Electronic Supplementary Material (ESI) for Dalton Transactions.

Supplementary Information

Slow magnetization dynamics in Co(II)/Co(III) triethanolamine/pivalate complexes

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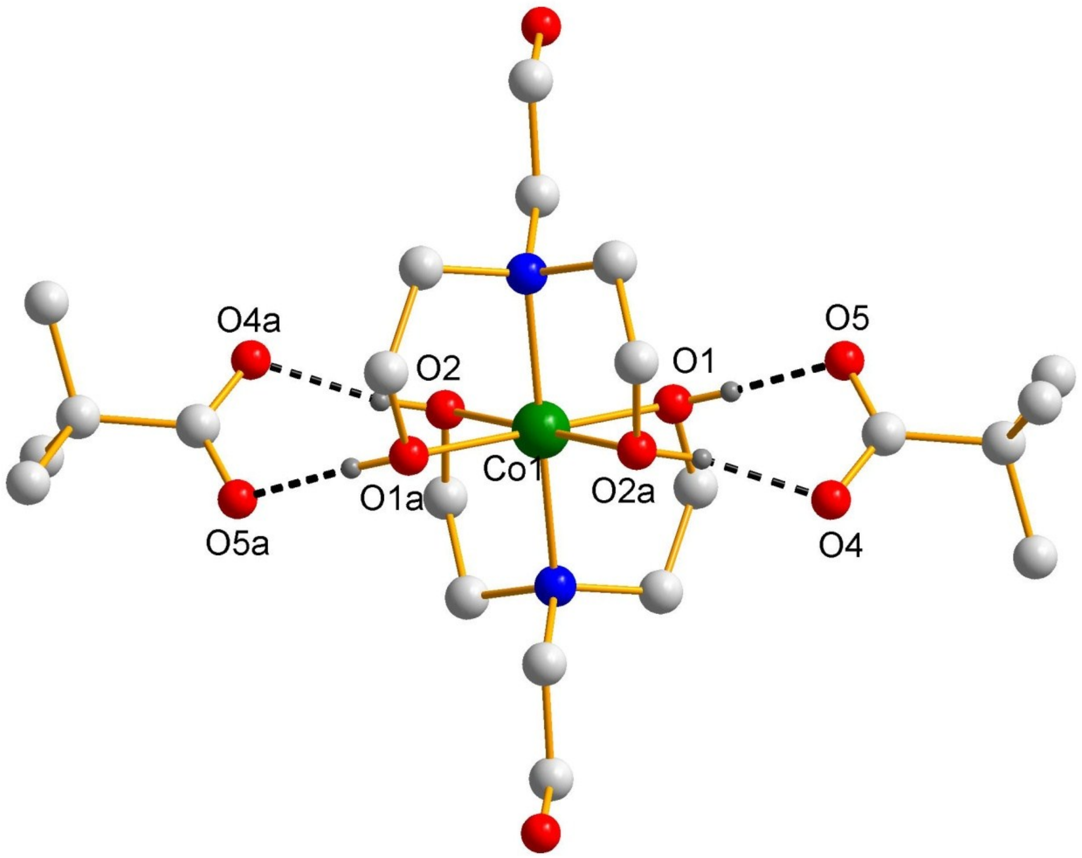

Figure SI1. Molecular representation of compound **1** in crystal structure showing H-bond interaction of pivalate counterions. H atoms have been omitted for sake of clarity. Symmetry equivalence operation, a: 1-*x*,1-*y*,1-*z*. Green: cobalt, red: oxygen, blue: nitrogen, light grey: carbon.

