International Tables for Crystallography (2006). Vol. A, Table 12.3.4.1, pp. 824–831.

Table 12.3.4.1. *Standard space-group symbols*

No.	Schoenflies symbol	Shubnikov symbol	Symbols of *International Tables*				Comments*†
			1935 Edition		Present Edition		
			Short	Full	Short	Full	
1	C_1^1	$(a/b/c)\cdot 1$	$P1$	$P1$	$P1$	$P1$	
2	C_i^1	$(a/b/c)\cdot\tilde{2}$	$P\bar{1}$	$P\bar{1}$	$P\bar{1}$	$P\bar{1}$	$(a/b/c)\cdot\bar{1}$ (Sh–K)
3	C_2^1	$(b:(c/a)):2$	$P2$	$P2$	$P2$	$P121$	
		$(c:(a/b)):2$				$P112$	
4	C_2^2	$(b:(c/a)):2_1$	$P2_1$	$P2_1$	$P2_1$	$P12_11$	
		$(c:(a/b)):2_1$				$P112_1$	
5	C_2^3	$\left(\frac{a+b}{2}\Big/b:(c/a)\right):2$	$C2$	$C2$	$C2$	$C121$	$B2$, $B112$ (*IT*, 1952)
		$\left(\frac{b+c}{2}\Big/c:(b/a)\right):2$				$A112$	$\left(\frac{a+c}{2}\Big/c:(a/b)\right):2$ (Sh–K)
6	C_s^1	$(b:(c/a))\cdot m$	Pm	Pm	Pm	$P1m1$	
		$(c:(a/b))\cdot m$				$P11m$	
7	C_s^2	$(b:(c/a))\cdot\tilde{c}$	Pc	Pc	Pc	$P1c1$	Pb, $P11b$ (*IT*, 1952)
		$(c:(b/a))\cdot\tilde{a}$				$P11a$	$(c:(a/b))\cdot\tilde{b}$ (Sh–K)
8	C_s^3	$\left(\frac{a+b}{2}\Big/b:(c/a)\right)\cdot m$	Cm	Cm	Cm	$C1m1$	Bm, $B11m$ (*IT*, 1952)
		$\left(\frac{b+c}{2}\Big/c:(b/a)\right)\cdot m$				$A11m$	$\left(\frac{a+c}{2}\Big/c:(a/b)\right)\cdot m$ (Sh–K)
9	C_s^4	$\left(\frac{a+b}{2}\Big/b:(c/a)\right)\cdot\tilde{c}$	Cc	Cc	Cc	$C1c1$	Bb, $B11b$ (*IT*, 1952)
		$\left(\frac{b+c}{2}\Big/c:(b/a)\right)\cdot\tilde{a}$				$A11a$	$\left(\frac{a+c}{2}\Big/c:(a/b)\right)\cdot\tilde{b}$ (Sh–K)
10	C_{2h}^1	$(b:(c/a))\cdot m:2$	$P2/m$	$P2/m$	$P2/m$	$P1\ 2/m\ 1$	
		$(c:(a/b))\cdot m:2$				$P11\ 2/m$	
11	C_{2h}^2	$(b:(c/a))\cdot m:2_1$	$P2_1/m$	$P2_1/m$	$P2_1/m$	$P1\ 2_1/m\ 1$	
		$(c:(a/b))\cdot m:2_1$				$P11\ 2_1/m$	
12	C_{2h}^3	$\left(\frac{a+b}{2}\Big/b:(c/a)\right)\cdot m:2$	$C2/m$	$C2/m$	$C2/m$	$C1\ 2/m\ 1$	$B2/m$, $B11\ 2/m$ (*IT*, 1952)
		$\left(\frac{b+c}{2}\Big/c:(b/a)\right)\cdot m:2$				$A11\ 2/m$	$\left(\frac{a+c}{2}\Big/c:(a/b)\right)\cdot m:2$ (Sh–K)
13	C_{2h}^4	$(b:(c/a))\cdot\tilde{c}:2$	$P2/c$	$P2/c$	$P2/c$	$P1\ 2/c\ 1$	$P2/b$, $P11\ 2/b$ (*IT*, 1952)
		$(c:(a/b))\cdot\tilde{a}:2$				$P11\ 2/a$	$(c:(a/b))\cdot\tilde{b}:2$ (Sh–K)
14	C_{2h}^5	$(b:(c/a))\cdot\tilde{c}:2_1$	$P2_1/c$	$P2_1/c$	$P2_1/c$	$P1\ 2_1/c\ 1$	$P2_1/b$, $P11\ 2_1/b$ (*IT*, 1952)
		$(c:(a/b))\cdot\tilde{a}:2_1$				$P11\ 2_1/a$	$(c:(a/b))\cdot\tilde{b}:2_1$ (Sh–K)
15	C_{2h}^6	$\left(\frac{a+b}{2}\Big/b:(c/a)\right)\cdot\tilde{c}:2$	$C2/c$	$C2/c$	$C2/c$	$C1\ 2/c\ 1$	$B2/b$, $B11\ 2/b$ (*IT*, 1952)
		$\left(\frac{b+c}{2}\Big/c:(b/a)\right)\cdot\tilde{a}:2$				$A11\ 2/a$	$\left(\frac{a+c}{2}\Big/c:(a/b)\right)\cdot\tilde{b}:2$ (Sh–K)
16	D_2^1	$(c:(a:b)):2:2$	$P222$	$P222$	$P222$	$P222$	
17	D_2^2	$(c:(a:b)):2_1:2$	$P222_1$	$P222_1$	$P222_1$	$P222_1$	
18	D_2^3	$(c:(a:b)):2\odot 2_1$	$P2_12_12$	$P2_12_12$	$P2_12_12$	$P2_12_12$	
19	D_2^4	$(c:(a:b)):2_1\odot 2_1$	$P2_12_12_1$	$P2_12_12_1$	$P2_12_12_1$	$P2_12_12_1$	
20	D_2^5	$\left(\frac{a+b}{2}:c:(a:b)\right):2_1:2$	$C222_1$	$C222_1$	$C222_1$	$C222_1$	
21	D_2^6	$\left(\frac{a+b}{2}:c:(a:b)\right):2:2$	$C222$	$C222$	$C222$	$C222$	
22	D_2^7	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:c:(a:b)\right):2:2$	$F222$	$F222$	$F222$	$F222$	
23	D_2^8	$\left(\frac{a+b+c}{2}\Big/c:(a:b)\right):2:2$	$I222$	$I222$	$I222$	$I222$	
24	D_2^9	$\left(\frac{a+b+c}{2}\Big/c:(a:b)\right):2:2_1$	$I2_12_12_1$	$I2_12_12_1$	$I2_12_12_1$	$I2_12_12_1$	

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Table 12.3.4.1. *Standard space-group symbols* (*cont.*)

