Electronic Supplementary Material (ESI) for Dalton Transactions.

Electronic Supporting Information

The ferromagnetic $[Ln_2Co_6]$ heterometallic complexes

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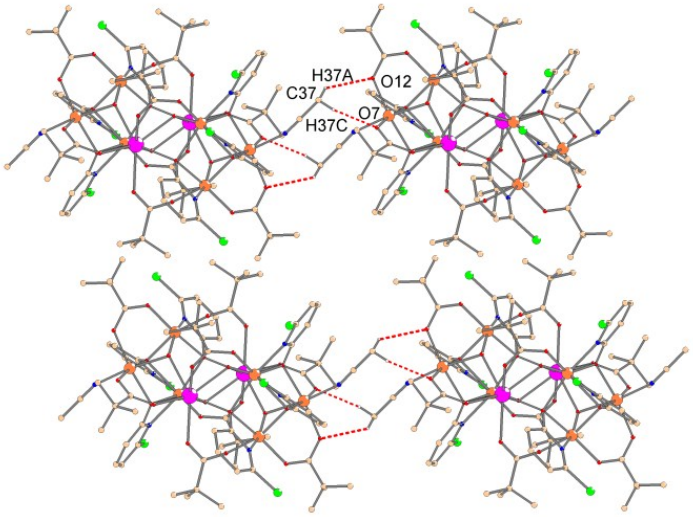

Fig. S1 The packing structure of complex **1**. The dashed lines represent hydrogen bonds.

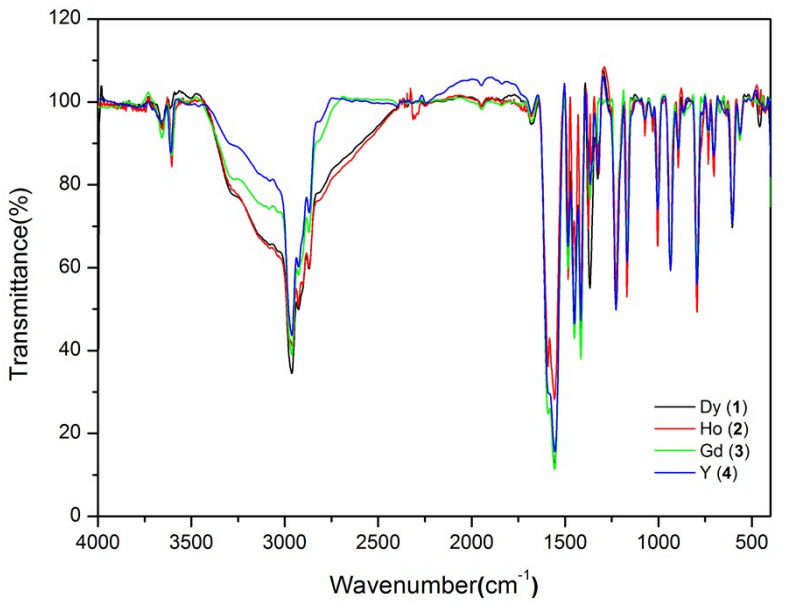

Fig. S2 The FTIR spectra for complexes **1**-**4** (crystals).

