Electronic Supplementary Material (ESI) for Journal of Materials Chemistry C.

Electronic Supporting Information for

Pt Complex Based Terpolymer Acceptors Linked Through Ancillary Ligand for All-Polymer Solar Cells

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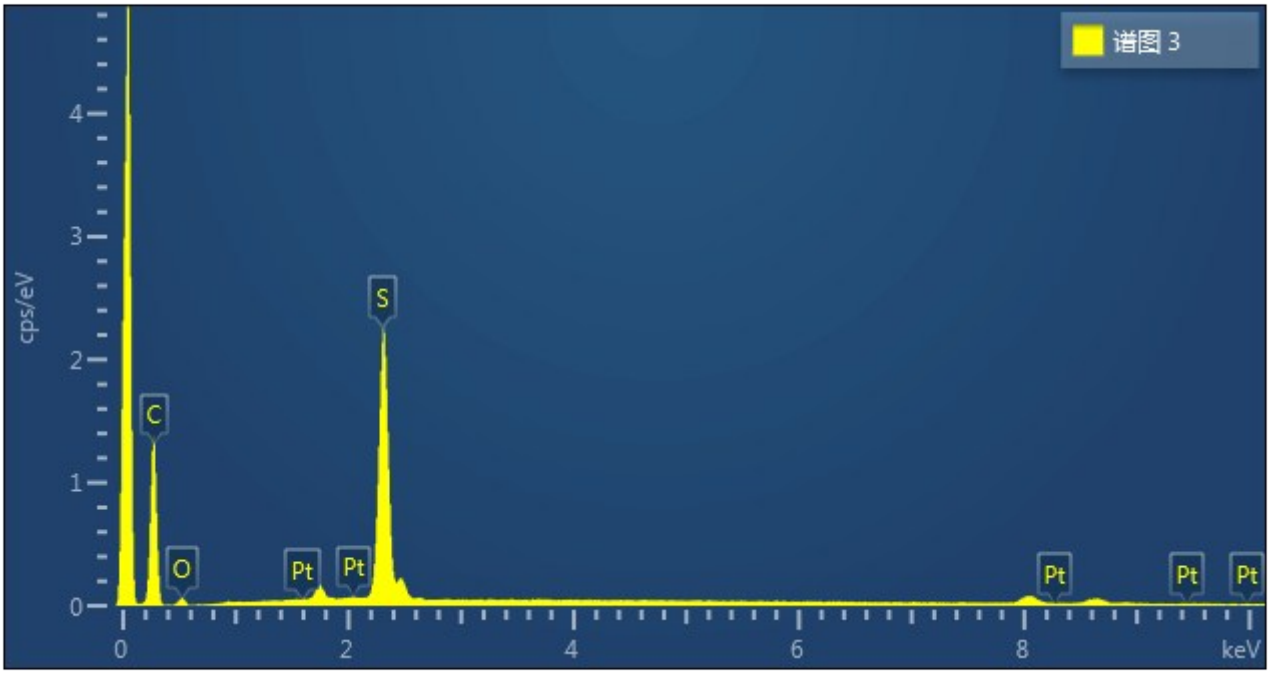

Figure S1. EDS elemental analysis spectrum of P(dbm)PtPyTPA1.

