Electronic Supporting Information for "Erbium-formate frameworks templated by diammonium cations: syntheses, structures, structural sransition and magnetic properties" by Mengyuan Li *et al.*

Table S1. Fitting data of Cole-Cole semicircles of **1** using extended Debye model at different temperatures and different fields.

T, K	χ_S, cm^3mol^{-1}	χ_T, cm^3mol^{-1}	τ, s	α	R
1.8	1.90	4.10	0.159	0.15	3.1×10^{-4}
1.9	2.01	4.14	0.169	0.17	1.5×10^{-4}
2.0	2.15	3.95	0.158	0.17	1.2×10^{-4}
2.1	2.25	3.85	0.163	0.20	1.9×10^{-4}
2.2	2.34	3.79	0.181	0.20	1.8×10^{-4}
2.4	2.43	3.57	0.226	0.29	3.0×10^{-5}
2.5	2.47	3.61	0.331	0.30	2.7×10^{-5}
2.6	2.48	3.29	0.282	0.26	2.7×10^{-5}

H, Oe	χ_S, cm^3mol^{-1}	χ_T, cm^3mol^{-1}	τ, s	α	R
400	3.65	4.34	0.241	0.34	1.3×10^{-5}
600	3.29	4.18	0.140	0.13	1.1×10^{-5}
1000	2.48	3.99	0.151	0.08	1.4×10^{-4}
1250	2.15	3.99	0.165	0.18	9.1×10^{-5}
1600	1.63	3.35	0.174	0.007	9.9×10^{-4}
1800	1.63	3.35	0.174	0.00	1.8×10^{-3}

Table S2. Fitting data of Cole-Cole semicircles of **2** using extended Debye model, and the relaxation time data derived from the peak positions of χ'' *versus f* plots at different temperatures and different fields.

T, K	χ_S, cm^3mol^{-1}	χ_T, cm^3mol^{-1}	$^a\tau$, s	$^b\tau_p$, s	α	R
1.8	1.40	3.20	0.211	0.209	0.061	6.8×10^{-5}
2.0	1.47	2.95	0.118	0.122	0.067	7.8×10^{-5}
2.2	1.60	2.75	0.082	0.084	0.070	6.0×10^{-5}
2.4	1.63	2.54	0.063	0.069	0.16	6.9×10^{-5}
2.6	1.72	2.37	0.060	0.063	0.16	2.7×10^{-5}
2.8	1.71	2.23	0.054	0.062	0.25	1.2×10^{-5}
3.0	1.81	2.07	0.069	0.062	0.020	4.7×10^{-5}
3.2	1.68	1.99	0.053	0.059	0.36	1.2×10^{-5}
3.4	1.66	1.88	0.057	0.061	0.35	8.1×10^{-6}

H, Oe	χ_S, cm^3mol^{-1}	χ_T, cm^3mol^{-1}	τ, s	τ_p, s	α	R
400	2.71	3.03	0.029	0.040	0.32	4.7×10^{-6}
600	2.48	3.01	0.037	0.040	0.23	8.9×10^{-6}
800	2.18	3.00	0.042	0.044	0.24	2.2×10^{-5}
1000	1.88	2.99	0.049	0.055	0.28	4.3×10^{-5}
1250	1.59	2.97	0.063	0.064	0.27	7.2×10^{-5}
1500	1.35	2.93	0.078	0.080	0.28	1.3×10^{-4}
1800	1.16	2.87	0.104	0.110	0.26	1.8×10^{-4}
2000	1.00	2.87	0.127	0.127	0.29	2.2×10^{-4}
4000	0.50	2.30	0.401	0.398	0.21	5.1×10^{-4}
6000	0.34	1.64	0.629	0.531	0.18	6.3×10^{-4}
10000	0.23	0.84	0.904	0.796	0.21	6.9×10^{-4}
15000				0.692		

a. relaxation time from fitting procedure. *b*. relaxation time from the peak positions of χ'' *versus f* plots.

