[Supporting information]

A series of coordination polymers assembled by 9,9-dimethylfluorene-2,7-dicarboxylic acid and various flexible bis(imidazole) ligands: synthesis, structures and properties

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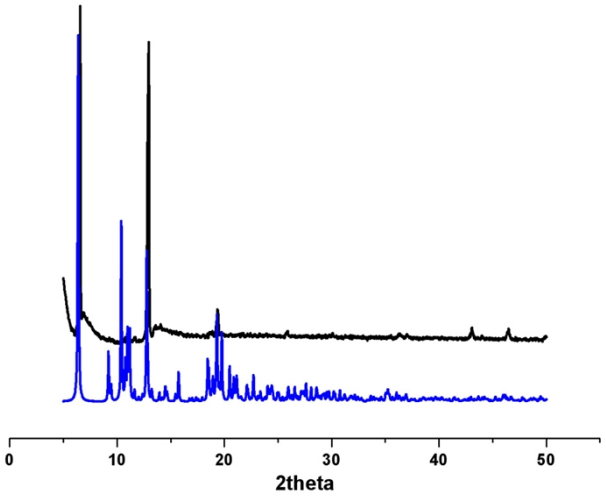

Figure S1. The simulated (blue) and experimental (black) XRPD patterns for **1**.

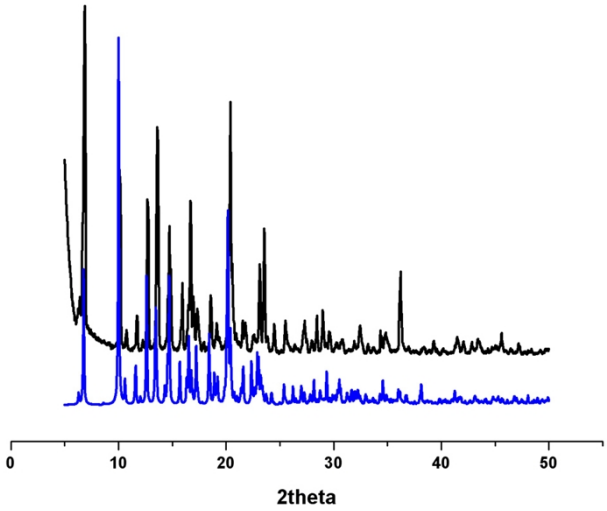

Figure S2. The simulated (blue) and experimental (black) XRPD patterns for **2**.

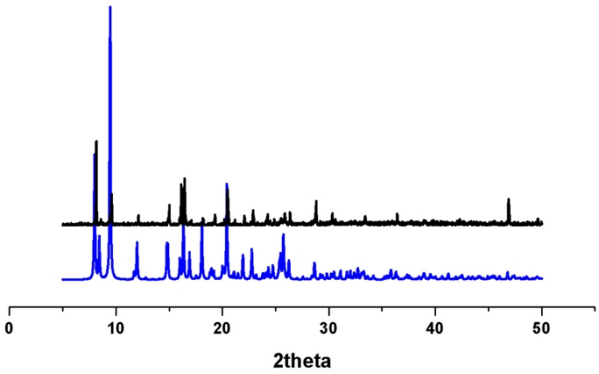

Figure S3. The simulated (blue) and experimental (black) XRPD patterns for **3**.

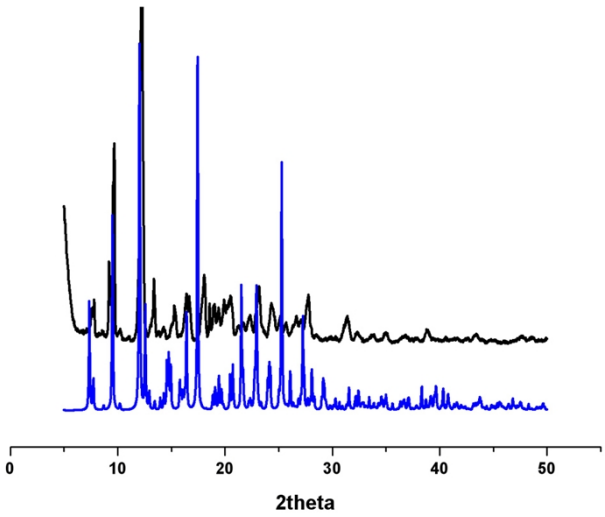

Figure S4. The simulated (blue) and experimental (black) XRPD patterns for **4**.

