Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information

Table S1 Selected bond lengths (Å) for **1-6**

		1	
Zn(1)-O(9)	1.943(11)	Zn(1)-O(12)	1.977(10)
Zn(1)-O(10)	1.945(9)	Zn(1)-O(8)#1	1.987(8)
O(9)-Zn(1)-O(10)	137.9(4)	O(9)-Zn(1)-O(12)	101.5(4)
O(10)-Zn(1)-O(12)	105.2(4)	O(9)-Zn(1)-O(8)#1	101.8(4)
O(10)-Zn(1)-O(8)#1	102.0(4)	O(12)-Zn(1)-O(8)#1	105.0(4)
[a]Symmetry codes:#1 x,-y+1/2,z-1/2			
		2	
Cd(1)-O(1)	2.254(5)	Cd(1)-O(5)	2.316(3)
Cd(1)-O(5)#1	2.316(3)	Cd(1)-O(2)#2	2.360(4)
Cd(1)-O(2)	2.363(4)	Cd(1)-O(3)#1	2.418(3)
Cd(1)-O(3)	2.418(3)		
O(1)-Cd(1)-O(5)	94.26(10)	O(1)-Cd(1)-O(5)#1	94.26(10)
O(5)-Cd(1)-O(5)#1	165.67(18)	O(1)-Cd(1)-O(2)#2	84.0(2)
O(5)-Cd(1)-O(2)#2	84.73(9)	O(5)#1-Cd(1)-O(2)#2	84.73(9)
O(1)-Cd(1)-O(2)	173.3(2)	O(5)-Cd(1)-O(2)	85.09(10)
O(5)#1-Cd(1)-O(2)	85.09(9)	O(2)#2-Cd(1)-O(2)	89.31(10)
O(1)-Cd(1)-O(3)#1	91.94(15)	O(5)-Cd(1)-O(3)#1	55.15(11)
O(5)#1-Cd(1)-O(3)#1	135.94(11)	O(2)#2-Cd(1)-O(3)#1	139.32(7)
O(2)-Cd(1)-O(3)#1	93.17(11)	O(1)-Cd(1)-O(3)	91.94(15)
O(5)-Cd(1)-O(3)	135.94(11)	O(5)#1-Cd(1)-O(3)	55.15(11)
O(2)#2-Cd(1)-O(3)	139.32(7)	O(2)-Cd(1)-O(3)	93.17(11)
O(3)#1-Cd(1)-O(3)	81.10(14)		
[a]Symmetry codes:#1 x,-y+1/2,z #2 x-1/2,y,-z+1/2			
		3	
Co(1)-O(5)	2.072(3)	Co(1)-O(1)	2.221(2)
Co(1)-O(4)	2.1348(17)	Co(1)-O(3)	2.2846(18)
Co(1)-O(4)#1	2.1348(17)	Co(1)-O(3)#1	2.2846(18)
Co(1)-O(1)#2	2.178(2)		
O(5)-Co(1)-O(4)	92.33(5)	O(4)-Co(1)-O(3)	59.07(6)
O(5)-Co(1)-O(4)#1	92.33(5)	O(4)#1-Co(1)-O(3)	137.59(6)
O(4)-Co(1)-O(4)#1	162.60(10)	O(1)#2-Co(1)-O(3)	91.72(6)
O(5)-Co(1)-O(1)#2	176.64(10)	O(1)-Co(1)-O(3)	140.60(4)
O(4)-Co(1)-O(1)#2	87.18(5)	O(5)-Co(1)-O(3)#1	90.87(8)
O(4)#1-Co(1)-O(1)#2	87.18(5)	O(4)-Co(1)-O(3)#1	137.59(6)
O(5)-Co(1)-O(1)	85.86(10)	O(4)#1-Co(1)-O(3)#1	59.07(6)
O(4)-Co(1)-O(1)	81.81(5)	O(1)#2-Co(1)-O(3)#1	91.72(6)
O(4)#1-Co(1)-O(1)	81.81(5)	O(1)-Co(1)-O(3)#1	140.60(4)
O(1)#2-Co(1)-O(1)	90.78(5)	O(3)-Co(1)-O(3)#1	78.61(8)
O(5)-Co(1)-O(3)	90.87(8)		

