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Proton conductivities of four low dimensional MOFs: affected by the amount of chelated ligands

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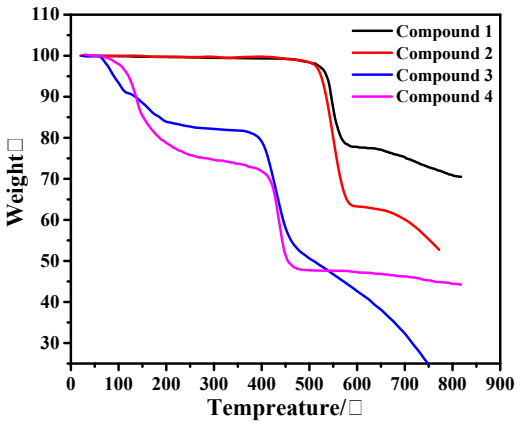

Fig. S1 The TG plots of compounds **1**-**4**.

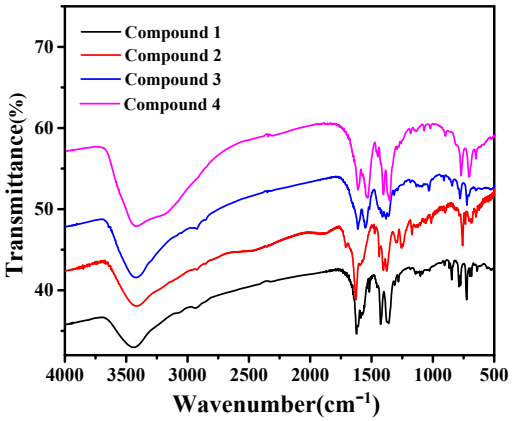

Fig. S2 The IR spectra of compounds **1**-**4**.

Table S1. Selected bond lengths (Å) and band angles (°) for compound **1**

Mn(1)-O(1)	2.125(2)	O(1)-Mn(1)-O(1)#1	180.00(13)
Mn(1)-O(1)#1	2.125(2)	O(1)-Mn(1)-O(3)#2	85.23(8)
Mn(1)-O(3)#2	2.1679(19)	O(1)#1-Mn(1)-O(3)#2	94.77(8)
Mn(1)-O(3)#3	2.1679(19)	O(1)-Mn(1)-O(3)#3	94.77(8)
Mn(1)-O(6)#4	2.172(2)	O(1)#1-Mn(1)-O(3)#3	85.23(8)
Mn(1)-O(6)#5	2.172(2)	O(3)#2-Mn(1)-O(3)#3	180.00(3)
Mn(2)-O(5)#5	2.094(2)	O(1)#1-Mn(1)-O(6)#4	94.94(9)
Mn(2)-O(2)	2.108(2)	O(1)-Mn(1)-O(6)#4	85.06(9)
Mn(2)-O(3)#2	2.168(2)	O(3)#2-Mn(1)-O(6)#4	94.04(8)
Mn(2)-N(1	2.219(3)	O(3)#3-Mn(1)-O(6)#4	85.96(8)
Mn(2)-N(2)	2.253(3)	O(1)-Mn(1)-O(6)#5	94.94(9)

Symmetry codes：#1 -x+2, -y, -z+1；#2 x+1, y, z #3-x+1, -y, -z+1; #4 -x+1, -y+1, -z+1; #5 x+1, y-1, z.

Table S2. Selected bond lengths (Å) and band angles (°) for compound **2**

Mn(1)-O(1)	2.124(4)	O(1)-Mn(1)-O(1)#1	180.0(2)
Mn(1)-O(1)#1	2.124(4)	O(1)-Mn(1)-O(6)#2	84.98(19)
Mn(1)-O(6)#2	2.147(4)	O(1)#1-Mn(1)-O(6)#2	95.02(19)
Mn(1)-O(6)#3	2.147(4)	O(1)-Mn(1)-O(6)#3	95.02(19)
Mn(1)-O(3)#4	2.192(4)	O(1)#1-Mn(1)-O(6)#3	84.98(19)
Mn(1)-O(3)#5	2.192(4)	O(6)#2-Mn(1)-O(6)#3	180.0(3)
Mn(2)-O(5)#3	2.097(4)	O(1)-Mn(1)-O(3)#4	84.07(16)
Mn(2)-O(2)	2.109(4)	O(1)#1-Mn(1)-O(3)#4	95.93(16)
Mn(2)-O(3)#4	2.165(4)	O(6)#2-Mn(1)-O(3)#4	93.12(16)
Mn(2)-N(1)	168.26(19)	O(6)#3-Mn(1)-O(3)#4	86.88(16)
Mn(2)-N(2)	169.44(16)	O(1)-Mn(1)-O(3)#5	95.93(16)

Symmetry codes：#1 -x+2, -y, -z+1；#2 -x+1, -y, -z; #3x+1, y, z+1; #4 x+1, y, z; #5-x+1, -y, -z+1.

