Supporting information for

Tuning Different Kinds of Entangled Metal-organic Frameworks through Modifying the Spacer Group of Aliphatic Dicarboxylate Ligands and Reactant Ratio †

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Received (in XXX, XXX) Xth XXXXXXXXX 201X, Accepted Xth XXXXXXXXX 201X
First published on the web Xth XXXXXXXXX 201X
DOI: 10.1039/b000000x

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Table S1 Selected bond lengths (Å) and angles (º) for **1**.

Cd(1)-N(2)[a]	2.321(3)	Cd(1)-O(3)[b]	2.330(3)
Cd(1)-O(1w)	2.330(3)	Cd(1)-N(1)	2.350(3)
Cd(1)-O(1)	2.374(3)	Cd(1)-O(4)[b]	2.574(3)
Cd(1)-O(2)	2.584(3)		
N(2)[a]-Cd(1)-O(3)[b]	138.10(10)	N(2)[a]-Cd(1)-O(1w)	90.71(12)
O(3)[b]-Cd(1)-O(1w)	90.51(10)	N(2)[a]-Cd(1)-N(1)	93.80(12)
O(3)[b]-Cd(1)-N(1)	86.63(11)	O(1w)-Cd(1)-N(1)	175.43(10)
N(2)[a]-Cd(1)-O(1)	135.80(10)	O(3)[b]-Cd(1)-O(1)	86.00(11)
O(1w)-Cd(1)-O(1)	91.77(10)	N(1)-Cd(1)-O(1)	84.48(11)
N(2)[a]-Cd(1)-O(4)[b]	85.40(9)	O(3)[b]-Cd(1)-O(4)[b]	52.94(9)
O(1w)-Cd(1)-O(4)[b]	85.91(9)	N(1)-Cd(1)-O(4)[b]	95.18(10)
O(1)-Cd(1)-O(4)[b]	138.79(9)	N(2)[a]-Cd(1)-O(2)	83.69(9)
O(3)[b]-Cd(1)-O(2)	138.21(10)	O(1w)-Cd(1)-O(2)	88.14(10)
N(1)-Cd(1)-O(2)	91.62(10)	O(1)-Cd(1)-O(2)	52.32(9)
O(4)[b]-Cd(1)-O(2)	167.49(9)		

Symmetry codes: (a): x, y, $1+z$; (b) $-2-x$, $0.5+y$, $0.5-z$.

Table S2 Selected bond lengths (Å) and angles (º) for **2**.

Cd(1)-N(2)[a]	2.338(10)	Cd(1)-N(1)	2.340(11)
Cd(1)-N(3)	2.369(12)	Cd(1)-O(4)	2.385(8)
Cd(1)-O(2)	2.391(8)	Cd(1)-O(1)	2.447(8)
Cd(1)-O(3)	2.462(9)		
N(2)[a]-Cd(1)-N(1)	95.6(3)	N(2)[a]-Cd(1)-N(3)	91.7(4)
N(1)-Cd(1)-N(3)	172.6(4)	N(2)[a]-Cd(1)-O(4)	138.6(3)
N(1)-Cd(1)-O(4)	85.6(3)	N(3)-Cd(1)-O(4)	88.3(4)
N(2)[a]-Cd(1)-O(2)	137.2(3)	N(1)-Cd(1)-O(2)	90.0(4)
N(3)-Cd(1)-O(2)	85.2(4)	O(4)-Cd(1)-O(2)	84.0(3)

N(2)[a]-Cd(1)-O(1)	84.8(3)	N(1)-Cd(1)-O(1)	85.3(4)
N(3)-Cd(1)-O(1)	96.3(4)	O(4)-Cd(1)-O(1)	136.3(3)
O(2)-Cd(1)-O(1)	53.3(3)	N(2)[a]-Cd(1)-O(3)	84.9(3)
N(1)-Cd(1)-O(3)	92.3(4)	N(3)-Cd(1)-O(3)	87.5(4)
O(4)-Cd(1)-O(3)	53.8(3)	O(2)-Cd(1)-O(3)	137.4(3)
O(1)-Cd(1)-O(3)			

Symmetry codes: (a): x, 1+y, z.

Table S3 Selected bond lengths (Å) and angles (º) for **3**.

