Supporting Information

How the Magnetic Field Impacts the Chiroptical Activities of Helical Copper Enantiomers

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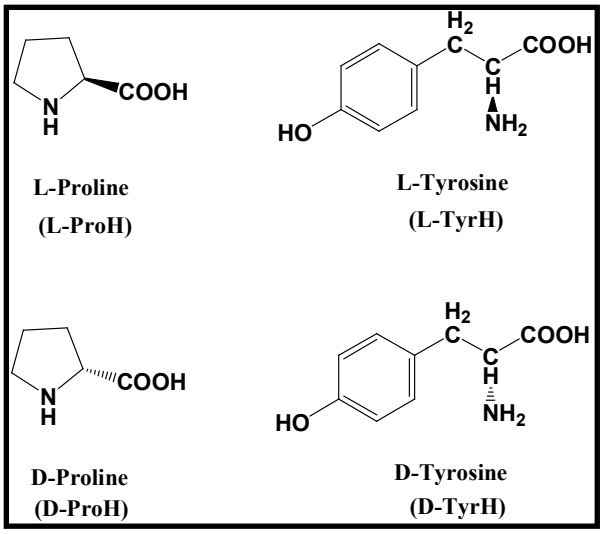

Scheme S1 the amino acid ligands using in this system.

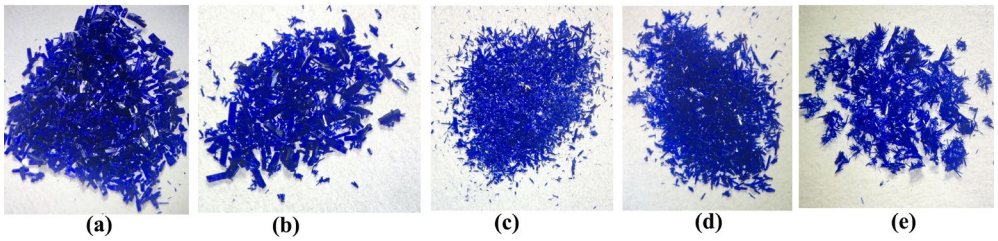

Fig. S1. The representational photos of **L-1** with the ratio of $CuSO_4 \cdot 5H_2O$: L-tyrH: L-proH: NaOH (a) 1:1:1:4; (b) 1:1:2:4; (c) 1:1:3:8; (d) 1:1:2:6; (e) 3:1:3:8.5 under the microscope.

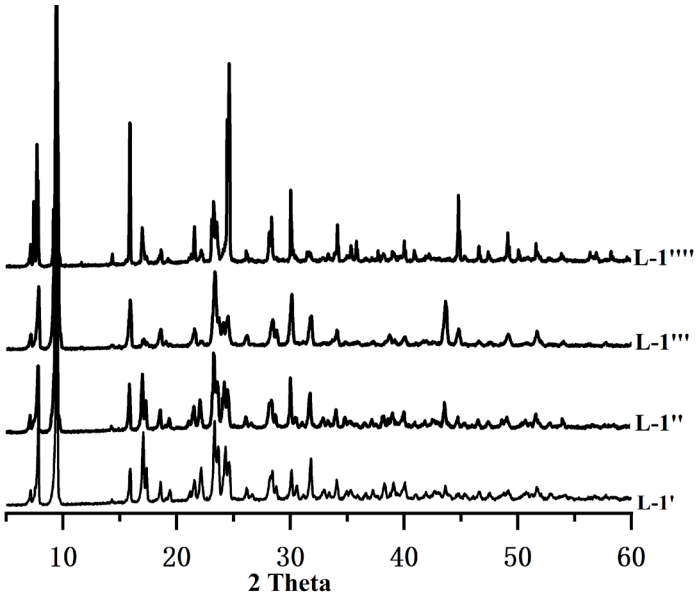

Fig. S2. The Powder X-ray diffraction (PXRD) patterns:
L-1': A mixture of L- tyrH (1 mmol, 0.1816 g) and NaOH (2mmol, 0.0801g) in 30 mL of deionized water, L- proH (1 mmol, 0.1152 g) and NaOH (2mmol, 0.0801g) in 30

mL of deionized water, $CuSO_4 \cdot 5H_2O$ (1 mmol, 0.2497g) in 30 mL of deionized water was stirred for 45 min, and then was heated at 80 °C for 15min before being stirred further at ambient temperature 15min. Microcrystal not suitable for testing was isolated after several days. The PXRD measurement was recorded as shown in Fig. S2.

