Supporting Information for

Multiple thermal magnetic relaxation in a two-dimensional ferromagnetic dysprosium(III) metal-organic framework

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Table S1. Continuous Shape Measures calculation for the Dy(III) ions in complex **1**.

Dy1, nine-coordination

Dy1	EP-9	OPY-9	HBPY-9	JTC-9	JCCU-9	CCU-9	JCSAPR-9	CSAPR-9	JTCTPR-9	TCTPR-9	JTDIC-9	HH-9	MFF-9
ABOXIY	33.716	23.895	17.892	13.309	8.801	7.612	2.174	1.217	1.912	1.210	11.301	11.616	1.797

EP-9	1	D9h	Enneagon
OPY-9	2	C8v	Octagonal pyramid
HBPY-9	3	D7h	Heptagonal bipyramid
JTC-9	4	C3v	Johnson triangular cupola J3
JCCU-9	5	C4v	Capped cube J8
CCU-9	6	C4v	Spherical-relaxed capped cube
JCSAPR-9	7	C4v	Capped square antiprism J10
CSAPR-9	8	C4v	Spherical capped square antiprism

JTCTPR-9 9 D3h Tricapped trigonal prism J51

TCTPR-9 10 D3h Spherical tricapped trigonal prism

JTDIC-9 11 C3v Tridiminished icosahedron J63

HH-9 12 C2v Hula-hoop

MFF-9 13 Cs Muffin

Dy2, eight-coordination

Dy2	OP-8	HPY-8	HBPY-8	CU-8	SAPR-8	TDD-8	JGBF-8	JETBPY-8	JBTPR-8	BTPR-8	JSD-8	TT-8	ETBPY-8
ABOXIY	30.363	23.407	16.796	9.798	0.366	1.872	16.253	28.942	2.580	1.725	4.911	10.547	24.476

OP-8 1 D8h Octagon

HPY-8 2 C7v Heptagonal pyramid

HBPY-8 3 D6h Hexagonal bipyramid

CU-8 4 Oh Cube

SAPR-8 5 D4d Square antiprism

TDD-8 6 D2d Triangular dodecahedron

JGBF-8 7 D2d Johnson gyrobifastigium J26

JETBPY-8 8 D3h Johnson elongated triangular bipyramid J14

JBTPR-8 9 C2v Biaugmented trigonal prism J50

BTPR-8 10 C2v Biaugmented trigonal prism

JSD-8 11 D2d Snub diphenoid J84

TT-8 12 Td Triakis tetrahedron

ETBPY-8 13 D3h Elongated trigonal bipyramid

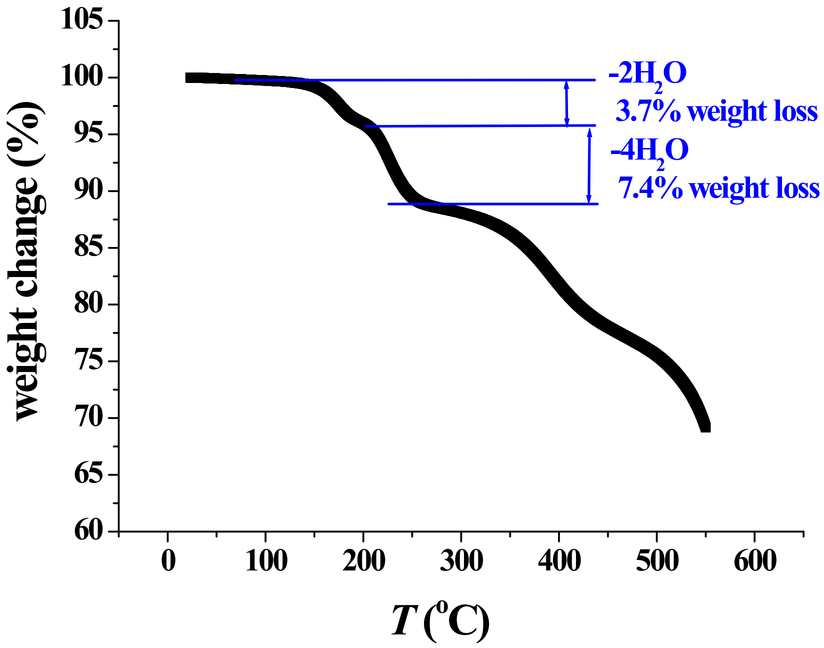

Fig. S1. TGA curve for complex **1**.

