Electronic Supplementary Information (ESI)

Layered rare-earth hydroxide (LRH, R = Tb, Y) composites with fluorescein: delamination, tunable luminescence and application on chemosensoring for detecting Fe(III) ions

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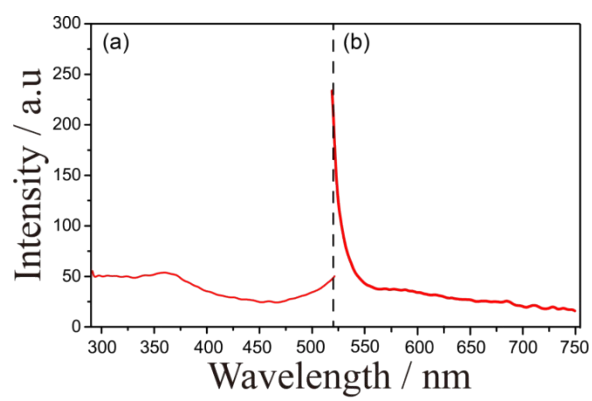

Fig. S1 Excitation (a) and emission (b) spectra of FLN-Na in solid state.

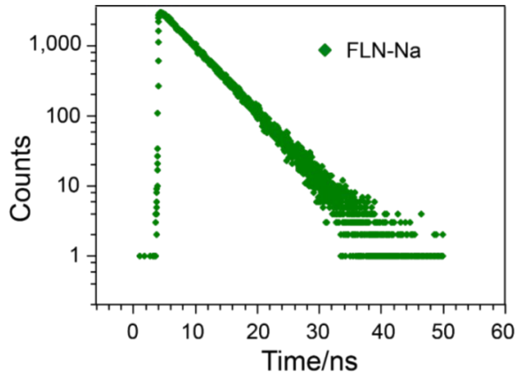

Fig. S2 Photoluminescence decay curve of FLN-Na.

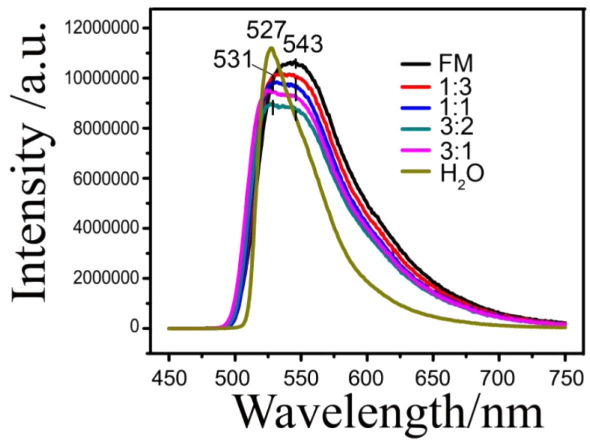

Fig. S3 Emission spectra of FLN-Na (FLN:NaOH = 1:1) when dissolved in pure FM (543 nm), water (527 nm) and in FM/water mixtures (0.003 g FLN-Na dissolved in 30 ml solvents).

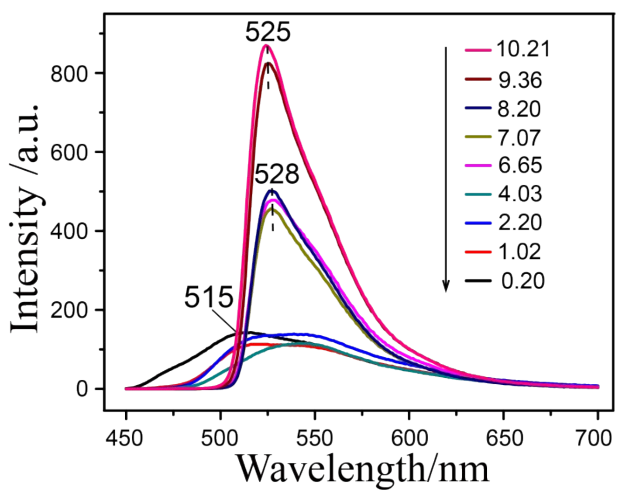

Fig. S4 Emission spectra of the aqueous solutions of FLN-Na (5.4×10^{-4} M) at different pH. The photoluminescence of FLN-Na in solutions with different pH was presented in Fig. S6. With the pH increase from 0.20 to 10.21, the luminescence intensity was gradually enhanced and the photoluminescence spectra became sharp. this indicates that the pH has big influence for the emission intensity and the emission wavelength.