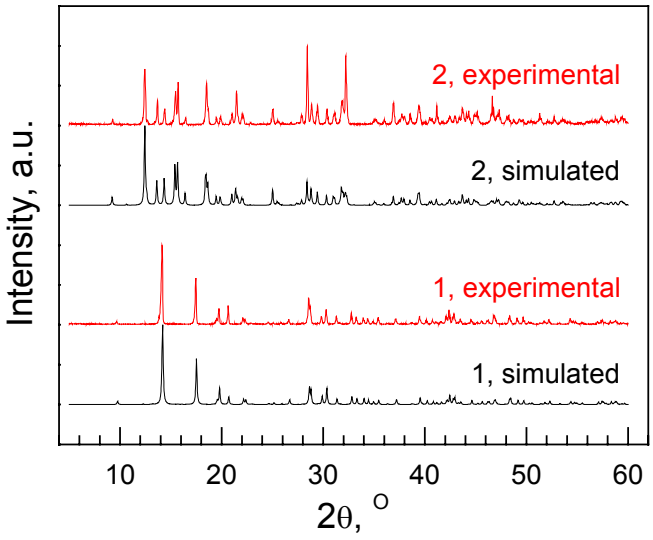

Fig. S1. The experimental PXRD patterns at room temperature and the simulated ones based on the single crystal structures of **1** to **2** at 290 K.

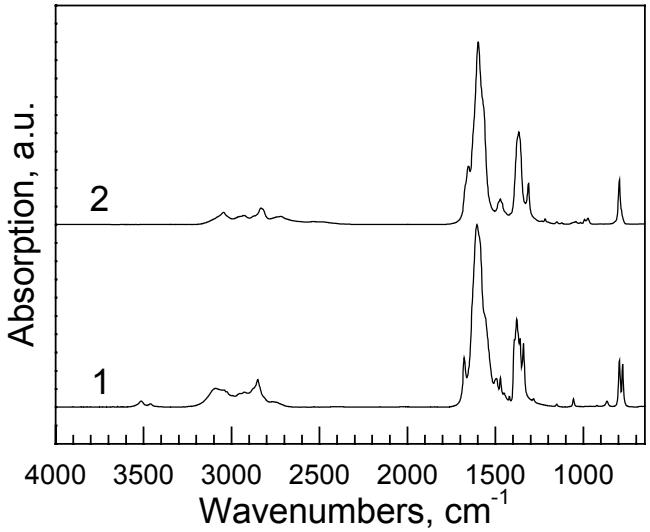

Fig. S2. IR spectra of **1** and **2** at room temperature.

