

## Electronic Supporting Information (ESI)

### Syntheses, Structures and Magnetic Properties of Two Heterometallic Carbonates: $\text{K}_2\text{Li}[\text{Cu}(\text{H}_2\text{O})_2\text{Ru}_2(\text{CO}_3)_4\text{X}_2] \cdot 5\text{H}_2\text{O}$ (X = Cl, Br)

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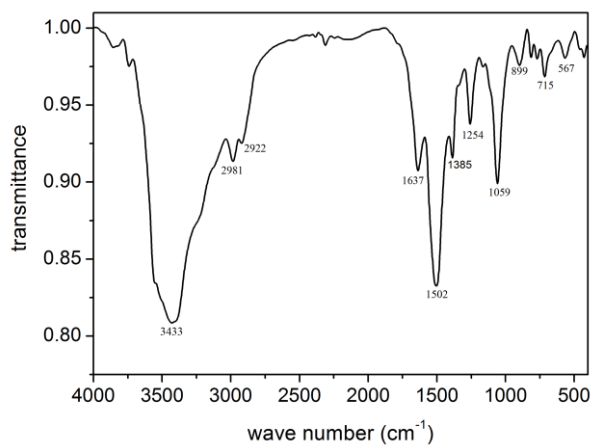
Table S1. Selected bond angles (°) of complexes **1** and **2**

1			
Ru(1A)–Ru(1)–Cl(1)	177.35(11)	O(3)–Cu(1)–O(4)	92.9(2)
Ru(1A)–Ru(1)–O(1)	88.94(17)	O(4)–Cu(1)–O(3D)	87.1(2)
Ru(1A)–Ru(1)–O(2A)	90.48(17)	O(3)–Cu(1)–O(3E)	93.0(4)
Cu(2)–O(3)–C(1)	128.9(6)	O(3)–Cu(1)–O(3F)	87.0(4)
2			
Ru(1A)–Ru(1)–Br(1)	177.37(2)	O(5)–Cu(1)–O(6)	92.10(12)
Ru(1A)–Ru(1)–O(1A)	89.07(8)	O(5)–Cu(1)–O(7)	86.04(13)
Ru(1A)–Ru(1)–O(2)	90.36(8)	O5–Cu(1)–O6D	87.90(12)
Ru(1A)–Ru(1)–O(3A)	90.42(8)	O5–Cu(1)–O7D	93.96(13)
Ru(1A)–Ru(1)–O(4)	88.83(8)	O6–Cu1–O7D	89.52(12)
Cu(1)–O(5)–C(1)	130.3(3)	O6D–Cu1–O7D	90.48(12)
Cu(1)–O(6)–C(2A)	128.0(3)		

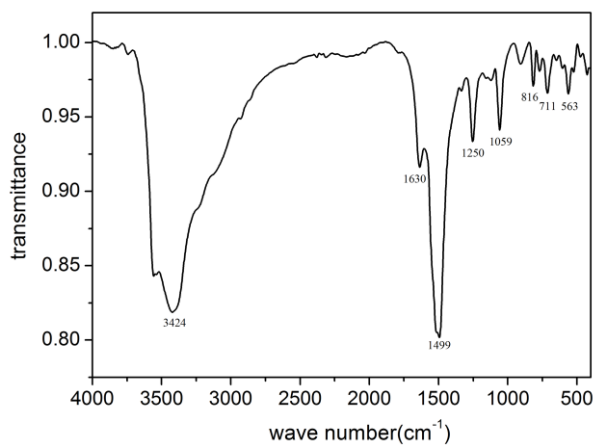
Symmetry codes: **1**: A: -x + 1, -y + 1, -z + 2; B: y, x, z; C: -y + 1, -x + 1, -z + 2; D: -x + 1, -y + 2, -z + 2; E: -y + 3/2, -x + 3/2, z; F: y - 1/2, x + 1/2, -z + 2. **2**: A, 1/2 - x, 1/2 - y, z; D: -x, 1 - y, 1 - z.

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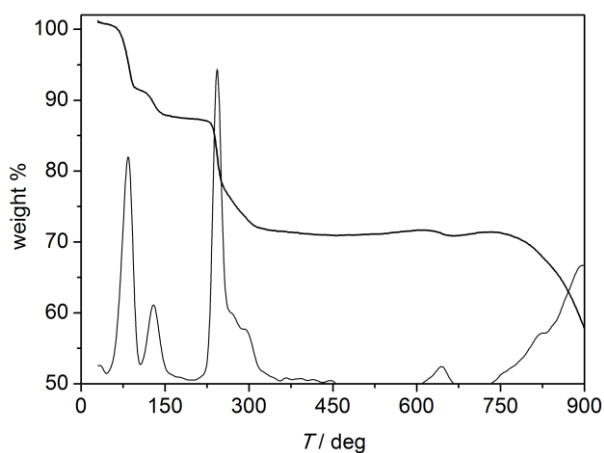
E-mail address: [liubin@nwu.edu.cn](mailto:liubin@nwu.edu.cn) (B. Liu)



