Supplementary Information

Viologen-Based Ln-MOFs Material with Photochromic and Photoluminescence for Anticounterfeiting

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Table S1 Crystallographic data for **1** and **2**

Empirical formula	$C_{40}H_{28}ClEu_2N_4O_{23}$	$C_{40}H_{30}ClN_4O_{24}Tb_2$
Formula weight	1272.03	1303.97
Temperature/K	298.15	298.15
Crystal system	monoclinic	monoclinic
Space group	*C*2/*c*	*C*2/*c*
a/Å	36.492(3)	36.461(3)
b/Å	12.6245(10)	12.5228(9)
c/Å	20.7562(16)	20.6904(14)
α/°	90	90
β/°	101.443(3)	101.468(3)
γ/°	90	90
Volume/Å^3	9372.2(12)	9258.5(12)
Z	8	8
ρ_{calc}g/cm^3	1.803	1.871
μ/mm^{-1}	2.798	3.181
F(000)	4984	5096
Radiation	Mo-*K*α (λ = 0.71073)	Mo-*K*α (λ = 0.71073)
2Θ range for data collection/°	4.836 to 50.128	4.72 to 50.228
Reflections collected	47815	39508
Independent reflections	8256 [R_{int} = 0.0476, R_{sigma} = 0.0307]	8184 [R_{int} = 0.1685, R_{sigma} = 0.0978]
Data/restraints/parameters	8256/240/632	8184/0/649
Goodness-of-fit on F^2	1.073	1.048
Final R indexes [I>=2*σ*(I)]	R_1 = 0.0449 wR_2 = 0.1295	R_1 = 0.0584 wR_2 = 0.1490
Final R indexes [all data]	R_1 = 0.0529 wR_2 = 0.1353	R_1 = 0.0795 wR_2 = 0.1613

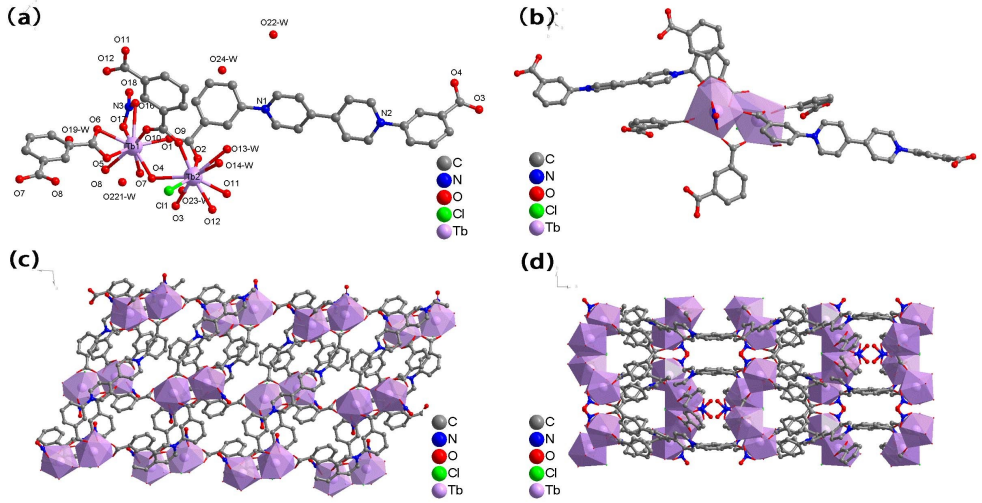

Figure S1. (a) Metal coordination environments of compound **2**. (b) Metal coordination environments of compound **2**. (c-d) 3D network stacking structure of **2** in the *b*,*c* direction.