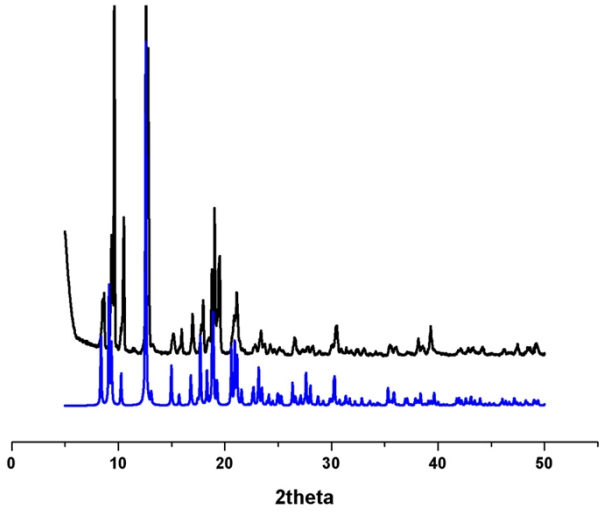

Figure S5. The simulated (blue) and experimental (black) XRPD patterns for **5**.

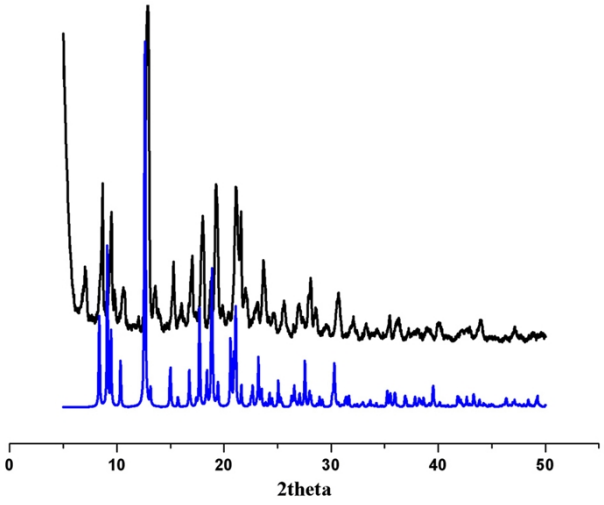

Figure S6. The simulated (blue) and experimental (black) XRPD patterns for **6**.

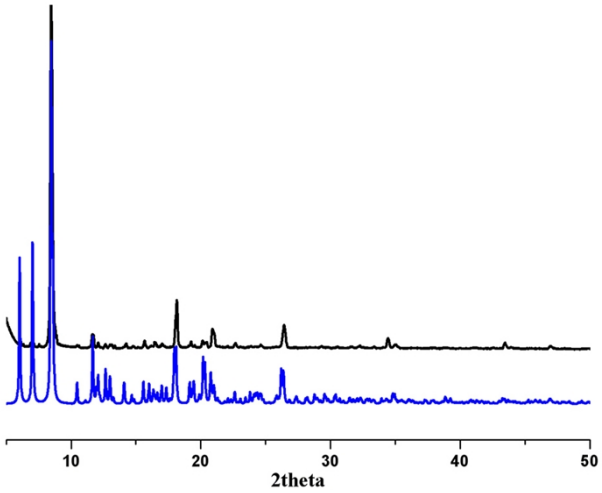

Figure S7. The simulated (blue) and experimental (black) XRPD patterns for **7**.

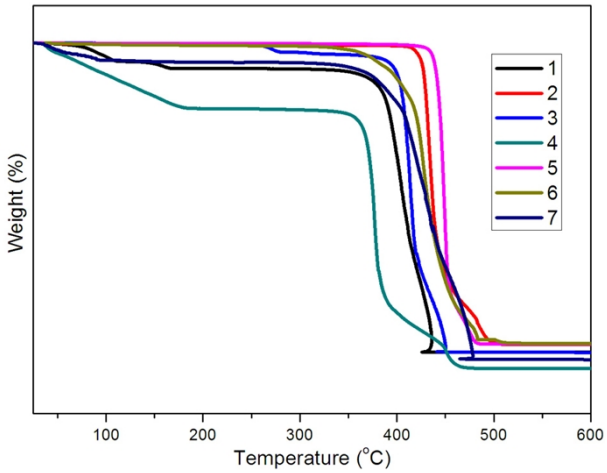

Figure S8. TGA curve of compound **1-7**.

