Supporting Information

Solution-Processed Self-Assembling Charge-Transfer Cocrystal/TIPS-Pentacene Heterojunctions for Artificial Synapses

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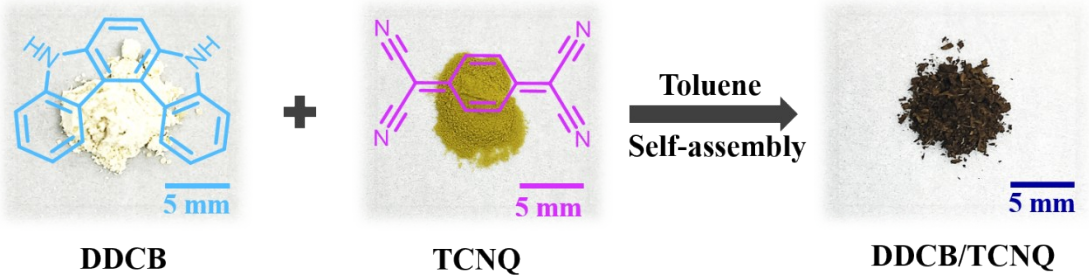

Figure S1. Schematic of the synthesis of DDCB/TCNQ cocrystals.

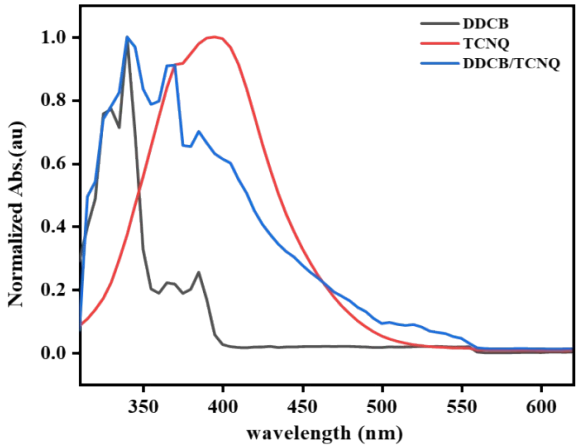

Figure S2. UV-Vis spectra of dilute solutions of DDCB, TCNQ, and a 1:1 DDCB/TCNQ mixture in toluene.

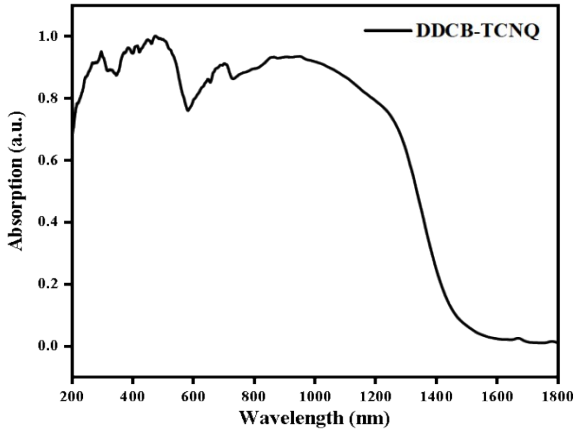

Figure S3. Solid-state UV-Vis absorption spectrum of DDCB-TCNQ cocrystal.

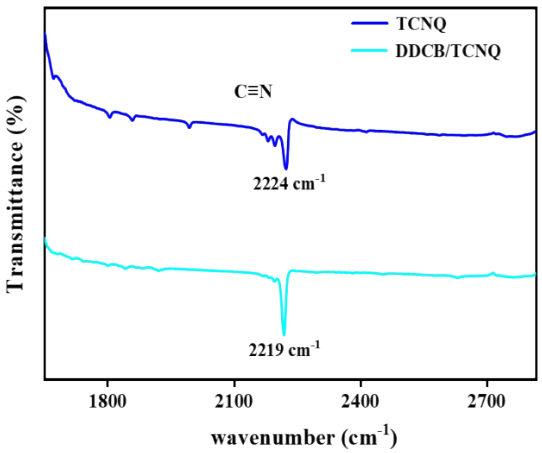

Figure S4. IR spectra of DDCB/TCNQ cocrystals.

