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Supporting Information

Fluorescence Detection of Malachite Green and Cations (Cr^{3+} , Fe^{3+} and Cu^{2+}) by A Europium-Based Coordination Polymer

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Materials and instrumentation

All reagents and solvents were commercially available and used as received without further purification. The IR absorption spectra of these complexes were recorded in the range of 400-4000 cm^{-1} by means of a Nicolet (Impact 410) spectrometer with KBr pellets. PXRD measurements were performed on a Bruker D8 Advance X-ray diffractometer using $\text{Cu-K}\alpha$ radiation (0.15418 nm), in which the X-ray tube was operated at 40 kV and 30 mA. TG analysis was performed on a Perkin Elmer thermogravimetric analyzer from room temperature to 1000 $^{\circ}\text{C}$ with a heating rate of 10 $\text{K}\cdot\text{min}^{-1}$ under N_2 atmosphere. Photoluminescence spectra were recorded on the Hitachi 850 fluorescence spectrophotometer at ambient temperature.

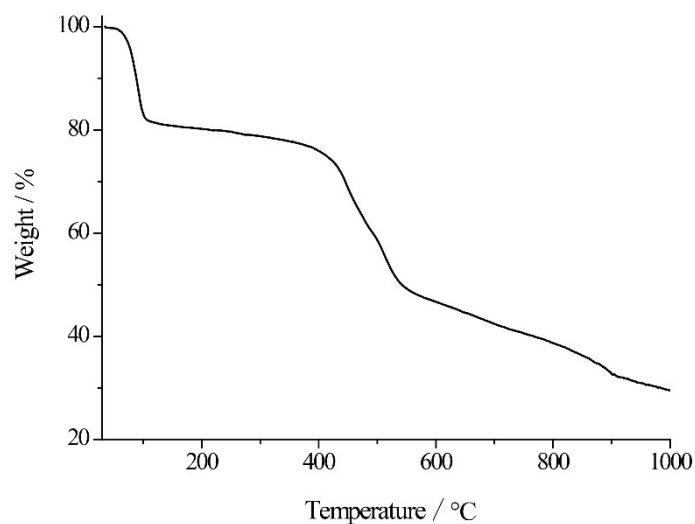


Fig. S1 TGA plot Eu-PDCA.

