Electronic Supplementary Material (ESI) for RSC Advances.

Supporting Information

Photovoltaic properties of 3,3'-(ethane-1,2-diylidene)-bis(indolin-2-one) based conjugated polymers

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1. *NMR spectra*

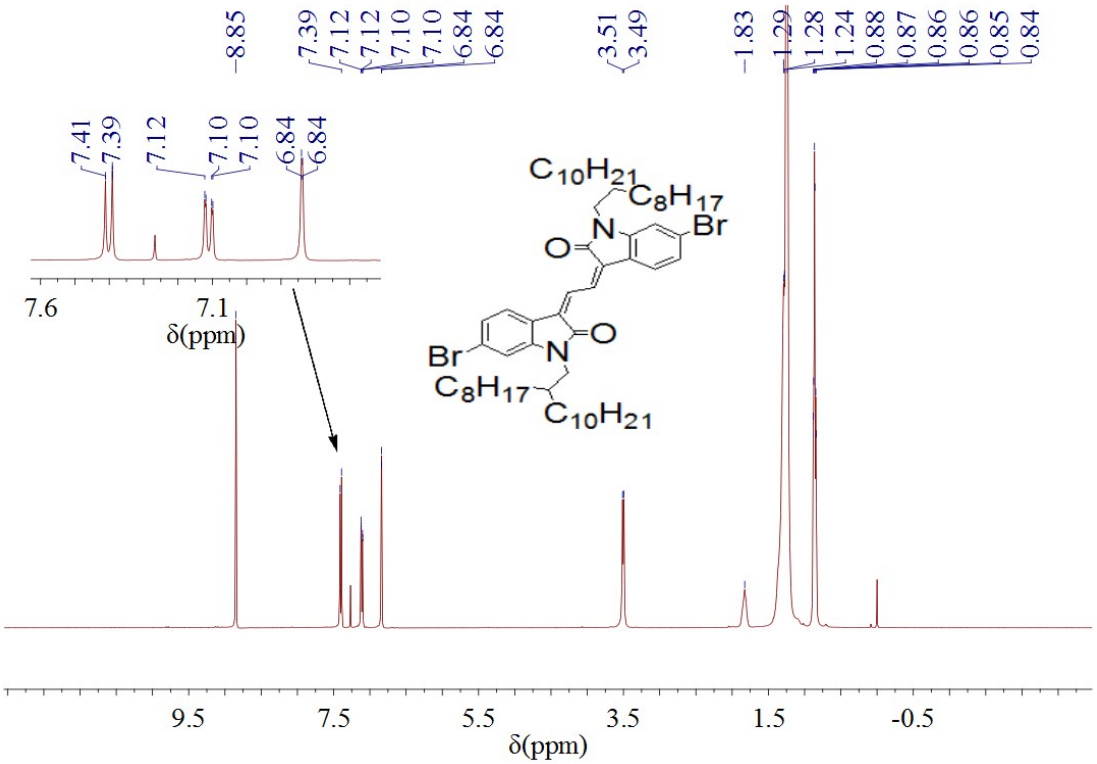

Fig. S1. ^{1}H NMR spectrum of compound **M**

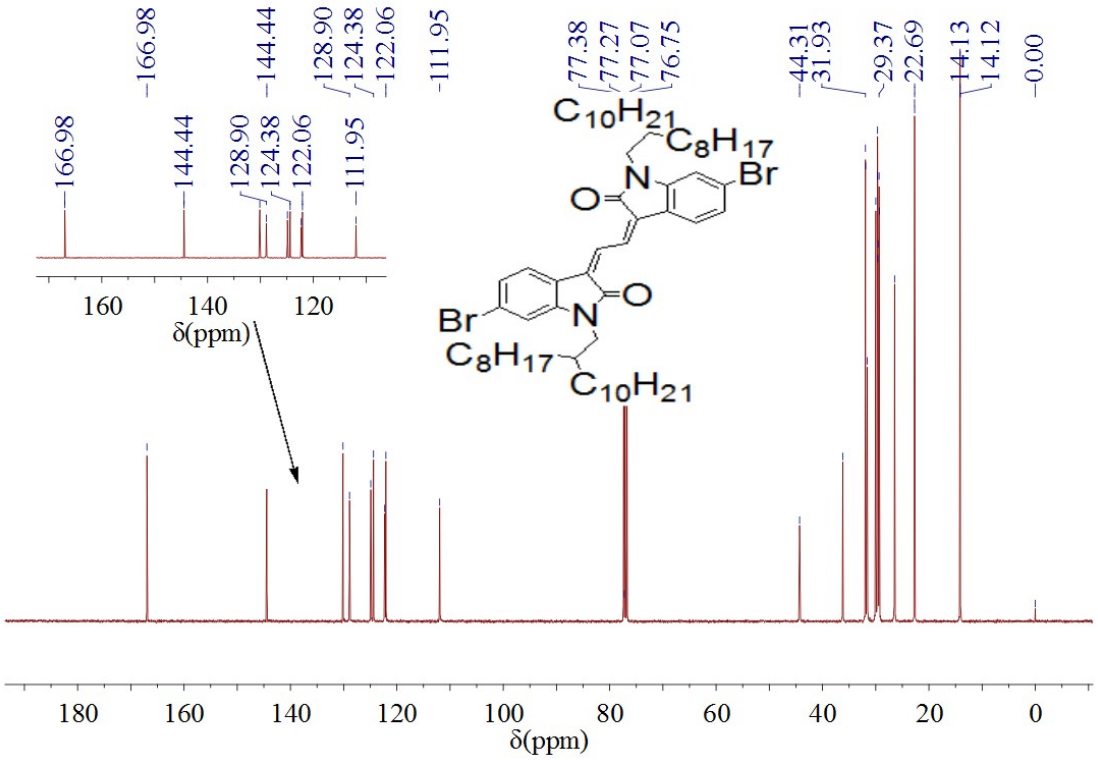

Fig. S2. ^{13}C NMR spectrum of compound **M**

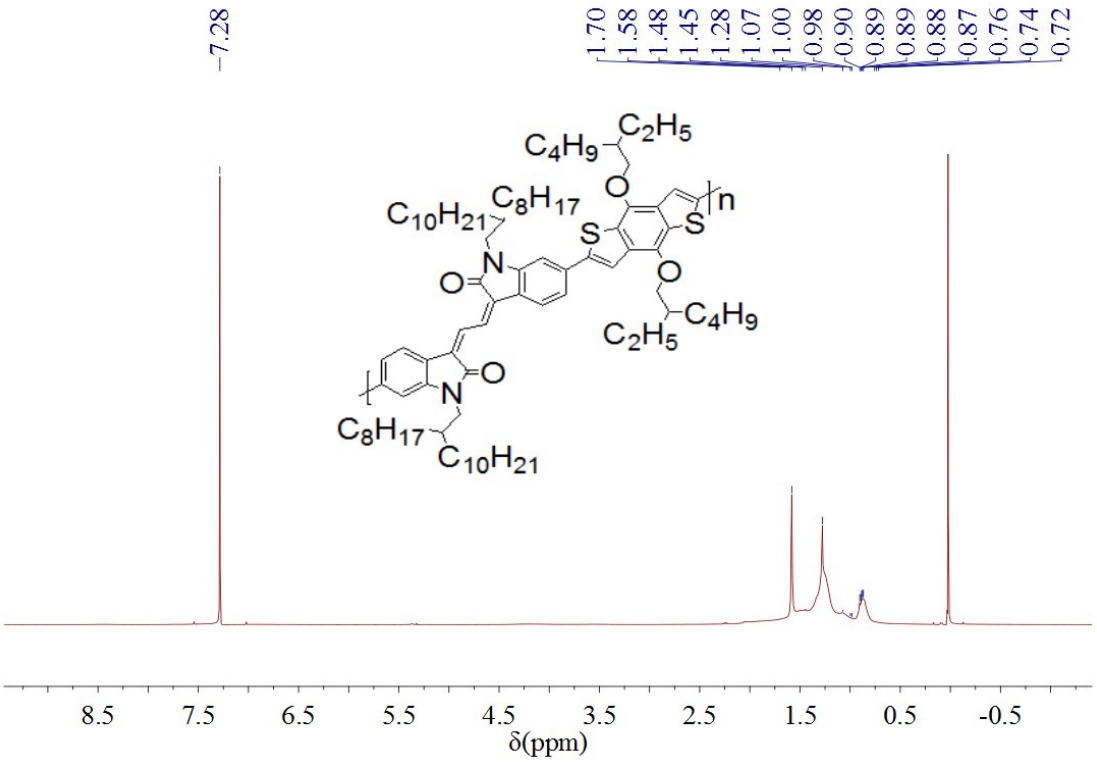

