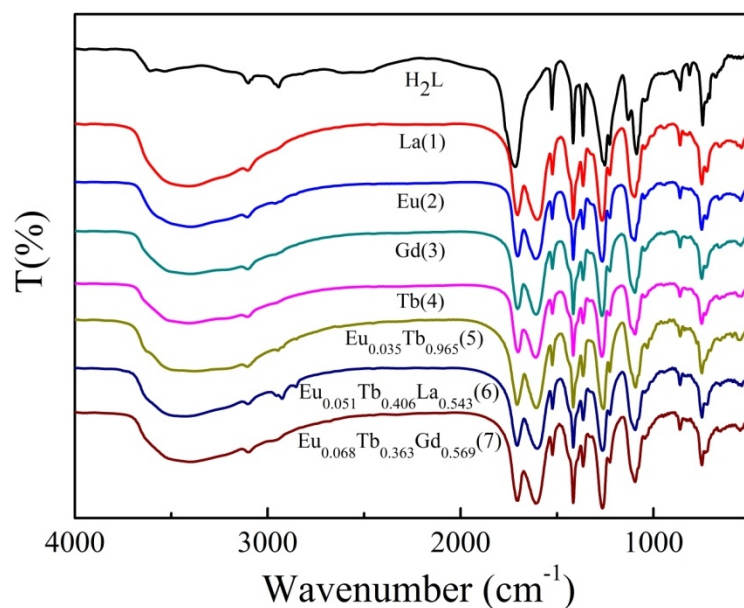


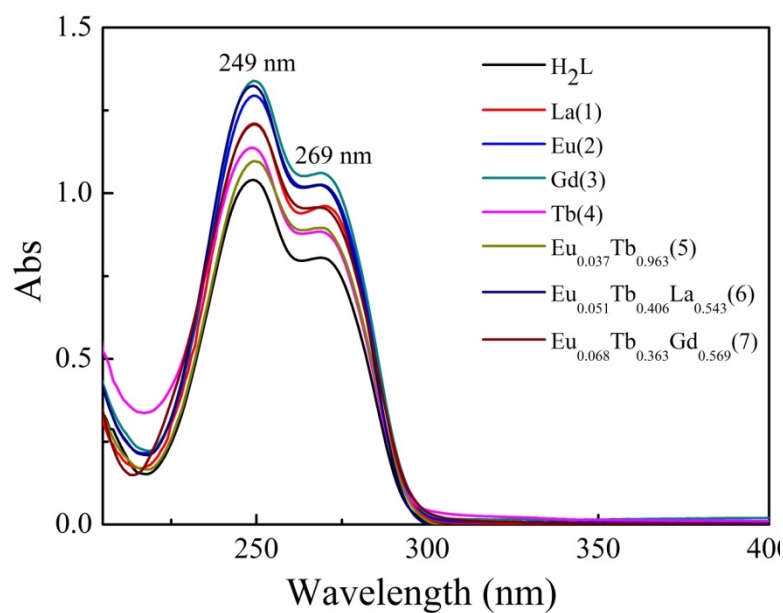
## Supporting Information

Color-tunable and white-light emission of one-dimensional L-di-2-thenoyltartaric acid  
mixed-lanthanide coordination polymers

Chang Feng, Jing-Wen Sun, Peng-Fei Yan\*, Yu-Xin Li, Tian-Qi Liu, Qing-Yan Sun, Guang-Ming Li\*