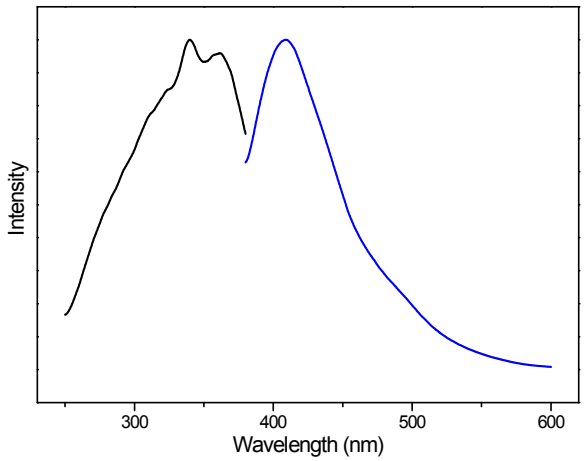

Figure S9. Excitation (black) and emission (blue) spectra of **2.**

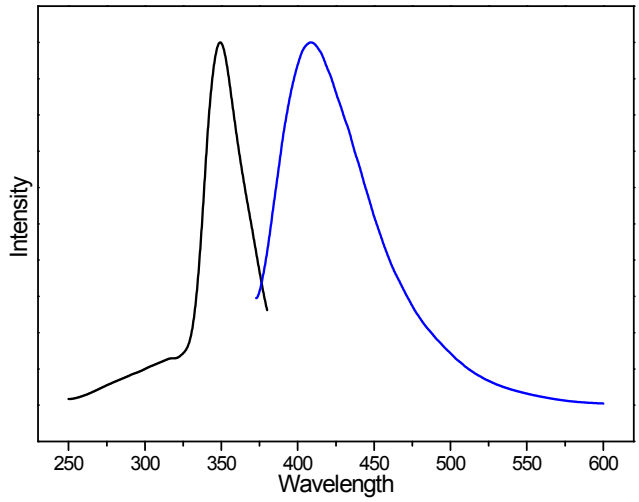

Figure S10. Excitation (black) and emission (blue) spectra of **4.**

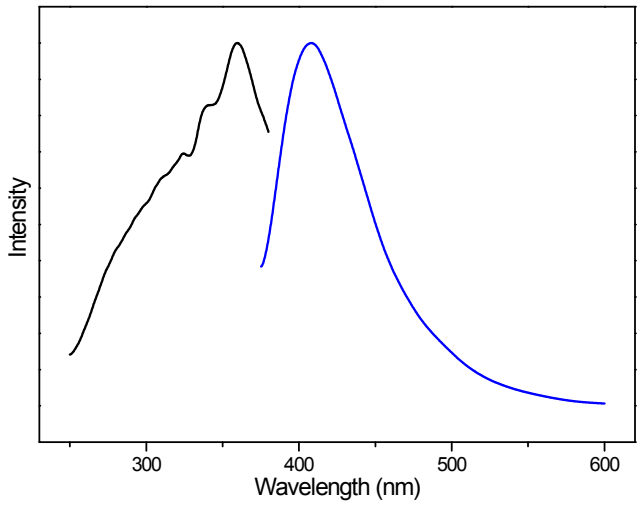

Figure S11. Excitation (black) and emission (blue) spectra of **5.**

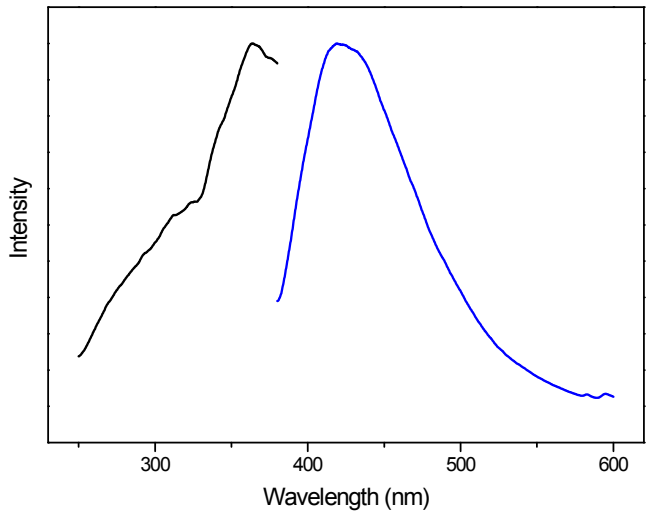

Figure S12. Excitation (black) and emission (blue) spectra of **6.**

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

Co(1)-N(4)	2.067(3)
Co(1)-O(3)	1.998(2)
Co(1)-O(6)	2.007(2)
Co(1)-OW1	2.126(2)
Co(1)-OW2	2.055(3)
Co(2)-N(1)	2.099(3)
Co(2)-O(1)	2.101(2)
Co(2)-O(4)#1	2.091(2)
Co(2)-O(5)#1	2.059(2)
Co(2)-O(7)#2	2.113(2)
Co(2)-OW1#1	2.178(2)
O(3)-Co(1)-O(6)	121.12(11)
O(3)-Co(1)-OW2	100.16(12)
O(6)-Co(1)-OW2	138.44(12)
O(3)-Co(1)-N(4)	96.89(12)
O(6)-Co(1)-N(4)	90.81(12)
OW2-Co(1)-N(4)	88.63(12)
O(3)-Co(1)-OW1	92.88(10)
O(6)-Co(1)-OW1	87.24(10)
OW2-Co(1)-OW1	86.03(11)
N(4)-Co(1)-OW1	169.58(11)
O(5)#1-Co(2)-O(4)#1	96.36(11)

O(5)#1-Co(2)-N(1)	89.45(11)
O(4)#1-Co(2)-N(1)	90.02(10)
O(5)#1-Co(2)-O(1)	87.98(11)
O(4)#1-Co(2)-O(1)	175.09(11)
N(1)-Co(2)-O(1)	92.32(11)
O(5)#1-Co(2)-O(7)#2	177.95(10)
O(4)#1-Co(2)-O(7)#2	85.69(10)
N(1)-Co(2)-O(7)#2	90.64(11)
O(1)-Co(2)-O(7)#2	89.97(11)
O(5)#1-Co(2)-OW1#1	88.83(9)
O(4)#1-Co(2)-OW1#1	89.25(9)
