Supporting Information

Synthesis, Structure and Properties of Two New Selenite Optical Materials: $K_2Zn_3Se_4O_{12}$, $K_4Zn_3V_4Se_2O_{19}$

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Table S1. Atomic coordinates and equivalent isotropic displacement parameters and bond valence sum (BVS)* calculations for $K_2Zn_3Se_4O_{12}$. *U*(eq) is defined as one third of the trace of the orthogonalized U_{ij} tensor.

Atoms	**x/a**	**y/b**	**z/c**	**U(eq)**	**BVS**
K(1)	-14(1)	11252(2)	1641(1)	29(1)	1.040
K(2)	5057(1)	6640(2)	3289(1)	29(1)	0.960
Zn(1)	2595(1)	8922(1)	2682(1)	20(1)	1.971
Zn(2)	6141(1)	11278(1)	4214(1)	21(1)	2.003
Zn(3)	1027(1)	6622(1)	752(1)	22(1)	1.969
Se(1)	1191(1)	11113(1)	4023(1)	19(1)	4.300
Se(2)	6165(1)	6746(1)	933(1)	16(1)	4.213
Se(3)	2458(1)	4459(1)	2254(1)	19(1)	4.242
Se(4)	7466(1)	5019(1)	4477(1)	20(1)	4.218
O(1)	5928(4)	6223(7)	-198(3)	24(1)	2.105
O(2)	6870(4)	5113(8)	3396(3)	27(1)	2.049
O(3)	1476(4)	10463(9)	2966(3)	32(1)	2.142
O(4)	5089(3)	7581(8)	1221(4)	27(1)	2.068
O(5)	1787(4)	4376(8)	1225(4)	31(1)	1.964
O(6)	738(4)	9067(7)	4434(3)	25(1)	2.186
O(7)	6255(4)	4543(7)	1447(4)	26(1)	2.037
O(8)	3533(4)	5372(10)	2025(4)	35(1)	2.088
O(9)	172(4)	12336(8)	3683(4)	32(1)	2.170
O(10)	7018(5)	2996(10)	4913(4)	47(2)	2.169
O(11)	1974(4)	6395(8)	2752(4)	36(1)	2.020
O(12)	8584(4)	4340(8)	4257(4)	34(1)	2.017

(BVS)*：The bond valence sums were calculated using the formula $V_i=\sum S_{ij}=\sum\exp[(r_0-r_{ij})/B]$, where S_{ij} is the bond valence associated with bond length r_{ij}, and r_0 and B (usually 0.37) are empirically determined parameters.[1]

Table S2. The selected bond lengths and angles of $K_2Zn_3Se_4O_{12}$.

