

Supporting Information

Regioregular conjugated polymer for high performance thick-film organic solar cells without processing additive

Hongliang Zhong,^{ac} Long Ye,^b Jung Yao Chen,^a Sae Byeok Jo,^a Chu Chen Chueh,^a Joshua H.

Carpenter,^b Harald Ade^{*b} and Alex K.-Y. Jen^{*ad}

^a Department of Materials Science and Engineering, University of Washington, Seattle, Washington 98195, USA. E-mail: ajen@u.washington.edu

^b Department of Physics and Organic and Carbon Electronics Laboratory, North Carolina State University, Raleigh, North Carolina 27695, USA. E-mail: hwade@ncsu.edu.

^c School of Chemistry and Chemical Engineering, Shanghai Jiao Tong University, Shanghai 200240, China.

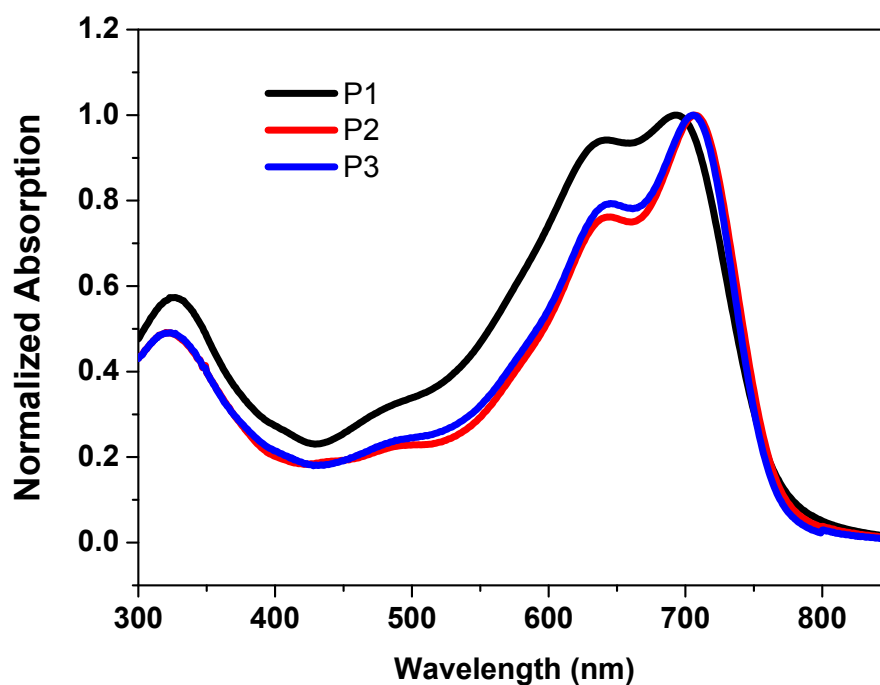
^d Department of Biology and Chemistry, City University of Hong Kong, Kowloon, Hong Kong.

Table S1 Molecular weights, optical and electrochemical properties of polymers.

Polymers	M_w (k Da)	PDI	$\lambda_{\max}$ (nm) ^a		E_g (eV) ^b	HOMO (eV) ^c	LUMO (eV) ^d
			Solution	Film			
P1	80	1.8	625, 687 (s)	643 (s), 694	1.62	-5.60	-3.98
P2	99	1.9	638 (s), 698	645 (s), 706	1.62	-5.46	-3.84
P3	80	1.7	640 (s), 705	645 (s), 706	1.62	-5.45	-3.83

^a) Letter s in parentheses, i.e. (s), represents shoulder peak; ^b) Optical band gap;

^c) Measured by cyclic voltammetry; ^d) Estimated by difference of band gap and HOMO.

**Fig. S1** UV-vis absorption spectra of polymers in solid state.

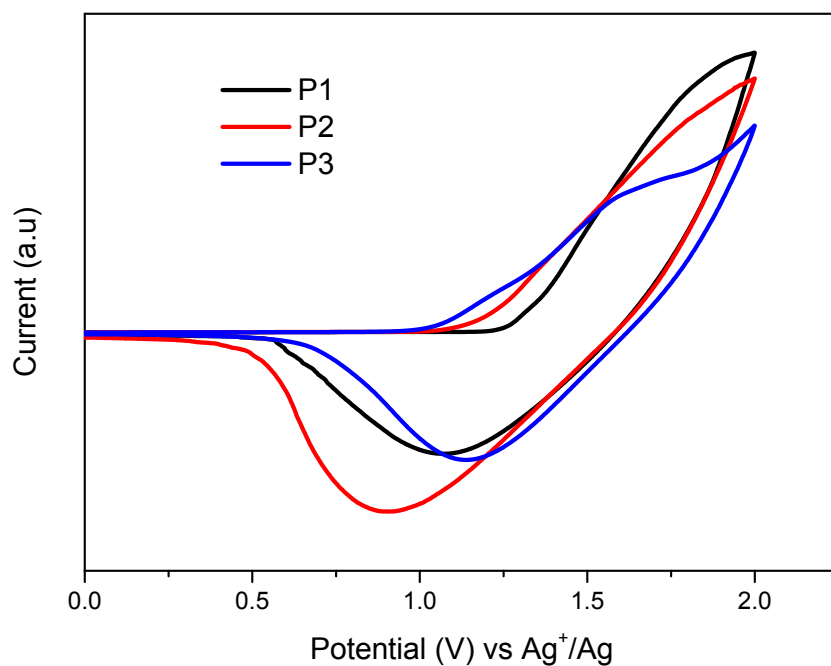


Fig. S2 Cyclic voltammetry curves of polymers.

