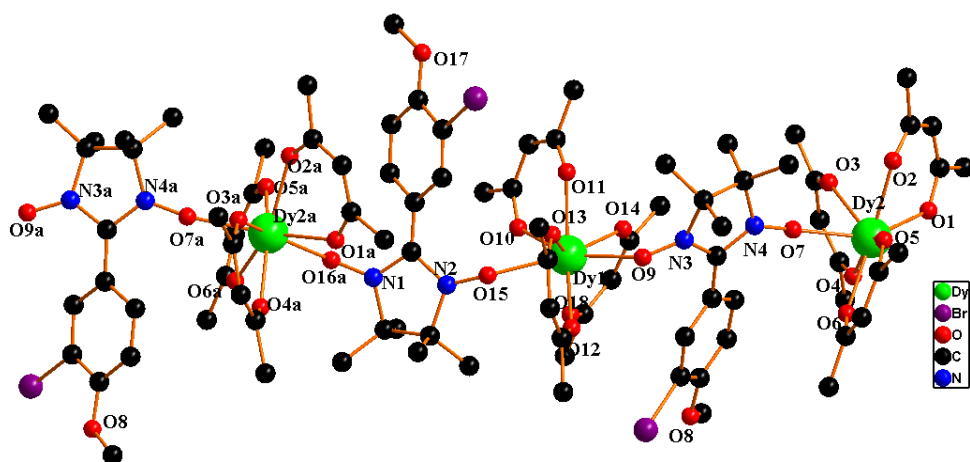
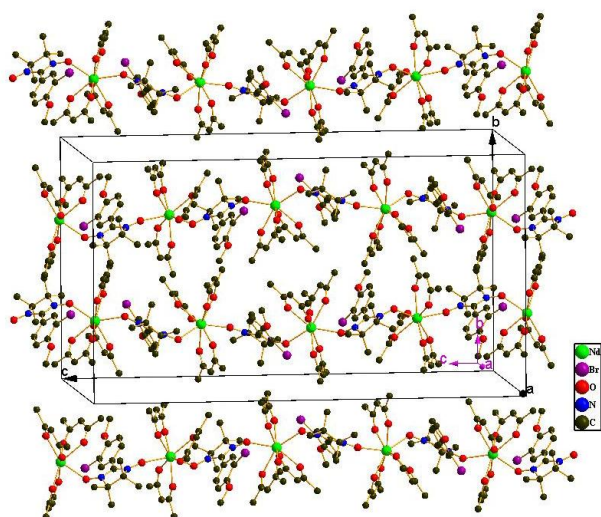


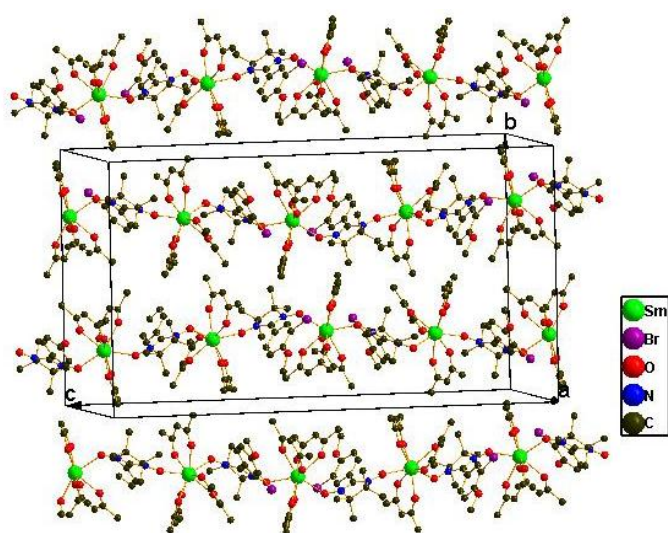
**Figure S3.** Crystal structure of complex 4. All hydrogen and fluorine atoms are omitted for clarity.