K(1)-O(6)#1	2.627(5)	Zn(2)-O(1)#6	1.959(5)
K(1)-O(3)	2.735(5)	Zn(2)-O(4)#3	1.980(5)
K(1)-O(9)#2	2.749(6)	Zn(2)-O(8)#3	1.989(5)
K(1)-O(12)#3	2.804(6)	Zn(3)-O(12)#3	1.954(6)
K(1)-O(11)#1	2.941(6)	Zn(3)-O(5)	1.961(5)
K(1)-O(9)	3.031(6)	Zn(3)-O(6)#8	1.966(5)
K(1)-O(5)#4	3.400(6)	Zn(3)-O(9)#2	1.985(5)
K(2)-O(2)	2.720(5)	Se(1)-O(3)	1.675(5)
K(2)-O(7)#3	2.760(5)	Se(1)-O(6)	1.678(5)
K(2)-O(8)	2.799(6)	Se(1)-O(9)	1.680(5)
K(2)-O(1)#6	2.812(5)	Se(2)-O(1)	1.676(5)
K(2)-O(4)#7	2.903(5)	Se(2)-O(4)	1.690(5)
K(2)-O(4)	3.062(6)	Se(2)-O(7)	1.691(5)
K(2)-O(8)#3	3.293(7)	Se(3)-O(5)	1.678(5)
Zn(1)-O(11)	1.952(6)	Se(3)-O(8)	1.682(5)
Zn(1)-O(3)	1.959(5)	Se(3)-O(11)	1.688(6)
Zn(1)-O(2)#3	1.969(5)	Se(4)-O(10)	1.675(6)
Zn(1)-O(7)#3	1.983(5)	Se(4)-O(12)	1.681(5)
Zn(2)-O(10)#4	1.917(6)	Se(4)-O(2)	1.698(5)
Zn(2)-O(1)#8	1.959(5)	K(2)-O(7)#7	2.760(5)
K(2)-O(1)#8	2.812(5)	Zn(2)-O(8)#7	1.989(5)
Zn(1)-O(2)#7	1.969(5)	K(2)-O(8)#7	3.293(7)
Zn(2)-O(4)#7	1.980(5)	Zn(3)-O(9)#1	1.985(5)
K(2)-O(4)#3	2.903(5)	K(1)-O(9)#1	2.749(6)
K(1)-O(5)#9	3.400(6)	Zn(2)-O(10)#9	1.917(6)
Zn(3)-O(6)#6	1.966(5)	K(1)-O(11)#2	2.941(6)
K(1)-O(6)#2	2.627(5)	Zn(3)-O(12)#7	1.954(6)
Zn(1)-O(7)#7	1.983(5)	K(1)-O(12)#7	2.804(6)
O(6)#1-K(1)-O(3)	141.45(19)	O(2)-K(2)-O(8)#3	75.63(16)
O(6)#1-K(1)-O(9)#2	127.37(18)	O(7)#3-K(2)-O(8)#3	81.95(15)
O(3)-K(1)-O(9)#2	88.06(19)	O(8)-K(2)-O(8)#3	125.24(14)
O(6)#1-K(1)-O(12)#3	108.82(18)	O(1)#6-K(2)-O(8)#3	58.65(14)
O(3)-K(1)-O(12)#3	73.05(17)	O(4)#7-K(2)-O(8)#3	147.71(14)
O(9)#2-K(1)-O(12)#3	60.45(16)	O(4)-K(2)-O(8)#3	68.59(13)
O(6)#1-K(1)-O(11)#1	80.71(16)	O(11)-Zn(1)-O(3)	96.4(3)
O(3)-K(1)-O(11)#1	117.23(17)	O(11)-Zn(1)-O(2)#3	128.0(2)
O(9)#2-K(1)-O(11)#1	91.32(16)	O(3)-Zn(1)-O(2)#3	107.8(2)
O(12)#3-K(1)-O(11)#1	150.56(18)	O(11)-Zn(1)-O(7)#3	119.6(2)
O(6)#1-K(1)-O(9)	112.64(15)	O(3)-Zn(1)-O(7)#3	110.9(2)
O(3)-K(1)-O(9)	51.66(14)	O(2)#3-Zn(1)-O(7)#3	94.0(2)
O(9)#2-K(1)-O(9)	114.00(17)	O(10)#4-Zn(2)-O(1)#6	115.6(2)
O(12)#3-K(1)-O(9)	124.65(17)	O(10)#4-Zn(2)-O(4)#3	111.8(3)
O(11)#1-K(1)-O(9)	72.31(17)	O(1)#6-Zn(2)-O(4)#3	112.1(2)

