List of space groups

There are 230 space groups in three dimensions, given by a number index, and a full name in Hermann–Mauguin notation, and a short name (international short symbol). The long names are given with spaces for readability. The groups each have a point group of the unit cell.

Contents

Symbols

In Hermann–Mauguin notation, space groups are named by a symbol combining the point group identifier with the uppercase letters describing the lattice type. Translations within the lattice in the form of screw axes and glide planes are also noted, giving a complete crystallographic space group.

These are the Bravais lattices in three dimensions:

- **P** primitive
- **I** body centered (from the German "Innenzentriert")
- **F** face centered (from the German "Flächenzentriert")
- **A** centered on A faces only
- **B** centered on B faces only
- **C** centered on C faces only
- **R** rhombohedral

A reflection plane **m** within the point groups can be replaced by a glide plane, labeled as **a**, **b**, or **c** depending on which axis the glide is along. There is also the **n** glide, which is a glide along the half of a diagonal of **a** face, and the **d** glide, which is along a quarter of either a face or space diagonal of the unit cell. The **d** glide is often called the diamond glide plane as it features in the diamond structure.

- $\boldsymbol{a}$, $\boldsymbol{b}$, or $\boldsymbol{c}$ glide translation along half the lattice vector of this face
- $\boldsymbol{n}$ glide translation along with half a face diagonal
- $\boldsymbol{d}$ glide planes with translation along a quarter of a face diagonal.
- $\boldsymbol{e}$ two glides with the same glide plane and translation along two (different) half-lattice vectors.

A gyration point can be replaced by a screw axis denoted by a number, *n*, where the angle of rotation is $\frac{360°}{n}$. The degree of translation is then added as a subscript showing how far along the axis the translation is, as a portion of the parallel lattice vector. For example, 2_1 is a 180° (twofold) rotation followed by a translation of ½ of the lattice vector. 3_1 is a 120° (threefold) rotation followed by a translation of ⅓ of the lattice vector.

The possible screw axes are: 2_1, 3_1, 3_2, 4_1, 4_2, 4_3, 6_1, 6_2, 6_3, 6_4, and 6_5.

In **Schoenflies notation**, the symbol of a space group is represented by the symbol of corresponding point group with additional superscript. The superscript doesn't give any additional information about symmetry elements of the space group, but is instead related to the order in which Schoenflies derived the space groups. This is somtimes supplemented with a symbol of the form $\boldsymbol{\Gamma_x^y}$ which specifies the bravais lattice. Here $\boldsymbol{x \in \{t, m, o, q, rh, h, c\}}$ is the lattice system, and $\boldsymbol{y \in \{\emptyset, b, v, f\}}$ is the centering type.[1]

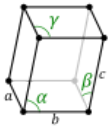
In **Fedorov symbol**, the type of space group is denoted as *s* (*symmorphic*), *h* (*hemisymmorphic*), or *a* (*asymmorphic*). The number is related to the order in which Fedorov derived space groups. There are 73 symmorphic, 54 hemisymmorphic, and 103 asymmorphic space groups. Symmorphic space groups can be obtained as combination of Bravais lattices with corresponding point group. These groups contain the same symmetry elements as the corresponding point groups. Hemisymmorphic space groups contain only axial combination of symmetry elements from the corresponding point groups. All the other space groups are asymmorphic. Example for point group 4/mmm ($\frac{4}{m}\frac{2}{m}\frac{2}{m}$): the symmorphic space groups are P4/mmm ($\boldsymbol{P}\frac{4}{m}\frac{2}{m}\frac{2}{m}$, *36s*) and I4/mmm ($\boldsymbol{I}\frac{4}{m}\frac{2}{m}\frac{2}{m}$, *37s*); hemisymmorphic space groups should contain axial combination 422, these are P4/mcc ($\boldsymbol{P}\frac{4}{m}\frac{2}{c}\frac{2}{c}$, *35h*), P4/nbm ($\boldsymbol{P}\frac{4}{n}\frac{2}{b}\frac{2}{m}$, *36h*), P4/nnc ($\boldsymbol{P}\frac{4}{n}\frac{2}{n}\frac{2}{c}$, *37h*), and I4/mcm ($\boldsymbol{I}\frac{4}{m}\frac{2}{c}\frac{2}{m}$, *38h*).

List of Triclinic

Triclinic crystal system

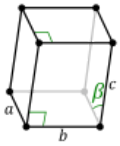
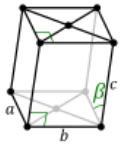
Number	Point group	Orbifold	Short name	Full name	Schoenflies	Fedorov	Shubnikov	Fibrifold
1	1	$\mathbf{1}$	P1	P 1	$\mathbf{\Gamma}_t C_1^1$	*1s*	$(a/b/c)\cdot\mathbf{1}$	$(\circ)$
2	$\overline{1}$	×	P$\overline{1}$	P $\overline{1}$	$\mathbf{\Gamma}_t C_i^1$	*2s*	$(a/b/c)\cdot\tilde{\mathbf{2}}$	$\mathbf{(2222)}$

Triclinic Bravais lattice



List of Monoclinic

Monoclinic Bravais lattice

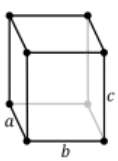
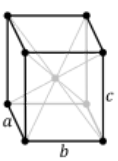
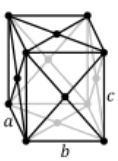
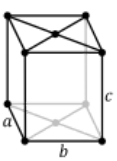
Simple (P)	Base (C)
	

Monoclinic crystal system

Number	Point group	Orbifold	Short name	Full name(s)		Schoenflies	Fedorov	Shubnikov	Fibrifold (primary)	Fibrifold (secondary)
3	2	$\mathbf{22}$	P2	P 1 2 1	P 1 1 2	$\mathbf{\Gamma}_m C_2^1$	*3s*	$(b:(c/a)):\mathbf{2}$	$(2_0 2_0 2_0 2_0)$	$(*_0 *_0)$
4			$P2_1$	P 1 2_1 1	P 1 1 2_1	$\mathbf{\Gamma}_m C_2^2$	*1a*	$(b:(c/a)):\mathbf{2_1}$	$(2_1 2_1 2_1 2_1)$	$(\bar{\times}\bar{\times})$
5			C2	C 1 2 1	B 1 1 2	$\mathbf{\Gamma}_m^b C_2^3$	*4s*	$\left(\frac{a+b}{2}/b:(c/a)\right):\mathbf{2}$	$(2_0 2_0 2_1 2_1)$	$(*_1 *_1)$, $(*\bar{\times})$
6	m	$*$	Pm	P 1 m 1	P 1 1 m	$\mathbf{\Gamma}_m C_s^1$	*5s*	$(b:(c/a))\cdot m$	$[\circ_0]$	$(*\cdot *\cdot)$
7			Pc	P 1 c 1	P 1 1 b	$\mathbf{\Gamma}_m C_s^2$	*1h*	$(b:(c/a))\cdot\tilde{c}$	$(\bar{\circ}_0)$	$(*:*:)$, $(\times\times_0)$
8			Cm	C 1 m 1	B 1 1 m	$\mathbf{\Gamma}_m^b C_s^3$	*6s*	$\left(\frac{a+b}{2}/b:(c/a)\right)\cdot m$	$[\circ_1]$	$(*\cdot *:)$, $(*\cdot\times)$
9			Cc	C 1 c 1	B 1 1 b	$\mathbf{\Gamma}_m^b C_s^4$	*2h*	$\left(\frac{a+b}{2}/b:(c/a)\right)\cdot\tilde{c}$	$(\bar{\circ}_1)$	$(*:\times)$, $(\times\times_1)$
10	2/m	$\mathbf{2*}$	P2/m	P 1 2/m 1	P 1 1 2/m	$\mathbf{\Gamma}_m C_{2h}^1$	*7s*	$(b:(c/a))\cdot m:\mathbf{2}$	$[2_0 2_0 2_0 2_0]$	$[*2\cdot 22\cdot 2)$
11			$P2_1/m$	P 1 2_1/m 1	P 1 1 2_1/m	$\mathbf{\Gamma}_m C_{2h}^2$	*2a*	$(b:(c/a))\cdot m:\mathbf{2_1}$	$[2_1 2_1 2_1 2_1]$	$(22*\cdot)$
12			C2/m	C 1 2/m 1	B 1 1 2/m	$\mathbf{\Gamma}_m^b C_{2h}^3$	*8s*	$\left(\frac{a+b}{2}/b:(c/a)\right)\cdot m:\mathbf{2}$	$[2_0 2_0 2_1 2_1]$	$(*2\cdot 22:2)$, $(2\bar{*}2\cdot 2)$
13			P2/c	P 1 2/c 1	P 1 1 2/b	$\mathbf{\Gamma}_m C_{2h}^4$	*3h*	$(b:(c/a))\cdot\tilde{c}:\mathbf{2}$	$(2_0 2_0 22)$	$(*2:22:2)$, $(22*_0)$
14			$P2_1/c$	P 1 2_1/c 1	P 1 1 2_1/b	$\mathbf{\Gamma}_m C_{2h}^5$	*3a*	$(b:(c/a))\cdot\tilde{c}:\mathbf{2_1}$	$(2_1 2_1 22)$	$(22*:)$, $(22\times)$
15			C2/c	C 1 2/c 1	B 1 1 2/b	$\mathbf{\Gamma}_m^b C_{2h}^6$	*4h*	$\left(\frac{a+b}{2}/b:(c/a)\right)\cdot\tilde{c}:\mathbf{2}$	$(2_0 2_1 22)$	$(2\bar{*}2:2)$, $(22*_1)$

