

## Electronic Supporting Information

### The various architectures and properties of a series of coordination polymers tuned by the central metals and auxiliary N-donor ligands

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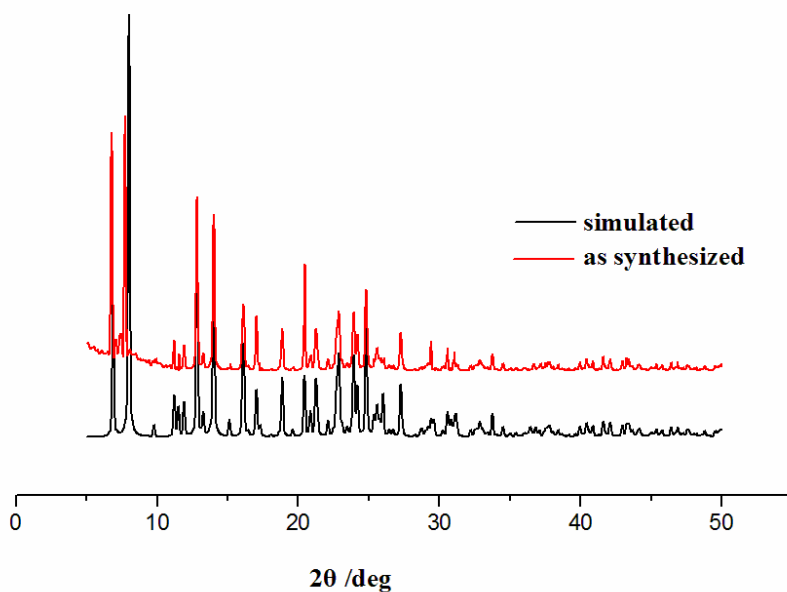


Fig. S1 PXRD of Complex 1.

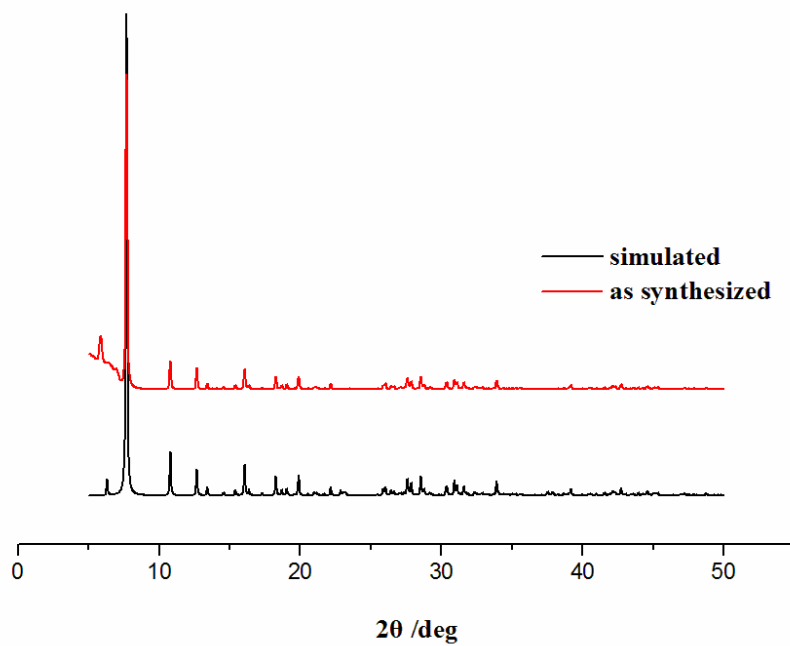


Fig. S2 PXRD of Complex 2.

