Supporting Information for

Six Zn(II) and Cd(II) Coordination Polymers Assembled from a Similar Binuclear Buiding Unit: Tunable Structures and Luminescent Properties

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1.1. Table S1 Selected Bond lengths [Å] and angles [º] for **1**.

Zn(1)-O(1)	1.983(4)
Zn(1)-N(2)#1	2.084(5)
Zn(1)-O(1)#2	2.173(4)
Zn(1)-N(1)	2.206(5)
Zn(1)-Cl(1)	2.213(3)
O(1)-Zn(1)-N(2)#1	120.0(2)
O(1)-Zn(1)-O(1)#2	73.70(19)
N(2)#1-Zn(1)-O(1)#2	87.43(19)
O(1)-Zn(1)-N(1)	78.73(17)
N(2)#1-Zn(1)-N(1)	99.55(19)
O(1)#2-Zn(1)-N(1)	151.23(17)
O(1)-Zn(1)-Cl(1)	129.22(18)
N(2)#1-Zn(1)-Cl(1)	109.51(17)
O(1)#2-Zn(1)-Cl(1)	99.37(15)
N(1)-Zn(1)-Cl(1)	104.37(15)
C(1)-O(1)-Zn(1)	117.5(3)
C(1)-O(1)-Zn(1)#2	135.9(4)
Zn(1)-O(1)-Zn(1)#2	106.30(19)
C(9)-N(1)-Zn(1)	132.4(4)
C(6)-N(1)-Zn(1)	109.3(4)
C(16)-N(2)-Zn(1)#3	122.0(4)
C(15)-N(2)-Zn(1)#3	119.4(4)

Symmetry transformations used to generate equivalent atoms:
#1 -x+1/2, y+1/2, -z+1/2 #2 -x+1, -y+1, -z
#3 -x+1/2, y-1/2, -z+1/2

1.2. Table S2 Selected Bond lengths [Å] and angles [º] for **2**.

I(1)-Zn(1)	2.5795(7)
Zn(1)-O(1)	1.969(3)
Zn(1)-N(2)#1	2.065(4)
Zn(1)-N(1)	2.209(4)
Zn(1)-O(1)#2	2.222(3)
N(2)-Zn(1)#3	2.065(4)
O(1)-Zn(1)-N(2)#1	119.09(15)
O(1)-Zn(1)-N(1)	79.42(13)
N(2)#1-Zn(1)-N(1)	102.02(14)
O(1)-Zn(1)-O(1)#2	73.25(13)
N(2)#1-Zn(1)-O(1)#2	85.94(14)

N(1)-Zn(1)-O(1)#2	151.89(12)
O(1)-Zn(1)-I(1)	125.16(11)
N(2)#1-Zn(1)-I(1)	113.78(11)
N(1)-Zn(1)-I(1)	103.39(10)
O(1)#2-Zn(1)-I(1)	97.68(9)
C(1)-O(1)-Zn(1)	116.4(3)
C(1)-O(1)-Zn(1)#2	136.9(3)
Zn(1)-O(1)-Zn(1)#2	106.75(13)
C(9)-N(1)-Zn(1)	133.2(3)
C(6)-N(1)-Zn(1)	107.9(3)
C(16)-N(2)-Zn(1)#3	122.1(3)
C(15)-N(2)-Zn(1)#3	118.3(3)

Symmetry transformations used to generate equivalent atoms:
#1 -x+1/2, y-1/2, -z-1/2 #2 -x, -y+2, -z
#3 -x+1/2, y+1/2, -z-1/2

1.3. Table S3 Selected Bond lengths [Å] and angles [º] for **3**.

Br(1)-Zn(1)	2.3697(6)
Zn(1)-O(1)	1.996(2)
Zn(1)-N(2)#1	2.090(3)
Zn(1)-O(1)#2	2.117(2)
Zn(1)-N(1)	2.239(2)
O(1)-Zn(1)#2	2.117(2)
O(1)-Zn(1)-N(2)#1	116.70(11)
O(1)-Zn(1)-O(1)#2	74.85(10)
N(2)#1-Zn(1)-O(1)#2	95.50(10)
O(1)-Zn(1)-N(1)	78.06(9)
N(2)#1-Zn(1)-N(1)	90.37(10)
O(1)#2-Zn(1)-N(1)	152.01(9)
O(1)-Zn(1)-Br(1)	126.54(8)
N(2)#1-Zn(1)-Br(1)	116.72(8)
O(1)#2-Zn(1)-Br(1)	101.84(7)
N(1)-Zn(1)-Br(1)	99.82(7)
C(1)-O(1)-Zn(1)	118.1(2)
C(1)-O(1)-Zn(1)#2	136.3(2)
Zn(1)-O(1)-Zn(1)#2	105.15(9)
C(9)-N(1)-Zn(1)	131.1(2)
C(6)-N(1)-Zn(1)	108.7(2)
C(16)-N(2)-Zn(1)#1	124.0(2)
C(15)-N(2)-Zn(1)#1	118.0(2)

