

*Electronic Supplementary Information (ESI) for*

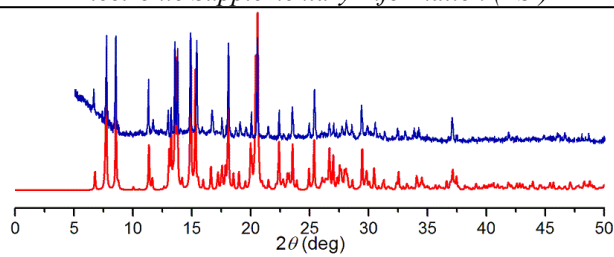
**Syntheses, Structures, and Magnetic Properties of Five Biphenyl-3,4',5-  
Tricarboxylic Acid Based Coordination Polymers from 1D Chain to 3D  
Framework**

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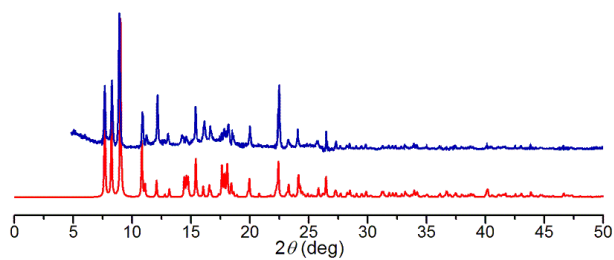
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**Table S1** Selected bond lengths (Å) and angles (°) for **1 – 5**.

