Supporting Information

Four Metal-Organic Frameworks Based on a Semirigid Tripodal Ligand and Different Secondary Building Units: Structures and Electrochemical Performance

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Contents

Table S1. Selected bond lengths (Å) and bond angles (º) for **1**-**4**.

Compound **1**

Co(1)-O(5)#1	2.083(5)	O(5)#2-Co(1)-O(1)#3	91.5(2)
Co(1)-O(5)#2	2.083(5)	O(5)#1-Co(1)-O(1)	91.5(2)
Co(1)-O(1)#3	2.086(6)	O(5)#2-Co(1)-O(1)	88.5(2)
Co(1)-O(1)	2.086(6)	O(1)#3-Co(1)-O(1)	180.00
Co(1)-O(8)#4	2.142(5)	O(5)#1-Co(1)-O(8)#4	91.4(2)
Co(1)-O(8)#5	2.142(5)	O(5)#2-Co(1)-O(8)#4	88.6(2)
Co(2)-O(4)#1	2.011(6)	O(1)#3-Co(1)-O(8)#4	86.5(2)
Co(2)-O(2)	2.019(5)	O(1)-Co(1)-O(8)#4	93.4(2)
Co(2)-O(10)	2.055(8)	O(5)#1-Co(1)-O(8)#5	88.6(2)
Co(2)-O(11)	2.097(7)	O(5)#2-Co(1)-O(8)#5	91.4(2)
Co(2)-O(8)#4	2.111(6)	O(1)#3-Co(1)-O(8)#5	93.5(2)
Co(2)-O(7)#4	2.179(6)	O(1)-Co(1)-O(8)#5	86.6(2)
O(5)#1-Co(1)-O(5)#2	180.00	O(8)#4-Co(1)-O(8)#5	180.000
O(5)#1-Co(1)-O(1)#3	88.5(2)	O(4)#1-Co(2)-O(2)	91.6(2)
O(10)-Co(2)-O(11)	87.1(3)	O(4)#1-Co(2)-O(10)	93.2(3)
O(4)#1-Co(2)-O(8)#4	103.2(3)	O(2)-Co(2)-O(10)	87.6(3)
O(2)-Co(2)-O(8)#4	97.7(2)	O(4)#1-Co(2)-O(11)	89.9(3)
O(10)-Co(2)-O(8)#4	162.6(3)	O(2)-Co(2)-O(11)	174.5(4)

Symmetry transformations used to generate equivalent atoms: #1 x+1,-y+1/2,z+1/2; #2 -x-1,y-1/2,-z+1/2; #3 -x,-y,-z+1; #4 x+1,-y-1/2,z+1/2; #5 -x-1,y+1/2,-z+1/2; #6 x-1,-y-1/2,z-1/2; #7 x-1,-y+1/2,z-1/2.

Compound **2**

Cd(1)-O(2)#1	2.239(3)	O(4)#2-Cd(1)-O(4)#3	180.00
Cd(1)-O(2)	2.239(3)	O(2)#1-Cd(1)-O(5)#4	89.34(15)
Cd(1)-O(4)#2	2.240(3)	O(2)-Cd(1)-O(5)#4	90.66(15)
Cd(1)-O(4)#3	2.240(3)	O(4)#2-Cd(1)-O(5)#4	95.22(15)
Cd(1)-O(5)#4	2.286(3)	O(4)#3-Cd(1)-O(5)#4	84.78(15)
Cd(1)-O(5)#5	2.286(3)	O(2)#1-Cd(1)-O(5)#5	90.66(16)
Cd(2)-O(1)	2.179(4)	O(2)-Cd(1)-O(5)#5	89.34(15)
Cd(2)-O(3)#3	2.235(4)	O(4)#2-Cd(1)-O(5)#5	84.78(15)
Cd(2)-O(5)#5	2.329(4)	O(4)#3-Cd(1)-O(5)#5	95.22(15)
Cd(2)-O(2W)	2.345(5)	O(5)#4-Cd(1)-O(5)#5	180.00
Cd(2)-O(1W)	2.344(7)	O(1)-Cd(2)-O(3)#3	99.19(18)
Cd(2)-O(6)#5	2.425(5)	O(1)-Cd(2)-O(5)#5	105.66(15)
O(2)#1-Cd(1)-O(2)	180.00	O(3)#3-Cd(2)-O(5)#5	98.46(15)
O(2)#1-Cd(1)-O(4)#2	90.85(18)	O(1)-Cd(2)-O(2W)	90.37(19)
O(3)#3-Cd(2)-O(1W)	83.0(2)	O(3)#3-Cd(2)-O(6)#5	92.22(19)
O(5)#5-Cd(2)-O(1W)	146.47(17)	O(5)#5-Cd(2)-O(6)#5	54.99(14)
O(2W)-Cd(2)-O(1W)	85.0(3)	O(2W)-Cd(2)-O(6)#5	81.80(18)
O(1)-Cd(2)-O(6)#5	70.11(19)	O(1W)-Cd(2)-O(6)#5	91.53(19)

