Electronic Supplementary Information

Tuning Luminescence via Transition Metal-Directed Strategy in Coordination Polymers

Table S1. Selected bond distances (Å) and angles (°) for compounds **1**-**6**.

1			
Cu(1)-N(2)	1.9746(16)	Cu(1)-N(3)	1.9806(16)
Cu(1)-O(1)#1	2.0086(10)	Cu(1)-O(1)	2.0086(10)
N(2)-Cu(1)-N(3)	180.000(1)	N(2)-Cu(1)-O(1)#1	87.56(3)
N(3)-Cu(1)-O(1)#1	92.44(3)	N(2)-Cu(1)-O(1)	87.56(3)
N(3)-Cu(1)-O(1)	92.44(3)	O(1)#1-Cu(1)-O(1)	175.12(5)
2			
Co(1)-O(5)#1	2.0818(14)	Co(1)-O(5)	2.0818(14)
Co(1)-O(2)	2.1211(13)	Co(1)-O(2)#1	2.1211(13)
Co(1)-N(2)#1	2.1550(16)	Co(1)-N(2)	2.1550(16)
O(5)#1-Co(1)-O(5)	180.0	O(5)#1-Co(1)-O(2)	90.38(5)
O(5)-Co(1)-O(2)	89.62(5)	O(5)#1-Co(1)-O(2)#1	89.62(5)
O(5)-Co(1)-O(2)#1	90.38(5)	O(2)-Co(1)-O(2)#1	180.000(1)
O(5)#1-Co(1)-N(2)#1	95.04(6)	O(5)-Co(1)-N(2)#1	84.96(6)
O(2)-Co(1)-N(2)#1	88.33(6)	O(2)#1-Co(1)-N(2)#1	91.67(6)
O(5)#1-Co(1)-N(2)	84.96(6)	O(5)-Co(1)-N(2)	95.04(6)
O(2)-Co(1)-N(2)	91.67(6)	O(2)#1-Co(1)-N(2)	88.33(6)
N(2)#1-Co(1)-N(2)	180.000(1)		
3			
Mn(1)-O(5)	2.0812(18)	Mn(1)-O(5)#1	2.0812(18)
Mn(1)-O(1)#1	2.1193(17)	Mn(1)-O(1)	2.1193(17)
Mn(1)-N(2)	2.156(2)	Mn(1)-N(2)#1	2.156(2)
O(5)-Mn(1)-O(5)#1	180.000(1)	O(5)-Mn(1)-O(1)#1	90.45(7)
O(5)#1-Mn(1)-O(1)#1	89.55(7)	O(5)-Mn(1)-O(1)	89.55(7)
O(5)#1-Mn(1)-O(1)	90.45(7)	O(1)#1-Mn(1)-O(1)	180.000(1)
O(5)-Mn(1)-N(2)	95.07(8)	O(5)#1-Mn(1)-N(2)	84.93(8)
O(1)#1-Mn(1)-N(2)	88.34(8)	O(1)-Mn(1)-N(2)	91.66(8)
O(5)-Mn(1)-N(2)#1	84.93(8)	O(5)#1-Mn(1)-N(2)#1	95.07(8)
O(1)#1-Mn(1)-N(2)#1	91.66(8)	O(1)-Mn(1)-N(2)#1	88.34(8)
N(2)-Mn(1)-N(2)#1	180.000(1)		
4			
Ag(1)-N(3)	2.1590(19)	Ag(1)-N(2)	2.1672(19)
Ag(1)-O(2)	2.5561(17)	Ag(1)-Ag(1)#1	3.1618(4)
N(3)-Ag(1)-N(2)	166.08(7)	N(3)-Ag(1)-O(2)	91.40(6)
N(2)-Ag(1)-O(2)	92.71(6)	N(3)-Ag(1)-Ag(1)#1	78.76(5)
N(2)-Ag(1)-Ag(1)#1	114.90(5)	O(2)-Ag(1)-Ag(1)#1	83.82(4)
5			

