Electronic Supplementary Material (ESI) for Dalton Transactions
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Supporting Information:

Syntheses, structures and properties of two 2-D layered hybrid organic-inorganic materials based on different V_4O_{12} building units

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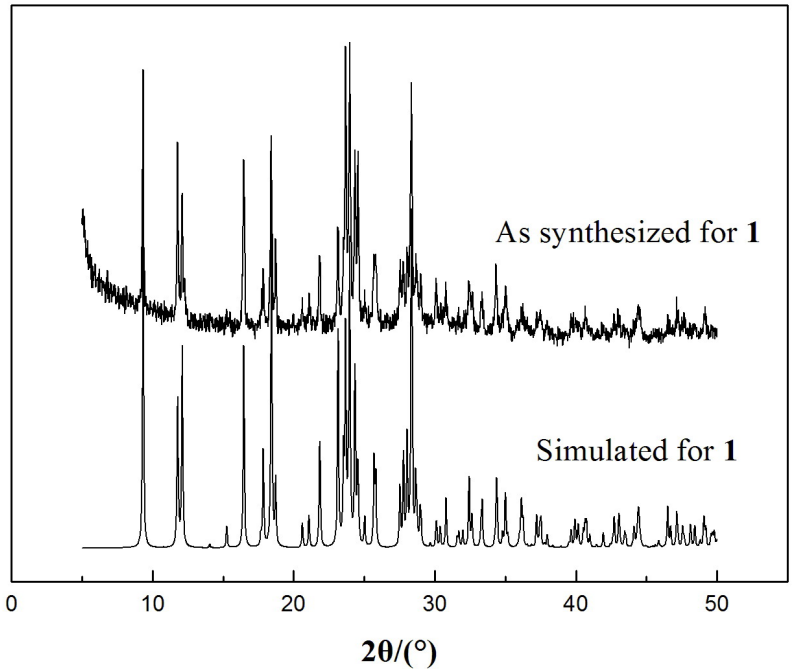

Fig. S1a PXRD patterns for compound **1**.

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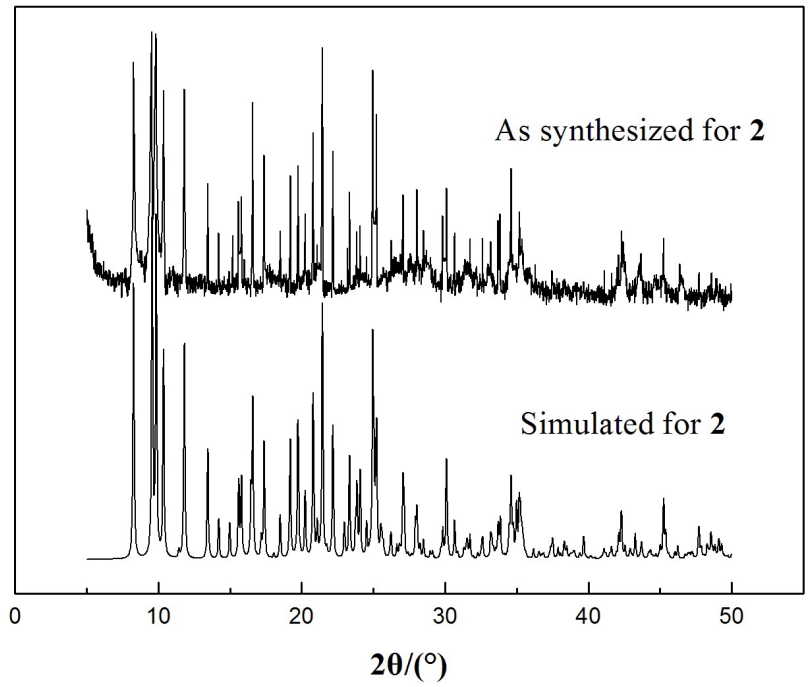

Fig. S1b PXRD patterns for compound **2**.

