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## **Phase Transition in $\text{K}_3\text{Na}(\text{MoO}_4)_2$ and Determination of the Twinned Structures of $\text{K}_3\text{Na}(\text{MoO}_4)_2$ and $\text{K}_{2.5}\text{Na}_{1.5}(\text{MoO}_4)_2$ at Room Temperature**

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**Material for deposit**

Atomic positional, occupational parameters and anisotropic displacement parameters  $U_{ij}$  ( $\text{\AA}^2$ ) of  $\text{K}_2\text{SiNa}_4\text{S}(\text{MoO}_4)_2$  with e. s. d.'s in parentheses in the standard unit cell. This model has been refined under these assumptions ("of" means the occupational factor):

of[Na(2)]=1.0- of[K(2)]  
of[Na(1)]=1.0- of[K(1)]  
of[Na]=1.5- of[Na(1)] - of[Na(2)]  
of[K] = 1.00 - of[Na]

Temperature parameters of the sodium and potassiums in the same site were supposed to be the same

The temperature factor is defined as  $\text{exp}[-2\pi^2(U_{11} h^2 a^{*2} + U_{22} k^2 b^{*2} + U_{33} l^2 c^{*2} + 2U_{12} hk a^*b^* + 2U_{13} hl a^*c^* + 2U_{23} kl b^*c^*)]$

	occupation	x	y	z	U11	U22	U33	U12	U13	U23
K(1)	0.82(2)	0.1684(6)	0.4766(3)	0.4138(1)	0.053(2)	0.024(1)	0.0305(9)	0.002(1)	0.004(2)	0.0035(5)
Na(1)	0.18(2)	0.1684(6)	0.4766(3)	0.4138(1)	0.053(2)	0.024(1)	0.0305(9)	0.002(1)	0.004(2)	0.0035(5)
K(2)	0.998(20)	0.0(0)	0.9485(5)	0.25(0)	0.077(4)	0.024(1)	0.0248(9)	0.0(0)	0.001(1)	0.0(0)
Na(2)	0.002(20)	0.0(0)	0.9485(5)	0.25(0)	0.077(4)	0.024(1)	0.0248(9)	0.0(0)	0.001(1)	0.0(0)
Na	1.14(2)	0.0(0)	0.0(0)	0.0(0)	0.015(4)	0.013(3)	0.014(3)	-0.000(1)	0.003(4)	0.0032(8)
K	-0.14(2)	0.0(0)	0.0(0)	0.0(0)	0.015(4)	0.013(3)	0.014(3)	-0.000(1)	0.003(4)	0.0032(8)
Mo	1.00	0.1660(1)	0.4767(1)	0.13847(4)	0.0313(8)	0.0124(4)	0.0205(3)	-0.0041(2)	0.0008(7)	0.0022(1)
O(1)	1.00	0.177(2)	0.539(1)	0.2512(5)	0.1(1)	0.055(5)	0.032(3)	-0.10(7)	-0.005(6)	-0.019(3)
O(2)	1.00	0.091(1)	0.694(1)	0.0835(5)	0.068(8)	0.030(4)	0.076(3)	0.009(3)	-0.014(5)	0.10(4)
O(3)	1.00	0.0802(9)	0.232(1)	0.1206(3)	0.068(7)	0.021(3)	0.036(3)	-0.008(3)	-0.008(3)	0.001(2)
O(4)	1.00	0.3198(9)	0.447(2)	0.0895(8)	0.028(4)	0.110(7)	0.047(4)	-0.012(5)	0.022(4)	0.018(6)

The domain fraction factors were refined to the values :

$f_1 = 0.064(2)$  ;  $f_2 = 0.349(2)$  ;  $f_3 = 0.059(1)$  ;  $f_4 = 0.169(2)$  ;  $f_5 = 0.118(1)$  ;  $f_6 = 0.241(2)$   
 $R(\text{observed only})=0.0441$  ;  $wR(\text{observed only})=0.0608$  ;  $R(\text{all})=0.0443$  ;  $Rw(\text{all})=0.0609$  ;  $S = 1.95$

### Material for Deposit

Atomic positional parameters and anisotropic displacement parameters  $U_{ij}$  ( $\text{\AA}^2$  of  $K_3Na(MoO_4)_2$  with e. s. d.'s in parentheses in the standard unit cell (this Table corresponds to Table 3 of the published article)

The temperature factor is defined as  $\text{expl-}2\pi^2(U_{11} h^2 a^{*2} + U_{22} k^2 b^{*2} + U_{33} l^2 c^{*2} + 2U_{12} hk a^*b^* + 2U_{13} hl a^*c^* + 2U_{23} kl b^*c^*)]$

atom	x	y	z	U11	U22	U33	U12	U13	U23
K(1)	0.1711(2)	0.4778(1)	0.41526(7)	0.0220(8)	0.0226(6)	0.0225(4)	0.0003(4)	-0.0018(5)	0.0023(2)
K(2)	0.0(0)	0.9474(3)	0.25(0)	0.032(1)	0.0210(6)	0.0273(5)	0.0(0)	0.0034(7)	0.0(0)
Na	0.0(0)	0.0(0)	0.0(0)	0.009(2)	0.015(2)	0.018(1)	-0.0012(7)	-0.003(1)	0.0013(4)
Mo	0.16278(5)	0.48090(5)	0.13946(2)	0.0098(3)	0.0094(2)	0.0148(2)	-0.0007(1)	-0.0015(2)	0.00046(7)
O(1)	0.1724(6)	0.5498(6)	0.2502(2)	0.059(4)	0.036(2)	0.022(1)	-0.001(3)	-0.003(2)	-0.008(2)
O(2)	0.0822(3)	0.6954(5)	0.0837(2)	0.024(2)	0.020(2)	0.040(1)	0.009(1)	-0.003(2)	0.008(1)
O(3)	0.0806(3)	0.2317(5)	0.1195(2)	0.026(3)	0.015(2)	0.041(2)	-0.007(1)	-0.007(1)	-0.001(1)
O(4)	0.3158(4)	0.4606(6)	0.0910(3)	0.017(2)	0.036(2)	0.043(2)	0.000(2)	0.008(2)	0.004(2)