No.	Schoenflies symbol	Shubnikov symbol	Symbols of *International Tables*				Comments*†
			1935 Edition		Present Edition		
			Short	Full	Short	Full	
25	C_{2v}^{1}	$(c:(a:b)):m\cdot 2$	*Pmm*	*Pmm*2	*Pmm*2	*Pmm*2	
26	C_{2v}^{2}	$(c:(a:b)):\widetilde{c}\cdot 2_1$	*Pmc*	*Pmc*2_1	*Pmc*2_1	*Pmc*2_1	
27	C_{2v}^{3}	$(c:(a:b)):\widetilde{c}\cdot 2$	*Pcc*	*Pcc*2	*Pcc*2	*Pcc*2	
28	C_{2v}^{4}	$(c:(a:b)):\widetilde{a}\cdot 2$	*Pma*	*Pma*2	*Pma*2	*Pma*2	
29	C_{2v}^{5}	$(c:(a:b)):\widetilde{a}\cdot 2_1$	*Pca*	*Pca*2_1	*Pca*2_1	*Pca*2_1	
30	C_{2v}^{6}	$(c:(a:b)):\widetilde{c}\odot 2$	*Pnc*	*Pnc*2	*Pnc*2	*Pnc*2	$(c:(a:b)):\widetilde{ac}\cdot 2$ (Sh–K)
31	C_{2v}^{7}	$(c:(a:b)):\widetilde{ac}\cdot 2_1$	*Pmn*	*Pmn*2_1	*Pmn*2_1	*Pmn*2_1	
32	C_{2v}^{8}	$(c:(a:b)):\widetilde{a}\odot 2$	*Pba*	*Pba*2	*Pba*2	*Pba*2	
33	C_{2v}^{9}	$(c:(a:b)):\widetilde{a}\odot 2_1$	*Pna*	*Pna*2_1	*Pna*2_1	*Pna*2_1	
34	C_{2v}^{10}	$(c:(a:b)):\widetilde{ac}\odot 2$	*Pnn*	*Pnn*2	*Pnn*2	*Pnn*2	
35	C_{2v}^{11}	$\left(\frac{a+b}{2}:c:(a:b)\right):m\cdot 2$	*Cmm*	*Cmm*2	*Cmm*2	*Cmm*2	
36	C_{2v}^{12}	$\left(\frac{a+b}{2}:c:(a:b)\right):\widetilde{c}\cdot 2_1$	*Cmc*	*Cmc*2_1	*Cmc*2_1	*Cmc*2_1	
37	C_{2v}^{13}	$\left(\frac{a+b}{2}:c:(a:b)\right):\widetilde{c}\cdot 2$	*Ccc*	*Ccc*2	*Ccc*2	*Ccc*2	
38	C_{2v}^{14}	$\left(\frac{b+c}{2}\Big/c:(a:b)\right):m\cdot 2$	*Amm*	*Amm*2	*Amm*2	*Amm*2	
39	C_{2v}^{15}	$\left(\frac{b+c}{2}\Big/c:(a:b)\right):m\cdot 2_1$	*Abm*	*Abm*2	*Aem*2	*Aem*2	$\left(\frac{b+c}{2}/c:(a:b)\right):\widetilde{c}\cdot 2$ (Sh–K) Use former symbol *Abm2* for generation
40	C_{2v}^{16}	$\left(\frac{b+c}{2}\Big/c:(a:b)\right):\widetilde{a}\cdot 2$	*Ama*	*Ama*2	*Ama*2	*Ama*2	
41	C_{2v}^{17}	$\left(\frac{b+c}{2}\Big/c:(a:b)\right):\widetilde{a}\cdot 2_1$	*Aba*	*Aba*2	*Aea*2	*Aea*2	$\left(\frac{b+c}{2}/c:(a:b)\right):\widetilde{ac}\cdot 2$ (Sh–K) Use former symbol *Aba2* for generation
42	C_{2v}^{18}	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:c:(a:b)\right):m\cdot 2$	*Fmm*	*Fmm*2	*Fmm*2	*Fmm*2	
43	C_{2v}^{19}	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:\widetilde{c}:(a:b)\right)$ $:\frac{1}{2}\widetilde{ac}\odot 2$	*Fdd*	*Fdd*2	*Fdd*2	*Fdd*2	
44	C_{2v}^{20}	$\left(\frac{a+b+c}{2}\Big/c:(a:b)\right):m\cdot 2$	*Imm*	*Imm*2	*Imm*2	*Imm*2	
45	C_{2v}^{21}	$\left(\frac{a+b+c}{2}\Big/c:(a:b)\right):\widetilde{c}\cdot 2$	*Iba*	*Iba*2	*Iba*2	*Iba*2	$\left(\frac{a+b+c}{2}\Big/c:(a:b)\right):\widetilde{a}\cdot 2_1$ (Sh–K)
46	C_{2v}^{22}	$\left(\frac{a+b+c}{2}\Big/c:(a:b)\right):\widetilde{a}\cdot 2$	*Ima*	*Ima*2	*Ima*2	*Ima*2	

between symmetry operations. It is possible, however, to derive the glide/screw parts of the elements in the full symbol directly from the glide/screw parts of the short symbol.

The product of operations corresponding to non-parallel glide or mirror planes generates a rotation or screw axis parallel to the intersection line. The screw part of the rotation is equal to the sum of the projections of the glide components of the planes on the axis. The angle between the planes determines the rotation part of the axis. For 90°, we obtain a twofold, for 60° a threefold, for 45° a fourfold and for 30° a sixfold axis.

Example: $Pbcn = D_{2h}^{14}$ (60)

The product of b and c generates a screw axis 2_1 in the z direction because the sum of the glide components in the z direction is $\frac{1}{2}$. The product of c and n generates a screw axis 2_1 in the x direction and the product between b and n produces a rotation axis 2 in the y direction because the y components for b and n add up to $1 \equiv 0$ modulo integers.

Thus, the full symbol is

$$P\frac{2_1}{b}\frac{2}{c}\frac{2_1}{n}.$$

In most cases, the full symbol is identical with the short symbol; differences between full and short symbols can only occur for space groups corresponding to lattice point groups (holohedries) and to the point group $m\bar{3}$. In all these cases, the short symbol is extended to the full symbol by adding the symbol for the maximal purely rotational subgroup. A special procedure is in use for monoclinic space groups. To indicate the choice of coordinate axes, the full symbol is treated like an orthorhombic symbol, in which the directions without symmetry are indicated by '1', *even though they do not correspond to lattice symmetry directions in the monoclinic case.*

Table 12.3.4.1. *Standard space-group symbols* (*cont.*)