Symmetry transformations used to generate equivalent atoms: #1 -x+2,-y+1,-z+1; #2 -x+2,-y+1,-z; #3 x,y,z+1; #4 -x+1,-y+1,-z; #5 x+1,y,z+1; #6 x-1,y,z-1; #7 x,y,z-1.

Compound **3**

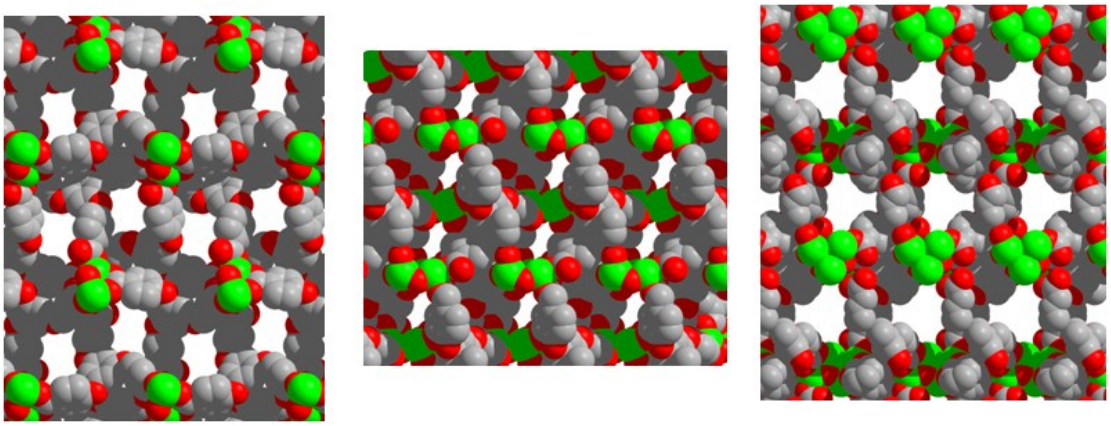
Mn(1)-O(6)#1	2.123(2)	O(4)#4-Mn(1)-O(2)	87.91(10)
Mn(1)-O(6)#2	2.123(2)	O(6)#1-Mn(1)-O(2)#5	91.10(10)
Mn(1)-O(4)#3	2.152(2)	O(6)#2-Mn(1)-O(2)#5	88.90(10)
Mn(1)-O(4)#4	2.152(2)	O(4)#3-Mn(1)-O(2)#5	87.91(10)
Mn(1)-O(2)	2.244(2)	O(4)#4-Mn(1)-O(2)#5	92.09(10)
Mn(1)-O(2)#5	2.244(2)	O(2)-Mn(1)-O(2)#5	180.00
Mn(2)-O(3)#3	2.095(3)	O(3)#3-Mn(2)-O(5)#2	90.17(11)
Mn(2)-O(5)#2	2.127(3)	O(3)#3-Mn(2)-O(1W)	102.13(11)
Mn(2)-O(1W)	2.137(3	O(5)#2-Mn(2)-O(1W)	87.18(11)
Mn(2)-O(10)	2.155(3)	O(5)#2-Mn(2)-O(10)	179.19(12)
Mn(2)-O(2)	2.279(2)	O(3)#3-Mn(2)-O(10)	89.02(13)
Mn(2)-O(1)	2.314(2)	O(1W)-Mn(2)-O(10)	92.97(14)
O(6)#1-Mn(1)-O(6)#2	180.00	O(3)#3-Mn(2)-O(2)	104.07(10)
O(6)#1-Mn(1)-O(4)#3	89.03(10)	O(5)#2-Mn(2)-O(2)	94.07(10)
O(6)#2-Mn(1)-O(4)#3	90.97(10)	O(1W)-Mn(2)-O(2)	153.76(10)
O(6)#1-Mn(1)-O(4)#4	90.97(10)	O(10)-Mn(2)-O(2)	86.14(12)
O(6)#2-Mn(1)-O(4)#4	89.03(10)	O(3)#3-Mn(2)-O(1)	160.02(10)
O(4)#3-Mn(1)-O(4)#4	180.00	O(5)#2-Mn(2)-O(1)	97.01(10)
O(6)#1-Mn(1)-O(2)	88.90(10)	O(1W)-Mn(2)-O(1)	96.84(10)
O(6)#2-Mn(1)-O(2)	91.10(10)	O(10)-Mn(2)-O(1)	83.76(12)
O(4)#3-Mn(1)-O(2)	92.09(10)	O(2)-Mn(2)-O(1)	56.96(8)

