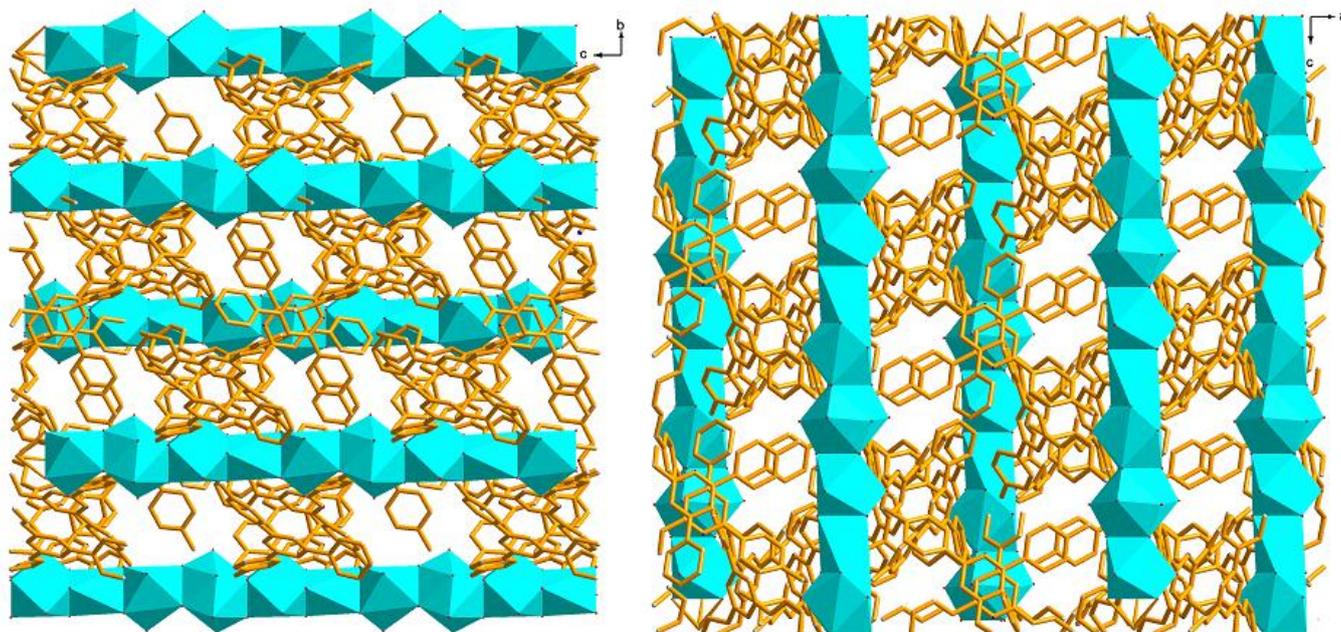
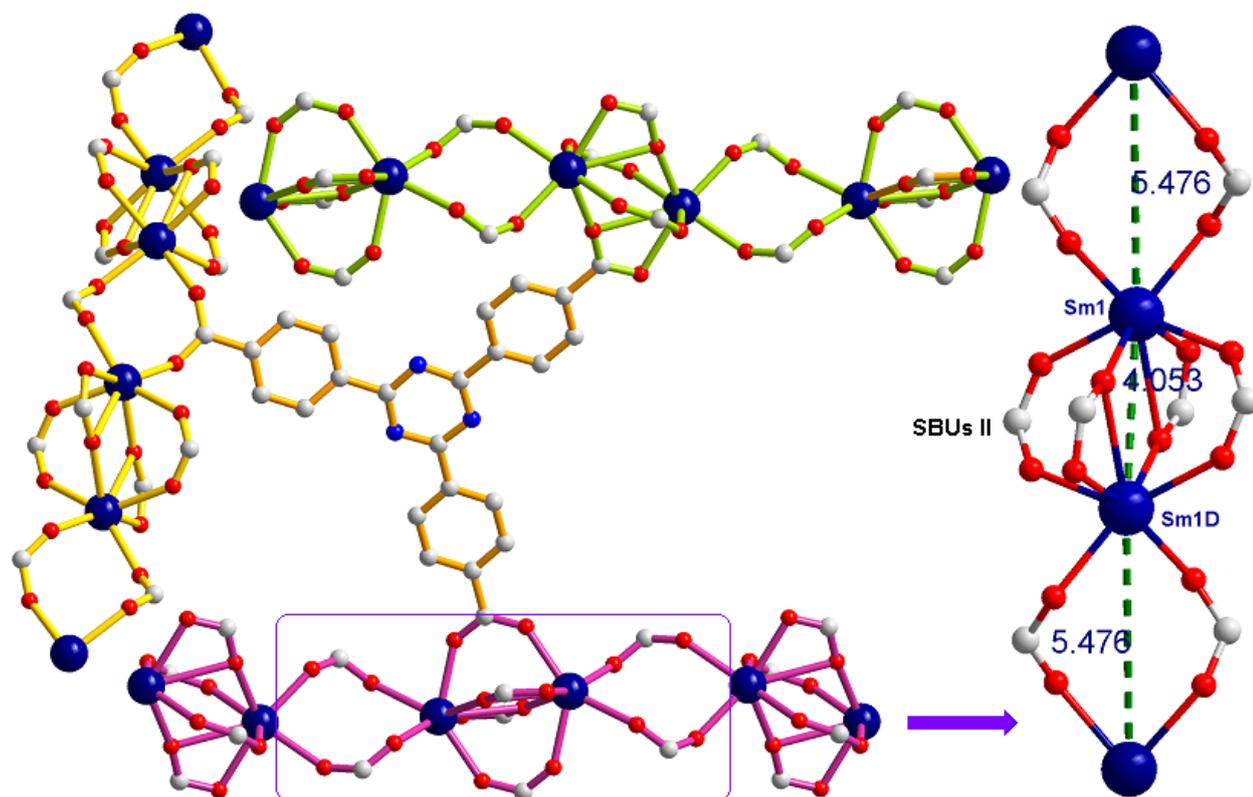


