

*Supplementary Materials*

# Nanostructure and Luminescent Properties of Bimetallic Lanthanide Eu/Gd, Tb/Gd and Eu/Tb Coordination Polymers

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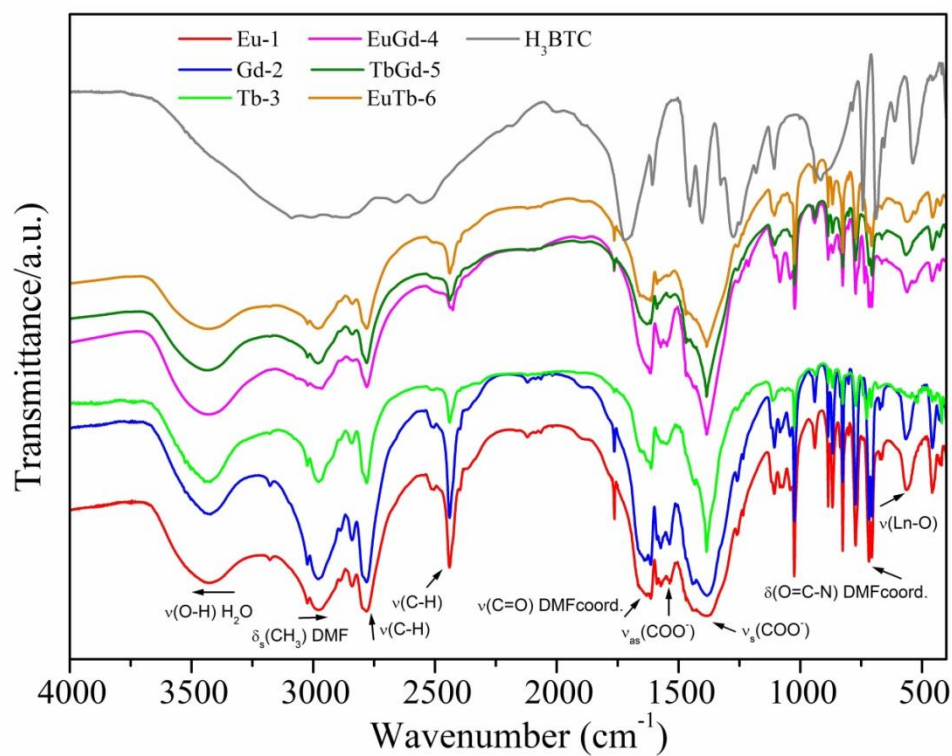


Figure S1. FTIR spectra of LnMOFs prepared by solvothermal synthesis.