O(6)#1-K(1)-O(5)#4	70.88(15)	O(10)#4-Zn(2)-O(8)#3	118.7(3)
O(3)-K(1)-O(5)#4	74.35(16)	O(1)#6-Zn(2)-O(8)#3	99.8(2)
O(9)#2-K(1)-O(5)#4	129.93(15)	O(4)#3-Zn(2)-O(8)#3	96.9(2)
O(12)#3-K(1)-O(5)#4	69.58(15)	O(12)#3-Zn(3)-O(5)	128.4(2)
O(11)#1-K(1)-O(5)#4	138.51(15)	O(12)#3-Zn(3)-O(6)#8	104.9(2)
O(9)-K(1)-O(5)#4	91.15(14)	O(5)-Zn(3)-O(6)#8	101.5(2)
O(2)-K(2)-O(7)#3	153.30(17)	O(12)#3-Zn(3)-O(9)#2	90.4(2)
O(2)-K(2)-O(8)	123.60(18)	O(5)-Zn(3)-O(9)#2	119.9(3)
O(7)#3-K(2)-O(8)	81.36(17)	O(6)#8-Zn(3)-O(9)#2	110.9(2)
O(2)-K(2)-O(1)#6	80.36(16)	O(3)-Se(1)-O(6)	103.1(3)
O(7)#3-K(2)-O(1)#6	75.63(15)	O(3)-Se(1)-O(9)	97.7(3)
O(8)-K(2)-O(1)#6	155.89(18)	O(6)-Se(1)-O(9)	101.1(3)
O(2)-K(2)-O(4)#7	72.42(15)	O(1)-Se(2)-O(4)	102.6(3)
O(7)#3-K(2)-O(4)#7	127.23(16)	O(1)-Se(2)-O(7)	103.5(2)
O(8)-K(2)-O(4)#7	77.92(17)	O(4)-Se(2)-O(7)	103.2(3)
O(1)#6-K(2)-O(4)#7	110.60(15)	O(5)-Se(3)-O(8)	105.5(3)
O(2)-K(2)-O(4)	92.15(15)	O(5)-Se(3)-O(11)	101.2(3)
O(7)#3-K(2)-O(4)	93.02(15)	O(8)-Se(3)-O(11)	100.6(3)
O(8)-K(2)-O(4)	60.72(15)	O(10)-Se(4)-O(12)	102.8(3)
O(1)#6-K(2)-O(4)	126.99(15)	O(10)-Se(4)-O(2)	102.2(3)
O(4)#7-K(2)-O(4)	116.79(16)	O(12)-Se(4)-O(2)	102.4(3)

Symmetry transformations used to generate equivalent atoms:

#1 -x,y+1/2,-z+1/2 #2 -x,y-1/2,-z+1/2

#3 -x+1,y+1/2,-z+1/2 #4 x,y+1,z #5 -x,-y+2,-z

#6 x,-y+3/2,z+1/2 #7 -x+1,y-1/2,-z+1/2

#8 x,-y+3/2,z-1/2 #9 x,y-1,z

Table S3. Atomic coordinates and equivalent isotropic displacement parameters and bond valence sum (BVS)* calculations for $K_4Zn_3V_4Se_2O_{19}$. *U*(eq) is defined as one third of the trace of the orthogonalized U_{ij} tensor.

Atoms	**x/a**	**y/b**	**z/c**	**U(eq)**	**BVS**
K(1)	4293(1)	6748(1)	4197(1)	22(1)	1.151
K(2)	2736(1)	13152(2)	2775(1)	31(1)	1.055
Zn(1)	9149(1)	5339(1)	6580(1)	17(1)	1.975
Zn(2)	5000	3349(1)	2500	19(1)	1.970
V(4)	6120(1)	5886(1)	3807(1)	17(1)	5.082
V(1A)	7562(1)	4033(3)	5262(2)	17(1)	5.056
V(1B)	7624(1)	4643(2)	4937(2)	16(1)	4.806
Se(1)	4387(1)	10923(1)	3896(1)	16(1)	4.046
O(1)	5310(2)	11127(4)	4165(3)	21(1)	1.980
O(2)	5818(2)	7633(4)	4034(3)	26(1)	2.103
O(3)	4335(2)	9371(4)	3107(3)	23(1)	1.988
O(4)	4167(2)	12322(4)	2986(3)	24(1)	2.046
O(5)	5388(2)	4712(4)	3666(3)	27(1)	1.882
O(6)	6747(2)	5173(4)	4977(3)	26(1)	2.032
O(7)	8099(2)	4753(5)	6229(3)	26(1)	1.742
O(8)	6534(2)	5856(5)	2754(3)	32(1)	1.910
O(9A)	7745(5)	2828(11)	4346(8)	0(2)	1.850
O(9B)	7952(4)	5834(9)	4178(7)	30(2)	1.893
O(9C)	7978(5)	3799(11)	4242(8)	0(2)	1.886

