Supporting Information for:

Differently Linked Perylene Bisimide Dimers with Various Twisting and Phase Structures for Nonfullerene All-Small Molecule Organic Solar Cells

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Table S1 The device performance parameters for the solar cells with different D/A ratios for DR3TBDTT:B-SdiPBI, DR3TBDTT:O-SdiPBI and DR3TBDTT:H-SdiPBI blend films.

Blends	**D/A Ratios (w/w)**	V_{OC} **(V)**	J_{SC} **(mA/cm^2)**	***FF*** **(%)**	***PCE*** **(%)**
DR3TBDTT:B-SdiPBI	1:2	0.91	1.45	28.85	0.38
	1:1	0.93	2.81	29.83	0.78
	2:1	0.92	2.42	26.67	0.59
DR3TBDTT:O-SdiPBI	1:2	0.91	1.94	30.87	0.55
	1:1	0.93	5.87	34.16	1.86
	2:1	0.89	4.32	35.21	1.37
DR3TBDTT:H-SdiPBI	1:2	0.80	5.59	34.37	1.54
	1:1	0.88	5.82	44.65	2.30
	2:1	0.88	7.26	47.48	3.05
	3:1	0.86	6.06	36.03	1.87

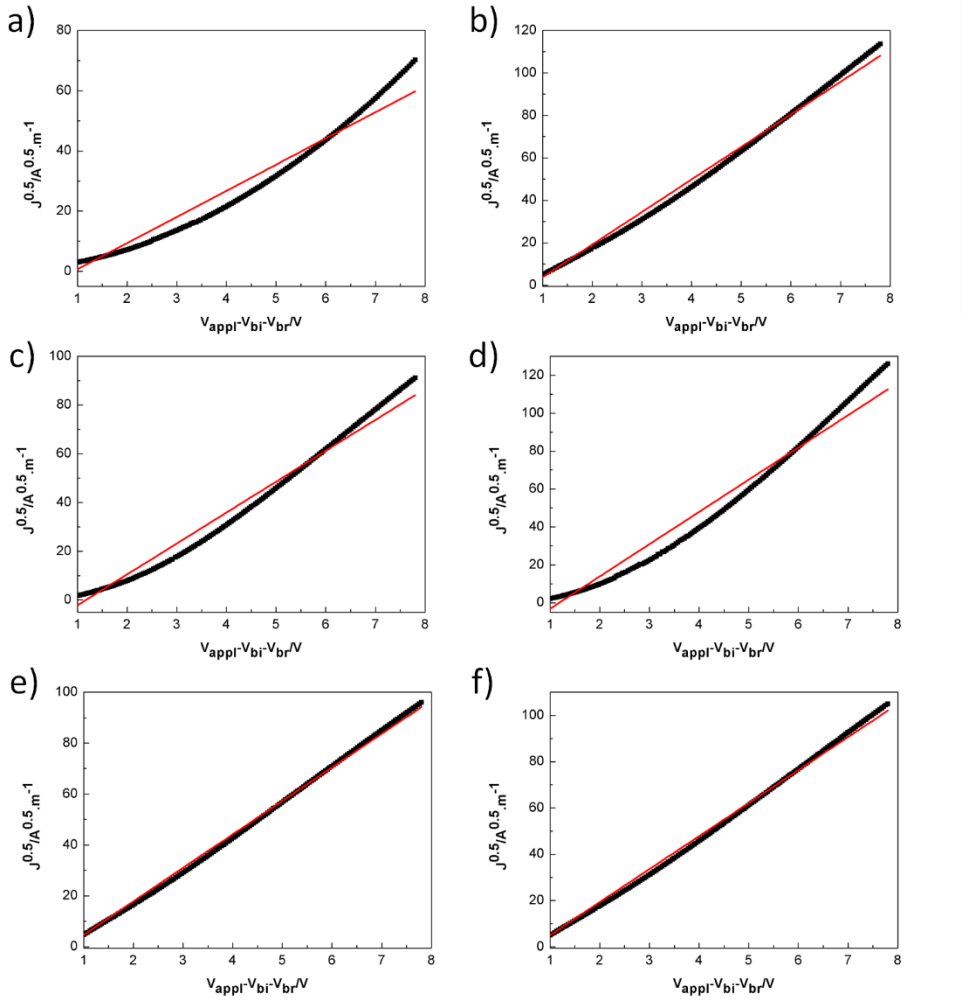

Figure. S1 $J^{0.5}$ vs V plots for the hole-only fabricated from DR3TBDTT: B-SdiPBI blend film (a) without SVA and (b) with SVA, DR3TBDTT: O-SdiPBI blend film (c) without SVA and (d) with SVA, DR3TBDTT: H-SdiPBI blend film (e) without SVA and (f) with SVA.

