

Supporting Information for:

Attaining Melt Processing of Complementary Semiconducting Polymer Blends at 130 °C via Side-Chain Engineering

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S1: NMR

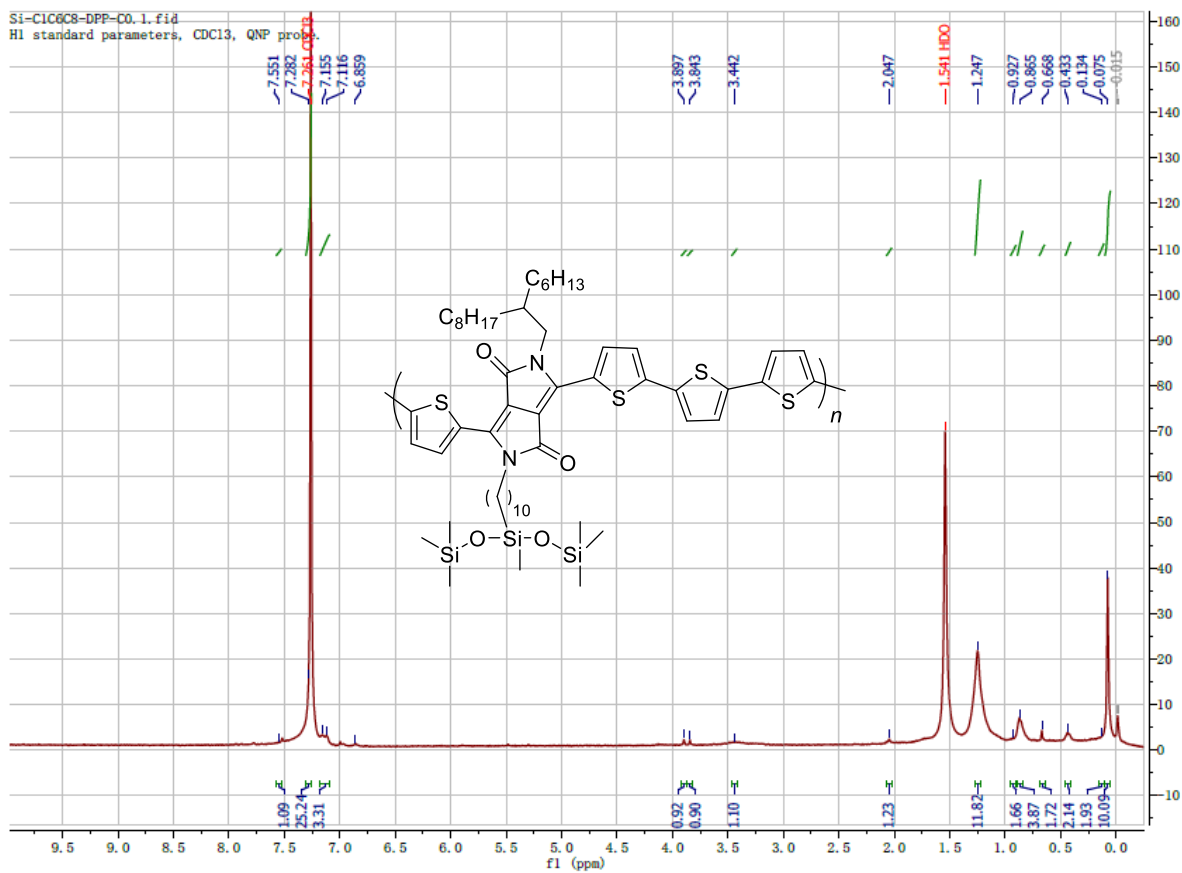


Figure S1: NMR spectrum of Si-C1C6C8-DPP-C0.

