

Supporting Information

Synthesis and photovoltaic performances of conjugated copolymers with 4,7-dithien-5-yl-2,1,3-benzothiadiazole and di(*p*-tolyl)phenylamine side groups

Haohao Li, Hao Luo, Zhencai Cao, Zhaojie Gu, Ping Shen, Bin Zhao, Huajie Chen,
Gui Yu, Songting Tan*

1. ^1H NMR spectra of important compounds and synthesized copolymers

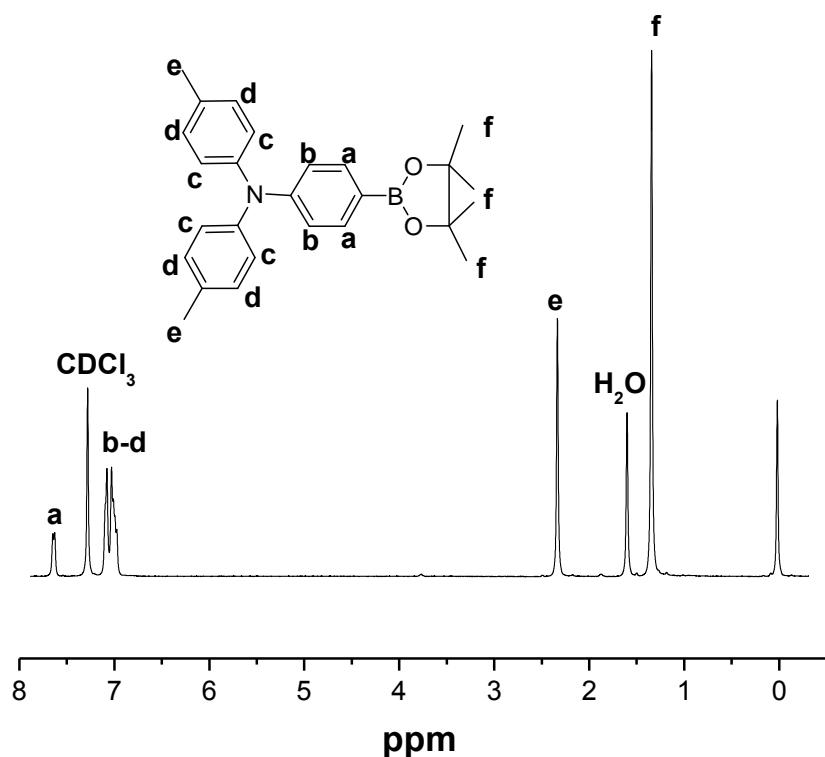


Fig. S1 ^1H NMR spectrum of compound 1.

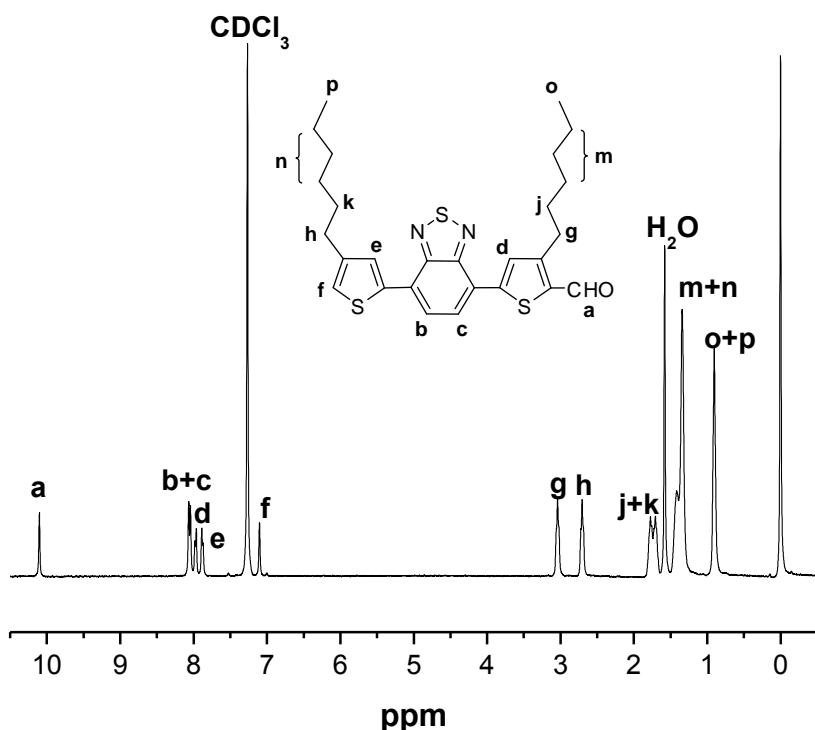


Fig. S2 ¹H NMR spectrum of compound 3.

