Electronic Supplementary Information

Transition Metal-Directed Assembly of Diverse Coordination Polymers Based on Multifunctional Ligand 2,4-dichloro-5-sulfamoylbenzoic acid

Table S1. Selected bond distances (Å) and angles (°) for compounds **1-4**.

1			
Co(1)-O(5)$^{\#1}$	2.0779(19)	Co(1)-O(5)	2.0779(19)
Co(1)-N(2)$^{\#1}$	2.150(2)	Co(1)-N(2)	2.150(2)
Co(1)-O(1)	2.178(2)	Co(1)-O(1)$^{\#1}$	2.178(2)
O(5)$^{\#1}$-Co(1)-O(5)	180.000(1)	O(5)$^{\#1}$-Co(1)-N(2)$^{\#1}$	85.87(8)
O(5)-Co(1)-N(2)$^{\#1}$	94.13(8)	O(5)$^{\#1}$-Co(1)-N(2)	94.13(8)
O(5)-Co(1)-N(2)	85.87(8)	N(2)$^{\#1}$-Co(1)-N(2)	180.000(1)
O(5)$^{\#1}$-Co(1)-O(1)	91.56(8)	O(5)-Co(1)-O(1)	88.44(8)
N(2)$^{\#1}$-Co(1)-O(1)	89.70(8)	N(2)-Co(1)-O(1)	90.30(8)
O(5)$^{\#1}$-Co(1)-O(1)$^{\#1}$	88.44(8)	O(5)-Co(1)-O(1)$^{\#1}$	91.56(8)
N(2)$^{\#1}$-Co(1)-O(1)$^{\#1}$	90.30(8)	N(2)-Co(1)-O(1)$^{\#1}$	89.70(8)
O(1)-Co(1)-O(1)$^{\#1}$	180.000(1)		
2			
Cd(1)-N(1)	2.2077(15)	Cd(1)-N(2)	2.3393(15)
Cd(1)-O(5)	2.3508(13)	Cd(1)-N(3)	2.3529(15)
Cd(1)-O(2)$^{\#1}$	2.4006(13)	Cd(1)-O(1)$^{\#1}$	2.4416(13)
Cd(1)-C(7)$^{\#1}$	2.7514(17)	O(1)-Cd(1)$^{\#1}$	2.4416(13)
O(2)-Cd(1)$^{\#1}$	2.4006(13)	C(7)-Cd(1)$^{\#1}$	2.7514(17)

N(1)-Cd(1)-N(2)	103.01(5)	N(1)-Cd(1)-O(5)	83.38(5)
N(2)-Cd(1)-O(5)	166.60(5)	N(1)-Cd(1)-N(3)	108.38(6)
N(2)-Cd(1)-N(3)	96.15(5)	O(5)-Cd(1)-N(3)	92.89(5)
N(1)-Cd(1)-O(2)$^{\#1}$	143.58(5)	N(2)-Cd(1)-O(2)$^{\#1}$	86.21(5)
O(5)-Cd(1)-O(2)$^{\#1}$	81.85(4)	N(3)-Cd(1)-O(2)$^{\#1}$	105.46(5)
N(1)-Cd(1)-O(1)$^{\#1}$	90.90(5)	N(2)-Cd(1)-O(1)$^{\#1}$	84.86(5)
O(5)-Cd(1)-O(1)$^{\#1}$	83.26(5)	N(3)-Cd(1)-O(1)$^{\#1}$	159.83(5)
O(2)$^{\#1}$-Cd(1)-O(1)$^{\#1}$	54.43(4)	N(1)-Cd(1)-C(7)$^{\#1}$	117.59(6)
N(2)-Cd(1)-C(7)$^{\#1}$	83.58(5)	O(5)-Cd(1)-C(7)$^{\#1}$	83.02(5)
N(3)-Cd(1)-C(7)$^{\#1}$	132.89(5)	O(2)$^{\#1}$-Cd(1)-C(7)$^{\#1}$	27.45(5)
O(1)$^{\#1}$-Cd(1)-C(7)$^{\#1}$	27.05(5)		
3			
Zn(1)-O(1)$^{\#1}$	1.9527(13)	Zn(1)-N(1)	1.9539(16)
Zn(1)-N(2)	2.0611(15)	Zn(1)-N(3)	2.0983(15)
O(1)-Zn(1)$^{\#2}$	1.9527(13)	O(1)$^{\#1}$-Zn(1)-N(1)	120.97(6)
O(1)$^{\#1}$-Zn(1)-N(2)	103.33(6)	N(1)-Zn(1)-N(2)	114.98(6)
O(1)$^{\#1}$-Zn(1)-N(3)	99.99(6)	N(1)-Zn(1)-N(3)	112.58(6)
N(2)-Zn(1)-N(3)	102.48(6)		
4			
Cu(1)-O(14)	1.907(3)	Cu(1)-O(7)	1.960(3)
Cu(1)-O(4)	2.003(3)	Cu(1)-N(4)	2.024(3)
Cu(1)-N(6)	2.326(3)	Cu(2)-O(13)	1.915(3)

