

## **Electronic Supplementary Information (ESI)**

# **Structural Diversity and Luminescent Properties of Coordination Polymers Based on 2,5-Bis(Imidazol-1-yl)Thiophene (Thim<sub>2</sub>) and Aromatic Multicarboxylates**

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**Table S1.** Selected bond distances (Å) and angles(°) for CPs 1-7

<b>1</b>					
Zn(1)-O(1)	1.949(4)	Zn(1)-O(3)	1.971(4)	Zn(1)-N(1)	2.014(4)
				Zn(1)-N(4)	2.018(5)
O(1)-Zn(1)-O(3)#1	107.76(16)	O(3)#1-Zn(1)-N(1)	95.51(17)	O(3)#1-Zn(1)-N(4)#2	110.55(18)
O(1)-Zn(1)-N(1)	122.23(17)	O(1)-Zn(1)-N(4)#2	114.47(18)	N(1)-Zn(1)-N(4)#2	104.57(19)
#1= x+1/2,-y+1/2,z+1/2, #2 -x+1/2,y+1/2,-z+5/2					
<b>2</b>					
Co(1)-O(2)	1.966(2)	Co(1)-O(3)#1	2.015(3)	Co(1)-N(1)	2.040(3)
				Co(1)-N(4)#2	2.046(3)
O(2)-Co(1)-O(3)#1	97.68(10)	O(3)#1-Co(1)-N(1)	121.00(12)	O(3)#1-Co(1)-N(4)#2	111.77(11)
O(2)-Co(1)-N(1)	105.75(11)	O(2)-Co(1)-N(4)#2	115.81(11)	N(1)-Co(1)-N(4)#2	105.13(11)
#1 x+1,y,z, #2 -x+3/2,-y+1,z+1/2					
<b>3</b>					
Co(1)-O(1)	1.967(4)	Co(1)-O(5)#1	1.989(4)	Co(1)-N(4)#2	2.011(4)
				Co(1)-N(1)	2.044(5)
O(1)-Co(1)-O(5)#1	107.28(17)	O(5)#1-Co(1)-N(4)#2	116.83(18)	O(5)#1-Co(1)-N(1)	106.90(18)
O(1)-Co(1)-N(4)#2	107.95(18)	O(1)-Co(1)-N(1)	95.17(17)	N(4)#2-Co(1)-N(1)	119.95(19)
#1 x+1/2,-y+1/2,z+1/2 #2 -x+3/2,y-1/2,-z+3/2					
<b>4</b>					
Zn(1)-O(1)	1.959(5)	Zn(1)-O(5)#1	1.976(5)	Zn(1)-N(1)	1.986(5)
				Zn(1)-N(4)#2	2.017(6)
O(1)-Zn(1)-O(5)#1	109.2(2)	O(5)#1-Zn(1)-N(1)	114.9(2)	O(5)#1-Zn(1)-N(4)#2	106.0(2)
O(1)-Zn(1)-N(1)	110.1(2)	O(1)-Zn(1)-N(4)#2	96.2(2)	N(1)-Zn(1)-N(4)#2	118.6(2)
#1 x-1/2,-y+1/2,z+1/2 #2 -x+1/2,y+1/2,-z+1/2					
<b>5</b>					
Co(1)-O(4)#1	1.979(2)	Co(1)-O(1)	1.998(2)	Co(1)-N(4)#2	2.029(3)
				Co(1)-N(1)	2.052(3)
O(4)#1-Co(1)-O(1)	102.13(10)	O(1)-Co(1)-N(4)#2	122.84(11)	O(1)-Co(1)-N(1)	113.38(10)
O(4)#1-Co(1)-N(4)#2	112.22(10)	O(4)#1-Co(1)-N(1)	94.80(10)	N(4)#2-Co(1)-N(1)	107.78(11)
#1 x+1/2,-y+5/2,z+1/2 #2 x,y+1,z					
<b>6</b>					

