Two Azido-Bridged Homospin Fe(II)/Co(II) Coordination Polymers Featuring Single-Chain Magnet Behavior

Jiong Yang, Yi-Fei Deng* and Yuan-Zhu Zhang*

Department of Chemistry, Southern University of Science and Technology, Shenzhen, 518055, P. R. China.

Table S1. The fitting results for **1** under zero dc field by a generalized Debye model.

T / K	τ / s	α
3.4	5.13×10^{-2}	0.59
3.5	1.95×10^{-2}	0.55
3.6	9.59×10^{-3}	0.52
3.7	5.15×10^{-3}	0.49
3.8	2.99×10^{-3}	0.48
3.9	1.73×10^{-3}	0.48
4.0	9.98×10^{-4}	0.47
4.1	5.74×10^{-4}	0.47
4.2	3.41×10^{-4}	0.47
4.3	1.86×10^{-4}	0.48
4.4	9.05×10^{-5}	0.48
4.5	4.32×10^{-5}	0.48
4.6	1.96×10^{-5}	0.47

Table S2. The fitting results for **2** under zero dc field by a generalized Debye model.

T / K	τ / s	α
2.0	1.06×10^{-1}	0.66
2.1	5.46×10^{-2}	0.65
2.2	2.82×10^{-2}	0.64
2.3	1.36×10^{-2}	0.63
2.4	6.66×10^{-3}	0.62
2.5	3.33×10^{-3}	0.60
2.6	1.71×10^{-3}	0.59
2.7	8.82×10^{-4}	0.58
2.8	4.43×10^{-4}	0.57
2.9	2.05×10^{-4}	0.56

Table S3. The fitting results for **1** at 3.5-4.5 K under 1000 Oe dc field by a generalized Debye model.

T / K	τ / s	α
3.5	1.36×10^{-1}	0.52
3.6	6.19×10^{-2}	0.50
3.7	2.96×10^{-2}	0.47
3.8	1.75×10^{-2}	0.47
3.9	1.07×10^{-2}	0.48
4.0	6.23×10^{-3}	0.47
4.1	3.96×10^{-3}	0.49
4.2	2.51×10^{-3}	0.51
4.3	1.45×10^{-3}	0.55
4.4	6.99×10^{-4}	0.61
4.5	3.34×10^{-4}	0.65

Table S4. Temperature dependence of the relaxation time for **1** at 6.59-7.21 K obtained from χ'' vs T plots under 1000 Oe dc field.

T / K	τ / s
6.59	1.61×10^{-3}
6.79	8.12×10^{-4}
6.99	3.21×10^{-4}
7.11	2.29×10^{-4}
7.21	1.59×10^{-4}

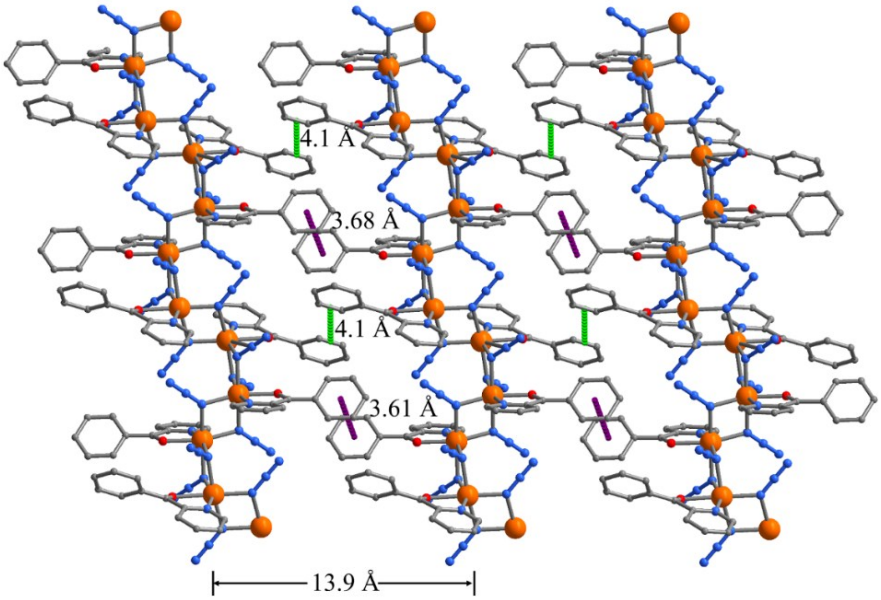

Figure S1. The packing diagram of **1** showing edge-to-edge (green line) and face-to-face (violet line) π···π interactions. All the counterions and hydrogen atoms are omitted for clarity. Colour codes: Fe(II), orange; O, red; C, grey; N, light blue.

