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Supplementary Information

Solution Processable Small Molecules as an Efficient Electron Transport Layer in Organic Optoelectronic Devices

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Experimental section

1. Materials and instruments

1,4-Dibromobenzene, benzothiadiazole, benzil, chlorodiphenylphosphine, and all the other materials were purchased from Sigma-Aldrich and TCI, used as received without purification. ^{1}H, ^{13}C, and ^{31}P NMR spectra were recorded on a JEOL JNM ECA 600 spectrometer. Gas chromatography mass spectroscopy (GC-MS) was conducted by using Bruker 450-GC & 320-MS spectrometer. UV-vis spectra were recorded on a JASCO V-530 UV-vis spectrophotometer. Cyclic voltammetry (CV) measurements were carried out by using a VersaSTAT3 potentiostat (Princeton Applied Research) in tetrabutylammonium hexafluorophosphate (0.1M, Bu_4NPF_6) as the electrolyte in acetonitrile. For CV measurements, a glassy carbon electrode coated with samples, platinum wire, and silver wire were used as the working, counter, and reference electrode, respectively. The energy levels of small molecules were calibrated with a ferrocene/ferrocenium external standard.

2. Syntheses

(4-bromophenyl)diphenylphosphine (2)

To the solution of 1,4-dibromobenzene (1) (5 g, 21.2 mmol) in THF (100 ml), n-Butyllithium (2.5 M, 9.4 ml, 23.5 mmol) was added dropwise under N_2 atmosphere at -78 ˚C. The mixture was stirred for 30 min, and then chlorodiphenylphosphine (4.2 ml, 23.3 mmol) was added. After further stirring for overnight at room temperature, the mixture was poured into water and extracted with dichloromethane (MC). Organic phase was separated and dried over magnesium sulfate. The curde product was purifed by column chromatography on a silica gel using hexane as eluent. The product **2** was obtained as a white solid (90% yield). ^{1}H-NMR (600 MHz, $CDCl_3$): δ = 7.45 (dd, J = 8.28, 1.38 Hz, 2H), 7.35-7.31 (m, 6H), 7.3-7.26 (m, 4H), 7.14 (m, 2H). ^{13}C-NMR (150 MHz, $CDCl_3$): δ = 136.7, 136.6, 135.3, 135.2, 133.8, 133.7, 131.78, 131.74, 129.0, 128.77, 128.72, 128.6, 128.5, 123.4. ^{31}P-NMR (243 MHz, $CDCl_3$): δ = -5.76.

Diphenyl(4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl)phosphine (3)

A mixture of (4-bromophenyl)diphenylphosphine (2) (2 g, 5.86 mmol), potassium acetate (1.4 g, 14.1 mmol) and 1,1′-Bis(diphenylphosphino)ferrocene]dichloropalladium(II) ($Pd(dppf)Cl_2$, 5 mol%) in dry toluene (30 ml) was stirred at 100 ˚C for 24 h under N_2 atmosphere. Upon completion of the reaction, the mixture was poured into water and extracted with MC. Organic phase was separated and dried over magnesium sulfate. The curde product was purifed by column chromatography on a silica gel using MC/hexane = 1/1 (v/v) as eluent. The product **3** was obtained as a white solid (60% yield). ^{1}H-NMR (600 MHz, $CDCl_3$): δ = 7.75 (m, 2H), 7.35-7.29 (m, 12H), 1.33 (s, 12H). ^{13}C-NMR (150 MHz, $CDCl_3$): δ = 141.3, 141.2, 137.2, 137.1, 134.97, 134.92, 134.1, 134.0, 133.1, 133.0, 129.0.

Diphenyl(4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl)phosphine oxide (4)

Diphenyl(4-(4,4,5,5-tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl)phosphine (3) (1 g, 2.58 mmol) was dissolved in MC (30 ml). Hydrogen peroxide (30 % aqueous H_2O_2, 10 ml) was added to the solution and the mixture was stirred at room temperature for 3 h. Upon completion of the reaction, the mixture was poured into water and extracted with MC. Organic phase was separated and dried over magnesium sulfate. The curde product was purifed by column chromatography on a silica gel using ethyl acetate (EA)/hexane = 4/1 (v/v) as eluent. The product **4** was obtained as a white solid (95% yield). ^{1}H-NMR (600 MHz, $CDCl_3$): δ = 7.89 (dd, J = 8.22, 3.43 Hz, 2H), 7.70-7.62 (m, 6H), 7.54 (m, 2H), 7.45 (m, 4H), 1.34 (s, 12H). ^{13}C-NMR (150 MHz, $CDCl_3$): δ = 135.5, 134.8, 134.6, 134.5, 132.8, 132.2, 132.1, 132.04, 132.03, 131.3, 131.2, 128.6, 128.5, 84.2, 24.9 ^{31}P-NMR (243 MHz, $CDCl_3$): δ = 29.64.

4-bromo-2,1,3-benzothiadiazole (6)

Bromine (1.69 ml, 33.1 mmol) was added dropwise using a dropping funnel to the solution of 2,1,3-benzothiadiazole (5) (5 g, 36.76 mmol) in 48% HBr (80 ml). The reaction mixture was refluxed for 2 h. After quenching of the reaction with aqueous $NaHSO_3$ solution, the mixture was poured into water and extracted with MC. Organic phase was separated and dried over magnesium sulfate. The curde product was purifed by column chromatography on a silica gel using MC/hexane = 1/5 (v/v) as eluent. The product **6** was obtained as a pale yellowish solid (71% yield). ^{1}H-NMR (600 MHz, $CDCl_3$): δ = 7.97 (dd, J = 8.58, 1.02Hz, 1H), 7.83 (d, 1H), 7.47 (m, 1H). ^{13}C-NMR (150 MHz, $CDCl_3$): δ = 154.6, 153.3, 132.0, 129.9, 120.9, 114.4.