Symmetry transformations used to generate equivalent atoms: #1 -x+1,-y+2,-z; #2 x+1,y,z+1; #3 -x+1,-y+2,-z+1; #4 x+1,y,z; #5 -x+2,-y+2,-z+1; #6 x-1,y,z; #7 x-1,y,z-1.

Compound **4**

Zn(1)-O(10)#1	2.059(3)	O(1)#2-Zn(1)-O(10)	89.63(13)
Zn(1)-O(1)#2	2.078(3)	O(4)-Zn(1)-O(10)	92.37(13)
Zn(1)-O(4)	2.100(3)	O(11)-Zn(1)-O(10)	99.07(14)
Zn(1)-O(11)	2.107(4)	O(1W)-Zn(1)-O(10)	175.70(14)
Zn(1)-O(1W)	2.112(4)	O(10)-Zn(2)-O(5)	118.64(13)
Zn(1)-O(10)	2.119(3)	O(8)#3-Zn(2)-O(5)	100.40(15)
Zn(2)-O(10)	1.936(3)	O(10)-Zn(2)-O(2)#2	101.75(14)
Zn(2)-O(8)#3	1.940(3)	O(8)#3-Zn(2)-O(2)#2	108.66(15)
Zn(2)-O(5)	1.978(3)	O(5)-Zn(2)-O(2)#2	103.66(15)
Zn(2)-O(2)#2)	1.992(3)	O(1)#2-Zn(1)-O(11)	90.37(14)
O(10)#1-Zn(1)-O(1)#2	170.98(13)	O(4)-Zn(1)-O(11)	166.61(15)
O(10)#1-Zn(1)-O(4)	88.63(14)	O(10)#1-Zn(1)-O(1W)	98.83(14)
O(1)#2-Zn(1)-O(4)	96.68(15)	O(1)#2-Zn(1)-O(1W)	89.02(14)
O(10)#1-Zn(1)-O(11)	85.93(13)	O(4)-Zn(1)-O(1W)	83.73(15)
O(10)#1-Zn(1)-O(10)	82.85(13)	O(11)-Zn(1)-O(1W)	85.02(15)

Symmetry transformations used to generate equivalent atoms: #1 -x,-y+1,-z+2; #2 x,y,z-1; #3 -x+1,y-1/2,-z+5/2; #4 x,y,z+1; #5 -x+1,y+1/2,-z+5/2.



(a) (b) (c)

Figure S1. A space-filling view of the porous network showing three different types of 1D channels along the crystallographic (a) *a*-axis, (b) *b*-axis, and (c) *c*-axis, in which the solvent molecules are omitted for clarity.