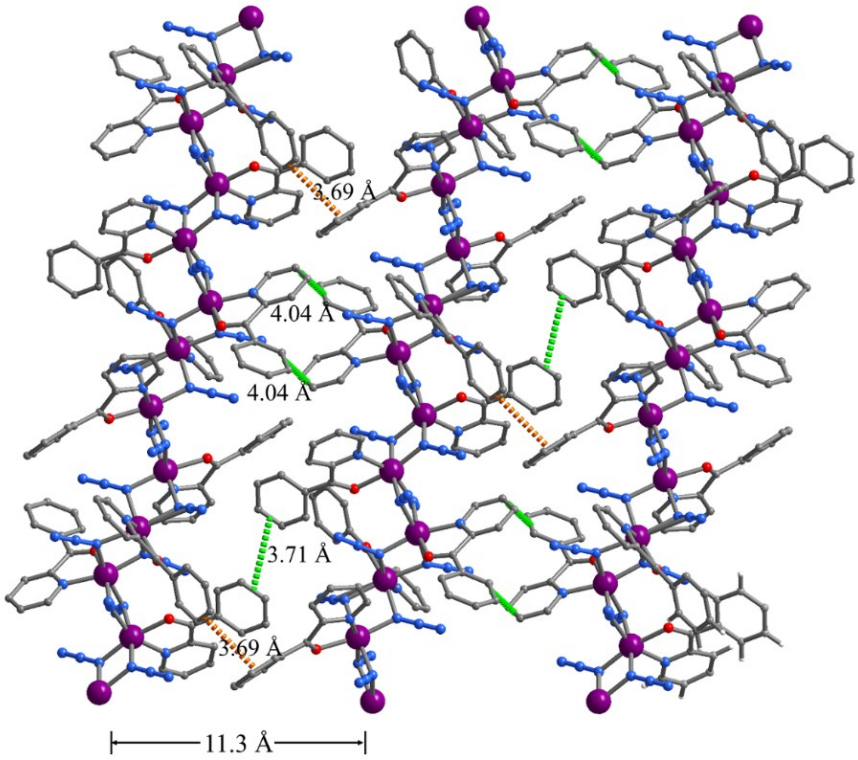

Figure S2. The packing diagram of **2** showing edge-to-edge (green line) and edge-to-face (orange line) π···π interactions. All the counterions, lattice solvents and hydrogen atoms are omitted for clarity. Colour codes: Co(II), violet; O, red; C, grey; N, light blue.

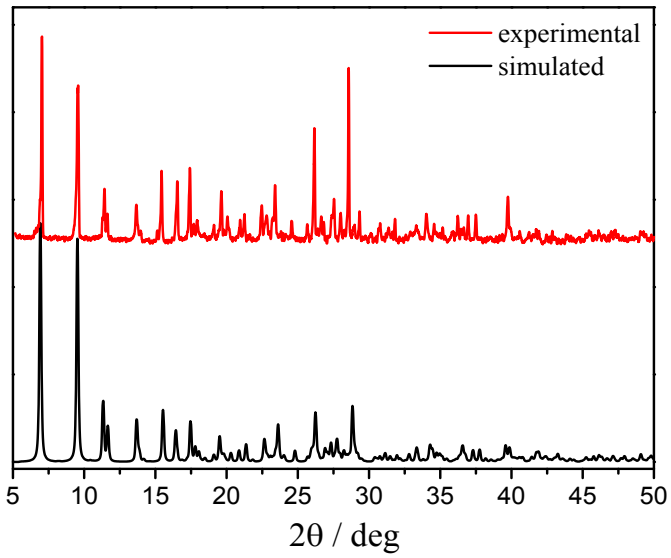

Figure S3. The experimental and calculated powder XRD patterns for **1**.

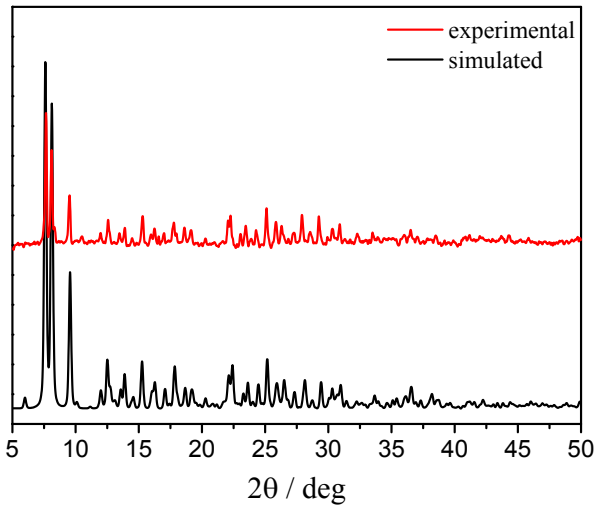

Figure S4. The experimental and calculated powder XRD patterns for **2**.

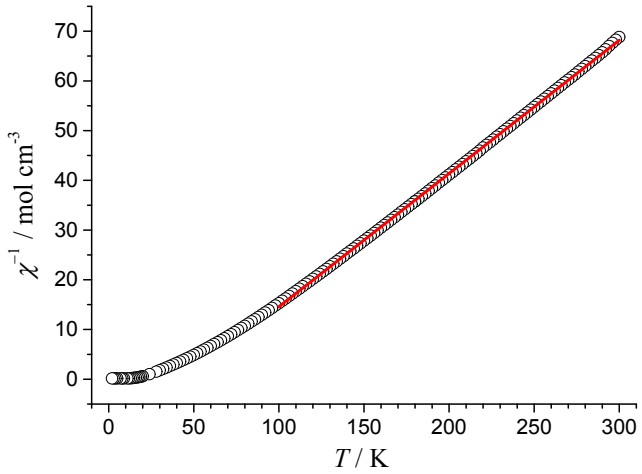

Figure S5. Temperature dependent χ^{-1} plots for **1** measured at 1000 Oe dc field. The red lines represent the Curie-Weiss fit to the data.

