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Electronic supplementary information

for

Room temperature ferroelectric copper(II) coordination polymers based on amino acid hydrazide ligands

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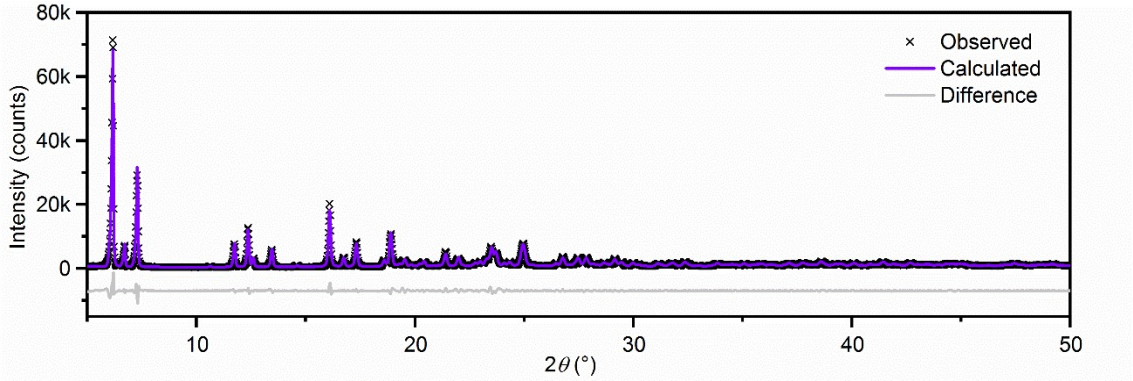


Figure S1. Room temperature XRD pattern and profile fitting results for$\{Cu_3(L2)_2(TPA)\}_n$×solvent (**2**).

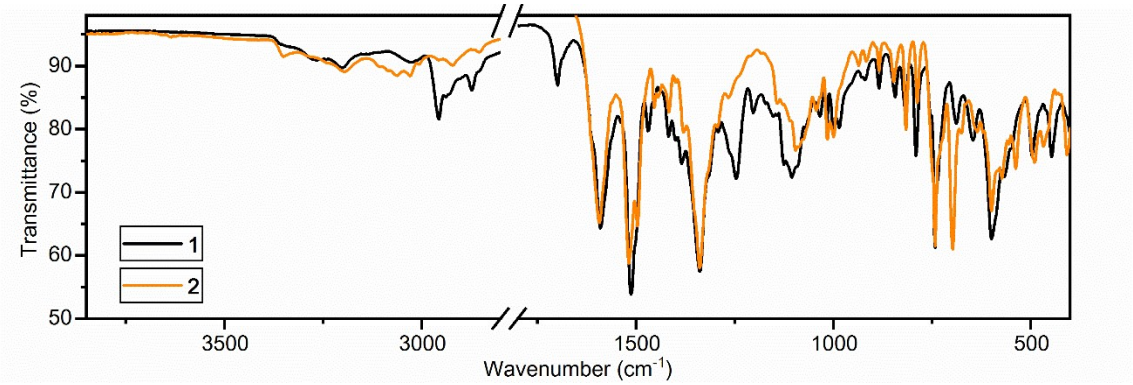


Figure S2. ATR spectra of coordination polymers $\{Cu_3(L1)_2(TPA)\}_n$×solvent (**1**) and $\{Cu_3(L2)_2(TPA)\}_n$×solvent (**2**)

