Luminescent sensing from a new Zn(II) metal-organic framework

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Measurements:

UV–Vis absorption spectroscopy was obtained on U-3010 spectrophotometer (Hitachi, Japan). Fluorescence spectra were performed with Eclipse fluorescence spectrophotometer (Varian, USA), the photomultiplier tube (PMT) voltage was 700 V, the scan speed was 1200 nm min\textsuperscript{-1}, the slit width of excitation and emission is 5 nm

Photoluminescence Measurements. The photoluminescence of GDMU-3 was investigated in the solid state at room temperature. For the experiments of sensing metal ions, GDMU-3 powder (5 mg) was immersed in DMF solutions containing 10\textsuperscript{-2} M of M(NO\textsubscript{3})\textsubscript{x}. Before photoluminescence measurements, the suspensions were oscillated for 30 min using ultrasonic waves to ensure uniform dispersion. For the titration experiments of Fe\textsuperscript{3+} ion, GDMU-3 powder (5 mg) was immersed in DMF with the dropped addition of different concentrations of Fe\textsuperscript{3+} in DMF.

Dye adsorption: Freshly prepared compound GDMU-3 (10 mg) were transferred to DMF solutions (8 mL) of Methylene and Solvent Yellow 2 in 10 mL sealed glass bottles. UV/Vis spectra were used to determine the selective adsorption ability of GDMU-3 after certain time intervals.

Dye release: Compound GDMU-3 loaded with Methylene and Solvent Yellow 2 (10 mg) were transferred to pure DMF and saturated NaCl in DMF solution (4 mL) in 10 mL sealed glass bottles. UV/ Vis spectra were used to determine the selective release
of GDMU-3 after certain time intervals.

Fig. S1 X-ray single crystal structure of GDMU-3 exhibiting two types of pores of about (a) 5.8 × 3.8 Å along the b axis and (b) 10.2 × 20.5 Å along the c axis, respectively.

Fig. S2 $^{13}$C NMR spectra of title compound.
Fig. S3. TGA curves of compound **GDMU-3**.

Fig. S4. PL curves of compound **GDMU-3** and L ligand at room temperature in the solid state (the inserts show excitation spectrum $\lambda_{ex} = 300$ nm for L(left) and $\lambda_{ex} = 320$ nm for GDMU-3(right)).

Fig. S5 UV-Vis-NIR spectra for title compound
Fig. S6 XRPD patterns for GDMU-3.

Fig. S7 The EDS of the solid samples of GDMU-3-Fe$^{3+}$ obtained by centrifugal separation of GDMU-3 soaked in DMF solution containing Fe(NO$_3$)$_2$ with 10$^{-2}$ M, washing with DMF, and drying in 60 °C oven.

Fig. S8 N1s XPS spectra of the original GDMU-3 (black) and GDMU-3 @Fe$^{3+}$ (red).
Figure S9. The structures of dye molecules that were used in the experiment of dye adsorption.

Fig. S10. The two of dyes released from the dye \( \text{I} \) in pure DMF and saturated NaCl solution in DMF marked by UV absorption: a) MB, b) solvent yellow 2.

Fig. S11. The UV/vis absorption spectra for NB and L.