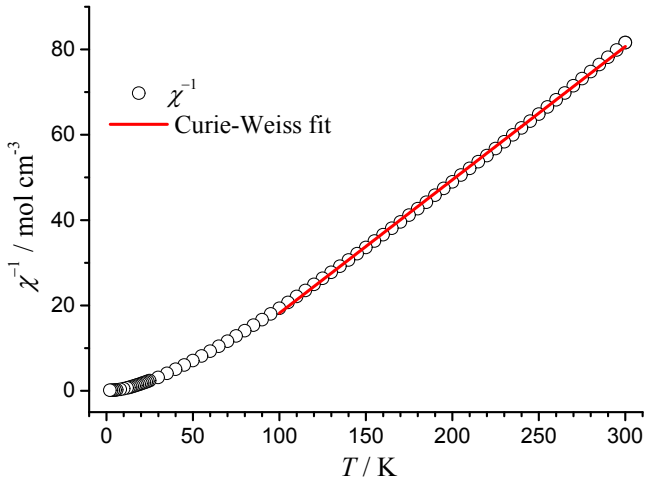

Figure S6. Temperature dependent χ^{-1} plots for **2** measured at 1000 Oe dc field. The red lines represent the Curie-Weiss fit to the data.

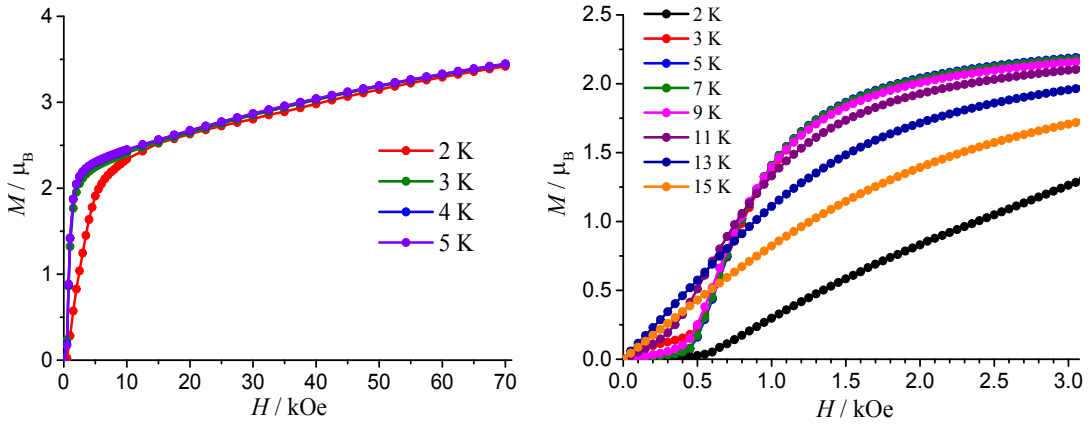

Figure S7. Field dependence of the magnetization for **1** between 2 and 15 K. Solid lines are guides for the eyes.

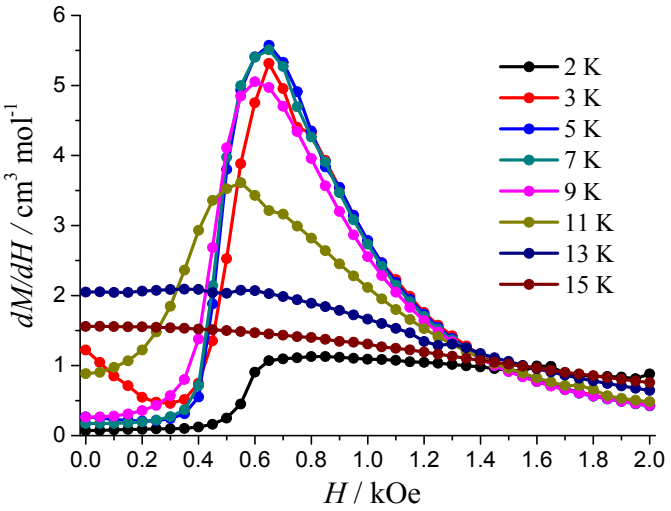

Figure S8. First field derivative of the magnetization as a function of the applied dc field for **1** between 2 and 15 K. Solid lines are guides for the eyes.

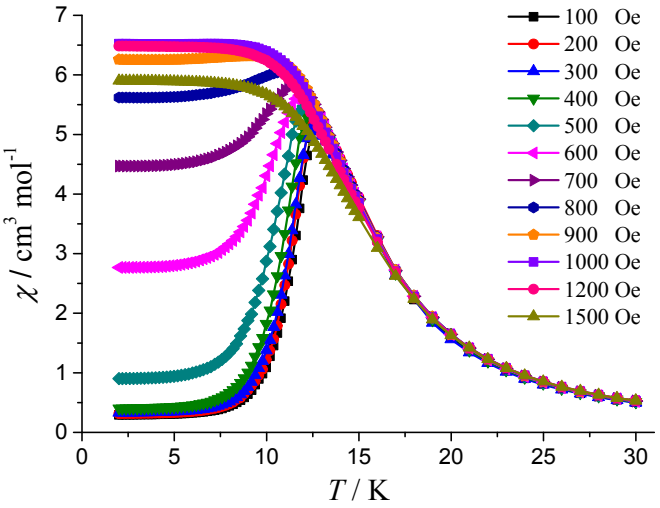

Figure S9. Temperature dependence of the magnetic susceptibility for **1** as a function of applied dc field. Solid lines are guides for the eyes.