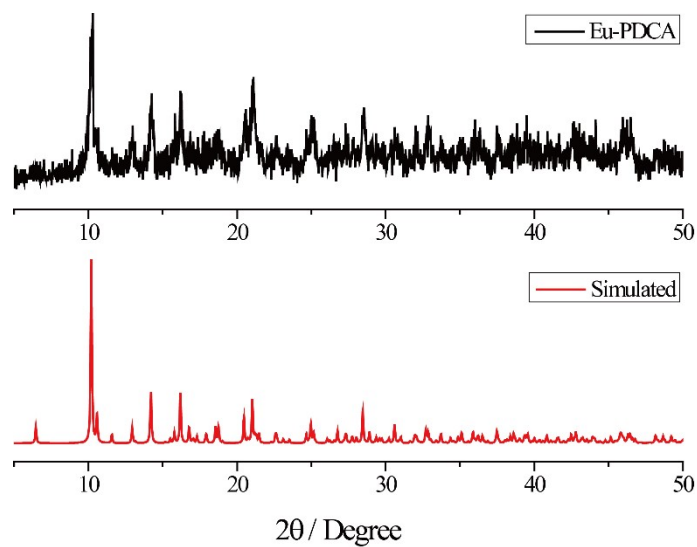
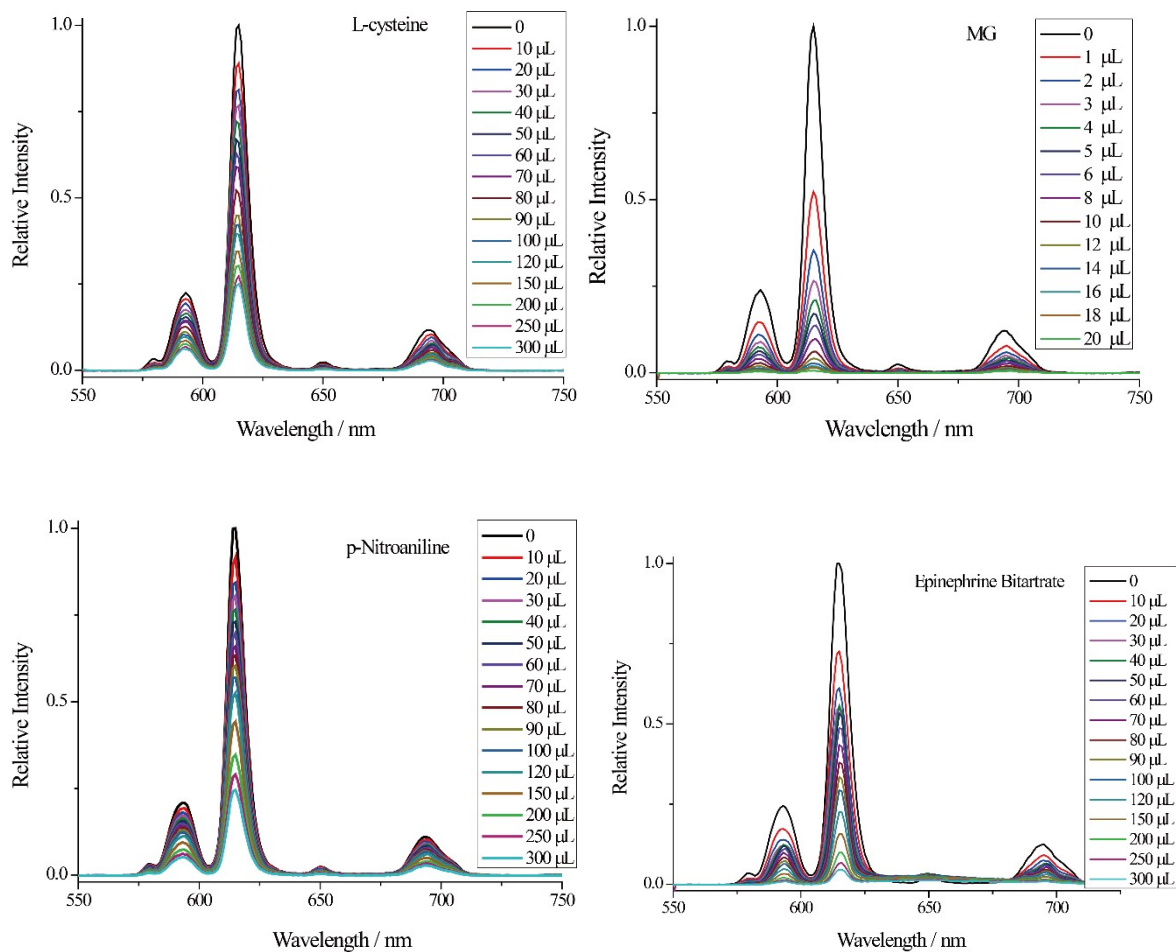


Fig. S2 PXRD of Eu-PDCA.