S2: UV-VIS

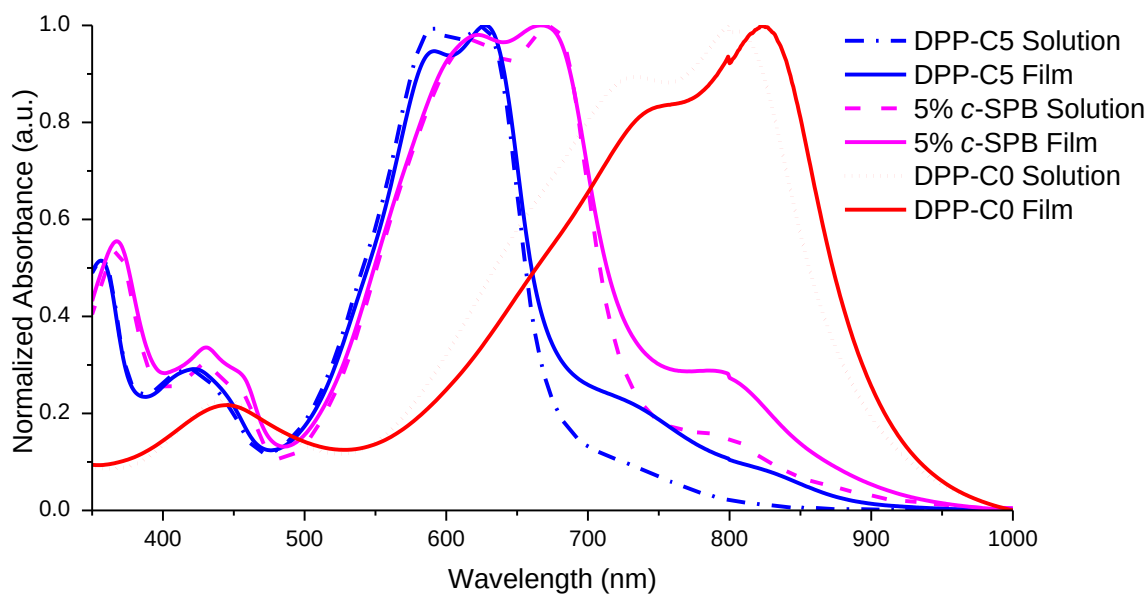


Figure S2: Normalized UV-Vis absorption of spectra of solution-state and solid-state Si-C1C6C8-DPP-C5, 5% *c*-SPB, and Si-C1C6C8-DPP-C0.

S3: Gel Permeation Chromatography (GPC)

