SUPPORTING INFORMATION

Metal-Organic Framework *vs.* Coordination Polymer—Influence of the Lanthanide on the Nature of the Heteroleptic Anilate/Terephtalate 3D Network

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Table S1. Crystallographic data for **1**-**3**.

	$[Yb_2(\mu\text{-}ClCNAn)_2(\mu\text{-}F_4BDC)(H_2O)_4]\cdot(H_2O)_3$ (1)	**$[Er_2(\mu\text{-}ClCNAn)_2(\mu\text{-}F_4BDC)(H_2O)_4]\cdot(H_2O)_4$ (2)**	**$[Eu_2(\mu\text{-}ClCNAn)_2(\mu\text{-}F_4BDC)(H_2O)_6]$ (3)**
Empirical formula	$C_{22}H_{14}N_2O_{19}F_4Cl_2Yb_2$	$C_{22}H_{16}N_2O_{20}F_4Cl_2Yb_2$	$C_{22}H_{12}N_2O_{18}F_4Cl_2Eu_2$
Fw	1103.33	1109.79	1043.16
Crystal color	red	red	red
Crystal size (mm^3)	0.03*0.03*0.02	0.12*0.05*0.04	0.10*0.08*0.05
Temperature (K)	150	270	220
Wavelength (Å)	1.54184	1.54184	1.54184
Crystal system, Z	Triclinic, 1	Triclinic, 1	Monoclinic, 4
Space group	*P*-1	*P*-1	*I*2/*a*
a (Å)	5.0711 (2)	5.1064 (2)	19.3998 (8)
b (Å)	10.7697 (7)	10.7800 (13)	9.2617 (3)
c (Å)	14.6511 (9)	14.7311 (14)	18.5209 (8)
α (°)	95.915 (5)	95.821 (9)	90
β (°)	99.675 (4)	99.673 (6)	121.571 (6)
γ (°)	90.477 (5)	90.532 (7)	90
V ($Å^3$)	784.31 (8)	794.97 (13)	2835.2 (2)
ρ_{calc} ($g.cm^{-3}$)	2.336	2.318	2.444
μ(CuKα) (mm^{-1})	13.334	12.112	34.181
θ range (°)	3.077–73.515	3.060–71.980	5.353–72.002
Data collected	5935	5303	5883
Data unique	3033	5303	2714
Data observed	2830	4819	2530
R(int)	0.0337	0.1949	0.0418
Nb of parameters / restraints	244/32	225/10	267/18
$R1(F)$,[a] $I > 2\sigma(I)$	0.0728	0.1614	0.0355
$wR2(F^2)$,[b] all data	0.2344	0.4610	0.0883
$S(F^2)$,[c] all data	1.134	2.290	1.087
CCDC number	21708733	21708734	21708735

[a] $R1(F) = \Sigma\|F_0\|-|F_C\|/\Sigma|F_0|$; [b] $wR2(F^2) = [\Sigma w(F_0^2-F_C^2)^2/\Sigma wF_0^4]^{1/2}$; [c] $S(F^2) = [\Sigma w(F_0^2-F_C^2)^2/(n+r-p)]^{1/2}$.