**Figure S1.** IR spectra of the H<sub>2</sub>L and complexes 1–7.



**Figure S2.** UV absorption spectra of the H<sub>2</sub>L and complexes 1–7 in methanol solution.

**Table S1.** Bond lengths (Å) and angles (deg) for complexes 1–4.

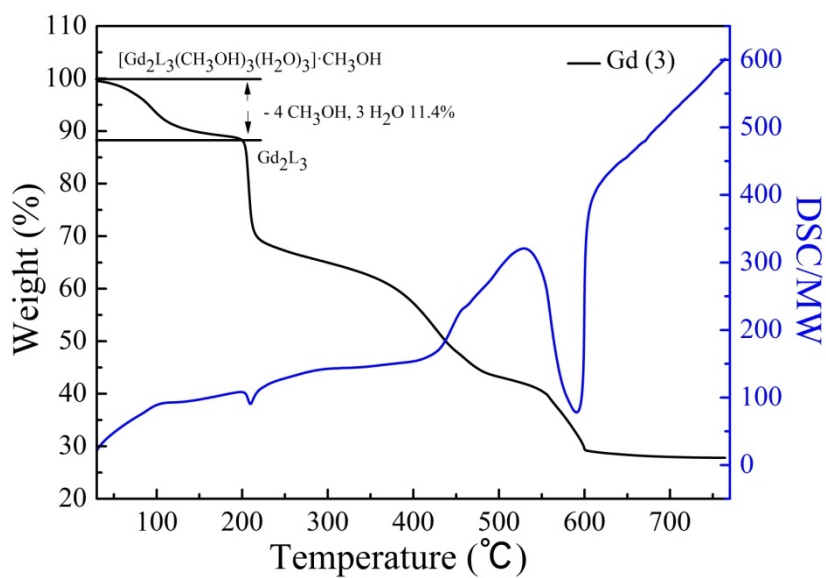
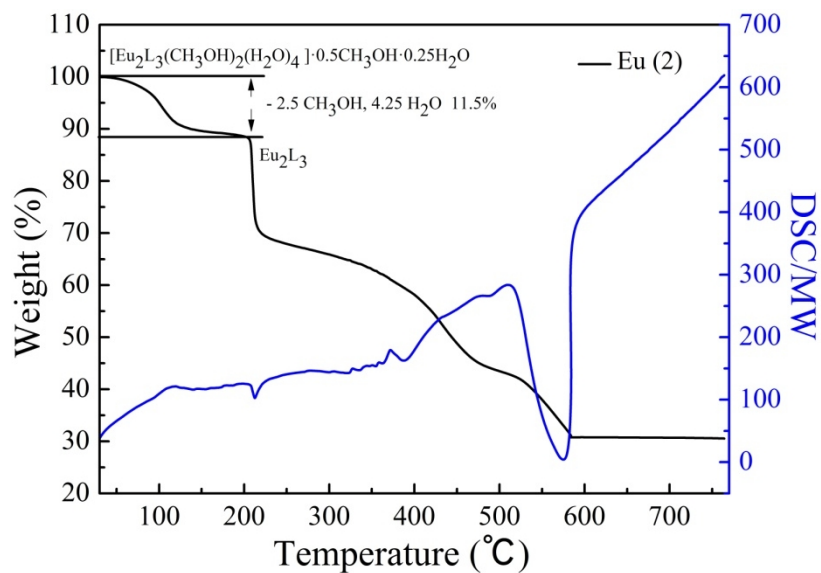
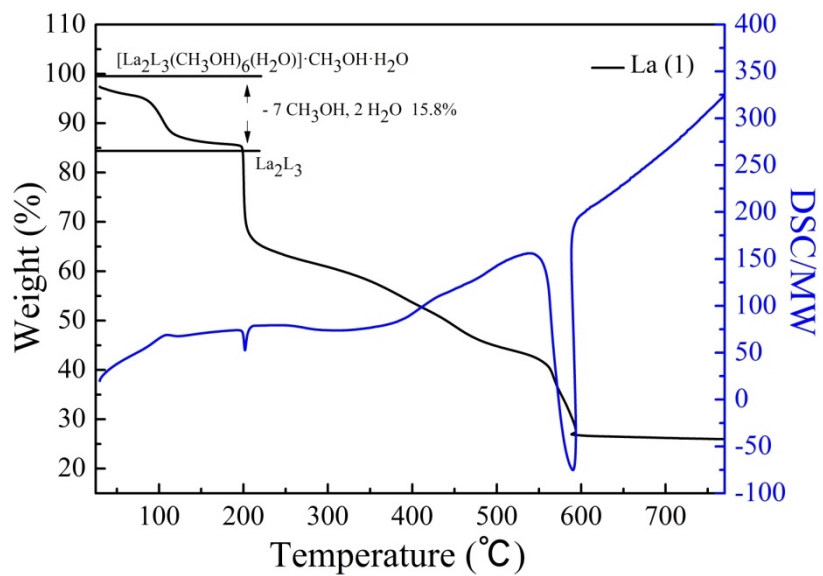
| Structural parameter                | 1                 | 2                 | 3                  | 4                 |
|-------------------------------------|-------------------|-------------------|--------------------|-------------------|
| the range of O–Ln bond distance (Å) | 2.424(8)–2.679(7) | 2.325(8)–2.576(8) | 2.303(11)–2.566(9) | 2.266(9)–2.538(9) |
| separation of Ln1···Ln2 (Å)         | 4.5825(15)        | 4.4785(15)        | 4.4568(15)         | 4.4383(15)        |
| separation of Ln1(2)···Ln1(2) (Å)   | 9.8870(51)        | 9.7490(5)         | 9.7280(51)         | 9.7170(51)        |
| the range of O–Ln–O bond angles (°) | 49.0(2)–146.5(3)  | 51.2(3)–156.6(5)  | 50.9(3)–157.6(4)   | 52.1(3)–158.4(4)  |
| Ln1–O–Ln2 bond angles (°)           | 122.169(261)      | 123.209(322)      | 122.801(351)       | 123.813(332)      |