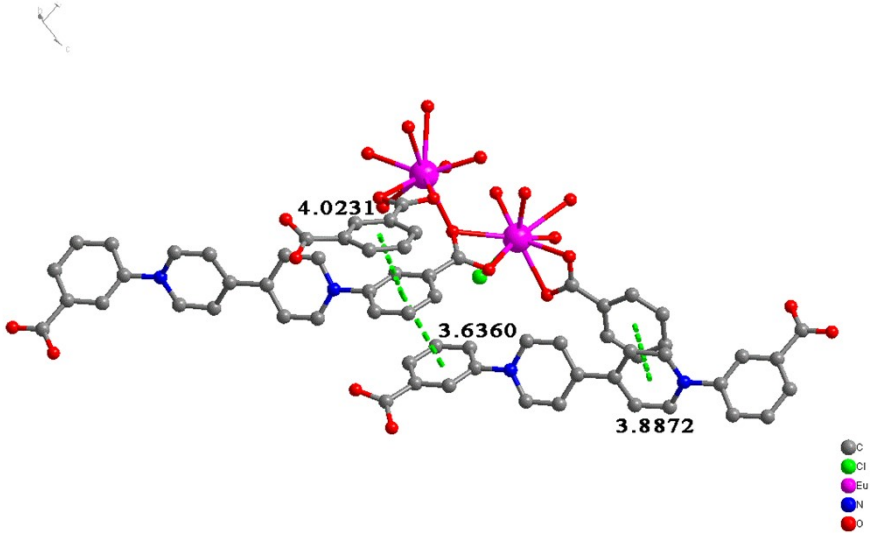

Figure S2. Structures of compound **1** by π···π interactions.

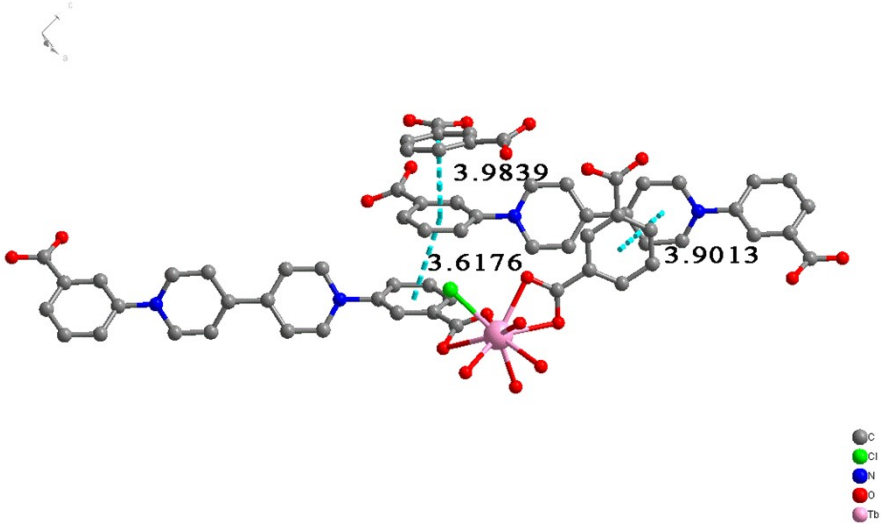

Figure S3. Structures of compound **2** by π···π interactions.

