Electronic supplementary information

Syntheses, structures, and photoluminescence of five silver(I) coordination polymers based on tetrakis(imidazol-1-ylmethyl)methane

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

Ag(1)-N(4)#1	2.112(3)	Ag(1)-N(1)	2.117(3)
N(4)#1-Ag(1)-N(1)	175.09(12)		

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

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

Ag(1)-N(1)	2.245(2)	Ag(1)-Br(1)	2.6424(11)
Ag(1)-Br(1)#1	2.7261(12)	Ag(1)-Ag(1)#1	3.0327(12)
Ag(1)-Ag(1)#3	3.1827(16)	Ag(1)-Br(1)#3	3.0781(13)
N(1)-Ag(1)-Br(1)	123.53(7)	N(1)-Ag(1)-Br(1)#1	110.23(7)
Br(1)-Ag(1)-Br(1)#1	116.57(2)	N(1)-Ag(1)-Ag(1)#1	121.33(7)
Br(1)-Ag(1)-Ag(1)#1	111.156(19)	Br(1)#1-Ag(1)-Ag(1)#1	54.31(3)
N(1)-Ag(1)-Ag(1)#2	170.04(7)	Br(1)-Ag(1)-Ag(1)#2	56.92(3)
Br(1)#1-Ag(1)-Ag(1)#2	64.36(3)	Ag(1)#1-Ag(1)-Ag(1)#2	63.30(3)
N(1)-Ag(1)-Br(1)#3	89.18(7)	Br(1)-Ag(1)-Br(1)#3	107.92(2)
Br(1)#1-Ag(1)-Br(1)#3	103.624(19)	Ag(1)#1-Ag(1)-Br(1)#3	52.98(3)
Ag(1)#2-Ag(1)-Br(1)#3	100.157(16)	N(1)-Ag(1)-Ag(1)#3	131.51(7)
Br(1)-Ag(1)-Ag(1)#3	62.996(19)	Br(1)#1-Ag(1)-Ag(1)#3	104.700(16)
Ag(1)#1-Ag(1)-Ag(1)#3	58.351(14)	Br(1)#3-Ag(1)-Ag(1)#3	49.895(17)

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

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

Ag(1)-N(3)#1	2.091(7)	Ag(1)-N(2)	2.097(8)
Ag(1)-Ag(1)#2	3.212(2)	Ag(2)-N(6)	2.086(8)
Ag(2)-N(7)#3	2.146(8)	Ag(2)-Ag(2)#2	3.3288(19)
N(3)#1-Ag(1)-N(2)	166.7(3)	N(3)#1-Ag(1)-Ag(1)#2	77.8(3)
N(2)-Ag(1)-Ag(1)#2	95.7(3)	N(6)-Ag(2)-N(7)#3	172.8(4)
N(6)-Ag(2)-Ag(2)#2	73.6(3)	N(7)#3-Ag(2)-Ag(2)#2	107.7(3)

Table S3b. Hydrogen bonds for **3** (Å and °).

D-H...A	d(D-H)	d(H...A)	d(D...A)	<(DHA)
O(1W)-H(1C)...O(1)	0.85(3)	2.35(19)	2.95(2)	127(20)
O(1W)-H(1D)...O(1W)#2	0.85(3)	2.3(2)	2.77(2)	113(21)

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

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

Ag(1)-N(1)	2.157(3)	Ag(1)-N(6)#1	2.163(3)
Ag(1)-O(2)	2.421(3)	Ag(1)-Ag(2)#2	3.1541(14)
Ag(2)-N(4)	2.118(3)	Ag(2)-N(8)#3	2.127(3)
Ag(2)-Ag(1)#2	3.1541(14)	N(1)-Ag(1)-N(6)#1	142.85(10)
N(1)-Ag(1)-O(2)	119.78(9)	N(6)#1-Ag(1)-O(2)	96.96(9)
N(1)-Ag(1)-Ag(2)#2	107.06(8)	N(6)#1-Ag(1)-Ag(2)#2	84.10(7)

O(2)-Ag(1)-Ag(2)#2	78.48(6)	N(4)-Ag(2)-N(8)#3	166.78(10)
N(4)-Ag(2)-Ag(1)#2	98.59(7)	N(8)#3-Ag(2)-Ag(1)#2	88.11(8)

Table S4b. Hydrogen bonds for **4** (Å and °).