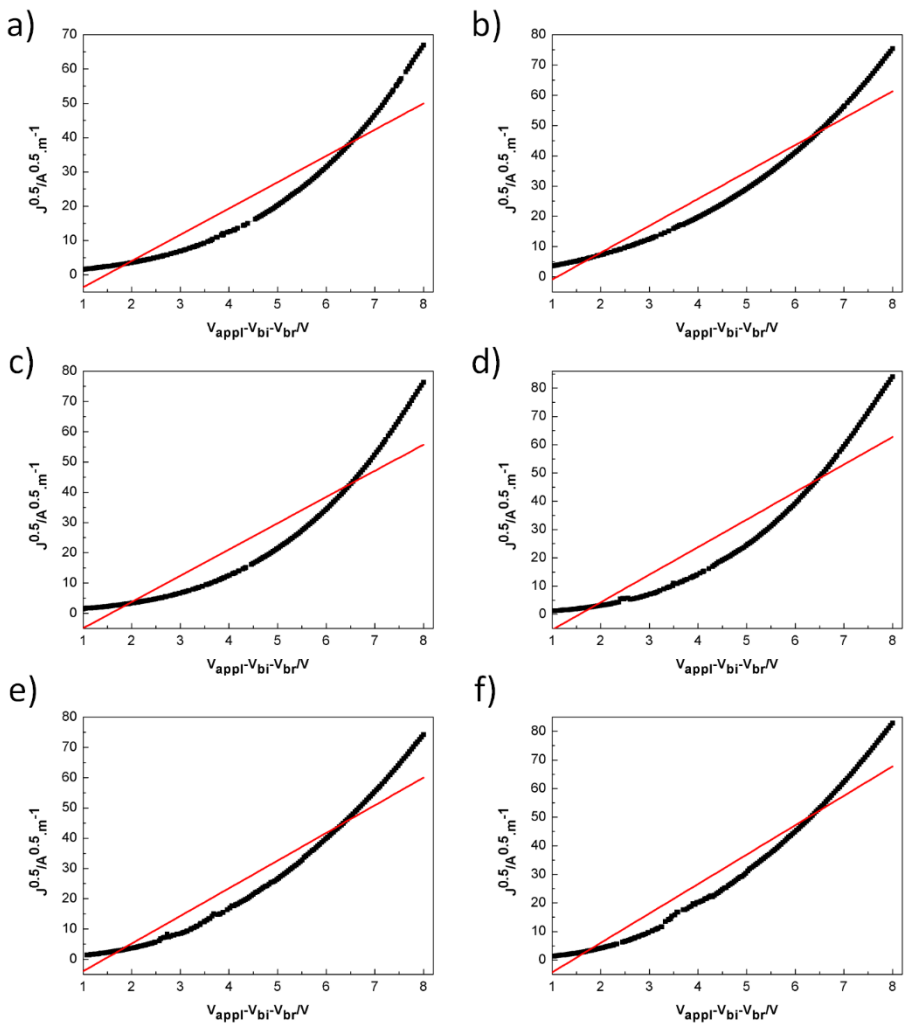

Figure. S2 $J^{0.5}$ vs V plots for the electron-only fabricated from DR3TBDTT: B-SdiPBI blend film (a) without SVA and (b) with SVA, DR3TBDTT: O-SdiPBI blend film (c) without SVA and (d) with SVA, DR3TBDTT: H-SdiPBI blend film (e) without SVA and (f) with SVA.