L-1'': A mixture of L- tyrH (1 mmol, 0.1816 g) and NaOH (1mmol, 0.0401g) in 30 mL of deionized water, L- proH (1 mmol, 0.1152 g) and NaOH (1mmol, 0.0402g) in 30 mL of deionized water, $CuSO_4 \cdot 5H_2O$ (1 mmol, 0.2497g) and NaOH (2mmol, 0.0802g) in 30 mL of deionized water was stirred for 45min, and then was heated at 80 °C for 15min before being stirred further at ambient temperature 15min. Microcrystal not suitable for testing was isolated after several days. The PXRD measurement was recorded as shown in Fig. S2.

L-1''': A mixture of L- tyrH (1 mmol, 0.1816 g) in 30 mL of deionized water, L- proH (1 mmol, 0.1152 g) in 30 mL of deionized water, $CuSO_4 \cdot 5H_2O$ (1 mmol, 0.2497g) and NaOH (4mmol, 0.1603g) in 30 mL of deionized water was stirred for 45 min, and then was heated at 80 °C for 15min before being stirred further at ambient temperature 15min. Microcrystal not suitable for testing was isolated after several days. The PXRD measurement was recorded as shown in Fig. S2.

L-1'''': A mixture of L- tyrH (1 mmol, 0.1816 g), L- proH (1 mmol, 0.1152 g) and NaOH (4mmol, 0.1602g) in 60 mL of deionized water was stirred for 20 min. Then a deionized water solution (30 mL) of $CuSO_4 \cdot 5H_2O$ (1 mmol, 0.2497g) was added and the reaction mixture was heated at 80 °C for 15min before being stirred further at ambient temperature 15min. Microcrystal not suitable for testing was isolated after several days. The PXRD measurement was recorded as shown in Fig. S2.

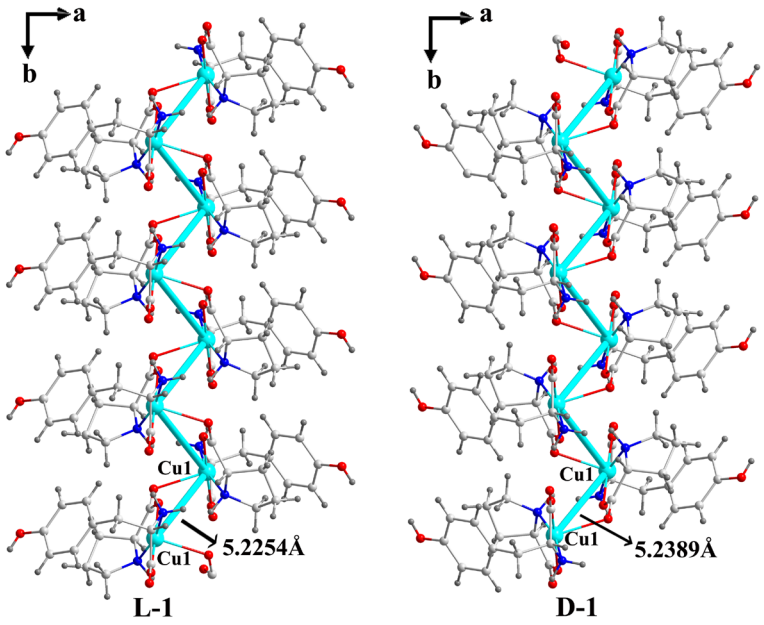

Fig. S3. View of the helical chain **L-1** (a) and **D-1** (b), respectively.

