**Supporting Information**

# Anion-induced Structures and Luminescent Properties of Chiral Lanthanide-Organic Frameworks Assembled by an Achiral Tripodal Ligand

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**Fig. S1** UV/Vis absorption spectra of free L, $Eu(NO_3)_3{\cdot}6H_2O$, $\{[EuL(NO_3)_3]{\cdot}1.5CHCl_3\}_n$, $Eu(pic)_3{\cdot}6H_2O$, and $[EuL(pic)_3]_n$ in $CH_3OH$ solution.

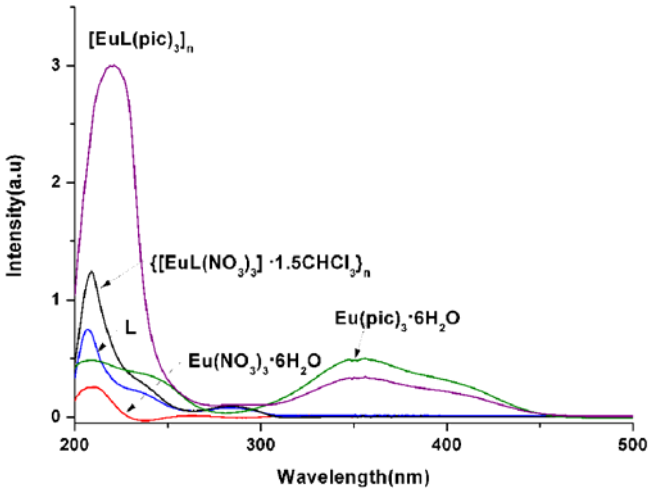


**Fig. S2** Room-temperature emission spectra for the samples $Eu(NO_3)_3{\cdot}6H_2O$, $\{[EuL(NO_3)_3]{\cdot}1.5CHCl_3\}_n$, $Eu(pic)_3{\cdot}6H_2O$, and $[EuL(pic)_3]_n$.