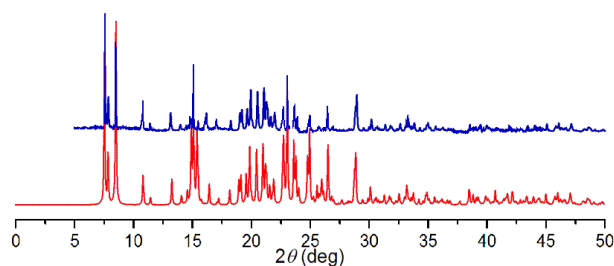
<b>Complex 1</b>							
Ni(1)-O(6) <sup>#1</sup>	1.9968(18)	Ni(1)-N(5)	2.053(2)	Ni(1)-N(7)	2.063(2)	Ni(1)-O(7)	2.0917(16)
Ni(1)-O(3)	2.0990(17)	Ni(1)-O(4)	2.1957(17)	Ni(2)-N(3)	2.094(2)	Ni(2)-N(1)	2.121(2)
Ni(2)-O(1)	2.1611(16)	O(6) <sup>#1</sup> -Ni(1)-N(5)	92.91(9)	O(6) <sup>#1</sup> -Ni(1)-N(7)	89.07(9)	N(5)-Ni(1)-N(7)	177.87(9)
O(6) <sup>#1</sup> -Ni(1)-O(7)	92.98(7)	N(5)-Ni(1)-O(7)	89.80(8)	N(7)-Ni(1)-O(7)	89.32(8)	O(6) <sup>#1</sup> -Ni(1)-O(3)	163.39(7)
N(5)-Ni(1)-O(3)	88.70(8)	N(7)-Ni(1)-O(3)	89.61(8)	O(7)-Ni(1)-O(3)	103.56(7)	O(6) <sup>#1</sup> -Ni(1)-O(4)	102.22(7)
N(5)-Ni(1)-O(4)	89.53(8)	N(7)-Ni(1)-O(4)	90.80(8)	O(7)-Ni(1)-O(4)	164.80(7)	O(3)-Ni(1)-O(4)	61.24(6)
N(3) <sup>#2</sup> -Ni(2)-N(3)	180.000(1)	N(3) <sup>#2</sup> -Ni(2)-N(1)	86.40(9)	N(3)-Ni(2)-N(1)	93.60(9)	N(3) <sup>#2</sup> -Ni(2)-N(1) <sup>#2</sup>	93.60(9)
N(3)-Ni(2)-N(1) <sup>#2</sup>	86.40(9)	N(1)-Ni(2)-N(1) <sup>#2</sup>	180.000(1)	N(3) <sup>#2</sup> -Ni(2)-O(1) <sup>#2</sup>	87.12(8)	N(3)-Ni(2)-O(1) <sup>#2</sup>	92.88(8)
N(1)-Ni(2)-O(1) <sup>#2</sup>	95.49(7)	N(1) <sup>#2</sup> -Ni(2)-O(1) <sup>#2</sup>	84.51(7)	N(3) <sup>#2</sup> -Ni(2)-O(1)	92.88(8)	N(3)-Ni(2)-O(1)	87.12(8)
N(1)-Ni(2)-O(1)	84.51(7)	N(1) <sup>#2</sup> -Ni(2)-O(1)	95.49(7)	O(1) <sup>#2</sup> -Ni(2)-O(1)	180.00(10)		
Symmetry codes: #1 x, y, z-1; #2 -x+2, -y+1, -z+1.							
<b>Complex 2</b>							
Co(1)-O(1)	2.071(3)	Co(1)-O(7)	2.071(3)	Co(1)-O(4) <sup>#1</sup>	2.076(3)	Co(1)-N(4) <sup>#2</sup>	2.111(4)
Co(1)-O(7) <sup>#3</sup>	2.118(3)	Co(1)-O(5) <sup>#4</sup>	2.142(3)	Co(2)-O(7)	1.968(3)	Co(2)-O(6) <sup>#5</sup>	1.992(3)
Co(2)-O(2)	2.002(3)	Co(2)-N(1)	2.057(4)	Co(2)-O(4) <sup>#6</sup>	2.253(3)	O(7)-Co(1)-O(1)	96.23(11)
O(1)-Co(1)-O(4) <sup>#1</sup>	172.09(11)	O(7)-Co(1)-O(4) <sup>#1</sup>	90.37(11)	O(1)-Co(1)-N(4) <sup>#2</sup>	88.24(13)	O(7)-Co(1)-N(4) <sup>#2</sup>	98.37(13)
O(4) <sup>#1</sup> -Co(1)-N(4) <sup>#2</sup>	95.13(13)	O(1)-Co(1)-O(7) <sup>#3</sup>	95.54(11)	O(7)-Co(1)-O(7) <sup>#3</sup>	82.60(12)	O(4) <sup>#1</sup> -Co(1)-O(7) <sup>#3</sup>	80.95(10)
N(4) <sup>#2</sup> -Co(1)-O(7) <sup>#3</sup>	175.98(13)	O(1)-Co(1)-O(5) <sup>#4</sup>	85.61(11)	O(7)-Co(1)-O(5) <sup>#4</sup>	173.36(11)	O(4) <sup>#1</sup> -Co(1)-O(5) <sup>#4</sup>	87.35(11)