List of Orthorhombic

Orthorhombic Bravais lattice

Simple (P)	Body (I)	Face (F)	Base (A or C)
			

Orthorhombic crystal system

Number	Point group	Orbifold	Short name	Full name	Schoenflies	Fedorov	Shubnikov	Fibrifold (primary)	Fibrifold (secondary)
16	222	222	P222	P 2 2 2	$\Gamma_o D_2^1$	*9s*	$(c:a:b):2:2$	$(*2_02_02_02_0)$	
17			$P222_1$	P 2 2 2_1	$\Gamma_o D_2^2$	*4a*	$(c:a:b):2_1:2$	$(*2_12_12_12_1)$	(2_02_0*)
18			$P2_12_12$	P 2_1 2_1 2	$\Gamma_o D_2^3$	*7a*	$(c:a:b):2\odot 2_1$	$(2_02_0\bar{\times})$	(2_12_1*)
19			$P2_12_12_1$	P 2_1 2_1 2_1	$\Gamma_o D_2^4$	*8a*	$(c:a:b):2_1\odot 2_1$	$(2_12_1\bar{\times})$	
20			$C222_1$	C 2 2 2_1	$\Gamma_o^b D_2^5$	*5a*	$\left(\frac{a+b}{2}:c:a:b\right):2_1:2$	$(2_1*2_12_1)$	(2_02_1*)
21			C222	C 2 2 2	$\Gamma_o^b D_2^6$	*10s*	$\left(\frac{a+b}{2}:c:a:b\right):2:2$	$(2_0*2_02_0)$	$(*2_02_02_12_1)$
22			F222	F 2 2 2	$\Gamma_o^f D_2^7$	*12s*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2}:c:a:b\right):2:2$	$(*2_02_12_02_1)$	
23			I222	I 2 2 2	$\Gamma_o^v D_2^8$	*11s*	$\left(\frac{a+b+c}{2}/c:a:b\right):2:2$	$(2_1*2_02_0)$	
24			$I2_12_12_1$	I 2_1 2_1 2_1	$\Gamma_o^v D_2^9$	*6a*	$\left(\frac{a+b+c}{2}/c:a:b\right):2:2_1$	$(2_0*2_12_1)$	
25	mm2	*22	Pmm2	P m m 2	$\Gamma_o C_{2v}^1$	*13s*	$(c:a:b):m\cdot 2$	$(*\cdot 2\cdot 2\cdot 2\cdot 2)$	$[*_0\cdot *_0\cdot]$
26			$Pmc2_1$	P m c 2_1	$\Gamma_o C_{2v}^2$	*9a*	$(c:a:b):\tilde{c}\cdot 2_1$	$(*\cdot 2:2\cdot 2:2)$	$(\bar{*}\cdot\bar{*}\cdot),$ $[\times_0\times_0]$
27			Pcc2	P c c 2	$\Gamma_o C_{2v}^3$	*5h*	$(c:a:b):\tilde{c}\cdot 2$	$(*:2:2:2:2)$	$(\bar{*}_0\bar{*}_0)$
28			Pma2	P m a 2	$\Gamma_o C_{2v}^4$	*6h*	$(c:a:b):\tilde{a}\cdot 2$	$(2_02_0*\cdot)$	$[*_0:*_0:],$ $(*\cdot *_0)$
29			$Pca2_1$	P c a 2_1	$\Gamma_o C_{2v}^5$	*11a*	$(c:a:b):\tilde{a}\cdot 2_1$	$(2_12_1*:)$	$(\bar{*}:\bar{*}:)$
30			Pnc2	P n c 2	$\Gamma_o C_{2v}^6$	*7h*	$(c:a:b):\tilde{c}\odot 2$	$(2_02_0*:)$	$(\bar{*}_1\bar{*}_1),$ $(*_0\times_0)$
31			$Pmn2_1$	P m n 2_1	$\Gamma_o C_{2v}^7$	*10a*	$(c:a:b):\widetilde{ac}\cdot 2_1$	$(2_12_1*\cdot)$	$(*\cdot\bar{\times}),$ $[\times_0\times_1]$
32			Pba2	P b a 2	$\Gamma_o C_{2v}^8$	*9h*	$(c:a:b):\tilde{a}\odot 2$	$(2_02_0\times_0)$	$(*:*_0)$
33			$Pna2_1$	P n a 2_1	$\Gamma_o C_{2v}^9$	*12a*	$(c:a:b):\tilde{a}\odot 2_1$	$(2_12_1\times)$	$(*:\times),$ $(\times\times_1)$
34			Pnn2	P n n 2	$\Gamma_o C_{2v}^{10}$	*8h*	$(c:a:b):\widetilde{ac}\odot 2$	$(2_02_0\times_1)$	$(*_0\times_1)$
35			Cmm2	C m m 2	$\Gamma_o^b C_{2v}^{11}$	*14s*	$\left(\frac{a+b}{2}:c:a:b\right):m\cdot 2$	$(2_0*\cdot 2\cdot 2)$	$[*_0\cdot *_0:]$
36			$Cmc2_1$	C m c 2_1	$\Gamma_o^b C_{2v}^{12}$	*13a*	$\left(\frac{a+b}{2}:c:a:b\right):\tilde{c}\cdot 2_1$	$(2_1*\cdot 2:2)$	$(\bar{*}:\bar{*}:),$ $[\times_1\times_1]$
37			Ccc2	C c c 2	$\Gamma_o^b C_{2v}^{13}$	*10h*	$\left(\frac{a+b}{2}:c:a:b\right):\tilde{c}\cdot 2$	$(2_0*:2:2)$	$(\bar{*}_0\bar{*}_1)$
38			Amm2	A m m 2	$\Gamma_o^b C_{2v}^{14}$	*15s*	$\left(\frac{b+c}{2}/c:a:b\right):m\cdot 2$	$(*\cdot 2\cdot 2\cdot 2:2)$	$[*_1\cdot *_1\cdot],$ $[*\cdot\times_0]$
39			Aem2	A b m 2	$\Gamma_o^b C_{2v}^{15}$	*11h*	$\left(\frac{b+c}{2}/c:a:b\right):m\cdot 2_1$	$(*\cdot 2:2\cdot 2:2)$	$[*_1:*_1:],$ $(\bar{*}\cdot\bar{*}_0)$
40			Ama2	A m a 2	$\Gamma_o^b C_{2v}^{16}$	*12h*	$\left(\frac{b+c}{2}/c:a:b\right):\tilde{a}\cdot 2$	$(2_02_1*\cdot)$	$(*\cdot *_1),$ $[*:\times_1]$
41			Aea2	A b a 2	$\Gamma_o^b C_{2v}^{17}$	*13h*	$\left(\frac{b+c}{2}/c:a:b\right):\tilde{a}\cdot 2_1$	$(2_02_1*:)$	$(*:*_1),$ $(\bar{*}:\bar{*}_1)$
42			Fmm2	F m m 2	$\Gamma_o^f C_{2v}^{18}$	*17s*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2}:c:a:b\right):m\cdot 2$	$(*\cdot 2\cdot 2:2:2)$	$[*_1\cdot *_1:]$
43			Fdd2	F dd2	$\Gamma_o^f C_{2v}^{19}$	*16h*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2}:c:a:b\right):\frac{1}{2}\widetilde{ac}\odot 2$	$(2_02_1\times)$	$(*_1\times)$
44			Imm2	I m m 2	$\Gamma_o^v C_{2v}^{20}$	*16s*	$\left(\frac{a+b+c}{2}/c:a:b\right):m\cdot 2$	$(2_1*\cdot 2\cdot 2)$	$[*\cdot\times_1]$
45			Iba2	I b a 2	$\Gamma_o^v C_{2v}^{21}$	*15h*	$\left(\frac{a+b+c}{2}/c:a:b\right):\tilde{c}\cdot 2$	$(2_1*:2:2)$	$(\bar{*}:\bar{*}_0)$
46			Ima2	I m a 2	$\Gamma_o^v C_{2v}^{22}$	*14h*	$\left(\frac{a+b+c}{2}/c:a:b\right):\tilde{a}\cdot 2$	$(2_0*\cdot 2:2)$	$(\bar{*}\cdot\bar{*}_1),$ $[*:\times_0]$
47	$\frac{2}{m}\frac{2}{m}\frac{2}{m}$	*222	Pmmm	P 2/m 2/m 2/m	$\Gamma_o D_{2h}^1$	*18s*	$(c:a:b)\cdot m:2\cdot m$	$[*\cdot 2\cdot 2\cdot 2\cdot 2]$	
48			Pnnn	P 2/n 2/n 2/n	$\Gamma_o D_{2h}^2$	*19h*	$(c:a:b)\cdot\widetilde{ab}:2\odot\widetilde{ac}$	$(2\bar{*}_12_02_0$	