Cd(1)-N(1)	2.2034(18)	Cd(1)-N(2)	2.3278(17)
Cd(1)-O(5)	2.3283(17)	Cd(1)-N(3)	2.3419(17)
Cd(1)-O(2)#1	2.3774(14)	Cd(1)-O(1)#1	2.4173(15)
Cd(1)-C(7)#1	2.725(2)	N(1)-Cd(1)-N(2)	109.87(7)
N(1)-Cd(1)-O(5)	84.88(7)	N(2)-Cd(1)-O(5)	88.11(7)
N(1)-Cd(1)-N(3)	103.90(6)	N(2)-Cd(1)-N(3)	95.11(6)
O(5)-Cd(1)-N(3)	168.89(7)	N(1)-Cd(1)-O(2)#1	93.41(6)
N(2)-Cd(1)-O(2)#1	156.29(6)	O(5)-Cd(1)-O(2)#1	89.57(7)
N(3)-Cd(1)-O(2)#1	83.21(6)	N(1)-Cd(1)-O(1)#1	146.38(6)
N(2)-Cd(1)-O(1)#1	101.21(6)	O(5)-Cd(1)-O(1)#1	83.62(7)
N(3)-Cd(1)-O(1)#1	85.33(6)	O(2)#1-Cd(1)-O(1)#1	55.09(5)
N(1)-Cd(1)-C(7)#1	120.46(6)	N(2)-Cd(1)-C(7)#1	128.84(6)
O(5)-Cd(1)-C(7)#1	87.73(7)	N(3)-Cd(1)-C(7)#1	81.96(6)
O(2)#1-Cd(1)-C(7)#1	27.45(6)	O(1)#1-Cd(1)-C(7)#1	27.72(6)
6			
Zn(1)-O(2)#1	1.9418(16)	Zn(1)-N(1)	1.950(2)
Zn(1)-N(2)	2.0690(19)	Zn(1)-N(3)	2.1037(18)
O(2)-Zn(1)#2	1.9418(16)	O(2)#1-Zn(1)-N(1)	118.42(8)
O(2)#1-Zn(1)-N(2)	108.31(8)	N(1)-Zn(1)-N(2)	111.68(8)
O(2)#1-Zn(1)-N(3)	100.78(7)	N(1)-Zn(1)-N(3)	111.60(8)
N(2)-Zn(1)-N(3)	104.74(8)	C(7)-O(2)-Zn(1)#2	111.69(15)
S(1)-N(1)-Zn(1)	121.73(11)	Zn(1)-N(1)-H(1A)	119.1
C(8)-N(2)-Zn(1)	121.11(15)	C(12)-N(2)-Zn(1)	121.70(16)
C(13)-N(3)-Zn(1)	120.05(15)	C(17)-N(3)-Zn(1)	122.65(15)

Symmetry code for **1-6**: (#1) -x+1,y,-z+3/2 for **1**; (#1) -x,-y+2,-z+1 for **2**; (#1) -x,-y+2,-z+1 for **3**; (#1) -x+1,-y+1,-z+1 for **4**; (#1) -x,-y+2,-z+2 for **5**; (#1) -x-1/2,y-1/2,-z-1/2, (#2) -x-1/2,y+1/2,-z-1/2 for **6**.

Table S2. Hydrogen-bonding parameters (Å, °) for compounds **1**-**4**.

D–H···A	*d* (D–H)	*d* (H···A)	*d* (D···A)	<(D–H···A)
1				
N(1)–H(1A)···O(2)[a]	0.86(2)	1.89(2)	2.7463(17)	174(2)
N(1)–H(1B)···O(4)[b]	0.87(2)	2.16(2)	3.0279(19)	170(2)
2				
N(1)–H(1A)···O(4)[a]	0.86(3)	2.24(3)	3.004(3)	149(3)
N(1)–H(1B)···O(1)[b]	0.81(4)	2.08(4)	2.854(3)	159(3)
C(8)–H(8)···O(5)[c]	0.95(3)	2.46(3)	3.354(3)	158(2)
C(11)–H(11)···O(3)[d]	0.95(3)	2.59(3)	3.519(3)	167(3)
3				
N(1)–H(1A)···O(4)[a]	0.96(5)	2.16(5)	3.003(4)	147(4)
N(1)–H(1B)···O(2)[b]	0.85(6)	2.05(6)	2.857(4)	161(5)
C(8)–H(8)···O(5)[c]	0.95(4)	2.46(4)	3.354(4)	157(3)
C(11)–H(11)···O(3)[d]	0.97(4)	2.60(4)	3.519(4)	160(3)