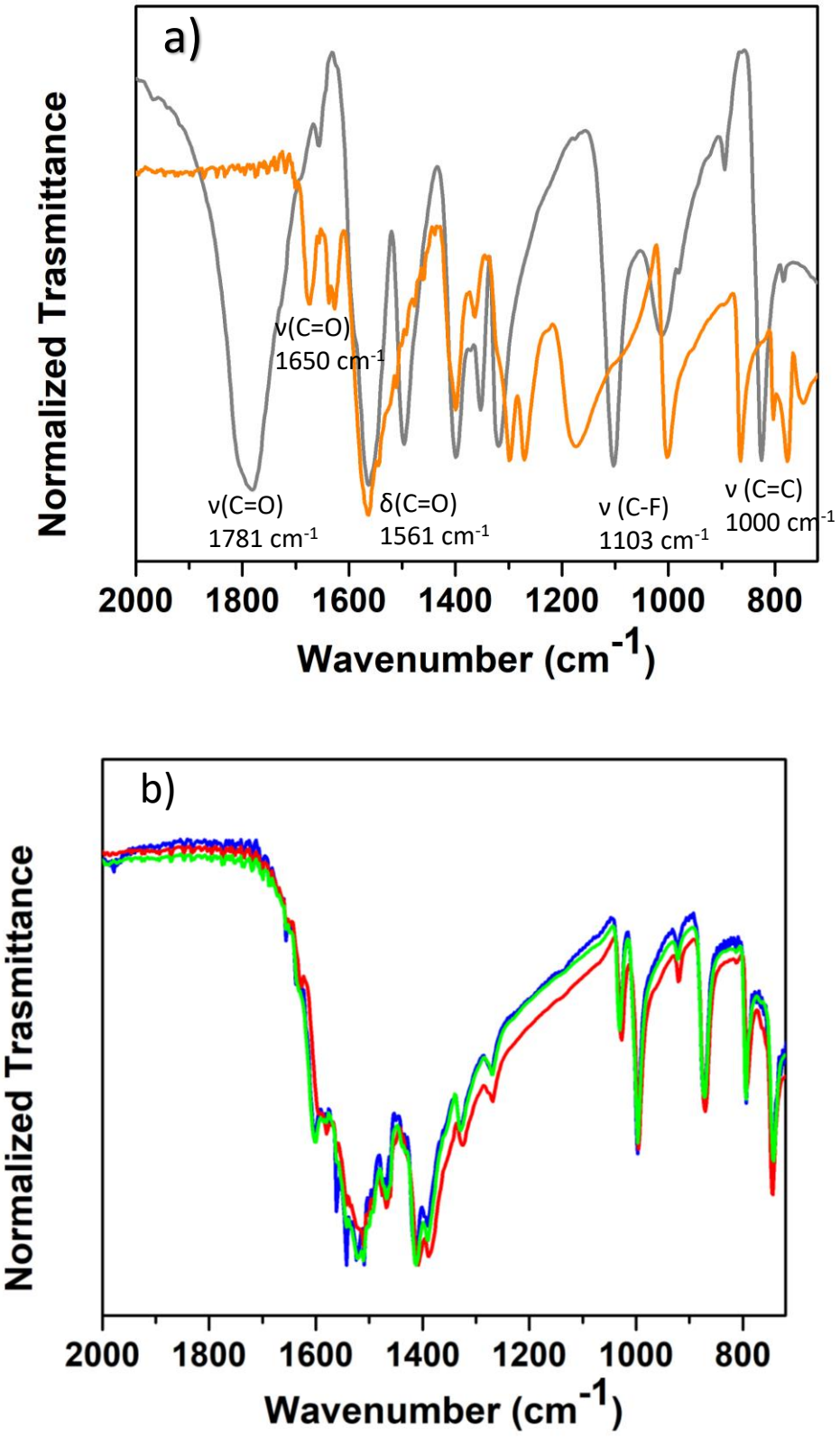


Figure S1. FT-IR spectra of: a) KHClCNAn (orange line), H_2F_4BDC (grey line) and b) **1** (red line), **2** (blue line) **3** (green line), in the 2000-700 cm^{-1} region.