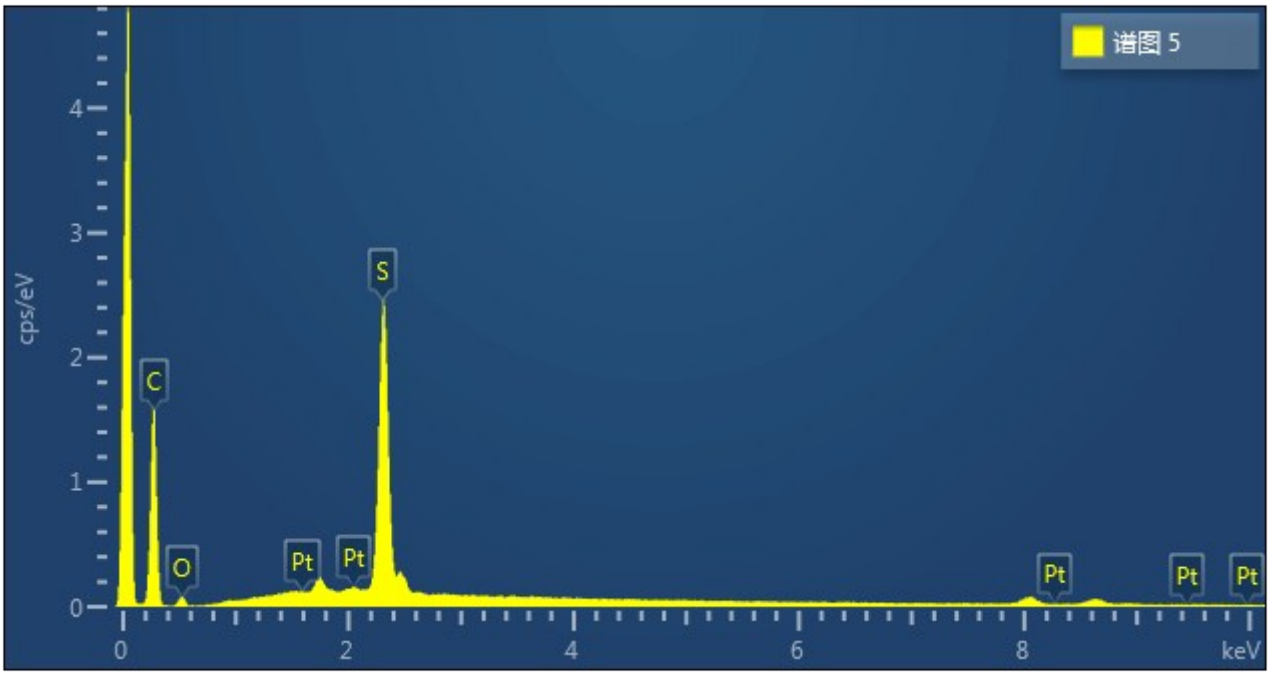

Figure S2. EDS elemental analysis spectrum of P(dbm)PtPyTPA2.

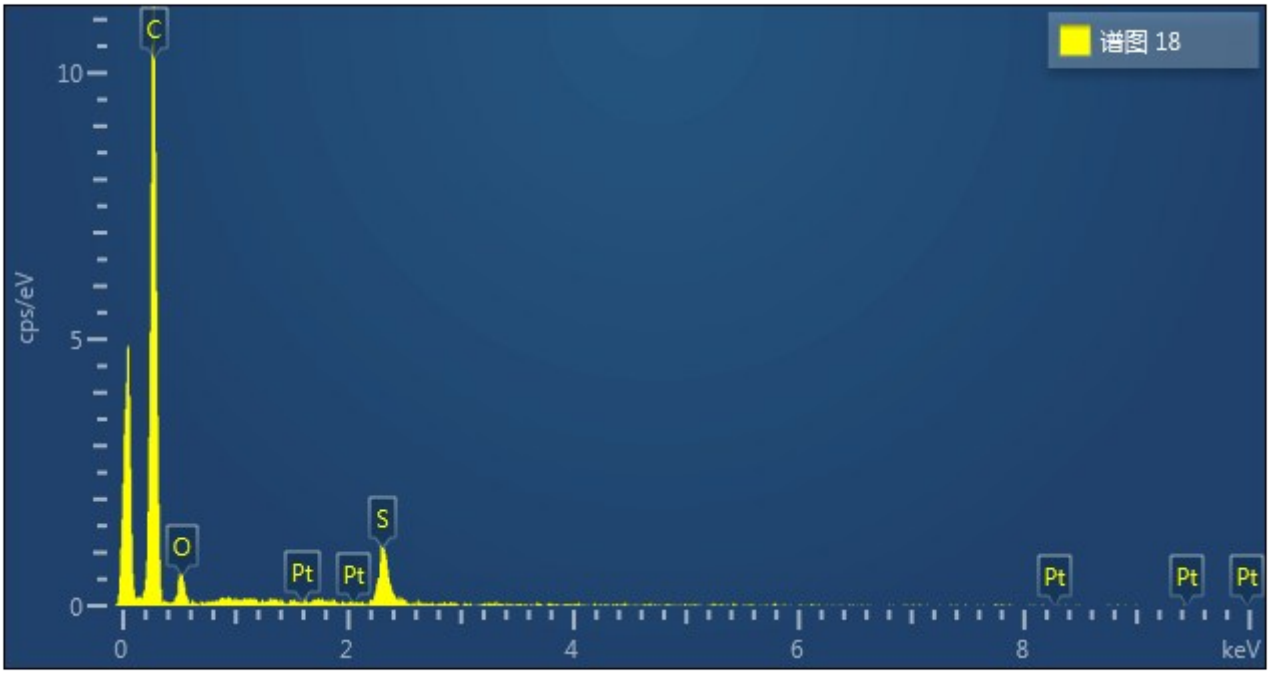

Figure S3. EDS elemental analysis spectrum of P(dbm)PtPyTPA5.