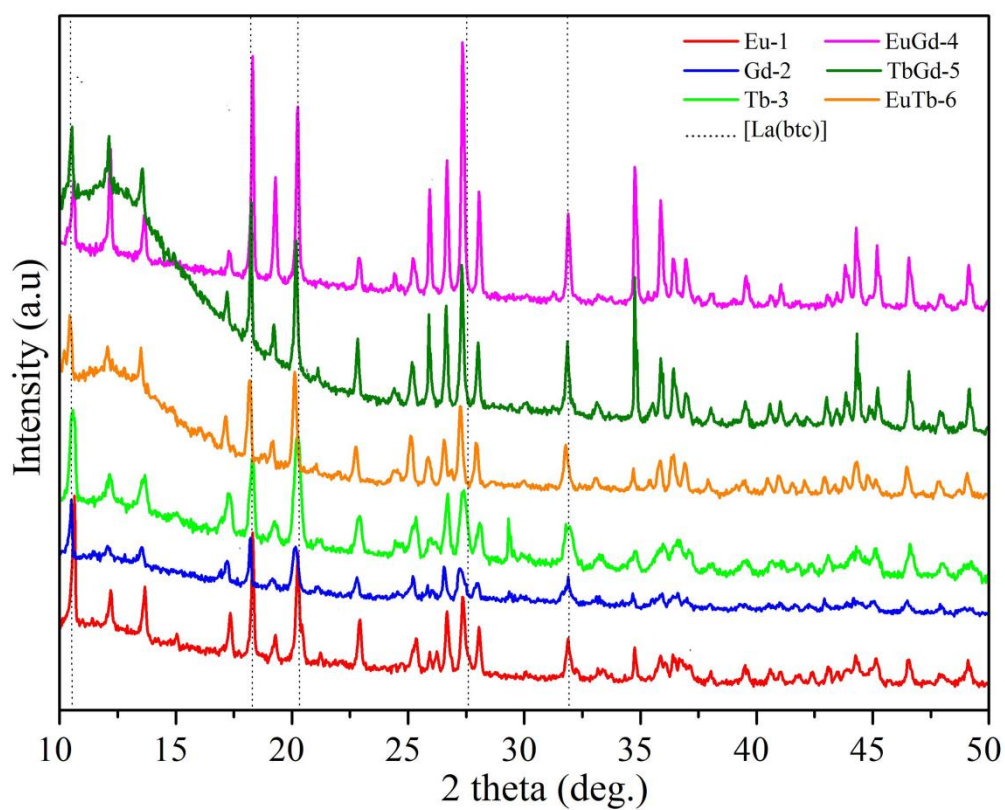
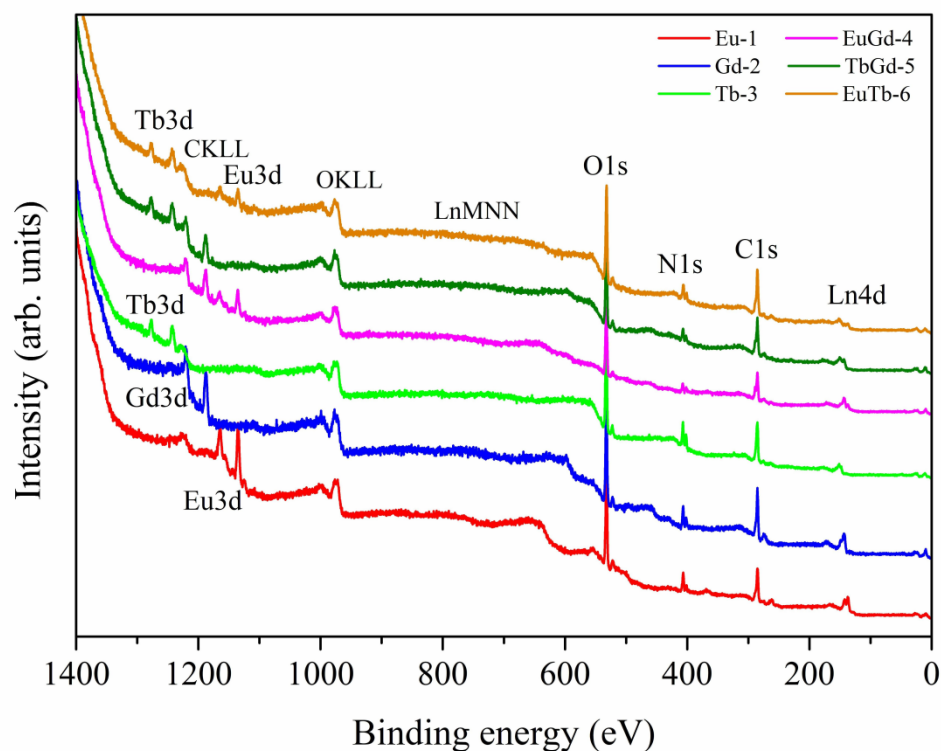