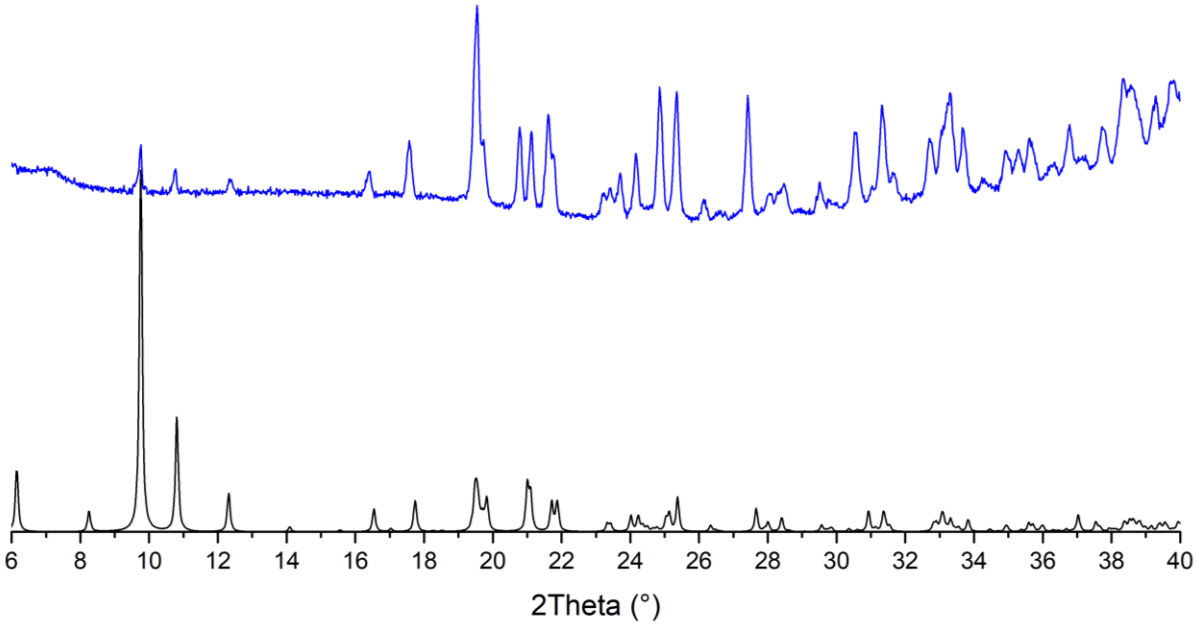


Figure S2. Simulated (black) and experimental (blue) X-ray powder patterns of **1**.

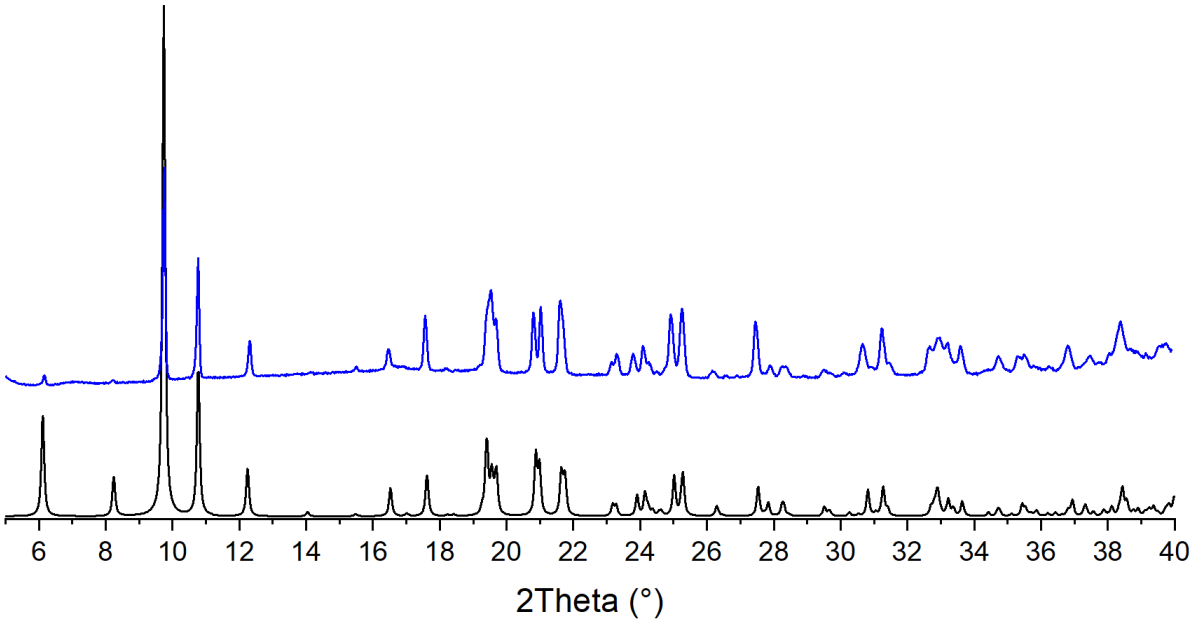


Figure S3. Simulated (black) and experimental (blue) X-ray powder patterns of **2**.

