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Electronic Supplementary Information

A nanoscaled lanthanide metal-organic framework as a colorimetric fluorescent sensor for dipicolinic acid based on modulating energy transfer

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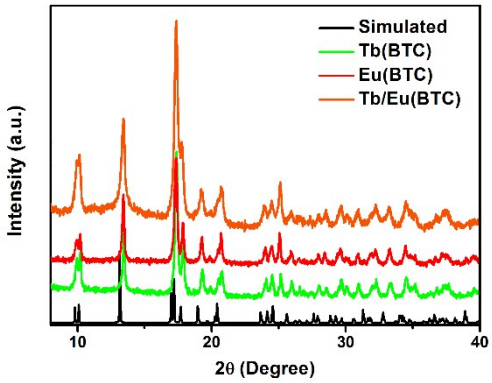

Fig. S1. X-ray powder diffraction patterns of La(BTC) simulated (black); Tb(BTC) (green); Eu(BTC) (red) and Tb/Eu(BTC) (orange).

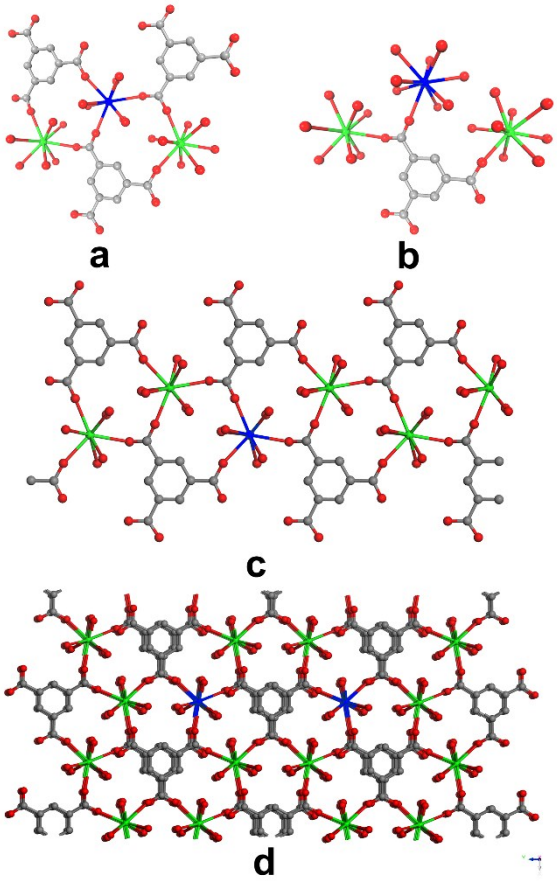

Fig. S2. The coordination modes of the metal atom (a), the carboxylate group (b), the 1D ribbon-like structure (c) and the 3D rod-like structure (d). All the figures were drawn using the CIF file of La(BTC)$(H_2O)_6$. Color code: C, gray; O, red; Tb, green; Eu, blue. The hydrogen atoms were omitted for clarity.

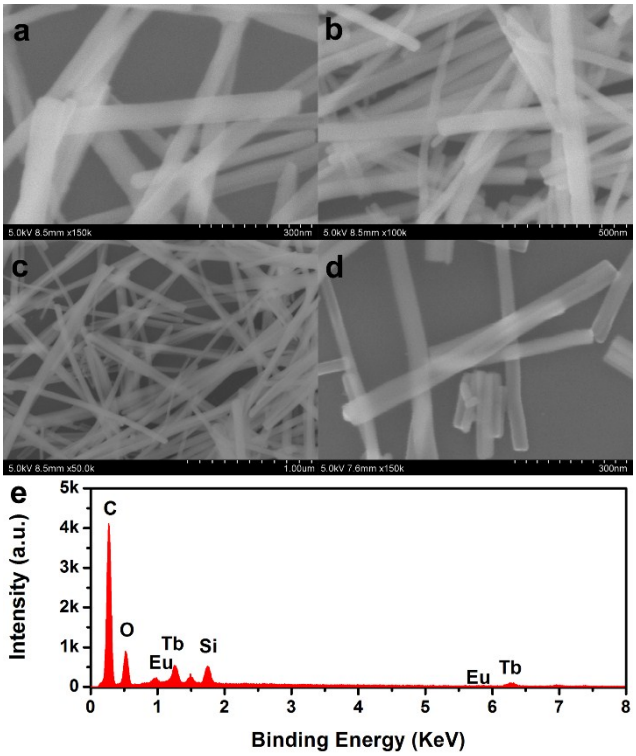

Fig. S3. SEM images of Tb(BTC) (a), Eu(BTC) (b), Tb/Eu(BTC) (c-d), and EDX analysis of Tb/Eu(BTC) (e); the Si peaks arising from substrate.