[a]Symmetry codes: #1 x,-y+1/2,z #2 x-1/2,y,-z+1/2 #3 x+1/2,y,-z+1/2 #4 -x,-y,-z+1			
4			
Mn(1)-O(34)	2.109(4)	Mn(1)-N(2)	2.246(4)
Mn(1)-O(32)	2.130(4)	Mn(1)-N(1)	2.302(4)
Mn(1)-O(36)	2.138(4)	Mn(1)-O(33)	2.426(4)
O(34)-Mn(1)-O(32)	114.98(19)	O(32)-Mn(1)-N(1)	97.57(17)
O(34)-Mn(1)-O(36)	85.89(18)	O(36)-Mn(1)-N(1)	87.28(17)
O(32)-Mn(1)-O(36)	93.3(2)	N(2)-Mn(1)-N(1)	72.80(15)
O(34)-Mn(1)-N(2)	88.44(18)	O(34)-Mn(1)-O(33)	83.48(18)
O(32)-Mn(1)-N(2)	131.17(18)	O(32)-Mn(1)-O(33)	56.21(15)
O(36)-Mn(1)-N(2)	132.40(19)	O(36)-Mn(1)-O(33)	138.30(17)
O(34)-Mn(1)-N(1)	147.0(2)	N(2)-Mn(1)-O(33)	87.52(15)
N(1)-Mn(1)-O(33)	121.34(17)		
[a]Symmetry codes: #1 -x+3,y+1/2,-z+3 #2 -x+3,y-1/2,-z+3			
5			
Ni(1)-N(1)#1	2.0415(16)	Ni(1)-O(1)#1	2.0483(15)
Ni(1)-N(1)	2.0415(16)	Ni(1)-O(2)	2.1638(13)
Ni(1)-O(1)	2.0483(15)	Ni(1)-O(2)#1	2.1638(13)
N(1)#1-Ni(1)-N(1)	81.59(9)	O(1)#1-Ni(1)-O(2)	95.17(6)
N(1)#1-Ni(1)-O(1)	168.85(6)	N(1)#1-Ni(1)-O(2)#1	95.98(6)
N(1)-Ni(1)-O(1)	94.85(7)	N(1)-Ni(1)-O(2)#1	107.41(6)
N(1)#1-Ni(1)-O(1)#1	94.85(7)	O(1)-Ni(1)-O(2)#1	95.17(6)
N(1)-Ni(1)-O(1)#1	168.85(6)	O(1)#1-Ni(1)-O(2)#1	62.28(5)
O(1)-Ni(1)-O(1)#1	90.53(11)	O(2)-Ni(1)-O(2)#1	149.09(7)
N(1)#1-Ni(1)-O(2)	107.41(6)	O(1)-Ni(1)-O(2)	62.28(5)
N(1)-Ni(1)-O(2)	95.98(6)		
[a]Symmetry codes: #1 -x+3/2,-y+3/2,z #2 -x+2,-y+1,-z			
6a			
Cu(1)-O(1)	1.957(3)	Cu(1)-O(2)#1	1.960(2)
Cu(1)-O(5)#1	1.967(2)	Cu(1)-O(4)	1.969(2)
Cu(1)-N(1)	2.180(3)		
O(1)-Cu(1)-O(2)#1	168.27(11)	O(1)-Cu(1)-O(5)#1	90.98(12)
O(2)#1-Cu(1)-O(5)#1	87.33(11)	O(1)-Cu(1)-O(4)	88.04(12)
O(2)#1-Cu(1)-O(4)	91.26(12)	O(5)#1-Cu(1)-O(4)	168.28(10)
O(1)-Cu(1)-N(1)	92.20(11)	O(2)#1-Cu(1)-N(1)	99.52(11)
O(5)#1-Cu(1)-N(1)	100.49(11)	O(4)-Cu(1)-N(1)	91.22(11)

