Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics.

Supporting information

Ag^+-induced photoluminescence enhancement in lanthanides post-functionalized MOFs and Ag^+ sensing

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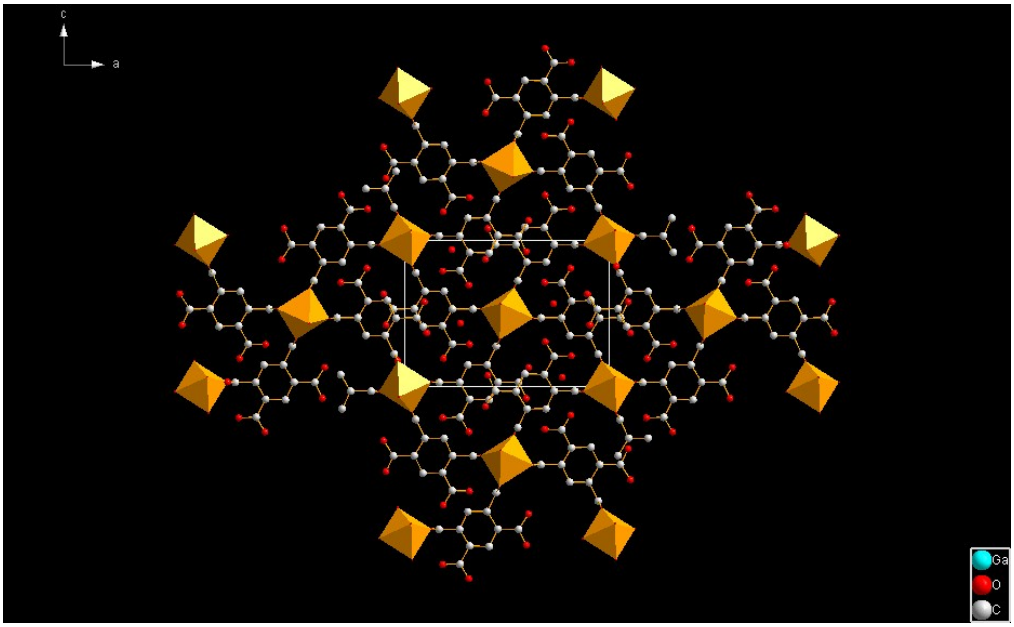

Fig. S1 The representative 3D-structure of MIL-61 with the open uncoordinated carboxyl sites.[1]

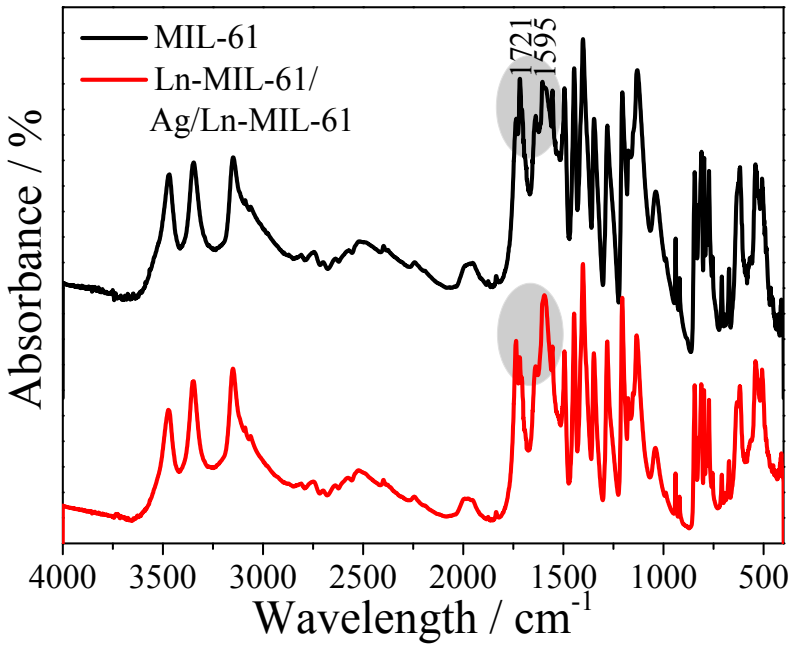

Fig. S2 The FTIR spectra of MIL-61 before (black line) and after (red line) PSMs.

