Electronic Supporting Information (ESI)

Layer Structural Bimetallic Metamagnets Obtained from the Aggregation of $Ru_2(CO_3)_4^{3-}$ and Co^{2+} in Existence of Halogen

Bin Liu,[a,] Yan-Yan Jia,[a] Jin Jin,[a] Xue-Mei Liu,[a] and Gang-Lin Xue,[a]*

[a]*Key Laboratory of Synthetic and Natural Functional Molecule Chemistry of Ministry of Education, College of Chemistry & Materials Science, Shaanxi Key Laboratory of Physico-Inorganic Chemistry, Northwest University, Xi'an 710069, P. R. China*

Corresponding Author: liubin@nwu.edu.cn (B. Liu). Fax: +86-29-88302604.

Table S1. Selected bond angles (°) of complexes **1** and **2**

1			
Ru(2)–Ru(1)–Cl(1)	179.23(9)	Ru(1)–Ru(2)–O(2)	90.88(19)
Ru(2)–Ru(1)–O(1)	88.70(19)	Ru(1)–Ru(2)–O(5)	89.70(19)
Ru(2)–Ru(1)–O(4)	89.88(19)	Ru(1)–Ru(2)–O(8)	89.86(19)
Ru(2)–Ru(1)–O(7)	89.49(19)	Ru(1)–Ru(2)–O(11)	89.95(19)
Ru(2)–Ru(1)–O(10)	89.81(19)	Ru(1)–Ru(2)–O(13)	179.4(2)
Co(1)–O(3)–C(1)	132.2(6)	Co(3)–O(9)–C(3)	130.0(6)
Co(2)–O(6)–C(2)	130.4(6)		
2			
Ru(1A)–Ru(1)–Br(1)	176.65(6)	Ru(2H)–Ru(2)–O(7)	176.5(2)
Ru(1A)–Ru(1)–O(1)	89.22(16)	Ru(2H)–Ru(2)–O(4)	90.43(16)
Ru(1A)–Ru(1)–O(3A)	89.78(16)	Ru(2H)–Ru(2)–O(6H)	89.40(16)
Co(1)–O(2)–C(1)	129.6(5)	Co(2)–O(5)–C(2)	129.5(5)

Symmetry codes: **1:** A, -1+x, -1+y, z; **2**: A, -x, y, -z; H, -x, y, 1-z.

* Corresponding author. Tel./fax: +86-029-88302604.

E-mail address: liubin@nwu.edu.cn (B. Liu)

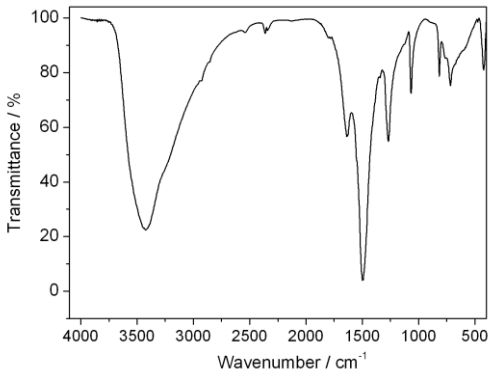

Fig S1. IR spectra of complex **1**.

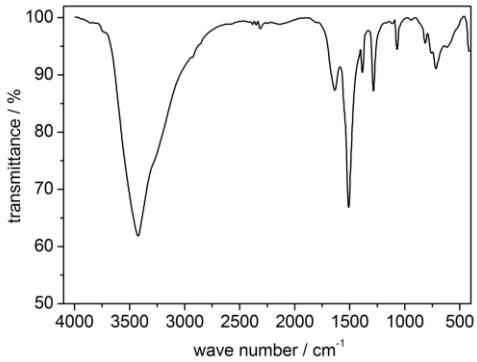

Fig S2. IR spectra of complex **2**.

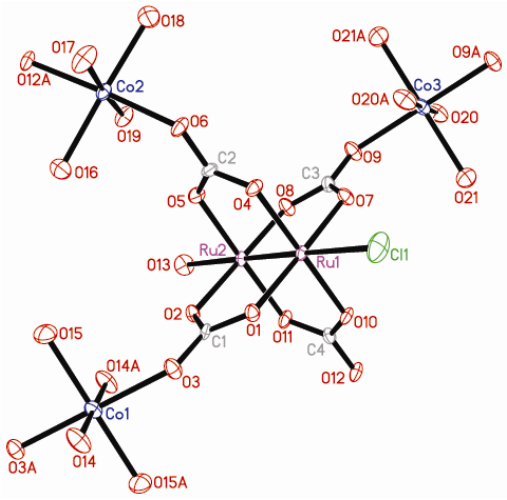

Fig. S3 ORTEP representation (30% thermal probability ellipsoids) of the crystal structure of **1**.

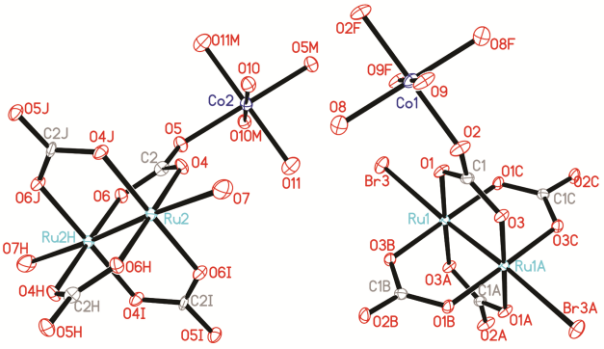

Fig. S4 ORTEP representation (30% thermal probability ellipsoids) of the crystal structure of **2**

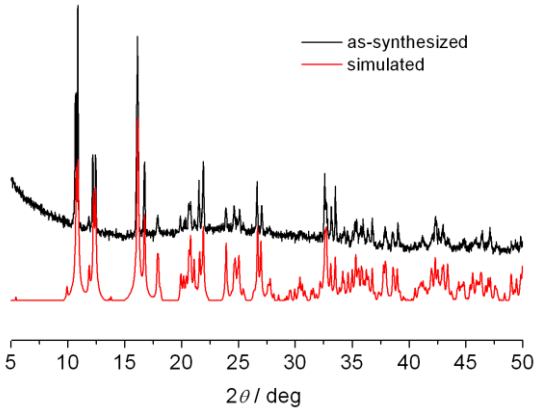

Fig. S5 Comparison of XRPD patterns of the simulated and as-synthesized of **1**.