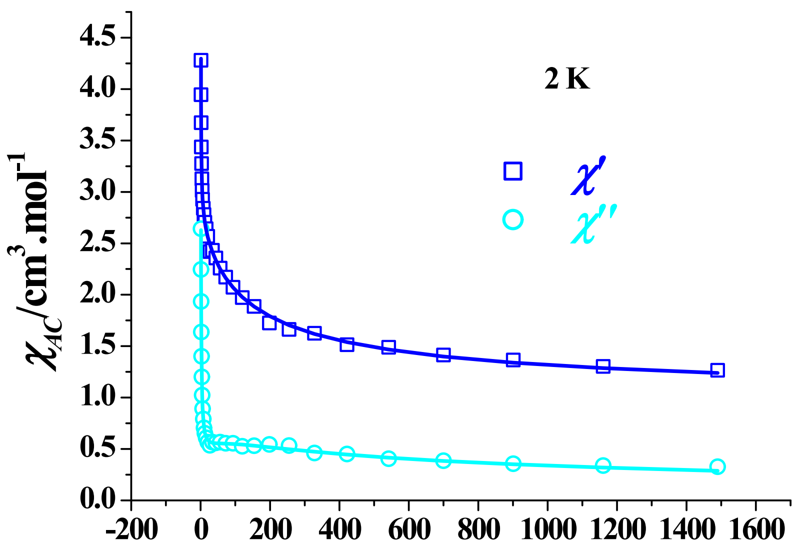

Fig. S2. Frequency dependence of the in-phase (χ', top) and out-of-phase (χ'', bottom) ac susceptibility of **1** at 2 K. the solid lines represent the best fitting with the sum of two modified Debye functions

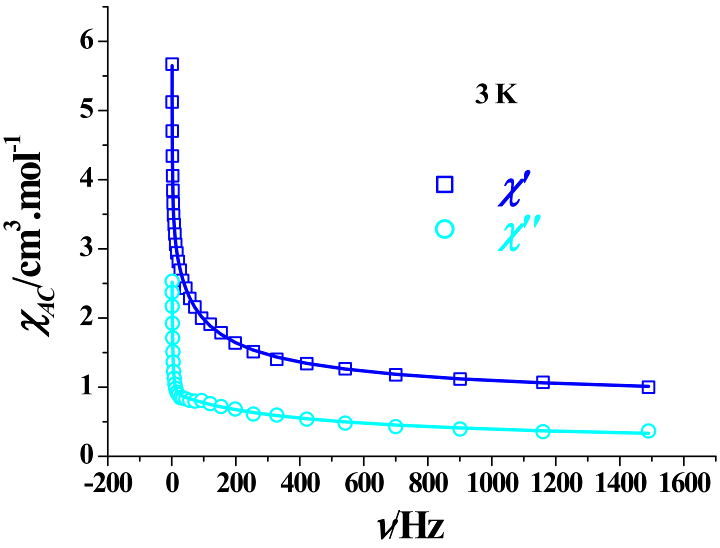

Fig. S3. Frequency dependence of the in-phase (χ', top) and out-of-phase (χ'', bottom) ac susceptibility of **1** at 3 K. the solid lines represent the best fitting with the sum of two modified Debye functions.