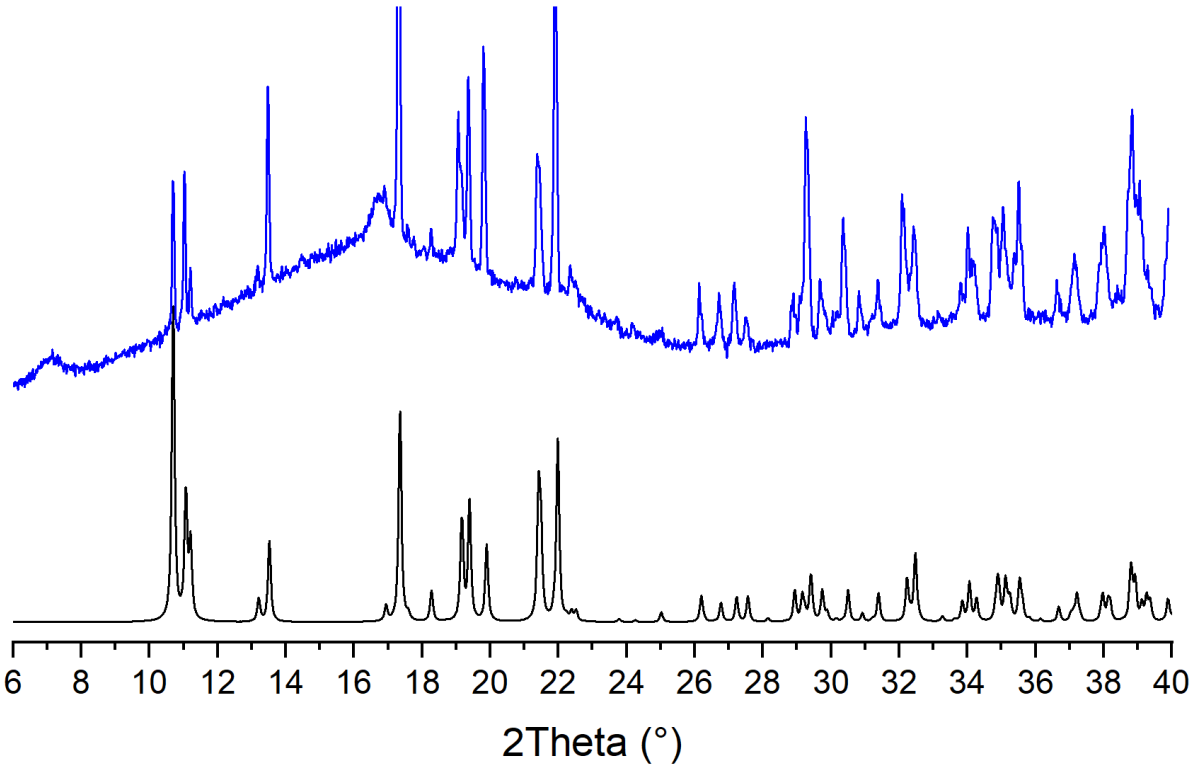
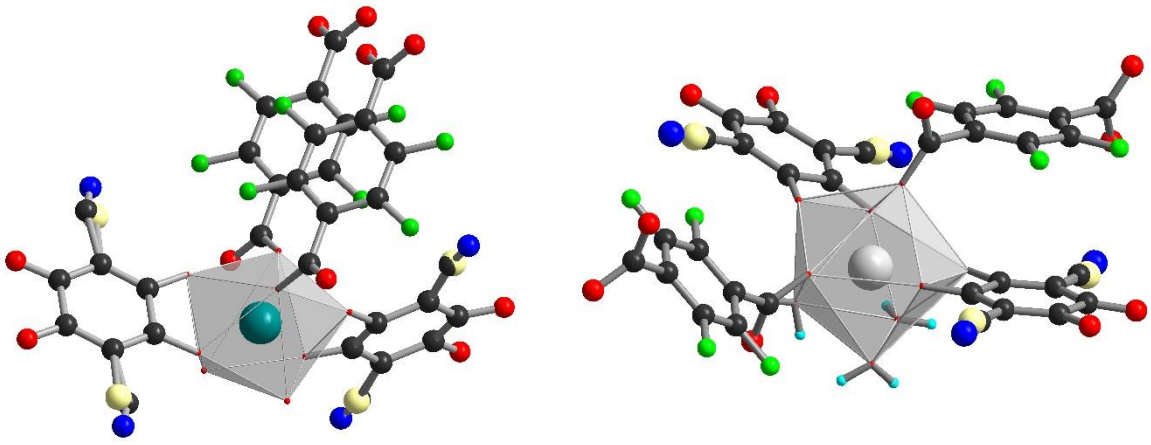


Figure S4. Simulated (black) and experimental (blue) X-ray powder patterns of **3**.



