

## Supporting Information

### **Grafting of a Eu<sup>3+</sup>-tfac complex on to a Tb<sup>3+</sup>-metal organic framework for use as a ratiometric thermometer**

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#### **Synthesis of Eu(tfac)<sub>3</sub>·2H<sub>2</sub>O**

The lanthanide β-diketonate complexes were synthesized according to known procedures.<sup>1,2</sup> In a flask 2.65 mmol of the β-diketonate ligand and 2 mmol of NaOH were dissolved in 20 ml of methanol and stirred for 15 minutes. Next, 0.65 mmol of a LnCl<sub>3</sub>·6H<sub>2</sub>O salt is added and the solution is stirred for 24h at room temperature. After 24h water is added and a suspension forms immediately. The suspension is filtered off, washed with H<sub>2</sub>O and dried in air.

Elemental analysis: (%) Calcd for C<sub>15</sub>H<sub>16</sub>EuF<sub>9</sub>O<sub>2</sub>: C, 32.68; H, 2.93%. Found: C, 32.89; H, 3.05%.

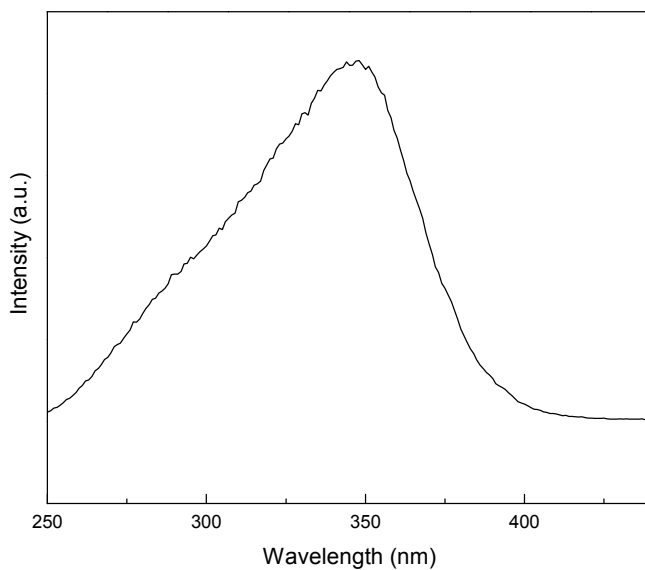


Fig. S1 Excitation spectrum of the TbMOF (observed at 542.0 nm).

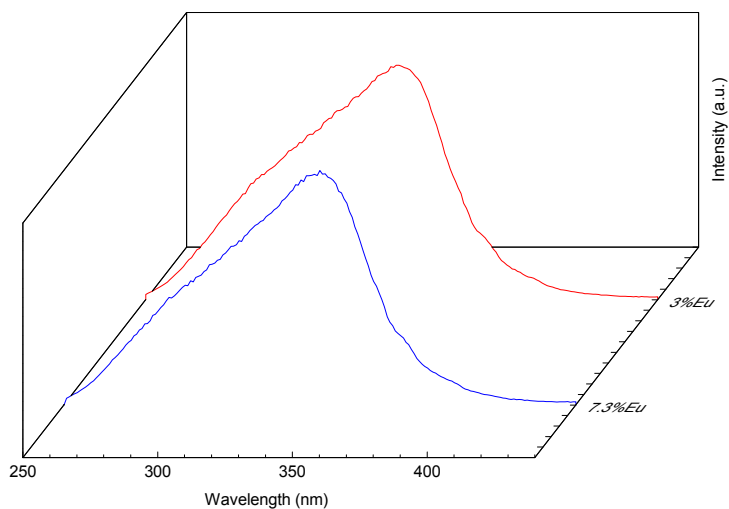


Fig. S2 Excitation spectra of the TbMOF@3%Eu\_tfac (3%Eu) and TbMOF@7.3%Eu\_tfac (7.3%Eu) compounds (observed at 542.0 nm).

Table S1. CIE color coordinates (x, y) calculated at different temperatures for TbMOF parent compound

Temperature [K]	x coordinate	y coordinate
250	0.283	0.442
260	0.277	0.431
270	0.272	0.421
280	0.272	0.418
290	0.271	0.419
300	0.275	0.429
310	0.274	0.428
320	0.269	0.415
330	0.262	0.397
340	0.255	0.377
350	0.248	0.351
360	0.237	0.312
370	0.226	0.275
380	0.217	0.244

Table S2. CIE color coordinates (x, y) calculated at different temperatures for TbMOF@3%Eu\_tfac compound

Temperature [K]	x coordinate	y coordinate
225	0.275	0.312
250	0.321	0.347
275	0.328	0.321
300	0.328	0.302
325	0.328	0.295
350	0.323	0.294
375	0.320	0.300

Table S3. CIE color coordinates (x, y) calculated at different temperatures for TbMOF@7.3%Eu\_tfac compound

Temperature [K]	x coordinate	y coordinate
200	0.375	0.477
225	0.375	0.467
250	0.379	0.453
275	0.384	0.428
300	0.386	0.395
325	0.384	0.360

Table S4. Relative Ln<sup>3+</sup> (Tb<sup>3+</sup>, Eu<sup>3+</sup>) contents for the samples during synthesis (calcd.) and as determined by WDXRF.

Sample	Tb <sup>3+</sup> ion (%)		Eu <sup>3+</sup> ion (%)	
	Calcd.	WDXRF	Calcd.	WDXRF
TbMOF@3%Eu_tfac	95	97	5	3
TbMOF@7.3%Eu_tfac	90	92.7	10	7.3

[1] K. Binnemans, P. Lenaerts, K. Driesen and C. Görrler-Walrand, *J. Mater. Chem.* **2004**, *14*, 191.

[2] R. A. Carboni and R. V. Lindsey, *J. Am. Chem. Soc.* **1959**, *81*, 4342.