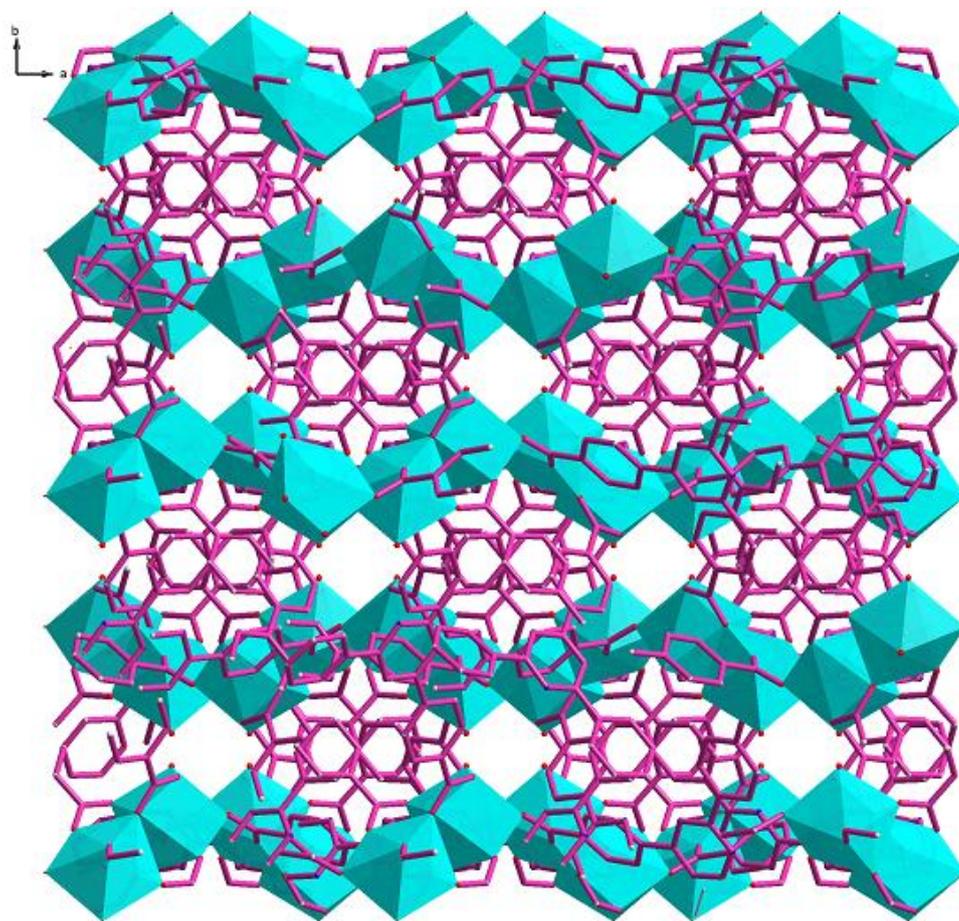
**Figure S1.** (a) L1 ligands linked two infinite  $[\text{Pr}_3\text{Na}(\text{COO})_{12}]_n$  chains along (0,0,1) direction.



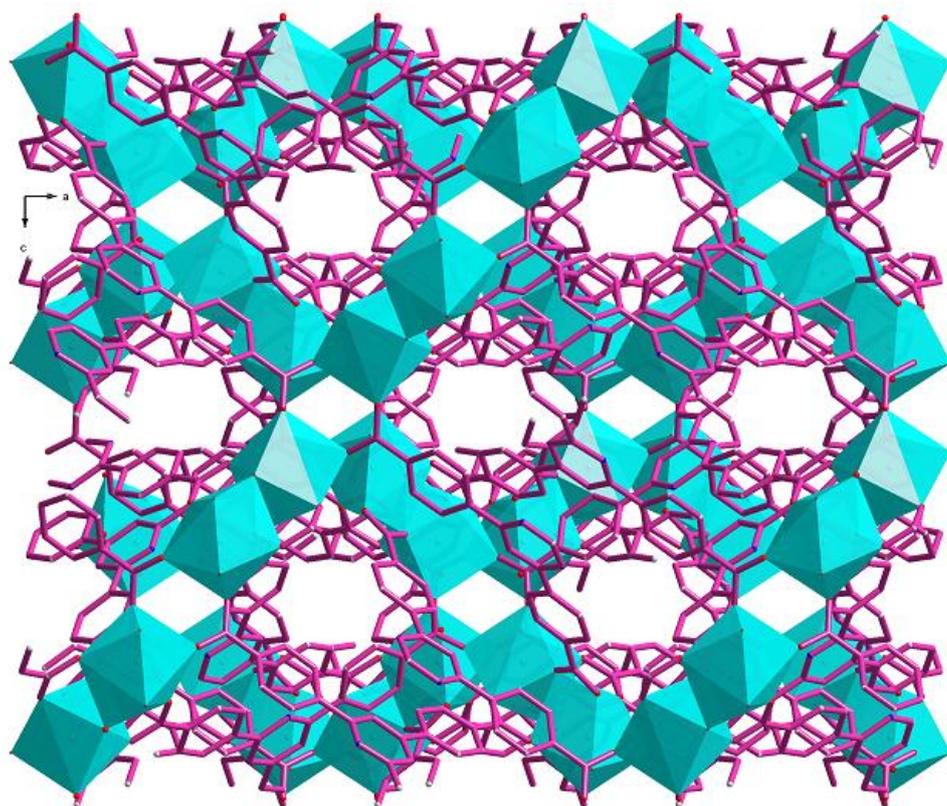
**Figure S2.** View of the 3D frameworks of compound **1** along bc plane (the left) and ac plane (the right).



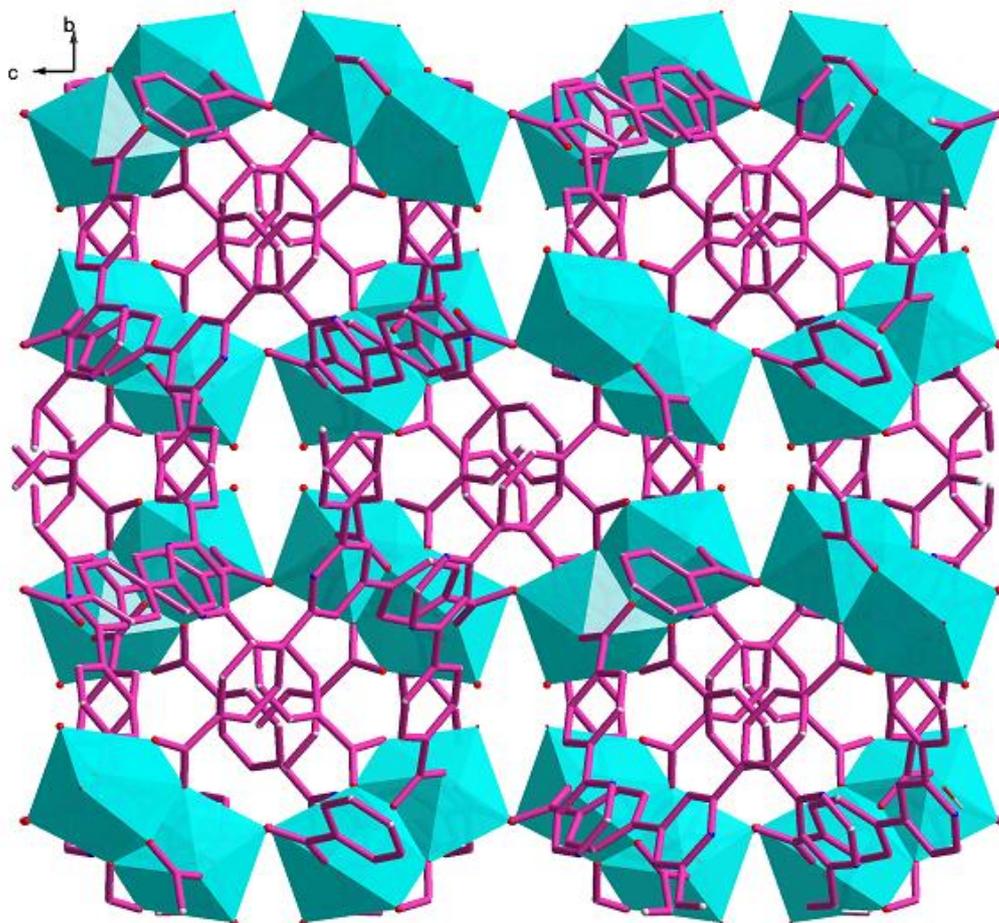
**Figure S3.** L2 ligands linked three infinite  $[\text{Sm}_2(\text{COO})_6]_n$  chains along different directions and the  $\text{Sm}_2(\text{COO})_6$ .