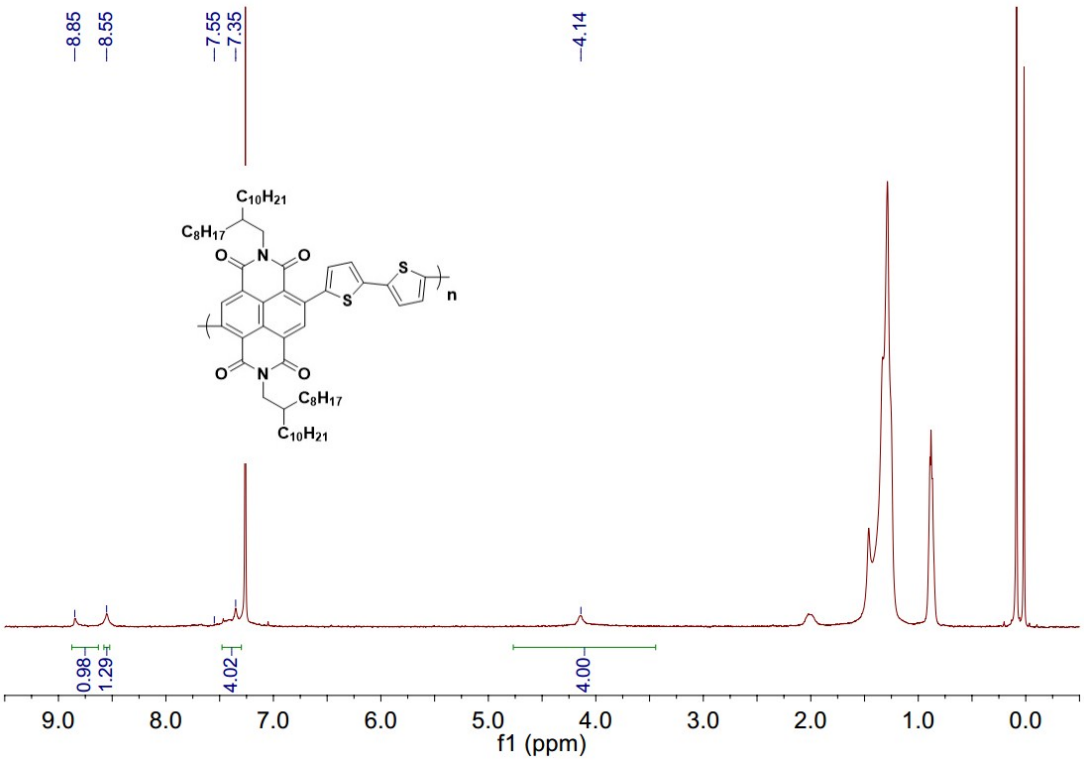

Figure S4. ^{1}H NMR spectra of PNDIT2.