[a]Symmetry codes: #1 -x+2,-y+1,-z+1 #2 -x+1,-y-1,-z #3 -x+2,-y,-z+2 #4 -x+3,-y,-z+1			
6b			
Cu(1)-O(2)#1	1.950(5)	Cu(1)-O(2)#2	1.950(5)
Cu(1)-O(1)	1.977(5)	Cu(1)-O(1)#3	1.977(5)
Cu(1)-N(1)	2.167(8)		
O(2)#1-Cu(1)-O(2)#2	87.4(3)	O(2)#1-Cu(1)-O(1)	168.66(19)
O(2)#2-Cu(1)-O(1)	91.2(2)	O(2)#1-Cu(1)-O(1)#3	91.2(2)
O(2)#2-Cu(1)-O(1)#3	168.66(19)	O(1)-Cu(1)-O(1)#3	87.9(3)
O(2)#1-Cu(1)-N(1)	99.3(2)	O(2)#2-Cu(1)-N(1)	99.3(2)
O(1)-Cu(1)-N(1)	92.0(2)	O(1)#3-Cu(1)-N(1)	92.0(2)
[a]Symmetry codes:#1 -x+1,-y,-z+1 #2 -x+1,y,-z+1 #3 x,-y,z #4 -x+5/2,-y+1/2,-z+2 #5 -x+2,-y,-z+3			

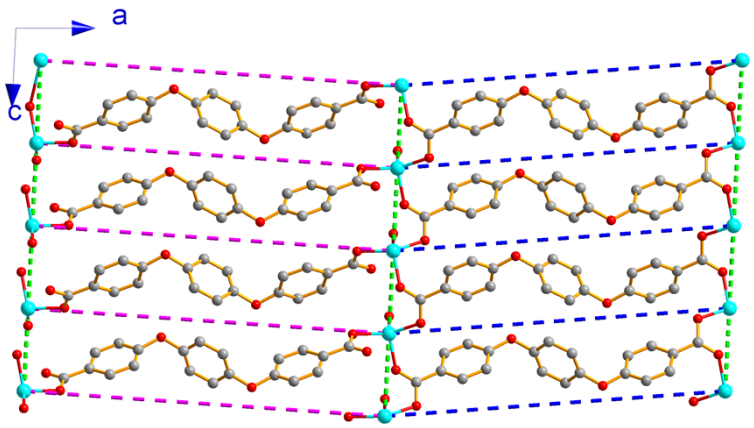


Fig S1 The distances between Zn (II) ions (purple dotted lines, distance: 19.158Å; blue dotted lines, distance: 18.102Å; green dotted lines, distance: 4.423Å)

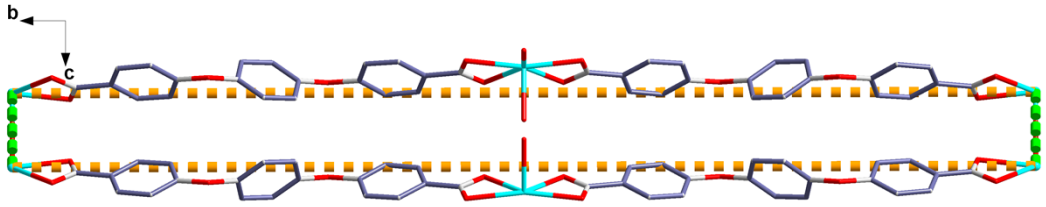


Fig S2 The rectangular grid built by four metal ions and four L^{2-} ligands (yellow dotted lines, distance: 40.564Å; green dotted lines, distance: 4.1214Å)