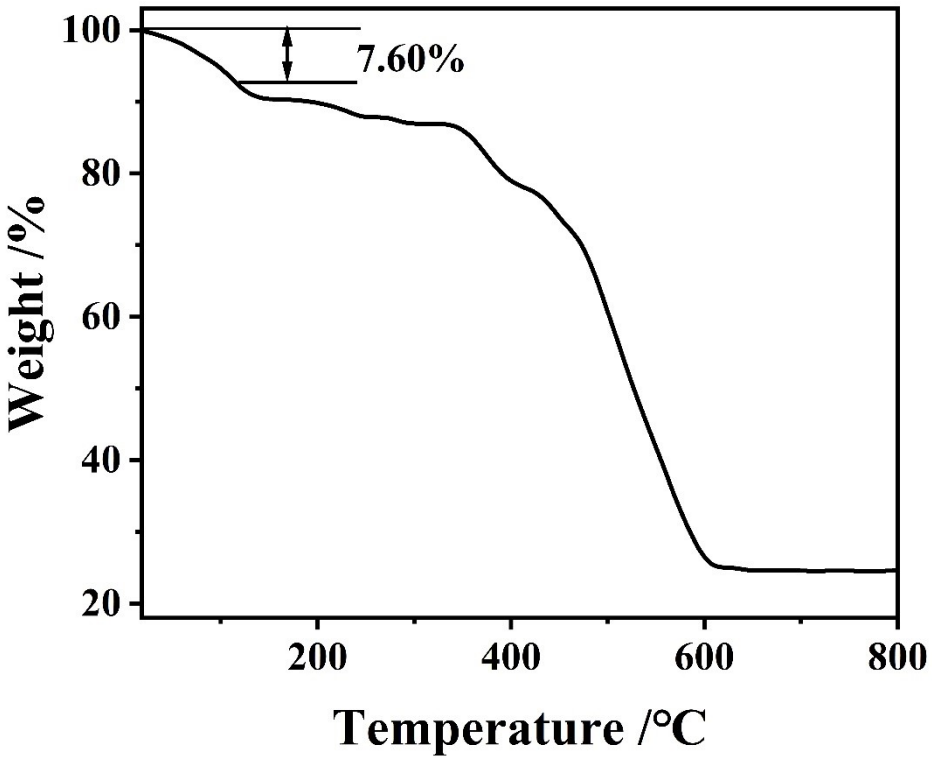

Figure S4. The TG plot for **1**.

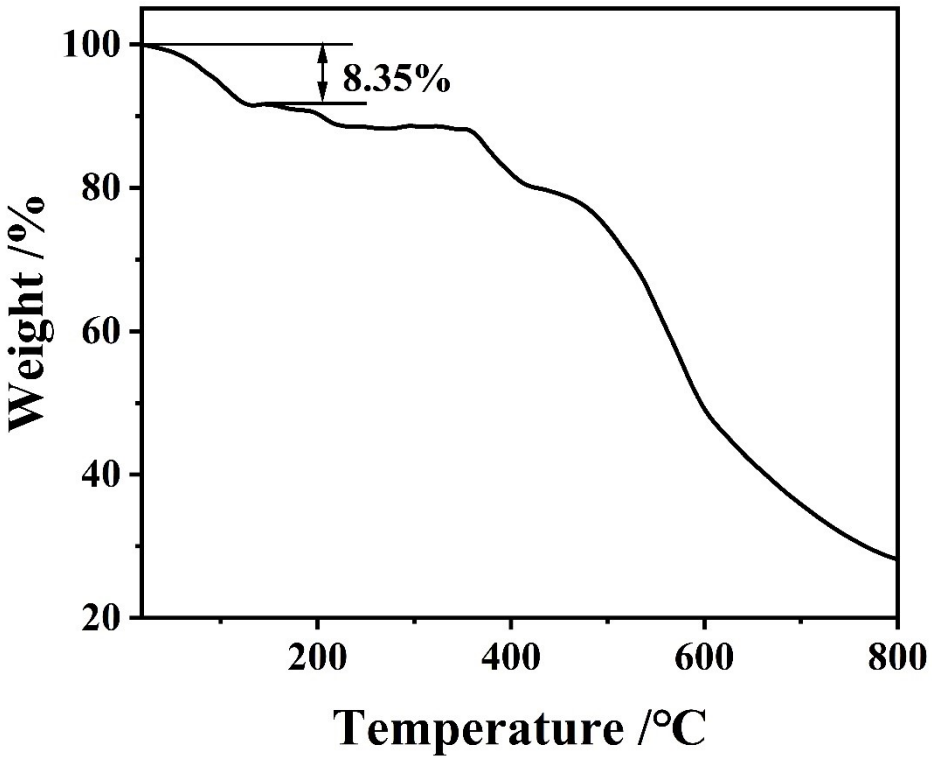

Figure S5. The TG plot for **2**.