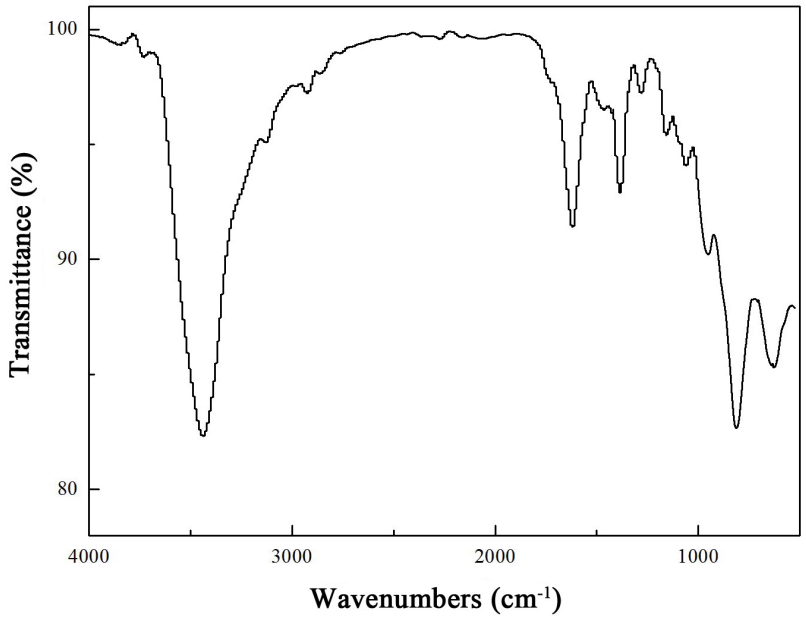

Fig. S2a The IR spectrum of compound **1**.

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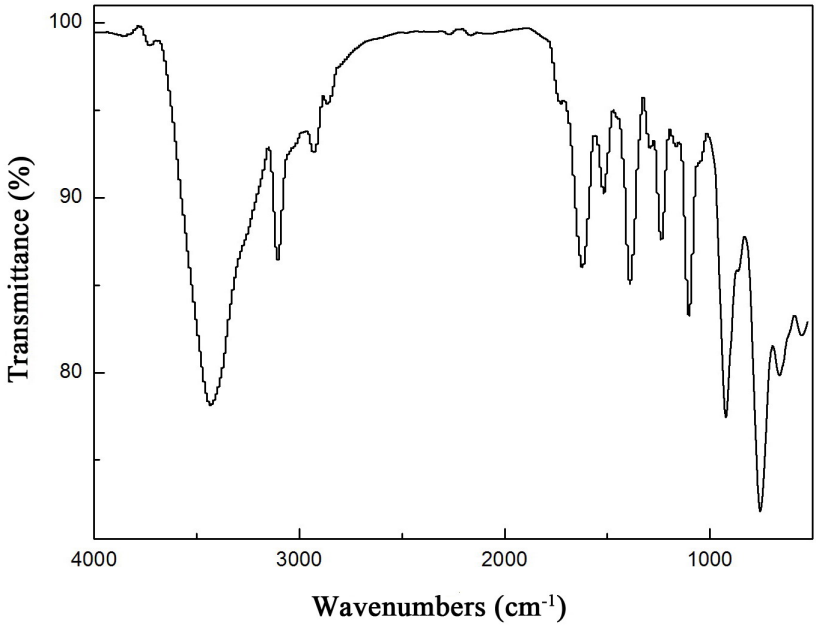

Fig. S2b The IR spectrum of compound **2**.

