

Supplementary Information for

Regioisomer Effects of [70]PCBM on Film Structures and Photovoltaic Properties of Composite Films with a Crystalline Conjugated Polymer P3HT

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Table S1. Photovoltaic parameters of the devices with the configuration of ITO/ZnO/P3HT:mix-[70]PCBM/MoO₃/metal reported in literatures.

metal	J_{SC} (mA cm ⁻²)	V_{OC} (V)	FF	PCE (%)	ref
Al	10.1	0.54	0.361	2.0	S1
Al	8.2	0.60	0.59	2.9	S2
Ag	10.3	0.54	0.59	3.3	S3
Au	10.4±0.2	0.563±0.005	0.548±0.009	3.21±0.10	– ^a

^a Data of the device based on P3HT:mix-[70]PCBM obtained in this study.

References in Table S1

- S1. M. Thambidurai, J. Y. Kim, J. Song, Y. Ko, N. Muthukumarasamy, D. Velauthapillai and C. Lee, *Sol. Energy*, 2014, **106**, 95.
- S2. E. Polydorou, A. Zeniou, D. Tsikritzis, A. Soultati, I. Sakellis, S. Gardelis, T. A. Papadopoulos, J. Briscoe, L. C. Palilis, S. Kennou, E. Gogolides, P. Argitis, D. Davazoglou and M. Vasilopoulou, *J. Mater. Chem. A*, 2016, **4**, 11844.
- S3. C. E. Song, K. Y. Ryu, S.-J. Hong, C. Bathula, S. K. Lee, W. S. Shin, J.-C. Lee, S. K. Choi, J. H. Kim and S.-J. Moon, *ChemSusChem*, 2013, **6**, 1445.

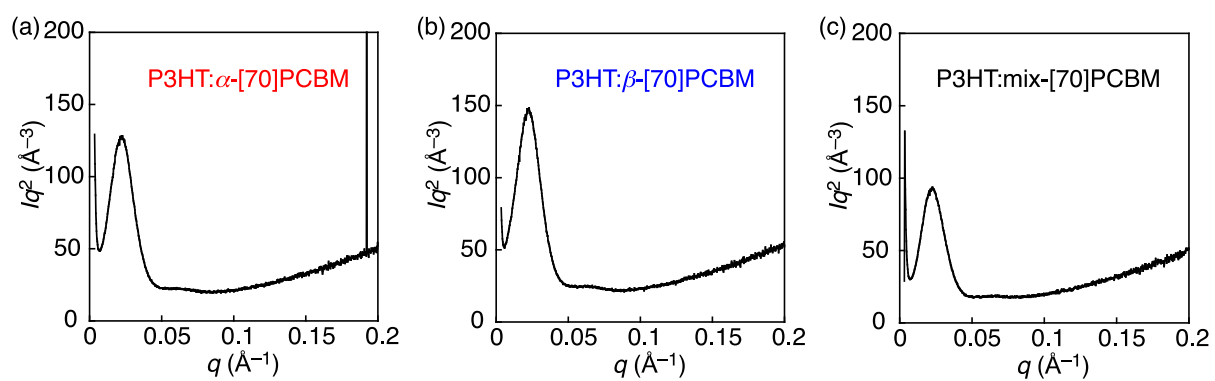


Fig. S1 Lorentz-corrected scattering patterns for (a) P3HT: α -[70]PCBM, (b) P3HT: β -[70]PCBM, and (c) P3HT:mix-[70]PCBM films on glass substrates.