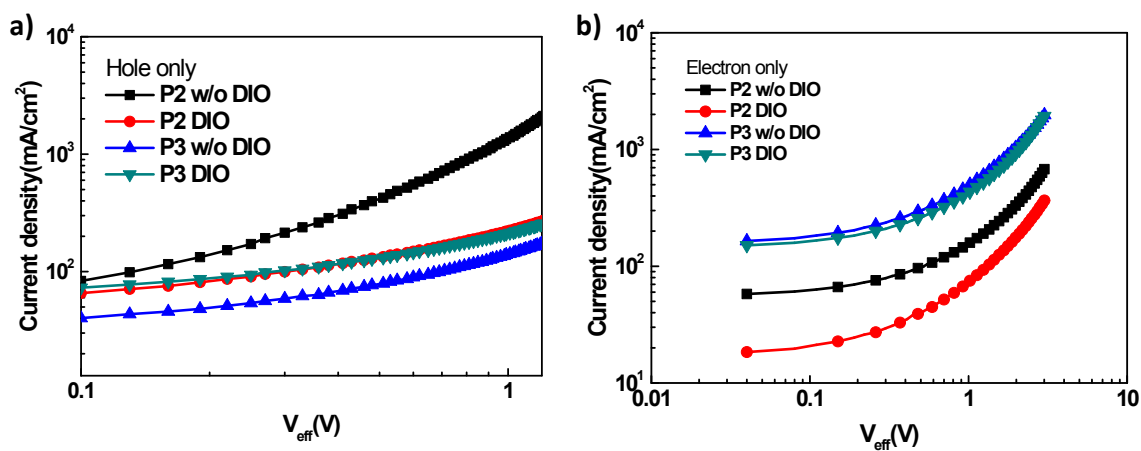


Fig. S3 Space-charge-limited current (SCLC) curves of a) hole-only diodes; and b) electron-only diodes.

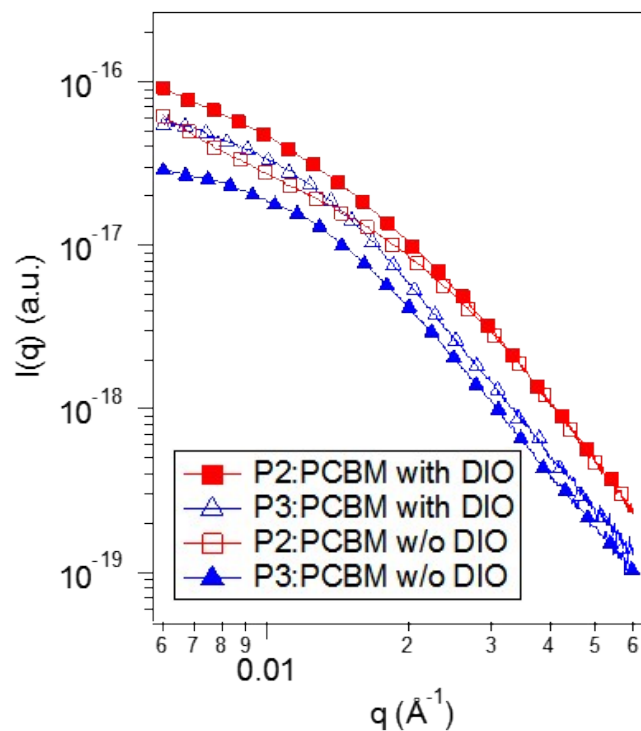


Fig. S4 Plots of 1D circularly averaged scattering intensities I as a function of q of the blend films acquired at 283.2 eV.

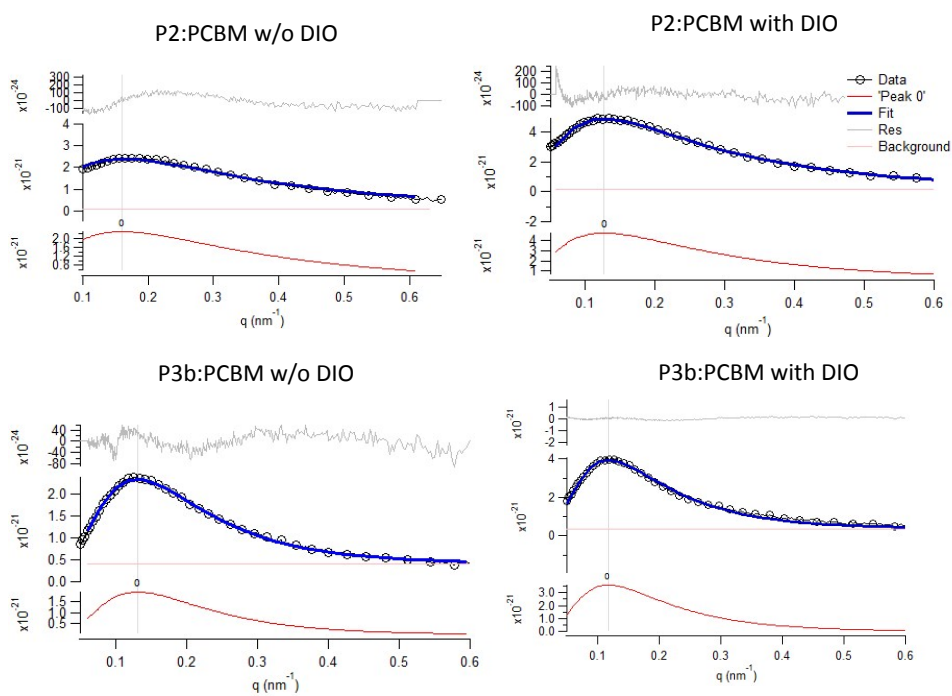


Fig. S5 Peak fits to the circularly-averaged R-SoXS profiles of polymer-PC₇₁BM blend films obtained at 283.2 eV with lognormal distributions.