Cd(1)-O(1w)	2.273(5)	Cd(1)-N(2)[a]	2.304(6)
Cd(1)-O(2)	2.339(5)	Cd(1)-N(1)	2.344(6)
Cd(1)-O(1)	2.440(5)	Cd(1)-O(7)	2.455(7)
Cd(1)-O(8)	2.565(7)	Cd(2)-O(6)	2.241(7)
Cd(2)-O(4)	2.318(6)	Cd(2)-N(4)[b]	2.338(7)
Cd(2)-N(3)	2.355(6)	Cd(2)-O(2w)	2.357(8)
Cd(2)-O(3)	2.530(6)	O(1w)-O1	2.7543
O(1w)-Cd(1)-N(2)[a]	175.0(2)	O(1w)-Cd(1)-O(2)	89.6(2)
N(2)[a]-Cd(1)-O(2)	95.2(2)	O(1w)-Cd(1)-N(1)	88.76(19)
N(2)[a]-Cd(1)-N(1)	92.8(2)	O(2)-Cd(1)-N(1)	85.5(2)
O(1w)-Cd(1)-O(1)	89.75(18)	N(2)[a]-Cd(1)-O(1)	92.0(2)
O(2)-Cd(1)-O(1)	54.31(18)	N(1)-Cd(1)-O(1)	139.78(19)
O(1w)-Cd(1)-O(7)	87.7(2)	N(2)[a]-Cd(1)-O(7)	87.9(2)
O(2)-Cd(1)-O(7)	139.5(2)	N(1)-Cd(1)-O(7)	134.7(2)
O(1)-Cd(1)-O(7)	85.3(2)	O(1w)-Cd(1)-O(8)	87.6(2)
N(2)[a]-Cd(1)-O(8)	87.9(2)	O(2)-Cd(1)-O(8)	169.8(2)
N(1)-Cd(1)-O(8)	84.7(2)	O(1)-Cd(1)-O(8)	135.43(19)
O(7)-Cd(1)-O(8)	50.1(2)	O(6)-Cd(2)-O(4)	138.6(2)
O(6)-Cd(2)-N(4)[b]	97.8(3)	O(4)-Cd(2)-N(4)[b]	91.7(2)
O(6)-Cd(2)-N(3)	130.5(3)	O(4)-Cd(2)-N(3)	89.3(2)
N(4)[b]-Cd(2)-N(3)	90.6(2)	O(6)-Cd(2)-O(2w)	88.4(4)
O(4)-Cd(2)-O(2w)	82.7(3)	N(4)[b]-Cd(2)-O(2w)	173.6(3)
N(3)-Cd(2)-O(2w)	86.5(2)	O(6)-Cd(2)-O(3)	86.6(2)
O(4)-Cd(2)-O(3)	53.23(18)	N(4)[b]-Cd(2)-O(3)	88.9(2)
N(3)-Cd(2)-O(3)	142.5(2)	O(2w)-Cd(2)-O(3)	90.0(2)
O(1w)-H1wb···O1	171		

Symmetry codes: (a): 0.5−x, −0.5+y, 0.5−z; (b): 0.5−x, 0.5+y, 0.5−z.

Table S4 Selected bond lengths (Å) and angles (º) for **4**.

Cd(1)-N(2)[a]	2.369(7)	Cd(1)-N(3)	2.379(8)

Cd(1)-O(4)[b]	2.400(6)	Cd(1)-N(1)	2.404(7)
Cd(1)-O(2)	2.417(6)	Cd(1)-O(1)	2.424(6)
Cd(1)-O(3)[b]	2.442(6)		
N(3)-Cd(1)-O(4)[b]	89.1(3)	N(2)[a]-Cd(1)-N(1)	93.2(2)
N(3)-Cd(1)-N(1)	88.5(3)	O(4)[b]-Cd(1)-N(1)	83.0(2)
N(2)[a]-Cd(1)-O(2)	90.1(2)	N(3)-Cd(1)-O(2)	89.2(2)
O(4)[b]-Cd(1)-O(2)	141.5(2)	N(1)-Cd(1)-O(2)	135.4(2)
N(2)[a]-Cd(1)-O(1)	90.7(2)	N(3)-Cd(1)-O(1)	90.3(3)
O(4)[b]-Cd(1)-O(1)	164.6(2)	N(1)-Cd(1)-O(1)	81.7(2)
O(2)-Cd(1)-O(1)	53.9(2)	N(2)[a]-Cd(1)-O(3)[a]	88.9(2)
N(3)-Cd(1)-O(3)[b]	89.4(2)	O(4)[b]-Cd(1)-O(3)[b]	53.6(2)
N(1)-Cd(1)-O(3)[b]	136.6(2)	O(2)-Cd(1)-O(3)[b]	87.89(19)
O(1)-Cd(1)-O(3)[b]	141.75(19)		

Symmetry codes: (a): 0.5+*x*, 0.5+*y*, *z;* (b): 0.5−*x*, 0.5+*y*, −0.5−*z*.

Table S5 Selected bond lengths (Å) and angles (º) for **5**.

