

Supporting Information

Small Molecular PDI-functionalized 9,9'-Bifluorenylidene Acceptors for Bulk Heterojunction Organic Solar Cells

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1. TGA thermograms

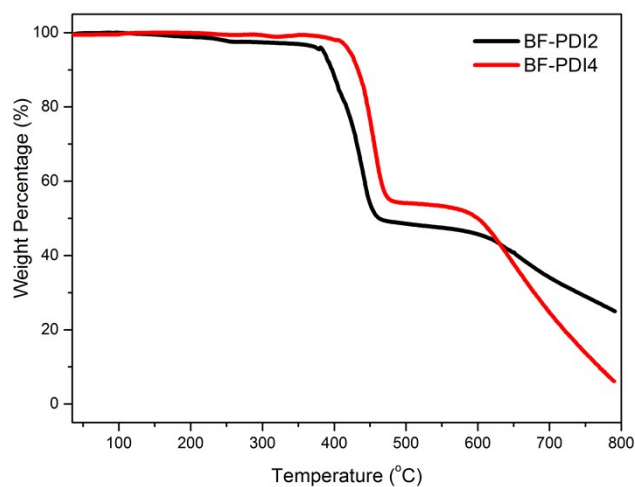


Figure S1 TGA thermogram of **BF-PDI2** and **BF-PDI4** at a temperature rate of 20 °C/min under nitrogen atmosphere.

2. DSC curves

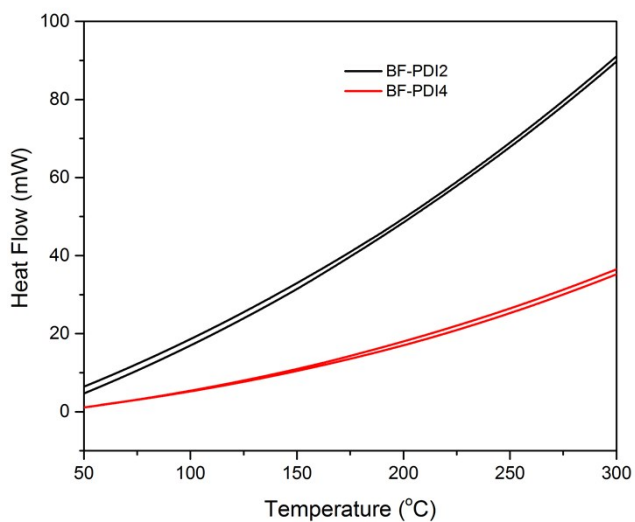


Figure S2 DSC curves of **BF-PDI2** and **BF-PDI4** at a heating temperature rate of 10 °C/min under nitrogen atmosphere.

3. Photovoltaic properties

Table S1 Photovoltaic performances of BHJ-OSCs with active layers of **PTB7-Th:BF-PDI2** and **PTB7-Th:BF-PDI4**.

Donor: Acceptor	Ratio	Additive	V _{oc} (V)	J _{sc} (mAcm ⁻²)	FF (%)	PCE (%)
PTB7-Th:BF-PDI2	1.5:1	--	0.92	5.28	35.98	1.75
	1.5:1	3% CN	0.91	5.83	40.03	2.12
	1:1	--	0.94	5.56	36.80	1.92
	1:1	3% CN	0.90	6.38	42.84	2.46
	1:1.5	--	0.93	5.42	36.17	1.82
	1:1.5	3% CN	0.90	5.99	40.76	2.20
PTB7-Th:BF-PDI4	1.5:1	--	0.81	10.28	39.06	3.25
	1.5:1	3% CN	0.85	9.13	52.35	4.06
	1:1	--	0.83	10.85	41.73	3.75
	1:1	3% CN	0.87	9.59	53.08	4.43
	1:1.5	--	0.81	10.5	38.37	3.28
	1:1.5	3% CN	0.87	9.07	55.74	4.37

Table S2 Photovoltaic performances of BHJ-OSCs with active layers of **PTB7-Th:BF-PDI2** and **PTB7-Th:BF-PDI4** by weight of 1:1 with different ratio of CN (v%).

Donor: Acceptor	CN (v%)	V _{oc} (V)	J _{sc} (mAcm ⁻²)	FF (%)	PCE (%)
PTB7-Th:BF-PDI2 (1:1)	1.5%	0.91	6.08	41.35	2.29
	2%	0.89	6.27	42.23	2.36
	3%	0.90	6.38	42.84	2.46
	4%	0.89	6.33	42.71	2.40
PTB7-Th:BF-PDI4 (1:1)	1.5%	0.85	9.78	52.56	4.37
	2%	0.86	9.61	52.78	4.36
	3%	0.87	9.59	53.08	4.43
	4%	0.87	9.49	53.19	4.39

References

1. Q. Yan and D. Zhao, *Org. Lett.* 2009, **11**, 3426-3429.