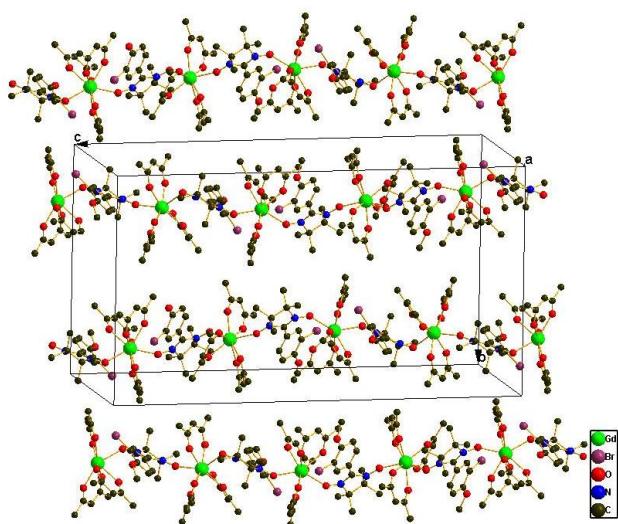
**Figure S4.** Crystal structure of complex 5. All hydrogen and fluorine atoms are omitted for clarity.



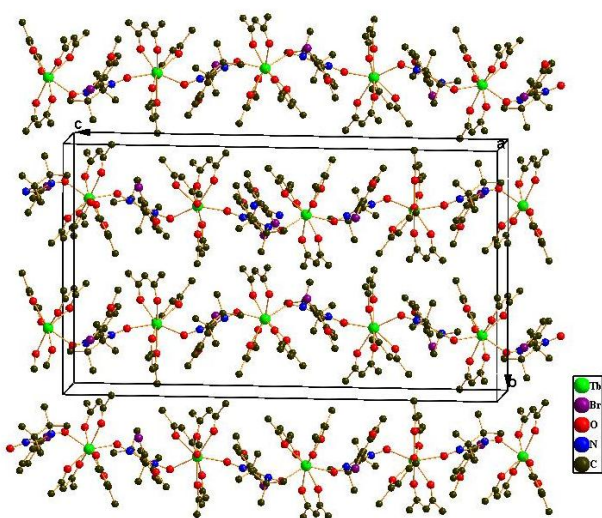
**Figure S5.** Packing diagram of complex 1. All hydrogen and fluorine atoms are not shown for the sake of clarity.



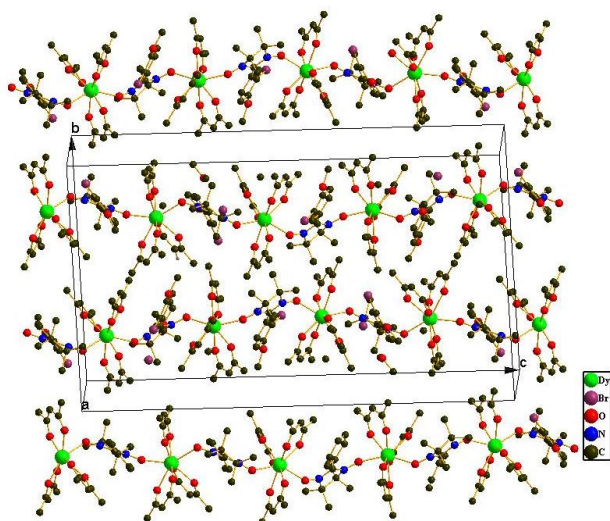
**Figure S6.** Packing diagram of complex 2. All hydrogen and fluorine atoms are not shown for the sake of clarity.



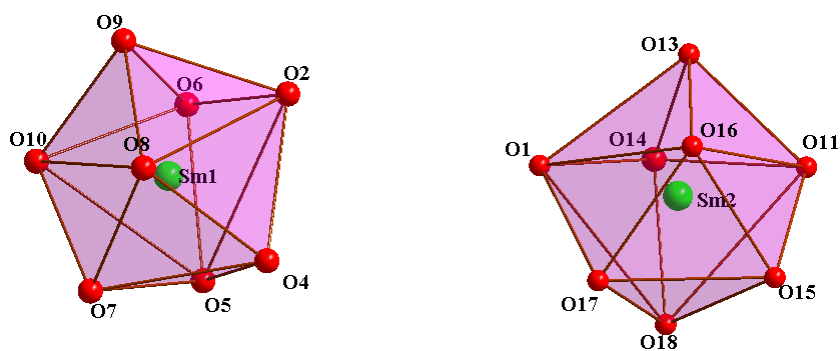
**Figure S7.** Packing diagram of complex 3. All hydrogen and fluorine atoms are not shown for the sake of clarity.