Symmetry transformations used to generate equivalent atoms:
#1 -x+1, y, -z+1/2 #2 -x+3/2, -y+3/2, -z+1
#3 -x+1, y, -z+3/2

1.4. Table S4 Selected Bond lengths [Å] and angles [º] for **4**.

Cd(1)-O(1)	2.2246(17)
Cd(1)-O(1)#1	2.2819(17)
Cd(1)-N(2)#2	2.311(2)
Cd(1)-O(3)	2.314(2)
Cd(1)-N(1)	2.379(2)
Cd(1)-O(2)	2.396(2)
Cd(1)-C(17)	2.691(3)
O(1)-Cd(1)#1	2.2819(17)
O(1)-Cd(1)-O(1)#1	73.26(7)
O(1)-Cd(1)-N(2)#2	113.54(8)
O(1)#1-Cd(1)-N(2)#2	85.80(8)
O(1)-Cd(1)-O(3)	103.26(8)
O(1)#1-Cd(1)-O(3)	93.88(8)
N(2)#2-Cd(1)-O(3)	141.29(8)
O(1)-Cd(1)-N(1)	72.66(6)
O(1)#1-Cd(1)-N(1)	144.93(6)
N(2)#2-Cd(1)-N(1)	100.35(7)
O(3)-Cd(1)-N(1)	101.70(8)
O(1)-Cd(1)-O(2)	157.45(8)
O(1)#1-Cd(1)-O(2)	111.35(8)
N(2)#2-Cd(1)-O(2)	88.98(8)
O(3)-Cd(1)-O(2)	55.13(8)
N(1)-Cd(1)-O(2)	103.31(8)
O(1)-Cd(1)-C(17)	130.45(9)
O(1)#1-Cd(1)-C(17)	104.28(8)
N(2)#2-Cd(1)-C(17)	115.61(9)
C(1)-O(1)-Cd(1)	118.09(14)
C(1)-O(1)-Cd(1)#1	135.10(15)
Cd(1)-O(1)-Cd(1)#1	106.74(7)
C(9)-N(1)-Cd(1)	129.21(16)
C(6)-N(1)-Cd(1)	111.47(15)
C(17)-O(2)-Cd(1)	89.44(18)
C(15)-N(2)-Cd(1)#3	121.23(17)
C(16)-N(2)-Cd(1)#3	120.51(17)
C(17)-O(3)-Cd(1)	93.40(18)

Symmetry transformations used to generate equivalent atoms:

#1 -x+1, -y+2, -z #2 -x+1/2, y+1/2, -z+1/2
#3 -x+1/2, y-1/2, -z+1/2

1.5. Table S5 Selected Bond lengths [Å] and angles [º] for **5**.

Cd(1)-O(1)	2.223(2)
Cd(1)-O(1)#1	2.284(2)
Cd(1)-N(2)#2	2.312(3)
Cd(1)-O(2)	2.331(3)
Cd(1)-N(1)	2.374(3)
Cd(1)-O(3)	2.389(3)
O(1)-Cd(1)#1	2.284(2)
N(2)-Cd(1)#3	2.312(3)
O(1)-Cd(1)-O(1)#1	73.44(9)
O(1)-Cd(1)-N(2)#2	115.18(10)
O(1)#1-Cd(1)-N(2)#2	85.71(10)
O(1)-Cd(1)-O(2)	101.85(11)
O(1)#1-Cd(1)-O(2)	93.66(11)
N(2)#2-Cd(1)-O(2)	140.95(10)
O(1)-Cd(1)-N(1)	72.65(9)
O(1)#1-Cd(1)-N(1)	144.90(9)
N(2)#2-Cd(1)-N(1)	100.66(10)
O(2)-Cd(1)-N(1)	101.86(10)
O(1)-Cd(1)-O(3)	155.91(11)
O(1)#1-Cd(1)-O(3)	111.32(10)
N(2)#2-Cd(1)-O(3)	88.89(10)
O(2)-Cd(1)-O(3)	55.02(10)
N(1)-Cd(1)-O(3)	103.35(10)
C(1)-O(1)-Cd(1)	118.22(19)
C(1)-O(1)-Cd(1)#1	135.0(2)
Cd(1)-O(1)-Cd(1)#1	106.55(9)
C(9)-N(1)-Cd(1)	129.2(2)
C(6)-N(1)-Cd(1)	111.7(2)
N(8)-O(2)-Cd(1)	93.3(2)
C(15)-N(2)-Cd(1)#3	121.0(2)
C(16)-N(2)-Cd(1)#3	120.7(2)