No.	Schoenflies symbol	Shubnikov symbol	Symbols of *International Tables*				Comments*†
			1935 Edition		Present Edition		
			Short	Full	Short	Full	
47	D_{2h}^{1}	$(c:(a:b))\cdot m:2\cdot m$	$Pmmm$	$P2/m\ 2/m\ 2/m$	$Pmmm$	$P2/m\ 2/m\ 2/m$	
48	D_{2h}^{2}	$(c:(a:b))\cdot\widetilde{ab}:2\odot\widetilde{ac}$	$Pnnn$	$P2/n\ 2/n\ 2/n$	$Pnnn$	$P2/n\ 2/n\ 2/n$	
49	D_{2h}^{3}	$(c:(a:b))\cdot m:2\cdot\widetilde{c}$	$Pccm$	$P2/c\ 2/c\ 2/m$	$Pccm$	$P2/c\ 2/c\ 2/m$	
50	D_{2h}^{4}	$(c:(a:b))\cdot\widetilde{ab}:2\odot\widetilde{a}$	$Pban$	$P2/b\ 2/a\ 2/n$	$Pban$	$P2/b\ 2/a\ 2/n$	
51	D_{2h}^{5}	$(c:(a:b))\cdot\widetilde{a}:2\cdot m$	$Pmma$	$P2_1/m\ 2/m\ 2/a$	$Pmma$	$P2_1/m\ 2/m\ 2/a$	
52	D_{2h}^{6}	$(c:(a:b))\cdot\widetilde{a}:2\odot\widetilde{ac}$	$Pnna$	$P2/n\ 2_1/n\ 2/a$	$Pnna$	$P2/n\ 2_1/n\ 2/a$	
53	D_{2h}^{7}	$(c:(a:b))\cdot\widetilde{a}:2_1\cdot\widetilde{ac}$	$Pmna$	$P2/m\ 2/n\ 2_1/a$	$Pmna$	$P2/m\ 2/n\ 2_1/a$	
54	D_{2h}^{8}	$(c:(a:b))\cdot\widetilde{a}:2\cdot\widetilde{c}$	$Pcca$	$P2_1/c\ 2/c\ 2/a$	$Pcca$	$P2_1/c\ 2/c\ 2/a$	
55	D_{2h}^{9}	$(c:(a:b))\cdot m:2\odot\widetilde{a}$	$Pbam$	$P2_1/b\ 2_1/a\ 2/m$	$Pbam$	$P2_1/b\ 2_1/a\ 2/m$	
56	D_{2h}^{10}	$(c:(a:b))\cdot\widetilde{ab}:2\cdot\widetilde{c}$	$Pccn$	$P2_1/c\ 2_1/c\ 2/n$	$Pccn$	$P2_1/c\ 2_1/c\ 2/n$	
57	D_{2h}^{11}	$(c:(a:b))\cdot m:2_1\odot\widetilde{c}$	$Pbcm$	$P2/b\ 2_1/c\ 2_1/m$	$Pbcm$	$P2/b\ 2_1/c\ 2_1/m$	
58	D_{2h}^{12}	$(c:(a:b))\cdot m:2\odot\widetilde{ac}$	$Pnnm$	$P2_1/n\ 2_1/n\ 2/m$	$Pnnm$	$P2_1/n\ 2_1/n\ 2/m$	
59	D_{2h}^{13}	$(c:(a:b))\cdot\widetilde{ab}:2\cdot m$	$Pmmn$	$P2_1/m\ 2_1/m\ 2/n$	$Pmmn$	$P2_1/m\ 2_1/m\ 2/n$	
60	D_{2h}^{14}	$(c:(a:b))\cdot\widetilde{ab}:2_1\odot\widetilde{c}$	$Pbcn$	$P2_1/b\ 2/c\ 2_1/n$	$Pbcn$	$P2_1/b\ 2/c\ 2_1/n$	
61	D_{2h}^{15}	$(c:(a:b))\cdot\widetilde{a}:2_1\odot\widetilde{c}$	$Pbca$	$P2_1/b\ 2_1/c\ 2_1/a$	$Pbca$	$P2_1/b\ 2_1/c\ 2_1/a$	
62	D_{2h}^{16}	$(c:(a:b))\cdot\widetilde{a}:2_1\odot m$	$Pnma$	$P2_1/n\ 2_1/m\ 2_1/a$	$Pnma$	$P2_1/n\ 2_1/m\ 2_1/a$	
63	D_{2h}^{17}	$\left(\frac{a+b}{2}:c:(a:b)\right)\cdot m:2_1\cdot\widetilde{c}$	$Cmcm$	$C2/m\ 2/c\ 2_1/m$	$Cmcm$	$C2/m\ 2/c\ 2_1/m$	
64	D_{2h}^{18}	$\left(\frac{a+b}{2}:c:(a:b)\right)\cdot\widetilde{a}:2_1\cdot\widetilde{c}$	$Cmca$	$C2/m\ 2/c\ 2_1/a$	$Cmce$	$C2/m\ 2/c\ 2_1/e$	Use former symbol *Cmca* for generation
65	D_{2h}^{19}	$\left(\frac{a+b}{2}:c:(a:b)\right)\cdot m:2\cdot m$	$Cmmm$	$C2/m\ 2/m\ 2/m$	$Cmmm$	$C2/m\ 2/m\ 2/m$	
66	D_{2h}^{20}	$\left(\frac{a+b}{2}:c:(a:b)\right)\cdot m:2\cdot\widetilde{c}$	$Cccm$	$C2/c\ 2/c\ 2/m$	$Cccm$	$C2/c\ 2/c\ 2/m$	
67	D_{2h}^{21}	$\left(\frac{a+b}{2}:c:(a:b)\right)\cdot\widetilde{a}:2\cdot m$	$Cmma$	$C2/m\ 2/m\ 2/a$	$Cmme$	$C2/m\ 2/m\ 2/e$	Use former symbol *Cmma* for generation
68	D_{2h}^{22}	$\left(\frac{a+b}{2}:c:(a:b)\right)\cdot\widetilde{a}:2\cdot\widetilde{c}$	$Ccca$	$C2/c\ 2/c\ 2/a$	$Ccce$	$C2/c\ 2/c\ 2/e$	Use former symbol *Ccca* for generation
69	D_{2h}^{23}	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:c:(a:b)\right)\cdot m:2\cdot m$	$Fmmm$	$F2/m\ 2/m\ 2/m$	$Fmmm$	$F2/m\ 2/m\ 2/m$	
70	D_{2h}^{24}	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:c:(a:b)\right)\cdot\frac{1}{2}\widetilde{ab}:2\odot\frac{1}{2}\widetilde{ac}$	$Fddd$	$F2/d\ 2/d\ 2/d$	$Fddd$	$F2/d\ 2/d\ 2/d$	
71	D_{2h}^{25}	$\left(\frac{a+b+c}{2}\Big/c:(a:b)\right)\cdot m:2\cdot m$	$Immm$	$I2/m\ 2/m\ 2/m$	$Immm$	$I2/m\ 2/m\ 2/m$	
72	D_{2h}^{26}	$\left(\frac{a+b+c}{2}\Big/c:(a:b)\right)\cdot m:2\cdot\widetilde{c}$	$Ibam$	$I2/b\ 2/a\ 2/m$	$Ibam$	$I2/b\ 2/a\ 2/m$	
73	D_{2h}^{27}	$\left(\frac{a+b+c}{2}\Big/c:(a:b)\right)\cdot\widetilde{a}:2\cdot\widetilde{c}$	$Ibca$	$I2_1/b\ 2_1/c\ 2_1/a$	$Ibca$	$I2_1/b\ 2_1/c\ 2_1/a$	$I2/b\ 2/c\ 2/a$ (*IT*, 1952)
74	D_{2h}^{28}	$\left(\frac{a+b+c}{2}\Big/c:(a:b)\right)\cdot\widetilde{a}:2\cdot m$	$Imma$	$I2_1/m\ 2_1/m\ 2_1/a$	$Imma$	$I2_1/m\ 2_1/m\ 2_1/a$	$I2/m\ 2/m\ 2/a$ (*IT*, 1952)
75	C_4^1	$(c:(a:a)):4$	$P4$	$P4$	$P4$	$P4$	
76	C_4^2	$(c:(a:a)):4_1$	$P4_1$	$P4_1$	$P4_1$	$P4_1$	
77	C_4^3	$(c:(a:a)):4_2$	$P4_2$	$P4_2$	$P4_2$	$P4_2$	
78	C_4^4	$(c:(a:a)):4_3$	$P4_3$	$P4_3$	$P4_3$	$P4_3$	
79	C_4^5	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):4$	$I4$	$I4$	$I4$	$I4$	
80	C_4^6	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):4_1$	$I4_1$	$I4_1$	$I4_1$	$I4_1$	

Table 12.3.4.1. *Standard space-group symbols* (*cont.*)