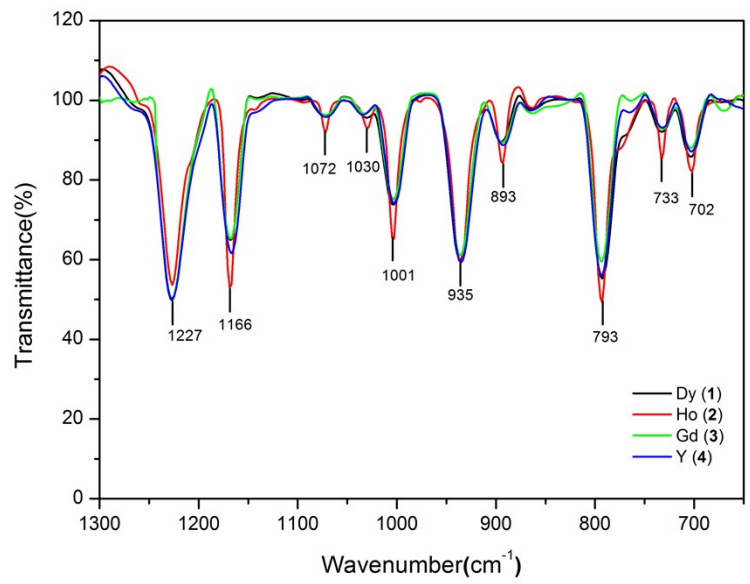

Fig. S3 The diagnostic C-O and C-H patterns in complexes **1**-**4**.

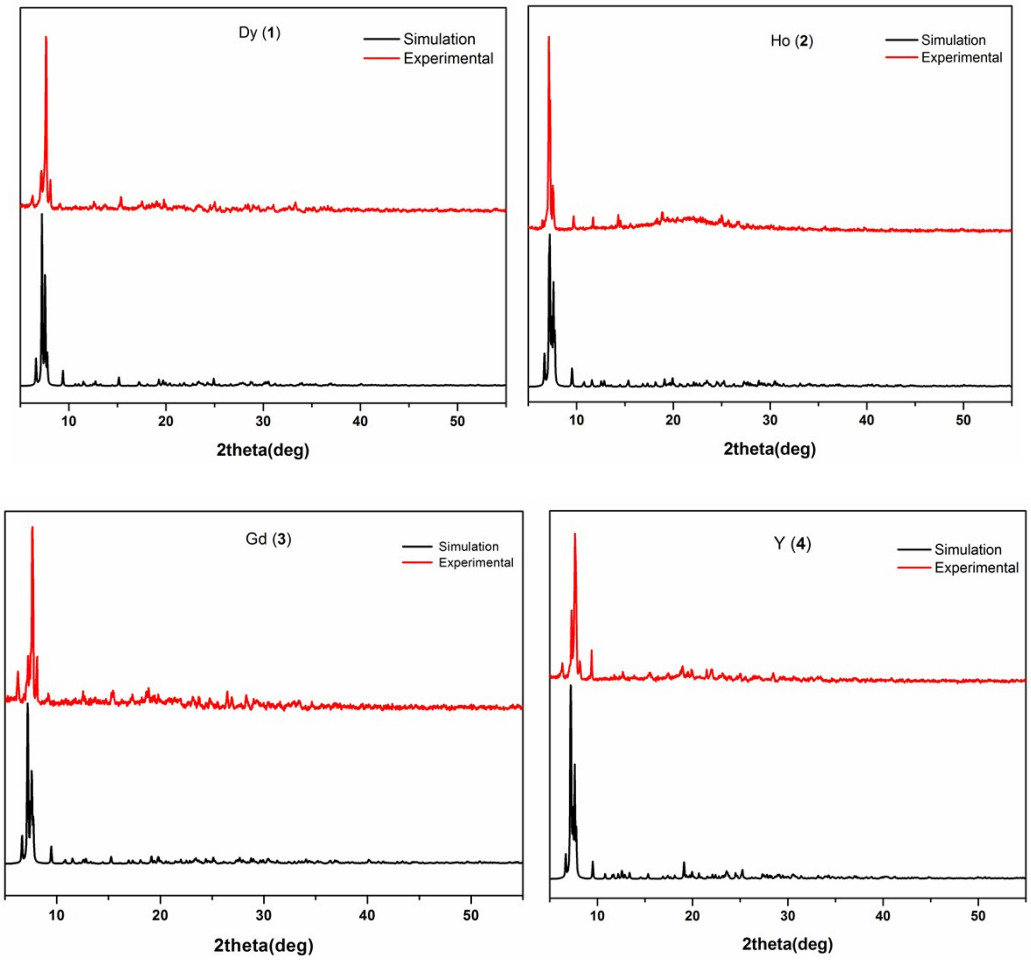

Fig. S4 The PXRD patterns for complexes **1**-**4**.