**Figure S8.** Packing diagram of complex 4. All hydrogen and fluorine atoms are not shown for the sake of clarity.



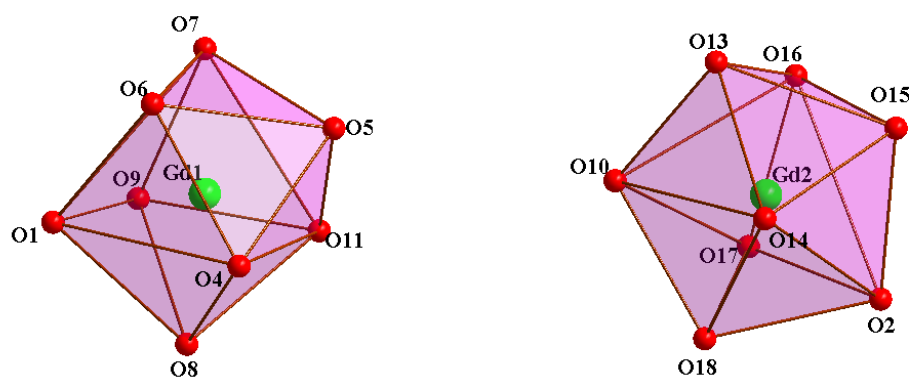
**Figure S9.** Packing diagram of complex **5**. All hydrogen and fluorine atoms are not shown for the sake of clarity.



**Figure S10.** The coordination polyhedron of Sm(III) ion in complex **2**.

**Table S1**  $\delta$  ( $^\circ$ ) and  $\varphi$  ( $^\circ$ ) values for complex **2**.

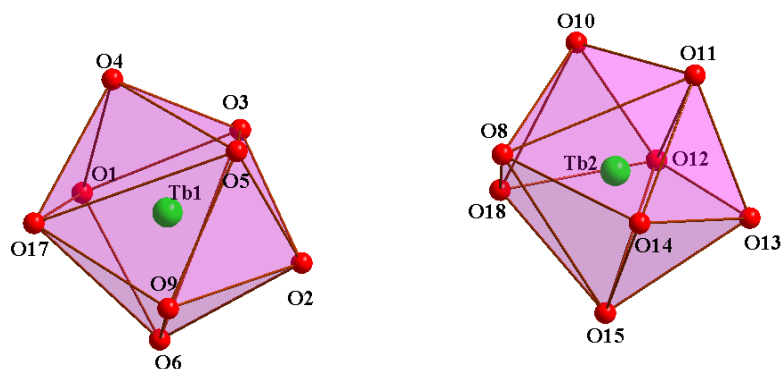
	Sm1		Sm2		TPRS	DD	SAPR
$\delta_1$	O(7)-[O(8)-O(10)]-O(9) <sup>a</sup>	18.8	O(13)-[O(11)-O(16)]-O(15) <sup>a</sup>	18.0	0.0	29.5	0.0
$\delta_2$	O(4)-[O(2)-O(5)]-O(6) <sup>a</sup>	17.8	O(14)-[O(1)-O(18)]-O(17) <sup>a</sup>	29.3	21.8	29.5	0.0
$\delta_3$	O(7)-[O(5)-O(10)]-O(6) <sup>a</sup>	35.1	O(13)-[O(16)-O(1)]-O(17) <sup>a</sup>	30.9	48.2	29.5	52.4
$\delta_4$	O(4)-[O(2)-O(8)]-O(9) <sup>a</sup>	37.3	O(14)-[O(11)-O(18)]-O(15) <sup>a</sup>	36.9	48.2	29.5	52.4
$\varphi_1$	O(7)-O(4)-O(10)-O(2) <sup>b</sup>	8.4	O(13)-O(14)-O(16)-O(18) <sup>b</sup>	6.0	14.1	0	25.4
$\varphi_2$	O(9)-O(6)-O(5)-O(8) <sup>b</sup>	8.8	O(15)-O(17)-O(1)-O(11) <sup>b</sup>	4.4	14.1	0	25.4



