Electronic Supplementary Information (ESI)

Syntheses, structures, magnetic and luminescent properties of a series of coordination polymers constructed from 1,4-naphthalenedicarboxylic and N-donor ligands

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Table of Contents

Table S1 Selected Bonds Lengths (Å) and Angles (°) for compounds **1-5**. ·····S3

Fig. S1 Experimental (red) and simulated (black) PXRD patterns for compound **1**(a); compound **2** (b); compound **3** (c); compound **4** (d); compound **5** (e). ·····S6

Fig. S2 The TGA curves for compounds **1-5**. ·····S8

Table S1. Selected Bonds Lengths (Å) and Angles (°) for compounds 1-5

Compound 1

Cd(1)-O(8C)	2.232(3)	Cd(1)-O(7B)	2.241(3)
Cd(1)-N(3)	2.309(4)	Cd(1)-N(4)	2.339(4)
Cd(1)-O(1)	2.343(3)	Cd(1)-O(2)	2.410(3)
Cd(2)-O(6)	2.208(3)	Cd(2)-O(5A)	2.252(3)
Cd(2)-N(2)	2.337(4)	Cd(2)-N(1)	2.347(4)
Cd(2)-O(4)	2.372(3)	Cd(2)-O(3)	2.389(4)
O(8C)-Cd(1)-O(7B)	99.48(12)	O(8C)-Cd(1)-N(3)	102.71(12)
O(7B)-Cd(1)-N(3)	85.26(13)	O(8C)-Cd(1)-N(4)	87.80(13)
O(7B)-Cd(1)-N(4)	155.90(13)	N(3)-Cd(1)-N(4)	70.69(14)
O(8C)-Cd(1)-O(1)	91.53(12)	O(7B)-Cd(1)-O(1)	116.80(12)
N(3)-Cd(1)-O(1)	151.62(14)	N(4)-Cd(1)-O(1)	85.68(13)
O(8C)-Cd(1)-O(2)	138.98(11)	O(7B)-Cd(1)-O(2)	80.29(12)
N(3)-Cd(1)-O(2)	118.03(13)	N(4)-Cd(1)-O(2)	109.09(13)
O(1)-Cd(1)-O(2)	54.55(11)	O(6)-Cd(2)-O(5A)	110.87(14)
O(6)-Cd(2)-N(2)	85.34(13)	O(5A)-Cd(2)-N(2)	84.53(12)
O(6)-Cd(2)-N(1)	139.76(15)	O(5A)-Cd(2)-N(1)	98.37(14)
N(2)-Cd(2)-N(1)	70.16(13)	O(6)-Cd(2)-O(4)	108.09(13)
O(5A)-Cd(2)-O(4)	84.88(12)	N(2)-Cd(2)-O(4)	165.24(12)
N(1)-Cd(2)-O(4)	101.32(13)	O(6)-Cd(2)-O(3)	85.82(15)
O(5A)-Cd(2)-O(3)	139.29(13)	N(2)-Cd(2)-O(3)	135.07(14)
N(1)-Cd(2)-O(3)	89.64(14)	O(4)-Cd(2)-O(3)	54.42(13)

Compound 2

Cd(1)-O(2)	2.307(3)	Cd(1)-N(2)	2.341(3)
Cd(1)-N(1)	2.345(3)	Cd(1)-O(4B)	2.347(3)
Cd(1)-O(1A)	2.416(3)	Cd(1)-O(3B)	2.425(3)
Cd(1)-O(2A)	2.464(3)	O(2)-Cd(1)-N(2)	86.87(10)
O(2)-Cd(1)-N(1)	107.20(10)	N(2)-Cd(1)-N(1)	71.14(12)
O(2)-Cd(1)-O(4B)	134.22(10)	N(2)-Cd(1)-O(4B)	138.87(10)
N(1)-Cd(1)-O(4B)	90.67(10)	O(2)-Cd(1)-O(1A)	116.39(11)
N(2)-Cd(1)-O(1A)	81.12(10)	N(1)-Cd(1)-O(1A)	126.26(11)
O(4B)-Cd(1)-O(1A)	80.99(11)	O(2)-Cd(1)-O(3B)	82.07(9)
N(2)-Cd(1)-O(3B)	156.61(10)	N(1)-Cd(1)-O(3B)	92.50(11)
O(4B)-Cd(1)-O(3B)	54.72(10)	O(1A)-Cd(1)-O(3B)	122.27(9)
O(2)-Cd(1)-O(2A)	76.96(10)	N(2)-Cd(1)-O(2A)	113.99(11)
N(1)-Cd(1)-O(2A)	173.87(10)	O(4B)-Cd(1)-O(2A)	83.23(9)
O(1A)-Cd(1)-O(2A)	53.38(9)	O(3B)-Cd(1)-O(2A)	83.54(9)