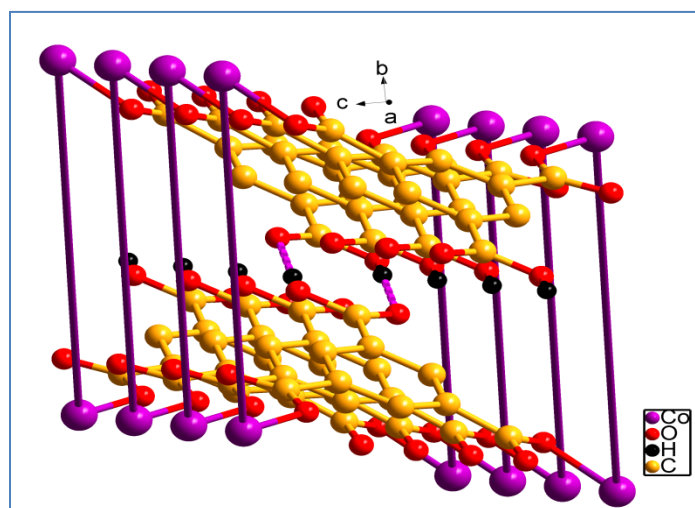
Zn(1)-O(1)	1.963(3)	Zn(1)-O(4)#1	1.963(2)	Zn(1)-N(1)	2.010(3)
				Zn(1)-N(4)#2	2.041(3)
O(1)-Zn(1)-O(4)#1	105.04(11)	O(4)#1-Zn(1)-N(1)	114.84(11)	O(4)#1-Zn(1)-N(4)#2	95.01(11)
O(1)-Zn(1)-N(1)	117.06(12)	O(1)-Zn(1)-N(4)#2	115.96(12)	N(1)-Zn(1)-N(4)#2	107.01(12)
#1 $x-1/2, -y+3/2, z-1/2$ #2 $x, y+1, z$					
7					
Mn(1)-O(1)	2.125(3)	Mn(1)-O(7)#2	2.295(3)	Mn(2)-O(6)	2.203(3)
Mn(1)-O(5)	2.135(3)	Mn(1)-O(8)#2	2.350(3)	Mn(2)-O(9W)	2.204(3)
Mn(1)-N(1)	2.238(3)	Mn(2)-O(2)	2.119(3)	Mn(2)-N(5)	2.254(3)
Mn(1)-N(8)#1	2.263(3)	Mn(2)-O(4)#3	2.182(3)	Mn(2)-N(4)#4	2.273(3)
O(1)-Mn(1)-O(5)	114.29(11)	O(1)-Mn(1)-O(8)#2	158.10(10)	O(6)-Mn(2)-O(9W)	102.14(11)
O(1)-Mn(1)-N(1)	89.65(11)	O(5)-Mn(1)-O(8)#2	86.57(10)	O(2)-Mn(2)-N(5)	98.11(11)
O(5)-Mn(1)-N(1)	100.01(11)	N(1)-Mn(1)-O(8)#2	93.28(11)	O(4)#3-Mn(2)-N(5)	98.14(12)
O(1)-Mn(1)-N(8)#1	82.55(11)	N(8)#1-Mn(1)-O(8)#2	88.06(11)	O(6)-Mn(2)-N(5)	90.29(12)
O(5)-Mn(1)-N(8)#1	98.37(11)	O(7)#2-Mn(1)-O(8)#2	56.55(10)	O(9W)-Mn(2)-N(5)	82.86(12)
N(1)-Mn(1)-N(8)#1	161.62(12)	O(2)-Mn(2)-O(4)#3	84.85(11)	O(2)-Mn(2)-N(4)#4	89.14(11)
O(1)-Mn(1)-O(7)#2	102.31(10)	O(2)-Mn(2)-O(6)	89.34(10)	O(4)#3-Mn(2)-N(4)#4	89.95(12)
O(5)-Mn(1)-O(7)#2	143.12(11)	O(4)#3-Mn(2)-O(6)	170.35(10)	O(6)-Mn(2)-N(4)#4	82.25(12)
N(1)-Mn(1)-O(7)#2	84.02(10)	O(2)-Mn(2)-O(9W)	168.48(11)	O(9W)-Mn(2)-N(4)#4	91.55(12)
N(8)#1-Mn(1)-O(7)#2	81.45(11)	O(4)#3-Mn(2)-O(9W)	83.65(11)	N(5)-Mn(2)-N(4)#4	169.56(12)
#1 $-x, -y, -z+1$ , #2 $x, y-1, z$ , #3 $-x+1, -y+1, -z$ , #4 $-x+2, -y+1, -z$					