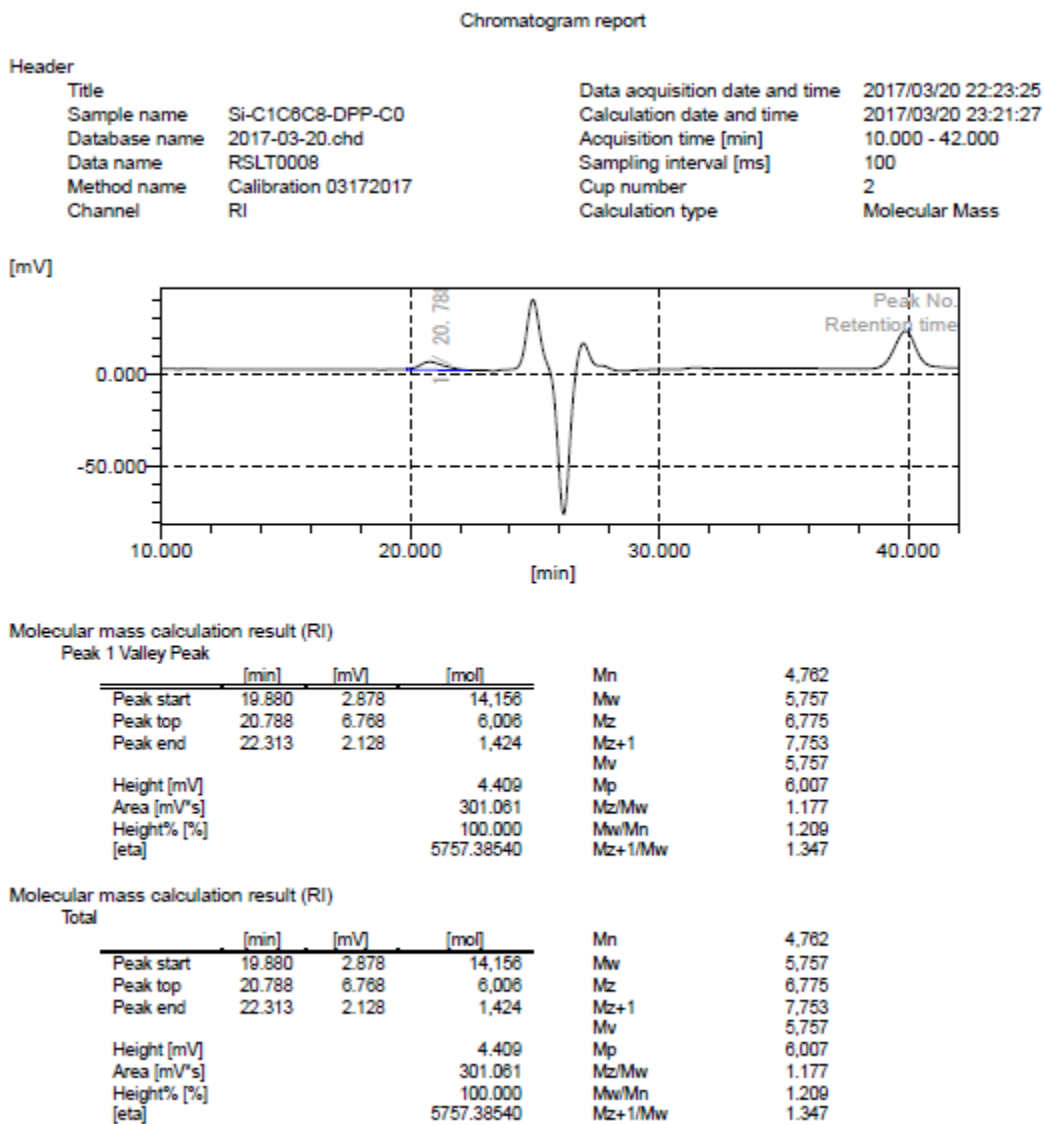


Figure S3: High-temperature GPC results of Si-C1C6C8-DPP-C0. Trichlorobenzene was used as eluent at 150 °C.

S4: Thermal-gravimetric Analysis (TGA)