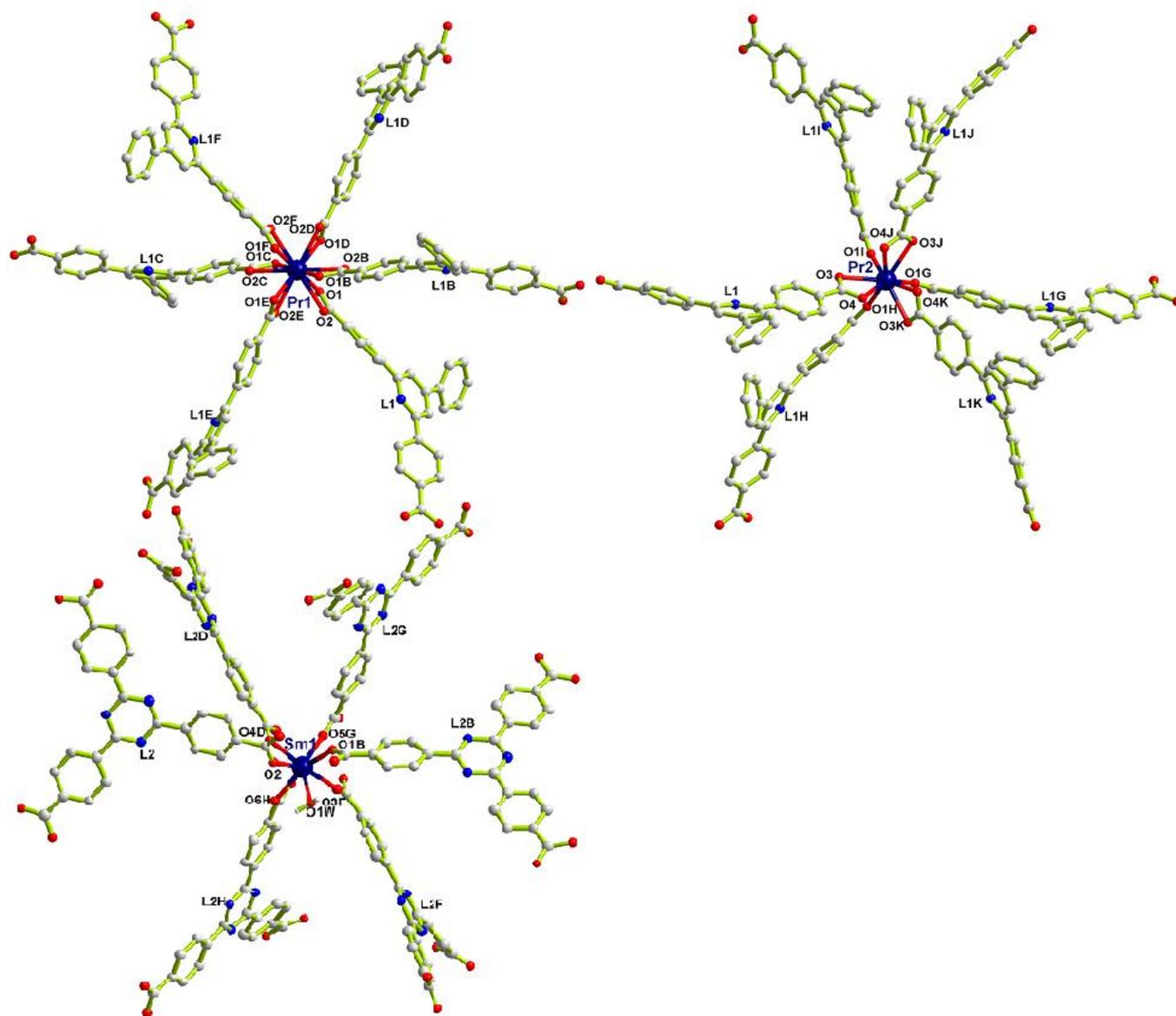
**Figure S4.** View of the 3D frameworks of compound 4 along ab plane.



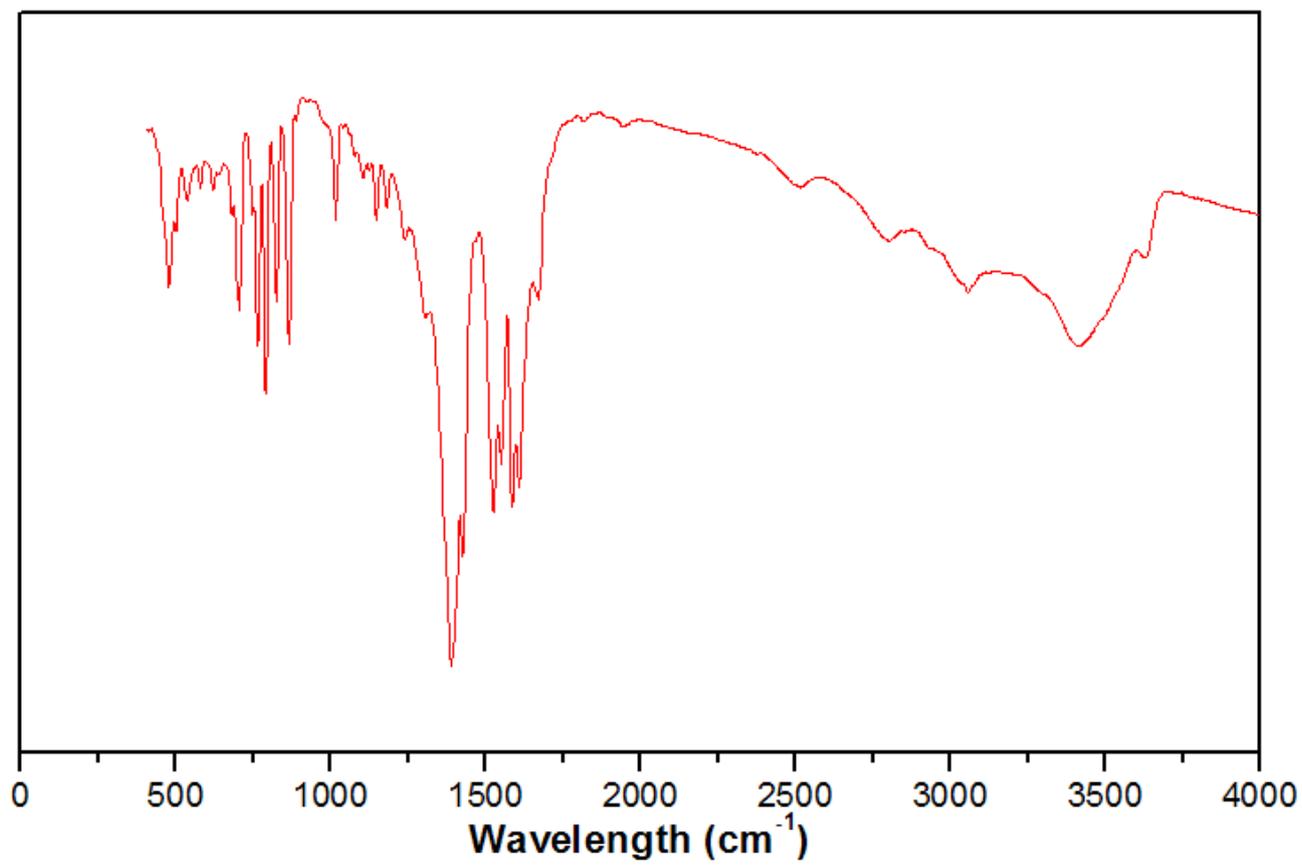
**Figure S5.** View of the 3D frameworks of **4** along ac plane.