(BVS)*：The bond valence sums were calculated using the formula $V_i=\sum S_{ij}=\sum\exp[(r_0-r_{ij})/B]$, where S_{ij} is the bond valence associated with bond length r_{ij}, and r_0 and B (usually 0.37) are empirically determined parameters.[1]

Table S4. The selected bond lengths and angles of $K_4Zn_3V_4Se_2O_{19}$.

K(1)-O(3)	2.708(4)	V(1A)-O(9A)	1.651(10)
K(1)-O(1)#1	2.825(4)	V(1A)-O(6)	1.807(4)
K(1)-O(8)#2	2.838(4)	V(1A)-O(9A)#12	1.831(11)
K(1)-O(5)	2.865(4)	V(1A)-O(9B)	2.293(8)
K(1)-O(6)#3	2.879(4)	V(1B)-O(9C)	1.394(10)
K(1)-O(2)	2.968(4)	V(1B)-O(9B)	1.609(8)
K(1)-O(5)#3	2.997(4)	V(1B)-O(6)	1.698(4)
K(1)-O(9C)#4	3.041(10)	V(1B)-O(7)	1.755(4)
K(1)-O(9A)#4	3.052(10)	V(1B)-O(9A)	1.799(10)
K(2)-O(9B)#4	2.710(8)	Se(1)-O(3)	1.695(4)
K(2)-O(4)	2.723(4)	Se(1)-O(1)	1.703(3)
K(2)-O(9A)#5	2.740(10)	Se(1)-O(4)	1.704(4)
K(2)-O(9C)#5	2.778(10)	Zn(1)-O(1)#8	1.965(4)
K(2)-O(7)#1	2.830(4)	K(1)-O(1)#1	2.825(4)
K(2)-O(8)#5	2.872(4)	Zn(1)-O(2)#8	1.958(4)
K(2)-O(8)#4	3.008(5)	Zn(1)-O(3)#6	1.947(4)
K(2)-O(6)#1	3.245(4)	Zn(2)-O(4)#13	1.966(4)
K(2)-O(7)#6	3.363(4)	K(1)-O(5)#3	2.997(4)
Zn(1)-O(3)#7	1.947(4)	K(1)-O(6)#3	2.879(4)
Zn(1)-O(2)#8	1.958(4)	K(2)-O(6)#1	3.245(4)
Zn(1)-O(1)#8	1.965(4)	K(2)-O(7)#1	2.830(4)
Zn(1)-O(7)	1.997(4)	K(2)-O(7)#7	3.363(4)
Zn(2)-O(5)	1.966(4)	K(1)-O(8)#2	2.838(4)
Zn(2)-O(5)#2	1.966(4)	K(2)-O(8)#10	2.872(4)
Zn(2)-O(4)#9	1.966(4)	K(2)-O(8)#11	3.008(5)
Zn(2)-O(4)#10	1.966(4)	V(1A)-O(9A)#12	1.831(11)
V(4)-O(8)	1.643(4)	K(2)-O(9A)#10	2.740(10)
V(4)-O(2)	1.680(4)	K(1)-O(9A)#11	3.052(10)
V(4)-O(5)	1.695(4)	K(2)-O(9B)#11	2.710(8)