D-H...A	d(D-H)	d(H...A)	d(D...A)	<(DHA)
O(1W)-H(1C)...O(1)$^{\#2}$	0.852(19)	2.07(2)	2.914(4)	173(4)
O(1W)-H(1D)...O(1)	0.855(19)	1.93(2)	2.783(4)	173(5)
O(2W)-H(2D)...O(3)$^{\#6}$	0.86(2)	2.38(7)	2.846(5)	114(6)
O(2W)-H(2C)...O(3)	0.85(2)	1.97(3)	2.785(5)	160(6)
O(4W)-H(4D)...O(1)	0.83(2)	2.01(4)	2.803(4)	159(10)
O(4W)-H(4C)...O(4)$^{\#7}$	0.85(2)	2.07(6)	2.817(6)	146(9)
O(3W)-H(3D)...O(2W)$^{\#7}$	0.85(2)	2.23(3)	3.070(7)	170(9)

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

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

Ag(1)-N(8)#1	2.133(3)	Ag(1)-N(4)	2.141(3)
Ag(2)-N(6)	2.127(3)	Ag(2)-N(1)#2	2.135(3)
N(8)#1-Ag(1)-N(4)	167.85(10)	N(6)-Ag(2)-N(1)#2	172.14(12)

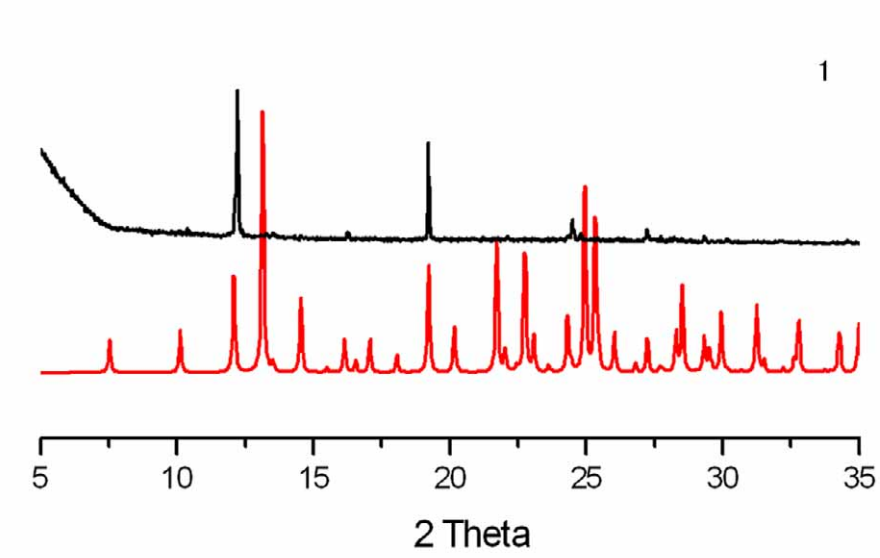
Table S5b. Hydrogen bonds for **5** (Å and °).