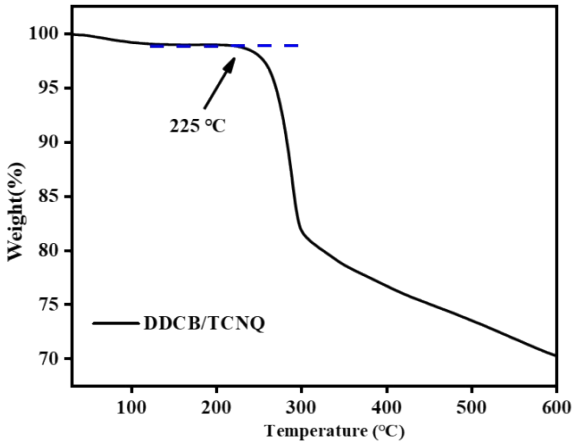

Figure S5. Thermogravimetric analysis curve of the DDCB/TCNQ cocrystal.

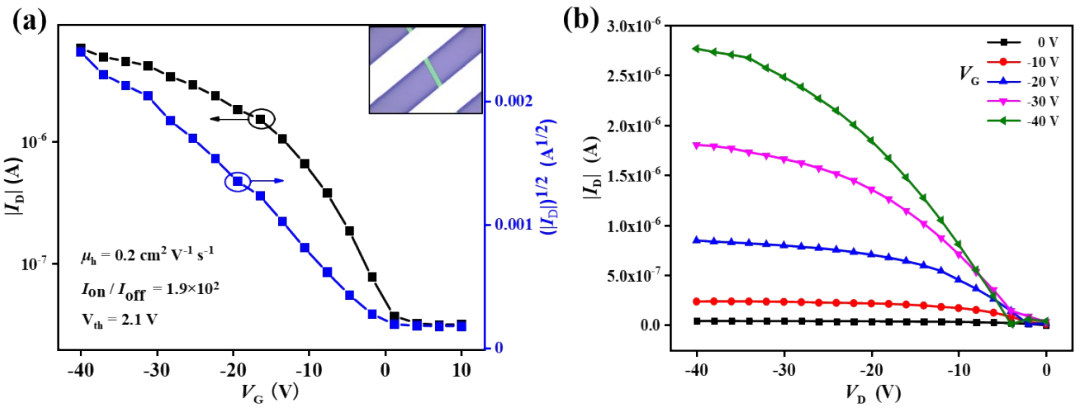

Figure S6. (a) Transfer and (b) output curves of TIPS-pentacene microribbon based OFET device.

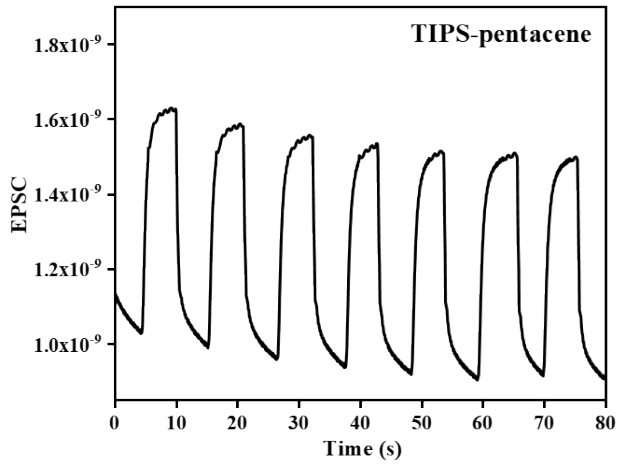

Figure S7. Synaptic characteristics of TIPS-pentacene device under light pulse stimulation (115.1 mW/cm^2, V_D = −10 V).