No.	Schoenflies symbol	Shubnikov symbol	Symbols of *International Tables*				Comments*†
			1935 Edition		Present Edition		
			Short	Full	Short	Full	
81	S_4^1	$(c:(a:a)):\widetilde{4}$	$P\bar{4}$	$P\bar{4}$	$P\bar{4}$	$P\bar{4}$	
82	S_4^2	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):\widetilde{4}$	$I\bar{4}$	$I\bar{4}$	$I\bar{4}$	$I\bar{4}$	
83	C_{4h}^1	$(c:(a:a))\cdot m:4$	$P4/m$	$P4/m$	$P4/m$	$P4/m$	
84	C_{4h}^2	$(c:(a:a))\cdot m:4_2$	$P4_2/m$	$P4_2/m$	$P4_2/m$	$P4_2/m$	
85	C_{4h}^3	$(c:(a:a))\cdot\widetilde{ab}:4$	$P4/n$	$P4/n$	$P4/n$	$P4/n$	
86	C_{4h}^4	$(c:(a:a))\cdot\widetilde{ab}:4_2$	$P4_2/n$	$P4_2/n$	$P4_2/n$	$P4_2/n$	
87	C_{4h}^5	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right)\cdot m:4$	$I4/m$	$I4/m$	$I4/m$	$I4/m$	
88	C_{4h}^6	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right)\cdot\widetilde{a}:4_1$	$I4_1/a$	$I4_1/a$	$I4_1/a$	$I4_1/a$	
89	D_4^1	$(c:(a:a)):4:2$	$P42$	$P422$	$P422$	$P422$	
90	D_4^2	$(c:(a:a)):4\odot 2_1$	$P42_1$	$P42_12$	$P42_12$	$P42_12$	
91	D_4^3	$(c:(a:a)):4_1:2$	$P4_12$	$P4_122$	$P4_122$	$P4_122$	
92	D_4^4	$(c:(a:a)):4_1\odot 2_1$	$P4_12_1$	$P4_12_12$	$P4_12_12$	$P4_12_12$	
93	D_4^5	$(c:(a:a)):4_2:2$	$P4_22$	$P4_222$	$P4_222$	$P4_222$	
94	D_4^6	$(c:(a:a)):4_2\odot 2_1$	$P4_22_1$	$P4_22_12$	$P4_22_12$	$P4_22_12$	
95	D_4^7	$(c:(a:a)):4_3:2$	$P4_32$	$P4_322$	$P4_322$	$P4_322$	
96	D_4^8	$(c:(a:a)):4_3\odot 2_1$	$P4_32_1$	$P4_32_12$	$P4_32_12$	$P4_32_12$	
97	D_4^9	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):4:2$	$I42$	$I422$	$I422$	$I422$	
98	D_4^{10}	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):4_1:2$	$I4_12$	$I4_122$	$I4_122$	$I4_122$	
99	C_{4v}^1	$(c:(a:a)):4\cdot m$	$P4mm$	$P4mm$	$P4mm$	$P4mm$	
100	C_{4v}^2	$(c:(a:a)):4\odot\widetilde{a}$	$P4bm$	$P4bm$	$P4bm$	$P4bm$	
101	C_{4v}^3	$(c:(a:a)):4_2\cdot\widetilde{c}$	$P4cm$	$P4_2cm$	$P4_2cm$	$P4_2cm$	
102	C_{4v}^4	$(c:(a:a)):4_2\odot\widetilde{ac}$	$P4nm$	$P4_2nm$	$P4_2nm$	$P4_2nm$	
103	C_{4v}^5	$(c:(a:a)):4\cdot\widetilde{c}$	$P4cc$	$P4cc$	$P4cc$	$P4cc$	
104	C_{4v}^6	$(c:(a:a)):4\odot\widetilde{ac}$	$P4nc$	$P4nc$	$P4nc$	$P4nc$	
105	C_{4v}^7	$(c:(a:a)):4_2\cdot m$	$P4mc$	$P4_2mc$	$P4_2mc$	$P4_2mc$	
106	C_{4v}^8	$(c:(a:a)):4_2\odot\widetilde{a}$	$P4bc$	$P4_2bc$	$P4_2bc$	$P4_2bc$	
107	C_{4v}^9	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):4\cdot m$	$I4mm$	$I4mm$	$I4mm$	$I4mm$	
108	C_{4v}^{10}	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):4\cdot\widetilde{c}$	$I4cm$	$I4cm$	$I4cm$	$I4cm$	
109	C_{4v}^{11}	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):4_1\odot m$	$I4md$	$I4_1md$	$I4_1md$	$I4_1md$	
110	C_{4v}^{12}	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):4_1\odot\widetilde{c}$	$I4cd$	$I4_1cd$	$I4_1cd$	$I4_1cd$	$\left(\frac{a+b+c}{2}\Big/c:a:a\right):4_1\cdot\widetilde{a}$ (Sh−K)
111	D_{2d}^1	$(c:(a:a)):\widetilde{4}:2$	$P\bar{4}2m$	$P\bar{4}2m$	$P\bar{4}2m$	$P\bar{4}2m$	
112	D_{2d}^2	$(c:(a:a)):\widetilde{4}\odot 2$	$P\bar{4}2c$	$P\bar{4}2c$	$P\bar{4}2c$	$P\bar{4}2c$	
113	D_{2d}^3	$(c:(a:a)):\widetilde{4}\cdot\widetilde{ab}$	$P\bar{4}2_1m$	$P\bar{4}2_1m$	$P\bar{4}2_1m$	$P\bar{4}2_1m$	
114	D_{2d}^4	$(c:(a:a)):\widetilde{4}\cdot\widetilde{abc}$	$P\bar{4}2_1c$	$P\bar{4}2_1c$	$P\bar{4}2_1c$	$P\bar{4}2_1c$	
115	D_{2d}^5	$(c:(a:a)):\widetilde{4}\cdot m$	$C\bar{4}2m$	$C\bar{4}2m$	$P\bar{4}m2$	$P\bar{4}m2$	
116	D_{2d}^6	$(c:(a:a)):\widetilde{4}\cdot\widetilde{c}$	$C\bar{4}2c$	$C\bar{4}2c$	$P\bar{4}c2$	$P\bar{4}c2$	
117	D_{2d}^7	$(c:(a:a)):\widetilde{4}\odot\widetilde{a}$	$C\bar{4}2b$	$C\bar{4}2b$	$P\bar{4}b2$	$P\bar{4}b2$	
118	D_{2d}^8	$(c:(a:a)):\widetilde{4}\cdot\widetilde{ac}$	$C\bar{4}2n$	$C\bar{4}2n$	$P\bar{4}n2$	$P\bar{4}n2$	
119	D_{2d}^9	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):\widetilde{4}\cdot m$	$F\bar{4}2m$	$F\bar{4}2m$	$I\bar{4}m2$	$I\bar{4}m2$	
120	D_{2d}^{10}	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):\widetilde{4}\cdot\widetilde{c}$	$F\bar{4}2c$	$F\bar{4}2c$	$I\bar{4}c2$	$I\bar{4}c2$	

Table 12.3.4.1. *Standard space-group symbols* (*cont.*)