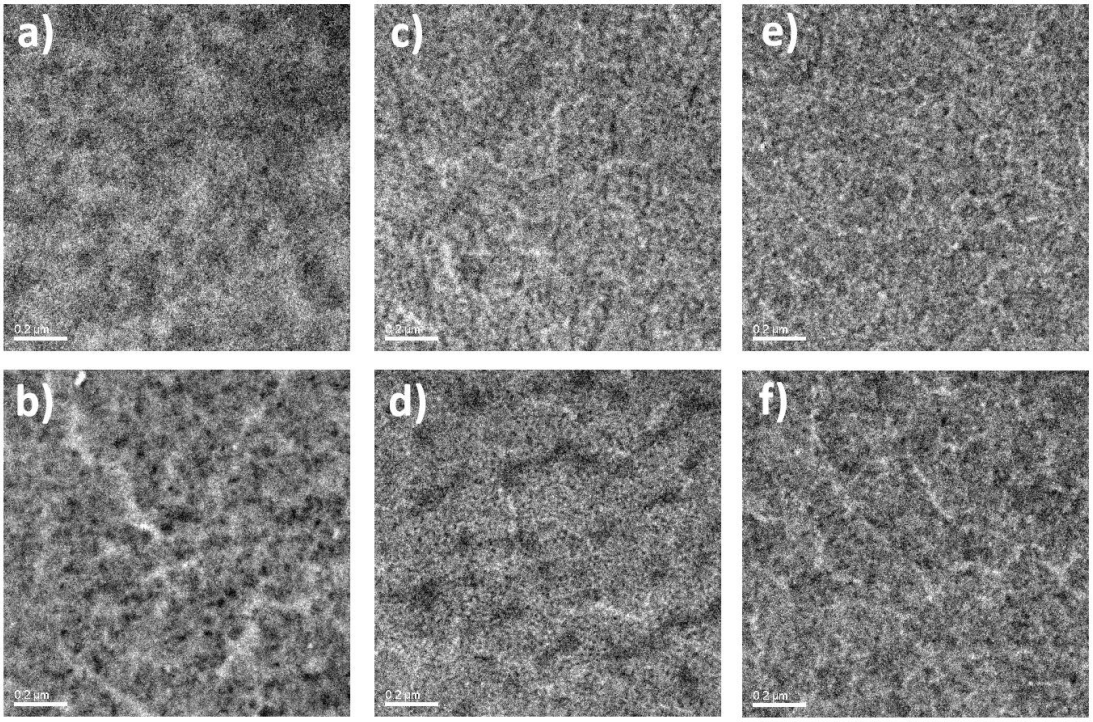

Figure. S3 TEM images (scale bar = 0.2 μm) of DR3TBDTT: B-SdiPBI blend film (a) without SVA and (b) with SVA, DR3TBDTT: O-SdiPBI blend film (c) without SVA and (d) with SVA, DR3TBDTT: H-SdiPBI blend film (e) without SVA and (f) with SVA.

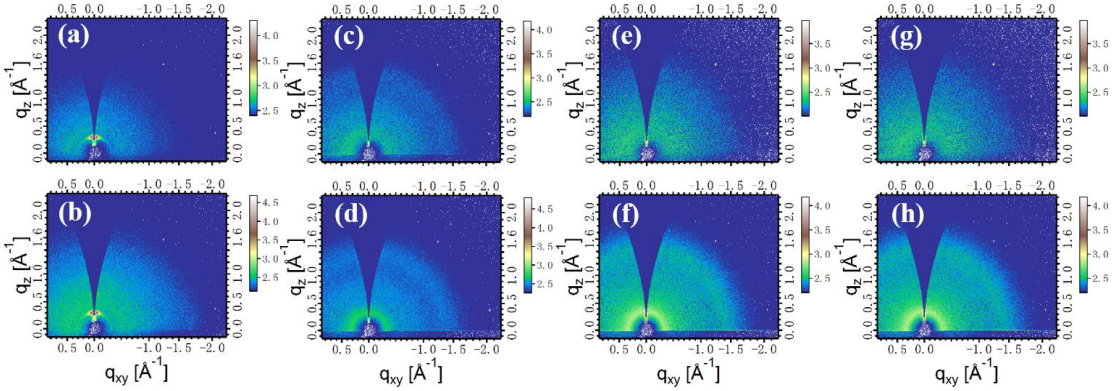

Figure. S4 2D GIWAXS patterns for DR3TBDTT neat film (a,b), B-SdiPBI neat film (c,d), O-SdiPBI neat film (e,f) and H-SdiPBI neat film (g,h) without (a,c,e,g) and with (b,d,f,h) SVA treatment.