N(4) <sup>#2</sup> -Co(1)-O(5) <sup>#4</sup>	88.05(13)	O(7) <sup>#3</sup> -Co(1)-O(5) <sup>#4</sup>	90.88(11)	O(7)-Co(2)-O(6) <sup>#5</sup>	106.12(12)	O(7)-Co(2)-O(2)	113.68(12)
O(6) <sup>#5</sup> -Co(2)-O(2)	137.73(13)	O(7)-Co(2)-N(1)	103.62(14)	O(6) <sup>#5</sup> -Co(2)-N(1)	93.59(14)	O(2)-Co(2)-N(1)	90.51(14)
O(7)-Co(2)-O(4) <sup>#6</sup>	80.02(11)	O(6) <sup>#5</sup> -Co(2)-O(4) <sup>#6</sup>	83.97(11)	O(2)-Co(2)-O(4) <sup>#6</sup>	89.26(11)	N(1)-Co(2)-O(4) <sup>#6</sup>	176.10(13)
Symmetry codes: #1 x, y+1, z; #2 -x+3/2, y+1/2, -z+1/2; #3 -x+2, -y+2, -z+1; #4 -x+5/2, y+1/2, -z+1/2; #5 x-1/2, -y+3/2, z+1/2; #6 -x+2, -y+1, -z+1.							
<b>Complex 3</b>							
N(1)-Zn(1)	2.046(3)	O(1)-Zn(1)	1.963(3)	Zn(1)-O(5) <sup>#3</sup>	1.964(2)	Zn(1)-N(4) <sup>#1</sup>	2.048(3)
O(1)-Zn(1)-O(5) <sup>#3</sup>	100.89(11)	O(1)-Zn(1)-N(1)	116.45(12)	O(5) <sup>#3</sup> -Zn(1)-N(1)	110.61(12)	O(1)-Zn(1)-N(4) <sup>#1</sup>	112.49(12)
O(5) <sup>#3</sup> -Zn(1)-N(4) <sup>#1</sup>	123.15(12)	N(1)-Zn(1)-N(4) <sup>#1</sup>	94.28(12)				
Symmetry codes: #1 -x, -y+2, -z+2; #3 x-1, y-1, z.							
<b>Complex 4</b>							
Co(1)-O(9) <sup>#1</sup>	1.990(2)	Co(1)-O(1)	2.021(2)	Co(1)-O(8)	2.018(2)	Co(1)-N(4) <sup>#2</sup>	2.100(3)
Co(1)-N(1)	2.123(3)	Co(2)-O(7)	2.045(2)	Co(2)-O(10) <sup>#1</sup>	2.047(2)	Co(2)-N(8) <sup>#3</sup>	2.072(3)
Co(2)-N(5)	2.087(3)	Co(2)-O(2) <sup>#4</sup>	2.104(2)	O(9) <sup>#1</sup> -Co(1)-O(1)	120.45(11)	N(4) <sup>#2</sup> -Co(1)-N(1)	174.19(15)
O(9) <sup>#1</sup> -Co(1)-O(8)	119.09(11)	O(1)-Co(1)-O(8)	120.04(10)	O(1)-Co(1)-N(4) <sup>#2</sup>	86.76(12)	O(9) <sup>#1</sup> -Co(1)-N(4) <sup>#2</sup>	93.78(11)
O(8)-Co(1)-N(4) <sup>#2</sup>	95.91(13)	O(9) <sup>#1</sup> -Co(1)-N(1)	84.83(10)	O(1)-Co(1)-N(1)	89.08(12)	O(8)-Co(1)-N(1)	89.68(12)
O(7)-Co(2)-O(2) <sup>#4</sup>	151.57(10)	O(7)-Co(2)-O(10) <sup>#1</sup>	119.00(11)	O(7)-Co(2)-N(8) <sup>#3</sup>	91.83(11)	O(10) <sup>#1</sup> -Co(2)-N(8) <sup>#3</sup>	102.11(12)
O(7)-Co(2)-N(5)	85.82(10)	O(10) <sup>#1</sup> -Co(2)-N(5)	89.75(12)	N(8) <sup>#3</sup> -Co(2)-N(5)	167.47(14)	O(10) <sup>#1</sup> -Co(2)-O(2) <sup>#4</sup>	87.76(9)
N(8) <sup>#3</sup> -Co(2)-O(2) <sup>#4</sup>	91.55(11)	N(5)-Co(2)-O(2) <sup>#4</sup>	84.81(11)				
Symmetry codes: #1 -x+2, y-1/2, -z+2; #2 x+1, y, z+1; #3 x-1, y, z-1; #4 -x+2, y+1/2, -z+2.							
