Electronic Supplementary Information for

Biphenyl-2,4,6,3',5'-pentacarboxylic Acid as Tecton for Six new Co(II) Coordination Polymers: PH and N-donor Ligands-Dependent Assemblies, Structure Diversities And Magnetic Properties

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Table S1. Selected Bond Lengths (Å) and Angles (º) for **1**–**6**.

1			
Co(1)-O(1)	2.055(3)	Co(1)-O(2)#1	2.116(3)
Co(1)-N(1)	2.128(3)	Co(1)-N(2)	2.126(3)
Co(1)-N(4)	2.145(3)	Co(1)-N(3)	2.152(3)
O(1)-Co(1)-O(2)#1	94.64(10)	O(1)-Co(1)-N(1)	92.90(10)
O(2)#1-Co(1)-N(1)	86.78(10)	O(1)-Co(1)-N(2)	169.43(10)
O(2)#1-Co(1)-N(2)	81.33(11)	N(1)-Co(1)-N(2)	77.18(11)
O(1)-Co(1)-N(4)	93.67(11)	O(2)#1-Co(1)-N(4)	171.22(11)
N(1)-Co(1)-N(4)	95.66(12)	N(2)-Co(1)-N(4)	90.96(12)

O(1)-Co(1)-N(3)	91.54(10)	O(2)#1-Co(1)-N(3)	100.39(11)
N(1)-Co(1)-N(3)	171.24(11)	N(2)-Co(1)-N(3)	98.78(11)
N(4)-Co(1)-N(3)	76.52(13)		
2			
Co(1)-O(1)	2.066(4)	Co(1)-O(2)#1	2.120(4)
Co(1)-N(2)	2.132(5)	Co(1)-N(1)	2.121(5)
Co(1)-N(3)	2.143(5)	Co(1)-N(4)	2.162(5)
Co(2)-O(7)	1.892(5)	Co(2)-O(10)#2	1.951(5)
Co(2)-O(11)	2.032(6)	Co(2)-O(5)#3	2.025(5)
O(1)-Co(1)-O(2)#1	95.08(16)	O(1)-Co(1)-N(2)	170.07(19)
O(2)#1-Co(1)-N(2)	81.79(18)	O(1)-Co(1)-N(1)	93.92(17)
O(2)#1-Co(1)-N(1)	87.78(17)	N(2)-Co(1)-N(1)	76.6(2)
O(1)-Co(1)-N(3)	89.82(17)	O(2)#1-Co(1)-N(3)	102.26(17)
N(2)-Co(1)-N(3)	100.0(2)	N(1)-Co(1)-N(3)	168.94(19)
O(1)-Co(1)-N(4)	92.13(19)	O(2)#1-Co(1)-N(4)	172.60(19)
N(2)-Co(1)-N(4)	91.4(2)	N(1)-Co(1)-N(4)	93.4(2)
N(3)-Co(1)-N(4)	76.1(2)	O(7)-Co(2)-O(11)	103.1(2)
O(7)-Co(2)-O(10)#2	117.7(2)	O(7)-Co(2)-O(5)#3	108.3(3)
O(10)#2-Co(2)-O(11)	117.3(2)	O(11)-Co(2)-O(5)#3	98.9(2)
O(10)#2-Co(2)-O(5)#3	109.7(2)		
3			
Co(1)-O(1)	1.952(2)	Co(1)-O(6)#1	1.958(2)
Co(1)-O(7)#2	2.039(3)	Co(1)-N(1)	2.056(3)
O(1)-Co(1)-O(6)#1	116.40(11)	O(1)-Co(1)-O(7)#2	110.13(11)
O(6)#1-Co(1)-O(7)#2	122.53(11)	O(1)-Co(1)-N(1)	110.50(11)
O(6)#1-Co(1)-N(1)	99.55(12)	O(7)#2-Co(1)-N(1)	93.77(12)
4			
Co(1)-O(6)#1	1.981(2)	Co(1)-O(1)	1.989(2)
Co(1)-O(11)#2	1.994(2)	Co(1)-O(3)	2.003(2)
Co(2)-O(5)#3	2.051(3)	Co(2)-O(8)#4	2.058(3)
Co(2)-O(2)	2.075(2)	Co(2)-O(1)	2.078(2)
Co(2)-N(1)	2.110(3)	Co(3)-O(4)#3	2.053(3)
Co(3)-O(9)#4	2.096(2)	Co(3)-O(1)	2.109(2)