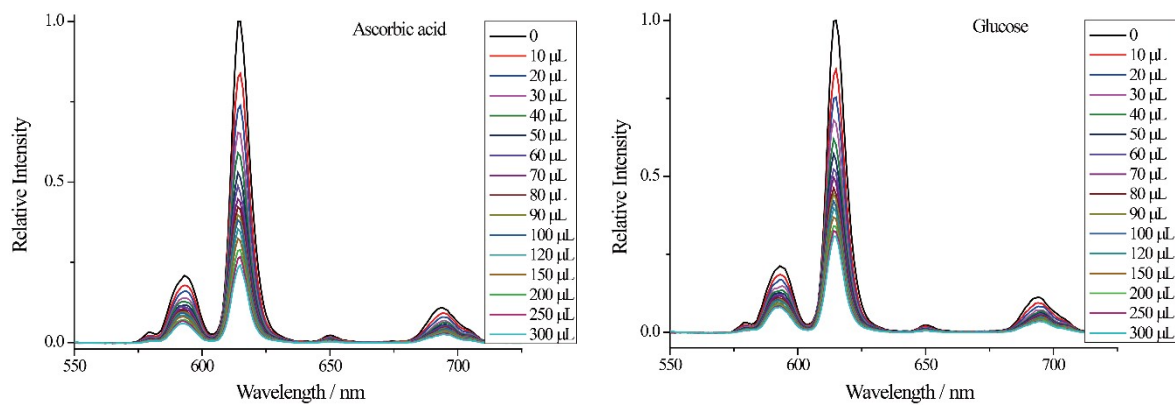
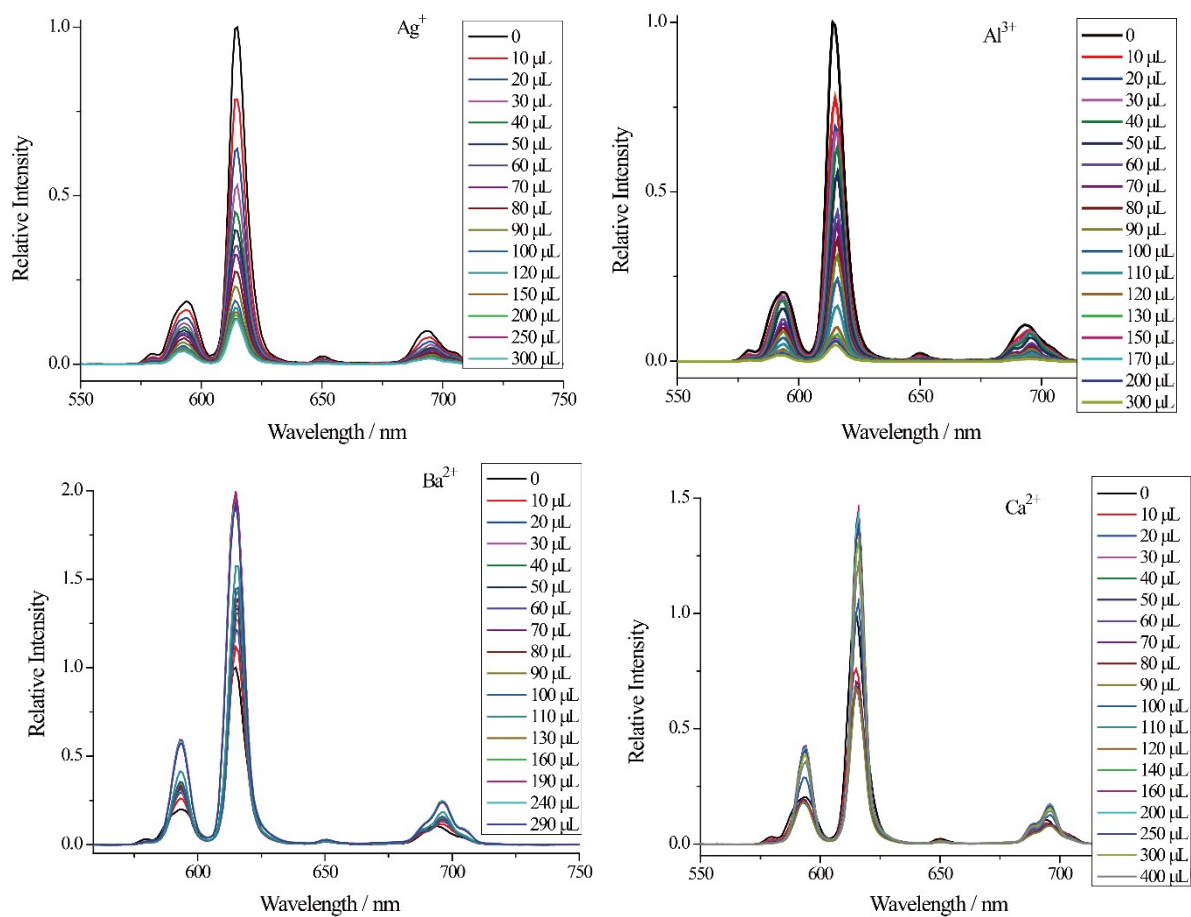


Fig. S3 Fluorescence spectra of Eu-PDCA (ethanol suspension, 1.0 mL) before and after added various analytes (excited at 265 nm).