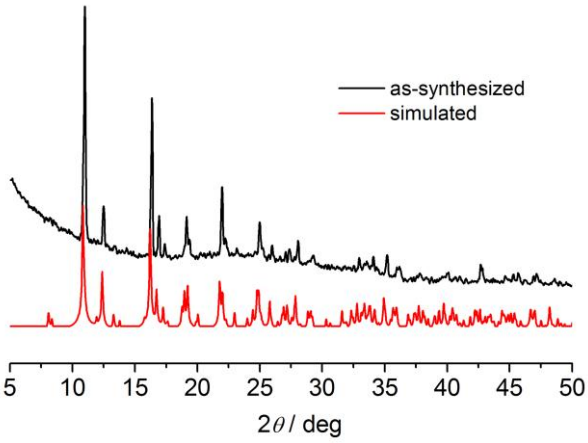

Fig. S6 Comparison of XRPD patterns of the simulated and as-synthesized of **2**.

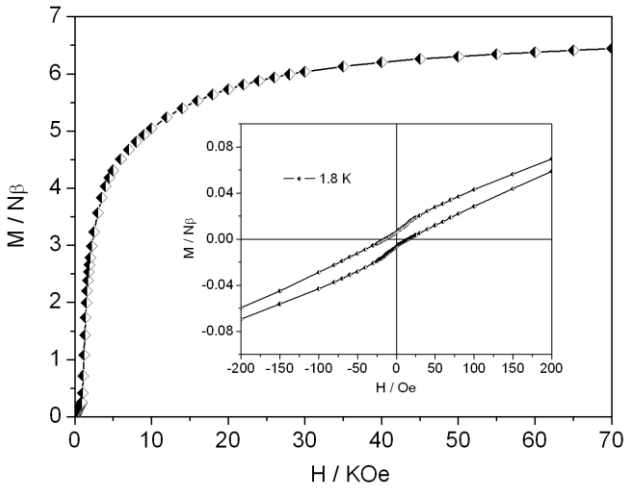

Fig. S7 *M* vs *H* plot for complex **1.**

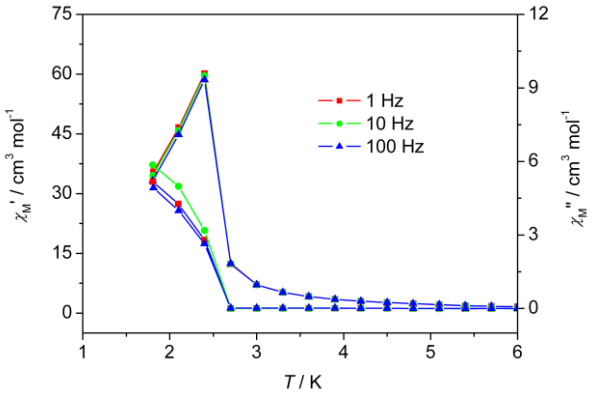

Fig. S8 χ_M' and χ_M" vs *T* plots for **2**

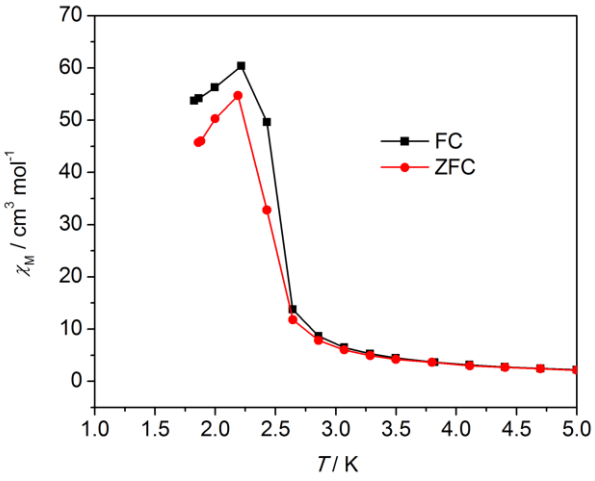

Fig. S9 FC and ZFC vs *T* plots for **2**

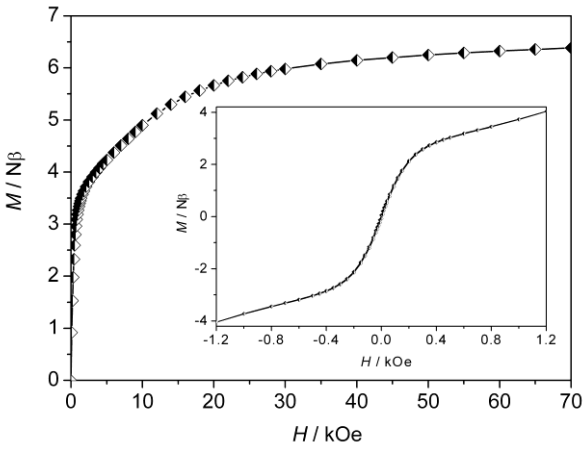

Fig. S10 *M* vs *H* plot for complex **2**