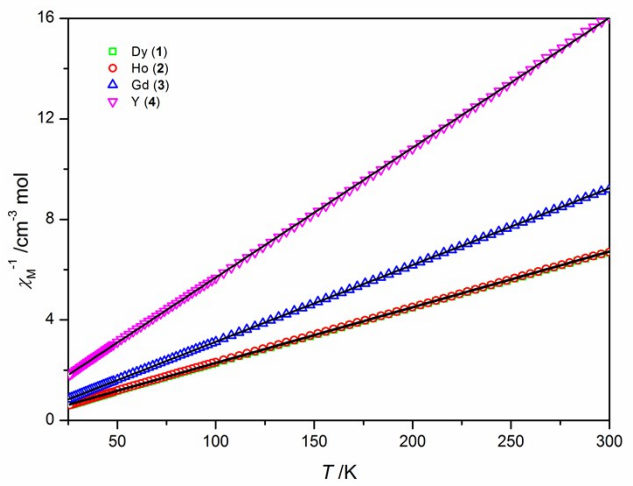

Fig. S5 The plots of $1/\chi_m$ versus T for complexes **1**-**4** between 25-300 K, and the solid lines represent the best fitting for the Curie-Weiss law $\chi = C/(T-\vartheta)$.

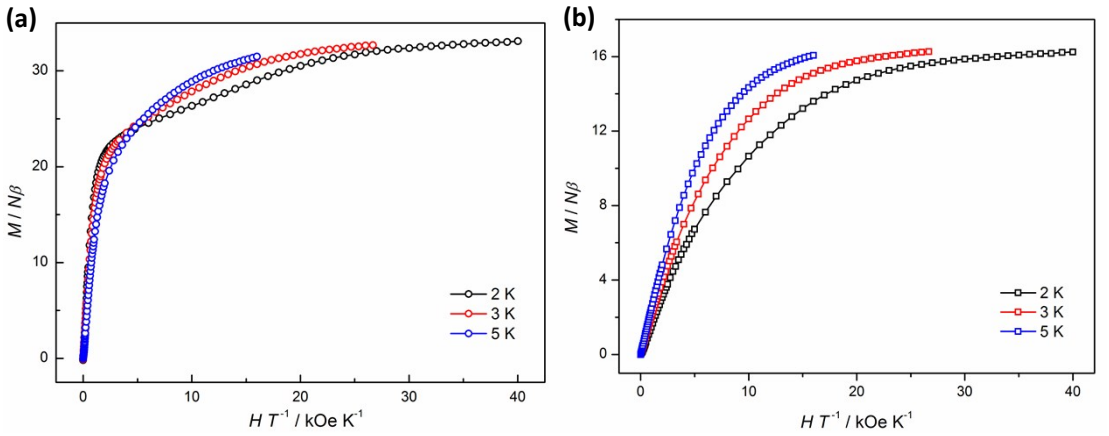

Fig. S6 The plots of M versus H/T for **1** (**a**) and **4** (**b**) at different temperatures (2, 3 and 5 K).

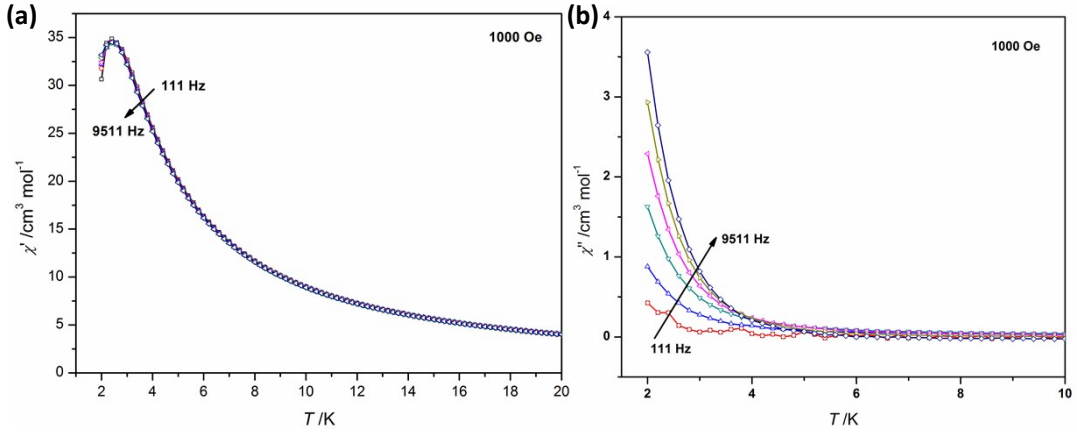

Fig. S7 The temperature dependence of χ' (**a**) and χ'' (**b**) components for **1** under a 1000 Oe dc field.

