Supporting information

A layered zinc phosphate decorated with organic fluorophore for selective luminescent sensing of metal cations

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Experimental Section

All the reagents were purchased from commercial channels and used without further purification; TPT was synthesized as reported. A TA Instrument Q600 SDT thermogravimetric analyzer was used to obtain the TGA curve in N_2 at a rate of 10 ºC min^{-1}. The emission/excitation spectra were recorded on a HITACHI F-4500 fluorescence spectrophotometer. IR spectra were characterized by a Bruker Tensor 27 FTIR spectrometer in the range of 4000-400 cm^{-1} using a KBr disk. The X-ray powder diffraction (XRD) data were collected with a Bruker D8 Advance X-ray diffractometer using CuKα radiation (λ = 1.5406 Å). The ion-exchange fractions are determined quantitatively by atomic absorption spectroscopy (AAS) on a HITACHI Z-2300 instrument.

A solution of $Zn(NO_3)_2 \cdot 6H_2O$ (0.58g, 2mmol), TPT (0.1g, 0.32mmol), H_3PO_3 (0.164g, 2mmol) and H_2O (4 mL) was stirred for 30min. The mixture was sealed in a 23ml Teflon-lined steel bomb and heated at 170ºC for 4320min. Red block-like crystals were collected in 32% yield based on $Zn(NO_3)_2 \cdot 6H_2O$.

Solid state luminescent properties were investigated at room temperature on a HITACHI F-4500 fluorescence spectrophotometer with the conditions of the method (PMT voltage: 400 V, scan speed: 240 nm/min, slit widths: ex 5.0 nm and em 5.0 nm). The ion exchanged sample of **1** was prepared by introducing 100 mg of dehydrated compound **1** (pretreated at 130 ^{o}C under vacuum) into 10.00 ml solution containing different amounts of $M(NO_3)_x$ (M = Cr^{3+}, Ni^{2+}, Ca^{2+}, Na^{+}, Mg^{2+} respectively), and collected by filtration and dried for 24 h.

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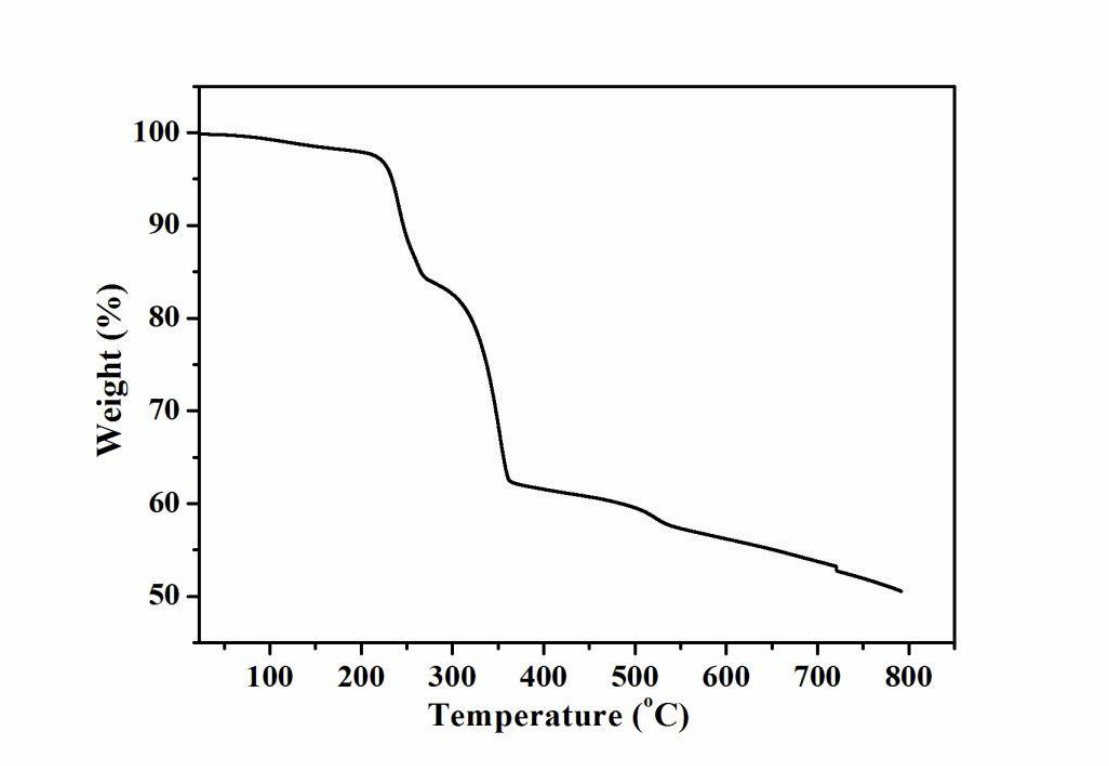