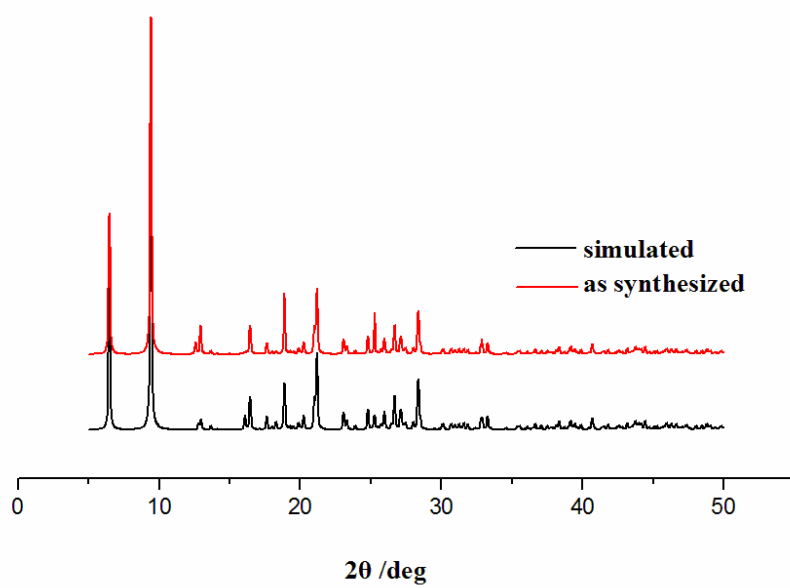
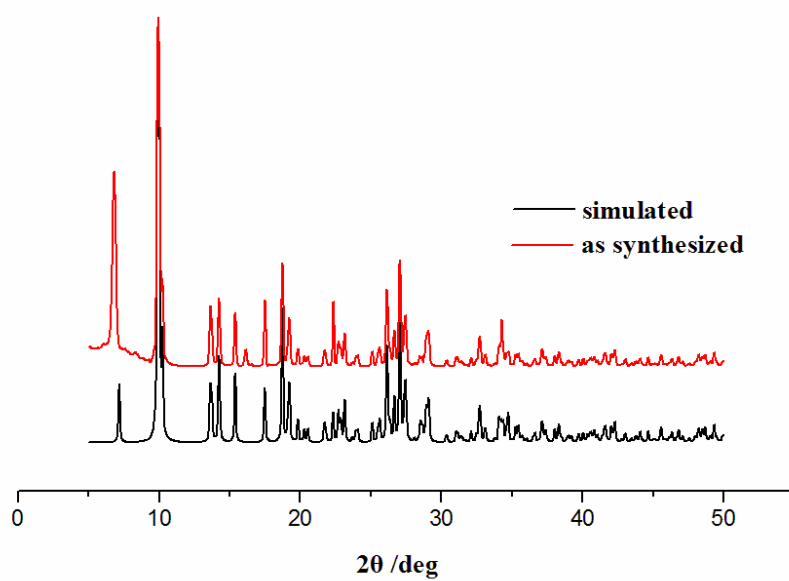
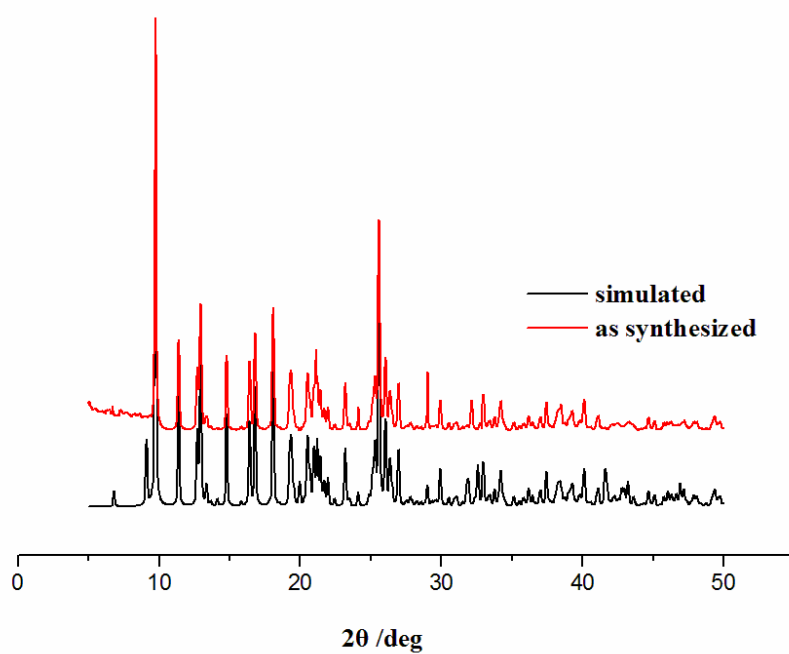