No.	Schoenflies symbol	Shubnikov symbol	Symbols of *International Tables*				Comments*†
			1935 Edition		Present Edition		
			Short	Full	Short	Full	
121	D_{2d}^{11}	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):\widetilde{4}:2$	$I\bar{4}2m$	$I\bar{4}2m$	$I\bar{4}2m$	$I\bar{4}2m$	
122	D_{2d}^{12}	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right):\widetilde{4}\odot\frac{1}{2}\widetilde{abc}$	$I\bar{4}2d$	$I\bar{4}2d$	$I\bar{4}2d$	$I\bar{4}2d$	
123	D_{4h}^{1}	$(c:(a:a))\cdot m:4\cdot m$	$P4/mmm$	$P4/m\ 2/m\ 2/m$	$P4/mmm$	$P4/m\ 2/m\ 2/m$	
124	D_{4h}^{2}	$(c:(a:a))\cdot m:4\cdot\widetilde{c}$	$P4/mcc$	$P4/m\ 2/c\ 2/c$	$P4/mcc$	$P4/m\ 2/c\ 2/c$	
125	D_{4h}^{3}	$(c:(a:a))\cdot\widetilde{ab}:4\odot\widetilde{a}$	$P4/nbm$	$P4/n\ 2/b\ 2/m$	$P4/nbm$	$P4/n\ 2/b\ 2/m$	$(c:a:a)\cdot\widetilde{ab}:4\odot\widetilde{b}$ (Sh–K)
126	D_{4h}^{4}	$(c:(a:a))\cdot\widetilde{ab}:4\odot\widetilde{ac}$	$P4/nnc$	$P4/n\ 2/n\ 2/c$	$P4/nnc$	$P4/n\ 2/n\ 2/c$	
127	D_{4h}^{5}	$(c:(a:a))\cdot m:4\odot\widetilde{a}$	$P4/mbm$	$P4/m\ 2_1/b\ 2/m$	$P4/mbm$	$P4/m\ 2_1/b\ 2/m$	$(c:a:a)\cdot m:4\odot\widetilde{b}$ (Sh–K)
128	D_{4h}^{6}	$(c:(a:a))\cdot m:4\odot\widetilde{ac}$	$P4/mnc$	$P4/m\ 2_1/n\ 2/c$	$P4/mnc$	$P4/m\ 2_1/n\ 2/c$	
129	D_{4h}^{7}	$(c:(a:a))\cdot\widetilde{ab}:4\cdot m$	$P4/nmm$	$P4/n\ 2_1/m\ 2/m$	$P4/nmm$	$P4/n\ 2_1/m\ 2/m$	
130	D_{4h}^{8}	$(c:(a:a)\cdot\widetilde{ab}:4\cdot\widetilde{c}$	$P4/ncc$	$P4/n\ 2/c\ 2/c$	$P4/ncc$	$P4/n\ 2/c\ 2/c$	
131	D_{4h}^{9}	$(c:(a:a))\cdot m:4_2\cdot m$	$P4/mmc$	$P4_2/m\ 2/m\ 2/c$	$P4_2/mmc$	$P4_2/m\ 2/m\ 2/c$	
132	D_{4h}^{10}	$(c:(a:a))\cdot m:4_2\cdot\widetilde{c}$	$P4/mcm$	$P4_2/m\ 2/c\ 2/m$	$P4_2/mcm$	$P4_2/m\ 2/c\ 2/m$	
133	D_{4h}^{11}	$(c:(a:a))\cdot\widetilde{ab}:4_2\odot\widetilde{a}$	$P4/nbc$	$P4_2/n\ 2/b\ 2/c$	$P4_2/nbc$	$P4_2/n\ 2/b\ 2/c$	$(c:a:a)\cdot\widetilde{ab}:4_2\odot\widetilde{b}$ (Sh–K)
134	D_{4h}^{12}	$(c:(a:a))\cdot\widetilde{ab}:4_2\odot\widetilde{ac}$	$P4/nnm$	$P4_2/n\ 2/n\ 2/m$	$P4_2/nnm$	$P4_2/n\ 2/n\ 2/m$	
135	D_{4h}^{13}	$(c:(a:a))\cdot n:4_2\odot\widetilde{a}$	$P4/mbc$	$P4_2/m\ 2_1/b\ 2/c$	$P4_2/mbc$	$P4_2/m\ 2_1/b\ 2/c$	$(c:a:a)\cdot m:4_2\odot\widetilde{b}$ (Sh–K)
136	D_{4h}^{14}	$(c:(a:a))\cdot m:4_2\odot\widetilde{ac}$	$P4/mnm$	$P4_2/m\ 2_1/n\ 2/m$	$P4_2/mnm$	$P4_2/m\ 2_1/n\ 2/m$	
137	D_{4h}^{15}	$(c:(a:a))\cdot\widetilde{ab}:4_2\cdot m$	$P4/nmc$	$P4_2/n\ 2_1/m\ 2/c$	$P4_2/nmc$	$P4_2/n\ 2_1/m\ 2/c$	
138	D_{4h}^{16}	$(c:(a:a))\cdot ab:4_2\cdot\widetilde{c}$	$P4/ncm$	$P4_2/n\ 2_1/c\ 2/m$	$P4_2/ncm$	$P4_2/n\ 2_1/c\ 2/m$	
139	D_{4h}^{17}	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right)\cdot m:4\cdot m$	$I4/mmm$	$I4/m\ 2/m\ 2/m$	$I4/mmm$	$I4/m\ 2/m\ 2/m$	
140	D_{4h}^{18}	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right)\cdot m:4\cdot\widetilde{c}$	$I4/mcm$	$I4/m\ 2/c\ 2/m$	$I4/mcm$	$I4/m\ 2/c\ 2/m$	
141	D_{4h}^{19}	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right)\cdot\widetilde{a}:4_1\odot m$	$I4/amd$	$I4_1/a\ 2/m\ 2/d$	$I4_1/amd$	$I4_1/a\ 2/m\ 2/d$	
142	D_{4h}^{20}	$\left(\frac{a+b+c}{2}\Big/c:(a:a)\right)\cdot\widetilde{a}:4_1\odot\widetilde{c}$	$I4/acd$	$I4_1/a\ 2/c\ 2/d$	$I4_1/acd$	$I4_1/a\ 2/c\ 2/d$	
143	C_3^1	$(c:(a/a)):3$	$C3$	$C3$	$P3$	$P3$	
144	C_3^2	$(c:(a/a)):3_1$	$C3_1$	$C3_1$	$P3_1$	$P3_1$	
145	C_3^3	$(c:(a/a)):3_2$	$C3_2$	$C3_2$	$P3_2$	$P3_2$	
146	C_3^4	$\left(\frac{2a+b+c}{3}\Big/\frac{a+2b+2c}{3}\Big/c:(a/a)\right):3$	$R3$	$R3$	$R3$	$R3$	Hexagonal setting (Sh–K)
		$(a/a/a)/3$					Rhombohedral setting (Sh–K)
147	C_{3i}^1	$(c:(a/a)):\widetilde{6}$	$C\bar{3}$	$C\bar{3}$	$P\bar{3}$	$P\bar{3}$	
148	C_{3i}^2	$\left(\frac{2a+b+c}{3}\Big/\frac{a+2b+2c}{3}\Big/c:(a/a)\right):\widetilde{6}$	$R\bar{3}$	$R\bar{3}$	$R\bar{3}$	$R\bar{3}$	Hexagonal setting (Sh–K)
		$(a/a/a)/\widetilde{6}$					Rhombohedral setting (Sh–K)
149	D_3^1	$(c:(a/a)):2:3$	$H32$	$H321$	$P312$	$P312$	
150	D_3^2	$(c:(a/a))\cdot 2:3$	$C32$	$C321$	$P321$	$P321$	
151	D_3^3	$(c:(a/a)):2:3_1$	$H3_12$	$H3_121$	$P3_112$	$P3_112$	
152	D_3^4	$(c:(a/a))\cdot 2:3_1$	$C3_12$	$C3_121$	$P3_121$	$P3_121$	
153	D_3^5	$(c:(a/a)):2:3_2$	$H3_22$	$H3_221$	$P3_212$	$P3_212$	
154	D_3^6	$(c:(a/a))\cdot 2:3_2$	$C3_22$	$C3_221$	$P3_221$	$P3_221$	
155	D_3^7	$\left(\frac{2a+b+c}{3}\Big/\frac{a+2b+2c}{3}\Big/c:(a/a)\right)\cdot 2:3$	$R32$	$R32$	$R32$	$R32$	Hexagonal setting (Sh–K)
		$(a/a/a)/3:2$					Rhombohedral setting (Sh–K)