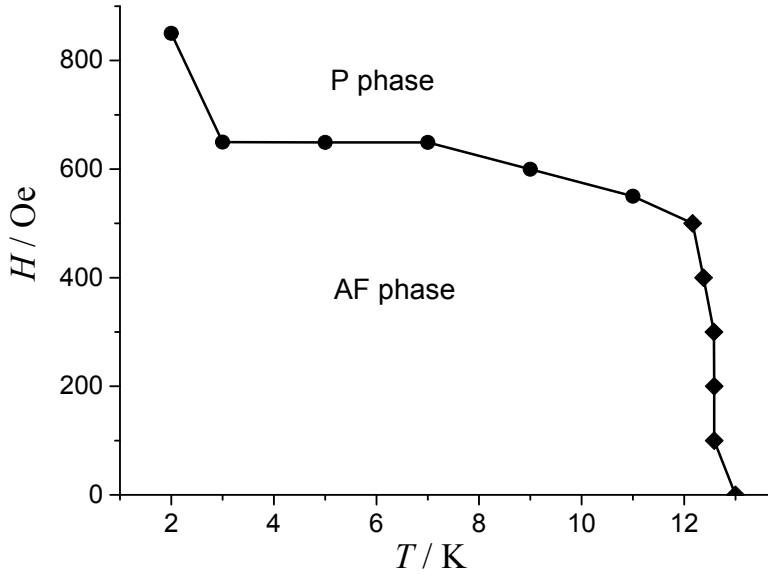

Figure S10. (*T*, *H*) phase diagram for **1**. The data are obtained from the location of the maximum for d*M*/d*H* vs *H* plots (●) and χ vs *T* plots (♦). The line is guide for the eyes.

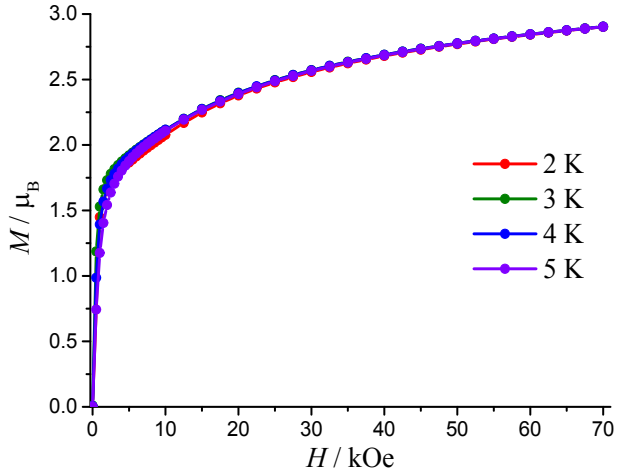

Figure S11. Field dependence of the magnetization for **2** between 2 and 5 K. Solid lines are guides for the eyes.

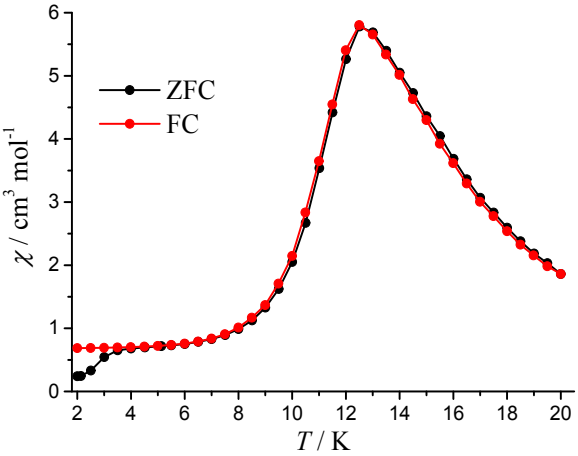

Figure S12. ZFC and FC magnetization versus temperature curves of **1** measured with an applied dc field of 50 Oe. Solid lines are guides for the eyes.

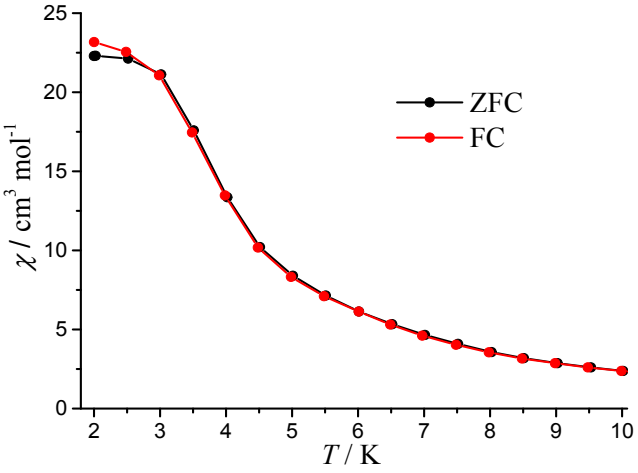

Figure S13. ZFC and FC magnetization versus temperature curves of **2** measured with an applied dc field of 50 Oe. Solid lines are guides for the eyes.