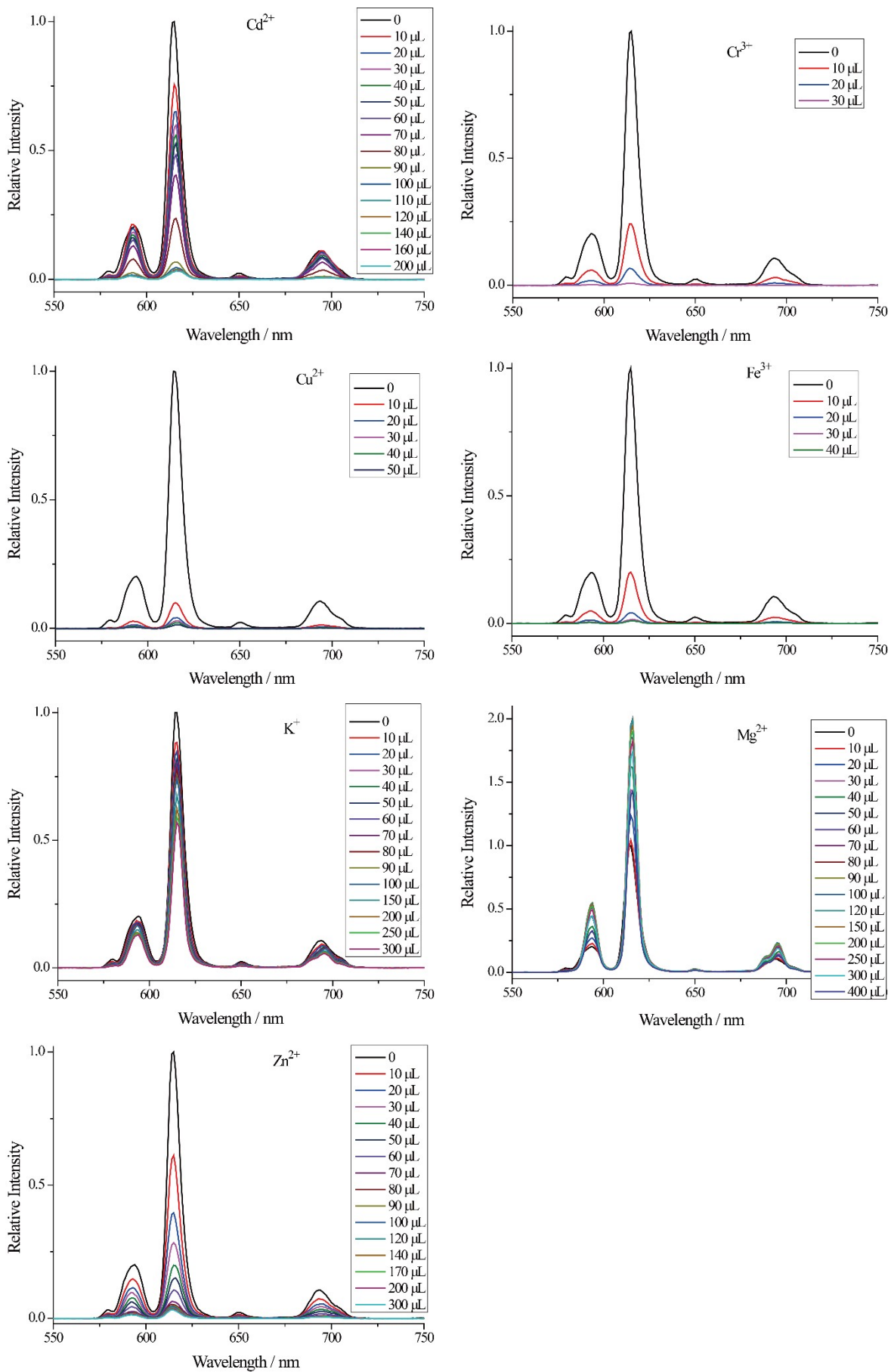
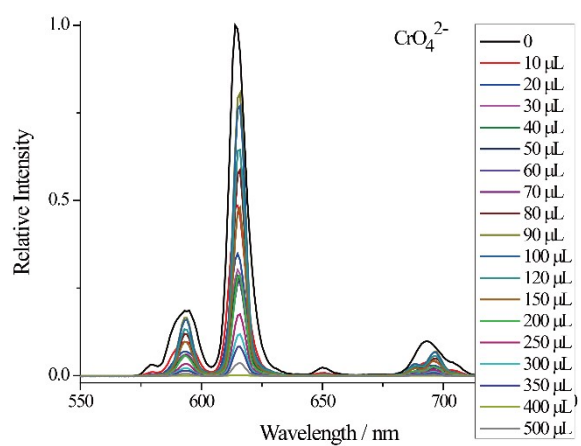
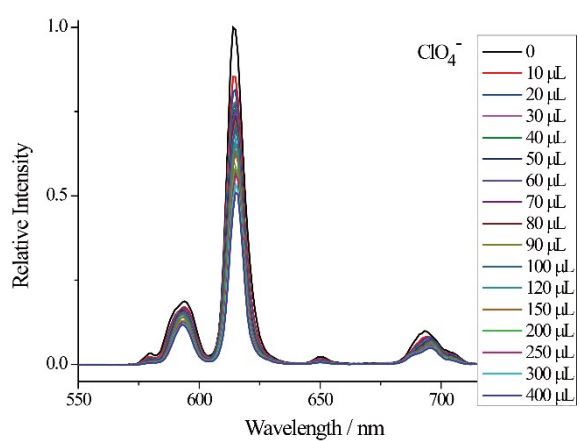
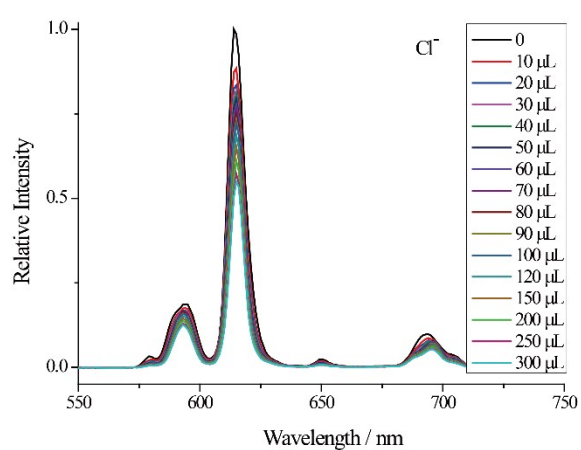
