Supplementary Material (ESI) for Chemical Communications

A two-step field-induced magnetic transition in spin-canted systems observed only for the Co^{II} coordination polymer

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Materials, Methods, Syntheses and Characterizations

All chemicals employed for synthesis were obtained commercially. 2-Chloro-pyrimidine-4,6-dicarboxylic acid (H_2cpdc) was synthesized by oxidizing 2-chloro-4,6-dimethylpyrimidine with $KMnO_4$ in aqueous solution according to the general experimental method.

Elemental analyses of C, H and N were carried out with a Vario EL III elemental analyzer. IR spectra were performed on a Spectrum One FT-IR spectrometer or Bomem BM102 FT-IR spectrometer with KBr pellets in the range 4000–400 cm^{-1}. Magnetic susceptibilities were measured for **1** and **2** on polycrystalline samples with a Quantum Design PPMS-9T system. Diamagnetic corrections were made for the sample holder and sample.

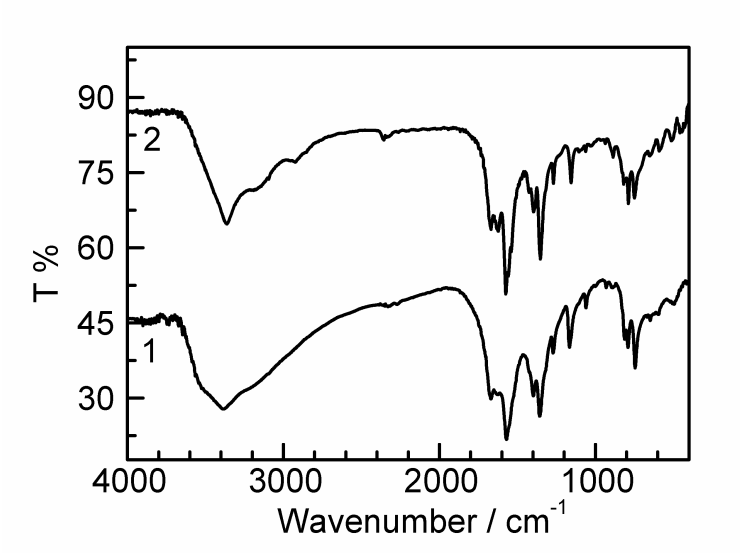

Fig. S1. IR spectra of **1** and **2**.

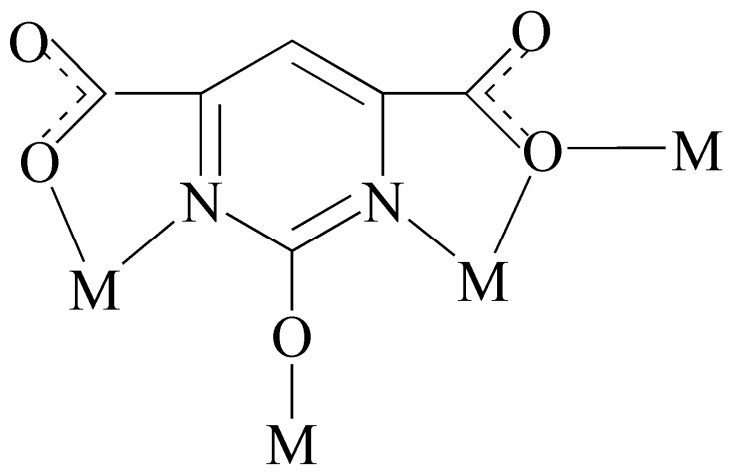

Fig S2. μ_4-coordination mode of $hpdc^{3-}$ in **1** and **2**.