Cd(1)-O(3)	2.272(4)	Cd(1)-N(1)	2.334(5)
Cd(1)-N(2)[a]	2.361(5)	Cd(1)-N(3)	2.390(5)
Cd(1)-O(2)	2.443(4)	Cd(1)-O(1)	2.488(5)
Cd(1)-O(4)	2.744(5)		
O(3)-Cd(1)-N(1)	90.18(18)	O(3)-Cd(1)-N(2)[a]	137.62(16)
N(1)-Cd(1)-N(2)[a]	88.21(19)	O(3)-Cd(1)-N(3)	87.25(17)
N(1)-Cd(1)-N(3)	177.17(19)	N(2)[a]-Cd(1)-N(3)	94.50(19)
O(3)-Cd(1)-O(2)	139.51(15)	N(1)-Cd(1)-O(2)	95.23(17)
N(2)[a]-Cd(1)-O(2)	82.74(16)	N(3)-Cd(1)-O(2)	85.96(16)
O(3)-Cd(1)-O(1)	87.12(16)	N(1)-Cd(1)-O(1)	92.20(17)
N(2)[a]-Cd(1)-O(1)	135.26(16)	N(3)-Cd(1)-O(1)	86.47(18)
O(2)-Cd(1)-O(1)	92.72(18)	O(3)-Cd(1)-O(4)	50.67(14)
N(1)-Cd(1)-O(4)	92.72(18)	N(2)[a]-Cd(1)-O(4)	87.10(15)
N(3)-Cd(1)-O(4)	86.58(17)	O(2)-Cd(1)-O(4)	166.87(14)
O(1)-Cd(1)-O(4)	137.48(14)		

Symmetry codes: (a): 0.5+*x*, 0.5+*y*, *z*.

Table S6 Selected bond lengths (Å) and angles (º) for **6**.

Cd(1)-O(1w)	2.338(3)	Cd(1)-N(1)	2.382(3)
Cd(1)-O(2)	2.389(2)	Cd(1)-O(4)	2.397(3)
Cd(1)-N(3)	2.419(3)	Cd(1)-O(1)	2.446(2)
Cd(1)-O(3)	2.451(3)	Cd(2)-O(2w)	2.341(3)
Cd(2)-N(4)	2.359(3)	Cd(2)-N(2)[a]	2.362(3)
Cd(2)-O(6)	2.368(2)	Cd(2)-O(7)	Cd(2)-O(7)

Cd(2)-O(8)	2.508(3)	Cd(2)-O(5)	2.510(3)
O(1w)-Cd(1)-N(1)	81.37(9)	O(1w)-Cd(1)-O(2)	143.40(9)
N(1)-Cd(1)-O(2)	100.25(9)	O(1w-Cd(1)-O(4)	130.60(10)
N(1)-Cd(1)-O(4)	84.67(9)	O(2)-Cd(1)-O(4)	85.68(9)
O(1w)-Cd(1)-N(3)	79.16(10)	N(1)-Cd(1)-N(3)	157.22(9)
O(2)-Cd(1)-N(3)	88.57(9)	O(4)-Cd(1)-N(3)	117.15(10)
O(1w)-Cd(1)-O(1)	90.14(9)	N(1)-Cd(1)-O(1)	83.87(9)
O(2)-Cd(1)-O(1)	54.16(8)	O(4)-Cd(1)-O(1)	135.04(8)
N(3)-Cd(1)-O(1)	84.46(9)	O(1w)-Cd(1)-O(3)	87.51(9)
N(1)-Cd(1)-O(3)	109.03(9)	O(2)-Cd(1)-O(3)	124.99(9)
O(4)-Cd(1)-O(3)	53.28(8)	N(3)-Cd(1)-O(3)	81.89(9)
O(1)-Cd(1)-O(3)	166.35(8)	O(2w)-Cd(2)-N(4)	86.61(10)
O(2w)-Cd(2)-N(2)[a]	81.82(10)	N(4)-Cd(2)-N(2)[a]	168.38(10)
O(2w)-Cd(2)-O(6)	138.67(9)	N(4)-Cd(2)-O(6)	86.14(9)
N(2)[a]-Cd(2)-O(6)	103.19(9)	O(2w)-Cd(2)-O(7)	84.59(9)
N(4)-Cd(2)-O(7)	86.89(9)	N(2)[a]-Cd(2)-O(7)	91.07(9)
O(6)-Cd(2)-O(7)	135.44(9)	O(2w)-Cd(2)-O(8)	133.78(10)
N(4)-Cd(2)-O(8)	106.62(9)	N(2)[a]-Cd(2)-O(8)	81.06(10)
O(6)-Cd(2)-O(8)	87.12(8)	O(7)-Cd(2)-O(8)	53.28(8)
O(2w)-Cd(2)-O(5)	88.73(9)	N(4)-Cd(2)-O(5)	100.44(9)
N(2)[a]-Cd(2)-O(5)	80.32(9)	O(6)-Cd(2)-O(5)	52.95(8)
O(7)-Cd(2)-O(5)	169.78(9)	O(8)-Cd(2)-O(5)	129.63(8)

Symmetry codes: (a): $x, y, -1+z$.

