Supporting information

4,7-Di-2-thienyl-2,1,3-benzothiadiazole with hexylthiophene side chains and a benzodithiophene Q2 based copolymer for efficient organic solar cells

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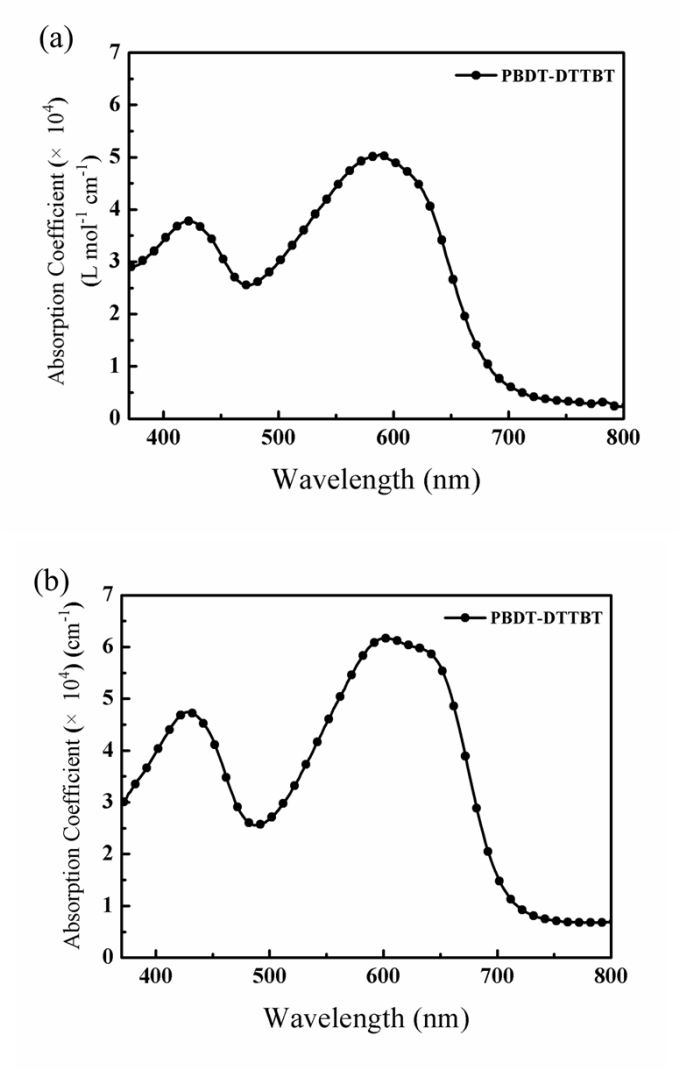


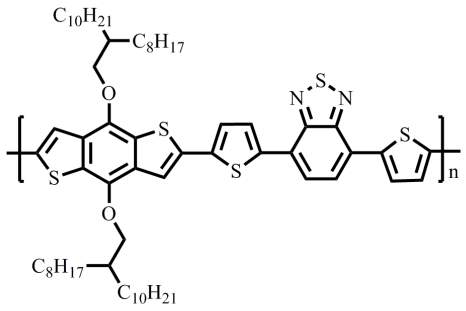
Figure S1. The absorption coefficient of PBDT-DTTBT in the $CHCl_3$ solution (a) and thin solid film (b).

Table S1 Photovoltaic properties of the PSCs based on the blend of PBDT-DTTBT and $PC_{71}BM$

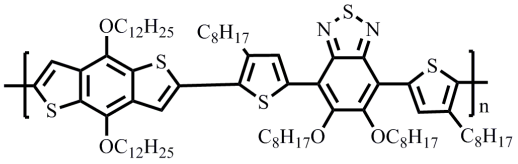
Ratio (A : D, w/w)	DIO (%)	V_{oc} (V)	J_{sc} (mA/cm^2)	FF (%)	PCE_{max}/PCE_{ave}[a]
1.5 : 1	2	0.81±0.01	10.64±0.04	57.53±0.16	4.97/（4.96±0.01）
1 : 1	2	0.80±0.01	12.56±0.22	60.38±0.70	6.19/（6.05±0.16）
1 : 1.5	2	0.80±0.01	9.99±0.10	62.82±0.23	4.93/（4.87±0.07）
1 : 2	2	0.79±0.01	9.68±0.17	62.14±1.04	4.91/（4.78±0.12）

[a] The average PCE was obtained from five devices.