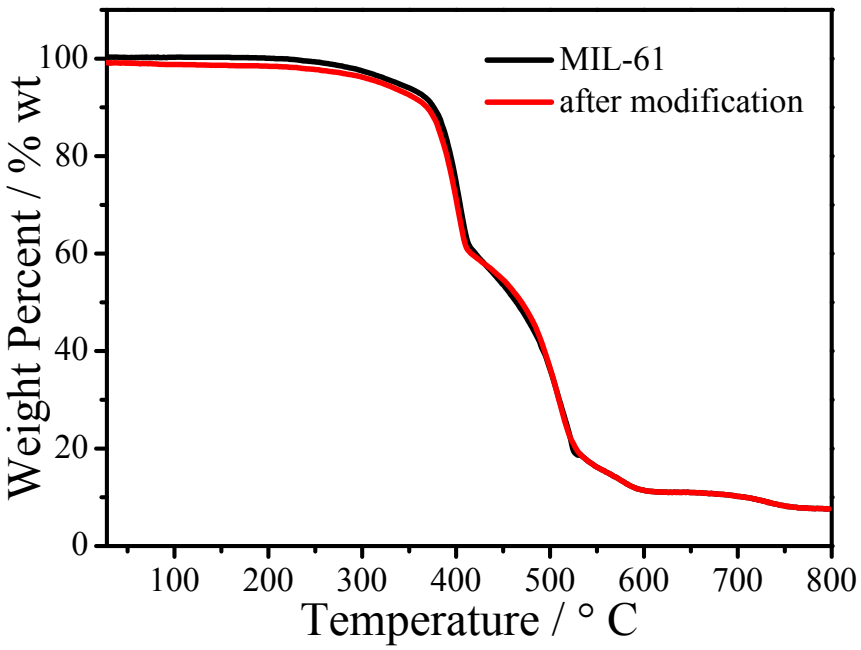

Fig. S3 Thermal gravimetric analysis of before (black line) and after (red line) modifications.

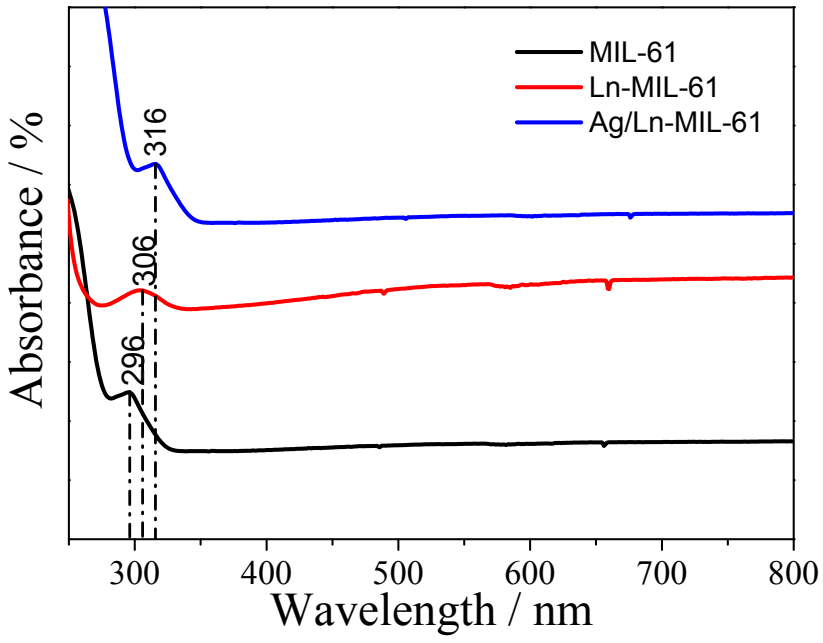

Fig. S4 The UV-Vis spectra of the suspensions of MIL-61, Ln-MIL-61 and Ag/Ln-MIL-61.

Table S1 EDS element analysis of Ln-MIL-61 and Ag/Ln-MIL-61.