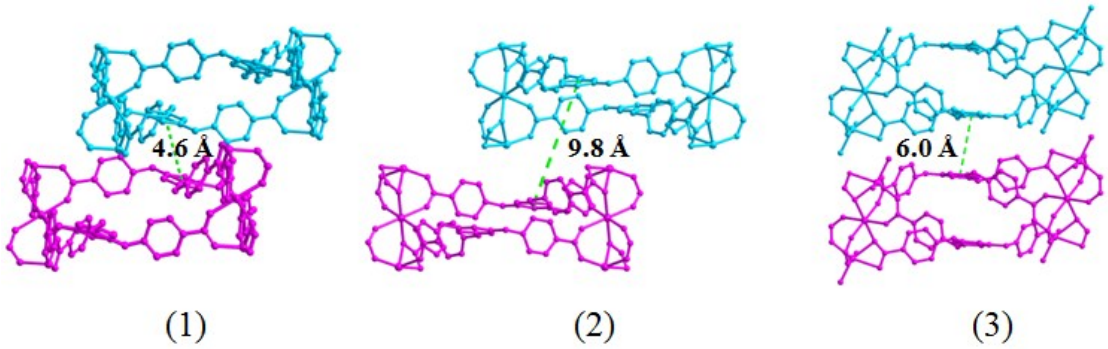
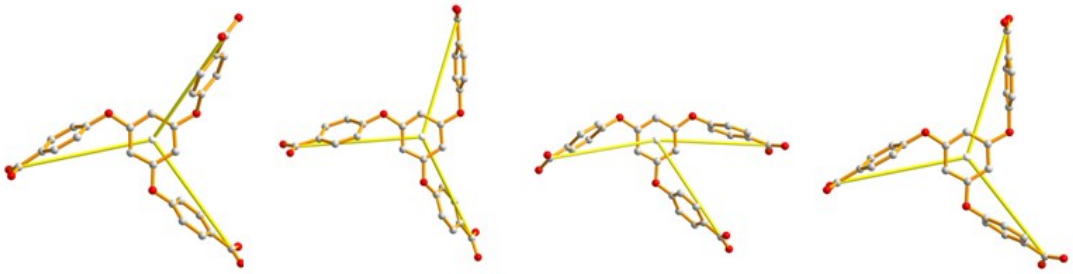


Figure S2. The distances observed between the adjacent layers in **1**-**3**.

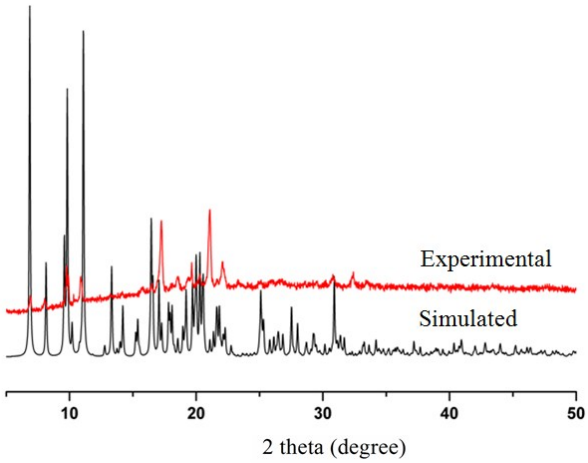
Table S2 The twisting angles of 4-carboxyphenoxy groups *vs*. the central benzene ring.

Complex	Twisting angles		
1	112.7	113.1	132.7
2	111.1	112.6	129.3
3	61.6	106.9	168.3
4	115.5	118.8	122.3

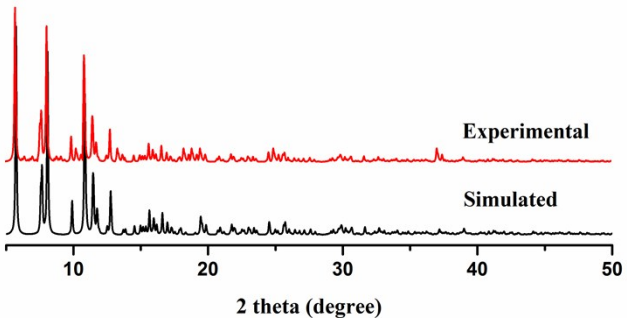


(1) (2) (3) (4)