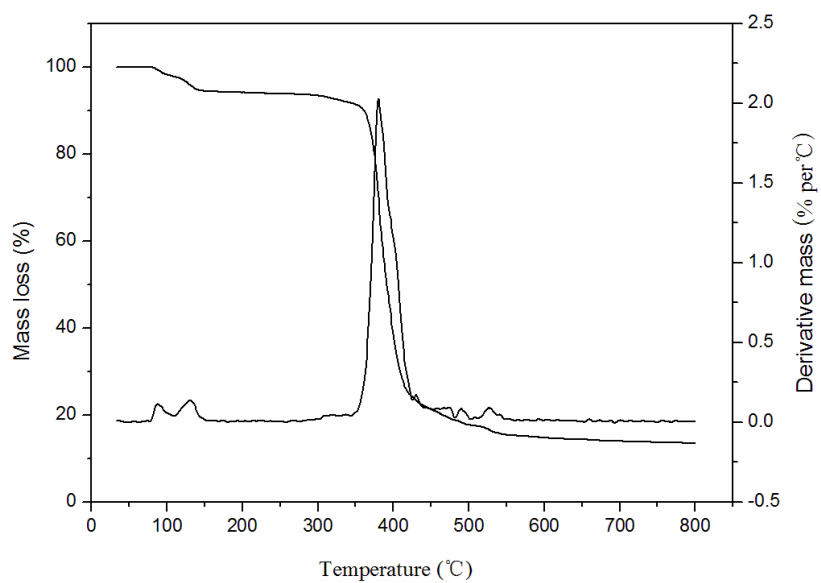
Fig. S3 PXRD of Complex 3.



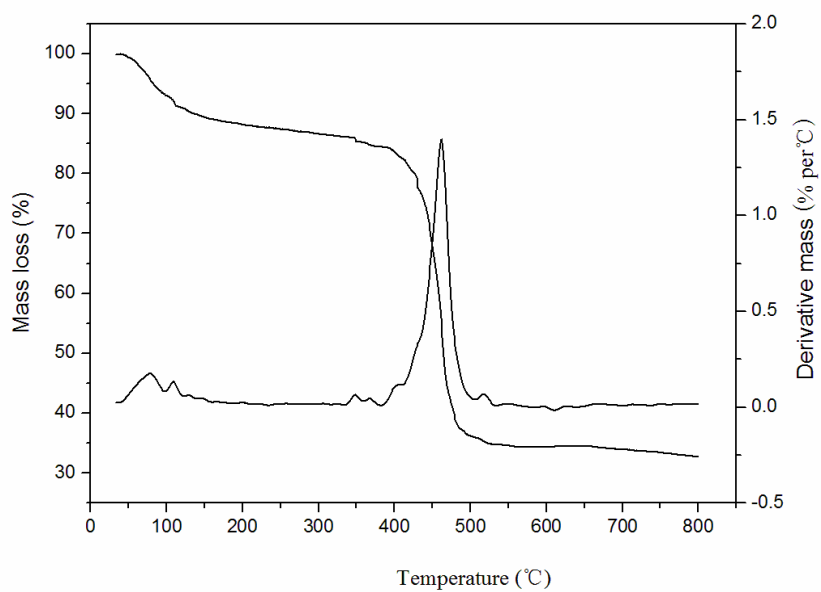
**Fig. S4** PXR D of Complex 4.



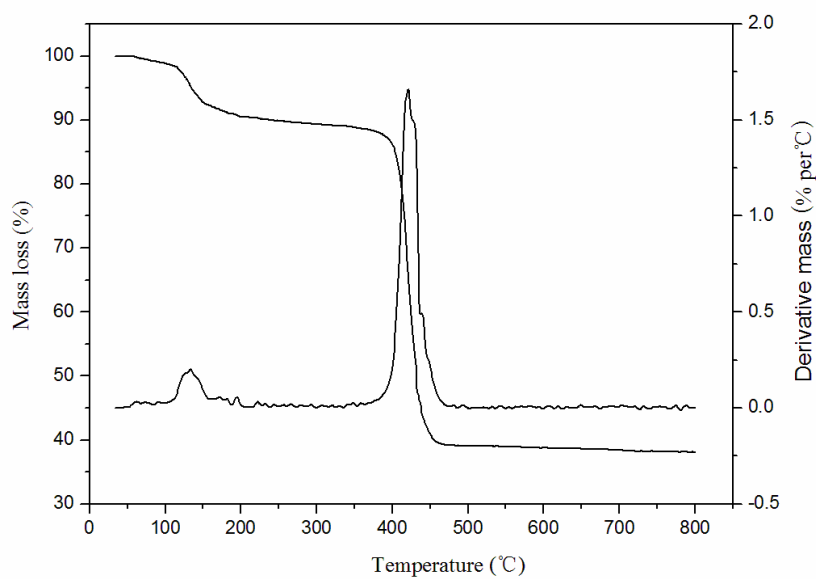
**Fig. S5** PXR D of Complex 5.