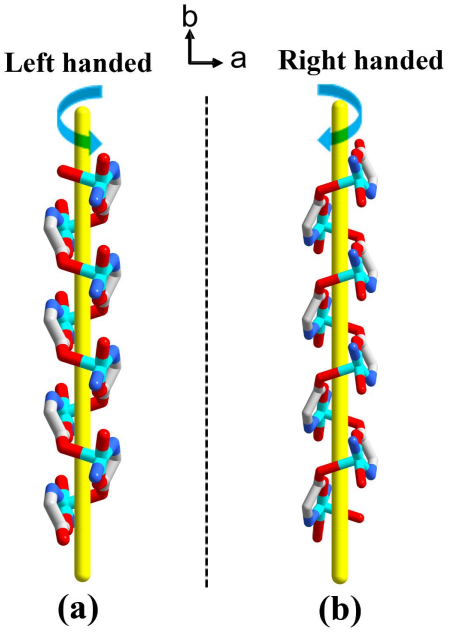

Fig. S4. View of the helical chain **L-1** (a) and **D-1** (b), respectively.

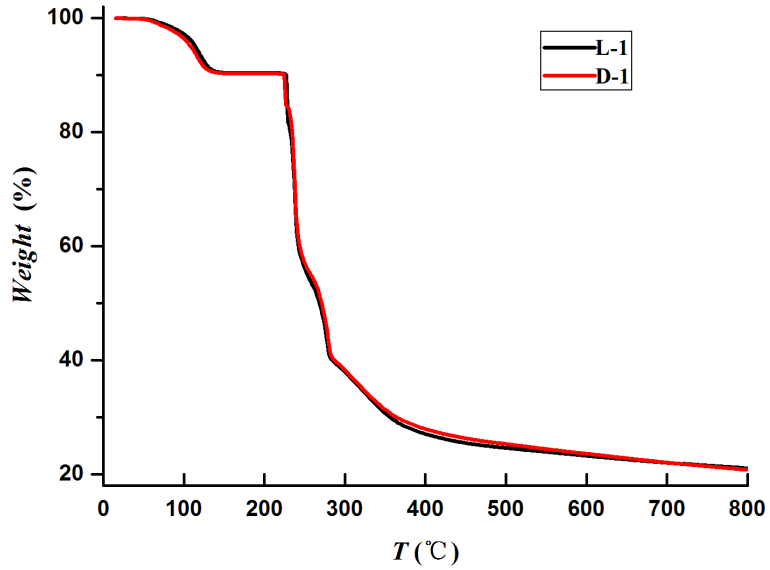

Fig. S5. The TGA curves of **L-1** (black) and **D-1** (red).

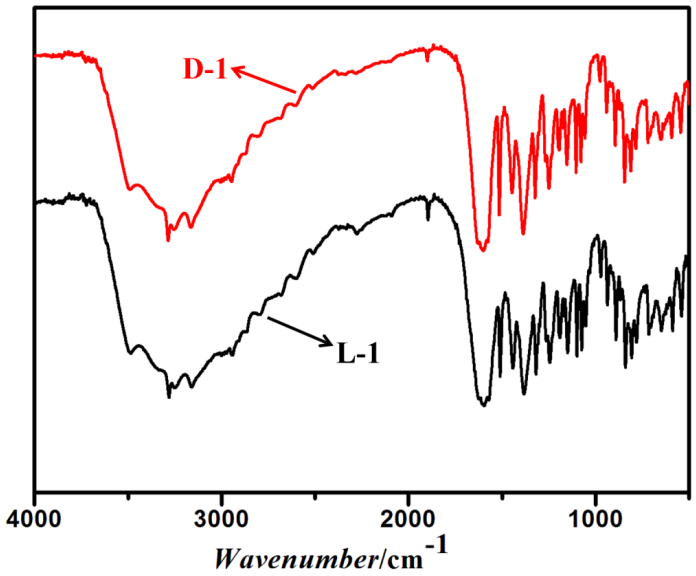

Fig. S6. The IR spectrum of **L-1** (black) and **D-1** (red) in KBr pellets from 4000 cm^{-1} to 400 cm^{-1}.