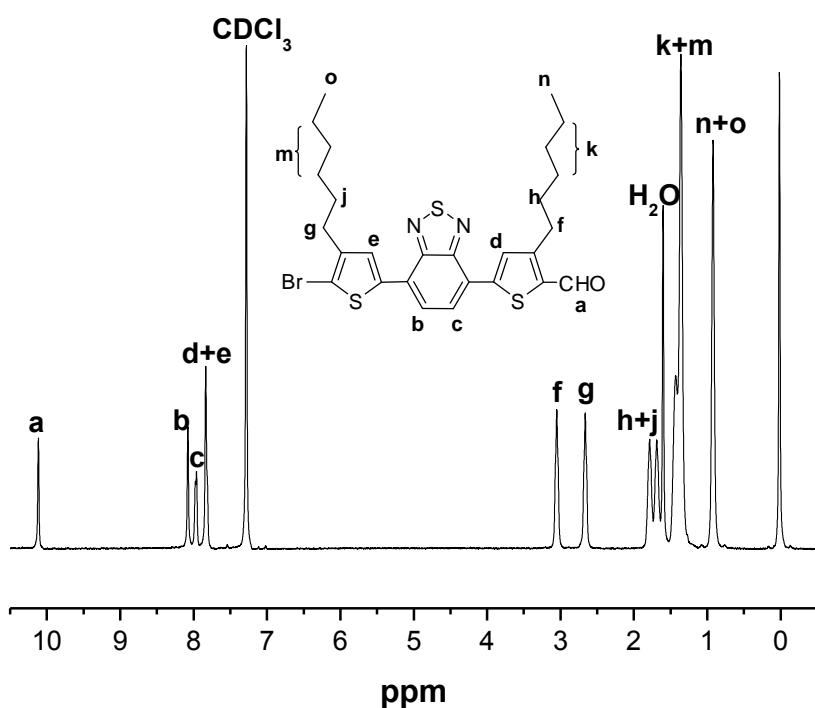


Fig. S3 ¹H NMR spectrum of compound 4.

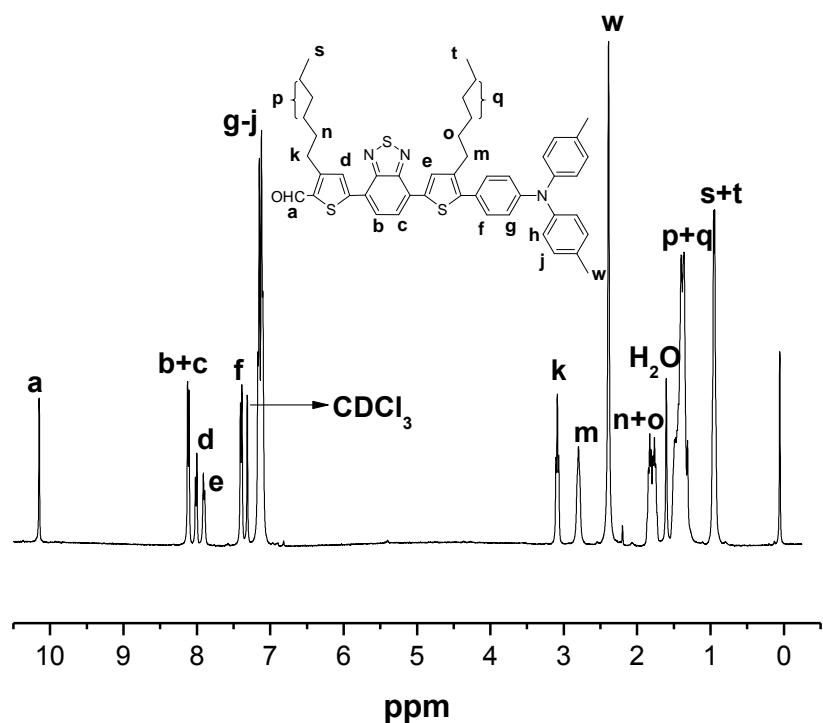


Fig. S4 ^1H NMR spectrum of compound 5.