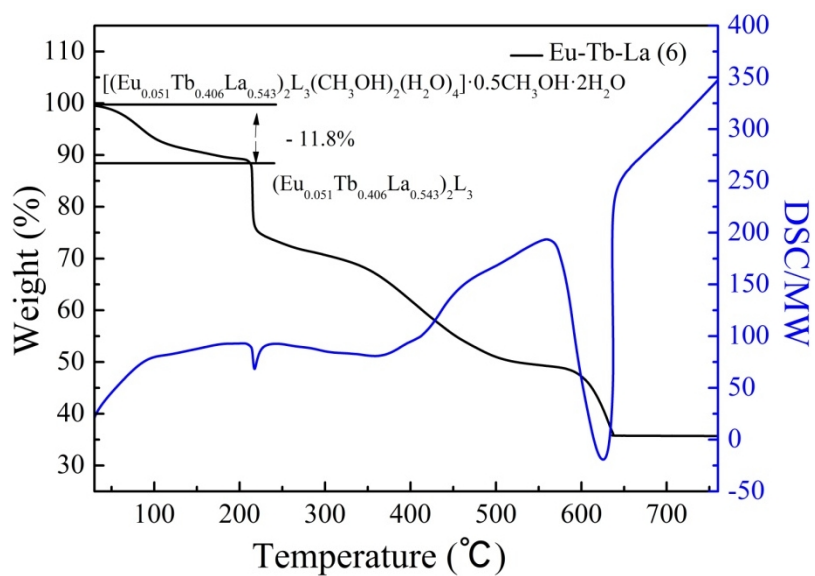
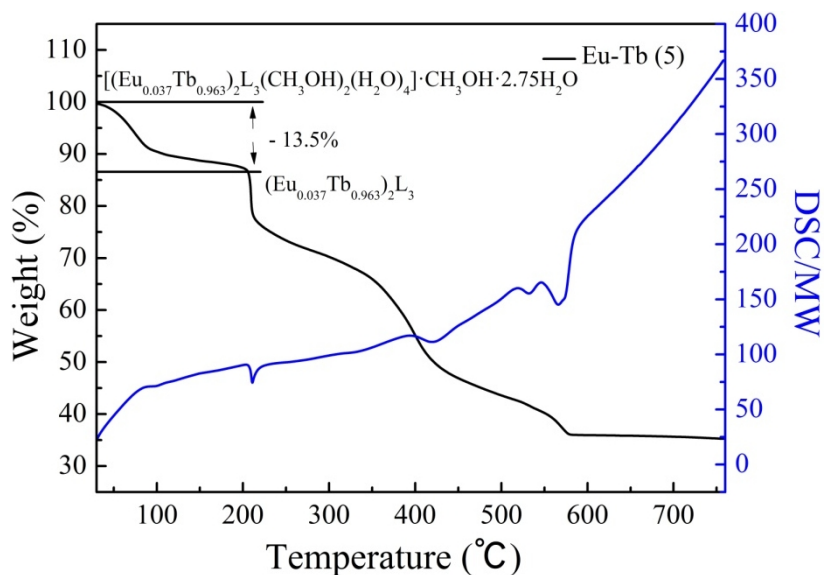
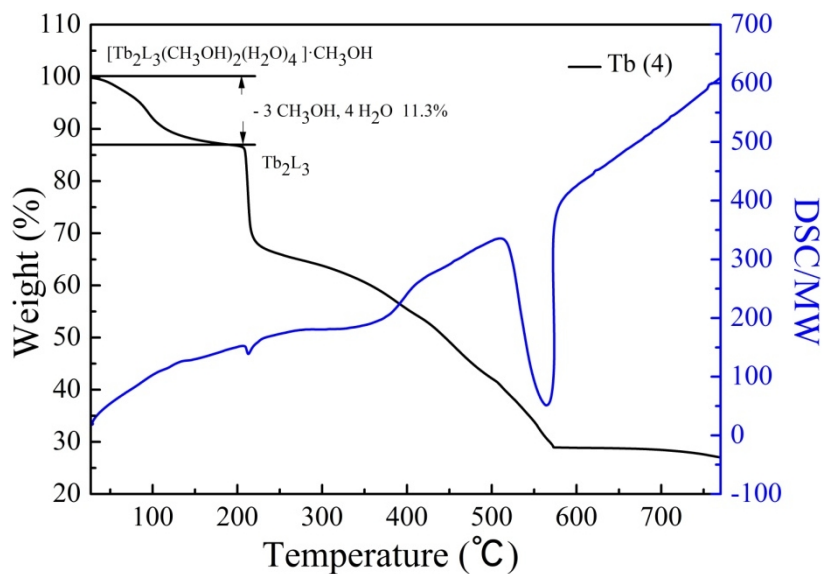
**Table S2.** Partial crystal data for complex 5.

| Comp.               | [(Eu <sub>0.037</sub> Tb <sub>0.963</sub> ) <sub>2</sub> L <sub>3</sub> (CH <sub>3</sub> OH) <sub>2</sub> (H <sub>2</sub> O) <sub>4</sub> ]·CH <sub>3</sub> OH·2.75H <sub>2</sub> O (5) |
|---------------------|---|
| Shape               | rod like  |
| Color               | Colorless   |
| Crystal system      | Orthorhombic  |
| Space group         | <i>P</i> 2 <sub>1</sub> 2 <sub>1</sub> 2 <sub>1</sub>   |
| a (Å)               | 9.732(5)  |
| b (Å)               | 21.990(5)   |
| c (Å)               | 31.208(5)   |
| α (deg)             | 90.00   |
| β (deg)             | 90.00   |
| γ (deg)             | 90.00   |
| V (Å <sup>3</sup> ) | 6679(4)   |

**Table S3.** Elemental analysis of lanthanide ions by ICP for complexes 5–7.

| Comp.        | 5   |      | 6   |      | 7    |     |      |      |
|--------------|-----|------|-----|------|------|-----|------|------|
|              | Eu  | Tb   | Eu  | Tb   | La   | Eu  | Tb   | Gd   |
| Wt % (Found) | 3.5 | 96.5 | 7.0 | 39.2 | 53.8 | 4.9 | 40.9 | 54.2 |
| Mol %        | 3.7 | 96.3 | 6.8 | 36.3 | 56.9 | 5.1 | 40.6 | 54.3 |