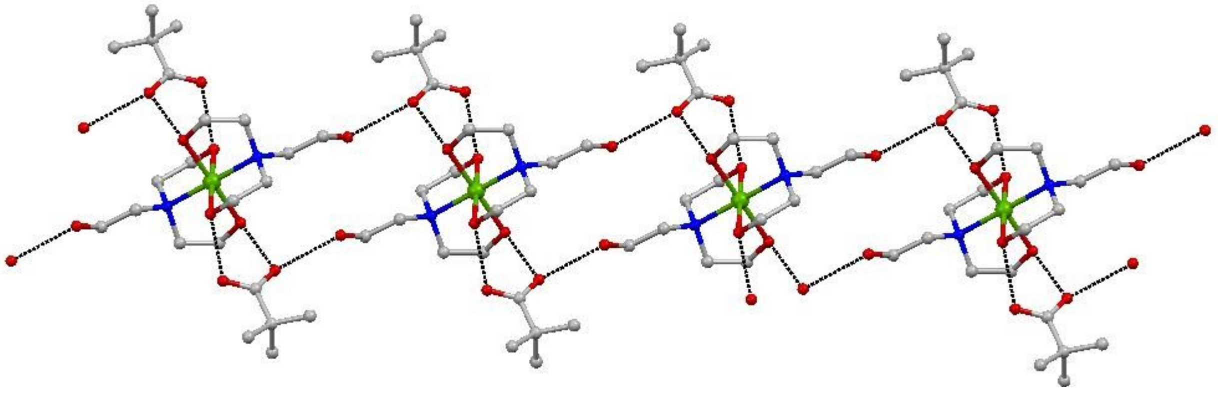

Figure SI2. Molecular representation of compound **1** crystal structure H-bond network along *b*-axis direction. H atoms have been omitted for sake of clarity. Green: cobalt, red: oxygen, blue: nitrogen, light grey: carbon.

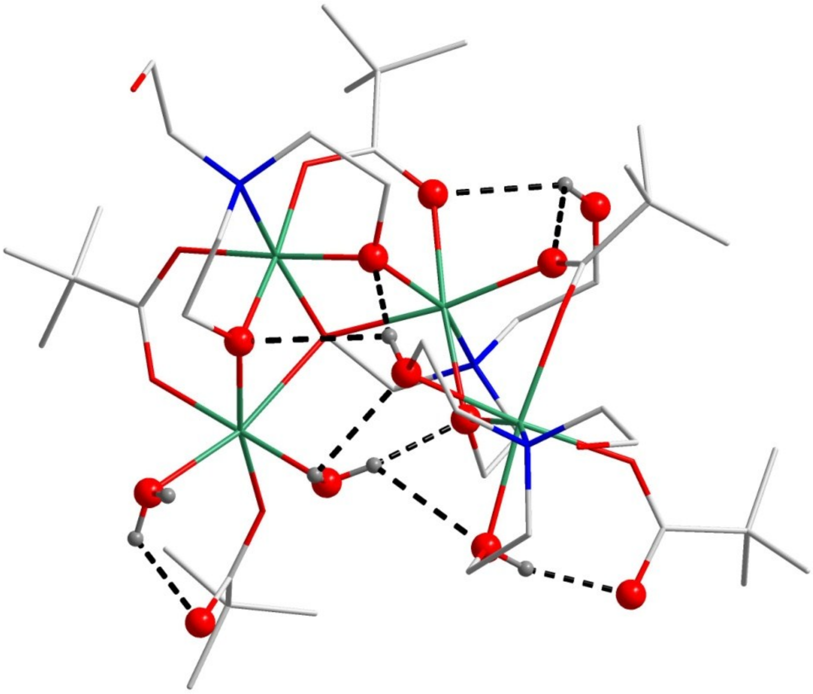

Figure SI3. Stick/ball molecular representation of compound **2** in crystal structure emphasizing the H-bond intra-molecular network. H atoms have been omitted for sake of clarity. Green: cobalt, red: oxygen, blue: nitrogen, light grey: carbon.