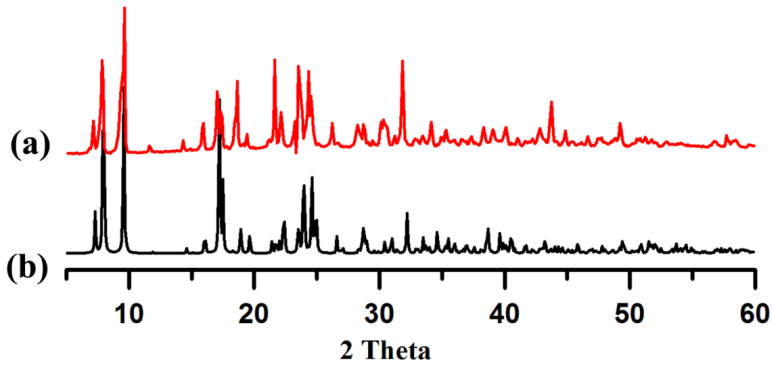

Fig. S7. The Powder X-ray diffraction (PXRD) patterns for **L-1**: (a) the experimental pattern at room temperature; (b) the simulated pattern from single crystal X-ray data.

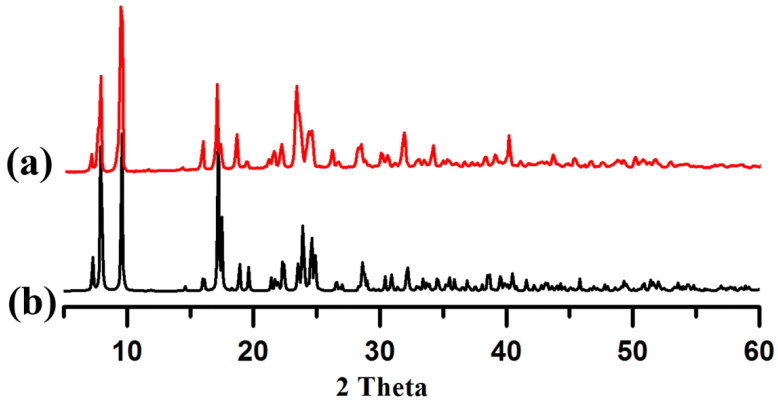

Fig. S8. The Powder X-ray diffraction (PXRD) patterns for **D-1**: (a) the experimental pattern at room temperature; (b) the simulated pattern from single crystal X-ray data.