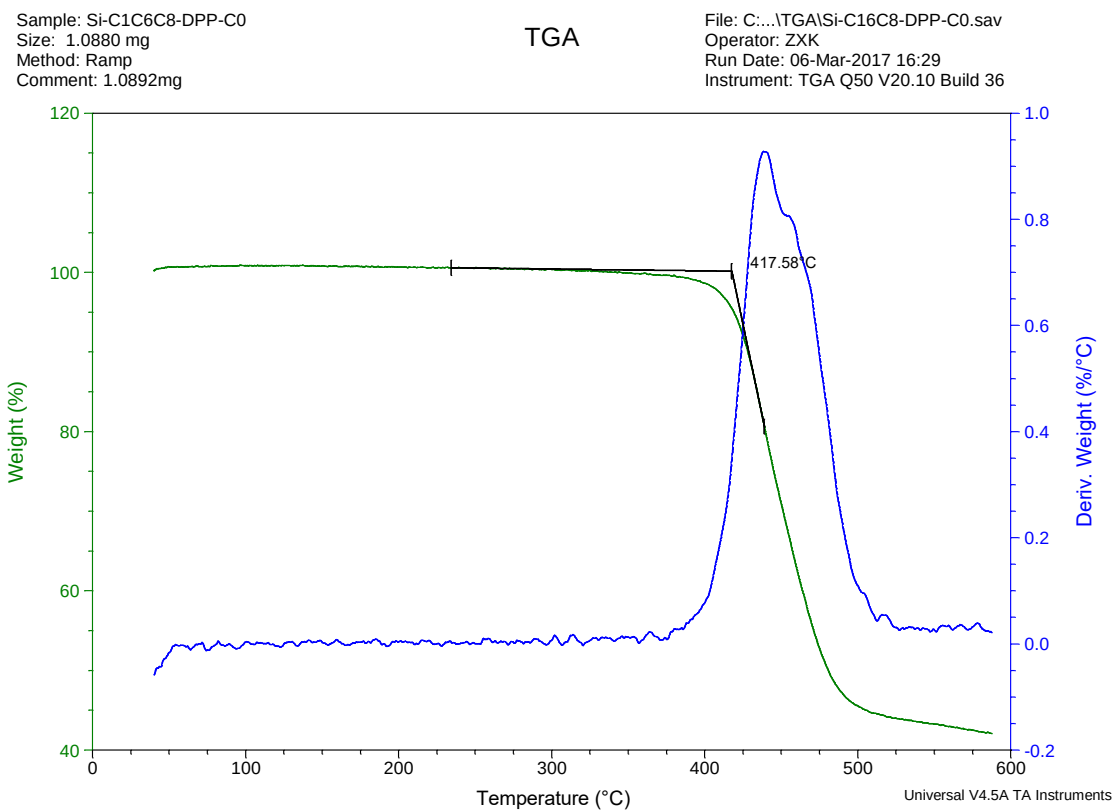


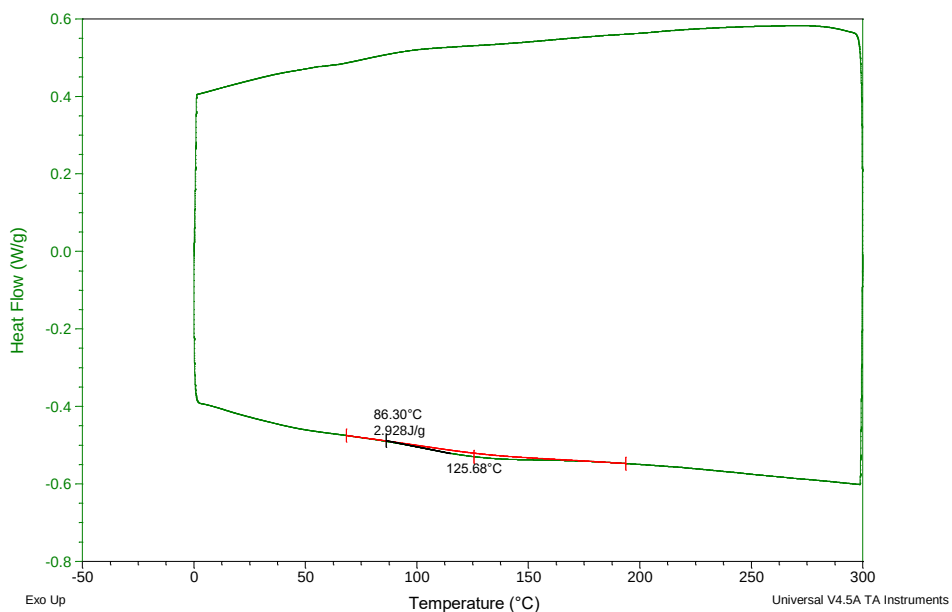
Figure S4: Thermal profiles of Si-C1C6C8-DPP-C0. The decomposition peak appears around 418 °C.

S5: Differential Scanning Calorimetry (DSC)

Sample: Si-C1C6C8-DPP-C5
Size: 3.0000 mg
Method: DPP-Standard

DSC

File: C:\...\DSC\Si-C1C6C8-DPP-C5.001
Operator: ZXK
Run Date: 22-Sep-2016 17:20
Instrument: DSC Q2000 V24.11 Build 124



Sample: Asy-c-SPB
Size: 6.1000 mg
Method: DPP-Standard

DSC

File: C:\...\DSC\Asy-c-SPB.002
Operator: ZXK
Run Date: 22-Sep-2016 14:41
Instrument: DSC Q2000 V24.11 Build 124