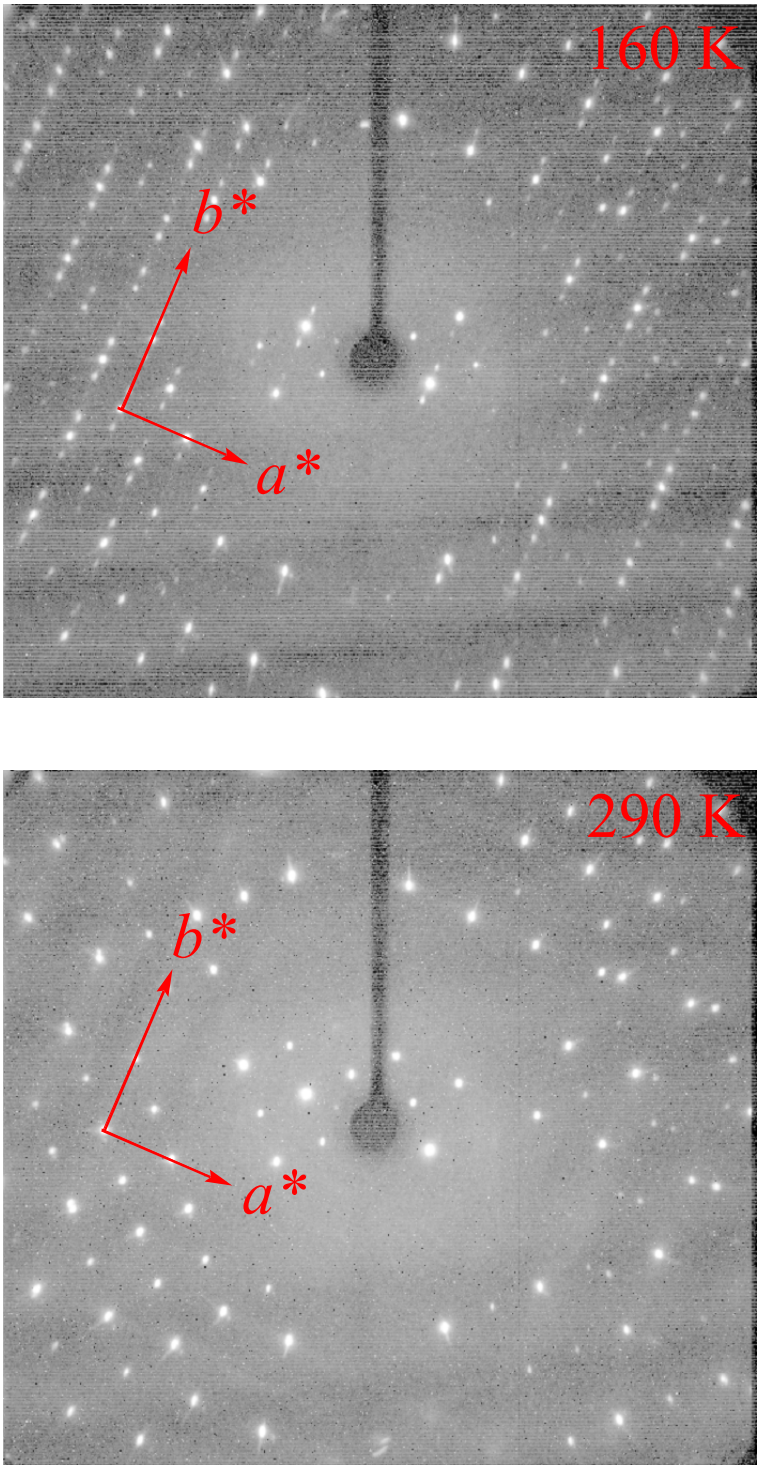

Fig. S3. The oscillation images of **2** at 160 K and 290 K, collected with the *c*-axis toward the primary beam and oscillated around an axis perpendicular to *c*-axis. At 160 K newly appeared diffraction spots indicated the doubling of *b* axis.

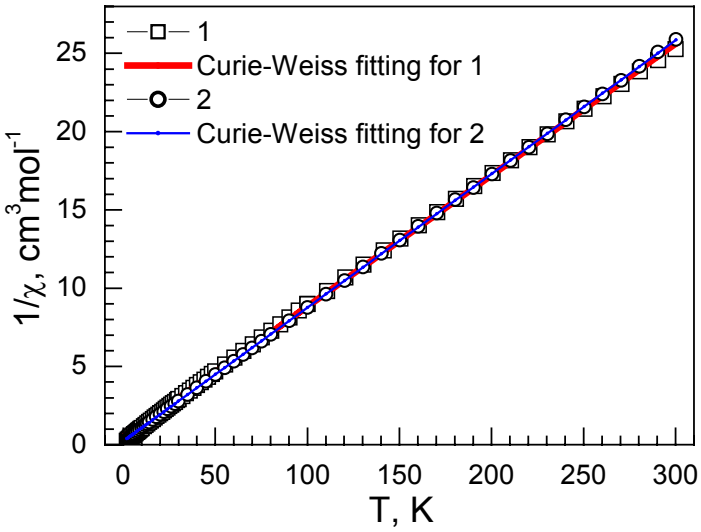

Fig. S4. The 1/χ *vs* T plots for **1** and **2**, with the Curie-Weiss fits in red and blue lines.