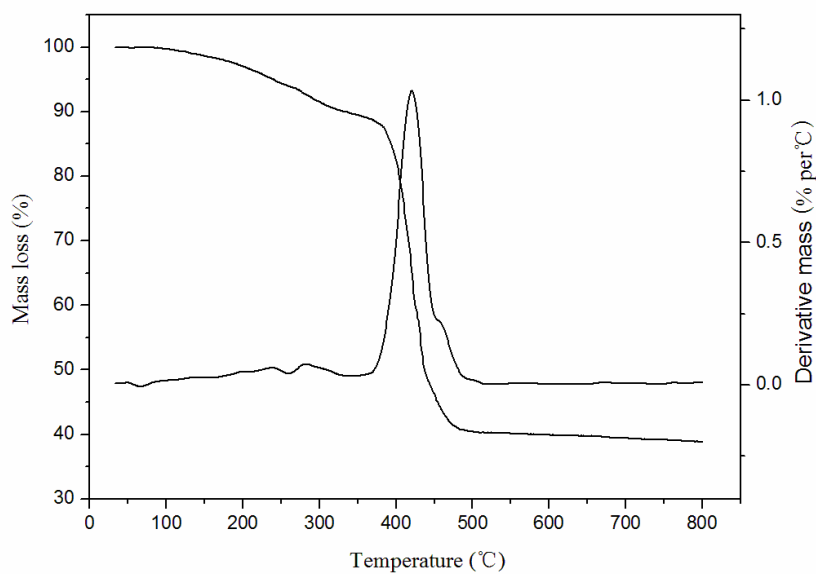
**Fig. S6** TG-DTG curve of Complex 1.



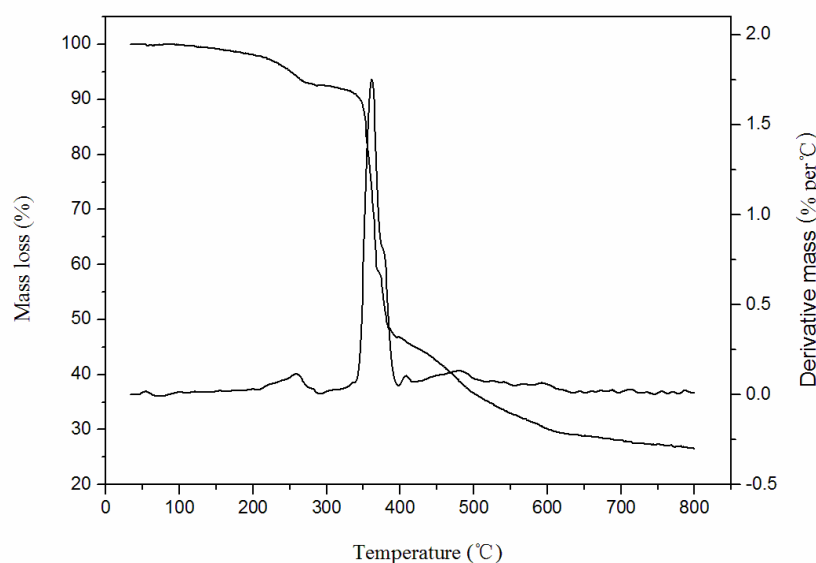
**Fig. S7** TG-DTG curve of Complex 2.