(a) **(b)**

Figure S5. Coordination environment of the metal ion in **1** (a) and **3** (b). Color code: C (black), H (cyan), O (red), N (blue), F (green), Cl (light yellow), Yb (teal), Eu (grey).

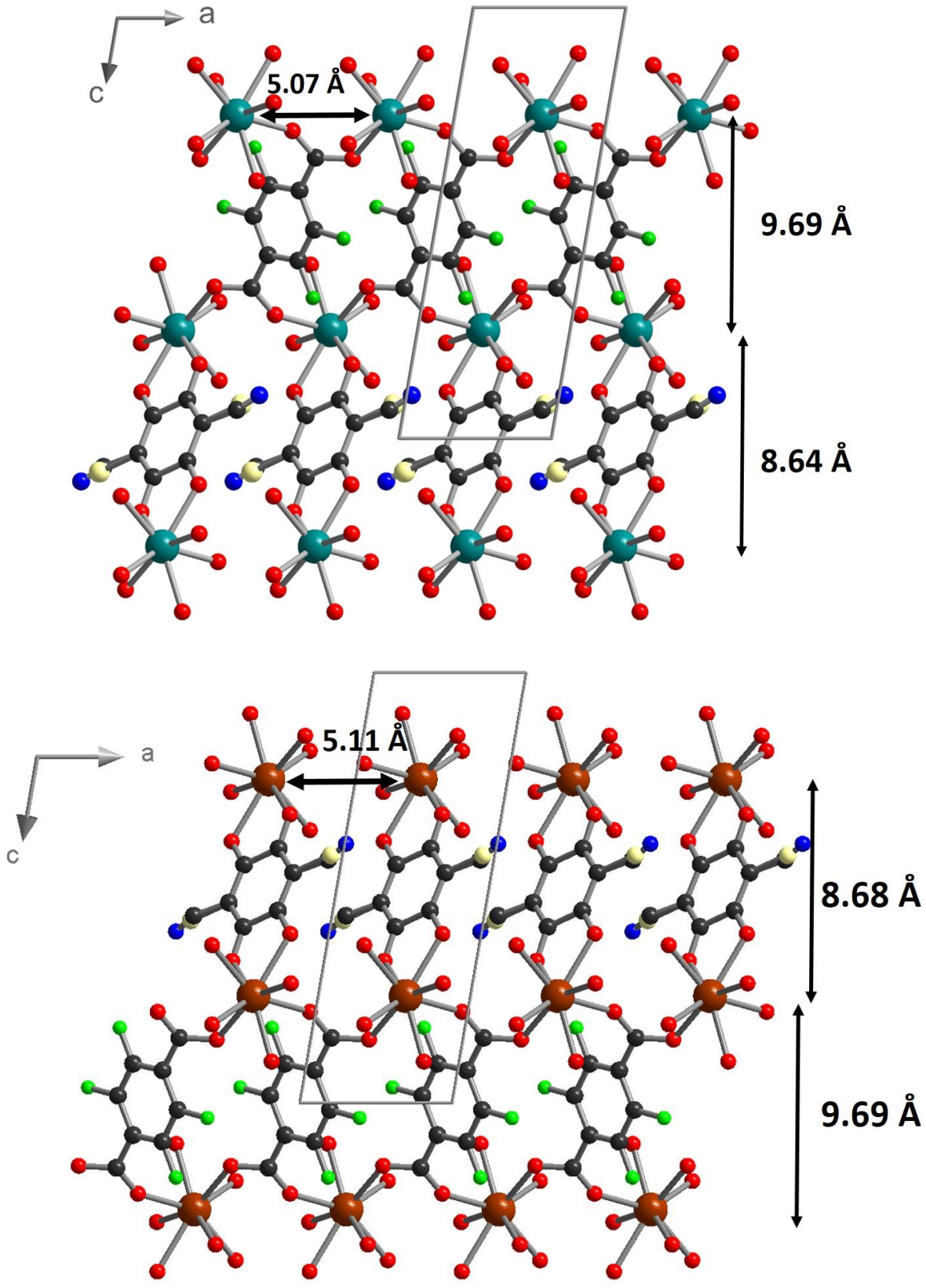


Figure S6. View of the crystal structures of **1** (top) and **2** (bottom) in the ac plane highlighting the shortest Ln(III)···Ln(III) distances. Color code: C (black), O (red), N (blue), F (green), Cl (light yellow), Yb (teal), Er (brown).