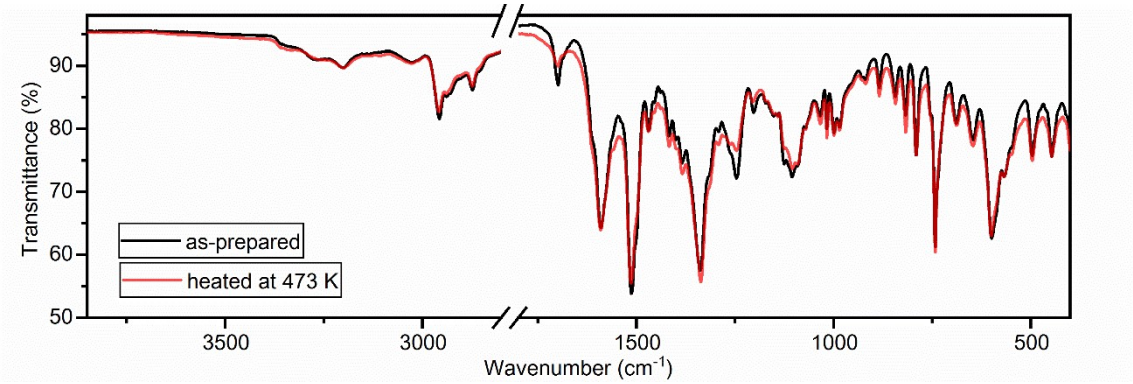


Figure S3. ATR spectra of coordination polymer $\{Cu_3(L1)_2(TPA)\}_n$×solvent (**1**) as-prepared and heated at 473 K.

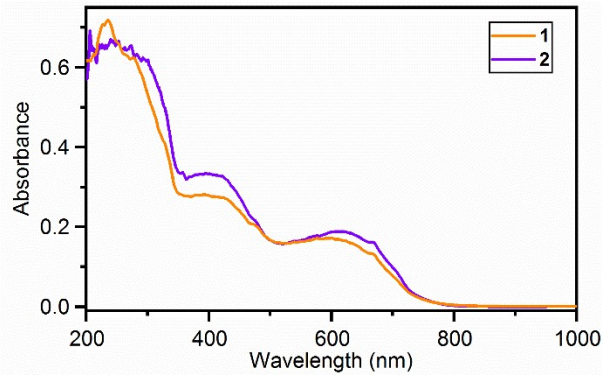
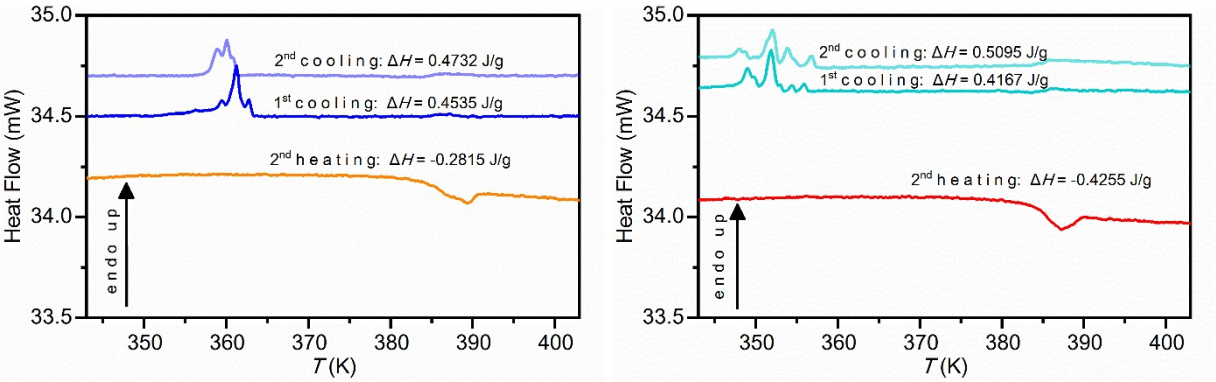


Figure S4. Solid state UV−visible diffuse reflectance spectrum of the $\{Cu_3(L1)_2(TPA)\}_n$×solvent (**1**) and $\{Cu_3(L2)_2(TPA)\}_n$×solvent (**2**)



(a) (b)

Figure S5. DSC curves for heating and cooling cycles for compounds **1** (a) and **2** (b).

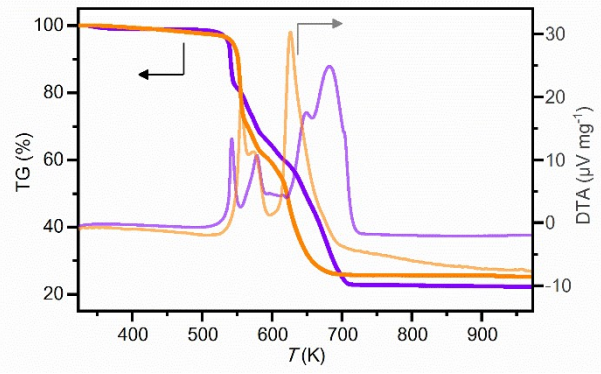


Figure S6. TG and DTA curves for compound **1** and **2** (orange and violet respectively) measured under a synthetic air atmosphere.