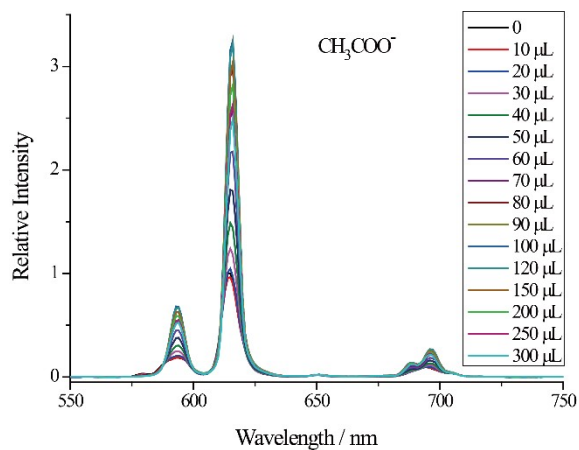
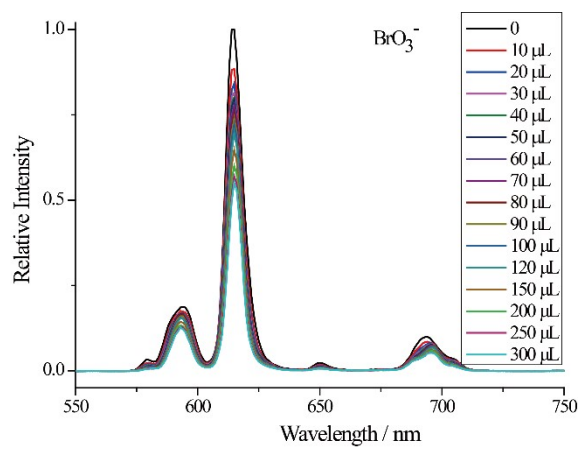
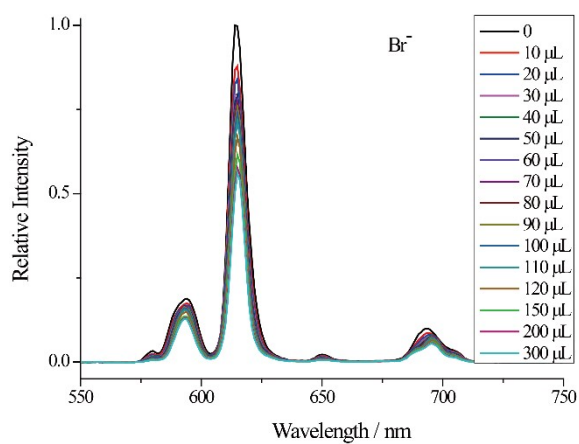