4,7-bromo-2,1,3-benzothiadiazole (7)

Bromine (3.8 ml, 74.43 mmol) was added dropwise using a dropping funnel to the solution of 2,1,3-benzothiadiazole (5 g, 36.76 mmol) in 48% HBr (80 ml). The reaction mixture was refluxed for 2 h. After quenching of the reaction with aqueous $NaHSO_3$ solution, the mixture was poured into water and extracted with MC. Organic phase was separated and dried over magnesium sulfate. The curde product was purifed by column chromatography on a silica gel using MC/hexane = 1/5 (v/v) as eluent. The product **7** was obtained as a pale yellowish solid (78% yield). ^{1}H-NMR (600 MHz, $CDCl_3$): δ = 7.72 (s, 2H). ^{13}C-NMR (150 MHz, $CDCl_3$): δ = 152.9, 132.3, 113.9.

5-bromo-2,3-diphenylquinoxaline (8)

To the solution of 4-bromo-2,1,3-benzothiadiazole (6) (2 g, 9.3 mmol) in ethanol (100 ml), $NaBH_4$ (6.51 g, 172 mmol) was slowly added in three portions. The reaction was kept at 0 ˚C for a while, and then allowed to warm to room temperature. The mixture was further stirred for overnight. Upon completion of the reaction, the mixture was poured into water and extracted with diethyl ether. After removal of the solvent, the mixture was dissolved in mixed solvent of ethanol (40 ml) and acetic acid (40 ml), and heated at 110 ˚C for overnight. The solution was cooled to room temperature, and poured into water and extracted with MC. Organic phase was separated and dried over magnesium sulfate. The curde product was purifed by column chromatography on a silica gel using MC/hexane = 1/5 (v/v) as eluent. The product **8** was obtained as a white solid (52% yield). ^{1}H-NMR (600 MHz, $CDCl_3$): δ = 8.13 (dd, J = 8.04, 1.02 Hz, 1H), 8.07 (dd, J = 7.56, 1.5 Hz, 1H), 7.62 (m, 3H), 7.55 (m, 2H), 7.41-7.33 (m, 6H). ^{13}C-NMR (150 MHz, $CDCl_3$): δ = 154.0, 153.7, 141.9, 138.9, 138.7, 138.4, 133.3, 130.3, 130.1, 129.9, 129.3, 129.2, 129.0, 128.5, 128.3, 124.2.

5,8-dibromo-2,3-diphenylquinoxaline (9)

To the solution of 4,7-dibromo-2,1,3-benzothiadiazole (1 g, 3.4 mmol) in ethanol (50 ml), $NaBH_4$ (2.38 g, 62.9 mmol) was slowly added in three portions. The reaction was kept at 0 ˚C for a while, and then allowed to warm to room temperature. The mixture was further stirred for overnight. Upon completion of the reaction, the mixture were poured into water and extracted with diethyl ether. After removal of the solvent, the mixture was dissolved in mixed solvent of ethanol (40 ml) and acetic acid (20 ml), and heated at 110 ˚C for overnight. The solution was cooled to room temperature, and poured into water and extracted with MC. Organic phase was separated and dried over magnesium sulfate. The curde product was purifed by column chromatography on a silica gel using MC/hexane = 1/5 (v/v) as eluent.

The product **9** was obtained as a white solid (64% yield). ^{1}H-NMR (600 MHz, $CDCl_3$): δ = 7.92 (s, 2H), 7.66 (d, 4H), 7.41 (t, 2H), 7.36 (t, 4H). ^{13}C-NMR (150 MHz, $CDCl_3$): δ = 154.2, 139.4, 138.0, 133.1, 130.3, 129.6, 128.4, 123.8.

Synthesis of QxTPPO1

In a Schlenk flask**,** **8** (1 mmol) and **4** (1 mmol) were dissolved in dry toluene (12 ml). After degassing with N_2 for 15min, $Pd(PPh_3)_4$ (5 mol%) and 2 M K_2CO_3 (5 ml) were added. The reaction mixture was heated and stirred at 90 ˚C for 48 h under N_2 atmosphere. Upon completion of the reaction, the reaction mixture was poured into water and extracted with dichloromethane. Organic phase was separated and dried over magnesium sulfate. After removal of solvent under reduced pressure, the crude residue was purified by column chromatography on a silica gel using diethyl ether/MC = 1/8 (v/v). **QxTPPO1** was obtained as a white solid (57% yield). ^{1}H-NMR (600 MHz, $CDCl_3$): δ = 8.19 (m, 1H), 7.92 (dd = 8.22, 2.04 Hz, 2H), 7.83-7.73 (m, 8H), 7.56 (m, 4H), 7.48 (m, 6H), 7.36 (m, 3H), 7.31 (t, 1H), 7.26 (t, 2H). ^{13}C-NMR (150 MHz, $CDCl_3$): δ = 153.2, 152.6, 142.1, 142.0, 141.2, 139.2, 139.1, 138.78, 138.73, 132.3, 132.2, 132.0, 131.8, 131.7, 131.09, 131.01, 130.1, 129.8, 129.4, 128.6, 128.5, 128.4, 128.2. ^{31}P-NMR (243 MHz, $CDCl_3$): δ = 29.83. GC-MS: m/z calcd, 558.186; found, 558.2 [M^+].