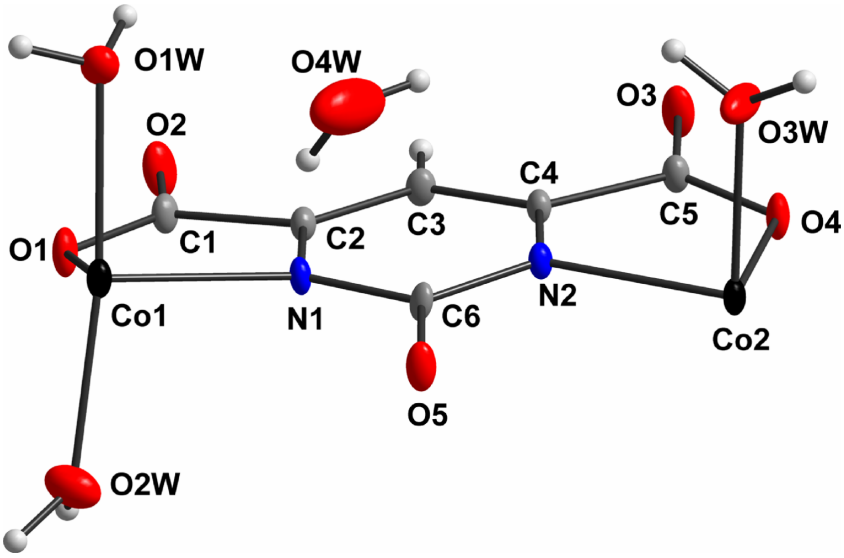

Fig. S3. Thermal ellipsoid plot showing the asymmetric unit of **2** with atom labeling (30% probability level).

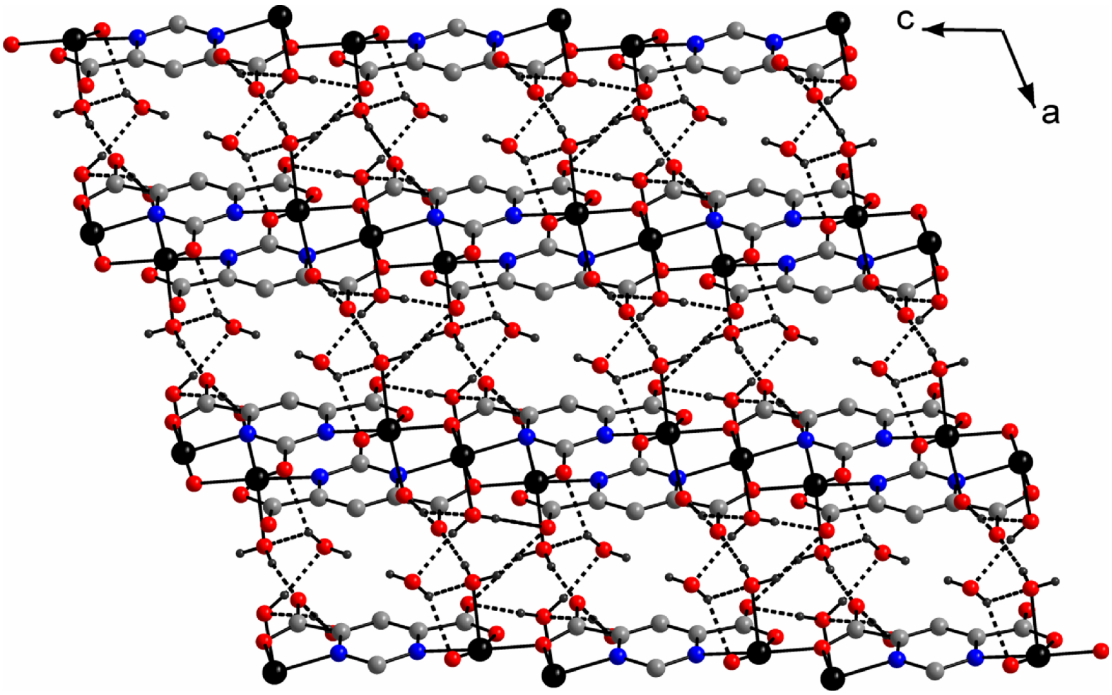

Fig. S4. 3D supramolecular network of **1** and **2** constructed by hydrogen bonds.