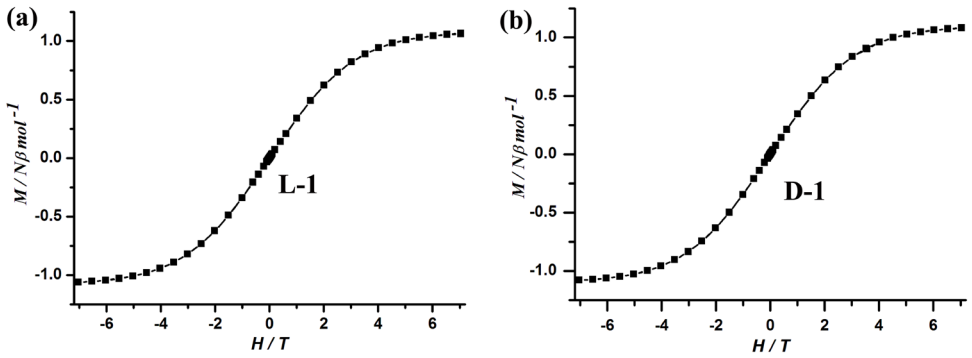

Fig.S9. Displaying no magnetic hysteresis loop for **L-1 (a)** and **D-1 (b).**

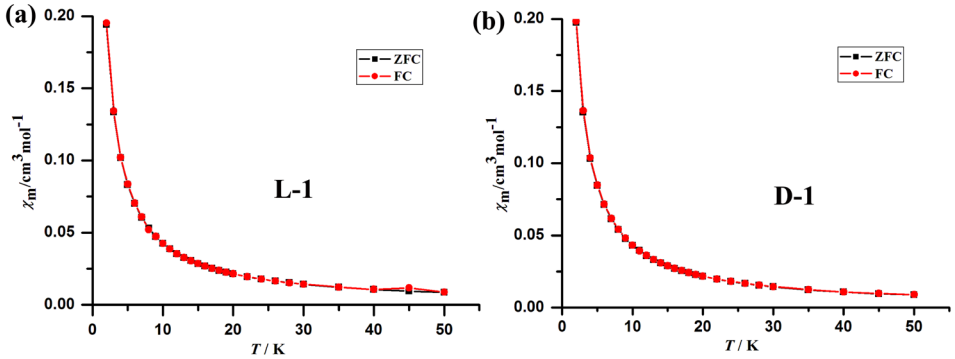

Fig.S10. Plots of zero-field-cooled (ZFC) and field-cooled (FC) susceptibilities versus *T* at the applied field of 100 Oe for **L-1** (a) and **D-1** (b).

Table S1. The crystallographic data for **L-1** and **D-1**.

	L-1	**D-1**
CCDC number	2038531	2041015
formula	C14H22Cu1N2O7	C14H22Cu1N2O7
fw	393.89	393.89
space group	P2(1)	P2(1)
crystal system	Monoclinic	Monoclinic
***a*/Å**	11.3860(2)	11.39160(13)
***b*/Å**	5.69090(10)	5.69116(6)
***c*/Å**	12.4062(2)	12.43561(14)
***α*/°**	90	90
***β*/°**	102.327(2)	102.1946(11)
***γ*/°**	90	90
V/Å^3	785.35(2)	788.026(15)
Z	2	2
calculated density (g.cm^{-3})	1.666	1.660
absorption coefficient (μ,mm^{-1})	2.347	2.339
F(000)	410	410
crystal size (mm)	0.6 x 0.4 x 0.35	0.4 x 0.12 x 0.1
θ range (deg)	3.647 to 71.523	3.636 to 74.311
unique reflns (R_{int})	3047 (0.0519)	3195(0.0361)
***R1*,[a] *wR2*[b] (*I >2σ(I)*)**	0.0227, 0.0587	0.0214, 0.0561
***R1*,[a] *wR2*[b] (all data)**	0.0229, 0.0591	0.0215, 0.0561
GOF on F^2	1.041	1.021

$^{a}R = \sum||F_o|-|F_c||/\sum|F_c|$. $^{b}wR_2 = \left[\sum w(|F_o|-|F_c|)^2/\sum w(F_o^2)\right]^{1/2}$, $w = 1/\sigma(F_o)^2$.

Table S2. Selected bond lengths (Å) and angles (deg) for **L-1**.

Bond lengths [Å]			
Cu(1)-O(1)	1.954(2)	Cu(1)-O(3)	1.949(2)
Cu(1)-N(2)	1.976(2)	Cu(1)-N(1)	2.001(2)
C(1)-N(1)	1.505(4)	C(1)-C(2)	1.524(4)
C(2)-C(3)	1.525(5)	C(3)-C(4)	1.544(3)
C(4)-N(1)	1.497(4)	C(4)-C(5)	1.518(4)
C(5)-O(2)	1.250(4)	C(5)-O(1)	1.281(3)
C(6)-N(2)	1.484(4)	C(6)-C(7)	1.523(4)
C(6)-C(8)	1.538(4)	C(7)-O(4)	1.240(4)
C(7)-O(3)	1.288(3)	C(8)-C(9)	1.513(4)
C(9)-C(14)	1.394(4)	C(9)-C(10)	1.397(4)
C(11)-C(12)	1.388(4)	C(12)-O(5)	1.376(3)
C(12)-C(13)	1.386(4)	C(13)-C(14)	1.393(4)
Angles [deg]			
O(3)-Cu(1)-O(1)	178.33(9)	N(2)-Cu(1)-N(1)	167.17(10)
O(3)-Cu(1)-N(2)	84.89(9)	C(4)-N(1)-Cu(1)	109.59(18)
O(1)-Cu(1)-N(2)	94.16(9)	C(1)-N(1)-Cu(1)	112.40(16)
O(3)-Cu(1)-N(1)	95.53(9)	C(6)-N(2)-Cu(1)	108.92(17)
O(1)-Cu(1)-N(1)	85.09(9)	C(5)-O(1)-Cu(1)	115.69(18)
C(7)-O(3)-Cu(1)	114.30(19)	O(4)-C(7)-O(3)	123.2(3)
O(4)-C(7)-C(6)	119.2(3)	O(3)-C(7)-C(6)	117.5(3)