<b>Complex 5</b>							
Mn(1)-O(4) <sup>#1</sup>	2.1251(18)	Mn(1)-O(10)	2.2490(19)	Mn(1)-N(9)	2.258(3)	Mn(2)-O(2)	2.120(2)
Mn(2)-O(9)	2.1977(18)	Mn(2)-O(5) <sup>#4</sup>	2.2079(18)	Mn(2)-O(1W)	2.223(2)	Mn(2)-N(4) <sup>#5</sup>	2.232(3)
Mn(2)-N(1)	2.304(2)	Mn(3)-O(3) <sup>#1</sup>	2.135(2)	Mn(3)-O(1)	2.1661(18)	Mn(3)-N(5)	2.220(3)
Mn(3)-O(9)	2.2236(19)	Mn(3)-N(8) <sup>#5</sup>	2.240(3)	Mn(3)-O(10)	2.3326(19)	O(4) <sup>#1</sup> -Mn(1)-O(4) <sup>#2</sup>	180.000(1)
O(4) <sup>#1</sup> -Mn(1)-O(10)	90.17(7)	O(4) <sup>#2</sup> -Mn(1)-O(10)	89.83(7)	O(4) <sup>#1</sup> -Mn(1)-O(10) <sup>#3</sup>	89.83(7)	O(4) <sup>#2</sup> -Mn(1)-O(10) <sup>#3</sup>	90.17(7)
O(10) <sup>#3</sup> -Mn(1)-O(10)	180.000(1)	O(4) <sup>#1</sup> -Mn(1)-N(9) <sup>#3</sup>	93.82(9)	O(4) <sup>#2</sup> -Mn(1)-N(9) <sup>#3</sup>	86.18(9)	O(10) <sup>#3</sup> -Mn(1)-N(9) <sup>#3</sup>	91.95(9)
O(10)-Mn(1)-N(9) <sup>#3</sup>	88.05(9)	O(4) <sup>#1</sup> -Mn(1)-N(9)	86.18(9)	O(4) <sup>#2</sup> -Mn(1)-N(9)	93.82(9)	O(10) <sup>#3</sup> -Mn(1)-N(9)	88.05(9)
O(10)-Mn(1)-N(9)	91.95(9)	N(9) <sup>#3</sup> -Mn(1)-N(9)	180.000(1)	O(2)-Mn(2)-O(9)	96.70(8)	O(2)-Mn(2)-O(5) <sup>#4</sup>	92.35(7)
O(9)-Mn(2)-O(5) <sup>#4</sup>	170.18(7)	O(2)-Mn(2)-O(1W)	176.46(7)	O(9)-Mn(2)-O(1W)	86.42(8)	O(5) <sup>#4</sup> -Mn(2)-O(1W)	84.43(8)
O(2)-Mn(2)-N(4) <sup>#5</sup>	96.32(10)	O(9)-Mn(2)-N(4) <sup>#5</sup>	88.32(9)	O(5) <sup>#4</sup> -Mn(2)-N(4) <sup>#5</sup>	94.48(8)	O(1W)-Mn(2)-N(4) <sup>#5</sup>	85.42(10)
O(2)-Mn(2)-N(1)	85.71(8)	O(9)-Mn(2)-N(1)	92.30(8)	O(5) <sup>#4</sup> -Mn(2)-N(1)	84.57(7)	O(1W)-Mn(2)-N(1)	92.51(9)
N(4) <sup>#5</sup> -Mn(2)-N(1)	177.80(9)	O(3) <sup>#1</sup> -Mn(3)-O(1)	122.12(8)	O(3) <sup>#1</sup> -Mn(3)-N(5)	81.87(9)	O(1)-Mn(3)-N(5)	85.27(9)
O(3) <sup>#1</sup> -Mn(3)-O(9)	148.26(7)	O(1)-Mn(3)-O(9)	89.26(7)	N(5)-Mn(3)-O(9)	97.51(8)	O(3) <sup>#1</sup> -Mn(3)-N(8) <sup>#5</sup>	83.53(10)
O(1)-Mn(3)-N(8) <sup>#5</sup>	81.91(9)	N(5)-Mn(3)-N(8) <sup>#5</sup>	151.42(11)	O(9)-Mn(3)-N(8) <sup>#5</sup>	107.71(11)	O(3) <sup>#1</sup> -Mn(3)-O(10)	87.81(8)
O(1)-Mn(3)-O(10)	149.71(8)	N(5)-Mn(3)-O(10)	105.34(9)	O(9)-Mn(3)-O(10)	61.57(7)	N(8) <sup>#5</sup> -Mn(3)-O(10)	98.49(9)
Symmetry codes: #1 -x+1, -y+2, -z+1; #2 x, y-1, z; #3 -x+1, -y+1, -z+1; #4 -x, -y+2, -z+2; #5 x, y, z-1.							



