Electronic Supplementary Information for Dalton Transactions

Supporting Information

Metal-organic framework (MOF): lanthanide(III)-doped approach for luminescence modulation and luminescent sensing

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1. Experimental Section

1.1 Materials and Methods.

Commercially available reagents have been used as received without further purification. Elemental analysis for C, H, and N was performed on a Perkin-Elmer 240 analyzer. TGA analysis was performed with a heating rate of 5°C/min using a NETZSCH STA 449C simultaneous TG-DSC instrument. PXRD research was performed on a Rigaku D/mex-rB instrument. ICP analysis was performed on a Vista PRO instrument.

1.2 The following preparation is designed for EA, ICP and PXRD studies:

1.2.1 Synthesis of Eu/Tb@1: The single crystal samples (6g) of **1** were immersed in 30mL of a 1mol/L $EuCl_3$ or $Tb(ClO_4)_3$ solution for 24h, and then the lanthanide-ion-infused **Eu**/**Tb@1** was isolated by filtration and drying at 30˚C for 24h.

1.2.2 Synthesis of Cu-Eu/Co-Tb@1: **Eu**/**Tb@1** powder samples (1g) were immersed in 20mL of a 1mol/L $CuCl_2$ or $CoCl_2$ solution for 24h, and then the metal-ion-infused **Cu-Eu**/**Co-Tb@1** was isolated by filtration and drying at 30˚C for 24h.

1.3 Luminescence studies: Photoluminescence of these researches was carried out in the solid state at room temperature. **Eu**/**Tb@1** were produced by immersing single crystal samples of **1** (40 mg) in 10mL of aqueous $EuCl_3$ or $Tb(ClO_4)_3$ solutions at various concentrations for 24h (10^{-6}~10^{-3} mol/L for $EuCl_3$ or 10^{-7}~10^{-3} mol/L for $Tb(ClO_4)_3$), then isolated by filtration and drying at 30°C for 24 h. Similarly, **M-Eu**/**Tb@1** were prepared by immersing powders of pre-synthesized **Eu**/**Tb@1** (see the **Synthesis of Eu**/**Tb@1** section**,** 40 mg) in 10mL 10^{-2}mol/L MCl_x aqueous solutions for 24h (M= Na^+, K^+, Zn^{2+}, Ni^{2+}, Mn^{2+}, Co^{2+}, Cu^{2+}) then isolated by filtration and drying at 30°C for 24 h. **Cu-Eu/Co-Tb@1** were yielded by immersing powders of pre-synthesized **Eu**/**Tb@1** (40 mg) in 10mL of aqueous $CuCl_2$ or $CoCl_2$ solutions for 24h with the concentration in the range of 10^{-2}~10^{-6}mol/L, respectively, then isolated by filtration and drying at 30°C for 24 h. Photoluminescence spectra were measured using a Hitachi F2500 fluorescence spectrometer, with excitation wavelength of 339nm, PMT voltage of 400V, scan speed of 300 nm/min, slit width of 5

nm for 1, corresponding vales of 322nm, 700V, 300 nm/min, 2.5 nm for **Eu@1** and **M-Eu@1,** and 316nm, 400V, 300 nm/min, 2.5 nm for **Tb@1** and **M-Tb@1**.

2. Figure section.

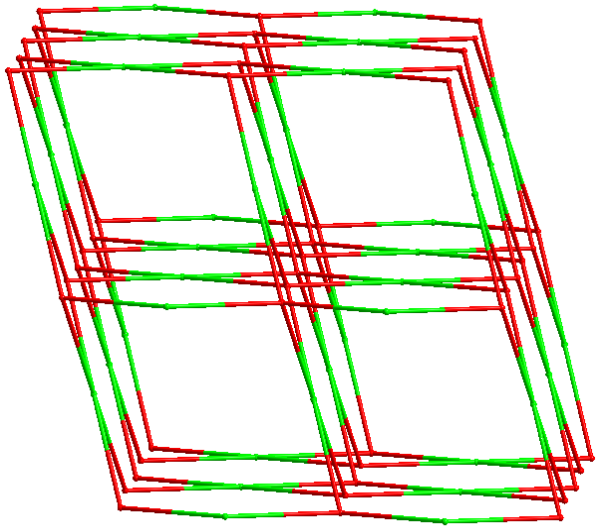

Fig. S1 Schematic description of the PtS net of **1** built on square L nodes (green) and tetrahedral zinc nodes (red).