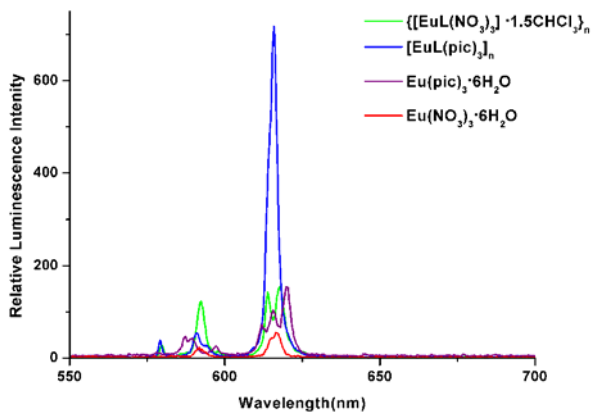


**Fig. S3** Luminescence decay curve of the compound $\{[EuL(NO_3)_3]{\cdot}1.5CHCl_3\}_n$.

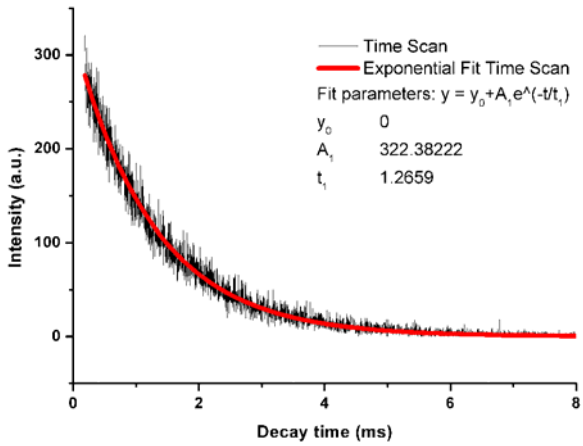

**Fig. S4** Luminescence decay curve of the compound $[EuL(pic)_3]_n$.

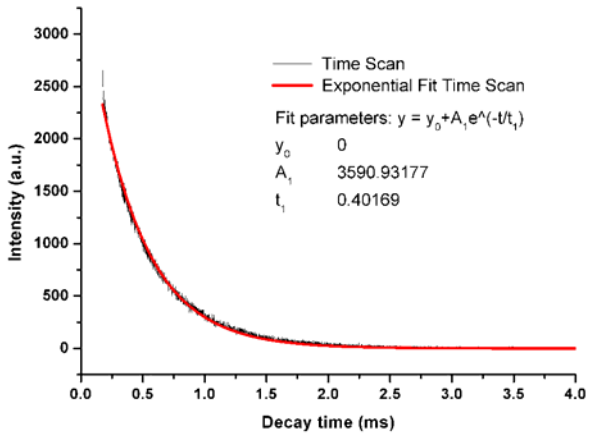


**Fig. S5**. Phosphorescence spectra of the compounds $GdL(NO_3)_3{\cdot}2H_2O$ (solid lines) and $Gd(pic)_3{\cdot}6H_2O$ (dash lines) in 1:1 methanol-ethanol mixed solutions.

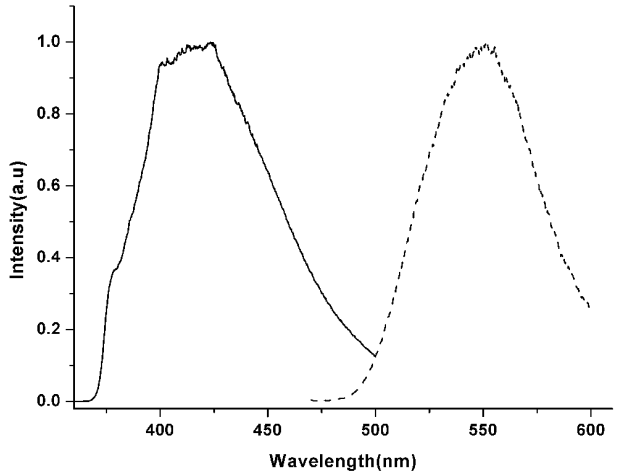


**Fig. S6**. Absorption spectra of the ligand L (solid lines) and picric acid (dash lines) in $CH_3OH$ solutions.

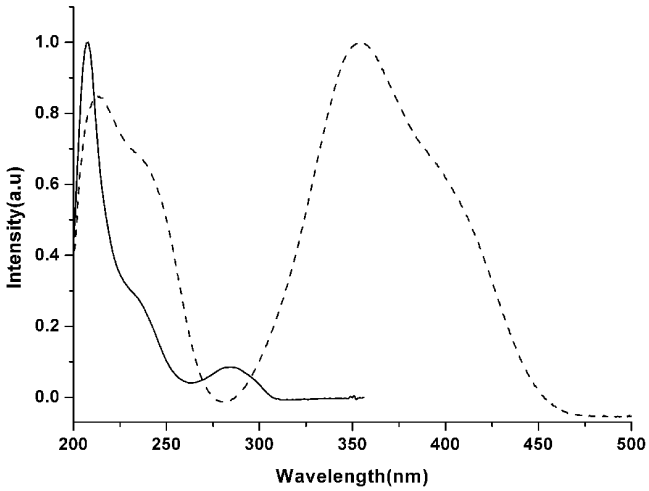

**Table S1**. Selected bond lengths (Å) and angles (º) for the LnOF $\{[EuL(NO_3)_3]\cdot 1.5CHCl_3\}_n$.

| | | | | | |
|---|---|---|---|---|---|
| Eu(1)-O(2) | 2.364(7) | Eu(1)-O(3) | 2.554(6) | Eu(1)-O(4) | 2.437(8) |
| O(2)-Eu(1)-O(4) | 86.3(2) | O(2)-Eu(1)-O(3) | 73.7(2) | O(4)-Eu(1)-O(3) | 51.4(2) |

**Table S2**. Selected bond lengths (Å) and angles (º) for the LnOF $[EuL(pic)_3]_n$.

| | | | | | |
|---|---|---|---|---|---|
| Eu(1)-O(9) | 2.339(2) | Eu(1)-O(2) | 2.402(2) | Eu(1)-O(3) | 2.631(2) |
| O(9)-Eu(1)-O(2) | 82.16(8) | O(9)-Eu(1)-O(3) | 69.68(7) | O(2)-Eu(1)-O(3) | 70.16(7) |