Cu(2)-O(3)	1.941(3)	Cu(2)-O(12)	1.980(3)
Cu(2)-N(8)	2.031(3)	Cu(2)-N(5)	2.267(3)
Cu(3)-O(15)	1.915(3)	Cu(3)-O(11)	1.925(3)
Cu(3)-O(8)	1.984(2)	Cu(3)-N(7)	2.017(3)
Cu(3)-O(6W)	2.333(11)	Cu(3)-O(1W)	2.412(6)
O(14)-Cu(1)-O(7)	90.96(11)	O(14)-Cu(1)-O(4)	88.33(11)
O(7)-Cu(1)-O(4)	169.07(10)	O(14)-Cu(1)-N(4)	169.32(12)
O(7)-Cu(1)-N(4)	89.47(12)	O(4)-Cu(1)-N(4)	89.23(12)
O(14)-Cu(1)-N(6)	97.22(12)	O(7)-Cu(1)-N(6)	92.90(12)
O(4)-Cu(1)-N(6)	98.00(11)	N(4)-Cu(1)-N(6)	93.41(12)
O(13)-Cu(2)-O(3)	92.30(11)	O(13)-Cu(2)-O(12)	87.30(11)
O(3)-Cu(2)-O(12)	176.42(11)	O(13)-Cu(2)-N(8)	166.49(12)
O(3)-Cu(2)-N(8)	90.11(12)	O(12)-Cu(2)-N(8)	89.47(12)
O(13)-Cu(2)-N(5)	96.79(12)	O(3)-Cu(2)-N(5)	92.82(11)
O(12)-Cu(2)-N(5)	90.75(11)	N(8)-Cu(2)-N(5)	96.37(13)
O(15)-Cu(3)-O(11)	92.85(11)	O(15)-Cu(3)-O(8)	92.00(11)
O(11)-Cu(3)-O(8)	175.03(11)	O(15)-Cu(3)-N(7)	163.16(14)
O(11)-Cu(3)-N(7)	85.64(12)	O(8)-Cu(3)-N(7)	89.40(11)
O(15)-Cu(3)-O(6W)	93.8(3)	O(11)-Cu(3)-O(6W)	81.4(4)
O(8)-Cu(3)-O(6W)	99.4(4)	N(7)-Cu(3)-O(6W)	102.5(3)
O(15)-Cu(3)-O(1W)	100.27(16)	O(11)-Cu(3)-O(1W)	102.1(2)
O(8)-Cu(3)-O(1W)	78.1(2)	N(7)-Cu(3)-O(1W)	96.44(17)

O(6W)-Cu(3)-O(1W)	22.0(3)

