Supporting Information

Syntheses, structures, and magnetic properties of three new chain compounds based on the pentagonal bipyramidal Co(II) building block

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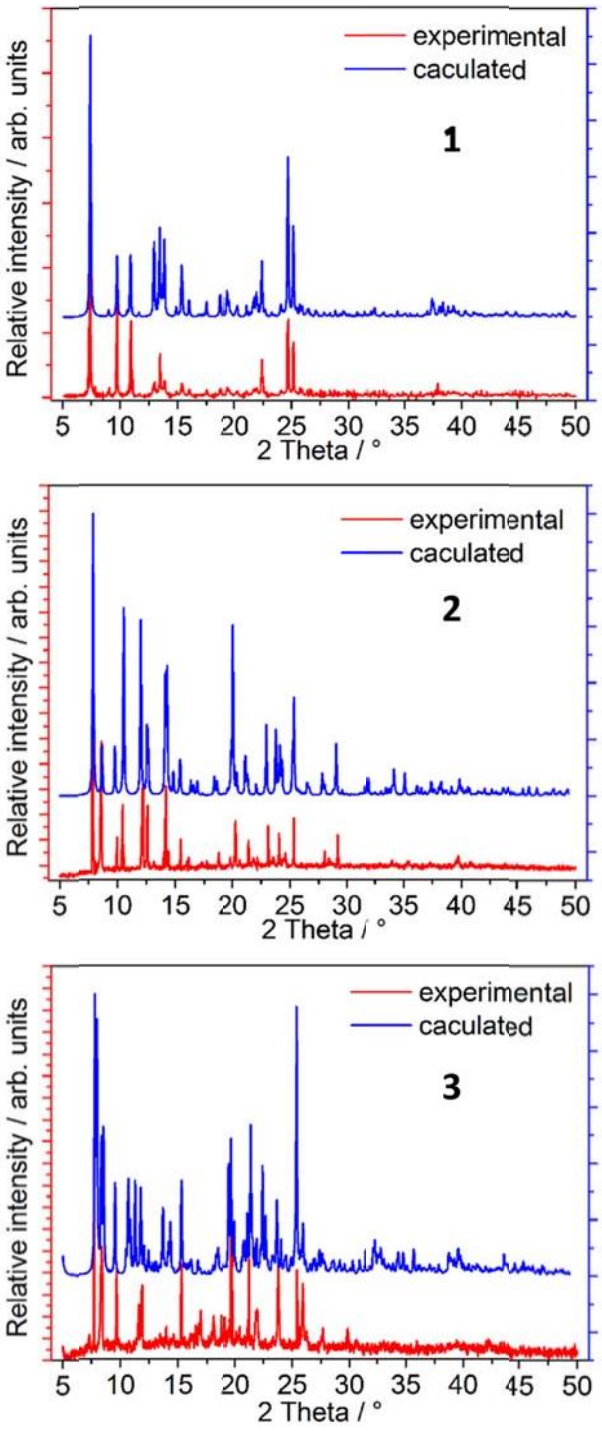

Figure S1 | The PXRD of **1-3**.