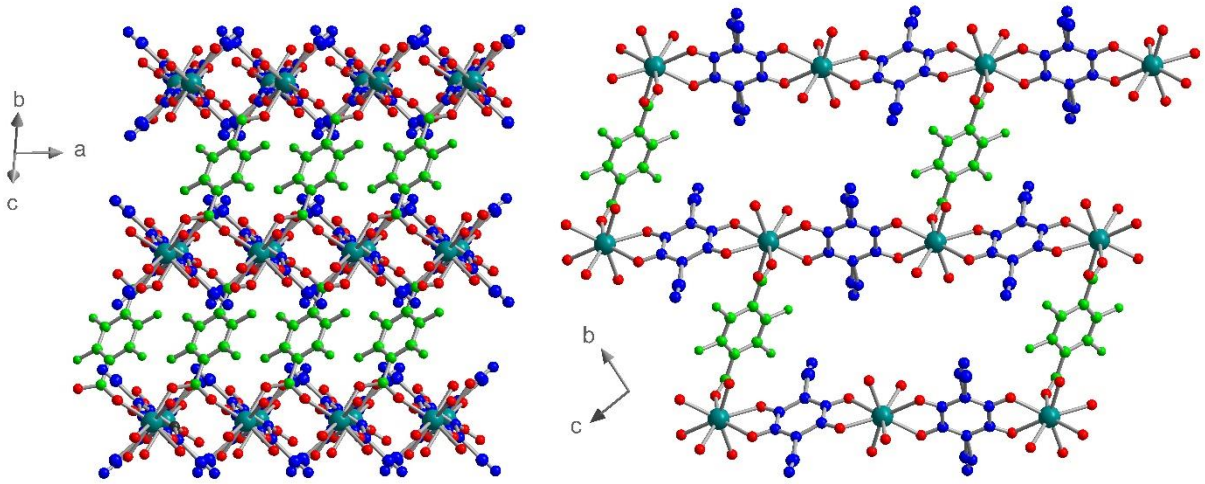


Figure S7. Views of the extended structure in **1**. $ClCNAn^{2-}$ and F_4BDC^{2-} are highlighted in blue and green respectively.

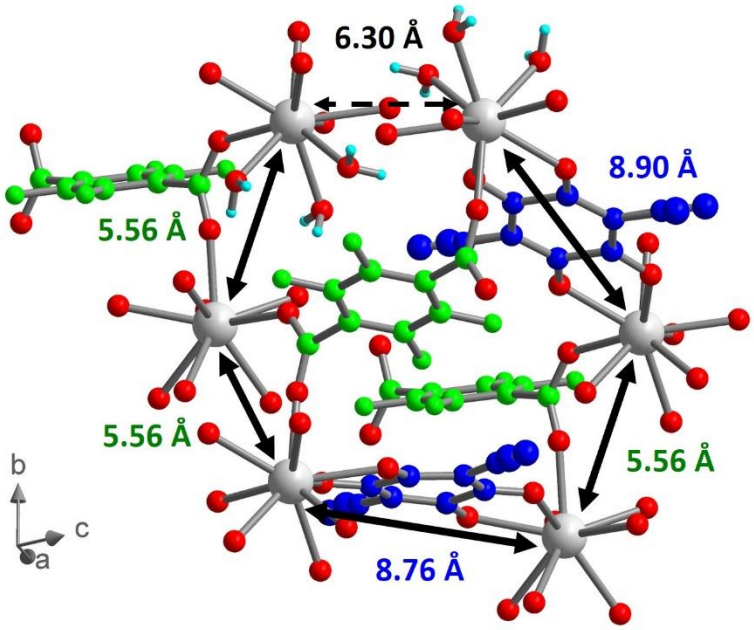


Figure S8. View of the crystal structure of **3** highlighting the shortest Eu···Eu distances. $ClCNAn^{2-}$ and F_4BDC^{2-} are highlighted in blue and green respectively.