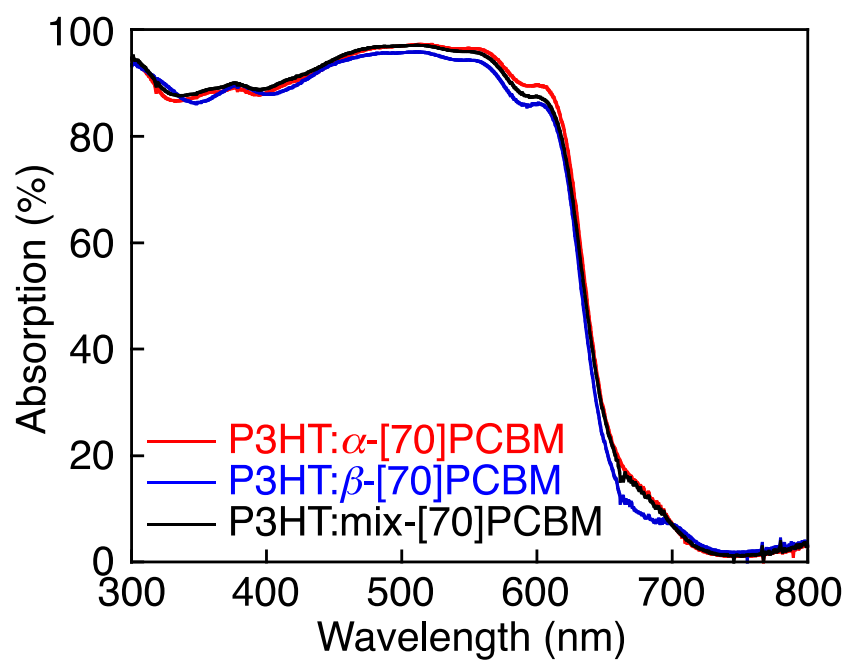


Fig. S2 UV-visible absorption spectra of P3HT:α-[70]PCBM (red), P3HT:β-[70]PCBM (blue), and P3HT:mix-[70]PCBM (black) films on ITO/ZnO substrates.

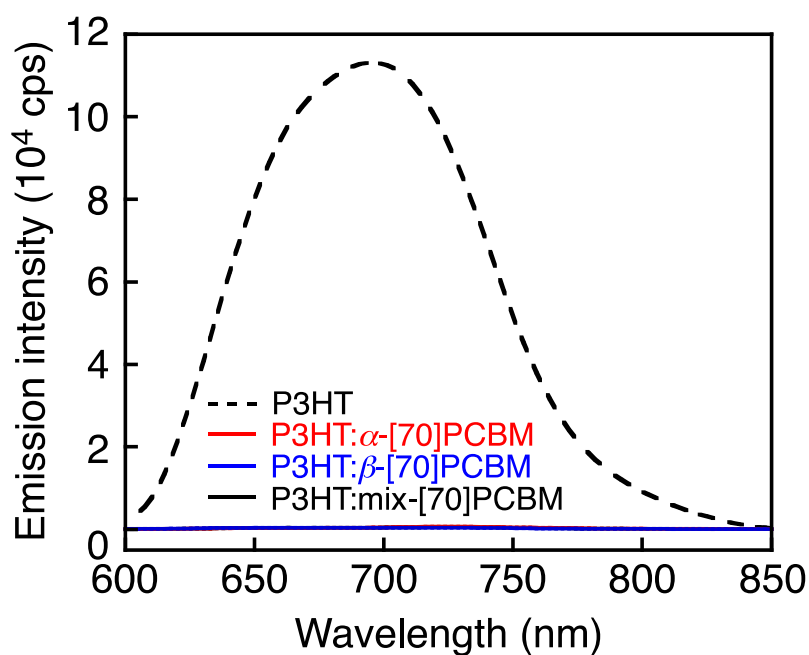


Fig. S3 Photoluminescence spectra of pristine P3HT (black dot), P3HT:α-[70]PCBM (red), P3HT:β-[70]PCBM (blue), and P3HT:mix-[70]PCBM (black) films excited at 550 nm. The relative emission intensities can be compared by normalizing the slight difference in the absorbances of the P3HT:fullerene isomer films at the excitation wavelengths. The quenching efficiencies of P3HT fluorescence in all the blend films are > 99%.