Supporting Information

for

Optimization of solution-processed oligothiophene:fullerene based organic solar cells by using solvent additives

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Further measurement data

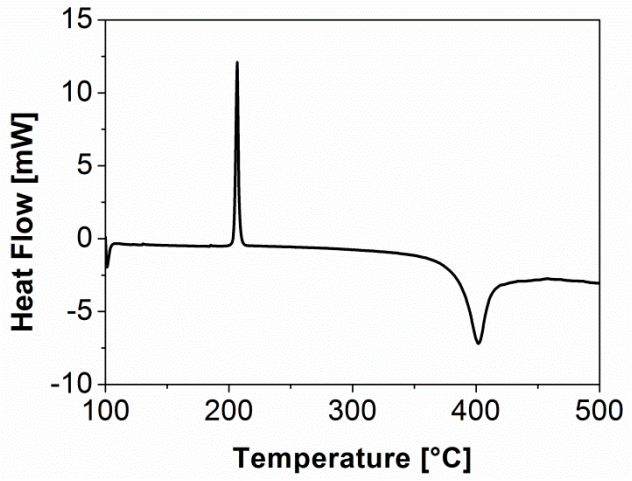

Figure S1: DSC trace of **DCV5T-Bu$_4$** after purification by column chromatography.

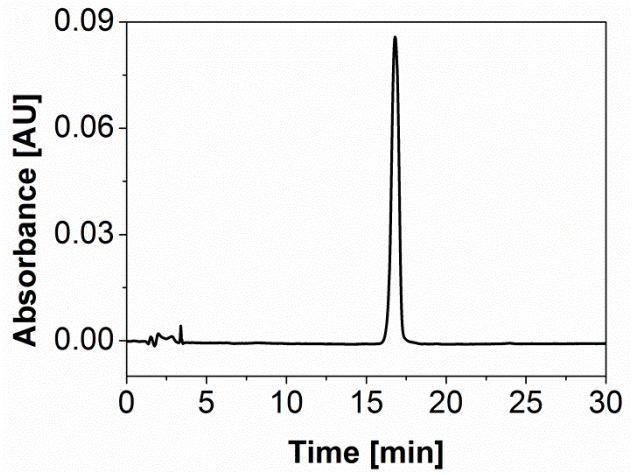

Figure S2: HPLC trace of **DCV5T-Bu$_4$** after purification by column chromatography. Detection wavelength 500 nm.

Table S1: Photovoltaic parameters of solar cells fabricated using **DCV5T-Bu$_4$** from CB or ODCB, using CN as additive and spin coated at 80 °C. Device structure: ITO|PEDOT:PSS|**DCV5T-Bu$_4$**:PCBM (1:1)|LiF|Al.

Donor:Acceptor	Solvent	Jsc (mA/cm^2)	Voc (V)	FF	PCE (%)
DCV5T-Bu$_4$:PC$_{71}$BM	CB	5.2	1.08	0.35	2.0
DCV5T-Bu$_4$:PC$_{71}$BM	CB:CN (0.375%)	5.6	1.09	0.39	2.4
DCV5T-Bu$_4$:PC$_{71}$BM	ODCB	5.7	1.08	0.40	2.5
DCV5T-Bu$_4$:PC$_{71}$BM	ODCB:CN (0.375%)	5.7	1.09	0.40	2.5

Table S2: Photovoltaic parameters of solar cells fabricated using **DCV5T-Bu$_4$** from CB or CB/CN with different D:A ratios and spin coated at 80 °C. Device structure: ITO|PEDOT:PSS|**DCV5T-Bu$_4$**:P_{61}CBM|LiF|Al.

Donor:Acceptor	**Donor:Acceptor ratio**	**Solvent**	**Jsc (mA/cm^2)**	**Voc (V)**	**FF**	**PCE (%)**
DCV5T-Bu$_4$:$PC_{61}BM$	1:2	CB	3.8	1.09	0.34	1.4
DCV5T-Bu$_4$:$PC_{61}BM$	1:1	CB	5.2	1.09	0.36	2.1
DCV5T-Bu$_4$:$PC_{61}BM$	3:2	CB	4.6	1.10	0.34	1.7
DCV5T-Bu$_4$:$PC_{61}BM$	1:1	CB:CN (0.5%)	6.0	1.10	0.41	2.7
DCV5T-Bu$_4$:$PC_{61}BM$	3:2	CB:CN (0.5%)	6.1	1.11	0.41	2.8
DCV5T-Bu$_4$:$PC_{61}BM$	1:0.8	CB:CN (0.375%)	6.0	1.11	0.42	2.8
DCV5T-Bu$_4$:$PC_{61}BM$	2:1	CB:CN (0.375%)	5.2	1.12	0.41	2.4