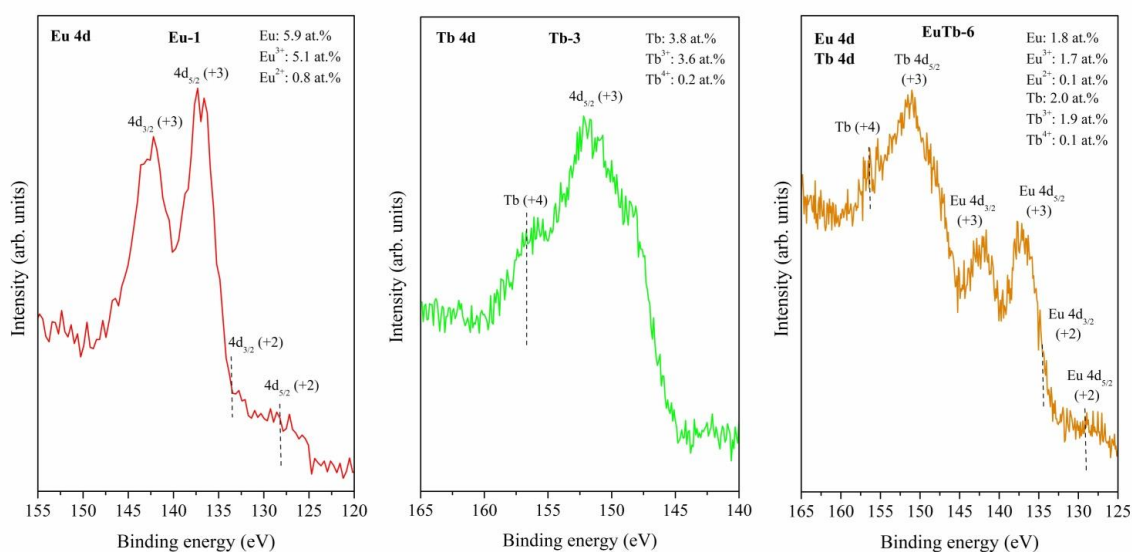
Figure S2. XRD patterns of LnMOFs prepared by solvothermal synthesis.



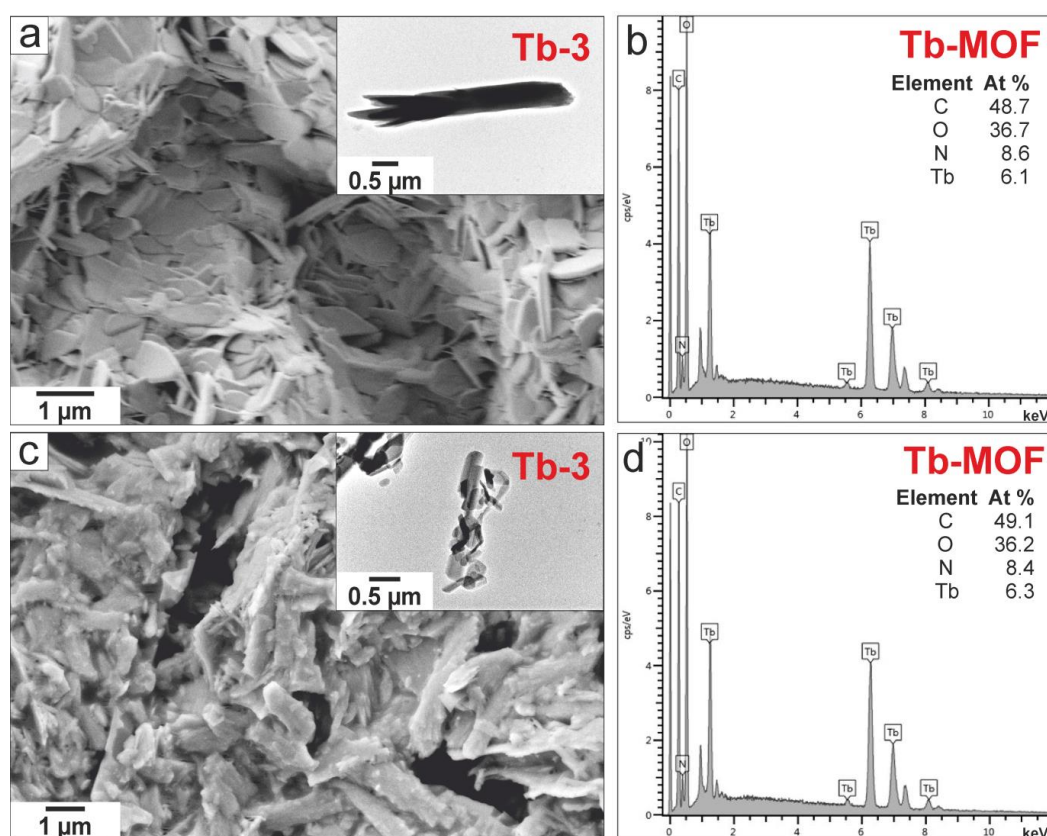
**Figure S3.** XPS survey spectra of LnMOFs prepared by solvothermal synthesis.