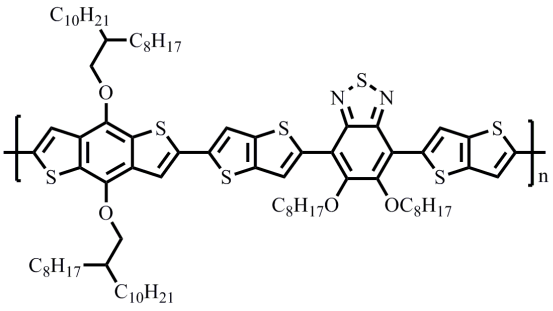
Figure S2. *J-V* curves of the PSCs based on PBDT-DTTBT and $PC_{71}BM$ with different D/A ratios.



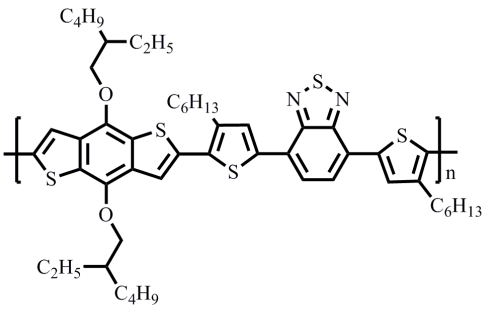
PBDT-DTBT



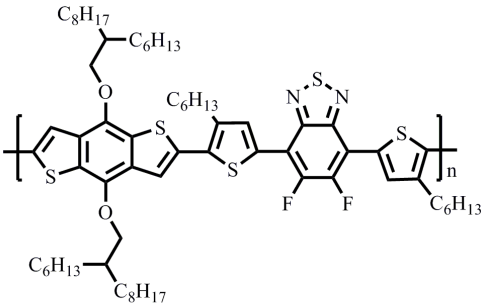
PBDT-TBT-C8



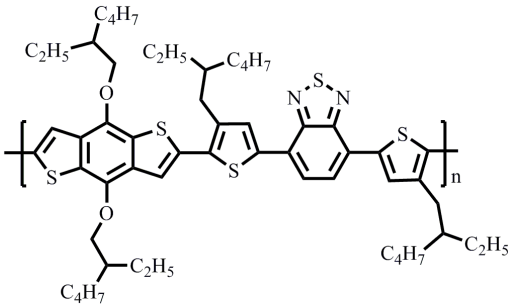
P(BDT-TT-BT)



PBDTC$_6$TBT



PBDT$_{HDO}$-DT$_H$BTff



PBDTDTBT

Figure S3. The molecular structures of PBDT-DTBT, PBDT-TBT-C8, P(BDT-TT-BT), P(BDT-TT-BT), PBDT$_{HDO}$-DT$_H$BTff and PBDTDTBT.

Figure S4. XRD pattern of PBDT-DTTBT as film

Figure S5. ^{1}H NMR spectrum of compound 4.

Figure S6. ^{1}H NMR spectrum of DTTBT.