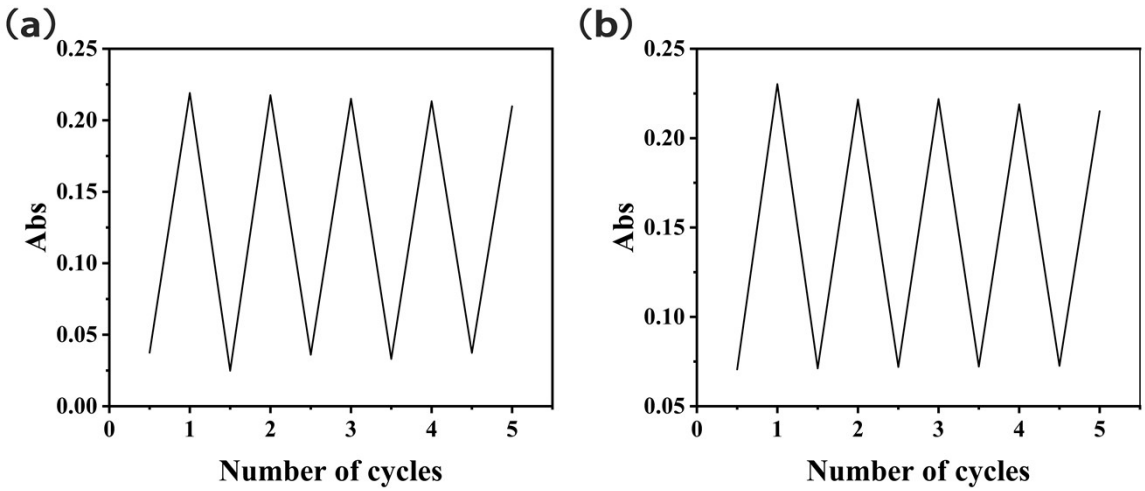

Figure S6. Stability of compounds **1** and **2**

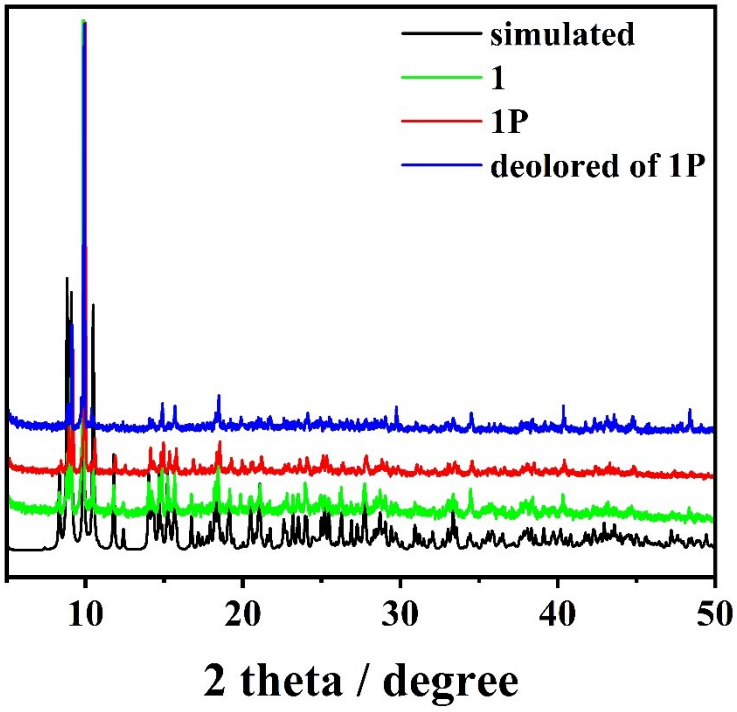

Figure S7. PXRD of **simulated**, **1**, **1P**, **decolored of 1P**.