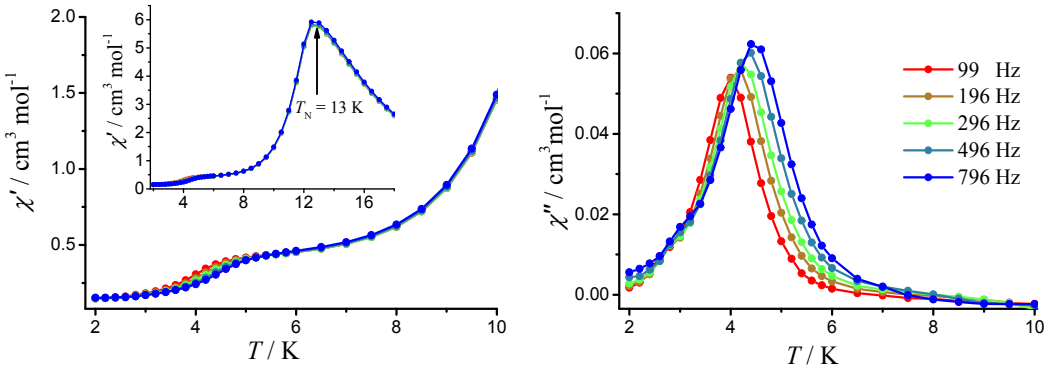

Figure S14. Temperature dependence of the in-phase and out-of-phase ac susceptibility for **1** under zero dc field. Solid lines are guides for the eyes.

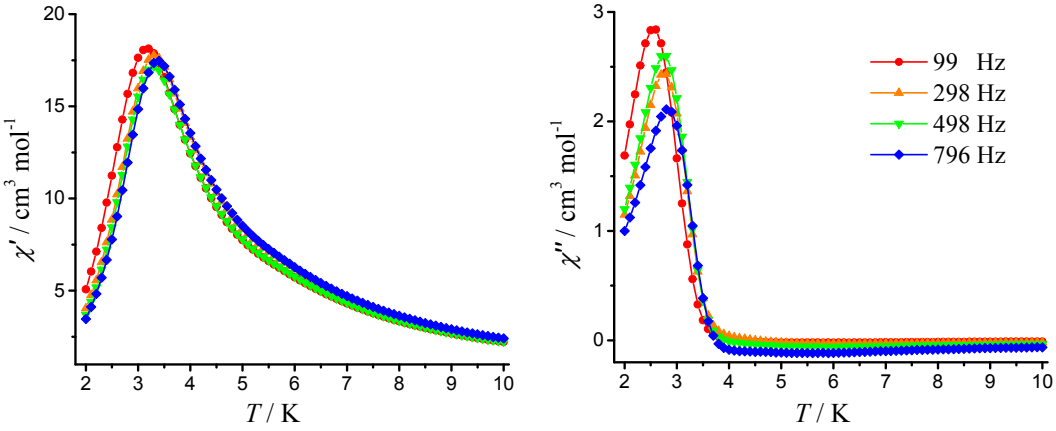

Figure S15. Temperature dependence of the in-phase and out-of-phase ac susceptibility for **2** under zero dc field. Solid lines are guides for the eyes.

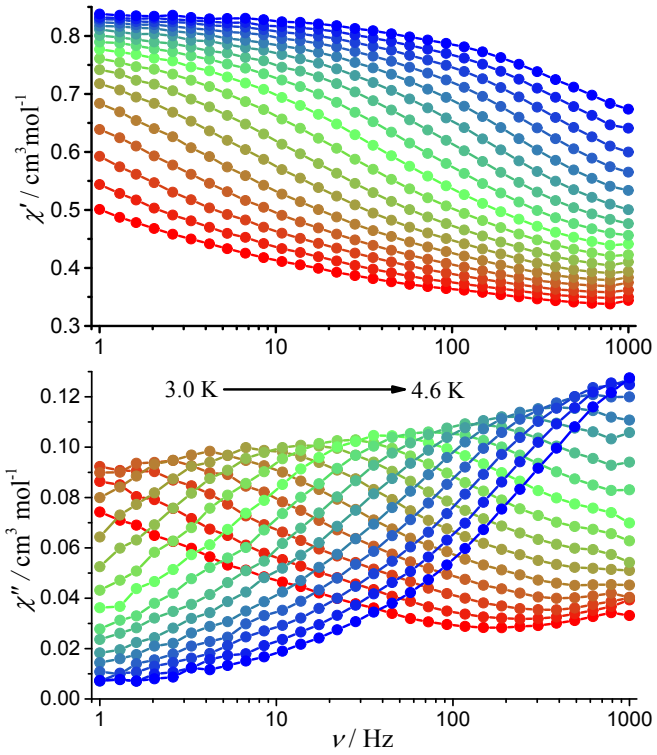

Figure S16. Frequency dependence of the in-phase and out-of-phase ac susceptibility for **1** under zero dc field. Solid lines are guides for the eyes.