Co(3)-O(10)#2	2.126(2)	Co(3)-N(2)#2	2.153(3)
Co(3)-O(12)	2.161(3)		
O(6)#1-Co(1)-O(1)	119.38 (10)	O(6)#1-Co(1)-O(11)#2	97.57(11)
O(1)-Co(1)-O(11)#2	100.80(10)	O(6)#1-Co(1)-O(3)	105.76(11)
O(1)-Co(1)-O(3)	113.79(10)	O(11)#2-Co(1)-O(3)	119.16(11)
O(5)#3-Co(2)-O(8)#4	101.09(14)	O(5)#3-Co(2)-O(2)	93.42(11)
O(8)#4-Co(2)-O(2)	164.86(12)	O(5)#3-Co(2)-O(1)	108.72(9)
O(8)#4-Co(2)-O(1)	87.68(11)	O(2)-Co(2)-O(1)	91.77(9)
O(5)#3-Co(2)-N(1)	95.28(10)	O(8)#4-Co(2)-N(1)	81.46(11)
O(2)-Co(2)-N(1)	93.01(10)	O(1)-Co(2)-N(1)	155.18(10)
O(4)#3-Co(3)-O(9)#4	94.29(13)	O(4)#3-Co(3)-O(1)	91.99(11)
O(9)#4-Co(3)-O(1)	92.88(9)	O(4)#3-Co(3)-O(10)#2	90.17(12)
O(9)#4-Co(3)-O(10)#2	173.49(10)	O(1)-Co(3)-O(10)#2	91.70(9)
O(4)#3-Co(3)-N(2)#2	88.58(11)	O(9)#4-Co(3)-N(2)#2	87.17(10)
O(4)#3-Co(3)-O(12)	176.7(4)	O(9)#4-Co(3)-O(12)	83.7(2)
O(1)-Co(3)-O(12)	90.8(4)	O(10)#2-Co(3)-O(12)	91.6(2)
N(2)#2-Co(3)-O(12)	88.7(4)	O(10)#2-Co(3)-N(2)#2	88.21(10)
O(1)-Co(3)-N(2)#2	179.43(10)		
5			
Co(1)-O(1)	2.036(3)	Co(1)-N(1)	2.100(3)
Co(1)-O(10)#1	2.103(3)	Co(1)-O(11)	2.112(3)
Co(1)-O(5)#2	2.129(3)	Co(1)-O(12)	2.198(3)
Co(2)-O(9)	2.066(3)	Co(2)-N(4)#3	2.106(3)
Co(2)-O(13)	2.103(3)	Co(2)-O(14)	2.131(3)
Co(2)-O(12)#1	2.140(2)	Co(2)-O(7)#4	2.172(3)
O(1)-Co(1)-N(1)	88. 86(11)	O(1)-Co(1)-O(10)#1	95.16(11)
N(1)-Co(1)-O(10)#1	90.08(11)	O(1)-Co(1)-O(11)	174.77(10)
N(1)-Co(1)-O(11)	96.27(11)	O(10)#1-Co(1)-O(11)	85.86(10)
O(1)-Co(1)-O(5)#2	92.53(11)	N(1)-Co(1)-O(5)#2	89.29(11)
O(10)#1-Co(1)-O(5)#2	172.27(10)	O(11)-Co(1)-O(5)#2	86.54(10)
O(1)-Co(1)-O(12)	88.91(10)	N(1)-Co(1)-O(12)	177.48(10)
O(10)#1-Co(1)-O(12)	91.28(9)	O(11)-Co(1)-O(12)	85.94(10)
O(5)#2-Co(1)-O(12)	89.64(9)	O(9)-Co(2)-N(4)#3	91.58(12)