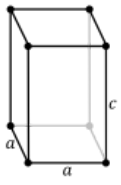
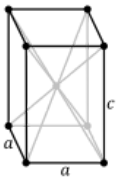
49			Pccm	P 2/c 2/c 2/m	$\Gamma_o D_{2h}^3$	*17h*	$(c:a:b)\cdot m:2\cdot\tilde{c}$	$[*{:}2{:}2{:}2{:}2]$	$(*2_02_02{\cdot}2)$
50			Pban	P 2/b 2/a 2/n	$\Gamma_o D_{2h}^4$	*18h*	$(c:a:b)\cdot\widetilde{ab}:2\odot\tilde{a}$	$(2\bar{*}_02_02_0)$	$(*2_02_02{:}2)$
51			Pmma	P 2_1/m 2/m 2/a	$\Gamma_o D_{2h}^5$	*14a*	$(c:a:b)\cdot\tilde{a}:2\cdot m$	$[2_02_0{*}{\cdot}]$	$[*{\cdot}2{:}2{\cdot}2{:}2],$ $[*2{\cdot}2{\cdot}2{\cdot}2]$
52			Pnna	P 2/n 2_1/n 2/a	$\Gamma_o D_{2h}^6$	*17a*	$(c:a:b)\cdot\tilde{a}:2\odot\widetilde{ac}$	$(2_02\bar{*}_1)$	$(2_0{*}2{:}2),$ $(2\bar{*}2_12_1)$
53			Pmna	P 2/m 2/n 2_1/a	$\Gamma_o D_{2h}^7$	*15a*	$(c:a:b)\cdot\tilde{a}:2_1\cdot\widetilde{ac}$	$[2_02_0{*}{:}]$	$(*2_12_12{\cdot}2),$ $(2_0{*}2{\cdot}2)$
54			Pcca	P 2_1/c 2/c 2/a	$\Gamma_o D_{2h}^8$	*16a*	$(c:a:b)\cdot\tilde{a}:2\cdot\tilde{c}$	$(2_02\bar{*}_0)$	$(*2{:}2{:}2{:}2),$ $(*2_12_12{:}2)$
55			Pbam	P 2_1/b 2_1/a 2/m	$\Gamma_o D_{2h}^9$	*22a*	$(c:a:b)\cdot m:2\odot\tilde{a}$	$[2_02_0{\times}_0]$	$(*2{\cdot}2{:}2{\cdot}2)$
56			Pccn	P 2_1/c 2_1/c 2/n	$\Gamma_o D_{2h}^{10}$	*27a*	$(c:a:b)\cdot\widetilde{ab}:2\cdot\tilde{c}$	$(2\bar{*}{:}2{:}2)$	$(2_12\bar{*}_0)$
57			Pbcm	P 2/b 2_1/c 2_1/m	$\Gamma_o D_{2h}^{11}$	*23a*	$(c:a:b)\cdot m:2_1\odot\tilde{c}$	$(2_02\bar{*}{\cdot})$	$(*2{:}2{\cdot}2{:}2),$ $[2_12_1{*}{:}]$
58			Pnnm	P 2_1/n 2_1/n 2/m	$\Gamma_o D_{2h}^{12}$	*25a*	$(c:a:b)\cdot m:2\odot\widetilde{ac}$	$[2_02_0{\times}_1]$	$(2_1{*}2{\cdot}2)$
59			Pmmn	P 2_1/m 2_1/m 2/n	$\Gamma_o D_{2h}^{13}$	*24a*	$(c:a:b)\cdot\widetilde{ab}:2\cdot m$	$(2\bar{*}{\cdot}2{\cdot}2)$	$[2_12_1{*}{\cdot}]$
60			Pbcn	P 2_1/b 2/c 2_1/n	$\Gamma_o D_{2h}^{14}$	*26a*	$(c:a:b)\cdot\widetilde{ab}:2_1\odot\tilde{c}$	$(2_02\bar{*}{:})$	$(2_1{*}2{:}2),$ $(2_12\bar{*}_1)$
61			Pbca	P 2_1/b 2_1/c 2_1/a	$\Gamma_o D_{2h}^{15}$	*29a*	$(c:a:b)\cdot\tilde{a}:2_1\odot\tilde{c}$	$(2_12\bar{*}{:})$	
62			Pnma	P 2_1/n 2_1/m 2_1/a	$\Gamma_o D_{2h}^{16}$	*28a*	$(c:a:b)\cdot\tilde{a}:2_1\odot m$	$(2_12\bar{*}{\cdot})$	$(2\bar{*}{\cdot}2{:}2),$ $[2_12_1{\times}]$
63			Cmcm	C 2/m 2/c 2_1/m	$\Gamma_o^b D_{2h}^{17}$	*18a*	$\left(\frac{a+b}{2}:c:a:b\right)\cdot m:2_1\cdot\tilde{c}$	$[2_02_1{*}{\cdot}]$	$(*2{\cdot}2{\cdot}2{:}2),$ $[2_1{*}{\cdot}2{:}2]$
64			Cmca	C 2/m 2/c 2_1/a	$\Gamma_o^b D_{2h}^{18}$	*19a*	$\left(\frac{a+b}{2}:c:a:b\right)\cdot\tilde{a}:2_1\cdot\tilde{c}$	$[2_02_1{*}{:}]$	$(*2{\cdot}2{:}2{:}2),$ $(*2_12{\cdot}2{:}2)$
65			Cmmm	C 2/m 2/m 2/m	$\Gamma_o^b D_{2h}^{19}$	*19s*	$\left(\frac{a+b}{2}:c:a:b\right)\cdot m:2\cdot m$	$[2_0{*}{\cdot}2{\cdot}2]$	$[*{\cdot}2{\cdot}2{\cdot}2{:}2]$
66			Cccm	C 2/c 2/c 2/m	$\Gamma_o^b D_{2h}^{20}$	*20h*	$\left(\frac{a+b}{2}:c:a:b\right)\cdot m:2\cdot\tilde{c}$	$[2_0{*}{:}2{:}2]$	$(*2_02_12{\cdot}2)$
67			Cmme	C 2/m 2/m 2/e	$\Gamma_o^b D_{2h}^{21}$	*21h*	$\left(\frac{a+b}{2}:c:a:b\right)\cdot\tilde{a}:2\cdot m$	$(*2_02{\cdot}2{\cdot}2)$	$[*{\cdot}2{:}2{:}2{:}2]$
68			Ccce	C 2/c 2/c 2/e	$\Gamma_o^b D_{2h}^{22}$	*22h*	$\left(\frac{a+b}{2}:c:a:b\right)\cdot\tilde{a}:2\cdot\tilde{c}$	$(*2_02{:}2{:}2)$	$(*2_02_12{:}2)$
69			Fmmm	F 2/m 2/m 2/m	$\Gamma_o^f D_{2h}^{23}$	*21s*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2}:c:a:b\right)\cdot m:2\cdot m$	$[*{\cdot}2{\cdot}2{:}2{:}2]$	
70			Fddd	F 2/d 2/d 2/d	$\Gamma_o^f D_{2h}^{24}$	*24h*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2}:c:a:b\right)\cdot\frac{1}{2}\widetilde{ab}:2\odot\frac{1}{2}\widetilde{ac}$	$(2\bar{*}_02_01)$	
71			Immm	I 2/m 2/m 2/m	$\Gamma_o^v D_{2h}^{25}$	*20s*	$\left(\frac{a+b+c}{2}/c:a:b\right)\cdot m:2\cdot m$	$[2_1{*}{\cdot}2{\cdot}2]$	
72			Ibam	I 2/b 2/a 2/m	$\Gamma_o^v D_{2h}^{26}$	*23h*	$\left(\frac{a+b+c}{2}/c:a:b\right)\cdot m:2\cdot\tilde{c}$	$[2_1{*}{:}2{:}2]$	$(*2_02{\cdot}2{:}2)$
73			Ibca	I 2/b 2/c 2/a	$\Gamma_o^v D_{2h}^{27}$	*21a*	$\left(\frac{a+b+c}{2}/c:a:b\right)\cdot\tilde{a}:2\cdot\tilde{c}$	$(*2_12{:}2{:}2)$	
74			Imma	I 2/m 2/m 2/a	$\Gamma_o^v D_{2h}^{28}$	*20a*	$\left(\frac{a+b+c}{2}/c:a:b\right)\cdot\tilde{a}:2\cdot m$	$(*2_12{\cdot}2{\cdot}2)$	$[2_0{*}{\cdot}2{:}2]$