### Material for Deposit

Atomic positional and occupational parameters and anisotropic displacement parameters  $U_{ij}$  ( $\text{\AA}^2$ ) of  $\text{K}_2.5\text{Na}_{1.5}(\text{MoO}_4)_2$  with e. s. d. 's in parentheses in the standard unit cell (this Table corresponds to Table 4 of the published article)

The temperature factor is defined as  $\text{expl-}2\pi^2(U_{11} h^2 a^{*2} + U_{22} k^2 b^{*2} + U_{33} l^2 c^{*2} + 2U_{12} hk a^*b^* + 2U_{13} hl a^*c^* + 2U_{23} kl b^*c^*)]$

atom	occupancy	x	y	z	U11	U22	U33	U12	U13	U23
K(1)/	0.76(2)/	0.1686(6)	0.4765(3)	0.4137(2)	0.051(2)	0.023(1)	0.0289(8)	0.003(1)	0.005(2)	0.0032(5)
Na(1)	0.24(2)									
K(2)/	0.98(2)/	0.0(0)	0.9487(5)	0.25(0)	0.076(4)	0.023(1)	0.0243(9)	0.0(0)	0.001(1)	0.0(0)
Na(2)	0.02(2)									
Na	1.00	0.0(0)	0.0(0)	0.0(0)	0.021(4)	0.021(3)	0.021(3)	0.000(1)	0.005(4)	0.0034(8)
Mo	1.00	0.1660(1)	0.4767(1)	0.13846(3)	0.0318(8)	0.0125(5)	0.0207(3)	-0.0042(2)	0.0006(7)	0.0022(1)
O(1)	1.00	0.176(2)	0.538(1)	0.2513(5)	0.09(1)	0.056(5)	0.030(3)	-0.008(7)	-0.004(6)	-0.019(3)
O(2)	1.00	0.091(1)	0.695(1)	0.0834(5)	0.069(7)	0.027(4)	0.072(3)	0.007(3)	-0.013(4)	0.008(4)
O(3)	1.00	0.0802(9)	0.232(1)	0.1205(3)	0.075(8)	0.020(3)	0.039(3)	-0.007(3)	-0.005(6)	-0.001(2)
O(4)	1.00	0.3200(9)	0.447(2)	0.0914(8)	0.029(4)	0.113(7)	0.056(5)	-0.006(5)	0.027(4)	0.031(6)

## Material for deposit

Atomic positional parameters of  $K_3Na(MoO_4)_2$  with e.s.d.'s in parentheses expressed in the pseudohexagonal unit cell. (The refinement was carried out under the same conditions as that which resulted in the parameters given in Table 3 of the published article.)

The lines with unlabelled atoms refer to the non-standard space group  $\overline{P}2_1^2$ ; the second and the third lines to the space groups which are obtained by rotation of the symmetry elements in  $\overline{P}2_1^2$  by 120 and 240° about the c axis in an anticlockwise direction, respectively (Tab. 1 of the published article).

atom	x	y	z
K(1)	0.3510(2)	0.6933(2)	0.41526(7)
K(1) <sup>A</sup>	0.3067(2)	0.6578(3)	0.41526(7)
K(1) <sup>B</sup>	0.3422(3)	0.6490(2)	0.41526(7)
K(2)	0.0526(3)	0.0526(3)	0.25
K(2) <sup>A</sup>	-0.0526(3)	0	0.25
K(2) <sup>B</sup>	0	-0.0526(3)	0.25
Na	0	0	0
Na <sup>A</sup>	0	0	0
Na <sup>B</sup>	0	0	0
Mo	0.35632(7)	0.68188(7)	0.13946(2)
Mo <sup>A</sup>	0.31812(7)	0.6744(1)	0.13946(2)
Mo <sup>B</sup>	0.3256(1)	0.64368(7)	0.13946(2)
O(1)	0.2778(8)	0.6226(9)	0.2502(2)
O(1) <sup>A</sup>	0.3774(9)	0.655(1)	0.2502(2)
O(1) <sup>B</sup>	0.345(1)	0.7222(8)	0.2502(2)
O(2)	0.2224(7)	0.3868(5)	0.0837(2)
O(2) <sup>A</sup>	0.6132(5)	0.8355(7)	0.0837(2)
O(2) <sup>B</sup>	0.1645(7)	0.7776(7)	0.0837(2)
O(3)	0.6877(5)	0.8490(6)	0.1195(2)
O(3) <sup>A</sup>	0.1511(6)	0.8387(6)	0.1195(2)
O(3) <sup>B</sup>	0.1613(6)	0.3123(5)	0.1195(2)
O(4)	0.2236(8)	0.8552(7)	0.0910(3)
O(4) <sup>A</sup>	0.1448(7)	0.3685(8)	0.0910(3)
O(4) <sup>B</sup>	0.6315(8)	0.7764(8)	0.0910(3)

## Material for deposit

Atomic positional parameters of  $\text{K}_2.5\text{Na}_{1.5}(\text{MoO}_4)_2$  with e.s.d.'s in parentheses expressed in the pseudohexagonal unit cell. (The refinement was carried out under the same conditions as that which resulted in the parameters given in Table 4 of the published article.)