Materials	Element	Weight / %	Atomic / %
Eu-MIL-61	C	33.81	49.47
	O	40.06	44.00
	Ga	25.75	6.49
	Eu	0.38	0.04
Tb-MIL-61	C	33.81	49.47
	O	40.06	44.00
	Ga	23.71	6.49
	Tb	2.42	0.04
Ag/Sm-MIL-61	C	37.43	50.81
	O	44.59	45.45
	Ga	13.48	3.15
	Sm	2.18	0.24
	Ag	2.32	0.35
Ag/Dy-MIL-61	C	39.11	50.42
	O	48.45	46.90
	Ga	11.81	2.62
	Dy	0.57	0.05
	Ag	0.06	0.01

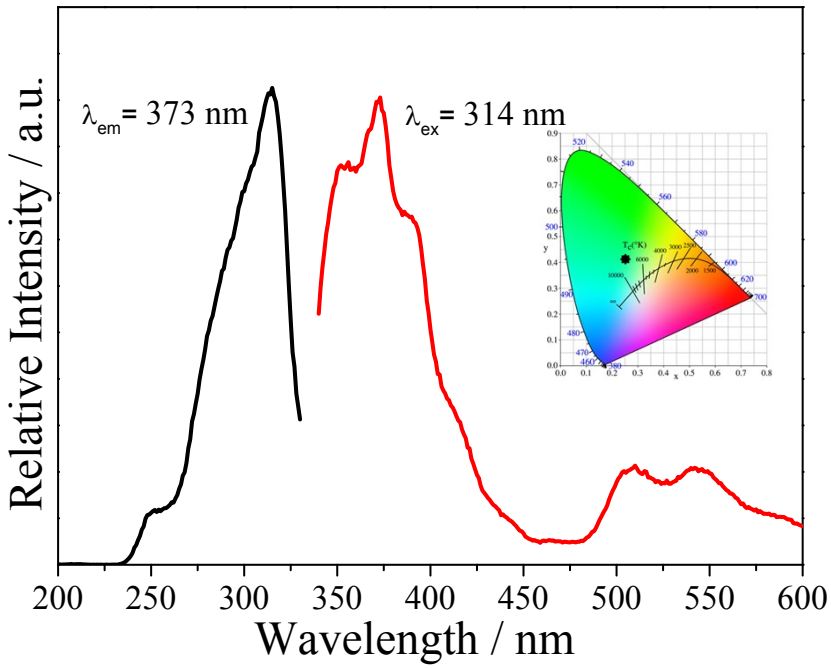

Fig. S5 The excitation and emission spectra of MIL-61. The inset is the corresponding CIE chromaticity diagram (x = 0.2487, y= 0.4074).

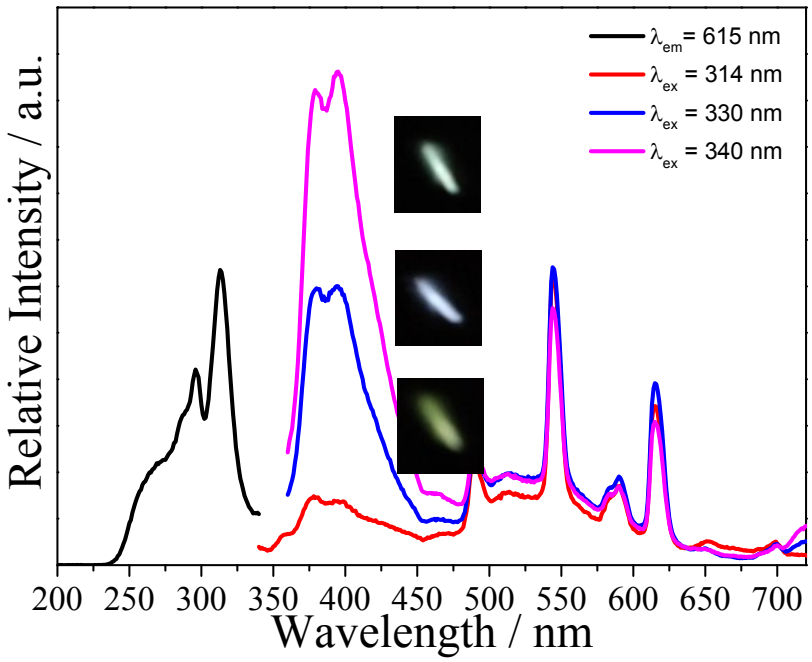

Fig. S6 The fluorescence emission spectra of solid–state Eu/Tb-MIL-61 (black line) under different excitation wavelength and the inset shows the corresponding pictures under Uv-lamp irradiation.