Compound 3

Cu(1)-O(8B)	1.9318(19)	Cu(1)-O(6)	1.9361(19)
Cu(1)-O(1)	2.021(2)	Cu(1)-O(3A)	2.042(2)
Cu(1)-N(4C)	2.145(3)	Cu(2)-O(2)	1.919(2)
Cu(2)-O(4A)	1.927(2)	Cu(2)-O(7B)	2.027(2)
Cu(2)-O(5)	2.0552(19)	Cu(2)-N(1)	2.115(3)
O(8B)-Cu(1)-O(6)	173.77(9)	O(8B)-Cu(1)-O(1)	87.65(9)
O(6)-Cu(1)-O(1)	88.54(9)	O(8B)-Cu(1)-O(3A)	90.01(9)
O(6)-Cu(1)-O(3A)	91.57(9)	O(1)-Cu(1)-O(3A)	157.03(9)

O(8B)-Cu(1)-N(4C)	99.74(10)	O(6)-Cu(1)-N(4C)	86.26(10)
O(1)-Cu(1)-N(4C)	111.93(10)	O(3A)-Cu(1)-N(4C)	90.98(10)
O(2)-Cu(2)-O(4A)	174.17(10)	O(2)-Cu(2)-O(7B)	89.28(10)
O(4A)-Cu(2)-O(7B)	89.75(10)	O(2)-Cu(2)-O(5)	89.18(9)
O(4A)-Cu(2)-O(5)	89.47(9)	O(7B)-Cu(2)-O(5)	156.97(9)
O(2)-Cu(2)-N(1)	89.17(10)	O(4A)-Cu(2)-N(1)	96.59(10)
O(7B)-Cu(2)-N(1)	108.91(10)	O(5)-Cu(2)-N(1)	94.05(10)

Compound 4

O(6)-Co(1)	2.0689(18)	O(7)-Co(1)	2.1265(18)
Co(1)-O(6B)	2.0689(18)	Co(1)-O(7B)	2.1265(18)
Co(1)-O(8C)	2.0884(19)	Co(1)-O(8D)	2.0884(19)
O(3)-Co(2)	2.053(2)	O(5)-Co(2)	2.046(2)
O(7)-Co(2)	2.2103(19)	Co(2)-O(1A)	2.046(2)
Co(2)-O(9C)	2.046(2)	N(1)-Co(2)	2.108(2)
Co(1)-O(7)-Co(2)	112.43(8)	O(6B)-Co(1)-O(6)	180.00
O(6B)-Co(1)-O(8C)	86.00(8)	O(6)-Co(1)-O(8C)	94.00(8)
O(6B)-Co(1)-O(8D)	94.00(8)	O(6)-Co(1)-O(8D)	86.00(8)
O(8C)-Co(1)-O(8D)	180.00	O(6B)-Co(1)-O(7)	89.04(7)
O(6)-Co(1)-O(7)	90.96(7)	O(8C)-Co(1)-O(7)	93.80(8)
O(8D)-Co(1)-O(7)	86.20(8)	O(6B)-Co(1)-O(7B)	90.96(7)
O(6)-Co(1)-O(7B)	89.04(7)	O(8C)-Co(1)-O(7B)	86.20(8)
O(8D)-Co(1)-O(7B)	93.80(8)	O(7)-Co(1)-O(7B)	180.00
O(9C)-Co(2)-O(1A)	88.98(15)	O(9C)-Co(2)-O(5)	90.12(13)
O(1A)-Co(2)-O(5)	176.81(10)	O(9C)-Co(2)-O(3)	172.37(10)
O(1A)-Co(2)-O(3)	90.86(14)	O(5)-Co(2)-O(3)	90.43(12)
O(9C)-Co(2)-N(1)	85.17(9)	O(1A)-Co(2)-N(1)	88.55(10)
O(5)-Co(2)-N(1)	94.42(9)	O(3)-Co(2)-N(1)	87.20(10)
O(9C)-Co(2)-O(7)	98.38(8)	O(1A)-Co(2)-O(7)	88.01(8)
O(5)-Co(2)-O(7)	89.09(8)	O(3)-Co(2)-O(7)	89.24(8)
N(1)-Co(2)-O(7)	175.01(8)		