The lines with unlabelled atoms refer to the non-standard space group  $\overline{\text{P}}2_1^2$ ; the second and the third lines to the space groups which are obtained by rotation of the symmetry elements in  $\overline{\text{P}}2_1^2$  by 120 and 240° about the c axis in an anticlockwise direction, respectively (Tab. 1 of the published article)

atom	x	y	z
K(1) / Na(1)	0.3548(6)	0.6921(6)	0.4137(1)
K(1) <sup>A</sup> / Na(1) <sup>A</sup>	0.3079(7)	0.663(1)	0.4137(1)
K(1) <sup>B</sup> / Na(1) <sup>B</sup>	0.337(1)	0.6452(6)	0.4137(1)
K(2) / Na(2)	0.0513(5)	0.0513(5)	0.25
K(2) <sup>A</sup> / Na(2) <sup>A</sup>	-0.0513(5)	0	0.25
K(2) <sup>B</sup> / Na(2) <sup>B</sup>	0	-0.0513(5)	0.25
Na	0	0	0
Na <sup>A</sup>	0	0	0
Na <sup>B</sup>	0	0	0
Mo	0.3573(2)	0.6893(2)	0.13846(3)
Mo <sup>A</sup>	0.3107(2)	0.6680(3)	0.13846(3)
Mo <sup>B</sup>	0.3320(2)	0.6427(2)	0.13846(3)
O(1)	0.286(2)	0.637(3)	0.2513(5)
O(1) <sup>A</sup>	0.363(3)	0.648(5)	0.2513(5)
O(1) <sup>B</sup>	0.352(4)	0.714(2)	0.2513(5)
O(2)	0.214(2)	0.396(1)	0.0834(5)
O(2) <sup>A</sup>	0.604(1)	0.818(2)	0.0834(5)
O(2) <sup>B</sup>	0.182(2)	0.786(2)	0.0834(5)
O(3)	0.688(1)	0.848(2)	0.1205(3)
O(3) <sup>A</sup>	0.151(2)	0.840(2)	0.1205(3)
O(3) <sup>B</sup>	0.160(2)	0.312(1)	0.1205(3)
O(4)	0.233(2)	0.873(2)	0.0914(8)
O(4) <sup>A</sup>	0.127(2)	0.360(2)	0.0914(8)
O(4) <sup>B</sup>	0.640(2)	0.767(2)	0.0914(8)