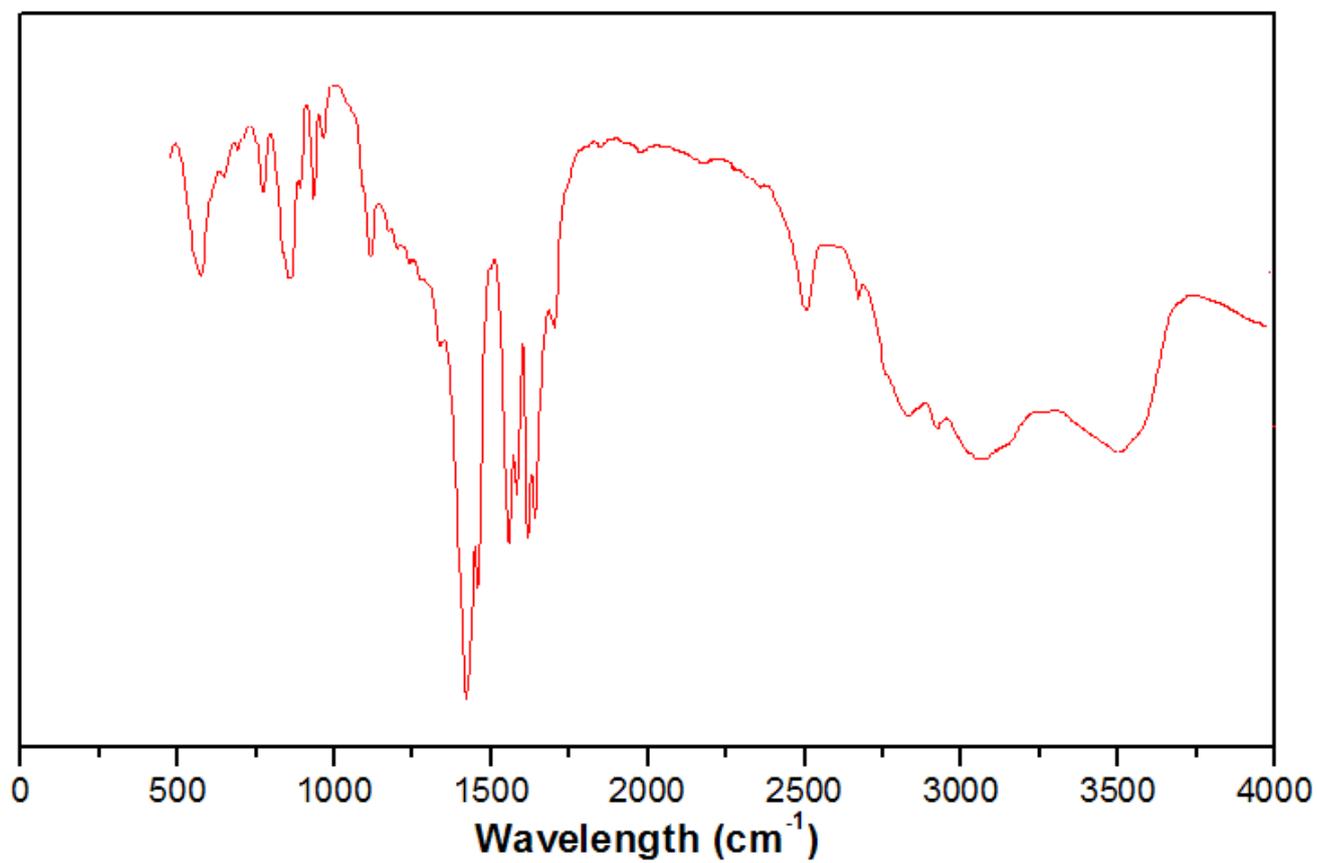
**Figure S6.** View of the 3D frameworks of **4** along ac plane.