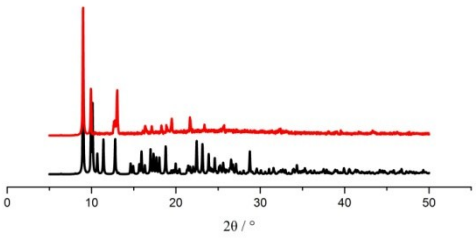
Compound 5

Cd(1)-O(1)	2.370(5)	Cd(1)-O(2)	2.437(5)
Cd(1)-O(5)	2.482(5)	Cd(1)-O(8)	2.500(7)
Cd(1)-O(9)	2.571(8)	Cd(1)-N(2)	2.252(5)
Cd(1)-N(3A)	2.39(5)	Cd(2)-O(5)	2.439(5)
Cd(2)-O(3B)	2.367(5)	Cd(2)-O(4B)	2.376(5)
Cd(2)-N(5)	2.260(5)	Cd(2)-N(8A)	2.21(5)
N(3A)-Cd(1)-N(2)	166.1(14)	N(3A)-Cd(1)-O(1)	95.5(15)
N(2)-Cd(1)-O(1)	96.31(18)	N(3A)-Cd(1)-O(2)	86.1(14)
N(2)-Cd(1)-O(2)	106.83(17)	O(1)-Cd(1)-O(2)	54.06(16)
N(3A)-Cd(1)-O(5)	83.6(15)	N(2)-Cd(1)-O(5)	86.71(17)
O(1)-Cd(1)-O(5)	165.59(16)	N(3A)-Cd(1)-O(8)	80.6(14)
O(2)-Cd(1)-O(5)	111.57(16)	N(2)-Cd(1)-O(8)	86.39(19)
O(1)-Cd(1)-O(8)	127.82(19)	O(2)-Cd(1)-O(8)	166.64(19)
O(5)-Cd(1)-O(8)	66.34(19)	N(2)-Cd(1)-O(9)	94.6(2)
O(1)-Cd(1)-O(9)	79.50(18)	N(3A)-Cd(1)-O(9)	82.2(13)
O(2)-Cd(1)-O(9)	129.97(18)	O(5)-Cd(1)-O(9)	114.40(17)
O(8)-Cd(1)-O(9)	48.41(19)	N(8A)-Cd(2)-N(5)	168.5(16)
N(8A)-Cd(2)-O(11)	89.4(15)	N(5)-Cd(2)-O(11)	83.0(2)
N(8A)-Cd(2)-O(3B)	92.5(15)	N(5)-Cd(2)-O(3B)	96.36(18)
O(11)-Cd(2)-O(3B)	171.5(2)	N(8A)-Cd(2)-O(4B)	93.7(15)
N(5)-Cd(2)-O(4B)	97.48(18)	O(11)-Cd(2)-O(4B)	117.6(2)
O(3B)-Cd(2)-O(4B)	54.09(17)	N(8A)-Cd(2)-O(5)	83.1(18)

N(5)-Cd(2)-O(5)	87.05(17)	O(8A)-Cd(2)-O(5)	79.9(2)
O(3B)-Cd(2)-O(5)	108.52(17)	O(4B)-Cd(2)-O(5)	162.31(17)

Symmetry codes: for compound **1**: (A) −x, −y + 1, −z + 1; (B) x, y, z – 1; (C) −x + 1, −y, −z + 1; for compound **2**: (A) −x, −y + 1, −z; (B) x − 1/2, −y + 1/2, z − 1/2; for compound **3**: (A) x, y − 1, z; (B) x − 1/2, −y + 1/2, z − 1/2; (C) x − 1/2, −y + 1/2, z + 1/2.; for compound **4**: (A) –x − 1/2, y − 1/2, −z + 1/2; (B) −x, −y, −z; (C) –x − 1/2, y − 1/2, −z − 1/2; (D) x + 1/2, −y + 1/2, z + 1/2; for compound **5**: (A) x − 1, y − 1, z; (B) x, −y + 1/2, z − 1/2.

(a)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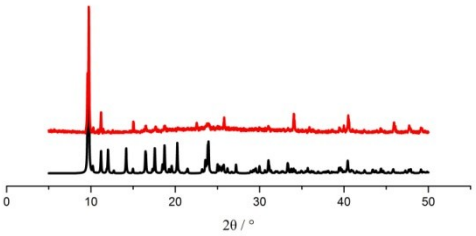
(b)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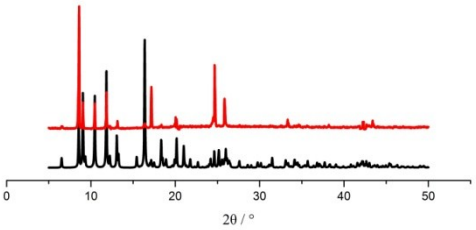
(c)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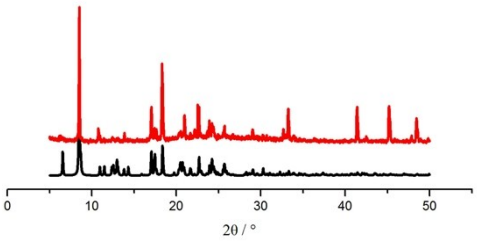
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(e)