**Figure S11.** The coordination polyhedron of Gd(III) ion in complex **3**.

**Table S2**  $\delta$  ( $^\circ$ ) and  $\varphi$  ( $^\circ$ ) values for complex **3**.

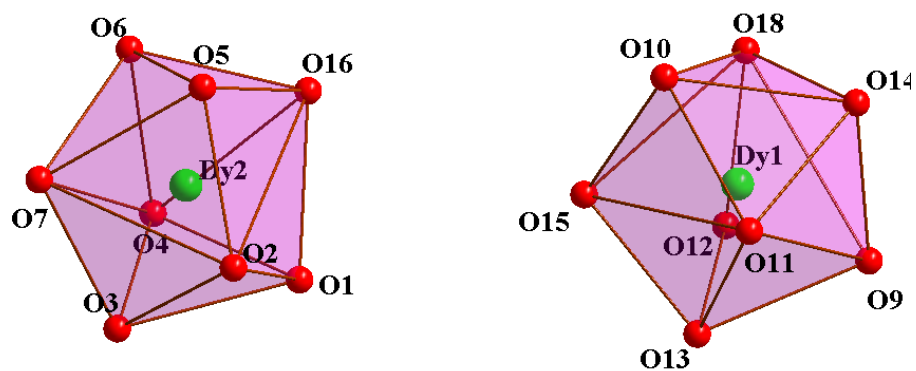
	Gd1		Gd2		TPRS	DD	SAPR
$\delta_1$	O(6)-[O(1)-O(7)]-O(9) <sup>a</sup>	19.3	O(13)-[O(10)-O(14)]-O(18) <sup>a</sup>	27.8	0.0	29.5	0.0
$\delta_2$	O(5)-[O(4)-O(11)]-O(8) <sup>a</sup>	18.7	O(15)-[O(2)-O(16)]-O(17) <sup>a</sup>	17.4	21.8	29.5	0.0
$\delta_3$	O(6)-[O(4)-O(1)]-O(8) <sup>a</sup>	35.5	O(13)-[O(16)-O(10)]-O(17) <sup>a</sup>	31.7	48.2	29.5	52.4
$\delta_4$	O(5)-[O(7)-O(11)]-O(9) <sup>a</sup>	37.8	O(15)-[O(2)-O(14)]-O(18) <sup>a</sup>	36.5	48.2	29.5	52.4
$\varphi_1$	O(6)-O(5)-O(1)-O(11) <sup>b</sup>	8.0	O(13)-O(15)-O(10)-O(2) <sup>b</sup>	4.6	14.1	0	25.4
$\varphi_2$	O(9)-O(8)-O(7)-O(4) <sup>b</sup>	9.2	O(18)-O(17)-O(14)-O(16) <sup>b</sup>	6.9	14.1	0	25.4