H	K	L	FO	FC	SIG	H	K	L	FO	FC	SIG	H	K	L	FO	FC	SIG
2	0	0	684.9	659.5	20.8	0	-6	1	328.2	316.4	10.0	5	1	1	145.9	139.9	4.6
4	0	0	920.8	889.2	27.7	2	-6	1	144.1	142.1	4.7	7	1	1	218.6	202.0	6.8
6	0	0	1605.9	1589.0	48.5	4	-6	1	116.7	118.7	3.9	9	1	1	441.3	419.7	13.4
8	0	0	424.6	428.7	12.9	6	-6	1	325.5	322.4	10.0	11	1	1	203.6	216.4	6.6
10	0	0	204.0	214.4	6.5	-9	-5	1	372.7	378.8	11.4	-12	2	1	294.6	308.3	9.2
12	0	0	483.2	491.3	14.7	-7	-5	1	202.8	209.4	6.4	-10	2	1	170.0	167.2	5.6
-11	1	0	213.5	219.6	6.8	-5	-5	1	97.0	97.7	3.2	-8	2	1	133.0	143.7	4.4
-9	1	0	863.5	865.5	26.0	-3	-5	1	380.5	371.0	11.5	-6	2	1	519.3	528.7	15.7
-7	1	0	366.8	375.6	11.1	-1	-5	1	222.6	218.4	6.9	-4	2	1	105.5	111.2	3.5
-5	1	0	347.2	365.5	10.5	1	-5	1	143.7	135.5	4.6	-2	2	1	126.7	125.2	4.0
-3	1	0	2200.2	2103.8	66.2	3	-5	1	370.5	362.4	11.2	0	2	1	271.7	259.1	8.2
-1	1	0	637.0	662.2	19.3	5	-5	1	128.9	131.7	4.3	2	2	1	106.0	97.1	3.4
1	1	0	689.7	660.3	20.8	7	-5	1	118.0	119.8	4.0	4	2	1	206.3	205.3	6.3
3	1	0	2379.3	2093.7	71.5	9	-5	1	282.2	283.4	8.7	6	2	1	630.3	598.4	19.0
5	1	0	376.6	378.9	11.4	-10	-4	1	175.5	178.6	5.7	8	2	1	268.9	261.0	8.3
7	1	0	373.2	367.0	11.3	-8	-4	1	116.7	109.0	3.9	10	2	1	122.5	109.5	4.1
9	1	0	902.1	870.4	27.2	-6	-4	1	421.8	408.7	12.8	12	2	1	379.9	387.5	11.7
11	1	0	226.0	222.7	7.2	-4	-4	1	119.9	110.1	4.0	-11	3	1	90.5	95.0	3.2
-12	2	0	421.5	419.3	12.9	-2	-4	1	181.6	181.6	5.6	-9	3	1	334.5	337.0	10.2
-10	2	0	242.2	241.3	7.6	0	-4	1	512.7	498.3	15.4	-7	3	1	225.8	227.4	7.0
-8	2	0	322.1	338.5	9.8	2	-4	1	193.6	192.5	6.0	-5	3	1	174.7	179.1	5.5
-6	2	0	1579.3	1613.7	47.7	4	-4	1	68.2	68.6	2.3	-3	3	1	415.5	396.2	12.5
-4	2	0	343.4	366.8	10.4	6	-4	1	380.6	379.7	11.5	-1	3	1	109.6	110.8	3.5
-2	2	0	842.8	865.3	25.5	8	-4	1	155.1	153.2	5.1	1	3	1	178.3	168.0	5.5
0	2	0	2358.2	2107.9	70.9	10	-4	1	95.2	88.8	3.2	3	3	1	417.9	395.5	12.6
2	2	0	908.5	882.4	27.5	-11	-3	1	114.6	110.1	3.8	5	3	1	234.9	222.0	7.2
4	2	0	379.3	379.3	11.4	-9	-3	1	405.2	390.4	12.3	7	3	1	175.5	163.9	5.6
6	2	0	1669.0	1593.4	50.4	-7	-3	1	270.3	257.4	8.3	9	3	1	404.2	392.5	12.3
8	2	0	342.9	348.1	10.4	-5	-3	1	213.3	201.8	6.6	11	3	1	180.8	180.4	6.0
10	2	0	245.7	247.1	7.7	-3	-3	1	486.8	451.1	14.7	-10	4	1	149.8	157.5	5.0
12	2	0	421.7	406.4	12.9	-1	-3	1	122.5	118.4	3.9	-8	4	1	85.0	86.9	2.9
-11	3	0	183.1	176.5	6.0	1	-3	1	166.9	161.0	5.1	-6	4	1	342.1	346.9	10.4
-9	3	0	687.7	684.5	20.7	3	-3	1	351.0	341.9	10.6	-4	4	1	101.6	97.4	3.4
-7	3	0	318.3	335.2	9.7	5	-3	1	194.5	197.2	6.0	-2	4	1	169.1	172.5	5.3
-5	3	0	342.1	358.4	10.4	7	-3	1	138.3	135.0	4.5	0	4	1	505.3	498.2	15.2
-3	3	0	1611.3	1591.2	48.6	9	-3	1	344.0	340.9	10.5	2	4	1	201.9	205.9	6.2
-1	3	0	357.7	361.3	10.8	11	-3	1	160.8	163.2	5.4	4	4	1	86.4	80.7	2.9
1	3	0	362.5	360.4	10.9	-12	-2	1	347.5	342.8	10.7	6	4	1	451.6	442.6	13.6
3	3	0	1690.1	1589.6	50.9	-10	-2	1	180.4	181.3	5.9	8	4	1	174.5	176.5	5.6
5	3	0	369.9	362.0	11.2	-8	-2	1	174.2	164.7	5.6	10	4	1	113.7	109.1	3.8
7	3	0	344.5	347.2	10.5	-6	-2	1	624.6	598.3	18.8	-9	5	1	305.5	323.5	9.4
9	3	0	697.7	663.9	21.0	-4	-2	1	136.7	138.6	4.3	-7	5	1	167.5	181.1	5.4
11	3	0	180.7	186.5	6.0	-2	-2	1	144.8	141.3	4.5	-5	5	1	82.0	81.8	2.8
-10	4	0	178.4	167.2	5.8	0	-2	1	278.7	261.9	8.4	-3	5	1	340.5	337.0	10.3
-8	4	0	229.6	238.9	7.2	2	-2	1	85.0	81.9	2.8	-1	5	1	215.8	210.8	6.7
-6	4	0	878.6	874.1	26.4	4	-2	1	170.3	176.9	5.3	1	5	1	145.7	143.3	4.7
-4	4	0	449.1	441.8	13.6	6	-2	1	521.6	528.8	15.7	3	5	1	404.9	395.6	12.3
-2	4	0	356.9	361.9	10.8	8	-2	1	237.5	238.4	7.3	5	5	1	144.5	148.5	4.7
0	4	0	1653.6	1621.7	49.9	10	-2	1	104.5	96.8	3.5	7	5	1	140.4	146.8	4.7
2	4	0	372.2	374.2	11.2	12	-2	1	346.5	353.4	10.7	9	5	1	324.1	337.9	9.9
4	4	0	451.1	432.5	13.6	-11	-1	1	139.9	148.3	4.7	-6	6	1	320.4	337.3	9.8
6	4	0	917.0	872.8	27.6	-9	-1	1	474.6	454.5	14.4	-4	6	1	169.8	170.7	5.5
8	4	0	244.3	246.4	7.6	-7	-1	1	242.6	229.4	7.5	-2	6	1	92.4	88.4	3.1
10	4	0	185.1	184.1	6.0	-5	-1	1	205.1	208.4	6.3	0	6	1	322.1	314.7	9.8
-9	5	0	442.6	425.2	13.4	-3	-1	1	332.5	321.9	10.0	2	6	1	150.6	151.6	4.9
-7	5	0	214.7	200.7	6.7	-1	-1	1	102.7	96.4	3.2	4	6	1	129.9	132.2	4.3
-5	5	0	200.9	199.7	6.3	1	-1	1	76.3	79.9	2.5	6	6	1	363.4	370.6	11.1
-3	5	0	898.9	872.2	27.0	3	-1	1	275.9	283.2	8.3	-3	7	1	295.7	305.0	9.1
-1	5	0	325.1	331.2	9.9	5	-1	1	116.5	120.3	3.8	-1	7	1	143.0	144.3	4.7
1	5	0	331.0	333.6	10.0	7	-1	1	185.2	188.2	5.8	1	7	1	97.9	95.8	3.3
3	5	0	902.8	866.0	27.1	9	-1	1	400.1	391.8	12.2	3	7	1	287.2	290.4	8.8
5	5	0	208.9	210.3	6.5	11	-1	1	191.1	201.9	6.2	-3	-7	2	74.3	73.4	2.8
7	5	0	224.8	217.6	7.0	-12	0	1	393.6	386.9	12.0	-1	-7	2	283.1	272.3	8.7
9	5	0	432.6	408.1	13.1	-10	0	1	162.1	158.1	5.4	1	-7	2	219.3	212.4	6.9
-6	6	0	546.3	516.7	16.5	-8	0	1	84.0	82.3	2.9	3	-7	2	42.4	53.8	2.8
-4	6	0	214.8	199.3	6.7	-6	0	1	435.6	410.2	13.2	-6	-6	2	94.5	81.2	3.2
-2	6	0	239.4	236.5	7.4	-4	0	1	113.4	98.2	3.8	-4	-6	2	322.2	312.2	9.8
0	6	0	717.5	692.6	21.6	-2	0	1	99.8	95.9	3.3	-2	-6	2	254.4	248.9	7.8
2	6	0	240.6	238.2	7.4	2	0	1	101.9	101.2	3.3	0	-6	2	61.5	59.2	2.4
4	6	0	220.3	213.1	6.9	4	0	1	151.4	150.2	4.8	2	-6	2	307.6	303.5	9.4
6	6	0	528.8	498.6	16.0	6	0	1	497.2	475.5	15.0	4	-6	2	248.8	249.1	7.7
-3	7	0	452.9	430.1	13.7	8	0	1	121.2	116.9	4.1	6	-6	2	48.7	55.9	2.6
-1	7	0	185.5	162.8	5.9	10	0	1	110.9	98.1	3.7	-9	-5	2	78.6	85.4	2.9
1	7	0	179.8	169.6	5.8	12	0	1	372.7	404.8	11.4	-7	-5	2	343.7	320.5	10.5
3	7	0	447.5	426.0	13.6	-11	1	1	122.9	134.8	4.1	-5	-5	2	317.2	299.7	9.7
-3	-7	1	325.4	326.5	10.0	-9	1	1	439.7	424.3	13.3	-3	-5	2	75.6	68.3	2.5
-1	-7	1	148.6	148.4	4.9	-7	1	1	220.2	218.1	6.8	-1	-5	2	474.4	467.7	14.3
1	-7	1	94.1	90.9	3.2	-5	1	1	193.7	186.7	6.0	1	-5	2	427.2	432.2	12.9
3	-7	1	269.2	270.0	8.3	-3	1	1	280.9	276.7	8.5	3	-5	2	63.0	56.3	2.3
-6	-6	1	376.2	385.8	11.5	-1	1	1	88.3	84.4	2.8	5	-5	2	395.8	388.6	12.0
-4	-6	1	187.6	184.8	5.9	1	1	1	91.8	91.9	2.9	7	-5	2	239.4	249.6	7.4
-2	-6	1	101.8	97.7	3.4	3	1	1	343.5	325.4	10.4	9	-5	2	57.8	53.0	2.7