4				
N(1)–H(1A)···O(1)[a]	0.77(3)	2.09(3)	2.843(3)	165(4)
N(1)–H(1B)···O(4)[b]	0.88(4)	2.18(4)	3.028(3)	163(3)
C(5)–H(5)···O(2)[c]	0.89(4)	2.44(4)	3.226(3)	147(3)

Symmetry code for **1**: (a) 1-x, 1-y, 1-z, (b) 3/2-x, 1/2-y, 1-z; for **2**: (a) -1+x, y, z, (b) -x, 1-y, -z, (c) 1-x, 2-y, 1-z, (d) -1+x, y, 1+z; for **3**: (a) -1+x, y, z, (b) -x, 1-y, -z, (c) 1-x, 2-y, 1-z, (d) -1+x, y, 1+z; for **4**: (a) 2-x, -y, 1-z, (b) 3-x, -y, -z, (c) 1+x, y, z.

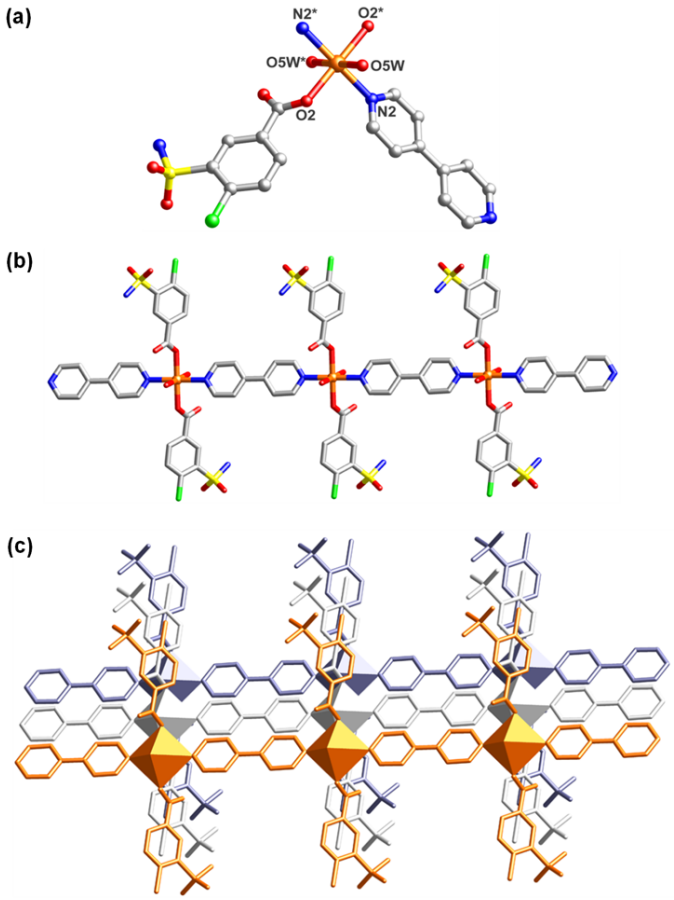

Figure S1. (a) Coordination environment of the M (M = Co or Mn) centre. Hydrogen atoms are omitted for clarity. (b) A drawing showing the 1D chain in **2** and **3**. (c) The 2D supramolecular arrangement formed via hydrogen interactions in **2** and **3**.

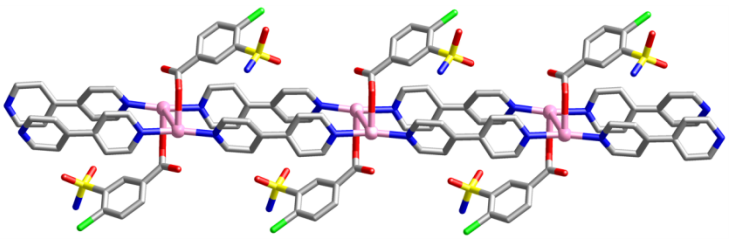

Figure S2. The monodentate coordinated H_3L ligands served as side-arms hang on both sides of the ladder up and down.