**Fig. S8** TG-DTG curve of Complex 3.



**Fig. S9** TG-DTG curve of Complex 4.



**Fig. S10** TG-DTG curve of Complex 5.

Table S1. Selected bond lengths [ $\text{\AA}$ ] and angles [ $^\circ$ ] for **1-5<sup>d</sup>**

<b>Complex 1</b>			
Zn(1)-O(2)	1.950(5)	Zn(1)-O(4)B	2.205(6)
Zn(1)-O(3)B	2.213(7)	O(4)-Zn(1)	2.205(6)
O(3)-Zn(1)	2.213(7)	Zn(1)-N(1)A	2.009(6)
Zn(1)-N(2)	2.012(5)	N(1)-Zn(1)	2.009(6)
O(2)-Zn(1)-N(1)A	122.5(2)	O(2)-Zn(1)-N(2)	101.6(2)
N(1)A-Zn(1)-N(2)	105.3(2)	O(2)-Zn(1)-O(4)B	100.9(2)
N(1)A-Zn(1)-O(4)B	124.8(2)	N(2)-Zn(1)-O(4)B	96.4(2)
O(2)-Zn(1)-O(3)B	88.4(2)	N(1)A-Zn(1)-O(3)B	88.1(2)
N(2)-Zn(1)-O(3)B	154.6(2)	O(4)B-Zn(1)-O(3)B	58.6(2)
<b>Complex 2</b>			
O(1)-Zn(2)	1.987(4)	O(2)-Zn(1)	1.973(3)
O(3)-Zn(1)A	2.051(4)	O(4)-Zn(2)B	2.094(4)
O(5)-Zn(1)E	1.932(4)	O(7)-Zn(2)F	2.003(3)
O(7)-Zn(1)	2.018(3)	O(7)-Zn(2)	2.078(3)
O(8)-Zn(2)	2.096(4)	Zn(1)-O(5)C	1.932(4)
Zn(1)-O(3)B	2.051(4)	Zn(2)-O(7)D	2.003(3)
Zn(2)-O(4)A	2.094(4)	Zn(2)F-O(7)-Zn(1)	122.30(16)
Zn(2)F-O(7)-Zn(2)	117.27(15)	Zn(1)-O(7)-Zn(2)	98.80(14)
O(5)C-Zn(1)-O(2)	108.73(16)	O(5)C-Zn(1)-O(7)	143.58(15)
O(2)-Zn(1)-O(7)	100.76(14)	O(5)C-Zn(1)-O(3)B	103.77(14)
O(2)-Zn(1)-O(3)B	94.05(14)	O(7)-Zn(1)-O(3)B	94.77(14)
O(1)-Zn(2)-O(7)D	138.46(15)	O(1)-Zn(2)-O(7)	104.54(14)
O(7)D-Zn(2)-O(7)	116.98(13)	O(1)-Zn(2)-O(4)A	92.73(15)

O(7)D-Zn(2)-O(4)A	91.90(14)	O(7)-Zn(2)-O(4)A	82.02(13)
O(1)-Zn(2)-O(8)	86.07(16)	O(7)D-Zn(2)-O(8)	92.94(15)
O(7)-Zn(2)-O(8)	92.51(15)	O(4)A-Zn(2)-O(8)	173.93(16)

### Complex 3

Cd(1)-O(4)	2.393(4)	Cd(1)-O(4)A	2.393(4)
Cd(1)-O(3)	2.419(4)	Cd(1)-O(3)A	2.419(4)
Cd(1)-O(1)B	2.443(4)	Cd(1)-O(1)C	2.443(4)
Cd(1)-O(2)B	2.494(4)	Cd(1)-O(2)C	2.494(4)
Cd(2)-O(8)	2.233(5)	Cd(2)-O(6)	2.277(4)
Cd(2)-O(7)	2.282(5)	Cd(2)-O(5)	2.334(4)
Cd(2)-O(1)D	2.359(4)	Cd(2)-O(2)E	2.361(4)
O(1)-Cd(2)D	2.359(4)	O(1)-Cd(1)B	2.443(4)
O(2)-Cd(2)E	2.361(4)	O(2)-Cd(1)B	2.494(4)
O(4)-Cd(1)-O(4)A	126.7(2)	O(4)-Cd(1)-O(3)	54.39(14)
O(4)A-Cd(1)-O(3)	178.91(15)	O(3)-Cd(1)-O(3)A	124.5(2)
O(4)-Cd(1)-O(1)B	100.31(14)	O(4)A-Cd(1)-O(1)B	102.43(13)
O(3)-Cd(1)-O(1)B	77.21(13)	O(3)A-Cd(1)-O(1)B	79.19(13)
O(4)-Cd(1)-O(1)C	102.43(13)	O(4)A-Cd(1)-O(1)C	100.31(14)
O(3)-Cd(1)-O(1)C	79.19(13)	O(3)A-Cd(1)-O(1)C	77.21(13)
O(1)B-Cd(1)-O(1)C	127.87(18)	O(4)-Cd(1)-O(2)B	80.40(14)
O(4)A-Cd(1)-O(2)B	76.68(14)	O(3)-Cd(1)-O(2)B	103.81(13)
O(3)A-Cd(1)-O(2)B	99.99(13)	O(1)B-Cd(1)-O(2)B	52.45(12)
O(1)C-Cd(1)-O(2)B	176.79(12)	O(4)-Cd(1)-O(2)C	76.68(14)
O(4)A-Cd(1)-O(2)C	80.40(14)	O(3)-Cd(1)-O(2)C	99.99(13)
O(3)A-Cd(1)-O(2)C	103.81(13)	O(1)B-Cd(1)-O(2)C	176.79(12)
O(1)C-Cd(1)-O(2)C	52.45(12)	O(2)B-Cd(1)-O(2)C	127.44(17)
O(8)-Cd(2)-O(1)D	81.90(16)	O(6)-Cd(2)-O(1)D	111.81(13)
O(7)-Cd(2)-O(1)D	78.66(15)	O(5)-Cd(2)-O(1)D	105.59(14)
O(8)-Cd(2)-O(2)E	82.68(17)	O(6)-Cd(2)-O(2)E	98.50(13)
O(7)-Cd(2)-O(2)E	79.58(15)	O(5)-Cd(2)-O(2)E	105.82(14)
O(1)D-Cd(2)-O(2)E	144.84(12)	Cd(2)D-O(1)-Cd(1)B	133.95(16)