Table S3. Selected bond lengths (Å) and angles (deg) for **D-1**.

Bond lengths [Å]			
Cu(1)-O(1)	1.9549(19)	Cu(1)-N(1)	2.002(2)
Cu(1)-O(3)	1.949(2)	C(1)-N(1)	1.503(3)
Cu(1)-N(2)	1.978(2)	C(1)-C(2)	1.520(4)
C(2)-C(3)	1.523(4)	C(3)-C(4)	1.542(3)
C(4)-N(1)	1.498(3)	C(4)-C(5)	1.521(4)
C(5)-O(2)	1.246(3)	C(5)-O(1)	1.279(3)
C(6)-N(2)	1.484(3)	C(6)-C(7)	1.525(4)
C(6)-C(8)	1.535(4)	C(7)-O(4)	1.238(3)
C(7)-O(3)	1.283(3)	C(8)-C(9)	1.515(4)
C(9)-C(14)	1.391(4)	C(9)-C(10)	1.394(4)
C(11)-C(12)	1.386(4)	C(12)-O(5)	1.374(3)
C(12)-C(13)	1.382(4)	C(13)-C(14)	1.397(4)
Angles [deg]			
O(3)-Cu(1)-O(1)	178.45(9)	N(2)-Cu(1)-N(1)	167.23(9)
O(3)-Cu(1)-N(2)	84.86(9)	C(4)-N(1)-Cu(1)	109.42(17)
O(1)-Cu(1)-N(2)	94.18(9)	C(1)-N(1)-Cu(1)	112.53(15)
O(3)-Cu(1)-N(1)	95.43(9)	C(6)-N(2)-Cu(1)	108.90(16)

O(1)-Cu(1)-N(1)	85.23(8)	C(5)-O(1)-Cu(1)	115.62(17)
C(7)-O(3)-Cu(1)	114.30(19)	O(4)-C(7)-O(3)	123.3(3)
O(4)-C(7)-C(6)	119.2(3)	O(3)-C(7)-C(6)	117.7(2)

Table S4. the different ratio of $CuSO_4 \cdot 5H_2O$: L-tyrH: L-proH: NaOH for the reaction systems of **L-1**.

	$CuSO_4 \cdot 5H_2O$	L-tyrH	L-proH	NaOH	The results
1	1mmol	1mmol	1mmol	2mmol	No product
2	1mmol	1mmol	1mmol	4mmol	single-crystal*
3	1mmol	1mmol	2mmol	4mmol	single-crystal
4	1mmol	1mmol	3mmol	8mmol	single-crystal
5	1mmol	1mmol	2mmol	6mmol	single-crystal
6	1mmol	2mmol	1mmol	6mmol	single-crystal
7	3mmol	1mmol	3mmol	8.5mmol	single-crystal
8	2mmol	1mmol	4mmol	10mmol	single-crystal
9	3mmol	1mmol	4mmol	10mmol	single-crystal
10	3mmol	0.5mmol	4mmol	10mmol	single-crystal
11	3mmol	1.5mmol	4mmol	10mmol	single-crystal
12	3.5mmol	1mmol	4mmol	10mmol	single-crystal
13	4mmol	1mmol	4mmol	10mmol	single-crystal

*The highest yield and best suitable for single-crystal X-ray crystallography.