**Figure S12.** The coordination polyhedron of Tb(III) ion in complex **4**.

**Table S3**  $\delta$  ( $^\circ$ ) and  $\varphi$  ( $^\circ$ ) values for complex **4**.

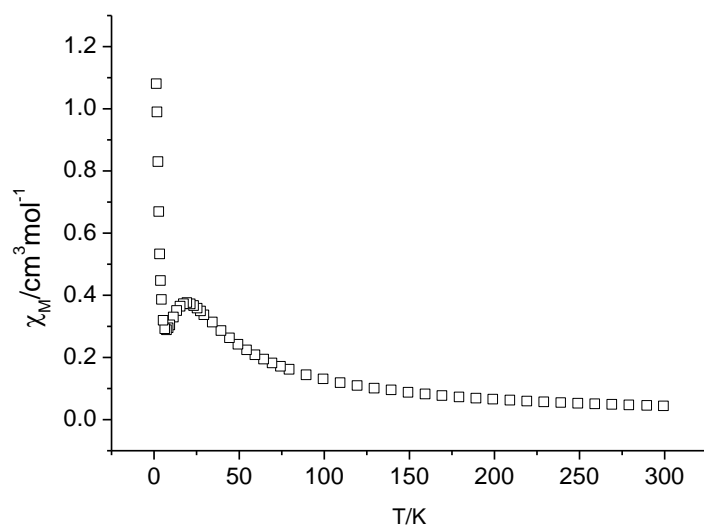
	Tb1		Tb2		TPRS	DD	SAPR
$\delta_1$	O(4)-[O(17)-O(5)]-O(9) <sup>a</sup>	18.2	O(10)-[O(11)-O(12)]-O(13) <sup>a</sup>	18.5	0.0	29.5	0.0
$\delta_2$	O(1)-[O(3)-O(6)]-O(2) <sup>a</sup>	19.1	O(18)-[O(8)-O(15)]-O(14) <sup>a</sup>	28.1	21.8	29.5	0.0
$\delta_3$	O(4)-[O(5)-O(3)]-O(2) <sup>a</sup>	36.7	O(10)-[O(11)-O(8)]-O(14) <sup>a</sup>	31.5	48.2	29.5	52.4
$\delta_4$	O(1)-[O(6)-O(17)]-O(9) <sup>a</sup>	35.0	O(18)-[O(15)-O(12)]-O(13) <sup>a</sup>	36.4	48.2	29.5	52.4
$\varphi_1$	O(4)-O(1)-O(5)-O(6) <sup>b</sup>	9.4	O(10)-O(18)-O(11)-O(15) <sup>b</sup>	6.3	14.1	0	25.4
$\varphi_2$	O(9)-O(2)-O(17)-O(3) <sup>b</sup>	7.1	O(13)-O(14)-O(12)-O(8) <sup>b</sup>	4.1	14.1	0	25.4



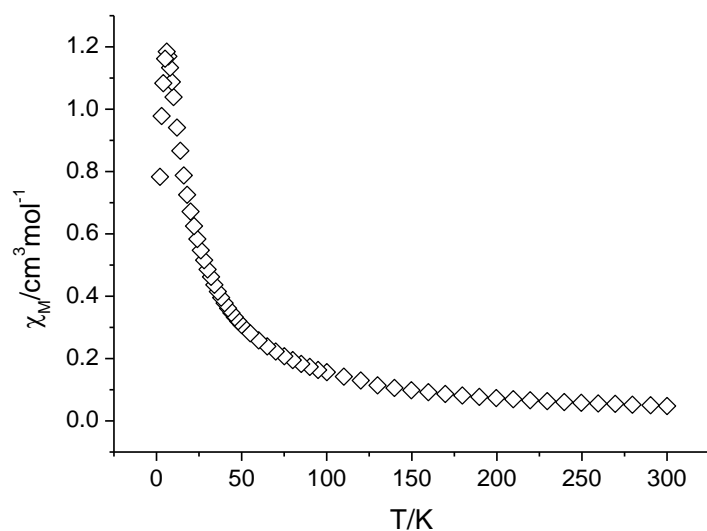
**Figure S13.** The coordination polyhedron of Dy(III) ion in complex **5**.