List of Tetragonal

Tetragonal crystal system

Number	Point group	Orbifold	Short name	Full name	Schoenflies	Fedorov	Shubnikov	Fibrifold
75	4	**44**	P4	P 4	$\Gamma_q C_4^1$	*22s*	$(c:a:a):4$	$(4_0 4_0 2_0)$
76			$P4_1$	P 4_1	$\Gamma_q C_4^2$	*30a*	$(c:a:a):4_1$	$(4_1 4_1 2_1)$
77			$P4_2$	P 4_2	$\Gamma_q C_4^3$	*33a*	$(c:a:a):4_2$	$(4_2 4_2 2_0)$
78			$P4_3$	P 4_3	$\Gamma_q C_4^4$	*31a*	$(c:a:a):4_3$	$(4_1 4_1 2_1)$
79			I4	I 4	$\Gamma_q^v C_4^5$	*23s*	$\left(\frac{a+b+c}{2}/c:a:a\right):4$	$(4_2 4_0 2_1)$
80			$I4_1$	I 4_1	$\Gamma_q^v C_4^6$	*32a*	$\left(\frac{a+b+c}{2}/c:a:a\right):4_1$	$(4_3 4_1 2_0)$
81	$\bar{4}$	**2×**	$P\bar{4}$	P $\bar{4}$	$\Gamma_q S_4^1$	*26s*	$(c:a:a):\tilde{4}$	(442_0)
82			$I\bar{4}$	I $\bar{4}$	$\Gamma_q^v S_4^2$	*27s*	$\left(\frac{a+b+c}{2}/c:a:a\right):\tilde{4}$	(442_1)
83	4/m	**4***	P4/m	P 4/m	$\Gamma_q C_{4h}^1$	*28s*	$(c:a:a)\cdot m:4$	$[4_0 4_0 2_0]$
84			$P4_2/m$	P 4_2/m	$\Gamma_q C_{4h}^2$	*41a*	$(c:a:a)\cdot m:4_2$	$[4_2 4_2 2_0]$
85			P4/n	P 4/n	$\Gamma_q C_{4h}^3$	29h	$(c:a:a)\cdot \widetilde{ab}:4$	$(44_0 2)$
86			$P4_2/n$	P 4_2/n	$\Gamma_q C_{4h}^4$	*42a*	$(c:a:a)\cdot \widetilde{ab}:4_2$	$(44_2 2)$
87			I4/m	I 4/m	$\Gamma_q^v C_{4h}^5$	*29s*	$\left(\frac{a+b+c}{2}/c:a:a\right)\cdot m:4$	$[4_2 4_0 2_1]$
88			$I4_1/a$	I 4_1/a	$\Gamma_q^v C_{4h}^6$	*40a*	$\left(\frac{a+b+c}{2}/c:a:a\right)\cdot \tilde{a}:4_1$	$(44_1 2)$
89	422	**224**	P422	P 4 2 2	$\Gamma_q D_4^1$	*30s*	$(c:a:a):4:2$	$(*4_0 4_0 2_0)$
90			$P42_12$	$P42_12$	$\Gamma_q D_4^2$	*43a*	$(c:a:a):4\ \odot\ 2_1$	$(4_0 *2_0)$
91			$P4_122$	P 4_1 2 2	$\Gamma_q D_4^3$	*44a*	$(c:a:a):4_1:2$	$(*4_1 4_1 2_1)$
92			$P4_12_12$	P 4_1 2_1 2	$\Gamma_q D_4^4$	*48a*	$(c:a:a):4_1\ \odot\ 2_1$	$(4_1 *2_1)$
93			$P4_222$	P 4_2 2 2	$\Gamma_q D_4^5$	*47a*	$(c:a:a):4_2:2$	$(*4_2 4_2 2_0)$
94			$P4_22_12$	P 4_2 2_1 2	$\Gamma_q D_4^6$	*50a*	$(c:a:a):4_2\ \odot\ 2_1$	$(4_2 *2_0)$
95			$P4_322$	P 4_3 2 2	$\Gamma_q D_4^7$	*45a*	$(c:a:a):4_3:2$	$(*4_1 4_1 2_1)$
96			$P4_32_12$	P 4_3 2_1 2	$\Gamma_q D_4^8$	*49a*	$(c:a:a):4_3\ \odot\ 2_1$	$(4_1 *2_1)$
97			I422	I 4 2 2	$\Gamma_q^v D_4^9$	*31s*	$\left(\frac{a+b+c}{2}/c:a:a\right):4:2$	$(*4_2 4_0 2_1)$
98			$I4_122$	I 4_1 2 2	$\Gamma_q^v D_4^{10}$	*46a*	$\left(\frac{a+b+c}{2}/c:a:a\right):4:2_1$	$(*4_3 4_1 2_0)$
99	4mm	***44**	P4mm	P 4 m m	$\Gamma_q C_{4v}^1$	*24s*	$(c:a:a):4\cdot m$	$(*\cdot 4\cdot 4\cdot 2)$
100			P4bm	P 4 b m	$\Gamma_q C_{4v}^2$	*26h*	$(c:a:a):4\odot \tilde{a}$	$(4_0 *\cdot 2)$
101			$P4_2cm$	P 4_2 c m	$\Gamma_q C_{4v}^3$	*37a*	$(c:a:a):4_2\cdot \tilde{c}$	$(*:4\cdot 4:2)$
102			$P4_2nm$	P 4_2 n m	$\Gamma_q C_{4v}^4$	*38a*	$(c:a:a):4_2\odot \widetilde{ac}$	$(4_2 *\cdot 2)$
103			P4cc	P 4 c c	$\Gamma_q C_{4v}^5$	*25h*	$(c:a:a):4\cdot \tilde{c}$	$(*:4:4:2)$
104			P4nc	P 4 n c	$\Gamma_q C_{4v}^6$	*27h*	$(c:a:a):4\odot \widetilde{ac}$	$(4_0 *:2)$
105			$P4_2mc$	P 4_2 m c	$\Gamma_q C_{4v}^7$	*36a*	$(c:a:a):4_2\cdot m$	$(*\cdot 4:4\cdot 2)$
106			$P4_2bc$	P 4_2 b c	$\Gamma_q C_{4v}^8$	*39a*	$(c:a:a):4\odot \tilde{a}$	$(4_2 *:2)$
107			I4mm	I 4 m m	$\Gamma_q^v C_{4v}^9$	*25s*	$\left(\frac{a+b+c}{2}/c:a:a\right):4\cdot m$	$(*\cdot 4\cdot 4:2)$
108			I4cm	I 4 c m	$\Gamma_q^v C_{4v}^{10}$	*28h*	$\left(\frac{a+b+c}{2}/c:a:a\right):4\cdot \tilde{c}$	$(*\cdot 4:4:2)$
109			$I4_1md$	I 4_1 m d	$\Gamma_q^v C_{4v}^{11}$	*34a*	$\left(\frac{a+b+c}{2}/c:a:a\right):4_1\odot m$	$(4_1 *\cdot 2)$
110			$I4_1cd$	I 4_1 c d	$\Gamma_q^v C_{4v}^{12}$	*35a*	$\left(\frac{a+b+c}{2}/c:a:a\right):4_1\odot \tilde{c}$	$(4_1 *:2)$
111	$\bar{4}2m$	**2*2**	$P\bar{4}2m$	P $\bar{4}$ 2 m	$\Gamma_q D_{2d}^1$	*32s*	$(c:a:a):\tilde{4}:2$	$(*4\cdot 42_0)$
112			$P\bar{4}2c$	P $\bar{4}$ 2 c	$\Gamma_q D_{2d}^2$	*30h*	$(c:a:a):\tilde{4}\ \odot\ 2$	$(*4:42_0)$
113						*52a*		

Tetragonal Bravais lattice

Simple (P)	Body (I)
	