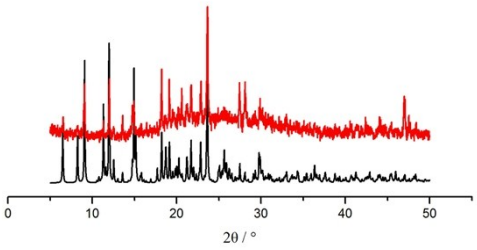
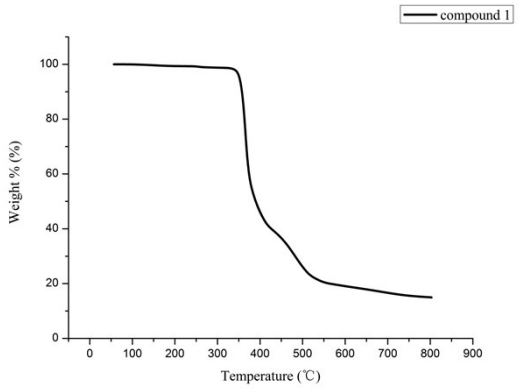
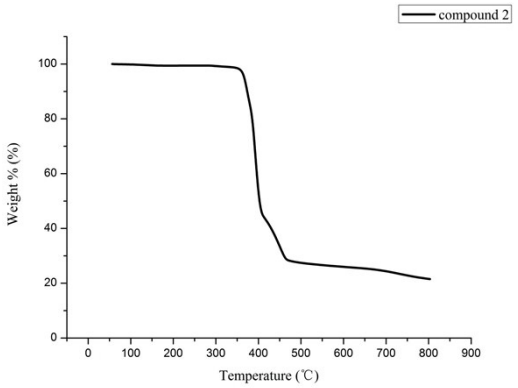


Fig. S1 Experimental (red) and simulated (black) PXRD patterns for compound **1**(a); compound **2** (b); compound **3** (c); compound **4** (d); compound **5** (e).

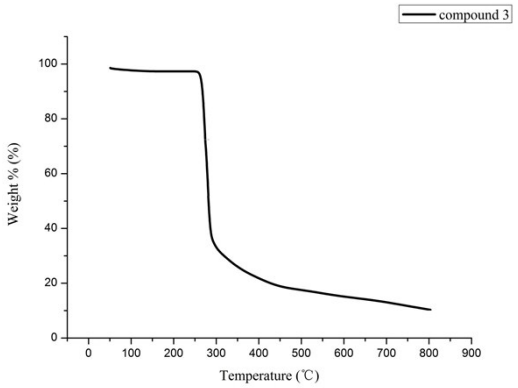
(a)


compound 1
Weight % (%)
Temperature (℃)

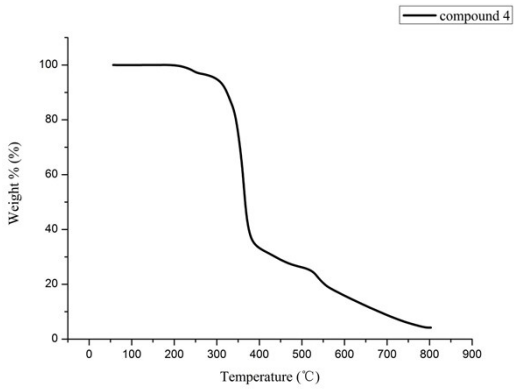
(b)


compound 2
Weight % (%)
Temperature (℃)

(c)


compound 3
Weight % (%)
Temperature (℃)

(d)



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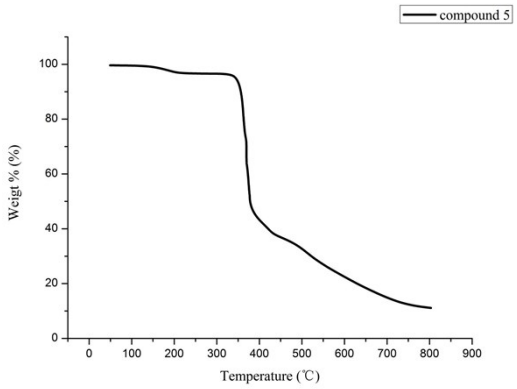

Fig. S2 The TGA curves for compound **1**(a); compound **2** (b); compound **3** (c); compound **4** (d); compound **5** (e).