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

Growth Regulation of Easily Crystallized Organic Long-persistent Luminescence System with in Situ Anti-Counterfeiting Application

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1. Experimental Section

Measurement and Characterization. The UV-Vis absorption spectra were measured using a SHZMADZU UV2700i spectrometer. The fluorescence spectra and phosphorescence spectra were measured using a Hitachi F-7000 fluorospectrophotometer. An Ocean optical fiber spectrophotometer was used to perform LPL emission spectra. The time-correlated single photon counting (TC-SPC) method (Horiba Jobin Yvon Instruments) was used to measure fluorescence decay emission spectra. An Edinburgh FLS1000 photoluminescence spectrometer was used to perform transient phosphorescence spectra. Electrochemical properties were conducted using the CHI660E electrochemical analyzer to perform cyclic voltammetry (CV) measurements. SEM were conducted using FlexSEM 1000 scanning electron microscope produced by Hitachi. Fluorescence microscope image obtained from DFC 7000T inverted fluorescence microscope.

2. Supplementary table and figures

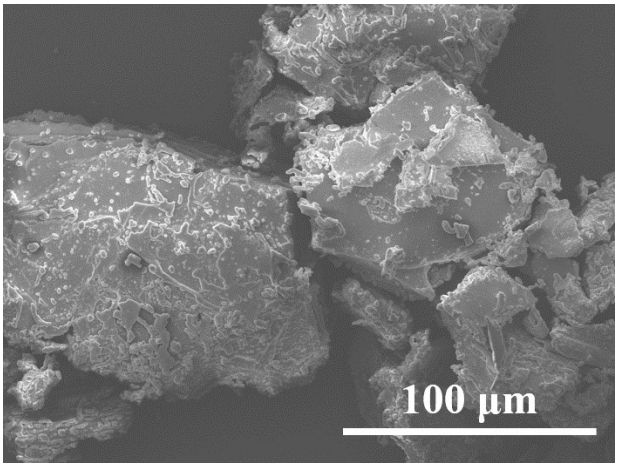

Fig. S1. SEM electron microscopy images of crystals prepared by traditional water-based method.

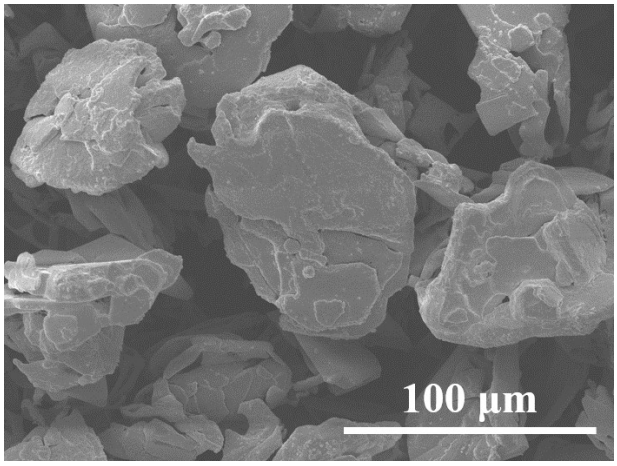

Fig. S2. SEM electron microscopy images of crystals prepared by S-W methods.

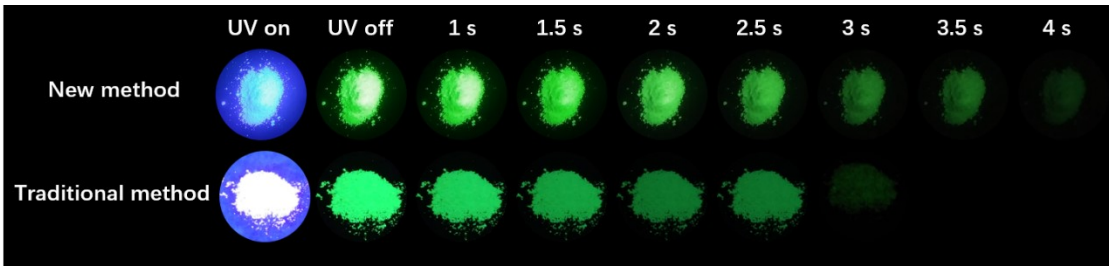

Fig. S3. Comparison of afterglow properties of TPP: *p*-TPD doped crystal prepared by traditional method without surfactants after grinding and TPP: *p*-TPD doped crystal directly prepared by new method with surfactants.