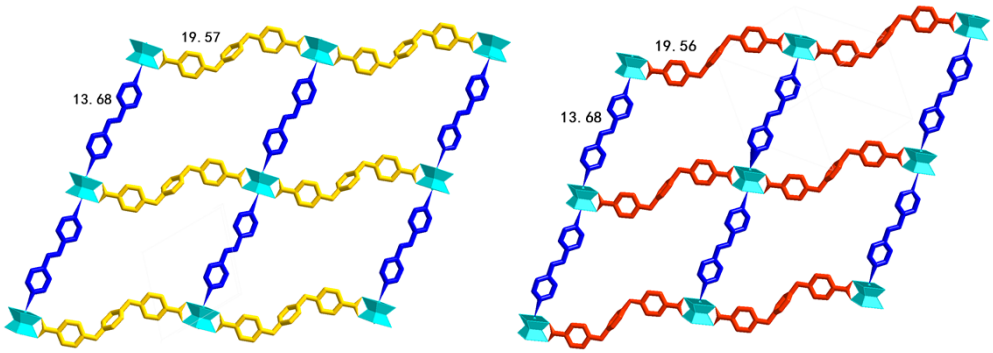


Fig S3 (a) Parallelogram grids with a size of 19.57 × 13.68 $Å^2$ built by a kind of L^{2-} ligands and bpp; (b) Parallelogram grids with a size of 19.56 × 13.68 $Å^2$ built by another kind of L^{2-} ligands and bpp.

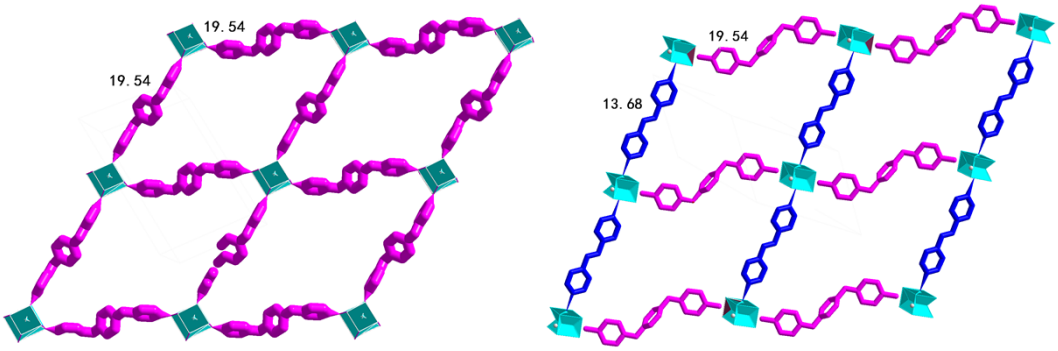
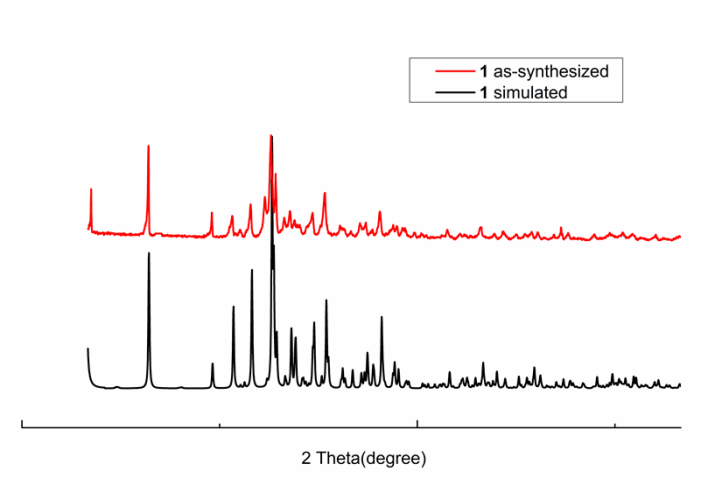
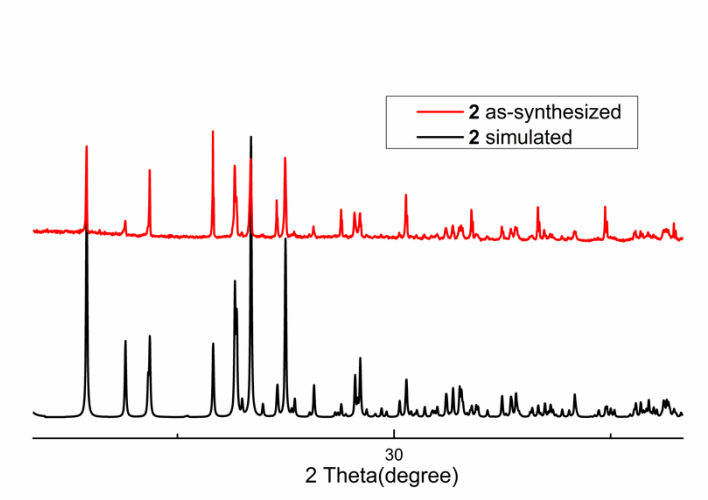
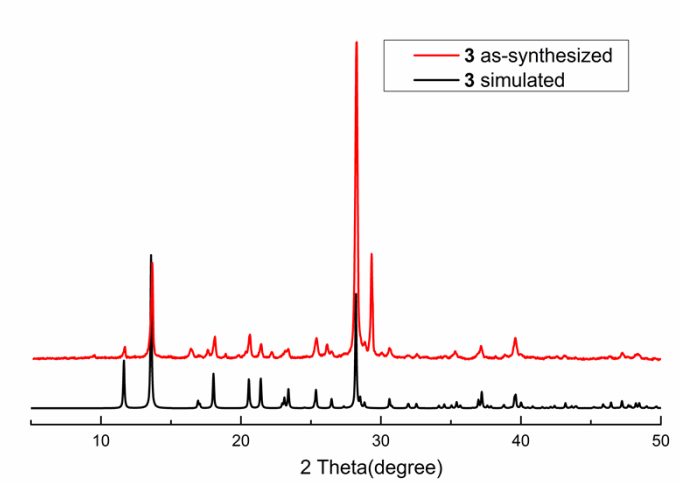
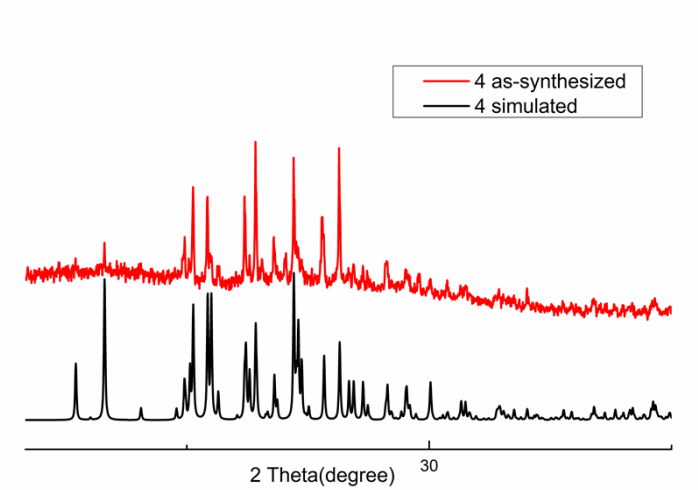