Fig. S3. ^{1}H NMR spectrum of **PEBI-BDTO**

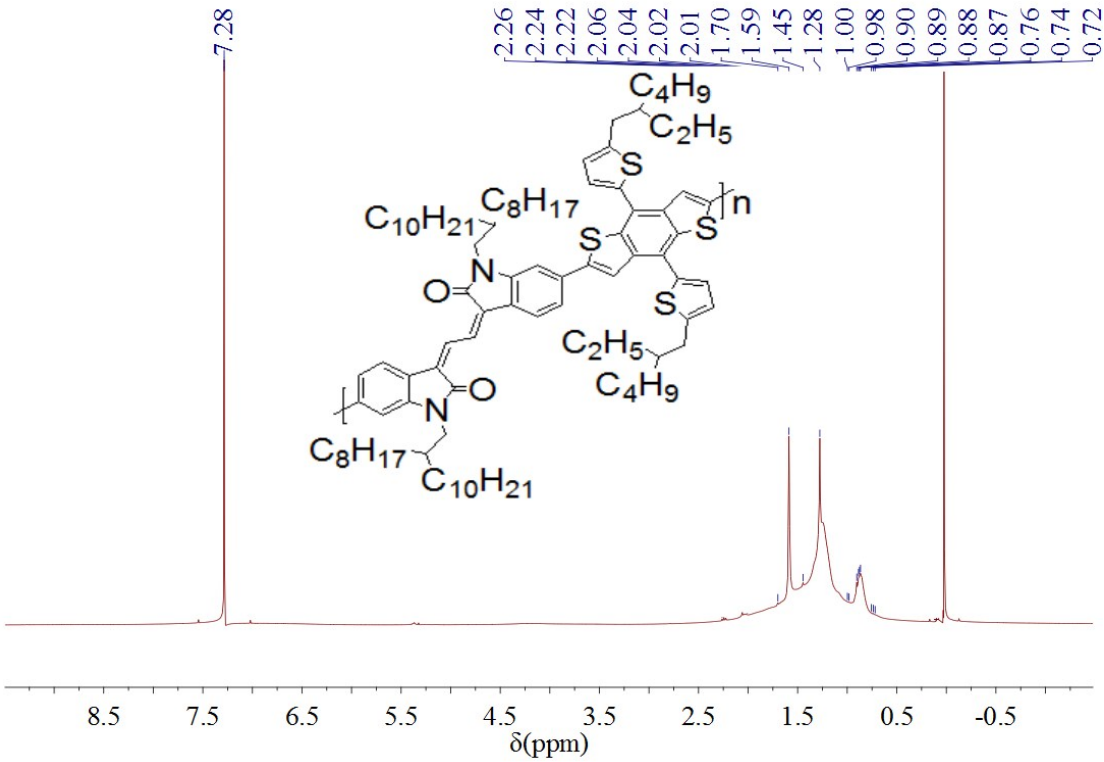

Fig. S4. ^{1}H NMR spectrum of **PEBI-BDT**

2. *TGA and DSC thermograms of polymers*

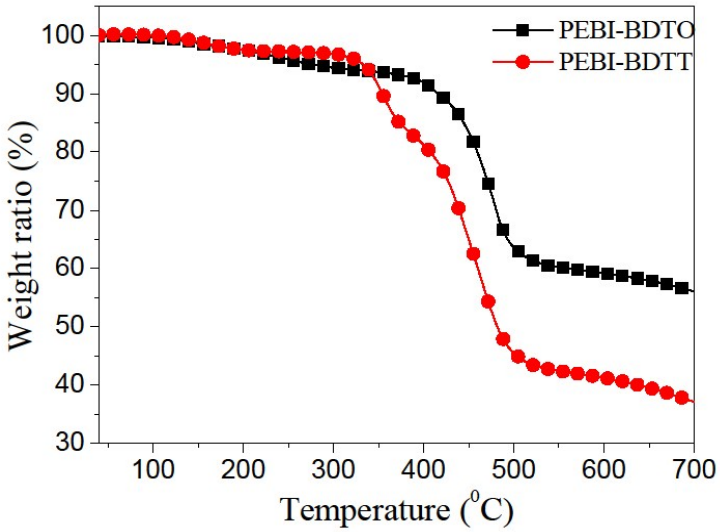

Fig. S5. TGA curves of polymers.