N(1)-Co(2)-OW1#1	178.05(11)
O(1)-Co(2)-OW1#1	88.55(9)
O(7)#2-Co(2)-OW1#1	91.11(9)

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

Table S2. Selected bond distances (Å) and angles (°) for **2**.

Zn(1)-N(4)	2.010(4)
Zn(1)-O(5)	1.924(3)
Zn(1)-O(6)#2	1.985(3)
Zn(1)-O(8)#3	1.945(4)
Zn(2)-N(1)	2.012(4)
Zn(2)-O(1)	1.972(3)
Zn(2)-O(2)#1	2.002(2)
Zn(2)-O(3)#4	1.986(3)
O(5)-Zn(1)-O(8)#3	121.52(19)
O(5)-Zn(1)-O(6)#2	108.64(15)
O(8)#3-Zn(1)-O(6)#2	101.51(14)
O(5)-Zn(1)-N(4)	108.64(16)
O(8)#3-Zn(1)-N(4)	113.77(16)
O(6)#2-Zn(1)-N(4)	100.11(15)
O(1)-Zn(2)-O(3)#4	116.77(12)
O(1)-Zn(2)-O(2)#1	103.00(11)
O(3)#4-Zn(2)-O(2)#1	95.06(11)
O(1)-Zn(2)-N(1)	113.09(13)
O(3)#4-Zn(2)-N(1)	119.71(14)
O(2)#1-Zn(2)-N(1)	104.74(13)

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

Table S3. Selected bond distances (Å) and angles (°) for **3**.

Co(1)-N(1)	2.067(3)
Co(1)-O(1)	2.001(2)
Co(1)-O(2)#1	2.008(2)
Co(1)-O(4)#2	2.017(2)
Co(1)-O(5)	2.1761(17)
O(1)-Co(1)-O(2)#1	111.08(9)
O(1)-Co(1)-O(4)#2	155.73(9)
O(2)#1-Co(1)-O(4)#2	93.10(10)
O(1)-Co(1)-N(1)	89.79(9)
O(2)#1-Co(1)-N(1)	96.82(10)
O(4)#2-Co(1)-N(1)	89.31(9)
O(1)-Co(1)-O(5)	88.55(7)
O(2)#1-Co(1)-O(5)	89.29(8)
O(4)#2-Co(1)-O(5)	89.78(8)
N(1)-Co(1)-O(5)	173.86(9)

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

Table S4. Selected bond distances (Å) and angles (°) for **4**.