**Table S3**. Hydrogen bonds in crystal packing (Å, º) for the LnOF $\{[EuL(NO_3)_3]\cdot 1.5CHCl_3\}_n$.

| D-H···A | *d*(D-H) | *d*(H···A) | *d*(D···A) | ∠DHA | Symmetry |
|---|---|---|---|---|---|
| N(1)-H(1)···O(1) | 0.86 | 1.97 | 2.6549 | 136 | |
| C(3)-H(3A)···O(1) | 0.97 | 2.56 | 2.9107 | 102 | 1-x+y,1-x,z |
| C(3)-H(3B)···O(4) | 0.97 | 2.46 | 3.3744 | 157 | 1-x,1-y,-1/2+z |
| C(10)-H(10)···O(2) | 0.93 | 2.38 | 2.7196 | 102 | |
| C(10)-H(10)···O(2) | 0.93 | 2.54 | 3.4069 | 155 | 1-y,1+x-y,z |
| C(11)-H(11A)···O(2) | 0.97 | 2.44 | 2.7859 | 100 | |
| C(11)-H(11A)···O(3) | 0.97 | 2.34 | 3.2954 | 169 | -x+y,1-x,z |

**Table S4**. Hydrogen bonds in crystal packing (Å, º) for the LnOF $[EuL(pic)_3]_n$.

| D-H···A | *d*(D-H) | *d*(H···A) | *d*(D···A) | ∠DHA | Symmetry |
|---|---|---|---|---|---|
| N(1)-H(1D)···O(1) | 0.86 | 1.95 | 2.6341 | 136 | |
| C(3)-H(3A)···O(1) | 0.97 | 2.52 | 2.8647 | 101 | 1-y,1/2+z,1/2-x |
| C(8)-H(8A)···O(2) | 0.93 | 2.46 | 2.7809 | 101 | |
| C(8)-H(8A)···O(3) | 0.93 | 2.51 | 3.3219 | 146 | |
| C(11)-H(11B)···O(2) | 0.97 | 2.48 | 3.2666 | 138 | 1/2+z,1/2-x,-y |
| C(19)-H(119)···O(6) | 0.93 | 2.55 | 3.1637 | 123 | 1/2+y,1/2-z,1-x |

**Table S5**. Photoluminescence data of the LnOFs $\{[EuL(NO_3)_3]\cdot 1.5CHCl_3\}_n$ and $[EuL(pic)_3]_n$.

| Compounds | $<\tau>$(ms) | $k_r$(ms$^{-1}$) | $k_{nr}$(ms$^{-1}$) | $q$(%) |
|---|---|---|---|---|
| $\{[EuL(NO_3)_3]\cdot 1.5CHCl_3\}_n$ | 1.2659 | 0.251 | 0.539 | 31.79 |
| $[EuL(pic)_3]_n$ | 0.4017 | 0.986 | 1.504 | 39.59 |

The luminescence decay curves of $\{[EuL(NO_3)_3]\cdot 1.5CHCl_3\}_n$ and $[Eu(pic)_3]_n$ (Figures S3 and S4) which were obtained from time-resolved luminescence experiments could fit to a monoexponential function

$$y = A_1 \exp(-t/\tau_1) + y_0$$

where $A_1$ is the pre-exponential factor obtained from the curve fitting, and $\tau_1$ stands for the lifetimes.

The $^5D_0$ quantum efficiencies ($q$) of the complexes are estimated on the basis of the luminescence data (emission spectra and $^5D_0$ lifetimes). Assuming that only nonradiative ($k_{nr}$) and radiative ($k_r$, estimated according to the reported method) processes are involved in the depopulation of the $^5D_0$ state, $q$ may be expressed as

$$q = \frac{k_r}{k_r + k_{nr}}$$

The lifetime ($\tau$), radiative ($k_r$), and non-radiative ($k_{nr}$) transition rates are related through the following equation:

$$\frac{1}{\tau} = k_r + k_{nr}$$