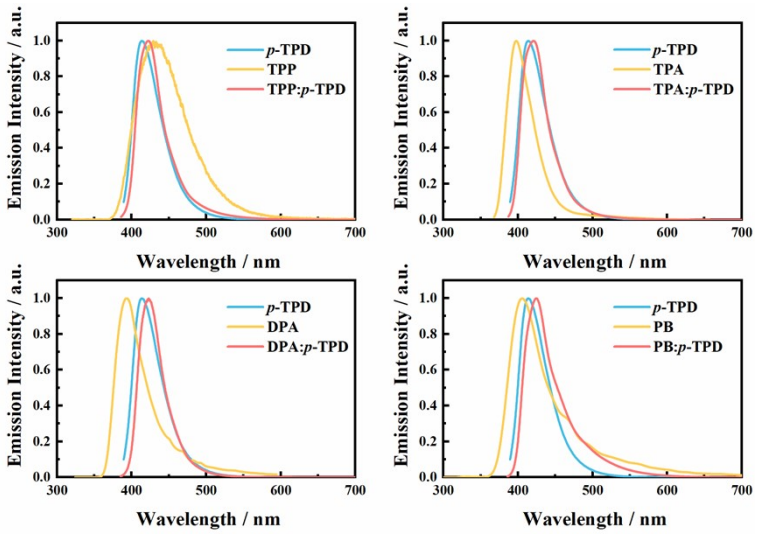

Fig. S4. Fluorescence emission spectra of compounds *p*-TPD, TPP, TPA, DPA, PB and doped crystals TPP:*p*-TPD, TPA:*p*-TPD, DPA:*p*-TPD and PB:*p*-TPD.

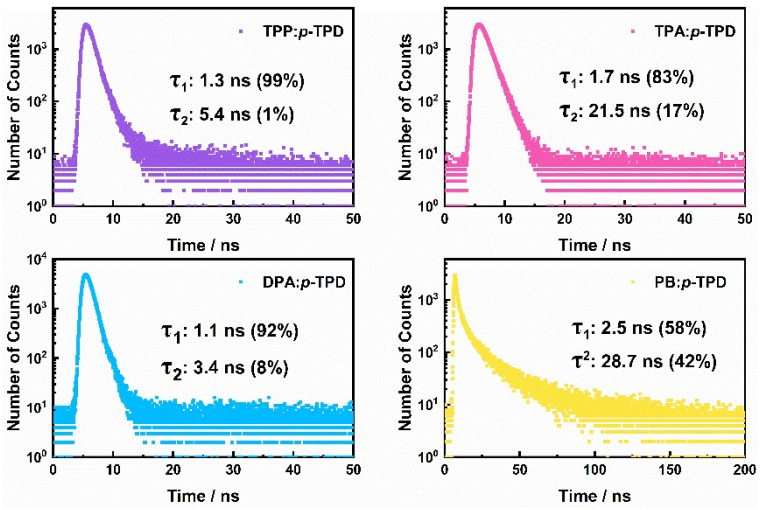

Fig. S5. Fluorescence emission attenuation spectra of doped crystals TPP:*p*-TPD, TPA:*p*-TPD, DPA:*p*-TPD, PB:*p*-TPD.

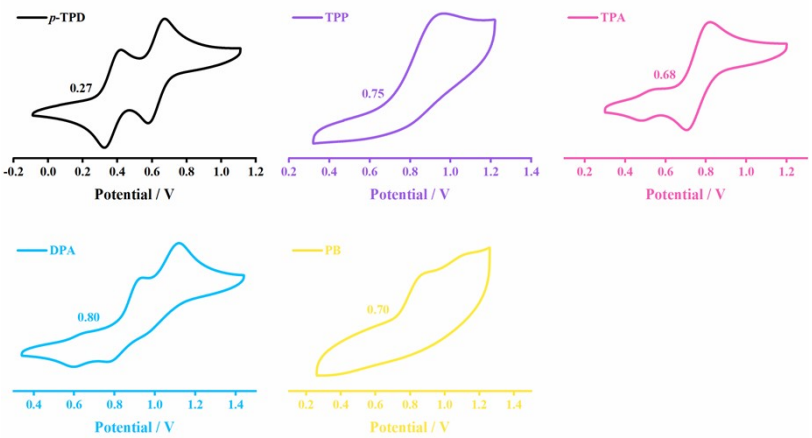

Fig. S6. Cyclic voltammetric curves of compounds *p*-TPD, DPA, MO-DPA and AM-DPA.