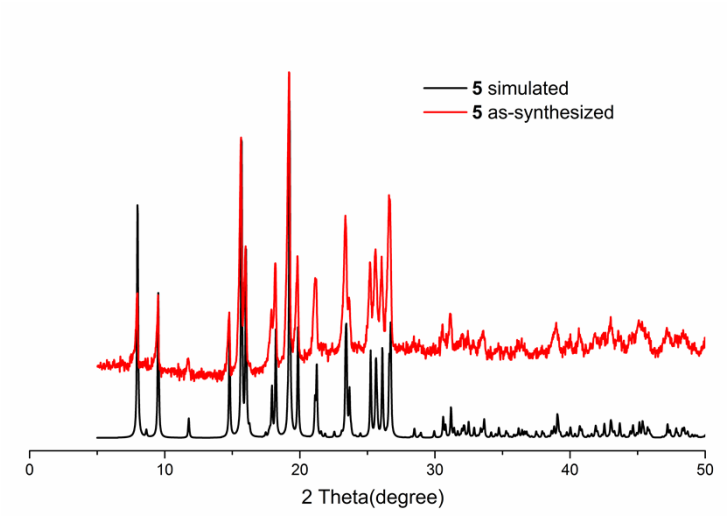
Fig S4 (a) the 2D network with rhombic grids bridged by L^{2-} ligands with a size of 19.54 ×19.54 $Å^2$; (b) parallelogram grids with a size of 19.54 × 13.68 $Å^2$ built by L^{2-} ligands and bpp;