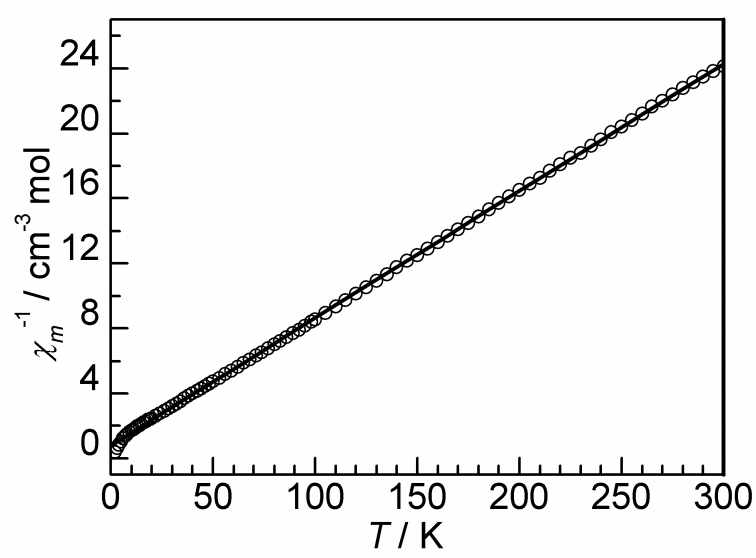

Fig. S5. Temperature dependence of χ_m^{-1}(○) for **1**. The solid line is the best-fit according to the Curie-Weiss law.

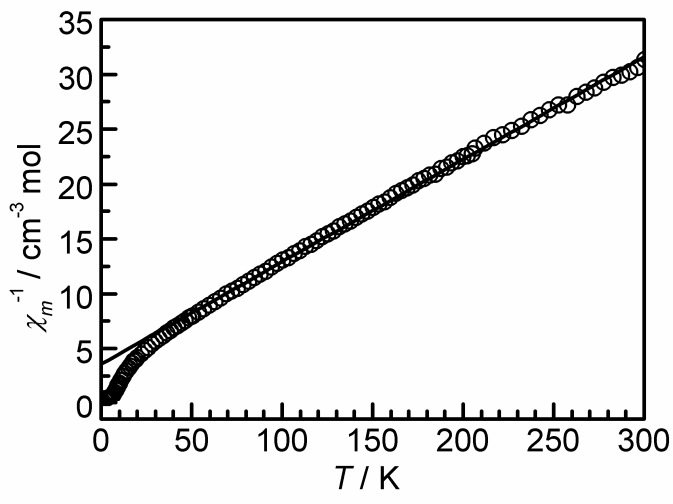

Fig S6. Temperature dependence of χ_m^{-1}(○) for **2**. The solid line is the best-fit according to the Curie-Weiss law.

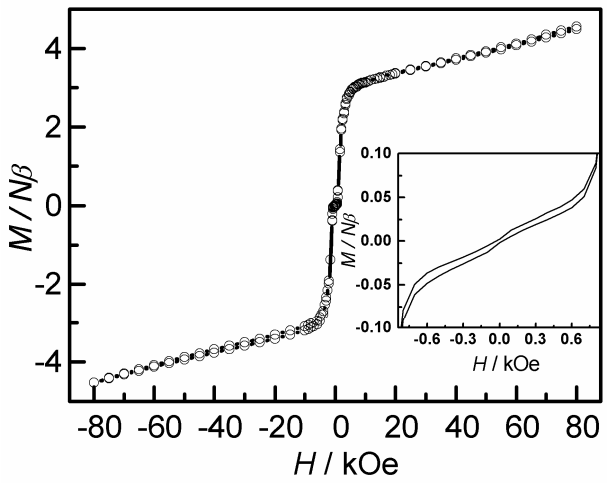

Fig. S7. Field dependence of the magnetizations of **2**. The inset gives a blow-up of the hysteresis loo0p.