H	K	L	FO	FC	SIG	H	K	L	FO	FC	SIG	H	K	L	FO	FC	SIG
-10	-4	2	288.4	276.4	8.9	6	2	2	58.0	56.7	2.2	-7	-3	3	334.7	331.3	10.2
-8	-4	2	245.0	238.0	7.6	8	2	2	485.8	460.6	14.7	-5	-3	3	560.2	537.0	16.9
-6	-4	2	76.3	78.8	2.6	10	2	2	257.5	241.9	8.0	-3	-3	3	205.9	188.8	6.3
-4	-4	2	379.8	360.0	11.5	12	2	2	92.2	85.9	3.4	-1	-3	3	257.6	250.2	7.8
-2	-4	2	568.4	547.8	17.1	-11	3	2	188.6	198.0	6.2	1	-3	3	389.9	390.4	11.8
0	-4	2	95.7	67.6	3.2	-9	3	2	54.5	62.6	2.6	3	-3	3	232.0	230.6	7.1
2	-4	2	603.8	605.6	18.2	-7	3	2	454.7	477.6	13.8	5	-3	3	249.9	249.9	7.6
4	-4	2	312.3	311.5	9.5	-5	3	2	540.9	549.6	16.3	7	-3	3	485.8	502.4	14.7
6	-4	2	56.4	54.0	2.2	-3	3	2	162.2	175.8	5.0	9	-3	3	182.5	182.1	5.8
8	-4	2	302.6	306.4	9.3	-1	3	2	764.8	779.3	23.0	11	-3	3	196.1	194.1	6.3
10	-4	2	197.9	208.8	6.3	1	3	2	668.9	658.5	20.1	-12	-2	3	249.3	256.3	7.9
-11	-3	2	205.9	195.3	6.6	3	3	2	105.3	95.1	3.5	-10	-2	3	274.7	273.6	8.5
-9	-3	2	68.3	71.1	2.6	5	3	2	647.4	623.0	19.5	-8	-2	3	589.3	577.9	17.8
-7	-3	2	483.0	464.2	14.6	7	3	2	430.6	408.8	13.0	-6	-2	3	473.1	466.8	14.3
-5	-3	2	574.8	552.7	17.3	9	3	2	72.5	71.4	2.7	-4	-2	3	287.9	276.3	8.7
-3	-3	2	163.2	160.5	5.1	11	3	2	285.1	274.5	8.9	-2	-2	3	589.2	564.2	17.7
-1	-3	2	784.8	772.7	23.6	-10	4	2	272.9	280.1	8.5	0	-2	3	172.8	167.3	5.3
1	-3	2	650.0	660.4	19.5	-8	4	2	225.2	229.9	7.0	2	-2	3	333.9	333.5	10.1
3	-3	2	98.0	107.5	3.3	-6	4	2	61.2	71.1	2.4	4	-2	3	389.3	412.1	11.7
5	-3	2	584.1	613.7	17.6	-4	4	2	357.7	359.4	10.8	6	-2	3	389.7	413.2	11.8
7	-3	2	408.2	427.7	12.4	-2	4	2	555.7	550.9	16.7	8	-2	3	265.5	276.5	8.2
9	-3	2	72.7	63.0	2.7	0	4	2	62.4	68.3	2.2	10	-2	3	433.7	442.4	13.2
11	-3	2	272.1	273.0	8.5	2	4	2	615.3	603.4	18.5	12	-2	3	208.4	205.4	6.7
-12	-2	2	59.1	56.9	3.0	4	4	2	328.7	304.3	10.0	-11	-1	3	437.0	421.7	13.3
-10	-2	2	335.0	324.8	10.3	6	4	2	62.8	57.4	2.3	-9	-1	3	253.1	244.6	7.9
-8	-2	2	419.6	403.6	12.7	8	4	2	326.9	319.1	10.0	-7	-1	3	333.5	312.2	10.2
-6	-2	2	50.8	58.0	2.1	10	4	2	208.5	198.6	6.6	-5	-1	3	494.0	478.5	14.9
-4	-2	2	796.2	760.7	23.9	-9	5	2	71.0	78.1	2.8	-3	-1	3	178.2	184.7	5.5
-2	-2	2	286.1	297.3	8.6	-7	5	2	312.1	325.5	9.6	-1	-1	3	195.4	189.4	5.9
0	-2	2	362.6	350.2	10.9	-5	5	2	305.4	293.1	9.3	1	-1	3	263.0	274.4	7.9
2	-2	2	207.4	237.7	6.3	-3	5	2	62.5	66.0	2.3	3	-1	3	158.2	175.2	4.9
4	-2	2	593.0	651.4	17.8	-1	5	2	470.2	477.4	14.2	5	-1	3	225.5	245.5	6.9
6	-2	2	88.3	64.2	3.0	1	5	2	430.3	420.6	13.0	7	-1	3	522.4	527.1	15.8
8	-2	2	441.8	464.2	13.4	3	5	2	61.7	57.6	2.3	9	-1	3	228.2	229.5	7.1
10	-2	2	238.2	247.2	7.4	5	5	2	415.6	396.8	12.6	11	-1	3	245.2	232.8	7.7
12	-2	2	89.0	79.0	3.2	7	5	2	249.0	239.4	7.7	-12	0	3	287.1	290.8	8.9
-11	-1	2	231.1	232.5	7.3	9	5	2	55.8	57.7	2.7	-10	0	3	220.6	233.8	6.9
-9	-1	2	57.2	57.1	2.6	-6	6	2	74.4	76.5	2.8	-8	0	3	615.6	565.8	18.6
-7	-1	2	640.1	622.5	19.3	-4	6	2	310.6	322.5	9.5	-6	0	3	306.9	276.8	9.4
-5	-1	2	657.7	635.5	19.8	-2	6	2	241.8	235.7	7.5	-4	0	3	430.3	400.0	13.0
-3	-1	2	363.3	339.8	11.0	0	6	2	55.0	59.0	2.3	-2	0	3	361.9	329.3	10.9
-1	-1	2	1084.7	1073.2	32.7	2	6	2	312.6	315.7	9.5	2	0	3	168.1	188.0	5.1
1	-1	2	1000.8	1084.0	30.2	4	6	2	244.9	234.2	7.6	4	0	3	582.3	599.6	17.5
3	-1	2	316.4	344.2	9.5	6	6	2	59.5	57.5	2.6	6	0	3	206.0	192.1	6.4
5	-1	2	713.8	765.3	21.5	-3	7	2	64.7	73.0	2.7	8	0	3	351.0	318.4	10.7
7	-1	2	523.4	544.8	15.8	-1	7	2	276.5	277.6	8.5	10	0	3	400.5	424.2	12.2
9	-1	2	76.0	74.7	2.7	1	7	2	217.4	205.0	6.8	12	0	3	263.9	272.3	8.3
11	-1	2	305.0	311.7	9.4	3	7	2	50.2	53.2	2.7	-11	1	3	416.7	400.3	12.7
-12	0	2	53.3	55.4	3.0	-3	-7	3	192.6	192.8	6.2	-9	1	3	231.6	228.3	7.2
-10	0	2	415.8	401.9	12.6	-1	-7	3	192.5	194.6	6.1	-7	1	3	260.1	282.0	8.0
-8	0	2	306.5	296.8	9.4	1	-7	3	290.7	292.8	8.9	-5	1	3	491.8	449.7	14.8
-6	0	2	114.4	97.7	3.8	3	-7	3	195.3	200.5	6.2	-3	1	3	168.5	169.0	5.2
-4	0	2	253.9	265.0	7.7	-6	-6	3	262.1	261.1	8.1	-1	1	3	165.7	156.8	5.1
-2	0	2	1149.3	1077.4	34.7	-4	-6	3	233.3	233.7	7.2	1	1	3	291.8	308.9	8.8
0	0	2	142.9	138.1	4.4	-2	-6	3	409.9	401.3	12.4	3	1	3	198.6	188.1	6.1
2	0	2	953.7	1071.3	28.8	0	-6	3	172.8	168.3	5.5	5	1	3	322.2	273.8	9.8
4	0	2	274.9	300.5	8.3	2	-6	3	221.8	221.0	6.9	7	1	3	582.1	557.8	17.6
6	0	2	153.3	149.0	4.9	4	-6	3	330.4	335.9	10.1	9	1	3	261.3	251.4	8.1
8	0	2	382.1	364.0	11.6	6	-6	3	239.2	242.3	7.5	11	1	3	280.0	253.6	8.7
10	0	2	309.2	299.9	9.5	-9	-5	3	227.4	228.9	7.2	-12	2	3	227.9	232.6	7.3
12	0	2	94.1	84.9	3.4	-7	-5	3	248.9	254.1	7.7	-10	2	3	211.8	235.7	6.7
-11	1	2	215.8	227.7	6.9	-5	-5	3	402.8	397.6	12.2	-8	2	3	554.4	523.1	16.7
-9	1	2	91.9	55.0	3.1	-3	-5	3	223.3	213.0	6.9	-6	2	3	417.5	417.1	12.6
-7	1	2	623.1	611.0	18.8	-1	-5	3	288.3	282.7	8.8	-4	2	3	225.7	227.5	6.9
-5	1	2	648.9	652.1	19.5	1	-5	3	469.9	461.0	14.2	-2	2	3	534.4	499.6	16.1
-3	1	2	363.0	351.1	11.0	3	-5	3	197.5	197.3	6.2	0	2	3	166.6	164.8	5.1
-1	1	2	1080.0	1078.0	32.6	5	-5	3	192.8	195.0	6.1	2	2	3	387.9	394.8	11.7
1	1	2	1054.4	1079.3	31.8	7	-5	3	337.6	352.3	10.3	4	2	3	495.9	464.6	14.9
3	1	2	384.1	335.5	11.6	9	-5	3	198.3	212.4	6.4	6	2	3	490.0	464.7	14.8
5	1	2	807.4	755.1	24.3	-10	-4	3	223.6	231.0	7.1	8	2	3	367.5	330.2	11.2
7	1	2	579.8	551.0	17.5	-8	-4	3	474.6	469.9	14.4	10	2	3	492.8	481.4	14.9
9	1	2	78.7	80.2	2.9	-6	-4	3	250.1	248.3	7.7	12	2	3	231.4	230.8	7.4
11	1	2	310.6	317.0	9.6	-4	-4	3	326.9	321.3	9.9	-11	3	3	334.6	333.4	10.3
-12	2	2	49.2	51.6	3.2	-2	-4	3	503.3	482.7	15.2	-9	3	3	185.8	182.6	6.0
-10	2	2	320.8	324.4	9.9	0	-4	3	388.7	392.3	11.7	-7	3	3	255.6	265.4	7.9
-8	2	2	397.6	410.9	12.1	2	-4	3	263.6	253.0	8.0	-5	3	3	484.1	469.8	14.6
-6	2	2	51.5	66.0	2.3	4	-4	3	464.8	471.4	14.0	-3	3	3	175.3	160.1	5.4
-4	2	2	758.8	777.5	22.8	6	-4	3	194.1	201.0	6.1	-1	3	3	236.4	229.6	7.2
-2	2	2	271.5	284.7	8.2	8	-4	3	215.7	217.0	6.7	1	3	3	409.2	414.4	12.3
0	2	2	358.6	352.9	10.8	10	-4	3	307.8	322.9	9.5	3	3	3	274.6	260.7	8.3
2	2	2	238.8	256.1	7.2	-11	-3	3	370.5	373.9	11.3	5	3	3	330.0	314.7	10.0
4	2	2	679.0	632.8	20.4	-9	-3	3	216.6	213.5	6.8	7	3	3	589.0	570.5	17.8