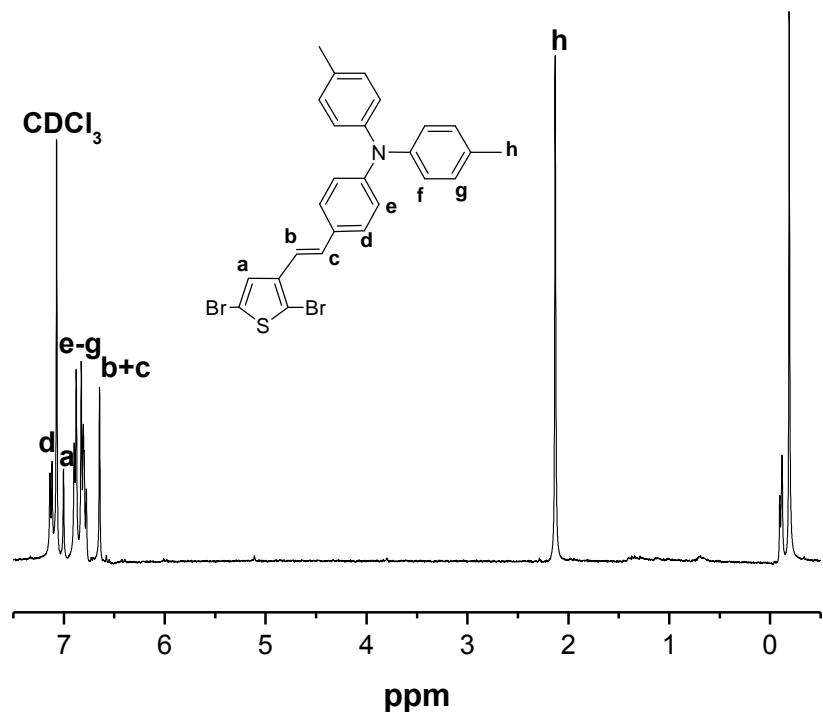


Fig. S5 ^1H NMR spectrum of compound M1.

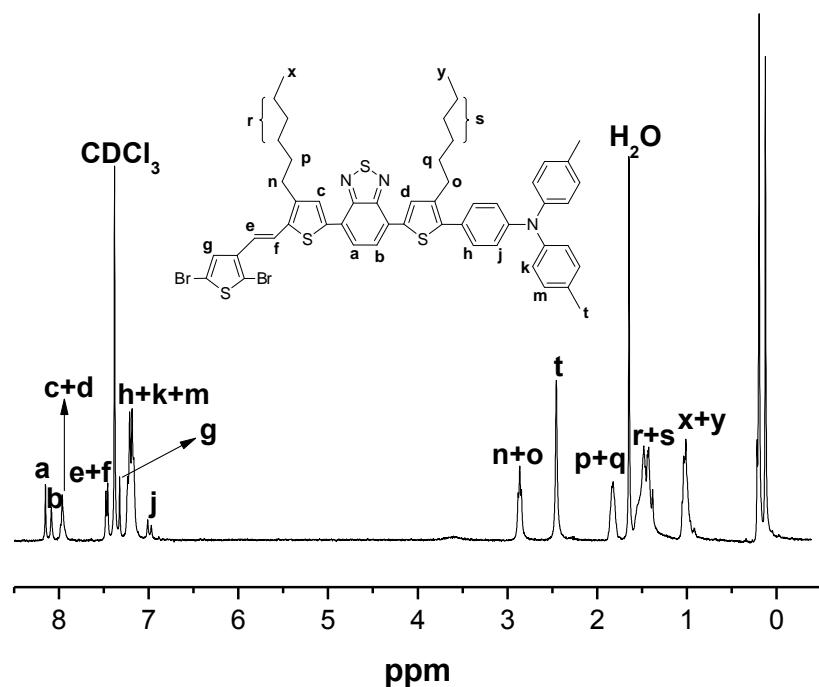


Fig. S6 ¹H NMR spectrum of compound M3.