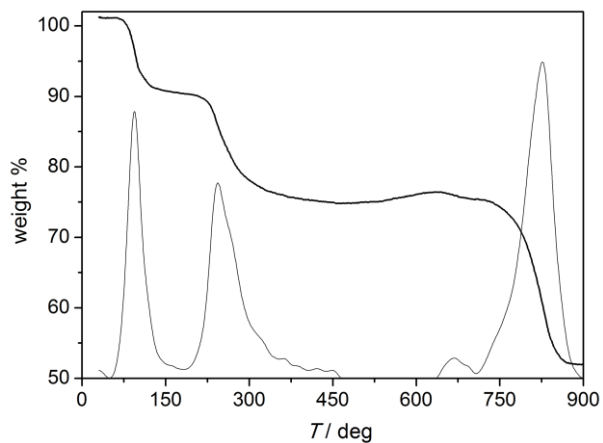
**Fig S1.** IR spectra of complex 1.



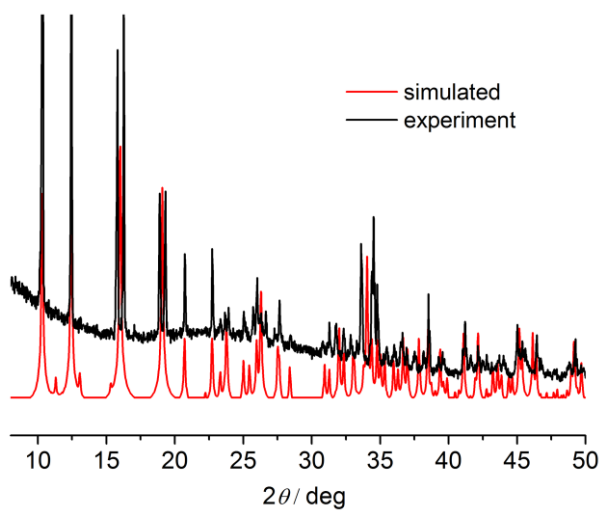
**Fig S2.** IR spectra of complex 2.



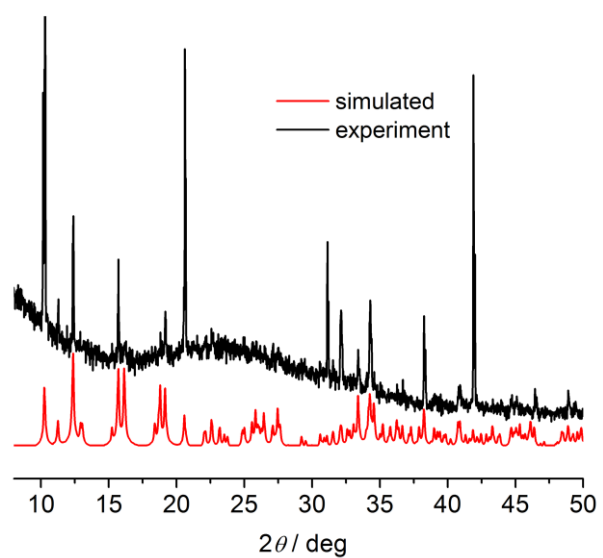
**Fig S3.** Thermal analysis of complex 1.



**Fig S4.** Thermal analysis of complex 2.

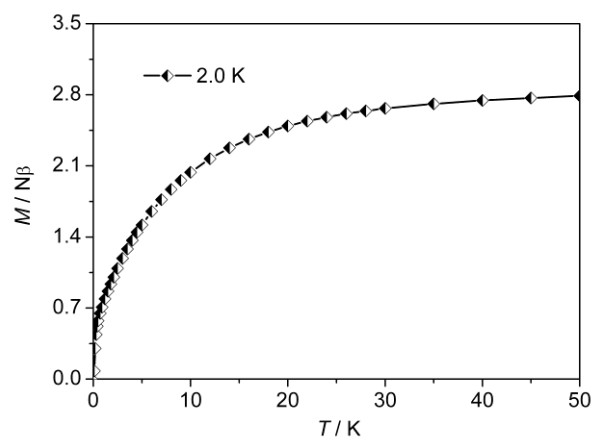


**Fig. S5** Comparison of XRPD patterns of the simulated and as-synthesized of 1.

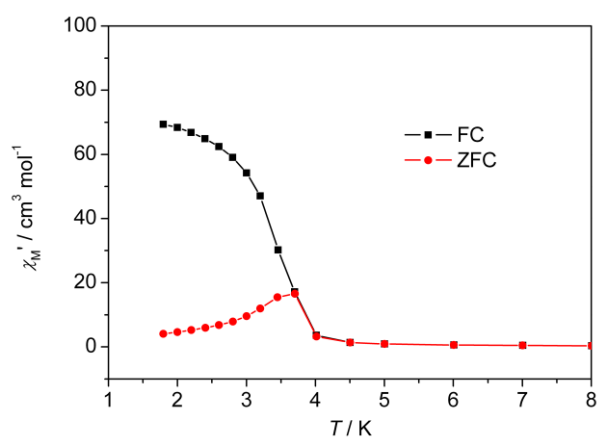


**Fig. S6** Comparison of XRPD patterns of the simulated and as-synthesized of 2.





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



**Fig. S11** FC and ZFC vs  $T$  plots for 2