**Table S4**  $\delta$  ( $^\circ$ ) and  $\varphi$  ( $^\circ$ ) values for complex **5**.

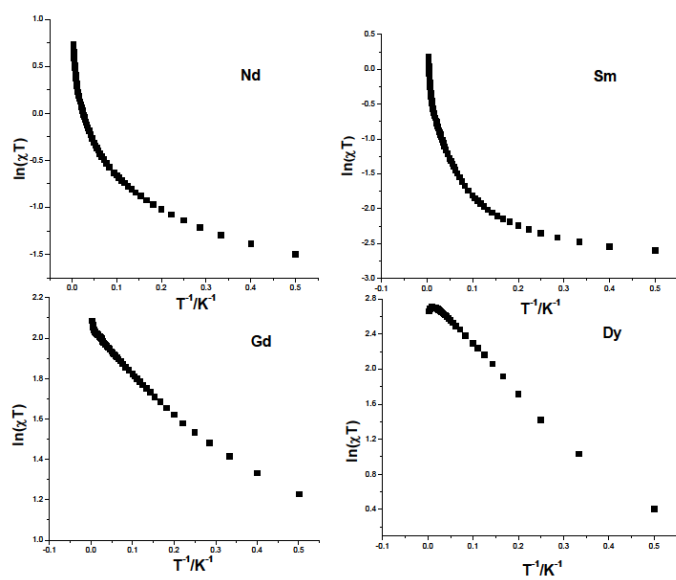
	Dy1		Dy2		TPRS	DD	SAPR
$\delta_1$	O(13)-[O(15)-O(11)]-O(10) <sup>a</sup>	17.4	O(3)-[O(7)-O(2)]-O(5) <sup>a</sup>	32.3	0.0	29.5	0.0
$\delta_2$	O(12)-[O(18)-O(9)]-O(14) <sup>a</sup>	18.6	O(1)-[O(4)-O(16)]-O(6) <sup>a</sup>	36.2	21.8	29.5	0.0
$\delta_3$	O(13)-[O(11)-O(9)]-O(14) <sup>a</sup>	36.9	O(3)-[O(7)-O(4)]-O(6) <sup>a</sup>	27.6	48.2	29.5	52.4
$\delta_4$	O(12)-[O(15)-O(18)]-O(10) <sup>a</sup>	36.1	O(1)-[O(2)-O(16)]-O(5) <sup>a</sup>	18.7	48.2	29.5	52.4
$\varphi_1$	O(13)-O(12)-O(11)-O(18) <sup>b</sup>	8.0	O(3)-O(1)-O(7)-O(16) <sup>b</sup>	4.6	14.1	0	25.4
$\varphi_2$	O(10)-O(14)-O(15)-O(9) <sup>b</sup>	9.2	O(5)-O(6)-O(2)-O(4) <sup>b</sup>	6.9	14.1	0	25.4



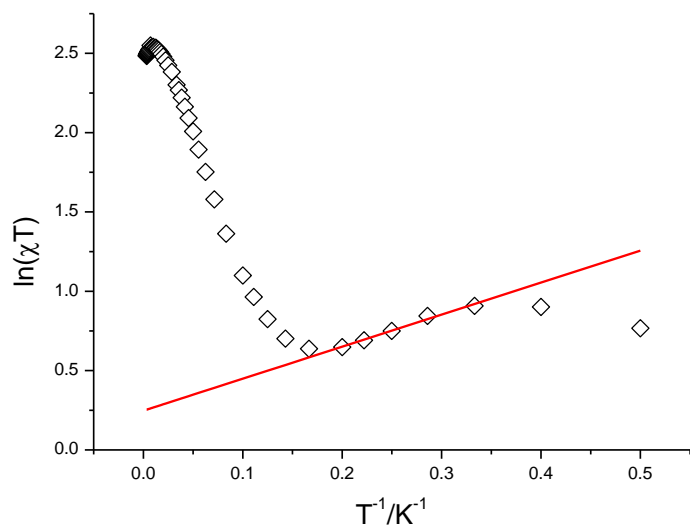
**Figure S14.**  $\chi_M$  versus  $T$  plot for **4**.



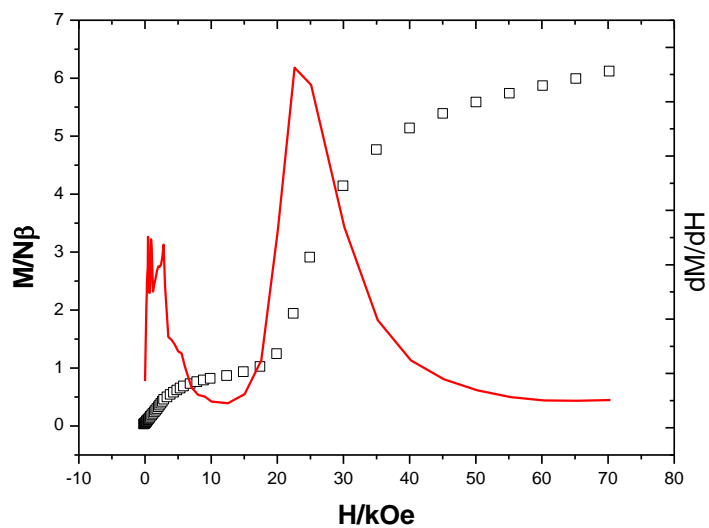
**Figure S15.**  $\chi_M$  versus  $T$  plot for **5**.