**Table S2.** C–H····O interactions present in **1** and **5-6**

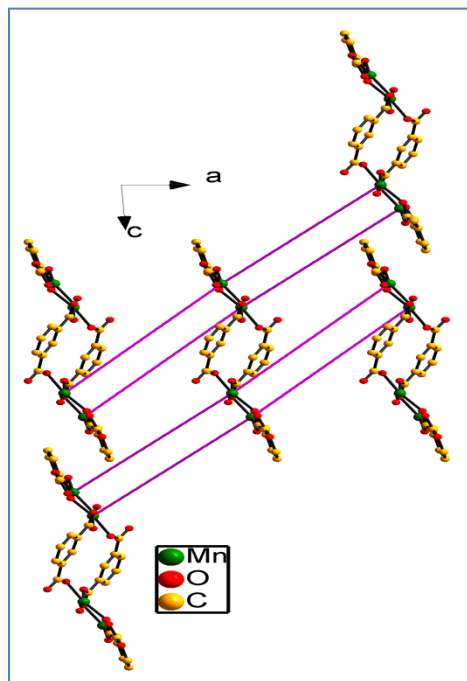
Compound no.	<i>D</i> –H···· <i>A</i>	H···· <i>A</i> Å	<i>D</i> ···· <i>A</i> Å	<i>D</i> –H···· <i>A</i> (°)
<b>1</b>	C3– H3····O4	2.289(9)	3.203(1)	167.00(2)
	C5– H5····O4	2.596(6)	3.496(7)	163.01(5)
<b>5</b>	C9– H9····O5	2.486(3)	3.247(1)	139.12(1)
<b>6</b>	C3– H3····O5	2.464(2)	3.220(8)	138.51(0)

**Table S3.** hydrogen bonding interactions present in **3-4**

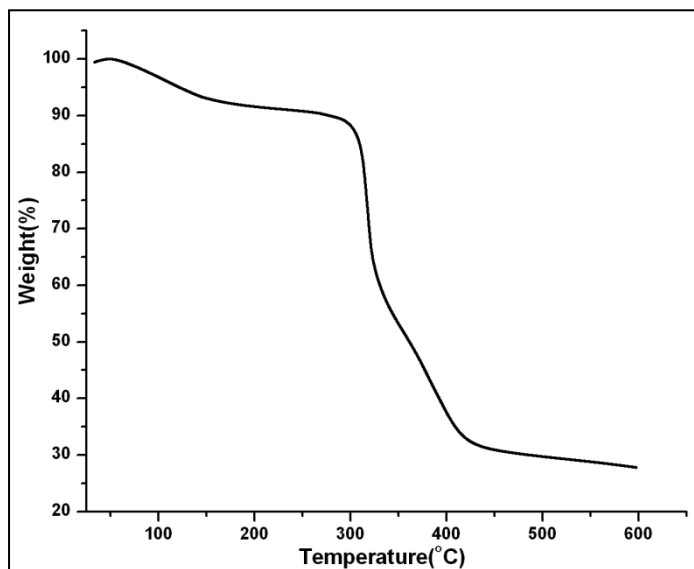
Compound no.	$D-H\cdots A$	$H\cdots A$ Å	$D\cdots A$ Å	$D-H\cdots A$ (°)
3	O3- H3 $\cdots$ O4	1.83(5)	2.63(5)	173.49(5)
4	O4- H4 $\cdots$ O3	1.82(5)	2.62(3)	158.40(5)



