Electronic supplementary information (ESI)

Metamagnetism and slow magnetic dynamics in an antiferromagnet composed of cobalt(II) chains with mixed azide-carboxylate bridges

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Synthesis of 1: A mixture solution of $Co(ClO_4)_2 \cdot 6H_2O$ (0.036 g, 0.1 mmol), NaN_3 (0.016 g, 0.25 mmol), and L (0.024 g, 0.1 mmol) in water (4 ml) and DMF (1.5 ml) was sealed in a Teflon-lined stainless steel vessel (25 ml), heated at 70ºC for 3 days, and then cooled to room temperature. Red plate crystals of **1** were obtained in a yield of 80% based on Co. Anal. Calcd for $CoC_{14}H_{12}N_4O_5$: C, 44.82; H, 3.22; N, 14.93. Found: C, 44.85; H, 3.34; N, 14.96. Main IR bands (KBr, cm^{-1}): 2080s [$\nu(N_3)$], 1625s, [ν_{as}(COO)], 1382s [ν_s(COO)].

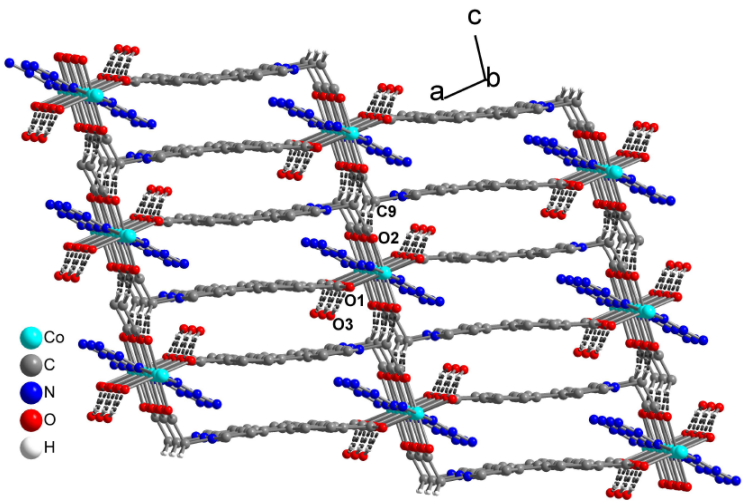

Fig. S1. 3D packing of the layers through hydrogen bonding interactions in **1**. For the interlayer interaction, C9-H9···O2(1-x, y, 2-z) = 169.2(2)°, H···O = 2.132(2) Å, and C···O = 3.213(9) Å; for the interaction involving the lattice water molecule, O3-H3B···O1(x, -y, z) = 171.3(1)°, H···O1 = 2.260(2) Å, and O···O = 3.089(9) Å. Each water molecule for two equivalent hydrogen bonds with carboxylate oxygen atoms from two adjacent ligands.

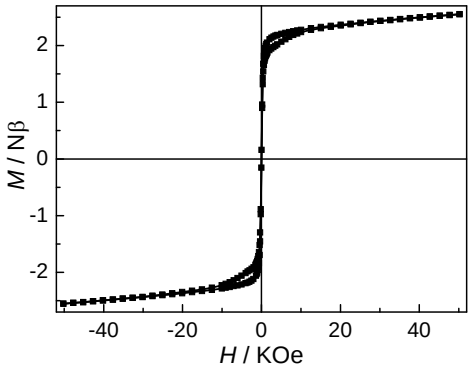

Fig. S2 Isothermal magnetization of **1** at 2 K.

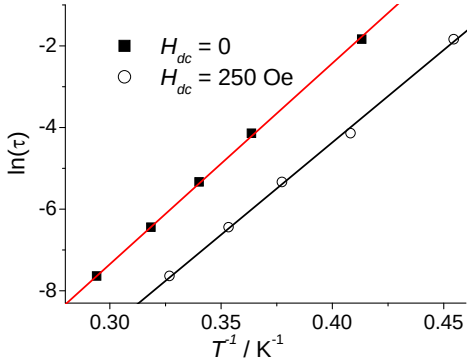

Fig. S3 Arrhenius plots and best linear fits for **1** at zero dc field (solid squares) and 250 Oe dc field (circles)

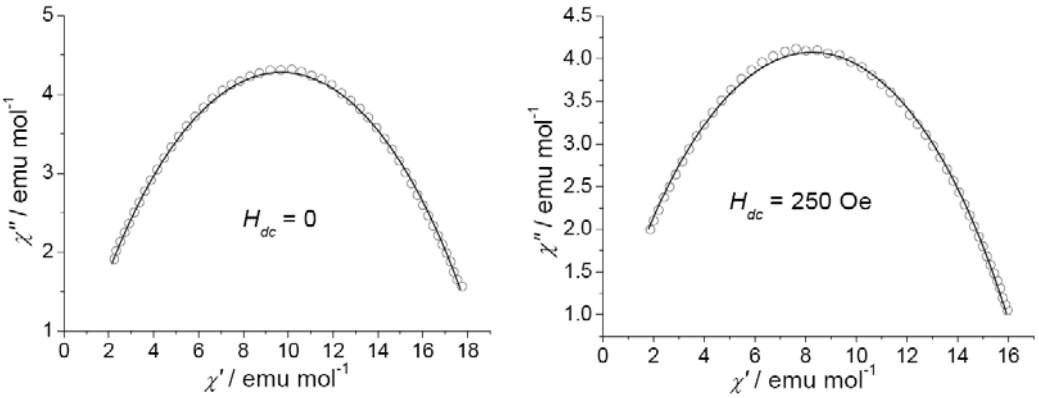

Fig. S4. Cole-Cole diagrams in the absence (left) and in the presence (right) of dc field. The data were measured by varying the frequency from 1 to 1000 Hz with a driving ac field of 2.5 Oe at T = 3.0 K and H_{dc} = 0, or T = 2.8 K and H_{dc} = 250 Oe. The solid curves represent the least-square fit to a generalized Debye model. References: (a) K. S. Cole, R. H. Cole, *J. Chem. Phys.* 1941, **9**, 341. (b) C. J. F. Boettcher, *Theory of Electric Polarisation*, Elsevier, Amsterdam, 1952. (c) S. M. Aubin, Z. Sun, L. Pardi, J. Krzysteck, K. Folting, L. J. Brunel, A. L. Rheingold, G. Christou, D. N. Hendrickson, *Inorg. Chem.* 1999, **38**, 5329.