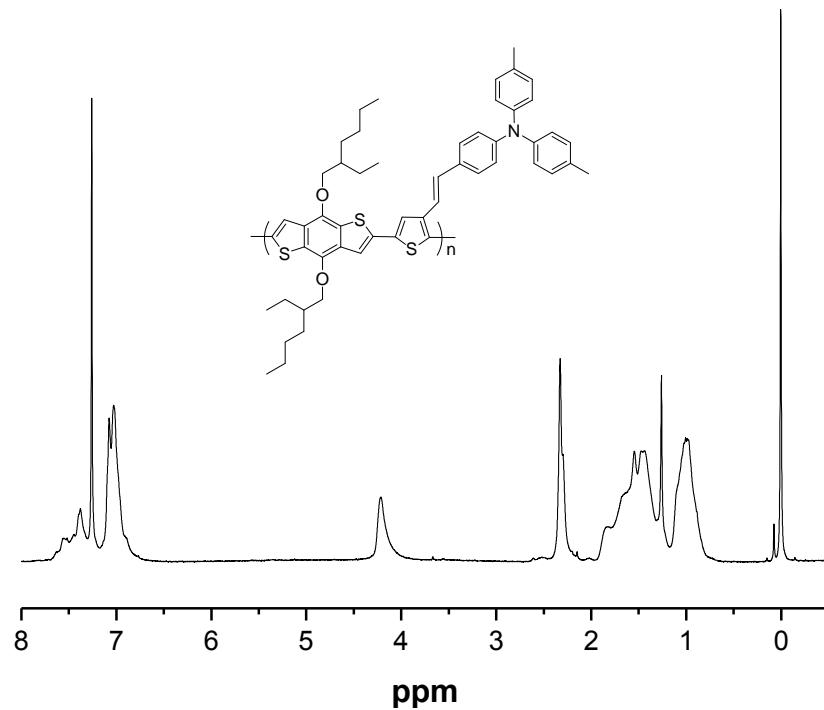


Fig. S7 ¹H NMR spectrum of compound PT-TPA.

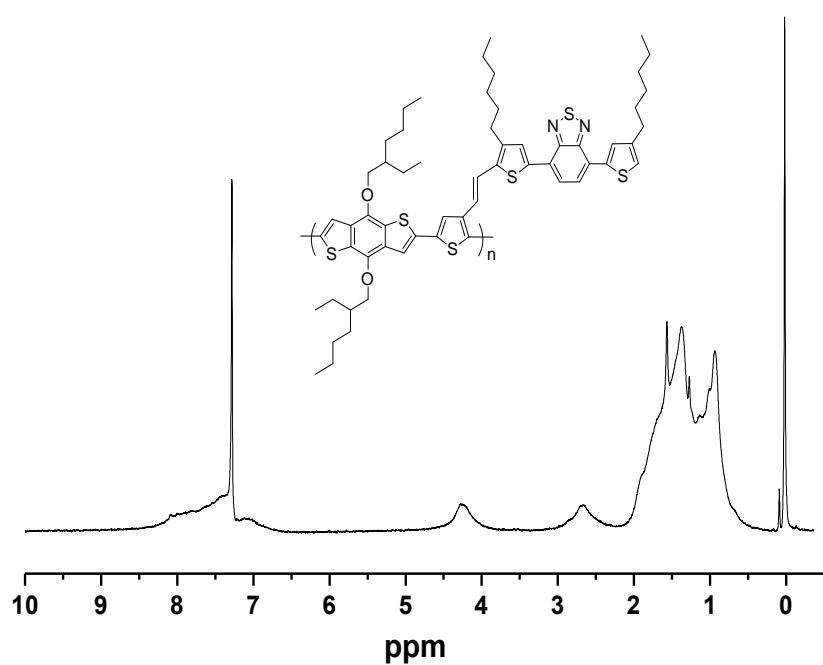


Fig. S8 ¹H NMR spectrum of compound **PT-DTBT**.