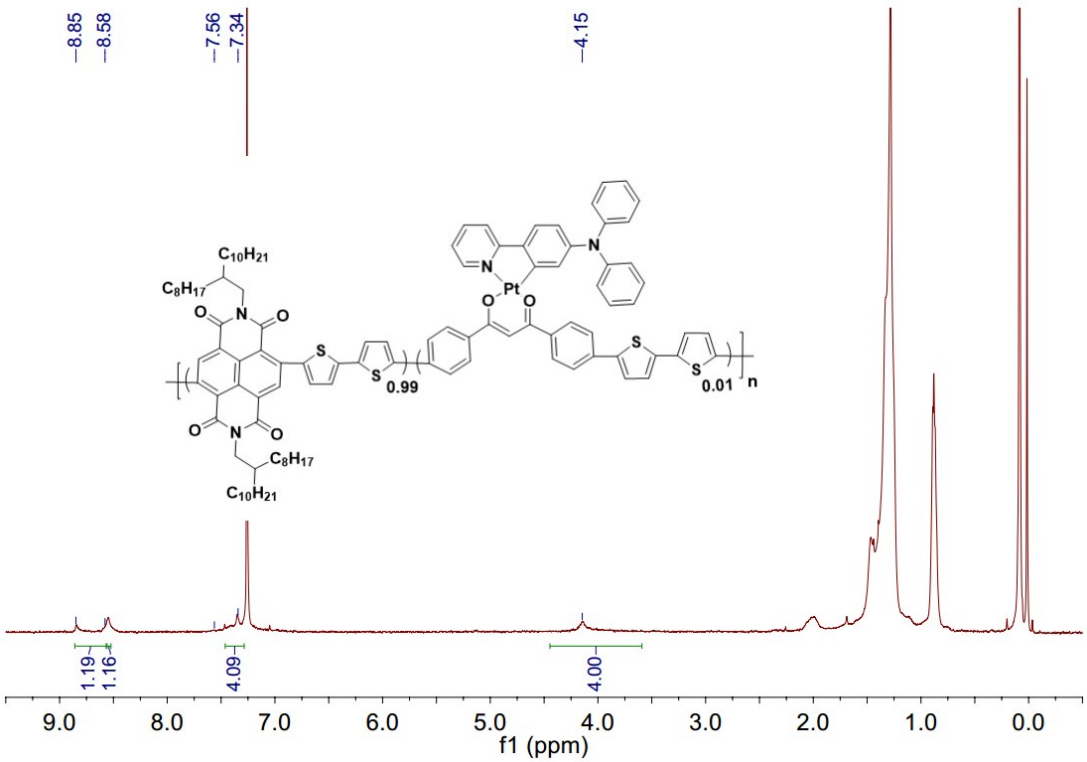

Figure S5. ^{1}H NMR spectra of P(dbm)PtPyTPA1.

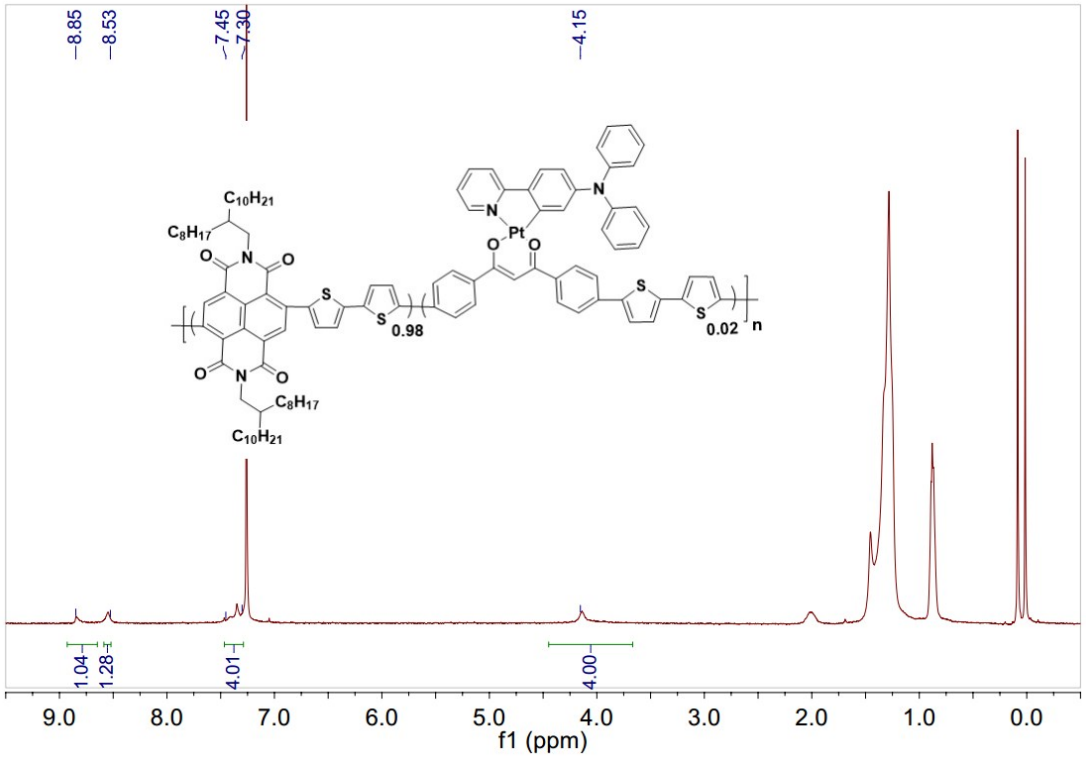

Figure S6. ^{1}H NMR spectra of P(dbm)PtPyTPA2.