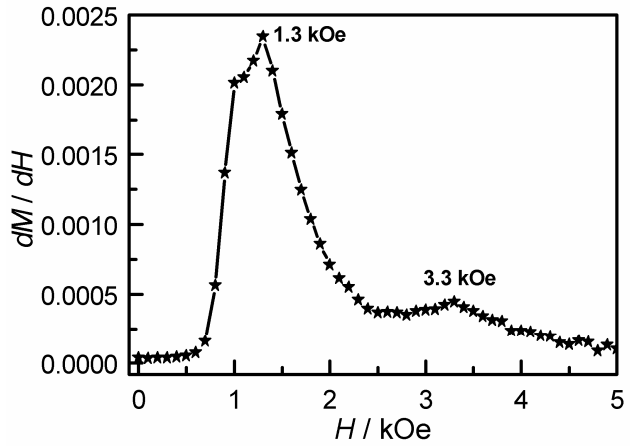

Fig. S8. The d*M*/d*H* derivative curve of **2** at 2 K.

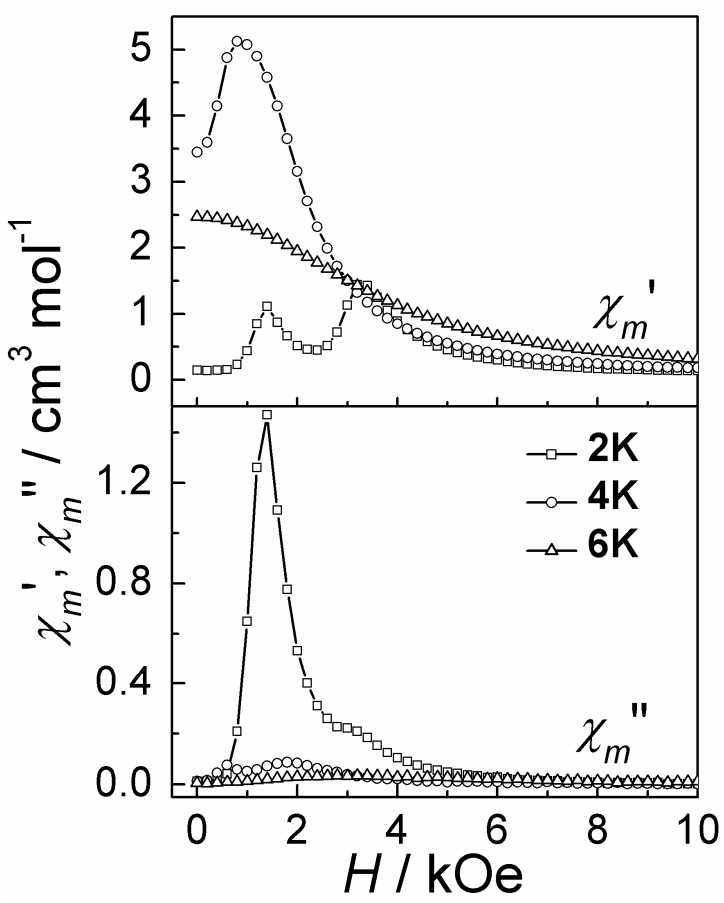

Fig. S9. Field-dependent *ac* magnetic susceptibilities of **2** measured at different temperatures.

Table S1. Hydrogen-bonding parameters in Compound 2

D	H	A	Symmetry code	D(D-H) (Å)	d(H..A) (Å)	d(D..A) (Å)	<DHA (°)
O1W	H1	O3	-x+1, -y+1, -z-1	0.805	1.963	2.752(4)	166.44
O2W	H4	O3	-x, -y+1, -z-1	0.811	2.088	2.854(4)	157.61
O3W	H7	O2	x, y-1, z-1	0.808	1.910	2.709(4)	169.88
O3W	H6	O4W	-x+1, -y+1, -z-1	0.808	1.948	2.753(4)	174.4
O4W	H9	O5	-x, -y+1, -z-1	0.817	2.167	2.886(5)	146.90