Synthesis of QxTPPO2

In a Schlenk flask, **9** (1 mmol) and **4** (2 mmol) were dissolved in dry toluene (12 ml). After degassing with N_2 for 15min, $Pd(PPh_3)_4$ (5 mol%) and 2 M K_2CO_3 (5 ml) were added. The reaction mixture was heated and stirred at 90 ˚C for 48 h under N_2 atmosphere. Upon completion of the reaction, the reaction mixture was poured into water and extracted with dichloromethane. Organic phase was separated and dried over magnesium sulfate. After removal of solvent under reduced pressure, the crude residue was purified by column chromatography on a silica gel using EA/MC = 1/2 (v/v). **QxTPPO2** was obtained as a white solid (67% yield). ^{1}H-NMR (600 MHz, $CDCl_3$): δ = 7.95 (dd = 8.28, 2.76 Hz, 2H), 7.89 (s, 1H), 7.83 (dd = 11.7, 8.22 Hz, 2H), 7.76 (m, 4H), 7.56 (m, 4H), 7.49 (m, 4H), 7.34 (t, 1H), 7.28 (t, 2H). ^{13}C-NMR (150 MHz, $CDCl_3$): δ = 152.0, 141.8, 139.1, 138.7, 138.5, 133.0, 132.35, 132.30, 132.2, 132.0, 131.89, 131.82, 131.1, 131.0, 130.9, 130.1, 130.0, 129.2, 128.68, 128.60, 128.3. ^{31}P-NMR (243 MHz, $CDCl_3$): δ = 29.62. GC-MS: m/z calcd, 834.877; found, 834.8 [M^+].

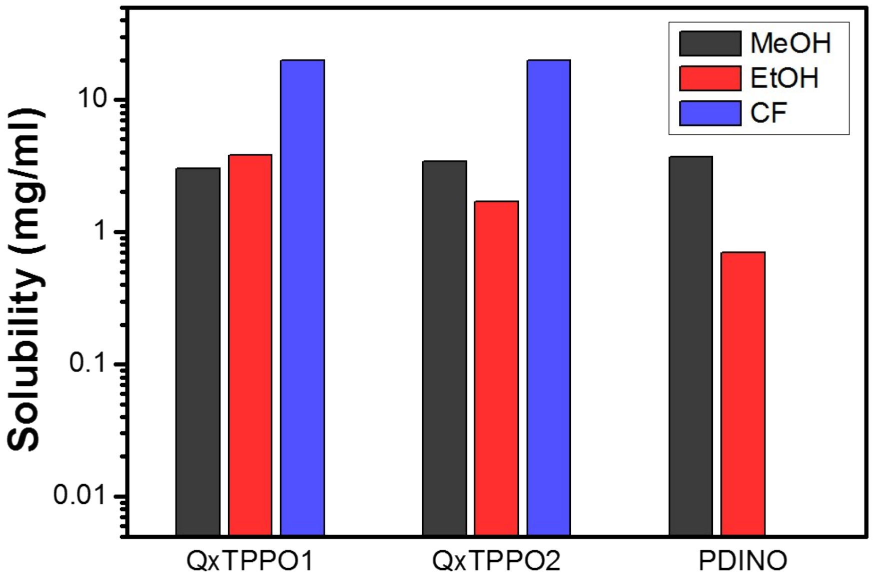

Fig. S1. Solubilities of QxTPPO1, QxTPPO2 and PDINO in common solvents

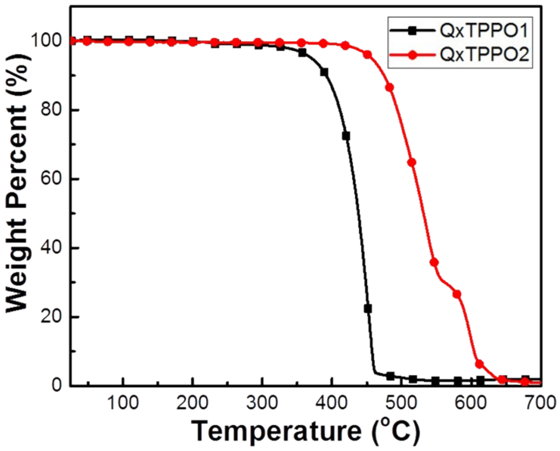

Fig. S2. TGA thermograms of QxTPPO1 and QxTPPO2 at a heating rate of 10˚C/min under air.

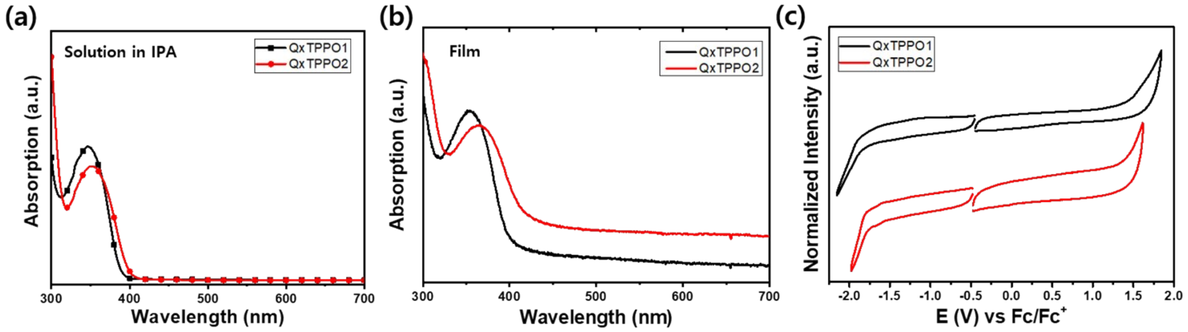

Fig. S3. UV-vis spectra of QPSMs; (a) solution of QPSMs in isopropyl alcohol (b) film of QPSMs. (c) cyclic voltammograms of QPSMs.