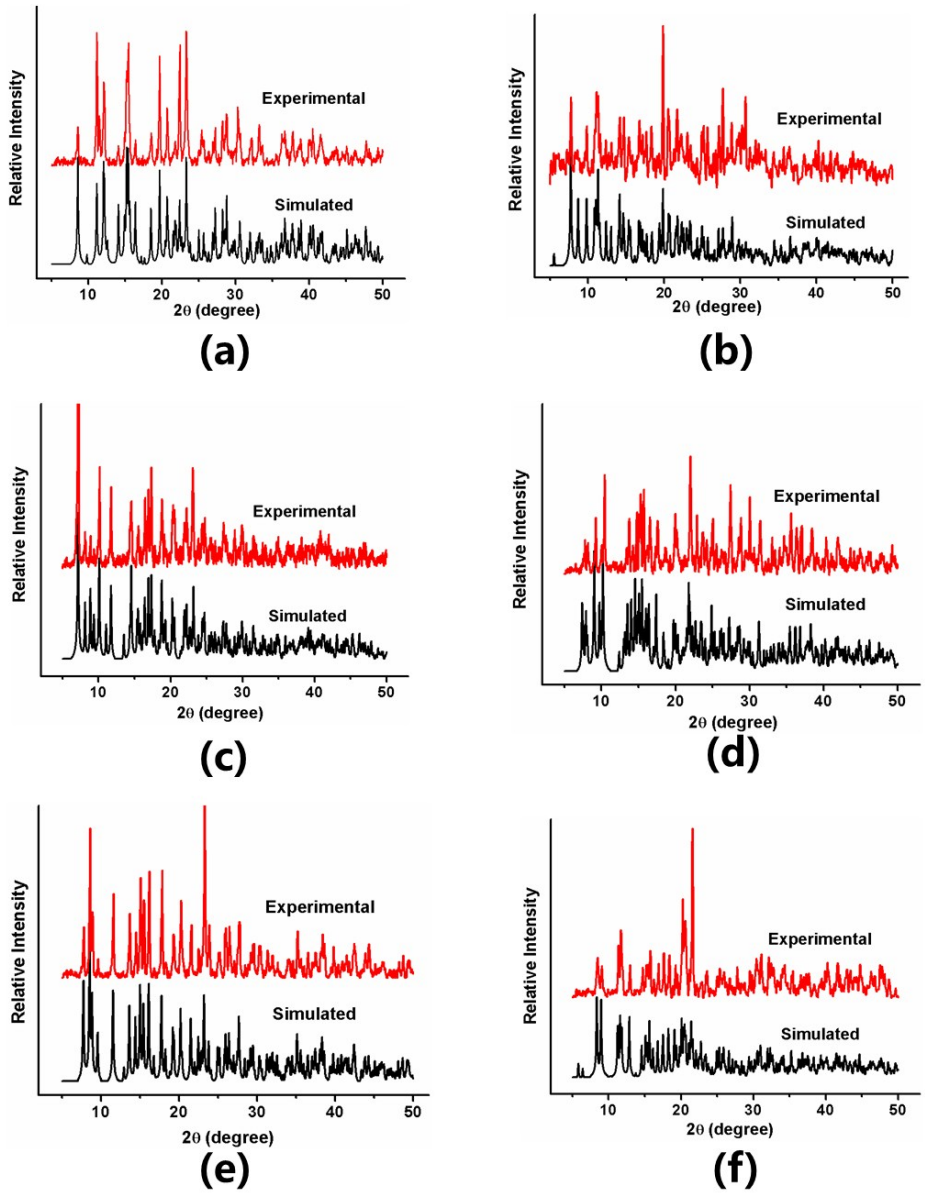

Figure S1. The simulated and experimental XRD patterns of each compound (a) for **1**, (b) for **2**, (c) for **3**, (d) for **4**, (e) for **5**, and (f) for **6**.

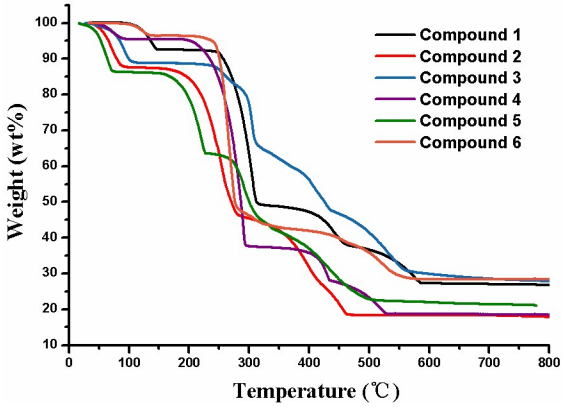

Figure S2. TG curves of compounds **1-6**.