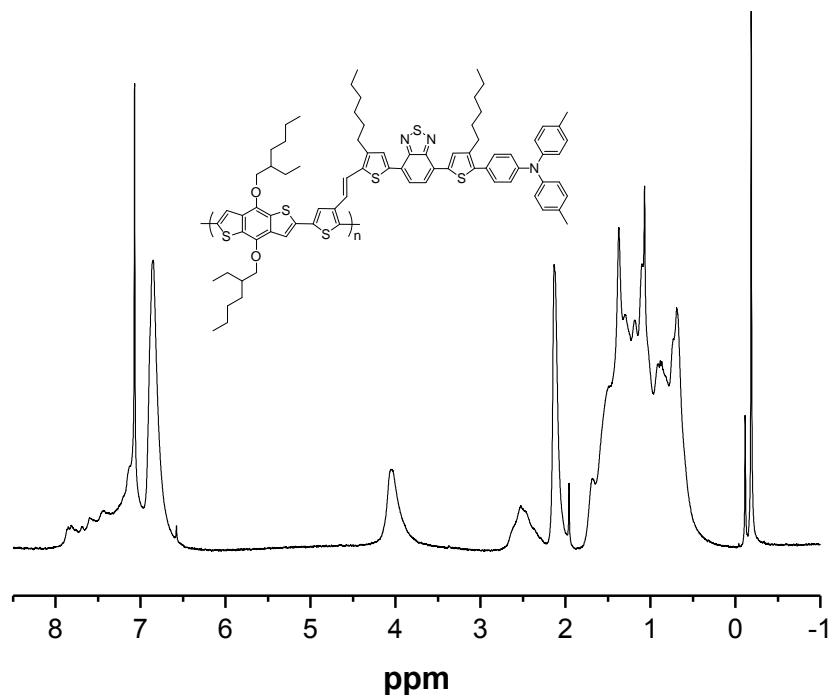


Fig. S9 ¹H NMR spectrum of compound **PT-DTBTPA**

2. Polymer Field-Effect Transistor Devices (FETs)

1) PT-TPA

PT-TPA	Average mobility /cm ² V ⁻¹ s ⁻¹	Maximum Mobility /cm ² V ⁻¹ s ⁻¹	On/off current ratio	V _{th} /V
rt	1.8×10 ⁻³	1.8×10 ⁻³	3.5×10 ³	-4
160°C	5.5×10 ⁻⁴	6.0×10 ⁻⁴	2.6×10 ⁶	-7

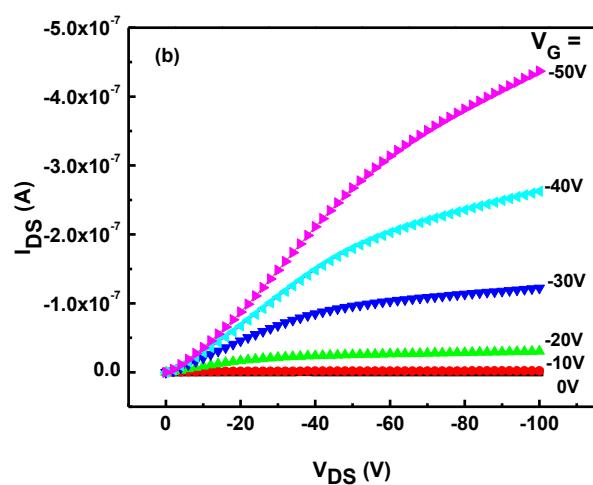
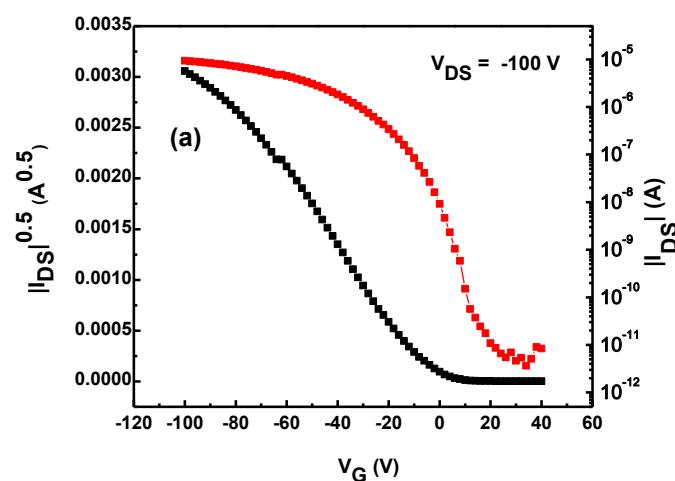