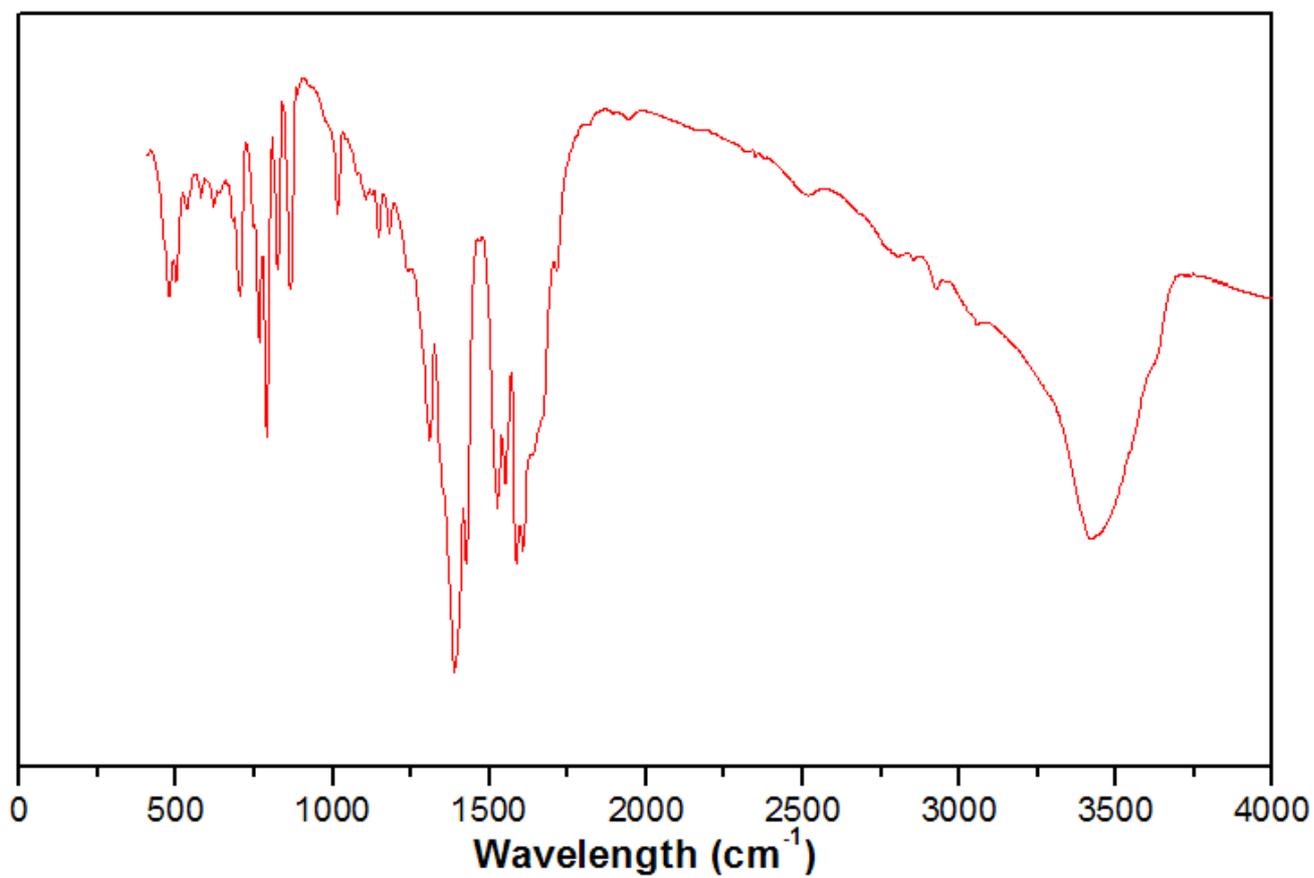
**Figure S7.** The coordination environments of the six-connected Ln<sup>III</sup> ions in compounds **1** and **4**.



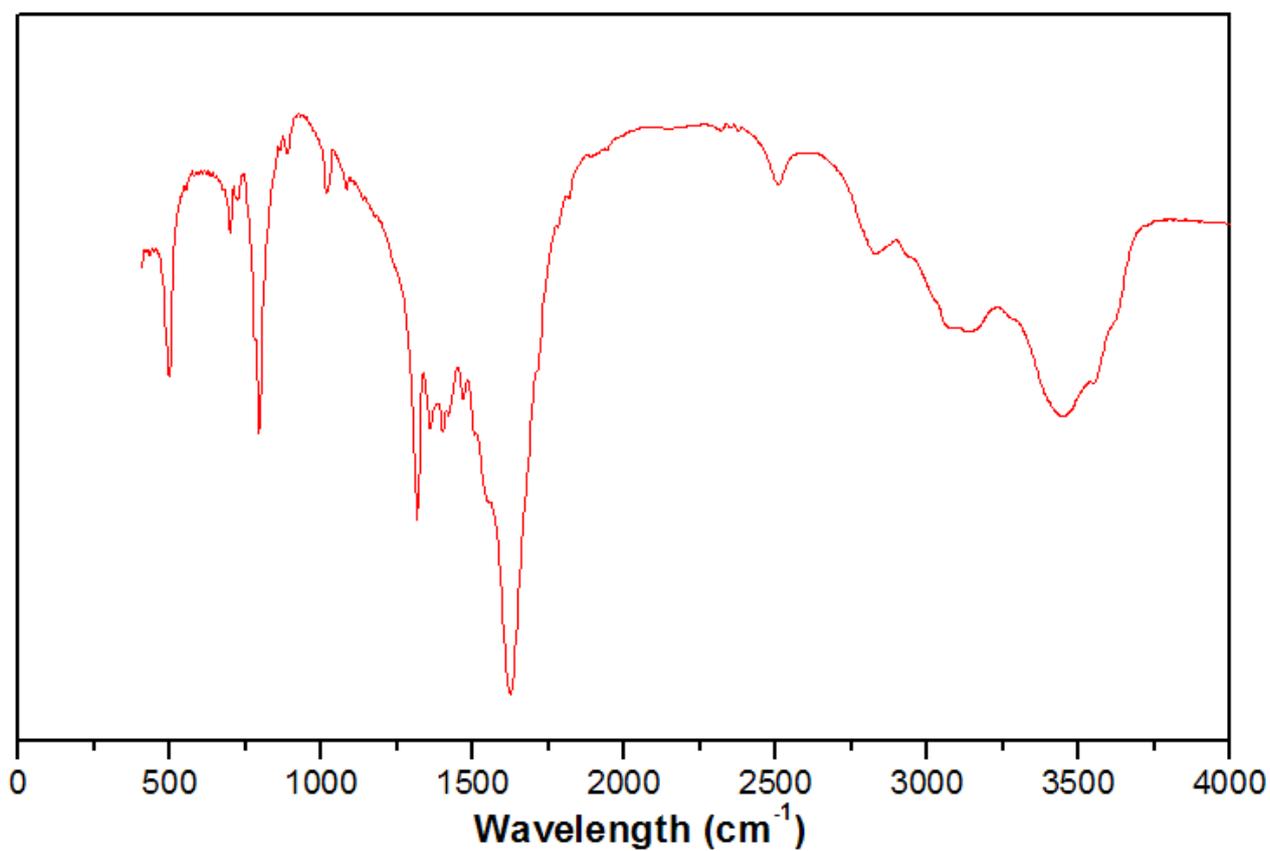
(a)



(b)