O(9)-Co(2)-O(13)	91.34(12)	N(4)#3-Co(2)-O(13)	95.51(12)
O(9)-Co(2)-O(14)	177.59(11)	N(4)#3-Co(2)-O(14)	90.60(12)
O(13)-Co(2)-O(14)	87.43(13)	O(9)-Co(2)-O(12)#1	94.98(10)
N(4)#3-Co(2)-O(12)#1	91.78(11)	O(13)-Co(2)-O(12)#1	170.22(11)
O(14)-Co(2)-O(12)#1	85.97(11)	O(9)-Co(2)-O(7)#4	83.97(11)
N(4)#3-Co(2)-O(7)#4	172.15(11)	O(13)-Co(2)-O(7)#4	91.07(11)
O(14)-Co(2)-O(7)#4	93.98(11)	O(12)#1-Co(2)-O(7)#4	82.20(9)
6			
Co(1)-O(7)#1	2.015(3)	Co(1)-N(5)	2.052(3)
Co(1)-N(7)	2.062(3)	Co(1)-O(2)	2.211(3)
Co(1)-O(1)	2.215(3)	Co(2)-O(10)#2	1.986(2)
Co(2)-O(6)	2.010(2)	Co(2)-N(1)	2.032(3)
Co(2)-N(4)#3	2.038(3)		
O(7)#1-Co(1)-N(5)	93.40(12)	O(7)#1-Co(1)-N(7)	97.43(14)
N(5)-Co(1)-N(7)	111.70(14)	O(7)#1-Co(1)-O(2)	113.78(13)
N(5)-Co(1)-O(2)	95.82(13)	N(7)-Co(1)-O(2)	137.00(14)
O(7)#1-Co(1)-O(1)	171.69(14)	N(5)-Co(1)-O(1)	90.45(14)
N(7)-Co(1)-O(1)	87.96(12)	O(2)-Co(1)-O(1)	58.43(12)
O(10)#2-Co(2)-O(6)	105.92(9)	O(10)#2-Co(2)-N(1)	109.92(10)
O(6)-Co(2)-N(1)	119.00(11)	O(10)#2-Co(2)-N(4)#3	92.88(10)
O(6)-Co(2)-N(4)#3	115.86(10)	N(1)-Co(2)-N(4)#3	109.83(12)

Symmetry codes: **1**: #1, - x, - y + 1, - z; **2**: #1, - x + 1, - y + 1, - z; #2, - x + 1/2, y - 1/2, - z + 1/2; #3, - x + 1, - y + 1, - z + 1/2; **3**: #1, x - 1, y, z; #2, - x + 1, - y, - z; **4**: #1, x - 1/2, - y + 1/2, z + 1/2; #2, x, y, z + 1; #3, x + 1/2, - y + 1/2, z + 1/2; #4, - x + 1/2, y - 1/2, - z + 1/2; **5**: #1, - x, - y + 1, - z + 1; #2, - x + 1, - y + 1, - z + 1; #3, - x, - y, - z; #4, - x, - y + 1, - z + 2; **6**: #1, - x + 1, y - 1/2, - z - 1/2; #2, - x + 2, - y + 1, - z; #3, - x + 2, - y + 2, - z.

Table S2. Hydrogen bonds for complexes **1** and **3**. (Å, º)

D-H...A	d(D-H)	d(H...A)	d(D...A)	<(DHA)
1				
O(4)-H(4A)...O(10)#2	0.82	1.76	2.557(6)	165
O(6)-H(6A)...O(9)#3	0.82	1.86	2.662(5)	164
O(7)-H(7A)...O(10)#4	0.82	2.00	2.819(5)	178
3				
O(10)-H(10A)...O(2)#4	0.82	1.86	2.673(5)	171
N(2)-H(2A)...O(5)#5	0.86	2.02	2.755(6)	143
N(2)-H(2A)...O(8)#6	0.86	2.33	2.929(5)	127
O(4)-H(4A)...O(1W)	0.82	1.81	2.633(5)	179