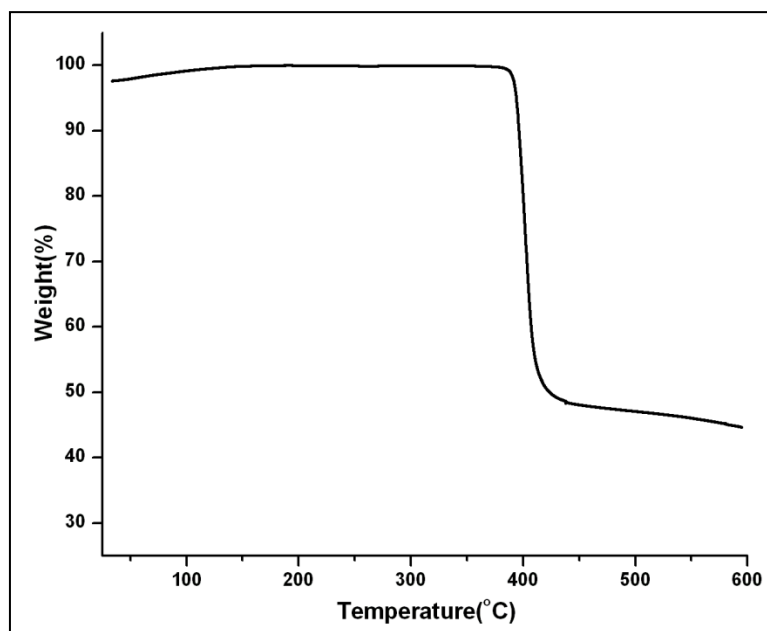
**Figure S1.** Hydrogen bonding interactions between carboxylate groups (thim<sub>2</sub> ligand has been omitted for clarity)



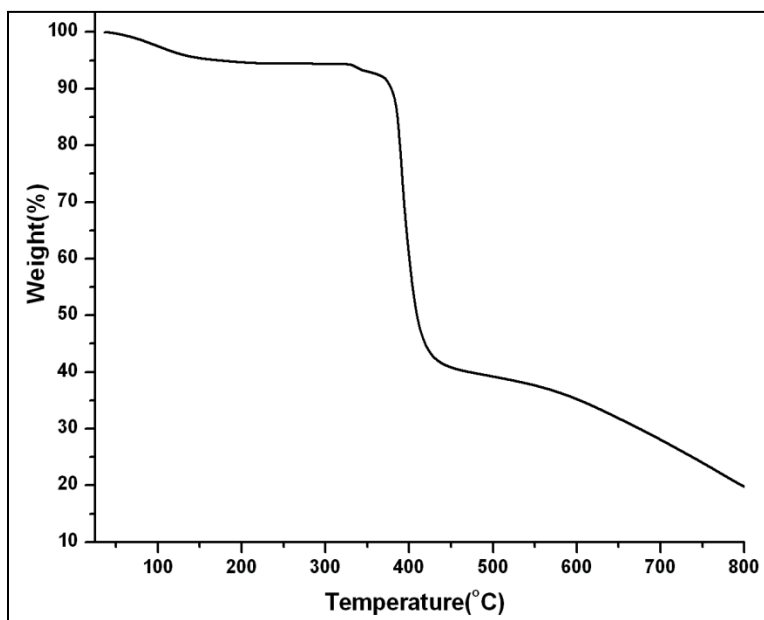
**Figure S2.** View of Connected neighboring 1D chains (thim<sub>2</sub> ligand has been omitted for clarity)