Fig. S10 Transfer and Output characteristics of the PT-TPA-based OTFTs devices annealing at 160 °C for 5 min.

2) PT-DTBT

PT-DTBT	Average mobility /cm ² V ⁻¹ s ⁻¹	Maximum Mobility /cm ² V ⁻¹ s ⁻¹	On/off current ratio	V _{th} /V
rt	1.2×10 ⁻³	1.2×10 ⁻³	3.0×10 ³	-2
160°C	3.2×10 ⁻³	8.0×10 ⁻³	1.0×10 ⁴	-16

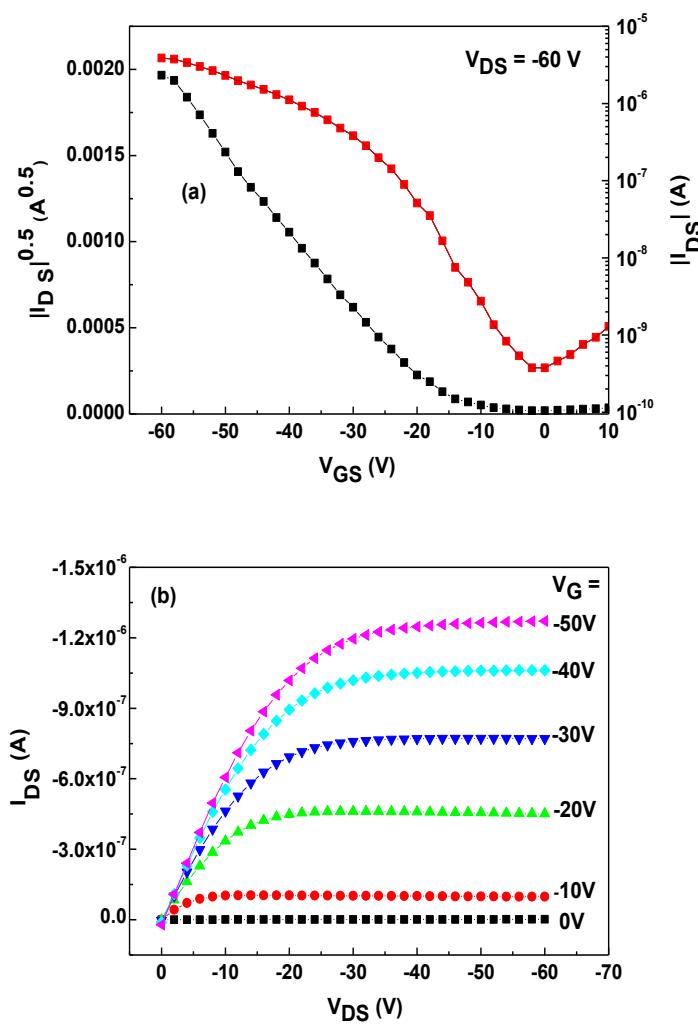


Fig. S11 Transfer and Output characteristics of the **PT-DTBT**-based OTFTs devices annealing at 160 °C for 5 min.