H	K	L	FO	FC	SIG
2	-4	15	220.7	236.8	7.0
-5	-3	15	177.9	176.4	5.8
-3	-3	15	70.8	76.3	2.8
-1	-3	15	231.4	231.1	7.2
1	-3	15	132.7	131.1	4.5
3	-3	15	47.1	48.3	2.5
5	-3	15	232.9	256.1	7.3
-6	-2	15	107.0	106.6	3.6
-4	-2	15	265.7	267.4	8.3
-2	-2	15	131.0	128.9	4.4
0	-2	15	45.5	44.5	2.5
2	-2	15	184.2	193.5	5.9
4	-2	15	132.7	128.5	4.4
6	-2	15	90.6	95.9	3.1
-7	-1	15	301.7	300.4	9.4
-5	-1	15	167.7	156.9	5.6
-3	-1	15	56.1	59.6	2.7
-1	-1	15	73.8	78.5	3.0
1	-1	15	67.0	62.8	2.6
3	-1	15	54.2	48.9	2.4
5	-1	15	240.5	252.4	7.5
7	-1	15	141.7	153.9	4.7
-6	0	15	60.3	57.9	2.8
-4	0	15	246.7	232.3	7.7
-2	0	15	76.8	75.4	3.0
2	0	15	76.1	82.5	2.9
4	0	15	137.7	127.1	4.5
6	0	15	73.6	81.0	2.7
-7	1	15	291.8	275.6	9.1
-5	1	15	146.8	137.6	4.9
-3	1	15	58.6	49.8	2.7
-1	1	15	91.0	68.7	3.3
1	1	15	81.5	72.4	3.0
3	1	15	63.9	59.1	2.8
5	1	15	281.6	273.1	8.7
7	1	15	154.7	176.8	5.2
-6	2	15	102.9	95.0	3.5
-4	2	15	271.6	236.6	8.4
-2	2	15	106.5	106.0	3.6
0	2	15	48.6	44.9	3.0
2	2	15	232.5	217.7	7.4
4	2	15	179.4	157.4	5.9
6	2	15	116.2	107.1	3.9
-5	3	15	144.7	140.3	4.8
-3	3	15	69.2	67.5	2.9
-1	3	15	245.1	220.7	7.7
1	3	15	137.5	140.5	4.6
3	3	15	55.9	56.8	3.0
5	3	15	263.3	293.7	8.3
-2	4	15	137.1	143.2	4.7
0	4	15	91.5	90.3	3.3
2	4	15	238.3	249.9	7.6
-3	-3	16	99.3	106.6	3.3
-1	-3	16	341.5	351.3	10.5
1	-3	16	261.8	273.6	8.1
3	-3	16	112.5	119.6	3.8
-4	-2	16	348.2	345.8	10.7
-2	-2	16	298.4	304.4	9.2
0	-2	16	183.0	187.8	5.9
2	-2	16	391.2	405.0	11.9
4	-2	16	255.3	276.1	7.9
-5	-1	16	278.3	267.8	8.7
-3	-1	16	171.7	168.9	5.6
-1	-1	16	461.2	460.9	14.0
1	-1	16	328.1	327.4	10.0
3	-1	16	179.8	184.0	5.8
5	-1	16	333.2	349.1	10.2
-6	0	16	117.2	119.4	3.9
-4	0	16	427.2	412.1	13.0
-2	0	16	347.2	328.3	10.6
0	0	16	213.7	212.2	6.8
2	0	16	464.6	457.9	14.1
4	0	16	300.8	307.0	9.2
6	0	16	94.7	110.0	3.2
-5	1	16	272.6	267.2	8.5
-3	1	16	201.7	180.9	6.5
-1	1	16	507.6	464.4	15.4
1	1	16	354.1	326.5	10.9
3	1	16	188.8	170.9	6.1
5	1	16	362.7	346.4	11.1
-4	2	16	365.6	350.2	11.2
-2	2	16	323.5	297.5	10.0