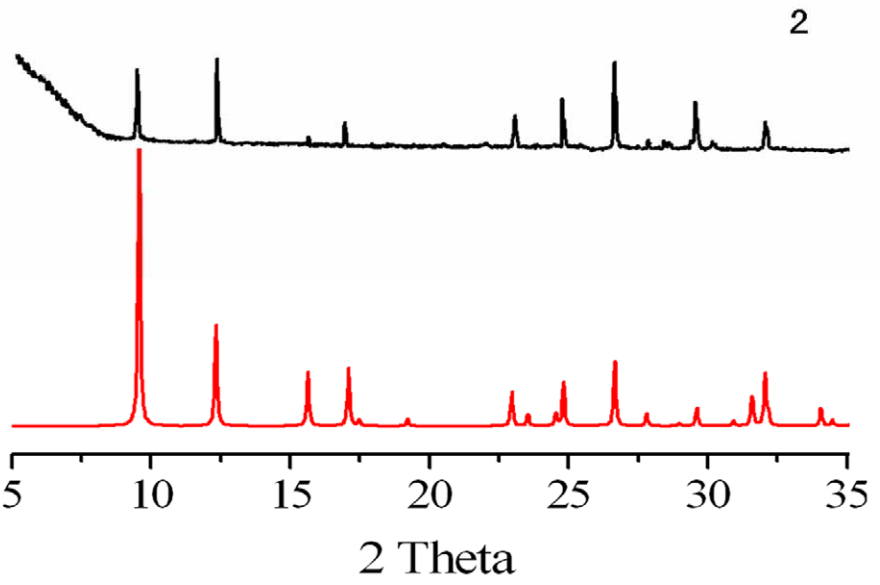
D-H...A	d(D-H)	d(H...A)	d(D...A)	<(DHA)
O(1W)-H(1D)...O(1)	0.848(19)	1.97(2)	2.790(4)	162(5)
O(1W)-H(1C)...O(3)	0.843(19)	2.16(3)	2.903(4)	146(4)
O(2W)-H(2C)...O(3W)	0.849(19)	1.95(3)	2.770(5)	163(6)
O(2W)-H(2D)...O(3)	0.878(19)	2.01(4)	2.805(5)	150(6)
O(3W)-H(3C)...O(1W)	0.848(19)	1.90(2)	2.735(5)	168(6)
O(3W)-H(3D)...O(6W)#1	0.855(19)	2.15(4)	2.903(7)	146(6)
O(4W)-H(4C)...O(4)	0.861(19)	1.87(3)	2.715(5)	165(5)
O(4W)-H(4D)...O(5W)#6	0.847(19)	2.15(5)	2.828(6)	137(6)
O(5W)-H(5D)...O(7W)	0.79(2)	2.51(8)	2.989(9)	120(7)
O(8W)-H(8C)...O(2W)#7	0.865(19)	2.17(2)	3.030(4)	171(5)
O(8W)-H(8D)...O(1)#5	0.846(19)	2.02(2)	2.850(4)	165(5)

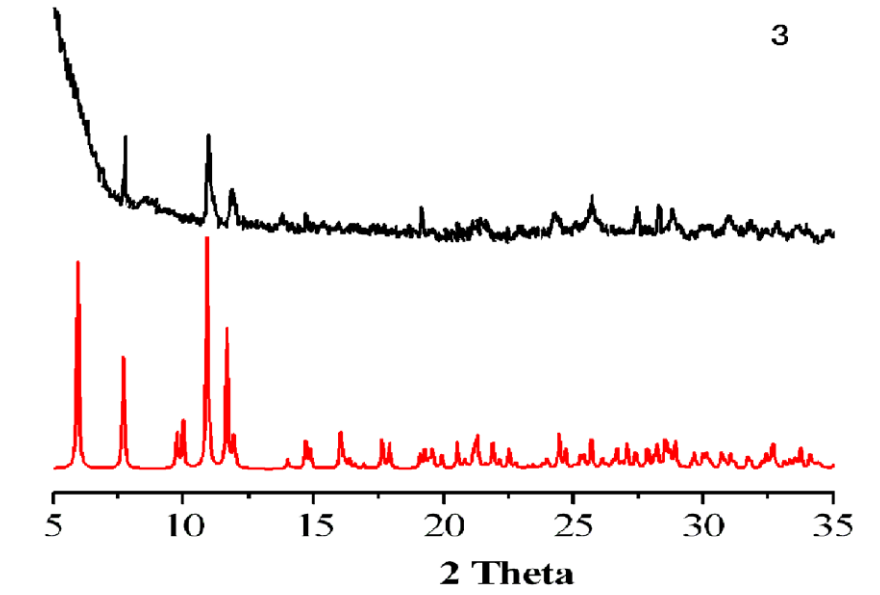
Symmetry transformations used to generate equivalent atoms:
#1 -x+1/2,y+1/2,-z+1/2; #2 -x-1,-y+2,-z; #3 -x,-y+2,-z; #4 -x+2,-y+2,-z+1; #5 -x+1/2,y-1/2,-z+1/2; #6 x,y+1,z; #7 -x+1,-y+1,-z+1.