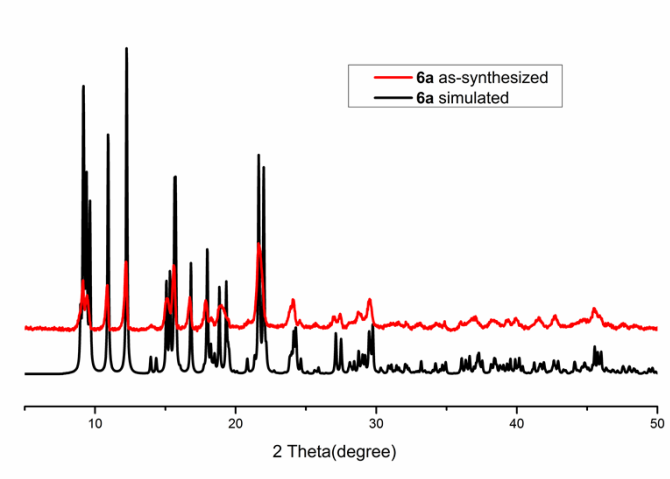



2 as-synthesized
2 simulated
30
2 Theta(degree)


3 as-synthesized
3 simulated
10
20
30
40
50
2 Theta(degree)


4 as-synthesized
4 simulated
2 Theta(degree)
30





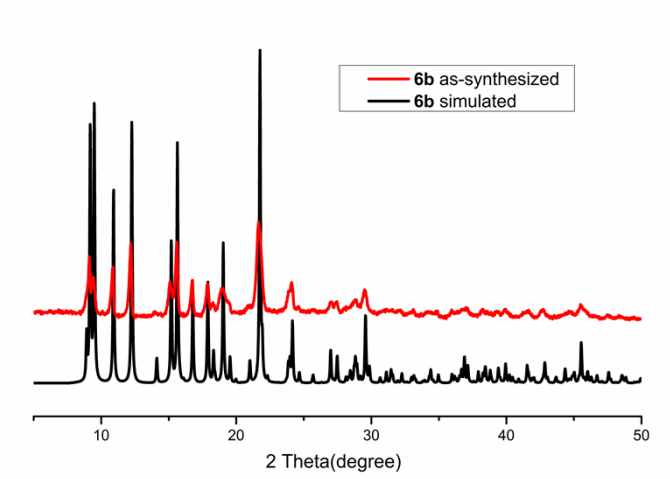


Fig S5 PXRD of compounds**1-6**

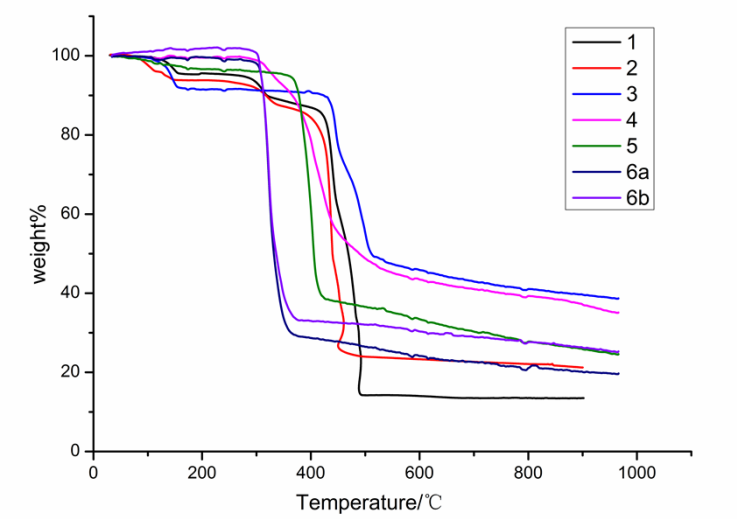


Figure S6 TGA plots of coordination polymers **1-6**.