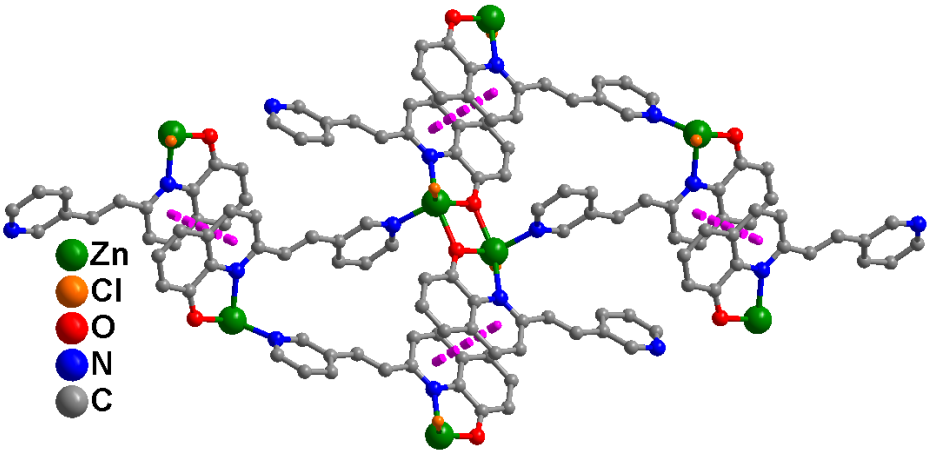
Symmetry transformations used to generate equivalent atoms:
#1 -x, -y+1, -z #2 -x+1, y+1/2, -z+1/2
#3 -x+1, y-1/2, -z+1/2

1.6. Table S6 Selected Bond lengths [Å] and angles [°] for **6**.

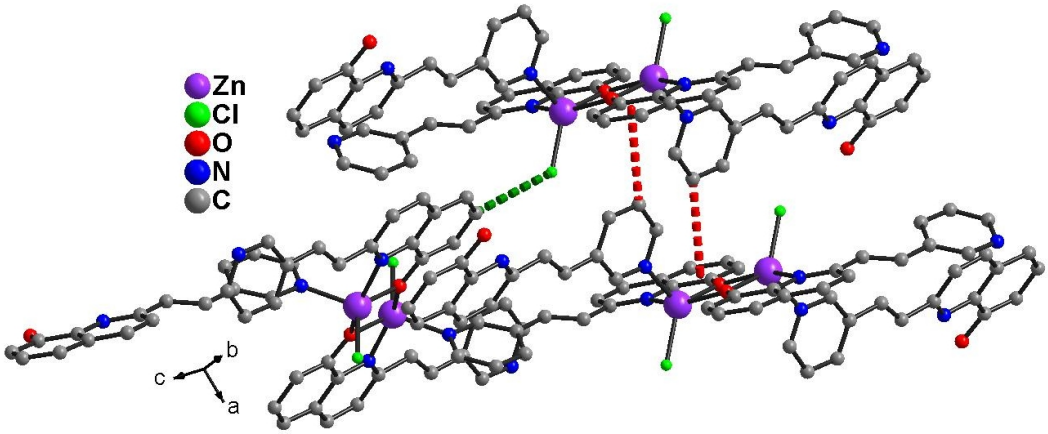
I(1)-Cd(1)	2.7061(4)
Cd(1)-O(1)	2.230(2)
Cd(1)-O(1)#1	2.268(3)
Cd(1)-N(2)#2	2.333(3)
Cd(1)-N(1)	2.371(3)
O(1)-Cd(1)#1	2.268(3)
N(2)-Cd(1)#2	2.333(3)
O(1)-Cd(1)-O(1)#1	74.97(10)
O(1)-Cd(1)-N(2)#2	117.87(11)
O(1)#1-Cd(1)-N(2)#2	89.96(10)
O(1)-Cd(1)-N(1)	72.11(9)
O(1)#1-Cd(1)-N(1)	139.60(10)
N(2)#2-Cd(1)-N(1)	85.31(10)
O(1)-Cd(1)-I(1)	128.31(8)
O(1)#1-Cd(1)-I(1)	109.68(7)
N(2)#2-Cd(1)-I(1)	113.64(8)
N(1)-Cd(1)-I(1)	108.92(7)
C(1)-O(1)-Cd(1)	118.4(2)
C(1)-O(1)-Cd(1)#1	132.4(2)
Cd(1)-O(1)-Cd(1)#1	105.03(10)
C(15)-N(2)-Cd(1)#2	118.3(2)
C(16)-N(2)-Cd(1)#2	122.4(3)