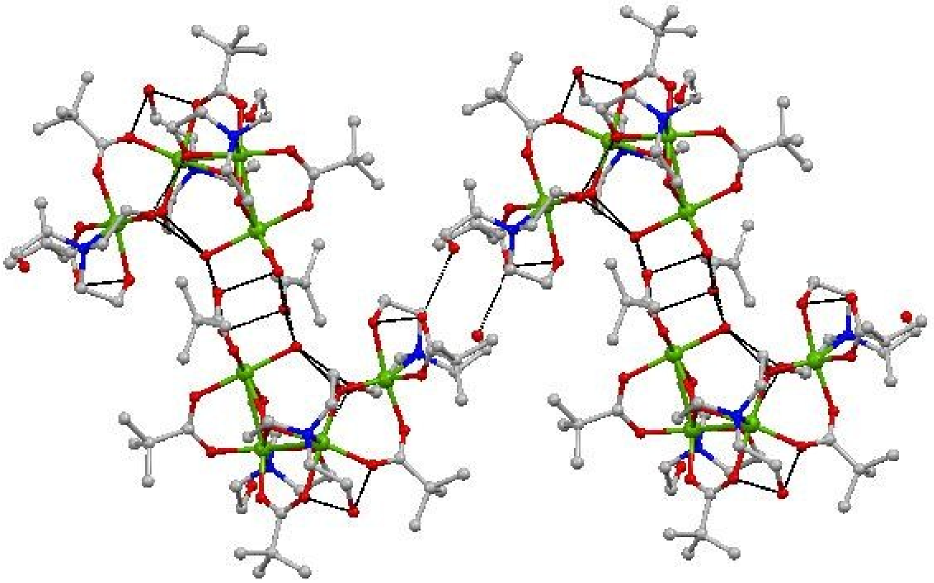

Figure SI4. Stick/ball molecular representation of compound **2** in crystal structure emphasizing the H-bond inter-molecular network. H atoms have been omitted for sake of clarity. Green: cobalt, red: oxygen, blue: nitrogen, light grey: carbon.

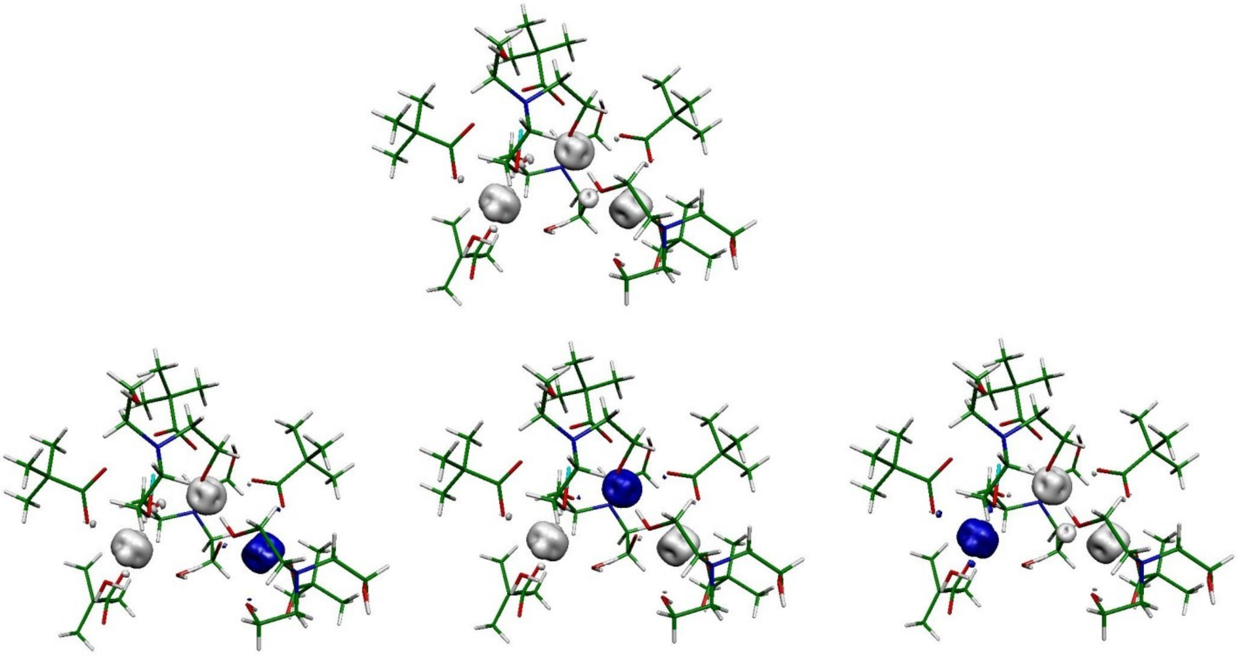

Figure SI5. Spin density isosurfaces (0.03 a.u.) arising from BS-DFT calculations of compound **1.** Top: High spin state (HS). Bottom: Broken symmetry states (BS). Green: cobalt, red: oxygen, blue: nitrogen, light grey: carbon.