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

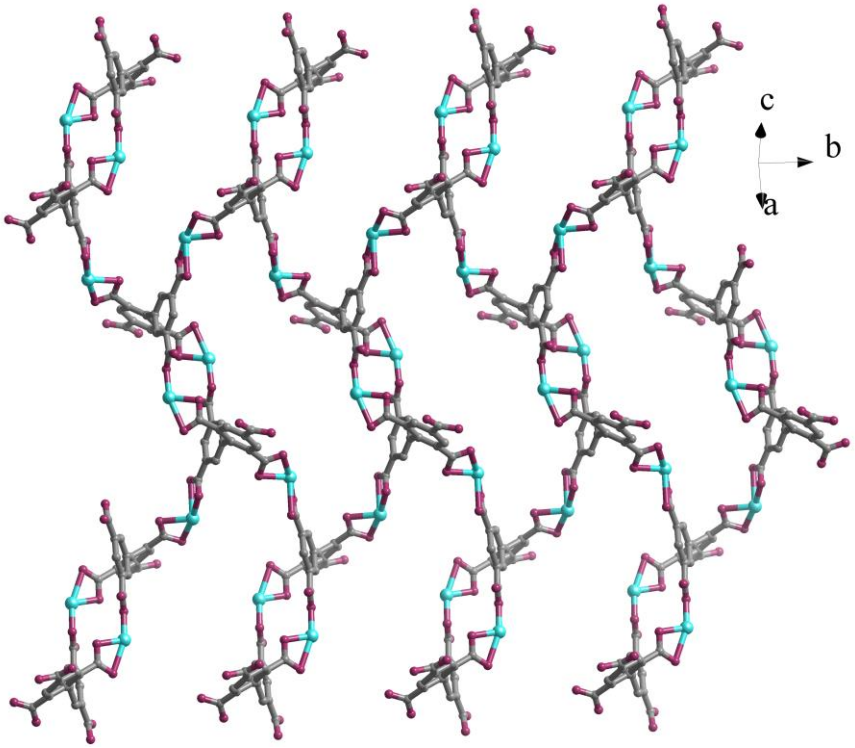


Fig. S1. 2D layer constructed by Co(II) and $Hbppc^{4-}$ in **6**.

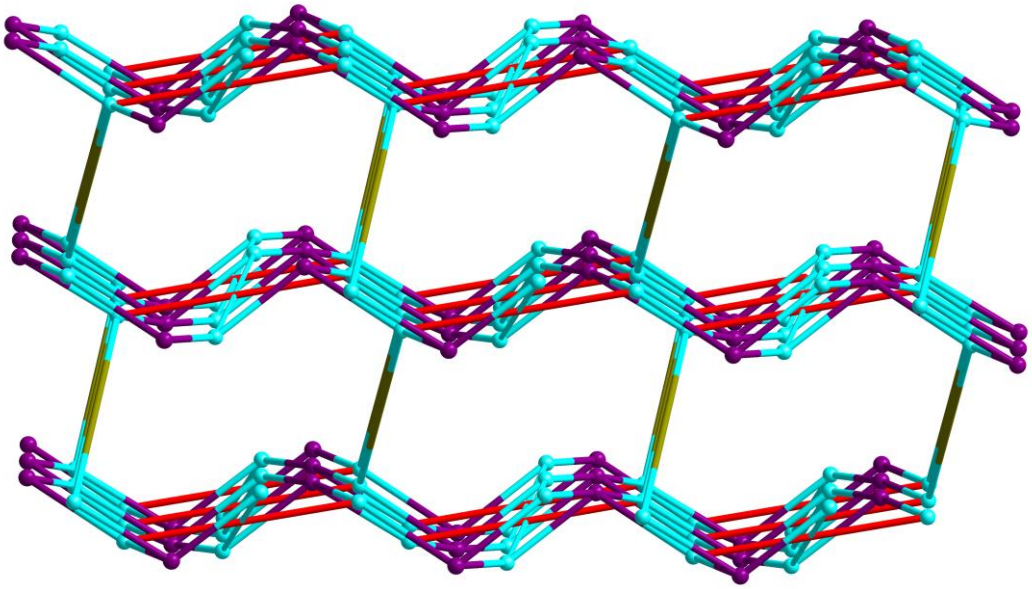
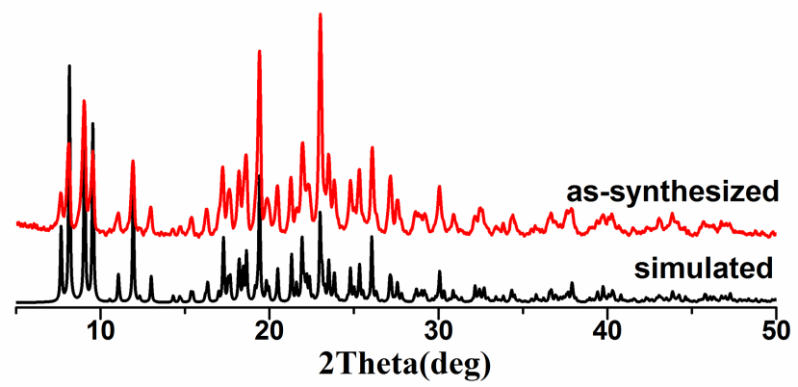
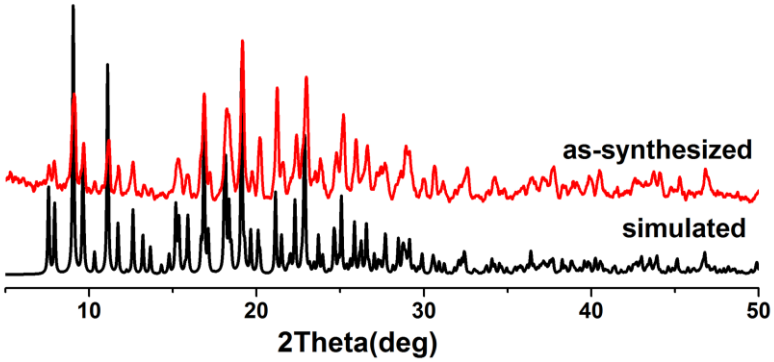