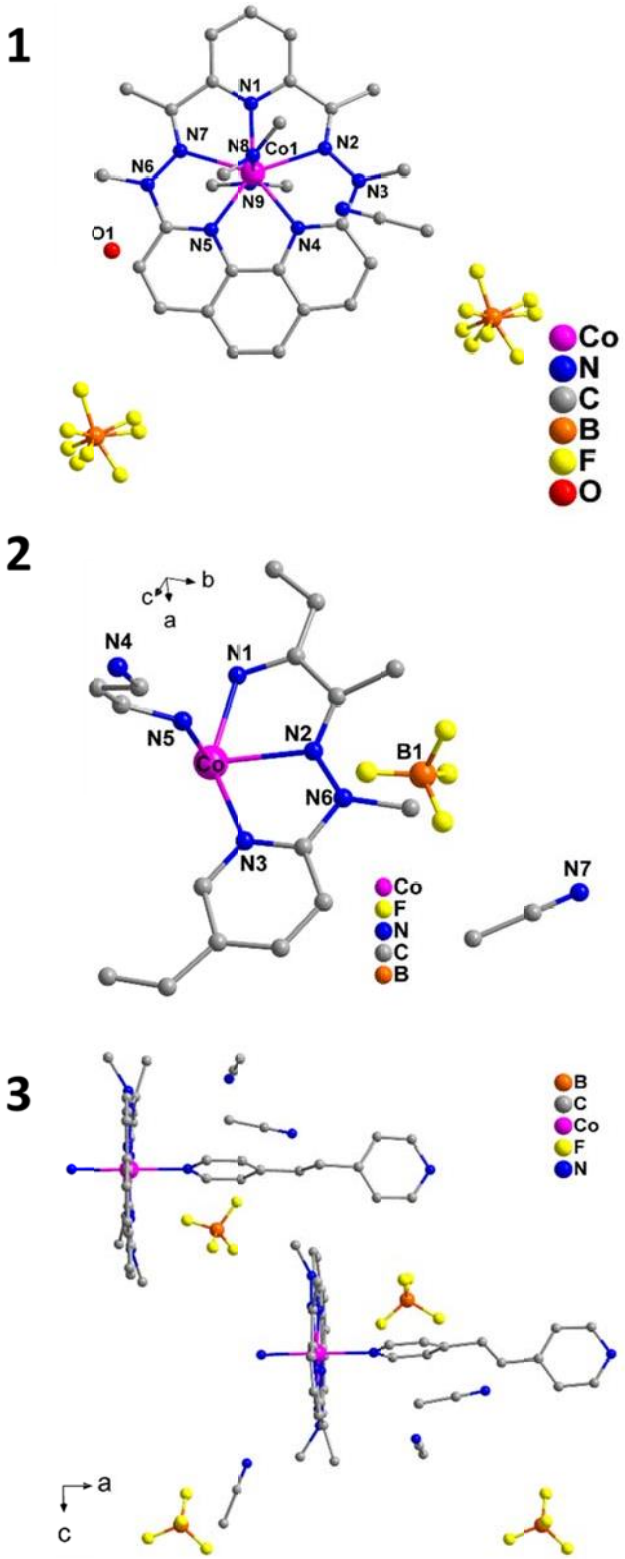

Figure S2｜The asymmetric units of **1**-**3**.