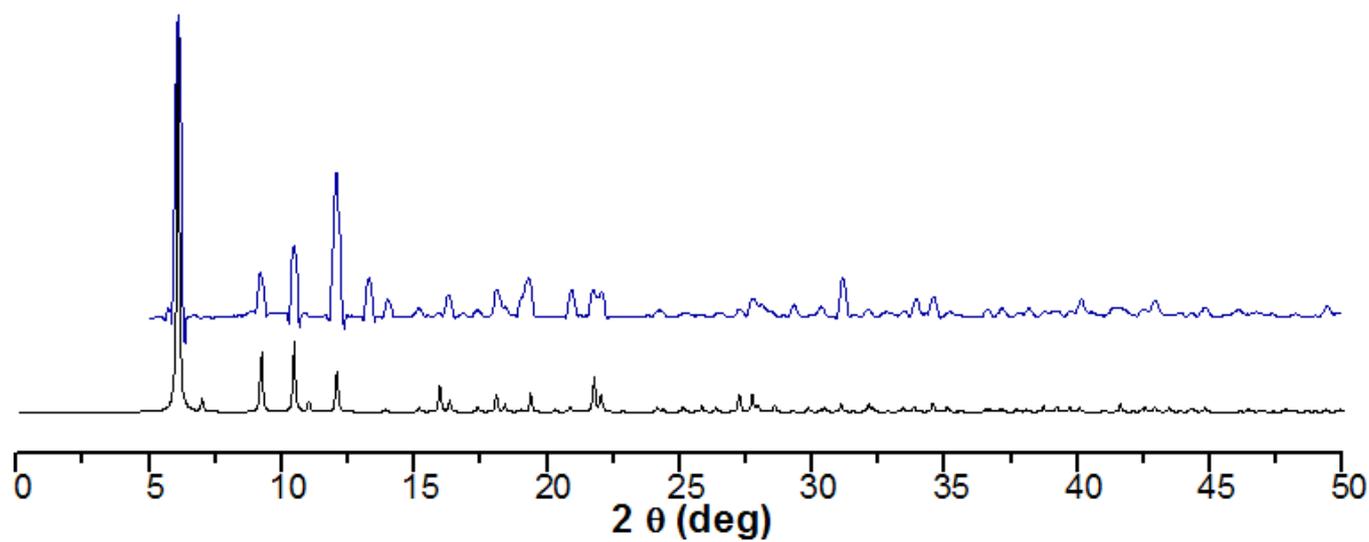


(c)

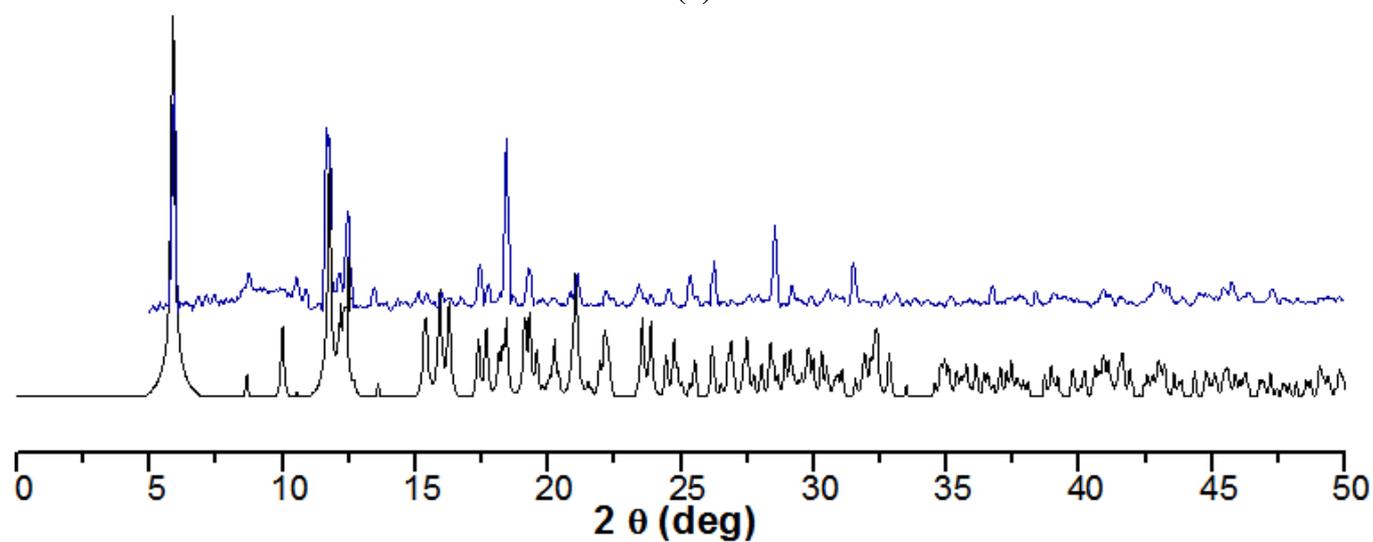


(d)

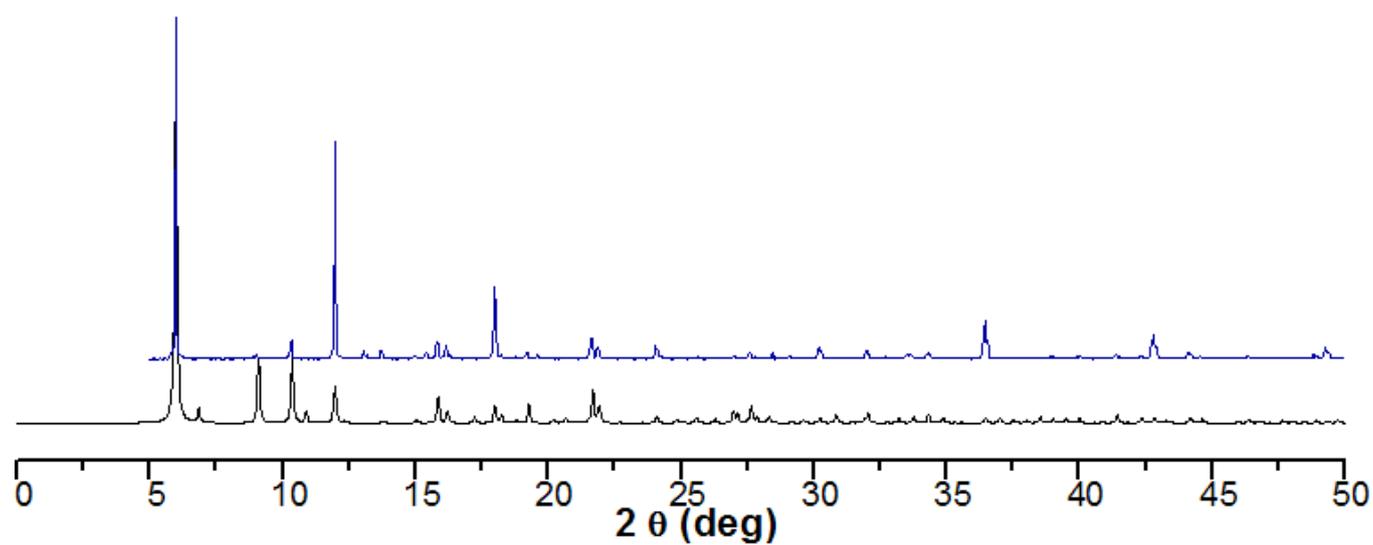
**Figure S8.** The IR spectra of of (a) **1**, (b) **2**, (c) **3** and (d) **4**.