Fig. S4 Fluorescence spectra of Eu-PDCA (ethanol suspension, 1.0 mL) before and after

added different metal ions (excited at 265 nm).



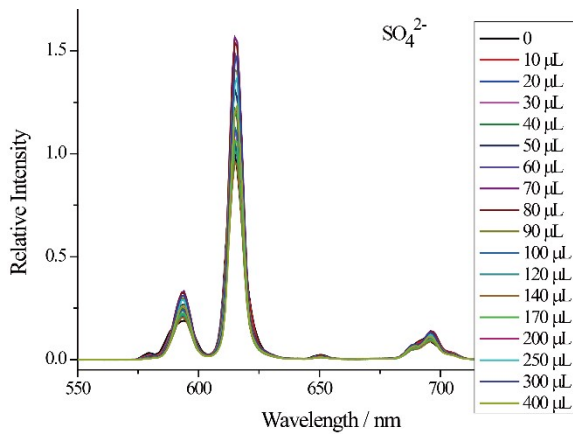
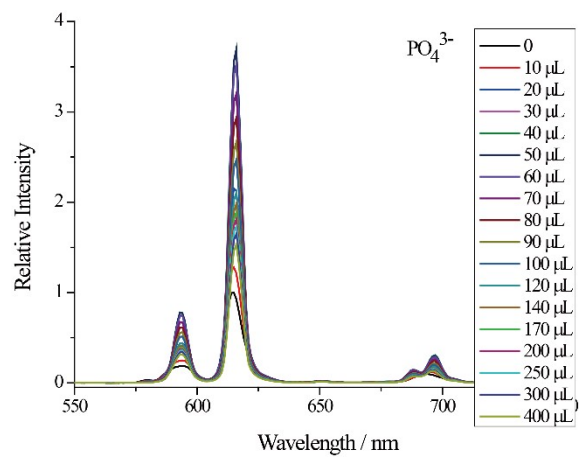
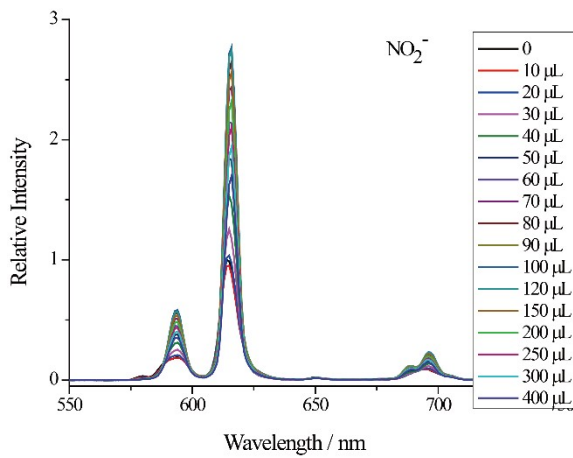