Table S6. Bond valence sum calculations for compounds **1**-**5**.

Compound	**1**	**2**	**3**	**4**	**5**
BVS	Ag1: 0.979	Ag1: 1.016	Ag1: 1.033 Ag2: 0.979	Ag1: 1.055 Ag2: 0.958	Ag1: 0.921; Ag2: 0.936







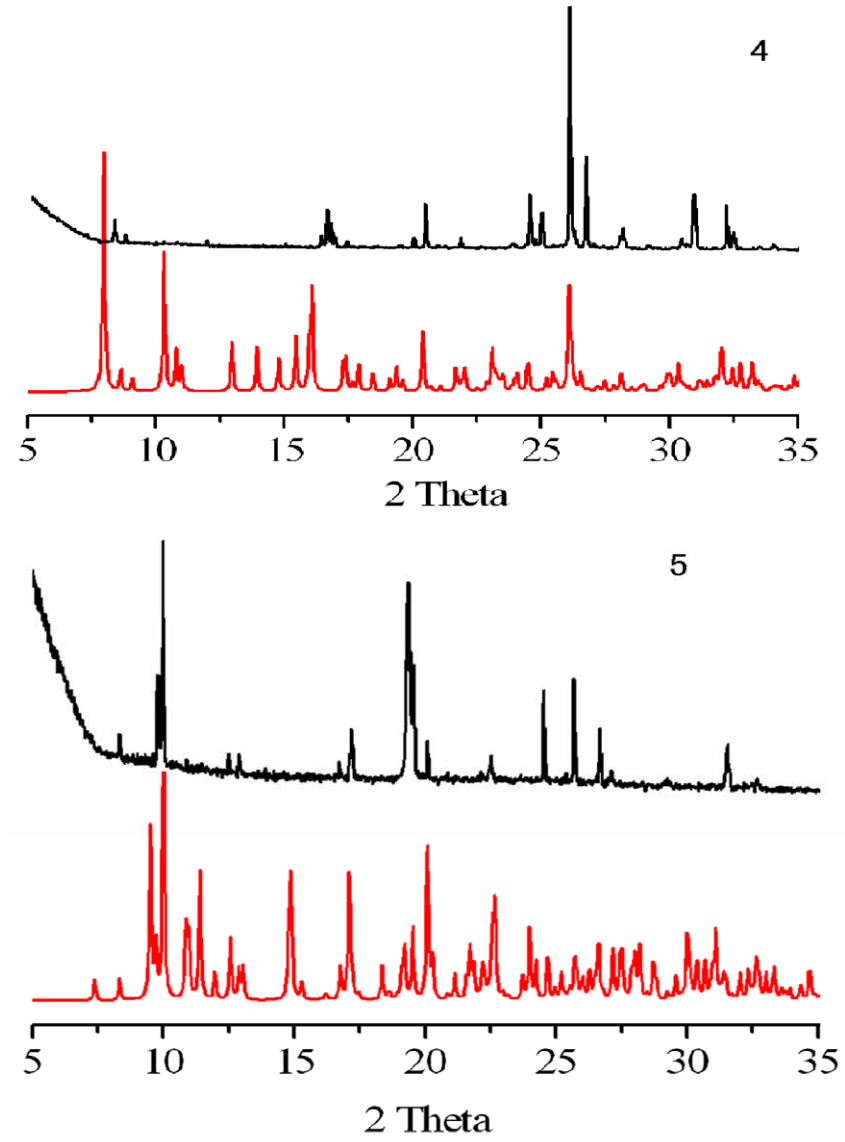


Fig. S1. The simulated (red) and experimental (black) XRPD patterns for compounds **1**-**5**.