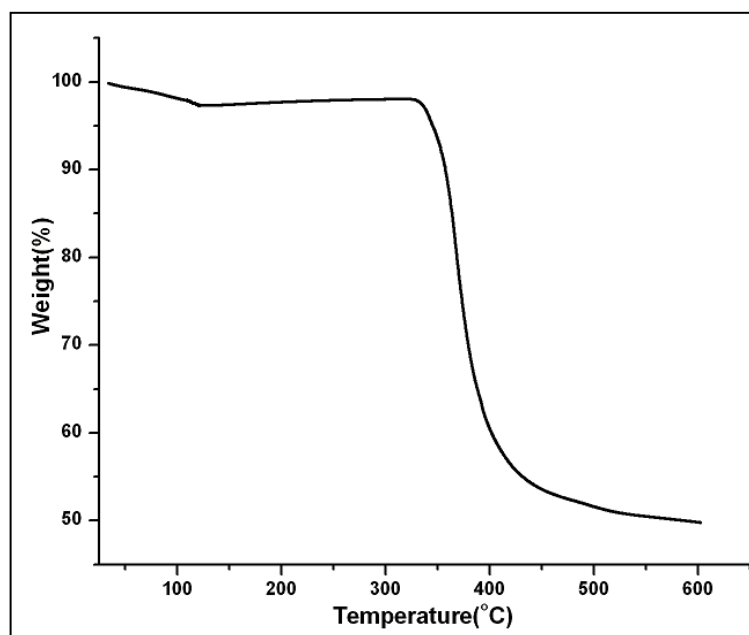
**Figure S3.** Thermogravimetric analysis of **1**.



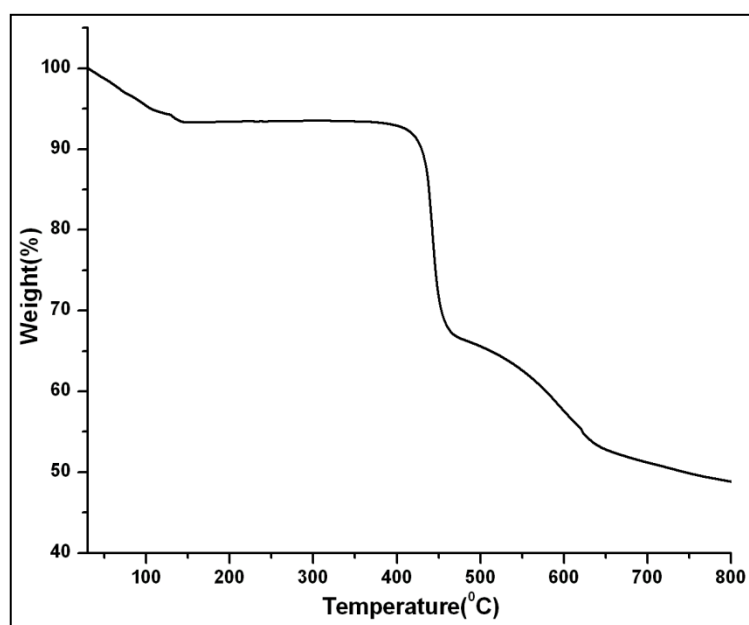
**Figure S4.** Thermogravimetric analysis of **2**.



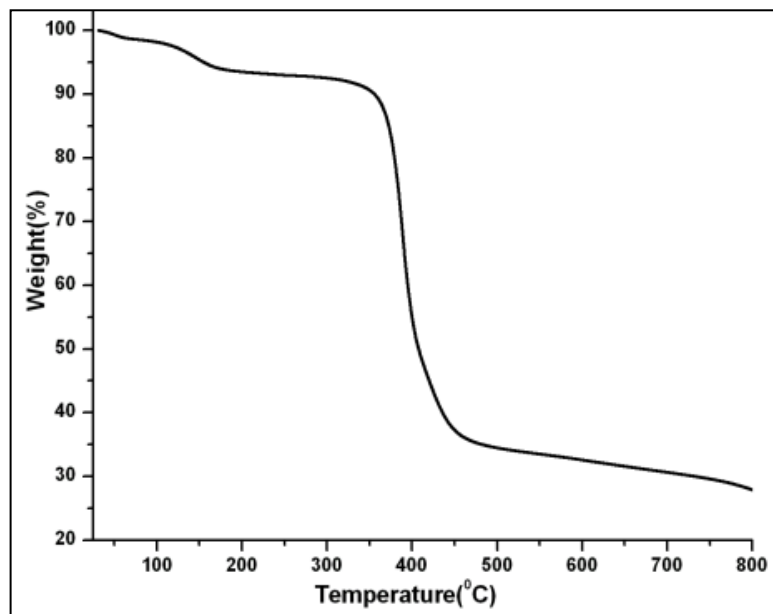
**Figure S5.** Thermogravimetric analysis of **3**.