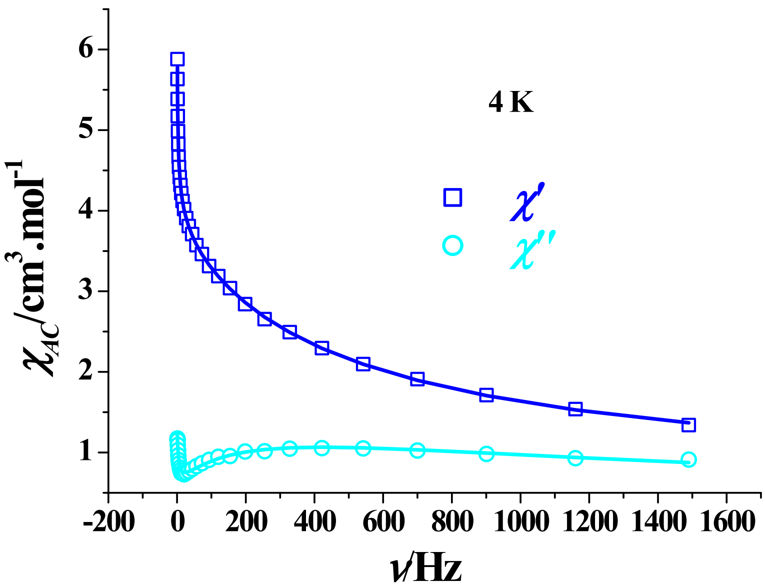

Fig. S4. Frequency dependence of the in-phase (χ', top) and out-of-phase (χ'', bottom) ac susceptibility of **1** at 4 K. the solid lines represent the best fitting with the sum of two modified Debye functions.

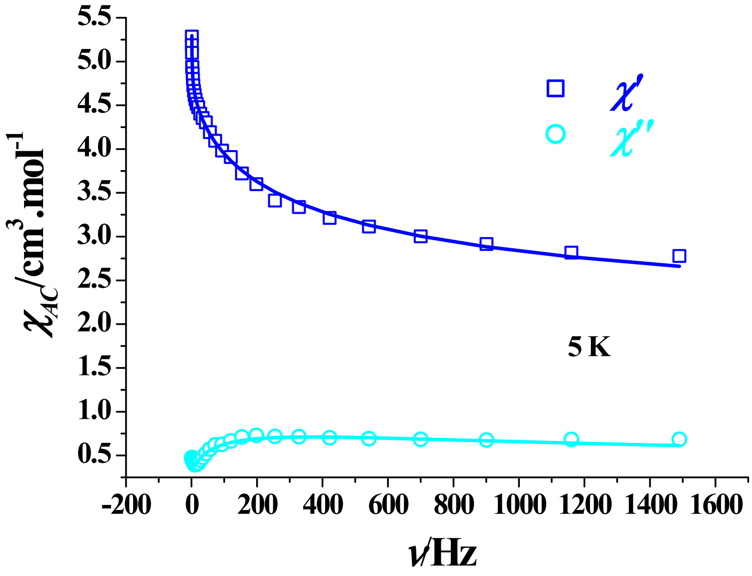

Fig. S5. Frequency dependence of the in-phase (χ', top) and out-of-phase (χ'', bottom) ac susceptibility of **1** at 5 K. the solid lines represent the best fitting with the sum of two modified Debye functions.

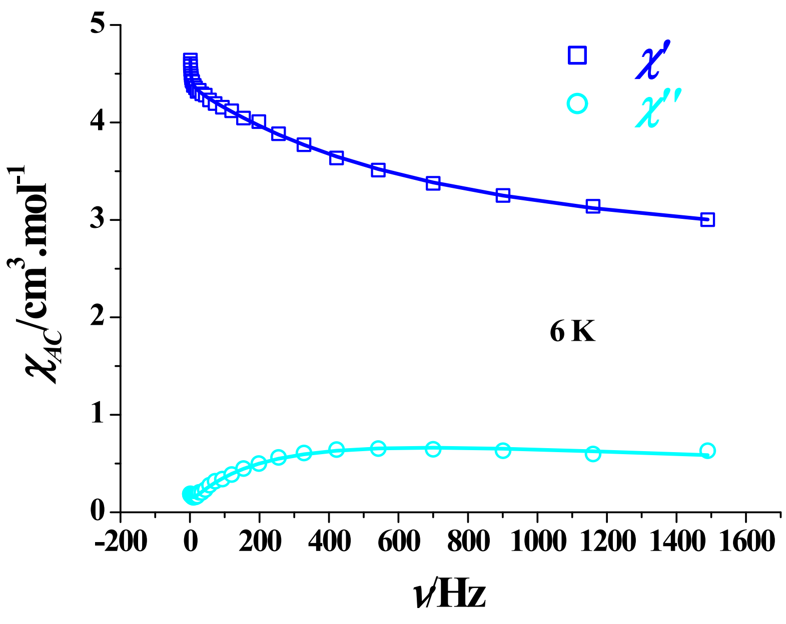

Fig. S6. Frequency dependence of the in-phase (χ', top) and out-of-phase (χ'', bottom) ac susceptibility of **1** at 6 K. the solid lines represent the best fitting with the sum of two modified Debye functions.