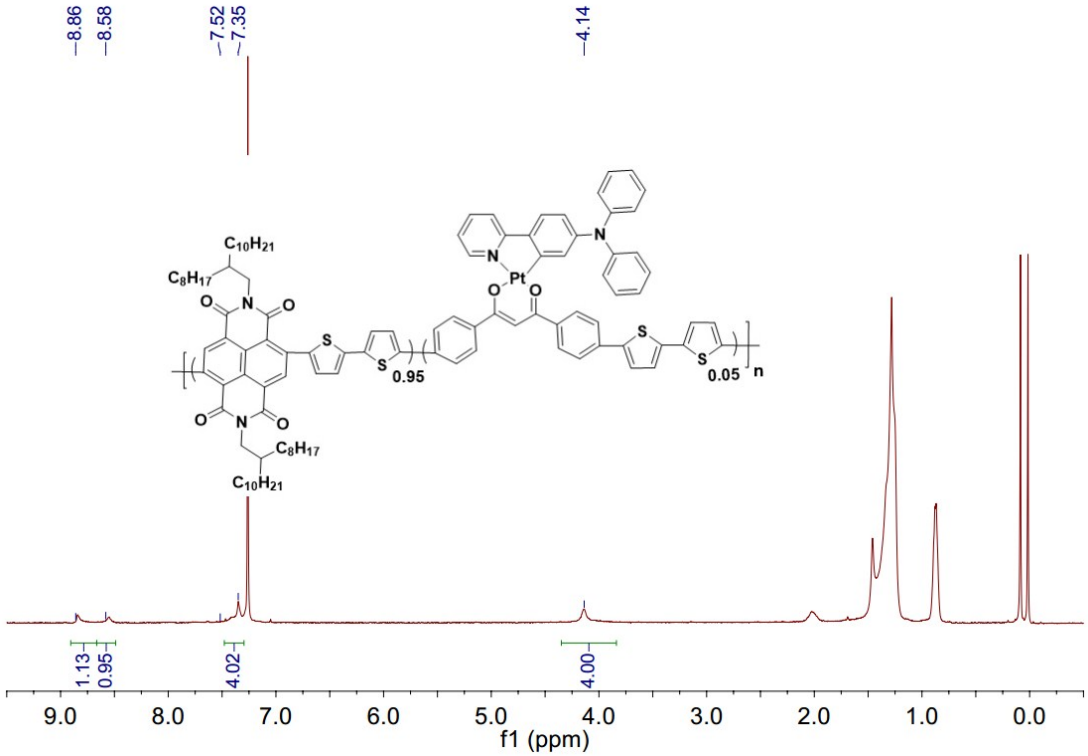

Figure S7. ^{1}H NMR spectra of P(dbm)PtPyTPA5.

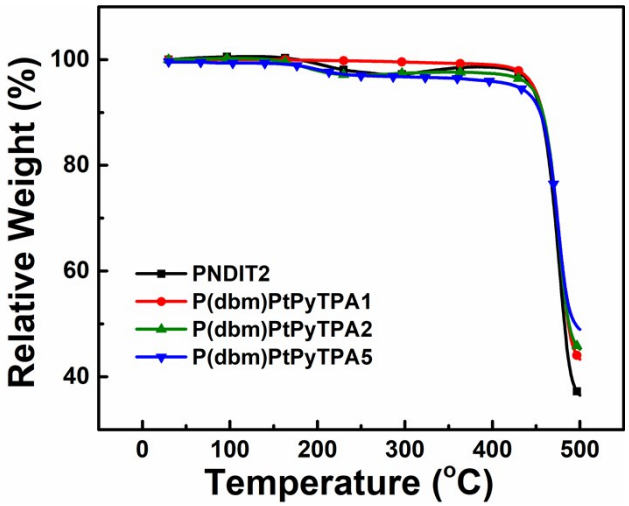

Figure S8. Thermogravimetric analysis (TGA) curves for polymer acceptors.