3) PT-DTBTPA

PT-DTBTPA	Average mobility/ $\text{cm}^2 \text{V}^{-1} \text{s}^{-1}$	Maximum Mobility / $\text{cm}^2 \text{V}^{-1} \text{s}^{-1}$	On/off current ratio	V_{th} / V
rt	1.2×10^{-3}	1.6×10^{-3}	3.4×10^3	-5
160°C	4.0×10^{-3}	4.5×10^{-3}	1.8×10^4	-1

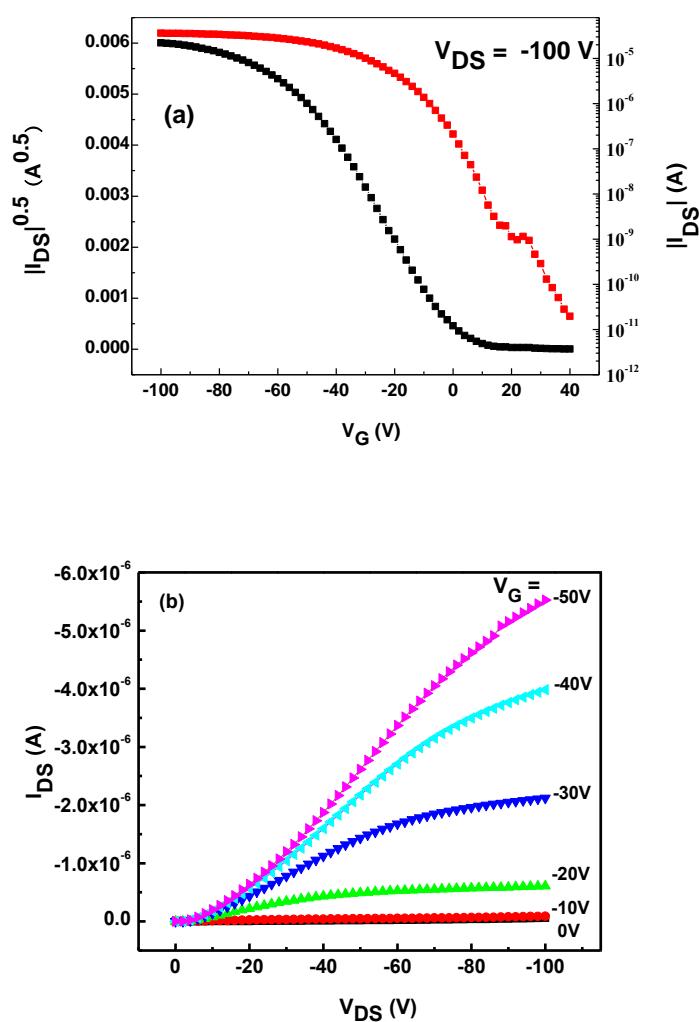


Fig. S12 Transfer and output characteristics of the **PT-DTBTPA**-based OTFTs devices annealing at 160 °C for 5 min.

3. AFM

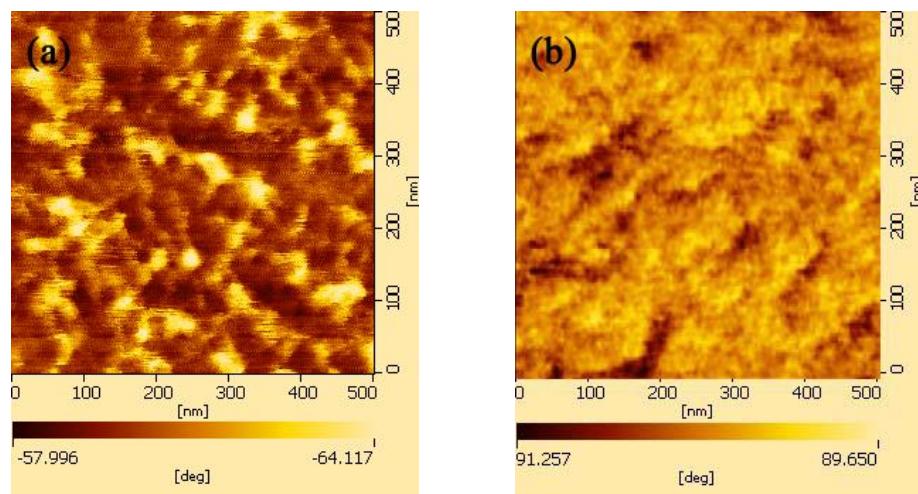


Fig. S13 AFM phase images (500×500 nm) for **PT-DTBTPA/PC₆₁BM** blend films (1:4, w/w): (a) without DIO, (b) with DIO.