V(4)-O(6)	1.862(4)	K(2)-O(9C)#10	2.778(10)
V(1A)-O(7)	1.599(4)	K(1)-O(9C)#11	3.041(10)
V(1A)-O(9C)	1.620(10)	O(9A)#5-K(2)-O(6)#1	158.9(2)
O(3)-K(1)-O(1)#1	77.85(11)	O(9C)#5-K(2)-O(6)#1	139.9(2)
O(3)-K(1)-O(8)#2	80.69(12)	O(7)#1-K(2)-O(6)#1	54.18(10)
O(1)#1-K(1)-O(8)#2	151.97(12)	O(8)#5-K(2)-O(6)#1	75.04(11)
O(3)-K(1)-O(5)	109.83(12)	O(8)#4-K(2)-O(6)#1	115.89(11)
O(1)#1-K(1)-O(5)	118.37(11)	O(9B)#4-K(2)-O(7)#6	77.9(2)
O(8)#2-K(1)-O(5)	85.83(12)	O(4)-K(2)-O(7)#6	65.01(11)
O(3)-K(1)-O(6)#3	139.73(12)	O(9A)#5-K(2)-O(7)#6	53.4(2)
O(1)#1-K(1)-O(6)#3	103.59(12)	O(9C)#5-K(2)-O(7)#6	73.8(2)
O(8)#2-K(1)-O(6)#3	81.66(12)	O(7)#1-K(2)-O(7)#6	158.66(7)
O(5)-K(1)-O(6)#3	104.61(12)	O(8)#5-K(2)-O(7)#6	110.69(12)
O(3)-K(1)-O(2)	68.85(11)	O(8)#4-K(2)-O(7)#6	72.12(11)
O(1)#1-K(1)-O(2)	74.33(11)	O(6)#1-K(2)-O(7)#6	143.89(10)
O(8)#2-K(1)-O(2)	114.06(12)	O(3)#7-Zn(1)-O(2)#8	105.63(15)
O(5)-K(1)-O(2)	55.54(11)	O(3)#7-Zn(1)-O(1)#8	122.91(16)
O(6)#3-K(1)-O(2)	151.08(11)	O(2)#8-Zn(1)-O(1)#8	111.08(16)
O(3)-K(1)-O(5)#3	144.96(11)	O(3)#7-Zn(1)-O(7)	106.41(17)
O(1)#1-K(1)-O(5)#3	67.40(11)	O(2)#8-Zn(1)-O(7)	103.48(17)
O(8)#2-K(1)-O(5)#3	133.58(12)	O(1)#8-Zn(1)-O(7)	105.65(16)
O(5)-K(1)-O(5)#3	83.94(12)	O(5)-Zn(2)-O(5)#2	104.5(2)
O(6)#3-K(1)-O(5)#3	57.76(11)	O(5)-Zn(2)-O(4)#9	105.04(17)
O(2)-K(1)-O(5)#3	96.57(11)	O(5)#2-Zn(2)-O(4)#9	107.71(16)
O(3)-K(1)-O(9C)#4	65.5(2)	O(5)-Zn(2)-O(4)#10	107.71(16)
O(1)#1-K(1)-O(9C)#4	73.3(2)	O(5)#2-Zn(2)-O(4)#10	105.04(17)
O(8)#2-K(1)-O(9C)#4	81.5(2)	O(4)#9-Zn(2)-O(4)#10	125.2(2)
O(5)-K(1)-O(9C)#4	167.0(2)	O(8)-V(4)-O(2)	111.3(2)
O(6)#3-K(1)-O(9C)#4	76.3(2)	O(8)-V(4)-O(5)	111.4(2)