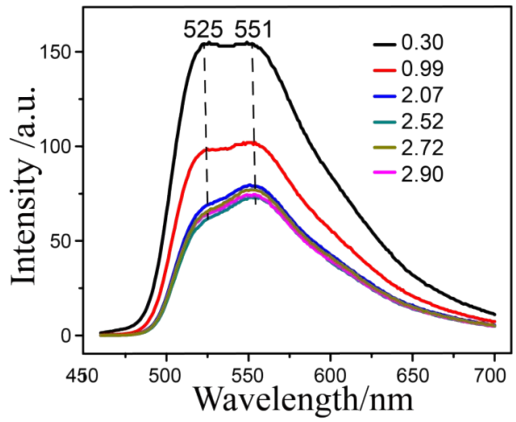

Fig. S5 Emission spectra of the mixed solution of 3 ml FM solution of FLN-Na (5.4×10^{-4} M) and 1 mL Fe^{3+} aqueous solutions (9.1×10^{-3} M, 500 ppm) at different pH. The emission intensity of FLN-Na tended to decrease following the increase of pH value of Fe^{3+} solution. However, the intensity hardly changed at the pH range of 2-3. Above results indicate the emission will be decreased at the pH of 0~2. The pH values of the solutions including Fe^{3+} in the present our system were larger than 2, and only the luminescence intensity in this range is comparable with other ions.

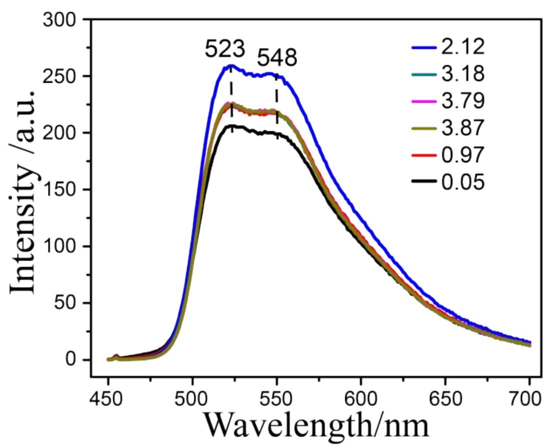

Fig. S6 Emission spectra of the mixed solution of 3 ml FM solution of FLN-Na (5.4×10^{-4} M) and 1 mL Al^{3+} aqueous solutions (1.8×10^{-2} M, 500 ppm) at different pH. The emissions of FLN-Na mixed with Al^{3+} at different pH were shown in Fig. S5. the fluorescence intensity was gradually enhanced after added Al^{3+} with the pH increase from 0.05 to 0.97 and then to 2.12, however, when the pH were 3.18, 3.79 and 3.87, the emission intensity dropped down to that the pH of 0.97. So there is an optimal pH value for the luminescence intensity of mixed solution of FLN-Na and Al^{3+}.

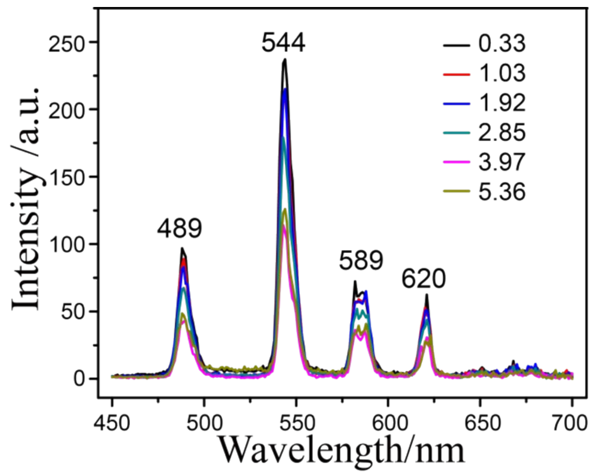

Fig. S7 Emission spectra of the $Tb(NO_3)_3{\cdot}6H_2O$ aqueous solutions (5×10^{-3} M) at different pH. The luminescence intensity gradually decreased with the increase of pH from 0.33 to 5.36, suggesting lower pH contributed to relatively better luminescence property for Tb^{3+}.

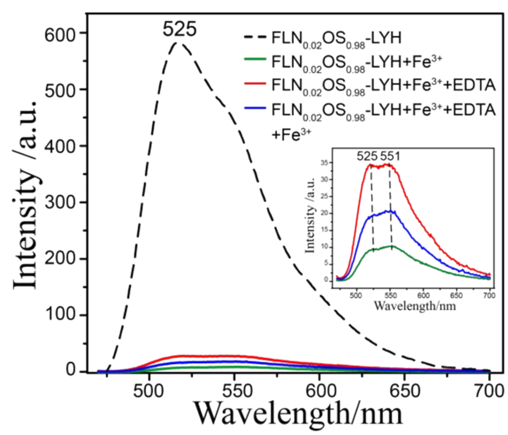

Fig. S8 Fluorescence spectra of $FLN_{0.02}OS_{0.98}$-LYH colloid in FM after subsequent addition of Fe^{3+} and EDTA.