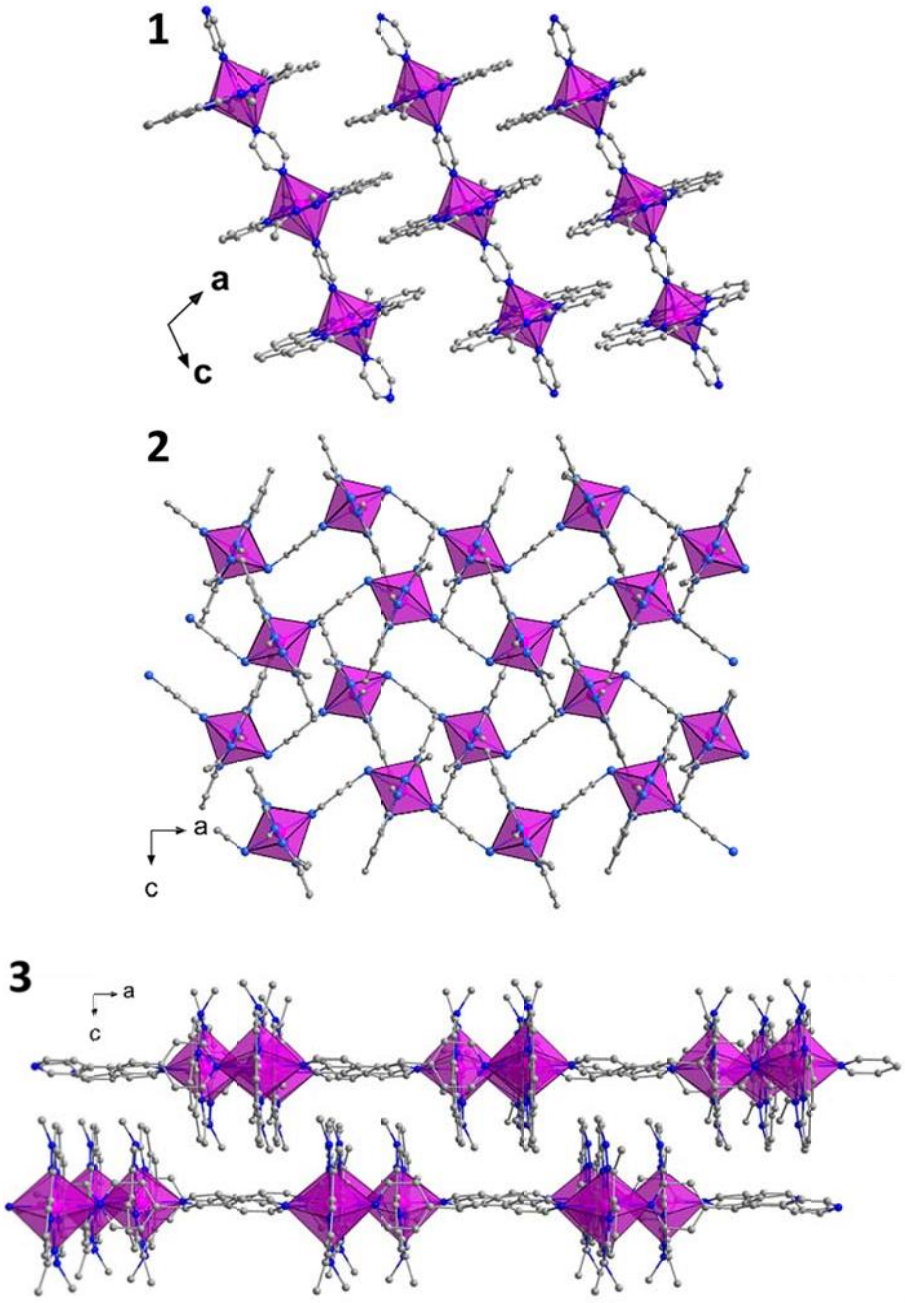

Figure S3｜The packing crystal structures of **1-3**.