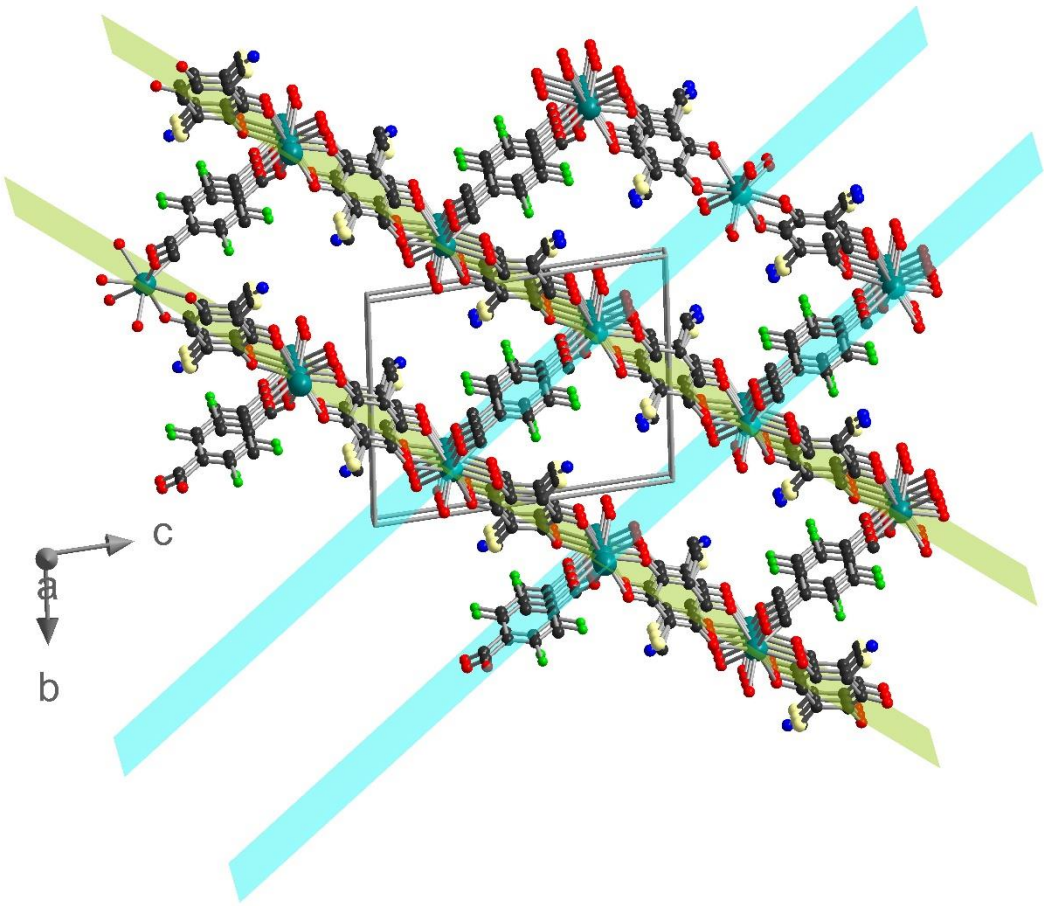


Figure S9. View of the crystal structure of **1** highlighting the (011) and (0-11) lattice planes in cyan and green respectively. Color code: C (black), O (red), N (blue), F (green), Cl (light yellow), Yb (teal).