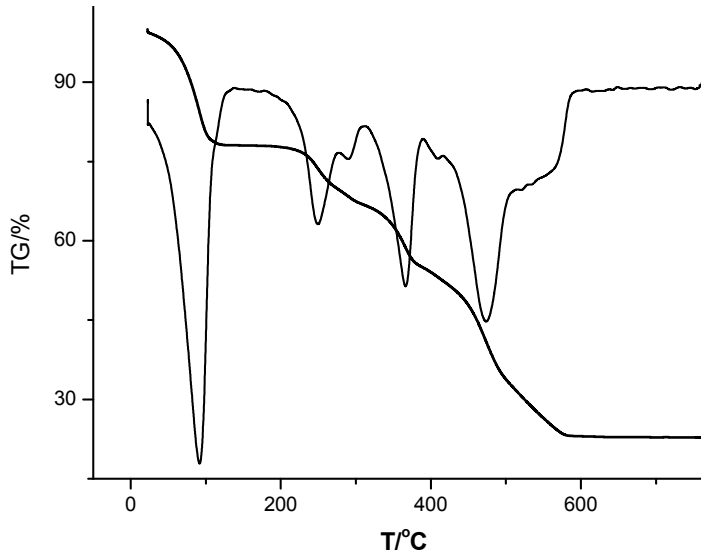

Fig. S2 The TG-DTA plot of **1**.

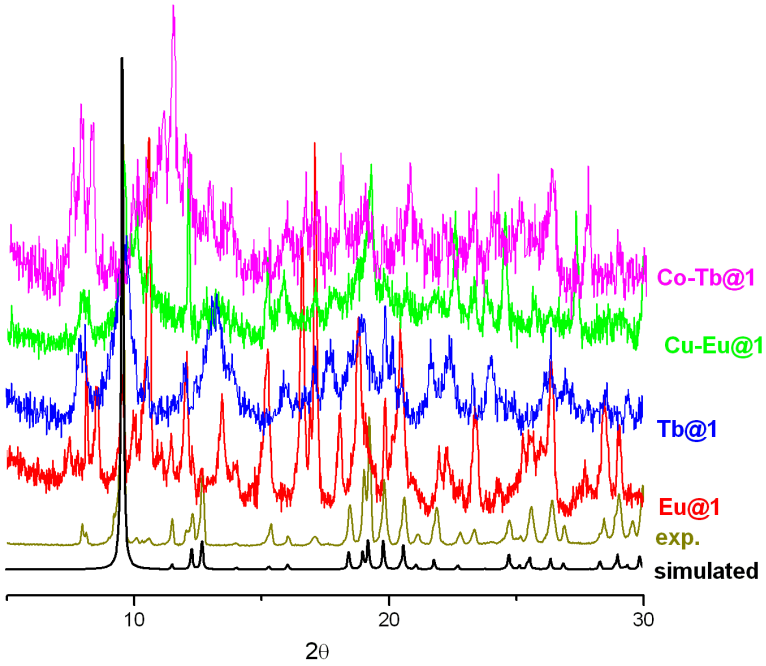

Fig. S3 The simulated and experimental PXRD patterns of these samples: black/simulated result of **1**, brown/experimental result of **1**, red/Eu@1, blue/Tb@1, green/Cu-Eu@1, purple/Co-Tb@1.

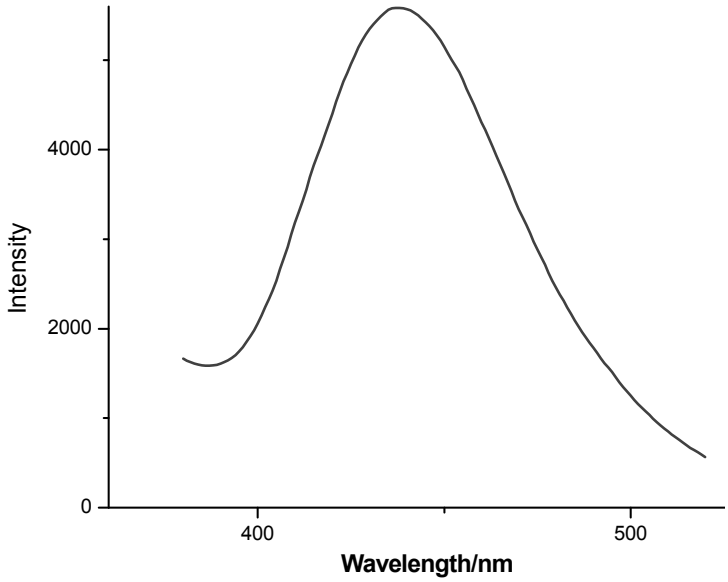

Fig. S4 Photoluminescence spectra of polymer **1**.