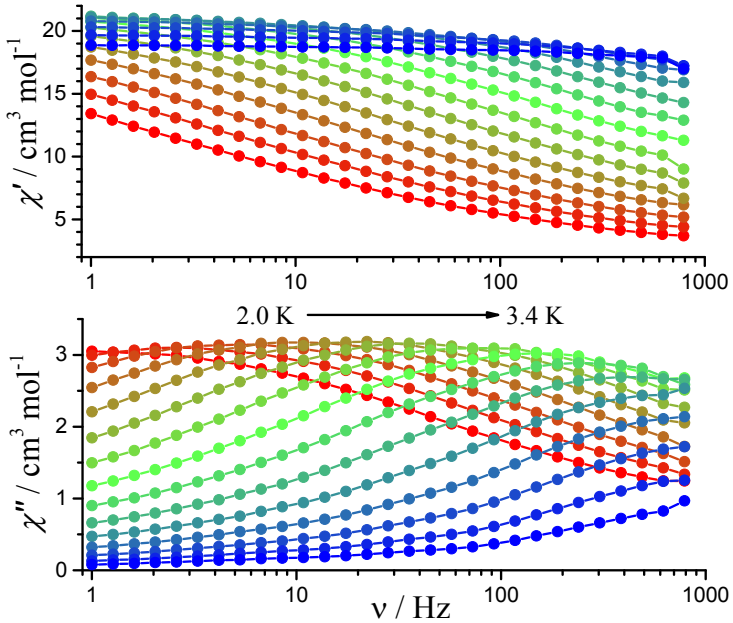

Figure S17. Frequency dependence of the in-phase and out-of-phase ac susceptibility for **2** under zero dc field. Solid lines are guides for the eyes.

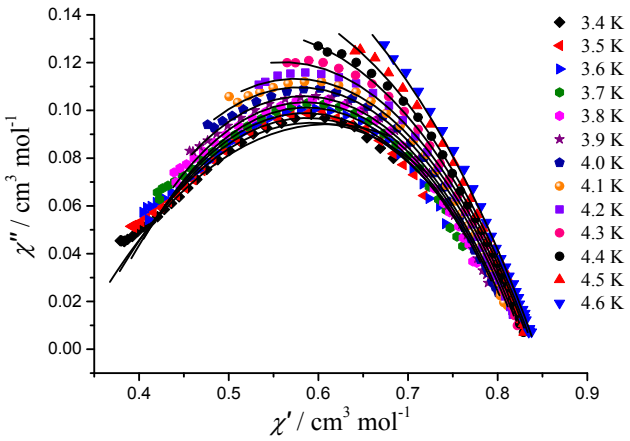

Figure S18. Cole-Cole plots of **1** under zero dc field. The lines represent the fit to the data.

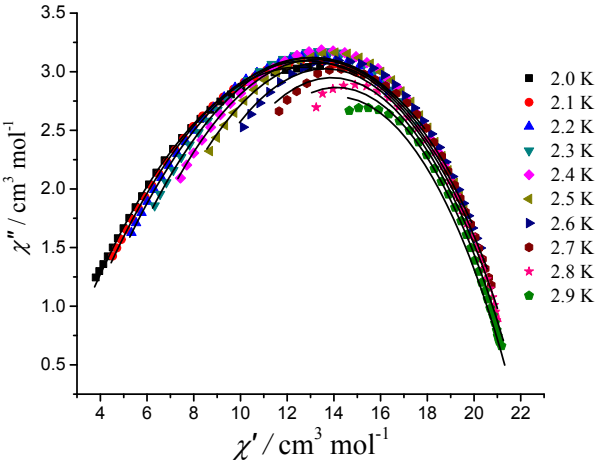

Figure S19. Cole-Cole plots of **2** under zero dc field. The lines represent the fit to the data.

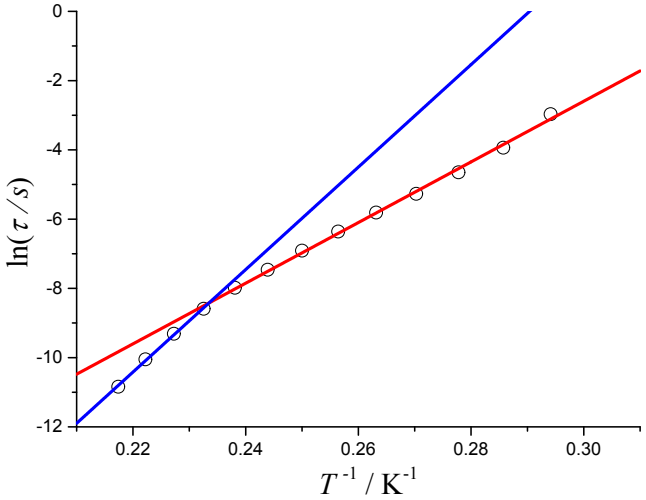

Figure S20. Temperature dependence of the relaxation time for **1** under zero dc field. The lines represent the fit by Arrhenius Law.