Table 12.3.4.1. *Standard space-group symbols* (*cont.*)

No.	Schoenflies symbol	Shubnikov symbol	Symbols of *International Tables*				Comments*†
			1935 Edition		Present Edition		
			Short	Full	Short	Full	
156	C_{3v}^{1}	$(c:(a/a)):m\cdot 3$	$C3m$	$C3m1$	$P3m1$	$P3m1$	
157	C_{3v}^{2}	$(a:c:a)\cdot m\cdot 3$	$H3m$	$H3m1$	$P31m$	$P31m$	$(c:(a/a))\cdot m\cdot 3$ (Sh−K) with special comment
158	C_{3v}^{3}	$(c:(a/a)):\widetilde{c}\cdot 3$	$C3c$	$C3c1$	$P3c1$	$P3c1$	
159	C_{3v}^{4}	$(a:c:a)\cdot\widetilde{c}\cdot 3$	$H3c$	$H3c1$	$P31c$	$P31c$	$(c:(a/a))\cdot\widetilde{c}\cdot 3$ (Sh−K) with special comment
160	C_{3v}^{5}	$\left(\frac{2a+b+c}{3}\Big/\frac{a+2b+2c}{3}\Big/c:(a/a)\right)\cdot m\cdot 3$	$R3m$	$R3m$	$R3m$	$R3m$	Hexagonal setting (Sh–K)
		$(a/a/a)/3\cdot m$					Rhombohedral setting (Sh–K)
161	C_{3v}^{6}	$\left(\frac{2a+b+c}{3}\Big/\frac{a+2b+2c}{3}\Big/c:(a/a)\right)\cdot\widetilde{c}\cdot 3$	$R3c$	$R3c$	$R3c$	$R3c$	Hexagonal setting (Sh–K)
		$(a/a/a)/3\cdot\widetilde{abc}$					Rhombohedral setting (Sh–K)
162	D_{3d}^{1}	$(a:c:a)\cdot m\cdot\widetilde{6}$	$H\bar{3}m$	$H\bar{3}\ 2/m\ 1$	$P\bar{3}1m$	$P\bar{3}1\ 2/m$	$(c:(a/a))\cdot m\cdot\widetilde{6}$ (Sh–K) with special comment
163	D_{3d}^{2}	$(a:c:a)\cdot\widetilde{c}\cdot\widetilde{6}$	$H\bar{3}c$	$H\bar{3}\ 2/c\ 1$	$P\bar{3}1c$	$P\bar{3}1\ 2/c$	$(c:(a/a))\cdot\widetilde{c}\cdot\widetilde{6}$ (Sh–K) with special comment
164	D_{3d}^{3}	$(c:(a/a)):m\cdot\widetilde{6}$	$C\bar{3}m$	$C\bar{3}\ 2/m\ 1$	$P\bar{3}m1$	$P\bar{3}\ 2/m\ 1$	
165	D_{3d}^{4}	$(c:(a/a)):\widetilde{c}\cdot\widetilde{6}$	$C\bar{3}c$	$C\bar{3}\ 2/c\ 1$	$P\bar{3}c1$	$P\bar{3}\ 2/c\ 1$	
166	D_{3d}^{5}	$\left(\frac{2a+b+c}{3}\Big/\frac{a+2b+2c}{3}\Big/c:(a/a)\right):m\cdot\widetilde{6}$	$R\bar{3}m$	$R\bar{3}\ 2/m$	$R\bar{3}m$	$R\bar{3}\ 2/m$	Hexagonal setting (Sh–K)
		$(a/a/a)/\widetilde{6}\cdot m$					Rhombohedral setting (Sh–K)
167	D_{3d}^{6}	$\left(\frac{2a+b+c}{3}\Big/\frac{a+2b+2c}{3}\Big/c:(a/a)\right):\widetilde{c}\cdot\widetilde{6}$	$R\bar{3}c$	$R\bar{3}\ 2/c$	$R\bar{3}c$	$R\bar{3}\ 2/c$	Hexagonal setting (Sh–K)
		$(a/a/a)/\widetilde{6}\cdot\widetilde{abc}$					Rhombohedral setting (Sh–K)
168	C_{6}^{1}	$(c:(a/a)):6$	$C6$	$C6$	$P6$	$P6$	
169	C_{6}^{2}	$(c:(a/a)):6_1$	$C6_1$	$C6_1$	$P6_1$	$P6_1$	
170	C_{6}^{3}	$(c:(a/a)):6_5$	$C6_5$	$C6_5$	$P6_5$	$P6_5$	
171	C_{6}^{4}	$(c:(a/a)):6_2$	$C6_2$	$C6_2$	$P6_2$	$P6_2$	
172	C_{6}^{5}	$(c:(a/a)):6_4$	$C6_4$	$C6_4$	$P6_4$	$P6_4$	
173	C_{6}^{6}	$(c:(a/a)):6_3$	$C6_3$	$C6_3$	$P6_3$	$P6_3$	
174	C_{3h}^{1}	$(c:(a/a)):3:m$	$C\bar{6}$	$C\bar{6}$	$P\bar{6}$	$P\bar{6}$	
175	C_{6h}^{1}	$(c:(a/a))\cdot m:6$	$C6/m$	$C6/m$	$P6/m$	$P6/m$	
176	C_{6h}^{2}	$(c:(a/a))\cdot m:6_3$	$C6_3/m$	$C6_3/m$	$P6_3/m$	$P6_3/m$	
177	D_{6}^{1}	$(c:(a/a))\cdot 2:6$	$C62$	$C622$	$P622$	$P622$	
178	D_{6}^{2}	$(c:(a/a))\cdot 2:6_1$	$C6_12$	$C6_122$	$P6_122$	$P6_122$	
179	D_{6}^{3}	$(c:(a/a))\cdot 2:6_5$	$C6_52$	$C6_522$	$P6_522$	$P6_522$	
180	D_{6}^{4}	$(c:(a/a))\cdot 2:6_2$	$C6_22$	$C6_222$	$P6_222$	$P6_222$	
181	D_{6}^{5}	$(c:(a/a))\cdot 2:6_4$	$C6_42$	$C6_422$	$P6_422$	$P6_422$	
182	D_{6}^{6}	$(c:(a/a))\cdot 2:6_3$	$C6_32$	$C6_322$	$P6_322$	$P6_322$	
183	C_{6v}^{1}	$(c:(a/a)):m\cdot 6$	$C6mm$	$C6mm$	$P6mm$	$P6mm$	
184	C_{6v}^{2}	$(c:(a/a)):\widetilde{c}\cdot 6$	$C6cc$	$C6cc$	$P6cc$	$P6cc$	
185	C_{6v}^{3}	$(c:(a/a)):\widetilde{c}\cdot 6_3$	$C6cm$	$C6_3cm$	$P6_3cm$	$P6_3cm$	
186	C_{6v}^{4}	$(c:(a/a)):m\cdot 6_3$	$C6mc$	$C6_3mc$	$P6_3mc$	$P6_3mc$	
187	D_{3h}^{1}	$(c:(a/a)):m\cdot 3:m$	$C\bar{6}m2$	$C\bar{6}m2$	$P\bar{6}m2$	$P\bar{6}m2$	
188	D_{3h}^{2}	$(c:(a/a)):\widetilde{c}\cdot 3:m$	$C\bar{6}c2$	$C\bar{6}c2$	$P\bar{6}c2$	$P\bar{6}c2$	
189	D_{3h}^{3}	$(c:(a/a))\cdot m:3\cdot m$	$H\bar{6}m2$	$H\bar{6}m2$	$P\bar{6}2m$	$P\bar{6}2m$	
190	D_{3h}^{4}	$(c:(a/a))\cdot m:3\cdot\widetilde{c}$	$H\bar{6}c2$	$H\bar{6}c2$	$P\bar{6}2c$	$P\bar{6}2c$	