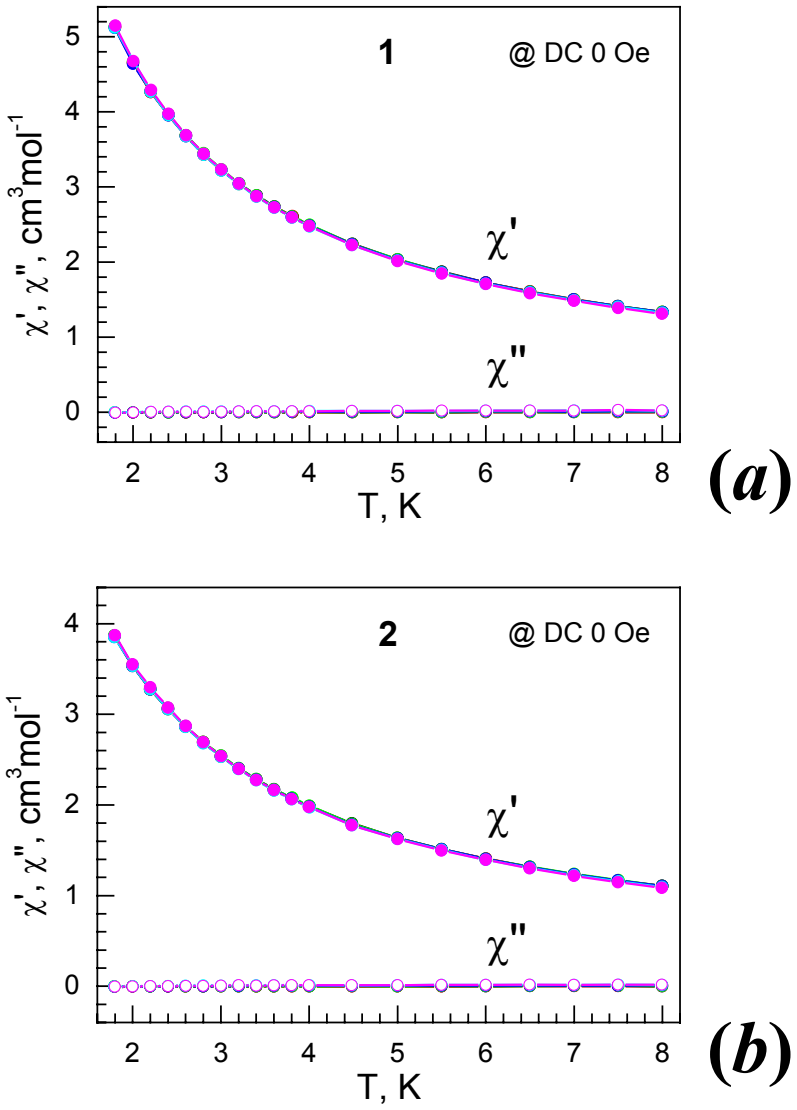

Fig. S5. Temperature dependence of ac susceptibilities of **1** (a) and **2** (b) under a zero dc field with an oscillating field of 3 Oe in frequencies of 10, 32, 100, 320, 1000 and 1500 Hz.

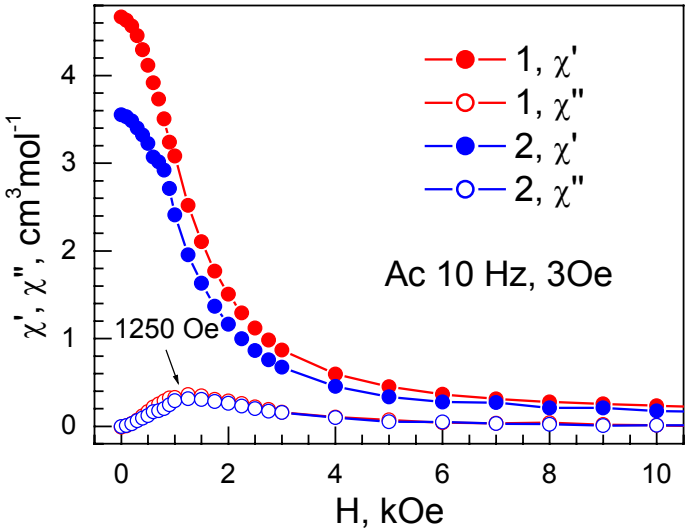

Fig. S6. Isothermal ac susceptibilities with an oscillating field of 3 Oe and frequency of 10 Hz for **1** and **2** at 2.0 K, under different bias static fields.