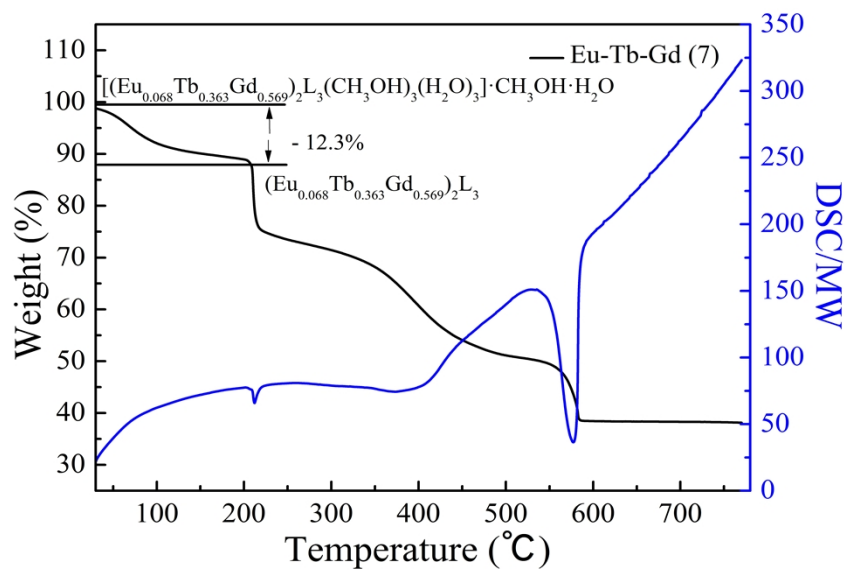
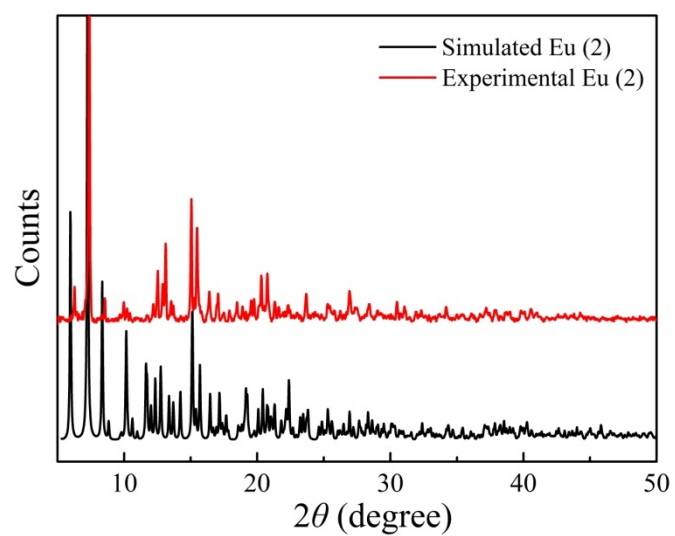
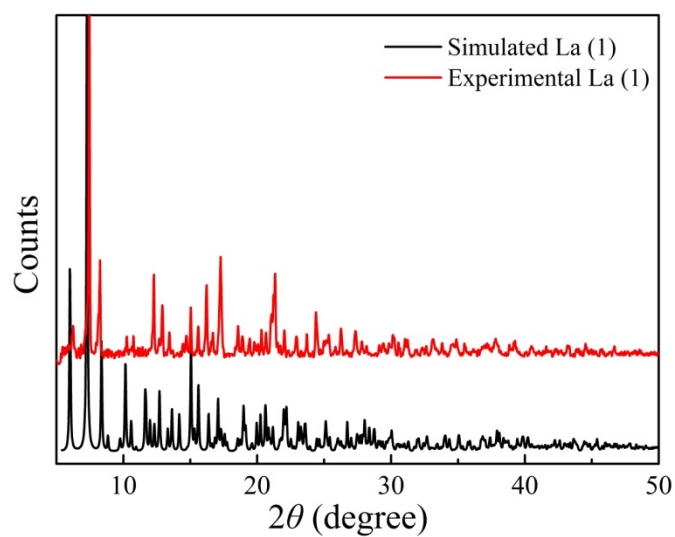
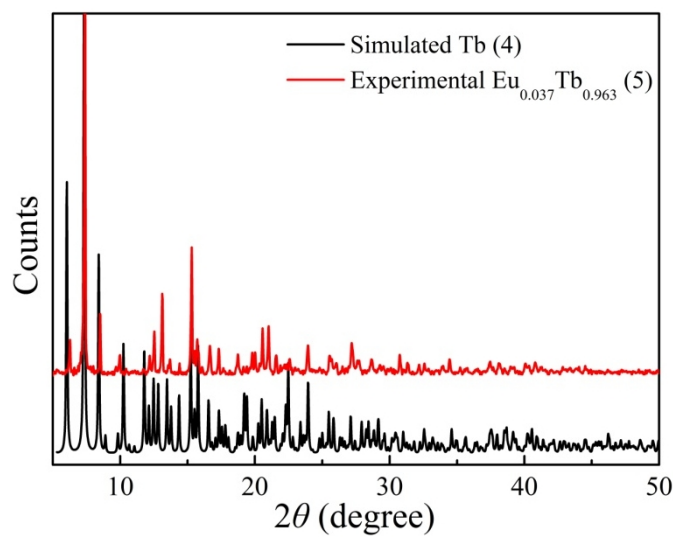