Table 12.3.4.1. *Standard space-group symbols* (*cont.*)

No.	Schoenflies symbol	Shubnikov symbol	Symbols of *International Tables*				Comments*†
			1935 Edition		Present Edition		
			Short	Full	Short	Full	
191	D_{6h}^1	$(c:(a/a))\cdot m:6\cdot m$	$C6/mmm$	$C6/m\ 2/m\ 2/m$	$P6/mmm$	$P6/m\ 2/m\ 2/m$	
192	D_{6h}^2	$(c:(a/a))\cdot m:6\cdot \widetilde{c}$	$C6/mcc$	$C6/m\ 2/c\ 2/c$	$P6/mcc$	$P6/m\ 2/c\ 2/c$	
193	D_{6h}^3	$(c:(a/a))\cdot m:6_3\cdot \widetilde{c}$	$C6/mcm$	$C6_3/m\ 2/c\ 2/m$	$P6_3/mcm$	$P6_3/m\ 2/c\ 2/m$	
194	D_{6h}^4	$(c:(a/a))\cdot m:6_3\cdot m$	$C6/mmc$	$C6_3/m\ 2/m\ 2/c$	$P6_3/mmc$	$P6_3/m\ 2/m\ 2/c$	
195	T^1	$(a:(a/a)):2/3$	$P23$	$P23$	$P23$	$P23$	
196	T^2	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:a:(a:a)\right):2/3$	$F23$	$F23$	$F23$	$F23$	
197	T^3	$\left(\frac{a+b+c}{2}\Big/a:(a:a)\right):2/3$	$I23$	$I23$	$I23$	$I23$	
198	T^4	$(a:(a:a)):2_1//3$	$P2_13$	$P2_13$	$P2_13$	$P2_13$	
199	T^5	$\left(\frac{a+b+c}{2}\Big/a:(a:a)\right):2_1//3$	$I2_13$	$I2_13$	$I2_13$	$I2_13$	
200	T_h^1	$(a:(a:a))\cdot m/\widetilde{6}$	$Pm3$	$P2/m\ \overline{3}$	$Pm\overline{3}$	$P2/m\ \overline{3}$	$Pm3$ (*IT*, 1952)
201	T_h^2	$(a:(a:a))\cdot \widetilde{ab}/\widetilde{6}$	$Pn3$	$P2/n\ \overline{3}$	$Pn\overline{3}$	$P2/n\ \overline{3}$	$Pn3$ (*IT*, 1952)
202	T_h^3	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:a:(a:a)\right)\cdot m/\widetilde{6}$	$Fm3$	$F2/m\ \overline{3}$	$Fm\overline{3}$	$F2/m\ \overline{3}$	$Fm3$ (*IT*, 1952)
203	T_h^4	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:a:(a:a)\right)\cdot \frac{1}{2}ab/\widetilde{6}$	$Fd3$	$F2/d\ \overline{3}$	$Fd\overline{3}$	$F2/d\ \overline{3}$	$Fd3$ (*IT*, 1952)
204	T_h^5	$\left(\frac{a+b+c}{2}\Big/a:(a:a)\right)\cdot m/\widetilde{6}$	$Im3$	$I2/m\ \overline{3}$	$Im\overline{3}$	$I2/m\ \overline{3}$	$Im3$ (*IT*, 1952)
205	T_h^6	$(a:(a:a))\cdot \widetilde{a}/\widetilde{6}$	$Pa3$	$P2_1/a\ \overline{3}$	$Pa\overline{3}$	$P2_1/a\ \overline{3}$	$Pa3$ (*IT*, 1952)
206	T_h^7	$\left(\frac{a+b+c}{2}\Big/a:(a:a)\right)\cdot \widetilde{a}/\widetilde{6}$	$Ia3$	$I2_1/a\ \overline{3}$	$Ia\overline{3}$	$I2_1/a\ \overline{3}$	$Ia3$ (*IT*, 1952)
207	O^1	$(a:(a:a)):4/3$	$P43$	$P432$	$P432$	$P432$	
208	O^2	$(a:(a:a)):4_2//3$	$P4_23$	$P4_232$	$P4_232$	$P4_232$	
209	O^3	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:a:(a:a)\right):4/3$	$F43$	$F432$	$F432$	$F432$	
210	O^4	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:a:(a:a)\right):4_1//3$	$F4_13$	$F4_132$	$F4_132$	$F4_132$	
211	O^5	$\left(\frac{a+b+c}{2}\Big/a:(a:a)\right):4/3$	$I43$	$I432$	$I432$	$I432$	
212	O^6	$(a:(a:a)):4_3//3$	$P4_33$	$P4_332$	$P4_332$	$P4_332$	
213	O^7	$(a:(a:a)):4_1//3$	$P4_13$	$P4_132$	$P4_132$	$P4_132$	
214	O^8	$\left(\frac{a+b+c}{2}\Big/a:(a:a)\right):4_1//3$	$I4_13$	$I4_132$	$I4_132$	$I4_132$	
215	T_d^1	$(a:(a:a)):\widetilde{4}/3$	$P\overline{4}3m$	$P\overline{4}3m$	$P\overline{4}3m$	$P\overline{4}3m$	
216	T_d^2	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:a:(a:a)\right):\widetilde{4}/3$	$F\overline{4}3m$	$F\overline{4}3m$	$F\overline{4}3m$	$F\overline{4}3m$	
217	T_d^3	$\left(\frac{a+b+c}{2}\Big/a:(a:a)\right):\widetilde{4}/3$	$I\overline{4}3m$	$I\overline{4}3m$	$I\overline{4}3m$	$I\overline{4}3m$	
218	T_d^4	$(a:(a:a)):\widetilde{4}//3$	$P\overline{4}3n$	$P\overline{4}3n$	$P\overline{4}3n$	$P\overline{4}3n$	
219	T_d^5	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:a:(a:a)\right):\widetilde{4}//3$	$F\overline{4}3c$	$F\overline{4}3c$	$F\overline{4}3c$	$F\overline{4}3c$	
220	T_d^6	$\left(\frac{a+b+c}{2}\Big/a:(a:a)\right):\widetilde{4}//3$	$I\overline{4}3d$	$I\overline{4}3d$	$I\overline{4}3d$	$I\overline{4}3d$	

Table 12.3.4.1. *Standard space-group symbols* (*cont.*)