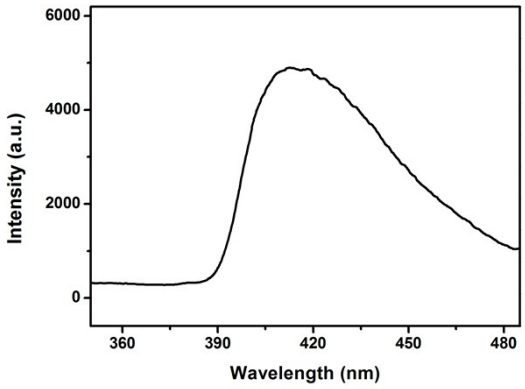

Fig. S4. The phosphorescence spectrum of Gd(BTC) under 268 nm excitation in 77 K.

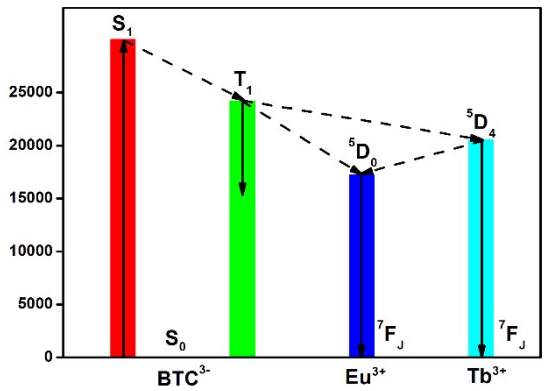

Fig. S5. Schematic diagram of the ligand-metal energy transfer from triplet state of the BTC^{3-} to Ln^{3+} ions and the metal-metal energy transfer from $^5D_4$ of the Tb^{3+} to $^5D_0$ of the Eu^{3+} ions.

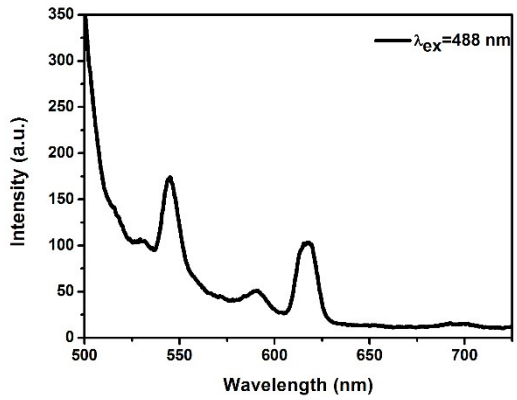

Fig. S6. The emission spectrum of Tb/Eu(BTC) at the excitation of 488nm.

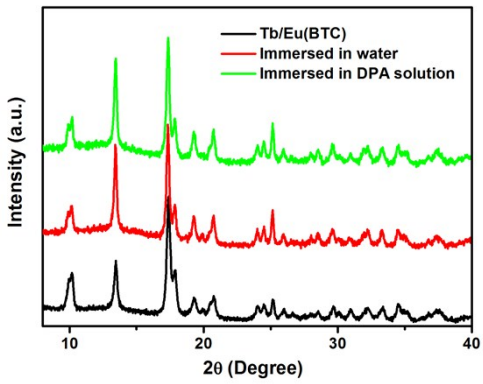

Fig. S7. XRD patterns of Tb/Eu(BTC): the as-synthesized Tb/Eu(BTC) (black), immersed in water (red), and treated by DPA aqueous solution (green).