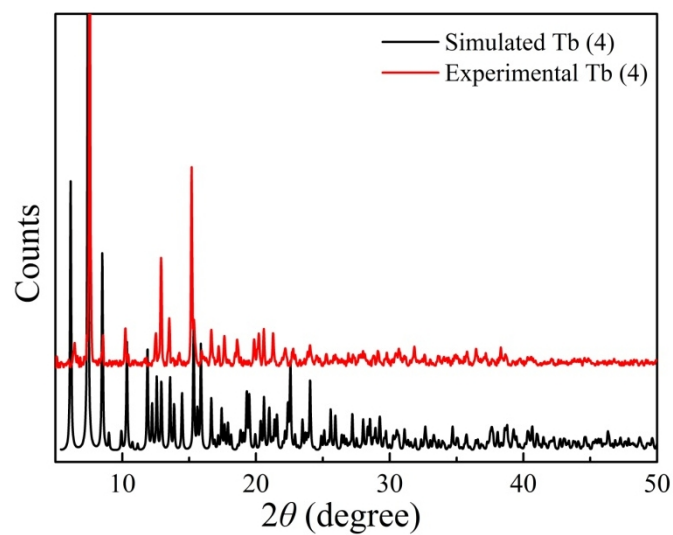
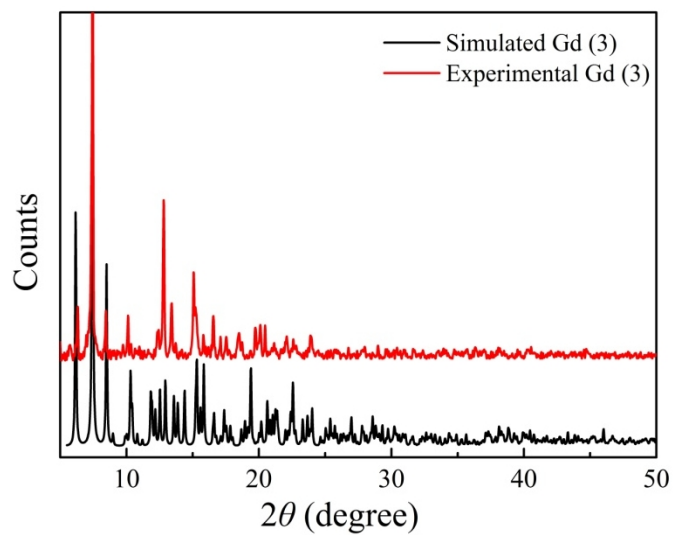
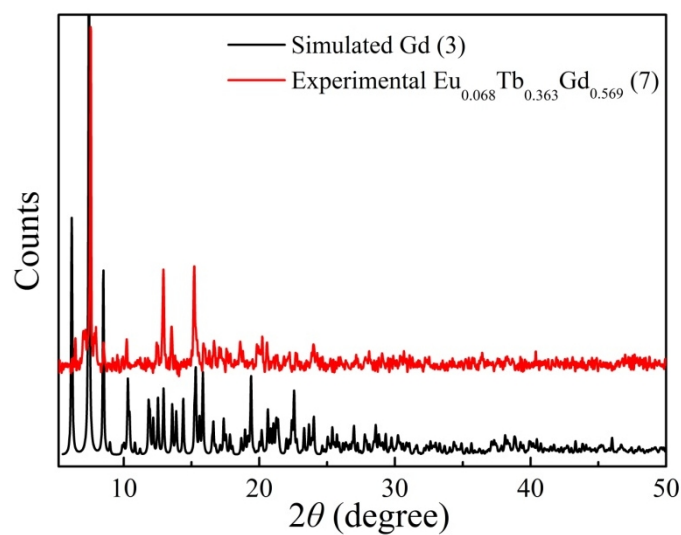
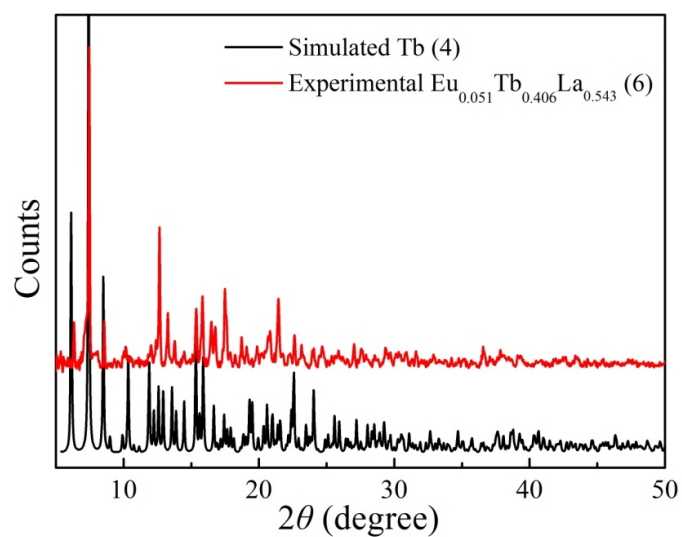