Symmetry transformations used to generate equivalent atoms:
#1 -x+1, -y, -z+1 #2 -x+1, -y+1, -z

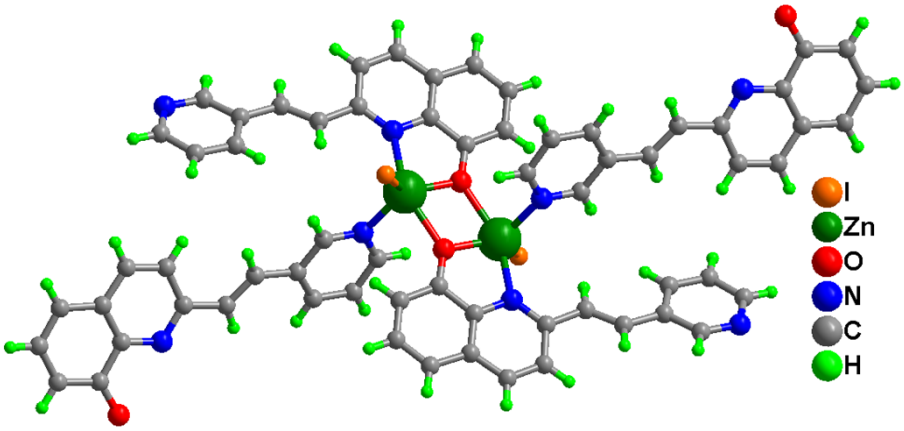
2.1. Fig. S1 View of π···π interactions (pink dashed lines) in **1**.



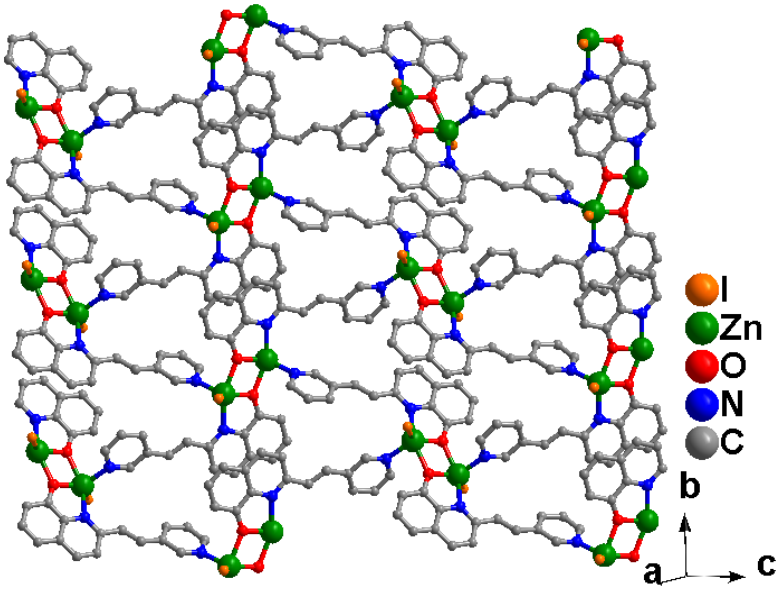
2.2. Fig. S2 2D supramolecular structure of **1** extends to a 3D network via C–H···π (red dashed lines) and C–H···Cl (green dashed lines) interactions.