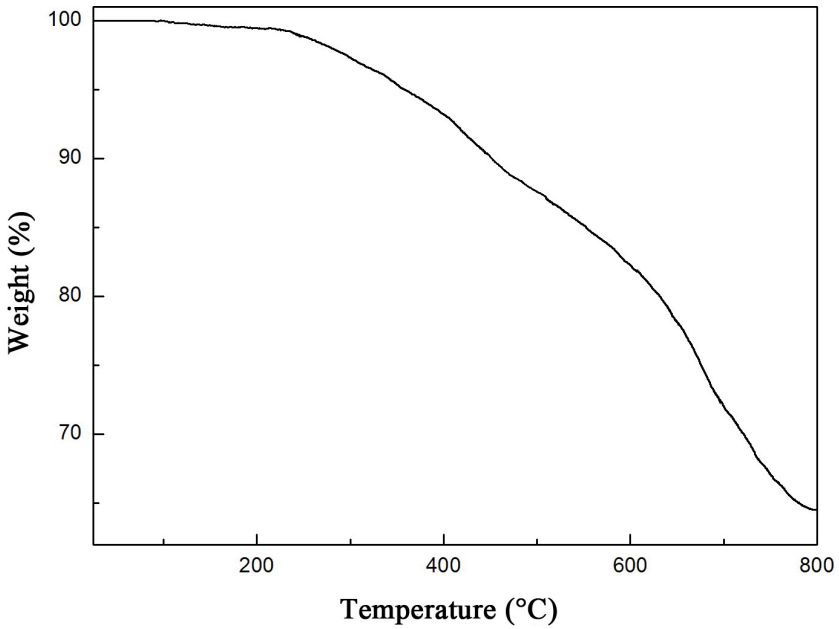

Fig. S3a TG curve for compound **1**.

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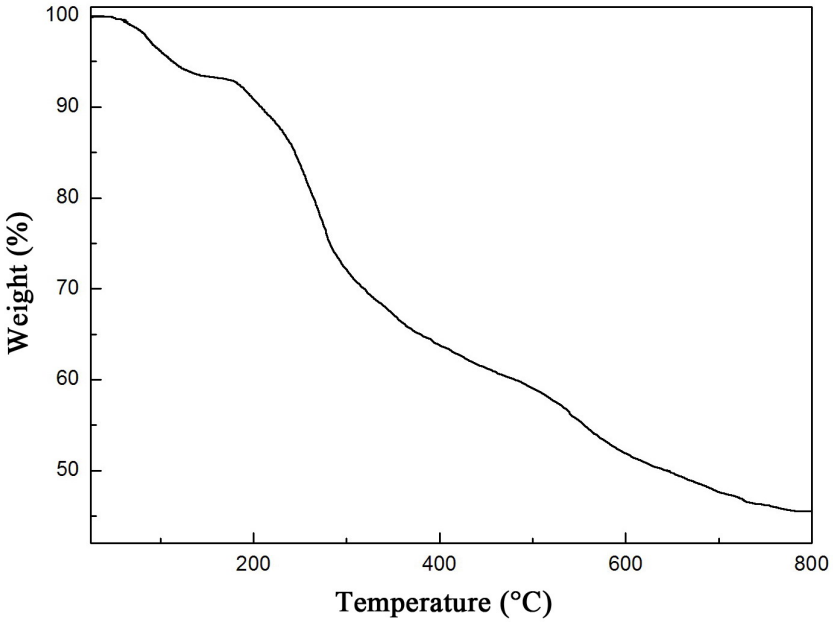

Fig. S3b TG curve for compound **2**.

Table S1a Selected bond distances (Å) and angles (°) for **1**

V(1)-O(7)	1.7795(10)	O(1)-V(3)#3	1.7569(11)
V(1)-O(10)	1.658(3)	O(2)-V(4)#4	1.7672(12)
V(1)-O(12)	1.640(3)	O(5)-V(3)#2	1.637(3)
V(1)-O(13)	1.780(3)	O(6)-V(4)#1	1.650(3)
V(2)-O(8)	1.7810(10)	O(7)-V(1)#5	1.7795(10)
V(2)-O(9)	1.640(2)	O(8)-V(2)#6	1.7810(10)
V(2)-O(11)	1.629(2)	Zn(1)-O(9)	2.008(3)
V(2)-O(14)	1.745(3)	Zn(1)-O(6)	2.030(3)
V(3)-O(1)	1.7569(11)	Zn(1)-O(12)	2.008(3)
V(3)-O(4)	1.622(3)	Zn(1)-N(1)	2.195(3)
V(3)-O(13)	1.801(3)	Zn(1)-N(2)	2.054(3)
V(3)-O(5)#1	1.637(3)	Zn(2)-O(5)	2.037(3)
V(4)-O(2)	1.7672(12)	Zn(2)-O(10)	1.975(3)
V(4)-O(3)	1.598(3)	Zn(2)-O(11)	2.017(3)
V(4)-O(14)	1.828(3)	Zn(2)-N(4)	2.221(3)
V(4)-O(6)#2	1.650(3)	Zn(2)-N(5)	2.044(3)
O(7)-V(1)-O(13)	108.17(9)	O(6)#2-V(4)-O(2)	108.76(13)
O(10)-V(1)-O(7)	109.44(10)	O(6)#2-V(4)-O(14)	111.56(13)
O(10)-V(1)-O(13)	110.08(14)	O(9)-Zn(1)-O(6)	98.84(13)
O(12)-V(1)-O(7)	108.78(11)	O(9)-Zn(1)-O(12)	111.22(11)
O(12)-V(1)-O(10)	109.97(15)	O(12)-Zn(1)-O(6)	93.95(12)
O(12)-V(1)-O(13)	110.36(13)	O(6)-Zn(1)-N(1)	163.18(11)
O(9)-V(2)-O(8)	109.22(9)	O(6)-Zn(1)-N(2)	91.00(11)