H	K	L	FO	FC	SIG
0	2	16	199.3	186.6	6.4
2	2	16	454.7	410.1	13.8
4	2	16	306.9	271.6	9.6
-3	3	16	106.1	102.4	3.5
-1	3	16	365.7	353.0	11.2
1	3	16	277.9	268.4	8.7
3	3	16	127.1	120.5	4.3
-2	-2	17	36.4	23.8	3.5
0	-2	17	97.7	98.9	3.4
2	-2	17	17.9	12.6	10.3
-3	-1	17	133.1	118.4	4.4
-1	-1	17	20.0	2.8	11.6
1	-1	17	28.5	3.9	4.2
3	-1	17	99.1	101.5	3.4
-4	0	17	19.6	15.1	11.3
-2	0	17	19.5	4.7	11.3
2	0	17	20.0	2.8	11.5
4	0	17	32.4	25.3	3.7
-3	1	17	131.1	108.9	4.4
-1	1	17	19.3	2.3	11.2
1	1	17	20.3	4.4	11.7
3	1	17	124.7	114.4	4.2
-2	2	17	45.9	21.1	3.1
0	2	17	111.0	102.0	3.8
2	2	17	14.6	15.1	8.5
-1	-1	18	294.6	300.3	9.1
1	-1	18	256.2	248.8	8.0
-2	0	18	277.1	250.2	8.7
0	0	18	722.1	671.3	21.8
2	0	18	300.8	294.6	9.3
-1	1	18	320.3	306.9	9.9
1	1	18	285.1	247.2	8.9