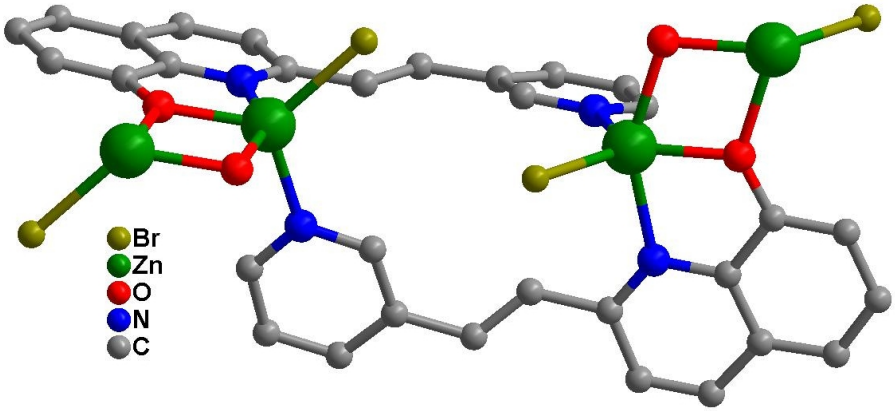
3.1. Fig. S3 View of the coordination geometry of Zn(II) atoms in **2**.



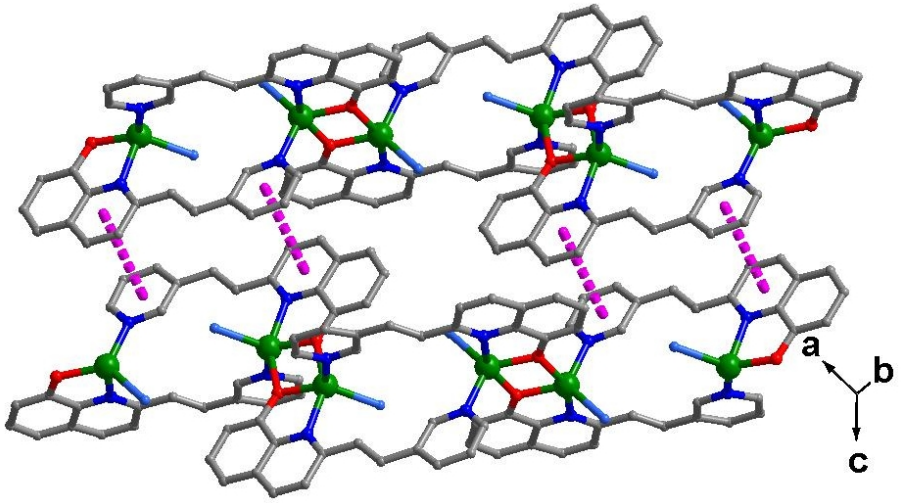
3.2. Fig. S4 Binuclear Zn units are linked into 2D supramolecular structure in **2**.



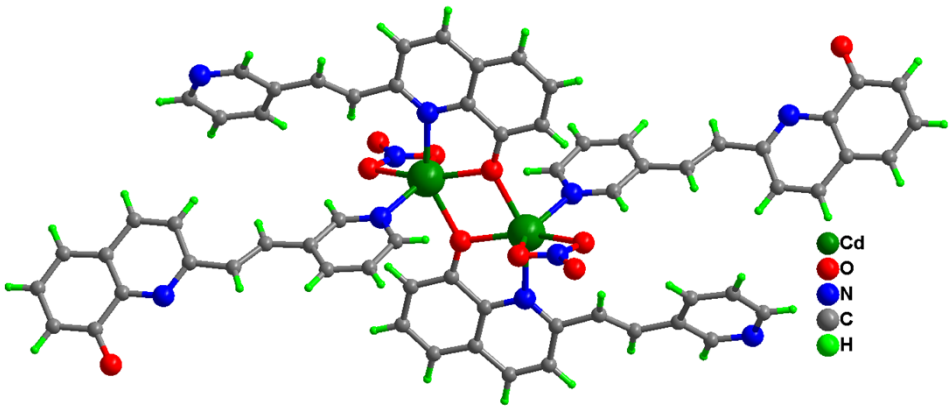
4.1. Fig. S5 Two Zn centers are bridged by two ligands to form a Zn_2L_2 cycle in **3**.