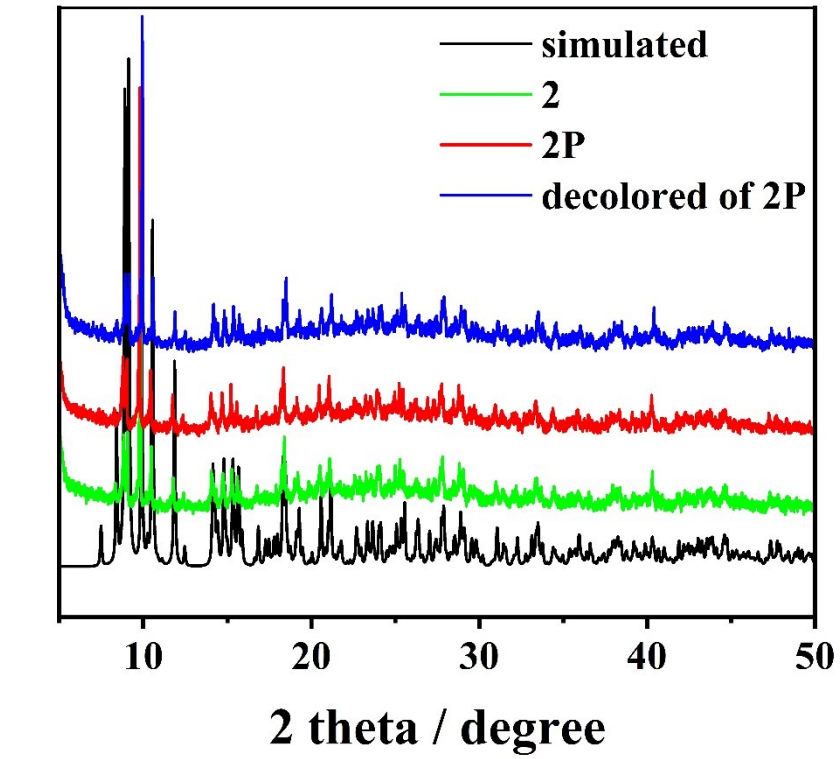

Figure S8. PXRD of **simulated**, **2**, **2P**, **decolored of 2P**.

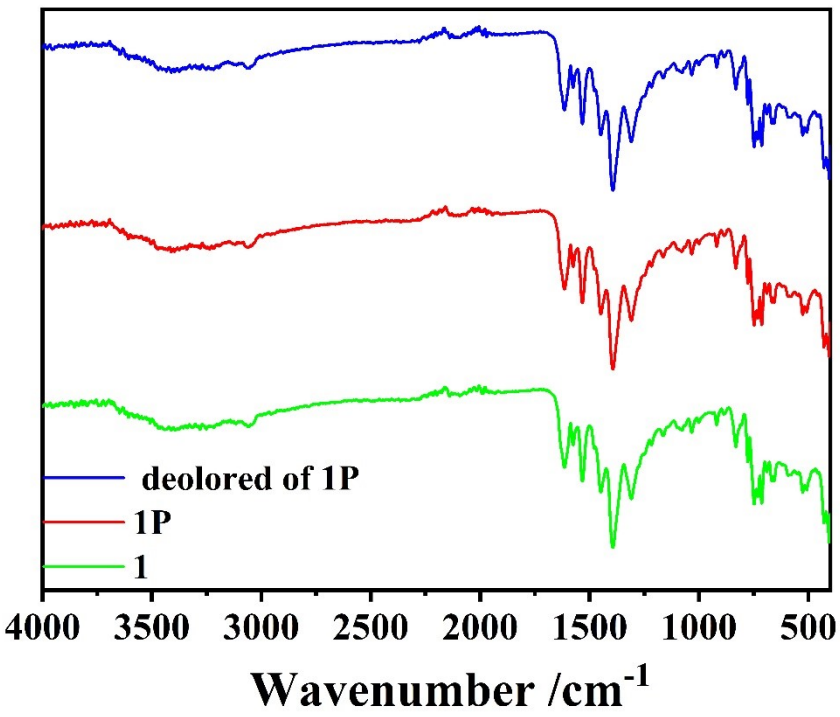

Figure S9. FT-IR spectra of **1**, **1P**, **decolored of 1P**.