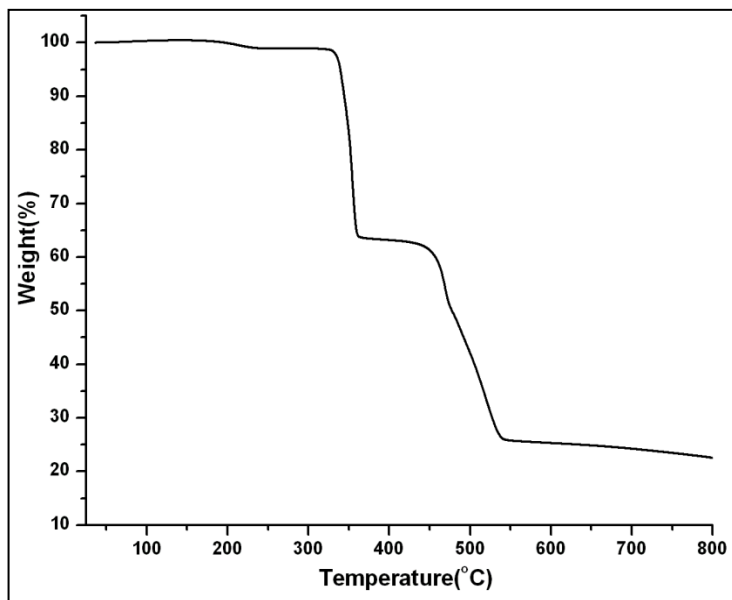
**Figure S6.** Thermogravimetric analysis of **4**.