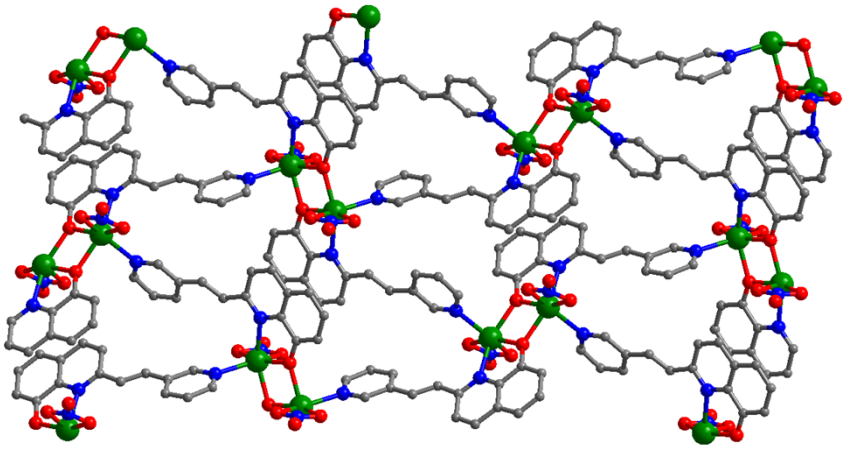
4.2. Fig. S6 The 1D chains are linked into 2D supramolecular structure by π···π interactions (pink dashed lines) in **3.**



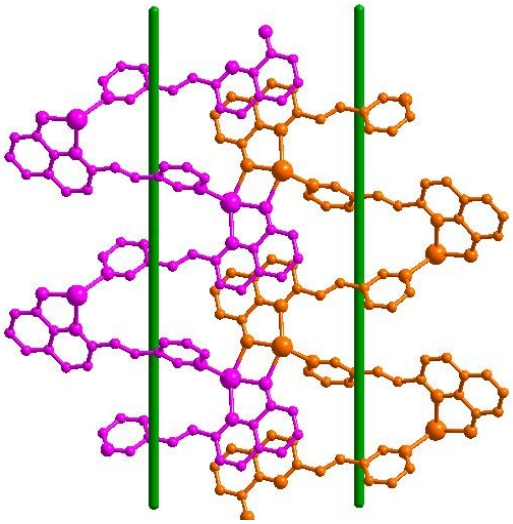
5.1. Fig. S7 View of the coordination geometry of Zn(II) atoms in **5**.



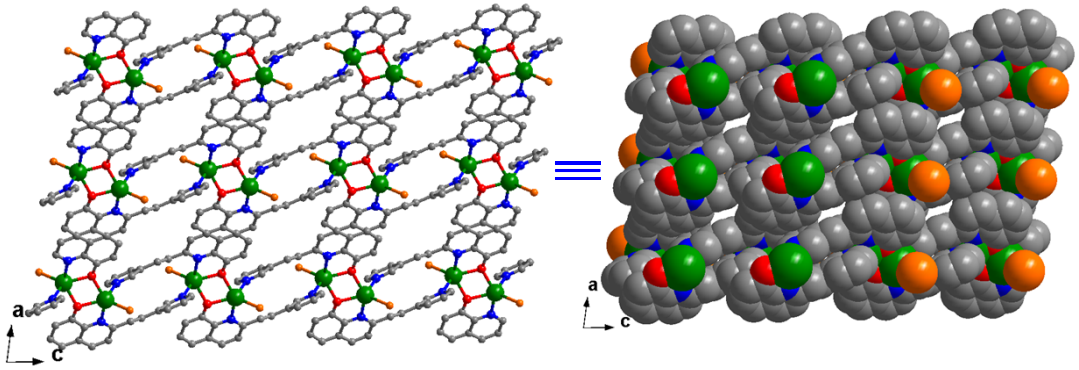
5.2. Fig. S8 Binuclear Cd units are linked into 2D supramolecular structure in **5**.



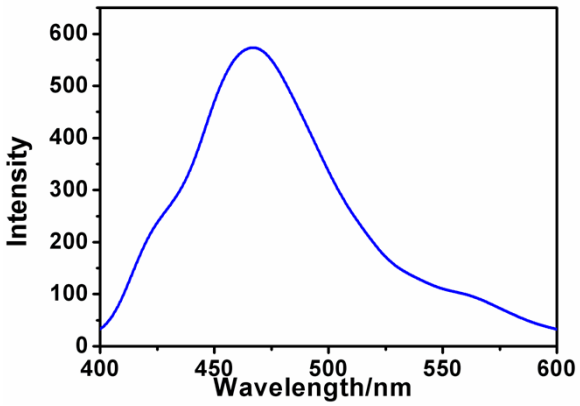
5.3. Fig. S9 A kind of *meso*-helical chain (*P*+*M*) are alternately arranged in **5**.



6.1. Fig. S10 View of 3D supramolecular structure in **6**.



7. Fig. S11. Emission spectra of ligand HL in the solid state.



8. Fig. S12. Fluorescence decay curves of coordination polymers **1-5** in the solid state.