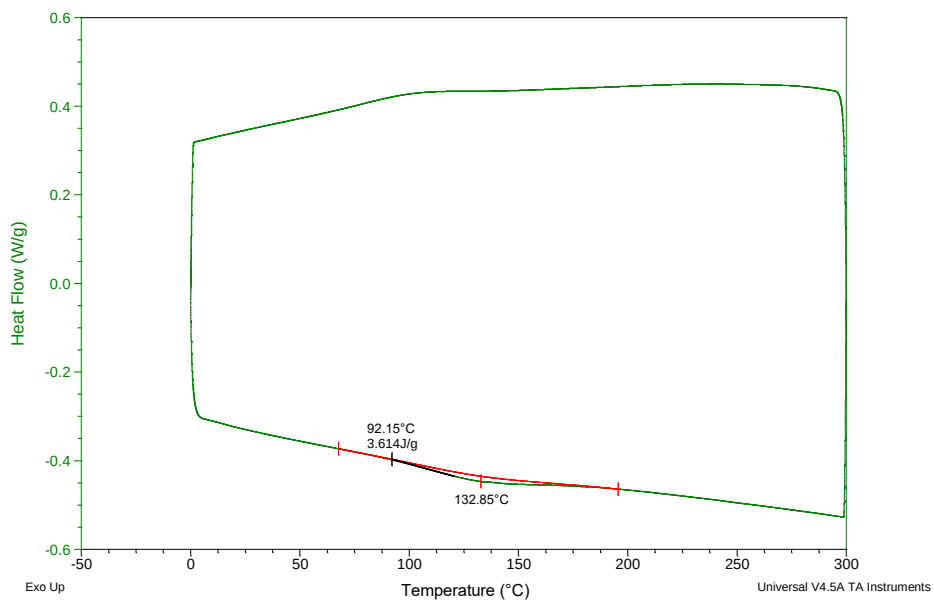
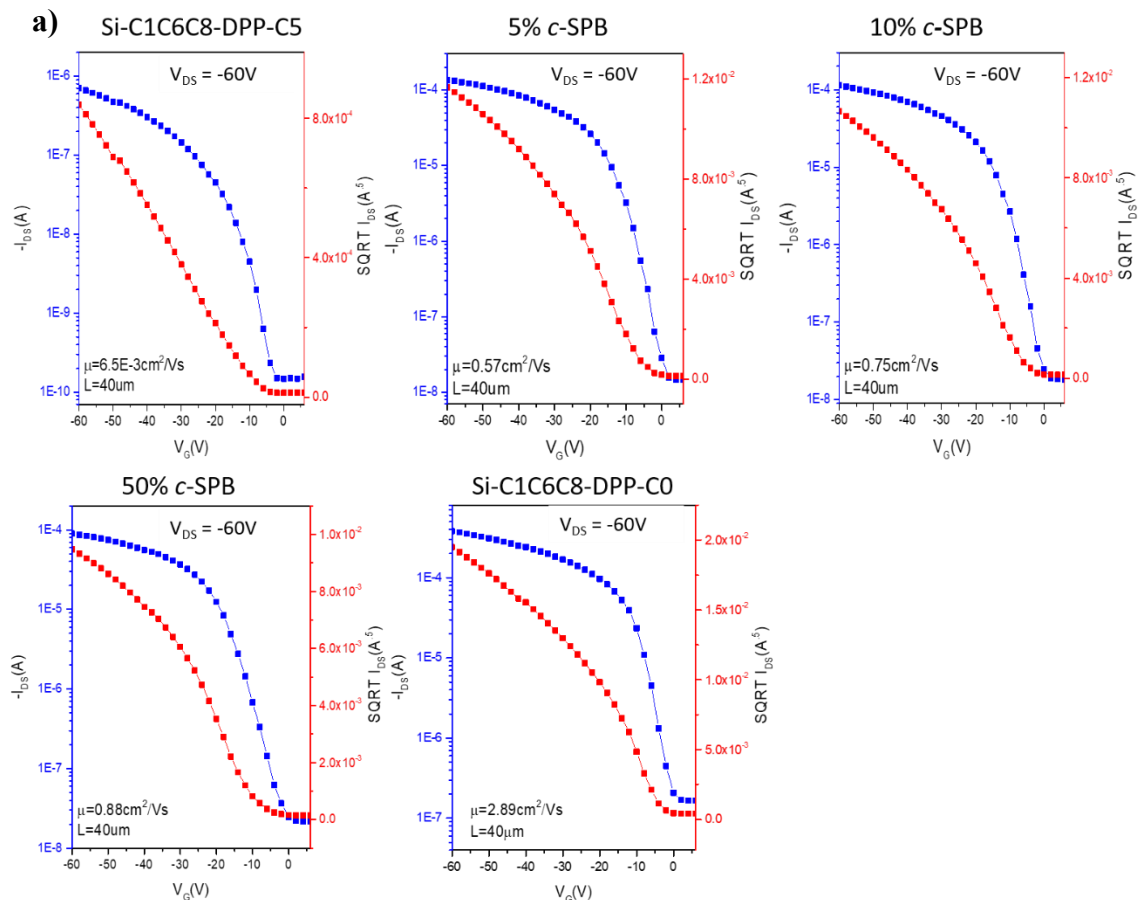