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O(9)-V(2)-O(14)	109.11(14)	O(9)-Zn(1)-N(1)	96.50(12)
O(11)-V(2)-O(8)	109.19(11)	O(9)-Zn(1)-N(2)	108.36(11)
O(11)-V(2)-O(9)	110.79(14)	O(12)-Zn(1)-N(1)	86.87(12)
O(11)-V(2)-O(14)	110.96(13)	O(12)-Zn(1)-N(2)	138.77(12)
O(14)-V(2)-O(8)	107.49(11)	N(2)-Zn(1)-N(1)	77.60(11)
O(1)-V(3)-O(13)	107.32(9)	O(10)-Zn(2)-O(5)	101.03(13)
O(4)-V(3)-O(1)	109.29(12)	O(10)-Zn(2)-O(11)	112.12(11)
O(4)-V(3)-O(5)#1	109.30(15)	O(11)-Zn(2)-O(5)	91.58(11)
O(4)-V(3)-O(13)	110.04(15)	O(5)-Zn(2)-N(4)	160.35(12)
O(5)#1-V(3)-O(1)	112.07(12)	O(5)-Zn(2)-N(5)	91.03(12)
O(5)#1-V(3)-O(13)	108.78(12)	O(10)-Zn(2)-N(4)	97.68(13)
O(2)-V(4)-O(14)	106.42(10)	O(10)-Zn(2)-N(5)	108.01(14)
O(3)-V(4)-O(2)	106.75(12)	O(11)-Zn(2)-N(4)	86.87(12)
O(3)-V(4)-O(6)#2	111.84(15)	O(11)-Zn(2)-N(5)	138.44(14)
O(3)-V(4)-O(14)	111.21(15)	N(5)-Zn(2)-N(4)	77.44(13)

Symmetry transformations used to generate equivalent atoms: #1 x-1,y,z; #2 x+1,y,z; #3 -x+1,-y+1,-z+1; #4 -x+3,-y+1,-z; #5 -x+2,-y+1,-z+1; #6 -x+2,-y+1,-z