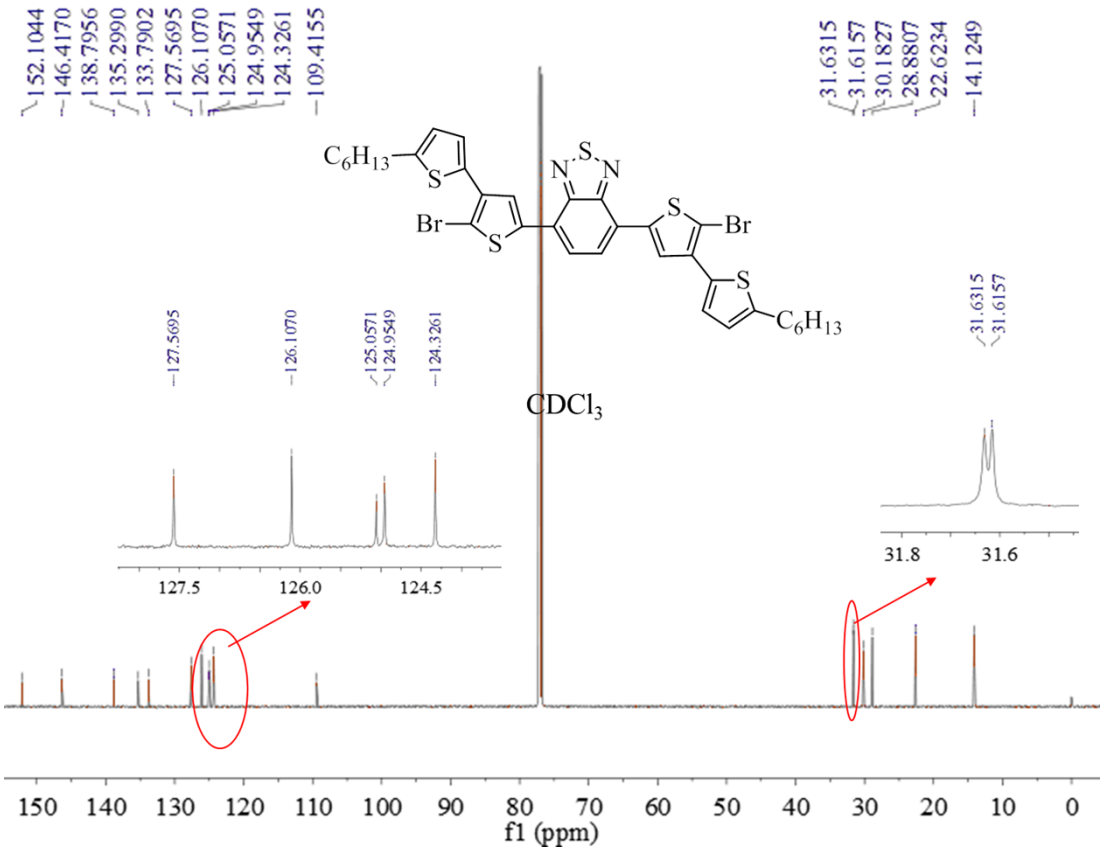


Figure S7. ^{13}C NMR spectrum of DTTBT.

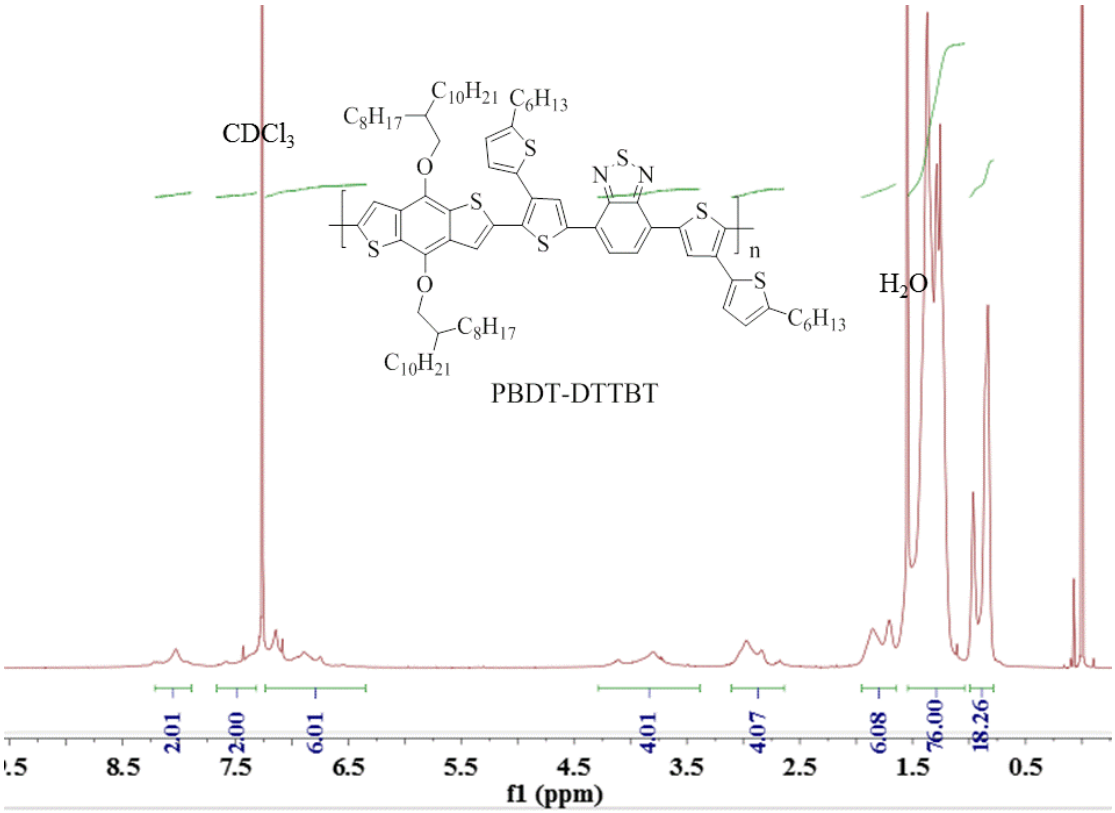


Figure S8. ^{1}H NMR spectrum of PBDT-DTTBT.