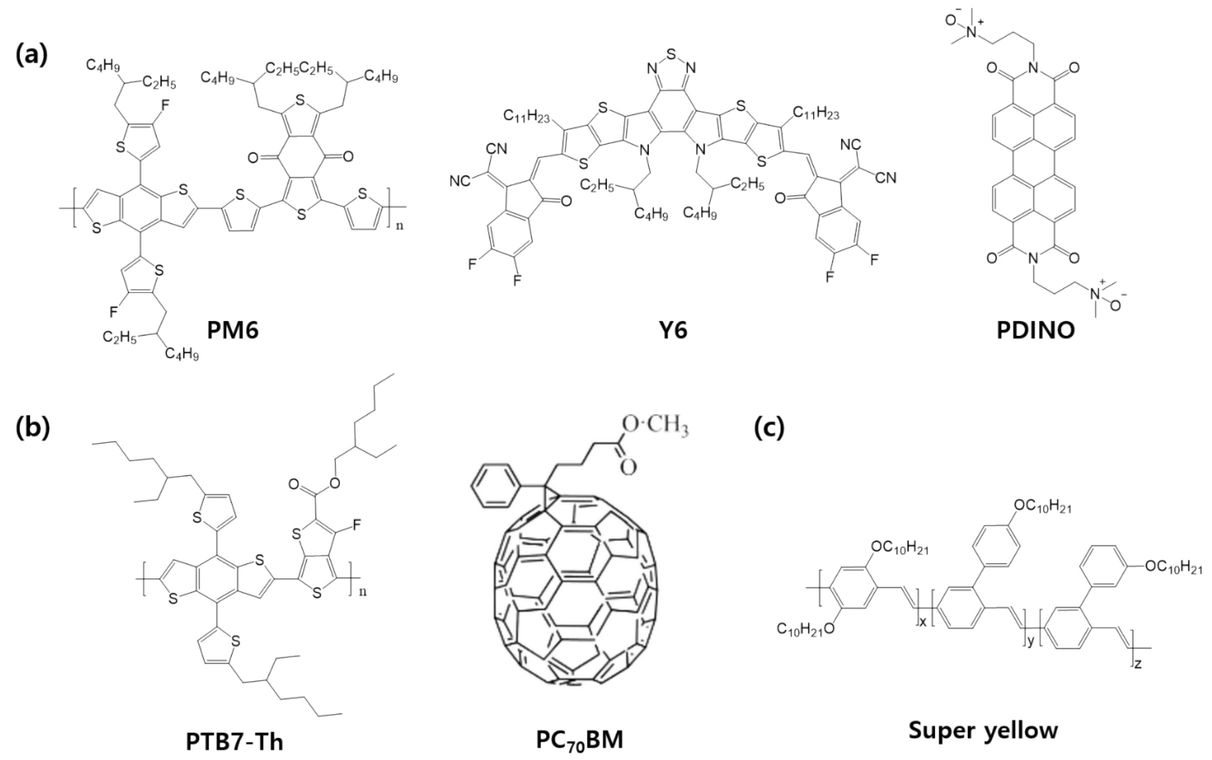

Fig. S4. Chemical structures for organic materials (a) polymer donor:non-fullerene acceptor system; Poly[[4,8-bis[5-(2-ethylhexyl)-4-fluoro-2-thienyl]benzo[1,2-b:4,5-b']dithiophene-2,6-diyl]-2,5-thiophenediyl[5,7-bis(2-ethylhexyl)-4,8-dioxo-4H,8H-benzo[1,2-c:4,5-c']dithiophene-1,3-diyl]-2,5-thiophenediyl] (PM6) as the donor material, 2,2'-((2Z,2'Z)-((12,13-bis(2-ethylhexyl)-3,9-diundecyl-12,13-dihydro-[1,2,5]thiadiazolo[3,4-e]thieno[2",3’':4’,5']thieno[2',3':4,5]pyrrolo[3,2-g]thieno[2',3':4,5]thieno[3,2-b]indole-2,10-diyl)bis(methanylylidene))bis(5,6-difluoro-3-oxo-2,3-dihydro-1H-indene-2,1-diylidene))dimalononitrile (Y6) as the non-fullerene acceptor, and 3,3'-(1,3,8,10-tetraoxoanthra[2,1,9-def:6,5,10-d'e'f']diisoquinoline-2,9(1H,3H,8H,10H)-diyl)bis(N,N-dimethylpropan-1-amine oxide) (PDINO) as ETL. (b) polymer donor:fullerene acceptor system; poly[4,8-bis[5-(2-ethylhexyl)-2-thienyl]benzo[1,2-b:4,5-b′]dithiophene-alt-(4-(2-ethylhexyl)-3-fluorothieno[3,4-b]thiophene-)-2-carboxylate-2- 6-diyl)] (PTB7-Th) as the donor material and [6,6]-phenyl C_{70}-butyric acid methyl ester ($PC_{70}BM$) as the accetor material. (c) poly(phenylvinylene) (Super yellow, SY) as the emissive layer in OLEDs.

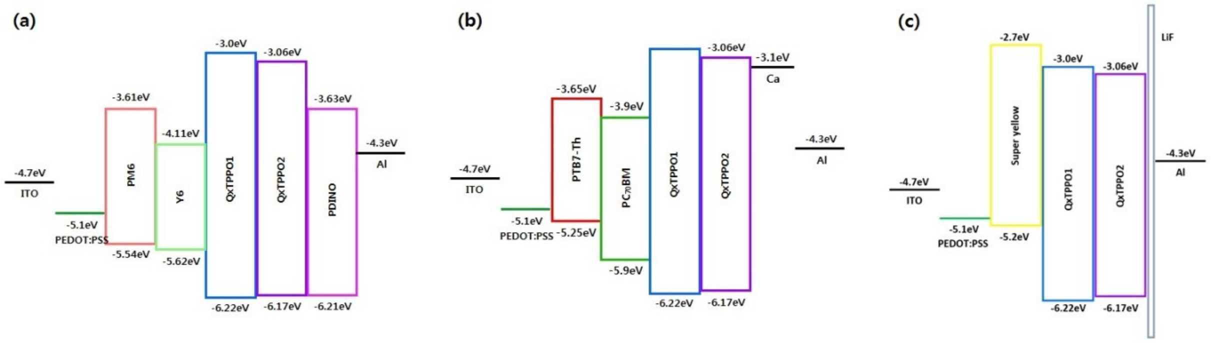

Fig. S5. Schematic energy level diagrams for (a) polymer donor:non-fullerene acceptor system, (b) polymer donor:fullerene acceptor system of OSCs and (c) OLEDs.

