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Supplementary Information to:

Identifying the Optimum Composition in Organic Solar Cells Comprising Non-Fullerene Electron Acceptors

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Table S1. Photovoltaic parameters for P3HT:YF25 BHJ devices of different blend ratios. Active layers were spin coated from 1,2-dichlorobenzene and annealed at 65 °C for 20 min.

P3HT:YF25 blend ratio w/w	J_{sc} mA/cm^2	V_{oc} V	**FF**	**PCE** %
65:35	1.7 ±0.1	0.56 ±0.01	0.36 ±0.01	0.34 ±0.03
55:45	2.6 ±0.1	0.54 ±0.01	0.38 ±0.01	0.52 ±0.05
50:50	3.3 ±0.2	0.50 ±0.01	0.46 ±0.02	0.76 ±0.07
42:58	4.0 ±0.2	0.50 ±0.01	0.49 ±0.02	0.99 ±0.09
35:65	3.5 ±0.2	0.48 ±0.01	0.44 ±0.01	0.74 ±0.07
25:75	1.9 ±0.1	0.46 ±0.01	0.43 ±0.01	0.37 ±0.04

Table S2. Photovoltaic parameters for P3HT:K12 BHJ devices of different blend ratios. Active layers were spin coated from 1,2-dichlorobenzene and annealed at 65 °C for 20 min.

P3HT:K12 blend ratio	J_{sc} mA/cm^2	V_{oc} V	**FF**	**PCE** %
56:44	1.6 ±0.1	0.62 ±0.01	0.45 ±0.01	0.44 ±0.01
50:50	1.9 ±0.1	0.61 ±0.01	0.47 ±0.01	0.53 ±0.01
45:55	2.1 ±0.1	0.61 ±0.01	0.47 ±0.02	0.60 ±0.04
40:60	2.3 ±0.1	0.60 ±0.01	0.49 ±0.01	0.67 ±0.02
33:67	2.4 ±0.1	0.62 ±0.01	0.50 ±0.01	0.73 ±0.01
29:71	2.2 ±0.1	0.61 ±0.01	0.49 ±0.01	0.67 ±0.01
25:75	2.1 ±0.1	0.61 ±0.02	0.49 ±0.01	0.61 ±0.04
20:80	1.7 ±0.1	0.57 ±0.01	0.42 ±0.01	0.41 ±0.02

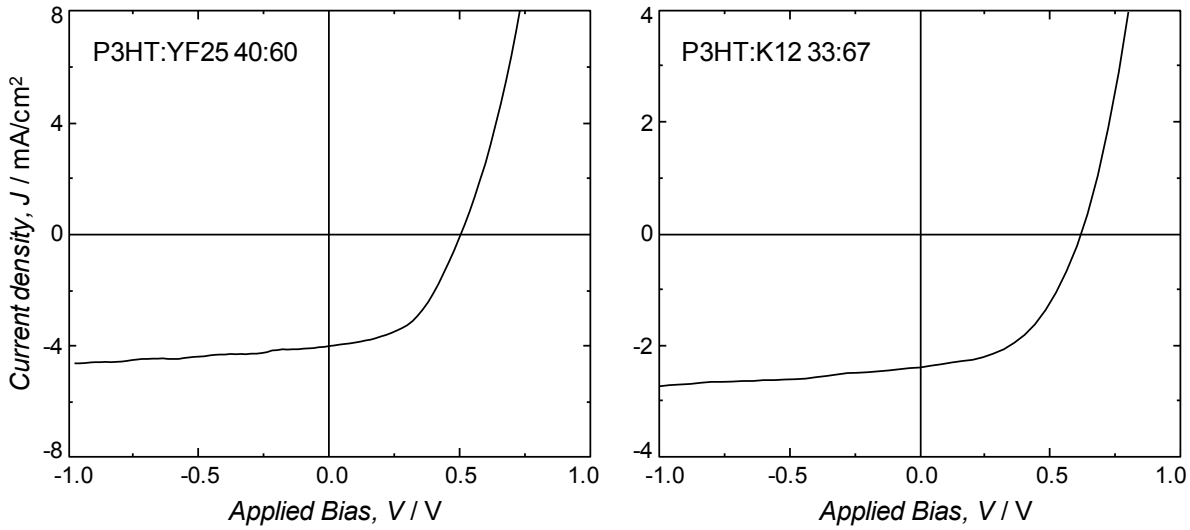

Figure S1. *J-V* curves of a P3HT:YF25 40:60 blend (left) and of a P3HT:K12 33:67 binary (right). Prior to photovoltaic device characterization, active layers were annealed at 65 °C for 20 min.

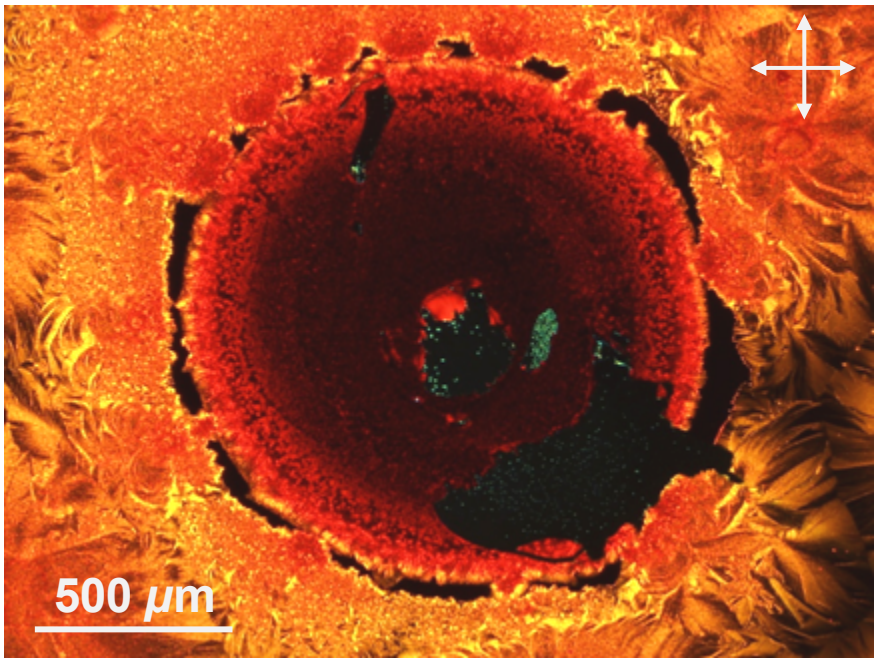

Figure S2. Uncut polarized optical micrograph of a P3HT:K12 composition gradient, fabricated with a diffusion experiment. A small piece of P3HT was placed in the melt of K12 and the two compounds were allowed to mutually diffuse into each other for about 5 min at a temperature of 250 °C. Subsequently, the film was quenched to room temperature and annealed at 80 °C for 20 min. The formation of a largely amorphous regime is illustrated by the absence of birefringence in the respective (black) areas.