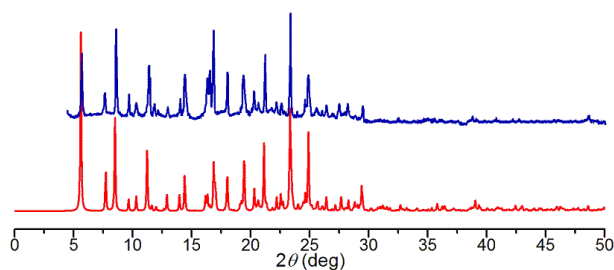
(a)



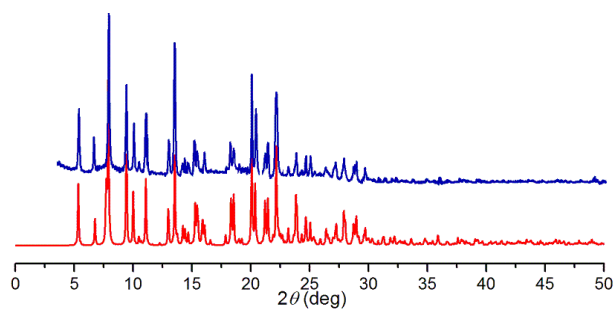
(b)



(c)

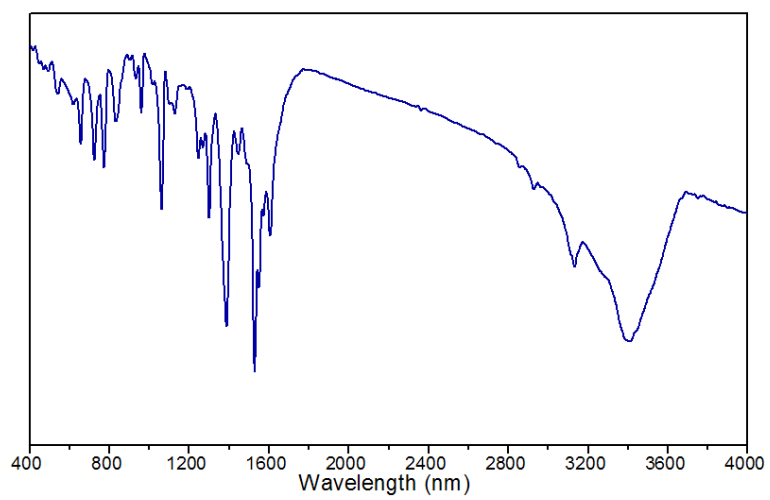


(d)

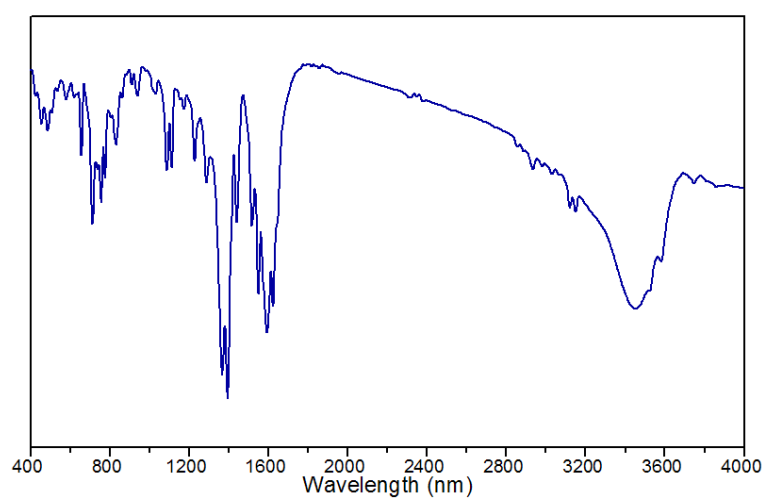


(e)