O(2)-K(1)-O(9C)#4	128.1(2)	O(2)-V(4)-O(5)	107.4(2)
O(5)#3-K(1)-O(9C)#4	106.9(2)	O(8)-V(4)-O(6)	109.9(2)
O(3)-K(1)-O(9A)#4	82.2(2)	O(2)-V(4)-O(6)	110.81(19)
O(1)#1-K(1)-O(9A)#4	83.8(2)	O(5)-V(4)-O(6)	105.88(19)
O(8)#2-K(1)-O(9A)#4	75.6(2)	O(7)-V(1A)-O(9C)	110.9(4)
O(5)-K(1)-O(9A)#4	156.1(2)	O(7)-V(1A)-O(9A)	129.3(4)
O(6)#3-K(1)-O(9A)#4	58.4(2)	O(9C)-V(1A)-O(9A)	34.8(5)
O(2)-K(1)-O(9A)#4	146.5(2)	O(7)-V(1A)-O(6)	109.9(2)
O(5)#3-K(1)-O(9A)#4	98.0(2)	O(9C)-V(1A)-O(6)	113.0(4)
O(9C)#4-K(1)-O(9A)#4	18.5(3)	O(9A)-V(1A)-O(6)	117.9(4)
O(9B)#4-K(2)-O(4)	71.63(18)	O(7)-V(1A)-O(9A)#12	109.1(4)
O(9B)#4-K(2)-O(9A)#5	124.7(3)	O(9C)-V(1A)-O(9A)#12	108.0(5)
O(4)-K(2)-O(9A)#5	103.9(2)	O(9A)-V(1A)-O(9A)#12	73.8(5)
O(9B)#4-K(2)-O(9C)#5	140.6(3)	O(6)-V(1A)-O(9A)#12	105.7(3)
O(4)-K(2)-O(9C)#5	118.1(2)	O(7)-V(1A)-O(9B)	88.6(3)
O(9A)#5-K(2)-O(9C)#5	20.4(3)	O(9C)-V(1A)-O(9B)	51.3(4)
O(9B)#4-K(2)-O(7)#1	103.5(2)	O(9A)-V(1A)-O(9B)	84.5(4)
O(4)-K(2)-O(7)#1	136.01(13)	O(6)-V(1A)-O(9B)	79.7(3)
O(9A)#5-K(2)-O(7)#1	113.1(2)	O(9A)#12-V(1A)-O(9B)	157.6(4)
O(9C)#5-K(2)-O(7)#1	93.7(2)	O(9C)-V(1B)-O(9B)	73.1(5)
O(9B)#4-K(2)-O(8)#5	138.93(19)	O(9C)-V(1B)-O(6)	135.1(5)
O(4)-K(2)-O(8)#5	76.22(12)	O(9B)-V(1B)-O(6)	106.6(3)
O(9A)#5-K(2)-O(8)#5	87.1(2)	O(9C)-V(1B)-O(7)	114.2(5)
O(9C)#5-K(2)-O(8)#5	77.7(2)	O(9B)-V(1B)-O(7)	110.4(3)
O(7)#1-K(2)-O(8)#5	82.55(12)	O(6)-V(1B)-O(7)	107.9(2)
O(9B)#4-K(2)-O(8)#4	62.28(18)	O(9C)-V(1B)-O(9A)	32.6(5)
O(4)-K(2)-O(8)#4	121.87(12)	O(9B)-V(1B)-O(9A)	104.3(5)
O(9A)#5-K(2)-O(8)#4	77.7(2)	O(6)-V(1B)-O(9A)	115.9(4)
O(9C)#5-K(2)-O(8)#4	83.1(2)	O(7)-V(1B)-O(9A)	111.5(4)

O(7)#1-K(2)-O(8)#4	89.50(11)	O(3)-Se(1)-O(1)	99.93(18)
O(8)#5-K(2)-O(8)#4	158.60(9)	O(3)-Se(1)-O(4)	101.12(19)
O(9B)#4-K(2)-O(6)#1	76.3(2)	O(1)-Se(1)-O(4)	101.11(18)
O(4)-K(2)-O(6)#1	83.04(11)		

Symmetry transformations used to generate equivalent atoms:

#1 -x+1,-y+2,-z+1	#2 -x+1,y,-z+1/2	#3 -x+1,-y+1,-z+1
#4 x-1/2,y+1/2,z	#5 -x+1,y+1,-z+1/2	#6 x-1/2,-y+3/2,z-1/2
#7 x+1/2,-y+3/2,z+1/2	#7 x+1/2,-y+3/2,z+1/2	#9 x,y-1,z
#10 -x+1,y-1,-z+1/2	#11 x+1/2,y-1/2,z	#12 -x+3/2,-y+1/2,-z+1
#13 x,y+1,z		

Table S5. Vanadate-selenite. Note the following compounds are all from ICSD and the anionic group is the [$VSeO_x$] group, except for other disordered structures, fluorides, and structures containing crystalline water, all vanadate-selenite are summarized.