Figure S1. Thermal gravimetric curve of **1**

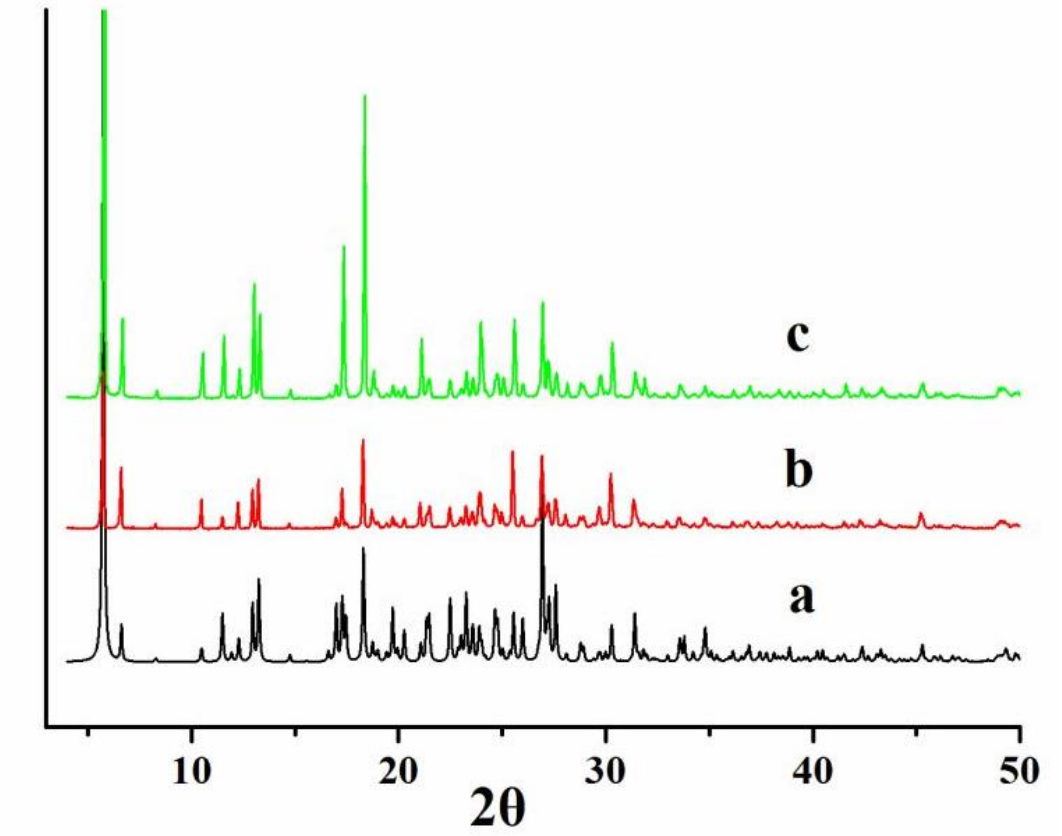

Figure S2 PXRD patterns for compound **1**: (a) simulated; (b) of a sample at room temperature; (c) of a sample calcined at 130^{o}C for 2 h in vacuum.

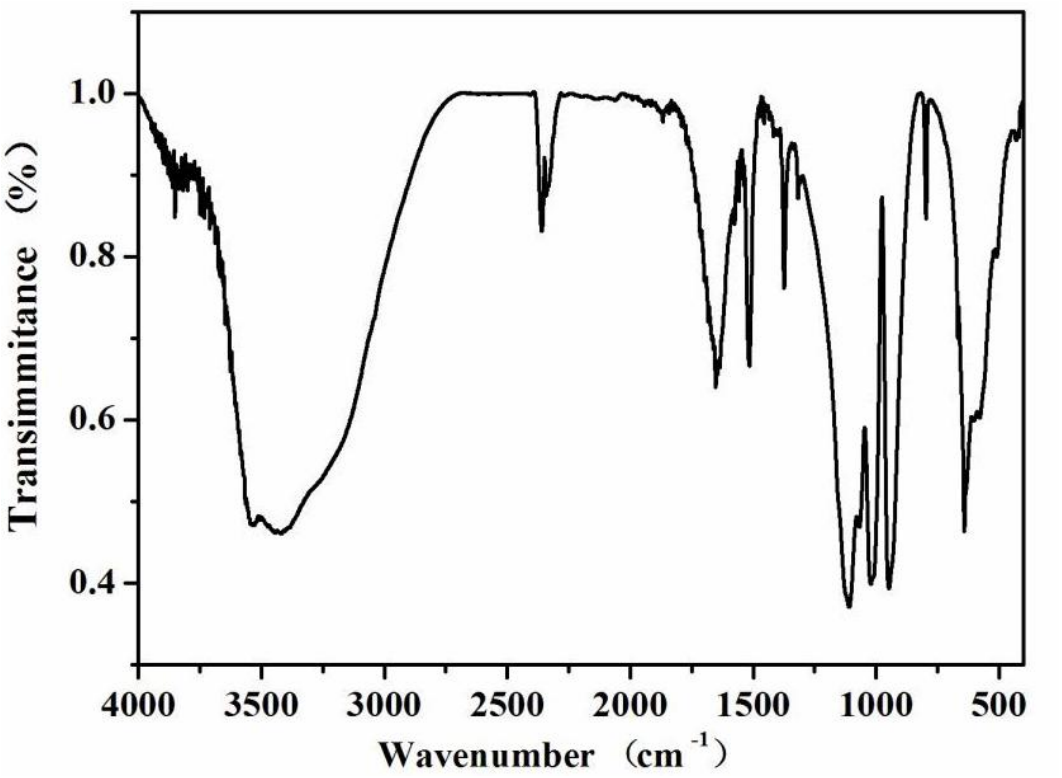

Figure S3. IR spectra of compound **1**