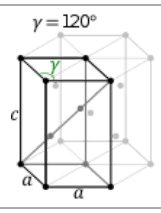
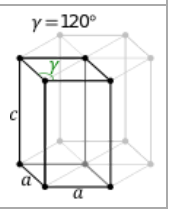
			$P\bar{4}2_1m$	$P\ \bar{4}\ 2_1\ m$	$\Gamma_q D^3_{2d}$		$(c:a:a):\tilde{4}\cdot\widetilde{ab}$	$(4\bar{\tilde{\cdot}}2)$
114			$P\bar{4}2_1c$	$P\ \bar{4}\ 2_1\ c$	$\Gamma_q D^4_{2d}$	*53a*	$(c:a:a):\tilde{4}\cdot\widetilde{abc}$	$(4\bar{\tilde{\cdot}}:2)$
115			$P\bar{4}m2$	$P\ \bar{4}\ m\ 2$	$\Gamma_q D^5_{2d}$	*33s*	$(c:a:a):\tilde{4}\cdot m$	$(*\cdot 44\cdot 2)$
116			$P\bar{4}c2$	$P\ \bar{4}\ c\ 2$	$\Gamma_q D^6_{2d}$	*31h*	$(c:a:a):\tilde{4}\cdot\tilde{c}$	$(*:44:2)$
117			$P\bar{4}b2$	$P\ \bar{4}\ b\ 2$	$\Gamma_q D^7_{2d}$	*32h*	$(c:a:a):\tilde{4}\odot\tilde{a}$	$(4\bar{\tilde{\cdot}}_0 2_0)$
118			$P\bar{4}n2$	$P\ \bar{4}\ n\ 2$	$\Gamma_q D^8_{2d}$	*33h*	$(c:a:a):\tilde{4}\cdot\widetilde{ac}$	$(4\bar{\tilde{\cdot}}_1 2_0)$
119			$I\bar{4}m2$	$I\ \bar{4}\ m\ 2$	$\Gamma^v_q D^9_{2d}$	*35s*	$\left(\frac{a+b+c}{2}/c:a:a\right):\tilde{4}\cdot m$	$(*4\cdot 42_1)$
120			$I\bar{4}c2$	$I\ \bar{4}\ c\ 2$	$\Gamma^v_q D^{10}_{2d}$	*34h*	$\left(\frac{a+b+c}{2}/c:a:a\right):\tilde{4}\cdot\tilde{c}$	$(*4:42_1)$
121			$I\bar{4}2m$	$I\ \bar{4}\ 2\ m$	$\Gamma^v_q D^{11}_{2d}$	*34s*	$\left(\frac{a+b+c}{2}/c:a:a\right):\tilde{4}:2$	$(*\cdot 44:2)$
122			$I\bar{4}2d$	$I\ \bar{4}\ 2\ d$	$\Gamma^v_q D^{12}_{2d}$	*51a*	$\left(\frac{a+b+c}{2}/c:a:a\right):\tilde{4}\odot\frac{1}{2}\widetilde{abc}$	$(4\bar{\tilde{\cdot}}2_1)$
123	4/m 2/m 2/m	*224	$P4/mmm$	$P\ 4/m\ 2/m\ 2/m$	$\Gamma_q D^1_{4h}$	*36s*	$(c:a:a)\cdot m:4\cdot m$	$[*\cdot 4\cdot 4\cdot 2]$
124			$P4/mcc$	$P\ 4/m\ 2/c\ 2/c$	$\Gamma_q D^2_{4h}$	*35h*	$(c:a:a)\cdot m:4\cdot\tilde{c}$	$[*:4:4:2]$
125			$P4/nbm$	$P\ 4/n\ 2/b\ 2/m$	$\Gamma_q D^3_{4h}$	*36h*	$(c:a:a)\cdot\widetilde{ab}:4\odot\tilde{a}$	$(*4_0 4\cdot 2)$
126			$P4/nnc$	$P\ 4/n\ 2/n\ 2/c$	$\Gamma_q D^4_{4h}$	*37h*	$(c:a:a)\cdot\widetilde{ab}:4\odot\widetilde{ac}$	$(*4_0 4:2)$
127			$P4/mbm$	$P\ 4/m\ 2_1/b\ 2/m$	$\Gamma_q D^5_{4h}$	*54a*	$(c:a:a)\cdot m:4\odot\tilde{a}$	$[4_0*\cdot 2]$
128			$P4/mnc$	$P\ 4/m\ 2_1/n\ 2/c$	$\Gamma_q D^6_{4h}$	*56a*	$(c:a:a)\cdot m:4\odot\widetilde{ac}$	$[4_0*:2]$
129			$P4/nmm$	$P\ 4/n\ 2_1/m\ 2/m$	$\Gamma_q D^7_{4h}$	*55a*	$(c:a:a)\cdot\widetilde{ab}:4\cdot m$	$(*4\cdot 4\cdot 2)$
130			$P4/ncc$	$P\ 4/n\ 2_1/c\ 2/c$	$\Gamma_q D^8_{4h}$	*57a*	$(c:a:a)\cdot\widetilde{ab}:4\cdot\tilde{c}$	$(*4:4:2)$
131			$P4_2/mmc$	$P\ 4_2/m\ 2/m\ 2/c$	$\Gamma_q D^9_{4h}$	*60a*	$(c:a:a)\cdot m:4_2\cdot m$	$[*\cdot 4:4\cdot 2]$
132			$P4_2/mcm$	$P\ 4_2/m\ 2/c\ 2/m$	$\Gamma_q D^{10}_{4h}$	*61a*	$(c:a:a)\cdot m:4_2\cdot\tilde{c}$	$[*:4\cdot 4:2]$
133			$P4_2/nbc$	$P\ 4_2/n\ 2/b\ 2/c$	$\Gamma_q D^{11}_{4h}$	*63a*	$(c:a:a)\cdot\widetilde{ab}:4_2\odot\tilde{a}$	$(*4_2 4:2)$
134			$P4_2/nnm$	$P\ 4_2/n\ 2/n\ 2/m$	$\Gamma_q D^{12}_{4h}$	*62a*	$(c:a:a)\cdot\widetilde{ab}:4_2\odot\widetilde{ac}$	$(*4_2 4\cdot 2)$
135			$P4_2/mbc$	$P\ 4_2/m\ 2_1/b\ 2/c$	$\Gamma_q D^{13}_{4h}$	*66a*	$(c:a:a)\cdot m:4_2\odot\tilde{a}$	$[4_2*:2]$
136			$P4_2/mnm$	$P\ 4_2/m\ 2_1/n\ 2/m$	$\Gamma_q D^{14}_{4h}$	*65a*	$(c:a:a)\cdot m:4_2\odot\widetilde{ac}$	$[4_2*\cdot 2]$
137			$P4_2/nmc$	$P\ 4_2/n\ 2_1/m\ 2/c$	$\Gamma_q D^{15}_{4h}$	*67a*	$(c:a:a)\cdot\widetilde{ab}:4_2\cdot m$	$(*4\cdot 4:2)$
138			$P4_2/ncm$	$P\ 4_2/n\ 2_1/c\ 2/m$	$\Gamma_q D^{16}_{4h}$	*65a*	$(c:a:a)\cdot\widetilde{ab}:4_2\cdot\tilde{c}$	$(*4:4\cdot 2)$
139			$I4/mmm$	$I\ 4/m\ 2/m\ 2/m$	$\Gamma^v_q D^{17}_{4h}$	*37s*	$\left(\frac{a+b+c}{2}/c:a:a\right)\cdot m:4\cdot m$	$[*\cdot 4\cdot 4:2]$
140			$I4/mcm$	$I\ 4/m\ 2/c\ 2/m$	$\Gamma^v_q D^{18}_{4h}$	*38h*	$\left(\frac{a+b+c}{2}/c:a:a\right)\cdot m:4\cdot\tilde{c}$	$[*\cdot 4:4:2]$
141			$I4_1/amd$	$I\ 4_1/a\ 2/m\ 2/d$	$\Gamma^v_q D^{19}_{4h}$	*59a*	$\left(\frac{a+b+c}{2}/c:a:a\right)\cdot\tilde{a}:4_1\odot m$	$(*4_1 4\cdot 2)$
142			$I4_1/acd$	$I\ 4_1/a\ 2/c\ 2/d$	$\Gamma^v_q D^{20}_{4h}$	*58a*	$\left(\frac{a+b+c}{2}/c:a:a\right)\cdot\tilde{a}:4_1\odot\tilde{c}$	$(*4_1 4:2)$