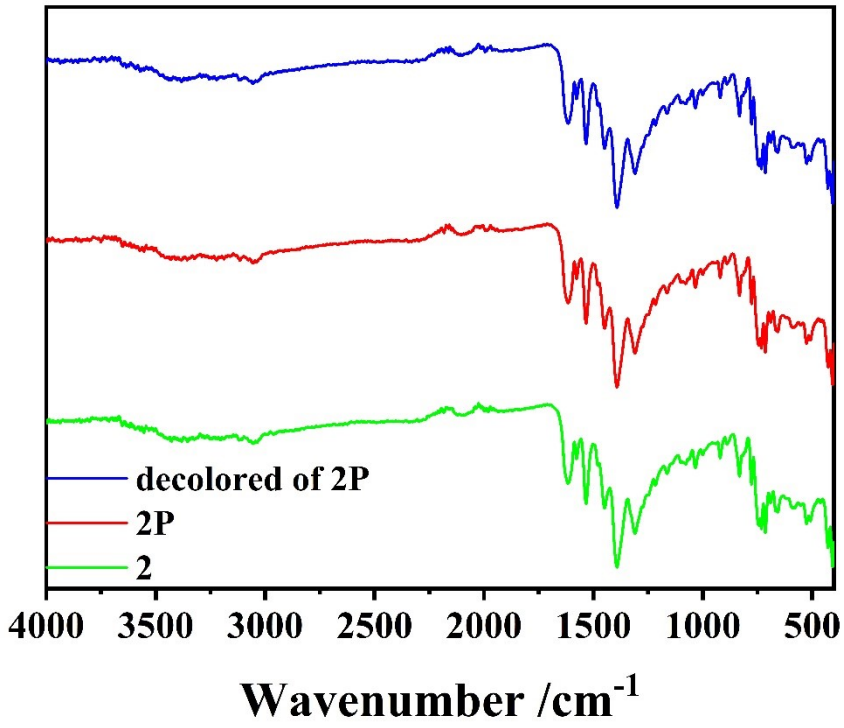

Figure S10. FT-IR spectra of **2**, **2P**, **decolored of 2P**.

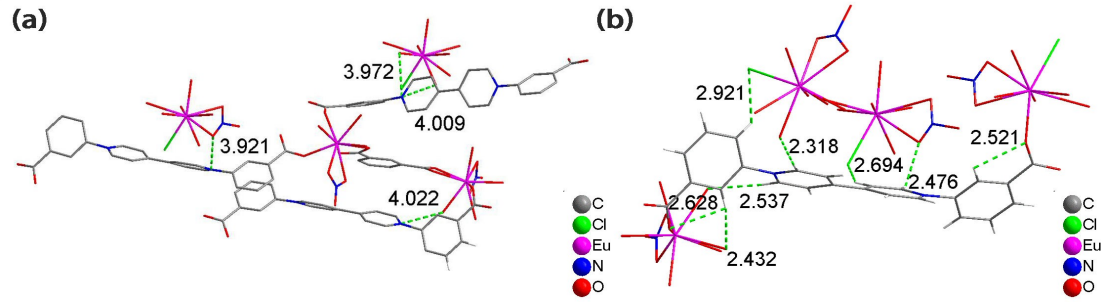

Figure S11. Electron transfer path of compound **1** : (a) N-O; (b)*α/β* C-H···O/Cl.

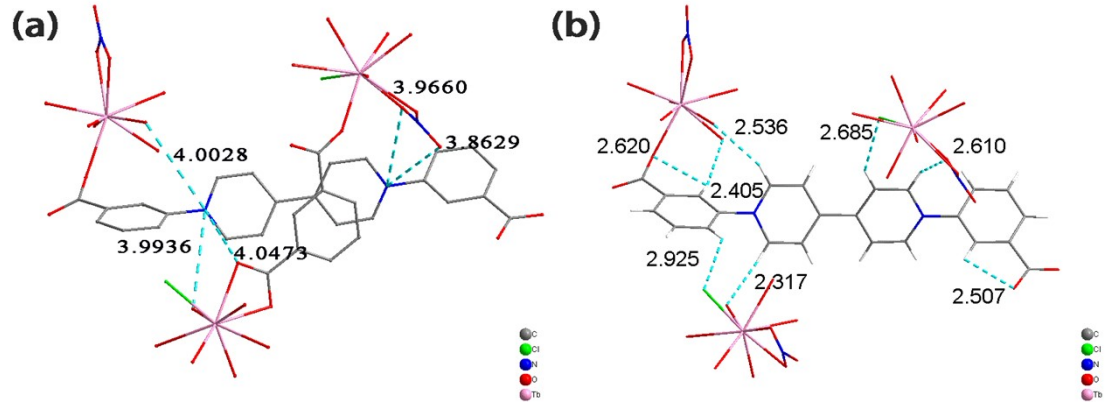

Figure S12. Electron transfer path of compound **2** : (a) N-O; (b)*α/β* C-H···O/Cl.