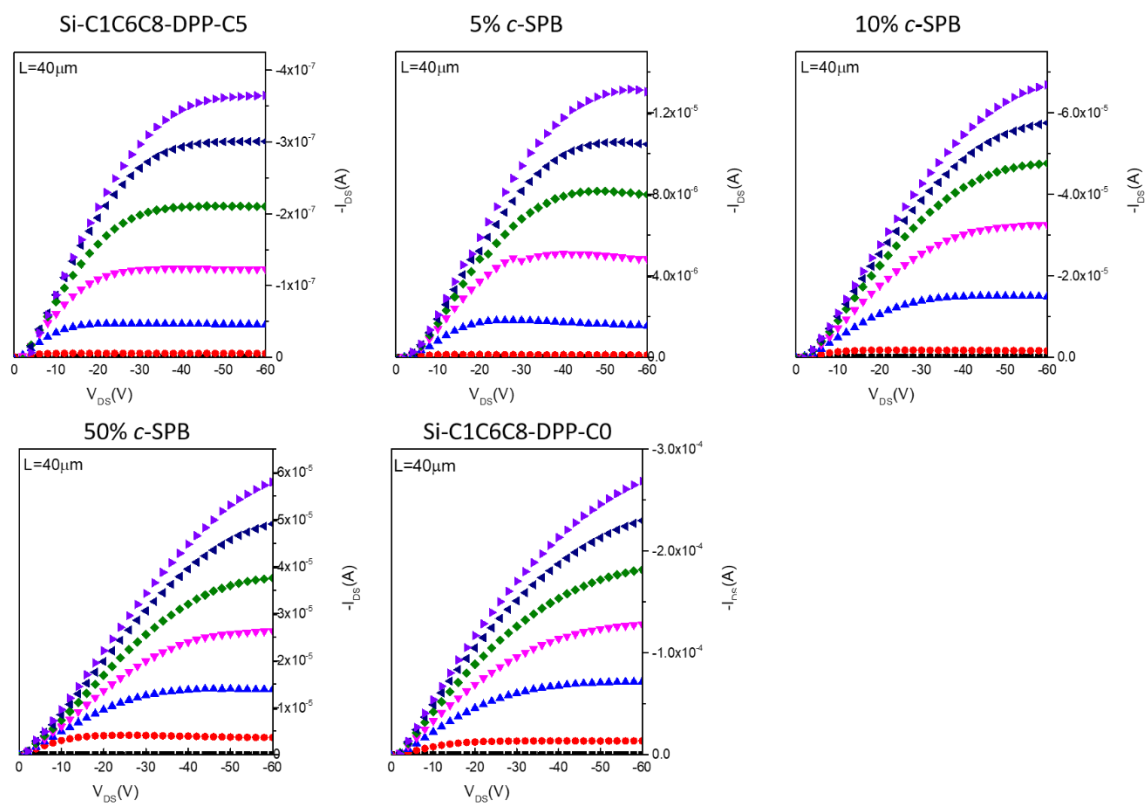
Figure S5. Thermal behavior curves of Si-C1C6C8-DPP-C5 and 5% *c*-SPB. The peaks maxima are highlighted on the thermal profiles.

S6: Device Fabrication and OFET Mobility Characterization

Charge carrier mobility measurements were carried out using Keithley 4200 at ambient. OFET performances were obtained by applying a gate bias from -60 V to 6 V, with the potential gradient between the source and drain contacts kept at -60 V. The OFET channel width and length were kept at 1400 and 40 μm , respectively.



b)



c)

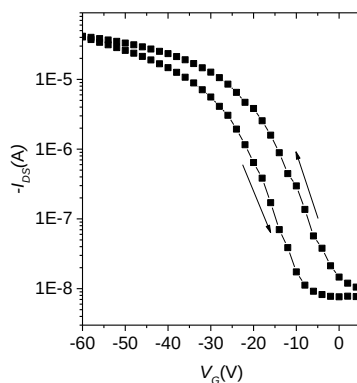


Figure S6: Representative **a)** transfer and **b)** output curves for OFET devices based on different ratios of the tie chain polymer (Si-C1C6C8-DPP-C0) added in the *c*-SPBs. **c)** Hysteresis analysis on an average melt processed OFET-device based on the polymer blend. Resilient hysteresis can be observed upon thin film delamination/lamination.

40 V < -V_G < 60 V		
Material	μ_{max}	μ_{avg}
	(cm²/Vs)	
Si-C1C6C8-DPP-C5	4.50E-3	3.00E-3
5% <i>c</i>-SPB	0.10	0.083
10% <i>c</i>-SPB	0.17	0.11
50% <i>c</i>-SPB	0.23	0.20
Si-C1C6C8-DPP-C0*	0.80	0.65

Table S1. Mobility values measured for high gate voltage regimes for representative OFET devices. A persistent dual-slope could be observed in all devices measured leading to lower calculated mobilities for gate voltage beyond -40 V.