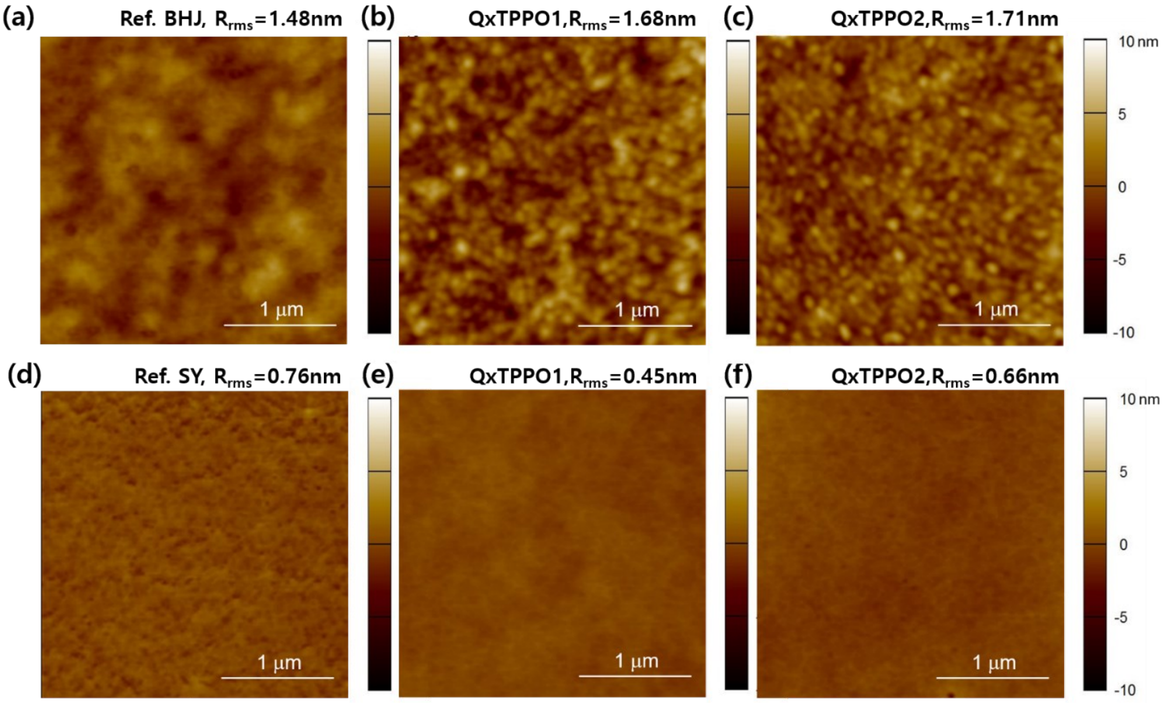

Fig. S6. AFM images and R_{rms} values of BHJ and super yellow (SY) layers with and without QPSMs. (a) BHJ without QPSMs (R_{rms} = 1.48 nm), (b) BHJ with QxTPPO1 (R_{rms} = 1.68 nm), (c) BHJ with QxTPPO2 (R_{rms} = 1.71 nm). (d) SY without QPSMs (R_{rms} = 0.76 nm), (e) SY with QxTPPO1 (R_{rms} = 0.45nm), (f) SY with QxTPPO2 (R_{rms} = 0.66 nm),

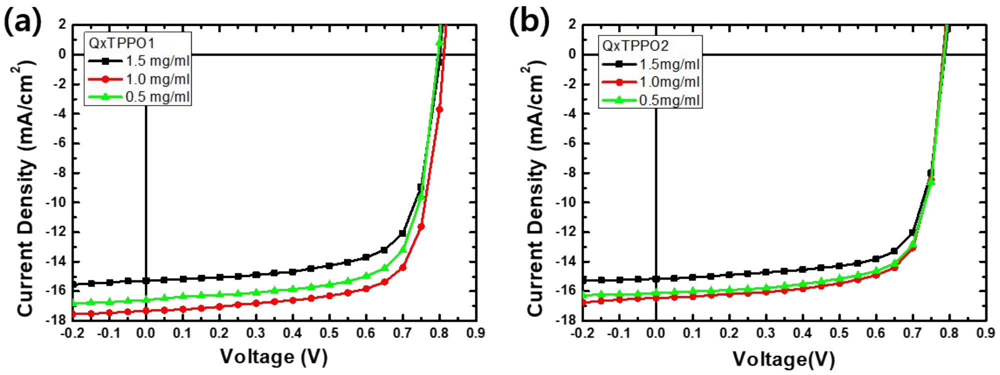

Fig. S7. OSCs performance with various concentration of the QPSMs solution at 6000rpm; (a) *J-V* characteristics of PTB7-Th:$PC_{70}BM$ with QxTPPO1 (b) *J-V* characteristics of PTB7-Th:$PC_{70}BM$ with QxTPPO2 under 100mW/cm^2 − AM 1.5G.