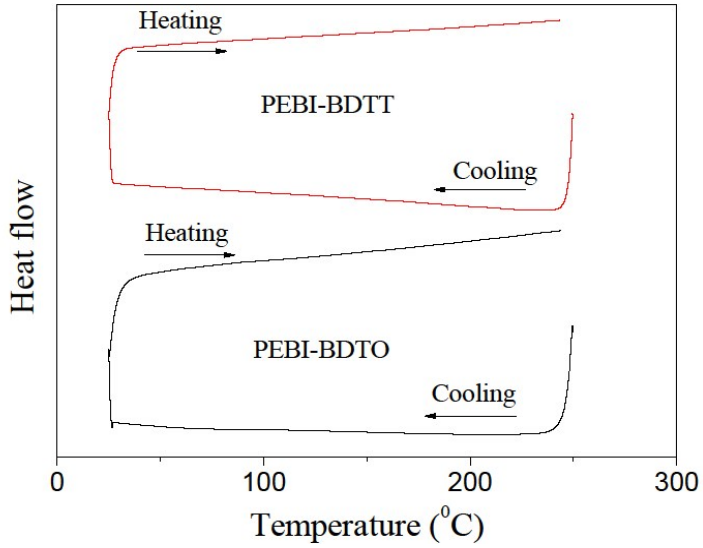

Fig. S6. DSC thermograms of polymers

The first cooling and the second heating scan of polymers with temperature ramp of 20 °C/min.

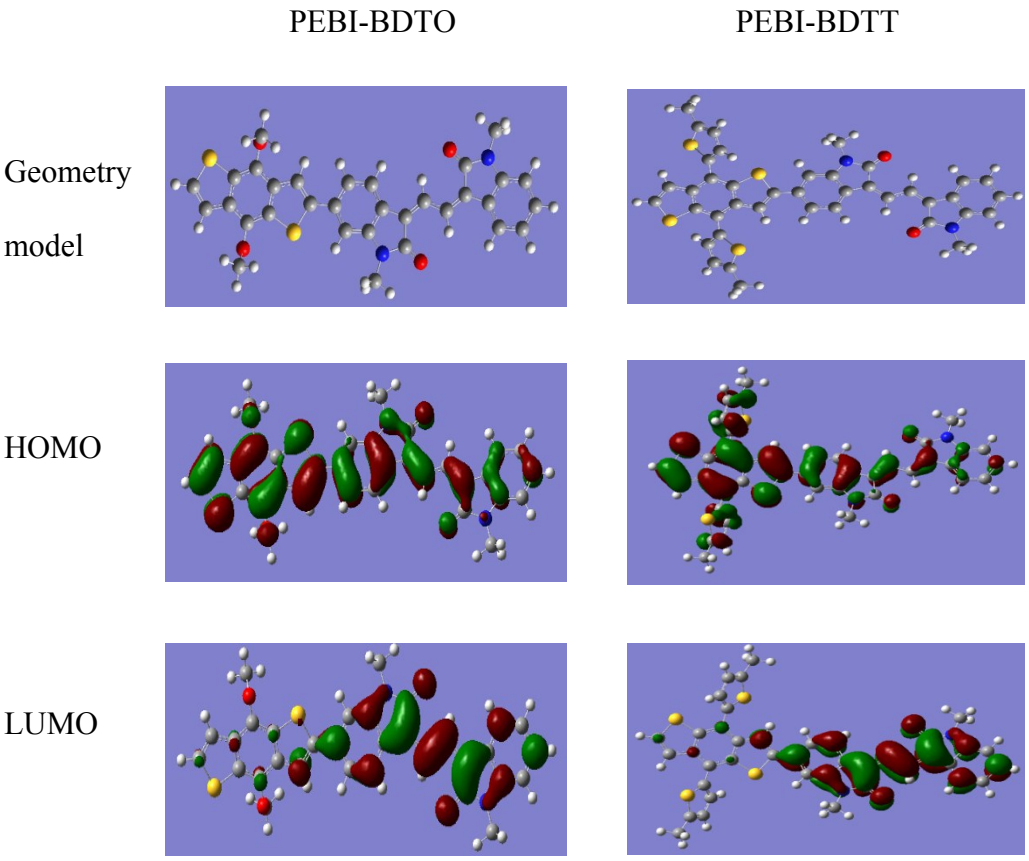

Fig. S7. The geometry, the LUMO and HOMO orbital of model **PEBI-BDTO** (left) and **PEBI-BDTT** (right) by DFT calculations with the B3LYP/6-31G** basis set.

