Electronic Supplementary Information (ESI) ***for***

Metallic Coordination Selectivity Effect the Trinuclear $M_3(RCOO)_6$ Secondary Building Units of Three Layer Metal-Carboxylate Frameworks

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Table S1 Selection bond lengths (Å) and angles (º) for **1-3**

1[a]		**2**[b]		**3**[c]	
Zn1-O1	1.967(1)	Mn1-O1	2.309(3)	Co1-O2	2.031(5)
Zn1-O5	1.969(1)	Mn1-O2	2.285(3)	Co1-O5	2.207(5)
Zn1-N1	2.002(1)	Mn1-O3	2.137(3)	Co1-O6	2.157(5)
Zn1-O3#1	1.942(1)	Mn1-O4	2.260(3)	Co1-O7	2.170(7)
Zn2-O2	2.060(1)	Mn1-O6#1	2.128(3)	Co1-N1	2.091(8)
Zn2-O5	2.184(1)	Mn1-O14#2	2.150(3)	Co1-O3#1	2.035(5)
Zn2-O4#2	2.052(1)	Mn2-O2	2.214(3)	Co2-O1	2.055(5)
		Mn2-O5	2.118(2)	Co2-O6	2.144(5)
O1-Zn1-O5	96.59(4)	Mn2-O13#3	2.162(2)	Co2-O4#1	2.055(5)
O1-Zn1-N1	102.33(5)	Mn3-O7	2.133(3)		
O1-Zn1-O3#1	117.31(5)	Mn3-O9	2.217(2)	O2-Co1-O5	155.57(19)
O5-Zn1-N1	127.99(5)	Mn3-O11	2.154(2)	O2-Co1-O6	97.33(18)
O3#1-Zn1-O5	112.23(4)	Mn4-O8	2.124(3)	O2-Co1-O7	85.5(2)
O3#1-Zn1-N1	101.07(5)	Mn4-O9	2.254(3)	O2-Co1-N1	104.8(3)
O2-Zn2-O5	90.51(4)	Mn4-O10	2.274(3)	O2-Co1-O3#1	98.2(2)
O2-Zn2-O4#2	84.61(4)	Mn4-O12	2.127(3)	O5-Co1-O7	84.1(2)
O2-Zn2-O2#3	180.00	Mn4-O15	2.169(3)	O5-Co1-N1	96.6(3)
O2-Zn2-O5#3	89.49(4)	Mn4-O16	2.237(3)	O3#1-Co1-O5	95.0(2)
O2-Zn2-O4#1	95.39(4)			O6-Co1-O7	85.79(19)
O4#2-Zn2-O5	88.36(4)	O1-Mn1-O2	57.88(9)	O6-Co1-N1	156.2(3)
O4#1-Zn2-O5	91.64(4)	O1-Mn1-O3	97.71(10)	O3#1-Co1-O6	100.15(19)
Zn1-O5-Zn2	99.55(4)	O1-Mn1-O4	85.81(11)	O7-Co1-N1	86.8(3)
		O1-Mn1-O6#1	151.54(9)	O3#1-Co1-O7	172.2(2)
		O1-Mn1-O14#2	95.59(10)	O3#1-Co1-N1	85.6(3)
		O2-Mn1-O3	155.59(11)	O1-Co2-O6	88.16(18)
		O2-Mn1-O4	88.72(10)	O1-Co2-O4#2	86.7(2)
		O2-Mn1-O6#1	95.84(10)	O1-Co2-O1#3	180.00
		O2-Mn1-O14#2	96.00(9)	O1-Co2-O6#3	91.84(18)
		O3-Mn1-O4	89.82(10)	O4#2-Co2-O1	93.3(2)
		O3-Mn1-O6#1	108.14(11)	Co1-O6-Co2	109.15(18)
		O3-Mn1-O14#2	85.35(10)		
		O4-Mn1-O6#1	82.63(12)		
		O4-Mn1-O14#2	175.11(10)		
		O6_f-Mn1-O14#2	98.14(11)		
		O2-Mn2-O5	92.08(9)		
		O2-Mn2-O13#3	88.68(9)		
		O2-Mn2-O5#1	87.92(9)		
		O2-Mn2-O13#2	91.32(9)		
		O5-Mn2-O13#3	93.45(9)		
		O5-Mn2-O13#2	86.56(9)		
		O7-Mn3-O9	91.09(8)		
		O7-Mn3-O11	92.77(8)		
		O9-Mn3-O11	87.69(8)		
		O7#4-Mn3-O9	88.91(8)		
		O7#4-Mn3-O11	87.23(8)		
		O8-Mn4-O9	95.57(9)		
		O8-Mn4-O10	92.41(9)		
		O8-Mn4-O12	106.28(10)		
		O8-Mn4-O15	83.16(10)		
		O8-Mn4-O16	170.07(9)		
		O9-Mn4-O12	93.03(9)		
		O9-Mn4-O15	164.94(10)		
		O9-Mn4-O16	89.95(9)		
		O10-Mn4-O12	147.34(10)		
		O10-Mn4-O15	106.98(10)		
		O10-Mn4-O16	83.51(10)		
		O12-Mn4-O15	101.75(10)		
		O12-Mn4-O16	81.59(10)		
		Mn1-O2-Mn2	108.65(12)		
		Mn3-O9 -Mn4	109.45(9)		

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

[b] Symmetry transformations used to generate equivalent atoms: #1 = 2-x,1-y,1-z; #2 = 2-x,2-y,-z; #3 = x,-1+y,1+z; #4 = 1-x,2-y,-z.

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

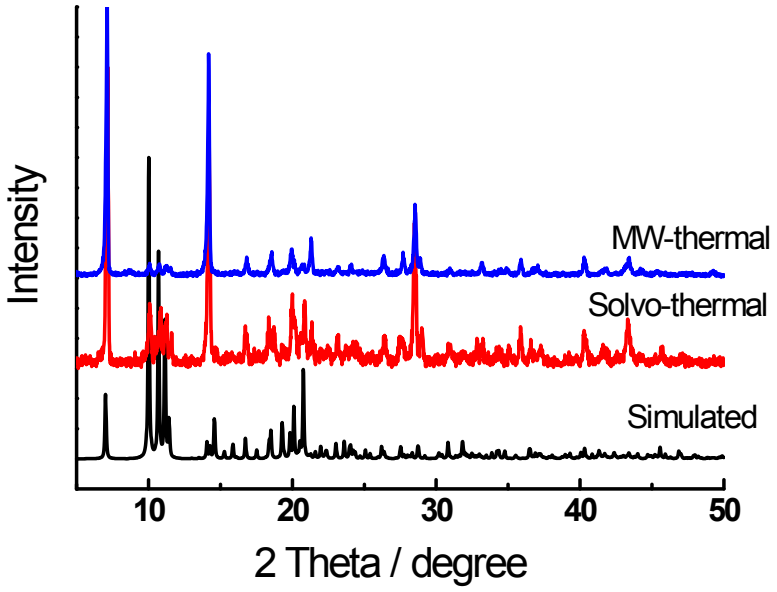

Figure S1. Powder X-ray diffraction (PXRD) of **3**.