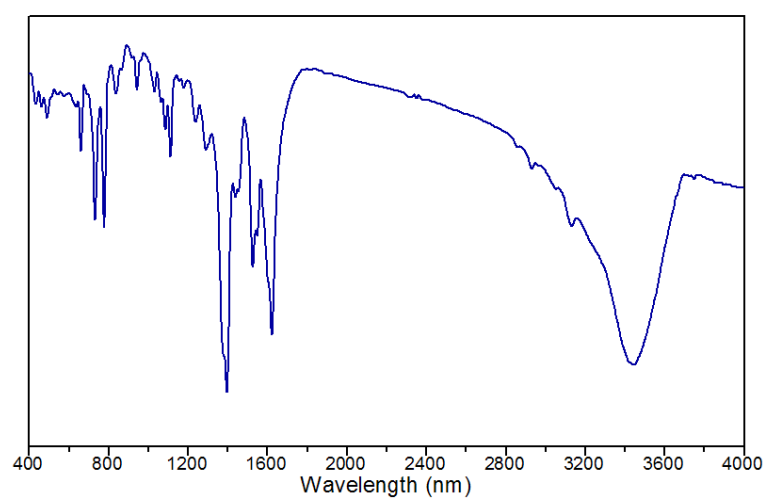
**Figure S1.** PXRD patterns of (a) **1**, (b) **2**, (c) **3**, (d) **4**, (e) **5**. Red: calculated from the X-ray single-crystal data; Dark blue: observed for the as-synthesized solids.



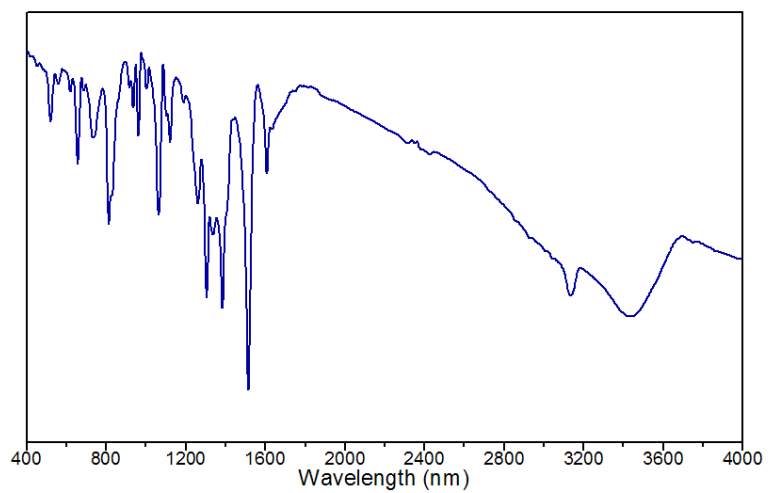
(a)



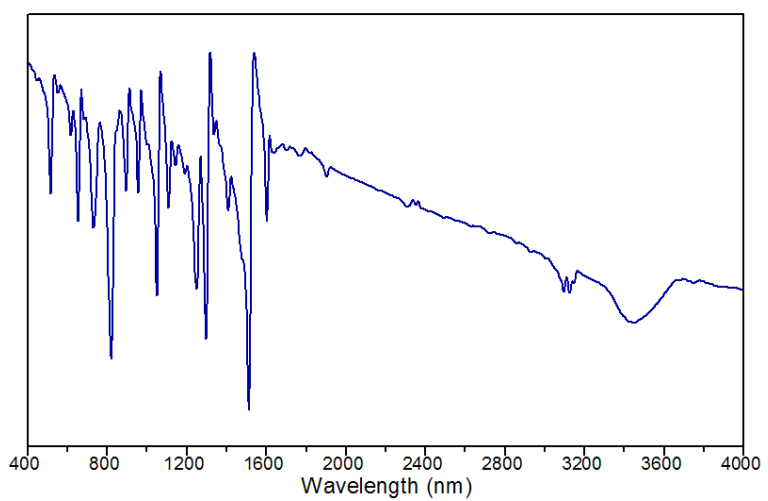
(b)