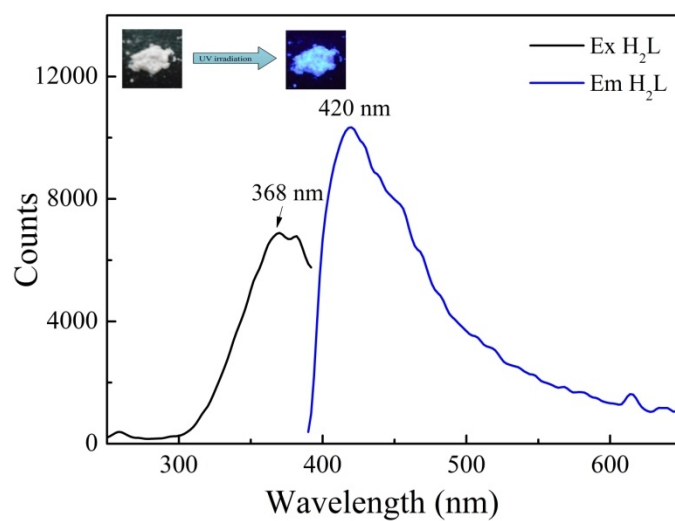
Figure S3. TG-DSC curves of complexes 1-7.



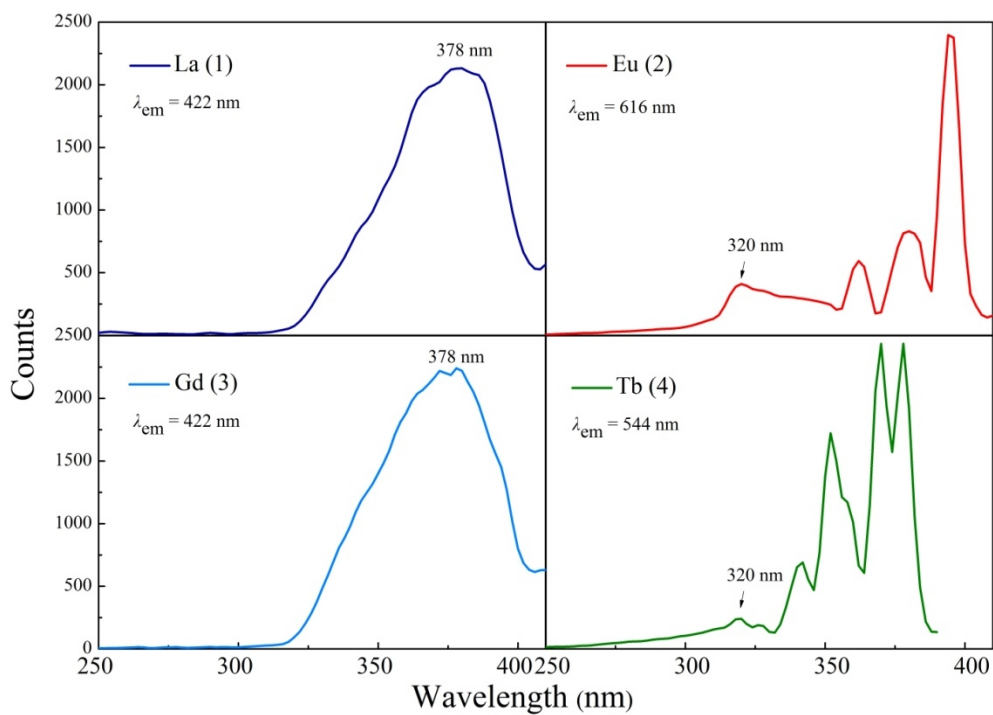




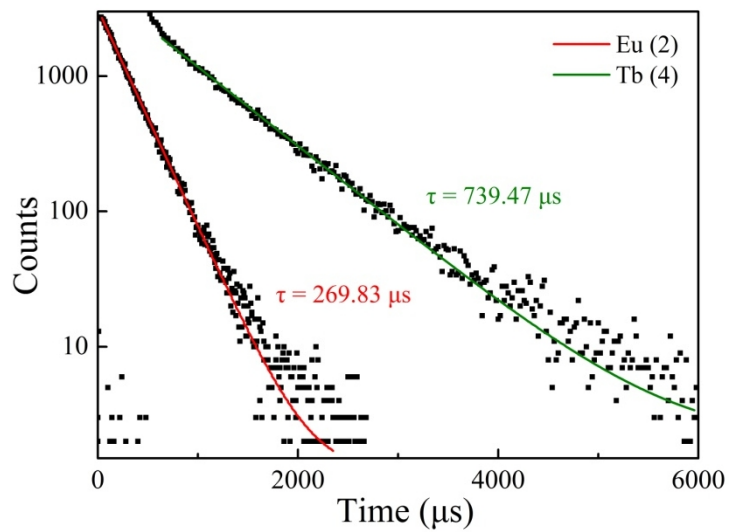
**Figure S4.** Powder X-ray diffraction patterns and the simulated patterns of complexes 1–7.