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

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

D–H···A	*d* (D–H)	*d* (H···A)	*d* (D···A)	<(D–H···A)
1				
N1–H1A···O4[a]	0.84(4)	2.35(4)	3.118(4)	152(4)
N1–H1B···O2[b]	0.85(5)	2.06(5)	2.885(4)	164(3)
C12–H12···O5[a]	0.93	2.50	3.385(4)	159.00
2				
C8–H8A···O4[a]	0.93	2.56	3.0476	113.00
C13–H13A···O5[b]	0.93	2.32	3.2383	167.00
3				
N1–H1A···O3[a]	0.86	2.33	3.1601	162.00
C12–H12A···O4[b]	0.93	2.57	2.9892	108.00
4				
C37–H37A···O2W[a]	0.93	2.55	3.336(14)	143.00

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

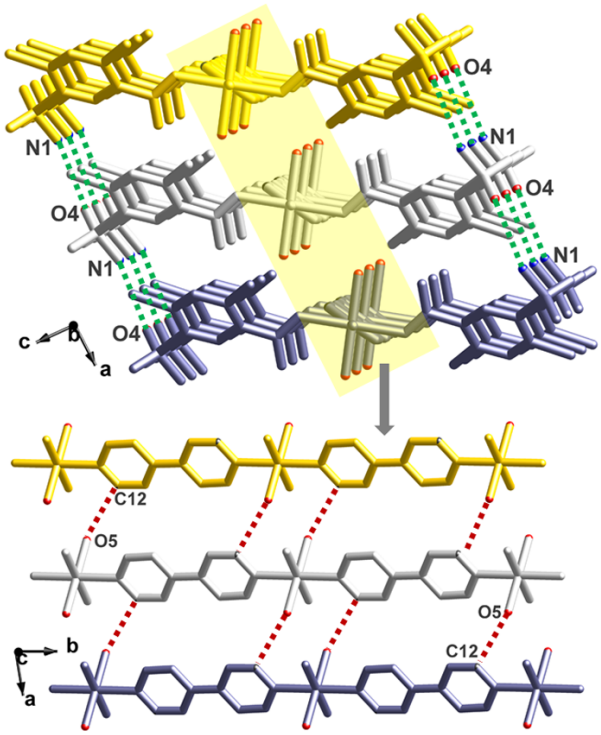

Figure S1. The N1–H···O4 and C12–H···O5 interactions in compound **1**.

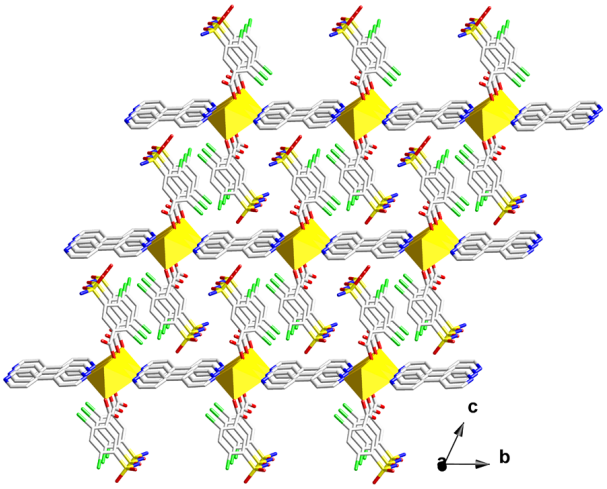

Figure S2. The 3D supramolecular framework formed via the N1–H···O2 interactions of compound **1**.

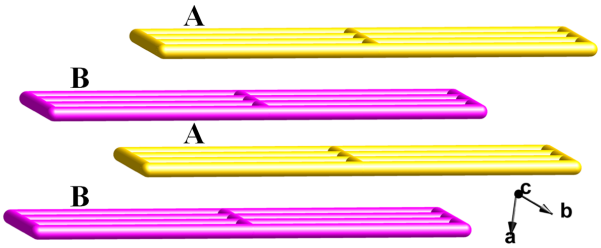

Figure S3. The 3D supramolecular of compound **2** in ABAB fashion.