H K L FO FC SIG



















H	K	L	FO	FC	SIG
-5	1	16	273.4	275.4	8.4
-3	1	16	97.4	91.9	3.1
-1	1	16	275.3	271.9	8.4
1	1	16	314.2	317.3	9.6
3	1	16	131.8	131.5	4.2
5	1	16	237.8	234.8	7.3
7	1	16	240.5	236.3	7.8
-6	2	16	57.9	56.7	2.8
-4	2	16	224.6	220.5	7.0
-2	2	16	290.6	292.3	8.9
0	2	16	110.1	102.0	3.5
2	2	16	241.8	239.5	7.4
4	2	16	272.2	264.1	8.4
6	2	16	102.4	99.6	3.5
-5	3	16	255.4	252.3	8.1
-3	3	16	70.6	71.1	2.6
-1	3	16	234.5	232.7	7.3
1	3	16	260.6	254.0	8.0
3	3	16	84.7	83.0	3.0
5	3	16	223.4	214.4	7.2
-2	4	16	250.8	240.8	8.0
0	4	16	76.5	72.5	3.2
2	4	16	210.1	208.5	7.0
-3	-3	17	95.9	97.1	3.3
-1	-3	17	43.4	46.7	2.4
1	-3	17	46.5	45.2	2.3
3	-3	17	132.0	123.9	4.5
-4	-2	17	37.2	36.3	2.4
-2	-2	17	17.3	15.6	7.5
0	-2	17	71.1	71.0	2.5
2	-2	17	13.7	14.1	6.1
4	-2	17	44.0	39.0	2.4
-5	-1	17	38.1	39.0	2.4
-3	-1	17	71.8	74.7	2.5
-1	-1	17	17.9	7.8	7.8
1	-1	17	17.1	6.0	7.4
3	-1	17	56.2	55.7	2.3
5	-1	17	44.7	42.6	2.5
-6	0	17	92.4	90.9	3.3
-4	0	17	16.8	12.8	7.3
-2	0	17	18.1	6.1	7.8
2	0	17	17.8	5.4	7.7
4	0	17	17.5	12.1	7.6
6	0	17	101.4	98.4	3.6
-5	1	17	41.9	41.7	2.4
-3	1	17	75.3	74.5	2.6
-1	1	17	17.1	7.8	7.4
1	1	17	17.3	5.4	7.5
3	1	17	48.7	52.0	2.4
5	1	17	43.3	40.1	2.5
-4	2	17	39.6	38.2	2.6
-2	2	17	17.6	16.0	7.6
0	2	17	68.3	68.0	2.5
2	2	17	18.1	13.2	7.9
4	2	17	41.4	37.2	2.6
-3	3	17	109.0	105.0	3.7
-1	3	17	43.2	46.0	2.7
1	3	17	51.0	46.2	2.5
3	3	17	122.6	121.4	4.1
-2	-2	18	237.9	225.5	7.5
0	-2	18	513.4	491.8	15.5
2	-2	18	248.3	234.6	7.9
-3	-1	18	511.8	489.9	15.5
-1	-1	18	254.0	246.9	7.8
1	-1	18	242.3	238.0	7.5
3	-1	18	524.5	496.0	15.8
-4	0	18	239.7	229.2	7.6
-2	0	18	251.0	244.4	7.7
0	0	18	588.1	565.0	17.7
2	0	18	240.0	234.2	7.4
4	0	18	243.9	238.7	7.7
-3	1	18	522.8	490.1	15.8
-1	1	18	260.4	246.0	8.0
1	1	18	239.4	235.7	7.4
3	1	18	522.5	496.8	15.8
-2	2	18	241.1	226.1	7.7
0	2	18	533.2	492.8	16.1
2	2	18	252.4	237.0	8.0
-1	-1	19	14.0	20.4	8.1
1	-1	19	17.9	17.3	10.3
-2	0	19	19.2	16.4	11.1
2	0	19	18.6	15.1	10.8
-1	1	19	27.0	20.8	4.5

H	K	L	FO	FC	SIG
1	1	19	19.4	16.0	11.2

H	K	L	FO	FC	SIG
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