List of Trigonal

Trigonal crystal system

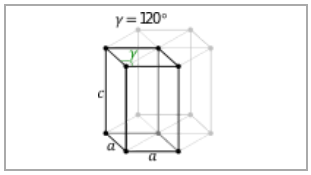
Number	Point group	Orbifold	Short name	Full name	Schoenflies	Fedorov	Shubnikov	Fibrifold
143	3	**33**	P3	P 3	$\mathbf{\Gamma}_h C_3^1$	*38s*	$(c:(a/a)):3$	$(3_0 3_0 3_0)$
144			$P3_1$	P 3_1	$\mathbf{\Gamma}_h C_3^2$	*68a*	$(c:(a/a)):3_1$	$(3_1 3_1 3_1)$
145			$P3_2$	P 3_2	$\mathbf{\Gamma}_h C_3^3$	*69a*	$(c:(a/a)):3_2$	$(3_1 3_1 3_1)$
146			R3	R 3	$\mathbf{\Gamma}_{rh} C_3^4$	*39s*	$(a/a/a)/3$	$(3_0 3_1 3_2)$
147	$\bar{3}$	**3×**	$P\bar{3}$	P $\bar{3}$	$\mathbf{\Gamma}_h C_{3i}^1$	*51s*	$(c:(a/a)):\tilde{6}$	$(63_0 2)$
148			$R\bar{3}$	R $\bar{3}$	$\mathbf{\Gamma}_{rh} C_{3i}^2$	*52s*	$(a/a/a)/\tilde{6}$	$(63_1 2)$
149	32	**223**	P312	P 3 1 2	$\mathbf{\Gamma}_h D_3^1$	*45s*	$(c:(a/a)):2:3$	$(*3_0 3_0 3_0)$
150			P321	P 3 2 1	$\mathbf{\Gamma}_h D_3^2$	*44s*	$(c:(a/a))\cdot 2:3$	$(3_0 *3_0)$
151			$P3_112$	P 3_1 1 2	$\mathbf{\Gamma}_h D_3^3$	*72a*	$(c:(a/a)):2:3_1$	$(*3_1 3_1 3_1)$
152			$P3_121$	P 3_1 2 1	$\mathbf{\Gamma}_h D_3^4$	*70a*	$(c:(a/a))\cdot 2:3_1$	$(3_1 *3_1)$
153			$P3_212$	P 3_2 1 2	$\mathbf{\Gamma}_h D_3^5$	*73a*	$(c:(a/a)):2:3_2$	$(*3_1 3_1 3_1)$
154			$P3_221$	P 3_2 2 1	$\mathbf{\Gamma}_h D_3^6$	*71a*	$(c:(a/a))\cdot 2:3_2$	$(3_1 *3_1)$
155			R32	R 3 2	$\mathbf{\Gamma}_{rh} D_3^7$	*46s*	$(a/a/a)/3:2$	$(*3_0 3_1 3_2)$
156	3m	***33**	P3m1	P 3 m 1	$\mathbf{\Gamma}_h C_{3v}^1$	*40s*	$(c:(a/a)):m\cdot 3$	$(*\cdot 3\cdot 3\cdot 3)$
157			P31m	P 3 1 m	$\mathbf{\Gamma}_h C_{3v}^2$	*41s*	$(c:(a/a))\cdot m\cdot 3$	$(3_0 *\cdot 3)$
158			P3c1	P 3 c 1	$\mathbf{\Gamma}_h C_{3v}^3$	*39h*	$(c:(a/a)):\tilde{c}:3$	$(*:3:3:3)$
159			P31c	P 3 1 c	$\mathbf{\Gamma}_h C_{3v}^4$	*40h*	$(c:(a/a))\cdot\tilde{c}:3$	$(3_0 *:3)$
160			R3m	R 3 m	$\mathbf{\Gamma}_{rh} C_{3v}^5$	*42s*	$(a/a/a)/3\cdot m$	$(3_1 *\cdot 3)$
161			R3c	R 3 c	$\mathbf{\Gamma}_{rh} C_{3v}^6$	*41h*	$(a/a/a)/3\cdot\tilde{c}$	$(3_1 *:3)$
162	$\bar{3}$ 2/m	**2*3**	$P\bar{3}1m$	P $\bar{3}$ 1 2/m	$\mathbf{\Gamma}_h D_{3d}^1$	*56s*	$(c:(a/a))\cdot m\cdot\tilde{6}$	$(*\cdot 63_0 2)$
163			$P\bar{3}1c$	P $\bar{3}$ 1 2/c	$\mathbf{\Gamma}_h D_{3d}^2$	*46h*	$(c:(a/a))\cdot\tilde{c}\cdot\tilde{6}$	$(*:63_0 2)$
164			$P\bar{3}m1$	P $\bar{3}$ 2/m 1	$\mathbf{\Gamma}_h D_{3d}^3$	*55s*	$(c:(a/a)):m\cdot\tilde{6}$	$(*6\cdot 3\cdot 2)$
165			$P\bar{3}c1$	P $\bar{3}$ 2/c 1	$\mathbf{\Gamma}_h D_{3d}^4$	*45h*	$(c:(a/a)):\tilde{c}\cdot\tilde{6}$	$(*6:3:2)$
166			$R\bar{3}m$	R $\bar{3}$ 2/m	$\mathbf{\Gamma}_{rh} D_{3d}^5$	*57s*	$(a/a/a)/\tilde{6}\cdot m$	$(*\cdot 63_1 2)$
167			$R\bar{3}c$	R $\bar{3}$ 2/c	$\mathbf{\Gamma}_{rh} D_{3d}^6$	*47h*	$(a/a/a)/\tilde{6}\cdot\tilde{c}$	$(*:63_1 2)$

Trigonal Bravais lattice

Rhombohedral (R)	Hexagonal (P)
	

List of Hexagonal

Hexagonal Bravais lattice

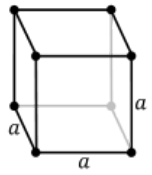
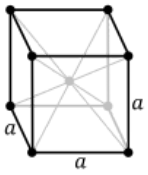
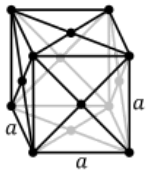