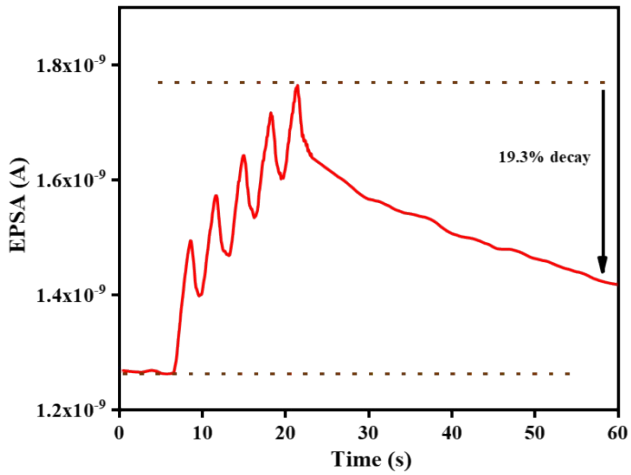

Figure S8. EPSC of the synaptic transistor triggered by 5 optical pulses (duration: 2 s, intensity: 115.1 mW/cm^2).

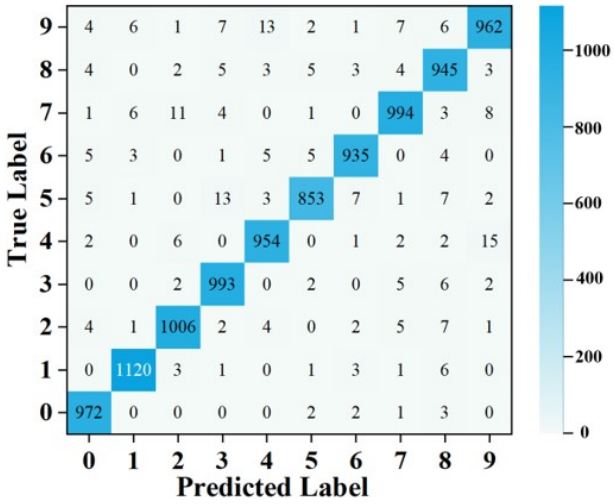

Figure S9. Confusion matrix after 50 training epochs.

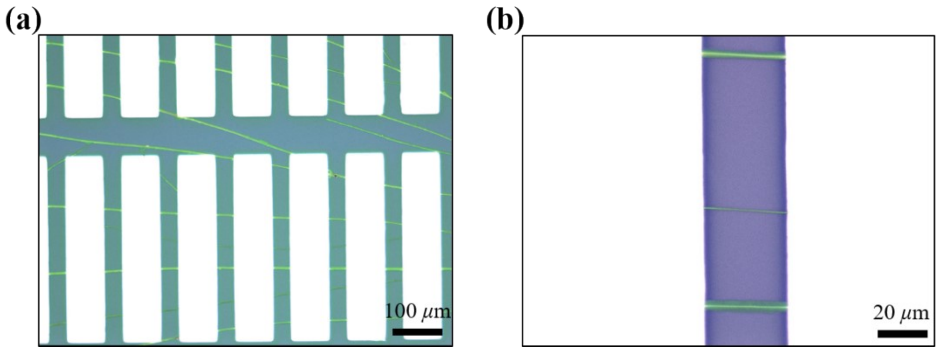

Figure S10. (a) Optical microscope images of the synaptic array and (b) magnified view.

Table S1 Crystal data and structure refinement for DDCB/TCNQ cocrystal.

	DDCB/TCNQ
Formula	C30H16N6
Formula weight	460.49
Temperature (K)	223
Wavelength (Å)	1.54178
Crystal system	monoclinic
space group	$P2_1/c$
Unit cell dimensions a (Å)	19.6268(9)
b (Å)	6.6292(4)
c (Å)	16.9400(9)
α (°)	90
β (°)	95.944(4)
γ (°)	90
Volume (Å^3)	2192.2(2)
Z	4
Absorption coefficient (mm^{-1})	0.683
F(000)	952.0
Crystal size (mm)	0.13 × 0.12 × 0.1
θ range (°)	9.06 to 136.752
Limiting indices	$-23 \leq h \leq 23$
	$-7 \leq k \leq 7$
	$-20 \leq l \leq 17$
Reflections collected	16970
R(int)	0.0987
Absorption correction	Semi-empirical from equivalents
Refinement method	Full-matrix leastsquares on F^2
R [I > 2sigma(I)]	R_1 = 0.0573
	wR_2 = 0.1344
R (all data)	R_1 = 0.1097
	wR_2 = 0.1698
CCDC NO.	2413854