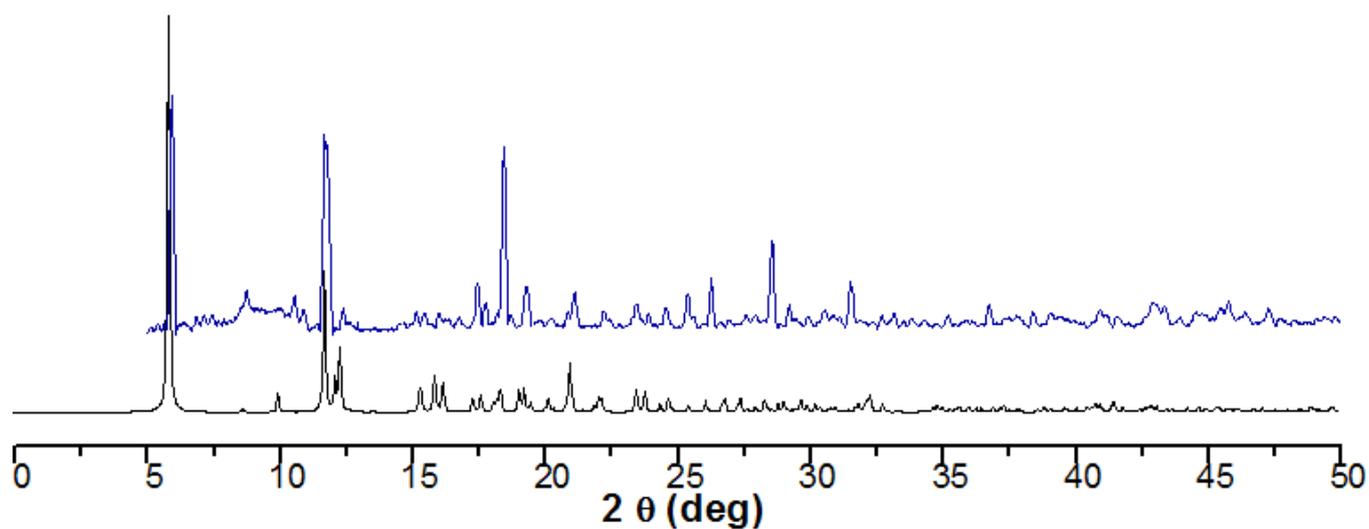
(a)



(b)

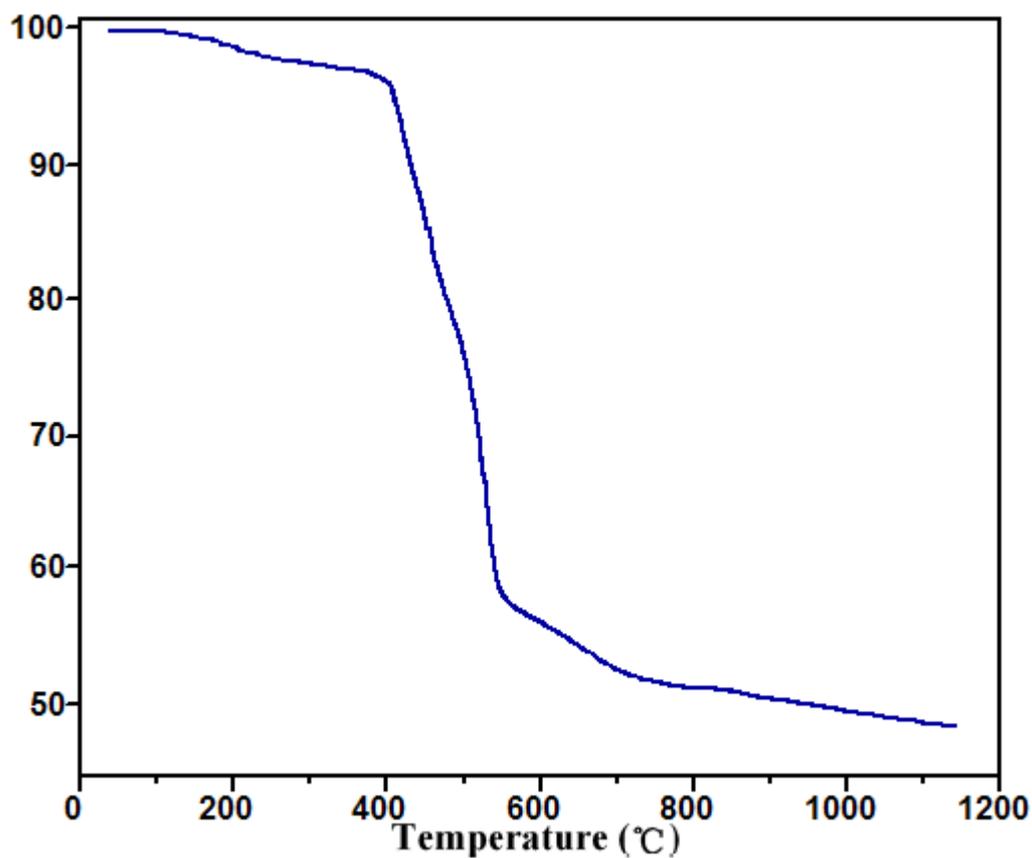


(c)

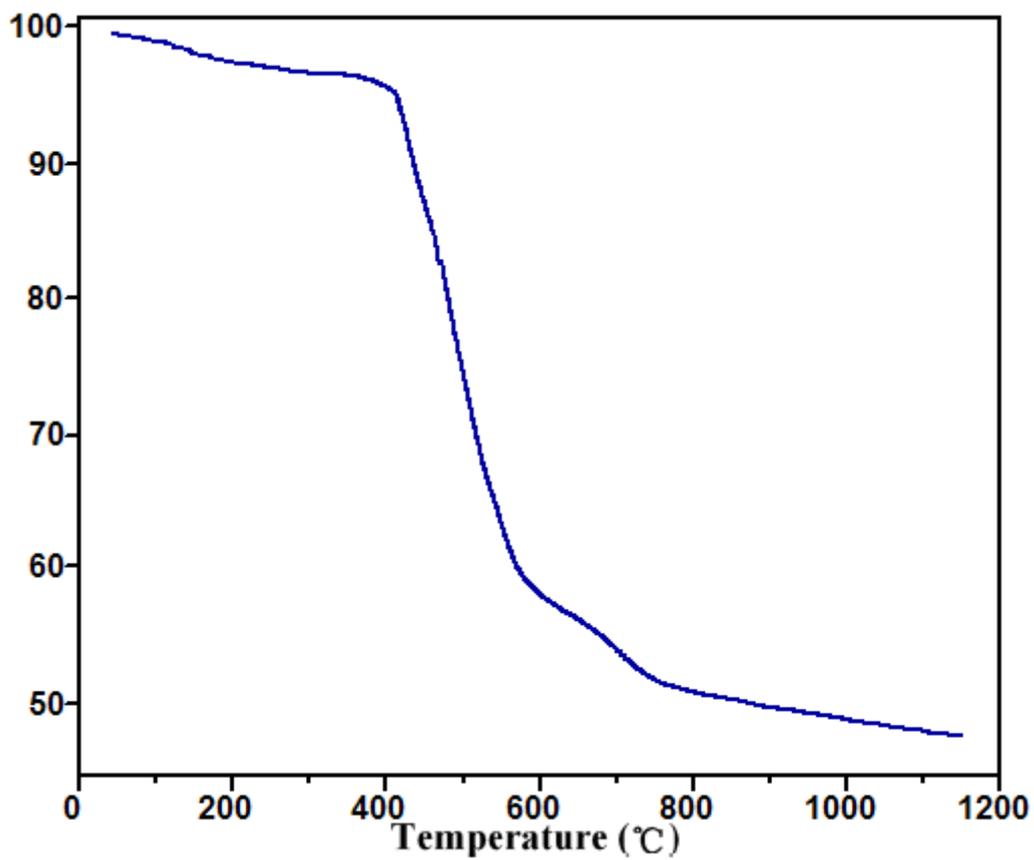


(d)