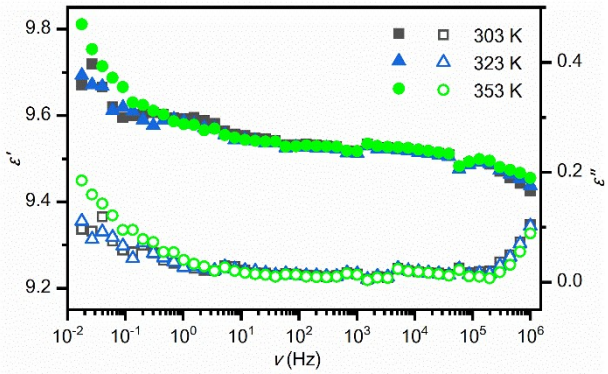


Figure S7. Frequency dependence of the real (closed symbols) and imaginary (open symbols) parts of the complex dielectric constant measured at different temperatures for compound **1**.

Table S1. Bond lengths (Å) involved in the first coordination sphere of copper(II) atoms in $\{Cu_3(L1)_2(TPA)\}_n$×solvent (**1**).

Cu1–N1	2.030(13)	Cu2–N2	1.865(15)	Cu3–N6	1.940(16)
Cu1–N4	2.003(14)	Cu2–N3	1.940(14)	Cu3–N7	2.037(14)
Cu1–N5	1.945(17)	Cu2–O1	1.950(10)	Cu3–O4	2.002(12)
Cu1–N8	1.943(15)	Cu2–O5	1.924(11)	Cu3–O7	1.874(15)

Table S2. Selected angles (°) in the coordination spheres of copper(II) atoms in $\{Cu_3(L1)_2(TPA)\}_n$×solvent (**1**).

N1–Cu1–N4	79.4(6)	N2–Cu2–N3	82.6(7)	N6–Cu3–N7	85.8(7)
N1–Cu1–N5	178.6(5)	N2–Cu2–O1	82.1(5)	N6–Cu3–O4	79.5(6)
N1–Cu1–N8	97.5(6)	N2–Cu2–O5	171.9(5)	N6–Cu3–O7	170.2(6)
N4–Cu1–N5	99.5(6)	N3–Cu2–O1	163.4(6)	N7–Cu3–O4	162.1(5)
N4–Cu1–N8	176.3(6)	N3–Cu2–O5	104.9(6)	N7–Cu3–O7	103.5(6)
N5–Cu1–N8	83.5(6)	O1–Cu2–O5	90.8(5)	O4–Cu3–O7	92.0(5)
Cu2–O1–C1	110.4(11)	Cu3–O4–C13	111.0(10)	C25–O5–Cu2	128.1(10)

Table S3. Hydrogen–bonding geometry in $\{Cu_3(L1)_2(TPA)\}_n$×solvent (**1**).

D–H···*A*	*D*–H/Å	H···*A*/Å	*D*···*A*/Å	*D*–H···*A*/°	Symm. op. on *A*
N3–H3C···O2	0.89	2.14	2.90(2)	142	1 + *x, y, z*
N7–H7B···O3	0.89	2.14	2.92(2)	146	-1 + *x, y, z*
N3–H3D···solvent	0.89				
N7–H7A···solvent	0.89				
N3–H3C···O6	0.89	2.51	2.88(2)	105	3 + *x*, -1 + *y, z*
C3–H3A···O1	0.97	2.57	2.914(19)	101	
C15–H15A···O4	0.97	2.52	2.87(2)	101	
C21–H21A···O3	0.97	2.56	3.24(2)	127	-1 + *x, y, z*
C28–H28···O7	0.93	2.49	2.80(2)	100	
C30–H30···O8	0.93	2.44	2.75(2)	100	