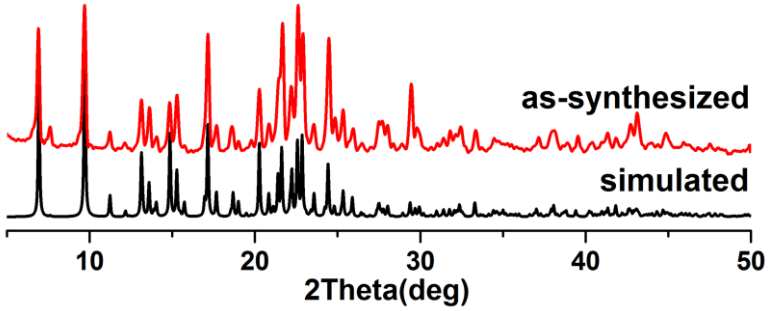
Fig. S2. Schematic representation of the (3,4,4)-connected 3D net.


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

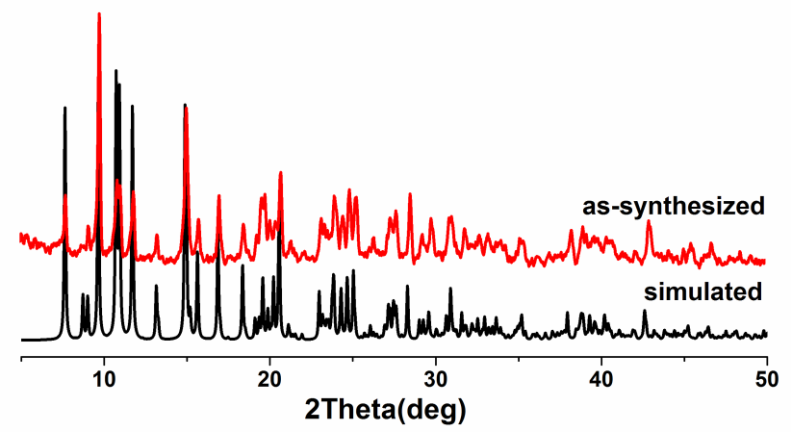
1


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

2


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

3