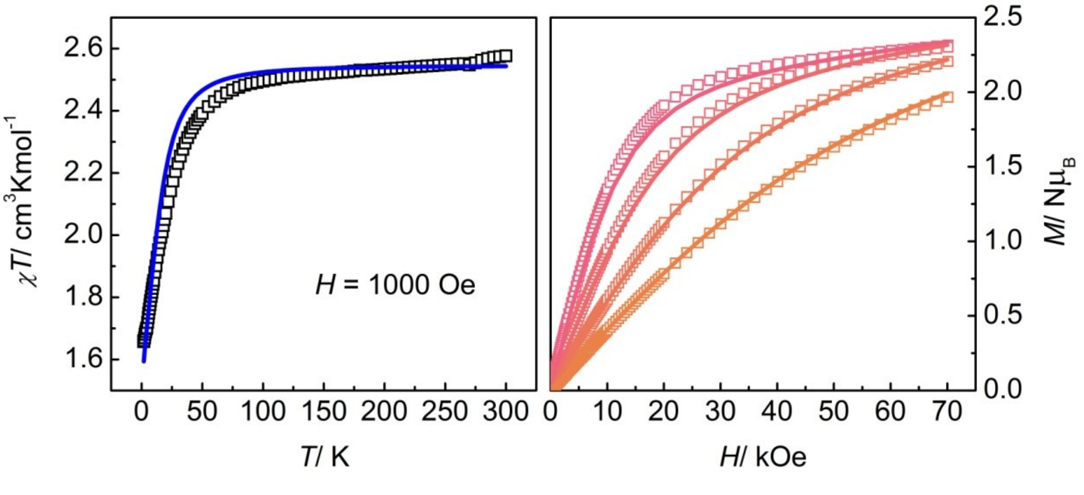

Figure SI6. Left: χT *vs*. T data of compound **1** measured at 1000 Oe. Right: M *vs*. H in the range 1.85-8 K data of compound **1**. Open symbols correspond to experimental points and full line correspond to simulation with D and E/D parameters obtained from the ab-initio quantum chemical calculations (Table 2), g factor fixed at 2.34 and Hamiltonian of Eq. 1 (see text).