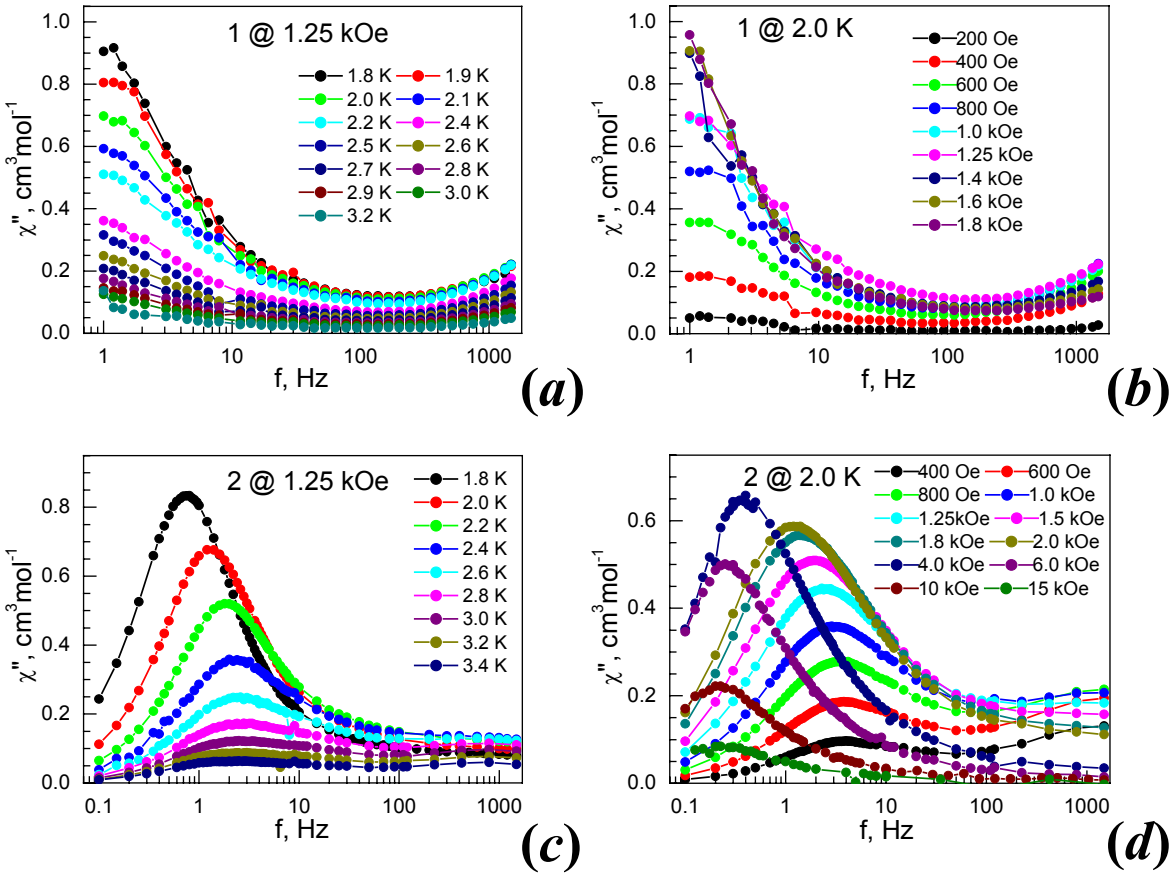

Fig. S7. χ'' *versus f* plots for **1** (a and b) and **2** (c and d)

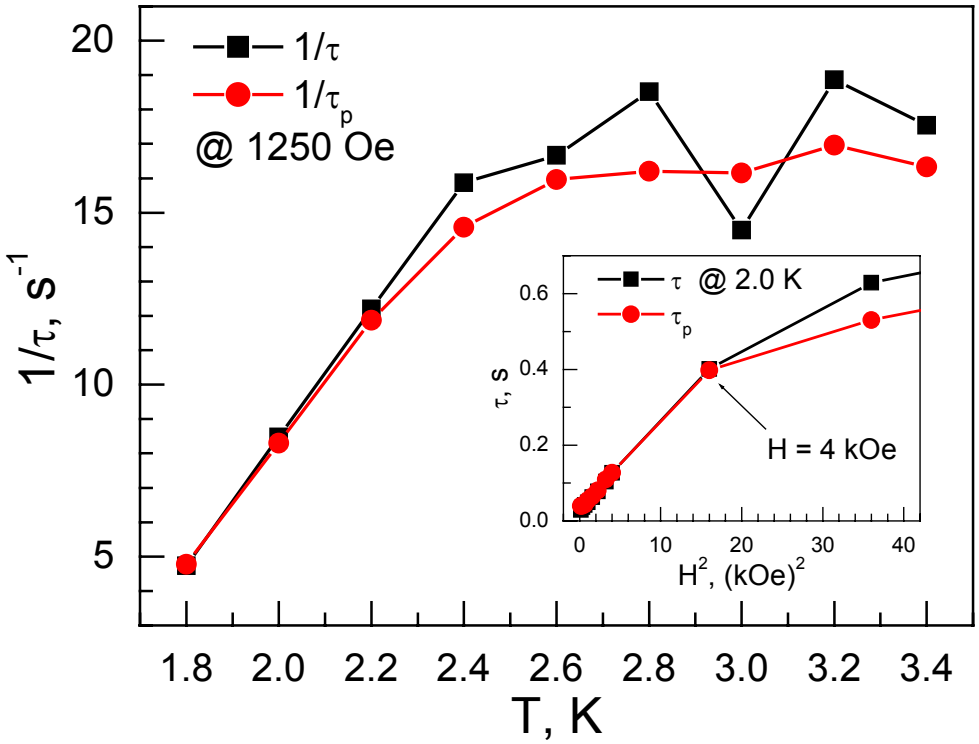

Fig. S8. 1/τ *versus* T and τ *versus* H^2 (inset) plots for **2**. Lines are for guiding.