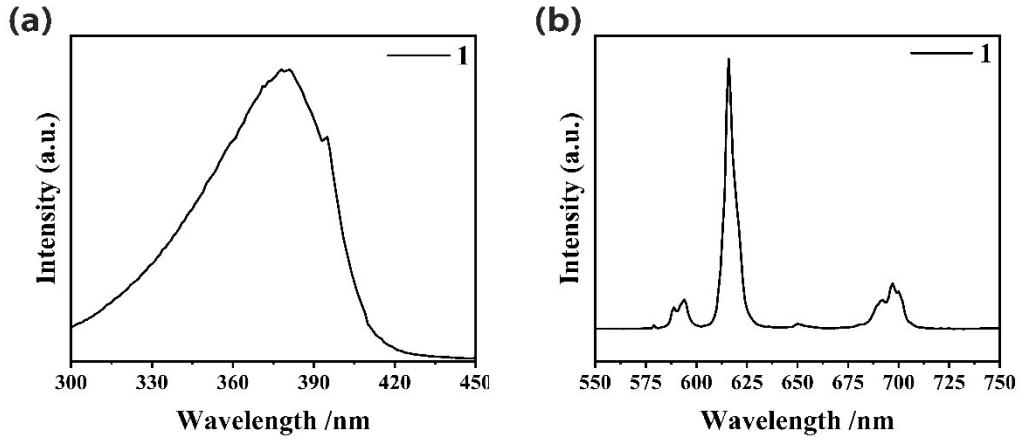

Figure S13. The solid-state excitation spectra (a) and emission spectra (b) of **1** at room temperature (λ_{ex} = 380 nm)

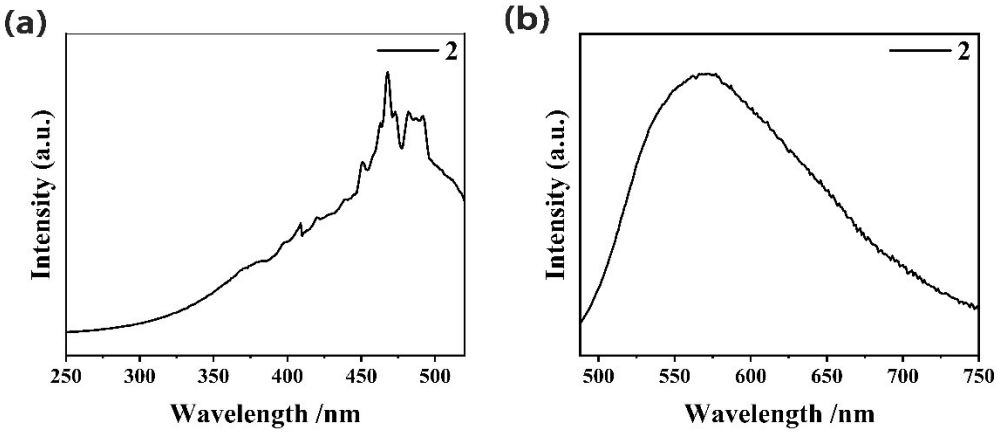

Figure S14. The solid-state excitation spectra (a) and emission spectra (b) of **2** at room temperature (λ_{ex} = 468 nm)

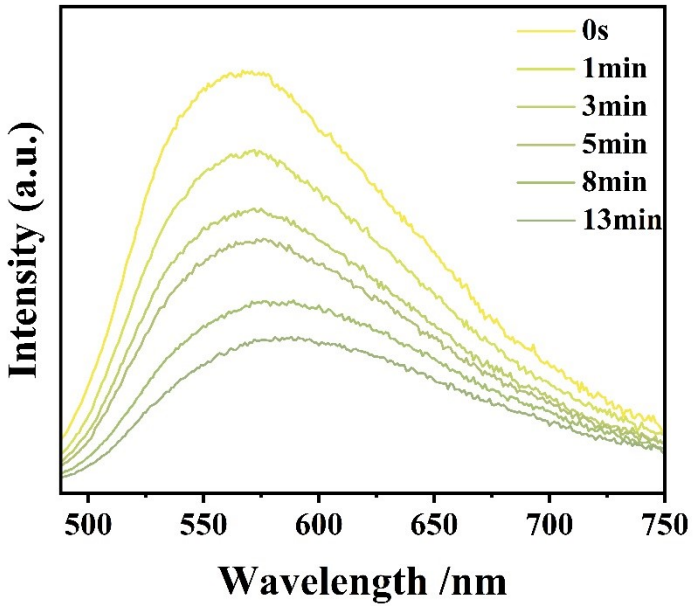

Figure S15. Photomodulated fluorescence spectra of **2**.