1. *Polymer solar cell devices performances*

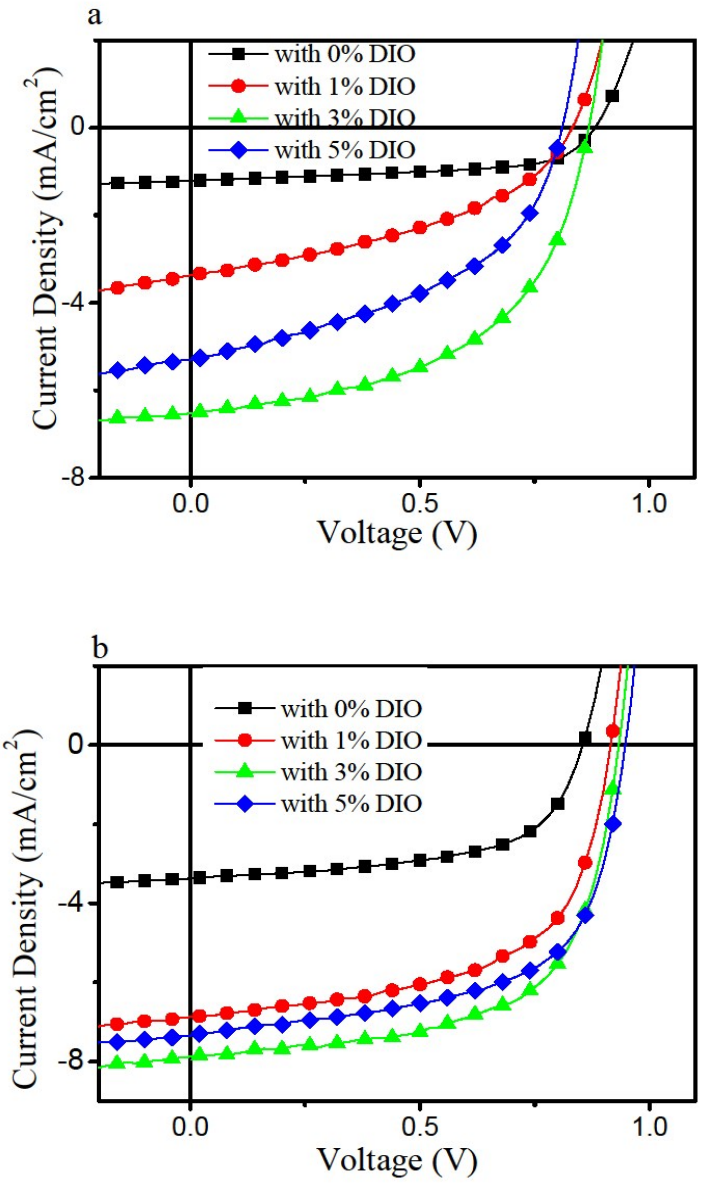

Fig. S8. *I-V* curves of PSC devices processed with different amount of DIO (a) **PEBI-BDTO**:$PC_{71}BM$ and (b) **PEBI-BDTT**:$PC_{71}BM$

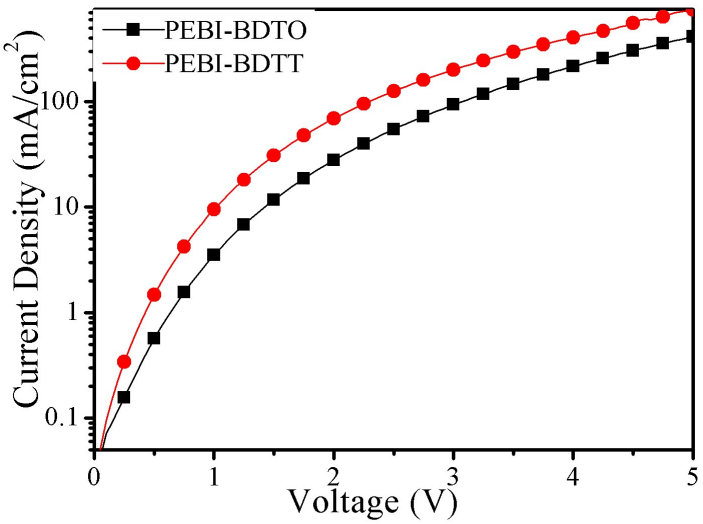

Fig. S9. *I-V* characteristics of **PEBI-BDTO** and **PEBI-BDTT** hole-only devices.

Table.S1. The solar cell performances with different amount of DIO

Active layer (w/w)		DIO(%)	*Jsc* (mA/cm^2)	Voc (V)	FF	PCE (%)
Polymer:$PC_{71}BM$	D:A					
PEBI-BDTO: $PC_{71}BM$	1:2	0	1.21	0.88	58.7	2.39±0.08
	1:2	1	3.37	0.84	41.2	2.54±0.13
	1:2	3	6.53	0.86	53.4	2.74±0.06
	1:2	5	5.48	0.82	51.7	3.00±0.12
PEBI-BDTT: $PC_{71}BM$	1:1.5	0	3.37	0.86	58.8	1.70±0.17
	1:1.5	1	6.87	0.92	58.5	3.70±0.11
	1:1.5	3	7.88	0.94	62.1	4.59±0.15
	1:1.5	5	7.34	0.94	61.4	4.23±0.07