Hexagonal crystal system

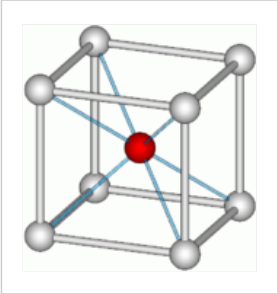
Number	Point group	Orbifold	Short name	Full name	Schoenflies	Fedorov	Shubnikov	Fibrifold
168	6	**66**	P6	P 6	$\mathbf{\Gamma_h C_6^1}$	*49s*	$(c:(a/a)):6$	$(6_0 3_0 2_0)$
169			$P6_1$	P 6_1	$\mathbf{\Gamma_h C_6^2}$	*74a*	$(c:(a/a)):6_1$	$(6_1 3_1 2_1)$
170			$P6_5$	P 6_5	$\mathbf{\Gamma_h C_6^3}$	*75a*	$(c:(a/a)):6_5$	$(6_1 3_1 2_1)$
171			$P6_2$	P 6_2	$\mathbf{\Gamma_h C_6^4}$	*76a*	$(c:(a/a)):6_2$	$(6_2 3_2 2_0)$
172			$P6_4$	P 6_4	$\mathbf{\Gamma_h C_6^5}$	*77a*	$(c:(a/a)):6_4$	$(6_2 3_2 2_0)$
173			$P6_3$	P 6_3	$\mathbf{\Gamma_h C_6^6}$	*78a*	$(c:(a/a)):6_3$	$(6_3 3_0 2_1)$
174	$\bar{6}$	**3∗**	$P\bar{6}$	P $\bar{6}$	$\mathbf{\Gamma_h C_{3h}^1}$	*43s*	$(c:(a/a)):3:m$	$[3_0 3_0 3_0]$
175	6/m	**6∗**	P6/m	P 6/m	$\mathbf{\Gamma_h C_{6h}^1}$	*53s*	$(c:(a/a))\cdot m:6$	$[6_0 3_0 2_0]$
176			$P6_3/m$	P 6_3/m	$\mathbf{\Gamma_h C_{6h}^2}$	*81a*	$(c:(a/a))\cdot m:6_3$	$[6_3 3_0 2_1]$
177	622	**226**	P622	P 6 2 2	$\mathbf{\Gamma_h D_6^1}$	*54s*	$(c:(a/a))\cdot 2:6$	$(*6_0 3_0 2_0)$
178			$P6_122$	P 6_1 2 2	$\mathbf{\Gamma_h D_6^2}$	*82a*	$(c:(a/a))\cdot 2:6_1$	$(*6_1 3_1 2_1)$
179			$P6_522$	P 6_5 2 2	$\mathbf{\Gamma_h D_6^3}$	*83a*	$(c:(a/a))\cdot 2:6_5$	$(*6_1 3_1 2_1)$
180			$P6_222$	P 6_2 2 2	$\mathbf{\Gamma_h D_6^4}$	*84a*	$(c:(a/a))\cdot 2:6_2$	$(*6_2 3_2 2_0)$
181			$P6_422$	P 6_4 2 2	$\mathbf{\Gamma_h D_6^5}$	*85a*	$(c:(a/a))\cdot 2:6_4$	$(*6_2 3_2 2_0)$
182			$P6_322$	P 6_3 2 2	$\mathbf{\Gamma_h D_6^6}$	*86a*	$(c:(a/a))\cdot 2:6_3$	$(*6_3 3_0 2_1)$
183	6mm	**∗66**	P6mm	P 6 m m	$\mathbf{\Gamma_h C_{6v}^1}$	*50s*	$(c:(a/a)):m\cdot 6$	$(*\cdot 6\cdot 3\cdot 2)$
184			P6cc	P 6 c c	$\mathbf{\Gamma_h C_{6v}^2}$	*44h*	$(c:(a/a)):\tilde{c}\cdot 6$	$(*:6:3:2)$
185			$P6_3cm$	P 6_3 c m	$\mathbf{\Gamma_h C_{6v}^3}$	*80a*	$(c:(a/a)):\tilde{c}\cdot 6_3$	$(*\cdot 6:3:2)$
186			$P6_3mc$	P 6_3 m c	$\mathbf{\Gamma_h C_{6v}^4}$	*79a*	$(c:(a/a)):m\cdot 6_3$	$(*:6\cdot 3\cdot 2)$
187	$\bar{6}$m2	**∗223**	$P\bar{6}m2$	P $\bar{6}$ m 2	$\mathbf{\Gamma_h D_{3h}^1}$	*48s*	$(c:(a/a)):m\cdot 3:m$	$[*\cdot 3\cdot 3\cdot 3]$
188			$P\bar{6}c2$	P $\bar{6}$ c 2	$\mathbf{\Gamma_h D_{3h}^2}$	*43h*	$(c:(a/a)):\tilde{c}\cdot 3:m$	$[*:3:3:3]$
189			$P\bar{6}2m$	P $\bar{6}$ 2 m	$\mathbf{\Gamma_h D_{3h}^3}$	*47s*	$(c:(a/a))\cdot m:3\cdot m$	$[3_0 *\cdot 3]$
190			$P\bar{6}2c$	P $\bar{6}$ 2 c	$\mathbf{\Gamma_h D_{3h}^4}$	*42h*	$(c:(a/a))\cdot m:3\cdot \tilde{c}$	$[3_0 *:3]$
191	6/m 2/m 2/m	**∗226**	P6/mmm	P 6/m 2/m 2/m	$\mathbf{\Gamma_h D_{6h}^1}$	*58s*	$(c:(a/a))\cdot m:6\cdot m$	$[*\cdot 6\cdot 3\cdot 2]$
192			P6/mcc	P 6/m 2/c 2/c	$\mathbf{\Gamma_h D_{6h}^2}$	*48h*	$(c:(a/a))\cdot m:6\cdot \tilde{c}$	$[*:6:3:2]$
193			$P6_3/mcm$	P 6_3/m 2/c 2/m	$\mathbf{\Gamma_h D_{6h}^3}$	*87a*	$(c:(a/a))\cdot m:6_3\cdot \tilde{c}$	$[*\cdot 6:3:2]$
194			$P6_3/mmc$	P 6_3/m 2/m 2/c	$\mathbf{\Gamma_h D_{6h}^4}$	*88a*	$(c:(a/a))\cdot m:6_3\cdot m$	$[*:6\cdot 3\cdot 2]$

List of Cubic

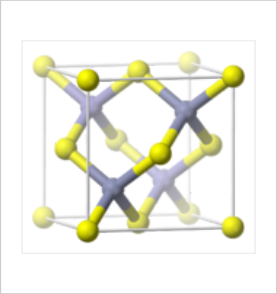
Cubic Bravais lattice

Simple (P)	Body centered (I)	Face centered (F)
		

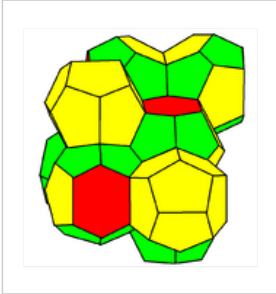
Example cubic structures



(221) Caesium chloride. Different colors for the two atom types.