No.	Compounds	Dimension	Basic units	Space group	Ref.
1	$Cs(VSeO_5)$	0D	$[VO_5]$	$P2_1$	2
2	$V_2(Se_2O_9)$	0D	$[V_4O_{18}]$	$P2_1/c$	3
3	$(VO)_2(SeO_3)_3$	0D	$[VO_5]$	$P2_1/c$	4
4	$Cu(VO)(SeO_3)_2$	0D	$[V_2O_{10}]$	$P2_1/c$	5
5	$V_2Se_2O_9$	0D	$[VO_5]$	$P2_1/c$	6
6	$Nd_7VO_4Se_8$	0D	$[VSe_2O_2]$	Pbam	7
7	$Sm_7VO_4Se_8$	0D	$[VSe_2O_2]$	Pbam	7
8	$V_2O_3(SeO_4)_2$	0D	$[V_2O_{11}]$	$C2/c$	8
9	$Pb_2V_2Se_2O_{11}$	0D	$[V_4O_{16}]$	$P\bar{1}$	9
10	$Pb_2V_3Se_5O_{18}$	0D	[VO6]	Pnma	9
11	$ScVSe_2O_8$	0D	$[V_2O_{10}]$	$P2_1/c$	10
12	$ScVSe_2O_8$	0D	$[V_2O_7]$	$P2_1/c$	10
13	$Sr_2(VO)_3(SeO_3)_5$	0D	$[VO_6]$	Pnma	11
14	$Ba_3(VO_2)_2(SeO_3)_4$	0D	$[VO_5]$	$P2_1/c$	11
15	$Sr_2(VO_2)_2(SeO_3)_3$	0D	$[VO_5]+[VO_6]$	$P2_1/c$	12
16	$Sr_4(VO_2)_2(SeO_3)_4(Se_2O_5)$	0D	$[VO_5]$	$Fdd2$	12
17	$Pb_4(VO_2)_2(SeO_3)_4(Se_2O_5)$	0D	$[VO_5]$	$Fdd2$	12
18	$(V_2O_3)(SeO_3)_2$	0D	$[V_4O_{18}]$	$P2_1/c$	13
19	$Pb_2(VO)(SeO_3)_3$	0D	$[VO_6]$	$P2_1/c$	13
20	$VOSe_2O_5$	1D	$[VO_6]$	$P4cc$	14
21	$VO(SeO_3)$	1D	$[VO_6]$	$P2_1/c$	15
22	$K(V_2SeO_7)$	1D	$[VO_4]+[VO_6]$	$Pnma$	16
23	$Rb(V_2SeO_7)$	1D	$[VO_4]+[VO_6]$	$Pnma$	17
24	$TlSeVO_5$	1D	$[VO_6]$	$Pna2_1$	18