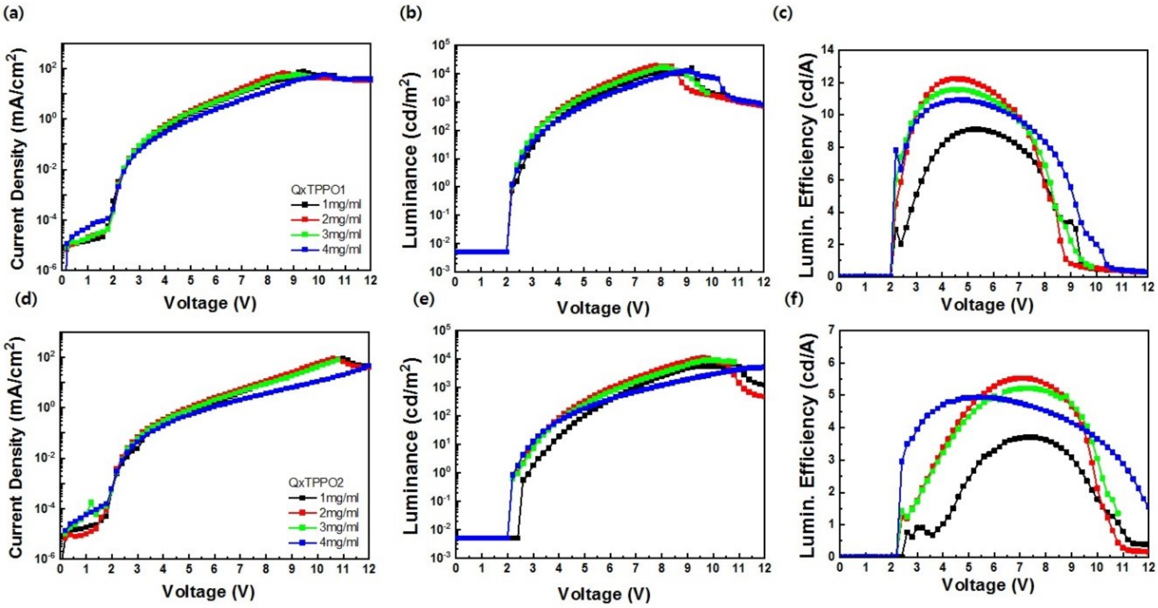

Fig. S8. OLEDs performance with various concentration of the QPSMs solution at 3000rpm; (a) *J*-*V* (b) *L*-*V* (c) *LE*-*V* characteristics with QxTPPO1 (d) *J*-*V* (e) *L*-*V* (f) *LE*-*V* characteristics with QxTPPO2.

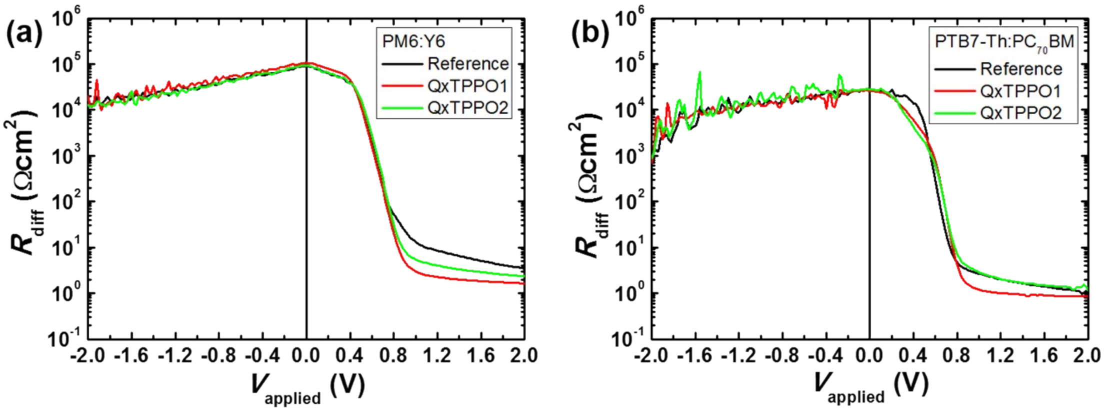

Fig. S9. Differential resistance of OSCs based on (a) PM6:Y6 (b) PTB7-Th:PC$_{70}$BM with QPSMs.

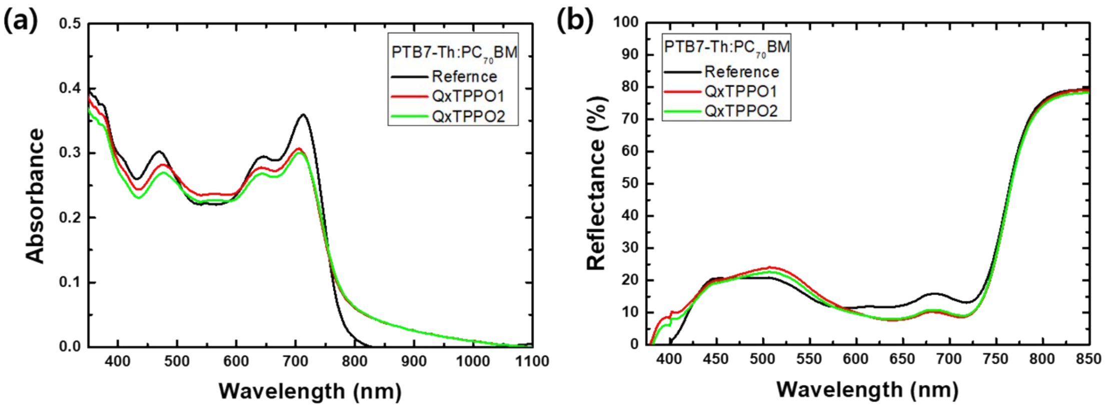

Fig. S10. (a) absorption spectrums of BHJ active layer with and without QPSMs; film configuration (glass/PEDOT:PSS/PTB7-Th:$PC_{70}BM$/ETL), (b) reflectance spectrums of OSC devices; configuration (ITO/PEDOT:PSS/PTB7-Th:$PC_{70}BM$/ETL/Al)