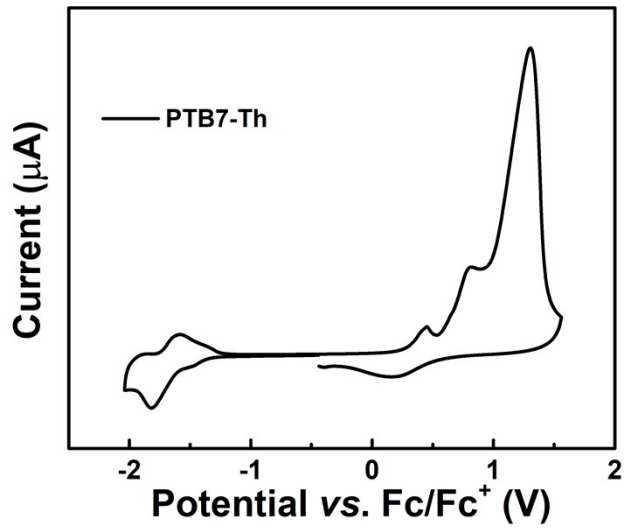

Figure S9. Cyclic voltammogram of PTB7-Th.

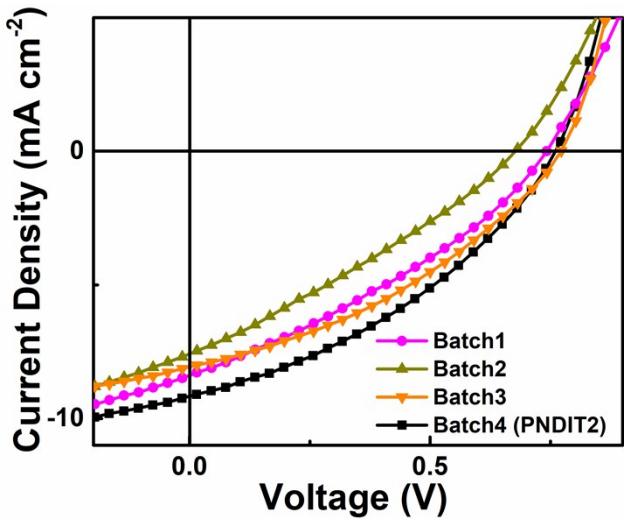

Figure S10. *J-V* curves of different batches of PNDIT2.

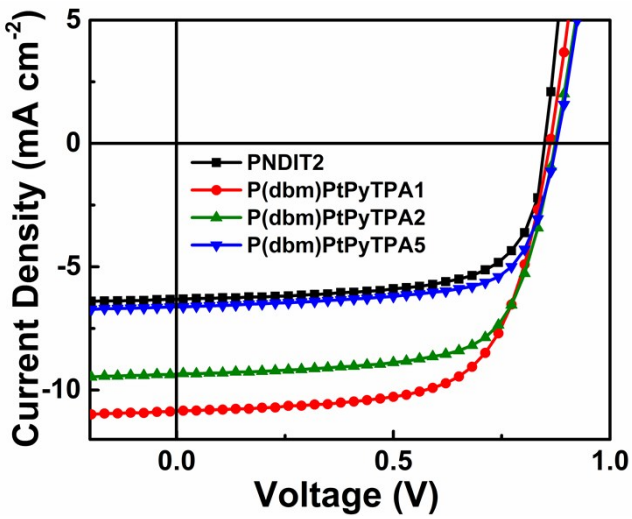

Figure S11. *J-V* curves of PBDB-T:P(dbm)PtPyTPAx (x=0, 1, 2 and 5) in conventional device structure.