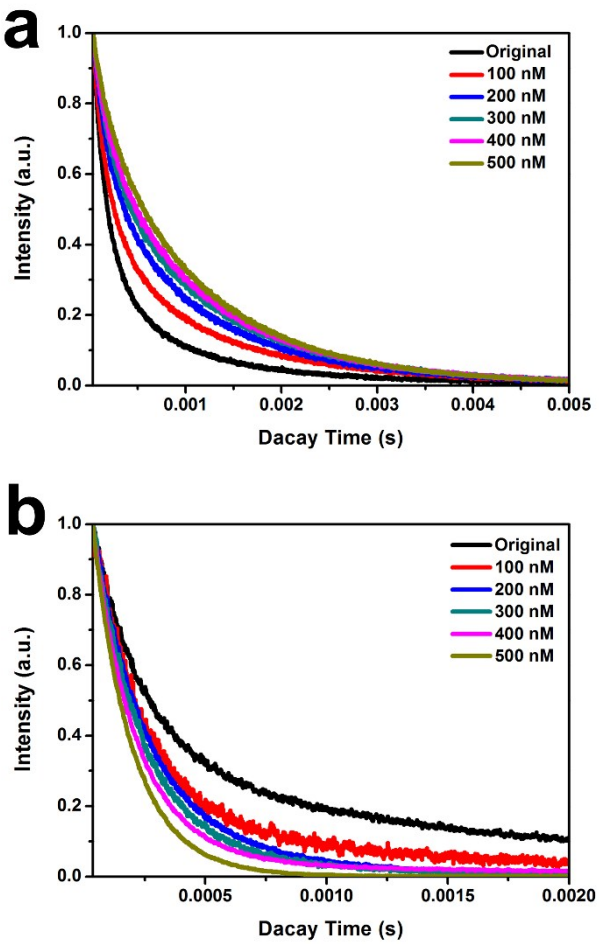

Fig. S8. DPA concentration dependence of the $^5D_4$ of Tb^{3+} (a) and $^5D_0$ of Eu^{3+} (b) decay curves (0-500 nM) for Tb/Eu(BTC). The decay curves were monitored at 545 nm and 615 nm, respectively, and excited at 268 nm.

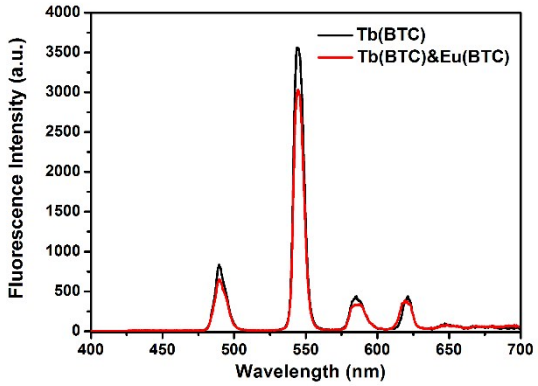

Fig. S9. The fluorescent emission spectra of Tb(BTC) and mixed Tb(BTC) and Eu(BTC) (molar ratio was 6:1).

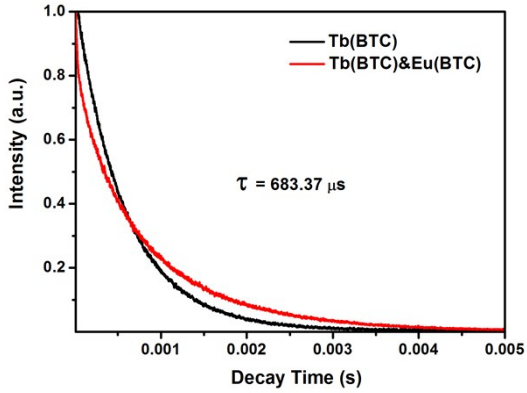

Fig. S10. The decay curves of Tb(BTC) and mixed Tb(BTC)&Eu(BTC) (Tb/Eu molar ratio was 6). Monitored at 545 nm and excited at 268 nm.

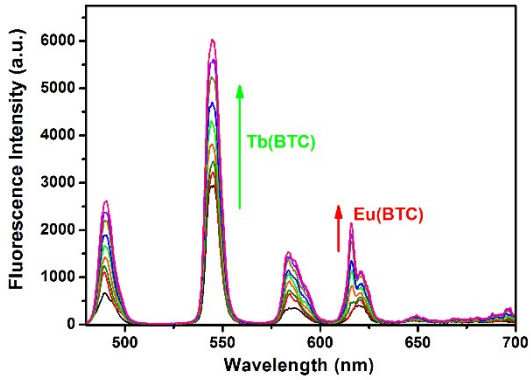

Fig. S11. Fluorescence spectra of Tb(BTC)&Eu(BTC) (Tb/Eu molar ratio was 6) in presence of different DPA concentration.