No.	Schoenflies symbol	Shubnikov symbol	Symbols of *International Tables*				Comments*†
			1935 Edition		Present Edition		
			Short	Full	Short	Full	
221	O_h^1	$(a:(a:a)):4/\widetilde{6}\cdot m$	$Pm3m$	$P4/m\,\bar{3}\,2/m$	$Pm\bar{3}m$	$P4/m\,\bar{3}\,2/m$	$Pm3m$ (*IT*, 1952)
222	O_h^2	$(a:(a:a)):4/\widetilde{6}\cdot\widetilde{abc}$	$Pn3n$	$P4/n\,\bar{3}\,2/n$	$Pn\bar{3}n$	$P4/n\,\bar{3}\,2/n$	$Pn3n$ (*IT*, 1952)
223	O_h^3	$(a:(a:a)):4_2//\widetilde{6}\cdot\widetilde{abc}$	$Pm3n$	$P4_2/m\,\bar{3}\,2/n$	$Pm\bar{3}n$	$P4_2/m\,\bar{3}\,2/n$	$Pm3n$ (*IT*, 1952)
224	O_h^4	$(a:(a:a)):4_2//\widetilde{6}\cdot m$	$Pn3m$	$P4_2/n\,\bar{3}\,2/m$	$Pn\bar{3}m$	$P4_2/n\,\bar{3}\,2/m$	$Pn3m$ (*IT*, 1952)
225	O_h^5	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:a:(a:a)\right):4/\widetilde{6}\cdot m$	$Fm3m$	$F4/m\,\bar{3}\,2/m$	$Fm\bar{3}m$	$F4/m\,\bar{3}\,2/m$	$Fm3m$ (*IT*, 1952)
226	O_h^6	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:a:(a:a)\right):4/\widetilde{6}\cdot\widetilde{c}$	$Fm3c$	$F4/m\,\bar{3}\,2/c$	$Fm\bar{3}c$	$F4/m\,\bar{3}\,2/c$	$Fm3c$ (*IT*, 1952)
227	O_h^7	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:a(a:a)\right)$ $:4_1//\widetilde{6}\cdot m$	$Fd3m$	$F4_1/d\,\bar{3}\,2/m$	$Fd\bar{3}m$	$F4_1/d\,\bar{3}\,2/m$	$Fd3m$ (*IT*, 1952)
228	O_h^8	$\left(\frac{a+c}{2}\Big/\frac{b+c}{2}\Big/\frac{a+b}{2}:a:(a:a)\right)$ $:4_1//\widetilde{6}\cdot\widetilde{c}$	$Fd3c$	$F4_1/d\,\bar{3}\,2/c$	$Fd\bar{3}c$	$F4_1/d\,\bar{3}\,2/c$	$Fd3c$ (*IT*, 1952)
229	O_h^9	$\left(\frac{a+b+c}{2}\Big/a:(a:a)\right):4/\widetilde{6}\cdot m$	$Im3m$	$I4/m\,\bar{3}\,2/m$	$Im\bar{3}m$	$I4/m\,\bar{3}\,2/m$	$Im3m$ (*IT*, 1952)
230	O_h^{10}	$\left(\frac{a+b+c}{2}\Big/a:(a:a)\right):4_1//\widetilde{6}\cdot\frac{1}{2}\widetilde{abc}$	$Ia3d$	$I4_1/a\,\bar{3}\,2/d$	$Ia\bar{3}d$	$I4_1/a\,\bar{3}\,2/d$	$Ia3d$ (*IT*, 1952)

* Abbreviations used in the column *Comments*: *IT*, 1952: *International Tables for X-ray Crystallography,* Vol. 1 (1952); Sh–K; Shubnikov & Koptsik (1972).
† Note that this table contains only one notation for the *b*-unique setting and one notation for the *c*-unique setting in the monoclinic case, always referring to cell choice 1 of the space-group tables.

12.3.3. Non-symbolized symmetry elements

Certain symmetry elements are not given explicitly in the full symbol because they can easily be derived. They are:

(i) Rotoinversion axes that are not used to indicate the lattice symmetry directions.

(ii) Rotation axes 2 included in the axes 4, $\bar{4}$ and 6 and rotation axes 3 included in the axes $\bar{3}$, 6 and $\bar{6}$.

(iii) Additional symmetry elements occurring in space groups with centred unit cells. These types of operation can be deduced from the product of the centring translation $(\boldsymbol{I}, \boldsymbol{g})$ with a symmetry operation $(\boldsymbol{W}, \boldsymbol{w})$. The new symmetry operation $(\boldsymbol{W}, \boldsymbol{g}+\boldsymbol{w})$ again has $\boldsymbol{W}$ as rotation part but a different glide/screw part if the component of $\boldsymbol{g}$ parallel to the symmetry element corresponding to $\boldsymbol{W}$ is not a lattice vector; *cf.* Chapter 4.1.

Example

Space group $C2/c$ (15) has a twofold axis along **b** with screw part $\boldsymbol{w}_g = (0,0,0)$. The translational part of the centring operation is $\boldsymbol{g} = (\frac{1}{2}, \frac{1}{2}, 0)$.

An additional axis parallel to **b** thus has a translation part $\boldsymbol{g}+\boldsymbol{w}_g = (\frac{1}{2}, \frac{1}{2}, 0)$. The component $(0, \frac{1}{2}, 0)$ indicates a screw axis 2_1 in the y direction, whereas the component $(\frac{1}{2}, 0, 0)$ indicates the location of this axis in $(\frac{1}{4}, y, 0)$. Similarly, it can be shown that glide plane *c* combined with the centring gives a glide plane *n*.

In the same way, in rhombohedral and cubic space groups, a rotation axis 3 is accompanied by screw axes 3_1 and 3_2.

In space groups with centred unit cells, the location parts of different symmetry elements may coincide. In $I\bar{4}2m$, for example, the mirror plane *m* contains simultaneously a non-symbolized glide plane *n*. The same applies to all mirror planes in *Fmmm*.

(iv) Symmetry elements with diagonal orientation always occur with different types of glide/screw parts simultaneously. In space group $P\bar{4}2m$ the translation vector along *a* can be decomposed as

$$\boldsymbol{w} = (1,0,0) = (\tfrac{1}{2}, \tfrac{1}{2}, 0) + (\tfrac{1}{2}, -\tfrac{1}{2}, 0) = \boldsymbol{w}_g + \boldsymbol{w}_l.$$

The diagonal mirror plane with normal along $[1\bar{1}0]$ passing through the origin is accompanied by a parallel glide plane with glide part $(\frac{1}{2}, \frac{1}{2}, 0)$ shifted by $(\frac{1}{4}, -\frac{1}{4}, 0)$. The same arguments lead to the occurrence of screw axes 2_1, 3_1 and 3_2 connected with diagonal rotation axes 2 or 3.

(v) For some investigations connected with *klassengleiche* subgroups, it is convenient to introduce an *extended full space-group symbol* that comprises all symmetry elements indicated in (iii) and (iv). The basic concept may be found in papers by Hermann (1929) and in *IT* (1952). These concepts have been applied by Bertaut (1976) and Zimmermann (1976); *cf.* Part 4.

Example

The full symbol of space group *Imma* (74) is

$$I\frac{2_1}{m}\frac{2_1}{m}\frac{2_1}{a}.$$

The *I*-centring operation introduces additional rotation axes and glide planes for all three sets of lattice symmetry directions. The extended full symbol is

$$I\frac{2,2_1}{m,n}\frac{2,2_1}{m,n}\frac{2,2_1}{a,b} \quad \text{or} \quad I\begin{matrix}\frac{2_1}{m} & \frac{2_1}{m} & \frac{2_1}{a}\\ \frac{2}{n} & \frac{2}{n} & \frac{2}{b}\end{matrix}.$$

This symbol shows immediately the eight subgroups with a *P* lattice corresponding to point group *mmm*:

references