**Table S1.** XPS elemental atomic % of LnMOF samples.

LnMOF	C	O	N	Eu	Gd	Tb
Eu-1	41.2	40.6	12.3	5.9	-	-
Gd-2	47.5	36.9	11.5	-	4.1	-
Tb-3	47.2	35.8	13.2	-	-	3.8
EuGd-4	51.6	36.7	6.9	2.5	2.3	-
TbGd-5	50.8	36.1	9.5	-	1.9	1.7
EuTb-6	53.7	33.8	8.7	1.8	-	2.0



**Figure S4.** HR XPS spectra of Eu 4d and Tb 4d of [Eu(btc)], Tb(btc)] and [Eu<sub>0.5</sub>Tb<sub>0.5</sub>(btc)] samples.



**Figure S5.** SEM morphology and TEM images (in insert) of TbMOF powders prepared by solvothermal synthesis a) (DMF/H<sub>2</sub>O), c) (DMF/H<sub>2</sub>O/NaOAc) and b,d) EDS spectra of [Tb(btc)].

**Table S2.** EDS analysis of Tb-3, EuGd-4, TbGd-5 and EuTb-6 samples from STEM/EDS spectra.

LnMOF	C	O	Eu	Gd	Tb
Tb-3	75.9	20.4	-	-	3.7
EuGd-4	76.5	19.9	1.5	2.1	-
TbGd-5	75.7	19.1	-	2.2	3.0
EuTb-6	74.6	20.2	2.5	-	2.7

**Table S3.** The applications of luminescent bimetallic LnMOFs.

LnMOF	MOF Type	CIE (x,y)	MOF Sensor	Reference
Eu/Gd-MOF	[Eu <sub>0.5</sub> Gd <sub>0.5</sub> (btc)]	(0.64, 0.35)		[10]
	[Gd <sub>1.9</sub> Eu <sub>0.1</sub> (bdc)]	red emission	light emitting material	[19]
	[Eu <sub>0.8</sub> Gd <sub>0.2</sub> (psa)]	(0.66, 0.34)		[20]
	[Eu <sub>0.0005</sub> Gd <sub>0.9995</sub> (ndc)]	red emission	thermal sensor	[24]
	[Eu <sub>0.05</sub> Gd <sub>0.95</sub> (btc)]	(0.565, 0.334)	in biological sensing	[38]
	[Eu <sub>0.5</sub> Gd <sub>0.5</sub> (btc)]	(0.654, 0.348)		This work
Tb/Gd-MOF	[Tb <sub>0.5</sub> Gd <sub>0.5</sub> (btc)]	(0.30, 0.61)		[10]
	[Tb <sub>0.05</sub> Gd <sub>0.95</sub> (btc)]	(0.245, 0.572)	light emitting material	[38]
	[Tb <sub>0.5</sub> Gd <sub>0.5</sub> (btc)]	(0.334, 0.562)		This work
Eu/Tb-MOF	[Eu <sub>0.8</sub> Tb <sub>0.2</sub> (psa)]	(0.62, 0.35)		[20]
	[Tb <sub>0.86</sub> Eu <sub>0.14</sub> (btc)]	red-orange	thermal sensor	[17]
	[Eu <sub>0.1</sub> Tb <sub>0.9</sub> (oba) <sub>2</sub> ]		sensing of dipicolinic acid	[21]
	[Eu <sub>0.5</sub> Tb <sub>1.5</sub> (fda) <sub>3</sub> ]		sensing of metanol	[22]
	[Eu <sub>0.5</sub> Tb <sub>0.5</sub> (h2l)]		sensing of glycol	[23]
	[Eu <sub>0.5</sub> Tb <sub>0.5</sub> (btc)]	(0.666, 0.331)	sensing of Fe <sup>3+</sup> ions	This work