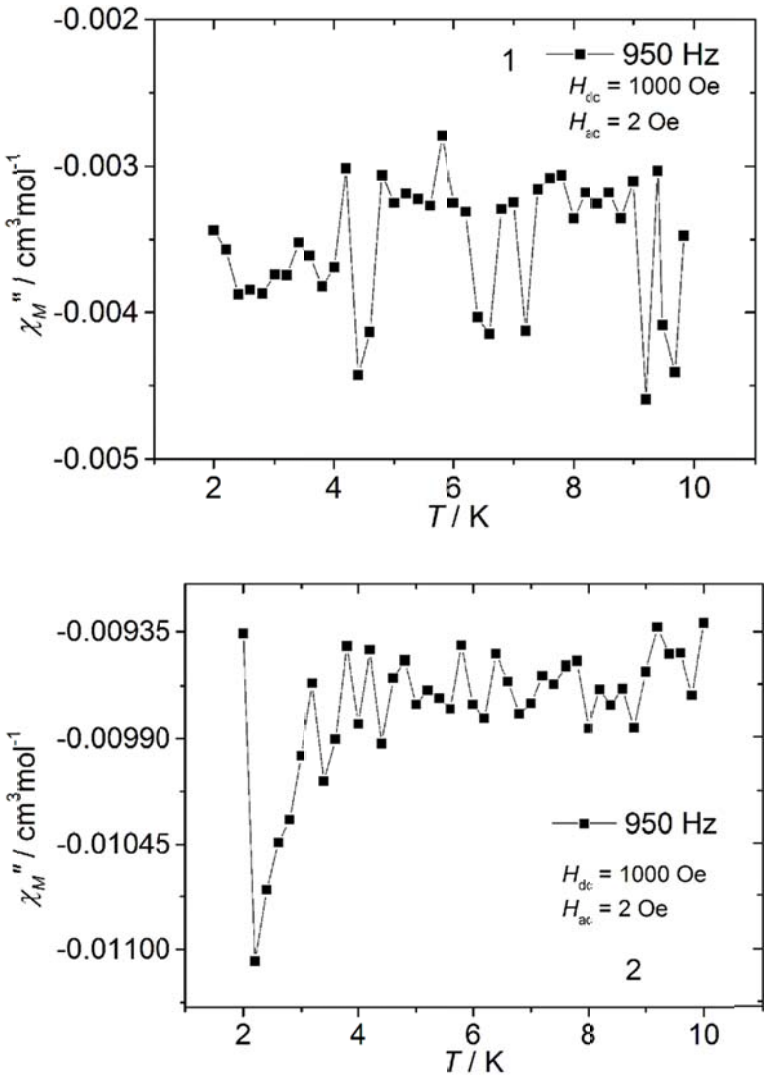

Figure S4 | Temperature dependence of the out-of-phase (χ'') part of the ac magnetic susceptibility for **1** and **2** in 1 kOe dc field, oscillating at 950 Hz.

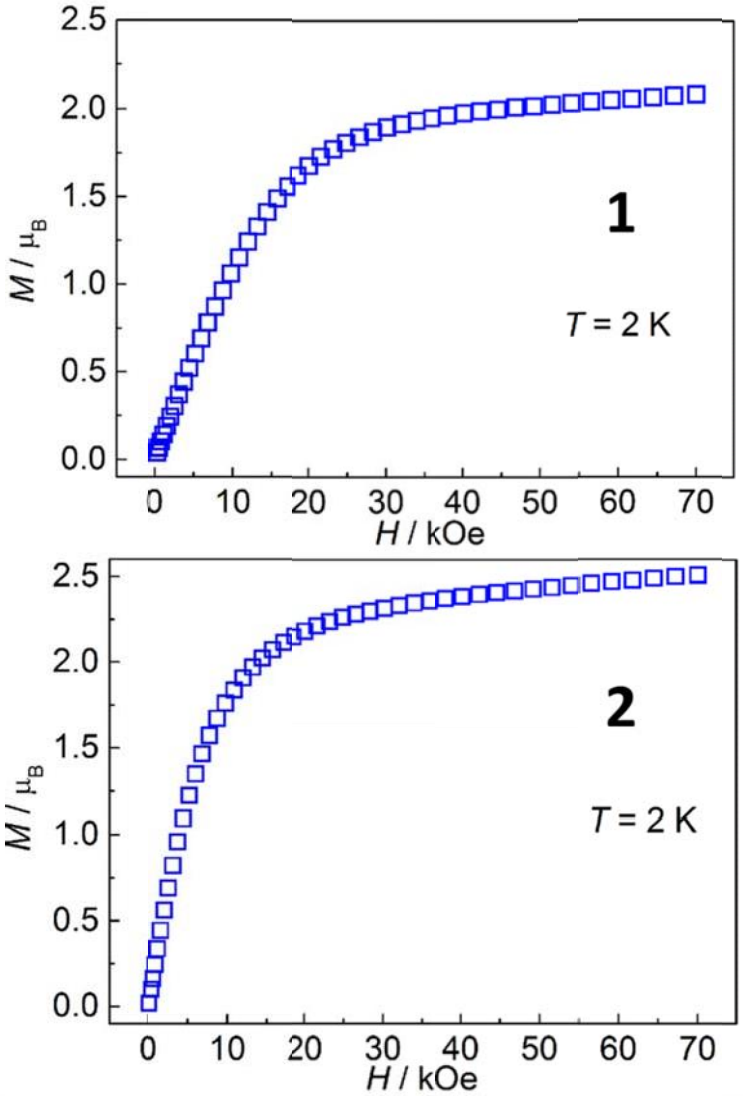

Figure S5｜The magnetization curves of **1** and **2** measured at 2.0 K.