S7: Grazing Incident X-Ray Diffraction

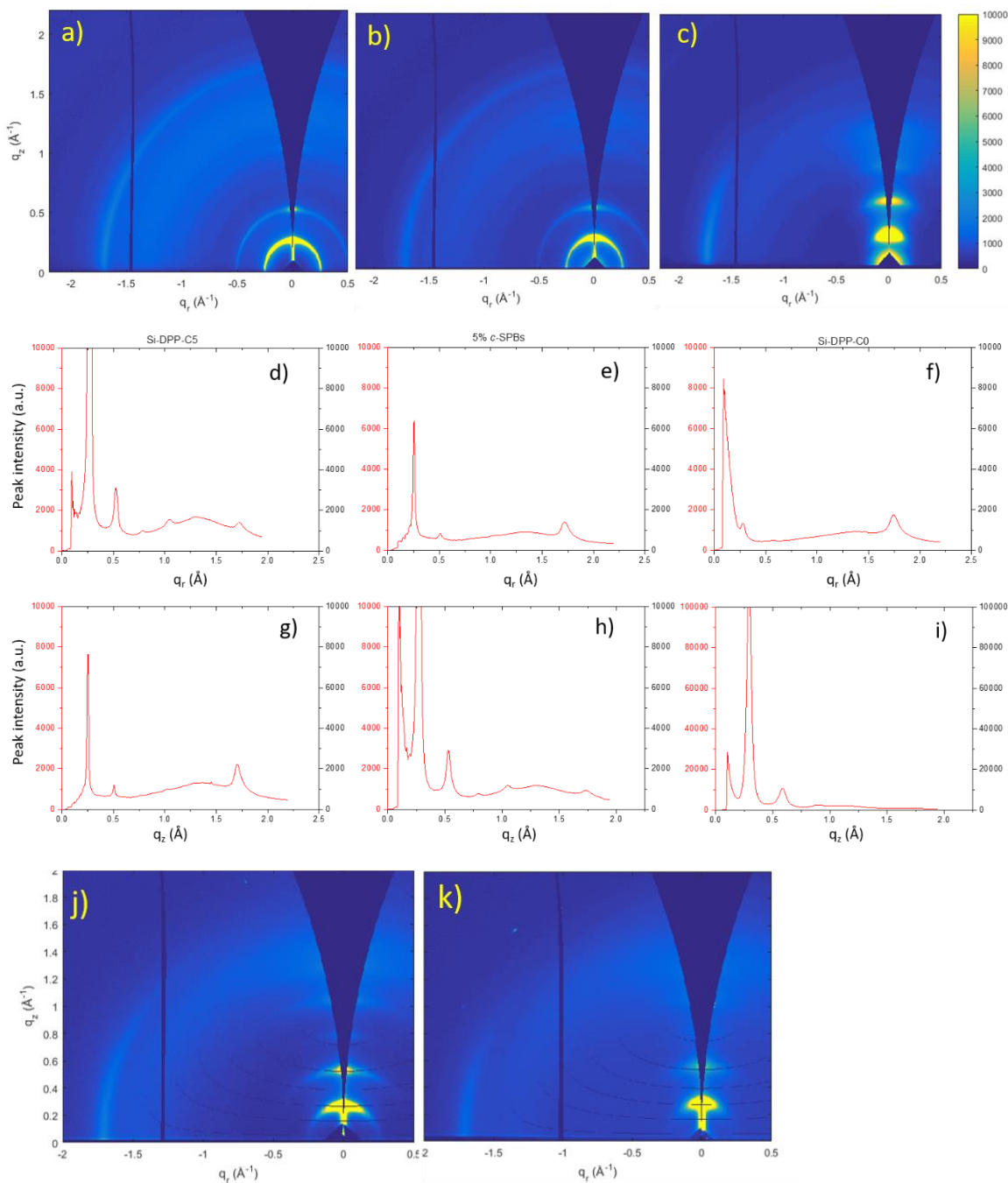


Figure S7: GIXRD patterns of a) melt-processed Si-C1C6C8-DPP-C5, b) 5% *c*-SPB, and c) drop-casted Si-C1C68-DPP-C0. 1-dimensional curves corresponding to: d)-f) in-plane linecuts; g)-i) out-of-plane linecuts for melt-processed thin films of Si-C1C6C8-DPP-C5, 5% *c*-SPB, and drop-casted Si-C1C6C8-DPP-C0. Appended are the GIXRD patterns of the spin cast thin films of j) Si-C1C6C8-DPP-C5 and k) 5% *c*-SPB for comparison.