(c)



(d)



(e)

**Figure S2.** The IR spectras of (a) **1**, (b) **2**, (c) **3**, (d) **4**, (e) **5**.

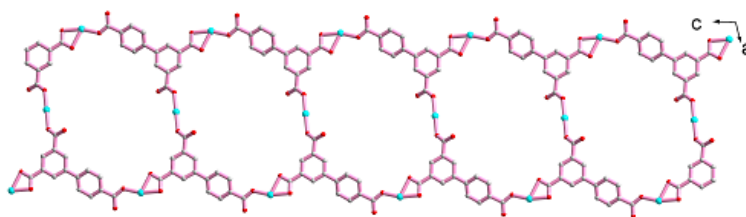


Figure S3. The 1D  $[\text{Ni}_3(\text{BPT})_2]_n$  ladder chain in compound 1 view along  $ac$  plane.

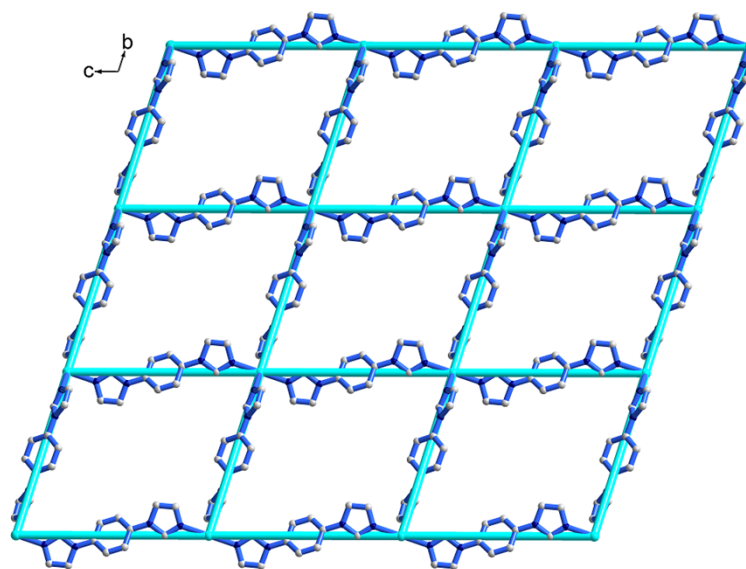


Figure S4. The 2D  $[\text{Ni}(\text{1,4-bib})_2]_n$  layer in compound 1 view along  $bc$  plane.