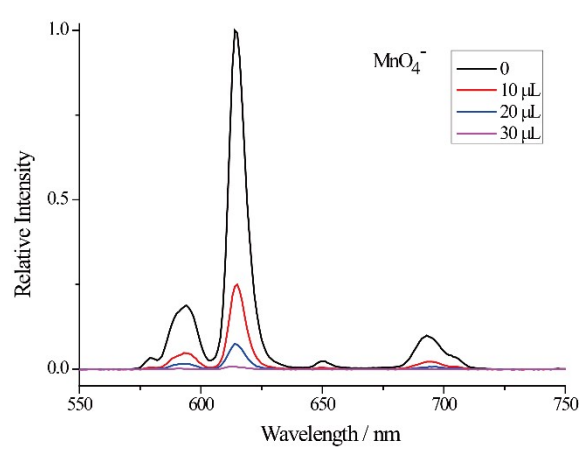
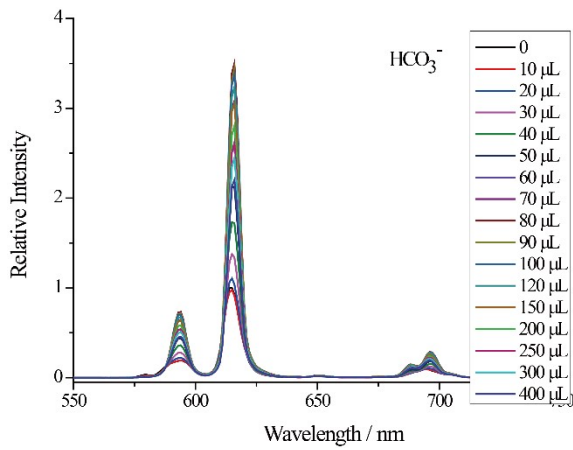
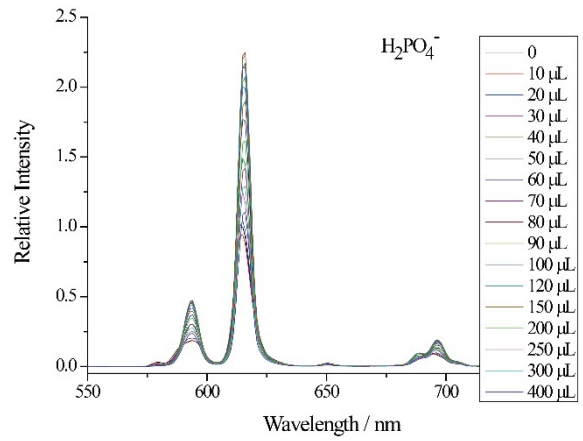
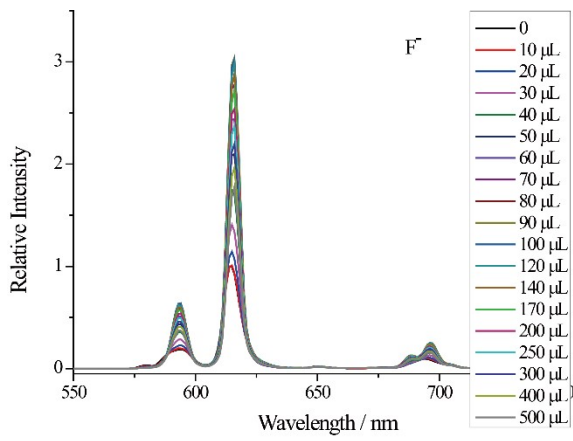


Fig. S5 Fluorescence spectra of Eu-PDCA (ethanol suspension, 1.0 mL) before and after added different anions (excited at 265 nm).