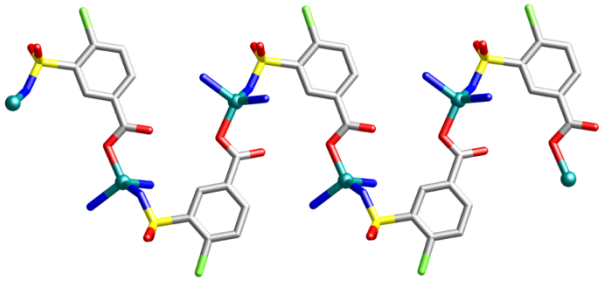

Figure S3. The 1D wave-like chain formed via H_3L ligands between adjacent Zn atoms.

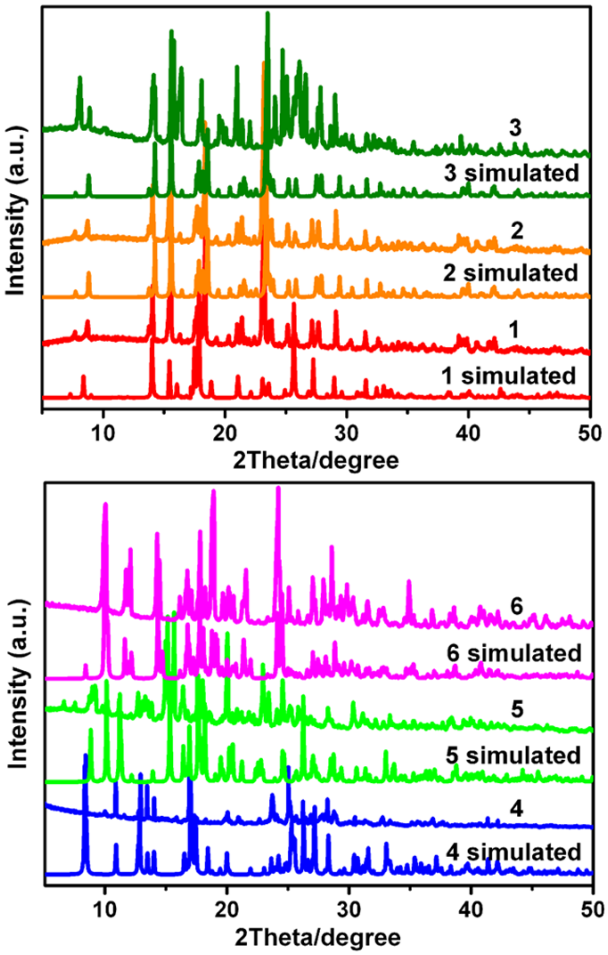

Figure S4. XRD spectra of compounds **1**-**6**. Simulated (lower trace) and experimental (upper trace).

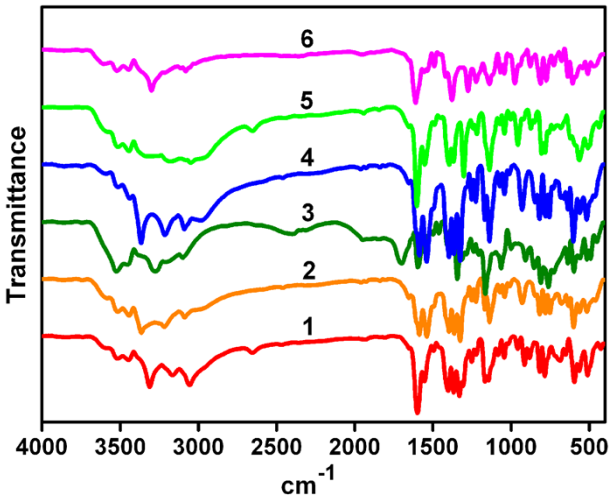

Figure S5. FT-IR spectra of compounds **1-6**.