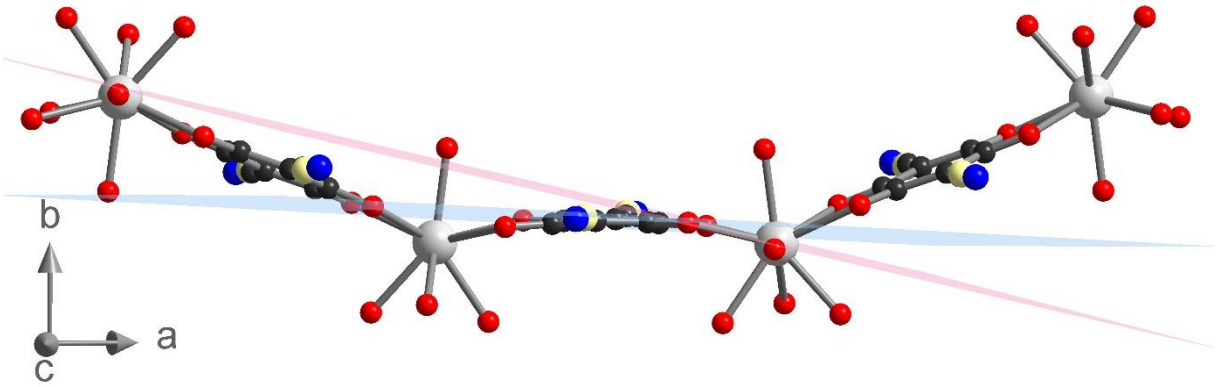


Figure S10. View of the Eu-anilate 1D chain of **3** highlighting the plane of the ligand (in blue) and the plane made by the Ln metal centre and the two coordinated O atoms (in red). Color code: C (black), O (red), N (blue), F (green), Cl (light yellow), Eu (gray).

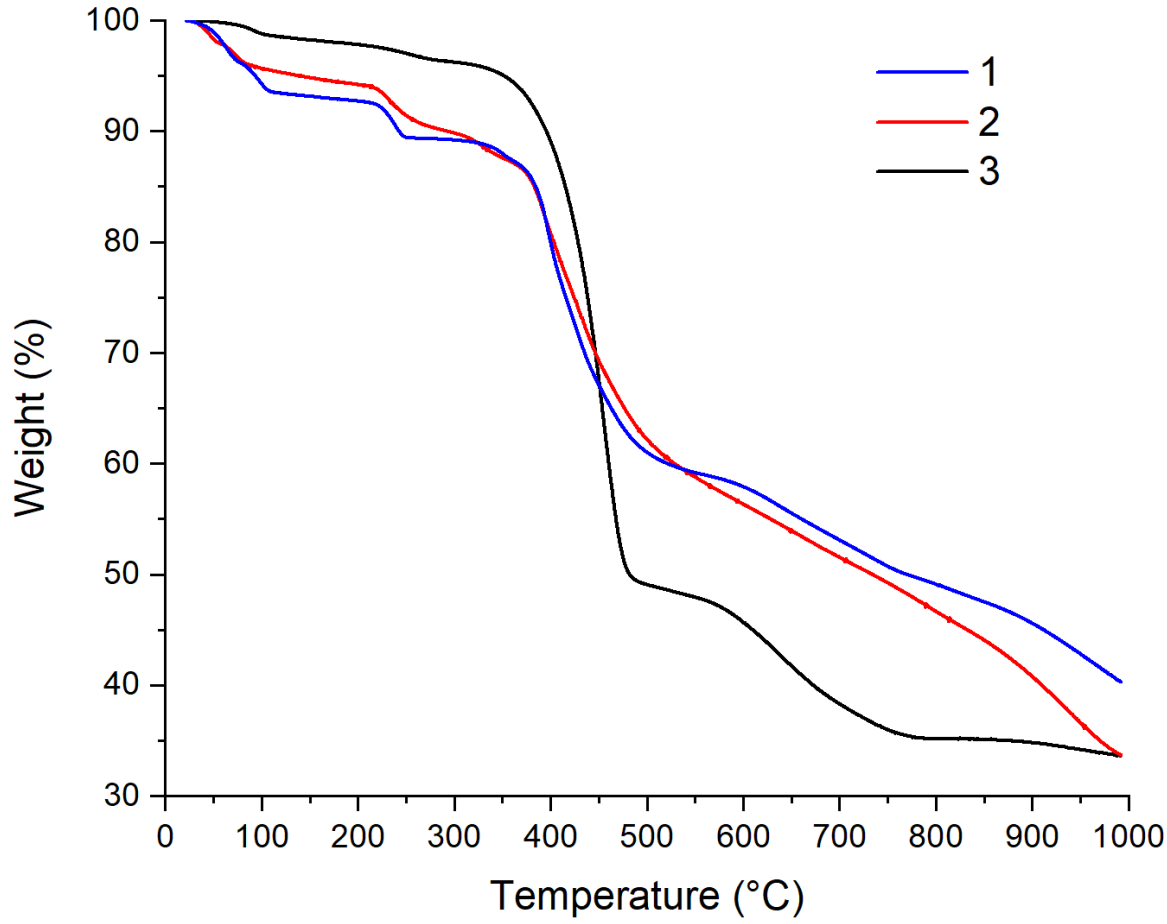


Figure S11. TGA of compounds **2** and **3**.