**Figure S7.** Thermogravimetric analysis of **5**.

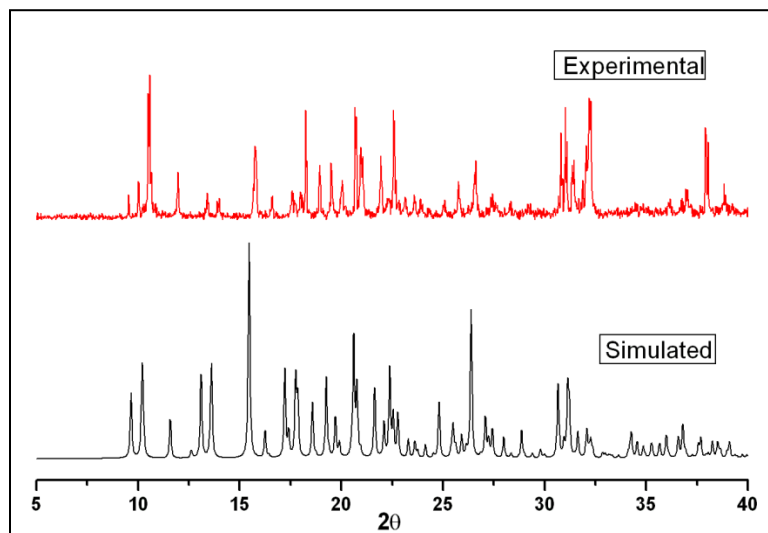


**Figure S8.** Thermogravimetric analysis of **6**.

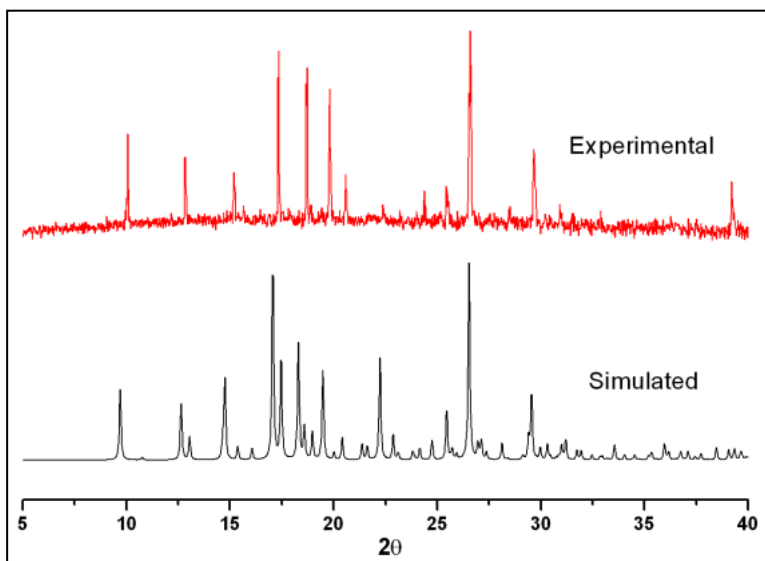




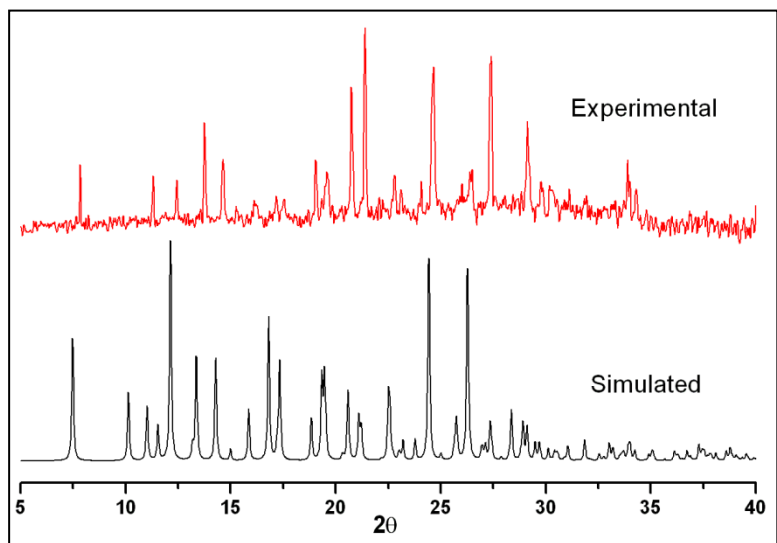
**Figure S9.** Thermogravimetric analysis of 7.