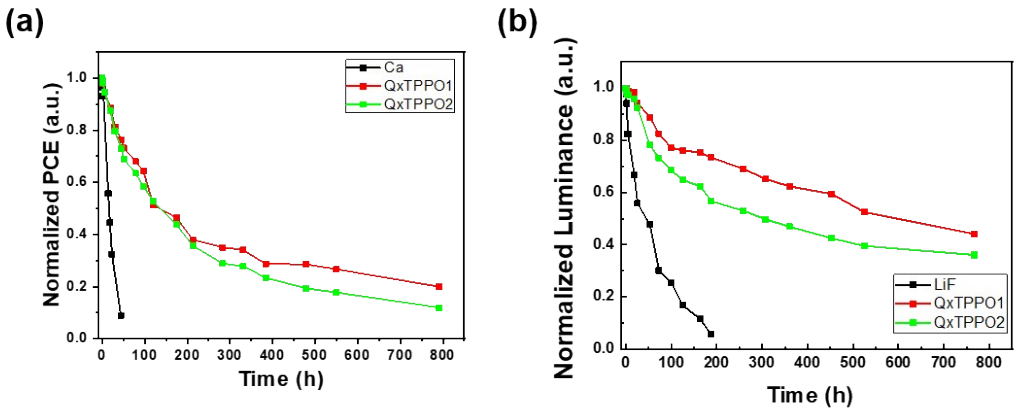

Fig. S11. Device stability of (a) OSCs based on PTB7-Th:$PC_{70}BM$ and (b) OLEDs based on Super Yellow with QPSMs.

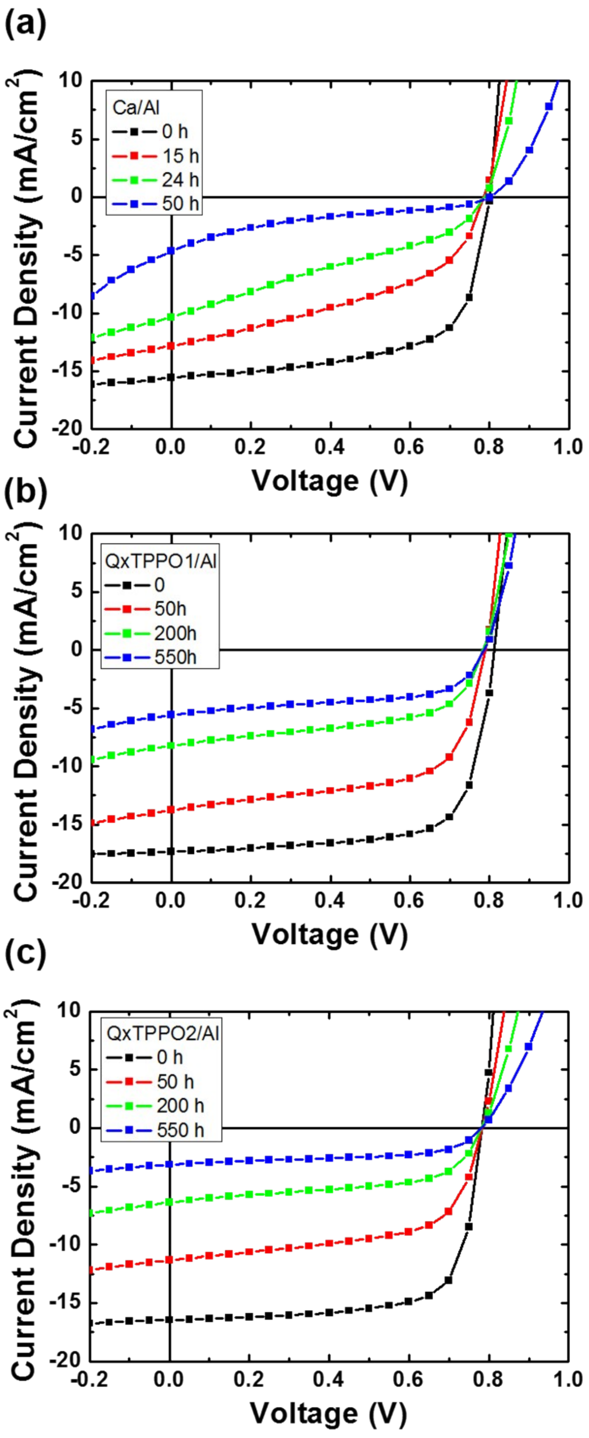

Fig. S12. *J*-*V* characteristics of OSCs based on PTB7-Th:PC$_{70}$BM showing degradation process (a) Ca/Al (b) QxTPPO1/Al (c) QxTPPO2/Al.

Table S1. Solubility values of QxTPPO1, QxTPPO2 and PDINO in common solvents.

	MeOH	**IPA**	**CF**
QxTPPO1	3.0*	3.8	20 (More than)
QxTPPO2	3.4	1.7	20 (More than)
PDINO	3.7	0.7	~0 (Non dissolved)

***Unit mg/ml**, Room Temperature, Anhydrous solvents

Table S2. Summary of optical and electrochemical properties of QPSMs.

			LUMO	**HOMO**	**E_g^{opt}**	**E_g^{cv}**
	(nm)[a]	**(nm)[b]**	**(eV)[c]**	**(eV)[d]**	**(eV)[e]**	**(eV)[f]**
QxTPPO1	265	399	3.01	6.22	3.10	3.21
QxTPPO2	282	417	3.06	6.17	2.97	3.11

[a,b] Maximum absorption wavelength of the solution and film, [c,d] estimated from the oxidation and reduction onset potential, [e] estimated from the absorption film edge, [f] calculated from HOMO and LUMO energy level.

Table S3. Summary of PTB7-Th:$PC_{70}BM$ based OSCs performance with various concentrations of the QPSMs solution at 6000rpm.

QxTPPO1 (mg/ml)	**J_{sc} (mA cm^{-2})**	**V_{oc} (V)**	**FF**	**PCE (%)**
0.5	16.59	0.80	0.71	9.38
1.0	17.32	0.81	0.72	10.07
1.5	15.29	0.80	0.70	8.57
QxTPPO2 (mg/ml)	**J_{sc} (mA cm^{-2})**	**V_{oc} (V)**	**FF**	**PCE (%)**
0.5	16.10	0.79	0.72	9.18
1.0	16.45	0.79	0.72	9.36
1.5	15.16	0.79	0.72	8.65

Table S4. Summary of SY based OLEDs performance with various concentration of the QPSMs solution at 3000rpm.