Table S1b Selected bond distances (Å) and angles (°) for **2**

V(1)-O(3)	1.819(2)	Cu(1)-N(8)	2.035(3)
V(1)-O(4)	1.635(3)	Cu(1)-O(5)#1	2.393(2)
V(1)-O(5)	1.641(2)	Cu(1)-N(1)#1	1.998(3)
V(1)-O(6)	1.811(2)	Cu(1)-N(8)#1	2.035(3)
V(2)-O(1)	1.639(3)	Cu(2)-O(1W)	2.503(4)
V(2)-O(2)	1.637(3)	Cu(2)-N(5)	2.028(3)
V(2)-O(6)	1.807(2)	Cu(2)-N(4)#2	2.034(3)
V(2)-O(3)#4	1.805(2)	Cu(2)-O(1W)#3	2.503(4)
Cu(1)-O(5)	2.393(2)	Cu(2)-N(5)#3	2.028(3)
Cu(1)-N(1)	1.998(3)	Cu(2)-N(4)#1	2.034(3)
O(3)-V(1)-O(4)	110.75(14)	O(5)#1-Cu(1)-N(8)	91.61(9)
O(3)-V(1)-O(5)	107.36(12)	N(1)#1-Cu(1)-N(8)	86.66(11)
O(3)-V(1)-O(6)	111.06(11)	N(8)-Cu(1)-N(8)#1	180.00
O(4)-V(1)-O(5)	108.54(15)	O(5)#1-Cu(1)-N(1)#1	90.57(11)
O(4)-V(1)-O(6)	108.47(14)	O(5)#1-Cu(1)-N(8)#1	88.40(9)
O(5)-V(1)-O(6)	110.64(12)	N(1)#1-Cu(1)-N(8)#1	93.34(11)
O(1)-V(2)-O(2)	108.87(14)	O(1W)-Cu(2)-N(5)	90.25(11)
O(1)-V(2)-O(6)	109.44(13)	O(1W)-Cu(2)-N(4)#2	93.52(11)
O(1)-V(2)-O(3)#4	110.74(14)	O(1W)-Cu(2)-O(1W)#3	180.00
O(2)-V(2)-O(6)	108.72(12)	O(1W)-Cu(2)-N(5)#3	89.75(11)
O(2)-V(2)-O(3)#4	108.66(12)	O(1W)-Cu(2)-N(4)#1	86.48(11)
O(3)#4-V(2)-O(6)	110.37(12)	N(4)#2-Cu(2)-N(5)	87.75(12)
O(5)-Cu(1)-N(1)	90.57(11)	O(1W)#3-Cu(2)-N(5)	89.75(11)

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O(5)-Cu(1)-N(8)	88.40(9)	N(5)-Cu(2)-N(5)#3	180.00
O(5)-Cu(1)-O(5)#1	180.00	N(4)#1-Cu(2)-N(5)	92.25(12)
O(5)-Cu(1)-N(1)#1	89.43(11)	O(1W)#3-Cu(2)-N(4)#2	86.48(11)
O(5)-Cu(1)-N(8)#1	91.61(9)	N(4)#2-Cu(2)-N(5)#3	92.25(12)
N(1)-Cu(1)-N(8)	93.34(11)	N(4)#2-Cu(2)-N(4)#1	180.00
O(5)#1-Cu(1)-N(1)	89.43(11)	O(1W)#3-Cu(2)-N(5)#3	90.25(11)
N(1)-Cu(1)-N(1)#1	180.00	O(1W)#3-Cu(2)-N(4)#1	93.52(11)
N(1)-Cu(1)-N(8)#1	86.66(11)	N(4)#1-Cu(2)-N(5)#3	87.75(12)

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

Table S2a Hydrogen bond interactions in compound **1**

D—H···A	H···A (Å)	D···A (Å)	D—H···A (°)
N(3)-H(3B)···O(3)	1.95	2.794(4)	167
N(6)-H(6A)···O(4)	1.97	2.812(5)	167
C(8)-H(8A)···O(9)	2.58	3.417(5)	150

Table S2b Hydrogen bond interactions in compound **2**

D—H···A	H···A (Å)	D···A (Å)	D—H···A (°)
O(1W)-H(1WA)···O(4)	1.99	2.802(5)	160
O(1W)-H(1WB)···O(7)	2.10	2.887(7)	157
C(3)-H(3A)···O(3)	2.35	3.283(4)	178
C(5)-H(5A)···O(5)	2.42	3.340(5)	170
C(7)-H(7A)···O(2)	2.29	3.186(4)	162
C(8)-H(8A)···O(4)	2.55	3.461(5)	165
C(9)-H(9A)···O(1)	2.49	3.294(6)	144
C(10)-H(10A)···O(2)	2.33	3.184(5)	153
C(11)-H(11A)···O(1)	2.58	3.522(5)	164
C(12)-H(12A)···O(2)	2.31	3.164(4)	152
C(12)-H(12A)···O(5)	2.53	3.061(4)	116
C(14)-H(14A)···O(1)	2.35	3.185(5)	150