Table S2 Luminescence lifetime of Ln-MIL-61 in the absence and presence of Ag^{+}

Compounds	Fluorescence lifetime / μs
Sm-MIL-61	6.86
Ag/Sm-MIL-61	232
Dy-MIL-61	7.89
Ag/Dy-MIL-61	246

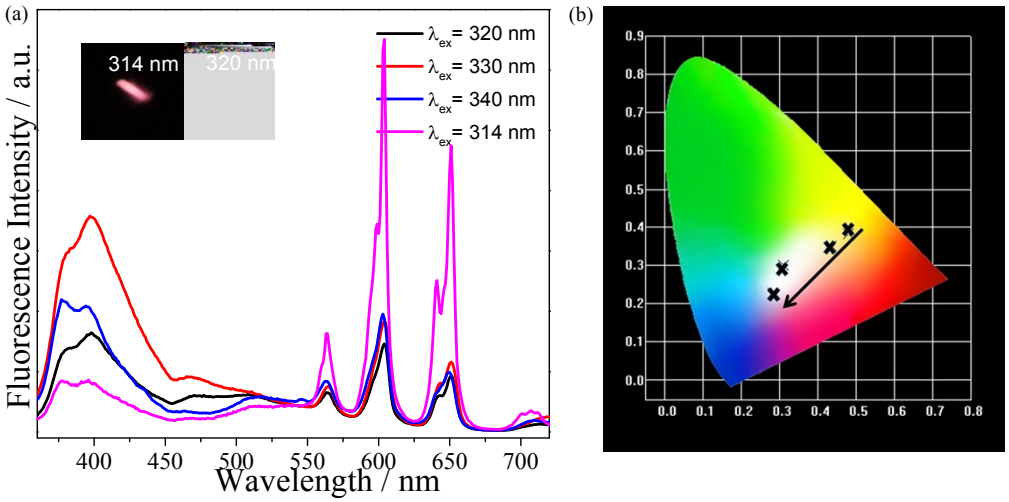

Fig. S7 (a) The emission spectra of Ag/Sm-MIL-61 monitored at different excitation wavelength, and the inset shows its orange and white photoluminescence colors with 320 and 314 nm UV excitations using a Xe lamp as the excitation source; (b) the CIE chromaticity diagram of Ag/Sm-MIL-61 excited at different wavelength.

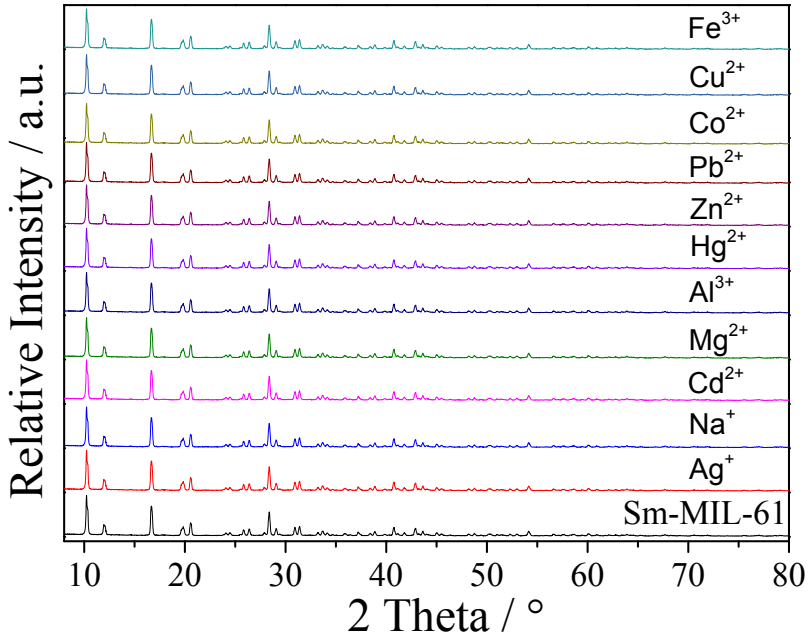

Fig. S8 PXRD patterns of Sm-MIL-61 treated by different anionic aqueous solutions, demonstrating the well-retained framework of Sm-MI-61 during the experiment.

