

Supporting Information

Influence of the Acceptor Crystallinity on the Open-Circuit Voltage in PTB7-Th : ITIC Organic Solar Cells

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S1. The carrier mobility measurement.

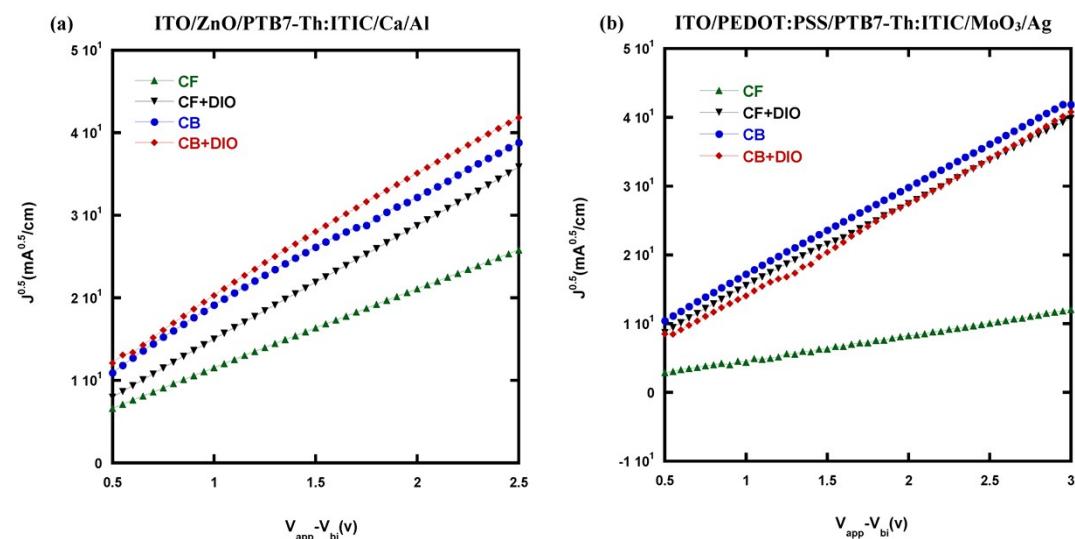


Figure S1. The carrier mobility measurement. (a) $J^{0.5}$ –V plots for electron-only and (b) $J^{0.5}$ –V plots for hole-only devices derived from different solvents.

Table S1. The carrier mobility measurement in PTB7-Th: ITIC OSCs with different solvent

Solvent	Thickness(nm)	Slope ^a	Slope ^b	Electron Mobility(cm ² /V/s)	Hole Mobility(cm ² /V/s)
CF	120	9.69	3.70	5.43E-05	7.90E-06
CF+DIO(0.6v%)	120	13.97	12.67	1.13E-04	9.27E-05
CB	120	13.91	13.09	1.12E-04	9.89E-05
CB+DIO(0.6v%)	120	14.26	13.16	1.17E-04	9.99E-05

strategies.

^a The slope of J-V curve in the electron mobility measurement.

^b The slope of J-V curve in the hole mobility measurement.

S2. The Transient Photovoltage measurement.

For the Transient Photovoltage (TPV) measurements, a weakened 620 nm laser pulse with a pulse width of 120 fs was used as the light source, which makes the device produce a small transient voltage on the basis of the steady voltage. The measuring equipment was linked to a Tektronix TDS 3052C digitizing oscilloscope in the open-circuit conditions. After filtering the DC signal, we can get the transient photovoltage signal, which is a single exponential decay curve. The decay life time τ can be obtained by exponential fitting with the exponential decay formula as following: $V = V_0 \exp(-t/\tau)$.