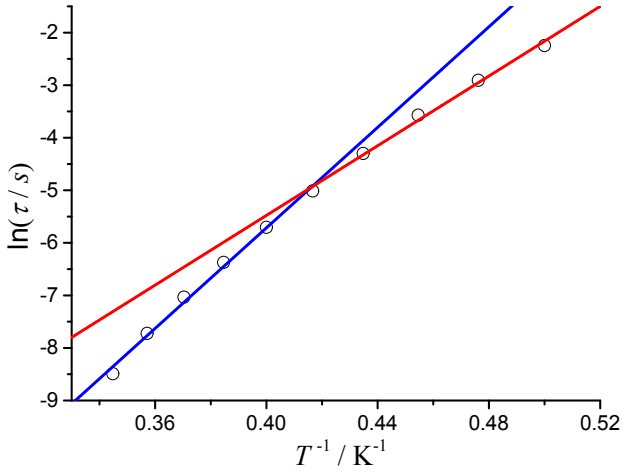

Figure S21. Temperature dependence of the relaxation time for **2** under zero dc field. The lines represent the fit by Arrhenius Law.

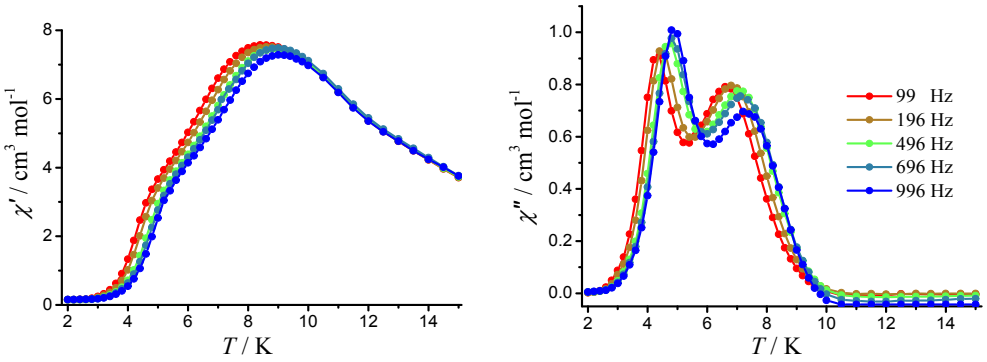

Figure S22. Temperature dependence of the in-phase and out-of-phase ac susceptibility for **1** under 1000 Oe dc field. Solid lines are guides for the eyes.

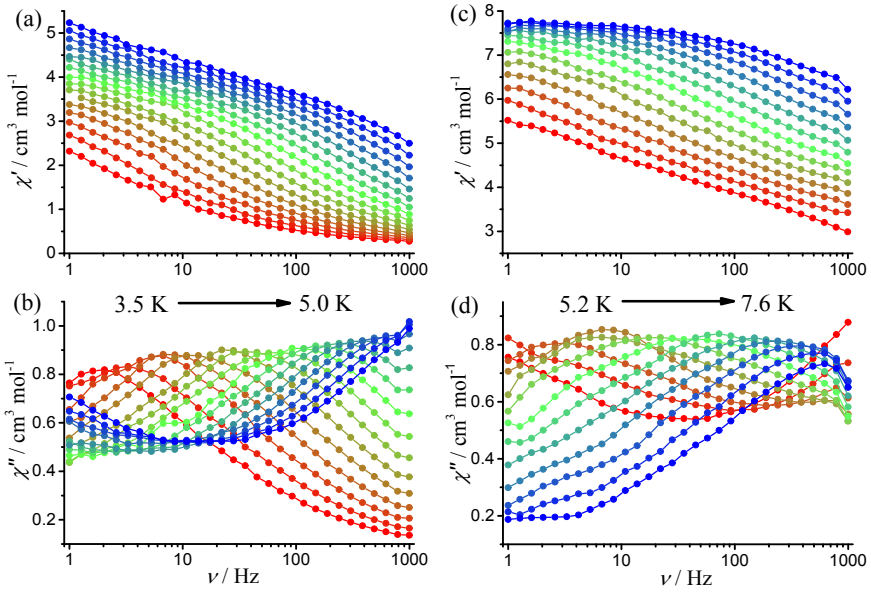

Figure S23. Frequency dependence of the in-phase and out-of-phase ac susceptibility for **1** at 3.5-5.0 K (a, b) and 5.2-7.6 K (c, d) under 1000 Oe dc field. Solid lines are guides for the eyes.

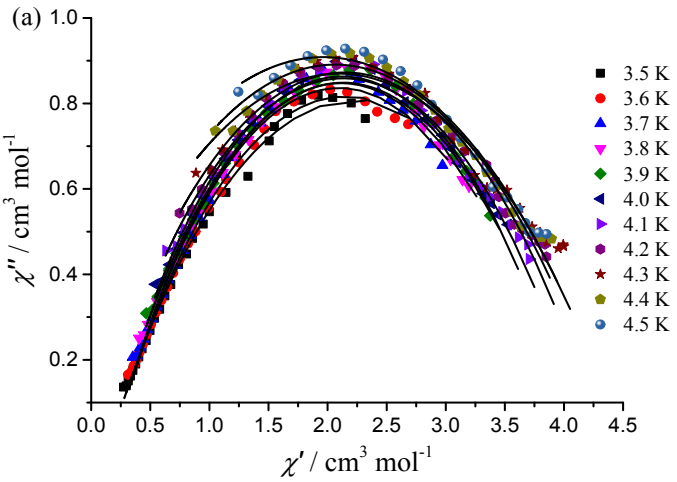

Figure S24. Cole-Cole plots of **1** at 3.5-4.5 K with an applied 1000 Oe dc field. The lines represent the fit to the data.