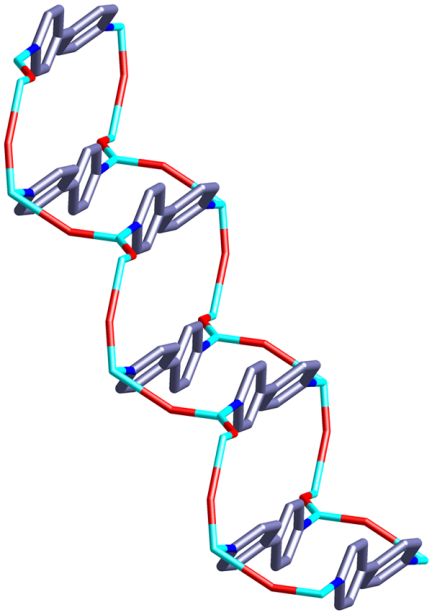

Figure S4. The double stranded ladder-like chain in compound **4**.

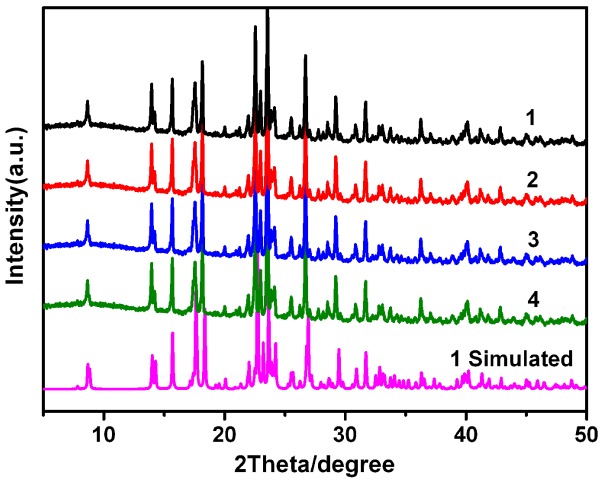

Figure S5. XRD spectra of compounds **1**-**4**. Simulated (lower) and experimental (upper) traces.

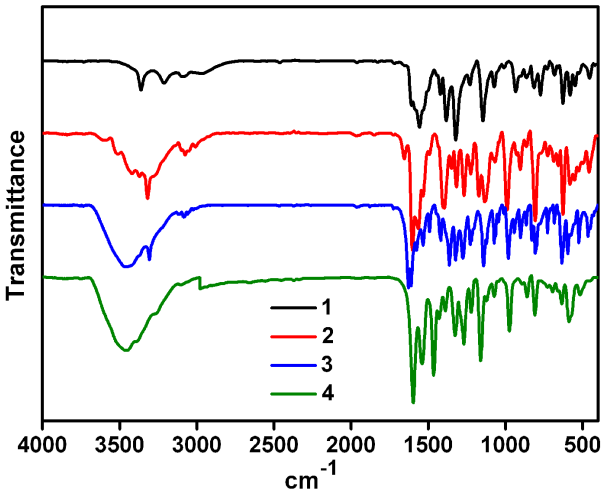

Figure S6. FT-IR spectra of compounds **1-4**.

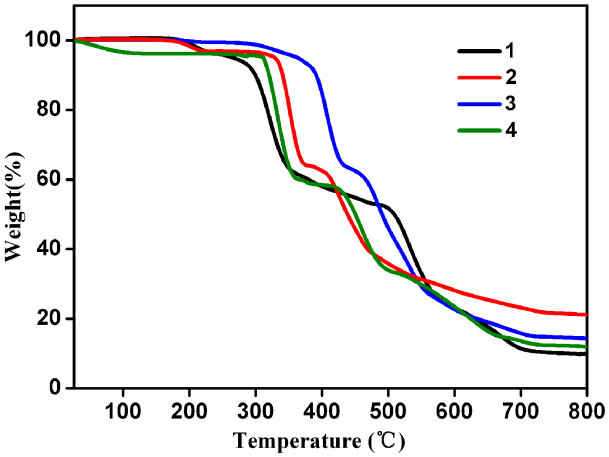

Figure S7. TG curves of compounds **1-4**.