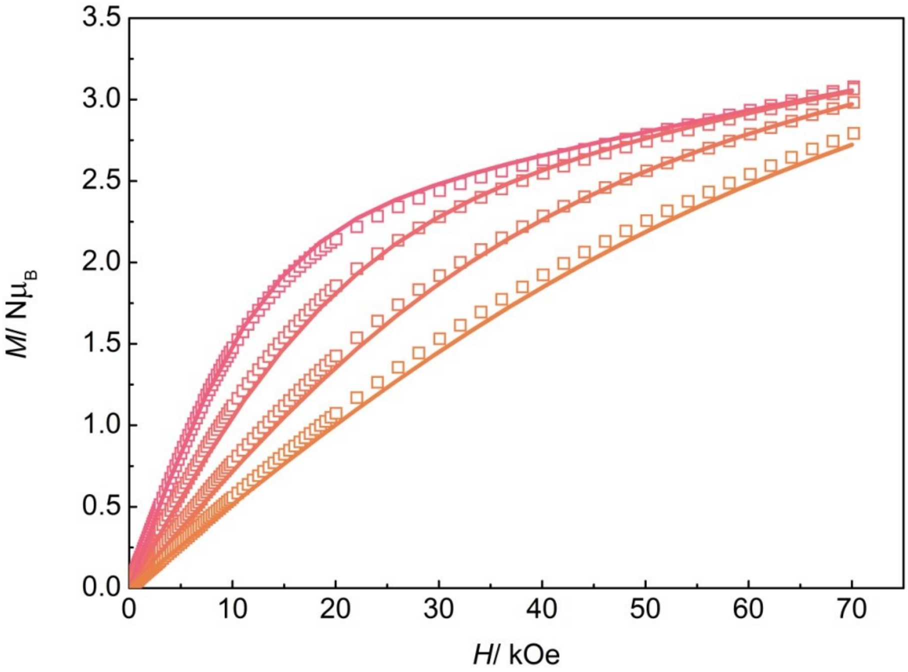

Figure SI7. M vs. H in the range 1.85 - 8 K data of compound **2**. Open symbols correspond to experimental points and full line correspond to best fitting with a three anisotropic exchange coupled $S_{\mathrm{eff}} = 1/2$ model (Hamiltonian Eq. 3) (see text).

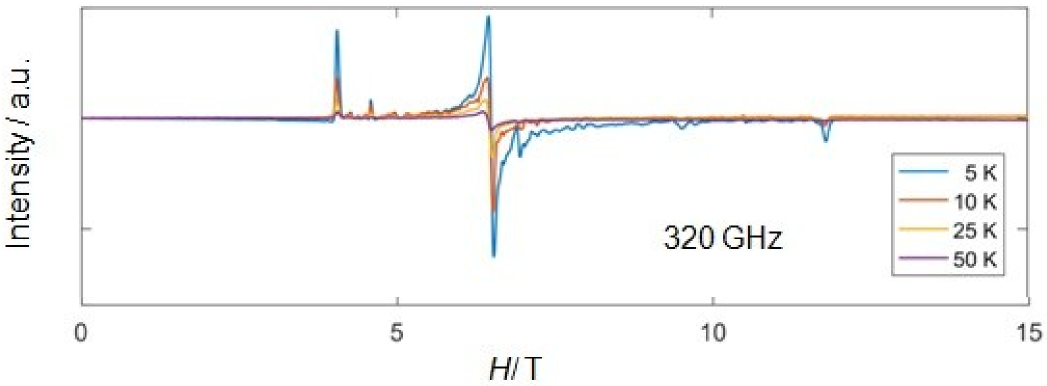

Figure SI8. HF-EPR of a complex **1** powder sample measured at 320 GHz at variable temperature.

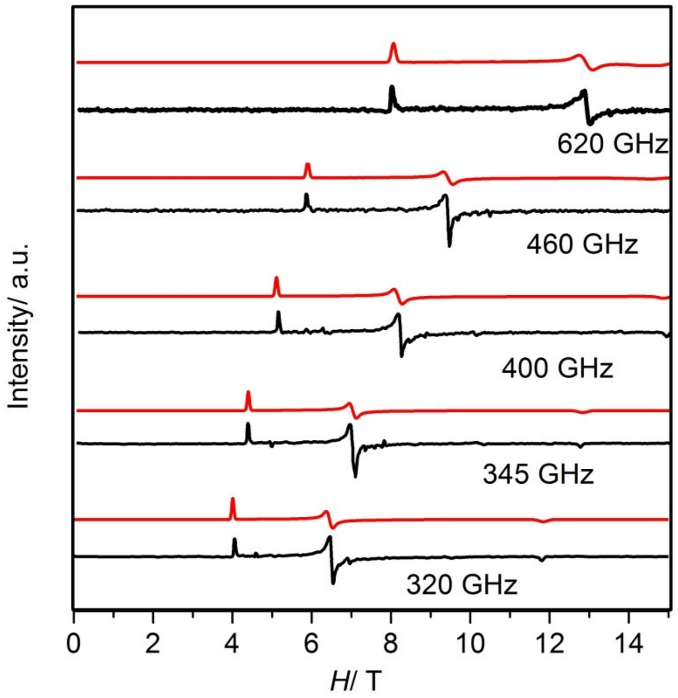

Figure SI9. HF-EPR spectra measured at 5K and variable microwave frequency of a compound **1** powder sample. Black: experimental; Red: simulated with DC magnetic data experimental ZFS *D* parameter (3 mT linewidth, and 0.04 *g*-strain).