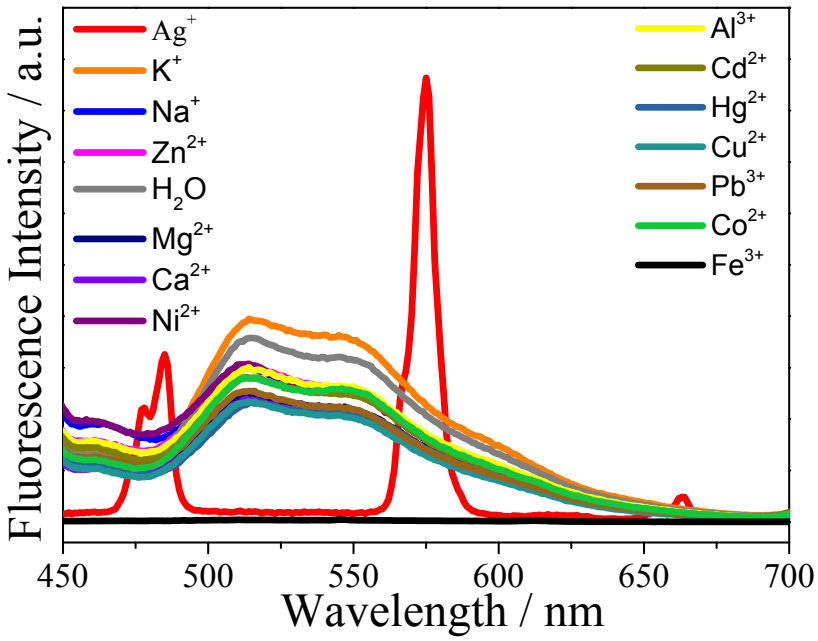

Fig. S9 PL spectra of Dy-MIL-61 dispersed in aqueous solutions containing different metal ions (100 μM).

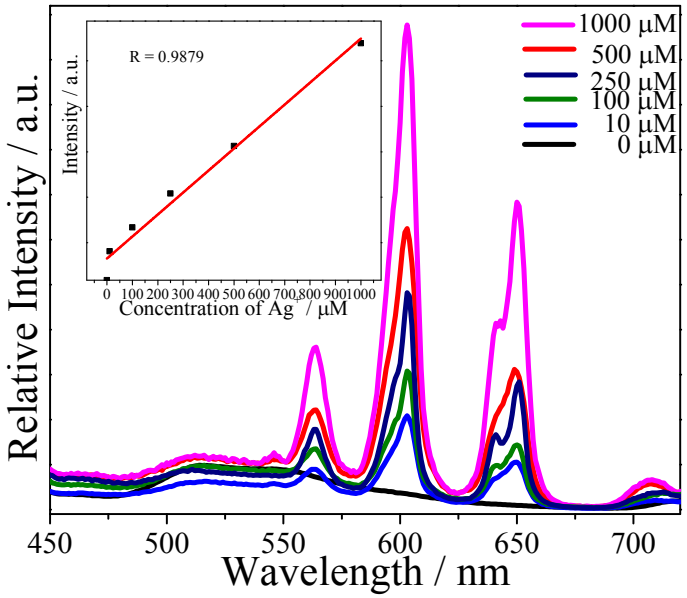

Fig. S10 The fluorescence spectra of Sm-MIL-61 sample dispersed in different concentration of Ag^+. The inset shows the line relationship between fluorescence intensities of $^4G_{5/2} \rightarrow {}^6H_{7/2}$ at 603 nm upon Sm-MIL-61 and Ag^+ concentration.

Reference

1 T. Loiseau, H. Muguerra, M. Haouas, F. Taulelle, G. Férey, *Solid State Sciences*, 2005, **7**, 603.
2 K. Barthelet, D. Riou, M. Nogues, G. Ferey, Inorg. Chem. 2003, 42, 1739.