### Complex 4

Cd(1)-O(3)A	2.303(5)	Cd(1)-O(3)B	2.303(5)
Cd(1)-O(1)C	2.232(5)	Cd(1)-O(1)	2.232(5)
Cd(1)B-O(3)	2.303(5)	Cd(2)-O(3)A	2.398(5)
Cd(2)-O(5)D	2.539(5)	Cd(2)-O(5)E	2.328(5)
Cd(2)-O(6)D	2.237(5)	Cd(2)-O(2)	2.158(5)
Cd(2)-O(4)A	2.306(6)	Cd(2)F-O(3)	2.398(5)
Cd(2)E-O(5)	2.328(5)	Cd(2)G-O(5)	2.539(5)
Cd(2)G-O(6)	2.237(5)	Cd(2)F-O(4)	2.306(6)
Cd(1)-N(1)	2.305(8)	Cd(1)-N(1)C	2.305(8)
O(3)A-Cd(1)-O(3)B	163.2(3)	O(3)A-Cd(1)-N(1)	101.0(2)
O(3)A-Cd(1)-N(1)C	91.4(2)	O(3)B-Cd(1)-N(1)	91.4(2)
O(3)B-Cd(1)-N(1)C	101.0(2)	O(1)-Cd(1)-O(3)B	82.6(2)

O(1)C-Cd(1)-O(3)A	82.6(2)	O(1)-Cd(1)-O(3)A	88.2(2)
O(1)C-Cd(1)-O(3)B	88.2(2)	O(1)C-Cd(1)-O(1)	113.3(4)
O(1)-Cd(1)-N(1)C	81.6(3)	O(1)C-Cd(1)-N(1)C	163.6(3)
O(1)C-Cd(1)-N(1)	81.6(3)	O(1)-Cd(1)-N(1)	163.6(3)
N(1)C-Cd(1)-N(1)	84.6(5)	O(3)A-Cd(2)-O(5)D	134.51(17)
O(5)E-Cd(2)-O(3)A	148.37(18)	O(5)E-Cd(2)-O(5)D	74.54(19)
O(6)D-Cd(2)-O(3)A	88.67(19)	O(6)D-Cd(2)-O(5)E	105.78(19)
O(6)D-Cd(2)-O(5)D	54.59(18)	O(6)D-Cd(2)-O(4)A	101.2(2)
O(2)-Cd(2)-O(3)A	97.96(19)	O(2)-Cd(2)-O(5)E	91.2(2)
O(2)-Cd(2)-O(5)D	93.07(19)	O(2)-Cd(2)-O(6)D	135.3(2)
O(2)-Cd(2)-O(4)A	118.9(2)	O(4)A-Cd(2)-O(3)A	55.32(19)
O(4)A-Cd(2)-O(5)D	146.54(18)	O(4)A-Cd(2)-O(5)E	93.8(2)
Cd(1)B-O(3)-Cd(2)F	110.9(2)		