(216) Sphalerite



(223) Weaire–Phelan structure

Cubic crystal system

Number	Point group	Orbifold	Short name	Full name	Schoenflies	Fedorov	Shubnikov	Conway	Fibrifold (preserving z)	Fibrifold (preserving x, y, z)
195	23	**332**	P23	P 2 3	$\boldsymbol{\Gamma_c T^1}$	*59s*	$(a:a:a):2/3$	$\mathbf{2^\circ}$	$(*2_02_02_02_0):3$	$(*2_02_02_02_0):3$
196			F23	F 2 3	$\boldsymbol{\Gamma_c^f T^2}$	*61s*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2}:a:a:a\right):2/3$	$\mathbf{1^\circ}$	$(*2_02_12_02_1):3$	$(*2_02_12_02_1):3$
197			I23	I 2 3	$\boldsymbol{\Gamma_c^v T^3}$	*60s*	$\left(\frac{a+b+c}{2}/a:a:a\right):2/3$	$\mathbf{4^{\circ\circ}}$	$(2_1*2_02_0):3$	$(2_1*2_02_0):3$
198			P2_13	P 2_1 3	$\boldsymbol{\Gamma_c T^4}$	*89a*	$(a:a:a):2_1/3$	$\mathbf{1^\circ/4}$	$(2_12_1\bar{\times}):3$	$(2_12_1\bar{\times}):3$
199			I2_13	I 2_1 3	$\boldsymbol{\Gamma_c^v T^5}$	*90a*	$\left(\frac{a+b+c}{2}/a:a:a\right):2_1/3$	$\mathbf{2^\circ/4}$	$(2_0*2_12_1):3$	$(2_0*2_12_1):3$
200	2/m $\bar{3}$	**3*2**	Pm$\bar{3}$	P 2/m $\bar{3}$	$\boldsymbol{\Gamma_c T_h^1}$	*62s*	$(a:a:a)\cdot m/\tilde{6}$	$\mathbf{4^-}$	$[*\cdot2\cdot2\cdot2\cdot2]:3$	$[*\cdot2\cdot2\cdot2\cdot2]:3$
201			Pn$\bar{3}$	P $\frac{2}{n}$ $\bar{3}$	$\boldsymbol{\Gamma_c T_h^2}$	*49h*	$(a:a:a)\cdot\widetilde{ab}/\tilde{6}$	$\mathbf{4^{\circ+}}$	$(2\bar{*}_12_02_0):3$	$(2\bar{*}_12_02_0):3$
202			Fm$\bar{3}$	F $\frac{2}{m}$ $\bar{3}$	$\boldsymbol{\Gamma_c^f T_h^3}$	*64s*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2}:a:a:a\right)\cdot m/\tilde{6}$	$\mathbf{2^-}$	$[*\cdot2\cdot2:2:2]:3$	$[*\cdot2\cdot2:2:2]:3$
203			Fd$\bar{3}$	F $\frac{2}{d}$ $\bar{3}$	$\boldsymbol{\Gamma_c^f T_h^4}$	*50h*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2}:a:a:a\right)\cdot\frac{1}{2}\widetilde{ab}/\tilde{6}$	$\mathbf{2^{\circ+}}$	$(2\bar{*}2_02_1):3$	$(2\bar{*}2_02_1):3$
204			Im$\bar{3}$	I $\frac{2}{m}$ $\bar{3}$	$\boldsymbol{\Gamma_c^v T_h^5}$	*63s*	$\left(\frac{a+b+c}{2}/a:a:a\right)\cdot m/\tilde{6}$	$\mathbf{8^{-\circ}}$	$[2_1*\cdot2\cdot2]:3$	$[2_1*\cdot2\cdot2]:3$
205			Pa$\bar{3}$	P $\frac{2_1}{a}$ $\bar{3}$	$\boldsymbol{\Gamma_c T_h^6}$	*91a*	$(a:a:a)\cdot\tilde{a}/\tilde{6}$	$\mathbf{2^-/4}$	$(2_12\bar{*}:):3)$	$(2_12\bar{*}:):3)$
206			Ia$\bar{3}$	I $\frac{2_1}{a}$ $\bar{3}$	$\boldsymbol{\Gamma_c^v T_h^7}$	*92a*	$\left(\frac{a+b+c}{2}/a:a:a\right)\cdot\tilde{a}/\tilde{6}$	$\mathbf{4^-/4}$	$(*2_12:2:2):3$	$(*2_12:2:2):3$
207	432	**432**	P432	P 4 3 2	$\boldsymbol{\Gamma_c O^1}$	*68s*	$(a:a:a):4/3$	$\mathbf{4^{\circ-}}$	$(*4_04_02_0):3$	$(*2_02_02_02_0):6$
208			P4_232	P 4_2 3 2	$\boldsymbol{\Gamma_c O^2}$	*98a*	$(a:a:a):4_2//3$	$\mathbf{4^+}$	$(*4_24_22_0):3$	$(*2_02_02_02_0):6$
209			F432	F 4 3 2	$\boldsymbol{\Gamma_c^f O^3}$	*70s*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2}:a:a:a\right):4/3$	$\mathbf{2^{\circ-}}$	$(*4_24_02_1):3$	$(*2_02_12_02_1):6$
210			F4_132	F 4_1 3 2	$\boldsymbol{\Gamma_c^f O^4}$	*97a*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2}:a:a:a\right):4_1//3$	$\mathbf{2^+}$	$(*4_34_12_0):3$	$(*2_02_12_02_1):6$
211			I432	I 4 3 2	$\boldsymbol{\Gamma_c^v O^5}$	*69s*	$\left(\frac{a+b+c}{2}/a:a:a\right):4/3$	$\mathbf{8^{+\circ}}$	$(4_24_02_1):3$	$(2_1*2_02_0):6$
212			P4_332	P 4_3 3 2	$\boldsymbol{\Gamma_c O^6}$	*94a*	$(a:a:a):4_3//3$	$\mathbf{2^+/4}$	$(4_1*2_1):3$	$(2_12_1\bar{\times}):6$
213			P4_132	P 4_1 3 2	$\boldsymbol{\Gamma_c O^7}$	*95a*	$(a:a:a):4_1//3$	$\mathbf{2^+/4}$	$(4_1*2_1):3$	$(2_12_1\bar{\times}):6$
214			I4_132	I 4_1 3 2	$\boldsymbol{\Gamma_c^v O^8}$	*96a*	$\left(\frac{a+b+c}{2}/:a:a:a\right):4_1//3$	$\mathbf{4^+/4}$	$(*4_34_12_0):3$	$(2_0*2_12_1):6$
215	$\bar{4}$3m	***332**	P$\bar{4}$3m	P $\bar{4}$ 3 m	$\boldsymbol{\Gamma_c T_d^1}$	*65s*	$(a:a:a):\tilde{4}/3$	$\mathbf{2^\circ:2}$	$(*4\cdot4_02_0):3$	$(*2_02_02_02_0):6$
216			F$\bar{4}$3m	F $\bar{4}$ 3 m	$\boldsymbol{\Gamma_c^f T_d^2}$	*67s*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2}:a:a:a\right):\tilde{4}/3$	$\mathbf{1^\circ:2}$	$(*4\cdot4_12_1):3$	$(*2_02_12_02_1):6$
217			I$\bar{4}$3m	I $\bar{4}$ 3 m	$\boldsymbol{\Gamma_c^v T_d^3}$	*66s*	$\left(\frac{a+b+c}{2}/a:a:a\right):\tilde{4}/3$	$\mathbf{4^\circ:2}$	$(*\cdot44:2):3$	$(2_1*2_02_0):6$
218			P$\bar{4}$3n	P $\bar{4}$ 3 n	$\boldsymbol{\Gamma_c T_d^4}$	*51h*	$(a:a:a):\tilde{4}//3$	$\mathbf{4^\circ}$	$(*4:4_02_0):3$	$(*2_02_02_02_0):6$
219			F$\bar{4}$3c	F $\bar{4}$ 3 c	$\boldsymbol{\Gamma_c^f T_d^5}$	*52h*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2}:a:a:a\right):\tilde{4}//3$	$\mathbf{2^{\circ\circ}}$	$(*4:4_12_1):3$	$(*2_02_12_02_1):6$
220			I$\bar{4}$3d	I $\bar{4}$ 3 d	$\boldsymbol{\Gamma_c^v T_d^6}$	*93a*	$\left(\frac{a+b+c}{2}/a:a:a\right):\tilde{4}//3$	$\mathbf{4^\circ/4}$	$(4\bar{*}2_1):3$	$(2_0*2_12_1):6$
221	4/m $\bar{3}$ 2/m	***432**	Pm$\bar{3}$m	P 4/m $\bar{3}$ 2/m	$\boldsymbol{\Gamma_c O_h^1}$	*71s*	$(a:a:a):4/\tilde{6}\cdot m$	$\mathbf{4^-:2}$	$[*\cdot4\cdot4\cdot2]:3$	$[*\cdot2\cdot2\cdot2\cdot2]:6$
222			Pn$\bar{3}$n	P $\frac{4}{3}$ $\frac{2}{n}$	$\boldsymbol{\Gamma_c O_h^2}$	*53h*	$(a:a:a):4/\tilde{6}\cdot\widetilde{abc}$	$\mathbf{8^{\circ\circ}}$	$(*4_04:2):3$	$(2\bar{*}_12_02_0):6$
223			Pm$\bar{3}$n	P $\frac{4_2}{m}$ $\bar{3}$ $\frac{2}{n}$	$\boldsymbol{\Gamma_c O_h^3}$	*102a*	$(a:a:a):4_2//\tilde{6}\cdot\widetilde{abc}$	$\mathbf{8^\circ}$	$[*\cdot4:4\cdot2]:3$	$[*\cdot2\cdot2\cdot2\cdot2]:6$
224			Pn$\bar{3}$m	P $\frac{4_2}{n}$ $\bar{3}$ $\frac{2}{m}$	$\boldsymbol{\Gamma_c O_h^4}$	*103a*	$(a:a:a):4_2//\tilde{6}\cdot m$	$\mathbf{4^+:2}$	$(*4_24\cdot2):3$	$(2\bar{*}_12_02_0):6$

225			$Fm\bar{3}m$	$F\frac{4}{3}\frac{m}{2}$	$\Gamma_c^f O_h^5$	*73s*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2} : a : a : a\right) : 4/\tilde{6}\cdot m$	$2^-:2$	$[*\cdot 4\cdot 4{:}2]:3$	$[*\cdot 2\cdot 2{:}2{:}2]:6$
226			$Fm\bar{3}c$	$F\frac{4}{3}\frac{m}{2}$	$\Gamma_c^f O_h^6$	*54h*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2} : a : a : a\right) : 4/\tilde{6}\cdot \tilde{c}$	4^{--}	$[*\cdot 4{:}4{:}2]:3$	$[*\cdot 2\cdot 2{:}2{:}2]:6$
227			$Fd\bar{3}m$	$F\frac{4_1}{3}\frac{d}{2}\frac{m}{2}$	$\Gamma_c^f O_h^7$	*100a*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2} : a : a : a\right) : 4_1//\tilde{6}\cdot m$	$2^+:2$	$(*4_1 4\cdot 2):3$	$(2\bar{*}2_0 2_1):6$
228			$Fd\bar{3}c$	$F\frac{4_1}{3}\frac{d}{2}\frac{c}{2}$	$\Gamma_c^f O_h^8$	*101a*	$\left(\frac{a+c}{2}/\frac{b+c}{2}/\frac{a+b}{2} : a : a : a\right) : 4_1//\tilde{6}\cdot \tilde{c}$	4^{++}	$(*4_1 4{:}2):3$	$(2\bar{*}2_0 2_1):6$
229			$Im\bar{3}m$	$I\frac{4}{3}\frac{m}{2}$	$\Gamma_c^v O_h^9$	*72s*	$\left(\frac{a+b+c}{2}/a : a : a\right) : 4/\tilde{6}\cdot m$	$8°:2$	$[*\cdot 4\cdot 4{:}2]:3$	$[2_1 *\cdot 2\cdot 2]:6$
230			$Ia\bar{3}d$	$I\frac{4_1}{3}\frac{a}{2}\frac{d}{2}$	$\Gamma_c^v O_h^{10}$	*99a*	$\left(\frac{a+b+c}{2}/a : a : a\right) : 4_1//\tilde{6}\cdot \frac{1}{2}\widetilde{abc}$	$8°/4$	$(*4_1 4{:}2):3$	$(*2_1 2{:}2{:}2):6$

References

1. Bradley, C. J.; Cracknell, A. P. (2010). *The mathematical theory of symmetry in solids : representation theory for point groups and space groups*. Oxford New York: Clarendon Press. pp. 127–134. ISBN 978-0-19-958258-7. OCLC 859155300 (https://www.worldcat.org/oclc/859155300).

External links

- International Union of Crystallography (http://www.iucr.org)
- Point Groups and Bravais Lattices (http://neon.mems.cmu.edu/degraef/pointgroups/)
- Full list of 230 crystallographic space groups (http://img.chem.ucl.ac.uk/sgp/mainmenu.htm)
- Conway et al. on fibrifold notation (https://www.emis.de/journals/BAG/vol.42/no.2/b42h2con.pdf)