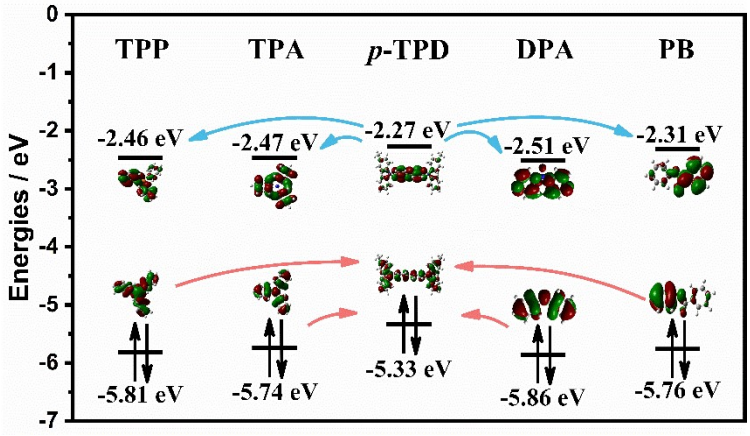

Fig. S7. Possible charge/hole transfer pathways between compound *p*-TPD, DPA, MO-DPA and AM-DPA

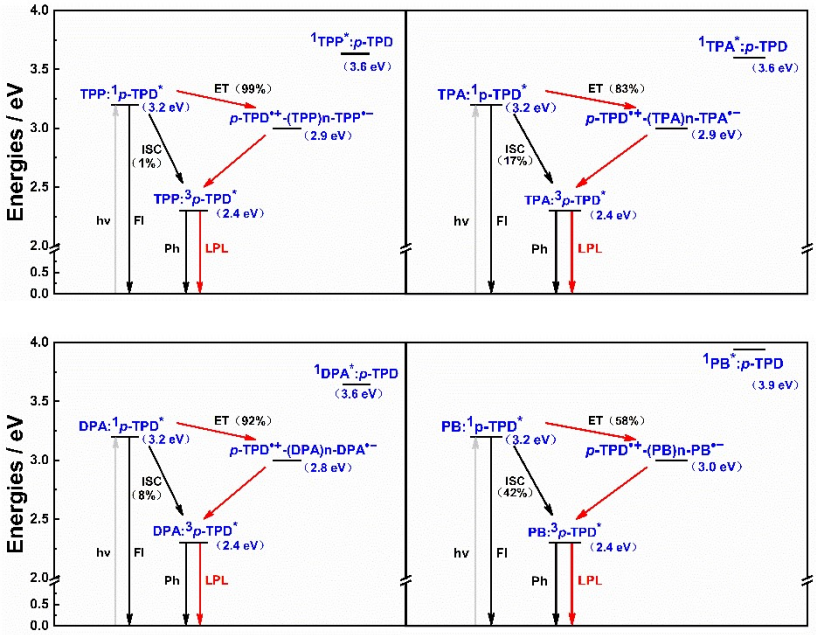

Fig. S8. Energy diagram and photophysical processes of the four doped-crystals upon 365 nm excitation.

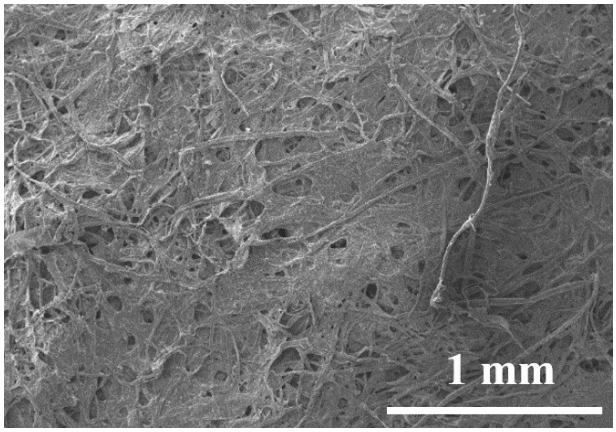

Fig. S9. SEM micrograph of encrypted paper.

Table S1. Photophysical parameters of host and guest materials.

	HOMO[eV]	LUMO[eV]	λ_{abs}[nm]	λ_F[nm]	E_{S1}[eV]	λ_P[nm]	E_{T1}[eV]
p-TPD	-5.33	-2.27	375.10	413.40	3.15	521.40	2.38
TPP	-5.81	-2.46	260.00	429.60	3.60	437.00	2.84
TPA	-5.74	-2.47	295.00	397.60	3.58	401.40	3.09
DPA	-5.86	-2.51	295.00	392.80	3.61	428.80	2.89
PB	-5.76	-2.31	230.00	405.00	3.91	414.00	3.00