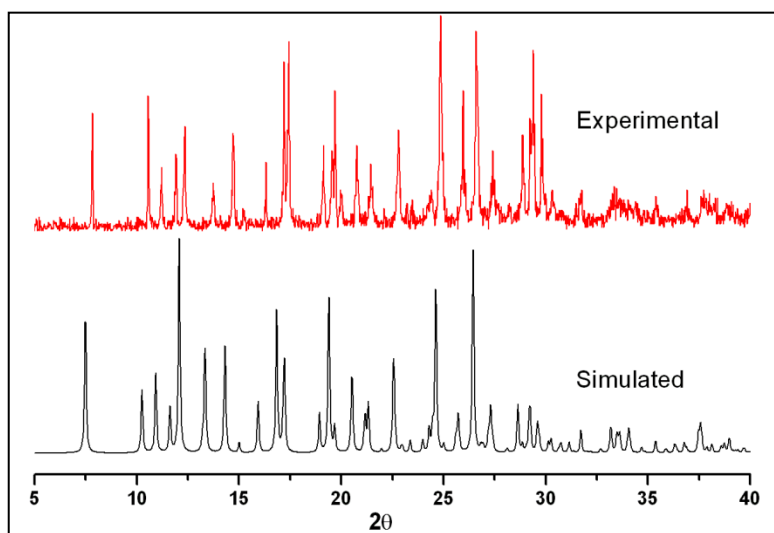
**Figure S10.** PXRD of complex 1



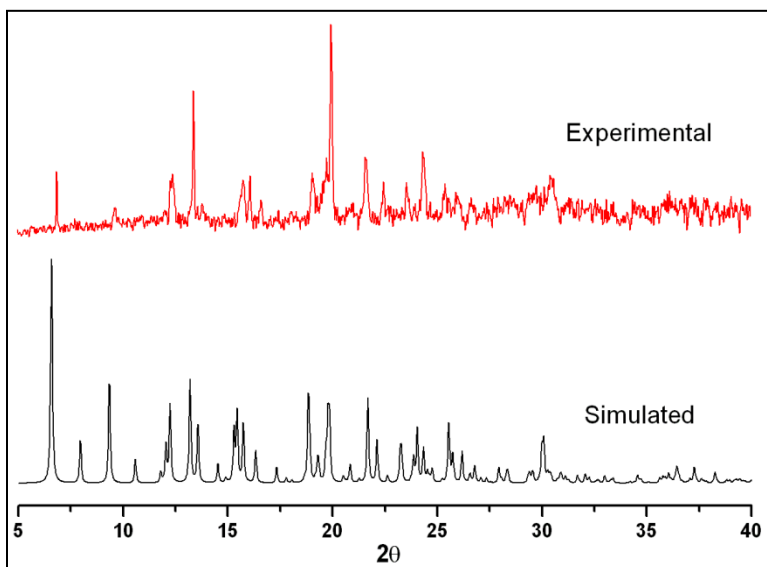
**Figure S11.** PXRD of complex 2



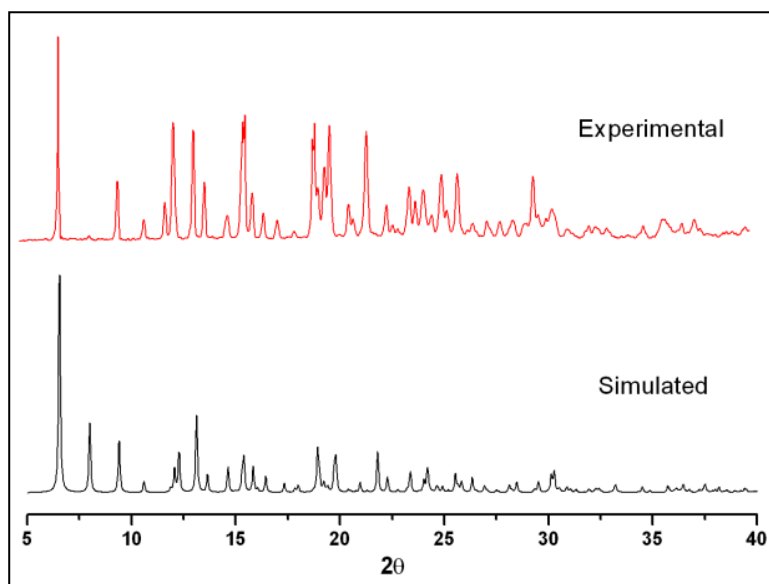
**Figure S12.** PXR D of complex 3



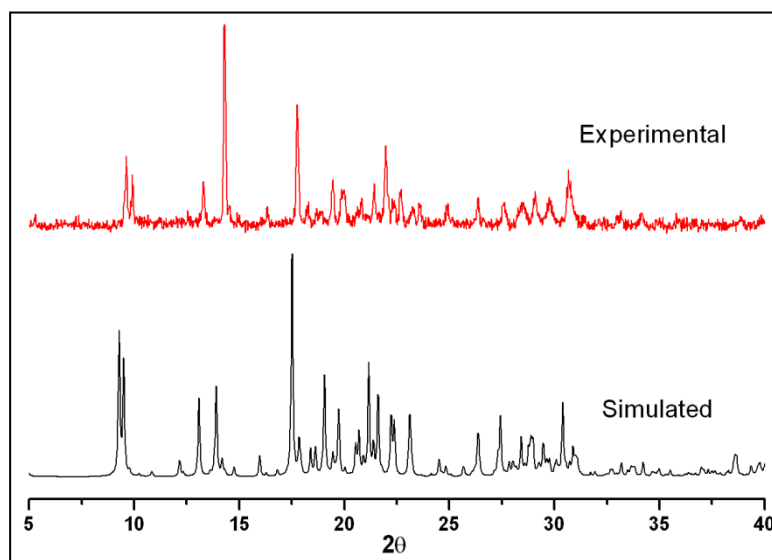
**Figure S13.** PXR D of complex 4



**Figure S14.** PXRD of complex 5



**Figure S15.** PXRD of complex 6



**Figure S16.** PXRD of complex 7