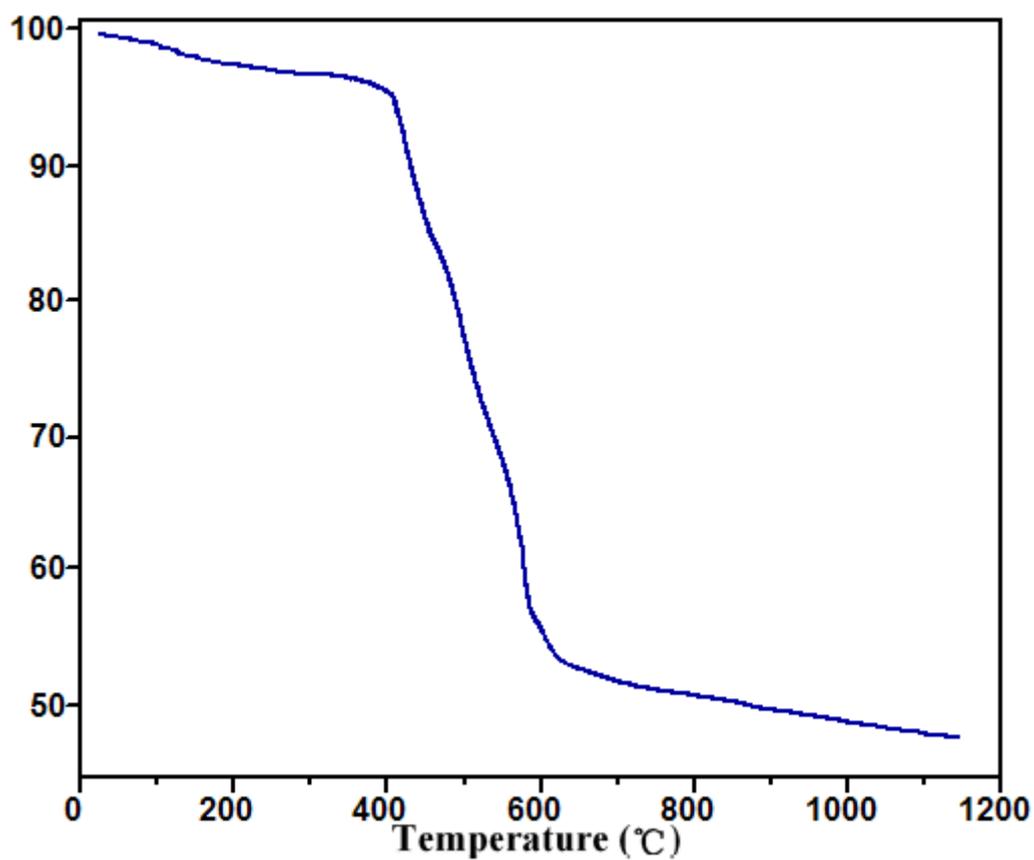
**Figure S9.** PXRD patterns of (a) **1**, (b) **2**, (c) **3** and (d) **4**. Black: calculated from the X-ray single-crystal data; blue: observed for the as-synthesized solids.



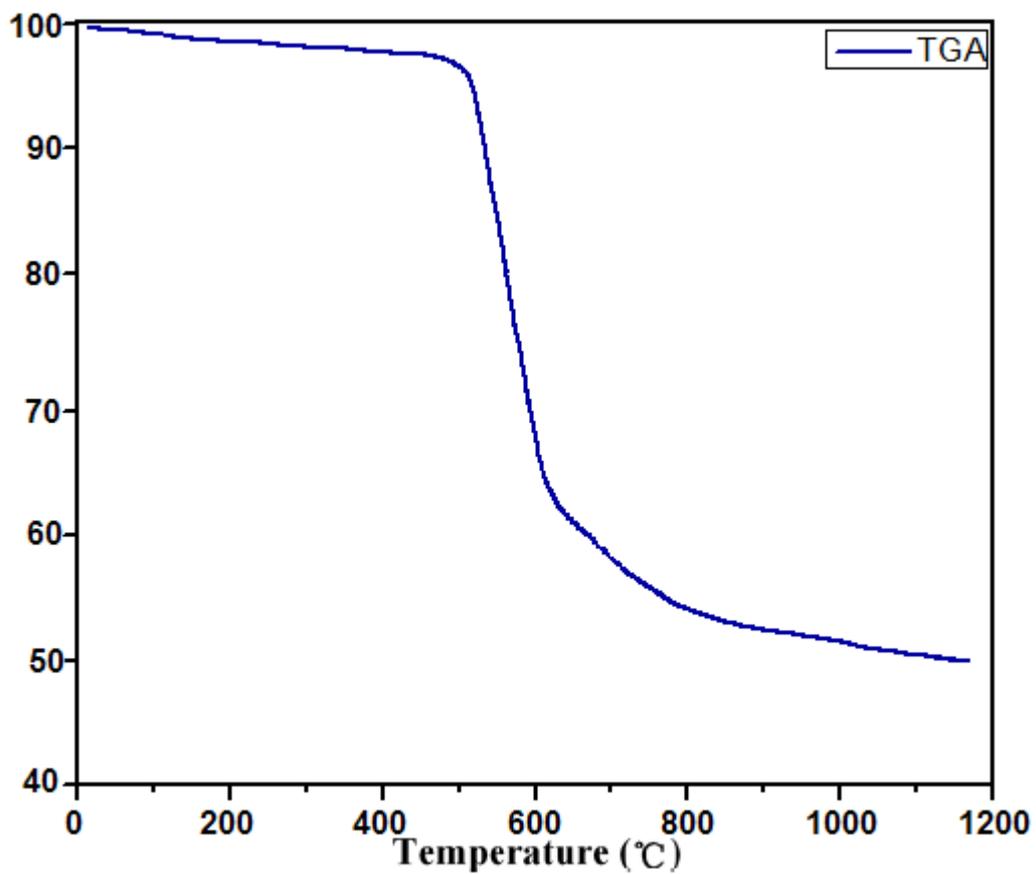
(a)



(b)



(c)



(d)

**Figure S10.** TGA curves of (a) **1**, (b) **2**, (c) **3** and (d) **4**. Black: calculated from the X-ray single-crystal data; blue: observed for the as-synthesized solids.