**Figure S16.**  $\ln(\chi T)$  vs.  $1/T$  plot for **1**, **2**, **3** and **5**.



**Figure S17.**  $\ln(\chi T)$  vs.  $1/T$  plot for **4** and the solid line representing the linear fit.



**Figure S18.** Plots of  $M$  vs  $H$  and  $dM/dH$  vs  $H$  for **4** at 2.0K.



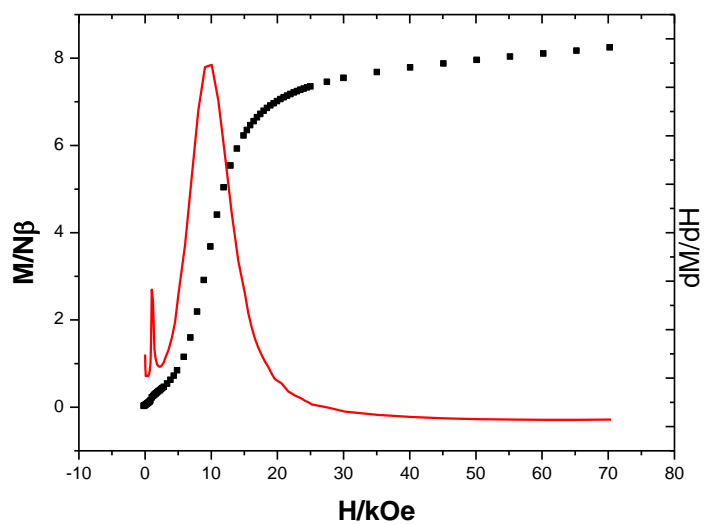


Figure S19. Plots of  $M$  vs  $H$  and  $dM/dH$  vs  $H$  for **5** at 2.0K.

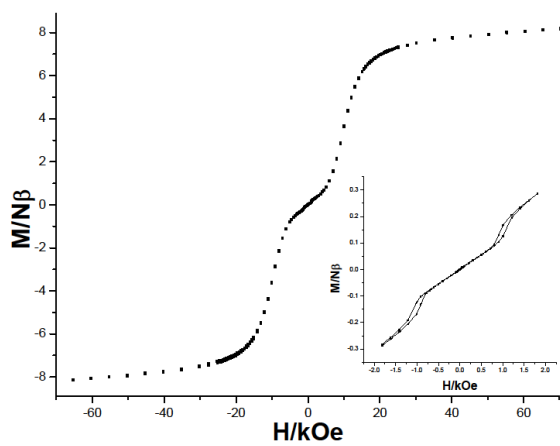


Figure S20. The hysteresis loop at 2.0 K for **5**.