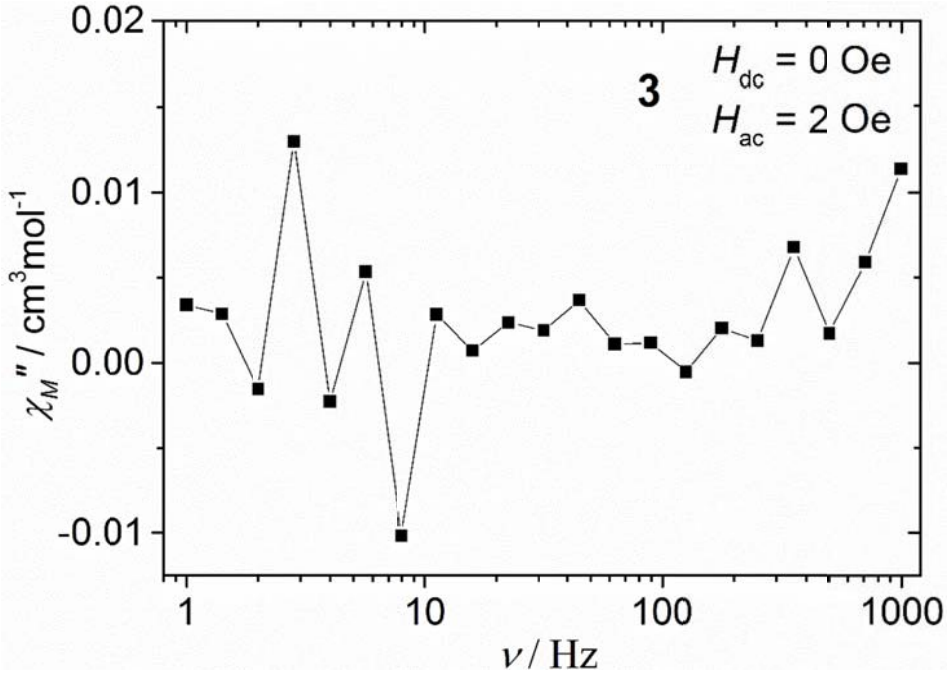

Figure S6 | Frequency ependence of out-of-phase (χ'') part of the ac magnetic susceptibility for **3** in 1 kOe dc field at 2 K.