Zn(1)-N(1)#3	2.005(4)
Zn(1)-O(1)	1.966(4)
Zn(1)-O(6)	1.946(4)
Zn(2)-N(4)	1.990(4)
Zn(2)-O(3)	1.951(4)
Zn(2)-O(7)	1.954(4)
O(6)#2-Zn(1)-O(1)	93.18(17)
O(1)-Zn(1)-N(1)#3	112.89(11)
O(6)#2-Zn(1)-N(1)#3	111.27(11)
N(1)#3-Zn(1)-N(1)#4	113.6(2)
O(3)-Zn(2)-O(7)	94.91(17)
O(3)-Zn(2)-N(4)	109.16(11)
O(7)-Zn(2)-N(4)	113.44(11)
N(4)-Zn(2)-N(4)#1	114.8(2)

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

Table S5. Selected bond distances (Å) and angles (°) for **5**.

Zn(1)-N(1)	1.964(6)

Zn(1)-O(1)	1.924(4)
Zn(1)-O(3)	1.947(5)
Zn(1)-O(4)	1.968(4)
O(1)-Zn(1)-O(3)	107.44(18)
O(1)-Zn(1)-N(1)	118.2(2)
O(3)-Zn(1)-N(1)	118.2(2)
O(1)-Zn(1)-O(4)	96.76(18)
O(3)-Zn(1)-O(4)	107.89(18)
N(1)-Zn(1)-O(4)	105.7(2)

Table S6. Selected bond distances (Å) and angles (°) for **6**.

Zn(1)-N(2)	1.986(4)
Zn(1)-O(1)	1.921(2)
Zn(1)-O(3)	1.947(3)
Zn(1)-O(4)#1	1.967(3)
O(1)-Zn(1)-O(3)	107.37(12)
O(1)-Zn(1)-O(4)#1	96.83(12)
O(3)-Zn(1)-O(4)#1	108.54(11)
O(1)-Zn(1)-N(2)	117.68(12)
O(3)-Zn(1)-N(2)	118.45(11)
O(4)#1-Zn(1)-N(2)	105.41(13)

Symmetry transformations used to generate equivalent atoms: #1 -x+1/2,-y+1/2,z-1/2

Table S7. Selected bond distances (Å) and angles (°) for **7**.

Ni(1)-N(4)	2.051(4)
Ni(1)-N(5)	2.077(4)
Ni(1)-O(2)	2.058(3)
Ni(1)-O(3)#3	2.095(3)
Ni(1)-O(6)	2.068(3)
Ni(1)-Ow3(9)	2.143(3)
Ni(2)-O(1)	2.018(3)
Ni(2)-O(5)	2.004(3)
Ni(2)-O(7)#1	2.172(3)
Ni(2)-O(7)#4	2.112(3)
Ni(2)-O(9)	2.094(3)
N(4)#2-Ni(1)-O(2)	87.04(14)
N(4)#2-Ni(1)-O(6)	87.76(17)
O(2)-Ni(1)-O(6)	99.13(14)
N(4)#2-Ni(1)-N(5)	96.89(19)

O(2)-Ni(1)-N(5)	87.11(15)
O(6)-Ni(1)-N(5)	172.43(14)
N(4)#2-Ni(1)-O(3)#3	86.93(14)
O(2)-Ni(1)-O(3)#3	171.84(12)
O(6)-Ni(1)-O(3)#3	86.14(13)
N(5)-Ni(1)-O(3)#3	88.16(15)
N(4)#2-Ni(1)-OW3	175.44(16)
O(2)-Ni(1)-OW3	94.89(12)
O(6)-Ni(1)-OW3	87.86(12)
N(5)-Ni(1)-OW3	87.34(14)
O(3)#3-Ni(1)-OW3	91.52(11)
O(5)-Ni(2)-O(1)	101.22(14)
O(5)-Ni(2)-N(1)	88.75(14)
O(1)-Ni(2)-N(1)	86.48(14)
O(5)-Ni(2)-OW3	87.83(12)
O(1)-Ni(2)-OW3	88.08(12)
N(1)-Ni(2)-OW3	172.90(13)
O(5)-Ni(2)-O(7)#4	170.58(12)
O(1)-Ni(2)-O(7)#4	88.11(13)
N(1)-Ni(2)-O(7)#4	93.18(14)
OW3-Ni(2)-O(7)#4	91.20(11)
O(5)-Ni(2)-O(7)#1	92.33(12)
O(1)-Ni(2)-O(7)#1	166.40(13)
N(1)-Ni(2)-O(7)#1	92.76(13)
OW3-Ni(2)-O(7)#1	93.59(11)
O(7)#4-Ni(2)-O(7)#1	78.37(11)

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