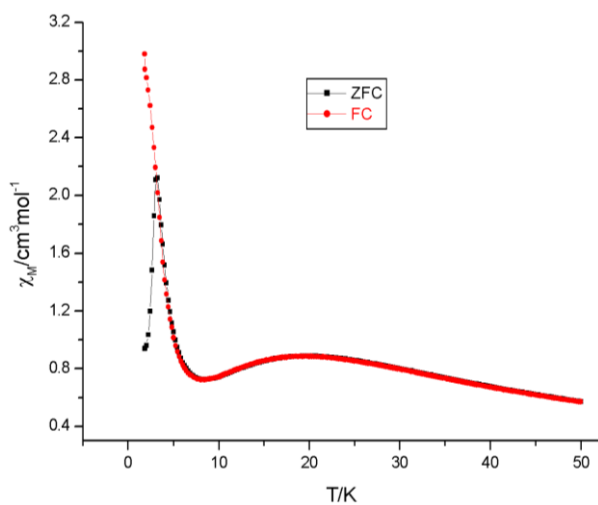
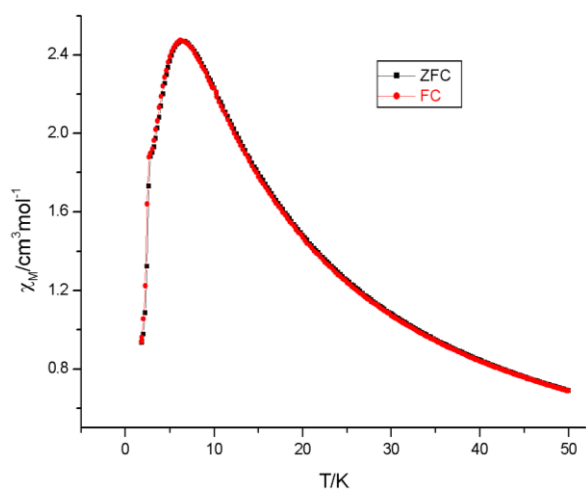
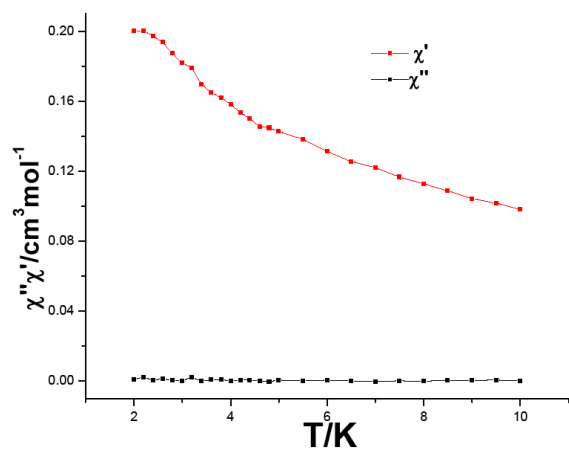


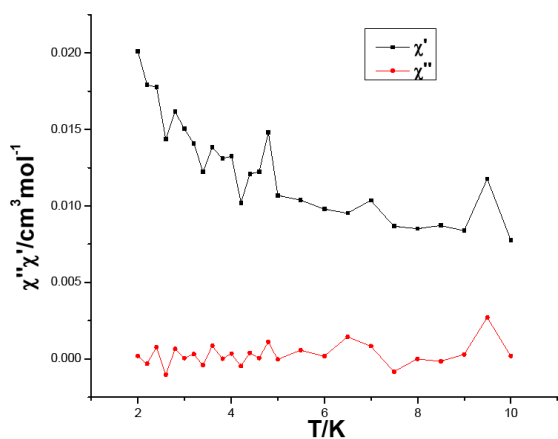
Figure S21 The field-cooled(FC) and Zero-field-cooled(ZFC) susceptibility at 50 Oe for **4**



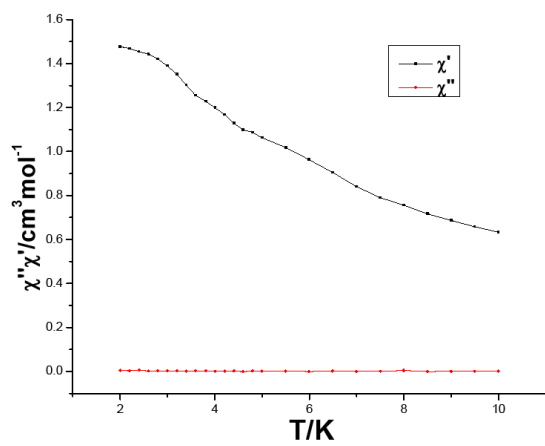
**Figure S22** The field-cooled(FC) and Zero-field-cooled(ZFC) susceptibility at 50 Oe for **5**



**Figure S23.** Temperature-dependent ac magnetic susceptibility of **1** in zero dc field with an oscillating of 3.5 Oe.



**Figure S24.** Temperature-dependent ac magnetic susceptibility of **2** in zero dc field with an oscillating of 3.5 Oe.



**Figure S25.** Temperature-dependent ac magnetic susceptibility of **3** in zero dc field with an oscillating of 3.5 Oe.