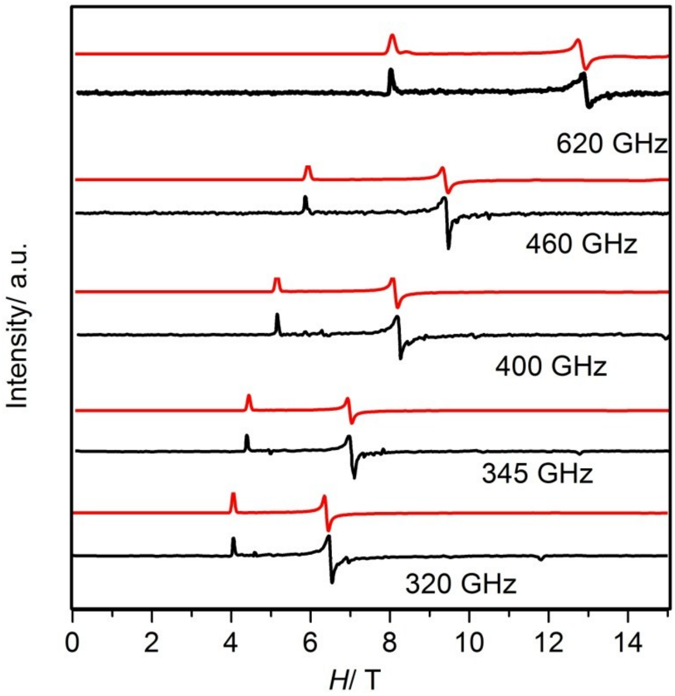

Figure SI10. HF-EPR spectra measured at 5K and variable microwave frequency of a compound **1** powder sample. Black: experimental; Red: simulated with quantum chemical ab-initio ZFS *D* and *E/D* parameters (3 mT linewidth, and 0.04 *g*-strain).