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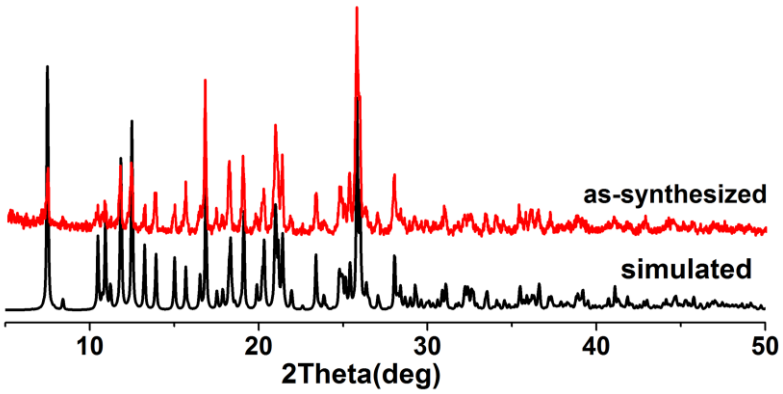

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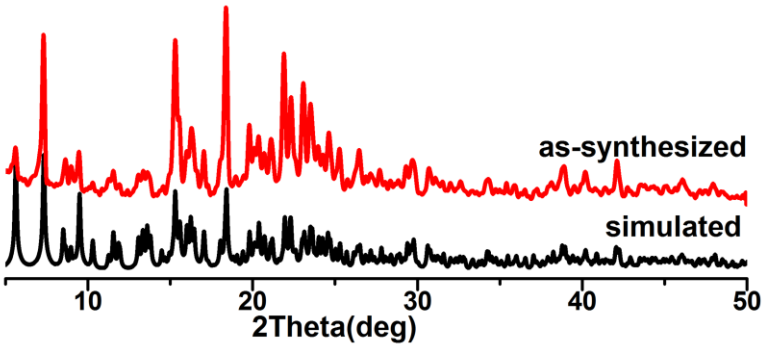

6

Fig. S3. PXRD patterns of the single crystals of complexes **1**−**6**.

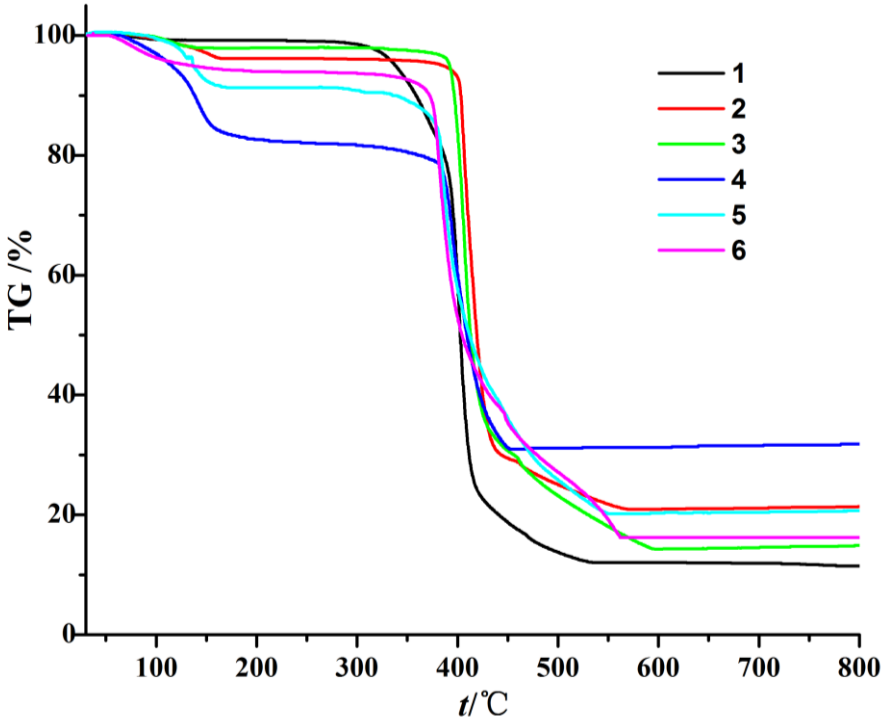

Fig. S4. TGA plots of complexes **1**–**6**.