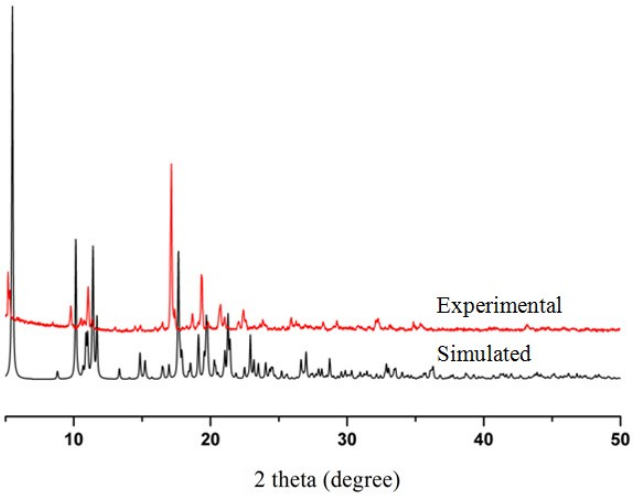
(a) for compound **1**



(a) for compound 2



(c) for compound **3**



(d) for compound **4**

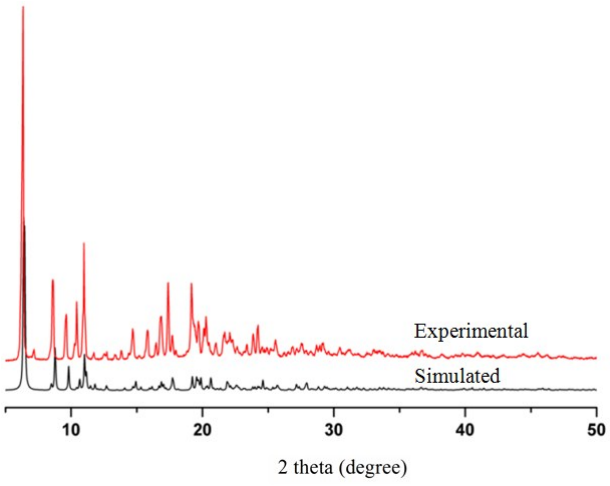


Figure S3. Powder x-ray diffraction patterns of **1** to **4**.

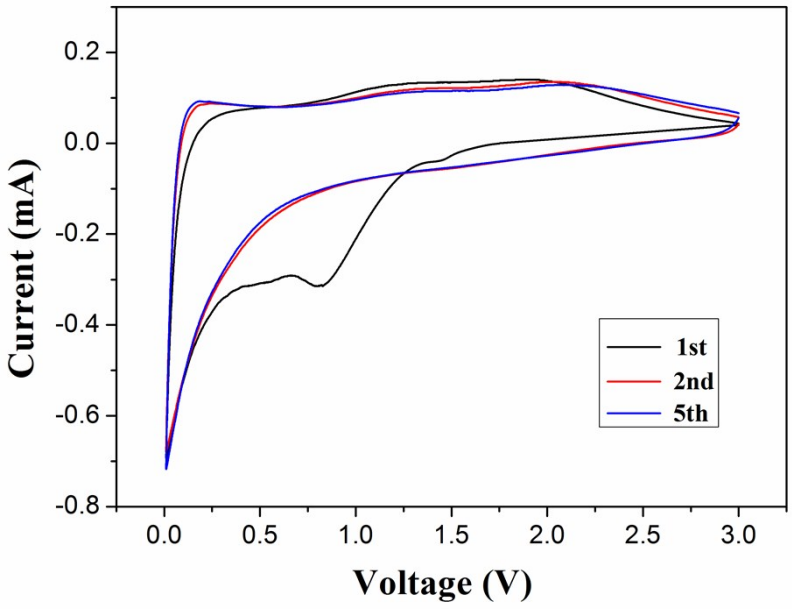


Figure S4. Cyclic voltammetry curve at 0.1mV s^{-1} scan rate.