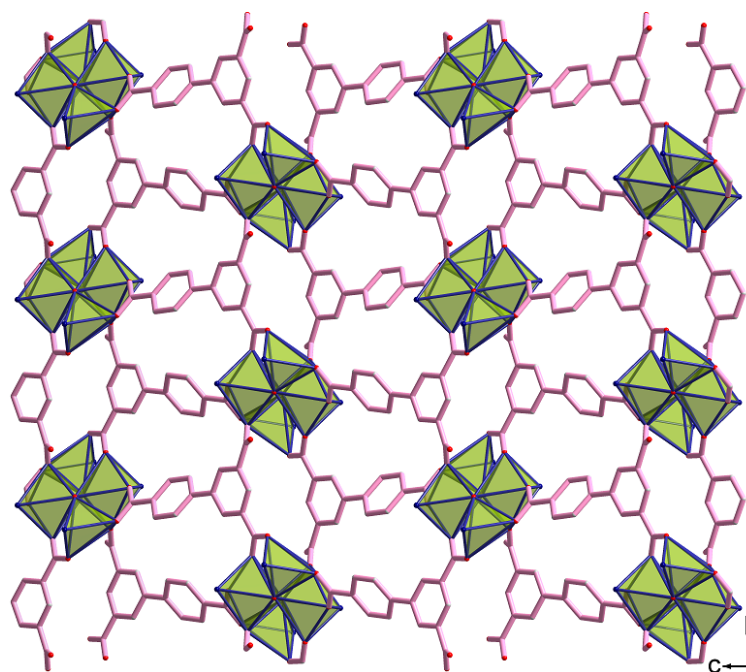
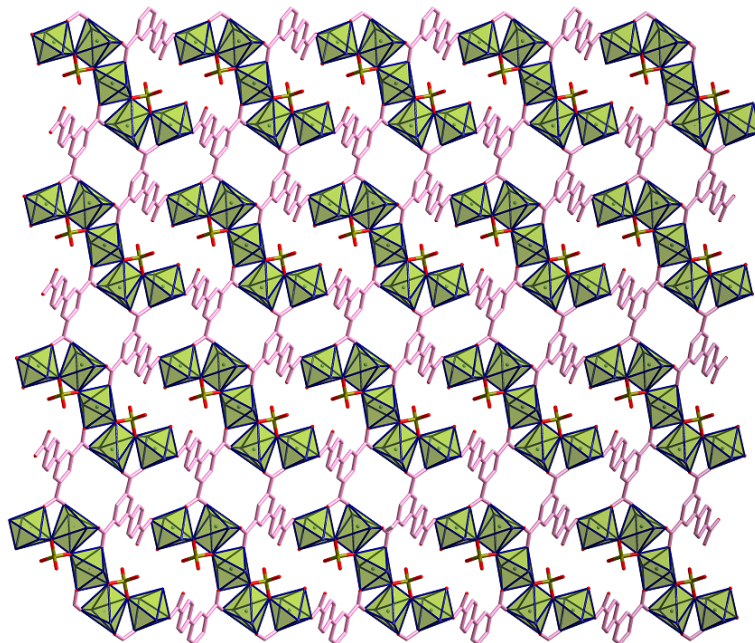
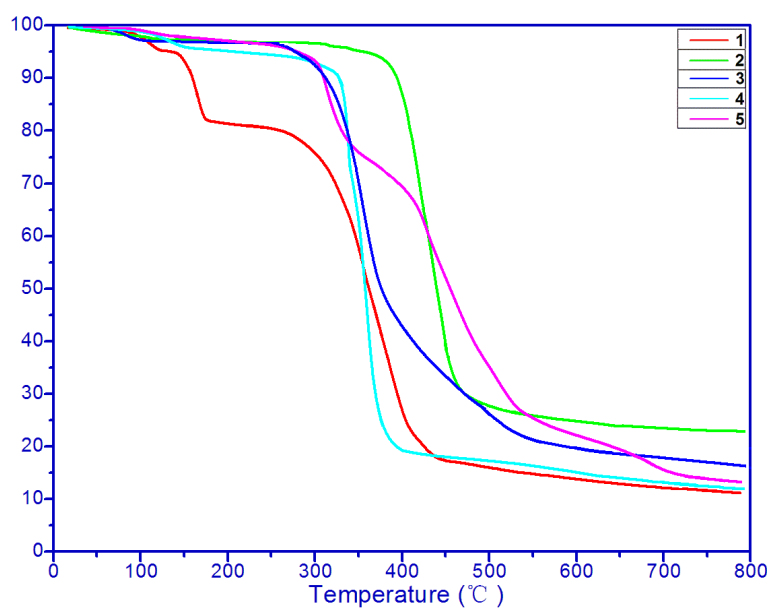


Figure S5. The 2D  $[\text{Co}_2(\mu_3\text{-OH})(\text{BPT})_3]_n$  bilayer in compound 2 view along  $bc$  plane.



**Figure S6.** The 2D  $[\text{Mn}_3(\text{SO}_4)_2(\text{BPT})_2]_n$  networks in compound **5**.



**Figure S7.** TGA curves for compounds **1–5**.