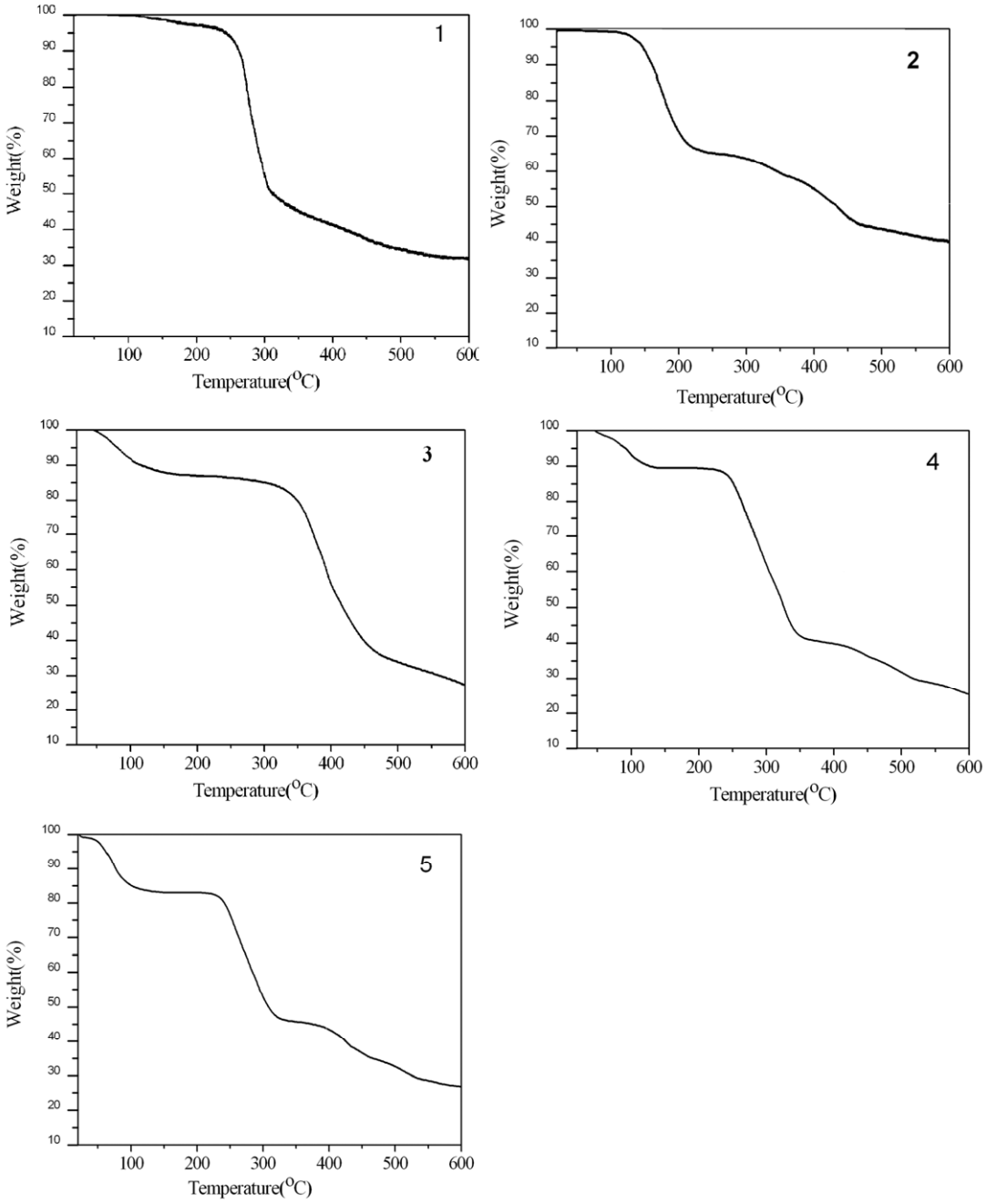


Fig. S2. The TGA curves of compounds **1**-**5**.