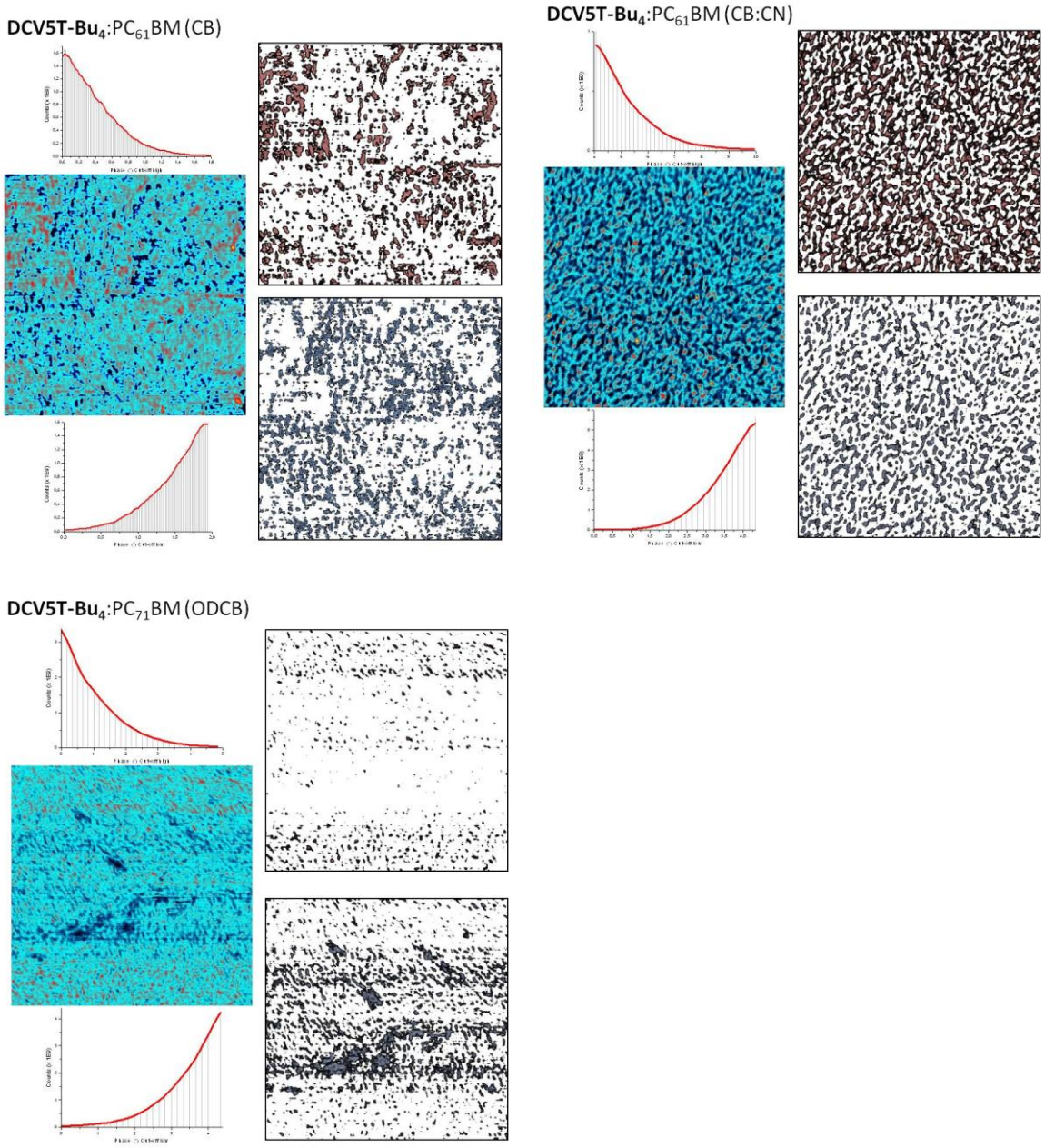

Figure S3: Representative phase images of the three blend materials (left) and separated histogram phases corresponding to the high (upper image) or low (bottom image) phase shift (Δ = 2–3°), related to the more-ordered phases of the two active materials.