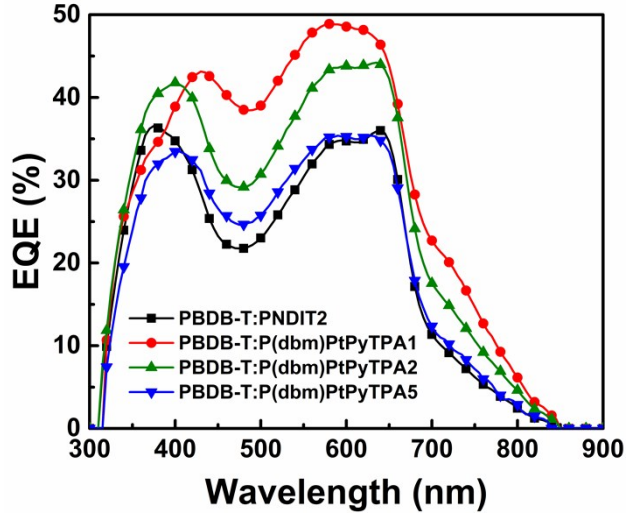

Figure S12. EQE spectra of PBDB-T:P(dbm)PtPyTPAx (x=0, 1, 2 and 5).

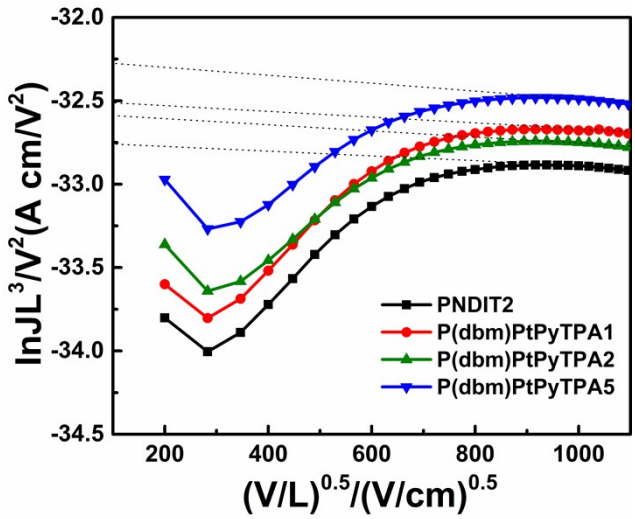

Figure S13. *J-V* curves of neat polymer acceptor in electron-only device structure under dark condition.

Table S1. Theoretical weight ratio of Pt element in P(dbm)PtPyTPAx (x = 1, 2, 5) and the practical values measured by EDS.

polymer acceptor	theoretical values (wt%)	values measured by EDS (wt%)
P(dbm)PtPyTPA1	0.20	0.17
P(dbm)PtPyTPA2	0.39	0.34
P(dbm)PtPyTPA5	0.98	0.64

Table S2. The key photovoltaic parameters of conventional devices based on PBDB-T:P(dbm)PtPyTPAx (x = 0, 1, 2 and 5) with average PCE collected from over 10 devices.

Active Layer	V_{oc} [V]	J_{sc} [mA cm^2]	FF [%]	PCE_{max} [%]	PCE_{ave} [%]
PBDB-T: PNDIT2	0.86 (0.86±0)	6.47 (6.17±0.30)	67.93 (68.06±0.44)	3.79	3.62
PBDB-T: P(dbm)PtPyTPA1	0.86 (0.86±0)	10.84 (10.57±0.55)	65.99 (65.71±1.52)	6.18	6.01
PBDB-T: P(dbm)PtPyTPA2	0.86 (0.86±0)	9.41 (9.23±0.18)	67.02 (69.35±2.33)	5.64	5.57
PBDB-T: P(dbm)PtPyTPA5	0.87 (0.87±0)	6.63 (6.54±0.22)	70.19 (69.87±1.90)	4.02	3.97

Table S3. Charge mobilities of polymer acceptor neat film and PTB7-Th:P(dbm)PtPyTPAx (x=0, 1, 2 and 5) blends, data achieved by an average of 6 devices.

	μ_h [cm^2 V^{-1} s^{-1}]	μ_e [cm^2 V^{-1} s^{-1}]
PNDIT2	-	1.98×10^{-5}
P(dbm)PtPyTPA1	-	2.35×10^{-5}
P(dbm)PtPyTPA2	-	2.55×10^{-5}
P(dbm)PtPyTPA5	-	3.29×10^{-5}
PTB7-Th: PNDIT2	2.49×10^{-4}	3.30×10^{-5}
PTB7-Th: P(dbm)PtPyTPA1	3.61×10^{-4}	4.29×10^{-5}
PTB7-Th: P(dbm)PtPyTPA2	5.07×10^{-4}	4.98×10^{-5}
PTB7-Th: P(dbm)PtPyTPA5	6.25×10^{-4}	5.61×10^{-5}