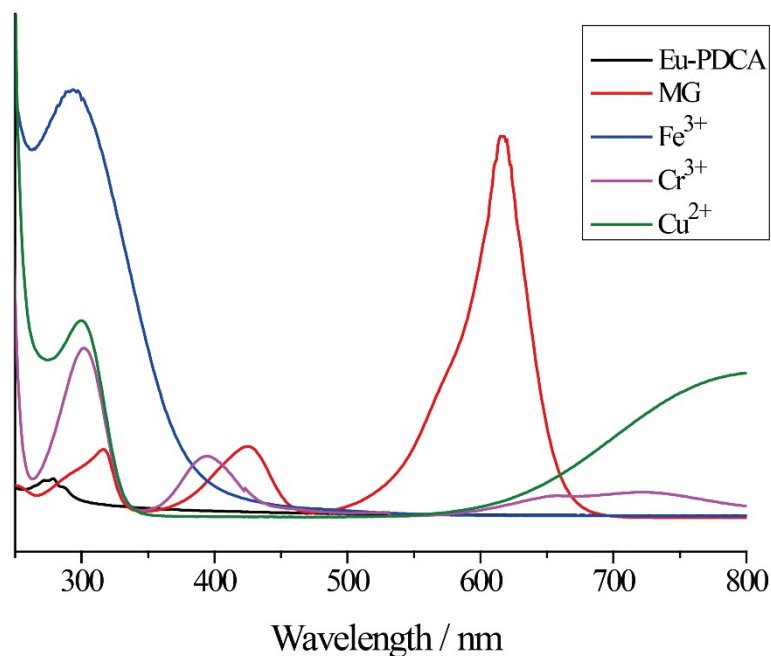


Fig. S6 Liquid UV-vis spectra of Eu-PDCA, MG, Cr³⁺, Fe³⁺ and Cu²⁺.

Table S1 Selected bond lengths (Å) and angles (°) for Eu-PDCA.

Eu(1)-O(5)	2.3881(16)	O(5)-Eu(1)-O(7)	80.15(6)
Eu(1)-O(8)	2.4291(17)	O(8)-Eu(1)-O(7)	97.17(7)
Eu(1)-O(7)	2.4369(16)	O(5)-Eu(1)-O(4)	71.82(6)
Eu(1)-O(4)	2.4387(15)	O(8)-Eu(1)-O(4)	70.41(6)
Eu(1)-O(2)	2.4632(16)	O(7)-Eu(1)-O(4)	74.38(6)
Eu(1)-O(9)	2.5109(16)	O(5)-Eu(1)-O(2)	85.75(6)
Eu(1)-N(4)	2.5613(18)	O(8)-Eu(1)-O(2)	78.34(7)
Eu(1)-N(3)	2.563(2)	O(2)-Eu(1)-N(4)	62.92(6)
		O(9)-Eu(1)-N(4)	65.28(6)
		O(8)-Eu(1)-N(3)	73.38(6)
		O(7)-Eu(1)-N(3)	63.00(6)

Table S2 Crystal data and structure refinement for Eu-PDCA.

Eu-PDCA	
Empirical formula	C ₁₄ H ₁₈ EuN ₂ O ₁₄
Formula weight	590.27
Crystal color	Yellow
Crystal size (mm)	0.16 x 0.15 x 0.12
Crystal system	Monoclinic
space group	<i>P2₁/c</i>
a (Å)	14.0026(6)
b (Å)	11.2217(5)
c (Å)	12.8398(5)
α (deg)	90.00
β (deg)	102.4680(10)
γ (deg)	90.00
Volume (Å ³)	1969.98(14)
Z	2
d _{calcd} (g/cm ³)	1.990
μ (mm ⁻¹)	3.262
F (000)	1164.0
λ (Å)	0.71073
Temperature	293(2) K
θ range (deg)	1.49 to 27.21
h ,k, l range	-16<=h<=12 -12<=h<=14 -17<=h<=17
Reflections collected / unique	11853 / 8500 [R(int) = 0.0120]
Completeness to θ	97.0 % (θ = 27.21)
Data / restraints / parameters	8500 / 2 / 595
Goodness-of-fit on F ²	1.049
Final R indices [I>2σ(I)] ^a	R1 = 0.0171 wR2 = 0.0413
R indices (all data)	R1 = 0.0203 wR2 = 0.0423
Largest diff. Peak and hole(e·Å ⁻³)	0.619 and -0.470