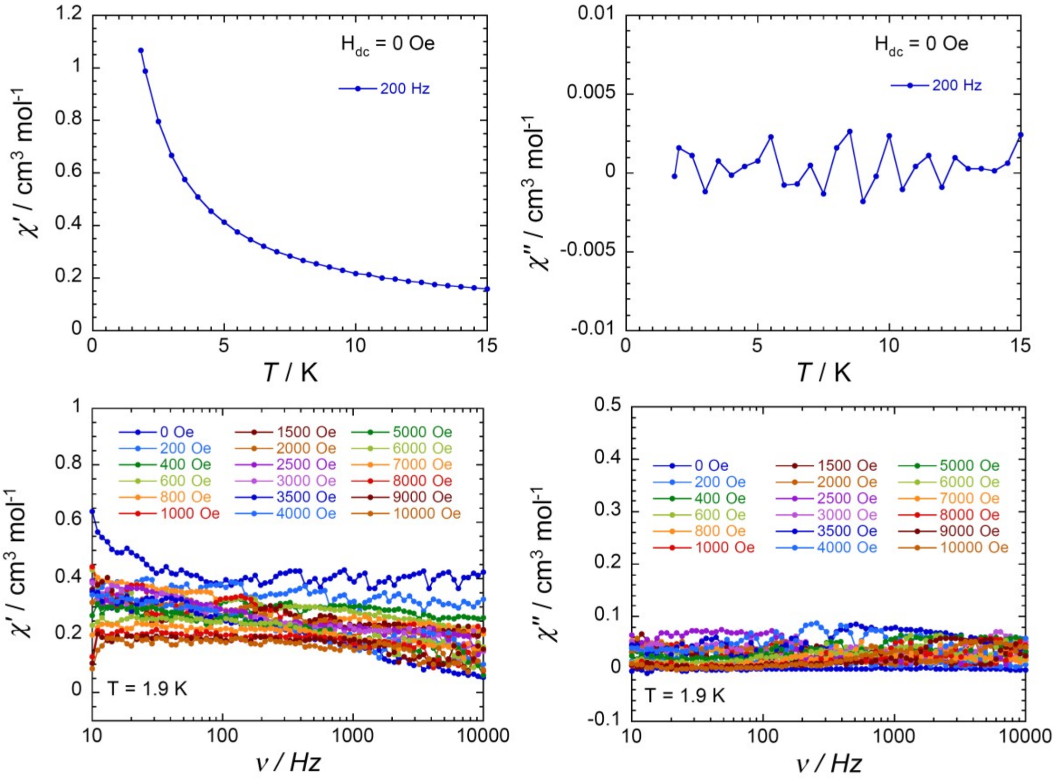

Figure SI11. AC susceptibility data for compound **1** at different external applied DC fields in the range 1.9 - 15 K.

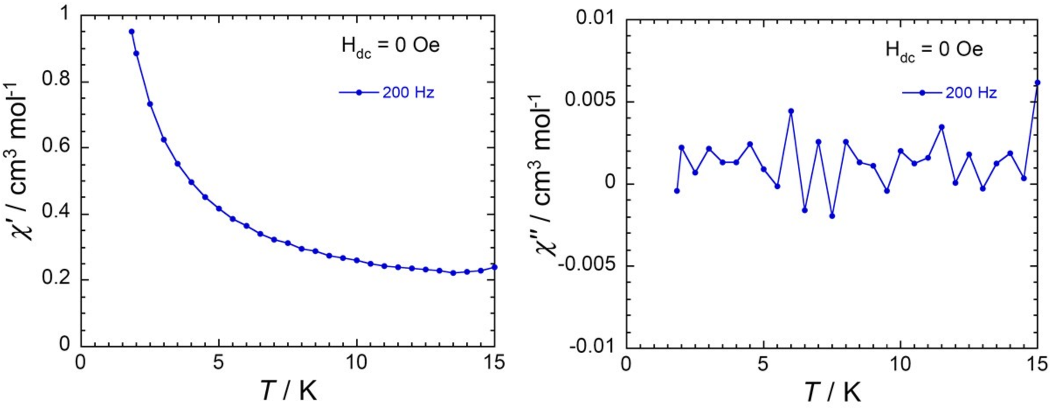

Figure SI12. AC susceptibility data for compound **2** at zero DC field in the range 1.9 - 15 K under a 200 Hz driving field frequency.

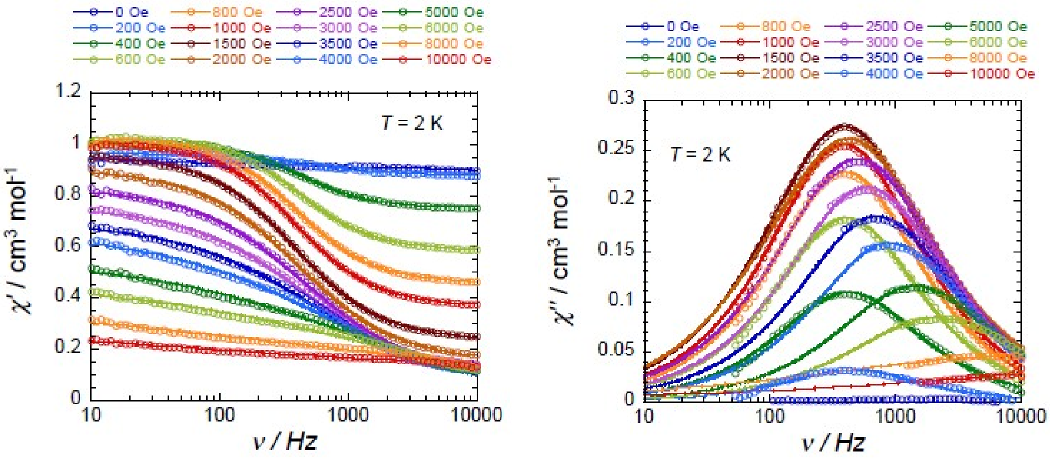

Figure SI13. AC susceptibility data for compound **2** at 2K under DC applied fields in the range 0-10000 Oe and with driving frequencies between 10-10000Hz. Full lines correspond to best fitting through generalized Debye model (see text).