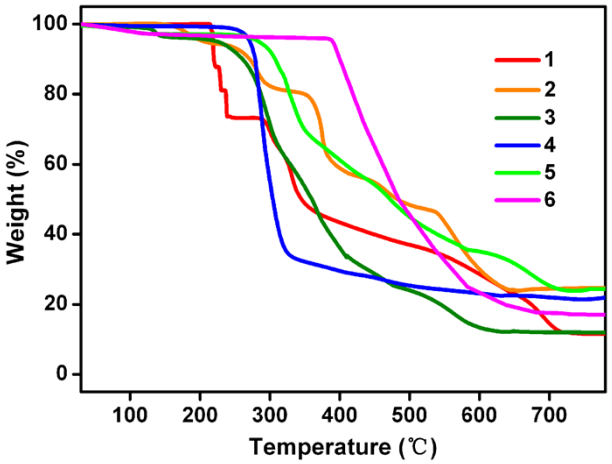

Figure S6. TG curves of compounds **1-6**.

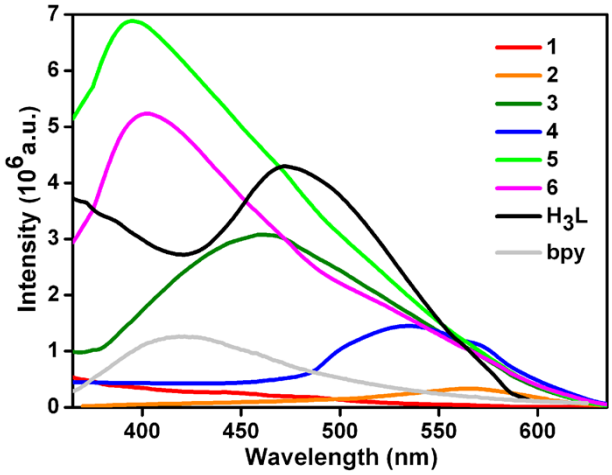

Figure S7. Solid-state photoluminescent spectra of free H_3L, bpy ligands and compounds **1-6**.

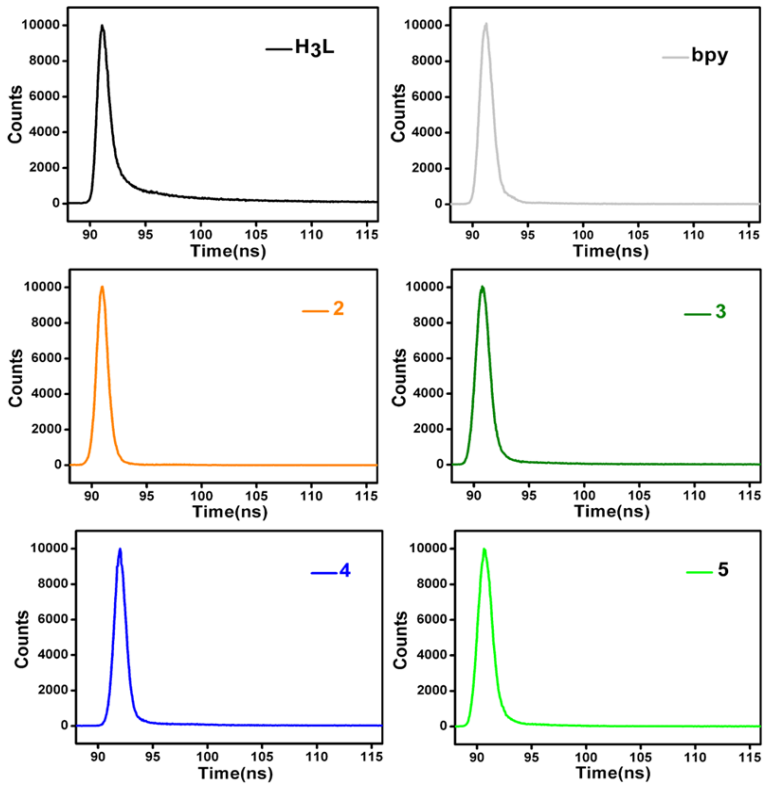

Figure S8. Fluorescence decay curves of compounds **2-5** as well as H_3L and bpy ligands.