QxTPPO1 (mg/ml)	**L $_{max}$ [cd/m^2] @ bias**	**LE $_{max}$ [cd/A] @ bias**	**Voltage [V] @ 0.1 cd m^{-2}**
1	15360 @ 9.2	9.13 @ 5.2	2.2
2	19450 @ 7.8	12.25 @ 4.4	2.2
3	17000 @ 8.2	11.57 @ 4.4	2.2
4	12610 @ 9.0	10.95 @ 4.6	2.2
QxTPPO2 (mg/ml)	**L $_{max}$ [cd/m^2] @ bias**	**LE $_{max}$ [cd/A] @ bias**	**Voltage [V] @ 0.1 cd m^{-2}**
1	6860 @ 10.8	3.71 @ 7.4	2.6
2	11330 @ 9.6	5.53 @ 7.0	2.2
3	9280 @ 9.8	5.22 @ 7.2	2.2
4	5210 @ 12.0	4.94 @ 5.4	2.2

Table S5. Summarized SCLC electron mobility of PTB7-Th:$PC_{70}BM$ with and without QPSMs.

Device configuration	Electron mobility (10^{-4} cm^2 V^{-1} S^{-1})
ITO/ZnO/PTB7-Th:$PC_{70}BM$/Al	2.82
ITO/ZnO/PTB7-Th:$PC_{70}BM$ /QxTPPO1/Al	4.64
ITO/ZnO/PTB7-Th:$PC_{70}BM$ /QxTPPO2/Al	4.15

Table S6. Summarized differential resistance of OSCs based on PM6:Y6 and PTB7-Th:$PC_{70}BM$ with and without QPSMs.

Device configuration	Rs (Ωcm^2)	Rsh ($K\Omega cm^2$)
ITO/PEDOT/PM6:Y6/Al	3.52	88.37
ITO/PEDOT/PM6:Y6/QxTPPO1/Al	1.66	105.33
ITO/PEDOT/PM6:Y6/QxTPPO2/Al	2.36	91.92
ITO/PEDOT/PTB7-Th:$PC_{70}BM$ /Al	1.12	26.85
ITO/PEDOT/PTB7-Th:$PC_{70}BM$ /QxTPPO1/Al	0.85	26.27
ITO/PEDOT/PTB7-Th:$PC_{70}BM$ /QxTPPO2/Al	1.12	27.73

Table S7. Summarized exciton lifetime of SY with and without QPSMs.

Film configuration	**τ_{avr} [ns]**	**χ^2**
SY	0.52	1.28
SY/QxTPPO1	0.51	1.38
SY/QxTPPO2	0.51	1.27

Table S8. Summarized device performances of PM6:Y6 OCSs reported so far.

Device Structure		Device configuration	Jsc [mA cm^{-2}]	FF [%]	Voc [V]	PCE [%]	Ref.
Conventional	**Binary**	PEDOT:PSS/ PM6:Y6(CN)/PDINO/Al	25.3	74.8	0.83	15.7	1*
		g-C3N4:PEDOT:PSS/PM6:Y6/PFN-Br/Al	26.71	73	0.84	16.38	2*
		PEDOT:PSS/PM6:Y6(GCl)/PFN-Br/Al	26.09	79.05	0.84	17.32	3*
		PEDOT:PSS/PM6:Y6(A3)/Phen-NaDPO/Ag	26.5	76.5	0.82	16.5	4*
		PEDOT:PSS-GO/PM6:Y6/PDINO-G/Al	25.65	75.78	0.85	16.52	5*
		WS2/PM6:Y6/PFN-Br/Al	25.9	73	0.84	15.8	6*
	Ternary	PEDOT:PSS/PM6:Y6:IT-4F/PDIN/Al	25.4	75.9	0.84	16.27	7
		PEDOT:PSS/PM6:Y6:Br-ITIC:PC71BM/PDIN/Al	25.8	76.4	0.85	16.8	8
		PEDOT:PSS/PM6:J71:Y6/PDIN/Al	25.55	76	0.85	16.5	9
		PEDOT:PSS/PM6:BTP-M:Y6/PFN-Br/Ag	26.56	73.46	0.87	17.03	10
		PEDOT:PSS/PM6:MF1:Y6/PDIN/Al	25.68	78.61	0.85	17.22	11
		PEDOT:PSS/PM6:SM1:Y6/PDINO/Al	25.7	77.5	0.83	16.55	12
		PEDOT:PSS/PM6:Y6:BTF/PDIN/Ag	26.11	74.22	0.85	16.53	13
		PEDOT:PSS/PM6:IN-4F:Y6/PDINO/Al	25.7	74.5	0.85	16.3	14
		WS2/PM6:Y6:PC71BM/PFN-Br/Al	26	78	0.84	17	6
Inverted	**Binary**	ZnO/ PM6:Y6(CN)/MoO3/Ag	25.2	76.1	0.82	15.7	1
		ZnO/PM6:Y6(BV)/MoO3/Ag	26	74	0.83	16	15
		ZnO:PBI-SO3H/PM6:Y6/MoO3/Al	24.67	73.46	0.84	15.2	16
		ZnO/NDINO-G/PM6:Y6/MoO3/Ag	25.12	76.2	0.82	15.7	5
		TEA-capped ZnO/PM6:Y6/MoO3/Ag	29.19	65.32	0.82	15.61	17
		ZnO:PBI/PM6:Y6/MoO3/Al	25.34	74.8	0.83	15.95	18
	Ternary	ZnO/PM6:Y6:PC71BM/MoO3/Ag	25.7	75	0.84	16.3	15
		ZnO/PM6:Y6:PC71BM(BV)/MoO3/Ag	26.3	77	0.84	17.1	15
		ZnO/PM6:Y6:3TP3T-4F/MoO3/Ag	25.9	74.9	0.85	16.7	19

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