25	$Th(VO_3)_2(SeO_3)$	1D	$[VO_5]$	*Pbcm*	19
26	$La_5V_3Se_6O_7$	1D	$[VSe_4O_2]$	*Pmmn*	20
27	$La_7VSe_5O_7$	1D	$[VSe_4O_2]$	*Cmcm*	20
28	$La_{13}V_7Se_{16}O_{15}$	1D	$[VSe_4O_2]$ +$[VSe_5O]$	$Cmc2_1$	20
29	$Bi_2V_2Se_4O_{16}$	1D	$[VO_6]$	$P2_1/c$	9
30	$ZnV(Se_2O_7)$	1D	$[VO_5]$ + $[VO_6]$	$P2_1/c$	21
31	$Cd_6V_2Se_5O_{21}$	1D	$[VO_4]$	$P2_1/c$	21
32	$InVSe_2O_8$	1D	$[VO_5]$	*Pm*	22
33	$Co_2V_2Se_2O_{11}$	1D	$[VO_5]$ + $[VO_6]$	$P2_1/m$	23
34	$Eu(VSe_2O_8)$	1D	$[VO_5]$	$P2_1/m$	24
35	$Gd(VSe_2O_8)$	1D	$[VO_6]$	$P2_1/m$	24
36	$Tb(VSe_2O_8)$	1D	$[VO_6]$	$P2_1/m$	24
37	$V_2Se_2O_9$	2D	$[VO_6]$	$P2_1/c$	25
38	$(NH_4)(VO_2)_3(SeO_3)_2$	2D	$[VO_6]$	$P6_3$	26
39	$K(VO_2)_3(SeO_3)_2$	2D	$[VO_6]$	$P6_3$	27
40	$Rb(Se_2V_3O_{12})$	2D	$[VO_6]$	$P6_3$	28
41	$Tl(Se_2V_3O_{12})$	2D	$[VO_6]$	$P6_3$	28
42	$Cs(VO_2)_3(SeO_3)_2$	2D	$[VO_6]$	$P6_3$	29
43	$YVSe_2O_8$	2D	$[VO_6]$	*Abm*2	30
44	$LaVSe_2O$	2D	$[VSe_4O_2]$ +$[VSe_6]$	*C*2/*m*	20
45	$La_5V_3Se_7O_5$	2D	$[VSe_4O_2]$ +$[VSe_6]$	*Pnma*	20
46	$Ba(V_2O_5)(SeO_3)$	2D	$[VO_5]$ + $[VO_6]$	*Pnma*	12
47	$AgV(SeO_5)$	2D	$[VO_4]$	*Pbcm*	31

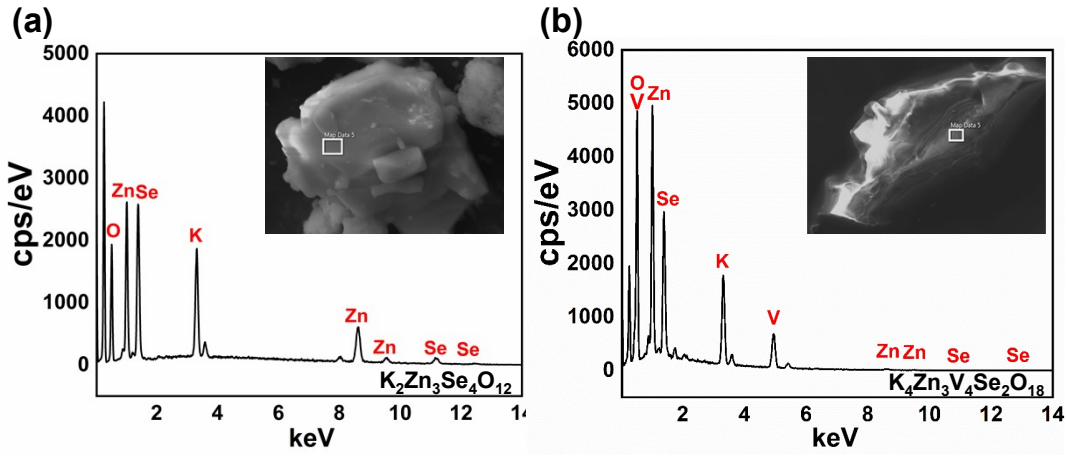

Figure S1. (a) Energy dispersive X-ray spectroscope (EDS) analysis for $K_2Zn_3Se_4O_{12}$. (b) Energy dispersive X-ray spectroscope (EDS) analysis for $K_4Zn_3V_4Se_2O_{19}$.

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