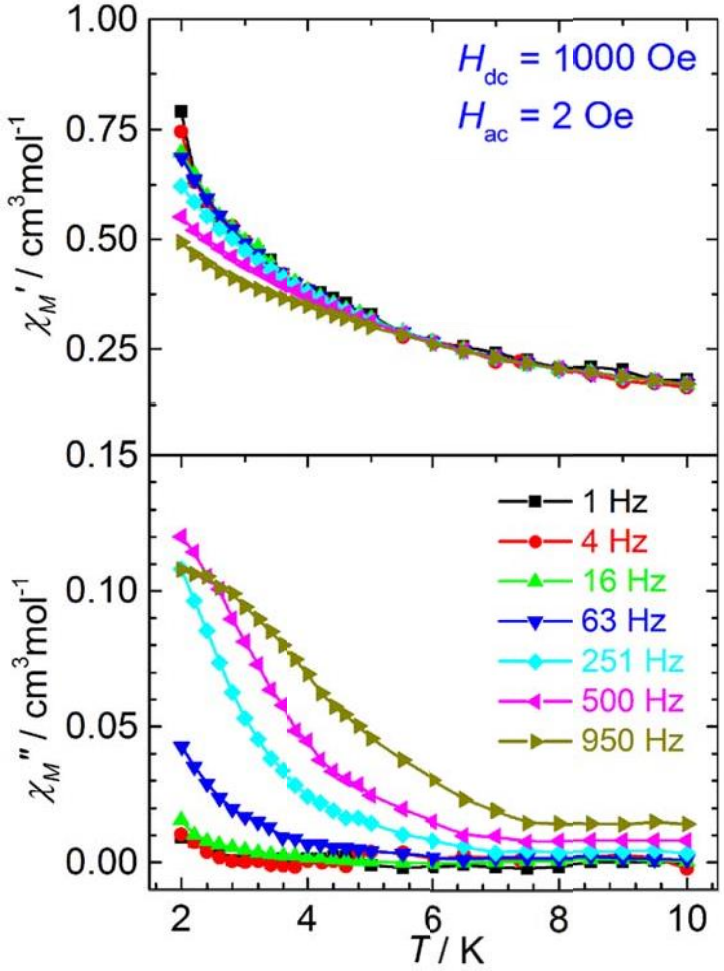

Figure S7｜Temperature-dependent of in-of-phase (χ') and out-of-phase (χ'') part ac signals under an applied field of 1 kOe for **3**.

Table S1. Selected bond lengths (Å) and angles (°) for **1**-**3**.

1					
Co1-N1	2.098(5)	Co1-N5	2.112(5)	Co1-N8	2.211(4)
Co1-N2	2.255(5)	Co1-N7	2.260(5)	Co1-N9	2.274(4)
Co1-N4	2.115(5)				
N8-Co1-N9	174.71(16)	N4-Co1-N8	96.73(17)	N4-Co1-N9	88.40(17)
N2-Co1-N7	88.32(16)	N5-Co1-N8	94.72(17)	N5-Co1-N9	87.77(17)
2					
Co1-N1	2.091(3)	Co1-N4	2.343(3)	Co1-N2#1	2.263(2)
Co1-N2	2.263(2)	Co1-N5	2.208(3)	Co1-N3#1	2.119(2)
Co1-N3	2.115(5)				
N5-Co1-N4	178.60(12)	N5-Co1-N2#1	92.90(7)	N5-Co1-N2	92.90(7)
N3#1-Co1-N2	145.06(10)	N1-Co1-N4	87.38(12)	N3-Co1-N4	93.19(9)
#1 x,-y+1/2,z; #2 x+1/2,y,-z+3/2; #3 x+1/2,-y+1/2,-z+3/2; #4 x-1/2,y,-z+3/2					
3					
Co1-N1	2.090(6)	Co1-N4	2.117(0)	Co1-N8	2.235(5)
Co1-N2	2.236(9)	Co1-N5	2.118(1)	Co1-N9	2.243(2)
Co1-N3	2.260(0)	2.289(4)			
N8-Co1-N9	179.67(81)	N1-Co1-N9	90.49(61)	N1-Co1-N8	89.76(01)
N4-Co1-N51	75.16(21)	N2-Co1-N4	69.61(81)	N5-Co1-N9	89.13(71)

Table S2. Relaxation fitting parameters from the least-square fitting of the Cole-Cole plots of **3** according to the generalized Debye model.

T / K	χ_S / $cm^3mol^{-1}K$	χ_T / $cm^3mol^{-1}K$	τ / s	α
1.8	0.49941	0.77122	0.00090	0.15390
2.0	0.47053	0.73140	0.00082	0.15067
2.2	0.44748	0.65042	0.00074	0.14496
2.5	0.42395	0.58264	0.00062	0.12748
2.8	0.39346	0.52406	0.00055	0.15363
3.1	0.39030	0.49462	0.00042	0.14528
3.4	0.35782	0.46622	0.00035	0.15351
3.7	0.34598	0.42436	0.00030	0.14842
4.0	0.32097	0.36229	0.00021	0.14868
4.3	0.31140	0.34628	0.00012	0.14827