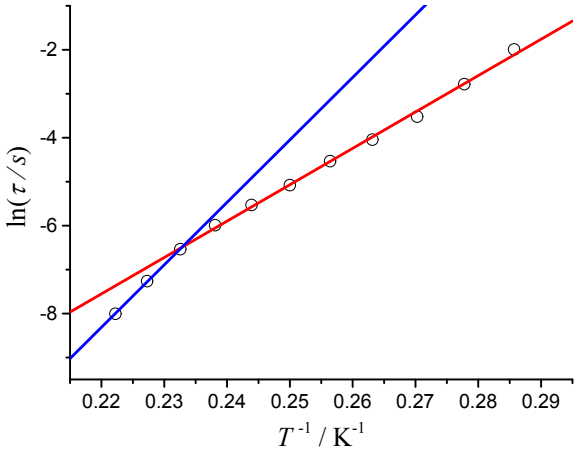

Figure S25. Temperature dependence of the relaxation time for **1** at 3.5-4.5 K under 1000 Oe dc field. The lines represent the fit by Arrhenius Law.

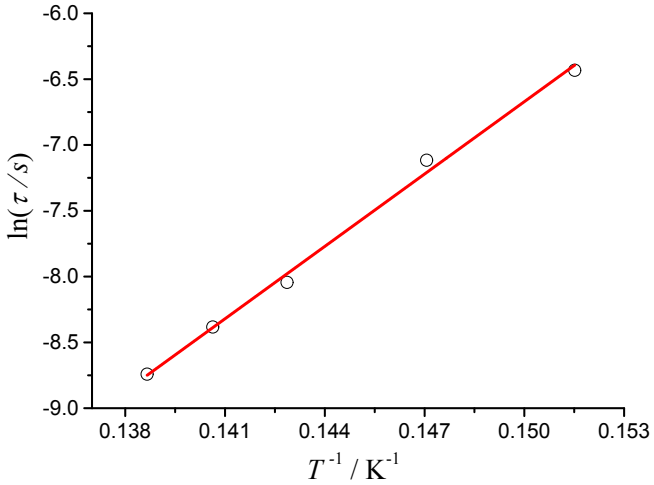

Figure S26. Temperature dependence of the relaxation time for **1** obtained from χ'' vs T plots via $\tau^{-1} = 2\pi\nu$ under 1000 Oe dc field. The lines represent the fit by Arrhenius Law.

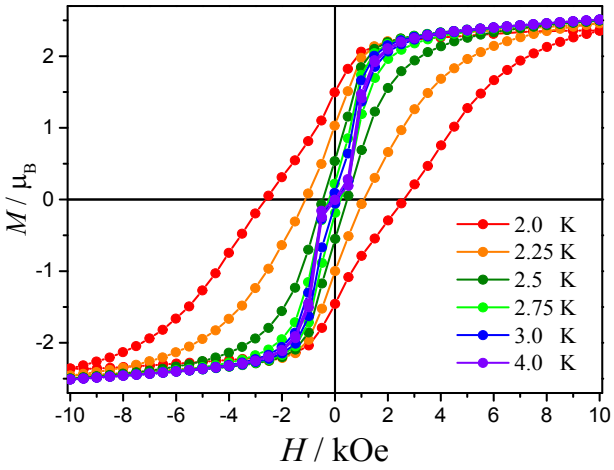

Figure S27. The magnetic hysteresis loops of **1** measured between 2 and 4 K with a field sweep rate of 20 Oe/s. Solid lines are guides for the eyes.

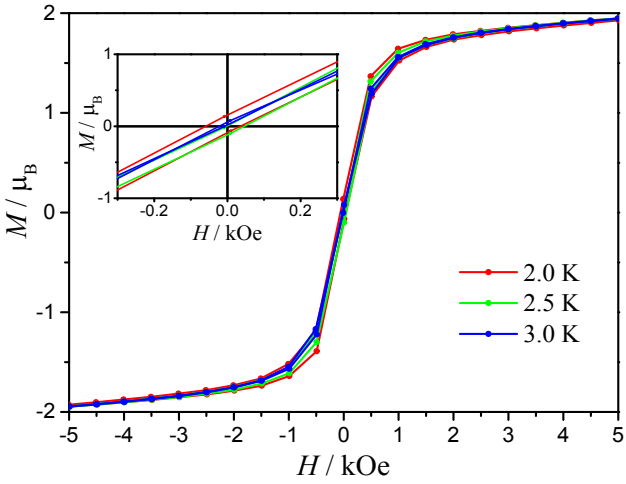

Figure S28. The magnetic hysteresis loops of **2** measured between 2 and 3 K with a field sweep rate of 20 Oe/s. Solid lines are guides for the eyes. Inset: Enlarged hysteresis loops of **1** at 2-3 K.