### Complex 5

Cd(1)-O(2)	2.256(5)	Cd(1)-O(2)A	2.256(5)
Cd(1)-O(3)B	2.431(6)	Cd(1)-O(3)C	2.431(6)
Cd(1)-O(4)C	2.434(6)	Cd(1)-O(4)B	2.434(6)
Cd(2)-O(5)	2.283(5)	Cd(2)-O(7)D	2.300(5)
Cd(2)-O(8)	2.386(5)	Cd(2)-O(6)	2.436(5)
O(3)-Cd(1)E	2.431(6)	O(4)-Cd(1)E	2.434(6)
Cd(2)-N(4)B	2.288(6)	Cd(2)-N(1)	2.305(6)
N(4)-Cd(2)E	2.288(5)	O(2)-Cd(1)-O(2)A	128.3(3)
O(2)-Cd(1)-O(3)B	129.32(19)	O(2)A-Cd(1)-O(3)B	92.2(2)
O(3)B-Cd(1)-O(3)C	79.2(4)	O(2)-Cd(1)-O(4)C	119.4(2)
O(2)A-Cd(1)-O(4)C	79.82(18)	O(3)B-Cd(1)-O(4)C	93.8(2)
O(3)C-Cd(1)-O(4)C	51.59(19)	O(2)-Cd(1)-O(4)B	79.82(18)
O(2)A-Cd(1)-O(4)B	119.4(2)	O(3)B-Cd(1)-O(4)B	51.59(19)
O(3)C-Cd(1)-O(4)B	93.8(2)	O(4)C-Cd(1)-O(4)B	137.8(3)
O(5)-Cd(2)-N(4)B	91.39(19)	O(5)-Cd(2)-O(7)D	91.44(17)
N(4)B-Cd(2)-O(7)D	102.0(2)	O(5)-Cd(2)-N(1)	87.58(19)
N(4)B-Cd(2)-N(1)	171.3(2)	O(7)D-Cd(2)-N(1)	86.67(19)
O(5)-Cd(2)-O(8)	174.72(17)	N(4)B-Cd(2)-O(8)	89.8(2)
O(7)D-Cd(2)-O(8)	83.28(17)	N(1)-Cd(2)-O(8)	92.02(19)
O(5)-Cd(2)-O(6)	104.24(18)	N(4)B-Cd(2)-O(6)	84.6(2)
O(7)D-Cd(2)-O(6)	162.90(18)	N(1)-Cd(2)-O(6)	87.22(19)
O(8)-Cd(2)-O(6)	80.99(19)		

<sup>4</sup>Symmetry codes: complex 1: (A)  $x+1/2, -y+3/2, z-1/2$ ; (B)  $-x+3/2, y-1/2, -z+1/2$ ; complex 2: (A)  $-x, y+1/2, -z+3/2$ ; (B)  $-x, y-1/2, -z+3/2$ ; (C)  $x, -y+3/2, z-1/2$ ; (D)  $-x+1/2, y+1/2, z$ ; (E)  $x, -y+3/2, z+1/2$ ; (F)  $-x+1/2, y-1/2, z$ ; complex 3: (A)  $-x+1, y, -z+1/2$ ; (B)  $-x+1, -y+2, -z+1$ ; (C)  $x, -y+2, z-1/2$ ; (D)  $-x+1/2, -y+3/2, -z+1$ ; (E)  $-x+1/2, -y+5/2, -z+1$ ; complex 4: (A)  $x+1/2, -y+3/2, z+1/2$ ; (B)  $-x+3/2, -y+3/2, -z+1$ ; (C)  $-x+2, y, -z+3/2$ ; (D)  $x+1, -y+1, z+1/2$ ; (E)  $-x+1, y, -z+3/2$ ; (F)  $x-1/2, -$



$y+3/2, z-1/2$ ; (G)  $x-1, -y+1, z-1/2$ ; complex 5: (A)  $-x+1/2, y, -z+1/2$ ; (B)  $x-1, y-1, z$ ; (C)  $-x+3/2, y-1, -z+1/2$ ; (D)  $-x+2, -y+1, -z+1$ ; (E)  $x+1, y+1, z$ .