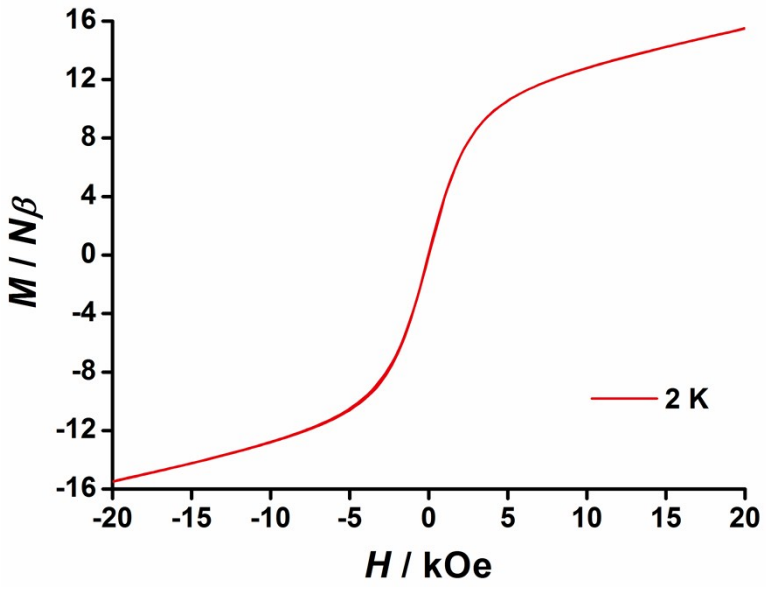

Fig. S8 Magnetic hysteresis loop at 2 K for **1**. Magnetic hysteresis loop was measured at a sweep rate of 0.02 T s^{-1} at 2 K for the crystalline sample.

Table S1 The average bond lengths associated with Ln^{III} and Co^{II} ions, and the separations between $Co^{II}\cdots Ln^{III}$ and $Co^{II}\cdots Co^{II}$, for complexes **1**-**4**.

lengths	**1**	**2**	**3**	**4**	lengths	**1**	**2**	**3**	**4**
Ln-O	2.366	2.353	2.385	2.348	Ln···Ln	3.896	3.876	3.935	3.875
Co1-O	2.089	2.091	2.085	2.086	Co1···Ln	3.449	3.437	3.460	3.430
Co2-O	2.060	2.054	2.055	2.053	Co2···Ln	3.982	3.956	3.994	3.953
Co3-O	2.101	2.093	2.094	2.092	Co3···Ln	3.767	3.760	3.801	3.760
Co1-N	2.105	2.097	2.104	2.102	Co1···Co2	3.114	3.111	3.109	3.108
Co2-N	2.156	2.146	2.145	2.154	Co1···Co3	3.827	3.863	3.864	3.840
Co3-N	2.153	2.145	2.149	2.156	Co2···Co3	3.426	3.412	3.424	3.391

Table S2 Bond-Valence Sum (BVS) calculations for Co and O atoms in **1**.

Atoms	BVS	Assignment	Atoms	BVS	Assignment
Co1	2.210	II	O1	1.147	OH^-
Co2	2.111	II	O2	1.129	OH^-
Co3	1.892	II			

Table S3 The resulted parameters from the fitting of Curie-Weiss law for complexes **1**-**4**.

	1	**2**	**3**	**4**
C (cm^3 mol^{-1} K)	45.23	45.11	32.85	17.93
ϑ (K)	-2.64	-3.66	-3.21	-9.94