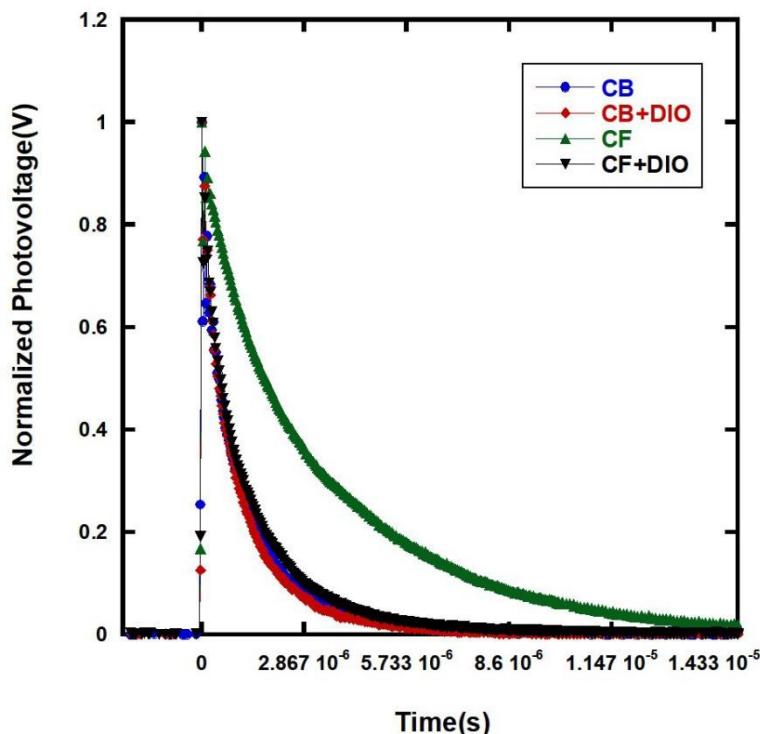


Table S2. The carrier life fitted from Transient Photovoltage Measurement.

Solvent	τ (us)
CB	1.65
CB+DIO(0.6v%)	1.65
CF	3.92
CF+DIO(0.6v%)	2.27

S3. The emission peaks of CT states with different solvents.

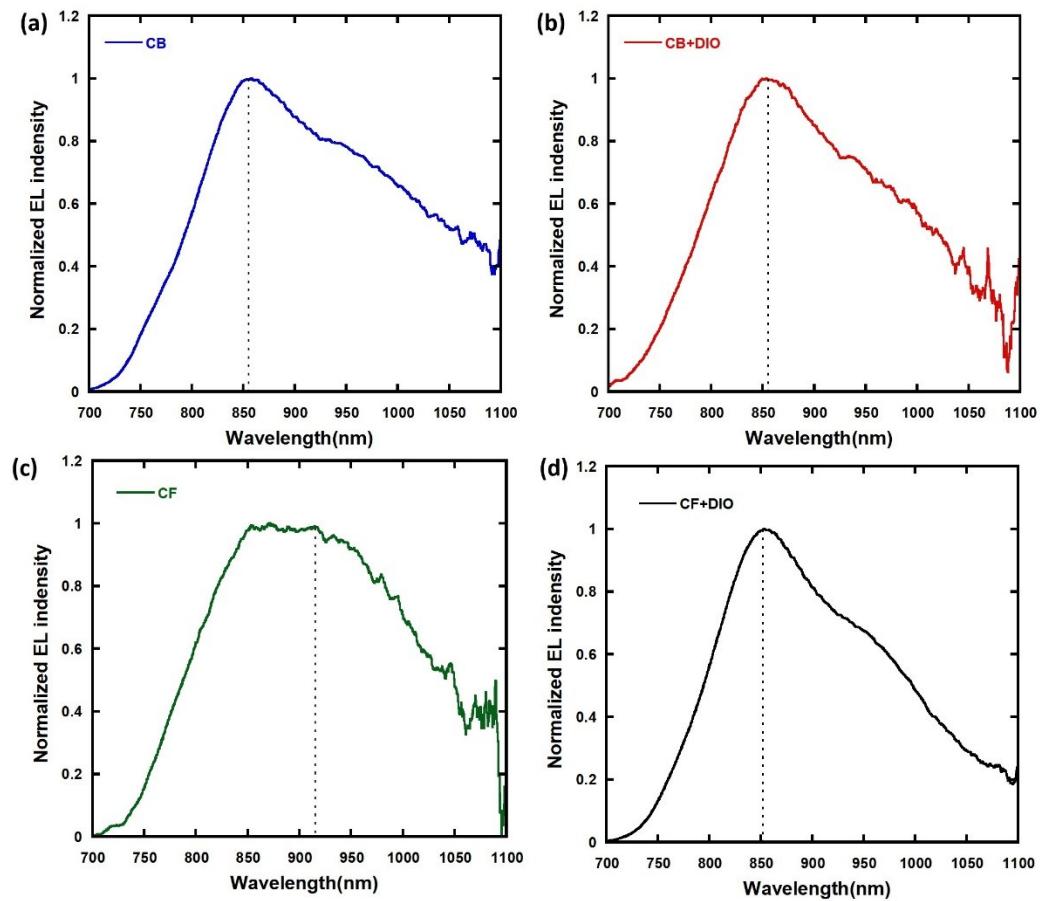


Table S3. The positions of emission peaks and the energy of CT states of the devices with

Solvent	E_{CT} (eV)	λ (nm)
CB	1.45	857
CB+DIO(0.6v%)	1.45	853
CF	1.35	920
CF+DIO(0.6v%)	1.46	851

different solvents.