**Figure S5.** Solid-state excitation spectra and emission spectra for  $\text{H}_2\text{L}$  at room temperature.

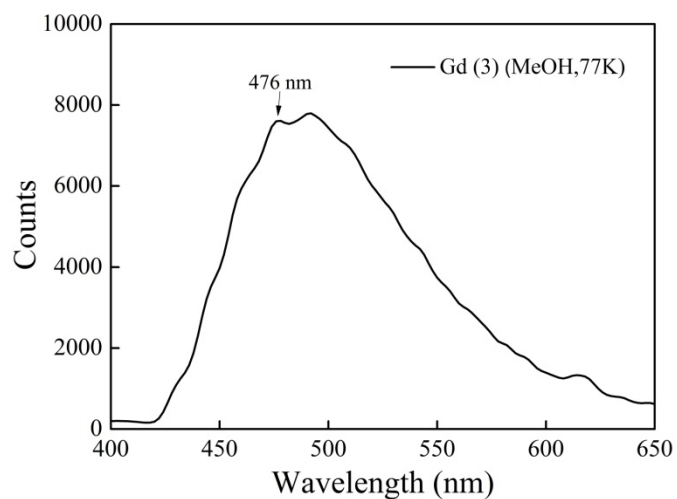


**Figure S6.** Solid-state excitation spectra for complexes **1–4** at room temperature.

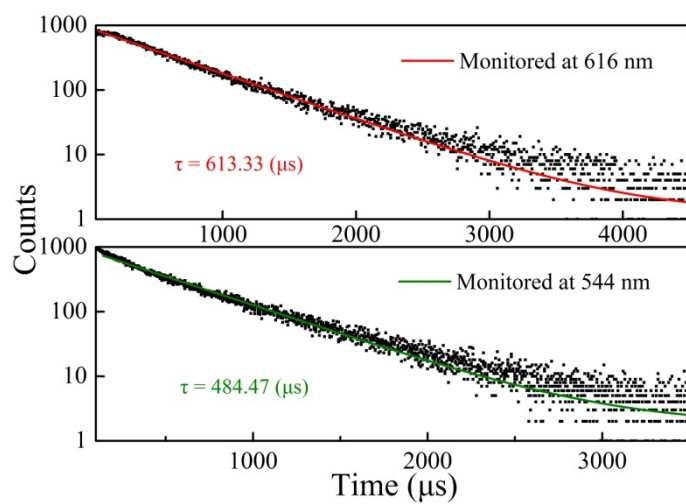


**Figure S7.** Decay curves for complexes **2** and **4**.

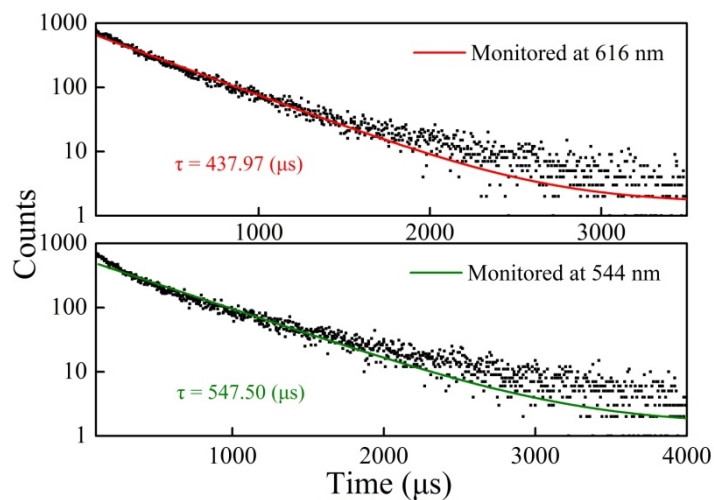




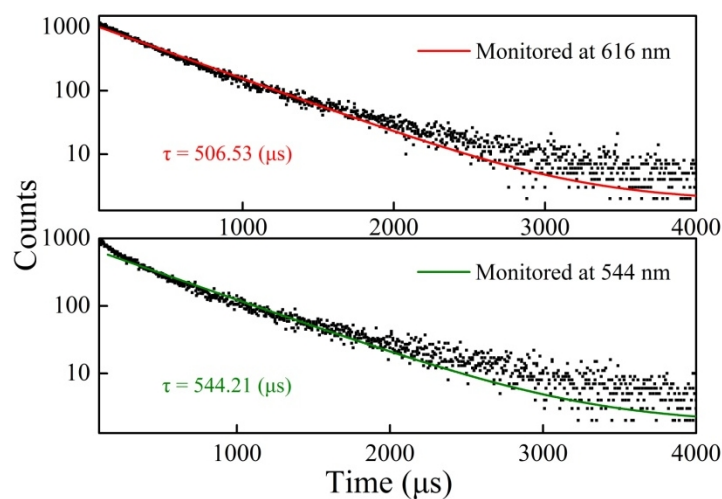
**Figure S8.** Phosphorescence spectrum for complex **3** in methanol solution at 77K.



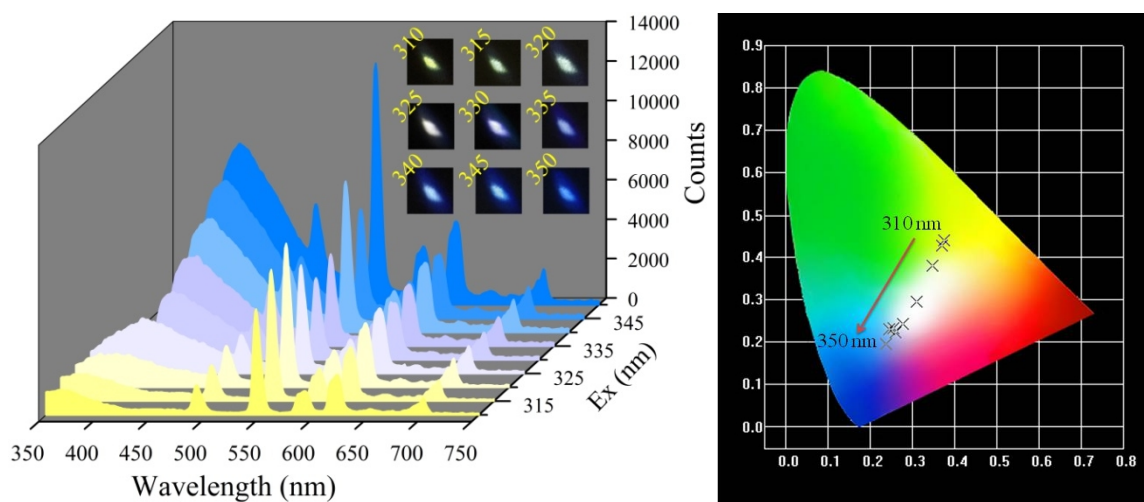
**Figure S9.** Decay curves for complex **5** excited at 326 nm.