Table S3. Selected bond lengths (Å) and band angles (°) for compound **3**

Co(1)-O(14)	2.043(5)	O(14)-Co(1)-O(13)	86.9(2)
Co(1)-O(13)	2.068(5)	O(14)-Co(1)-N(2)	99.7(2)
Co(1)-N(2)	2.096(6)	O(13)-Co(1)-N(2)	107.2(2)
Co(1)-N(1)	2.128(6)	O(14)-Co(1)-N(1)	87.8(2)
Co(1)-O(1)	2.129(4)	O(13)-Co(1)-N(1)	173.2(2)
Co(1)-O(2)	2.222(5)	O(13)-Co(1)-O(1)	89.5(2)
Co(2)-O(15)	2.013(6)	O(14)-Co(1)-O(1)	107.6(2)
Co(2)-O(16)	2.032(6	N(2)-Co(1)-O(1)	148.8(2)

Co(2)-O(17)	2.071(5)	N(1)-Co(1)-O(1)	88.2(2)
Co(2)-O(18)	2.084(5)	O(14)-Co(1)-O(2)	165.0(2)
Co(2)-O(5)	2.161(4)	O(13)-Co(1)-O(2)	84.3(2)
Co(2)-O(6)	2.168(5)	N(2)-Co(1)-O(2)	94.5(2)
Co(3)-O(4)#1	2.050(4)	N(1)-Co(1)-O(2)	100.0(2)
Co(3)-O(10)#2	2.069(4)	O(1)-Co(1)-O(2)	60.24(15)
Co(3)-O(19)	2.126(5)	O(14)-Co(1)-C(13)	137.4(2)
Co(3)-O(20)	2.134(4)	O(13)-Co(1)-C(13)	87.0(2)
Co(3)-N(4)	2.154(5)	N(2)-Co(1)-C(13)	122.3(2)
Co(3)-N(3)	2.156(5)	N(1)-Co(1)-C(13)	94.1(2)

Symmetry codes：#1 x-1/2, -y+1/2, z+1/2；#2 x+1/2, -y+1/2, z-1/2

Table S4. Selected bond lengths (Å) and band angles (°) for compound **4**

Ni(1)-N(1)#1	2.063(5)	N(1)#1-Ni(1)-N(1)	180.000(1)
Ni(1)-N(1)	2.063(5)	N(1)#1-Ni(1)-O(7)#1	89.60(19)
Ni(1)-O(7)#1	2.088(5)	N(1)-Ni(1)-O(7)#1	90.40(19)
Ni(1)-O(7)	2.088(5)	N(1)#1-Ni(1)-O(7)	90.40(19)
Ni(1)-O(8)	2.116(5)	N(1)-Ni(1)-O(7)	89.60(19)
Ni(1)-O(8)#1	2.116(5)	O(7)#1-Ni(1)-O(7)	180.000(1)
Ni(2)-O(2)	1.981(4)	N(1)#1-Ni(1)-O(8)	89.7(2)
Ni(2)-O(2)#2	1.981(4)	N(1)-Ni(1)-O(8)	90.3(2)
Ni(2)-O(10)	2.059(5)	O(7)#1-Ni(1)-O(8)	91.5(2)
Ni(2)-O(10)#2	2.059(5)	O(7)-Ni(1)-O(8)	88.5(2)
Ni(2)-O(9)	2.100(5)	N(1)#1-Ni(1)-O(8)#1	90.3(2)
Ni(2)-O(9)#2	2.100(5)	N(1)-Ni(1)-O(8)#1	89.7(2)
Ni(3)-O(6)	2.017(5)	O(7)#1-Ni(1)-O(8)#1	88.5(2)
Ni(3)-O(6)#3	2.017(5)	O(7)-Ni(1)-O(8)#1	91.5(2)
Ni(3)-O(12)#3	2.057(6)	O(8)-Ni(1)-O(8)#1	180.000(2)
Ni(3)-O(12)	2.057(6)	O(2)-Ni(2)-O(2)#2	180.0(3)

Symmetry codes：#1 -x+1, -y+2, -z+1；#2 -x+1, -y+1, -z；#3-x, -y+2, -z+2.