Th:PC₇₁BM PSCs processed under various conditions.

Device Structure	J_{sc} [mA cm ⁻²]	V_{oc} [V]	FF	PCE [%]
PEDOT:PSS/Active Layer (3% DPE)	16.0	0.80	0.66	8.53
PEDOT:PSS/3% DPSe treated/Active Layer (3% DPE)	15.5	0.72	0.55	6.16
PEDOT:PSS/Active Layer (3% DPSe)	15.5	0.72	0.53	5.87

Table S2. Summary of photovoltaic parameters for PTB7-Th:PC₇₁BM PSCs processed with methanol treatment.

Solvent additive (3 vol%)	J_{sc} [mA cm ⁻²]	V_{oc} [V]	FF	PCE [%]
Control	14.5	0.82	0.52	6.16
DPE	15.7	0.80	0.67	8.74
DPS	15.4	0.81	0.70	8.86
DPSe	14.8	0.81	0.70	8.39

Table S3. Summary of photovoltaic parameters for PTB7-Th:PC₇₁BM PSCs with 1 vol% of additives

Solvent additive (1 vol%)	J_{sc} [mA cm ⁻²]	V_{oc} [V]	FF	PCE [%]
Control	13.4	0.79	0.49	5.15
DPE	15.9	0.80	0.62	7.99
DPS	16.0	0.80	0.63	8.10
DPS _e	15.2	0.66	0.53	5.31

Table S4. Shunt and series resistances of PTB7-Th:PC₇₁BM PSCs calculated from dark *J-V* curve

Solvent additive (3 vol%)	R_{sh} [M Ω cm ²]	R_s [Ω cm ²]
Control	0.54	7.25
DPE	10.7	5.92
DPS	2.87	4.27
DPS _e	16.9	13.5