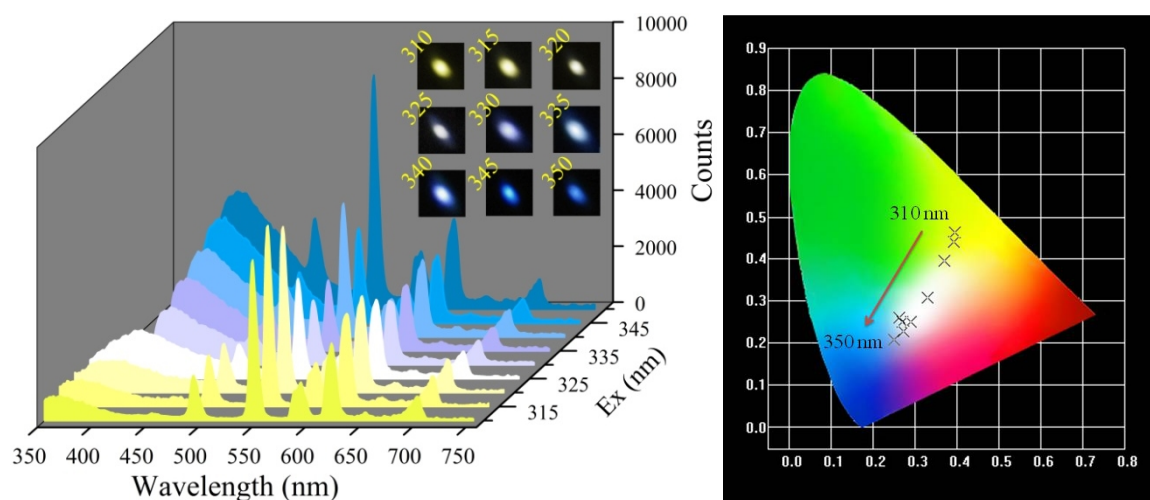
**Figure S10.** Decay curves for complex **6** excited at 322 nm.



**Figure S11.** Decay curves for complex **7** excited at 323 nm.



**Figure S12.** Left: Solid-state emission spectra of the complex **6** with excitation wavelengths varying from 310 to 350 nm (scanning interval = 5 nm). Inset: optical photograph of a powder sample of complex **6** excited at corresponding excitation wavelength. Right: The CIE-1931 chromaticity diagram for complex **6** with excitation wavelengths varying from 310 to 390 nm (scanning interval = 5 nm) showing the location of the color-tunable chromaticity of visual emission image.



**Figure S13.** Left: Solid-state emission spectra of the complex **7** with excitation wavelengths varying from 310 to 350 nm (scanning interval = 5 nm). Inset: optical photograph of a powder sample of complex **7** excited at corresponding excitation wavelength. Right: The CIE-1931 chromaticity diagram showing the emissions for complex **6** with excitation wavelengths varying from 310 to 390 nm (scanning interval = 5 nm) showing the location of the color-tunable chromaticity of visual emission image.

**Table S4.** CIE chromaticity coordinates for the  $\text{Ln}^{3+}$ -doped complexes **5–7** excited from 310 to 350nm.

| Excitation<br>$\lambda/\text{nm}$ | <b>5</b>       | <b>6</b>       | <b>7</b>       |
|-----------------------------------|----------------|----------------|----------------|
|                                   | CIE (x, y)     | CIE (x, y)     | CIE (x, y)     |
| <b>310</b>                        | (0.408, 0.504) | (0.376, 0.441) | (0.395, 0.462) |
| <b>315</b>                        | (0.395, 0.467) | (0.370, 0.427) | (0.392, 0.441) |
| <b>320</b>                        | (0.360, 0.399) | (0.348, 0.380) | (0.371, 0.396) |
| <b>325</b>                        | (0.335, 0.366) | (0.310, 0.294) | (0.329, 0.308) |
| <b>330</b>                        | (0.299, 0.292) | (0.277, 0.242) | (0.291, 0.249) |
| <b>335</b>                        | (0.277, 0.255) | (0.259, 0.222) | (0.272, 0.228) |
| <b>340</b>                        | (0.276, 0.270) | (0.255, 0.233) | (0.271, 0.250) |
| <b>345</b>                        | (0.249, 0.219) | (0.238, 0.194) | (0.250, 0.208) |
| <b>350</b>                        | (0.265, 0.268) | (0.246, 0.231) | (0.263, 0.259) |