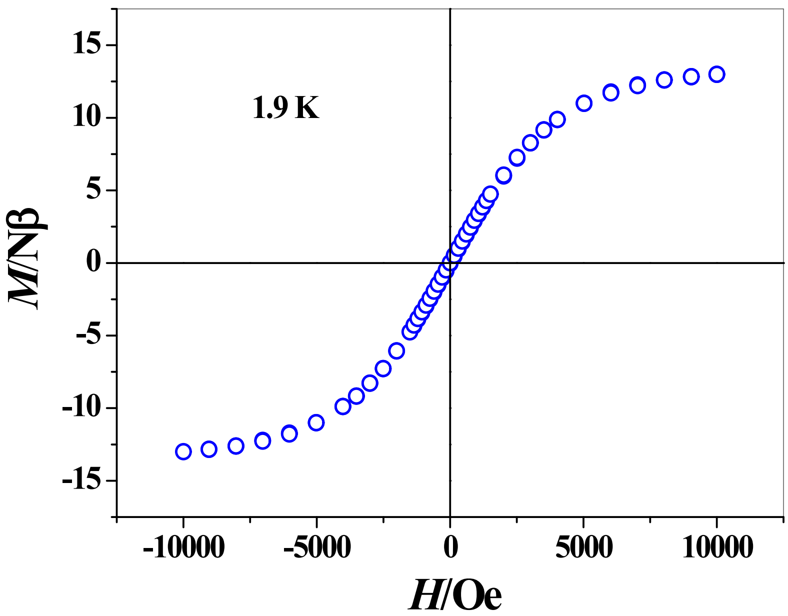

Figure S7. Plot of M versus H at 1.9 K from −10000 to 10000 Oe for **1**.

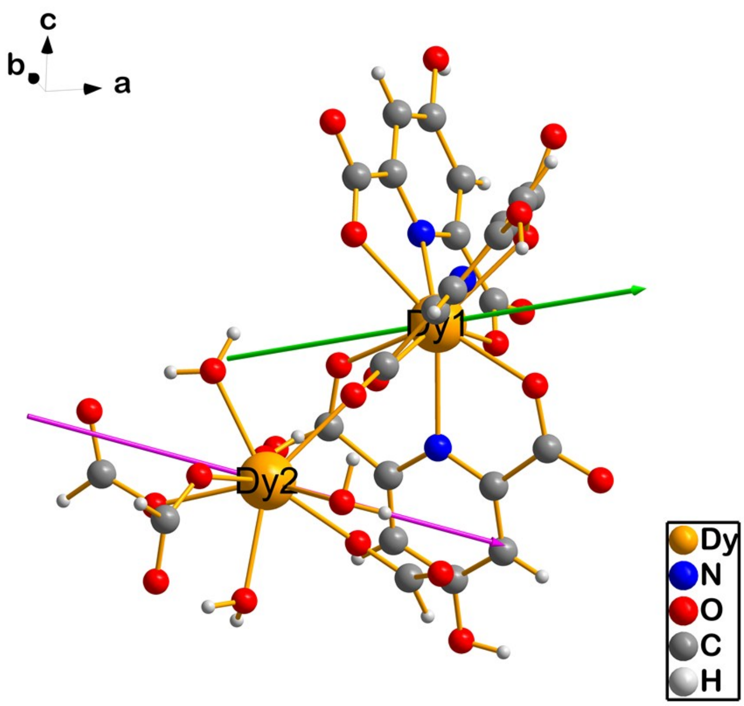

Figure S8. The fragment for CASSCF/RASSI calculations. The vectors are the calculated easy axes (green for Dy1 and pink for Dy2).

Table S2. Linear combination of two modified Debye model fitting parameters from 2 K to 6 K of **1** under 2k Oe dc field.

T(K)	χ_2(cm^3.mol^{-1})	χ_1(cm^3.mol^{-1})	χ_0(cm^3.mol^{-1})	τ_1(s)	α_1	τ_2(s)	α_2
2	13.6195	2.87424	0.94387	0.00114	0.40658	0.6535	0.16444
3	9.40215	3.77649	0.66312	0.00257	0.44481	0.22462	0.10008
4	9.64635	3.7187	0.37426	0.00031	0.33492	0.43189	0.48279
5	5.74306	4.9487	1.67699	0.00042	0.48001	0.1375	0.04474
6	4.90616	2.41576	4.36308	0.00023	0.24372	0.14306	0.2792